



SEE SHEETS 129/601 COMMENT:
TOP REINFORCING MAT REQUIRED (SEE 'BENDING' TAB).
HAND CHECK REQUIRED FOR ANCHOR PULLOUT.



See Sheets 91/601 and 103, 110, 124 of 597 comment:
The above calculation is not valid if the heel soil bearing
pressure exceeds that of the toe
because the wall would then tend to rotate into the retained
soil. INSPECTOR MAY REQUIRE GEO TECH REPORT
FOR VERIFICATION.

**FULL SIZED LEDGIBLE COLOR REPORT
IS REQUIRED TO BE PROVIDED BY THE
PERMITTEE ON SITE FOR ALL
INSPECTIONS**

Structural Calculations

PREPARED FOR:

InSite Architects
1000 University Ave W
Suite 130
St. Paul, MN 55104

PROJECT:

Wesley Bradley Park
Phase II – Care Center
2220236.20

PREPARED BY:

Kyle Gysler, PE
Senior Project Engineer

REVIEWED BY:

Drew McEachern, PE, SE
Principal

DATE:

October 2023

Structural Calculations

For



Wesley Bradley Park Phase II – Care Center Puyallup, WA

Project # 2220236.20

**Project Principal
Project Engineer**

Drew McEachern, PE, SE
Kyle Gysler, PE

Design Criteria

Design Codes and Standards

Codes and Standards: Structural design and construction shall be in accordance with the applicable sections of the following codes and standards as adopted and amended by the local building authority: International Building Code, 2018 Edition.

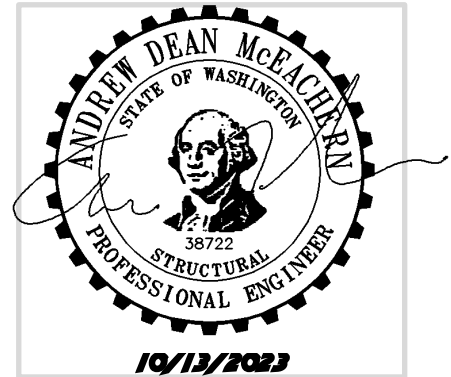
Structural Design Criteria:

Live Load Criteria:

Roof (Min Blanket Snow)	25 psf
Residential (Private Rooms and Corridors)	40 psf
Residential (Public Rooms and Corridors)	100 psf
Stairs and Exits	100 psf
Decks and Balconies (1.5x Occupancy Served, not exceeding 100 psf)	60 psf
Mechanical Mezzanine	50 psf
Light Storage	125 psf
Parking Garage	40 psf or 3,000 lbs wheel
Handrails and Guards	50 plf or 200 lbs concentrated

Wind Load Criteria:

Basic Wind Speed	98 mph
Risk Category	II
Wind Exposure	B
Topographic Factor	1.0



Seismic Criteria:

Risk Category	II
Seismic Importance Factor	1.00
$S_s = 1.257$	$S_1 = 0.434$
$S_{ds} = 1.006$	$S_{d1} = 0.434$
Site Class	= C
Seismic Design Category	= D
Response Modification Coeff. (R):	6 ½ (Light-Frame Steel Sheet Shear Wall) 5 (Special Reinforced Concrete Shear Wall)
Seismic Response Coeff. (C_s):	0.154 (Light-Frame Steel Sheet Shear Wall) 0.200 (Special Reinforced Concrete Shear Wall)

Soil Criteria:

Based on Geotechnical Engineering Report by: Terra Associates, Inc., dated November 14, 2016.

Allowable Soil Bearing Capacity: 3,000 psf allow 33% increase for loads from wind or seismic origin.

Active Earth Pressure	=	35 pcf
At Rest Earth Pressure	=	100 psf (uniform)
Seismic Earth Pressure	=	8H psf
Friction Coefficient	=	0.35
Passive Pressure	=	350 pcf

Project Description

The project consists of an addition to the Wesley Bradley Park Campus. The new building will be located adjacent to The Lodge building and will include catered living and amenities. The new structure will include one story of cold-formed steel framing supported on one story of cast-in-place concrete construction. The gravity system for the cold-formed steel structure will consist of metal roof deck spanning between light gauge steel roof joists which will be supported by steel beams and light gauge stud walls. The metal deck will act as the diaphragm for the upper structure lateral system which will span between light gauge stud walls sheathed with steel sheets for lateral resistance. The gravity system for the cast-in-place concrete structure will consist of a post-tensioned concrete slab spanning between concrete walls and columns. The post-tensioned slab will act as the diaphragm for the lower structure lateral system which will span between special concrete shear walls. Conventional shallow foundations will be used to support the lower structure.

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1.0 - DESIGN CRITERIA

Code Search

Code: International Building Code 2018

Occupancy:

Occupancy Group = R Residential

Risk Category & Importance Factors:

Risk Category = II
Wind factor = 1.00
Snow factor = 1.00
Seismic factor = 1.00

Type of Construction:

Fire Rating:
Roof = 0.0 hr
Floor = 0.0 hr

Building Geometry:

Roof angle (θ) 4.50 / 12 20.6 deg
Building length (L) 355.0 ft
Least width (B) 90.0 ft
Mean Roof Ht (h) 18.0 ft
Parapet ht above grd 18.0 ft
Minimum parapet ht 3.0 ft

Live Loads:

Roof 0 to 200 sf: 20 psf
200 to 600 sf: 23.4 - 0.0195Area, but not less than 12 psf
over 600 sf: 12 psf

Floor:

Typical Floor 40 psf
Partitions 15 psf
Dining rooms and restaurants 100 psf
Public rooms & corridors serving them 100 psf

Project: Wesley Bradley Park 2 Care Center
 Project No.: 2220236.20
 Date: 10/13/2023
 By: KBG
 Code: IBC 2018, ref. ASCE 7 (2016)



<u>Typical Roof Unit Dead Load</u>	(psf)	Roof Slope:		0.25 in.	per 12 in.	Seismic
		Decking	Joists	Beams	Girders	
Asphalt Shingles		2.0	2.0	2.0	2.0	2.0
1/2" Cover Board / Rigid		3.0	3.0	3.0	3.0	3.0
9/16" 22 GA Metal Deck		1.8	1.8	1.8	1.8	1.8
Batt Insulation		--	1.5	1.5	1.5	1.5
MEP		--	1.5	1.5	1.5	1.5
10" x 14 GA Joists at 16" oc		--	2.6	2.6	2.6	2.6
1/2" RC Channel		--	0.3	0.3	0.3	0.3
5/8" Gypsum Drywall		--	2.8	2.8	2.8	2.8
Miscellaneous		1.5	1.5	1.5	1.5	1.5
		--	--	--	--	--
		--	--	--	--	--
2x Interior and Exterior Walls (projected in plan)		--	--	--	--	7.0
Total Roof Dead Load		8.3	17.0	17.0	17.0	24.0
Total Roof Dead Load (w. Slope)		8.3	17.0	17.0	17.0	24.0
Total Roof Design Dead Load		9.0	18.0	18.0	18.0	25.0
Total Roof Design Dead Load (Solar Readiness + 4 psf)		13.0	22.0	22.0	22.0	29.0

<u>Roof Live Loads per IBC Chapter 16</u>	(psf)
Typical Roof Live Load	20.0
Minimum Snow Load per WABO	25.0
Calculated Snow Load	17.0
Roof Areas Used for Mechanical Purposes	50.0

Notes

- 1)
- 2)
- 3)
- 4)
- 5)



Typical PT Slab Unit Dead Load

(psf)

	Decking	Joists	Beams	Girders	Seismic
Floor Finishes	2.0	2.0	2.0	2.0	2.0
10" Concrete Slab	125.0	125.0	125.0	125.0	125.0
MEP	2.0	2.0	2.0	2.0	2.0
Batt Insulation	2.0	2.0	2.0	2.0	2.0
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
Miscellaneous	1.5	1.5	1.5	1.5	1.5
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
2x Interior and Exterior Walls (projected in plan)	--	--	--	--	7.0
Total Deck Dead Load	132.5	132.5	132.5	132.5	139.5
Total Deck Design Dead Load	133.0	133.0	133.0	133.0	140.0

Deck Live Loads per IBC Chapter 16

(psf)

Residential (Private)	40.0
Public Corridors / Stairs and Exits	100.0
Mechanical Rooms	50.0
Light Storage Rooms	125.0

Notes

- 1)
- 2)
- 3)
- 4)
- 5)

Project: Wesley Bradley Park 2 Care Center
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Typical Exterior Wall Unit Dead Load (psf)

	Wall
6" x 18 GA Studs at 16" oc	1.7
(2) 5/8" Gypsum Drywall (1 hr. Rated)	5.6
0.027" Steel Sheathing	1.5
Cement Fiber Board Finish	2.5
Weather Proofing Membrane	0.5
Batt Insulation	0.5
Miscellaneous	0.5
Total Exterior Wall Dead Load	13.0

Typical Interior Wall Unit Dead Load (psf)

	Wall
6" x 18 GA Studs at 16" oc	1.7
(2) 5/8" Gypsum Drywall (1 hr. Rated)	5.6
0.027" Steel Sheathing	1.5
Batt Insulation	0.5
Miscellaneous	0.5
Total Interior Wall Dead Load	10.0

Wind Loads : ASCE 7- 16

Ultimate Wind Speed 104 mph
Nominal Wind Speed 80.6 mph
Risk Category II
Exposure Category B
Enclosure Classif. Enclosed Building
Internal pressure +/-0.18
Directionality (Kd) 0.85
Kh case 1 0.701
Kh case 2 0.605
Type of roof Hip

Topographic Factor (Kzt)

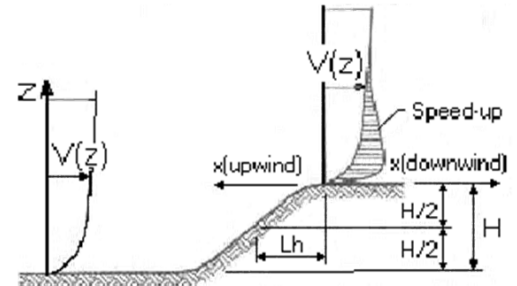
Topography 2D Escarpment
Hill Height (H) 350.0 ft
Half Hill Length (Lh) 1760.0 ft
Actual H/Lh = 0.20
Use H/Lh = 0.00
Modified Lh = 1760.0 ft
From top of crest: x = 5069.0 ft
Bldg up/down wind? downwind

H/Lh = 0.00 $K_1 = 0.000$
x/Lh = 2.88 $K_2 = 0.280$
z/Lh = 0.01 $K_3 = 0.975$

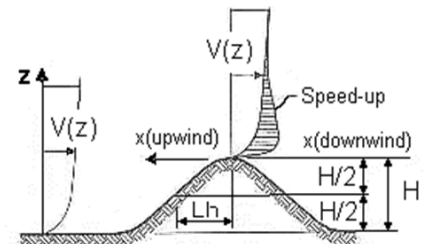
At Mean Roof Ht:

$$K_{zt} = (1 + K_1 K_2 K_3)^2 = 1.00$$

$H/Lh < 0.2$
 $\therefore K_{zt} = 1.0$



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

Gust Effect Factor

h = 18.0 ft
B = 90.0 ft
/z (0.6h) = 30.0 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).

If building h/B > 4 then may be flexible and should be investigated.

h/B = 0.20 Rigid structure (low rise bldg)

G = 0.85 Using rigid structure default

Rigid Structure

$\bar{e} = 0.33$
 $l = 320$ ft
 $z_{min} = 30$ ft
c = 0.30
 $g_Q, g_v = 3.4$
 $L_z = 310.0$ ft
Q = 0.87
 $I_z = 0.30$
G = 0.85

Flexible or Dynamically Sensitive Structure

34 rcy (η_1) = 0.0 Hz
Damping ratio (β) = 0
/b = 0.45
/a = 0.25
Vz = 67.0
 $N_1 = 0.00$
 $R_n = 0.000$
 $R_n = 28.282$ $\eta = 0.000$ h = 18.0 ft
 $R_B = 28.282$ $\eta = 0.000$
 $R_L = 28.282$ $\eta = 0.000$
 $g_R = 0.000$
R = 0.000
Gf = 0.000

Wind Loads - MWFRS $h \leq 60'$ (Low-rise Buildings) except for open buildings

$K_z = K_h$ (case 1) = 0.70
Base pressure (q_h) = **16.5 psf**
 $G C_{pi}$ = +/-0.18

Edge Strip (a) = 7.2 ft
End Zone (2a) = 14.4 ft
Zone 2 length = 45.0 ft

Wind Pressure Coefficients

Surface	CASE A $\theta = 20.6 \text{ deg}$			CASE B		
	GCpf	w/-GCpi	w/+GCpi	GCpf	w/-GCpi	w/+GCpi
1	0.53	0.71	0.35	-0.45	-0.27	-0.63
2	-0.64	-0.46	-0.82	-0.69	-0.51	-0.87
3	-0.48	-0.30	-0.66	-0.37	-0.19	-0.55
4	-0.43	-0.25	-0.61	-0.45	-0.27	-0.63
5				0.40	0.58	0.22
6				-0.29	-0.11	-0.47
1E	0.79	0.97	0.61	-0.48	-0.30	-0.66
2E	-1.00	-0.82	-1.18	-1.07	-0.89	-1.25
3E	-0.68	-0.50	-0.86	-0.53	-0.35	-0.71
4E	-0.63	-0.45	-0.81	-0.48	-0.30	-0.66
5E				0.61	0.79	0.43
6E				-0.43	-0.25	-0.61

Ultimate Wind Surface Pressures (psf)

1	11.7	5.8	-4.5	-10.4
2	-7.6	-13.5	-8.4	-14.3
3	-4.9	-10.8	-3.1	-9.1
4	-4.1	-10.0	-4.5	-10.4
5			9.6	3.6
6			-1.8	-7.7
1E	16.1	10.1	-4.9	-10.9
2E	-13.4	-19.4	-14.7	-20.6
3E	-8.3	-14.2	-5.8	-11.7
4E	-7.4	-13.4	-4.9	-10.9
5E			13.0	7.1
6E			-4.1	-10.1

Parapet

Windward parapet = 24.7 psf ($G C_{pn} = +1.5$)
Leeward parapet = -16.5 psf ($G C_{pn} = -1.0$)

Windward roof overhangs = 11.5 psf (upward) add to windward roof pressure

Horizontal MWFRS Simple Diaphragm Pressures (psf)

Transverse direction (normal to L)

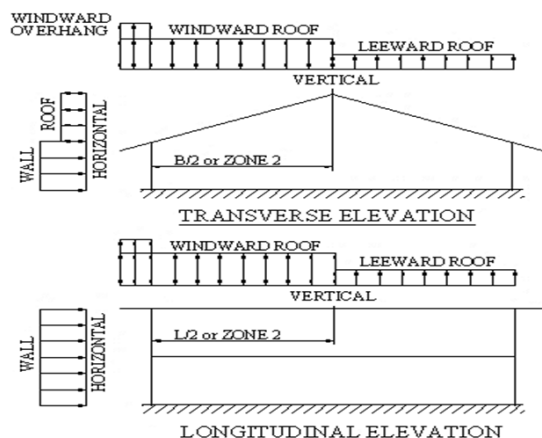
Interior Zone: Wall 15.8 psf
Roof -2.7 psf **
End Zone: Wall 23.5 psf
Roof -5.2 psf **

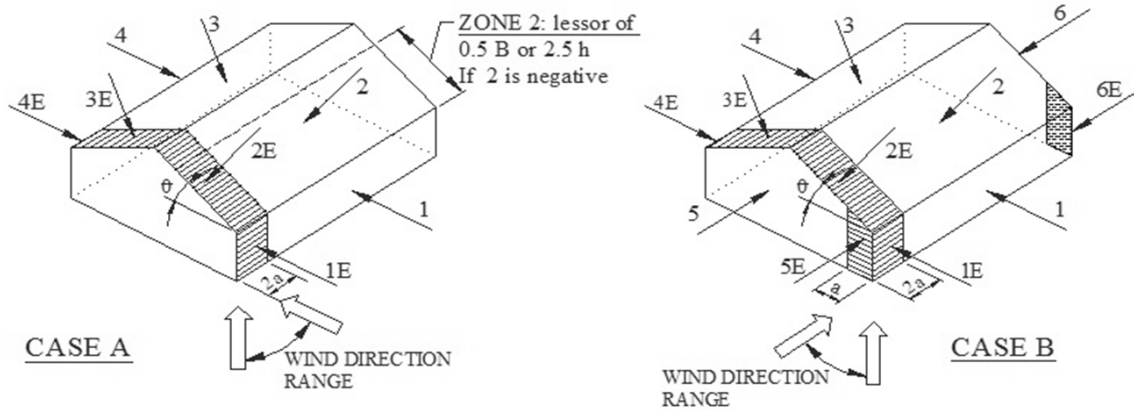
Longitudinal direction (parallel to L)

Interior Zone: Wall 11.4 psf
End Zone: Wall 17.1 psf

** NOTE: Total horiz force shall not be less than that determined by neglecting roof forces (except for MWFRS moment frames).

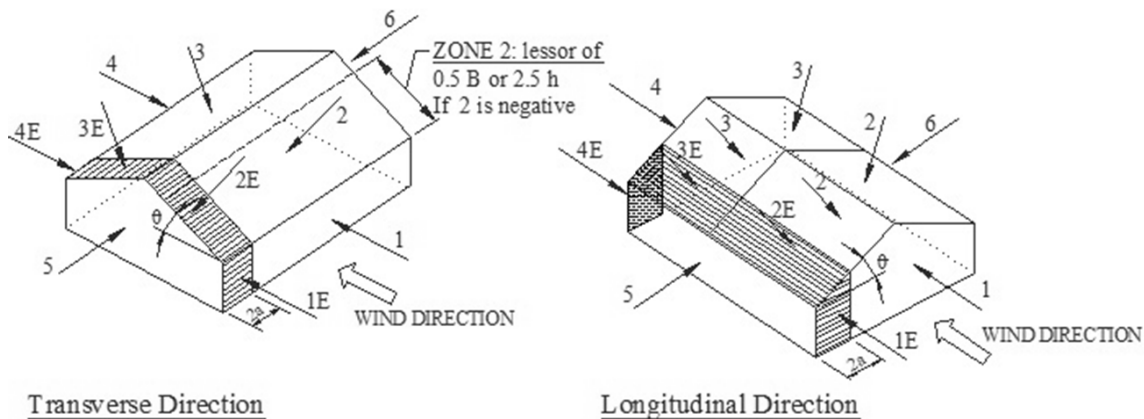
The code requires the MWFRS be designed for a min ultimate force of 16 psf multiplied by the wall area plus an 8 psf force applied to the vertical projection of the roof.





NOTE: Torsional loads are 25% of zones 1 - 6. See code for loading diagram.
Exception: One story buildings $h < 30'$ and 1 to 2 story buildings framed with light-frame construction or with flexible diaphragms need not be designed for the torsional load case.

ASCE 7-98 & ASCE 7-10 (& later) - MWFRS wind pressure zones



NOTE: Torsional loads are 25% of zones 1 - 4. See code for loading diagram.
Exception: One story buildings $h < 30'$ and 1 to 2 story buildings framed with light-frame construction or with flexible diaphragms need not be designed for the torsional load case.

ASCE 7-02 and ASCE 7-05 - MWFRS wind pressure zones

Ultimate Wind Pressures

Wind Loads - Components & Cladding : $h \leq 60'$

Kh (case 1) = 0.70 h = 18.0 ft
Base pressure (qh) = **16.5 psf** a = 7.2 ft
Minimum parapet ht = 3.0 ft GCpi = +/-0.18
Roof Angle (θ) = 20.6 deg qi = qh = 16.5 psf
Type of roof = Hip

Roof	Area	GCp +/- GCpi				Surface Pressure (psf)			
		7 sf	10 sf	100 sf	200 sf	7 sf	10 sf	100 sf	200 sf
Negative Zone 1		-1.58	-1.58	-0.98	-0.98	-26.1	-26.1	-16.2	-16.2
Negative Zone 2e & 2r		-2.18	-2.18	-1.41	-1.18	-35.9	-35.9	-23.3	-19.5
Negative Zone 3		-2.18	-2.18	-1.41	-1.18	-35.9	-35.9	-23.3	-19.5
Positive All Zones		0.88	0.88	0.48	0.48	16.0	16.0	16.0	16.0
Overhang Zone 1		-1.9	-1.9	-1.8	-1.8	-31.3	-31.3	-29.7	-29.7
Overhang Zone 2e & 2r		-2.5	-2.5	-2.12	-2	-41.2	-41.2	-34.9	-33.0
Overhang Zone 3		-3.1	-3.1	-1.87	-1.5	-51.1	-51.1	-30.8	-24.7

Overhang pressures in the table above assume an internal pressure coefficient (GCpi) of 0.0
Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 3 psf)

User input	
25 sf	50 sf
-22.1	-19.1
-30.9	-27.1
-30.9	-27.1
16.0	16.0
-30.7	-30.2
-38.7	-36.8
-43.0	-36.9

Parapet

qp = 16.5 psf

	Solid Parapet Pressure	Surface Pressure (psf)					
		10 sf	20 sf	50 sf	100 sf	200 sf	500 sf
CASE A: Zone 2e & 2r :		49.5	44.8	38.6	33.9	29.2	28.0
Zone 3 :		49.5	44.8	38.6	33.9	29.2	28.0
CASE B : Interior zone :		-34.6	-32.9	-30.6	-28.8	-27.0	-24.7
Corner zone :		-39.6	-36.9	-33.5	-30.8	-28.2	-24.7

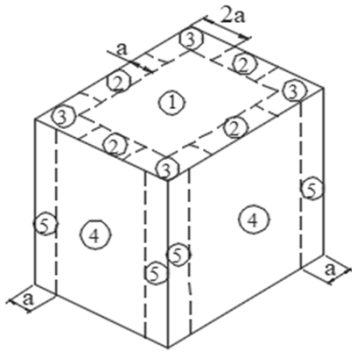
User input	
50 sf	
38.6	
38.6	
-30.6	
-33.5	

Walls

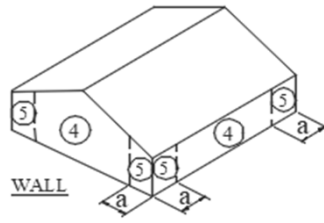
Area	GCp +/- GCpi				Surface Pressure at h			
	10 sf	100 sf	200 sf	500 sf	10 sf	100 sf	200 sf	500 sf
Negative Zone 4	-1.28	-1.10	-1.05	-0.98	-21.1	-18.2	-17.3	-16.2
Negative Zone 5	-1.58	-1.23	-1.12	-0.98	-26.1	-20.2	-18.5	-16.2
Positive Zone 4 & 5	1.18	1.00	0.95	0.88	19.5	16.5	16.0	16.0

User input	
10 sf	200 sf
-21.1	-17.3
-26.1	-18.5
19.5	16.0

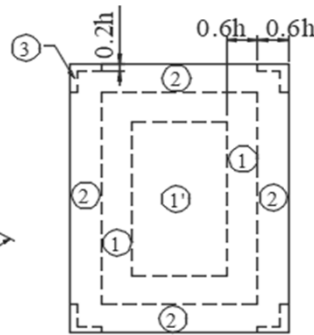
Location of C&C Wind Pressure Zones - ASCE 7-16



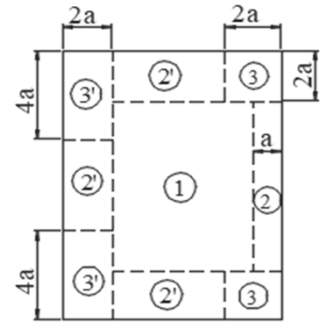
Roofs w/ $\theta \leq 10^\circ$
and all walls
 $h > 60'$



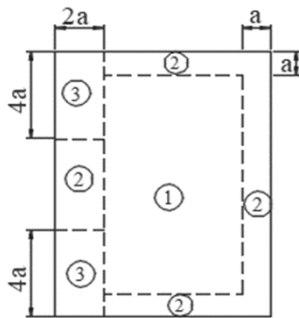
Walls $h \leq 60'$
& alt design $h < 90'$



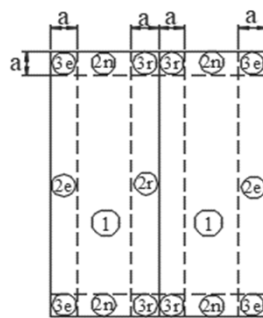
Gable, Sawtooth and
Multispan Gable $\theta \leq 7$ degrees &
Monoslope ≤ 3 degrees
 $h \leq 60'$ & alt design $h < 90'$



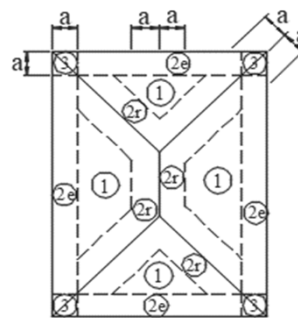
Monoslope roofs
 $3^\circ < \theta \leq 10^\circ$
 $h \leq 60'$ & alt design $h < 90'$



Monoslope roofs
 $10^\circ < \theta \leq 30^\circ$
 $h \leq 60'$ & alt design $h < 90'$



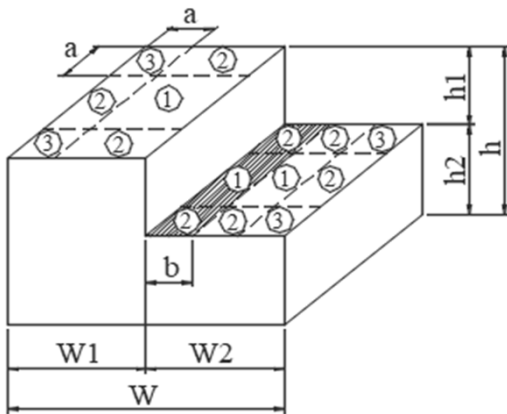
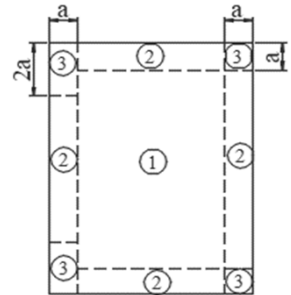
Multispan Gable &
Gable $7^\circ < \theta \leq 45^\circ$



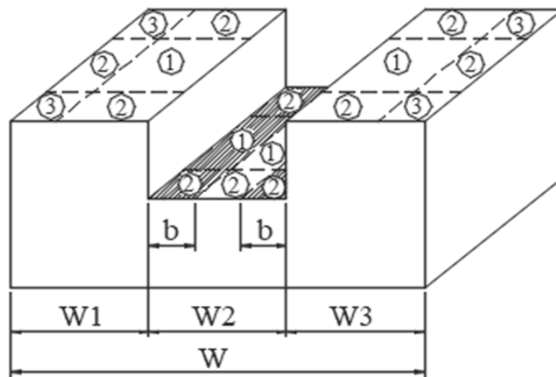
Hip $7^\circ < \theta \leq 27^\circ$



Sawtooth $10^\circ < \theta \leq 45^\circ$
 $h \leq 60'$ & alt design $h < 90'$



Stepped roofs $\theta \leq 3^\circ$
 $h \leq 60'$ & alt design $h < 90'$



Project: Wesley Bradley Park 2 Care Center
 Project No.: 2220236.20
 Date: 10/13/2023
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 Code: IBC 2018, ref. ASCE 7 (2016)



Seismic Base Shear per the Equivalent Lateral Force Procedure (ASCE 7-16 § 12.8)

Project 707 39th Avenue Southeast
Location Puyallup, WA 98374

Latitude 47.155637 °N
 Longitude 122.282849 °W

Mapped Spectral Accelerations (%g)	
Site Class	D (Default)
S_S	1.257
S_1	0.434

Site Coefficients (%g)	
F_a	F_v
Table 11.4-1	Table 11.4-2
1.2	1.5

Adjusted MCE Spectral Response Acceleration Parameters (ASCE 7-16 § 11.4.4)

S_{MS}	$F_a \cdot S_s$	1.508	(EQN 11.4-1)
S_{M1}	$F_v \cdot S_1$	0.651	(EQN 11.4-1)

Design Spectral Acceleration Parameters (ASCE 7-16 § 11.4.5)

S_{DS}	$2/3 \cdot S_{MS}$	1.006	(EQN 11.4-3)
S_{D1}	$2/3 \cdot S_{M1}$	0.434	(EQN 11.4-4)

Building Site Classification and Importance Factor (ASCE 7-16 § 1.5.2)

Occupancy Category:	II	
Seismic Importance Factor [I_e]:	1.00	(TBL 1.5-2)
Design Category Based On:		
S_1	N/A	
S_{DS}	D	
S_{D1}	D	
Seismic Design Category	D	

Design Coefficients and Factors for SFRS (ASCE 7-16 § 12.2)

	UPPER	LOWER	
Seismic Force Resisting System per ASCE 7 (T. 12.2-1):	LFWSW	SRCSW	
Is the Diaphragm Flexible? (T 12.2-1: Footnote b)	NO	NO	(TBL 12.2-1) Footnote b
Response Modification Coefficient [R]:	6.5	5	(TBL 12.2-1)
System Overstrength Factor [Ω_0]:	3	3	(TBL 12.2-1)
Deflection Amplification Factor [C_d]:	4	5	(TBL 12.2-1)
System Limitations: (For Seismic Design Category D)	65'	160'	(TBL 12.2-1)

Determine the Structural Period (ASCE 7-16 § 12.8.2)

C_t		0.02		(TBL 12.8-2)
x		0.75		(TBL 12.8-2)
h_n		12.0	feet	
C_u	Take As:	1.0		(TBL 12.8-1)
T_a	$C_u \cdot C_t \cdot h_n^x$	0.129	seconds	(EQN 12.8-7)
T_L		6		(FIG 22-14)
T_s	S_{D1} / S_{DS}	0.432		

Project: Wesley Bradley Park 2 Care Center
 Project No.: 2220236.20
 Date: 10/13/2023
 By: KBG
 Code: IBC 2018, ref. ASCE 7 (2016)



Seismic Response Coefficient (ASCE 7-16 § 12.8.1)

			UPPER	LOWER	
ρ	Redundancy		1.0	1.0	(§ 12.3.4)
C_s	$S_{DS}/(R/I)$		0.155	0.201	(EQN 12.8-2)
$C_{s\ MAX}$	$S_{D1}/(T \cdot R/I)$	$T \leq T_L$	0.518	0.673	(EQN 12.8-3)
	$S_{D1} \cdot T_L / (T^2 \cdot R/I)$	$T > T_L$			(EQN 12.8-4)
$C_{s\ MIN}$	$0.044 \cdot S_{DS} \cdot I$	$S_1 < 0.6g$	0.044	0.044	(EQN 12.8-5)
	$0.5 \cdot S_1 / (R/I)$	$S_1 \geq 0.6g$			(EQN 12.8-6)
V_u	$C_s \cdot W$		$0.155 \cdot W$	$0.201 \cdot W$	STRENGTH
V_u (incl. ρ)	$\rho \cdot C_s \cdot W$		0.155·W	0.201·W	STRENGTH
V_{ASD}	$0.7 \cdot V$		$0.108 \cdot W$	$0.141 \cdot W$	ASD
V_{ASD} (incl. ρ)	$0.7 \cdot \rho \cdot V$		0.108·W	0.141·W	ASD

Vertical Distribution of Forces. ASCE 7-16 § 12.8.3

STRENGTH

k		1.000				
UPPER						
LEVEL	W _x (kips)	h _x (feet)	W _x ·h _x ^k	C _{vx} = W _x ·h _x ^k /ΣW _x ·h _x ^k	F _x = C _{vx} ·V	F _x = C _{vx} ·V/ΣW _x
ROOF	829.4	29.0	24053	1.000	0.155*W	128.3
TOTAL	829.4		24053	1.000	0.155*W	128 kips

Two-Stage Analysis - Amplified Transfer Force. ASCE 7-16 § 12.2.3.2

R / ρ_{UPPER}	6.5					
R / ρ_{LOWER}	5	Lower Portion Seismic Force Resisting System:				
$A_{R/\rho}$	1.3	SRCSW			R	5
					ρ	1.0
Amplified Transfer Force:		167 kips	117 kips	ASD		

Vertical Distribution of Forces. ASCE 7-16 § 12.8.3

STRENGTH

k	1.000					
LOWER						
LEVEL	W _x (kips)	h _x (feet)	W _x ·h _x ^k	C _{vx} = W _x ·h _x ^k /ΣW _x ·h _x ^k	F _x = C _{vx} ·V	F _x = C _{vx} ·V/ΣW _x
TRANSFER						166.8
1	4671.2	11.0	51383	1.000	0.201*W	939.5
TOTAL	4671.2		51383	1.000	0.201*W	1106 kips

Project: Wesley Bradley Park 2 Care Center
 Project No.: 2220236.20
 Date: 10/13/2023
 By: KBG
 Code: IBC 2018, ref. ASCE 7 (2016)



Effective Seismic Weight (Upper 5 Floors of LFW)

Roof	Unit Weight (psf)	Area (ft ²)	Weight (k)	Story Weight
Typical Roof	22.0	27700	609.4	
Perimeter Walls	13.0	6270	81.5	
Interior Walls	10.0	13850	138.5	
				<u>+ 829.4 kips</u>

Total Seismic Weight - Upper 829 kips

Level 1	Unit Weight (psf)	Area (ft ²)	Weight (k)
Typical Floor	140.0	28665	4013.1
Perimeter Walls - Concrete	150.0	4147	622.1
Interior Walls - Concrete	100.0	360.25	36.0

+ 4671.2 kips

Total Seismic Weight - Lower 4671 kips

2.0 - FOUNDATION DESIGN



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC#: KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: F2.5x5.5

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf

Increases based on footing plan dimension

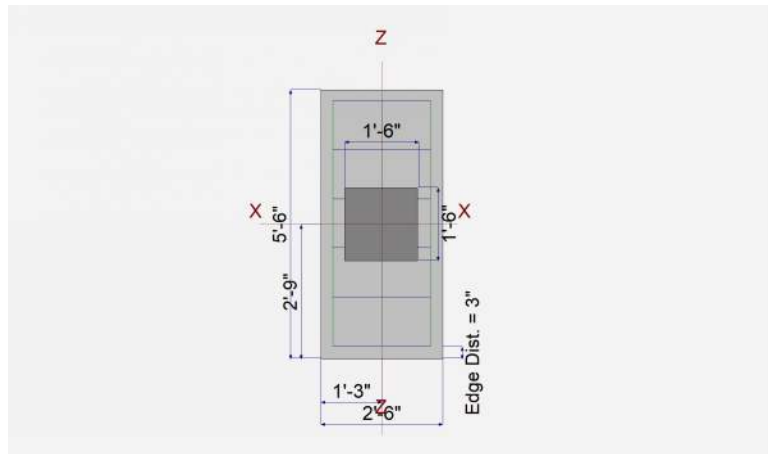
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	2.50 ft
Length parallel to Z-Z Axis	=	5.50 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	18.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



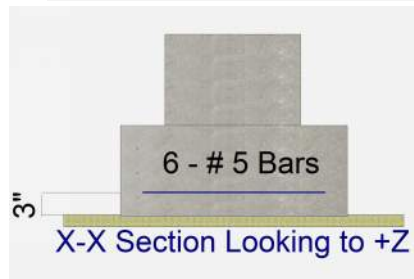
Reinforcing

Bars parallel to X-X Axis	=	6.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5
Bars parallel to Z-Z Axis	=	3.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	Bars along X-X Axis	
# Bars required within zone	62.5 %	
# Bars required on each side of zone	37.5 %	



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	28.580		7.070	3.760		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k



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General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F2.5x5.5

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9380	Soil Bearing	2.814 ksf	3.0 ksf	+D+0.750L+0.750S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.03273	Z Flexure (+X)	0.4317 k-ft/ft	13.192 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.03273	Z Flexure (-X)	0.4317 k-ft/ft	13.192 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.4778	X Flexure (+Z)	6.907 k-ft/ft	14.455 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.4778	X Flexure (-Z)	6.907 k-ft/ft	14.455 k-ft/ft	+1.20D+1.60L+0.50S
PASS	n/a	1-way Shear (+X)	0.0 psi	82.158 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	82.158 psi	n/a
PASS	0.4924	1-way Shear (+Z)	40.453 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4924	1-way Shear (-Z)	40.453 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	n/a	2-way Punching	31.268 psi	82.158 psi	+1.20D+1.60L+0.50S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0	2.224	2.224	n/a	n/a	0.741
X-X, +D+L	3.0	n/a	0.0	2.738	2.738	n/a	n/a	0.913
X-X, +D+S	3.0	n/a	0.0	2.497	2.497	n/a	n/a	0.832
X-X, +D+0.750L	3.0	n/a	0.0	2.609	2.609	n/a	n/a	0.870
X-X, +D+0.750L+0.750S	3.0	n/a	0.0	2.814	2.814	n/a	n/a	0.938
X-X, +0.60D	3.0	n/a	0.0	1.334	1.334	n/a	n/a	0.445
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	2.224	2.224	0.741
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.738	2.738	0.913
Z-Z, +D+S	3.0	0.0	n/a	n/a	n/a	2.497	2.497	0.832
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.609	2.609	0.870
Z-Z, +D+0.750L+0.750S	3.0	0.0	n/a	n/a	n/a	2.814	2.814	0.938
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.334	1.334	0.445

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	5.819	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.40D	5.819	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+1.60L	6.633	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+1.60L	6.633	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+1.60L+0.50S	6.907	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+1.60L+0.50S	6.907	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L	5.502	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L	5.502	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D	4.988	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D	4.988	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L+1.60S	6.377	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L+1.60S	6.377	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+1.60S	5.863	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F2.5x5.5

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	5.863	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L+0.50S	5.776	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L+0.50S	5.776	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L+0.70S	5.885	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +1.20D+0.50L+0.70S	5.885	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +0.90D	3.741	+Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
X-X, +0.90D	3.741	-Z	Bottom	0.2592	AsMin	0.3720	14.455	OK
Z-Z, +1.40D	0.3637	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.40D	0.3637	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+1.60L	0.4146	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+1.60L	0.4146	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+1.60L+0.50S	0.4317	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+1.60L+0.50S	0.4317	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L	0.3439	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L	0.3439	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D	0.3118	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D	0.3118	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L+1.60S	0.3986	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L+1.60S	0.3986	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+1.60S	0.3665	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+1.60S	0.3665	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L+0.50S	0.3610	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L+0.50S	0.3610	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L+0.70S	0.3678	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +1.20D+0.50L+0.70S	0.3678	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +0.90D	0.2338	-X	Bottom	0.2592	AsMin	0.3382	13.192	OK
Z-Z, +0.90D	0.2338	+X	Bottom	0.2592	AsMin	0.3382	13.192	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	34.08 psi	34.08 psi	34.08 psi	82.16 psi	0.41	OK
+1.20D+1.60L	0.00 psi	0.00 psi	38.85 psi	38.85 psi	38.85 psi	82.16 psi	0.47	OK
+1.20D+1.60L+0.50S	0.00 psi	0.00 psi	40.45 psi	40.45 psi	40.45 psi	82.16 psi	0.49	OK
+1.20D+0.50L	0.00 psi	0.00 psi	32.23 psi	32.23 psi	32.23 psi	82.16 psi	0.39	OK
+1.20D	0.00 psi	0.00 psi	29.22 psi	29.22 psi	29.22 psi	82.16 psi	0.36	OK
+1.20D+0.50L+1.60S	0.00 psi	0.00 psi	37.35 psi	37.35 psi	37.35 psi	82.16 psi	0.45	OK
+1.20D+1.60S	0.00 psi	0.00 psi	34.34 psi	34.34 psi	34.34 psi	82.16 psi	0.42	OK
+1.20D+0.50L+0.50S	0.00 psi	0.00 psi	33.83 psi	33.83 psi	33.83 psi	82.16 psi	0.41	OK
+1.20D+0.50L+0.70S	0.00 psi	0.00 psi	34.47 psi	34.47 psi	34.47 psi	82.16 psi	0.42	OK
+0.90D	0.00 psi	0.00 psi	21.91 psi	21.91 psi	21.91 psi	82.16 psi	0.27	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	26.35 psi	164.32psi	0.1603	OK
+1.20D+1.60L	30.03 psi	164.32psi	0.1828	OK
+1.20D+1.60L+0.50S	31.27 psi	164.32psi	0.1903	OK
+1.20D+0.50L	24.91 psi	164.32psi	0.1516	OK
+1.20D	22.58 psi	164.32psi	0.1374	OK
+1.20D+0.50L+1.60S	28.87 psi	164.32psi	0.1757	OK
+1.20D+1.60S	26.54 psi	164.32psi	0.1615	OK
+1.20D+0.50L+0.50S	26.15 psi	164.32psi	0.1591	OK
+1.20D+0.50L+0.70S	26.64 psi	164.32psi	0.1621	OK
+0.90D	16.94 psi	164.32psi	0.1031	OK

General Footing

Project File: 2220236 care center concrete framing.ec6

LIC# : KW-06014847. Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F2.5x5.5 (near exist sw fdn)

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values		
Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use fgt wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	Yes
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footings base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

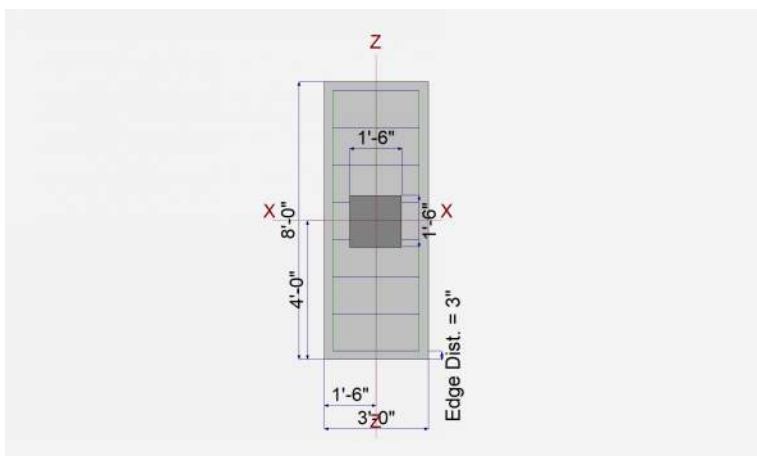
Allowable pressure increase per foot of depth = ksf

when max. length or width is greater than = ft

Dimensions

Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	8.0 ft
Footing Thickness	=	18.0 in

Pedestal dimensions...		
px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	18.0 in
Height		12.0 in
Rebar Centerline to Edge of Concrete...		
at Bottom of footing	=	3.0 in



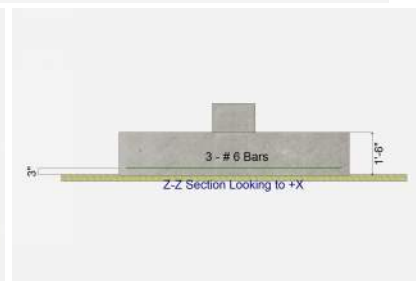
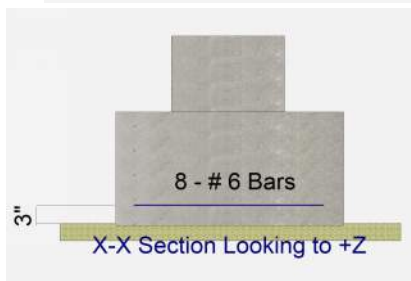
Reinforcing

Bars parallel to X-X Axis	=		8
Number of Bars			
Reinforcing Bar Size	=	#	6
Bars parallel to Z-Z Axis	=		3
Number of Bars			
Reinforcing Bar Size	=	#	6

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	Bars along X-X Axis
# Bars required within zone	54.5 %
# Bars required on each side of zone	45.5 %



Applied Loads

		D	Lr	L	S	W	E	H
P : Column Load	=	48.20		23.40	7.70			k
OB : Overburden	=							ksf
M-xx	=							k-ft
M-zz	=							k-ft
V-x	=							k
V-z	=							k



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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F2.5x5.5 (near exist sw fdn)

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9949	Soil Bearing	3.201 ksf	3.218 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.04027	Z Flexure (+X)	1.162 k-ft/ft	28.846 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.04027	Z Flexure (-X)	1.162 k-ft/ft	28.846 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.7562	X Flexure (+Z)	21.812 k-ft/ft	28.846 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.7562	X Flexure (-Z)	21.812 k-ft/ft	28.846 k-ft/ft	+1.20D+1.60L+0.50S
PASS	n/a	1-way Shear (+X)	0.0 psi	82.158 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	82.158 psi	n/a
PASS	0.5586	1-way Shear (+Z)	45.894 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.5586	1-way Shear (-Z)	45.894 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	n/a	2-way Punching	34.405 psi	82.158 psi	+1.20D+1.60L+0.50S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.218	n/a	0.0			2.226	2.226	n/a	n/a	0.692
X-X, +D+L	3.218	n/a	0.0			3.201	3.201	n/a	n/a	0.995
X-X, +D+S	3.218	n/a	0.0			2.547	2.547	n/a	n/a	0.792
X-X, +D+0.750L	3.218	n/a	0.0			2.957	2.957	n/a	n/a	0.919
X-X, +D+0.750L+0.750S	3.218	n/a	0.0			3.198	3.198	n/a	n/a	0.994
X-X, +0.60D	3.218	n/a	0.0			1.336	1.336	n/a	n/a	0.415
Z-Z, D Only	3.218	0.0	n/a			n/a	n/a	2.226	2.226	0.692
Z-Z, +D+L	3.218	0.0	n/a			n/a	n/a	3.201	3.201	0.995
Z-Z, +D+S	3.218	0.0	n/a			n/a	n/a	2.547	2.547	0.792
Z-Z, +D+0.750L	3.218	0.0	n/a			n/a	n/a	2.957	2.957	0.919
Z-Z, +D+0.750L+0.750S	3.218	0.0	n/a			n/a	n/a	3.198	3.198	0.994
Z-Z, +0.60D	3.218	0.0	n/a			n/a	n/a	1.336	1.336	0.415

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	14.848	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.40D	14.848	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+1.60L	20.965	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+1.60L	20.965	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+1.60L+0.50S	21.812	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+1.60L+0.50S	21.812	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L	15.301	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L	15.301	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D	12.727	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D	12.727	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L+1.60S	18.012	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L+1.60S	18.012	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+1.60S	15.438	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
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General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F2.5x5.5 (near exist sw fdn)

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	15.438	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L+0.50S	16.148	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L+0.50S	16.148	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L+0.70S	16.487	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +1.20D+0.50L+0.70S	16.487	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +0.90D	9.545	+Z	Bottom	0.3888	AsMin	0.440	28.846	OK
X-X, +0.90D	9.545	-Z	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.40D	0.7908	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.40D	0.7908	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+1.60L	1.117	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+1.60L	1.117	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+1.60L+0.50S	1.162	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+1.60L+0.50S	1.162	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L	0.8149	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L	0.8149	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D	0.6778	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D	0.6778	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L+1.60S	0.9593	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L+1.60S	0.9593	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+1.60S	0.8222	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+1.60S	0.8222	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L+0.50S	0.860	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L+0.50S	0.860	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L+0.70S	0.8781	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +1.20D+0.50L+0.70S	0.8781	+X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +0.90D	0.5084	-X	Bottom	0.3888	AsMin	0.440	28.846	OK
Z-Z, +0.90D	0.5084	+X	Bottom	0.3888	AsMin	0.440	28.846	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	31.24 psi	31.24 psi	31.24 psi	82.16 psi	0.38	OK
+1.20D+1.60L	0.00 psi	0.00 psi	44.11 psi	44.11 psi	44.11 psi	82.16 psi	0.54	OK
+1.20D+1.60L+0.50S	0.00 psi	0.00 psi	45.89 psi	45.89 psi	45.89 psi	82.16 psi	0.56	OK
+1.20D+0.50L	0.00 psi	0.00 psi	32.19 psi	32.19 psi	32.19 psi	82.16 psi	0.39	OK
+1.20D	0.00 psi	0.00 psi	26.78 psi	26.78 psi	26.78 psi	82.16 psi	0.33	OK
+1.20D+0.50L+1.60S	0.00 psi	0.00 psi	37.90 psi	37.90 psi	37.90 psi	82.16 psi	0.46	OK
+1.20D+1.60S	0.00 psi	0.00 psi	32.48 psi	32.48 psi	32.48 psi	82.16 psi	0.40	OK
+1.20D+0.50L+0.50S	0.00 psi	0.00 psi	33.98 psi	33.98 psi	33.98 psi	82.16 psi	0.41	OK
+1.20D+0.50L+0.70S	0.00 psi	0.00 psi	34.69 psi	34.69 psi	34.69 psi	82.16 psi	0.42	OK
+0.90D	0.00 psi	0.00 psi	20.08 psi	20.08 psi	20.08 psi	82.16 psi	0.24	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	23.42 psi	164.32psi	0.1425	OK
+1.20D+1.60L	33.07 psi	164.32psi	0.2013	OK
+1.20D+1.60L+0.50S	34.41 psi	164.32psi	0.2094	OK
+1.20D+0.50L	24.14 psi	164.32psi	0.1469	OK
+1.20D	20.08 psi	164.32psi	0.1222	OK
+1.20D+0.50L+1.60S	28.41 psi	164.32psi	0.1729	OK
+1.20D+1.60S	24.35 psi	164.32psi	0.1482	OK
+1.20D+0.50L+0.50S	25.47 psi	164.32psi	0.155	OK
+1.20D+0.50L+0.70S	26.01 psi	164.32psi	0.1583	OK
+0.90D	15.06 psi	164.32psi	0.09163	OK



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General Footing

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LIC#: KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F6.0

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.02 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	350.0 pcf
Soil/Concrete Friction Coeff.	=	0.350

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

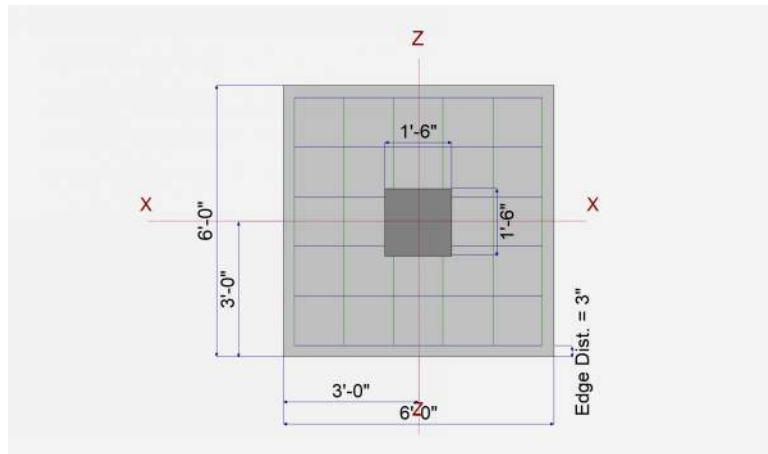
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	6.0 ft
Length parallel to Z-Z Axis	=	6.0 ft
Footing Thickness	=	14.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	18.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



Reinforcing

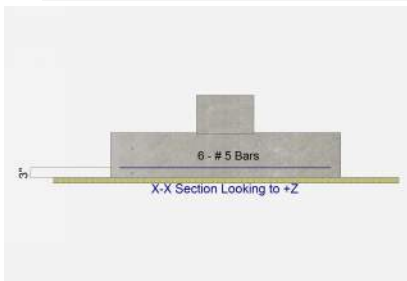
Bars parallel to X-X Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 5

Bars parallel to Z-Z Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	69.230		24.350	11.880		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k



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DESCRIPTION: F6.0

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9490	Soil Bearing	2.847 ksf	3.0 ksf	+D+0.750L+0.750S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.6030	Z Flexure (+X)	8.997 k-ft/ft	14.921 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.6030	Z Flexure (-X)	8.997 k-ft/ft	14.921 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.6030	X Flexure (+Z)	8.997 k-ft/ft	14.921 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.6030	X Flexure (-Z)	8.997 k-ft/ft	14.921 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.4327	1-way Shear (+X)	35.549 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4327	1-way Shear (-X)	35.549 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4327	1-way Shear (+Z)	35.549 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4327	1-way Shear (-Z)	35.549 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.5127	2-way Punching	84.248 psi	164.317 psi	+1.20D+1.60L+0.50S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			2.092	2.092	n/a	n/a	0.697
X-X, +D+L	3.0	n/a	0.0			2.769	2.769	n/a	n/a	0.923
X-X, +D+S	3.0	n/a	0.0			2.422	2.422	n/a	n/a	0.807
X-X, +D+0.750L	3.0	n/a	0.0			2.60	2.60	n/a	n/a	0.867
X-X, +D+0.750L+0.750S	3.0	n/a	0.0			2.847	2.847	n/a	n/a	0.949
X-X, +0.60D	3.0	n/a	0.0			1.255	1.255	n/a	n/a	0.418
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	2.092	2.092	0.697
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	2.769	2.769	0.923
Z-Z, +D+S	3.0	0.0	n/a			n/a	n/a	2.422	2.422	0.807
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	2.60	2.60	0.867
Z-Z, +D+0.750L+0.750S	3.0	0.0	n/a			n/a	n/a	2.847	2.847	0.949
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	1.255	1.255	0.418

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	6.814	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.40D	6.814	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+1.60L	8.579	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+1.60L	8.579	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+1.60L+0.50S	8.997	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+1.60L+0.50S	8.997	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L	6.696	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L	6.696	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D	5.840	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D	5.840	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L+1.60S	8.032	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L+1.60S	8.032	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+1.60S	7.177	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK



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AHBL, INC

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DESCRIPTION: F6.0

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	7.177	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L+0.50S	7.114	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L+0.50S	7.114	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L+0.70S	7.281	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +1.20D+0.50L+0.70S	7.281	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +0.90D	4.380	+Z	Bottom	0.3024	AsMin	0.310	14.921	OK
X-X, +0.90D	4.380	-Z	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.40D	6.814	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.40D	6.814	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+1.60L	8.579	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+1.60L	8.579	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+1.60L+0.50S	8.997	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+1.60L+0.50S	8.997	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L	6.696	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L	6.696	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D	5.840	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D	5.840	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L+1.60S	8.032	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L+1.60S	8.032	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+1.60S	7.177	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+1.60S	7.177	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L+0.50S	7.114	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L+0.50S	7.114	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L+0.70S	7.281	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +1.20D+0.50L+0.70S	7.281	+X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +0.90D	4.380	-X	Bottom	0.3024	AsMin	0.310	14.921	OK
Z-Z, +0.90D	4.380	+X	Bottom	0.3024	AsMin	0.310	14.921	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	26.92 psi	26.92 psi	26.92 psi	26.92 psi	26.92 psi	82.16 psi	0.33	OK
+1.20D+1.60L	33.90 psi	33.90 psi	33.90 psi	33.90 psi	33.90 psi	82.16 psi	0.41	OK
+1.20D+1.60L+0.50S	35.55 psi	35.55 psi	35.55 psi	35.55 psi	35.55 psi	82.16 psi	0.43	OK
+1.20D+0.50L	26.46 psi	26.46 psi	26.46 psi	26.46 psi	26.46 psi	82.16 psi	0.32	OK
+1.20D	23.08 psi	23.08 psi	23.08 psi	23.08 psi	23.08 psi	82.16 psi	0.28	OK
+1.20D+0.50L+1.60S	31.74 psi	31.74 psi	31.74 psi	31.74 psi	31.74 psi	82.16 psi	0.39	OK
+1.20D+1.60S	28.36 psi	28.36 psi	28.36 psi	28.36 psi	28.36 psi	82.16 psi	0.35	OK
+1.20D+0.50L+0.50S	28.11 psi	28.11 psi	28.11 psi	28.11 psi	28.11 psi	82.16 psi	0.34	OK
+1.20D+0.50L+0.70S	28.77 psi	28.77 psi	28.77 psi	28.77 psi	28.77 psi	82.16 psi	0.35	OK
+0.90D	17.31 psi	17.31 psi	17.31 psi	17.31 psi	17.31 psi	82.16 psi	0.21	OK

All units k

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	63.80 psi	164.32psi	0.3883	OK
+1.20D+1.60L	80.34 psi	164.32psi	0.4889	OK
+1.20D+1.60L+0.50S	84.25 psi	164.32psi	0.5127	OK
+1.20D+0.50L	62.70 psi	164.32psi	0.3816	OK
+1.20D	54.69 psi	164.32psi	0.3328	OK
+1.20D+0.50L+1.60S	75.22 psi	164.32psi	0.4578	OK
+1.20D+1.60S	67.20 psi	164.32psi	0.409	OK
+1.20D+0.50L+0.50S	66.62 psi	164.32psi	0.4054	OK
+1.20D+0.50L+0.70S	68.18 psi	164.32psi	0.4149	OK
+0.90D	41.02 psi	164.32psi	0.2496	OK



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC#: KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F8.0

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.02 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	350.0 pcf
Soil/Concrete Friction Coeff.	=	0.350

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

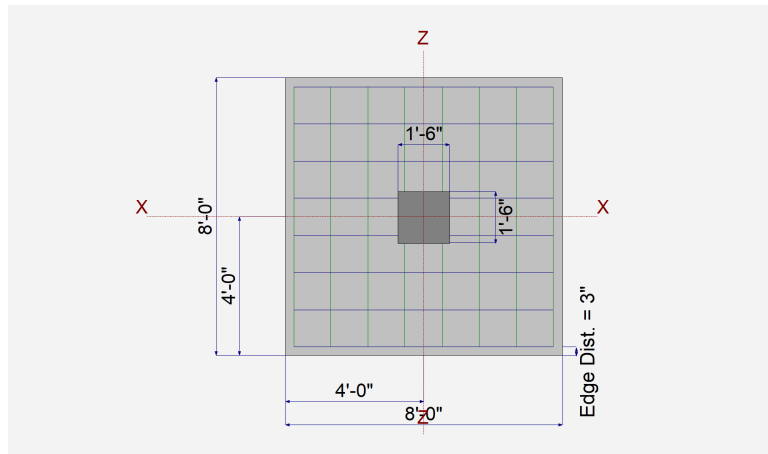
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	8.0 ft
Length parallel to Z-Z Axis	=	8.0 ft
Footing Thickness	=	20.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	18.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



Reinforcing

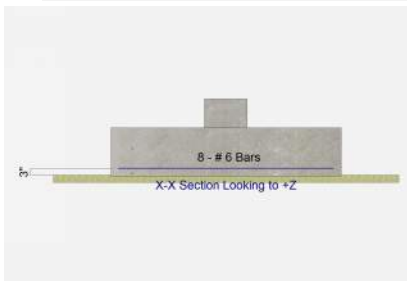
Bars parallel to X-X Axis	=	
Number of Bars	=	8
Reinforcing Bar Size	=	# 6

Bars parallel to Z-Z Axis	=	
Number of Bars	=	8
Reinforcing Bar Size	=	# 6

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	126.90		39.110	17.450		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k



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DESCRIPTION: F8.0

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9623	Soil Bearing	2.887 ksf	3.0 ksf	+D+0.750L+0.750S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.5623	Z Flexure (+X)	18.448 k-ft/ft	32.806 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.5623	Z Flexure (-X)	18.448 k-ft/ft	32.806 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.5623	X Flexure (+Z)	18.448 k-ft/ft	32.806 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.5623	X Flexure (-Z)	18.448 k-ft/ft	32.806 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.3835	1-way Shear (+X)	31.510 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.3835	1-way Shear (-X)	31.510 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.3835	1-way Shear (+Z)	31.510 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.3835	1-way Shear (-Z)	31.510 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4976	2-way Punching	81.767 psi	164.317 psi	+1.20D+1.60L+0.50S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			2.224	2.224	n/a	n/a	0.741
X-X, +D+L	3.0	n/a	0.0			2.836	2.836	n/a	n/a	0.945
X-X, +D+S	3.0	n/a	0.0			2.497	2.497	n/a	n/a	0.832
X-X, +D+0.750L	3.0	n/a	0.0			2.683	2.683	n/a	n/a	0.894
X-X, +D+0.750L+0.750S	3.0	n/a	0.0			2.887	2.887	n/a	n/a	0.962
X-X, +0.60D	3.0	n/a	0.0			1.335	1.335	n/a	n/a	0.445
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	2.224	2.224	0.741
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	2.836	2.836	0.945
Z-Z, +D+S	3.0	0.0	n/a			n/a	n/a	2.497	2.497	0.832
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	2.683	2.683	0.894
Z-Z, +D+0.750L+0.750S	3.0	0.0	n/a			n/a	n/a	2.887	2.887	0.962
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	1.335	1.335	0.445

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	14.659	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.40D	14.659	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+1.60L	17.728	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+1.60L	17.728	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+1.60L+0.50S	18.448	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+1.60L+0.50S	18.448	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L	14.179	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L	14.179	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D	12.565	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D	12.565	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L+1.60S	16.482	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L+1.60S	16.482	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+1.60S	14.869	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F8.0

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	14.869	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L+0.50S	14.898	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L+0.50S	14.898	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L+0.70S	15.186	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +1.20D+0.50L+0.70S	15.186	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +0.90D	9.424	+Z	Bottom	0.4320	AsMin	0.440	32.806	OK
X-X, +0.90D	9.424	-Z	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.40D	14.659	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.40D	14.659	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+1.60L	17.728	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+1.60L	17.728	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+1.60L+0.50S	18.448	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+1.60L+0.50S	18.448	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L	14.179	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L	14.179	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D	12.565	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D	12.565	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L+1.60S	16.482	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L+1.60S	16.482	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+1.60S	14.869	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+1.60S	14.869	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L+0.50S	14.898	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L+0.50S	14.898	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L+0.70S	15.186	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +1.20D+0.50L+0.70S	15.186	+X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +0.90D	9.424	-X	Bottom	0.4320	AsMin	0.440	32.806	OK
Z-Z, +0.90D	9.424	+X	Bottom	0.4320	AsMin	0.440	32.806	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	25.04 psi	25.04 psi	25.04 psi	25.04 psi	25.04 psi	82.16 psi	0.30	OK
+1.20D+1.60L	30.28 psi	30.28 psi	30.28 psi	30.28 psi	30.28 psi	82.16 psi	0.37	OK
+1.20D+1.60L+0.50S	31.51 psi	31.51 psi	31.51 psi	31.51 psi	31.51 psi	82.16 psi	0.38	OK
+1.20D+0.50L	24.22 psi	24.22 psi	24.22 psi	24.22 psi	24.22 psi	82.16 psi	0.29	OK
+1.20D	21.46 psi	21.46 psi	21.46 psi	21.46 psi	21.46 psi	82.16 psi	0.26	OK
+1.20D+0.50L+1.60S	28.15 psi	28.15 psi	28.15 psi	28.15 psi	28.15 psi	82.16 psi	0.34	OK
+1.20D+1.60S	25.40 psi	25.40 psi	25.40 psi	25.40 psi	25.40 psi	82.16 psi	0.31	OK
+1.20D+0.50L+0.50S	25.45 psi	25.45 psi	25.45 psi	25.45 psi	25.45 psi	82.16 psi	0.31	OK
+1.20D+0.50L+0.70S	25.94 psi	25.94 psi	25.94 psi	25.94 psi	25.94 psi	82.16 psi	0.32	OK
+0.90D	16.10 psi	16.10 psi	16.10 psi	16.10 psi	16.10 psi	82.16 psi	0.20	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	64.97 psi	164.32psi	0.3954	OK
+1.20D+1.60L	78.58 psi	164.32psi	0.4782	OK
+1.20D+1.60L+0.50S	81.77 psi	164.32psi	0.4976	OK
+1.20D+0.50L	62.84 psi	164.32psi	0.3824	OK
+1.20D	55.69 psi	164.32psi	0.3389	OK
+1.20D+0.50L+1.60S	73.05 psi	164.32psi	0.4446	OK
+1.20D+1.60S	65.90 psi	164.32psi	0.4011	OK
+1.20D+0.50L+0.50S	66.03 psi	164.32psi	0.4019	OK
+1.20D+0.50L+0.70S	67.31 psi	164.32psi	0.4096	OK
+0.90D	41.77 psi	164.32psi	0.2542	OK



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General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F10.0

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.02 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	350.0 pcf
Soil/Concrete Friction Coeff.	=	0.350

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

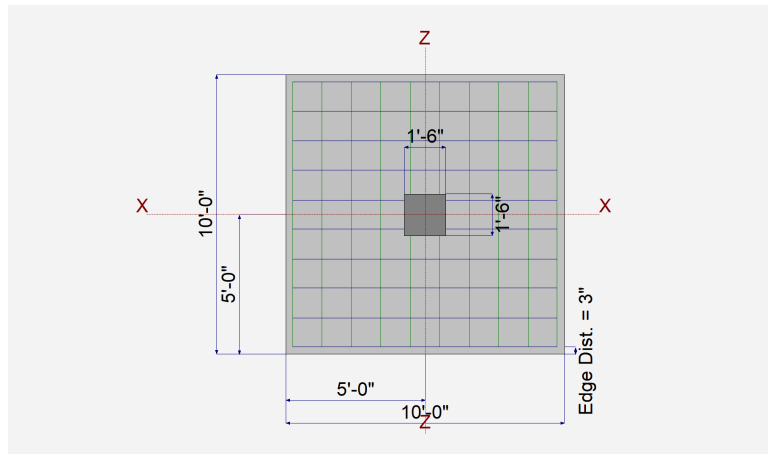
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	10.0 ft
Length parallel to Z-Z Axis	=	10.0 ft
Footing Thickness	=	24.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	18.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



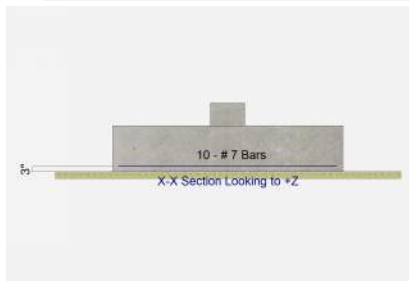
Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	10.0
Reinforcing Bar Size	=	# 7
Bars parallel to Z-Z Axis	=	
Number of Bars	=	10.0
Reinforcing Bar Size	=	# 7

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	175.20		84.150	29.690		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: F10.0

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9653	Soil Bearing	2.896 ksf	3.0 ksf	+D+0.750L+0.750S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.5894	Z Flexure (+X)	32.483 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.5894	Z Flexure (-X)	32.483 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.5894	X Flexure (+Z)	32.483 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.5894	X Flexure (-Z)	32.483 k-ft/ft	55.112 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.4344	1-way Shear (+X)	35.687 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4344	1-way Shear (-X)	35.687 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4344	1-way Shear (+Z)	35.687 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.4344	1-way Shear (-Z)	35.687 psi	82.158 psi	+1.20D+1.60L+0.50S
PASS	0.5998	2-way Punching	98.562 psi	164.317 psi	+1.20D+1.60L+0.50S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			2.042	2.042	n/a	n/a	0.681
X-X, +D+L	3.0	n/a	0.0			2.884	2.884	n/a	n/a	0.961
X-X, +D+S	3.0	n/a	0.0			2.339	2.339	n/a	n/a	0.780
X-X, +D+0.750L	3.0	n/a	0.0			2.673	2.673	n/a	n/a	0.891
X-X, +D+0.750L+0.750S	3.0	n/a	0.0			2.896	2.896	n/a	n/a	0.965
X-X, +0.60D	3.0	n/a	0.0			1.225	1.225	n/a	n/a	0.408
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	2.042	2.042	0.681
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	2.884	2.884	0.961
Z-Z, +D+S	3.0	0.0	n/a			n/a	n/a	2.339	2.339	0.780
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	2.673	2.673	0.891
Z-Z, +D+0.750L+0.750S	3.0	0.0	n/a			n/a	n/a	2.896	2.896	0.965
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	1.225	1.225	0.408

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	22.149	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.40D	22.149	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+1.60L	31.143	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+1.60L	31.143	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+1.60L+0.50S	32.483	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+1.60L+0.50S	32.483	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L	22.784	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L	22.784	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D	18.985	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D	18.985	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L+1.60S	27.074	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L+1.60S	27.074	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+1.60S	23.274	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK



AHBL, INC.
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: F10.0

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	23.274	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L+0.50S	24.125	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L+0.50S	24.125	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L+0.70S	24.661	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +1.20D+0.50L+0.70S	24.661	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +0.90D	14.239	+Z	Bottom	0.5184	AsMin	0.60	55.112	OK
X-X, +0.90D	14.239	-Z	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.40D	22.149	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.40D	22.149	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+1.60L	31.143	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+1.60L	31.143	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+1.60L+0.50S	32.483	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+1.60L+0.50S	32.483	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L	22.784	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L	22.784	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D	18.985	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D	18.985	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L+1.60S	27.074	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L+1.60S	27.074	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+1.60S	23.274	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+1.60S	23.274	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L+0.50S	24.125	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L+0.50S	24.125	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L+0.70S	24.661	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +1.20D+0.50L+0.70S	24.661	+X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +0.90D	14.239	-X	Bottom	0.5184	AsMin	0.60	55.112	OK
Z-Z, +0.90D	14.239	+X	Bottom	0.5184	AsMin	0.60	55.112	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	24.33 psi	24.33 psi	24.33 psi	24.33 psi	24.33 psi	82.16 psi	0.30	OK
+1.20D+1.60L	34.21 psi	34.21 psi	34.21 psi	34.21 psi	34.21 psi	82.16 psi	0.42	OK
+1.20D+1.60L+0.50S	35.69 psi	35.69 psi	35.69 psi	35.69 psi	35.69 psi	82.16 psi	0.43	OK
+1.20D+0.50L	25.03 psi	25.03 psi	25.03 psi	25.03 psi	25.03 psi	82.16 psi	0.30	OK
+1.20D	20.86 psi	20.86 psi	20.86 psi	20.86 psi	20.86 psi	82.16 psi	0.25	OK
+1.20D+0.50L+1.60S	29.74 psi	29.74 psi	29.74 psi	29.74 psi	29.74 psi	82.16 psi	0.36	OK
+1.20D+1.60S	25.57 psi	25.57 psi	25.57 psi	25.57 psi	25.57 psi	82.16 psi	0.31	OK
+1.20D+0.50L+0.50S	26.50 psi	26.50 psi	26.50 psi	26.50 psi	26.50 psi	82.16 psi	0.32	OK
+1.20D+0.50L+0.70S	27.09 psi	27.09 psi	27.09 psi	27.09 psi	27.09 psi	82.16 psi	0.33	OK
+0.90D	15.64 psi	15.64 psi	15.64 psi	15.64 psi	15.64 psi	82.16 psi	0.19	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	67.21 psi	164.32psi	0.409	OK
+1.20D+1.60L	94.50 psi	164.32psi	0.5751	OK
+1.20D+1.60L+0.50S	98.56 psi	164.32psi	0.5998	OK
+1.20D+0.50L	69.13 psi	164.32psi	0.4207	OK
+1.20D	57.60 psi	164.32psi	0.3506	OK
+1.20D+0.50L+1.60S	82.15 psi	164.32psi	0.4999	OK
+1.20D+1.60S	70.62 psi	164.32psi	0.4298	OK
+1.20D+0.50L+0.50S	73.20 psi	164.32psi	0.4455	OK
+1.20D+0.50L+0.70S	74.83 psi	164.32psi	0.4554	OK
+0.90D	43.20 psi	164.32psi	0.2629	OK



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Pole Footing Embedded in Soil

Project File: 2220236_care center concrete framing.ec6

LIC#: KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: Entry Canopy Foundation

Code References

Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape Rectangular
Pole Footing Width 42.0 in
Find Lateral Pressure for Given Depth
No Lateral Restraint at Ground Surface
Allow Passive 350.0 pcf
Max Passive 1,500.0 psf
Embedment Depth of Footing 3.50 ft

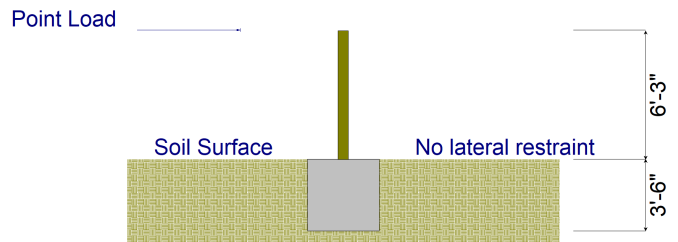
Controlling Values

Governing Load Combination D+0.70E
Lateral Load 0.660 k
Moment 4.125 k-ft

NO Ground Surface Restraint

Pressures at 1/3 Depth
Actual **265.0** psf
Allowable **408.333** psf

Footing Base Area 12.250 ft²
Maximum Soil Pressure 0.6776 ksf



Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k)		Vertical Load (k)
D : Dead Load	0.10 k		k/ft	4.50 k
Lr : Roof Live	0.0 k		k/ft	k
L : Live	k		k/ft	k
S : Snow	0.10 k		k/ft	3.80 k
W : Wind	k		k/ft	k
E : Earthquake	0.80 k		k/ft	-0.50 k
H : Lateral Earth	k		k/ft	k
Load distance above ground surface	6.250 ft	TOP of Load above ground surface	ft	
		BOTTOM of Load above ground surface	ft	

Load Combination Results

Load Combination	Forces @ Ground Surface		Pressure at 1/3 Depth		Soil Increase
	Loads - (k)	Moments - (ft-k)	Actual - (psf)	Allow - (psf)	Factor
D Only	0.100	0.625	41.0	408.3	1.000
+D+S	0.200	1.250	81.0	408.3	1.000
+D+0.750S	0.175	1.094	71.0	408.3	1.000
+D+0.70E	0.660	4.125	265.0	408.3	1.000
+D+0.750S+0.5250E	0.595	3.719	239.0	408.3	1.000
+0.60D	0.060	0.375	25.0	408.3	1.000
+0.60D+0.70E	0.620	3.875	249.0	408.3	1.000



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2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall

Code Reference:

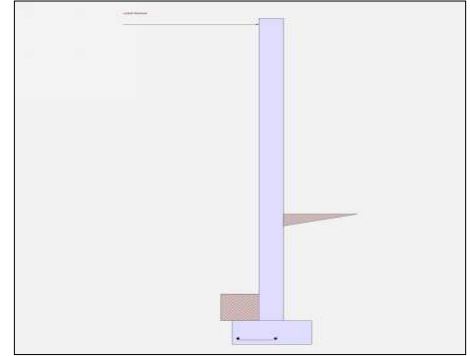
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	6.0 ft
Wall height above soil	=	11.0 ft
Total Wall Height	=	17.0 ft
Top Support Height	=	16.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,503.0 lbs
Axial Live Load	=	440.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	6.0 ft
...Height to Bottom	=	0.0 ft
Load Type	=	Earth (H) (Service Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3
Added seismic per unit area	=	0.0 psf

Design Summary

Total Bearing Load	=	6,349.25 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	1,814.07 psf OK
Soil Pressure @ Heel	=	1,814.07 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,227.17 psf
ACI Factored @ Heel	=	2,227.17 psf
Footing Shear @ Toe	=	2.485 psi OK
Footing Shear @ Heel	=	7.987 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	6.970 lbs
Reaction at Bottom	=	1,766.47 lbs

Sliding Calcs

Lateral Sliding Force	=	1,766.47 lbs
-----------------------	---	--------------

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 16.50 ft	0.06627 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.046	0.174	0.299
Moment.....Actual	= 835.87 ft-#	3,983.51 ft-#	3,983.51 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 16.545 lbs		2,016.91 lbs
Shear.....Actual	= 0.1451 psi		28.013 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



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Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall

Footing Strengths & Dimensions

Toe Width	=	1.250 ft
Heel Width	=	2.250
Total Footing Width	=	3.50
Footing Thickness	=	16.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,227.17	2,227.17 psf
Mu' : Upward	= 1,739.98	ft-#
Mu' : Downward	= 342.188	ft-#
Mu: Design	= 1,398	-809 ft-#
Actual 1-Way Shear	= 2.485	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Heel: None Spec'd	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		1.21 in2
Min footing T&S reinf Area per foot		0.35 in2 /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 6.94 in		#4@ 13.89 in
#5@ 10.76 in		#5@ 21.53 in
#6@ 15.28 in		#6@ 30.56 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	1,412.94 lbs
Heel Active Pressure	=	353.535
Sliding Force	=	1,766.47 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-2,853.56ft-#
Surcharge Over Heel	125.0	2.875 359.375
Adjacent Footing Load	= 0.0 lbs	0.0 ft 0.0ft-#
Axial Dead Load on Stem	= 1,943.0 lbs	1.750 ft 3,400.25ft-#
Soil Over Toe	= 206.250 lbs	0.6250 ft 128.906ft-#
Surcharge Over Toe	= 0.0 lbs	0.0 ft 0.0ft-#
Stem Weight	= 2,550.0 lbs	1.750 ft 4,462.50ft-#
Soil Over Heel	= 825.0 lbs	2.875 ft 2,371.88ft-#
Footing Weight	= 700.0 lbs	1.751 ft 1,225.50ft-#
Total Vertical Force	= 6,349.25 lbs	Base Moment = 9,094.85ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall

Rebar Lap & Embedment Lengths Information



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
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Project Descr:

Restrained Retaining Wall

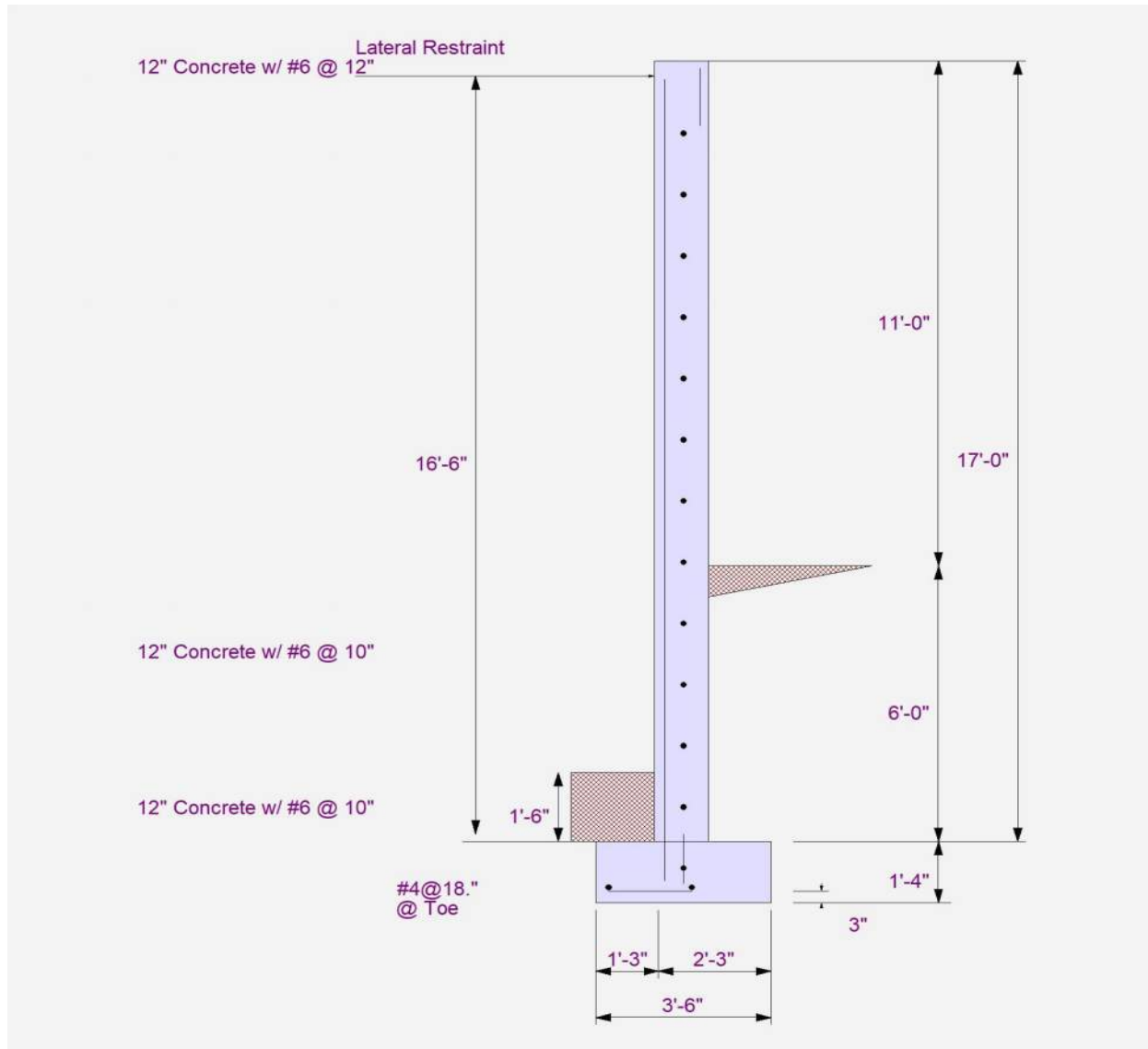
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall





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Restrained Retaining Wall

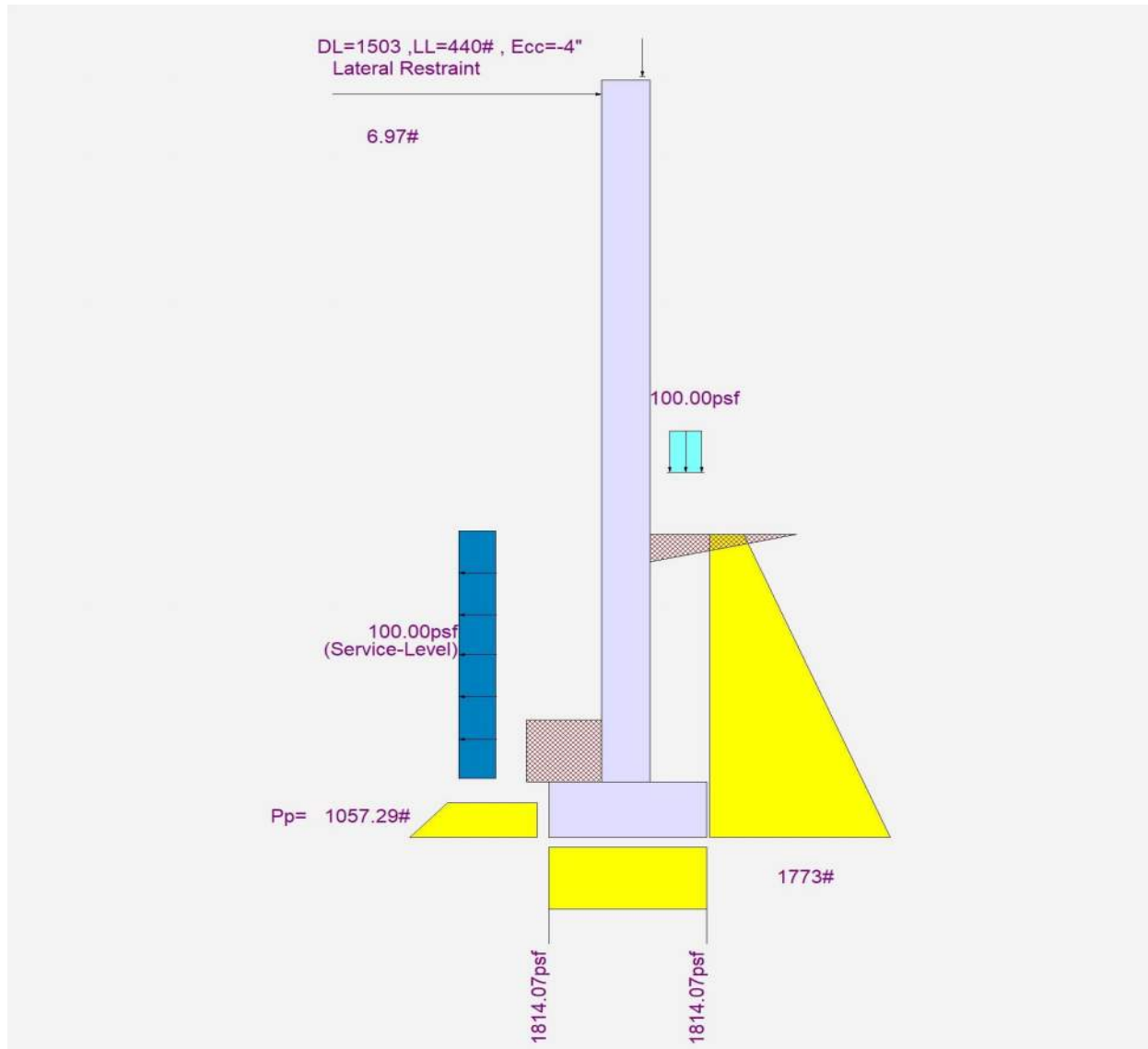
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 17' Basement Wall





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 17' Basement Wall - EQ

Code Reference:

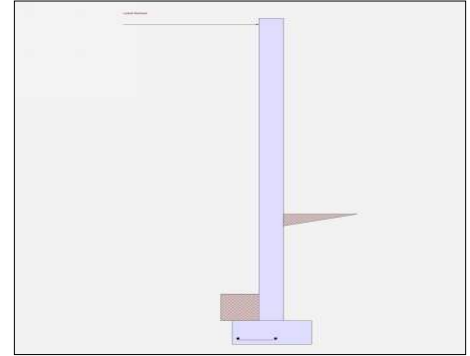
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	6.0 ft
Wall height above soil	=	11.0 ft
Total Wall Height	=	17.0 ft
Top Support Height	=	16.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,503.0 lbs
Axial Live Load	=	440.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	6.0 ft
...Height to Bottom	=	ft
Load Type	=	Earth (H) (Service Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 41.068 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	6,224.25 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	1,778.36 psf OK
Soil Pressure @ Heel	=	1,778.36 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,184.31 psf
ACI Factored @ Heel	=	2,184.31 psf
Footing Shear @ Toe	=	2.425 psi OK
Footing Shear @ Heel	=	8.891 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	10.306 lbs
Reaction at Bottom	=	1,776.22 lbs

Sliding Calcs

Lateral Sliding Force	=	1,776.22 lbs
-----------------------	---	--------------

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 16.50 ft	0.06627 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.046	0.179	0.306
Moment.....Actual	= 835.87 ft-#	4,077.01 ft-#	4,077.01 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 19.343 lbs		2,060.67 lbs
Shear.....Actual	= 0.1697 psi		28.620 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 17' Basement Wall - EQ

Footing Strengths & Dimensions

Toe Width	=	1.250 ft
Heel Width	=	2.250
Total Footing Width	=	3.50
Footing Thickness	=	16.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,184.31	2,184.31 psf
Mu' : Upward	= 1,706.50	ft-#
Mu' : Downward	= 342.188	ft-#
Mu: Design	= 1,364	-900 ft-#
Actual 1-Way Shear	= 2.425	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Heel: None Spec'd	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		1.21 in2
Min footing T&S reinf Area per foot		0.35 in2 /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 6.94 in		#4@ 13.89 in
#5@ 10.76 in		#5@ 21.53 in
#6@ 15.28 in		#6@ 30.56 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	1,465.10 lbs
Heel Active Pressure	=	311.111
Sliding Force	=	1,776.22 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-2,965.02ft-#
Surcharge Over Heel	0.0	0.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft
Axial Dead Load on Stem	= 1,943.0 lbs	1.750 ft
Soil Over Toe	= 206.250 lbs	0.6250 ft
Surcharge Over Toe	= 0.0 lbs	0.0 ft
Stem Weight	= 2,550.0 lbs	1.750 ft
Soil Over Heel	= 825.0 lbs	2.875 ft
Footing Weight	= 700.0 lbs	1.751 ft
Total Vertical Force	= 6,224.25 lbs	Base Moment = 8,624.02ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

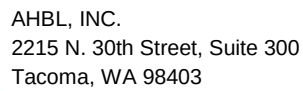
LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 17' Basement Wall - EQ

Rebar Lap & Embedment Lengths Information



Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Project File: 2220236_care center concrete framing.ec6

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Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

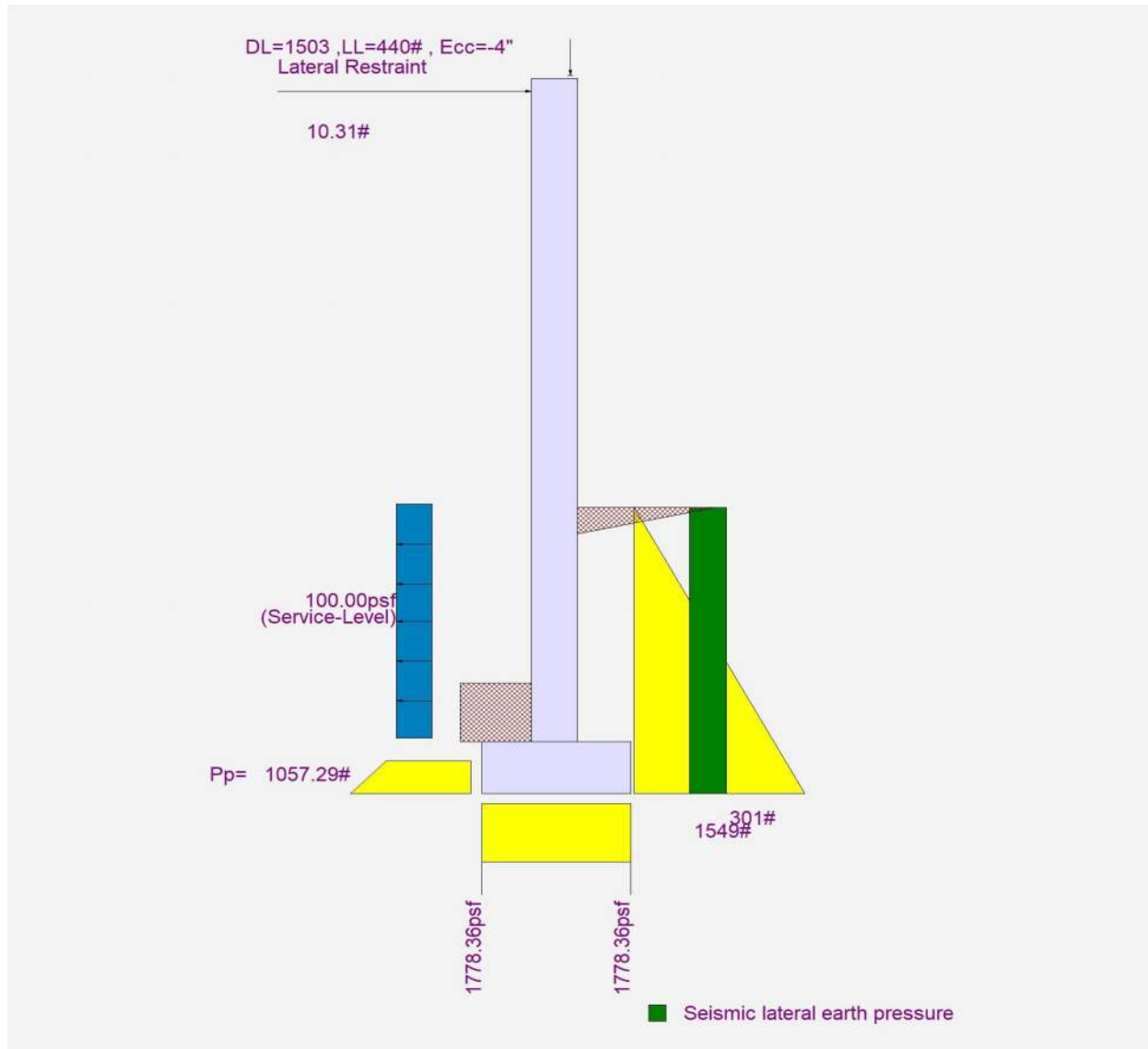
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 17' Basement Wall - EQ





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2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall - Slab Dowels

Code Reference:

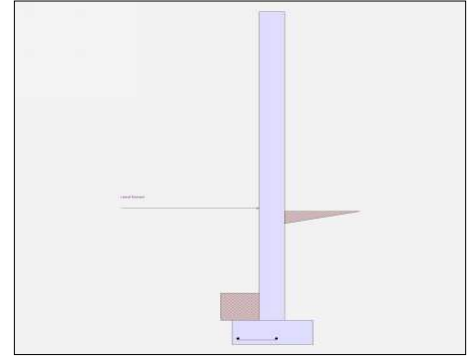
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	6.0 ft
Wall height above soil	=	11.0 ft
Total Wall Height	=	17.0 ft
Top Support Height	=	6.0 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	9.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,503.0 lbs
Axial Live Load	=	440.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	6.0 ft
...Height to Bottom	=	0.0 ft
Load Type	=	Earth (H)
		(Service Level)
Wind on Exposed Stem	=	0.00 psf
		(Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	6,360.50 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	1,817.29 psf OK
Soil Pressure @ Heel	=	1,817.29 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,231.03 psf
ACI Factored @ Heel	=	2,231.03 psf
Footing Shear @ Toe	=	2.470 psi OK
Footing Shear @ Heel	=	8.017 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	259.662 lbs
Reaction at Bottom	=	1,513.77 lbs

Sliding Calcs

Lateral Sliding Force	=	1,513.77 lbs
-----------------------	---	--------------

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 6.0 ft	0.02410 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.046	0.087	0.150
Moment.....Actual	= 835.87 ft-#	1,993.44 ft-#	1,993.44 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 381.294 lbs		1,656.28 lbs
Shear.....Actual	= 3.345 psi		23.004 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall - Slab Dowels

Footing Strengths & Dimensions

Toe Width	=	1.250 ft
Heel Width	=	2.250
Total Footing Width	=	3.50
Footing Thickness	=	16.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,231.03	2,231.03 psf
Mu' : Upward	= 1,742.99	ft-#
Mu' : Downward	= 353.438	ft-#
Mu: Design	= 1,390	-812 ft-#
Actual 1-Way Shear	= 2.470	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		1.21 in ²
Min footing T&S reinf Area per foot		0.35 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 6.94 in		#4@ 13.89 in
#5@ 10.76 in		#5@ 21.53 in
#6@ 15.28 in		#6@ 30.56 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	1,160.24 lbs
Heel Active Pressure	=	353.535
Sliding Force	=	1,513.77 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem			=	-1,421.03ft-#
Surcharge Over Heel	125.0	2.875		359.375
Adjacent Footing Load	= 0.0 lbs	0.0 ft		0.0ft-#
Axial Dead Load on Stem	= 1,943.0 lbs	1.750 ft		3,400.25ft-#
Soil Over Toe	= 206.250 lbs	0.6250 ft		128.906ft-#
Surcharge Over Toe	= 11.250 lbs	0.6250 ft		7.031ft-#
Stem Weight	= 2,550.0 lbs	1.750 ft		4,462.50ft-#
Soil Over Heel	= 825.0 lbs	2.875 ft		2,371.88ft-#
Footing Weight	= 700.0 lbs	1.751 ft		1,225.50ft-#
Total Vertical Force	≡ 6,360.50 lbs	Base Moment	=	10,534.4ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

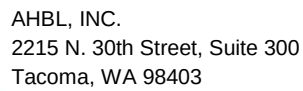
LIC# : KW-06014847, Build:20.23.04.05

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DESCRIPTION: 17' Basement Wall - Slab Dowels

Rebar Lap & Embedment Lengths Information

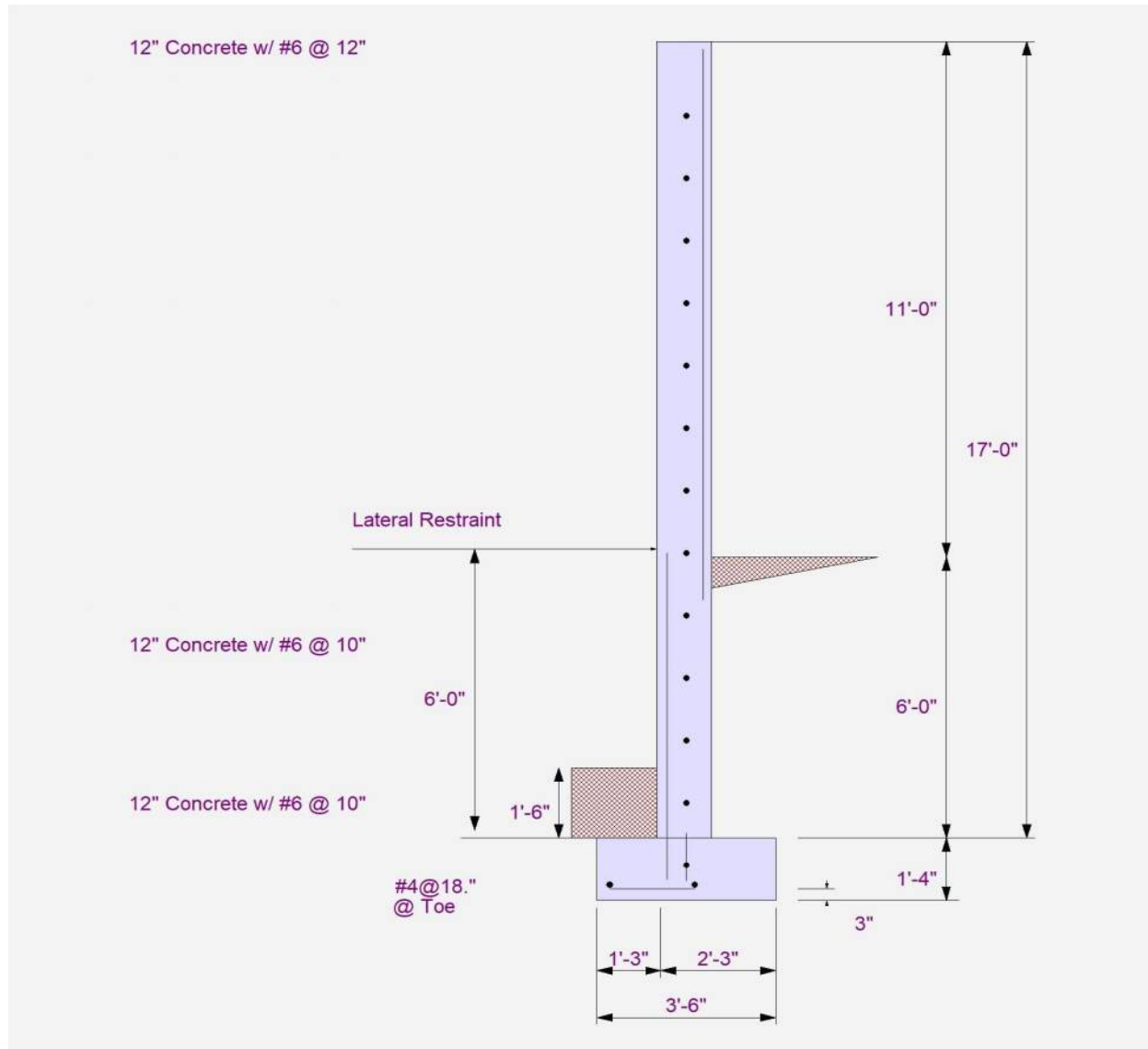


Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Project File: 2220236_care center concrete framing.ec6

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DESCRIPTION: 17' Basement Wall - Slab Dowels





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

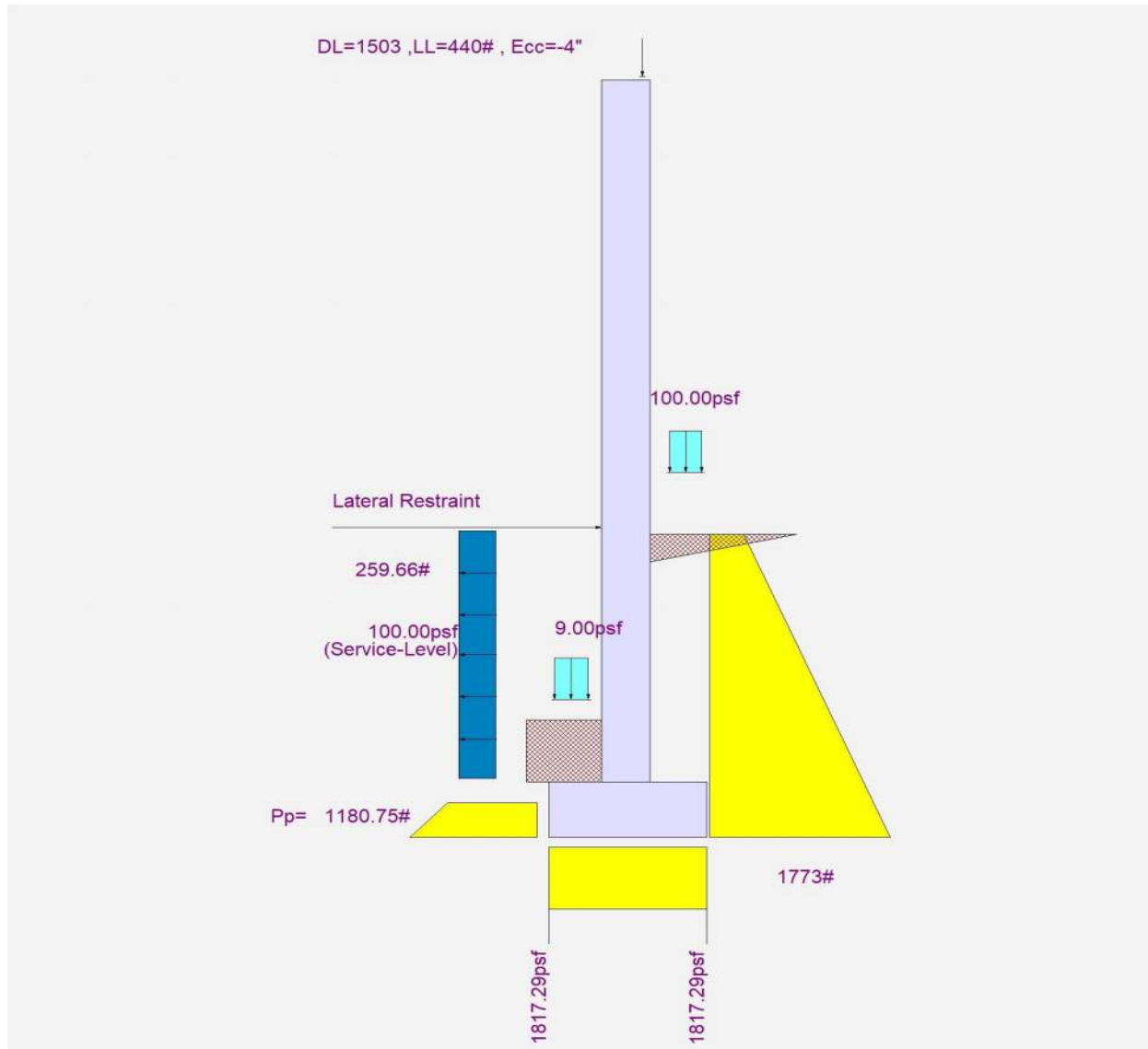
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 17' Basement Wall - Slab Dowels





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 19' Basement Wall

Code Reference:

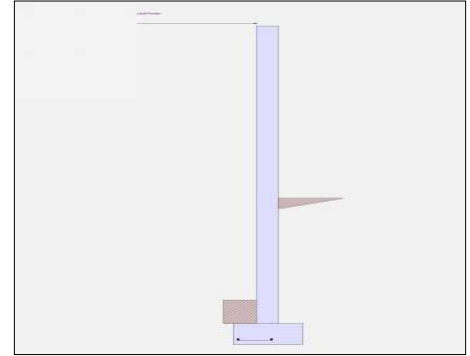
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	8.0 ft
Wall height above soil	=	11.0 ft
Total Wall Height	=	19.0 ft
Top Support Height	=	19 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,503.0 lbs
Axial Live Load	=	440.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	9.333 ft
...Height to Bottom	=	-1.333 ft
Load Type	=	Earth (H)
		(Service Level)
Wind on Exposed Stem	=	0.00 psf
		(Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	6,924.25 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	1,978.36 psf OK
Soil Pressure @ Heel	=	1,978.36 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,424.31 psf
ACI Factored @ Heel	=	2,424.31 psf
Footing Shear @ Toe	=	2.759 psi OK
Footing Shear @ Heel	=	7.472 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	112.619 lbs
Reaction at Bottom	=	2,641.10 lbs

Sliding Calcs

Lateral Sliding Force	=	2,641.10 lbs
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Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 19 ft	0.07631 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.046	0.337	0.577
Moment.....Actual	= 835.87 ft-#	7,690.15 ft-#	7,690.15 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 157.969 lbs		3,161.26 lbs
Shear.....Actual	= 1.386 psi		43.906 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall

Footing Strengths & Dimensions

Toe Width	=	1.250 ft
Heel Width	=	2.250
Total Footing Width	=	3.50
Footing Thickness	=	16.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,424.31	2,424.31 psf
Mu' : Upward	= 1,894.0	ft-#
Mu' : Downward	= 342.188	ft-#
Mu: Design	= 1,552	-756 ft-#
Actual 1-Way Shear	= 2.759	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Heel: None Spec'd	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		1.21 in2
Min footing T&S reinf Area per foot		0.35 in2 /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 6.94 in		#4@ 13.89 in
#5@ 10.76 in		#5@ 21.53 in
#6@ 15.28 in		#6@ 30.56 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	2,194.23 lbs
Heel Active Pressure	=	446.869
Sliding Force	=	2,641.10 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-5,464.83ft-#
Surcharge Over Heel	125.0	2.875 359.375
Adjacent Footing Load	= 0.0 lbs	0.0 ft 0.0ft-#
Axial Dead Load on Stem	= 1,943.0 lbs	1.750 ft 3,400.25ft-#
Soil Over Toe	= 206.250 lbs	0.6250 ft 128.906ft-#
Surcharge Over Toe	= 0.0 lbs	0.0 ft 0.0ft-#
Stem Weight	= 2,850.0 lbs	1.750 ft 4,987.50ft-#
Soil Over Heel	= 1,100.0 lbs	2.875 ft 3,162.50ft-#
Footing Weight	= 700.0 lbs	1.751 ft 1,225.50ft-#
Total Vertical Force	=	6,924.25 lbs
Base Moment	=	7,799.20ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall

Rebar Lap & Embedment Lengths Information

Restrained Retaining Wall

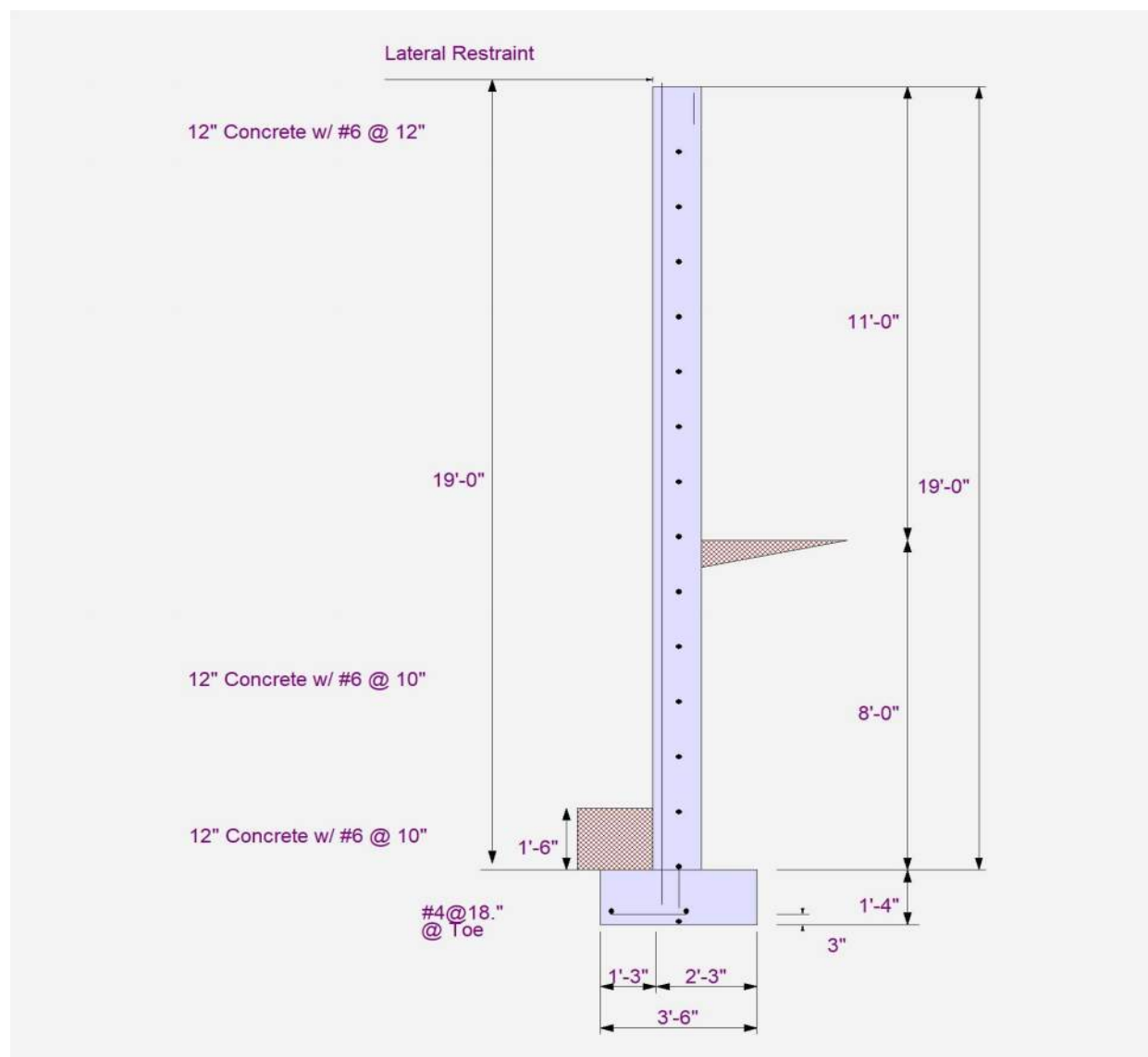
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 19' Basement Wall





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

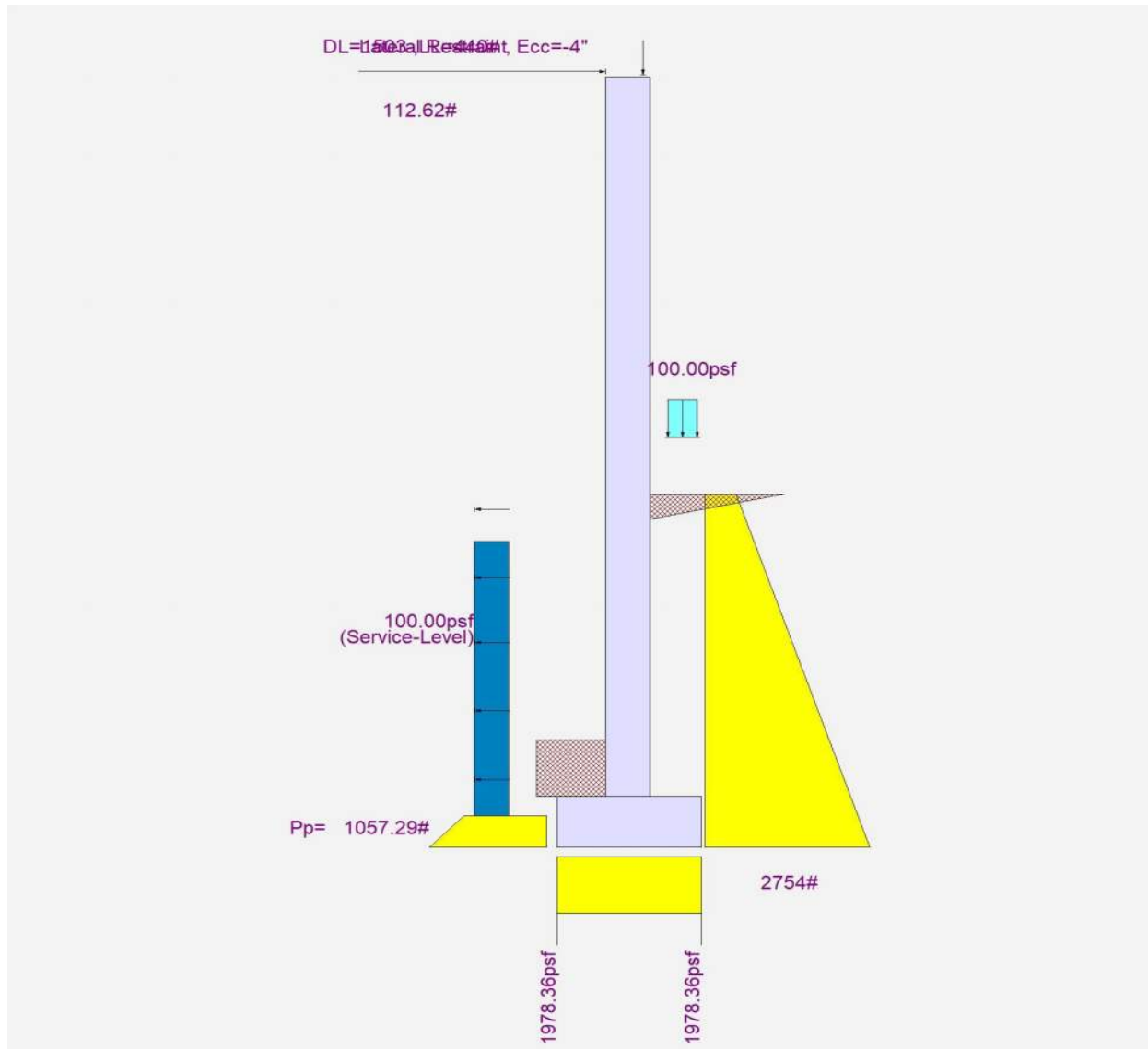
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 19' Basement Wall





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - Slab Dowel

Code Reference:

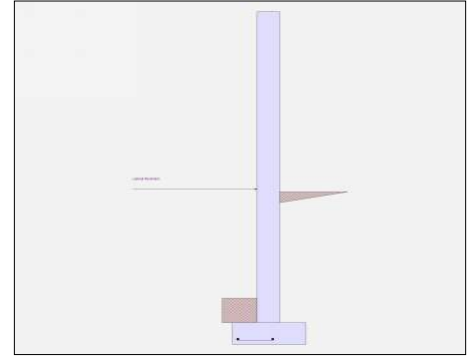
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	8.0 ft
Wall height above soil	=	11.0 ft
Total Wall Height	=	19.0 ft
Top Support Height	=	8.0 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,503.0 lbs
Axial Live Load	=	440.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	9.333 ft
...Height to Bottom	=	-1.333 ft
Load Type	=	Earth (H)
		(Service Level)
Wind on Exposed Stem	=	0.00 psf
		(Strength Level)
Wind acts left-to-right toward retention side.		
K_h Soil Density Multiplier	=	0.07273 g

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3
Added seismic per unit area	=	0.0 psf

Design Summary

Total Bearing Load	=	6,924.25 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	1,978.36 psf OK
Soil Pressure @ Heel	=	1,978.36 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,424.31 psf
ACI Factored @ Heel	=	2,424.31 psf
Footing Shear @ Toe	=	2.759 psi OK
Footing Shear @ Heel	=	7.472 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	675.66 lbs
Reaction at Bottom	=	2,101.48 lbs

Sliding Calcs

Lateral Sliding Force	=	2,101.48 lbs
-----------------------	---	--------------

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 8.0 ft	0.03213 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.040	0.154	0.264
Moment.....Actual	= 729.25 ft-#	3,518.29 ft-#	3,518.29 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 738.34 lbs		2,422.57 lbs
Shear.....Actual	= 6.477 psi		33.647 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - Slab Dowel

Footing Strengths & Dimensions

Toe Width	=	1.250 ft
Heel Width	=	2.250
Total Footing Width	=	3.50
Footing Thickness	=	16.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,424.31	2,424.31 psf
Mu' : Upward	= 1,894.0	ft-#
Mu' : Downward	= 342.188	ft-#
Mu: Design	= 1,552	-756 ft-#
Actual 1-Way Shear	= 2.759	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		1.21 in ²
Min footing T&S reinf Area per foot		0.35 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 6.94 in		#4@ 13.89 in
#5@ 10.76 in		#5@ 21.53 in
#6@ 15.28 in		#6@ 30.56 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	1,654.61 lbs
Heel Active Pressure	=	446.869
Sliding Force	=	2,101.48 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-2,415.50ft-#
Surcharge Over Heel	125.0	2.875 359.375
Adjacent Footing Load	= 0.0 lbs	0.0 ft 0.0ft-#
Axial Dead Load on Stem	= 1,943.0 lbs	1.750 ft 3,400.25ft-#
Soil Over Toe	= 206.250 lbs	0.6250 ft 128.906ft-#
Surcharge Over Toe	= 0.0 lbs	0.0 ft 0.0ft-#
Stem Weight	= 2,850.0 lbs	1.750 ft 4,987.50ft-#
Soil Over Heel	= 1,100.0 lbs	2.875 ft 3,162.50ft-#
Footing Weight	= 700.0 lbs	1.751 ft 1,225.50ft-#
Total Vertical Force	= 6,924.25 lbs	Base Moment = 10,848.5ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - Slab Dowel

Rebar Lap & Embedment Lengths Information

Restrained Retaining Wall

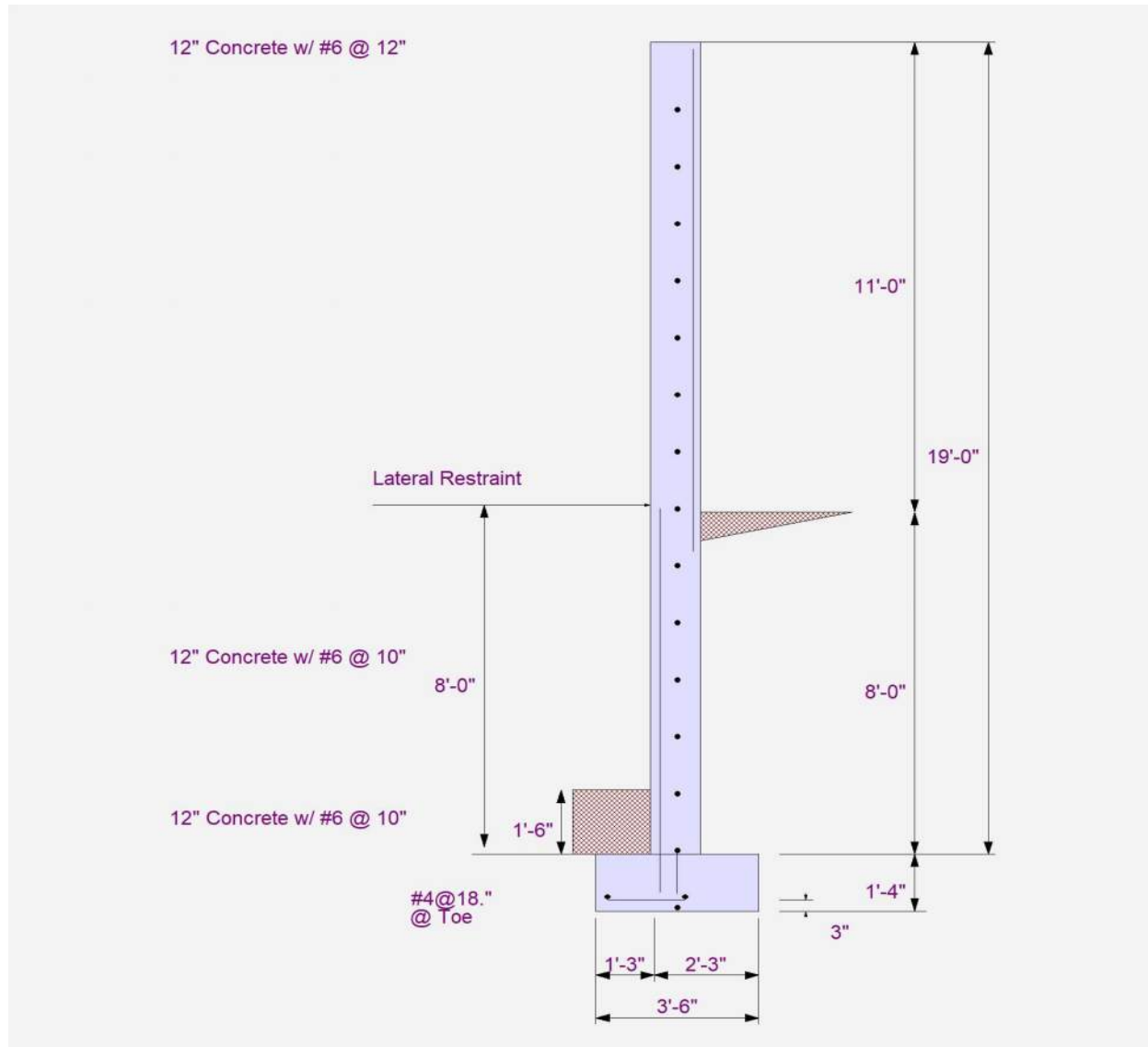
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 19' Basement Wall - Slab Dowel





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

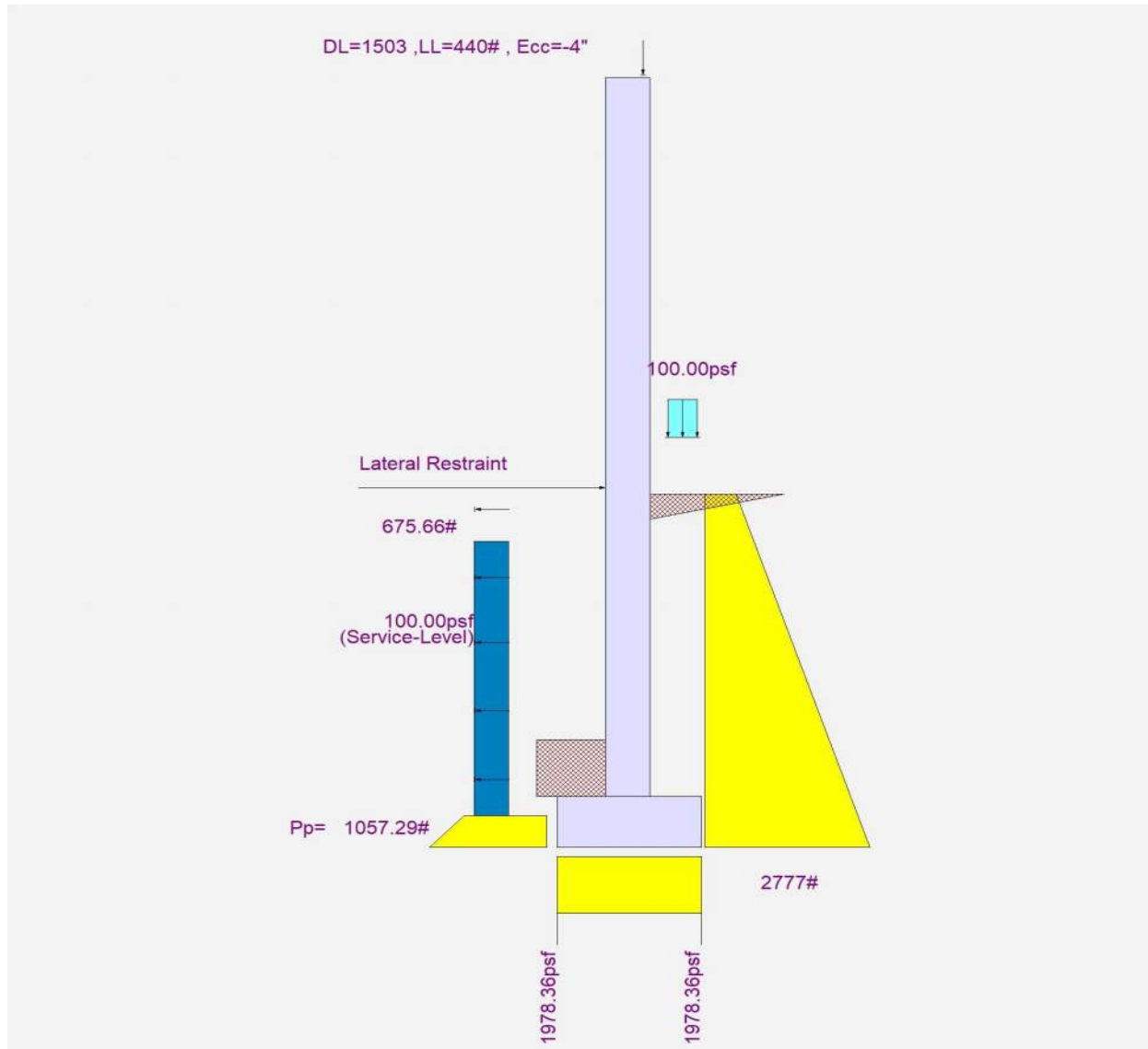
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 19' Basement Wall - Slab Dowel





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - EQ

Code Reference:

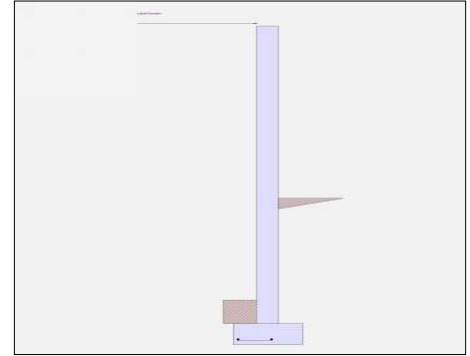
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	8.0 ft
Wall height above soil	=	11.0 ft
Total Wall Height	=	19.0 ft
Top Support Height	=	19 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,503.0 lbs
Axial Live Load	=	440.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	9.333 ft
...Height to Bottom	=	-1.333 ft
Load Type	=	Earth (H)
		(Service Level)
Wind on Exposed Stem	=	0.00 psf
		(Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 52.269 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	6,799.25 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	1,942.64 psf OK
Soil Pressure @ Heel	=	1,942.64 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,381.46 psf
ACI Factored @ Heel	=	2,381.46 psf
Footing Shear @ Toe	=	2.699 psi OK
Footing Shear @ Heel	=	8.375 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	125.594 lbs
Reaction at Bottom	=	2,749.30 lbs

Sliding Calcs

Lateral Sliding Force	=	2,749.30 lbs
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Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 19 ft	0.07631 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	12.00 in	12.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.046	0.426	0.727
Moment.....Actual	= 835.87 ft-#	8,164.05 ft-#	8,164.05 ft-#
Moment.....Allowable	= 18,167.5 ft-#	19,157.5 ft-#	11,237.5 ft-#
Shear Force @ this height	= 173.045 lbs		3,336.27 lbs
Shear.....Actual	= 1.518 psi		46.337 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - EQ

Footing Strengths & Dimensions

Toe Width	=	1.250 ft
Heel Width	=	2.250
Total Footing Width	=	3.50
Footing Thickness	=	16.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,381.46	2,381.46 psf
Mu' : Upward	= 1,860.51	ft-#
Mu' : Downward	= 342.188	ft-#
Mu: Design	= 1,518	-848 ft-#
Actual 1-Way Shear	= 2.699	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		1.21 in ²
Min footing T&S reinf Area per foot		0.35 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 6.94 in		#4@ 13.89 in
#5@ 10.76 in		#5@ 21.53 in
#6@ 15.28 in		#6@ 30.56 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	2,344.86 lbs
Heel Active Pressure	=	404.444
Sliding Force	=	2,749.30 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-5,872.71 ft-#
Surcharge Over Heel	0.0	0.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft
Axial Dead Load on Stem	= 1,943.0 lbs	1.750 ft
Soil Over Toe	= 206.250 lbs	0.6250 ft
Surcharge Over Toe	= 0.0 lbs	0.0 ft
Stem Weight	= 2,850.0 lbs	1.750 ft
Soil Over Heel	= 1,100.0 lbs	2.875 ft
Footing Weight	= 700.0 lbs	1.751 ft
Total Vertical Force	= 6,799.25 lbs	Base Moment = 7,031.95 ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - EQ

Rebar Lap & Embedment Lengths Information



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

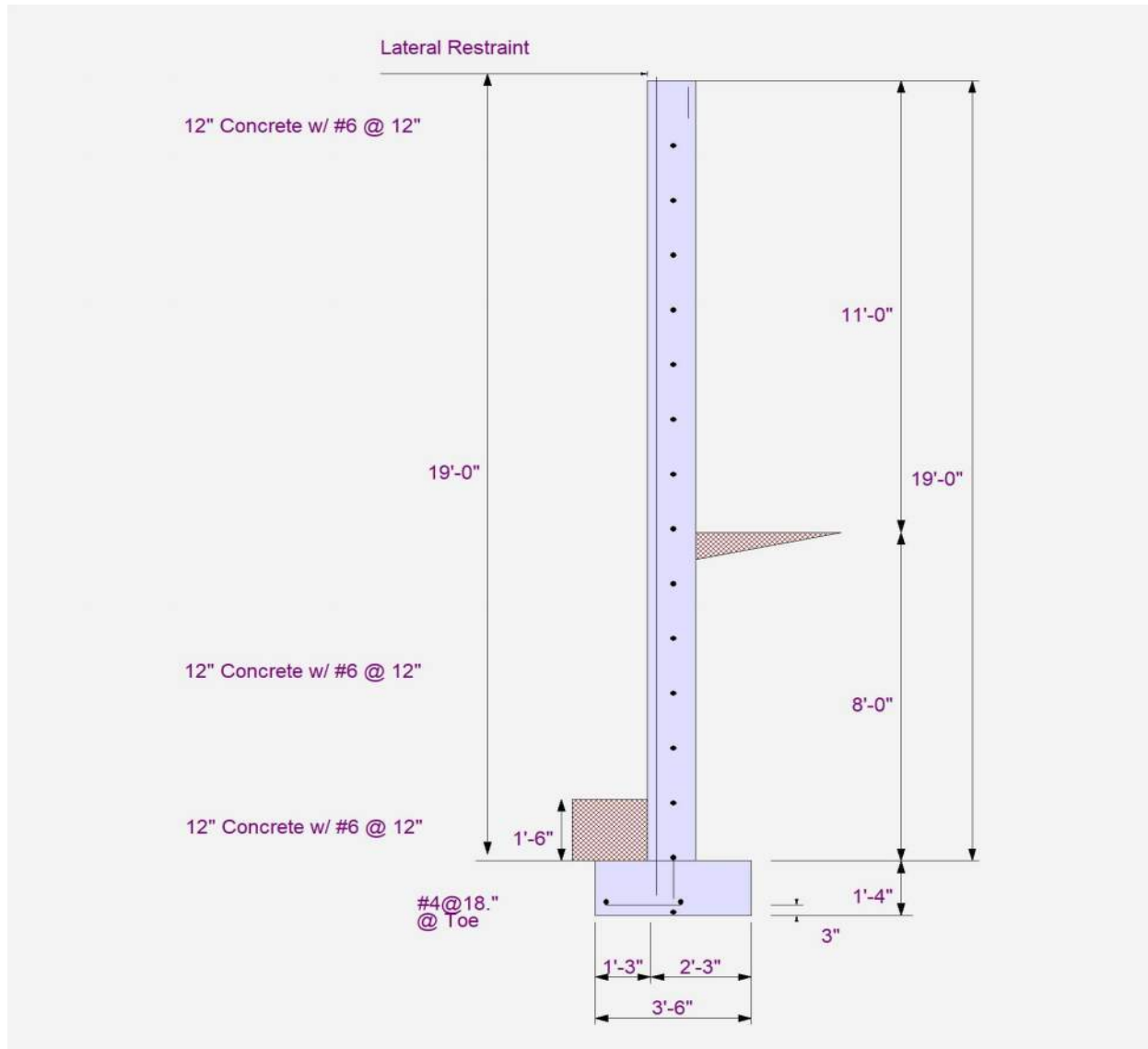
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 19' Basement Wall - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

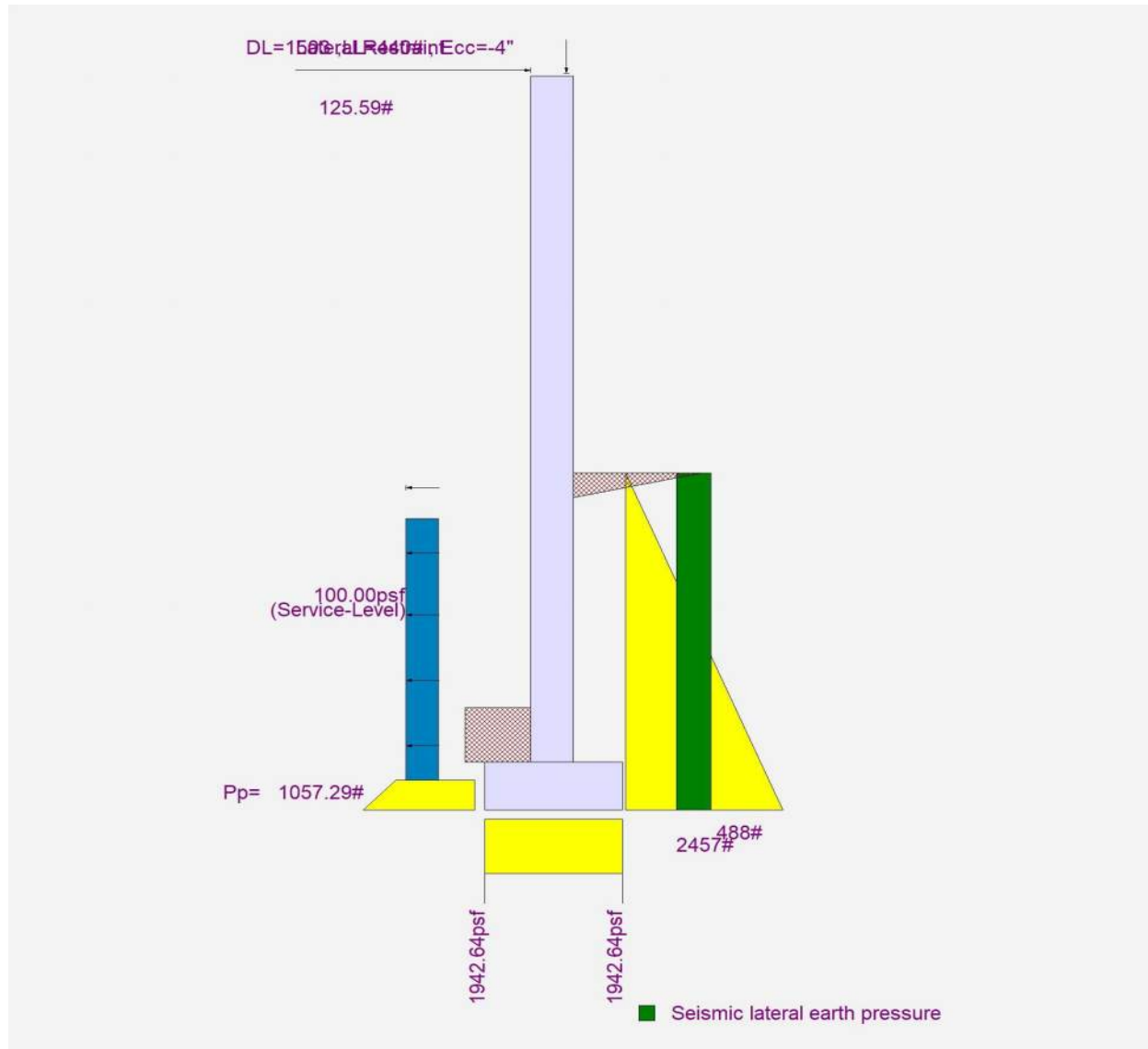
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 19' Basement Wall - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 19' Basement Wall (Construction Backfill)

Code Reference:

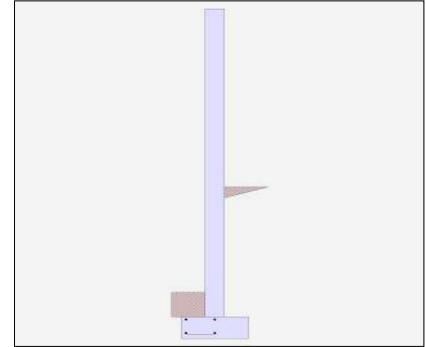
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	8.00 ft
Wall height above soil	=	11.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	18.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	525.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.525
Soil height to ignore for passive pressure	=	24.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 19' Basement Wall (Construction Backfill)

Design Summary

Wall Stability Ratios

Overtuning	=	2.50	OK
Sliding	=	2.60	OK
Global Stability	=	2.09	

Total Bearing Load	=	5,529 lbs
...resultant ecc.	=	3.42 in

Eccentricity within middle third

Soil Pressure @ Toe	=	2,064 psf	OK
Soil Pressure @ Heel	=	711 psf	OK
Allowable	=	3,000 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	2,890 psf	
ACI Factored @ Heel	=	995 psf	
Footing Shear @ Toe	=	3.2 psi	OK
Footing Shear @ Heel	=	6.1 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	1,524.4 lbs	
less 100% Passive Force	=	1,057.3 lbs	
less 100% Friction Force	=	2,902.8 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Design Height Above Ftg

ft =	0.00
Wall Material Above "Ht"	= Concrete
Design Method	= SD
Thickness	= 12.00
Rebar Size	= # 6
Rebar Spacing	= 12.00
Rebar Placed at	= Center

Design Data

fb/FB + fa/Fa	=	0.425
---------------	---	-------

Total Force @ Section

Service Level	lbs =
Strength Level	lbs = 1,792.0

Moment....Actual

Service Level	ft-# =
Strength Level	ft-# = 4,778.7

Moment.....Allowable	=	11,237.5
----------------------	---	----------

Shear.....Actual

Service Level	psi =
Strength Level	psi = 24.9

Shear.....Allowable	psi = 94.9
---------------------	------------

Anet (Masonry)	in2 =
----------------	-------

Wall Weight	psf = 150.0
-------------	-------------

Rebar Depth 'd'	in = 6.00
-----------------	-----------

Masonry Data

f'm	psi =
Fs	psi =
Solid Grouting	=
Modular Ratio 'n'	=
Equiv. Solid Thick.	=
Masonry Block Type	=
Masonry Design Method	= ASD

Concrete Data

f'c	psi = 4,000.0
Fy	psi = 60,000.0

Bottom

Stem OK

ft = 0.00

= Concrete

= SD

= 12.00

= # 6

= 12.00

= Center

= 0.425

lbs =

lbs = 1,792.0

ft-# =

ft-# = 4,778.7

= 11,237.5

psi =

psi = 24.9

psi = 94.9

in2 =

psf = 150.0

in = 6.00



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 19' Basement Wall (Construction Backfill)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.1869 in ² /ft	
(4/3) * As :	0.2492 in ² /ft	Min Stem T&S Reinf Area 5.472 in ²
200bd/fy : 200(12)(6)/60000 :	0.24 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.288 in ² /ft
0.0018bh : 0.0018(12)(12) :	0.2592 in ² /ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.24 in ² /ft	#4@ 8.33 in #4@ 16.67 in
Provided Area :	0.44 in ² /ft	#5@ 12.92 in #5@ 25.83 in
Maximum Area :	1.3005 in ² /ft	#6@ 18.33 in #6@ 36.67 in

Footing Data

Toe Width	=	1.25 ft
Heel Width	=	2.25
Total Footing Width	=	3.50
Footing Thickness	=	16.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c = 3,000 psi	Fy = 60,000 psi	
Footing Concrete Density = 150.00 pcf		
Min. As % = 0.0018		
Cover @ Top 2.00	@ Btm = 3.00 in	

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,890	995 psf
Mu' : Upward	= 2,082	953 ft-#
Mu' : Downward	= 342	2,358 ft-#
Mu: Design	= 1,739 OK	1,405 ft-# OK
phiMn	= 24,143	5,368 ft-#
Actual 1-Way Shear	= 3.24	6.13 psi
Allow 1-Way Shear	= 82.16	43.82 psi
Toe Reinforcing	= # 6 @ 12.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 6.94 in, #5@ 10.76 in, #6@ 15.27 in, #7@ 20.83 in, #8@ 27.43 in, #9@ 34.72 in, #10@ 44.09 in

Heel: phiMn = ph*5*lambda*sqrt(fc)*Sm

Key: No key defined

Min footing T&S reinf Area	1.21 in ²
Min footing T&S reinf Area per foot	0.35 in ² /ft
<u>If one layer of horizontal bars:</u>	<u>If two layers of horizontal bars:</u>
#4@ 6.94 in	#4@ 13.89 in
#5@ 10.76 in	#5@ 21.53 in
#6@ 15.28 in	#6@ 30.56 in

Cantilevered Retaining Wall

Project File: 2220236 care center concrete framing.ec6

LIC# : KW-06014847. Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 19' Basement Wall (Construction Backfill)

Summary of Overturning & Resisting Forces & Moments

.....OVERTURNING.....				RESISTING.....			
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)	1,524.4	3.11	4,742.7	Soil Over HL (ab. water tbl)	1,100.0	2.88	3,162.5
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		2.88	3,162.5
Hydrostatic Force				Water Table			
Buoyant Force =				Sloped Soil Over Heel =			
Surcharge over Heel =				Surcharge Over Heel =			
Surcharge Over Toe =				Adjacent Footing Load =			
Adjacent Footing Load =				Axial Dead Load on Stem =			
Added Lateral Load =				* Axial Live Load on Stem =			
Load @ Stem Above Soil =				Soil Over Toe =	206.3	0.63	128.9
=				Surcharge Over Toe =			
				Stem Weight(s) =	2,850.0	1.75	4,987.5
				Earth @ Stem Transitions =			
				Footing Weight =	700.0	1.75	1,225.0
				Key Weight =			
				Vert. Component =	672.9	3.50	2,355.2
Total	= 1,524.4	O.T.M.	= 4,742.7	Total	= 5,529.2 lbs	R.M.	= 11,859.1
Resisting/Overturning Ratio		=	2.50	* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.			
Vertical Loads used for Soil Pressure =		5,529.2 lbs					

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.311	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 19' Basement Wall (Construction Backfill)

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) = 22.20 in

Development length for #6 bar specified in this stem design segment = 17.08 in

Hooked embedment length into footing for #6 bar specified in this stem design segment = 11.50 in

As Provided = 0.4400 in²/ft

As Required = 0.2400 in²/ft

Cantilevered Retaining Wall

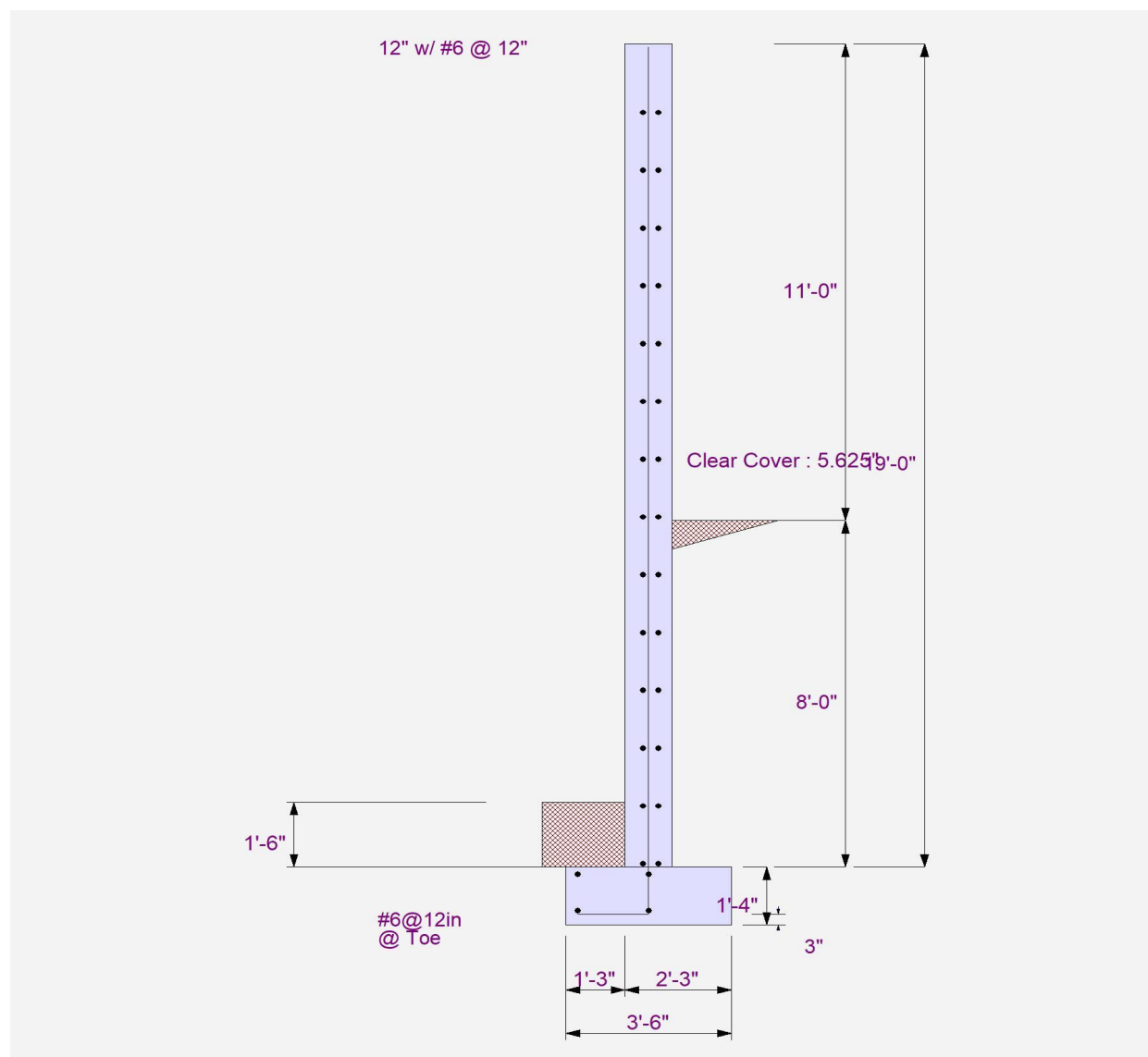
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 19' Basement Wall (Construction Backfill)





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Cantilevered Retaining Wall

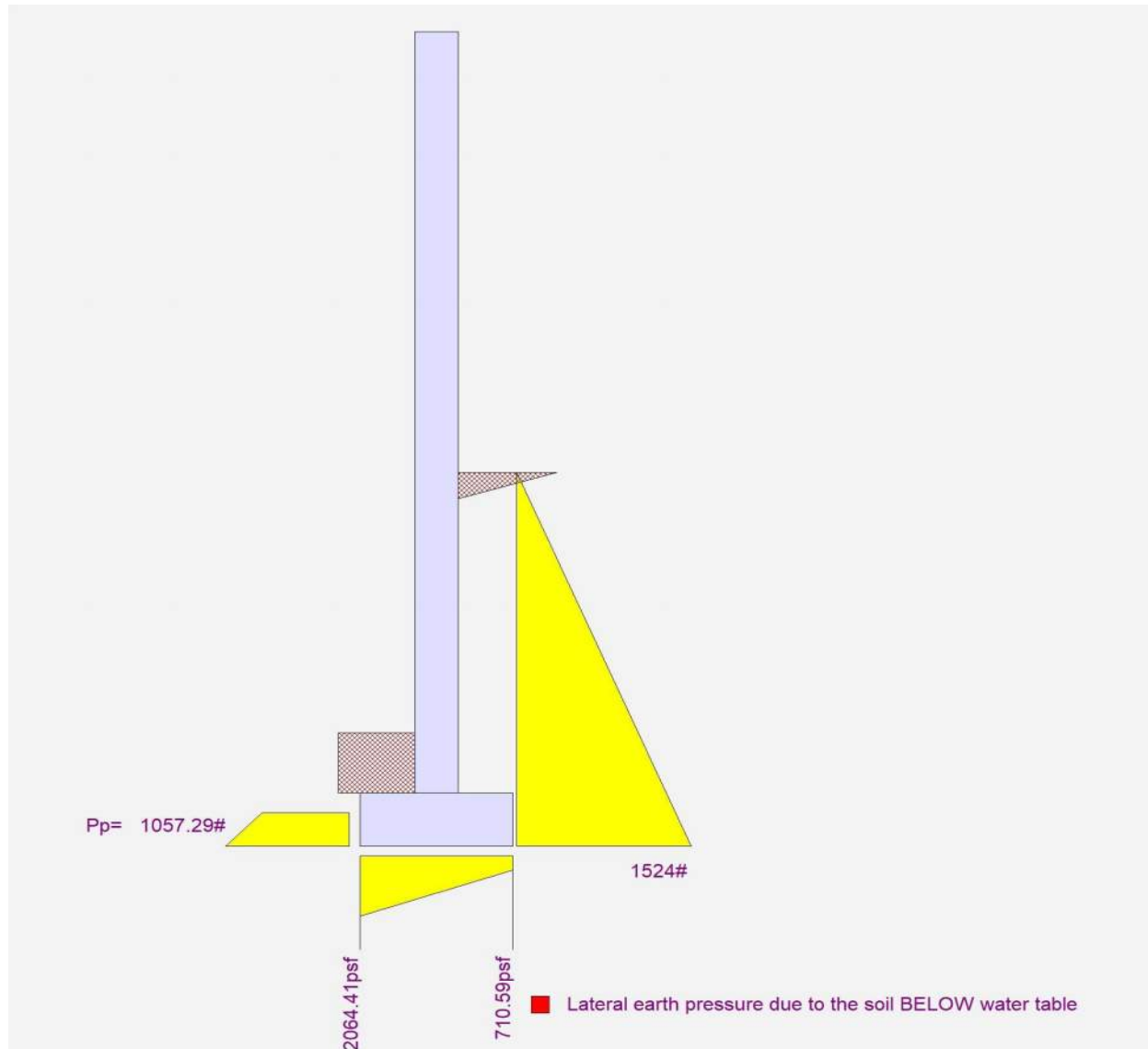
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LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 19' Basement Wall (Construction Backfill)





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2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
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Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 23' Basement Wall

Code Reference:

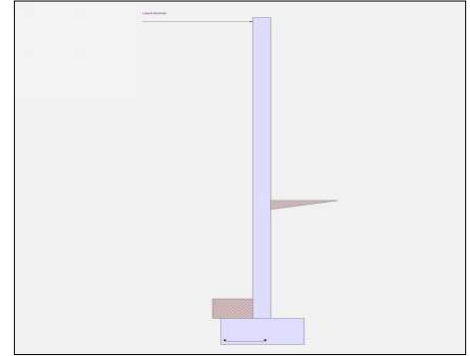
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	9.0 ft
Wall height above soil	=	14.0 ft
Total Wall Height	=	23.0 ft
Top Support Height	=	22.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	2,760.0 lbs
Axial Live Load	=	560.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	11.0 ft
...Height to Bottom	=	-2.0 ft
Load Type	=	Earth (H) (Service Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	10,780.0 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	2,156.0 psf OK
Soil Pressure @ Heel	=	2,156.0 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,632.0 psf
ACI Factored @ Heel	=	2,632.0 psf
Footing Shear @ Toe	=	2.459 psi OK
Footing Shear @ Heel	=	7.163 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	114.20 lbs
Reaction at Bottom	=	3,452.30 lbs

Sliding Calcs

Lateral Sliding Force	=	3,452.30 lbs
-----------------------	---	--------------

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 22.50 ft	0.09036 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.077	0.474	0.812
Moment.....Actual	= 1,402.67 ft-#	10,829.7 ft-#	10,829.7 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 162.374 lbs		3,883.81 lbs
Shear.....Actual	= 1.424 psi		53.942 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



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Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 23' Basement Wall

Footing Strengths & Dimensions

Toe Width	=	2.0 ft
Heel Width	=	3.0
Total Footing Width	=	5.0
Footing Thickness	=	24.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,632.0	2,632.0 psf
Mu' : Upward	= 5,264.0	ft-#
Mu' : Downward	= 1,116.0	ft-#
Mu: Design	= 4,148	-1,848 ft-#
Actual 1-Way Shear	= 2.459	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		2.59 in ²
Min footing T&S reinf Area per foot		0.52 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 4.63 in		#4@ 9.26 in
#5@ 7.18 in		#5@ 14.35 in
#6@ 10.19 in		#6@ 20.37 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	2,688.66 lbs
Heel Active Pressure	=	763.64
Sliding Force	=	3,452.30 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem			=	-7,692.47 ft-#
Surcharge Over Heel	200.0	4.0		800.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft		0.0 ft-#
Axial Dead Load on Stem	= 3,320.0 lbs	2.50 ft		8,300.0 ft-#
Soil Over Toe	= 330.0 lbs	1.0 ft		330.0 ft-#
Surcharge Over Toe	= 0.0 lbs	0.0 ft		0.0 ft-#
Stem Weight	= 3,450.0 lbs	2.50 ft		8,625.0 ft-#
Soil Over Heel	= 1,980.0 lbs	4.0 ft		7,920.0 ft-#
Footing Weight	= 1,500.0 lbs	2.50 ft		3,750.50 ft-#
Total Vertical Force	= 10,780.0 lbs	Base Moment	=	22,033.0 ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



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DESCRIPTION: 23' Basement Wall

Rebar Lap & Embedment Lengths Information



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Restrained Retaining Wall

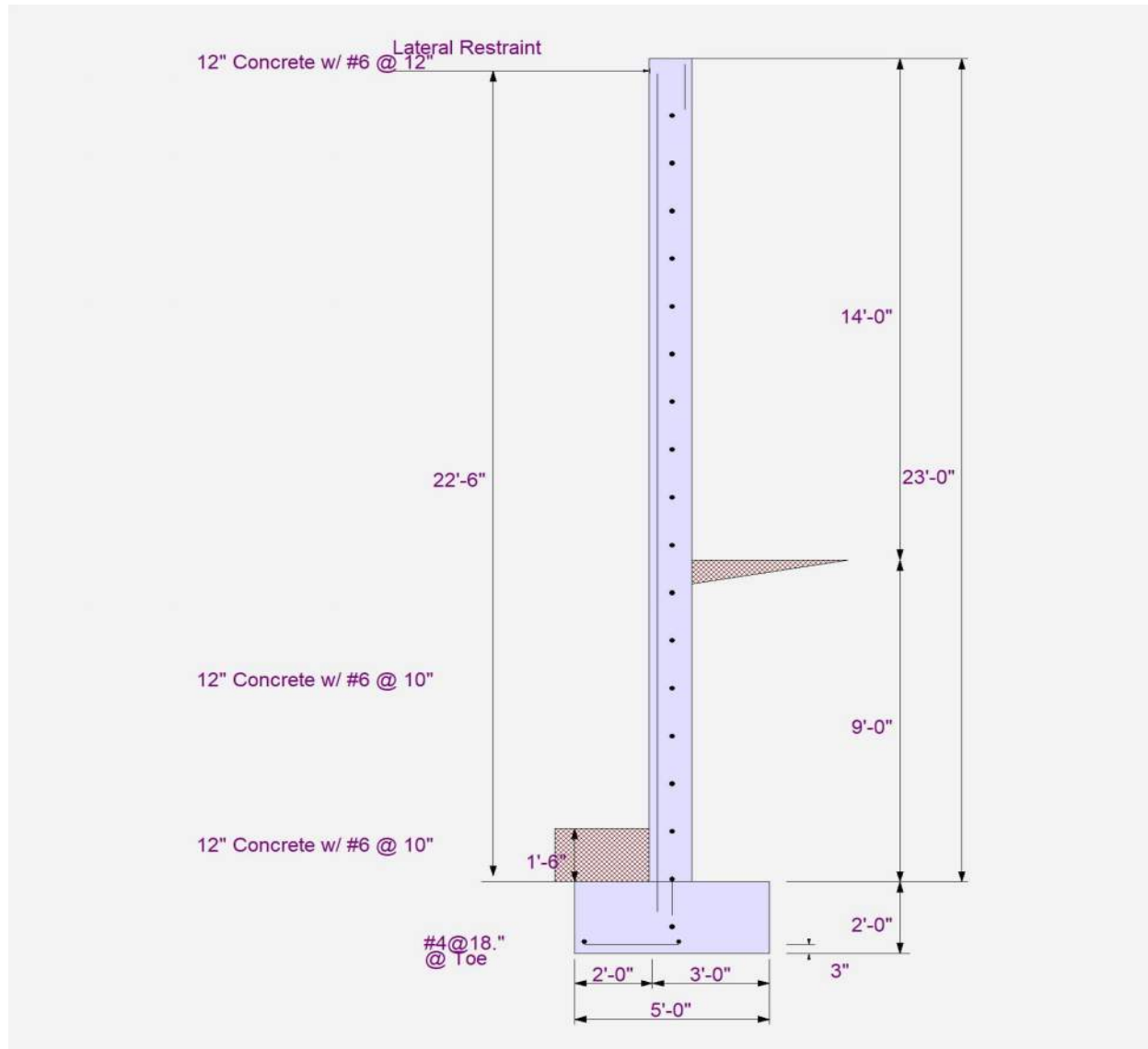
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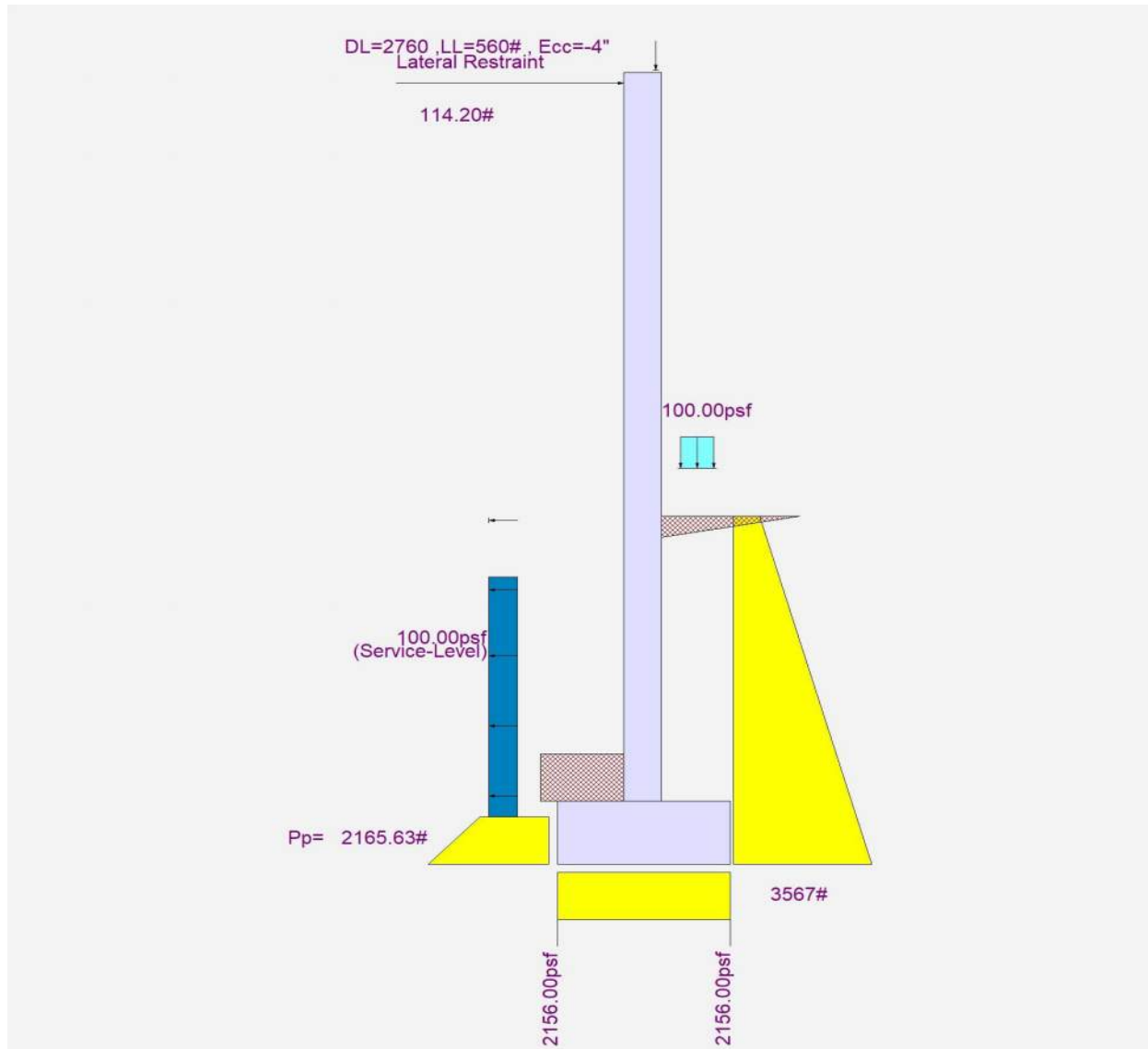
Project File: 2220236_care center concrete framing.ec6

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Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 23' Basement Wall - EQ

Code Reference:

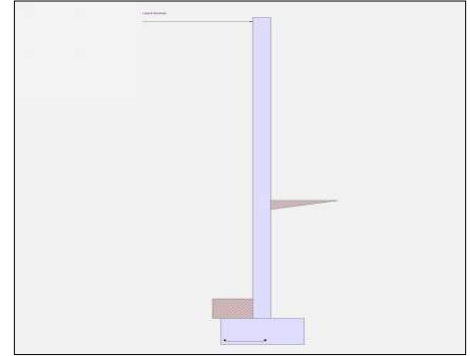
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	9.0 ft
Wall height above soil	=	14.0 ft
Total Wall Height	=	23.0 ft
Top Support Height	=	22.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	2,760.0 lbs
Axial Live Load	=	560.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	100.0 #/ft
...Height to Top	=	11.0 ft
...Height to Bottom	=	-2.0 ft
Load Type	=	Earth (H)
		(Service Level)
Wind on Exposed Stem	=	0.00 psf
		(Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 61.602 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	10,580.0 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	2,116.0 psf OK
Soil Pressure @ Heel	=	2,116.0 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,584.0 psf
ACI Factored @ Heel	=	2,584.0 psf
Footing Shear @ Toe	=	2.402 psi OK
Footing Shear @ Heel	=	8.031 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	133.50 lbs
Reaction at Bottom	=	3,637.42 lbs

Sliding Calcs

Lateral Sliding Force	=	3,637.42 lbs
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Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 22.50 ft	0.09036 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Center
Rebar Depth 'd'	= 9.50 in	10.0 in	6.0 in
Design Data			
fb/FB + fa/Fa	= 0.077	0.516	0.885
Moment.....Actual	= 1,402.67 ft-#	11,791.2 ft-#	11,791.2 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	13,330.8 ft-#
Shear Force @ this height	= 186.411 lbs		4,193.62 lbs
Shear.....Actual	= 1.635 psi		58.245 psi
Shear.....Allowable	= 94.868 psi		94.868 psi



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 23' Basement Wall - EQ

Footing Strengths & Dimensions

Toe Width	=	2.0 ft
Heel Width	=	3.0
Total Footing Width	=	5.0
Footing Thickness	=	24.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,584.0	2,584.0 psf
Mu' : Upward	= 5,168.0	ft-#
Mu' : Downward	= 1,116.0	ft-#
Mu: Design	= 4,052	-2,072 ft-#
Actual 1-Way Shear	= 2.402	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		2.59 in ²
Min footing T&S reinf Area per foot		0.52 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 4.63 in		#4@ 9.26 in
#5@ 7.18 in		#5@ 14.35 in
#6@ 10.19 in		#6@ 20.37 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	2,937.42 lbs
Heel Active Pressure	=	700.0
Sliding Force	=	3,637.42 lbs

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-8,464.48 ft-#
Surcharge Over Heel	0.0	0.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft
Axial Dead Load on Stem	= 3,320.0 lbs	2.50 ft
Soil Over Toe	= 330.0 lbs	1.0 ft
Surcharge Over Toe	= 0.0 lbs	0.0 ft
Stem Weight	= 3,450.0 lbs	2.50 ft
Soil Over Heel	= 1,980.0 lbs	4.0 ft
Footing Weight	= 1,500.0 lbs	2.50 ft
Total Vertical Force	=	10,580.0 lbs
Base Moment	=	20,461.0 ft-#

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 23' Basement Wall - EQ

Rebar Lap & Embedment Lengths Information

Restrained Retaining Wall

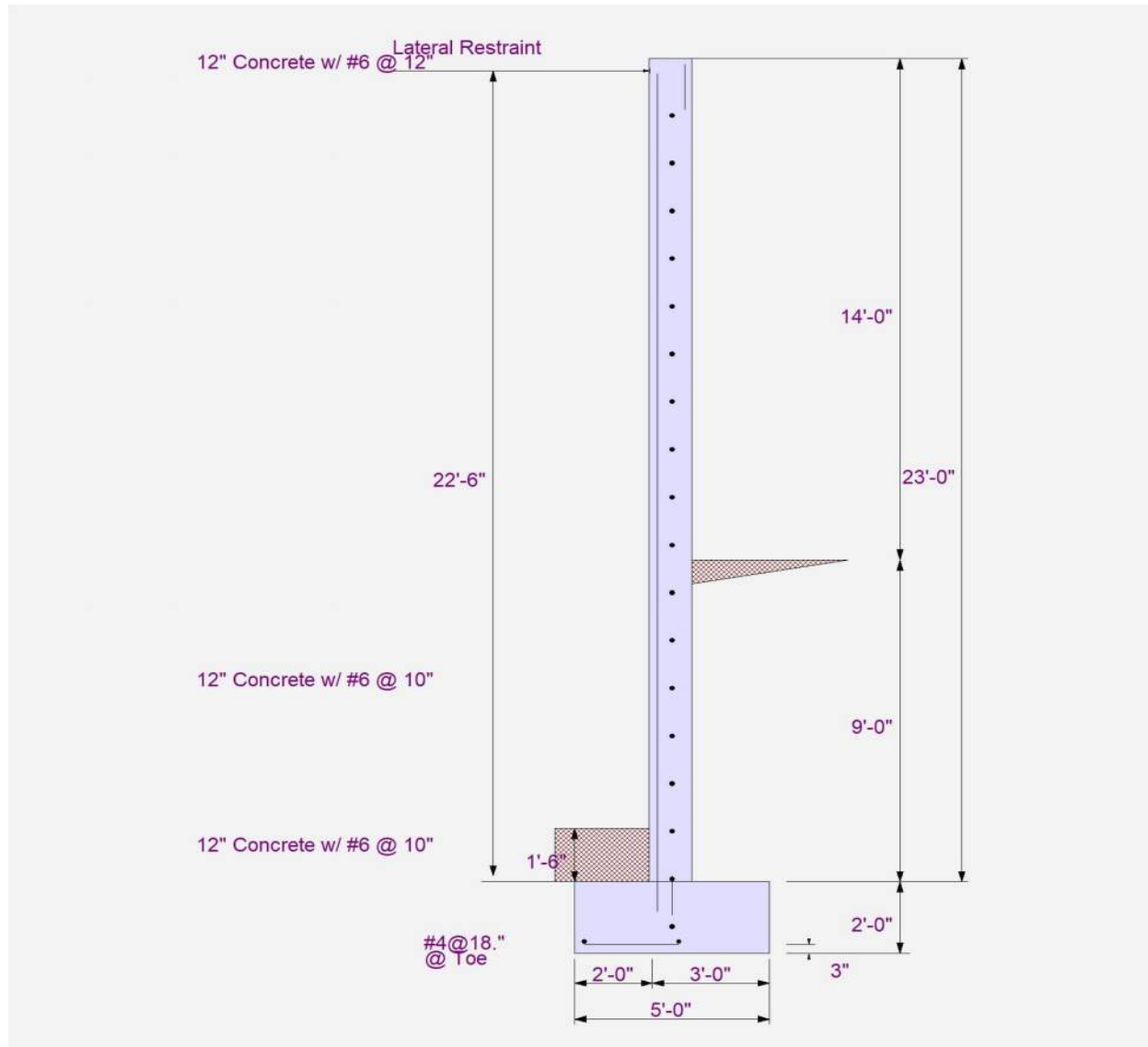
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 23' Basement Wall - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
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Project Descr:

Restrained Retaining Wall

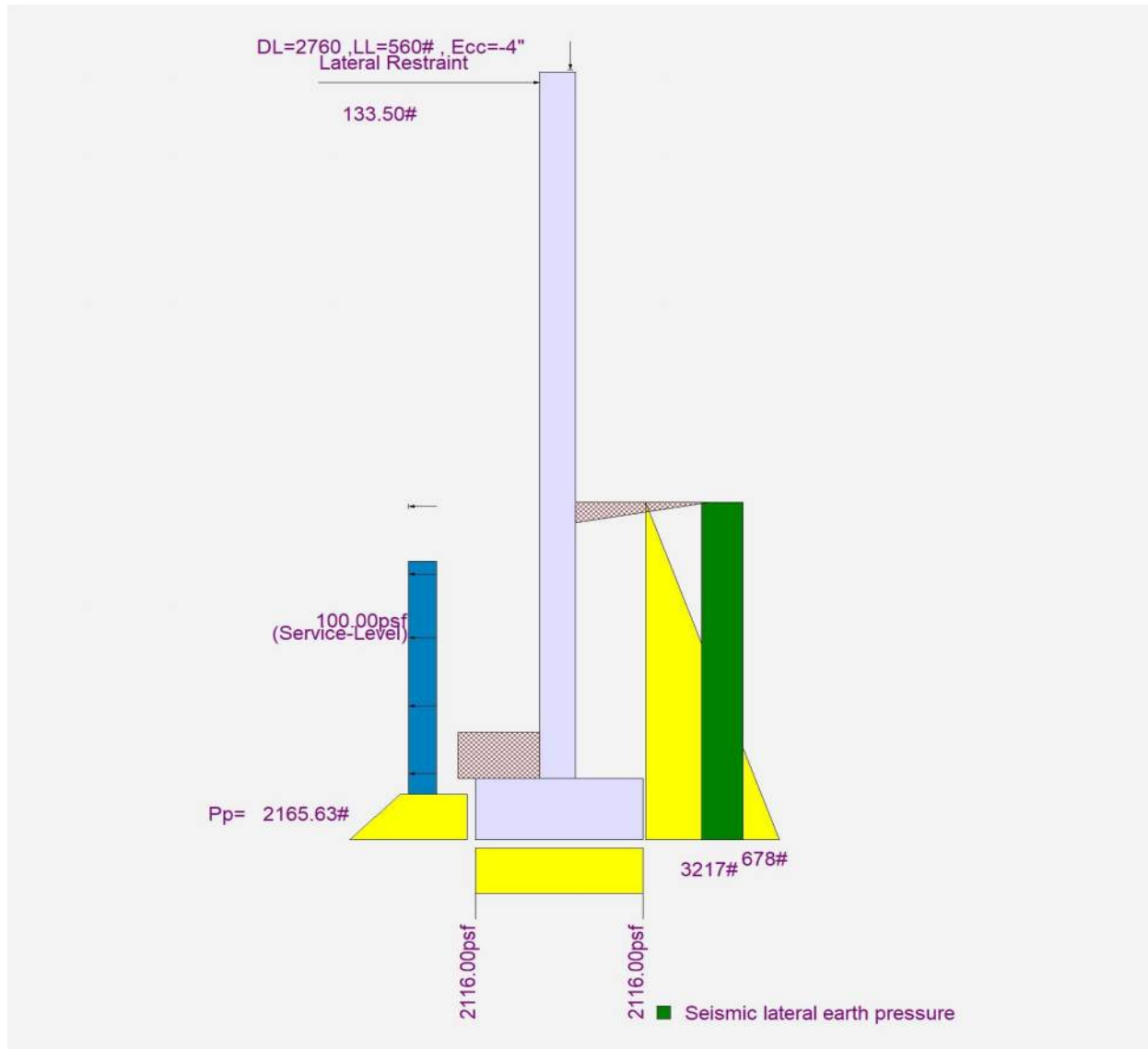
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 23' Basement Wall - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 25' Basement Wall at Pool

Code Reference:

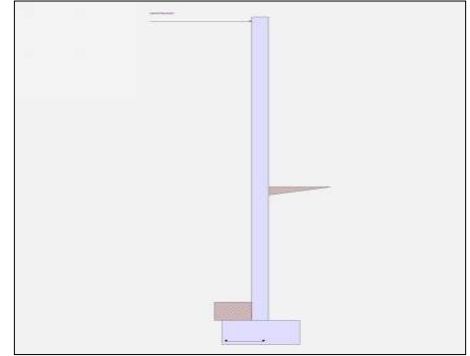
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	11.0 ft
Wall height above soil	=	14.0 ft
Total Wall Height	=	25.0 ft
Top Support Height	=	24.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	2,760.0 lbs
Axial Live Load	=	560.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	150.0 #/ft
...Height to Top	=	13.0 ft
...Height to Bottom	=	-2.0 ft
Load Type	=	Earth (H) (Service Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		
K_h Soil Density Multiplier	=	0.2 g

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3
Added seismic per unit area	=	0.0 psf

Design Summary

Total Bearing Load	=	11,520.0 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	2,304.0 psf OK
Soil Pressure @ Heel	=	2,304.0 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,809.60 psf
ACI Factored @ Heel	=	2,809.60 psf
Footing Shear @ Toe	=	2.670 psi OK
Footing Shear @ Heel	=	6.493 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	298.805 lbs
Reaction at Bottom	=	5,021.33 lbs

Sliding Calcs

Lateral Sliding Force	=	5,021.33 lbs
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Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 24.50 ft	0.09839 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Edge
Rebar Depth 'd'	= 9.50 in	10.0 in	9.50 in
Design Data			
fb/FB + fa/Fa	= 0.077	0.832	0.877
Moment.....Actual	= 1,402.67 ft-#	18,989.0 ft-#	18,989.0 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	21,646.8 ft-#
Shear Force @ this height	= 406.573 lbs		5,881.43 lbs
Shear.....Actual	= 3.566 psi		51.591 psi
Shear.....Allowable	= 94.868 psi		94.868 psi



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 25' Basement Wall at Pool

Footing Strengths & Dimensions

Toe Width	=	2 ft
Heel Width	=	3
Total Footing Width	=	5.0
Footing Thickness	=	24.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,809.60	2,809.60 psf
Mu' : Upward	= 5,619.20	ft-#
Mu' : Downward	= 1,116.0	ft-#
Mu: Design	= 4,503	-1,675 ft-#
Actual 1-Way Shear	= 2.670	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		2.59 in ²
Min footing T&S reinf Area per foot		0.52 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 4.63 in		#4@ 9.26 in
#5@ 7.18 in		#5@ 14.35 in
#6@ 10.19 in		#6@ 20.37 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	4,117.70 lbs
Heel Active Pressure	=	903.64
Sliding Force	=	5,021.33 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-13,612.3ft-#
Surcharge Over Heel	200.0	4.0 800.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft 0.0ft-#
Axial Dead Load on Stem	= 3,320.0 lbs	2.50 ft 8,300.0ft-#
Soil Over Toe	= 330.0 lbs	1.0 ft 330.0ft-#
Surcharge Over Toe	= 0.0 lbs	0.0 ft 0.0ft-#
Stem Weight	= 3,750.0 lbs	2.50 ft 9,375.0ft-#
Soil Over Heel	= 2,420.0 lbs	4.0 ft 9,680.0ft-#
Footing Weight	= 1,500.0 lbs	2.50 ft 3,750.50ft-#
Total Vertical Force	=	11,520.0 lbs
Base Moment	=	18,623.2ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 25' Basement Wall at Pool

Rebar Lap & Embedment Lengths Information



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

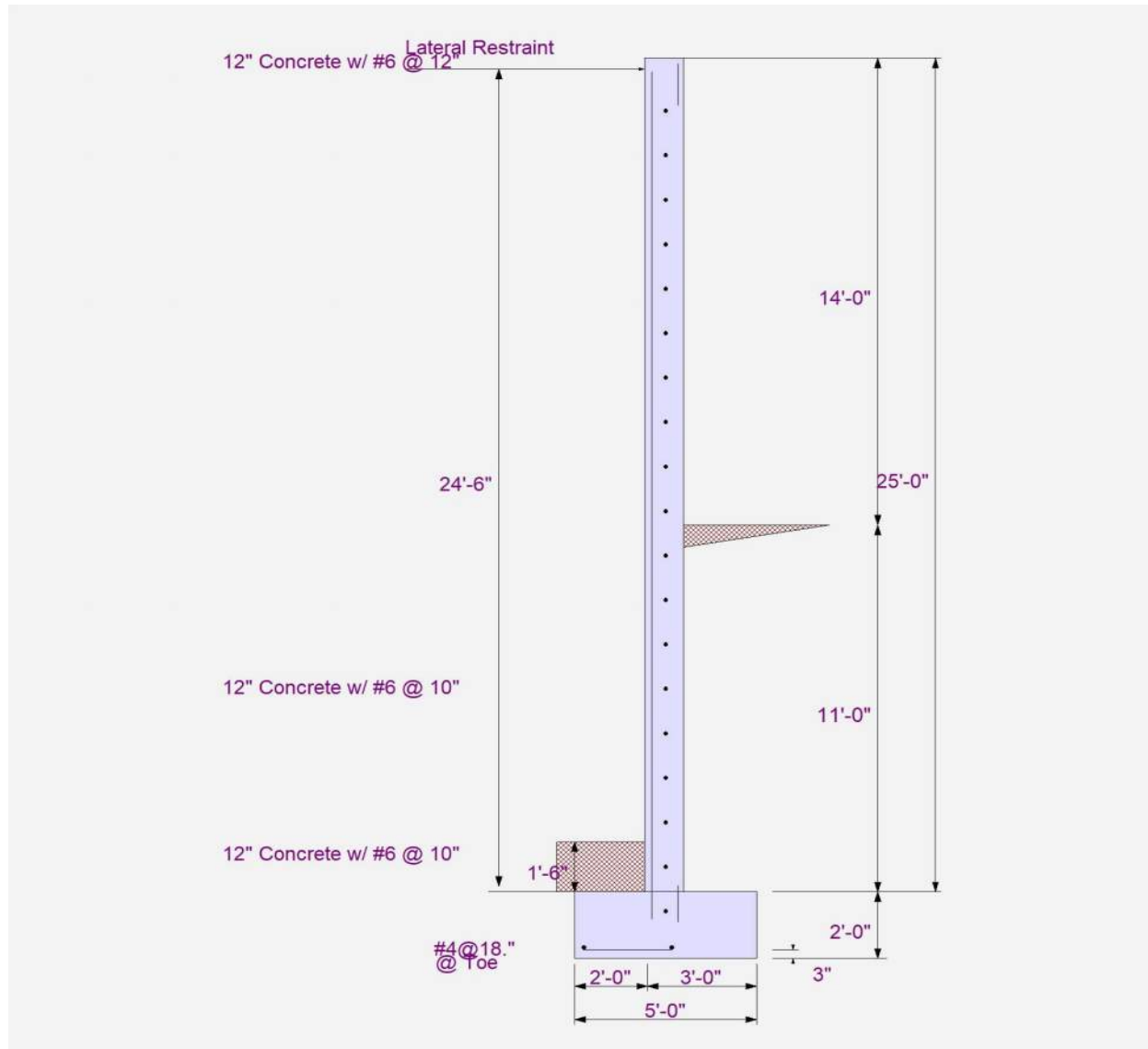
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 25' Basement Wall at Pool





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

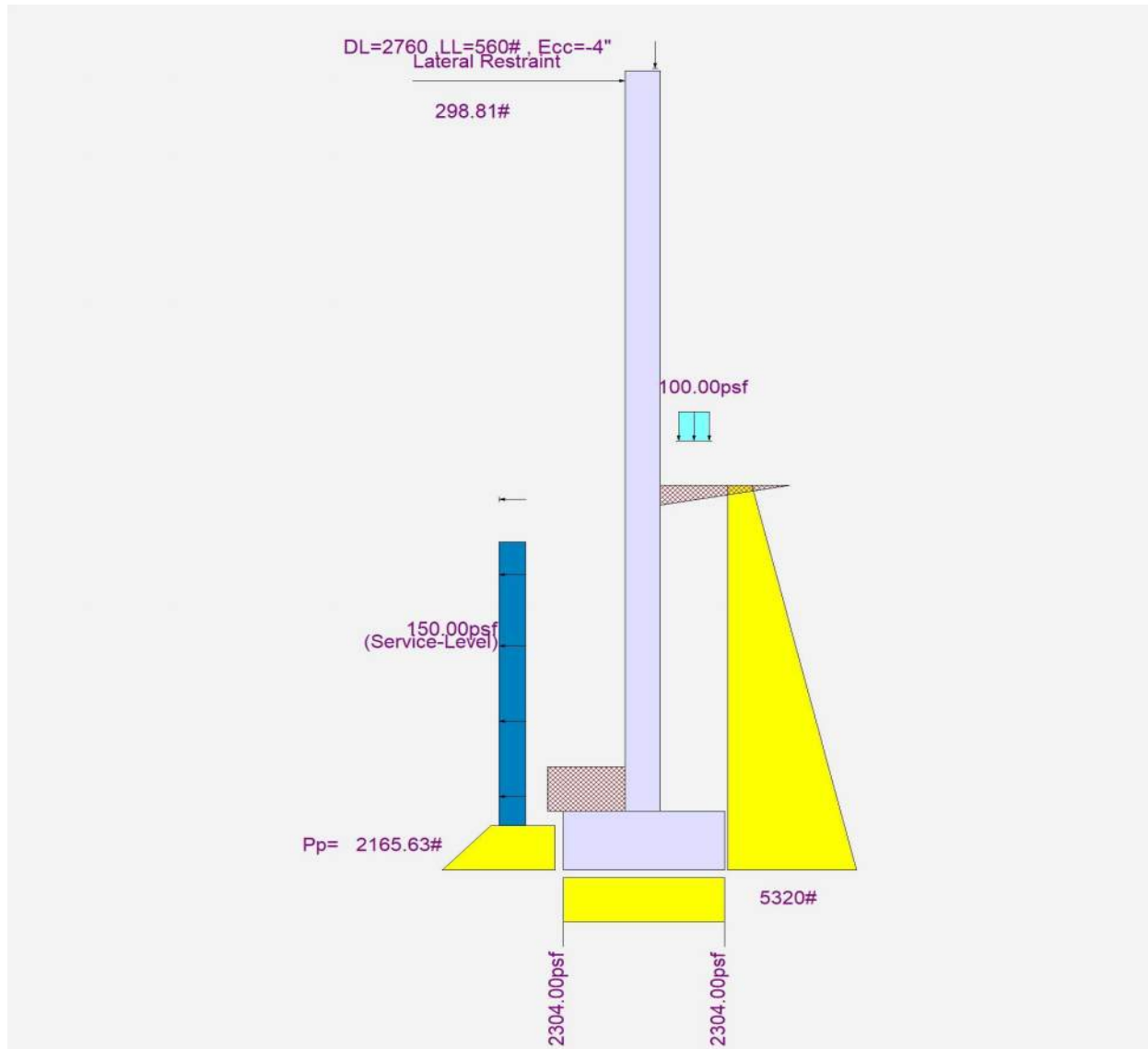
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 25' Basement Wall at Pool





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 25' Basement Wall Adjacent to Pool - EQ

Code Reference:

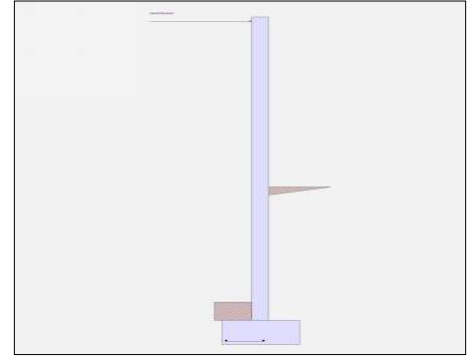
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	11.0 ft
Wall height above soil	=	14.0 ft
Total Wall Height	=	25.0 ft
Top Support Height	=	24.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footings Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	2,760.0 lbs
Axial Live Load	=	560.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	150.0 #/ft
...Height to Top	=	13.0 ft
...Height to Bottom	=	-3.0 ft
Load Type	=	Earth (H) (Service Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		

K_h Soil Density Multiplier = 0.07273 g Added seismic per unit area = 72.803 psf

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3

Design Summary

Total Bearing Load	=	11,320.0 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	2,264.0 psf OK
Soil Pressure @ Heel	=	2,264.0 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,761.60 psf
ACI Factored @ Heel	=	2,761.60 psf
Footing Shear @ Toe	=	2.613 psi OK
Footing Shear @ Heel	=	7.361 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	341.602 lbs
Reaction at Bottom	=	5,365.73 lbs

Sliding Calcs

Lateral Sliding Force	=	5,365.73 lbs
-----------------------	---	--------------

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 24.50 ft	0.09839 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 10.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Edge
Rebar Depth 'd'	= 9.50 in	10.0 in	9.50 in
Design Data			
fb/FB + fa/Fa	= 0.065	0.893	0.942
Moment.....Actual	= 1,402.67 ft-#	20,398.6 ft-#	20,398.6 ft-#
Moment.....Allowable	= 21,646.8 ft-#	22,834.8 ft-#	21,646.8 ft-#
Shear Force @ this height	= 461.780 lbs		6,410.26 lbs
Shear.....Actual	= 4.051 psi		56.230 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 25' Basement Wall Adjacent to Pool - EQ

Footing Strengths & Dimensions

Toe Width	=	2 ft
Heel Width	=	3
Total Footing Width	=	5.0
Footing Thickness	=	24.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,761.60	2,761.60 psf
Mu' : Upward	= 5,523.20	ft-#
Mu' : Downward	= 1,116.0	ft-#
Mu: Design	= 4,407	-1,899 ft-#
Actual 1-Way Shear	= 2.613	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Heel: None Spec'd	-or-	phiMn = phi * 5 * lambda * sqrt(fc) * Sm
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		2.59 in2
Min footing T&S reinf Area per foot		0.52 in2 /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 4.63 in		#4@ 9.26 in
#5@ 7.18 in		#5@ 14.35 in
#6@ 10.19 in		#6@ 20.37 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	4,525.73 lbs
Heel Active Pressure	=	840.0
Sliding Force	=	5,365.73 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-14,668.3ft-#
Surcharge Over Heel	0.0	0.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft
Axial Dead Load on Stem	= 3,320.0 lbs	2.50 ft
Soil Over Toe	= 330.0 lbs	1.0 ft
Surcharge Over Toe	= 0.0 lbs	0.0 ft
Stem Weight	= 3,750.0 lbs	2.50 ft
Soil Over Heel	= 2,420.0 lbs	4.0 ft
Footing Weight	= 1,500.0 lbs	2.50 ft
Total Vertical Force	=	11,320.0 lbs
Base Moment	=	16,767.2ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 25' Basement Wall Adjacent to Pool - EQ

Rebar Lap & Embedment Lengths Information



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

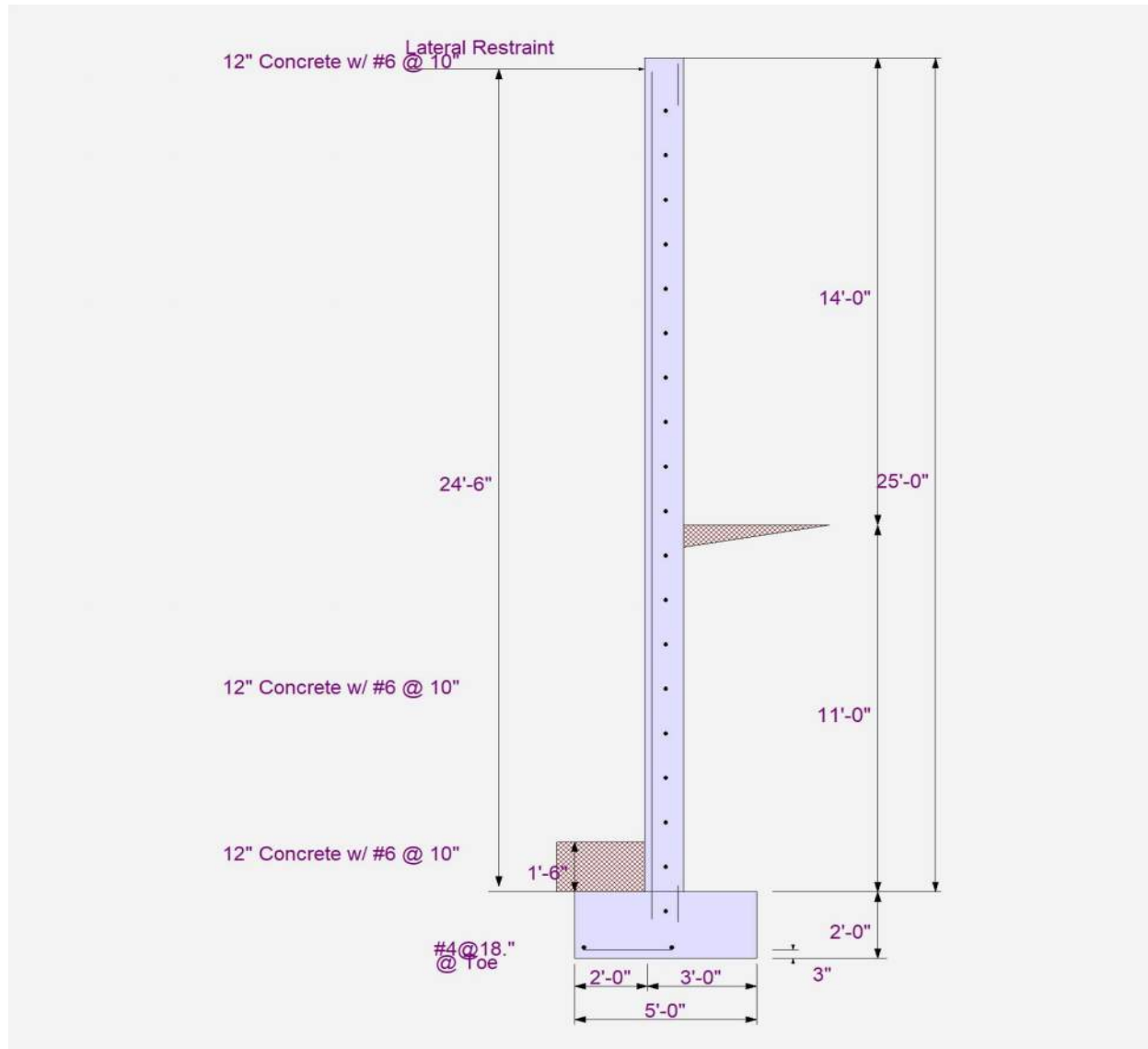
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 25' Basement Wall Adjacent to Pool - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
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Project Descr:

Restrained Retaining Wall

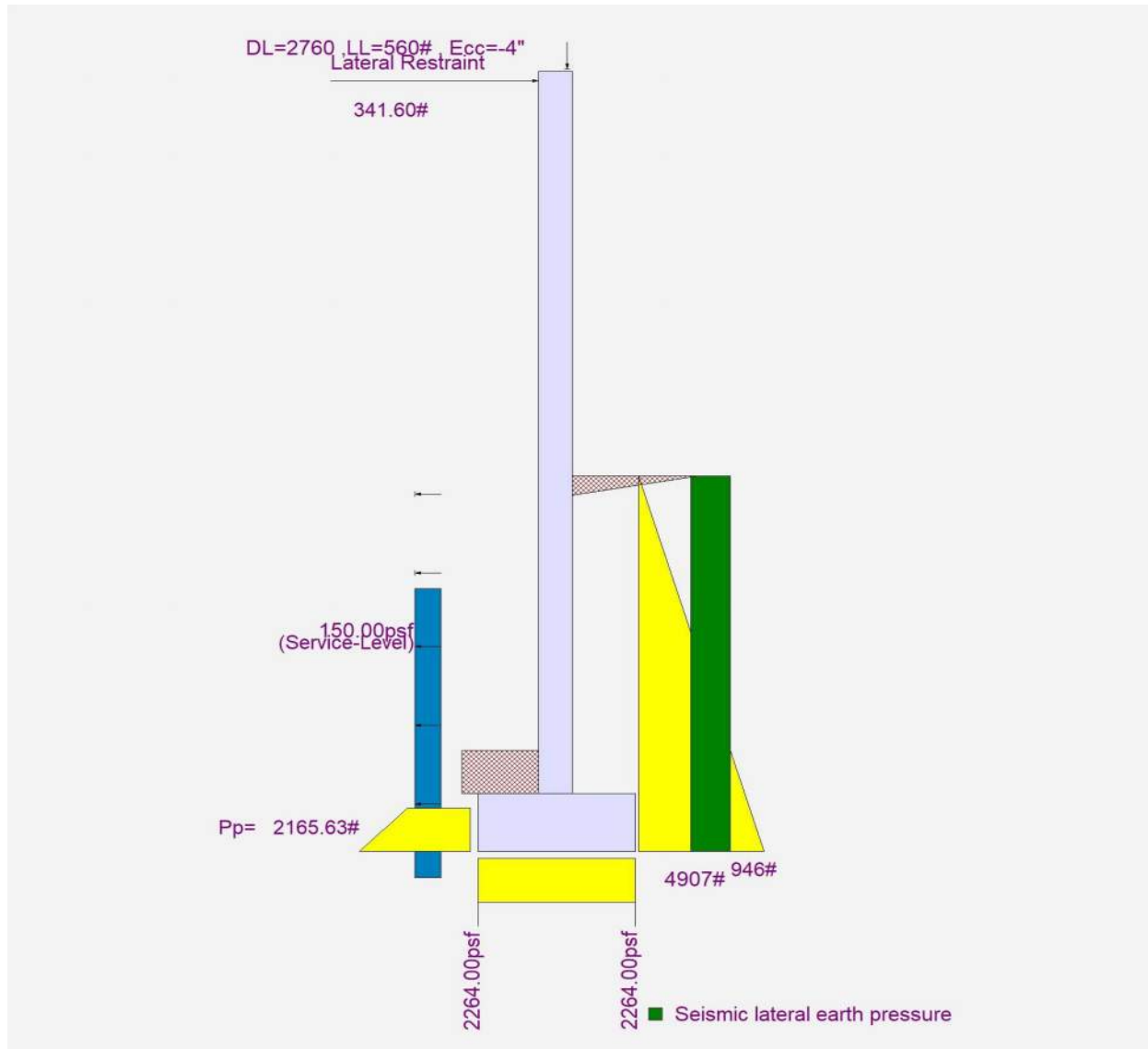
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 25' Basement Wall Adjacent to Pool - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 25' Basement Wall at Pool (Construction Backfill)

Code Reference:

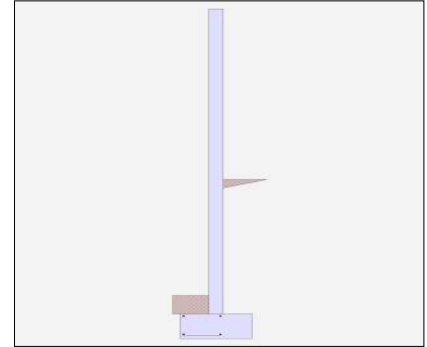
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	11.00 ft
Wall height above soil	=	14.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	18.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	525.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.525
Soil height to ignore for passive pressure	=	24.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 25' Basement Wall at Pool (Construction Backfill)

Design Summary

Wall Stability Ratios

Overturing	=	2.31	OK
Sliding	=	2.38	OK
Global Stability	=	2.09	

Total Bearing Load	=	9,305 lbs
...resultant ecc.	=	4.73 in

Eccentricity within middle third

Soil Pressure @ Toe	=	2,357 psf	OK
Soil Pressure @ Heel	=	843 psf	OK
Allowable	=	3,000 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	3,300 psf	
ACI Factored @ Heel	=	1,180 psf	
Footing Shear @ Toe	=	3.1 psi	OK
Footing Shear @ Heel	=	9.5 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	2,957.5 lbs	
less 100% Passive Force	=	2,165.6 lbs	
less 100% Friction Force	=	4,885.4 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Design Height Above Ftg

ft =	0.00
Wall Material Above "Ht"	= Concrete
Design Method	= SD
Thickness	= 12.00
Rebar Size	= # 6
Rebar Spacing	= 10.00
Rebar Placed at	= Edge

Design Data

fb/FB + fa/Fa	=	0.566
---------------	---	-------

Total Force @ Section

Service Level	lbs =
Strength Level	lbs = 3,388.0

Moment....Actual

Service Level	ft-# =
Strength Level	ft-# = 12,422.7

Moment.....Allowable	=	21,943.8
----------------------	---	----------

Shear.....Actual

Service Level	psi =
Strength Level	psi = 29.3

Shear.....Allowable	psi = 94.9
---------------------	------------

Anet (Masonry)	in2 =
----------------	-------

Wall Weight	psf = 150.0
-------------	-------------

Rebar Depth 'd'	in = 9.63
-----------------	-----------

Masonry Data

f'm	psi =
Fs	psi =
Solid Grouting	=
Modular Ratio 'n'	=
Equiv. Solid Thick.	=
Masonry Block Type	=
Masonry Design Method	= ASD

Concrete Data

f'c	psi = 4,000.0
Fy	psi = 60,000.0

Bottom

Stem OK

ft = 0.00

= Concrete

= SD

= 12.00

= # 6

= 10.00

= Edge

= 0.566

lbs =

lbs = 3,388.0

ft-# =

ft-# = 12,422.7

= 21,943.8

psi =

psi = 29.3

psi = 94.9

in2 =

psf = 150.0

in = 9.63



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Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 25' Basement Wall at Pool (Construction Backfill)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.2966 in ² /ft	
(4/3) * As :	0.3955 in ² /ft	Min Stem T&S Reinf Area 7.200 in ²
200bd/fy : 200(12)(9.625)/60000 :	0.385 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.288 in ² /ft
0.0018bh : 0.0018(12)(12) :	0.2592 in ² /ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.385 in ² /ft	#4@ 8.33 in #4@ 16.67 in
Provided Area :	0.528 in ² /ft	#5@ 12.92 in #5@ 25.83 in
Maximum Area :	2.0862 in ² /ft	#6@ 18.33 in #6@ 36.67 in

Footing Data

Toe Width	=	2.00 ft
Heel Width	=	3.00
Total Footing Width	=	5.00
Footing Thickness	=	24.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	3,000 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm.= 3.00 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 3,300	1,180 psf
Mu' : Upward	= 6,034	2,926 ft-#
Mu' : Downward	= 1,116	7,802 ft-#
Mu: Design	= 4,918 OK	4,876 ft-# OK
phiMn	= 70,124	13,255 ft-#
Actual 1-Way Shear	= 3.10	9.49 psi
Allow 1-Way Shear	= 82.16	43.82 psi
Toe Reinforcing	= # 8 @ 12.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 4.62 in, #5@ 7.17 in, #6@ 10.18 in, #7@ 13.88 in, #8@ 18.28 in, #9@ 23.14 in, #10@ 29.39 in

Heel: phiMn = ph*5*lambda*sqrt(fc)*Sm

Key: No key defined

Min footing T&S reinf Area 2.59 in²
Min footing T&S reinf Area per foot 0.52 in²/ft

If one layer of horizontal bars:

#4@ 4.63 in
#5@ 7.18 in
#6@ 10.19 in

If two layers of horizontal bars:

#4@ 9.26 in
#5@ 14.35 in
#6@ 20.37 in



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 25' Basement Wall at Pool (Construction Backfill)

Summary of Overturning & Resisting Forces & Moments

Item	OVERTURNING.....				RESISTING.....			
	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#	
HL Act Pres (ab water tbl)	2,957.5	4.33	12,815.8	Soil Over HL (ab. water tbl)	2,420.0	4.00	9,680.0	
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		4.00	9,680.0	
Hydrostatic Force				Water Table				
Buoyant Force	=			Sloped Soil Over Heel	=			
Surcharge over Heel	=			Surcharge Over Heel	=			
Surcharge Over Toe	=			Adjacent Footing Load	=			
Adjacent Footing Load	=			Axial Dead Load on Stem	=			
Added Lateral Load	=			* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=			Soil Over Toe	=	330.0	330.0	
				Surcharge Over Toe	=			
				Stem Weight(s)	=	3,750.0	9,375.0	
				Earth @ Stem Transitions	=			
				Footing Weight	=	1,500.0	3,750.0	
				Key Weight	=			
				Vert. Component	=	1,305.5	6,527.5	
Total	=	2,957.5	O.T.M. =		Total =	9,305.5 lbs	R.M.=	29,662.5
Resisting/Overturning Ratio			=	2.31				
Vertical Loads used for Soil Pressure =				9,305.5 lbs				
* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.								

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 250.0 pci
Horizontal Defl @ Top of Wall (approximate only) 0.327 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



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LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 25' Basement Wall at Pool (Construction Backfill)

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) = 22.20 in

Development length for #6 bar specified in this stem design segment = 17.08 in

Hooked embedment length into footing for #6 bar specified in this stem design segment = 8.39 in

As Provided = 0.5280 in²/ft

As Required = 0.3850 in²/ft



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Cantilevered Retaining Wall

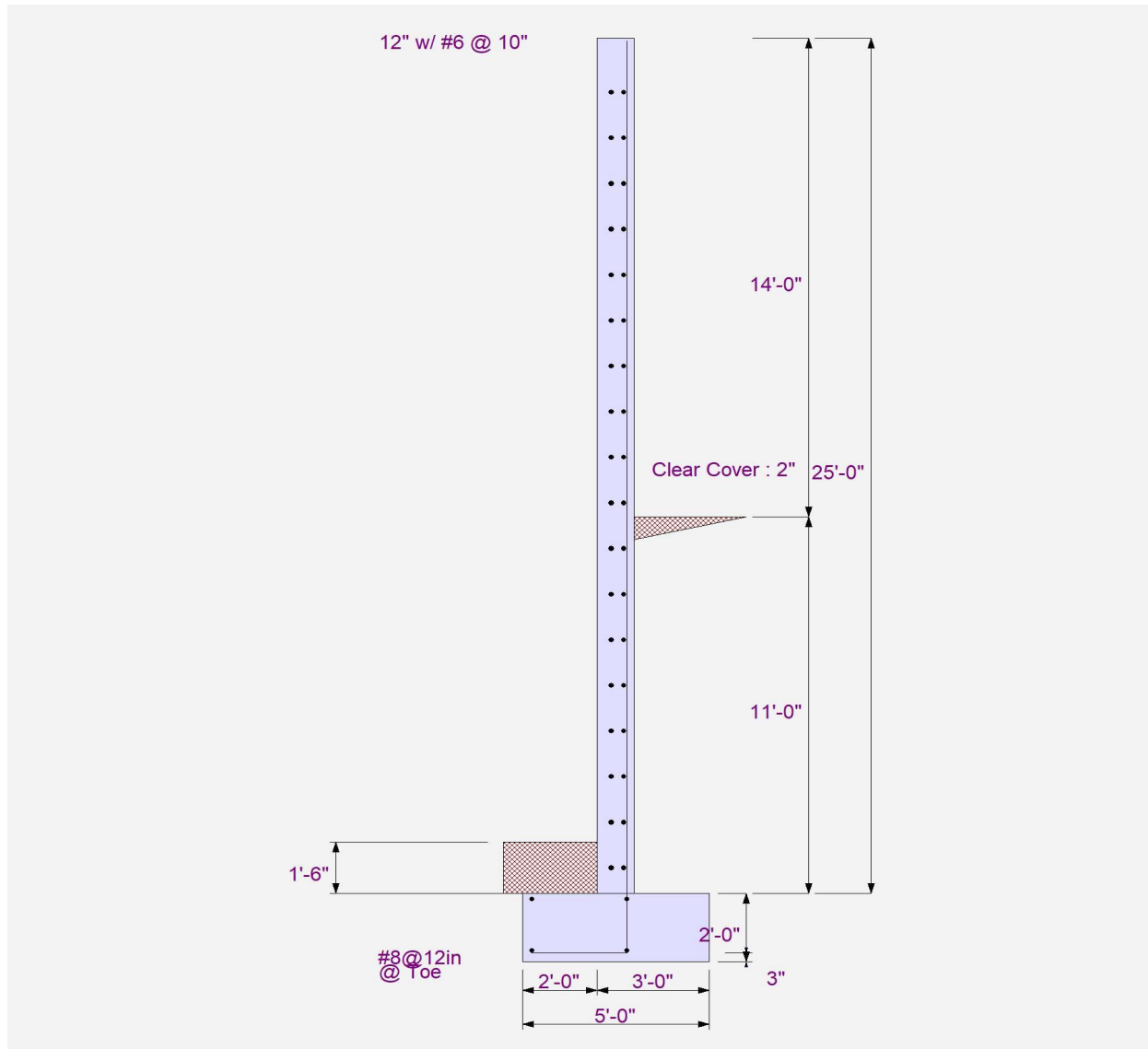
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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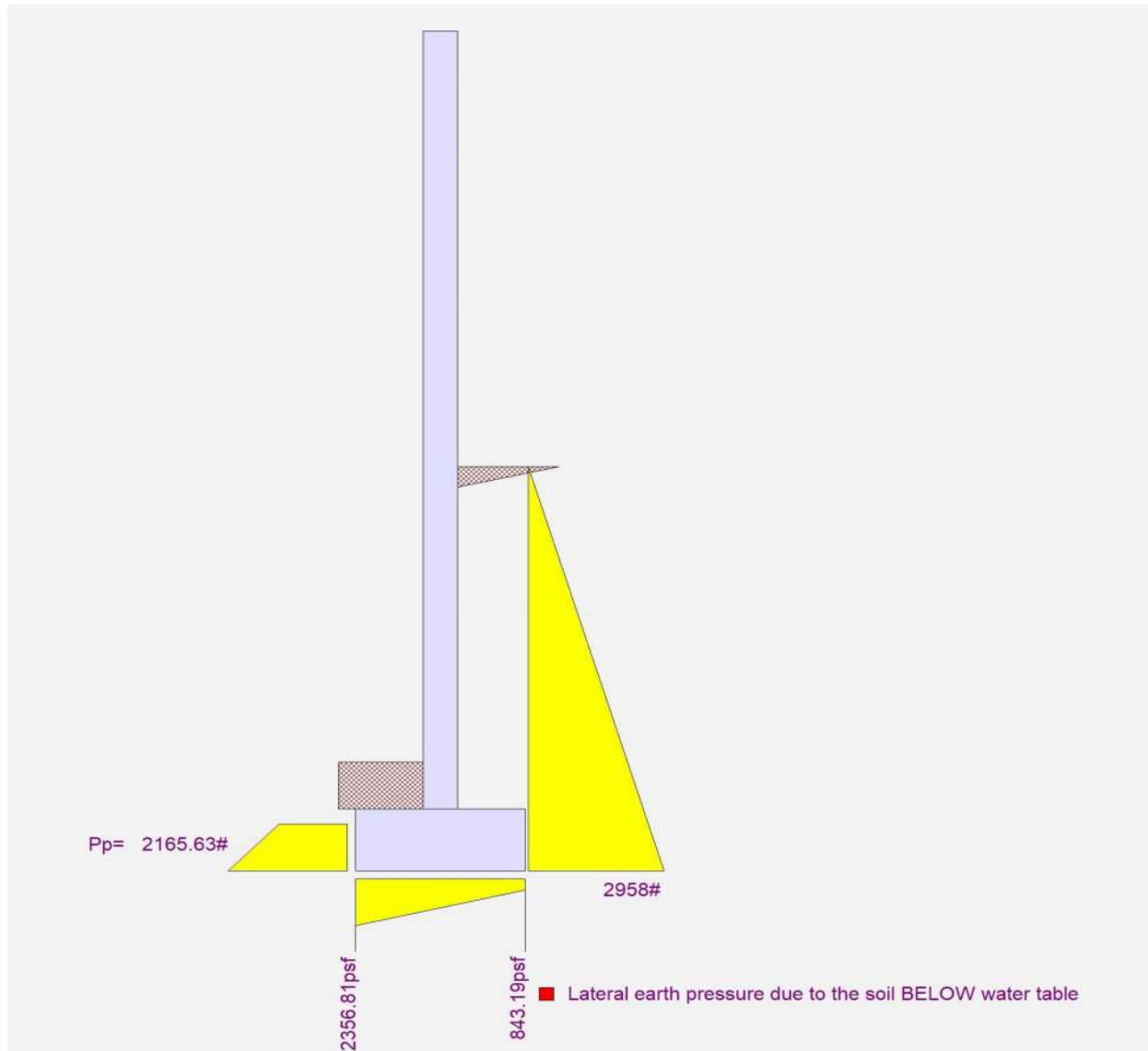
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LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 25' Basement Wall at Pool (Construction Backfill)





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2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 23' Basement Wall

Code Reference:

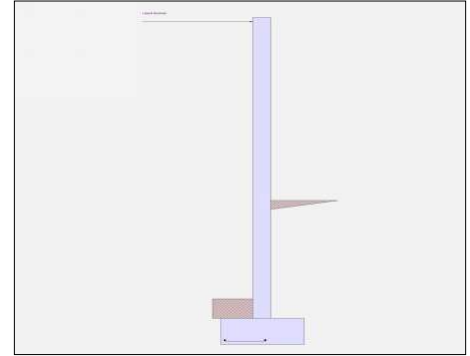
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	9.0 ft
Wall height above soil	=	14.0 ft
Total Wall Height	=	23.0 ft
Top Support Height	=	22.50 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	18.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	525.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.5250 psf
Soil height to ignore for passive pressure	=	24.0 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	2,760.0 lbs
Axial Live Load	=	560.0 lbs
Axial Load Eccentricity	=	-4.0 in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	150.0 #/ft
...Height to Top	=	13.0 ft
...Height to Bottom	=	-2.0 ft
Load Type	=	Earth (H) (Service Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		
K_h Soil Density Multiplier	=	0.2 g

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3
Added seismic per unit area	=	0.0 psf

Design Summary

Total Bearing Load	=	10,780.0 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	2,156.0 psf OK
Soil Pressure @ Heel	=	2,156.0 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	2,632.0 psf
ACI Factored @ Heel	=	2,632.0 psf
Footing Shear @ Toe	=	2.459 psi OK
Footing Shear @ Heel	=	7.163 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	277.682 lbs
Reaction at Bottom	=	4,138.82 lbs

Sliding Calcs

Lateral Sliding Force	=	4,138.82 lbs
-----------------------	---	--------------

Concrete Stem Construction

Thickness	=	12.00 in
Wall Weight	=	150.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 22.50 ft	0.09036 ft	0.00 ft
Rebar Size	= # 6	# 6	# 6
Rebar Spacing	= 12.00 in	10.00 in	10.00 in
Rebar Placed at	= Edge	Edge	Edge
Rebar Depth 'd'	= 9.50 in	10.0 in	9.50 in
Design Data			
fb/FB + fa/Fa	= 0.077	0.624	0.658
Moment.....Actual	= 1,402.67 ft-#	14,245.7 ft-#	14,245.7 ft-#
Moment.....Allowable	= 18,167.5 ft-#	22,834.8 ft-#	21,646.8 ft-#
Shear Force @ this height	= 358.552 lbs		4,707.63 lbs
Shear.....Actual	= 3.145 psi		41.295 psi
Shear.....Allowable	= 94.868 psi		94.868 psi

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000



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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: 23' Basement Wall

Footing Strengths & Dimensions

Toe Width	=	2 ft
Heel Width	=	3
Total Footing Width	=	5.0
Footing Thickness	=	24.0 in
Key Width	=	12.0 in
Key Depth	=	in
Key Distance from Toe	=	2 ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,632.0	2,632.0 psf
Mu' : Upward	= 5,264.0	ft-#
Mu' : Downward	= 1,116.0	ft-#
Mu: Design	= 4,148	-1,848 ft-#
Actual 1-Way Shear	= 2.459	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 4 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		2.59 in ²
Min footing T&S reinf Area per foot		0.52 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 4.63 in		#4@ 9.26 in
#5@ 7.18 in		#5@ 14.35 in
#6@ 10.19 in		#6@ 20.37 in

Summary of Forces on Footing : Slab is NOT providing sliding, stem is FIXED at footing

Forces acting on footing for sliding & soil pressure....

Sliding Forces

Stem Shear @ Top of Footing	=	3,375.18 lbs
Heel Active Pressure	=	763.64
Sliding Force	=	4,138.82 lbs

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem			=	-10,539.1ft-#
Surcharge Over Heel	200.0	4.0		800.0
Adjacent Footing Load	= 0.0 lbs	0.0 ft		0.0ft-#
Axial Dead Load on Stem	= 3,320.0 lbs	2.50 ft		8,300.0ft-#
Soil Over Toe	= 330.0 lbs	1.0 ft		330.0ft-#
Surcharge Over Toe	= 0.0 lbs	0.0 ft		0.0ft-#
Stem Weight	= 3,450.0 lbs	2.50 ft		8,625.0ft-#
Soil Over Heel	= 1,980.0 lbs	4.0 ft		7,920.0ft-#
Footing Weight	= 1,500.0 lbs	2.50 ft		3,750.50ft-#
Total Vertical Force	= 10,780.0 lbs	Base Moment	=	19,186.4ft-#

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



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Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

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DESCRIPTION: 23' Basement Wall

Rebar Lap & Embedment Lengths Information



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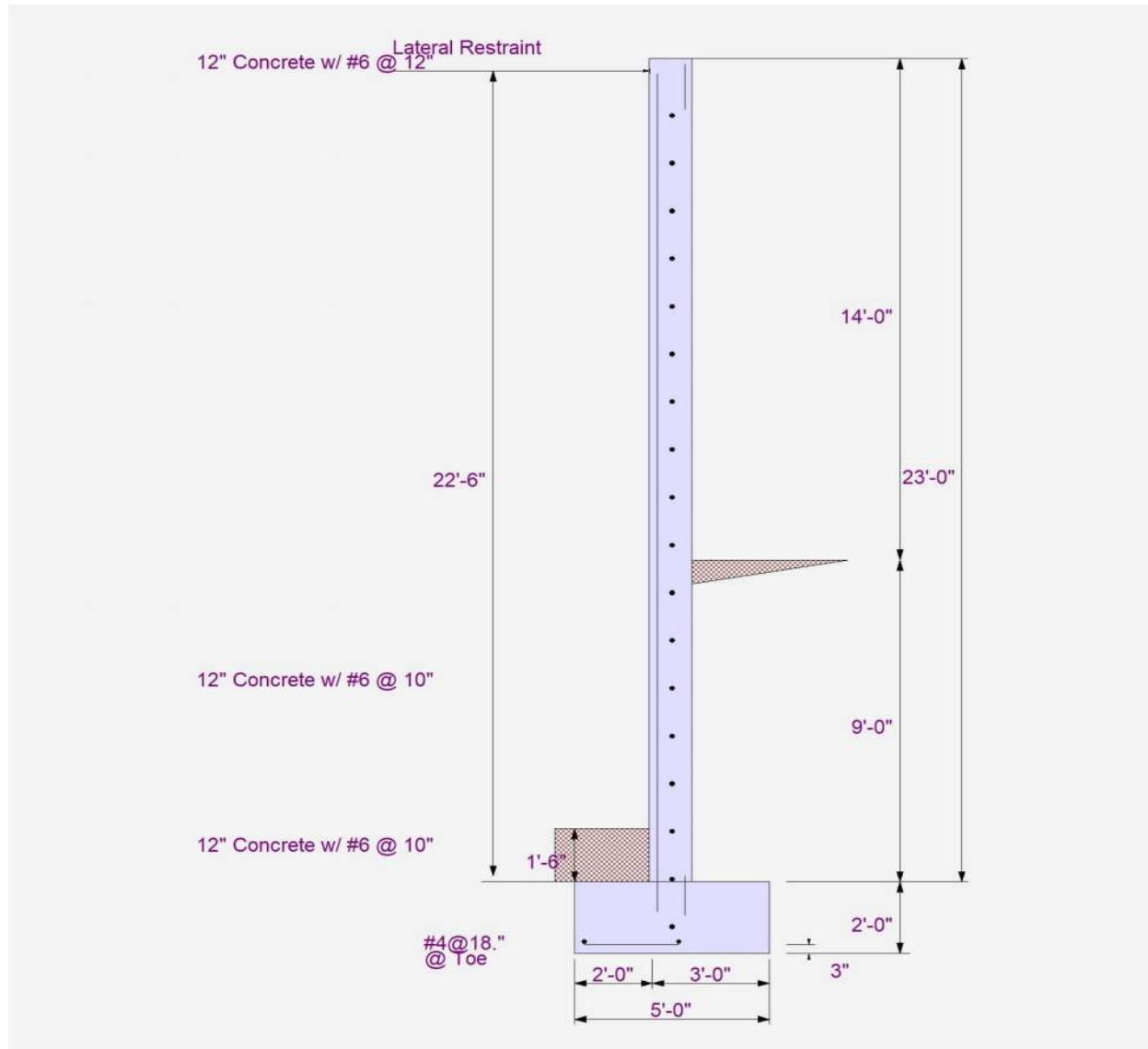
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

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DESCRIPTION: 23' Basement Wall





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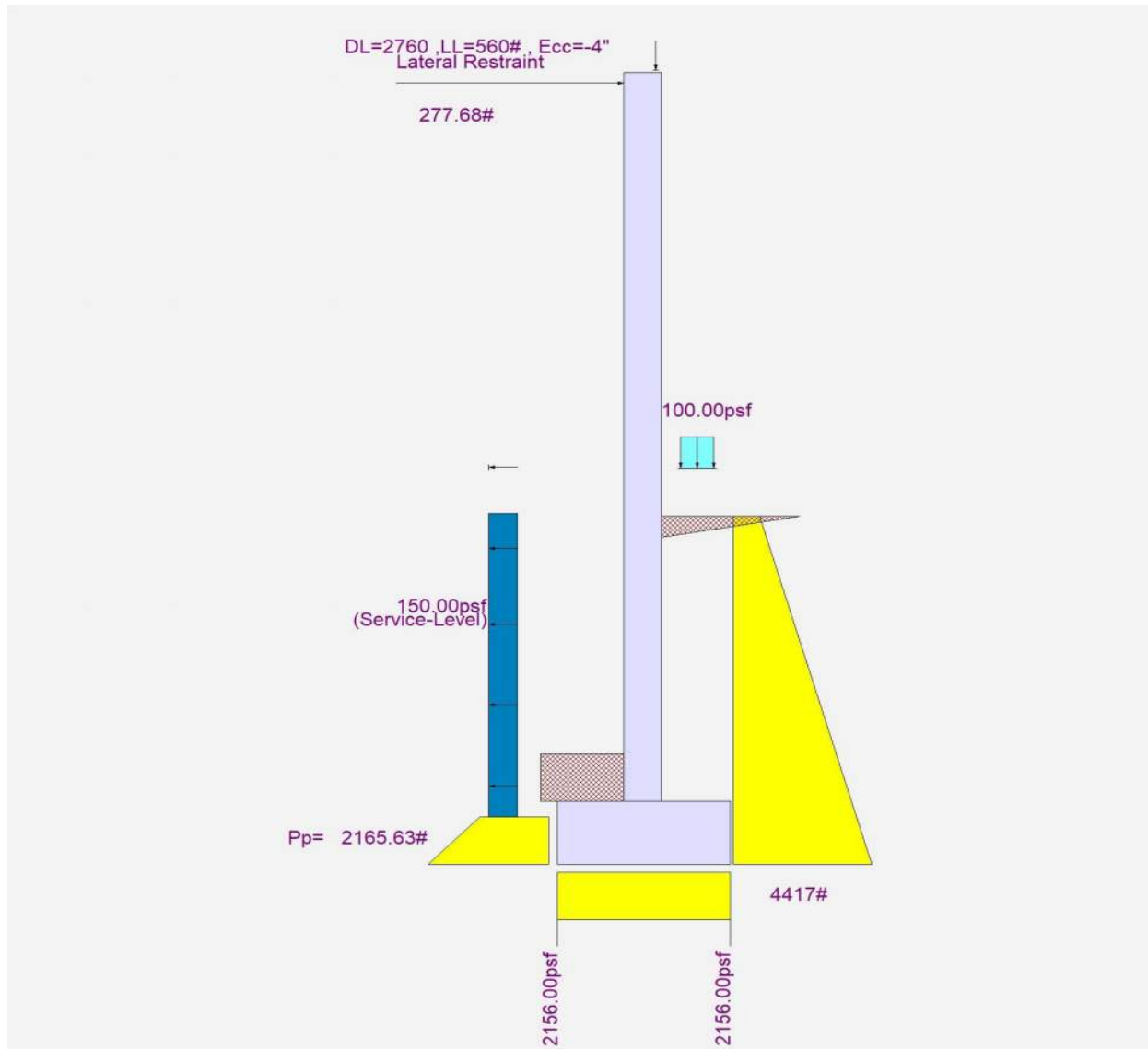
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

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DESCRIPTION: 23' Basement Wall





AHBL, INC.
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 9' Cantilevered Basement Wall

Code Reference:

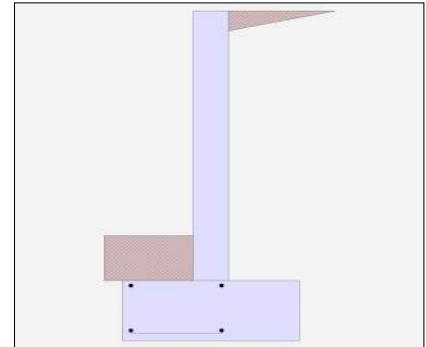
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	9.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	18.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	525.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.525
Soil height to ignore for passive pressure	=	24.00 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 9' Cantilevered Basement Wall

Design Summary

Wall Stability Ratios

Overtuning	=	2.15	OK
Sliding	=	2.22	OK
Global Stability	=	2.45	

Total Bearing Load	=	6,295 lbs
...resultant ecc.	=	5.02 in

Eccentricity within middle third

Soil Pressure @ Toe	=	1,610 psf	OK
Soil Pressure @ Heel	=	534 psf	OK
Allowable	=	3,000 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	2,254 psf	
ACI Factored @ Heel	=	748 psf	
Footing Shear @ Toe	=	1.9 psi	OK
Footing Shear @ Heel	=	10.7 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	2,467.5 lbs	
less 100% Passive Force	=	2,165.6 lbs	
less 100% Friction Force	=	3,304.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Design Height Above Ftg

Wall Material Above "Ht"	=	Concrete
Design Method	=	SD
Thickness	=	12.00
Rebar Size	=	# 6
Rebar Spacing	=	10.00
Rebar Placed at	=	Edge

Design Data

fb/FB + fa/Fa	=	0.404
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Total Force @ Section

Service Level	lbs =
Strength Level	lbs = 2,726.2

Moment....Actual

Service Level	ft-# =
Strength Level	ft-# = 8,865.8

Moment.....Allowable	=	21,943.8
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Shear.....Actual

Service Level	psi =
Strength Level	psi = 23.6

Shear.....Allowable	psi = 94.9
---------------------	------------

Anet (Masonry)	in2 =
----------------	-------

Wall Weight	psf = 150.0
-------------	-------------

Rebar Depth 'd'	in = 9.63
-----------------	-----------

Masonry Data

f'm	psi =
Fs	psi =
Solid Grouting	=
Modular Ratio 'n'	=
Equiv. Solid Thick.	=
Masonry Block Type	=
Masonry Design Method	= ASD

Concrete Data

f'c	psi = 4,000.0
Fy	psi = 60,000.0

Bottom

Stem OK

ft = 0.00

Concrete

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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 9' Cantilevered Basement Wall

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.2117 in2/ft	
(4/3) * As :	0.2823 in2/ft	Min Stem T&S Reinf Area 2.592 in2
200bd/fy : 200(12)(9.625)/60000 :	0.385 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.288 in2/ft
0.0018bh : 0.0018(12)(12) :	0.2592 in2/ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.2823 in2/ft	#4@ 8.33 in #4@ 16.67 in
Provided Area :	0.528 in2/ft	#5@ 12.92 in #5@ 25.83 in
Maximum Area :	2.0862 in2/ft	#6@ 18.33 in #6@ 36.67 in

Footing Data

Toe Width	=	2.00 ft
Heel Width	=	3.00
Total Footing Width	=	5.00
Footing Thickness	=	24.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c = 3,000 psi	Fy = 60,000 psi	
Footing Concrete Density = 150.00 pcf		
Min. As % = 0.0018		
Cover @ Top 2.00	@ Btm.= 3.00 in	

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,254	748 psf
Mu' : Upward	= 4,106	1,897 ft-#
Mu' : Downward	= 1,116	6,407 ft-#
Mu: Design	= 2,990 OK	4,510 ft-# OK
phiMn	= 47,775	13,255 ft-#
Actual 1-Way Shear	= 1.88	10.66 psi
Allow 1-Way Shear	= 82.16	43.82 psi
Toe Reinforcing	= # 6 @ 10.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 4.62 in, #5@ 7.17 in, #6@ 10.18 in, #7@ 13.88 in, #8@ 18.28 in, #9@ 23.14 in, #10@ 29.39 in

Heel: phiMn = ph*5*lambda*sqrt(fc)*Sm

Key: No key defined

Min footing T&S reinf Area 2.59 in2
Min footing T&S reinf Area per foot 0.52 in2 /ft

If one layer of horizontal bars:

#4@ 4.63 in
#5@ 7.18 in
#6@ 10.19 in

If two layers of horizontal bars:

#4@ 9.26 in
#5@ 14.35 in
#6@ 20.37 in

Cantilevered Retaining Wall

Project File: 2220236 care center concrete framing.ec6

LIC# : KW-06014847. Build:20.23.2.14

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DESCRIPTION: 9' Cantilevered Basement Wall

Summary of Overturning & Resisting Forces & Moments

.....OVERTURNING.....				RESISTING.....			
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)	2,117.5	3.67	7,764.2	Soil Over HL (ab. water tbl)	1,980.0	4.00	7,920.0
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		4.00	7,920.0
Hydrostatic Force				Water Table			
Buoyant Force =				Sloped Soil Over Heel =			
Surcharge over Heel =	350.0	5.50	1,925.0	Surcharge Over Heel =	200.0	4.00	800.0
Surcharge Over Toe =				Adjacent Footing Load =			
Adjacent Footing Load =				Axial Dead Load on Stem =			
Added Lateral Load =				* Axial Live Load on Stem =			
Load @ Stem Above Soil =				Soil Over Toe =	330.0	1.00	330.0
=				Surcharge Over Toe =			
				Stem Weight(s) =	1,350.0	2.50	3,375.0
				Earth @ Stem Transitions =			
Total =	2,467.5	O.T.M.	= 9,689.2	Footing Weight =	1,500.0	2.50	3,750.0
				Key Weight =			
Resisting/Overturning Ratio		=	2.15	Vert. Component =	934.7	5.00	4,673.5
Vertical Loads used for Soil Pressure =		6,294.7	lbs	Total =	6,294.7	lbs	R.M. = 20,848.5

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
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Horizontal Defl @ Top of Wall (approximate only) 0.080 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 9' Cantilevered Basement Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) = 22.20 in

Development length for #6 bar specified in this stem design segment = 17.08 in

Hooked embedment length into footing for #6 bar specified in this stem design segment = 6.15 in

As Provided = 0.5280 in²/ft

As Required = 0.2823 in²/ft



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Cantilevered Retaining Wall

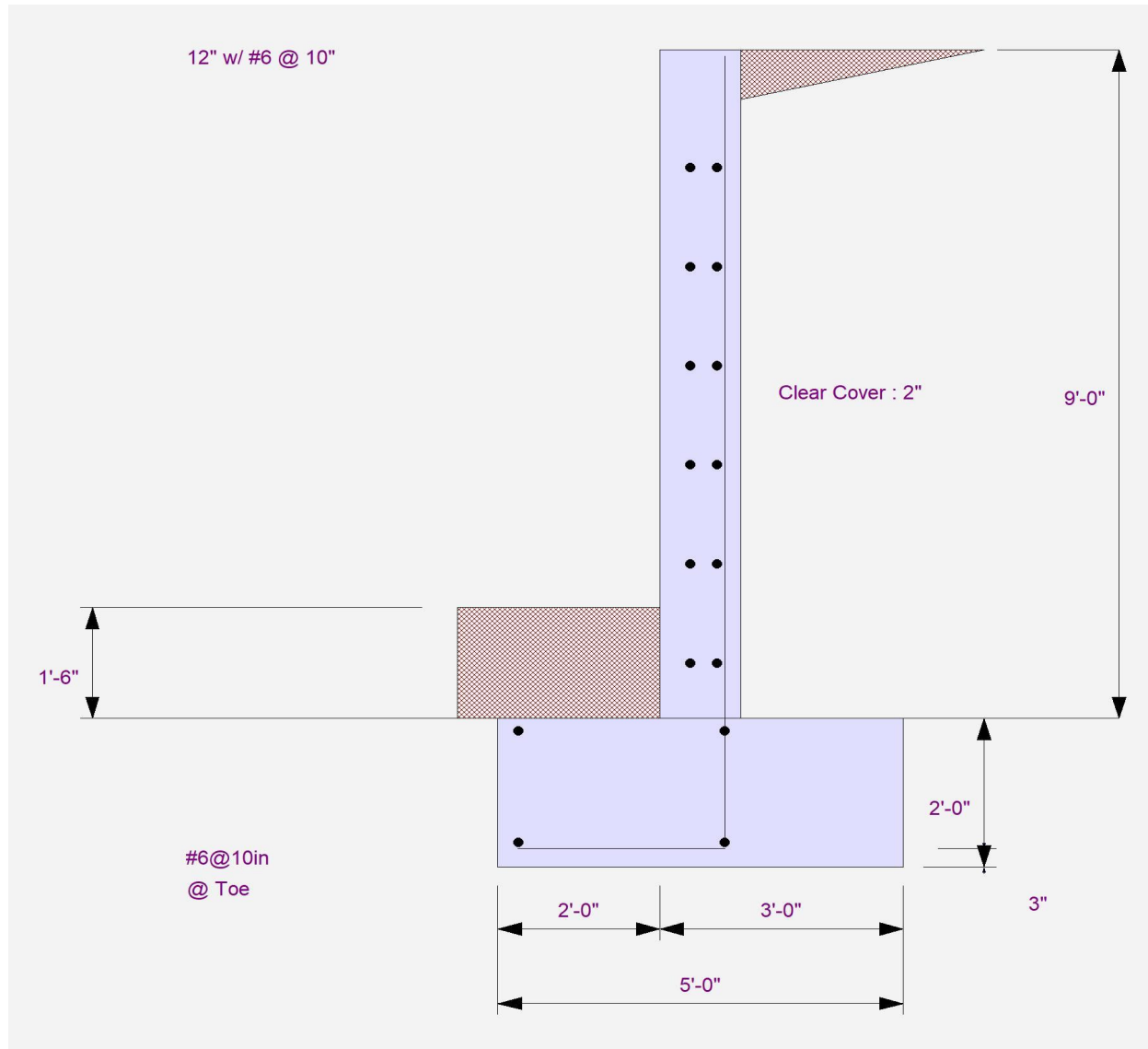
Project File: 2220236_care center concrete framing.ec6

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DESCRIPTION: 9' Cantilevered Basement Wall





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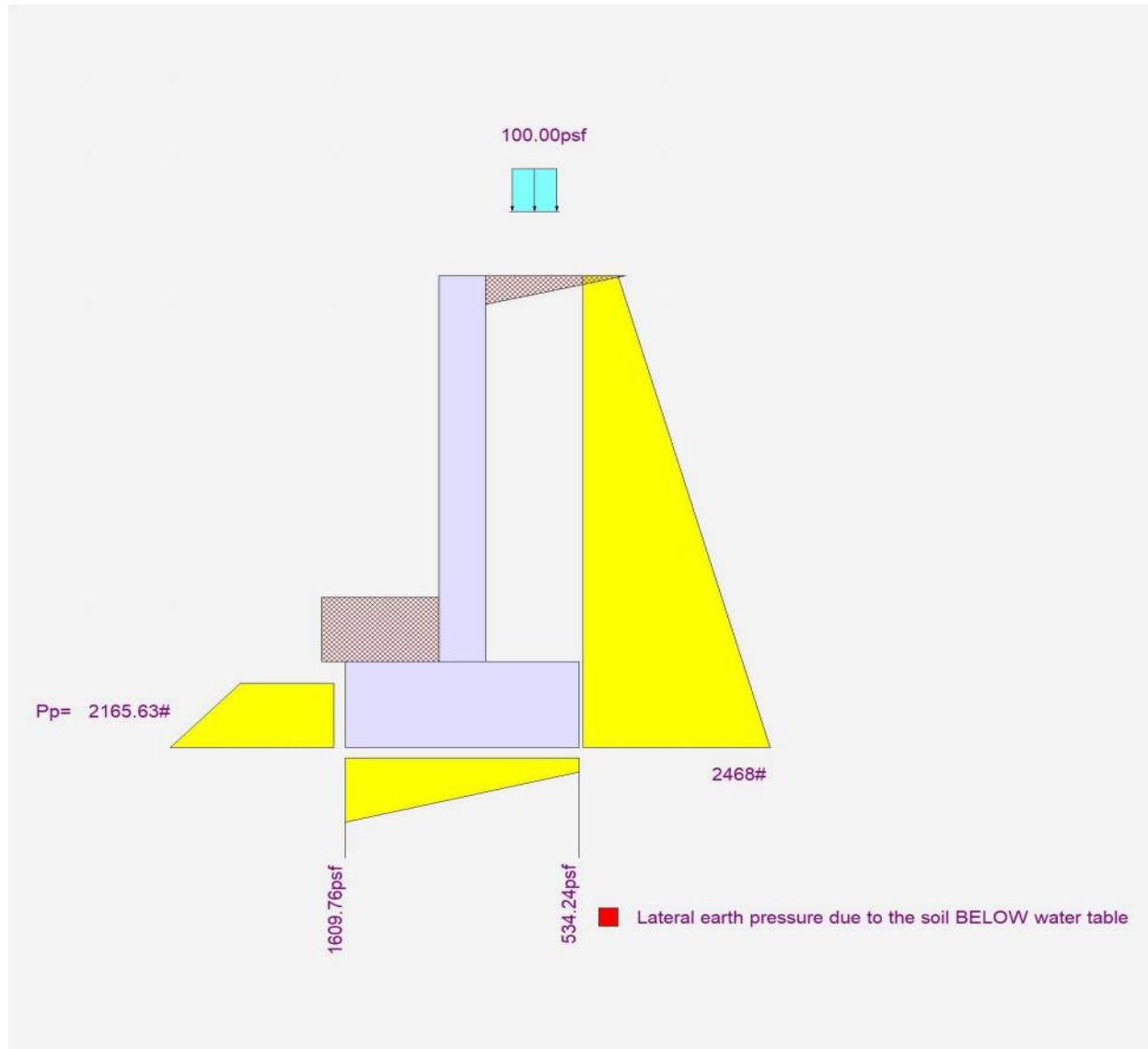
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DESCRIPTION: 9' Cantilevered Basement Wall





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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 9' Cantilevered Basement Wall - EQ

Code Reference:

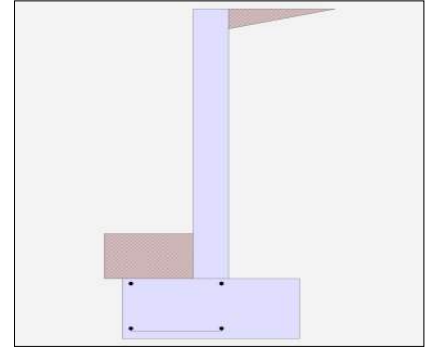
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	9.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	18.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	525.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.525
Soil height to ignore for passive pressure	=	24.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Earth Pressure Seismic Load

Method : Uniform		
Multiplier Used	=	8.000
(Multiplier used on soil density)		

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Uniform Seismic Force	=	88.000
Total Seismic Force	=	968.000



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AHBL, INC

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DESCRIPTION: 9' Cantilevered Basement Wall - EQ

Design Summary

Wall Stability Ratios

Overtuning	=	1.74	OK
Sliding	=	1.92	OK
Global Stability	=	2.45	

Total Bearing Load	=	6,095 lbs
...resultant ecc.	=	10.10 in

Eccentricity outside middle third

Soil Pressure @ Toe	=	2,074 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	3,000 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	2,904 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	2.6 psi	OK
Footing Shear @ Heel	=	13.1 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	2,795.1 lbs	
less 100% Passive Force	-	2,165.6 lbs	
less 100% Friction Force	= -	3,199.7 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Design Height Above Ftg

ft =	0.00
Wall Material Above "Ht"	= Concrete
Design Method	= SD
Thickness	= 12.00
Rebar Size	= # 6
Rebar Spacing	= 10.00
Rebar Placed at	= Edge

Design Data

fb/FB + fa/Fa	=	0.472
---------------	---	-------

Total Force @ Section

Service Level	lbs =
Strength Level	lbs = 3,060.0

Moment....Actual

Service Level	ft-# =
Strength Level	ft-# = 10,368.0

Moment.....Allowable

=	21,943.8
---	----------

Shear.....Actual

Service Level	psi =
Strength Level	psi = 26.5

Shear.....Allowable

psi =	94.9
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Anet (Masonry)

in2 =	
-------	--

Wall Weight

psf =	150.0
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Rebar Depth 'd'

in =	9.63
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Masonry Data

f'm	psi =
Fs	psi =
Solid Grouting	=
Modular Ratio 'n'	=
Equiv. Solid Thick.	=
Masonry Block Type	=
Masonry Design Method	= ASD

Concrete Data

f'c	psi = 4,000.0
Fy	psi = 60,000.0



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 9' Cantilevered Basement Wall - EQ

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.2476 in ² /ft	
(4/3) * As :	0.3301 in ² /ft	Min Stem T&S Reinf Area 2.592 in ²
200bd/fy : 200(12)(9.625)/60000 :	0.385 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.288 in ² /ft
0.0018bh : 0.0018(12)(12) :	0.2592 in ² /ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.3301 in ² /ft	#4@ 8.33 in #4@ 16.67 in
Provided Area :	0.528 in ² /ft	#5@ 12.92 in #5@ 25.83 in
Maximum Area :	2.0862 in ² /ft	#6@ 18.33 in #6@ 36.67 in

Footing Data

Toe Width	=	2.00 ft
Heel Width	=	3.00
Total Footing Width	=	5.00
Footing Thickness	=	24.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	3,000 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm.= 3.00 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,904	0 psf
Mu' : Upward	= 5,030	750 ft-#
Mu' : Downward	= 1,116	6,087 ft-#
Mu: Design	= 3,914 OK	5,337 ft-# OK
phiMn	= 47,775	13,255 ft-#
Actual 1-Way Shear	= 2.60	13.08 psi
Allow 1-Way Shear	= 82.16	43.82 psi
Toe Reinforcing	= # 6 @ 10.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 4.62 in, #5@ 7.17 in, #6@ 10.18 in, #7@ 13.88 in, #8@ 18.28 in, #9@ 23.14 in, #10@ 29.39 in

Heel: phiMn = ph*5*lambda*sqrt(fc)*Sm

Key: No key defined

Min footing T&S reinf Area	2.59 in ²
Min footing T&S reinf Area per foot	0.52 in ² /ft
<u>If one layer of horizontal bars:</u>	<u>If two layers of horizontal bars:</u>
#4@ 4.63 in	#4@ 9.26 in
#5@ 7.18 in	#5@ 14.35 in
#6@ 10.19 in	#6@ 20.37 in



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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 9' Cantilevered Basement Wall - EQ

Summary of Overturning & Resisting Forces & Moments

.....OVERTURNING.....				RESISTING.....					
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#		
HL Act Pres (ab water tbl)	2,117.5	3.67	7,764.2	Soil Over HL (ab. water tbl)	1,980.0	4.00	7,920.0		
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		4.00	7,920.0		
Hydrostatic Force				Water Table					
Buoyant Force	=			Sloped Soil Over Heel	=				
Surcharge over Heel	=			Surcharge Over Heel	=				
Surcharge Over Toe	=			Adjacent Footing Load	=				
Adjacent Footing Load	=			Axial Dead Load on Stem	=				
Added Lateral Load	=			* Axial Live Load on Stem	=				
Load @ Stem Above Soil	=			Soil Over Toe	=	330.0	1.00	330.0	
Seismic Earth Load	=	677.6	5.50	3,726.8	Surcharge Over Toe	=			
	=			Stem Weight(s)	=	1,350.0	2.50	3,375.0	
				Earth @ Stem Transitions	=				
Total	=	2,795.1	O.T.M. =	11,491.0	Footing Weight	=	1,500.0	2.50	3,750.0
				Key Weight	=				
Resisting/Overturning Ratio			=	1.74	Vert. Component	=	934.7	5.00	4,673.5
Vertical Loads used for Soil Pressure	=	6,094.7	lbs		Total =	6,094.7	lbs	R.M.=	20,048.5

If seismic is included, the OTM and sliding ratios may be 1.1 per section 1807.2.3 of IBC.

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 250.0 pci
Horizontal Defl @ Top of Wall (approximate only) 0.104 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



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LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 9' Cantilevered Basement Wall - EQ

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) = 22.20 in

Development length for #6 bar specified in this stem design segment = 17.08 in

Hooked embedment length into footing for #6 bar specified in this stem design segment = 7.19 in

As Provided = 0.5280 in²/ft

As Required = 0.3301 in²/ft



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Cantilevered Retaining Wall

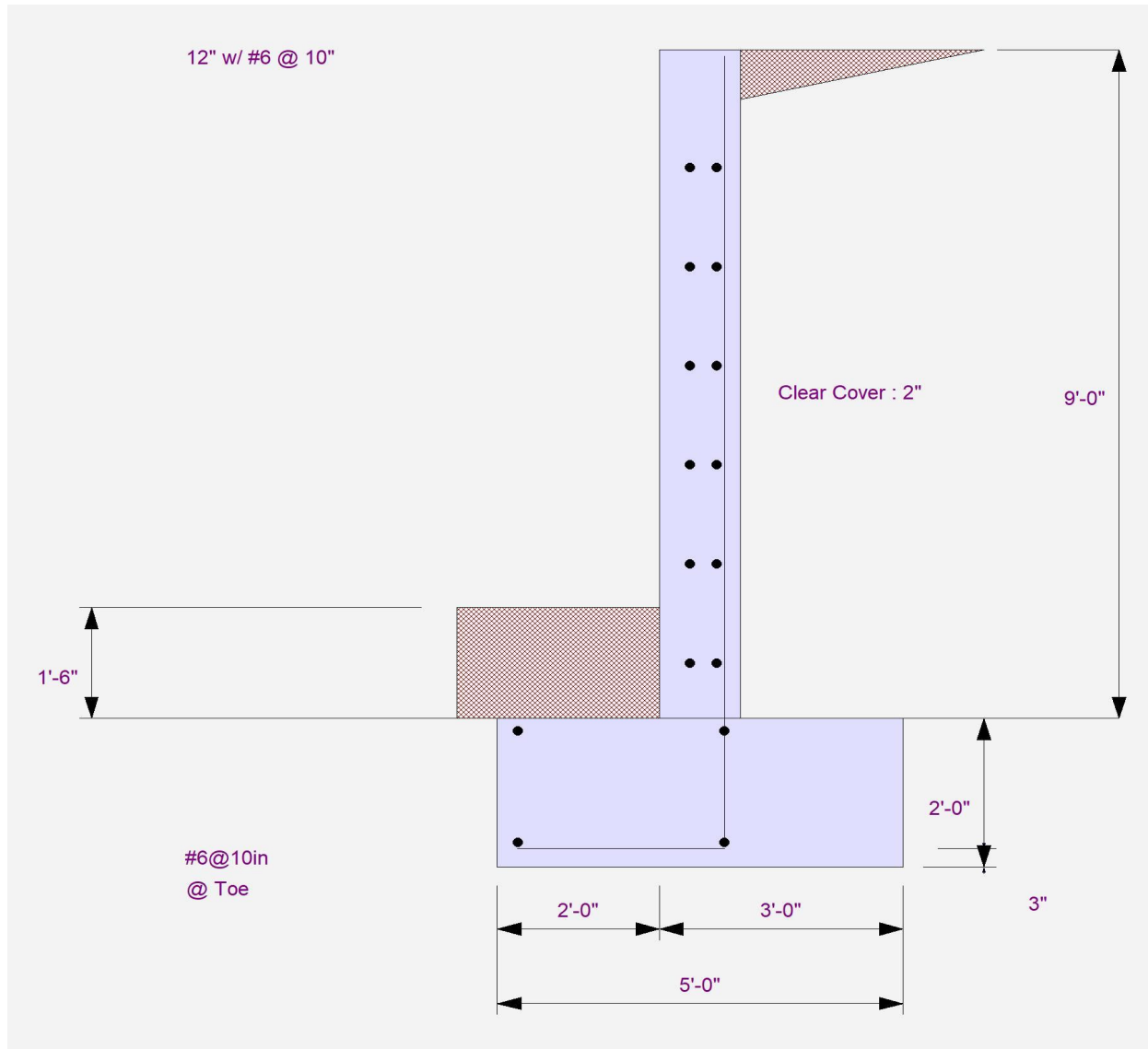
Project File: 2220236_care center concrete framing.ec6

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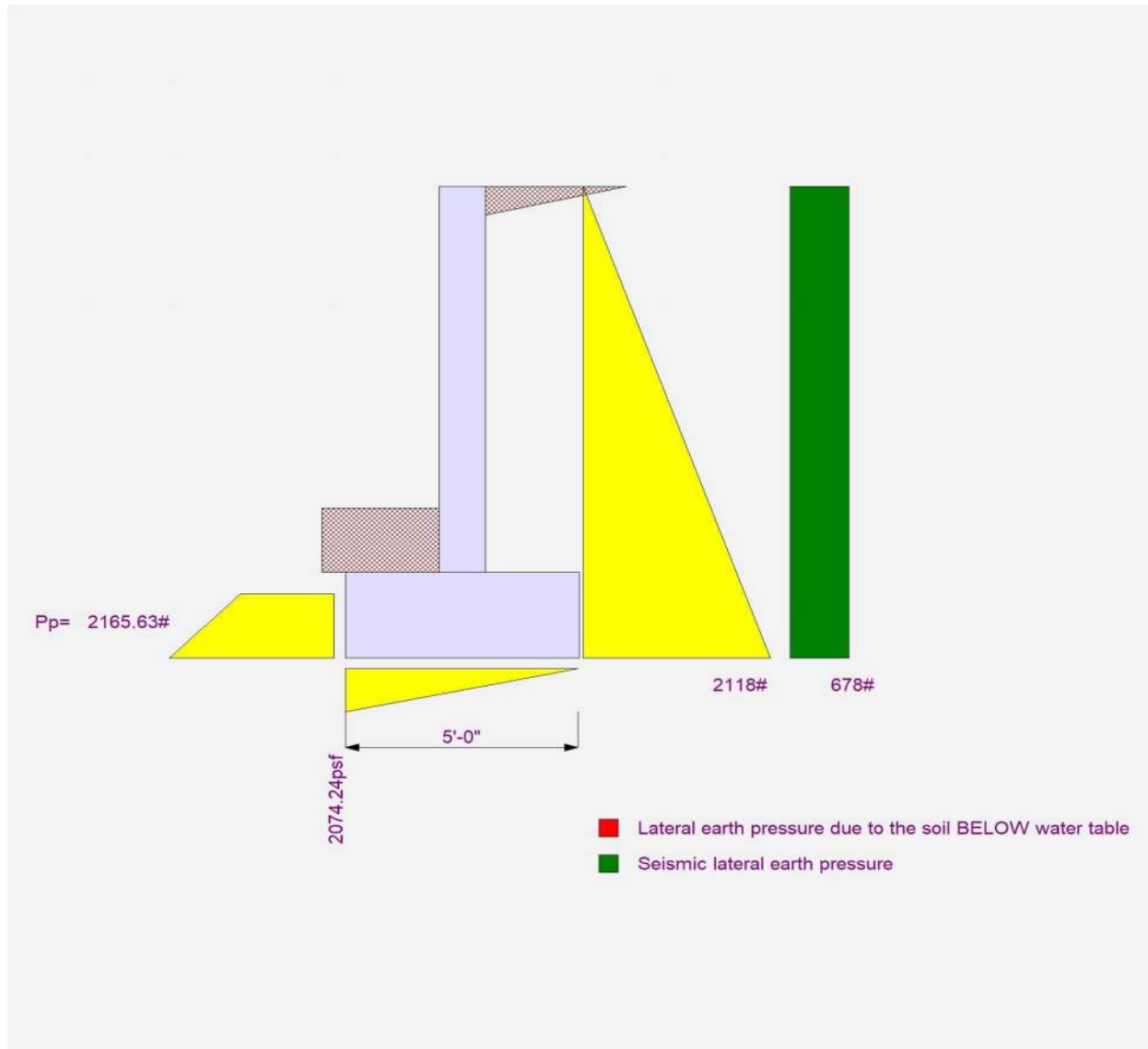
Project File: 2220236_care center concrete framing.ec6

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Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall

Code Reference:

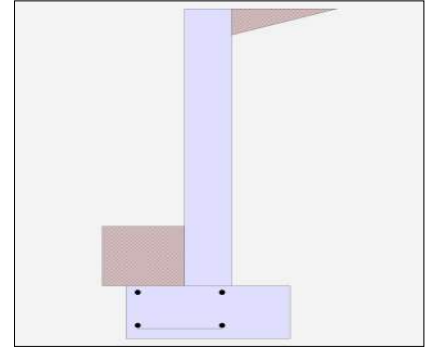
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	7.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	18.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	525.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.525
Soil height to ignore for passive pressure	=	24.00 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 7' Cantilevered Basement Wall

Design Summary

Wall Stability Ratios

Overturing	=	1.83	OK
Sliding	=	1.98	OK
Global Stability	=	2.46	

Total Bearing Load	=	3,580 lbs
...resultant ecc.	=	6.35 in

Eccentricity within middle third

Soil Pressure @ Toe	=	1,659 psf	OK
Soil Pressure @ Heel	=	80 psf	OK
Allowable	=	3,000 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	2,323 psf	
ACI Factored @ Heel	=	112 psf	
Footing Shear @ Toe	=	2.4 psi	OK
Footing Shear @ Heel	=	11.2 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	1,480.4 lbs	
less 100% Passive Force	-	1,057.3 lbs	
less 100% Friction Force	= -	1,879.6 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Design Height Above Ftg

ft =	0.00
Wall Material Above "Ht"	= Concrete
Design Method	= SD
Thickness	= 12.00
Rebar Size	= # 6
Rebar Spacing	= 10.00
Rebar Placed at	= Edge

Design Data

fb/FB + fa/Fa	=	0.202
---------------	---	-------

Total Force @ Section

Service Level	lbs =
Strength Level	lbs = 1,728.4

Moment....Actual

Service Level	ft-# =
Strength Level	ft-# = 4,448.6

Moment.....Allowable	=	21,943.8
----------------------	---	----------

Shear.....Actual

Service Level	psi =
Strength Level	psi = 15.0

Shear.....Allowable	psi = 94.9
---------------------	------------

Anet (Masonry)	in2 =
----------------	-------

Wall Weight	psf = 150.0
-------------	-------------

Rebar Depth 'd'	in = 9.63
-----------------	-----------

Masonry Data

f'm	psi =
Fs	psi =
Solid Grouting	=
Modular Ratio 'n'	=
Equiv. Solid Thick.	=
Masonry Block Type	=
Masonry Design Method	= ASD

Concrete Data

f'c	psi = 4,000.0
Fy	psi = 60,000.0

Bottom

Stem OK

ft = 0.00

= Concrete

= SD

= 12.00

= # 6

= 10.00

= Edge

= 0.202

lbs =

lbs = 1,728.4

ft-# =

ft-# = 4,448.6

= 21,943.8

psi =

psi = 15.0

psi = 94.9

in2 =

psf = 150.0

in = 9.63



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.1062 in ² /ft	
(4/3) * As :	0.1416 in ² /ft	Min Stem T&S Reinf Area 2.016 in ²
200bd/fy : 200(12)(9.625)/60000 :	0.385 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.288 in ² /ft
0.0018bh : 0.0018(12)(12) :	0.2592 in ² /ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.2592 in ² /ft	#4@ 8.33 in #4@ 16.67 in
Provided Area :	0.528 in ² /ft	#5@ 12.92 in #5@ 25.83 in
Maximum Area :	2.0862 in ² /ft	#6@ 18.33 in #6@ 36.67 in

Footing Data

Toe Width	=	1.25 ft
Heel Width	=	2.25
Total Footing Width	=	3.50
Footing Thickness	=	16.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c = 3,000 psi	Fy = 60,000 psi	
Footing Concrete Density = 150.00 pcf		
Min. As % = 0.0018		
Cover @ Top 2.00	@ Btm.= 3.00 in	

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,323	112 psf
Mu' : Upward	= 1,609	293 ft-#
Mu' : Downward	= 342	2,107 ft-#
Mu: Design	= 1,267 OK	1,814 ft-# OK
phiMn	= 28,767	5,368 ft-#
Actual 1-Way Shear	= 2.43	11.19 psi
Allow 1-Way Shear	= 82.16	43.82 psi
Toe Reinforcing	= # 6 @ 10.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 6.94 in, #5@ 10.76 in, #6@ 15.27 in, #7@ 20.83 in, #8@ 27.43 in, #9@ 34.72 in, #10@ 44.09 in

Heel: phiMn = ph*5*lambda*sqrt(fc)*Sm

Key: No key defined

Min footing T&S reinf Area	1.21 in ²
Min footing T&S reinf Area per foot	0.35 in ² /ft
<u>If one layer of horizontal bars:</u>	<u>If two layers of horizontal bars:</u>
#4@ 6.94 in	#4@ 13.89 in
#5@ 10.76 in	#5@ 21.53 in
#6@ 15.28 in	#6@ 30.56 in

Cantilevered Retaining Wall

Project File: 2220236 care center concrete framing.ec6

LIC# : KW-06014847. Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 7' Cantilevered Basement Wall

Summary of Overturning & Resisting Forces & Moments

.....OVERTURNING.....				RESISTING.....			
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)	1,215.3	2.78	3,375.8	Soil Over HL (ab. water tbl)	962.5	2.88	2,767.2
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		2.88	2,767.2
Hydrostatic Force				Water Table			
Buoyant Force =				Sloped Soil Over Heel =			
Surcharge over Heel =	265.2	4.17	1,104.8	Surcharge Over Heel =	125.0	2.88	359.4
Surcharge Over Toe =				Adjacent Footing Load =			
Adjacent Footing Load =				Axial Dead Load on Stem =			
Added Lateral Load =				* Axial Live Load on Stem =			
Load @ Stem Above Soil =				Soil Over Toe =	206.3	0.63	128.9
=				Surcharge Over Toe =			
				Stem Weight(s) =	1,050.0	1.75	1,837.5
				Earth @ Stem Transitions =			
				Footing Weight =	700.0	1.75	1,225.0
				Key Weight =			
				Vert. Component =	536.4	3.50	1,877.6
Total	= 1,480.4	O.T.M.	= 4,480.6	Total =	3,580.2 lbs	R.M.=	8,195.5
Resisting/Overturning Ratio		=	1.83	* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.			
Vertical Loads used for Soil Pressure =		3,580.2	lbs				

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 250.0 pci

Horizontal Defl @ Top of Wall (approximate only) 0.092 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 7' Cantilevered Basement Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) = 22.20 in

Development length for #6 bar specified in this stem design segment = 17.08 in

Hooked embedment length into footing for #6 bar specified in this stem design segment = 6.00 in

As Provided = 0.5280 in²/ft

As Required = 0.2592 in²/ft



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

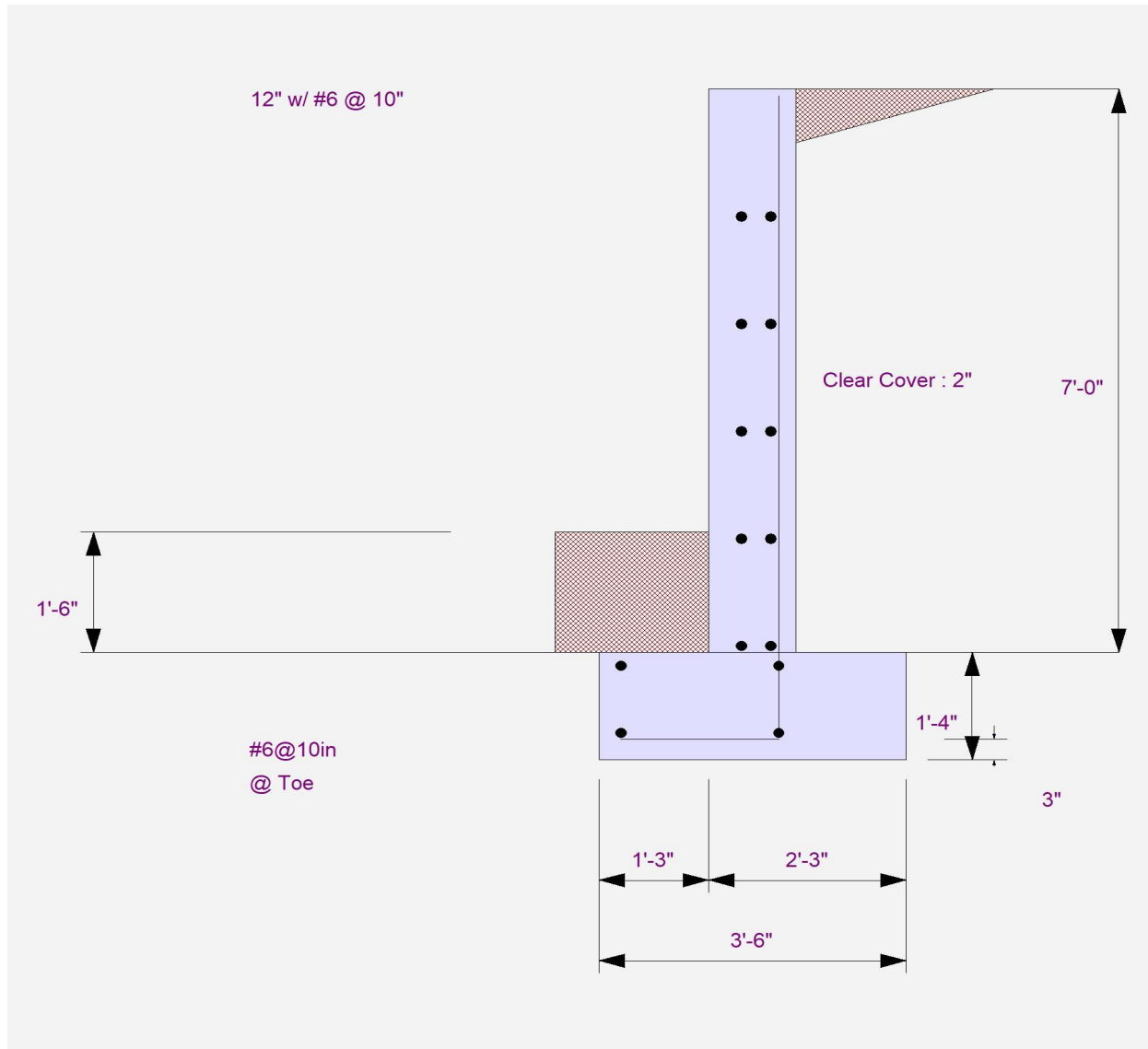
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

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DESCRIPTION: 7' Cantilevered Basement Wall



Cantilevered Retaining Wall

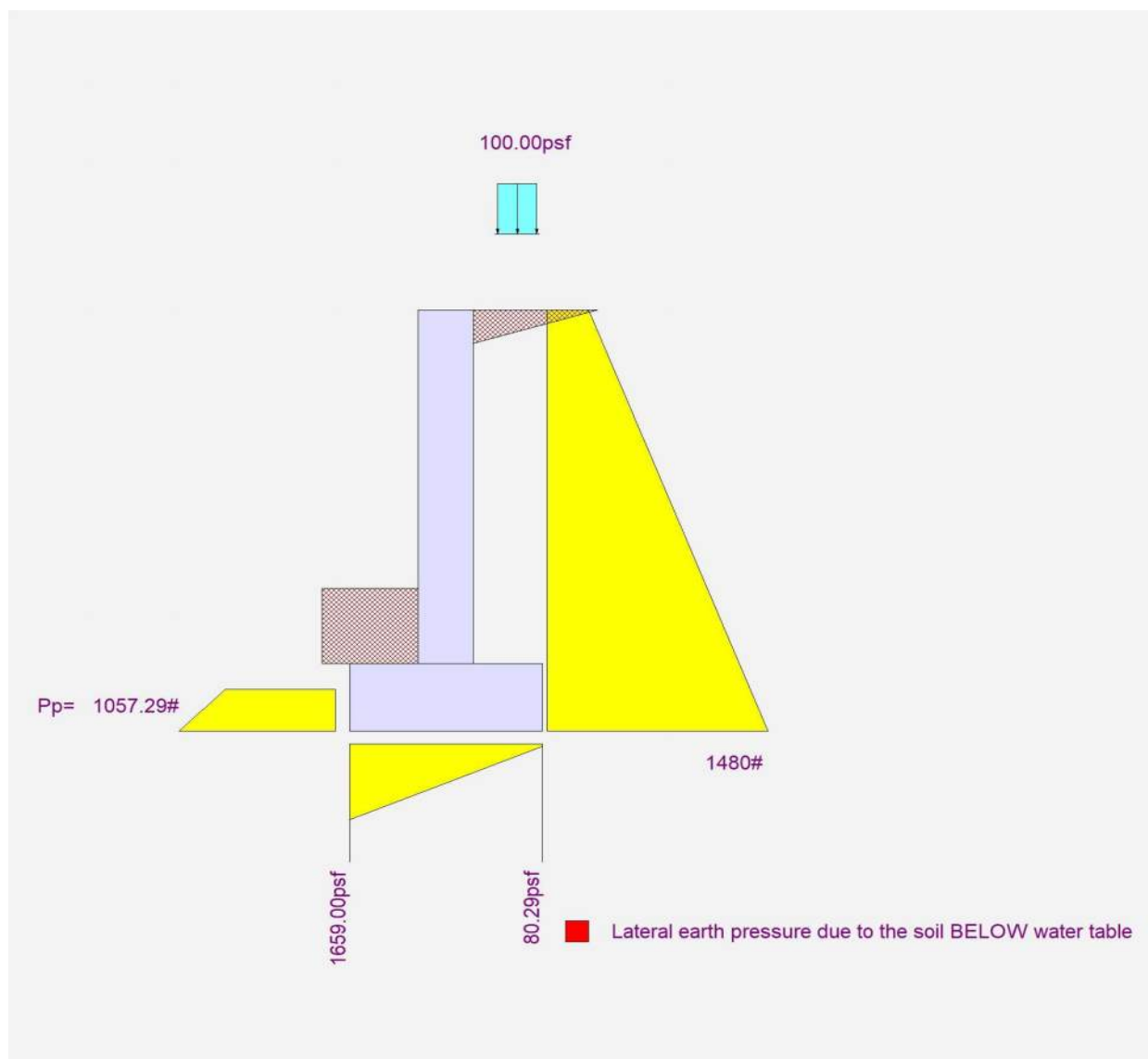
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall





AHBL, INC.
2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 7' Cantilevered Basement Wall - EQ

Code Reference:

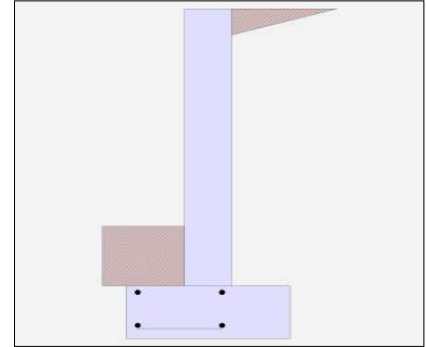
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	7.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	18.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	525.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.525
Soil height to ignore for passive pressure	=	24.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Earth Pressure Seismic Load

Method : Uniform		
Multiplier Used	=	8.000
(Multiplier used on soil density)		

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Uniform Seismic Force	=	66.667
Total Seismic Force	=	555.556

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300



AHBL, INC.
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Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall - EQ

Design Summary

Wall Stability Ratios

Overtuning	=	1.57	OK
Sliding	=	1.79	OK
Global Stability	=	2.46	

Total Bearing Load	=	3,455 lbs
...resultant ecc.	=	9.32 in

Eccentricity outside middle third

Soil Pressure @ Toe	=	2,000 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	3,000 psf	

Soil Pressure Less Than Allowable

ACI Factored @ Toe	=	2,800 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	3.0 psi	OK
Footing Shear @ Heel	=	12.5 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	1,604.2 lbs	
less 100% Passive Force	=	1,057.3 lbs	
less 100% Friction Force	=	1,814.0 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

Design Height Above Ftg

ft =	0.00
Wall Material Above "Ht"	= Concrete
Design Method	= SD
Thickness	= 12.00
Rebar Size	= # 6
Rebar Spacing	= 10.00
Rebar Placed at	= Edge

Design Data

fb/FB + fa/Fa	=	0.220
---------------	---	-------

Total Force @ Section

Service Level	lbs =
Strength Level	lbs = 1,838.7

Moment....Actual

Service Level	ft-# =
Strength Level	ft-# = 4,834.7

Moment.....Allowable	=	21,943.8
----------------------	---	----------

Shear.....Actual

Service Level	psi =
Strength Level	psi = 15.9

Shear.....Allowable	psi = 94.9
---------------------	------------

Anet (Masonry)	in2 =
----------------	-------

Wall Weight	psf = 150.0
-------------	-------------

Rebar Depth 'd'	in = 9.63
-----------------	-----------

Masonry Data

f'm	psi =
Fs	psi =
Solid Grouting	=
Modular Ratio 'n'	=
Equiv. Solid Thick.	=
Masonry Block Type	=
Masonry Design Method	= ASD

Concrete Data

f'c	psi = 4,000.0
Fy	psi = 60,000.0

Bottom

Stem OK

ft = 0.00

= Concrete

= SD

SD

SD

= 12.00

= # 6

= 10.00

= Edge

= 0.220

lbs =

lbs = 1,838.7

ft-# =

ft-# = 4,834.7

= 21,943.8

psi =

psi = 15.9

psi = 94.9

in2 =

psf = 150.0

in = 9.63



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall - EQ

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.1154 in ² /ft	
(4/3) * As :	0.1539 in ² /ft	Min Stem T&S Reinf Area 2.016 in ²
200bd/fy : 200(12)(9.625)/60000 :	0.385 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.288 in ² /ft
0.0018bh : 0.0018(12)(12) :	0.2592 in ² /ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.2592 in ² /ft	#4@ 8.33 in #4@ 16.67 in
Provided Area :	0.528 in ² /ft	#5@ 12.92 in #5@ 25.83 in
Maximum Area :	2.0862 in ² /ft	#6@ 18.33 in #6@ 36.67 in

Footing Data

Toe Width	=	1.25 ft
Heel Width	=	2.25
Total Footing Width	=	3.50
Footing Thickness	=	16.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	3,000 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm.= 3.00 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 2,800	0 psf
Mu' : Upward	= 1,875	48 ft-#
Mu' : Downward	= 342	1,982 ft-#
Mu: Design	= 1,533 OK	1,934 ft-# OK
phiMn	= 28,767	5,368 ft-#
Actual 1-Way Shear	= 3.05	12.49 psi
Allow 1-Way Shear	= 82.16	43.82 psi
Toe Reinforcing	= # 6 @ 10.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 6.94 in, #5@ 10.76 in, #6@ 15.27 in, #7@ 20.83 in, #8@ 27.43 in, #9@ 34.72 in, #10@ 44.09 in

Heel: phiMn = ph*5*lambda*sqrt(fc)*Sm

Key: No key defined

Min footing T&S reinf Area	1.21 in ²
Min footing T&S reinf Area per foot	0.35 in ² /ft
<u>If one layer of horizontal bars:</u>	<u>If two layers of horizontal bars:</u>
#4@ 6.94 in	#4@ 13.89 in
#5@ 10.76 in	#5@ 21.53 in
#6@ 15.28 in	#6@ 30.56 in



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 7' Cantilevered Basement Wall - EQ

Summary of Overturning & Resisting Forces & Moments

.....OVERTURNING.....				RESISTING.....			
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)	1,215.3	2.78	3,375.8	Soil Over HL (ab. water tbl)	962.5	2.88	2,767.2
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		2.88	2,767.2
Hydrostatic Force				Water Table			
Buoyant Force	=			Sloped Soil Over Heel	=		
Surcharge over Heel	=			Surcharge Over Heel	=		
Surcharge Over Toe	=			Adjacent Footing Load	=		
Adjacent Footing Load	=			Axial Dead Load on Stem	=		
Added Lateral Load	=			* Axial Live Load on Stem	=		
Load @ Stem Above Soil	=			Soil Over Toe	=	206.3	0.63
Seismic Earth Load	=	388.9	4.17	1,620.4	Surcharge Over Toe	=	
	=			Stem Weight(s)	=	1,050.0	1.75
	=			Earth @ Stem Transitions	=		
Total	=	1,604.2	O.T.M.	=			
			4,996.1				
Resisting/Overturning Ratio			=	1.57			
Vertical Loads used for Soil Pressure	=	3,455.2	lbs				
				Total	=	3,455.2 lbs	R.M. = 7,836.2

If seismic is included, the OTM and sliding ratios may be 1.1 per section 1807.2.3 of IBC.

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 250.0 pci
Horizontal Defl @ Top of Wall (approximate only) 0.111 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

(c) ENERCALC INC 1983-2022

DESCRIPTION: 7' Cantilevered Basement Wall - EQ

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) = 22.20 in

Development length for #6 bar specified in this stem design segment = 17.08 in

Hooked embedment length into footing for #6 bar specified in this stem design segment = 6.00 in

As Provided = 0.5280 in²/ft

As Required = 0.2592 in²/ft



AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

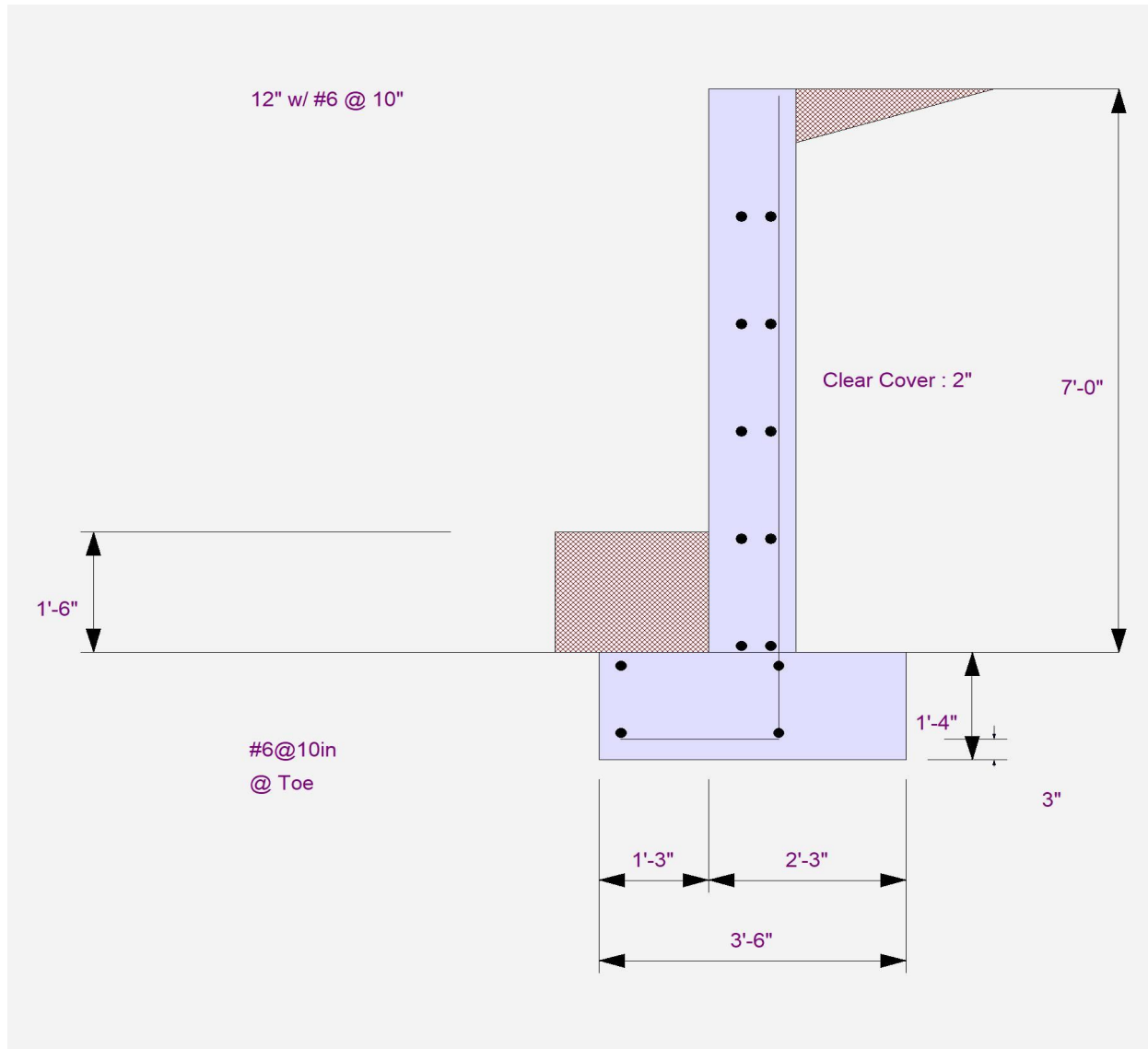
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

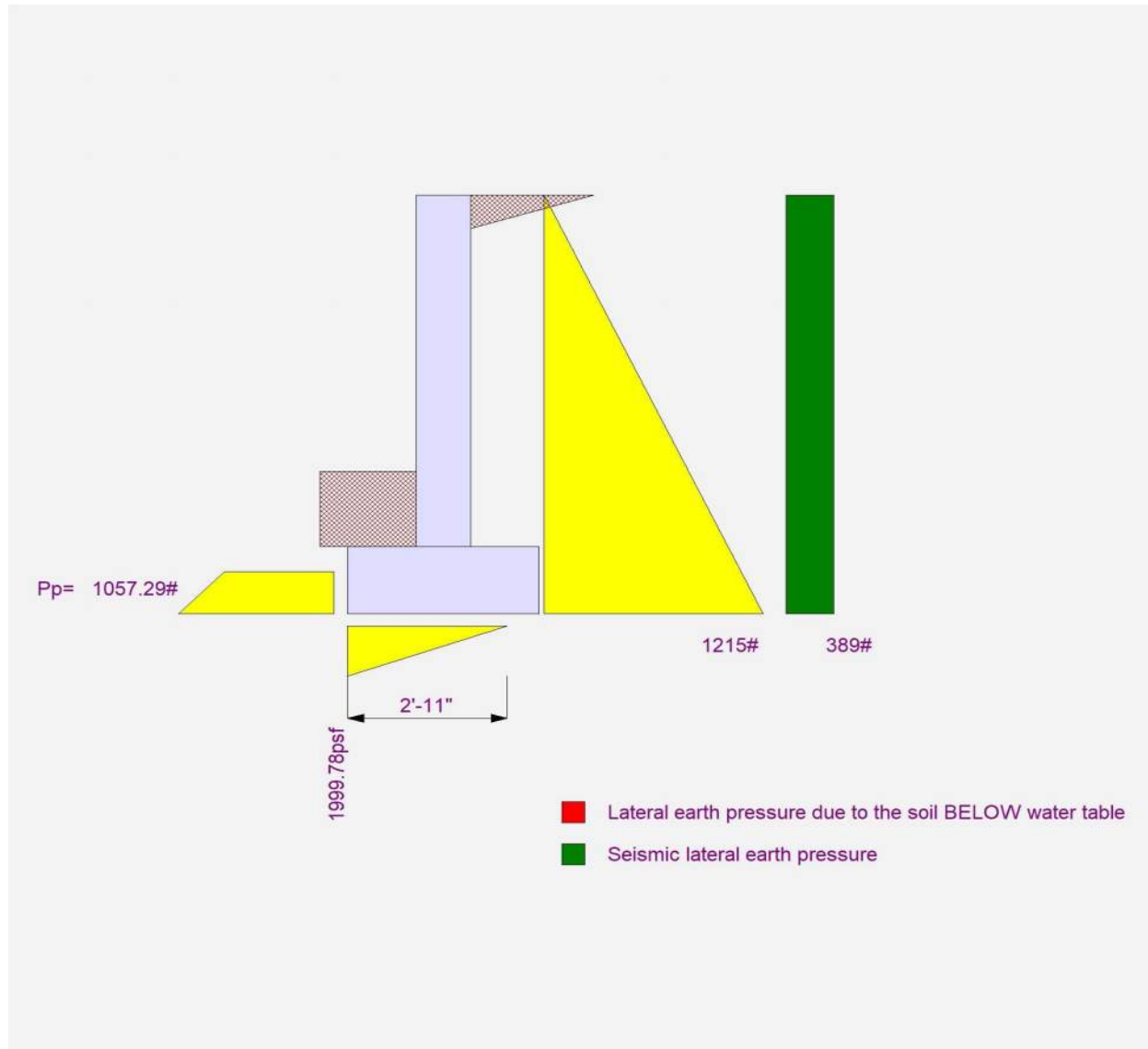
Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.2.14

AHBL, INC

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DESCRIPTION: 7' Cantilevered Basement Wall - EQ





AHBL, INC.
2215 N. 30th Street, Suite 300
Tacoma, WA 98403

Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC#: KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: Shear Wall - Grid 2

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	525.0 pcf
Soil/Concrete Friction Coeff.	=	0.5250

Increases based on footing Depth

Footing base depth below soil surface	=	6.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

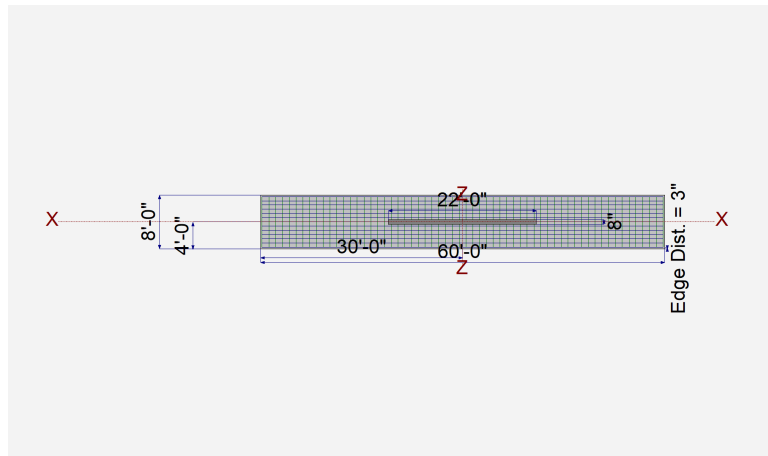
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	60.0 ft
Length parallel to Z-Z Axis	=	8.0 ft
Footing Thickness	=	48.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	264.0 in
pz : parallel to Z-Z Axis	=	8.0 in
Height	=	48.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	13
Reinforcing Bar Size	=	# 10

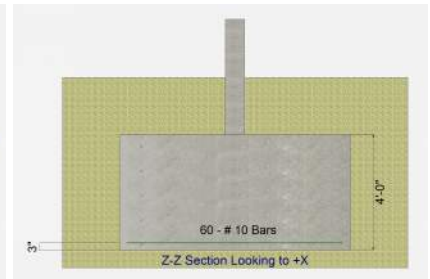
Bars parallel to Z-Z Axis	=	
Number of Bars	=	60
Reinforcing Bar Size	=	# 10

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

Bars along Z-Z Axis

# Bars required within zone	=	23.5 %
# Bars required on each side of zone	=	76.5 %



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	69.10		14.60	9.50		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=					5,400.0	k-ft
V-x	=					400.0	k
V-z	=						k



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General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

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DESCRIPTION: Shear Wall - Grid 2

DESIGN SUMMARY

Design N.G.

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9613	Soil Bearing	2.884 ksf	3.0 ksf	+0.60D+0.70E about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	1.345	Overturning - Z-Z	6,020.0 k-ft	8,097.72 k-ft	+0.60D+0.70E
FAIL	0.7461	Sliding - X-X	280.0 k	208.910 k	+0.60D+0.70E
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.9963	Z Flexure (+X)	397.650 k-ft/ft	399.119 k-ft/ft	+0.90D+E
PASS	0.4337	Z Flexure (-X)	173.091 k-ft/ft	399.119 k-ft/ft	+1.20D+0.50L+0.70S+E
PASS	0.006001	X Flexure (+Z)	1.501 k-ft/ft	250.059 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.006001	X Flexure (-Z)	1.501 k-ft/ft	250.059 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.6872	1-way Shear (+X)	56.459 psi	82.158 psi	+0.90D+E
PASS	0.3246	1-way Shear (-X)	26.667 psi	82.158 psi	+1.20D+0.50L+0.70S+E
PASS	n/a	1-way Shear (+Z)	0.0 psi	82.158 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	82.158 psi	n/a
PASS	0.03468	2-way Punching	3.022 psi	87.138 psi	+0.90D+E



Top reinforcing mat required (see 'Bending' tab).

Hand check required for anchor pullout.

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0	0.9372	0.9372	n/a	n/a	0.312
X-X, +D+L	3.0	n/a	0.0	0.9677	0.9677	n/a	n/a	0.323
X-X, +D+S	3.0	n/a	0.0	0.9570	0.9570	n/a	n/a	0.319
X-X, +D+0.750L	3.0	n/a	0.0	0.960	0.960	n/a	n/a	0.320
X-X, +D+0.750L+0.750S	3.0	n/a	0.0	0.9749	0.9749	n/a	n/a	0.325
X-X, +D+0.70E	3.0	n/a	0.0	0.9372	0.9372	n/a	n/a	0.312
X-X, +D+0.750L+0.750S+0.5250E	3.0	n/a	0.0	0.9749	0.9749	n/a	n/a	0.325
X-X, +0.60D	3.0	n/a	0.0	0.5623	0.5623	n/a	n/a	0.187
X-X, +0.60D+0.70E	3.0	n/a	0.0	0.5623	0.5623	n/a	n/a	0.187
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	0.9372	0.9372	0.312
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	0.9677	0.9677	0.323
Z-Z, +D+S	3.0	0.0	n/a	n/a	n/a	0.9570	0.9570	0.319
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	0.960	0.960	0.320
Z-Z, +D+0.750L+0.750S	3.0	0.0	n/a	n/a	n/a	0.9749	0.9749	0.325
Z-Z, +D+0.70E	3.0	160.579	n/a	n/a	n/a	0.0	2.242	0.747
Z-Z, +D+0.750L+0.750S+0.5250E	3.0	115.782	n/a	n/a	n/a	0.04367	1.906	0.635
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	0.5623	0.5623	0.187
Z-Z, +0.60D+0.70E	3.0	267.631	n/a	n/a	n/a	0.0	2.884	0.961

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D Only	None	0.0 k-ft	Infinity	OK
X-X, +D+L	None	0.0 k-ft	Infinity	OK
X-X, +D+S	None	0.0 k-ft	Infinity	OK
X-X, +D+0.750L	None	0.0 k-ft	Infinity	OK
X-X, +D+0.750L+0.750S	None	0.0 k-ft	Infinity	OK
X-X, +D+0.70E	None	0.0 k-ft	Infinity	OK
X-X, +D+0.750L+0.750S+0.5250E	None	0.0 k-ft	Infinity	OK
X-X, +0.60D	None	0.0 k-ft	Infinity	OK
X-X, +0.60D+0.70E	None	0.0 k-ft	Infinity	OK
Z-Z, D Only	None	0.0 k-ft	Infinity	OK
Z-Z, +D+L	None	0.0 k-ft	Infinity	OK
Z-Z, +D+S	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750L	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750L+0.750S	None	0.0 k-ft	Infinity	OK



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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: Shear Wall - Grid 2

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Z-Z, +D+0.70E	6,020.0 k-ft	13,496.2 k-ft	2.242	OK
Z-Z, +D+0.750L+0.750S+0.5250E	4,515.0 k-ft	14,038.5 k-ft	3.109	OK
Z-Z, +0.60D	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D+0.70E	6,020.0 k-ft	8,097.72 k-ft	1.345	OK

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
X-X, D Only	0.0 k	303.384 k	No Sliding	OK
X-X, +D+L	0.0 k	311.049 k	No Sliding	OK
X-X, +D+S	0.0 k	308.371 k	No Sliding	OK
X-X, +D+0.750L	0.0 k	309.132 k	No Sliding	OK
X-X, +D+0.750L+0.750S	0.0 k	312.873 k	No Sliding	OK
X-X, +D+0.70E	280.0 k	303.384 k	1.084	OK
X-X, +D+0.750L+0.750S+0.5250E	210.0 k	312.873 k	1.490	OK
X-X, +0.60D	0.0 k	208.910 k	No Sliding	OK
X-X, +0.60D+0.70E	280.0 k	208.910 k	0.7461	No Good!
Z-Z, D Only	0.0 k	740.18 k	No Sliding	OK
Z-Z, +D+L	0.0 k	747.85 k	No Sliding	OK
Z-Z, +D+S	0.0 k	745.17 k	No Sliding	OK
Z-Z, +D+0.750L	0.0 k	745.93 k	No Sliding	OK
Z-Z, +D+0.750L+0.750S+0.5250E	0.0 k	749.67 k	No Sliding	OK
Z-Z, +0.60D	0.0 k	645.71 k	No Sliding	OK
Z-Z, +0.60D+0.70E	0.0 k	645.71 k	No Sliding	OK
Z-Z, +D+0.750L+0.750S	0.0 k	749.67 k	No Sliding	OK
Z-Z, +D+0.70E	0.0 k	740.18 k	No Sliding	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	1.292	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.40D	1.292	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+1.60L	1.434	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+1.60L	1.434	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+1.60L+0.50S	1.501	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+1.60L+0.50S	1.501	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L	1.209	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L	1.209	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D	1.107	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D	1.107	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L+1.60S	1.422	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L+1.60S	1.422	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+1.60S	1.320	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+1.60S	1.320	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L+0.50S	1.276	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L+0.50S	1.276	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L+0.70S+E	1.302	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +1.20D+0.50L+0.70S+E	1.302	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +0.90D	0.8303	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +0.90D	0.8303	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +0.90D+E	0.8303	+Z	Bottom	1.037	AsMin	1.270	250.059	OK
X-X, +0.90D+E	0.8303	-Z	Bottom	1.037	AsMin	1.270	250.059	OK
Z-Z, +1.40D	34.676	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.40D	34.676	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+1.60L	38.505	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+1.60L	38.505	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+1.60L+0.50S	40.291	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+1.60L+0.50S	40.291	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L	32.467	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L	32.467	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D	29.722	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D	29.722	+X	Bottom	1.037	AsMin	2.064	399.119	OK



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General Footing

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

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DESCRIPTION: Shear Wall - Grid 2

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
Z-Z, +1.20D+0.50L+1.60S	38.182	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L+1.60S	38.182	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+1.60S	35.437	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+1.60S	35.437	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L+0.50S	34.253	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L+0.50S	34.253	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L+0.70S+E	173.091	-X	Top	1.037	AsMin	2.064	399.119	OK
Z-Z, +1.20D+0.50L+0.70S+E	318.325	+X	Bottom	1.630	Min for Bending	2.064	399.119	OK
Z-Z, +0.90D	22.292	-X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +0.90D	22.292	+X	Bottom	1.037	AsMin	2.064	399.119	OK
Z-Z, +0.90D+E	129.946	-X	Top	1.037	AsMin	2.064	399.119	OK
Z-Z, +0.90D+E	397.650	+X	Bottom	2.056	Min for Bending	2.064	399.119	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	5.34 psi	5.34 psi	0.00 psi	0.00 psi	5.34 psi	82.16 psi	0.06	OK
+1.20D+1.60L	5.93 psi	5.93 psi	0.00 psi	0.00 psi	5.93 psi	82.16 psi	0.07	OK
+1.20D+1.60L+0.50S	6.20 psi	6.20 psi	0.00 psi	0.00 psi	6.20 psi	82.16 psi	0.08	OK
+1.20D+0.50L	5.00 psi	5.00 psi	0.00 psi	0.00 psi	5.00 psi	82.16 psi	0.06	OK
+1.20D	4.58 psi	4.58 psi	0.00 psi	0.00 psi	4.58 psi	82.16 psi	0.06	OK
+1.20D+0.50L+1.60S	5.88 psi	5.88 psi	0.00 psi	0.00 psi	5.88 psi	82.16 psi	0.07	OK
+1.20D+1.60S	5.45 psi	5.45 psi	0.00 psi	0.00 psi	5.45 psi	82.16 psi	0.07	OK
+1.20D+0.50L+0.50S	5.27 psi	5.27 psi	0.00 psi	0.00 psi	5.27 psi	82.16 psi	0.06	OK
+1.20D+0.50L+0.70S+E	26.67 psi	46.62 psi	0.00 psi	0.00 psi	46.62 psi	82.16 psi	0.57	OK
+0.90D	3.43 psi	3.43 psi	0.00 psi	0.00 psi	3.43 psi	82.16 psi	0.04	OK
+0.90D+E	20.00 psi	56.46 psi	0.00 psi	0.00 psi	56.46 psi	82.16 psi	0.69	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	2.17 psi	87.14psi	0.02484	OK
+1.20D+1.60L	2.40 psi	87.14psi	0.02759	OK
+1.20D+1.60L+0.50S	2.52 psi	87.14psi	0.02887	OK
+1.20D+0.50L	2.03 psi	87.14psi	0.02326	OK
+1.20D	1.86 psi	87.14psi	0.0213	OK
+1.20D+0.50L+1.60S	2.38 psi	87.14psi	0.02736	OK
+1.20D+1.60S	2.21 psi	87.14psi	0.02539	OK
+1.20D+0.50L+0.50S	2.14 psi	87.14psi	0.02454	OK
+1.20D+0.50L+0.70S+E	2.72 psi	87.14psi	0.03125	OK
+0.90D	1.39 psi	87.14psi	0.01597	OK
+0.90D+E	3.02 psi	87.14psi	0.03468	OK



AHBL, INC.
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 3' Slab Step (Constr)

Code Reference:

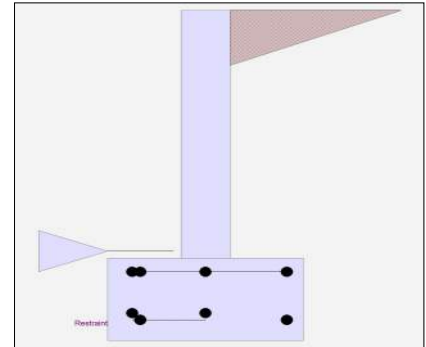
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	3.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	0.00 in
Water table above bottom of footing	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	350.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	20.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Strength Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300



AHBL, INC.
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Cantilevered Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 3' Slab Step (Constr)

Design Summary

Wall Stability Ratios

Overtuning = 2.24 OK
Slab Resists All Sliding !
Global Stability = 2.50

Total Bearing Load = 788 lbs
...resultant ecc. = 3.96 in

Eccentricity within middle third

Soil Pressure @ Toe = 784 psf OK
Soil Pressure @ Heel = 3 psf OK
Allowable = 3,000 psf
Soil Pressure Less Than Allowable

ACI Factored @ Toe = 1,098 psf
ACI Factored @ Heel = 5 psf
Footing Shear @ Toe = 0.4 psi OK
Footing Shear @ Heel = 2.6 psi OK
Allowable = 82.2 psi

Sliding Calcs

Lateral Sliding Force = 305.5 lbs

Vertical component of active lateral soil pressure IS
NOT considered in the calculation of soil bearing

Load Factors

Building Code
Dead Load 1.200
Live Load 1.600
Earth, H 1.600
Wind, W 1.600
Seismic, E 1.000

Stem Construction

Design Height Above Ftg

ft = 0.00
Wall Material Above "Ht" = Concrete
Design Method = SD SD SD
Thickness = 6.00
Rebar Size = # 4
Rebar Spacing = 12.00
Rebar Placed at = Center

Design Data

fb/FB + fa/Fa = 0.116

Total Force @ Section

Service Level lbs =
Strength Level lbs = 282.5

Moment....Actual

Service Level ft-# =
Strength Level ft-# = 297.8

Moment.....Allowable = 2,567.3

Shear.....Actual

Service Level psi =
Strength Level psi = 7.8

Shear.....Allowable psi = 94.9

Anet (Masonry) in2 =

Wall Weight psf = 75.0

Rebar Depth 'd' in = 3.00

Masonry Data

f'm psi =
Fs psi =
Solid Grouting =
Modular Ratio 'n' =
Equiv. Solid Thick. =
Masonry Block Type =
Masonry Design Method = ASD

Concrete Data

f'c psi = 4,000.0
Fy psi = 60,000.0



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DESCRIPTION: 3' Slab Step (Constr)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing
As (based on applied moment) :	0.0247 in ² /ft	
(4/3) * As :	0.0329 in ² /ft	Min Stem T&S Reinf Area 0.432 in ²
200bd/fy : 200(12)(3)/60000 :	0.12 in ² /ft	Min Stem T&S Reinf Area per ft of stem Height : 0.144 in ² /ft
0.0018bh : 0.0018(12)(6) :	0.1296 in ² /ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.1296 in ² /ft	#4@ 16.67 in #4@ 33.33 in
Provided Area :	0.2 in ² /ft	#5@ 25.83 in #5@ 51.67 in
Maximum Area :	0.6503 in ² /ft	#6@ 36.67 in #6@ 73.33 in

Footing Data

Toe Width	=	0.75 ft
Heel Width	=	1.25
Total Footing Width	=	2.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c = 3,000 psi	Fy = 60,000 psi	
Footing Concrete Density = 150.00 pcf		
Min. As % = 0.0018		
Cover @ Top 2.00	@ Btm.= 3.00 in	

Footing Design Results

	Toe	Heel
Factored Pressure	= 1,098	5 psf
Mu' : Upward	= 270	40 ft-#
Mu' : Downward	= 51	171 ft-#
Mu: Design	= 220 OK	131 ft-# OK
phiMn	= 27,464	24,231 ft-#
Actual 1-Way Shear	= 0.37	2.62 psi
Allow 1-Way Shear	= 82.16	82.16 psi
Toe Reinforcing	= # 8 @ 12.00 in	
Heel Reinforcing	= # 7 @ 12.00 in	
Key Reinforcing	= None Spec'd	
Footing Torsion, Tu	=	0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area 0.52 in²
Min footing T&S reinf Area per foot 0.26 in² /ft

If one layer of horizontal bars:

#4@ 9.26 in
#5@ 14.35 in
#6@ 20.37 in

If two layers of horizontal bars:

#4@ 18.52 in
#5@ 28.70 in
#6@ 40.74 in

Cantilevered Retaining Wall

Project File: 2220236 care center concrete framing.ec6

LIC# : KW-06014847. Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 3' Slab Step (Constr)

Summary of Overturning & Resisting Forces & Moments

.....OVERTURNING.....				RESISTING.....			
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)	280.0	1.33	373.3	Soil Over HL (ab. water tbl)	247.5	1.63	402.2
HL Act Pres (be water tbl)				Soil Over HL (bel. water tbl)		1.63	402.2
Hydrostatic Force				Water Table			
Buoyant Force =				Sloped Soil Over Heel =			
Surcharge over Heel =	25.5	2.00	50.9	Surcharge Over Heel =	15.0	1.63	24.4
Surcharge Over Toe =				Adjacent Footing Load =			
Adjacent Footing Load =				Axial Dead Load on Stem =			
Added Lateral Load =				* Axial Live Load on Stem =			
Load @ Stem Above Soil =				Soil Over Toe =			
=				Surcharge Over Toe =			
				Stem Weight(s) =	225.0	1.00	225.0
				Earth @ Stem Transitions =			
Total =	305.5	O.T.M.	= 424.2	Footing Weight =	300.0	1.00	300.0
				Key Weight =			
				Vert. Component =			
Resisting/Overturning Ratio		=	2.24				
Vertical Loads used for Soil Pressure =		787.5 lbs					

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
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Horizontal Defl @ Top of Wall (approximate only) 0.033 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.



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LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 3' Slab Step (Constr)

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment (25.4.2.3a) = 15.60 in

Development length for #4 bar specified in this stem design segment = 12.00 in

Hooked embedment length into footing for #4 bar specified in this stem design segment = 6.00 in

As Provided = 0.2000 in²/ft

As Required = 0.1296 in²/ft



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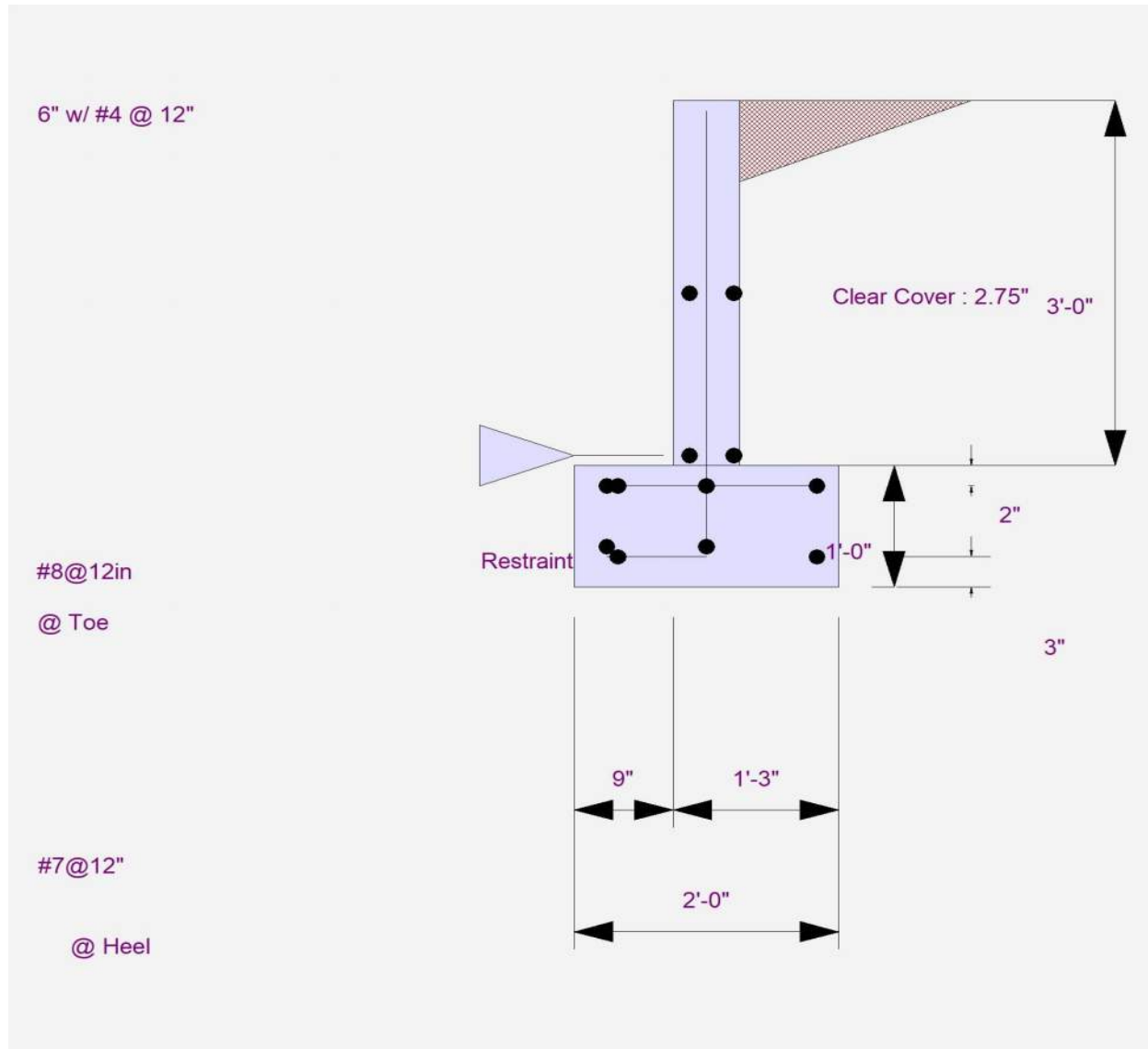
Project File: 2220236_care center concrete framing.ec6

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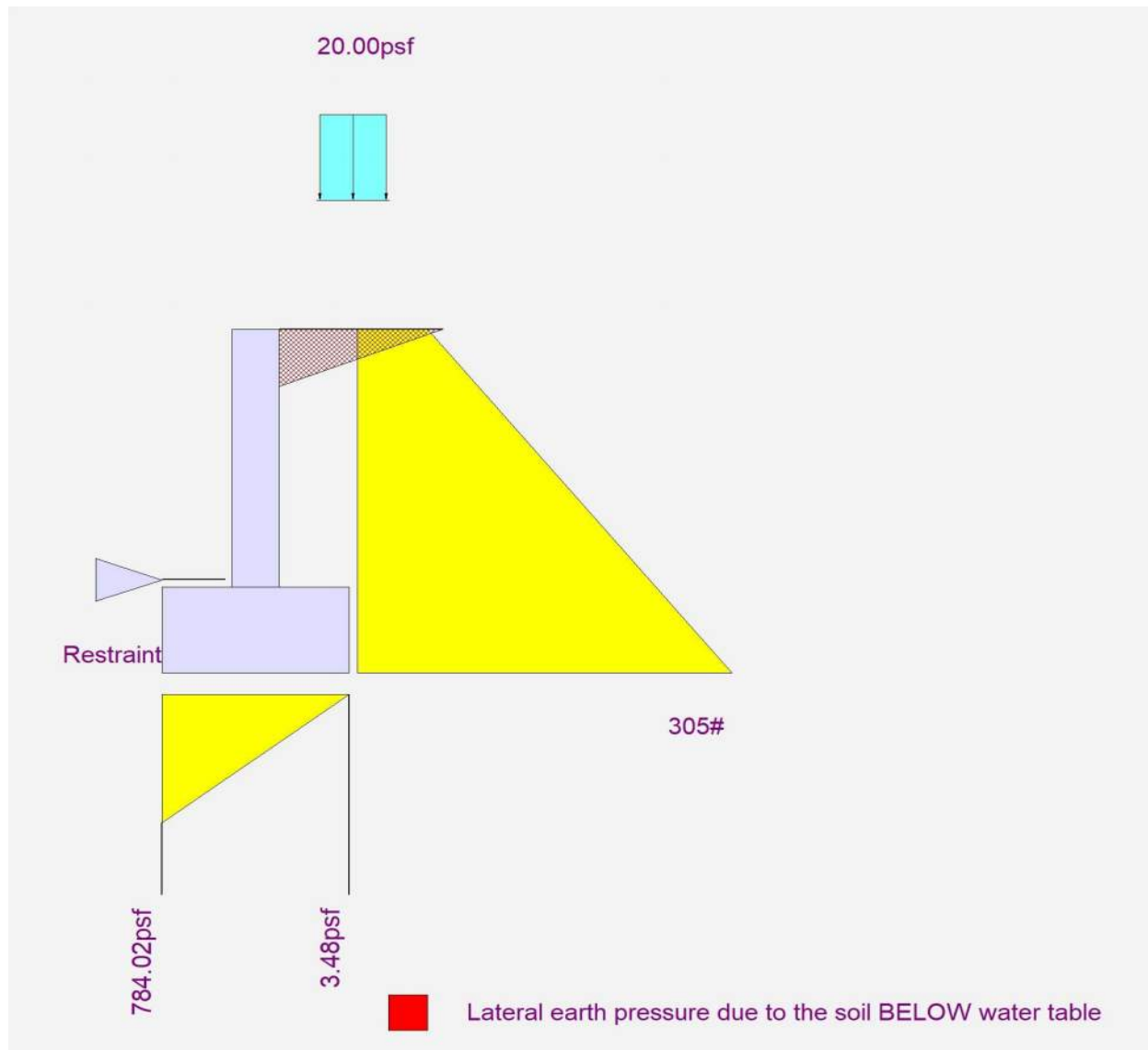
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2215 N. 30th Street, Suite 300
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Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

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DESCRIPTION: 3' Slab Step

Code Reference:

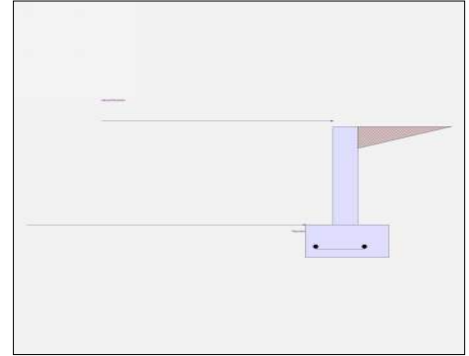
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	3.0 ft
Wall height above soil	=	ft
Total Wall Height	=	3.0 ft
Top Support Height	=	3 ft
Slope Behind Wall	=	0
Height of Soil over Toe	=	0.0 in

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
At-Rest Heel Pressure	=	35.0 psf/ft
	=	0.0 psf/ft
Passive Pressure	=	350.0 psf/ft
Soil Density	=	110 pcf
Footing Soil Frictior	=	0.4 psf
Soil height to ignore for passive pressure	=	12 in



Surcharge Loads

Surcharge Over Heel	=	100.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	100.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	lbs
Axial Live Load	=	lbs
Axial Load Eccentricity	=	in

Earth Pressure Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	#/ft
...Height to Top	=	ft
...Height to Bottom	=	ft
Load Type	=	Wind (W) (Strength Level)
Wind on Exposed Stem	=	0.00 psf (Strength Level)
Wind acts left-to-right toward retention side.		
K_h Soil Density Multiplier	=	0.2 g

Adjacent Footing Load

Adjacent Footing Load	=	lbs
Footing Width	=	ft
Eccentricity	=	in
Wall to Ftg CL Dist	=	ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	ft
Poisson's Ratio	=	0.3
Added seismic per unit area	=	0.0 psf

Design Summary

Total Bearing Load	=	922.50 lbs
...resultant ecc.	=	0.0 in
Soil Pressure @ Toe	=	461.250 psf OK
Soil Pressure @ Heel	=	461.250 psf OK
Allowable	=	psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	553.50 psf
ACI Factored @ Heel	=	553.50 psf
Footing Shear @ Toe	=	0.08721 psi OK
Footing Shear @ Heel	=	-1.201 psi OK
Allowable	=	82.158 psi
Reaction at Top	=	66.292 lbs
Reaction at Bottom	=	339.978 lbs

Sliding Calcs

Lateral Sliding Force	=	339.978 lbs
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Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Concrete Stem Construction

Thickness	=	6.00 in
Wall Weight	=	75.0 psf
Stem is FIXED to top of footing		

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
Design Height Above Ftg	= 3 ft	0.01205 ft	0.00 ft
Rebar Size	= # 4	# 4	# 4
Rebar Spacing	= 16.00 in	16.00 in	16.00 in
Rebar Placed at	= Center	Center	Center
Rebar Depth 'd'	= 3.0 in	3.0 in	3.0 in
Design Data			
fb/FB + fa/Fa	=	0.081	0.081
Moment.....Actual	= 0.0 ft-#	158.075 ft-#	158.075 ft-#
Moment.....Allowable	= 1,950.33 ft-#	1,950.33 ft-#	1,950.33 ft-#
Shear Force @ this height	= 108.285 lbs		297.055 lbs
Shear.....Actual	= 3.008 psi		8.252 psi
Shear.....Allowable	= 94.868 psi		94.868 psi



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Restrained Retaining Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 3' Slab Step

Footing Strengths & Dimensions

Toe Width	=	0.75 ft
Heel Width	=	1.25
Total Footing Width	=	2.0
Footing Thickness	=	12.0 in
Key Width	=	in
Key Depth	=	in
Key Distance from Toe	=	ft
f'c =	3,000 psi	Fy = 60000 psi
Footing Concrete Density	=	150 pcf
Min. As %	=	0.0018
Cover @ Top	= 2 in	@ Btm.= 3 in

Footing Design Results

	Toe	Heel
Factored Pressure	= 553.50	553.50 psf
Mu' : Upward	= 155.672	ft-#
Mu' : Downward	= 95.625	ft-#
Mu: Design	= 60	51 ft-#
Actual 1-Way Shear	= 0.08721	psi
Allow 1-Way Shear	= 82.158	82.158 psi

Other Acceptable Sizes & Spacings:

Toe: # 7 @ 18.00 in	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Heel: None Spec'd	-or-	$\phi M_n = \phi * 5 * \lambda * \sqrt{f_c} * S_m$
Key: # 0 @ 0.00 in	-or-	No key defined
Min footing T&S reinf Area		0.52 in ²
Min footing T&S reinf Area per foot		0.26 in ² /ft
If one layer of horizontal bars:		If two layers of horizontal bars:
#4@ 9.26 in		#4@ 18.52 in
#5@ 14.35 in		#5@ 28.70 in
#6@ 20.37 in		#6@ 40.74 in

Summary of Forces on Footing : Slab RESISTS sliding, stem is FIXED at footing

Forces acting on footing for soil pressure

>>> Sliding Forces are restrained by the adjacent slab

Load & Moment Summary For Footing : For Soil Pressure Calcs

Moment @ Top of Footing Applied from Stem	=	-98.797 ft-#
Surcharge Over Heel	= 75.0 lbs 1.625 ft	121.875 ft-#
Adjacent Footing Load	= 0.0 lbs 0.0 ft	0.0 ft-#
Axial Dead Load on Stem	= 0.0 lbs 0.0 ft	0.0 ft-#
Soil Over Toe	= 0.0 lbs 0.0 ft	0.0 ft-#
Surcharge Over Toe	= 75.0 lbs 0.3750 ft	28.125 ft-#
Stem Weight	= 225.0 lbs 1.0 ft	225.0 ft-#
Soil Over Heel	= 247.50 lbs 1.625 ft	402.188 ft-#
Footing Weight	= 300.0 lbs 1.0 ft	300.0 ft-#
Total Vertical Force	= 922.50 lbs	Base Moment = 978.39 ft-#

Stem is specified to be fixed to footing, and top restraint is assumed to react out any tendency for moment at the footing/soil interface, so uniform soil pressure is assumed.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.



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Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.05.25

AHBL, INC

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DESCRIPTION: 3' Slab Step

Rebar Lap & Embedment Lengths Information



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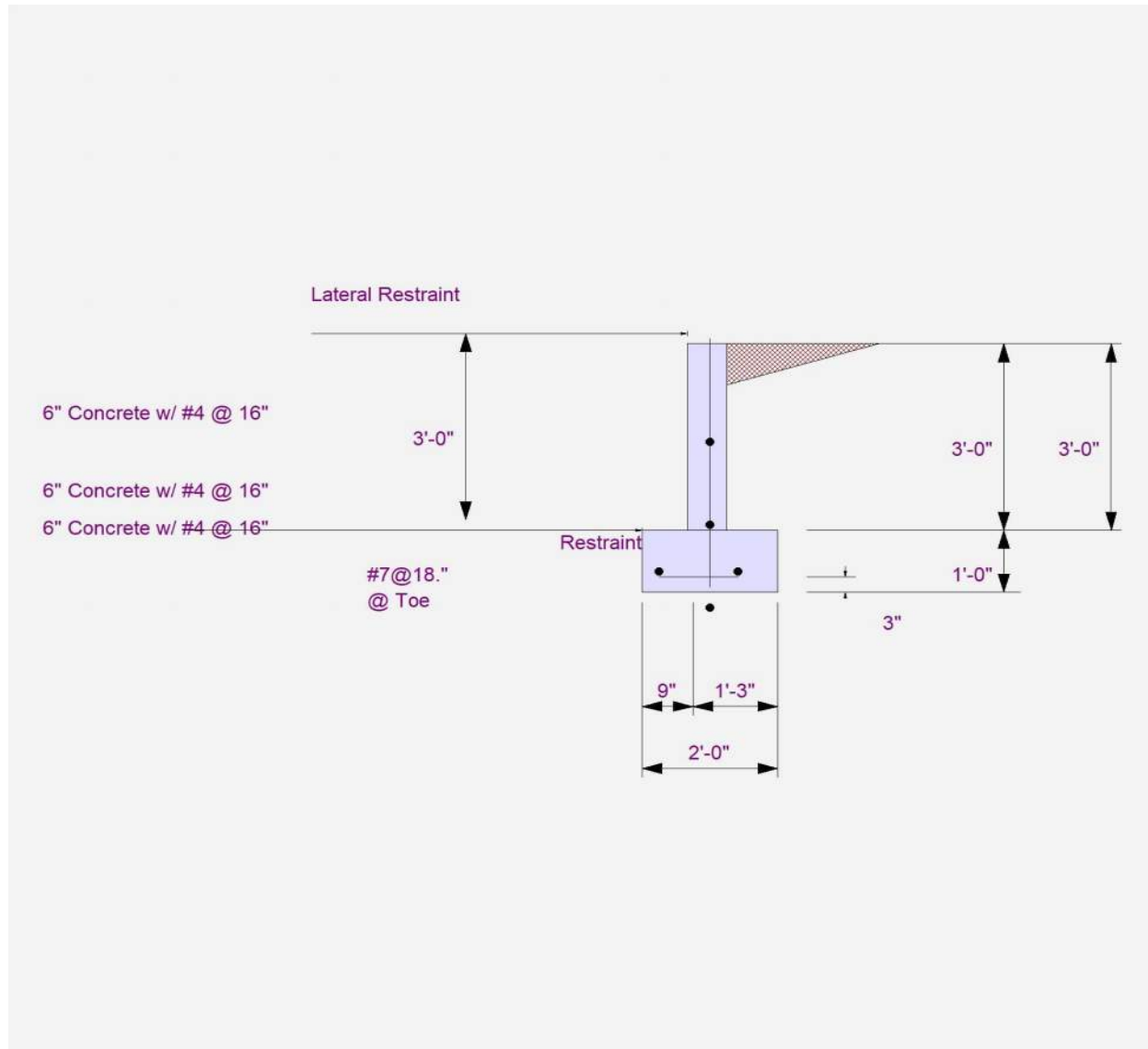
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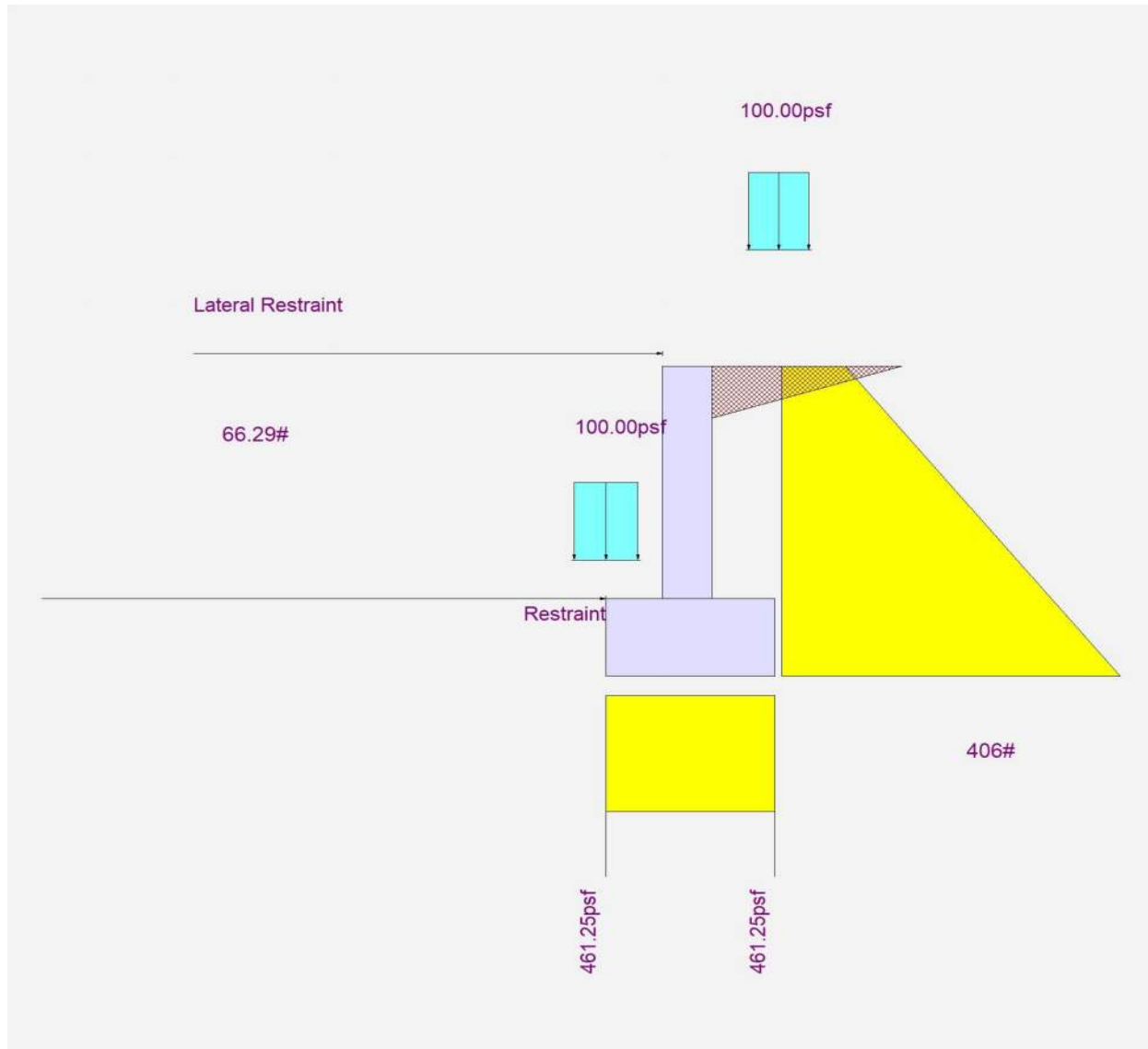
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AHBL, INC

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DESCRIPTION: 3' Slab Step



3.0 - ROOF FRAMING DESIGN

TRADEREADY® FLOOR JOIST SPAN TABLES

COMPARE TO TYPICAL ROOF LOAD:
18 PSF DL + 27.5 PSF SL = 45.5 PSF
10 PSF DL + 40 PSF LL = 50 PSF > 45.5 PSF **OK**

Product Code	10 psf Dead Load and 40 psf Live Load							
	TL Deflection = L/240, LL Deflection = L/360 Single Span				TL Deflection = L/240, LL Deflection = L/480 Single Span			
	Spacing (in) o.c.				Spacing (in) o.c.			
	12	16	19.2	24	12	16	19.2	24
725TDJ24-175-43	15' 6"	13' 5"	12' 3"	10' 11"	14' 9"	13' 5"	12' 3"	10' 11"
725TDJ24-175-54	17' 5"	15' 10"	14' 11"	13' 10"	15' 10"	14' 4"	13' 6"	12' 7"
725TDJ24-175-68	18' 8"	17' 0"	16' 0"	14' 10"	17' 0"	15' 5"	14' 6"	13' 6"
725TDJ24-175-97	20' 9"	18' 10"	17' 9"	16' 6"	18' 10"	17' 1"	16' 1"	15' 0"
800TDJ24-175-43	16' 2"	14' 0"	12' 9"	11' 5"	15' 11"	14' 0"	12' 9"	11' 5"
800TDJ24-175-54	18' 10"	17' 1"	16' 1"	14' 11"	17' 1"	15' 7"	14' 8"	13' 7"
800TDJ24-175-68	20' 3"	18' 5"	17' 4"	16' 1"	18' 5"	16' 8"	15' 9"	14' 7"
800TDJ24-175-97	22' 6"	20' 5"	19' 3"	17' 10"	20' 5"	18' 7"	17' 6"	16' 3"
925TDJ24-175-43	17' 0"	14' 9"	13' 5"	12' 0"	17' 0"	14' 9"	13' 5"	12' 0"
925TDJ24-175-54	21' 2"	19' 3"	17' 9"	15' 11"	19' 3"	17' 6"	16' 6"	15' 3"
925TDJ24-175-68	22' 9"	20' 8"	19' 6"	18' 1"	20' 8"	18' 10"	17' 8"	16' 5"
925TDJ24-175-97	25' 4"	23' 0"	21' 8"	20' 1"	23' 0"	20' 11"	19' 8"	18' 3"
1125TDJ24-175-54	24' 2"	20' 11"	19' 1"	17' 1"	22' 8"	20' 7"	19' 1"	17' 1"
1125TDJ24-175-68	26' 9"	24' 4"	22' 4"	20' 0"	24' 4"	22' 1"	20' 10"	19' 4"
1125TDJ24-175-97	29' 10"	27' 1"	25' 6"	23' 8"	27' 1"	24' 7"	23' 2"	21' 6"
1000TDW24-200-54	23' 1"	21' 0"	19' 3"	17' 3"	21' 0"	19' 1"	17' 11"	16' 8"
1000TDW24-200-68	24' 10"	22' 7"	21' 3"	19' 8"	22' 7"	20' 6"	19' 3"	17' 11"
1000TDW24-200-97	27' 8"	25' 1"	23' 8"	21' 11"	25' 1"	22' 10"	21' 6"	19' 11"
1200TDW24-200-54	25' 7"	22' 2"	20' 3"	18' 1"	24' 4"	22' 2"	20' 3"	18' 1"
1200TDW24-200-68	28' 10"	26' 0"	23' 9"	21' 3"	26' 2"	23' 10"	22' 5"	20' 9"
1200TDW24-200-97	32' 2"	29' 2"	27' 6"	25' 6"	29' 2"	26' 6"	25' 0"	23' 2"
1400TDW24-200-68	30' 8"	26' 7"	24' 3"	21' 9"	29' 9"	26' 7"	24' 3"	21' 9"
1400TDW24-200-97	36' 7"	33' 3"	30' 4"	27' 2"	33' 3"	30' 2"	28' 5"	26' 5"

Live Load = 40 psf

Product Code	12 psf Dead Load and 40 psf Live Load							
	TL Deflection = L/240, LL Deflection = L/360 Single Span				TL Deflection = L/240, LL Deflection = L/480 Single Span			
	Spacing (in) o.c.				Spacing (in) o.c.			
	12	16	19.2	24	12	16	19.2	24
725TDJ24-175-43	15' 2"	13' 2"	12' 0"	10' 9"	14' 9"	13' 2"	12' 0"	10' 9"
725TDJ24-175-54	17' 5"	15' 10"	14' 11"	13' 10"	15' 10"	14' 4"	13' 6"	12' 7"
725TDJ24-175-68	18' 8"	17' 0"	16' 0"	14' 10"	17' 0"	15' 5"	14' 6"	13' 6"
725TDJ24-175-97	20' 9"	18' 10"	17' 9"	16' 6"	18' 10"	17' 1"	16' 1"	15' 0"
800TDJ24-175-43	15' 10"	13' 9"	12' 6"	11' 2"	15' 10"	13' 9"	12' 6"	11' 2"
800TDJ24-175-54	18' 10"	17' 1"	16' 1"	14' 11"	17' 1"	15' 7"	14' 8"	13' 7"
800TDJ24-175-68	20' 3"	18' 5"	17' 4"	16' 1"	18' 5"	16' 8"	15' 9"	14' 7"
800TDJ24-175-97	22' 6"	20' 5"	19' 3"	17' 10"	20' 5"	18' 7"	17' 6"	16' 3"
925TDJ24-175-43	16' 8"	14' 5"	13' 2"	11' 9"	16' 8"	14' 5"	13' 2"	11' 9"
925TDJ24-175-54	21' 2"	19' 1"	17' 5"	15' 7"	19' 3"	17' 6"	16' 6"	15' 3"
925TDJ24-175-68	22' 9"	20' 8"	19' 6"	18' 1"	20' 8"	18' 10"	17' 8"	16' 5"
925TDJ24-175-97	25' 4"	23' 0"	21' 8"	20' 1"	23' 0"	20' 11"	19' 8"	18' 3"
1125TDJ24-175-54	23' 8"	20' 6"	18' 9"	16' 9"	22' 8"	20' 6"	18' 9"	16' 9"
1125TDJ24-175-68	26' 9"	24' 0"	21' 11"	19' 7"	24' 4"	22' 1"	20' 10"	19' 4"
1125TDJ24-175-97	29' 10"	27' 1"	25' 6"	23' 8"	27' 1"	24' 7"	23' 2"	21' 6"
1000TDW24-200-54	23' 1"	20' 8"	18' 11"	16' 11"	21' 0"	19' 1"	17' 11"	16' 8"
1000TDW24-200-68	24' 10"	22' 7"	21' 3"	19' 8"	22' 7"	20' 6"	19' 3"	17' 11"
1000TDW24-200-97	27' 8"	25' 1"	23' 8"	21' 11"	25' 1"	22' 10"	21' 6"	19' 11"
1200TDW24-200-54	25' 1"	21' 9"	19' 10"	17' 9"	24' 4"	21' 9"	19' 10"	17' 9"
1200TDW24-200-68	28' 10"	25' 6"	23' 3"	20' 10"	26' 2"	23' 10"	22' 5"	20' 9"
1200TDW24-200-97	32' 2"	29' 2"	27' 6"	25' 6"	29' 2"	26' 6"	25' 0"	23' 2"
1400TDW24-200-68	30' 1"	26' 1"	23' 10"	21' 3"	29' 9"	26' 1"	23' 10"	21' 3"
1400TDW24-200-97	36' 7"	32' 7"	29' 9"	26' 7"	33' 3"	30' 2"	28' 5"	26' 5"

*See span table notes on page 10.

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TRADEREADY® FLOOR JOIST SPAN TABLES

COMPARE TO ROOF MECH LOAD:
18 PSF DL + 50 PSF LL = 68 PSF
25 PSF DL + 50 PSF LL = 75 PSF > 68 PSF **OK**

Product Code	25 psf Dead Load and 50 psf Live Load							
	TL Deflection = L/240, LL Deflection = L/360 Single Span				TL Deflection = L/240, LL Deflection = L/480 Single Span			
	Spacing (in) o.c.				Spacing (in) o.c.			
	12	16	19.2	24	12	16	19.2	24
725TDJ24-175-43	12' 8"	10' 11"	10' 0"	8' 11"	12' 8"	10' 11"	10' 0"	8' 11"
725TDJ24-175-54	16' 2"	14' 6"	13' 3"	11' 10"	14' 8"	13' 4"	12' 7"	11' 8"
725TDJ24-175-68	17' 4"	15' 9"	14' 10"	13' 9"	15' 9"	14' 4"	13' 6"	12' 6"
725TDJ24-175-97	19' 3"	17' 6"	16' 6"	15' 3"	17' 6"	15' 11"	15' 0"	13' 11"
800TDJ24-175-43	13' 2"	11' 5"	10' 5"	9' 4"	13' 2"	11' 5"	10' 5"	9' 4"
800TDJ24-175-54	17' 6"	15' 3"	13' 11"	12' 5"	15' 11"	14' 5"	13' 7"	12' 5"
800TDJ24-175-68	18' 9"	17' 1"	16' 1"	14' 5"	17' 1"	15' 6"	14' 7"	13' 6"
800TDJ24-175-97	20' 10"	19' 0"	17' 10"	16' 7"	19' 0"	17' 3"	16' 3"	15' 1"
925TDJ24-175-43	13' 10"	12' 0"	11' 0"	9' 10"	13' 10"	12' 0"	11' 0"	9' 10"
925TDJ24-175-54	18' 4"	15' 11"	14' 6"	13' 0"	17' 11"	15' 11"	14' 6"	13' 0"
925TDJ24-175-68	21' 2"	18' 6"	16' 11"	15' 1"	19' 2"	17' 5"	16' 5"	15' 1"
925TDJ24-175-97	23' 6"	21' 4"	20' 1"	18' 8"	21' 4"	19' 5"	18' 3"	17' 0"
1125TDJ24-175-54	19' 9"	17' 1"	15' 7"	13' 11"	19' 9"	17' 1"	15' 7"	13' 11"
1125TDJ24-175-68	23' 1"	20' 0"	18' 3"	16' 4"	22' 7"	20' 0"	18' 3"	16' 4"
1125TDJ24-175-97	27' 8"	24' 11"	22' 9"	20' 4"	25' 2"	22' 10"	21' 6"	20' 0"
1000TDW24-200-54	19' 11"	17' 3"	15' 9"	14' 1"	19' 6"	17' 3"	15' 9"	14' 1"
1000TDW24-200-68	23' 0"	20' 2"	18' 5"	16' 5"	20' 11"	19' 0"	17' 11"	16' 5"
1000TDW24-200-97	25' 8"	23' 4"	21' 11"	20' 4"	23' 4"	21' 2"	19' 11"	18' 6"
1200TDW24-200-54	20' 11"	18' 1"	16' 6"	14' 9"	20' 11"	18' 1"	16' 6"	14' 9"
1200TDW24-200-68	24' 6"	21' 3"	19' 5"	17' 4"	24' 4"	21' 3"	19' 5"	17' 4"
1200TDW24-200-97	29' 10"	26' 11"	24' 7"	22' 0"	27' 1"	24' 8"	23' 2"	21' 6"
1400TDW24-200-68	25' 1"	21' 9"	19' 10"	17' 9"	25' 1"	21' 9"	19' 10"	17' 9"
1400TDW24-200-97	31' 4"	27' 2"	24' 9"	22' 2"	30' 10"	27' 2"	24' 9"	22' 2"

Live Load = 50 psf

Product Code	40 psf Dead Load and 50 psf Live Load							
	TL Deflection = L/240, LL Deflection = L/360 Single Span				TL Deflection = L/240, LL Deflection = L/480 Single Span			
	Spacing (in) o.c.				Spacing (in) o.c.			
	12	16	19.2	24	12	16	19.2	24
725TDJ24-175-43	11' 6"	10' 0"	9' 1"	8' 2"	11' 6"	10' 0"	9' 1"	8' 2"
725TDJ24-175-54	15' 2"	13' 3"	12' 1"	10' 10"	14' 8"	13' 3"	12' 1"	10' 10"
725TDJ24-175-68	16' 4"	14' 10"	13' 11"	12' 7"	15' 9"	14' 4"	13' 6"	12' 6"
725TDJ24-175-97	18' 1"	16' 6"	15' 6"	14' 5"	17' 6"	15' 11"	15' 0"	13' 11"
800TDJ24-175-43	12' 0"	10' 5"	9' 6"	8' 6"	12' 0"	10' 5"	9' 6"	8' 6"
800TDJ24-175-54	16' 1"	13' 11"	12' 8"	11' 4"	15' 11"	13' 11"	12' 8"	11' 4"
800TDJ24-175-68	17' 8"	16' 1"	14' 9"	13' 2"	17' 1"	15' 6"	14' 7"	13' 2"
800TDJ24-175-97	19' 8"	17' 10"	16' 9"	15' 7"	19' 0"	17' 3"	16' 3"	15' 1"
925TDJ24-175-43	12' 8"	11' 0"	10' 0"	8' 11"	12' 8"	11' 0"	10' 0"	8' 11"
925TDJ24-175-54	16' 9"	14' 6"	13' 3"	11' 10"	16' 9"	14' 6"	13' 3"	11' 10"
925TDJ24-175-68	19' 6"	16' 11"	15' 5"	13' 9"	19' 2"	16' 11"	15' 5"	13' 9"
925TDJ24-175-97	22' 2"	20' 1"	18' 11"	17' 3"	21' 4"	19' 5"	18' 3"	17' 0"
1125TDJ24-175-54	18' 0"	15' 7"	14' 3"	12' 9"	18' 0"	15' 7"	14' 3"	12' 9"
1125TDJ24-175-68	21' 1"	18' 3"	16' 8"	14' 11"	21' 1"	18' 3"	16' 8"	14' 11"
1125TDJ24-175-97	26' 1"	22' 9"	20' 9"	18' 7"	25' 2"	22' 9"	20' 9"	18' 7"
1000TDW24-200-54	18' 2"	15' 9"	14' 4"	12' 10"	18' 2"	15' 9"	14' 4"	12' 10"
1000TDW24-200-68	21' 3"	18' 5"	16' 10"	15' 0"	20' 11"	18' 5"	16' 10"	15' 0"
1000TDW24-200-97	24' 2"	21' 11"	20' 8"	19' 0"	23' 4"	21' 2"	19' 11"	18' 6"
1200TDW24-200-54	19' 1"	16' 6"	15' 1"	13' 6"	19' 1"	16' 6"	15' 1"	13' 6"
1200TDW24-200-68	22' 5"	19' 5"	17' 8"	15' 10"	22' 5"	19' 5"	17' 8"	15' 10"
1200TDW24-200-97	28' 1"	24' 7"	22' 5"	20' 1"	27' 1"	24' 7"	22' 5"	20' 1"
1400TDW24-200-68	22' 11"	19' 10"	18' 1"	16' 2"	22' 11"	19' 10"	18' 1"	16' 2"
1400TDW24-200-97	28' 7"	24' 9"	22' 7"	20' 3"	28' 7"	24' 9"	22' 7"	20' 3"

*See span table notes on page 10.

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10 psf Dead Load and 40 psf Live Load

Section	F _y (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center			Spacing (in) on center			Spacing (in) on center			Spacing (in) on center		
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	11' 3"	9' 9"	7' 11"	11' 3"	9' 6"	7' 4"	11' 3"	9' 9"	7' 11"	11' 3"	9' 6"	7' 4"
600S200-33	33	12' 0"	10' 4"	8' 6"	11' 7"	9' 9"	7' 6"	11' 11"	10' 4"	8' 6"	11' 7"	9' 9"	7' 6"
600S162-43	33	13' 8"	12' 0"	9' 10"	13' 11"	12' 0"	9' 10"	12' 5"	11' 3"	9' 10"	13' 11"	12' 0"	9' 10"
600S200-43	33	14' 4"	12' 5"	10' 2"	14' 4"	12' 5"	10' 0"	13' 0"	11' 10"	10' 2"	14' 4"	12' 5"	10' 0"
600S250-43	33	14' 8"	12' 9"	10' 5"	14' 8"	12' 9"	10' 2"	13' 7"	12' 4"	10' 5"	14' 8"	12' 9"	10' 2"
600S162-54	50	14' 7"	13' 3"	11' 7"	16' 5"	14' 11"	13' 0"	13' 3"	12' 1"	10' 7"	14' 11"	13' 7"	11' 10"
600S200-54	50	15' 4"	14' 0"	12' 2"	17' 3"	15' 8"	13' 6"	14' 0"	12' 8"	11' 1"	15' 8"	14' 3"	12' 5"
600S250-54	50	16' 1"	14' 8"	12' 9"	18' 1"	16' 5"	13' 10"	14' 8"	13' 3"	11' 7"	16' 5"	14' 11"	13' 0"
600S162-68	50	15' 8"	14' 3"	12' 5"	17' 7"	16' 0"	14' 0"	14' 3"	12' 11"	11' 4"	16' 0"	14' 6"	12' 8"
600S200-68	50	16' 6"	15' 0"	13' 1"	18' 6"	16' 10"	14' 8"	15' 0"	13' 7"	11' 11"	16' 10"	15' 3"	13' 4"
600S250-68	50	17' 3"	15' 8"	13' 9"	19' 5"	17' 8"	15' 5"	15' 8"	14' 3"	12' 6"	17' 8"	16' 0"	14' 0"
600S162-97	50	17' 4"	15' 9"	13' 9"	19' 6"	17' 9"	15' 6"	15' 9"	14' 4"	12' 6"	17' 9"	16' 1"	14' 1"
600S200-97	50	18' 4"	16' 8"	14' 6"	20' 7"	18' 8"	16' 4"	16' 8"	15' 1"	13' 2"	18' 8"	17' 0"	14' 10"
600S250-97	50	19' 3"	17' 6"	15' 3"	21' 7"	19' 7"	17' 2"	17' 6"	15' 10"	13' 10"	19' 7"	17' 10"	15' 7"
600S162-118	50	18' 4"	16' 8"	14' 7"	20' 7"	18' 9"	16' 4"	16' 8"	15' 2"	13' 3"	18' 9"	17' 0"	14' 10"
600S200-118	50	19' 4"	17' 7"	15' 4"	21' 9"	19' 9"	17' 3"	17' 7"	16' 0"	14' 0"	19' 9"	17' 11"	15' 8"
600S250-118	50	20' 4"	18' 6"	16' 2"	22' 10"	20' 9"	18' 2"	18' 6"	16' 10"	14' 8"	20' 9"	18' 10"	16' 6"
800S162-33	33	13' 0"	11' 3"	9' 2"	11' 3"	9' 2"	6' 8"	13' 0"	11' 3"	9' 2"	11' 3"	9' 2"	6' 8"
800S200-33	33	13' 11"	12' 1"	9' 6"	11' 8"	9' 6"	6' 10"	13' 11"	12' 1"	9' 6"	11' 8"	9' 6"	6' 10"
800S162-43	33	15' 8"	13' 6"	11' 1"	15' 5"	13' 1"	10' 4"	15' 6"	13' 6"	11' 1"	15' 5"	13' 1"	10' 4"
800S200-43	33	16' 9"	14' 6"	11' 10"	16' 9"	14' 6"	11' 3"	16' 4"	14' 6"	11' 10"	16' 9"	14' 6"	11' 3"
800S250-43	33	17' 2"	14' 10"	12' 2"	17' 2"	14' 7"	11' 4"	17' 0"	14' 10"	12' 2"	17' 2"	14' 7"	11' 4"
800S162-54	50	18' 5"	16' 8"	14' 7"	20' 7"	18' 1"	14' 9"	16' 9"	15' 3"	13' 3"	18' 9"	17' 0"	14' 9"
800S200-54	50	19' 4"	17' 6"	15' 4"	21' 8"	19' 4"	15' 9"	17' 6"	15' 11"	13' 11"	19' 8"	17' 11"	15' 7"
800S250-54	50	20' 2"	18' 3"	16' 0"	22' 7"	19' 9"	16' 2"	18' 3"	16' 7"	14' 6"	20' 6"	18' 8"	16' 2"
800S162-68	50	19' 9"	18' 0"	15' 8"	22' 3"	20' 2"	17' 4"	18' 0"	16' 4"	14' 3"	20' 2"	18' 4"	16' 0"
800S200-68	50	20' 9"	18' 10"	16' 5"	23' 3"	21' 2"	18' 6"	18' 10"	17' 1"	14' 11"	21' 2"	19' 2"	16' 9"
800S250-68	50	21' 8"	19' 8"	17' 2"	24' 3"	22' 1"	18' 11"	19' 8"	17' 10"	15' 7"	22' 1"	20' 1"	17' 6"
800S162-97	50	22' 0"	20' 0"	17' 5"	24' 8"	22' 5"	19' 7"	20' 0"	18' 2"	15' 10"	22' 5"	20' 4"	17' 10"
800S200-97	50	23' 1"	20' 11"	18' 4"	25' 11"	23' 6"	20' 6"	20' 11"	19' 0"	16' 7"	23' 6"	21' 4"	18' 8"
800S250-97	50	24' 1"	21' 11"	19' 1"	27' 1"	24' 7"	21' 6"	21' 11"	19' 11"	17' 4"	24' 7"	22' 4"	19' 6"
800S162-118	50	23' 3"	21' 1"	18' 5"	26' 1"	23' 9"	20' 9"	21' 1"	19' 2"	16' 9"	23' 9"	21' 7"	18' 10"
800S200-118	50	24' 5"	22' 2"	19' 5"	27' 5"	24' 11"	21' 9"	22' 2"	20' 2"	17' 7"	24' 11"	22' 8"	19' 9"
800S250-118	50	25' 6"	23' 2"	20' 3"	28' 8"	26' 1"	22' 9"	23' 2"	21' 1"	18' 5"	26' 1"	23' 8"	20' 8"
1000S162-43	33	17' 4"	15' 0"	12' 3"	16' 5"	13' 8"	10' 5"	17' 4"	15' 0"	12' 3"	16' 5"	13' 8"	10' 5"
1000S200-43	33	18' 8"	16' 2"	13' 2"	17' 3"	14' 3"	10' 9"	18' 8"	16' 2"	13' 2"	17' 3"	14' 3"	10' 9"
1000S250-43	33	19' 3"	16' 8"	13' 7"	17' 10"	14' 9"	11' 0"	19' 3"	16' 8"	13' 7"	17' 10"	14' 9"	11' 0"
1000S162-54	50	21' 11"	19' 10"	16' 5"	23' 2"	20' 1"	15' 10"	20' 0"	18' 1"	15' 9"	22' 4"	20' 1"	15' 10"
1000S200-54	50	22' 10"	20' 9"	17' 8"	24' 7"	20' 10"	16' 4"	20' 10"	18' 11"	16' 6"	23' 4"	20' 10"	16' 4"
1000S250-54	50	24' 0"	21' 10"	18' 1"	25' 7"	21' 9"	17' 0"	21' 10"	19' 10"	17' 4"	24' 6"	21' 9"	17' 0"
1000S162-68	50	23' 9"	21' 7"	18' 9"	26' 7"	23' 9"	19' 5"	21' 7"	19' 8"	17' 2"	24' 3"	22' 0"	19' 2"
1000S200-68	50	24' 10"	22' 6"	19' 8"	27' 9"	25' 2"	20' 9"	22' 7"	20' 6"	17' 11"	25' 4"	22' 11"	20' 0"
1000S250-68	50	25' 10"	23' 5"	20' 6"	29' 0"	26' 1"	21' 4"	23' 5"	21' 4"	18' 7"	26' 4"	23' 11"	20' 11"
1000S162-97	50	26' 6"	24' 1"	21' 0"	29' 9"	27' 0"	23' 7"	24' 1"	21' 10"	19' 1"	27' 0"	24' 6"	21' 5"
1000S200-97	50	27' 8"	25' 1"	21' 11"	31' 0"	28' 2"	24' 8"	25' 1"	22' 10"	19' 11"	28' 2"	25' 7"	22' 5"
1000S250-97	50	28' 9"	26' 2"	22' 10"	32' 4"	29' 4"	25' 8"	26' 2"	23' 9"	20' 9"	29' 4"	26' 8"	23' 4"
1000S162-118	50	28' 0"	25' 6"	22' 3"	31' 6"	28' 7"	25' 0"	25' 6"	23' 2"	20' 3"	28' 7"	26' 0"	22' 8"
1000S200-118	50	29' 4"	26' 8"	23' 3"	32' 11"	29' 11"	26' 1"	26' 8"	24' 2"	21' 2"	29' 11"	27' 2"	23' 9"
1000S250-118	50	30' 7"	27' 9"	24' 3"	34' 4"	31' 2"	27' 3"	27' 9"	25' 3"	22' 0"	31' 2"	28' 4"	24' 9"

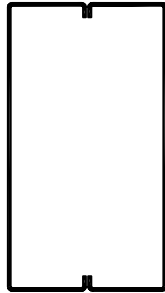
"e" web stiffeners required at ends.

Web stiffeners required at interior supports for double span conditions.

See Table Notes on page 42.

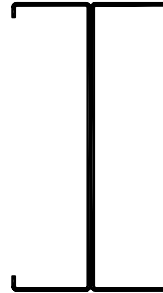
Table Notes

1. Values are for unpunched members.
2. Total load deflection is limited to $L/360$.
3. Headers are made from two boxed or back-to-back members.
4. Allowable moment, shear, and web crippling are based on twice the capacity of a single member. The moment of inertia is based on twice the value of the single member.
5. Web crippling check is based on 1" of bearing at end supports.
6. Members are assumed adequately braced for bending.
7. Allowable loads are for simply supported headers with uniform bending loads only.
8. See page 5 for additional table notes.



Boxed Header

TYP ROOF LOAD:
DL = 18 PSF
SL = 27.5 PSF
TOTAL = 45.5 PSF



Back-to-Back Header

Header Allowable Uniform Loads (PLF)

Section	Yield Strength (ksi)	Span					
		3 (ft)	4 (ft)	5 (ft)	6 (ft)	8 (ft)	10 (ft)
550S162-33	33	931.4e	698.5e	460.1e	319.5e	179.7e	115.0e
550S162-43	33	1946.5e	1094.9e	700.8e	486.6e	273.7e	164.6e
550S162-54	50	3484.7e	1960.1e	1254.5e	871.2e	396.8e	203.2
550S162-68	50	4782.6e	2690.2e	1721.7e	1157.8e	488.5e	250.1
600S137-33	33	850.8e	638.1e	436.5e	303.1e	170.5e	109.1e
600S162-33	33	850.8e	638.1e	504.9e	350.6e	197.2e	126.2e
600S200-33	33	850.8e	638.1e	510.5e	398.7e	224.2e	143.5e
600S137-43	33	1751.1e	985.0e	630.4e	437.8e	246.3e	157.6e
600S162-43	33	1887.6e	1205.1e	771.3e	535.6e	301.3e	192.8e
600S200-43	33	1887.6e	1282.4e	820.7e	569.9e	320.6e	205.2e
600S250-43	33	1887.6e	1350.7e	864.4e	600.3e	337.7e	216.1e
600S137-54	50	3146.8e	1770.1e	1132.9e	786.7e	429.8e	220.1
600S162-54	50	3763.8e	2158.3e	1381.3e	959.3e	488.3e	250.0e
600S200-54	50	3763.8e	2281.9e	1460.4e	1024.2e	566.7e	290.1e
600S250-54	50	3763.8e	2392.7e	1531.4e	1063.4e	598.2e	329.1e
600S137-68	50	4280.5e	2407.8e	1541.0e	1070.1e	528.3e	270.5
600S162-68	50	5288.3e	2974.7e	1903.8e	1244.2e	614.2e	308.1
600S200-68	50	5880.1e	3307.5e	2116.8e	1394.2e	683.2e	358.4
600S250-68	50	5788.2e	3255.8e	2083.7e	1312.2e	616.7e	316.7e
600S137-97	50	7526.5e	4233.7e	2709.5e	1694.8e	715	366.1
600S162-97	50	8403.7e	4727.1e	3025.3e	1941.3e	819	419.3
600S200-97	50	9432.6e	5305.9e	3395.7e	2270.9e	958.0e	490.5
600S250-97	50	9898.1e	5567.7e	3563.3e	2474.5e	1109.0e	567.8
600S137-118	50	9138.7e	5140.5e	3289.9e	1987.9e	838.7	429.4
600S162-118	50	10212.8e	5744.7e	3676.6e	2287.3e	965	494.1
600S200-118	50	11620.3e	6536.4e	4183.3e	2687.4e	1133.7	580.5
600S250-118	50	12729.2e	7160.2e	4582.5e	3121.2e	1316.7e	674.2
800S137-33	33	632.0e	474.0e	379.2e	316.0e	223.2e	142.8e
800S162-33	33	632.0e	474.0e	379.2e	316.0e	237.0e	168.1e
800S200-33	33	632.0e	474.0e	379.2e	316.0e	237.0e	189.6e
800S137-43	33	1401.5e	1051.2e	840.9e	584.3e	328.7e	210.3e
800S162-43	33	1401.5e	1051.2e	840.9e	678.8e	381.8e	244.4e
800S200-43	33	1401.5e	1051.2e	840.9e	700.8e	437.2e	279.8e
800S250-43	33	1401.5e	1051.2e	840.9e	700.8e	459.5e	294.1e
800S137-54	50	2788.4e	2091.3e	1518.3e	1054.4e	593.1e	379.6e
800S162-54	50	2788.4e	2091.3e	1673.0e	1215.2e	683.6e	437.5e
800S200-54	50	2788.4e	2091.3e	1673.0e	1324.1e	778.6e	498.3e
800S250-54	50	2788.4e	2091.3e	1673.0e	1394.2e	815.2e	521.7e
800S137-68	50	5627.6e	3297.6e	2110.4e	1465.6e	824.4e	527.6e
800S162-68	50	5627.6e	3759.1e	2405.8e	1664.3e	884.7e	601.4e
800S200-68	50	5627.6e	4220.7e	2917.3e	1941.3e	958.0e	711.5e
800S250-68	50	5627.6e	4220.7e	2866.9e	2367.0e	1331.5e	751.5e
800S137-97	50	9468.1e	5325.8e	3408.5e	2664.3e	1498.7e	849.0e
800S162-97	50	10657.1e	5994.6e	3836.6e	3324.4e	1870.0e	979.3e
800S200-97	50	13297.5e	7479.8e	4787.1e	3460.0e	1946.2e	1117.9e
800S250-97	50	13839.9e	7785.0e	4982.4e	3539.3e	1732.3e	886.9
800S137-118	50	14157.3e	7963.5e	5096.6e	3897.3e	1964.0e	1005.5e
800S162-118	50	15589.2e	8768.9e	5612.1e	4353.7e	2273.2e	1163.9e
800S200-118	50	17414.8e	9795.8e	6269.3e	4552.5e	2560.8e	1332.2e
800S250-118	50	18210.1e	10243.2e	6555.6e			771

6' SPAN MAX TRIB:
 $959 / 45.5 = 21.1 \text{ FT}$

8' SPAN MAX TRIB:
 $488 / 45.5 = 10.7 \text{ FT}$

6' SPAN MAX TRIB:
 $1215 / 45.5 = 26.7 \text{ FT}$

8' SPAN MAX TRIB:
 $683 / 45.5 = 15.0 \text{ FT}$

"e" web stiffeners required at ends.

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Header Allowable Uniform Loads (PLF)

Section	Yield Strength (ksi)	Span						
		3 (ft)	4 (ft)	5 (ft)	6 (ft)	8 (ft)	10 (ft)	12 (ft)
1000S137-43	33	1114.6e	835.9e	668.7e	557.3e	397.8e	254.6e	176.8e
1000S162-43	33	1114.6e	835.9e	668.7e	557.3e	418.0e	299.9e	208.2e
1000S200-43	33	1114.6e	835.9e	668.7e	557.3e	418.0e	334.4e	242.1e
1000S250-43	33	1114.6e	835.9e	668.7e	557.3e	418.0e	334.4e	256.2e
1000S137-54	50	2214.5e	1660.8e	1328.7e	1107.2e	721.1e	461.5e	320.5e
1000S162-54	50	2214.5e	1660.8e	1328.7e	1107.2e	830.4e	538.3e	373.8e
1000S200-54	50	2214.5e	1660.8e	1328.7e	1107.2e	830.4e	621.6e	431.6e
1000S250-54	50	2214.5e	1660.8e	1328.7e	1107.2e	830.4e	655.5e	455.2e
1000S137-68	50	4460.5e	3345.4e	2611.5e	1813.5e	1020.1e	652.9e	453.4e
1000S162-68	50	4460.5e	3345.4e	2676.3e	2087.2e	1174.0e	751.4e	521.8e
1000S200-68	50	4460.5e	3345.4e	2676.3e	2230.3e	1243.8e	866.0e	597.2e
1000S250-68	50	4460.5e	3345.4e	2676.3e	2230.3e	1419.4e	908.4e	630.8e
1000S137-97	50	12117.7e	6816.2e	4362.4e	3029.4e	1704.1e	1090.6e	757.4e
1000S162-97	50	13151.6e	7712.9e	4936.2e	3427.9e	8' SPAN MAX TRIB: 1174 / 45.5 = 25.8 FT	10' SPAN MAX TRIB: 751 / 45.5 = 16.5 FT	857.0e
1000S200-97	50	13151.6e	8727.6e	5585.7e	3878.9e			969.7e
1000S250-97	50	13151.6e	9863.7e	6407.1e	4449.4e			1104.1e
1000S137-118	50	15854.9e	8918.4e	5707.8e	3963.7e	2229.6e	1426.9e	910.9e
1000S162-118	50	17827.7e	10028.1e	6418.0e	4456.9e	2507.0e	1604.5e	1020.2e
1000S200-118	50	20110.4e	11312.1e	7239.8e	5027.6e	2828.0e	1809.9e	1166.0e
1000S250-118	50	21646.1e	13316.3e	8522.4e	5918.4e	3329.1e	2130.6e	1319.2e
1200S137-54	50	1836.5e	1377.4e	1101.9e	918.2e	688.7e	529.9e	368.0e
1200S162-54	50	1836.5e	1377.4e	1101.9e	918.2e	688.7e	550.9e	432.9e
1200S200-54	50	1836.5e	1377.4e	1101.9e	918.2e	688.7e	550.9e	459.1e
1200S250-54	50	1836.5e	1377.4e	1101.9e	918.2e	688.7e	550.9e	459.1e
1200S137-68	50	3694.3e	2770.7e	2216.6e	1847.2e	1187.3e	759.9e	527.7e
1200S162-68	50	3694.3e	2770.7e	2216.6e	1847.2e	1377.9e	881.8e	612.4e
1200S200-68	50	3694.3e	2770.7e	2216.6e	1847.2e	1385.4e	1020.7e	708.8e
1200S250-68	50	3694.3e	2770.7e	2216.6e	1847.2e	1385.4e	1087.9e	755.5e
1200S137-97	50	10862.7e	8144.0e	5212.1e	3619.5e	2036.0e	1303.0e	904.9e
1200S162-97	50	10862.7e	8147.0e	5936.1e	4122.3e	2318.8e	1484.0e	1030.6e
1200S200-97	50	10862.7e	8147.0e	6517.6e	4698.7e	2643.0e	1691.5e	1174.7e
1200S250-97	50	10862.7e	8147.0e	6517.6e	5013.8e	2820.3e	1805.0e	1253.5e
1200S137-118	50	19323.9e	10869.7e	6956.6e	4831.0e	2717.4e	1739.1e	1207.7e
1200S162-118	50	19980.7e	12269.5e	7852.5e	5453.1e	3067.4e	8' SPAN MAX TRIB: 1484 / 45.5 = 32.6 FT	10' SPAN MAX TRIB: 1030 / 45.5 = 22.6 FT
1200S200-118	50	19980.7e	13900.1e	8896.1e	6177.8e	3475.0e		
1200S250-118	50	19980.7e	14880.8e	9523.7e	6613.7e	3720.2e		
1200S300-118	50	19980.7e	14985.5e	10756.0e	7469.4e	4201.6e	2689.0e	1867.4e
1200S350-118	50	19980.7e	14985.5e	11988.4e	8850.4e	4978.3e	3186.1e	2212.6e
1400S162-54	50	1568.7e	1176.5e	941.2e	784.4e	588.3e	470.6e	392.2e
1400S200-54	50	1568.7e	1176.5e	941.2e	784.4e	588.3e	470.6e	392.2e
1400S250-54	50	1568.7e	1176.5e	941.2e	784.4e	588.3e	470.6e	392.2e
1400S300-54	50	1568.7e	1176.5e	941.2e	784.4e	588.3e	470.6e	392.2e
1400S350-54	50	1568.7e	1176.5e	941.2e	784.4e	588.3e	470.6e	392.2e
1400S162-68	50	3152.8e	2364.6e	1891.7e	1576.4e	1182.3e	945.8e	690.3e
1400S200-68	50	3152.8e	2364.6e	1891.7e	1576.4e	1182.3e	945.8e	788.2e
1400S250-68	50	3152.8e	2364.6e	1891.7e	1576.4e	1182.3e	945.8e	788.2e
1400S300-68	50	3152.8e	2364.6e	1891.7e	1576.4e	1182.3e	945.8e	788.2e
1400S350-68	50	3152.8e	2364.6e	1891.7e	1576.4e	1182.3e	945.8e	788.2e
1400S162-97	50	9252.4e	6939.3e	5551.4e	4626.2e	2665.9e	1706.2e	1184.8e
1400S200-97	50	9252.4e	6939.3e	5551.4e	4626.2e	3062.0e	1959.7e	1360.9e
1400S250-97	50	9252.4e	6939.3e	5551.4e	4626.2e	3290.4e	2105.8e	1462.4e
1400S300-97	50	9252.4e	6939.3e	5551.4e	4626.2e	3446.8e	2206.0e	1531.9e
1400S350-97	50	9252.4e	6939.3e	5551.4e	4626.2e	3469.6e	2683.4e	1863.5e
1400S162-118	50	16993.8e	12745.4e	9153.4e	6356.5e	3575.5e	2288.3e	1589.1e
1400S200-118	50	16993.8e	12745.4e	10196.3e	7245.3e	4075.5e	2608.3e	1811.3e
1400S250-118	50	16993.8e	12745.4e	10196.3e	7793.3e	4383.7e	2805.6e	1948.3e
1400S300-118	50	16993.8e	12745.4e	10196.3e	8178.0e	4600.1e	2944.1e	2044.5e
1400S350-118	50	16993.8e	12745.4e	10196.3e	8496.9e	5892.6e	3771.3e	2618.9e
1600S162-68	50	2749.7e	2062.3e	1649.8e	1374.8e	1031.1e	824.9e	687.4e
1600S200-68	50	2749.7e	2062.3e	1649.8e	1374.8e	1031.1e	824.9e	687.4e
1600S250-68	50	2749.7e	2062.3e	1649.8e	1374.8e	1031.1e	824.9e	687.4e
1600S300-68	50	2749.7e	2062.3e	1649.8e	1374.8e	1031.1e	824.9e	687.4e
1600S350-68	50	2749.7e	2062.3e	1649.8e	1374.8e	1031.1e	824.9e	687.4e
1600S162-97	50	8057.9e	6043.4e	4834.7e	4028.9e	2975.1e	1904.1e	1322.3e
1600S200-97	50	8057.9e	6043.4e	4834.7e	4028.9e	3021.7e	2199.8e	1527.7e
1600S250-97	50	8057.9e	6043.4e	4834.7e	4028.9e	3021.7e	2381.4e	1653.7e
1600S300-97	50	8057.9e	6043.4e	4834.7e	4028.9e	3021.7e	2417.4e	1743.7e
1600S350-97	50	8057.9e	6043.4e	4834.7e	4028.9e	3021.7e	2417.4e	2014.5e
1600S162-118	50	14783.8e	11087.9e	8870.3e	7175.0e	4035.9e	2583.0e	1793.8e
1600S200-118	50	14783.8e	11087.9e	8870.3e	7391.9e	4622.1e	2958.1e	2054.3e
1600S250-118	50	14783.8e	11087.9e	8870.3e	7391.9e	5001.5e	3201.0e	2222.9e
1600S300-118	50	14783.8e	11087.9e	8870.3e	7391.9e	5275.8e	3376.5e	2344.8e
1600S350-118	50	14783.8e	11087.9e	8870.3e	7391.9e	5543.9e	4061.0e	2820.1e

"e" web stiffeners required at ends.

See Table Notes on page 56.

4.0 - STEEL WALL AND COLUMN DESIGN

Table Notes

- Allowable axial loads listed in kips (1 kip = 1,000 pounds).
- Allowable axial loads listed are based on simple one span condition.
- Allowable axial loads determined in accordance with AISI S100 Section C5 and with the assumption that axial load passes through centroid of the effective section.
- Allowable axial loads are based on 4'-0" on center bracing.
- Studs are assumed to be adequately braced at a maximum spacing of L_u to develop full allowable moment, M_a .
- Listed wind pressures represent calculated designed wind pressure (1.0 W based on 2009 or 0.6 W based on 2012 IBC or later ASD load combinations). For deflection calculations, listed wind pressures have been reduced by 0.70 as allowed by IBC. The 5 psf pressure has not been reduced for deflection checks.
- End supports have not been checked for web crippling. See web crippling tables on page 51.
- See page 5 for additional table notes.

5 psf Lateral Load (Interior Walls)													
Wall Height (ft)	Spacing (in) oc	350S162				362S137				362S162			
		33 ksi		50 ksi		33 ksi		50 ksi		33 ksi		50 ksi	
		33	43	54	68	33	43	54	68	33	43	54	68
8	12	1.81	2.56	3.97	5.08	1.49	2.14	3.32	4.37	1.87	2.65	4.15	5.38
	16	1.74	2.48	3.90	5.01	1.42	2.07	3.26	4.30	1.80	2.57	4.08	5.31
	24	1.58	2.32	3.76	4.87	1.29	1.93	3.13	4.17	1.65	2.42	3.94	5.17
9	12	1.67	2.38	3.65	4.67	1.38	2.01	3.11	4.07	1.74	2.48	3.86	4.99
	16	1.57	2.28	3.56	4.58	1.30	1.92	3.02	3.99	1.64	2.38	3.77	4.90
	24	1.39	2.09	3.39	4.41	1.13	1.74	2.87	3.82	1.46	2.19	3.60	4.72
10	12	1.51	2.18	3.29	4.23	1.26	1.85	2.85	3.73	1.58	2.29	3.53	4.55
	16	1.40	2.07	3.19	4.12	1.16	1.75	2.75	3.63	1.47	2.17	3.42	4.44
	24	1.19	1.84	2.99	3.92	0.96	1.54	2.57	3.44	1.26	1.95	3.22	4.23
12	12	1.18	1.75	2.56	3.31	0.99	1.51	2.27	2.97	1.25	1.87	2.79	3.60
	16	1.04 ⁴	1.61	2.44	3.18	0.86 ⁴	1.37	2.15	2.85	1.11	1.72	2.66	3.47
	24	0.79 ³	1.34 ³	2.21	2.94	0.63 ³	1.12 ³	1.93 ⁴	2.62	0.86 ³	1.44 ⁴	2.42	3.22
14	12	0.86 ³	1.33	1.95	2.54	0.72 ³	1.15 ⁴	1.75	2.30	0.93 ⁴	1.44	2.14	2.78
	16	0.71 ³	1.17 ³	1.82 ⁴	2.40	0.59 ³	1.00 ³	1.62 ⁴	2.16	0.78 ³	1.28 ⁴	2.00	2.64
	24	0.46 ²	0.89 ³	1.58 ³	2.16 ³	0.34 ²	0.73 ²	1.39 ³	1.92 ³	0.52 ²	0.99 ³	1.75 ³	2.38 ⁴
16	12	0.59 ³	0.96 ³	1.48 ⁴	1.95	0.50 ³	0.83 ³	1.33 ³	1.76 ⁴	0.65 ³	1.06 ³	1.63 ⁴	2.14
	16	0.45 ²	0.80 ³	1.35 ³	1.81 ³	0.36 ²	0.68 ²	1.20 ³	1.63 ³	0.51 ²	0.90 ³	1.49 ³	2.00 ⁴
	24	0.21 ¹	0.54 ²	1.12 ²	1.57 ³	0.12 ¹	0.42 ¹	0.97 ²	1.39 ²	0.25 ¹	0.62 ²	1.25 ²	1.74 ³

5 psf Lateral Load (Interior Walls)													
Wall Height (ft)	Spacing (in) oc	400S137				400S162				400S200			
		33 ksi		50 ksi		33 ksi		50 ksi		33 ksi		50 ksi	
		33	43	54	68	33	43	54	68	33	43	54	68
8	12	1.61	2.31	3.67	4.98	2.03	2.87	4.62	6.18	2.42	3.55	5.77	7.63
	16	1.55	2.25	3.61	4.91	1.96	2.80	4.55	6.11	2.34	3.48	5.70	7.56
	24	1.42	2.12	3.49	4.78	1.82	2.66	4.42	5.97	2.19	3.32	5.54	7.41
9	12	1.52	2.20	3.49	4.79	1.91	2.72	4.37	5.85	2.28	3.37	5.43	7.19
	16	1.44	2.12	3.42	4.70	1.82	2.63	4.28	5.76	2.19	3.27	5.33	7.10
	24	1.28	1.95	3.27	4.54	1.65	2.46	4.11	5.59	2.00	3.08	5.14	6.91
10	12	1.41	2.07	3.28	4.49	1.77	2.56	4.08	5.47	2.13	3.16	5.04	6.70
	16	1.31	1.97	3.19	4.38	1.67	2.45	3.97	5.36	2.01	3.04	4.92	6.58
	24	1.12	1.77	3.00	4.18	1.46	2.23	3.77	5.14	1.79	2.81	4.69	6.34
12	12	1.16	1.76	2.77	3.75	1.46	2.17	3.41	4.54	1.79	2.69	4.19	5.57
	16	1.03	1.62	2.64	3.61	1.32	2.02	3.27	4.39	1.63	2.53	4.03	5.41
	24	0.80 ³	1.36 ⁴	2.40	3.35	1.06 ⁴	1.74	3.01	4.12	1.35	2.22	3.74	5.11
14	12	0.90 ⁴	1.41	2.22	2.96	1.14	1.75	2.71	3.57	1.43	2.19	3.32	4.39
	16	0.75 ³	1.25 ⁴	2.08	2.80	0.98 ³	1.58	2.55	3.41	1.25 ⁴	2.00	3.14	4.21
	24	0.49 ²	0.96 ³	1.81 ³	2.52 ⁴	0.70 ³	1.26 ³	2.27 ⁴	3.10	0.92 ³	1.65 ⁴	2.82	3.88
16	12	0.65 ³	1.08 ³	1.74	2.30	0.84 ³	1.35 ⁴	2.12	2.78	1.07 ⁴	1.71	2.60	3.42
	16	0.50 ²	0.91 ³	1.59 ³	2.14 ⁴	0.68 ³	1.17 ³	1.96 ⁴	2.61	0.89 ³	1.51 ⁴	2.41	3.24
	24	0.23 ¹	0.61 ²	1.32 ³	1.86 ³	0.39 ²	0.85 ²	1.67 ³	2.31 ³	0.56 ²	1.16 ³	2.09 ³	2.91 ⁴

If no note, deflection meets L/720

¹Deflection meets L/120

²Deflection meets L/240

³Deflection meets L/360

⁴Deflection meets L/600

5 psf Lateral Load (Interior Walls)

Wall Height (ft)	Spacing (in) oc.	600S137					600S162					600S200				
		33 ksi		50 ksi			33 ksi		50 ksi			33 ksi		50 ksi		
		33	43	54	68	97	33	43	54	68	97	33	43	54	68	97
8	12	1.77	2.51	3.81	5.05	7.54	2.42	3.40	5.61	7.45	11.39	2.86	4.31	7.46	9.97	15.65
	16	1.73	2.47	3.78	5.02	7.52	2.37	3.35	5.57	7.41	11.35	2.81	4.26	7.41	9.93	15.60
	24	1.65	2.39	3.72	4.96	7.46	2.28	3.27	5.49	7.33	11.28	2.72	4.16	7.31	9.83	15.51
9	12	1.74	2.47	3.78	5.02	7.52	2.38	3.36	5.57	7.41	11.35	2.80	4.23	7.31	9.79	15.39
	16	1.69	2.43	3.74	4.98	7.48	2.32	3.30	5.52	7.36	11.31	2.74	4.16	7.25	9.73	15.33
	24	1.59	2.33	3.66	4.90	7.41	2.20	3.19	5.42	7.26	11.21	2.62	4.03	7.12	9.61	15.20
10	12	1.70	2.44	3.75	4.99	7.49	2.33	3.31	5.53	7.37	11.31	2.73	4.13	7.14	9.58	15.07
	16	1.63	2.37	3.70	4.94	7.44	2.25	3.24	5.46	7.30	11.25	2.65	4.05	7.05	9.50	14.99
	24	1.51	2.25	3.59	4.83	7.36	2.10	3.11	5.33	7.17	11.12	2.50	3.88	6.89	9.35	14.83
12	12	1.60	2.34	3.66	4.90	7.41	2.17	3.15	5.35	7.25	11.19	2.55	3.88	6.67	9.00	14.21
	16	1.51	2.25	3.59	4.82	7.34	2.06	3.05	5.25	7.15	11.09	2.44	3.76	6.55	8.89	14.09
	24	1.33	2.07	3.43	4.67	7.21	1.85	2.85	5.05	6.95	10.89	2.22	3.53	6.31	8.66	13.85
14	12	1.48	2.22	3.55	4.79	7.31	1.95	2.91	4.93	6.77	10.96	2.32	3.56	6.07	8.26	13.08
	16	1.36	2.09	3.44	4.67	7.20	1.81	2.78	4.80	6.63	10.80	2.17	3.40	5.91	8.10	12.91
	24	1.11	1.85	3.21	4.45	7.00	1.54	2.51	4.53	6.35	10.49	1.89	3.09	5.59	7.79	12.58
16	12	1.34	2.07	3.40	4.63	7.15	1.71	2.62	4.41	6.10	9.89	2.05	3.18	5.38	7.38	11.74
	16	1.18	1.90	3.24	4.46	7.00	1.53	2.45	4.24	5.91	9.68	1.87	2.98	5.18	7.17	11.52
	24	0.87 ³	1.59	2.95	4.16	6.71	1.20 ⁴	2.12	3.91	5.57	9.28	1.52	2.61	4.79	6.79	11.09

5 psf Lateral Load (Interior Walls)

Wall Height (ft)	Spacing (in) oc.	800S137				800S162					800S200				
		33 ksi		50 ksi		33 ksi		50 ksi			33 ksi		50 ksi		
		43	54	68	97	43	54	68	97	118	43	54	68	97	118
8	12	2.43	3.57	4.74	7.21	3.35	5.43	7.25	11.25	14.30	4.47	7.74	10.29	15.98	20.46
	16	2.40	3.55	4.72	7.19	3.32	5.40	7.22	11.23	14.28	4.44	7.71	10.25	15.95	20.43
	24	2.35	3.50	4.68	7.16	3.26	5.35	7.16	11.17	14.23	4.36	7.64	10.19	15.88	20.37
9	12	2.40	3.55	4.73	7.20	3.33	5.41	7.22	11.23	14.28	4.44	7.71	10.26	15.95	20.43
	16	2.37	3.52	4.70	7.17	3.29	5.37	7.19	11.20	14.25	4.39	7.67	10.21	15.91	20.39
	24	2.30	3.47	4.65	7.12	3.21	5.30	7.12	11.13	14.19	4.30	7.57	10.13	15.83	20.31
10	12	2.38	3.53	4.71	7.18	3.30	5.38	7.19	11.20	14.26	4.41	7.68	10.22	15.92	20.40
	16	2.34	3.49	4.67	7.15	3.25	5.33	7.15	11.16	14.22	4.35	7.62	10.17	15.87	20.35
	24	2.26	3.43	4.61	7.09	3.15	5.24	7.06	11.07	14.14	4.23	7.50	10.06	15.76	20.25
12	12	2.32	3.48	4.66	7.13	3.22	5.31	7.13	11.14	14.20	4.32	7.59	10.14	15.84	20.32
	16	2.26	3.43	4.61	7.09	3.15	5.24	7.06	11.07	14.14	4.23	7.50	10.06	15.76	20.24
	24	2.14	3.33	4.51	7.00	3.00	5.11	6.93	10.94	14.03	4.06	7.32	9.90	15.60	20.08
14	12	2.25	3.42	4.60	7.08	3.13	5.22	7.04	11.05	14.12	4.16	7.36	9.96	15.72	20.20
	16	2.16	3.35	4.53	7.01	3.03	5.13	6.94	10.95	14.03	4.04	7.24	9.84	15.61	20.09
	24	2.00	3.21	4.40	6.88	2.83	4.94	6.76	10.76	13.87	3.80	6.99	9.61	15.38	19.86
16	12	2.16	3.34	4.52	7.00	3.02	5.11	6.93	10.93	14.01	3.93	6.95	9.45	15.15	19.78
	16	2.05	3.25	4.43	6.91	2.89	4.98	6.80	10.80	13.89	3.77	6.78	9.30	15.00	19.62
	24	1.83	3.06	4.25	6.74	2.62	4.72	6.54	10.53	13.66	3.46	6.46	9.00	14.68	19.29

15 psf Lateral Load

Wall Height (ft)	Spacing (in) oc.	350S162				362S137				362S162				362S200			
		33 ksi		50 ksi		33 ksi		50 ksi		33 ksi		50 ksi		33 ksi		50 ksi	
		33	43	54	68	33	43	54	68	33	43	54	68	33	43	54	68
8	12	1.37	2.10	3.56	4.66	1.09	1.72	2.95	3.98	1.44	2.20	3.74	4.96	1.77	2.79	4.71	6.22
	16	1.16	1.89	3.36	4.46	0.91	1.53	2.77	3.80	1.23	1.99	3.55	4.76	1.55	2.56	4.49	6.01
	24	0.78	1.49	2.99	4.08	0.56 ⁴	1.16	2.43	3.44	0.85	1.59	3.17	4.38	1.13	2.13	4.06	5.58
9	12	1.13	1.82	3.14	4.16	0.90	1.49	2.64	3.59	1.21	1.93	3.35	4.47	1.51	2.47	4.21	5.60
	16	0.90	1.57	2.91	3.92	0.68	1.26	2.43	3.37	0.97	1.68	3.12	4.23	1.25	2.19	3.94	5.34
	24	0.46 ³	1.11 ⁴	2.48	3.48	0.28 ³	0.83 ⁴	2.03	2.94	0.53 ³	1.21	2.68	3.77	0.77 ⁴	1.68	3.44	4.84
10	12	0.90	1.53	2.71	3.63	0.70 ⁴	1.25	2.31	3.16	0.97	1.64	2.94	3.94	1.25	2.13	3.69	4.95
	16	0.64 ³	1.25	2.45	3.37	0.46 ³	0.99 ⁴	2.07	2.91	0.71 ⁴	1.36	2.67	3.66	0.95	1.82	3.38	4.65
	24	0.17 ³	0.74 ³	1.99 ⁴	2.88	-	0.51 ³	1.62 ³	2.44 ⁴	0.23 ³	0.84 ³	2.18 ⁴	3.15	0.42 ³	1.25 ⁴	2.83	4.09
12	12	0.47 ³	0.98 ³	1.90 ⁴	2.62	0.33 ³	0.78 ³	1.63 ⁴	2.30	0.53 ³	1.08 ⁴	2.10	2.88	0.74 ³	1.46	2.65	3.66
	16	0.18 ²	0.67 ³	1.62 ³	2.33 ⁴	-	0.48 ³	1.36 ³	2.02 ⁴	0.24 ²	0.76 ³	1.81 ³	2.58 ⁴	0.41 ³	1.11 ³	2.32 ⁴	3.32
	24	-	0.13 ²	1.13 ²	1.81 ³	-	-	0.89 ²	1.51 ³	-	0.20 ²	1.29 ³	2.03 ³	-	0.49 ³	1.73 ³	2.72 ³
14	12	0.13 ²	0.53 ²	1.27 ³	1.83 ³	-	0.38 ²	1.08 ³	1.60 ³	0.18 ²	0.61 ³	1.42 ³	2.03 ³	0.32 ²	0.90 ³	1.82 ³	2.61 ⁴
	16	-	0.22 ²	1.00 ²	1.54 ³	-	-	0.82 ²	1.31 ³	-	0.29 ²	1.14 ²	1.73 ³	-	0.54 ²	1.49 ³	2.28 ³
	24	-	-	0.53 ¹	1.04 ²	-	-	0.35 ¹	0.82 ²	-	-	0.64 ¹	1.19 ²	-	-	0.92 ²	1.69 ²
16	12	-	0.20 ¹	0.82 ²	1.26 ³	-	-	0.68 ²	1.07 ²	-	0.26 ²	0.93 ²	1.41 ³	-	0.46 ²	1.22 ³	1.85 ³
	16	-	-	0.57 ¹	0.98 ²	-	-	0.42 ¹	0.80 ²	-	-	0.66 ¹	1.12 ²	-	0.12 ¹	0.91 ²	1.53 ²
	24	-	-	0.13 ¹	0.51 ¹	-	-	-	0.34 ¹	-	-	0.19 ¹	0.62 ¹	-	-	0.38 ¹	0.97 ¹

If no note, deflection meets L/720

¹Deflection meets L/120

²Deflection meets L/240

³Deflection meets L/360

⁴Deflection meets L/600

See Table Notes on page 31.

15 psf Lateral Load

Wall Height (ft)	Spacing (in) oc	400S137				400S162				400S200				550S162			
		33 ksi		50 ksi		33 ksi		50 ksi		33 ksi		50 ksi		33 ksi		50 ksi	
		33	43	54	68	33	43	54	68	33	43	54	68	33	43	54	68
8	12	1.24	1.92	3.32	4.60	1.62	2.45	4.22	5.77	1.97	3.10	5.32	7.19	2.08	3.09	5.36	7.19
	16	1.06	1.74	3.14	4.41	1.42	2.25	4.04	5.57	1.76	2.88	5.10	6.97	1.93	2.95	5.22	7.06
	24	0.72	1.38	2.81	4.06	1.05	1.86	3.67	5.18	1.35	2.46	4.68	6.55	1.64	2.68	4.96	6.80
9	12	1.05	1.71	3.05	4.30	1.40	2.20	3.87	5.33	1.73	2.80	4.86	6.63	1.94	2.94	5.20	7.07
	16	0.84	1.49	2.83	4.07	1.17	1.95	3.64	5.08	1.47	2.53	4.59	6.36	1.75	2.77	5.03	6.90
	24	0.44 ⁴	1.06	2.43	3.63	0.73 ⁴	1.49	3.20	4.61	0.99	2.03	4.09	5.84	1.38	2.42	4.69	6.56
10	12	0.86	1.49	2.74	3.89	1.17	1.93	3.48	4.83	1.47	2.48	4.36	6.01	1.77	2.77	4.97	6.90
	16	0.62 ⁴	1.22	2.49	3.62	0.90	1.64	3.21	4.54	1.18	2.17	4.05	5.69	1.54	2.56	4.76	6.69
	24	0.17 ³	0.74 ³	2.03 ⁴	3.11	0.41 ³	1.12 ⁴	2.70	3.99	0.64 ⁴	1.59	3.47	5.09	1.10	2.14	4.34	6.26
12	12	0.48 ³	1.01 ⁴	2.08	2.99	0.72 ⁴	1.37	2.65	3.73	0.96 ⁴	1.81	3.33	4.69	1.39	2.36	4.40	6.22
	16	0.19 ³	0.70 ³	1.78 ⁴	2.67	0.41 ³	1.03 ³	2.33 ⁴	3.38	0.61 ³	1.44 ⁴	2.96	4.31	1.08	2.07	4.10	5.91
	24	-	0.14 ²	1.25 ³	2.09 ³	-	0.43 ³	1.75 ³	2.76 ³	-	0.78 ³	2.31 ³	3.62 ⁴	0.52 ⁴	1.51	3.54	5.32
14	12	0.15 ²	0.58 ³	1.46 ³	2.15 ⁴	0.33 ³	0.86 ³	1.89 ³	2.70	0.50 ³	1.21 ³	2.39 ⁴	3.44	0.97	1.90	3.71	5.36
	16	-	0.25 ²	1.15 ³	1.82 ³	-	0.50 ³	1.56 ³	2.35 ³	0.14 ²	0.81 ³	2.01 ³	3.05 ⁴	0.61 ³	1.53	3.34	4.97
	24	-	-	0.62 ²	1.24 ²	-	-	0.98 ²	1.72 ³	-	0.13 ²	1.36 ²	2.36 ³	-	0.87 ³	2.66 ⁴	4.24
16	12	-	0.23 ²	0.97 ²	1.49 ³	-	0.44 ²	1.30 ³	1.92 ³	0.14 ²	0.71 ³	1.67 ³	2.48 ³	0.58 ³	1.41 ⁴	2.98	4.42
	16	-	-	0.67 ²	1.17 ²	-	-	0.98 ²	1.58 ³	-	0.32 ²	1.30 ²	2.10 ³	0.18 ³	1.00 ³	2.57 ⁴	3.97
	24	-	-	0.16 ¹	0.62 ¹	-	-	0.42 ¹	0.98 ²	-	-	0.68 ¹	1.45 ²	-	0.28 ²	1.83 ³	3.18 ³

15 psf Lateral Load

Wall Height (ft)	Spacing (in) oc	600S137					600S162					600S200				
		33 ksi		50 ksi			33 ksi		50 ksi			33 ksi		50 ksi		
		33	43	54	68	97	33	43	54	68	97	33	43	54	68	97
8	12	1.54	2.28	3.62	4.86	7.38	2.14	3.14	5.37	7.22	11.17	2.57	4.01	7.16	9.69	15.37
	16	1.42	2.17	3.53	4.77	7.30	2.00	3.02	5.25	7.10	11.06	2.43	3.86	7.01	9.55	15.23
	24	1.19	1.95	3.34	4.58	7.14	1.73	2.77	5.02	6.87	10.83	2.15	3.56	6.71	9.27	14.95
9	12	1.44	2.18	3.54	4.78	7.31	2.02	3.03	5.26	7.11	11.06	2.43	3.84	6.92	9.43	15.02
	16	1.29	2.04	3.41	4.66	7.21	1.85	2.87	5.11	6.96	10.91	2.26	3.65	6.73	9.25	14.84
	24	1.01	1.76	3.17	4.42	7.00	1.51	2.56	4.81	6.67	10.62	1.90	3.27	6.35	8.89	14.48
10	12	1.33	2.07	3.44	4.68	7.22	1.89	2.91	5.14	6.98	10.93	2.28	3.65	6.65	9.12	14.60
	16	1.15	1.90	3.28	4.53	7.09	1.67	2.71	4.94	6.79	10.74	2.06	3.41	6.41	8.89	14.37
	24	0.80	1.55	2.98	4.23	6.83	1.26	2.32	4.57	6.42	10.37	1.63	2.96	5.94	8.45	13.91
12	12	1.07	1.81	3.20	4.44	7.00	1.54	2.56	4.76	6.66	10.59	1.91	3.19	5.96	8.33	13.50
	16	0.82	1.56	2.97	4.21	6.80	1.25	2.28	4.48	6.37	10.29	1.60	2.86	5.63	8.00	13.16
	24	0.35 ⁴	1.08	2.54	3.78	6.41	0.70	1.75	3.94	5.82	9.73	1.03	2.24	4.98	7.37	12.50
14	12	0.78	1.50	2.89	4.12	6.70	1.15	2.13	4.15	5.95	10.05	1.49	2.65	5.14	7.34	12.10
	16	0.46 ⁴	1.17	2.59	3.81	6.42	0.79	1.78	3.79	5.58	9.63	1.11	2.24	4.71	6.92	11.64
	24	-	0.57 ³	2.02 ⁴	3.22	5.87	0.14 ³	1.12 ⁴	3.11	4.87	8.83	0.42 ³	1.48	3.92	6.13	10.77
16	12	0.46 ³	1.16	2.53	3.73	6.31	0.75 ⁴	1.67	3.45	5.08	8.73	1.05	2.09	4.26	6.25	10.49
	16	-	0.76 ³	2.15 ⁴	3.33	5.92	0.35 ³	1.26 ⁴	3.03	4.64	8.21	0.62 ³	1.62	3.76	5.75	9.94
	24	-	-	1.47 ³	2.61 ³	5.21	-	0.51 ³	2.28 ³	3.82 ⁴	7.28	-	0.76 ³	2.88 ⁴	4.84	8.92

15 psf Lateral Load

Wall Height (ft)	Spacing (in) oc	800S137				800S162					800S200				
		33 ksi		50 ksi		33 ksi		50 ksi			33 ksi		50 ksi		
		43	54	68	97	43	54	68	97	118	43	54	68	97	118
8	12	2.27	3.44	4.62	7.10	3.17	5.26	7.08	11.09	14.16	4.25	7.53	10.09	15.79	20.28
	16	2.19	3.38	4.56	7.04	3.07	5.18	7.00	11.01	14.09	4.14	7.42	9.99	15.70	20.19
	24	2.03	3.25	4.44	6.93	2.89	5.01	6.83	10.85	13.95	3.93	7.21	9.80	15.51	20.00
9	12	2.20	3.39	4.57	7.05	3.09	5.19	7.01	11.02	14.10	4.16	7.44	10.00	15.71	20.20
	16	2.10	3.31	4.49	6.98	2.97	5.08	6.90	10.92	14.01	4.02	7.30	9.88	15.59	20.08
	24	1.91	3.14	4.34	6.83	2.73	4.87	6.69	10.71	13.83	3.74	7.02	9.63	15.35	19.84
10	12	2.13	3.33	4.51	6.99	3.00	5.11	6.93	10.94	14.03	4.06	7.33	9.90	15.61	20.10
	16	2.01	3.22	4.42	6.90	2.85	4.97	6.80	10.81	13.92	3.88	7.15	9.75	15.46	19.95
	24	1.76	3.02	4.22	6.72	2.56	4.70	6.53	10.55	13.69	3.54	6.81	9.43	15.16	19.65
12	12	1.96	3.18	4.37	6.86	2.79	4.91	6.73	10.74	13.85	3.80	7.06	9.66	15.37	19.85
	16	1.78	3.03	4.23	6.72	2.57	4.71	6.53	10.55	13.68	3.55	6.81	9.42	15.14	19.62
	24	1.43	2.74	3.95	6.45	2.15	4.31	6.14	10.16	13.33	3.05	6.30	8.95	14.68	19.16
14	12	1.75	3.00	4.20	6.69	2.53	4.65	6.48	10.48	13.62	3.45	6.63	9.27	15.04	19.52
	16	1.51	2.80	4.00	6.50	2.24	4.38	6.20	10.20	13.37	3.11	6.28	8.94	14.71	19.18
	24	1.04	2.40	3.61	6.12	1.68	3.84	5.66	9.65	12.88	2.46	5.59	8.29	14.05	18.52
16	12	1.51	2.79	3.99	6.48	2.23	4.35	6.16	10.14	13.31	3.02	6.00	8.55	14.22	18.82
	16	1.20	2.53	3.73	6.22	1.86	3.98	5.80	9.77	12.96	2.59	5.55	8.12	13.78	18.35
	24	0.61	2.02	3.22	5.73	1.15	3.29	5.09	9.03	12.29	1.79	4.71	7.30	12.92	17.45

If no note, deflection meets L/720

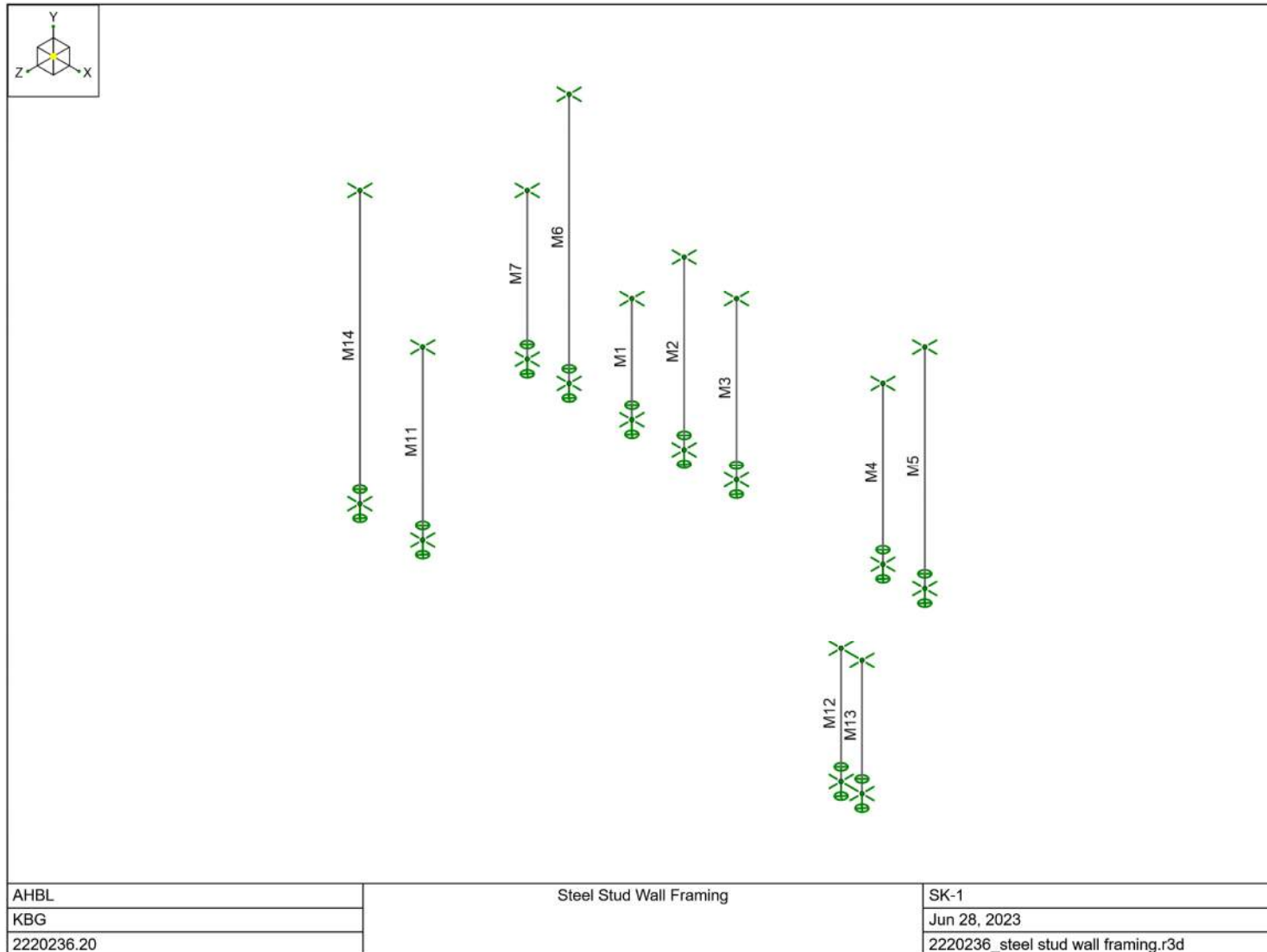
¹Deflection meets L/120

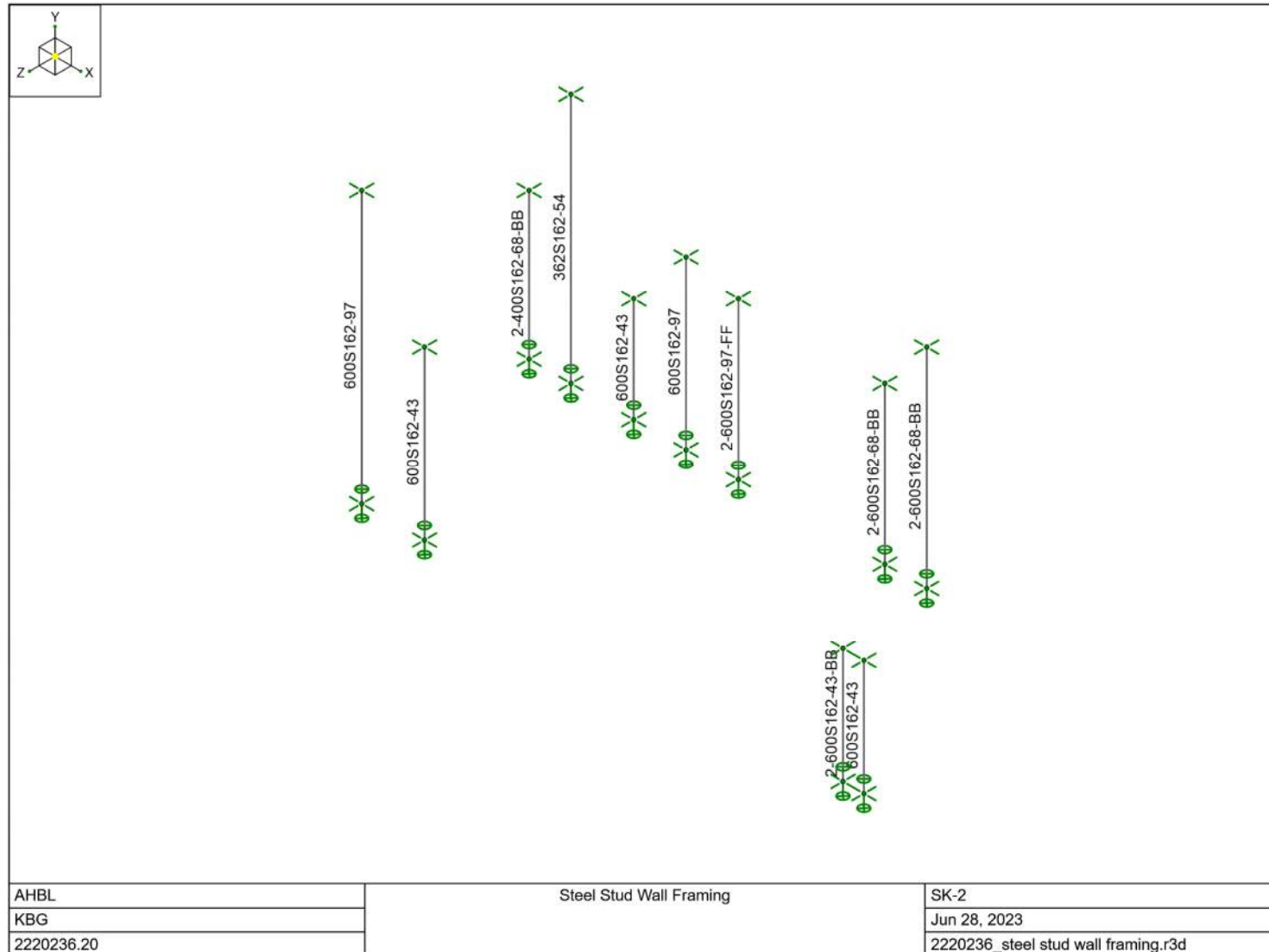
²Deflection meets L/240

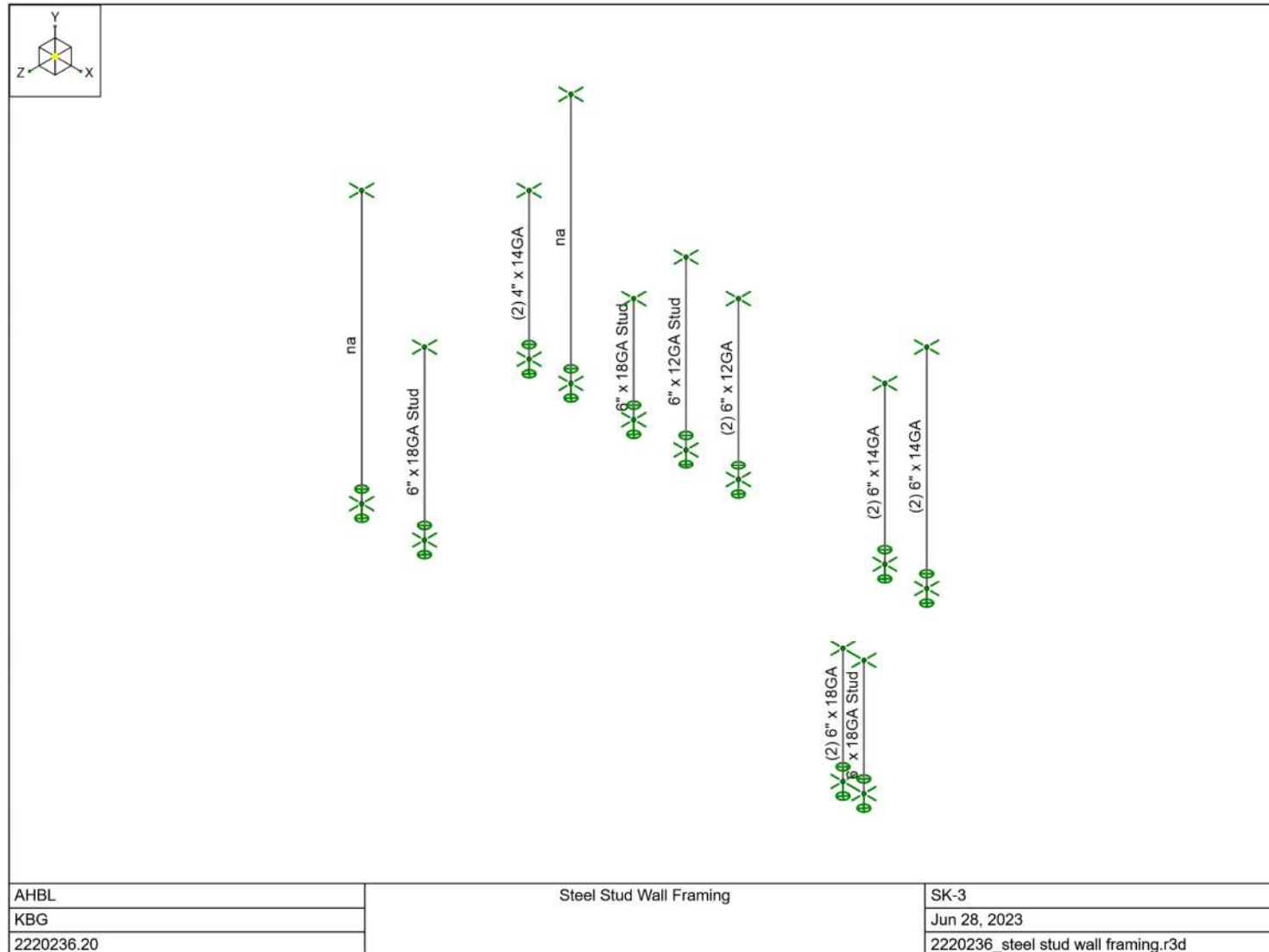
³Deflection meets L/360

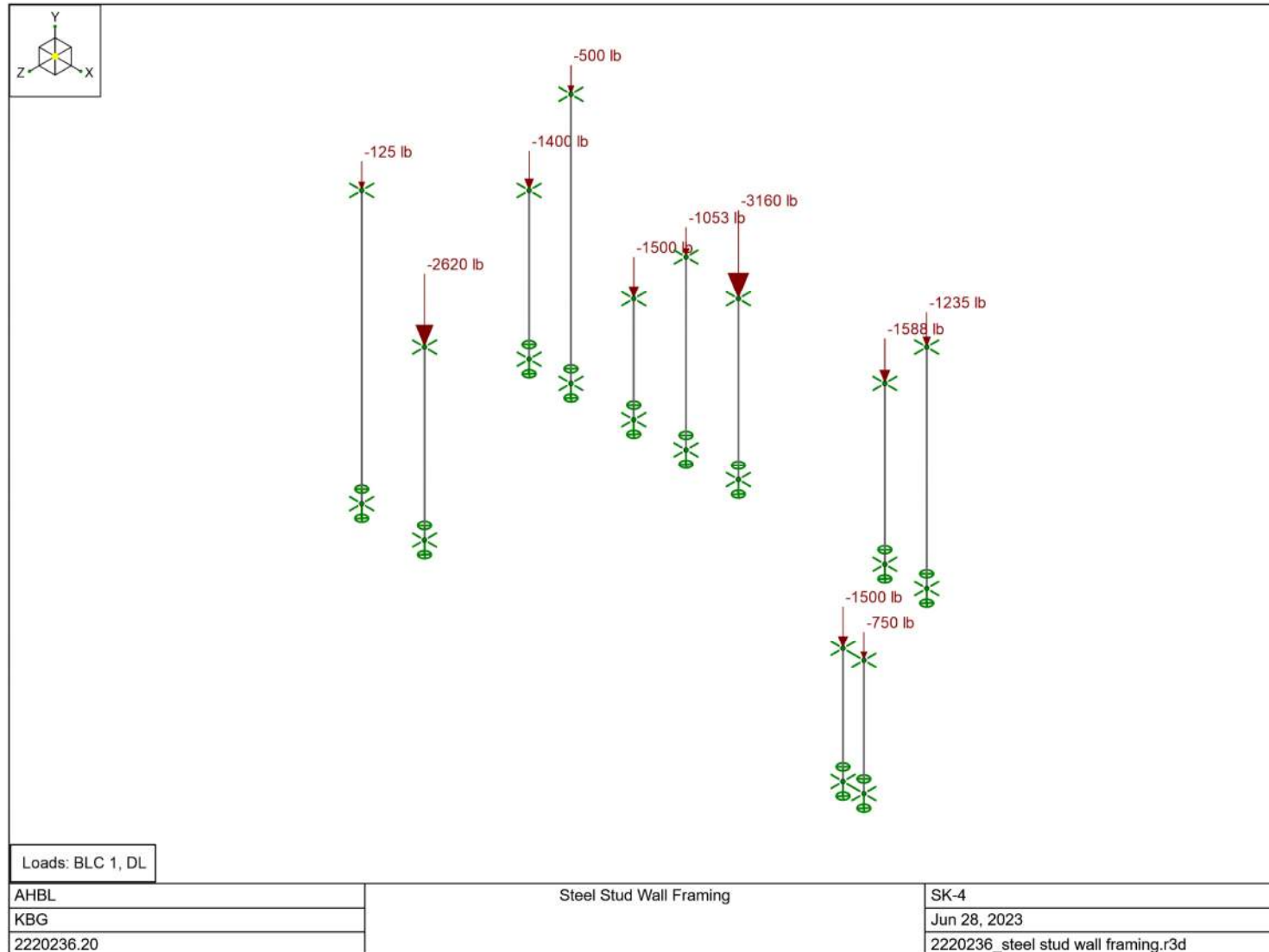
⁴Deflection meets L/600

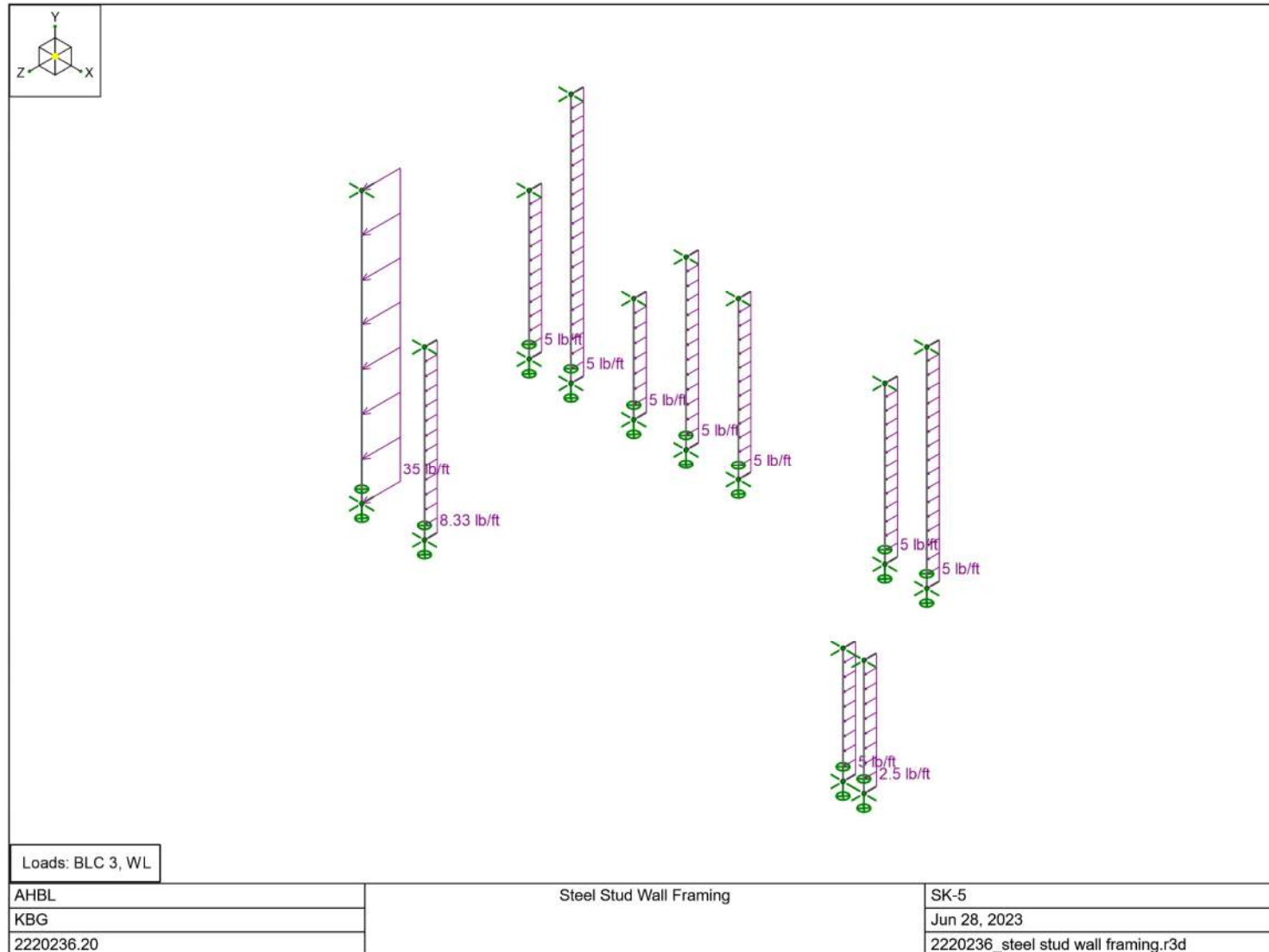
See Table Notes on page 31.

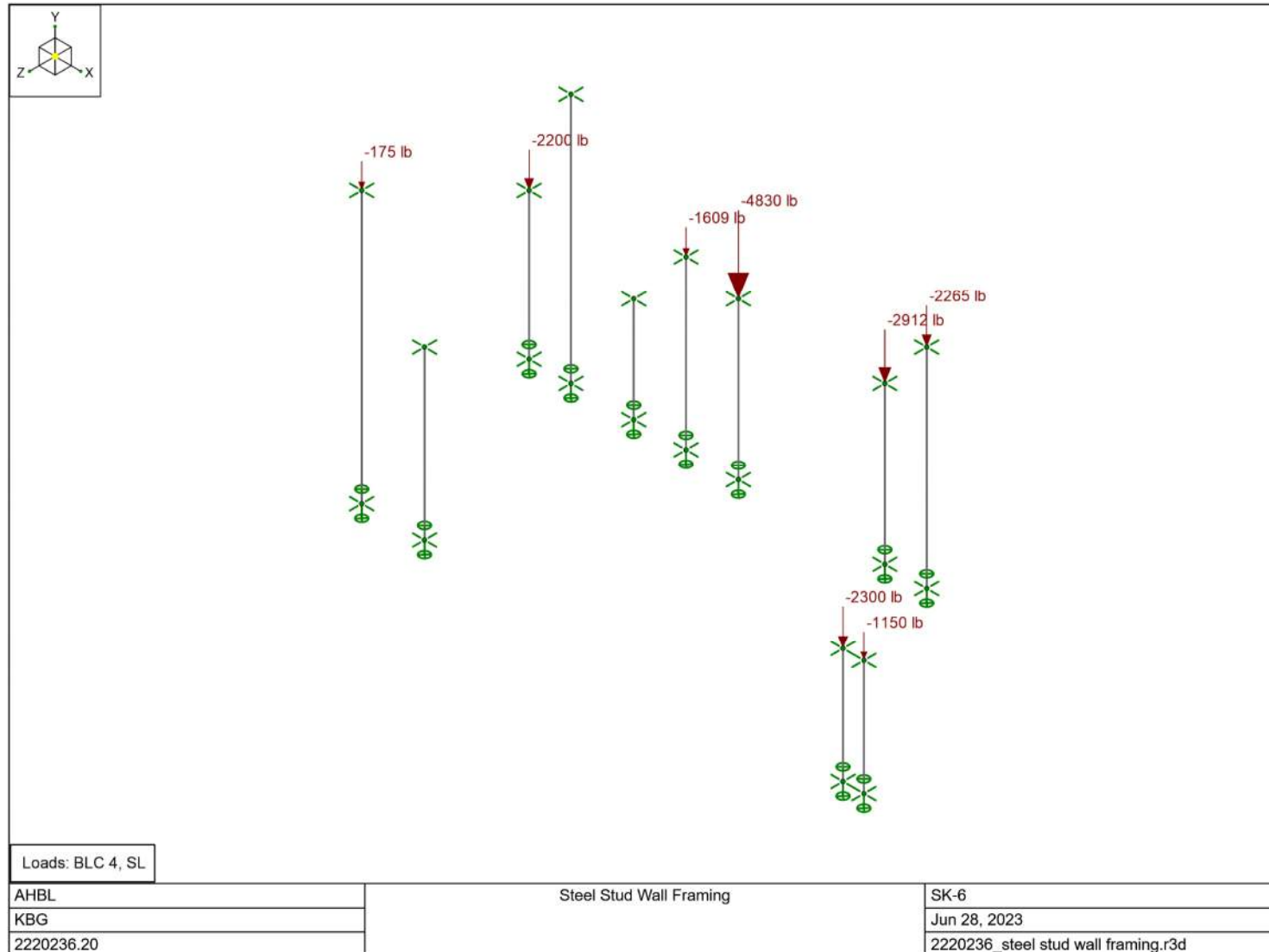


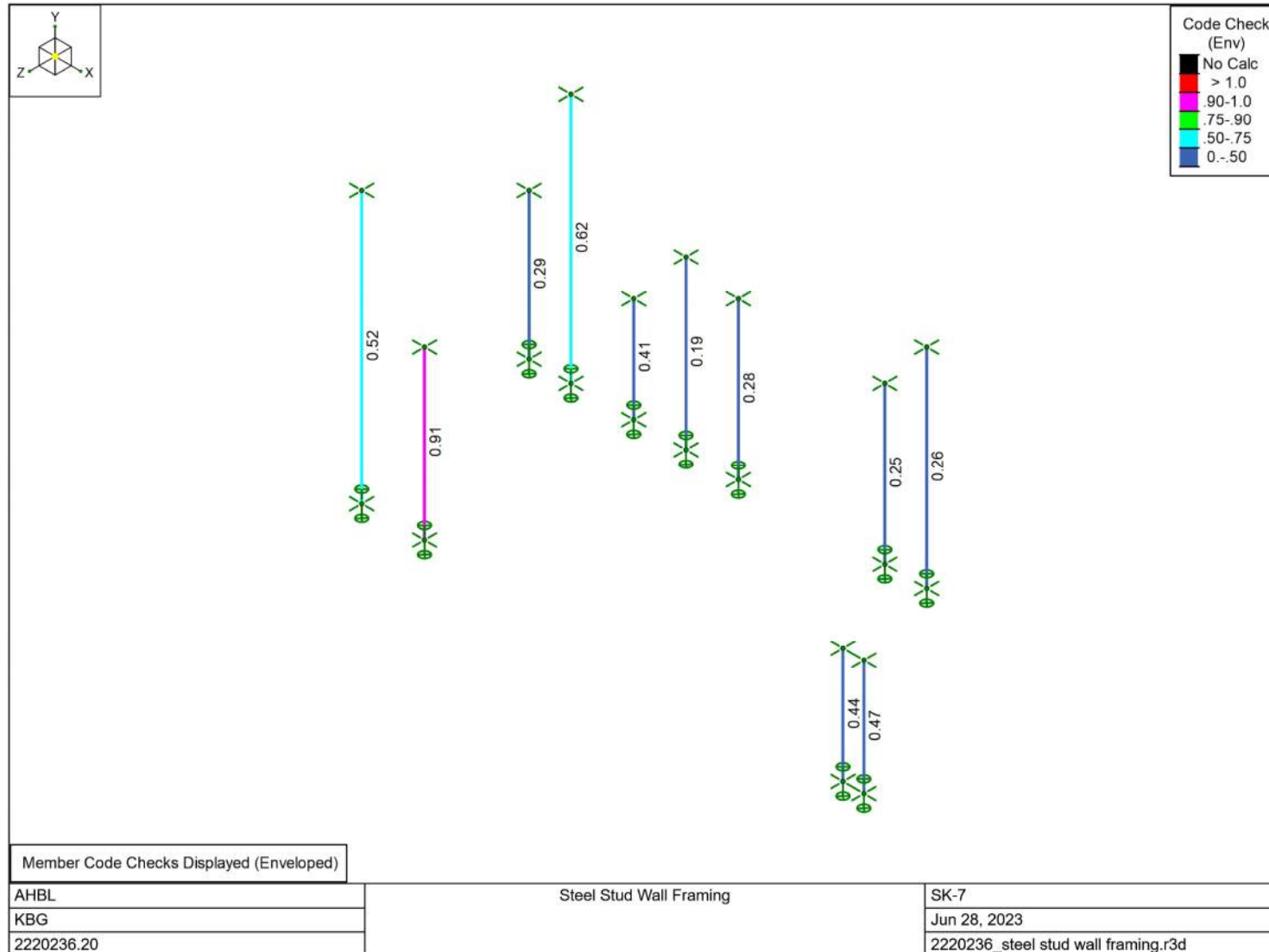












Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	-4	0	0	
2	N2	-4	10	0	
3	N3	1	0	0	
4	N4	1	16	0	
5	N5	6	0	0	
6	N6	6	15	0	
7	N7	20	0	0	
8	N8	20	15	0	
9	N9	24	0	0	
10	N10	24	20	0	
11	N11	-10	0	0	
12	N12	-10	24	0	
13	N13	-14	0	0	
14	N14	-14	14	0	
15	N20	-4	0	20	
16	N21	-4	16	20	
17	N22	36	0	20	
18	N23	36	11	20	
19	N24	38	0	20	
20	N25	38	11	20	
21	N26	-10	0	20	
22	N27	-10	26	20	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	Y Rot [k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction
2	N2	Reaction		Reaction	
3	N3	Reaction	Reaction	Reaction	Reaction
4	N4	Reaction		Reaction	
5	N5	Reaction	Reaction	Reaction	Reaction
6	N6	Reaction		Reaction	
7	N7	Reaction	Reaction	Reaction	Reaction
8	N8	Reaction		Reaction	
9	N9	Reaction	Reaction	Reaction	Reaction
10	N10	Reaction		Reaction	
11	N11	Reaction	Reaction	Reaction	Reaction
12	N12	Reaction		Reaction	

Node Boundary Conditions (Continued)

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	Y Rot [k-ft/rad]
13	N13	Reaction	Reaction	Reaction	Reaction
14	N14	Reaction		Reaction	
15	N20	Reaction	Reaction	Reaction	Reaction
16	N21	Reaction		Reaction	
17	N22	Reaction	Reaction	Reaction	Reaction
18	N23	Reaction		Reaction	
19	N24	Reaction	Reaction	Reaction	Reaction
20	N25	Reaction		Reaction	
21	N26	Reaction	Reaction	Reaction	Reaction
22	N27	Reaction		Reaction	

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-6}/^{\circ}\text{F}$]	Density [k/ft ³]	Yield [ksi]	Fu [ksi]
1	A570 33	29500	11346	0.3	0.65	0.49	33	52
2	A607 C1 55	29500	11346	0.3	0.65	0.49	55	70
3	CFS 33	29500	11346	0.3	0.65	0.49	33	45
4	CFS 50	29500	11346	0.3	0.65	0.49	50	65

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	I _{yy} [in ⁴]	I _{zz} [in ⁴]	J [in ⁴]
1	6" x 18GA Stud	600S162-43	Column	CS	CFS 33	Typical	0.447	0.148	2.32	0.000303
2	6" x 12GA Stud	600S162-97	Column	CS	CFS 50	Typical	0.966	0.283	4.8	0.003
3	(2) 6" x 12GA	2-600S162-97-FF	Column	CS	CFS 50	Typical	1.932	3.412	9.6	7.753
4	(2) 6" x 14GA	2-600S162-68-BB	Column	CS B-to-B	CFS 50	Typical	1.386	0.672	7.04	0.002
5	4" x 16GA Stud	400S162-54	Column	CS	CFS 50	Typical	0.443	0.159	1.1	0.000473
6	(2) 4" x 14GA	2-400S162-68-BB	Column	CS B-to-B	CFS 50	Typical	1.1	0.671	2.7	0.002
7	(2) 6" x 18GA	2-600S162-43-BB	Column	CS B-to-B	CFS 33	Typical	0.894	0.449	4.64	0.000606

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N2	90	6" x 18GA Stud	Column	CS	CFS 33	Typical
2	M2	N3	N4	90	6" x 12GA Stud	Column	CS	CFS 50	Typical
3	M3	N5	N6	90	(2) 6" x 12GA	Column	CS	CFS 50	Typical
4	M4	N7	N8	90	(2) 6" x 14GA	Column	CS B-to-B	CFS 50	Typical
5	M5	N9	N10	90	(2) 6" x 14GA	Column	CS B-to-B	CFS 50	Typical



Company : AHBL
 Designer : KBG
 Job Number : 2220236.20
 Model Name : Steel Stud Wall Framing

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Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
6	M6	N11	N12	90	362S162-54	Column	CS	CFS 50	Typical
7	M7	N13	N14	90	(2) 4" x 14GA	Column	CS B-to-B	CFS 50	Typical
8	M11	N20	N21	90	6" x 18GA Stud	Column	CS	CFS 33	Typical
9	M12	N22	N23	90	(2) 6" x 18GA	Column	CS B-to-B	CFS 33	Typical
10	M13	N24	N25	90	6" x 18GA Stud	Column	CS	CFS 33	Typical
11	M14	N26	N27	90	600S162-97	Column	CS	CFS 50	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	M11	Yes	** NA **	None
9	M12	Yes	** NA **	None
10	M13	Yes	** NA **	None
11	M14	Yes	** NA **	None

Cold Formed Steel Design Parameters

	Label	Shape	Length [ft]	Lb y-y [ft]	Lcomp top [ft]	Lcomp bot [ft]	L-Torque [ft]	K z-z	a [ft]	y sway	z sway
1	M1	6" x 18GA Stud	10	4	Lbyy	Lbyy	4				
2	M2	6" x 12GA Stud	16	4	Lbyy	Lbyy	4	0.5			
3	M3	(2) 6" x 12GA	15	4	Lbyy	Lbyy	4		1		
4	M4	(2) 6" x 14GA	15	4	Lbyy	Lbyy	4		1		
5	M5	(2) 6" x 14GA	20	4	Lbyy	Lbyy	4		1		
6	M6	362S162-54	24	4	Lbyy	Lbyy	4				
7	M7	(2) 4" x 14GA	14	4	Lbyy	Lbyy	4		1		
8	M11	6" x 18GA Stud	16	4	Lbyy	Lbyy	4				
9	M12	(2) 6" x 18GA	11	4	Lbyy	Lbyy	4		1		
10	M13	6" x 18GA Stud	11	4	Lbyy	Lbyy	4		1		
11	M14	600S162-97	26	4	Lbyy	Lbyy	4				

Node Loads and Enforced Displacements (BLC 1 : DL)

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-in), (in, rad), (lb*s ² /ft, lb*s ² *ft)]
1	N2	L	Y	-1500
2	N4	L	Y	-1053
3	N6	L	Y	-3160
4	N1	L	Y	0
5	N8	L	Y	-1588
6	N10	L	Y	-1235
7	N12	L	Y	-500
8	N14	L	Y	-1400
9	N21	L	Y	-2620
10	N23	L	Y	-1500
11	N25	L	Y	-750
12	N27	L	Y	-125

Node Loads and Enforced Displacements (BLC 4 : SL)

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-in), (in, rad), (lb*s ² /ft, lb*s ² *ft)]
1	N4	L	Y	-1609
2	N6	L	Y	-4830
3	N8	L	Y	-2912
4	N10	L	Y	-2265
5	N14	L	Y	-2200
6	N23	L	Y	-2300
7	N25	L	Y	-1150
8	N27	L	Y	-175

Member Distributed Loads (BLC 3 : WL)

	Member Label	Direction	Start Magnitude [lb/ft, F, ksf, lb-in/ft]	End Magnitude [lb/ft, F, ksf, lb-in/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M1	Z	5	5	0	%100
2	M11	Z	8.33	8.33	0	%100
3	M5	Z	5	5	0	%100
4	M4	Z	5	5	0	%100
5	M3	Z	5	5	0	%100
6	M2	Z	5	5	0	%100
7	M6	Z	5	5	0	%100
8	M7	Z	5	5	0	%100
9	M12	Z	5	5	0	%100
10	M13	Z	2.5	2.5	0	%100

Member Distributed Loads (BLC 3 : WL) (Continued)

	Member Label	Direction	Start Magnitude [lb/ft, F, ksf, lb-in/ft]	End Magnitude [lb/ft, F, ksf, lb-in/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
11	M14	Z	35	35	0	%100

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed
1	DL	DL	-1	12	
2	LL	LL			
3	WL	WL			11
4	SL	SL		8	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor
1	DL	Yes	Y	DL	1		
2	DL + LL	Yes	Y	DL	1	LL	1
3	DL + 0.6*WL	Yes	Y	DL	1	WL	0.6
4	DL + SL	Yes	Y	DL	1	SL	1
5	0.42*WL	Yes	Y	DL	1	WL	0.42

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N1	max	0	5	1515.21	5	0	4	0	5	0	5	0	5
2		min	0	1	1515.21	1	-15	3	0	1	0	1	0	1
3	N2	max	0	5	0	5	0	4	0	5	0	5	0	5
4		min	0	1	0	1	-15	3	0	1	0	1	0	1
5	N3	max	0	5	2714.593	4	0	4	0	5	0	5	0	5
6		min	0	1	1105.593	1	-24	3	0	1	0	1	0	1
7	N4	max	0	5	0	5	0	4	0	5	0	5	0	5
8		min	0	1	0	1	-24	3	0	1	0	1	0	1
9	N5	max	0	5	8088.613	4	0	4	0	5	0	5	0	5
10		min	0	1	3258.612	1	-22.5	3	0	1	0	1	0	1
11	N6	max	0	5	0	5	0	4	0	5	0	5	0	5
12		min	0	1	0	1	-22.5	3	0	1	0	1	0	1
13	N7	max	0	5	4570.744	4	0	4	0	5	0	5	0	5
14		min	0	1	1658.744	1	-22.5	3	0	1	0	1	0	1
15	N8	max	0	5	0	5	0	4	0	5	0	5	0	5
16		min	0	1	0	1	-22.5	3	0	1	0	1	0	1

Envelope Node Reactions (Continued)

Node Label			X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
17	N9	max	0	5	3594.325	4	0	4	0	5	0	5	0	5
18		min	0	1	1329.325	1	-30	3	0	1	0	1	0	1
19	N10	max	0	5	0	5	0	4	0	5	0	5	0	5
20		min	0	1	0	1	-30	3	0	1	0	1	0	1
21	N11	max	0	5	534.463	5	0	4	0	5	0	5	0	5
22		min	0	1	534.463	1	-36	3	0	1	0	1	0	1
23	N12	max	0	5	0	5	0	4	0	5	0	5	0	5
24		min	0	1	0	1	-36	3	0	1	0	1	0	1
25	N13	max	0	5	3652.403	4	0	4	0	5	0	5	0	5
26		min	0	1	1452.403	1	-21	3	0	1	0	1	0	1
27	N14	max	0	5	0	5	0	4	0	5	0	5	0	5
28		min	0	1	0	1	-21	3	0	1	0	1	0	1
29	N20	max	0	5	2644.337	5	0	4	0	5	0	5	0	5
30		min	0	1	2644.337	1	-39.984	3	0	1	0	1	0	1
31	N21	max	0	5	0	5	0	4	0	5	0	5	0	5
32		min	0	1	0	1	-39.984	3	0	1	0	1	0	1
33	N22	max	0	5	3833.463	4	0	4	0	5	0	5	0	5
34		min	0	1	1533.463	1	-16.5	3	0	1	0	1	0	1
35	N23	max	0	5	0	5	0	4	0	5	0	5	0	5
36		min	0	1	0	1	-16.5	3	0	1	0	1	0	1
37	N24	max	0	5	1916.731	4	0	4	0	5	0	5	0	5
38		min	0	1	766.731	1	-8.25	3	0	1	0	1	0	1
39	N25	max	0	5	0	5	0	4	0	5	0	5	0	5
40		min	0	1	0	1	-8.25	3	0	1	0	1	0	1
41	N26	max	0	5	385.464	4	0	4	0	5	0	5	0	5
42		min	0	1	210.464	1	-273	3	0	1	0	1	0	1
43	N27	max	0	5	0	5	0	4	0	5	0	5	0	5
44		min	0	1	0	1	-273	3	0	1	0	1	0	1
45	Totals:	max	0	5	33450.346	4	0	4						
46		min	0	1	16009.346	1	-1017.468	3						

Envelope Member End Reactions

Member	Member End		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[lb-in]	LC	y-y Moment[lb-in]	LC	z-z Moment[lb-in]	LC	
1	M1	I	max	1515.21	5	0	4	0	5	0	5	0	5	0	5
2			min	1515.21	1	-15	3	0	1	0	1	0	1	0	1
3		J	max	1500	5	15	3	0	5	0	5	0	5	0	5
4			min	1500	1	0	1	0	1	0	1	0	1	0	1
5	M2	I	max	2714.593	4	0	4	0	5	0	5	0	5	0	5

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[lb-in]	LC	y-y Moment[lb-in]	LC	z-z Moment[lb-in]	LC
6			min	1105.593	1	-24	3	0	1	0	1	0	1	0	1
7		J	max	2662	4	24	3	0	5	0	5	0	5	0	5
8			min	1053	1	0	1	0	1	0	1	0	1	0	1
9	M3	I	max	8088.613	4	0	4	0	5	0	5	0	5	0	5
10			min	3258.612	1	-22.5	3	0	1	0	1	0	1	0	1
11		J	max	7990	4	22.5	3	0	5	0	5	0	5	0	5
12			min	3160	1	0	1	0	1	0	1	0	1	0	1
13	M4	I	max	4570.744	4	0	4	0	5	0	5	0	5	0	5
14			min	1658.744	1	-22.5	3	0	1	0	1	0	1	0	1
15		J	max	4500	4	22.5	3	0	5	0	5	0	5	0	5
16			min	1588	1	0	1	0	1	0	1	0	1	0	1
17	M5	I	max	3594.325	4	0	4	0	5	0	5	0	5	0	5
18			min	1329.325	1	-30	3	0	1	0	1	0	1	0	1
19		J	max	3500	4	30	3	0	5	0	5	0	5	0	5
20			min	1235	1	0	1	0	1	0	1	0	1	0	1
21	M6	I	max	534.463	5	0	4	0	5	0	5	0	5	0	5
22			min	534.463	1	-36	3	0	1	0	1	0	1	0	1
23		J	max	500	5	36	3	0	5	0	5	0	5	0	5
24			min	500	1	0	1	0	1	0	1	0	1	0	1
25	M7	I	max	3652.403	4	0	4	0	5	0	5	0	5	0	5
26			min	1452.403	1	-21	3	0	1	0	1	0	1	0	1
27		J	max	3600	4	21	3	0	5	0	5	0	5	0	5
28			min	1400	1	0	1	0	1	0	1	0	1	0	1
29	M11	I	max	2644.337	5	0	4	0	5	0	5	0	5	0	5
30			min	2644.337	1	-39.984	3	0	1	0	1	0	1	0	1
31		J	max	2620	5	39.984	3	0	5	0	5	0	5	0	5
32			min	2620	1	0	1	0	1	0	1	0	1	0	1
33	M12	I	max	3833.463	4	0	4	0	5	0	5	0	5	0	5
34			min	1533.463	1	-16.5	3	0	1	0	1	0	1	0	1
35		J	max	3800	4	16.5	3	0	5	0	5	0	5	0	5
36			min	1500	1	0	1	0	1	0	1	0	1	0	1
37	M13	I	max	1916.731	4	0	4	0	5	0	5	0	5	0	5
38			min	766.731	1	-8.25	3	0	1	0	1	0	1	0	1
39		J	max	1900	4	8.25	3	0	5	0	5	0	5	0	5
40			min	750	1	0	1	0	1	0	1	0	1	0	1
41	M14	I	max	385.464	4	0	4	0	5	0	5	0	5	0	5
42			min	210.464	1	-273	3	0	1	0	1	0	1	0	1
43		J	max	300	4	273	3	0	5	0	5	0	5	0	5
44			min	125	1	0	1	0	1	0	1	0	1	0	1



Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : Steel Stud Wall Framing

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Envelope Member End Reactions (Continued)

Member	Member End	Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[lb-in]	LC	y-y Moment[lb-in]	LC	z-z Moment[lb-in]	LC
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Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : Steel Stud Wall Framing

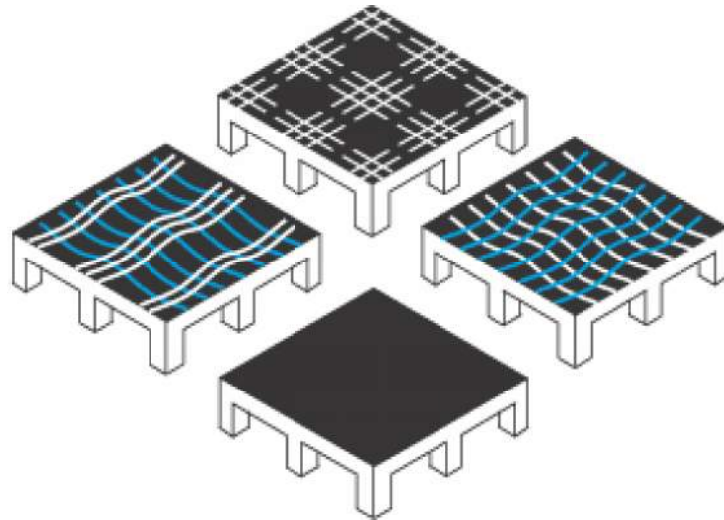
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Envelope AISI S100-12: ASD Member Cold Formed Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	Pn/Om[lb]	Tn/Om[lb]	Mnyy/Om[lb-in]	Mnzz/Om[lb-in]	Cb	Cmyy	Cmzz	Eqn
1	M1	600S162-43	0.413	4.896	3	0.011	10	y	3	4052.998	8832.934	2421.228	11021.04	1	0.6	0.85	C5.2.1-2
2	M2	600S162-97	0.195	0	4	0.002	16	y	3	13937.153	28922.156	6986.404	41959.263	1	0.6	0.6	C5.2.1-1
3	M3	2-600S162-97-FF	0.276	0	4	0.001	15	y	3	29309.588	57844.311	48516.018	95762.567	1	0.6	0.6	C5.2.1-1
4	M4	2-600S162-68-BB	0.248	0	4	0.002	15	y	3	18405.42	41497.006	NC	52238.074	1	0.6	0.6	C5.2.1-1
5	M5	2-600S162-68-BB	0.261	0	4	0.003	20	y	3	13776.491	41497.006	NC	52238.074	1	0.6	0.6	C5.2.1-1
6	M6	362S162-54	0.619	11.5	3	0.011	24	y	3	1370.214	12634.731	3664.8	13111.577	1	0.6	0.85	C5.2.1-1
7	M7	2-400S162-68-BB	0.286	0	4	0.002	14	y	3	12757.038	32934.132	NC	37279.18	1	0.6	0.6	C5.2.1-1
8	M11	600S162-43	0.907	8	3	0.028	16	y	3	3691.149	8832.934	2421.228	11364.344	1	0.6	0.85	C5.2.1-1
9	M12	2-600S162-43-BB	0.441	0	4	0.006	11	y	3	8687.365	17665.868	NC	21425.574	1	0.6	0.6	C5.2.1-1
10	M13	600S162-43	0.474	0	4	0.006	11	y	3	4042.903	8832.934	2421.228	10712.787	1	0.6	0.6	C5.2.1-1
11	M14	600S162-97	0.517	13	3	0.026	26	y	3	6599.636	28922.156	6986.404	43307.674	1	0.6	0.85	C5.2.1-2

5.0 - POST-TENSIONED SLAB DESIGN



WBP2_L1 - Care Center.cpt
6/26/2023

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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 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

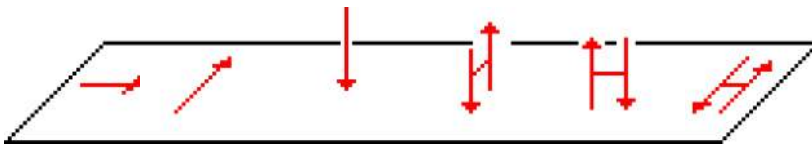
Floor Area: ft²
Tendon Angles (for friction): radians

Density: pcf
Temperature Change: °F

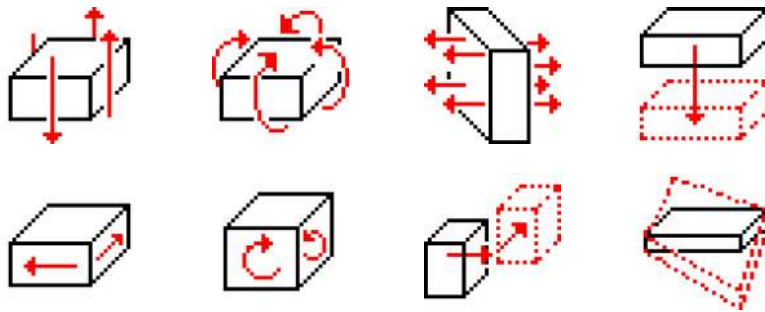
Elongations: inches

Signs

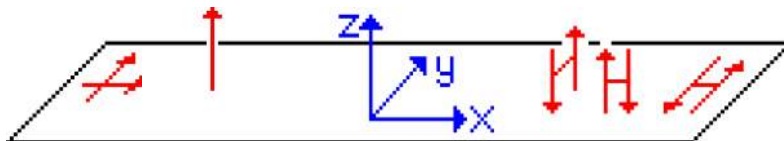
Positive Loads



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)
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	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)
½" Unbonded	unbonded	0.153	28000	175	243	270	0.5	1	6
½" 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)
½" Unbonded	216	0.25	0	0.0014	0.07	22
½" 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

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>
3/8" 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	0.1217	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 Design

318-19 Min. Reinforcement

User Minimum Design

Specified Min. Reinforcement

Initial Service Design

318-19 Initial Service Design

Service Design

318-19 Service Design

Include detailed section analysis

Sustained Service Design

318-19 Sustained Service Design

Strength Design

318-19 Strength Design

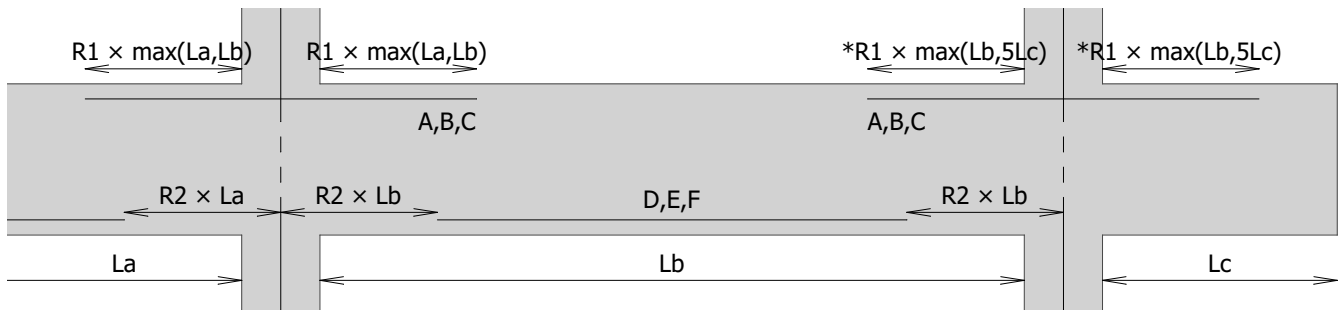
Punching Shear Design

Ductility Design

318-19 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

Group	PT	I.P.	Eff. Force	Number of		Min Force	Max Force	Force Incr.	Min	Max	Strands
Name	System	Ratio	(Kips)	Strands	Optimize	(Kips)	(Kips)	(Kips)	Strands	Strands	Increment

Distributed Tendon Quadrilateral Groups

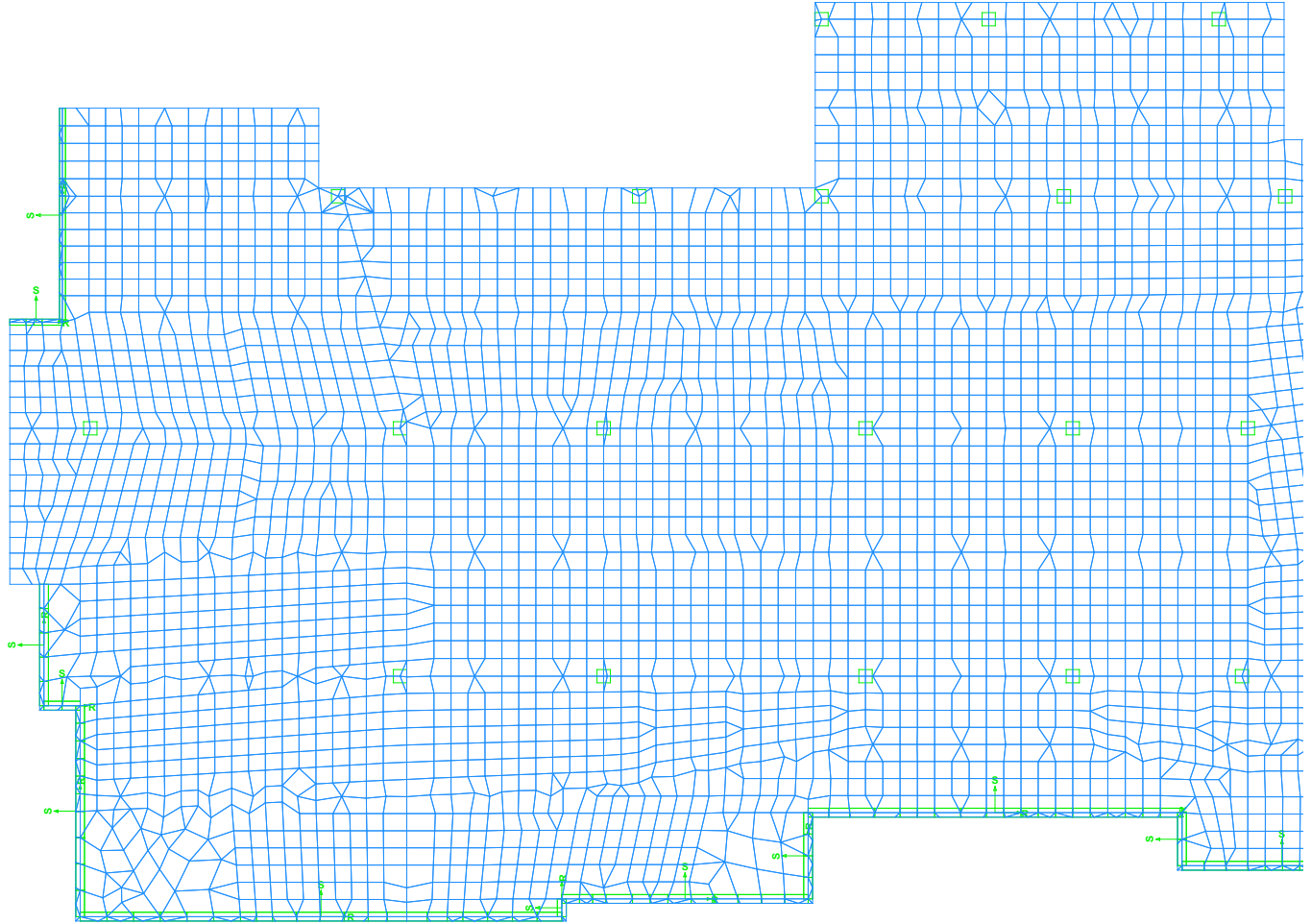
Group	PT	I.P.	Spacing	Eff. Force	# Strands		Min Force	Max Force	Force Incr.	Min Strand	Max Strand	Strands In
Name	System	Ratio	(feet)	(kips/ft)	(1/feet)	Optimize	(kips/ft)	(kips/ft)	(kips/ft)	(1/feet)	(1/feet)	(1/feet)

Profile Polyline Groups

Group	Elevation	Elevation		Min Elevation	Max Elevation	Elevation Incr.
Name	Reference	(inches)	Optimize	(inches)	(inches)	(inches)

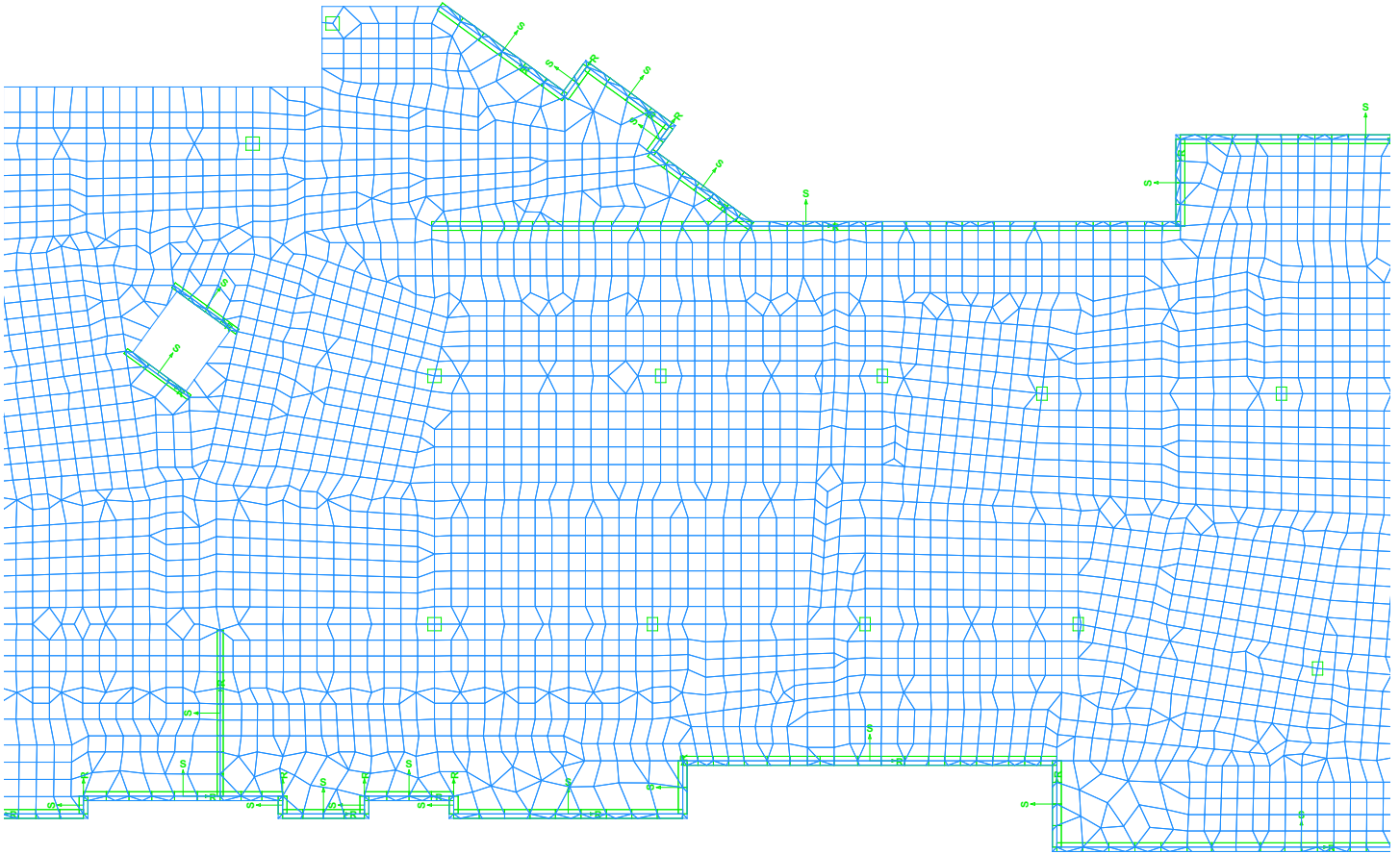
Element: Standard Plan

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 Icon
Scale = 1:250

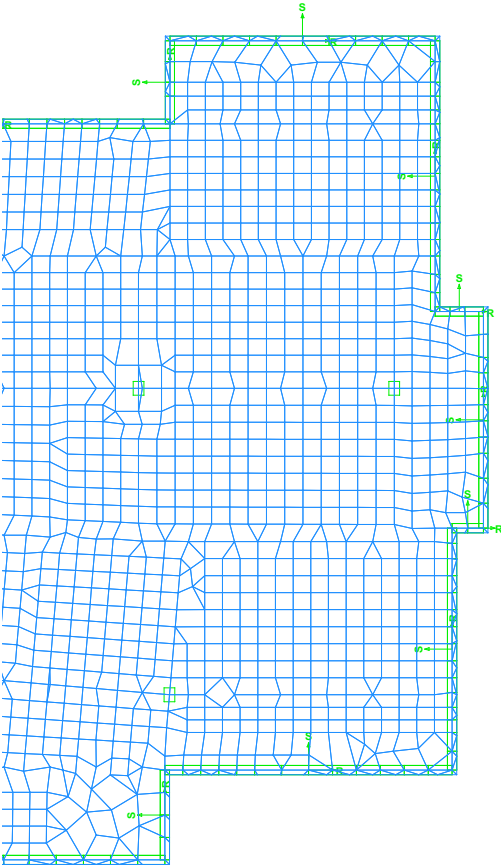


Element: Standard Plan (2)

is; Line Springs; Line Spring Icons; Area Springs; Area Spring Icons; Point Supports; Point Support Icons; Line Supports; Line Support Icons;

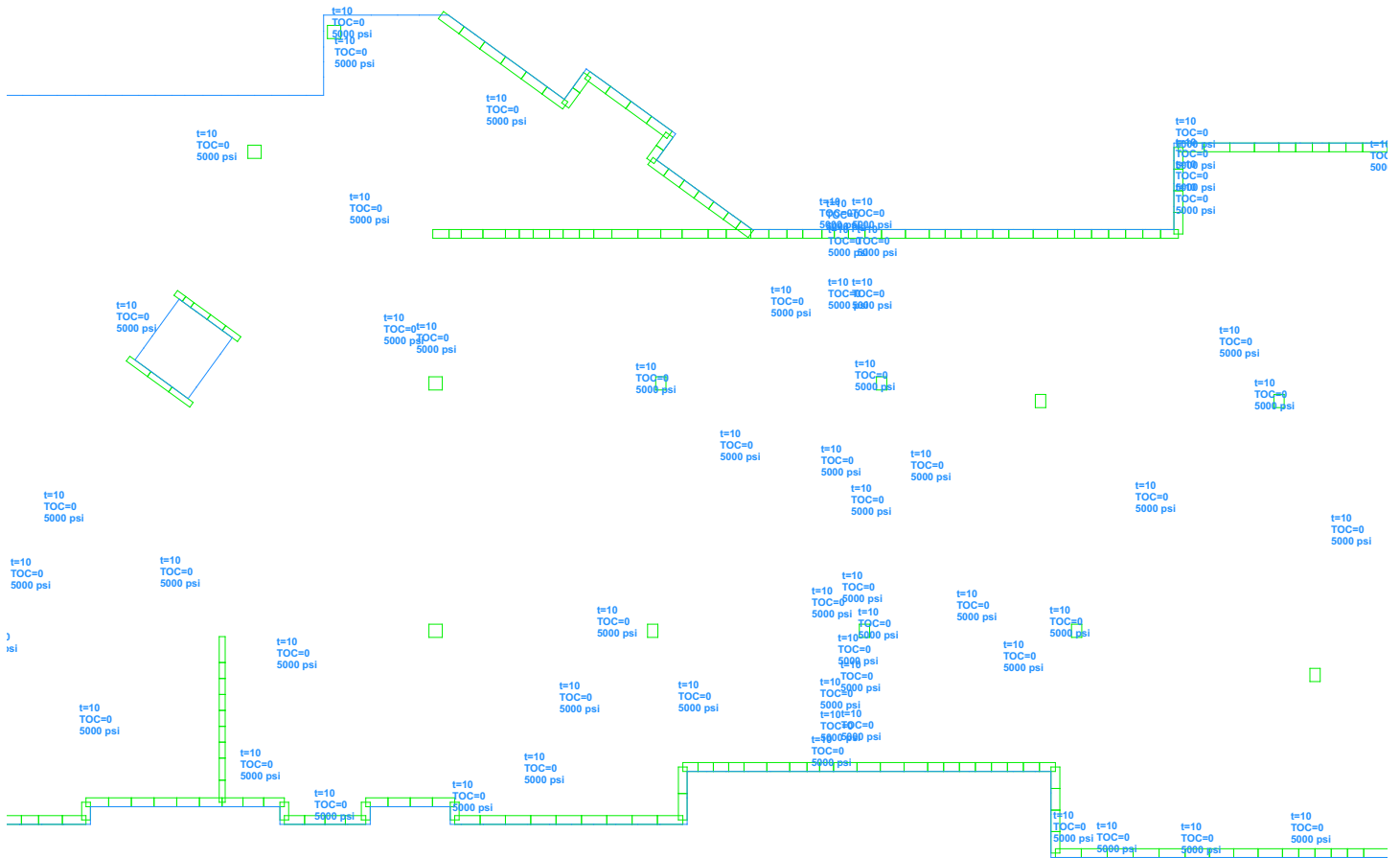


Element: Standard Plan (3)

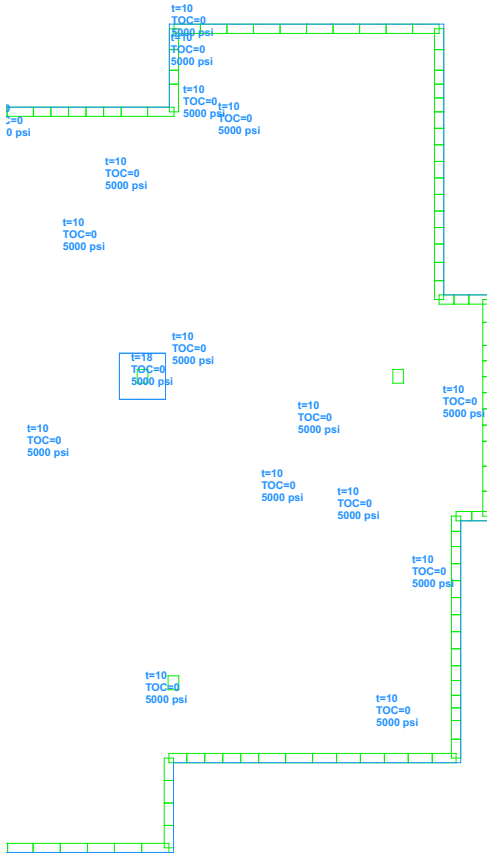


Element: Slab Summary Plan (2)

sses; Slab Element Elevations; Slab Element Concrete Models;

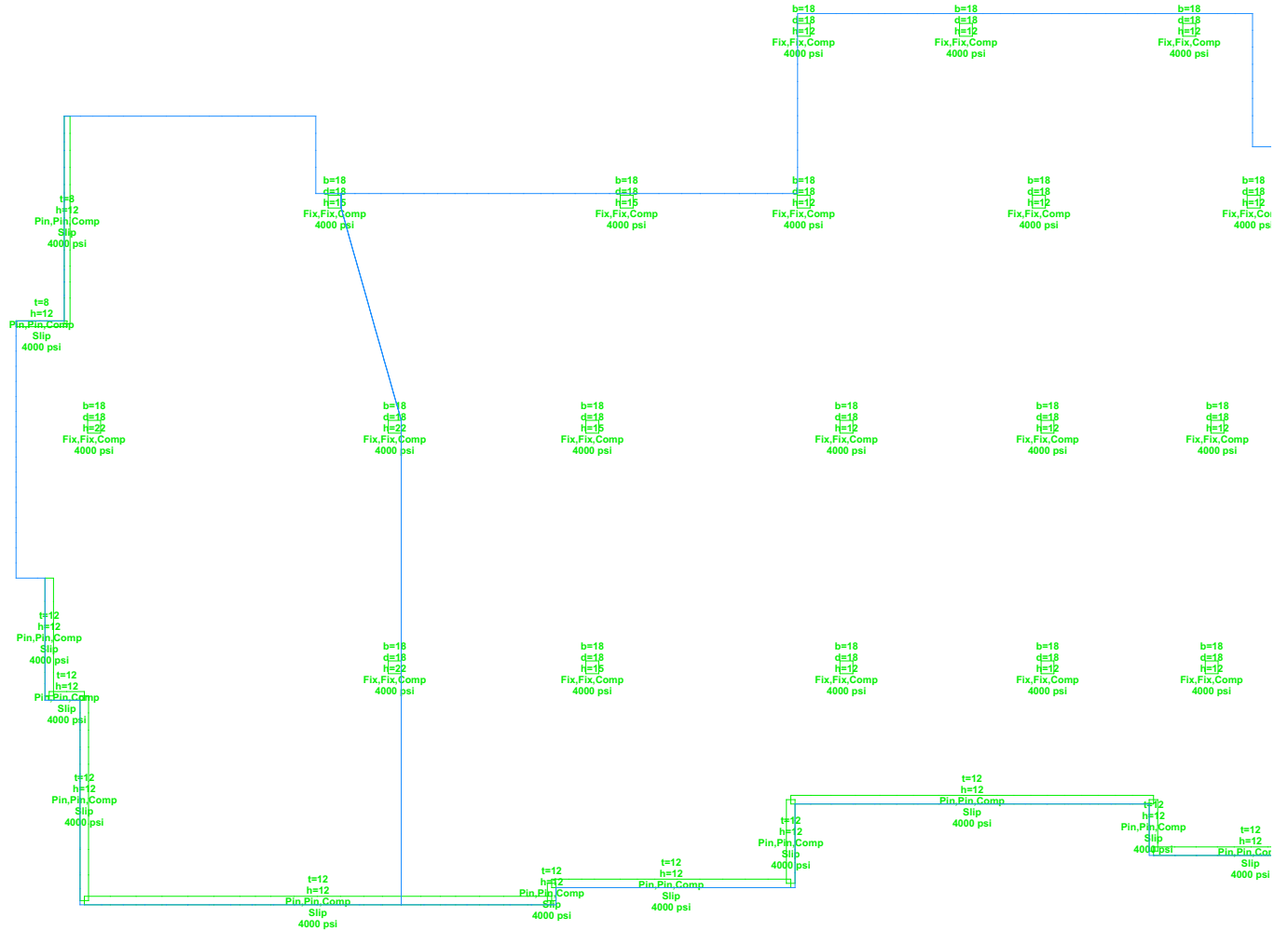


Element: Slab Summary Plan (3)

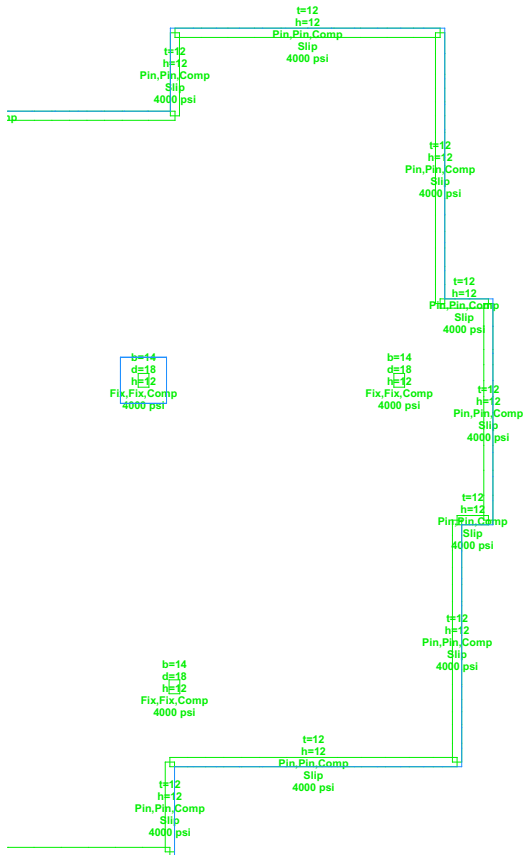


Element: Supports Below Slab Summary Plan

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 Dimens
Scale = 1:250

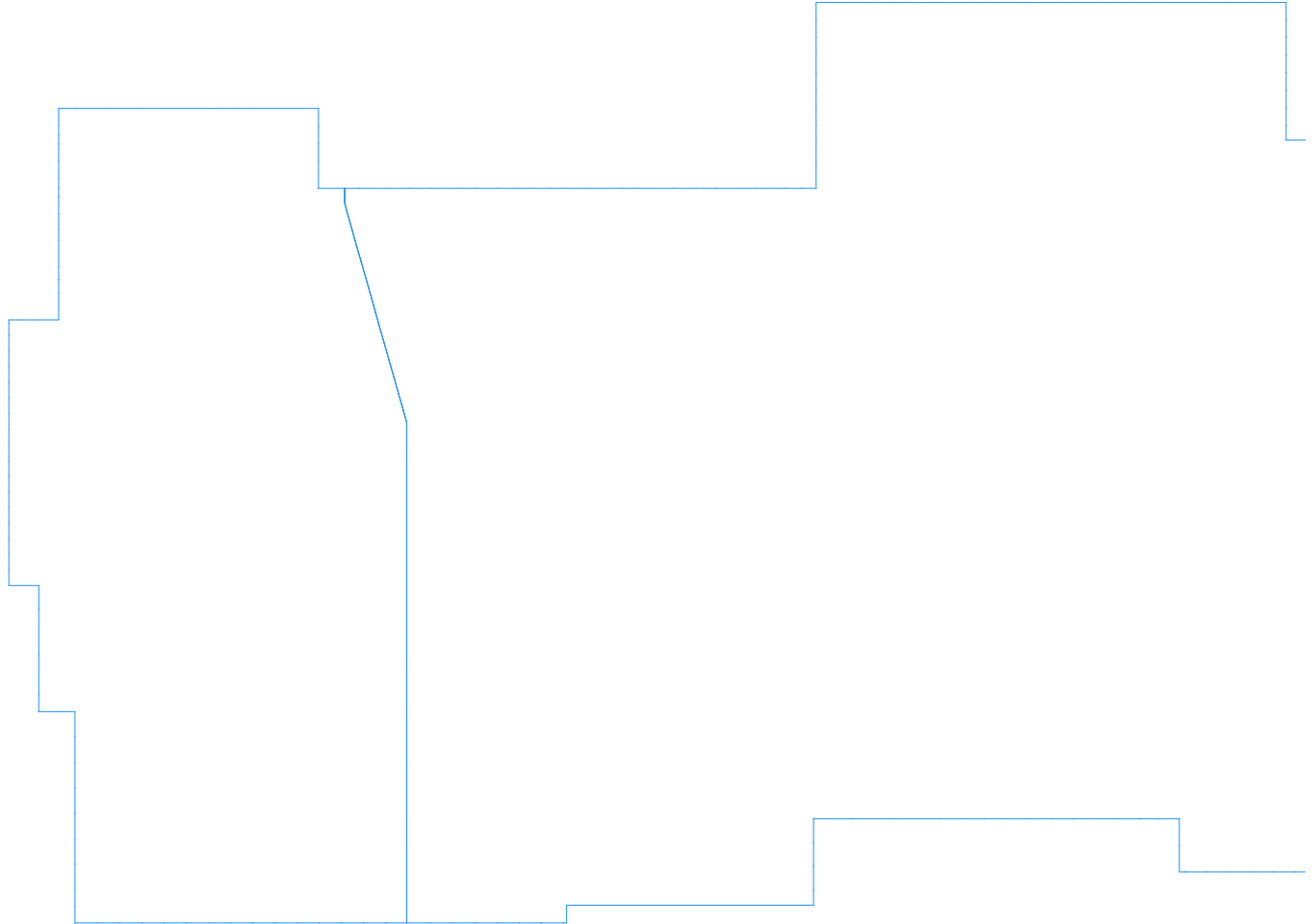


line Only;



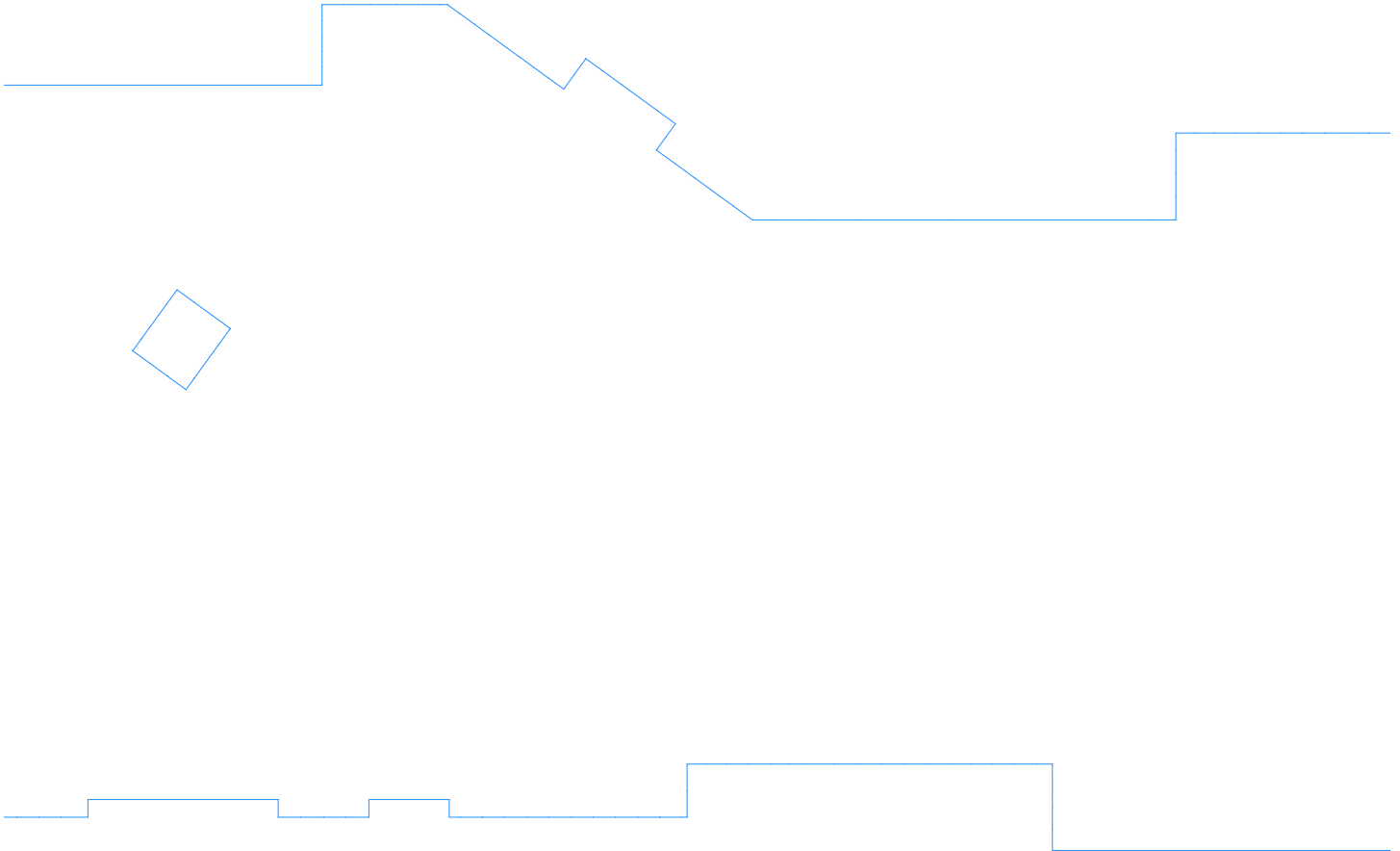
Element: Supports Above Slab Summary Plan

Element: User Lines; User Notes; User Dimensions; Wall Elements Above; Wall Element Thicknesses; Wall Element Heights; Wall Element Fixity; Wall Element Shear Fixity; Wall Element Concrete Models; Wall Element Outline Only; Column Elements Above; Column Element Dimens
Scale = 1:250

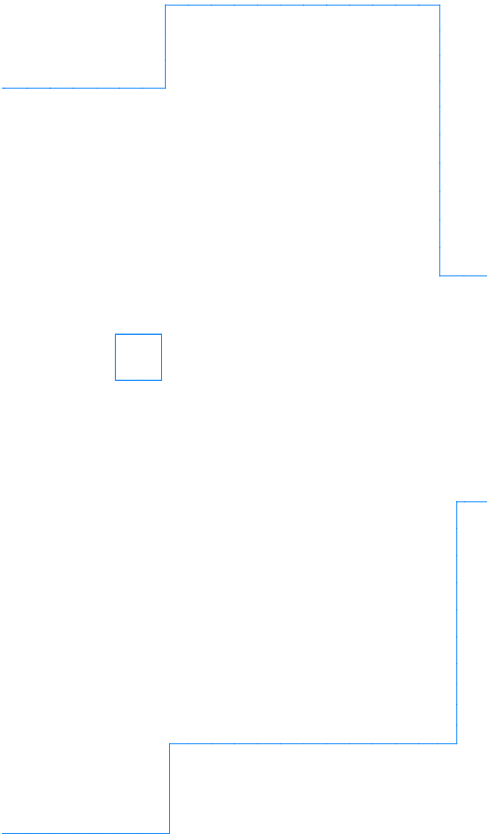


Element: Supports Above Slab Summary Plan (2)

ions; Column Element Heights; Column Element Fixity; Column Element Concrete Models; Slab Elements; Slab Element Outline Only;

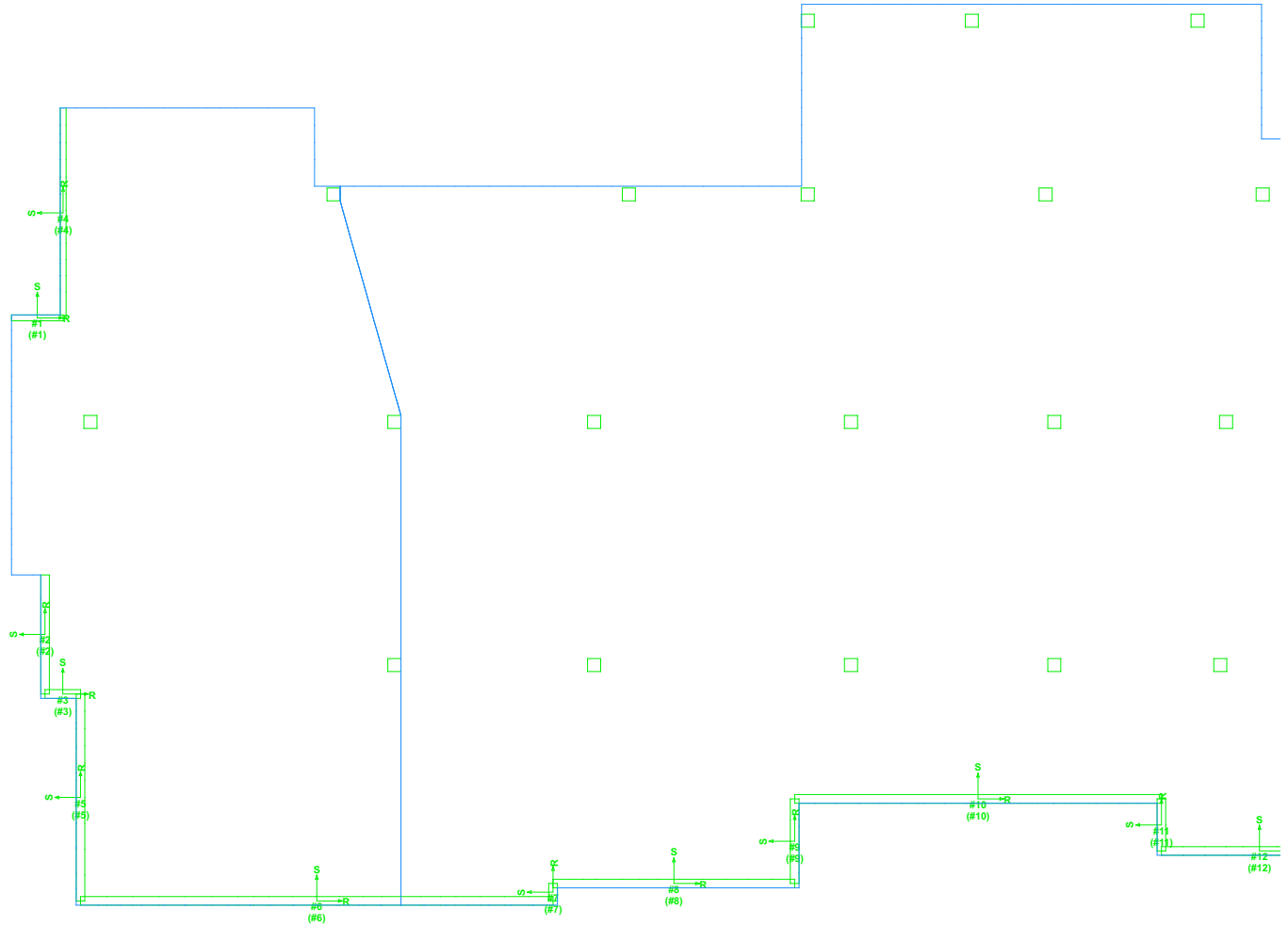


Element: Supports Above Slab Summary Plan (3)

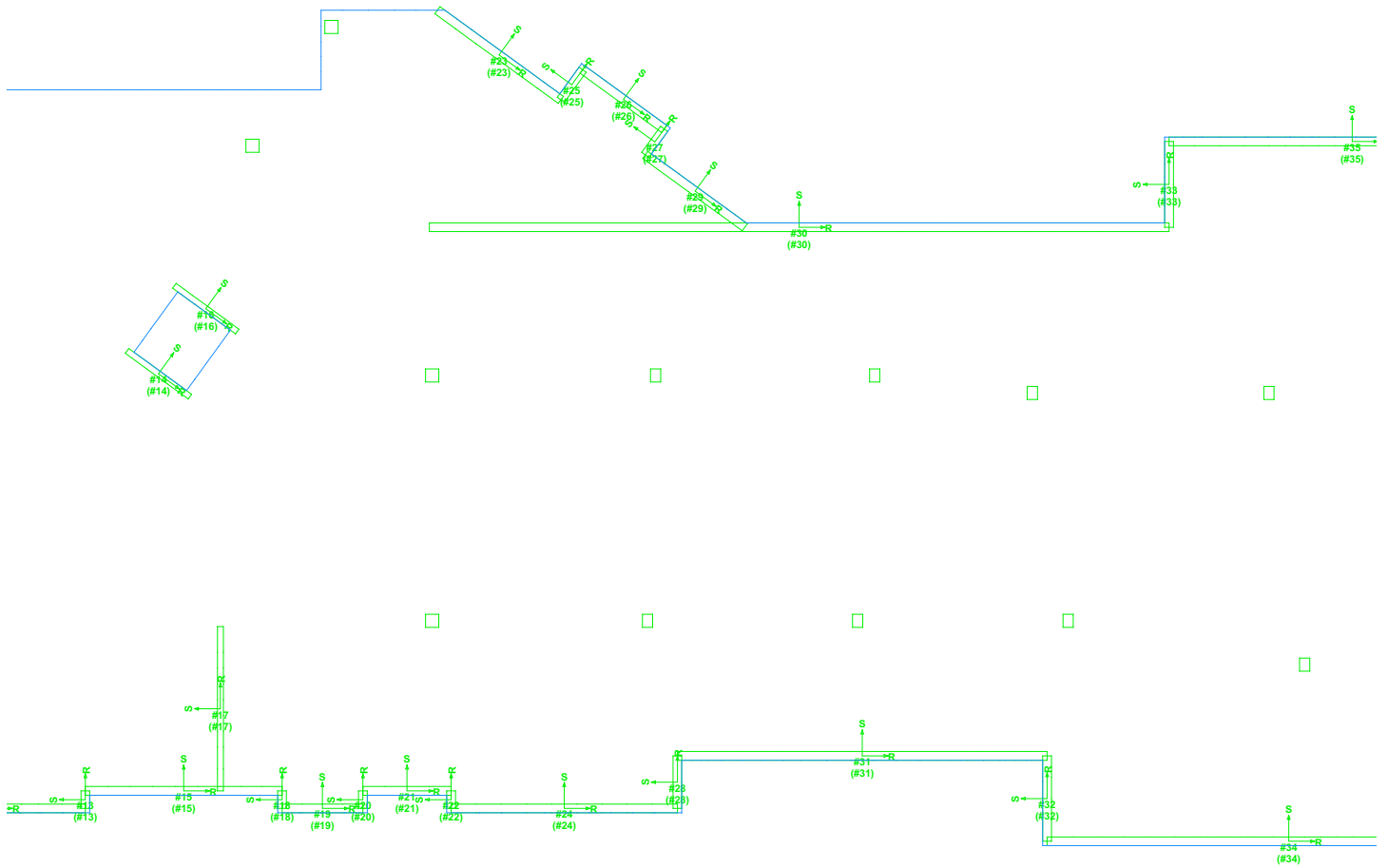


Element: Wall Group Below Slab Summary Plan

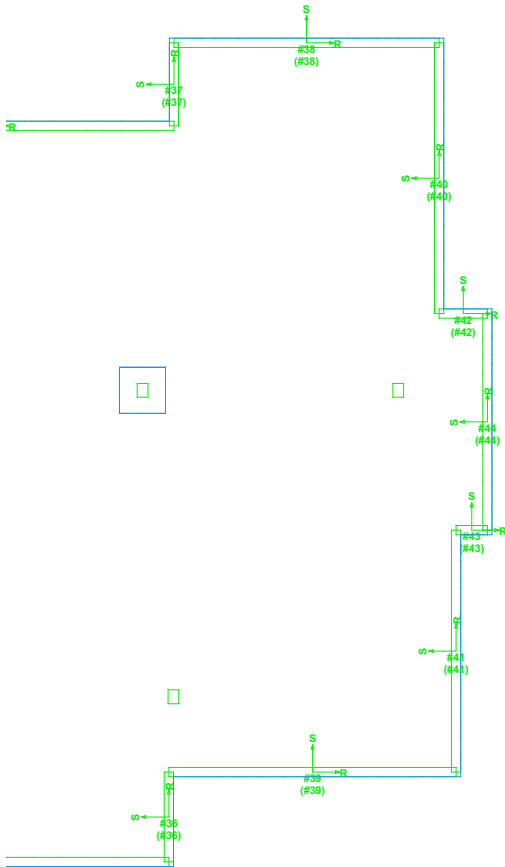
Element: Wall Element Groups Below; Wall Element Group Numbers; Wall Element Group Names; Wall Element Group Axes; Column Elements Below; Slab Elements; Slab Element Outline Only;
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Element: Wall Group Below Slab Summary Plan (2)

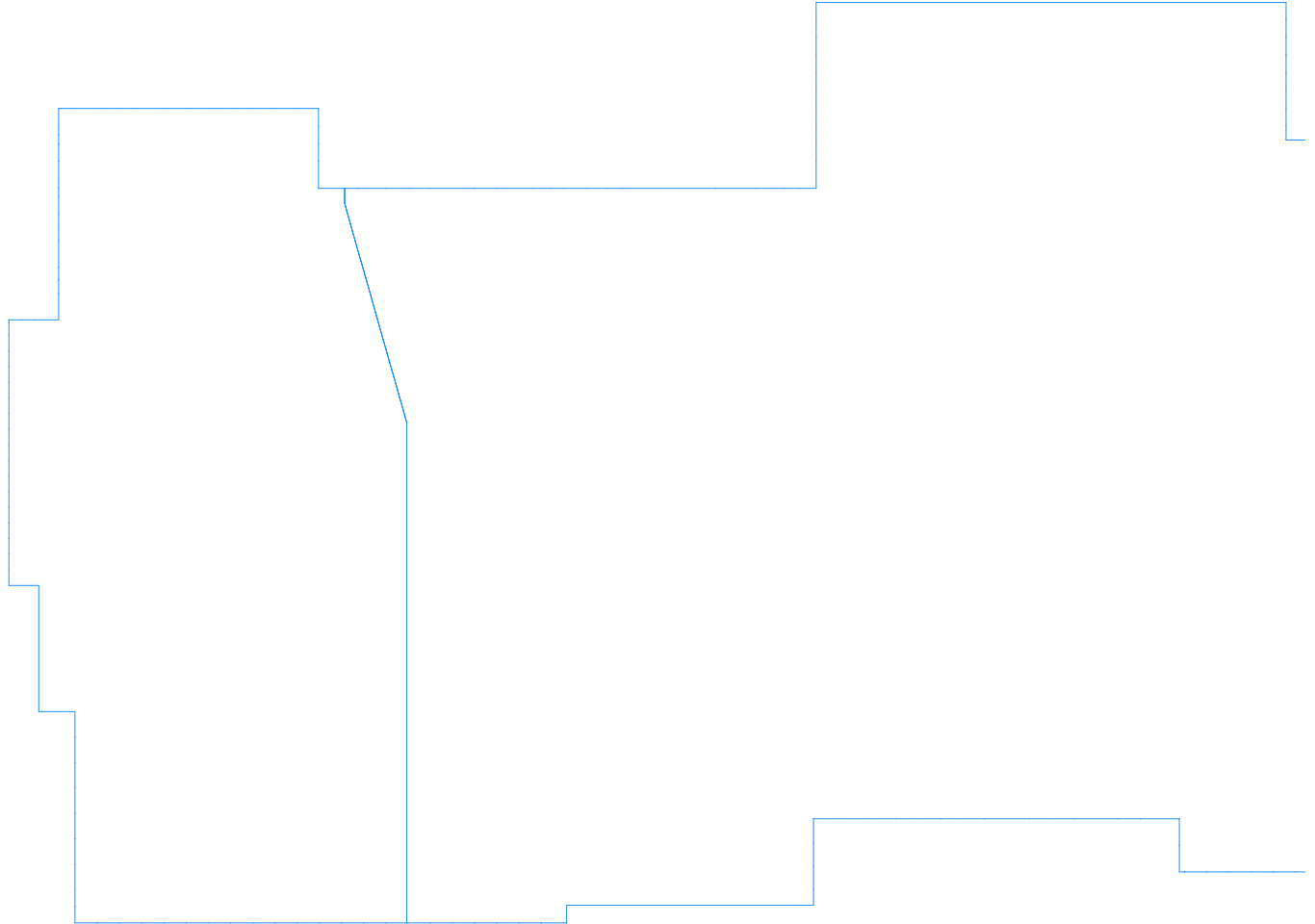


Element: Wall Group Below Slab Summary Plan (3)

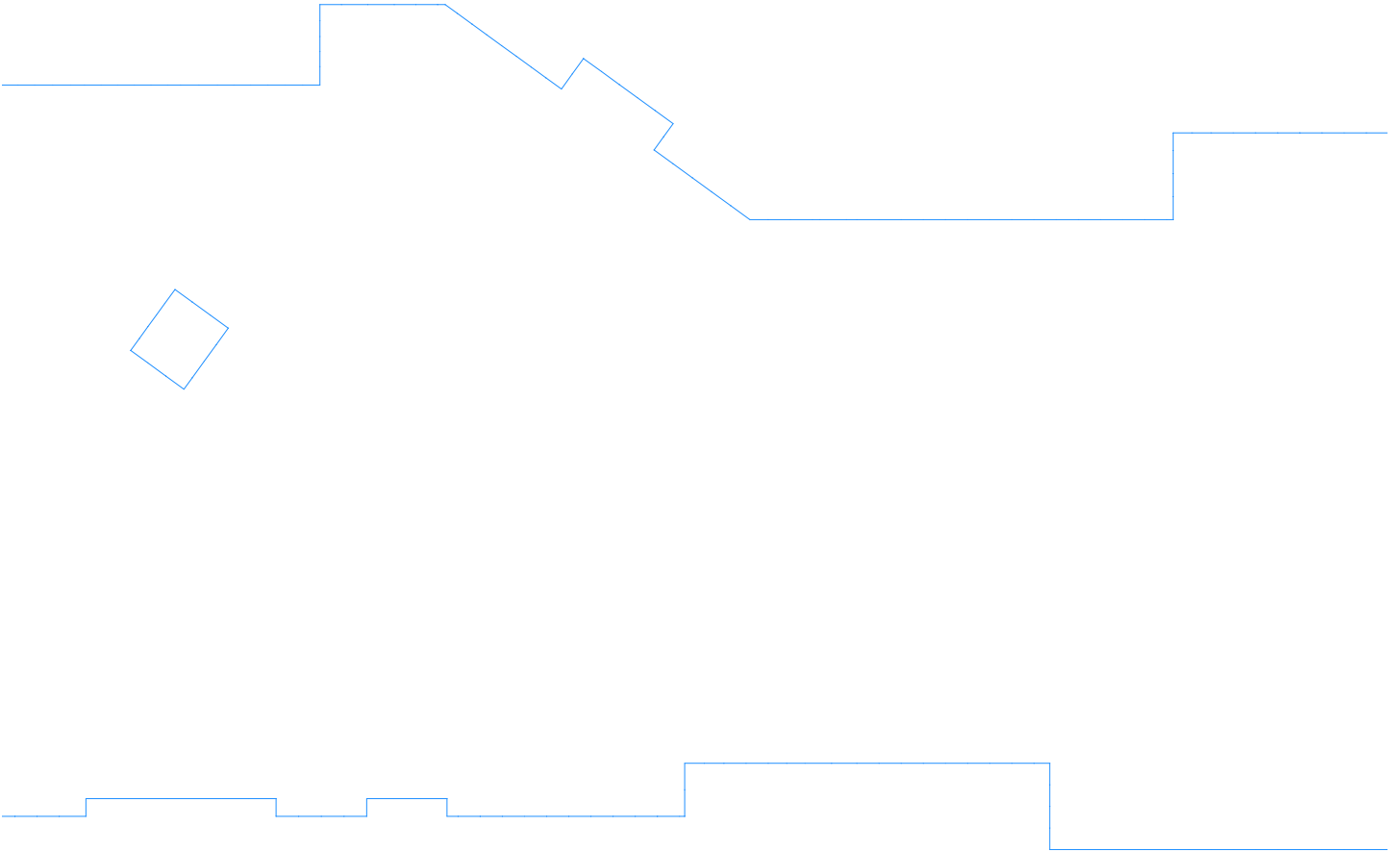


Element: Wall Group Above Slab Summary Plan

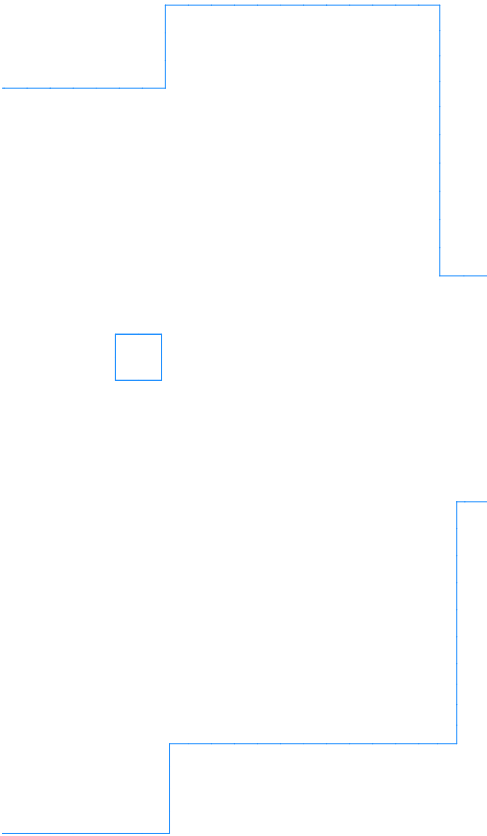
Element: Wall Element Groups Above; Wall Element Group Numbers; Wall Element Group Names; Wall Element Group Axes; Column Elements Above; Slab Elements; Slab Element Outline Only;
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Element: Wall Group Above Slab Summary Plan (2)

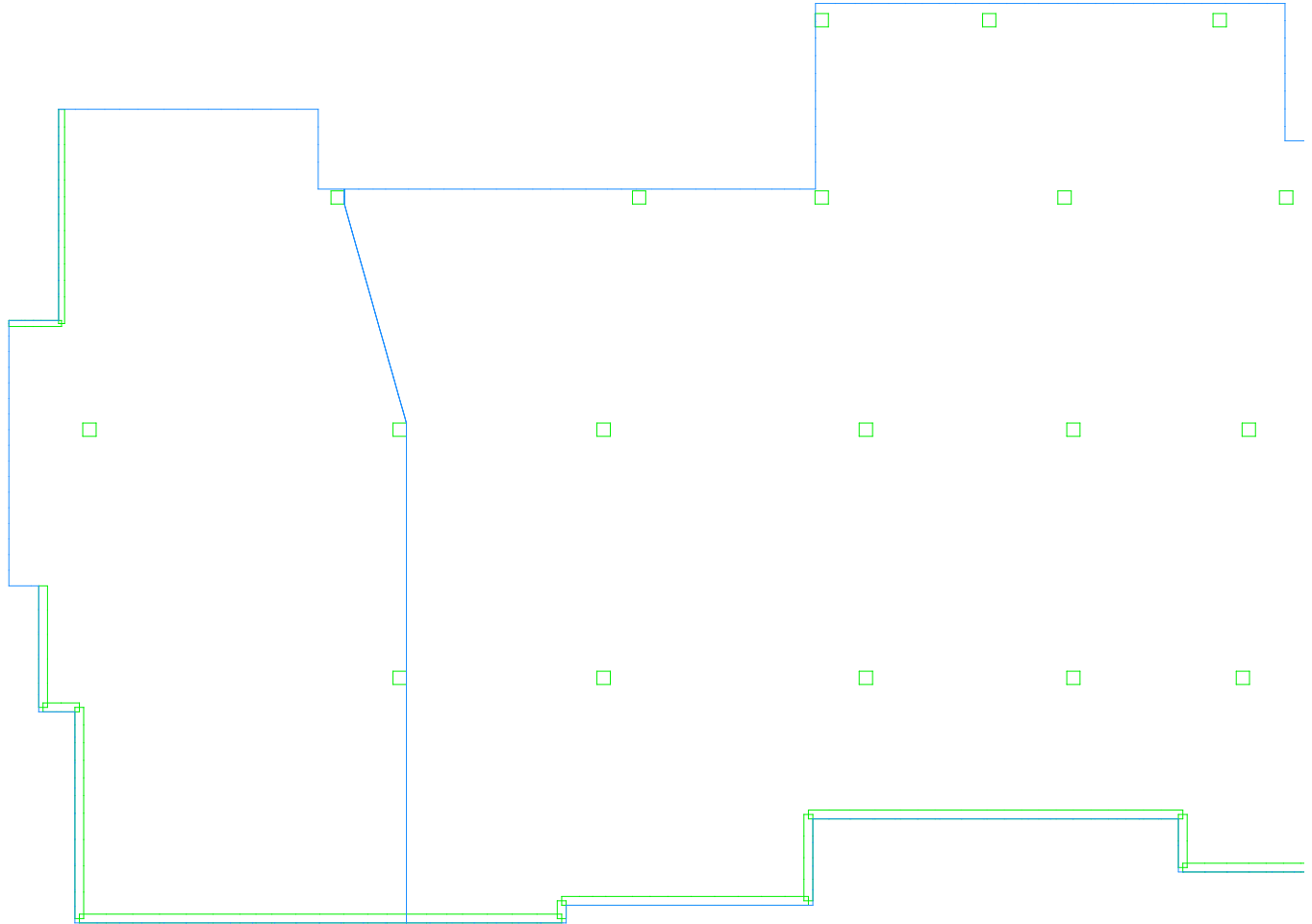


Element: Wall Group Above Slab Summary Plan (3)

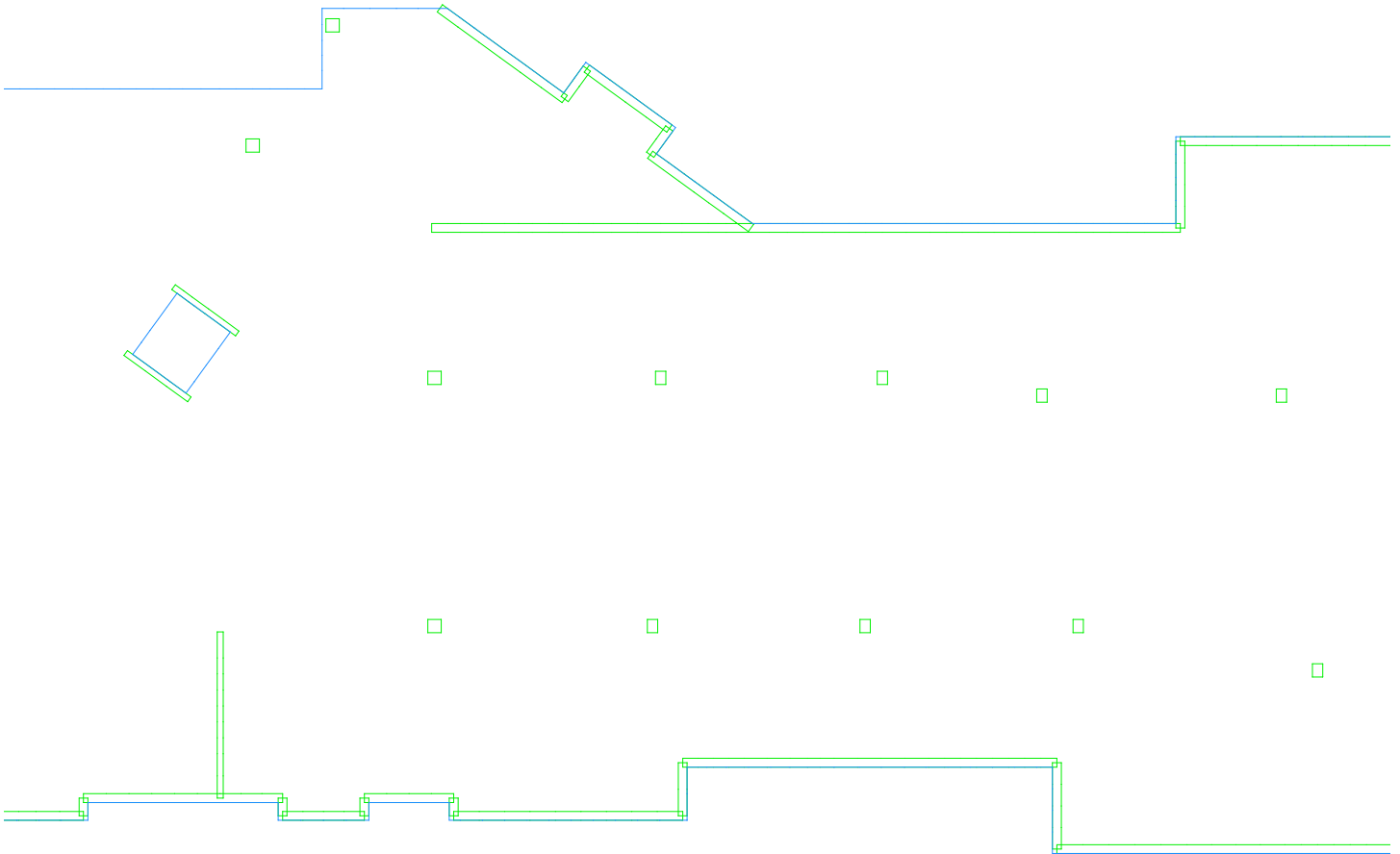


Temporary Construction (At Stressing) Loading: All Loads Pl

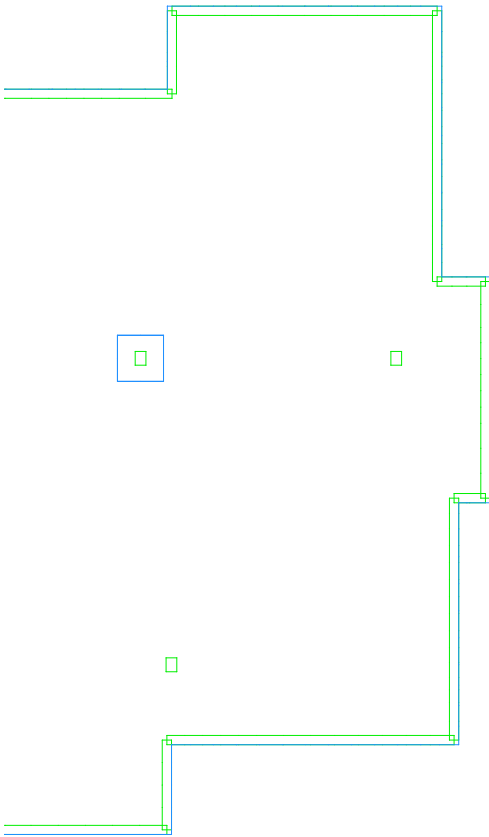
Temporary Construction (At Stressing) Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Temporary Construction (At Stressing) Loading: All Loads Pl

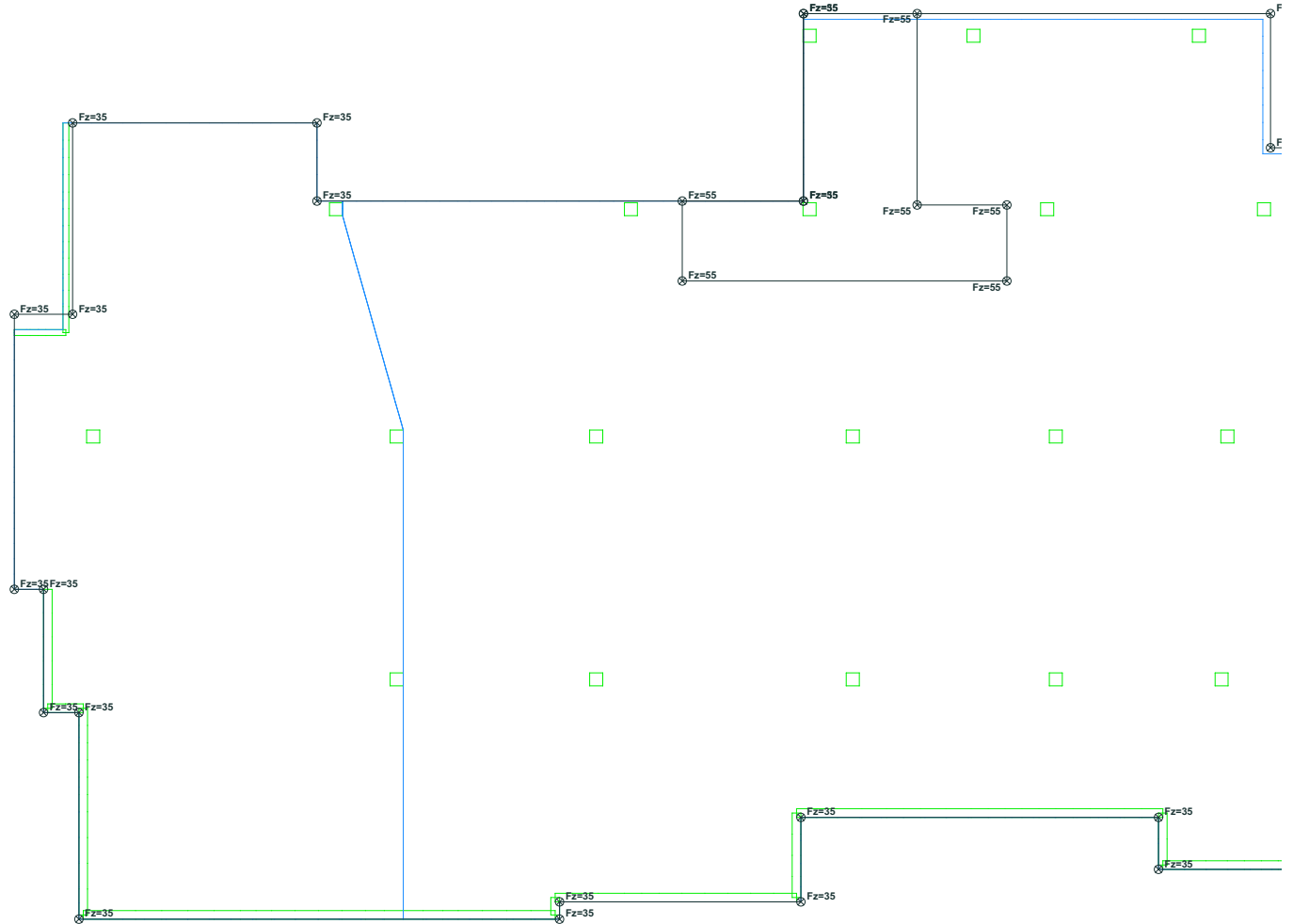


Temporary Construction (At Stressing) Loading: All Loads Pl

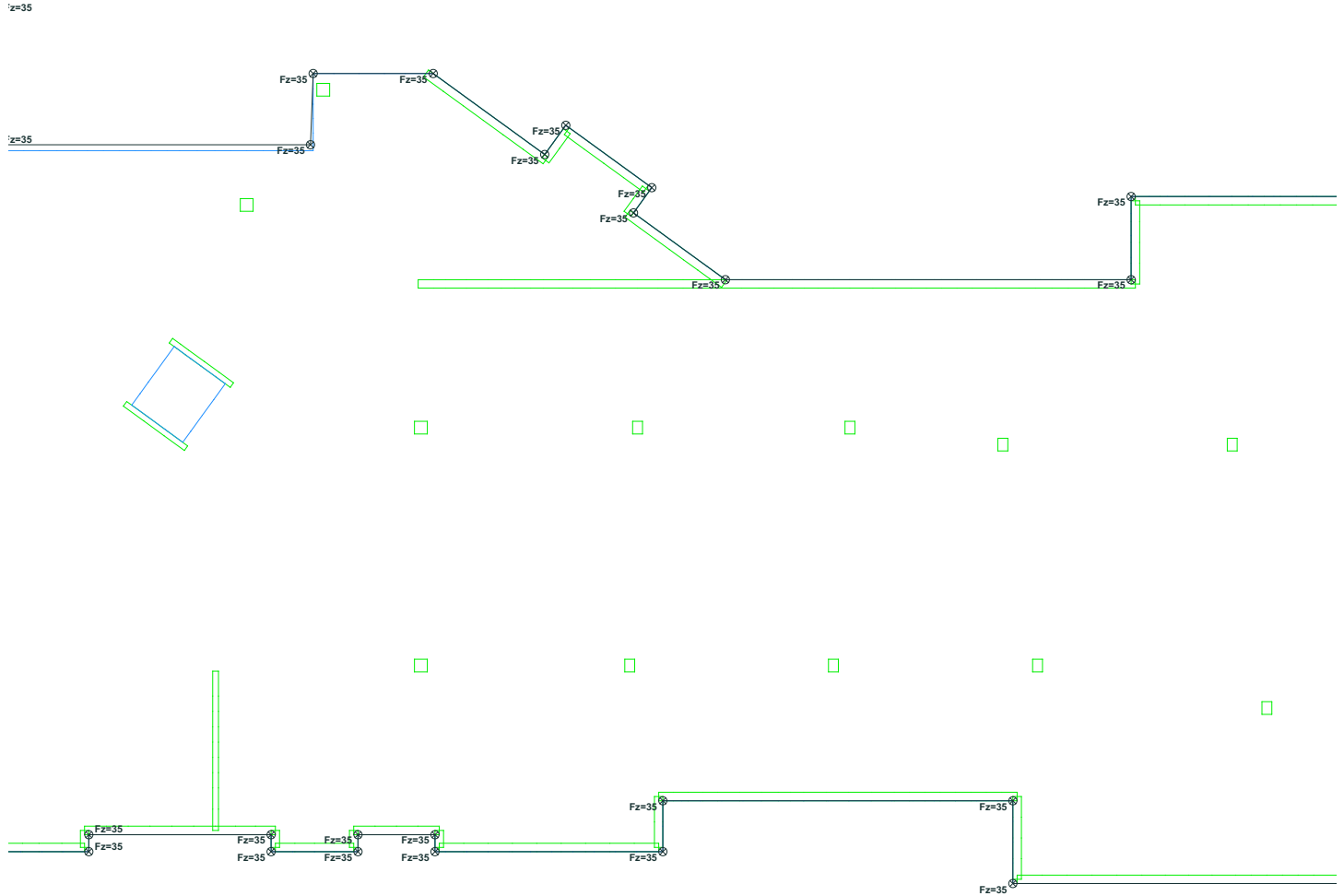


Other Dead Loading: All Loads Plan

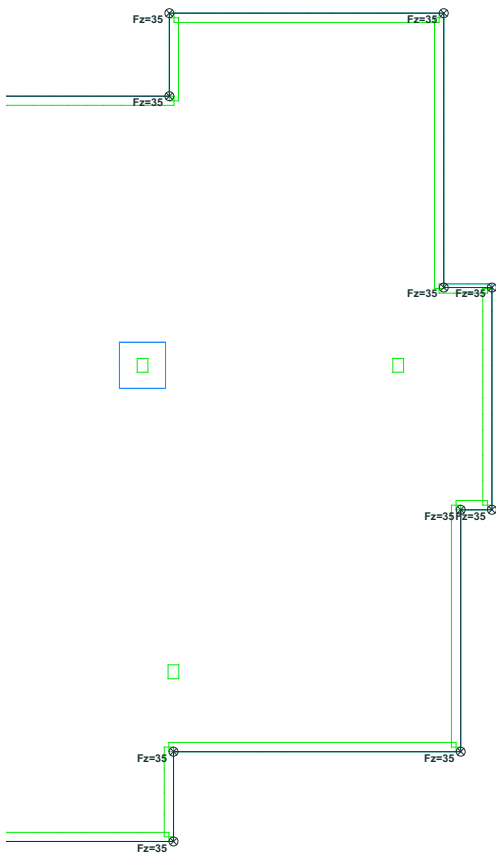
Other Dead Loading: Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values; User Notes; User Lines; User Dimensions;
 Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



Other Dead Loading: All Loads Plan (2)

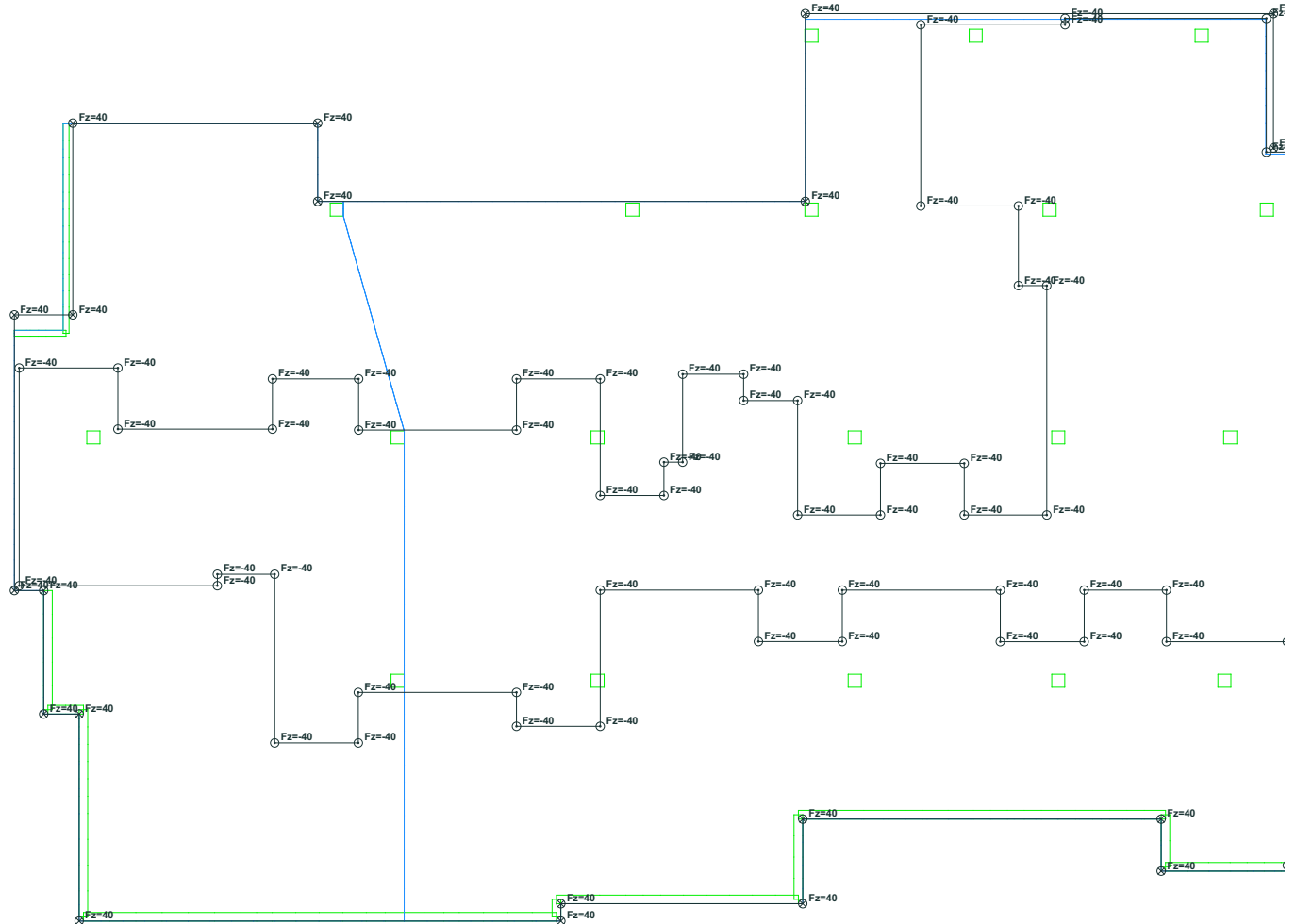


Other Dead Loading: All Loads Plan (3)

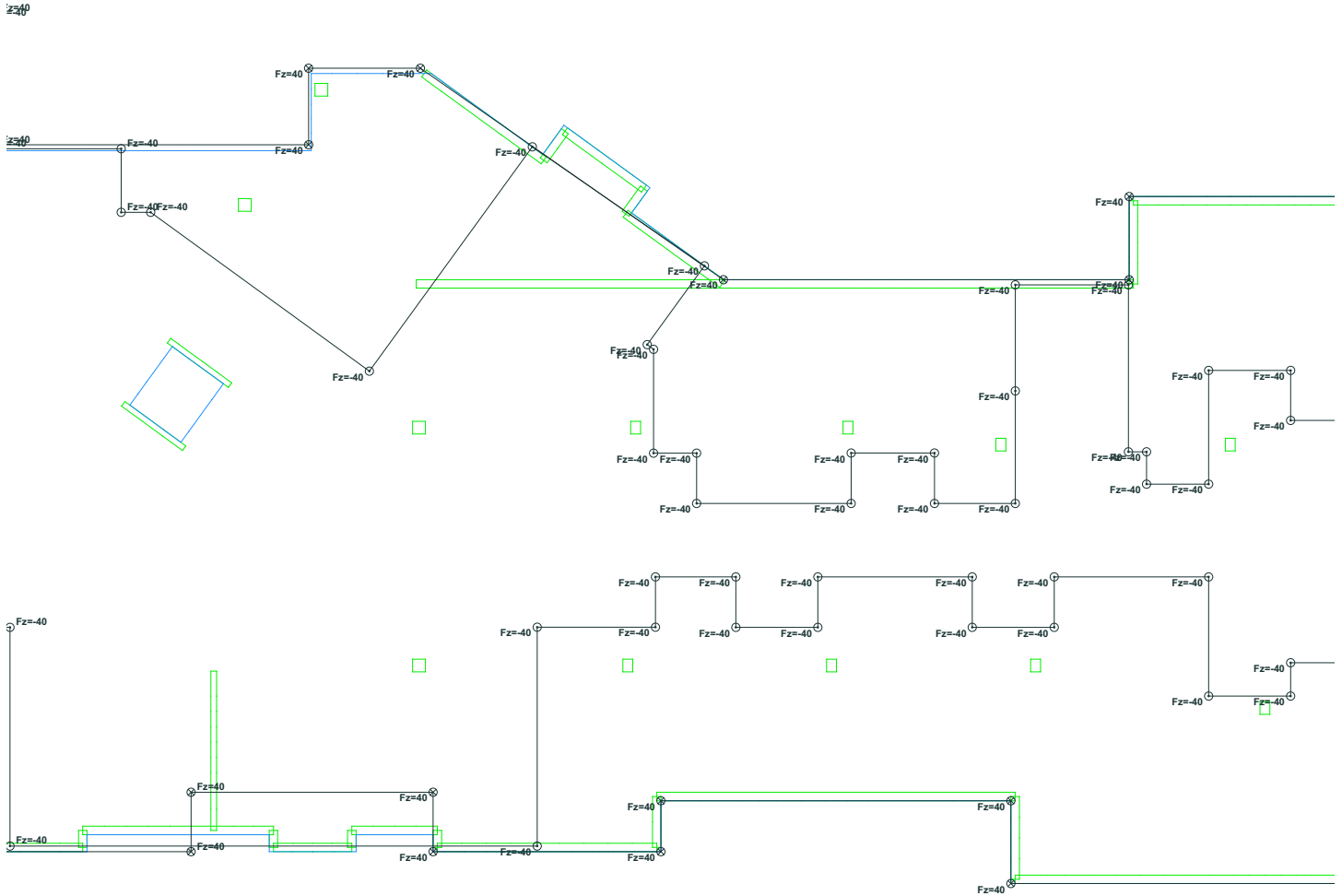


Live (Reducible) Loading: All Loads Plan

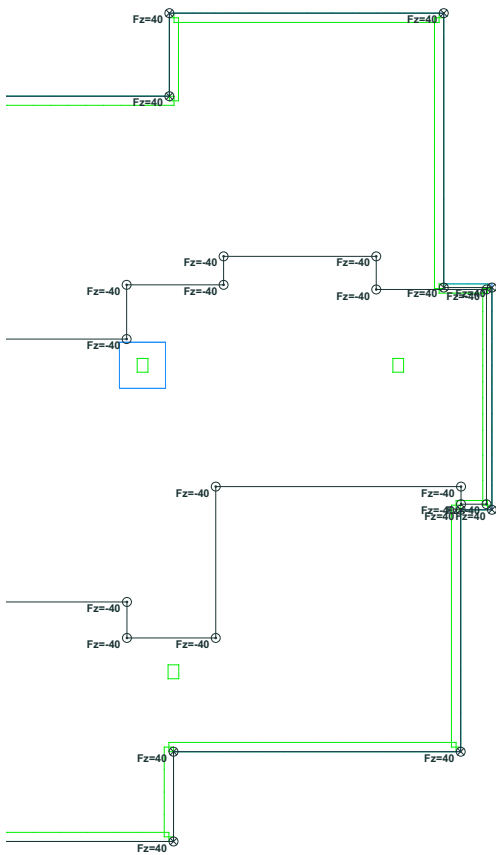
Live (Reducible) Loading: Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values; User Notes; User Lines; User Dimensions;
 Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



Live (Reducible) Loading: All Loads Plan (2)

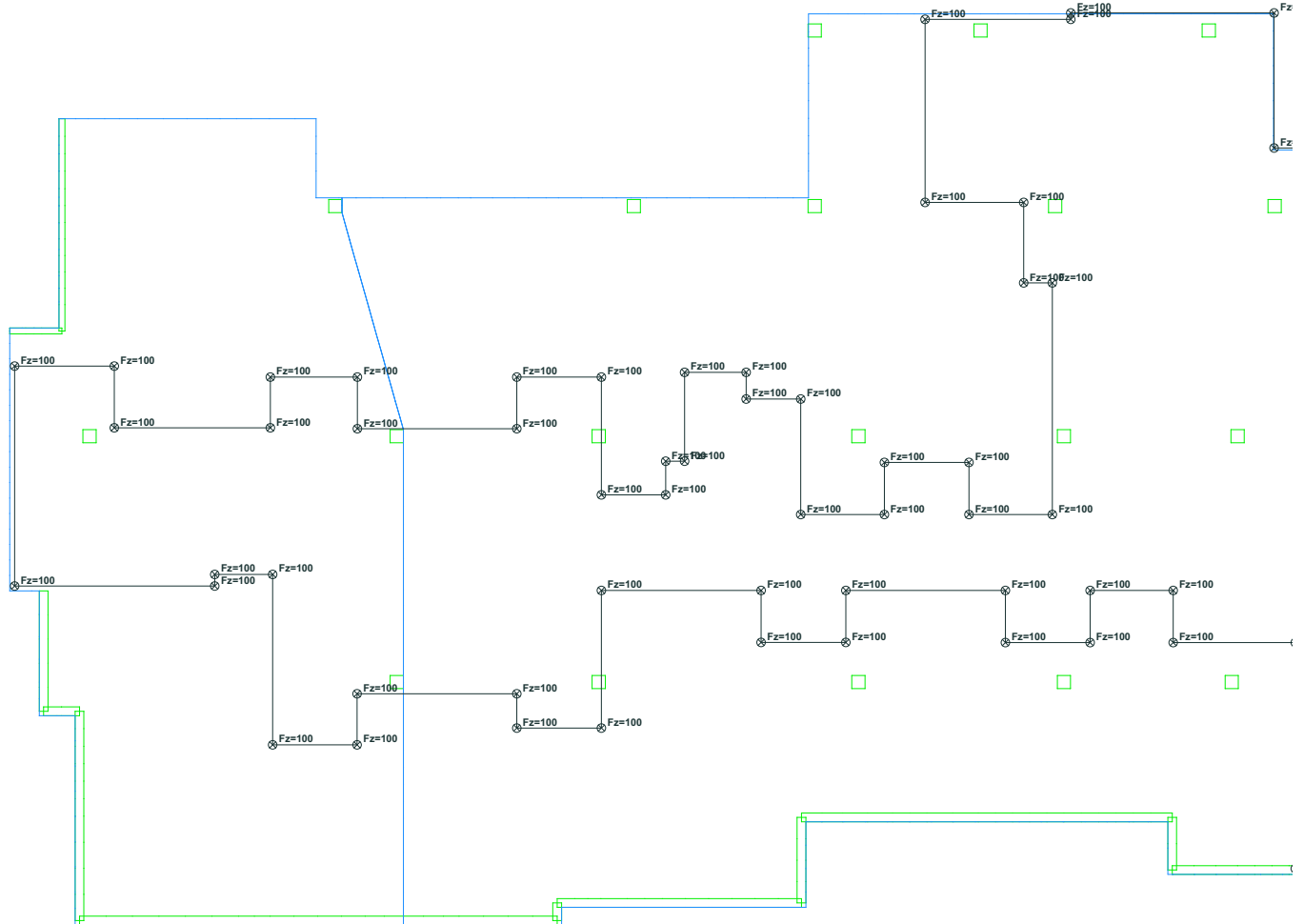


Live (Reducible) Loading: All Loads Plan (3)



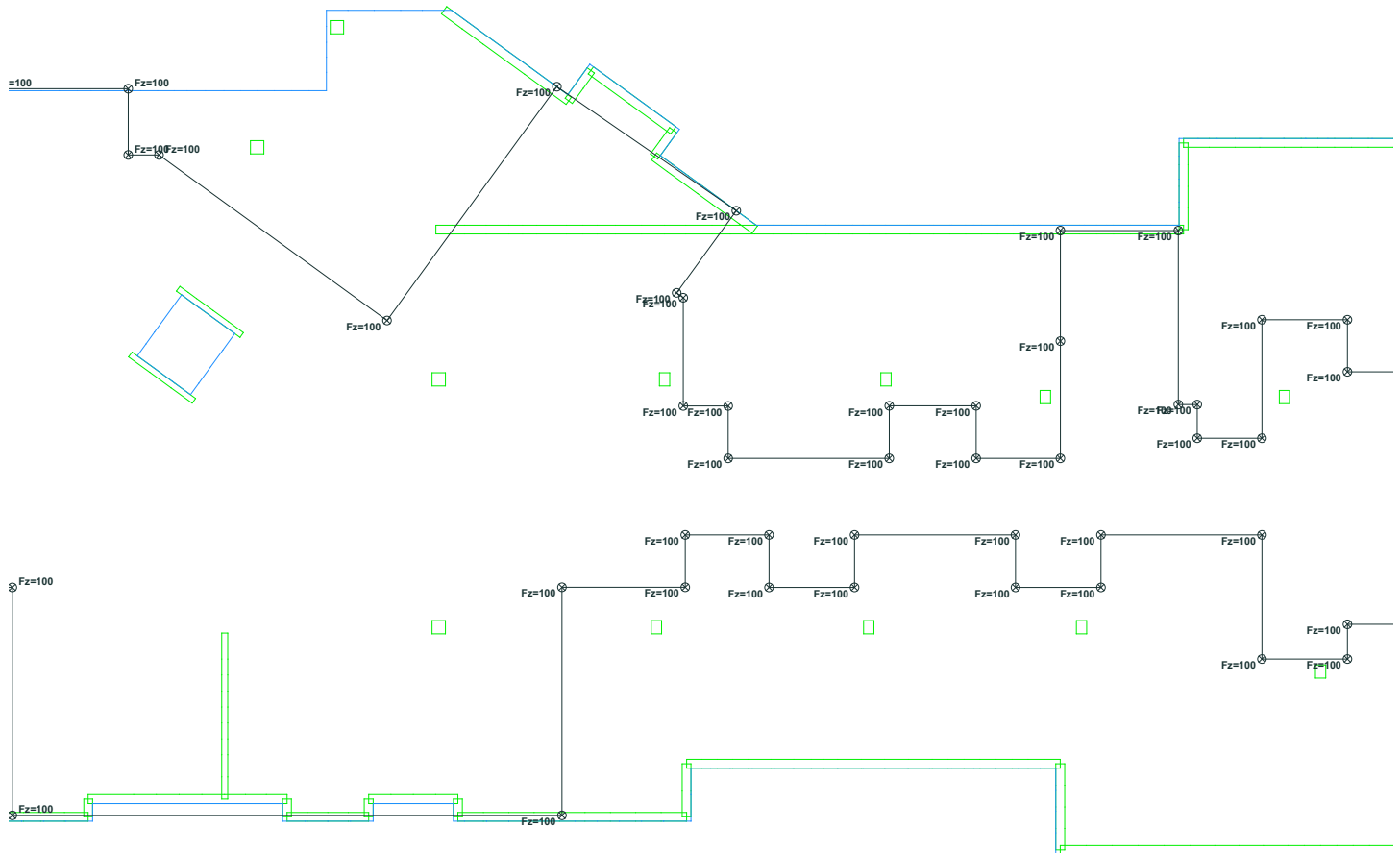
Live (Unreducible) Loading: All Loads Plan

Live (Unreducible) Loading: Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values; 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 = 1:250

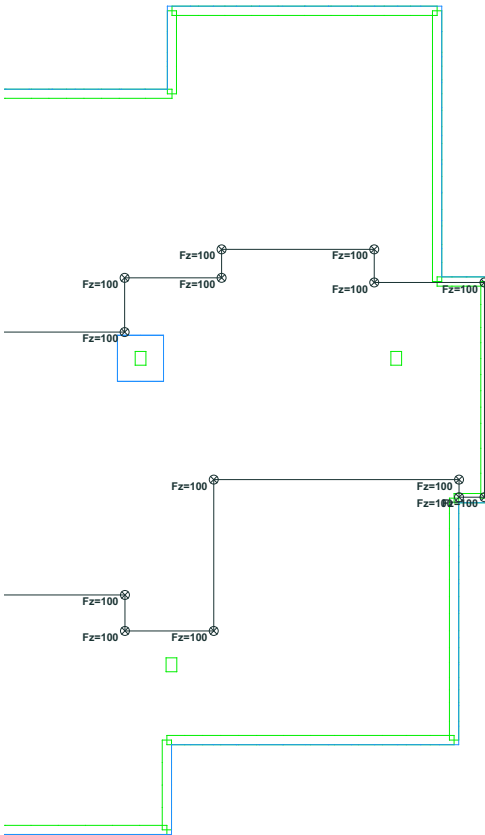


Live (Unreducible) Loading: All Loads Plan (2)

=100

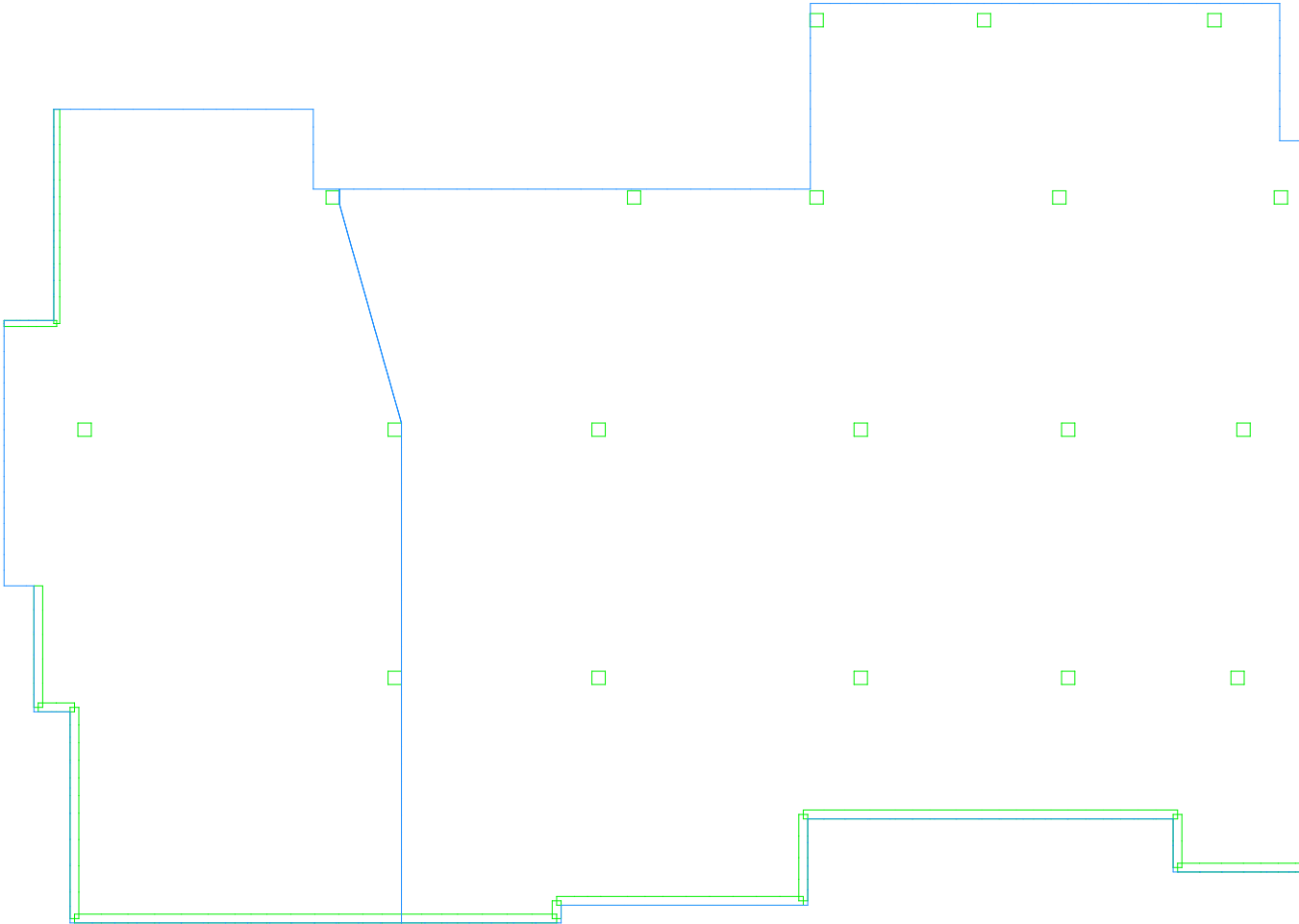


Live (Unreducible) Loading: All Loads Plan (3)

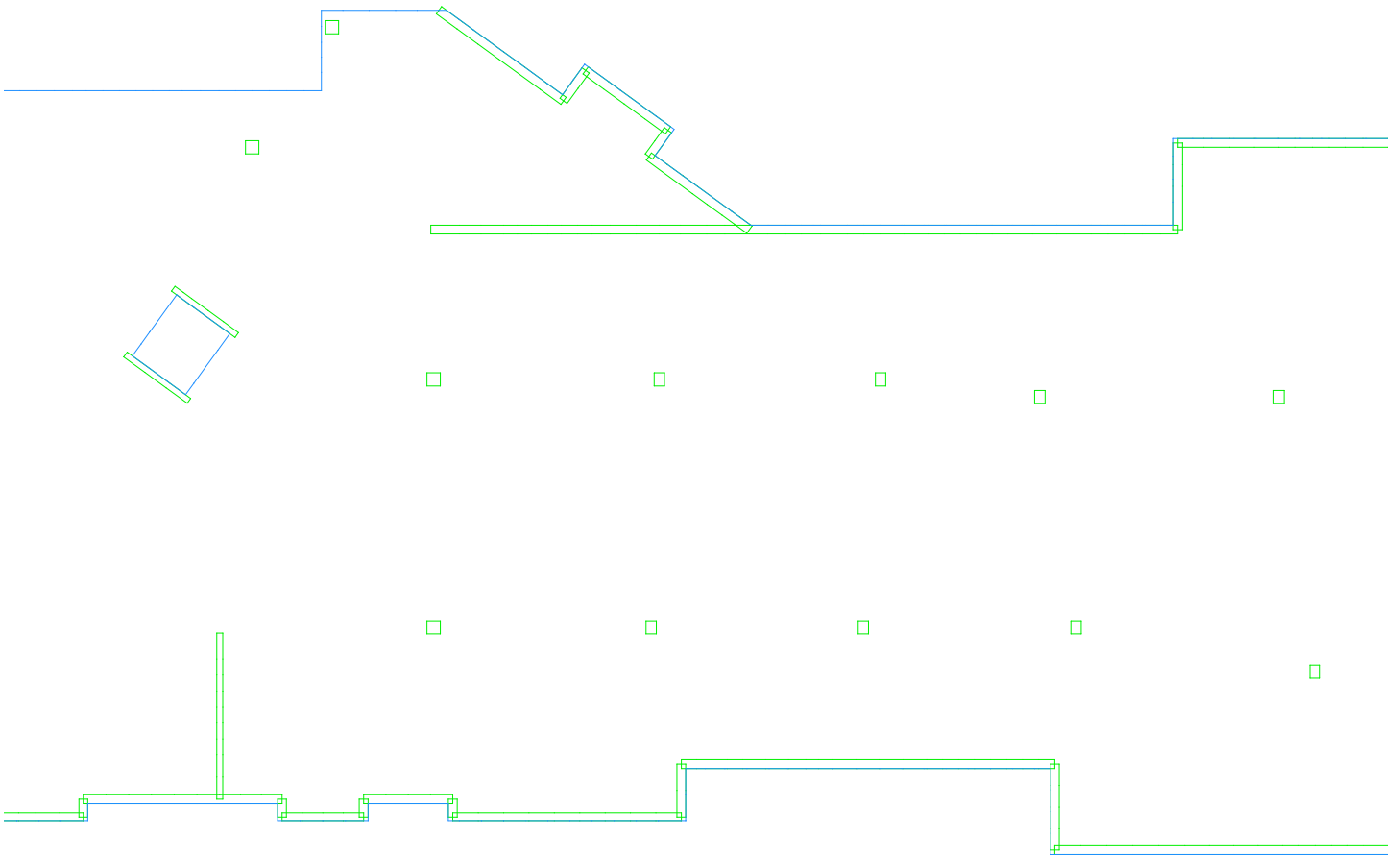


Live (Storage) Loading: All Loads Plan

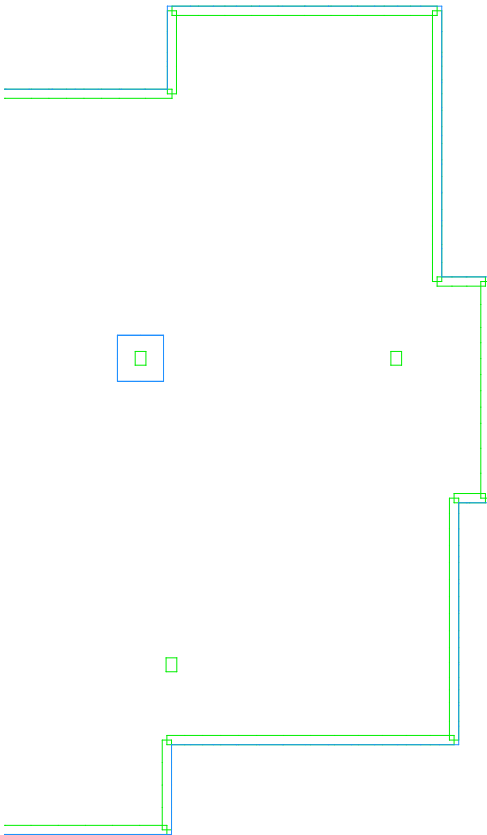
Live (Storage) Loading: Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values; User Notes; User Lines; User Dimensions;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Live (Storage) Loading: All Loads Plan (2)

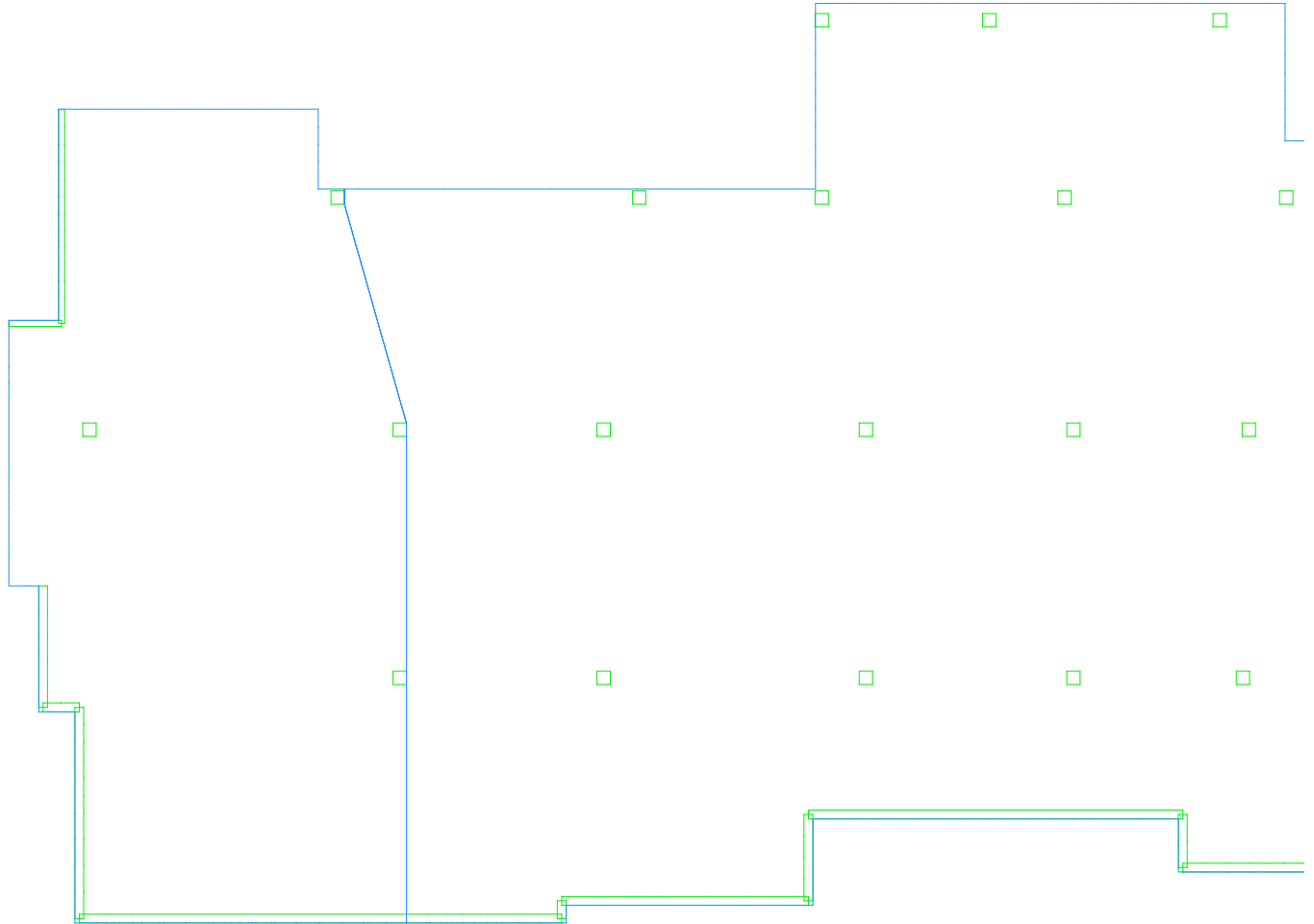


Live (Storage) Loading: All Loads Plan (3)

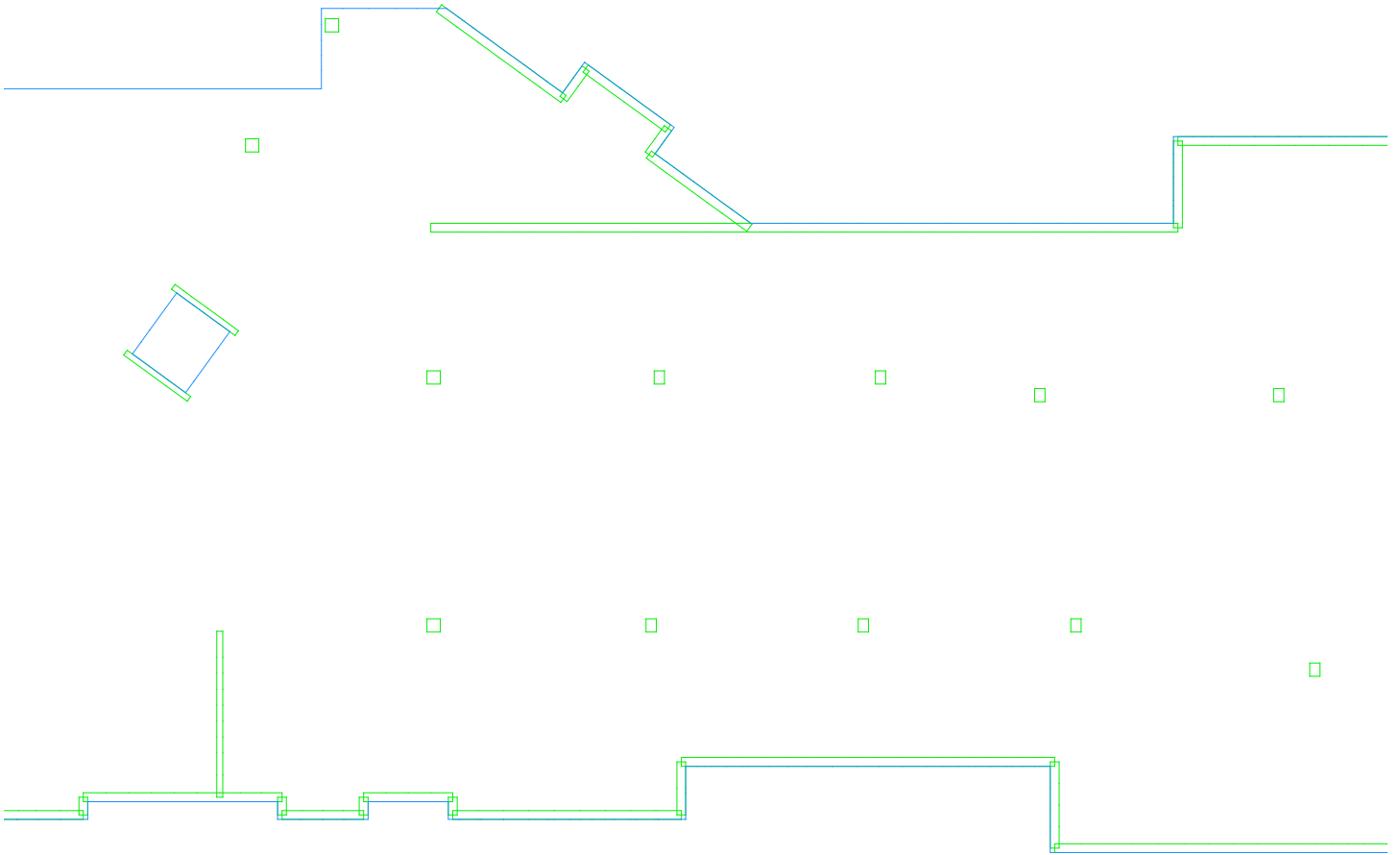


Live (Parking) Loading: All Loads Plan

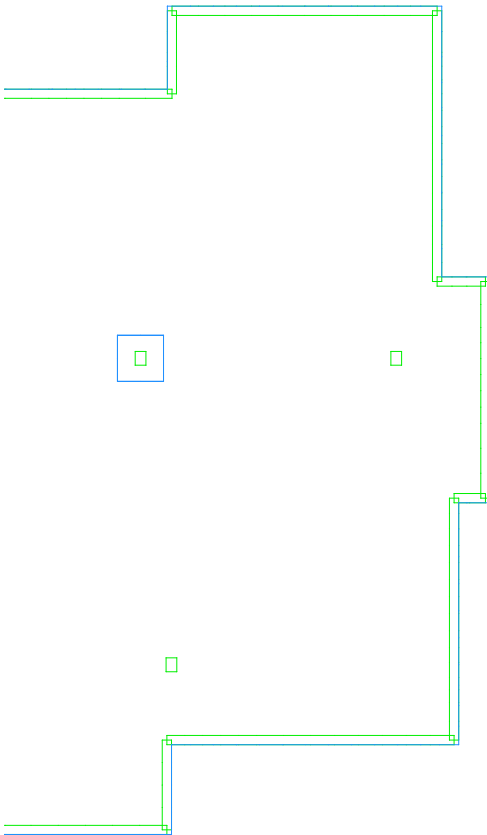
Live (Parking) Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Live (Parking) Loading: All Loads Plan (2)

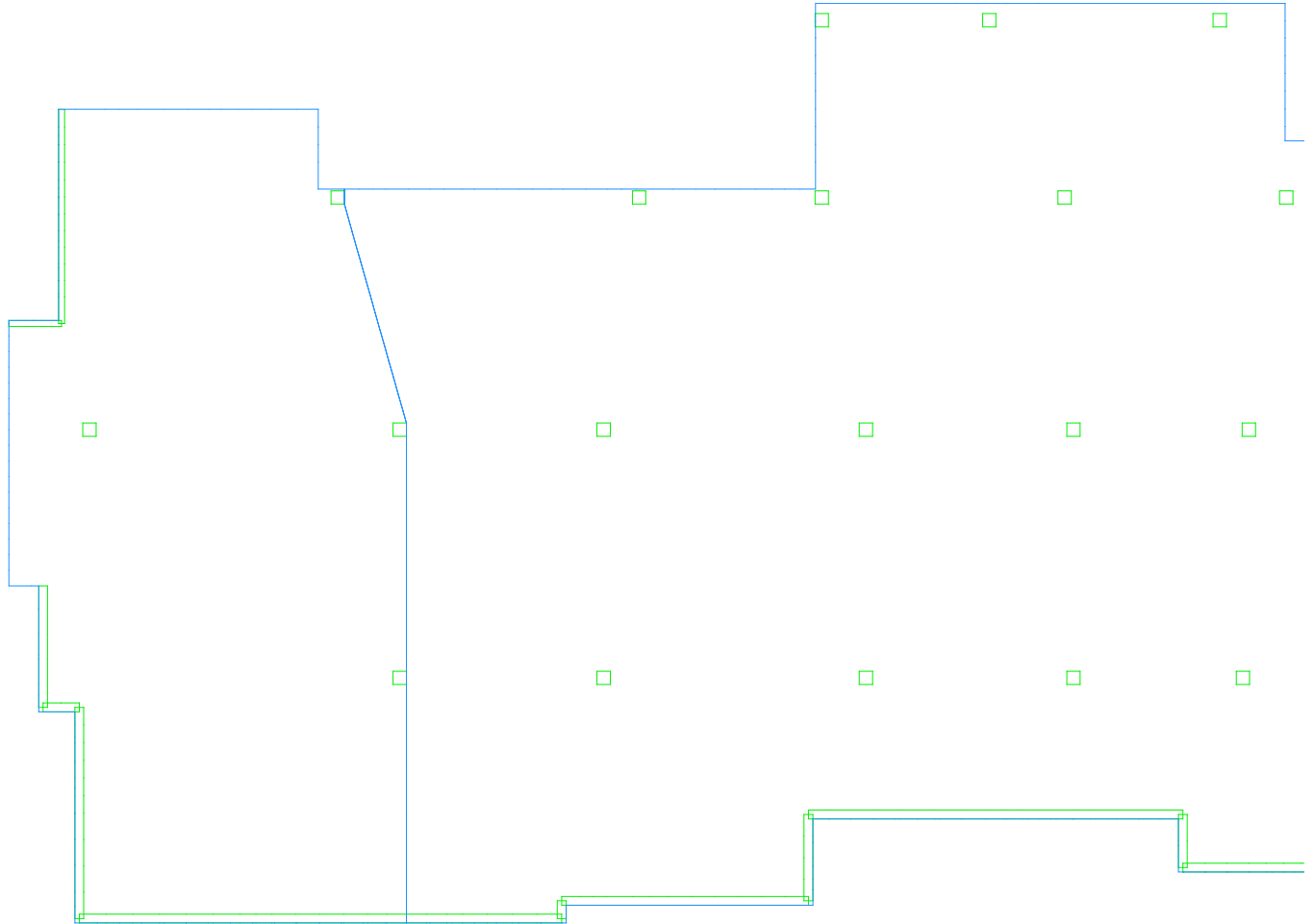


Live (Parking) Loading: All Loads Plan (3)

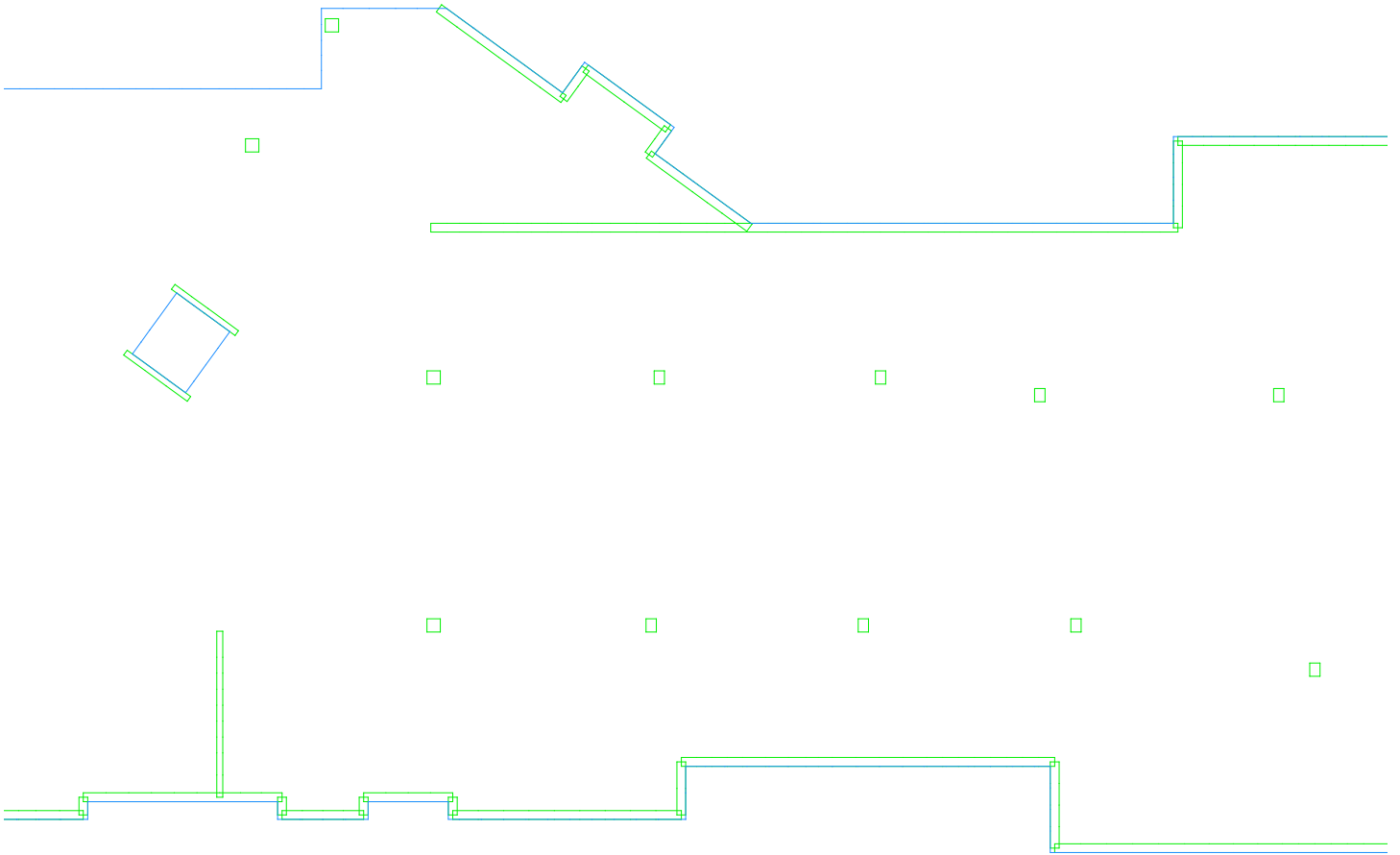


Live (Roof) Loading: All Loads Plan

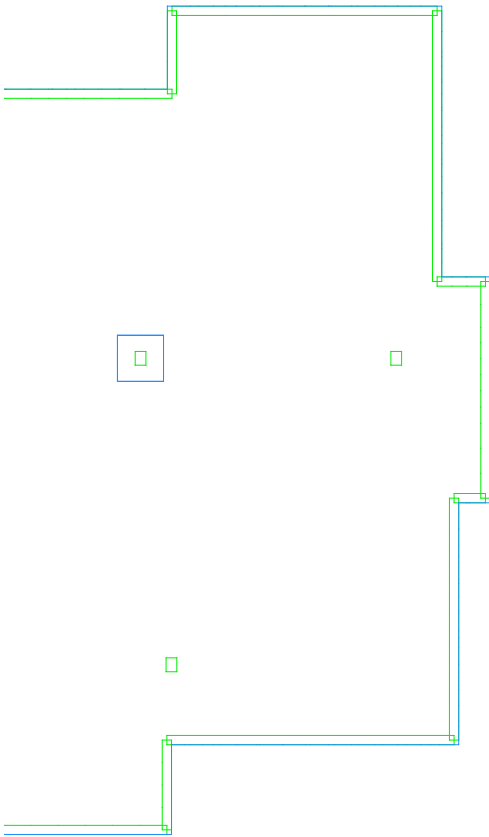
Live (Roof) Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Live (Roof) Loading: All Loads Plan (2)

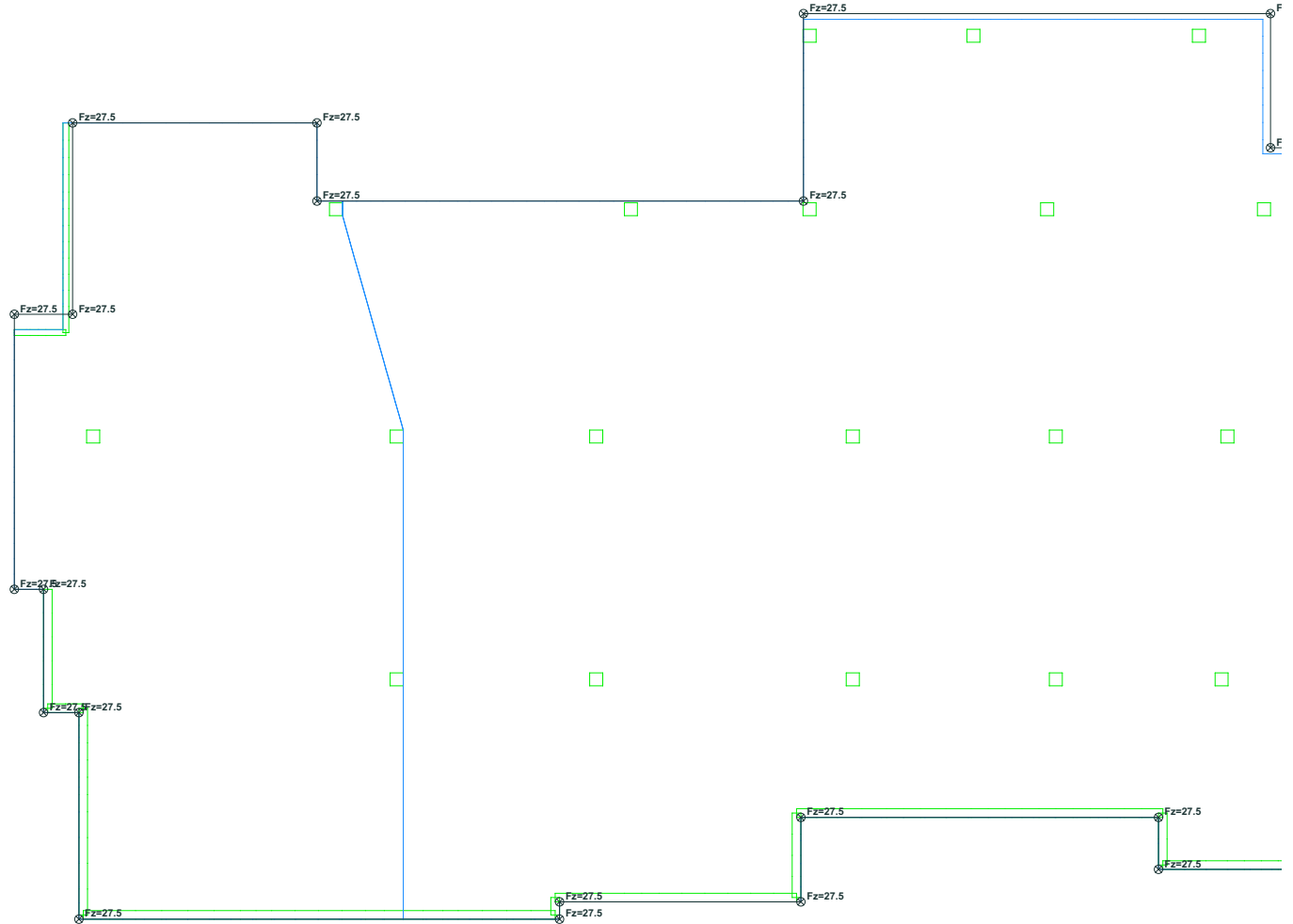


Live (Roof) Loading: All Loads Plan (3)

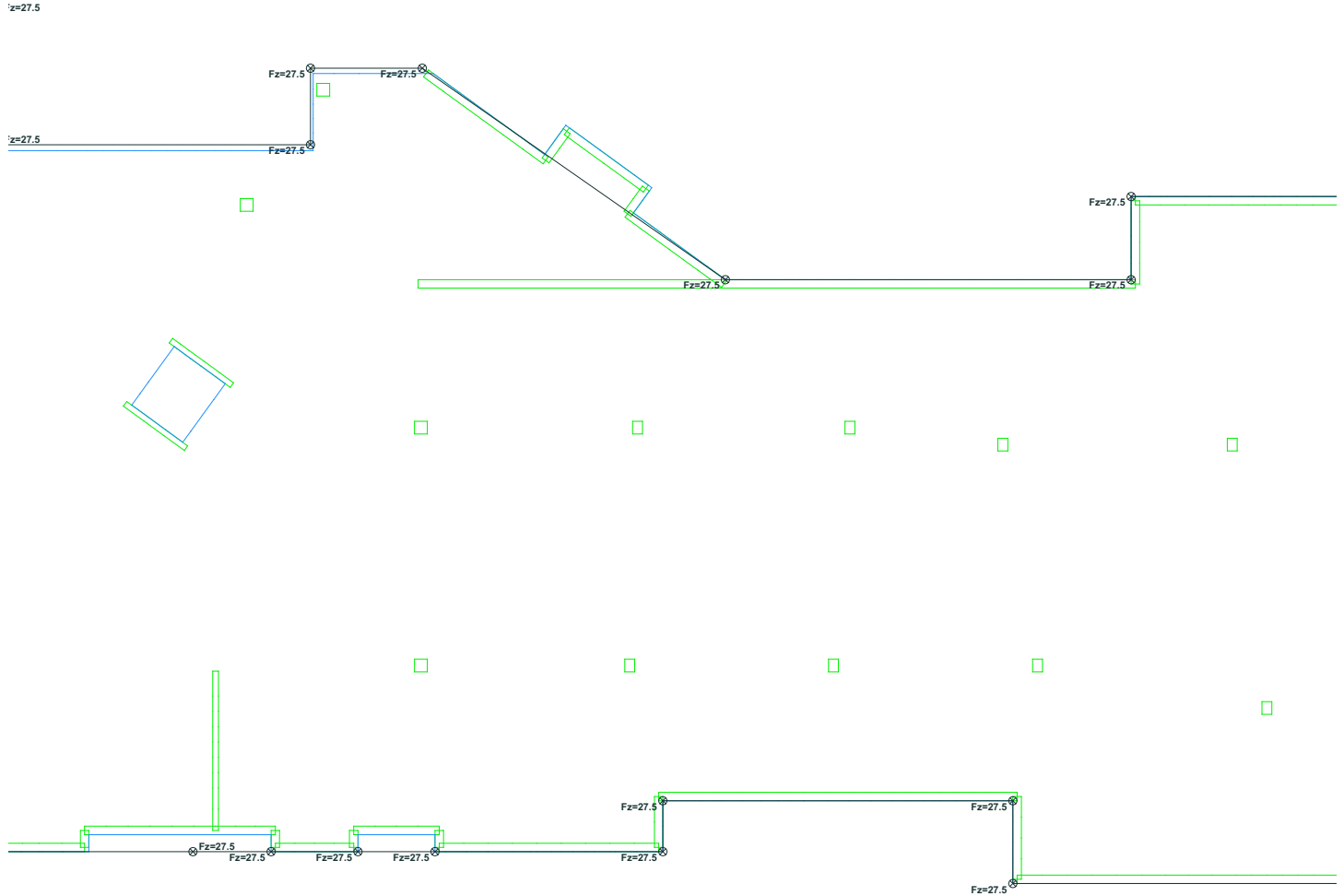


Snow Loading: All Loads Plan

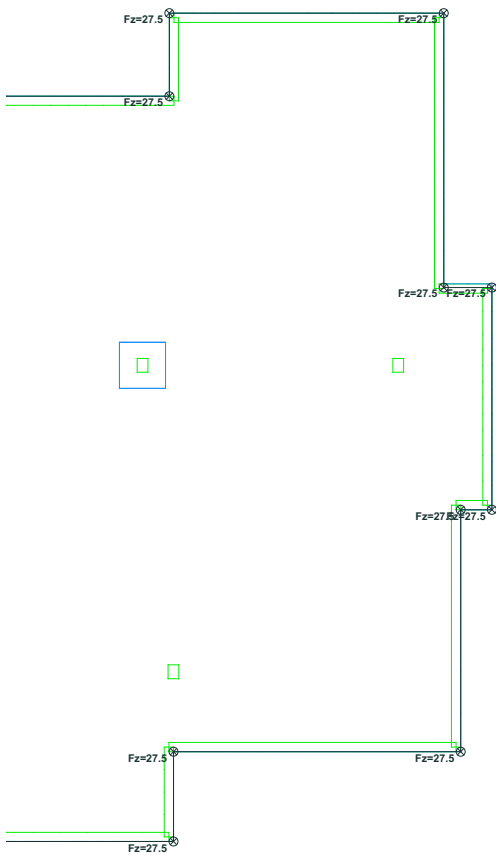
Snow Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



Snow Loading: All Loads Plan (2)

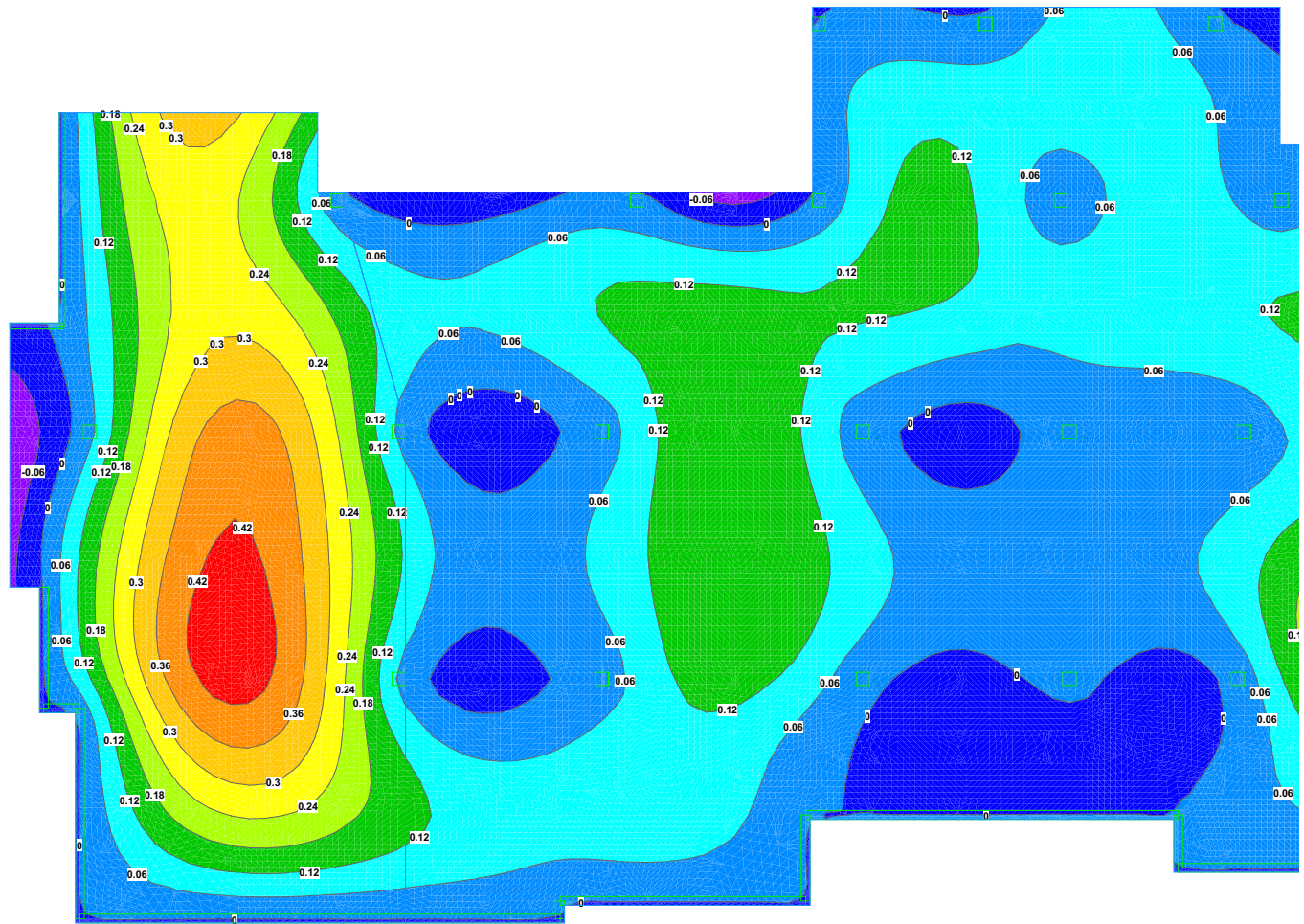


Snow Loading: All Loads Plan (3)

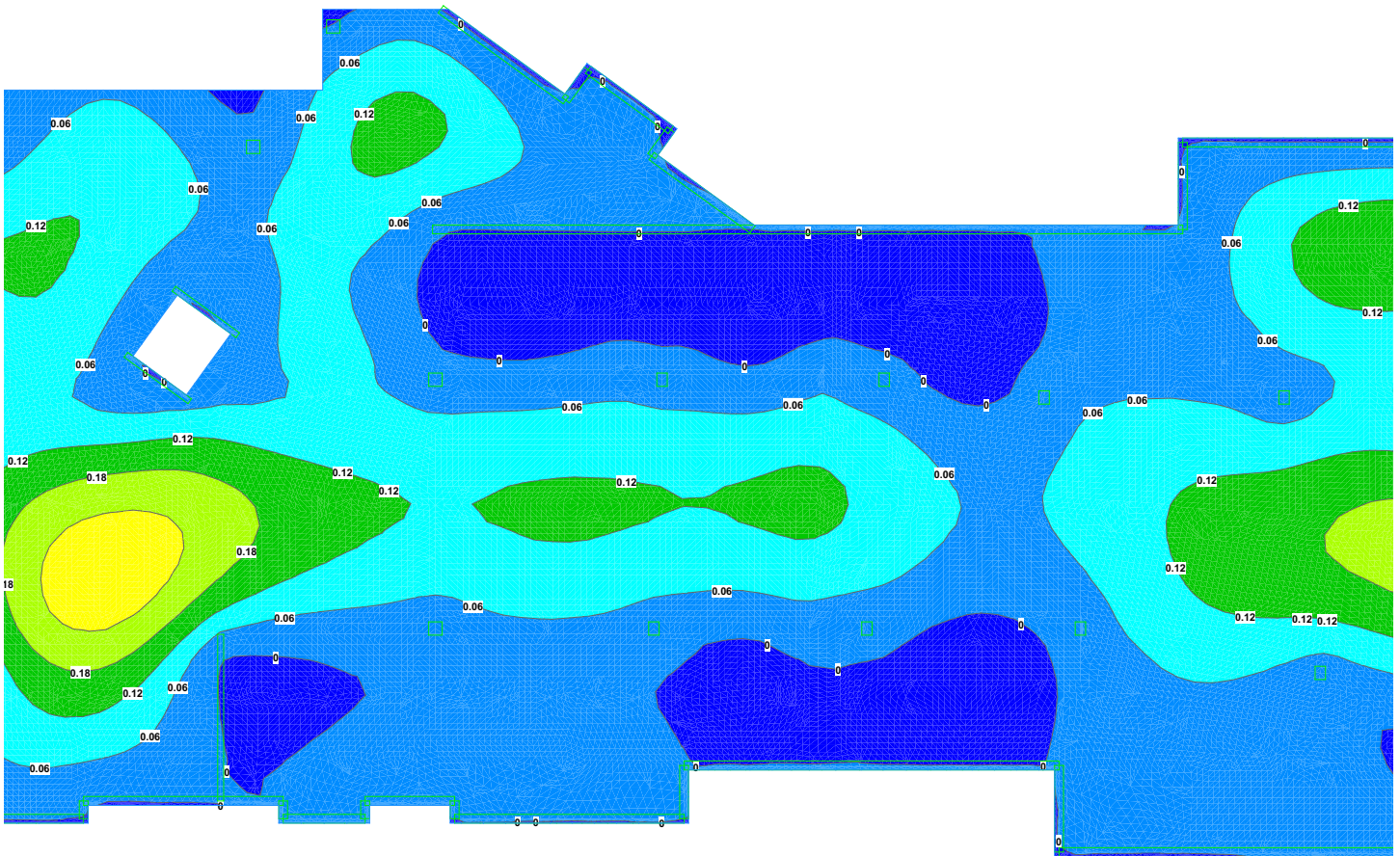


Service LC: D + L: Max Deflection Plan

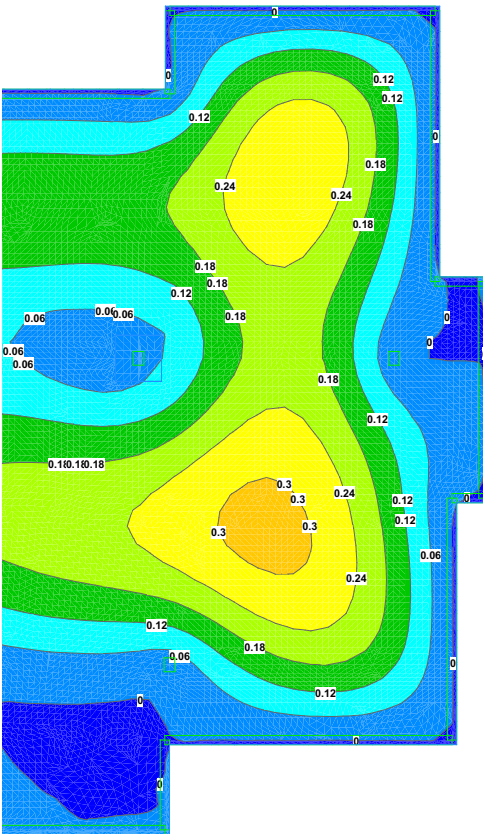
Service LC: D + L: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + L - Vertical Deflection Plot (Maximum Values)
Min Value = -0.1155 inches @ (-371.9,-83.18) Max Value = 0.4566 inches @ (-346.9,-107.3)



Service LC: D + L: Max Deflection Plan (2)

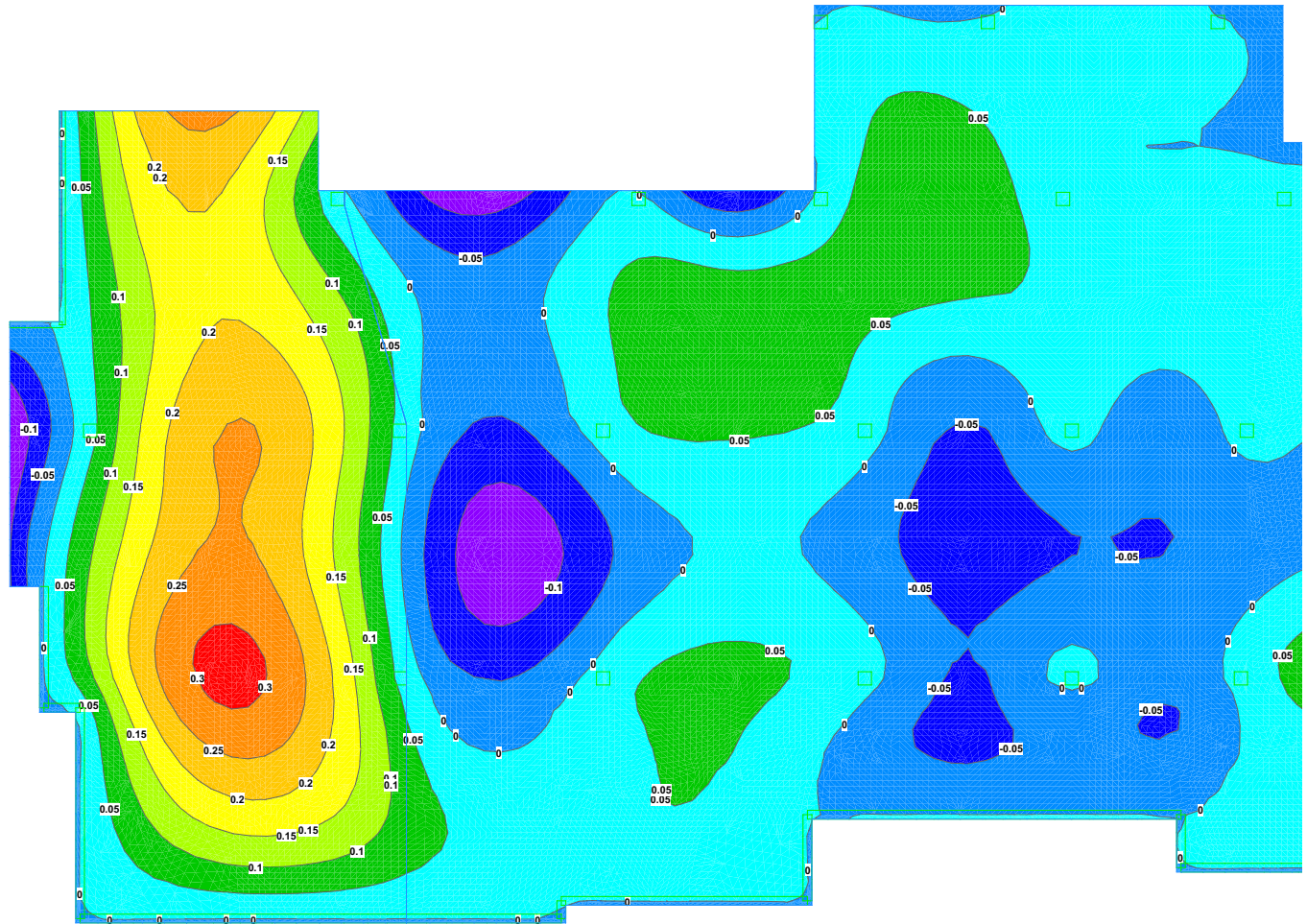


Service LC: D + L: Max Deflection Plan (3)

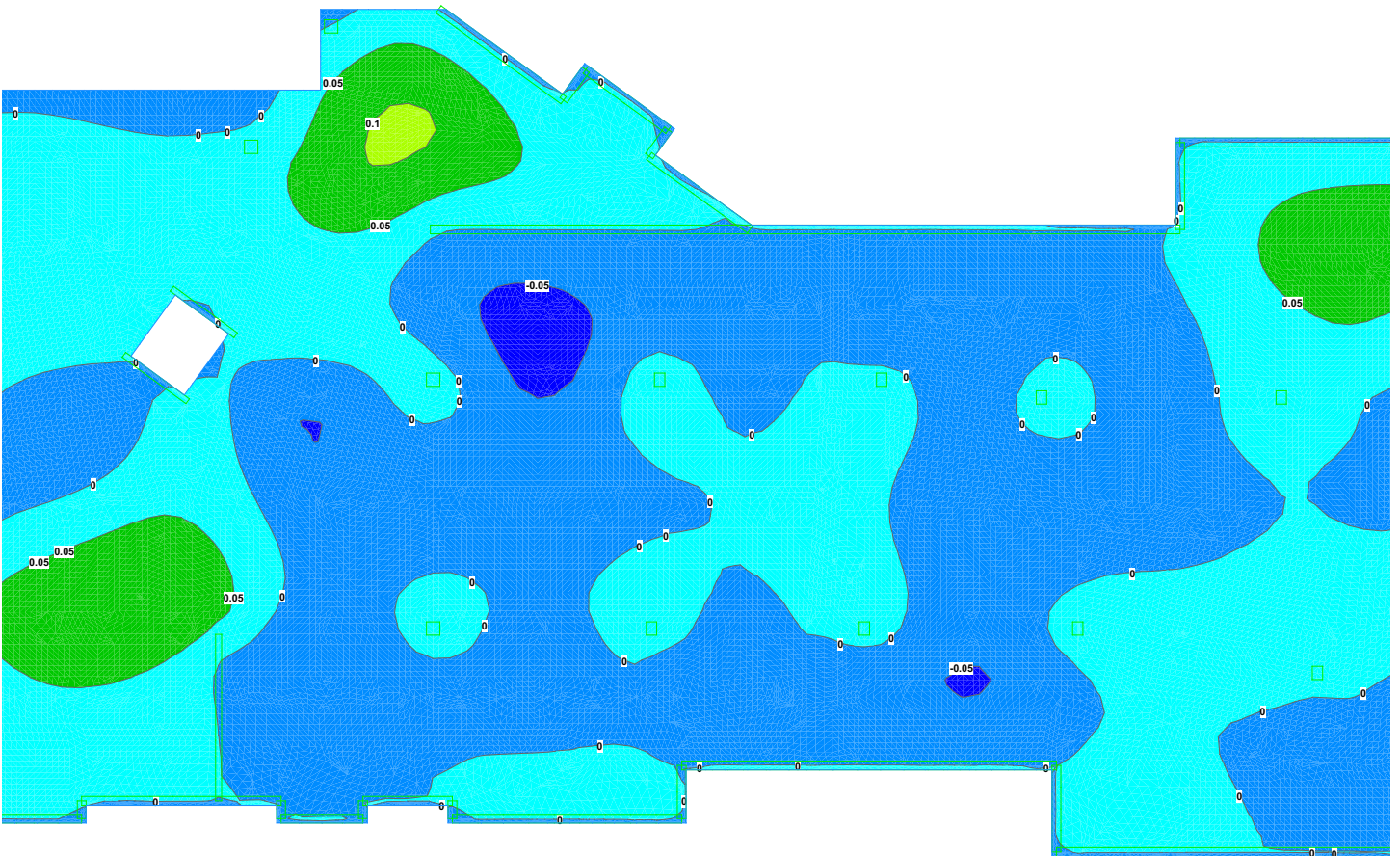


Service LC: D + L: Min Deflection Plan

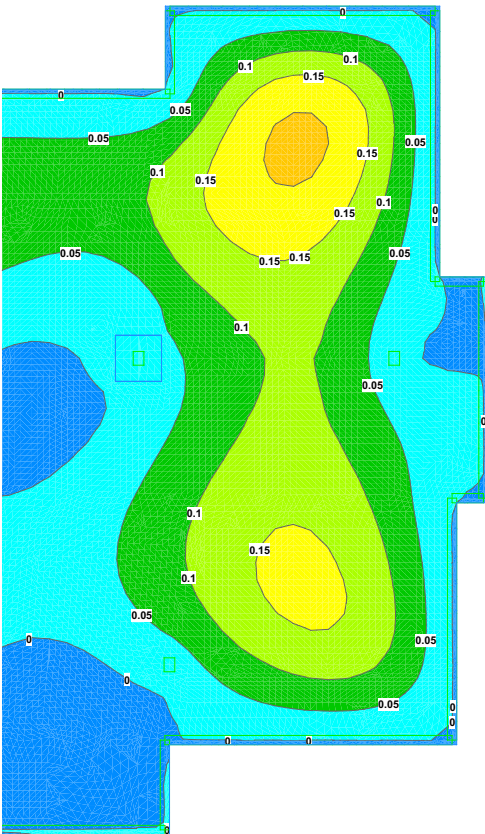
Service LC: D + L: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + L - Vertical Deflection Plot (Minimum Values)
Min Value = -0.1467 inches @ (-371.9,-83.18) Max Value = 0.3166 inches @ (-346.9,-109.2)



Service LC: D + L: Min Deflection Plan (2)

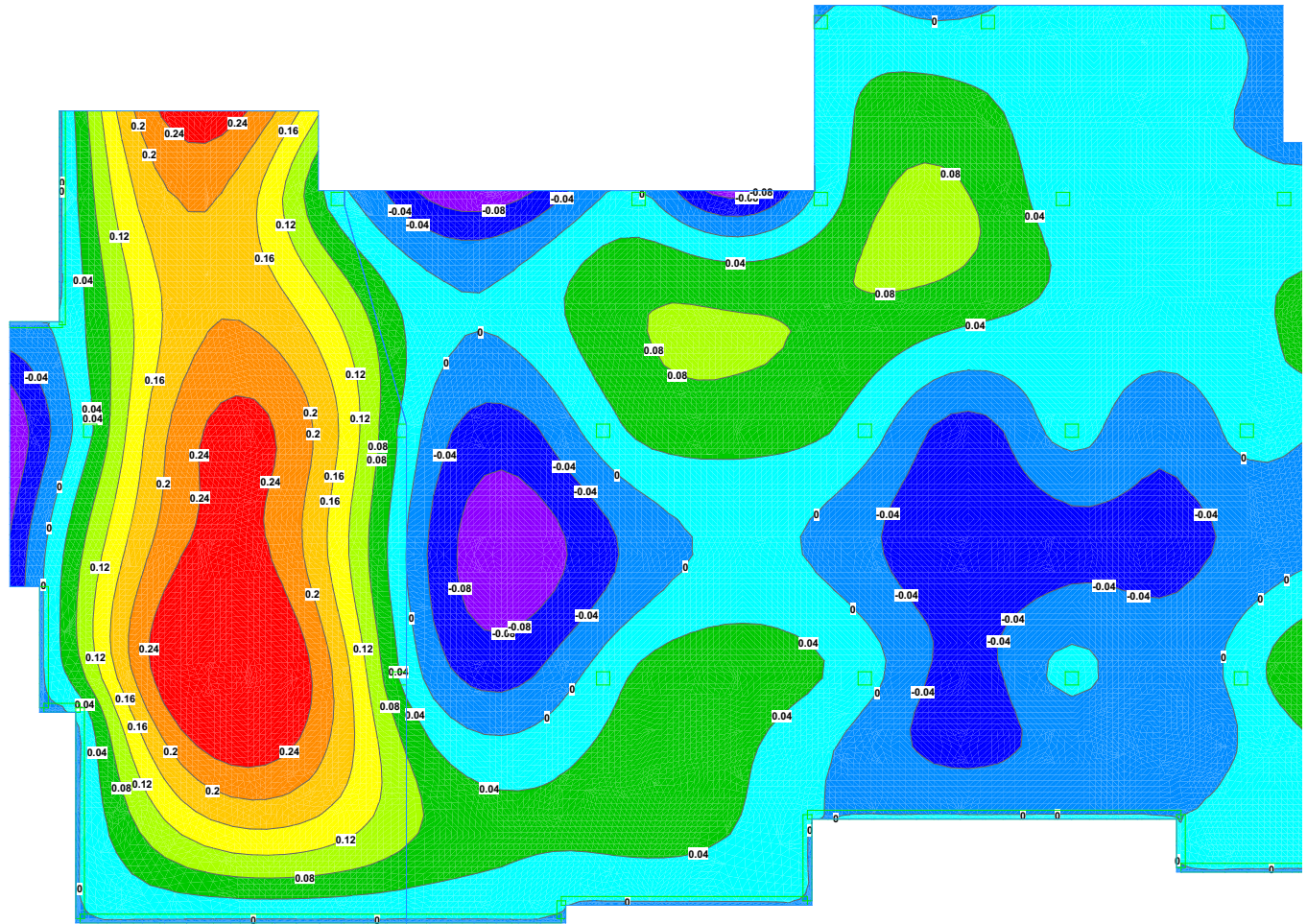


Service LC: D + L: Min Deflection Plan (3)

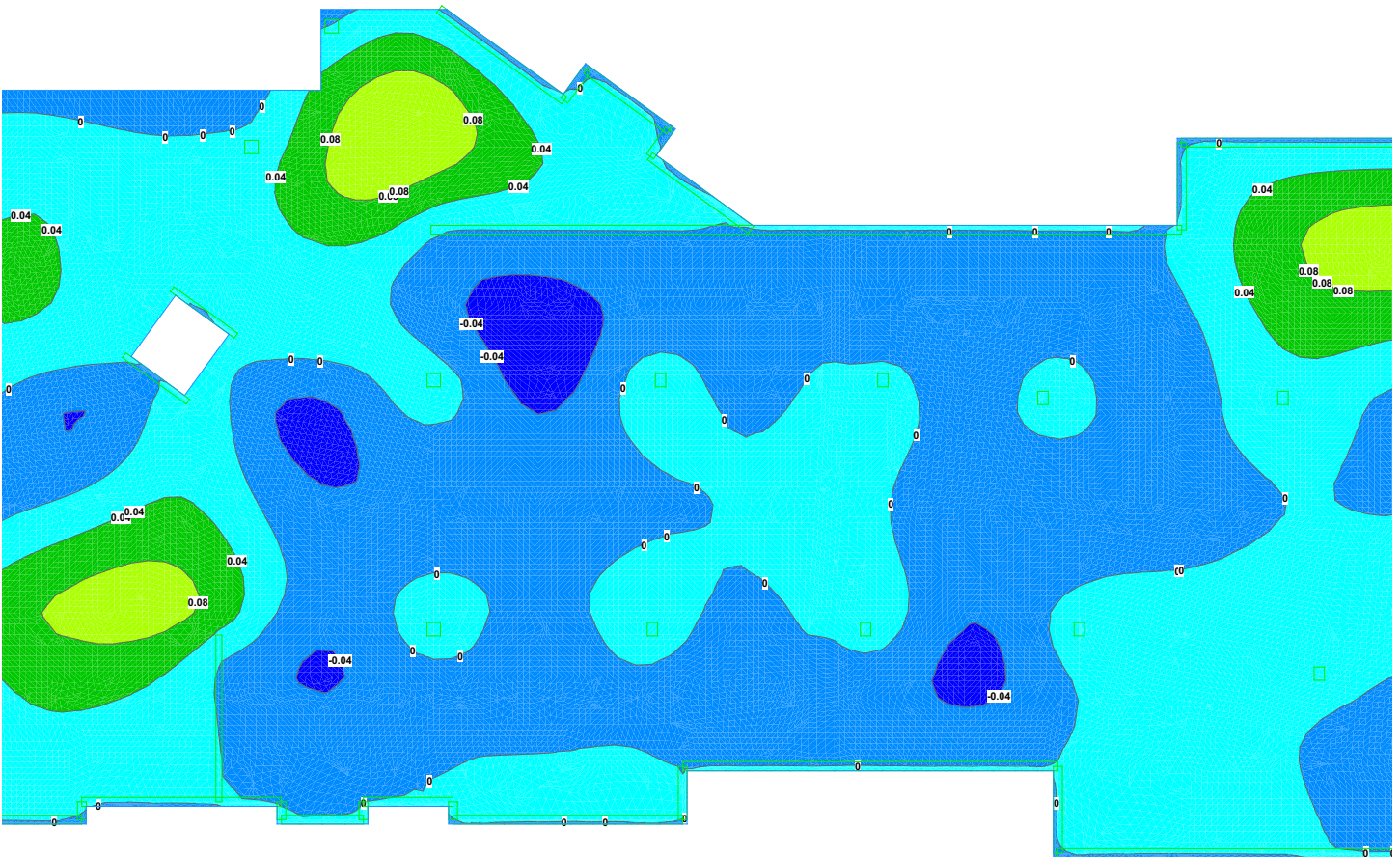


Service LC: D + Lr: Max Deflection Plan

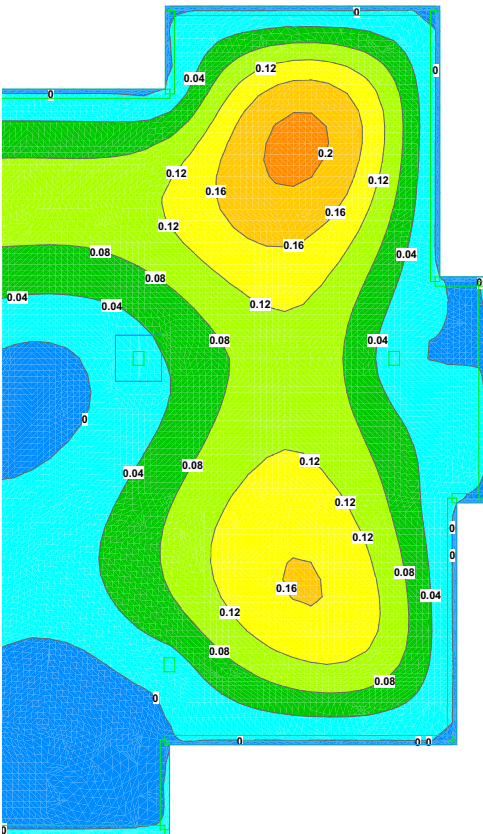
Service LC: D + Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Service LC: D + Lr - Vertical Deflection Plot (Maximum Values)
 Min Value = -0.1155 inches @ (-371.9,-83.18) Max Value = 0.3166 inches @ (-346.9,-109.2)



Service LC: D + Lr: Max Deflection Plan (2)

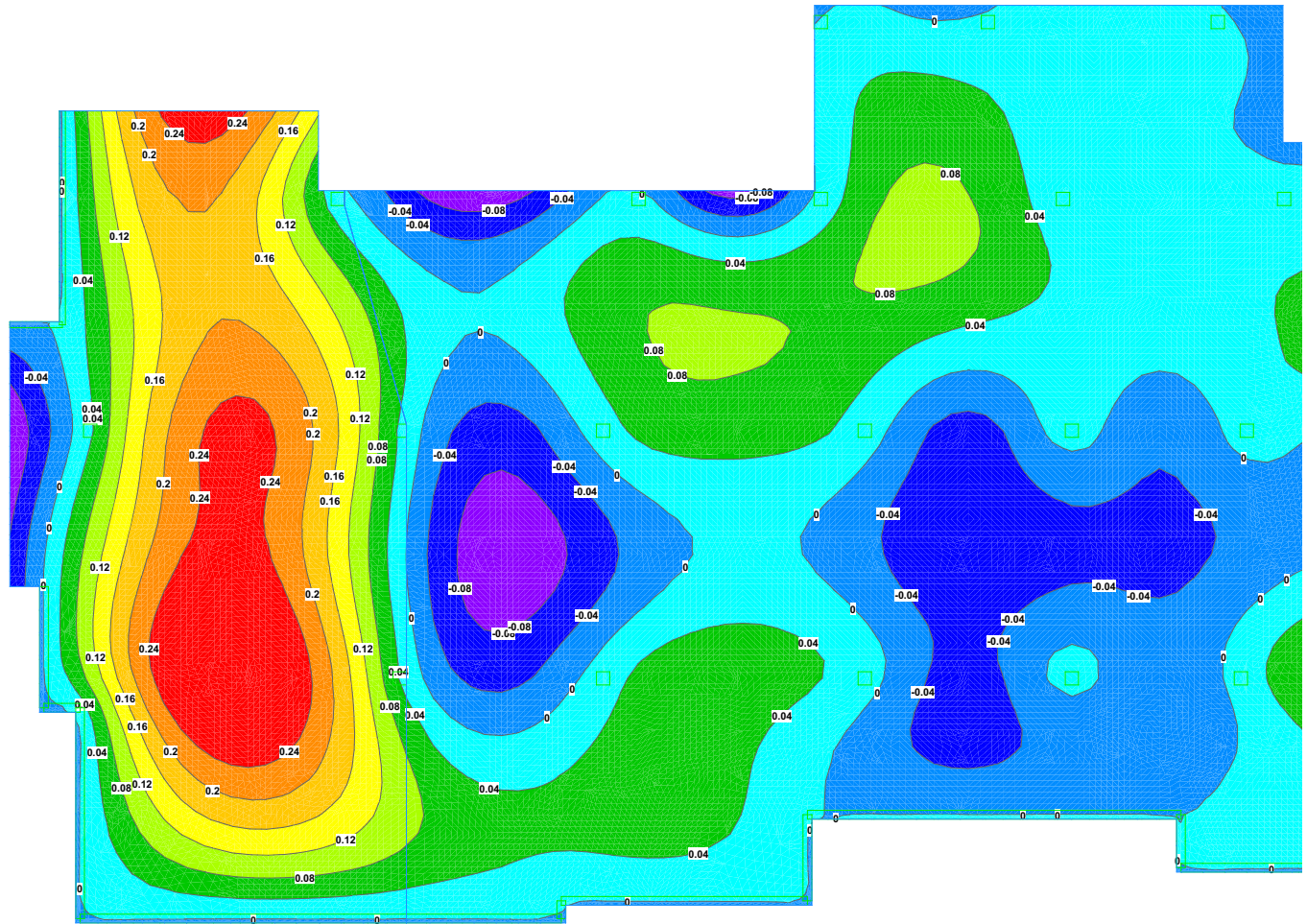


Service LC: D + Lr: Max Deflection Plan (3)

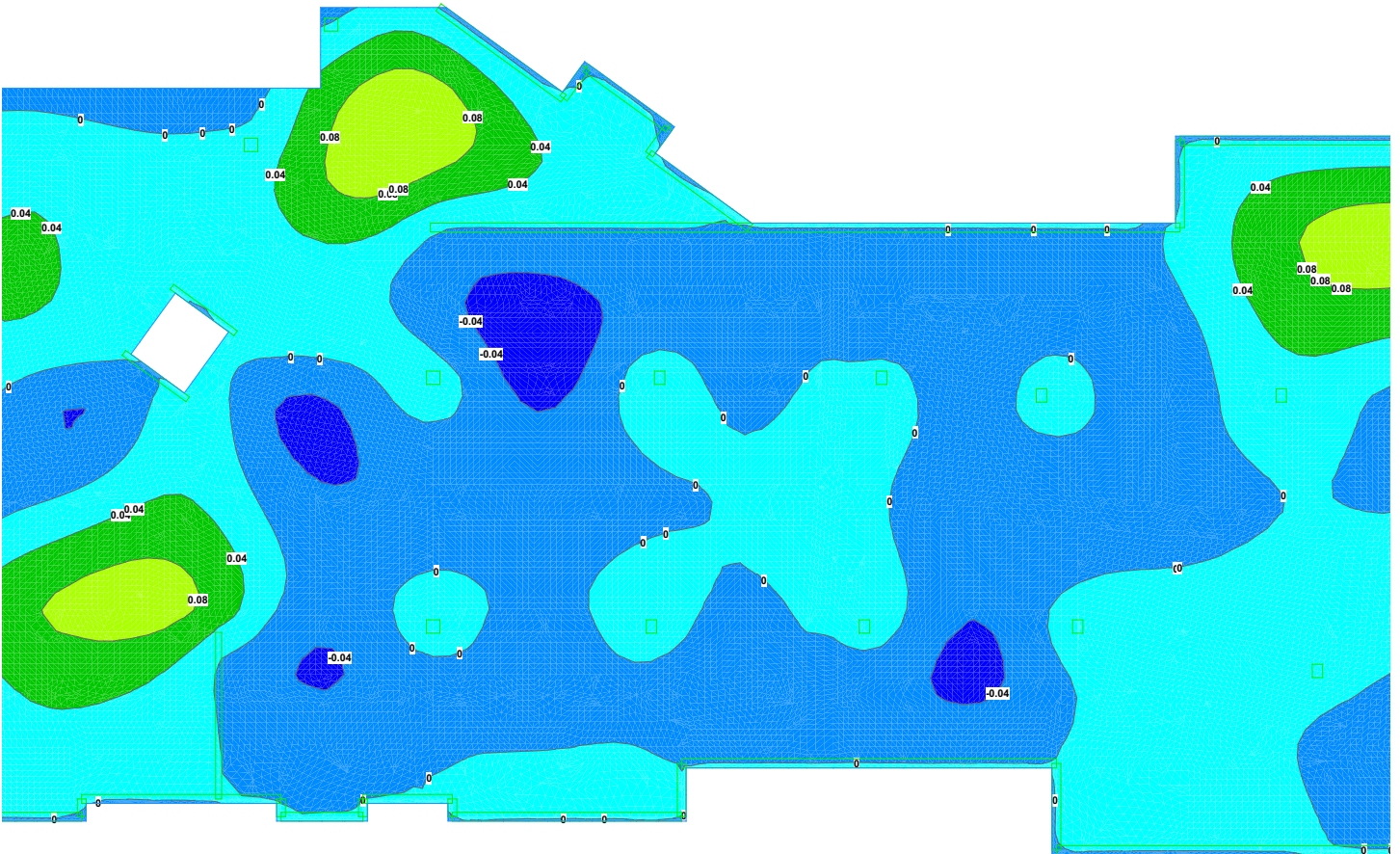


Service LC: D + Lr: Min Deflection Plan

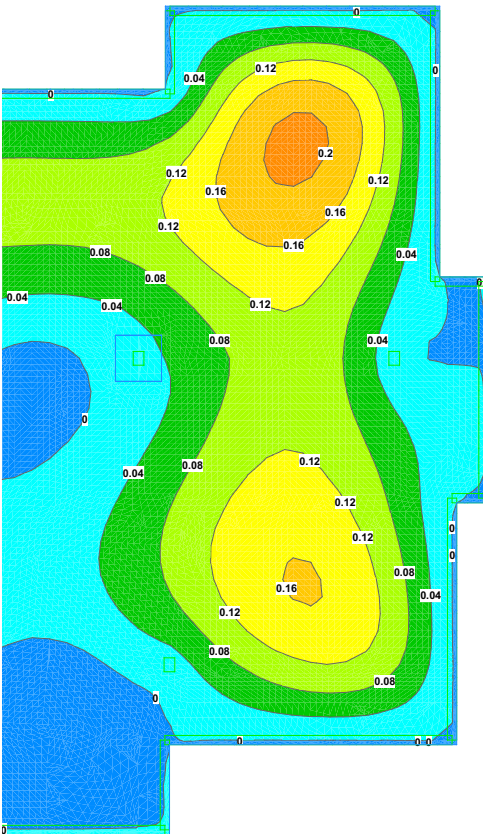
Service LC: D + Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Service LC: D + Lr - Vertical Deflection Plot (Minimum Values)
 Min Value = -0.1155 inches @ (-371.9,-83.18) Max Value = 0.3166 inches @ (-346.9,-109.2)



Service LC: D + Lr: Min Deflection Plan (2)



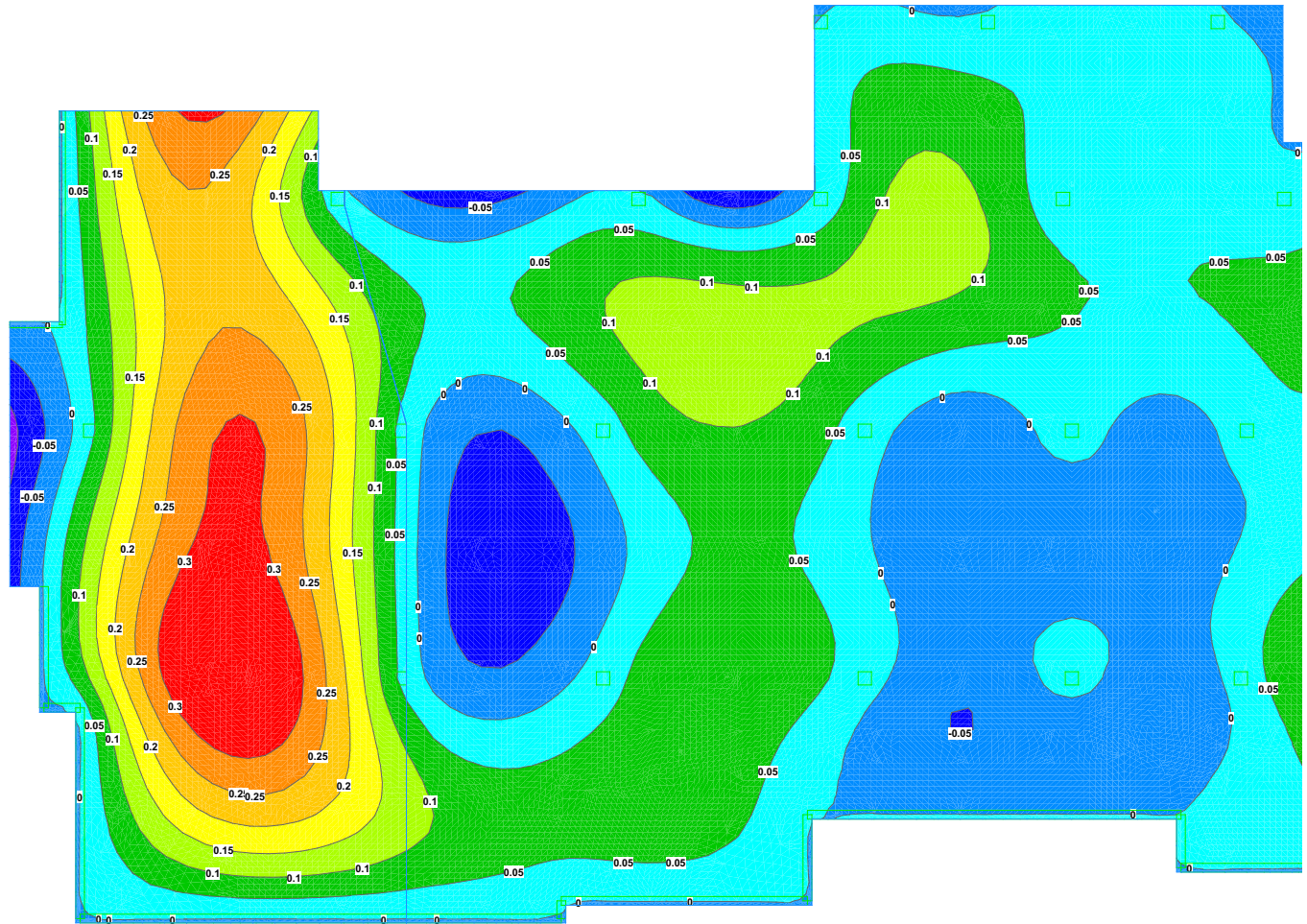
Service LC: D + Lr: Min Deflection Plan (3)



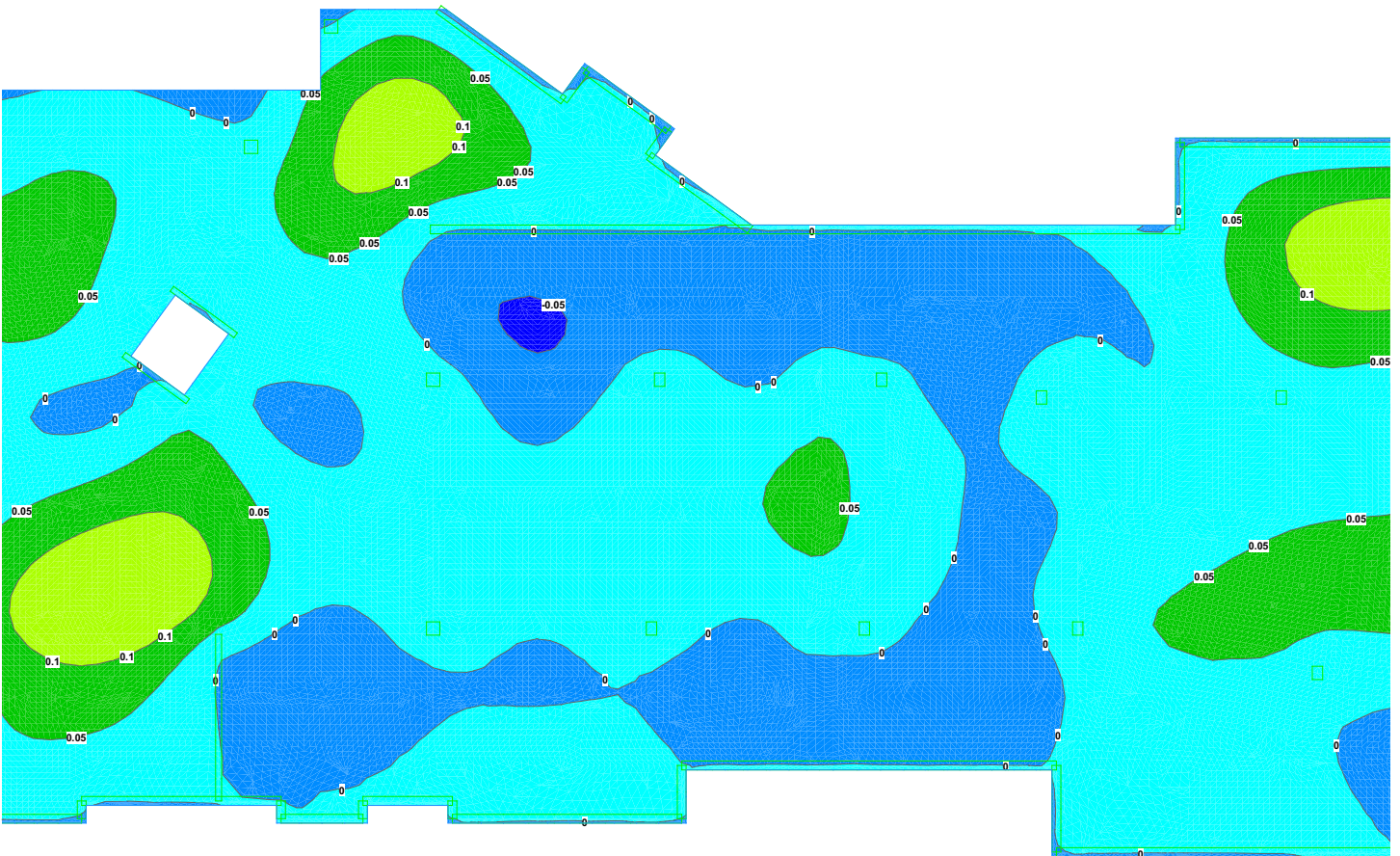
Service LC: D + S: Max Deflection Plan

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)

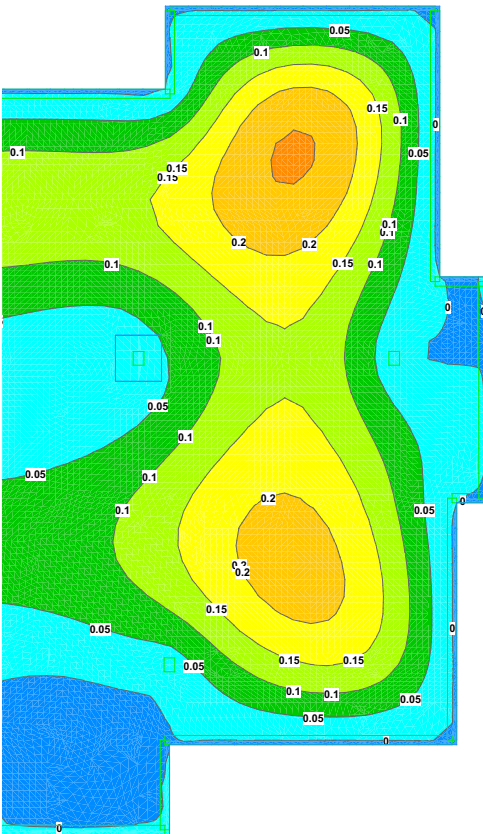
Min Value = -0.1155 inches @ (-371.9, -83.18) Max Value = 0.3752 inches @ (-346.9, -109.2)



Service LC: D + S: Max Deflection Plan (2)

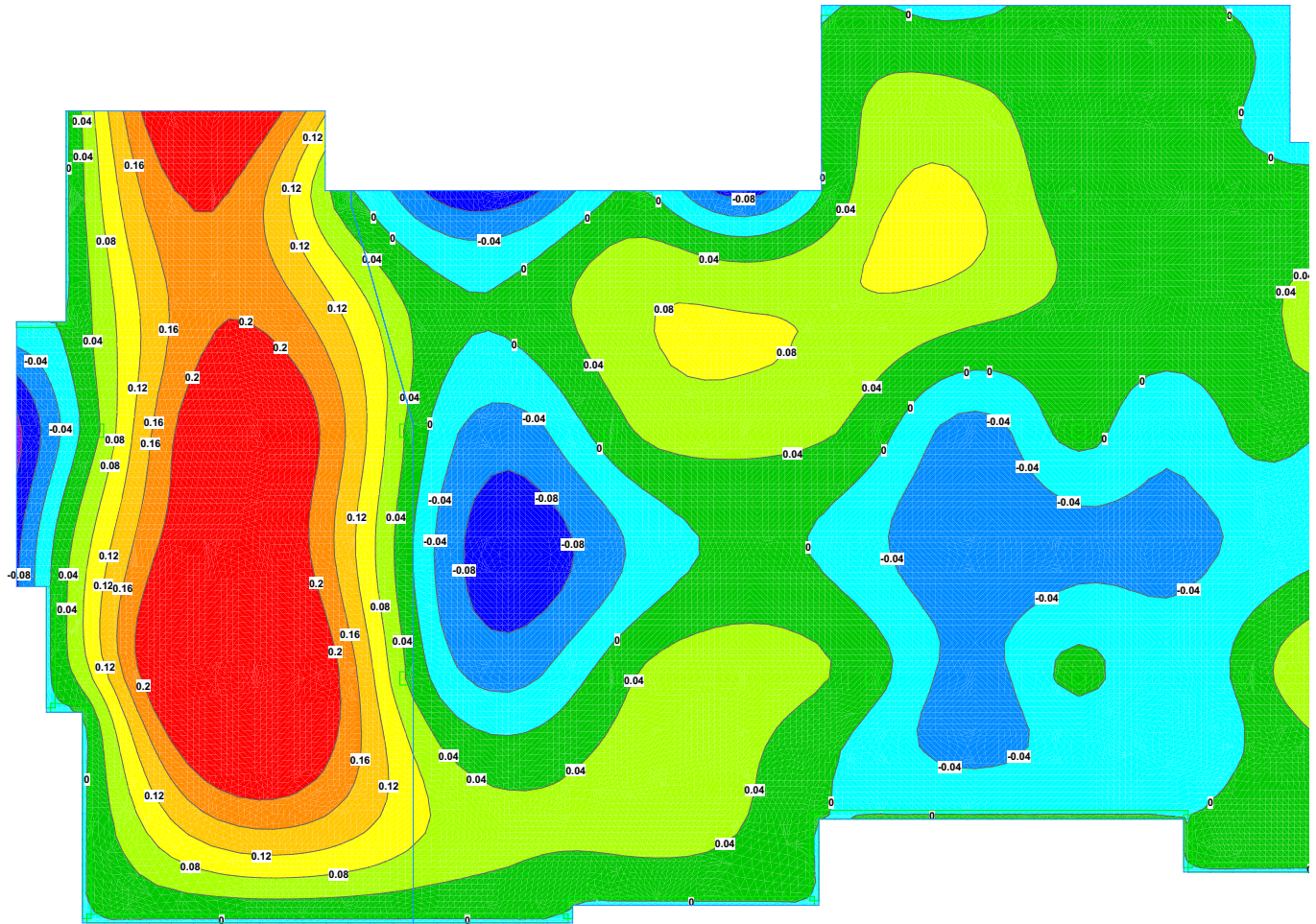


Service LC: D + S: Max Deflection Plan (3)

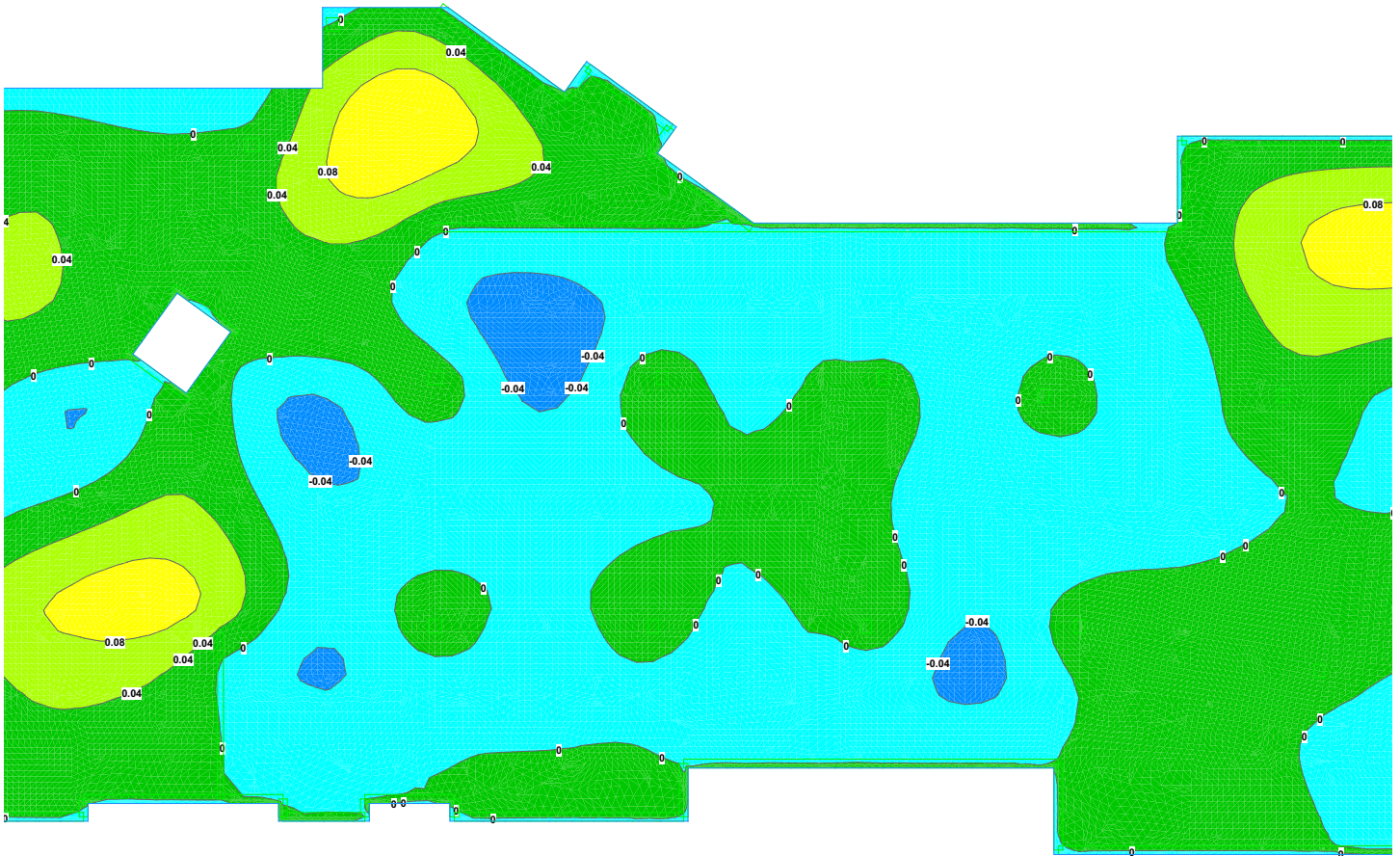


Service LC: D + S: Min Deflection Plan

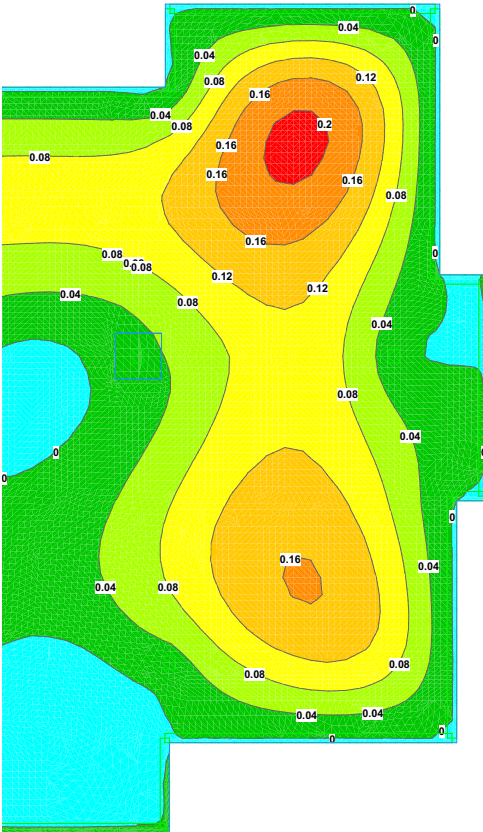
Service LC: D + S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Service LC: D + S - Vertical Deflection Plot (Minimum Values)
 Min Value = -0.1313 inches @ (-371.9,-84.94) Max Value = 0.3166 inches @ (-346.9,-109.2)



Service LC: D + S: Min Deflection Plan (2)

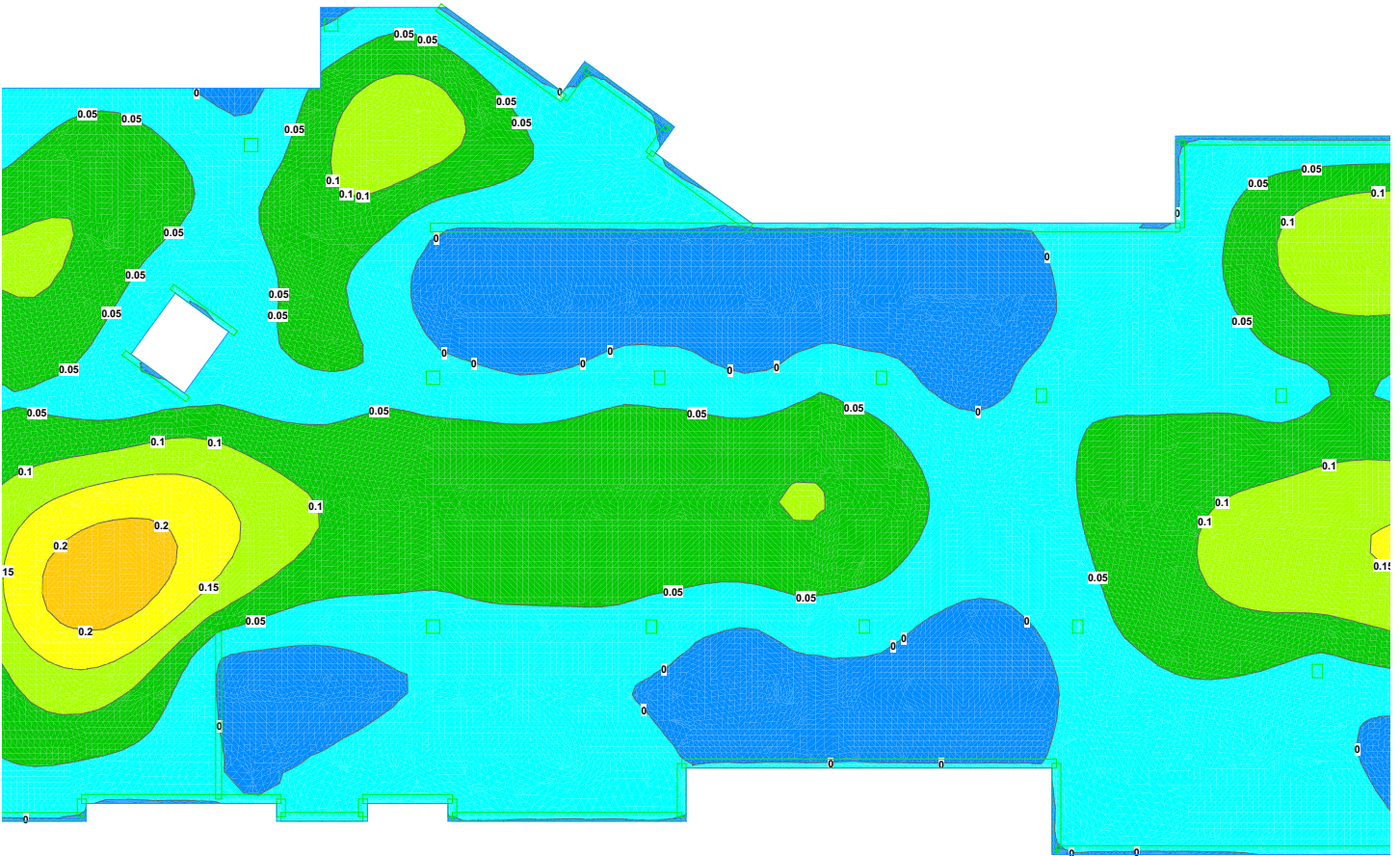


Service LC: D + S: Min Deflection Plan (3)

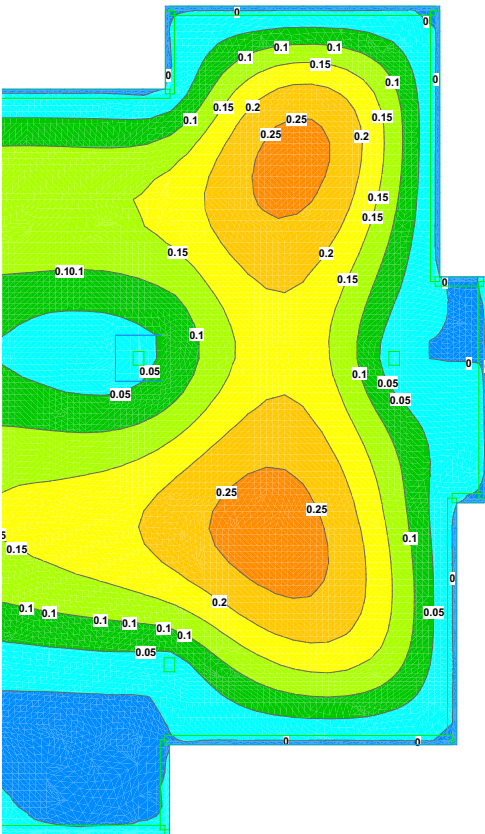


A complex contour plot showing a function landscape. The plot features a prominent red peak on the left side, indicating a local maximum, and several blue valleys, indicating local minima. The color scale ranges from -0.05 (dark blue) to 0.3 (red). The plot includes a grid of points and contour lines. The axes are labeled with values from 0 to 0.3. The plot is divided into several regions by contour lines, with the highest values concentrated in the red peak and the lowest values in the blue valleys. The plot is a 2D representation of a function, likely a cost function or a fitness function, used in optimization algorithms. The plot is a 2D representation of a function, likely a cost function or a fitness function, used in optimization algorithms. The plot is a 2D representation of a function, likely a cost function or a fitness function, used in optimization algorithms.

Service LC: D + 0.75L + 0.75Lr: Max Deflection Plan (2)

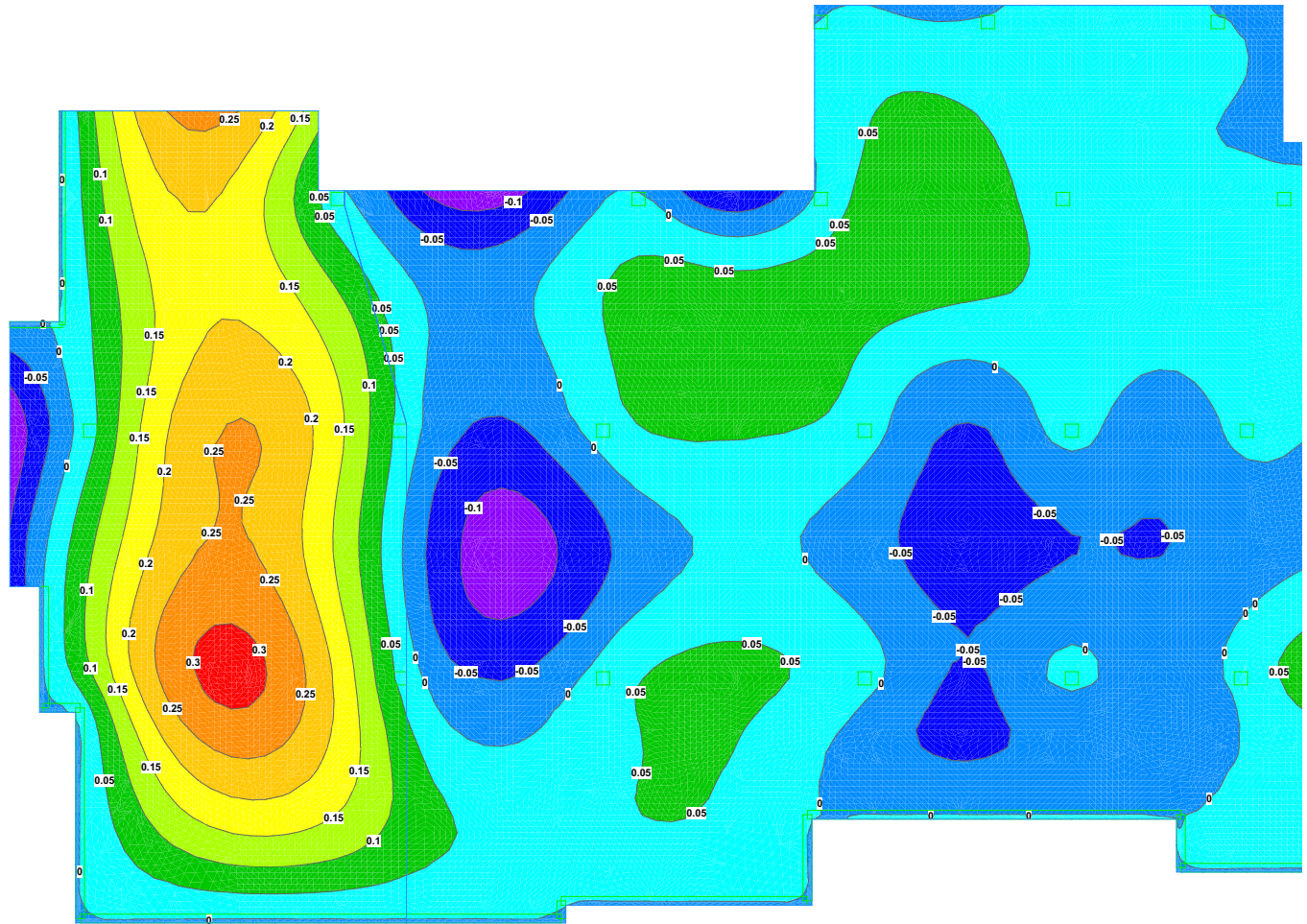


Service LC: D + 0.75L + 0.75Lr: Max Deflection Plan (3)

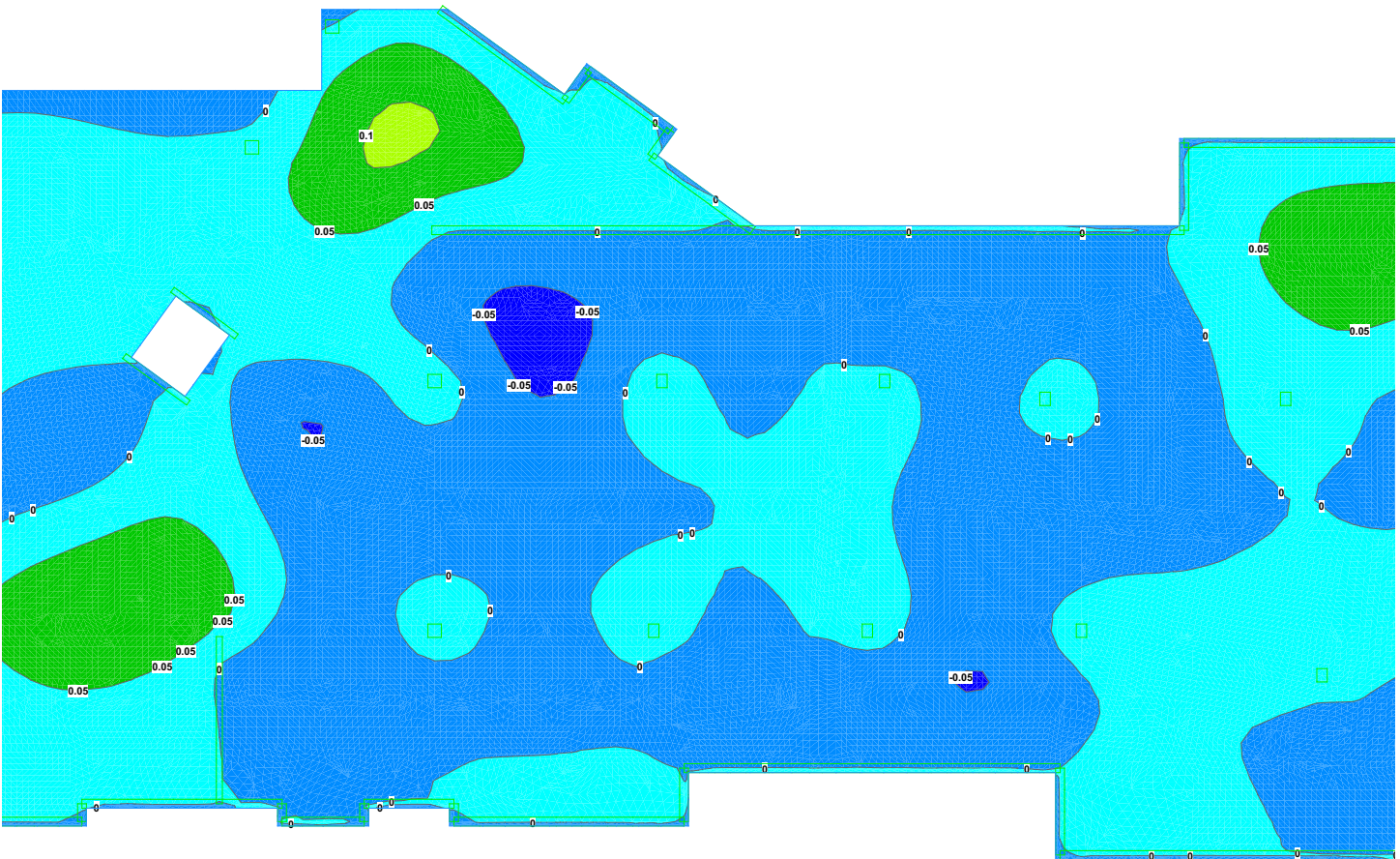


Service LC: D + 0.75L + 0.75Lr: Min Deflection Plan

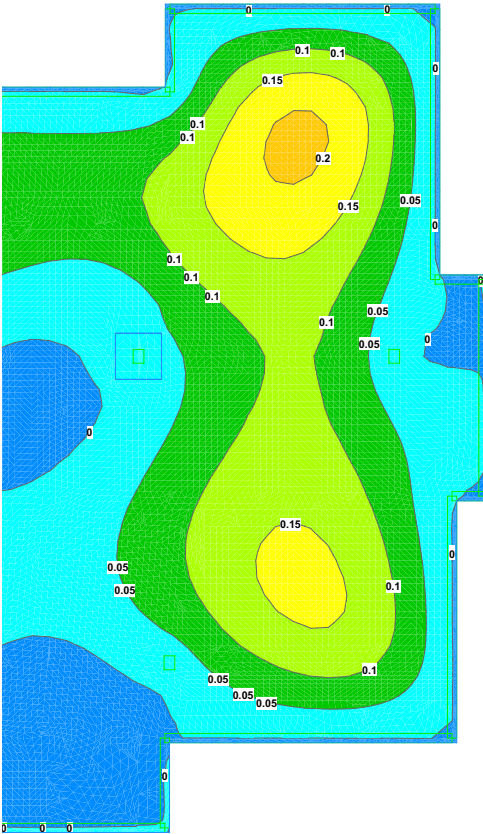
Service LC: D + 0.75L + 0.75Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75Lr - Vertical Deflection Plot (Minimum Values)
Min Value = -0.1389 inches @ (-371.9,-83.18) Max Value = 0.3166 inches @ (-346.9,-109.2)



Service LC: D + 0.75L + 0.75Lr: Min Deflection Plan (2)

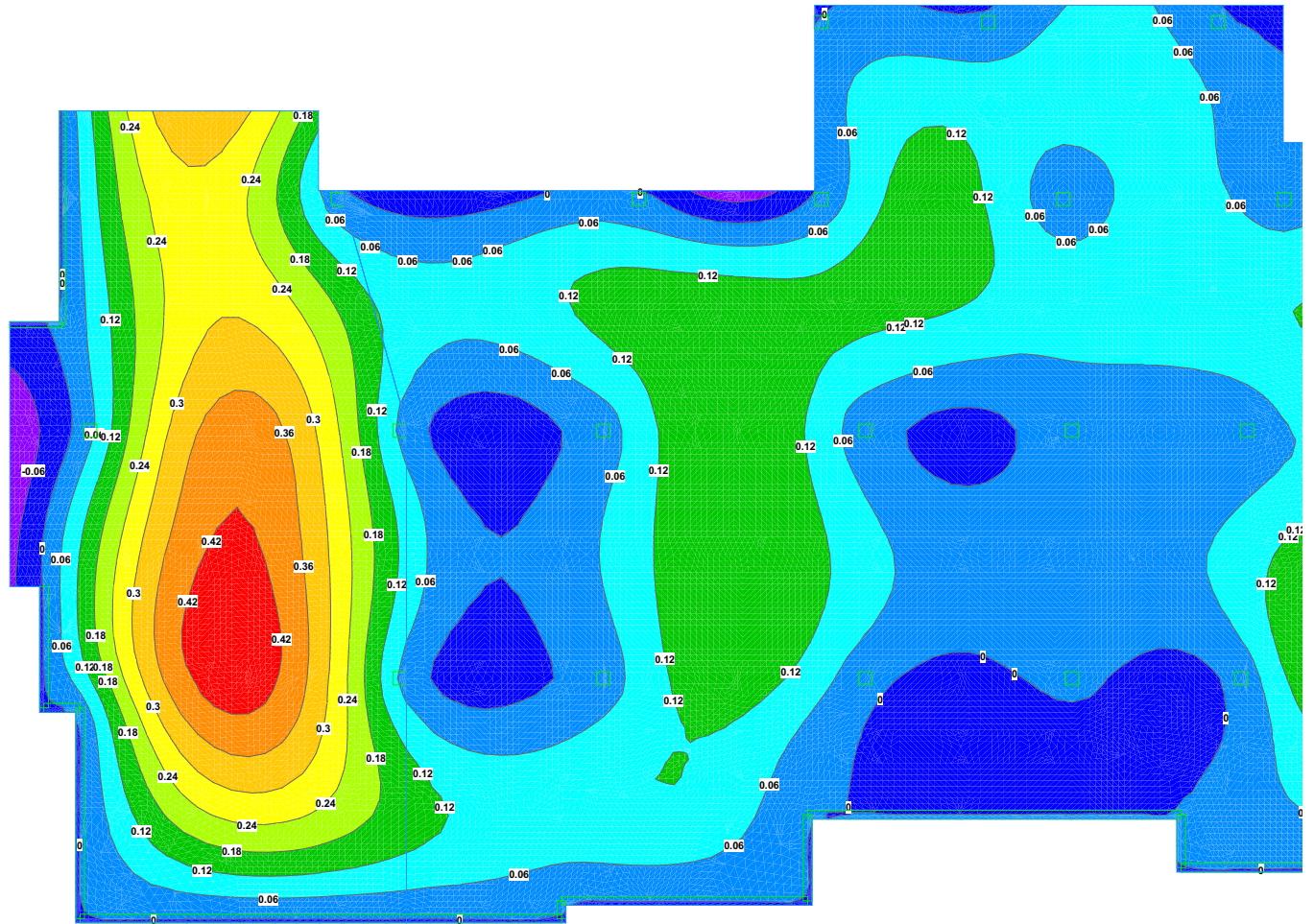


Service LC: D + 0.75L + 0.75Lr: Min Deflection Plan (3)

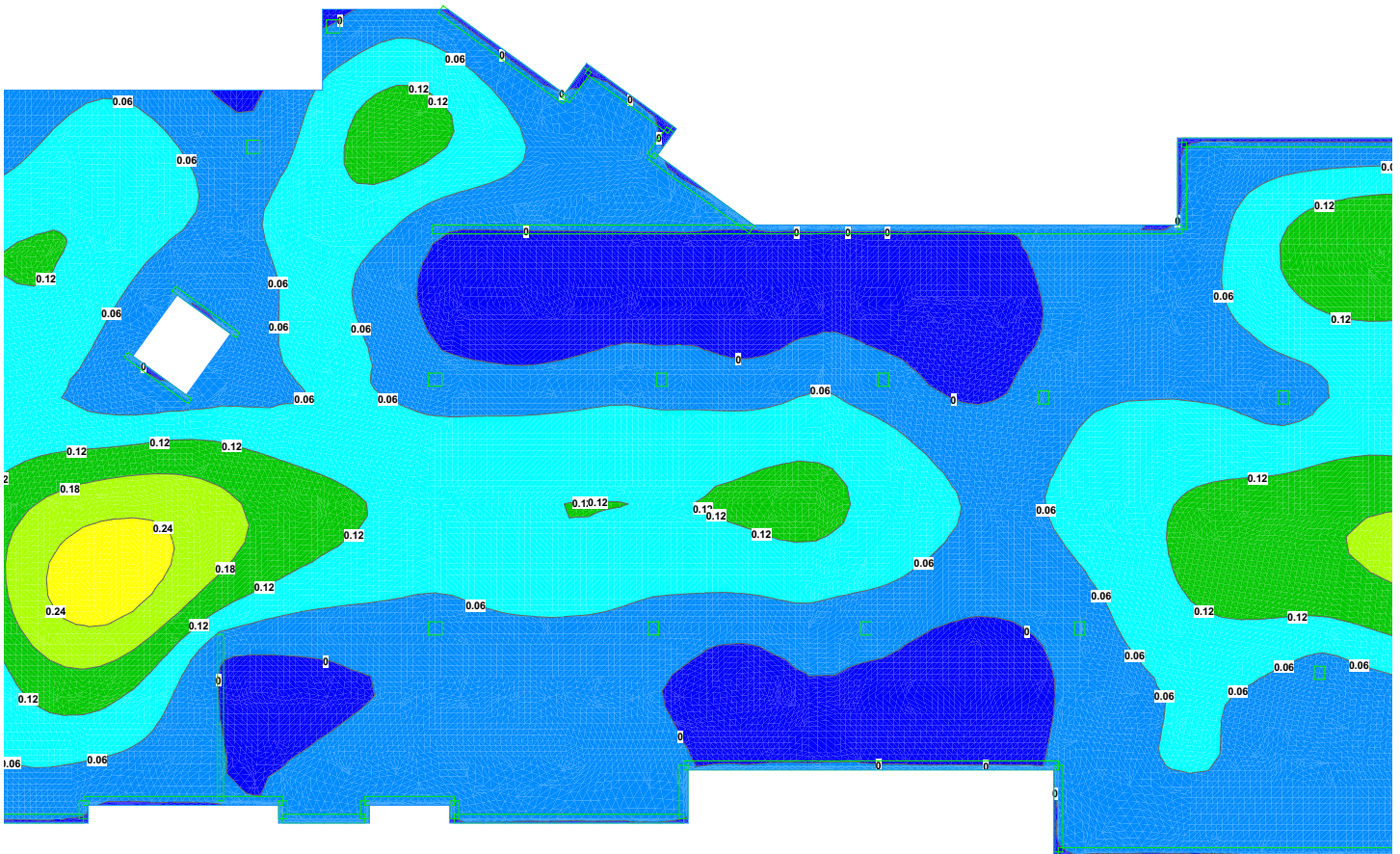


Service LC: D + 0.75L + 0.75S: Max Deflection Plan

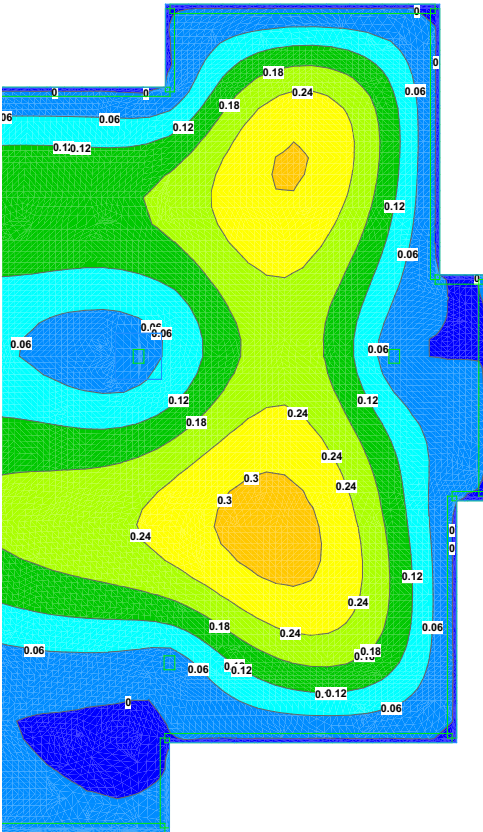
Service LC: D + 0.75L + 0.75S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75S - Vertical Deflection Plot (Maximum Values)
Min Value = -0.1155 inches @ (-371.9,-83.18) Max Value = 0.4652 inches @ (-346.9,-107.3)



Service LC: D + 0.75L + 0.75S: Max Deflection Plan (2)

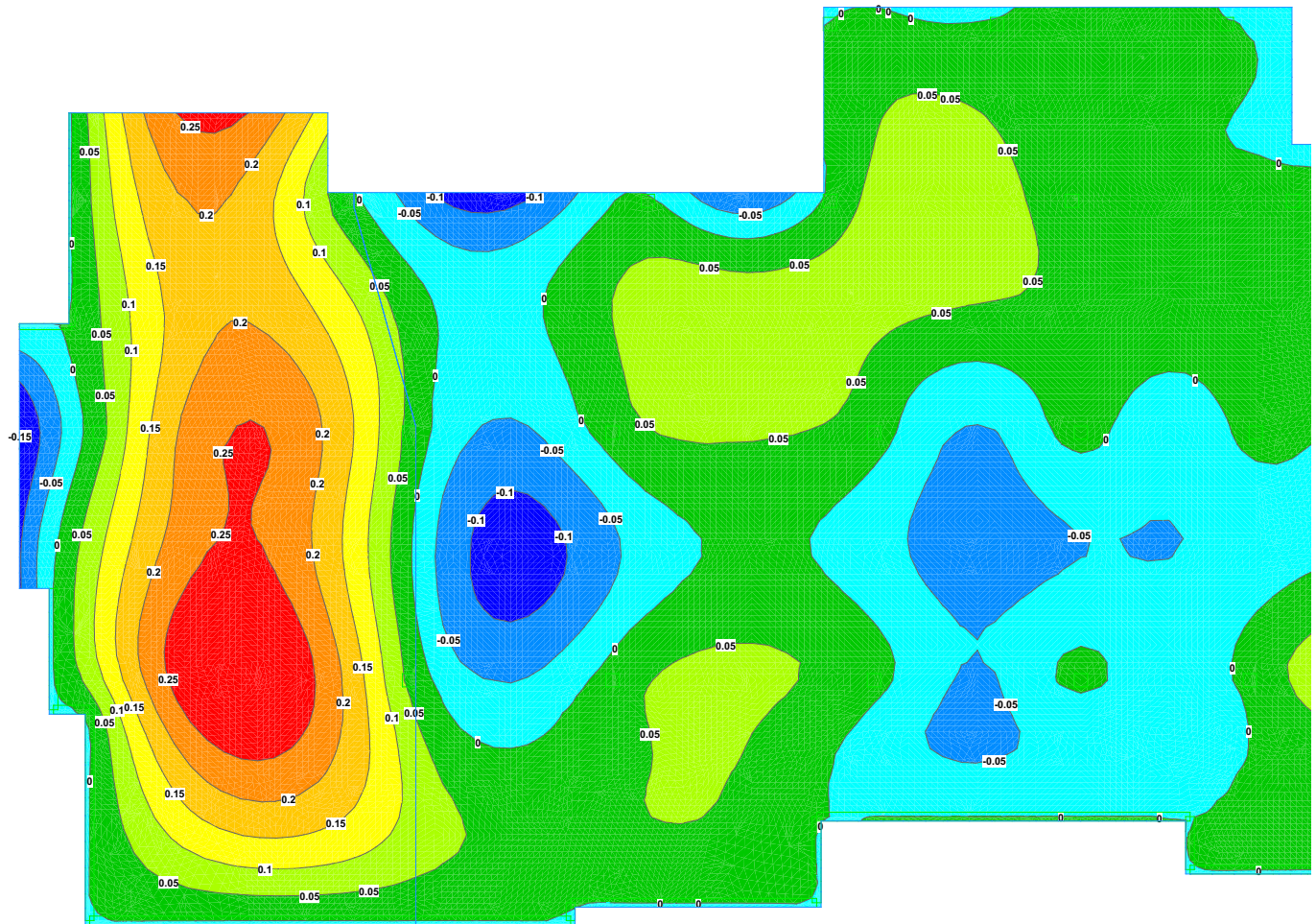


Service LC: D + 0.75L + 0.75S: Max Deflection Plan (3)

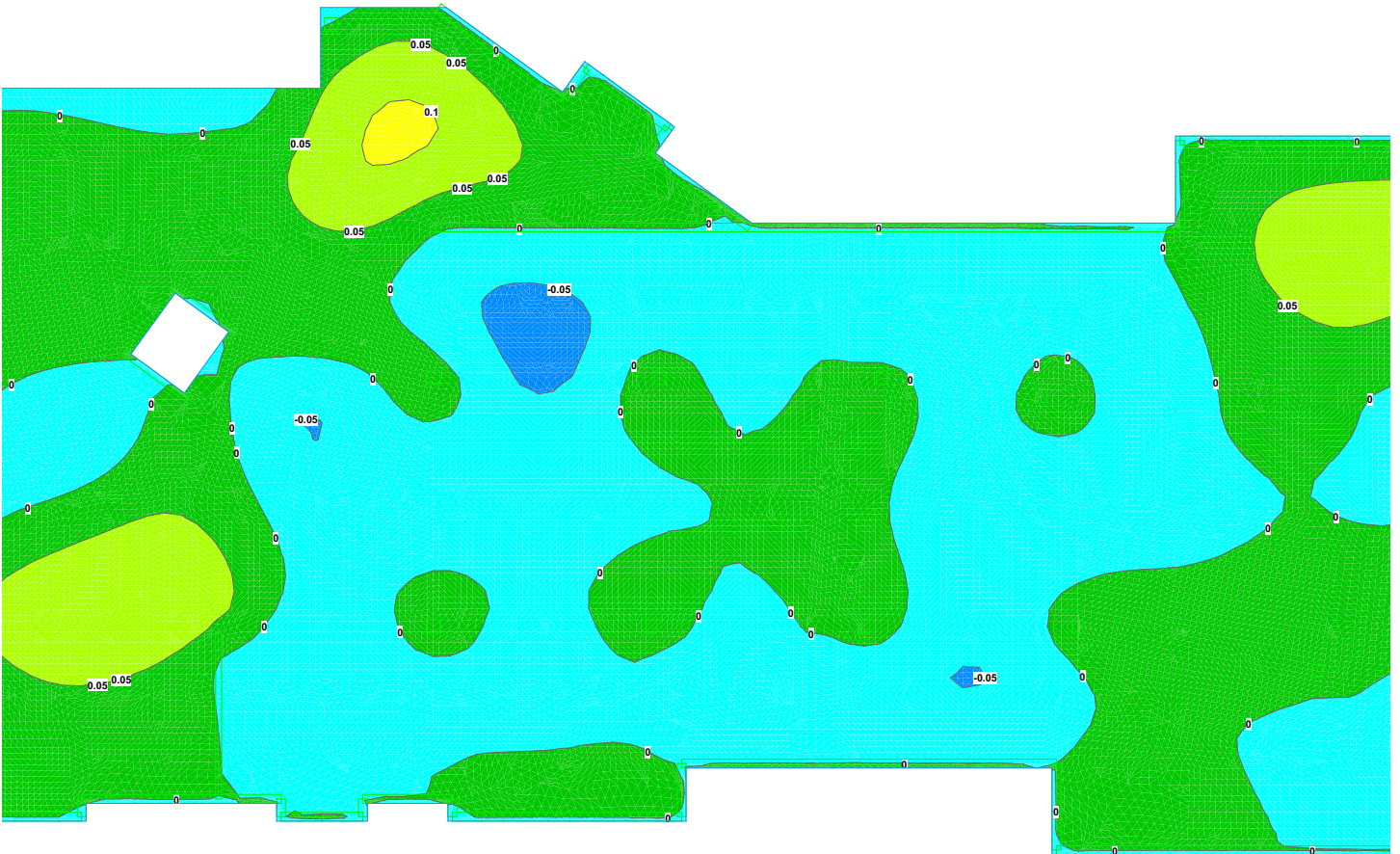


Service LC: D + 0.75L + 0.75S: Min Deflection Plan

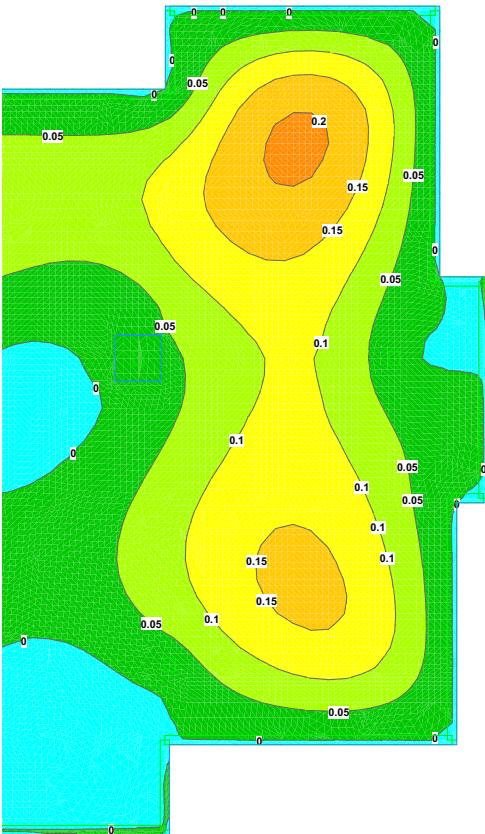
Service LC: D + 0.75L + 0.75S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75S - Vertical Deflection Plot (Minimum Values)
Min Value = -0.1507 inches @ (-371.9,-83.18) Max Value = 0.3166 inches @ (-346.9,-109.2)



Service LC: D + 0.75L + 0.75S: Min Deflection Plan (2)

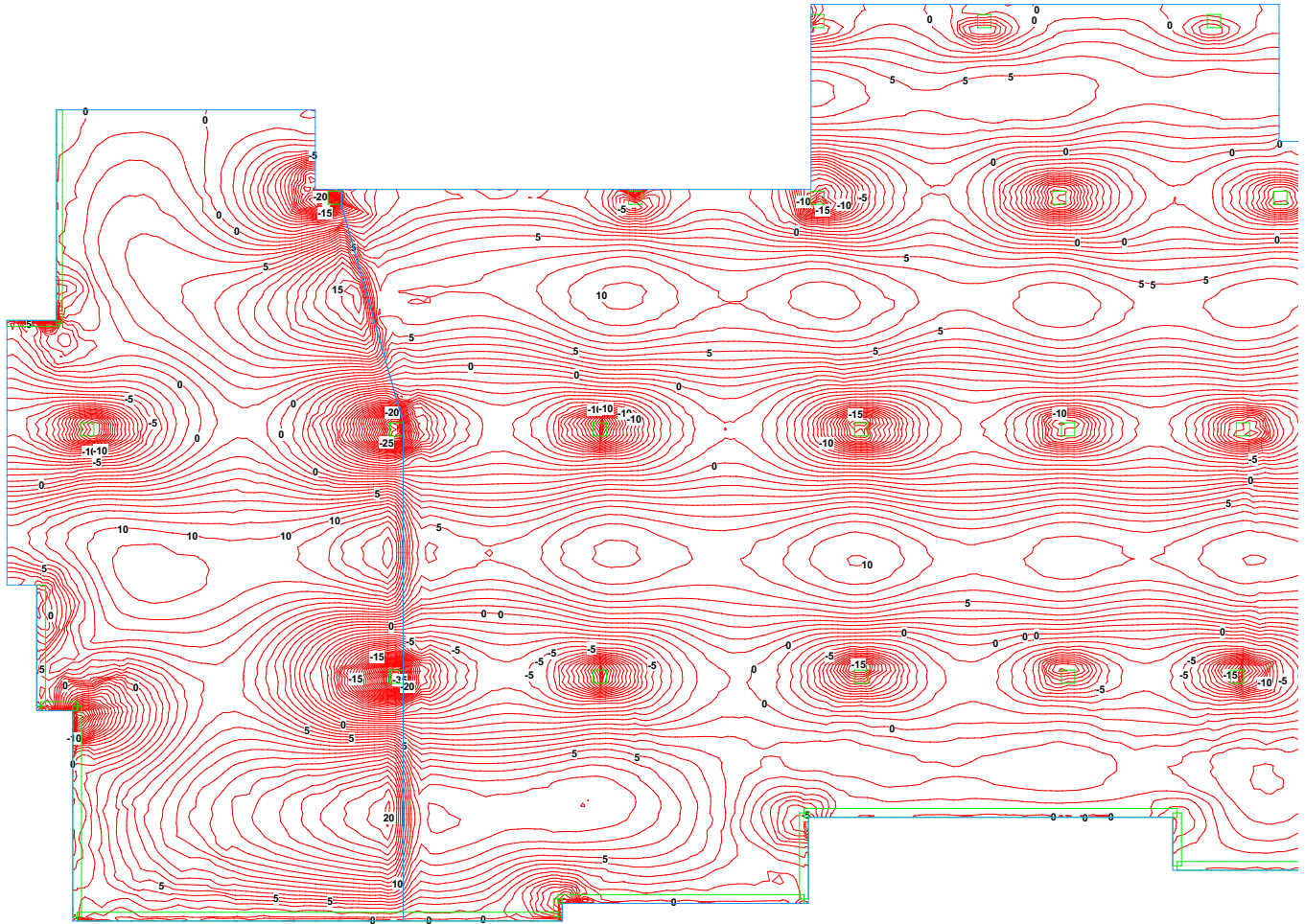


Service LC: D + 0.75L + 0.75S: Min Deflection Plan (3)

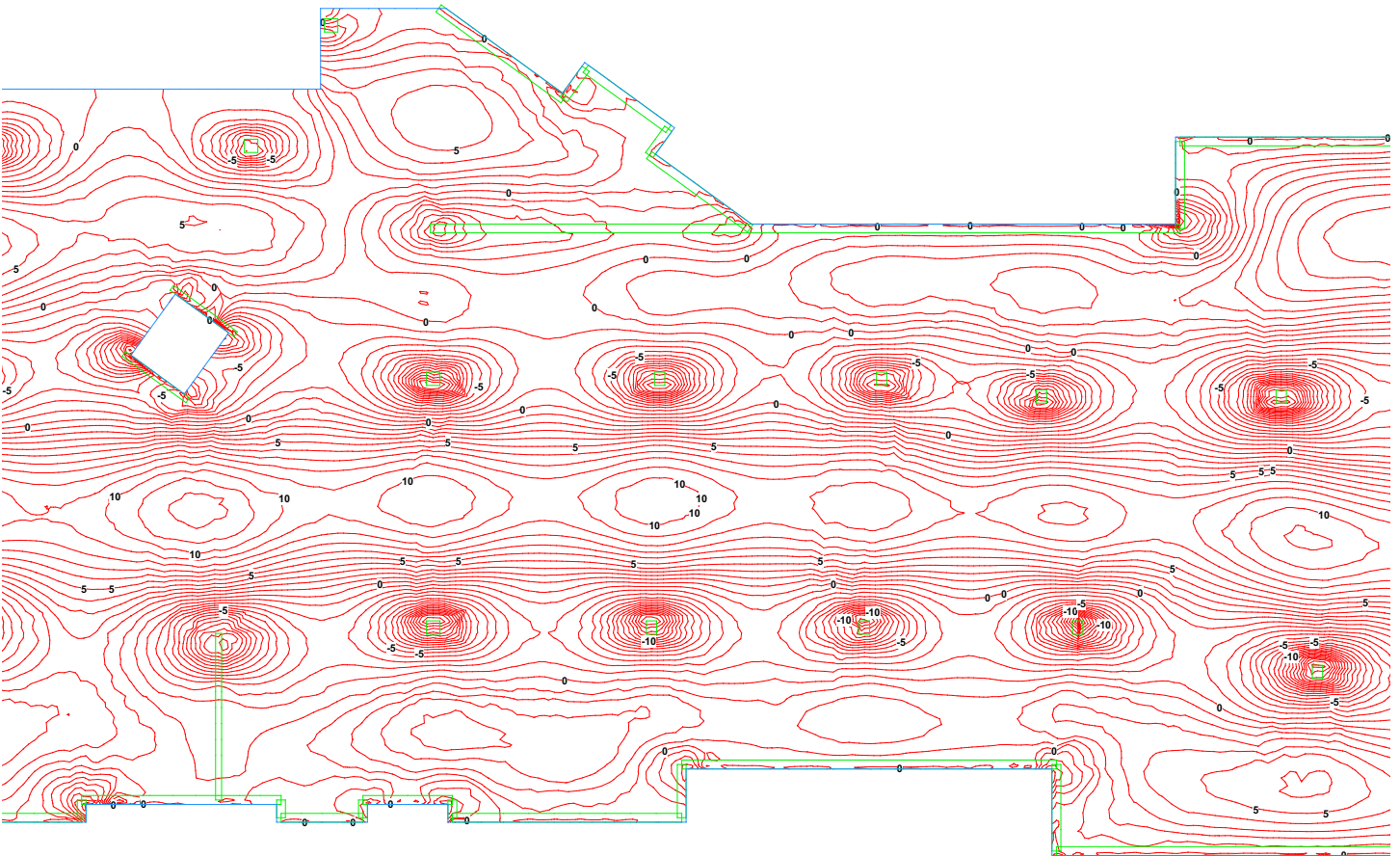


Factored LC: 1.4D: Max Mx Plan

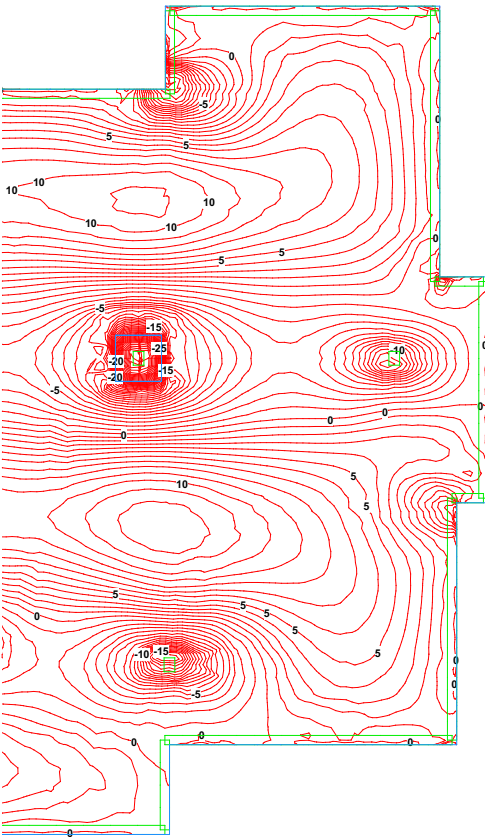
Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.4D - Bending Moment Plot (Maximum Values) (X-Axis Direction)
 One Contour = 1 Kips
 Min Value = -38.7 Kips @ (-54.85,-86.43) Max Value = 19.74 Kips @ (-328.4,-126.7)



Factored LC: 1.4D: Max Mx Plan (2)



Factored LC: 1.4D: Max Mx Plan (3)



Factored LC: 1.4D: Min Mx Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;

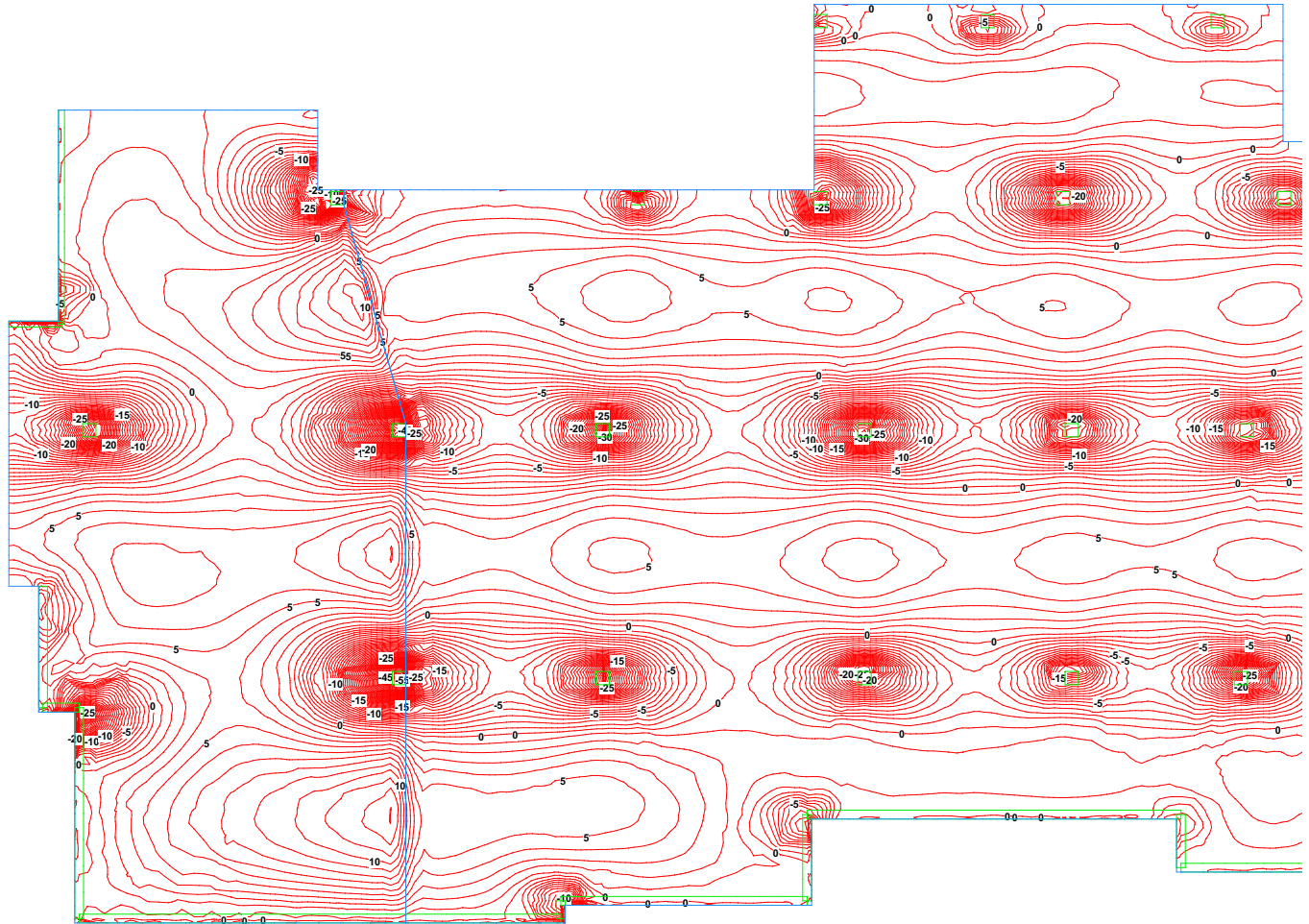
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1:250

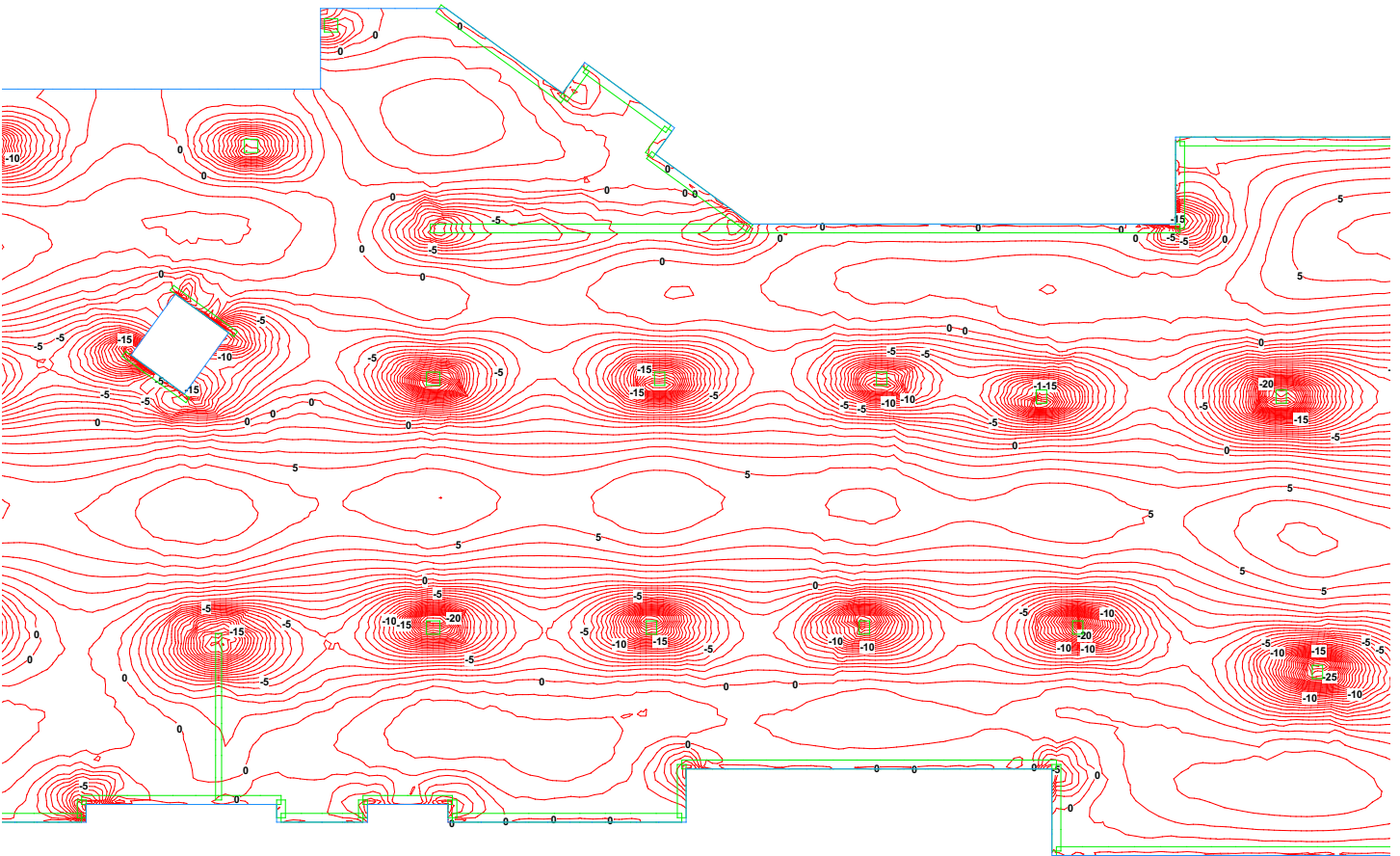
Factored LC: 1.4D - Bending Moment Plot (Minimum Values) (X-Axis Direction)

One Contour = 1 Kips

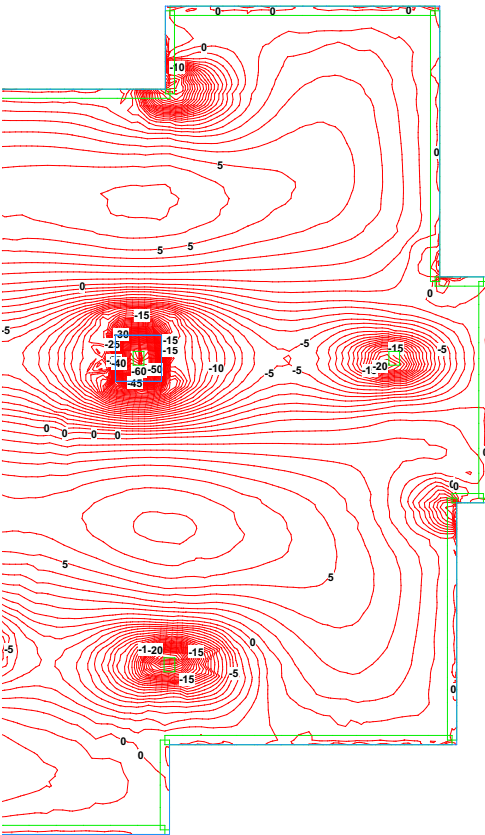
Min Value = -60.2 Kips @ (-54.85,-86.43) Max Value = 12.69 Kips @ (-328.4,-126.7)



Factored LC: 1.4D: Min Mx Plan (2)

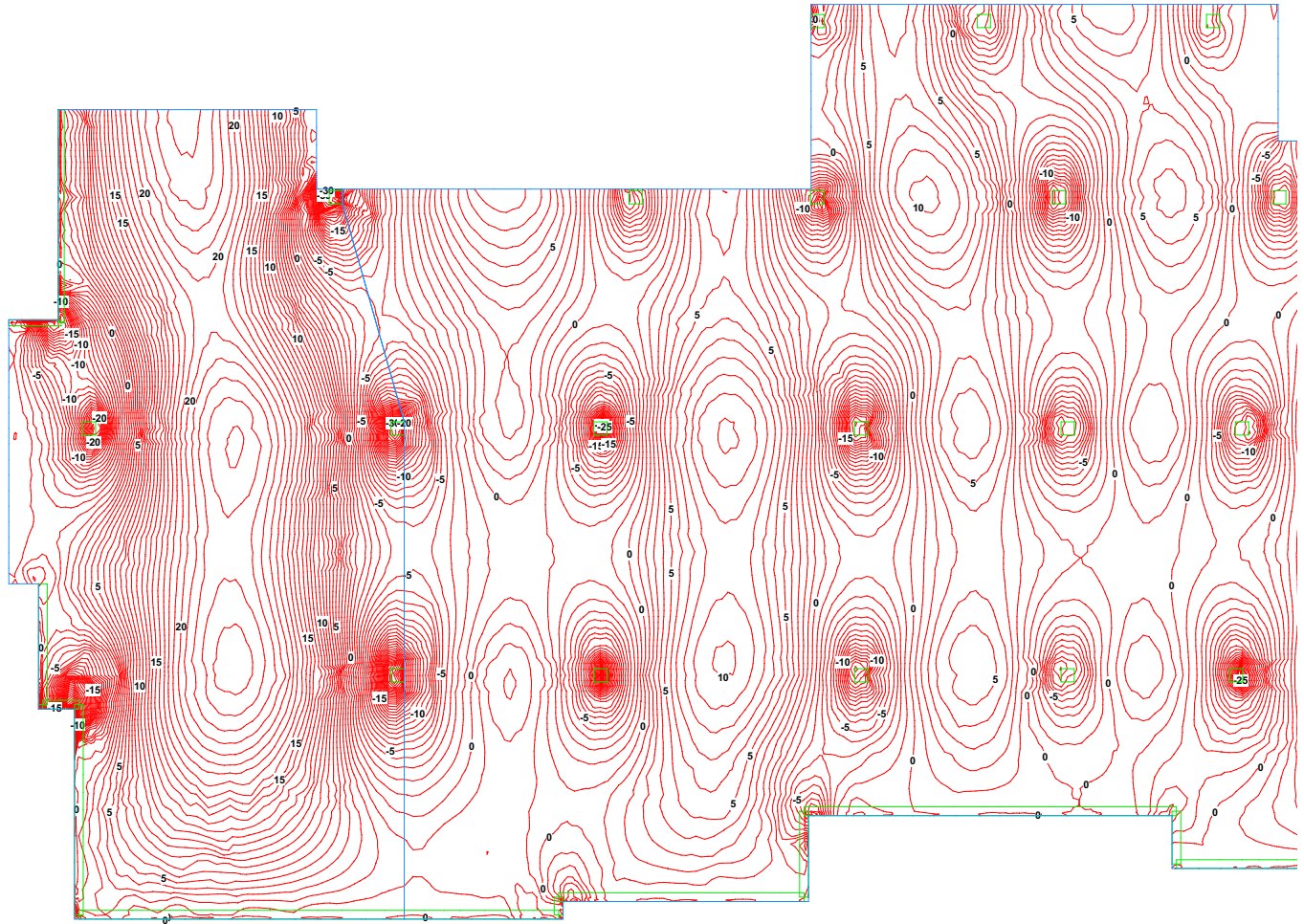


Factored LC: 1.4D: Min Mx Plan (3)

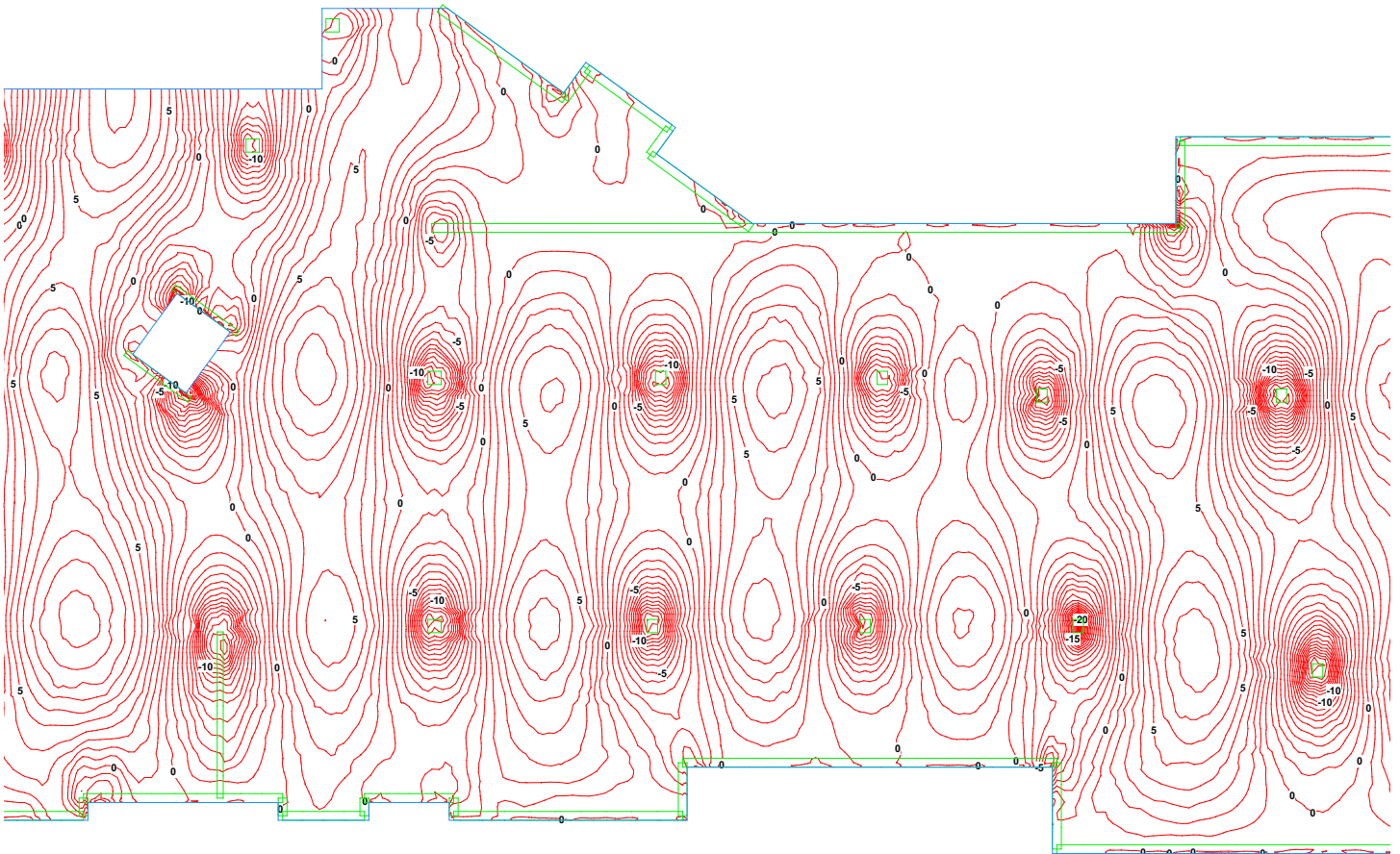


Factored LC: 1.4D: Max My Plan

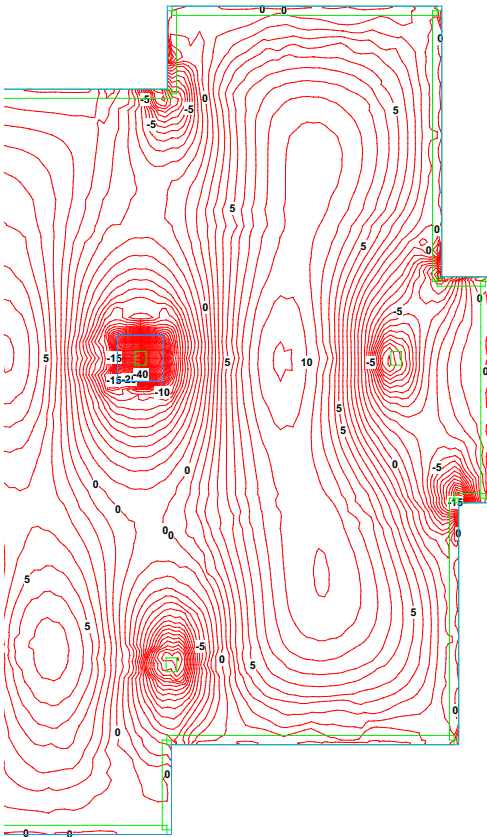
Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.4D - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
 One Contour = 1 Kips
 Min Value = -54.2 Kips @ (-54.64,-85.18) Max Value = 24.5 Kips @ (-345.9,-109.1)



Factored LC: 1.4D: Max My Plan (2)

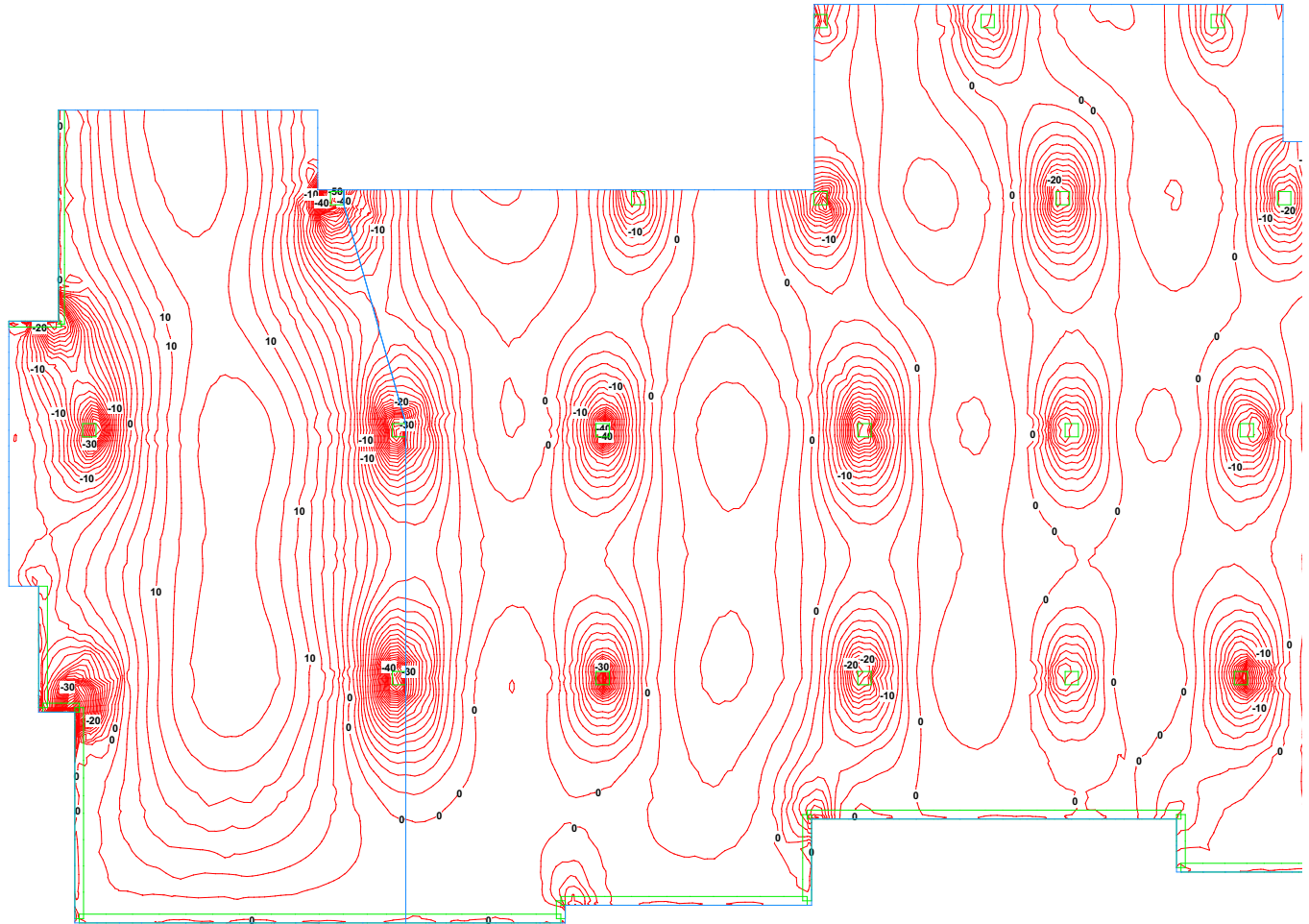


Factored LC: 1.4D: Max My Plan (3)

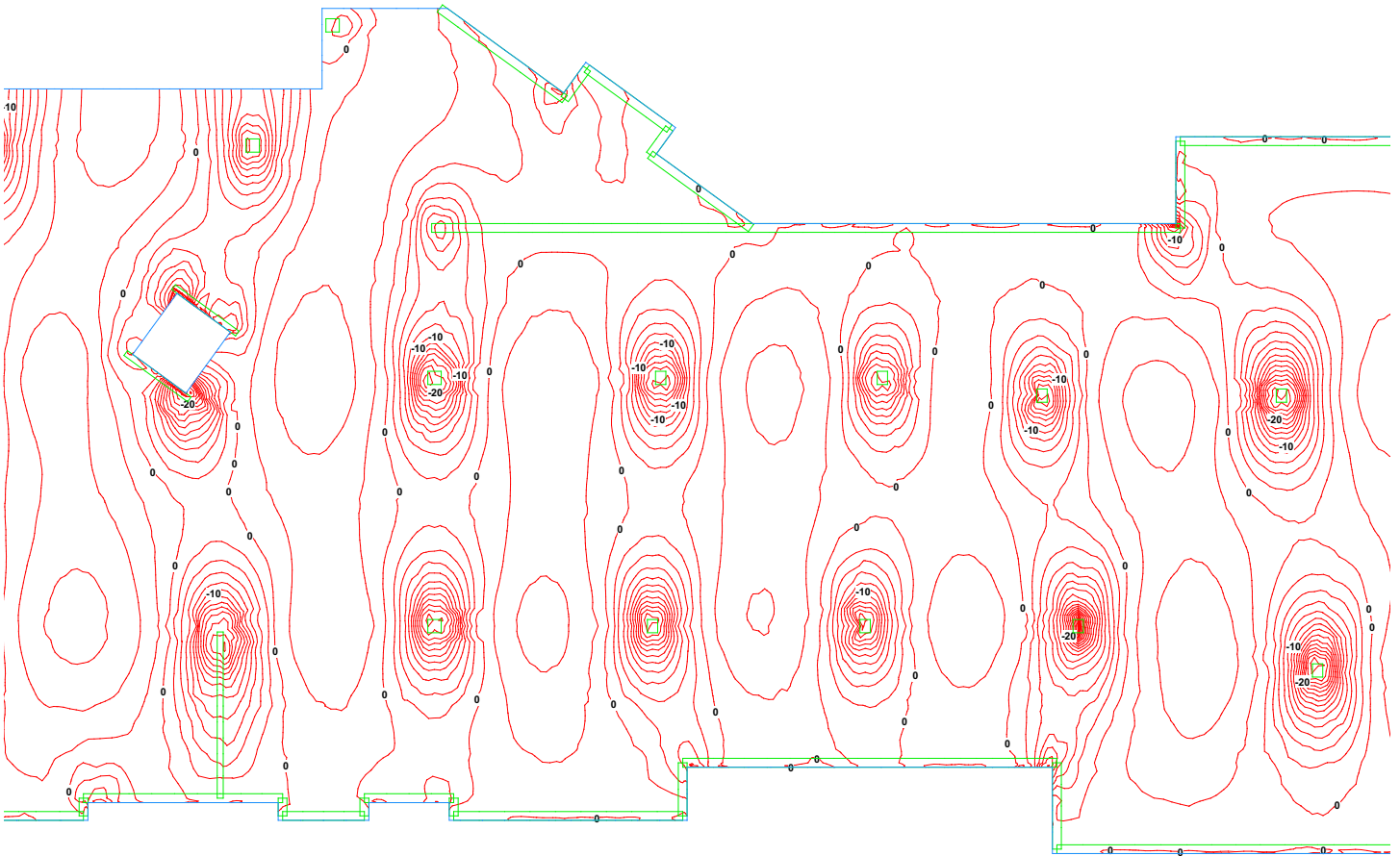


Factored LC: 1.4D: Min My Plan

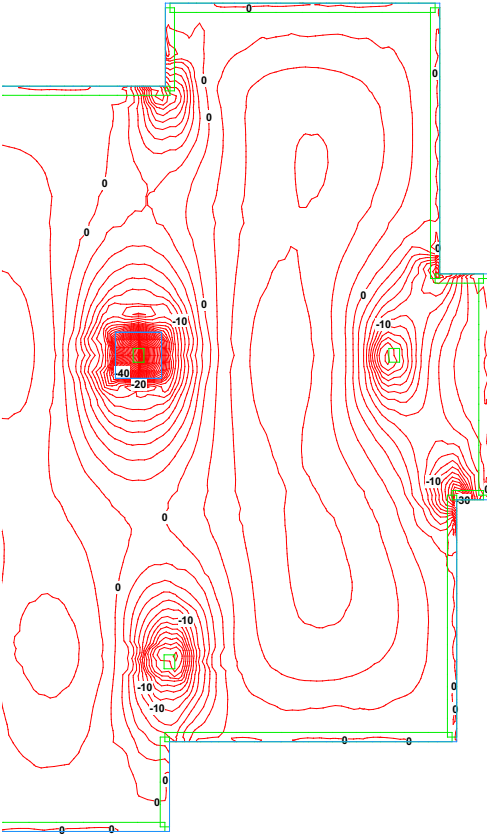
Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Contour = 2 Kips
Min Value = -84.32 Kips @ (-54.64,-85.18) Max Value = 15.75 Kips @ (-345.9,-109.1)



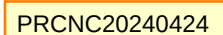
Factored LC: 1.4D: Min My Plan (2)



Factored LC: 1.4D: Min My Plan (3)

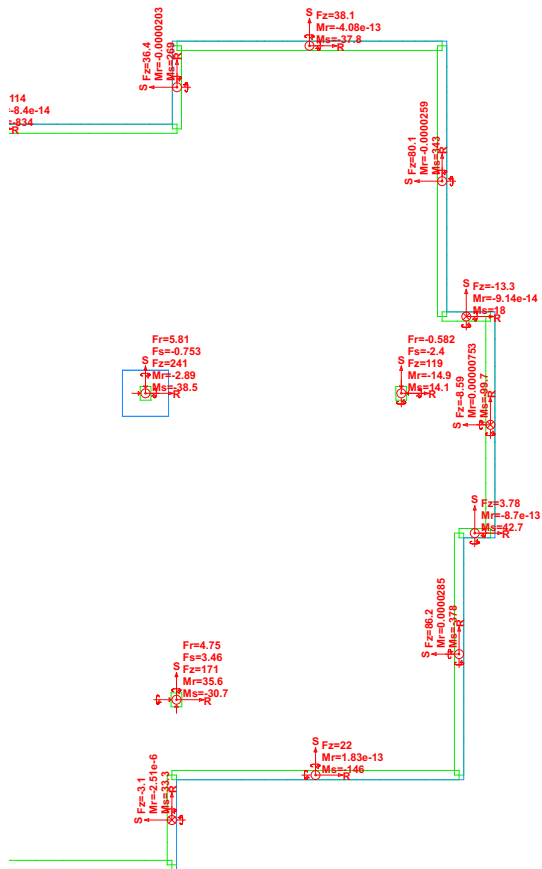


Factored LC: 1.4D - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Ms,Mz)(Standard Context)





Factored LC: 1.4D: Std Reactions Plan (3)



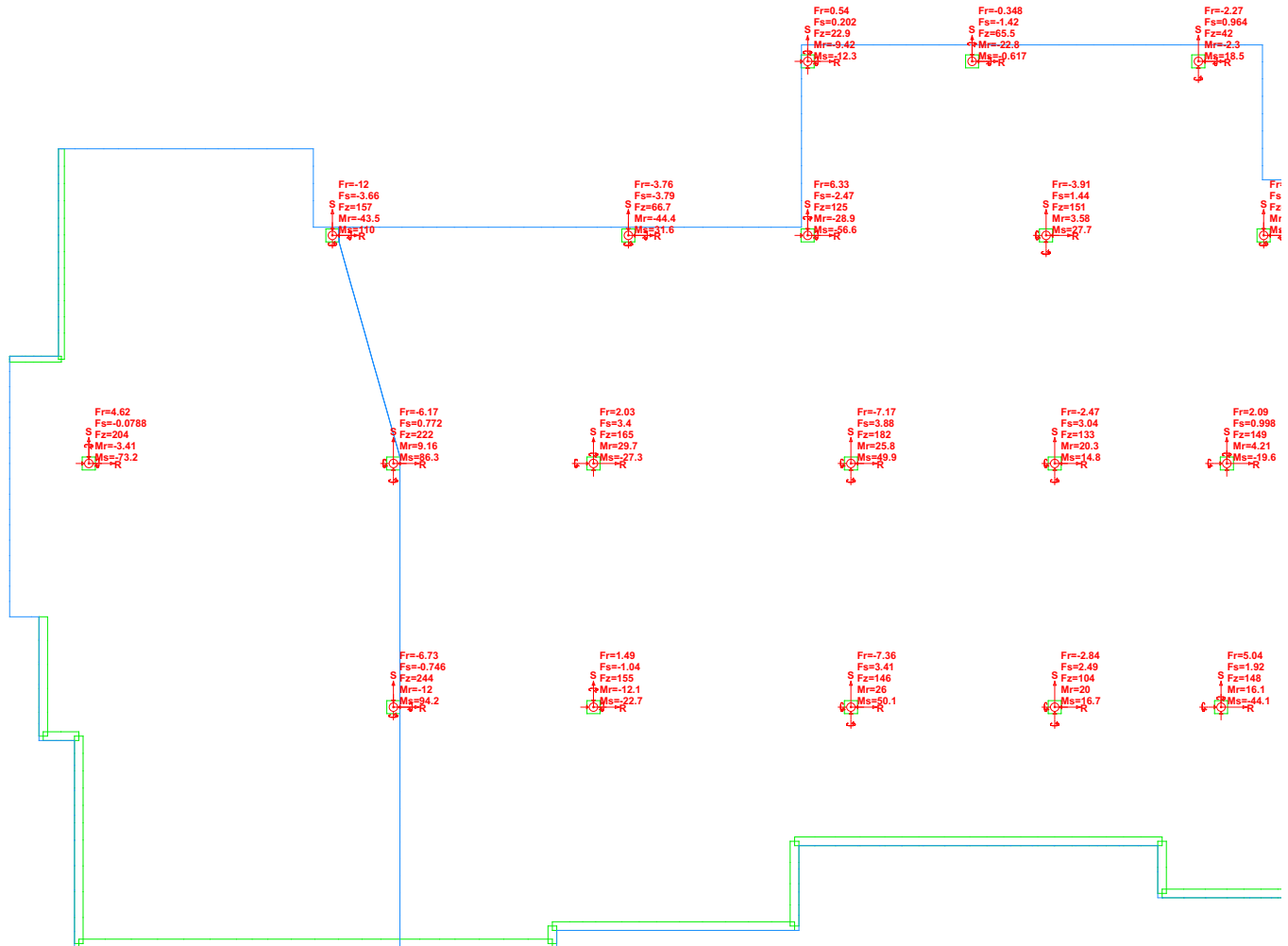
Factored LC: 1.4D: Max Reactions Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;

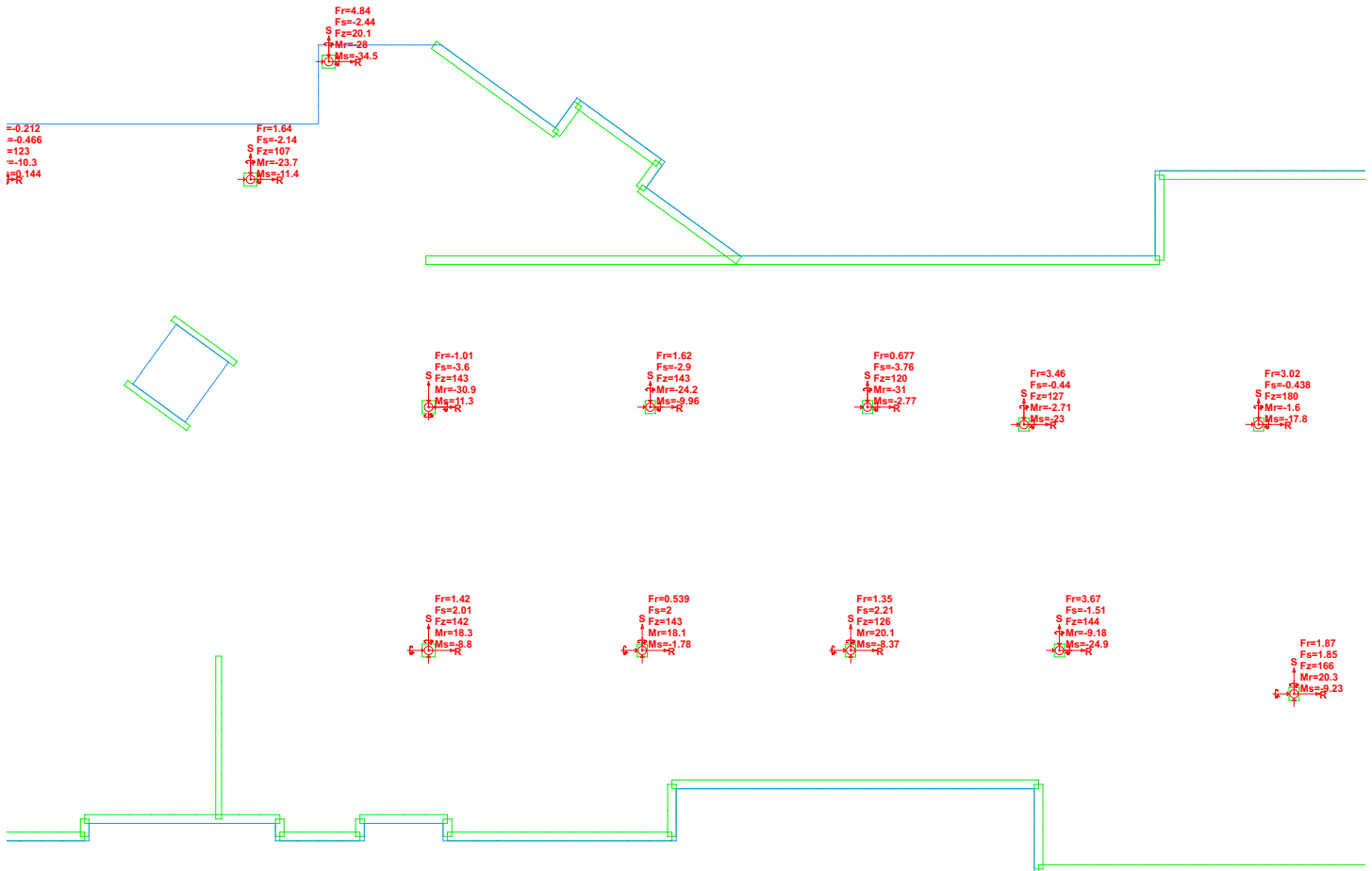
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1:250

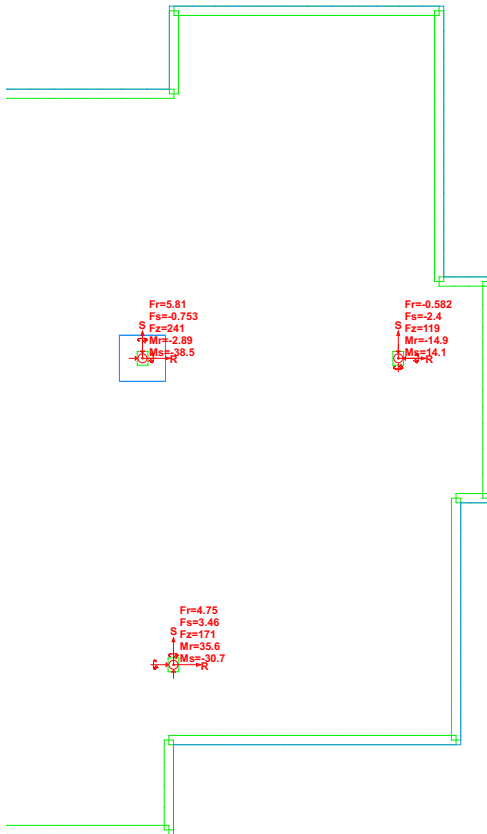
Factored LC: 1.4D - Reaction Plot: (Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



Factored LC: 1.4D: Max Reactions Plan (2)

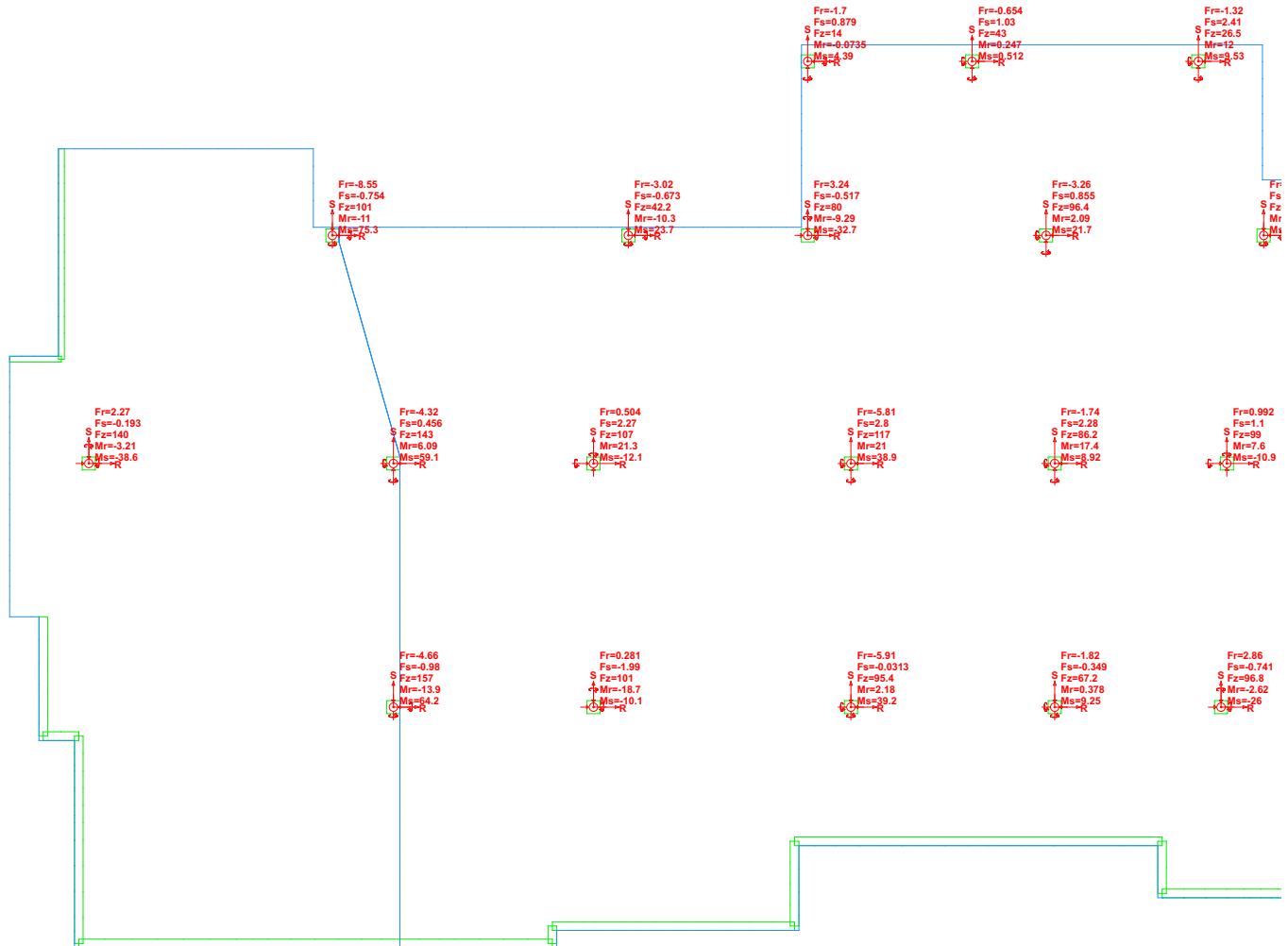


Factored LC: 1.4D: Max Reactions Plan (3)

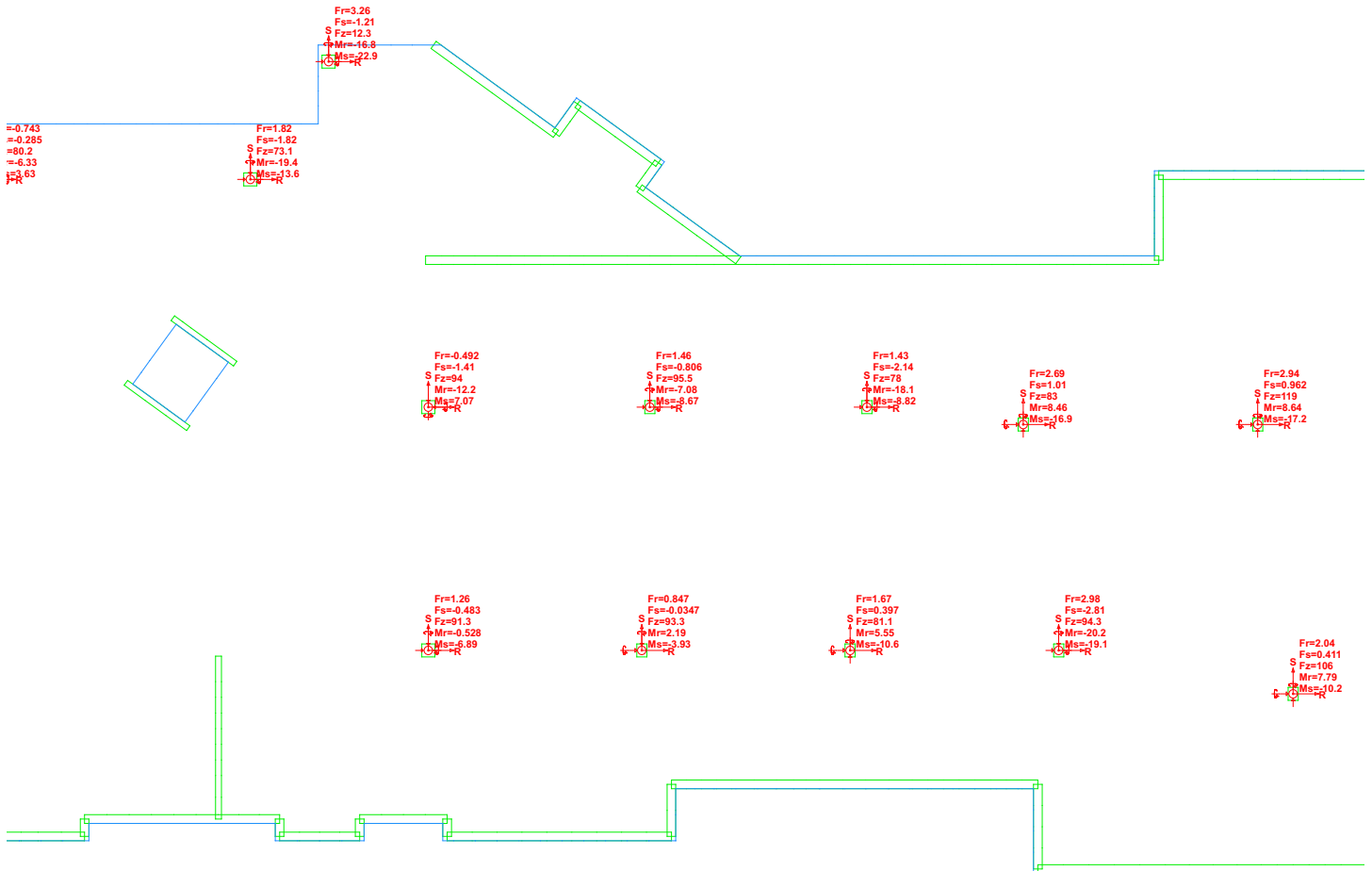


Factored LC: 1.4D: Min Reactions Plan

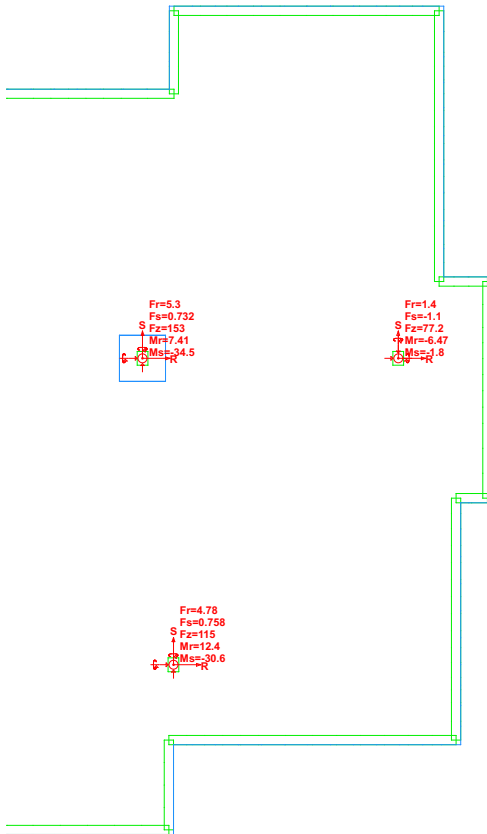
Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.4D - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Min Fz Context)



Factored LC: 1.4D: Min Reactions Plan (2)

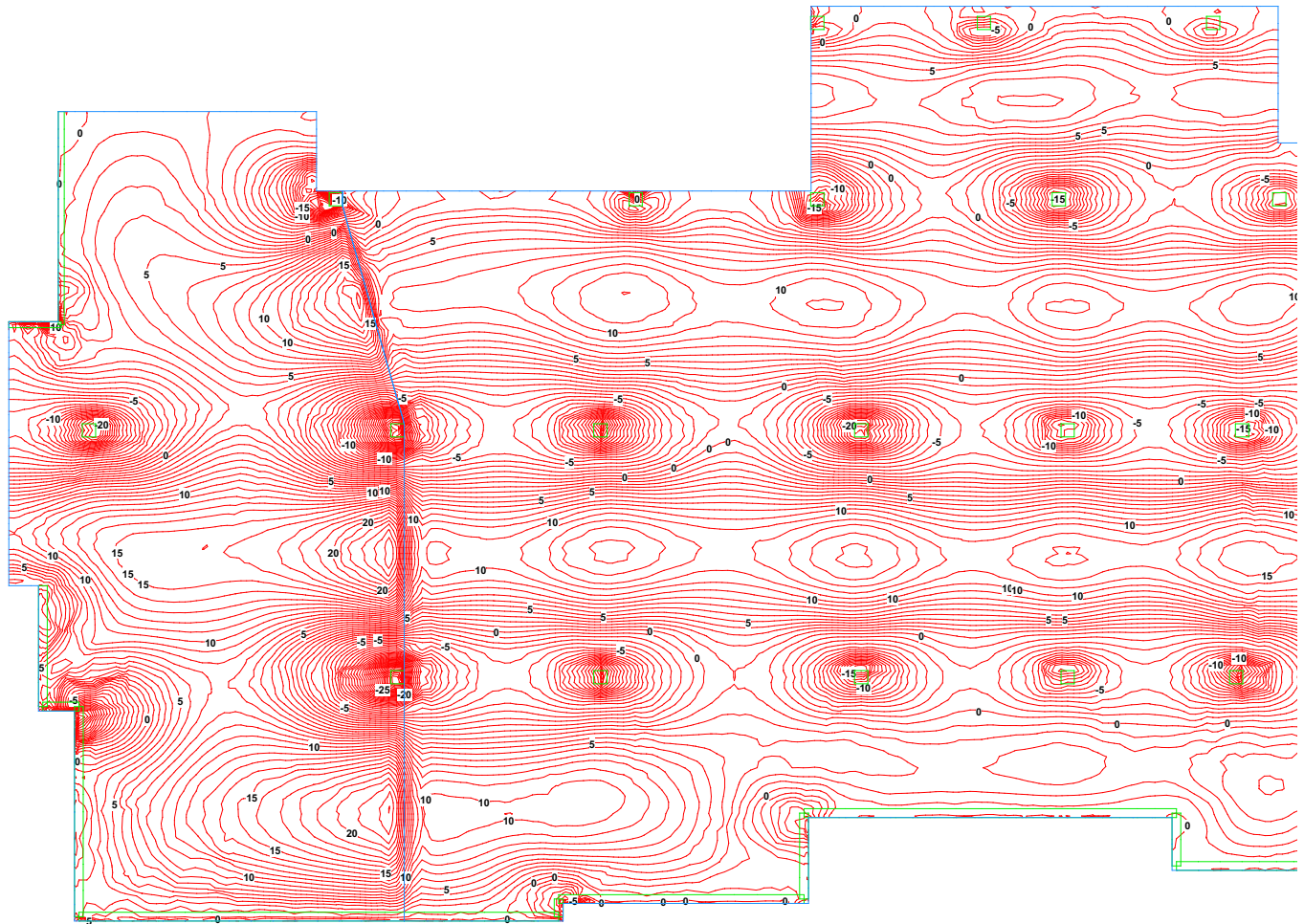


Factored LC: 1.4D: Min Reactions Plan (3)

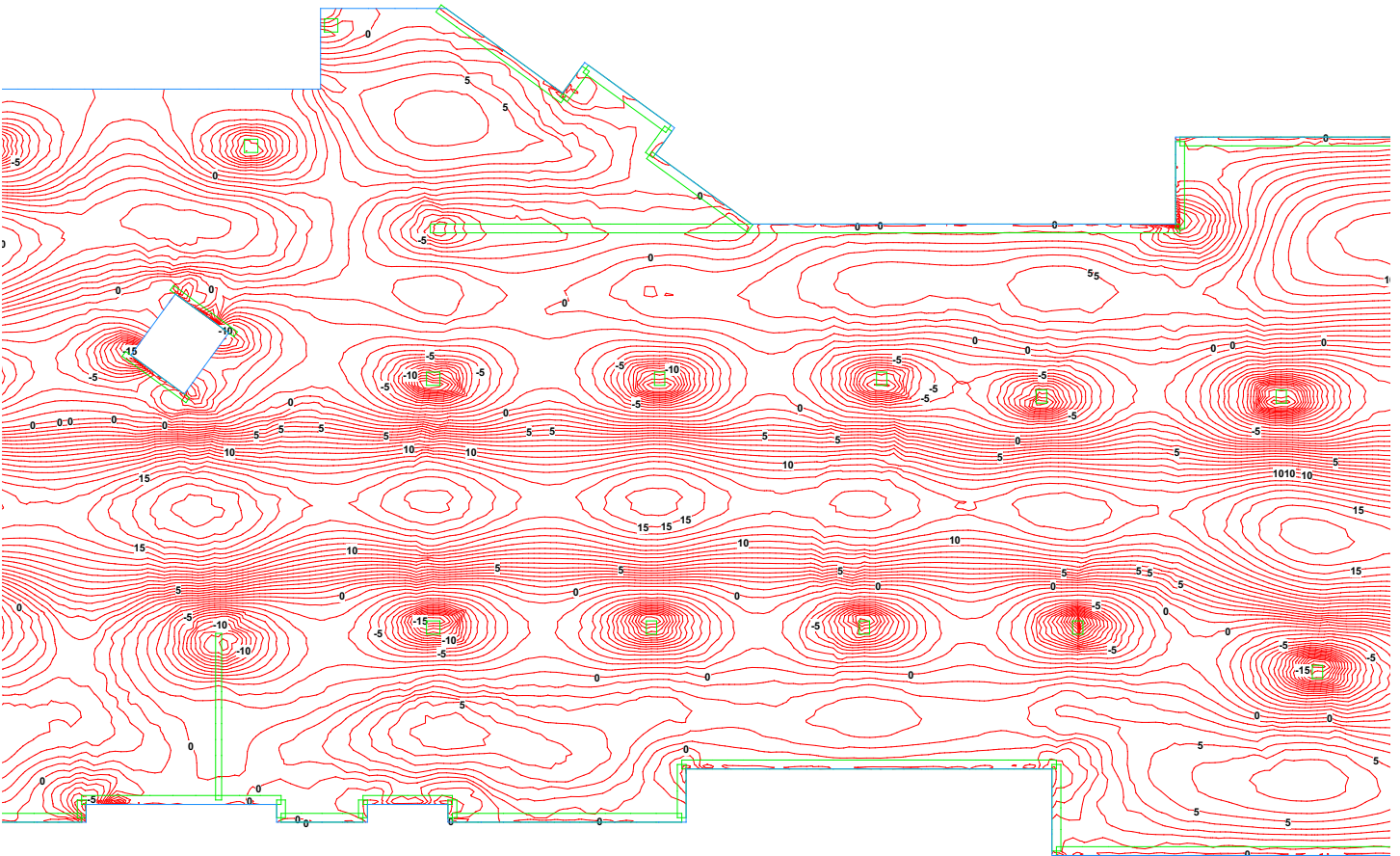


Factored LC: 1.2D + 1.6L + 0.5Lr: Max Mx Plan

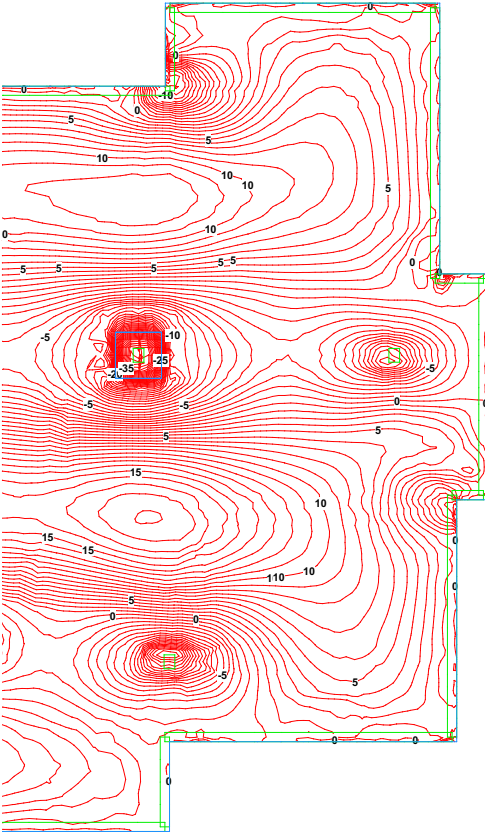
Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (X-Axis Direction)
 One Contour = 1 Kips
 Min Value = -38.7 Kips @ (-54.85,-86.43) Max Value = 25.24 Kips @ (-328.3,-97.17)



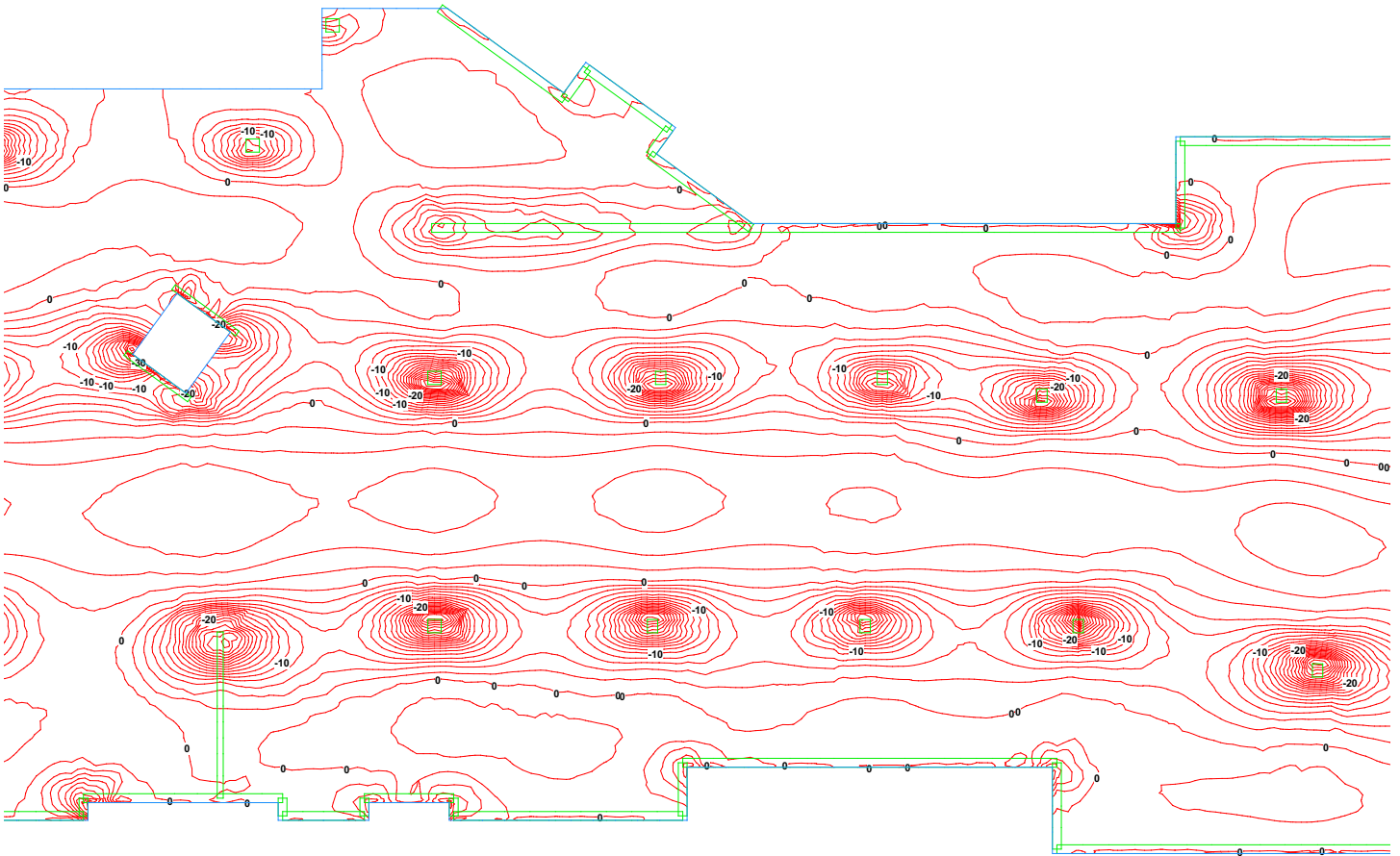
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Mx Plan (2)



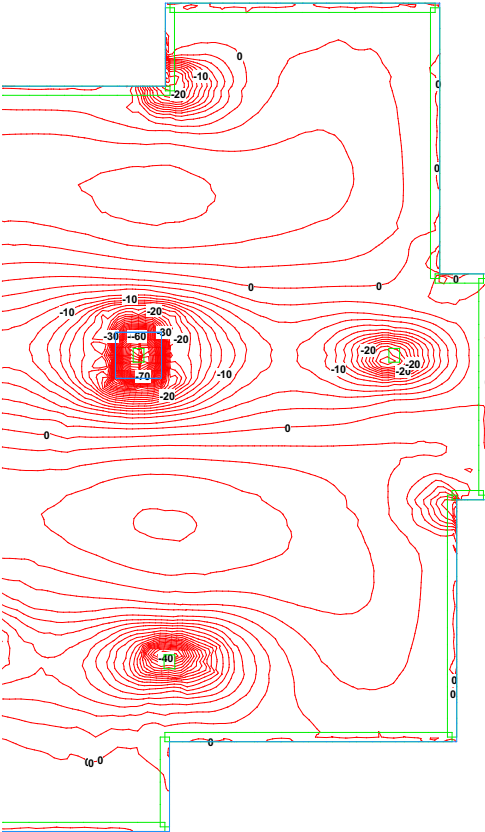
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Mx Plan (3)



Factored LC: 1.2D + 1.6L + 0.5Lr: Min Mx Plan (2)

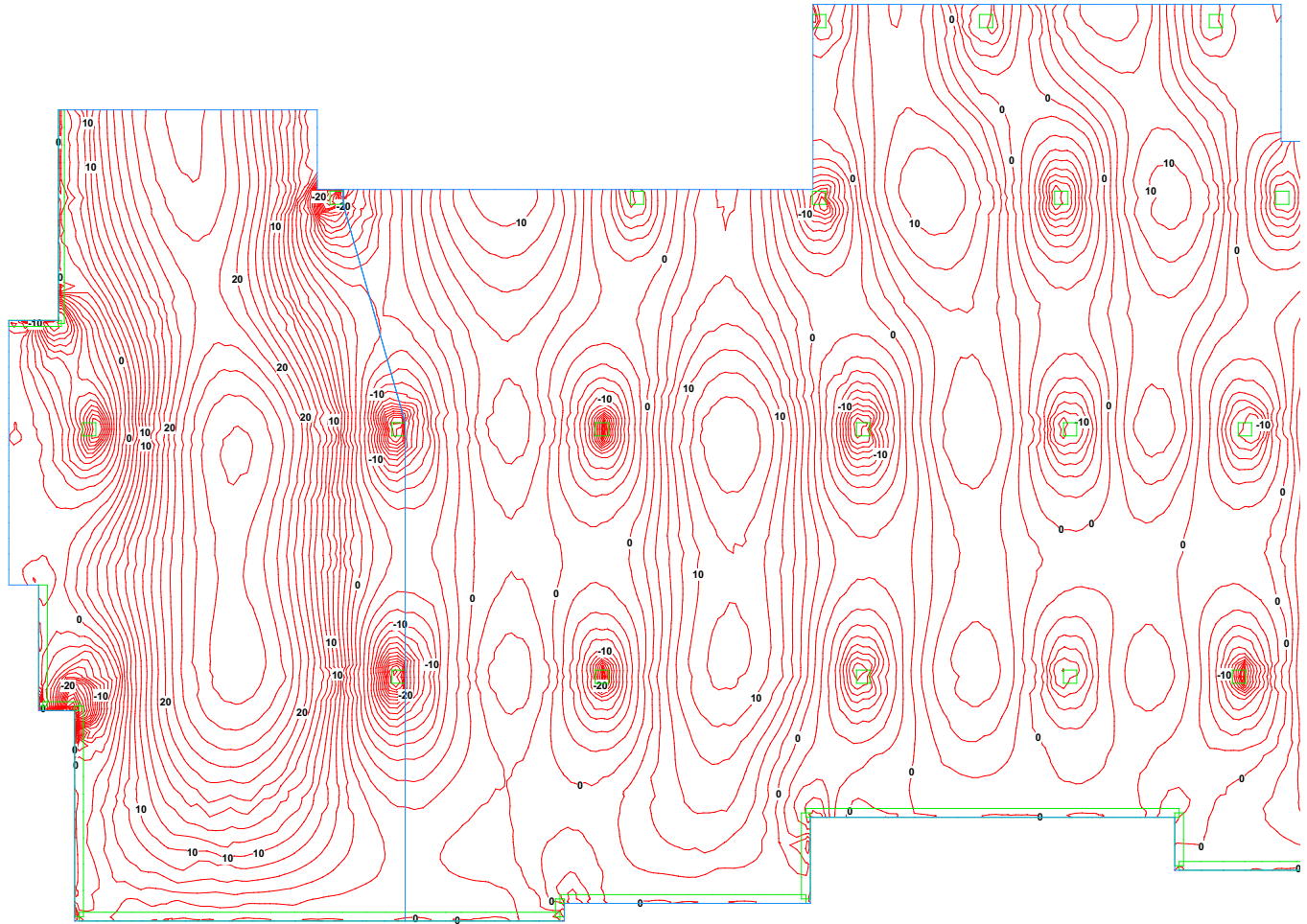


Factored LC: 1.2D + 1.6L + 0.5Lr: Min Mx Plan (3)

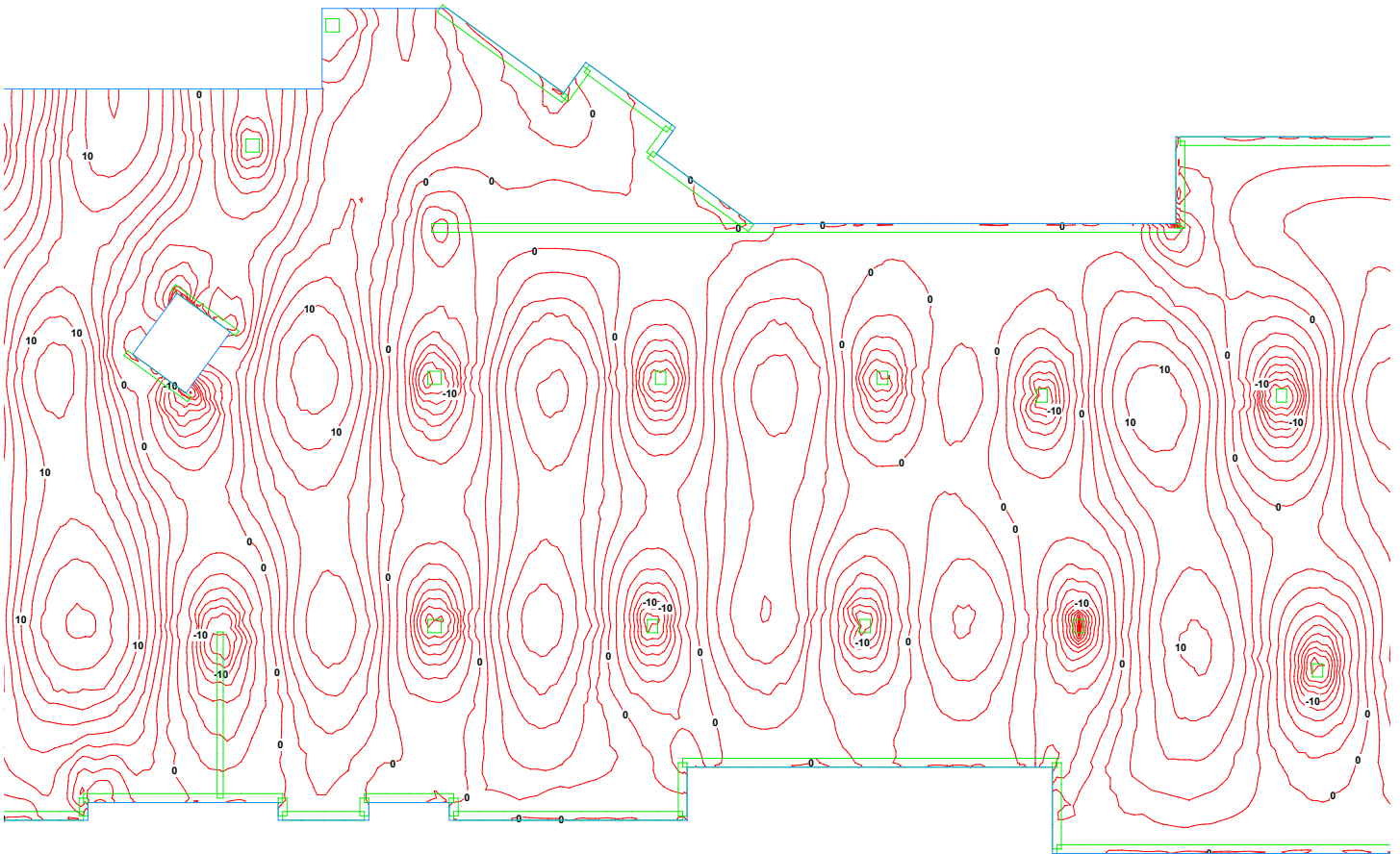


Factored LC: 1.2D + 1.6L + 0.5Lr: Max My Plan

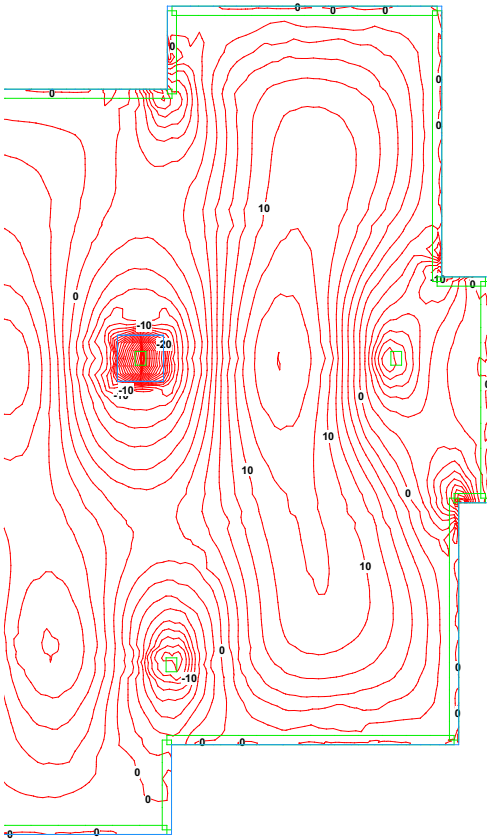
Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
 One Contour = 2 Kips
 Min Value = -54.2 Kips @ (-54.64,-85.18) Max Value = 30.49 Kips @ (-346.1,-84.94)



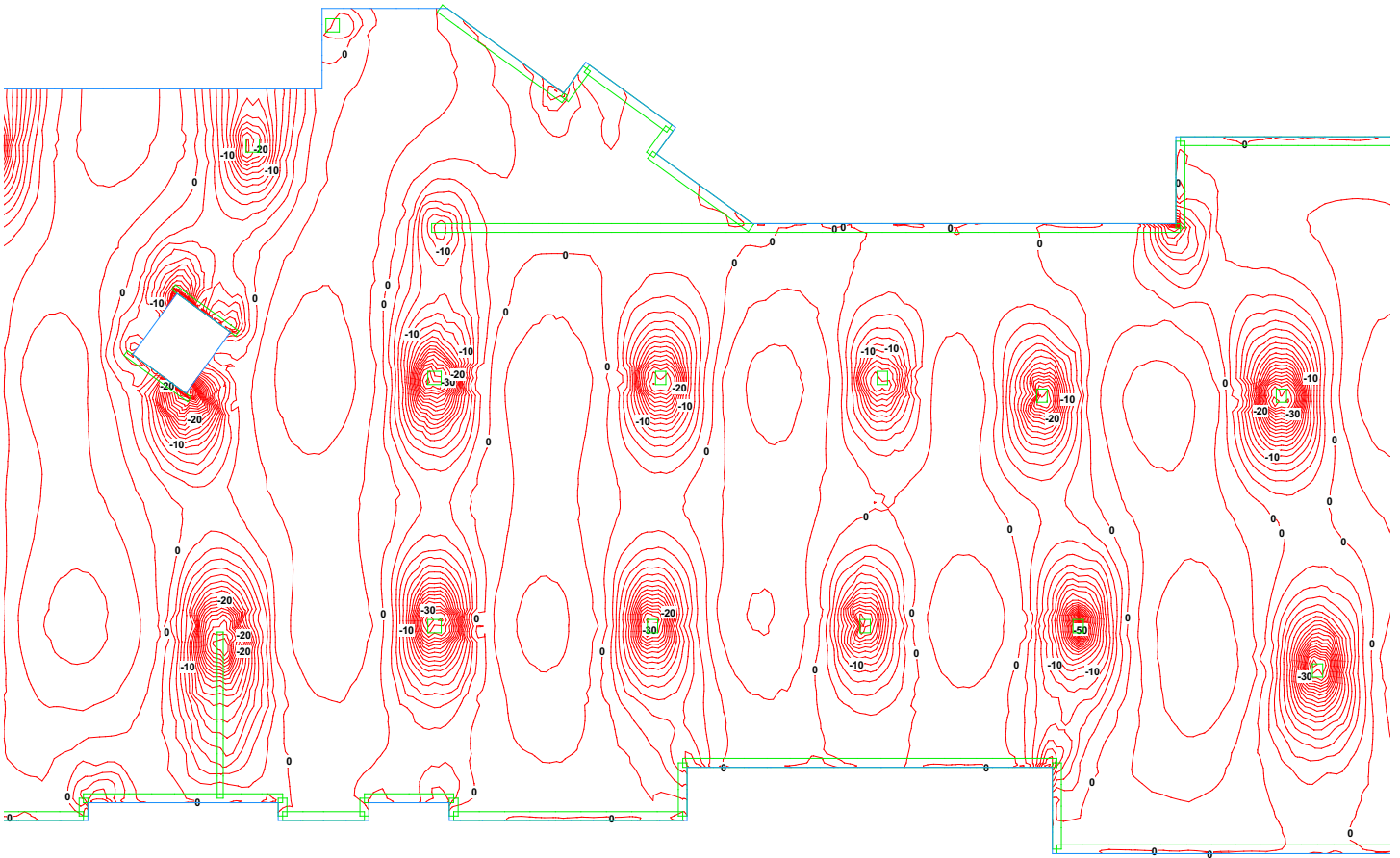
Factored LC: 1.2D + 1.6L + 0.5Lr: Max My Plan (2)



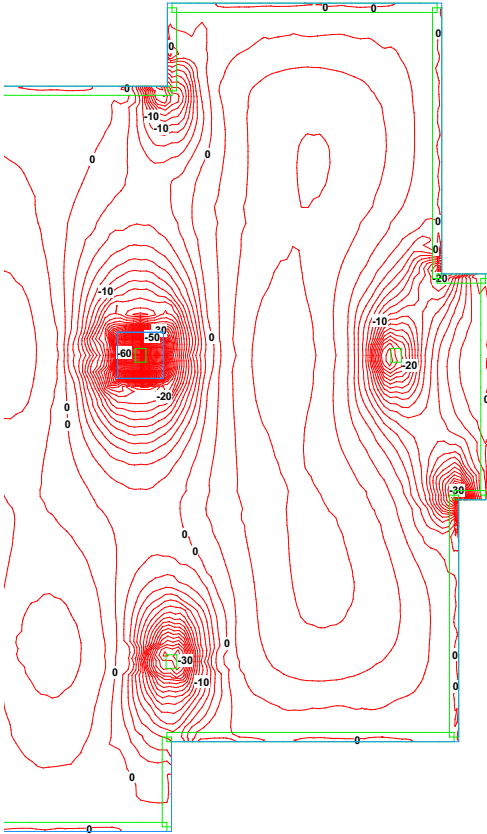
Factored LC: 1.2D + 1.6L + 0.5Lr: Max My Plan (3)



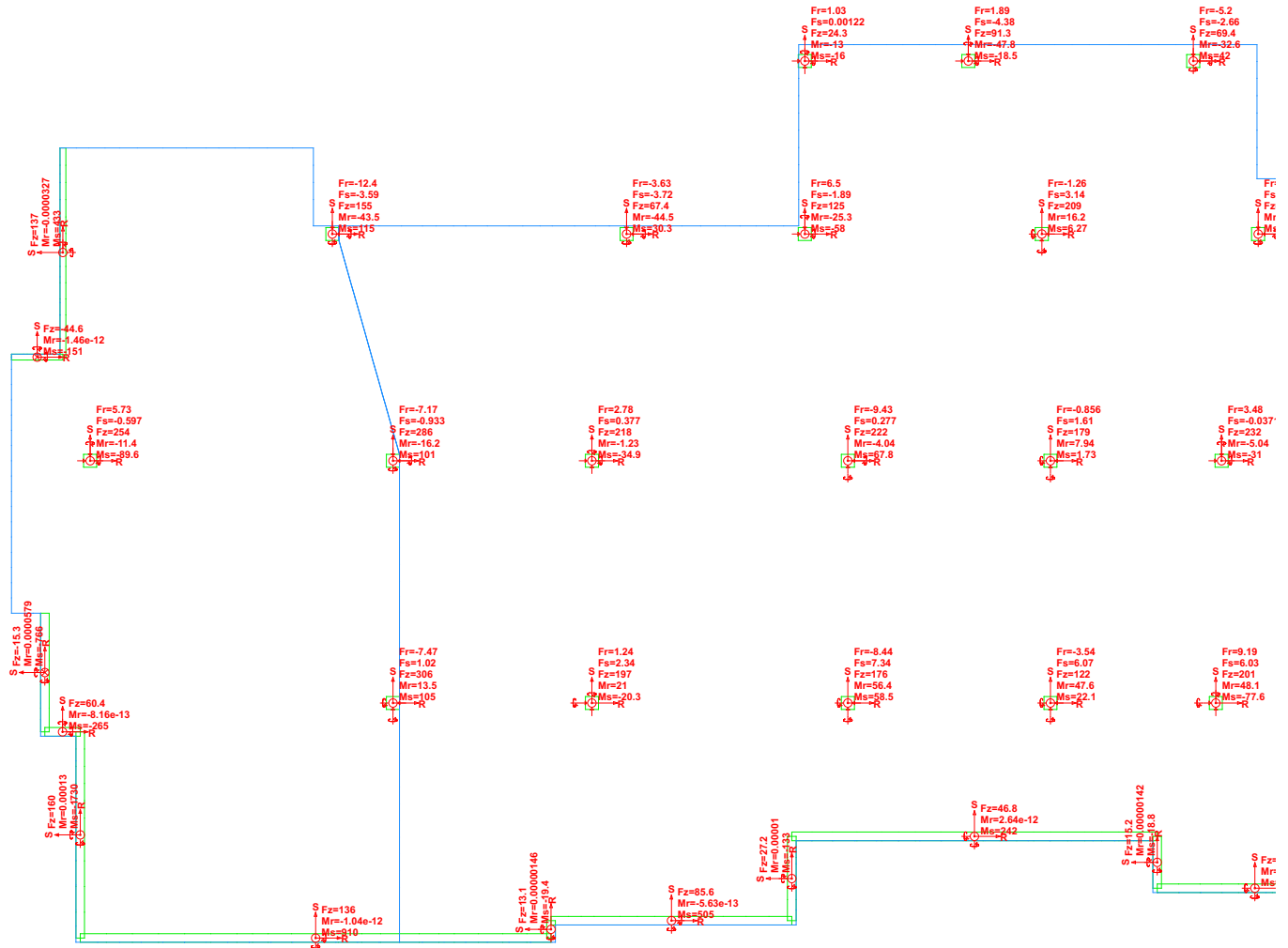
Factored LC: 1.2D + 1.6L + 0.5Lr: Min My Plan (2)



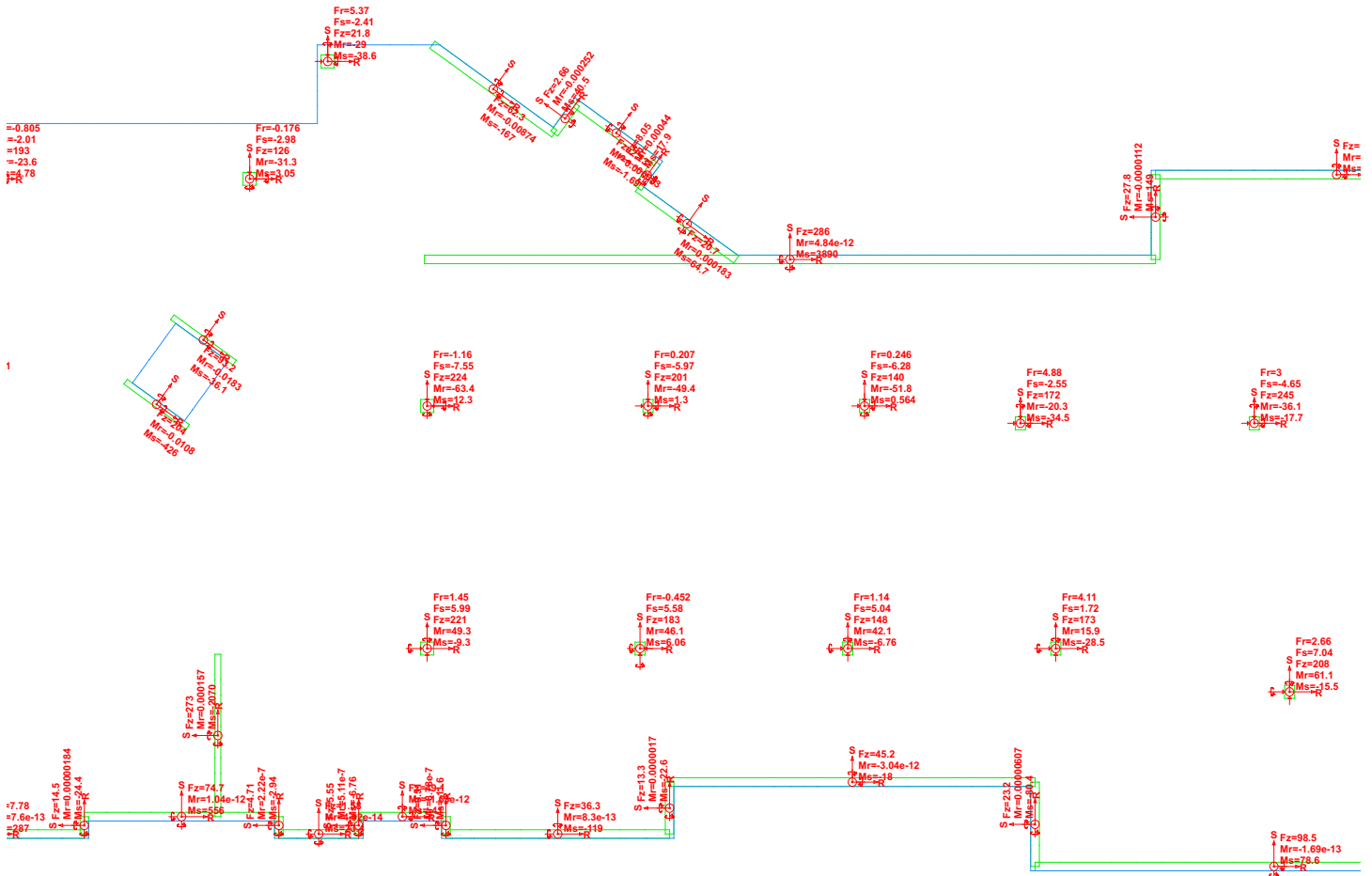
Factored LC: 1.2D + 1.6L + 0.5Lr: Min My Plan (3)



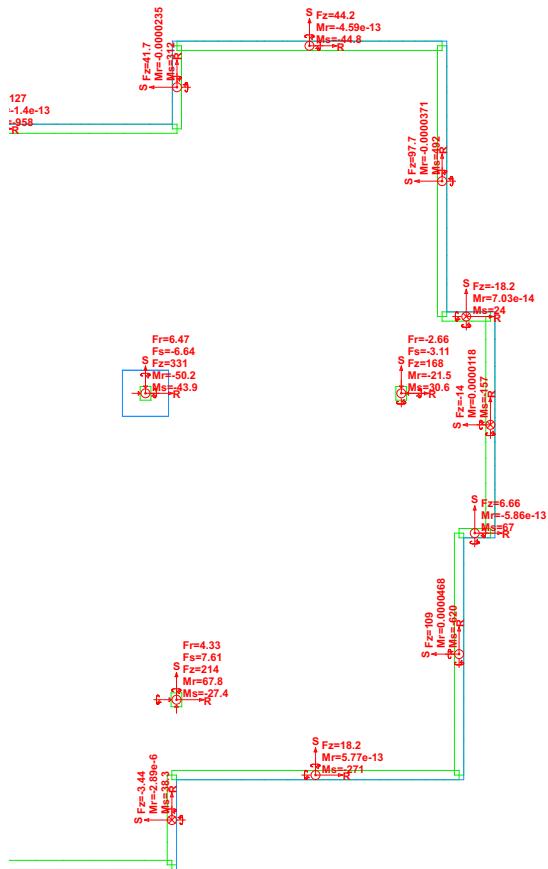
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Ms,Mz)(Standard Context)



Factored LC: 1.2D + 1.6L + 0.5Lr: Std Reactions Plan (2)

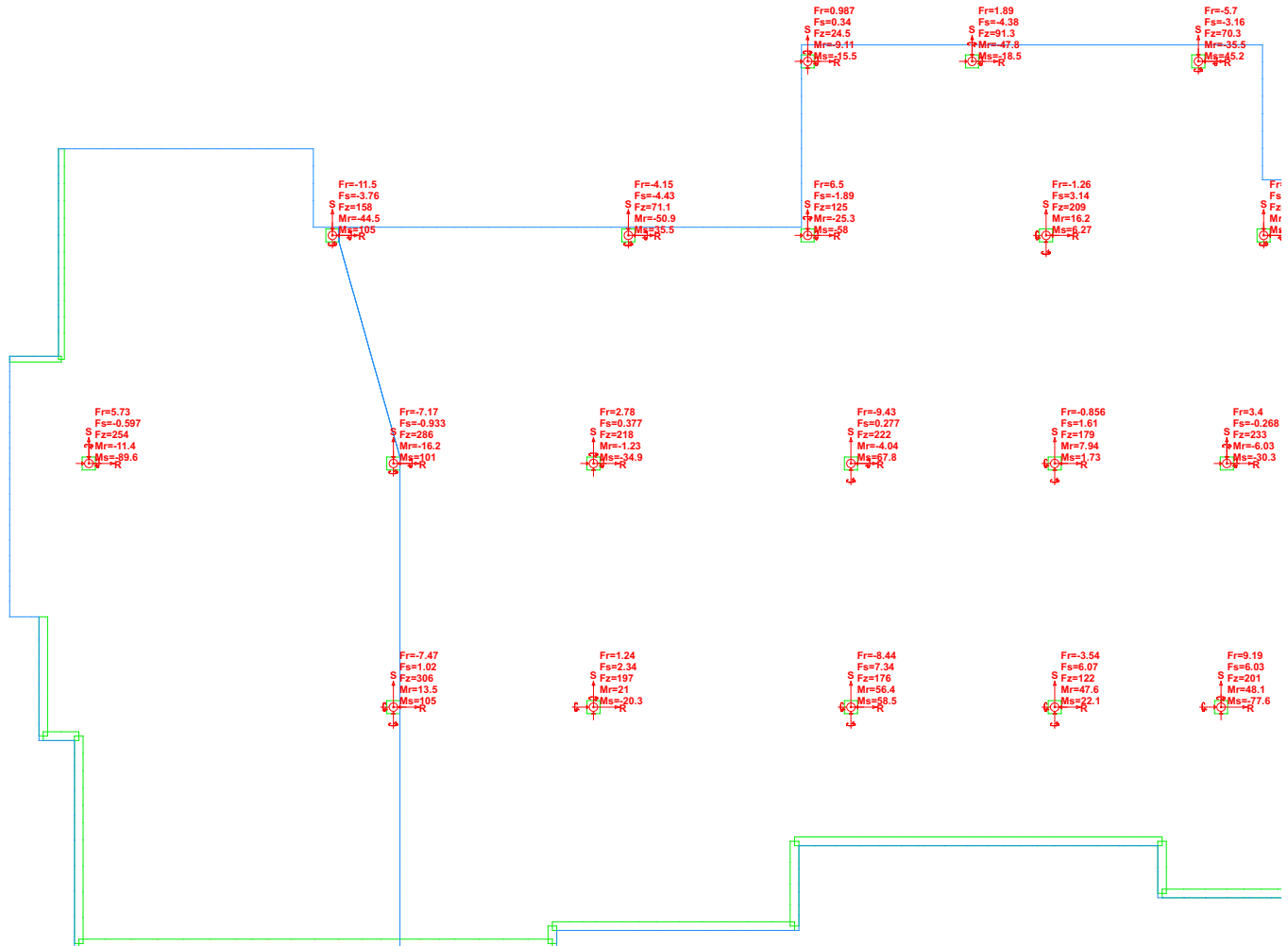


Factored LC: 1.2D + 1.6L + 0.5Lr: Std Reactions Plan (3)

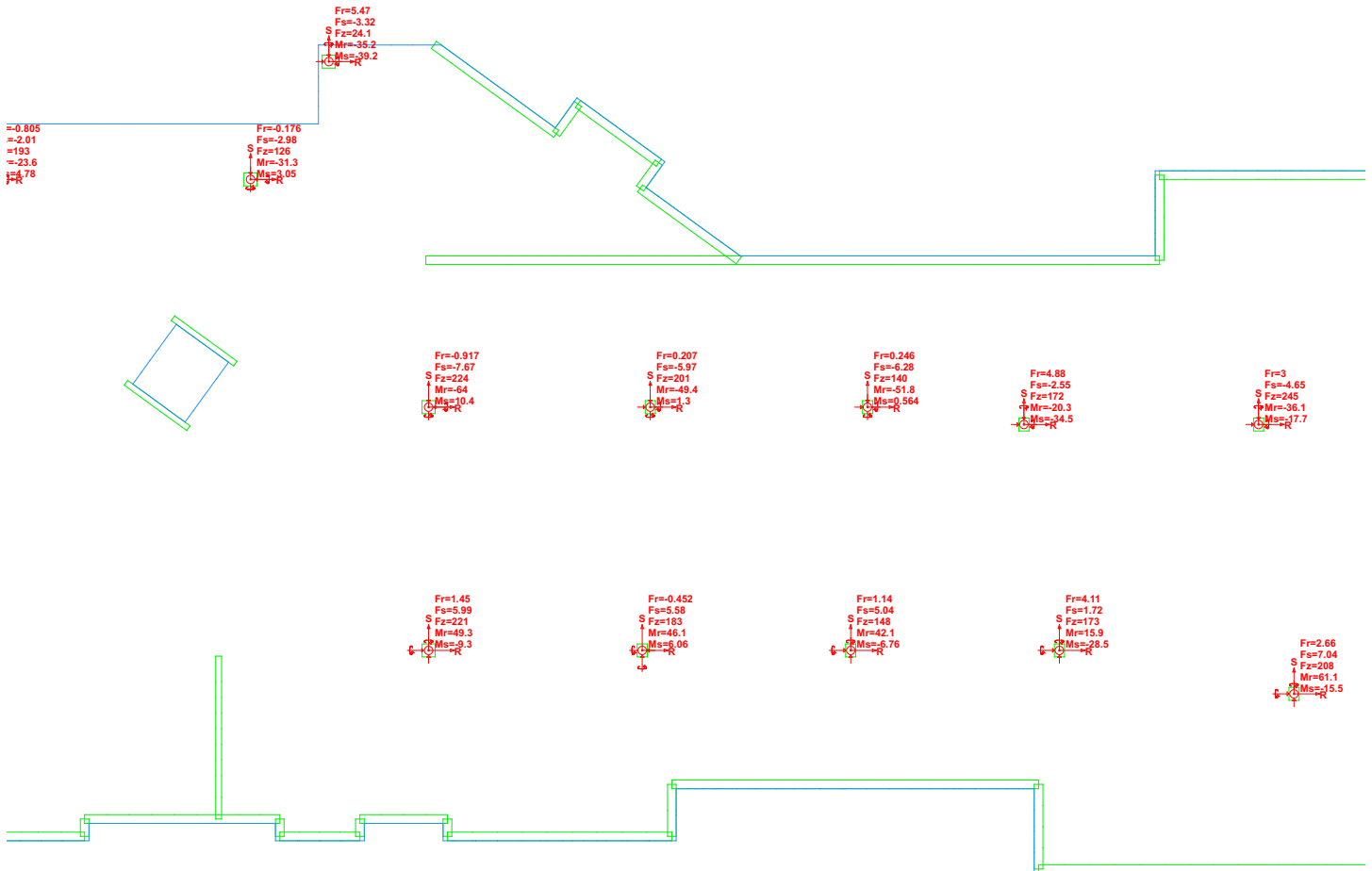


Factored LC: 1.2D + 1.6L + 0.5Lr: Max Reactions Plan

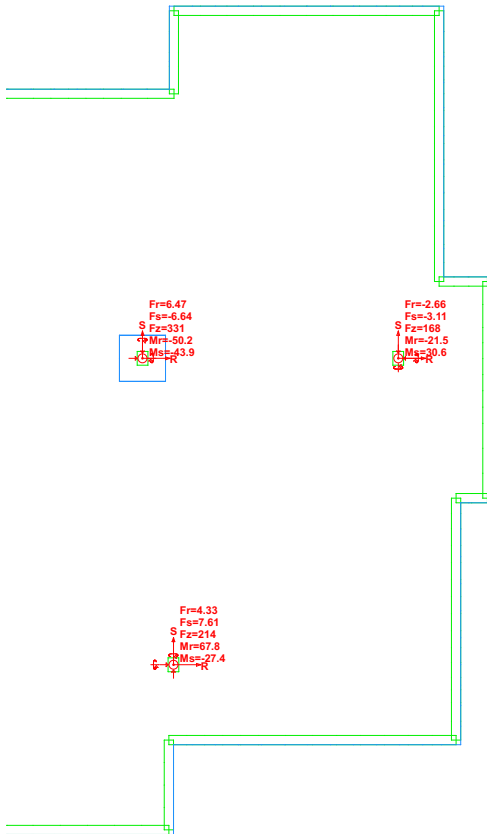
Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



Factored LC: 1.2D + 1.6L + 0.5Lr: Max Reactions Plan (2)

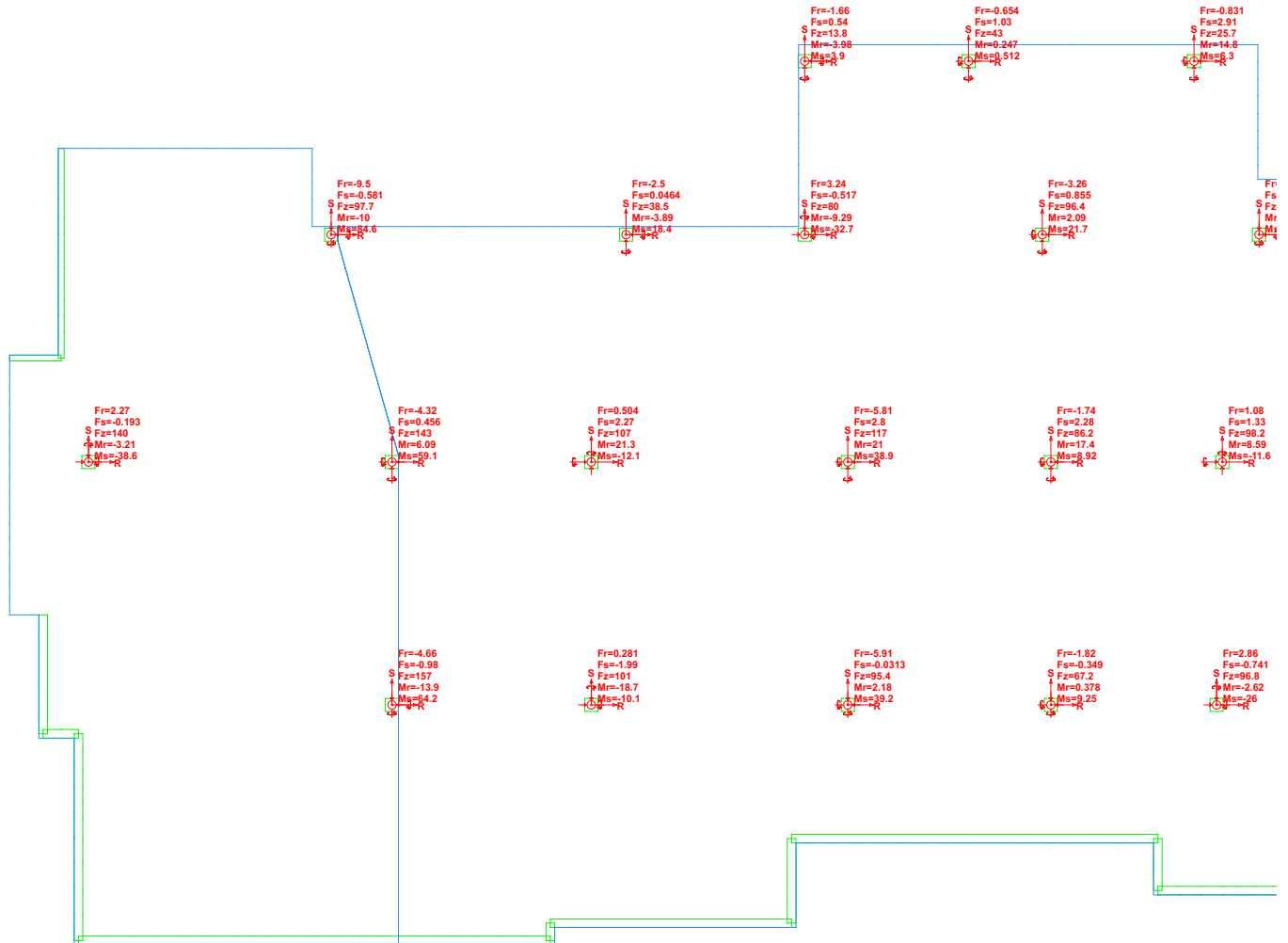


Factored LC: 1.2D + 1.6L + 0.5Lr: Max Reactions Plan (3)

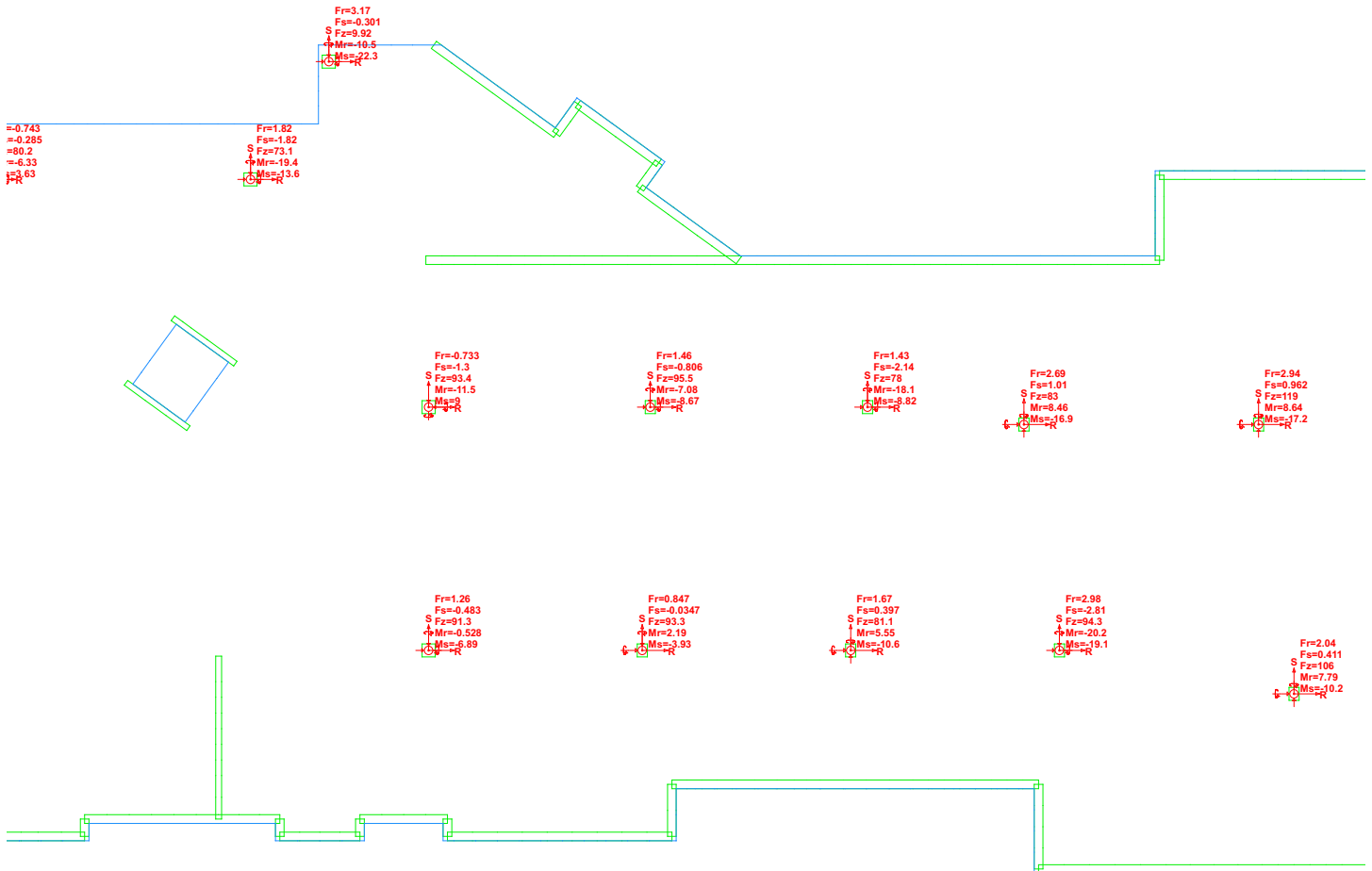


Factored LC: 1.2D + 1.6L + 0.5Lr: Min Reactions Plan

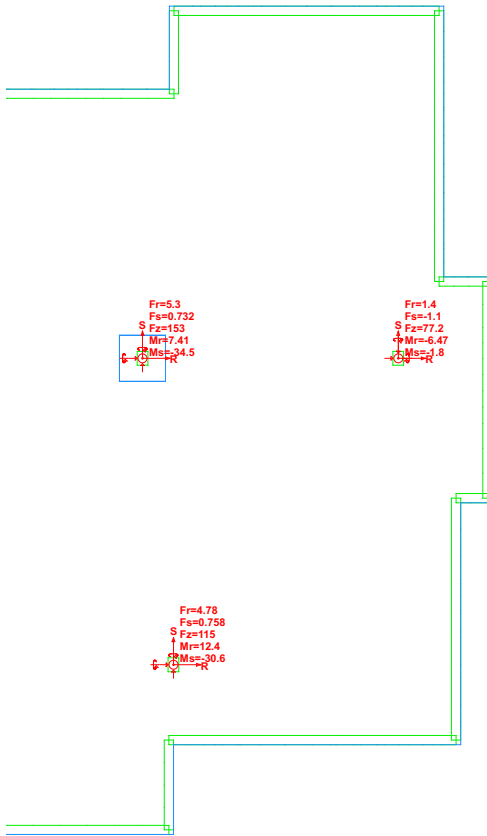
Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Mz)(Min Fz Context)



Factored LC: 1.2D + 1.6L + 0.5Lr: Min Reactions Plan (2)

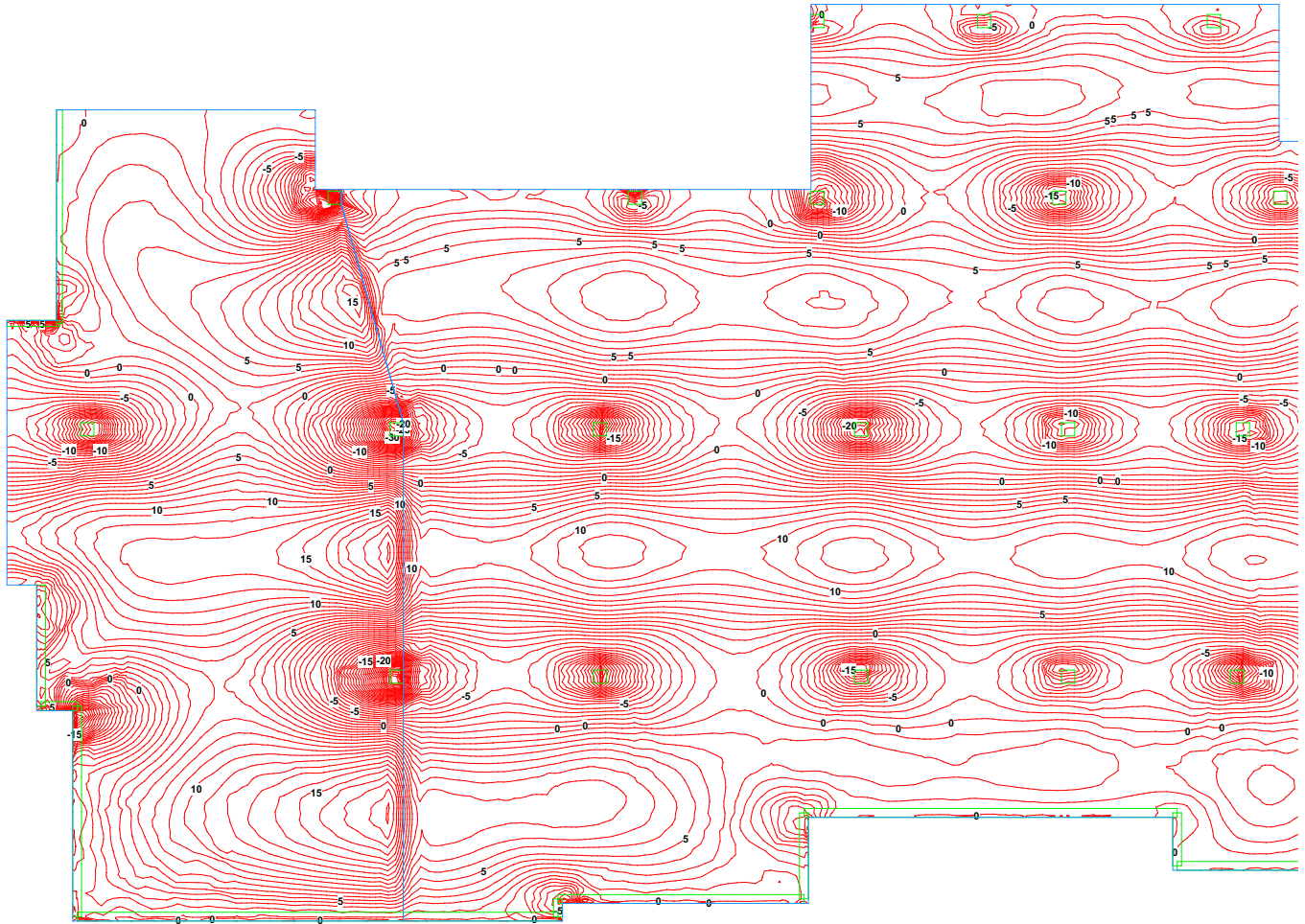


Factored LC: 1.2D + 1.6L + 0.5Lr: Min Reactions Plan (3)

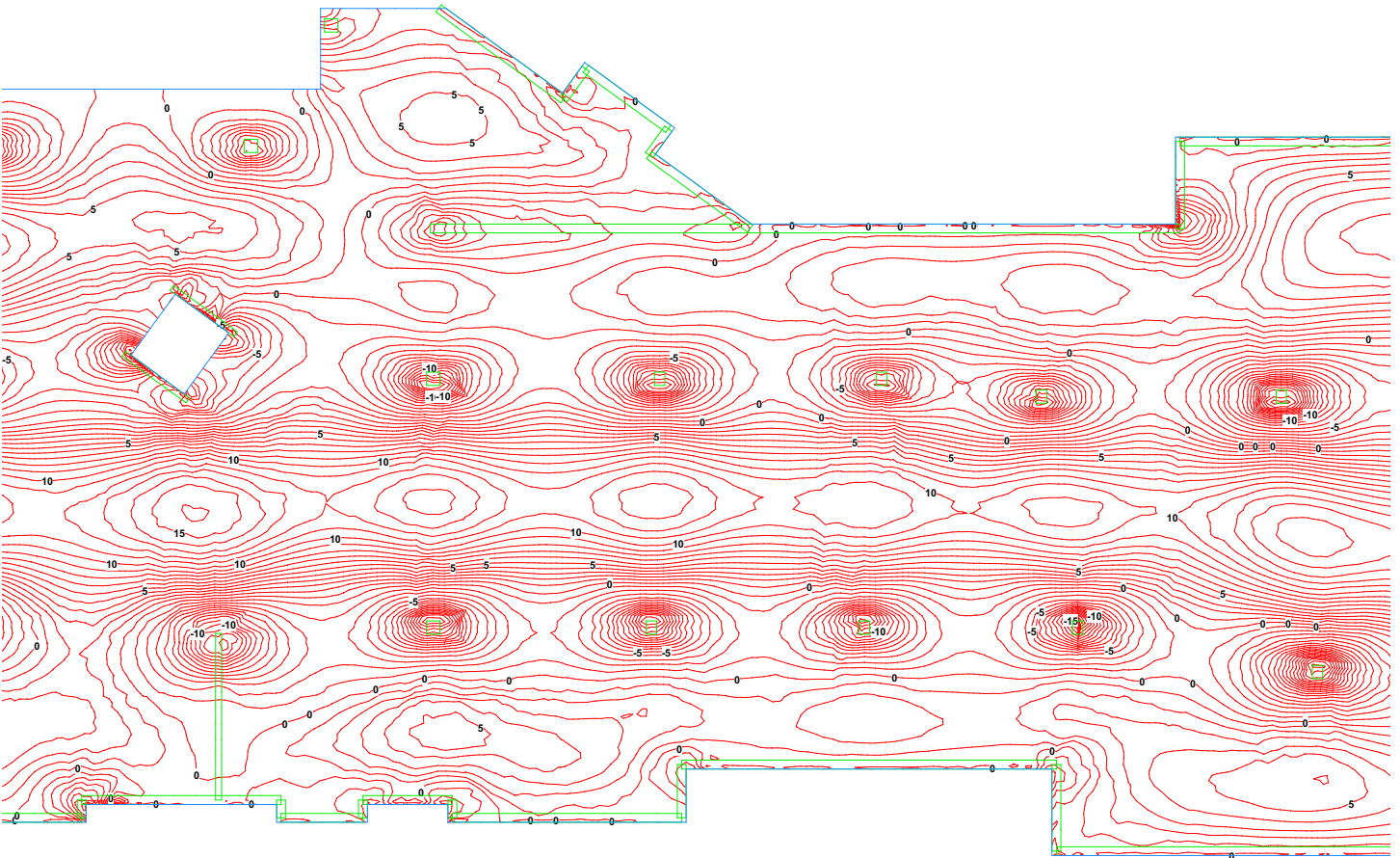


Factored LC: 1.2D + f1L + 1.6Lr: Max Mx Plan

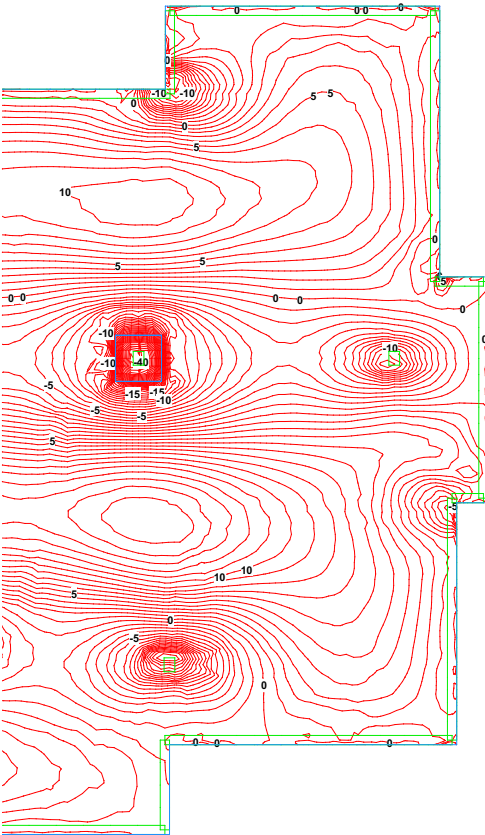
Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Maximum Values) (X-Axis Direction)
 One Contour = 1 Kips
 Min Value = -38.7 Kips @ (-54.85,-86.43) Max Value = 20.66 Kips @ (-328.3,-97.17)



Factored LC: 1.2D + f1L + 1.6Lr: Max Mx Plan (2)

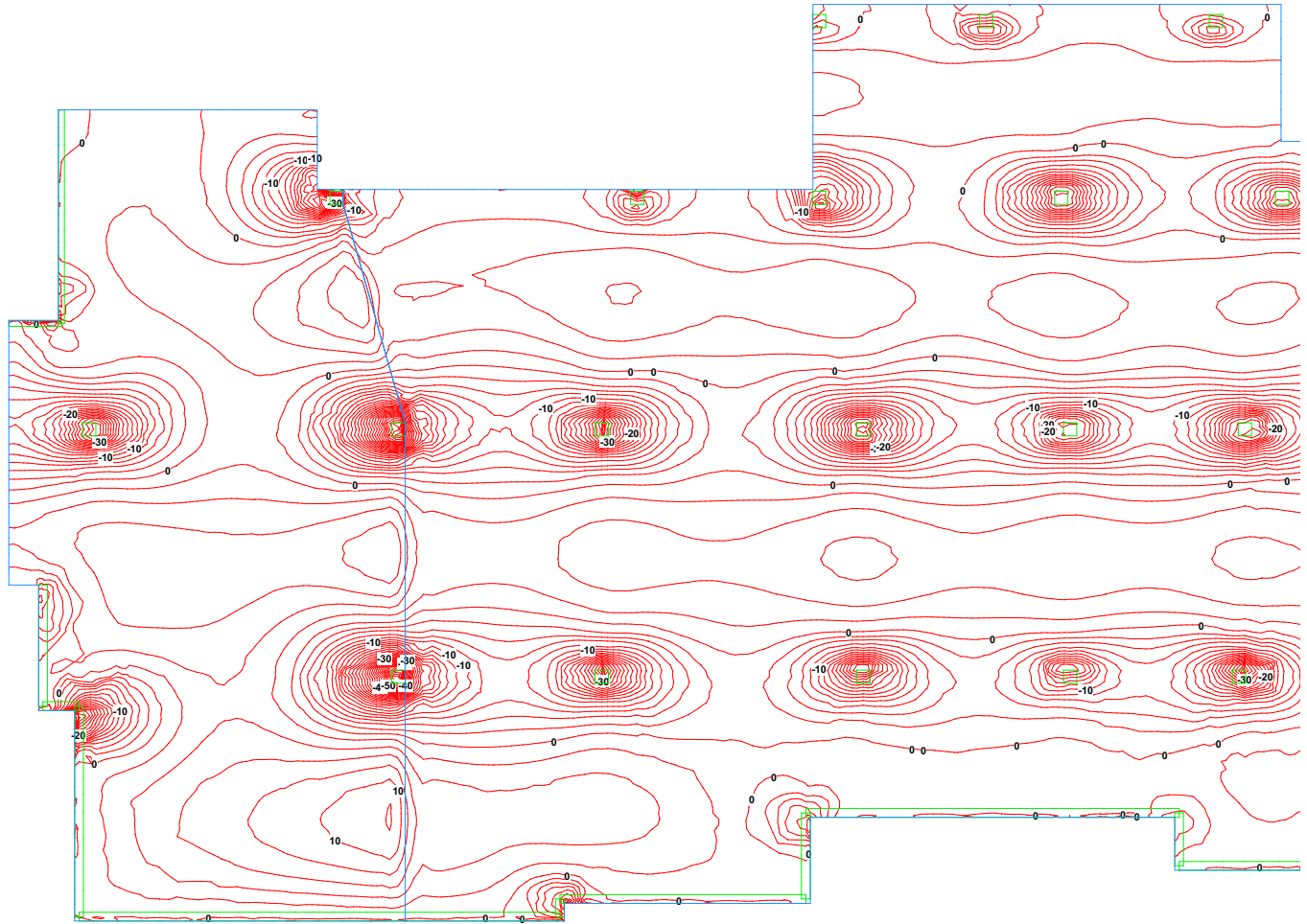


Factored LC: 1.2D + f1L + 1.6Lr: Max Mx Plan (3)

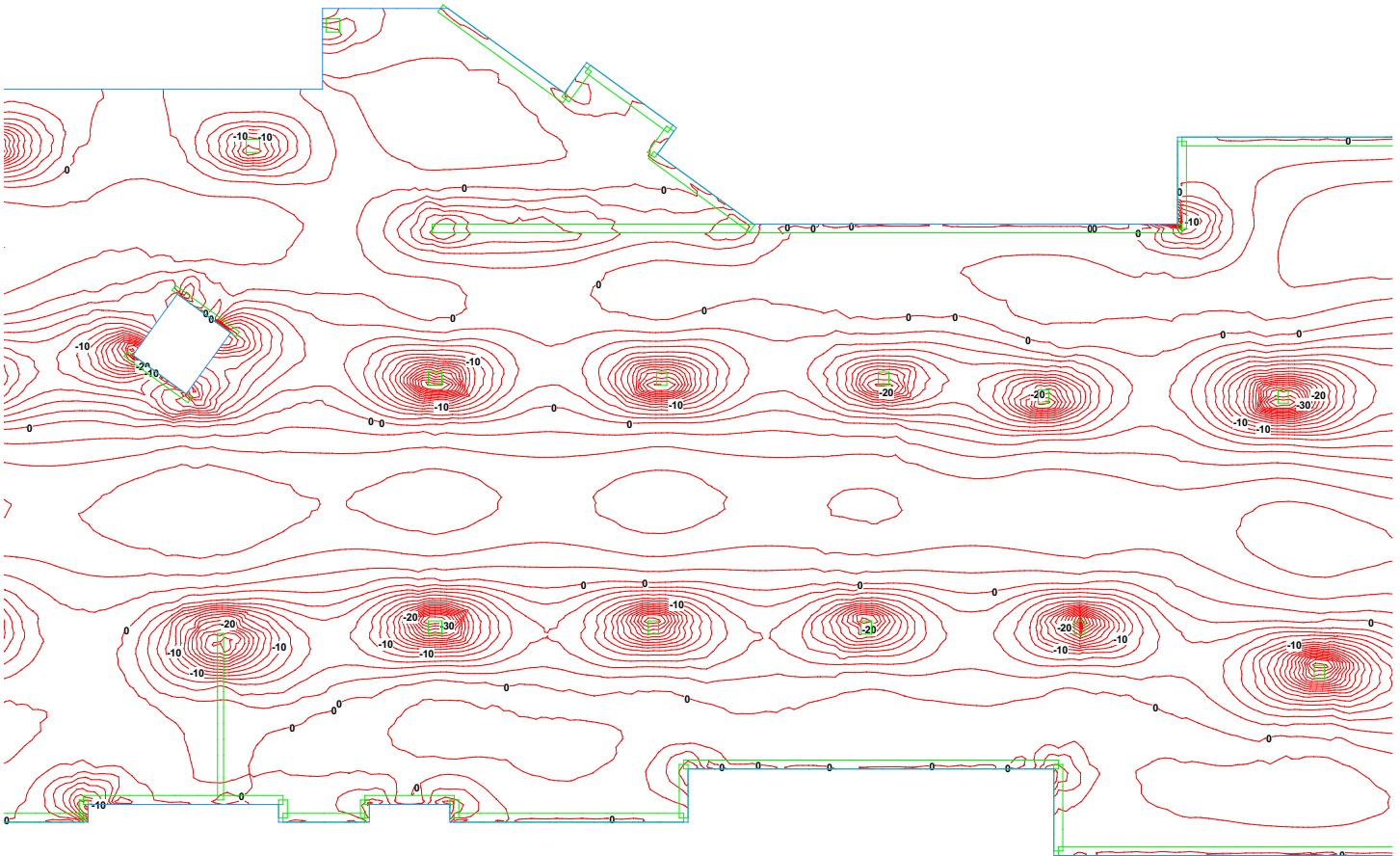


Factored LC: 1.2D + f1L + 1.6Lr: Min Mx Plan

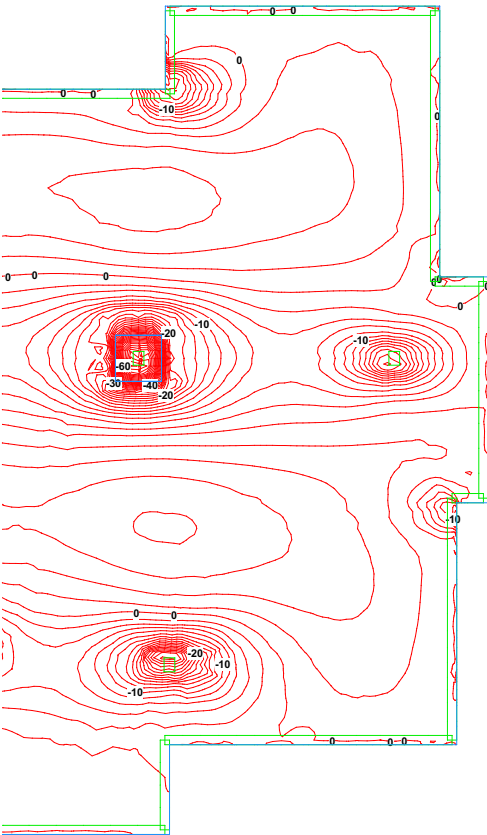
Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Minimum Values) (X-Axis Direction)
 One Contour = 2 Kips
 Min Value = -71.16 Kips @ (-54.85, -86.43) Max Value = 11.87 Kips @ (-328.4, -126.7)



Factored LC: 1.2D + f1L + 1.6Lr: Min Mx Plan (2)

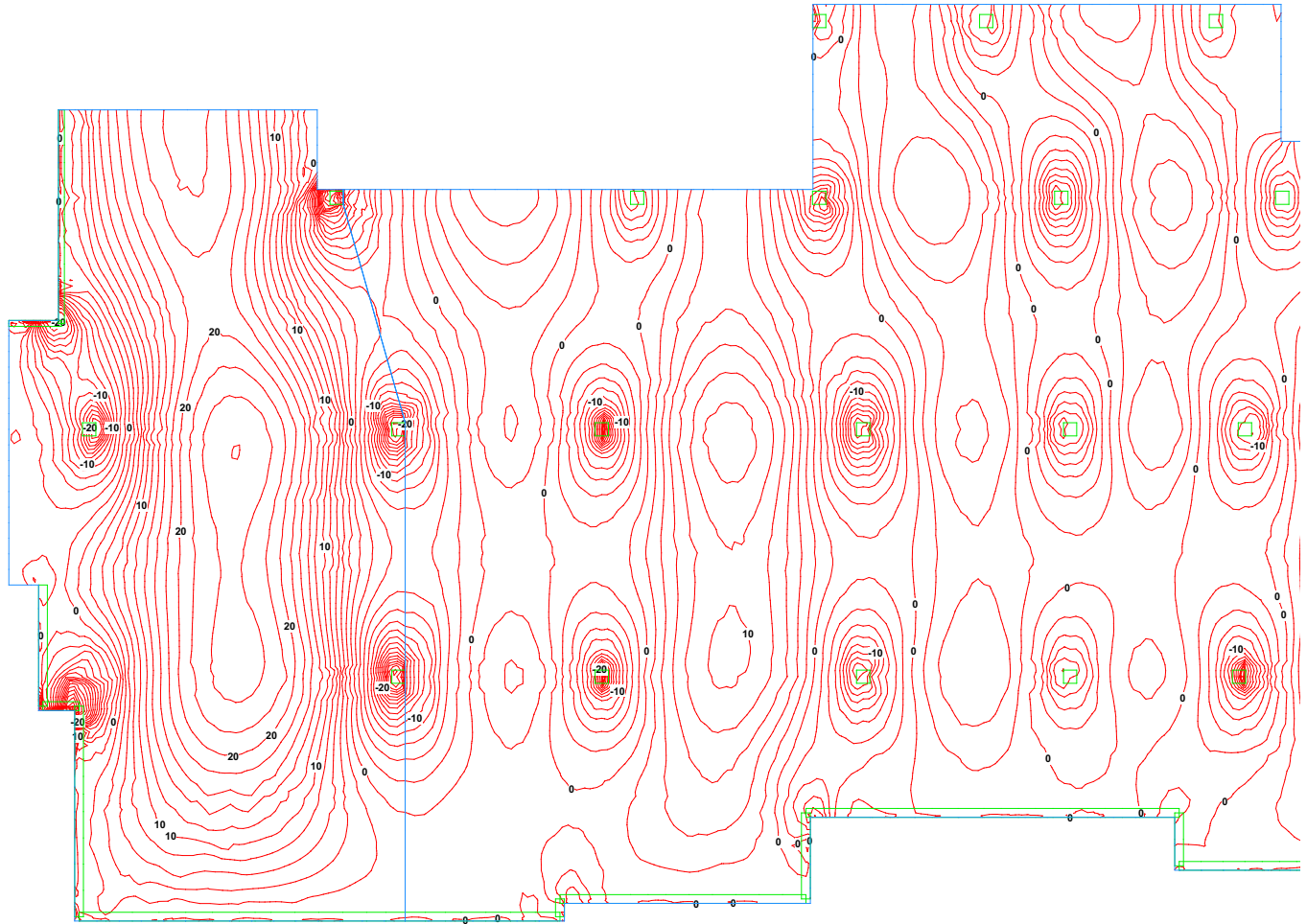


Factored LC: 1.2D + f1L + 1.6Lr: Min Mx Plan (3)

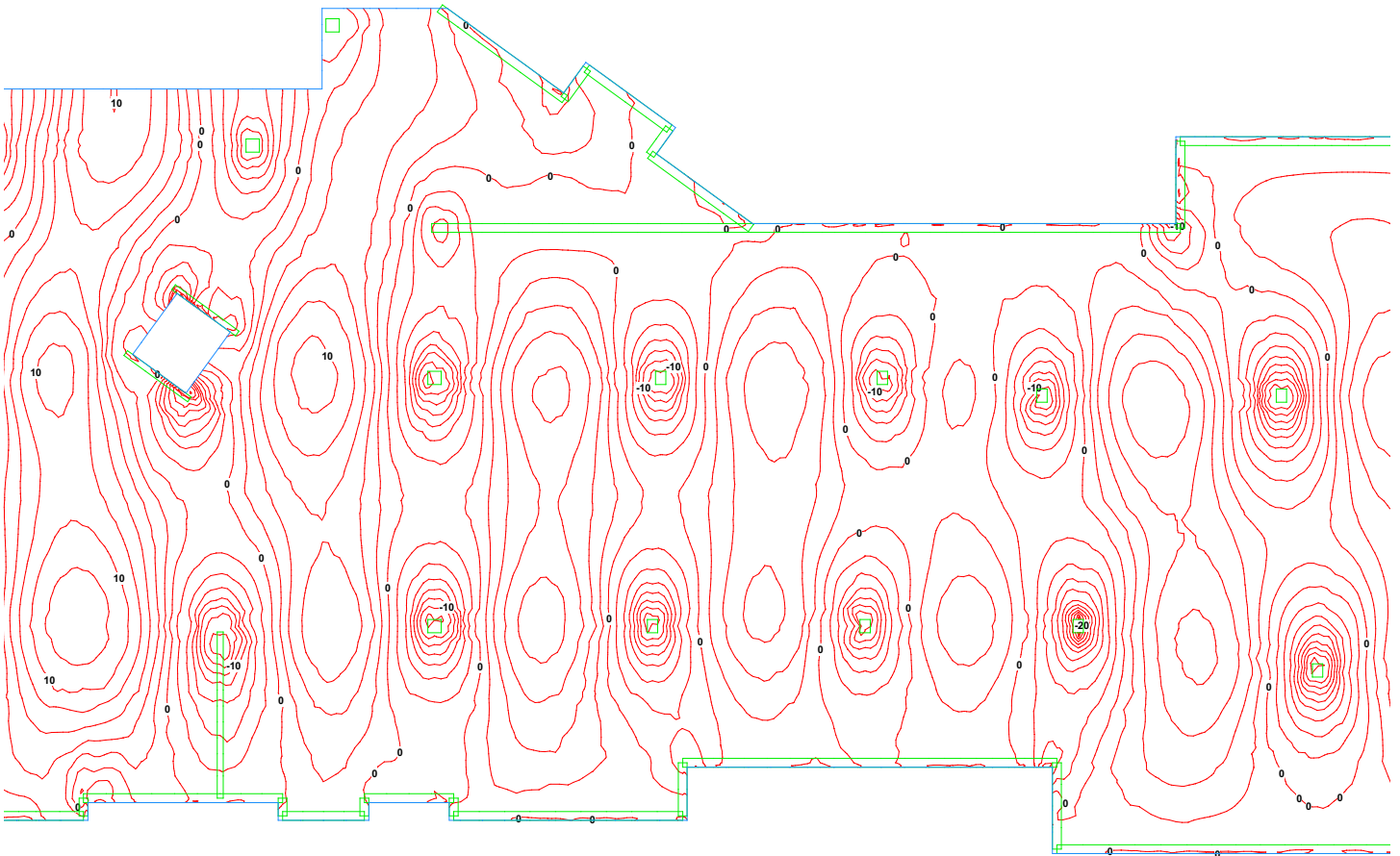


Factored LC: 1.2D + f1L + 1.6Lr: Max My Plan

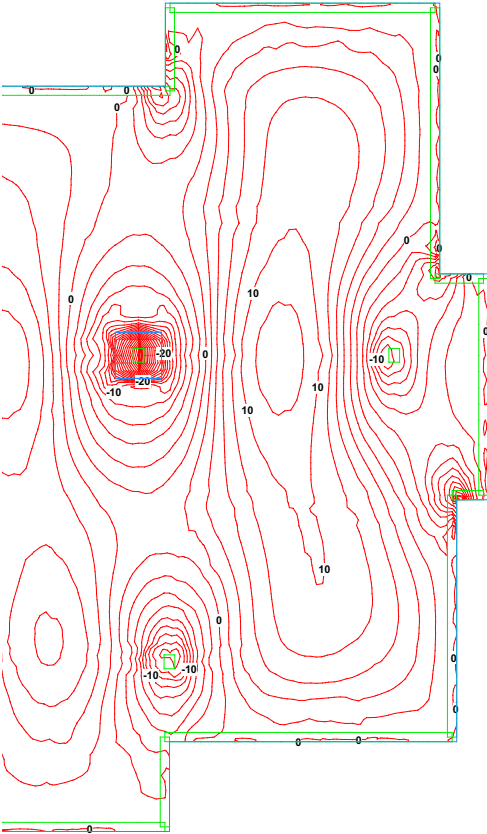
Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
 One Contour = 2 Kips
 Min Value = -54.2 Kips @ (-54.64,-85.18) Max Value = 26.02 Kips @ (-346.1,-84.94)



Factored LC: 1.2D + f1L + 1.6Lr: Max My Plan (2)

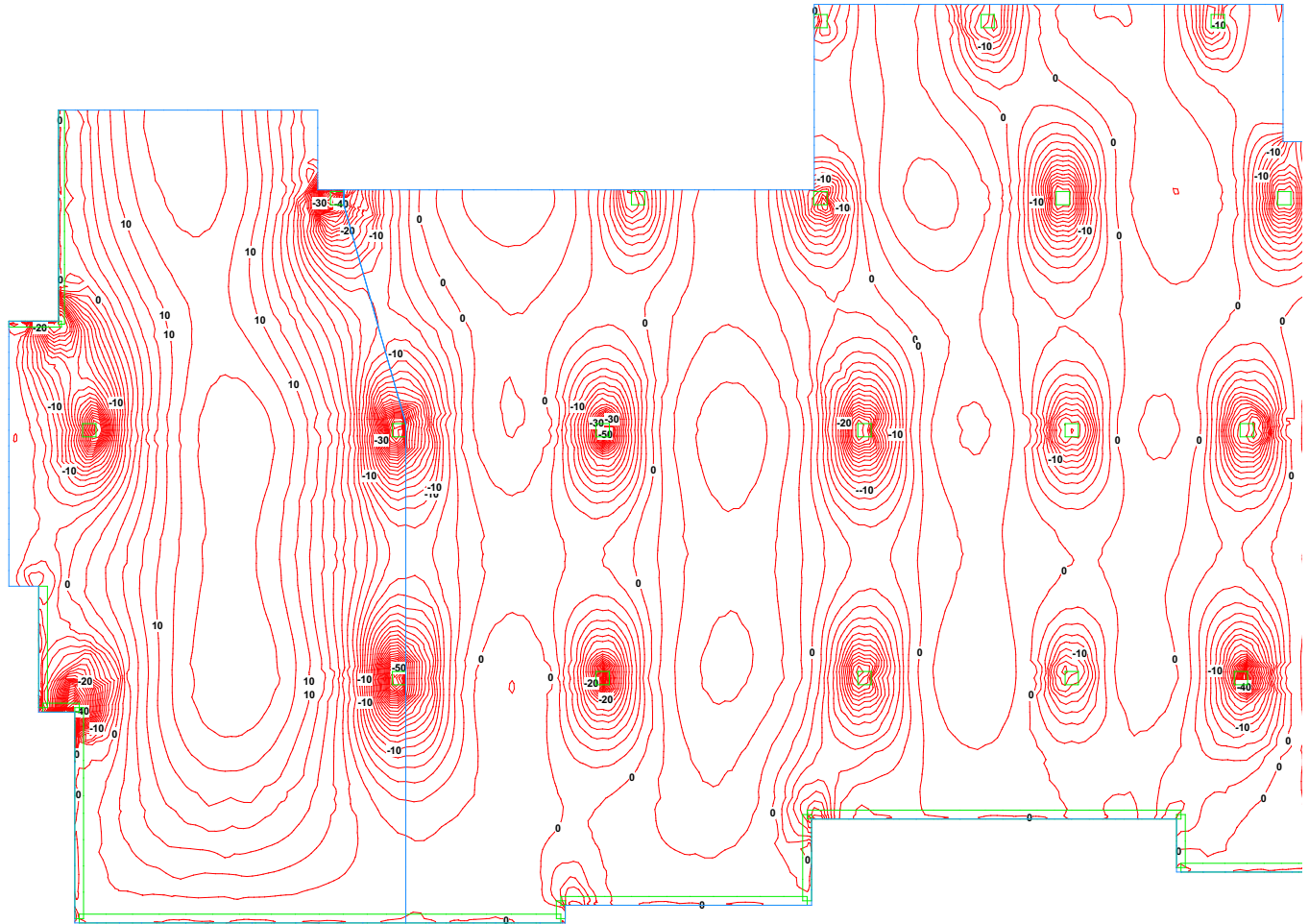


Factored LC: 1.2D + f1L + 1.6Lr: Max My Plan (3)

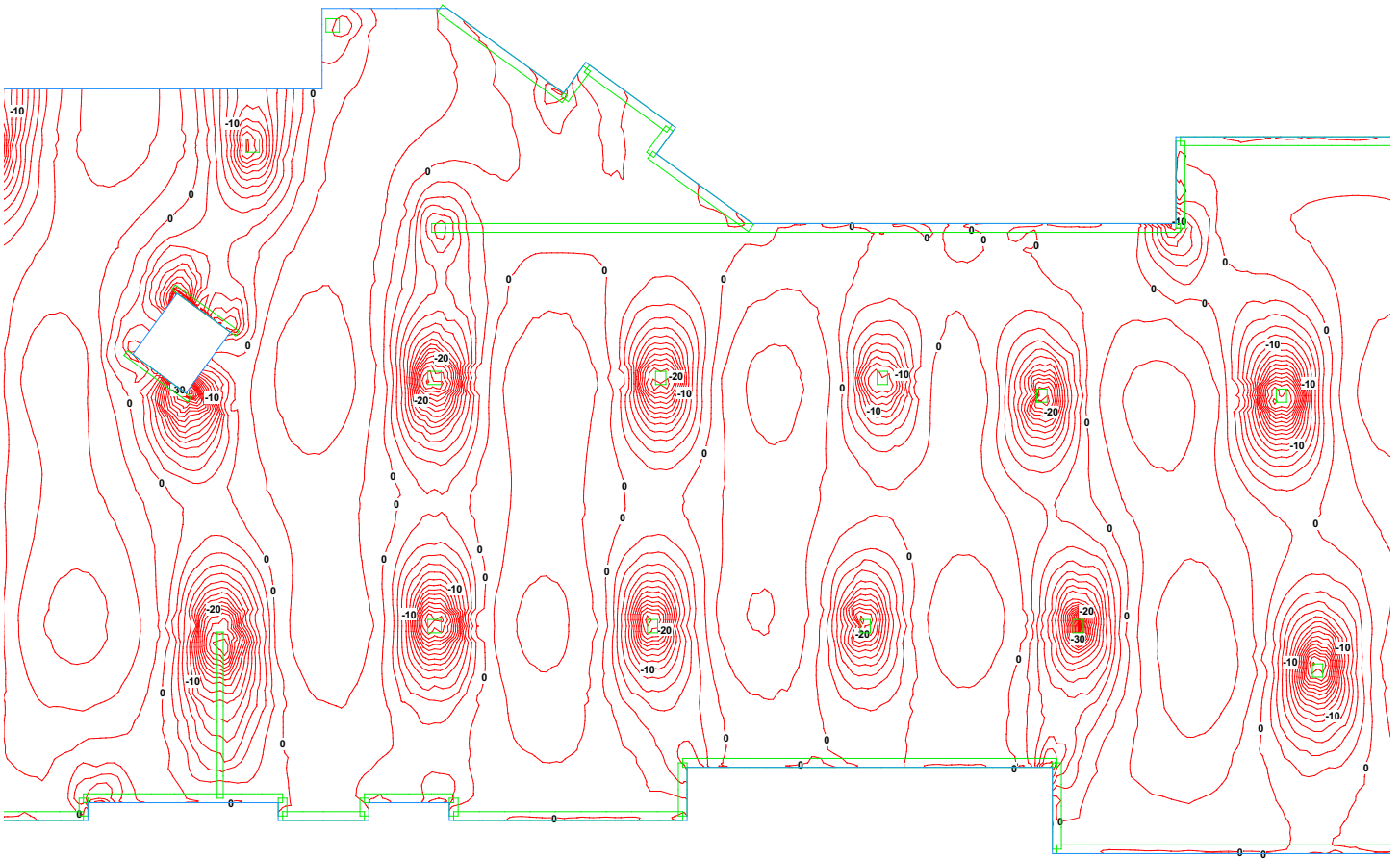


Factored LC: 1.2D + f1L + 1.6Lr: Min My Plan

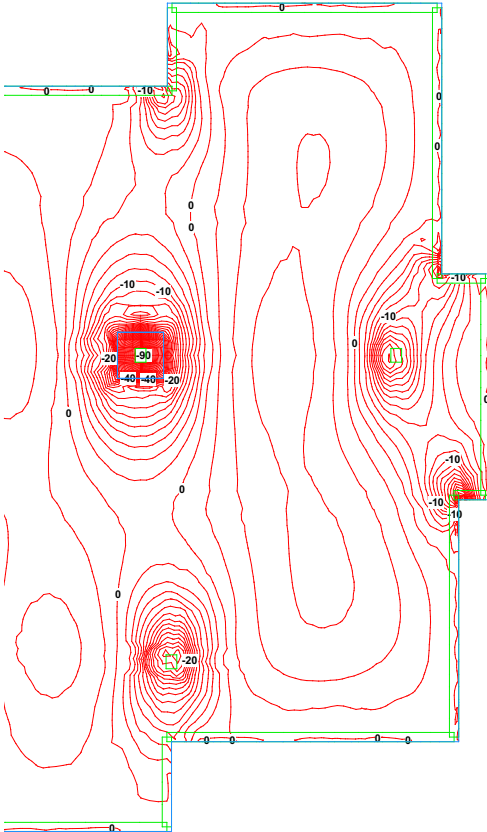
Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1.250
 Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
 One Contour = 2 Kips
 Min Value = -98.73 Kips @ (-54.64,-85.18) Max Value = 15.75 Kips @ (-345.9,-109.1)



Factored LC: 1.2D + f1L + 1.6Lr: Min My Plan (2)



Factored LC: 1.2D + f1L + 1.6Lr: Min My Plan (3)



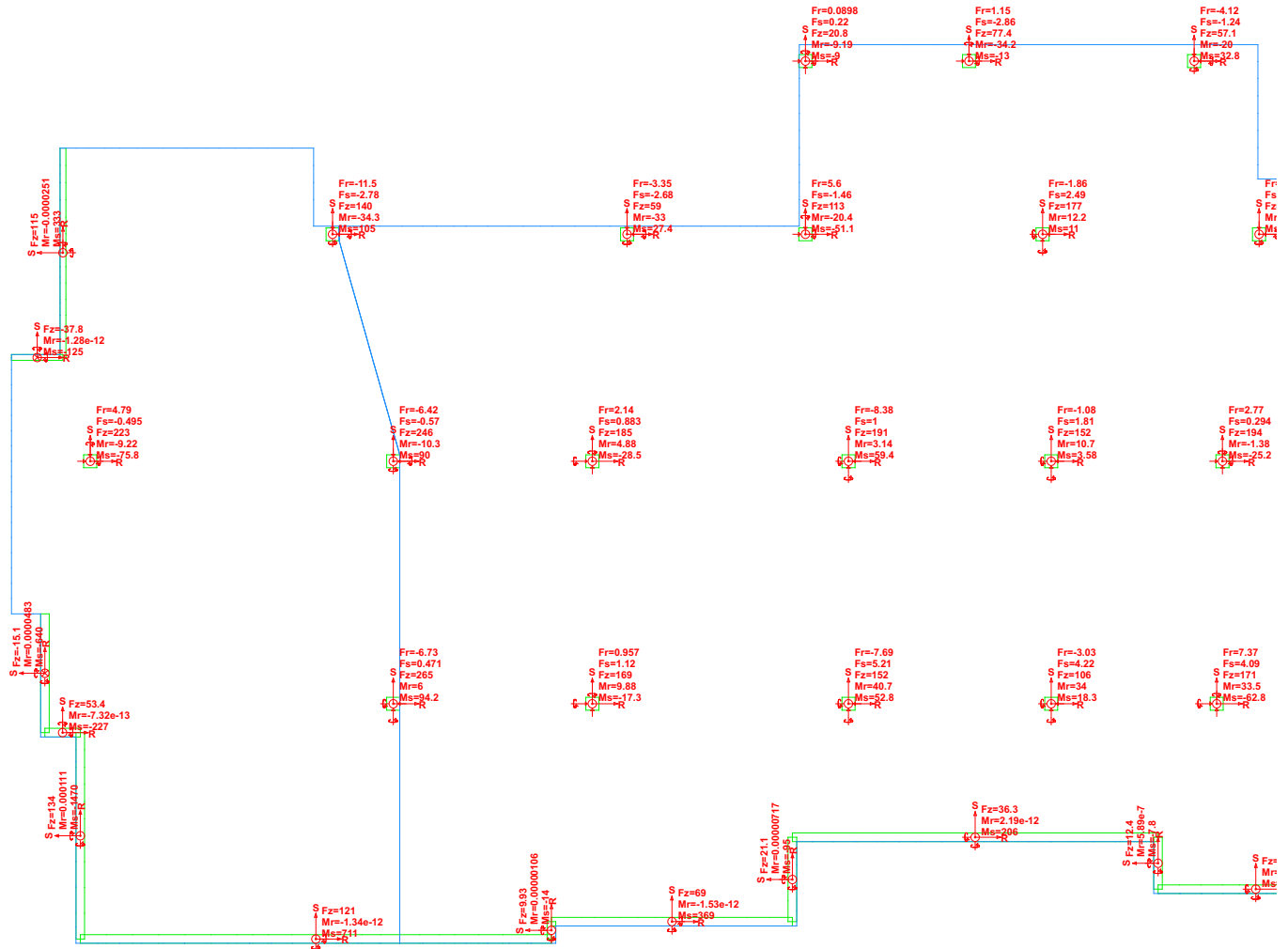
Factored LC: 1.2D + f1L + 1.6Lr: Std Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;

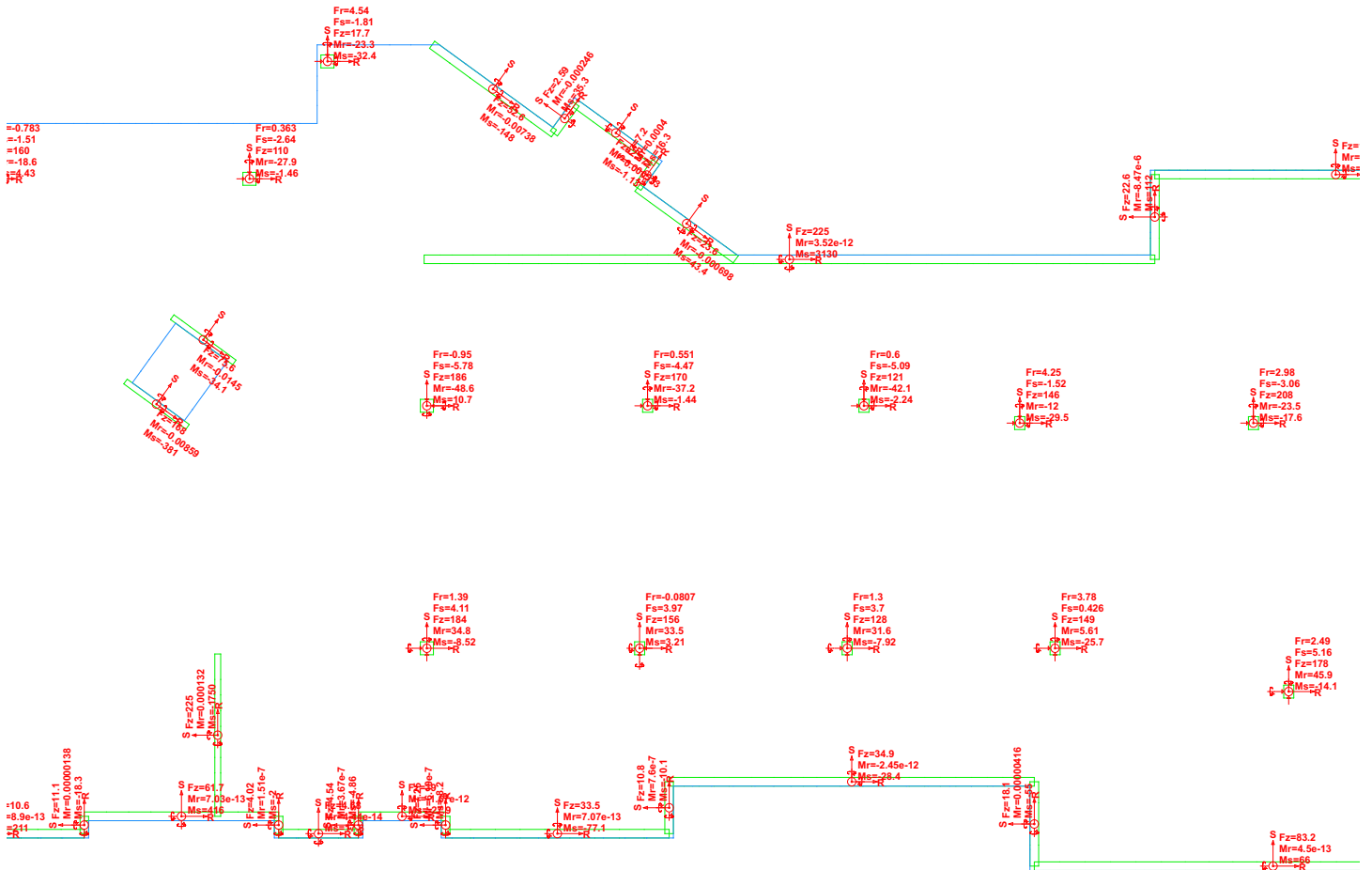
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1:250

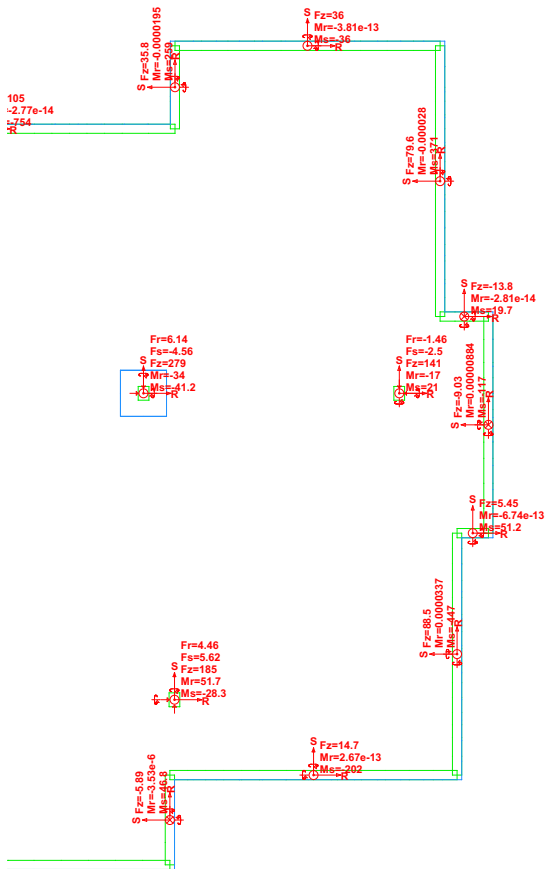
Factored LC: 1.2D + f1L + 1.6Lr - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Mx,Mz)(Standard Context)



Factored LC: 1.2D + f1L + 1.6Lr: Std Reactions Plan (2)



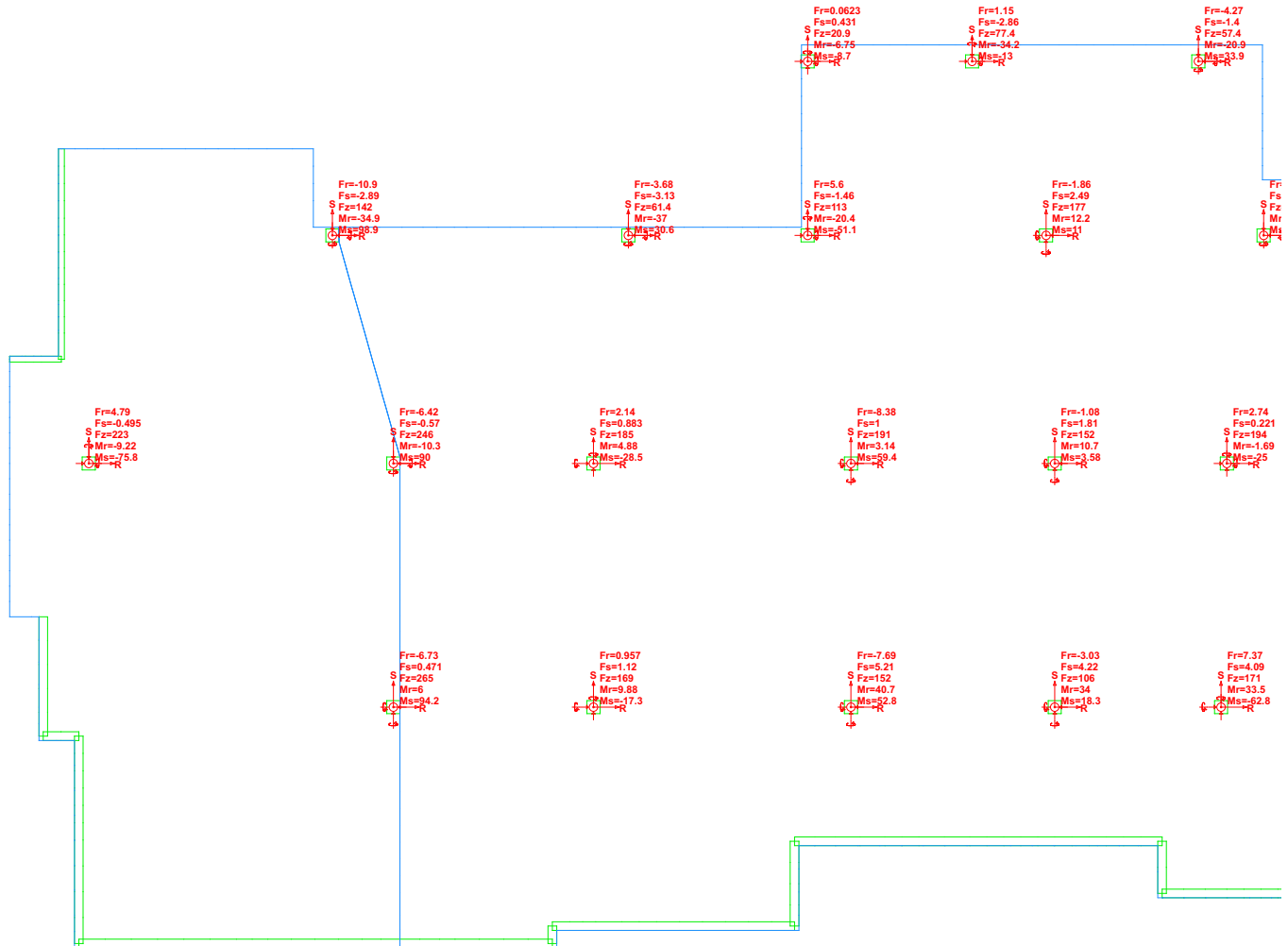
Factored LC: 1.2D + f1L + 1.6Lr: Std Reactions Plan (3)



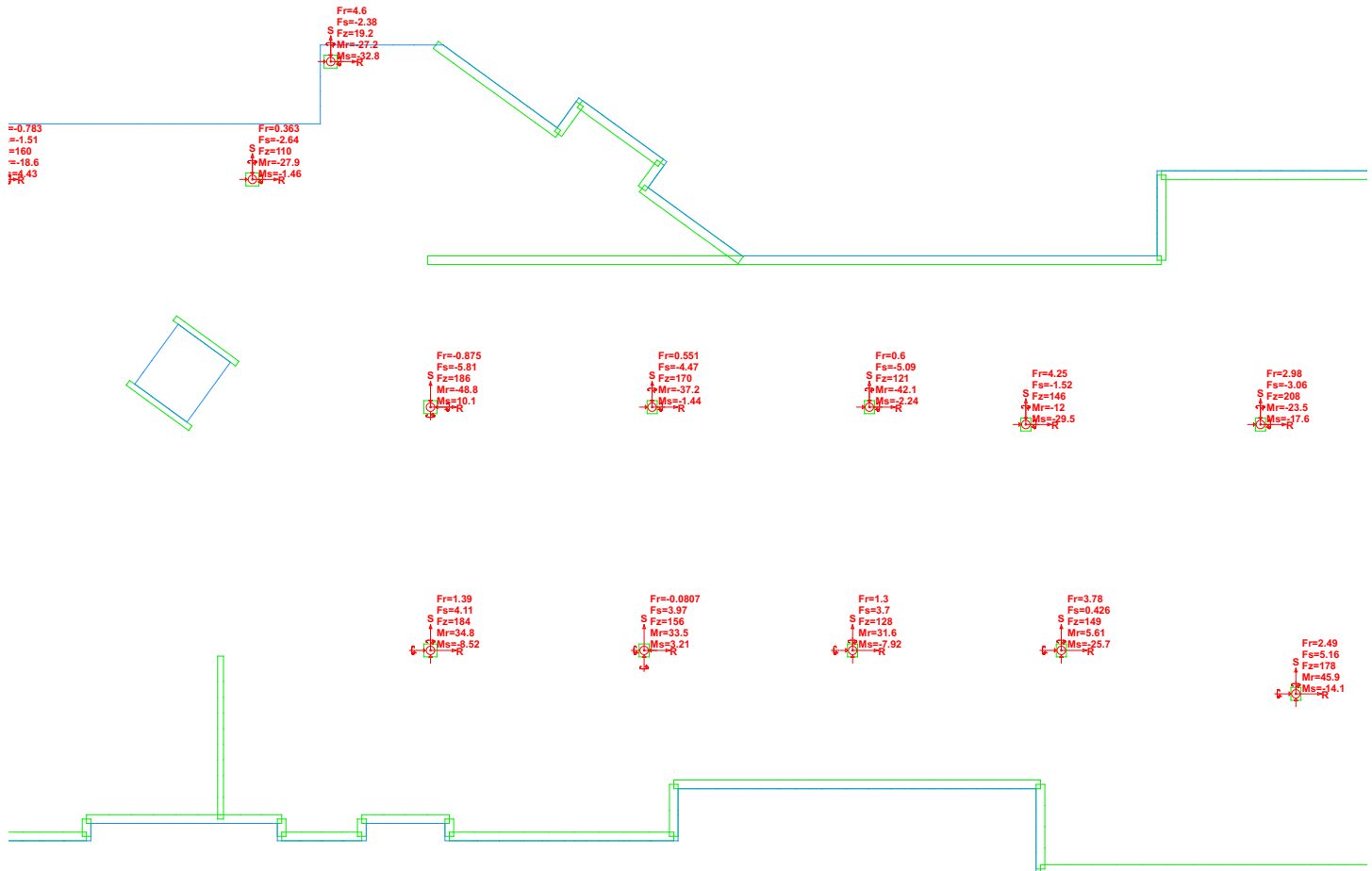
Factored LC: 1.2D + f1L + 1.6Lr: Max Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;

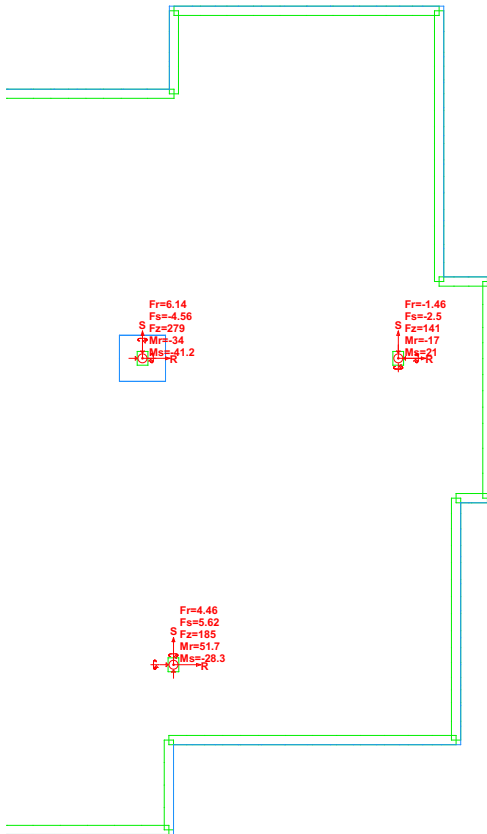
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1/250
Factored LC: 1.2D + f1L + 1.6Lr - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)

Factored LC: 1.2D + f1L + 1.6Lr: Max Reactions Plan (2)



Factored LC: 1.2D + f1L + 1.6Lr: Max Reactions Plan (3)



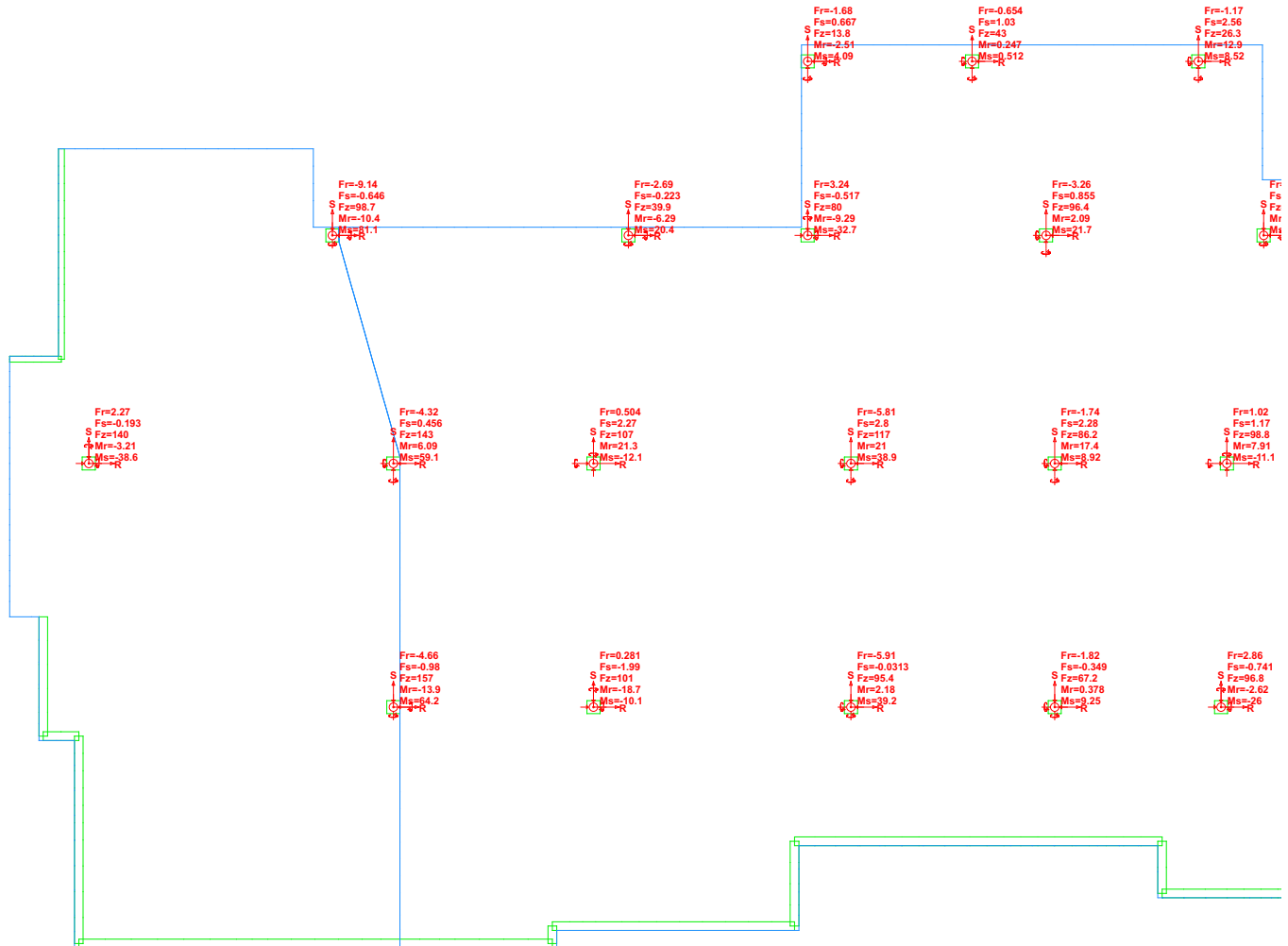
Factored LC: 1.2D + f1L + 1.6Lr: Min Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;

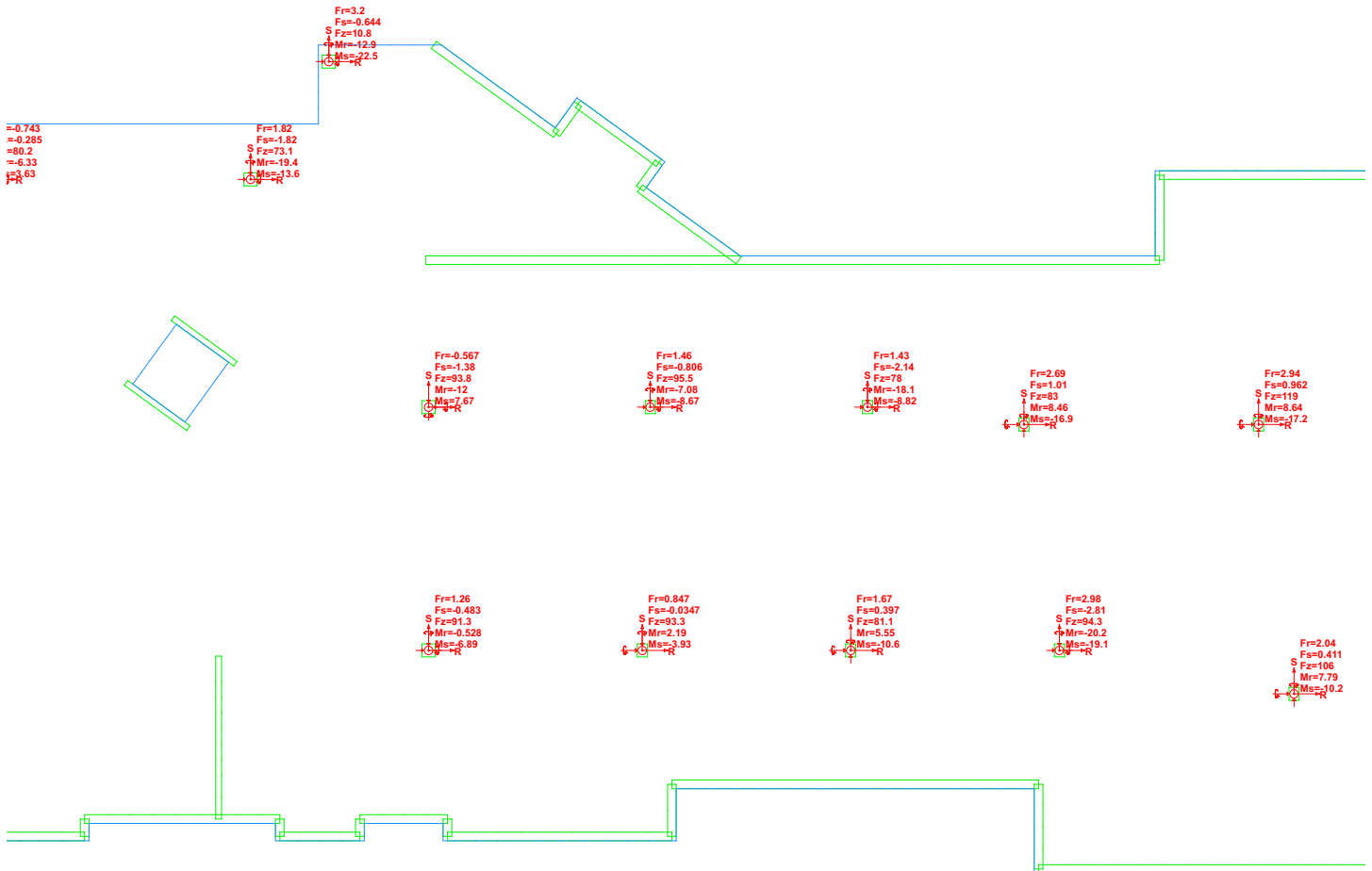
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Scale = 1:250

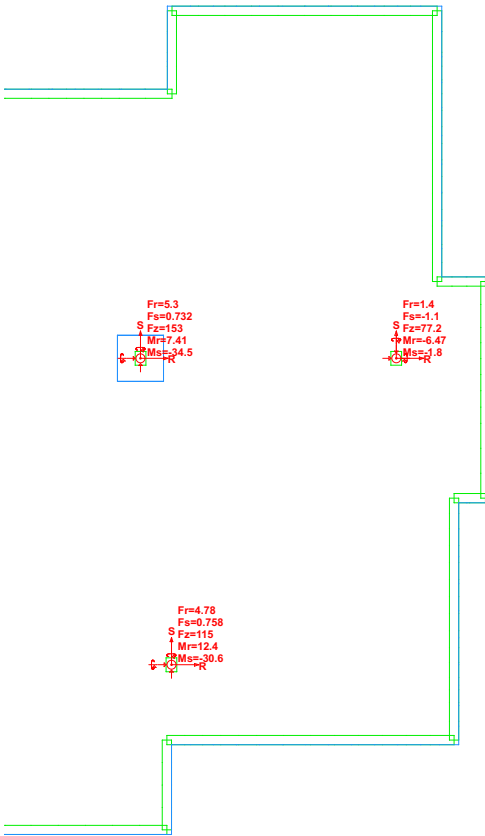
Factored LC: 1.2D + f1L + 1.6Lr - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Mz)(Min Fz Context)



Factored LC: 1.2D + f1L + 1.6Lr: Min Reactions Plan (2)

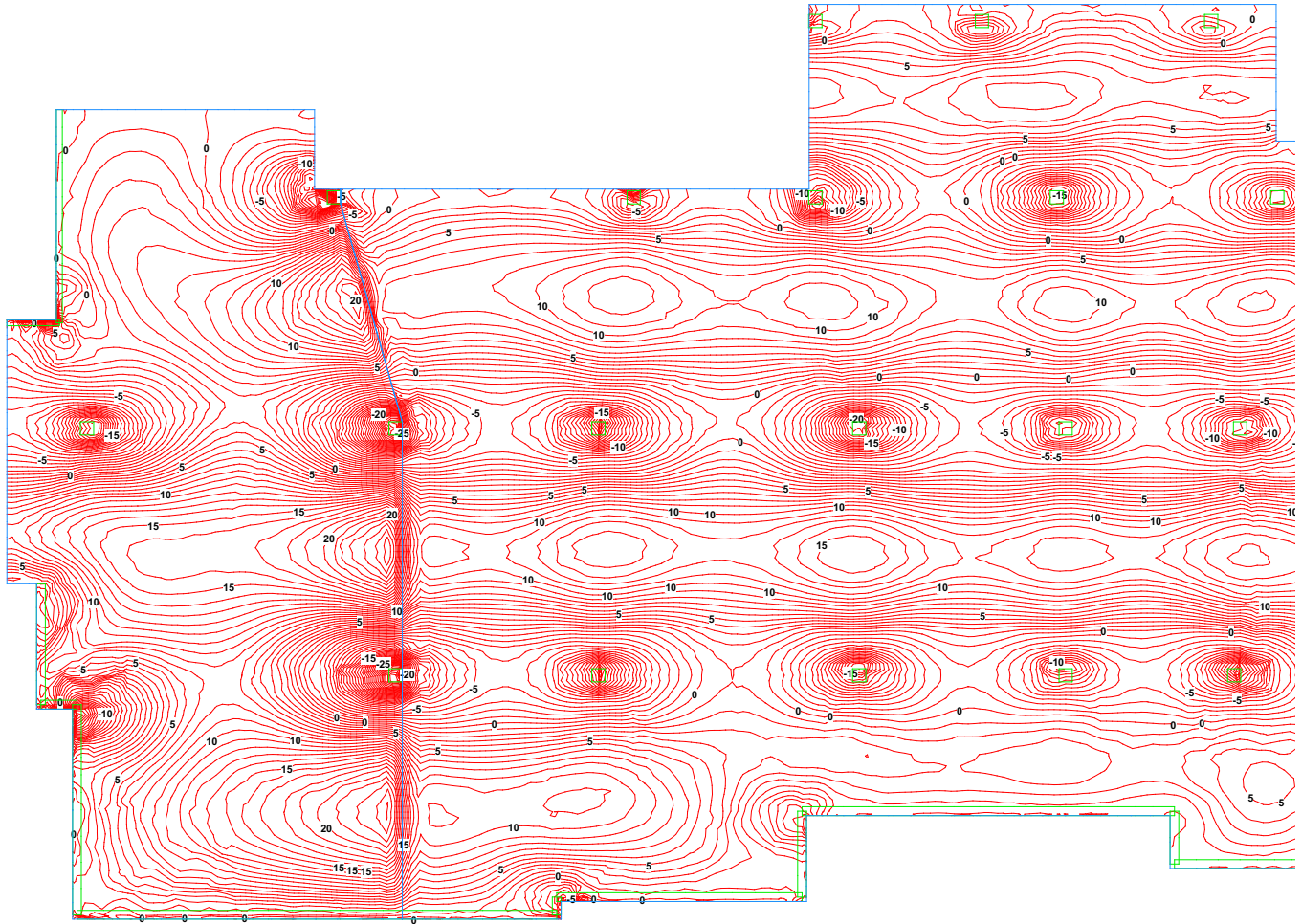


Factored LC: 1.2D + f1L + 1.6Lr: Min Reactions Plan (3)

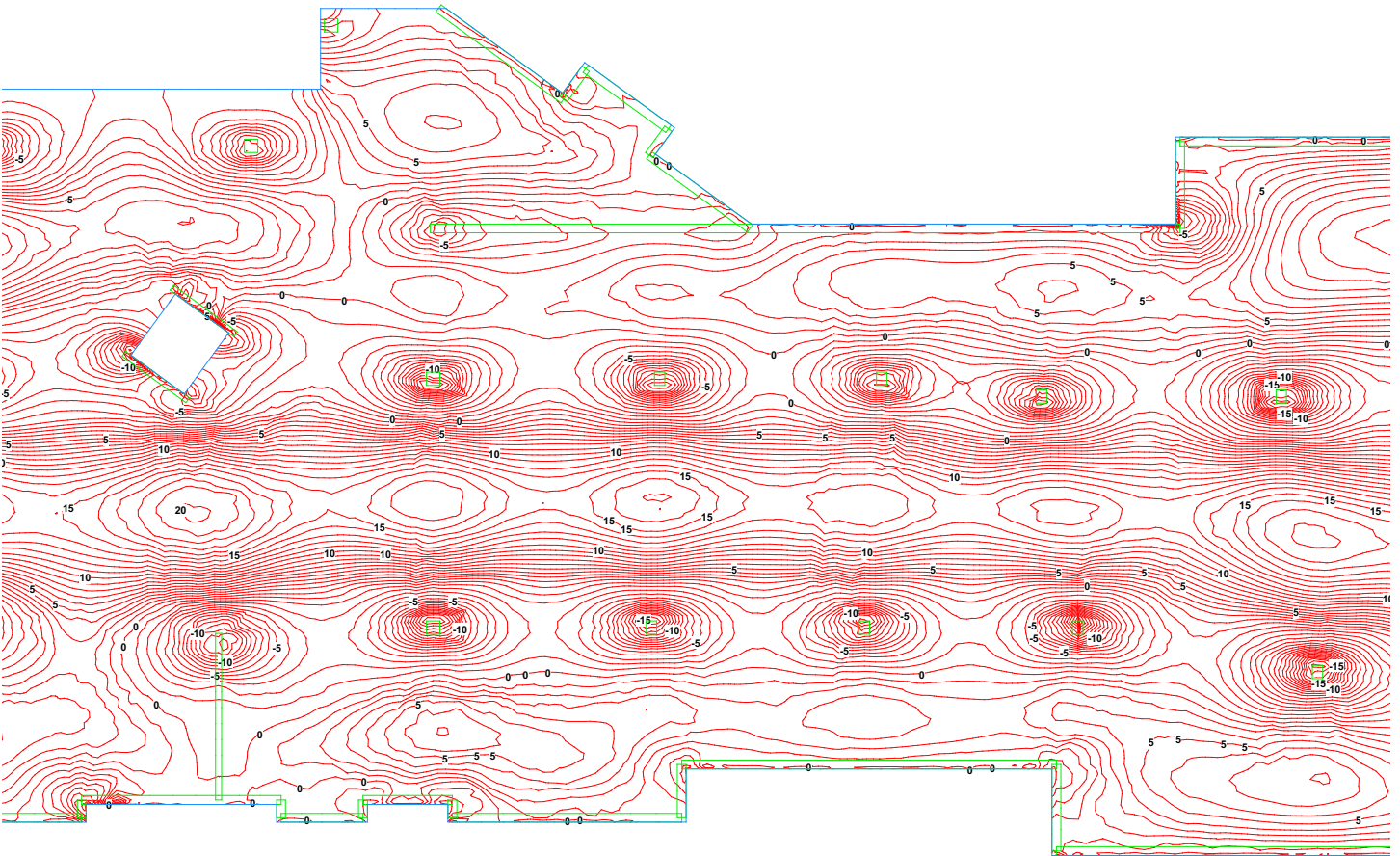


Factored LC: 1.2D + 1.6L + 0.5S: Max Mx Plan

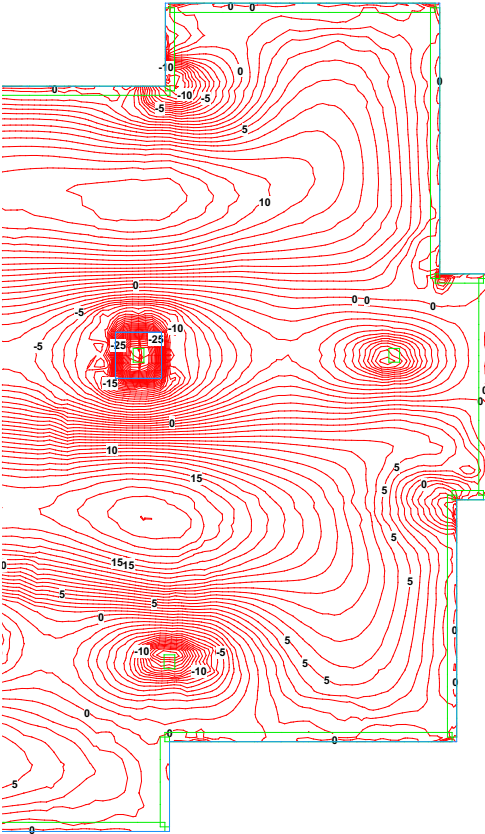
Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1.250
 Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Maximum Values) (X-Axis Direction)
 One Contour = 1 Kips
 Min Value = -38.7 Kips @ (-54.85,-86.43) Max Value = 26.04 Kips @ (-328.3,-97.17)



Factored LC: 1.2D + 1.6L + 0.5S: Max Mx Plan (2)

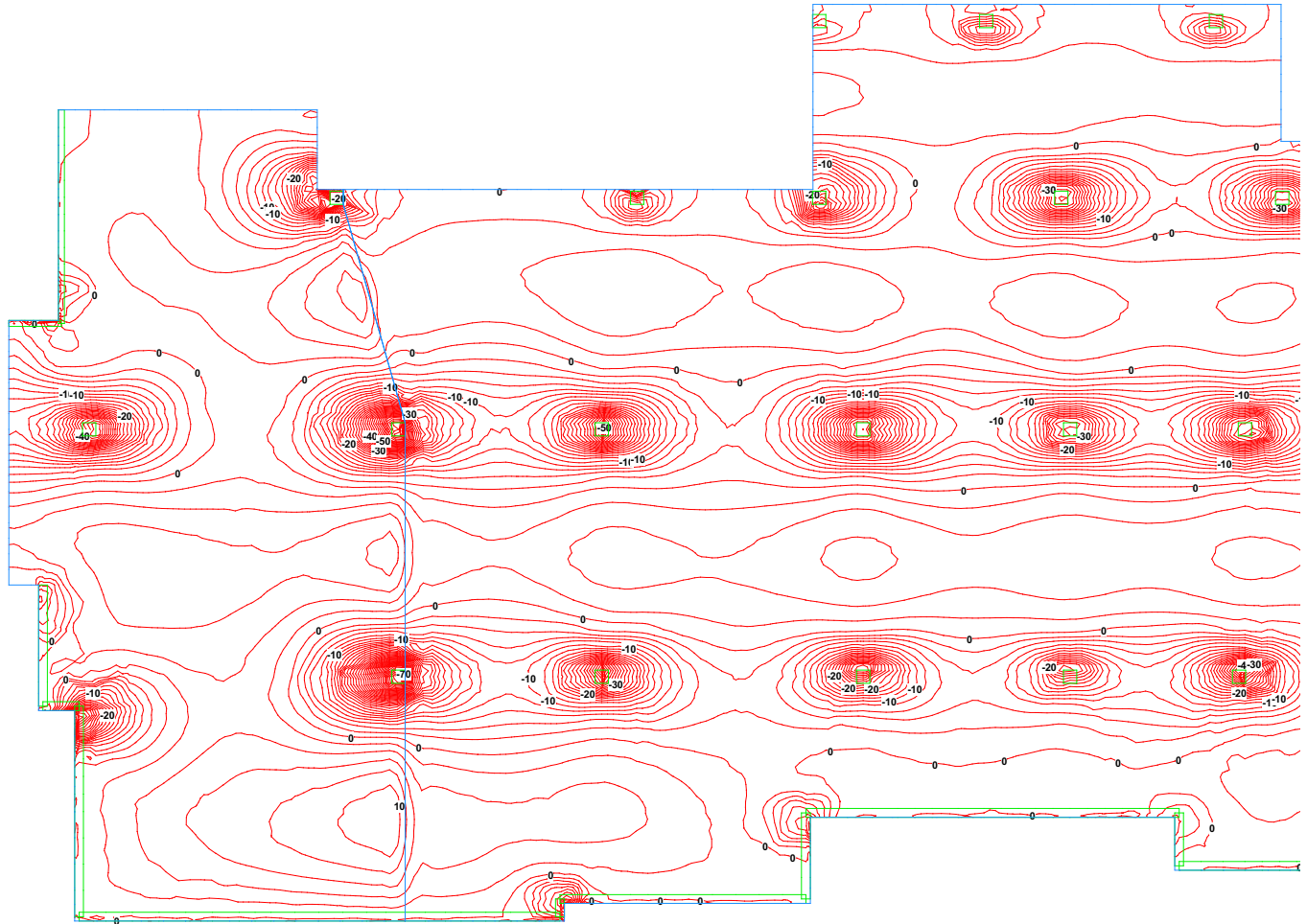


Factored LC: 1.2D + 1.6L + 0.5S: Max Mx Plan (3)

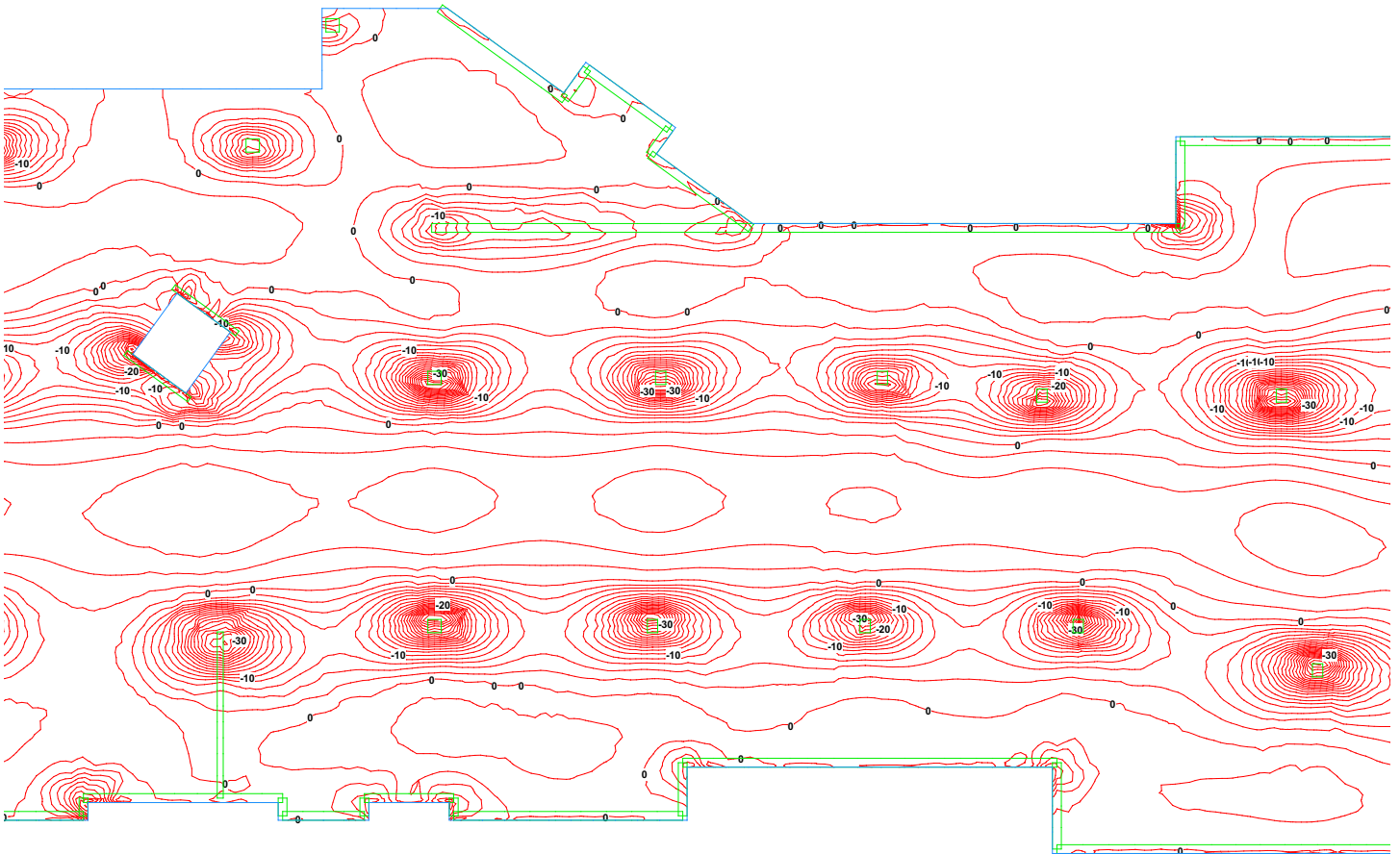


Factored LC: 1.2D + 1.6L + 0.5S: Min Mx Plan

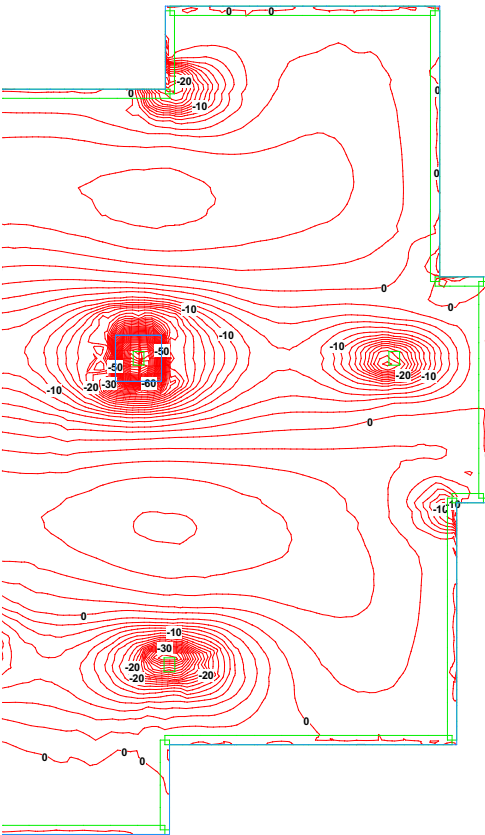
Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Minimum Values) (X-Axis Direction)
 One Contour = 2 Kips
 Min Value = -89.46 Kips @ (-54.85, -86.43) Max Value = 11.37 Kips @ (-328.4, -126.7)



Factored LC: 1.2D + 1.6L + 0.5S: Min Mx Plan (2)

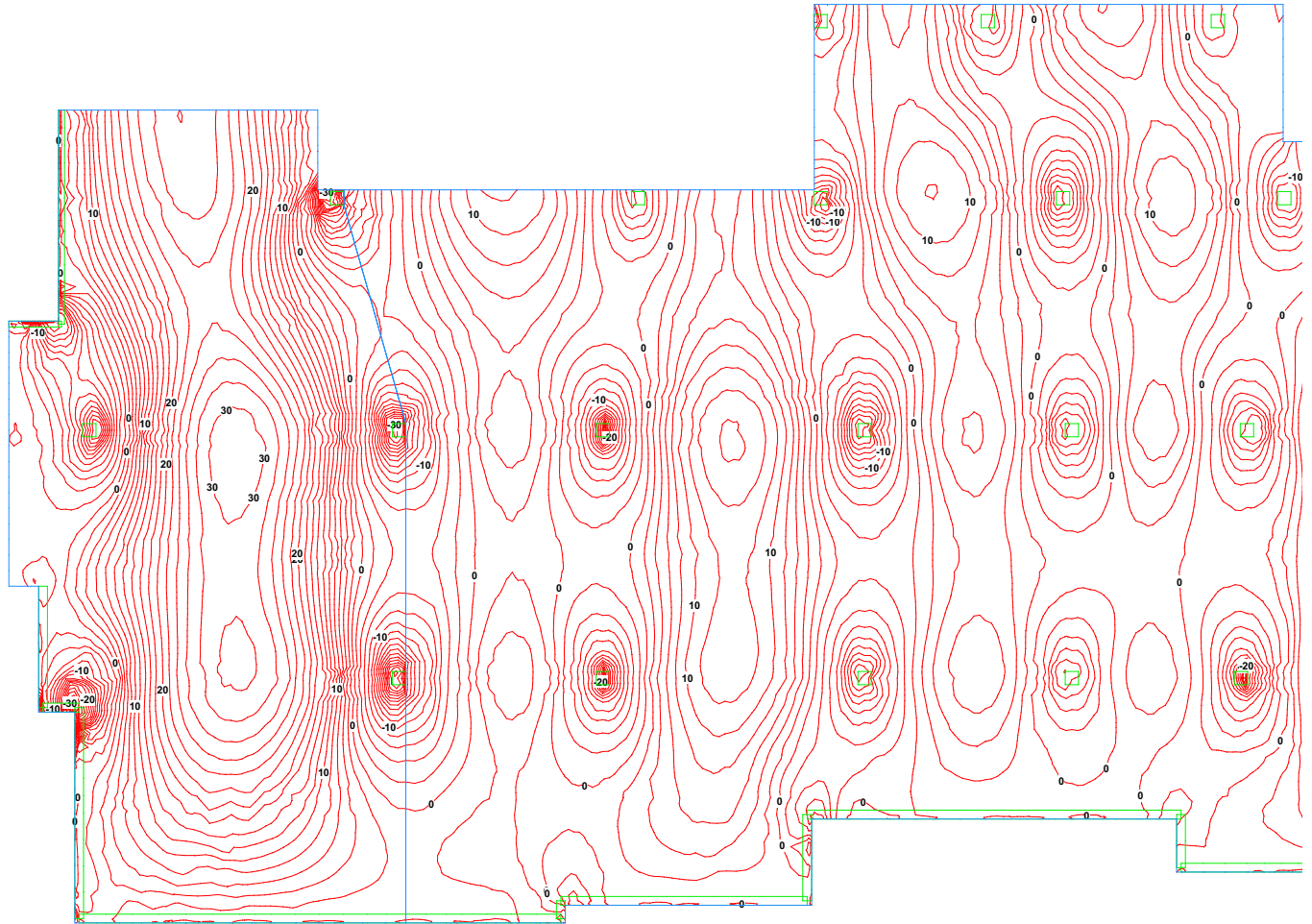


Factored LC: 1.2D + 1.6L + 0.5S: Min Mx Plan (3)

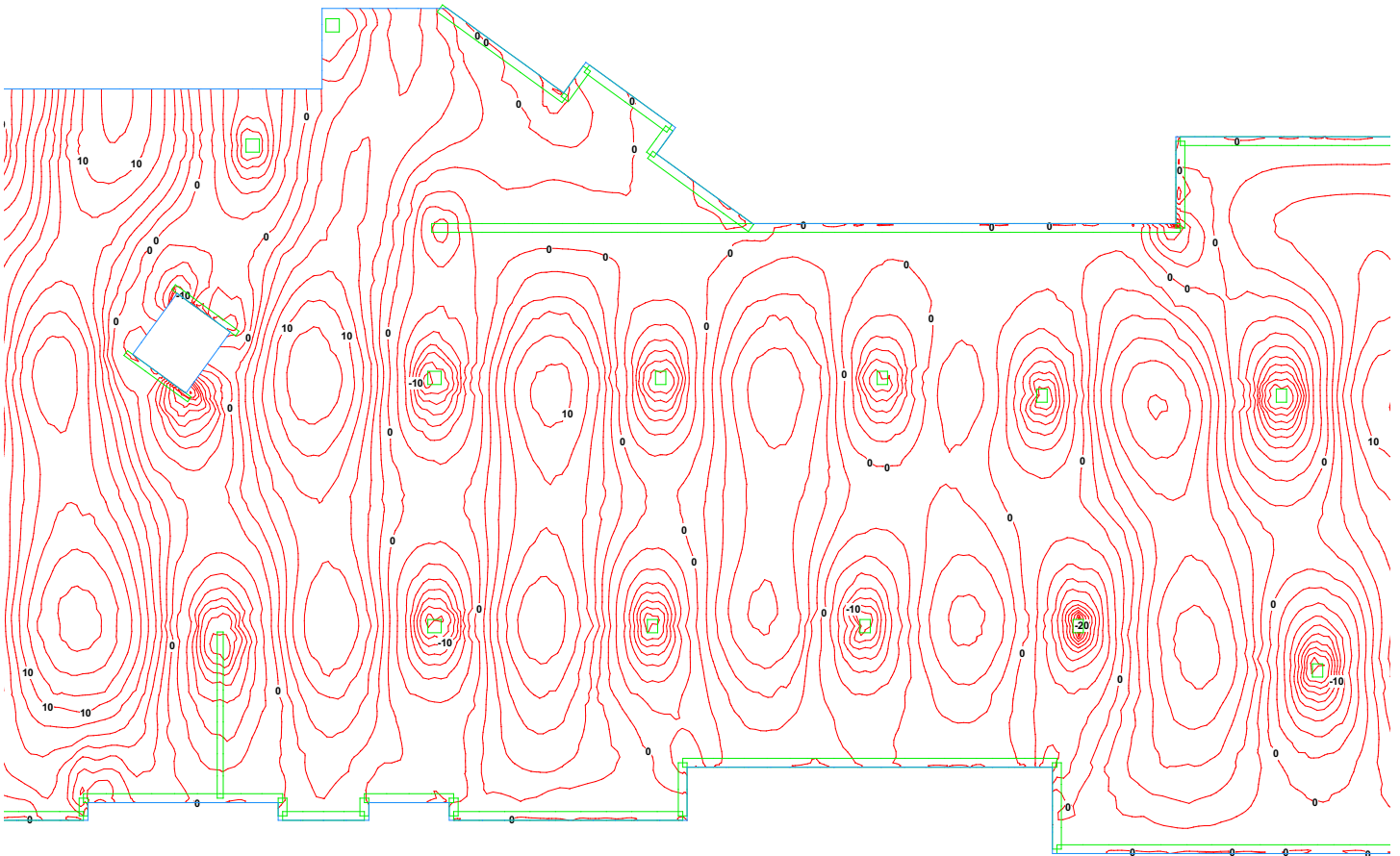


Factored LC: 1.2D + 1.6L + 0.5S: Max My Plan

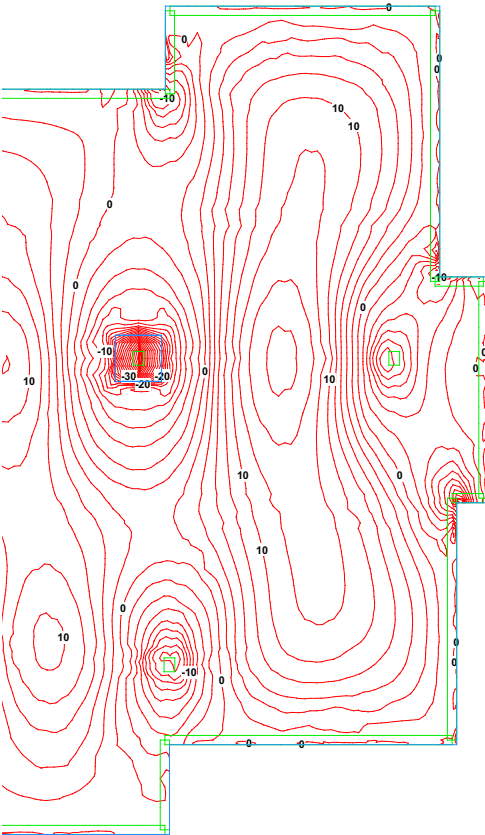
Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
 One Contour = 2 Kips
 Min Value = -54.2 Kips @ (-54.64,-85.18) Max Value = 31.67 Kips @ (-346.1,-84.94)



Factored LC: 1.2D + 1.6L + 0.5S: Max My Plan (2)

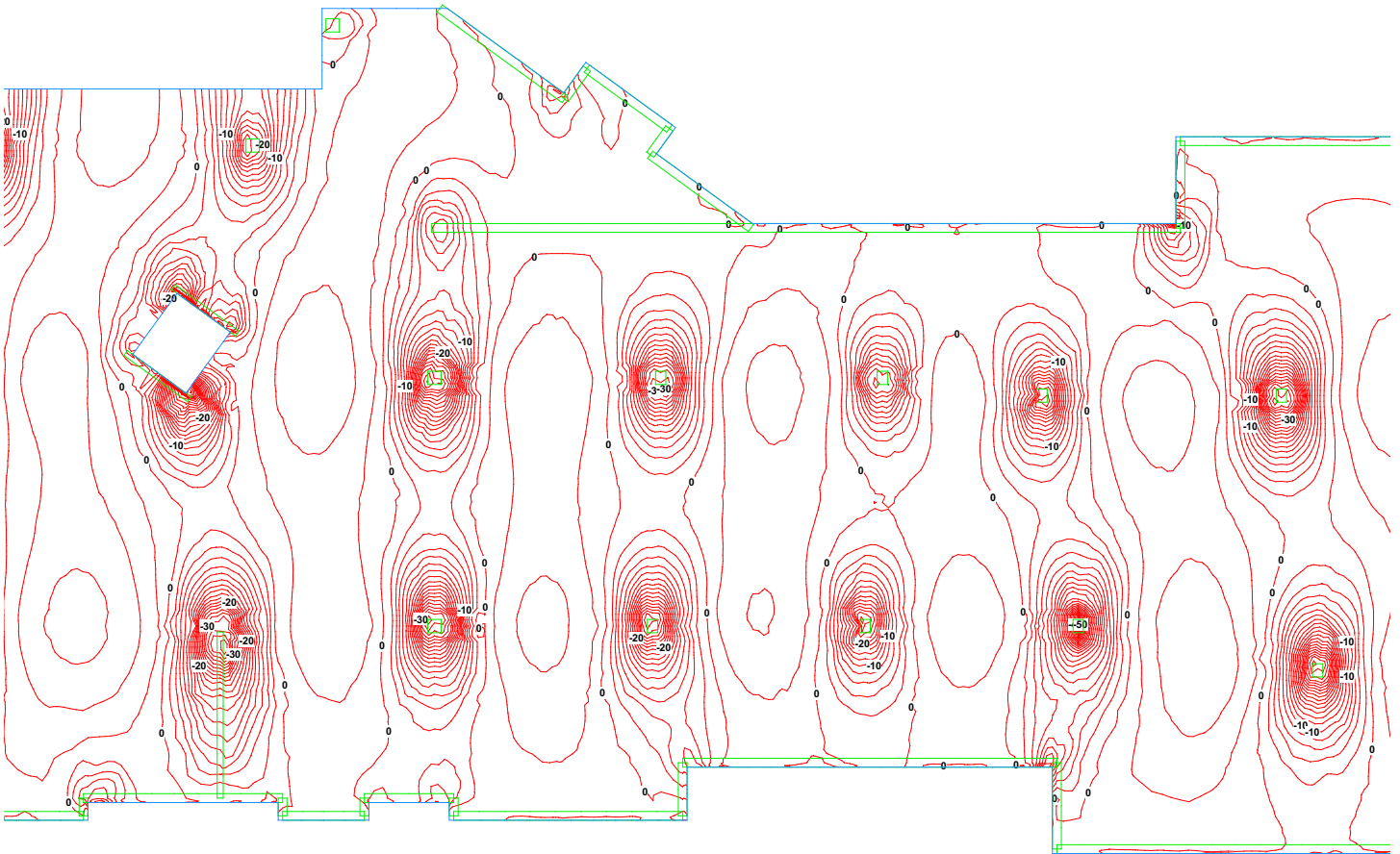


Factored LC: 1.2D + 1.6L + 0.5S: Max My Plan (3)

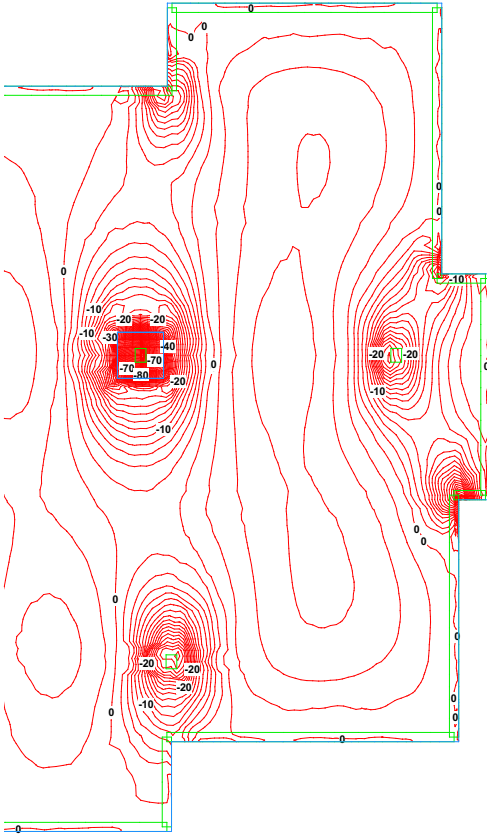


The figure displays a contour plot of the energy landscape for a 2D Ising spin glass. The plot is characterized by a complex arrangement of red contour lines that delineate regions of different energy levels. A prominent feature is the presence of many local minima, which are indicated by green 'X' marks. These minima represent stable states or metastable states of the system. A blue line traces a path through the landscape, starting from a high-energy region (top left) and moving towards a lower-energy region (bottom center). The axes are labeled with values ranging from -60 to 0, with the vertical axis (y-axis) showing values from -60 to 0 and the horizontal axis (x-axis) showing values from -60 to 0. The overall shape of the landscape is irregular, reflecting the complex nature of the spin glass phase.

Factored LC: 1.2D + 1.6L + 0.5S: Min My Plan (2)

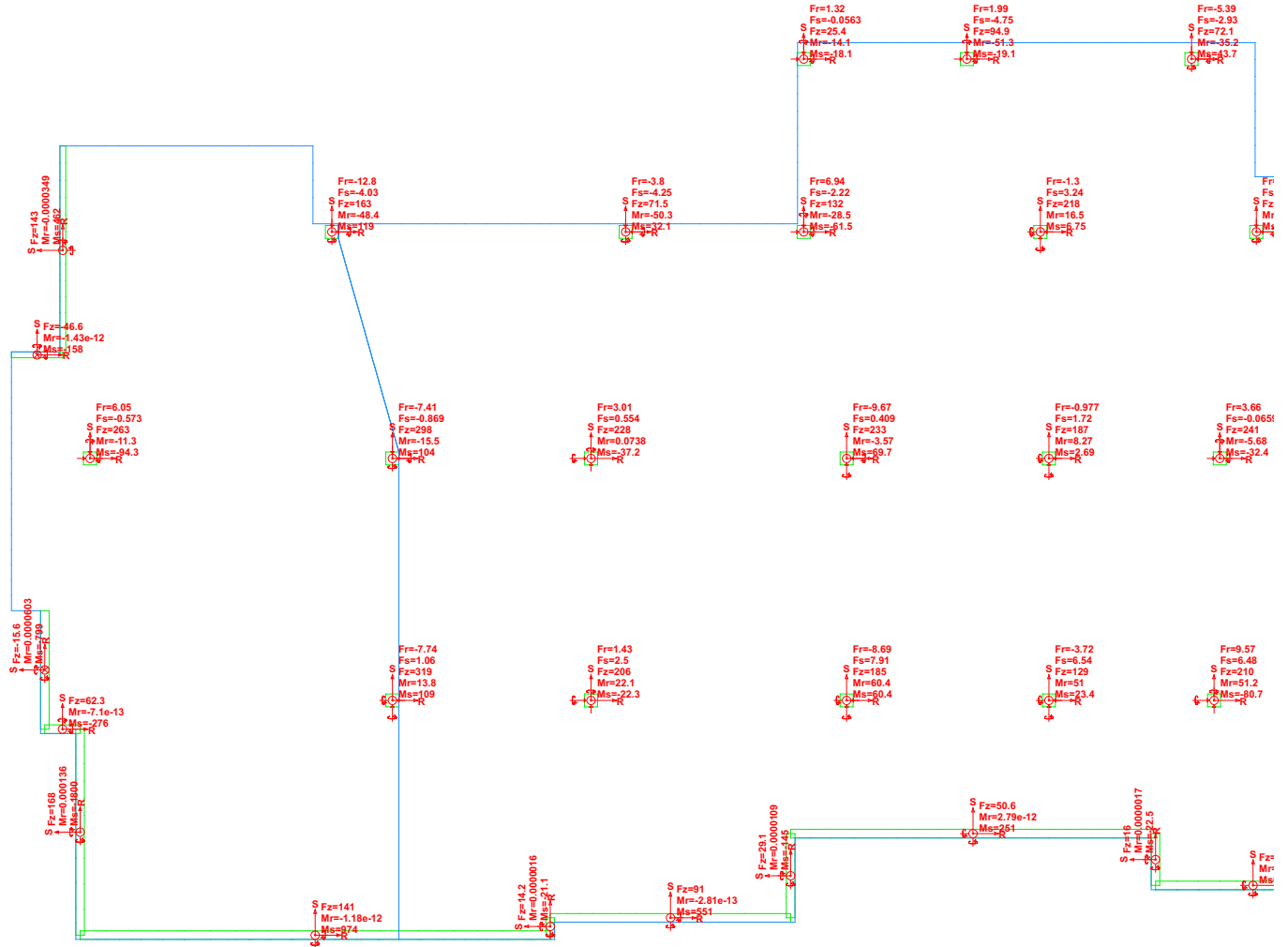


Factored LC: 1.2D + 1.6L + 0.5S: Min My Plan (3)

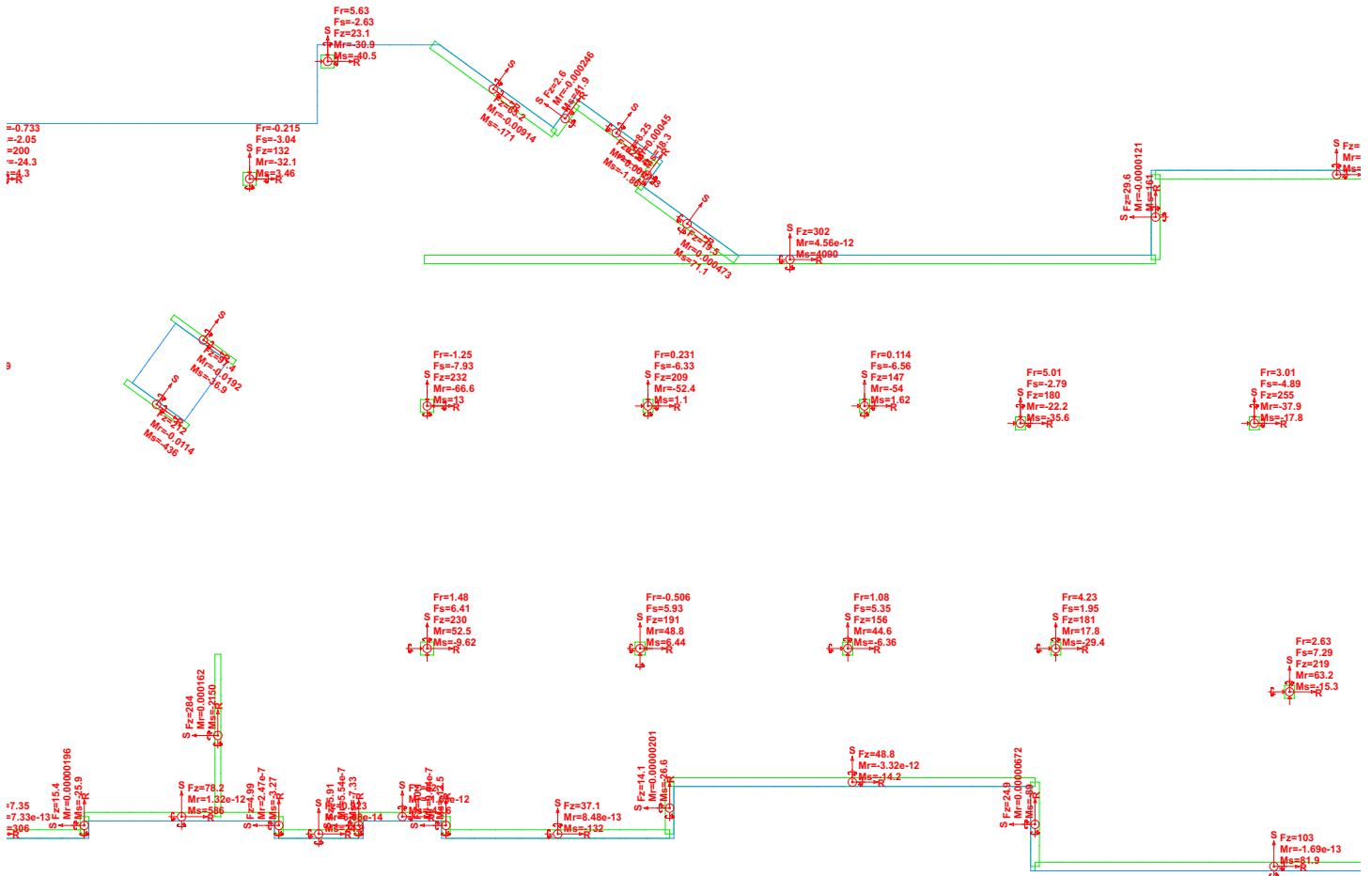


Factored LC: 1.2D + 1.6L + 0.5S: Std Reactions Plan

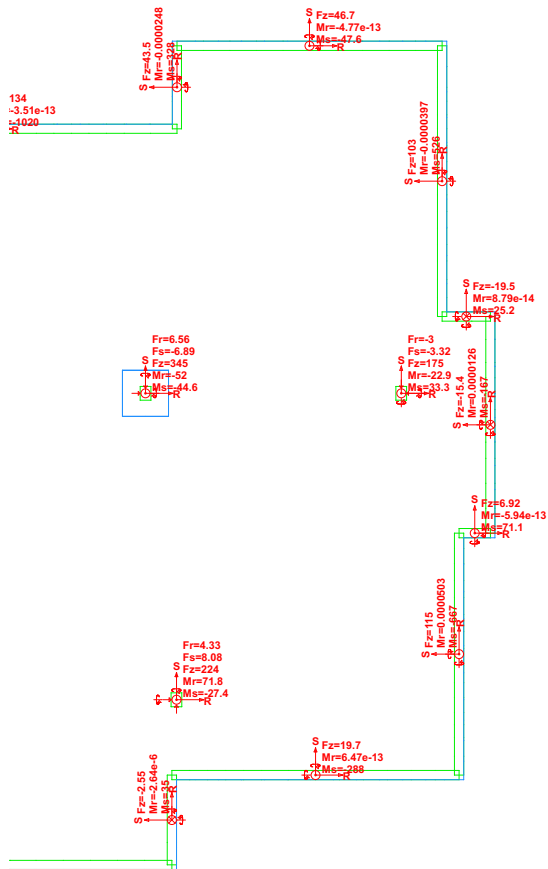
Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Mz)(Standard Context)



Factored LC: 1.2D + 1.6L + 0.5S: Std Reactions Plan (2)

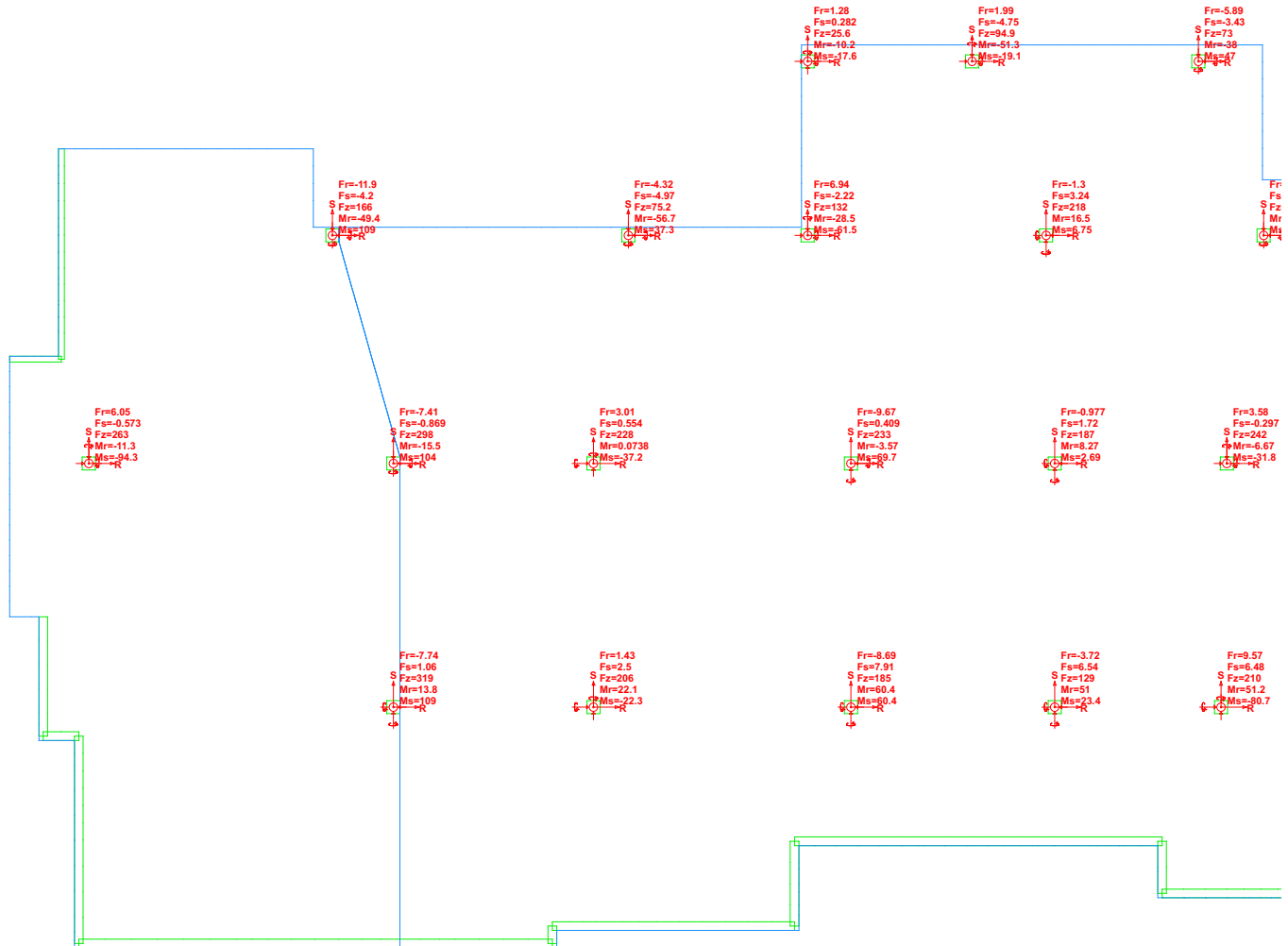


Factored LC: 1.2D + 1.6L + 0.5S: Std Reactions Plan (3)

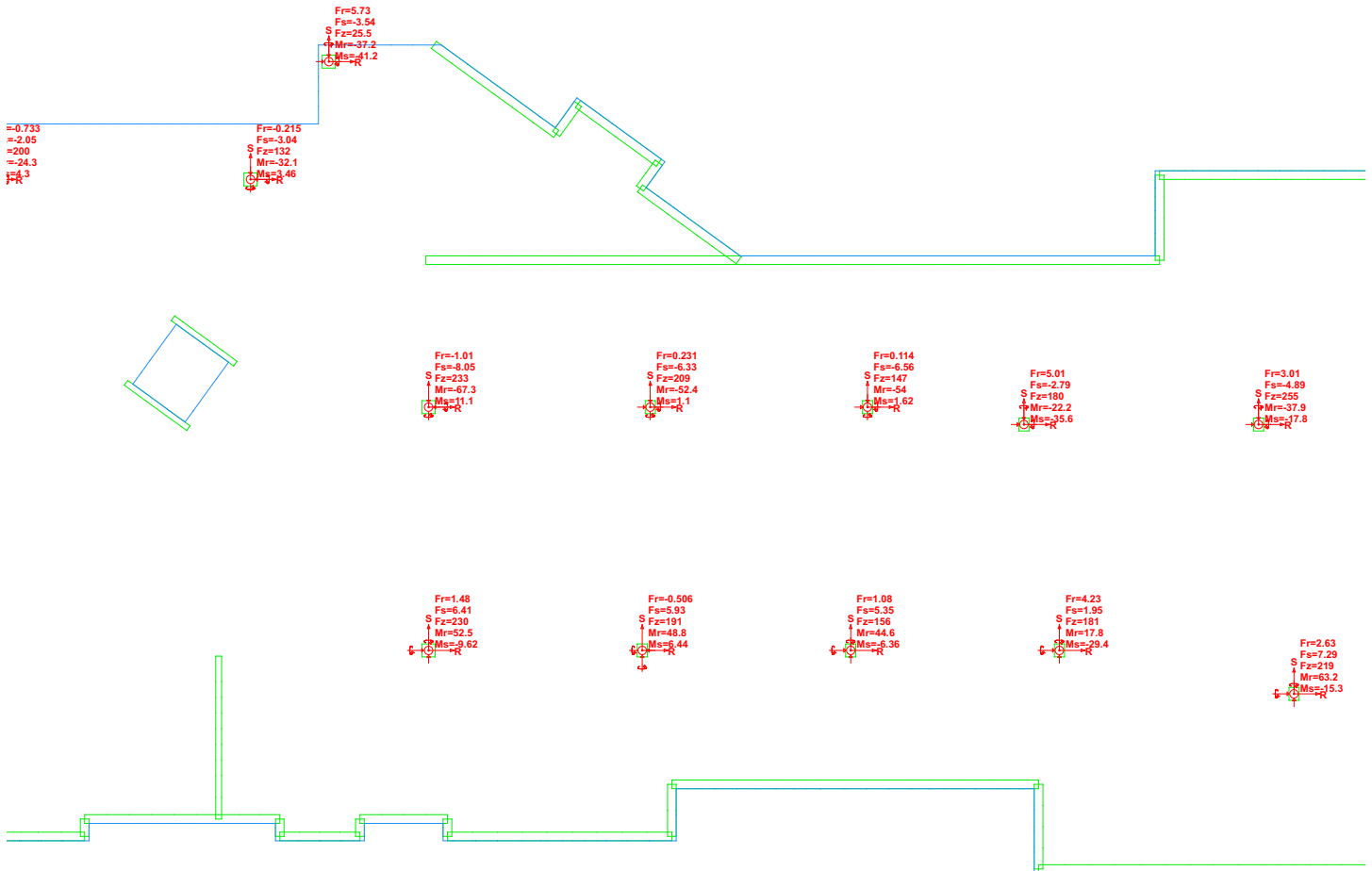


Factored LC: 1.2D + 1.6L + 0.5S: Max Reactions Plan

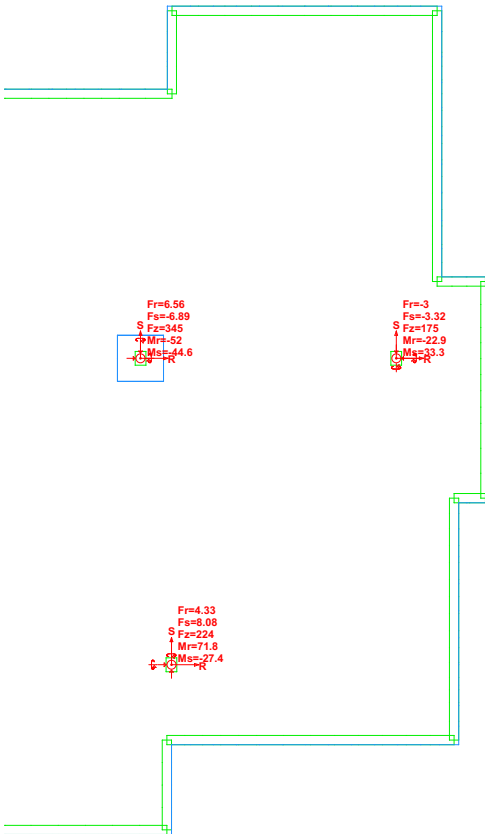
Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



Factored LC: 1.2D + 1.6L + 0.5S: Max Reactions Plan (2)

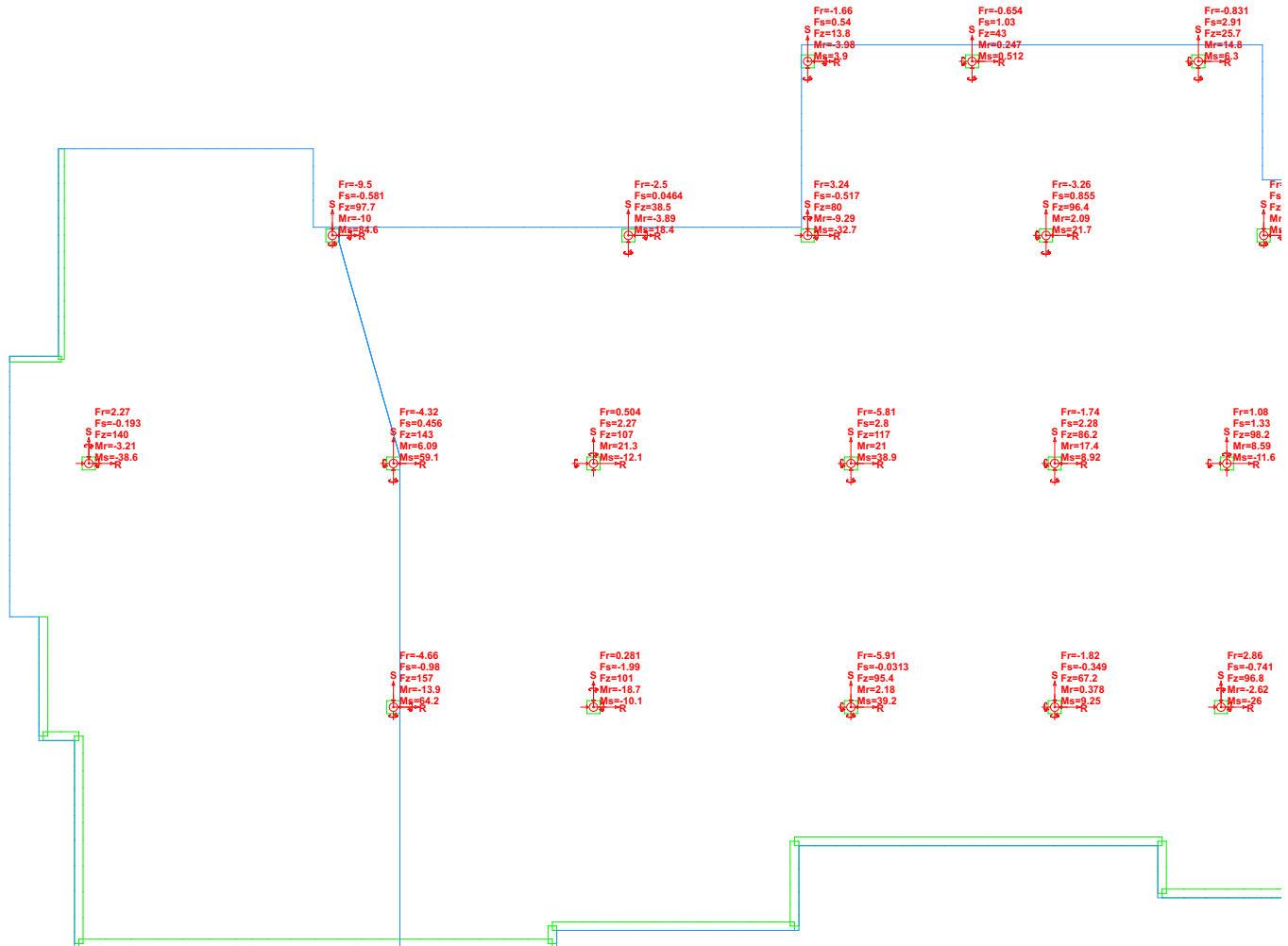


Factored LC: 1.2D + 1.6L + 0.5S: Max Reactions Plan (3)

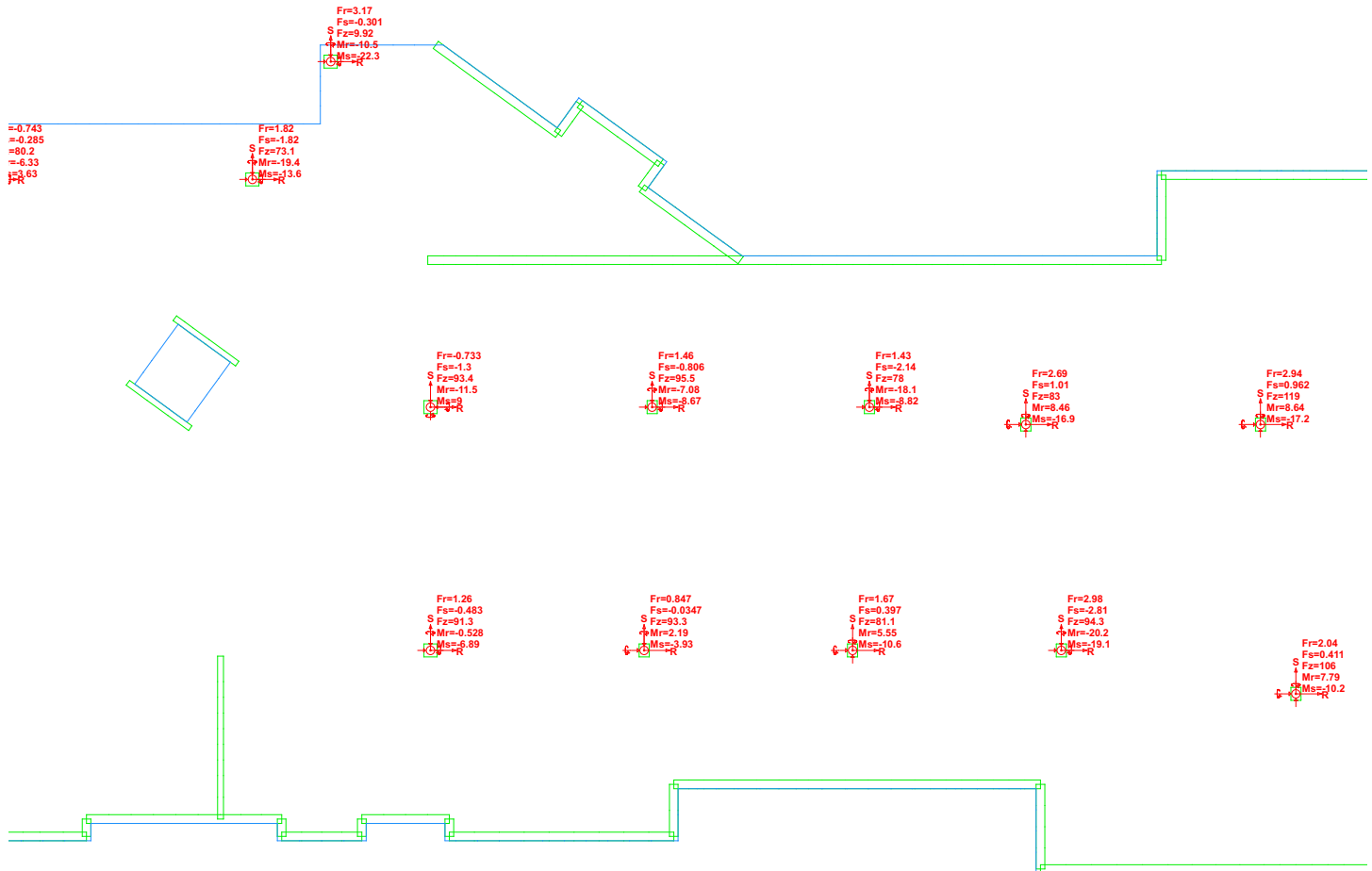


Factored LC: 1.2D + 1.6L + 0.5S: Min Reactions Plan

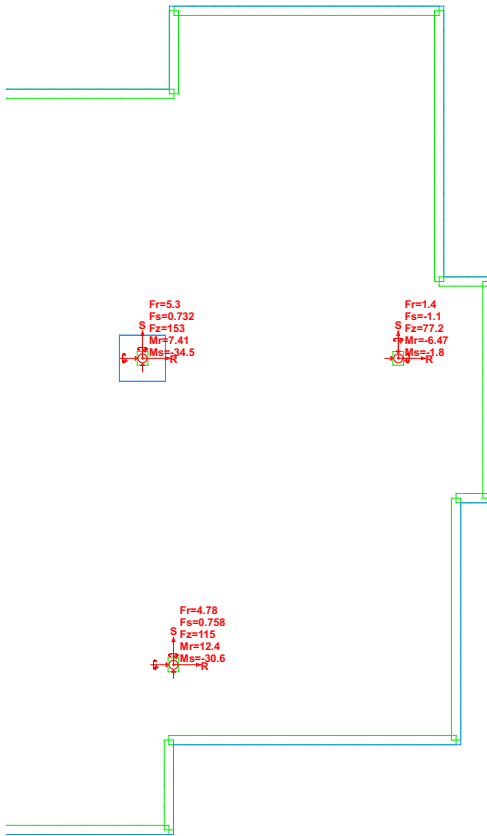
Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Mz)(Min Fz Context)



Factored LC: 1.2D + 1.6L + 0.5S: Min Reactions Plan (2)

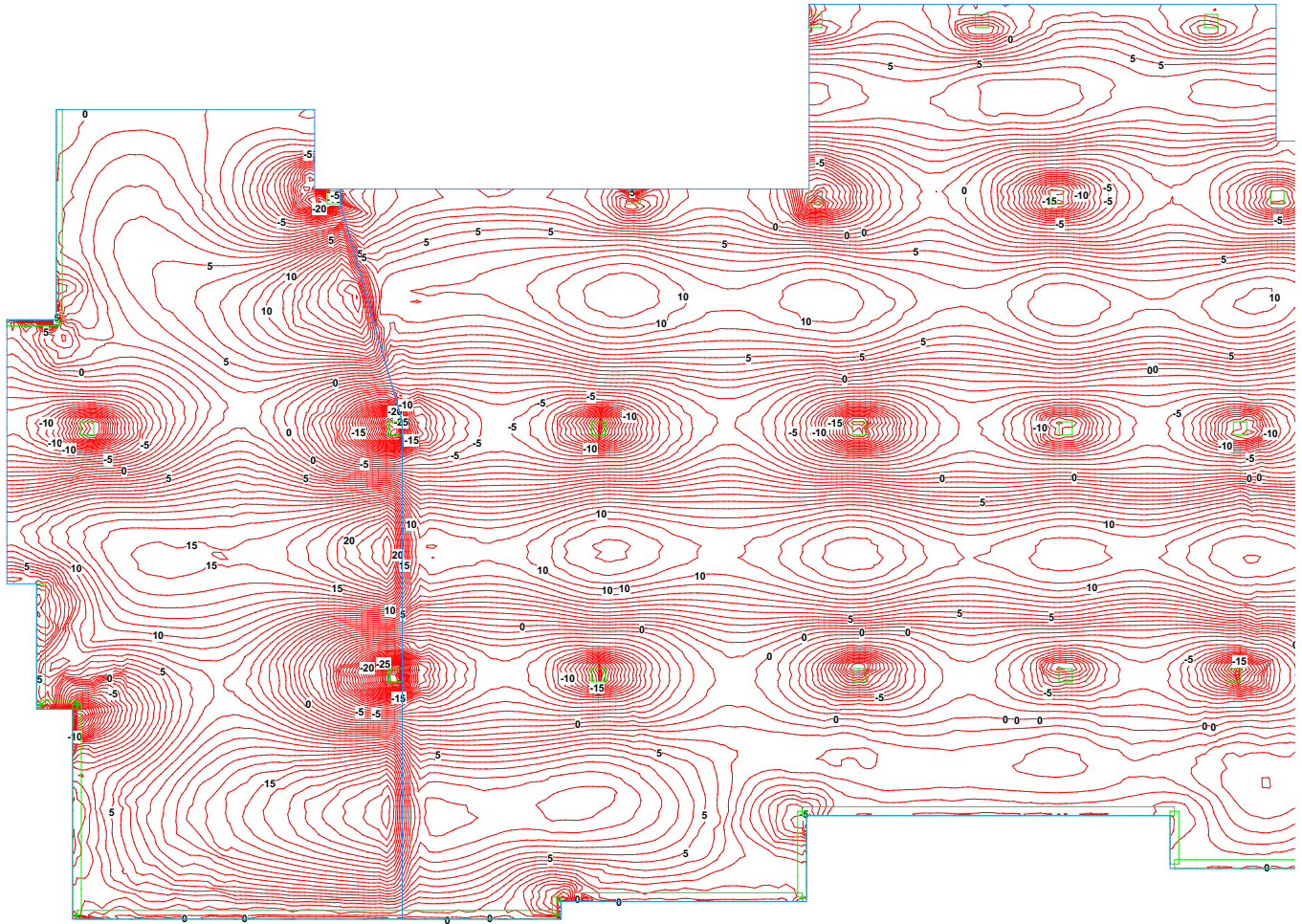


Factored LC: 1.2D + 1.6L + 0.5S: Min Reactions Plan (3)

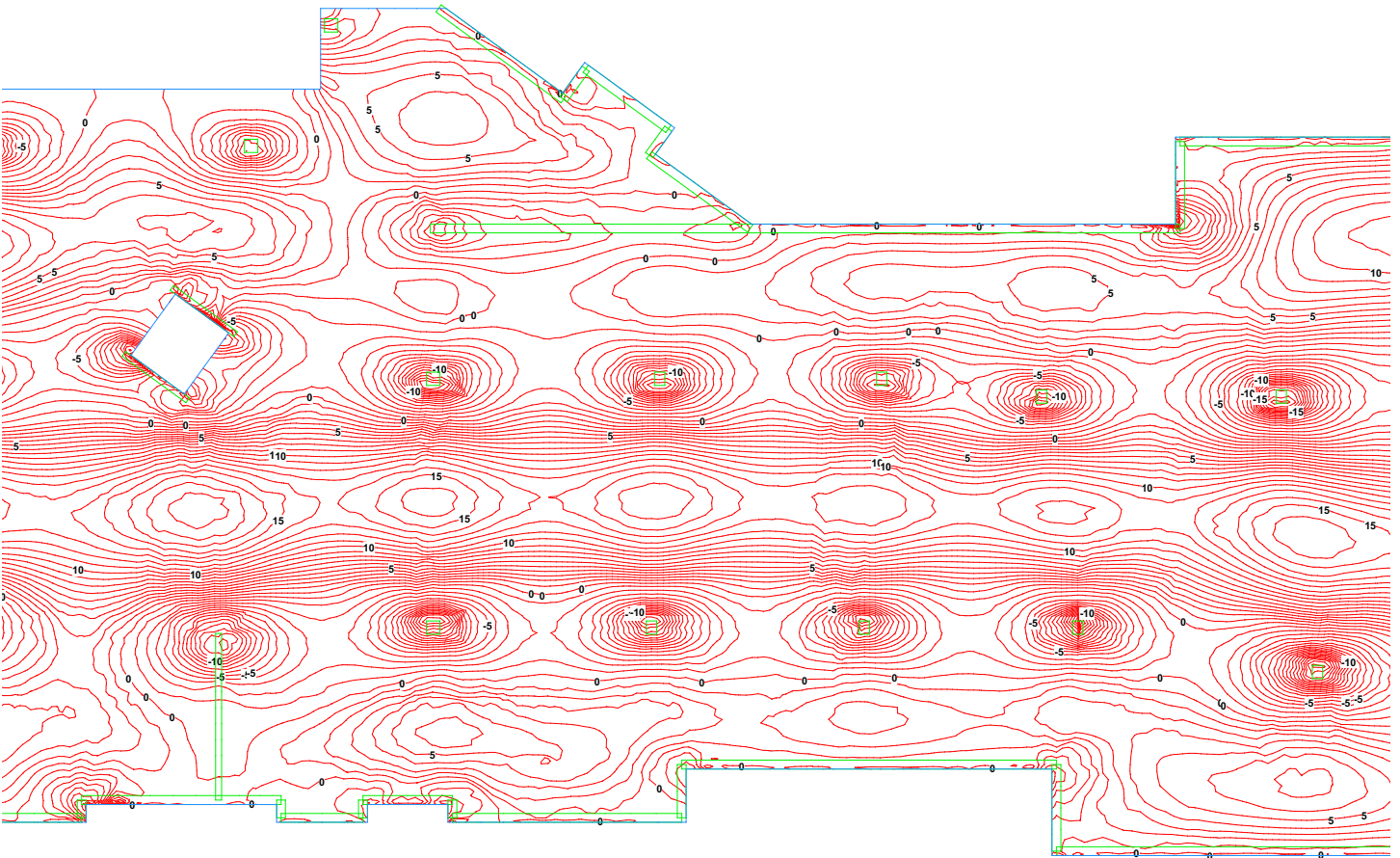


Factored LC: 1.2D + f1L + 1.6S: Max Mx Plan

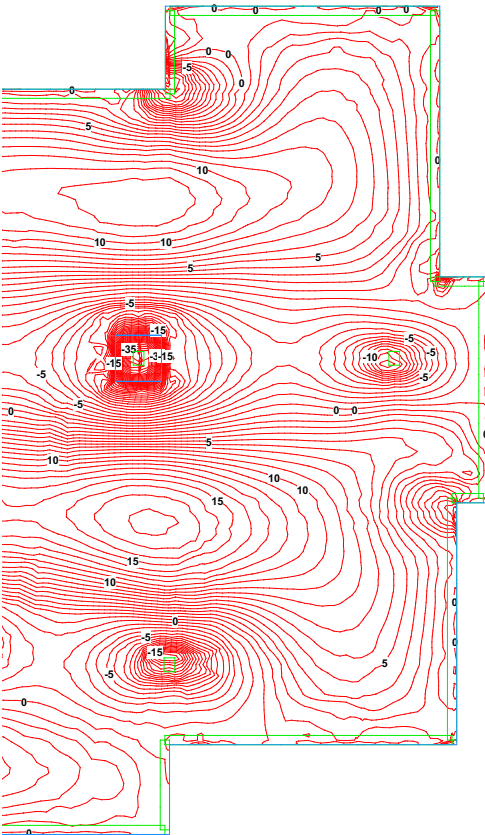
Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1.250
 Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Maximum Values) (X-Axis Direction)
 One Contour = 1 Kips
 Min Value = -38.7 Kips @ (-54.85,-86.43) Max Value = 23.2 Kips @ (-328.3,-97.17)



Factored LC: 1.2D + f1L + 1.6S: Max Mx Plan (2)

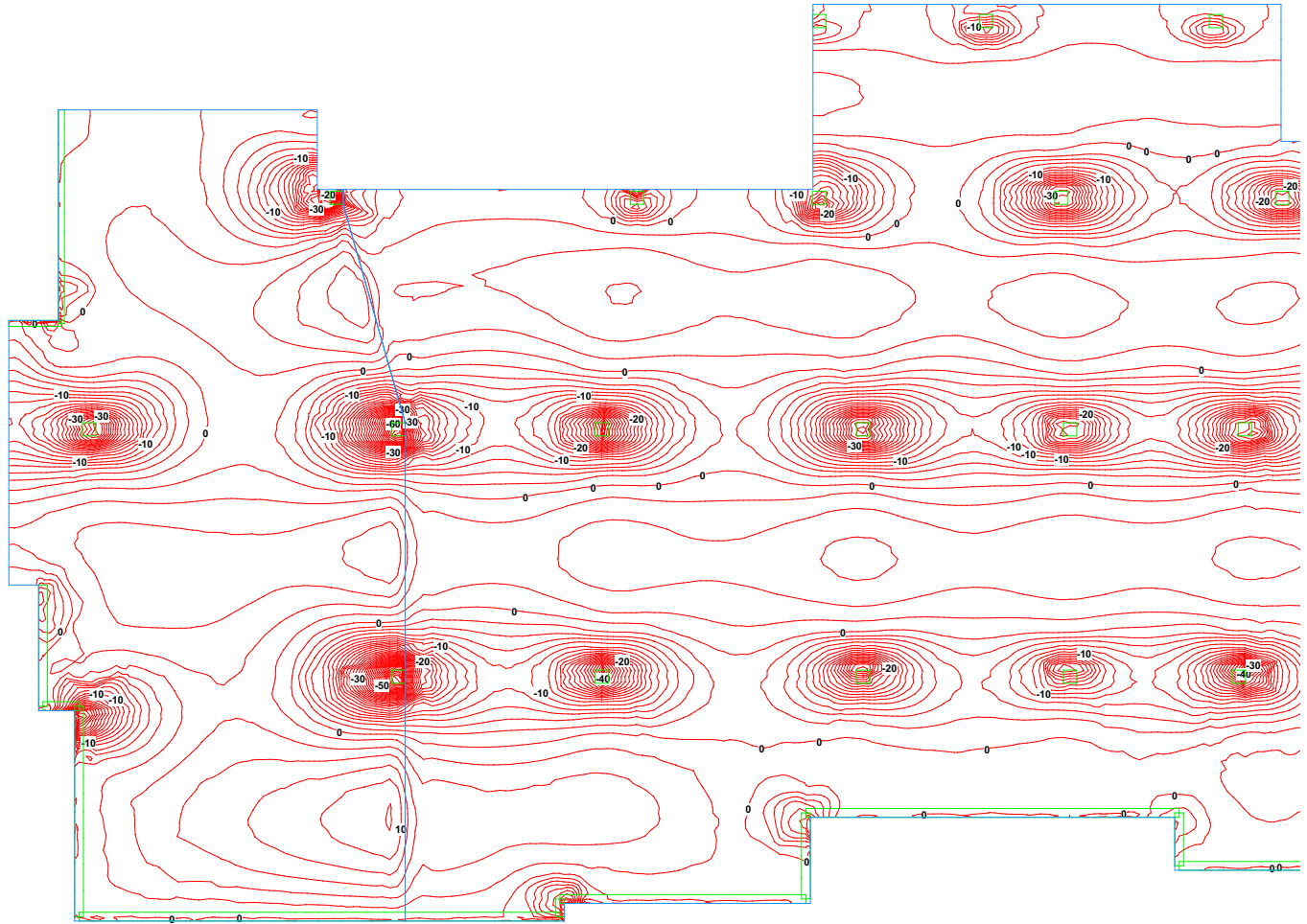


Factored LC: 1.2D + f1L + 1.6S: Max Mx Plan (3)

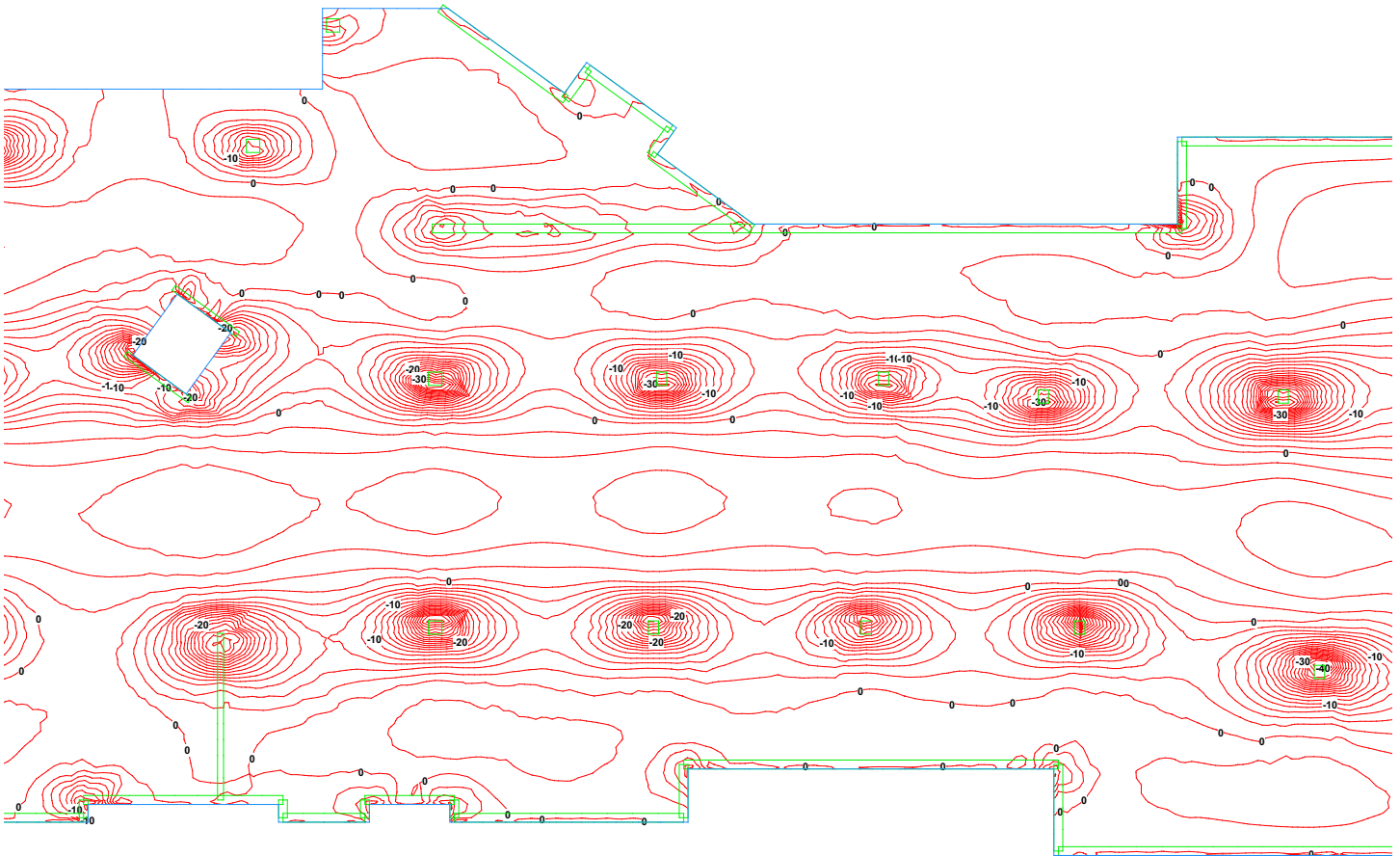


Factored LC: 1.2D + f1L + 1.6S: Min Mx Plan

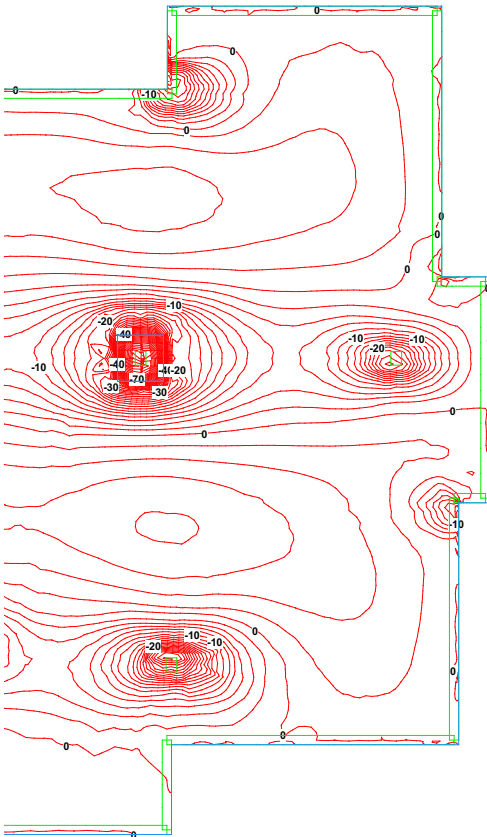
Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Minimum Values) (X-Axis Direction)
 One Contour = 2 Kips
 Min Value = -82.94 Kips @ (-54.85, -86.43) Max Value = 11.87 Kips @ (-328.4, -126.7)



Factored LC: 1.2D + f1L + 1.6S: Min Mx Plan (2)

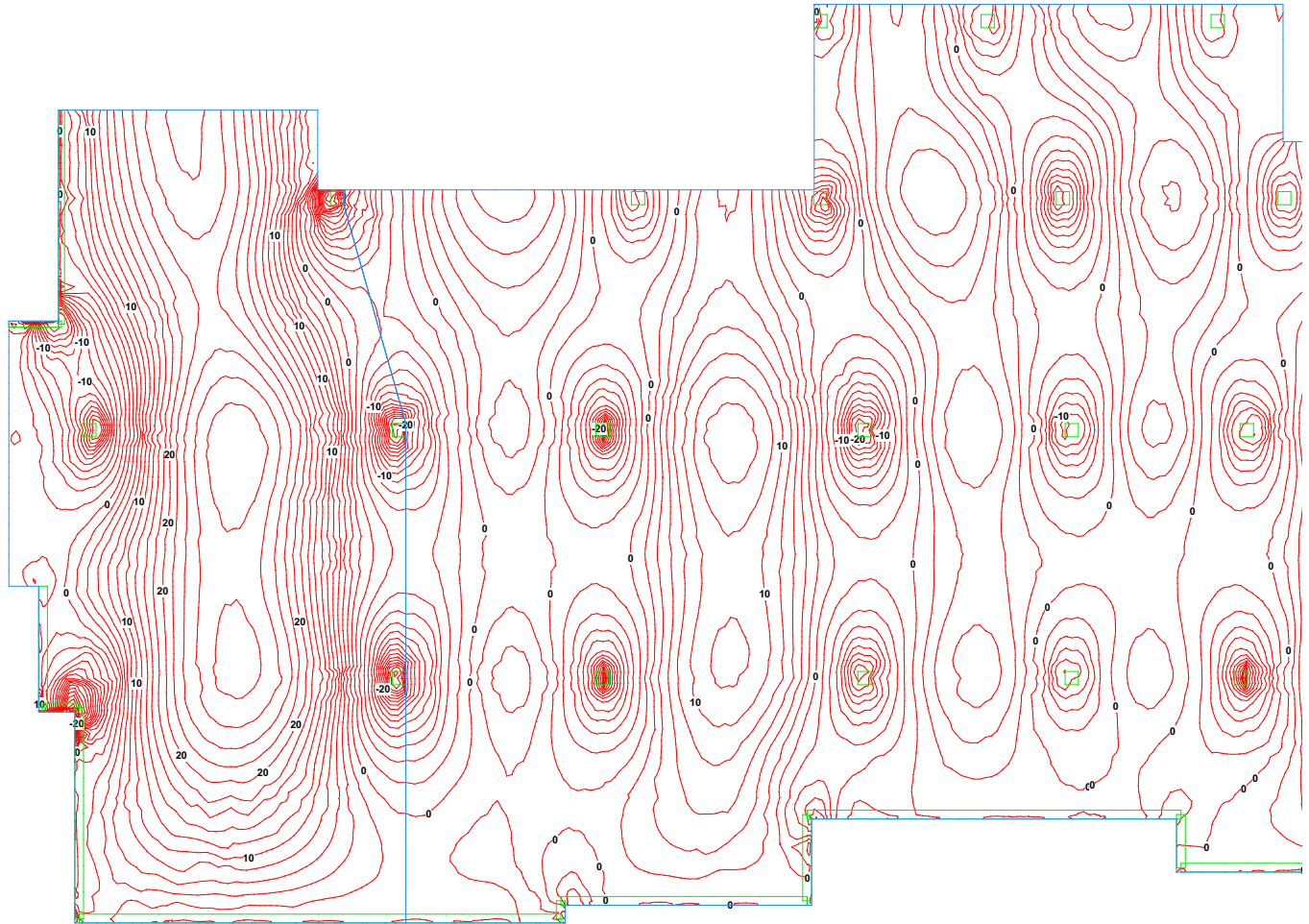


Factored LC: 1.2D + f1L + 1.6S: Min Mx Plan (3)

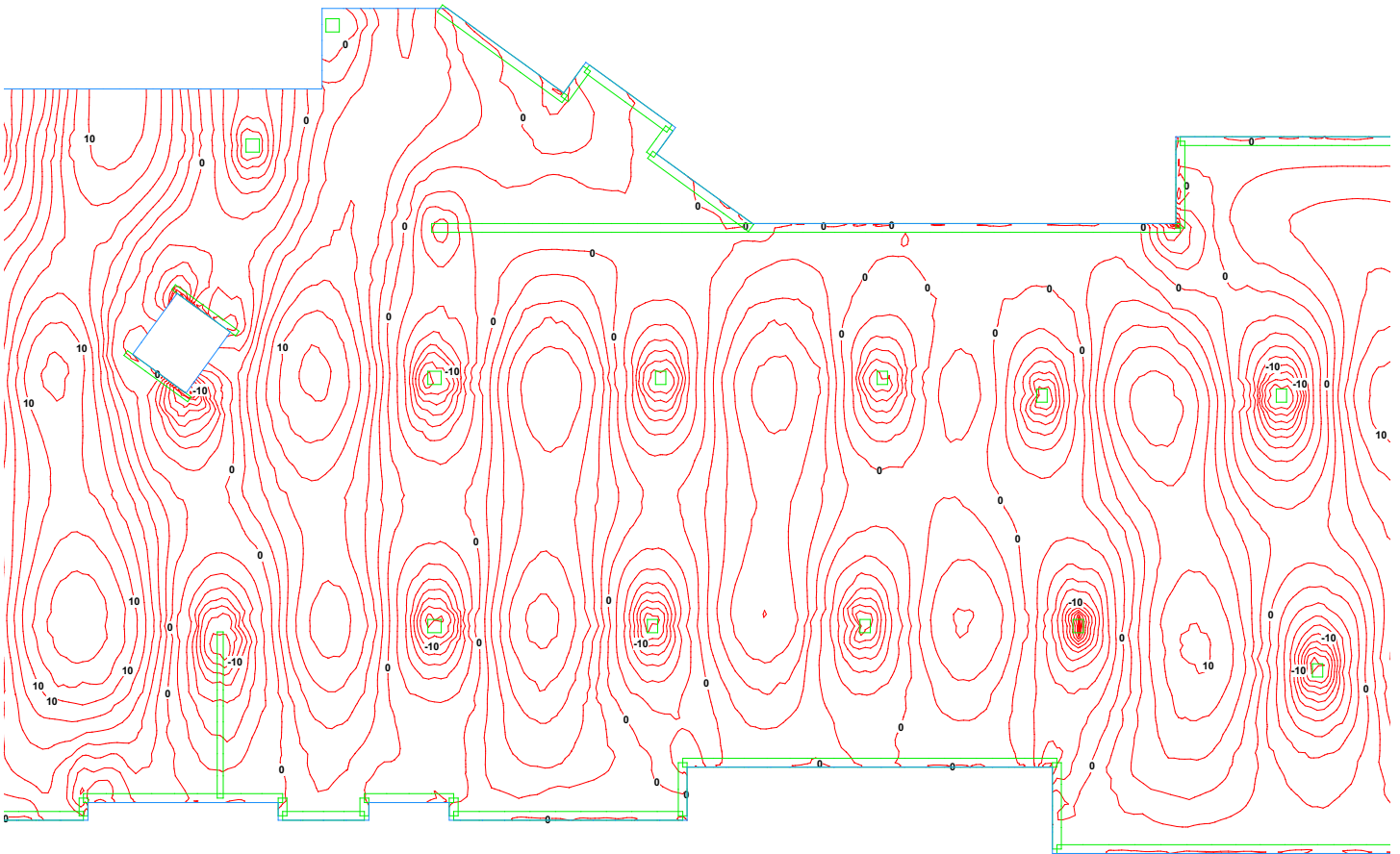


Factored LC: 1.2D + f1L + 1.6S: Max My Plan

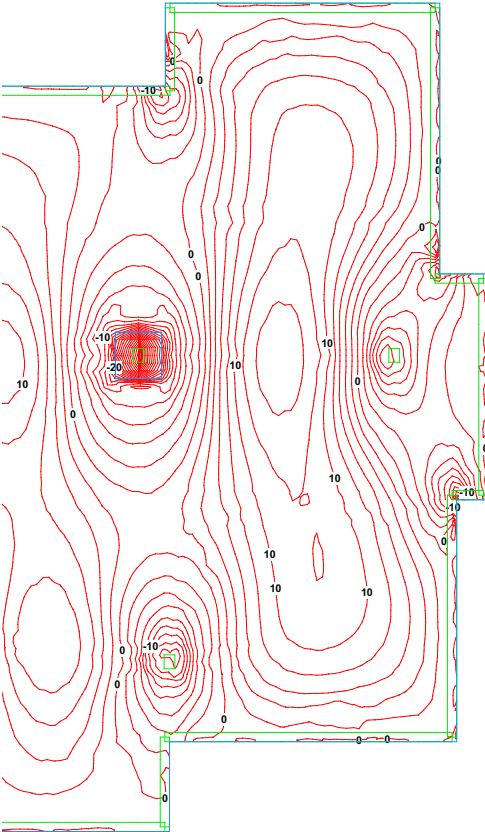
Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
 One Contour = 2 Kips
 Min Value = -54.2 Kips @ (-54.64,-85.18) Max Value = 29.78 Kips @ (-346.1,-84.94)



Factored LC: 1.2D + f1L + 1.6S: Max My Plan (2)

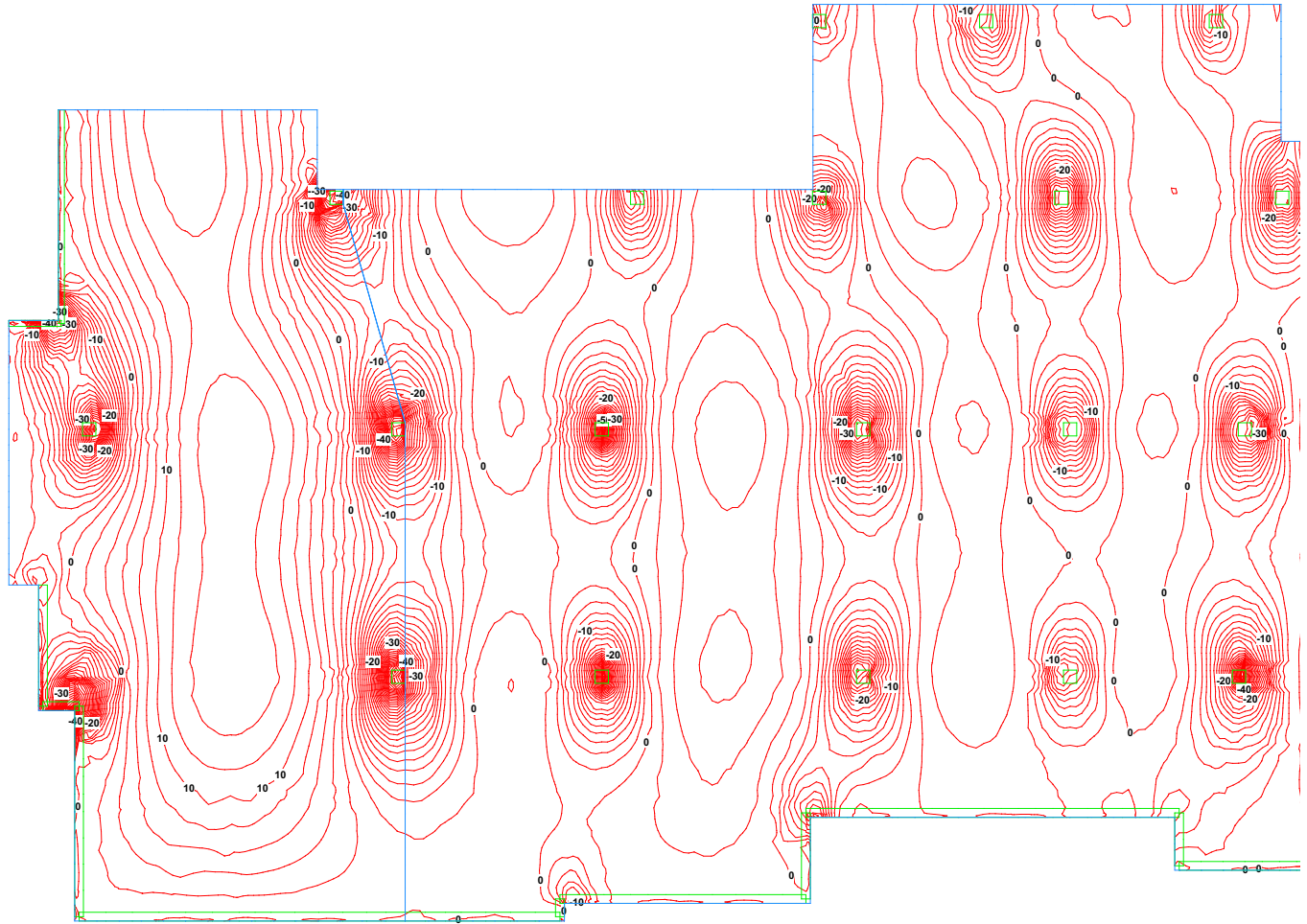


Factored LC: 1.2D + f1L + 1.6S: Max My Plan (3)

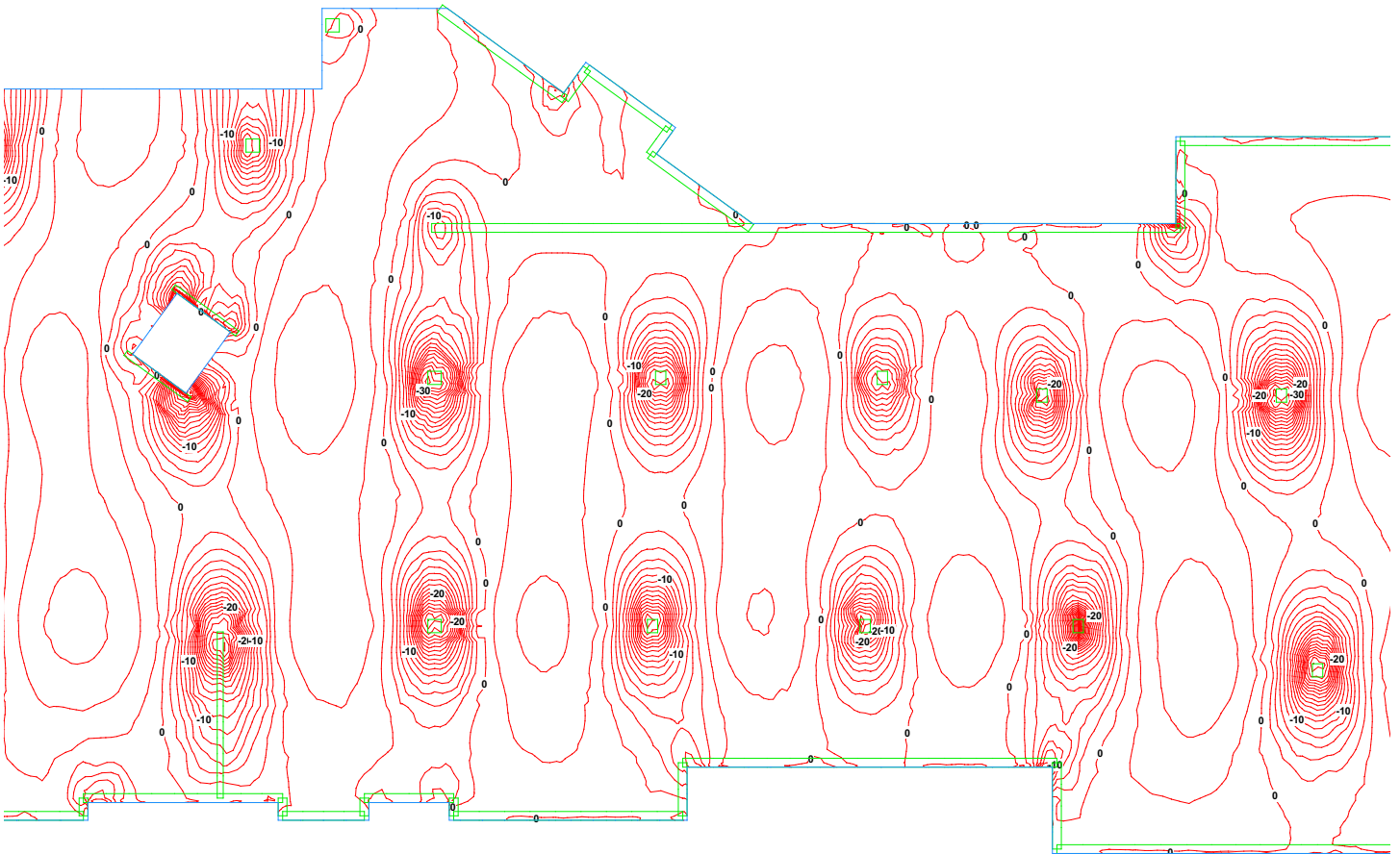


Factored LC: 1.2D + f1L + 1.6S: Min My Plan

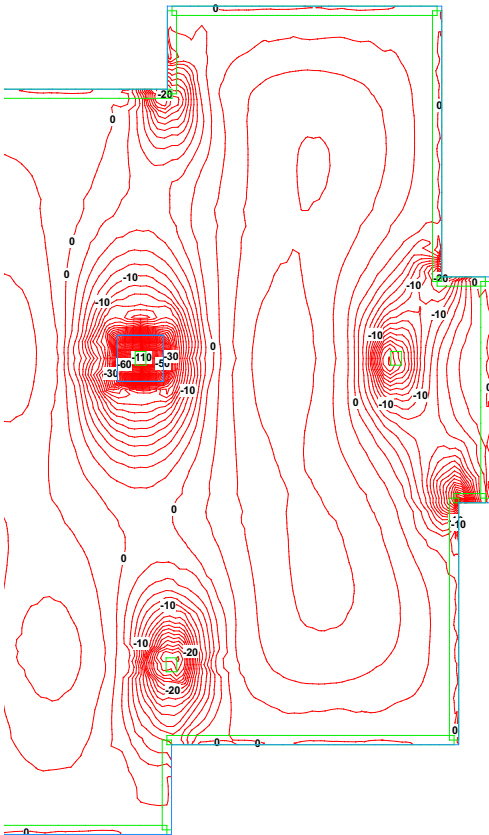
Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1.250
 Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
 One Contour = 2 Kips
 Min Value = -115.2 Kips @ (-54.64,-85.18) Max Value = 15.75 Kips @ (-345.9,-109.1)



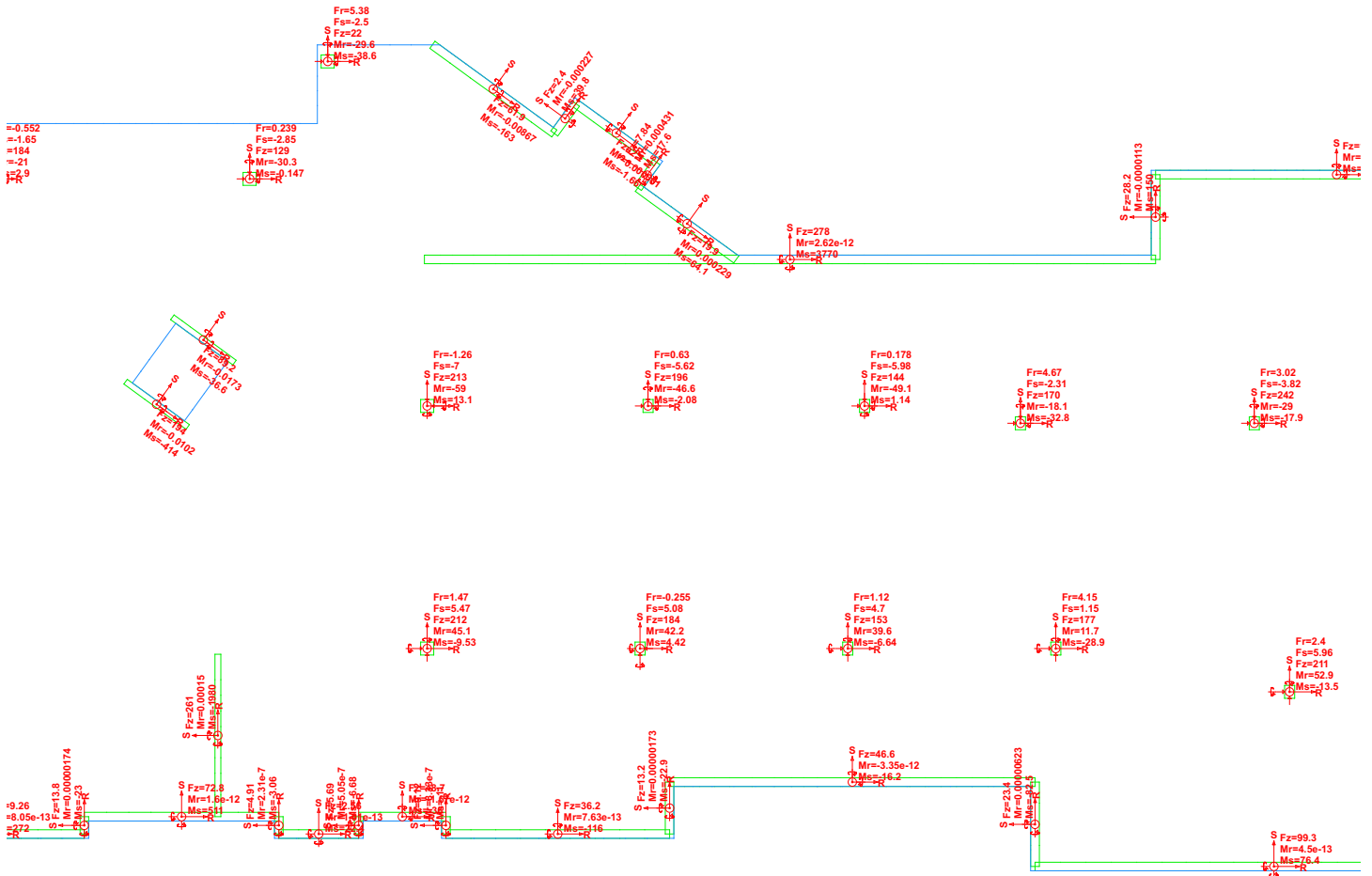
Factored LC: 1.2D + f1L + 1.6S: Min My Plan (2)



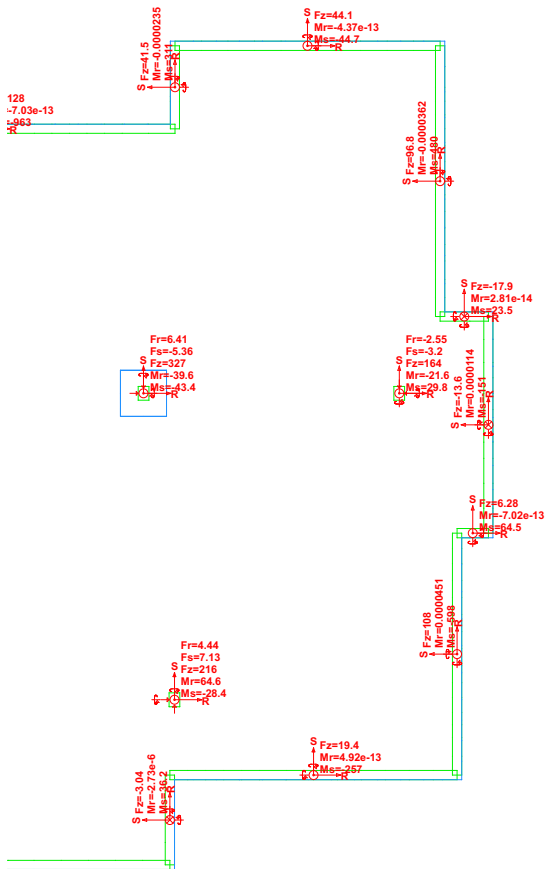
Factored LC: 1.2D + f1L + 1.6S: Min My Plan (3)



Factored LC: 1.2D + f1L + 1.6S: Std Reactions Plan (2)



Factored LC: 1.2D + f1L + 1.6S: Std Reactions Plan (3)



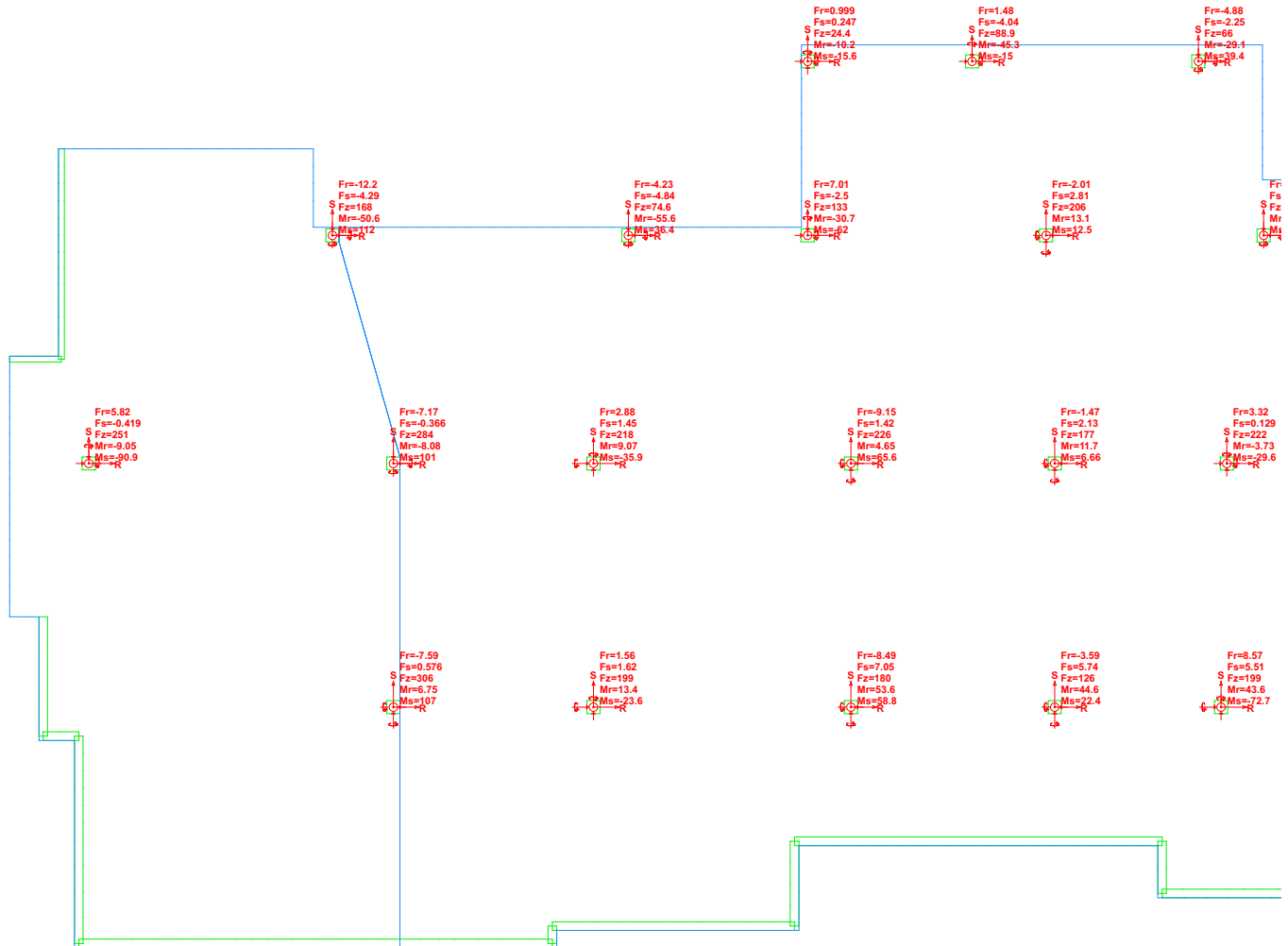
Factored LC: 1.2D + f1L + 1.6S: Max Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;

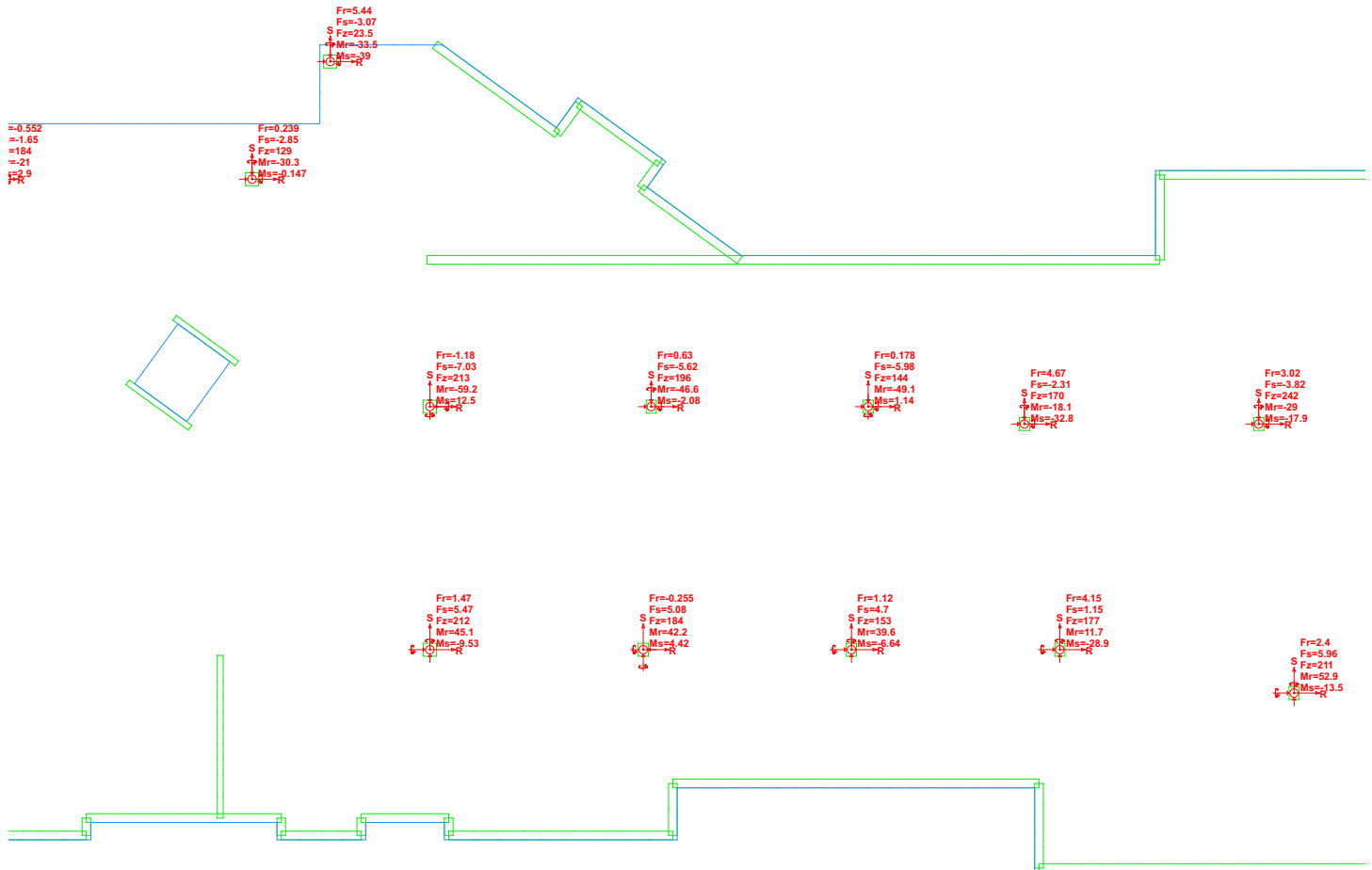
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1:250

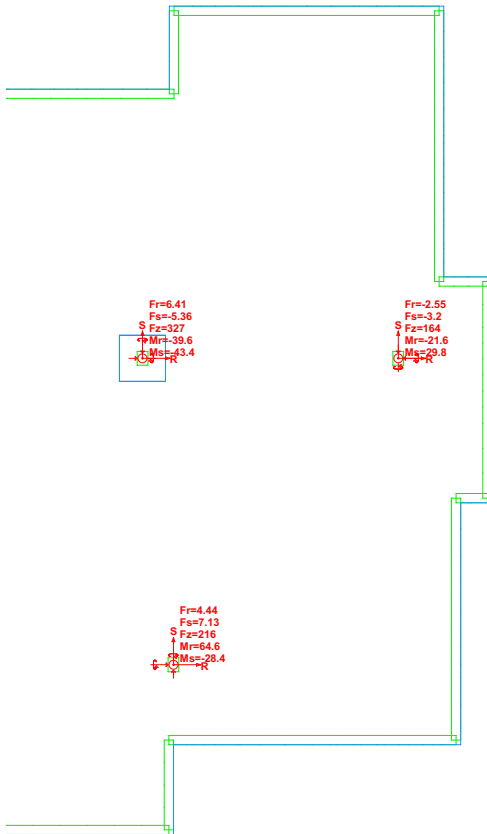
Factored LC: 1.2D + f1L + 1.6S - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



Factored LC: 1.2D + f1L + 1.6S: Max Reactions Plan (2)



Factored LC: 1.2D + f1L + 1.6S: Max Reactions Plan (3)



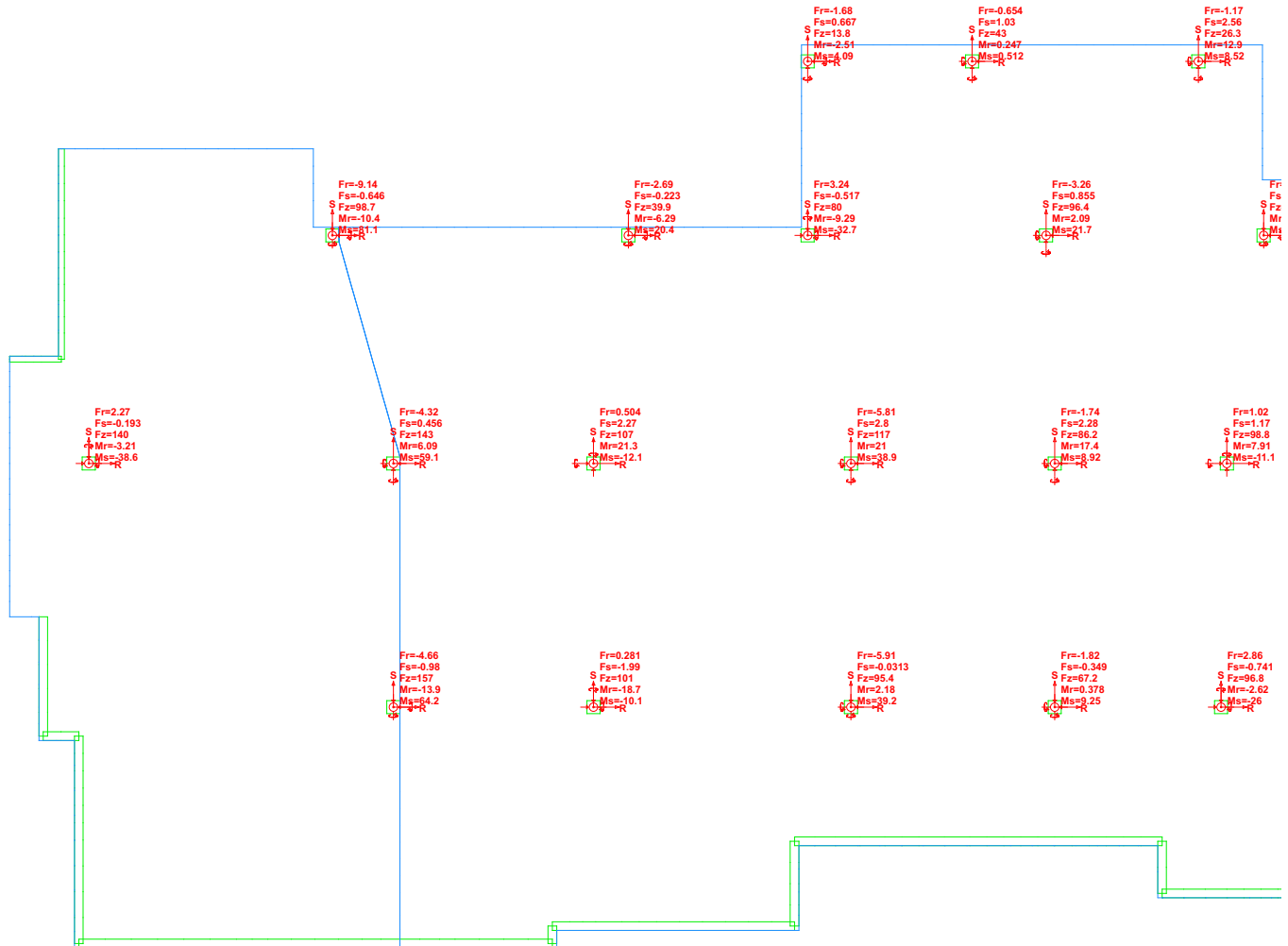
Factored LC: 1.2D + f1L + 1.6S: Min Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;

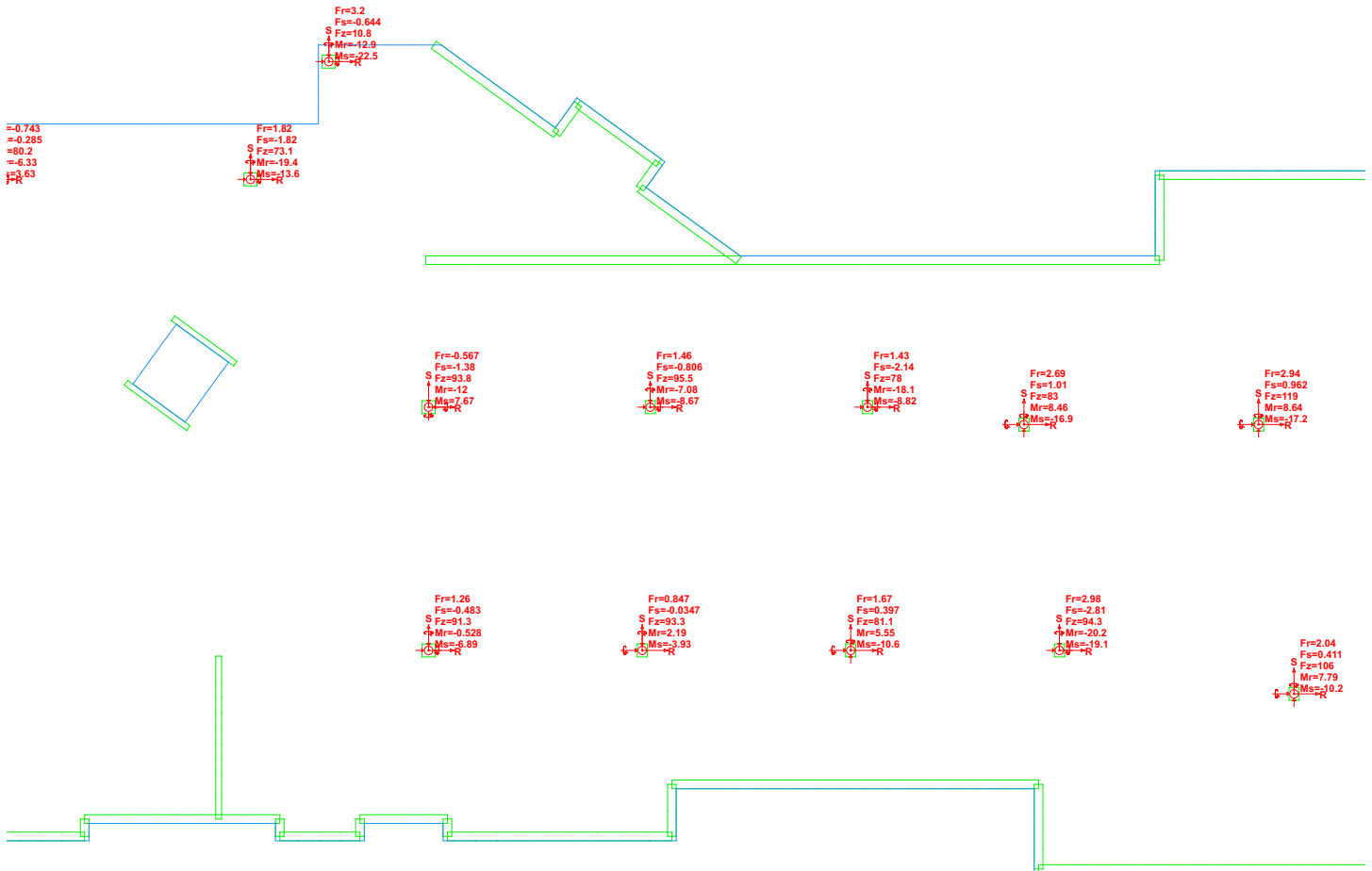
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1:250

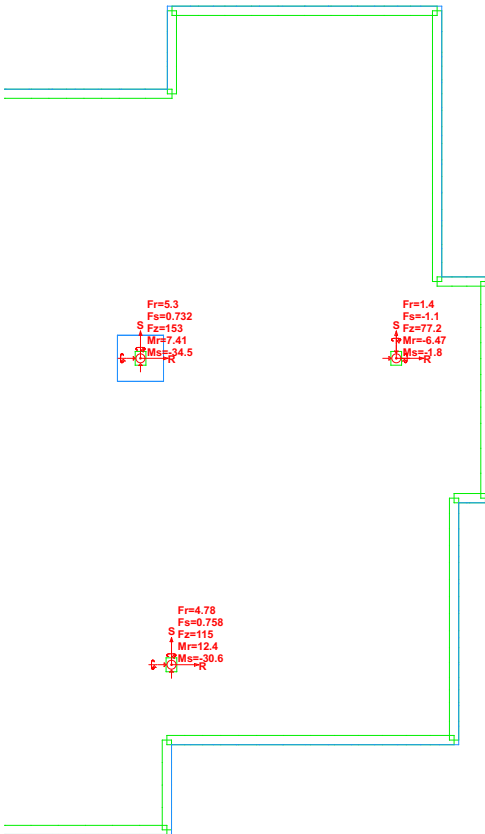
Factored LC: 1.2D + f1L + 1.6S - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Mz)(Min Fz Context)



Factored LC: 1.2D + f1L + 1.6S: Min Reactions Plan (2)

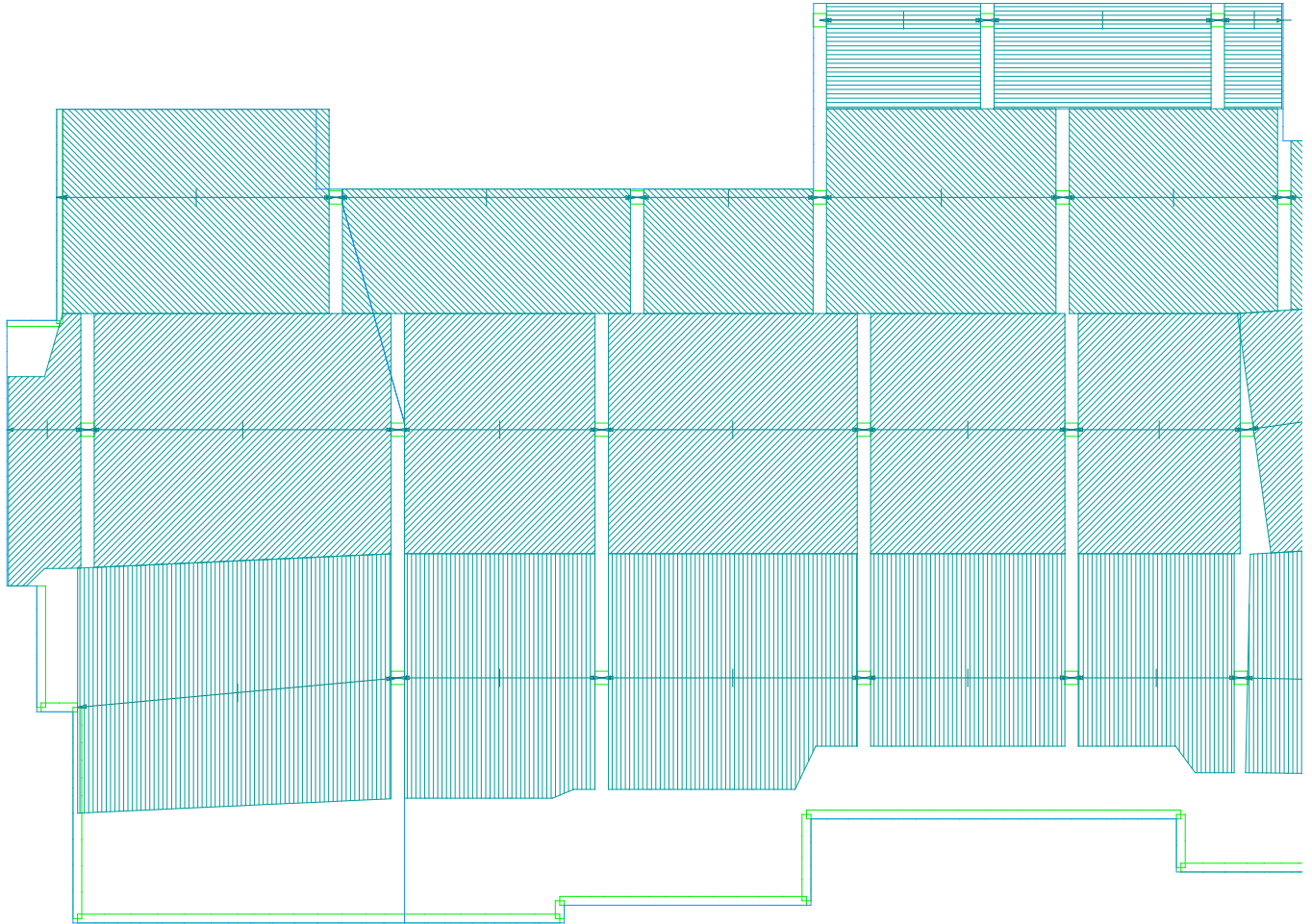


Factored LC: 1.2D + f1L + 1.6S: Min Reactions Plan (3)

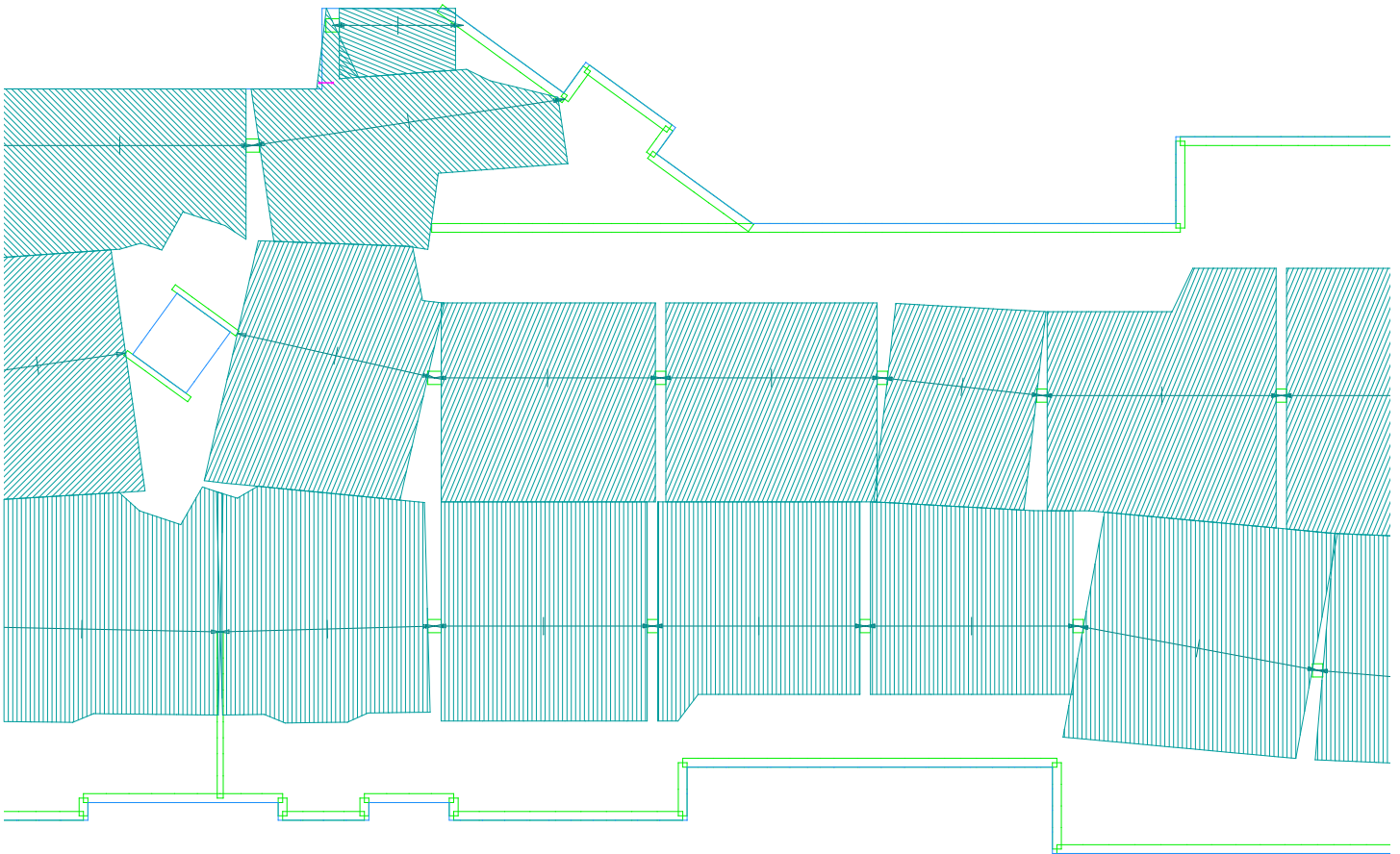


Design Strip: Latitude Design Spans Plan

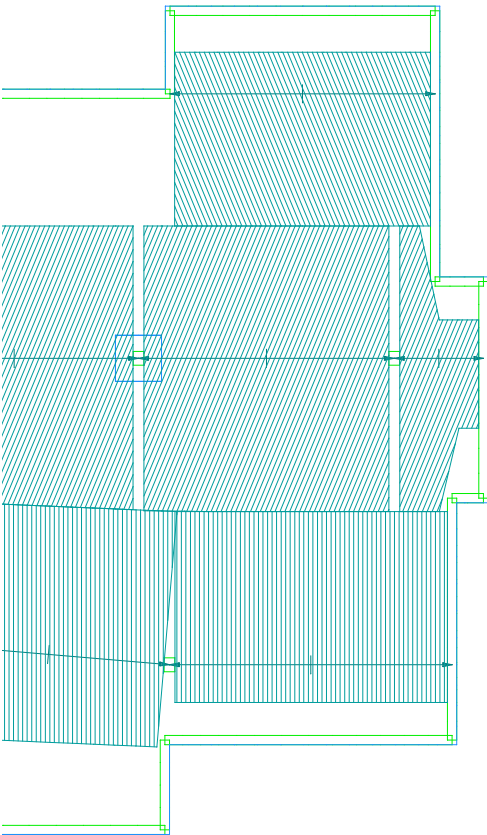
Design Strip: User Lines; User Notes; User Dimensions; Latitude SSs; Latitude SSSs; SSS Hatching; Latitude DSs; Latitude Span Boundaries; Latitude Strip Boundaries; Latitude Deflection Checks;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Design Strip: Latitude Design Spans Plan (2)

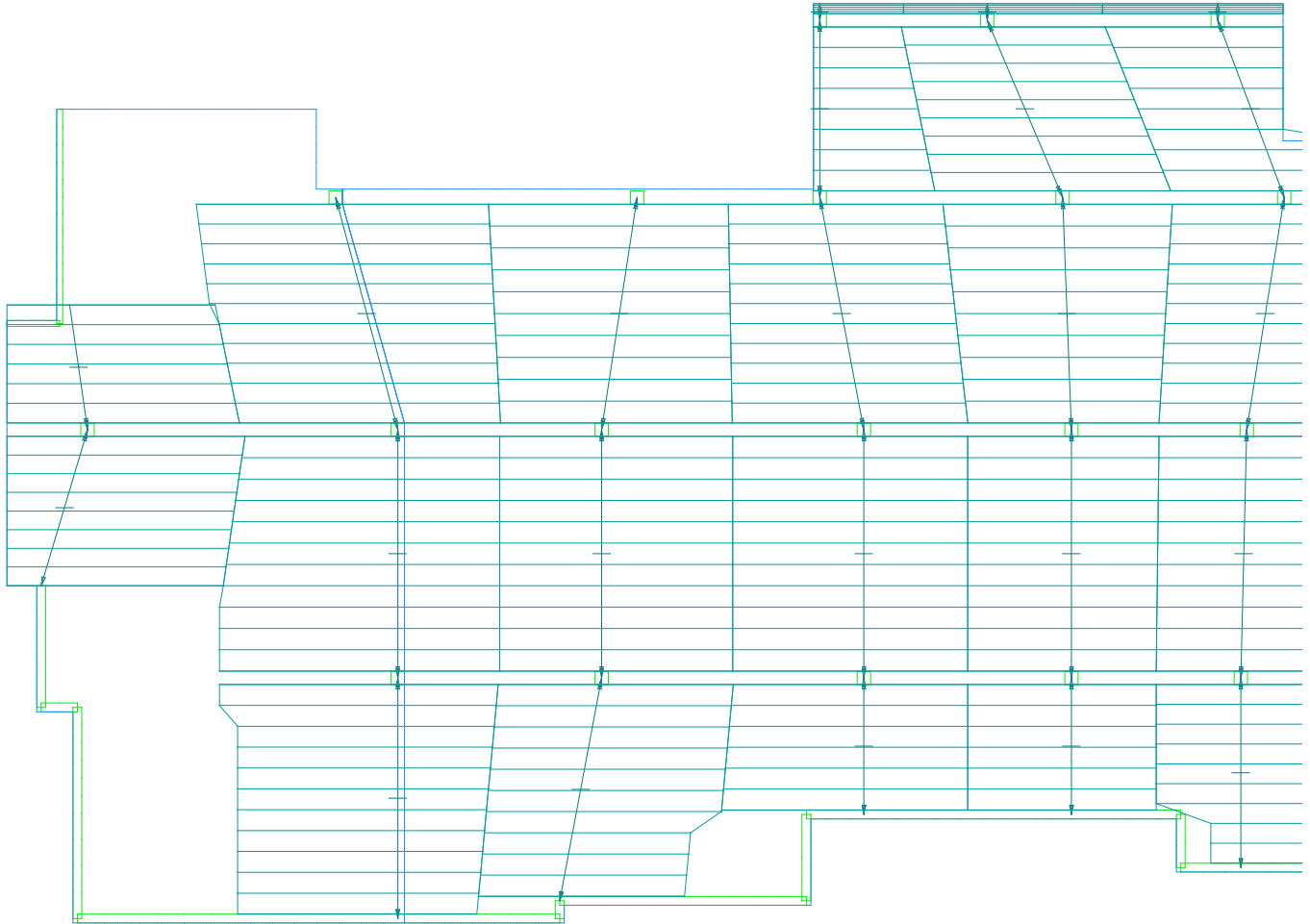


Design Strip: Latitude Design Spans Plan (3)

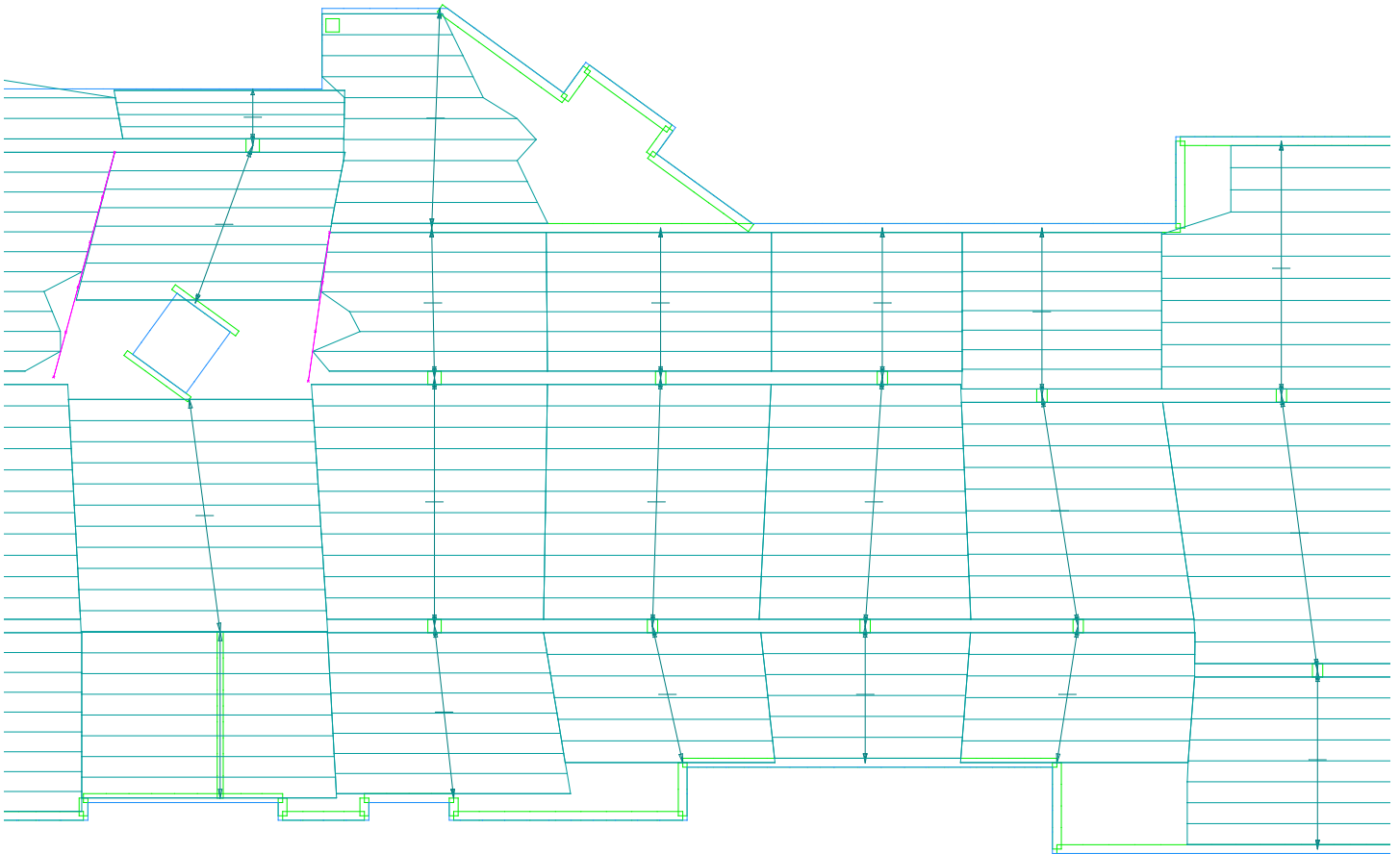


Design Strip: Longitude Design Spans Plan

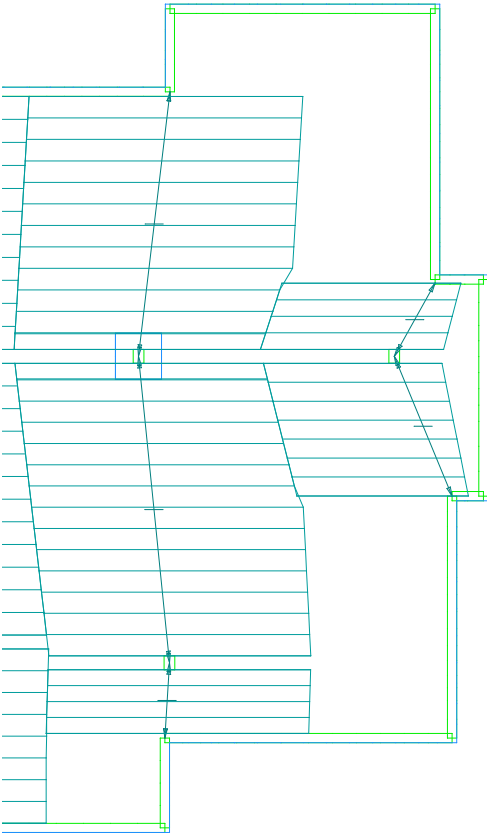
Design Strip: Longitude Span Boundaries; Longitude SSs; Longitude DSs; Longitude Strip Boundaries; Longitude SSSs; SSS Internal Sections; Longitude Deflection Checks; User Notes; User Lines; User Dimensions;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Design Strip: Longitude Design Spans Plan (2)

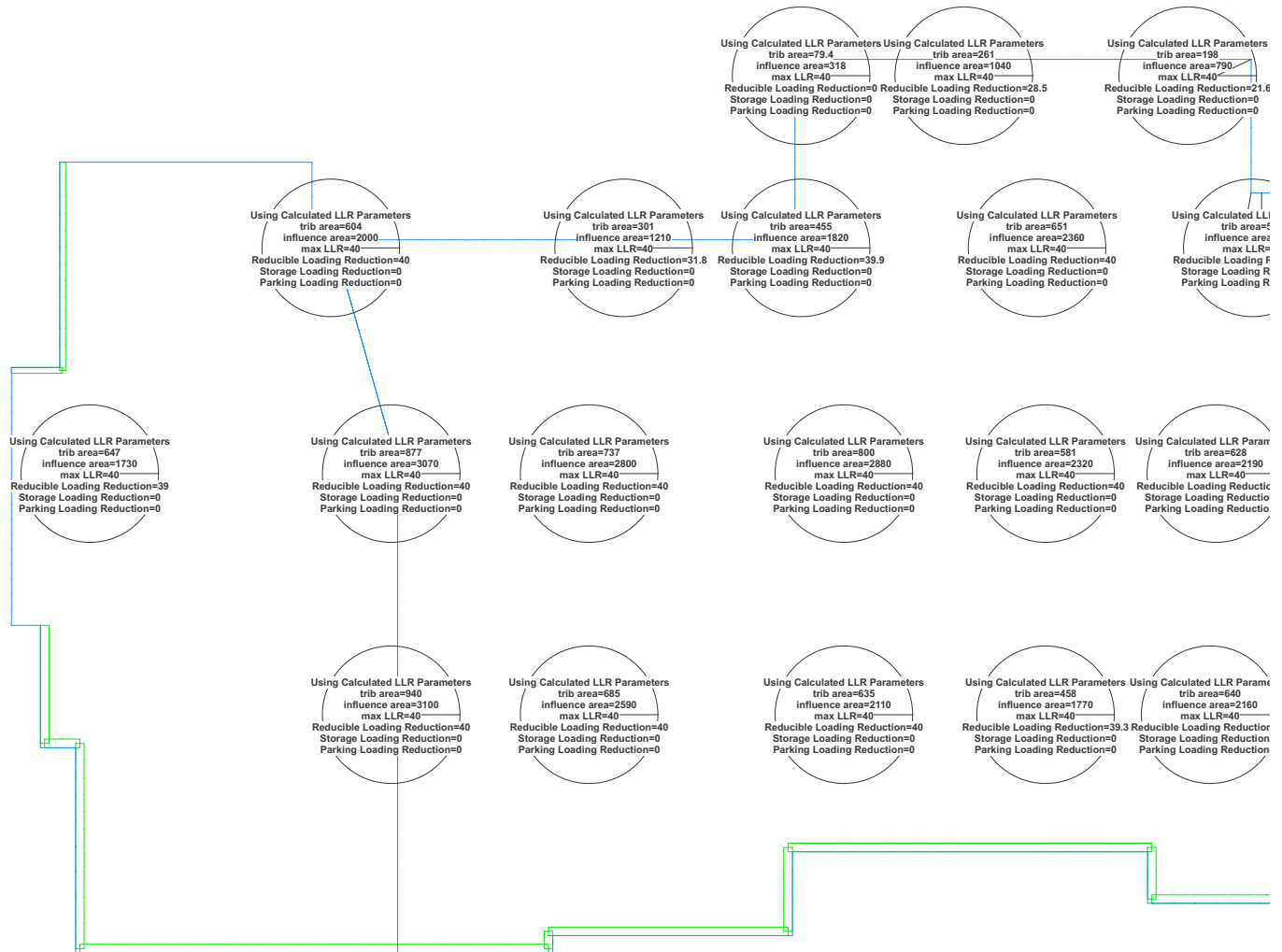


Design Strip: Longitude Design Spans Plan (3)

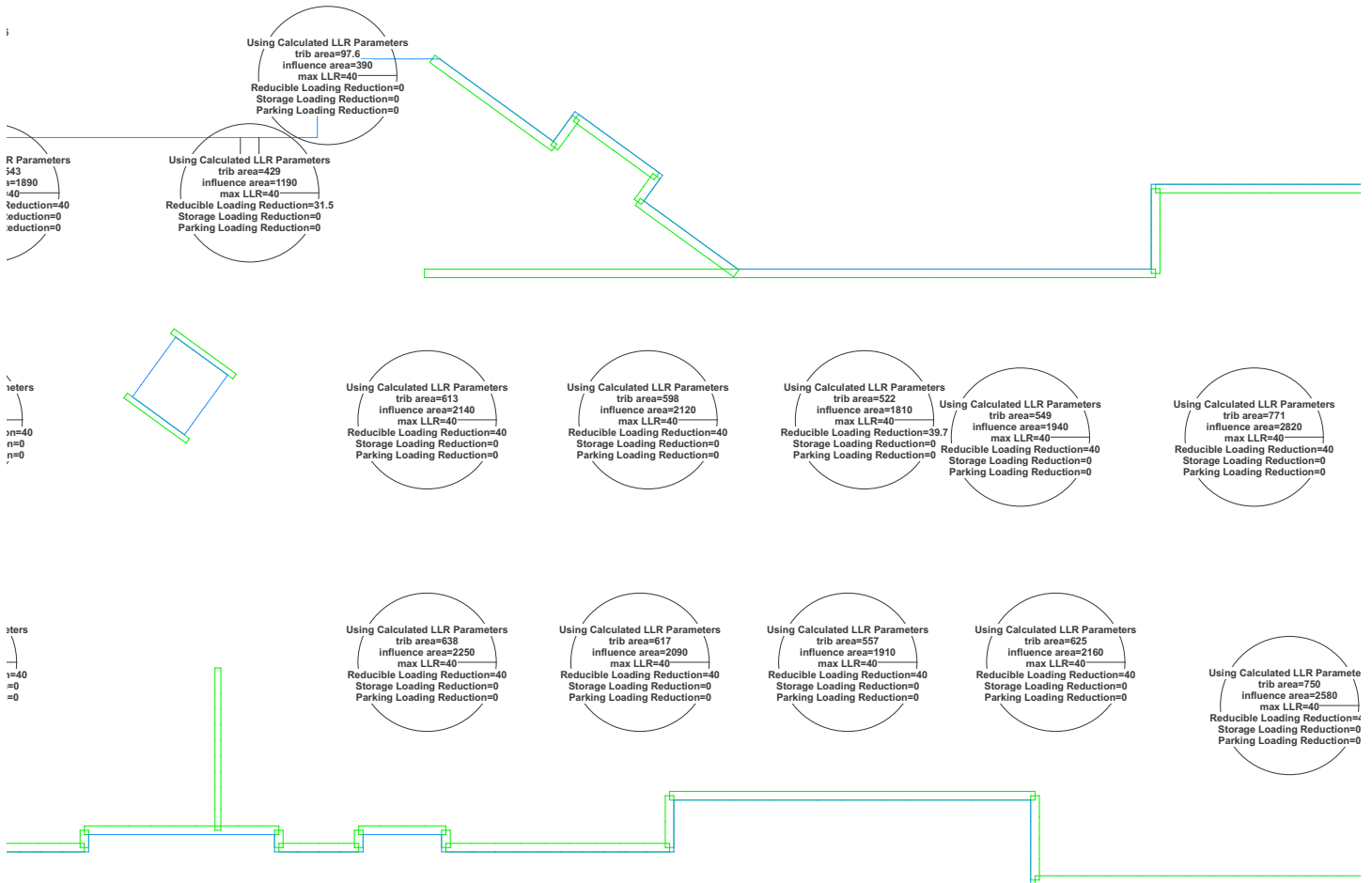


Design Strip: Punching Checks Plan

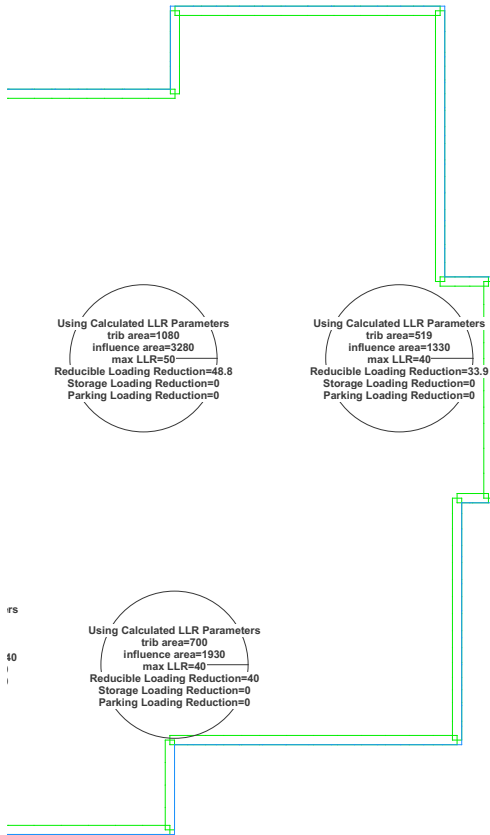
Design Strip: Punching Checks; Punching Check LLR Parameters; Punching Check Sections; User Notes; User Lines; User Dimensions;
 Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



Design Strip: Punching Checks Plan (2)



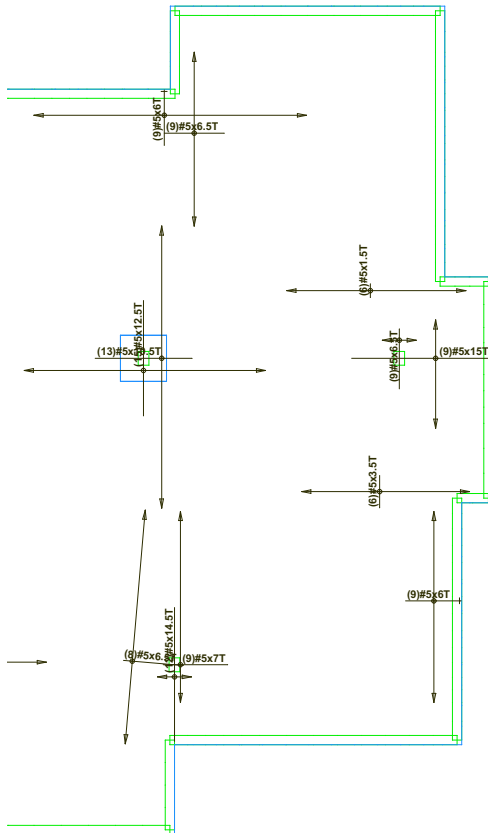
Design Strip: Punching Checks Plan (3)



[illegible]

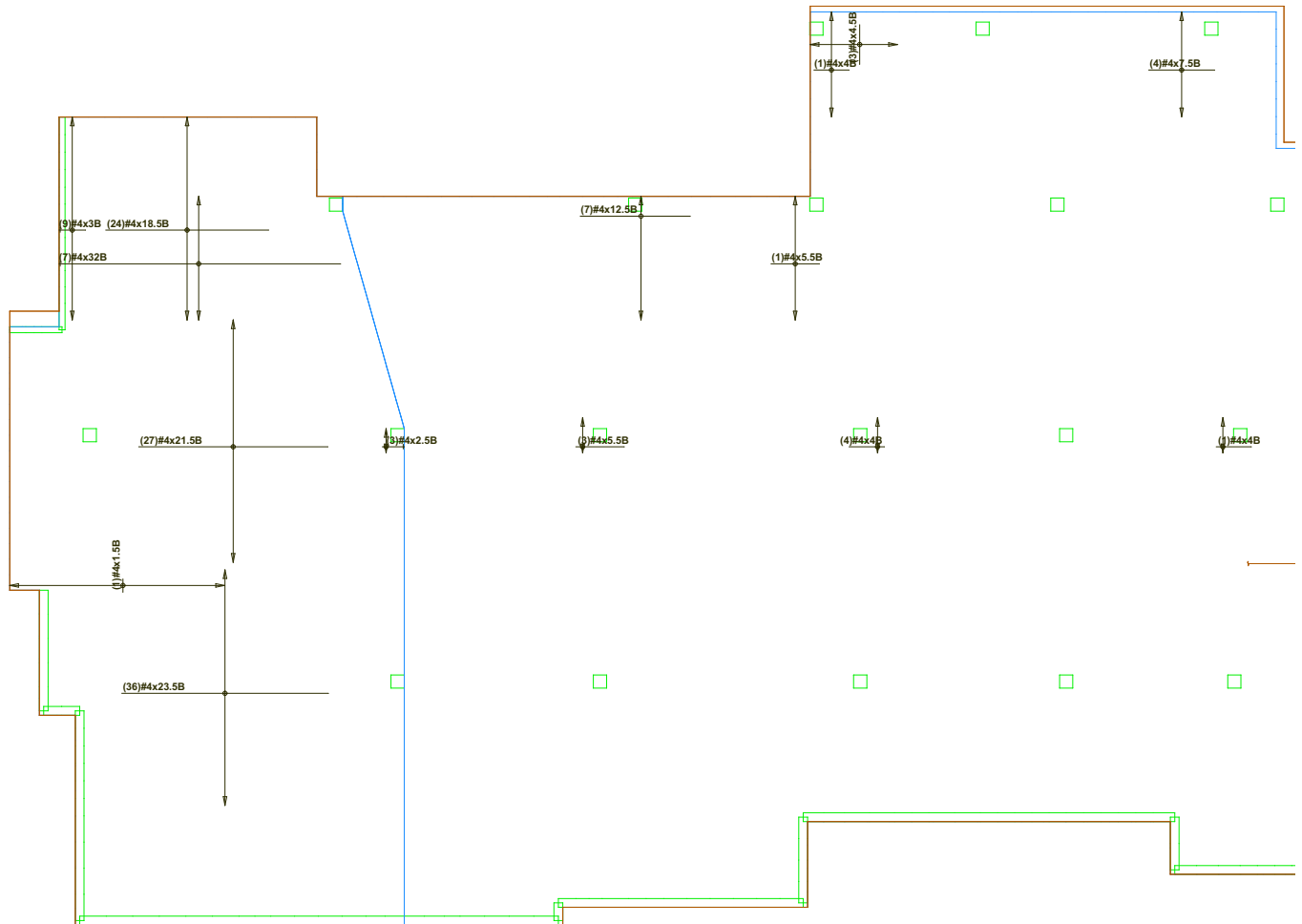
Reinforcement: Top Bars Plan (3)

Options; Distributed Reinf. Extent;



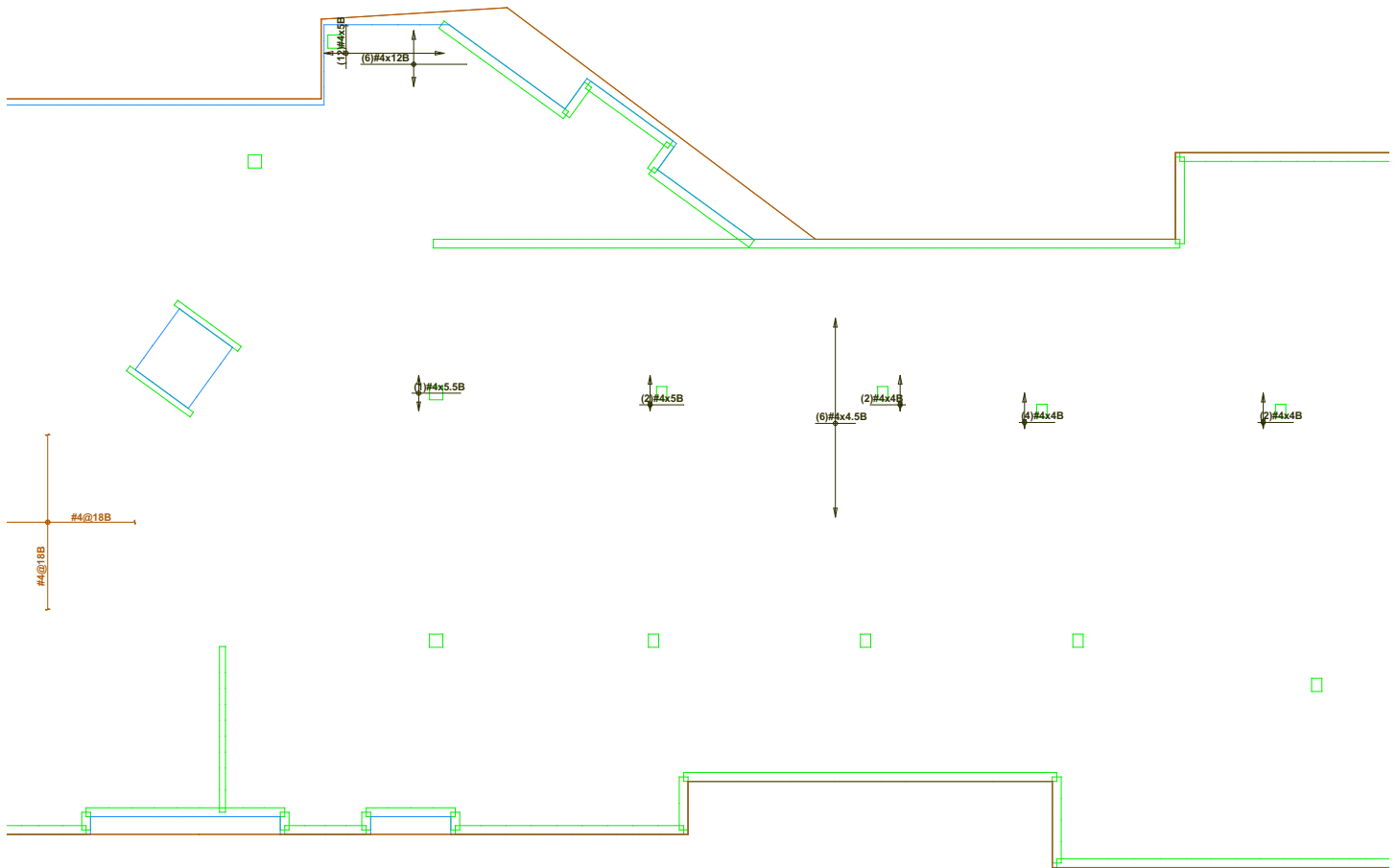
Reinforcement: Bottom Bars Plan

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.; L 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



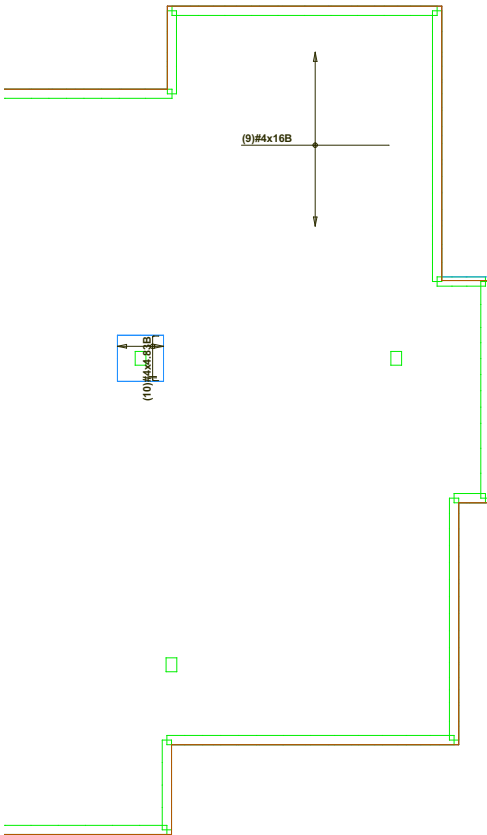
Reinforcement: Bottom Bars Plan (2)

.ongitude User Distributed Reinf.; Longitude Program Distributed Reinf.; Bottom Face Concentrated Reinf.; Both Faces Concentrated Reinf.; Bottom Face Distributed Reinf.; Both Faces Distributed Reinf.; Concentrated Reinf. Descriptions; Concentrated Reinf. Extent; Distributed Rein



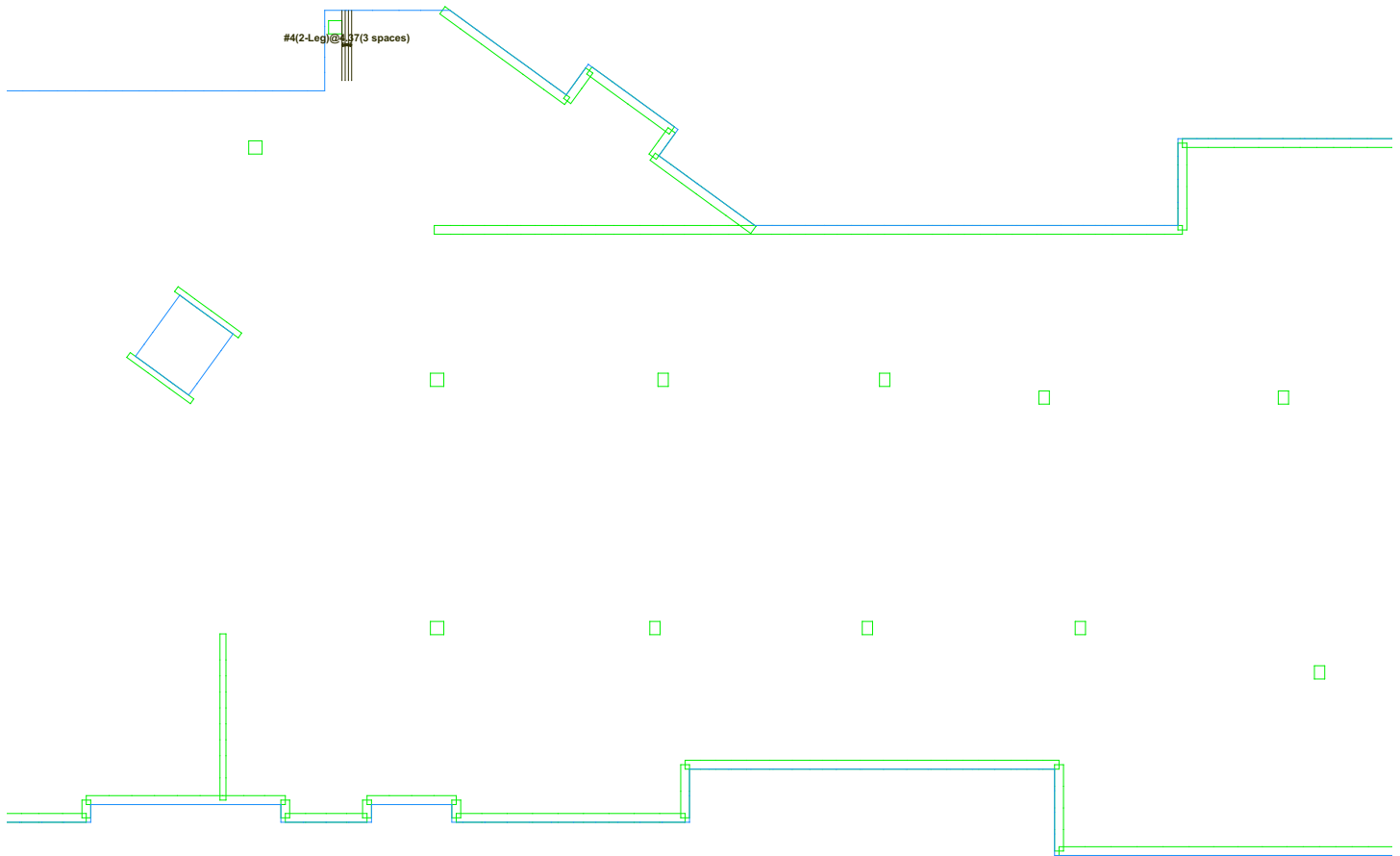
Reinforcement: Bottom Bars Plan (3)

f. Descriptions; Distributed Reinf. Extent;

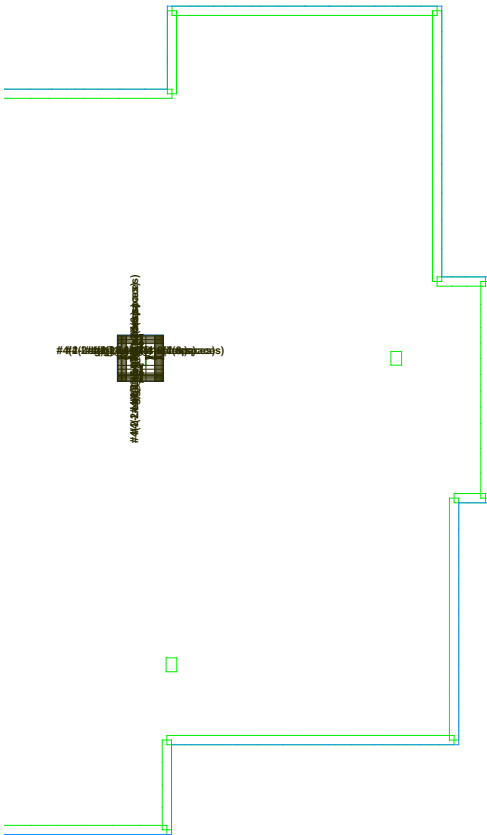


Reinforcement: Shear Bars Plan (2)

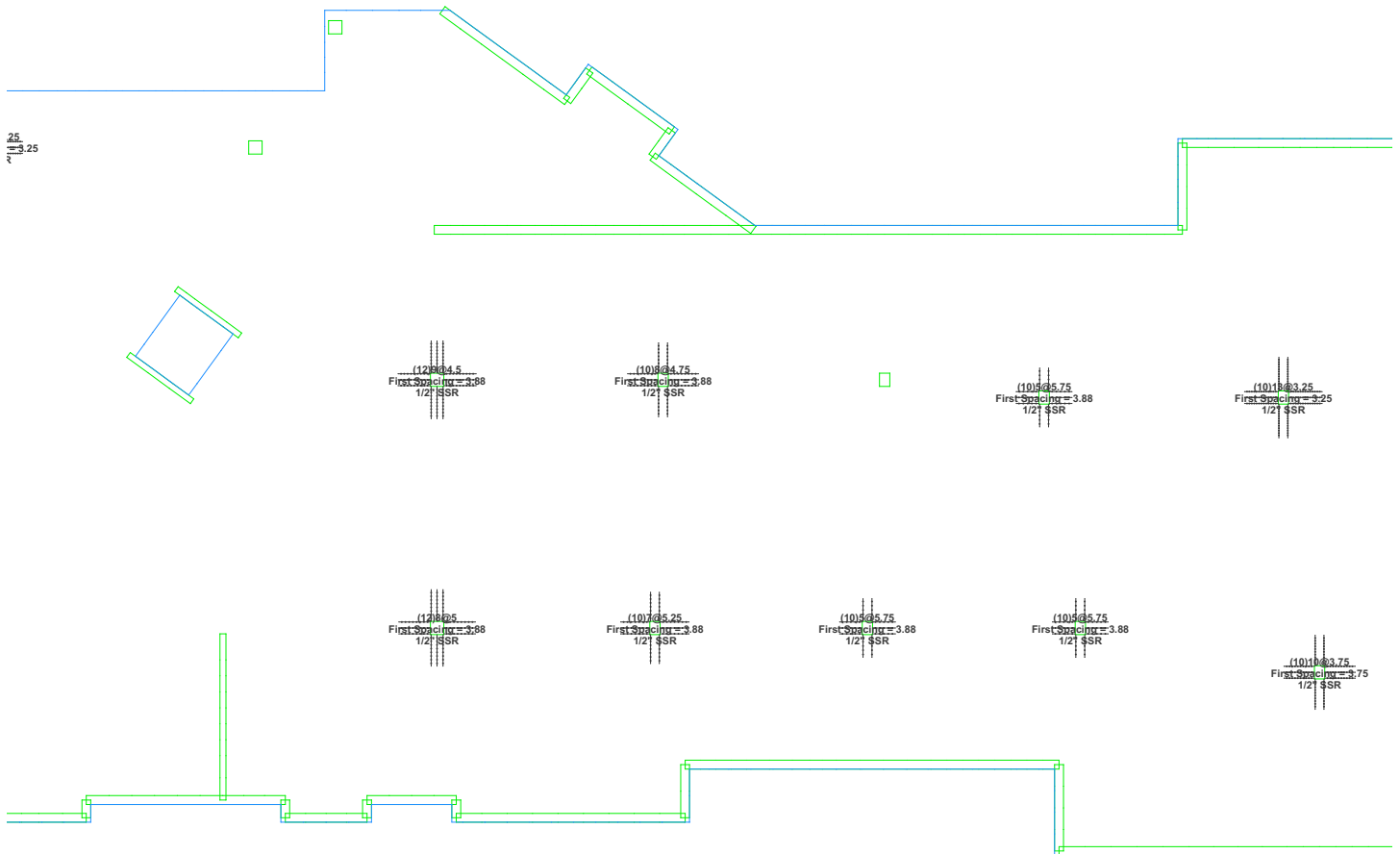
Reinf.; Longitude User Individual Transverse Bars; Longitude Program Individual Transverse Bars; Transverse Reinf. Descriptions; Transverse Reinf. Extent;



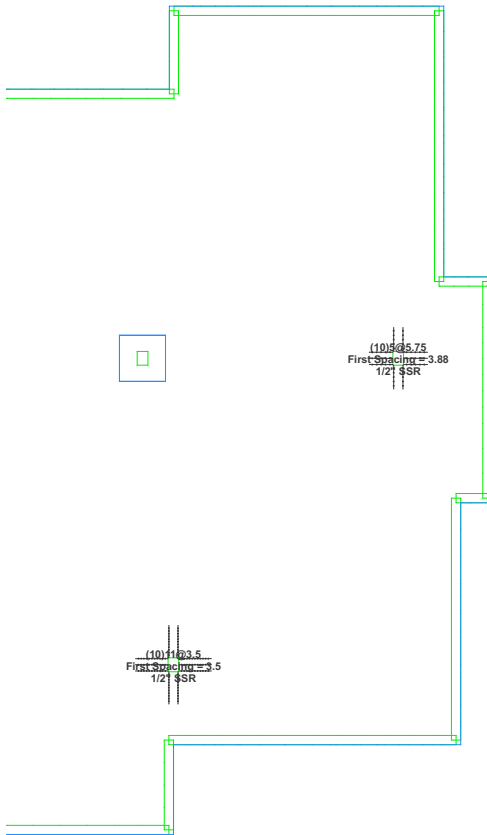
Reinforcement: Shear Bars Plan (3)



Reinforcement: SSR Plan (2)

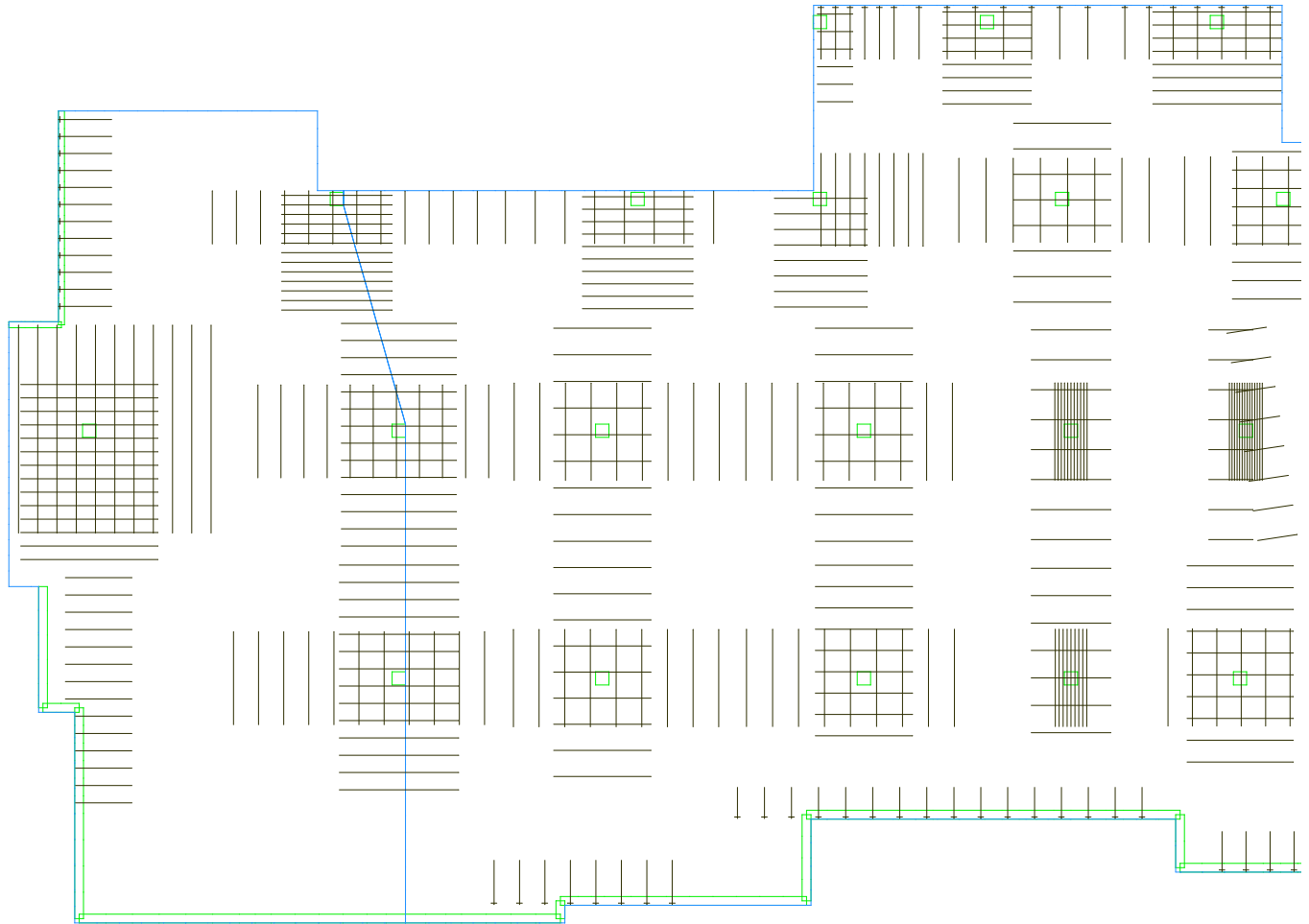


Reinforcement: SSR Plan (3)

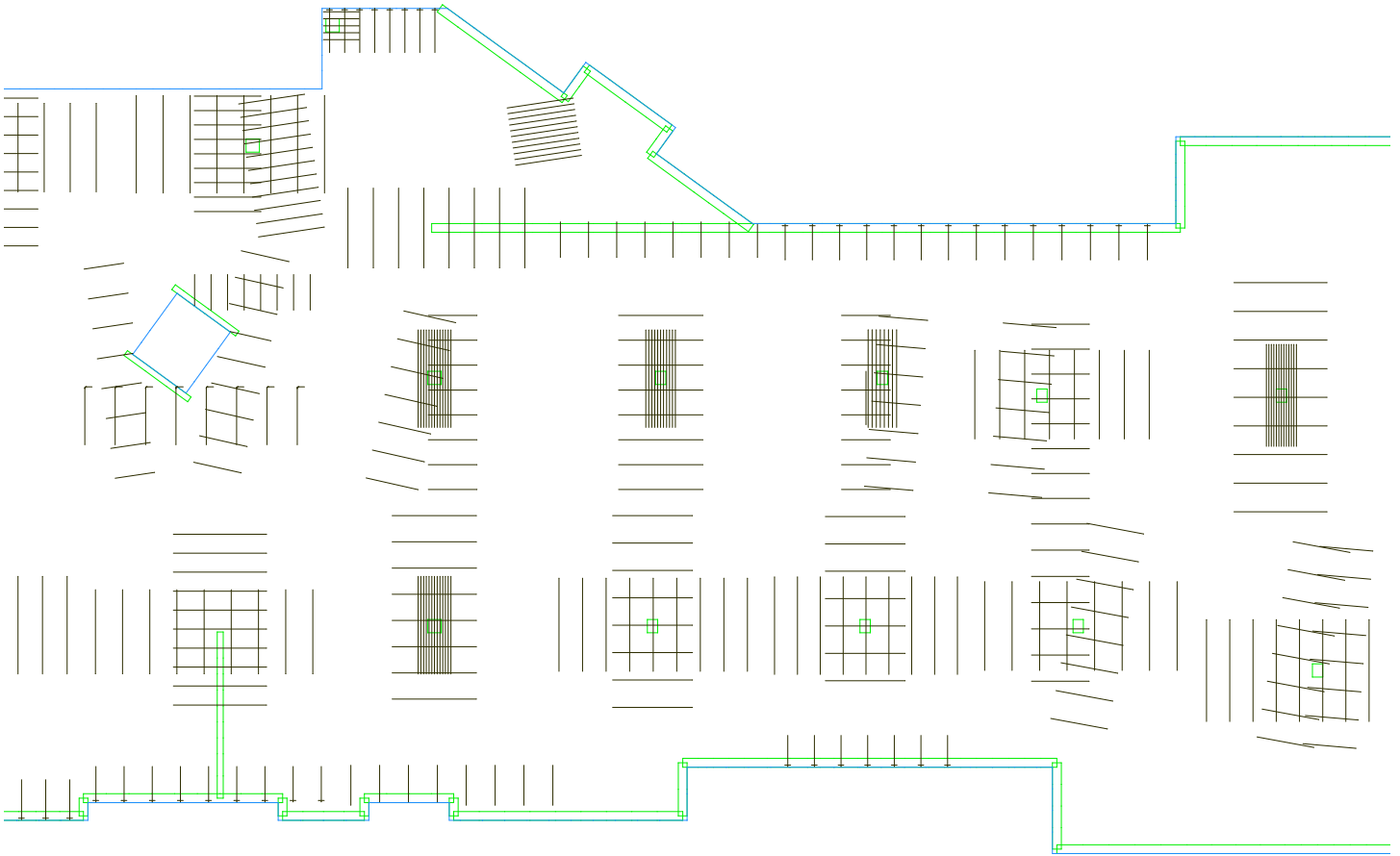


Reinforcement: Individual Top Bars Plan

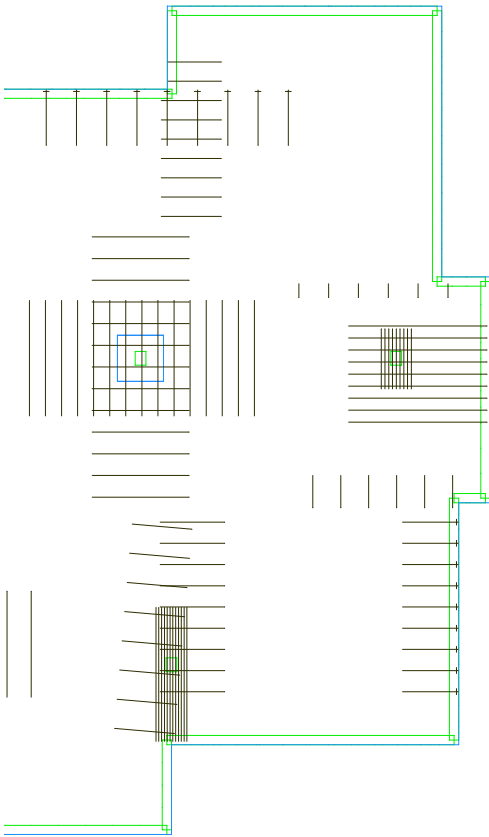
Reinforcement: User Lines; User Notes; User Dimensions; Longitude User Individual Bars; Longitude Program Individual Bars; Latitude User Individual Bars; Latitude Program Individual Bars; Top Face Individual Bars; Both Faces Individual Bars;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



Reinforcement: Individual Top Bars Plan (2)

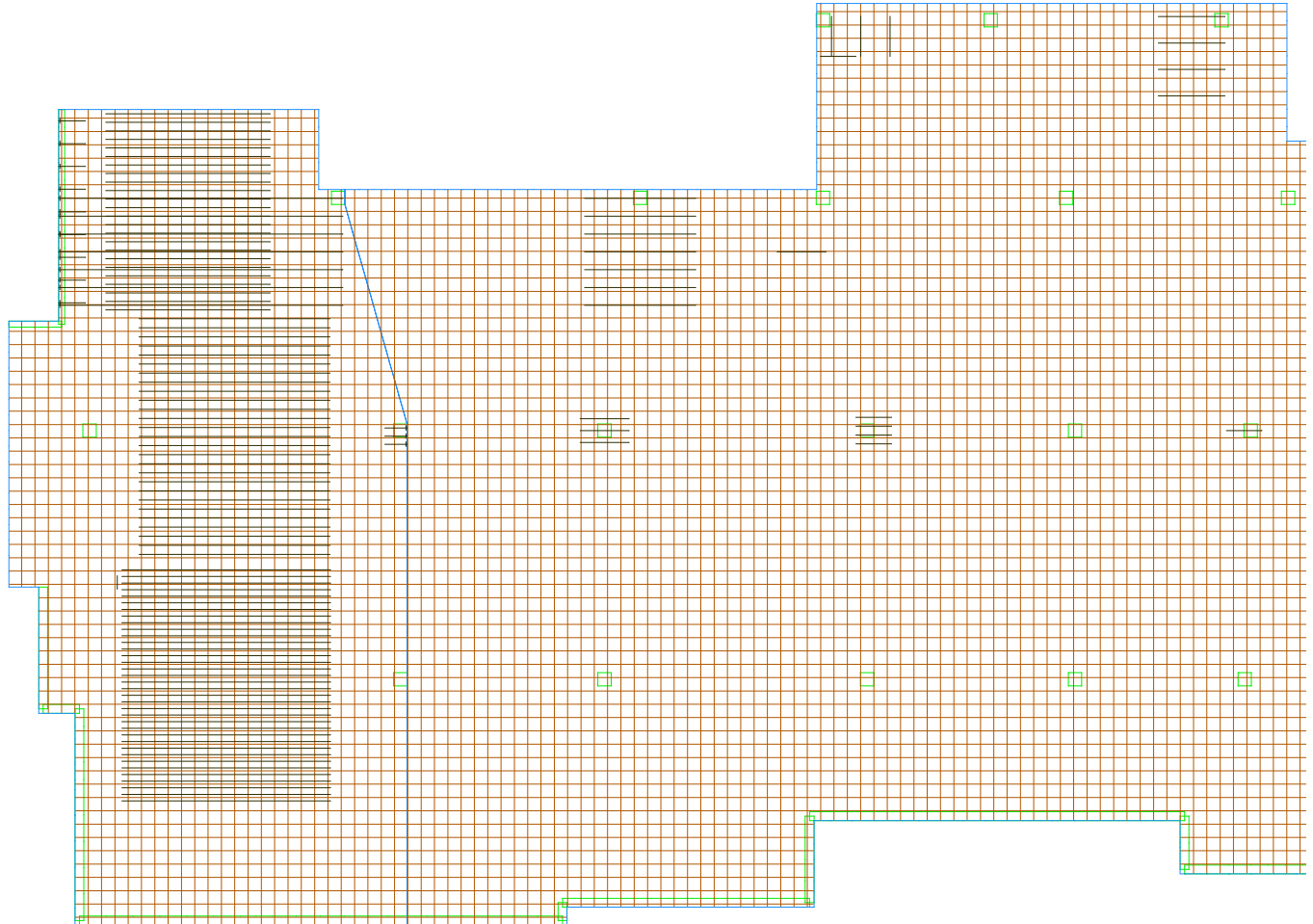


Reinforcement: Individual Top Bars Plan (3)

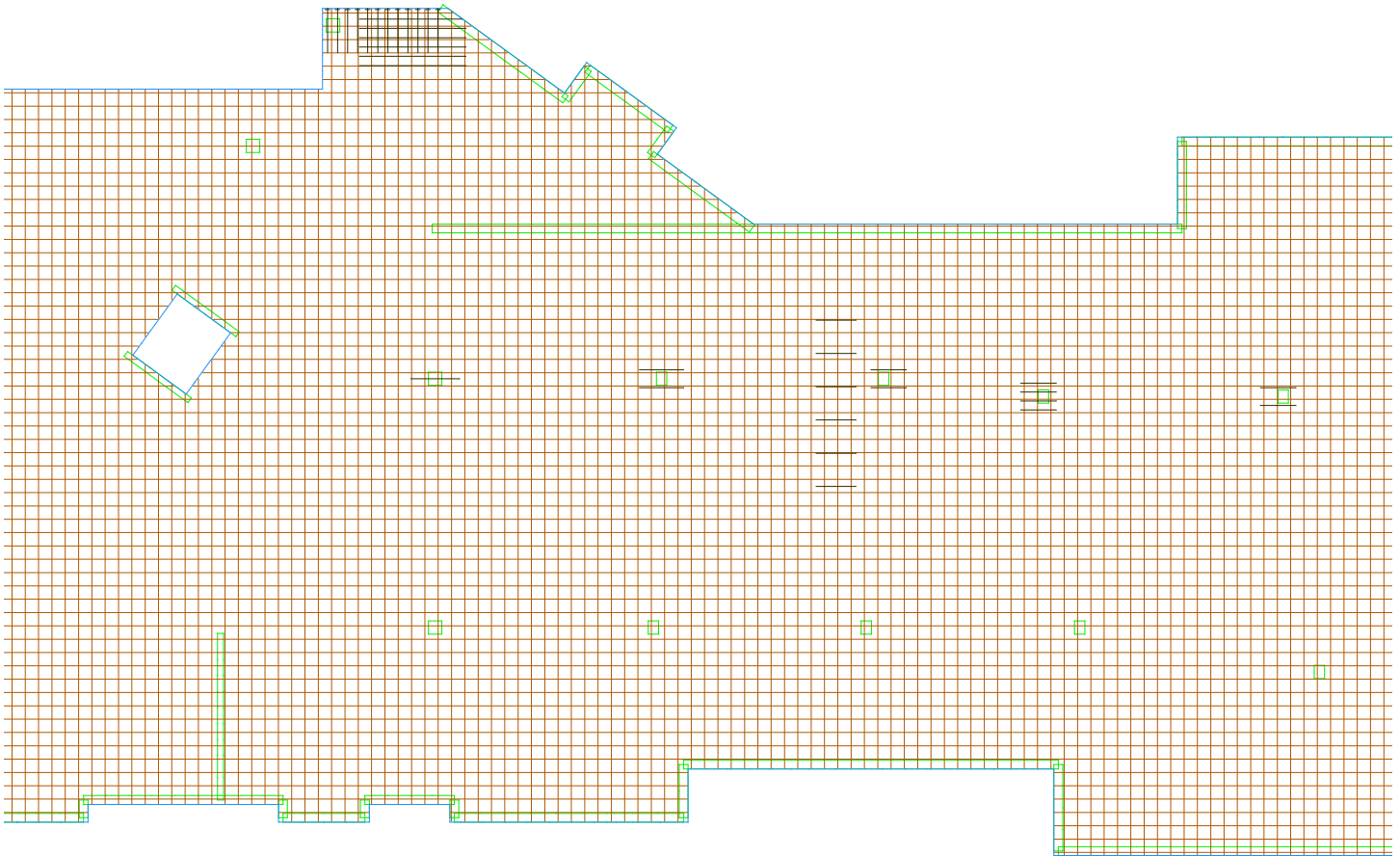


Reinforcement: Individual Bottom Bars Plan

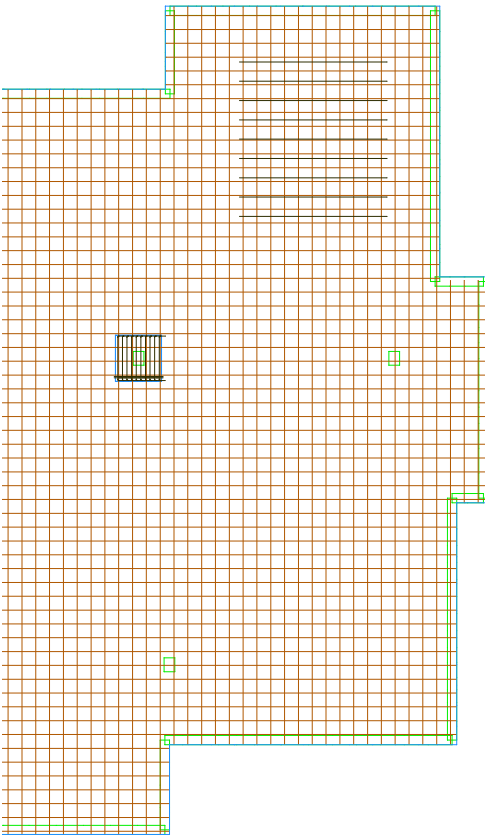
Reinforcement: User Lines; User Notes; User Dimensions; Longitude User Individual Bars; Longitude Program Individual Bars; Latitude User Individual Bars; Latitude Program Individual Bars; Bottom Face Individual Bars; Both Faces Individual Bars;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



Reinforcement: Individual Bottom Bars Plan (2)

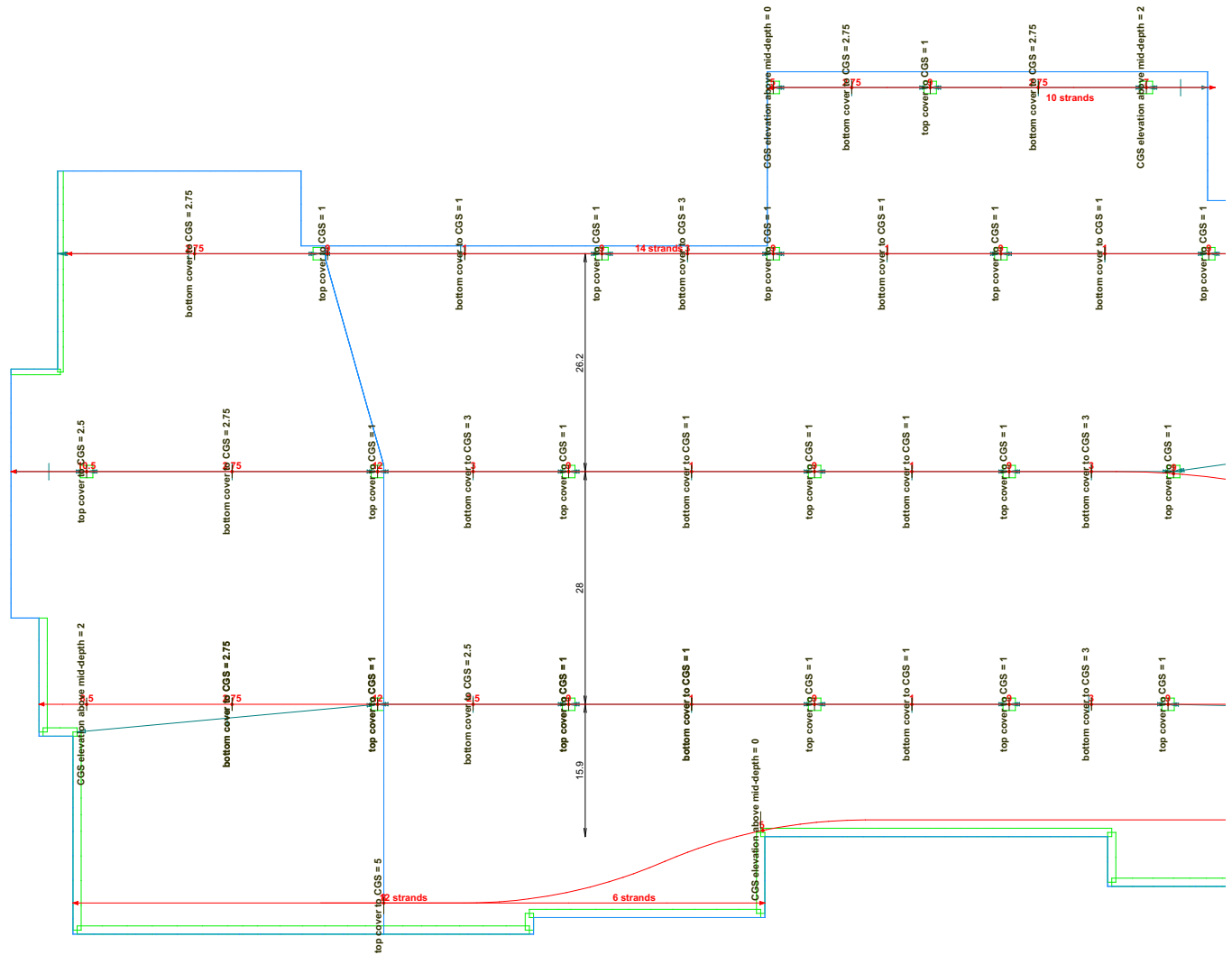


Reinforcement: Individual Bottom Bars Plan (3)



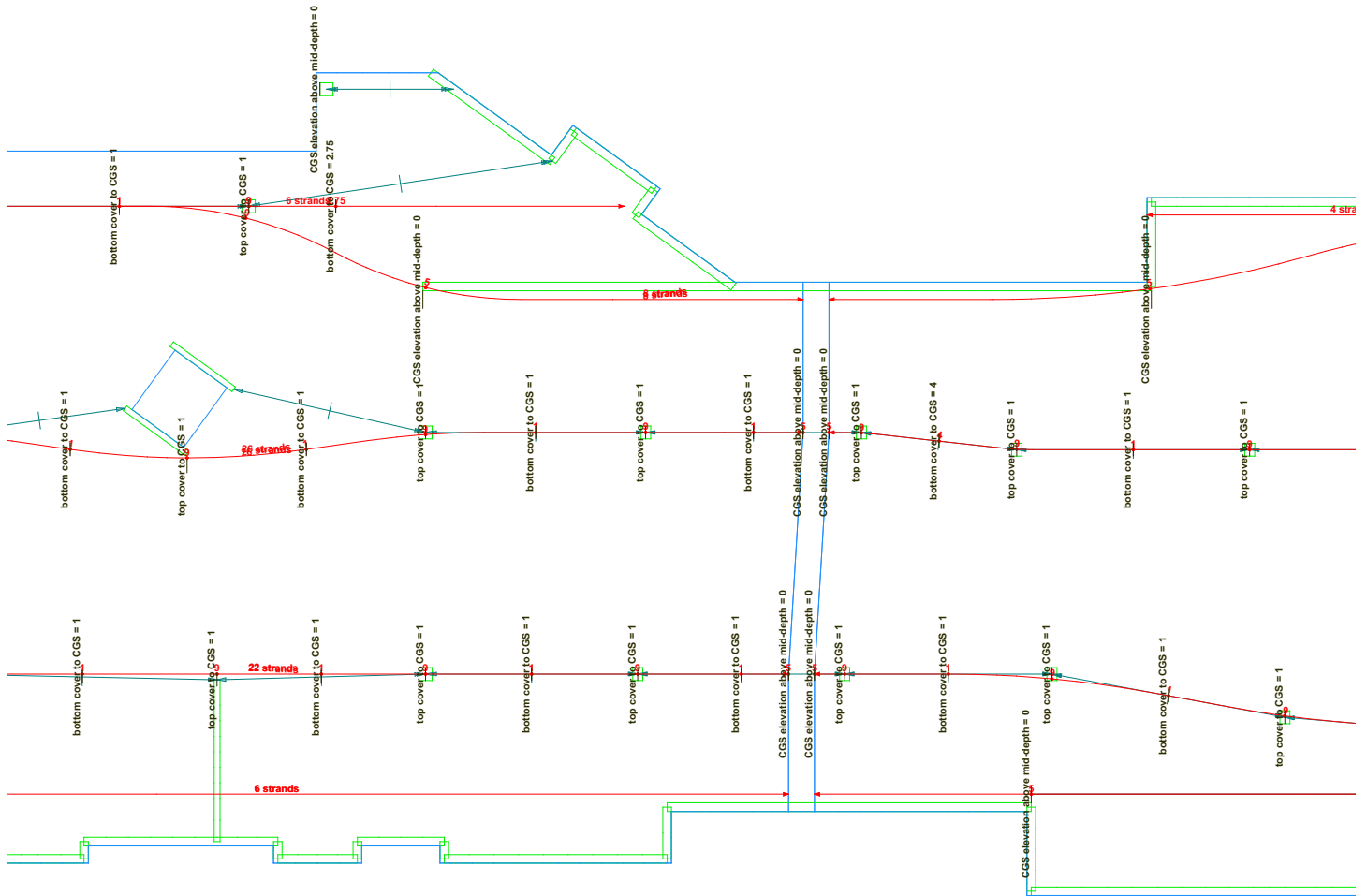
Latitude Tendon Parameters: Standard Plan

Latitude Tendon Parameters: Banded Tendons; Banded Tendon Description; Banded Tendon Fillet Graphics; Distributed Tendon Quadrilateral; Distributed Tendon Description; Distributed Tendon Profile Area Edge; Distributed Tendon Profile Span Changes; Distributed Tendon Profile
 Mesh Input: Slab Areas;
 Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
 Design Strip: Latitude SSs;
 Manual Latitude Tendon: Tendons; Num Strands; Tendon Points; Profile Values;
 Scale = 1:250



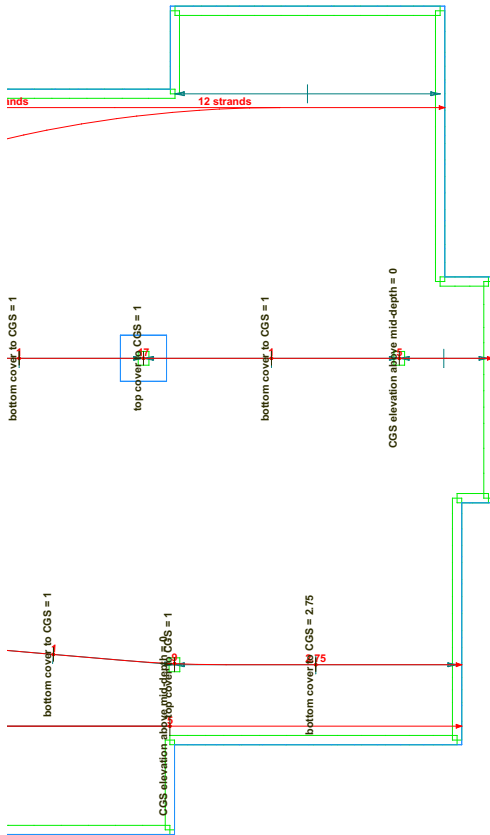
Latitude Tendon Parameters: Standard Plan (2)

Concrete Elevation Change; Distributed Tendon Profile Polyline Ends; Distributed Tendon Overlap Areas; Tendon Void; Tendon Profile Polyline; Tendon Profile Polyline Details; Profile Points; Profile Elevation Values; Profile Nodes; Jack Region; Jack Region Hatching; Jack Region



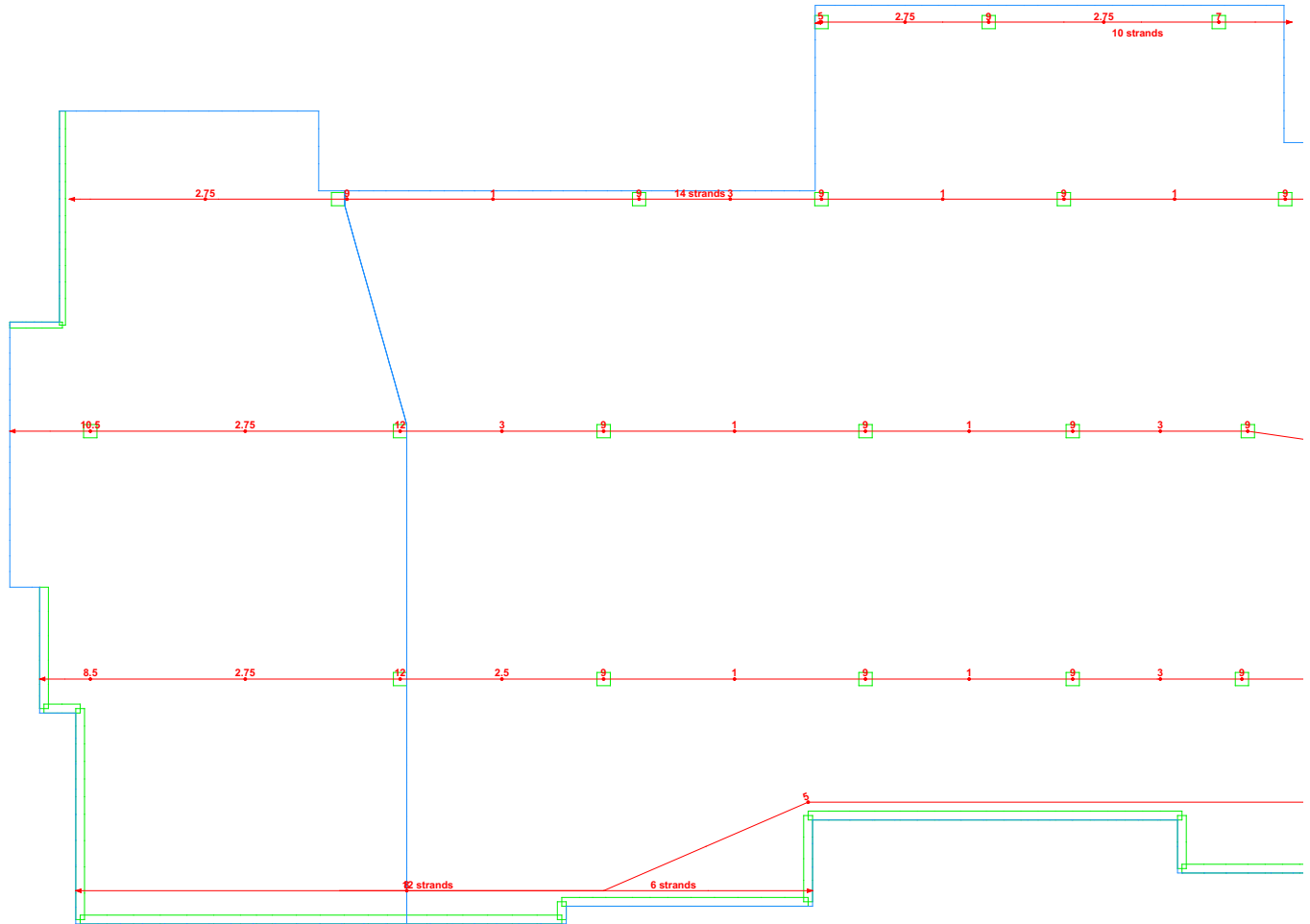
Latitude Tendon Parameters: Standard Plan (3)

Corner Icon; User Notes; User Lines; User Dimensions;

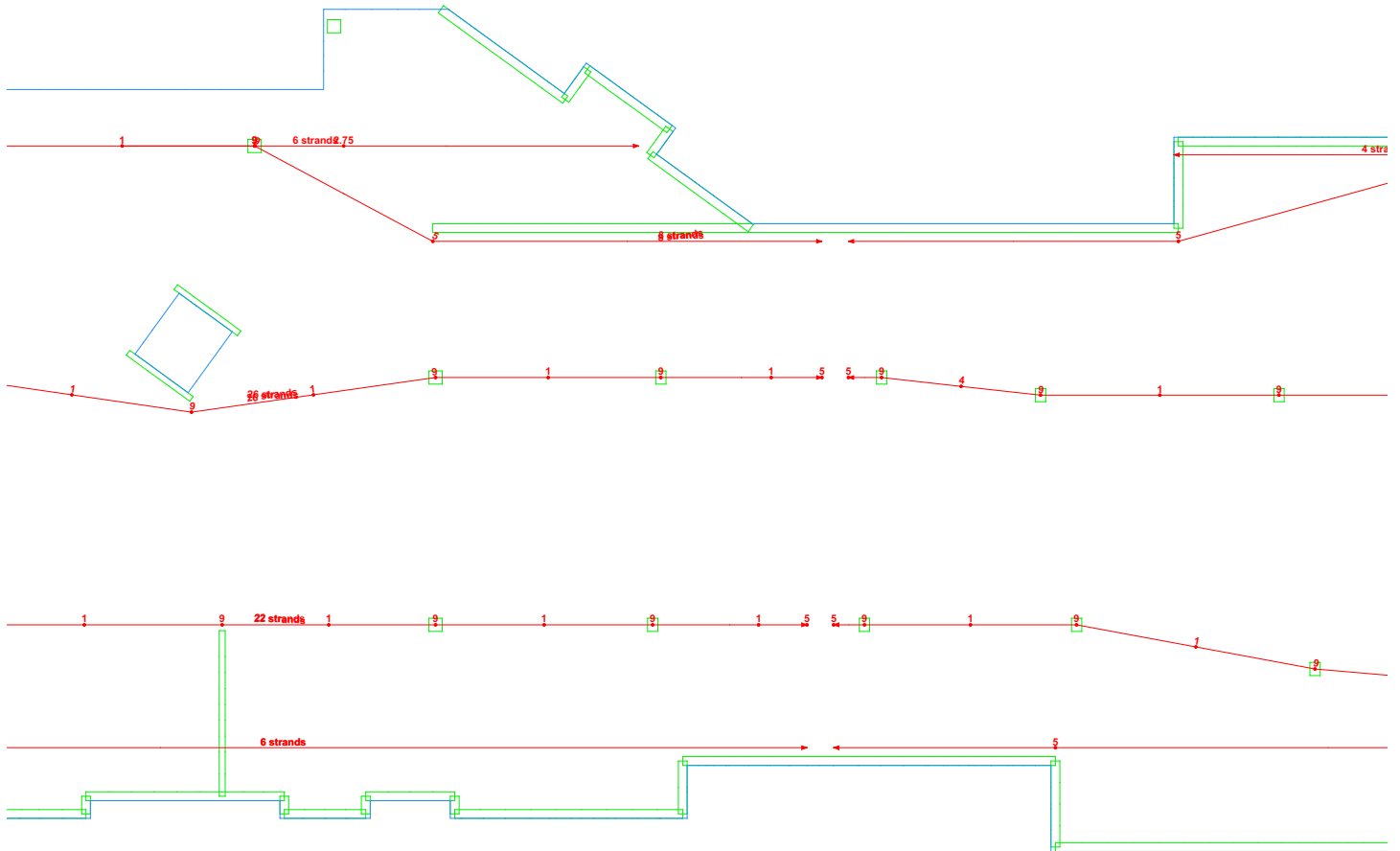


Manual Latitude Tendon: Standard Plan

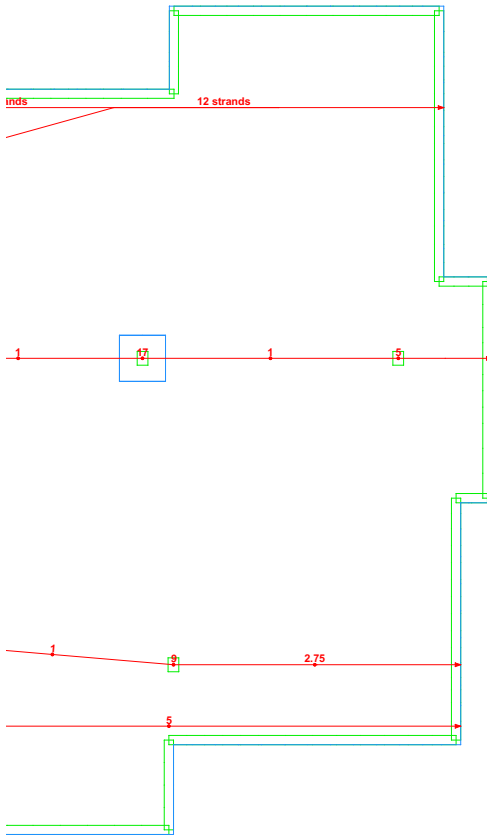
Manual Latitude Tendon: User Lines; User Notes; User Dimensions; Tendons; Num Strands; Tendon Inflection Ratio; Tendon Points; Profile Values; Jacks;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Latitude Tendon Parameters: Banded Tendons; Banded Tendon Description; Distributed Tendon Quadrilateral; Distributed Tendon Description; Distributed Tendon Overlap Areas; Profile Points; Profile Elevation Values; Profile Nodes; Jack Region;
 Scale = 1:250



Manual Latitude Tendon: Standard Plan (2)

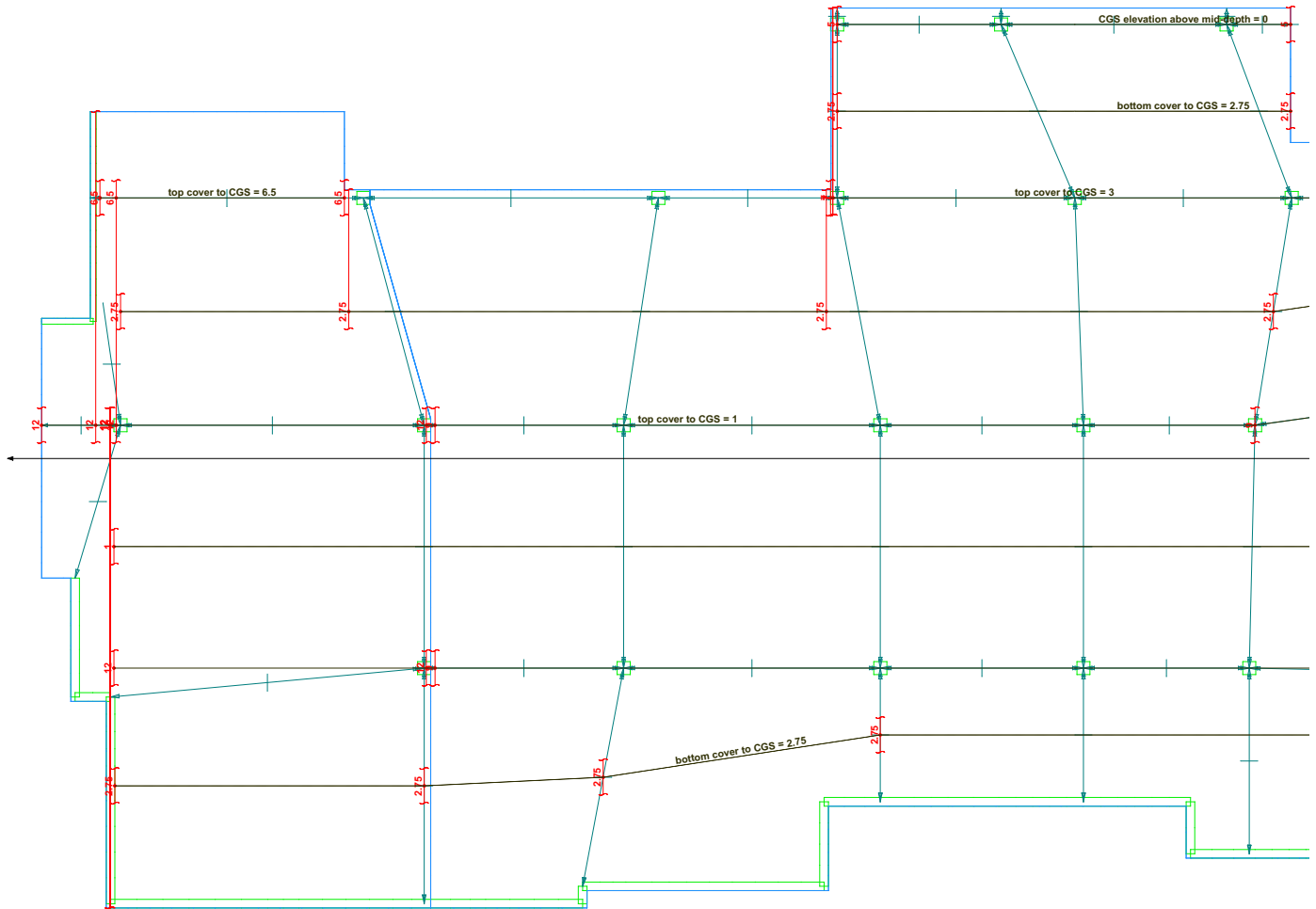


Manual Latitude Tendon: Standard Plan (3)



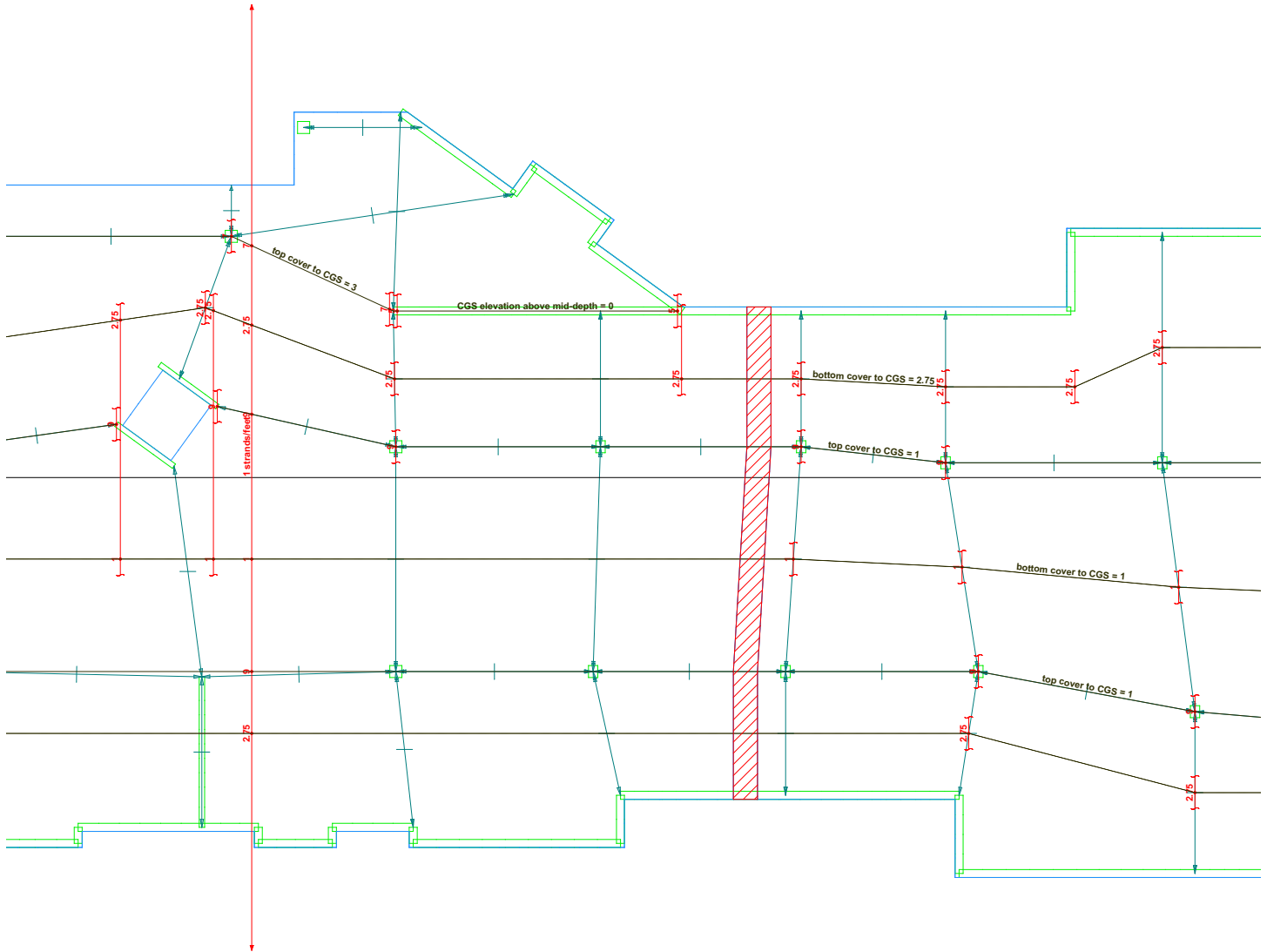
Longitude Tendon Parameters: Standard Plan

Longitude Tendon Parameters: Banded Tendons; Banded Tendon Description; Banded Tendon Fillet Graphics; Distributed Tendon Quadrilateral; Distributed Tendon Description; Distributed Tendon Profile Area Edge; Distributed Tendon Profile Span Changes; Distributed Tendon Prof
 Mesh Input: Slab Areas;
 Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
 Design Strip: Latitude SSs; Longitude SSs;
 Manual Longitude Tendon: Tendons; Num Strands; Tendon Points; Profile Values;
 Scale = 1:250



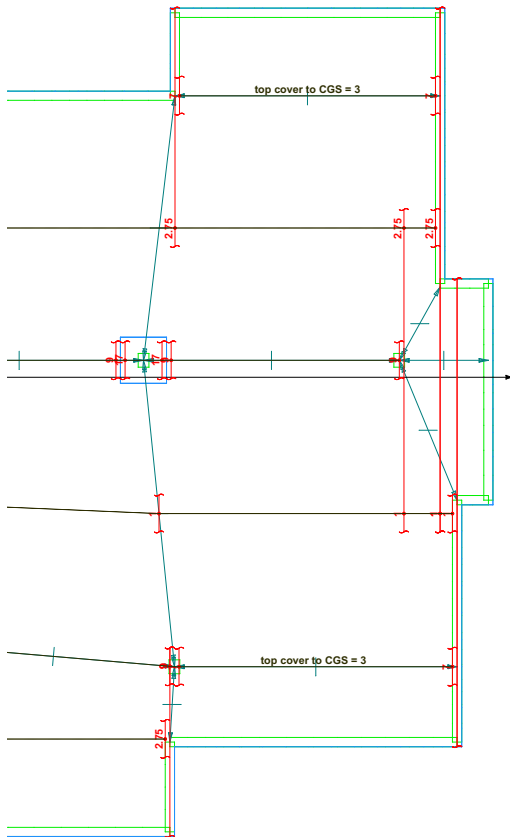
Longitude Tendon Parameters: Standard Plan (2)

File Concrete Elevation Change; Distributed Tendon Profile Polyline Ends; Distributed Tendon Overlap Areas; Tendon Void; Tendon Profile Polyline; Tendon Profile Polyline Details; Profile Points; Profile Elevation Values; Profile Nodes; Jack Region; Jack Region Hatching; Jack Region

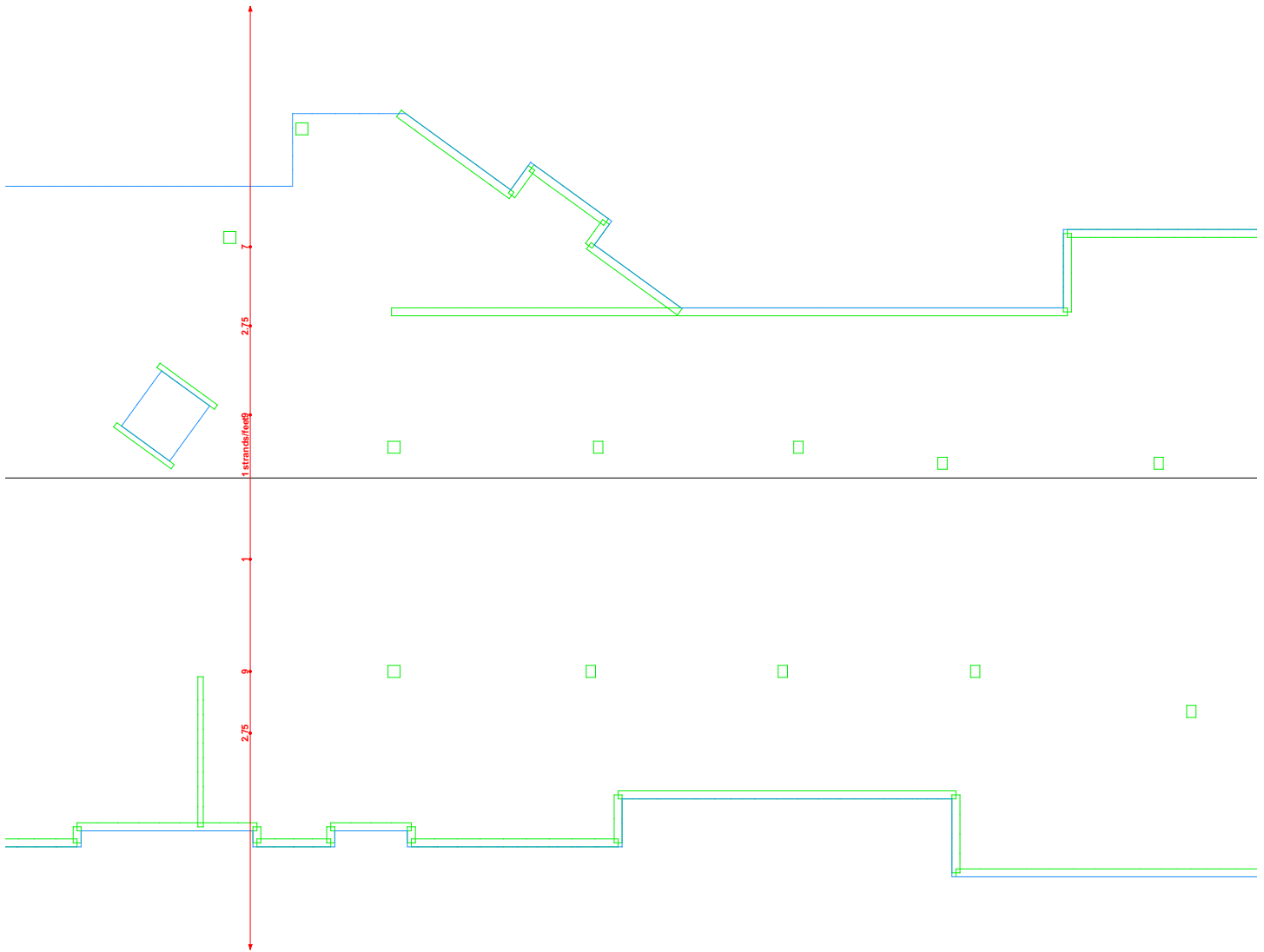


Longitude Tendon Parameters: Standard Plan (3)

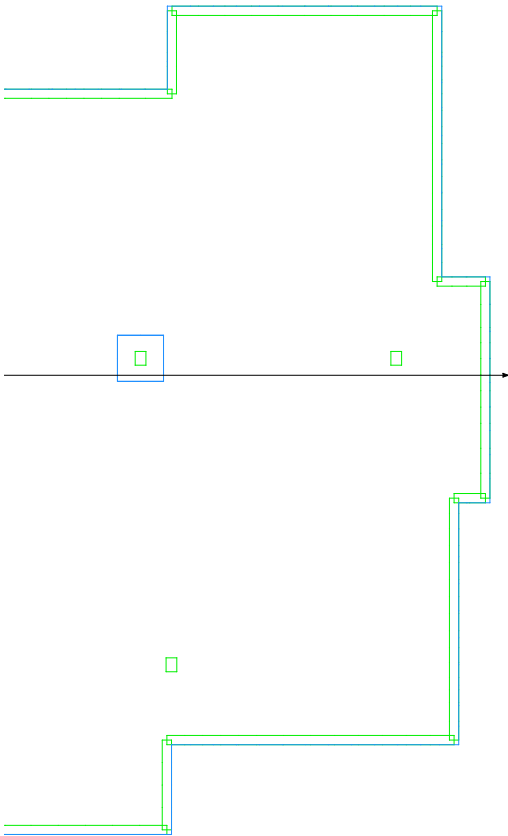
in Corner Icon; User Notes; User Lines; User Dimensions;



Manual Longitude Tendon: Standard Plan (2)

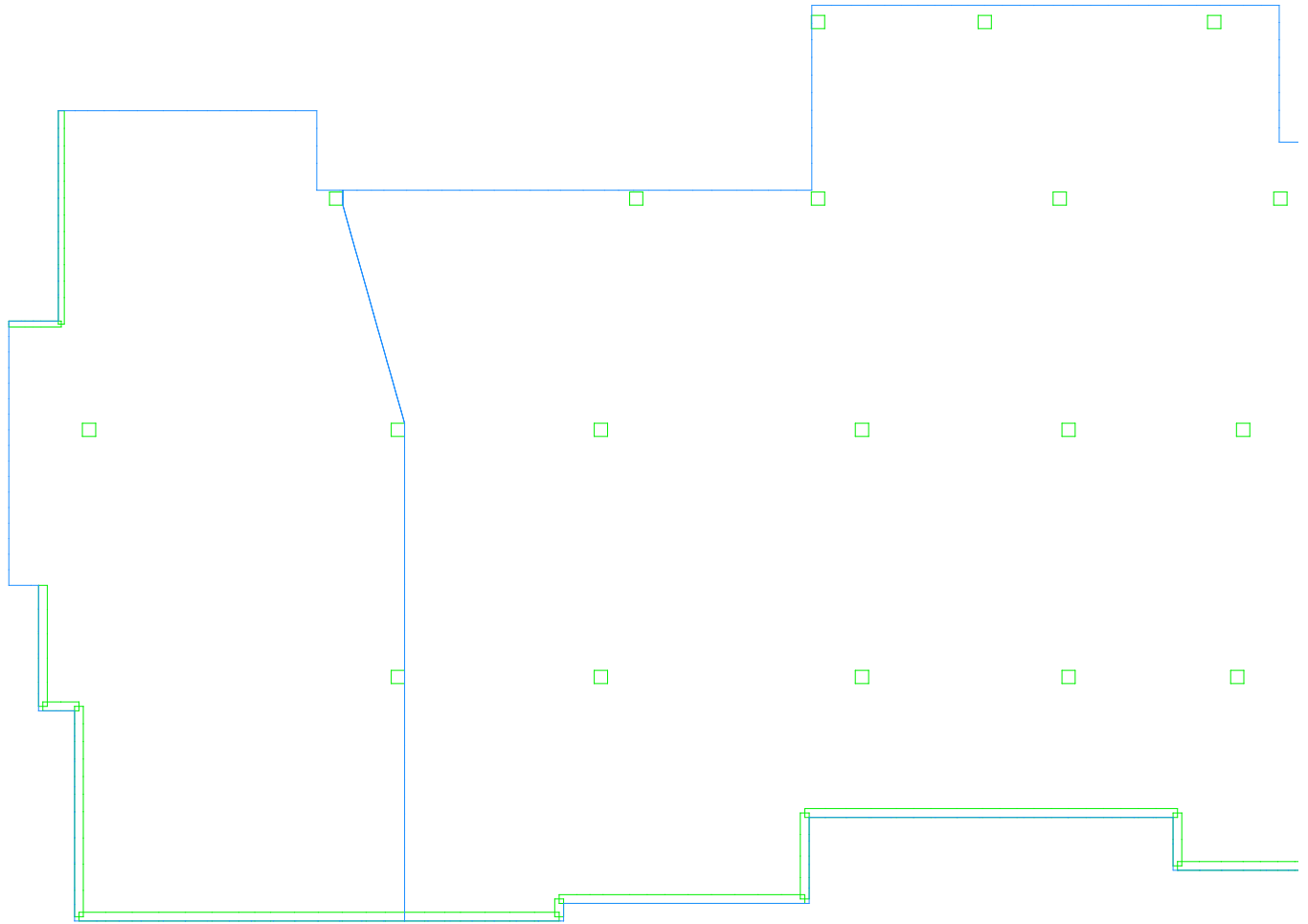


Manual Longitude Tendon: Standard Plan (3)

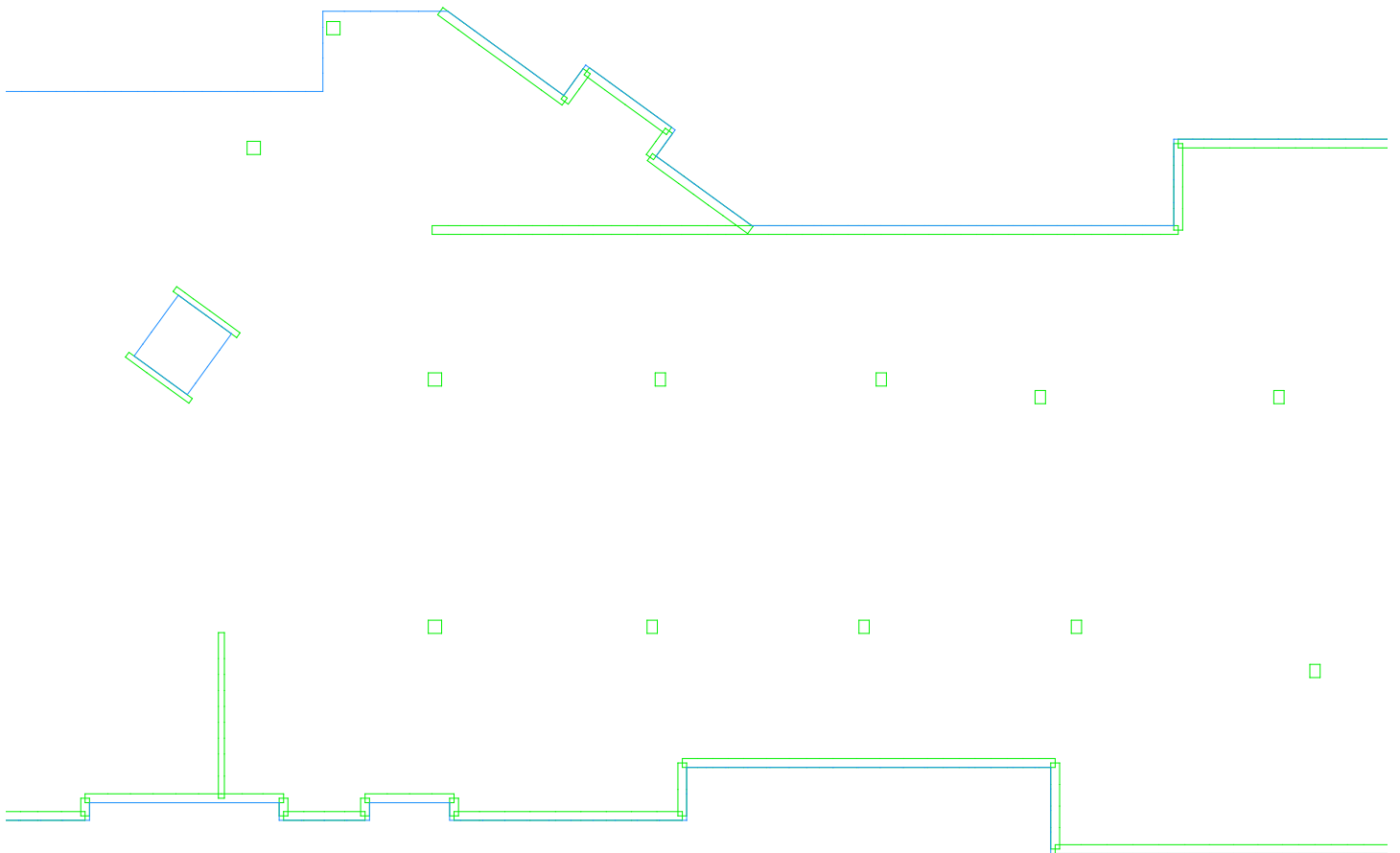


Maximum Short Term Load: Std Deflection Plan

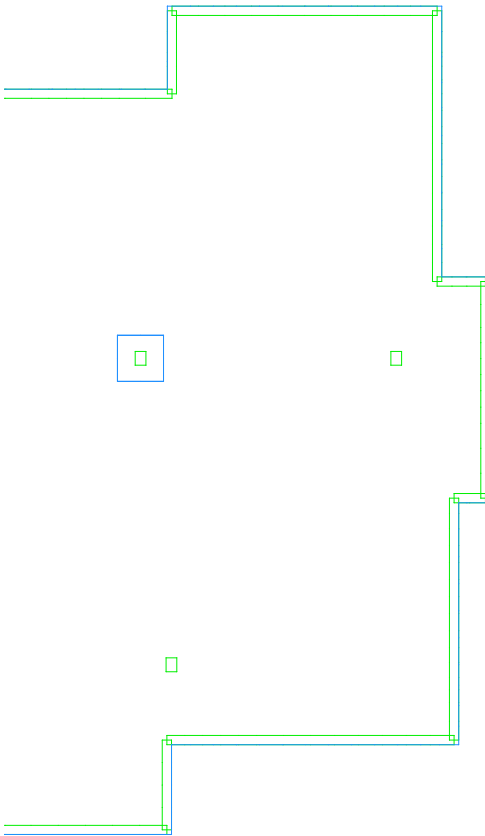
Maximum Short Term Load: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Maximum Short Term Load - Vertical Deflection Plot
 -0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4
 Min Value = 0 inches @ (0,0) Max Value = 0 inches @ (0,0)



Maximum Short Term Load: Std Deflection Plan (2)

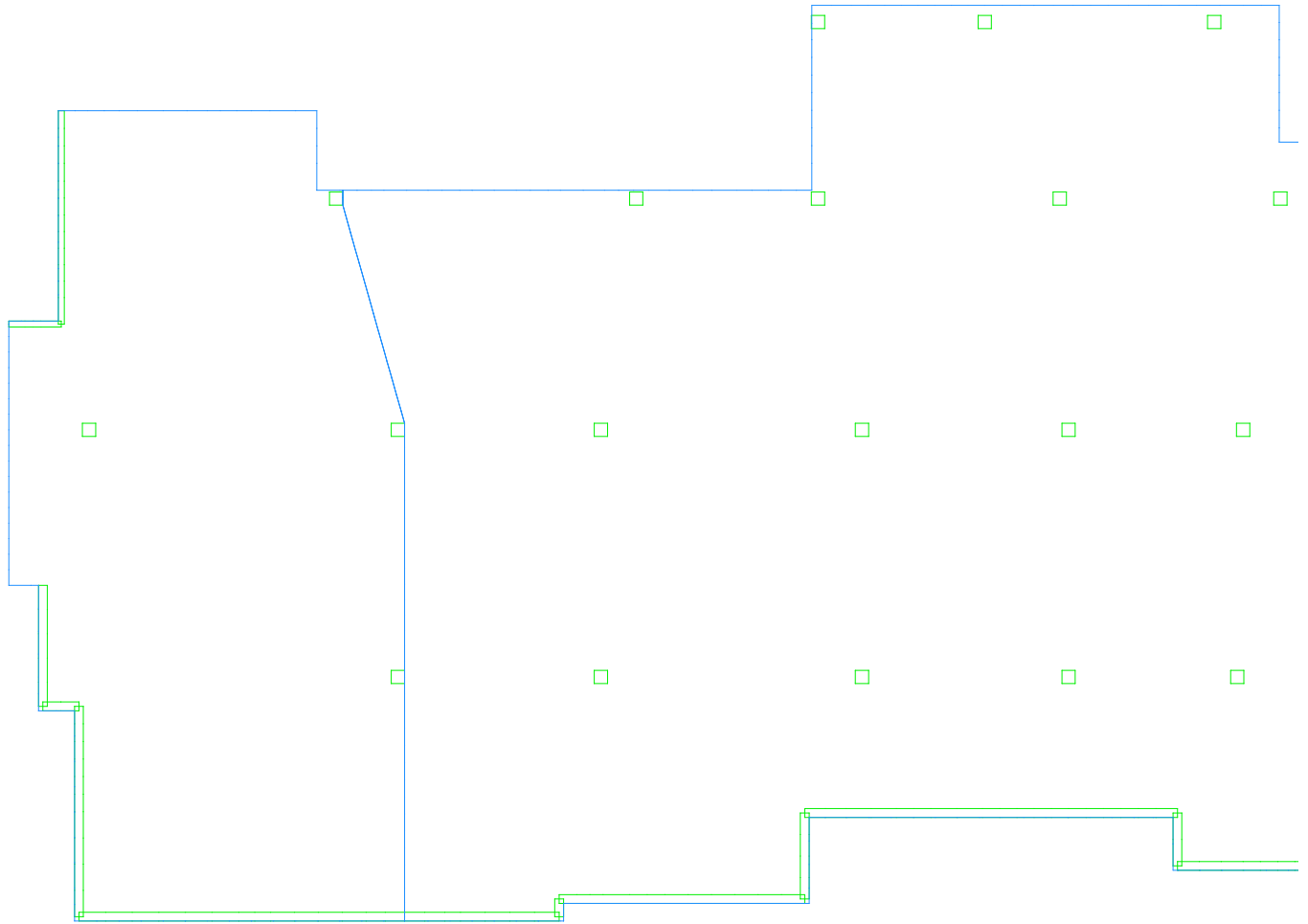


Maximum Short Term Load: Std Deflection Plan (3)



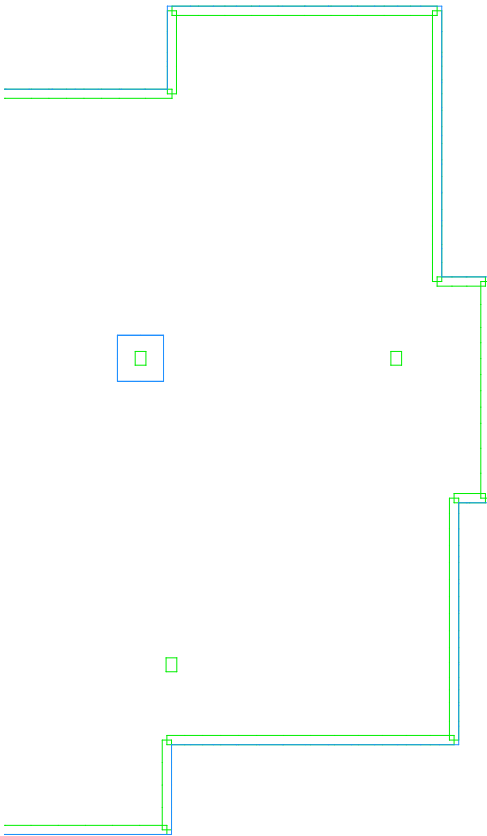
Sustained Load: Std Deflection Plan

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
-0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4
Min Value = 0 inches @ (0,0) Max Value = 0 inches @ (0,0)



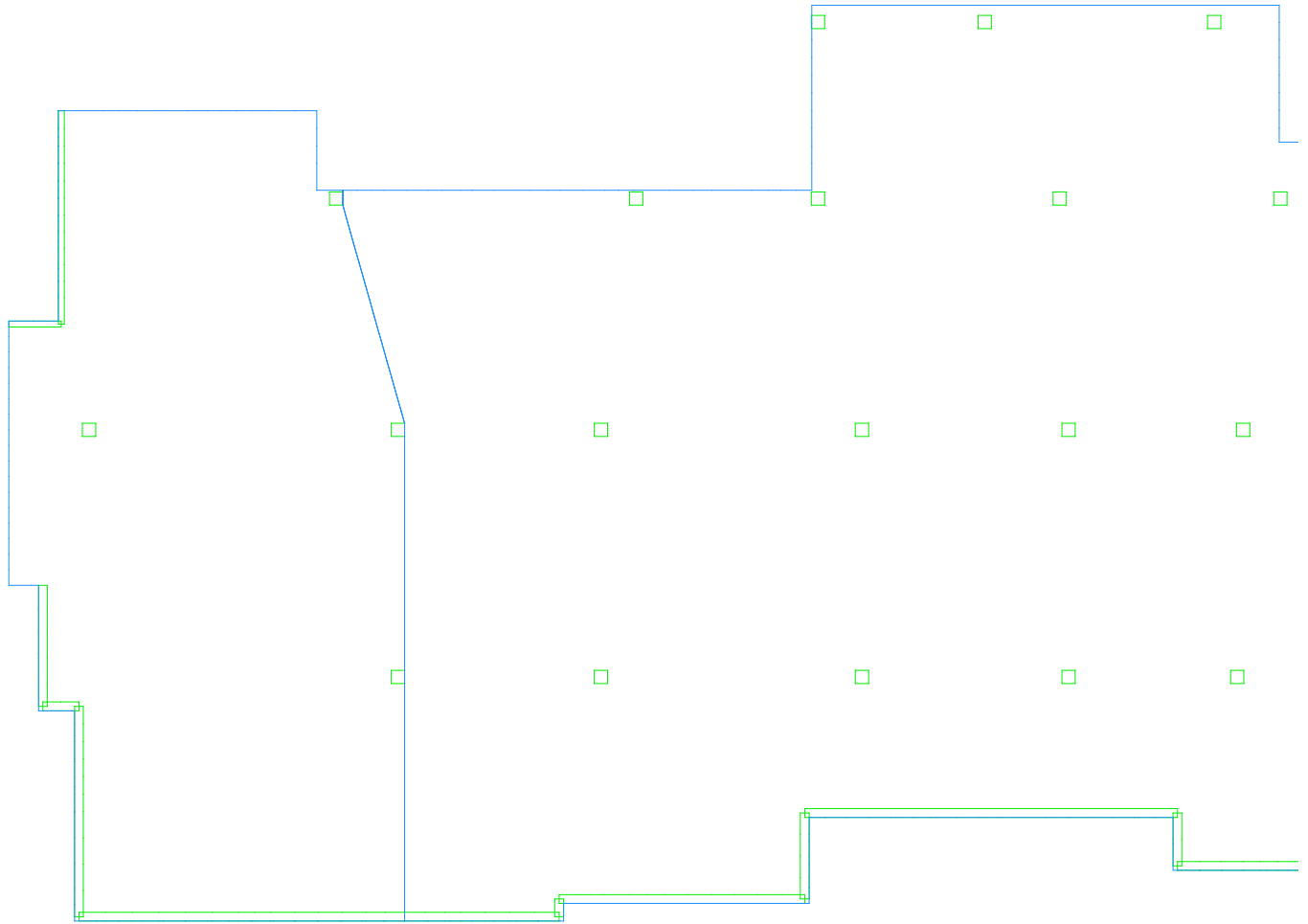
Sustained Load: Std Deflection Plan (2)

Sustained Load: Std Deflection Plan (3)

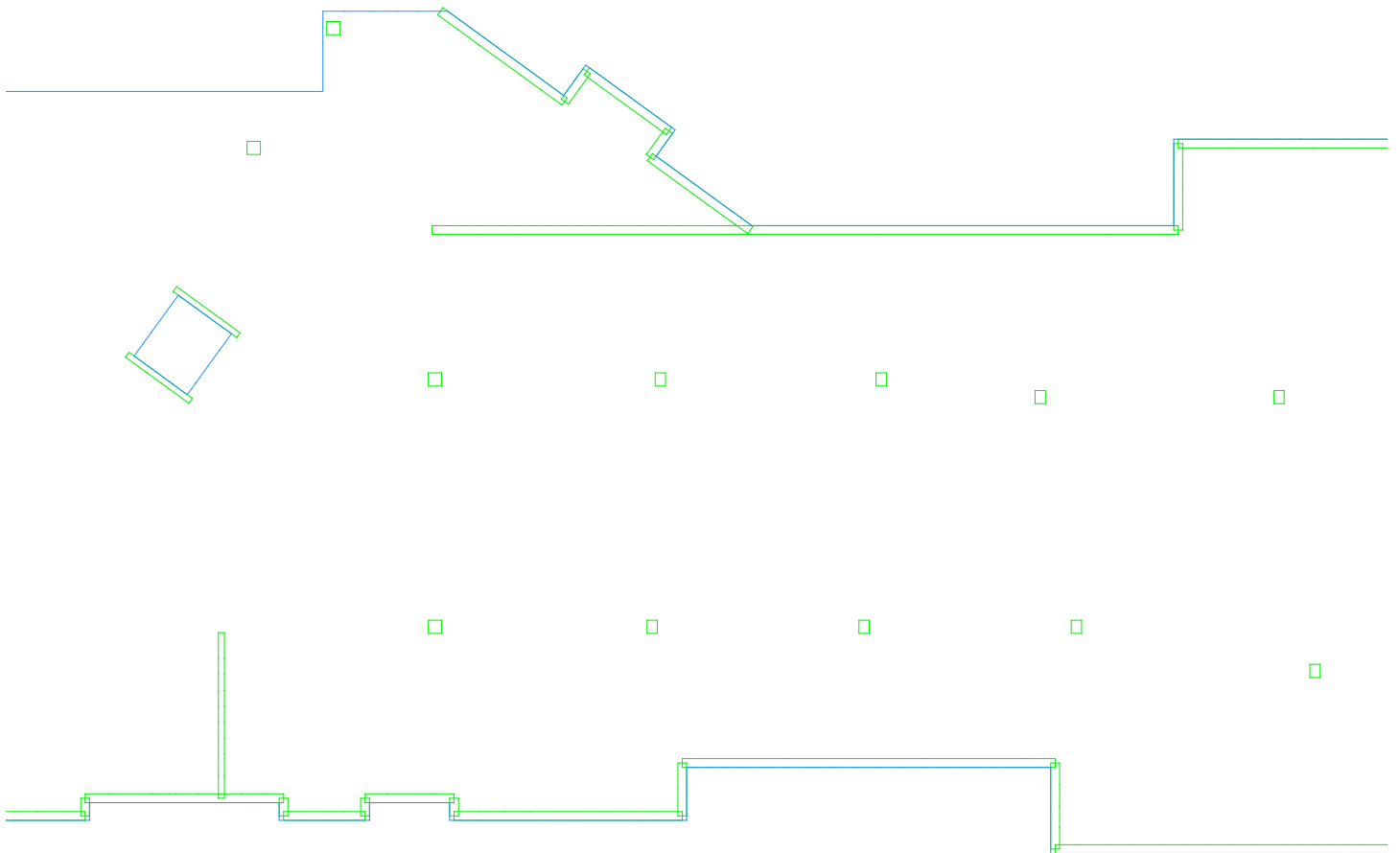


Final Instantaneous Load: Std Deflection Plan

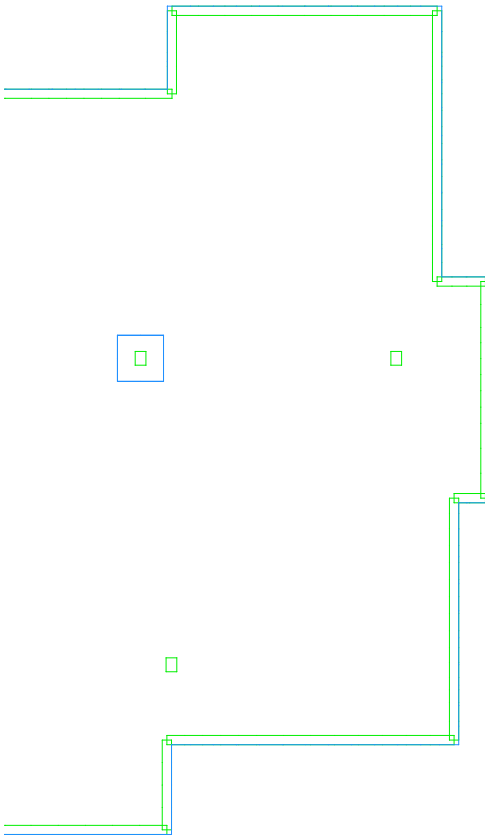
Final Instantaneous Load: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Final Instantaneous Load - Vertical Deflection Plot
 -0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4
 Min Value = 0 inches @ (0,0) Max Value = 0 inches @ (0,0)



Final Instantaneous Load: Std Deflection Plan (2)

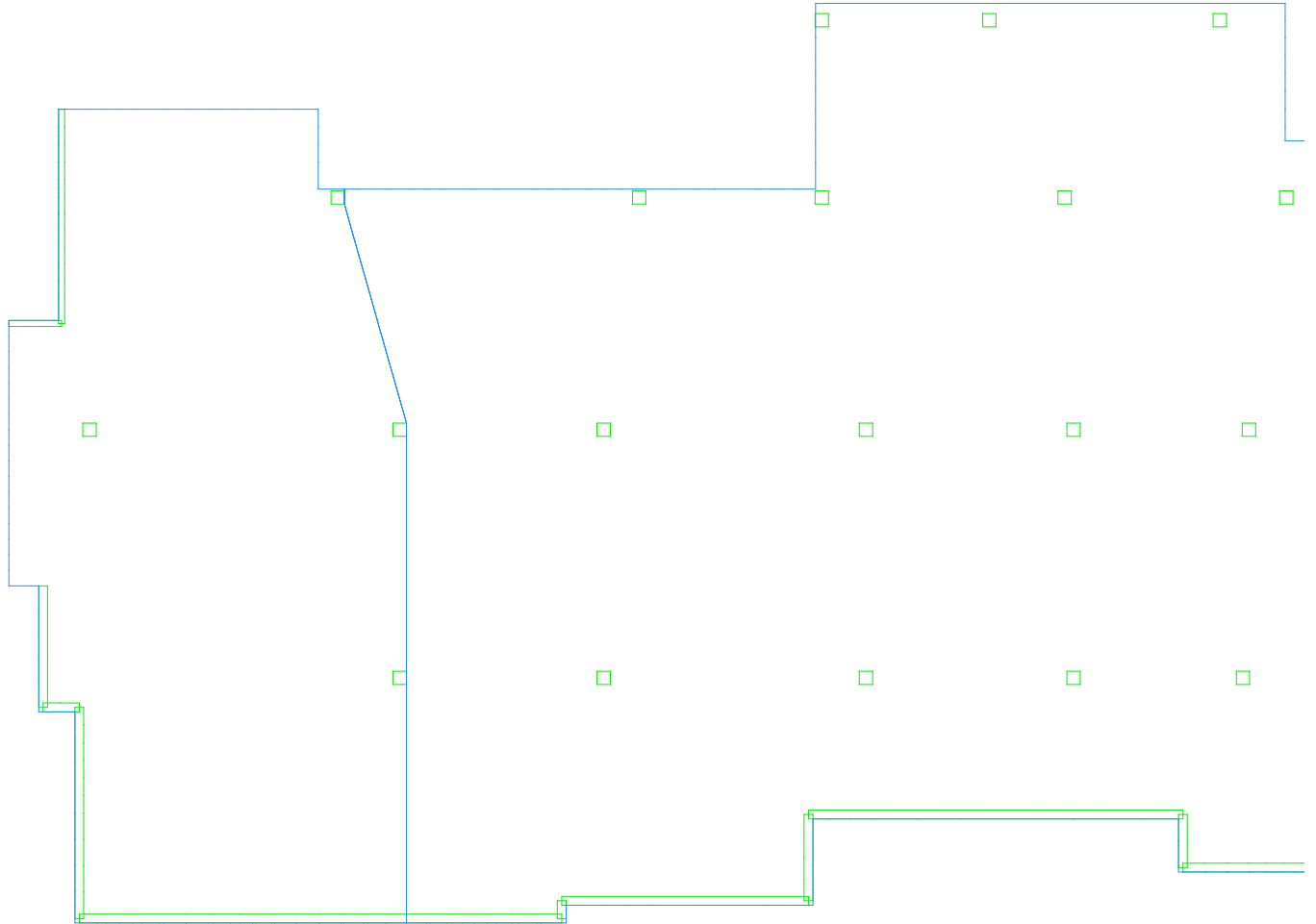


Final Instantaneous Load: Std Deflection Plan (3)

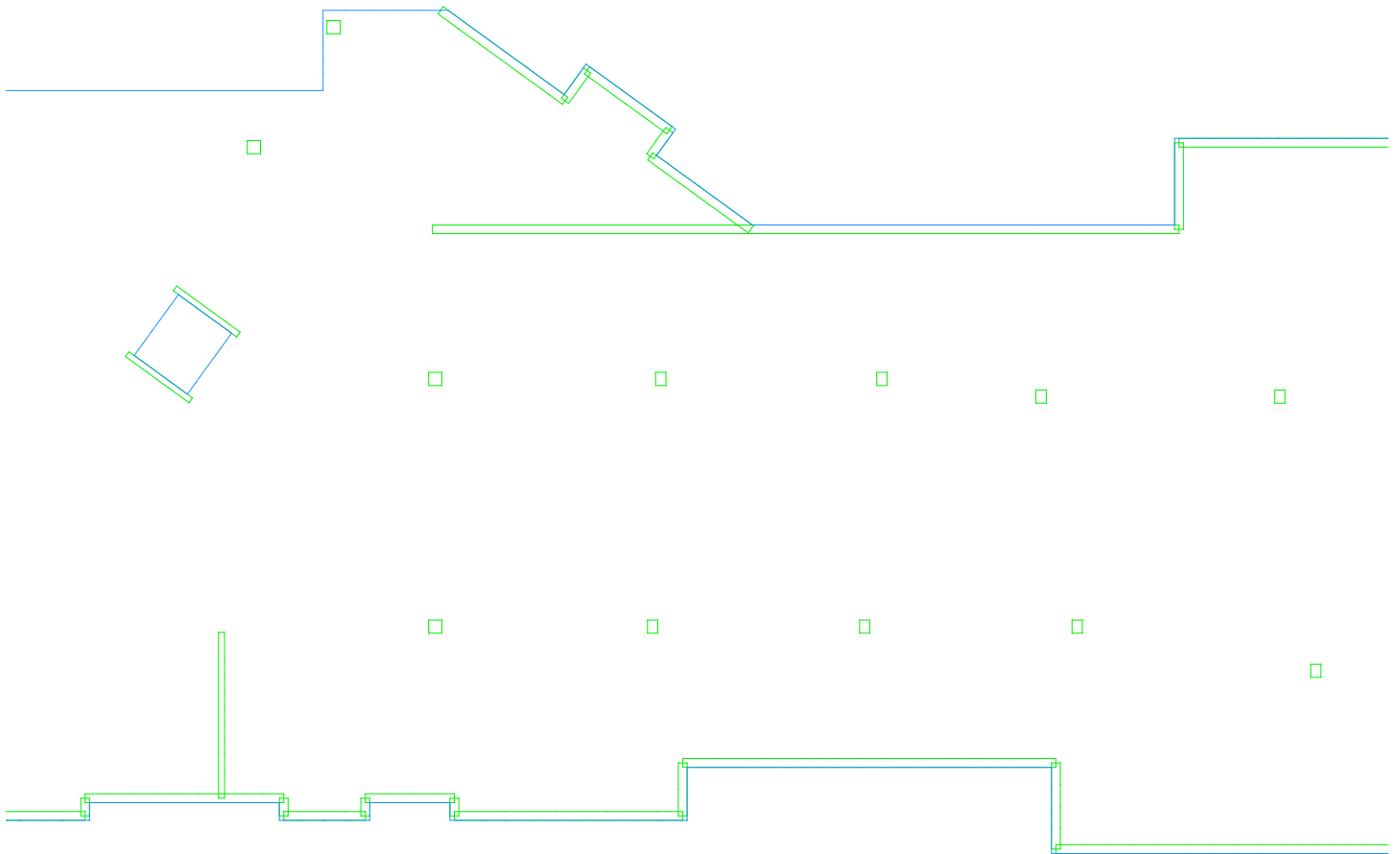


Additional Mass Loading: All Loads Plan

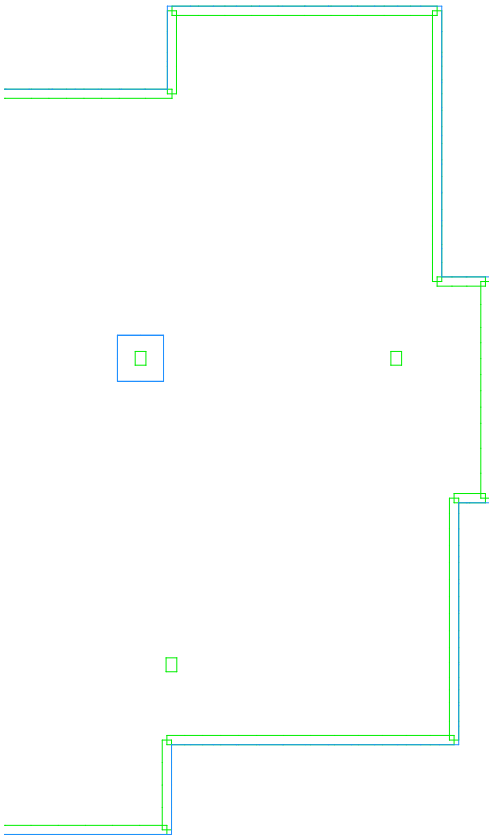
Additional Mass Loading: User Lines; User Notes; User Dimensions; Mass Point Loads; Mass Point Load Icons; Mass Point Load Values; Mass Line Loads; Mass Line Load Icons; Mass Line Load Values; Mass Area Loads; Mass Area Load Icons; Mass Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Additional Mass Loading: All Loads Plan (2)

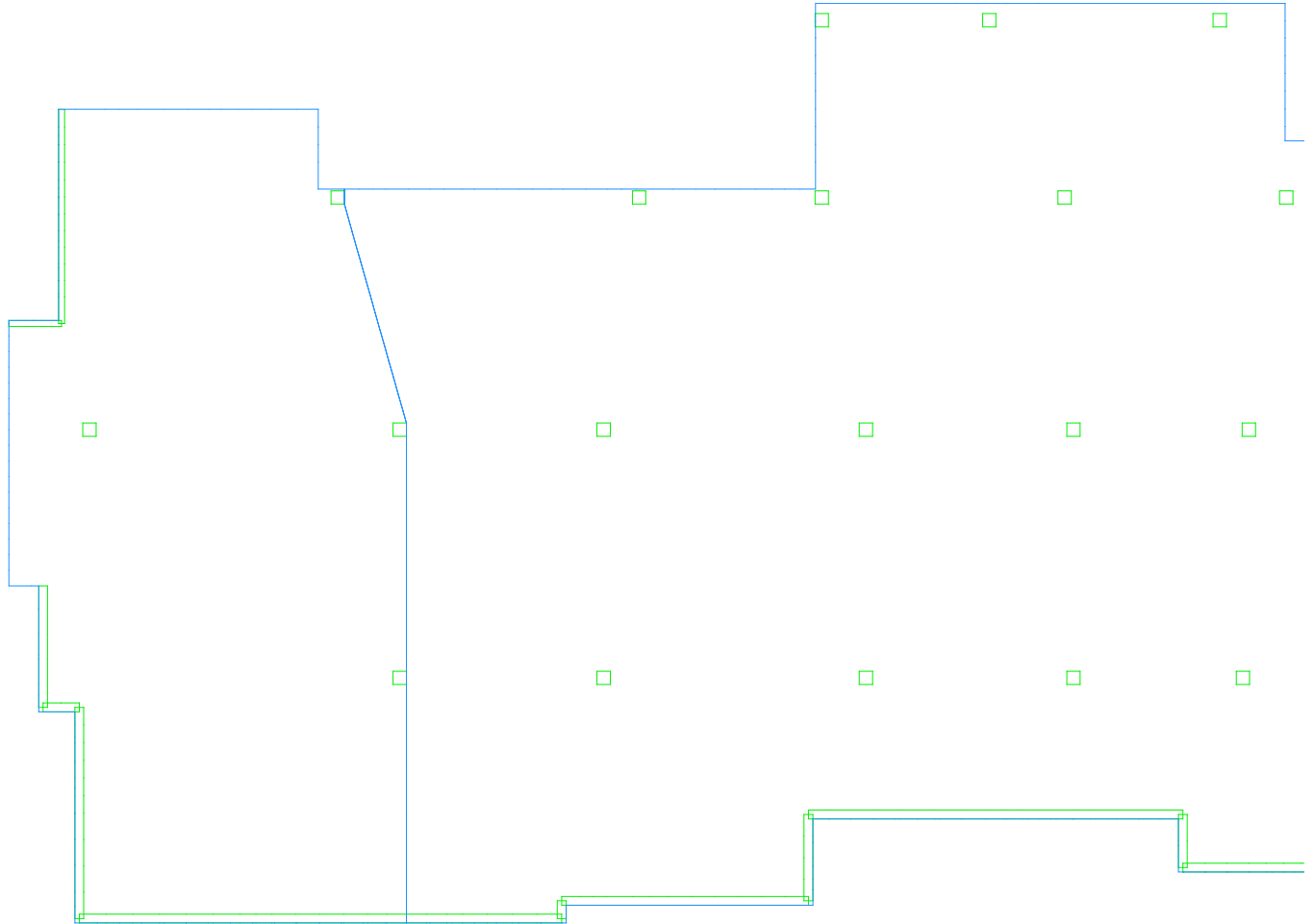


Additional Mass Loading: All Loads Plan (3)

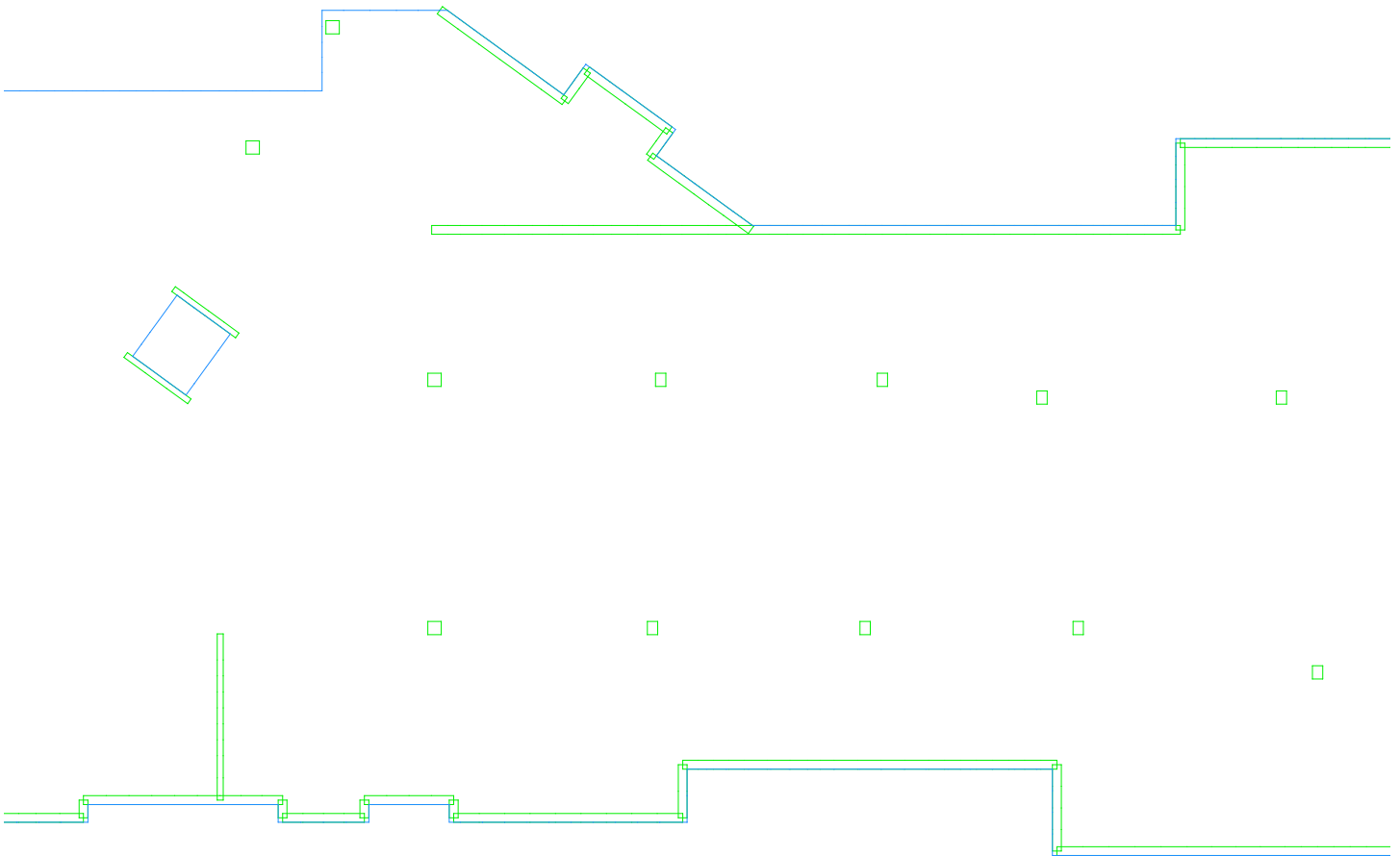


Vibration Analysis: Excitation Areas Plan

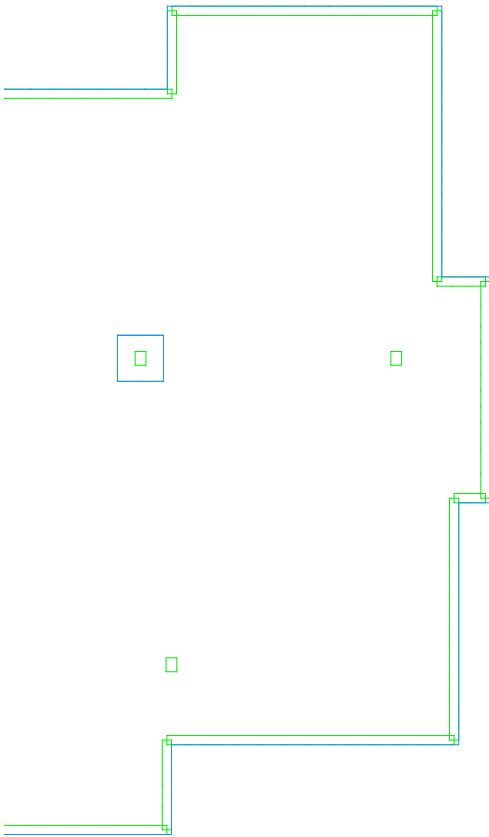
Vibration Analysis: User Lines; User Notes; User Dimensions; Vibration Excitation Area; Vibration Excitation Area Hatching;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Vibration Analysis: Excitation Areas Plan (2)

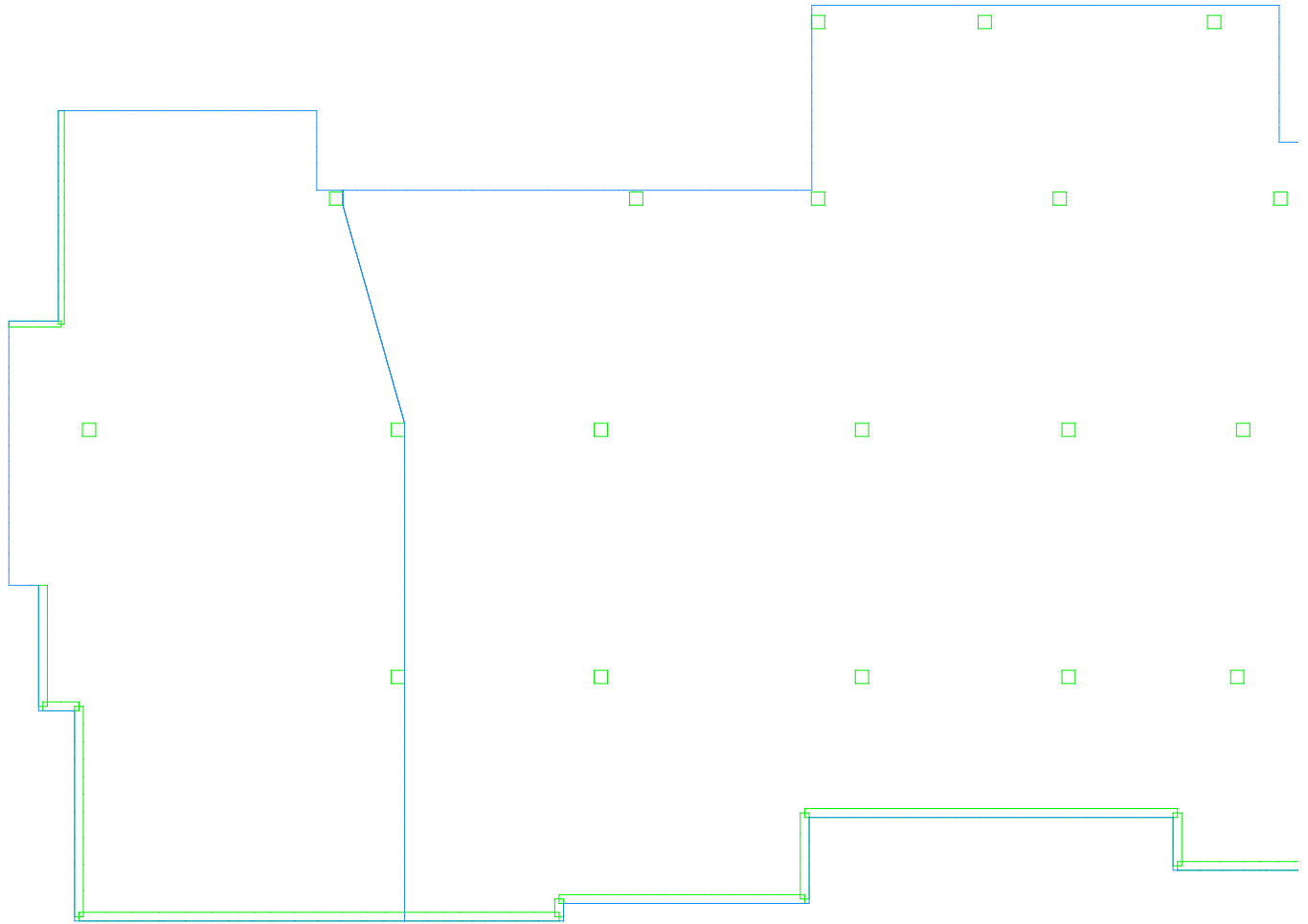


Vibration Analysis: Excitation Areas Plan (3)

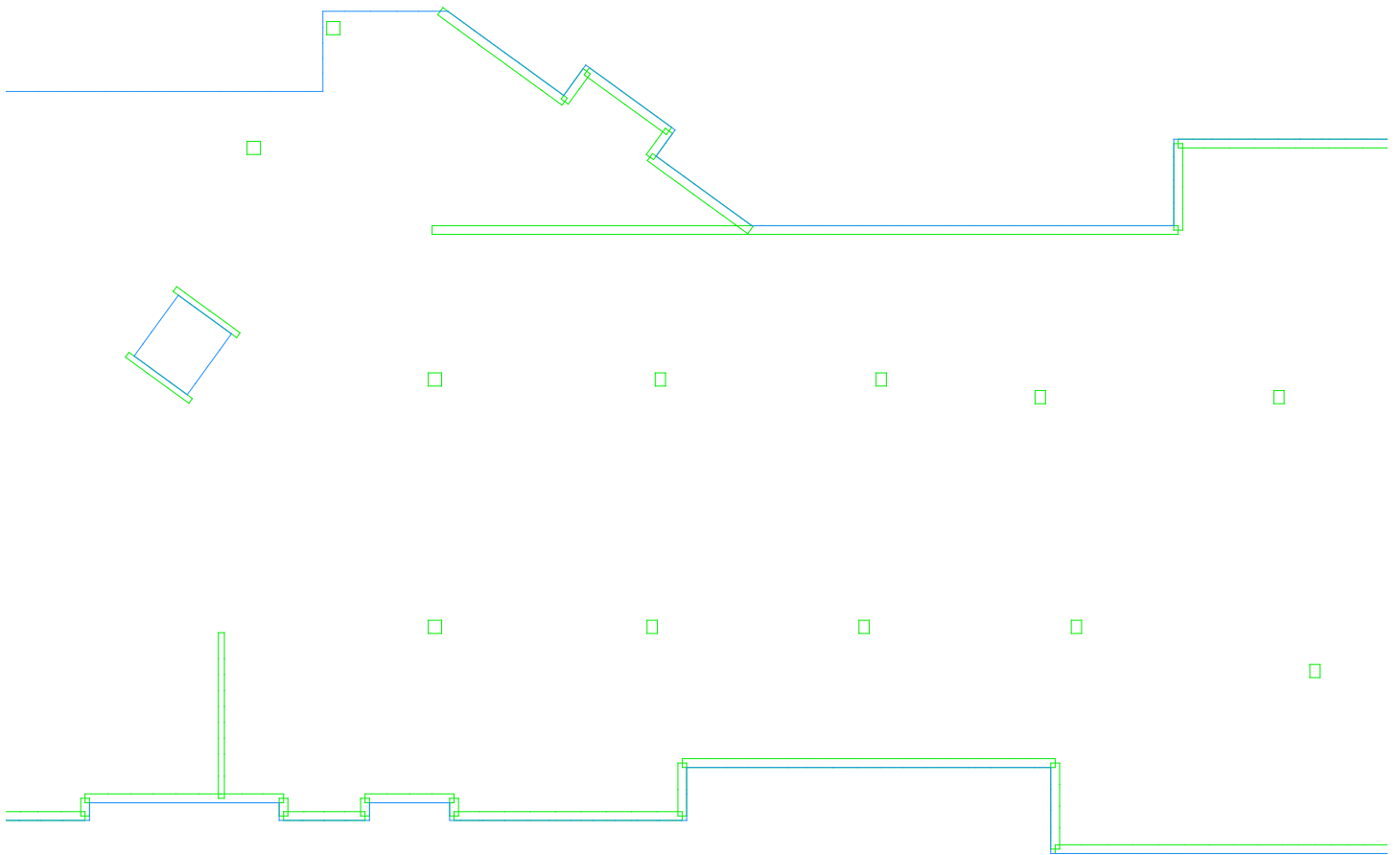


Vibration Analysis: Max RMS Velocity Plan

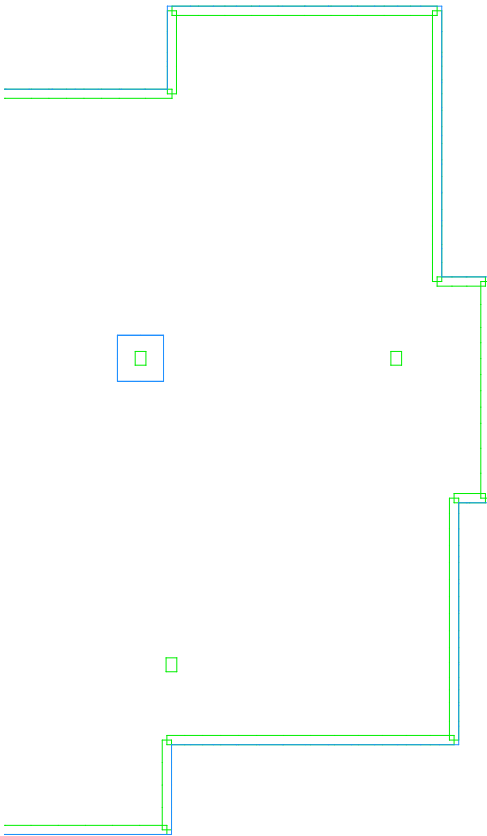
Vibration Analysis: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Vibration Analysis - (Vertical RMS Velocity Plot) (Maximum Values)
-0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4
Min Value = 0 ft/sec @ (0,0) Max Value = 0 ft/sec @ (0,0)



Vibration Analysis: Max RMS Velocity Plan (2)

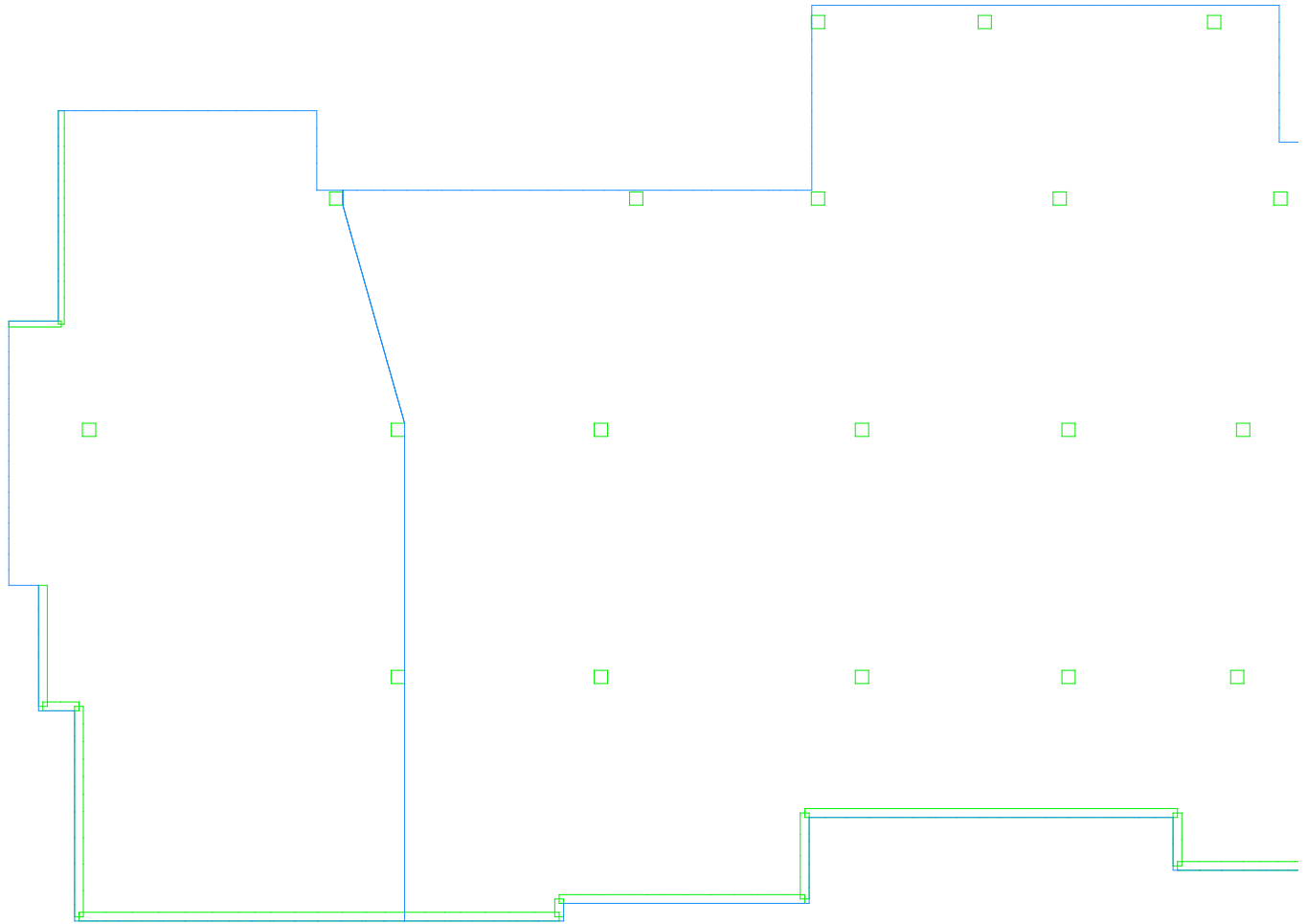


Vibration Analysis: Max RMS Velocity Plan (3)

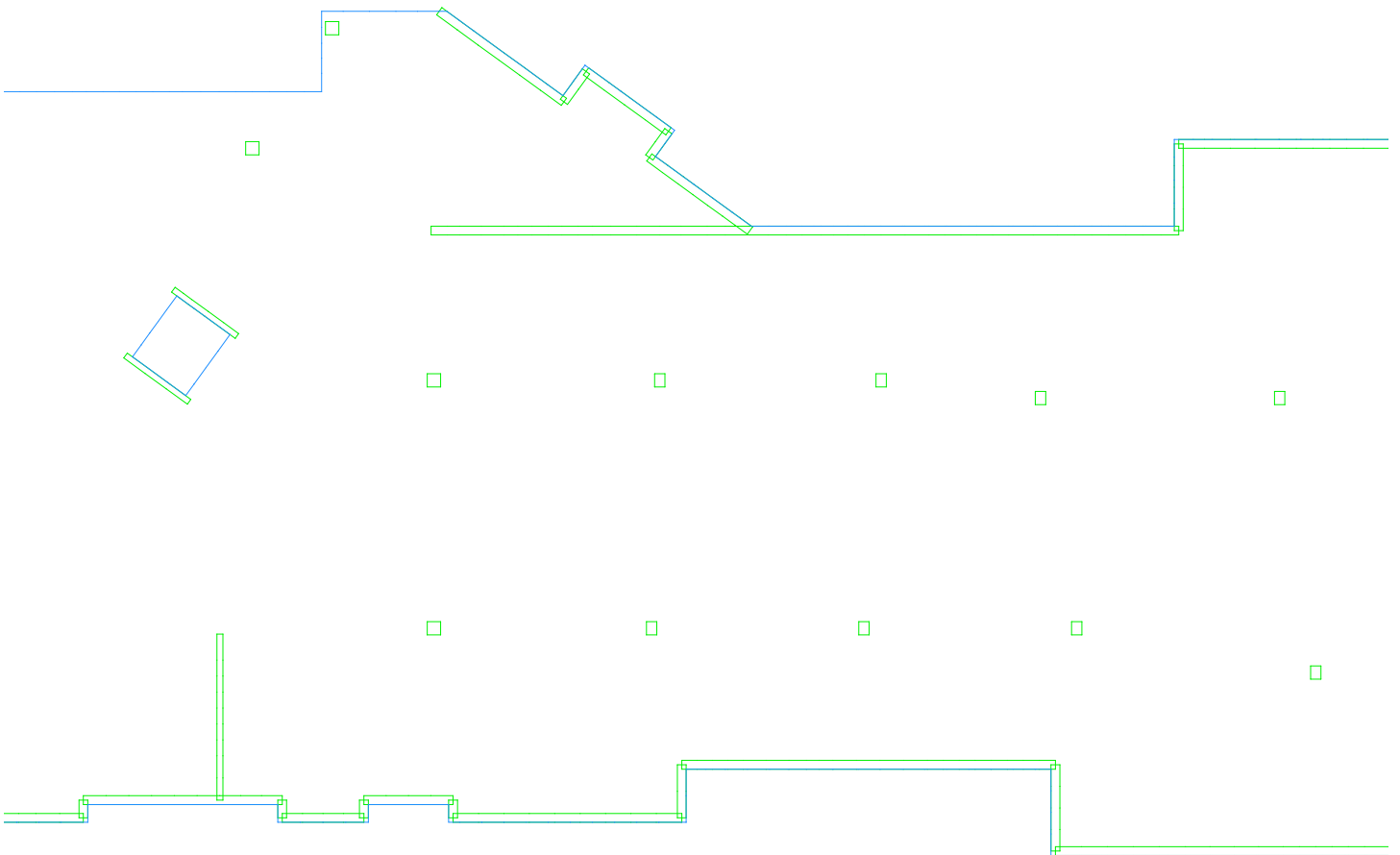


Vibration Analysis: Max RMS Acceleration Plan

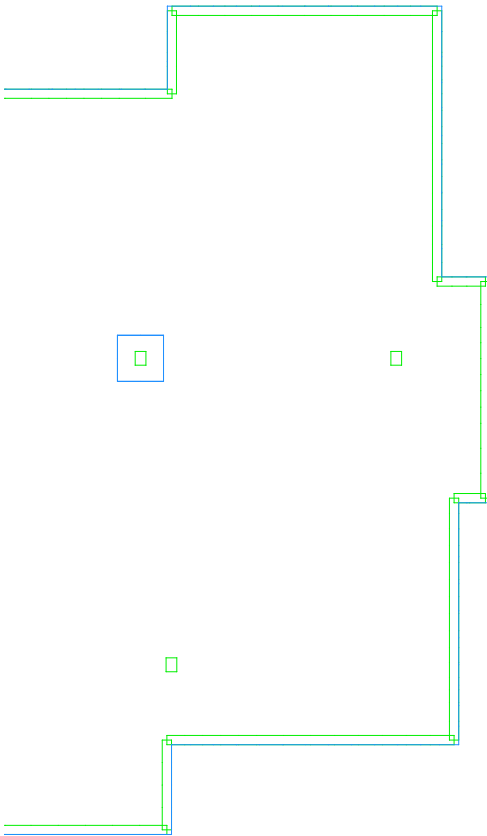
Vibration Analysis: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Vibration Analysis - (Vertical RMS Acceleration Plot) (Maximum Values)
-0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4
Min Value = 0 ft/sec² @ (0,0) Max Value = 0 ft/sec² @ (0,0)



Vibration Analysis: Max RMS Acceleration Plan (2)

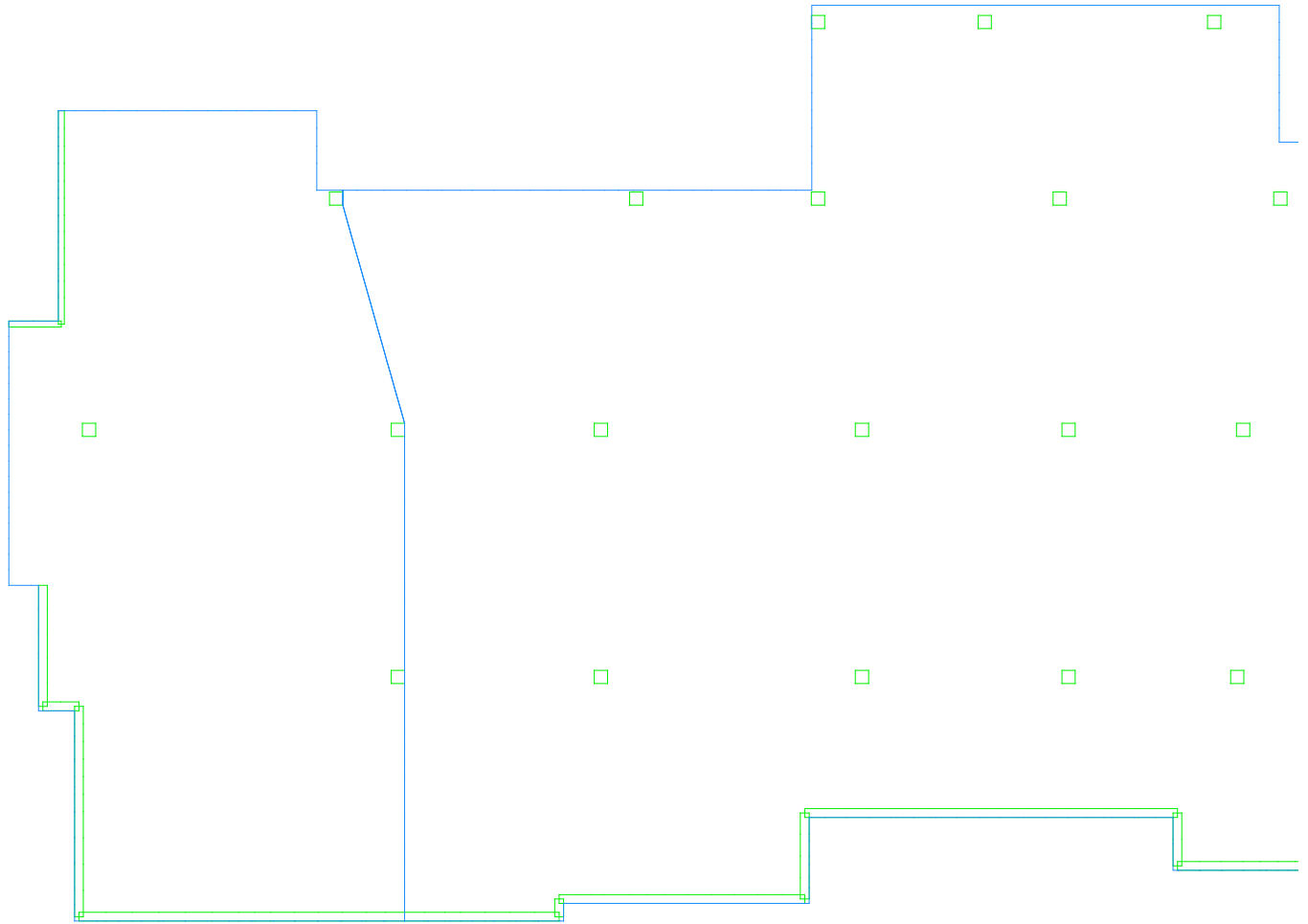


Vibration Analysis: Max RMS Acceleration Plan (3)

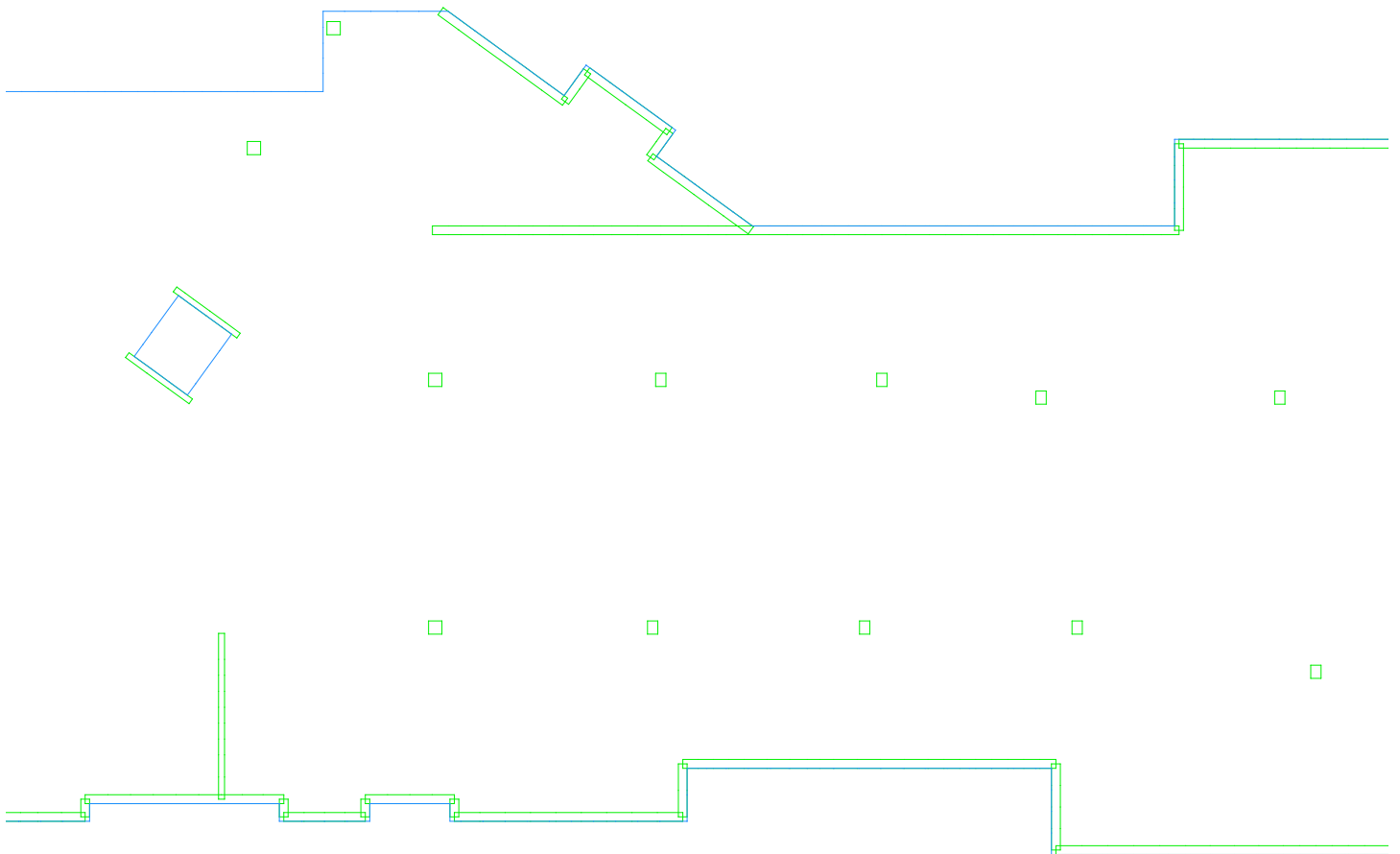


Vibration Analysis: Max Response Factor Plan

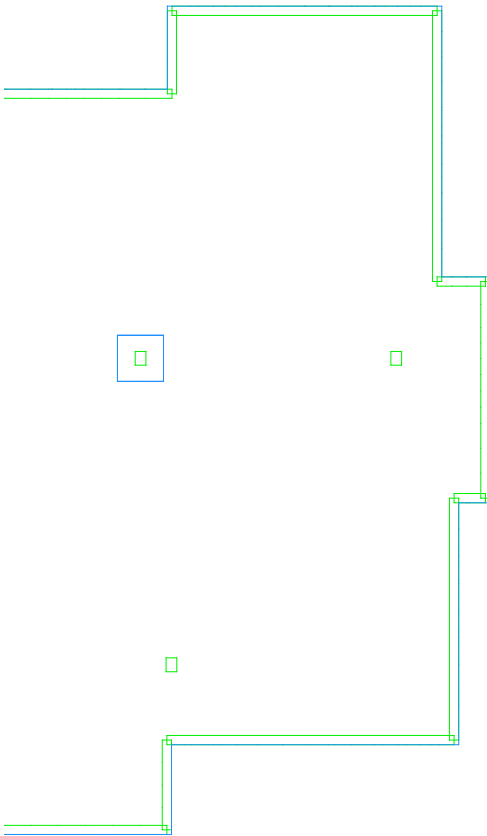
Vibration Analysis: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Vibration Analysis - (Vertical Response Factor Plot) (Maximum Values)
-0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4
Min Value = 0 @ (0,0) Max Value = 0 @ (0,0)



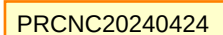
Vibration Analysis: Max Response Factor Plan (2)



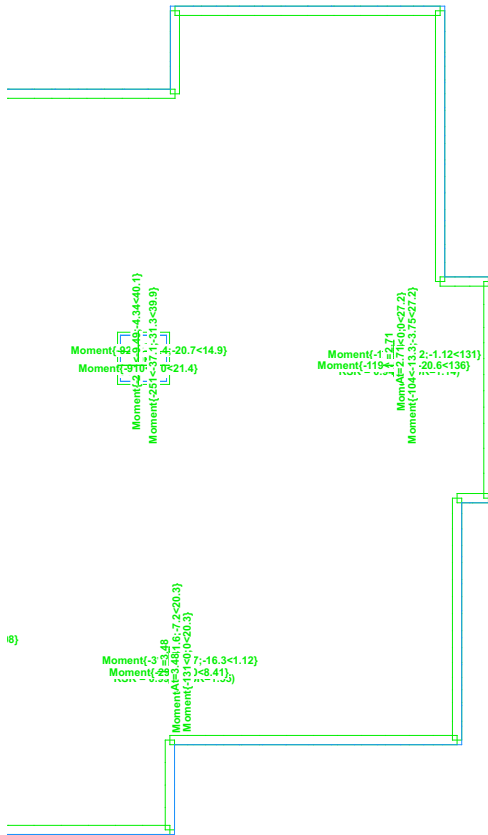
Vibration Analysis: Max Response Factor Plan (3)



The diagram illustrates a hierarchical tree structure for classifying 1000 samples into 10 classes. The tree is rooted at the top and branches downwards. Each internal node is labeled with a class name and a set of moment values. The leaves of the tree are labeled with sample IDs. The tree is color-coded: green for the left half and blue for the right half. The root node is 'OK' with a moment of 73.6. The left half (green) branches into 'OK' and 'Ab' nodes, while the right half (blue) branches into 'OK' and 'Ab' nodes. The tree is highly detailed, with many nodes and branches, and a large number of sample IDs at the leaves.



Design Status: Punching Shear Status Plan (3)

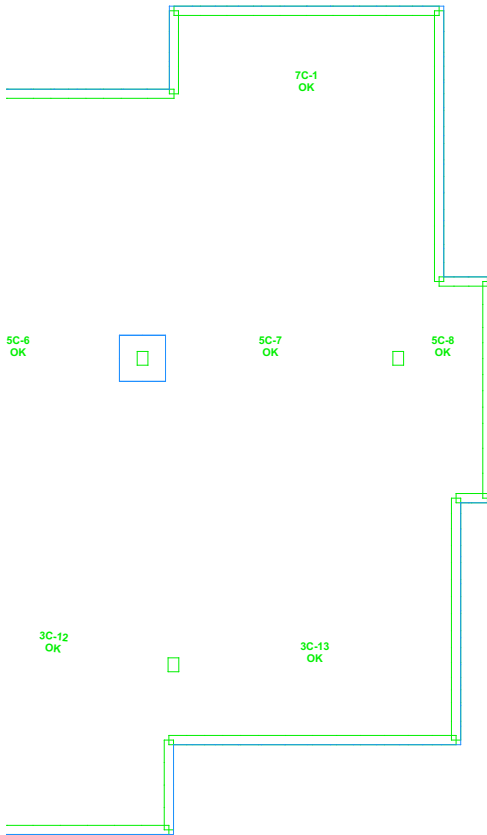


The diagram consists of a network of blue and green lines forming various shapes and paths. Labels are placed near specific points or segments:

- 1C-7 OK (near a tilted blue square)
- 2C-6 OK (near a horizontal blue line segment)
- 2C-7 OK (near a blue line segment that turns upwards)
- 3C-6 OK (near a horizontal blue line segment at the bottom left)
- 3C-7 OK (near a vertical blue line segment at the bottom left)
- 3C-8 OK (near a horizontal blue line segment at the bottom)
- 3C-9 OK (near a horizontal blue line segment at the bottom)
- 3C-10 OK (near a horizontal blue line segment at the bottom)
- 3C-11 OK (near a horizontal blue line segment at the bottom right)
- 5C-1 OK (near a blue line segment that turns upwards)
- 5C-2 OK (near a horizontal blue line segment)
- 5C-3 OK (near a horizontal blue line segment)
- 5C-4 OK (near a horizontal blue line segment)
- 5C-5 OK (near a horizontal blue line segment)
- 6C-1 OK (near a blue line segment that turns upwards)

Green lines generally follow the paths of the blue lines, often forming a second set of lines parallel to or slightly offset from the blue ones. Small green squares are also present at various points along these paths.

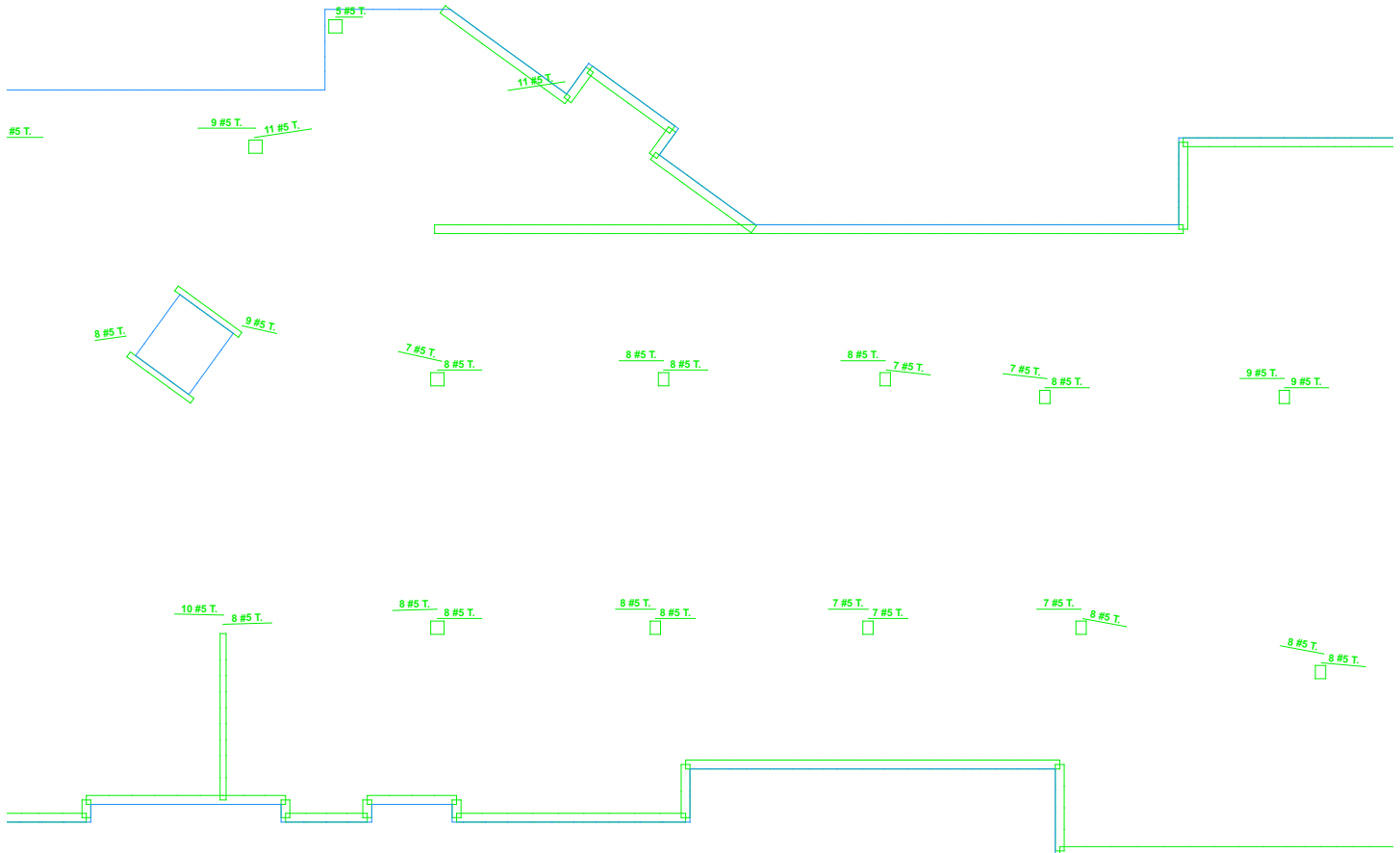
Design Status: Latitude Status Plan (3)



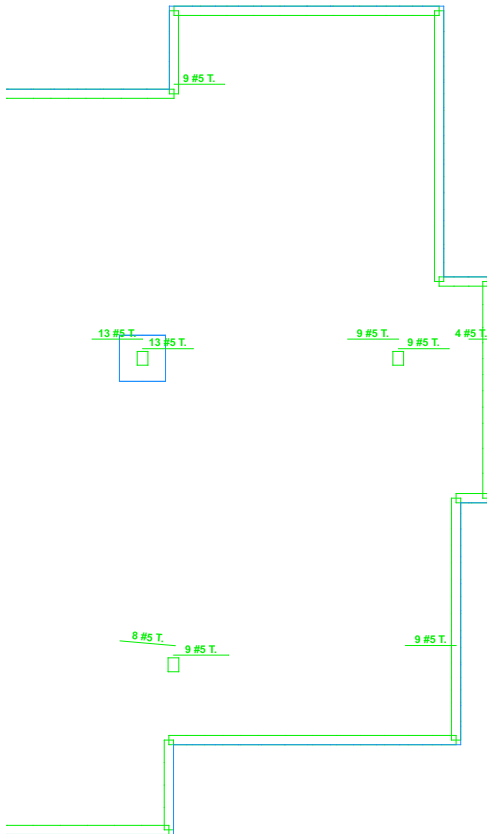
Design Status: Latitude Top Reinforcement Plan (2)

:k Status; Deflection Check Status;

oncentrated Reinf.; Latitude User Distributed Reinf.;

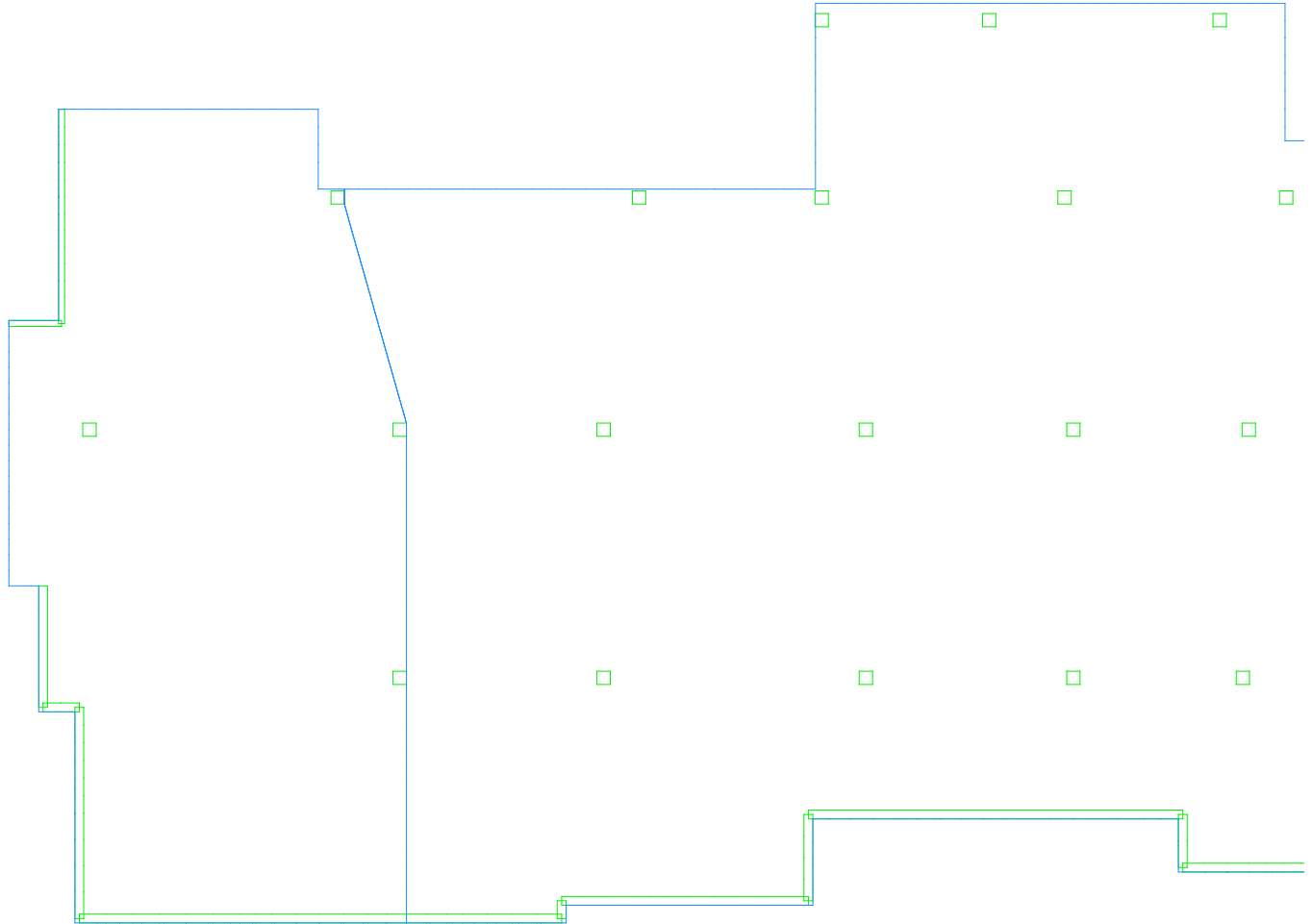


Design Status: Latitude Top Reinforcement Plan (3)



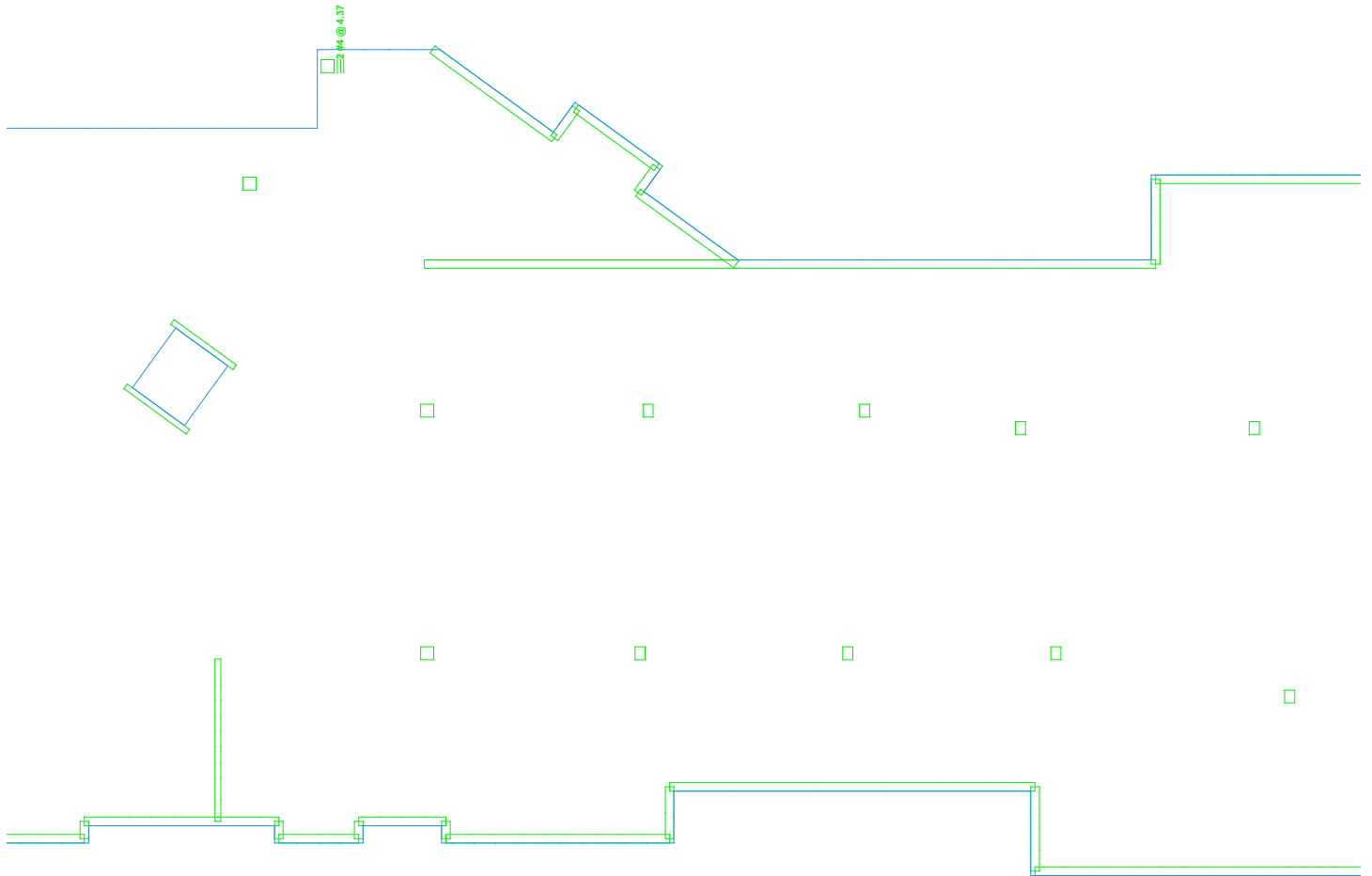
Design Status: Latitude Shear Reinforcement Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Designs; Span Design Shear Bars; Span Design Bar Descriptions; Latitude DS Designs; DS Design Numbers; DS Design Shear Bars; Latitude Span Segment Deflection Checks; Latitude Deflection Checks; 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

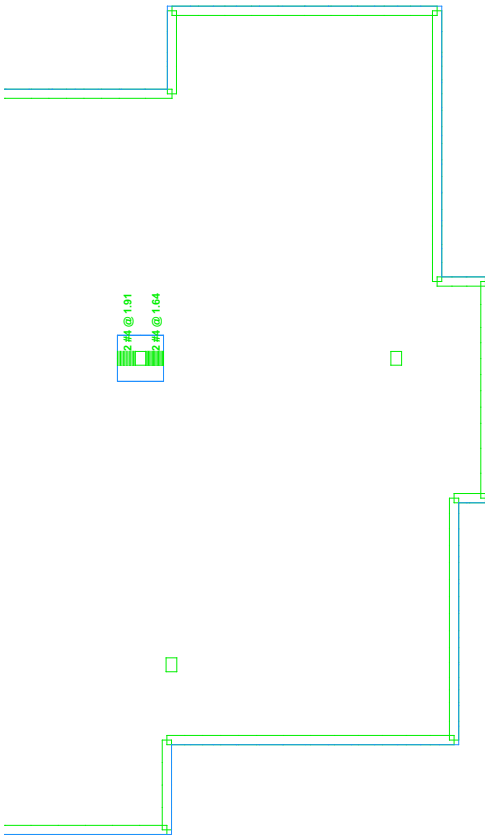


Design Status: Latitude Shear Reinforcement Plan (2)

1 Segment Deflection Check Status; Deflection Check Status;

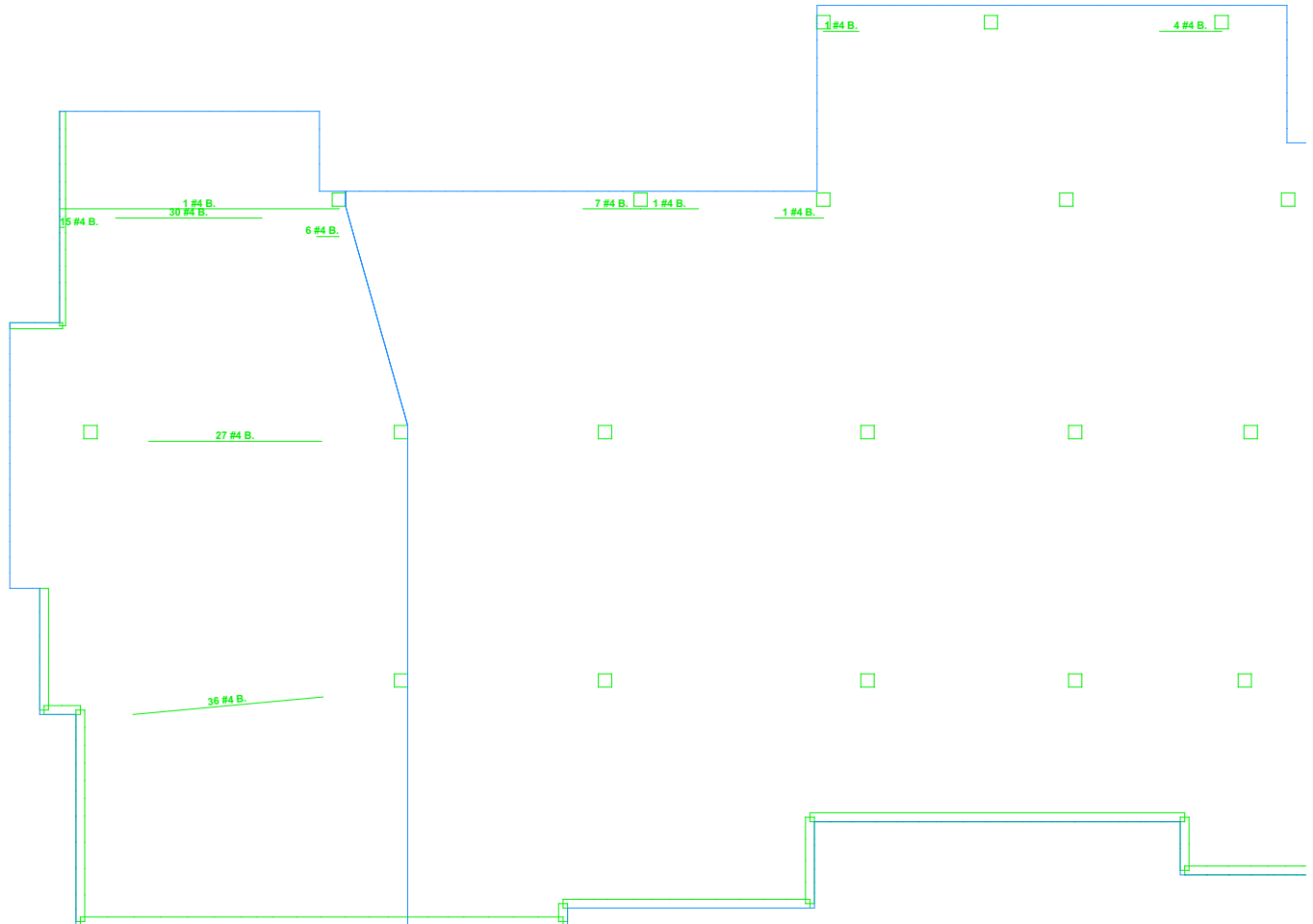


Design Status: Latitude Shear Reinforcement Plan (3)



Design Status: Latitude Bottom Reinforcement Plan

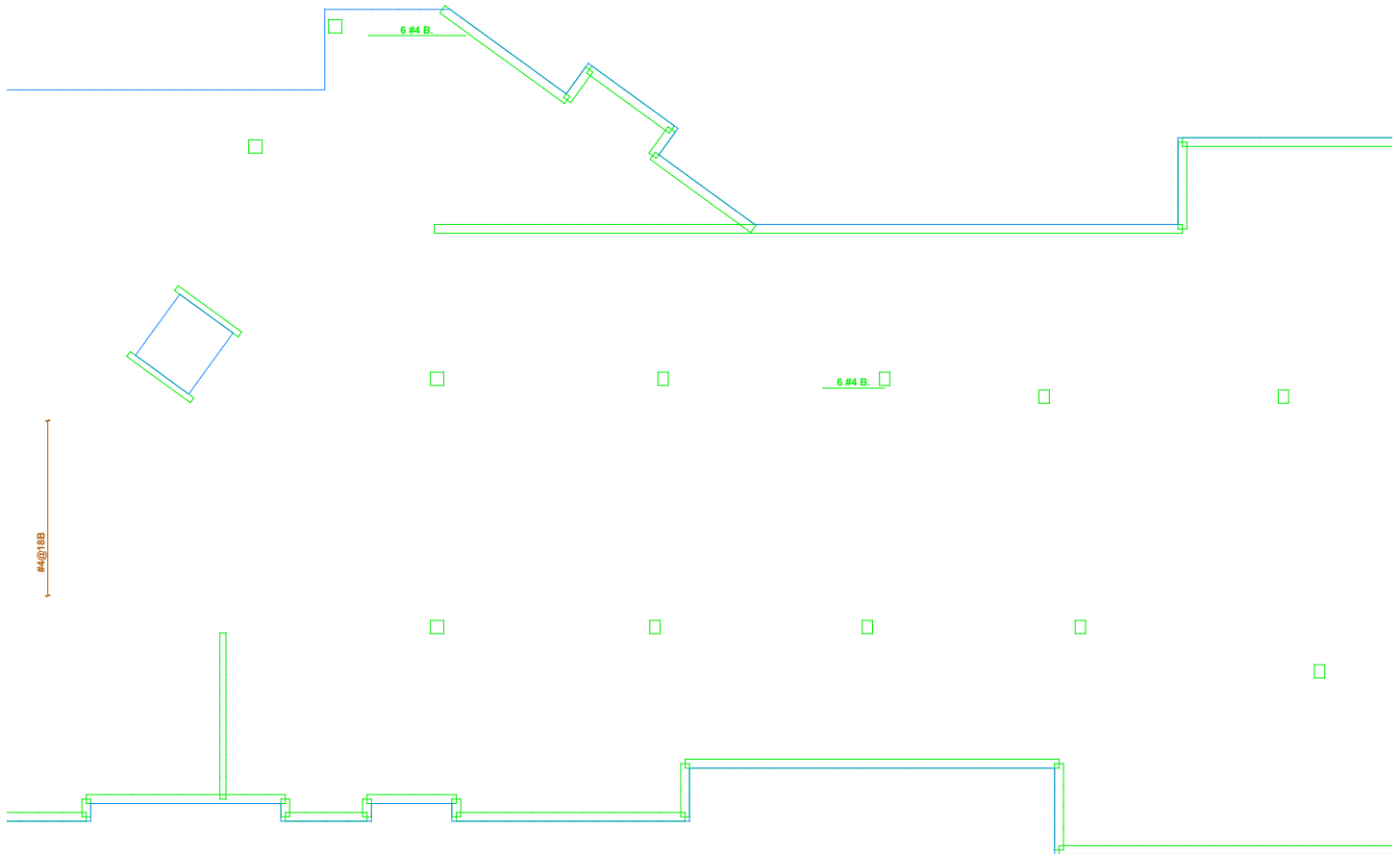
Design Status: User Lines; User Notes; User Dimensions; Latitude Span Designs; Span Design Bottom Bars; Span Design Bar Descriptions; Latitude DS Designs; DS Design Bottom Bars; Latitude Span Segment Deflection Checks; Latitude Deflection Checks; Span Segment Deflection Checks; Wall Elements Below; Wall 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 Scale = 1:250



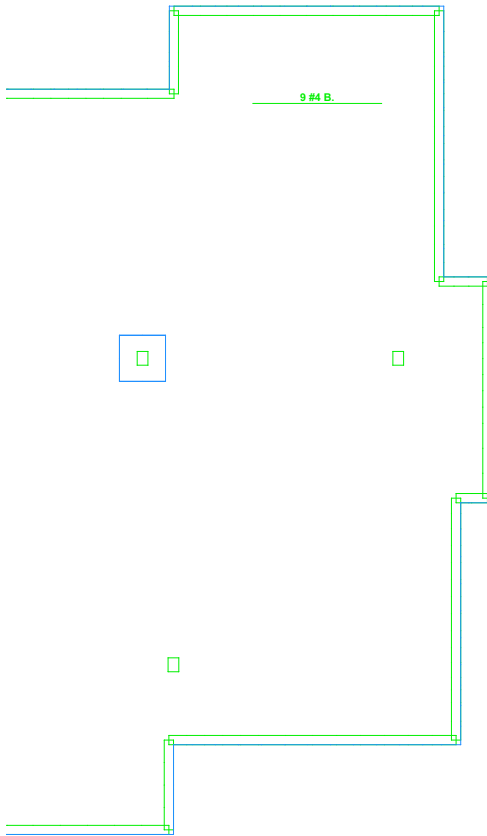
Design Status: Latitude Bottom Reinforcement Plan (2)

on Check Status; Deflection Check Status;

User Concentrated Reinf.; Latitude User Distributed Reinf.;

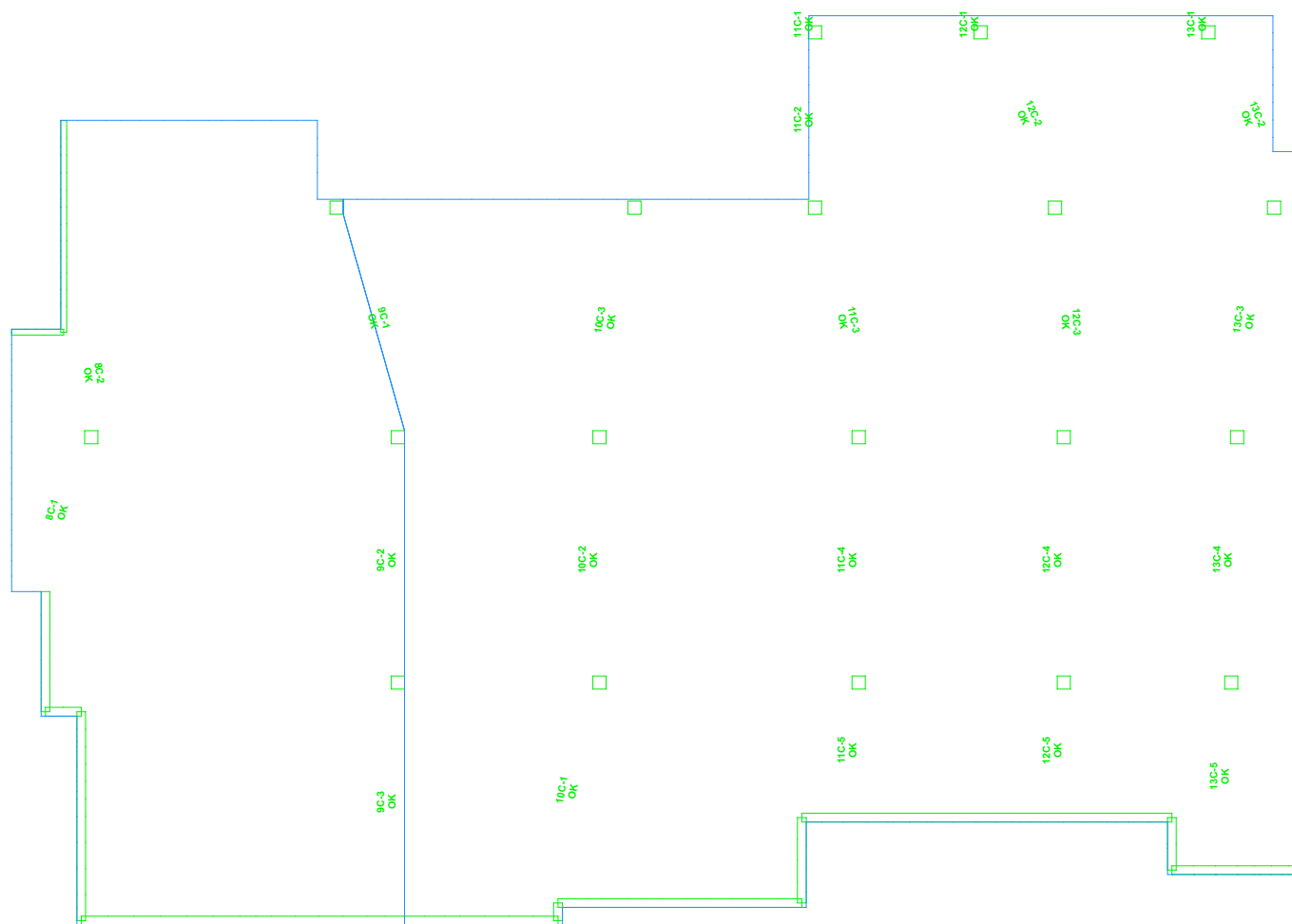


Design Status: Latitude Bottom Reinforcement Plan (3)



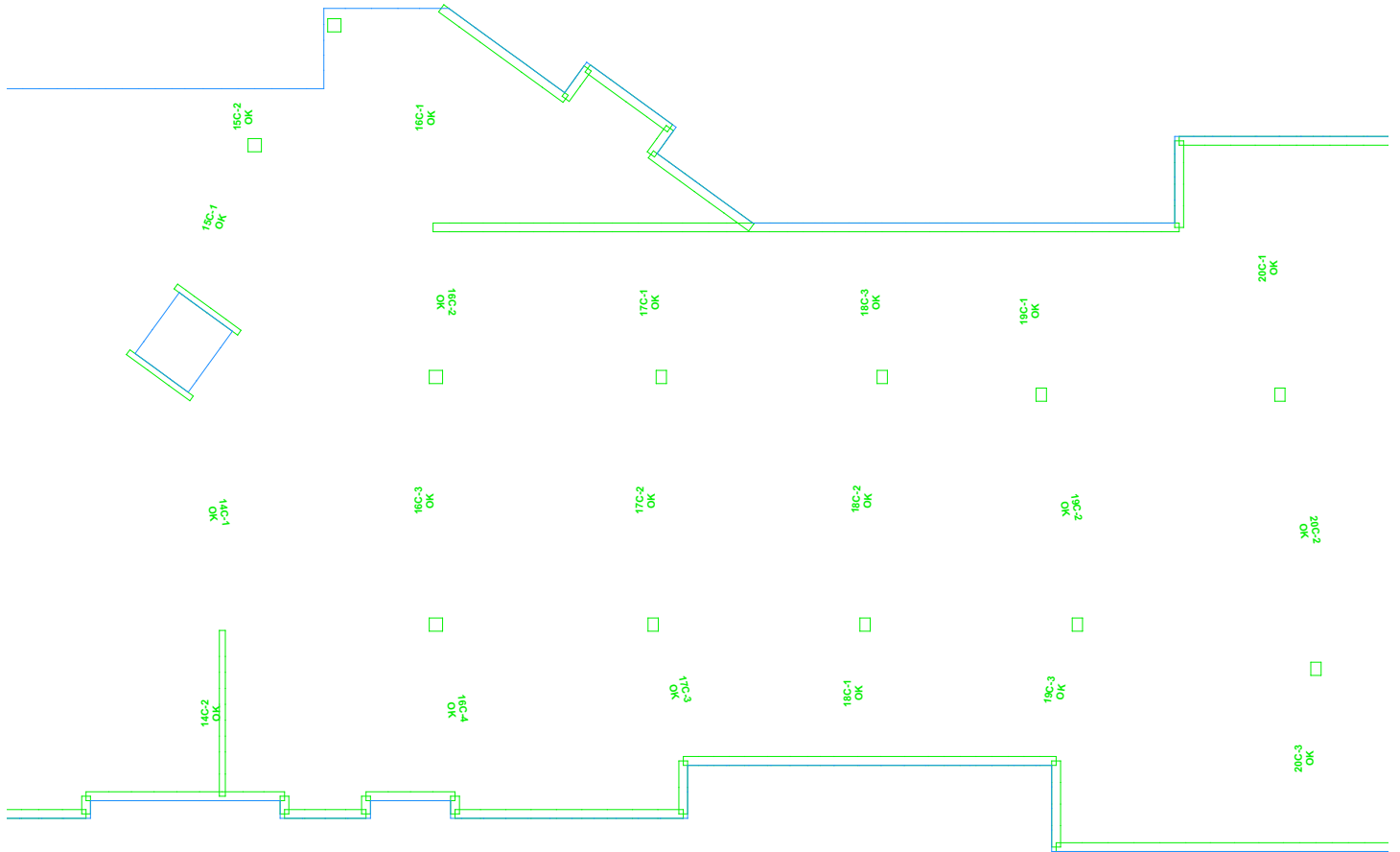
Design Status: Longitude Status Plan

Design Status: User Lines; User Notes; User Dimensions; Longitude Span Designs; Span Design Numbers; Span Design Status; Longitude DS Designs; DS Design Numbers; DS Design Status; Longitude Span Segment Deflection Checks; Longitude Deflection Checks; Span Segmen
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

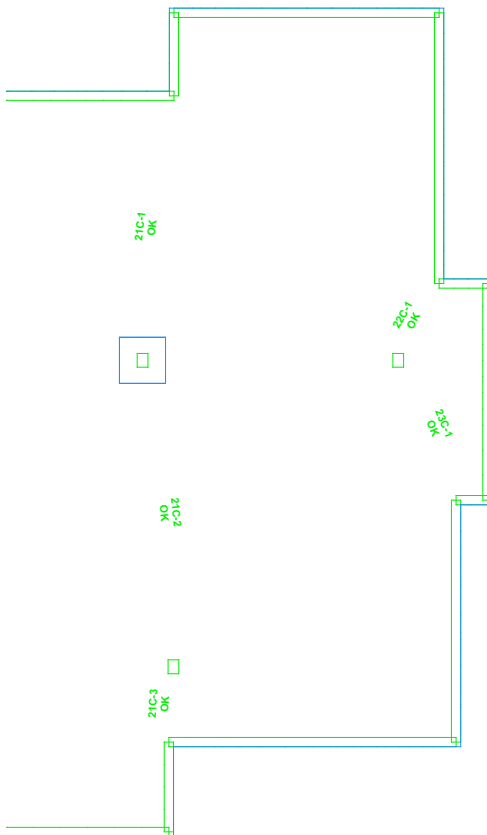


Design Status: Longitude Status Plan (2)

it Deflection Check Status; Deflection Check Status;

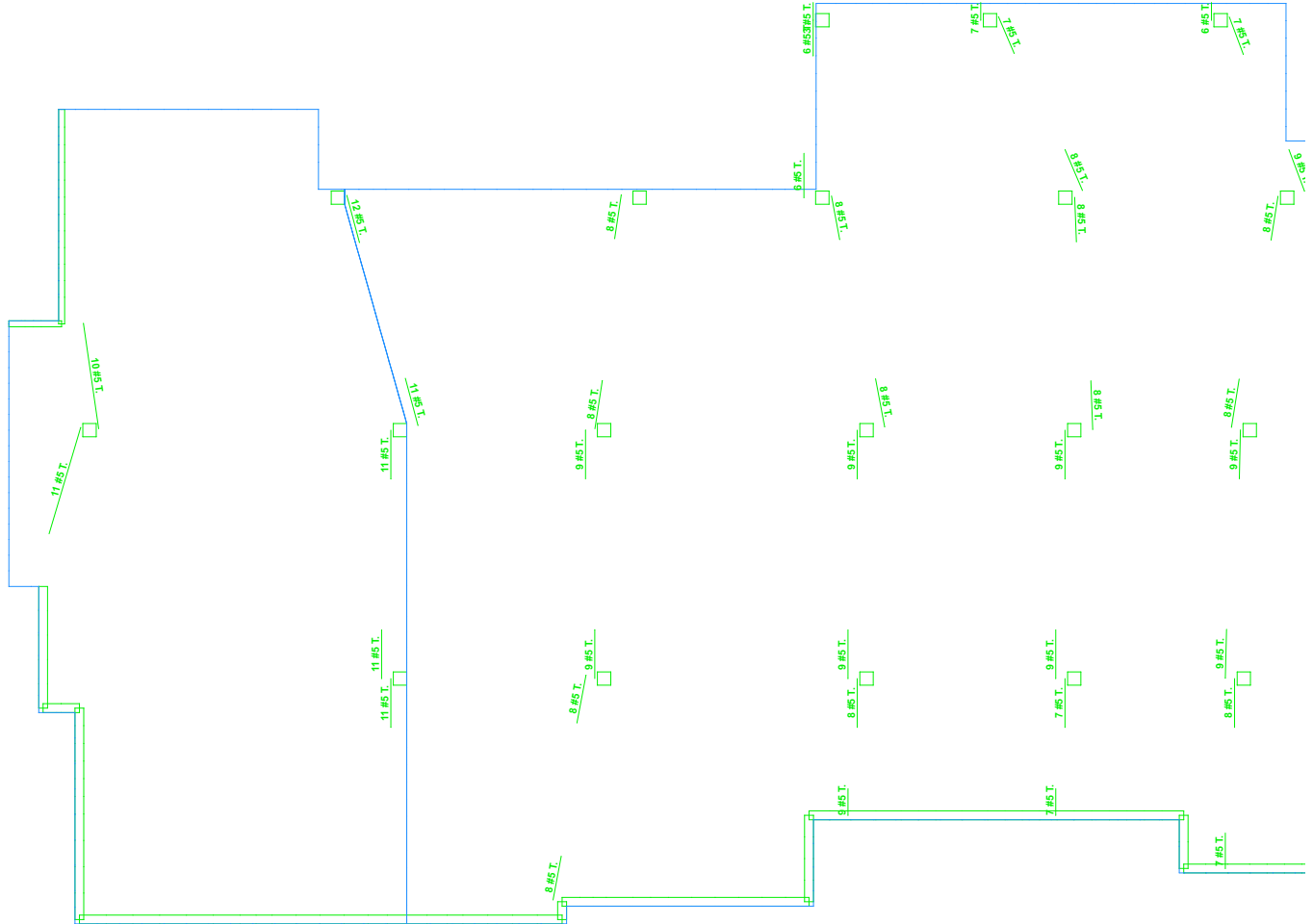


Design Status: Longitude Status Plan (3)



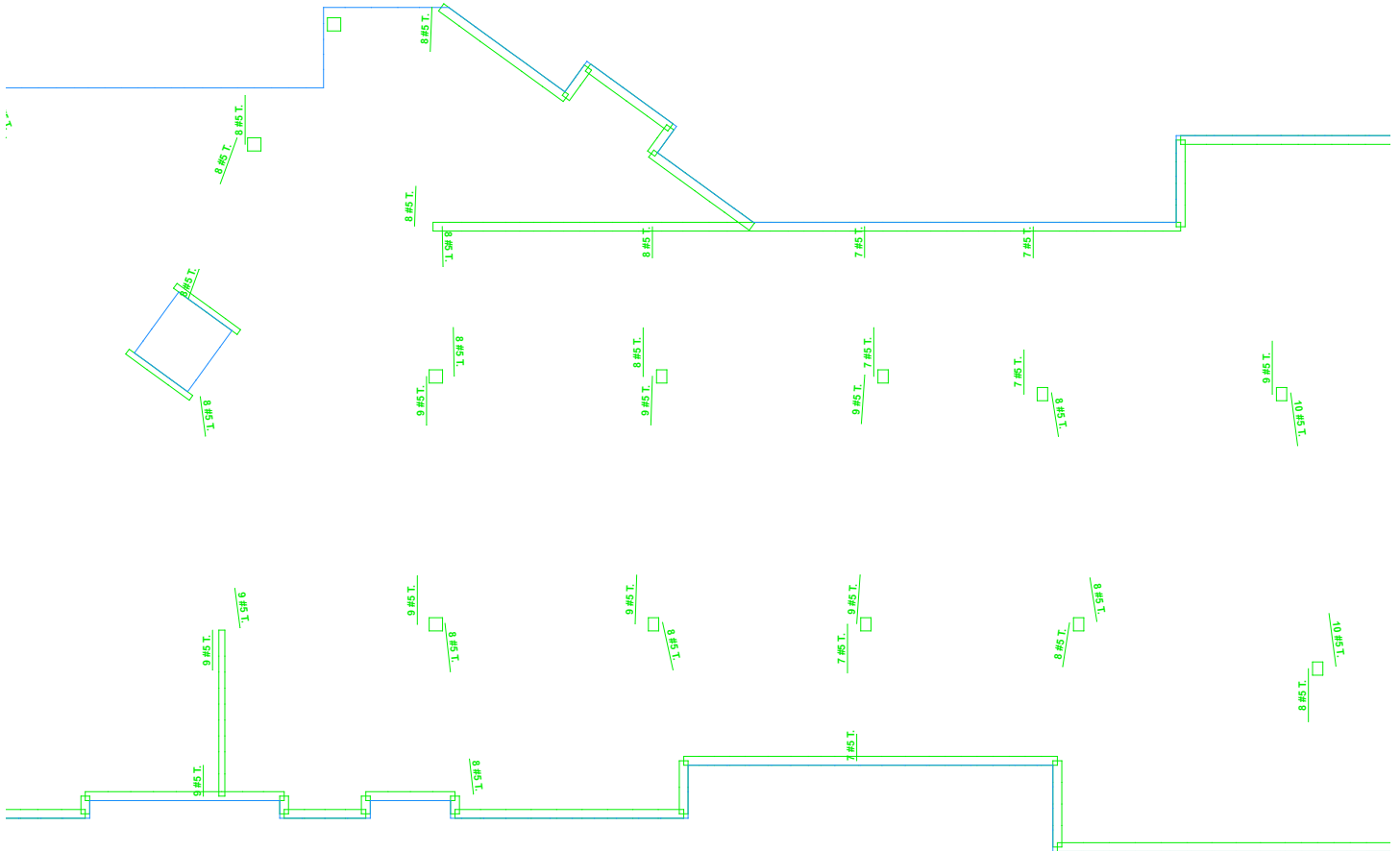
Design Status: Longitude Top Reinforcement Plan

Design Status: User Lines; User Notes; User Dimensions; Longitude Span Designs; Span Design Top Bars; Span Design Bar Descriptions; Longitude DS Designs; DS Design Top Bars; Longitude Span Segment Deflection Checks; Longitude Deflection Checks; Span Segment Deflect 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; Longitude User Scale = 1:250

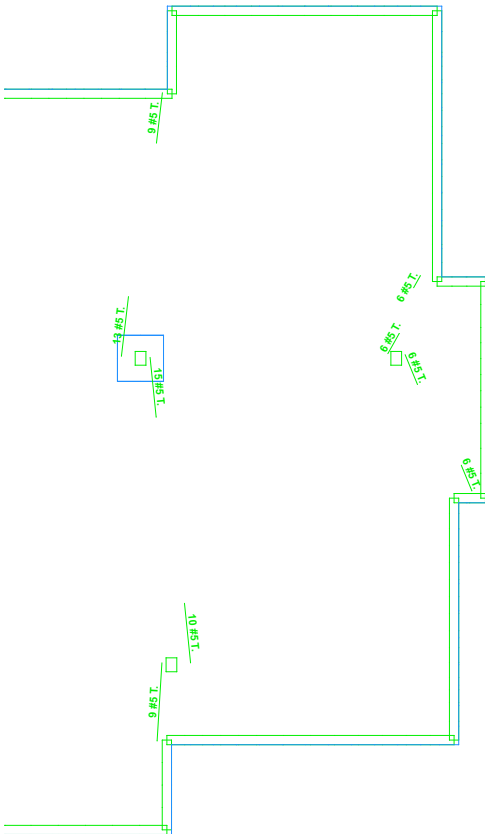


Design Status: Longitude Top Reinforcement Plan (2)

Concentrated Reinf.; Longitude User Distributed Reinf.;

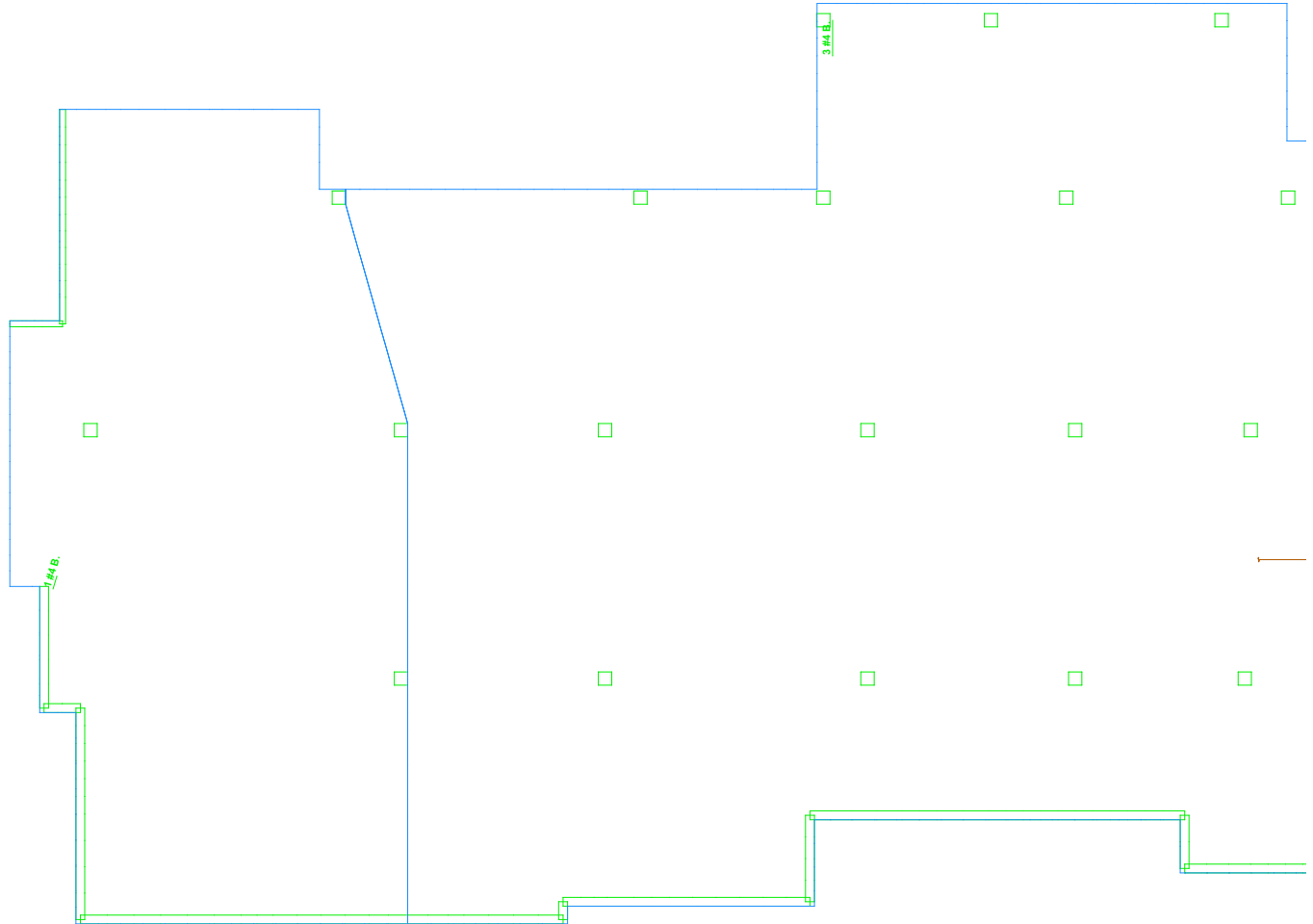


Design Status: Longitude Top Reinforcement Plan (3)



Design Status: Longitude Bottom Reinforcement Plan

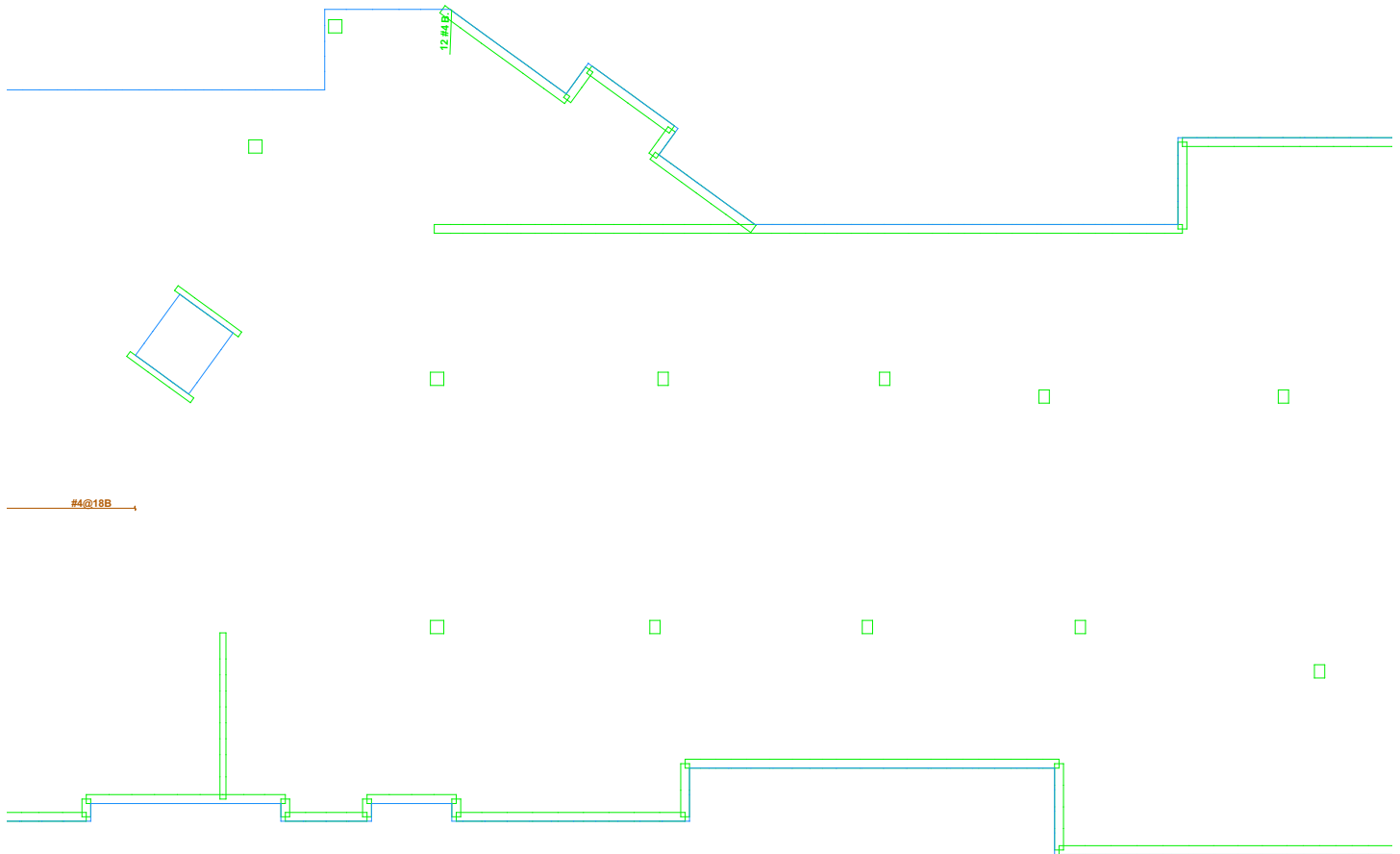
Design Status: User Lines; User Notes; User Dimensions; Longitude Span Designs; Span Design Bottom Bars; Span Design Bar Descriptions; Longitude DS Designs; DS Design Bottom Bars; Longitude Span Segment Deflection Checks; Longitude Deflection Checks; Span Segment Element: Wall Elements Below; Wall Elements 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; Longitude
 Scale = 1:250



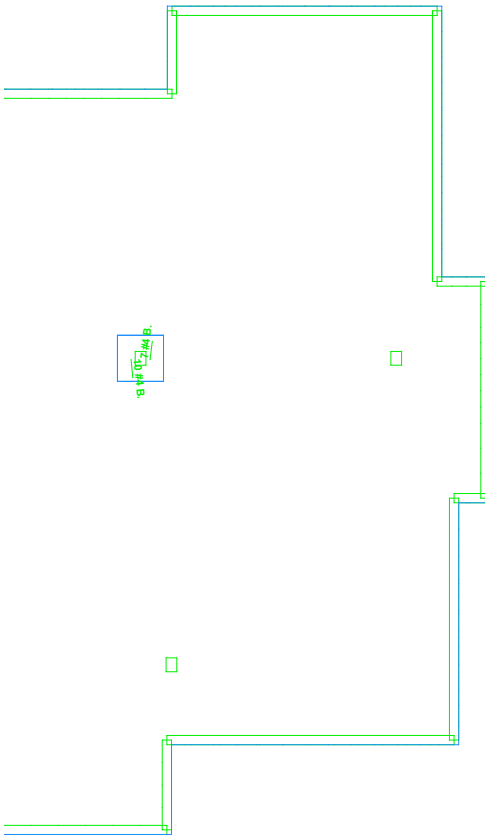
Design Status: Longitude Bottom Reinforcement Plan (2)

Deflection Check Status; Deflection Check Status;

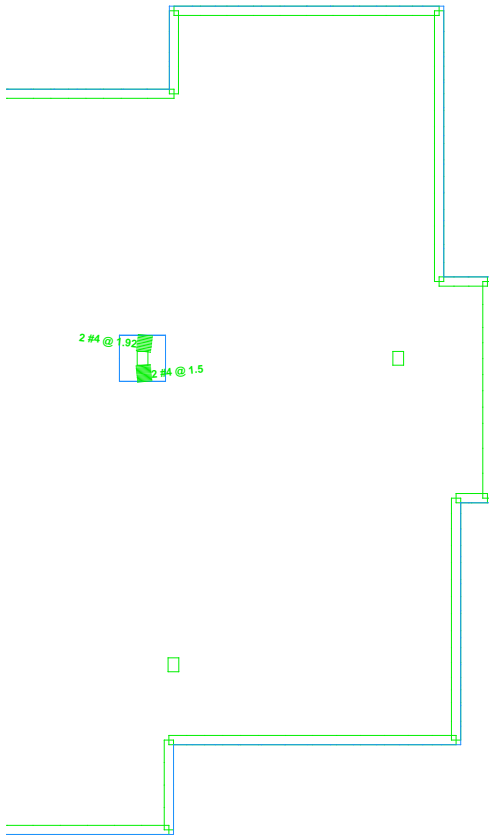
de User Concentrated Reinf.; Longitude User Distributed Reinf.;



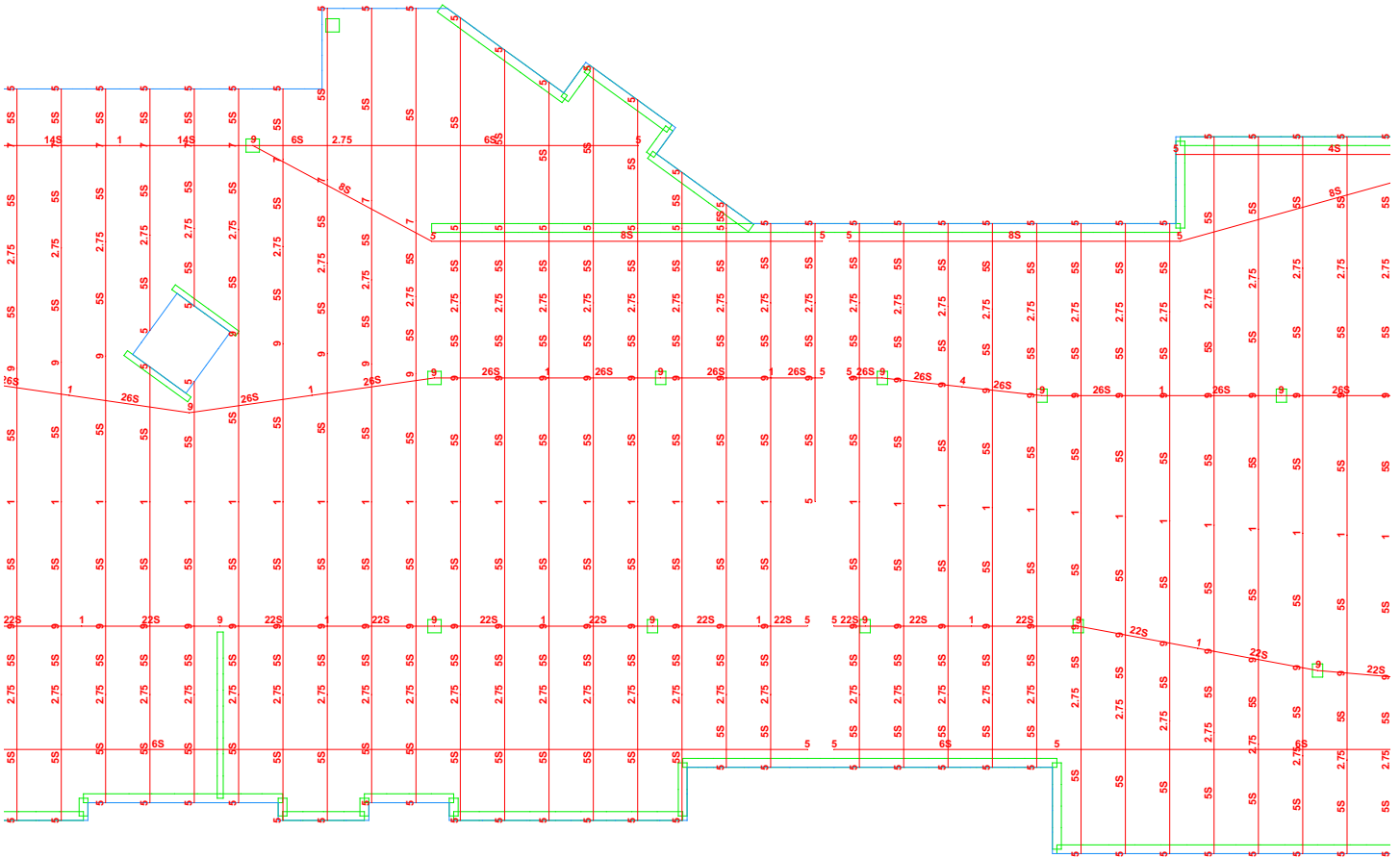
Design Status: Longitude Bottom Reinforcement Plan (3)



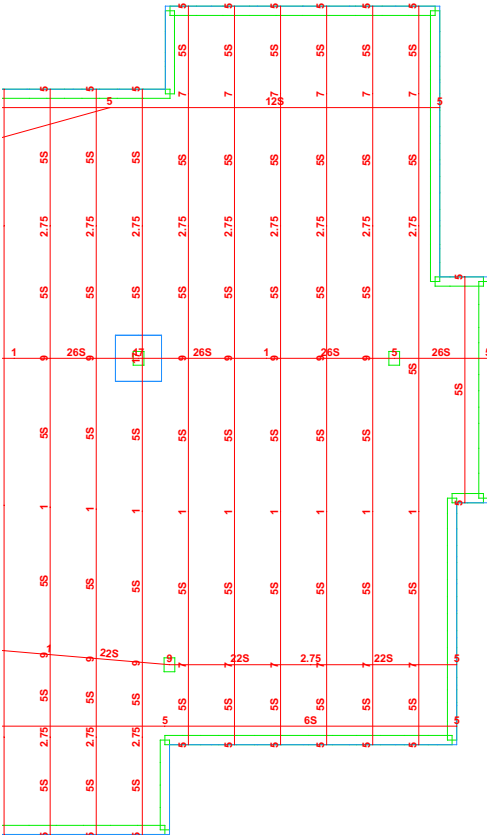
Design Status: Longitude Shear Reinforcement Plan (3)



Design Status: PT Export Plan (2)



Design Status: PT Export Plan (3)



Calc Log

Calculating Through Detailing (Everything Out-of-Date)(Considering Previous Warnings)

Active Calculation Options:

The structure is not automatically stabilized in the X and Y directions.
 Supports above slab NOT included in self-dead loading.
 Tendon vertical component NOT considered in punch check reactions.
 Design reinforcement.
 6 zero-tension iterations are used to eliminate tension in area springs.
 Creep Factor of 3.35 used in ECR calculations.
 Shrinkage strain of 0.0004 used in ECR calculations.
 ACI 318-19 is used in design.
 IBC 2018 is used for live load reduction calculations.

Assembling Stiffness Matrix.

39695 Degrees of Freedom

Triangularizing Stiffness Matrix.

Creating Self-Dead Loading.

Generating Program Tendons.

Creating Balance Loading.

WARNING: An error has occurred while trying to calculate the tendons effective stresses. Two connected tendons have inconsistent half spar

User Continued After Warning

WARNING: An error has occurred while trying to calculate the tendons effective stresses. Two connected tendons have inconsistent half spar

User Continued After Warning

WARNING: Tendon #66 (Generated Latitude Tendon) ((-130.5,-111.2)) has a radius (3.675) that is less than the minimum allowable (6)

User Continued After Warning

WARNING: Tendon #67 (Generated Latitude Tendon) ((-128.7,-83.18)) has a radius (4.219) that is less than the minimum allowable (6)

User Continued After Warning

Detailing User Reinforcement.

WARNING: In detailing of longitude distributed user reinforcement at (-221.3,-97.78), some bars were removed due to the slab geometry.

User Continued After Warning

Determining Concrete Cross Sections

Determining Tendon Cross Sections

Determining Reinforcing Bar Cross Sections

Solving for Self-Dead Loading.

Solving for Self-Dead Loading - Pattern: Full Pattern.

Total Loads: (0,0,-3690) Kips

Total Reactions: (7.5e-11,8.52e-11,3690) Kips

Load-Reaction Tolerance: (7.5e-11,8.52e-11,1.77e-10) Kips

Solving for Balance Loading.

Solving for Balance Loading - Pattern: Full Pattern.

Total Loads: (-0.0000474,0.000171,-1.53e-14) Kips

Total Reactions: (0.0000474,-0.000171,-4.76e-11) Kips

Load-Reaction Tolerance: (-4.04e-10,-3.88e-11,-4.76e-11) Kips

Solving for Temporary Construction (At Stressing) Loading.

Temporary Construction (At Stressing) Loading has No Loads.

Solving for Other Dead Loading.

Solving for Other Dead Loading - Pattern: Full Pattern.

Total Loads: (0,0,-1030) Kips

Total Reactions: (2.65e-11,2.41e-11,1030) Kips

Load-Reaction Tolerance: (2.65e-11,2.41e-11,5.63e-11) Kips

Solving for Live (Reducible) Loading.

Solving for Live (Reducible) Loading - Pattern: Full Pattern.

Total Loads: (0,0,-604) Kips

Total Reactions: (1.81e-11,2.19e-11,604) Kips

Load-Reaction Tolerance: (1.81e-11,2.19e-11,6.2e-11) Kips

Solving for Live (Unreducible) Loading.

Solving for Live (Unreducible) Loading - Pattern: Full Pattern.

Total Loads: (0,0,-1310) Kips

Total Reactions: (1.34e-11,5.06e-12,1310) Kips

Load-Reaction Tolerance: (1.34e-11,5.06e-12,-1.72e-11) Kips

Solving for Live (Storage) Loading.

Live (Storage) Loading has No Loads.

Solving for Live (Parking) Loading.

Live (Parking) Loading has No Loads.

Solving for Live (Roof) Loading.

Live (Roof) Loading has No Loads.

Solving for Snow Loading.

Solving for Snow Loading - Pattern: Full Pattern.

Calc Log (2)

1 ratios. Revise tendon #13 ((-316,-135.1)) or #21 ((-293,-135.1)) (Generated Latitude Tendon).

1 ratios. Revise tendon #21 ((-293,-135.1)) or #13 ((-316,-135.1)) (Generated Latitude Tendon).

Calc Log (3)

Total Loads: (0,0,-780) Kips

Total Reactions: (1.61e-11,1.64e-11,780) Kips

Load-Reaction Tolerance: (1.61e-11,1.64e-11,3.14e-11) Kips

Calculating Precompression in Cross Sections

Solving for Hyperstatic Loading.

Solving for All Dead LC.

Solving for Dead + Balance LC.

Solving for Initial Service LC.

Solving for Service LC: D + L.

Solving for Service LC: D + Lr.

Solving for Service LC: D + S.

Solving for Service LC: D + 0.75L + 0.75Lr.

Solving for Service LC: D + 0.75L + 0.75S.

Solving for Sustained Service LC.

Solving for Factored LC: 1.4D.

Solving for Factored LC: 1.2D + 1.6L + 0.5Lr.

Solving for Factored LC: 1.2D + f1L + 1.6Lr.

Solving for Factored LC: 1.2D + 1.6L + 0.5S.

Solving for Factored LC: 1.2D + f1L + 1.6S.

Calculating Code Minimum Design envelopes.

Calculating User Minimum Design envelopes.

Calculating Initial Service Design envelopes.

Calculating Service Design envelopes.

Calculating Sustained Service Design envelopes.

Calculating Strength Design envelopes.

Calculating Ductility Design envelopes.

Calculating Code Minimum Design - Pass 0

Calculating User Minimum Design - Pass 0

Calculating Initial Service Design - Pass 0

Calculating Service Design - Pass 0

Calculating Sustained Service Design - Pass 0

Calculating Strength Design - Pass 0

Calculating Ductility Design - Pass 0

Calculating Code Minimum Design - Pass 1

Calculating User Minimum Design - Pass 1

Calculating Initial Service Design - Pass 1

Calculating Service Design - Pass 1

Calculating Sustained Service Design - Pass 1

Calculating Strength Design - Pass 1

Calculating Ductility Design - Pass 1

Calculating Code Minimum Design - Pass 2

Calculating User Minimum Design - Pass 2

Calculating Initial Service Design - Pass 2

Calculating Service Design - Pass 2

Calculating Sustained Service Design - Pass 2

Calculating Strength Design - Pass 2

Calculating Ductility Design - Pass 2

Calculating Code Minimum Design - Final Design Check

Calculating User Minimum Design - Final Design Check

Calculating Initial Service Design - Final Design Check

Calculating Service Design - Final Design Check

Calculating Sustained Service Design - Final Design Check

Calculating Strength Design - Final Design Check

Calculating Ductility Design - Final Design Check

Laying Out Program Reinforcement

Optimizing Program Reinforcement Layout

Converting SSR Designs

Converting Program Transverse Bar Designs

Detailing User Transverse Reinforcement

Detailing Program Reinforcement

Estimating Costs

Deflection Checks are already up to date.

This analysis has been completed successfully, check above for any warnings or errors.

Calc Log (4)

Estimate

Concrete Costs

Materials:	100 per yd ³	x	911.2 yd ³	=	91120
Labor:	50 per yd ³	x	911.2 yd ³	=	45560
Total:	150 per yd ³	x	911.2 yd ³	=	136700

Post-Tensioning Cost:

Materials:	1 per pounds	x	27340 pounds	=	27340
Labor:	0.5 per pounds	x	27340 pounds	=	13670
Total:	1.5 per pounds	x	27340 pounds	=	41010

Formwork Cost:

Materials:	1 per ft ²	x	28430 ft ²	=	28430
Labor:	1 per ft ²	x	28430 ft ²	=	28430
Total:	2 per ft ²	x	28430 ft ²	=	56860

Mild Steel Reinforcing Cost

Materials:	1000 per tons	x	18.21 tons	=	18210
Labor:	500 per tons	x	18.21 tons	=	9107
Total:	1500 per tons	x	18.21 tons	=	27320

SSR Costs

Materials:	2 per stud	x	2069 studs	=	4138
Labor:	1 per stud	x	2069 studs	=	2069
Total:	3 per stud	x	2069 studs	=	6207

Total Costs

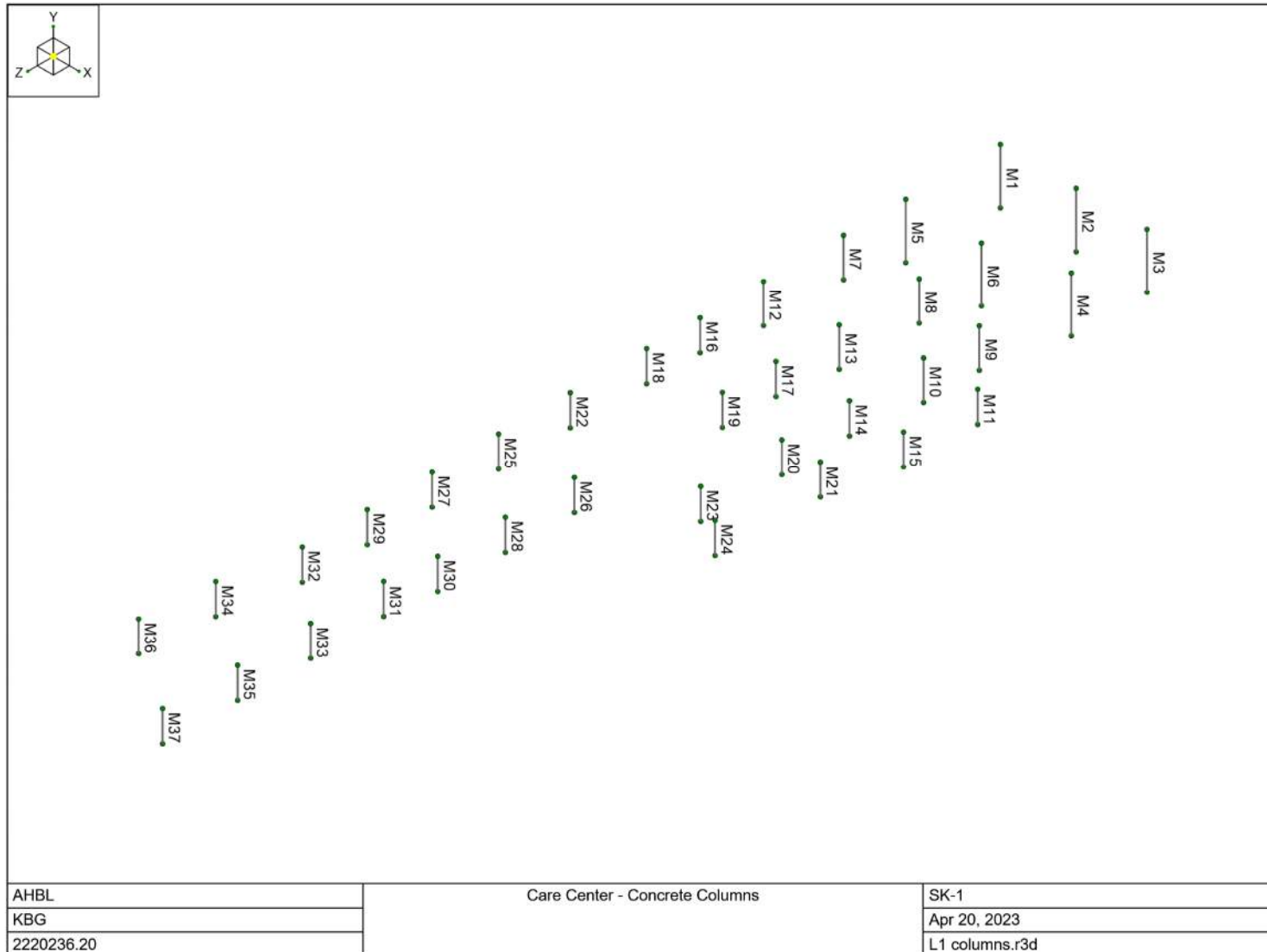
Materials:	5.953 per ft ²	x	28430 ft ²	=	169200
Labor:	3.476 per ft ²	x	28430 ft ²	=	98830
Total:	9.429 per ft ²	x	28430 ft ²	=	268100

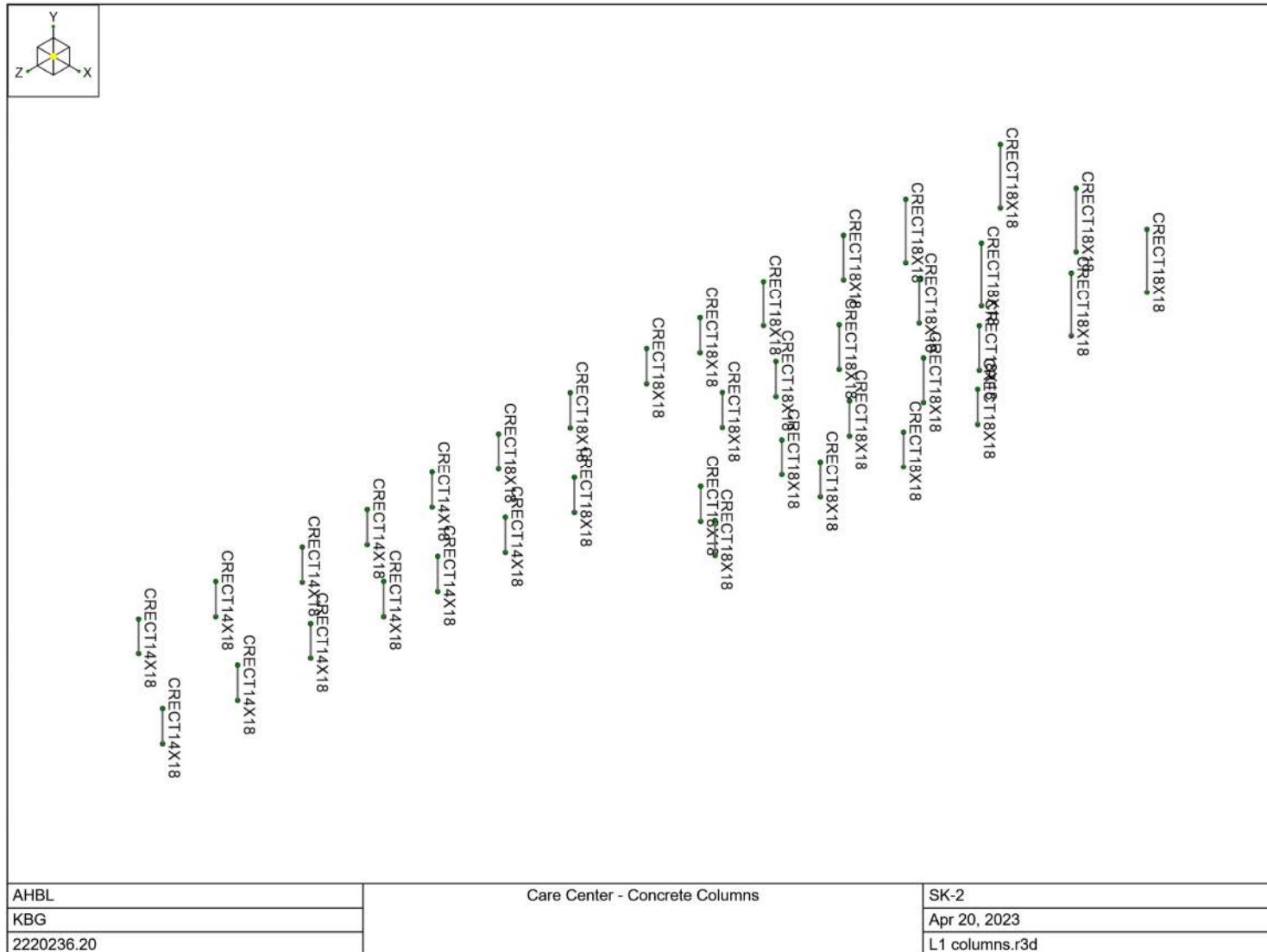
6.0 - CONCRETE COLUMN DESIGN

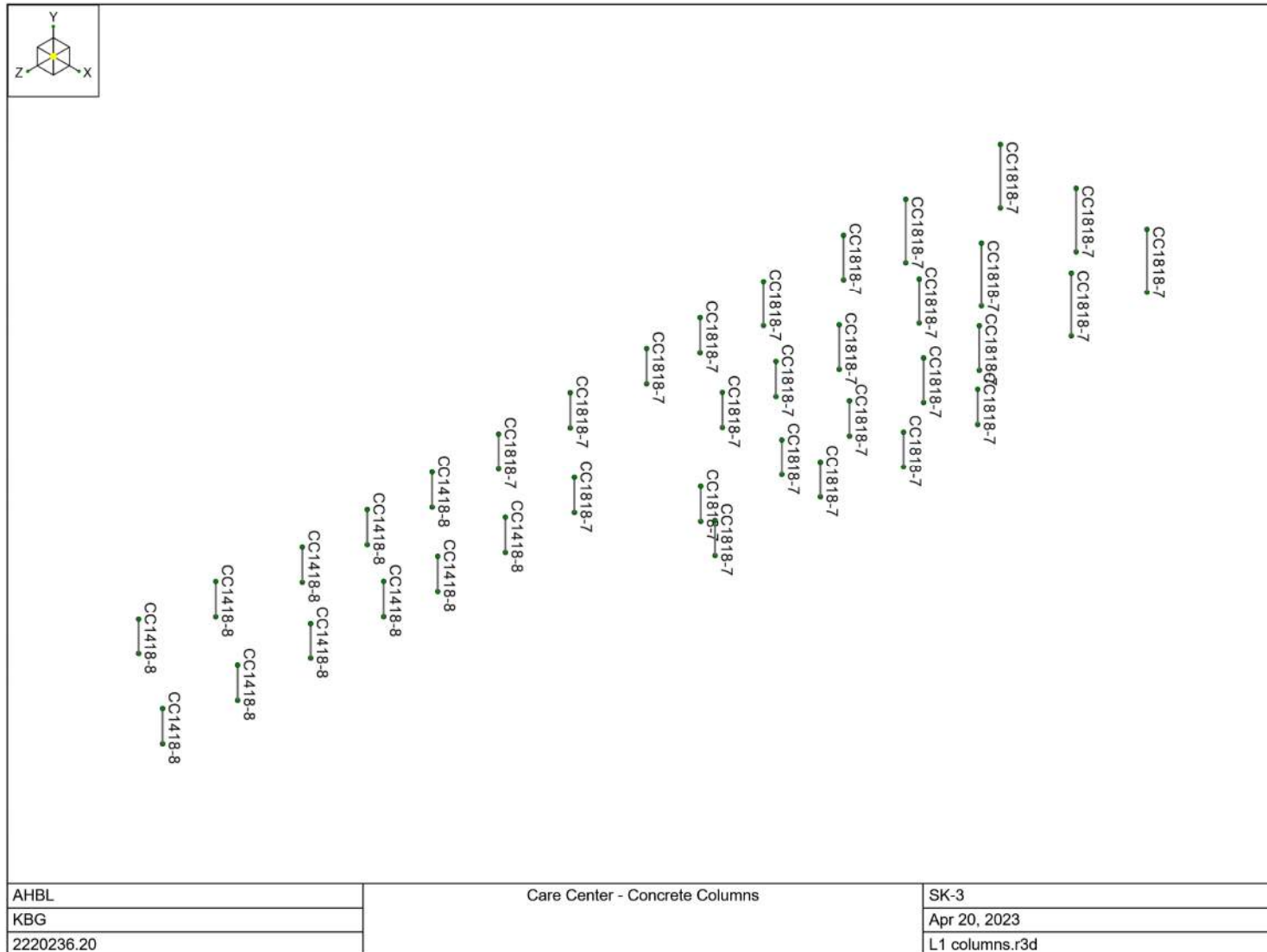
CONCRETE COLUMN LOADS

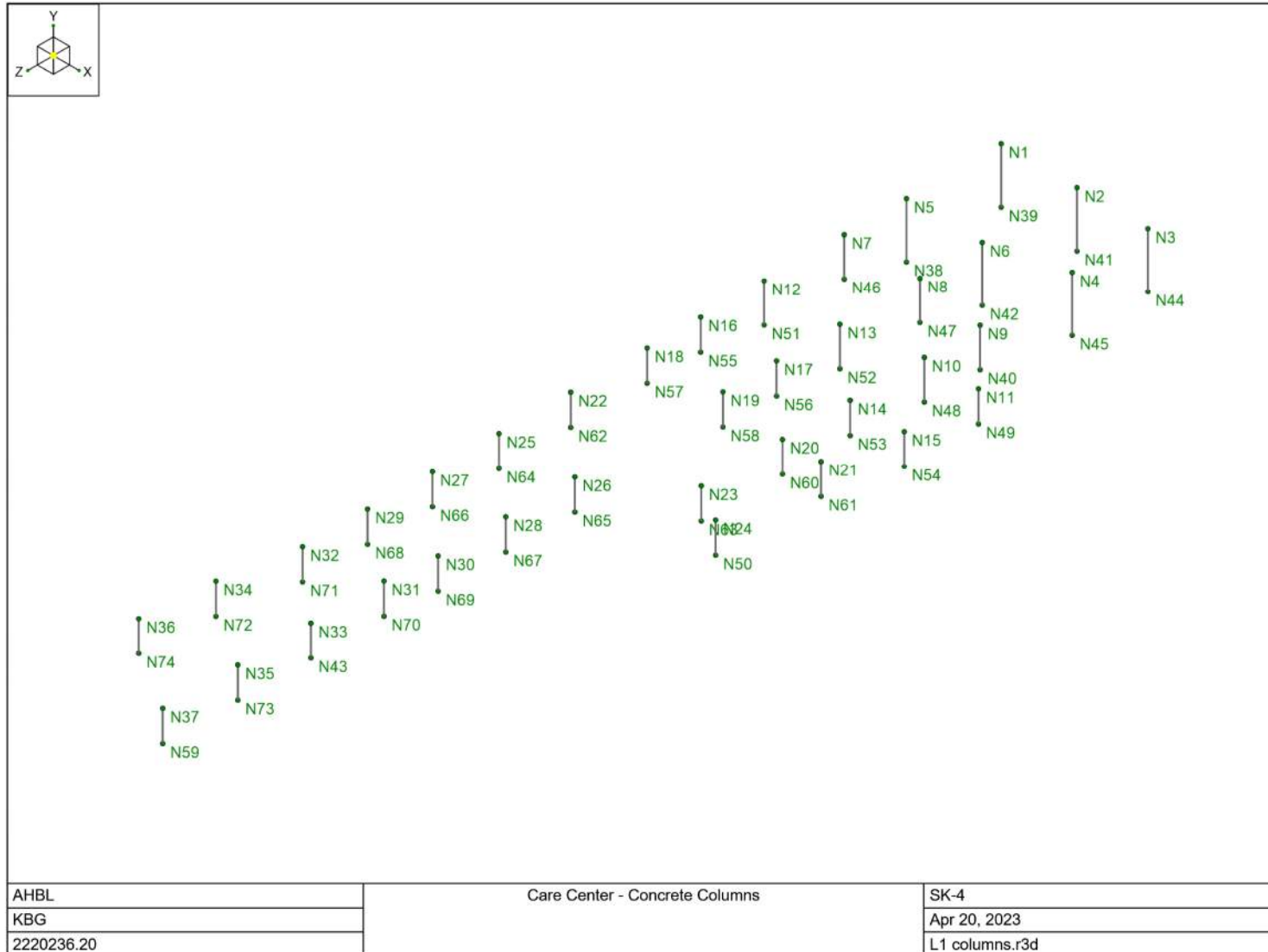
DL					LL (reducible)			
ID	Location (feet)	Std. Fz (Kips)	Std. Mr (kip-ft)	Std. Ms (kip-ft)	ID	Std. Fz (Kips)	Std. Mr (kip-ft)	Std. Ms (kip-ft)
1	(-362.8,-111.2)	-126.9	23.63	-45.6	1	-16.23	2.972	-5.942
2	(-362.8,-83.18)	-134.7	4.732	-68.58	2	-11.38	4.353	-7.586
3	(-362.8,-56.97)	-71.29	-4.789	-72.99	3	-14.56	-0.5053	-13.2
4	(-333.8,-56.97)	-103	-75.16	58.77	4	-22.91	-16.25	7.565
5	(-327.8,-111.2)	-166.8	1.131	52.9	5	-16.58	-8.058	6.465
6	(-327.8,-83.18)	-159.3	5.498	53.03	6	-14.49	10.44	4.507
7	(-304.8,-111.2)	-108.6	9.858	-23.69	7	-15.42	-7.82	-6.397
8	(-304.8,-83.18)	-116.1	12.62	-29.39	8	-13.73	13.6	-4.211
9	(-300.8,-56.97)	-48.2	-70	15.89	9	-12.78	-18.56	6.272
10	(-280.2,-56.97)	-91.23	-43.05	-53.53	10	-18.01	-11.28	-9.811
11	(-280.2,-36.97)	-28.58	-19.85	-69.17	11	-4.41	-1.926	-10.09
12	(-275.3,-111.2)	-101.2	43.16	22.02	12	-16.8	1.847	3.052
13	(-275.3,-83.18)	-129.9	5.191	22.4	13	-20.5	10.53	0.2049
14	(-252.8,-56.97)	-109.2	-2.688	20.42	14	-8.27	-2.909	9.136
15	(-252.8,-36.97)	-53.88	-36.22	11.54	15	-1.866	1.006	4.787
16	(-251.8,-111.2)	-75.45	35.33	12.5	16	-13.44	0.6629	2.114
17	(-251.8,-83.18)	-94.08	1.594	11.94	17	-9.314	4.386	7.397
18	(-232.1,-111.2)	-98.31	30.45	-27.2	18	-9.416	-1.428	2.222
19	(-232.1,-83.18)	-98.87	-7.31	-14.63	19	0.9216	0.6218	-0.4752
20	(-227.8,-56.97)	-82.07	-17.87	-7.687	20	-0.2256	1.787	-3.397
21	(-227.8,-42.74)	-26.66	10.2	38.47	21	-0.5026	1.091	-1.867
22	(-203.8,-111.2)	-107.9	41.28	11.68	22	-0.1103	0.4119	1.214
23	(-197.8,-56.97)	-69.23	-8.659	12.05	23	-12.58	0.5448	-1.376
24	(-189.6,-43.41)	-12.65	-10.13	-13.56	24	-3.677	-3.578	-3.458
25	(-177.3,-111.2)	-98.26	41.69	1.79	25	-0.4722	-0.3497	-0.5206
26	(-177.3,-83.18)	-105.6	-34.11	5.702	26	-0.4619	1.525	1.958
27	(-152.8,-111.2)	-97.2	33.93	5.741	27	-12.69	-1.354	-2.115
28	(-151.8,-83.18)	-102.6	-35.05	-1.002	28	-7.21	-0.2608	-6.922
29	(-128.8,-111.2)	-89.18	30.73	7.291	29	-16.03	0.1376	1.201
30	(-126.8,-83.18)	-84.26	-30.03	20.59	30	-15.61	0.1523	3.944
31	(-108.8,-85.18)	-87.89	-26.29	-18.57	31	-8.216	-0.1227	1.267
32	(-104.8,-111.2)	-99.93	23.23	-17.83	32	-17.04	-2.966	-2.721
33	(-81.85,-85.18)	-123.3	-23.59	-1.719	33	-11.38	6.931	-0.2302
34	(-77.76,-116.2)	-119.9	27.22	3.022	34	-17.86	-7.766	4.176
35	(-54.85,-85.18)	-175.2	-24.04	-13.04	35	-15.87	12.45	-0.1485
36	(-51.49,-118.4)	-112.1	52.12	-0.5008	36	-15.42	2.014	-1.683
37	(-27.1,-85.18)	-82.23	-19.07	51.44	37	-5.832	-2.363	5.219

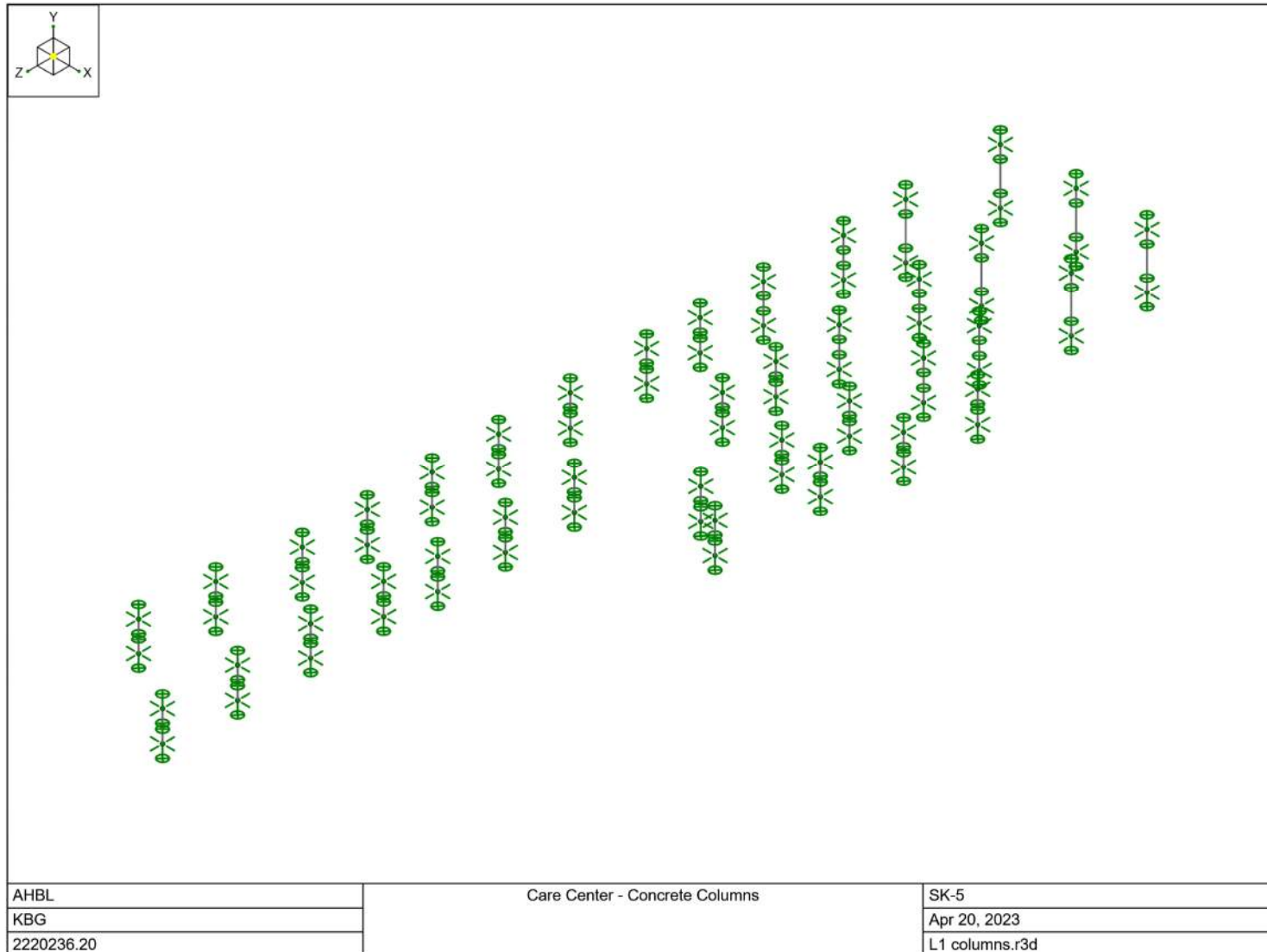
LL (unreducible)				SL				Qa (ksf)	Footing	Use
ID	Std. Fz (Kips)	Std. Mr (kip-ft)	Std. Ms (kip-ft)	ID	Std. Fz (Kips)	Std. Mr (kip-ft)	Std. Ms (kip-ft)			
1	-22.88	4.842	-7.913	1	-17.45	3.375	-6.261	3	8.0	8.0
2	-39.32	-7.898	-15.05	2	-18.63	0.8209	-9.353		9.0	10.0
3	0.7231	-1.014	-3.094	3	-9.809	-0.6263	-9.926		6.0	8.0
4	1.592	-0.5193	5.757	4	-15.31	-11.32	6.784		7.0	8.0
5	-48.91	20.48	8.372	5	-24.85	0.09353	6.747		10.0	10.0
6	-51.24	-21.71	12.8	6	-24.06	1.21	6.62		10.0	10.0
7	-30.61	25.75	2.234	7	-19.02	1.706	-3.784		8.0	8.0
8	-39.45	-26.85	-6.035	8	-20.29	1.969	-4.555		8.0	8.0
9	2.318	3.231	-3.062	9	-8.146	-11.87	3.47		5.0	6.0
10	-1.374	2.731	-3.598	10	-12.76	-7.006	-7.735		7.0	8.0
11	-2.66	-3.813	-10.03	11	-3.763	-2.373	-9.697		4.0	E
12	-21.39	22.1	5.828	12	-17.43	7.347	3.701		8.0	8.0
13	-28.54	-25.44	13.4	13	-21.94	0.2396	3.826		9.0	10.0
14	-43.65	5.504	-15.06	14	-17.69	-0.4865	2.14		8.0	8.0
15	-27.85	-24.04	-8.758	15	-8.942	-5.919	0.8827		6.0	E
16	-13.66	20.17	2.425	16	-13	6.002	2.12		7.0	8.0
17	-35.26	-11.08	-11.68	17	-16.1	-0.03127	1.874		8.0	8.0
18	-37.89	22.27	-22.72	18	-16.89	5.143	-4.72		8.0	8.0
19	-64.26	-6.347	-7.879	19	-17.04	-1.318	-2.494		8.0	8.0
20	-51.09	-16.01	4.4	20	-14.2	-3.176	-1.125		8.0	8.0
21	-15.7	3.518	29.73	21	-4.662	1.718	6.892		4.0	6.0
22	-67.13	24.54	4.076	22	-18.54	7.032	1.956		9.0	10.0
23	-11.77	-7.014	10.9	23	-11.88	-1.554	2.052		6.0	6.0
24	1.269	2.461	0.1886	24	-2.179	-1.783	-2.326		3.0	6.0
25	-60.22	26.76	2.275	25	-16.88	7.12	0.2678		8.0	8.0
26	-64.85	-25.31	-1.388	26	-18.15	-5.911	0.9646		8.0	8.0
27	-29.02	24.51	8.738	27	-16.71	5.809	0.9491		8.0	8.0
28	-46.06	-21.36	16.6	28	-17.62	-6.053	-0.1947		8.0	8.0
29	-15.67	18.83	1.425	29	-15.33	5.272	1.218		7.0	8.0
30	-13.65	-19.21	2.929	30	-14.48	-5.178	3.517		7.0	8.0
31	-34.41	-16.09	-14.81	31	-15.11	-4.508	-3.201		7.0	8.0
32	-19.84	21.92	-4.508	32	-17.17	3.99	-3.11		8.0	8.0
33	-48.57	-32.04	-0.5833	33	-21.18	-4.045	-0.3187		9.0	10.0
34	-30.31	36.45	-8.685	34	-20.61	4.685	0.4823		8.0	8.0
35	-68.28	-46	-7.872	35	-29.69	-4.09	-2.267		10.0	10.0
36	-31.47	27.66	3.733	36	-19.25	8.991	-0.1306		8.0	8.0
37	-36.79	-5.835	18.99	37	-14.13	-3.229	8.81		7.0	8.0



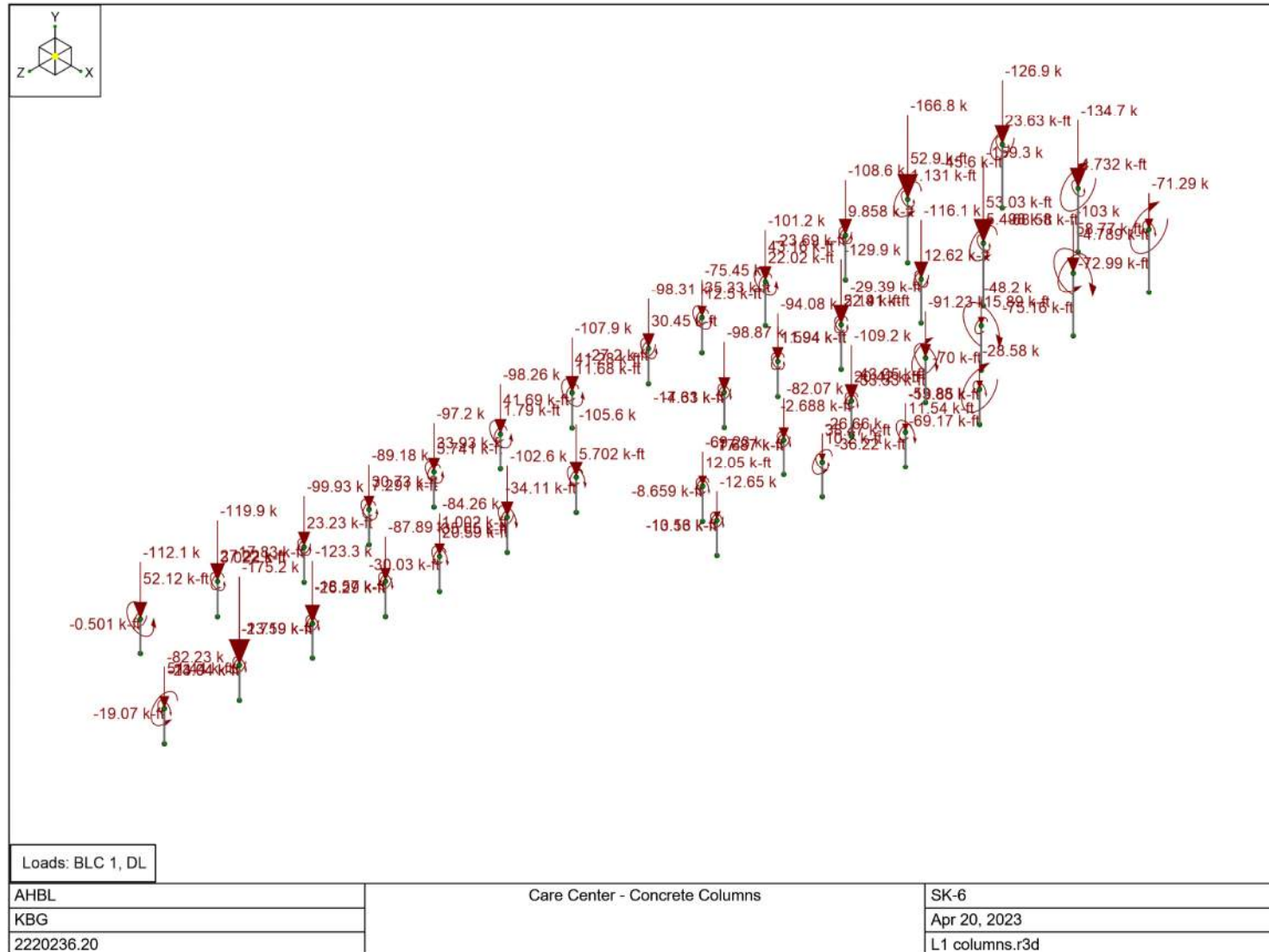


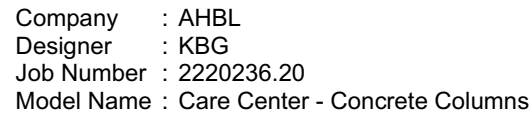






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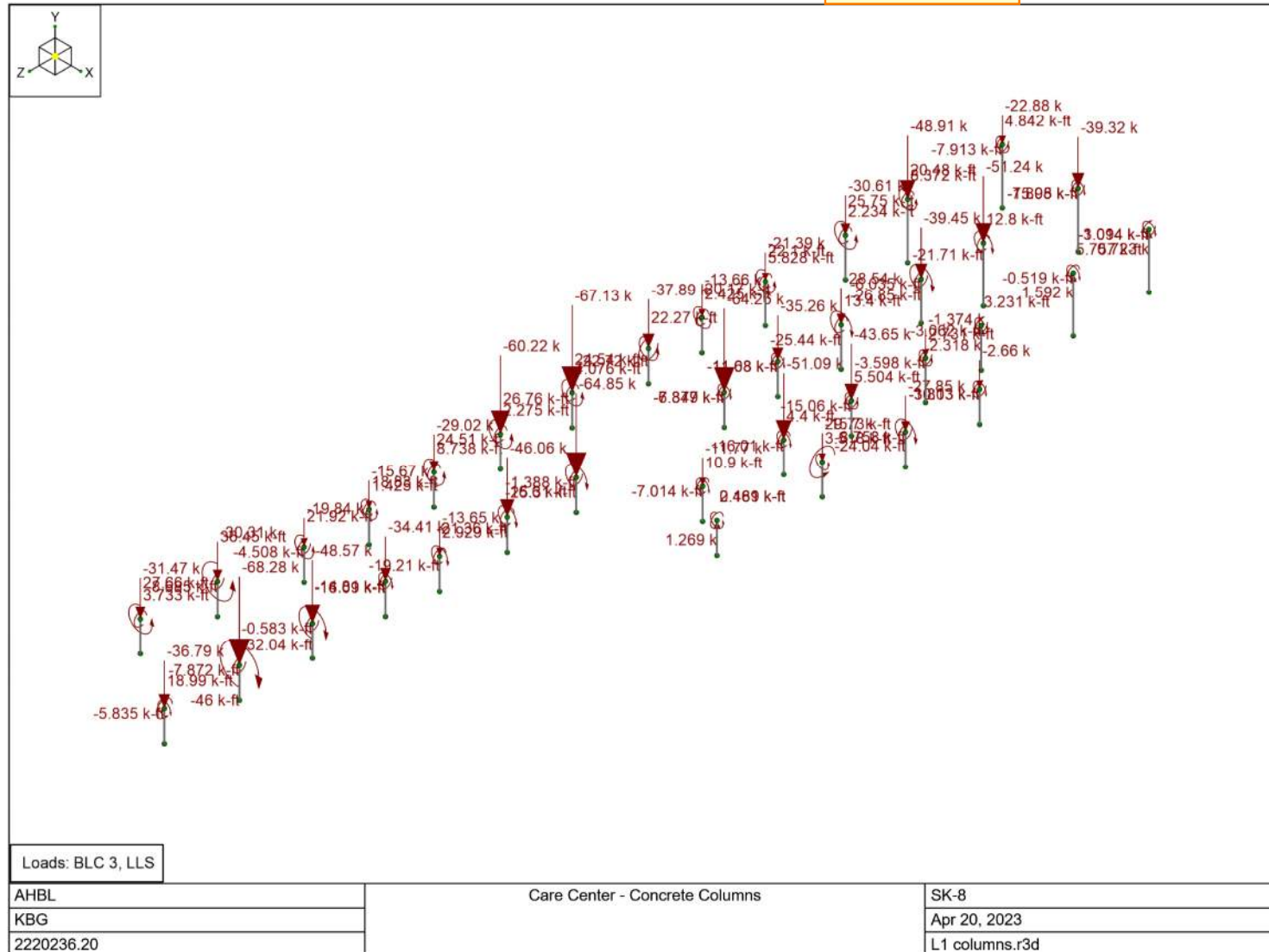


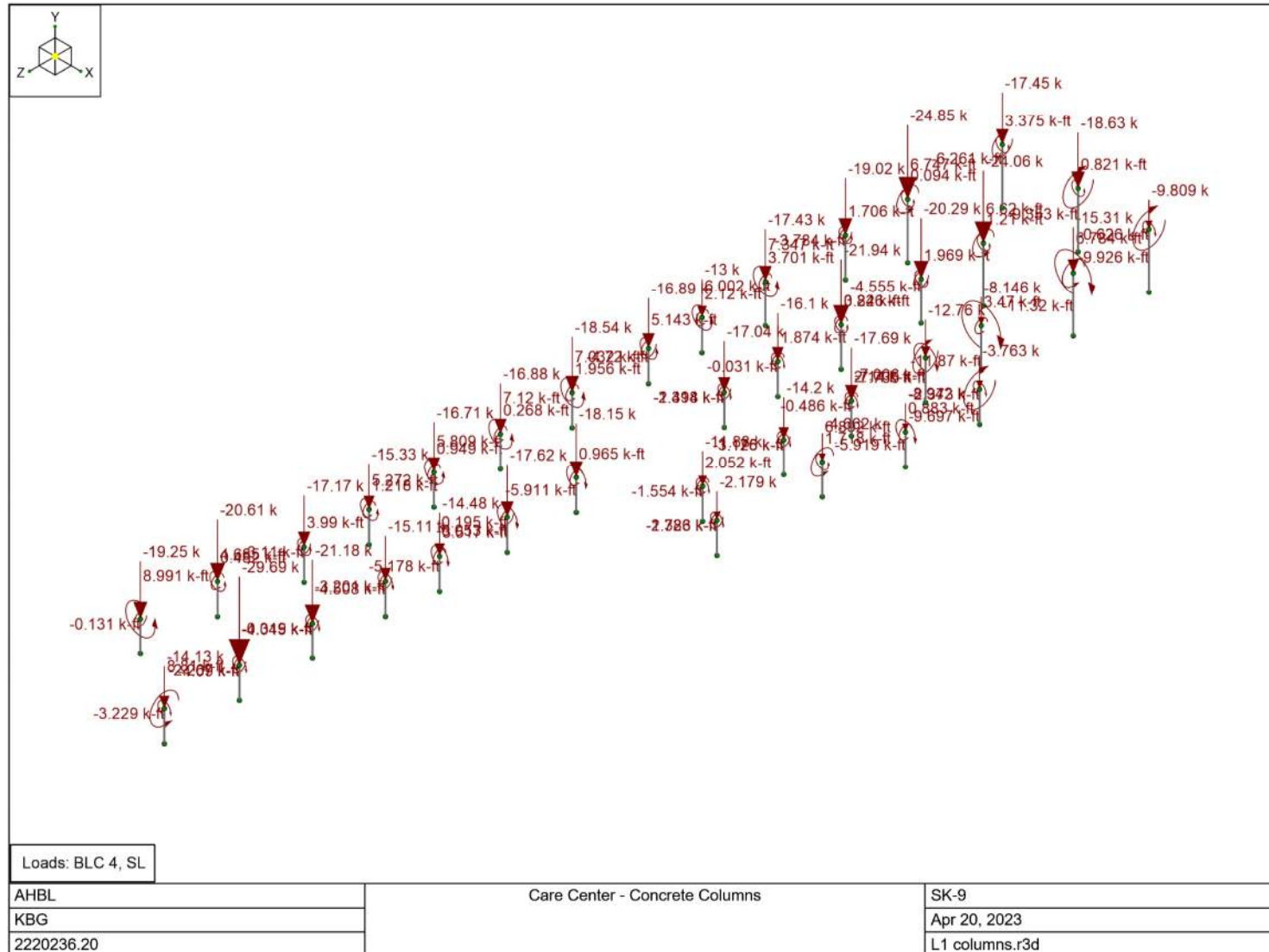


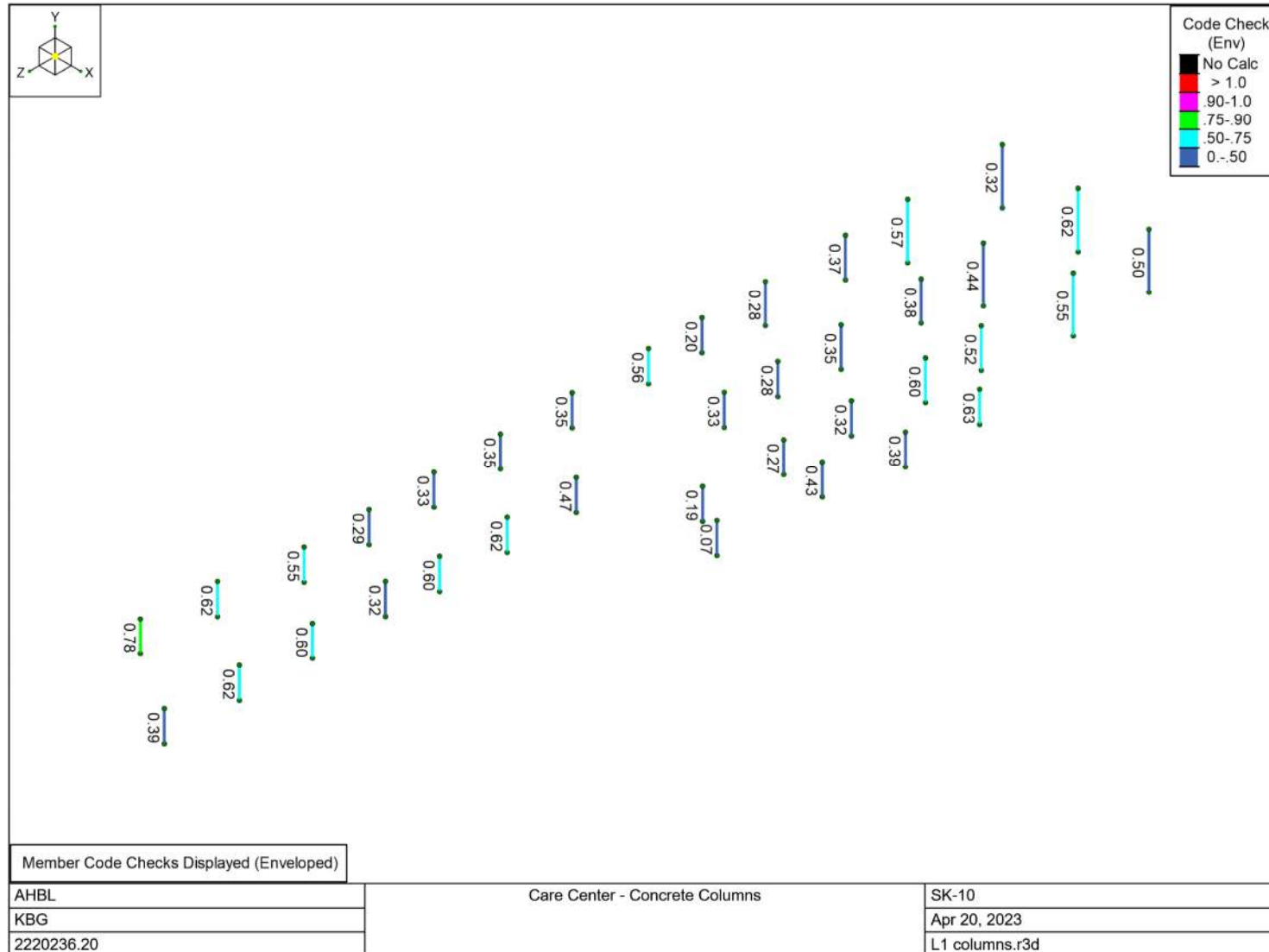
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Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	-111.181759	0	-362.845801	
2	N2	-83.181759	0	-362.845801	
3	N3	-56.972441	0	-362.845801	
4	N4	-56.972441	0	-334.845801	
5	N5	-111.181759	0	-327.845801	
6	N6	-83.181759	0	-327.845801	
7	N7	-111.181759	0	-304.845801	
8	N8	-83.181759	0	-304.845801	
9	N9	-56.972441	0	-300.845801	
10	N10	-56.972441	0	-280.241142	
11	N11	-36.972441	0	-280.241142	
12	N12	-111.181759	0	-275.262467	
13	N13	-83.181759	0	-275.262467	
14	N14	-56.972441	0	-252.845801	
15	N15	-36.972441	0	-252.845801	
16	N16	-111.181759	0	-251.845801	
17	N17	-83.181759	0	-251.845801	
18	N18	-111.181759	0	-232.068898	
19	N19	-83.181759	0	-232.069882	
20	N20	-56.972441	0	-227.845801	
21	N21	-42.743438	0	-227.845801	
22	N22	-111.181759	0	-203.845801	
23	N23	-56.968504	0	-197.845801	
24	N24	-43.411417	0	-189.58563	
25	N25	-111.181759	0	-177.345801	
26	N26	-83.181759	0	-177.345801	
27	N27	-111.181759	0	-152.762467	
28	N28	-83.181759	0	-151.845801	
29	N29	-111.181759	0	-128.781168	
30	N30	-83.181759	0	-126.845801	
31	N31	-85.181759	0	-108.845801	
32	N32	-111.181759	0	-104.762467	
33	N33	-85.181759	0	-81.845801	
34	N34	-116.181759	0	-77.762467	
35	N35	-85.181759	0	-54.845801	
36	N36	-118.431759	0	-51.492454	
37	N37	-85.181759	0	-27.095801	
38	N38	-111.181759	-20.25	-327.845801	
39	N39	-111.181759	-20.25	-362.845801	



Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : Care Center - Concrete Columns

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Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
40	N40	-56.972441	-14.25	-300.845801	
41	N41	-83.181759	-20.25	-362.845801	
42	N42	-83.181759	-20.25	-327.845801	
43	N43	-85.181759	-11.25	-81.845801	
44	N44	-56.972441	-20.25	-362.845801	
45	N45	-56.972441	-20.25	-334.845801	
46	N46	-111.181759	-14.25	-304.845801	
47	N47	-83.181759	-14.25	-304.845801	
48	N48	-56.972441	-14.25	-280.241142	
49	N49	-36.972441	-11.25	-280.241142	
50	N50	-43.411417	-11.25	-189.58563	
51	N51	-111.181759	-14.25	-275.262467	
52	N52	-83.181759	-14.25	-275.262467	
53	N53	-56.972441	-11.25	-252.845801	
54	N54	-36.972441	-11.25	-252.845801	
55	N55	-111.181759	-11.25	-251.845801	
56	N56	-83.181759	-11.25	-251.845801	
57	N57	-111.181759	-11.25	-232.068898	
58	N58	-83.181759	-11.25	-232.069882	
59	N59	-85.181759	-11.25	-27.095801	
60	N60	-56.972441	-11.25	-227.845801	
61	N61	-42.743438	-11.25	-227.845801	
62	N62	-111.181759	-11.25	-203.845801	
63	N63	-56.968504	-11.25	-197.845801	
64	N64	-111.181759	-11.25	-177.345801	
65	N65	-83.181759	-11.25	-177.345801	
66	N66	-111.181759	-11.25	-152.762467	
67	N67	-83.181759	-11.25	-151.845801	
68	N68	-111.181759	-11.25	-128.781168	
69	N69	-83.181759	-11.25	-126.845801	
70	N70	-85.181759	-11.25	-108.845801	
71	N71	-111.181759	-11.25	-104.762467	
72	N72	-116.181759	-11.25	-77.762467	
73	N73	-85.181759	-11.25	-54.845801	
74	N74	-118.431759	-11.25	-51.492454	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	Y Rot [k-ft/rad]
1	N69	Reaction	Reaction	Reaction	Reaction
2	N70	Reaction	Reaction	Reaction	Reaction
3	N65	Reaction	Reaction	Reaction	Reaction
4	N73	Reaction	Reaction	Reaction	Reaction
5	N74	Reaction	Reaction	Reaction	Reaction
6	N51	Reaction	Reaction	Reaction	Reaction
7	N71	Reaction	Reaction	Reaction	Reaction
8	N53	Reaction	Reaction	Reaction	Reaction
9	N54	Reaction	Reaction	Reaction	Reaction
10	N55	Reaction	Reaction	Reaction	Reaction
11	N58	Reaction	Reaction	Reaction	Reaction
12	N60	Reaction	Reaction	Reaction	Reaction
13	N62	Reaction	Reaction	Reaction	Reaction
14	N38	Reaction	Reaction	Reaction	Reaction
15	N64	Reaction	Reaction	Reaction	Reaction
16	N39	Reaction	Reaction	Reaction	Reaction
17	N66	Reaction	Reaction	Reaction	Reaction
18	N67	Reaction	Reaction	Reaction	Reaction
19	N41	Reaction	Reaction	Reaction	Reaction
20	N68	Reaction	Reaction	Reaction	Reaction
21	N42	Reaction	Reaction	Reaction	Reaction
22	N43	Reaction	Reaction	Reaction	Reaction
23	N44	Reaction	Reaction	Reaction	Reaction
24	N46	Reaction	Reaction	Reaction	Reaction
25	N47	Reaction	Reaction	Reaction	Reaction
26	N72	Reaction	Reaction	Reaction	Reaction
27	N48	Reaction	Reaction	Reaction	Reaction
28	N49	Reaction	Reaction	Reaction	Reaction
29	N45	Reaction	Reaction	Reaction	Reaction
30	N50	Reaction	Reaction	Reaction	Reaction
31	N59	Reaction	Reaction	Reaction	Reaction
32	N56	Reaction	Reaction	Reaction	Reaction
33	N52	Reaction	Reaction	Reaction	Reaction
34	N40	Reaction	Reaction	Reaction	Reaction
35	N57	Reaction	Reaction	Reaction	Reaction
36	N63	Reaction	Reaction	Reaction	Reaction
37	N61	Reaction	Reaction	Reaction	Reaction
38	N5	Reaction		Reaction	Reaction
39	N1	Reaction		Reaction	Reaction



Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : Care Center - Concrete Columns

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Node Boundary Conditions (Continued)

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	Y Rot [k-ft/rad]
40	N21	Reaction		Reaction	Reaction
41	N11	Reaction		Reaction	Reaction
42	N35	Reaction		Reaction	Reaction
43	N22	Reaction		Reaction	Reaction
44	N36	Reaction		Reaction	Reaction
45	N24	Reaction		Reaction	Reaction
46	N9	Reaction		Reaction	Reaction
47	N23	Reaction		Reaction	Reaction
48	N12	Reaction		Reaction	Reaction
49	N13	Reaction		Reaction	Reaction
50	N25	Reaction		Reaction	Reaction
51	N26	Reaction		Reaction	Reaction
52	N14	Reaction		Reaction	Reaction
53	N2	Reaction		Reaction	Reaction
54	N27	Reaction		Reaction	Reaction
55	N6	Reaction		Reaction	Reaction
56	N15	Reaction		Reaction	Reaction
57	N3	Reaction		Reaction	Reaction
58	N28	Reaction		Reaction	Reaction
59	N4	Reaction		Reaction	Reaction
60	N16	Reaction		Reaction	Reaction
61	N33	Reaction		Reaction	Reaction
62	N7	Reaction		Reaction	Reaction
63	N17	Reaction		Reaction	Reaction
64	N8	Reaction		Reaction	Reaction
65	N29	Reaction		Reaction	Reaction
66	N18	Reaction		Reaction	Reaction
67	N10	Reaction		Reaction	Reaction
68	N30	Reaction		Reaction	Reaction
69	N37	Reaction		Reaction	Reaction
70	N31	Reaction		Reaction	Reaction
71	N20	Reaction		Reaction	Reaction
72	N19	Reaction		Reaction	Reaction
73	N32	Reaction		Reaction	Reaction
74	N34	Reaction		Reaction	Reaction

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-6}/^{\circ}\text{F}^{-1}$]	Density [k/ft ³]	f'c [ksi]	Lambda	Flex Steel [ksi]	Shear Steel [ksi]
1	Conc3000NW	3156	1372	0.15	0.6	0.145	3	1	60	60
2	Conc3500NW	3409	1482	0.15	0.6	0.145	3.5	1	60	60
3	Conc4000NW	3644	1584	0.15	0.6	0.145	4	1	60	60
4	Conc3000LW	2085	907	0.15	0.6	0.11	3	0.75	60	60
5	Conc3500LW	2252	979	0.15	0.6	0.11	3.5	0.75	60	60
6	Conc4000LW	2408	1047	0.15	0.6	0.11	4	0.75	60	60

Concrete Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1	CC1818-7	CRECT18X18	Column	Rectangular	Conc4000NW	Type 1	324	8748	8748	12947.04
2	CC1418-8	CRECT14X18	Column	Rectangular	Conc4000NW	Type 2	252	6804	4116	8396.64

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N39	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
2	M2	N2	N41	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
3	M3	N3	N44	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
4	M4	N4	N45	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
5	M5	N5	N38	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
6	M6	N6	N42	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
7	M7	N7	N46	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
8	M8	N8	N47	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
9	M9	N9	N40	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
10	M10	N10	N48	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
11	M11	N11	N49	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
12	M12	N12	N51	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
13	M13	N13	N52	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
14	M14	N14	N53	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
15	M15	N15	N54	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
16	M16	N16	N55	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
17	M17	N17	N56	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
18	M18	N18	N57	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
19	M19	N19	N58	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
20	M20	N20	N60	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
21	M21	N21	N61	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
22	M22	N22	N62	CC1818-7	Column	Rectangular	Conc4000NW	Type 1

Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
23	M23	N23	N63	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
24	M24	N24	N50	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
25	M25	N25	N64	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
26	M26	N26	N65	CC1818-7	Column	Rectangular	Conc4000NW	Type 1
27	M27	N27	N66	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
28	M28	N28	N67	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
29	M29	N29	N68	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
30	M30	N30	N69	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
31	M31	N31	N70	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
32	M32	N32	N71	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
33	M33	N33	N43	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
34	M34	N34	N72	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
35	M35	N35	N73	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
36	M36	N36	N74	CC1418-8	Column	Rectangular	Conc4000NW	Type 2
37	M37	N37	N59	CC1418-8	Column	Rectangular	Conc4000NW	Type 2

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
14	M14	Yes	** NA **	None
15	M15	Yes	** NA **	None
16	M16	Yes	** NA **	None
17	M17	Yes	** NA **	None
18	M18	Yes	** NA **	None
19	M19	Yes	** NA **	None
20	M20	Yes	** NA **	None

Member Advanced Data (Continued)

	Label	Physical	Deflection Ratio Options	Seismic DR
21	M21	Yes	** NA **	None
22	M22	Yes	** NA **	None
23	M23	Yes	** NA **	None
24	M24	Yes	** NA **	None
25	M25	Yes	** NA **	None
26	M26	Yes	** NA **	None
27	M27	Yes	** NA **	None
28	M28	Yes	** NA **	None
29	M29	Yes	** NA **	None
30	M30	Yes	** NA **	None
31	M31	Yes	** NA **	None
32	M32	Yes	** NA **	None
33	M33	Yes	** NA **	None
34	M34	Yes	** NA **	None
35	M35	Yes	** NA **	None
36	M36	Yes	** NA **	None
37	M37	Yes	** NA **	None

Concrete Column Design Parameters

	Label	Shape	Length [ft]	y sway	z sway	Rebar Design	Flexural Layout	Rebar Design	Shear Layout
1	M1	CC1818-7	20.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
2	M2	CC1818-7	20.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
3	M3	CC1818-7	20.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
4	M4	CC1818-7	20.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
5	M5	CC1818-7	20.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
6	M6	CC1818-7	20.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
7	M7	CC1818-7	14.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
8	M8	CC1818-7	14.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
9	M9	CC1818-7	14.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
10	M10	CC1818-7	14.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
11	M11	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
12	M12	CC1818-7	14.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
13	M13	CC1818-7	14.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
14	M14	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
15	M15	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
16	M16	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
17	M17	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
18	M18	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule

Concrete Column Design Parameters (Continued)

	Label	Shape	Length [ft]	y sway	z sway	Rebar Design	Flexural Layout	Rebar Design	Shear Layout
19	M19	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
20	M20	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
21	M21	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
22	M22	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
23	M23	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
24	M24	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
25	M25	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
26	M26	CC1818-7	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
27	M27	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
28	M28	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
29	M29	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
30	M30	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
31	M31	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
32	M32	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
33	M33	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
34	M34	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
35	M35	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
36	M36	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule
37	M37	CC1418-8	11.25			Design Rule	Use Design Rule	Design Rule	Use Design Rule

Design Size and Code Check Parameters

	Label	Max Axial/Bending Chk	Max Shear Chk
1	Type 1	1	1
2	Type 2	1	1

Concrete Rebar Parameters

	Label	Optimize Rebar ?	Min Flex Bar	Max Flex Bar	Shear Bar	Legs per Stirrup	Top (Column) Cover [in]	Bottom Cover [in]	Side Cover [in]	Top/Bottom Bars	Add'l Side Bars	Shear Bar Spacing [in]
1	Type 1	Explicit	#7	#10	#4	2	2	2	2	3	1	4
2	Type 2	Explicit	#8	#10	#4	2	2	1.5	1.5	3	0	4

Node Loads and Enforced Displacements (BLC 1 : DL)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² /ft)]
1	N1	L	Y	-126.9
2	N2	L	Y	-134.7
3	N3	L	Y	-71.29

Node Loads and Enforced Displacements (BLC 1 : DL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
4	N4	L	Y	-103
5	N5	L	Y	-166.8
6	N6	L	Y	-159.3
7	N7	L	Y	-108.6
8	N8	L	Y	-116.1
9	N9	L	Y	-48.2
10	N10	L	Y	-91.23
11	N11	L	Y	-28.58
12	N12	L	Y	-101.2
13	N13	L	Y	-129.9
14	N14	L	Y	-109.2
15	N15	L	Y	-53.88
16	N16	L	Y	-75.45
17	N17	L	Y	-94.08
18	N18	L	Y	-98.31
19	N19	L	Y	-98.87
20	N20	L	Y	-82.07
21	N21	L	Y	-26.66
22	N22	L	Y	-107.9
23	N23	L	Y	-69.23
24	N24	L	Y	-12.65
25	N25	L	Y	-98.26
26	N26	L	Y	-105.6
27	N27	L	Y	-97.2
28	N28	L	Y	-102.6
29	N29	L	Y	-89.18
30	N30	L	Y	-84.26
31	N31	L	Y	-87.89
32	N32	L	Y	-99.93
33	N33	L	Y	-123.3
34	N34	L	Y	-119.9
35	N35	L	Y	-175.2
36	N36	L	Y	-112.1
37	N37	L	Y	-82.23
38	N1	L	MZ	23.63
39	N2	L	MZ	4.732
40	N3	L	MZ	-4.789
41	N4	L	MZ	-75.16
42	N5	L	MZ	1.131

Node Loads and Enforced Displacements (BLC 1 : DL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
43	N6	L	MZ	5.498
44	N7	L	MZ	9.858
45	N8	L	MZ	12.62
46	N9	L	MZ	-70
47	N10	L	MZ	-43.05
48	N11	L	MZ	-19.85
49	N12	L	MZ	43.16
50	N13	L	MZ	5.191
51	N14	L	MZ	-2.688
52	N15	L	MZ	-36.22
53	N16	L	MZ	35.33
54	N17	L	MZ	1.594
55	N18	L	MZ	30.45
56	N19	L	MZ	-7.31
57	N20	L	MZ	-17.87
58	N21	L	MZ	10.2
59	N22	L	MZ	41.28
60	N23	L	MZ	-8.659
61	N24	L	MZ	-10.13
62	N25	L	MZ	41.69
63	N26	L	MZ	-34.11
64	N27	L	MZ	33.93
65	N28	L	MZ	-35.05
66	N29	L	MZ	30.73
67	N30	L	MZ	-30.03
68	N31	L	MZ	-26.29
69	N32	L	MZ	23.23
70	N33	L	MZ	-23.59
71	N34	L	MZ	27.22
72	N35	L	MZ	-24.04
73	N36	L	MZ	52.12
74	N37	L	MZ	-19.07
75	N1	L	MX	-45.6
76	N2	L	MX	-68.58
77	N3	L	MX	-72.99
78	N4	L	MX	58.77
79	N5	L	MX	52.9
80	N6	L	MX	53.03
81	N7	L	MX	-23.69

Node Loads and Enforced Displacements (BLC 1 : DL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
82	N8	L	MX	-29.39
83	N9	L	MX	15.89
84	N10	L	MX	-53.53
85	N11	L	MX	-69.17
86	N12	L	MX	22.02
87	N13	L	MX	22.4
88	N14	L	MX	20.42
89	N15	L	MX	11.54
90	N16	L	MX	12.5
91	N17	L	MX	11.94
92	N18	L	MX	-27.2
93	N19	L	MX	-14.63
94	N20	L	MX	-7.687
95	N21	L	MX	38.47
96	N22	L	MX	11.68
97	N23	L	MX	12.05
98	N24	L	MX	-13.56
99	N25	L	MX	1.79
100	N26	L	MX	5.702
101	N27	L	MX	5.741
102	N28	L	MX	-1.002
103	N29	L	MX	7.291
104	N30	L	MX	20.59
105	N31	L	MX	-18.57
106	N32	L	MX	-17.83
107	N33	L	MX	-1.719
108	N34	L	MX	3.022
109	N35	L	MX	-13.04
110	N36	L	MX	-0.501
111	N37	L	MX	51.44

Node Loads and Enforced Displacements (BLC 2 : LL)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
1	N1	L	Y	-16.23
2	N2	L	Y	-11.38
3	N3	L	Y	-14.56
4	N4	L	Y	-22.91
5	N5	L	Y	-16.58

Node Loads and Enforced Displacements (BLC 2 : LL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
6	N6	L	Y	-14.49
7	N7	L	Y	-15.42
8	N8	L	Y	-13.73
9	N9	L	Y	-12.78
10	N10	L	Y	-18.01
11	N11	L	Y	-4.41
12	N12	L	Y	-16.8
13	N13	L	Y	-20.5
14	N14	L	Y	-8.27
15	N15	L	Y	-1.866
16	N16	L	Y	-13.44
17	N17	L	Y	-9.314
18	N18	L	Y	-9.416
19	N19	L	Y	0.922
20	N20	L	Y	-0.226
21	N21	L	Y	-0.503
22	N22	L	Y	-0.11
23	N23	L	Y	-12.58
24	N24	L	Y	-3.677
25	N25	L	Y	-0.472
26	N26	L	Y	-0.462
27	N27	L	Y	-12.69
28	N28	L	Y	-7.21
29	N29	L	Y	-16.03
30	N30	L	Y	-15.61
31	N31	L	Y	-8.216
32	N32	L	Y	-17.04
33	N33	L	Y	-11.38
34	N34	L	Y	-17.86
35	N35	L	Y	-15.87
36	N36	L	Y	-15.42
37	N37	L	Y	-5.832
38	N1	L	MZ	2.972
39	N2	L	MZ	4.353
40	N3	L	MZ	-0.505
41	N4	L	MZ	-16.25
42	N5	L	MZ	-8.058
43	N6	L	MZ	10.44
44	N7	L	MZ	-7.82

Node Loads and Enforced Displacements (BLC 2 : LL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
45	N8	L	MZ	13.6
46	N9	L	MZ	-18.56
47	N10	L	MZ	-11.28
48	N11	L	MZ	-1.926
49	N12	L	MZ	1.847
50	N13	L	MZ	10.53
51	N14	L	MZ	-2.909
52	N15	L	MZ	1.006
53	N16	L	MZ	0.663
54	N17	L	MZ	4.386
55	N18	L	MZ	-1.428
56	N19	L	MZ	0.622
57	N20	L	MZ	1.787
58	N21	L	MZ	1.091
59	N22	L	MZ	0.412
60	N23	L	MZ	0.545
61	N24	L	MZ	-3.578
62	N25	L	MZ	-0.35
63	N26	L	MZ	1.525
64	N27	L	MZ	-1.354
65	N28	L	MZ	-0.261
66	N29	L	MZ	0.138
67	N30	L	MZ	0.152
68	N31	L	MZ	-0.123
69	N32	L	MZ	-2.966
70	N33	L	MZ	6.931
71	N34	L	MZ	-7.766
72	N35	L	MZ	12.45
73	N36	L	MZ	2.014
74	N37	L	MZ	-2.363
75	N1	L	MX	-5.942
76	N2	L	MX	-7.586
77	N3	L	MX	-13.2
78	N4	L	MX	7.565
79	N5	L	MX	6.465
80	N6	L	MX	4.507
81	N7	L	MX	-6.397
82	N8	L	MX	-4.211
83	N9	L	MX	6.272

Node Loads and Enforced Displacements (BLC 2 : LL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
84	N10	L	MX	-9.811
85	N11	L	MX	-10.09
86	N12	L	MX	3.052
87	N13	L	MX	0.205
88	N14	L	MX	9.136
89	N15	L	MX	4.787
90	N16	L	MX	2.114
91	N17	L	MX	7.397
92	N18	L	MX	2.222
93	N19	L	MX	-0.475
94	N20	L	MX	-3.397
95	N21	L	MX	-1.867
96	N22	L	MX	1.214
97	N23	L	MX	-1.376
98	N24	L	MX	-3.458
99	N25	L	MX	-0.521
100	N26	L	MX	1.958
101	N27	L	MX	-2.115
102	N28	L	MX	-6.922
103	N29	L	MX	1.201
104	N30	L	MX	3.944
105	N31	L	MX	1.267
106	N32	L	MX	-2.721
107	N33	L	MX	-0.23
108	N34	L	MX	4.176
109	N35	L	MX	-0.148
110	N36	L	MX	-1.683
111	N37	L	MX	5.219

Node Loads and Enforced Displacements (BLC 3 : LLS)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
1	N1	L	Y	-22.88
2	N2	L	Y	-39.32
3	N3	L	Y	0.723
4	N4	L	Y	1.592
5	N5	L	Y	-48.91
6	N6	L	Y	-51.24
7	N7	L	Y	-30.61

Node Loads and Enforced Displacements (BLC 3 : LLS) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
8	N8	L	Y	-39.45
9	N9	L	Y	2.318
10	N10	L	Y	-1.374
11	N11	L	Y	-2.66
12	N12	L	Y	-21.39
13	N13	L	Y	-28.54
14	N14	L	Y	-43.65
15	N15	L	Y	-27.85
16	N16	L	Y	-13.66
17	N17	L	Y	-35.26
18	N18	L	Y	-37.89
19	N19	L	Y	-64.26
20	N20	L	Y	-51.09
21	N21	L	Y	-15.7
22	N22	L	Y	-67.13
23	N23	L	Y	-11.77
24	N24	L	Y	1.269
25	N25	L	Y	-60.22
26	N26	L	Y	-64.85
27	N27	L	Y	-29.02
28	N28	L	Y	-46.06
29	N29	L	Y	-15.67
30	N30	L	Y	-13.65
31	N31	L	Y	-34.41
32	N32	L	Y	-19.84
33	N33	L	Y	-48.57
34	N34	L	Y	-30.31
35	N35	L	Y	-68.28
36	N36	L	Y	-31.47
37	N37	L	Y	-36.79
38	N1	L	MZ	4.842
39	N2	L	MZ	-7.898
40	N3	L	MZ	-1.014
41	N4	L	MZ	-0.519
42	N5	L	MZ	20.48
43	N6	L	MZ	-21.71
44	N7	L	MZ	25.75
45	N8	L	MZ	-26.85
46	N9	L	MZ	3.231

Node Loads and Enforced Displacements (BLC 3 : LLS) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
47	N10	L	MZ	2.731
48	N11	L	MZ	-3.813
49	N12	L	MZ	22.1
50	N13	L	MZ	-25.44
51	N14	L	MZ	5.504
52	N15	L	MZ	-24.04
53	N16	L	MZ	20.17
54	N17	L	MZ	-11.08
55	N18	L	MZ	22.27
56	N19	L	MZ	-6.347
57	N20	L	MZ	-16.01
58	N21	L	MZ	3.518
59	N22	L	MZ	24.54
60	N23	L	MZ	-7.014
61	N24	L	MZ	2.461
62	N25	L	MZ	26.76
63	N26	L	MZ	-25.31
64	N27	L	MZ	24.51
65	N28	L	MZ	-21.36
66	N29	L	MZ	18.83
67	N30	L	MZ	-19.21
68	N31	L	MZ	-16.09
69	N32	L	MZ	21.92
70	N33	L	MZ	-32.04
71	N34	L	MZ	36.45
72	N35	L	MZ	-46
73	N36	L	MZ	27.66
74	N37	L	MZ	-5.835
75	N1	L	MX	-7.913
76	N2	L	MX	-15.05
77	N3	L	MX	-3.094
78	N4	L	MX	5.757
79	N5	L	MX	8.372
80	N6	L	MX	12.8
81	N7	L	MX	2.234
82	N8	L	MX	-6.035
83	N9	L	MX	-3.062
84	N10	L	MX	-3.598
85	N11	L	MX	-10.03

Node Loads and Enforced Displacements (BLC 3 : LLS) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
86	N12	L	MX	5.828
87	N13	L	MX	13.4
88	N14	L	MX	-15.06
89	N15	L	MX	-8.758
90	N16	L	MX	2.425
91	N17	L	MX	-11.68
92	N18	L	MX	-22.72
93	N19	L	MX	-7.879
94	N20	L	MX	4.4
95	N21	L	MX	29.73
96	N22	L	MX	4.076
97	N23	L	MX	10.9
98	N24	L	MX	0.189
99	N25	L	MX	2.275
100	N26	L	MX	-1.388
101	N27	L	MX	8.738
102	N28	L	MX	16.6
103	N29	L	MX	1.425
104	N30	L	MX	2.929
105	N31	L	MX	-14.81
106	N32	L	MX	-4.508
107	N33	L	MX	-0.583
108	N34	L	MX	-8.685
109	N35	L	MX	-7.872
110	N36	L	MX	3.733
111	N37	L	MX	18.99

Node Loads and Enforced Displacements (BLC 4 : SL)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
1	N1	L	Y	-17.45
2	N2	L	Y	-18.63
3	N3	L	Y	-9.809
4	N4	L	Y	-15.31
5	N5	L	Y	-24.85
6	N6	L	Y	-24.06
7	N7	L	Y	-19.02
8	N8	L	Y	-20.29
9	N9	L	Y	-8.146

Node Loads and Enforced Displacements (BLC 4 : SL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
10	N10	L	Y	-12.76
11	N11	L	Y	-3.763
12	N12	L	Y	-17.43
13	N13	L	Y	-21.94
14	N14	L	Y	-17.69
15	N15	L	Y	-8.942
16	N16	L	Y	-13
17	N17	L	Y	-16.1
18	N18	L	Y	-16.89
19	N19	L	Y	-17.04
20	N20	L	Y	-14.2
21	N21	L	Y	-4.662
22	N22	L	Y	-18.54
23	N23	L	Y	-11.88
24	N24	L	Y	-2.179
25	N25	L	Y	-16.88
26	N26	L	Y	-18.15
27	N27	L	Y	-16.71
28	N28	L	Y	-17.62
29	N29	L	Y	-15.33
30	N30	L	Y	-14.48
31	N31	L	Y	-15.11
32	N32	L	Y	-17.17
33	N33	L	Y	-21.18
34	N34	L	Y	-20.61
35	N35	L	Y	-29.69
36	N36	L	Y	-19.25
37	N37	L	Y	-14.13
38	N1	L	MZ	3.375
39	N2	L	MZ	0.821
40	N3	L	MZ	-0.626
41	N4	L	MZ	-11.32
42	N5	L	MZ	0.094
43	N6	L	MZ	1.21
44	N7	L	MZ	1.706
45	N8	L	MZ	1.969
46	N9	L	MZ	-11.87
47	N10	L	MZ	-7.006
48	N11	L	MZ	-2.373

Node Loads and Enforced Displacements (BLC 4 : SL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
49	N12	L	MZ	7.347
50	N13	L	MZ	0.24
51	N14	L	MZ	-0.486
52	N15	L	MZ	-5.919
53	N16	L	MZ	6.002
54	N17	L	MZ	-0.031
55	N18	L	MZ	5.143
56	N19	L	MZ	-1.318
57	N20	L	MZ	-3.176
58	N21	L	MZ	1.718
59	N22	L	MZ	7.032
60	N23	L	MZ	-1.554
61	N24	L	MZ	-1.783
62	N25	L	MZ	7.12
63	N26	L	MZ	-5.911
64	N27	L	MZ	5.809
65	N28	L	MZ	-6.053
66	N29	L	MZ	5.272
67	N30	L	MZ	-5.178
68	N31	L	MZ	-4.508
69	N32	L	MZ	3.99
70	N33	L	MZ	-4.045
71	N34	L	MZ	4.685
72	N35	L	MZ	-4.09
73	N36	L	MZ	8.991
74	N37	L	MZ	-3.229
75	N1	L	MX	-6.261
76	N2	L	MX	-9.353
77	N3	L	MX	-9.926
78	N4	L	MX	6.784
79	N5	L	MX	6.747
80	N6	L	MX	6.62
81	N7	L	MX	-3.784
82	N8	L	MX	-4.555
83	N9	L	MX	3.47
84	N10	L	MX	-7.735
85	N11	L	MX	-9.697
86	N12	L	MX	3.701
87	N13	L	MX	3.826

Node Loads and Enforced Displacements (BLC 4 : SL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
88	N14	L	MX	2.14
89	N15	L	MX	0.883
90	N16	L	MX	2.12
91	N17	L	MX	1.874
92	N18	L	MX	-4.72
93	N19	L	MX	-2.494
94	N20	L	MX	-1.125
95	N21	L	MX	6.892
96	N22	L	MX	1.956
97	N23	L	MX	2.052
98	N24	L	MX	-2.326
99	N25	L	MX	0.268
100	N26	L	MX	0.965
101	N27	L	MX	0.949
102	N28	L	MX	-0.195
103	N29	L	MX	1.218
104	N30	L	MX	3.517
105	N31	L	MX	-3.201
106	N32	L	MX	-3.11
107	N33	L	MX	-0.319
108	N34	L	MX	0.482
109	N35	L	MX	-2.267
110	N36	L	MX	-0.131
111	N37	L	MX	8.81

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal
1	DL	DL	-1	111
2	LL	LL		111
3	LLS	LLS		111
4	SL	SL		111

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	IBC 16-1	Yes	Y	DL	1.4								
2	IBC 16-2 (a)	Yes	Y	DL	1.2	LL	1.6	LLS	1.6				
3	IBC 16-2 (b)	Yes	Y	DL	1.2	LL	1.6	LLS	1.6	SL	0.5	SLN	0.5



Company : AHBL
 Designer : KBG
 Job Number : 2220236.20
 Model Name : Care Center - Concrete Columns

4/20/2023
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Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
4	IBC 16-3 (c)	Yes	Y	DL	1.2	SL	1.6	SLN	1.6	LL	0.5	LLS	1

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N69	max	6.144	3	158.594	3	3.33	3	0	4	0	4	0	4
2		min	3.737	1	121.961	1	2.562	1	0	1	0	1	0	1
3	N70	max	5.31	3	184.65	3	-2.311	1	0	4	0	4	0	4
4		min	3.272	1	127.043	1	-4.049	3	0	1	0	1	0	1
5	N65	max	7.284	3	244.698	3	0.732	3	0	4	0	4	0	4
6		min	4.245	1	152.978	1	0.689	2	0	1	0	1	0	1
7	N73	max	7.518	3	363.151	3	-1.623	1	0	4	0	4	0	4
8		min	2.992	1	249.277	1	-2.632	3	0	1	0	1	0	1
9	N74	max	-6.486	1	222.595	3	0.238	2	0	4	0	4	0	4
10		min	-10.179	3	160.937	1	-0.062	1	0	1	0	1	0	1
11	N51	max	-4.24	1	196.838	3	2.981	3	0	4	0	4	0	4
12		min	-6.581	3	148.189	1	2.163	1	0	1	0	1	0	1
13	N71	max	-2.891	1	190.935	3	-2.219	1	0	4	0	4	0	4
14		min	-5.351	3	143.899	1	-3.068	3	0	1	0	1	0	1
15	N53	max	0.335	1	227.361	3	2.541	1	0	4	0	4	0	4
16		min	-0.082	2	158.018	1	1.336	2	0	1	0	1	0	1
17	N54	max	7.402	3	121.077	3	1.436	1	0	4	0	4	0	4
18		min	4.507	1	80.57	1	0.666	2	0	1	0	1	0	1
19	N55	max	-4.397	1	144.804	3	2.073	3	0	4	0	4	0	4
20		min	-6.998	3	110.768	1	1.556	1	0	1	0	1	0	1
21	N58	max	1.653	3	232.91	3	-1.821	1	0	4	0	4	0	4
22		min	0.91	1	143.556	1	-2.86	3	0	1	0	1	0	1
23	N60	max	4.07	3	192.093	3	-0.677	2	0	4	0	4	0	4
24		min	2.224	1	120.036	1	-0.957	1	0	1	0	1	0	1
25	N62	max	-5.137	1	250.739	3	2.085	3	0	4	0	4	0	4
26		min	-8.264	3	156.198	1	1.454	1	0	1	0	1	0	1
27	N38	max	-0.078	1	325.297	3	4.474	3	0	4	0	4	0	4
28		min	-1.051	3	242.769	1	3.657	1	0	1	0	1	0	1
29	N64	max	-5.188	1	227.864	3	0.452	3	0	4	0	4	0	4
30		min	-8.52	3	142.702	1	0.223	1	0	1	0	1	0	1
31	N39	max	-1.634	1	231.509	3	-3.153	1	0	4	0	4	0	4
32		min	-2.101	3	186.909	1	-3.952	3	0	1	0	1	0	1
33	N66	max	-4.222	1	195.157	3	1.596	3	0	4	0	4	0	4
34		min	-7.171	3	140.077	1	0.714	1	0	1	0	1	0	1

Envelope Node Reactions (Continued)

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
35	N67	max	7.083	3	220.588	3	1.27	2	0	4	0	4	0	4
36		min	4.362	1	147.637	1	-0.125	1	0	1	0	1	0	1
37	N41	max	0	2	260.003	3	-4.741	1	0	4	0	4	0	4
38		min	-0.327	1	197.829	1	-6.083	3	0	1	0	1	0	1
39	N68	max	-3.824	1	168.827	3	1.205	3	0	4	0	4	0	4
40		min	-6.21	3	128.849	1	0.907	1	0	1	0	1	0	1
41	N42	max	0.565	2	316.286	3	4.673	3	0	4	0	4	0	4
42		min	-0.38	1	232.269	1	3.666	1	0	1	0	1	0	1
43	N43	max	6.267	3	257.896	3	-0.214	1	0	4	0	4	0	4
44		min	2.936	1	176.617	1	-0.313	3	0	1	0	1	0	1
45	N44	max	0.419	3	120.519	3	-5.046	1	0	4	0	4	0	4
46		min	0.331	1	109.055	1	-5.858	3	0	1	0	1	0	1
47	N46	max	-0.969	1	219.057	3	-2.327	1	0	4	0	4	0	4
48		min	-2.903	3	158.549	1	-2.595	3	0	1	0	1	0	1
49	N47	max	0.425	2	240.132	3	-2.887	1	0	4	0	4	0	4
50		min	-1.24	1	169.049	1	-3.785	3	0	1	0	1	0	1
51	N72	max	-3.387	1	234.683	3	0.376	1	0	4	0	4	0	4
52		min	-7.191	3	171.857	1	-0.319	2	0	1	0	1	0	1
53	N48	max	4.831	3	152.449	3	-5.259	1	0	4	0	4	0	4
54		min	4.229	1	134.231	1	-6.285	3	0	1	0	1	0	1
55	N49	max	3.039	3	51.894	3	-8.608	1	0	4	0	4	0	4
56		min	2.47	1	45.15	1	-10.671	3	0	1	0	1	0	1
57	N45	max	6.058	3	173.292	3	4.703	3	0	4	0	4	0	4
58		min	5.196	1	153.449	1	4.063	1	0	1	0	1	0	1
59	N50	max	1.319	3	24.527	3	-1.687	1	0	4	0	4	0	4
60		min	1.239	2	22.848	1	-2.015	3	0	1	0	1	0	1
61	N59	max	3.344	3	177.362	3	9.322	3	0	4	0	4	0	4
62		min	2.373	1	119.119	1	6.401	1	0	1	0	1	0	1
63	N56	max	0.783	3	196.669	3	1.486	1	0	4	0	4	0	4
64		min	-0.198	1	136.85	1	0.664	2	0	1	0	1	0	1
65	N52	max	1.237	2	250.893	3	3.548	3	0	4	0	4	0	4
66		min	-0.51	1	188.369	1	2.201	1	0	1	0	1	0	1
67	N40	max	8.032	3	84.231	3	1.82	3	0	4	0	4	0	4
68		min	6.877	1	73.989	1	1.561	1	0	1	0	1	0	1
69	N57	max	-3.789	1	206.511	3	-3.385	1	0	4	0	4	0	4
70		min	-6.441	3	142.772	1	-6.026	3	0	1	0	1	0	1
71	N63	max	1.913	3	132.38	3	2.731	3	0	4	0	4	0	4
72		min	1.078	1	102.06	1	1.5	1	0	1	0	1	0	1
73	N61	max	-1.269	1	64.652	3	8.373	3	0	4	0	4	0	4

Envelope Node Reactions (Continued)

Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
74		min		-1.82	3	42.462	1	4.787	1	0	1	0	1
75	N5	max		1.051	3	0	4	-3.657	1	0	4	0	4
76		min		0.078	1	0	1	-4.474	3	0	1	0	1
77	N1	max		2.101	3	0	4	3.952	3	0	4	0	4
78		min		1.634	1	0	1	3.153	1	0	1	0	1
79	N21	max		1.82	3	0	4	-4.787	1	0	4	0	4
80		min		1.269	1	0	1	-8.373	3	0	1	0	1
81	N11	max		-2.47	1	0	4	10.671	3	0	4	0	4
82		min		-3.039	3	0	1	8.608	1	0	1	0	1
83	N35	max		-2.992	1	0	4	2.632	3	0	4	0	4
84		min		-7.518	3	0	1	1.623	1	0	1	0	1
85	N22	max		8.264	3	0	4	-1.454	1	0	4	0	4
86		min		5.137	1	0	1	-2.085	3	0	1	0	1
87	N36	max		10.179	3	0	4	0.062	1	0	4	0	4
88		min		6.486	1	0	1	-0.238	2	0	1	0	1
89	N24	max		-1.239	2	0	4	2.015	3	0	4	0	4
90		min		-1.319	3	0	1	1.687	1	0	1	0	1
91	N9	max		-6.877	1	0	4	-1.561	1	0	4	0	4
92		min		-8.032	3	0	1	-1.82	3	0	1	0	1
93	N23	max		-1.078	1	0	4	-1.5	1	0	4	0	4
94		min		-1.913	3	0	1	-2.731	3	0	1	0	1
95	N12	max		6.581	3	0	4	-2.163	1	0	4	0	4
96		min		4.24	1	0	1	-2.981	3	0	1	0	1
97	N13	max		0.51	1	0	4	-2.201	1	0	4	0	4
98		min		-1.237	2	0	1	-3.548	3	0	1	0	1
99	N25	max		8.52	3	0	4	-0.223	1	0	4	0	4
100		min		5.188	1	0	1	-0.452	3	0	1	0	1
101	N26	max		-4.245	1	0	4	-0.689	2	0	4	0	4
102		min		-7.284	3	0	1	-0.732	3	0	1	0	1
103	N14	max		0.082	2	0	4	-1.336	2	0	4	0	4
104		min		-0.335	1	0	1	-2.541	1	0	1	0	1
105	N2	max		0.327	1	0	4	6.083	3	0	4	0	4
106		min		0	2	0	1	4.741	1	0	1	0	1
107	N27	max		7.171	3	0	4	-0.714	1	0	4	0	4
108		min		4.222	1	0	1	-1.596	3	0	1	0	1
109	N6	max		0.38	1	0	4	-3.666	1	0	4	0	4
110		min		-0.565	2	0	1	-4.673	3	0	1	0	1
111	N15	max		-4.507	1	0	4	-0.666	2	0	4	0	4
112		min		-7.402	3	0	1	-1.436	1	0	1	0	1

Envelope Node Reactions (Continued)

Node Label			X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
113	N3	max	-0.331	1	0	4	5.858	3	0	4	0	4	0	4
114		min	-0.419	3	0	1	5.046	1	0	1	0	1	0	1
115	N28	max	-4.362	1	0	4	0.125	1	0	4	0	4	0	4
116		min	-7.083	3	0	1	-1.27	2	0	1	0	1	0	1
117	N4	max	-5.196	1	0	4	-4.063	1	0	4	0	4	0	4
118		min	-6.058	3	0	1	-4.703	3	0	1	0	1	0	1
119	N16	max	6.998	3	0	4	-1.556	1	0	4	0	4	0	4
120		min	4.397	1	0	1	-2.073	3	0	1	0	1	0	1
121	N33	max	-2.936	1	0	4	0.313	3	0	4	0	4	0	4
122		min	-6.267	3	0	1	0.214	1	0	1	0	1	0	1
123	N7	max	2.903	3	0	4	2.595	3	0	4	0	4	0	4
124		min	0.969	1	0	1	2.327	1	0	1	0	1	0	1
125	N17	max	0.198	1	0	4	-0.664	2	0	4	0	4	0	4
126		min	-0.783	3	0	1	-1.486	1	0	1	0	1	0	1
127	N8	max	1.24	1	0	4	3.785	3	0	4	0	4	0	4
128		min	-0.425	2	0	1	2.887	1	0	1	0	1	0	1
129	N29	max	6.21	3	0	4	-0.907	1	0	4	0	4	0	4
130		min	3.824	1	0	1	-1.205	3	0	1	0	1	0	1
131	N18	max	6.441	3	0	4	6.026	3	0	4	0	4	0	4
132		min	3.789	1	0	1	3.385	1	0	1	0	1	0	1
133	N10	max	-4.229	1	0	4	6.285	3	0	4	0	4	0	4
134		min	-4.831	3	0	1	5.259	1	0	1	0	1	0	1
135	N30	max	-3.737	1	0	4	-2.562	1	0	4	0	4	0	4
136		min	-6.144	3	0	1	-3.33	3	0	1	0	1	0	1
137	N37	max	-2.373	1	0	4	-6.401	1	0	4	0	4	0	4
138		min	-3.344	3	0	1	-9.322	3	0	1	0	1	0	1
139	N31	max	-3.272	1	0	4	4.049	3	0	4	0	4	0	4
140		min	-5.31	3	0	1	2.311	1	0	1	0	1	0	1
141	N20	max	-2.224	1	0	4	0.957	1	0	4	0	4	0	4
142		min	-4.07	3	0	1	0.677	2	0	1	0	1	0	1
143	N19	max	-0.91	1	0	4	2.86	3	0	4	0	4	0	4
144		min	-1.653	3	0	1	1.821	1	0	1	0	1	0	1
145	N32	max	5.351	3	0	4	3.068	3	0	4	0	4	0	4
146		min	2.891	1	0	1	2.219	1	0	1	0	1	0	1
147	N34	max	7.191	3	0	4	0.319	2	0	4	0	4	0	4
148		min	3.387	1	0	1	-0.376	1	0	1	0	1	0	1
149	Totals:	max	0	2	7263.119	3	0	3						
150		min	0	3	5238.898	1	0	2						



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Envelope Concrete Column Design Results

Column	Shape	UC Max	Loc[ft]	UC LC	Shear UC	LC	Loc[ft]	Dir	Phi used	Pn[k]	Mny[k-ft]	Mnz[k-ft]	Vny[k]	Vnz[k]
1	M1	CRECT18X18	0.324	20.25	3	0.034	3	0	z	0.65	1099.102		154.232	154.232
2	M2	CRECT18X18	0.619	0	3	0.051	3	0	z	0.65	626.159	306.007	158.453	158.453
3	M3	CRECT18X18	0.495	0	3	0.057	3	0	z	0.83	273.811	288.476	137.789	137.789
4	M4	CRECT18X18	0.554	0	3	0.055	3	0	y	0.9	183.738	270.286	145.607	145.607
5	M5	CRECT18X18	0.575	0	3	0.035	3	0	z	0.65	849.491	242.486	168.127	168.127
6	M6	CRECT18X18	0.443	20.25	3	0.037	3	0	z	0.65	1099.102		166.792	166.792
7	M7	CRECT18X18	0.372	0	3	0.025	3	0	y	0.65	881.699	152.737	152.735	152.735
8	M8	CRECT18X18	0.379	0	3	0.032	3	0	z	0.65	952.79	219.109	155.857	155.857
9	M9	CRECT18X18	0.519	0	3	0.081	3	0	y	0.887	170.761	56.316	132.761	132.761
10	M10	CRECT18X18	0.605	0	3	0.059	3	0	z	0.691	351.439	214.299	142.867	142.867
11	M11	CRECT18X18	0.634	0	3	0.111	3	0	z	0.9	83.205	210.327	128.144	128.144
12	M12	CRECT18X18	0.276	14.25	3	0.059	3	0	y	0.65	1099.102		149.444	149.444
13	M13	CRECT18X18	0.351	14.25	3	0.03	3	0	z	0.65	1099.102		157.452	157.452
14	M14	CRECT18X18	0.318	11.25	3	0.024	1	0	z	0.65	1099.102		143.758	143.758
15	M15	CRECT18X18	0.39	0	3	0.071	3	0	y	0.677	441.786	30.049	138.394	138.394
16	M16	CRECT18X18	0.203	11.25	3	0.066	3	0	y	0.65	1099.102		141.909	141.909
17	M17	CRECT18X18	0.275	11.25	3	0.014	1	0	z	0.65	1099.102		140.622	140.622
18	M18	CRECT18X18	0.557	0	3	0.057	3	0	y	0.65	558.412	187.32	151.051	151.051
19	M19	CRECT18X18	0.331	0	3	0.025	3	0	z	0.65	1060.851	149.35	154.962	154.962
20	M20	CRECT18X18	0.269	11.25	3	0.036	3	0	y	0.65	1099.102		148.915	148.915
21	M21	CRECT18X18	0.429	0	3	0.086	3	0	z	0.9	155.927	243.777	130.034	130.034
22	M22	CRECT18X18	0.351	11.25	3	0.07	3	0	y	0.65	1099.102		157.603	157.603
23	M23	CRECT18X18	0.185	11.25	3	0.026	3	0	z	0.65	1099.102		140.068	140.068
24	M24	CRECT18X18	0.074	5.625	3	0.022	3	0	z	0.65	461.883	234.475	124.09	124.09
25	M25	CRECT18X18	0.353	5.625	3	0.074	3	0	y	0.65	984.12		154.214	154.214
26	M26	CRECT18X18	0.469	0	3	0.062	3	0	y	0.65	787.629	26.998	156.708	156.708
27	M27	CRECT14X18	0.334	11.25	3	0.08	3	0	y	0.65	898.817		119.25	144.346
28	M28	CRECT14X18	0.623	0	3	0.077	3	0	y	0.65	535.875	35.003	122.883	148.113
29	M29	CRECT14X18	0.289	11.25	3	0.072	3	0	y	0.65	898.817		115.488	140.445
30	M30	CRECT14X18	0.598	0	3	0.072	3	0	y	0.65	399.253	96.394	114.026	138.929
31	M31	CRECT14X18	0.316	11.25	3	0.06	3	0	y	0.65	898.817		117.749	142.789
32	M32	CRECT14X18	0.555	0	3	0.06	3	0	y	0.65	519.842	95.694	118.646	143.72
33	M33	CRECT14X18	0.597	0	3	0.065	3	0	y	0.65	656.297		128.212	153.64
34	M34	CRECT14X18	0.621	0	3	0.077	3	0	y	0.65	572.479		124.896	150.201
35	M35	CRECT14X18	0.622	11.25	3	0.074	3	11.25	y	0.65	898.817		135.059	160.741
36	M36	CRECT14X18	0.781	0	3	0.11	3	0	y	0.65	431.849		123.169	148.411
37	M37	CRECT14X18	0.393	0	3	0.088	3	0	z	0.896	194.231	241.447	116.708	141.709



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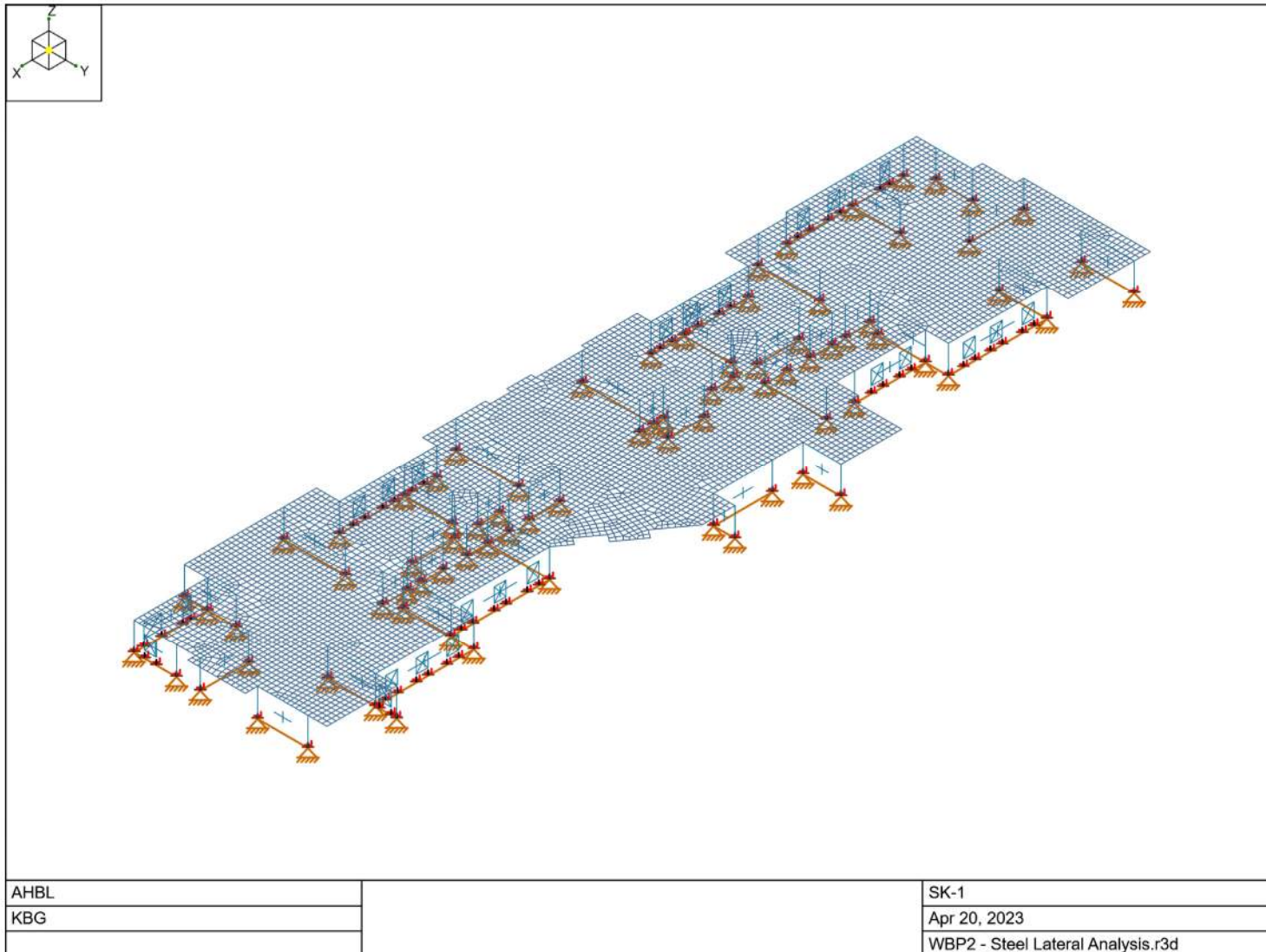
Concrete Column Bending Reinforcement

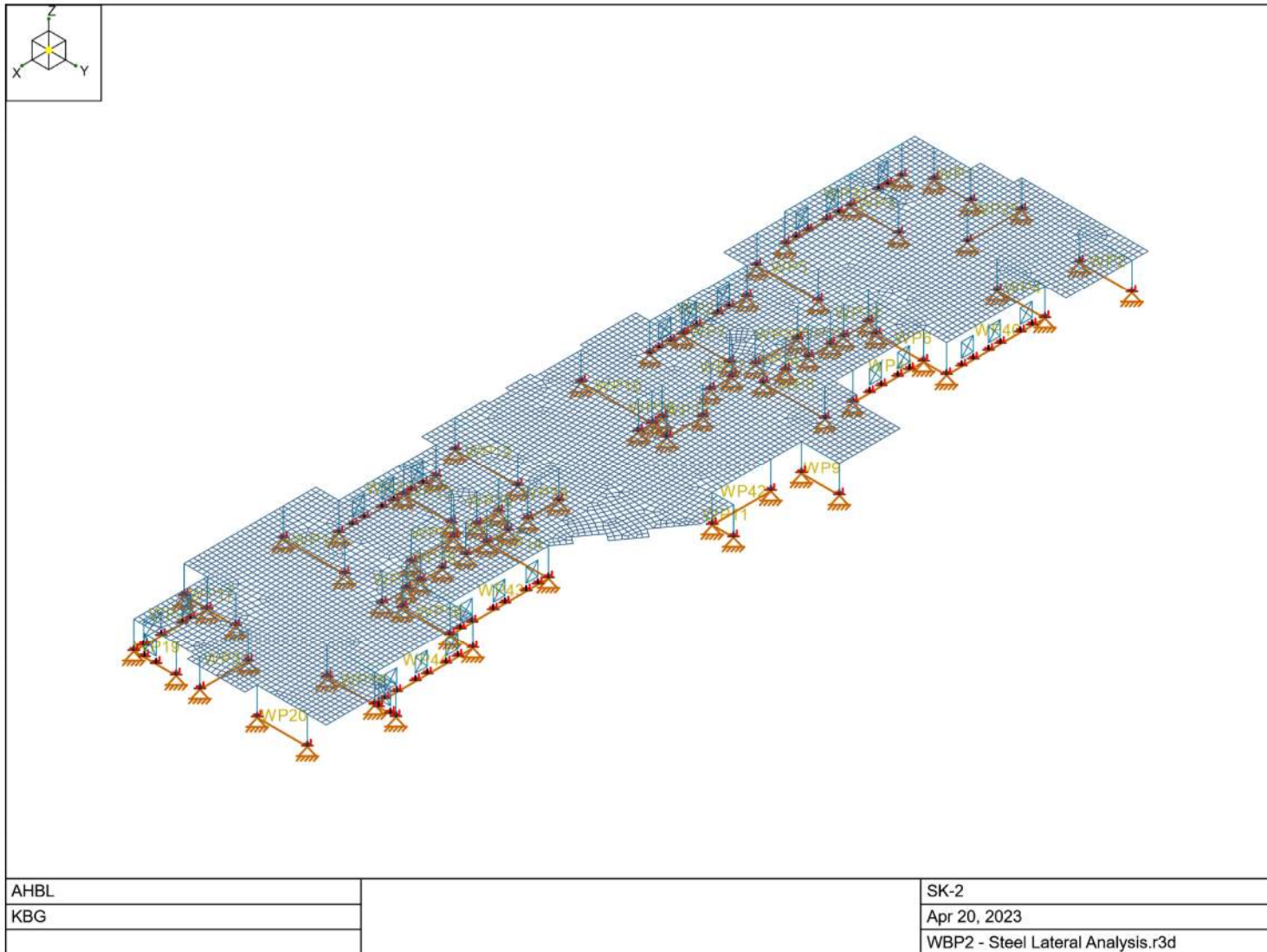
	Column	Shape	Span
1	M1	CRECT18X18	1
2	M2	CRECT18X18	1
3	M3	CRECT18X18	1
4	M4	CRECT18X18	1
5	M5	CRECT18X18	1
6	M6	CRECT18X18	1
7	M7	CRECT18X18	1
8	M8	CRECT18X18	1
9	M9	CRECT18X18	1
10	M10	CRECT18X18	1
11	M11	CRECT18X18	1
12	M12	CRECT18X18	1
13	M13	CRECT18X18	1
14	M14	CRECT18X18	1
15	M15	CRECT18X18	1
16	M16	CRECT18X18	1
17	M17	CRECT18X18	1
18	M18	CRECT18X18	1
19	M19	CRECT18X18	1
20	M20	CRECT18X18	1
21	M21	CRECT18X18	1
22	M22	CRECT18X18	1
23	M23	CRECT18X18	1
24	M24	CRECT18X18	1
25	M25	CRECT18X18	1
26	M26	CRECT18X18	1
27	M27	CRECT14X18	1
28	M28	CRECT14X18	1
29	M29	CRECT14X18	1
30	M30	CRECT14X18	1
31	M31	CRECT14X18	1
32	M32	CRECT14X18	1
33	M33	CRECT14X18	1
34	M34	CRECT14X18	1
35	M35	CRECT14X18	1
36	M36	CRECT14X18	1
37	M37	CRECT14X18	1

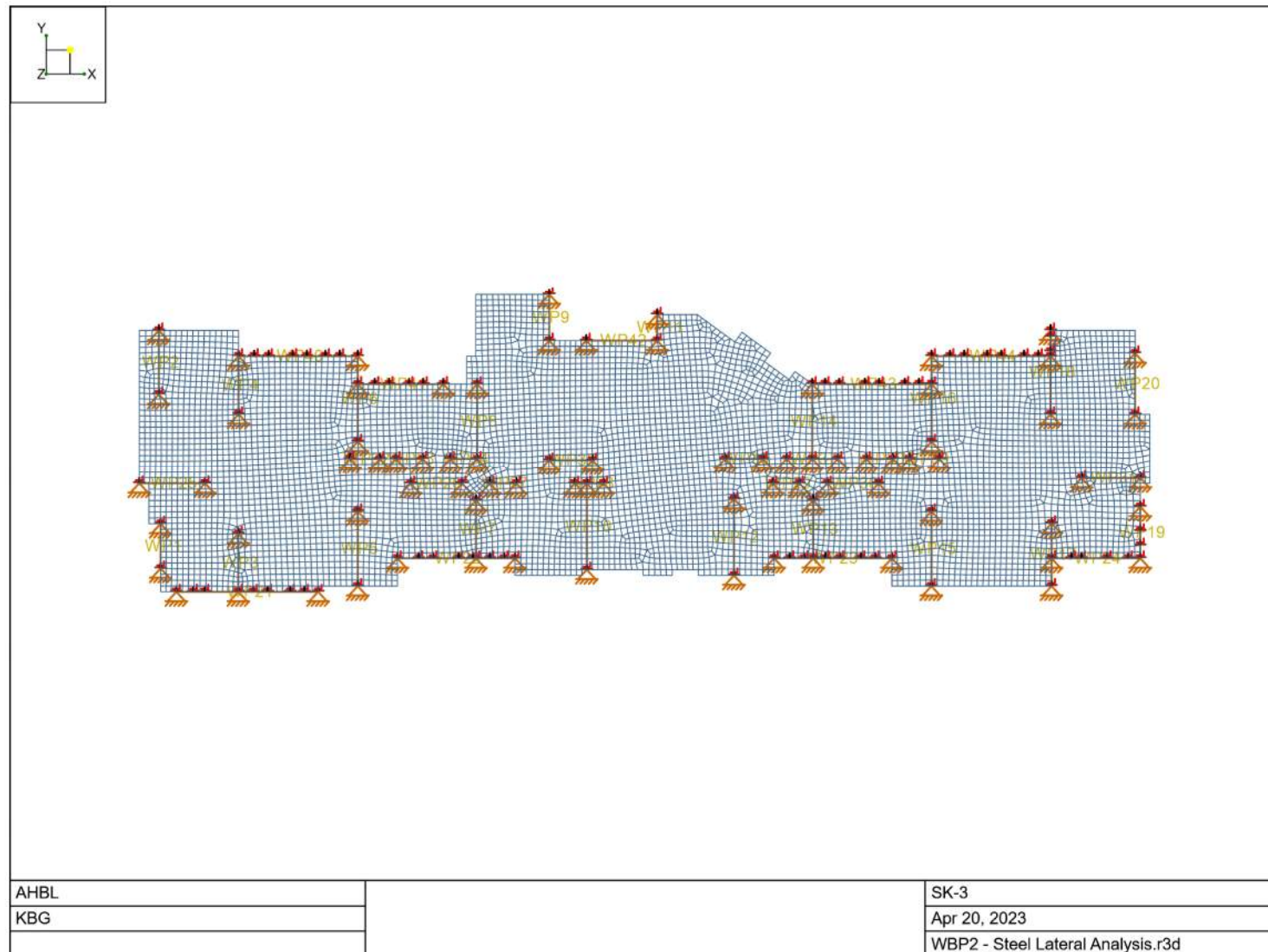
Concrete Column Shear Reinforcement

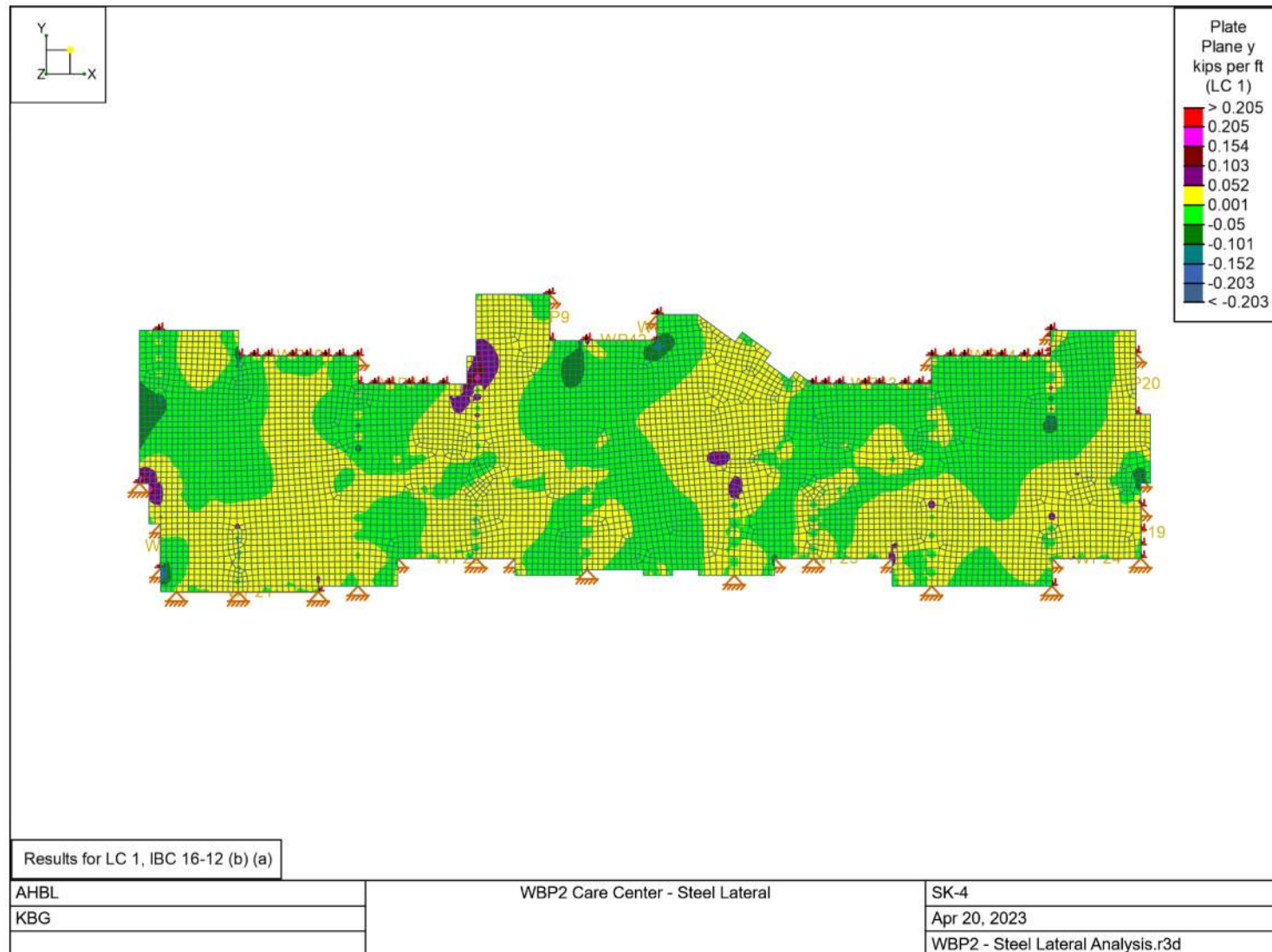
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1	M1	1
2	M2	1
3	M3	1
4	M4	1
5	M5	1
6	M6	1
7	M7	1
8	M8	1
9	M9	1
10	M10	1
11	M11	1
12	M12	1
13	M13	1
14	M14	1
15	M15	1
16	M16	1
17	M17	1
18	M18	1
19	M19	1
20	M20	1
21	M21	1
22	M22	1
23	M23	1
24	M24	1
25	M25	1
26	M26	1
27	M27	1
28	M28	1
29	M29	1
30	M30	1
31	M31	1
32	M32	1
33	M33	1
34	M34	1
35	M35	1
36	M36	1
37	M37	1

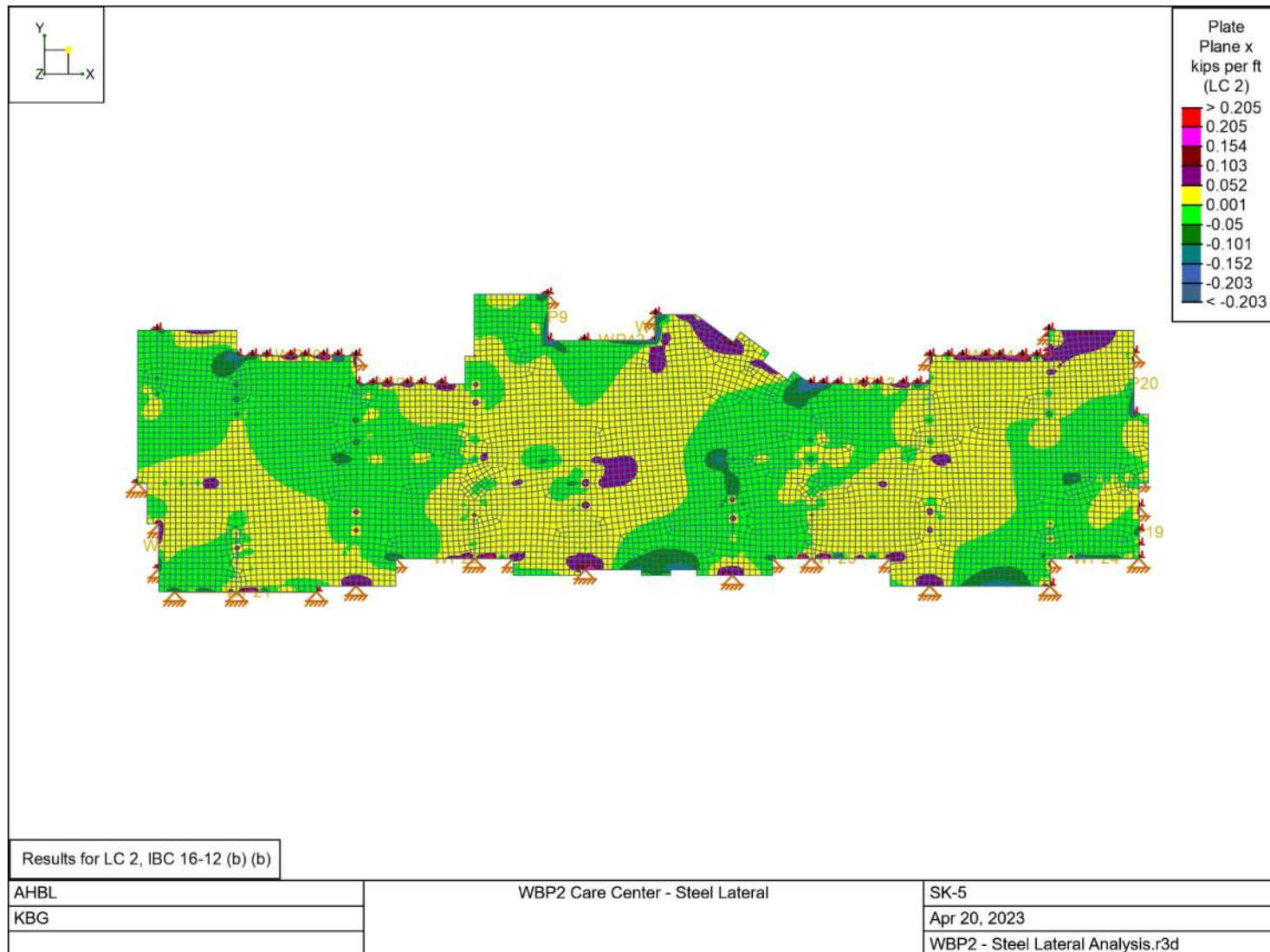
7.0 - STEEL LATERAL DESIGN



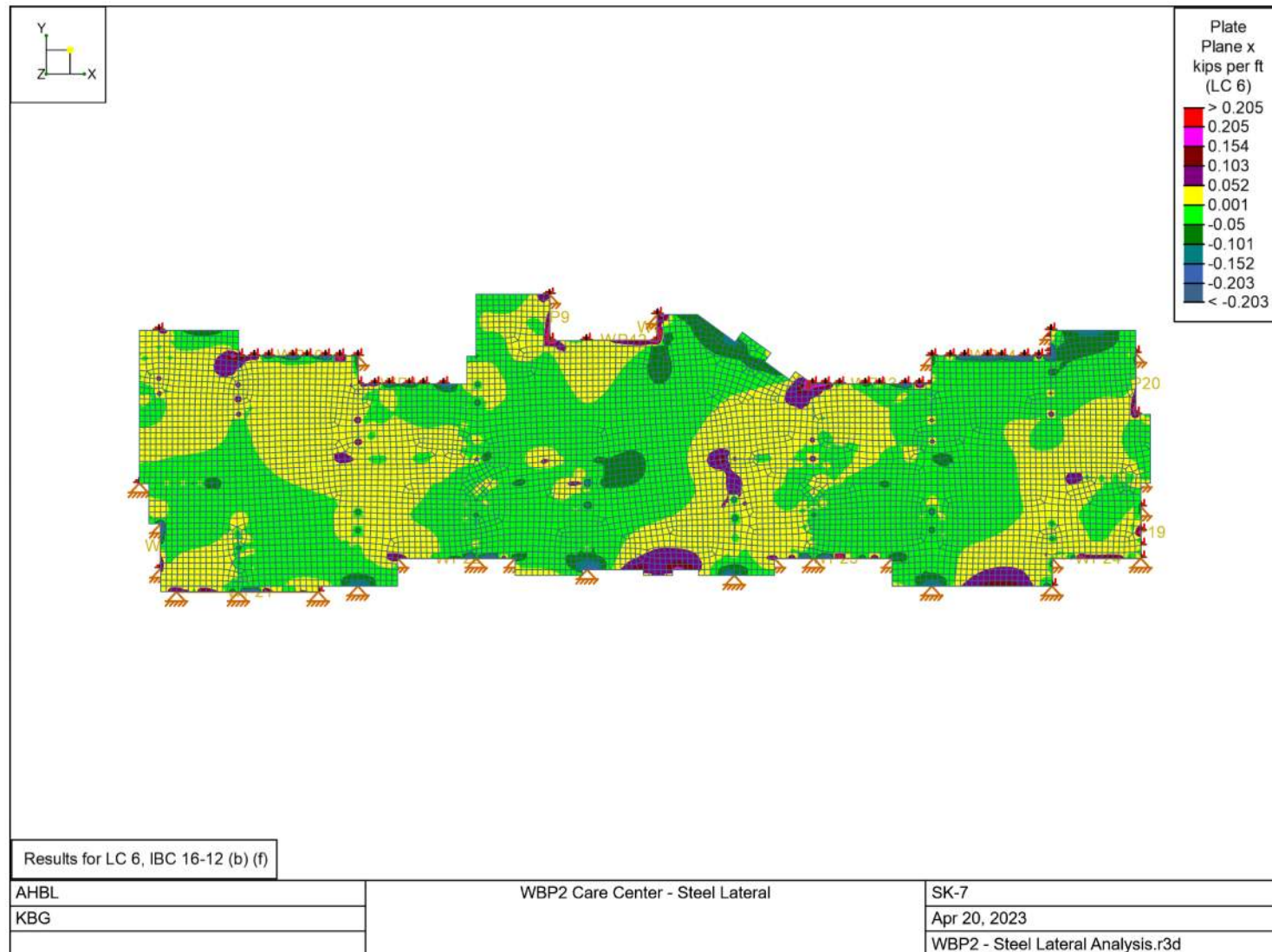


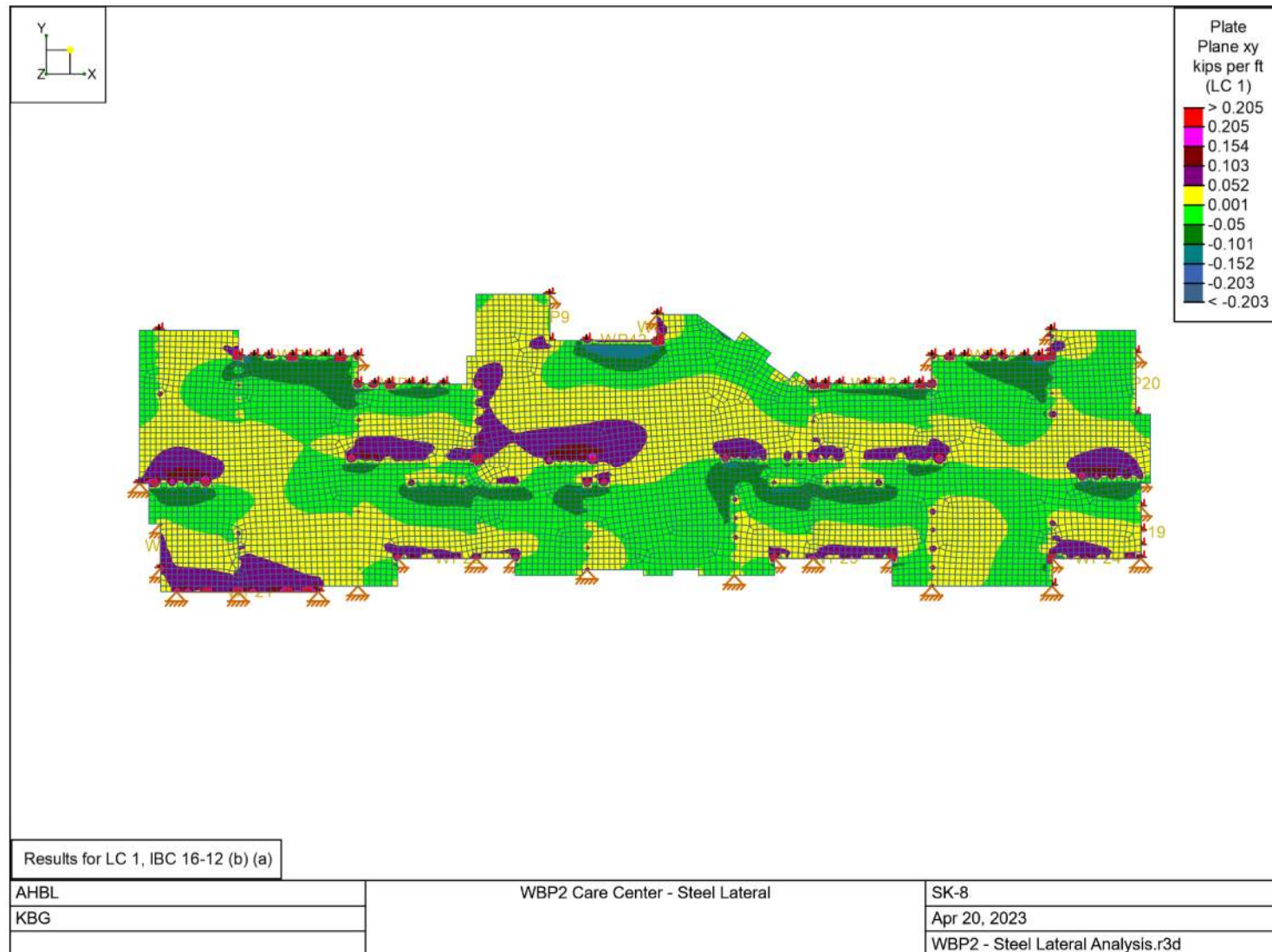


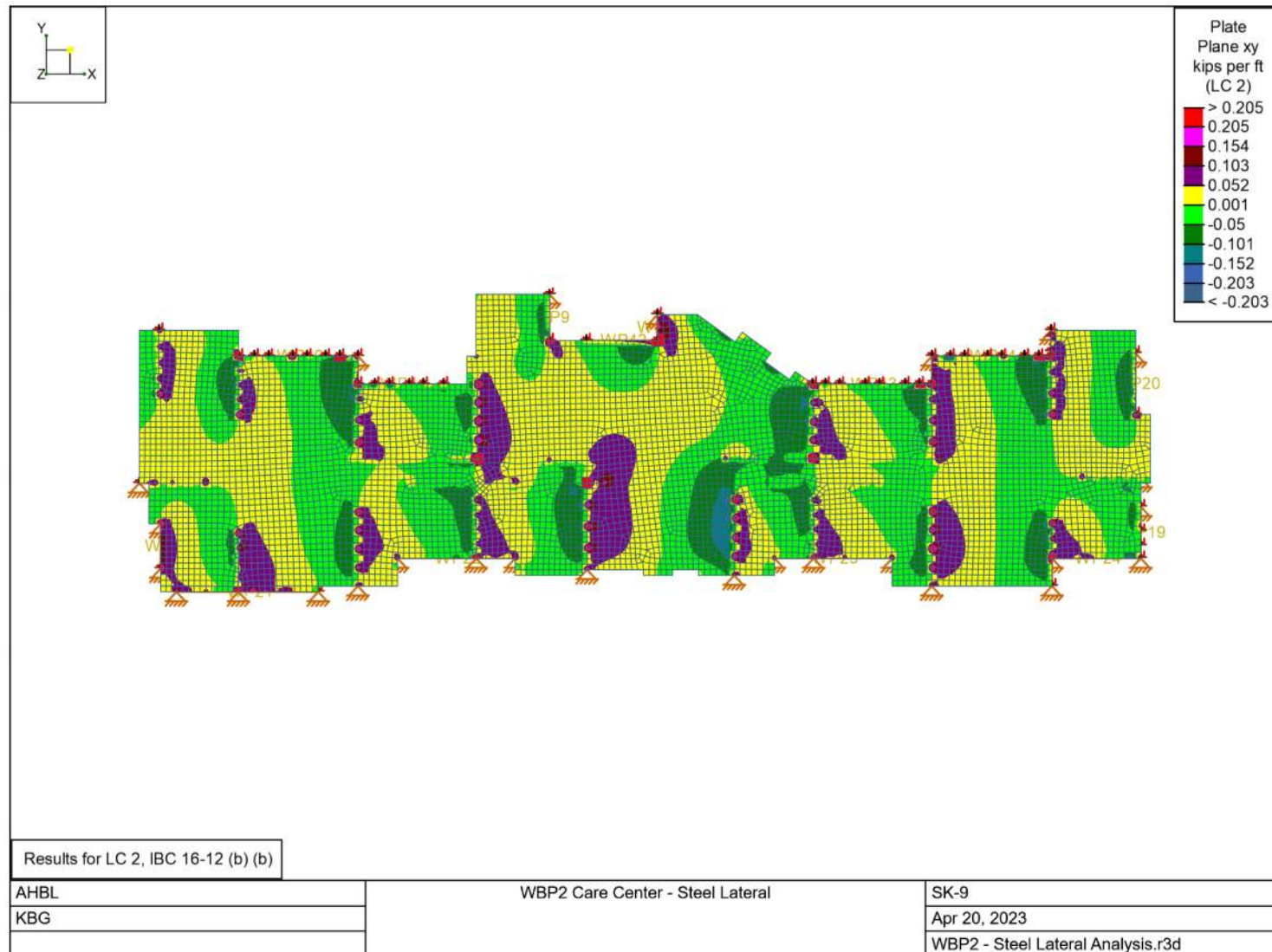


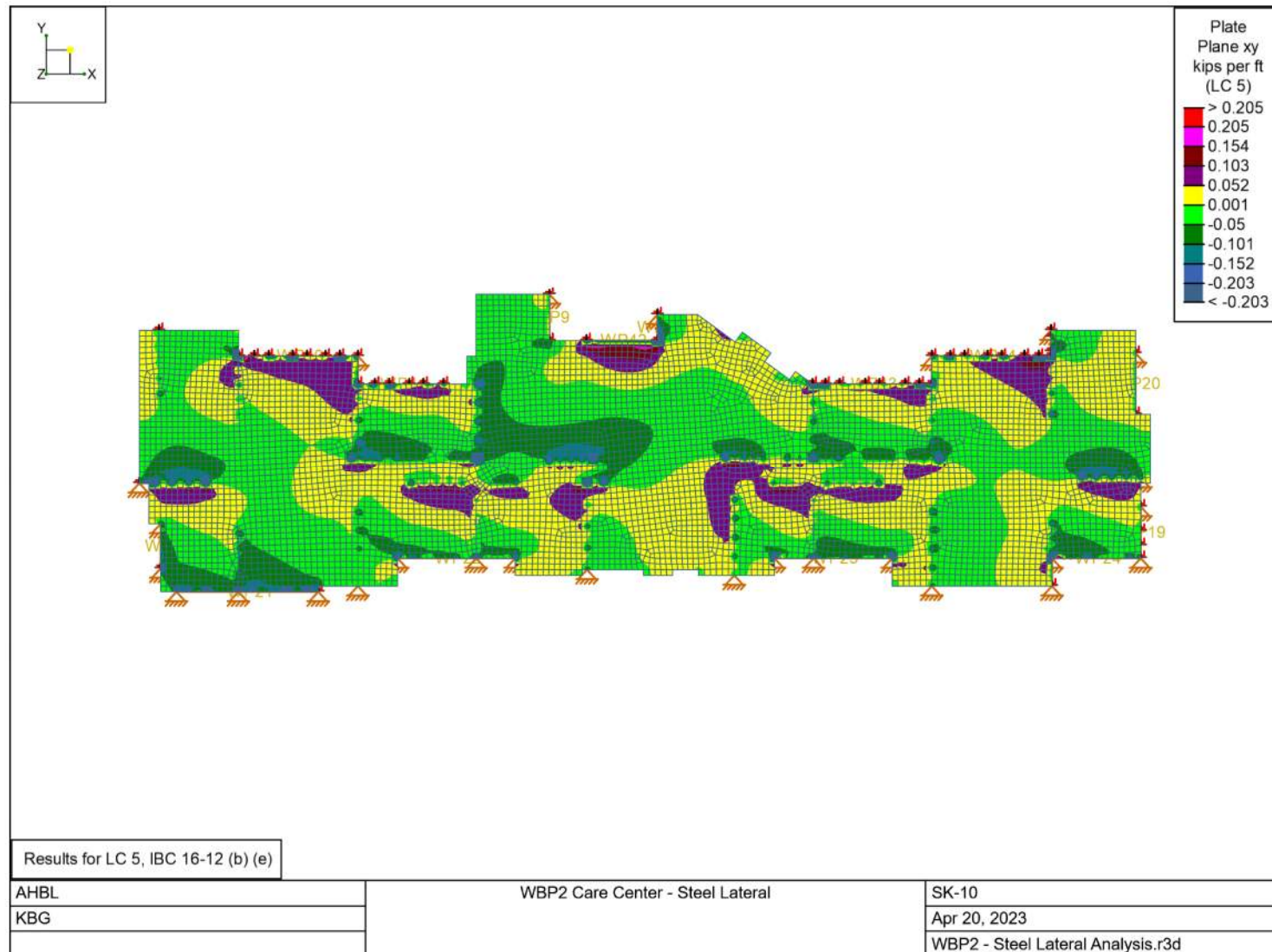


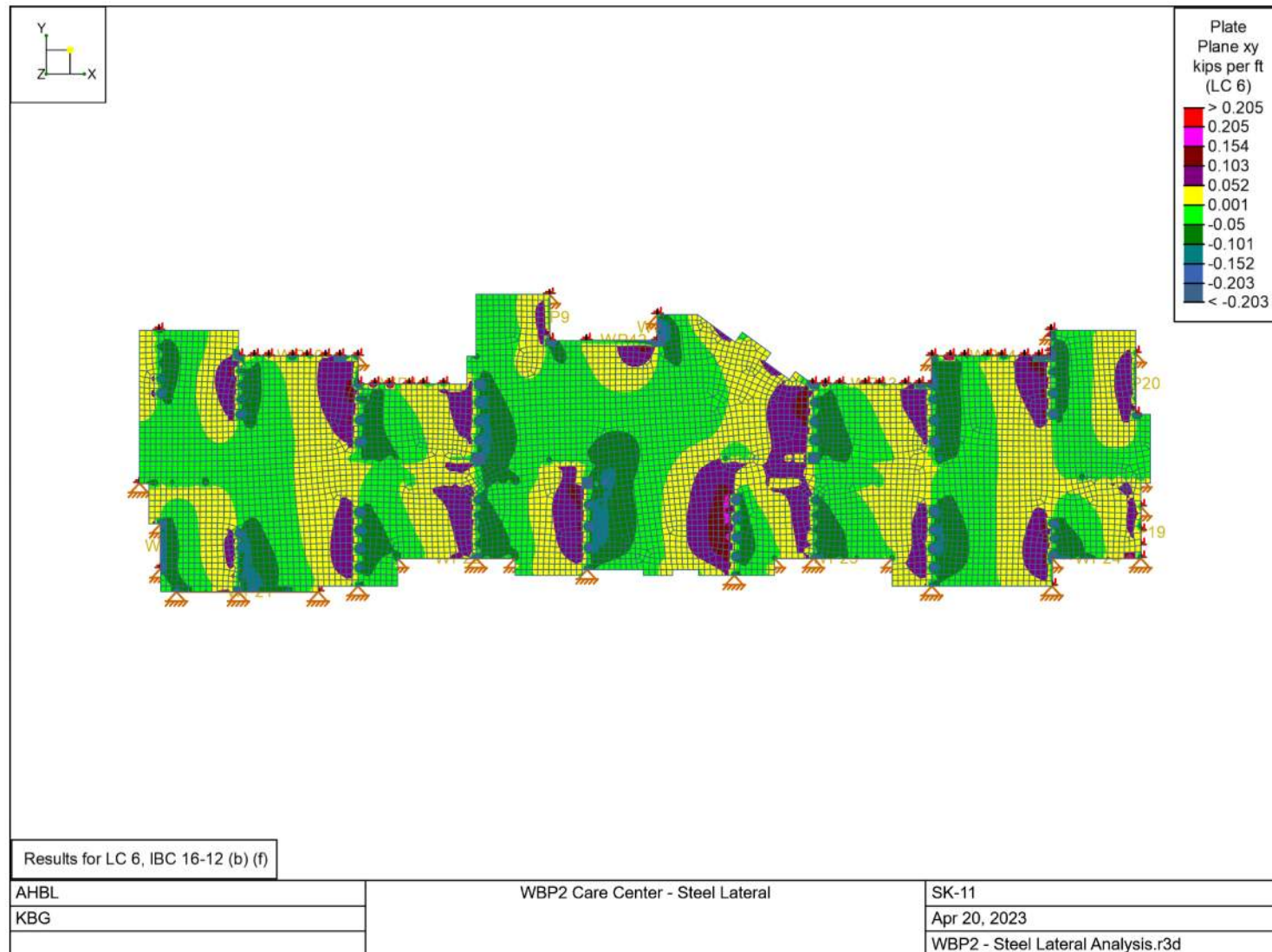












Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [10^{-6}F^{-1}]	Density [k/ft ³]	Yield [ksi]	Fu [ksi]
1	A653 SS Gr33	29500	11346	0.3	0.65	0.49	33	45
2	A653 SS Gr50/1	29500	11346	0.3	0.65	0.49	50	65

General Materials Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [10^{-6}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	10100	4077	0.3	1.29	0.173	Isotropic
6	gen Steel	29000	11154	0.3	0.65	0.49	Isotropic
7	gen Plywood	1800	38	0	0.3	0.035	Isotropic
8	RIGID	1e+6		0.3	0	0	Isotropic
9	gen Ortho	N/A	N/A	N/A	0.65	0.49	Orthotropic
10	Verco SV	29000	11154	0.3	0.65	0	Isotropic

Plate Primary Data

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
1	P1	N334	N333	N332	N331	gen Conc3NW	0.013

Plate Advanced Data

	Label	Plane Stress	Rotate
1	P1	Yes	90

Wall Panel Data

	Label	A Node	B Node	C Node	D Node	Material Type	Material Set	Thickness [in]	Design Rule	Panel/Spacing
1	WP1	N152	N17	N60	N153	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
2	WP2	N139	N4	N5	N140	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
3	WP3	N137	N2	N3	N138	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
4	WP4	N141	N6	N109	N115	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
5	WP5	N154	N18	N19	N155	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
6	WP6	N142	N7	N108	N116	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
7	WP7	N157	N21	N20	N156	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@3/12 33 EQ 16

Wall Panel Data (Continued)

	Label	A Node	B Node	C Node	D Node	Material Type	Material Set	Thickness [in]	Design Rule	Panel/Spacing
8	WP8	N145	N10	N9	N146	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
9	WP9	N130	N101	N102	N129	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
10	WP10	N159	N23	N22	N158	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@3/12 43 EQ 16
11	WP11	N118	N100	N99	N192	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@2/12 43 EQ 16
12	WP12	N191	N54	N53	N190	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@2/12 33 EQ 16
13	WP13	N132	N52	N51	N131	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
14	WP14	N189	N50	N91	N170	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
15	WP15	N194	N56	N55	N193	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
16	WP16	N120	N49	N89	N119	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
17	WP17	N187	N80	N47	N188	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
18	WP18	N125	N48	N87	N126	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@2/12 33 EQ 16
19	WP19	N167	N82	N57	N195	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
20	WP20	N133	N113	N114	N134	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
21	WP21	N135	N1	N62	N136	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
22	WP22	N123	N65	N66	N124	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
23	WP23	N168	N77	N78	N169	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
24	WP24	N166	N81	N82	N167	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@2/12 43 EQ 16
25	WP25	N150	N112	N16	N151	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@3/12 33 EQ 16
26	WP26	N163	N29	N28	N162	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
27	WP27	N128	N27	N26	N127	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
28	WP28	N161	N25	N24	N160	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@2/12 43 EQ 16
29	WP29	N184	N44	N43	N183	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 33 EQ 16
30	WP30	N180	N40	N39	N179	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
31	WP31	N174	N34	N33	N173	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@3/12 33 EQ 16
32	WP32	N149	N15	N14	N148	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
33	WP33	N122	N13	N12	N121	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
34	WP34	N147	N11	N10	N145	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
35	WP35	N164	N30	N31	N165	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
36	WP36	N186	N46	N45	N185	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
37	WP37	N182	N42	N41	N181	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
38	WP38	N178	N38	N37	N177	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
39	WP39	N176	N36	N35	N175	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@4/12 43 EQ 16
40	WP40	N115	N109	N108	N116	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@3/12 33 EQ 16
41	WP41	N143	N107	N8	N144	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
42	WP42	N117	N32	N100	N118	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@2/12 33 EQ 16
43	WP43	N170	N91	N90	N171	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@6/12 33 EQ 16
44	WP44	N119	N89	N88	N172	CFS	A653 SS Gr33	6 (stud)	Typical	0.027 #8@3/12 33 EQ 16



Company : AHBL
 Designer : KBG
 Job Number :
 Model Name : WBP2 Care Center - Steel Lateral

4/20/2023
 1:31:24 PM
 Checked By : _____

Wall Panel Advanced Data

	Label	Seismic Rule	Design Method	SSAF	In-Plane Icr Factor	Out-Plane Icr Factor	Cm In-Plane	Cm Out-Plane	Stud Bracing	Sheathing Connect	Dist [in]
1	WP1	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
2	WP2	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
3	WP3	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
4	WP4	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
5	WP5	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
6	WP6	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
7	WP7	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
8	WP8	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
9	WP9	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
10	WP10	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
11	WP11	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
12	WP12	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
13	WP13	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
14	WP14	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
15	WP15	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
16	WP16	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
17	WP17	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
18	WP18	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
19	WP19	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
20	WP20	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
21	WP21	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
22	WP22	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
23	WP23	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
24	WP24	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
25	WP25	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
26	WP26	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
27	WP27	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
28	WP28	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
29	WP29	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
30	WP30	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
31	WP31	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
32	WP32	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
33	WP33	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
34	WP34	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
35	WP35	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
36	WP36	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
37	WP37	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
38	WP38	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	
39	WP39	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A	

Wall Panel Advanced Data (Continued)

	Label	Seismic Rule	Design Method	SSAF	In-Plane Icr Factor	Out-Plane Icr Factor	Cm In-Plane	Cm Out-Plane	Stud Bracing	Sheathing Connect Dist [in]
40	WP40	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A
41	WP41	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A
42	WP42	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A
43	WP43	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A
44	WP44	N/A	Type I - Segmented	N/A	N/A	N/A	N/A	N/A	All Steel	N/A

Wall Panel U.C. Parameters

	Label	Max Bending Chk	Max Shear Chk
1	Typical	1	1

Basic Load Cases

	BLC Description	Category	Y Gravity	Surface (Plate/Wall)
1	DL	DL	-1	
2	SL	SL		
3	ELX	ELX		7061
4	ELY	ELY		7061

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	IBC 16-12 (b) (a)	Yes	Y	DL	1	Sds*DL	0.14	ELX	0.7	ELY	0.21		
2	IBC 16-12 (b) (b)	Yes	Y	DL	1	Sds*DL	0.14	ELY	0.7	ELX	0.21		
3	IBC 16-12 (b) (c)	Yes	Y	DL	1	Sds*DL	0.14	ELX	0.7	ELY	-0.21		
4	IBC 16-12 (b) (d)	Yes	Y	DL	1	Sds*DL	0.14	ELY	0.7	ELX	-0.21		
5	IBC 16-12 (b) (e)	Yes	Y	DL	1	Sds*DL	0.14	ELX	-0.7	ELY	-0.21		
6	IBC 16-12 (b) (f)	Yes	Y	DL	1	Sds*DL	0.14	ELY	-0.7	ELX	-0.21		
7	IBC 16-12 (b) (g)	Yes	Y	DL	1	Sds*DL	0.14	ELX	-0.7	ELY	0.21		
8	IBC 16-12 (b) (h)	Yes	Y	DL	1	Sds*DL	0.14	ELY	-0.7	ELX	0.21		
9	IBC 16-14 (a)	Yes	Y	DL	1	Sds*DL	0.105	ELX	0.525	ELY	0.158	SL	0.75
10	IBC 16-14 (b)	Yes	Y	DL	1	Sds*DL	0.105	ELY	0.525	ELX	0.158	SL	0.75
11	IBC 16-14 (c)	Yes	Y	DL	1	Sds*DL	0.105	ELX	0.525	ELY	-0.158	SL	0.75
12	IBC 16-14 (d)	Yes	Y	DL	1	Sds*DL	0.105	ELY	0.525	ELX	-0.158	SL	0.75
13	IBC 16-14 (e)	Yes	Y	DL	1	Sds*DL	0.105	ELX	-0.525	ELY	-0.158	SL	0.75
14	IBC 16-14 (f)	Yes	Y	DL	1	Sds*DL	0.105	ELY	-0.525	ELX	-0.158	SL	0.75
15	IBC 16-14 (g)	Yes	Y	DL	1	Sds*DL	0.105	ELX	-0.525	ELY	0.158	SL	0.75
16	IBC 16-14 (h)	Yes	Y	DL	1	Sds*DL	0.105	ELY	-0.525	ELX	0.158	SL	0.75

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
17	IBC 16-16 (a)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELX	0.7	ELY	0.21		
18	IBC 16-16 (b)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELY	0.7	ELX	0.21		
19	IBC 16-16 (c)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELX	0.7	ELY	-0.21		
20	IBC 16-16 (d)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELY	0.7	ELX	-0.21		
21	IBC 16-16 (e)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELX	-0.7	ELY	-0.21		
22	IBC 16-16 (f)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELY	-0.7	ELX	-0.21		
23	IBC 16-16 (g)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELX	-0.7	ELY	0.21		
24	IBC 16-16 (h)	Yes	Y	DL	0.6	Sds*DL	-0.14	ELY	-0.7	ELX	0.21		
25	ELX		Y	ELX	1								
26	-ELX		Y	ELX	-1								
27	ELY		Y	ELY	1								
28	-ELY		Y	ELY	-1								

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	WP1	max	0	7	3.651	6	0	21	36.458	18	0	20	2.518	8
2		min	0	19	-2.991	18	0	1	-42.392	6	0	8	-2.3	20
3	WP2	max	0	7	4.676	6	0	7	47.323	18	0	24	1.583	8
4		min	0	19	-3.876	18	0	19	-54.093	6	0	1	-1.463	20
5	WP3	max	0.024	17	6.94	6	3.178	18	40.582	20	0	24	11.148	3
6		min	-0.024	23	-5.534	18	-3.74	6	-46.547	8	0	1	-11.075	23
7	WP4	max	0.11	3	7.351	8	3.04	5	65.097	20	0	24	13.08	5
8		min	-0.106	23	-6.221	20	-2.778	17	-72.409	8	0	1	-12.899	17
9	WP5	max	0	21	7.076	8	0	7	71.898	20	0	24	1.242	7
10		min	0	1	-5.912	20	0	19	-82.539	8	0	1	-1.158	19
11	WP6	max	0.119	3	8.064	6	2.026	5	70.89	18	0	24	5.78	7
12		min	-0.119	23	-6.35	18	-1.874	17	-83.051	6	0	1	-5.752	19
13	WP7	max	0.144	17	6.154	8	2.334	20	42.643	18	0	18	4.149	17
14		min	-0.148	5	-4.861	20	-2.774	8	-49.44	6	0	6	-4.181	5
15	WP8	max	0.063	3	9.319	6	3.494	17	70.649	20	0	8	14.226	19
16		min	-0.057	23	-7.83	18	-3.798	5	-80.261	8	0	20	-14.25	7
17	WP9	max	0	23	4.006	8	0	20	41.475	20	0	24	8.242	18
18		min	0	3	-3.407	20	0	8	-46.611	8	0	1	-8.76	6
19	WP10	max	0.118	3	12.181	8	5.215	6	60.182	20	0	24	14.824	5
20		min	-0.116	23	-10.468	20	-4.667	18	-67.566	8	0	1	-14.69	17
21	WP11	max	0.041	8	5.741	6	4.773	18	39.722	20	0	24	5.742	8
22		min	-0.037	20	-4.881	18	-5.289	6	-44.483	8	0	1	-5.494	20
23	WP12	max	0	23	8.718	6	0	21	91.061	18	0	24	4.009	20

Envelope Node Reactions (Continued)

Node Label			X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
24		min	0	3	-7.507	18	0	1	-102.19	6	0	1	-4.178	8
25	WP13	max	0.114	17	5.641	6	2.135	20	34.338	18	0	24	4.342	3
26		min	-0.115	5	-4.361	18	-2.58	8	-40.765	6	0	1	-4.287	23
27	WP14	max	0.056	3	9.142	8	2.669	20	33.312	20	0	20	0.519	1
28		min	-0.053	23	-7.31	20	-3.095	8	-38.611	8	0	8	-0.513	21
29	WP15	max	0	21	6.971	6	0	19	71.107	18	0	24	2.65	21
30		min	0	1	-5.846	18	0	7	-81.28	6	0	1	-2.807	1
31	WP16	max	0.115	17	7.953	8	0.991	8	70.979	20	0	24	5.153	23
32		min	-0.115	5	-6.267	20	-0.823	20	-82.902	8	0	1	-5.188	3
33	WP17	max	0.127	19	6.135	6	5.033	23	61.959	18	0	24	4.181	18
34		min	-0.129	7	-5.009	18	-5.1	3	-71.236	6	0	1	-4.342	6
35	WP18	max	0.224	17	7.242	6	3.096	3	70.984	18	0	24	8.755	23
36		min	-0.227	5	-5.995	18	-2.9	23	-80.439	6	0	1	-8.932	3
37	WP19	max	0.077	3	2.862	8	0.935	18	21.528	20	0	24	2.163	17
38		min	-0.072	23	-2.171	20	-1.131	6	-25.265	8	0	1	-2.259	5
39	WP20	max	0	21	4.028	8	0	1	40.145	20	0	24	3.017	20
40		min	0	1	-3.28	20	0	21	-46.403	8	0	1	-3.304	8
41	WP21	max	6.523	5	0.204	4	3.74	6	0	24	85	5	4.053	3
42		min	-6.469	17	0.031	24	-3.178	18	0	1	-82.587	17	-3.605	23
43	WP22	max	5.8	23	0.209	2	2.774	8	0	24	82.19	23	2.83	19
44		min	-5.827	3	0.008	22	-2.334	20	0	1	-85.628	3	-3.934	7
45	WP23	max	6.362	7	0.188	2	2.58	8	0	24	77.579	5	4.3	3
46		min	-6.353	19	0.016	22	-2.135	20	0	1	-74.397	17	-2.928	23
47	WP24	max	5.604	23	0.131	4	4.796	3	0	24	24.048	17	3.041	8
48		min	-5.638	3	-0.041	24	-4.532	23	0	1	-26.421	5	-1.977	20
49	WP25	max	6.711	23	0.174	6	0	4	0	24	80.528	23	4.3	19
50		min	-6.73	3	0.07	18	0	24	0	1	-80.759	3	-4.514	7
51	WP26	max	3.885	23	0.136	6	0	22	0	24	46.615	23	3.433	18
52		min	-3.896	3	0.055	18	0	2	0	1	-46.749	3	-3.919	6
53	WP27	max	2.453	5	0.07	8	0	17	0	24	29.434	5	2.921	8
54		min	-2.44	17	0.028	20	0	5	0	1	-29.28	17	-2.716	20
55	WP28	max	4.664	5	0.05	4	4.667	18	0	6	53.874	23	4.078	6
56		min	-4.653	17	-0.031	24	-5.215	6	0	18	-54.174	3	-3.755	18
57	WP29	max	2.438	23	0.07	6	0	22	0	3	29.259	23	2.626	18
58		min	-2.469	3	0.028	18	0	2	0	23	-29.63	3	-2.844	6
59	WP30	max	3.86	23	0.136	8	0	24	0	17	46.322	23	3.959	8
60		min	-3.863	3	0.055	20	0	4	0	5	-46.352	3	-3.469	20
61	WP31	max	6.188	5	0.155	8	0	4	0	24	74.251	5	3.328	1
62		min	-6.187	17	0.063	20	0	24	0	1	-74.242	17	-3.313	21

Envelope Node Reactions (Continued)

Node Label			X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
63	WP32	max	3.687	5	0.079	8	0	21	0	5	44.24	5	1.368	5
64		min	-3.68	17	0.032	20	0	1	0	17	-44.16	17	-1.162	17
65	WP33	max	2.111	21	0.07	6	0	2	0	21	25.337	21	0.143	5
66		min	-2.114	1	0.028	18	0	22	0	1	-25.374	1	-0.096	17
67	WP34	max	3.305	5	0.041	7	3.798	5	0	3	25.563	23	6.069	18
68		min	-3.275	17	-0.019	19	-3.494	17	0	23	-26.566	3	-7.339	6
69	WP35	max	5.499	5	0.115	8	0	4	0	23	65.984	5	0.456	20
70		min	-5.467	17	0.047	20	0	24	0	3	-65.606	17	-0.542	8
71	WP36	max	4.817	5	0.1	6	0	4	0	24	57.804	5	3.524	18
72		min	-4.816	17	0.04	18	0	24	0	1	-57.792	17	-3.728	6
73	WP37	max	3.732	23	0.047	2	4.074	8	0	3	45.257	23	1.818	2
74		min	-3.747	3	-0.011	22	-3.458	20	0	23	-45.441	3	-1.745	22
75	WP38	max	1.856	23	0.07	8	0	4	0	23	22.276	23	0.127	19
76		min	-1.857	3	0.028	20	0	24	0	3	-22.279	3	-0.166	7
77	WP39	max	3.515	23	0.079	6	0	24	0	17	42.174	23	0.926	23
78		min	-3.523	3	0.032	18	0	4	0	5	-42.271	3	-1.14	3
79	WP40	max	7.144	5	0.188	4	2.463	18	0	24	20.449	18	0.397	21
80		min	-7.098	17	0.004	24	-2.899	6	0	1	-21.803	6	-0.491	1
81	WP41	max	4.922	23	0.15	2	3.527	3	0	24	4.393	20	5.566	6
82		min	-4.981	3	0.029	22	-3.504	23	0	1	-4.607	8	-3.542	18
83	WP42	max	7.651	23	0.177	4	5.289	6	0	24	80.649	23	15.252	20
84		min	-7.673	3	-0.086	24	-4.773	18	0	1	-87.256	3	-18.92	8
85	WP43	max	6.043	5	0.196	4	1.499	20	0	24	16.694	18	0.42	5
86		min	-5.985	17	0.014	24	-1.687	8	0	1	-20.134	6	-0.351	17
87	WP44	max	6.615	23	0.187	2	1.997	20	0	18	13.869	3	0.862	6
88		min	-6.658	3	0.006	22	-2.365	8	0	6	-13.726	23	-0.677	18
89	Totals:	max	112.384	5	131.781	8	0	5						
90		min	-112.384	1	-104.557	20	0	17						

Envelope Wall Panel Forces

	Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC
1	WP1	0	max	0	23	3.709	6	0.058	23	0	19	36.456	18
2		0	min	0	1	-3.049	18	-0.058	1	0	5	-42.39	6
3	WP2	0	max	0	23	4.768	6	0.092	23	0	19	47.321	18
4		0	min	0	1	-3.967	18	-0.092	1	0	5	-54.09	6
5	WP3	0	max	3.178	18	7.017	6	0.053	21	0.002	7	40.581	20
6		0	min	-3.74	6	-5.611	18	-0.053	1	-0.002	19	-46.545	8
7	WP4	0	max	3.04	5	7.426	8	0.037	3	0.002	23	65.095	20

Envelope Wall Panel Forces (Continued)

	Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC
8		0	min	-2.778	17	-6.295	20	-0.032	23	-0.002	3	-72.408	8
9	WP5	0	max	0	23	7.188	8	0.112	23	0.002	23	71.897	20
10		0	min	0	1	-6.024	20	-0.112	1	-0.002	1	-82.537	8
11	WP6	0	max	2.026	5	8.174	6	0.009	3	0	17	70.886	18
12		0	min	-1.874	17	-6.46	18	-0.009	23	0	5	-83.046	6
13	WP7	0	max	2.334	20	6.25	8	0.048	17	0.002	5	42.643	18
14		0	min	-2.774	8	-4.957	20	-0.052	5	-0.002	17	-49.439	6
15	WP8	0	max	3.494	17	9.43	6	0.073	5	0.002	23	70.647	20
16		0	min	-3.798	5	-7.941	18	-0.068	17	-0.002	3	-80.258	8
17	WP9	0	max	0	23	4.065	8	0.058	23	0	19	41.473	20
18		0	min	0	1	-3.465	20	-0.058	1	0	5	-46.609	8
19	WP10	0	max	5.215	6	12.308	8	0.016	5	0	17	60.176	20
20		0	min	-4.667	18	-10.595	20	-0.015	17	0	5	-67.56	8
21	WP11	0	max	4.773	18	5.771	6	0.041	6	0	17	39.719	20
22		0	min	-5.289	6	-4.912	18	-0.036	18	0	5	-44.48	8
23	WP12	0	max	0	21	8.829	6	0.112	23	0.002	23	91.059	18
24		0	min	0	1	-7.619	18	-0.112	1	-0.002	1	-102.188	6
25	WP13	0	max	2.135	20	5.736	6	0.018	17	0	7	34.336	18
26		0	min	-2.58	8	-4.457	18	-0.02	5	0	19	-40.762	6
27	WP14	0	max	2.669	20	9.255	8	0.063	5	0.002	23	33.311	20
28		0	min	-3.095	8	-7.423	20	-0.06	17	-0.002	3	-38.608	8
29	WP15	0	max	0	19	7.083	6	0.112	23	0.002	23	71.106	18
30		0	min	0	5	-5.958	18	-0.112	1	-0.002	1	-81.278	6
31	WP16	0	max	0.991	8	8.062	8	0.007	17	0.002	5	70.978	20
32		0	min	-0.823	20	-6.376	20	-0.007	5	-0.002	17	-82.9	8
33	WP17	0	max	5.033	23	6.21	6	0.052	19	0	7	61.957	18
34		0	min	-5.1	3	-5.084	18	-0.052	7	0	19	-71.233	6
35	WP18	0	max	3.096	3	7.395	6	0.071	17	0.002	5	70.983	18
36		0	min	-2.9	23	-6.148	18	-0.075	5	-0.002	17	-80.438	6
37	WP19	0	max	0.935	18	2.933	8	0.025	6	0.001	17	21.525	20
38		0	min	-1.131	6	-2.242	20	-0.021	18	-0.001	5	-25.263	8
39	WP20	0	max	0	19	4.104	8	0.076	23	0.002	23	40.146	20
40		0	min	0	5	-3.356	20	-0.076	1	-0.002	1	-46.403	8
41	WP21	0	max	3.74	6	6.708	5	0.09	18	0.002	6	82.582	17
42		0	min	-3.178	18	-6.654	17	-0.326	6	-0.002	18	-84.995	5
43	WP22	0	max	2.774	8	5.977	23	0.065	20	0	8	85.624	3
44		0	min	-2.334	20	-6.004	3	-0.282	8	0	20	-82.187	23
45	WP23	0	max	2.58	8	6.518	7	0.057	20	0.001	2	74.395	17
46		0	min	-2.135	20	-6.51	19	-0.262	8	-0.001	22	-77.577	5

Envelope Wall Panel Forces (Continued)

	Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC
47	WP24	0	max	4.796	3	5.726	23	0.04	18	0.001	6	26.424	5
48		0	min	-4.532	23	-5.76	3	-0.13	6	-0.001	18	-24.052	17
49	WP25	0	max	0	20	6.8	23	0.02	20	0	4	80.755	3
50		0	min	0	6	-6.82	3	-0.264	6	0	22	-80.525	23
51	WP26	0	max	0	22	3.942	23	0.003	20	0	8	46.747	3
52		0	min	0	2	-3.953	3	-0.193	6	0	18	-46.613	23
53	WP27	0	max	0	19	2.482	5	0.001	20	0	8	29.278	17
54		0	min	0	5	-2.469	17	-0.099	6	0	18	-29.432	5
55	WP28	0	max	4.667	18	4.689	5	0.007	24	0	6	54.171	3
56		0	min	-5.215	6	-4.678	17	-0.025	4	0	18	-53.872	23
57	WP29	0	max	0	22	2.468	23	0.001	20	0	8	29.629	3
58		0	min	0	2	-2.499	3	-0.099	6	0	18	-29.258	23
59	WP30	0	max	0	24	3.918	23	0.003	20	0	8	46.35	3
60		0	min	0	4	-3.92	3	-0.193	6	0	18	-46.32	23
61	WP31	0	max	0	20	6.265	5	0.015	20	0.001	4	74.239	17
62		0	min	0	8	-6.265	17	-0.233	6	0	22	-74.249	5
63	WP32	0	max	0	22	3.736	5	0.018	20	0.003	8	44.155	17
64		0	min	0	1	-3.73	17	-0.129	6	-0.003	18	-44.235	5
65	WP33	0	max	0	2	2.141	21	0.001	20	0	8	25.372	1
66		0	min	0	21	-2.144	1	-0.1	6	0	18	-25.336	21
67	WP34	0	max	3.798	5	3.335	5	0.021	17	0	6	26.564	3
68		0	min	-3.494	17	-3.305	17	-0.043	5	0	18	-25.561	23
69	WP35	0	max	0	4	5.56	5	0.015	20	0	4	65.603	17
70		0	min	0	24	-5.529	17	-0.177	8	0	22	-65.981	5
71	WP36	0	max	0	4	4.867	5	0.009	20	0.003	8	57.787	17
72		0	min	0	24	-4.866	17	-0.15	6	-0.003	18	-57.799	5
73	WP37	0	max	4.074	8	3.788	23	0.025	20	0	8	45.438	3
74		0	min	-3.458	20	-3.803	3	-0.062	8	0	20	-45.254	23
75	WP38	0	max	0	7	1.886	23	0.001	20	0	8	22.278	3
76		0	min	0	19	-1.886	3	-0.1	6	0	18	-22.275	23
77	WP39	0	max	0	24	3.564	23	0.018	20	0.003	8	42.266	3
78		0	min	0	4	-3.572	3	-0.129	6	-0.003	18	-42.169	23
79	WP40	0	max	2.463	18	7.297	5	0.056	18	0.002	4	21.804	6
80		0	min	-2.899	6	-7.252	17	-0.248	6	-0.001	24	-20.45	18
81	WP41	0	max	3.527	3	5.046	23	0.054	20	0.001	2	4.607	8
82		0	min	-3.504	23	-5.106	3	-0.232	8	-0.001	22	-4.392	20
83	WP42	0	max	5.289	6	7.746	23	-0.001	19	0.004	4	87.257	3
84		0	min	-4.773	18	-7.767	3	-0.092	7	-0.004	24	-80.65	23
85	WP43	0	max	1.499	20	6.186	5	0.046	18	0.002	4	20.134	6

Envelope Wall Panel Forces (Continued)

Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC
86	0	min	-1.687	8	-6.128	17	-0.256	6	-0.001	24	-16.695	18
87	0	max	1.997	20	6.794	23	0.075	20	0.005	2	13.725	23
88	0	min	-2.365	8	-6.836	3	-0.268	8	-0.005	22	-13.868	3

AISI S100-16: ASD Wall Panel CFS Code Checks (Axial)

	Wall Panel	Region	Stud Size	Stud Spacing[in]	Axial Check	Gov LC	Chord Size	Chord Axial Check	Gov LC
1	WP1	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.803	6
2	WP2	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.717	6
3	WP3	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.595	4
4	WP4	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.078	8
5	WP5	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.934	8
6	WP6	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.839	6
7	WP7	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.691	6
8	WP8	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.764	4
9	WP9	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.854	8
10	WP10	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.724	8
11	WP11	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.428	20
12	WP12	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.132	6
13	WP13	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.556	6
14	WP14	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.414	20
15	WP15	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.92	6
16	WP16	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.834	8
17	WP17	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.829	8
18	WP18	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
19		R4	600S162-43	16	0	N/A	2-600S162-43-BB	1.054	6
20	WP19	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.812	8
21		R4	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
22	WP20	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.643	8
23	WP21	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
24		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.489	5
25		R7	600S162-43	16	0	N/A	2-600S162-43-BB	0.861	3
26		R10	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
27	WP22	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
28		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.624	3
29		R7	600S162-43	16	0	N/A	2-600S162-43-BB	0.813	5
30		R10	600S162-43	16	0	N/A	2-600S162-43-BB	0.882	7
31	WP23	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
32		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.794	5

AISI S100-16: ASD Wall Panel CFS Code Checks (Axial) (Continued)

Wall Panel	Region	Stud Size	Stud Spacing[in]	Axial Check	Gov LC	Chord Size	Chord Axial Check	Gov LC	
33		R7	600S162-43	16	0	N/A	2-600S162-43-BB	0.923	3
34		R10	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
35	WP24	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
36		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.773	3
37		R7	600S162-43	16	0	N/A	2-600S162-43-BB	0.962	3
38	WP25	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.037	3
39	WP26	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.77	3
40	WP27	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.942	5
41	WP28	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.611	17
42	WP29	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.947	3
43	WP30	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.763	3
44	WP31	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.069	5
45	WP32	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.249	5
46	WP33	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.806	1
47	WP34	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.8	5
48	WP35	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.279	5
49	WP36	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.292	5
50	WP37	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.783	3
51	WP38	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.707	3
52	WP39	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.193	3
53	WP40	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.667	5
54		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.525	5
55		R7	600S162-43	16	0	N/A	2-600S162-43-BB	1.001	3
56		R10	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
57	WP41	R1	600S162-43	16	0	N/A	2-600S162-43-BB	0.79	7
58		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.564	3
59		R7	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
60	WP42	R1	600S162-43	16	0	N/A	2-600S162-43-BB	1.046	8
61	WP43	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
62		R4	600S162-43	16	0	N/A	2-600S162-43-BB	0.756	5
63		R7	600S162-43	16	0	N/A	2-600S162-43-BB	0.669	1
64		R10	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
65	WP44	R1	600S162-43	16	0	N/A	2-600S162-43-BB	NC	NC
66		R4	600S162-43	16	0	N/A	2-600S162-43-BB	1.026	5
67		R7	600S162-43	16	0	N/A	2-600S162-43-BB	0.691	3
68		R10	600S162-43	16	0	N/A	2-600S162-43-BB	0.66	3

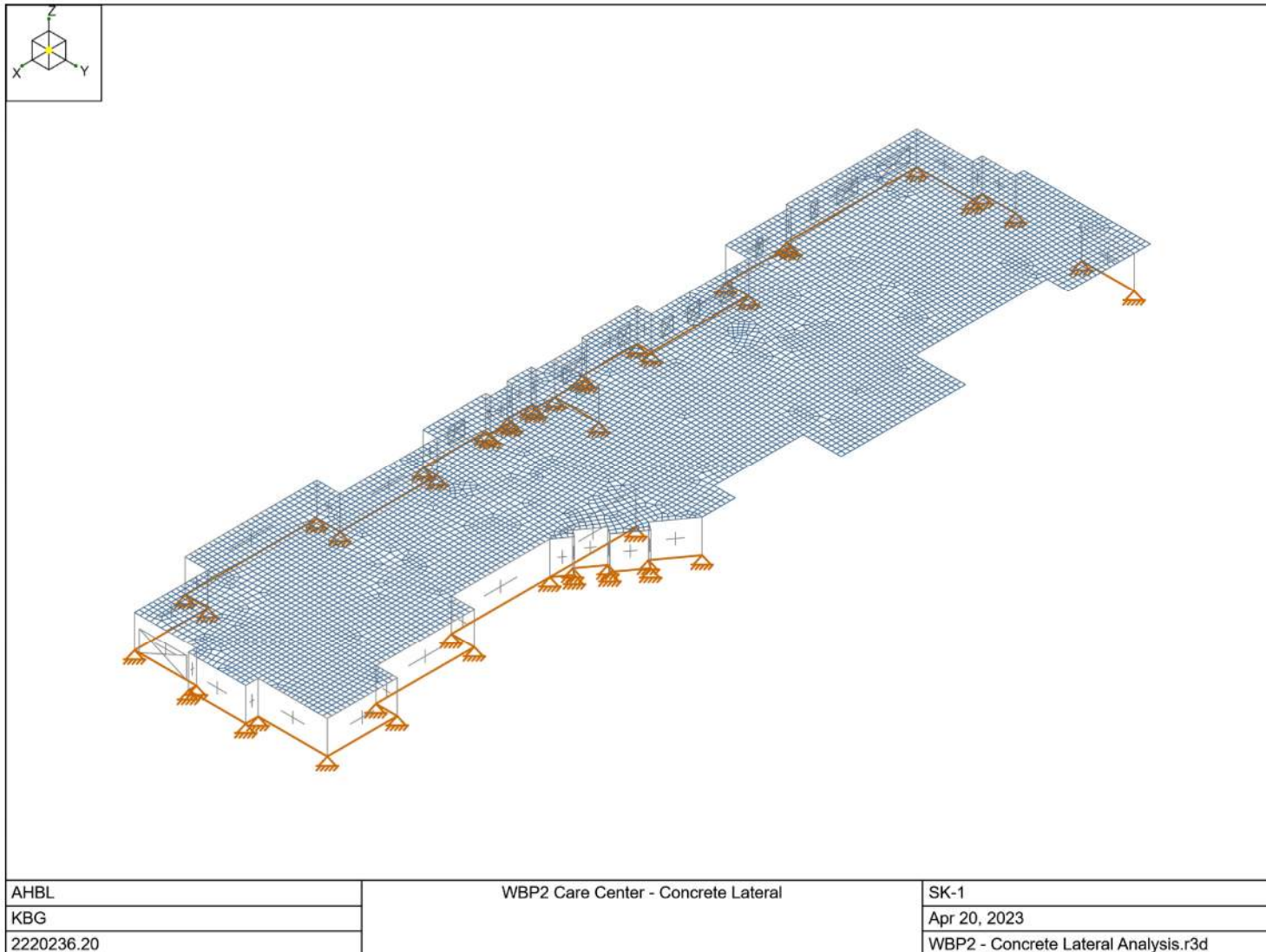
AISI S100-16: ASD Wall Panel CFS Code Checks (In-Plane)

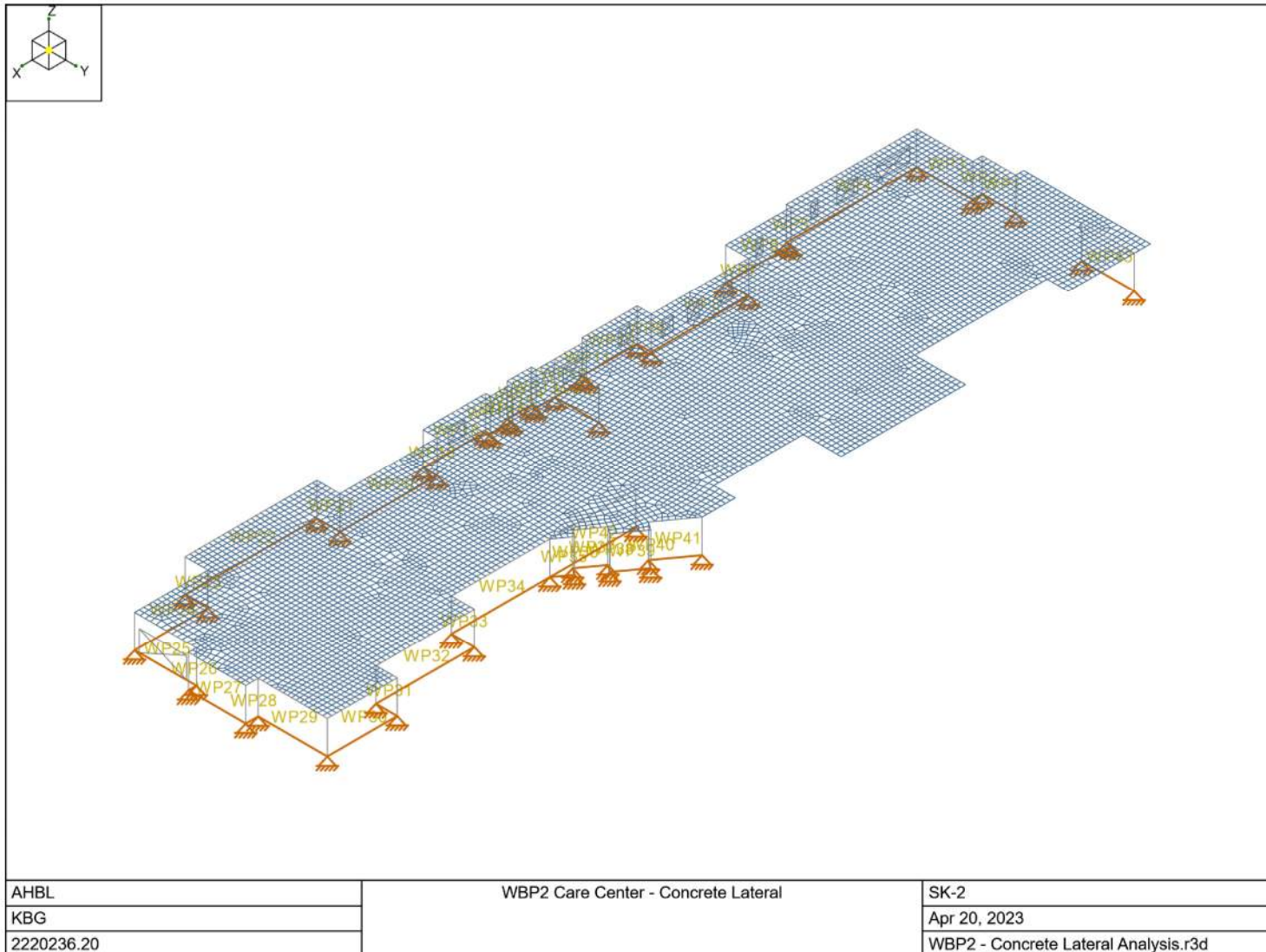
	Wall Panel	Shear Panel Label	Region	Shear Check	Shear Force[k/ft]	Gov LC	Hold-down Force[k]	Gov LC
1	WP1	0.027 #8@6/12 33 EQ	R1	0.917	0.237	6	2.711	6
2	WP2	0.027 #8@6/12 33 EQ	R1	0.824	0.213	6	2.419	6
3	WP3	0.027 #8@4/12 43 EQ	R1	0.861	0.345	6	3.892	6
4	WP4	0.027 #8@4/12 43 EQ	R1	0.913	0.365	8	3.907	3
5	WP5	0.027 #8@4/12 33 EQ	R1	0.966	0.274	8	3.151	8
6	WP6	0.027 #8@4/12 33 EQ	R1	0.962	0.273	6	2.931	18
7	WP7	0.027 #8@3/12 33 EQ	R1	0.991	0.308	8	3.466	8
8	WP8	0.027 #8@4/12 43 EQ	R1	0.9	0.36	6	4.15	6
9	WP9	0.027 #8@6/12 33 EQ	R1	0.972	0.251	8	2.883	8
10	WP10	0.027 #8@3/12 43 EQ	R1	0.939	0.408	8	4.192	20
11	WP11	0.027 #8@2/12 43 EQ	R1	1.358	0.635	6	7.203	6
12	WP12	0.027 #8@2/12 33 EQ	R1	0.976	0.33	6	3.819	6
13	WP13	0.027 #8@4/12 33 EQ	R1	0.997	0.283	6	3.16	6
14	WP14	0.027 #8@4/12 43 EQ	R1	0.883	0.353	8	3.021	8
15	WP15	0.027 #8@4/12 33 EQ	R1	0.953	0.271	6	3.105	6
16	WP16	0.027 #8@4/12 33 EQ	R1	0.949	0.27	8	2.784	20
17	WP17	0.027 #8@4/12 33 EQ	R1	0.996	0.283	6	4.037	8
18	WP18	0.027 #8@2/12 33 EQ	R1	NC	0	N/A	NC	NC
19		0.027 #8@2/12 33 EQ	R4	0.971	0.328	6	3.885	5
20	WP19	0.027 #8@6/12 33 EQ	R1	0.936	0.242	8	2.74	8
21		0.027 #8@6/12 33 EQ	R4	NC	0	N/A	NC	NC
22	WP20	0.027 #8@6/12 33 EQ	R1	0.742	0.192	8	2.171	8
23	WP21	0.027 #8@4/12 33 EQ	R1	NC	0	N/A	NC	NC
24		0.027 #8@4/12 33 EQ	R4	0.615	0.175	5	1.65	5
25		0.027 #8@4/12 33 EQ	R7	0.963	0.274	5	3.539	17
26		0.027 #8@4/12 33 EQ	R10	NC	0	N/A	NC	NC
27	WP22	0.027 #8@4/12 33 EQ	R1	NC	0	N/A	NC	NC
28		0.027 #8@4/12 33 EQ	R4	0.855	0.243	3	2.744	23
29		0.027 #8@4/12 33 EQ	R7	0.885	0.251	5	2.745	5
30		0.027 #8@4/12 33 EQ	R10	0.949	0.269	7	2.977	7
31	WP23	0.027 #8@4/12 33 EQ	R1	NC	0	N/A	NC	NC
32		0.027 #8@4/12 33 EQ	R4	0.858	0.244	3	2.68	5
33		0.027 #8@4/12 33 EQ	R7	0.972	0.276	3	3.419	23
34		0.027 #8@4/12 33 EQ	R10	NC	0	N/A	NC	NC
35	WP24	0.027 #8@2/12 43 EQ	R1	NC	0	N/A	NC	NC
36		0.027 #8@2/12 43 EQ	R4	0.533	0.25	3	2.608	3
37		0.027 #8@2/12 43 EQ	R7	0.983	0.46	3	5.028	23
38	WP25	0.027 #8@3/12 33 EQ	R1	0.949	0.295	3	3.498	3
39	WP26	0.027 #8@6/12 33 EQ	R1	0.849	0.22	3	2.597	3

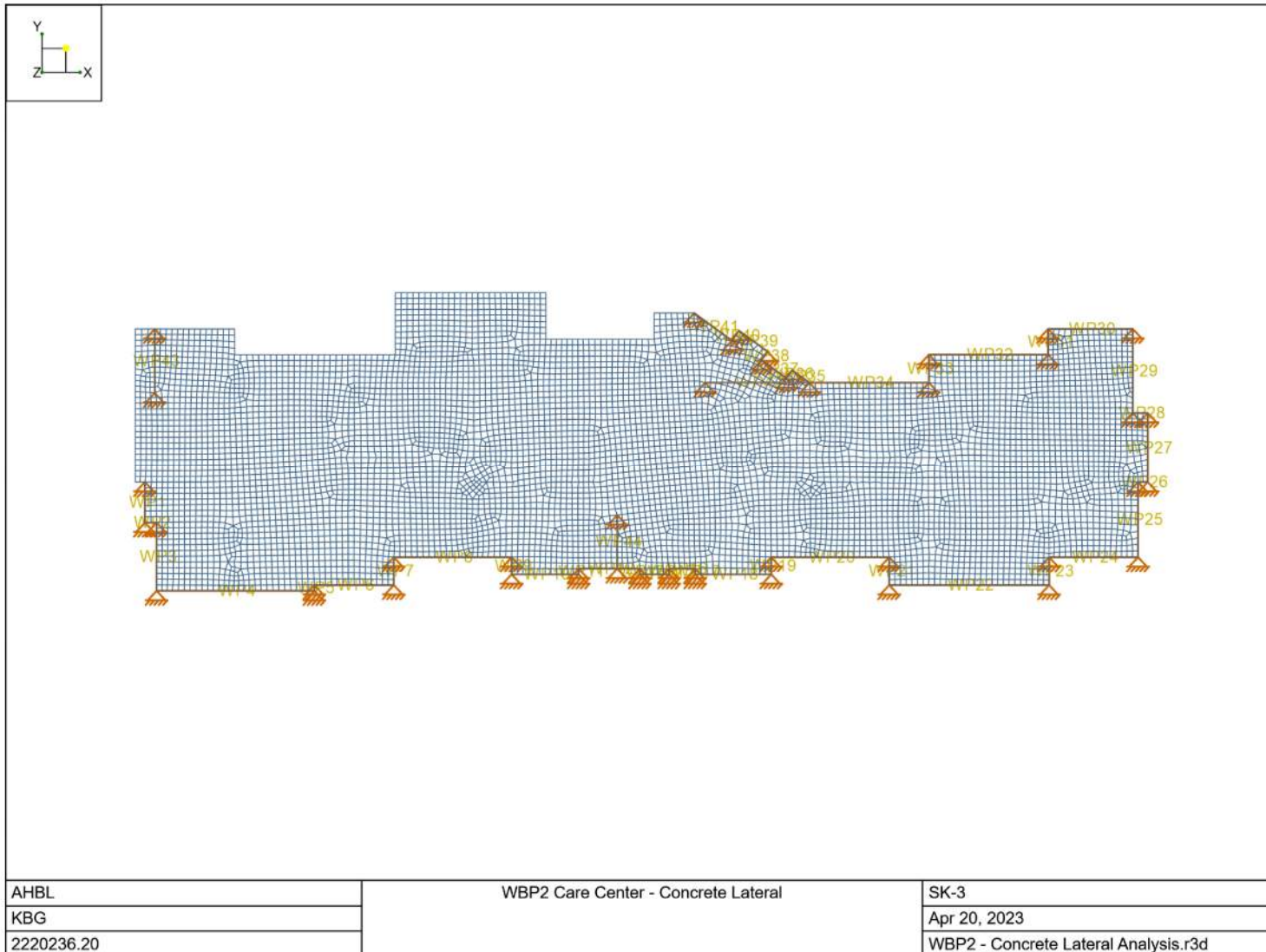
AISI S100-16: ASD Wall Panel CFS Code Checks (In-Plane) (Continued)

Wall Panel		Shear Panel Label	Region	Shear Check	Shear Force[k/ft]	Gov LC	Hold-down Force[k]	Gov LC
40	WP27	0.027 #8@4/12 33 EQ	R1	0.944	0.268	5	3.178	5
41	WP28	0.027 #8@2/12 43 EQ	R1	0.99	0.463	5	6.341	5
42	WP29	0.027 #8@4/12 33 EQ	R1	0.949	0.27	3	3.196	3
43	WP30	0.027 #8@6/12 33 EQ	R1	0.842	0.218	3	2.575	3
44	WP31	0.027 #8@3/12 33 EQ	R1	0.978	0.304	5	3.607	5
45	WP32	0.027 #8@4/12 43 EQ	R1	0.89	0.356	5	4.213	5
46	WP33	0.027 #8@6/12 33 EQ	R1	0.888	0.23	1	2.718	1
47	WP34	0.027 #8@4/12 43 EQ	R1	0.888	0.355	5	4.131	17
48	WP35	0.027 #8@4/12 43 EQ	R1	0.91	0.364	5	4.317	5
49	WP36	0.027 #8@4/12 43 EQ	R1	0.917	0.367	5	4.358	5
50	WP37	0.027 #8@6/12 33 EQ	R1	0.829	0.215	3	3.088	23
51	WP38	0.027 #8@6/12 33 EQ	R1	0.781	0.202	3	2.387	3
52	WP39	0.027 #8@4/12 43 EQ	R1	0.851	0.34	3	4.025	3
53	WP40	0.027 #8@3/12 33 EQ	R1	0.779	0.243	1	2.735	17
54		0.027 #8@3/12 33 EQ	R4	0.525	0.164	5	1.772	5
55		0.027 #8@3/12 33 EQ	R7	0.956	0.297	3	3.378	3
56		0.027 #8@3/12 33 EQ	R10	NC	0	N/A	NC	NC
57	WP41	0.027 #8@6/12 33 EQ	R1	0.963	0.249	5	2.666	7
58		0.027 #8@6/12 33 EQ	R4	0.677	0.175	3	1.902	3
59		0.027 #8@6/12 33 EQ	R7	NC	0	N/A	NC	NC
60	WP42	0.027 #8@2/12 33 EQ	R1	0.927	0.313	3	4.841	20
61	WP43	0.027 #8@6/12 33 EQ	R1	NC	0	N/A	NC	NC
62		0.027 #8@6/12 33 EQ	R4	0.911	0.236	5	2.55	5
63		0.027 #8@6/12 33 EQ	R7	0.787	0.204	1	2.258	1
64		0.027 #8@6/12 33 EQ	R10	NC	0	N/A	NC	NC
65	WP44	0.027 #8@3/12 33 EQ	R1	NC	0	N/A	NC	NC
66		0.027 #8@3/12 33 EQ	R4	0.988	0.308	5	3.462	5
67		0.027 #8@3/12 33 EQ	R7	0.681	0.212	3	2.333	3
68		0.027 #8@3/12 33 EQ	R10	0.785	0.244	3	2.651	23

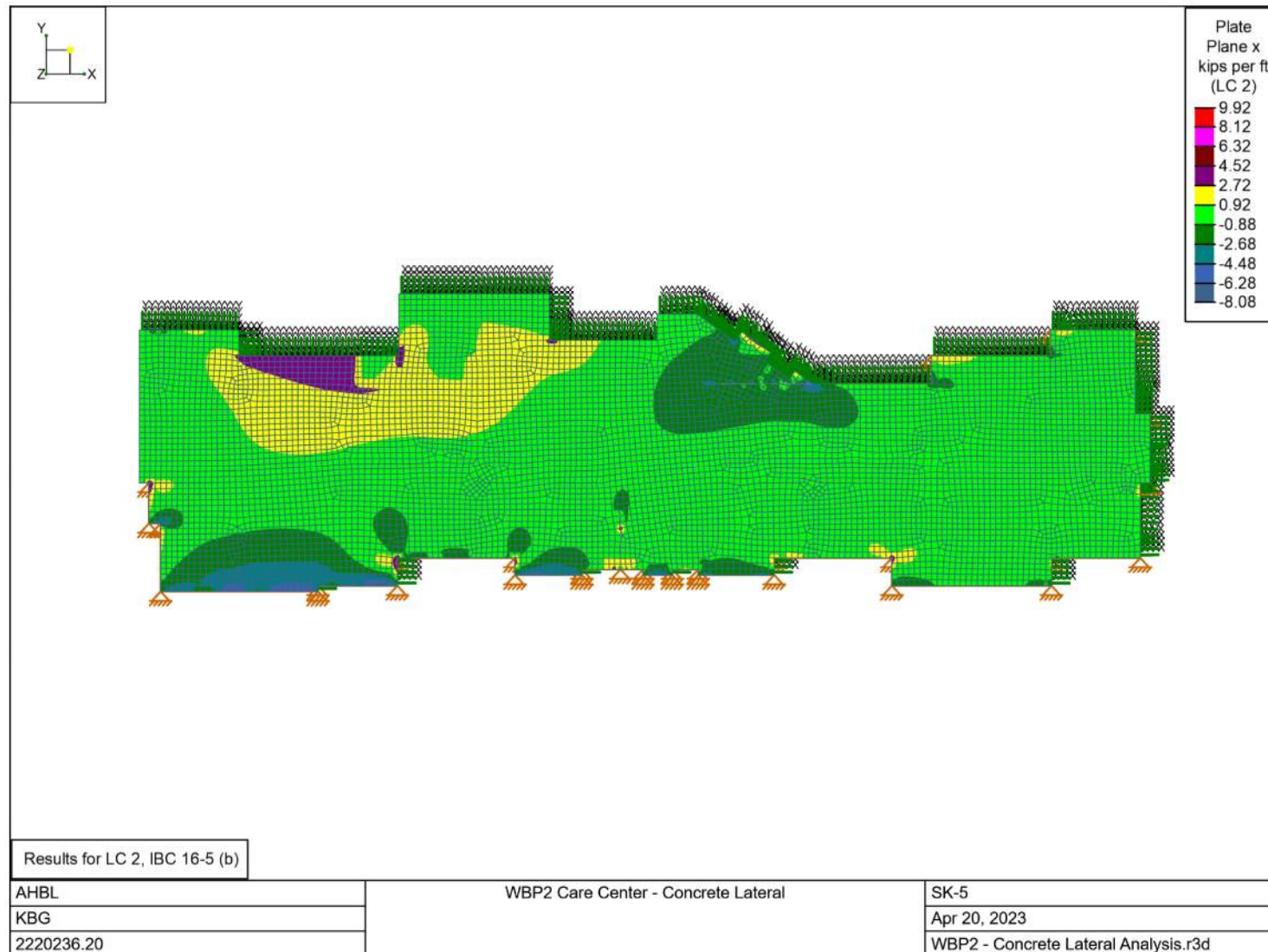
8.0 - CONCRETE LATERAL DESIGN



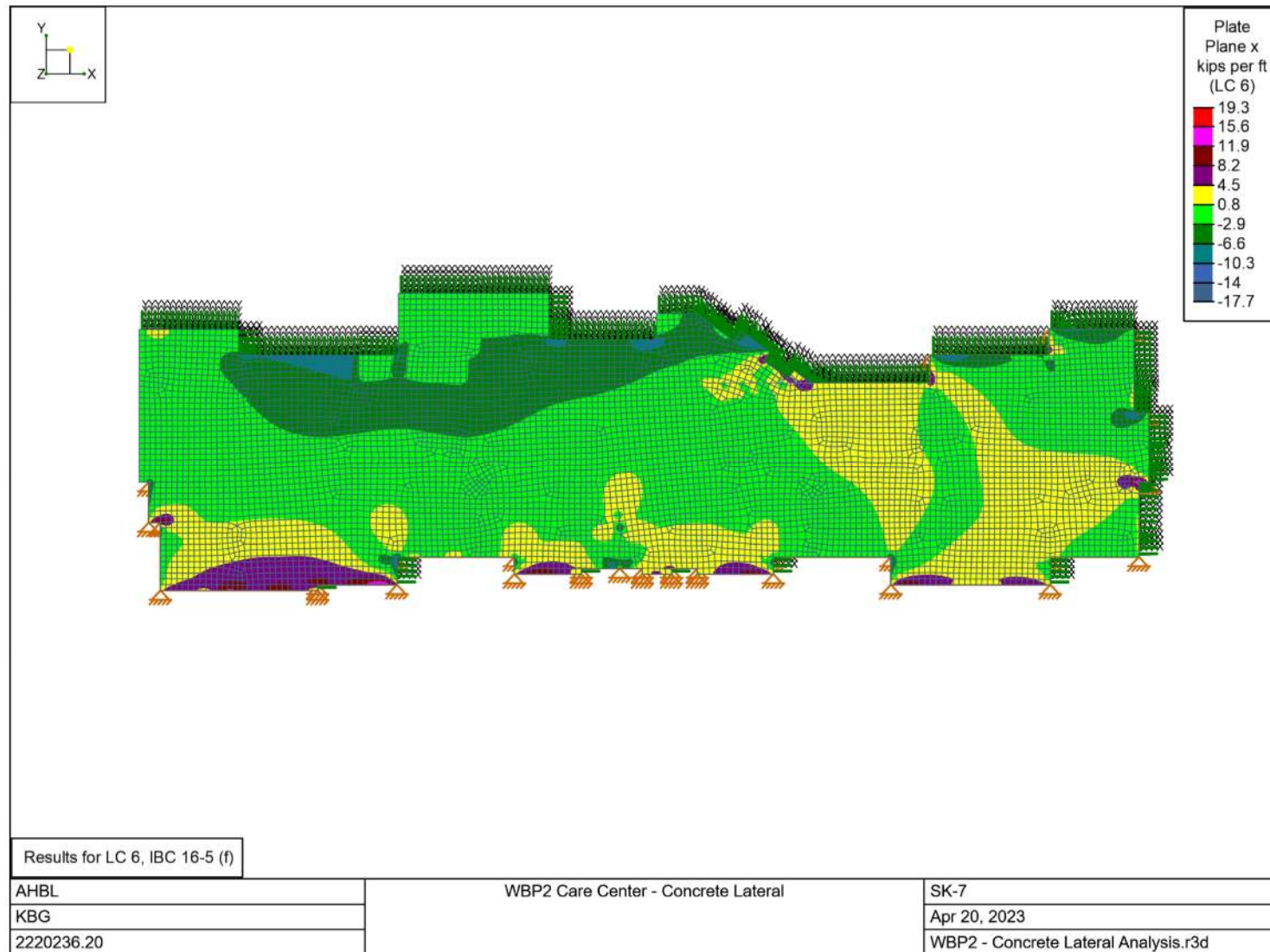












Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N-NW	-364.438999	-138.796256	12	
2	N-SW	-20.377863	-127.046398	12	
3	N-SE	-22.21461	-47.024446	12	
4	N-NE	-371.938993	-47.024446	12	

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-5} F^{-1}$]	Density [k/ft ³]	f'c [ksi]	Lambda	Flex Steel [ksi]	Shear Steel [ksi]
1	Conc3000NW	3156	1372	0.15	0.6	0.145	3	1	60	60
2	Conc3500NW	3409	1482	0.15	0.6	0.145	3.5	1	60	60
3	Conc4000NW	3644	1584	0.15	0.6	0.145	4	1	60	60
4	Conc3000LW	2085	907	0.15	0.6	0.11	3	0.75	60	60
5	Conc3500LW	2252	979	0.15	0.6	0.11	3.5	0.75	60	60
6	Conc4000LW	2408	1047	0.15	0.6	0.11	4	0.75	60	60

General Materials Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-5} F^{-1}$]	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	10100	4077	0.3	1.29	0.173	Isotropic
6	gen_Steel	29000	11154	0.3	0.65	0.49	Isotropic
7	gen_Plywood	1800	38	0	0.3	0.035	Isotropic
8	RIGID	1e+6		0.3	0	0	Isotropic
9	gen_Ortho	N/A	N/A	N/A	0.65	0.49	Orthotropic
10	gen_Conc5NW	4074	1771.3	0.15	0.6	0	Isotropic

Plate Primary Data

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
1	P1	N334	N333	N332	N331	gen_Conc5NW	10



Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : WBP2 Care Center - Concrete Lateral

4/20/2023
12:02:29 PM
Checked By : _____

Plate Advanced Data

	Label	Plane Stress	Rotate
1	P1	Yes	90

Wall Panel Data

	Label	A Node	B Node	C Node	D Node	Material Type	Material Set	Thickness [in]	Design Rule	Panel/Spacing
1	WP1	N7675	N58	N59	N7678	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
2	WP2	N7678	N59	N60	N7709	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
3	WP3	N7709	N60	N-NW	N7676	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
4	WP4	N7676	N-NW	N62	N7707	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
5	WP5	N7707	N62	N63	N7679	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
6	WP6	N7679	N63	N64	N7680	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
7	WP7	N7680	N64	N65	N7673	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
8	WP8	N7673	N65	N66	N7690	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
9	WP9	N7690	N66	N67	N7681	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
10	WP10	N7681	N67	N68	N7682	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
11	WP11	N7682	N68	N69	N7683	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
12	WP12	N7683	N69	N70	N7684	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
13	WP13	N7684	N70	N71	N7685	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
14	WP14	N7685	N71	N72	N7687	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
15	WP15	N7687	N72	N73	N7689	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
16	WP16	N7689	N73	N74	N7691	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
17	WP17	N7691	N74	N75	N7672	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
18	WP18	N7672	N75	N76	N7671	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
19	WP19	N7671	N76	N77	N7677	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
20	WP20	N7677	N77	N78	N7712	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
21	WP21	N7712	N78	N79	N7692	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
22	WP22	N7692	N79	N80	N7713	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
23	WP23	N7713	N80	N81	N7710	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
24	WP24	N7710	N81	N-SW	N7711	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
25	WP25	N7711	N-SW	N83	N7688	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
26	WP26	N7688	N83	N84	N7695	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
27	WP27	N7695	N84	N85	N7696	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
28	WP28	N7696	N85	N113	N7674	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
29	WP29	N7674	N113	N-SE	N7694	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
30	WP30	N7694	N-SE	N87	N7717	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
31	WP31	N7717	N87	N88	N7706	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
32	WP32	N7706	N88	N89	N7693	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
33	WP33	N7693	N89	N90	N7704	Concrete	Conc4000NW	12	12" Wall - Typical	N/A

Wall Panel Data (Continued)

	Label	A Node	B Node	C Node	D Node	Material Type	Material Set	Thickness [in]	Design Rule	Panel/Spacing
34	WP34	N7704	N90	N91	N7686	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
35	WP35	N7686	N91	N92	N7697	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
36	WP36	N7697	N92	N93	N7699	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
37	WP37	N7699	N93	N94	N7700	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
38	WP38	N7700	N94	N95	N7701	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
39	WP39	N7701	N95	N96	N7702	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
40	WP40	N7702	N96	N97	N7698	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
41	WP41	N7698	N97	N98	N7703	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
42	WP42	N7686	N91	N4895	N7716	Concrete	Conc4000NW	12	12" Wall - Typical	N/A
43	WP43	N7708	N4	N5	N7705	Concrete	Conc4000NW	8	8" Wall - Typical	N/A
44	WP44	N7715	N3673	N3730	N7714	Concrete	Conc4000NW	8	8" Wall - Typical	N/A

Wall Panel Advanced Data

	Label	Seismic Rule	Design Method	SSAF	Stud Bracing	Sheathing Connect Dist [in]
1	WP1	None	N/A	N/A	N/A	N/A
2	WP2	None	N/A	N/A	N/A	N/A
3	WP3	None	N/A	N/A	N/A	N/A
4	WP4	None	N/A	N/A	N/A	N/A
5	WP5	None	N/A	N/A	N/A	N/A
6	WP6	None	N/A	N/A	N/A	N/A
7	WP7	None	N/A	N/A	N/A	N/A
8	WP8	None	N/A	N/A	N/A	N/A
9	WP9	None	N/A	N/A	N/A	N/A
10	WP10	None	N/A	N/A	N/A	N/A
11	WP11	None	N/A	N/A	N/A	N/A
12	WP12	None	N/A	N/A	N/A	N/A
13	WP13	None	N/A	N/A	N/A	N/A
14	WP14	None	N/A	N/A	N/A	N/A
15	WP15	None	N/A	N/A	N/A	N/A
16	WP16	None	N/A	N/A	N/A	N/A
17	WP17	None	N/A	N/A	N/A	N/A
18	WP18	None	N/A	N/A	N/A	N/A
19	WP19	None	N/A	N/A	N/A	N/A
20	WP20	None	N/A	N/A	N/A	N/A
21	WP21	None	N/A	N/A	N/A	N/A
22	WP22	None	N/A	N/A	N/A	N/A
23	WP23	None	N/A	N/A	N/A	N/A
24	WP24	None	N/A	N/A	N/A	N/A



Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : WBP2 Care Center - Concrete Lateral

PRCNC20240424

4/20/2023
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Checked By : _____

Wall Panel Advanced Data (Continued)

	Label	Seismic Rule	Design Method	SSAF	Stud Bracing	Sheathing Connect Dist [in]
25	WP25	None	N/A	N/A	N/A	N/A
26	WP26	None	N/A	N/A	N/A	N/A
27	WP27	None	N/A	N/A	N/A	N/A
28	WP28	None	N/A	N/A	N/A	N/A
29	WP29	None	N/A	N/A	N/A	N/A
30	WP30	None	N/A	N/A	N/A	N/A
31	WP31	None	N/A	N/A	N/A	N/A
32	WP32	None	N/A	N/A	N/A	N/A
33	WP33	None	N/A	N/A	N/A	N/A
34	WP34	None	N/A	N/A	N/A	N/A
35	WP35	None	N/A	N/A	N/A	N/A
36	WP36	None	N/A	N/A	N/A	N/A
37	WP37	None	N/A	N/A	N/A	N/A
38	WP38	None	N/A	N/A	N/A	N/A
39	WP39	None	N/A	N/A	N/A	N/A
40	WP40	None	N/A	N/A	N/A	N/A
41	WP41	None	N/A	N/A	N/A	N/A
42	WP42	None	N/A	N/A	N/A	N/A
43	WP43	None	N/A	N/A	N/A	N/A
44	WP44	None	N/A	N/A	N/A	N/A

Wall Panel U.C. Parameters

	Label	Max Bending Chk	Max Shear Chk
1	12" Wall - Typical	1	1
2	8" Wall - Typical	1	1

Concrete Wall Panel Rebar Parameters

	Label	Vert Bar Size	Max Vert Bar Space [in]	Min Vert Bar Space [in]	Vert Bar Inc [in]	Horz Bar Size	Max Horz Bar Space [in]	Min Horz Bar Space [in]	Horz Bar Inc [in]	Group Wall
1	12" Wall - Typical	#6	12	12	2	#5	12	12	2	
2	8" Wall - Typical	#5	12	12	2	#5	12	12	2	

Concrete Wall Panel Cover Parameters

	Label	Outer Bars	Location	Int Cover -z [in]	Ext Cover +z [in]	Edge Cover [in]	Transfer In	Transfer Out
1	12" Wall - Typical	Vertical	Each Face	1.5	1.5	2		
2	8" Wall - Typical	Vertical	Centered	NA	NA	2		

Basic Load Cases

	BLC Description	Category	Y Gravity	Surface(Plate/Wall)
1	DL	DL	-1	
2	SL	SL		
3	ELX	ELX		7317
4	ELY	ELY		7317

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	IBC 16-5 (a)	Yes	Y	DL	1.2	Sds*DL	0.2	ELX	1	ELY	0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
2	IBC 16-5 (b)	Yes	Y	DL	1.2	Sds*DL	0.2	ELY	1	ELX	0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
3	IBC 16-5 (c)	Yes	Y	DL	1.2	Sds*DL	0.2	ELX	1	ELY	-0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
4	IBC 16-5 (d)	Yes	Y	DL	1.2	Sds*DL	0.2	ELY	1	ELX	-0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
5	IBC 16-5 (e)	Yes	Y	DL	1.2	Sds*DL	0.2	ELX	-1	ELY	-0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
6	IBC 16-5 (f)	Yes	Y	DL	1.2	Sds*DL	0.2	ELY	-1	ELX	-0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
7	IBC 16-5 (g)	Yes	Y	DL	1.2	Sds*DL	0.2	ELX	-1	ELY	0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
8	IBC 16-5 (h)	Yes	Y	DL	1.2	Sds*DL	0.2	ELY	-1	ELX	0.3	LL	0.5	LLS	1	SL	0.2	SLN	0.7
9	IBC 16-7 (a)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELX	1	ELY	0.3								
10	IBC 16-7 (b)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELY	1	ELX	0.3								
11	IBC 16-7 (c)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELX	1	ELY	-0.3								
12	IBC 16-7 (d)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELY	1	ELX	-0.3								
13	IBC 16-7 (e)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELX	-1	ELY	-0.3								
14	IBC 16-7 (f)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELY	-1	ELX	-0.3								
15	IBC 16-7 (g)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELX	-1	ELY	0.3								
16	IBC 16-7 (h)	Yes	Y	DL	0.9	Sds*DL	-0.2	ELY	-1	ELX	0.3								

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	WP1	max	0.417	9	140.128	6	54.46	12	449.377	10	0	16	2.868	9
2		min	-0.768	5	-48.024	10	-108.979	8	-875.91	6	0	1	-3.722	5
3	WP2	max	17.352	12	1.063	1	4.496	12	0	16	43.615	5	0.292	6
4		min	-32.827	8	0.261	13	-9.104	8	0	1	-35.521	9	-0.138	10
5	WP3	max	0.171	9	310.969	6	87.096	6	1062.008	10	0	10	-2.056	10
6		min	-3.105	5	-110.346	10	-49.814	10	-1966.887	6	0	6	-10.736	6
7	WP4	max	200.495	5	43.864	4	170.929	6	0	16	72.001	15	124.079	4
8		min	-145.164	9	19.76	16	-74.679	10	0	1	-765.192	3	21.614	16
9	WP5	max	0.73	8	47.651	6	3.998	12	1.755	10	0	16	0.346	6
10		min	0.166	12	-0.547	10	-6.18	8	-58.393	6	0	1	-0.261	10

Envelope Node Reactions (Continued)

Node Label			X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
11	WP6	max	136.953	5	21.578	4	66.271	8	0	16	1478.971	12	17.66	8
12		min	-102.315	9	8.46	16	-54.732	12	0	1	-3161.824	8	-2.384	12
13	WP7	max	1.995	8	224.972	6	23.005	6	469.59	12	0	16	0.256	5
14		min	0.399	12	-84.667	10	-14.652	10	-936.644	8	0	1	-0.244	9
15	WP8	max	140.984	5	33.087	4	195.083	12	0	16	556.311	15	-0.454	9
16		min	-127.425	9	14.695	16	-369.844	8	0	1	-561.195	3	-17.139	5
17	WP9	max	0.009	11	128.622	8	13.339	8	156.781	10	0	16	0.269	11
18		min	-1.524	7	-40.989	12	-9.032	12	-396.926	6	0	1	-0.54	7
19	WP10	max	70.826	15	15.272	4	239.18	8	0	16	619.294	6	11.941	4
20		min	-81.289	3	4.534	16	-99.611	12	0	1	-466.772	10	-7.645	16
21	WP11	max	0.605	8	34.664	6	5.832	9	2.078	12	0	16	0.188	15
22		min	0.011	12	2.718	10	-10.095	5	-52.438	8	0	1	-0.547	3
23	WP12	max	64.038	15	6.383	4	5.587	14	0	16	245.671	12	2.949	9
24		min	-70.449	3	0.519	16	-23.249	2	0	1	-586.439	8	-6.851	5
25	WP13	max	-0.027	10	37.176	8	13.555	8	6.44	12	0	16	0.606	8
26		min	-0.441	6	-5.259	12	-6.876	12	-46.26	8	0	1	-0.158	12
27	WP14	max	43.147	7	3.729	4	187.154	8	0	16	59.186	5	1.968	15
28		min	-39.102	11	-0.903	16	-66.774	12	0	1	-43.468	9	-2.195	3
29	WP15	max	0.35	8	32.103	6	1.104	12	3.311	12	0	16	0.161	8
30		min	0.065	12	2.387	10	-2.806	8	-47.548	8	0	1	-0.015	12
31	WP16	max	32.06	15	3.128	4	56.216	12	0	16	64.771	7	1.944	3
32		min	-41.14	3	-1.064	16	-183.288	8	0	1	-55.456	11	-1.321	15
33	WP17	max	-0.134	9	42.079	8	4.195	10	2.48	12	0	16	0.614	2
34		min	-0.439	5	-1.262	12	-5.011	6	-53.512	8	0	1	0.027	14
35	WP18	max	76.517	7	16.508	4	247.061	8	0	16	312.169	12	22.432	6
36		min	-67.159	11	5.653	16	-93.735	12	0	1	-511.888	8	2.289	10
37	WP19	max	1.33	8	108.05	6	9.173	6	110.728	12	0	16	0.078	10
38		min	0.185	12	-13.929	10	-5.743	10	-370.112	8	0	1	-0.081	6
39	WP20	max	140.321	15	42.659	4	97.308	12	0	16	1046.533	15	9.764	8
40		min	-176.895	3	19.897	16	-285.867	8	0	1	-1318.695	3	-4.733	12
41	WP21	max	-0.614	10	175.662	8	25.476	8	146.944	10	0	16	0.241	3
42		min	-1.79	6	-31.235	12	-13.571	12	-605.19	6	0	1	-0.16	15
43	WP22	max	111.963	15	63.349	4	207.14	8	0	16	880.328	15	3.476	15
44		min	-179.589	3	30.976	16	-59.85	12	0	1	-1005.358	3	-4.133	3
45	WP23	max	1.777	8	126.411	6	9.378	6	145.005	12	0	16	0.062	3
46		min	0.602	12	-5.892	10	-4.479	10	-590.436	8	0	1	-0.025	15
47	WP24	max	67.749	15	28.408	4	20.325	10	0	16	842.068	12	3.552	12
48		min	-88.926	3	12.882	16	-62.375	6	0	1	-2443.925	8	-11.352	8
49	WP25	max	1.299	8	54.849	8	32.83	6	617.017	5	0	16	1.917	12

Envelope Node Reactions (Continued)

Node Label			X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
50		min	0.052	12	-0.848	12	-12.426	10	-58.12	9	0	1	-3.717	8
51	WP26	max	12.305	6	0.733	4	7.548	6	0	16	8.015	15	0.135	12
52		min	-3.513	10	-0.055	16	-0.881	10	0	1	-28.311	3	-0.447	8
53	WP27	max	0.395	3	237.004	8	33.819	3	174.398	12	0	16	9.052	8
54		min	-0.341	15	-16.298	12	-23.478	15	-1091.736	8	0	1	-1.213	12
55	WP28	max	7.191	12	1.314	2	8.858	6	0	16	54.094	5	0.09	9
56		min	-26.981	8	0.529	14	-3.642	10	0	1	-20.248	9	-0.16	5
57	WP29	max	-0.625	10	309.227	6	15.469	12	532.505	10	0	16	9.412	2
58		min	-2.039	6	-23.38	10	-46.355	8	-1976.409	6	0	1	2.422	14
59	WP30	max	108.273	6	25.787	4	30.993	12	0	12	526.52	5	0.602	11
60		min	-48.19	10	12.589	16	-141.664	8	0	8	-347.995	9	-1.772	7
61	WP31	max	1.501	8	123.813	6	6.022	9	53.959	12	0	16	0.075	12
62		min	0.605	12	-7.808	10	-6.981	5	-362.153	8	0	1	-0.285	8
63	WP32	max	149.235	5	43.093	4	7.452	12	0	7	975.911	12	0.899	3
64		min	-82.874	9	20.917	16	-12.86	8	0	11	-3389.875	8	-0.309	15
65	WP33	max	1.791	8	163.675	6	10.301	10	146.217	12	0	16	0.209	6
66		min	0.619	12	-23.08	10	-21.779	6	-595.183	8	0	1	-0.063	10
67	WP34	max	195.823	5	42.174	4	165.674	8	0	16	332.891	12	15.27	6
68		min	-110.893	9	19.976	16	-52.376	12	0	1	-1064.167	8	5.123	10
69	WP35	max	-1.338	12	66.036	8	16.819	10	23.644	12	32.543	12	5.459	8
70		min	-89.863	8	2.83	12	-66.511	6	-197.963	8	-272.472	8	-0.032	12
71	WP36	max	12.699	7	17.791	7	4.38	16	8.471	10	59.977	6	0.728	4
72		min	-0.863	11	-1.364	11	-6.514	4	-82.552	6	-6.154	10	0.083	16
73	WP37	max	34.342	12	83.962	8	164.232	6	65.659	12	90.372	12	1.256	12
74		min	-113.142	8	-22.255	12	-57.193	10	-220.786	8	-303.886	8	-4.184	8
75	WP38	max	44.04	8	61.794	8	7.646	12	22.577	10	67.572	6	0.217	12
76		min	-9.043	12	-11.77	12	-16.726	8	-93.004	6	-16.403	10	-0.691	8
77	WP39	max	23.471	12	67.998	8	89.131	10	56.515	12	77.787	12	3.893	8
78		min	-89.332	8	-13.578	12	-223.026	6	-193.046	8	-265.705	8	-1.475	12
79	WP40	max	26.433	6	35.982	6	8.824	3	37.084	10	107.055	6	-0.017	15
80		min	-3.727	10	-4.751	10	-4.064	15	-147.349	6	-26.943	10	-0.367	3
81	WP41	max	25.228	15	81.918	3	48.282	5	327.152	12	450.286	12	-18.09	12
82		min	-93.933	3	-10.945	15	-43.819	9	-942.039	8	-1296.605	8	-56.8	8
83	WP42	max	183.944	5	42.981	4	97.284	6	0	1	1035.92	13	-67.028	12
84		min	-102.654	9	20.802	16	-37.116	10	0	13	-1317.901	1	-159.33	8
85	WP43	max	0	4	162.777	6	0	2	1092.77	10	0	16	0.562	8
86		min	0	16	-67.471	10	0	14	-1982.516	6	0	1	-0.36	12
87	WP44	max	0.096	1	306.488	8	95.399	12	906.054	12	0	8	0.708	9
88		min	-0.075	13	-113.955	12	-200.563	8	-2007.386	8	0	12	-0.859	5

Envelope Node Reactions (Continued)

Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
89	Totals:	max	1380.414	7	3484.148	6	0	6					
90		min	-1380.414	9	-328.547	10	0	10					

Envelope Wall Panel Forces

	Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC
1	WP1	-2	max	54.46	12	48.789	10	0.639	3	0.003	15	875.837	6
2		-2	min	-108.979	8	-140.887	6	-0.286	15	-0.003	3	-449.35	10
3	WP2	-2	max	4.496	12	17.401	12	-0.294	15	0.001	8	35.519	9
4		-2	min	-9.104	8	-32.877	8	-1.03	3	0	12	-43.621	5
5	WP3	-2	max	87.096	6	111.467	10	2.817	8	0.001	15	1966.731	6
6		-2	min	-49.814	10	-312.097	6	0.115	12	-0.003	3	-1061.95	10
7	WP4	-2	max	170.929	6	203.291	5	-19.814	10	0.05	4	765.192	3
8		-2	min	-74.679	10	-147.955	9	-43.819	6	-0.024	16	-71.974	15
9	WP5	-2	max	3.998	12	47.836	6	0.756	5	0.001	15	1.756	10
10		-2	min	-6.18	8	-0.732	10	0.139	9	-0.001	3	-58.37	6
11	WP6	-2	max	66.271	8	138.242	5	-9.567	11	0.023	4	3161.852	8
12		-2	min	-54.732	12	-103.605	9	-20.48	7	-0.014	16	-1478.981	12
13	WP7	-2	max	23.005	6	225.37	6	1.944	6	0.005	15	469.553	12
14		-2	min	-14.652	10	-85.062	10	0.449	10	-0.006	3	-936.537	8
15	WP8	-2	max	195.083	12	142.855	5	-15.244	10	0.026	4	561.137	3
16		-2	min	-369.844	8	-129.298	9	-32.499	6	0.01	16	-556.246	15
17	WP9	-2	max	13.339	8	41.33	12	1.183	7	0	11	396.868	6
18		-2	min	-9.032	12	-128.966	8	0.333	11	-0.001	7	-156.765	10
19	WP10	-2	max	239.18	8	71.989	15	-5.717	16	0.024	6	466.773	10
20		-2	min	-99.611	12	-82.453	3	-14.112	4	0.011	10	-619.3	6
21	WP11	-2	max	5.832	9	34.847	6	0.572	6	0.001	15	2.081	12
22		-2	min	-10.095	5	2.533	10	0.044	10	-0.001	3	-52.423	8
23	WP12	-2	max	5.587	14	65.301	15	-1.783	16	0.01	14	586.408	8
24		-2	min	-23.249	2	-71.711	3	-5.121	4	-0.014	2	-245.643	12
25	WP13	-2	max	13.555	8	5.434	12	0.505	3	0.001	9	46.242	8
26		-2	min	-6.876	12	-37.354	8	-0.037	15	-0.001	5	-6.439	12
27	WP14	-2	max	187.154	8	43.686	7	0.347	16	0.02	12	43.474	9
28		-2	min	-66.774	12	-39.642	11	-3.192	4	-0.027	8	-59.19	5
29	WP15	-2	max	1.104	12	32.286	6	0.439	5	0.001	15	3.314	12
30		-2	min	-2.806	8	2.203	10	-0.024	9	-0.001	3	-47.534	8
31	WP16	-2	max	56.216	12	32.632	15	0.508	16	0.057	4	55.465	11
32		-2	min	-183.288	8	-41.71	3	-2.555	4	-0.015	16	-64.784	7
33	WP17	-2	max	4.195	10	1.443	12	0.528	3	0.001	9	53.492	8

Envelope Wall Panel Forces (Continued)

Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC	
34	-2	min	-5.011	6	-42.259	8	0.045	15	-0.001	5	-2.48	12	
35	WP18	-2	max	247.061	8	77.958	7	-7.114	16	0.031	4	511.87	8
36		-2	min	-93.735	12	-68.601	11	-15.069	4	-0.004	16	-312.148	12
37	WP19	-2	max	9.173	6	108.22	6	1.307	6	0	15	110.722	12
38		-2	min	-5.743	10	-14.097	10	0.207	10	-0.001	3	-370.059	8
39	WP20	-2	max	97.308	12	142.211	15	-19.832	10	0.028	4	1318.614	3
40		-2	min	-285.867	8	-178.783	3	-42.702	6	0.003	16	-1046.47	15
41	WP21	-2	max	25.476	8	31.628	12	2.012	3	0.005	9	605.11	6
42		-2	min	-13.571	12	-176.058	8	0.392	15	-0.006	5	-146.936	10
43	WP22	-2	max	207.14	8	114.581	15	-29.272	10	0.033	6	1005.266	3
44		-2	min	-59.85	12	-182.207	3	-65.064	6	0.014	10	-880.27	15
45	WP23	-2	max	9.378	6	126.79	6	1.969	5	0.001	15	145.004	12
46		-2	min	-4.479	10	-6.27	10	0.41	9	-0.003	3	-590.375	8
47	WP24	-2	max	20.325	10	69.264	15	-13.015	10	0.009	6	2443.891	8
48		-2	min	-62.375	6	-90.44	3	-28.273	6	0.001	10	-842.045	12
49	WP25	-2	max	32.83	6	55.253	8	1.321	6	0.001	15	617.036	5
50		-2	min	-12.426	10	-1.25	12	0.03	10	-0.002	3	-58.112	9
51	WP26	-2	max	7.548	6	12.352	6	-0.104	16	0.001	6	28.313	3
52		-2	min	-0.881	10	-3.561	10	-0.574	4	0	10	-8.012	15
53	WP27	-2	max	33.819	3	238.251	8	0.974	5	0	15	174.389	12
54		-2	min	-23.478	15	-17.544	12	-0.922	9	0	3	-1091.618	8
55	WP28	-2	max	8.858	6	27.03	8	1.331	8	0	14	54.098	5
56		-2	min	-3.642	10	-7.24	12	0.512	12	-0.001	2	-20.242	9
57	WP29	-2	max	15.469	12	310.519	6	0.36	15	0.007	5	532.499	10
58		-2	min	-46.355	8	-24.673	10	-3.025	3	-0.006	9	-1976.261	6
59	WP30	-2	max	30.993	12	48.579	10	26.701	6	0	10	526.467	5
60		-2	min	-141.664	8	-108.661	6	11.671	10	-0.019	6	-347.971	9
61	WP31	-2	max	6.022	9	8.197	10	-0.333	9	0.006	3	362.096	8
62		-2	min	-6.981	5	-124.201	6	-1.772	5	-0.005	15	-53.961	12
63	WP32	-2	max	7.452	12	84.692	9	44.152	6	-0.008	16	975.924	12
64		-2	min	-12.86	8	-151.052	5	19.857	10	-0.024	4	-3389.921	8
65	WP33	-2	max	10.301	10	23.467	10	-0.424	9	0.003	3	595.104	8
66		-2	min	-21.779	6	-164.06	6	-1.986	5	-0.002	15	-146.207	12
67	WP34	-2	max	165.674	8	112.767	9	42.653	6	-0.045	16	332.902	12
68		-2	min	-52.376	12	-197.697	5	19.508	10	-0.117	4	-1064.222	8
69	WP35	-2	max	16.819	10	111.831	8	1.962	4	0.001	9	40.226	12
70		-2	min	-66.511	6	2.428	12	0.141	16	-0.002	5	-336.738	8
71	WP36	-2	max	4.38	16	1.67	11	0.198	2	0	7	102.032	6
72		-2	min	-6.514	4	-21.916	7	-0.119	14	0	11	-10.473	10

Envelope Wall Panel Forces (Continued)

Wall Label	Elevation [ft]		Axial [k]	LC	x Shear [k]	LC	z Shear [k]	LC	x-x Moment [k-ft]	LC	z-z Moment [k-ft]	LC	
73	WP37	-2	max	164.232	6	141.346	8	3.045	4	0.006	14	111.69	12
74		-2	min	-57.193	10	-41.317	12	0.576	16	-0.007	2	-375.558	8
75	WP38	-2	max	7.646	12	75.975	8	-0.268	12	0.001	3	27.901	10
76		-2	min	-16.726	8	-14.936	12	-0.821	8	0	15	-114.923	6
77	WP39	-2	max	89.131	10	112.672	8	4.235	4	0	9	96.135	12
78		-2	min	-223.026	6	-27.41	12	1.053	16	-0.003	5	-328.372	8
79	WP40	-2	max	8.824	3	6.189	10	0.169	10	0	7	182.111	6
80		-2	min	-4.064	15	-44.801	6	-0.181	6	0	11	-45.834	10
81	WP41	-2	max	48.282	5	124.889	3	11.913	7	-0.002	14	556.571	12
82		-2	min	-43.819	9	-27.59	15	5.12	11	-0.007	2	-1602.631	8
83	WP42	-2	max	97.284	6	104.273	9	43.732	6	0.082	6	1035.86	13
84		-2	min	-37.116	10	-185.564	5	20.057	10	0.017	10	-1317.881	1
85	WP43	-2	max	0	16	163.865	6	1.088	15	0.008	15	1092.745	10
86		-2	min	0	1	-68.559	10	-1.088	1	-0.008	1	-1982.443	6
87	WP44	-2	max	95.399	12	307.472	8	0.946	7	0.005	9	905.994	12
88		-2	min	-200.563	8	-114.967	12	-0.925	11	-0.005	5	-2007.225	8

Concrete Wall Reinforcement

	Wall	Region	Thickness[in]	Hor. Bar Size	Vert. Bar Size
1	WP1	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
2	WP2	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
3	WP3	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
4	WP4	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
5		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
6		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
7		R4	12	#5@12in oc (ef)	#6@12in oc (ef)
8		R5	12	#5@12in oc (ef)	#6@12in oc (ef)
9		R6	12	#5@12in oc (ef)	#6@12in oc (ef)
10		R7	12	#5@12in oc (ef)	#6@12in oc (ef)
11		R8	12	#5@12in oc (ef)	#6@12in oc (ef)
12		R9	12	#5@12in oc (ef)	#6@12in oc (ef)
13		R10	12	#5@12in oc (ef)	#6@12in oc (ef)
14	WP5	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
15	WP6	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
16		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
17		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
18		R4	12	#5@12in oc (ef)	#6@12in oc (ef)
19	WP7	R1	12	#5@12in oc (ef)	#6@12in oc (ef)

Concrete Wall Reinforcement (Continued)

	Wall	Region	Thickness[in]	Hor. Bar Size	Vert. Bar Size
20	WP8	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
21		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
22		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
23		R4	12	#5@12in oc (ef)	#6@12in oc (ef)
24		R5	12	#5@12in oc (ef)	#6@12in oc (ef)
25		R6	12	#5@12in oc (ef)	#6@12in oc (ef)
26		R7	12	#5@12in oc (ef)	#6@12in oc (ef)
27		R8	12	#5@12in oc (ef)	#6@12in oc (ef)
28		R9	12	#5@12in oc (ef)	#6@12in oc (ef)
29		R10	12	#5@12in oc (ef)	#6@12in oc (ef)
30	WP9	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
31	WP10	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
32		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
33		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
34		R4	12	#5@12in oc (ef)	#6@12in oc (ef)
35	WP11	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
36	WP12	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
37		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
38		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
39		R4	12	#5@12in oc (ef)	#6@12in oc (ef)
40	WP13	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
41	WP14	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
42	WP15	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
43	WP16	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
44	WP17	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
45	WP18	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
46		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
47		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
48		R4	12	#5@12in oc (ef)	#6@12in oc (ef)
49	WP19	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
50	WP20	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
51	WP21	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
52	WP22	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
53	WP23	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
54	WP24	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
55	WP25	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
56		R2	12	#5@12in oc (ef)	#6@12in oc (ef)
57		R3	12	#5@12in oc (ef)	#6@12in oc (ef)
58	WP26	R1	12	#5@12in oc (ef)	#6@12in oc (ef)

Concrete Wall Reinforcement (Continued)

	Wall	Region	Thickness[in]	Hor. Bar Size	Vert. Bar Size
59	WP27	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
60	WP28	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
61	WP29	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
62	WP30	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
63	WP31	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
64	WP32	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
65	WP33	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
66	WP34	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
67	WP35	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
68	WP36	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
69	WP37	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
70	WP38	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
71	WP39	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
72	WP40	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
73	WP41	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
74	WP42	R1	12	#5@12in oc (ef)	#6@12in oc (ef)
75	WP43	R1	8	#5@12in oc (ctr)	#5@12in oc (ctr)
76	WP44	R1	8	#5@12in oc (ctr)	#5@12in oc (ctr)

ACI 318-19 Wall Panel Concrete Code Checks (In-Plane)

	Wall Panel	Region	Max UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
1	WP1	R1	0.178	5	0.25	6	NC	4310.164	564.054
2	WP2	R1	0.12	5	0.202	8	NC	362.636	168.53
3	WP3	R1	0.159	6	0.272	6	NC	12379.145	1146.556
4	WP4	R1	0.091	3	0.151	5	NC	2456.746	496.064
5		R2	0.074	5	0.183	5	NC	180.594	137.479
6		R3	0.149	5	0.139	5	NC	209.42	144.31
7		R4	0.095	5	0.15	5	NC	1424.2	357.504
8		R5	0.043	5	0.127	5	NC	1797.721	432.929
9		R6	0.07	5	0.075	5	NC	1774.786	432.929
10		R7	0.133	5	0.169	5	NC	1424.2	357.504
11		R8	0.032	5	0.088	6	NC	4291.597	673.445
12		R9	0.035	5	0.047	5	NC	4257.743	673.445
13		R10	0.185	10	0.092	5	-143.139	87.535	123.818
14	WP5	R1	0.691	6	0.58	6	NC	84.43	82.545
15	WP6	R1	0.157	12	0.113	5	-620.268	2153.949	617.324
16		R2	0.051	15	0.138	7	NC	180.594	137.479
17		R3	0.115	9	0.1	5	NC	180.594	144.31

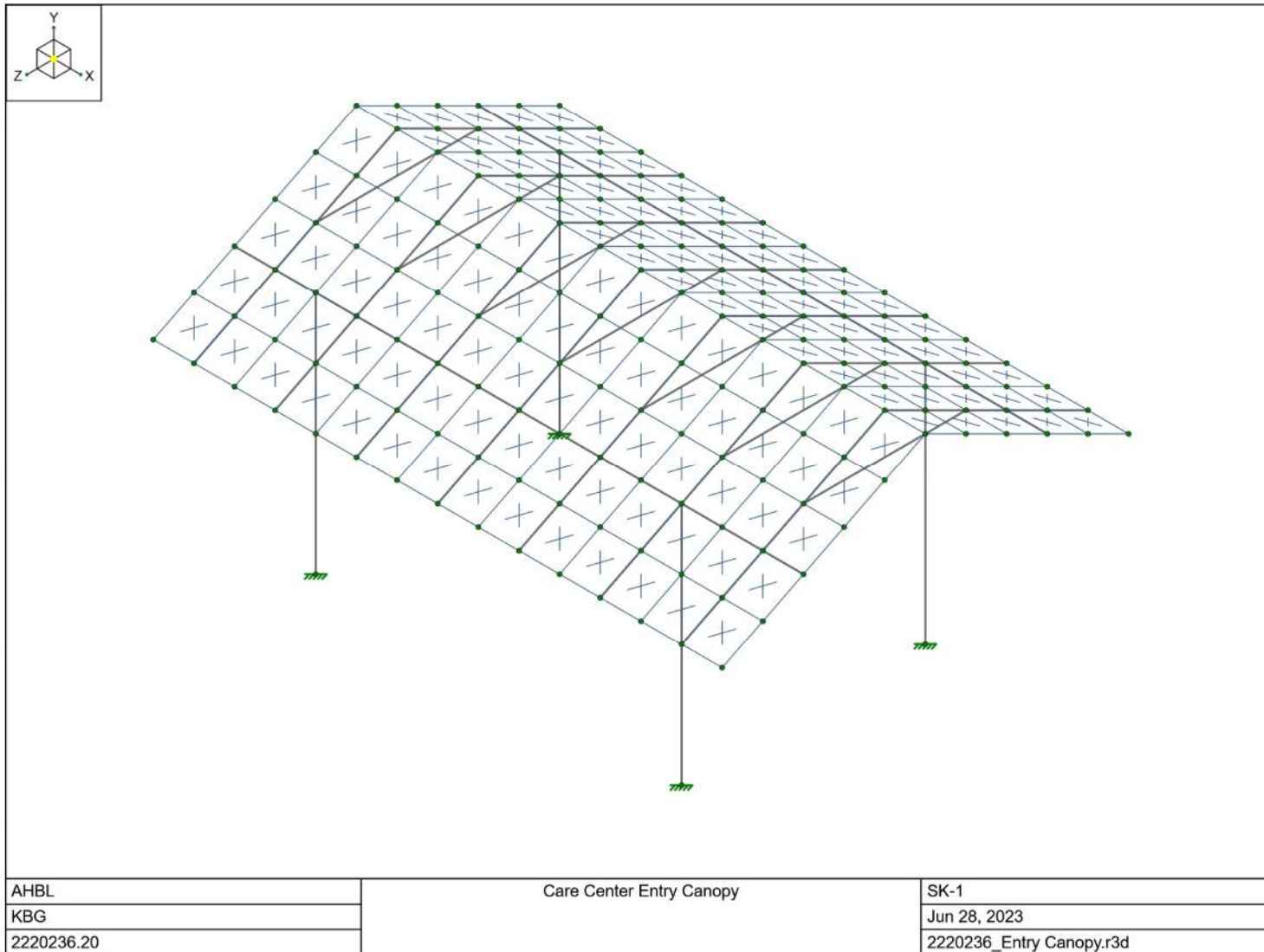
ACI 318-19 Wall Panel Concrete Code Checks (In-Plane) (Continued)

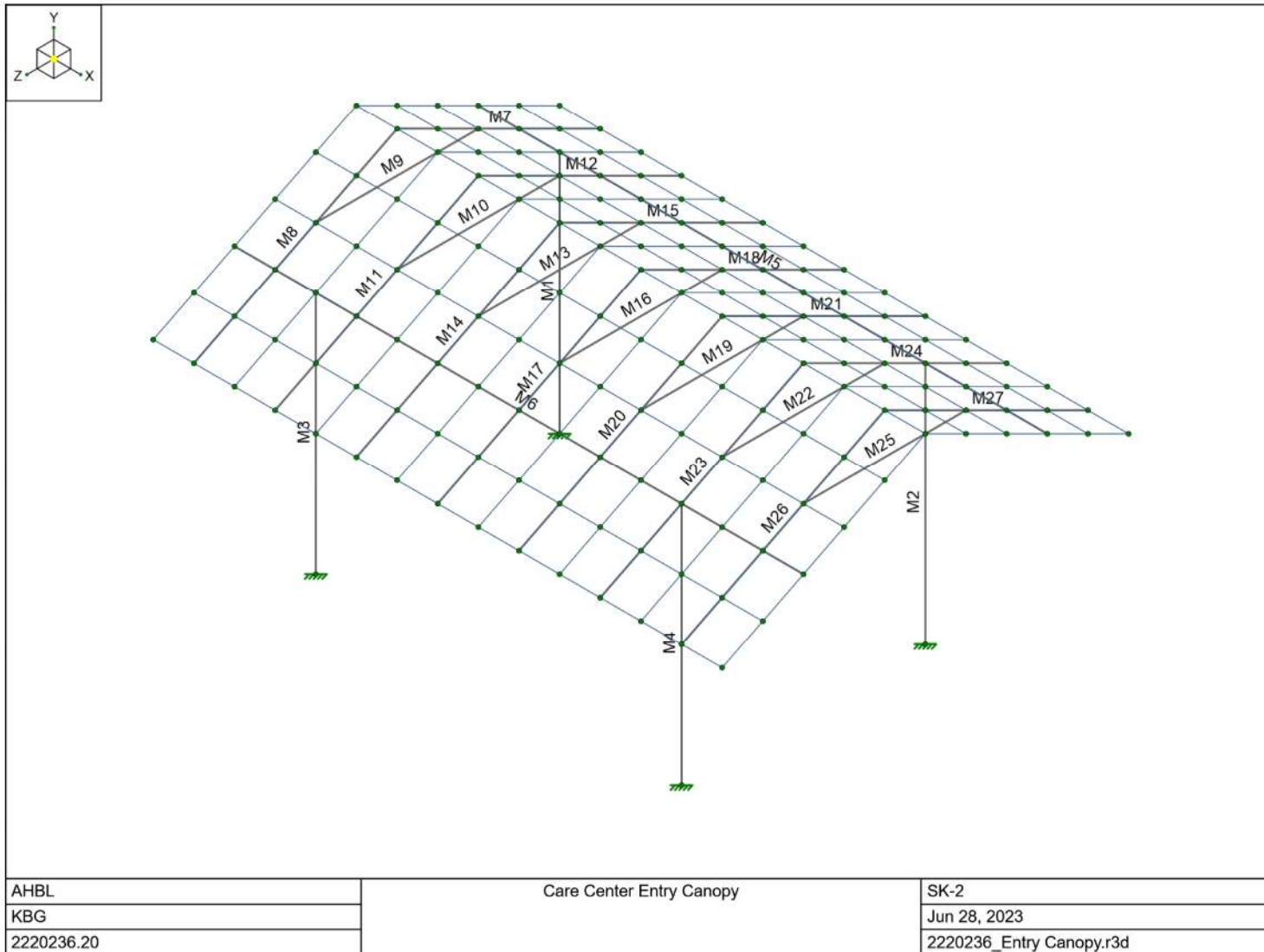
	Wall Panel	Region	Max UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
18		R4	0.208	6	0.127	5	-572.555	1247.89	482.043
19	WP7	R1	0.437	8	0.481	6	NC	2144.258	468.999
20	WP8	R1	0.532	8	0.266	8	-238.565	37.492	156.713
21		R2	0.056	3	0.143	3	NC	548.42	240.516
22		R3	0.116	3	0.11	3	NC	557.366	240.516
23		R4	0.101	3	0.136	3	NC	803.737	247.636
24		R5	0.047	7	0.121	7	NC	557.366	240.516
25		R6	0.097	7	0.092	7	NC	548.42	240.516
26		R7	0.086	7	0.13	5	NC	1797.721	426.098
27		R8	0.056	5	0.161	5	NC	557.366	240.516
28		R9	0.116	5	0.117	5	NC	548.42	240.516
29		R10	0.499	8	0.237	6	-333.991	230.528	262.11
30	WP9	R1	0.501	6	0.521	8	NC	791.809	247.636
31	WP10	R1	0.096	3	0.089	7	NC	5361.626	744.598
32		R2	0.05	3	0.122	3	NC	548.42	240.516
33		R3	0.124	8	0.094	3	NC	557.366	240.516
34		R4	0.385	12	0.258	8	-143.139	34.852	123.818
35	WP11	R1	0.621	8	0.422	6	NC	84.43	82.545
36	WP12	R1	0.117	6	0.136	3	NC	3018.006	552.787
37		R2	0.033	5	0.086	5	NC	1424.2	384.826
38		R3	0.062	5	0.056	5	NC	1406.307	384.826
39		R4	0.535	6	0.188	6	-95.426	5.515	75.043
40	WP13	R1	0.548	8	0.453	8	NC	84.43	82.545
41	WP14	R1	0.14	12	0.089	7	-477.129	88.204	493.058
42	WP15	R1	0.563	8	0.391	6	NC	84.43	82.545
43	WP16	R1	0.427	8	0.118	3	-429.416	67.66	352.597
44	WP17	R1	0.634	8	0.512	8	NC	84.43	82.545
45	WP18	R1	0.097	11	0.082	5	NC	2545.87	513.035
46		R2	0.032	3	0.107	3	NC	1078.315	336.722
47		R3	0.044	3	0.054	7	NC	1093.225	336.722
48		R4	0.088	5	0.131	8	NC	1797.722	426.099
49	WP19	R1	0.46	8	0.437	6	NC	803.737	247.636
50	WP20	R1	0.143	8	0.09	3	-2003.943	7994.991	1989.268
51	WP21	R1	0.285	6	0.375	8	NC	2119.671	468.999
52	WP22	R1	0.015	3	0.068	3	NC	67917.03	2696.786
53	WP23	R1	0.275	8	0.27	6	NC	2144.258	468.999
54	WP24	R1	0.117	8	0.06	3	NC	20899.122	1499.217
55	WP25	R1	0.219	3	0.212	8	NC	378.524	175.402
56		R2	0.022	8	0.032	4	NC	8713.614	962.064

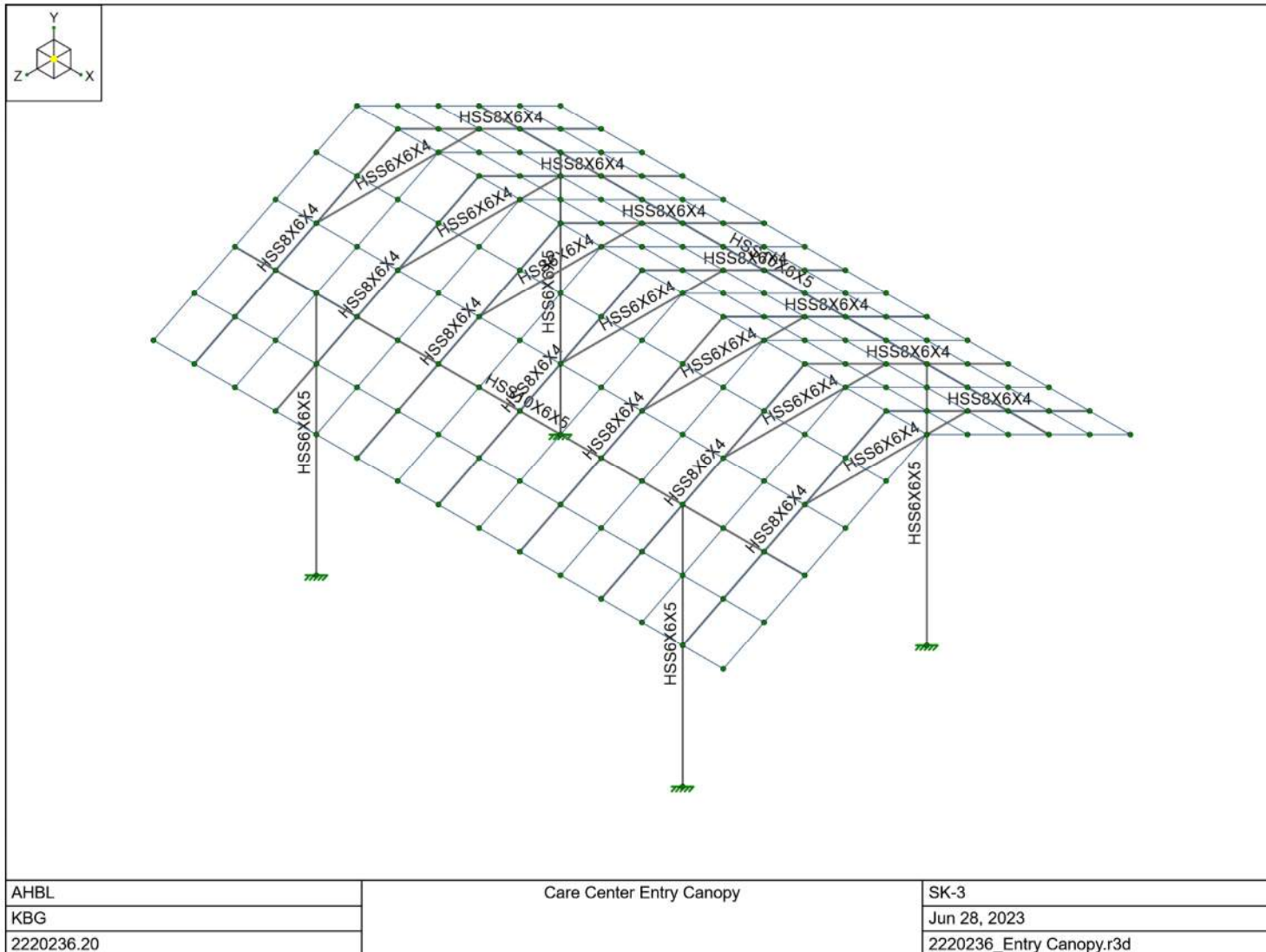
ACI 318-19 Wall Panel Concrete Code Checks (In-Plane) (Continued)

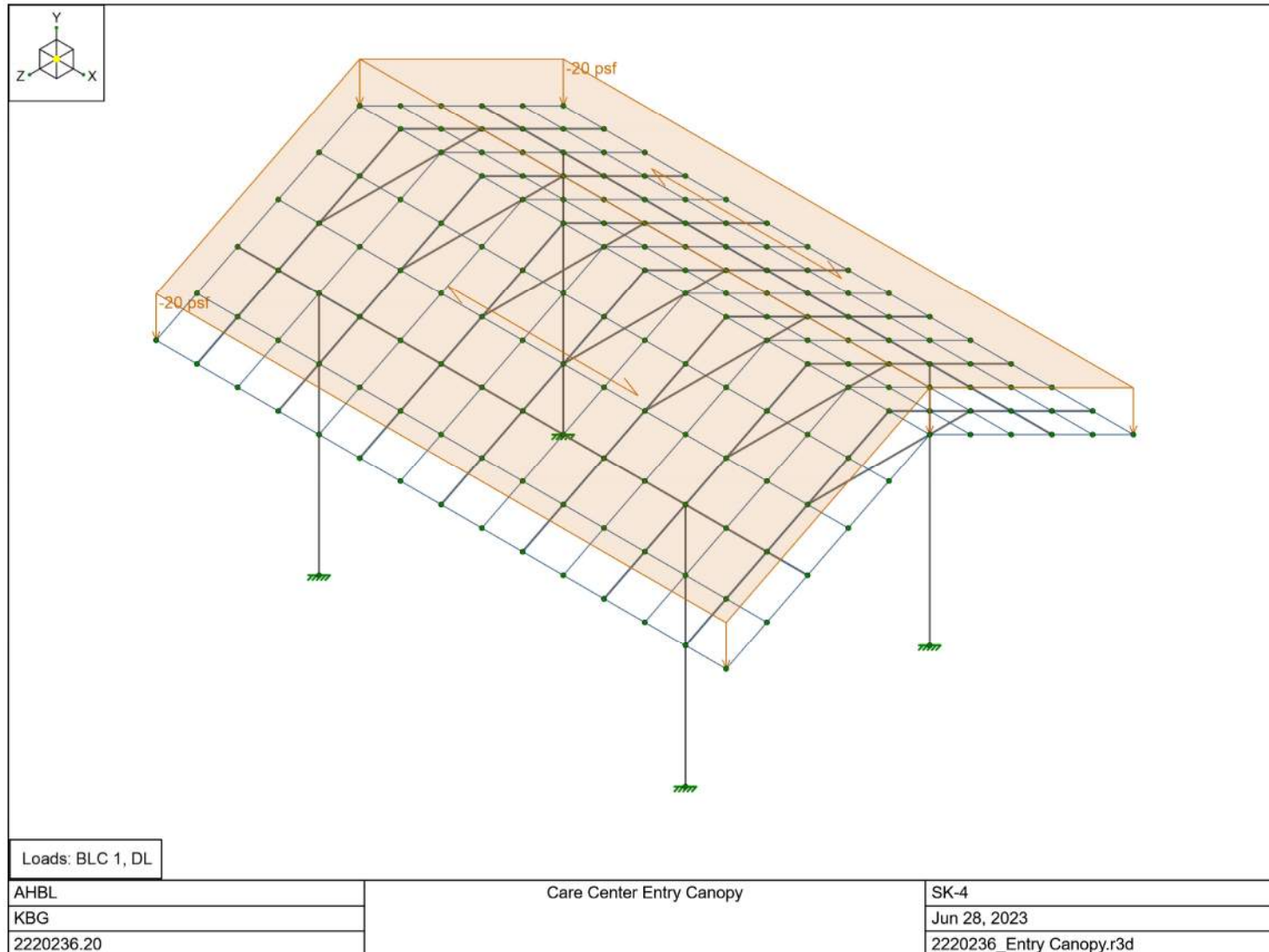
	Wall Panel	Region	Max UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
57		R3	0.455	8	0.227	6	NC	84.43	79.221
58	WP26	R1	0.097	3	0.098	6	NC	291.066	140.155
59	WP27	R1	0.082	8	0.203	8	NC	13268.358	1173.518
60	WP28	R1	0.094	5	0.132	8	NC	576.162	215.962
61	WP29	R1	0.103	6	0.22	6	NC	19155.098	1413.094
62	WP30	R1	0.027	5	0.076	6	NC	19266.741	1427.399
63	WP31	R1	0.204	8	0.291	6	NC	1774.786	426.098
64	WP32	R1	0.089	8	0.076	5	NC	38094.317	2010.815
65	WP33	R1	0.279	8	0.348	6	NC	2129.968	471.034
66	WP34	R1	0.028	8	0.098	5	NC	38176.568	2015.469
67	WP35	R1	0.205	3	0.376	8	NC	1326.446	297.142
68	WP36	R1	0.341	6	0.152	7	NC	299.589	143.841
69	WP37	R1	0.088	11	0.273	8	NC	2593.924	517.04
70	WP38	R1	0.356	6	0.502	8	NC	322.875	151.333
71	WP39	R1	0.36	6	0.24	8	-620.268	785.626	470.306
72	WP40	R1	0.489	6	0.255	6	NC	372.576	175.409
73	WP41	R1	0.265	8	0.159	3	NC	6053.756	785.966
74	WP42	R1	0.045	1	0.106	5	NC	29368.014	1758.224
75	WP43	R1	0.489	6	0.267	6	NC	4056.256	614.285
76	WP44	R1	0.637	8	0.788	8	-314.773	3150.223	390.385

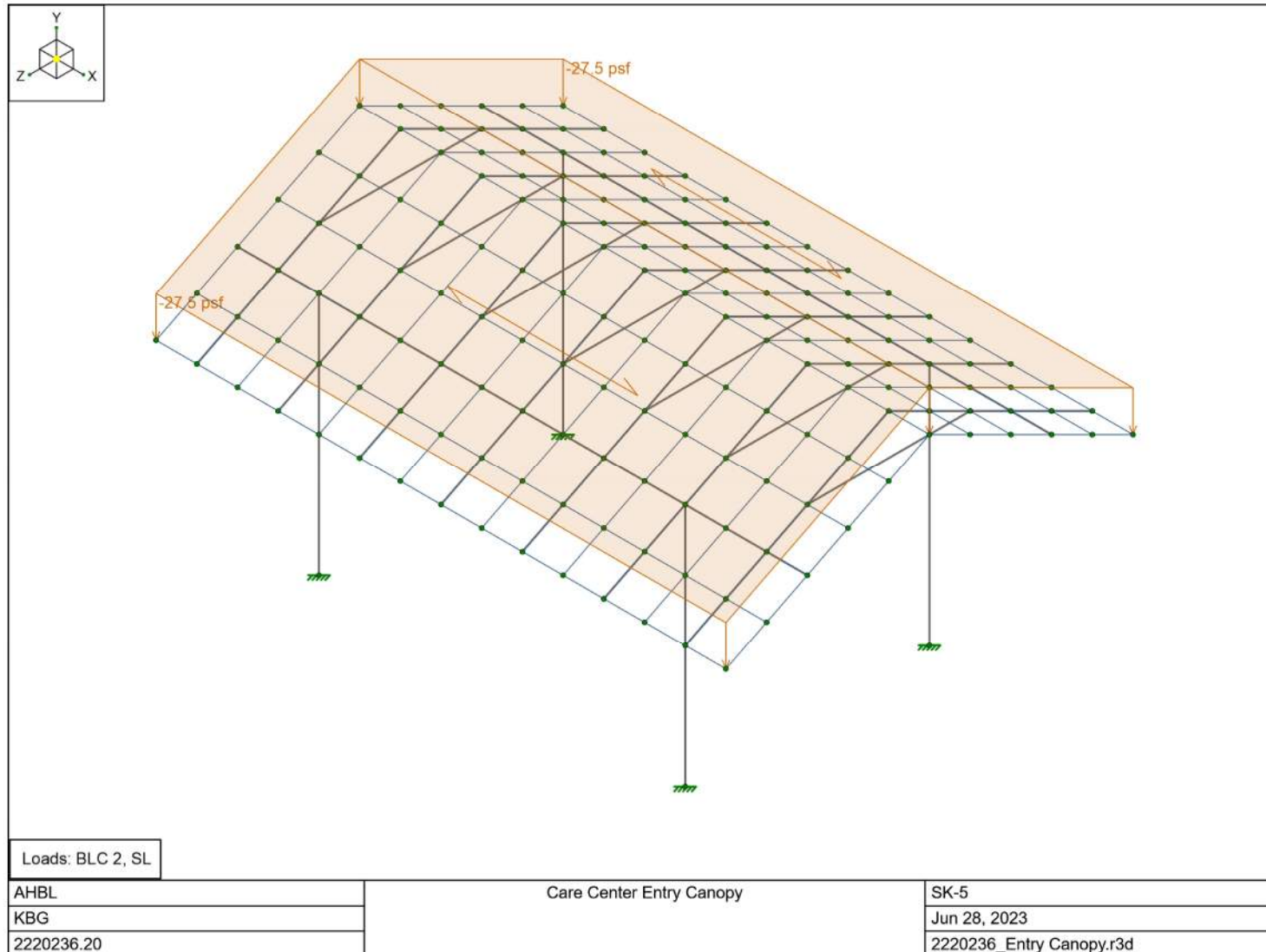
9.0 - CANOPY DESIGN

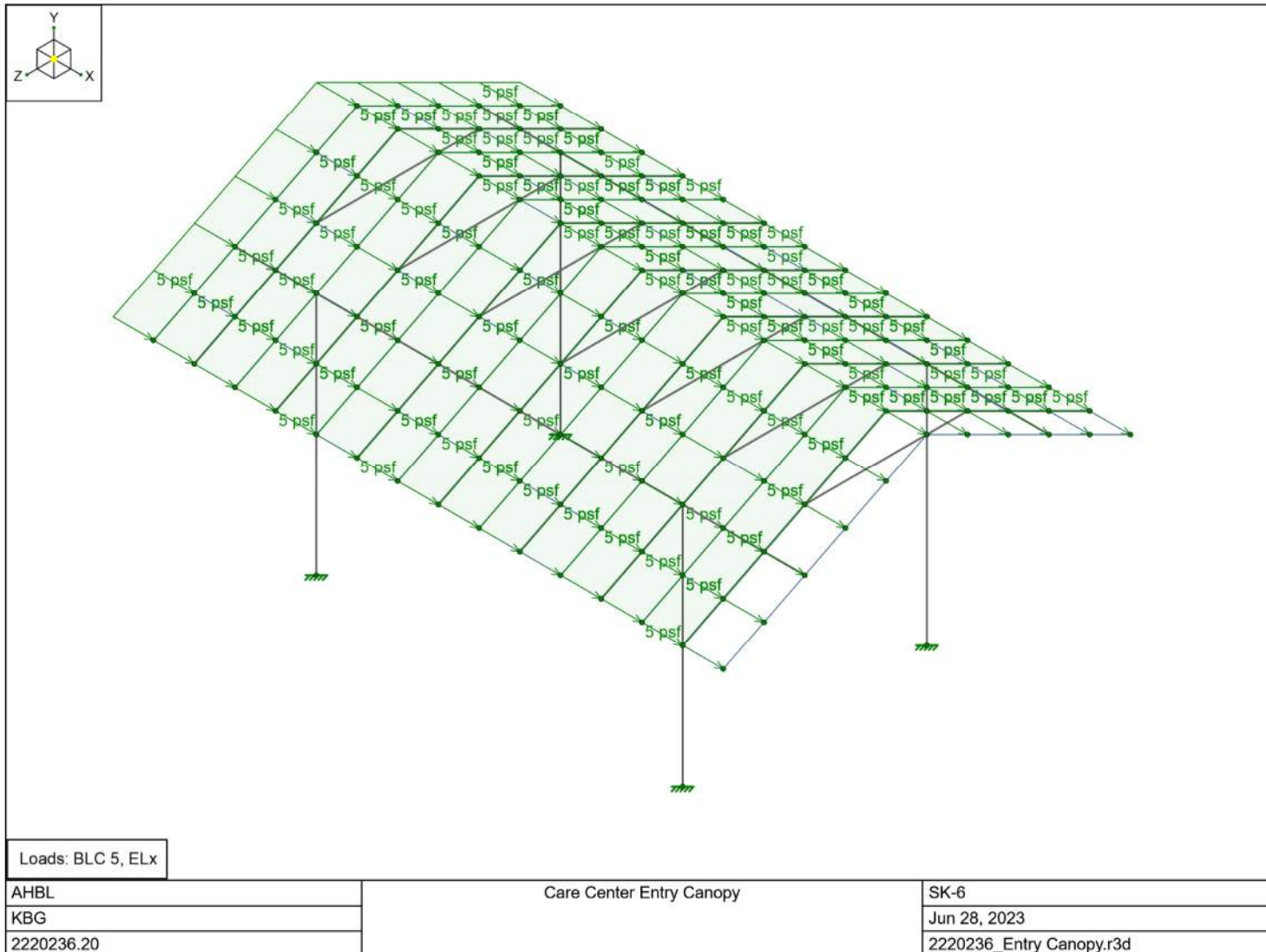


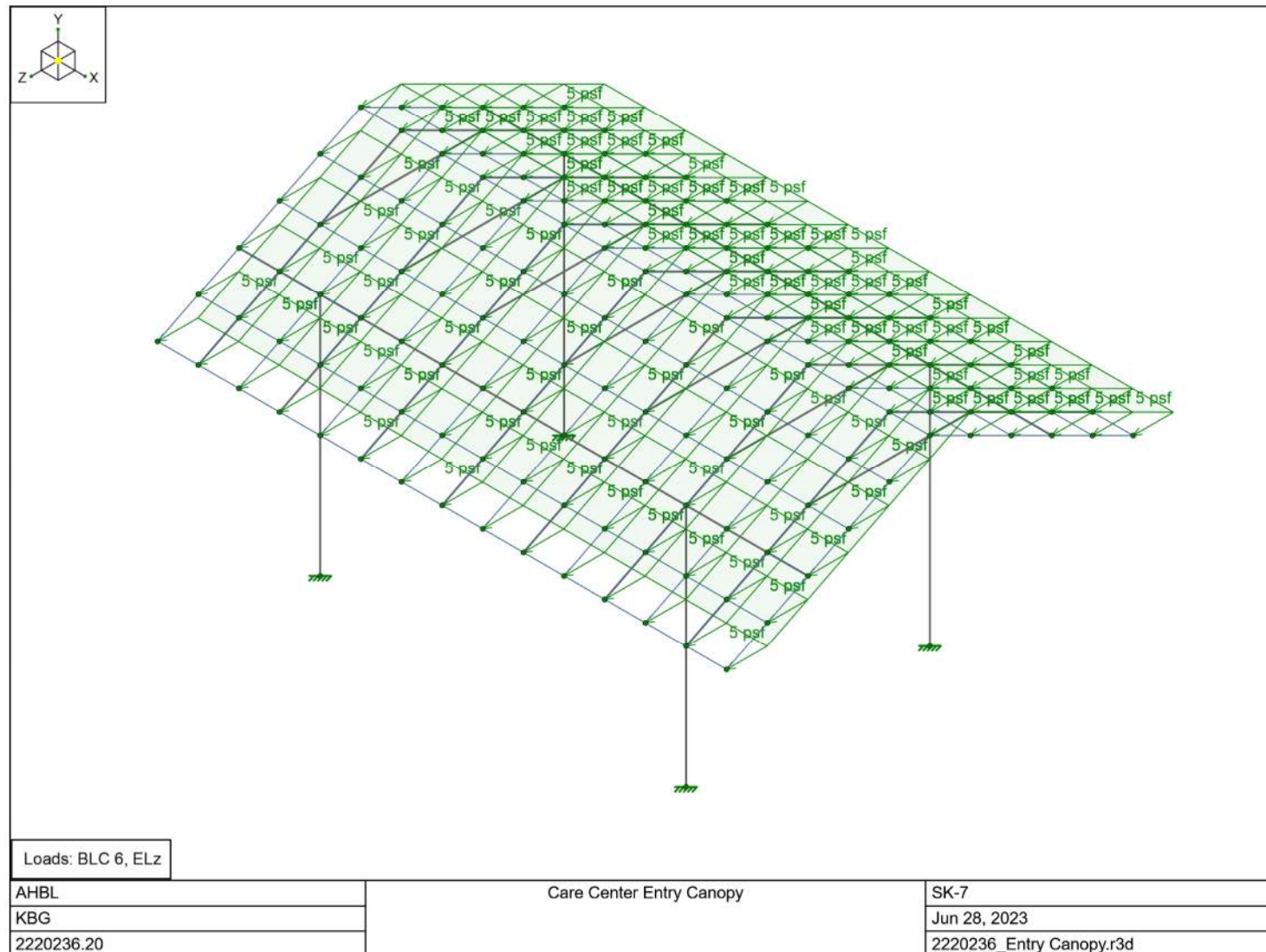


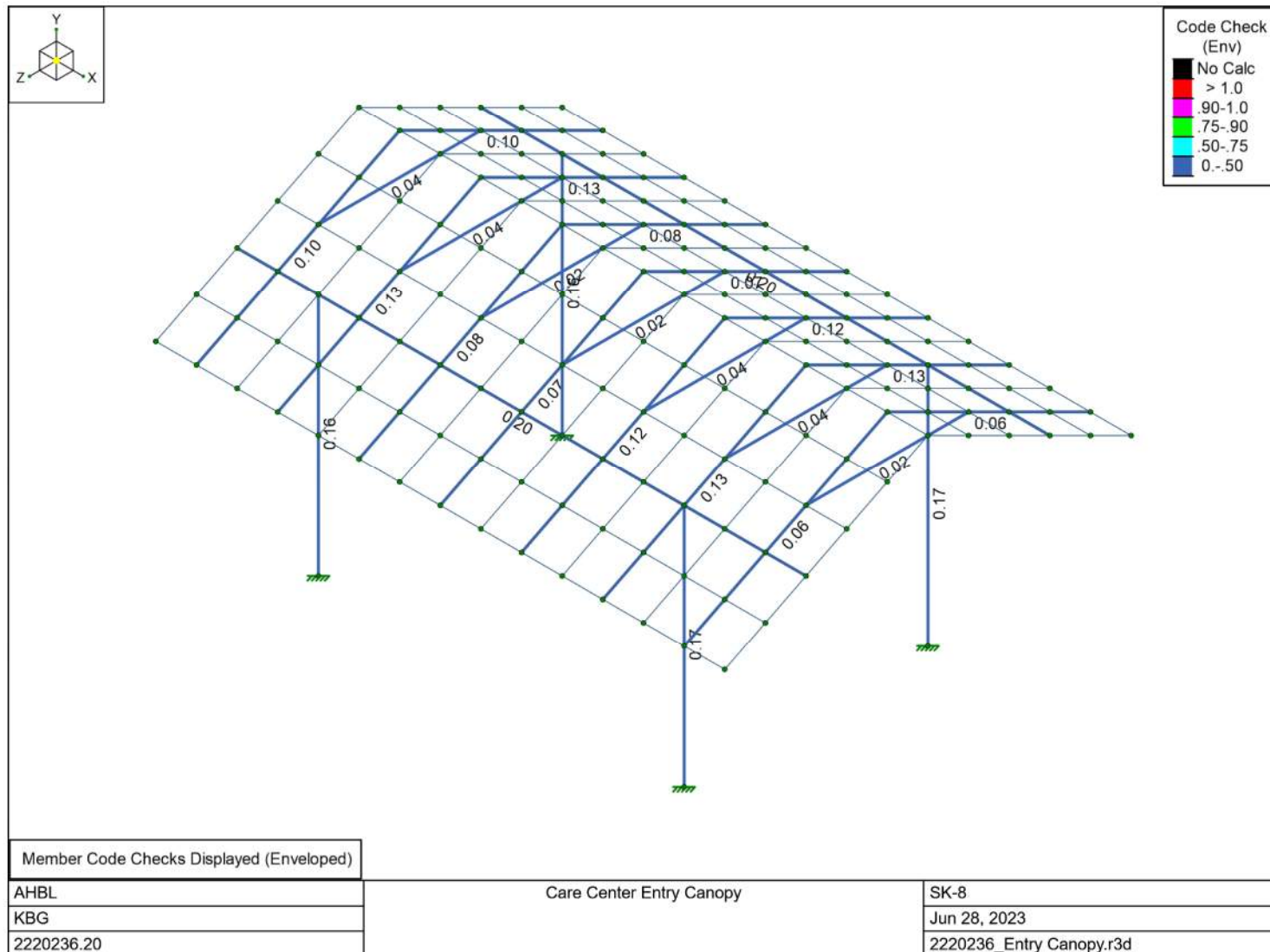














Company : AHBL
Designer : KBG
Job Number : 2220236.20
Model Name : Care Center Entry Canopy

6/28/2023
9:10:39 PM
Checked By : _____

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	4	0	4	
2	N2	22	0	4	
3	N3	4	0	16	
4	N4	22	0	16	
5	N5	4	12	4	
6	N6	22	12	4	
7	N7	4	12	16	
8	N8	22	12	16	
9	N9	0	12	4	
10	N10	28	12	4	
11	N11	0	12	16	
12	N12	28	12	16	
13	N13	2	10	0	
14	N14	2	12	4	
15	N15	2	15	10	
16	N16	2	12	16	
17	N17	2	10	20	
18	N18	2	13	6	
19	N19	2	13	14	
20	N20	6	10	20	
21	N21	6	12	4	
22	N22	6	15	10	
23	N23	6	12	16	
24	N24	6	13	6	
25	N25	6	13	14	
26	N26	6	10	0	
27	N27	10	10	20	
28	N28	10	12	4	
29	N29	10	15	10	
30	N30	10	12	16	
31	N31	10	13	6	
32	N32	10	13	14	
33	N33	10	10	0	
34	N34	14	10	20	
35	N35	14	12	4	
36	N36	14	15	10	
37	N37	14	12	16	
38	N38	14	13	6	
39	N39	14	13	14	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
40	N40	14	10	0	
41	N41	18	10	20	
42	N42	18	12	4	
43	N43	18	15	10	
44	N44	18	12	16	
45	N45	18	13	6	
46	N46	18	13	14	
47	N47	18	10	0	
48	N48	22	10	20	
49	N49	22	15	10	
50	N50	22	13	6	
51	N51	22	13	14	
52	N52	22	10	0	
53	N53	26	10	20	
54	N54	26	12	4	
55	N55	26	15	10	
56	N56	26	12	16	
57	N57	26	13	6	
58	N58	26	13	14	
59	N59	26	10	0	
60	N60	0	10	0	
61	N61	28	10	0	
62	N62	0	10	20	
63	N63	28	10	20	
64	N64	0	15	10	
65	N65	28	15	10	
66	N66	8	12.000187	4.000374	
67	N67	8	12.999517	5.999034	
68	N68	20	11.000913	2.001826	
69	N69	18	11.000491	2.000981	
70	N70	20	10	0	
71	N71	4	12.99963	5.99926	
72	N72	10	13.9996	7.9992	
73	N73	12	13.999719	7.999437	
74	N74	12	15	10	
75	N75	6	13.999724	7.999447	
76	N76	8	13.999269	7.998539	
77	N77	8	15	10	
78	N78	12	12.000318	4.000636	



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Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
79	N79	12	12.999269	5.998539	
80	N80	14	13.999867	7.999733	
81	N81	2	13.999207	7.998415	
82	N82	0	14	8	
83	N83	0	13	6	
84	N84	4	13.999372	7.998745	
85	N85	4	15	10	
86	N86	18	13.99979	7.999579	
87	N87	20	13.999796	7.999593	
88	N88	20	15	10	
89	N89	8	10	0	
90	N90	8	11.000237	2.000474	
91	N91	6	11.000764	2.001528	
92	N92	24	11.000078	2.000155	
93	N93	22	11.000421	2.000843	
94	N94	24	10	0	
95	N95	16	13.000259	6.000518	
96	N96	16	12.000404	4.000808	
97	N97	16	11.00027	2.000541	
98	N98	16	10	0	
99	N99	14	11.000257	2.000513	
100	N100	26	11.000109	2.000218	
101	N101	28	11	2	
102	N102	20	12.000148	4.000295	
103	N103	4	11.000116	2.000232	
104	N104	4	10	0	
105	N105	12	11.001061	2.002122	
106	N106	10	11.000946	2.001891	
107	N107	12	10	0	
108	N108	2	11.000164	2.000328	
109	N109	0	11	2	
110	N110	22	13.999863	7.999726	
111	N111	24	13.999945	7.99989	
112	N112	24	15	10	
113	N113	16	13.999685	7.99937	
114	N114	20	12.999544	5.999089	
115	N115	16	15	10	
116	N116	28	13	6	
117	N117	26	13.99981	7.99962	



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Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
118	N118	28	14	8	
119	N119	24	12.999887	5.999774	
120	N120	24	12.00009	4.00018	
121	N121	8	14.000821	11.998358	
122	N122	8	13.000958	13.998083	
123	N123	10	14.000546	11.998909	
124	N124	20	11.000913	17.998174	
125	N125	18	11.000594	17.998813	
126	N126	20	10	20	
127	N127	4	13.000269	13.999461	
128	N128	12	14.0009	11.998201	
129	N129	14	14.000722	11.998556	
130	N130	8	12.000723	15.998554	
131	N131	12	13.000358	13.999284	
132	N132	12	12.000698	15.998604	
133	N133	2	14.000483	11.999034	
134	N134	0	14	12	
135	N135	0	13	14	
136	N136	6	14.000308	11.999385	
137	N137	4	14.000413	11.999175	
138	N138	20	14.000351	11.999297	
139	N139	22	14.000232	11.999536	
140	N140	8	10	20	
141	N141	8	11.000375	17.99925	
142	N142	6	11.000995	17.998011	
143	N143	24	11.000094	17.999811	
144	N144	22	11.000456	17.999087	
145	N145	24	10	20	
146	N146	16	13.000539	13.998922	
147	N147	16	12.000483	15.999033	
148	N148	16	11.000312	17.999375	
149	N149	16	10	20	
150	N150	14	11.000336	17.999328	
151	N151	26	11.000144	17.999712	
152	N152	28	11	18	
153	N153	20	12.000536	15.998927	
154	N154	4	11.000145	17.99971	
155	N155	4	10	20	
156	N156	12	11.00029	17.999421	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
157	N157	10	11.000261	17.999479	
158	N158	12	10	20	
159	N159	2	11.000166	17.999668	
160	N160	0	11	18	
161	N161	24	14.000283	11.999435	
162	N162	16	14.000901	11.998197	
163	N163	20	13.000918	13.998164	
164	N164	18	14.000702	11.998595	
165	N165	28	13	14	
166	N166	26	14.000136	11.999729	
167	N167	28	14	12	
168	N168	24	13.000303	13.999393	
169	N169	24	12.000155	15.999691	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N4	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N3	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [10^{-6}F^{-1}]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B RECT	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A500 Gr.C RND	29000	11154	0.3	0.65	0.527	46	1.4	62	1.3
7	A500 Gr.C RECT	29000	11154	0.3	0.65	0.527	50	1.4	62	1.3
8	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
9	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
10	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1



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Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1	HSS Beam	HSS10X6X5	Beam	Tube	A500 Gr.C RECT	Typical	8.76	53.3	118	118
2	HSS Truss Chord	HSS8X6X4	Beam	Tube	A500 Gr.C RECT	Typical	6.17	36.4	56.6	70.3
3	HSS Column	HSS6X6X5	Column	Tube	A500 Gr.C RECT	Typical	6.43	34.3	34.3	55.4
4	HSS Truss Web	HSS6X6X4	VBrace	Tube	A500 Gr.C RECT	Typical	5.24	28.6	28.6	45.6

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N5	HSS Column	Column	Tube	A500 Gr.C RECT	Typical
2	M2	N2	N6	HSS Column	Column	Tube	A500 Gr.C RECT	Typical
3	M3	N3	N7	HSS Column	Column	Tube	A500 Gr.C RECT	Typical
4	M4	N4	N8	HSS Column	Column	Tube	A500 Gr.C RECT	Typical
5	M5	N9	N10	HSS Beam	Beam	Tube	A500 Gr.C RECT	Typical
6	M6	N11	N12	HSS Beam	Beam	Tube	A500 Gr.C RECT	Typical
7	M7	N13	N15	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
8	M8	N17	N15	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
9	M9	N18	N19	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
10	M10	N24	N25	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
11	M11	N20	N22	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
12	M12	N26	N22	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
13	M13	N31	N32	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
14	M14	N27	N29	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
15	M15	N33	N29	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
16	M16	N38	N39	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
17	M17	N34	N36	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
18	M18	N40	N36	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
19	M19	N45	N46	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
20	M20	N41	N43	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
21	M21	N47	N43	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
22	M22	N50	N51	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
23	M23	N48	N49	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
24	M24	N52	N49	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
25	M25	N57	N58	HSS Truss Web	VBrace	Tube	A500 Gr.C RECT	Typical
26	M26	N53	N55	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	Typical
27	M27	N59	N55	HSS Truss Chord	Beam	Tube	A500 Gr.C RECT	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	Default	None
6	M6	Yes	Default	None
7	M7	Yes	Default	None
8	M8	Yes	Default	None
9	M9	Yes	** NA **	None
10	M10	Yes	** NA **	None
11	M11	Yes	Default	None
12	M12	Yes	Default	None
13	M13	Yes	** NA **	None
14	M14	Yes	Default	None
15	M15	Yes	Default	None
16	M16	Yes	** NA **	None
17	M17	Yes	Default	None
18	M18	Yes	Default	None
19	M19	Yes	** NA **	None
20	M20	Yes	Default	None
21	M21	Yes	Default	None
22	M22	Yes	** NA **	None
23	M23	Yes	Default	None
24	M24	Yes	Default	None
25	M25	Yes	** NA **	None
26	M26	Yes	Default	None
27	M27	Yes	Default	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lb y-y [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
1	M1	HSS Column	12		Lbyy	N/A	N/A	Lateral
2	M2	HSS Column	12		Lbyy	N/A	N/A	Lateral
3	M3	HSS Column	12		Lbyy	N/A	N/A	Lateral
4	M4	HSS Column	12		Lbyy	N/A	N/A	Lateral
5	M5	HSS Beam	28	4	Lbyy	N/A	N/A	Lateral
6	M6	HSS Beam	28	4	Lbyy	N/A	N/A	Lateral
7	M7	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [ft]	Lb y-y [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
8	M8	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
9	M9	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
10	M10	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
11	M11	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
12	M12	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
13	M13	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
14	M14	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
15	M15	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
16	M16	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
17	M17	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
18	M18	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
19	M19	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
20	M20	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
21	M21	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
22	M22	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
23	M23	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
24	M24	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
25	M25	HSS Truss Web	8		Lbyy	N/A	N/A	Lateral
26	M26	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral
27	M27	HSS Truss Chord	11.18	2	Lbyy	N/A	N/A	Lateral

Plate Primary Data

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
1	P62	N108	N109	N60	N13	Plywood (2)	0.5
2	P61	N108	N103	N5	N14	Plywood (2)	0.5
3	P60	N105	N107	N40	N99	Plywood (2)	0.5
4	P59	N90	N66	N21	N91	Plywood (2)	0.5
5	P58	N105	N78	N28	N106	Plywood (2)	0.5
6	P57	N103	N91	N21	N5	Plywood (2)	0.5
7	P56	N100	N59	N61	N101	Plywood (2)	0.5
8	P55	N93	N68	N70	N52	Plywood (2)	0.5
9	P54	N100	N54	N120	N92	Plywood (2)	0.5
10	P53	N97	N99	N40	N98	Plywood (2)	0.5
11	P52	N97	N69	N42	N96	Plywood (2)	0.5
12	P51	N96	N95	N38	N35	Plywood (2)	0.5
13	P50	N93	N92	N120	N6	Plywood (2)	0.5
14	P49	N90	N89	N33	N106	Plywood (2)	0.5
15	P48	N87	N86	N45	N114	Plywood (2)	0.5



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Plate Primary Data (Continued)

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
16	P47	N81	N15	N64	N82	Plywood (2)	0.5
17	P46	N84	N75	N22	N85	Plywood (2)	0.5
18	P45	N81	N18	N71	N84	Plywood (2)	0.5
19	P44	N73	N80	N36	N74	Plywood (2)	0.5
20	P43	N79	N78	N35	N38	Plywood (2)	0.5
21	P42	N76	N72	N29	N77	Plywood (2)	0.5
22	P41	N76	N75	N24	N67	Plywood (2)	0.5
23	P40	N73	N72	N31	N79	Plywood (2)	0.5
24	P39	N5	N71	N18	N14	Plywood (2)	0.5
25	P38	N69	N68	N102	N42	Plywood (2)	0.5
26	P37	N67	N66	N28	N31	Plywood (2)	0.5
27	P36	N120	N119	N50	N6	Plywood (2)	0.5
28	P35	N57	N117	N111	N119	Plywood (2)	0.5
29	P34	N55	N117	N118	N65	Plywood (2)	0.5
30	P33	N57	N54	N10	N116	Plywood (2)	0.5
31	P32	N80	N113	N115	N36	Plywood (2)	0.5
32	P31	N110	N87	N114	N50	Plywood (2)	0.5
33	P30	N102	N114	N45	N42	Plywood (2)	0.5
34	P29	N86	N113	N95	N45	Plywood (2)	0.5
35	P28	N110	N111	N112	N49	Plywood (2)	0.5
36	P27	N109	N108	N14	N9	Plywood (2)	0.5
37	P26	N103	N108	N13	N104	Plywood (2)	0.5
38	P25	N107	N105	N106	N33	Plywood (2)	0.5
39	P24	N66	N90	N106	N28	Plywood (2)	0.5
40	P23	N78	N105	N99	N35	Plywood (2)	0.5
41	P22	N91	N103	N104	N26	Plywood (2)	0.5
42	P21	N59	N100	N92	N94	Plywood (2)	0.5
43	P20	N68	N93	N6	N102	Plywood (2)	0.5
44	P19	N54	N100	N101	N10	Plywood (2)	0.5
45	P18	N99	N97	N96	N35	Plywood (2)	0.5
46	P17	N69	N97	N98	N47	Plywood (2)	0.5
47	P16	N95	N96	N42	N45	Plywood (2)	0.5
48	P15	N92	N93	N52	N94	Plywood (2)	0.5
49	P14	N89	N90	N91	N26	Plywood (2)	0.5
50	P13	N86	N87	N88	N43	Plywood (2)	0.5
51	P12	N15	N81	N84	N85	Plywood (2)	0.5
52	P11	N75	N84	N71	N24	Plywood (2)	0.5
53	P10	N14	N18	N83	N9	Plywood (2)	0.5
54	P9	N18	N81	N82	N83	Plywood (2)	0.5



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Plate Primary Data (Continued)

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
55	P8	N80	N73	N79	N38	Plywood (2)	0.5
56	P7	N78	N79	N31	N28	Plywood (2)	0.5
57	P6	N72	N76	N67	N31	Plywood (2)	0.5
58	P5	N75	N76	N77	N22	Plywood (2)	0.5
59	P4	N72	N73	N74	N29	Plywood (2)	0.5
60	P3	N71	N5	N21	N24	Plywood (2)	0.5
61	P2	N68	N69	N47	N70	Plywood (2)	0.5
62	P1	N66	N67	N24	N21	Plywood (2)	0.5
63	P63	N111	N110	N50	N119	Plywood (2)	0.5
64	P64	N113	N86	N43	N115	Plywood (2)	0.5
65	P65	N114	N102	N6	N50	Plywood (2)	0.5
66	P66	N87	N110	N49	N88	Plywood (2)	0.5
67	P67	N113	N80	N38	N95	Plywood (2)	0.5
68	P68	N54	N57	N119	N120	Plywood (2)	0.5
69	P69	N117	N55	N112	N111	Plywood (2)	0.5
70	P70	N117	N57	N116	N118	Plywood (2)	0.5
71	P71	N121	N122	N32	N123	Plywood (2)	0.5
72	P72	N124	N125	N41	N126	Plywood (2)	0.5
73	P73	N127	N7	N23	N25	Plywood (2)	0.5
74	P74	N74	N128	N129	N36	Plywood (2)	0.5
75	P75	N77	N121	N123	N29	Plywood (2)	0.5
76	P76	N130	N122	N25	N23	Plywood (2)	0.5
77	P77	N128	N131	N39	N129	Plywood (2)	0.5
78	P78	N132	N131	N32	N30	Plywood (2)	0.5
79	P79	N19	N133	N134	N135	Plywood (2)	0.5
80	P80	N16	N19	N135	N11	Plywood (2)	0.5
81	P81	N136	N137	N127	N25	Plywood (2)	0.5
82	P82	N15	N133	N137	N85	Plywood (2)	0.5
83	P83	N88	N138	N139	N49	Plywood (2)	0.5
84	P84	N140	N141	N142	N20	Plywood (2)	0.5
85	P85	N143	N144	N48	N145	Plywood (2)	0.5
86	P86	N146	N147	N44	N46	Plywood (2)	0.5
87	P87	N125	N148	N149	N41	Plywood (2)	0.5
88	P88	N150	N148	N147	N37	Plywood (2)	0.5
89	P89	N56	N151	N152	N12	Plywood (2)	0.5
90	P90	N124	N144	N8	N153	Plywood (2)	0.5
91	P91	N53	N151	N143	N145	Plywood (2)	0.5
92	P92	N142	N154	N155	N20	Plywood (2)	0.5
93	P93	N132	N156	N150	N37	Plywood (2)	0.5



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Plate Primary Data (Continued)

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
94	P94	N130	N141	N157	N30	Plywood (2)	0.5
95	P95	N158	N156	N157	N27	Plywood (2)	0.5
96	P96	N154	N159	N17	N155	Plywood (2)	0.5
97	P97	N160	N159	N16	N11	Plywood (2)	0.5
98	P98	N139	N161	N112	N49	Plywood (2)	0.5
99	P99	N146	N162	N129	N39	Plywood (2)	0.5
100	P100	N138	N163	N51	N139	Plywood (2)	0.5
101	P101	N153	N163	N46	N44	Plywood (2)	0.5
102	P102	N115	N162	N164	N43	Plywood (2)	0.5
103	P103	N58	N56	N12	N165	Plywood (2)	0.5
104	P104	N55	N166	N167	N65	Plywood (2)	0.5
105	P105	N58	N166	N161	N168	Plywood (2)	0.5
106	P106	N169	N168	N51	N8	Plywood (2)	0.5
107	P107	N122	N121	N136	N25	Plywood (2)	0.5
108	P108	N125	N124	N153	N44	Plywood (2)	0.5
109	P109	N7	N127	N19	N16	Plywood (2)	0.5
110	P110	N128	N74	N29	N123	Plywood (2)	0.5
111	P111	N121	N77	N22	N136	Plywood (2)	0.5
112	P112	N122	N130	N30	N32	Plywood (2)	0.5
113	P113	N131	N128	N123	N32	Plywood (2)	0.5
114	P114	N131	N132	N37	N39	Plywood (2)	0.5
115	P115	N133	N19	N127	N137	Plywood (2)	0.5
116	P116	N137	N136	N22	N85	Plywood (2)	0.5
117	P117	N133	N15	N64	N134	Plywood (2)	0.5
118	P118	N138	N88	N43	N164	Plywood (2)	0.5
119	P119	N141	N140	N27	N157	Plywood (2)	0.5
120	P120	N144	N143	N169	N8	Plywood (2)	0.5
121	P121	N147	N146	N39	N37	Plywood (2)	0.5
122	P122	N148	N125	N44	N147	Plywood (2)	0.5
123	P123	N148	N150	N34	N149	Plywood (2)	0.5
124	P124	N151	N56	N169	N143	Plywood (2)	0.5
125	P125	N144	N124	N126	N48	Plywood (2)	0.5
126	P126	N151	N53	N63	N152	Plywood (2)	0.5
127	P127	N154	N142	N23	N7	Plywood (2)	0.5
128	P128	N156	N132	N30	N157	Plywood (2)	0.5
129	P129	N141	N130	N23	N142	Plywood (2)	0.5
130	P130	N156	N158	N34	N150	Plywood (2)	0.5
131	P131	N159	N154	N7	N16	Plywood (2)	0.5
132	P132	N159	N160	N62	N17	Plywood (2)	0.5

Plate Primary Data (Continued)

	Label	A Node	B Node	C Node	D Node	Material	Thickness [in]
133	P133	N161	N139	N51	N168	Plywood (2)	0.5
134	P134	N162	N146	N46	N164	Plywood (2)	0.5
135	P135	N163	N138	N164	N46	Plywood (2)	0.5
136	P136	N163	N153	N8	N51	Plywood (2)	0.5
137	P137	N162	N115	N36	N129	Plywood (2)	0.5
138	P138	N56	N58	N168	N169	Plywood (2)	0.5
139	P139	N166	N55	N112	N161	Plywood (2)	0.5
140	P140	N166	N58	N165	N167	Plywood (2)	0.5

Plate Advanced Data

	Label	Plane Stress	Rotate
1	P62	Yes	0
2	P61	Yes	0
3	P60	Yes	0
4	P59	Yes	0
5	P58	Yes	0
6	P57	Yes	0
7	P56	Yes	0
8	P55	Yes	0
9	P54	Yes	0
10	P53	Yes	0
11	P52	Yes	0
12	P51	Yes	0
13	P50	Yes	0
14	P49	Yes	0
15	P48	Yes	0
16	P47	Yes	0
17	P46	Yes	0
18	P45	Yes	0
19	P44	Yes	0
20	P43	Yes	0
21	P42	Yes	0
22	P41	Yes	0
23	P40	Yes	0
24	P39	Yes	0
25	P38	Yes	0
26	P37	Yes	0
27	P36	Yes	0



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Plate Advanced Data (Continued)

	Label	Plane Stress	Rotate
28	P35	Yes	0
29	P34	Yes	0
30	P33	Yes	0
31	P32	Yes	0
32	P31	Yes	0
33	P30	Yes	0
34	P29	Yes	0
35	P28	Yes	0
36	P27	Yes	0
37	P26	Yes	0
38	P25	Yes	0
39	P24	Yes	0
40	P23	Yes	0
41	P22	Yes	0
42	P21	Yes	0
43	P20	Yes	0
44	P19	Yes	0
45	P18	Yes	0
46	P17	Yes	0
47	P16	Yes	0
48	P15	Yes	0
49	P14	Yes	0
50	P13	Yes	0
51	P12	Yes	0
52	P11	Yes	0
53	P10	Yes	0
54	P9	Yes	0
55	P8	Yes	0
56	P7	Yes	0
57	P6	Yes	0
58	P5	Yes	0
59	P4	Yes	0
60	P3	Yes	0
61	P2	Yes	0
62	P1	Yes	0
63	P63	Yes	0
64	P64	Yes	0
65	P65	Yes	0
66	P66	Yes	0



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Plate Advanced Data (Continued)

	Label	Plane Stress	Rotate
67	P67	Yes	0
68	P68	Yes	0
69	P69	Yes	0
70	P70	Yes	0
71	P71	Yes	0
72	P72	Yes	0
73	P73	Yes	0
74	P74	Yes	0
75	P75	Yes	0
76	P76	Yes	0
77	P77	Yes	0
78	P78	Yes	0
79	P79	Yes	0
80	P80	Yes	0
81	P81	Yes	0
82	P82	Yes	0
83	P83	Yes	0
84	P84	Yes	0
85	P85	Yes	0
86	P86	Yes	0
87	P87	Yes	0
88	P88	Yes	0
89	P89	Yes	0
90	P90	Yes	0
91	P91	Yes	0
92	P92	Yes	0
93	P93	Yes	0
94	P94	Yes	0
95	P95	Yes	0
96	P96	Yes	0
97	P97	Yes	0
98	P98	Yes	0
99	P99	Yes	0
100	P100	Yes	0
101	P101	Yes	0
102	P102	Yes	0
103	P103	Yes	0
104	P104	Yes	0
105	P105	Yes	0



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Plate Advanced Data (Continued)

	Label	Plane Stress	Rotate
106	P106	Yes	0
107	P107	Yes	0
108	P108	Yes	0
109	P109	Yes	0
110	P110	Yes	0
111	P111	Yes	0
112	P112	Yes	0
113	P113	Yes	0
114	P114	Yes	0
115	P115	Yes	0
116	P116	Yes	0
117	P117	Yes	0
118	P118	Yes	0
119	P119	Yes	0
120	P120	Yes	0
121	P121	Yes	0
122	P122	Yes	0
123	P123	Yes	0
124	P124	Yes	0
125	P125	Yes	0
126	P126	Yes	0
127	P127	Yes	0
128	P128	Yes	0
129	P129	Yes	0
130	P130	Yes	0
131	P131	Yes	0
132	P132	Yes	0
133	P133	Yes	0
134	P134	Yes	0
135	P135	Yes	0
136	P136	Yes	0
137	P137	Yes	0
138	P138	Yes	0
139	P139	Yes	0
140	P140	Yes	0



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Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, psf, k-ft/ft]	End Magnitude [k/ft, F, psf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M7	Y	-0.08	-0.08	2.554e-15	11.18
2	M12	Y	-0.08	-0.08	1.554e-15	11.18
3	M15	Y	-0.08	-0.08	3.442e-15	11.18
4	M18	Y	-0.08	-0.08	3.886e-15	11.18
5	M21	Y	-0.08	-0.08	2.554e-15	11.18
6	M24	Y	-0.08	-0.08	4.552e-15	11.18
7	M27	Y	-0.08	-0.08	0	11.18
8	M8	Y	-0.08	-0.08	0	11.18
9	M11	Y	-0.08	-0.08	0	11.18
10	M14	Y	-0.08	-0.08	0	11.18
11	M17	Y	-0.08	-0.08	0	11.18
12	M20	Y	-0.08	-0.08	0	11.18
13	M23	Y	-0.08	-0.08	0	11.18
14	M26	Y	-0.08	-0.08	0	11.18

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, psf, k-ft/ft]	End Magnitude [k/ft, F, psf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M7	Y	-0.11	-0.11	2.554e-15	11.18
2	M12	Y	-0.11	-0.11	1.554e-15	11.18
3	M15	Y	-0.11	-0.11	3.442e-15	11.18
4	M18	Y	-0.11	-0.11	3.886e-15	11.18
5	M21	Y	-0.11	-0.11	2.554e-15	11.18
6	M24	Y	-0.11	-0.11	4.552e-15	11.18
7	M27	Y	-0.11	-0.11	0	11.18
8	M8	Y	-0.11	-0.11	0	11.18
9	M11	Y	-0.11	-0.11	0	11.18
10	M14	Y	-0.11	-0.11	0	11.18
11	M17	Y	-0.11	-0.11	0	11.18
12	M20	Y	-0.11	-0.11	0	11.18
13	M23	Y	-0.11	-0.11	0	11.18
14	M26	Y	-0.11	-0.11	0	11.18



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Plate Surface Loads (BLC 5 : ELx)

	Plate Label	Direction	Magnitude [psf, F]
1	P1	X	5
2	P78	X	5
3	P64	X	5
4	P2	X	5
5	P4	X	5
6	P89	X	5
7	P5	X	5
8	P15	X	5
9	P10	X	5
10	P133	X	5
11	P21	X	5
12	P18	X	5
13	P105	X	5
14	P128	X	5
15	P13	X	5
16	P116	X	5
17	P20	X	5
18	P22	X	5
19	P30	X	5
20	P27	X	5
21	P33	X	5
22	P99	X	5
23	P29	X	5
24	P32	X	5
25	P90	X	5
26	P108	X	5
27	P51	X	5
28	P62	X	5
29	P54	X	5
30	P98	X	5
31	P50	X	5
32	P65	X	5
33	P126	X	5
34	P96	X	5
35	P134	X	5
36	P101	X	5
37	P135	X	5
38	P127	X	5
39	P11	X	5

Plate Surface Loads (BLC 5 : ELx) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
40	P44	X	5
41	P85	X	5
42	P48	X	5
43	P12	X	5
44	P68	X	5
45	P55	X	5
46	P8	X	5
47	P138	X	5
48	P70	X	5
49	P9	X	5
50	P49	X	5
51	P46	X	5
52	P42	X	5
53	P19	X	5
54	P60	X	5
55	P3	X	5
56	P120	X	5
57	P82	X	5
58	P79	X	5
59	P7	X	5
60	P24	X	5
61	P69	X	5
62	P124	X	5
63	P140	X	5
64	P94	X	5
65	P100	X	5
66	P130	X	5
67	P104	X	5
68	P74	X	5
69	P132	X	5
70	P80	X	5
71	P97	X	5
72	P47	X	5
73	P117	X	5
74	P39	X	5
75	P109	X	5
76	P131	X	5
77	P45	X	5
78	P26	X	5

Plate Surface Loads (BLC 5 : ELx) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
79	P115	X	5
80	P81	X	5
81	P73	X	5
82	P92	X	5
83	P41	X	5
84	P111	X	5
85	P14	X	5
86	P84	X	5
87	P76	X	5
88	P129	X	5
89	P107	X	5
90	P119	X	5
91	P71	X	5
92	P112	X	5
93	P75	X	5
94	P37	X	5
95	P6	X	5
96	P40	X	5
97	P110	X	5
98	P25	X	5
99	P95	X	5
100	P113	X	5
101	P43	X	5
102	P114	X	5
103	P93	X	5
104	P23	X	5
105	P77	X	5
106	P123	X	5
107	P88	X	5
108	P67	X	5
109	P137	X	5
110	P121	X	5
111	P102	X	5
112	P16	X	5
113	P17	X	5
114	P87	X	5
115	P86	X	5
116	P122	X	5
117	P38	X	5



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Plate Surface Loads (BLC 5 : ELx) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
118	P72	X	5
119	P118	X	5
120	P136	X	5
121	P66	X	5
122	P83	X	5
123	P31	X	5
124	P125	X	5
125	P63	X	5
126	P28	X	5
127	P36	X	5
128	P106	X	5
129	P34	X	5
130	P139	X	5
131	P103	X	5
132	P91	X	5
133	P35	X	5
134	P61	X	5
135	P59	X	5
136	P58	X	5
137	P57	X	5
138	P56	X	5
139	P53	X	5
140	P52	X	5

Plate Surface Loads (BLC 6 : ELz)

	Plate Label	Direction	Magnitude [psf, F]
1	P52	Z	5
2	P53	Z	5
3	P56	Z	5
4	P57	Z	5
5	P58	Z	5
6	P59	Z	5
7	P61	Z	5
8	P35	Z	5
9	P91	Z	5
10	P103	Z	5
11	P139	Z	5
12	P34	Z	5



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Plate Surface Loads (BLC 6 : ELz) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
13	P106	Z	5
14	P36	Z	5
15	P28	Z	5
16	P63	Z	5
17	P125	Z	5
18	P31	Z	5
19	P83	Z	5
20	P66	Z	5
21	P136	Z	5
22	P118	Z	5
23	P72	Z	5
24	P38	Z	5
25	P122	Z	5
26	P86	Z	5
27	P87	Z	5
28	P17	Z	5
29	P16	Z	5
30	P102	Z	5
31	P121	Z	5
32	P137	Z	5
33	P67	Z	5
34	P88	Z	5
35	P123	Z	5
36	P77	Z	5
37	P23	Z	5
38	P93	Z	5
39	P114	Z	5
40	P43	Z	5
41	P113	Z	5
42	P95	Z	5
43	P25	Z	5
44	P110	Z	5
45	P40	Z	5
46	P6	Z	5
47	P37	Z	5
48	P75	Z	5
49	P112	Z	5
50	P71	Z	5
51	P119	Z	5



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Plate Surface Loads (BLC 6 : ELz) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
52	P107	Z	5
53	P129	Z	5
54	P76	Z	5
55	P84	Z	5
56	P14	Z	5
57	P111	Z	5
58	P41	Z	5
59	P92	Z	5
60	P73	Z	5
61	P81	Z	5
62	P115	Z	5
63	P26	Z	5
64	P45	Z	5
65	P131	Z	5
66	P109	Z	5
67	P39	Z	5
68	P117	Z	5
69	P47	Z	5
70	P97	Z	5
71	P80	Z	5
72	P132	Z	5
73	P74	Z	5
74	P104	Z	5
75	P130	Z	5
76	P100	Z	5
77	P94	Z	5
78	P140	Z	5
79	P124	Z	5
80	P69	Z	5
81	P24	Z	5
82	P7	Z	5
83	P79	Z	5
84	P82	Z	5
85	P120	Z	5
86	P3	Z	5
87	P60	Z	5
88	P19	Z	5
89	P42	Z	5
90	P46	Z	5

Plate Surface Loads (BLC 6 : ELz) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
91	P49	Z	5
92	P9	Z	5
93	P70	Z	5
94	P138	Z	5
95	P8	Z	5
96	P55	Z	5
97	P68	Z	5
98	P12	Z	5
99	P48	Z	5
100	P85	Z	5
101	P44	Z	5
102	P11	Z	5
103	P127	Z	5
104	P135	Z	5
105	P101	Z	5
106	P134	Z	5
107	P96	Z	5
108	P126	Z	5
109	P65	Z	5
110	P50	Z	5
111	P98	Z	5
112	P54	Z	5
113	P62	Z	5
114	P51	Z	5
115	P108	Z	5
116	P90	Z	5
117	P32	Z	5
118	P29	Z	5
119	P99	Z	5
120	P33	Z	5
121	P27	Z	5
122	P30	Z	5
123	P22	Z	5
124	P20	Z	5
125	P116	Z	5
126	P13	Z	5
127	P128	Z	5
128	P105	Z	5
129	P18	Z	5

Plate Surface Loads (BLC 6 : ELz) (Continued)

	Plate Label	Direction	Magnitude [psf, F]
130	P21	Z	5
131	P133	Z	5
132	P10	Z	5
133	P15	Z	5
134	P5	Z	5
135	P89	Z	5
136	P4	Z	5
137	P2	Z	5
138	P64	Z	5
139	P78	Z	5
140	P1	Z	5

Basic Load Cases

	BLC Description	Category	Y Gravity	Distributed	Area(Member)	Surface(Plate/Wall)
1	DL	DL	-1		2	
2	SL	SL			2	
3	WLx	WLX				
4	WLz	WLZ				
5	ELx	ELX				140
6	ELz	ELZ				140
7	BLC 1 Transient Area Loads	None		14		
8	BLC 2 Transient Area Loads	None		14		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	IBC 16-8	Yes	Y	DL	1												
2	IBC 16-10 (b)	Yes	Y	DL	1	SL	1	SLN	1								
3	IBC 16-12 (a) (a)	Yes	Y	DL	1	WLX	0.6										
4	IBC 16-12 (a) (b)	Yes	Y	DL	1	WLZ	0.6										
5	IBC 16-12 (a) (c)	Yes	Y	DL	1	WLX	-0.6										
6	IBC 16-12 (a) (d)	Yes	Y	DL	1	WLZ	-0.6										
7	IBC 16-13 (b) (a)	Yes	Y	DL	1	WLX	0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75		
8	IBC 16-13 (b) (b)	Yes	Y	DL	1	WLZ	0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75		
9	IBC 16-13 (b) (c)	Yes	Y	DL	1	WLX	-0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75		
10	IBC 16-13 (b) (d)	Yes	Y	DL	1	WLZ	-0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75		
11	IBC 16-15 (a)	Yes	Y	DL	0.6	WLX	0.6										
12	IBC 16-15 (b)	Yes	Y	DL	0.6	WLZ	0.6										

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
13	IBC 16-15 (c)	Yes	Y	DL	0.6	WLX	-0.6										
14	IBC 16-15 (d)	Yes	Y	DL	0.6	WLZ	-0.6										
15	IBC 16-12 (b) (a)	Yes	Y	DL	1	Sds*DL	0.14	Rho*ELX	0.7								
16	IBC 16-12 (b) (b)	Yes	Y	DL	1	Sds*DL	0.14	Rho*ELZ	0.7								
17	IBC 16-12 (b) (c)	Yes	Y	DL	1	Sds*DL	0.14	Rho*ELX	-0.7								
18	IBC 16-12 (b) (d)	Yes	Y	DL	1	Sds*DL	0.14	Rho*ELZ	-0.7								
19	IBC 16-14 (a)	Yes	Y	DL	1	Sds*DL	0.105	Rho*ELX	0.525	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75
20	IBC 16-14 (b)	Yes	Y	DL	1	Sds*DL	0.105	Rho*ELZ	0.525	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75
21	IBC 16-14 (c)	Yes	Y	DL	1	Sds*DL	0.105	Rho*ELX	-0.525	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75
22	IBC 16-14 (d)	Yes	Y	DL	1	Sds*DL	0.105	Rho*ELZ	-0.525	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75
23	IBC 16-16 (a)	Yes	Y	DL	0.6	Sds*DL	-0.14	Rho*ELX	0.7								
24	IBC 16-16 (b)	Yes	Y	DL	0.6	Sds*DL	-0.14	Rho*ELZ	0.7								
25	IBC 16-16 (c)	Yes	Y	DL	0.6	Sds*DL	-0.14	Rho*ELX	-0.7								
26	IBC 16-16 (d)	Yes	Y	DL	0.6	Sds*DL	-0.14	Rho*ELZ	-0.7								
27	SL	Yes	Y	SL	1												
28	WLx	Yes	Y	WLX	1												
29	WLz	Yes	Y	WLZ	1												
30	ELx	Yes	Y	ELX	1												
31	ELz	Yes	Y	ELZ	1												

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	0.501	25	10.308	2	0.629	18	4.033	18	0.037	31	4.954	30
2		min	-0.789	30	-0.864	31	-0.85	31	-5.369	31	-0.054	22	-3.255	25
3	N1	max	0.673	17	8.329	2	0.531	18	3.497	18	0.064	31	4.891	30
4		min	-0.776	30	-0.721	31	-0.721	31	-4.686	31	-0.042	26	-3.927	17
5	N4	max	0.501	25	10.308	2	0.578	26	3.724	26	0.054	20	4.954	30
6		min	-0.789	30	0	28	-0.844	31	-5.37	31	-0.026	30	-3.256	25
7	N3	max	0.673	17	8.329	2	0.493	26	3.254	26	0.064	31	4.891	30
8		min	-0.776	30	-0.54	30	-0.716	31	-4.686	31	-0.055	18	-3.927	17
9	Totals:	max	2.191	17	37.273	2	2.191	18						
10		min	-3.13	30	0	31	-3.13	31						

Envelope Member End Reactions

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
1	M1	I	max	8.329	2	0.775	30	0.544	18	0.064	31	4.686	31	4.891	30
2			min	-0.721	31	-0.684	17	-0.719	31	-0.042	26	-3.497	18	-3.927	17
3		J	max	8.046	2	0.775	30	0.544	18	0.064	31	3.03	18	4.281	17
4			min	-0.721	31	-0.684	17	-0.719	31	-0.042	26	-3.937	31	-4.405	30
5	M2	I	max	10.308	2	0.791	30	0.647	18	0.037	31	5.369	31	4.954	30
6			min	-0.864	31	-0.506	25	-0.847	31	-0.054	22	-4.033	18	-3.255	25
7		J	max	10.025	2	0.791	30	0.647	18	0.037	31	3.726	18	2.815	25
8			min	-0.864	31	-0.506	25	-0.847	31	-0.054	22	-4.789	31	-4.532	30
9	M3	I	max	8.329	2	0.775	30	0.496	26	0.064	31	4.686	31	4.891	30
10			min	-0.54	30	-0.684	17	-0.719	31	-0.055	18	-3.254	26	-3.927	17
11		J	max	8.046	2	0.775	30	0.496	26	0.064	31	2.698	26	4.281	17
12			min	-0.54	30	-0.684	17	-0.719	31	-0.055	18	-3.938	31	-4.405	30
13	M4	I	max	10.308	2	0.791	30	0.583	26	0.054	20	5.37	31	4.954	30
14			min	0	28	-0.506	25	-0.847	31	-0.026	30	-3.724	26	-3.256	25
15		J	max	10.025	2	0.791	30	0.583	26	0.054	20	3.27	26	2.815	25
16			min	0	28	-0.506	25	-0.847	31	-0.026	30	-4.79	31	-4.532	30
17	M5	I	max	0.014	30	0.003	31	0.022	31	0	31	0	31	0	31
18			min	-0.015	21	-0.089	19	-0.178	19	0	26	0	18	0	18
19		J	max	0.007	25	0.011	25	0.023	25	0	18	0	31	0	31
20			min	-0.012	30	-0.02	15	-0.04	15	0	31	0	26	0	26
21	M6	I	max	0.014	30	0	29	0.178	19	0	31	0	31	0	26
22			min	-0.015	21	-0.089	19	0	28	0	18	0	26	0	31
23		J	max	0.007	25	0.011	25	0.04	15	0	26	0	31	0	18
24			min	-0.012	30	-0.02	15	-0.023	25	0	31	0	18	0	31
25	M7	I	max	0.006	31	0.007	18	0.002	31	0.003	31	0	31	0	31
26			min	-0.024	19	-0.011	31	-0.031	2	-0.002	18	0	22	0	26
27		J	max	1.562	2	0	29	0.05	17	0.037	25	0.073	25	0.548	2
28			min	-0.091	31	-0.877	20	-0.071	30	-0.24	19	-0.481	19	0	31
29	M8	I	max	0.003	25	0.011	31	0.031	2	0.003	31	0	20	0	18
30			min	-0.024	19	-0.007	18	0	28	-0.002	26	0	1	0	31
31		J	max	1.562	2	0.177	31	0.071	30	0.24	19	0.481	19	0.548	2
32			min	0	28	-0.877	22	-0.05	17	-0.037	25	-0.073	25	0	28
33	M9	I	max	0	29	0.166	18	0.012	31	0.015	18	0.018	25	0.258	26
34			min	-3.421	19	-0.109	31	-0.008	18	-0.021	31	-0.298	19	-0.487	20
35		J	max	0	29	0.042	26	0.012	31	0.015	18	0.046	31	0.436	31
36			min	-3.421	19	-0.166	16	-0.008	18	-0.021	31	-0.298	19	-0.487	22
37	M10	I	max	0.643	30	0.156	18	0.006	31	0.011	26	0.002	30	0.262	26
38			min	-1.904	21	-0.095	31	-0.004	26	-0.016	31	-0.596	2	-0.382	31
39		J	max	0.643	30	0.032	26	0.006	31	0.011	26	0.022	31	0.382	31



Company : AHBL
 Designer : KBG
 Job Number : 2220236.20
 Model Name : Care Center Entry Canopy

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Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
40			min	-1.904	21	-0.156	16	-0.004	26	-0.016	31	-0.596	2	-0.295	22
41	M11	I	max	0.025	30	0.01	31	0.004	22	0	18	0	31	0	2
42			min	-0.016	25	-0.007	26	-0.002	31	0	31	0	1	0	28
43		J	max	1.167	2	0.156	31	0.217	2	0.543	2	1.086	2	0.421	2
44			min	-0.128	30	-0.683	22	-0.004	31	-0.02	31	0	28	-0.026	30
45	M12	I	max	0.025	30	0.007	18	0.001	30	0	26	0	31	0	2
46			min	-0.016	25	-0.01	31	-0.003	20	0	31	0	1	0	28
47		J	max	1.167	2	0.057	30	0	29	0	29	0.01	31	0.421	2
48			min	-0.128	30	-0.683	20	-0.217	2	-0.543	2	-1.086	2	-0.026	30
49	M13	I	max	0.913	19	0.108	18	0.003	31	0.004	26	0.132	30	0.197	18
50			min	-0.096	25	-0.029	31	-0.002	26	-0.006	31	-0.385	21	-0.117	31
51		J	max	0.913	19	0	30	0.003	31	0.004	26	0.132	30	0.197	16
52			min	-0.096	25	-0.108	16	-0.002	26	-0.006	31	-0.385	21	-0.037	26
53	M14	I	max	0.077	19	0.01	31	0.003	30	0	31	0	31	0	2
54			min	0	31	-0.007	26	-0.003	17	0	26	0	1	0	31
55		J	max	0.657	21	0.052	31	0.139	21	0.351	21	0.702	21	0.289	21
56			min	-0.084	30	-0.403	22	-0.041	30	-0.118	30	-0.236	30	-0.025	30
57	M15	I	max	0.077	19	0.007	18	0.003	17	0	26	0	31	0	2
58			min	0	28	-0.01	31	-0.003	30	0	31	0	1	0	28
59		J	max	0.657	21	0.041	30	0.041	30	0.118	30	0.236	30	0.289	21
60			min	-0.084	30	-0.403	20	-0.139	21	-0.351	21	-0.702	21	-0.025	30
61	M16	I	max	1.102	2	0.101	18	0.001	26	0.006	31	0.31	19	0.197	22
62			min	-0.097	30	-0.019	31	-0.001	31	-0.004	26	-0.052	25	-0.078	31
63		J	max	1.102	2	0	27	0.001	26	0.006	31	0.31	19	0.197	20
64			min	-0.097	30	-0.101	16	-0.001	31	-0.004	26	-0.052	25	-0.01	30
65	M17	I	max	0.085	2	0.01	31	0.003	30	0	26	0	31	0	2
66			min	-0.002	30	-0.007	26	-0.003	17	0	20	0	1	0	31
67		J	max	0.579	2	0.037	31	0.011	25	0.044	25	0.087	25	0.269	2
68			min	0	28	-0.365	2	-0.102	19	-0.279	19	-0.558	19	0	28
69	M18	I	max	0.085	2	0.007	18	0.003	17	0	31	0	31	0	2
70			min	-0.002	30	-0.01	31	-0.003	30	0	26	0	1	0	28
71		J	max	0.579	2	0	29	0.102	19	0.279	19	0.558	19	0.269	2
72			min	-0.02	31	-0.365	2	-0.011	25	-0.044	25	-0.087	25	0	28
73	M19	I	max	0.131	25	0.122	18	0.002	26	0.013	31	0.657	19	0.146	18
74			min	-1.372	19	-0.048	31	-0.003	31	-0.009	26	0	28	-0.191	31
75		J	max	0.131	25	0	30	0.002	26	0.013	31	0.657	19	0.191	31
76			min	-1.372	19	-0.122	16	-0.003	31	-0.009	26	-0.013	31	-0.144	22
77	M20	I	max	0.036	21	0.01	31	0.009	19	0	26	0	31	0	2
78			min	-0.015	30	-0.007	26	-0.004	25	0	31	0	1	0	31

Envelope Member End Reactions (Continued)

Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC	
79		J	max	1.044	19	0.081	31	0.007	31	0.015	31	0	29	0.394	2
80			min	0	28	-0.594	22	-0.266	19	-0.615	19	-1.229	19	0	28
81	M21	I	max	0.036	21	0.007	18	0.004	25	0	18	0	31	0	2
82			min	-0.015	30	-0.01	31	-0.009	19	0	31	0	1	0	28
83		J	max	1.044	19	0	29	0.266	19	0.615	19	1.229	19	0.394	2
84			min	-0.042	31	-0.594	20	0	28	0	28	-0.007	31	0	28
85	M22	I	max	0	29	0.21	18	0.002	26	0.008	31	0.306	21	0.438	26
86			min	-3.572	2	-0.171	31	-0.003	31	-0.006	26	-0.099	30	-0.686	31
87		J	max	0	29	0.086	26	0.002	26	0.008	31	0.306	21	0.685	31
88			min	-3.572	2	-0.21	16	-0.003	31	-0.006	26	-0.099	30	-0.613	22
89	M23	I	max	0	29	0.01	31	0.002	30	0	31	0	31	0	2
90			min	-0.103	20	-0.007	18	-0.013	21	0	18	0	1	0	31
91		J	max	1.547	2	0.276	31	0.074	30	0.11	30	0.219	30	0.479	2
92			min	0	28	-0.893	22	-0.085	21	-0.271	21	-0.542	21	0	28
93	M24	I	max	0.028	31	0.007	18	0.013	21	0	31	0	31	0	2
94			min	-0.103	22	-0.01	31	-0.002	30	0	26	0	1	0	28
95		J	max	1.547	2	0.003	26	0.085	21	0.271	21	0.542	21	0.479	2
96			min	-0.157	31	-0.893	20	-0.074	30	-0.11	30	-0.219	30	0	28
97	M25	I	max	0.455	30	0.127	18	0.003	18	0.008	31	0.018	31	0.143	26
98			min	-1.752	21	-0.056	31	-0.005	31	-0.006	18	-0.174	19	-0.232	20
99		J	max	0.455	30	0.004	26	0.003	18	0.008	31	0.008	25	0.223	31
100			min	-1.752	21	-0.127	16	-0.005	31	-0.006	18	-0.174	19	-0.232	22
101	M26	I	max	0.017	19	0.011	31	0.013	30	0.002	18	0	31	0	18
102			min	-0.004	31	-0.007	26	-0.022	21	-0.003	31	0	1	0	31
103		J	max	1.245	2	0.093	31	0.159	19	0.201	19	0.403	19	0.493	2
104			min	-0.088	30	-0.698	22	-0.007	31	0	28	-0.005	31	-0.021	30
105	M27	I	max	0.017	19	0.007	18	0.022	21	0.002	26	0	31	0	31
106			min	0	25	-0.011	31	-0.013	30	-0.003	31	0	1	0	26
107		J	max	1.245	2	0.041	30	0	29	0.011	31	0	29	0.493	2
108			min	-0.088	30	-0.698	20	-0.159	19	-0.201	19	-0.403	19	-0.021	30

Envelope AISC 15TH (360-16): ASD Member Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	Pnc/om [k]	Pnt/om [k]	Mnyy/om [k-ft]	Mnzz/om [k-ft]	Cb	Eqn
1	M1	HSS6X6X5	0.158	12	21	0.016	12	z	31	144.886	192.515	33.932	33.932	2.232	H1-1b
2	M2	HSS6X6X5	0.166	0	31	0.017	12	z	31	144.886	192.515	33.932	33.932	2.264	H1-1b
3	M3	HSS6X6X5	0.158	12	21	0.016	12	z	31	144.886	192.515	33.932	33.932	2.232	H1-1b
4	M4	HSS6X6X5	0.167	0	31	0.017	12	z	31	144.886	192.515	33.932	33.932	2.264	H1-1b
5	M5	HSS10X6X5	0.199	21.875	19	0.077	4.083	v	20	142.109	262.275	46.457	71.856	1.667	H1-1b



Company : AHBL
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Envelope AISC 15TH (360-16): ASD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	Pnc/om [k]	Pnt/om [k]	Mnyy/om [k-ft]	Mnzz/om [k-ft]	Cb	Eqn
6	M6	HSS10X6X5	0.199	21.875	19	0.077	4.083	y	22	142.109	262.275	46.457	71.856	1.667	H1-1b
7	M7	HSS8X6X4	0.098	4.542	22	0.044	4.542	y	19	160.041	184.731	31.838	42.166	2.384	H1-1b
8	M8	HSS8X6X4	0.098	4.542	20	0.044	4.542	y	19	160.041	184.731	31.838	42.166	2.384	H1-1b
9	M9	HSS6X6X4	0.037	0.917	20	0.004	0	y	18	138.665	156.886	27.944	27.944	1.209	H1-1b
10	M10	HSS6X6X4	0.037	1.417	20	0.004	0	y	18	138.665	156.886	27.944	27.944	1.287	H1-1b
11	M11	HSS8X6X4	0.134	4.542	20	0.05	6.638	z	2	160.041	184.731	31.838	42.166	2.264	H1-1b
12	M12	HSS8X6X4	0.134	4.542	22	0.05	6.638	z	2	160.041	184.731	31.838	42.166	2.264	H1-1b
13	M13	HSS6X6X4	0.02	0	22	0.003	0	y	18	138.665	156.886	27.944	27.944	2.797	H1-1b
14	M14	HSS8X6X4	0.08	4.542	21	0.032	6.638	z	21	160.041	184.731	31.838	42.166	2.2	H1-1b
15	M15	HSS8X6X4	0.08	4.542	21	0.032	6.638	z	21	160.041	184.731	31.838	42.166	2.2	H1-1b
16	M16	HSS6X6X4	0.02	0	19	0.002	0	y	18	138.665	156.886	27.944	27.944	3	H1-1b
17	M17	HSS8X6X4	0.07	4.426	19	0.026	6.638	z	19	160.041	184.731	31.838	42.166	2.234	H1-1b
18	M18	HSS8X6X4	0.07	4.426	19	0.026	6.638	z	19	160.041	184.731	31.838	42.166	2.234	H1-1b
19	M19	HSS6X6X4	0.036	4	19	0.003	0	y	18	138.665	156.886	27.944	27.944	1.093	H1-1b
20	M20	HSS8X6X4	0.125	4.542	20	0.055	6.638	z	19	160.041	184.731	31.838	42.166	2.179	H1-1b
21	M21	HSS8X6X4	0.125	4.542	22	0.055	6.638	z	19	160.041	184.731	31.838	42.166	2.179	H1-1b
22	M22	HSS6X6X4	0.042	0	20	0.005	8	y	16	138.665	156.886	27.944	27.944	1.429	H1-1b
23	M23	HSS8X6X4	0.131	4.542	20	0.046	4.542	y	20	160.041	184.731	31.838	42.166	2.41	H1-1b
24	M24	HSS8X6X4	0.131	4.542	22	0.046	4.542	y	22	160.041	184.731	31.838	42.166	2.41	H1-1b
25	M25	HSS6X6X4	0.021	4	2	0.003	8	y	16	138.665	156.886	27.944	27.944	1.069	H1-1b
26	M26	HSS8X6X4	0.057	4.426	19	0.03	4.542	y	2	160.041	184.731	31.838	42.166	2.264	H1-1b
27	M27	HSS8X6X4	0.057	4.426	19	0.03	4.542	y	2	160.041	184.731	31.838	42.166	2.264	H1-1b

10.0 - MISCELLANEOUS DESIGN

Interior Allowable Ceiling/Soffit Spans (S-Sections) - L/240

Section	Fy (ksi)	4 psf						6 psf						13 psf *					
		Lateral Support of Compression Flange						Lateral Support of Compression Flange						Lateral Support of Compression Flange					
		Unsupported			Midspan			Unsupported			Midspan			Unsupported			Midspan		
		Joist Spacing (in) on center			Joist Spacing (in) on center			Joist Spacing (in) on center			Joist Spacing (in) on center			Joist Spacing (in) on center			Joist Spacing (in) on center		
	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24	
162S125-18	33	7' 3"	6' 7"	5' 10"	8' 6"	7' 8"	6' 7"	6' 5"	5' 10"	5' 1"	7' 4"	6' 7"	5' 9"	5' 0"	4' 5"	3' 9"	5' 7"	4' 10"	3' 11"
162S125-27	33	8' 7"	7' 11"	7' 1"	9' 8"	8' 10"	7' 8"	7' 8"	7' 1"	6' 3"	8' 6"	7' 8"	6' 8"	6' 1"	5' 6"	4' 9"	6' 6"	5' 11"	5' 2"
162S125-30	33	9' 0"	8' 3"	7' 4"	10' 0"	9' 1"	7' 11"	8' 0"	7' 4"	6' 7"	8' 9"	7' 11"	6' 11"	6' 5"	5' 10"	5' 0"	6' 9"	6' 1"	5' 4"
162S125-33	33	9' 6"	8' 8"	7' 8"	10' 4"	9' 5"	8' 2"	8' 4"	7' 8"	6' 10"	9' 0"	8' 2"	7' 2"	6' 8"	6' 1"	5' 4"	7' 0"	6' 4"	5' 6"
162S137-27	33	9' 11"	9' 2"	8' 0"	10' 1"	9' 2"	8' 0"	8' 10"	8' 0"	7' 0"	8' 10"	8' 0"	7' 0"	6' 10"	6' 2"	5' 5"	6' 10"	6' 2"	5' 5"
162S137-30	33	10' 4"	9' 6"	8' 3"	10' 5"	9' 6"	8' 3"	9' 1"	8' 3"	7' 3"	9' 1"	8' 3"	7' 3"	7' 0"	6' 5"	5' 7"	7' 0"	6' 5"	5' 7"
162S137-33	33	10' 9"	9' 9"	8' 7"	10' 9"	9' 9"	8' 7"	9' 5"	8' 7"	7' 6"	9' 5"	8' 7"	7' 6"	7' 3"	6' 7"	5' 9"	7' 3"	6' 7"	5' 9"
250S125-18	33	8' 5"	7' 9"	6' 11"	11' 7"	10' 6"	9' 1"	7' 6"	6' 11"	6' 2"	10' 1"	9' 1"	7' 8"	6' 0"	5' 6"	4' 10"	7' 5"	6' 3"	5' 2"
250S125-27	33	9' 8"	8' 11"	8' 0"	13' 5"	12' 2"	10' 7"	8' 8"	8' 0"	7' 2"	11' 8"	10' 7"	9' 3"	7' 0"	6' 6"	5' 9"	9' 0"	8' 2"	6' 10"
250S125-30	33	10' 1"	9' 3"	8' 3"	13' 10"	12' 7"	10' 11"	9' 0"	8' 3"	7' 5"	12' 1"	10' 11"	9' 7"	7' 3"	6' 8"	6' 0"	9' 4"	8' 5"	7' 3"
250S125-33	33	10' 6"	9' 8"	8' 7"	14' 3"	13' 0"	11' 4"	9' 4"	8' 7"	7' 8"	12' 6"	11' 4"	9' 11"	7' 6"	6' 11"	6' 2"	9' 7"	8' 9"	7' 7"
250S125-43	33	11' 9"	10' 10"	9' 7"	15' 6"	14' 1"	12' 4"	10' 5"	9' 7"	8' 6"	13' 7"	12' 4"	10' 9"	8' 4"	7' 8"	6' 10"	10' 6"	9' 6"	8' 4"
250S137-27	33	11' 0"	10' 2"	9' 2"	14' 0"	12' 9"	11' 1"	9' 10"	9' 2"	8' 2"	12' 3"	11' 1"	9' 9"	8' 0"	7' 5"	6' 8"	9' 6"	8' 7"	7' 6"
250S137-30	33	11' 5"	10' 6"	9' 5"	14' 5"	13' 2"	11' 6"	10' 2"	9' 5"	8' 5"	12' 8"	11' 6"	10' 0"	8' 3"	7' 8"	6' 10"	9' 9"	8' 10"	7' 9"
250S137-33	33	11' 10"	10' 11"	9' 9"	14' 11"	13' 7"	11' 10"	10' 7"	9' 9"	8' 9"	13' 1"	11' 10"	10' 4"	8' 7"	7' 11"	7' 1"	10' 1"	9' 2"	8' 0"
250S137-43	33	13' 3"	12' 2"	10' 10"	16' 3"	14' 9"	12' 11"	11' 9"	10' 10"	9' 7"	14' 2"	12' 11"	11' 3"	9' 5"	8' 8"	7' 9"	10' 11"	9' 11"	8' 8"
250S162-33	33	13' 6"	12' 5"	11' 2"	15' 8"	14' 3"	12' 5"	12' 1"	11' 2"	10' 0"	13' 8"	12' 5"	10' 10"	9' 10"	9' 1"	8' 1"	10' 7"	9' 7"	8' 5"
250S162-43	33	15' 0"	13' 9"	12' 3"	17' 1"	15' 6"	13' 6"	13' 4"	12' 3"	10' 11"	14' 11"	13' 6"	11' 10"	10' 9"	9' 11"	8' 10"	11' 6"	10' 5"	9' 2"
350S125-18	33	9' 2"	8' 6"	7' 6"	12' 6"	11' 5"	9' 11"	8' 3"	7' 6"	6' 8"	11' 0"	9' 11"	8' 5"	6' 6"	5' 11"	5' 3"	8' 2"	7' 2"	6' 0"
350S125-27	33	10' 7"	9' 9"	8' 9"	14' 11"	13' 9"	12' 3"	9' 5"	8' 9"	7' 9"	13' 4"	12' 3"	10' 7"	7' 7"	7' 1"	6' 4"	10' 4"	9' 3"	7' 9"
350S125-30	33	10' 11"	10' 1"	9' 0"	15' 5"	14' 2"	12' 9"	9' 9"	9' 0"	8' 1"	13' 9"	12' 9"	11' 2"	7' 11"	7' 3"	6' 6"	10' 11"	9' 9"	8' 3"
350S125-33	33	11' 4"	10' 5"	9' 4"	16' 0"	14' 9"	13' 2"	10' 1"	9' 4"	8' 4"	14' 3"	13' 2"	11' 9"	8' 2"	7' 7"	6' 9"	11' 5"	10' 4"	8' 10"
350S125-43	33	12' 7"	11' 7"	10' 4"	17' 7"	16' 3"	14' 6"	11' 2"	10' 4"	9' 2"	15' 8"	14' 6"	12' 11"	9' 0"	8' 3"	7' 5"	12' 7"	11' 6"	10' 1"
350S137-27	33	11' 11"	11' 0"	9' 11"	17' 0"	15' 9"	14' 1"	10' 8"	9' 11"	8' 11"	15' 3"	14' 1"	12' 4"	8' 8"	8' 1"	7' 3"	11' 11"	10' 7"	8' 11"
350S137-30	33	12' 4"	11' 5"	10' 3"	17' 7"	16' 3"	14' 7"	11' 0"	10' 3"	9' 2"	15' 9"	14' 7"	12' 10"	9' 0"	8' 4"	7' 6"	12' 6"	11' 3"	9' 6"
350S137-33	33	12' 9"	11' 10"	10' 7"	18' 2"	16' 9"	15' 1"	11' 5"	10' 7"	9' 6"	16' 3"	15' 1"	13' 4"	9' 3"	8' 7"	7' 8"	13' 0"	11' 9"	10' 0"
350S137-43	33	14' 2"	13' 0"	11' 7"	19' 10"	18' 4"	16' 5"	12' 7"	11' 7"	10' 4"	17' 9"	16' 5"	14' 7"	10' 2"	9' 4"	8' 5"	14' 2"	12' 11"	11' 3"
350S162-33	33	14' 6"	13' 5"	12' 1"	20' 3"	18' 5"	16' 1"	13' 0"	12' 1"	10' 10"	17' 9"	16' 1"	14' 1"	10' 7"	9' 10"	8' 10"	13' 8"	12' 5"	10' 10"
350S162-43	33	16' 0"	14' 9"	13' 2"	22' 1"	20' 0"	17' 6"	14' 3"	13' 2"	11' 9"	19' 3"	17' 6"	15' 3"	11' 6"	10' 8"	9' 7"	14' 11"	13' 6"	11' 10"
362S125-18	33	9' 3"	8' 7"	7' 7"	12' 8"	11' 7"	10' 0"	8' 4"	7' 7"	6' 9"	11' 1"	10' 0"	8' 6"	6' 7"	6' 0"	5' 4"	8' 3"	7' 4"	6' 1"
362S125-27	33	10' 8"	9' 10"	8' 10"	15' 0"	13' 11"	12' 4"	9' 6"	8' 10"	7' 10"	13' 5"	12' 4"	10' 9"	7' 8"	7' 1"	6' 5"	10' 5"	9' 4"	7' 11"
362S125-30	33	11' 0"	10' 2"	9' 1"	15' 6"	14' 4"	12' 10"	9' 10"	9' 1"	8' 2"	13' 11"	12' 10"	11' 4"	8' 0"	7' 4"	6' 7"	11' 0"	9' 11"	8' 5"
362S125-33	33	11' 5"	10' 7"	9' 5"	16' 2"	14' 10"	13' 3"	10' 3"	9' 5"	8' 5"	14' 5"	13' 3"	11' 10"	8' 3"	7' 8"	6' 10"	11' 7"	10' 6"	9' 0"
362S125-43	33	12' 8"	11' 8"	10' 5"	17' 9"	16' 5"	14' 8"	11' 3"	10' 5"	9' 3"	15' 10"	14' 8"	13' 0"	9' 1"	8' 4"	7' 6"	12' 9"	11' 8"	10' 2"
362S137-27	33	12' 0"	11' 2"	10' 0"	17' 2"	15' 11"	14' 3"	10' 10"	10' 0"	9' 0"	15' 5"	14' 3"	12' 6"	8' 9"	8' 2"	7' 4"	12' 1"	10' 9"	9' 1"
362S137-30	33	12' 5"	11' 6"	10' 4"	17' 8"	16' 5"	14' 8"	11' 2"	10' 4"	9' 3"	15' 10"	14' 8"	13' 0"	9' 1"	8' 5"	7' 6"	12' 8"	11' 5"	9' 8"
362S137-33	33	12' 11"	11' 11"	10' 8"	18' 4"	16' 11"	15' 2"	11' 6"	10' 8"	9' 7"	16' 5"	15' 2"	13' 6"	9' 4"	8' 8"	7' 9"	13' 2"	11' 11"	10' 2"
362S137-43	33	14' 3"	13' 2"	11' 8"	20' 0"	18' 6"	16' 7"	12' 8"	11' 8"	10' 5"	17' 11"	16' 7"	14' 9"	10' 3"	9' 5"	8' 6"	14' 5"	13' 2"	11' 5"
362S162-33	33	14' 8"	13' 7"	12' 2"	20' 10"	18' 11"	16' 6"	13' 2"	12' 2"	10' 11"	18' 2"	16' 6"	14' 5"	10' 8"	9' 11"	8' 11"	14' 1"	12' 9"	11' 2"
362S162-43	33	16' 2"	14' 11"	13' 4"	22' 8"	20' 7"	18' 0"	14' 5"	13' 4"	11' 11"	19' 10"	18' 0"	15' 9"	11' 8"	10' 9"	9' 8"	15' 4"	13' 11"	12' 2"
400S125-18	33	9' 6"	8' 9"	7' 10"	13' 0"	11' 11"	10' 5"	8' 6"	7' 10"	6' 11"	11' 6"	10' 5"	8' 11"	6' 9"	6' 2"	5' 6"	8' 7"	7' 8"	6' 5"
400S125-27	33	10' 11"	10' 1"	9' 1"	15' 5"	14' 3"	12' 9"	9' 9"	9' 1"	8' 1"	13' 10"	12' 9"	11' 2"	7' 11"	7' 4"	6' 7"	10' 10"	9' 9"	8' 3"
400S125-30	33	11' 4"	10' 5"	9' 4"	16' 0"	14' 9"	13' 2"	10' 1"	9' 4"	8' 4"	14' 3"	13' 2"	11' 9"	8' 2"	7' 7"	6' 9"	11' 5"	10' 4"	8' 9"
400S125-33	33	11' 9"	10' 10"	9' 8"	16' 7"	15' 3"	13' 8"	10' 6"	9' 8"	8' 8"	14' 9"	13' 8"	12' 2"	8' 6"	7' 10"	7' 0"	11' 11"	10' 11"	9' 4"
400S125-43	33	13' 0"	12' 0"	10' 8"	18' 3"	16' 10"	15' 0"	11' 7"	10' 8"	9' 6"	16' 3"	15' 0"	13' 5"	9' 4"	8' 7"	7' 8"	13' 1"	12' 0"	10' 7"
400S137-27	33	12' 4"	11' 5"	10' 3"	17' 7"	16' 4"	14' 8"	11' 1"	10' 3"	9' 2"	15' 10"	14' 8"	13' 0"	9' 0"	8' 4"	7' 6"	12' 7"	11' 3"	9' 6"
400S137-30	33	12' 9"	11' 10"	10' 7"	18' 2"	16' 10"	15' 1"	11' 5"	10' 7"	9' 6"	16' 4"	15' 1"	13' 5"	9' 3"	8' 7"	7' 9"	13' 1"	11' 10"	10' 1"
400S137-33	33	13' 3"	12' 3"	10' 11"	18' 9"	17' 4"	15' 7"	11' 10"	10' 11"	9' 10"	16' 10"	15' 7"	13' 11"	9' 7"	8' 11"	8' 0"	13' 7"	12' 4"	10' 8"
400S137-43	33	14' 7"	13' 6"	12' 0"	20' 7"	19' 0"	17' 0"	13' 0"	12' 0"	10' 9"	18' 4"	17' 0"	15' 2"	10' 6"	9' 8"	8' 8"	14' 10"	13' 7"	11' 10"
400S162-33	33	15' 0"	13' 11"	12' 6"	21' 5"	19' 10"	17' 9"	13' 6"	12' 6"	11' 2"	19' 3"	17' 9"	15' 7"	10' 11"	10' 2"	9' 1"	15' 2"	13' 9"	11' 9"
400S162-43	33	16' 7"	15' 3"	13' 8"	23' 4"	21' 7"	19' 4"	14' 9"	13' 8"	12' 2"	20' 11"	19' 4"	16' 11"	11' 11"	11' 0"	9' 11"	16' 6"	15' 0"	13' 1"
600S125-27	33	12' 5"	11' 6"	10' 4"	17' 11"	16' 6"	14' 9"	11' 2"	10' 4"	9' 4"	16' 0"	14' 9"	13' 2"	9' 2"	8' 6"	7' 7"			

Table Notes

- Allowable composite limiting heights are calculated using ICC-ES AC86-2012.
- No fasteners are required for attaching the stud to the track.
- Stud end bearing must be a minimum of 1 inch.
- Composite limiting heights are based on a single layer of 5/8" type X gypsum board installed in the vertical orientation to both sides of the wall over full height using minimum No. 6 Type S Drywall screws spaced a maximum of 12" oc for studs at 24" spacing, and 16" oc for studs at 16" and 12" spacing.

Section	Fy (ksi)	Spacing (in) oc	5 psf			7.5 psf			10 psf		
			L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
162S125-18	33	12	13' 0" f	11' 1"	9' 10"	10' 8" f	9' 8"	8' 7"	9' 3" f	8' 9"	7' 9"
		16	11' 3" f	10' 1"	8' 11"	9' 3" f	8' 9"	7' 9"	8' 0" f	7' 11"	-
		24	9' 3" f	8' 9"	7' 9"	-	-	-	-	-	-
162S125-27	33	12	14' 9"	11' 8"	10' 2"	12' 10"	10' 2"	8' 7"	11' 8"	9' 1"	7' 6"
		16	13' 4"	10' 7"	9' 1"	11' 8"	9' 1"	7' 6"	10' 7"	7' 11"	-
		24	11' 8"	9' 1"	-	10' 2"	-	-	9' 1"	-	-
162S125-30	33	12	14' 11"	11' 10"	10' 4"	13' 1"	10' 4"	8' 11"	11' 10"	9' 4"	7' 11"
		16	13' 7"	10' 9"	9' 4"	11' 10"	9' 4"	7' 11"	10' 9"	8' 3"	-
		24	11' 10"	9' 4"	7' 11"	10' 4"	7' 11"	-	9' 4"	-	-
250S125-18	33	12	16' 4" f	14' 2"	12' 9"	13' 4" f	12' 4"	11' 2"	11' 7" f	11' 3"	10' 2"
		16	14' 2" f	12' 10"	11' 7"	11' 7" f	11' 3"	10' 2"	10' 0" f	10' 0" f	9' 0"
		24	11' 7" f	11' 3"	10' 2"	9' 5" f	9' 5" f	8' 6"	8' 2" f	8' 2" f	-
250S125-27	33	12	18' 7"	15' 4"	13' 9"	16' 3"	13' 5"	12' 0"	14' 9"	12' 2"	10' 11"
		16	16' 10"	13' 11"	12' 5"	14' 9"	12' 2"	10' 11"	13' 5"	11' 1"	9' 11"
		24	14' 9"	12' 2"	10' 11"	12' 11"	10' 8"	9' 4"	11' 3" f	9' 8"	8' 1"
250S125-30	33	12	18' 5"	15' 10"	14' 1"	16' 1"	13' 10"	12' 4"	14' 7"	12' 7"	11' 2"
		16	16' 9"	14' 5"	12' 10"	14' 7"	12' 7"	11' 2"	13' 3"	11' 5"	10' 2"
		24	14' 7"	12' 7"	11' 2"	12' 9"	11' 0"	9' 9"	11' 7"	10' 0"	8' 8"
250S125-33	33	12	19' 8"	15' 8"	13' 8"	17' 3"	13' 8"	11' 11"	15' 8"	12' 5"	10' 10"
		16	17' 11"	14' 3"	12' 5"	15' 8"	12' 5"	10' 10"	14' 3"	11' 3"	9' 10"
		24	15' 8"	12' 5"	10' 10"	13' 8"	10' 10"	9' 5"	12' 4" f	9' 10"	8' 4"
350S125-18	33	12	18' 3" f	16' 4"	14' 4"	14' 11" f	14' 4"	12' 6"	12' 11" f	12' 11" f	11' 4"
		16	15' 10" f	14' 10"	13' 0"	12' 11" f	12' 11" f	11' 4"	11' 2" f	11' 2" f	10' 3"
		24	12' 11" f	12' 11" f	11' 4"	10' 7" f	10' 7" f	9' 11"	9' 2" f	9' 2" f	9' 0"
350S125-27	33	12	22' 6"	17' 11"	15' 7"	19' 8"	15' 7"	13' 8"	17' 11"	14' 2"	12' 4"
		16	20' 6"	16' 3"	14' 2"	17' 11"	14' 2"	12' 4"	15' 10" f	12' 11"	11' 2"
		24	17' 11"	14' 2"	12' 4"	14' 11" f	12' 4"	10' 8"	12' 11" f	11' 2"	-
350S125-30	33	12	22' 6"	17' 11"	15' 8"	19' 8"	15' 8"	13' 8"	17' 11"	14' 2"	12' 4"
		16	20' 6"	16' 3"	14' 2"	17' 11"	14' 2"	12' 4"	16' 3"	12' 11"	11' 1"
		24	17' 11"	14' 2"	12' 4"	15' 8"	12' 4"	10' 7"	13' 9" f	11' 1"	-
350S125-33	33	12	23' 0"	18' 3"	15' 11"	20' 1"	15' 11"	13' 11"	18' 3"	14' 6"	12' 8"
		16	20' 11"	16' 7"	14' 6"	18' 3"	14' 6"	12' 8"	16' 7"	13' 2"	11' 4"
		24	18' 3"	14' 6"	12' 8"	15' 11"	12' 8"	10' 10"	14' 4" f	11' 4"	9' 8"
362S125-18	33	12	18' 8" f	16' 8"	14' 7"	15' 3" f	14' 7"	12' 9"	13' 2" f	13' 2" f	11' 6"
		16	16' 2" f	15' 2"	13' 3"	13' 2" f	13' 2" f	11' 6"	11' 5" f	11' 5" f	10' 4"
		24	13' 2" f	13' 2" f	11' 6"	10' 9" f	10' 9" f	9' 11"	9' 4" f	9' 4" f	8' 11"
362S125-27	33	12	22' 10"	18' 2"	15' 10"	19' 11"	15' 10"	13' 10"	18' 2"	14' 5"	12' 6"
		16	20' 9"	16' 6"	14' 5"	18' 2"	14' 5"	12' 6"	15' 9" f	13' 1"	11' 1"
		24	18' 2"	14' 5"	12' 6"	14' 11" f	12' 6"	10' 7"	12' 11" f	11' 1"	-
362S125-30	33	12	22' 10"	18' 3"	16' 4"	19' 11"	16' 0"	14' 3"	18' 1"	14' 6"	12' 11"
		16	20' 8"	16' 7"	14' 10"	18' 1"	14' 6"	12' 11"	16' 5"	13' 2"	11' 6"
		24	18' 1"	14' 6"	12' 11"	15' 9" f	12' 8"	10' 11"	13' 8" f	11' 4"	-
362S125-33	33	12	24' 2"	19' 2"	16' 9"	21' 1"	16' 9"	14' 8"	19' 2"	15' 3"	13' 4"
		16	21' 11"	17' 5"	15' 3"	19' 2"	15' 3"	13' 4"	17' 5"	13' 10"	11' 11"
		24	19' 2"	15' 3"	13' 4"	16' 8" f	13' 4"	11' 4"	14' 5" f	11' 11"	10' 1"

Note: "f" adjacent to the height value indicates that flexural stress controls the allowable wall height.

Section	Fy (ksi)	Spacing (in) oc	5 psf			7.5 psf			10 psf		
			L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
400S125-18	33	12	19' 3" f	17' 6"	15' 4"	15' 9" f	15' 4"	13' 4"	13' 8" f	13' 8" f	12' 2"
		16	16' 8" f	15' 11"	13' 11"	13' 8" f	13' 8" f	12' 2"	11' 10" f	11' 10" f	11' 0"
		24	13' 8" f	13' 8" f	12' 2"	11' 2" f	11' 2" f	10' 7"	9' 8" f	9' 8" f	9' 7"
400S125-27	33	12	24' 6"	19' 5"	17' 0"	21' 5"	17' 0"	14' 10"	18' 8" f	15' 5"	13' 6"
		16	22' 3"	17' 8"	15' 5"	18' 8" f	15' 5"	13' 6"	16' 2" f	14' 0"	12' 2"
		24	18' 8" f	15' 5"	13' 6"	15' 3" f	13' 6"	11' 8"	13' 3" f	12' 2"	10' 6"
400S125-30	33	12	24' 6"	19' 5"	17' 0"	21' 5"	17' 0"	14' 10"	19' 5"	15' 5"	13' 6"
		16	22' 3"	17' 8"	15' 5"	19' 5"	15' 5"	13' 6"	17' 5" f	14' 0"	12' 2"
		24	19' 5"	15' 5"	13' 6"	16' 5" f	13' 6"	11' 7"	14' 2" f	12' 2"	10' 4"
400S125-33	33	12	25' 3"	20' 1"	17' 6"	22' 1"	17' 6"	15' 4"	20' 1"	15' 11"	13' 11"
		16	22' 11"	18' 3"	15' 11"	20' 1"	15' 11"	13' 11"	18' 3"	14' 5"	12' 7"
		24	20' 1"	15' 11"	13' 11"	17' 3" f	13' 11"	12' 0"	15' 0" f	12' 7"	10' 9"
550S125-18	33	12	21' 11" f	21' 11" f	19' 6"	17' 10" f	17' 10" f	17' 0"	15' 6" f	15' 6" f	15' 6" f
		16	19' 0" f	19' 0" f	17' 9"	15' 6" f	15' 6" f	15' 6" f	13' 5" f	13' 5" f	13' 5" f
		24	15' 6" f	15' 6" f	15' 6" f	12' 8" f	12' 8" f	12' 8" f	-	-	-
550S125-27	33	12	30' 4"	24' 8"	21' 10"	26' 9" f	21' 10"	19' 4"	23' 2" f	20' 0"	17' 8"
		16	27' 11"	22' 8"	20' 0"	23' 2" f	20' 0"	17' 8"	20' 1" f	18' 4"	16' 0"
		24	23' 2" f	20' 0"	17' 8"	18' 11" f	17' 8"	15' 5"	16' 5" f	16' 0"	-
550S125-30	33	12	30' 5"	24' 10"	22' 0"	27' 0"	22' 0"	19' 5"	24' 10"	20' 2"	17' 10"
		16	28' 0"	22' 9"	20' 2"	24' 10" f	20' 2"	17' 10"	21' 7" f	18' 6"	16' 2"
		24	24' 10"	20' 2"	17' 10"	20' 4" f	17' 10"	15' 7"	17' 7" f	16' 2"	-
600S125-18	33	12	23' 2" f	22' 9"	19' 11"	18' 11" f	18' 11" f	17' 5"	16' 4" f	16' 4" f	15' 10"
		16	20' 1" f	20' 1" f	18' 1"	16' 4" f	16' 4" f	15' 10"	14' 2" f	14' 2" f	14' 2" f
		24	16' 4" f	16' 4" f	15' 10"	13' 4" f	13' 4" f	13' 4" f	-	-	-
600S125-27	33	12	32' 5" f	26' 9"	23' 5"	26' 5" f	23' 5"	20' 5"	22' 11" f	21' 3"	18' 7"
		16	28' 1" f	24' 4"	21' 3"	22' 11" f	21' 3"	18' 7"	19' 10" f	19' 4"	16' 10"
		24	22' 11" f	21' 3"	18' 7"	18' 8" f	18' 7"	16' 1"	16' 2" f	16' 2" f	-
600S125-30	33	12	34' 2"	27' 1"	23' 8"	28' 11" f	23' 8"	20' 8"	25' 0" f	21' 6"	18' 9"
		16	30' 8" f	24' 7"	21' 6"	25' 0" f	21' 6"	18' 9"	21' 8" f	19' 6"	17' 1"
		24	25' 0" f	21' 6"	18' 9"	20' 5" f	18' 9"	16' 5"	17' 8" f	17' 1"	-
600S125-33	33	12	35' 4"	28' 1"	24' 6"	30' 10"	24' 6"	21' 5"	27' 10" f	22' 3"	19' 5"
		16	32' 1" f	25' 6"	22' 3"	27' 10" f	22' 3"	19' 5"	24' 1" f	20' 3"	17' 8"
		24	27' 10" f	22' 3"	19' 5"	22' 9" f	19' 5"	16' 11"	19' 8" f	17' 8"	-

Note: 'f' adjacent to the height value indicates that flexural stress controls the allowable wall height.

See Table Notes on page 19.

Table Notes

- Five pounds per square foot (psf), 7.5 psf, and 10 psf loads have **not** been reduced for strength or deflection checks; full lateral load is applied.
- Web crippling check based on 1" end bearing.
- Limiting heights are based on studs braced at maximum spacing of 48" oc. Bracing can be placed at a greater distance if deflection controls (d), maximum brace spacing is listed under Lbr.
- See page 5 for additional table notes.

Section	Fy (ksi)	Lu (in)	Spacing (in) oc	5 psf						7.5 psf						10 psf					
				L/120	Lbr	L/240	Lbr	L/360	Lbr	L/120	Lbr	L/240	Lbr	L/360	Lbr	L/120	Lbr	L/240	Lbr	L/360	Lbr
162S125-18	33	29.0	12	8' 5" f (48)	7' 10" d (59)	6' 11" d (73)	6' 10" f (48)	6' 9" d (50)	6' 0" d (66)	5' 11" f (48)	5' 11" f (48)	5' 5" d (61)	5' 2" f (48)	5' 2" f (48)	5' 5" d (61)	5' 11" f (48)	5' 11" f (48)	5' 5" d (61)	5' 5" d (61)	4' 11" d (55)	4' 2" f (48)
			16	7' 3" f (48)	7' 1" d (53)	6' 3" d (68)	5' 11" f (48)	5' 11" f (48)	5' 5" d (61)	5' 11" f (48)	5' 11" f (48)	5' 5" d (61)	5' 2" f (48)	5' 2" f (48)	5' 5" d (61)	5' 11" f (48)	5' 11" f (48)	5' 5" d (61)	5' 5" d (61)	4' 11" d (55)	4' 2" f (48)
			24	5' 11" f (48)	5' 11" f (48)	5' 5" d (61)	4' 10" f (48)	4' 10" f (48)	4' 8" d (53)	4' 10" f (48)	4' 10" f (48)	4' 8" d (53)	4' 2" f (48)	4' 2" f (48)	4' 8" d (53)	4' 10" f (48)	4' 10" f (48)	4' 8" d (53)	4' 8" d (53)	4' 11" d (55)	4' 2" f (48)
162S125-27	33	29.1	12	11' 1" f (48)	9' 0" d (78)	7' 10" d (92)	9' 0" f (48)	7' 10" d (70)	6' 10" d (84)	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	6' 3" d (79)	6' 3" d (79)	6' 3" d (79)
			16	9' 7" f (48)	8' 2" d (73)	7' 2" d (87)	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	6' 9" f (48)	6' 6" d (57)	5' 8" d (75)	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	6' 3" d (79)	6' 3" d (79)	6' 3" d (79)
			24	7' 10" f (48)	7' 1" d (64)	6' 3" d (79)	6' 5" f (48)	6' 3" d (53)	5' 5" d (73)	6' 5" f (48)	6' 3" d (53)	5' 5" d (73)	5' 6" f (48)	5' 6" f (48)	4' 11" d (67)	6' 5" f (48)	6' 5" f (48)	5' 6" f (48)	5' 6" f (48)	4' 11" d (67)	4' 11" d (67)
162S125-30	33	29.2	12	11' 8" d (51)	9' 3" d (81)	8' 1" d (98)	9' 8" f (48)	8' 1" d (74)	7' 1" d (89)	8' 4" f (48)	7' 4" d (70)	6' 5" d (83)	8' 4" f (48)	7' 4" d (70)	6' 5" d (83)	8' 4" f (48)	7' 4" d (70)	6' 5" d (83)	6' 5" d (83)	6' 5" d (83)	6' 5" d (83)
			16	10' 3" f (48)	8' 5" d (76)	7' 4" d (91)	8' 4" f (48)	7' 4" d (70)	6' 5" d (83)	8' 4" f (48)	7' 4" d (70)	6' 5" d (83)	7' 3" f (48)	6' 8" d (63)	5' 10" d (78)	7' 3" f (48)	6' 8" d (63)	5' 10" d (78)	5' 10" d (78)	5' 10" d (78)	5' 10" d (78)
			24	8' 4" f (48)	7' 4" d (70)	6' 5" d (83)	6' 10" f (48)	6' 5" d (60)	5' 7" d (76)	6' 10" f (48)	6' 5" d (60)	5' 7" d (76)	5' 11" f (48)	5' 10" d (51)	5' 1" d (72)	5' 11" f (48)	5' 10" d (51)	5' 1" d (72)	5' 1" d (72)	5' 1" d (72)	5' 1" d (72)
162S125-33	33	29.2	12	12' 0" d (60)	9' 7" d (85)	8' 4" d (105)	10' 5" f (48)	8' 4" d (78)	7' 4" d (95)	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	6' 8" d (88)	6' 8" d (88)	6' 8" d (88)
			16	10' 11" d (50)	8' 8" d (80)	7' 7" d (98)	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	7' 9" f (48)	6' 11" d (68)	6' 0" d (82)	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	6' 0" d (82)	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	6' 0" d (82)	6' 0" d (82)
			24	9' 0" f (48)	7' 7" d (73)	6' 8" d (88)	7' 4" f (48)	6' 8" d (66)	5' 10" d (80)	7' 4" f (48)	6' 8" d (66)	5' 10" d (80)	6' 4" f (48)	6' 0" d (60)	5' 3" d (75)	6' 4" f (48)	6' 0" d (60)	5' 3" d (75)	5' 3" d (75)	5' 3" d (75)	5' 3" d (75)
250S125-18	33	29.0	12	11' 6" f (48)	10' 9" d (57)	9' 6" d (69)	9' 5" f (48)	9' 4" d (49)	8' 3" d (64)	8' 2" f (48)	8' 2" f (48)	7' 6" d (59)	7' 1" f (48)	7' 1" f (48)	6' 9" d (54)	8' 2" f (48)	8' 2" f (48)	7' 6" d (59)	7' 6" d (59)	7' 6" d (59)	7' 6" d (59)
			16	10' 0" f (48)	9' 8" d (52)	8' 7" d (65)	8' 2" f (48)	8' 2" f (48)	7' 6" d (59)	8' 2" f (48)	8' 2" f (48)	7' 6" d (59)	7' 1" f (48)	7' 1" f (48)	6' 9" d (54)	7' 1" f (48)	7' 1" f (48)	6' 9" d (54)	6' 9" d (54)	6' 9" d (54)	6' 9" d (54)
			24	8' 2" f (48)	8' 2" f (48)	7' 6" d (59)	6' 8" f (48)	6' 8" f (48)	6' 6" d (52)	6' 8" f (48)	6' 8" f (48)	6' 6" d (52)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)	5' 9" e f (48)
250S125-27	33	28.9	12	14' 10" f (48)	12' 5" d (70)	10' 10" d (81)	12' 1" f (48)	10' 10" d (63)	9' 6" d (75)	10' 6" f (48)	9' 10" d (57)	8' 7" d (72)	10' 6" f (48)	9' 10" d (57)	8' 7" d (72)	10' 6" f (48)	9' 10" d (57)	8' 7" d (72)	8' 7" d (72)	8' 7" d (72)	8' 7" d (72)
			16	12' 10" f (48)	11' 3" d (65)	9' 11" d (77)	10' 6" f (48)	9' 10" d (57)	8' 7" d (72)	9' 1" f (48)	8' 11" d (50)	7' 10" d (67)	10' 6" f (48)	9' 10" d (57)	8' 7" d (72)	9' 1" f (48)	8' 11" d (50)	7' 10" d (67)	7' 10" d (67)	7' 10" d (67)	7' 10" d (67)
			24	10' 6" f (48)	9' 10" d (57)	8' 7" d (72)	8' 7" f (48)	8' 7" f (48)	7' 6" d (65)	8' 7" f (48)	8' 7" f (48)	7' 6" d (65)	7' 5" f (48)	7' 5" f (48)	6' 10" d (60)	7' 5" f (48)	7' 5" f (48)	6' 10" d (60)	6' 10" d (60)	6' 10" d (60)	6' 10" d (60)
250S125-30	33	28.9	12	15' 9" f (48)	12' 10" d (72)	11' 3" d (84)	12' 11" f (48)	11' 2" d (67)	9' 10" d (78)	11' 2" f (48)	10' 2" d (62)	8' 11" d (73)	11' 2" f (48)	10' 2" d (62)	8' 11" d (73)	11' 2" f (48)	10' 2" d (62)	8' 11" d (73)	8' 11" d (73)	8' 11" d (73)	8' 11" d (73)
			16	13' 8" f (48)	11' 8" d (68)	10' 2" d (79)	11' 2" f (48)	10' 2" d (62)	8' 11" d (73)	9' 8" f (48)	9' 3" d (55)	8' 1" d (69)	9' 8" f (48)	9' 3" d (55)	8' 1" d (69)	9' 8" f (48)	9' 3" d (55)	8' 1" d (69)	8' 1" d (69)	8' 1" d (69)	8' 1" d (69)
			24	11' 2" f (48)	10' 2" d (62)	8' 11" d (73)	9' 1" f (48)	8' 10" d (52)	7' 9" d (68)	7' 11" f (48)	7' 11" f (48)	7' 1" d (64)	7' 11" f (48)	7' 11" f (48)	7' 1" d (64)	7' 11" f (48)	7' 11" f (48)	7' 1" d (64)	7' 1" d (64)	7' 1" d (64)	7' 1" d (64)
250S125-33	33	28.9	12	16' 8" d (50)	13' 3" d (74)	11' 7" d (88)	13' 9" f (48)	11' 7" d (68)	10' 1" d (81)	11' 11" f (48)	10' 6" d (65)	9' 2" d (76)	11' 11" f (48)	10' 6" d (65)	9' 2" d (76)	11' 11" f (48)	10' 6" d (65)	9' 2" d (76)	9' 2" d (76)	9' 2" d (76)	9' 2" d (76)
			16	14' 7" f (48)	12' 1" d (70)	10' 6" d (82)	11' 11" f (48)	10' 6" d (65)	9' 2" d (76)	10' 4" f (48)	9' 6" d (60)	8' 4" d (72)	10' 4" f (48)	9' 6" d (60)	8' 4" d (72)	10' 4" f (48)	9' 6" d (60)	8' 4" d (72)	8' 4" d (72)	8' 4" d (72)	8' 4" d (72)
			24	11' 11" f (48)	10' 6" d (65)	9' 2" d (76)	9' 9" f (48)	9' 2" d (76)	8' 0" d (70)	8' 5" f (48)	8' 4" d (50)	7' 4" d (66)	8' 5" f (48)	8' 4" d (50)	7' 4" d (66)	8' 5" f (48)	8' 4" d (50)	7' 4" d (66)	7' 4" d (66)	7' 4" d (66)	7' 4" d (66)
250S125-43	33	28.9	12	18' 2" d (59)	14' 5" d (83)	12' 7" d (99)	15' 10" d (50)	12' 7" d (76)	11' 0" d (91)	13' 11" f (48)	11' 5" d (71)	10' 0" d (85)	13' 11" f (48)	11' 5" d (71)	10' 0" d (85)	13' 11" f (48)	11' 5" d (71)	10' 0" d (85)	10' 0" d (85)	10' 0" d (85)	10' 0" d (85)
			16	16' 6" d (53)	13' 1" d (78)	11' 5" d (93)	13' 11" f (48)	11' 5" d (71)	10' 0" d (85)	12' 1" f (48)	10' 5" d (67)	9' 1" d (80)	12' 1" f (48)	10' 5" d (67)	9' 1" d (80)	12' 1" f (48)	10' 5" d (67)	9' 1" d (80)	9' 1" d (80)	9' 1" d (80)	9' 1" d (80)
			24	13' 11" f (48)	11' 5" d (71)	10' 0" d (85)	11' 4" f (48)	10' 0" d (64)	8' 9" d (78)	9' 10" f (48)	9' 1" d (59)	7' 11" d (73)	9' 10" f (48)	9' 1" d (59)	7' 11" d (73)	9' 10" f (48)	9' 1" d (59)	7' 11" d (73)	7' 11" d (73)	7' 11" d (73)	7' 11" d (73)
350S125-18	33	28.8	12	12' 10" f (48)	12' 10" f (48)	12' 3" d (55)	10' 6" f (48)	10' 6" f (48)	10' 6" f (48)	9' 1" f (48)	9' 1" f (48)	9' 1" f (48)	7' 10" e f (48)	7' 10" e f (48)	7' 10" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)
			16	11' 1" f (48)	11' 1" f (48)	11' 1" d (48)	9' 1" f (48)	9' 1" f (48)	9' 1" f (48)	9' 1" f (48)	9' 1" f (48)	9' 1" f (48)	7' 5" e f (48)	7' 5" e f (48)	7' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)
			24	9' 1" f (48)	9' 1" f (48)	9' 1" f (48)	7' 5" e f (48)	7' 5" e f (48)	7' 5" e f (48)	7' 5" e f (48)	7' 5" e f (48)	7' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)	6' 5" e f (48)
350S125-27	33	28.7	12	17' 3" f (48)	16' 1" d (59)	14' 1" d (73)	14' 1" f (48)	14' 0" d (48)	12' 3" d (67)	12' 2" f (48)	12' 2" f (48)	12' 2" d (62)	12' 2" f (48)	12' 2" f (48)	12' 2" d (62)	12' 2" f (48)	12' 2" f (48)	12' 2" d (62)	12' 2" d (62)	12' 2" d (62)	12' 2" d (62)
			16	14' 11" f (48)	14' 7" d (52)	12' 10" d (69)	14' 11" f (48)	14' 7" d (52)	12' 10" d (69)	12' 2" f (48)	12' 2" f (48)	12' 2" d (62)	9' 11" f (48)	9' 11" f (48)	9' 9" d (52)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)
			24	12' 2" f (48)	12' 2" f (48)	11' 2" d (62)	9' 11" f (48)	9' 11" f (48)	9' 9" d (52)	9' 11" f (48)	9' 11" f (48)	9' 9" d (52)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)	8' 7" f (48)
350S125-30	33	28.6	12	18' 6" f (48)	16' 7" d (64)	14' 6" d (75)	15' 2" f (48)	14' 6" d (55)	12' 8" d (69)	13' 1" f (48)	13' 1" f (48)	11' 6" d (65)	13' 1" f (48)	13' 1" f (48)	11' 6" d (65)	13' 1" f (48)	13' 1" f (48)	11' 6" d (65)	11' 6" d (65)	11' 6" d (65)	11' 6" d (65)
			16	16' 1" f (48)	15' 1" d (58)	13' 2" d (71)	13' 1" f (48)	13' 1" f (48)	11' 6" d (65)	11' 4" f (48)	11' 4" f (48)	10' 6" d (61)	11' 4" f (48)	11' 4" f (48)	10' 6" d (61)	11' 4" f (48)	11' 4" f (48)	10' 6" d (61)	10' 6" d (61)	10' 6" d (61)	10' 6" d (61)
			24	13' 1" f (48)	13' 1" f (48)	11' 6" d (65)	10' 8" f (48)	10' 8" f (48)	10' 1" d (58)	9' 3" f (48)	9' 3" f (48)	9' 1" d (51)	9' 3" f (48)	9' 3" f (48)	9' 1" d (51)	9' 3" f (48)	9' 3" f (48)	9' 1" d (51)	9' 1" d (51)	9' 1" d (51)	9' 1" d (51)
350S125-33	33	28.6	12	20' 0" f (48)	17' 2" d (66)	15' 0" d (78)	16' 4" f (48)	15' 0" d (60)	13' 1" d (71)	14' 2" f (48)	13' 7" d (55)	11' 1" d (67)	14' 2" f (48)	13' 7" d (55)	11' 1" d (67)	14' 2" f (48)	13' 7" d (55)	11' 1" d (67)	11' 1" d (67)	11' 1" d (67)	11' 1" d (67)
			16	17' 4" f (48)	15' 7" d (62)	13' 8" d (73)	14' 2" f (48)	13' 7" d (55)	11' 1" d (67)	12' 3" f (48)	12' 3" f (48)	12' 3" d (64)	12' 3" f (48)	12' 3" f (48)	12' 3" d (64)	12' 3" f (48)	12' 3" f (48)	12' 3" d (64)	12' 3" d (64)	12' 3" d (64)	1

Section	Fy (ksi)	Lv (in)	Spacing (in) oc	5 psf						7.5 psf						10 psf						
				L/120	Lbr	L/240	Lbr	L/360	Lbr	L/120	Lbr	L/240	Lbr	L/360	Lbr	L/120	Lbr	L/240	Lbr	L/360	Lbr	
362S125-68	50	22.7	12	27' 7" d (63)	21' 11" d (86)	19' 2" d (104)		24' 1" d (58)	19' 2" d (78)	16' 9" d (94)		21' 11" d (55)	17' 5" d (73)	15' 2" d (88)	21' 11" d (55)	17' 5" d (73)	15' 2" d (88)		21' 11" d (55)	17' 5" d (73)	15' 2" d (88)	
			16	25' 1" d (60)	19' 11" d (80)	17' 5" d (97)		21' 11" d (55)	17' 5" d (73)	15' 2" d (88)		19' 11" d (52)	15' 10" d (69)	13' 10" d (82)		19' 11" d (52)	15' 10" d (69)	13' 10" d (82)		19' 11" d (52)	15' 10" d (69)	13' 10" d (82)
			24	21' 11" d (55)	17' 5" d (73)	15' 2" d (88)		19' 2" d (50)	15' 2" d (67)	13' 3" d (80)		17' 0" f (48)	13' 10" d (63)	12' 1" d (75)		17' 0" f (48)	13' 10" d (63)	12' 1" d (75)		17' 0" f (48)	13' 10" d (63)	12' 1" d (75)
400S125-18	33	28.7	12	13' 9" e f (48)	13' 9" e f (48)	13' 7" e d (49)		11' 3" e f (48)	11' 3" e f (48)	9' 9" e f (48)		9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)		9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)	
			16	11' 11" e f (48)	11' 11" e f (48)	11' 11" e f (48)		9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)		8' 5" e f (48)	8' 5" e f (48)	8' 5" e f (48)		8' 5" e f (48)	8' 5" e f (48)	8' 5" e f (48)		8' 5" e f (48)	8' 5" e f (48)	8' 5" e f (48)
			24	9' 9" e f (48)	9' 9" e f (48)	9' 9" e f (48)		7' 11" e f (48)	7' 11" e f (48)	7' 11" e f (48)		6' 10" e f (48)	6' 10" e f (48)	6' 10" e f (48)		6' 10" e f (48)	6' 10" e f (48)	6' 10" e f (48)		6' 10" e f (48)	6' 10" e f (48)	6' 10" e f (48)
400S125-27	33	28.5	12	18' 6" f (48)	17' 10" d (54)	15' 8" d (69)		15' 2" f (48)	15' 2" f (48)	13' 8" d (63)		13' 1" f (48)	13' 1" f (48)	12' 4" d (57)	13' 1" f (48)	13' 1" f (48)	12' 4" d (57)		13' 1" f (48)	13' 1" f (48)	12' 4" d (57)	
			16	16' 1" f (48)	16' 1" f (48)	14' 2" d (65)		13' 1" f (48)	13' 1" f (48)	12' 4" d (57)		11' 4" f (48)	11' 4" f (48)	11' 3" d (50)		11' 4" f (48)	11' 4" f (48)	11' 3" d (50)		11' 4" f (48)	11' 4" f (48)	11' 3" d (50)
			24	13' 1" f (48)	13' 1" f (48)	12' 4" d (57)		10' 8" f (48)	10' 8" f (48)	10' 8" f (48)		9' 3" f (48)	9' 3" f (48)	9' 3" f (48)		9' 3" f (48)	9' 3" f (48)	9' 3" f (48)		9' 3" f (48)	9' 3" f (48)	9' 3" f (48)
400S125-30	33	28.5	12	19' 11" f (48)	18' 5" d (60)	16' 2" d (72)		16' 3" f (48)	16' 1" d (50)	14' 1" d (66)		14' 1" f (48)	14' 1" f (48)	12' 10" d (62)	14' 1" f (48)	14' 1" f (48)	12' 10" d (62)		14' 1" f (48)	14' 1" f (48)	12' 10" d (62)	
			16	17' 3" f (48)	16' 9" d (53)	14' 8" d (68)		14' 1" f (48)	14' 1" f (48)	12' 10" d (62)		12' 3" f (48)	12' 3" f (48)	11' 7" d (56)		12' 3" f (48)	12' 3" f (48)	11' 7" d (56)		12' 3" f (48)	12' 3" f (48)	11' 7" d (56)
			24	14' 1" f (48)	14' 1" f (48)	12' 10" d (62)		11' 6" f (48)	11' 6" f (48)	11' 2" d (53)		10' 0" f (48)	10' 0" f (48)	10' 0" f (48)		10' 0" f (48)	10' 0" f (48)	10' 0" f (48)		10' 0" f (48)	10' 0" f (48)	10' 0" f (48)
400S125-33	33	28.4	12	21' 7" f (48)	19' 1" d (63)	16' 8" d (74)		17' 7" f (48)	16' 8" d (57)	14' 7" d (68)		15' 3" f (48)	15' 1" d (49)	13' 3" d (65)	15' 3" f (48)	15' 1" d (49)	13' 3" d (65)		15' 3" f (48)	15' 1" d (49)	13' 3" d (65)	
			16	18' 8" f (48)	17' 4" d (59)	15' 2" d (70)		15' 3" f (48)	15' 1" d (49)	13' 3" d (65)		13' 2" f (48)	13' 2" f (48)	12' 0" d (61)		13' 2" f (48)	13' 2" f (48)	12' 0" d (61)		13' 2" f (48)	13' 2" f (48)	12' 0" d (61)
			24	15' 3" f (48)	15' 1" d (49)	13' 3" d (65)		12' 5" f (48)	12' 5" f (48)	11' 7" d (59)		10' 9" f (48)	10' 9" f (48)	10' 6" d (53)		10' 9" f (48)	10' 9" f (48)	10' 6" d (53)		10' 9" f (48)	10' 9" f (48)	10' 6" d (53)
400S125-43	33	28.2	12	25' 6" f (48)	20' 9" d (70)	18' 2" d (82)		20' 10" f (48)	18' 2" d (63)	15' 10" d (75)		18' 1" f (48)	16' 6" d (59)	14' 5" d (71)	18' 1" f (48)	16' 6" d (59)	14' 5" d (71)		18' 1" f (48)	16' 6" d (59)	14' 5" d (71)	
			16	22' 1" f (48)	18' 10" d (65)	16' 6" d (77)		18' 1" f (48)	16' 6" d (59)	14' 5" d (71)		15' 8" f (48)	15' 0" d (54)	13' 1" d (67)		15' 8" f (48)	15' 0" d (54)	13' 1" d (67)		15' 8" f (48)	15' 0" d (54)	13' 1" d (67)
			24	18' 1" f (48)	16' 6" d (59)	14' 5" d (71)		14' 9" f (48)	14' 5" d (51)	12' 7" d (65)		12' 9" f (48)	12' 9" f (48)	11' 5" d (61)		12' 9" f (48)	12' 9" f (48)	11' 5" d (61)		12' 9" f (48)	12' 9" f (48)	11' 5" d (61)
400S125-54	50	22.7	12	28' 0" d (57)	22' 2" d (75)	19' 5" d (89)		24' 5" d (52)	19' 5" d (69)	16' 11" d (82)		22' 2" d (49)	17' 8" d (65)	15' 5" d (77)	22' 2" d (49)	17' 8" d (65)	15' 5" d (77)		22' 2" d (49)	17' 8" d (65)	15' 5" d (77)	
			16	25' 5" d (53)	20' 2" d (71)	17' 8" d (84)		22' 2" d (49)	17' 8" d (65)	15' 5" d (77)		19' 5" f (48)	16' 0" d (62)	14' 0" d (73)		19' 5" f (48)	16' 0" d (62)	14' 0" d (73)		19' 5" f (48)	16' 0" d (62)	14' 0" d (73)
			24	22' 2" d (49)	17' 8" d (65)	15' 5" d (77)		18' 4" f (48)	15' 5" d (60)	13' 5" d (71)		15' 10" f (48)	14' 0" d (57)	12' 3" d (67)		15' 10" f (48)	14' 0" d (57)	12' 3" d (67)		15' 10" f (48)	14' 0" d (57)	12' 3" d (67)
400S125-68	50	22.5	12	29' 10" d (61)	23' 8" d (82)	20' 8" d (98)		26' 1" d (56)	20' 8" d (75)	18' 1" d (90)		23' 8" d (53)	18' 10" d (71)	16' 5" d (84)	23' 8" d (53)	18' 10" d (71)	16' 5" d (84)		23' 8" d (53)	18' 10" d (71)	16' 5" d (84)	
			16	27' 2" d (58)	21' 6" d (77)	18' 10" d (92)		23' 8" d (53)	18' 10" d (71)	16' 5" d (84)		21' 6" d (50)	17' 1" d (66)	14' 11" d (79)		21' 6" d (50)	17' 1" d (66)	14' 11" d (79)		21' 6" d (50)	17' 1" d (66)	14' 11" d (79)
			24	23' 8" d (53)	18' 10" d (71)	16' 5" d (84)		20' 8" d (48)	16' 5" d (65)	14' 4" d (77)		18' 0" f (48)	14' 11" d (61)	13' 0" d (72)		18' 0" f (48)	14' 11" d (61)	13' 0" d (72)		18' 0" f (48)	14' 11" d (61)	13' 0" d (72)
550S125-27	33	27.9	12	23' 7" f (48)	22' 10" d (53)	20' 2" d (67)		19' 3" f (48)	19' 3" f (48)	17' 6" d (61)		16' 8" f (48)	16' 8" f (48)	15' 11" d (55)	16' 8" f (48)	16' 8" f (48)	15' 11" d (55)		16' 8" f (48)	16' 8" f (48)	15' 11" d (55)	
			16	20' 5" f (48)	20' 5" f (48)	18' 3" d (63)		16' 8" f (48)	16' 8" f (48)	15' 11" d (55)		14' 5" f (48)	14' 5" f (48)	14' 5" d (48)		14' 5" f (48)	14' 5" f (48)	14' 5" d (48)		14' 5" f (48)	14' 5" f (48)	14' 5" d (48)
			24	16' 8" f (48)	16' 8" f (48)	15' 11" d (55)		13' 7" f (48)	13' 7" f (48)	13' 7" f (48)		11' 9" e f (48)	11' 9" e f (48)	11' 9" e f (48)		11' 9" e f (48)	11' 9" e f (48)	11' 9" e f (48)		11' 9" e f (48)	11' 9" e f (48)	11' 9" e f (48)
550S125-30	33	27.9	12	25' 5" f (48)	23' 9" d (58)	20' 10" d (69)		20' 9" f (48)	20' 8" d (48)	18' 2" d (64)		18' 0" f (48)	18' 0" f (48)	16' 6" d (60)	18' 0" f (48)	18' 0" f (48)	16' 6" d (60)		18' 0" f (48)	18' 0" f (48)	16' 6" d (60)	
			16	22' 0" f (48)	21' 6" d (52)	18' 11" d (65)		18' 0" f (48)	18' 0" f (48)	16' 6" d (60)		15' 7" f (48)	15' 7" f (48)	14' 11" d (54)		15' 7" f (48)	15' 7" f (48)	14' 11" d (54)		15' 7" f (48)	15' 7" f (48)	14' 11" d (54)
			24	18' 0" f (48)	18' 0" f (48)	16' 6" d (60)		14' 8" f (48)	14' 8" f (48)	14' 4" d (52)		12' 8" e f (48)	12' 8" e f (48)	12' 8" e f (48)		12' 8" e f (48)	12' 8" e f (48)	12' 8" e f (48)		12' 8" e f (48)	12' 8" e f (48)	12' 8" e f (48)
550S125-33	33	27.8	12	27' 6" f (48)	24' 8" d (61)	21' 6" d (72)		22' 5" f (48)	21' 6" d (55)	18' 10" d (66)		19' 5" f (48)	19' 5" f (48)	17' 1" d (62)	19' 5" f (48)	19' 5" f (48)	17' 1" d (62)		19' 5" f (48)	19' 5" f (48)	17' 1" d (62)	
			16	23' 10" f (48)	22' 4" d (57)	19' 7" d (68)		19' 5" f (48)	19' 5" f (48)	17' 1" d (62)		16' 10" f (48)	16' 10" f (48)	15' 6" d (58)		16' 10" f (48)	16' 10" f (48)	15' 6" d (58)		16' 10" f (48)	16' 10" f (48)	15' 6" d (58)
			24	19' 5" f (48)	19' 5" f (48)	17' 1" d (62)		15' 10" f (48)	15' 10" f (48)	14' 11" d (57)		13' 9" f (48)	13' 9" f (48)	13' 6" d (51)		13' 9" f (48)	13' 9" f (48)	13' 6" d (51)		13' 9" f (48)	13' 9" f (48)	13' 6" d (51)
550S125-43	33	27.6	12	32' 7" f (48)	26' 10" d (66)	23' 5" d (76)		26' 8" f (48)	23' 5" d (61)	20' 5" d (71)		23' 1" f (48)	21' 3" d (57)	18' 7" d (67)	23' 1" f (48)	21' 3" d (57)	18' 7" d (67)		23' 1" f (48)	21' 3" d (57)	18' 7" d (67)	
			16	28' 3" f (48)	24' 4" d (62)	21' 3" d (72)		23' 1" f (48)	21' 3" d (57)	18' 7" d (67)		20' 0" f (48)	19' 4" d (52)	16' 11" d (64)		20' 0" f (48)	19' 4" d (52)	16' 11" d (64)		20' 0" f (48)	19' 4" d (52)	16' 11" d (64)
			24	23' 1" f (48)	21' 3" d (57)	18' 7" d (67)		18' 10" f (48)	18' 7" d (50)	16' 3" d (62)		16' 4" f (48)	16' 4" f (48)	14' 9" d (59)		16' 4" f (48)	16' 4" f (48)	14' 9" d (59)		16' 4" f (48)	16' 4" f (48)	14' 9" d (59)
550S125-54	50	22.1	12	36' 2" d (53)	28' 9" d (69)	25' 1" d (80)		31' 7" d (50)	25' 1" d (64)	21' 11" d (74)		28' 2" f (48)	22' 9" d (61)	19' 11" d (71)	28' 2" f (48)	22' 9" d (61)	19' 11" d (71)		28' 2" f (48)	22' 9" d (61)	19' 11" d (71)	
			16	32' 10" d (51)	26' 1" d (65)	22' 9" d (76)		28' 2" f (48)	22' 9" d (61)	19' 11" d (71)		24' 4" f (48)	20' 8" d (58)	18' 1" d (67)		24' 4" f (48)	20' 8" d (58)	18' 1" d (67)		24' 4" f (48)	20' 8" d (58)	18' 1" d (67)
			24	28' 2" f (48)	22' 9" d (61)	19' 11" d (71)		23' 0" f (48)	19' 11" d (57)	17' 5" d (65)		19' 11" f (48)	18' 1" d (53)	15' 10" d (62)		19' 11" f (48)	18' 1" d (53)	15' 10" d (62)		19' 11" f (48)	18' 1" d (53)	15' 10" d (62)
550S125-68	50	21.8	12	38' 8" d (55.8)	30' 8" d (73)	26' 10" d (86)		33' 9" d (52)	26' 10" d (67)	23' 5" d (79)		30' 8" d (49)	24' 4" d (64)	21' 3" d (74)	30' 8" d (49)	24' 4" d (64)	21' 3" d (74)		30' 8" d (49)	24' 4" d (64)	21' 3" d (74)	
			16	35' 2" d (53.0)	27' 11" d (69)	24' 4" d (81)		30' 8" d (49)	24' 4" d (64)	21' 3" d (74)		27' 1" f (48)	22' 2" d (60)	19' 4" d (70)		27' 1" f (48)	22' 2" d (60)	19' 4" d (70)		27' 1" f (48)	22' 2" d (60)	19' 4" d (70)

Screw Capacities

Table Notes

- Capacities based on AISI S100 Section E4.
- When connecting materials of different steel thicknesses or tensile strengths, use the lowest values. Tabulated values assume two sheets of equal thickness are connected.
- Capacities are based on Allowable Strength Design (ASD) and include safety factor of 3.0.
- Where multiple fasteners are used, screws are assumed to have a center-to-center spacing of at least 3 times the nominal diameter (d).
- Screws are assumed to have a center-of-screw to edge-of-steel dimension of at least 1.5 times the nominal diameter (d) of the screw.
- Pull-out capacity is based on the lesser of pull-out capacity in sheet closest to screw tip or tension strength of screw.
- Pull-over capacity is based on the lesser of pull-over capacity for sheet closest to screw header or tension strength of screw.
- Values are for pure shear or tension loads. See AISI Section E4.5 for combined shear and pull-over.
- Screw Shear (Pss), tension (Pts), diameter, and head diameter are from CFSEI Tech Note (F701-12).
- Screw shear strength is the average value, and tension strength is the lowest value listed in CFSEI Tech Note (F701-12).
- Higher values for screw strength (Pss, Pts), may be obtained by specifying screws from a specific manufacturer.

Allowable Screw Connection Capacity (lbs)																		
Thickness (Mils)	Design Thickness	Fy Yield (ksi)	Fu Tensile (ksi)	#6 Screw			#8 Screw			#10 Screw			#12 Screw			¼" Screw		
				(Pss = 643 lbs, Pts = 419 lbs)			(Pss = 1278 lbs, Pts = 586 lbs)			(Pss = 1644 lbs, Pts = 1158 lbs)			(Pss = 2330 lbs, Pts = 2325 lbs)			(Pss = 3048 lbs, Pts = 3201 lbs)		
				0.138" dia, 0.272" Head			0.164" dia, 0.272" Head			0.190" dia, 0.340" Head			0.216" dia, 0.340" Head			0.250" dia, 0.409" Head		
				Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over
18	0.0188	33	33	44	24	84	48	29	84	52	33	105	55	38	105	60	44	127
27	0.0283	33	33	82	37	127	89	43	127	96	50	159	102	57	159	110	66	191
30	0.0312	33	33	95	40	140	103	48	140	111	55	175	118	63	175	127	73	211
33	0.0346	33	45	151	61	140	164	72	195	177	84	265	188	95	265	203	110	318
43	0.0451	33	45	214	79	140	244	94	195	263	109	345	280	124	345	302	144	415
54	0.0566	33	45	214	100	140	344	118	195	370	137	386	394	156	433	424	180	521
68	0.0713	33	45	214	125	140	426	149	195	523	173	386	557	196	545	600	227	656
97	0.1017	33	45	214	140	140	426	195	195	548	246	386	777	280	775	1,016	324	936
118	0.1242	33	45	214	140	140	426	195	195	548	301	386	777	342	775	1,016	396	1,067
54	0.0566	50	65	214	140	140	426	171	195	534	198	386	569	225	625	613	261	752
68	0.0713	50	65	214	140	140	426	195	195	548	249	386	777	284	775	866	328	948
97	0.1017	50	65	214	140	140	426	195	195	548	356	386	777	405	775	1,016	468	1,067
118	0.1242	50	65	214	140	140	426	195	195	548	386	386	777	494	775	1,016	572	1,067

Weld Capacities

Table Notes

- Capacities based on the AISI S100 Specification Sections E2.4 for fillet welds and E2.5 for flare groove welds.
- When connecting materials of different steel thicknesses or tensile strengths, use the lowest values.
- Capacities are based on Allowable Strength Design (ASD).
- Weld capacities are based on E60 electrodes. For material thinner than 68 mil, 0.030" to 0.035" diameter wire electrodes may provide best results.
- Longitudinal capacity is considered to be loading in the direction of the length of the weld.
- Transverse capacity is loading in perpendicular direction of the length of the weld.
- For flare groove welds, the effective throat of weld is conservatively assumed to be less than 2t.
- For longitudinal fillet welds, a minimum value of EQ E2.4-1, E2.4-2, and E2.4-4 was used.
- For transverse fillet welds, a minimum value of EQ E2.4-3 and E2.4-4 was used.
- For longitudinal flare groove welds, a minimum value of EQ E2.5-2 and E2.5-3 was used.

Allowable Weld Capacity (lbs / in)							
Thickness (Mils)	Design Thickness	Fy Yield (ksi)	Fu Tensile (ksi)	Fillet Welds		Flare Groove Welds	
				Longitudinal	Transverse	Longitudinal	Transverse
43	0.0451	33	45	499	864	544	663
54	0.0566	33	45	626	1084	682	832
68	0.0713	33	45	789	1365	859	1048
97	0.1017	33	45	1125	1269	- ¹	- ¹
54	0.0566	50	65	905	1566	985	1202
68	0.0713	50	65	1140	1972	1241	1514
97	0.1017	50	65	1269	1269	- ¹	- ¹

¹Weld capacity for material thickness greater than 0.10" requires engineering judgment to determine leg of welds, W1 and W2.



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2215 N. 30th Street, Suite 300
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Project Title: Wesley Bradley Park Ph.2 - Care Center
Engineer: KBG
Project ID: 2220236.20
Project Descr:

Masonry Slender Wall

Project File: 2220236_care center concrete framing.ec6

LIC# : KW-06014847, Build:20.23.04.05

AHBL, INC

(c) ENERCALC INC 1983-2023

DESCRIPTION: Trash Enclosure

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16

Construction Type : Grouted Hollow Concrete Masonry

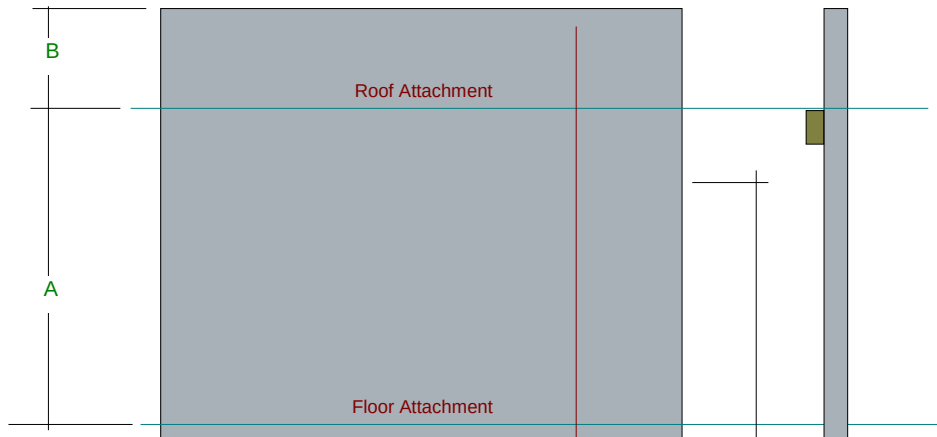
F'm	=	1.50 ksi	Nom. Wall Thickness	8 in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness	7.625 in	Min Allow Out-of-plane Defl Ra	=	0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance	3.8125 in	Minimum Vertical Steel %	=	0.0020
Em = f'm *	=	900.0	Lower Level Rebar . . .				
Max % of ρ bal.	=	0.007126	Bar Size	# 6			
Grout Density	=	140 pcf	Bar Spacing	16 in			
Block Weight		Normal Weight					
Wall Weight	=	86.0 psf					

Wall is Solid Grouted

One-Story Wall Dimensions

A Clear Height	=	12 ft
B Parapet height	=	ft

Wall Support Condition Top Free, Bottom Fix



Lateral Loads

Wind Loads :

Full area WIND load 15.0 psf

Seismic Loads :

Wall Weight Seismic Load Input Method : ASCE seismic factors entered

SDS Value per ASCE 12.11.1 $S_{DS} * I = 1$

$F_p = \text{Wall Wt.} * 0.40 = 34.40 \text{ psf}$



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DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

Governing Load Combination . . .		Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check +0.90D+E	Maximum Bending Stress Rat 0.5621			
		Max Mu	-2.529 k-ft	Phi * Mn	4.499 k-ft
PASS	Service Deflection Check E Only	Actual Defl. Ratio L/	178	Allowable Defl. Ratio	150.0
		Max. Deflection	1.618 in	/2 for Cantilever	
PASS	Axial Load Check +1.20D+E	Max Pu / Ag	13.522 psi	Max. Allow. Defl.	1.920 in
		Location	0.20 ft	0.2 * f'm	300.0 psi
FAIL	Reinforcing Limit Check	Actual As/bd	0.007213	Max Allow As/bd	0.007127

Maximum Reactions for Load Combination...

Top Horizontal	0.0 k
Base Horizontal E Only	0.4128 k
Vertical Reaction +D+0.70E	1.032 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load		Mcr k-ft	Mu k-ft	Moment Values			As in^2	As Ratio	0.6 * rho bal	Bar 'd'
	Pu k	0.2*f'm*b*t k			Phi	Phi Mn k-ft					
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.0000	0.00
+1.20D+0.50W at 0.00 to 0.40	1.238	27.468	0.59	0.54	0.90	4.56	0.330	0.0072	0.0067	0.0067	0.00
+1.20D+W at 0.00 to 0.40	1.238	27.468	0.59	1.10	0.90	4.56	0.330	0.0072	0.0067	0.0067	0.00
+1.20D+E at 0.00 to 0.40	1.238	27.468	0.59	2.55	0.90	4.56	0.330	0.0072	0.0067	0.0067	0.00
+0.90D+W at 0.00 to 0.40	0.929	27.468	0.59	1.09	0.90	4.50	0.330	0.0072	0.0068	0.0068	0.00
+0.90D+E at 0.00 to 0.40	0.928	27.468	0.59	2.53	0.90	4.50	0.330	0.0072	0.0068	0.0068	0.00

Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	Moment Values		I gross in^4	Stiffness		Deflections		Defl. Ratio
		Mcr k-ft	Mactual k-ft		I cracked in^4	I effective in^4	Deflection in		
	0.000	0.00	0.00	0.00	0.00	0.000	0.000		0.0
+D+0.60W at 11.60 to 12.00	0.034	0.59	0.00	443.30	51.14	443.300	0.075		3,864.9
+D+0.70E at 11.60 to 12.00	0.036	0.59	0.00	443.30	51.14	443.300	0.939		306.9
+D+0.450W at 11.60 to 12.00	0.034	0.59	0.00	443.30	51.14	443.300	0.050		5,806.5
+D+0.5250E at 11.60 to 12.00	0.035	0.59	0.00	443.30	51.14	443.300	0.541		532.0
+0.60D+0.60W at 11.60 to 12.00	0.021	0.59	0.00	443.30	51.12	443.300	0.074		3,872.4
+0.60D+0.70E at 11.60 to 12.00	0.022	0.59	0.00	443.30	51.12	443.300	0.934		308.4
W Only at 11.60 to 12.00	0.000	0.59	0.00	443.30	51.08	443.300	0.348		827.4
E Only at 11.60 to 12.00	0.004	0.59	0.00	443.30	51.09	443.300	1.618		178.1

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.00 k	1.032 k
+D+0.60W	0.1 k	0.00 k	1.032 k
+D+0.70E	0.3 k	0.00 k	1.032 k
+D+0.450W	0.1 k	0.00 k	1.032 k
+D+0.5250E	0.2 k	0.00 k	1.032 k
+0.60D+0.60W	0.1 k	0.00 k	0.619 k
+0.60D+0.70E	0.3 k	0.00 k	0.619 k
W Only	0.2 k	0.00 k	0.000 k



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E Only	0.4 k	0.00 k	0.000 k
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