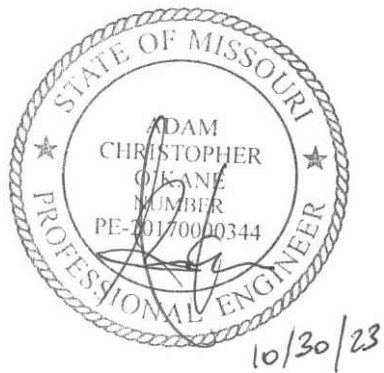


LEIGH & O'KANE L.L.C. – STRUCTURAL CALCULATIONS FOR

Lee's Summit Market Plaza

Lee's Summit, MO



Adam O'Kane, P.E. & Reagan Holden, E.I.
11-1-2023

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Revision:	Date:	Sheet No. i
Project Name: Lee's Summit Market Plaza		

Table of Contents

General Design Considerations.....1

Referenced Design Standards1

Wind Loading (ASCE7)3

Wind Loading C&C (ASCE7).....9

Typical Masonry Wall17

Full Height Masonry Wall Grid 2.....25

Masonry Lintel Over Garage Doors33

Typical Trench Footing37

Typical Trench Footing Reinforcement.....40

Wall Footing Under Grid 246

Wall Footing Between Garage Doors49

Vestibule Beam52

Baseplates.....55

Braced Frame Connections.....80

Canopy Drilled Shaft120

Canopy Drilled Shaft L-Pile Output.....127

Canopy Baseplates234

Tension Anchor Supplemental Reinforcing242

TSD Output243



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Revision:	Date:	Sheet No. 1
Project Name: Lee's Summit Market Plaza		

GENERAL DESIGN CONSIDERATIONS

The calculations provided are for a new steel and masonry building for the Market Plaza in downtown Lee's Summit, MO. Foundations will be isolated spread footings at column locations and continuous wall footings underneath the masonry walls. The popup section of the building will be framed with wide flange columns and beams. The front entry section of the building will use HSS columns and wide flange beams. The exterior walls of the building will be load bearing masonry. The masonry walls will be used to transfer the lateral loads. The roof framing system will use steel bar joists for the majority of the building, and channel sections above the front entry. Calculations are also provided for a foundation system to be used under a canopy by others that is adjacent to the building, Calculations for the building were mainly completed using Tekla Structural Designer (TSD).

REFERENCED DESIGN STANDARDS

- IBC 2021 International Building Code 2021 Edition
- ASCE 7-16 Minimum Design Loads for Building and Other Structures
- ACI 318-19 Building Code Requirements for Structural Concrete
- TMS 402-2016 Building Code Requirements for Masonry Structures
- AISC 341-16 Seismic Provisions for Structural Steel Buildings
- AISC 360-16 Specification for Structural Steel Buildings
- AISI S100-16(2020) w/S2-20 North American Specification for Design of Cold-Formed Steel Structural Members –
- AWS D1.1-2020 Structural Welding Code – Steel
- SJI 100-20 45th Edition Standard Specification, Load Tables and Weight Tables for K-Series, LH Series, DLH-Series and Joist Girders

DESIGN CRITERIA

Dead Loads: Self Weight of Framing plus any
Superimposed Dead Loads

Live Load from IBC 2021 and ASCE 7-16

Roof	20 psf
Ground Floor	100 psf

Wind Loads from ASCE 7-16

Building Risk Category	III
Exposure Category	C
Basic Wind Speed, V	117 mph
Roof Pressure	28 psf (uplift)
Windward Walls	26 psf
Leeward Walls	18 psf
Side Walls	23 psf



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Revision:	Date:	Sheet No. 2
Project Name: Lee's Summit Market Plaza		

Snow Loads from ASCE 7-16

Importance Factor	1.10
Ground Snow Load, P_g	20 psf
Minimum Roof Snow Load	22 psf
Flat Roof Snow Load	15.4 psf
Drift Load Parapet	42 psf
Thermal Factor, C_t	1.0
Exposure Factor, C_e	1.0

Seismic Loads from ASCE 7-16

Importance Factor	1.25
S_s (Short Period Response Acceleration)	0.100
S_1 (1 Second Period Response Acceleration)	0.068
Site Classification	C
Building Risk Category	III
Seismic Design Category	B

Rain Loads

60-min Duration/100 Year Rain Intensity, i	3.91 in/h
15-min Duration/100 Year Rain Intensity, i	8.30 in/h



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Project Name: Lee's Summit Market Plaza		

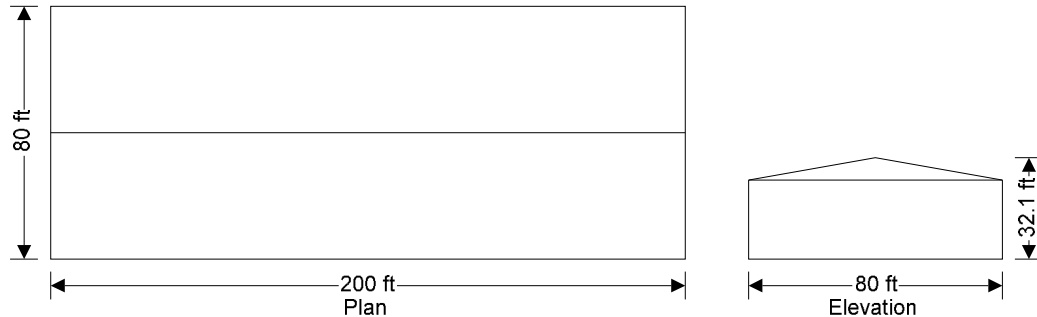
WIND LOADING (ASCE7)

WIND LOADING

In accordance with ASCE7-16

Using the directional design method

Tedds calculation version 2.1.14



Building data

Type of roof; Gable
Length of building; $b = 200.00$ ft
Width of building; $d = 80.00$ ft
Height to eaves; $H = 25.00$ ft
Pitch of roof; $\alpha_0 = 10.0$ deg
Mean height; $h = 28.53$ ft

General wind load requirements

Basic wind speed; $V = 117.0$ mph
Risk category; III
Velocity pressure exponent coef (Table 26.6-1); $K_d = 0.85$
Ground elevation above sea level; $z_{gl} = 0$ ft
Ground elevation factor; $K_e = \exp(-0.0000362 \times z_{gl}/1\text{ft}) = 1.00$
Exposure category (cl 26.7.3); C
Enclosure classification (cl.26.12); Enclosed buildings
Internal pressure coef +ve (Table 26.13-1); $GC_{pi_p} = 0.18$
Internal pressure coef -ve (Table 26.13-1); $GC_{pi_n} = -0.18$

Gust effect factor for rigid structures

Terrain exposure constants (Table 26.11-1)
Integral length scale factor; $I = 500.0$ ft
Turbulence intensity factor; $c = 0.20$
Minimum equivalent height; $z_{min} = 15.0$ ft
Peak factor for background response; $g_Q = 3.400$
Peak factor for wind response; $g_v = 3.400$
Integral length scale power law exponent; $\bar{\epsilon} = 0.200$
Equivalent height of the structure; $\bar{z} = \max(0.6 \times h, z_{min}) = 17.12$ ft
Intensity of turbulence (Eqn. 26.11-7); $I_{\bar{z}} = c \times (33 \text{ ft} / \bar{z})^{1/6} = 0.22$
Integral length scale of turbulence (Eqn. 26.11-9); $L_{\bar{z}} = I \times (\bar{z} / 33 \text{ ft})^{\bar{\epsilon}} = 438.48$ ft



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Revision:	Date:	Sheet No. 4
Project Name: Lee's Summit Market Plaza		

Background response (Eqn. 26.11-8);

$$Q = \sqrt{(1 / (1 + 0.63 \times ((\min(B, L) + h) / L \bar{z})^{0.63}))} = \mathbf{0.890}$$

Gust effect factor (Eqn. 26.11-6);

$$G = G_f = 0.925 \times (1 + 1.7 \times g_a \times I \bar{z} \times Q) / (1 + 1.7 \times g_v \times I \bar{z}) = \mathbf{0.87}$$

Minimum design wind loading (cl.27.1.5);

$$p_{min_r} = \mathbf{8 \text{ lb/ft}^2}$$

Topography

Topography factor not significant;

$$K_{zt} = 1.0$$

Velocity pressure equation;

$$q = 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1 \text{ psf/mph}^2;$$

Velocity pressures table

z (ft)	K _z (Table 26.10-1)	q _z (psf)
15.00	0.85	25.32
15.00	0.85	25.32
20.00	0.90	26.81
25.00	0.94	28.00
28.53	0.97	28.84
32.05	0.99	29.56

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.); $q_i = \mathbf{28.84 \text{ psf}}$

Pressures and forces

Net pressure;

$$p = q \times G_f \times C_{pe} - q_i \times GC_{pi};$$

Net force;

$$F_w = p \times A_{ref};$$

Roof load case 1 - Wind 0, GC_{pi} 0.18, -C_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient C _{pe}	Peak velocity pressure q _p (psf)	Net pressure p (psf)	Area A _{ref} (ft ²)	Net force F _w (kips)
A (-ve)	28.53	-0.79	28.84	-24.85	8123.41	-201.84
B (-ve)	28.53	-0.39	28.84	-14.83	8123.41	-120.51

Total vertical net force;

$$F_{w,v} = \mathbf{-317.45 \text{ kips}}$$

Total horizontal net force;

$$F_{w,h} = \mathbf{-14.12 \text{ kips}}$$

Walls load case 1 - Wind 0, GC_{pi} 0.18, -C_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient C _{pe}	Peak velocity pressure q _p (psf)	Net pressure p (psf)	Area A _{ref} (ft ²)	Net force F _w (kips)
A ₁	15.00	0.80	25.32	12.39	3000.00	37.16
A ₂	15.00	0.80	25.32	12.39	0.00	0.00
A ₃	25.00	0.80	28.00	14.25	2000.00	28.50
B	28.53	-0.50	28.84	-17.71	5000.00	-88.53
C	28.53	-0.70	28.84	-22.71	2282.12	-51.83
D	28.53	-0.70	28.84	-22.71	2282.12	-51.83

Overall loading

Projected vertical plan area of wall;

$$A_{vert_w_0} = b \times H = \mathbf{5000.00 \text{ ft}^2}$$

Projected vertical area of roof;

$$A_{vert_r_0} = b \times d/2 \times \tan(\alpha_0) = \mathbf{1410.62 \text{ ft}^2}$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_0} + p_{min_r} \times A_{vert_r_0} = \mathbf{91.28 \text{ kips}}$$



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Revision:	Date:	Sheet No. 5
Project Name: Lee's Summit Market Plaza		

Leeward net force;
Windward net force;
Overall horizontal loading;

$$F_l = F_{w,wb} = -88.5 \text{ kips}$$

$$F_w = F_{w,wa_1} + F_{w,wa_2} + F_{w,wa_3} = 65.7 \text{ kips}$$

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = 140.1 \text{ kips}$$

Roof load case 2 - Wind 0, $GC_{pi} -0.18$, $+C_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient C_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A (+ve)	28.53	-0.18	28.84	0.69	8123.41	5.57
B (+ve)	28.53	-0.39	28.84	-4.45	8123.41	-36.17

Total vertical net force;
Total horizontal net force;

$$F_{w,v} = -30.13 \text{ kips}$$

$$F_{w,h} = 7.25 \text{ kips}$$

Walls load case 2 - Wind 0, $GC_{pi} -0.18$, $+C_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient C_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	25.32	22.77	3000.00	68.31
A ₂	15.00	0.80	25.32	22.77	0.00	0.00
A ₃	25.00	0.80	28.00	24.63	2000.00	49.26
B	28.53	-0.50	28.84	-7.32	5000.00	-36.62
C	28.53	-0.70	28.84	-12.33	2282.12	-28.14
D	28.53	-0.70	28.84	-12.33	2282.12	-28.14

Overall loading

Projected vertical plan area of wall;
Projected vertical area of roof;
Minimum overall horizontal loading;
Leeward net force;
Windward net force;
Overall horizontal loading;

$$A_{vert_w_0} = b \times H = 5000.00 \text{ ft}^2$$

$$A_{vert_r_0} = b \times d/2 \times \tan(\alpha_0) = 1410.62 \text{ ft}^2$$

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_0} + p_{min_r} \times A_{vert_r_0} = 91.28 \text{ kips}$$

$$F_l = F_{w,wb} = -36.6 \text{ kips}$$

$$F_w = F_{w,wa_1} + F_{w,wa_2} + F_{w,wa_3} = 117.6 \text{ kips}$$

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = 161.4 \text{ kips}$$

Roof load case 3 - Wind 90, $GC_{pi} 0.18$, $-C_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient C_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A (-ve)	28.53	-0.90	28.84	-27.72	1158.66	-32.12
B (-ve)	28.53	-0.90	28.84	-27.72	1158.66	-32.12
C (-ve)	28.53	-0.50	28.84	-17.71	2317.33	-41.03
D (-ve)	28.53	-0.30	28.84	-12.70	11612.17	-147.48

Total vertical net force;
Total horizontal net force;

$$F_{w,v} = -248.90 \text{ kips}$$

$$F_{w,h} = 0.00 \text{ kips}$$

Walls load case 3 - Wind 90, $GC_{pi} 0.18$, $-C_{pe}$



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Revision:	Date:	Sheet No. 6
Project Name: Lee's Summit Market Plaza		

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	25.32	12.39	1200.00	14.87
A ₂	20.00	0.80	26.81	13.42	400.00	5.37
A ₃	32.05	0.80	29.56	15.33	682.12	10.46
B	28.53	-0.28	28.84	-12.07	2282.12	-27.56
C	28.53	-0.70	28.84	-22.71	5000.00	-113.56
D	28.53	-0.70	28.84	-22.71	5000.00	-113.56

Overall loading

Projected vertical plan area of wall;

$$A_{vert_w_90} = d \times H + d^2 \times \tan(\alpha_0) / 4 = \mathbf{2282.12 \text{ ft}^2}$$

Projected vertical area of roof;

$$A_{vert_r_90} = \mathbf{0.00 \text{ ft}^2}$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_90} + p_{min_r} \times A_{vert_r_90} = \mathbf{36.51 \text{ kips}}$$

Leeward net force;

$$F_l = F_{w,WB} = \mathbf{-27.6 \text{ kips}}$$

Windward net force;

$$F_w = F_{w,WA_1} + F_{w,WA_2} + F_{w,WA_3} = \mathbf{30.7 \text{ kips}}$$

Overall horizontal loading;

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = \mathbf{58.2 \text{ kips}}$$

Roof load case 4 - Wind 90, GC_{pi} -0.18, $+c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A (+ve)	28.53	-0.18	28.84	0.69	1158.66	0.79
B (+ve)	28.53	-0.18	28.84	0.69	1158.66	0.79
C (+ve)	28.53	-0.18	28.84	0.69	2317.33	1.59
D (+ve)	28.53	-0.18	28.84	0.69	11612.17	7.96

Total vertical net force;

$$F_{w,v} = \mathbf{10.97 \text{ kips}}$$

Total horizontal net force;

$$F_{w,h} = \mathbf{0.00 \text{ kips}}$$

Walls load case 4 - Wind 90, GC_{pi} -0.18, $+c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	25.32	22.77	1200.00	27.32
A ₂	20.00	0.80	26.81	23.80	400.00	9.52
A ₃	32.05	0.80	29.56	25.71	682.12	17.54
B	28.53	-0.28	28.84	-1.69	2282.12	-3.86
C	28.53	-0.70	28.84	-12.33	5000.00	-61.65
D	28.53	-0.70	28.84	-12.33	5000.00	-61.65

Overall loading

Projected vertical plan area of wall;

$$A_{vert_w_90} = d \times H + d^2 \times \tan(\alpha_0) / 4 = \mathbf{2282.12 \text{ ft}^2}$$

Projected vertical area of roof;

$$A_{vert_r_90} = \mathbf{0.00 \text{ ft}^2}$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_90} + p_{min_r} \times A_{vert_r_90} = \mathbf{36.51 \text{ kips}}$$

Leeward net force;

$$F_l = F_{w,WB} = \mathbf{-3.9 \text{ kips}}$$



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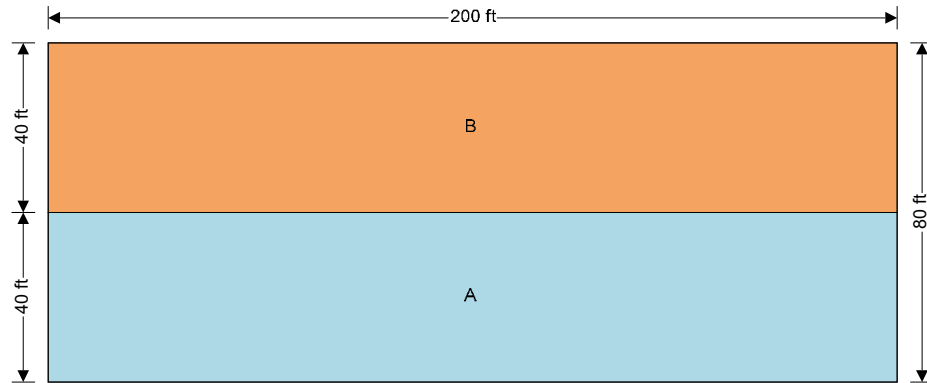
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Windward net force;

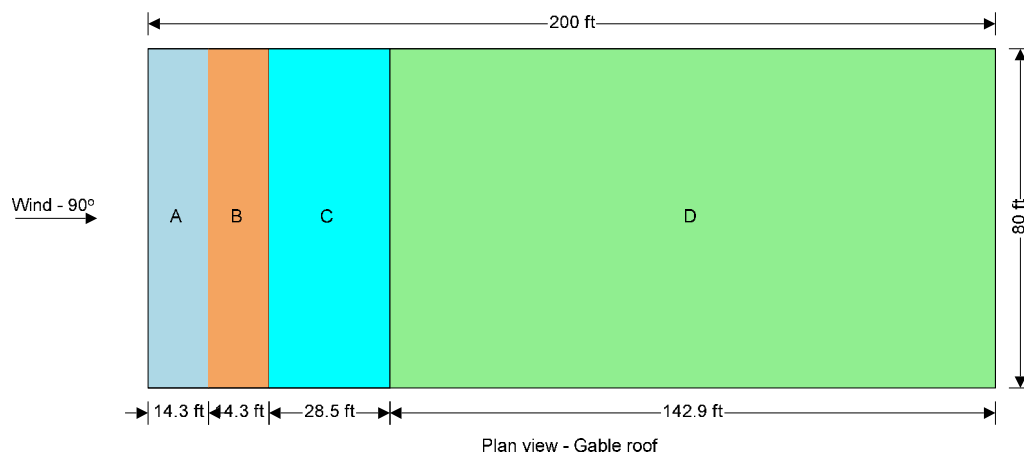
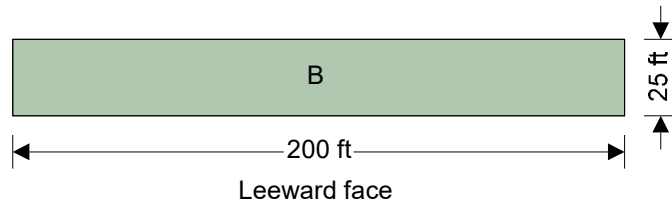
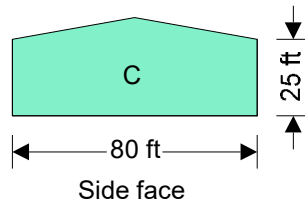
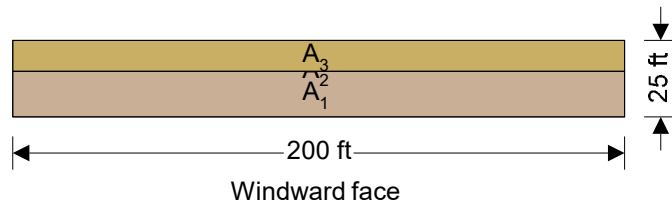
$$F_w = F_{w,WA_1} + F_{w,WA_2} + F_{w,WA_3} = \mathbf{54.4 \text{ kips}}$$

Overall horizontal loading;

$$F_{w,total} = \max(F_w - F_i + F_{w,h}, F_{w,total_min}) = \mathbf{58.2 \text{ kips}}$$



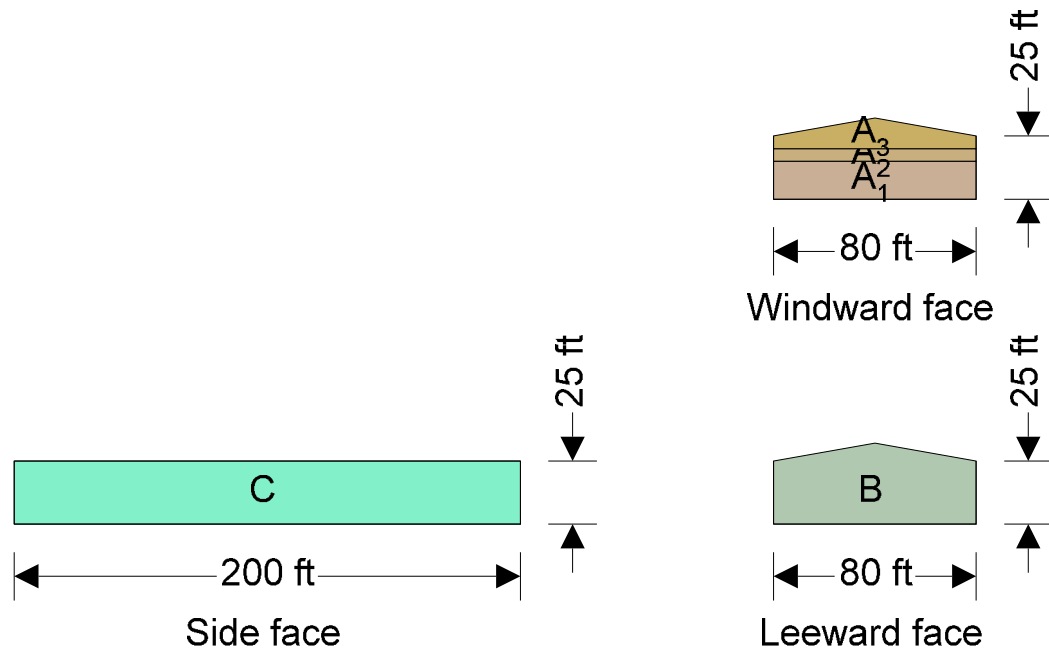
Wind - 0°
Plan view - Gable roof





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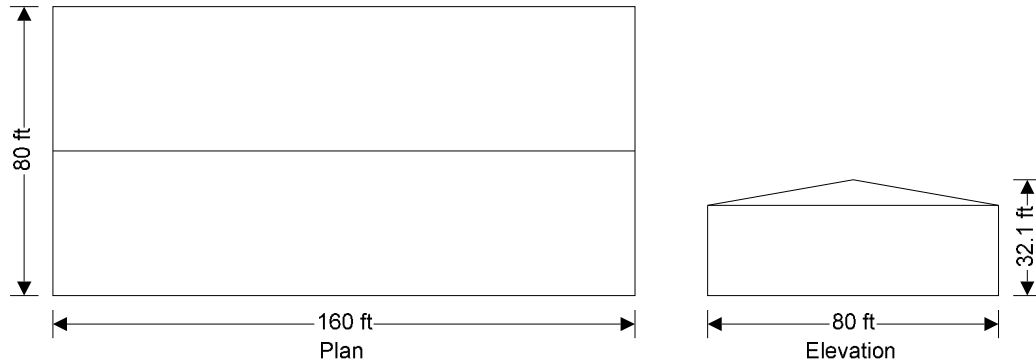
WIND LOADING C&C (ASCE7)

WIND LOADING

In accordance with ASCE7-16

Using the components and cladding design method

Tedds calculation version 2.1.14



Building data

Type of roof;	Gable
Length of building;	b = 160.00 ft
Width of building;	d = 80.00 ft
Height to eaves;	H = 25.00 ft
Pitch of roof;	α_0 = 10.0 deg
Mean height;	h = 28.53 ft
End zone width;	a = max(min(0.1×min(b, d), 0.4×h), 0.04×min(b, d), 3ft) = 8.00 ft

General wind load requirements

Basic wind speed;	V = 117.0 mph
Risk category;	III
Velocity pressure exponent coef (Table 26.6-1);	K _d = 0.85
Ground elevation above sea level;	z _{gl} = 0 ft
Ground elevation factor;	K _e = exp(-0.0000362 × z _{gl} /1ft) = 1.00
Exposure category (cl 26.7.3);	C
Enclosure classification (cl.26.12);	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1);	GC _{pi_p} = 0.18
Internal pressure coef -ve (Table 26.13-1);	GC _{pi_n} = -0.18

Gust effect factor for rigid structures

Terrain exposure constants (Table 26.11-1)	
Integral length scale factor;	I = 500.0 ft
Turbulence intensity factor;	c = 0.20
Minimum equivalent height;	z _{min} = 15.0 ft
Peak factor for background response;	g _Q = 3.400
Peak factor for wind response;	g _v = 3.400
Integral length scale power law exponent;	$\bar{\epsilon}$ = 0.200
Equivalent height of the structure;	$\bar{z}$ = max (0.6 × h, z _{min}) = 17.12 ft



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Revision:	Date:	Sheet No. 10
Project Name: Lee's Summit Market Plaza		

Intensity of turbulence (Eqn. 26.11-7);

$$I_z = c \times (33 \text{ ft} / \bar{z})^{1/6} = \mathbf{0.22}$$

Integral length scale of turbulence (Eqn. 26.11-9);

$$L_z = l \times (\bar{z} / 33 \text{ ft})^{\bar{\epsilon}} = \mathbf{438.48 \text{ ft}}$$

Background response (Eqn. 26.11-8);

$$Q = \sqrt{(1 / (1 + 0.63 \times ((\min(B, L) + h) / L_z)^{0.63}))} = \mathbf{0.890}$$

Gust effect factor (Eqn. 26.11-6);

$$G = G_f = 0.925 \times (1 + 1.7 \times g_q \times I_z \times Q) / (1 + 1.7 \times g_v \times I_z) = \mathbf{0.87}$$

Topography

Topography factor not significant;

$$K_{zt} = 1.0$$

Velocity pressure

Velocity pressure coefficient (Table 26.10-1);

$$K_z = \mathbf{0.97}$$

Velocity pressure;

$$q_h = 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \times 1 \text{ psf/mph}^2 = \mathbf{28.8 \text{ psf}}$$

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.); $q_i = \mathbf{28.84 \text{ psf}}$

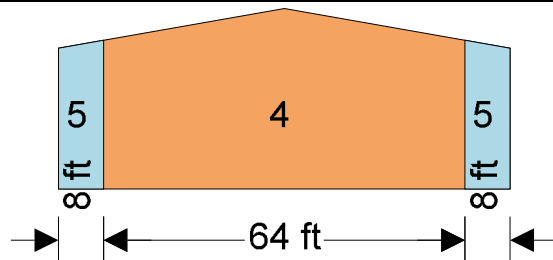
Equations used in tables

Net pressure;

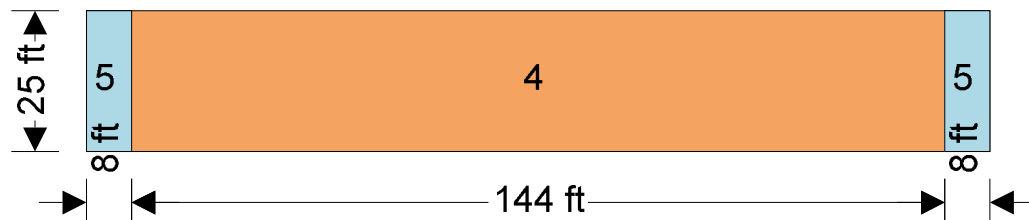
$$p = q_h \times [GC_p - GC_{pi}];$$

Components and cladding pressures - Wall (Table 30.3-1)

Component	Zone	Length (ft)	Width (ft)	Eff. area (ft ²)	+GC _p	-GC _p	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	4	-	-	10.0	0.90	-0.99	31.1	-33.7
50 sf	4	-	-	50.0	0.79	-0.88	27.9	-30.5
200 sf	4	-	-	200.0	0.69	-0.78	25.2	-27.8
>500 sf	4	-	-	500.1	0.63	-0.72	23.4	-26.0
<=10 sf	5	-	-	10.0	0.90	-1.26	31.1	-41.5
50 sf	5	-	-	50.0	0.79	-1.04	27.9	-35.1
200 sf	5	-	-	200.0	0.69	-0.85	25.2	-29.6
>500 sf	5	-	-	500.1	0.63	-0.72	23.4	-26.0



Elevation of gable wall



Elevation of side wall



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Revision:	Date:	Sheet No. 11
Project Name: Lee's Summit Market Plaza		

Components and cladding pressures - Roof (Figure 30.3-2B)

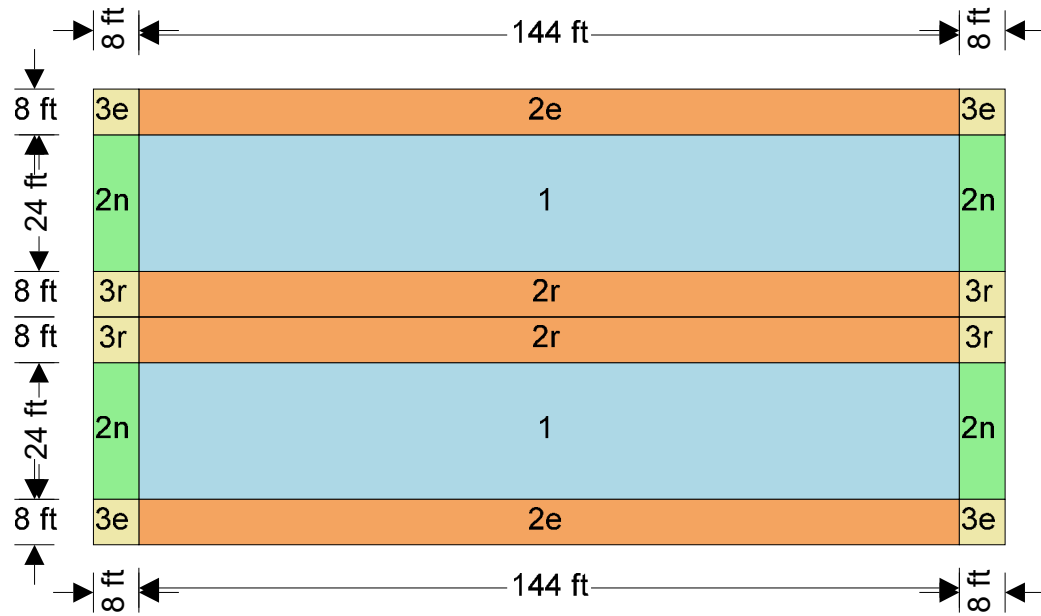
Component	Zone	Length (ft)	Width (ft)	Eff. area (ft ²)	+GC _p	-GC _p	Pres (+ve) (psf)	Pres (-ve) (psf)
<=2 sf	1	-	-	2.0	0.70	-2.00	25.4	-62.9
20 sf	1	-	-	20.0	0.46	-2.00	18.6	-62.9
50 sf	1	-	-	50.0	0.37	-1.15	15.9 #	-38.2
>100 sf	1	-	-	100.1	0.30	-0.50	13.8 #	-19.6
<=2 sf	2e	-	-	2.0	0.70	-2.00	25.4	-62.9
20 sf	2e	-	-	20.0	0.46	-2.00	18.6	-62.9
50 sf	2e	-	-	50.0	0.37	-1.15	15.9 #	-38.2
>100 sf	2e	-	-	100.1	0.30	-0.50	13.8 #	-19.6
<=2 sf	2n	-	-	2.0	0.70	-3.00	25.4	-91.7
10 sf	2n	-	-	10.0	0.54	-3.00	20.6	-91.7
100 sf	2n	-	-	100.0	0.30	-1.57	13.8 #	-50.5
>200 sf	2n	-	-	200.1	0.30	-1.14	13.8 #	-38.0
<=2 sf	2r	-	-	2.0	0.70	-3.00	25.4	-91.7
10 sf	2r	-	-	10.0	0.54	-3.00	20.6	-91.7
100 sf	2r	-	-	100.0	0.30	-1.57	13.8 #	-50.5
>250 sf	2r	-	-	250.1	0.30	-1.00	13.8 #	-34.0
<=2 sf	3e	-	-	2.0	0.70	-3.00	25.4	-91.7
10 sf	3e	-	-	10.0	0.54	-3.00	20.6	-91.7
50 sf	3e	-	-	50.0	0.37	-2.00	15.9 #	-62.9
>250 sf	3e	-	-	250.1	0.30	-1.00	13.8 #	-34.0
<=2 sf	3r	-	-	2.0	0.70	-3.60	25.4	-109.0
10 sf	3r	-	-	10.0	0.54	-3.60	20.6	-109.0
64 sf	3r	-	-	64.0	0.35	-2.15	15.2 #	-67.2
>100 sf	3r	-	-	100.1	0.30	-1.80	13.8 #	-57.1

The final net design wind pressure, including all permitted reductions, used in the design shall not be less than 16psf acting in either direction



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Revision:	Date:	Sheet No. 12
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Plan on roof



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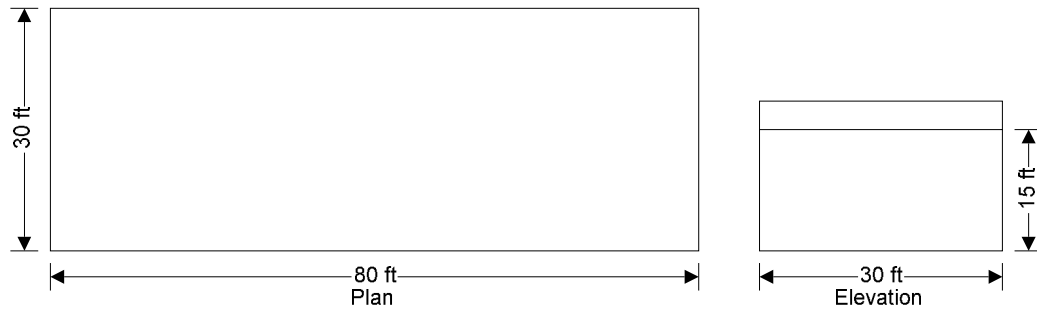
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Revision:	Date:	Sheet No. 13
Project Name: Lee's Summit Market Plaza		

WIND LOADING

In accordance with ASCE7-16

Using the components and cladding design method

Tedds calculation version 2.1.14



Building data

Type of roof;	Flat
Length of building;	b = 80.00 ft
Width of building;	d = 30.00 ft
Height to eaves;	H = 15.00 ft
Height of parapet;	h _p = 3.50 ft
Mean height;	h = 15.00 ft
End zone width;	a = max(min(0.1×min(b, d), 0.4×h), 0.04×min(b, d), 3ft) = 3.00 ft

General wind load requirements

Basic wind speed;	V = 117.0 mph
Risk category;	III
Velocity pressure exponent coef (Table 26.6-1);	K _d = 0.85
Ground elevation above sea level;	Z _{g1} = 0 ft
Ground elevation factor;	K _e = exp(-0.0000362 × Z _{g1} /1ft) = 1.00
Exposure category (cl 26.7.3);	C
Enclosure classification (cl.26.12);	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1);	GC _{pi_p} = 0.18
Internal pressure coef -ve (Table 26.13-1);	GC _{pi_n} = -0.18
Parapet internal pressure coef +ve (Table 26.11-1);	GC _{pi_pp} = 0.00
Parapet internal pressure coef -ve (Table 26.11-1);	GC _{pi_np} = 0.00

Gust effect factor for rigid structures

Terrain exposure constants (Table 26.11-1)	
Integral length scale factor;	I = 500.0 ft
Turbulence intensity factor;	c = 0.20
Minimum equivalent height;	Z _{min} = 15.0 ft
Peak factor for background response;	g _Q = 3.400
Peak factor for wind response;	g _v = 3.400
Integral length scale power law exponent;	$\bar{\epsilon}$ = 0.200
Equivalent height of the structure;	$\bar{Z}$ = max (0.6 × h, Z _{min}) = 15.00 ft
Intensity of turbulence (Eqn. 26.11-7);	I _z = c × (33 ft / $\bar{Z}$) ^{1/6} = 0.23



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Revision:	Date:	Sheet No. 14
Project Name: Lee's Summit Market Plaza		

Integral length scale of turbulence (Eqn. 26.11-9);

$$L_z = L \times (\bar{z} / 33 \text{ ft})^{\frac{1}{3}} = \mathbf{427.06 \text{ ft}}$$

Background response (Eqn. 26.11-8);

$$Q = \sqrt{(1 / (1 + 0.63 \times ((\min(B, L) + h) / L_z)^{0.63}))} = \mathbf{0.931}$$

Gust effect factor (Eqn. 26.11-6);

$$G = G_f = 0.925 \times (1 + 1.7 \times g_Q \times L_z \times Q) / (1 + 1.7 \times g_v \times L_z) = \mathbf{0.89}$$

Topography

Topography factor not significant;

$$K_{zt} = 1.0$$

Velocity pressure

Velocity pressure coefficient (Table 26.10-1);

$$K_z = \mathbf{0.85}$$

Velocity pressure;

$$q_h = 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \times 1 \text{ psf/mph}^2 = \mathbf{25.3 \text{ psf}}$$

Velocity pressure at parapet

Velocity pressure coefficient (Table 26.10-1);

$$K_z = \mathbf{0.89}$$

Velocity pressure;

$$q_p = 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \times 1 \text{ psf/mph}^2 = \mathbf{26.4 \text{ psf}}$$

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.);

$$q_i = \mathbf{25.32 \text{ psf}}$$

Equations used in tables

Net pressure;

$$p = q_h \times [GC_p - GC_{pi}];$$

Parapet net pressure;

$$p = q_p \times [GC_p - GC_{pi_p}];$$

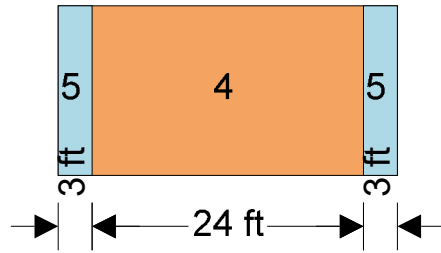
Components and cladding pressures - Wall (Table 30.3-1 and (Figure 30.3-2A))

Component	Zone	Length (ft)	Width (ft)	Eff. area (ft ²)	+GC _p	-GC _p	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	4	-	-	10.0	0.90	-0.99	27.3	-29.6
50 sf	4	-	-	50.0	0.79	-0.88	24.5	-26.8
200 sf	4	-	-	200.0	0.69	-0.78	22.1	-24.4
>500 sf	4	-	-	500.1	0.63	-0.72	20.5	-22.8
<=10 sf	5	-	-	10.0	0.90	-1.26	27.3	-36.5
50 sf	5	-	-	50.0	0.79	-1.04	24.5	-30.8
200 sf	5	-	-	200.0	0.69	-0.85	22.1	-26.0
>500 sf	5	-	-	500.1	0.63	-0.72	20.5	-22.8

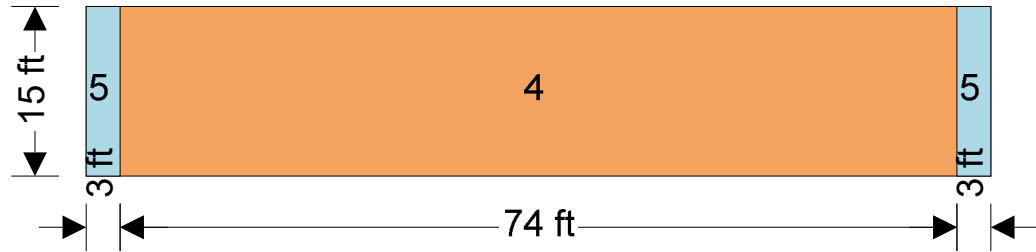


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Revision:	Date:	Sheet No. 15
Project Name: Lee's Summit Market Plaza		



Elevation of gable wall



Elevation of side wall

Components and cladding pressures - Roof (Figure 30.3-2A)

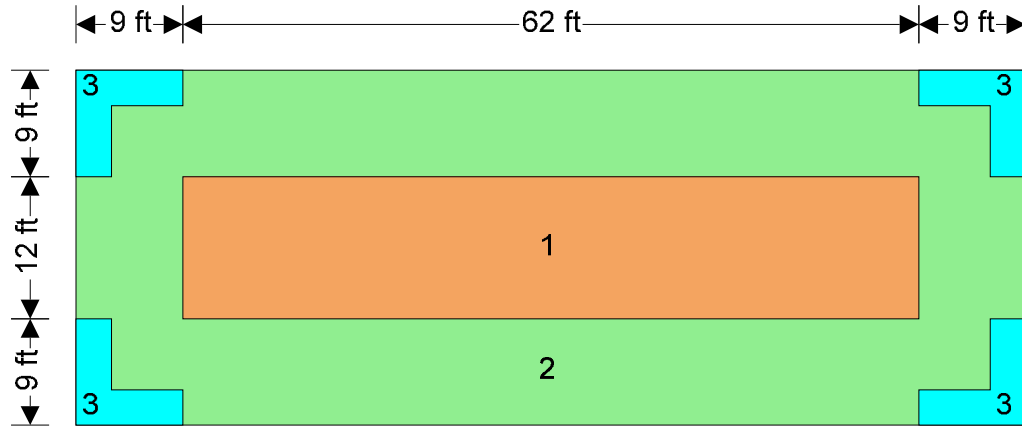
Component	Zone	Length (ft)	Width (ft)	Eff. area (ft ²)	+GC _p	-GC _p	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	1	-	-	10.0	0.30	-1.70	12.2 #	-47.6
100 sf	1	-	-	100.0	0.20	-1.29	9.6 #	-37.2
200 sf	1	-	-	200.0	0.20	-1.16	9.6 #	-34.0
>500 sf	1	-	-	500.1	0.20	-1.00	9.6 #	-29.9
<=10 sf	2	-	-	10.0	0.90	-2.30	27.3	-62.8
100 sf	2	-	-	100.0	0.74	-1.77	23.3	-49.4
200 sf	2	-	-	200.0	0.69	-1.61	22.1	-45.3
>500 sf	2	-	-	500.1	0.63	-1.40	20.5	-40.0
<=10 sf	3	-	-	10.0	0.90	-2.30	27.3	-62.8
20 sf	3	-	-	20.0	0.85	-2.14	26.1	-58.8
50 sf	3	-	-	50.0	0.79	-1.93	24.5	-53.4
>100 sf	3	-	-	100.1	0.74	-1.77	23.3	-49.4

The final net design wind pressure, including all permitted reductions, used in the design shall not be less than 16psf acting in either direction



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Revision:	Date:	Sheet No. 16
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Plan on roof



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Revision:	Date:	Sheet No. 17
Project Name: Lee's Summit Market Plaza		

TYPICAL MASONRY WALL

MASONRY WALL PANEL DESIGN (TMS 402/602-16)

In accordance with strength design method

Tedds calculation version 2.2.11

Masonry wall panel details

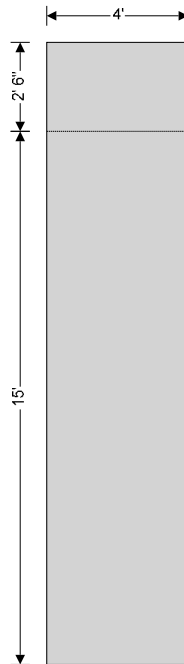
Between Garages - Reinforced single-wythe wall with a parapet, the wall is pinned at the top and at the bottom for out of plane loads

The wall is fixed at the bottom and free at the top for in plane loads

Panel length; $L = 4$ ft

Panel height; $h = 15$ ft

Parapet height; $h_p = 2.5$ ft



Seismic properties

Seismic design category; B

Seismic importance factor (ASCE7 Table 1.5-2); $I_e = 1.25$

Design spectral response acceleration parameter, short periods (IBC 1613.2.4 or ASCE7 11.4.5)

$S_{DS} = 0.087$

Shear wall designation; Ordinary reinforced

Redundancy factor, on in-plane load; $\rho_{ve} = 1.0$

Redundancy factor, on out-of-plane load; $\rho_E = 1.0$

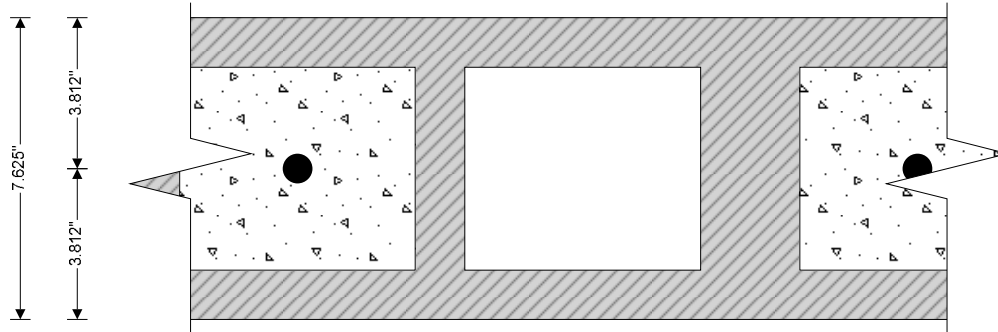
Construction details

Wall thickness; $t = 7.625$ in



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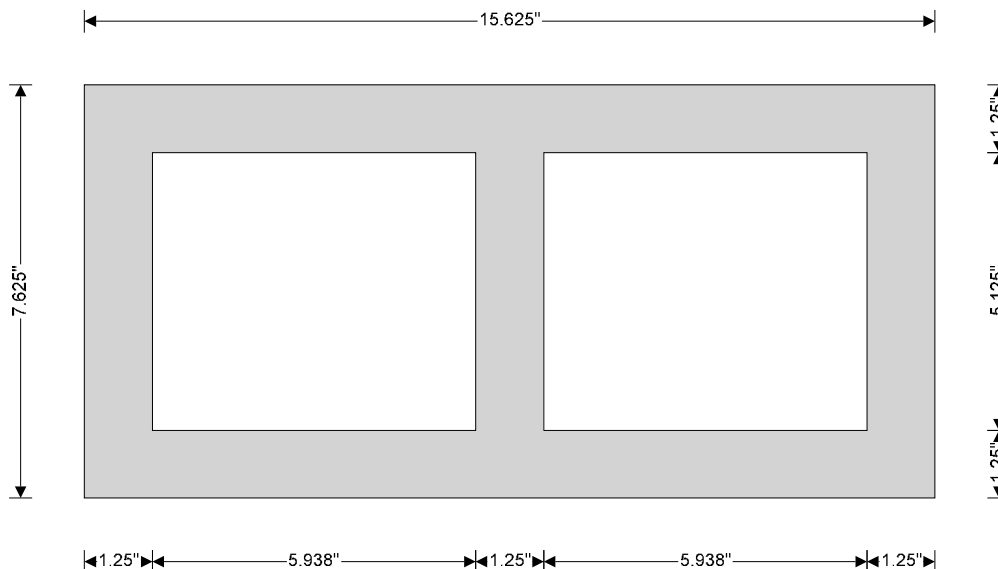
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Revision:	Date:	Sheet No. 18
Project Name: Lee's Summit Market Plaza		



Masonry details

Hollow concrete units grouted at 16 in on center in running bond fully bedded with PCL class S mortar

Compressive strength of unit;	$f_{cu} = 1900$ psi
Density of masonry units;	$\gamma_{block} = 115$ lb/ft ³
Height of masonry units;	$h_b = 7.625$ in
Length of masonry units;	$l_b = 15.625$ in
Number of internal webs;	$N_{web} = 1$
Number of end webs;	$N_{end} = 2$
Internal web thickness;	$t_{bw} = 1.25$ in
Face shell thickness;	$t_{bf} = 1.25$ in
End web thickness;	$t_{be} = 1.25$ in
Area of block;	$A_{block} = [t \times l_b - (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b = 44.76$ in ² /ft
Area of grout;	$A_{grout} = [0.5 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b = 23.37$ in ² /ft
Density of grout;	$\gamma_{grout} = 140$ lb/ft ³
Self weight of wall construction;	$WSW_w = A_{block} \times \gamma_{block} + A_{grout} \times \gamma_{grout} = 58.47$ psf
Self weight of bond beam;	$WSW_b = 2 \times t_{bf} \times \gamma_{block} + (t - 2 \times t_{bf}) \times \gamma_{grout} = 83.75$ psf
Self weight of wall;	$WSW = ((s_v - h_b) \times WSW_w + h_b \times WSW_b) / s_v = 60.47$ psf





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Revision:	Date:	Sheet No. 19
Project Name: Lee's Summit Market Plaza		

From TMS 602-16 Table 2 - Compressive strength of masonry

Net compressive strength of masonry; $f_m = 1900$ psi
Modulus of elasticity for masonry; $E_m = 900 \times f_m = 1710000$ psi
Shear modulus of masonry; $G_v = 0.4 \times E_m = 684000$ psi

From TMS 402 -16 Table 9.1.9.2 - Modulus of rupture

Modulus of rupture normal to bed; $f_{r_norm} = 123$ psi
Modulus of rupture parallel to bed; $f_{r_para} = 167$ psi

Reinforcement details

Yield strength of reinforcement; $f_y = 60000$ psi
Allowable tensile stress in reinforcement; $F_s = 32000$ psi
Modulus of elasticity for reinforcement; $E_s = 29000000$ psi
Vertical reinforcement provided; No.6 bars at 16 in centers
Area of vertical reinforcement; $A_s = \pi \times Dia^2 / (4 \times s) = 0.33$ in²/ft
Yield strength of horizontal reinforcement; $f_{yv} = 60000$ psi
Allowable tensile stress in horizontal reinforcement; $F_{sv} = 32000$ psi
Horizontal reinforcement provided; (2) No. 5 bars at 96 in centers
Area of horizontal reinforcement; $A_v = 2 \times \pi \times HDia^2 / (4 \times s_v) = 0.08$ in²/ft
Minimum area of vertical reinf. (cl. 9.3.6.2); $A_{s_min} = A_v / 3 = 0.03$ in²/ft

PASS - Area of vertical reinforcement provided exceeds the minimum

Seismic reinforcement requirements

Minimum vertical reinf., seismic (Ch. 7); No. 4 bars at 120 in

PASS - Vertical distributed reinforcement meets minimum seismic requirements

Minimum horizontal reinf., seismic (Ch. 7); (1) No. 4 bar at 120 in

PASS - Horizontal distributed reinforcement meets minimum seismic requirements

Lateral out-of-plane loads

Wind load on panel; $W = 20$ psf
Wind load on parapet; $W_p = 20$ psf
Seismic load factor (ASCE7 12.11.1); $F_p = 0.4 \times S_{DS} \times I_e = 0.044$
Seismic load from wall; $E_{wall} = \max(F_p, 0.1) \times w_{sw} = 6$ psf
Additional seismic load; $E_{add} = 0$ psf
Seismic lateral load on panel; $E = E_{wall} + E_{add} = 6$ psf

Lateral in-plane loads

Wind shear load on wall; $V_W = 4200$ lbs
Wind moment load on wall; $M_W = 63000$ lbs_ft
Seismic shear load on wall; $V_E = 4200$ lbs
Seismic moment load on wall; $M_E = 63000$ lbs_ft

Vertical loading details

Dead load from above; $DL_{above} = 600$ lb/ft;
Live roof load from above; $LL_{r_above} = 600$ lb/ft;
Snow load from above; $SL_{above} = 2000$ lb/ft;
Vertical seismic load factor applied to dead load; $F_{Ev} = 0.2 \times S_{DS} = 0.017$



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Revision:	Date:	Sheet No. 20
Project Name: Lee's Summit Market Plaza		

From IBC 2018 cl.1605.2 - Basic load combinations (Utilization)

Load combination no.1;	$1.4 \times DL$; (0.044)
Load combination no.2;	$1.2 \times DL + 1.6 \times LL + 0.5 \times (LL_r \text{ or } SL \text{ or } RL)$; (0.057)
Load combination no.3;	$1.2 \times DL + 0.5 \times LL + 1.6 \times (LL_r \text{ or } SL \text{ or } RL)$; (0.098)
Load combination no.4;	$1.2 \times DL + 1.6 \times (LL_r \text{ or } SL \text{ or } RL) + 0.5 \times W$; (0.425)
Load combination no.5;	$1.2 \times DL + W + 0.5 \times LL + 0.5 \times (LL_r \text{ or } SL \text{ or } RL)$; (0.929)
Load combination no.6;	$1.2 \times DL + E_h + E_v + 0.5 \times LL + 0.7 \times SL$; (0.912)
Load combination no.7;	$0.9 \times DL + W$; (0.997)
Load combination no.8;	$0.9 \times DL + E_h - E_v$; (0.999)

Properties of masonry section

Cross-sectional area;	$A = [t \times l_b - 0.5 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b = 68.1 \text{ in}^2/\text{ft}$
Properties for walls loaded out-of-plane:	
Moment of inertia;	$I = t^3 / 12 - 0.5 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})^3 / (12 \times l_b) = 392.2 \text{ in}^4/\text{ft}$
Section modulus;	$S = I / c = 102.9 \text{ in}^3/\text{ft}$
Radius of gyration;	$r = \sqrt{I / A} = 2.399 \text{ in}$
Effective height factor;	$K = 1$
Properties for walls loaded in-plane:	
Net moment of inertia;	$I_{x_net} = t \times L^3 / 12 - 2 \times (I_{x_cell} + A_{cell} \times X_{cell}^2) = 66198 \text{ in}^4$
Net section modulus;	$S_{x_net} = I_{x_net} / (L / 2) = 2758 \text{ in}^3$

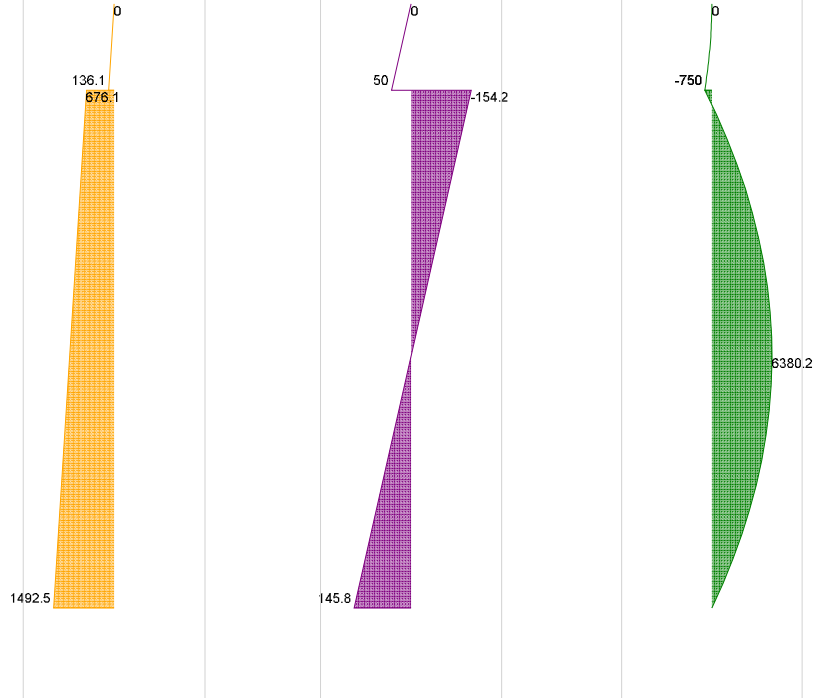
Consider wall at maximum moment location under load combination no.7



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Revision:	Date:	Sheet No. 21
Project Name: Lee's Summit Market Plaza		

Axial force, out of plane - Combination No.7 - lbs/ft Shear force, out of plane - Combination No.7 - lbs/ft Moment force, out of plane - Combination No.7 - lb_in



Maximum moment location;
Axial load at mid-height of panel;
Slenderness ratio;
Nominal axial strength;

7.29 ft
 $P = 1096 \text{ lb/ft}$
 $(K \times h) / r = 75.025; < 99$
 $P_n = 0.8 \times (0.8 \times f'_m \times (A - A_s) + A_s \times 0 \text{ ksi}) \times [1 - ((K \times h) / (140 \times r))^2] = 58767 \text{ lb/ft}$

Strength reduction factor;
Design axial strength;

$\phi = 0.9$
 $\phi \times P_n = 52890 \text{ lb/ft}$
 $P / (\phi \times P_n) = 0.021$

PASS - Nominal axial strength exceeds axial load

Factored axial stress;
Factored axial stress limit;

$P / t = 12 \text{ psi}$
 $0.2 \times f'_m = 380 \text{ psi}$

PASS - Allowable stress under out of plane loads exceeds factored axial stress

Nominal cracking moment strength;
Modular ratio;
Distance to neutral axis;
Moment of inertia of cracked section;
By iteration;

$M_{cr} = S \times f_{r_norm} = 12704 \text{ lb_in/ft}$
 $n = E_s / E_m = 16.959$
 $c_{cr} = (A_s \times f_y + P) / (0.64 \times f'_m) = 1.438 \text{ in}$
 $I_{cr} = n \times (A_s \times P \times t / (f_y \times 2 \times d)) \times (d - c_{cr})^2 + c_{cr}^3 / 3 = 45.3 \text{ in}^4/\text{ft}$
 $M_{u0} = M = 6380 \text{ lb_in/ft}$
 $\delta_{u0} = 5 \times M_{u0} \times h^2 / (48 \times E_m \times I) = 0.032 \text{ in}$
 $M_{u1} = M_{u0} + P \times \delta_{u0} = 6415 \text{ lb_in/ft}$
 $\delta_{u1} = 5 \times M_{u1} \times h^2 / (48 \times E_m \times I) = 0.032 \text{ in}$

;



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Revision:	Date:	Sheet No. 22
Project Name: Lee's Summit Market Plaza		

Bending moment at mid-height of panel;

$$M = M_{u0} + P \times \delta_{u1} = \mathbf{6416 \text{ lb_in/ft}}$$

Depth of reinforcement;

$$d = \mathbf{3.813 \text{ in}}$$

Effective width per bar;

$$b_{\text{eff}} = \min(s, 6 \times t_{\text{nom}}, 72 \text{ in}) = \mathbf{16 \text{ in}}$$

Strength reduction factor;

$$\phi = \mathbf{0.9}$$

Tensile strain in reinforcement;

$$\epsilon_s = f_y / E_s = \mathbf{0.0021}$$

Maximum usable compressive strain of masonry;

$$\epsilon_{mu} = \mathbf{0.0025}$$

Fiber of max.compressive strain to neutral axis;

$$c_{\text{bal}} = \epsilon_{mu} \times d / (\epsilon_{mu} + \epsilon_s) = \mathbf{2.086 \text{ in}}$$

Tensile force at balance point;

$$T_{\text{bal}} = A_s \times f_y = \mathbf{19880 \text{ lb/ft}}$$

$$\beta_1 = \mathbf{0.8}$$

Compressive force at balance point;

$$C_{\text{bal}} = 0.8 \times f'_m \times \beta_1 \times c_{\text{bal}} = \mathbf{30440 \text{ lb/ft}}$$

Design axial force at balance point;

$$P_{\text{bal}} = \phi \times (C_{\text{bal}} - T_{\text{bal}}) = \mathbf{9504 \text{ lb/ft}}$$

Design moment at balance point;

$$M_{\text{bal}} = \phi \times [T_{\text{bal}} \times (d - t / 2) + C_{\text{bal}} \times (t / 2 - \beta_1 \times c_{\text{bal}} / 2)] = \mathbf{81588 \text{ lb_in/ft}}$$

Maximum design moment from interaction diagram; $M_c = \mathbf{61364 \text{ lb_in/ft}}$

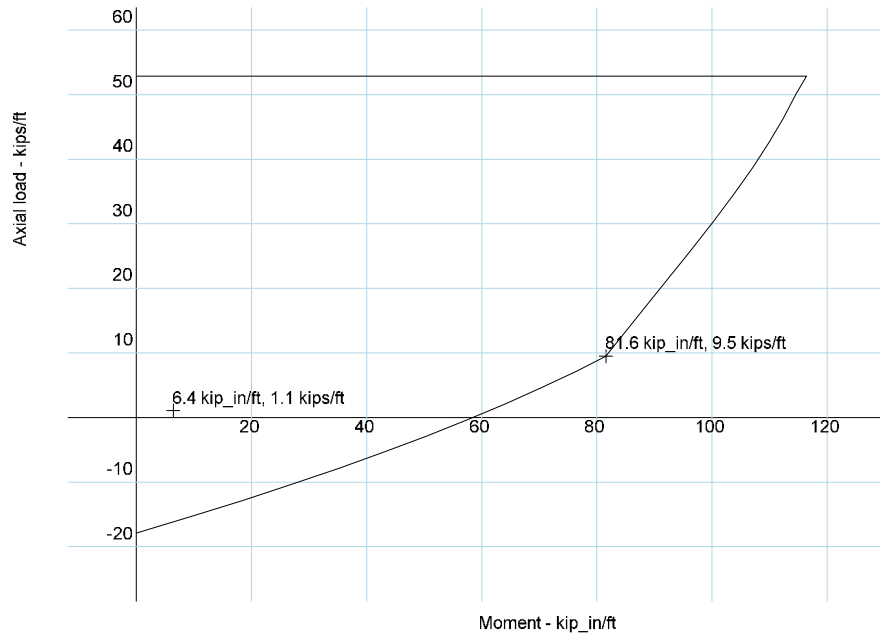
$$M / M_c = \mathbf{0.105}$$

PASS - Combination of applied axial load and flexure is acceptable

Maximum area of tensile reinforcement (9.3.3.2);

$$A_{s_max} = 0.64 \times f'_m \times [\epsilon_{mu} / (\epsilon_{mu} + 1.5 \times \epsilon_s)] \times d / f_y = \mathbf{0.414 \text{ in}^2/\text{ft}}$$

PASS - Area of reinforcement provided is less than maximum allowable



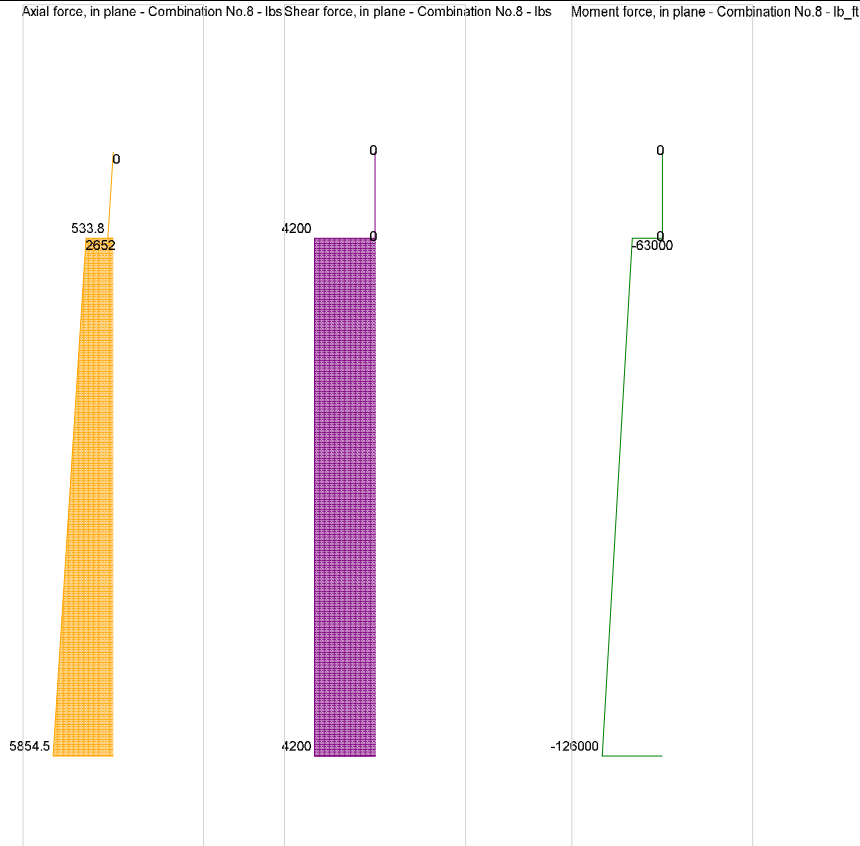
Strength interaction diagram

Consider wall at bottom under load combination no.8



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Revision:	Date:	Sheet No. 23
Project Name: Lee's Summit Market Plaza		



Shear force;
Compressive force;
Depth to reinforcement;
Net shear area;
Nominal masonry shear strength;

$$V = 4 \text{ kips}$$

$$N_u = 5970 \text{ lb}$$

$$d_{in} = L - l_b / 4 = 3.67 \text{ ft}$$

$$A_{nv} = 2 \times d_{in} \times t_{bf} + d_{in} / s_{grout} \times (l_b / (N_{web} + 1)) \times (t - 2 \times t_{bf}) = 220.576 \text{ in}^2$$

$$V_{nm} = [4 - 1.75 \times \min(M_u / (V \times d_{in}), 1)] \times A_{nv} \times \sqrt{f'_m \times 1 \text{ psi}} + 0.25 \times N_u = 23 \text{ kips}$$

$$V_n = \min(V_{nm}, 4 \times A_{nv} \times \sqrt{f'_m \times 1 \text{ psi}}) \times 0.75 = 17 \text{ kips}$$

$$\phi_v = 0.8$$

$$\phi_v \times V_n = 14 \text{ kips}$$

$$V / (\phi_v \times V_n) = 0.303$$

Shear reinforcement is not required for strength

Nominal reinf. shear strength;
Nominal shear strength;
Design shear strength;

$$V_{ns} = 0.5 \times A_v \times f_{yv} \times d_{in} = 8 \text{ kips}$$

$$V_n = \min(V_{nm} + V_{ns}, 4 \times A_{nv} \times \sqrt{f'_m \times 1 \text{ psi}}) \times 0.75 = 24 \text{ kips}$$

$$\phi_v \times V_n = 19 \text{ kips}$$

$$V / (\phi_v \times V_n) = 0.222$$

PASS - Design shear strength exceeds applied shear strength

Coefficient of friction
Distance to neutral axis
Area in compression
Nominal shear friction strength

$$\mu = 0.7$$

$$C_{NA} = 0.55 \text{ ft}$$

$$A_{nc} = A \times C_{NA} = 37.5 \text{ in}^2$$

$$V_{nf} = \max(0.42 \times f'_m \times A_{nc}, 0 \text{ lbs}) = 29.9 \text{ kips}$$



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Revision:	Date:	Sheet No. 24
Project Name: Lee's Summit Market Plaza		

Design shear friction strength

$$\phi V_{nf} = 23.9 \text{ kips}$$

Shear friction utilization

$$V / \phi V_{nf} = 0.176$$

PASS - Allowable shear friction stress exceeds applied shear stress

Axial load at base of wall;

$$P = 5855 \text{ lb}$$

Moment at base of wall;

$$M = 1512000 \text{ lb_in}$$

By iteration, tension at balance point;

$$T_{bal} = 28555 \text{ lb}$$

Compression at balance point;

$$C_{bal} = 200905 \text{ lb}$$

Axial load at balance point;

$$P_{bal} = C_{bal} - T_{bal} = 172350 \text{ lb}$$

By iteration, moment at balance point;

$$M_{bal} = 3382892 \text{ lb_in}$$

Maximum moment from interaction diagram;

$$M_c = 1513797 \text{ lb_in}$$

$$M / M_c = 0.999$$

PASS - Combination of applied axial load and flexure is acceptable

Maximum reinforcement check (9.3.3.2)

Moment ratio;

$$M_u / (V \times d_{in}) = 8.16$$

Distance to reinforcement;

$$d_1 = 40 \text{ in}$$

Flexural ductility coefficient;

$$\alpha = 1.5$$

Location of neutral axis;

$$C_{Asmax} = d_1 \times (\epsilon_{mu} / (\alpha \times \epsilon_s + \epsilon_{mu})) = 17.85 \text{ in}$$

End zones are assumed to be grouted solid for depth of comp. block

Axial force;

$$N_{u_As} = P_{DL,b,in} + 0.75 \times P_{LL,b,in} = 6.6 \text{ kips}$$

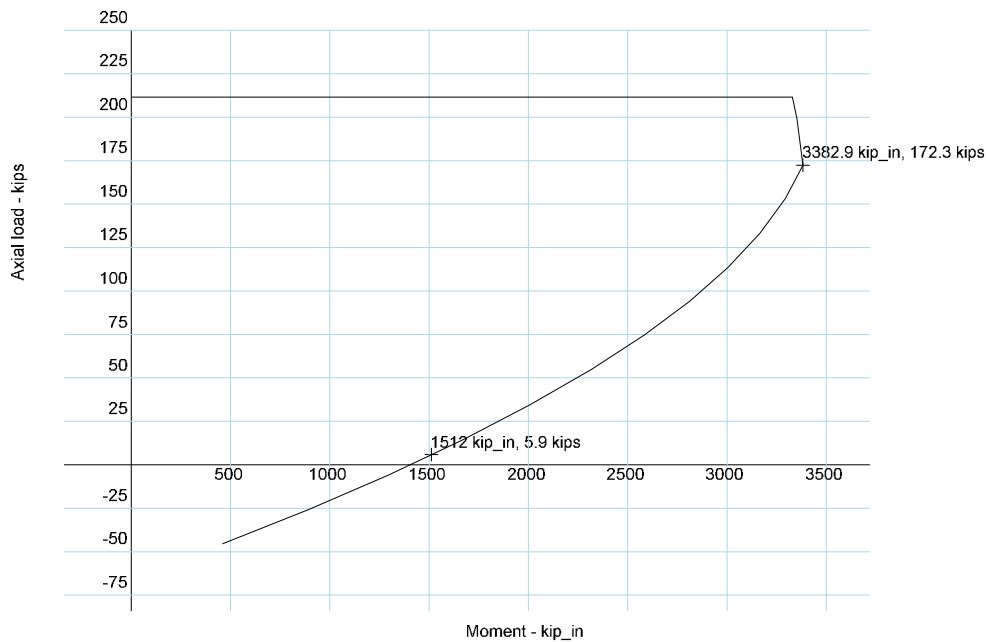
Maximum allowable reinforcement ratio;

$$\rho_{max} = [0.64 \times f_m \times (\epsilon_{mu} / (\alpha \times \epsilon_s + \epsilon_{mu})) - N_{u_As} / (t \times d_1)] / (f_y \times (\alpha \times \epsilon_s - \epsilon_{mu}) / (\alpha \times \epsilon_s + \epsilon_{mu})) = 0.0806$$

Maximum allowable reinforcement;

$$A_{s_max_in} = \rho_{max} \times t = 7.37 \text{ in}^2 / \text{ft}$$

PASS - Reinforcement is less than maximum allowable



Strength interaction diagram



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Revision:	Date:	Sheet No. 25
Project Name: Lee's Summit Market Plaza		

FULL HEIGHT MASONRY WALL GRID 2

MASONRY WALL PANEL DESIGN (TMS 402/602-16)

In accordance with strength design method

Tedds calculation version 2.2.11

Masonry wall panel details

Tall Wall - Reinforced single-wythe wall with a parapet, the wall is pinned at the top and at the bottom for out of plane loads

The wall is fixed at the bottom and free at the top for in plane loads

Panel length; $L = 60$ ft
Panel height; $h = 30$ ft
Parapet height; $h_p = 2$ ft



Seismic properties

Seismic design category; B
Seismic importance factor (ASCE7 Table 1.5-2); $I_e = 1.25$
Design spectral response acceleration parameter, short periods (IBC 1613.2.4 or ASCE7 11.4.5)
 $S_{DS} = 0.087$
Shear wall designation; Ordinary reinforced
Redundancy factor, on in-plane load; $\rho_{ve} = 1.0$
Redundancy factor, on out-of-plane load; $\rho_E = 1.0$

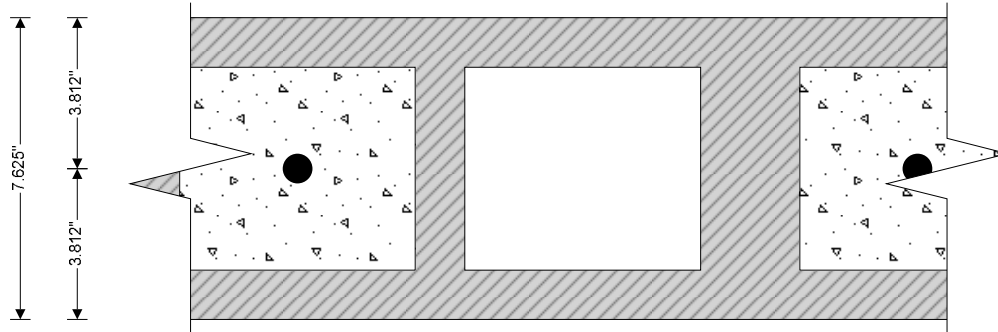
Construction details

Wall thickness; $t = 7.625$ in



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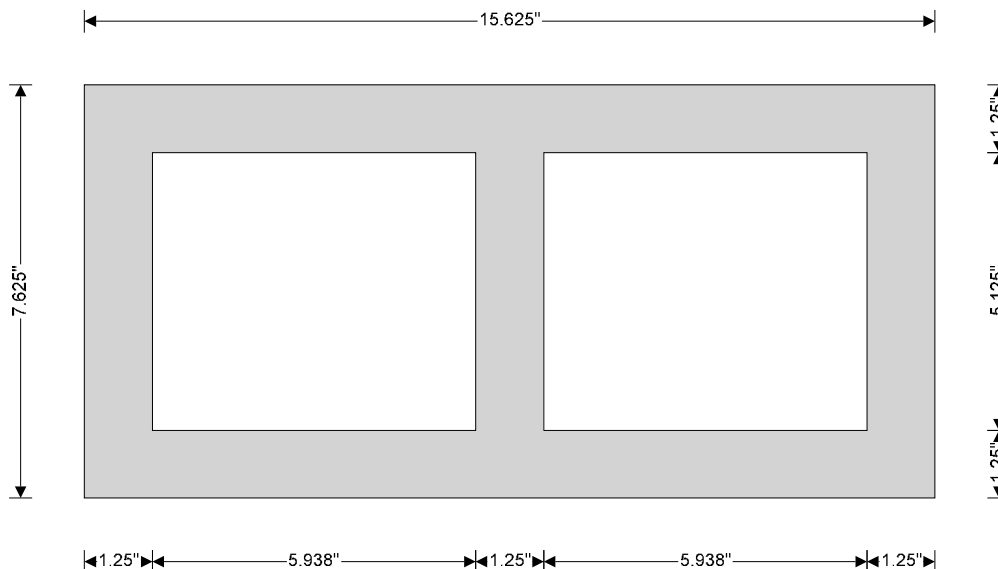
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Revision:	Date:	Sheet No. 26
Project Name: Lee's Summit Market Plaza		



Masonry details

Hollow concrete units grouted at 16 in on center in running bond fully bedded with PCL class S mortar

Compressive strength of unit;	$f_{cu} = 1900$ psi
Density of masonry units;	$\gamma_{block} = 115$ lb/ft ³
Height of masonry units;	$h_b = 7.625$ in
Length of masonry units;	$l_b = 15.625$ in
Number of internal webs;	$N_{web} = 1$
Number of end webs;	$N_{end} = 2$
Internal web thickness;	$t_{bw} = 1.25$ in
Face shell thickness;	$t_{bf} = 1.25$ in
End web thickness;	$t_{be} = 1.25$ in
Area of block;	$A_{block} = [t \times l_b - (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b = 44.76$ in ² /ft
Area of grout;	$A_{grout} = [0.5 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b = 23.37$ in ² /ft
Density of grout;	$\gamma_{grout} = 140$ lb/ft ³
Self weight of wall construction;	$WSW_w = A_{block} \times \gamma_{block} + A_{grout} \times \gamma_{grout} = 58.47$ psf
Self weight of bond beam;	$WSW_b = 2 \times t_{bf} \times \gamma_{block} + (t - 2 \times t_{bf}) \times \gamma_{grout} = 83.75$ psf
Self weight of wall;	$WSW = ((s_v - h_b) \times WSW_w + h_b \times WSW_b) / s_v = 60.47$ psf





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Revision:	Date:	Sheet No. 27
Project Name: Lee's Summit Market Plaza		

From TMS 602-16 Table 2 - Compressive strength of masonry

Net compressive strength of masonry; $f_m = 1900$ psi
Modulus of elasticity for masonry; $E_m = 900 \times f_m = 1710000$ psi
Shear modulus of masonry; $G_v = 0.4 \times E_m = 684000$ psi

From TMS 402 -16 Table 9.1.9.2 - Modulus of rupture

Modulus of rupture normal to bed; $f_{r_norm} = 123$ psi
Modulus of rupture parallel to bed; $f_{r_para} = 167$ psi

Reinforcement details

Yield strength of reinforcement; $f_y = 60000$ psi
Allowable tensile stress in reinforcement; $F_s = 32000$ psi
Modulus of elasticity for reinforcement; $E_s = 29000000$ psi
Vertical reinforcement provided; No.6 bars at 16 in centers
Area of vertical reinforcement; $A_s = \pi \times Dia^2 / (4 \times s) = 0.33$ in²/ft
Yield strength of horizontal reinforcement; $f_{yv} = 60000$ psi
Allowable tensile stress in horizontal reinforcement; $F_{sv} = 32000$ psi
Horizontal reinforcement provided; (2) No. 5 bars at 96 in centers
Area of horizontal reinforcement; $A_v = 2 \times \pi \times HDia^2 / (4 \times s_v) = 0.08$ in²/ft
Minimum area of vertical reinf. (cl. 9.3.6.2); $A_{s_min} = A_v / 3 = 0.03$ in²/ft
PASS - Area of vertical reinforcement provided exceeds the minimum

Seismic reinforcement requirements

Minimum vertical reinf., seismic (Ch. 7); No. 4 bars at 120 in
PASS - Vertical distributed reinforcement meets minimum seismic requirements
Minimum horizontal reinf., seismic (Ch. 7); (1) No. 4 bar at 120 in
PASS - Horizontal distributed reinforcement meets minimum seismic requirements

Lateral out-of-plane loads

Wind load on panel; $W = 20$ psf
Seismic load factor (ASCE7 12.11.1); $F_p = 0.4 \times S_{DS} \times I_e = 0.044$
Seismic load from wall; $E_{wall} = \max(F_p, 0.1) \times w_{sw} = 6$ psf
Additional seismic load; $E_{add} = 0$ psf
Seismic lateral load on panel; $E = E_{wall} + E_{add} = 6$ psf

Lateral in-plane loads

Wind shear load on wall; $V_W = 60000$ lbs
Wind moment load on wall; $M_W = 900000$ lbs_ft
Seismic shear load on wall; $V_E = 60000$ lbs
Seismic moment load on wall; $M_E = 900000$ lbs_ft

Vertical loading details

Dead load from above; $DL_{above} = 800$ lb/ft;
Live roof load from above; $LL_{r_above} = 400$ lb/ft;
Snow load from above; $SL_{above} = 2500$ lb/ft;
Vertical seismic load factor applied to dead load; $F_{Ev} = 0.2 \times S_{DS} = 0.017$



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Revision:	Date:	Sheet No. 28
Project Name: Lee's Summit Market Plaza		

From IBC 2018 cl.1605.2 - Basic load combinations (Utilization)

Load combination no.1;	$1.4 \times DL$; (0.237)
Load combination no.2;	$1.2 \times DL + 1.6 \times LL + 0.5 \times (LL_r \text{ or } SL \text{ or } RL)$; (0.281)
Load combination no.3;	$1.2 \times DL + 0.5 \times LL + 1.6 \times (LL_r \text{ or } SL \text{ or } RL)$; (0.451)
Load combination no.4;	$1.2 \times DL + 1.6 \times (LL_r \text{ or } SL \text{ or } RL) + 0.5 \times W$; (0.578)
Load combination no.5;	$1.2 \times DL + W + 0.5 \times LL + 0.5 \times (LL_r \text{ or } SL \text{ or } RL)$; (0.698)
Load combination no.6;	$1.2 \times DL + E_h + E_v + 0.5 \times LL + 0.7 \times SL$; (0.315)
Load combination no.7;	$0.9 \times DL + W$; (0.528)
Load combination no.8;	$0.9 \times DL + E_h - E_v$; (0.169)

Properties of masonry section

Cross-sectional area;	$A = [t \times l_b - 0.5 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b = 68.1 \text{ in}^2/\text{ft}$
Properties for walls loaded out-of-plane:	
Moment of inertia;	$I = t^3 / 12 - 0.5 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})^3 / (12 \times l_b) = 392.2 \text{ in}^4/\text{ft}$
Section modulus;	$S = I / c = 102.9 \text{ in}^3/\text{ft}$
Radius of gyration;	$r = \sqrt{I / A} = 2.399 \text{ in}$
Effective height factor;	$K = 1$
Properties for walls loaded in-plane:	
Net moment of inertia;	$I_{x_net} = t \times L^3 / 12 - 2 \times (I_{x_cell} + A_{cell} \times X_{cell1}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell3}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell5}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell7}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell9}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell11}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell13}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell15}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell17}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell19}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell21}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell23}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell25}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell27}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell29}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell31}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell33}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell35}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell37}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell39}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell41}^2) - 2 \times (I_{x_cell} + A_{cell} \times X_{cell43}^2) = 181894017 \text{ in}^4$
Net section modulus;	$S_{x_net} = I_{x_net} / (L / 2) = 505261 \text{ in}^3$

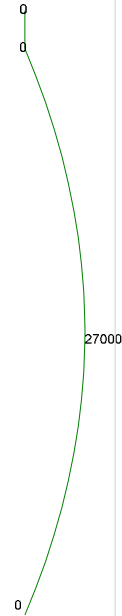
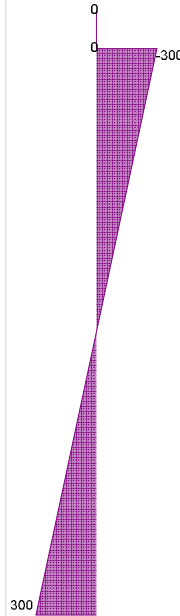
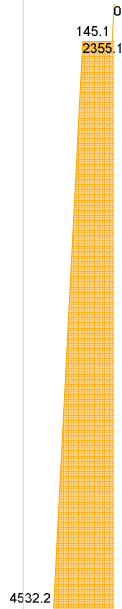
Consider wall at maximum moment location under load combination no.5



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Revision:	Date:	Sheet No. 29
Project Name: Lee's Summit Market Plaza		

Axial force, out of plane - Combination No.5 - lbs/ft Shear force, out of plane - Combination No.5 - lbs/ft Moment force, out of plane - Combination No.5 - lb_in



Maximum moment location;
Axial load at mid-height of panel;
Slenderness ratio;
Nominal axial strength;
Strength reduction factor;
Design axial strength;

15 ft
 $P = 3444 \text{ lb/ft}$
 $(K \times h) / r = 150.049; > 99$
 $P_n = 0.8 \times (0.8 \times f'_m \times (A - A_s) + A_s \times 0 \text{ ksi}) \times (70 \times r / (K \times h))^2 = 17942 \text{ lb/ft}$
 $\phi = 0.9$
 $\phi \times P_n = 16148 \text{ lb/ft}$
 $P / (\phi \times P_n) = 0.213$

PASS - Nominal axial strength exceeds axial load

Factored axial stress;
Factored axial stress limit;

$P / t = 38 \text{ psi}$
 $0.05 \times f'_m = 95 \text{ psi}$

PASS - Allowable stress under out of plane loads exceeds factored axial stress

Nominal cracking moment strength;
Modular ratio;
Distance to neutral axis;
Moment of inertia of cracked section;
By iteration;

$M_{cr} = S \times f_{r_norm} = 12704 \text{ lb_in/ft}$
 $n = E_s / E_m = 16.959$
 $c_{cr} = (A_s \times f_y + P) / (0.64 \times f'_m) = 1.598 \text{ in}$
 $I_{cr} = n \times (A_s \times P \times t / (f_y \times 2 \times d)) \times (d - c_{cr})^2 + c_{cr}^3 / 3 = 48.7 \text{ in}^4/\text{ft}$
 $M_{u0} = M = 27000 \text{ lb_in/ft}$
 $\delta_{u0} = 5 \times M_{cr} \times h^2 / (48 \times E_m \times I) + 5 \times (M_{u0} - M_{cr}) \times h^2 / (48 \times E_m \times I_{cr}) = 2.576 \text{ in}$
 $M_{u11} = M_{u0} + P \times \delta_{u10} = 47069 \text{ lb_in/ft}$

;



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Revision:	Date:	Sheet No. 30
Project Name: Lee's Summit Market Plaza		

Bending moment at mid-height of panel;

Depth of reinforcement;

Effective width per bar;

Strength reduction factor;

Tensile strain in reinforcement;

Maximum usable compressive strain of masonry;

Fiber of max.compressive strain to neutral axis;

Tensile force at balance point;

Compressive force at balance point;

Design axial force at balance point;

Design moment at balance point;

Maximum design moment from interaction diagram; $M_c = 67431 \text{ lb_in/ft}$

Maximum area of tensile reinforcement (9.3.3.2);

$$\delta_{u11} = 5 \times M_{cr} \times h^2 / (48 \times E_m \times I) + 5 \times (M_{u11} - M_{cr}) \times h^2 / (48 \times E_m \times I_{cr}) = 5.832 \text{ in}$$

$$M = M_{u0} + P \times \delta_{u11} = 47084 \text{ lb_in/ft}$$

$$d = 3.813 \text{ in}$$

$$b_{eff} = \min(s, 6 \times t_{nom}, 72 \text{ in}) = 16 \text{ in}$$

$$\phi = 0.9$$

$$\epsilon_s = f_y / E_s = 0.0021$$

$$\epsilon_{mu} = 0.0025$$

$$C_{bal} = \epsilon_{mu} \times d / (\epsilon_{mu} + \epsilon_s) = 2.086 \text{ in}$$

$$T_{bal} = A_s \times f_y = 19880 \text{ lb/ft}$$

$$\beta_1 = 0.8$$

$$C_{bal} = 0.8 \times f'_m \times \beta_1 \times C_{bal} = 30440 \text{ lb/ft}$$

$$P_{bal} = \phi \times (C_{bal} - T_{bal}) = 9504 \text{ lb/ft}$$

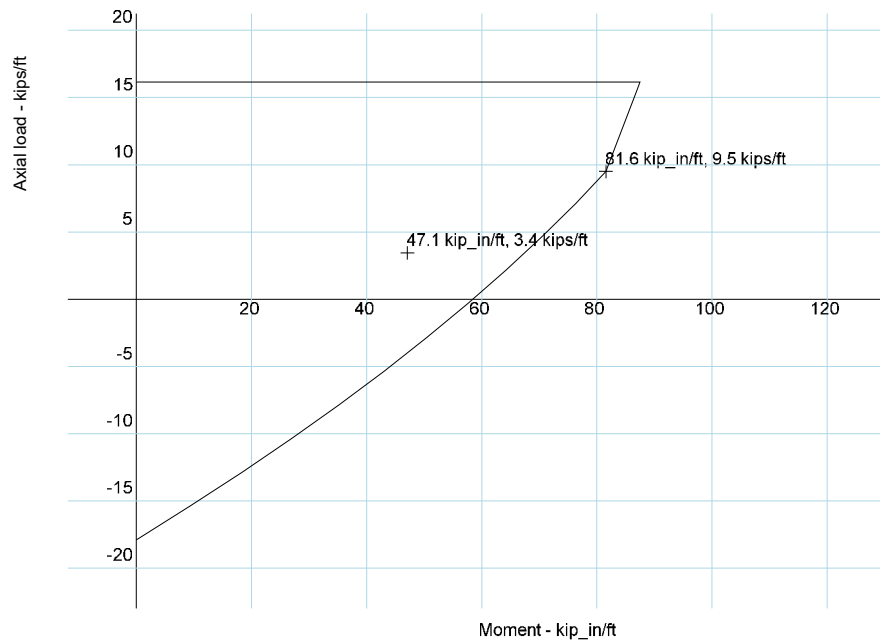
$$M_{bal} = \phi \times [T_{bal} \times (d - t / 2) + C_{bal} \times (t / 2 - \beta_1 \times C_{bal} / 2)] = 81588 \text{ lb_in/ft}$$

$$M / M_c = 0.698$$

PASS - Combination of applied axial load and flexure is acceptable

$$A_{s_max} = 0.64 \times f'_m \times [\epsilon_{mu} / (\epsilon_{mu} + 1.5 \times \epsilon_s)] \times d / f_y = 0.414 \text{ in}^2/\text{ft}$$

PASS - Area of reinforcement provided is less than maximum allowable



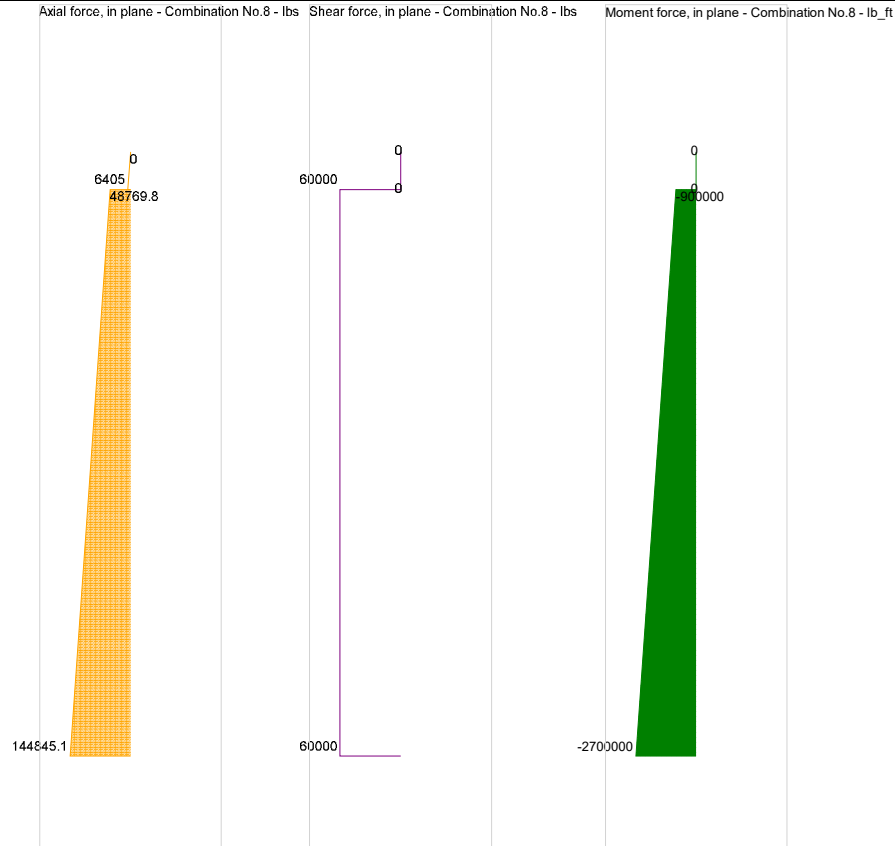
Strength interaction diagram

Consider wall at bottom under load combination no.8



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Revision:	Date:	Sheet No. 31
Project Name: Lee's Summit Market Plaza		



Shear force;
Compressive force;
Depth to reinforcement;
Net shear area;
Nominal masonry shear strength;

Nominal shear strength;
Strength reduction factor;
Design shear strength;

Nominal reinf. shear strength;
Nominal shear strength;
Design shear strength;

Coefficient of friction
Distance to neutral axis
Area in compression
Nominal shear friction strength

$$V = 60 \text{ kips}$$

$$N_u = 147701 \text{ lb}$$

$$d_{in} = L - l_b / 4 = 59.67 \text{ ft}$$

$$A_{nv} = 2 \times d_{in} \times t_{bf} + d_{in} / s_{grout} \times (l_b / (N_{web} + 1)) \times (t - 2 \times t_{bf}) = 3582.217 \text{ in}^2$$

$$V_{nm} = [4 - 1.75 \times \min(M_u / (V \times d_{in}), 1)] \times A_{nv} \times \sqrt{(f'_m \times 1 \text{ psi})} + 0.25 \times N_u = 455 \text{ kips}$$

$$V_n = \min(V_{nm}, 4.656 \times A_{nv} \times \sqrt{(f'_m \times 1 \text{ psi})}) \times 0.75 = 342 \text{ kips}$$

$$\phi_v = 0.8$$

$$\phi_v \times V_n = 273 \text{ kips}$$

$$V / (\phi_v \times V_n) = 0.220$$

Shear reinforcement is not required for strength

$$V_{ns} = 0.5 \times A_v \times f_{yv} \times d_{in} = 137 \text{ kips}$$

$$V_n = \min(V_{nm} + V_{ns}, 4.656 \times A_{nv} \times \sqrt{(f'_m \times 1 \text{ psi})}) \times 0.75 = 445 \text{ kips}$$

$$\phi_v \times V_n = 356 \text{ kips}$$

$$V / (\phi_v \times V_n) = 0.169$$

PASS - Design shear strength exceeds applied shear strength

$$\mu = 0.7$$

$$C_{NA} = 8.95 \text{ ft}$$

$$A_{nc} = A \times C_{NA} = 609.8 \text{ in}^2$$

$$V_{nf} = 706.6 \text{ kips}$$



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Revision:	Date:	Sheet No. 32
Project Name: Lee's Summit Market Plaza		

Design shear friction strength

$$\phi V_{nf} = 565.2 \text{ kips}$$

Shear friction utilization

$$V / \phi V_{nf} = 0.106$$

PASS - Allowable shear friction stress exceeds applied shear stress

Axial load at base of wall;

$$P = 144845 \text{ lb}$$

Moment at base of wall;

$$M = 32400000 \text{ lb_in}$$

By iteration, tension at balance point;

$$T_{bal} = 253758 \text{ lb}$$

Compression at balance point;

$$C_{bal} = 3269272 \text{ lb}$$

Axial load at balance point;

$$P_{bal} = C_{bal} - T_{bal} = 3015514 \text{ lb}$$

By iteration, moment at balance point;

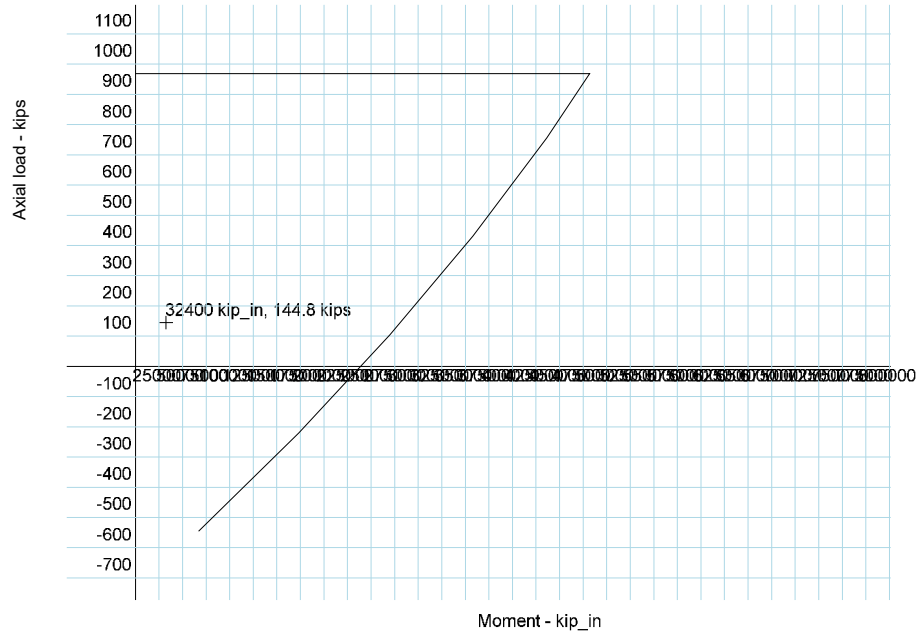
$$M_{bal} = 728852828 \text{ lb_in}$$

Maximum moment from interaction diagram;

$$M_c = 280836362 \text{ lb_in}$$

$$M / M_c = 0.115$$

PASS - Combination of applied axial load and flexure is acceptable



Strength interaction diagram



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Revision:	Date:	Sheet No. 33
Project Name: Lee's Summit Market Plaza		

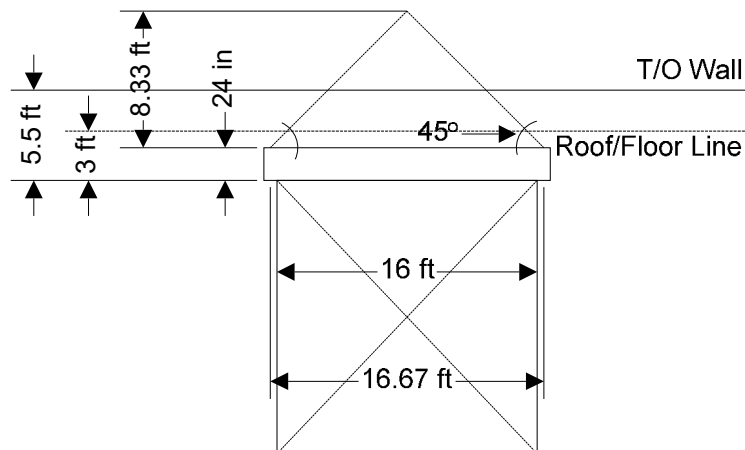
MASONRY LINTEL OVER GARAGE DOORS

MASONRY LINTEL ANALYSIS AND DESIGN TO TMS/MSJC 2016

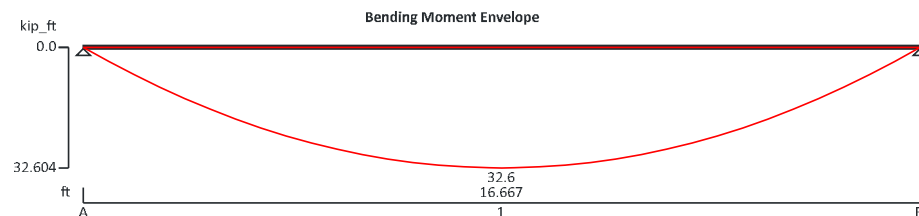
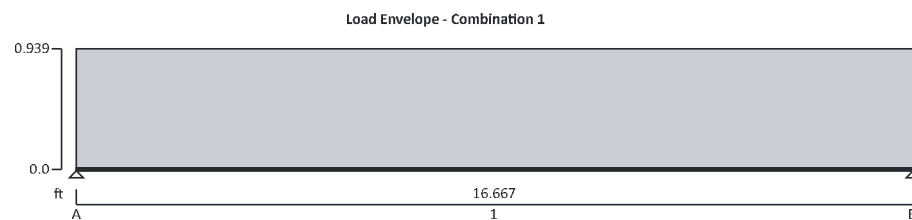
Using the allowable stress design method

Tedds calculation version 1.2.02

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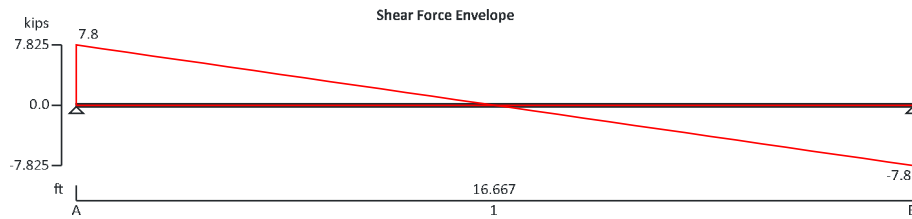
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Revision:	Date:	Sheet No. 34
Project Name: Lee's Summit Market Plaza		



Support conditions

Support A

Vertically restrained

Rotationally free

Support B

Vertically restrained

Rotationally free

Applied loading

Beam loads

Self - Dead self weight of beam $\times 1$

Wall - Dead full UDL 193 lb/ft

Dead - Dead full UDL 120 lb/ft

RL - Roof Live full UDL 120 lb/ft

Drift - Snow full UDL 340 lb/ft

Load combinations

Load combination 1

Support A

Dead $\times 1.00$

Roof Live $\times 1.00$

Snow $\times 1.00$

Dead $\times 1.00$

Roof Live $\times 1.00$

Snow $\times 1.00$

Support B

Dead $\times 1.00$

Roof Live $\times 1.00$

Snow $\times 1.00$

Analysis results

Maximum moment;

$M_{\max} = 32.604$ kip_ft;

$M_{\min} = 0$ kip_ft

Maximum shear;

$V_{\max} = 7.82$ kips;

$V_{\min} = -7.82$ kips

Maximum reaction at support A;

$R_{A_{\max}} = 7.8$ kips;

$R_{A_{\min}} = 7.8$ kips

Unfactored dead load reaction at support A;

$R_{A_{\text{Dead}}} = 4$ kips

Unfactored roof live load reaction at support A;

$R_{A_{\text{Roof Live}}} = 1$ kips

Unfactored snow load reaction at support A;

$R_{A_{\text{Snow}}} = 2.8$ kips

Maximum reaction at support B;

$R_{B_{\max}} = 7.8$ kips;

$R_{B_{\min}} = 7.8$ kips

Unfactored dead load reaction at support B;

$R_{B_{\text{Dead}}} = 4$ kips

Unfactored roof live load reaction at support B;

$R_{B_{\text{Roof Live}}} = 1$ kips

Unfactored snow load reaction at support B;

$R_{B_{\text{Snow}}} = 2.8$ kips

Masonry details

Masonry type;

Concrete



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Revision:	Date:	Sheet No. 35
Project Name: Lee's Summit Market Plaza		

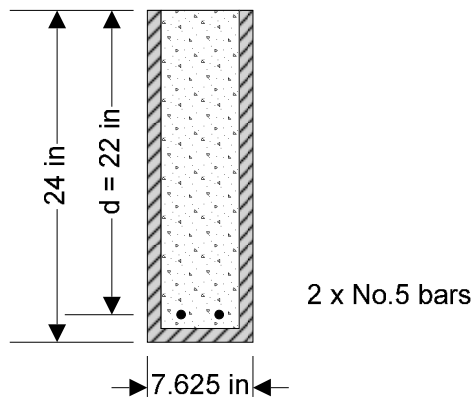
Density of masonry unit; $\gamma = 115 \text{ lb/ft}^3$
Pattern bond; Running
Mortar type; PCL Type S
Compressive strength of masonry unit; $f_{cu} = 1900 \text{ psi}$
Net compressive strength of masonry (Table 2); $f_m = 1900 \text{ psi}$
Modulus of elasticity (4.2.2); $E_m = 900 \times f_m = 1710000 \text{ psi}$
Allowable flexural tensile stress; (8.2.4.2); $F_t = 106 \text{ psi}$

Reinforcement details

Allowable tensile stress; $F_s = 32000 \text{ psi}$
Modulus of elasticity of steel; $E_s = 29000000 \text{ psi}$

Cover to reinforcement

Bottom cover to reinforcement; $C_{nom_b} = 1.5 \text{ in}$
Side cover to reinforcement; $C_{nom_s} = 1.5 \text{ in}$



Section properties

Modular ratio; $n = E_s / E_m = 16.96$
Section width; $b = 7.625 \text{ in}$
Section depth; $h = 24 \text{ in}$
Net shear area; $A_{nv} = b \times d = 167.75 \text{ in}^2$
Section modulus; $S = b \times h^2 / 6 = 732 \text{ in}^3$
Depth to tension reinforcement; $d = 22 \text{ in}$
Moment of inertia of net section; $I_n = b \times h^3 / 12 = 8784 \text{ in}^4$
Cracked moment of inertia; $I_{cr} = b \times (k \times d)^3 / 3 + n \times A_s \times (d - k \times d)^2 = 3224.1 \text{ in}^4$

Flexure design (Chapter 8)

Tension reinforcement; 2 x No. 5 bars
Area of tension reinforcement; $A_s = N_{bot} \times \text{BarArea}_{bot} = 0.62 \text{ in}^2$
Reinforcement ratio; $\rho_{ratio} = A_s / (b \times d) = 0.00370$
Neutral axis factor; $k = \sqrt{(2 \times \rho_{ratio} \times n + (\rho_{ratio} \times n)^2)} - \rho_{ratio} \times n = 0.297$
Lever arm factor; $j = 1 - k / 3 = 0.901$
Cracking moment; $M_{cr} = 2.5 \times F_t \times S = 16.2 \text{ kip_ft}$
Design bending moment; $M = 32.60 \text{ kip_ft}$



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Revision:	Date:	Sheet No. 36
Project Name: Lee's Summit Market Plaza		

Tensile stress in reinforcement;
Allowable tensile stress in reinf. (8.3.3.1);
Reinforcement stress ratio;

$$f_s = M / (A_s \times j \times d) = \mathbf{31834 \text{ psi}}$$
$$F_s = \mathbf{32000 \text{ psi}}$$
$$f_s / F_s = \mathbf{0.995}$$

PASS - Allowable tensile stress exceeds tensile stress due to flexure

Compressive stress in masonry;
Allowable stress in masonry (8.3.4.2.2);
Masonry stress ratio;

$$f_b = 2 \times M / (j \times k \times b \times d^2) = \mathbf{792.6 \text{ psi}}$$
$$F_b = 0.45 \times f'_m = \mathbf{855.0 \text{ psi}}$$
$$f_b / F_b = \mathbf{0.927}$$

PASS - Allowable compressive stress exceeds compressive stress due to flexure

Shear design (Chapter 8)

Location of shear force;
Design shear force;
Depth of shear area;
Moment shear relationship, M/Vd ;
Shear stress (8-21);
Allowable masonry shear stress (8-26);

Masonry shear stress ratio;

Face of support

$$V = \mathbf{7.51 \text{ kips}}$$
$$d_v = \mathbf{24.00 \text{ in}}$$

Assume; $M_{Vd\text{ratio}} = 1$

$$f_v = V / A_{nv} = \mathbf{44.8 \text{ psi}}$$
$$F_v = 1/2 \times (4.0 - 1.75 \times M_{Vd\text{ratio}}) \times \sqrt{f'_m} \times 1 \text{ psi}$$
$$F_v = \mathbf{49.0 \text{ psi}}$$
$$f_v / F_v = \mathbf{0.913}$$

PASS - Allowable shear stress exceeds shear stress in masonry

Deflection (5.2.1.4)

Deflection load combination;
Moment at midspan under deflection loads;
Effective moment of inertia (5-1);
Maximum instantaneous deflection;
Deflection limit;

Dead + Roof Live

$$M_a = \mathbf{20.799 \text{ kip_ft}}$$
$$I_{\text{eff}} = \min(I_n \times (M_{cr} / M_a)^3 + I_{cr} \times (1 - (M_{cr} / M_a)^3), I_n) = \mathbf{5834.4 \text{ in}^4}$$
$$\delta_{\text{inst}} = \mathbf{0.1 \text{ in; or span / 1919}}$$
$$\delta_{\text{limit}} = \text{span} / 600$$

PASS - Deflection limit exceeds deflection of lintel

;



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Job No. 23-23

Revision:

Date:

Sheet No. 37

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TYPICAL TRENCH FOOTING

FOOTING ANALYSIS

In accordance with ACI318-

Tedds calculation version 3.3.07

Summary results

Overall design status;

PASS;

Overall design utilisation;

0.998

Description	Unit	Applied	Resisting	FoS	Result
Uplift verification	kips	4.3			Pass
Description	Unit	Applied	Resisting	Utilization	Result
Soil bearing	ksf	2.143	2.147	0.998	Pass

Strip footing details - considering a one meter strip

Length of footing;

$L_x = 1$ ft

Width of footing;

$L_y = 2$ ft

Footing area;

$A = L_x \times L_y = 2$ ft²

Depth of footing;

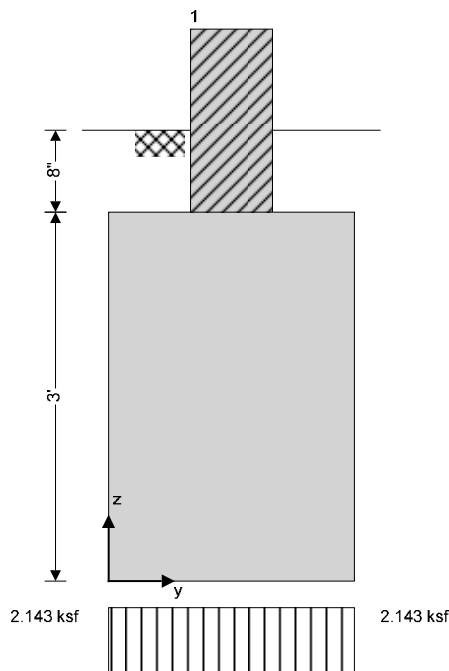
$h = 36$ in

Depth of soil over footing;

$h_{\text{soil}} = 8$ in

Density of concrete;

$\gamma_{\text{conc}} = 150.0$ lb/ft³



Wall no.1 details

Width of wall;

$l_{y1} = 8$ in

position in y-axis;

$y_1 = 12$ in



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Revision:	Date:	Sheet No. 38
Project Name: Lee's Summit Market Plaza		

Soil properties

Net allowable bearing pressure;
Density of soil;
Angle of internal friction;
Design base friction angle;
Coefficient of base friction;

$q_{allow_Net} = 2$ ksf; using a soil factor of safety, FS_{soil} , of 3
 $\gamma_{soil} = 120.0$ lb/ft³
 $\phi_b = 30.0$ deg
 $\delta_{bb} = 30.0$ deg
 $\tan(\delta_{bb}) = 0.577$

Footing loads

Self weight;
Soil weight;

$F_{swt} = h \times \gamma_{conc} = 450$ psf
 $F_{soil} = h_{soil} \times \gamma_{soil} = 80$ psf

Wall no.1 loads per linear foot

Dead load in z;
Live roof load in z;
Snow load in z;

$F_{Dz1} = 1.4$ kips
 $F_{Lrz1} = 0.3$ kips
 $F_{Sz1} = 1.9$ kips

Footing analysis for soil and stability

Load combinations per ASCE 7-16

1.0D (0.556)
1.0D + 1.0L (0.556)
1.0D + 1.0Lr (0.626)
1.0D + 1.0S (0.998)
1.0D + 1.0R (0.556)
1.0D + 0.75L + 0.75Lr (0.608)
1.0D + 0.75L + 0.75S (0.888)
1.0D + 0.75L + 0.75R (0.556)

Combination 4 results: 1.0D + 1.0S

Forces on footing per linear foot

Force in z-axis;

$F_{dz} = \gamma_D \times A \times (F_{swt} + F_{soil}) + \gamma_D \times (F_{Dz1} - l_{x1} \times l_{y1} \times h_{soil} \times \gamma_{soil}) + \gamma_S \times F_{Sz1} = 4.3$ kips

Moments on footing per linear foot

Moment in y-axis, about y is 0;

$M_{dy} = \gamma_D \times (A \times (F_{swt} + F_{soil}) \times L_y / 2) + \gamma_D \times (((F_{Dz1} - l_{x1} \times l_{y1} \times h_{soil} \times \gamma_{soil})) \times y_1) + \gamma_S \times (F_{Sz1} \times y_1) = 4.3$ kip_ft

Uplift verification

Vertical force;

$F_{dz} = 4.287$ kips

PASS - Footing is not subject to uplift

Stability against sliding

Resistance due to base friction;

$F_{Rfriction} = \max(F_{dz}, 0 \text{ kN}) \times \tan(\delta_{bb}) = 2.475$ kips

Bearing resistance

Eccentricity of base reaction

Eccentricity of base reaction in y-axis;

$e_{dy} = M_{dy} / F_{dz} - L_y / 2 = 0.000$ in

Strip base pressures

$q_1 = F_{dz} \times (1 - 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = 2.143$ ksf



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Revision:	Date:	Sheet No. 39
Project Name: Lee's Summit Market Plaza		

Minimum base pressure;

Maximum base pressure;

Allowable bearing capacity

Allowable bearing capacity;

$$q_2 = F_{dz} \times (1 + 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = \mathbf{2.143 \text{ ksf}}$$

$$q_{\min} = \min(q_1, q_2) = \mathbf{2.143 \text{ ksf}}$$

$$q_{\max} = \max(q_1, q_2) = \mathbf{2.143 \text{ ksf}}$$

$$q_{\text{allow}} = q_{\text{allow_Net}} + ((h + h_{\text{soil}}) \times \gamma_{\text{soil}}) / FS_{\text{soil}} = \mathbf{2.147 \text{ ksf}}$$

$$q_{\max} / q_{\text{allow}} = \mathbf{0.998}$$

PASS - Allowable bearing capacity exceeds design base pressure



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Job No. 23-23

Revision:

Date:

Sheet No. 40

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TYPICAL TRENCH FOOTING REINFORCEMENT

RC BEAM ANALYSIS & DESIGN (ACI318-2014)

In accordance with ACI318-2014

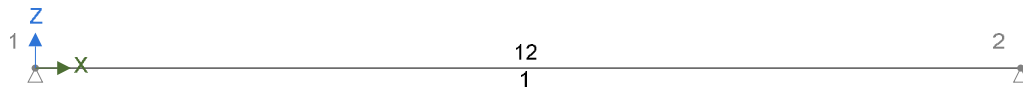
Tedds calculation version 3.3.18

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Concrete (4000 150) - R 24x36



Span	Length (ft)	Section	Start Support	End Support
1	12	R 24x36	Pinned	Pinned
R 24x36: Area 864 in ² , Inertia Major 93312 in ⁴ , Inertia Minor 41472 in ⁴ , Shear area parallel to Minor 720 in ² , Shear area parallel to Major 720 in ²				
Concrete (4000 150): Density 150 lbm/ft ³ , Youngs 3834 ksi, Shear 1750 ksi, Thermal 0.00001 °C ⁻¹				

Loading

Self weight included

Dead - Loading (kips/ft)



Roof Live - Loading (kips/ft)



Snow - Loading (kips/ft)



Load combination factors

Load combination	Self Weight	Dead	Roof Live	Snow
1.4D (Strength)	1.40	1.40		



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Revision:	Date:	Sheet No. 41
Project Name: Lee's Summit Market Plaza		

Load combination	Self Weight	Dead	Roof Live	Snow
1.2D + 1.0L + 1.6S (Strength)	1.20	1.20		1.60
1.0D + 0.0L + 1.0S (Service)	1.00	1.00		1.00

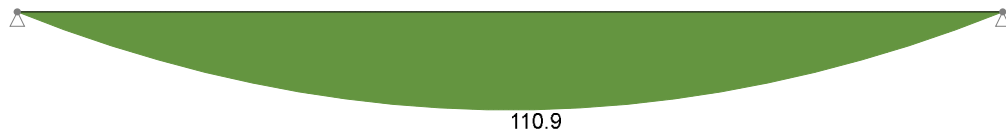
Member Loads

Member	Load case	Load Type	Orientation	Description
Beam	Dead	UDL	GlobalZ	1.7 kips/ft
Beam	Roof Live	UDL	GlobalZ	0.3 kips/ft
Beam	Snow	UDL	GlobalZ	1.9 kips/ft

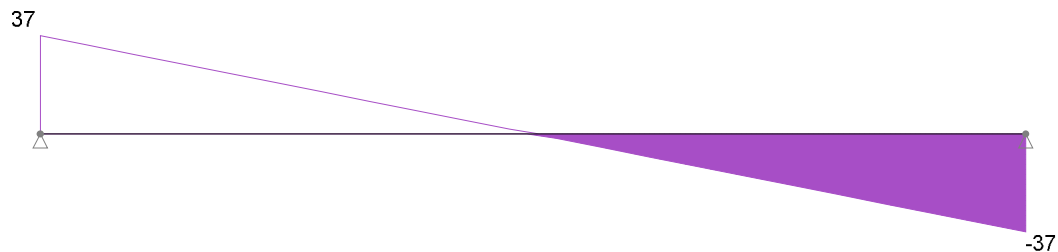
Results

Forces

Strength combinations - Moment envelope (kip_ft)



Strength combinations - Shear envelope (kips)



;

Concrete details

Compressive strength of concrete;

$f'_c = 4000$ psi

Density of reinforced concrete;

$w_c = 150$ lb / ft³

Concrete type;

Normal weight

Modulus of elasticity of concrete (cl.19.2.2.1);

$E = (w_c / 1 \text{ lb/ft}^3)^{1.5} \times 33 \text{ psi} \times (f'_c / 1 \text{ psi})^{0.5} = 3834254$ psi

Strength reduction factor for shear;

$\phi_s = 0.75$

Reinforcement details

Yield strength of reinforcement;

$f_y = 60000$ psi

Compression-controlled strain limit (cl.21.2.2.1);

$\epsilon_{ty} = 0.00200$

Nominal cover to reinforcement

Cover to top reinforcement;

$C_{nom_t} = 3$ in

Cover to bottom reinforcement;

$C_{nom_b} = 3$ in

Cover to side reinforcement;

$C_{nom_s} = 3$ in



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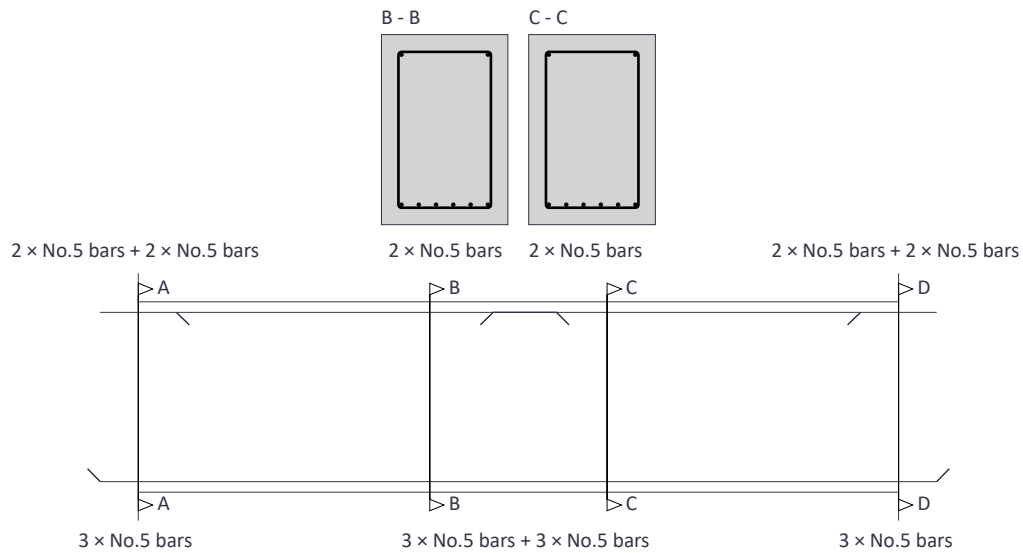
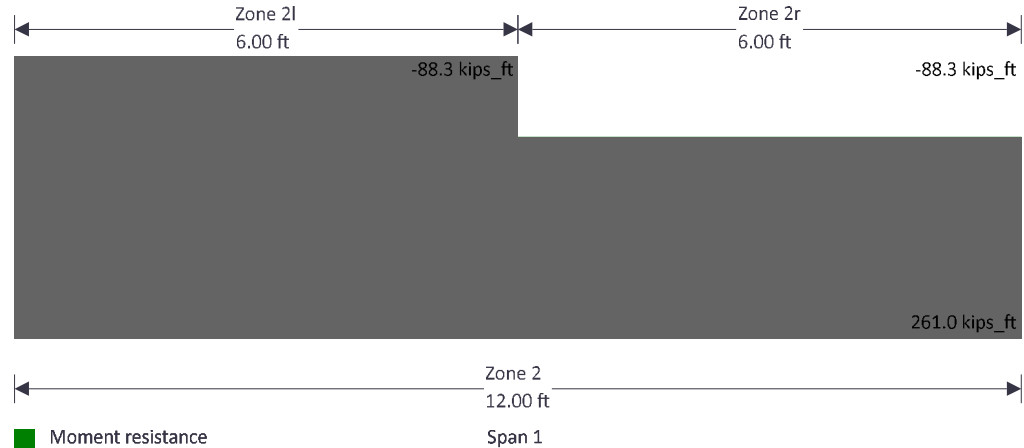
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Revision:	Date:	Sheet No. 42
Project Name: Lee's Summit Market Plaza		

Beam - Span 1

Rectangular section details

Section width; $b = 24$ in
Section depth; $h = 36$ in

Moment design



Zone 2 - Positive moment. Rectangular section in flexure (Section 9.5.2)

Factored bending moment at section;

$$M_u = \text{abs}(M_{m1_s1_z2_max_red}) = 110.880 \text{ kip_ft}$$

Effective depth to tension reinforcement;

$$d = 32.188 \text{ in}$$

Tension reinforcement provided;

$$3 \times \text{No.5 bars} + 3 \times \text{No.5 bars}$$

Area of tension reinforcement provided;

$$A_{s,prov} = 1.841 \text{ in}^2$$

Minimum area of reinforcement (cl.9.6.1.2);

$$A_{s,min} = \min(\max(3 \text{ psi} \times \sqrt{f'_c} / 1 \text{ psi}), 200 \text{ psi}) \times b \times d / f_y, 4/3 \times A_{s,des} = 1.028 \text{ in}^2$$

PASS - Area of reinforcement provided is greater than minimum area of reinforcement required

Stress block depth factor (cl.22.2.2.4.3);

$$\beta_1 = \min(\max(0.85 - 0.05 \times (f'_c - 4 \text{ ksi}) / 1 \text{ ksi}, 0.65), 0.85) = 0.85$$



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Revision:	Date:	Sheet No. 43
Project Name: Lee's Summit Market Plaza		

Depth of equivalent rectangular stress block;
Depth to neutral axis;
Net tensile strain in extreme tension fibers;

$$a = A_{s,prov} \times f_y / (0.85 \times f_c \times b) = \mathbf{1.354 \text{ in}}$$

$$c = a / \beta_1 = \mathbf{1.592 \text{ in}}$$

$$\epsilon_t = 0.003 \times (d_o - c) / \max(c, 0.001 \text{ in}) = \mathbf{0.05764}$$

Net tensile strain in tension controlled zone

Strength reduction factor (cl.21.2.1);
Nominal moment strength;
Design moment strength;

$$\phi_f = \min(\max(0.65 + 0.25 \times (\epsilon_t - \epsilon_{ty}) / (0.005 - \epsilon_{ty}), 0.65), 0.9) = \mathbf{0.90}$$

$$M_n = A_{s,prov} \times f_y \times (d - a / 2) = \mathbf{290.021 \text{ kip_ft}}$$

$$\phi M_n = M_n \times \phi_f = \mathbf{261.019 \text{ kip_ft}}$$

PASS - Required moment strength is less than design moment strength

Flexural cracking

Max. center to center spacing of tension reinf.;
Service load stress in reinforcement (cl.24.3.2);
Clear cover of reinforcement;
Maximum allowable bot bar spacing (Table 24.3.2);

$$S_{b,max} = S_{bot} + \phi_{m1_s1_z2_b_L1} = \mathbf{3.275 \text{ in}}$$

$$f_s = 2/3 \times f_y = \mathbf{40000 \text{ psi}}$$

$$C_c = C_{nom_b} + \phi_v = \mathbf{3.500 \text{ in}}$$

$$s_{max} = \min(15 \text{ in} \times 40000 \text{ psi} / f_s - 2.5 \times c_c, 12 \text{ in} \times 40000 \text{ psi} / f_s) = \mathbf{6.250 \text{ in}}$$

PASS - Maximum allowable tension reinforcement spacing exceeds actual spacing

Control of deflections (Section 24.2)

Concrete density factor;
Reinforcement yield strength factor;
Minimum thickness of beam (Table 9.3.1.1);

$$K_w = \mathbf{1.00}$$

$$K_f = 0.4 + f_y / 100000 \text{ psi} = \mathbf{1.00}$$

$$h_{min} = (L_{m1_s1} / 16.0) \times K_w \times K_f = \mathbf{9 \text{ in}}$$

PASS - Thickness of beam exceeds minimum thickness

Spacing limits for reinforcement

Top bar clear spacing;

$$S_{top} = (b - (2 \times (C_{nom_s} + \phi_{m1_s1_z2_v}) + \phi_{m1_s1_z2r_t_L1} \times N_{m1_s1_z2r_t_L1})) / (N_{m1_s1_z2r_t_L1} - 1) = \mathbf{15.750 \text{ in}}$$

Min. allowable top bar clear spacing (cl.25.2.1);

$$S_{top,min} = \mathbf{1.000 \text{ in}}$$

Bottom bar clear spacing;

$$S_{bot} = (b - (2 \times (C_{nom_s} + \phi_{m1_s1_z2_v}) + \phi_{m1_s1_z2_b_L1} \times N_{m1_s1_z2_b_L1} + \phi_{m1_s1_z1_b_L1} \times N_{m1_s1_z1_b_L1})) / ((N_{m1_s1_z2_b_L1} + N_{m1_s1_z1_b_L1}) - 1) = \mathbf{2.650 \text{ in}}$$

Min. allowable bottom bar clear spacing (cl.25.2.1); $S_{bot,min} = \mathbf{1.000 \text{ in}}$

PASS - Actual bar spacing exceeds minimum allowable



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Date: 11/01/2023

Job No. 23-23

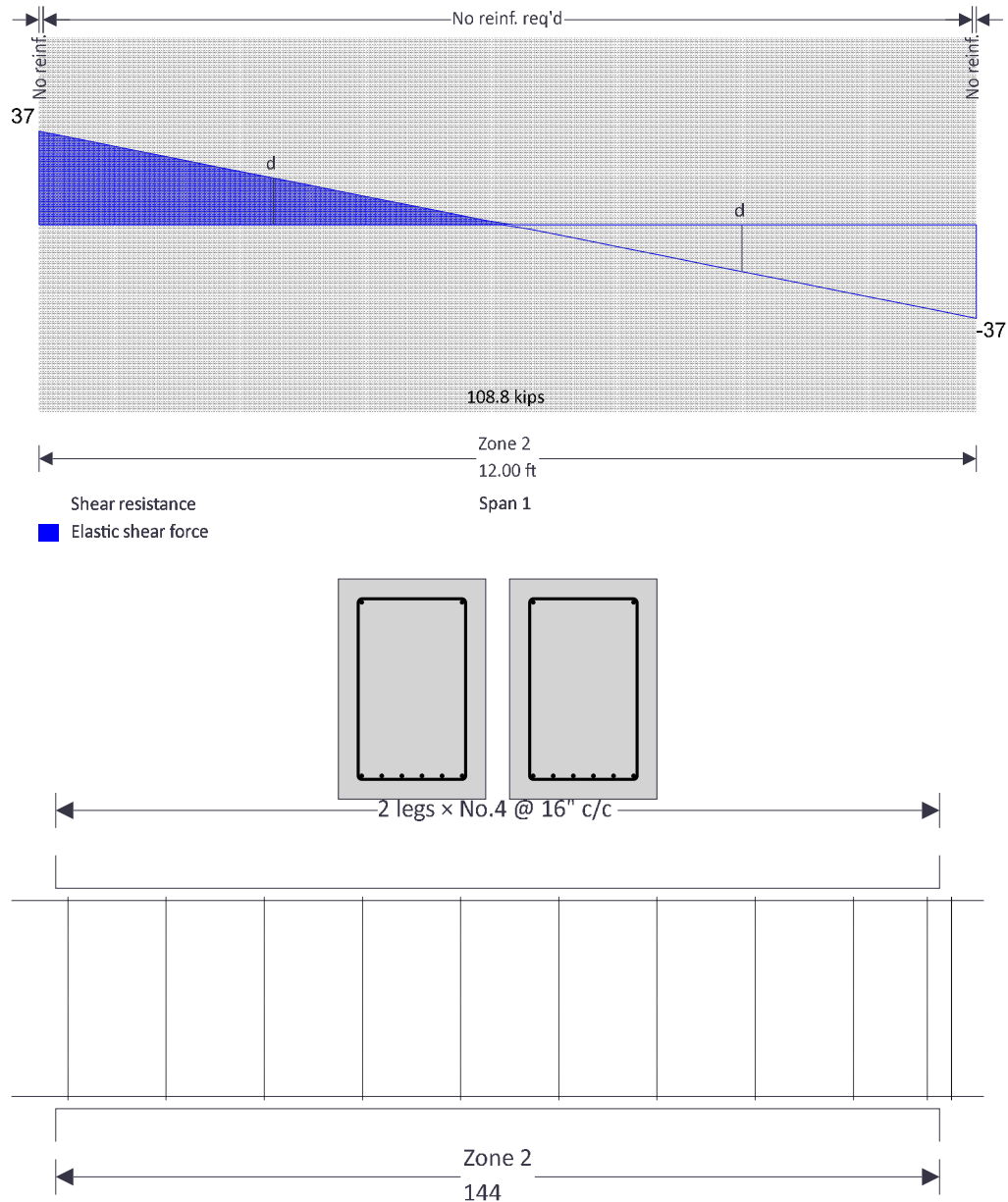
Revision:

Date:

Sheet No. 44

Project Name: Lee's Summit Market Plaza

Shear design



Rectangular section in shear

Concrete weight modification factor;

$\lambda = 1.00$

Location where min. reinf. is req'd (V_u less ϕV_c);

N/A no reinf. required along full length

Location where no reinf. is req'd (V_u less $\phi V_c / 2$);

Between 0.00 ft and 12.00 ft

Maximum reinforcement shear strength;

$\phi V_{s,max} = \phi_s \times 8 \text{ psi} \times \sqrt{(\min(f'_c, 10000 \text{ psi}) / 1 \text{ psi})} \times b \times d = \mathbf{327.865 \text{ kips}}$

Minimum area of shear reinf. (Table 9.6.3.3);

$A_{sv,min} = \max(50 \text{ psi}, 0.75 \text{ psi} \times \sqrt{(f'_c / 1 \text{ psi})}) \times b / \min(f_y, 60000 \text{ psi}) = \mathbf{0.240 \text{ in}^2/\text{ft}}$



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Revision:	Date:	Sheet No. 45
Project Name: Lee's Summit Market Plaza		

Zone 2

Effective depth of long. reinf. used for shear zone; $d = 32.188$ in

Concrete shear strength (eqn. 22.5.5.1); $\phi V_c = \phi_s \times \lambda \times 2 \text{ psi} \times \sqrt{(\min(f'_c, 10000 \text{ psi}) / 1 \text{ psi})} \times b \times d = 73.286$ kips

Design shear force within zone; $V_u = 18.480$ kips

Reinf. shear strength required (eqn. 22.5.1.1); $\phi V_s = \max(V_u - \phi V_c, 0 \text{ kips}) = 0.000$ kips

Area of design shear reinf. req'd (eqn. 22.5.10.5.3); $A_{sv,des} = \phi V_s / (\phi_s \times \min(f_y, 60000 \text{ psi}) \times d) = 0.000$ in²/ft

Area of shear reinforcement required; $A_{sv,req} = 0 \text{ mm}^2/\text{ft} = 0.000$ in²/ft

Shear reinforcement provided; 2 legs $\times$ No.4 @ 16" c/c

Area of shear reinforcement provided; $A_{sv,prov} = 0.295$ in²/ft

PASS - No shear reinforcement required ($\phi V_c/2 \geq V_u$)



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Date: 11/01/2023

Job No. 23-23

Revision:

Date:

Sheet No. 46

Project Name: Lee's Summit Market Plaza

WALL FOOTING UNDER GRID 2

FOOTING ANALYSIS

In accordance with ACI318-14

Tedds calculation version 3.3.07

Summary results

Overall design status;

PASS;

Overall design utilisation;

0.975

Description	Unit	Applied	Resisting	FoS	Result
Uplift verification	kips	6.1			Pass
Description	Unit	Applied	Resisting	Utilization	Result
Soil bearing	ksf	2.029	2.08	0.975	Pass

Strip footing details - considering a one meter strip

Length of footing;

$L_x = 1$ ft

Width of footing;

$L_y = 3$ ft

Footing area;

$A = L_x \times L_y = 3$ ft²

Depth of footing;

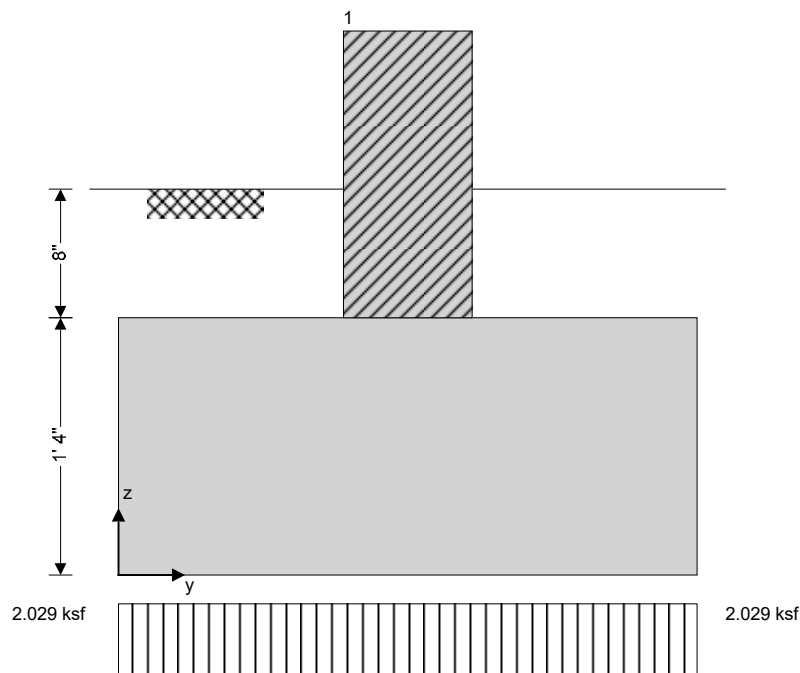
$h = 16$ in

Depth of soil over footing;

$h_{\text{soil}} = 8$ in

Density of concrete;

$\gamma_{\text{conc}} = 150.0$ lb/ft³



Wall no.1 details

Width of wall;

$l_{y1} = 8$ in

position in y-axis;

$y_1 = 18$ in



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Revision:	Date:	Sheet No. 47
Project Name: Lee's Summit Market Plaza		

Soil properties

Net allowable bearing pressure;
Density of soil;
Angle of internal friction;
Design base friction angle;
Coefficient of base friction;

$q_{allow_Net} = 2$ ksf; using a soil factor of safety, FS_{soil} , of 3
 $\gamma_{soil} = 120.0$ lb/ft³
 $\phi_b = 30.0$ deg
 $\delta_{bb} = 30.0$ deg
 $\tan(\delta_{bb}) = 0.577$

Footing loads

Self weight;
Soil weight;

$F_{swt} = h \times \gamma_{conc} = 200$ psf
 $F_{soil} = h_{soil} \times \gamma_{soil} = 80$ psf

Wall no.1 loads per linear foot

Dead load in z;
Live roof load in z;
Snow load in z;
Wind load in y;
Wind load moment in y;

$F_{Dz1} = 2.8$ kips
 $F_{Lrz1} = 0.8$ kips
 $F_{Sz1} = 2.5$ kips
 $F_{Wy1} = 0.6$ kips
 $M_{Wy1} = 9.0$ kip_ft

Footing analysis for soil and stability

Load combinations per ASCE 7-16

1.0D (0.575)
1.0D + 1.0L (0.575)
1.0D + 1.0Lr (0.703)
1.0D + 1.0S (0.975)
1.0D + 1.0R (0.575)
1.0D + 0.75L + 0.75Lr (0.671)
1.0D + 0.75L + 0.75S (0.875)
1.0D + 0.75L + 0.75R (0.575)

Combination 4 results: 1.0D + 1.0S

Forces on footing per linear foot

Force in z-axis;

$F_{dz} = \gamma_D \times A \times (F_{swt} + F_{soil}) + \gamma_D \times (F_{Dz1} - l_{x1} \times l_{y1} \times h_{soil} \times \gamma_{soil}) + \gamma_S \times F_{Sz1} = 6.1$ kips

Moments on footing per linear foot

Moment in y-axis, about y is 0;

$M_{dy} = \gamma_D \times (A \times (F_{swt} + F_{soil}) \times L_y / 2) + \gamma_D \times (((F_{Dz1} - l_{x1} \times l_{y1} \times h_{soil} \times \gamma_{soil})) \times y_1) + \gamma_S \times (F_{Sz1} \times y_1) = 9.1$ kip_ft

Uplift verification

Vertical force;

$F_{dz} = 6.087$ kips

PASS - Footing is not subject to uplift

Stability against sliding

Resistance due to base friction;

$F_{Rfriction} = \max(F_{dz}, 0 \text{ kN}) \times \tan(\delta_{bb}) = 3.514$ kips

Bearing resistance

Eccentricity of base reaction

Eccentricity of base reaction in y-axis;

$e_{dy} = M_{dy} / F_{dz} - L_y / 2 = 0.000$ in



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Revision:	Date:	Sheet No. 48
Project Name: Lee's Summit Market Plaza		

Strip base pressures

Minimum base pressure;

Maximum base pressure;

Allowable bearing capacity

Allowable bearing capacity;

$$q_1 = F_{dz} \times (1 - 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = \mathbf{2.029 \text{ ksf}}$$

$$q_2 = F_{dz} \times (1 + 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = \mathbf{2.029 \text{ ksf}}$$

$$q_{\min} = \min(q_1, q_2) = \mathbf{2.029 \text{ ksf}}$$

$$q_{\max} = \max(q_1, q_2) = \mathbf{2.029 \text{ ksf}}$$

$$q_{\text{allow}} = q_{\text{allow_Net}} + ((h + h_{\text{soil}}) \times \gamma_{\text{soil}}) / FS_{\text{soil}} = \mathbf{2.08 \text{ ksf}}$$

$$q_{\max} / q_{\text{allow}} = \mathbf{0.975}$$

PASS - Allowable bearing capacity exceeds design base pressure



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Date: 11/01/2023

Job No. 23-23

Revision:

Date:

Sheet No. 49

Project Name: Lee's Summit Market Plaza

WALL FOOTING BETWEEN GARAGE DOORS

FOOTING ANALYSIS

In accordance with ACI318-

Tedds calculation version 3.3.07

Summary results

Overall design status;

PASS;

Overall design utilisation;

0.731

Description	Unit	Applied	Resisting	FoS	Result
Uplift verification	kips	15.7			Pass
Description	Unit	Applied	Resisting	Utilization	Result
Soil bearing	ksf	1.568	2.147	0.731	Pass

Pad footing details

Length of footing;

$L_x = 5$ ft

Width of footing;

$L_y = 3$ ft

Footing area;

$A = L_x \times L_y = 15$ ft²

Depth of footing;

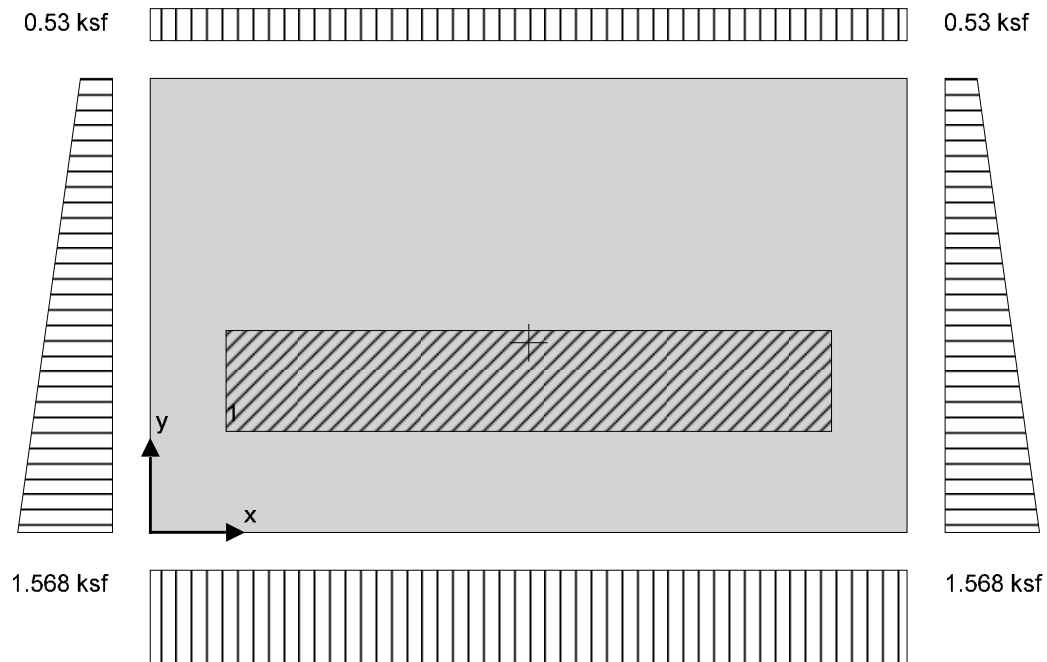
$h = 36$ in

Depth of soil over footing;

$h_{\text{soil}} = 8$ in

Density of concrete;

$\gamma_{\text{conc}} = 150.0$ lb/ft³



Column no.1 details

Length of column;

$l_{x1} = 48.00$ in

Width of column;

$l_{y1} = 8.00$ in

position in x-axis;

$x_1 = 30.00$ in



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Revision:	Date:	Sheet No. 50
Project Name: Lee's Summit Market Plaza		

position in y-axis;

$$y_1 = 12.00 \text{ in}$$

Soil properties

Net allowable bearing pressure;

$$q_{\text{allow_Net}} = 2 \text{ ksf, using a soil factor of safety, } F_{S_{\text{soil}}}, \text{ of } 3$$

Density of soil;

$$\gamma_{\text{soil}} = 120.0 \text{ lb/ft}^3$$

Angle of internal friction;

$$\phi_b = 30.0 \text{ deg}$$

Design base friction angle;

$$\delta_{bb} = 30.0 \text{ deg}$$

Coefficient of base friction;

$$\tan(\delta_{bb}) = 0.577$$

Footing loads

Self weight;

$$F_{\text{swt}} = h \times \gamma_{\text{conc}} = 450 \text{ psf}$$

Soil weight;

$$F_{\text{soil}} = h_{\text{soil}} \times \gamma_{\text{soil}} = 80 \text{ psf}$$

Column no.1 loads

Dead load in z;

$$F_{Dz1} = 6.0 \text{ kips}$$

Live roof load in z;

$$F_{Lrz1} = 0.5 \text{ kips}$$

Snow load in z;

$$F_{Sz1} = 2.0 \text{ kips}$$

Footing analysis for soil and stability

Load combinations per ASCE 7-16

1.0D (0.606)

1.0D + 1.0L (0.606)

1.0D + 1.0S (0.731)

Combination 4 results: 1.0D + 1.0S

Forces on footing

Force in z-axis;

$$F_{dz} = \gamma_D \times A \times (F_{\text{swt}} + F_{\text{soil}}) + \gamma_D \times (F_{Dz1} - l_{x1} \times l_{y1} \times h_{\text{soil}} \times \gamma_{\text{soil}}) + \gamma_S \times F_{Sz1} = 15.7 \text{ kips}$$

Moments on footing

Moment in x-axis, about x is 0;

$$M_{dx} = \gamma_D \times (A \times (F_{\text{swt}} + F_{\text{soil}}) \times L_x / 2) + \gamma_D \times (((F_{Dz1} - l_{x1} \times l_{y1} \times h_{\text{soil}} \times \gamma_{\text{soil}})) \times x_1) + \gamma_S \times (F_{Sz1} \times x_1) = 39.3 \text{ kip_ft}$$

Moment in y-axis, about y is 0;

$$M_{dy} = \gamma_D \times (A \times (F_{\text{swt}} + F_{\text{soil}}) \times L_y / 2) + \gamma_D \times (((F_{Dz1} - l_{x1} \times l_{y1} \times h_{\text{soil}} \times \gamma_{\text{soil}})) \times y_1) + \gamma_S \times (F_{Sz1} \times y_1) = 19.7 \text{ kip_ft}$$

Uplift verification

Vertical force;

$$F_{dz} = 15.737 \text{ kips}$$

PASS - Footing is not subject to uplift

Bearing resistance

Eccentricity of base reaction

Eccentricity of base reaction in x-axis;

$$e_{dx} = M_{dx} / F_{dz} - L_x / 2 = 0 \text{ in}$$

Eccentricity of base reaction in y-axis;

$$e_{dy} = M_{dy} / F_{dz} - L_y / 2 = -2.969 \text{ in}$$

Pad base pressures

$$q_1 = F_{dz} \times (1 - 6 \times e_{dx} / L_x - 6 \times e_{dy} / L_y) / (L_x \times L_y) = 1.568 \text{ ksf}$$

$$q_2 = F_{dz} \times (1 - 6 \times e_{dx} / L_x + 6 \times e_{dy} / L_y) / (L_x \times L_y) = 0.53 \text{ ksf}$$

$$q_3 = F_{dz} \times (1 + 6 \times e_{dx} / L_x - 6 \times e_{dy} / L_y) / (L_x \times L_y) = 1.568 \text{ ksf}$$

$$q_4 = F_{dz} \times (1 + 6 \times e_{dx} / L_x + 6 \times e_{dy} / L_y) / (L_x \times L_y) = 0.53 \text{ ksf}$$

Minimum base pressure;

$$q_{\text{min}} = \min(q_1, q_2, q_3, q_4) = 0.53 \text{ ksf}$$



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Revision:	Date:	Sheet No. 51
Project Name: Lee's Summit Market Plaza		

Maximum base pressure;

$$q_{\max} = \max(q_1, q_2, q_3, q_4) = 1.568 \text{ ksf}$$

Allowable bearing capacity

Allowable bearing capacity;

$$q_{\text{allow}} = q_{\text{allow_Net}} + ((h + h_{\text{soil}}) \times \gamma_{\text{soil}}) / FS_{\text{soil}} = 2.147 \text{ ksf}$$

$$q_{\max} / q_{\text{allow}} = 0.731$$

PASS - Allowable bearing capacity exceeds design base pressure



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Date: 11/01/2023

Job No. 23-23

Revision:

Date:

Sheet No. 52

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VESTIBULE BEAM

STEEL MEMBER ANALYSIS & DESIGN (AISC 360)

In accordance with AISC360 15th Edition published 2016 using the LRFD method

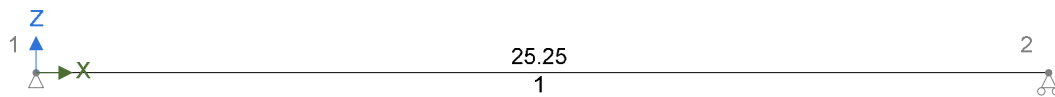
Tedds calculation version 4.4.10

ANALYSIS

Tedds calculation version 1.0.37

Geometry

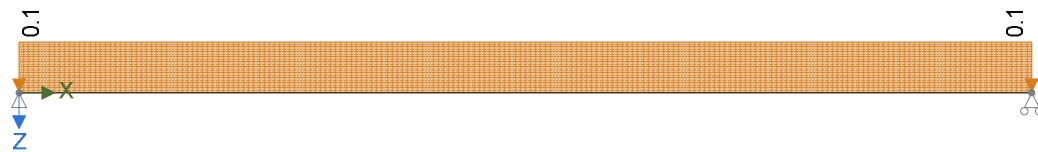
Geometry (ft) - Steel (AISC) - HSS 6x6x5/8



Loading

Self weight included

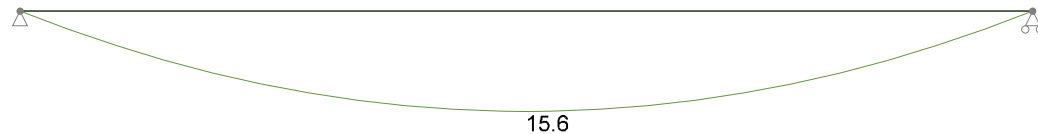
Dead - Loading (kips/ft)



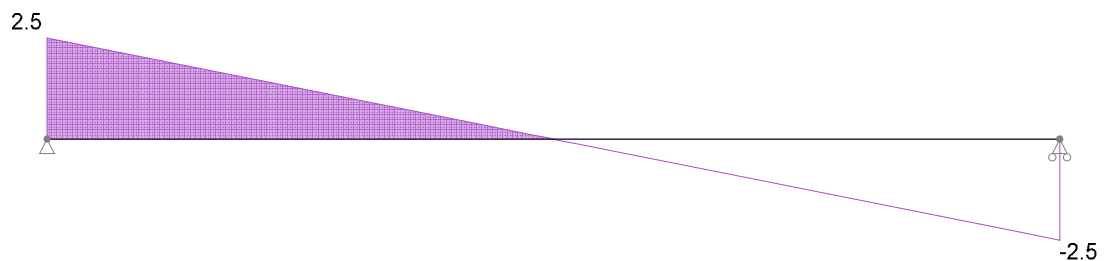
Results

Forces

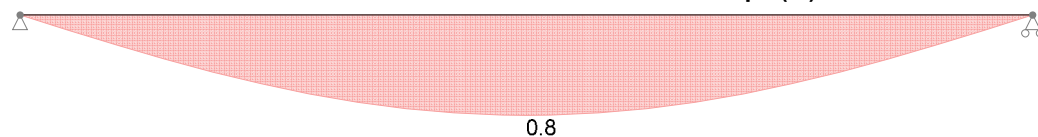
Strength combinations - Moment envelope (kip_ft)



Strength combinations - Shear envelope (kips)



Service combinations - Deflection envelope (in)





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Revision:	Date:	Sheet No. 53
Project Name: Lee's Summit Market Plaza		

;

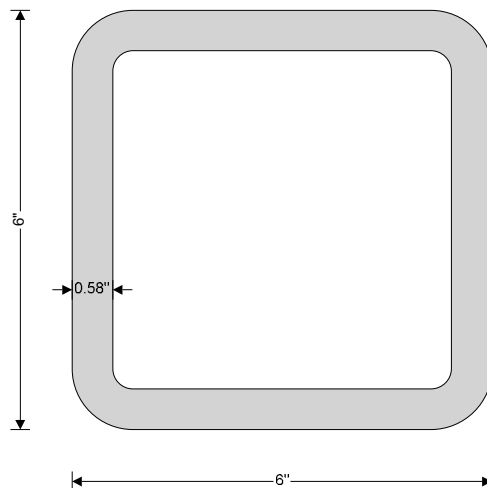
Resistance factors

Shear;	$\phi_v = 0.90$
Flexure;	$\phi_b = 0.90$
Tensile yielding;	$\phi_{t,y} = 0.90$
Tensile rupture;	$\phi_{t,r} = 0.75$
Compression;	$\phi_c = 0.90$

Beam design

Section details

Section type;	HSS 6x6x5/8 (AISC 15th Edn (v15.0))
ASTM steel designation;	User defined
Steel yield stress;	$F_y = 50$ ksi
Steel tensile stress;	$F_u = 65$ ksi
Modulus of elasticity;	$E = 29000$ ksi



HSS 6x6x5/8 (AISC 15th Edn (v15.0))

Section depth, d , 6 in
Section breadth, b_f , 6 in
Weight of section, W , 42.3 lbf/ft
Section thickness, t , 0.581 in
Area of section, A , 11.7 in²
Radius of gyration about x-axis, r_x , 2.17 in
Radius of gyration about y-axis, r_y , 2.17 in
Elastic section modulus about x-axis, S_x , 18.4 in³
Elastic section modulus about y-axis, S_y , 18.4 in³
Plastic section modulus about x-axis, Z_x , 23.2 in³
Plastic section modulus about y-axis, Z_y , 23.2 in³
Second moment of area about x-axis, I_x , 55.2 in⁴
Second moment of area about y-axis, I_y , 55.2 in⁴

Lateral restraint

Both flanges have lateral restraint at supports only

Consider Combination 1 - 1.4D (Strength)

Classification of sections for local buckling - Section B4

Classification of flanges in flexure - Table B4.1b (case 17)

Width to thickness ratio;	$(b_f - 3 \times t) / t = 7.33$	
Limiting ratio for compact section;	$\lambda_{pff} = 1.12 \times \sqrt{E / F_y} = 26.97$	
Limiting ratio for non-compact section;	$\lambda_{rff} = 1.40 \times \sqrt{E / F_y} = 33.72$	Compact

Classification of web in flexure - Table B4.1b (case 19)

Width to thickness ratio;	$(d - 3 \times t) / t = 7.33$	
Limiting ratio for compact section;	$\lambda_{pwf} = 2.42 \times \sqrt{E / F_y} = 58.28$	
Limiting ratio for non-compact section;	$\lambda_{rwf} = 5.70 \times \sqrt{E / F_y} = 137.27$	Compact



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Revision:	Date:	Sheet No. 54
Project Name: Lee's Summit Market Plaza		

Section is compact in flexure

Check design at start of span

Design of members for shear - Chapter G

Required shear strength;

$$V_{r,x} = 2.5 \text{ kips}$$

Web area;

$$A_w = 2 \times (d - 3 \times t) \times t = 4.947 \text{ in}^2$$

Web plate buckling coefficient;

$$k_v = 5$$

$$(d - 3 \times t) / t \leq 1.10 \times \sqrt{(k_v \times E / F_y)}$$

Web shear coefficient - eq G2-9;

$$C_{v2} = 1.000$$

Nominal shear strength - eq G4-1;

$$V_{n,x} = 0.6 \times F_y \times A_w \times C_{v2} = 148.4 \text{ kips}$$

Resistance factor;

$$\phi_v = 0.90$$

Design shear strength;

$$V_{c,x} = \phi_v \times V_{n,x} = 133.6 \text{ kips}$$

$$V_{r,x} / V_{c,x} = 0.019$$

PASS - Design shear strength exceeds required shear strength

Check design 12ft 7.5in along span

Design of members for flexure - Chapter F

Required flexural strength;

$$M_{r,x} = 15.6 \text{ kips_ft}$$

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1;

$$M_{n,yld,x} = M_{p,x} = F_y \times Z_x = 96.7 \text{ kips_ft}$$

Design flexural strength - F1

Nominal flexural strength;

$$M_{n,x} = M_{n,yld,x} = 96.7 \text{ kips_ft}$$

Design flexural strength;

$$M_{c,x} = \phi_b \times M_{n,x} = 87 \text{ kips_ft}$$

$$M_{r,x} / M_{c,x} = 0.179$$

PASS - Design flexural strength exceeds required flexural strength

Consider Combination 3 - 1.0D + 1.0L (Service)

Check design 12ft 7.5in along span

Design of members for x-x axis deflection

Maximum deflection;

$$\delta_x = 0.801 \text{ in}$$

Allowable deflection;

$$\delta_{x,Allowable} = L_{m1_s1} / 360 = 0.842 \text{ in}$$

$$\delta_x / \delta_{x,Allowable} = 0.951$$

PASS - Allowable deflection exceeds design deflection



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Revision:	Date:	Sheet No. 55
Project Name: Lee's Summit Market Plaza		

BASEPLATES

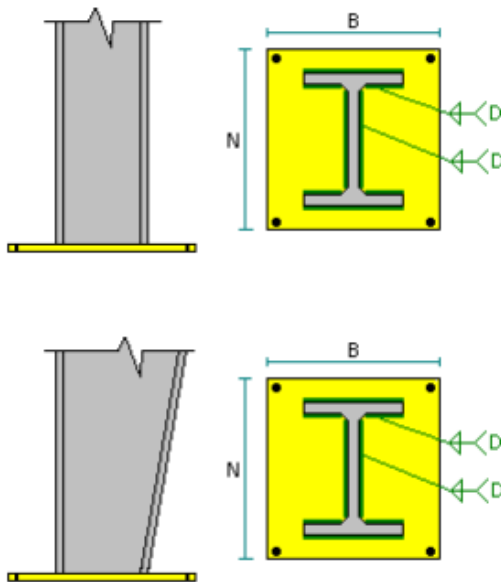
Steel connections

Data

Family: Column - Base (CB)
Type: Base plate

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	W 10X68
Material	:	A36
Longitudinal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	12 in
B: Transversal dimension	:	12 in
Thickness	:	0.75 in
Material	:	A36
Column weld	:	E70XX
Outer welds flanges only	:	No
D: Column weld size (1/16 in)	:	5
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	36 in
Transversal dimension	:	36 in
Thickness	:	16 in



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Revision:	Date:	Sheet No. 56
Project Name: Lee's Summit Market Plaza		

Material	:	C 4-60
Include grouting	:	No
<u>Anchor</u>		
Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	3 in
Transverse edge distance on the plate	:	3 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/8"
Effective embedment depth	:	12 in
Total length	:	13.245 in
Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
<u>Anchor reinforcement</u>		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No



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Revision:	Date:	Sheet No. 57
Project Name: Lee's Summit Market Plaza		

Steel connections

Results

Family: Column - Base (CB)
Type: Base plate
Design code: AISC 360-16 LRFD, ACI 318-11

DEMANDS						
Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-130.00	0.00	0.00	3.00	3.00	Design

Design for major axis
Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS						
Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[in]	2.81	0.25	--	✓	
Weld size	[1/16in]	5	3	--	✓	table J2.4

DESIGN CHECK						
Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[Kip/in2]	4.42	0.90	DL1	0.20	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[Kip*ft/ft]	4.56	1.73	DL1	0.38	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	4.56	0.00	DL1	0.00	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[Kip/ft]	125.29	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear capacity	[Kip/ft]	83.53	2.29	DL1	0.03	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld axial capacity	[Kip/ft]	125.29	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Ratio	0.38					

Major axis
Anchors

GEOMETRIC CONSIDERATIONS						
Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[in]	6.00	1.50	--	✓	Sec. D.8.1
Concrete cover	[in]	14.81	3.00	--	✓	Sec. 7.7.1
Effective length	[in]	12.24	--	15.76	✓	



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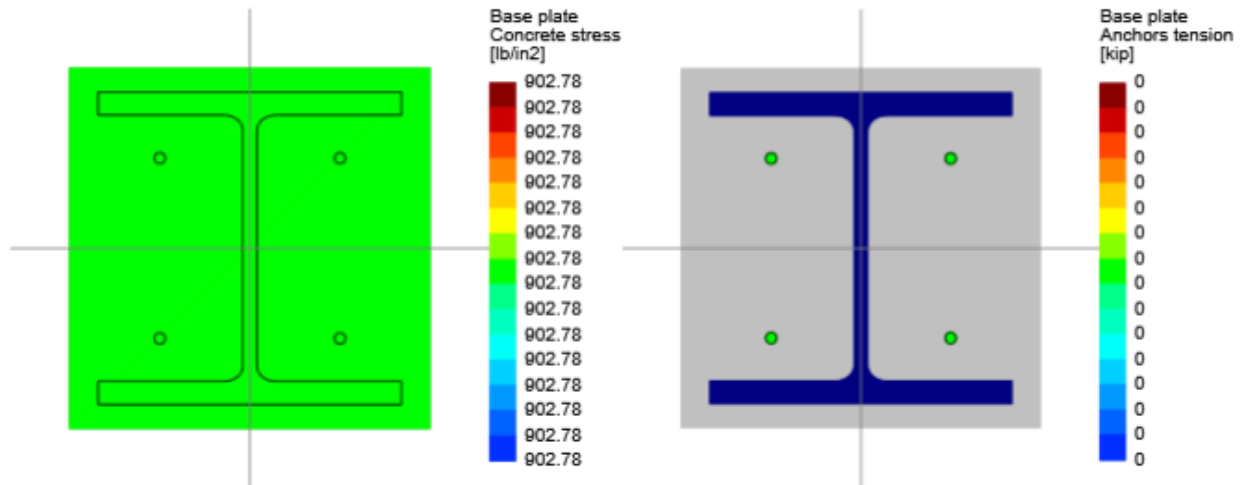
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Revision:	Date:	Sheet No. 58
Project Name: Lee's Summit Market Plaza		

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[Kip]	3.37	0.00	DL1	0.00	Eq. D-2
Breakout of anchor in tension	[Kip]	44.46	0.00	DL1	0.00	Eq. D-3, Sec. D.3.3.4.4
Pullout of anchor in tension	[Kip]	5.14	0.00	DL1	0.00	Sec. D.3.3.4.4
Anchor shear	[Kip]	1.75	0.75	DL1	0.43	Eq. D-29
Breakout of anchor in shear	[Kip]	14.43	0.75	DL1	0.05	Table D.4.1.1, Sec. D.4.3
Breakout of group of anchors in shear	[Kip]	15.49	3.00	DL1	0.19	Table D.4.1.1, Sec. D.4.3
Pryout of anchor in shear	[Kip]	88.91	0.75	DL1	0.01	Eq. D-3, Table D.4.1.1, Sec. D.4.3
Ratio	0.43					
Global critical strength ratio	0.43					

Major axis

Maximum compression and tension (DL1)



Maximum bearing pressure	902.78	[psi]
Minimum bearing pressure	902.78	[psi]
Maximum anchor tension	0.00	[Kip]
Minimum anchor tension	0.00	[Kip]
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

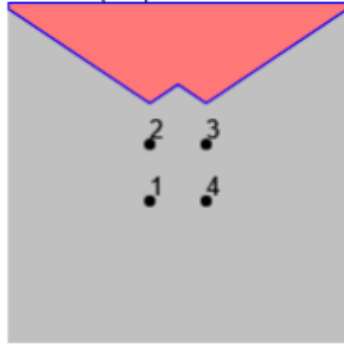
Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-3.00	-3.00	0.75	0.00
2	-3.00	3.00	0.75	0.00
3	3.00	3.00	0.75	0.00
4	3.00	-3.00	0.75	0.00



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Revision:	Date:	Sheet No. 59
Project Name: Lee's Summit Market Plaza		

Results for shear breakout (DL1)



Group	Area [in ²]	Shear [Kip]	Anchors
1	576.00	3.00	1, 2, 3, 4
2	576.00	1.50	2, 3

Major axis



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Revision:	Date:	Sheet No. 60
Project Name: Lee's Summit Market Plaza		

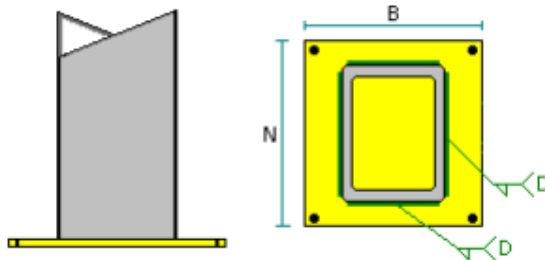
Steel connections

Data

Family: Column - Base (CB)
 Type: Base plate

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type : Prismatic member
 Section : HSS_SQR 6X6X5_8
 Material : A36
 Longitudinal offset : 0 in

CONNECTOR

Base plate

Connection type : Unstiffened
 Position on the support : Center
 N: Longitudinal dimension : 12 in
 B: Transversal dimension : 12 in
 Thickness : 0.75 in
 Material : A36
 Column weld : E70XX
 D: Column weld size (1/16 in) : 5
 Override A2/A1 ratio : No
 Include shear lug : No

Support

With pedestal : No
 Longitudinal dimension : 36 in
 Transversal dimension : 36 in
 Thickness : 16 in
 Material : C 4-60
 Include grouting : No

Anchor

Anchor position : Longitudinal position
 Rows number per side : 1
 Anchors per row : 2
 Longitudinal edge distance on the plate : 1.5 in
 Transverse edge distance on the plate : 1.5 in
 Anchor type : Headed
 Head type : Hexagonal
 Include lock nut : No
 Anchor : 3/8"
 Effective embedment depth : 12 in
 Total length : 13.245 in



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Revision:	Date:	Sheet No. 61
Project Name: Lee's Summit Market Plaza		

Material	:	F1554 Gr36
Fy	:	36 kip/in ²
Fu	:	58 kip/in ²
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
<u>Anchor reinforcement</u>		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No



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Revision:	Date:	Sheet No. 62
Project Name: Lee's Summit Market Plaza		

Steel connections

Results

Family: Column - Base (CB)
Type: Base plate
Design code: AISC 360-16 LRFD, ACI 318-11

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-95.00	0.00	0.00	3.00	3.00	Design

Design for major axis Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[in]	1.31	0.25	--	✓	
Weld size	[1/16in]	5	4	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[Kip/in ²]	4.42	0.66	DL1	0.15	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[Kip*ft/ft]	4.56	3.27	DL1	0.72	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	4.56	0.00	DL1	0.00	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[Kip/ft]	125.29	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear and axial capacity	[Kip/ft]	125.29	4.23	DL1	0.03	p. 8-9, Sec. J2.5, Sec. J2.4
Ratio	0.72					

Major axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[in]	9.00	1.50	--	✓	Sec. D.8.1
Concrete cover	[in]	13.31	3.00	--	✓	Sec. 7.7.1
Effective length	[in]	12.24	--	15.76	✓	



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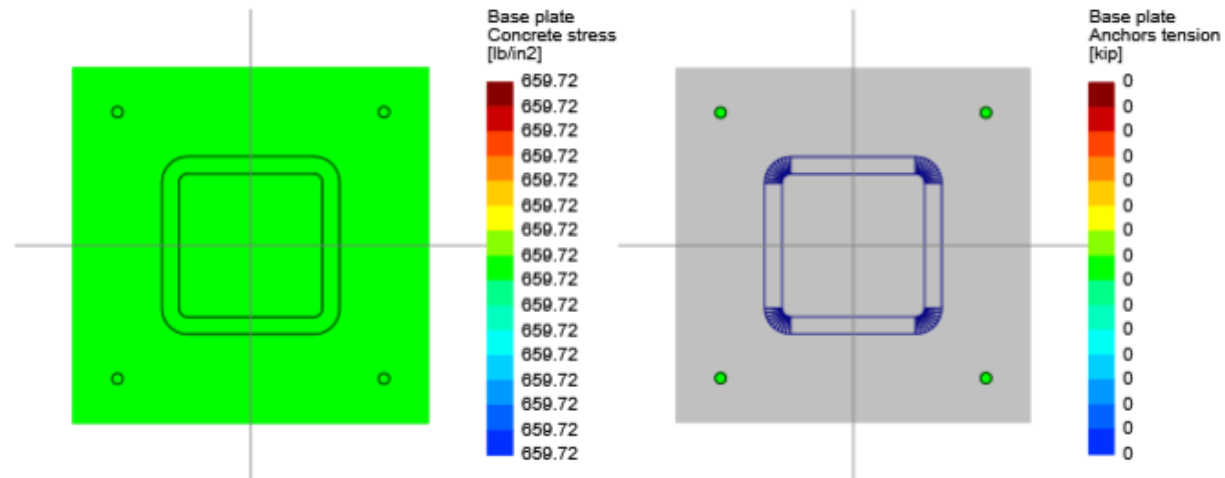
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Revision:	Date:	Sheet No. 63
Project Name: Lee's Summit Market Plaza		

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[Kip]	3.37	0.00	DL1	0.00	Eq. D-2
Breakout of anchor in tension	[Kip]	39.44	0.00	DL1	0.00	Eq. D-3, Sec. D.3.3.4.4
Pullout of anchor in tension	[Kip]	5.14	0.00	DL1	0.00	Sec. D.3.3.4.4
Anchor shear	[Kip]	1.75	0.75	DL1	0.43	Eq. D-29
Breakout of anchor in shear	[Kip]	13.32	0.75	DL1	0.06	Table D.4.1.1, Sec. D.4.3
Breakout of group of anchors in shear	[Kip]	15.04	3.00	DL1	0.20	Table D.4.1.1, Sec. D.4.3
Pryout of anchor in shear	[Kip]	78.88	0.75	DL1	0.01	Eq. D-3, Table D.4.1.1, Sec. D.4.3
Ratio	0.43					
Global critical strength ratio	0.72					

Major axis

Maximum compression and tension (DL1)



Maximum bearing pressure	659.72	[psi]
Minimum bearing pressure	659.72	[psi]
Maximum anchor tension	0.00	[Kip]
Minimum anchor tension	0.00	[Kip]
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-4.50	-4.50	0.75	0.00
2	-4.50	4.50	0.75	0.00
3	4.50	4.50	0.75	0.00
4	4.50	-4.50	0.75	0.00



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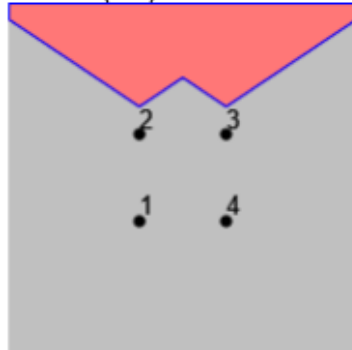
Date:

Sheet No. 64

Project Name: Lee's Summit Market Plaza

Major axis

Results for shear breakout (DL1)



Group	Area [in ²]	Shear [Kip]	Anchors
1	576.00	3.00	1, 2, 3, 4
2	576.00	1.50	2, 3



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Revision:	Date:	Sheet No. 65
Project Name: Lee's Summit Market Plaza		

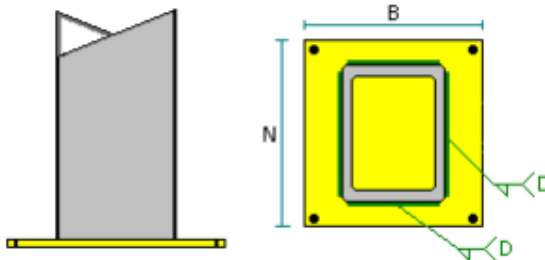
Steel connections

Data

Family: Column - Base (CB)
Type: Base plate

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	HSS_SQR 6X6X5_8
Material	:	A36
Longitudinal offset	:	2.5 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	12 in
B: Transversal dimension	:	12 in
Thickness	:	0.75 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	5
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	36 in
Transversal dimension	:	36 in
Thickness	:	16 in
Material	:	C 4-60
Include grouting	:	No

Anchor

Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1.5 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/8"
Effective embedment depth	:	12 in
Total length	:	13.245 in



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Revision:	Date:	Sheet No. 66
Project Name: Lee's Summit Market Plaza		

Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
<u>Anchor reinforcement</u>		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No



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Revision:	Date:	Sheet No. 67
Project Name: Lee's Summit Market Plaza		

Steel connections

Results

Family: Column - Base (CB)
Type: Base plate
Design code: AISC 360-16 LRFD, ACI 318-11

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-50.00	0.00	0.00	3.00	3.00	Design

Design for major axis Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[in]	1.31	0.25	--	✓	
Weld size	[1/16in]	5	4	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[Kip/in ²]	4.42	0.59	DL1	0.13	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[Kip*ft/ft]	4.56	2.93	DL1	0.64	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	4.56	0.18	DL1	0.04	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[Kip/ft]	125.29	0.59	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4, HSS Manual p. 7-10
Elastic method weld shear and axial capacity	[Kip/ft]	125.29	4.23	DL1	0.03	p. 8-9, Sec. J2.5, Sec. J2.4

Ratio 0.64

Major axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[in]	9.00	1.50	--	✓	Sec. D.8.1
Concrete cover	[in]	13.31	3.00	--	✓	Sec. 7.7.1
Effective length	[in]	12.24	--	15.76	✓	



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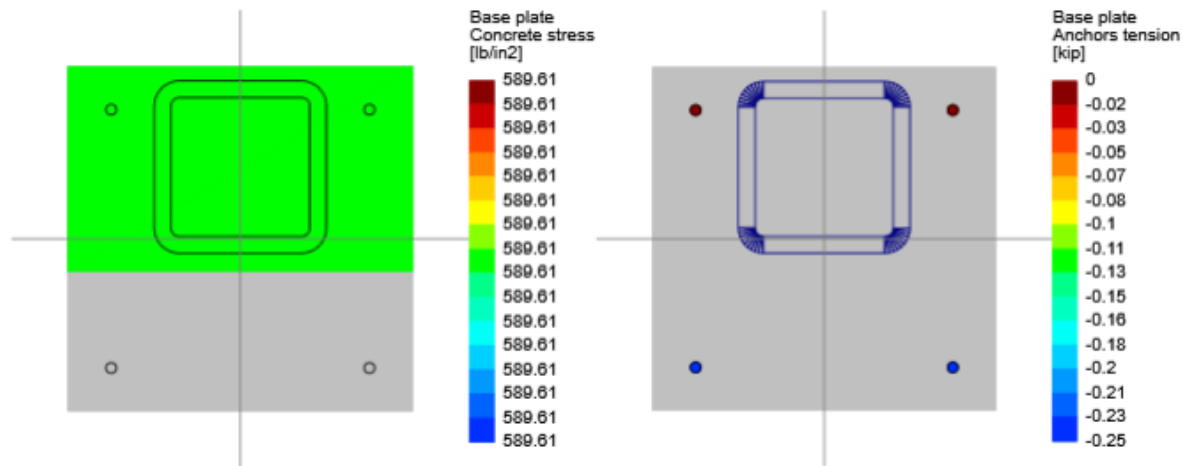
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Revision:	Date:	Sheet No. 68
Project Name: Lee's Summit Market Plaza		

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[Kip]	3.37	0.25	DL1	0.07	Eq. D-2
Breakout of anchor in tension	[Kip]	39.44	0.25	DL1	0.01	Eq. D-3, Sec. D.3.3.4.4
Breakout of group of anchors in tension	[Kip]	47.81	0.49	DL1	0.01	Eq. D-4, Sec. D.3.3.4.4
Pullout of anchor in tension	[Kip]	5.14	0.25	DL1	0.05	Sec. D.3.3.4.4
Anchor shear	[Kip]	1.75	0.75	DL1	0.43	Eq. D-29
Breakout of anchor in shear	[Kip]	13.32	0.75	DL1	0.06	Table D.4.1.1, Sec. D.4.3
Breakout of group of anchors in shear	[Kip]	15.04	3.00	DL1	0.20	Table D.4.1.1, Sec. D.4.3
Pryout of anchor in shear	[Kip]	78.88	0.75	DL1	0.01	Eq. D-3, Table D.4.1.1, Sec. D.4.3
Pryout of group of anchors in shear	[Kip]	95.63	1.50	DL1	0.02	Eq. D-4, Table D.4.1.1, Sec. D.4.3
Interaction of tensile and shear forces	[Kip]	1.20	0.00	DL1	0.00	Eq. D-2, Eq. D-3, Sec. D.3.3.4.4, Eq. D-4, Eq. D-29, Table D.4.1.1, Sec. D.4.3, Sec. D.7
Ratio					0.43	
Global critical strength ratio					0.64	

Major axis

Maximum compression and tension (DL1)



Maximum bearing pressure	589.61	[psi]
Minimum bearing pressure	589.61	[psi]
Maximum anchor tension	0.25	[Kip]
Minimum anchor tension	0.00	[Kip]
Neutral axis angle	0.00	
Bearing length	7.14	[in]



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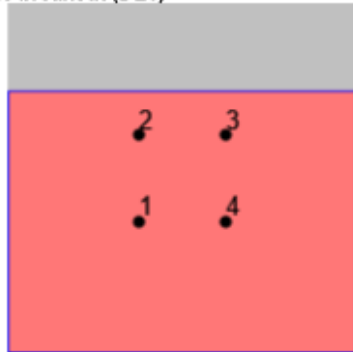
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Revision:	Date:	Sheet No. 69
Project Name: Lee's Summit Market Plaza		

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-4.50	-4.50	0.75	0.25
2	-4.50	4.50	0.75	0.00
3	4.50	4.50	0.75	0.00
4	4.50	-4.50	0.75	0.25

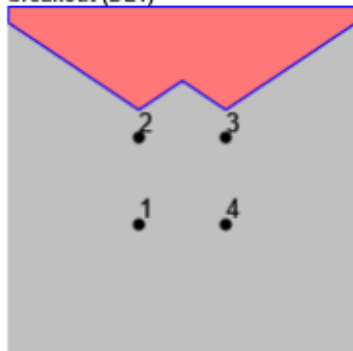
Major axis

Results for tensile breakout (DL1)



Group	Area [in2]	Tension [Kip]	Anchors
1	972.00	0.49	1, 4

Results for shear breakout (DL1)



Group	Area [in2]	Shear [Kip]	Anchors
1	576.00	3.00	1, 2, 3, 4
2	576.00	1.50	2, 3



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Revision:	Date:	Sheet No. 70
Project Name: Lee's Summit Market Plaza		

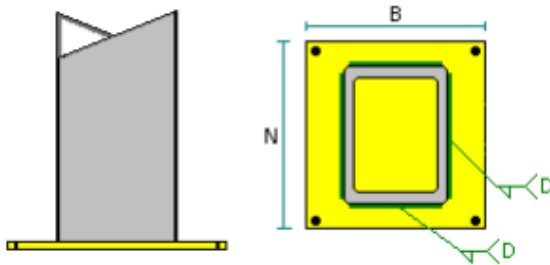
Steel connections

Data

Family: Column - Base (CB)
Type: Base plate

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	HSS_SQR 4-1_2X4-1_2X3_8
Material	:	A36
Longitudinal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	11 in
B: Transversal dimension	:	11 in
Thickness	:	0.75 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	3
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	36 in
Transversal dimension	:	36 in
Thickness	:	16 in
Material	:	C 4-60
Include grouting	:	No

Anchor

Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1.5 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/8"
Effective embedment depth	:	12 in
Total length	:	13.245 in



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Revision:	Date:	Sheet No. 71
Project Name: Lee's Summit Market Plaza		

Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
<u>Anchor reinforcement</u>		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No



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Revision:	Date:	Sheet No. 72
Project Name: Lee's Summit Market Plaza		

Steel connections

Results

Family: Column - Base (CB)
Type: Base plate
Design code: AISC 360-16 LRFD, ACI 318-11

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-50.00	0.00	0.00	3.00	3.00	Design

Design for major axis Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[in]	1.31	0.25	--	✓	
Weld size	[1/16in]	3	3	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[Kip/in ²]	4.42	0.41	DL1	0.09	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[Kip*ft/ft]	4.56	2.34	DL1	0.51	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	4.56	0.00	DL1	0.00	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[Kip/ft]	75.17	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear and axial capacity	[Kip/ft]	75.17	5.21	DL1	0.07	p. 8-9, Sec. J2.5, Sec. J2.4
Ratio	0.51					

Major axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[in]	8.00	1.50	--	✓	Sec. D.8.1
Concrete cover	[in]	13.81	3.00	--	✓	Sec. 7.7.1
Effective length	[in]	12.24	--	15.76	✓	



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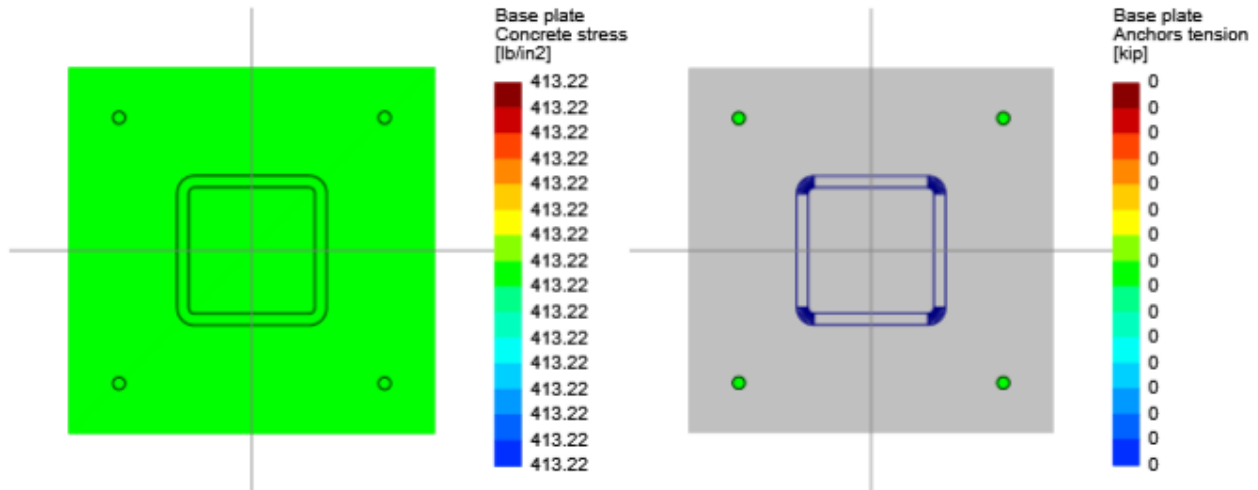
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Revision:	Date:	Sheet No. 73
Project Name: Lee's Summit Market Plaza		

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[Kip]	3.37	0.00	DL1	0.00	Eq. D-2
Breakout of anchor in tension	[Kip]	41.07	0.00	DL1	0.00	Eq. D-3, Sec. D.3.3.4.4
Pullout of anchor in tension	[Kip]	5.14	0.00	DL1	0.00	Sec. D.3.3.4.4
Anchor shear	[Kip]	1.75	0.75	DL1	0.43	Eq. D-29
Breakout of anchor in shear	[Kip]	13.81	0.75	DL1	0.05	Table D.4.1.1, Sec. D.4.3
Breakout of group of anchors in shear	[Kip]	15.19	3.00	DL1	0.20	Table D.4.1.1, Sec. D.4.3
Pryout of anchor in shear	[Kip]	82.14	0.75	DL1	0.01	Eq. D-3, Table D.4.1.1, Sec. D.4.3
Ratio		0.43				
Global critical strength ratio		0.51				

Major axis

Maximum compression and tension (DL1)



Maximum bearing pressure	413.22	[psi]
Minimum bearing pressure	413.22	[psi]
Maximum anchor tension	0.00	[Kip]
Minimum anchor tension	0.00	[Kip]
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-4.00	-4.00	0.75	0.00
2	-4.00	4.00	0.75	0.00
3	4.00	4.00	0.75	0.00
4	4.00	-4.00	0.75	0.00



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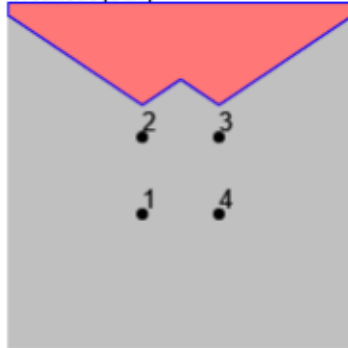
Date:

Sheet No. 74

Project Name: Lee's Summit Market Plaza

Major axis

Results for shear breakout (DL1)



Group	Area [in ²]	Shear [Kip]	Anchors
1	576.00	3.00	1, 2, 3, 4
2	576.00	1.50	2, 3



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Revision:	Date:	Sheet No. 75
Project Name: Lee's Summit Market Plaza		

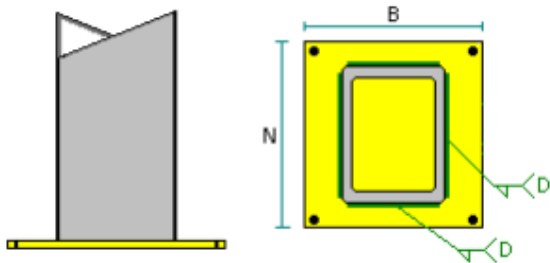
Steel connections

Data

Family: Column - Base (CB)
Type: Base plate

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type : Prismatic member
Section : HSS_SQR 4X4X3_8
Material : A36
Longitudinal offset : 0 in

CONNECTOR

Base plate

Connection type : Unstiffened
Position on the support : Center
N: Longitudinal dimension : 10 in
B: Transversal dimension : 10 in
Thickness : 0.75 in
Material : A36
Column weld : E70XX
D: Column weld size (1/16 in) : 3
Override A2/A1 ratio : No
Include shear lug : No

Support

With pedestal : No
Longitudinal dimension : 36 in
Transversal dimension : 36 in
Thickness : 16 in
Material : C 4-60
Include grouting : No

Anchor

Anchor position : Longitudinal position
Rows number per side : 1
Anchors per row : 2
Longitudinal edge distance on the plate : 1.5 in
Transverse edge distance on the plate : 1.5 in
Anchor type : Headed
Head type : Hexagonal
Include lock nut : No
Anchor : 3/8"
Effective embedment depth : 12 in
Total length : 13.245 in



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Revision:	Date:	Sheet No. 76
Project Name: Lee's Summit Market Plaza		

Material : F1554 Gr36
Fy : 36 kip/in2
Fu : 58 kip/in2
Cracked concrete : No
Brittle steel : No
Anchors welded to base plate : No

Anchor reinforcement

Type of reinforcement : Primary
Tension reinforcement : No
Shear reinforcement : No



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Revision:	Date:	Sheet No. 77
Project Name: Lee's Summit Market Plaza		

Steel connections

Results

Family: Column - Base (CB)
Type: Base plate
Design code: AISC 360-16 LRFD, ACI 318-11

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-50.00	0.00	0.00	3.00	3.00	Design

Design for major axis Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[in]	1.31	0.25	--	✓	
Weld size	[1/16in]	3	3	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[Kip/in ²]	4.42	0.50	DL1	0.11	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[Kip*ft/ft]	4.56	2.40	DL1	0.53	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	4.56	0.00	DL1	0.00	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[Kip/ft]	75.17	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear and axial capacity	[Kip/ft]	75.17	6.10	DL1	0.08	p. 8-9, Sec. J2.5, Sec. J2.4

Ratio 0.53

Major axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[in]	7.00	1.50	--	✓	Sec. D.8.1
Concrete cover	[in]	14.31	3.00	--	✓	Sec. 7.7.1
Effective length	[in]	12.24	--	15.76	✓	



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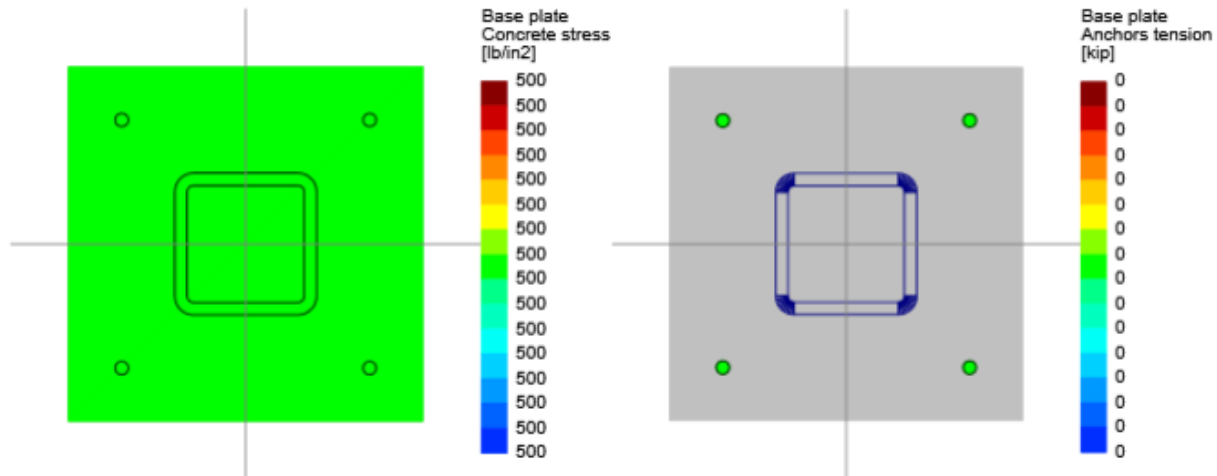
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Revision:	Date:	Sheet No. 78
Project Name: Lee's Summit Market Plaza		

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[Kip]	3.37	0.00	DL1	0.00	Eq. D-2
Breakout of anchor in tension	[Kip]	42.74	0.00	DL1	0.00	Eq. D-3, Sec. D.3.3.4.4
Pullout of anchor in tension	[Kip]	5.14	0.00	DL1	0.00	Sec. D.3.3.4.4
Anchor shear	[Kip]	1.75	0.75	DL1	0.43	Eq. D-29
Breakout of anchor in shear	[Kip]	14.24	0.75	DL1	0.05	Table D.4.1.1, Sec. D.4.3
Breakout of group of anchors in shear	[Kip]	15.34	3.00	DL1	0.20	Table D.4.1.1, Sec. D.4.3
Pryout of anchor in shear	[Kip]	85.48	0.75	DL1	0.01	Eq. D-3, Table D.4.1.1, Sec. D.4.3
Ratio					0.43	
Global critical strength ratio					0.53	

Major axis

Maximum compression and tension (DL1)



Maximum bearing pressure	500.00	[psi]
Minimum bearing pressure	500.00	[psi]
Maximum anchor tension	0.00	[Kip]
Minimum anchor tension	0.00	[Kip]
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-3.50	-3.50	0.75	0.00
2	-3.50	3.50	0.75	0.00
3	3.50	3.50	0.75	0.00
4	3.50	-3.50	0.75	0.00



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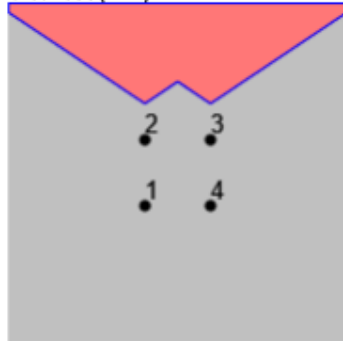
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Sheet No. 79

Project Name: Lee's Summit Market Plaza

Major axis

Results for shear breakout (DL1)



Group	Area [in ²]	Shear [Kip]	Anchors
1	576.00	3.00	1, 2, 3, 4
2	576.00	1.50	2, 3



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Revision:	Date:	Sheet No. 80
Project Name: Lee's Summit Market Plaza		

BRACED FRAME CONNECTIONS

Project:
Project no:
Author:



Project data

Project name
Project number
Author
Description
Date 10/27/2023
Code AISC/ACI

Material

Steel A36, A500, Gr. C, A992



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Revision:	Date:	Sheet No. 81
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Project item B.6 at Lower Roof

Design

Name B.6 at Lower Roof
 Description
 Analysis Stress, strain/ simplified loading
 Design code AISC - LRFD (2016)

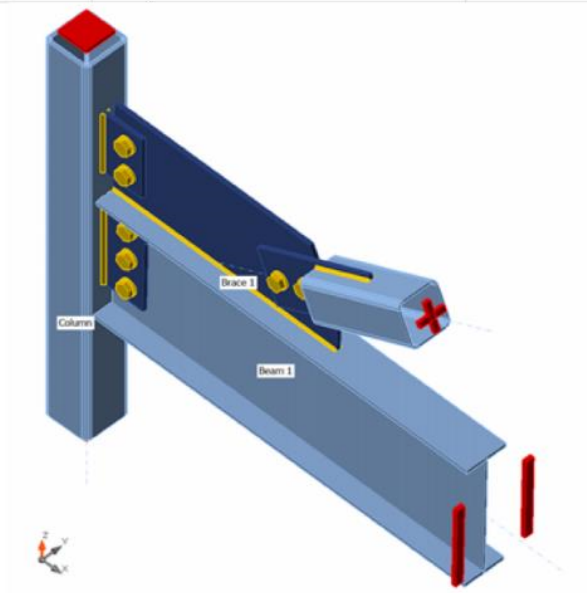
Members

Geometry

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [in]	Offset ey [in]	Offset ez [in]
Column	4 - HSS(Imp)4-1/2X4-1/2X3/8	0,00	90,00	0,00	0,000	0,000	0,000
Beam 1	5 - W(Imp)12X19	0.00	-1.19	0.00	0.000	0.000	0.000
Brace 1	6 - HSS(Imp)4X4X3/16	0.00	24,43	0.00	0.000	0.000	0.000

Supports and forces

Name	Support	Forces in	X [in]
Column / begin	N-Vy-Vz-Mx-My-Mz	Node	0,000
Column / end	N-Vy-Vz-Mx-My-Mz	Node	0.000
Beam 1 / end	Vy-Mx-Mz	Bolts	4.871
Brace 1 / end	Mx-My-Mz	Bolts	0,000





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Revision:	Date:	Sheet No. 82
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Cross-sections

Name	Material
4 - HSS(Imp)4-1/2X4-1/2X3/8	A500, Gr. C
5 - W(Imp)12X19	A992
6 - HSS(Imp)4X4X3/16	A500, Gr. C

Bolts

Name	Bolt assembly	Diameter [in]	f_u [ksi]	Gross area [in ²]
3/4 A325	3/4 A325	0.750	120.00	0.442

Load effects (Equilibrium not required)

Name	Member	N [kip]	Vy [kip]	Vz [kip]	Mx [kip.ft]	My [kip.ft]	Mz [kip.ft]
LE1	Beam 1 / End	0.000	0.000	-15.000	0.000	0.000	0.000
	Brace 1 / End	12.000	0.000	0.000	0.000	0.000	0.000
LE2	Beam 1 / End	0.000	0.000	-15.000	0.000	0.000	0.000
	Brace 1 / End	-12.000	0.000	0.000	0.000	0.000	0.000

Check

Summary

Name	Value	Check status
Analysis	100.0%	OK
Plates	0.25 < 5.00%	OK
Bolts	59.0 < 100%	OK
Welds	76.0 < 100%	OK
Buckling	Not calculated	
GMNA	Not calculated	

Plates

Name	Material	t_p [in]	Loads	σ_{Ed} [ksi]	ϵ_{pl} [%]	$\sigma_{c,Ed}$ [ksi]	Status
Column	A500, Gr. C	3/8	LE2	41.47	0.25	0.00	OK
Beam 1-bfl 1	A992	3/8	LE1	25.42	0.00	0.00	OK
Beam 1-tfl 1	A992	3/8	LE2	26.15	0.00	0.00	OK
Beam 1-w 1	A992	1/4	LE2	45.06	0.21	2.89	OK
Brace 1	A500, Gr. C	3/16	LE2	13.09	0.00	0.00	OK
Beam 1 Shear Plate	A36	3/8	LE2	28.82	0.03	2.52	OK
Brace 1 Gusset Plate	A36	3/8	LE2	22.37	0.00	1.74	OK
BR1 Gusset Shear Plate	A36	3/8	LE1	25.13	0.00	1.29	OK
BR1 Paddle Plate	A36	3/8	LE1	24.85	0.00	1.51	OK



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Revision:	Date:	Sheet No. 83
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:

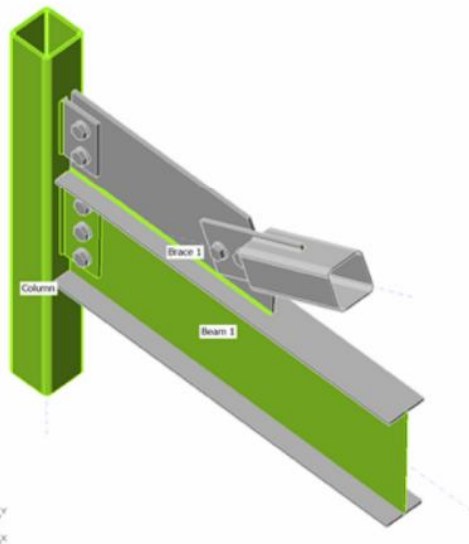


Design data

Material	F_y [ksi]	ϵ_{lim} [%]
A500, Gr. C	46.00	5.00
A992	50.00	5.00
A36	36.00	5.00

Symbol explanation

t_p	Plate thickness
σ_{Ed}	Equivalent stress
ϵ_{pl}	Plastic strain
$\sigma_{c,Ed}$	Contact stress
F_y	Yield strength
ϵ_{lim}	Limit of plastic strain



Overall check, LE2



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Job No. 23-23

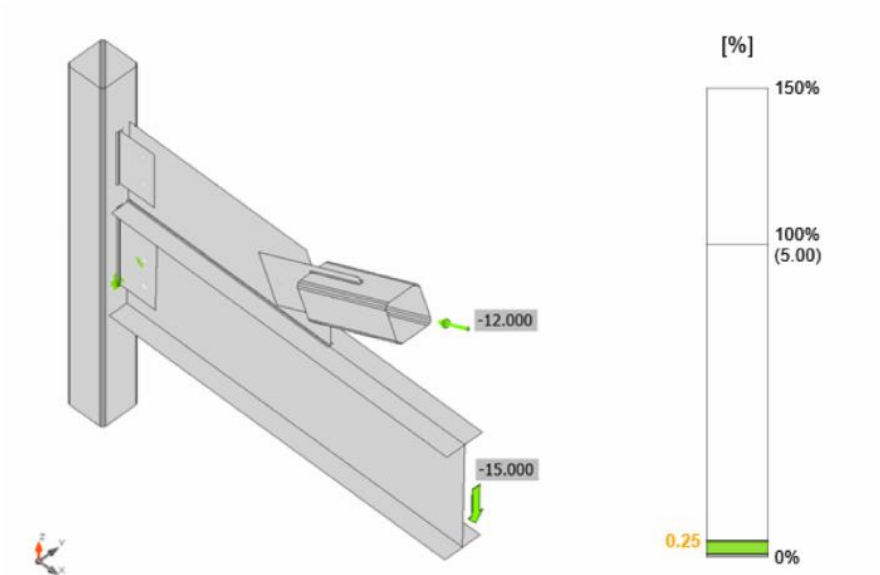
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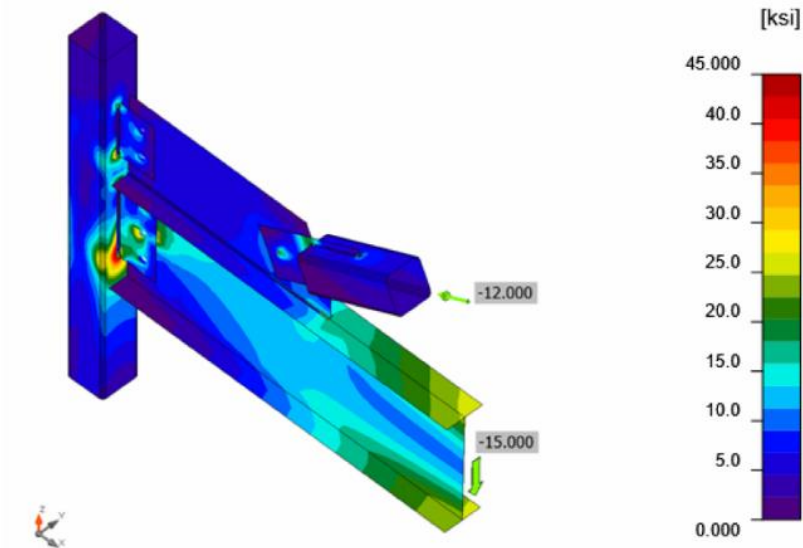
Sheet No. 84

Project Name: Lee's Summit Market Plaza

Project:
Project no:
Author:



Strain check, LE2



Equivalent stress, LE2



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Revision:	Date:	Sheet No. 85
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Bolts

Shape	Item	Grade	Loads	F_t [kip]	V [kip]	$\phi R_{n,bearing}$ [kip]	U_t [%]	U_s [%]	U_{ts} [%]	Status
	B1	3/4 A325 - 1	LE2	1,212	4,297	17,274	4,07	24,87	-	OK
	B2	3/4 A325 - 1	LE2	1,488	10,541	20,728	4,99	58,97	-	OK
	B3	3/4 A325 - 1	LE2	0,691	4,079	17,274	2,32	23,62	-	OK
	B4	3/4 A325 - 1	LE2	0,573	3,557	18,737	1,92	19,90	-	OK
	B5	3/4 A325 - 1	LE2	0,618	4,037	30,835	2,07	22,58	-	OK
	B6	3/4 A325 - 1	LE2	0,722	6,266	30,835	2,42	35,05	-	OK
	B7	3/4 A325 - 1	LE2	1,526	6,305	30,835	5,12	35,27	-	OK

Design data

Grade	$\phi R_{n,tension}$ [kip]	$\phi R_{n,shear}$ [kip]
3/4 A325 - 1	29,795	17,877

Symbol explanation

F_t	Tension force
V	Resultant of bolt shear forces V_y and V_z in shear planes
$\phi R_{n,bearing}$	Bolt bearing resistance
U_t	Utilization in tension
U_s	Utilization in shear
U_{ts}	Utilization in tension and shear
$\phi R_{n,tension}$	Bolt tension resistance - AISC 360-16 – J3.6
$\phi R_{n,shear}$	Bolt shear resistance - AISC 360-16 – J3.6

Detailed result for B2

Tension resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nt} \cdot A_b = 29,795 \text{ kip} \geq F_t = 1,488 \text{ kip}$$

Where:

$$F_{nt} = 89,92 \text{ ksi} \quad \text{— nominal tensile stress AISC 360-16 – Table J3.2}$$

$$A_b = 0,442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0,750 \quad \text{— resistance factor}$$



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 86
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Shear resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nv} \cdot A_b = 17.877 \text{ kip} \geq V = 10.541 \text{ kip}$$

Where:

$$F_{nv} = 53.95 \text{ ksi} \quad \text{— nominal shear stress AISC 360-16 – Table J3.2}$$

$$A_b = 0.442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0.750 \quad \text{— resistance factor}$$

Bearing resistance check (AISC 360-16 – J3-6)

$$R_n = 1.200 \cdot l_c \cdot t \cdot F_u \leq 2.400 \cdot d \cdot t \cdot F_u$$

$$\phi R_n = 20.728 \text{ kip} \geq V = 10.541 \text{ kip}$$

Where:

$$l_c = 11.468 \text{ in} \quad \text{— clear distance, in the direction of the force, between the edge of the hole and the edge of the adjacent hole or edge of the material}$$

$$t = 0.236 \text{ in} \quad \text{— thickness of the plate}$$

$$d = 0.750 \text{ in} \quad \text{— diameter of a bolt}$$

$$F_u = 65.00 \text{ ksi} \quad \text{— tensile strength of the connected material}$$

$$\phi = 0.750 \quad \text{— resistance factor for bearing at bolt holes}$$

Interaction of tension and shear check (AISC 360-16 – J3-2)

The required stress, in either shear or tension, is less than or equal to 30% of the corresponding available stress and the effects of combined stresses need not be investigated.



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Revision:	Date:	Sheet No. 87
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Welds

Item	Edge	Xu	t _w [in]	w [in]	L [in]	L _c [in]	Loads	F _n [kip]	φR _n [kip]	Ut [%]	Status
Column-w 1	Beam 1 Shear Plate	E70xx	▲ 3/16	▲ 1/4	8,945	0,308	LE2	1,849	2,432	76,04	OK
		E70xx	▲ 3/16	▲ 1/4	8,945	0,308	LE2	1,784	2,355	75,77	OK
Beam 1-tfl 1	Brace 1 Gusset Plate	E70xx	▲ 1/8	▲ 3/16	22,827	0,992	LE1	4,117	5,489	75,01	OK
		E70xx	▲ 1/8	▲ 3/16	22,827	0,992	LE2	3,997	5,475	73,01	OK
Column-w 1	BR1 Gusset Shear Plate	E70xx	▲ 3/16	▲ 1/4	5,963	0,314	LE1	1,781	2,371	75,13	OK
		E70xx	▲ 3/16	▲ 1/4	5,963	0,314	LE1	1,582	2,286	69,20	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE2	0,989	1,311	75,43	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE2	0,601	1,311	45,86	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE2	0,742	1,311	56,65	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE2	0,991	1,311	75,58	OK

Symbol explanation

t _w	Throat thickness of weld
w	Leg size of weld
L	Length of weld
L _c	Length of weld critical element
F _n	Force in weld critical element
φR _n	Weld resistance - AISC 360-16 – J2-4
Ut	Utilization
▲	Fillet weld

Detailed result for Column-w 1 / Beam 1 Shear Plate

Weld resistance check (AISC 360-16 – J2-4)

$$\phi R_n = \phi \cdot F_{nw} \cdot A_{we} = 2,432 \text{ kip} \geq F_n = 1,849 \text{ kip}$$

Where:

$F_{nw} = 59,47 \text{ ksi}$ – nominal stress of weld material:

- $F_{nw} = 0,6 \cdot F_{EXX} \cdot (1 + 0,5 \cdot \sin^{1,5} \theta)$, where:
 - $F_{EXX} = 70,00 \text{ ksi}$ – electrode classification number, i.e. minimum specified tensile strength
 - $\theta = 62,19^\circ$ – angle of loading measured from the weld longitudinal axis

$A_{we} = 0,055 \text{ in}^2$ – effective area of weld critical element

$\phi = 0,75$ – resistance factor for welded connections



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Revision:	Date:	Sheet No. 88
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Buckling

Buckling analysis was not calculated.



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Revision:	Date:	Sheet No. 89
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Project item B at Lower Roof

Design

Name B at Lower Roof
 Description
 Analysis Stress, strain/ simplified loading
 Design code AISC - LRFD (2016)

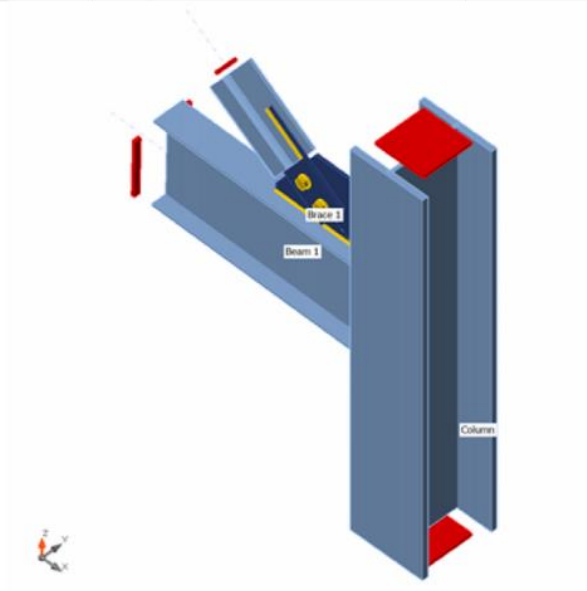
Members

Geometry

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [in]	Offset ey [in]	Offset ez [in]
Column	11 - W(Imp)10X68	0,00	90,00	90,00	0,000	0,000	0,000
Beam 1	5 - W(Imp)12X19	180,00	1,19	0,00	0,000	0,000	0,000
Brace 1	6 - HSS(Imp)4X4X3/16	180,00	35,29	0,00	0,000	0,000	0,000

Supports and forces

Name	Support	Forces in	X [in]
Column / begin	N-Vy-Vz-Mx-My-Mz	Node	0,000
Column / end	N-Vy-Vz-Mx-My-Mz	Node	0,000
Beam 1 / end	Vy-Mx-Mz	Bolts	7,686
Brace 1 / end	Mx-My-Mz	Bolts	0,000





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Revision:	Date:	Sheet No. 90
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Cross-sections

Name	Material
11 - W(Imp)10X68	A992
5 - W(Imp)12X19	A992
6 - HSS(Imp)4X4X3/16	A500, Gr. C

Bolts

Name	Bolt assembly	Diameter [in]	f_u [ksi]	Gross area [in ²]
3/4 A325	3/4 A325	0.750	120.00	0.442

Load effects (Equilibrium not required)

Name	Member	N [kip]	Vy [kip]	Vz [kip]	Mx [kip.ft]	My [kip.ft]	Mz [kip.ft]
LE1	Beam 1 / End	0.000	0.000	-15.000	0.000	0.000	0.000
	Brace 1 / End	12.000	0.000	0.000	0.000	0.000	0.000
LE2	Beam 1 / End	0.000	0.000	-15.000	0.000	0.000	0.000
	Brace 1 / End	-12.000	0.000	0.000	0.000	0.000	0.000

Check

Summary

Name	Value	Check status
Analysis	100.0%	OK
Plates	0.56 < 5.00%	OK
Bolts	39.5 < 100%	OK
Welds	80.1 < 100%	OK
Buckling	Not calculated	

Plates

Name	Material	t_p [in]	Loads	σ_{Ed} [ksi]	ϵ_{pl} [%]	$\sigma_{c,Ed}$ [ksi]	Status
Column-bfl 1	A992	3/4	LE2	9.31	0.00	0.00	OK
Column-tfl 1	A992	3/4	LE2	10.71	0.00	0.00	OK
Column-w 1	A992	7/16	LE2	45.07	0.22	0.00	OK
Beam 1-bfl 1	A992	3/8	LE2	19.73	0.00	0.00	OK
Beam 1-tfl 1	A992	3/8	LE1	20.05	0.00	0.00	OK
Beam 1-w 1	A992	1/4	LE2	41.18	0.00	2.59	OK
Brace 1	A500, Gr. C	3/16	LE1	13.53	0.00	0.00	OK
Beam 1 Shear Plate	A36	3/8	LE2	32.56	0.56	2.26	OK
Brace 1 Gusset Plate	A36	3/8	LE2	21.58	0.00	2.14	OK
BR1 Gusset Shear Plate	A36	3/8	LE2	32.53	0.45	2.46	OK
BR1 Paddle Plate	A36	3/8	LE1	26.21	0.00	1.44	OK



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Date: 11/01/2023

Job No. 23-23

Revision:

Date:

Sheet No. 91

Project Name: Lee's Summit Market Plaza

Project:
Project no:
Author:

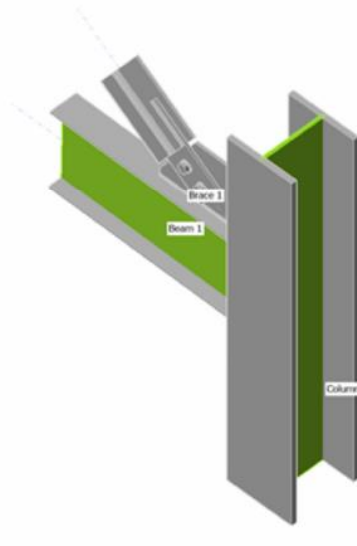


Design data

Material	F_y [ksi]	ϵ_{lim} [%]
A992	50.00	5.00
A500, Gr. C	46.00	5.00
A36	36.00	5.00

Symbol explanation

t_p	Plate thickness
σ_{Ed}	Equivalent stress
ϵ_{pl}	Plastic strain
$\sigma_{c,Ed}$	Contact stress
F_y	Yield strength
ϵ_{lim}	Limit of plastic strain



Overall check, LE2



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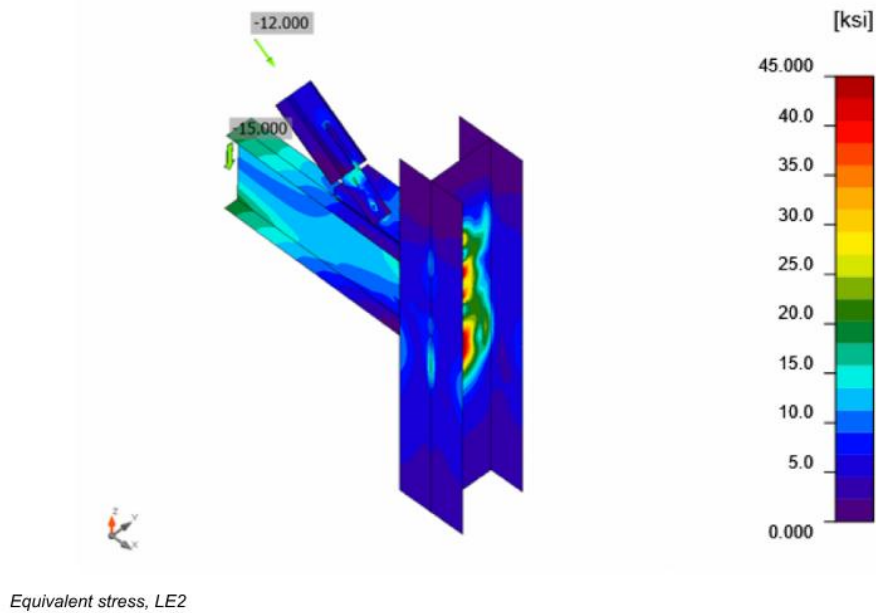
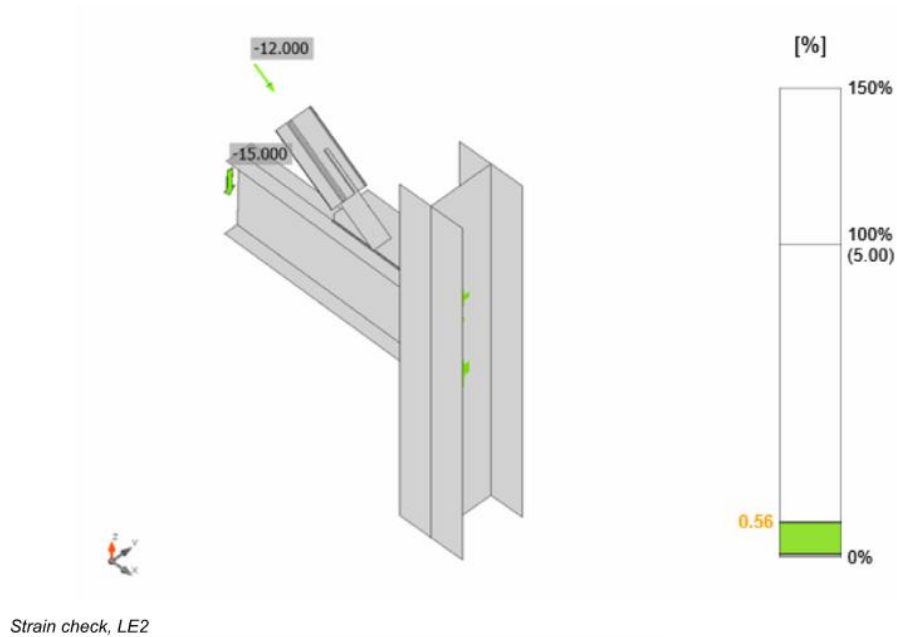
Revision:

Date:

Sheet No. 92

Project Name: Lee's Summit Market Plaza

Project:
Project no:
Author:





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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 93
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Bolts

Shape	Item	Grade	Loads	F_t [kip]	V [kip]	$\phi R_{n,bearing}$ [kip]	U_t [%]	U_s [%]	U_{ts} [%]	Status
	B1	3/4 A325 - 1	LE2	1,005	4,483	17,274	3,37	25,95	-	OK
	B2	3/4 A325 - 1	LE2	0,893	7,057	20,728	3,00	39,48	-	OK
	B3	3/4 A325 - 1	LE2	0,544	4,367	17,274	1,83	25,28	-	OK
	B4	3/4 A325 - 1	LE2	1,215	4,298	18,741	4,08	24,04	-	OK
	B5	3/4 A325 - 1	LE2	0,801	6,074	30,835	2,69	33,98	-	OK
	B6	3/4 A325 - 1	LE2	0,644	6,203	30,835	2,16	34,70	-	OK
	B7	3/4 A325 - 1	LE2	0,919	6,174	30,835	3,08	34,54	-	OK

Design data

Grade	$\phi R_{n,tension}$ [kip]	$\phi R_{n,shear}$ [kip]
3/4 A325 - 1	29.795	17.877

Symbol explanation

F_t	Tension force
V	Resultant of bolt shear forces V_y and V_z in shear planes
$\phi R_{n,bearing}$	Bolt bearing resistance
U_t	Utilization in tension
U_s	Utilization in shear
U_{ts}	Utilization in tension and shear
$\phi R_{n,tension}$	Bolt tension resistance - AISC 360-16 – J3.6
$\phi R_{n,shear}$	Bolt shear resistance - AISC 360-16 – J3.6

Detailed result for B2

Tension resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nt} \cdot A_b = 29.795 \text{ kip} \geq F_t = 0.893 \text{ kip}$$

Where:

$F_{nt} = 89,92 \text{ ksi}$ – nominal tensile stress AISC 360-16 – Table J3.2

$A_b = 0,442 \text{ in}^2$ – gross bolt cross-sectional area

$\phi = 0.750$ – resistance factor



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 94
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Shear resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nv} \cdot A_b = 17.877 \text{ kip} \geq V = 7.057 \text{ kip}$$

Where:

$$F_{nv} = 53.95 \text{ ksi} \quad \text{— nominal shear stress AISC 360-16 – Table J3.2}$$

$$A_b = 0.442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0.750 \quad \text{— resistance factor}$$

Bearing resistance check (AISC 360-16 – J3-6)

$$R_n = 1.200 \cdot l_c \cdot t \cdot F_u \leq 2.400 \cdot d \cdot t \cdot F_u$$

$$\phi R_n = 20.728 \text{ kip} \geq V = 7.057 \text{ kip}$$

Where:

$$l_c = 7.913 \text{ in} \quad \text{— clear distance, in the direction of the force, between the edge of the hole and the edge of the adjacent hole or edge of the material}$$

$$t = 0.236 \text{ in} \quad \text{— thickness of the plate}$$

$$d = 0.750 \text{ in} \quad \text{— diameter of a bolt}$$

$$F_u = 65.00 \text{ ksi} \quad \text{— tensile strength of the connected material}$$

$$\phi = 0.750 \quad \text{— resistance factor for bearing at bolt holes}$$

Interaction of tension and shear check (AISC 360-16 – J3-2)

The required stress, in either shear or tension, is less than or equal to 30% of the corresponding available stress and the effects of combined stresses need not be investigated.



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 95
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Welds

Item	Edge	Xu	t _w [in]	w [in]	L [in]	L _c [in]	Loads	F _n [kip]	φR _n [kip]	Ut [%]	Status
Column-w 1	Beam 1 Shear Plate	E70xx	▲ 3/16	▲ 1/4	8,923	0,446	LE2	2,860	3,727	76,75	OK
		E70xx	▲ 3/16	▲ 1/4	8,923	0,446	LE2	2,891	3,727	77,58	OK
Beam 1-tfl 1	Brace 1 Gusset Plate	E70xx	▲ 1/8	▲ 3/16	14,834	0,742	LE2	1,779	4,055	43,87	OK
		E70xx	▲ 1/8	▲ 3/16	14,834	0,742	LE1	1,840	4,039	45,55	OK
Column-w 1	BR1 Gusset Shear Plate	E70xx	▲ 3/16	▲ 1/4	5,972	0,427	LE2	2,761	3,446	80,12	OK
		E70xx	▲ 3/16	▲ 1/4	5,972	0,427	LE2	2,762	3,449	80,08	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8	▲ 3/16	5,925	0,312	LE1	0,628	1,302	48,24	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE1	0,994	1,311	75,83	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE2	0,988	1,311	75,42	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8	▲ 3/16	5,963	0,314	LE2	0,698	1,311	53,23	OK

Symbol explanation

t _w	Throat thickness of weld
w	Leg size of weld
L	Length of weld
L _c	Length of weld critical element
F _n	Force in weld critical element
φR _n	Weld resistance - AISC 360-16 - J2-4
Ut	Utilization
▲	Fillet weld

Detailed result for Column-w 1 / BR1 Gusset Shear Plate

Weld resistance check (AISC 360-16 - J2-4)

$$\phi R_n = \phi \cdot F_{nw} \cdot A_{we} = 3,446 \text{ kip} \geq F_n = 2,761 \text{ kip}$$

Where:

$F_{nw} = 60,93 \text{ ksi}$ — nominal stress of weld material:

- $F_{nw} = 0,6 \cdot F_{EXX} \cdot (1 + 0,5 \cdot \sin^{1,5} \theta)$, where:
 - $F_{EXX} = 70,00 \text{ ksi}$ — electrode classification number, i.e. minimum specified tensile strength
 - $\theta = 68,91^\circ$ — angle of loading measured from the weld longitudinal axis

$A_{we} = 0,075 \text{ in}^2$ — effective area of weld critical element

$\phi = 0,75$ — resistance factor for welded connections



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Revision:	Date:	Sheet No. 96
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Buckling

Buckling analysis was not calculated.



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Revision:	Date:	Sheet No. 97
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Project item B.6 at Upper Roof

Design

Name B.6 at Upper Roof
 Description
 Analysis Stress, strain/ simplified loading
 Design code AISC - LRFD (2016)

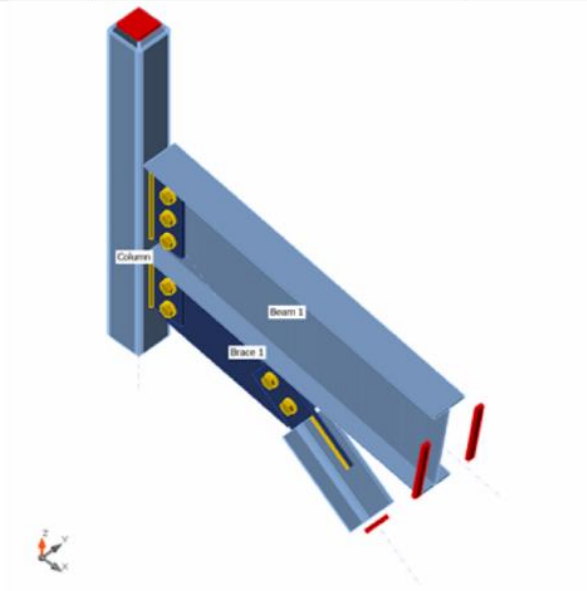
Members

Geometry

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [in]	Offset ey [in]	Offset ez [in]
Column	4 - HSS(Imp)4-1/2X4-1/2X3/8	0,00	90,00	0,00	0,000	0,000	0,000
Beam 1	5 - W(Imp)12X19	0,00	-9,46	0,00	0,000	0,000	0,000
Brace 1	6 - HSS(Imp)4X4X3/16	0,00	-35,29	0,00	0,000	0,000	0,000

Supports and forces

Name	Support	Forces in	X [in]
Column / begin	N-Vy-Vz-Mx-My-Mz	Node	0,000
Column / end	N-Vy-Vz-Mx-My-Mz	Node	0,000
Beam 1 / end	Vy-Mx-Mz	Bolts	4,844
Brace 1 / end	Mx-My-Mz	Bolts	0,000





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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 98
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Cross-sections

Name	Material
4 - HSS(Imp)4-1/2X4-1/2X3/8	A500, Gr. C
5 - W(Imp)12X19	A992
6 - HSS(Imp)4X4X3/16	A500, Gr. C

Bolts

Name	Bolt assembly	Diameter [in]	f_u [ksi]	Gross area [in ²]
3/4 A325	3/4 A325	0.750	120.00	0.442

Load effects (Equilibrium not required)

Name	Member	N [kip]	Vy [kip]	Vz [kip]	Mx [kip.ft]	My [kip.ft]	Mz [kip.ft]
LE1	Beam 1 / End	0.000	0.000	-5.000	0.000	0.000	0.000
	Brace 1 / End	12.000	0.000	0.000	0.000	0.000	0.000
LE2	Beam 1 / End	0.000	0.000	-5.000	0.000	0.000	0.000
	Brace 1 / End	-12.000	0.000	0.000	0.000	0.000	0.000

Check

Summary

Name	Value	Check status
Analysis	100.0%	OK
Plates	0.00 < 5.00%	OK
Bolts	34,2 < 100%	OK
Welds	75,6 < 100%	OK
Buckling	Not calculated	
GMNA	Not calculated	

Plates

Name	Material	t_p [in]	Loads	σ_{Ed} [ksi]	ϵ_{pl} [%]	$\sigma_{c,Ed}$ [ksi]	Status
Column	A500, Gr. C	3/8	LE1	41,19	0,00	0,00	OK
Beam 1-bfl 1	A992	3/8	LE2	9,21	0,00	0,00	OK
Beam 1-tfl 1	A992	3/8	LE1	8,59	0,00	0,00	OK
Beam 1-w 1	A992	1/4	LE2	27,98	0,00	1,78	OK
Brace 1	A500, Gr. C	3/16	LE2	12,61	0,00	0,00	OK
Brace 1 Gusset Plate	A36	3/8	LE2	23,40	0,00	1,76	OK
BR1 Shear Plate	A36	3/8	LE1	11,51	0,00	0,65	OK
BR1 Paddle Plate	A36	3/8	LE1	24,57	0,00	1,53	OK
B1 Shear Plate	A36	3/8	LE1	20,16	0,00	2,29	OK



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 99
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:

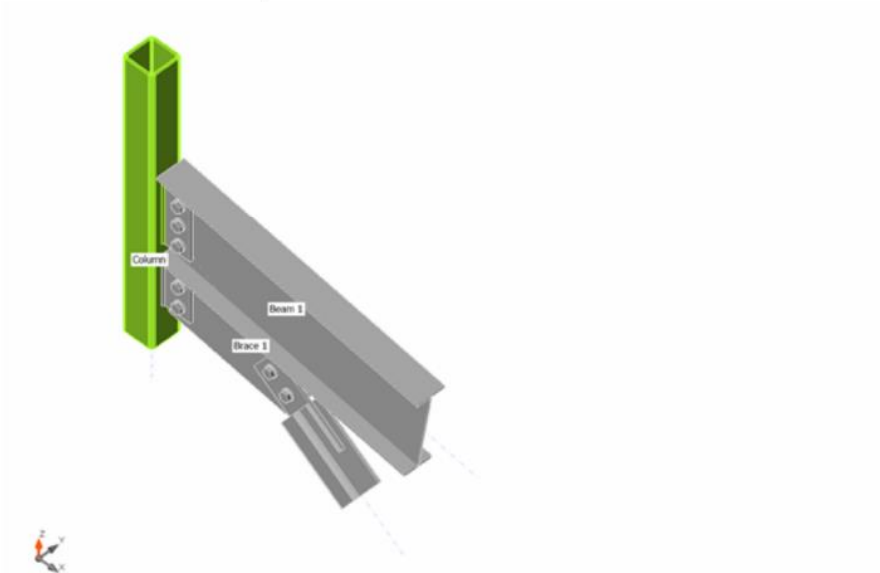


Design data

Material	F_y [ksi]	ϵ_{lim} [%]
A500, Gr. C	46.00	5.00
A992	50.00	5.00
A36	36.00	5.00

Symbol explanation

t_p	Plate thickness
σ_{Ed}	Equivalent stress
ϵ_{pl}	Plastic strain
$\sigma_{c,Ed}$	Contact stress
F_y	Yield strength
ϵ_{lim}	Limit of plastic strain



Overall check, LE1



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Date: 11/01/2023

Job No. 23-23

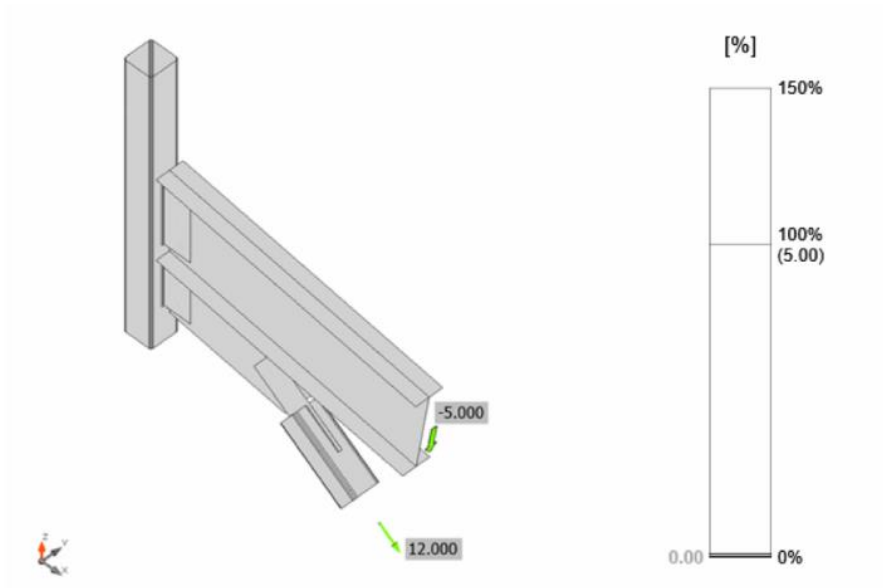
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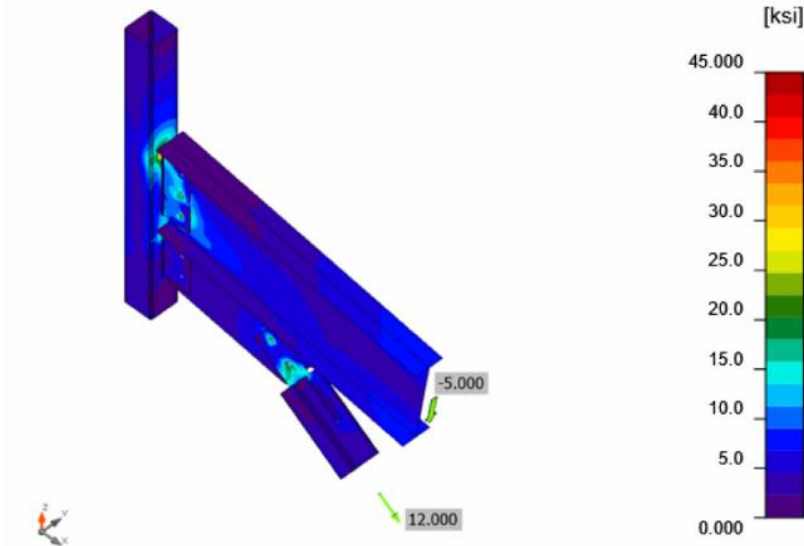
Sheet No. 100

Project Name: Lee's Summit Market Plaza

Project:
Project no:
Author:



Strain check, LE1



Equivalent stress, LE1



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 101
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Bolts

Shape	Item	Grade	Loads	F_t [kip]	V [kip]	$\phi R_{n,bearing}$ [kip]	U_t [%]	U_s [%]	U_{ts} [%]	Status
	B1	3/4 A325 - 1	LE1	0.277	1.836	25.696	0.93	10.27	-	OK
	B2	3/4 A325 - 1	LE1	0.292	2.272	30.835	0.98	12.71	-	OK
	B3	3/4 A325 - 1	LE1	1.329	6.072	22.930	4.46	33.96	-	OK
	B4	3/4 A325 - 1	LE2	1.555	6.121	30.835	5.22	34.24	-	OK
	B5	3/4 A325 - 1	LE1	0.610	2.722	17.274	2.05	15.76	-	OK
	B6	3/4 A325 - 1	LE2	1.069	5.878	20.728	3.59	32.88	-	OK
	B7	3/4 A325 - 1	LE1	0.983	4.167	20.728	3.30	23.31	-	OK

Design data

Grade	$\phi R_{n,tension}$ [kip]	$\phi R_{n,shear}$ [kip]
3/4 A325 - 1	29.795	17.877

Symbol explanation

F_t	Tension force
V	Resultant of bolt shear forces V_y and V_z in shear planes
$\phi R_{n,bearing}$	Bolt bearing resistance
U_t	Utilization in tension
U_s	Utilization in shear
U_{ts}	Utilization in tension and shear
$\phi R_{n,tension}$	Bolt tension resistance - AISC 360-16 – J3.6
$\phi R_{n,shear}$	Bolt shear resistance - AISC 360-16 – J3.6

Detailed result for B4

Tension resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nt} \cdot A_b = 29.795 \text{ kip} \geq F_t = 1.555 \text{ kip}$$

Where:

$F_{nt} = 89.92 \text{ ksi}$ – nominal tensile stress AISC 360-16 – Table J3.2

$A_b = 0.442 \text{ in}^2$ – gross bolt cross-sectional area

$\phi = 0.750$ – resistance factor



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 102
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Shear resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nv} \cdot A_b = 17.877 \text{ kip} \geq V = 6.121 \text{ kip}$$

Where:

$$F_{nv} = 53.95 \text{ ksi} \quad \text{— nominal shear stress AISC 360-16 – Table J3.2}$$

$$A_b = 0.442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0.750 \quad \text{— resistance factor}$$

Bearing resistance check (AISC 360-16 – J3-6)

$$R_n = 1.200 \cdot l_c \cdot t \cdot F_u \leq 2.400 \cdot d \cdot t \cdot F_u$$

$$\phi R_n = 30.835 \text{ kip} \geq V = 6.121 \text{ kip}$$

Where:

$$l_c = 2.187 \text{ in} \quad \text{— clear distance, in the direction of the force, between the edge of the hole and the edge of the adjacent hole or edge of the material}$$

$$t = 0.394 \text{ in} \quad \text{— thickness of the plate}$$

$$d = 0.750 \text{ in} \quad \text{— diameter of a bolt}$$

$$F_u = 58.02 \text{ ksi} \quad \text{— tensile strength of the connected material}$$

$$\phi = 0.750 \quad \text{— resistance factor for bearing at bolt holes}$$

Interaction of tension and shear check (AISC 360-16 – J3-2)

The required stress, in either shear or tension, is less than or equal to 30% of the corresponding available stress and the effects of combined stresses need not be investigated.



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 103
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Welds

Item	Edge	Xu	t _w [in]	w [in]	L [in]	L _c [in]	Loads	F _n [kip]	φR _n [kip]	Ut [%]	Status
Beam 1-bfl 1	Brace 1 Gusset Plate	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	21.905	0.996	LE2	1.768	5.741	30.79	OK
		E70xx	▲ 1/8 ▲	▲ 3/16 ▲	21.905	0.996	LE1	1.560	5.902	26.44	OK
Column-w 1	BR1 Shear Plate	E70xx	▲ 3/16 ▲	▲ 1/4 ▲	5.963	0.314	LE1	0.827	2.238	36.93	OK
		E70xx	▲ 3/16 ▲	▲ 1/4 ▲	5.963	0.314	LE1	0.838	2.311	36.28	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5.963	0.314	LE2	0.988	1.311	75.41	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5.963	0.314	LE2	0.674	1.311	51.45	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5.925	0.312	LE2	0.605	1.302	46.46	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5.963	0.314	LE2	0.991	1.311	75.63	OK
Column-w 1	B1 Shear Plate	E70xx	▲ 3/16 ▲	▲ 1/4 ▲	8.943	0.308	LE1	1.660	2.206	75.25	OK
		E70xx	▲ 3/16 ▲	▲ 1/4 ▲	8.943	0.308	LE1	1.587	2.111	75.20	OK

Symbol explanation

t _w	Throat thickness of weld
w	Leg size of weld
L	Length of weld
L _c	Length of weld critical element
F _n	Force in weld critical element
φR _n	Weld resistance - AISC 360-16 - J2-4
Ut	Utilization
▲	Fillet weld

Detailed result for BR1 Paddle Plate / Brace 1-w 3

Weld resistance check (AISC 360-16 - J2-4)

$$\phi R_n = \phi \cdot F_{nw} \cdot A_{we} = 1.311 \text{ kip} \geq F_n = 0.991 \text{ kip}$$

Where:

$$F_{nw} = 42.00 \text{ ksi} \quad \text{— nominal stress of weld material}$$

- $F_{nw} = 0.6 \cdot F_{EXX}$, where:
 - $F_{EXX} = 70.00 \text{ ksi}$ — electrode classification number, i.e. minimum specified tensile strength
 - Directional strength increase is not used for HSS welds

$$A_{we} = 0.042 \text{ in}^2 \quad \text{— effective area of weld critical element}$$

$$\phi = 0.75 \quad \text{— resistance factor for welded connections}$$



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Revision:	Date:	Sheet No. 104
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Buckling

Buckling analysis was not calculated.



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Revision:	Date:	Sheet No. 105
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Project item B at Upper Roof

Design

Name B at Upper Roof
 Description
 Analysis Stress, strain/ simplified loading
 Design code AISC - LRFD (2016)

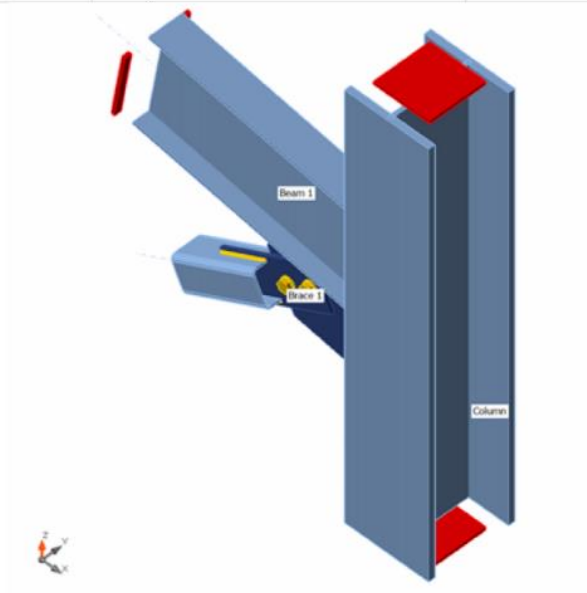
Members

Geometry

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [in]	Offset ey [in]	Offset ez [in]
Column	11 - W(Imp)10X68	0,00	90,00	90,00	0,000	0,000	0,000
Beam 1	5 - W(Imp)12X19	180,00	9,46	0,00	0,000	0,000	0,000
Brace 1	6 - HSS(Imp)4X4X3/16	180,00	-27,43	0,00	0,000	0,000	0,000

Supports and forces

Name	Support	Forces in	X [in]
Column / begin	N-Vy-Vz-Mx-My-Mz	Node	0,000
Column / end	N-Vy-Vz-Mx-My-Mz	Node	0,000
Beam 1 / end	Vy-Mx-Mz	Bolts	7,621
Brace 1 / end	Mx-My-Mz	Bolts	0,000





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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 106
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Cross-sections

Name	Material
11 - W(Imp)10X68	A992
5 - W(Imp)12X19	A992
6 - HSS(Imp)4X4X3/16	A500, Gr. C

Bolts

Name	Bolt assembly	Diameter [in]	f_u [ksi]	Gross area [in ²]
3/4 A325	3/4 A325	0.750	120.00	0.442

Load effects (Equilibrium not required)

Name	Member	N [kip]	Vy [kip]	Vz [kip]	Mx [kip.ft]	My [kip.ft]	Mz [kip.ft]
LE1	Beam 1 / End	0.000	0.000	-5.000	0.000	0.000	0.000
	Brace 1 / End	12.000	0.000	0.000	0.000	0.000	0.000
LE2	Beam 1 / End	0.000	0.000	-5.000	0.000	0.000	0.000
	Brace 1 / End	-12.000	0.000	0.000	0.000	0.000	0.000

Check

Summary

Name	Value	Check status
Analysis	100.0%	OK
Plates	0.07 < 5.00%	OK
Bolts	33.8 < 100%	OK
Welds	75.6 < 100%	OK
Buckling	Not calculated	

Plates

Name	Material	t_p [in]	Loads	σ_{Ed} [ksi]	ϵ_p [%]	$\sigma_{c,Ed}$ [ksi]	Status
Column-bfl 1	A992	3/4	LE1	7.57	0.00	0.00	OK
Column-tfl 1	A992	3/4	LE1	8.68	0.00	0.00	OK
Column-w 1	A992	7/16	LE1	44.44	0.00	0.00	OK
Beam 1-bfl 1	A992	3/8	LE2	6.37	0.00	0.00	OK
Beam 1-tfl 1	A992	3/8	LE1	6.25	0.00	0.00	OK
Beam 1-w 1	A992	1/4	LE1	31.02	0.00	2.41	OK
Brace 1	A500, Gr. C	3/16	LE2	12.30	0.00	0.00	OK
Brace 1 Gusset Plate	A36	3/8	LE1	22.70	0.00	1.46	OK
BR1 Shear Plate	A36	3/8	LE1	24.68	0.01	1.60	OK
BR1 Paddle Plate	A36	3/8	LE1	24.65	0.00	1.49	OK
B1 Shear Plate	A36	3/8	LE1	28.29	0.07	2.36	OK



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Made by: ACO/RAH

Date: 11/01/2023

Job No. 23-23

Revision:

Date:

Sheet No. 107

Project Name: Lee's Summit Market Plaza

Project:
Project no:
Author:

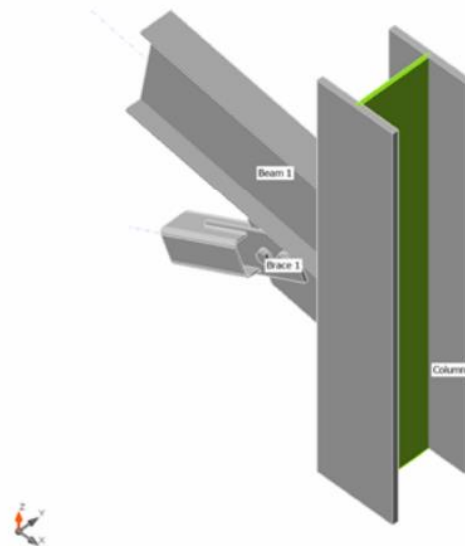


Design data

Material	F_y [ksi]	ϵ_{lim} [%]
A992	50.00	5.00
A500, Gr. C	46.00	5.00
A36	36.00	5.00

Symbol explanation

t_p	Plate thickness
σ_{Ed}	Equivalent stress
ϵ_{pl}	Plastic strain
$\sigma_{c,Ed}$	Contact stress
F_y	Yield strength
ϵ_{lim}	Limit of plastic strain



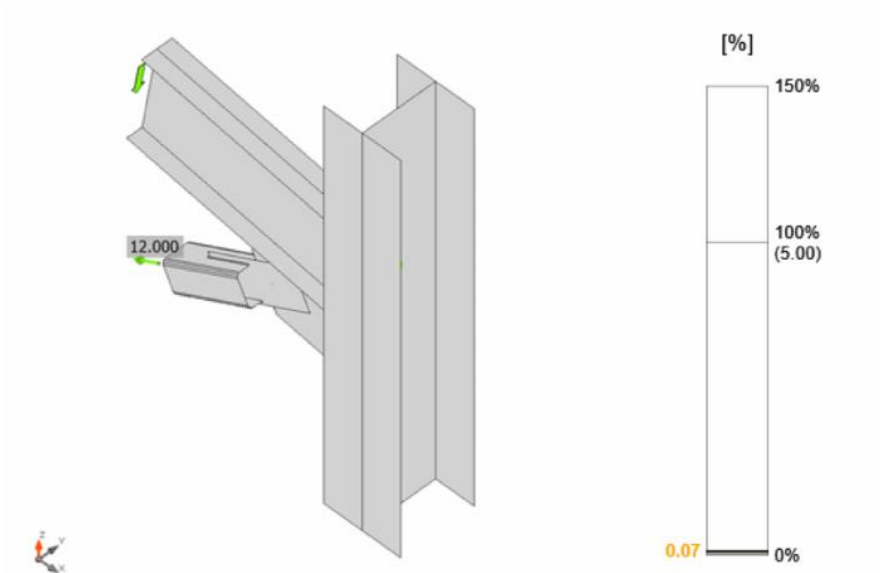
Overall check, LE1



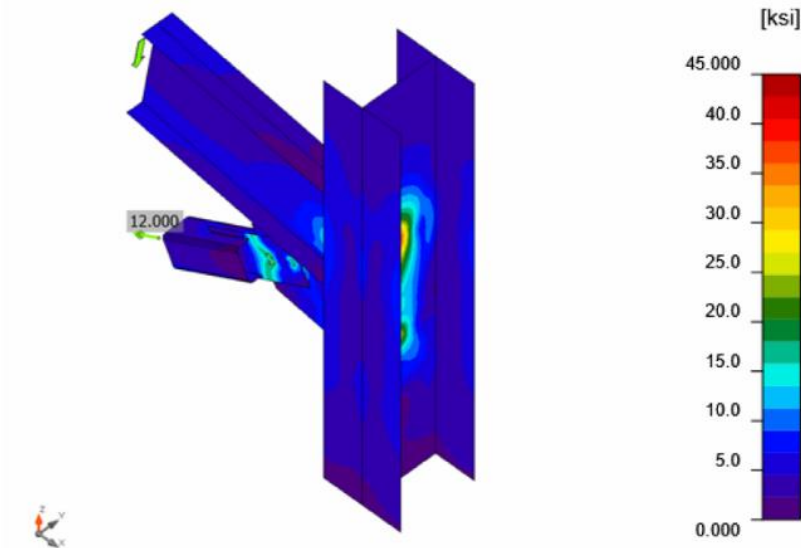
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 108
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Strain check, LE1



Equivalent stress, LE1



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 109
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Bolts

Shape	Item	Grade	Loads	F_t [kip]	V [kip]	$\phi R_{n,bearing}$ [kip]	U_t [%]	U_s [%]	U_{ts} [%]	Status
	B1	3/4 A325 - 1	LE1	0.443	1.855	25.696	1.49	10.38	-	OK
	B2	3/4 A325 - 1	LE2	0.283	3.572	30.835	0.95	19.98	-	OK
	B3	3/4 A325 - 1	LE1	1.417	6.046	22.727	4.75	33.82	-	OK
	B4	3/4 A325 - 1	LE1	1.245	6.049	22.727	4.18	33.84	-	OK
	B5	3/4 A325 - 1	LE1	0.446	2.652	17.274	1.50	15.35	-	OK
	B6	3/4 A325 - 1	LE1	0.764	4.064	20.728	2.56	22.73	-	OK
	B7	3/4 A325 - 1	LE1	1.523	4.728	20.728	5.11	26.45	-	OK

Design data

Grade	$\phi R_{n,tension}$ [kip]	$\phi R_{n,shear}$ [kip]
3/4 A325 - 1	29.795	17.877

Symbol explanation

F_t	Tension force
V	Resultant of bolt shear forces V_y and V_z in shear planes
$\phi R_{n,bearing}$	Bolt bearing resistance
U_t	Utilization in tension
U_s	Utilization in shear
U_{ts}	Utilization in tension and shear
$\phi R_{n,tension}$	Bolt tension resistance - AISC 360-16 – J3.6
$\phi R_{n,shear}$	Bolt shear resistance - AISC 360-16 – J3.6

Detailed result for B4

Tension resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nt} \cdot A_b = 29.795 \text{ kip} \geq F_t = 1.245 \text{ kip}$$

Where:

$$F_{nt} = 89.92 \text{ ksi} \quad \text{— nominal tensile stress AISC 360-16 – Table J3.2}$$

$$A_b = 0.442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0.750 \quad \text{— resistance factor}$$



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 110
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Shear resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nv} \cdot A_b = 17.877 \text{ kip} \geq V = 6.049 \text{ kip}$$

Where:

$$F_{nv} = 53.95 \text{ ksi} \quad \text{— nominal shear stress AISC 360-16 – Table J3.2}$$

$$A_b = 0.442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0.750 \quad \text{— resistance factor}$$

Bearing resistance check (AISC 360-16 – J3-6)

$$R_n = 1.200 \cdot l_c \cdot t \cdot F_u \leq 2.400 \cdot d \cdot t \cdot F_u$$

$$\phi R_n = 22.727 \text{ kip} \geq V = 6.049 \text{ kip}$$

Where:

$$l_c = 1.106 \text{ in} \quad \text{— clear distance, in the direction of the force, between the edge of the hole and the edge of the adjacent hole or edge of the material}$$

$$t = 0.394 \text{ in} \quad \text{— thickness of the plate}$$

$$d = 0.750 \text{ in} \quad \text{— diameter of a bolt}$$

$$F_u = 58.02 \text{ ksi} \quad \text{— tensile strength of the connected material}$$

$$\phi = 0.750 \quad \text{— resistance factor for bearing at bolt holes}$$

Interaction of tension and shear check (AISC 360-16 – J3-2)

The required stress, in either shear or tension, is less than or equal to 30% of the corresponding available stress and the effects of combined stresses need not be investigated.



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 111
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Welds

Item	Edge	Xu	t _w [in]	w [in]	L [in]	L _c [in]	Loads	F _n [kip]	φR _n [kip]	Ut [%]	Status
Beam 1-bfl 1	Brace 1 Gusset Plate	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	13,262	0,603	LE2	0,554	2,916	19,00	OK
		E70xx	▲ 1/8 ▲	▲ 3/16 ▲	13,305	0,605	LE1	0,818	3,749	21,81	OK
Column-w 1	BR1 Shear Plate	E70xx	▲ 3/16 ▲	▲ 1/4 ▲	5,972	0,427	LE1	2,527	3,364	75,11	OK
		E70xx	▲ 3/16 ▲	▲ 1/4 ▲	5,972	0,427	LE1	2,389	3,310	72,17	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5,963	0,314	LE1	0,641	1,311	48,87	OK
BR1 Paddle Plate	Brace 1-w 1	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5,963	0,314	LE2	0,987	1,311	75,29	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5,963	0,314	LE2	0,991	1,311	75,60	OK
BR1 Paddle Plate	Brace 1-w 3	E70xx	▲ 1/8 ▲	▲ 3/16 ▲	5,925	0,312	LE2	0,602	1,302	46,26	OK
Column-w 1	B1 Shear Plate	E70xx	▲ 3/16 ▲	▲ 1/4 ▲	8,961	0,448	LE1	2,794	3,705	75,43	OK
		E70xx	▲ 3/16 ▲	▲ 1/4 ▲	8,961	0,448	LE1	2,806	3,709	75,64	OK

Symbol explanation

t _w	Throat thickness of weld
w	Leg size of weld
L	Length of weld
L _c	Length of weld critical element
F _n	Force in weld critical element
φR _n	Weld resistance - AISC 360-16 - J2-4
Ut	Utilization
▲	Fillet weld

Detailed result for Column-w 1 / B1 Shear Plate

Weld resistance check (AISC 360-16 - J2-4)

$$\phi R_n = \phi \cdot F_{nw} \cdot A_{we} = 3,709 \text{ kip} \geq F_n = 2,806 \text{ kip}$$

Where:

$$F_{nw} = 62,44 \text{ ksi} \quad \text{— nominal stress of weld material}$$

- $F_{nw} = 0.6 \cdot F_{EXX} \cdot (1 + 0.5 \cdot \sin^{1.5} \theta)$, where:
 - $F_{EXX} = 70.00 \text{ ksi}$ — electrode classification number, i.e. minimum specified tensile strength
 - $\theta = 79,16^\circ$ — angle of loading measured from the weld longitudinal axis

$$A_{we} = 0,079 \text{ in}^2 \quad \text{— effective area of weld critical element}$$

$$\phi = 0.75 \quad \text{— resistance factor for welded connections}$$



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 112
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Buckling

Buckling analysis was not calculated.



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 113
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Project item Brace Intersection

Design

Name: Brace Intersection
 Description:
 Analysis: Stress, strain/ simplified loading
 Design code: AISC - LRFD (2016)

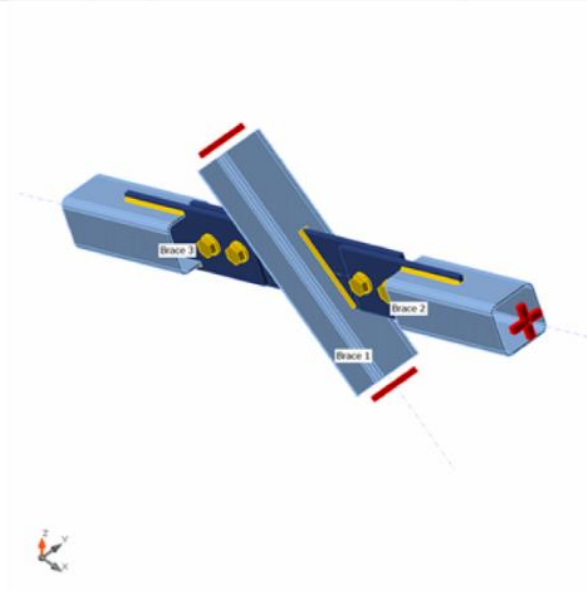
Members

Geometry

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [in]	Offset ey [in]	Offset ez [in]
Brace 1	6 - HSS(Imp)4X4X3/16	180,00	35,29	0,00	0,000	0,000	0,000
Brace 2	6 - HSS(Imp)4X4X3/16	0.00	24.43	0.00	0.000	0.000	0.000
Brace 3	6 - HSS(Imp)4X4X3/16	180.00	-24.43	0.00	0.000	0.000	0.000

Supports and forces

Name	Support	Forces in	X [in]
Brace 1 / begin	N-Vy-Vz-Mx-My-Mz	Bolts	0,000
Brace 1 / end	N-Vy-Vz-Mx-My-Mz	Bolts	0.000
Brace 2 / end	Mx-My-Mz	Bolts	0,000
Brace 3 / end	Mx-My-Mz	Bolts	0,000





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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 114
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Cross-sections

Name	Material
6 - HSS(Im)4X4X3/16	A500, Gr. C

Bolts

Name	Bolt assembly	Diameter [in]	f_u [ksi]	Gross area [in ²]
3/4 A325	3/4 A325	0.750	120,00	0,442

Load effects (Equilibrium not required)

Name	Member	N [kip]	Vy [kip]	Vz [kip]	Mx [kip.ft]	My [kip.ft]	Mz [kip.ft]
LE1	Brace 2 / End	4.000	0.000	0.000	0.000	0.000	0.000
	Brace 3 / End	-4.000	0.000	0.000	0.000	0.000	0.000
LE2	Brace 2 / End	-4.000	0.000	0.000	0.000	0.000	0.000
	Brace 3 / End	4.000	0.000	0.000	0.000	0.000	0.000

Check

Summary

Name	Value	Check status
Analysis	100,0%	OK
Plates	0.25 < 5.00%	OK
Preloaded bolts	25.6 < 100%	OK
Welds	78,9 < 100%	OK
Buckling	Not calculated	
GMNA	Not calculated	

Plates

Name	Material	t_p [in]	Loads	σ_{Ed} [ksi]	ϵ_{pl} [%]	$\sigma_{c,Ed}$ [ksi]	Status
Brace 1	A500, Gr. C	3/16	LE1	41.47	0.25	0.00	OK
Brace 2	A500, Gr. C	3/16	LE2	7.13	0.00	0.00	OK
Brace 3	A500, Gr. C	3/16	LE1	7.11	0.00	0.00	OK
Gusset	A36	3/8	LE2	7.66	0.00	0.81	OK
BR2 Paddle Plate	A36	3/8	LE1	10.41	0.00	0.81	OK
BR3 Paddle Plate	A36	3/8	LE2	10.42	0.00	0.81	OK

Design data

Material	F_y [ksi]	ϵ_{lim} [%]
A500, Gr. C	46,00	5,00
A36	36,00	5,00



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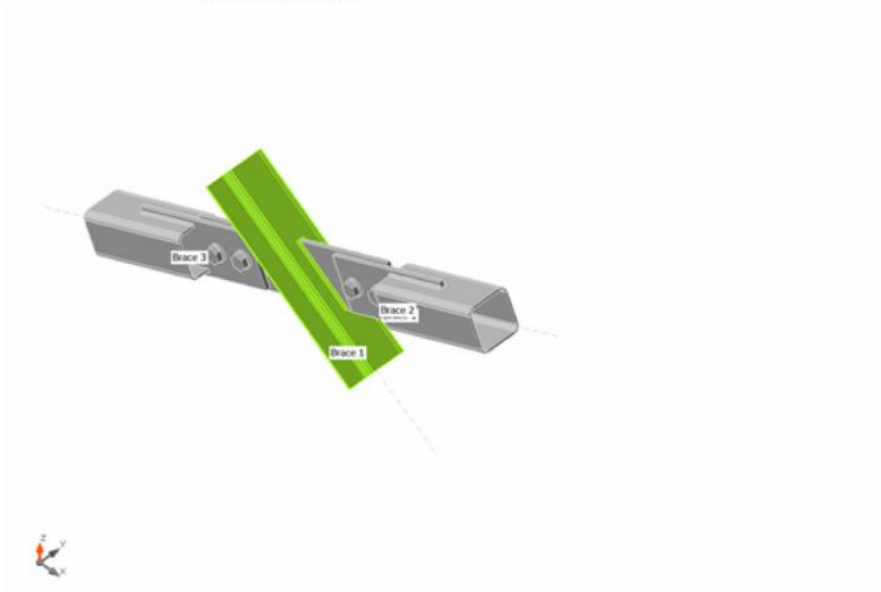
Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 115
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Symbol explanation

t_p	Plate thickness
σ_{Ed}	Equivalent stress
ϵ_{pl}	Plastic strain
$\sigma_{c,Ed}$	Contact stress
F_y	Yield strength
ϵ_{lim}	Limit of plastic strain



Overall check, LE1



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Date: 11/01/2023

Job No. 23-23

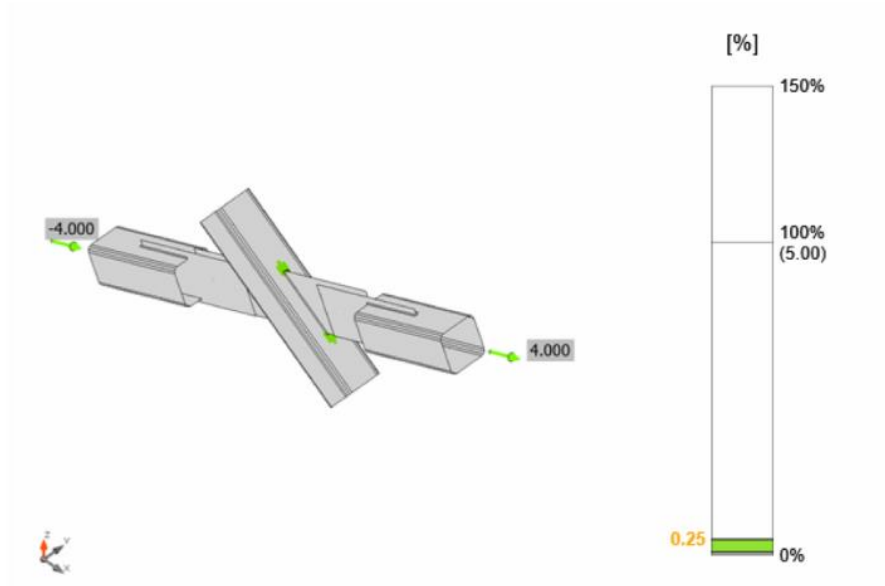
Revision:

Date:

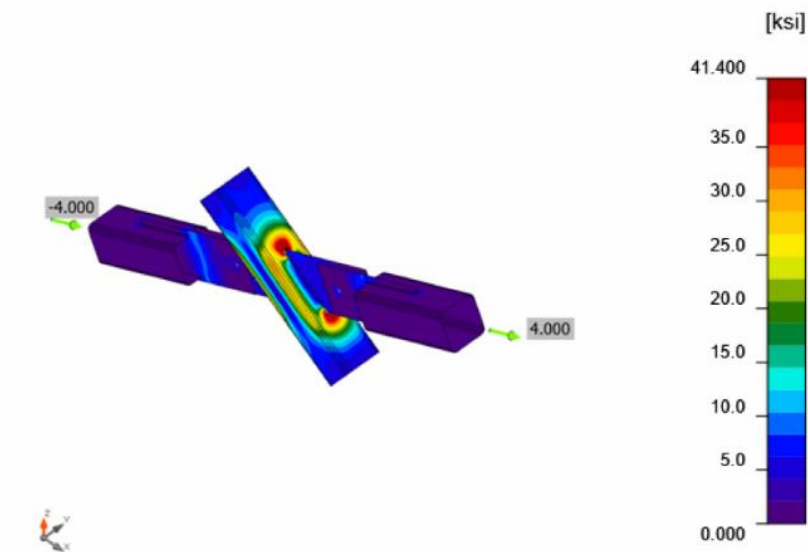
Sheet No. 116

Project Name: Lee's Summit Market Plaza

Project:
Project no:
Author:



Strain check, LE1



Equivalent stress, LE1



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 117
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Preloaded bolts

Shape	Item	Grade	Loads	F_t [kip]	V [kip]	$\phi R_{n,slip}$ [kip]	U_t [%]	U_s [%]	Status
	B1	3/4 A325	LE1	0.454	1.727	9.375	1.52	18.43	OK
	B2	3/4 A325	LE2	0.430	2.399	9.382	1.44	25.58	OK
	B3	3/4 A325	LE2	0.454	1.727	9.375	1.53	18.42	OK
	B4	3/4 A325	LE1	0.431	2.400	9.382	1.45	25.58	OK

Design data

Grade	$\phi R_{n,tension}$ [kip]	μ [-]
3/4 A325	29.795	0.300

Symbol explanation

F_t	Tension force
V	Resultant of shear forces V_y and V_z in shear planes transferred by friction
$\phi R_{n,slip}$	Bolt slip resistance - AISC 360-16 – J3.8
U_t	Utilization in tension
U_s	Utilization in shear
$\phi R_{n,tension}$	Bolt tension resistance - AISC 360-16 – J3.6
μ	Friction coefficient in slip-resistance

Detailed result for B4

Tension resistance check (AISC 360-16 – J3-1)

$$\phi R_n = \phi \cdot F_{nt} \cdot A_b = 29.795 \text{ kip} \geq F_t = 0.431 \text{ kip}$$

Where:

$$F_{nt} = 89.92 \text{ ksi} \quad \text{— nominal tensile stress AISC 360-16 – Table J3.2}$$

$$A_b = 0.442 \text{ in}^2 \quad \text{— gross bolt cross-sectional area}$$

$$\phi = 0.750 \quad \text{— resistance factor}$$



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 118
Project Name: Lee's Summit Market Plaza		

Project:
 Project no:
 Author:



Slip resistance check (AISC 360-16 – J3.8)

$$\phi R_n = \phi \cdot k_{sc} \cdot \mu \cdot D_u \cdot h_f \cdot T_b \cdot n_s = 9.382 \text{ kip} \geq V = 2.400 \text{ kip}$$

Where:

$\mu = 0.300$ – slip factor

$D_u = 1.130$ – multiplier that reflects the ratio of the mean installed bolt pretension to the specified minimum bolt pretension

$h_f = 1.000$ – factor for fillers

$T_b = 28.056 \text{ kip}$ – preloading force

$n_s = 1$ – number of the friction surfaces

$k_{sc} = 0.986$ – factor for combined tension and shear:

- $k_{sc} = 1 - \frac{F_t}{D_u \cdot T_b \cdot n_b}$, where:
 - $F_t = 0.431 \text{ kip}$ – required tension force using LFRD load combinations
 - $n_b = 1$ – number of bolts carrying the applied tension

$\phi = 1.000$ – resistance factor for slip resistant joint

Welds

Item	Edge	Xu	t _w [in]	w [in]	L [in]	L _c [in]	Loads	F _n [kip]	φR _n [kip]	Ut [%]	Status
Gusset	Brace 1-w 1	E70xx	▲ 1/8	▲ 3/16	6.330	0.316	LE1	1.043	1.322	78.88	OK
Gusset	Brace 1-w 1	E70xx	▲ 1/8	▲ 3/16	6.330	0.316	LE1	1.039	1.322	78.63	OK
Gusset	Brace 1-w 3	E70xx	▲ 1/8	▲ 3/16	6.330	0.316	LE2	1.039	1.322	78.63	OK
Gusset	Brace 1-w 3	E70xx	▲ 1/8	▲ 3/16	6.330	0.316	LE2	1.043	1.322	78.89	OK
BR2 Paddle Plate	Brace 2-w 1	E70xx	▲ 1/8	▲ 3/16	5.963	0.314	LE2	0.640	1.311	48.84	OK
BR2 Paddle Plate	Brace 2-w 1	E70xx	▲ 1/8	▲ 3/16	5.925	0.312	LE2	0.271	1.302	20.80	OK
BR2 Paddle Plate	Brace 2-w 3	E70xx	▲ 1/8	▲ 3/16	5.925	0.312	LE2	0.248	1.302	19.03	OK
BR2 Paddle Plate	Brace 2-w 3	E70xx	▲ 1/8	▲ 3/16	5.963	0.314	LE2	0.566	1.311	43.17	OK
BR3 Paddle Plate	Brace 3-w 1	E70xx	▲ 1/8	▲ 3/16	5.925	0.312	LE1	0.248	1.302	19.03	OK
BR3 Paddle Plate	Brace 3-w 1	E70xx	▲ 1/8	▲ 3/16	5.963	0.314	LE1	0.566	1.311	43.22	OK
BR3 Paddle Plate	Brace 3-w 3	E70xx	▲ 1/8	▲ 3/16	5.963	0.314	LE1	0.640	1.311	48.86	OK
BR3 Paddle Plate	Brace 3-w 3	E70xx	▲ 1/8	▲ 3/16	5.925	0.312	LE1	0.271	1.302	20.78	OK

Symbol explanation

t _w	Throat thickness of weld
w	Leg size of weld
L	Length of weld
L _c	Length of weld critical element
F _n	Force in weld critical element
φR _n	Weld resistance - AISC 360-16 – J2-4
Ut	Utilization
▲	Fillet weld



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Revision:	Date:	Sheet No. 119
Project Name: Lee's Summit Market Plaza		

Project:
Project no:
Author:



Detailed result for Gusset / Brace 1-w 3

Weld resistance check (AISC 360-16 – J2-4)

$$\phi R_n = \phi \cdot F_{nw} \cdot A_{we} = 1,322 \text{ kip} \geq F_n = 1,043 \text{ kip}$$

Where:

$$F_{nw} = 42,00 \text{ ksi} \text{ — nominal stress of weld material}$$

- $F_{nw} = 0,6 \cdot F_{EXX}$, where:
 - $F_{EXX} = 70,00 \text{ ksi}$ — electrode classification number, i.e. minimum specified tensile strength
 - Directional strength increase is not used for HSS welds

$$A_{we} = 0,042 \text{ in}^2 \text{ — effective area of weld critical element}$$

$$\phi = 0,75 \text{ — resistance factor for welded connections}$$

Buckling

Buckling analysis was not calculated.

Code settings

Item	Value	Unit	Reference
Friction coefficient - concrete	0.400	-	ACI 349-01 – B.6.1.4
Friction coefficient in slip-resistance	0.300	-	AISC 360-16 – J3.8
Limit plastic strain	0.050	-	
Detailing	No		
Distance between bolts [d]	2.660	-	AISC 360-16 – J3.3
Distance between bolts and edge [d]	1.250	-	AISC 360-16 – J3.4
Concrete breakout resistance check	Both		
Base metal capacity check at weld fusion face	No		AISC 360-16 – J2-2
Deformation at bolt hole at service load is design consideration	Yes		AISC 360-16 – J3.10
Cracked concrete	Yes		ACI 318-14 – 17
Local deformation check	No		
Local deformation limit	0.030	-	CIDECT DG 1, 3 - 1.1
Geometrical nonlinearity (GMNA)	Yes		Analysis with large deformations for hollow section joints

Software info

Application: IDEA StatiCa Connection
Version: 23.0.1.1401
Developed by: IDEA StatiCa



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 120
Project Name: Lee's Summit Market Plaza		

CANOPY DRILLED SHAFT

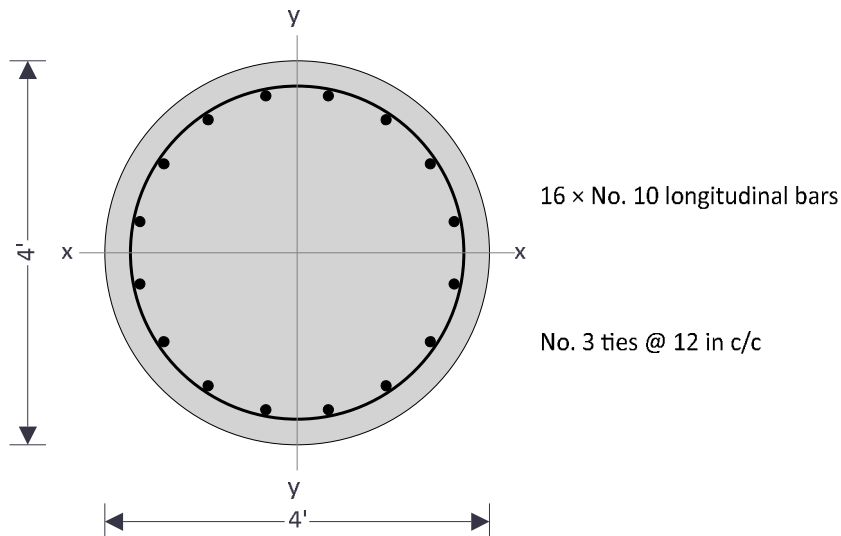
RC COLUMN DESIGN

In accordance with ACI318-14

Tedds calculation version 2.2.07

Design summary

Description	Unit	Capacity	Applied	Utilization	Result
For ultimate axial load 104.0 kips:					PASS
Bending x axis	kip_ft	1807.4	868.0	0.480	PASS
Bending y axis	kip_ft	965.1	17.9	0.019	PASS



Applied loads

Ultimate axial force acting on column;
Ultimate smaller end moment about x axis;
Ultimate larger end moment about x axis;
Column curvature about x axis;
Ratio of DL moment to total moment;

$P_{u_act} = 104$ kips
 $M_{1x_act} = 1$ kips_ft
 $M_{2x_act} = 609$ kips_ft
single curvature
 $\beta_d = 0.600$

Geometry of column

Column diameter;
Clear cover to all reinforcement;
Unsupported height of column about x axis;
Effective height factor about x axis;
Column state about the x axis;
Unsupported height of column about y axis;
Effective height factor about y axis;
Column state about the y axis;

$h = 48.0$ in
 $c_c = 3.00$ in
 $l_{ux} = 18.0$ ft
 $k_x = 2.00$
Braced
 $l_{uy} = 18.0$ ft
 $k_y = 2.00$
Braced

Reinforcement of column

Numbers of bars of longitudinal steel;
Longitudinal steel bar diameter number;

$N = 16$
 $D_{bar_num} = 10$



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Revision:	Date:	Sheet No. 121
Project Name: Lee's Summit Market Plaza		

Diameter of longitudinal bar;
Stirrup bar diameter number;
Diameter of stirrup bar;
Specified yield strength of reinforcement;
Specified compressive strength of concrete;
Modulus of elasticity of bar reinforcement;
Modulus of elasticity of concrete;
Yield strain;
Ultimate design strain;

$$\begin{aligned}D_{long} &= \mathbf{1.270 \text{ in}} \\D_{stir_num} &= \mathbf{3} \\D_{stir} &= \mathbf{0.375 \text{ in}} \\f_y &= \mathbf{60000 \text{ psi}} \\f'_c &= \mathbf{4000 \text{ psi}} \\E_s &= \mathbf{29 \times 10^6 \text{ psi}} \\E_c &= 57000 \times f'_c{}^{1/2} \times (1 \text{ psi})^{1/2} = \mathbf{3604997 \text{ psi}} \\\epsilon_y &= f_y / E_s = \mathbf{0.00207} \\\epsilon_c &= \mathbf{0.003 \text{ in/in}}\end{aligned}$$

Check for minimum area of steel

Gross area of column;
Area of steel;
Minimum area of steel required;

$$\begin{aligned}A_g &= \pi \times h^2 / 4 = \mathbf{1809.55737 \text{ in}^2} \\A_{st} &= N \times (\pi \times D_{long}^2) / 4 = \mathbf{20.268 \text{ in}^2} \\A_{st_min} &= 0.01 \times A_g = \mathbf{18.096 \text{ in}^2}\end{aligned}$$

$A_{st} > A_{st_min}$, PASS- Minimum steel check

Check for maximum area of steel - 10.6.1.1

Permissible maximum area of steel;

$$A_{st_max} = 0.08 \times A_g = \mathbf{144.765 \text{ in}^2}$$

$A_{st} < A_{st_max}$, PASS - Maximum steel check

Design of column ties - 25.7.2

Spacing of lateral ties;
16 times longitudinal bar diameter;
48 times tie bar diameter;
Least column dimension;
Required tie spacing ;

$$\begin{aligned}S_{v_ties} &= \mathbf{12.000 \text{ in}} \\S_{v1} &= 16 \times D_{long} = \mathbf{20.320 \text{ in}} \\S_{v2} &= 48 \times D_{stir} = \mathbf{18.000 \text{ in}} \\S_{v3} &= \min(h, b) = \mathbf{48.00000 \text{ in}} \\s &= \min(S_{v1}, S_{v2}, S_{v3}) = \mathbf{18.000 \text{ in}}\end{aligned}$$

$S_{v_ties} < s$ PASS

Slenderness check about x axis

Radius of gyration;
Actual slenderness ratio;
Permissible slenderness ratio;

$$\begin{aligned}r_x &= 0.25 \times h = \mathbf{12 \text{ in}} \\r_{x_act} &= k_x \times l_{ux} / r_x = \mathbf{36} \\r_{x_perm} &= \min(34 - 12 \times (M_{1x_act} / M_{2x_act}), 40) = \mathbf{33.98}\end{aligned}$$

Column is slender about the X axis

Magnified moments about x axis

Moment of inertia of section;
Euler's buckling load;
Correction factor for actual to equiv. mmt.diagram;
Moment magnifier;
Magnified moment about x axis;
Minimum factored moment about x axis;
Minimum magnified moment about x axis;

$$\begin{aligned}I_{gx} &= (\pi \times h^4) / 64 = \mathbf{260576.261 \text{ in}^4} \\P_{cx} &= (\pi^2 / (k_x \times l_{ux})^2) \times (0.4 \times E_c \times I_{gx} / (1 + \beta_d)) = \mathbf{12419.72 \text{ kips}} \\C_{mx} &= 0.6 + (0.4 \times M_{1x_act} / M_{2x_act}) = \mathbf{0.601} \\\delta_{nsx} &= \max(C_{mx} / (1 - (P_{u_act} / (0.75 \times P_{cx}))), 1.0) = \mathbf{1} \\M_{cx} &= \delta_{nsx} \times M_{2x_act} = \mathbf{609 \text{ kip_ft}} \\M_{2x_min} &= P_{u_act} \times (0.6 \text{ in} + 0.03 \times h) = \mathbf{17.68 \text{ kip_ft}} \\M_{cx_min} &= \delta_{nsx} \times M_{2x_min} = \mathbf{17.68 \text{ kip_ft}}\end{aligned}$$

Slenderness check about y axis

Radius of gyration;
Actual slenderness ratio;
Permissible slenderness ratio;

$$\begin{aligned}r_y &= 0.25 \times h = \mathbf{12 \text{ in}} \\r_{y_act} &= k_y \times l_{uy} / r_y = \mathbf{36} \\r_{y_perm} &= \min(34 - 12 \times (M_{1y_act} / M_{2y_act}), 40) = \mathbf{34}\end{aligned}$$

Column is slender about the Y axis



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 122
Project Name: Lee's Summit Market Plaza		

Magnified moments about y axis

Moment of inertia of section;

$$I_{gy} = (\pi \times h^4) / 64 = \mathbf{260576.261 \text{ in}^4}$$

Euler's buckling load;

$$P_{cy} = (\pi^2 / (k_y \times l_{uy})^2) \times (0.4 \times E_c \times I_{gy} / (1 + \beta_d)) = \mathbf{12419.72 \text{ kips}}$$

Correction factor for actual to equiv. mmt.diagram;

$$C_{my} = 1.0$$

Moment magnifier;

$$\delta_{nsy} = \max(C_{my} / (1 - (P_{u_act} / (0.75 \times P_{cy}))), 1.0) = \mathbf{1.011}$$

Minimum factored moment about y axis;

$$M_{zy_min} = P_{u_act} \times (0.6 \text{ in} + 0.03 \times h) = \mathbf{17.68 \text{ kip_ft}}$$

Minimum magnified moment about y axis;

$$M_{cy_min} = \delta_{nsy} \times M_{zy_min} = \mathbf{17.88 \text{ kip_ft}}$$

Axial load capacity of axially loaded column

Strength reduction factor;

$$\phi = \mathbf{0.65000}$$

Area of steel on compression face;

$$A'_s = A_{st} / 2 = \mathbf{10.134 \text{ in}^2}$$

Area of steel on tension face;

$$A_s = A_{st} / 2 = \mathbf{10.134 \text{ in}^2}$$

Net axial load capacity of column;

$$P_n = 0.8 \times (0.85 \times f'_c \times (A_g - A_{st}) + f_y \times A_{st}) = \mathbf{5839.745 \text{ kips}}$$

Ultimate axial load capacity of column;

$$P_u = \phi \times P_n = \mathbf{3795.834 \text{ kips}}$$

PASS : Column is safe in axial loading

Net moments for biaxial column

Assuming strength reduction factor;

$$\phi = 0.65$$

Net moment about major (X) axis;

$$M_{nx} = M_{cx} / \phi = \mathbf{936.92 \text{ kips_ft}}$$

Net moment about minor (Y) axis;

$$M_{ny} = M_{cy_min} / \phi = \mathbf{27.51 \text{ kips_ft}}$$

Uniaxially loaded circular column

Details of column cross section

c/d_t ratio;

$$r_{xb} = \mathbf{0.233}$$

Depth of tension steel;

$$d_t = h - x_{x1} = \mathbf{43.606 \text{ in}}$$

Depth of NA from extreme compression face;

$$c_x = r_{xb} \times d_t = \mathbf{10.160 \text{ in}}$$

Factor of depth of compressive stress block;

$$\beta_1 = \mathbf{0.850}$$

Depth of equivalent rectangular stress block;

$$a_x = \min((\beta_1 \times c_x), h) = \mathbf{8.636 \text{ in}}$$

Half angle subtended by compression concrete;

$$\theta_{sbxc} = \arccos((h / 2 - a_x) / (h / 2)) = \mathbf{50.2 \text{ deg}}$$

Angle in radians;

$$\theta_{sbxc_rad} = \theta_{sbxc} / 90 \text{ deg} \times \pi / 2 = \mathbf{0.876}$$

Area of compression concrete;

$$A_{sbxc} = h^2 \times (\theta_{sbxc_rad} - \sin(\theta_{sbxc}) \times \cos(\theta_{sbxc})) / 4 = \mathbf{221.335 \text{ in}^2}$$

Moment of area of compressive block;

$$Z_{sbx} = h^3 \times ((\sin(\theta_{sbxc}))^3) / 12 = \mathbf{4178.387 \text{ in}^3}$$

Yield strain in steel;

$$\epsilon_{sx} = f_y / E_s = \mathbf{0.002}$$

Strength reduction factor;

$$\phi_x = \mathbf{0.900}$$

Details of concrete block

Force carried by concrete

Forces carried by concrete;

$$P_{xcon} = 0.85 \times f'_c \times A_{sbxc} = \mathbf{752.540 \text{ kips}}$$

Moment carried by concrete

Moment carried by concrete;

$$M_{xcon} = 0.85 \times f'_c \times Z_{sbx} = \mathbf{1183.876 \text{ kip_ft}}$$

Details of steel layer 1

Depth of layer;

$$x_{x1} = \mathbf{4.394 \text{ in}}$$

Strain of layer;

$$\epsilon_{x1} = \epsilon_c \times (1 - x_{x1} / c_x) = \mathbf{0.00170}$$

Stress in layer;

$$\sigma_{x1} = \min(f_y, E_s \times \epsilon_{x1}) - 0.85 \times f'_c = \mathbf{45972.01 \text{ psi}}$$

Force carried by layer;

$$P_{x1} = 2 \times A_{bar} \times \sigma_{x1} = \mathbf{116.472 \text{ kips}}$$



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Revision:	Date:	Sheet No. 123
Project Name: Lee's Summit Market Plaza		

Moment carried by steel layer;

$$M_{x1} = P_{x1} \times ((h / 2) - x_{x1}) = \mathbf{190.295 \text{ kip_ft}}$$

Details of steel layer 2

Depth of layer;

$$x_{x2} = \mathbf{7.379 \text{ in}}$$

Strain of layer;

$$\epsilon_{x2} = \epsilon_c \times (1 - x_{x2} / c_x) = \mathbf{0.00082}$$

Stress in layer;

$$\sigma_{x2} = \min(f_y, E_s \times \epsilon_{x2}) - 0.85 \times f'_c = \mathbf{20412.12 \text{ psi}}$$

Force carried by layer;

$$P_{x2} = 2 \times A_{bar} \times \sigma_{x2} = \mathbf{51.715 \text{ kips}}$$

Moment carried by steel layer;

$$M_{x2} = P_{x2} \times ((h / 2) - x_{x2}) = \mathbf{71.630 \text{ kip_ft}}$$

Details of steel layer 3

Depth of layer;

$$x_{x3} = \mathbf{12.894 \text{ in}}$$

Strain of layer;

$$\epsilon_{x3} = \epsilon_c \times (1 - x_{x3} / c_x) = \mathbf{-0.00081}$$

Stress in layer;

$$\sigma_{x3} = \max(-1 \times f_y, E_s \times \epsilon_{x3}) = \mathbf{-23416.40 \text{ psi}}$$

Force carried by layer;

$$P_{x3} = 2 \times A_{bar} \times \sigma_{x3} = \mathbf{-59.326 \text{ kips}}$$

Moment carried by steel layer;

$$M_{x3} = P_{x3} \times ((h / 2) - x_{x3}) = \mathbf{-54.906 \text{ kip_ft}}$$

Details of steel layer 4

Depth of layer;

$$x_{x4} = \mathbf{20.100 \text{ in}}$$

Strain of layer;

$$\epsilon_{x4} = \epsilon_c \times (1 - x_{x4} / c_x) = \mathbf{-0.00294}$$

Stress in layer;

$$\sigma_{x4} = \max(-1 \times f_y, E_s \times \epsilon_{x4}) = \mathbf{-60000.00 \text{ psi}}$$

Force carried by layer;

$$P_{x4} = 2 \times A_{bar} \times \sigma_{x4} = \mathbf{-152.012 \text{ kips}}$$

Moment carried by steel layer;

$$M_{x4} = P_{x4} \times ((h / 2) - x_{x4}) = \mathbf{-49.402 \text{ kip_ft}}$$

Details of steel layer 5

Depth of layer;

$$x_{x5} = \mathbf{27.900 \text{ in}}$$

Strain of layer;

$$\epsilon_{x5} = \epsilon_c \times (1 - x_{x5} / c_x) = \mathbf{-0.00524}$$

Stress in layer;

$$\sigma_{x5} = \max(-1 \times f_y, E_s \times \epsilon_{x5}) = \mathbf{-60000.00 \text{ psi}}$$

Force carried by layer;

$$P_{x5} = 2 \times A_{bar} \times \sigma_{x5} = \mathbf{-152.012 \text{ kips}}$$

Moment carried by steel layer;

$$M_{x5} = P_{x5} \times ((h / 2) - x_{x5}) = \mathbf{49.402 \text{ kip_ft}}$$

Details of steel layer 6

Depth of layer;

$$x_{x6} = \mathbf{35.106 \text{ in}}$$

Strain of layer;

$$\epsilon_{x6} = \epsilon_c \times (1 - x_{x6} / c_x) = \mathbf{-0.00737}$$

Stress in layer;

$$\sigma_{x6} = \max(-1 \times f_y, E_s \times \epsilon_{x6}) = \mathbf{-60000.00 \text{ psi}}$$

Force carried by layer;

$$P_{x6} = 2 \times A_{bar} \times \sigma_{x6} = \mathbf{-152.012 \text{ kips}}$$

Moment carried by steel layer;

$$M_{x6} = P_{x6} \times ((h / 2) - x_{x6}) = \mathbf{140.685 \text{ kip_ft}}$$

Details of steel layer 7

Depth of layer;

$$x_{x7} = \mathbf{40.621 \text{ in}}$$

Strain of layer;

$$\epsilon_{x7} = \epsilon_c \times (1 - x_{x7} / c_x) = \mathbf{-0.00899}$$

Stress in layer;

$$\sigma_{x7} = \max(-1 \times f_y, E_s \times \epsilon_{x7}) = \mathbf{-60000.00 \text{ psi}}$$

Force carried by layer;

$$P_{x7} = 2 \times A_{bar} \times \sigma_{x7} = \mathbf{-152.012 \text{ kips}}$$

Moment carried by steel layer;

$$M_{x7} = P_{x7} \times ((h / 2) - x_{x7}) = \mathbf{210.551 \text{ kip_ft}}$$

Details of steel layer 8

Depth of layer;

$$x_{x8} = \mathbf{43.606 \text{ in}}$$

Strain of layer;

$$\epsilon_{x8} = \epsilon_c \times (1 - x_{x8} / c_x) = \mathbf{-0.00988}$$

Stress in layer;

$$\sigma_{x8} = \max(-1 \times f_y, E_s \times \epsilon_{x8}) = \mathbf{-60000.00 \text{ psi}}$$



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Revision:	Date:	Sheet No. 124
Project Name: Lee's Summit Market Plaza		

Force carried by layer;

$$P_{x8} = 2 \times A_{bar} \times \sigma_{x8} = -152.012 \text{ kips}$$

Moment carried by steel layer;

$$M_{x8} = P_{x8} \times ((h / 2) - x_{x8}) = 248.361 \text{ kip_ft}$$

Force carried by steel

Sum of forces by steel;

$$P_{xs} = -646.5 \text{ kips}$$

Total force carried by column

Nominal axial load strength;

$$P_{nx} = 115.565 \text{ kips}$$

Strength reduction factor;

$$\phi_x = 0.900$$

Ultimate axial load carrying capacity of column;

$$P_{ux} = \phi_x \times P_{nx} = 104.008 \text{ kips}$$

Total moment carried by column

Total moment carried by column;

$$M_{ox} = 2008.250 \text{ kip_ft};$$

Ultimate moment strength capacity of column;

$$M_{ux} = \phi_x \times M_{ox} = 1807.425 \text{ kip_ft}$$

Equivalent required uniaxial moment about x axis

Equivalent required uniaxial nominal moment;

$$M_{nxe} = M_{nx} + M_{ny} \times h / b \times ((1 - \beta) / \beta) = 964.43019 \text{ kip_ft}$$

Equivalent required uniaxial ultimate moment;

$$M_{uxe} = M_{nxe} \times \phi_x = 867.987 \text{ kip_ft};$$

Check load capacity about the x axis

Factored axial load;

$$P_{u_act} = 104 \text{ kips}$$

Ultimate axial capacity;

$$P_{ux} = 104 \text{ kips}$$

PASS - Ultimate axial capacity exceeds factored axial load

Equivalent required uniaxial factored moment;

$$M_{uxe} = 868 \text{ kip_ft}$$

Ultimate moment capacity about the x axis;

$$M_{ux} = 1807.4 \text{ kip_ft}$$

PASS - Ultimate moment capacity exceeds factored moment about x axis

Uniaxially loaded circular column

Details of column cross section

c/d_t ratio;

$$r_{yb} = 0.236$$

Depth of tension steel;

$$d_t = h - x_{y1} = 43.990 \text{ in}$$

Depth of NA from extreme compression face;

$$c_y = r_{yb} \times d_t = 10.367 \text{ in}$$

Factor of depth of compressive stress block;

$$\beta_1 = 0.850$$

Depth of equivalent rectangular stress block;

$$a_y = \min((\beta_1 \times c_y), h) = 8.812 \text{ in}$$

Half angle subtended by compression concrete;

$$\theta_{sbyc} = \arccos((h / 2 - a_y) / (h / 2)) = 50.7 \text{ deg}$$

Angle in radians;

$$\theta_{sbyc_rad} = \theta_{sbyc} / 90 \text{ deg} \times \pi / 2 = 0.886$$

Area of compression concrete;

$$A_{sbyc} = h^2 \times (\theta_{sbyc_rad} - \sin(\theta_{sbyc}) \times \cos(\theta_{sbyc})) / 4 = 227.859 \text{ in}^2$$

Moment of area of compressive block;

$$Z_{sby} = h^3 \times ((\sin(\theta_{sbyc}))^3) / 12 = 4278.043 \text{ in}^3$$

Yield strain in steel;

$$\epsilon_{sy} = f_y / E_s = 0.002$$

Strength reduction factor;

$$\phi_y = 0.900$$

Details of concrete block

Force carried by concrete

Forces carried by concrete;

$$P_{ycon} = 0.85 \times f'_c \times A_{sbyc} = 774.720 \text{ kips}$$

Moment carried by concrete

Moment carried by concrete;

$$M_{ycon} = 0.85 \times f'_c \times Z_{sby} = 1212.112 \text{ kip_ft}$$

Details of steel layer 1

Depth of layer;

$$x_{y1} = 4.010 \text{ in}$$



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 125
Project Name: Lee's Summit Market Plaza		

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$\epsilon_{y1} = \epsilon_c \times (1 - x_{y1} / c_y) = \mathbf{0.00184}$$

$$\sigma_{y1} = \min(f_y, E_s \times \epsilon_{y1}) - 0.85 \times f'_c = \mathbf{49947.88 \text{ psi}}$$

$$P_{y1} = A_{bar} \times \sigma_{y1} = \mathbf{63.272 \text{ kips}}$$

$$M_{y1} = P_{y1} \times ((h / 2) - x_{y1}) = \mathbf{105.401 \text{ kip_ft}}$$

Details of steel layer 2

Depth of layer;

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$x_{y2} = \mathbf{5.532 \text{ in}}$$

$$\epsilon_{y2} = \epsilon_c \times (1 - x_{y2} / c_y) = \mathbf{0.00140}$$

$$\sigma_{y2} = \min(f_y, E_s \times \epsilon_{y2}) - 0.85 \times f'_c = \mathbf{37178.14 \text{ psi}}$$

$$P_{y2} = 2 \times A_{bar} \times \sigma_{y2} = \mathbf{94.192 \text{ kips}}$$

$$M_{y2} = P_{y2} \times ((h / 2) - x_{y2}) = \mathbf{144.965 \text{ kip_ft}}$$

Details of steel layer 3

Depth of layer;

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$x_{y3} = \mathbf{9.865 \text{ in}}$$

$$\epsilon_{y3} = \epsilon_c \times (1 - x_{y3} / c_y) = \mathbf{0.00015}$$

$$\sigma_{y3} = \min(f_y, E_s \times \epsilon_{y3}) = \mathbf{4212.98 \text{ psi}}$$

$$P_{y3} = 2 \times A_{bar} \times \sigma_{y3} = \mathbf{10.674 \text{ kips}}$$

$$M_{y3} = P_{y3} \times ((h / 2) - x_{y3}) = \mathbf{12.573 \text{ kip_ft}}$$

Details of steel layer 4

Depth of layer;

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$x_{y4} = \mathbf{16.350 \text{ in}}$$

$$\epsilon_{y4} = \epsilon_c \times (1 - x_{y4} / c_y) = \mathbf{-0.00173}$$

$$\sigma_{y4} = \max(-1 \times f_y, E_s \times \epsilon_{y4}) = \mathbf{-50211.33 \text{ psi}}$$

$$P_{y4} = 2 \times A_{bar} \times \sigma_{y4} = \mathbf{-127.212 \text{ kips}}$$

$$M_{y4} = P_{y4} \times ((h / 2) - x_{y4}) = \mathbf{-81.096 \text{ kip_ft}}$$

Details of steel layer 5

Depth of layer;

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$x_{y5} = \mathbf{24.000 \text{ in}}$$

$$\epsilon_{y5} = \epsilon_c \times (1 - x_{y5} / c_y) = \mathbf{-0.00395}$$

$$\sigma_{y5} = \max(-1 \times f_y, E_s \times \epsilon_{y5}) = \mathbf{-60000.00 \text{ psi}}$$

$$P_{y5} = 2 \times A_{bar} \times \sigma_{y5} = \mathbf{-152.012 \text{ kips}}$$

$$M_{y5} = P_{y5} \times ((h / 2) - x_{y5}) = \mathbf{0.000 \text{ kip_ft}}$$

Details of steel layer 6

Depth of layer;

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$x_{y6} = \mathbf{31.650 \text{ in}}$$

$$\epsilon_{y6} = \epsilon_c \times (1 - x_{y6} / c_y) = \mathbf{-0.00616}$$

$$\sigma_{y6} = \max(-1 \times f_y, E_s \times \epsilon_{y6}) = \mathbf{-60000.00 \text{ psi}}$$

$$P_{y6} = 2 \times A_{bar} \times \sigma_{y6} = \mathbf{-152.012 \text{ kips}}$$

$$M_{y6} = P_{y6} \times ((h / 2) - x_{y6}) = \mathbf{96.906 \text{ kip_ft}}$$

Details of steel layer 7

Depth of layer;

Strain of layer;

Stress in layer;

Force carried by layer;

Moment carried by steel layer;

$$x_{y7} = \mathbf{38.135 \text{ in}}$$

$$\epsilon_{y7} = \epsilon_c \times (1 - x_{y7} / c_y) = \mathbf{-0.00804}$$

$$\sigma_{y7} = \max(-1 \times f_y, E_s \times \epsilon_{y7}) = \mathbf{-60000.00 \text{ psi}}$$

$$P_{y7} = 2 \times A_{bar} \times \sigma_{y7} = \mathbf{-152.012 \text{ kips}}$$

$$M_{y7} = P_{y7} \times ((h / 2) - x_{y7}) = \mathbf{179.059 \text{ kip_ft}}$$

Details of steel layer 8



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Revision:	Date:	Sheet No. 126
Project Name: Lee's Summit Market Plaza		

Depth of layer;

$$x_{y8} = 42.468 \text{ in}$$

Strain of layer;

$$\epsilon_{y8} = \epsilon_c \times (1 - x_{y8} / c_y) = -0.00929$$

Stress in layer;

$$\sigma_{y8} = \max(-1 \times f_y, E_s \times \epsilon_{y8}) = -60000.00 \text{ psi}$$

Force carried by layer;

$$P_{y8} = 2 \times A_{bar} \times \sigma_{y8} = -152.012 \text{ kips}$$

Moment carried by steel layer;

$$M_{y8} = P_{y8} \times ((h / 2) - x_{y8}) = 233.951 \text{ kip_ft}$$

Details of steel layer 9

Depth of layer;

$$x_{y9} = 43.990 \text{ in}$$

Strain of layer;

$$\epsilon_{y9} = \epsilon_c \times (1 - x_{y9} / c_y) = -0.00973$$

Stress in layer;

$$\sigma_{y9} = \max(-1 \times f_y, E_s \times \epsilon_{y9}) = -60000.00 \text{ psi}$$

Force carried by layer;

$$P_{y9} = A_{bar} \times \sigma_{y9} = -76.006 \text{ kips}$$

Moment carried by steel layer;

$$M_{y9} = P_{y9} \times ((h / 2) - x_{y9}) = 126.614 \text{ kip_ft}$$

Force carried by steel

Sum of forces by steel;

$$P_{ys} = -649.5 \text{ kips}$$

Total force carried by column

Nominal axial load strength;

$$P_{ny} = 115.564 \text{ kips}$$

Strength reduction factor;

$$\phi_y = 0.900$$

Ultimate axial load carrying capacity of column;

$$P_{uy} = \phi_y \times P_{ny} = 104.008 \text{ kips}$$

Moment carried by biaxial column minor axis

Nominal moment strength;

$$M_{oy} = 2011.820 \text{ kip_ft}$$

Contour beta factor

Contour beta factor;

$$\beta = 0.500 ;$$

$$M_{nx_upon_M_{ox1}} = M_{nx} / M_{ox} = 0.46654;$$

;

$$M_{ny_upon_M_{oy}} = 0.533$$

Net moment along minor axis resisted by column;

$$M_{ny1} = M_{oy} \times (M_{ny_upon_M_{oy}}) = 1072.300 \text{ kip_ft};$$

Ultimate moment along minor axis ;

$$M_{uy} = M_{ny1} \times \phi_y = 965.070 \text{ kip_ft};$$

Check load capacity about the y axis

Factored axial load;

$$P_{u_act} = 104 \text{ kips}$$

Ultimate axial capacity;

$$P_{uy} = 104 \text{ kips}$$

PASS - Ultimate axial capacity exceeds factored axial load

Factored moment about the y axis;

$$M_{uy_max} = \phi \times M_{ny} = 17.9 \text{ kip_ft}$$

Ultimate moment capacity about the y axis;

$$M_{uy} = 965.1 \text{ kip_ft}$$

PASS - Ultimate moment capacity exceeds factored moment about y axis



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Revision:	Date:	Sheet No. 127
Project Name: Lee's Summit Market Plaza		

CANOPY DRILLED SHAFT L-PILE OUTPUT

=====

LPIle for Windows(Beta), Version 2018-10.009

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method
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Files Used for Analysis

Path to file locations:

\\nas01\leok\Production\Current Projects\23-23 LS Market
Plaza\Engineering\Calculations\KDH\LPIle\

Name of input data file:

Node 2 - Calc 4 - Controls.lp10

Name of output report file:

Node 2 - Calc 4 - Controls.lp10

Name of plot output file:

Node 2 - Calc 4 - Controls.lp10

Name of runtime message file:

Node 2 - Calc 4 - Controls.lp10

Date and Time of Analysis



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 128
Project Name: Lee's Summit Market Plaza		

Date: October 27, 2023

Time: 18:15:43

Problem Title

Project Name: Lee's Summit Market Plaza

Job Number: 23-23

Client:

Engineer: Kenton Hawley, E.I.

Description:

Program Options and Settings

Computational Options:

- Use Load and Resistance Factors (LRFD) in computations

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed = 500
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 100.0000 in
- Number of pile increments = 100

Loading Type and Number of Cycles of Loading:

- Static loading specified



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 129
Project Name: Lee's Summit Market Plaza		

- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	17.000 ft
Depth of ground surface below top of pile	=	0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	48.0000
2	17.000	48.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile

Length of section	=	17.000000 ft
Shaft Diameter	=	48.000000 in



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Revision:	Date:	Sheet No. 130
Project Name: Lee's Summit Market Plaza		

Shear capacity of section = 0.0000 lbs

Ground Slope and Pile Batter Angles

Ground Slope Angle = 0.000 degrees
= 0.000 radians

Pile Batter Angle = 0.000 degrees
= 0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is stiff clay without free water

Distance from top of pile to top of layer = 0.0000 ft
Distance from top of pile to bottom of layer = 3.000000 ft
Effective unit weight at top of layer = 60.000000 pcf
Effective unit weight at bottom of layer = 60.000000 pcf
Undrained cohesion at top of layer = 750.000000 psf
Undrained cohesion at bottom of layer = 750.000000 psf
Epsilon-50 at top of layer = 0.020000
Epsilon-50 at bottom of layer = 0.020000

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer = 3.000000 ft
Distance from top of pile to bottom of layer = 13.000000 ft
Effective unit weight at top of layer = 60.000000 pcf
Effective unit weight at bottom of layer = 60.000000 pcf
Undrained cohesion at top of layer = 750.000000 psf
Undrained cohesion at bottom of layer = 750.000000 psf
Epsilon-50 at top of layer = 0.020000
Epsilon-50 at bottom of layer = 0.020000

Layer 3 is strong rock (vuggy limestone)

Distance from top of pile to top of layer = 13.000000 ft
Distance from top of pile to bottom of layer = 100.000000 ft



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Revision:	Date:	Sheet No. 131
Project Name: Lee's Summit Market Plaza		

Effective unit weight at top of layer = 145.000000 pcf
Effective unit weight at bottom of layer = 145.000000 pcf
Uniaxial compressive strength at top of layer = 1200. psi
Uniaxial compressive strength at bottom of layer = 1200. psi

(Depth of the lowest soil layer extends 83.000 ft below the pile tip)

Summary of Input Soil Properties

Layer E50 Layer or Num. krm	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Undrained Cohesion psf	Uniaxial qu psi
1 0.02000	Stiff Clay	0.00	60.0000	750.0000	--
0.02000	w/o Free Water	3.0000	60.0000	750.0000	--
2 0.02000	Stiff Clay	3.0000	60.0000	750.0000	--
0.02000	w/o Free Water	13.0000	60.0000	750.0000	--
3 --	Strong Rock	13.0000	145.0000	--	1200.
--	(Vuggy Limestone)	100.0000	145.0000	--	1200.
--					

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Unfactored Loading Groups for LRFD Analysis

Number of Loading Groups = 3



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Revision:	Date:	Sheet No. 133
Project Name: Lee's Summit Market Plaza		

2	1.20	--	--	--	--	--	--	--	--	0.50
--	--	0.90	0.75	LRFD: 1.2D + 0.5S						
3	1.20	--	--	--	0.50	--	--	--	--	1.60
--	--	0.90	0.75	LRFD: 1.2D + 1.6S + 0.5W						
4	1.20	--	--	--	1.00	--	--	--	--	0.50
--	--	0.90	0.75	LRFD: 1.2D + 1.0W + 0.5S						
5	0.90	--	--	--	1.00	--	--	--	--	--
--	--	0.90	0.75	LRFD: 0.9D + 1.0W						
6	2.00	--	--	--	--	--	--	--	--	--
--	--	1.00	1.00	ASD: D (Doubled for Deflection Check)						
7	2.00	--	--	--	--	--	--	--	--	2.00
--	--	1.00	1.00	ASD: D + S (Doubled for Deflection Check)						
8	2.00	--	--	--	1.20	--	--	--	--	--
--	--	1.00	1.00	ASD: D + 0.6W (Doubled for Deflection Check)						
9	2.00	--	--	--	0.90	--	--	--	--	1.50
--	--	1.00	1.00	ASD: D + 0.45W + 0.75S (Doubled for Deflection Check)						
10	1.20	--	--	--	1.20	--	--	--	--	--
--	--	1.00	1.00	ASD: 0.6D + 0.6W (Doubled for Deflection Check)						



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Revision:	Date:	Sheet No. 134
Project Name: Lee's Summit Market Plaza		

Computed Factored Loads for LRFD Analyses

Factored Load Combination No. 1

Load Combination Name = LRFD: 1.4D

Structural Resistance Factor for Flexure = 0.900
Structural Resistance Factor for Shear = 0.750

Factored Load = 1.40*DL

Factored Horizontal Force = 3154.20 lbs
Factored Vertical Force = 29852.20 lbs
Factored Moment = 568131.20 in-lbs

Factored Load Combination No. 2

Load Combination Name = LRFD: 1.2D + 0.5S

Structural Resistance Factor for Flexure = 0.900
Structural Resistance Factor for Shear = 0.750

Factored Load = 1.20*DL + 0.50*Sn

Factored Horizontal Force = 8238.10 lbs
Factored Vertical Force = 46420.60 lbs
Factored Moment = 1502801.60 in-lbs

Factored Load Combination No. 3

Load Combination Name = LRFD: 1.2D + 1.6S + 0.5W

Structural Resistance Factor for Flexure = 0.900
Structural Resistance Factor for Shear = 0.750

Factored Load = 1.20*DL + 0.50*W + 1.60*Sn



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Revision:	Date:	Sheet No. 135
Project Name: Lee's Summit Market Plaza		

Factored Horizontal Force = 28979.00 lbs
Factored Vertical Force = 103408.20 lbs
Factored Moment = 5670755.00 in-lbs

Factored Load Combination No. 4

Load Combination Name = LRFD: 1.2D + 1.0W + 0.5S

Structural Resistance Factor for Flexure = 0.900
Structural Resistance Factor for Shear = 0.750

Factored Load = 1.20*DL + 1.00*W + 0.50*Sn

Factored Horizontal Force = 25368.10 lbs
Factored Vertical Force = 68730.60 lbs
Factored Moment = 5369047.60 in-lbs

Factored Load Combination No. 5

Load Combination Name = LRFD: 0.9D + 1.0W

Structural Resistance Factor for Flexure = 0.900
Structural Resistance Factor for Shear = 0.750

Factored Load = 0.90*DL + 1.00*W

Factored Horizontal Force = 19157.70 lbs
Factored Vertical Force = 41500.70 lbs
Factored Moment = 4231473.20 in-lbs

Factored Load Combination No. 6

Load Combination Name = ASD: D (Doubled for Deflection Check)

Structural Resistance Factor for Flexure = 1.000
Structural Resistance Factor for Shear = 1.000



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Revision:	Date:	Sheet No. 136
Project Name: Lee's Summit Market Plaza		

Factored Load = $2.00 \cdot DL$

Factored Horizontal Force = 4506.00 lbs
Factored Vertical Force = 42646.00 lbs
Factored Moment = 811616.00 in-lbs

Factored Load Combination No. 7

Load Combination Name = ASD: D + S (Doubled for Deflection Check)

Structural Resistance Factor for Flexure = 1.000

Structural Resistance Factor for Shear = 1.000

Factored Load = $2.00 \cdot DL + 2.00 \cdot S_n$

Factored Horizontal Force = 26644.00 lbs
Factored Vertical Force = 125978.00 lbs
Factored Moment = 4874944.00 in-lbs

Factored Load Combination No. 8

Load Combination Name = ASD: D + 0.6W (Doubled for Deflection Check)

Structural Resistance Factor for Flexure = 1.000

Structural Resistance Factor for Shear = 1.000

Factored Load = $2.00 \cdot DL + 1.20 \cdot W$

Factored Horizontal Force = 25062.00 lbs
Factored Vertical Force = 69418.00 lbs
Factored Moment = 5451111.20 in-lbs

Factored Load Combination No. 9

Load Combination Name = ASD: D + 0.45W + 0.75S (Doubled for Deflection Check)

Structural Resistance Factor for Flexure = 1.000

Structural Resistance Factor for Shear = 1.000



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Revision:	Date:	Sheet No. 137
Project Name: Lee's Summit Market Plaza		

Factored Load = $2.00 \cdot DL + 0.90 \cdot W + 1.50 \cdot S_n$

Factored Horizontal Force = 36526.50 lbs
Factored Vertical Force = 125224.00 lbs
Factored Moment = 7338733.40 in-lbs

Factored Load Combination No. 10

Load Combination Name = ASD: $0.6D + 0.6W$ (Doubled for Deflection Check)

Structural Resistance Factor for Flexure = 1.000
Structural Resistance Factor for Shear = 1.000

Factored Load = $1.20 \cdot DL + 1.20 \cdot W$

Factored Horizontal Force = 23259.60 lbs
Factored Vertical Force = 52359.60 lbs
Factored Moment = 5126464.80 in-lbs

Totals of Factored Loads by Load Combination:

Load Combination Combination Name Number	Factored Horiz. Force lbs	Factored Moment in-lbs	Factored Vert. Force lbs	Load
1 1.4D	3154.20	568131.20	29852.20	LRFD:
2 1.2D + 0.5S	8238.10	1502801.60	46420.60	LRFD:
3 1.2D + 1.6S + 0.5W	28979.00	5670755.00	103408.20	LRFD:
4 1.2D + 1.0W + 0.5S	25368.10	5369047.60	68730.60	LRFD:



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Revision:	Date:	Sheet No. 138
Project Name: Lee's Summit Market Plaza		

5 0.9D + 1.0W	19157.70	4231473.20	41500.70	LRFD:
6 (Doubled for Deflection Check)	4506.00	811616.00	42646.00	ASD: D
7 S (Doubled for Deflection Check)	26644.00	4874944.00	125978.00	ASD: D +
8 0.6W (Doubled for Deflection Check)	25062.00	5451111.20	69418.00	ASD: D +
9 0.45W + 0.75S (Doubled for Deflection Check)	36526.50	7338733.40	125224.00	ASD: D +
10 0.6D + 0.6W (Doubled for Deflection Check)	23259.60	5126464.80	52359.60	ASD:

Sorted Values of Axial Thrust Forces Sorted for LRFD Computations:

Number of Unique Axial Thrust Values = 10

Number	Factored Axial Thrust
1	33169.111
2	42646.000
3	46111.889
4	51578.444
5	52359.600
6	69418.000
7	76367.333
8	114898.000
9	125224.000
10	125978.000

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from LRFD load combinations



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Revision:	Date:	Sheet No. 139
Project Name: Lee's Summit Market Plaza		

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	17.000000 ft
Shaft Diameter	=	48.000000 in
Concrete Cover Thickness (to edge of long. rebar)	=	3.000000 in
Number of Reinforcing Bars	=	16 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	1810. sq. in.
Total Area of Reinforcing Steel	=	20.320000 sq. in.
Area Ratio of Steel Reinforcement	=	1.12 percent
Edge-to-Edge Bar Spacing	=	6.676029 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	8.90
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in
Confined Section		
Type: Hoop		
Number of Transverse Bars (per spacing)	=	1
Spacing of Transverse Bars	=	12.000000 in
Yield Stress of Transverse Bars	=	60000. psi
Total Area of Confinement Steel	=	0.110000 sq. in.
rho_s	=	0.0008653
ke	=	0.875446
f'cc	=	4156. psi
f'l	=	22.725431 psi
Epsilon cc	=	0.002389
Epsilon cu	=	0.005574
r	=	1.932341

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	7302.607 kips
Tensile Load for Cracking of Concrete	=	-812.146 kips
Nominal Axial Tensile Capacity	=	-1219.200 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
-----	-----	-----	-----	-----
1	1.270000	1.270000	20.365000	0.000000



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Revision:	Date:	Sheet No. 140
Project Name: Lee's Summit Market Plaza		

2	1.270000	1.270000	18.814807	7.793348
3	1.270000	1.270000	14.400230	14.400230
4	1.270000	1.270000	7.793348	18.814807
5	1.270000	1.270000	0.000000	20.365000
6	1.270000	1.270000	-7.793348	18.814807
7	1.270000	1.270000	-14.400230	14.400230
8	1.270000	1.270000	-18.814807	7.793348
9	1.270000	1.270000	-20.365000	0.000000
10	1.270000	1.270000	-18.814807	-7.793348
11	1.270000	1.270000	-14.400230	-14.400230
12	1.270000	1.270000	-7.793348	-18.814807
13	1.270000	1.270000	0.000000	-20.365000
14	1.270000	1.270000	7.793348	-18.814807
15	1.270000	1.270000	14.400230	-14.400230
16	1.270000	1.270000	18.814807	-7.793348

NOTE: The positions of the above rebars were computed by LPILE

Minimum spacing between any two bars not equal to zero = 6.676 inches
 between bars 11 and 12.

Ratio of bar spacing to maximum aggregate size = 8.90

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.341649 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from LRFD Pile-head Loadings = 10

Number	Axial Thrust Force kips
-----	-----
1	33.169
2	42.646
3	46.112
4	51.578
5	52.360
6	69.418
7	76.367
8	114.898
9	125.224



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 141
Project Name: Lee's Summit Market Plaza		

10 125.978

Definitions of Run Messages and Notes:

C = concrete in section has cracked in tension.
 Y = stress in reinforcing steel has reached yield stress.
 T = ACI 318 criteria for tension-controlled section met, tensile strain in reinforcement exceeds 0.005 while simultaneously compressive strain in concrete more than 0.003. See ACI 318, Section 10.3.4.
 Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

Bending Stiffness (EI) = Computed Bending Moment / Curvature.
 Position of neutral axis is measured from edge of compression side of pile.
 Compressive stresses and strains are positive in sign.
 Tensile stresses and strains are negative in sign.

Axial Thrust Force = 33.169 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in ² ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	718.6732031	1149877125.	31.3848638	0.00001962	-0.00001038
0.0701663	0.0821307	0.5645007			
0.00000125	1450.	1159988434.	27.9225011	0.00003490	-0.00002510
0.1247068	0.1454117	1.0034907			
0.00000188	2179.	1162186280.	26.7737079	0.00005020	-0.00003980
0.1792428	0.2082187	1.4427704			
0.00000250	2906.	1162210565.	26.1982874	0.00006550	-0.00005450
0.2337128	0.2704993	1.8819758			
0.00000313	3629.	1161341326.	25.8515815	0.00008079	-0.00006921
0.2880938	0.3322458	2.3210496			
0.00000375	4350.	1160013391.	25.6188786	0.00009607	-0.00008393
0.3423657	0.3934531	2.7599531			
0.00000438	5068.	1158418873.	25.4514328	0.0001114	-0.00009865
0.3965151	0.4541240	3.1987006			
0.00000500	5783.	1156651649.	25.3246202	0.0001266	-0.0001134
0.4505243	0.5142559	3.6372699			
0.00000563	5783.	1028134800.	14.8431544	0.00008349	-0.0001865
0.2956535	0.3407959	-5.3695604 C			
0.00000625	5783.	925321320.	14.5996728	0.00009125	-0.0002088
0.3229308	0.3715813	-6.0103093 C			



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 142
Project Name: Lee's Summit Market Plaza		

0.00000688	5783.	841201200.	14.3953305	0.00009897	-0.0002310
0.3500571	0.4020947	-6.6520810 C			
0.00000750	5783.	771101100.	14.2255134	0.0001067	-0.0002533
0.3771696	0.4324934	-7.2937508 C			
0.00000813	5783.	711785630.	14.0795449	0.0001144	-0.0002756
0.4041876	0.4626893	-7.9359572 C			
0.00000875	5783.	660943800.	13.9528854	0.0001221	-0.0002979
0.4311275	0.4927032	-8.5785553 C			
0.00001000	5783.	578325825.	13.7481581	0.0001375	-0.0003425
0.4849492	0.5523906	-9.8634341 C			
0.00001125	5783.	514067400.	13.5870122	0.0001529	-0.0003871
0.5385529	0.6114816	-11.1489373 C			
0.00001250	5783.	462660660.	13.4573612	0.0001682	-0.0004318
0.5919689	0.6700264	-12.4347065 C			
0.00001375	5783.	420600600.	13.3524065	0.0001836	-0.0004764
0.6452706	0.7281202	-13.7200279 C			
0.00001500	5783.	385550550.	13.2659861	0.0001990	-0.0005210
0.6984443	0.7857622	-15.0048960 C			
0.00001625	5783.	355892815.	13.1936058	0.0002144	-0.0005656
0.7514635	0.8429375	-16.2894132 C			
0.00001750	5783.	330471900.	13.1304124	0.0002298	-0.0006102
0.8042021	0.8995244	-17.5745157 C			
0.00001875	5783.	308440440.	13.0765333	0.0002452	-0.0006548
0.8567757	0.9556613	-18.8591350 C			
0.00002000	5783.	289162912.	13.0302319	0.0002606	-0.0006994
0.9091716	1.0113470	-20.1432654 C			
0.00002125	5784.	272186859.	12.9901806	0.0002760	-0.0007440
0.9613772	1.0665807	-21.4269012 C			
0.00002250	6098.	271036644.	12.9553465	0.0002915	-0.0007885
1.0133800	1.1213614	-22.7100364 C			
0.00002375	6412.	269993935.	12.9249145	0.0003070	-0.0008330
1.0651676	1.1756879	-23.9926651 C			
0.00002500	6726.	269042481.	12.8982325	0.0003225	-0.0008775
1.1167281	1.2295593	-25.2747814 C			
0.00002625	7039.	268169126.	12.8747726	0.0003380	-0.0009220
1.1680494	1.2829745	-26.5563793 C			
0.00002750	7352.	267363104.	12.8541033	0.0003535	-0.0009665
1.2191198	1.3359323	-27.8374526 C			
0.00003000	7978.	265918967.	12.8197690	0.0003846	-0.0010554
1.3204624	1.4404712	-30.3980009 C			
0.00003250	8601.	264654987.	12.7930222	0.0004158	-0.0011442
1.4206663	1.5431669	-32.9563765 C			
0.00003500	9224.	263531801.	12.7722872	0.0004470	-0.0012330
1.5196454	1.6440096	-35.5125284 C			
0.00003750	9845.	262520533.	12.7564094	0.0004784	-0.0013216
1.6173175	1.7429891	-38.0664046 C			
0.00004000	10464.	261599495.	12.7445238	0.0005098	-0.0014102
1.7136038	1.8400947	-40.6179530 C			
0.00004250	11082.	260752142.	12.7359699	0.0005413	-0.0014987
1.8084302	1.9353158	-43.1671174 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 143
Project Name: Lee's Summit Market Plaza		

0.00004500	11698.	259965537.	12.7302347	0.0005729	-0.0015871
1.9017257	2.0286406	-45.7138439 C			
0.00004750	12313.	259229475.	12.7269141	0.0006045	-0.0016755
1.9934242	2.1200573	-48.2580758 C			
0.00005000	12927.	258535784.	12.7256856	0.0006363	-0.0017637
2.0834633	2.2095535	-50.7997557 C			
0.00005250	13539.	257877832.	12.7262892	0.0006681	-0.0018519
2.1717852	2.2971163	-53.3388246 C			
0.00005750	14757.	256648343.	12.7321814	0.0007321	-0.0020279
2.3430669	2.4663877	-58.4088878 C			
0.00006250	15969.	255507639.	12.7433012	0.0007965	-0.0022035
2.5068921	2.6277582	-60.0000000 CY			
0.00006750	17096.	253280933.	12.7394145	0.0008599	-0.0023801
2.6598369	2.7780475	-60.0000000 CY			
0.00007250	17844.	246129228.	12.6479219	0.0009170	-0.0025630
2.7897720	2.9054916	-60.0000000 CY			
0.00007750	18498.	238689246.	12.5496274	0.0009726	-0.0027474
2.9096730	3.0228984	-60.0000000 CY			
0.00008250	19000.	230301961.	12.4271506	0.0010252	-0.0029348
3.0169614	3.1277580	-60.0000000 CY			
0.00008750	19362.	221283946.	12.2867336	0.0010751	-0.0031249
3.1130454	3.2214470	-60.0000000 CY			
0.00009250	19721.	213202049.	12.1601038	0.0011248	-0.0033152
3.2037227	3.3095875	-60.0000000 CY			
0.00009750	20077.	205917964.	12.0467505	0.0011746	-0.0035054
3.2893735	3.3924812	-60.0000000 CY			
0.0001025	20423.	199252329.	11.9446668	0.0012243	-0.0036957
3.3700646	3.4701087	-60.0000000 CY			
0.0001075	20654.	192125666.	11.8210866	0.0012708	-0.0038892
3.4408125	3.5376404	-60.0000000 CY			
0.0001125	20818.	185049142.	11.6886956	0.0013150	-0.0040850
3.5042190	3.5975803	-60.0000000 CY			
0.0001175	20980.	178549442.	11.5659101	0.0013590	-0.0042810
3.5636875	3.6531169	-60.0000000 CY			
0.0001225	21140.	172569114.	11.4546403	0.0014032	-0.0044768
3.6198340	3.7047422	-60.0000000 CY			
0.0001275	21298.	167046846.	11.3535595	0.0014476	-0.0046724
3.6727122	3.7524071	-60.0000000 CY			
0.0001325	21455.	161927231.	11.2604225	0.0014920	-0.0048680
3.7222167	3.7959186	-60.0000000 CY			
0.0001375	21609.	157157560.	11.1713676	0.0015361	-0.0050639
3.7680158	3.8349101	-60.0000000 CY			
0.0001425	21762.	152712879.	11.0899563	0.0015803	-0.0052597
3.8108408	3.8699237	-60.0000000 CY			
0.0001475	21913.	148559944.	11.0154406	0.0016248	-0.0054552
3.8507575	3.9009047	-60.0000000 CY			
0.0001525	22060.	144652911.	10.9462472	0.0016693	-0.0056507
3.8877190	3.9277161	-60.0000000 CY			
0.0001575	22184.	140849043.	10.8751158	0.0017128	-0.0058472
3.9210188	3.9498345	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 144
Project Name: Lee's Summit Market Plaza		

0.0001625	22268.	137030975.	10.7953579	0.0017542	-0.0060458
3.9501759	3.9671169	-60.0000000 CY			
0.0001675	22325.	133284673.	10.7078414	0.0017936	-0.0062464
3.9756615	3.9801413	-60.0000000 CY			
0.0001725	22379.	129732414.	10.6251422	0.0018328	-0.0064472
3.9991024	3.9898894	-60.0000000 CY			
0.0001775	22432.	126375669.	10.5480261	0.0018723	-0.0066477
4.0206902	3.9963990	-60.0000000 CY			
0.0001825	22484.	123198278.	10.4760496	0.0019119	-0.0068481
4.0404741	3.9996279	-60.0000000 CY			
0.0001875	22535.	120185057.	10.4089168	0.0019517	-0.0070483
4.0585115	3.9945543	-60.0000000 CY			
0.0001925	22585.	117323508.	10.3462156	0.0019916	-0.0072484
4.0748454	3.9987590	-60.0000000 CY			
0.0001975	22633.	114596947.	10.2849710	0.0020313	-0.0074487
4.0893377	3.9991187	-60.0000000 CY			
0.0002025	22679.	111995283.	10.2258839	0.0020707	-0.0076493
4.1021523	3.9961488	-60.0000000 CY			
0.0002075	22725.	109515891.	10.1703846	0.0021104	-0.0078496
4.1134673	3.9993021	-60.0000000 CY			
0.0002125	22769.	107149471.	10.1183380	0.0021501	-0.0080499
4.1233358	3.9972172	60.0000000 CY			
0.0002175	22813.	104887427.	10.0696471	0.0021901	-0.0082499
4.1318077	3.9957448	60.0000000 CY			
0.0002225	22856.	102724536.	10.0237810	0.0022303	-0.0084497
4.1389128	3.9990030	60.0000000 CY			
0.0002275	22899.	100654061.	9.9805928	0.0022706	-0.0086494
4.1446998	3.9993372	60.0000000 CY			
0.0002325	22940.	98668256.	9.9402418	0.0023111	-0.0088489
4.1492225	3.9932712	60.0000000 CY			
0.0002375	22981.	96764094.	9.9021248	0.0023518	-0.0090482
4.1525126	3.9974617	60.0000000 CY			
0.0002425	23022.	94936495.	9.8661116	0.0023925	-0.0092475
4.1546176	3.9996542	60.0000000 CY			
0.0002475	23062.	93178955.	9.8315467	0.0024333	-0.0094467
4.1555825	3.9961007	60.0000000 CY			
0.0002525	23100.	91485250.	9.7967897	0.0024737	-0.0096463
4.1554695	3.9929515	60.0000000 CY			
0.0002725	23249.	85317337.	9.6751778	0.0026365	-0.0104435
4.1547938	3.9903387	60.0000000 CY			
0.0002925	23391.	79969227.	9.5766227	0.0028012	-0.0112388
4.1544313	3.9992816	60.0000000 CY			
0.0003125	23494.	75181872.	9.4780664	0.0029619	-0.0120381
4.1549040	3.9972593	60.0000000 CY			
0.0003325	23544.	70808297.	9.3668899	0.0031145	-0.0128455
4.1556447	3.9902118	60.0000000 CY			
0.0003525	23568.	66859221.	9.2530785	0.0032617	-0.0136583
4.1544897	3.9955718	60.0000000 CY			
0.0003725	23591.	63330811.	9.1526998	0.0034094	-0.0144706
4.1552088	3.9989623	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 145
Project Name: Lee's Summit Market Plaza		

0.0003925	23607.	60145513.	9.0715644	0.0035606	-0.0152794
4.1546805	3.9850073	60.0000000 CY			
0.0004125	23623.	57266887.	9.0000431	0.0037125	-0.0160875
4.1552201	3.9966297	60.0000000 CY			
0.0004325	23636.	54649442.	8.9385177	0.0038659	-0.0168941
4.1534000	3.9976680	60.0000000 CY			
0.0004525	23636.	52233997.	8.9354153	0.0040433	-0.0176767
4.1554500	3.9828266	60.0000000 CY			
0.0004725	23636.	50023034.	8.9761046	0.0042412	-0.0184388
4.1536505	3.9992128	60.0000000 CY			
0.0004925	23636.	47991642.	9.0497353	0.0044570	-0.0191830
4.1545314	3.9754162	60.0000000 CY			
0.0005125	23636.	46118797.	9.0067444	0.0046160	-0.0199840
4.1513411	3.9889114	60.0000000 CY			
0.0005325	23636.	44386636.	9.1193714	0.0048561	-0.0207039
4.1551617	3.9904706	60.0000000 CY			

Axial Thrust Force = 42.646 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	714.8562826	1143770052.	33.3816997	0.00002086	-0.00000914
0.0746640	0.0873674	0.6006933			
0.00000125	1446.	1156420631.	28.9099043	0.00003614	-0.00002386
0.1291522	0.1505487	1.0392840			
0.00000188	2175.	1159787692.	27.4304858	0.00005143	-0.00003857
0.1836741	0.2133021	1.4784827			
0.00000250	2901.	1160431699.	26.6908612	0.00006673	-0.00005327
0.2381387	0.2755407	1.9176874			
0.00000313	3625.	1159941811.	26.2459582	0.00008202	-0.00006798
0.2925168	0.3372492	2.3567900			
0.00000375	4346.	1158870200.	25.9480623	0.00009731	-0.00008269
0.3467880	0.3984227	2.7957518			
0.00000438	5064.	1157457683.	25.7339543	0.0001126	-0.00009741
0.4009339	0.4590580	3.2345455			
0.00000500	5779.	1155828238.	25.5723303	0.0001279	-0.0001121
0.4549418	0.5191578	3.6731879			
0.00000563	5779.	1027402878.	15.5338059	0.00008738	-0.0001826
0.3095903	0.3565380	-5.2568979 C			
0.00000625	5779.	924662590.	15.2316129	0.00009520	-0.0002048
0.3370871	0.3875178	-5.8957701 C			
0.00000688	5779.	840602355.	14.9803826	0.0001030	-0.0002270
0.3644598	0.4182554	-6.5354362 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 146
Project Name: Lee's Summit Market Plaza		

0.00000750	5779.	770552159.	14.7684072	0.0001108	-0.0002492
0.3917344	0.4487833	-7.1756714 C			
0.00000813	5779.	711278916.	14.5877550	0.0001185	-0.0002715
0.4189420	0.4791388	-7.8162102 C			
0.00000875	5779.	660473279.	14.4295757	0.0001263	-0.0002937
0.4460139	0.5092485	-8.4575951 C			
0.00001000	5779.	577914119.	14.1736152	0.0001417	-0.0003383
0.5000952	0.5691224	-9.7400516 C			
0.00001125	5779.	513701439.	13.9693769	0.0001572	-0.0003828
0.5538234	0.6282524	-11.0241908 C			
0.00001250	5779.	462331295.	13.8068058	0.0001726	-0.0004274
0.6074277	0.6869079	-12.3080329 C			
0.00001375	5779.	420301177.	13.6747134	0.0001880	-0.0004720
0.6609022	0.7450972	-13.5915080 C			
0.00001500	5779.	385276079.	13.5618819	0.0002034	-0.0005166
0.7140431	0.8026143	-14.8761813 C			
0.00001625	5779.	355639458.	13.4673885	0.0002188	-0.0005612
0.7670388	0.8596785	-16.1603931 C			
0.00001750	5779.	330236639.	13.3873144	0.0002343	-0.0006057
0.8198761	0.9162888	-17.4441379 C			
0.00001875	5779.	308220863.	13.3187857	0.0002497	-0.0006503
0.8725419	0.9724443	-18.7274102 C			
0.00002000	5779.	288957059.	13.2596475	0.0002652	-0.0006948
0.9250234	1.0281441	-20.0102044 C			
0.00002125	5894.	277377725.	13.2082515	0.0002807	-0.0007393
0.9773078	1.0833872	-21.2925150 C			
0.00002250	6209.	275933757.	13.1619431	0.0002961	-0.0007839
1.0292772	1.1380617	-22.5752320 C			
0.00002375	6522.	274627679.	13.1209736	0.0003116	-0.0008284
1.0810052	1.1922580	-23.8576293 C			
0.00002500	6836.	273439130.	13.0848125	0.0003271	-0.0008729
1.1325025	1.2459989	-25.1395109 C			
0.00002625	7149.	272351200.	13.0527807	0.0003426	-0.0009174
1.1837571	1.2992831	-26.4208706 C			
0.00002750	7462.	271350052.	13.0243229	0.0003582	-0.0009618
1.2347573	1.3521097	-27.7017024 C			
0.00003000	8087.	269564282.	12.9763708	0.0003893	-0.0010507
1.3359492	1.4563852	-30.2617573 C			
0.00003250	8710.	268011024.	12.9381161	0.0004205	-0.0011395
1.4359891	1.5588158	-32.8196255 C			
0.00003500	9332.	266639693.	12.9075313	0.0004518	-0.0012282
1.5347915	1.6593918	-35.3752557 C			
0.00003750	9953.	265413182.	12.8831304	0.0004831	-0.0013169
1.6322746	1.7581029	-37.9285955 C			
0.00004000	10572.	264303647.	12.8638001	0.0005146	-0.0014054
1.7283603	1.8549384	-40.4795918 C			
0.00004250	11190.	263289783.	12.8486896	0.0005461	-0.0014939
1.8229747	1.9498873	-43.0281900 C			
0.00004500	11806.	262354990.	12.8371383	0.0005777	-0.0015823
1.9160476	2.0429378	-45.5743354 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 147
Project Name: Lee's Summit Market Plaza		

0.00004750	12421.	261486206.	12.8286254	0.0006094	-0.0016706
2.0075135	2.1340782	-48.1179690 C			
0.00005000	13034.	260672911.	12.8227352	0.0006411	-0.0017589
2.0973106	2.2232959	-50.6590341 C			
0.00005250	13645.	259906598.	12.8191320	0.0006730	-0.0018470
2.1853817	2.3105778	-53.1974715 C			
0.00005750	14863.	258488237.	12.8177391	0.0007370	-0.0020230
2.3561377	2.4792799	-58.2662199 C			
0.00006250	16074.	257188330.	12.8227790	0.0008014	-0.0021986
2.5194091	2.6400699	-60.0000000 CY			
0.00006750	17208.	254929210.	12.8154746	0.0008650	-0.0023750
2.6720677	2.7900527	-60.0000000 CY			
0.00007250	17967.	247814836.	12.7251146	0.0009226	-0.0025574
2.8024062	2.9178724	-60.0000000 CY			
0.00007750	18620.	240259518.	12.6226746	0.0009783	-0.0027417
2.9217671	3.0347291	-60.0000000 CY			
0.00008250	19133.	231915665.	12.4995080	0.0010312	-0.0029288
3.0290317	3.1395405	-60.0000000 CY			
0.00008750	19495.	222800653.	12.3554399	0.0010811	-0.0031189
3.1245585	3.2326551	-60.0000000 CY			
0.00009250	19855.	214643440.	12.2288401	0.0011312	-0.0033088
3.2152274	3.3207452	-60.0000000 CY			
0.00009750	20210.	207280871.	12.1124628	0.0011810	-0.0034990
3.3003018	3.4030248	-60.0000000 CY			
0.0001025	20557.	200560549.	12.0081555	0.0012308	-0.0036892
3.3805014	3.4801066	-60.0000000 CY			
0.0001075	20796.	193454651.	11.8847305	0.0012776	-0.0038824
3.4511477	3.5474531	-60.0000000 CY			
0.0001125	20962.	186330442.	11.7533761	0.0013223	-0.0040777
3.5145802	3.6073095	-60.0000000 CY			
0.0001175	21123.	179773281.	11.6282359	0.0013663	-0.0042737
3.5735006	3.6622031	-60.0000000 CY			
0.0001225	21283.	173740133.	11.5148154	0.0014106	-0.0044694
3.6291064	3.7131751	-60.0000000 CY			
0.0001275	21442.	168169133.	11.4117641	0.0014550	-0.0046650
3.6814518	3.7601757	-60.0000000 CY			
0.0001325	21599.	163007748.	11.3179365	0.0014996	-0.0048604
3.7305963	3.8031537	-60.0000000 CY			
0.0001375	21753.	158202637.	11.2294314	0.0015440	-0.0050560
3.7761948	3.8417174	-60.0000000 CY			
0.0001425	21905.	153718608.	11.1463965	0.0015884	-0.0052516
3.8184949	3.8760022	-60.0000000 CY			
0.0001475	22056.	149528932.	11.0703796	0.0016329	-0.0054471
3.8578969	3.9062404	-60.0000000 CY			
0.0001525	22203.	145591930.	11.0000334	0.0016775	-0.0056425
3.8943857	3.9323170	-60.0000000 CY			
0.0001575	22331.	141781969.	10.9290666	0.0017213	-0.0058387
3.9273779	3.9537892	-60.0000000 CY			
0.0001625	22419.	137960094.	10.8498471	0.0017631	-0.0060369
3.9562799	3.9704337	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 148
Project Name: Lee's Summit Market Plaza		

0.0001675	22478.	134198734.	10.7647974	0.0018031	-0.0062369
3.9817213	3.9828899	-60.0000000 CY			
0.0001725	22532.	130618187.	10.6807898	0.0018424	-0.0064376
4.0047031	3.9918326	-60.0000000 CY			
0.0001775	22584.	127234714.	10.6024492	0.0018819	-0.0066381
4.0258428	3.9975233	-60.0000000 CY			
0.0001825	22636.	124032031.	10.5293254	0.0019216	-0.0068384
4.0451896	3.9999194	-60.0000000 CY			
0.0001875	22686.	120994517.	10.4611596	0.0019615	-0.0070385
4.0628043	3.9959793	-60.0000000 CY			
0.0001925	22736.	118110318.	10.3974344	0.0020015	-0.0072385
4.0787215	3.9993863	-60.0000000 CY			
0.0001975	22785.	115367217.	10.3379010	0.0020417	-0.0074383
4.0929958	3.9958412	-60.0000000 CY			
0.0002025	22831.	112748080.	10.2792502	0.0020815	-0.0076385
4.1054897	3.9974396	-60.0000000 CY			
0.0002075	22877.	110249130.	10.2228097	0.0021212	-0.0078388
4.1163983	3.9997785	60.0000000 CY			
0.0002125	22921.	107863332.	10.1699970	0.0021611	-0.0080389
4.1258773	3.9937755	60.0000000 CY			
0.0002175	22964.	105583646.	10.1204370	0.0022012	-0.0082388
4.1339627	3.9971357	60.0000000 CY			
0.0002225	23007.	103403886.	10.0737489	0.0022414	-0.0084386
4.1406930	3.9996085	60.0000000 CY			
0.0002275	23049.	101316470.	10.0299294	0.0022818	-0.0086382
4.1461208	3.9958182	60.0000000 CY			
0.0002325	23091.	99315385.	9.9888078	0.0023224	-0.0088376
4.1502892	3.9950920	60.0000000 CY			
0.0002375	23132.	97396572.	9.9499593	0.0023631	-0.0090369
4.1532369	3.9985304	60.0000000 CY			
0.0002425	23172.	95554909.	9.9132514	0.0024040	-0.0092360
4.1550109	3.9999581	60.0000000 CY			
0.0002475	23212.	93784078.	9.8788878	0.0024450	-0.0094350
4.1556577	3.9924272	60.0000000 CY			
0.0002525	23251.	92081424.	9.8464197	0.0024862	-0.0096338
4.1552176	3.9950060	60.0000000 CY			
0.0002725	23399.	85866566.	9.7230320	0.0026495	-0.0104305
4.1543021	3.9915016	60.0000000 CY			
0.0002925	23540.	80477976.	9.6224402	0.0028146	-0.0112254
4.1541415	3.9950799	60.0000000 CY			
0.0003125	23646.	75666550.	9.5235270	0.0029761	-0.0120239
4.1543935	3.9986095	60.0000000 CY			
0.0003325	23698.	71273545.	9.4135192	0.0031300	-0.0128300
4.1554896	3.9856764	60.0000000 CY			
0.0003525	23725.	67306319.	9.3040129	0.0032797	-0.0136403
4.1551070	3.9977430	60.0000000 CY			
0.0003725	23747.	63749434.	9.2032841	0.0034282	-0.0144518
4.1546349	3.9930547	60.0000000 CY			
0.0003925	23763.	60541854.	9.1202268	0.0035797	-0.0152603
4.1552623	3.9895566	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
 816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 149
Project Name: Lee's Summit Market Plaza		

0.0004125	23778.	57643197.	9.0469445	0.0037319	-0.0160681
4.1546334	3.9985907	60.0000000 CY			
0.0004325	23778.	54977615.	9.0368747	0.0039084	-0.0168516
4.1551715	3.9843309	60.0000000 CY			
0.0004525	23778.	52547665.	8.9810191	0.0040639	-0.0176561
4.1549651	3.9880825	60.0000000 CY			
0.0004725	23778.	50323426.	9.0223998	0.0042631	-0.0184169
4.1546540	3.9999763	60.0000000 CY			
0.0004925	23778.	48279835.	9.0963119	0.0044799	-0.0191601
4.1534911	3.9824517	60.0000000 CY			
0.0005125	23778.	46395744.	9.2042684	0.0047172	-0.0198828
4.1556345	3.9993992	60.0000000 CY			
0.0005325	23778.	44653180.	9.1702399	0.0048832	-0.0206768
4.1542333	3.9819780	60.0000000 CY			

Axial Thrust Force = 46.112 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	713.5841275	1141734604.	34.1152113	0.00002132	-0.00000868
0.0763162	0.0892902	0.6139882			
0.00000125	1444.	1155135505.	29.2718322	0.00003659	-0.00002341
0.1307816	0.1524307	1.0524039			
0.00000188	2173.	1158912008.	27.6709799	0.00005188	-0.00003812
0.1852967	0.2151626	1.4915595			
0.00000250	2899.	1159781384.	26.8712503	0.00006718	-0.00005282
0.2397595	0.2773860	1.9307657			
0.00000313	3623.	1159429008.	26.3903586	0.00008247	-0.00006753
0.2941361	0.3390804	2.3698763			
0.00000375	4344.	1158449576.	26.0684729	0.00009776	-0.00008224
0.3484054	0.4002397	2.8088464			
0.00000438	5062.	1157104972.	25.8374040	0.0001130	-0.00009696
0.4025518	0.4608638	3.2476707			
0.00000500	5778.	1155524879.	25.6629107	0.0001283	-0.0001117
0.4565570	0.5209494	3.6863221			
0.00000563	5778.	1027133226.	15.7775220	0.00008875	-0.0001813
0.3145069	0.3620850	-5.2171417 C			
0.00000625	5778.	924419903.	15.4562567	0.00009660	-0.0002034
0.3421178	0.3931745	-5.8550535 C			
0.00000688	5778.	840381730.	15.1892107	0.0001044	-0.0002256
0.3695989	0.4240150	-6.4938011 C			
0.00000750	5778.	770349919.	14.9620608	0.0001122	-0.0002478
0.3969278	0.4545850	-7.1335517 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
www.leok.com

Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 150
Project Name: Lee's Summit Market Plaza		

0.00000813	5778.	711092233.	14.7683475	0.0001200	-0.0002700
0.4241827	0.4849749	-7.7736581 C			
0.00000875	5778.	660299931.	14.6014407	0.0001278	-0.0002922
0.4513786	0.5152041	-8.4139844 C			
0.00001000	5778.	577762440.	14.3242011	0.0001432	-0.0003368
0.5054532	0.5750347	-9.6963816 C			
0.00001125	5778.	513566613.	14.1081103	0.0001587	-0.0003813
0.5593609	0.6343270	-10.9789290 C			
0.00001250	5778.	462209952.	13.9318452	0.0001741	-0.0004259
0.6129557	0.6929381	-12.2627061 C			
0.00001375	5778.	420190865.	13.7887352	0.0001896	-0.0004704
0.6664283	0.7510926	-13.5460418 C			
0.00001500	5778.	385174960.	13.6701603	0.0002051	-0.0005149
0.7197469	0.8087700	-14.8290802 C			
0.00001625	5778.	355546117.	13.5674922	0.0002205	-0.0005595
0.7727290	0.8657884	-16.1132193 C			
0.00001750	5778.	330149965.	13.4804132	0.0002359	-0.0006041
0.8255512	0.9223528	-17.3968903 C			
0.00001875	5778.	308139968.	13.4058157	0.0002514	-0.0006486
0.8782007	0.9784624	-18.6800876 C			
0.00002000	5778.	288881220.	13.3413691	0.0002668	-0.0006932
0.9306644	1.0341161	-19.9628059 C			
0.00002125	5935.	279270718.	13.2852910	0.0002823	-0.0007377
0.9829298	1.0893130	-21.2450393 C			
0.00002250	6249.	277721795.	13.2361955	0.0002978	-0.0007822
1.0349844	1.1440520	-22.5267823 C			
0.00002375	6563.	276321690.	13.1927254	0.0003133	-0.0008267
1.0867945	1.1983100	-23.8082103 C			
0.00002500	6876.	275046455.	13.1530958	0.0003288	-0.0008712
1.1382684	1.2520031	-25.0900055 C			
0.00002625	7189.	273880071.	13.1179276	0.0003443	-0.0009157
1.1894983	1.3052395	-26.3712776 C			
0.00002750	7502.	272807581.	13.0866200	0.0003599	-0.0009601
1.2404727	1.3580180	-27.6520205 C			
0.00003000	8127.	270896902.	13.0336851	0.0003910	-0.0010490
1.3416090	1.4621971	-30.2118939 C			
0.00003250	8750.	269237876.	12.9912197	0.0004222	-0.0011378
1.4415884	1.5645307	-32.7695753 C			
0.00003500	9372.	267775817.	12.9570309	0.0004535	-0.0012265
1.5403257	1.6650091	-35.3250135 C			
0.00003750	9993.	266470607.	12.9295115	0.0004849	-0.0013151
1.6377392	1.7636220	-37.8781561 C			
0.00004000	10612.	265292147.	12.9074572	0.0005163	-0.0014037
1.7337511	1.8603586	-40.4289495 C			
0.00004250	11229.	264217404.	12.8899478	0.0005478	-0.0014922
1.8282875	1.9552079	-42.9773393 C			
0.00004500	11845.	263228454.	12.8762685	0.0005794	-0.0015806
1.9212788	2.0481582	-45.5232695 C			
0.00004750	12460.	262311118.	12.8658559	0.0006111	-0.0016689
2.0126591	2.1391973	-48.0666843 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 151
Project Name: Lee's Summit Market Plaza		

0.00005000	13073.	261454092.	12.8582601	0.0006429	-0.0017571
2.1023674	2.2283131	-50.6075233 C			
0.00005250	13684.	260648158.	12.8531177	0.0006748	-0.0018452
2.1903464	2.3154921	-53.1457285 C			
0.00005750	14902.	259160734.	12.8490595	0.0007388	-0.0020212
2.3609096	2.4839857	-58.2139934 C			
0.00006250	16113.	257802625.	12.8518750	0.0008032	-0.0021968
2.5239779	2.6445633	-60.0000000 CY			
0.00006750	17248.	255525900.	12.8432216	0.0008669	-0.0023731
2.6765149	2.7944175	-60.0000000 CY			
0.00007250	18011.	248427917.	12.7522522	0.0009245	-0.0025555
2.8068313	2.9222082	-60.0000000 CY			
0.00007750	18665.	240833501.	12.6494258	0.0009803	-0.0027397
2.9261784	3.0390437	-60.0000000 CY			
0.00008250	19182.	232505590.	12.5260110	0.0010334	-0.0029266
3.0334332	3.1438361	-60.0000000 CY			
0.00008750	19544.	223355110.	12.3806062	0.0010833	-0.0031167
3.1287559	3.2367402	-60.0000000 CY			
0.00009250	19903.	215168048.	12.2533523	0.0011334	-0.0033066
3.2193090	3.3247021	-60.0000000 CY			
0.00009750	20258.	207779063.	12.1365372	0.0011833	-0.0034967
3.3042836	3.4068644	-60.0000000 CY			
0.0001025	20606.	201038761.	12.0314168	0.0012332	-0.0036868
3.3843034	3.4837458	-60.0000000 CY			
0.0001075	20849.	193940503.	11.9080529	0.0012801	-0.0038799
3.4549114	3.5510227	-60.0000000 CY			
0.0001125	21014.	186795316.	11.7761674	0.0013248	-0.0040752
3.5182061	3.6107093	-60.0000000 CY			
0.0001175	21176.	180220656.	11.6510812	0.0013690	-0.0042710
3.5770715	3.6655032	-60.0000000 CY			
0.0001225	21336.	174168208.	11.5368728	0.0014133	-0.0044667
3.6324796	3.7162356	-60.0000000 CY			
0.0001275	21494.	168579388.	11.4330998	0.0014577	-0.0046623
3.6846302	3.7629924	-60.0000000 CY			
0.0001325	21651.	163401508.	11.3386091	0.0015024	-0.0048576
3.7335831	3.8057224	-60.0000000 CY			
0.0001375	21805.	158584647.	11.2507222	0.0015470	-0.0050530
3.7791666	3.8441776	-60.0000000 CY			
0.0001425	21957.	154086224.	11.1670928	0.0015913	-0.0052487
3.8212747	3.8781946	-60.0000000 CY			
0.0001475	22108.	149883112.	11.0905261	0.0016359	-0.0054441
3.8604887	3.9081600	-60.0000000 CY			
0.0001525	22255.	145935152.	11.0197583	0.0016805	-0.0056395
3.8968046	3.9339663	-60.0000000 CY			
0.0001575	22384.	142122981.	10.9488559	0.0017244	-0.0058356
3.9296836	3.9551991	-60.0000000 CY			
0.0001625	22474.	138299403.	10.8697248	0.0017663	-0.0060337
3.9584787	3.9715998	-60.0000000 CY			
0.0001675	22534.	134532864.	10.7857032	0.0018066	-0.0062334
3.9839141	3.9838475	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 152
Project Name: Lee's Summit Market Plaza		

0.0001725	22587.	130941966.	10.7012160	0.0018460	-0.0064340
4.0067282	3.9924939	-60.0000000 CY			
0.0001775	22640.	127548719.	10.6224266	0.0018855	-0.0066345
4.0277042	3.9978834	-60.0000000 CY			
0.0001825	22691.	124336785.	10.5488822	0.0019252	-0.0068348
4.0468914	3.9999730	-60.0000000 CY			
0.0001875	22742.	121290393.	10.4803370	0.0019651	-0.0070349
4.0643516	3.9964482	-60.0000000 CY			
0.0001925	22792.	118397909.	10.4162366	0.0020051	-0.0072349
4.0801168	3.9995617	-60.0000000 CY			
0.0001975	22840.	115646722.	10.3563810	0.0020454	-0.0074346
4.0942450	3.9946969	-60.0000000 CY			
0.0002025	22887.	113023236.	10.2988515	0.0020855	-0.0076345
4.1066850	3.9978478	-60.0000000 CY			
0.0002075	22932.	110517125.	10.2420661	0.0021252	-0.0078348
4.1174452	3.9998866	60.0000000 CY			
0.0002125	22976.	108124253.	10.1889706	0.0021652	-0.0080348
4.1267819	3.9931401	60.0000000 CY			
0.0002175	23020.	105838114.	10.1390921	0.0022053	-0.0082347
4.1347263	3.9975777	60.0000000 CY			
0.0002225	23063.	103652184.	10.0921028	0.0022455	-0.0084345
4.1413199	3.9997611	60.0000000 CY			
0.0002275	23105.	101558587.	10.0480495	0.0022859	-0.0086341
4.1466164	3.9945257	60.0000000 CY			
0.0002325	23146.	99551914.	10.0066456	0.0023265	-0.0088335
4.1506556	3.9956888	60.0000000 CY			
0.0002375	23187.	97627742.	9.9675290	0.0023673	-0.0090327
4.1534784	3.9988500	60.0000000 CY			
0.0002425	23227.	95780936.	9.9305666	0.0024082	-0.0092318
4.1551318	3.9999959	60.0000000 CY			
0.0002475	23266.	94004909.	9.8960128	0.0024493	-0.0094307
4.1556617	3.9910983	60.0000000 CY			
0.0002525	23305.	92297571.	9.8633019	0.0024905	-0.0096295
4.1551086	3.9956244	60.0000000 CY			
0.0002725	23453.	86067306.	9.7406194	0.0026543	-0.0104257
4.1543294	3.9924127	60.0000000 CY			
0.0002925	23594.	80663927.	9.6392779	0.0028195	-0.0112205
4.1543628	3.9935358	60.0000000 CY			
0.0003125	23701.	75843709.	9.5402422	0.0029813	-0.0120187
4.1541739	3.9989919	60.0000000 CY			
0.0003325	23755.	71443274.	9.4306016	0.0031357	-0.0128243
4.1553930	3.9870816	60.0000000 CY			
0.0003525	23783.	67469762.	9.3227836	0.0032863	-0.0136337
4.1552761	3.9983604	60.0000000 CY			
0.0003725	23804.	63902420.	9.2219506	0.0034352	-0.0144448
4.1543662	3.9908747	60.0000000 CY			
0.0003925	23820.	60686730.	9.1381660	0.0035867	-0.0152533
4.1554112	3.9910267	60.0000000 CY			
0.0004125	23835.	57780750.	9.0642354	0.0037390	-0.0160610
4.1543571	3.9991013	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
 816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 153
Project Name: Lee's Summit Market Plaza		

0.0004325	23835.	55108807.	9.0542430	0.0039160	-0.0168440
4.1553484	3.9819757	60.0000000 CY			
0.0004525	23835.	52673059.	8.9978388	0.0040715	-0.0176485
4.1547171	3.9897793	60.0000000 CY			
0.0004725	23835.	50443512.	9.0395207	0.0042712	-0.0184088
4.1549365	3.9989018	60.0000000 CY			
0.0004925	23835.	48395044.	9.1135150	0.0044884	-0.0191516
4.1530251	3.9847510	60.0000000 CY			
0.0005125	23835.	46506457.	9.2235232	0.0047271	-0.0198729
4.1556616	3.9963053	60.0000000 CY			
0.0005325	23835.	44759736.	9.1890849	0.0048932	-0.0206668
4.1537724	3.9788318	60.0000000 CY			

Axial Thrust Force = 51.578 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	711.7173857	1138747817.	35.2753016	0.00002205	-0.00000795
0.0789291	0.0923302	0.6350148			
0.00000125	1441.	1153131769.	29.8435011	0.00003730	-0.00002270
0.1333552	0.1554025	1.0731269			
0.00000188	2170.	1157535411.	28.0507089	0.00005260	-0.00003740
0.1878585	0.2180994	1.5122073			
0.00000250	2897.	1158752296.	27.1558036	0.00006789	-0.00005211
0.2423160	0.2802961	1.9513958			
0.00000313	3621.	1158616469.	26.6180937	0.00008318	-0.00006682
0.2966897	0.3419673	2.3905147			
0.00000375	4342.	1157785148.	26.2585370	0.00009847	-0.00008153
0.3509583	0.4031068	2.8295159			
0.00000438	5060.	1156545930.	26.0005552	0.0001138	-0.00009625
0.4051031	0.4637108	3.2683705			
0.00000500	5775.	1155045988.	25.8059760	0.0001290	-0.0001110
0.4591078	0.5237782	3.7070665			
0.00000563	5775.	1026707545.	16.1563578	0.00009088	-0.0001791
0.3221477	0.3706989	-5.1553441 C			
0.00000625	5775.	924036790.	15.8040839	0.00009878	-0.0002012
0.3499053	0.4019243	-5.7920098 C			
0.00000688	5775.	840033446.	15.5116169	0.0001066	-0.0002234
0.3775310	0.4328980	-6.4295214 C			
0.00000750	5775.	770030659.	15.2628574	0.0001145	-0.0002455
0.4049923	0.4635871	-7.0681285 C			
0.00000813	5775.	710797531.	15.0505655	0.0001223	-0.0002677
0.4323702	0.4940855	-7.7071605 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 154
Project Name: Lee's Summit Market Plaza		

0.00000875	5775.	660026279.	14.8649421	0.0001301	-0.0002899
0.4596011	0.5243253	-8.3471209 C			
0.00001000	5775.	577522994.	14.5617946	0.0001456	-0.0003344
0.5139041	0.5843527	-9.6274795 C			
0.00001125	5775.	513353772.	14.3213527	0.0001611	-0.0003789
0.5678689	0.6436535	-10.9093587 C			
0.00001250	5775.	462018395.	14.1291373	0.0001766	-0.0004234
0.6216742	0.7024417	-12.1911877 C			
0.00001375	5775.	420016723.	13.9683538	0.0001921	-0.0004679
0.6751295	0.7605259	-13.4744189 C			
0.00001500	5775.	385015329.	13.8353977	0.0002075	-0.0005125
0.7284467	0.8181524	-14.7572020 C			
0.00001625	5775.	355398766.	13.7238585	0.0002230	-0.0005570
0.7816123	0.8753204	-16.0395316 C			
0.00001750	5775.	330013139.	13.6273145	0.0002385	-0.0006015
0.8345007	0.9319092	-17.3223378 C			
0.00001875	5775.	308012263.	13.5431417	0.0002539	-0.0006461
0.8871240	0.9879462	-18.6054166 C			
0.00002000	5775.	288761497.	13.4703197	0.0002694	-0.0006906
0.9395595	1.0435272	-19.8880145 C			
0.00002125	5998.	282255721.	13.4068544	0.0002849	-0.0007351
0.9917946	1.0986513	-21.1701259 C			
0.00002250	6312.	280537652.	13.3511952	0.0003004	-0.0007796
1.0438168	1.1533173	-22.4517451 C			
0.00002375	6626.	278986602.	13.3021178	0.0003159	-0.0008241
1.0956137	1.2075242	-23.7328663 C			
0.00002500	6939.	277577393.	13.2586430	0.0003315	-0.0008685
1.1471733	1.2612710	-25.0134838 C			
0.00002625	7253.	276289640.	13.2199780	0.0003470	-0.0009130
1.1984838	1.3145566	-26.2935916 C			
0.00002750	7565.	275105826.	13.1849264	0.0003626	-0.0009574
1.2494831	1.3673281	-27.5736211 C			
0.00003000	8190.	272998171.	13.1241298	0.0003937	-0.0010463
1.3505312	1.4713550	-30.1332069 C			
0.00003250	8813.	271172355.	13.0750209	0.0004249	-0.0011351
1.4504148	1.5735356	-32.6905927 C			
0.00003500	9435.	269567221.	13.0351458	0.0004562	-0.0012238
1.5490490	1.6738600	-35.2457269 C			
0.00003750	10055.	268137907.	13.0027061	0.0004876	-0.0013124
1.6463523	1.7723179	-37.7985570 C			
0.00004000	10674.	266850752.	12.9763541	0.0005191	-0.0014009
1.7422472	1.8688985	-40.3490292 C			
0.00004250	11291.	265680005.	12.9550597	0.0005506	-0.0014894
1.8366603	1.9635906	-42.8970888 C			
0.00004500	11907.	264605624.	12.9380230	0.0005822	-0.0015778
1.9295222	2.0563825	-45.4426799 C			
0.00004750	12522.	263611773.	12.9246132	0.0006139	-0.0016661
2.0207675	2.1472622	-47.9857452 C			
0.00005000	13134.	262685758.	12.9143264	0.0006457	-0.0017543
2.1103351	2.2362168	-50.5262276 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 155
Project Name: Lee's Summit Market Plaza		

0.00005250	13745.	261817342.	12.9067557	0.0006776	-0.0018424
2.1981686	2.3232336	-53.0640649 C			
0.00005750	14963.	260221002.	12.8984924	0.0007417	-0.0020183
2.3684268	2.4913981	-58.1315646 C			
0.00006250	16173.	258771108.	12.8977988	0.0008061	-0.0021939
2.5311744	2.6516402	-60.0000000 CY			
0.00006750	17312.	256466677.	12.8870188	0.0008699	-0.0023701
2.6835190	2.8012912	-60.0000000 CY			
0.00007250	18081.	249394583.	12.7950914	0.0009276	-0.0025524
2.8137992	2.9290349	-60.0000000 CY			
0.00007750	18735.	241738484.	12.6916590	0.0009836	-0.0027364
2.9331232	3.0458356	-60.0000000 CY			
0.00008250	19258.	233435784.	12.5678571	0.0010368	-0.0029232
3.0403612	3.1505967	-60.0000000 CY			
0.00008750	19620.	224229370.	12.4203425	0.0010868	-0.0031132
3.1353618	3.2431681	-60.0000000 CY			
0.00009250	19979.	215992353.	12.2912160	0.0011369	-0.0033031
3.2255921	3.3307917	-60.0000000 CY			
0.00009750	20335.	208564588.	12.1745547	0.0011870	-0.0034930
3.3105482	3.4129027	-60.0000000 CY			
0.0001025	20684.	201792766.	12.0681517	0.0012370	-0.0036830
3.3902835	3.4894670	-60.0000000 CY			
0.0001075	20931.	194706609.	11.9448895	0.0012841	-0.0038759
3.4608299	3.5566318	-60.0000000 CY			
0.0001125	21097.	187526180.	11.8116048	0.0013288	-0.0040712
3.5238181	3.6159663	-60.0000000 CY			
0.0001175	21259.	180926100.	11.6871703	0.0013732	-0.0042668
3.5826845	3.6706838	-60.0000000 CY			
0.0001225	21418.	174843181.	11.5717180	0.0014175	-0.0044625
3.6377806	3.7210369	-60.0000000 CY			
0.0001275	21576.	169226256.	11.4668054	0.0014620	-0.0046580
3.6896239	3.7674082	-60.0000000 CY			
0.0001325	21733.	164022360.	11.3712678	0.0015067	-0.0048533
3.7382748	3.8097460	-60.0000000 CY			
0.0001375	21888.	159186222.	11.2841114	0.0015516	-0.0050484
3.7837975	3.8479970	-60.0000000 CY			
0.0001425	22040.	154665814.	11.1997963	0.0015960	-0.0052440
3.8256379	3.8816192	-60.0000000 CY			
0.0001475	22190.	150441522.	11.1223617	0.0016405	-0.0054395
3.8645556	3.9111529	-60.0000000 CY			
0.0001525	22338.	146476284.	11.0509292	0.0016853	-0.0056347
3.9005987	3.9365312	-60.0000000 CY			
0.0001575	22469.	142660646.	10.9801325	0.0017294	-0.0058306
3.9332984	3.9573829	-60.0000000 CY			
0.0001625	22561.	138834403.	10.9011459	0.0017714	-0.0060286
3.9619241	3.9733952	-60.0000000 CY			
0.0001675	22622.	135056001.	10.8174899	0.0018119	-0.0062281
3.9872160	3.9852505	-60.0000000 CY			
0.0001725	22676.	131452451.	10.7335157	0.0018515	-0.0064285
4.0098968	3.9934826	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 156
Project Name: Lee's Summit Market Plaza		

0.0001775	22728.	128043800.	10.6540172	0.0018911	-0.0066289
4.0306151	3.9983951	-60.0000000 CY			
0.0001825	22779.	124817246.	10.5798126	0.0019308	-0.0068292
4.0495511	3.9997664	-60.0000000 CY			
0.0001875	22829.	121756885.	10.5106633	0.0019707	-0.0070293
4.0667675	3.9971305	-60.0000000 CY			
0.0001925	22879.	118851336.	10.4459701	0.0020108	-0.0072292
4.0822930	3.9997790	-60.0000000 CY			
0.0001975	22927.	116087404.	10.3856042	0.0020512	-0.0074288
4.0961910	3.9941536	-60.0000000 CY			
0.0002025	22975.	113455499.	10.3291202	0.0020916	-0.0076284
4.1084987	3.9984086	-60.0000000 CY			
0.0002075	23020.	110939625.	10.2725305	0.0021316	-0.0078284
4.1190690	3.9999844	60.0000000 CY			
0.0002125	23064.	108535620.	10.2189860	0.0021715	-0.0080285
4.1281813	3.9942146	60.0000000 CY			
0.0002175	23107.	106239304.	10.1686046	0.0022117	-0.0082283
4.1359037	3.9982013	60.0000000 CY			
0.0002225	23150.	104043642.	10.1211396	0.0022520	-0.0084280
4.1422820	3.9999259	60.0000000 CY			
0.0002275	23191.	101940312.	10.0767143	0.0022925	-0.0086275
4.1473717	3.9924812	60.0000000 CY			
0.0002325	23233.	99924824.	10.0348644	0.0023331	-0.0088269
4.1512076	3.9965540	60.0000000 CY			
0.0002375	23273.	97992199.	9.9953245	0.0023739	-0.0090261
4.1538338	3.9992758	60.0000000 CY			
0.0002425	23313.	96136932.	9.9580304	0.0024148	-0.0092252
4.1552977	3.9985103	60.0000000 CY			
0.0002475	23352.	94353077.	9.9231029	0.0024560	-0.0094240
4.1556433	3.9921235	60.0000000 CY			
0.0002525	23391.	92638351.	9.8900085	0.0024972	-0.0096228
4.1549124	3.9965192	60.0000000 CY			
0.0002725	23540.	86383785.	9.7684545	0.0026619	-0.0104181
4.1546395	3.9937491	60.0000000 CY			
0.0002925	23680.	80957098.	9.6659252	0.0028273	-0.0112127
4.1546765	3.9910921	60.0000000 CY			
0.0003125	23788.	76123028.	9.5667052	0.0029896	-0.0120104
4.1537916	3.9994718	60.0000000 CY			
0.0003325	23844.	71710897.	9.4576568	0.0031447	-0.0128153
4.1551968	3.9891589	60.0000000 CY			
0.0003525	23874.	67727473.	9.3525494	0.0032968	-0.0136232
4.1554809	3.9991376	60.0000000 CY			
0.0003725	23894.	64143634.	9.2515568	0.0034462	-0.0144338
4.1538780	3.9874170	60.0000000 CY			
0.0003925	23909.	60915154.	9.1666197	0.0035979	-0.0152421
4.1555760	3.9931299	60.0000000 CY			
0.0004125	23924.	57997626.	9.0916620	0.0037503	-0.0160497
4.1538538	3.9996766	60.0000000 CY			
0.0004325	23924.	55315655.	9.0817995	0.0039279	-0.0168321
4.1555476	3.9785305	60.0000000 CY			



250 NE Mulberry St., Suite 201
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 816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 157
Project Name: Lee's Summit Market Plaza		

0.0004525	23924.	52870764.	9.0245260	0.0040836	-0.0176364
4.1542485	3.9922042	60.0000000 CY			
0.0004725	23924.	50632848.	9.0667611	0.0042840	-0.0183960
4.1552891	3.9948664	60.0000000 CY			
0.0004925	23924.	48576692.	9.1408383	0.0045019	-0.0191381
4.1521961	3.9880713	60.0000000 CY			
0.0005125	23924.	46681016.	9.2541676	0.0047428	-0.0198572
4.1555690	3.9913812	60.0000000 CY			
0.0005325	23924.	44927739.	9.2190817	0.0049092	-0.0206508
4.1529114	3.9738238	60.0000000 CY			

Axial Thrust Force = 52.360 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	711.4707708	1138353233.	35.4414916	0.00002215	-0.00000785
0.0793034	0.0927656	0.6380270			
0.00000125	1441.	1152846796.	29.9252449	0.00003741	-0.00002259
0.1337231	0.1558274	1.0760901			
0.00000188	2170.	1157339234.	28.1050092	0.00005270	-0.00003730
0.1882248	0.2185192	1.5151599			
0.00000250	2897.	1158605979.	27.1965218	0.00006799	-0.00005201
0.2426818	0.2807124	1.9543478			
0.00000313	3620.	1158500282.	26.6506521	0.00008328	-0.00006672
0.2970548	0.3423800	2.3934654			
0.00000375	4341.	1157690173.	26.2857167	0.00009857	-0.00008143
0.3513233	0.4035167	2.8324717			
0.00000438	5060.	1156465772.	26.0238676	0.0001139	-0.00009615
0.4054676	0.4641175	3.2713282			
0.00000500	5775.	1154977353.	25.8264224	0.0001291	-0.0001109
0.4594723	0.5241824	3.7100313			
0.00000563	5775.	1026646536.	16.2091817	0.00009118	-0.0001788
0.3232129	0.3718991	-5.1467272 C			
0.00000625	5775.	923981882.	15.8531542	0.00009908	-0.0002009
0.3510038	0.4031578	-5.7831158 C			
0.00000688	5775.	839983529.	15.5576977	0.0001070	-0.0002230
0.3786645	0.4341667	-6.4203340 C			
0.00000750	5775.	769984902.	15.3051248	0.0001148	-0.0002452
0.4061253	0.4648512	-7.0589353 C			
0.00000813	5775.	710755294.	15.0909029	0.0001226	-0.0002674
0.4335402	0.4953867	-7.6976560 C			
0.00000875	5775.	659987059.	14.9024228	0.0001304	-0.0002896
0.4607704	0.5256217	-8.3376102 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 158
Project Name: Lee's Summit Market Plaza		

0.00001000	5775.	577488676.	14.5957543	0.0001460	-0.0003340
0.5151117	0.5856835	-9.6176312 C			
0.00001125	5775.	513323268.	14.3515809	0.0001615	-0.0003785
0.5690746	0.6449745	-10.8994967 C			
0.00001250	5775.	461990941.	14.1573373	0.0001770	-0.0004230
0.6229200	0.7037989	-12.1809652 C			
0.00001375	5775.	419991765.	13.9940277	0.0001924	-0.0004676
0.6763728	0.7618731	-13.4641814 C			
0.00001500	5775.	384992451.	13.8589671	0.0002079	-0.0005121
0.7296872	0.8194896	-14.7469493 C			
0.00001625	5775.	355377647.	13.7456476	0.0002234	-0.0005566
0.7828496	0.8766476	-16.0292635 C			
0.00001750	5775.	329993529.	13.6483125	0.0002388	-0.0006012
0.8357794	0.9332739	-17.3116814 C			
0.00001875	5775.	307993961.	13.5627711	0.0002543	-0.0006457
0.8883989	0.9893006	-18.5947432 C			
0.00002000	5775.	288744338.	13.4887520	0.0002698	-0.0006902
0.9408304	1.0448712	-19.8773238 C			
0.00002125	6007.	282682198.	13.4242308	0.0002853	-0.0007347
0.9930611	1.0999849	-21.1594177 C			
0.00002250	6321.	280939962.	13.3676335	0.0003008	-0.0007792
1.0450786	1.1546404	-22.4410191 C			
0.00002375	6635.	279367283.	13.3177170	0.0003163	-0.0008237
1.0968706	1.2088369	-23.7221223 C			
0.00002500	6948.	277938603.	13.2734874	0.0003318	-0.0008682
1.1484250	1.2625732	-25.0027215 C			
0.00002625	7262.	276633229.	13.2341399	0.0003474	-0.0009126
1.1997299	1.3158483	-26.2828109 C			
0.00002750	7574.	275434175.	13.1989790	0.0003630	-0.0009570
1.2507703	1.3686576	-27.5624141 C			
0.00003000	8199.	273298376.	13.1370588	0.0003941	-0.0010459
1.3518057	1.4726627	-30.1219588 C			
0.00003250	8822.	271448730.	13.0870002	0.0004253	-0.0011347
1.4516756	1.5748215	-32.6793022 C			
0.00003500	9444.	269823153.	13.0463124	0.0004566	-0.0012234
1.5502949	1.6751239	-35.2343928 C			
0.00003750	10064.	268376107.	13.0131695	0.0004880	-0.0013120
1.6475824	1.7735597	-37.7871781 C			
0.00004000	10683.	267073423.	12.9862031	0.0005194	-0.0014006
1.7434606	1.8701179	-40.3376043 C			
0.00004250	11300.	265888959.	12.9643678	0.0005510	-0.0014890
1.8378561	1.9647876	-42.8856166 C			
0.00004500	11916.	264802370.	12.9468512	0.0005826	-0.0015774
1.9306994	2.0575568	-45.4311590 C			
0.00004750	12530.	263797585.	12.9330130	0.0006143	-0.0016657
2.0219254	2.1484137	-47.9741745 C			
0.00005000	13143.	262861715.	12.9223416	0.0006461	-0.0017539
2.1114729	2.2373453	-50.5146057 C			
0.00005250	13754.	261984371.	12.9144239	0.0006780	-0.0018420
2.1992855	2.3243389	-53.0523902 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 159
Project Name: Lee's Summit Market Plaza		

0.00005750	14971.	260372469.	12.9055596	0.0007421	-0.0020179
2.3695001	2.4924563	-58.1197803 C			
0.00006250	16182.	258909460.	12.9043644	0.0008065	-0.0021935
2.5322017	2.6526505	-60.0000000 CY			
0.00006750	17321.	256601072.	12.8932806	0.0008703	-0.0023697
2.6845188	2.8022724	-60.0000000 CY			
0.00007250	18091.	249532686.	12.8012167	0.0009281	-0.0025519
2.8147937	2.9300093	-60.0000000 CY			
0.00007750	18745.	241867770.	12.6976980	0.0009841	-0.0027359
2.9341143	3.0468049	-60.0000000 CY			
0.00008250	19269.	233568680.	12.5738412	0.0010373	-0.0029227
3.0413498	3.1515613	-60.0000000 CY			
0.00008750	19631.	224354273.	12.4260250	0.0010873	-0.0031127
3.1363044	3.2440851	-60.0000000 CY			
0.00009250	19990.	216110119.	12.2966308	0.0011374	-0.0033026
3.2264885	3.3316603	-60.0000000 CY			
0.00009750	20346.	208676811.	12.1799920	0.0011875	-0.0034925
3.3114417	3.4137638	-60.0000000 CY			
0.0001025	20695.	201900486.	12.0734057	0.0012375	-0.0036825
3.3911364	3.4902826	-60.0000000 CY			
0.0001075	20943.	194816063.	11.9501585	0.0012846	-0.0038754
3.4616739	3.5574312	-60.0000000 CY			
0.0001125	21108.	187630599.	11.8166737	0.0013294	-0.0040706
3.5246183	3.6167153	-60.0000000 CY			
0.0001175	21271.	181026884.	11.6923330	0.0013738	-0.0042662
3.5834846	3.6714216	-60.0000000 CY			
0.0001225	21430.	174939612.	11.5767028	0.0014181	-0.0044619
3.6385361	3.7217205	-60.0000000 CY			
0.0001275	21588.	169318671.	11.4716272	0.0014626	-0.0046574
3.6903356	3.7680366	-60.0000000 CY			
0.0001325	21745.	164111057.	11.3759400	0.0015073	-0.0048527
3.7389432	3.8103182	-60.0000000 CY			
0.0001375	21900.	159271468.	11.2886457	0.0015522	-0.0050478
3.7844236	3.8485120	-60.0000000 CY			
0.0001425	22052.	154748617.	11.2044756	0.0015966	-0.0052434
3.8262593	3.8821052	-60.0000000 CY			
0.0001475	22202.	150521296.	11.1269169	0.0016412	-0.0054388
3.8651346	3.9115771	-60.0000000 CY			
0.0001525	22349.	146553589.	11.0553895	0.0016859	-0.0056341
3.9011388	3.9368941	-60.0000000 CY			
0.0001575	22481.	142737458.	10.9846083	0.0017301	-0.0058299
3.9338128	3.9576910	-60.0000000 CY			
0.0001625	22573.	138910836.	10.9056428	0.0017722	-0.0060278
3.9624142	3.9736473	-60.0000000 CY			
0.0001675	22634.	135130337.	10.8219010	0.0018127	-0.0062273
3.9876711	3.9854402	-60.0000000 CY			
0.0001725	22688.	131525384.	10.7381396	0.0018523	-0.0064277
4.0103471	3.9936185	-60.0000000 CY			
0.0001775	22740.	128114527.	10.6585396	0.0018919	-0.0066281
4.0310285	3.9984626	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 160
Project Name: Lee's Summit Market Plaza		

0.0001825	22792.	124885856.	10.5842443	0.0019316	-0.0068284
4.0499290	3.9995129	-60.0000000 CY			
0.0001875	22842.	121823528.	10.5150048	0.0019716	-0.0070284
4.0671102	3.9972222	-60.0000000 CY			
0.0001925	22891.	118916111.	10.4502268	0.0020117	-0.0072283
4.0826015	3.9998041	-60.0000000 CY			
0.0001975	22940.	116150359.	10.3897877	0.0020520	-0.0074280
4.0964667	3.9942868	-60.0000000 CY			
0.0002025	22987.	113516780.	10.3332268	0.0020925	-0.0076275
4.1087418	3.9984782	-60.0000000 CY			
0.0002075	23032.	110999984.	10.2768931	0.0021325	-0.0078275
4.1192984	3.9999911	60.0000000 CY			
0.0002125	23076.	108594386.	10.2232841	0.0021724	-0.0080276
4.1283786	3.9943610	60.0000000 CY			
0.0002175	23120.	106296616.	10.1728307	0.0022126	-0.0082274
4.1360692	3.9982830	60.0000000 CY			
0.0002225	23162.	104099563.	10.1252977	0.0022529	-0.0084271
4.1424169	3.9999418	60.0000000 CY			
0.0002275	23204.	101994844.	10.0808190	0.0022934	-0.0086266
4.1474770	3.9921884	60.0000000 CY			
0.0002325	23245.	99978097.	10.0389052	0.0023340	-0.0088260
4.1512839	3.9966699	60.0000000 CY			
0.0002375	23286.	98044264.	9.9993048	0.0023748	-0.0090252
4.1538820	3.9993287	60.0000000 CY			
0.0002425	23326.	96187769.	9.9619671	0.0024158	-0.0092242
4.1553189	3.9982110	60.0000000 CY			
0.0002475	23365.	94402815.	9.9269821	0.0024569	-0.0094231
4.1556382	3.9923032	60.0000000 CY			
0.0002525	23403.	92687034.	9.8938328	0.0024982	-0.0096218
4.1548819	3.9966389	60.0000000 CY			
0.0002725	23552.	86428995.	9.7724417	0.0026630	-0.0104170
4.1546805	3.9939299	60.0000000 CY			
0.0002925	23692.	80998979.	9.6697421	0.0028284	-0.0112116
4.1547179	3.9907420	60.0000000 CY			
0.0003125	23801.	76162931.	9.5704967	0.0029908	-0.0120092
4.1537763	3.9995280	60.0000000 CY			
0.0003325	23857.	71749132.	9.4615342	0.0031460	-0.0128140
4.1551644	3.9894417	60.0000000 CY			
0.0003525	23887.	67764290.	9.3568190	0.0032983	-0.0136217
4.1555039	3.9992287	60.0000000 CY			
0.0003725	23906.	64178094.	9.2558041	0.0034478	-0.0144322
4.1538018	3.9869210	60.0000000 CY			
0.0003925	23922.	60947787.	9.1707018	0.0035995	-0.0152405
4.1555925	3.9934087	60.0000000 CY			
0.0004125	23937.	58028609.	9.0955968	0.0037519	-0.0160481
4.1537751	3.9997355	60.0000000 CY			
0.0004325	23937.	55345205.	9.0857537	0.0039296	-0.0168304
4.1555681	3.9790586	60.0000000 CY			
0.0004525	23937.	52899008.	9.0283556	0.0040853	-0.0176347
4.1541737	3.9925253	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
 816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 161
Project Name: Lee's Summit Market Plaza		

0.0004725	23937.	50659897.	9.0706713	0.0042859	-0.0183941
4.1553300	3.9942872	60.0000000 CY			
0.0004925	23937.	48602642.	9.1447621	0.0045038	-0.0191362
4.1520682	3.9885147	60.0000000 CY			
0.0005125	23937.	46705954.	9.2585747	0.0047450	-0.0198550
4.1555421	3.9906731	60.0000000 CY			
0.0005325	23937.	44951739.	9.2233961	0.0049115	-0.0206485
4.1527749	3.9731035	60.0000000 CY			

Axial Thrust Force = 69.418 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	707.0825451	1131332072.	39.0886948	0.00002443	-0.00000557
0.0875177	0.1023147	0.7041326			
0.00000125	1434.	1146860871.	31.7164879	0.00003965	-0.00002035
0.1417863	0.1651311	1.1410227			
0.00000188	2162.	1153099066.	29.2932793	0.00005492	-0.00003508
0.1962405	0.2277013	1.5797721			
0.00000250	2889.	1155401807.	28.0863766	0.00007022	-0.00004978
0.2506753	0.2898048	2.0188623			
0.00000313	3612.	1155961293.	27.3627217	0.00008551	-0.00006449
0.3050380	0.3513990	2.4579967			
0.00000375	4334.	1155603211.	26.8795494	0.0001008	-0.00007920
0.3592979	0.4124666	2.8970510			
0.00000438	5052.	1154706432.	26.5334845	0.0001161	-0.00009392
0.4134349	0.4730024	3.3359859			
0.00000500	5767.	1153465911.	26.2730311	0.0001314	-0.0001086
0.4674330	0.5330052	3.7747895			
0.00000563	5767.	1025303032.	17.3306167	0.00009748	-0.0001725
0.3458190	0.3973340	-4.9637931 C			
0.00000625	5767.	922772729.	16.8893235	0.0001056	-0.0001944
0.3741886	0.4291559	-5.5953101 C			
0.00000688	5767.	838884299.	16.5204302	0.0001136	-0.0002164
0.4023349	0.4606217	-6.2283892 C			
0.00000750	5767.	768977274.	16.2050211	0.0001215	-0.0002385
0.4302346	0.4917100	-6.8632079 C			
0.00000813	5767.	709825176.	15.9340887	0.0001295	-0.0002605
0.4579831	0.5225311	-7.4989803 C			
0.00000875	5767.	659123378.	15.6988737	0.0001374	-0.0002826
0.4856029	0.5531133	-8.1355108 C			
0.00001000	5767.	576732955.	15.3085371	0.0001531	-0.0003269
0.5404403	0.6135560	-9.4109242 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
www.leok.com

Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 162
Project Name: Lee's Summit Market Plaza		

0.00001125	5767.	512651516.	14.9998482	0.0001687	-0.0003713
0.5949120	0.6732424	-10.6879995 C			
0.00001250	5767.	461386364.	14.7490521	0.0001844	-0.0004156
0.6490376	0.7322138	-11.9664686 C			
0.00001375	5767.	419442149.	14.5416783	0.0001999	-0.0004601
0.7028682	0.7905442	-13.2458057 C			
0.00001500	5767.	384488637.	14.3667749	0.0002155	-0.0005045
0.7563861	0.8482312	-14.5260529 C			
0.00001625	5767.	354912588.	14.2197341	0.0002311	-0.0005489
0.8097423	0.9054529	-15.8058503 C			
0.00001750	5767.	329561689.	14.0922821	0.0002466	-0.0005934
0.8627829	0.9620587	-17.0863668 C			
0.00001875	5767.	307590910.	13.9808587	0.0002621	-0.0006379
0.9155190	1.0180757	-18.3674080 C			
0.00002000	5890.	294507786.	13.8841819	0.0002777	-0.0006823
0.9680574	1.0736309	-19.6479745 C			
0.00002125	6205.	291979156.	13.7996582	0.0002932	-0.0007268
1.0203852	1.1287232	-20.9280605 C			
0.00002250	6519.	289716684.	13.7252708	0.0003088	-0.0007712
1.0724901	1.1833515	-22.2076607 C			
0.00002375	6832.	287676241.	13.6586740	0.0003244	-0.0008156
1.1242991	1.2374519	-23.4872882 C			
0.00002500	7146.	285822518.	13.5979510	0.0003399	-0.0008601
1.1757376	1.2909591	-24.7674855 C			
0.00002625	7458.	284132476.	13.5436883	0.0003555	-0.0009045
1.2269206	1.3440045	-26.0471672 C			
0.00002750	7771.	282583679.	13.4950125	0.0003711	-0.0009489
1.2778363	1.3965870	-27.3263274 C			
0.00003000	8395.	279838760.	13.4116559	0.0004023	-0.0010377
1.3788211	1.5003583	-29.8830592 C			
0.00003250	9018.	277472969.	13.3434141	0.0004337	-0.0011263
1.4786035	1.6022637	-32.4376321 C			
0.00003500	9639.	275404300.	13.2870973	0.0004650	-0.0012150
1.5770992	1.7022932	-34.9899961 C			
0.00003750	10259.	273572600.	13.2403671	0.0004965	-0.0013035
1.6742273	1.8004366	-37.5401007 C			
0.00004000	10877.	271932743.	13.2014706	0.0005281	-0.0013919
1.7699111	1.8966830	-40.0878940 C			
0.00004250	11494.	270448902.	13.1678709	0.0005596	-0.0014804
1.8639250	1.9908685	-42.6347990 C			
0.00004500	12109.	269095846.	13.1398686	0.0005913	-0.0015687
1.9563610	2.0831428	-45.1792713 C			
0.00004750	12723.	267852354.	13.1166697	0.0006230	-0.0016570
2.0471619	2.1735007	-47.7211874 C			
0.00005000	13335.	266701386.	13.0975943	0.0006549	-0.0017451
2.1362678	2.2619294	-50.2604881 C			
0.00005250	13946.	265629135.	13.0820932	0.0006868	-0.0018332
2.2236231	2.3484154	-52.7971130 C			
0.00005750	15161.	263677514.	13.0600973	0.0007510	-0.0020090
2.3928809	2.5155039	-57.8620876 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 163
Project Name: Lee's Summit Market Plaza		

0.00006250	16371.	261928147.	13.0479443	0.0008155	-0.0021845
2.5545764	2.6746486	-60.0000000 CY			
0.00006750	17519.	259533538.	13.0302346	0.0008795	-0.0023605
2.7062863	2.8236306	-60.0000000 CY			
0.00007250	18310.	252546521.	12.9352085	0.0009378	-0.0025422
2.8364394	2.9512121	-60.0000000 CY			
0.00007750	18962.	244676864.	12.8250638	0.0009939	-0.0027261
2.9549040	3.0671316	-60.0000000 CY			
0.00008250	19508.	236454574.	12.7044670	0.0010481	-0.0029119
3.0627955	3.1724806	-60.0000000 CY			
0.00008750	19870.	227080238.	12.5503879	0.0010982	-0.0031018
3.1567970	3.2640148	-60.0000000 CY			
0.00009250	20228.	218680249.	12.4151393	0.0011484	-0.0032916
3.2459719	3.3505292	-60.0000000 CY			
0.00009750	20584.	211116456.	12.2961662	0.0011989	-0.0034811
3.3303927	3.4320106	-60.0000000 CY			
0.0001025	20936.	204251214.	12.1884323	0.0012493	-0.0036707
3.4096596	3.5079765	-60.0000000 CY			
0.0001075	21200.	197204988.	12.0655454	0.0012970	-0.0038630
3.4799945	3.5747571	-60.0000000 CY			
0.0001125	21365.	189909579.	11.9276821	0.0013419	-0.0040581
3.5419816	3.6329355	-60.0000000 CY			
0.0001175	21528.	183217244.	11.8029616	0.0013868	-0.0042532
3.6004607	3.6870326	-60.0000000 CY			
0.0001225	21688.	177044099.	11.6859095	0.0014315	-0.0044485
3.6549141	3.7364844	-60.0000000 CY			
0.0001275	21845.	171335480.	11.5772677	0.0014761	-0.0046439
3.7057552	3.7815890	-60.0000000 CY			
0.0001325	22001.	166046699.	11.4783047	0.0015209	-0.0048391
3.7534208	3.8226380	-60.0000000 CY			
0.0001375	22156.	161131744.	11.3879940	0.0015658	-0.0050342
3.7979765	3.8595770	-60.0000000 CY			
0.0001425	22309.	156551049.	11.3054543	0.0016110	-0.0052290
3.8394915	3.8923498	-60.0000000 CY			
0.0001475	22459.	152261959.	11.2267706	0.0016559	-0.0054241
3.8776485	3.9206206	-60.0000000 CY			
0.0001525	22607.	148240371.	11.1531693	0.0017009	-0.0056191
3.9128020	3.9445877	-60.0000000 CY			
0.0001575	22745.	144413586.	11.0827580	0.0017455	-0.0058145
3.9449094	3.9641651	-60.0000000 CY			
0.0001625	22844.	140578838.	11.0042849	0.0017882	-0.0060118
3.9729749	3.9788765	-60.0000000 CY			
0.0001675	22906.	136752572.	10.9186685	0.0018289	-0.0062111
3.9974693	3.9892923	-60.0000000 CY			
0.0001725	22961.	133109244.	10.8369137	0.0018694	-0.0064106
4.0197673	3.9961785	-60.0000000 CY			
0.0001775	23014.	129657876.	10.7578180	0.0019095	-0.0066105
4.0399005	3.9995787	-60.0000000 CY			
0.0001825	23065.	126383007.	10.6815318	0.0019494	-0.0068106
4.0580257	3.9947570	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 164
Project Name: Lee's Summit Market Plaza		

0.0001875	23115.	123277723.	10.6103148	0.0019894	-0.0070106
4.0744411	3.9988605	-60.0000000 CY			
0.0001925	23163.	120329214.	10.5437252	0.0020297	-0.0072103
4.0891901	3.9984963	-60.0000000 CY			
0.0001975	23211.	117524098.	10.4816292	0.0020701	-0.0074099
4.1023346	3.9968243	-60.0000000 CY			
0.0002025	23258.	114853928.	10.4233839	0.0021107	-0.0076093
4.1139005	3.9996138	-60.0000000 CY			
0.0002075	23304.	112307725.	10.3689041	0.0021515	-0.0078085
4.1239484	3.9948969	60.0000000 CY			
0.0002125	23349.	109876622.	10.3177175	0.0021925	-0.0080075
4.1325158	3.9971038	60.0000000 CY			
0.0002175	23391.	107547090.	10.2656889	0.0022328	-0.0082072
4.1395167	3.9995991	60.0000000 CY			
0.0002225	23433.	105318704.	10.2168460	0.0022732	-0.0084068
4.1452008	3.9958686	60.0000000 CY			
0.0002275	23475.	103184707.	10.1709991	0.0023139	-0.0086061
4.1496116	3.9954284	60.0000000 CY			
0.0002325	23515.	101140453.	10.1276885	0.0023547	-0.0088053
4.1527874	3.9987169	60.0000000 CY			
0.0002375	23555.	99180242.	10.0867626	0.0023956	-0.0090044
4.1547757	3.9999849	60.0000000 CY			
0.0002425	23595.	97297037.	10.0484500	0.0024367	-0.0092033
4.1556236	3.9916357	60.0000000 CY			
0.0002475	23633.	95488100.	10.0122038	0.0024780	-0.0094020
4.1553709	3.9957271	60.0000000 CY			
0.0002525	23672.	93749264.	9.9778533	0.0025194	-0.0096006
4.1547400	3.9987411	60.0000000 CY			
0.0002725	23820.	87413381.	9.8583312	0.0026864	-0.0103936
4.1553575	3.9971809	60.0000000 CY			
0.0002925	23959.	81912793.	9.7536733	0.0028529	-0.0111871
4.1554002	3.9916230	60.0000000 CY			
0.0003125	24073.	77033456.	9.6539950	0.0030169	-0.0119831
4.1548877	3.9982435	60.0000000 CY			
0.0003325	24134.	72583563.	9.5469333	0.0031744	-0.0127856
4.1541814	3.9947225	60.0000000 CY			
0.0003525	24166.	68557047.	9.4403690	0.0033277	-0.0135923
4.1556404	3.9989782	60.0000000 CY			
0.0003725	24186.	64930103.	9.3496300	0.0034827	-0.0143973
4.1540163	3.9882729	60.0000000 CY			
0.0003925	24202.	61659895.	9.2608853	0.0036349	-0.0152051
4.1555116	3.9980942	60.0000000 CY			
0.0004125	24214.	58700887.	9.1848125	0.0037887	-0.0160113
4.1530932	3.9932704	60.0000000 CY			
0.0004325	24214.	55986395.	9.1731702	0.0039674	-0.0167926
4.1555102	3.9890538	60.0000000 CY			
0.0004525	24214.	53511858.	9.2110488	0.0041680	-0.0175520
4.1540771	3.9996461	60.0000000 CY			
0.0004725	24214.	51246806.	9.1572089	0.0043268	-0.0183532
4.1556293	3.9814675	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 165
Project Name: Lee's Summit Market Plaza		

0.0004925	24214.	49165717.	9.2317011	0.0045466	-0.0190934
4.1529110	3.9961844	60.0000000 CY			
0.0005125	24214.	47247055.	9.3566568	0.0047953	-0.0198047
4.1540871	3.9749131	60.0000000 CY			

Axial Thrust Force = 76.367 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in

6.25000E-07	705.9259881	1129481581.	40.5845533	0.00002537	-0.00000463
0.0908865	0.1062278	0.7312450			
0.00000125	1431.	1144549437.	32.4490839	0.00004056	-0.00001944
0.1450838	0.1689330	1.1675793			
0.00000188	2159.	1151398843.	29.7786211	0.00005583	-0.00003417
0.1995141	0.2314484	1.6061625			
0.00000250	2885.	1154103760.	28.4496814	0.00007112	-0.00004888
0.2539383	0.2935138	2.0452019			
0.00000313	3609.	1154922785.	27.6531511	0.00008642	-0.00006358
0.3082935	0.3550744	2.4843168			
0.00000375	4330.	1154746330.	27.1216576	0.0001017	-0.00007829
0.3625484	0.4161123	2.9233803			
0.00000438	5049.	1153984388.	26.7413091	0.0001170	-0.00009301
0.4166833	0.4766225	3.3623536			
0.00000500	5764.	1152844867.	26.4551587	0.0001323	-0.0001077
0.4706785	0.5365999	3.8011980			
0.00000563	5764.	1024750993.	17.7665224	0.00009994	-0.0001701
0.3546012	0.4071965	-4.8926860 C			
0.00000625	5764.	922275894.	17.2927881	0.0001081	-0.0001919
0.3832108	0.4392535	-5.5221821 C			
0.00000688	5764.	838432631.	16.8955398	0.0001162	-0.0002138
0.4115514	0.4709026	-6.1536017 C			
0.00000750	5764.	768563245.	16.5585779	0.0001242	-0.0002358
0.4396999	0.5022344	-6.7863093 C			
0.00000813	5764.	709442995.	16.2651256	0.0001322	-0.0002578
0.4675719	0.5331592	-7.4209797 C			
0.00000875	5764.	658768496.	16.0119058	0.0001401	-0.0002799
0.4953547	0.5638885	-8.0560789 C			
0.00001000	5764.	576422434.	15.5917057	0.0001559	-0.0003241
0.5504931	0.6245972	-9.3288053 C			
0.00001125	5764.	512375497.	15.2557690	0.0001716	-0.0003684
0.6051011	0.6843689	-10.6045053 C			
0.00001250	5764.	461137947.	14.9837849	0.0001873	-0.0004127
0.6593862	0.7434519	-11.8813779 C			



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 166
Project Name: Lee's Summit Market Plaza		

0.00001375	5764.	419216315.	14.7586345	0.0002029	-0.0004571
0.7133511	0.8018673	-13.1592945 C			
0.00001500	5764.	384281622.	14.5696822	0.0002185	-0.0005015
0.7670394	0.8596791	-14.4377882 C			
0.00001625	5764.	354721498.	14.4073113	0.0002341	-0.0005459
0.8203666	0.9168131	-15.7174545 C			
0.00001750	5764.	329384248.	14.2690367	0.0002497	-0.0005903
0.8735162	0.9734808	-16.9966638 C			
0.00001875	5764.	307425298.	14.1496961	0.0002653	-0.0006347
0.9264520	1.0296569	-18.2756027 C			
0.00002000	5970.	298523578.	14.0427188	0.0002809	-0.0006791
0.9789532	1.0851218	-19.5560231 C			
0.00002125	6285.	295754357.	13.9491099	0.0002964	-0.0007236
1.0312413	1.1401236	-20.8359610 C			
0.00002250	6599.	293277978.	13.8666499	0.0003120	-0.0007680
1.0833039	1.1946613	-22.1154109 C			
0.00002375	6912.	291048071.	13.7935867	0.0003276	-0.0008124
1.1351286	1.2487339	-23.3943671 C			
0.00002500	7226.	289027535.	13.7285184	0.0003432	-0.0008568
1.1867035	1.3023402	-24.6728241 C			
0.00002625	7539.	287185436.	13.6699544	0.0003588	-0.0009012
1.2379853	1.3554469	-25.9510471 C			
0.00002750	7851.	285494203.	13.6157527	0.0003744	-0.0009456
1.2888480	1.4079354	-27.2300371 C			
0.00003000	8475.	282499905.	13.5227340	0.0004057	-0.0010343
1.3897196	1.5115182	-29.7864213 C			
0.00003250	9097.	279922956.	13.4463269	0.0004370	-0.0011230
1.4893796	1.6132338	-32.3406368 C			
0.00003500	9719.	277673156.	13.3830210	0.0004684	-0.0012116
1.5877439	1.7130724	-34.8926335 C			
0.00003750	10338.	275684345.	13.3302430	0.0004999	-0.0013001
1.6847322	1.8110236	-37.4423606 C			
0.00004000	10956.	273906890.	13.2860636	0.0005314	-0.0013886
1.7802680	1.9070766	-39.9897661 C			
0.00004250	11573.	272302825.	13.2490085	0.0005631	-0.0014769
1.8742792	2.0012201	-42.5347969 C			
0.00004500	12188.	270842609.	13.2179318	0.0005948	-0.0015652
1.9666976	2.0934425	-45.0773989 C			
0.00004750	12801.	269502616.	13.1916140	0.0006266	-0.0016534
2.0574162	2.1836888	-47.6179516 C			
0.00005000	13413.	268264052.	13.1691122	0.0006585	-0.0017415
2.1463409	2.2719121	-50.1567872 C			
0.00005250	14023.	267112435.	13.1505192	0.0006904	-0.0018296
2.2335087	2.3581910	-52.6929344 C			
0.00005750	15239.	265022472.	13.1231696	0.0007546	-0.0020054
2.4023745	2.5248594	-57.7569145 C			
0.00006250	16447.	263156497.	13.1065495	0.0008192	-0.0021808
2.5636582	2.6835756	-60.0000000 CY			
0.00006750	17599.	260726878.	13.0861447	0.0008833	-0.0023567
2.7151181	2.8322946	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 167
Project Name: Lee's Summit Market Plaza		

0.00007250	18399.	253773227.	12.9899232	0.0009418	-0.0025382
2.8452178	2.9598092	-60.0000000 CY			
0.00007750	19051.	245819177.	12.8766822	0.0009979	-0.0027221
2.9632680	3.0753072	-60.0000000 CY			
0.00008250	19604.	237620527.	12.7560760	0.0010524	-0.0029076
3.0711981	3.1806736	-60.0000000 CY			
0.00008750	19967.	228189859.	12.6012022	0.0011026	-0.0030974
3.1650961	3.2720813	-60.0000000 CY			
0.00009250	20325.	219726414.	12.4635641	0.0011529	-0.0032871
3.2538592	3.3581617	-60.0000000 CY			
0.00009750	20680.	212105580.	12.3424581	0.0012034	-0.0034766
3.3378690	3.4392011	-60.0000000 CY			
0.0001025	21033.	205202766.	12.2352942	0.0012541	-0.0036659
3.4171241	3.5150954	-60.0000000 CY			
0.0001075	21304.	198177498.	12.1127334	0.0013021	-0.0038579
3.4873977	3.5817430	-60.0000000 CY			
0.0001125	21469.	190837313.	11.9730814	0.0013470	-0.0040530
3.5489946	3.6394680	-60.0000000 CY			
0.0001175	21632.	184103274.	11.8467095	0.0013920	-0.0042480
3.6070848	3.6931011	-60.0000000 CY			
0.0001225	21793.	177900722.	11.7305939	0.0014370	-0.0044430
3.6615198	3.7424094	-60.0000000 CY			
0.0001275	21950.	172156383.	11.6204951	0.0014816	-0.0046384
3.7119706	3.7870170	-60.0000000 CY			
0.0001325	22106.	166834541.	11.5201938	0.0015264	-0.0048336
3.7592527	3.8275602	-60.0000000 CY			
0.0001375	22260.	161888887.	11.4286510	0.0015714	-0.0050286
3.8034320	3.8639842	-60.0000000 CY			
0.0001425	22412.	157279606.	11.3449744	0.0016167	-0.0052233
3.8445783	3.8962324	-60.0000000 CY			
0.0001475	22563.	152970326.	11.2676610	0.0016620	-0.0054180
3.8826747	3.9241832	-60.0000000 CY			
0.0001525	22711.	148923508.	11.1930331	0.0017069	-0.0056131
3.9174604	3.9475807	-60.0000000 CY			
0.0001575	22851.	145086425.	11.1224295	0.0017518	-0.0058082
3.9492960	3.9666295	-60.0000000 CY			
0.0001625	22953.	141249679.	11.0442270	0.0017947	-0.0060053
3.9771490	3.9808296	-60.0000000 CY			
0.0001675	23016.	137410504.	10.9581875	0.0018355	-0.0062045
4.0013689	3.9906955	-60.0000000 CY			
0.0001725	23072.	133749001.	10.8756754	0.0018761	-0.0064039
4.0233611	3.9970047	-60.0000000 CY			
0.0001775	23126.	130285984.	10.7985537	0.0019167	-0.0066033
4.0434289	3.9998347	-60.0000000 CY			
0.0001825	23176.	126992309.	10.7214501	0.0019567	-0.0068033
4.0612386	3.9958159	-60.0000000 CY			
0.0001875	23226.	123869523.	10.6494242	0.0019968	-0.0070032
4.0773429	3.9993250	-60.0000000 CY			
0.0001925	23274.	120903936.	10.5821426	0.0020371	-0.0072029
4.0917937	3.9961776	-60.0000000 CY			



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 168
Project Name: Lee's Summit Market Plaza		

0.0001975	23321.	118083157.	10.5193149	0.0020776	-0.0074024
4.1046418	3.9976514	-60.0000000 CY			
0.0002025	23368.	115398080.	10.4603807	0.0021182	-0.0076018
4.1159199	3.9998629	60.0000000 CY			
0.0002075	23414.	112837176.	10.4053291	0.0021591	-0.0078009
4.1256918	3.9935466	60.0000000 CY			
0.0002125	23459.	110392999.	10.3536852	0.0022002	-0.0079998
4.1339937	3.9979104	60.0000000 CY			
0.0002175	23502.	108055918.	10.3038369	0.0022411	-0.0081989
4.1408286	3.9998740	60.0000000 CY			
0.0002225	23544.	105814593.	10.2544916	0.0022816	-0.0083984
4.1462442	3.9932425	60.0000000 CY			
0.0002275	23585.	103668899.	10.2080424	0.0023223	-0.0085977
4.1503906	3.9965569	60.0000000 CY			
0.0002325	23625.	101613438.	10.1641606	0.0023632	-0.0087968
4.1533107	3.9992802	60.0000000 CY			
0.0002375	23665.	99642114.	10.1227675	0.0024042	-0.0089958
4.1550524	3.9984680	60.0000000 CY			
0.0002425	23704.	97748452.	10.0839705	0.0024454	-0.0091946
4.1556606	3.9926043	60.0000000 CY			
0.0002475	23743.	95929744.	10.0472086	0.0024867	-0.0093933
4.1551765	3.9968436	60.0000000 CY			
0.0002525	23781.	94181516.	10.0123670	0.0025281	-0.0095919
4.1550277	3.9993114	60.0000000 CY			
0.0002725	23929.	87811174.	9.8911600	0.0026953	-0.0103847
4.1555136	3.9980982	60.0000000 CY			
0.0002925	24068.	82284642.	9.7881911	0.0028630	-0.0111770
4.1555571	3.9934680	60.0000000 CY			
0.0003125	24184.	77387467.	9.6884597	0.0030276	-0.0119724
4.1552023	3.9948668	60.0000000 CY			
0.0003325	24247.	72923215.	9.5821337	0.0031861	-0.0127739
4.1536291	3.9963715	60.0000000 CY			
0.0003525	24280.	68879008.	9.4749397	0.0033399	-0.0135801
4.1555251	3.9951575	60.0000000 CY			
0.0003725	24299.	65233176.	9.3849133	0.0034959	-0.0143841
4.1545923	3.9910969	60.0000000 CY			
0.0003925	24315.	61949710.	9.2982173	0.0036496	-0.0151904
4.1552336	3.9992093	60.0000000 CY			
0.0004125	24327.	58974379.	9.2218197	0.0038040	-0.0159960
4.1539406	3.9884843	60.0000000 CY			
0.0004325	24327.	56247241.	9.2093905	0.0039831	-0.0167769
4.1552069	3.9922535	60.0000000 CY			
0.0004525	24327.	53761175.	9.2480490	0.0041847	-0.0175353
4.1547735	3.9943969	60.0000000 CY			
0.0004725	24327.	51485569.	9.3220763	0.0044047	-0.0182753
4.1531461	3.9909363	60.0000000 CY			
0.0004925	24327.	49394785.	9.2703808	0.0045657	-0.0190743
4.1539833	3.9982717	60.0000000 CY			
0.0005125	24327.	47467183.	9.3912043	0.0048130	-0.0197870
4.1531959	3.9752823	60.0000000 CY			



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 169
Project Name: Lee's Summit Market Plaza		

Axial Thrust Force = 114.898 kips

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	704.0228235	1126436518.	48.9379773	0.00003059	5.86236E-07
0.1096969	0.1280439	0.8826508			
0.00000125	1417.	1133611492.	36.5416968	0.00004568	-0.00001432
0.1635016	0.1901373	1.3159365			
0.00000188	2142.	1142423655.	32.4832042	0.00006091	-0.00002909
0.2177519	0.2522954	1.7532242			
0.00000250	2868.	1147015021.	30.4711315	0.00007618	-0.00004382
0.2720889	0.3141170	2.1917570			
0.00000313	3591.	1149187225.	29.2685270	0.00009146	-0.00005854
0.3263945	0.3754831	2.6307103			
0.00000375	4312.	1149979564.	28.4678067	0.0001068	-0.00007325
0.3806148	0.4363492	3.0697740			
0.00000438	5031.	1149937220.	27.8959061	0.0001220	-0.00008796
0.4347218	0.4967007	3.5088431			
0.00000500	5747.	1149349126.	27.4665152	0.0001373	-0.0001027
0.4886917	0.5565276	3.9478447			
0.00000563	5747.	1021643667.	20.0055667	0.0001125	-0.0001575
0.3996658	0.4576423	-4.5274420 C			
0.00000625	5747.	919479301.	19.3741693	0.0001211	-0.0001789
0.4297022	0.4911177	-5.1449318 C			
0.00000688	5747.	835890273.	18.8406173	0.0001295	-0.0002005
0.4592838	0.5239734	-5.7658019 C			
0.00000750	5747.	766232751.	18.3843806	0.0001379	-0.0002221
0.4885147	0.5563319	-6.3891972 C			
0.00000813	5747.	707291770.	17.9899160	0.0001462	-0.0002438
0.5174603	0.5882712	-7.0145760 C			
0.00000875	5747.	656770929.	17.6427260	0.0001544	-0.0002656
0.5460803	0.6197520	-7.6422582 C			
0.00001000	5747.	574674563.	17.0666071	0.0001707	-0.0003093
0.6027612	0.6818148	-8.9010840 C			
0.00001125	5747.	510821834.	16.6041620	0.0001868	-0.0003532
0.6586793	0.7426847	-10.1645922 C			
0.00001250	5747.	459739650.	16.2246193	0.0002028	-0.0003972
0.7139711	0.8025366	-11.4315755 C			
0.00001375	5747.	417945137.	15.9087492	0.0002187	-0.0004413
0.7687889	0.8615580	-12.7006862 C			
0.00001500	5747.	383116375.	15.6426947	0.0002346	-0.0004854
0.8232288	0.9198717	-13.9710278 C			



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 170
Project Name: Lee's Summit Market Plaza		

0.00001625	5747.	353645885.	15.4125576	0.0002505	-0.0005295
0.8771432	0.9773381	-15.2437322 C			
0.00001750	5782.	330407297.	15.2149939	0.0002663	-0.0005737
0.9307852	1.0342440	-16.5165906 C			
0.00001875	6098.	325208278.	15.0420714	0.0002820	-0.0006180
0.9840504	1.0904938	-17.7903736 C			
0.00002000	6412.	320624966.	14.8887725	0.0002978	-0.0006622
1.0369002	1.1460623	-19.0653119 C			
0.00002125	6727.	316564343.	14.7542820	0.0003135	-0.0007065
1.0895153	1.2011533	-20.3397736 C			
0.00002250	7041.	312938404.	14.6353157	0.0003293	-0.0007507
1.1418711	1.2557534	-21.6138564 C			
0.00002375	7354.	309662552.	14.5260355	0.0003450	-0.0007950
1.1936848	1.3095812	-22.8898930 C			
0.00002500	7668.	306700165.	14.4283742	0.0003607	-0.0008393
1.2452311	1.3629354	-24.1654286 C			
0.00002625	7980.	304006335.	14.3406795	0.0003764	-0.0008836
1.2964983	1.4158148	-25.4404577 C			
0.00002750	8292.	301544319.	14.2615994	0.0003922	-0.0009278
1.3474746	1.4682183	-26.7149744 C			
0.00003000	8916.	297195076.	14.1237375	0.0004237	-0.0010163
1.4483870	1.5714672	-29.2635483 C			
0.00003250	9537.	293459488.	14.0062871	0.0004552	-0.0011048
1.5476913	1.6724828	-31.8128743 C			
0.00003500	10158.	290215258.	13.9077968	0.0004868	-0.0011932
1.6456354	1.7715944	-34.3599861 C			
0.00003750	10776.	287363368.	13.8245207	0.0005184	-0.0012816
1.7421405	1.8687913	-36.9048336 C			
0.00004000	11393.	284829544.	13.7536501	0.0005501	-0.0013699
1.8371318	1.9640626	-39.4473657 C			
0.00004250	12009.	282556976.	13.6930380	0.0005820	-0.0014580
1.9305389	2.0573967	-41.9875305 C			
0.00004500	12622.	280498641.	13.6395324	0.0006138	-0.0015462
2.0221019	2.1485892	-44.5272101 C			
0.00004750	13235.	278622275.	13.5930656	0.0006457	-0.0016343
2.1119088	2.2377776	-47.0649520 C			
0.00005000	13845.	276900802.	13.5530412	0.0006777	-0.0017223
2.1999646	2.3250109	-49.6000901 C			
0.00005250	14454.	275311501.	13.5185777	0.0007097	-0.0018103
2.2862166	2.4102754	-52.1325654 C			
0.00005750	15666.	272458233.	13.4635767	0.0007742	-0.0019858
2.4531205	2.5748412	-57.1892857 C			
0.00006250	16872.	269948479.	13.4236599	0.0008390	-0.0021610
2.6122865	2.7313559	-60.0000000 CY			
0.00006750	18041.	267277256.	13.3888099	0.0009037	-0.0023363
2.7623784	2.8786408	-60.0000000 CY			
0.00007250	18890.	260549581.	13.2906969	0.0009636	-0.0025164
2.8928484	3.0064364	-60.0000000 CY			
0.00007750	19541.	252141451.	13.1642265	0.0010202	-0.0026998
3.0092116	3.1201913	-60.0000000 CY			



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Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 171
Project Name: Lee's Summit Market Plaza		

0.00008250	20135.	244059532.	13.0397736	0.0010758	-0.0028842
3.1166775	3.2249834	-60.0000000 CY			
0.00008750	20501.	234301389.	12.8769281	0.0011267	-0.0030733
3.2093820	3.3150769	-60.0000000 CY			
0.00009250	20860.	225515066.	12.7330012	0.0011778	-0.0032622
3.2969636	3.3998050	-60.0000000 CY			
0.00009750	21214.	217580679.	12.6006661	0.0012286	-0.0034514
3.3787897	3.4784676	-60.0000000 CY			
0.0001025	21565.	210392875.	12.4830870	0.0012795	-0.0036405
3.4558113	3.5518758	-60.0000000 CY			
0.0001075	21868.	203424617.	12.3658683	0.0013293	-0.0038307
3.5262371	3.6182302	-60.0000000 CY			
0.0001125	22047.	195973784.	12.2267140	0.0013755	-0.0040245
3.5872425	3.6748844	-60.0000000 CY			
0.0001175	22209.	189008608.	12.0911351	0.0014207	-0.0042193
3.6431758	3.7259132	-60.0000000 CY			
0.0001225	22368.	182599404.	11.9682271	0.0014661	-0.0044139
3.6957251	3.7727870	-60.0000000 CY			
0.0001275	22527.	176680512.	11.8565292	0.0015117	-0.0046083
3.7449548	3.8154508	-60.0000000 CY			
0.0001325	22683.	171195129.	11.7544917	0.0015575	-0.0048025
3.7908933	3.8538142	-60.0000000 CY			
0.0001375	22836.	166079316.	11.6560817	0.0016027	-0.0049973
3.8329902	3.8873418	-60.0000000 CY			
0.0001425	22987.	161311577.	11.5660699	0.0016482	-0.0051918
3.8720970	3.9166384	-60.0000000 CY			
0.0001475	23136.	156856288.	11.4836338	0.0016938	-0.0053862
3.9082881	3.9416431	-60.0000000 CY			
0.0001525	23284.	152682491.	11.4080602	0.0017397	-0.0055803
3.9416401	3.9622926	-60.0000000 CY			
0.0001575	23427.	148743353.	11.3376478	0.0017857	-0.0057743
3.9721210	3.9784687	-60.0000000 CY			
0.0001625	23546.	144898895.	11.2643611	0.0018305	-0.0059695
3.9991152	3.9898940	-60.0000000 CY			
0.0001675	23626.	141047932.	11.1797131	0.0018726	-0.0061674
4.0221571	3.9967377	-60.0000000 CY			
0.0001725	23682.	137289784.	11.0932520	0.0019136	-0.0063664
4.0424801	3.9997770	-60.0000000 CY			
0.0001775	23735.	133718495.	11.0116221	0.0019546	-0.0065654
4.0608443	3.9960189	-60.0000000 CY			
0.0001825	23787.	130337339.	10.9355001	0.0019957	-0.0067643
4.0774062	3.9994587	-60.0000000 CY			
0.0001875	23837.	127130555.	10.8645266	0.0020371	-0.0069629
4.0922231	3.9950376	-60.0000000 CY			
0.0001925	23886.	124084216.	10.7981743	0.0020786	-0.0071614
4.1053381	3.9983230	-60.0000000 CY			
0.0001975	23932.	121176579.	10.7312588	0.0021194	-0.0073606
4.1165540	3.9999834	-60.0000000 CY			
0.0002025	23977.	118406668.	10.6688184	0.0021604	-0.0075596
4.1262631	3.9950977	-60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 172
Project Name: Lee's Summit Market Plaza		

0.0002075	24022.	115766907.	10.6101580	0.0022016	-0.0077584
4.1344936	3.9987561	60.0000000 CY			
0.0002125	24065.	113248343.	10.5549767	0.0022429	-0.0079571
4.1412955	3.9999999	60.0000000 CY			
0.0002175	24108.	110840222.	10.5034461	0.0022845	-0.0081555
4.1467308	3.9942412	60.0000000 CY			
0.0002225	24150.	108537906.	10.4548449	0.0023262	-0.0083538
4.1508324	3.9981407	60.0000000 CY			
0.0002275	24191.	106334408.	10.4089846	0.0023680	-0.0085520
4.1536523	3.9998958	60.0000000 CY			
0.0002325	24232.	104221708.	10.3659938	0.0024101	-0.0087499
4.1552432	3.9932208	60.0000000 CY			
0.0002375	24271.	102195349.	10.3254586	0.0024523	-0.0089477
4.1556491	3.9958203	60.0000000 CY			
0.0002425	24310.	100246059.	10.2841235	0.0024939	-0.0091461
4.1549411	3.9988073	60.0000000 CY			
0.0002475	24347.	98373180.	10.2444811	0.0025355	-0.0093445
4.1553130	3.9999805	60.0000000 CY			
0.0002525	24384.	96571204.	10.2072741	0.0025773	-0.0095427
4.1556481	3.9923294	60.0000000 CY			
0.0002725	24528.	90011603.	10.0762708	0.0027458	-0.0103342
4.1553677	3.9970802	60.0000000 CY			
0.0002925	24666.	84328887.	9.9697067	0.0029161	-0.0111239
4.1552386	3.9993985	60.0000000 CY			
0.0003125	24792.	79335793.	9.8808265	0.0030878	-0.0119122
4.1554747	3.9939246	60.0000000 CY			
0.0003325	24872.	74803141.	9.7820517	0.0032525	-0.0127075
4.1555909	3.9969709	60.0000000 CY			
0.0003525	24904.	70649642.	9.6766249	0.0034110	-0.0135090
4.1535300	3.9923185	60.0000000 CY			
0.0003725	24922.	66904619.	9.5782596	0.0035679	-0.0143121
4.1555696	3.9996763	60.0000000 CY			
0.0003925	24936.	63531700.	9.4954603	0.0037270	-0.0151130
4.1536805	3.9840425	60.0000000 CY			
0.0004125	24936.	60451375.	9.4748921	0.0039084	-0.0158916
4.1552698	3.9963630	60.0000000 CY			
0.0004325	24936.	57655936.	9.4106779	0.0040701	-0.0166899
4.1532012	3.9987311	60.0000000 CY			
0.0004525	24936.	55107607.	9.4459684	0.0042743	-0.0174457
4.1551556	3.9864537	60.0000000 CY			
0.0004725	24936.	52775010.	9.5168233	0.0044967	-0.0181833
4.1548951	3.9993014	60.0000000 CY			
0.0004925	24936.	50631863.	9.6273826	0.0047415	-0.0188985
4.1519816	3.9888060	60.0000000 CY			
0.0005125	24936.	48655985.	9.7808578	0.0050127	-0.0195873
4.1551138	3.9838790	60.0000000 CY			

Axial Thrust Force = 125.224 kips



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 173
Project Name: Lee's Summit Market Plaza		

Bending Max Conf Curvature Stress rad/in. ksi	Bending Max Conc Moment Stress in-kip ksi	Bending Max Steel Stiffness Stress kip-in2 ksi	Depth to Run N Axis Msg in	Max Comp Strain in/in	Max Tens Strain in/in
6.25000E-07	703.7637727	1126022036.	51.1806252	0.00003199	0.00000199
0.1147462	0.1338904	0.9232988			
0.00000125	1414.	1131312321.	37.6468711	0.00004706	-0.00001294
0.1684742	0.1958533	1.3559990			
0.00000188	2138.	1140190848.	33.2119801	0.00006227	-0.00002773
0.2226650	0.2579029	1.7928514			
0.00000250	2863.	1145169751.	31.0151009	0.00007754	-0.00004246
0.2769716	0.3196515	2.2311948			
0.00000313	3586.	1147662446.	29.7027843	0.00009282	-0.00005718
0.3312587	0.3809597	2.6700648			
0.00000375	4308.	1148700331.	28.8295124	0.0001081	-0.00007189
0.3854670	0.4417770	3.1091095			
0.00000438	5026.	1148842685.	28.2059695	0.0001234	-0.00008660
0.4395635	0.5020828	3.5481824			
0.00000500	5742.	1148400110.	27.7380525	0.0001387	-0.0001013
0.4935253	0.5618681	3.9872176			
0.00000563	5742.	1020800098.	20.5615531	0.0001157	-0.0001543
0.4108435	0.4701134	-4.4367467 C			
0.00000625	5742.	918720088.	19.8935016	0.0001243	-0.0001757
0.4412882	0.5039992	-5.0508028 C			
0.00000688	5742.	835200080.	19.3272646	0.0001329	-0.0001971
0.4712100	0.5371885	-5.6687766 C			
0.00000750	5742.	765600073.	18.8426039	0.0001413	-0.0002187
0.5007477	0.5698426	-6.2895336 C			
0.00000813	5742.	706707760.	18.4228493	0.0001497	-0.0002403
0.5299627	0.6020353	-6.9125661 C			
0.00000875	5742.	656228634.	18.0547276	0.0001580	-0.0002620
0.5588735	0.6337926	-7.5377128 C			
0.00001000	5742.	574200055.	17.4396474	0.0001744	-0.0003056
0.6159556	0.6962091	-8.7929023 C			
0.00001125	5742.	510400049.	16.9462428	0.0001906	-0.0003494
0.6722424	0.7573968	-10.0529882 C			
0.00001250	5742.	459360044.	16.5424891	0.0002068	-0.0003932
0.7279209	0.8175856	-11.3163477 C			
0.00001375	5742.	417600040.	16.2034135	0.0002228	-0.0004372
0.7829550	0.8767606	-12.5831888 C			
0.00001500	5742.	382800037.	15.9168033	0.0002388	-0.0004812
0.8375419	0.9351549	-13.8517905 C			
0.00001625	5742.	353353880.	15.6719019	0.0002547	-0.0005253
0.8917460	0.9928556	-15.1215162 C			
0.00001750	5899.	337101190.	15.4583666	0.0002705	-0.0005695
0.9454706	1.0497773	-16.3930789 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 174
Project Name: Lee's Summit Market Plaza		

0.00001875	6215.	331463999.	15.2721060	0.0002864	-0.0006136
0.9988457	1.1060741	-17.6652923 C			
0.00002000	6530.	326511512.	15.1095945	0.0003022	-0.0006578
1.0519677	1.1618620	-18.9372351 C			
0.00002125	6845.	322098178.	14.9624416	0.0003180	-0.0007020
1.1045209	1.2168241	-20.2114953 C			
0.00002250	7159.	318159392.	14.8323821	0.0003337	-0.0007463
1.1568232	1.2713075	-21.4852706 C			
0.00002375	7472.	314620084.	14.7167248	0.0003495	-0.0007905
1.2088622	1.3253109	-22.7585557 C			
0.00002500	7785.	311415894.	14.6123835	0.0003653	-0.0008347
1.2605481	1.3787531	-24.0320219 C			
0.00002625	8098.	308491960.	14.5162246	0.0003811	-0.0008789
1.3117383	1.4314995	-25.3068239 C			
0.00002750	8410.	305820699.	14.4294538	0.0003968	-0.0009232
1.3626343	1.4837695	-26.5811105 C			
0.00003000	9033.	301109407.	14.2794093	0.0004284	-0.0010116
1.4634990	1.5868759	-29.1281139 C			
0.00003250	9655.	297076562.	14.1545187	0.0004600	-0.0011000
1.5630352	1.6880424	-31.6731660 C			
0.00003500	10275.	293564829.	14.0459627	0.0004916	-0.0011884
1.6607798	1.7868762	-34.2197477 C			
0.00003750	10893.	290480910.	13.9539763	0.0005233	-0.0012767
1.7570734	1.8837935	-36.7640506 C			
0.00004000	11510.	287743877.	13.8754969	0.0005550	-0.0013650
1.8518420	1.9787831	-39.3060234 C			
0.00004250	12125.	285291830.	13.8081835	0.0005868	-0.0014532
1.9450155	2.0718336	-41.8456137 C			
0.00004500	12738.	283076616.	13.7502158	0.0006188	-0.0015412
2.0365287	2.1629328	-44.3827682 C			
0.00004750	13350.	281060205.	13.7001578	0.0006508	-0.0016292
2.1263202	2.2520684	-46.9174325 C			
0.00005000	13961.	279210632.	13.6559719	0.0006828	-0.0017172
2.2142108	2.3391057	-49.4508406 C			
0.00005250	14569.	277504010.	13.6170571	0.0007149	-0.0018051
2.3001854	2.4240689	-51.9826304 C			
0.00005750	15781.	274446248.	13.5543479	0.0007794	-0.0019806
2.4665116	2.5880237	-57.0379247 C			
0.00006250	16985.	271764140.	13.5079983	0.0008442	-0.0021558
2.6250735	2.7439148	-60.0000000 CY			
0.00006750	18158.	269010760.	13.4687650	0.0009091	-0.0023309
2.7747081	2.8907273	-60.0000000 CY			
0.00007250	19021.	262354244.	13.3693154	0.0009693	-0.0025107
2.9051240	3.0184479	-60.0000000 CY			
0.00007750	19672.	253826742.	13.2399129	0.0010261	-0.0026939
3.0211221	3.1318199	-60.0000000 CY			
0.00008250	20275.	245752463.	13.1155818	0.0010820	-0.0028780
3.1286273	3.2366150	-60.0000000 CY			
0.00008750	20644.	235930503.	12.9497778	0.0011331	-0.0030669
3.2208730	3.3262182	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 175
Project Name: Lee's Summit Market Plaza		

0.00009250	21002.	227050798.	12.8024271	0.0011842	-0.0032558
3.3078568	3.4103090	-60.0000000 CY			
0.00009750	21357.	219045327.	12.6703207	0.0012354	-0.0034446
3.3896032	3.4888163	-60.0000000 CY			
0.0001025	21708.	211780981.	12.5498779	0.0012864	-0.0036336
3.4660152	3.5615416	-60.0000000 CY			
0.0001075	22017.	204808512.	12.4320432	0.0013364	-0.0038236
3.5361491	3.6274942	-60.0000000 CY			
0.0001125	22200.	197335660.	12.2923375	0.0013829	-0.0040171
3.5968832	3.6837497	-60.0000000 CY			
0.0001175	22363.	190321074.	12.1571940	0.0014285	-0.0042115
3.6526646	3.7344627	-60.0000000 CY			
0.0001225	22522.	183854951.	12.0320195	0.0014739	-0.0044061
3.7046452	3.7806175	-60.0000000 CY			
0.0001275	22680.	177883533.	11.9182463	0.0015196	-0.0046004
3.7533163	3.8225496	-60.0000000 CY			
0.0001325	22836.	172350571.	11.8146139	0.0015654	-0.0047946
3.7987478	3.8602018	-60.0000000 CY			
0.0001375	22990.	167200104.	11.7176297	0.0016112	-0.0049888
3.8407127	3.8932848	-60.0000000 CY			
0.0001425	23141.	162389912.	11.6259109	0.0016567	-0.0051833
3.8792744	3.9217776	-60.0000000 CY			
0.0001475	23290.	157894978.	11.5418975	0.0017024	-0.0053776
3.9149326	3.9459625	-60.0000000 CY			
0.0001525	23437.	153684069.	11.4648639	0.0017484	-0.0055716
3.9477643	3.9657754	-60.0000000 CY			
0.0001575	23580.	149714602.	11.3933389	0.0017945	-0.0057655
3.9777639	3.9811116	-60.0000000 CY			
0.0001625	23703.	145866822.	11.3212710	0.0018397	-0.0059603
4.0045128	3.9917693	-60.0000000 CY			
0.0001675	23788.	142020826.	11.2398798	0.0018827	-0.0061573
4.0274946	3.9978441	-60.0000000 CY			
0.0001725	23846.	138236821.	11.1523606	0.0019238	-0.0063562
4.0473707	3.9999830	-60.0000000 CY			
0.0001775	23898.	134636359.	11.0694952	0.0019648	-0.0065552
4.0652790	3.9972747	-60.0000000 CY			
0.0001825	23949.	131228048.	10.9921605	0.0020061	-0.0067539
4.0813926	3.9998487	-60.0000000 CY			
0.0001875	23999.	127994897.	10.9201346	0.0020475	-0.0069525
4.0957788	3.9954317	-60.0000000 CY			
0.0001925	24048.	124924646.	10.8528227	0.0020892	-0.0071508
4.1084757	3.9991121	-60.0000000 CY			
0.0001975	24096.	122003150.	10.7890546	0.0021308	-0.0073492
4.1194961	3.9976274	60.0000000 CY			
0.0002025	24140.	119210997.	10.7255895	0.0021719	-0.0075481
4.1287830	3.9966560	60.0000000 CY			
0.0002075	24184.	116550337.	10.6659165	0.0022132	-0.0077468
4.1366020	3.9994709	60.0000000 CY			
0.0002125	24227.	114010935.	10.6099334	0.0022546	-0.0079454
4.1430101	3.9964446	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 176
Project Name: Lee's Summit Market Plaza		

0.0002175	24270.	111583970.	10.5574677	0.0022962	-0.0081438
4.1480571	3.9959768	60.0000000 CY			
0.0002225	24311.	109263666.	10.5079769	0.0023380	-0.0083420
4.1517837	3.9990645	60.0000000 CY			
0.0002275	24352.	107042765.	10.4613082	0.0023799	-0.0085401
4.1542418	3.9992862	60.0000000 CY			
0.0002325	24392.	104912975.	10.4176308	0.0024221	-0.0087379
4.1554829	3.9931652	60.0000000 CY			
0.0002375	24432.	102871016.	10.3762995	0.0024644	-0.0089356
4.1555502	3.9973118	60.0000000 CY			
0.0002425	24471.	100911431.	10.3371756	0.0025068	-0.0091332
4.1545324	3.9995634	60.0000000 CY			
0.0002475	24509.	99025763.	10.2984683	0.0025489	-0.0093311
4.1555450	3.9971156	60.0000000 CY			
0.0002525	24545.	97209719.	10.2605485	0.0025908	-0.0095292
4.1555295	3.9922025	60.0000000 CY			
0.0002725	24688.	90599362.	10.1269212	0.0027596	-0.0103204
4.1550335	3.9927529	60.0000000 CY			
0.0002925	24826.	84873926.	10.0178666	0.0029302	-0.0111098
4.1548422	3.9999080	60.0000000 CY			
0.0003125	24954.	79851994.	9.9294582	0.0031030	-0.0118970
4.1551594	3.9961769	60.0000000 CY			
0.0003325	25039.	75304625.	9.8376790	0.0032710	-0.0126890
4.1556563	3.9911720	60.0000000 CY			
0.0003525	25071.	71123164.	9.7322027	0.0034306	-0.0134894
4.1544770	3.9955281	60.0000000 CY			
0.0003725	25088.	67351669.	9.6316075	0.0035878	-0.0142922
4.1552187	3.9990899	60.0000000 CY			
0.0003925	25101.	63952494.	9.5480418	0.0037476	-0.0150924
4.1546282	3.9846462	60.0000000 CY			
0.0004125	25101.	60851767.	9.5261826	0.0039296	-0.0158704
4.1546448	3.9985655	60.0000000 CY			
0.0004325	25101.	58037813.	9.5565323	0.0041332	-0.0166268
4.1555172	3.9789533	60.0000000 CY			
0.0004525	25101.	55472606.	9.4963345	0.0042971	-0.0174229
4.1544020	3.9914948	60.0000000 CY			
0.0004725	25101.	53124559.	9.5718130	0.0045227	-0.0181573
4.1555098	3.9911553	60.0000000 CY			
0.0004925	25101.	50967216.	9.6835561	0.0047692	-0.0188708
4.1519580	3.9941526	60.0000000 CY			
0.0005125	25101.	48978252.	9.8442221	0.0050452	-0.0195548
4.1539084	3.9736976	60.0000000 CY			

Axial Thrust Force = 125.978 kips

Bending Max Conf Curvature Stress	Bending Max Conc Moment Stress	Bending Max Steel Stiffness Stress	Depth to Run N Axis Msg	Max Comp Strain	Max Tens Strain
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250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 177
Project Name: Lee's Summit Market Plaza		

rad/in. ksi	in-kip ksi	kip-in2 ksi	in	in/in	in/in
6.25000E-07	703.7448246	1125991719.	51.3444004	0.00003209	0.00000209
0.1151149	0.1343172	0.9262673			
0.00000125	1414.	1131157414.	37.7277155	0.00004716	-0.00001284
0.1688380	0.1962712	1.3589297			
0.00000188	2138.	1140029734.	33.2652378	0.00006237	-0.00002763
0.2230240	0.2583126	1.7957473			
0.00000250	2863.	1145037122.	31.0548771	0.00007764	-0.00004236
0.2773286	0.3200561	2.2340786			
0.00000313	3586.	1147551634.	29.7345212	0.00009292	-0.00005708
0.3316141	0.3813598	2.6729410			
0.00000375	4307.	1148606734.	28.8559331	0.0001082	-0.00007179
0.3858214	0.4421733	3.1119827			
0.00000438	5026.	1148762908.	28.2286305	0.0001235	-0.00008650
0.4399174	0.5024760	3.5510575			
0.00000500	5742.	1148330786.	27.7578945	0.0001388	-0.0001012
0.4938785	0.5622582	3.9900947			
0.00000563	5742.	1020738476.	20.6014422	0.0001159	-0.0001541
0.4116453	0.4710073	-4.4302398 C			
0.00000625	5742.	918664629.	19.9310193	0.0001246	-0.0001754
0.4421249	0.5049289	-5.0440028 C			
0.00000688	5742.	835149662.	19.3625769	0.0001331	-0.0001969
0.4720752	0.5381465	-5.6617362 C			
0.00000750	5742.	765553857.	18.8758826	0.0001416	-0.0002184
0.5016359	0.5708228	-6.2822955 C			
0.00000813	5742.	706665099.	18.4544517	0.0001499	-0.0002401
0.5308750	0.6030389	-6.9051198 C			
0.00000875	5742.	656189020.	18.0840901	0.0001582	-0.0002618
0.5597849	0.6347921	-7.5302621 C			
0.00001000	5742.	574165393.	17.4668966	0.0001747	-0.0003053
0.6169190	0.6972593	-8.7850000 C			
0.00001125	5742.	510369238.	16.9712311	0.0001909	-0.0003491
0.6732327	0.7584702	-10.0448358 C			
0.00001250	5742.	459332314.	16.5655369	0.0002071	-0.0003929
0.7289318	0.8186754	-11.3079929 C			
0.00001375	5742.	417574831.	16.2245514	0.0002231	-0.0004369
0.7839706	0.8778497	-12.5747601 C			
0.00001500	5742.	382776929.	15.9368274	0.0002391	-0.0004809
0.8385868	0.9362699	-13.8430800 C			
0.00001625	5742.	353332549.	15.6904120	0.0002550	-0.0005250
0.8927875	0.9939616	-15.1127933 C			
0.00001750	5908.	337589858.	15.4761459	0.0002708	-0.0005692
0.9465426	1.0509104	-16.3840559 C			
0.00001875	6223.	331919573.	15.2887249	0.0002867	-0.0006133
0.9999137	1.1071981	-17.6562558 C			
0.00002000	6539.	326940129.	15.1255394	0.0003025	-0.0006575
1.0530548	1.1630011	-18.9279871 C			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 178
Project Name: Lee's Summit Market Plaza		

0.00002125	6853.	322502148.	14.9776491	0.0003183	-0.0007017
1.1056162	1.2179673	-20.2021237 C			
0.00002250	7167.	318540470.	14.8467677	0.0003341	-0.0007459
1.1579137	1.2724412	-21.4758840 C			
0.00002375	7481.	314980673.	14.7303754	0.0003498	-0.0007902
1.2099476	1.3264351	-22.7491539 C			
0.00002500	7794.	311760133.	14.6258273	0.0003656	-0.0008344
1.2616660	1.3799069	-24.0222751 C			
0.00002625	8107.	308819401.	14.5290501	0.0003814	-0.0008786
1.3128505	1.4326436	-25.2970605 C			
0.00002750	8419.	306132864.	14.4417175	0.0003971	-0.0009229
1.3637406	1.4849039	-26.5713302 C			
0.00003000	9042.	301394828.	14.2906906	0.0004287	-0.0010113
1.4645928	1.5879907	-29.1182991 C			
0.00003250	9664.	297339971.	14.1651620	0.0004604	-0.0010996
1.5641354	1.6891576	-31.6631348 C			
0.00003500	10283.	293809326.	14.0560581	0.0004920	-0.0011880
1.6618847	1.7879907	-34.2095010 C			
0.00003750	10902.	290708469.	13.9634354	0.0005236	-0.0012764
1.7581628	1.8848876	-36.7537639 C			
0.00004000	11518.	287956601.	13.8844002	0.0005554	-0.0013646
1.8529151	1.9798567	-39.2956956 C			
0.00004250	12133.	285491451.	13.8165972	0.0005872	-0.0014528
1.9460715	2.0728864	-41.8352438 C			
0.00004500	12747.	283264577.	13.7581953	0.0006191	-0.0015409
2.0375668	2.1639647	-44.3723550 C			
0.00004750	13359.	281237723.	13.7077495	0.0006511	-0.0016289
2.1273399	2.2530792	-46.9069749 C			
0.00005000	13969.	279379220.	13.6634938	0.0006832	-0.0017168
2.2152497	2.3401334	-49.4399338 C			
0.00005250	14577.	277664032.	13.6242539	0.0007153	-0.0018047
2.3012040	2.4250746	-51.9716733 C			
0.00005750	15789.	274591341.	13.5609816	0.0007798	-0.0019802
2.4674879	2.5889847	-57.0268630 C			
0.00006250	16994.	271896650.	13.5141621	0.0008446	-0.0021554
2.6260056	2.7448302	-60.0000000 CY			
0.00006750	18167.	269137275.	13.4746088	0.0009095	-0.0023305
2.7756067	2.8916082	-60.0000000 CY			
0.00007250	19030.	262485967.	13.3750623	0.0009697	-0.0025103
2.9060185	3.0193231	-60.0000000 CY			
0.00007750	19681.	253949388.	13.2453347	0.0010265	-0.0026935
3.0219724	3.1326499	-60.0000000 CY			
0.00008250	20285.	245873382.	13.1210664	0.0010825	-0.0028775
3.1294885	3.2374532	-60.0000000 CY			
0.00008750	20654.	236049416.	12.9551045	0.0011336	-0.0030664
3.2217098	3.3270292	-60.0000000 CY			
0.00009250	21013.	227162894.	12.8075035	0.0011847	-0.0032553
3.3086499	3.4110734	-60.0000000 CY			
0.00009750	21367.	219152229.	12.6754146	0.0012359	-0.0034441
3.3903902	3.4895690	-60.0000000 CY			



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 179
Project Name: Lee's Summit Market Plaza		

0.0001025	21718.	211882295.	12.5547625	0.0012869	-0.0036331
3.4667577	3.5622443	-60.0000000 CY			
0.0001075	22028.	204909525.	12.4368834	0.0013370	-0.0038230
3.5368702	3.6281673	-60.0000000 CY			
0.0001125	22211.	197434849.	12.2970866	0.0013834	-0.0040166
3.5975768	3.6843865	-60.0000000 CY			
0.0001175	22374.	190416876.	12.1620270	0.0014290	-0.0042110
3.6533545	3.7350829	-60.0000000 CY			
0.0001225	22533.	183946595.	12.0366868	0.0014745	-0.0044055
3.7052935	3.7811850	-60.0000000 CY			
0.0001275	22691.	177971342.	11.9227619	0.0015202	-0.0045998
3.7539238	3.8230636	-60.0000000 CY			
0.0001325	22848.	172434830.	11.8189902	0.0015660	-0.0047940
3.7993154	3.8606612	-60.0000000 CY			
0.0001375	23001.	167281907.	11.7221341	0.0016118	-0.0049882
3.8412733	3.8937134	-60.0000000 CY			
0.0001425	23152.	162468614.	11.6302905	0.0016573	-0.0051827
3.8797952	3.9221474	-60.0000000 CY			
0.0001475	23301.	157970785.	11.5461618	0.0017031	-0.0053769
3.9154146	3.9462721	-60.0000000 CY			
0.0001525	23448.	153757167.	11.4690215	0.0017490	-0.0055710
3.9482083	3.9660236	-60.0000000 CY			
0.0001575	23591.	149785486.	11.3974153	0.0017951	-0.0057649
3.9781727	3.9812982	-60.0000000 CY			
0.0001625	23715.	145937260.	11.3253642	0.0018404	-0.0059596
4.0048966	3.9918968	-60.0000000 CY			
0.0001675	23800.	142091835.	11.2442868	0.0018834	-0.0061566
4.0278804	3.9979162	-60.0000000 CY			
0.0001725	23858.	138305942.	11.1566905	0.0019245	-0.0063555
4.0477239	3.9999889	-60.0000000 CY			
0.0001775	23910.	134703351.	11.0737345	0.0019656	-0.0065544
4.0655989	3.9973574	-60.0000000 CY			
0.0001825	23961.	131293057.	10.9963111	0.0020068	-0.0067532
4.0816798	3.9998678	-60.0000000 CY			
0.0001875	24011.	128057982.	10.9242080	0.0020483	-0.0069517
4.0960346	3.9955405	-60.0000000 CY			
0.0001925	24060.	124985961.	10.8568162	0.0020899	-0.0071501
4.1087005	3.9991601	-60.0000000 CY			
0.0001975	24108.	122063454.	10.7932937	0.0021317	-0.0073483
4.1197068	3.9973649	60.0000000 CY			
0.0002025	24152.	119269699.	10.7297500	0.0021728	-0.0075472
4.1289628	3.9967585	60.0000000 CY			
0.0002075	24196.	116607513.	10.6700029	0.0022140	-0.0077460
4.1367518	3.9995115	60.0000000 CY			
0.0002125	24239.	114066590.	10.6139610	0.0022555	-0.0079445
4.1431312	3.9961763	60.0000000 CY			
0.0002175	24281.	111638252.	10.5614266	0.0022971	-0.0081429
4.1481499	3.9960918	60.0000000 CY			
0.0002225	24323.	109316634.	10.5118707	0.0023389	-0.0083411
4.1518491	3.9991199	60.0000000 CY			



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
 816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 180
Project Name: Lee's Summit Market Plaza		

0.0002275	24364.	107094405.	10.4651534	0.0023808	-0.0085392
4.1542810	3.9990119	60.0000000 CY			
0.0002325	24404.	104963427.	10.4214147	0.0024230	-0.0087370
4.1554964	3.9933186	60.0000000 CY			
0.0002375	24444.	102920329.	10.3800252	0.0024653	-0.0089347
4.1555391	3.9974082	60.0000000 CY			
0.0002425	24483.	100959651.	10.3408459	0.0025077	-0.0091323
4.1545678	3.9996020	60.0000000 CY			
0.0002475	24521.	99073369.	10.3024318	0.0025499	-0.0093301
4.1555571	3.9968080	60.0000000 CY			
0.0002525	24557.	97256320.	10.2644545	0.0025918	-0.0095282
4.1555161	3.9923860	60.0000000 CY			
0.0002725	24700.	90642259.	10.1306346	0.0027606	-0.0103194
4.1550042	3.9924356	60.0000000 CY			
0.0002925	24837.	84913704.	10.0213977	0.0029313	-0.0111087
4.1548081	3.9999278	60.0000000 CY			
0.0003125	24966.	79889669.	9.9330254	0.0031041	-0.0118959
4.1551303	3.9963217	60.0000000 CY			
0.0003325	25051.	75340791.	9.8416492	0.0032723	-0.0126877
4.1556520	3.9907581	60.0000000 CY			
0.0003525	25083.	71157387.	9.7362045	0.0034320	-0.0134880
4.1545343	3.9957259	60.0000000 CY			
0.0003725	25101.	67384224.	9.6355692	0.0035892	-0.0142908
4.1551824	3.9986272	60.0000000 CY			
0.0003925	25113.	63983206.	9.5519080	0.0037491	-0.0150909
4.1546855	3.9850423	60.0000000 CY			
0.0004125	25113.	60880990.	9.5299548	0.0039311	-0.0158689
4.1545876	3.9986878	60.0000000 CY			
0.0004325	25113.	58065684.	9.5603575	0.0041349	-0.0166251
4.1555397	3.9784346	60.0000000 CY			
0.0004525	25113.	55499245.	9.5000408	0.0042988	-0.0174212
4.1543336	3.9918196	60.0000000 CY			
0.0004725	25113.	53150071.	9.5758671	0.0045246	-0.0181554
4.1555363	3.9905547	60.0000000 CY			
0.0004925	25113.	50991692.	9.6877025	0.0047712	-0.0188688
4.1521077	3.9944791	60.0000000 CY			
0.0005125	25113.	49001773.	9.8481110	0.0050472	-0.0195528
4.1538130	3.9730727	60.0000000 CY			

 Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003
 or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
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250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
 816.444.3144
 www.leok.com

Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 181
Project Name: Lee's Summit Market Plaza		

1	33.169	23506.677	0.00300000
2	42.646	23653.974	0.00300000
3	46.112	23707.660	0.00300000
4	51.578	23792.165	0.00300000
5	52.360	23804.224	0.00300000
6	69.418	24061.276	0.00300000
7	76.367	24164.215	0.00300000
8	114.898	24727.884	0.00300000
9	125.224	24877.379	0.00300000
10	125.978	24888.279	0.00300000

Note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, Section 9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in ²
1	0.65	23507.	21.559922	15279.	256156972.
2	0.65	23654.	27.719900	15375.	257938727.
3	0.65	23708.	29.972728	15410.	258590722.
4	0.65	23792.	33.525989	15465.	259619478.
5	0.65	23804.	34.033740	15473.	259766526.
6	0.65	24061.	45.121700	15640.	262985361.
7	0.65	24164.	49.638767	15707.	264299935.
8	0.65	24728.	74.683700	16073.	271611310.
9	0.65	24877.	81.395600	16170.	273578699.
10	0.65	24888.	81.885700	16177.	273722492.
1	0.70	23507.	23.218378	16455.	254548704.
2	0.70	23654.	29.852200	16558.	256224628.
3	0.70	23708.	32.278322	16595.	256834655.
4	0.70	23792.	36.104911	16655.	257796703.
5	0.70	23804.	36.651720	16663.	257934163.
6	0.70	24061.	48.592600	16843.	260942807.
7	0.70	24164.	53.457133	16915.	262169976.
8	0.70	24728.	80.428600	17310.	268948597.
9	0.70	24877.	87.656800	17414.	270757341.
10	0.70	24888.	88.184600	17422.	270889414.



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 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 182
Project Name: Lee's Summit Market Plaza		

1	0.75	23507.	24.876833	17630.	248179019.
2	0.75	23654.	31.984500	17740.	249934514.
3	0.75	23708.	34.583917	17781.	250570070.
4	0.75	23792.	38.683833	17844.	251572280.
5	0.75	23804.	39.269700	17853.	251715468.
6	0.75	24061.	52.063500	18046.	254875200.
7	0.75	24164.	57.275500	18123.	256168515.
8	0.75	24728.	86.173500	18546.	263276165.
9	0.75	24877.	93.918000	18658.	265153196.
10	0.75	24888.	94.483500	18666.	265290049.

 Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.00	0.00	N.A.	No	0.00	29768.
2	3.0000	3.0000	Yes	No	29768.	192480.
3	13.0000	13.0000	No	Yes	N.A.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for LRFD Load Case Number 1

Load Case No. 1: LRFD: 1.4D

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 183
Project Name: Lee's Summit Market Plaza		

Res.	Soil	Spr.	Distrib.					
X	y		Moment	Force	S	Stress	Stiffness	p
Es*h	Lat.	Load						
feet	inches	in-lbs		lbs	radians	psi*	in-lb^2	
lb/inch	lb/inch	lb/inch						
0.00	0.00505	568131.		3154.	-7.11E-05	0.00	1.15E+12	
-80.4220	16235.	0.00						
0.1700	0.00491	574403.		2990.	-7.01E-05	0.00	1.15E+12	
-80.7716	33568.	0.00						
0.3400	0.00477	580338.		2825.	-6.91E-05	0.00	1.15E+12	
-81.1034	34709.	0.00						
0.5100	0.00463	585936.		2659.	-6.80E-05	0.00	1.15E+12	
-81.4173	35896.	0.00						
0.6800	0.00449	591195.		2493.	-6.70E-05	0.00	1.15E+12	
-81.7132	37132.	0.00						
0.8500	0.00435	596113.		2326.	-6.59E-05	0.00	1.15E+12	
-81.9908	38419.	0.00						
1.0200	0.00422	600691.		2158.	-6.49E-05	0.00	1.15E+12	
-82.2501	39758.	0.00						
1.1900	0.00409	604926.		1990.	-6.38E-05	0.00	1.15E+12	
-82.4909	41155.	0.00						
1.3600	0.00396	608818.		1821.	-6.27E-05	0.00	1.15E+12	
-82.7130	42610.	0.00						
1.5300	0.00383	612365.		1653.	-6.16E-05	0.00	1.15E+12	
-82.9163	44129.	0.00						
1.7000	0.00371	615567.		1483.	-6.06E-05	0.00	1.15E+12	
-83.1005	45713.	0.00						
1.8700	0.00359	618424.		1313.	-5.95E-05	0.00	1.15E+12	
-83.2657	47368.	0.00						
2.0400	0.00347	620934.		1143.	-5.84E-05	0.00	1.15E+12	
-83.4115	49096.	0.00						
2.2100	0.00335	623096.		973.1869	-5.73E-05	0.00	1.15E+12	
-83.5378	50902.	0.00						
2.3800	0.00323	624911.		802.6609	-5.61E-05	0.00	1.15E+12	
-83.6446	52791.	0.00						
2.5500	0.00312	626378.		631.9373	-5.50E-05	0.00	1.15E+12	
-83.7315	54767.	0.00						
2.7200	0.00301	627496.		461.0568	-5.39E-05	0.00	1.15E+12	
-83.7984	56836.	0.00						
2.8900	0.00290	628266.		290.0602	-5.28E-05	0.00	1.15E+12	
-83.8453	59004.	0.00						
3.0600	0.00279	628686.		118.9889	-5.17E-05	0.00	1.15E+12	
-83.8717	61276.	0.00						
3.2300	0.00269	628757.		-52.1156	-5.06E-05	0.00	1.15E+12	
-83.8777	63658.	0.00						
3.4000	0.00259	628480.		-223.2112	-4.95E-05	0.00	1.15E+12	
-83.8631	66159.	0.00						
3.5700	0.00249	627853.		-394.2558	-4.83E-05	0.00	1.15E+12	



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 184
Project Name: Lee's Summit Market Plaza		

-83.8276	68785.	0.00				
3.7400	0.00239	626877.	-565.2065	-4.72E-05	0.00	1.15E+12
-83.7711	71544.	0.00				
3.9100	0.00229	625553.	-736.0203	-4.61E-05	0.00	1.15E+12
-83.6934	74446.	0.00				
4.0800	0.00220	623880.	-906.6537	-4.50E-05	0.00	1.15E+12
-83.5943	77499.	0.00				
4.2500	0.00211	621859.	-1077.	-4.39E-05	0.00	1.15E+12
-83.4735	80714.	0.00				
4.4200	0.00202	619491.	-1247.	-4.28E-05	0.00	1.15E+12
-83.3309	84102.	0.00				
4.5900	0.00194	616775.	-1417.	-4.17E-05	0.00	1.15E+12
-83.1664	87676.	0.00				
4.7600	0.00185	613714.	-1586.	-4.06E-05	0.00	1.15E+12
-82.9795	91448.	0.00				
4.9300	0.00177	610308.	-1756.	-3.95E-05	0.00	1.15E+12
-82.7703	95432.	0.00				
5.1000	0.00169	606556.	-1924.	-3.85E-05	0.00	1.15E+12
-82.5383	99645.	0.00				
5.2700	0.00161	602462.	-2092.	-3.74E-05	0.00	1.15E+12
-82.2833	104103.	0.00				
5.4400	0.00154	598024.	-2260.	-3.63E-05	0.00	1.15E+12
-82.0052	108824.	0.00				
5.6100	0.00146	593246.	-2427.	-3.53E-05	0.00	1.15E+12
-81.7036	113831.	0.00				
5.7800	0.00139	588127.	-2593.	-3.42E-05	0.00	1.15E+12
-81.3783	119143.	0.00				
5.9500	0.00132	582670.	-2759.	-3.32E-05	0.00	1.15E+12
-81.0289	124788.	0.00				
6.1200	0.00126	576875.	-2924.	-3.21E-05	0.00	1.15E+12
-80.6552	130791.	0.00				
6.2900	0.00119	570745.	-3088.	-3.11E-05	0.00	1.15E+12
-80.2567	137182.	0.00				
6.4600	0.00113	564280.	-3251.	-3.01E-05	0.00	1.15E+12
-79.8332	143996.	0.00				
6.6300	0.00107	557483.	-3414.	-2.91E-05	0.00	1.15E+12
-79.3843	151269.	0.00				
6.8000	0.00101	550356.	-3575.	-2.81E-05	0.00	1.15E+12
-78.9094	159042.	0.00				
6.9700	9.56E-04	542901.	-3735.	-2.72E-05	0.00	1.15E+12
-77.9439	166370.	0.00				
7.1400	9.01E-04	535121.	-3890.	-2.62E-05	0.00	1.15E+12
-74.0812	167679.	0.00				
7.3100	8.49E-04	527032.	-4037.	-2.53E-05	0.00	1.15E+12
-70.3089	168988.	0.00				
7.4800	7.98E-04	518651.	-4177.	-2.44E-05	0.00	1.15E+12
-66.6285	170297.	0.00				
7.6500	7.49E-04	509993.	-4309.	-2.34E-05	0.00	1.15E+12
-63.0410	171606.	0.00				
7.8200	7.03E-04	501072.	-4434.	-2.25E-05	0.00	1.15E+12



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 185
Project Name: Lee's Summit Market Plaza		

-59.5474	172916.	0.00				
7.9900	6.57E-04	491903.	-4552.	-2.17E-05	0.00	1.15E+12
-56.1485	174225.	0.00				
8.1600	6.14E-04	482501.	-4664.	-2.08E-05	0.00	1.15E+12
-52.8450	175534.	0.00				
8.3300	5.73E-04	472878.	-4768.	-1.99E-05	0.00	1.15E+12
-49.6372	176843.	0.00				
8.5000	5.33E-04	463049.	-4866.	-1.91E-05	0.00	1.15E+12
-46.5256	178152.	0.00				
8.6700	4.95E-04	453027.	-4958.	-1.83E-05	0.00	1.15E+12
-43.5103	179461.	0.00				
8.8400	4.58E-04	442823.	-5044.	-1.75E-05	0.00	1.15E+12
-40.5913	180770.	0.00				
9.0100	4.23E-04	432450.	-5124.	-1.67E-05	0.00	1.15E+12
-37.7684	182080.	0.00				
9.1800	3.90E-04	421920.	-5198.	-1.60E-05	0.00	1.15E+12
-35.0414	183389.	0.00				
9.3500	3.58E-04	411244.	-5267.	-1.52E-05	0.00	1.15E+12
-32.4099	184698.	0.00				
9.5200	3.28E-04	400434.	-5330.	-1.45E-05	0.00	1.15E+12
-29.8732	186007.	0.00				
9.6900	2.99E-04	389499.	-5389.	-1.38E-05	0.00	1.15E+12
-27.4307	187316.	0.00				
9.8600	2.71E-04	378449.	-5442.	-1.31E-05	0.00	1.15E+12
-25.0814	188625.	0.00				
10.0300	2.45E-04	367295.	-5491.	-1.25E-05	0.00	1.15E+12
-22.8244	189934.	0.00				
10.2000	2.20E-04	356047.	-5536.	-1.18E-05	0.00	1.15E+12
-20.6585	191244.	0.00				
10.3700	1.97E-04	344712.	-5576.	-1.12E-05	0.00	1.15E+12
-18.5824	192553.	0.00				
10.5400	1.75E-04	333300.	-5611.	-1.06E-05	0.00	1.15E+12
-16.5947	193862.	0.00				
10.7100	1.54E-04	321818.	-5643.	-1.00E-05	0.00	1.15E+12
-14.6938	195171.	0.00				
10.8800	1.34E-04	310276.	-5671.	-9.47E-06	0.00	1.15E+12
-12.8782	196480.	0.00				
11.0500	1.15E-04	298680.	-5696.	-8.93E-06	0.00	1.15E+12
-11.1459	197789.	0.00				
11.2200	9.73E-05	287038.	-5717.	-8.41E-06	0.00	1.15E+12
-9.4950	199098.	0.00				
11.3900	8.07E-05	275355.	-5735.	-7.91E-06	0.00	1.15E+12
-7.9235	200408.	0.00				
11.5600	6.50E-05	263640.	-5749.	-7.43E-06	0.00	1.15E+12
-6.4292	201717.	0.00				
11.7300	5.03E-05	251899.	-5761.	-6.97E-06	0.00	1.15E+12
-5.0098	203026.	0.00				
11.9000	3.66E-05	240136.	-5770.	-6.54E-06	0.00	1.15E+12
-3.6629	204335.	0.00				
12.0700	2.37E-05	228358.	-5776.	-6.12E-06	0.00	1.15E+12



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 186
Project Name: Lee's Summit Market Plaza		

-2.3859	205644.	0.00				
12.2400	1.16E-05	216570.	-5780.	-5.73E-06	0.00	1.15E+12
-1.1761	206953.	0.00				
12.4100	3.03E-07	204777.	-5781.	-5.35E-06	0.00	1.15E+12
-0.03095	208262.	0.00				
12.5800	-1.02E-05	192984.	-5780.	-5.00E-06	0.00	1.15E+12
1.0526	209572.	0.00				
12.7500	-2.01E-05	181196.	-5777.	-4.67E-06	0.00	1.15E+12
2.0775	210881.	0.00				
12.9200	-2.93E-05	169416.	-5772.	-4.36E-06	0.00	1.15E+12
3.0468	212190.	0.00				
13.0900	-3.79E-05	157648.	-5722.	-4.07E-06	0.00	1.15E+12
45.4488	2448000.	0.00				
13.2600	-4.59E-05	146070.	-5620.	-3.80E-06	0.00	1.15E+12
55.0625	2448000.	0.00				
13.4300	-5.34E-05	134721.	-5498.	-3.55E-06	0.00	1.15E+12
64.0418	2448000.	0.00				
13.6000	-6.04E-05	123638.	-5359.	-3.32E-06	0.00	1.15E+12
72.4359	2448000.	0.00				
13.7700	-6.69E-05	112857.	-5203.	-3.11E-06	0.00	1.15E+12
80.2931	2448000.	0.00				
13.9400	-7.31E-05	102410.	-5032.	-2.92E-06	0.00	1.15E+12
87.6602	2448000.	0.00				
14.1100	-7.88E-05	92328.	-4846.	-2.75E-06	0.00	1.15E+12
94.5825	2448000.	0.00				
14.2800	-8.43E-05	82639.	-4646.	-2.59E-06	0.00	1.15E+12
101.1038	2448000.	0.00				
14.4500	-8.94E-05	73372.	-4434.	-2.45E-06	0.00	1.15E+12
107.2663	2448000.	0.00				
14.6200	-9.43E-05	64550.	-4209.	-2.33E-06	0.00	1.15E+12
113.1100	2448000.	0.00				
14.7900	-9.89E-05	56199.	-3973.	-2.22E-06	0.00	1.15E+12
118.6735	2448000.	0.00				
14.9600	-1.03E-04	48342.	-3725.	-2.13E-06	0.00	1.15E+12
123.9928	2448000.	0.00				
15.1300	-1.08E-04	41002.	-3467.	-2.05E-06	0.00	1.15E+12
129.1022	2448000.	0.00				
15.3000	-1.12E-04	34198.	-3198.	-1.98E-06	0.00	1.15E+12
134.0335	2448000.	0.00				
15.4700	-1.16E-04	27952.	-2920.	-1.93E-06	0.00	1.15E+12
138.8163	2448000.	0.00				
15.6400	-1.20E-04	22284.	-2632.	-1.88E-06	0.00	1.15E+12
143.4778	2448000.	0.00				
15.8100	-1.23E-04	17213.	-2335.	-1.85E-06	0.00	1.15E+12
148.0424	2448000.	0.00				
15.9800	-1.27E-04	12758.	-2028.	-1.82E-06	0.00	1.15E+12
152.5323	2448000.	0.00				
16.1500	-1.31E-04	8938.	-1713.	-1.80E-06	0.00	1.15E+12
156.9667	2448000.	0.00				
16.3200	-1.34E-04	5771.	-1388.	-1.79E-06	0.00	1.15E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 188
Project Name: Lee's Summit Market Plaza		

0.00	0.03135	1502802.	8238.	-3.02E-04	0.00	1.16E+12
-126.8073	4125.	0.00				
0.1700	0.03074	1519372.	7979.	-3.00E-04	0.00	1.16E+12
-127.6477	8471.	0.00				
0.3400	0.03013	1535411.	7717.	-2.97E-04	0.00	1.16E+12
-128.4697	8698.	0.00				
0.5100	0.02953	1550915.	7454.	-2.94E-04	0.00	1.16E+12
-129.2732	8931.	0.00				
0.6800	0.02893	1565881.	7190.	-2.92E-04	0.00	1.16E+12
-130.0581	9171.	0.00				
0.8500	0.02834	1580305.	6924.	-2.89E-04	0.00	1.16E+12
-130.8242	9417.	0.00				
1.0200	0.02775	1594184.	6656.	-2.86E-04	0.00	1.16E+12
-131.5713	9671.	0.00				
1.1900	0.02717	1607516.	6387.	-2.83E-04	0.00	1.16E+12
-132.2993	9933.	0.00				
1.3600	0.02660	1620297.	6116.	-2.80E-04	0.00	1.16E+12
-133.0080	10202.	0.00				
1.5300	0.02603	1632524.	5844.	-2.77E-04	0.00	1.16E+12
-133.6973	10479.	0.00				
1.7000	0.02547	1644195.	5571.	-2.75E-04	0.00	1.16E+12
-134.3670	10764.	0.00				
1.8700	0.02491	1655306.	5296.	-2.72E-04	0.00	1.16E+12
-135.0169	11058.	0.00				
2.0400	0.02436	1665854.	5020.	-2.69E-04	0.00	1.16E+12
-135.6469	11361.	0.00				
2.2100	0.02381	1675838.	4743.	-2.66E-04	0.00	1.16E+12
-136.2568	11673.	0.00				
2.3800	0.02327	1685255.	4464.	-2.63E-04	0.00	1.16E+12
-136.8465	11995.	0.00				
2.5500	0.02274	1694102.	4184.	-2.60E-04	0.00	1.16E+12
-137.4157	12328.	0.00				
2.7200	0.02221	1702377.	3904.	-2.57E-04	0.00	1.16E+12
-137.9643	12671.	0.00				
2.8900	0.02169	1710077.	3622.	-2.54E-04	0.00	1.16E+12
-138.4921	13024.	0.00				
3.0600	0.02118	1717201.	3339.	-2.51E-04	0.00	1.16E+12
-138.9988	13390.	0.00				
3.2300	0.02067	1723746.	3054.	-2.48E-04	0.00	1.16E+12
-139.4843	13767.	0.00				
3.4000	0.02017	1729710.	2769.	-2.45E-04	0.00	1.16E+12
-139.9485	14157.	0.00				
3.5700	0.01967	1735091.	2483.	-2.42E-04	0.00	1.16E+12
-140.3910	14560.	0.00				
3.7400	0.01918	1739888.	2197.	-2.39E-04	0.00	1.16E+12
-140.8117	14977.	0.00				
3.9100	0.01870	1744099.	1909.	-2.36E-04	0.00	1.16E+12
-141.2104	15408.	0.00				
4.0800	0.01822	1747722.	1621.	-2.32E-04	0.00	1.16E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 189
Project Name: Lee's Summit Market Plaza		

-141.5868	15853.	0.00				
4.2500	0.01775	1750755.	1331.	-2.29E-04	0.00	1.16E+12
-141.9407	16315.	0.00				
4.4200	0.01728	1753197.	1041.	-2.26E-04	0.00	1.16E+12
-142.2719	16793.	0.00				
4.5900	0.01682	1755047.	750.9071	-2.23E-04	0.00	1.16E+12
-142.5800	17288.	0.00				
4.7600	0.01637	1756303.	459.7532	-2.20E-04	0.00	1.16E+12
-142.8650	17800.	0.00				
4.9300	0.01593	1756964.	168.0421	-2.17E-04	0.00	1.16E+12
-143.1263	18332.	0.00				
5.1000	0.01549	1757030.	-124.1779	-2.14E-04	0.00	1.16E+12
-143.3639	18884.	0.00				
5.2700	0.01505	1756498.	-416.8580	-2.11E-04	0.00	1.16E+12
-143.5773	19456.	0.00				
5.4400	0.01463	1755369.	-709.9486	-2.08E-04	0.00	1.16E+12
-143.7664	20050.	0.00				
5.6100	0.01421	1753641.	-1003.	-2.05E-04	0.00	1.16E+12
-143.9307	20667.	0.00				
5.7800	0.01379	1751314.	-1297.	-2.02E-04	0.00	1.16E+12
-144.0699	21309.	0.00				
5.9500	0.01338	1748387.	-1591.	-1.98E-04	0.00	1.16E+12
-144.1838	21975.	0.00				
6.1200	0.01298	1744859.	-1885.	-1.95E-04	0.00	1.16E+12
-144.2718	22669.	0.00				
6.2900	0.01259	1740731.	-2180.	-1.92E-04	0.00	1.16E+12
-144.3336	23391.	0.00				
6.4600	0.01220	1736002.	-2474.	-1.89E-04	0.00	1.16E+12
-144.3689	24143.	0.00				
6.6300	0.01182	1730672.	-2769.	-1.86E-04	0.00	1.16E+12
-144.3771	24927.	0.00				
6.8000	0.01144	1724741.	-3063.	-1.83E-04	0.00	1.16E+12
-144.3578	25744.	0.00				
6.9700	0.01107	1718209.	-3358.	-1.80E-04	0.00	1.16E+12
-144.3105	26597.	0.00				
7.1400	0.01070	1711075.	-3652.	-1.77E-04	0.00	1.16E+12
-144.2348	27488.	0.00				
7.3100	0.01035	1703342.	-3946.	-1.74E-04	0.00	1.16E+12
-144.1299	28419.	0.00				
7.4800	0.00999	1695008.	-4240.	-1.71E-04	0.00	1.16E+12
-143.9955	29392.	0.00				
7.6500	0.00965	1686075.	-4534.	-1.68E-04	0.00	1.16E+12
-143.8308	30411.	0.00				
7.8200	0.00931	1676543.	-4827.	-1.65E-04	0.00	1.16E+12
-143.6351	31478.	0.00				
7.9900	0.00897	1666412.	-5120.	-1.62E-04	0.00	1.16E+12
-143.4078	32597.	0.00				
8.1600	0.00865	1655685.	-5412.	-1.59E-04	0.00	1.16E+12
-143.1480	33772.	0.00				
8.3300	0.00833	1644362.	-5704.	-1.56E-04	0.00	1.16E+12



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Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 190
Project Name: Lee's Summit Market Plaza		

-142.8550	35006.	0.00				
8.5000	0.00801	1632444.	-5995.	-1.53E-04	0.00	1.16E+12
-142.5278	36303.	0.00				
8.6700	0.00770	1619932.	-6285.	-1.51E-04	0.00	1.16E+12
-142.1655	37669.	0.00				
8.8400	0.00739	1606829.	-6575.	-1.48E-04	0.00	1.16E+12
-141.7670	39109.	0.00				
9.0100	0.00710	1593135.	-6864.	-1.45E-04	0.00	1.16E+12
-141.3312	40628.	0.00				
9.1800	0.00680	1578853.	-7151.	-1.42E-04	0.00	1.16E+12
-140.8568	42234.	0.00				
9.3500	0.00652	1563985.	-7438.	-1.39E-04	0.00	1.16E+12
-140.3425	43933.	0.00				
9.5200	0.00624	1548532.	-7724.	-1.37E-04	0.00	1.16E+12
-139.7867	45733.	0.00				
9.6900	0.00596	1532497.	-8008.	-1.34E-04	0.00	1.16E+12
-139.1879	47645.	0.00				
9.8600	0.00569	1515883.	-8292.	-1.31E-04	0.00	1.16E+12
-138.5442	49677.	0.00				
10.0300	0.00542	1498692.	-8574.	-1.28E-04	0.00	1.16E+12
-137.8538	51843.	0.00				
10.2000	0.00517	1480927.	-8854.	-1.26E-04	0.00	1.16E+12
-137.1143	54155.	0.00				
10.3700	0.00491	1462591.	-9133.	-1.23E-04	0.00	1.16E+12
-136.3233	56628.	0.00				
10.5400	0.00466	1443687.	-9410.	-1.21E-04	0.00	1.16E+12
-135.4781	59281.	0.00				
10.7100	0.00442	1424220.	-9686.	-1.18E-04	0.00	1.15E+12
-134.5757	62132.	0.00				
10.8800	0.00418	1404192.	-9959.	-1.16E-04	0.00	1.15E+12
-133.6127	65207.	0.00				
11.0500	0.00395	1383608.	-10231.	-1.13E-04	0.00	1.15E+12
-132.5851	68533.	0.00				
11.2200	0.00372	1362472.	-10500.	-1.11E-04	0.00	1.15E+12
-131.4886	72142.	0.00				
11.3900	0.00349	1340788.	-10767.	-1.08E-04	0.00	1.15E+12
-130.3181	76073.	0.00				
11.5600	0.00328	1318562.	-11032.	-1.06E-04	0.00	1.15E+12
-129.0679	80373.	0.00				
11.7300	0.00306	1295799.	-11294.	-1.04E-04	0.00	1.15E+12
-127.7314	85097.	0.00				
11.9000	0.00285	1272503.	-11553.	-1.01E-04	0.00	1.15E+12
-126.3007	90317.	0.00				
12.0700	0.00265	1248682.	-11809.	-9.92E-05	0.00	1.15E+12
-124.7668	96115.	0.00				
12.2400	0.00245	1224342.	-12062.	-9.70E-05	0.00	1.15E+12
-123.1188	102601.	0.00				
12.4100	0.00225	1199489.	-12311.	-9.49E-05	0.00	1.15E+12
-121.3438	109910.	0.00				
12.5800	0.00206	1174130.	-12557.	-9.28E-05	0.00	1.15E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 191
Project Name: Lee's Summit Market Plaza		

-119.4261	118220.	0.00				
12.7500	0.00187	1148275.	-12798.	-9.07E-05	0.00	1.15E+12
-117.3464	127765.	0.00				
12.9200	0.00169	1121931.	-13035.	-8.87E-05	0.00	1.15E+12
-115.0806	138862.	0.00				
13.0900	0.00151	1095108.	-15003.	-8.68E-05	0.00	1.15E+12
-1814.	2448000.	0.00				
13.2600	0.00134	1060735.	-18489.	-8.48E-05	0.00	1.15E+12
-1604.	2448000.	0.00				
13.4300	0.00117	1019688.	-21552.	-8.30E-05	0.00	1.15E+12
-1399.	2448000.	0.00				
13.6000	9.98E-04	972819.	-24200.	-8.12E-05	0.00	1.15E+12
-1198.	2448000.	0.00				
13.7700	8.34E-04	920967.	-26443.	-7.95E-05	0.00	1.15E+12
-1001.	2448000.	0.00				
13.9400	6.73E-04	864948.	-28288.	-7.80E-05	0.00	1.15E+12
-808.1743	2448000.	0.00				
14.1100	5.16E-04	805567.	-29744.	-7.65E-05	0.00	1.14E+12
-619.2153	2448000.	0.00				
14.2800	3.61E-04	743608.	-30818.	-7.51E-05	0.00	1.14E+12
-433.7710	2448000.	0.00				
14.4500	2.10E-04	679844.	-31517.	-7.38E-05	0.00	1.14E+12
-251.5768	2448000.	0.00				
14.6200	6.03E-05	615033.	-31847.	-7.27E-05	0.00	1.14E+12
-72.3566	2448000.	0.00				
14.7900	-8.68E-05	549921.	-31815.	-7.16E-05	0.00	1.14E+12
104.1731	2448000.	0.00				
14.9600	-2.32E-04	485242.	-31425.	-7.07E-05	0.00	1.14E+12
278.2971	2448000.	0.00				
15.1300	-3.75E-04	421721.	-30682.	-6.99E-05	0.00	1.14E+12
450.2983	2448000.	0.00				
15.3000	-5.17E-04	360074.	-29589.	-6.92E-05	0.00	1.14E+12
620.4546	2448000.	0.00				
15.4700	-6.58E-04	301009.	-28152.	-6.86E-05	0.00	1.14E+12
789.0358	2448000.	0.00				
15.6400	-7.97E-04	245228.	-26371.	-6.81E-05	0.00	1.14E+12
956.3001	2448000.	0.00				
15.8100	-9.35E-04	193427.	-24251.	-6.77E-05	0.00	1.14E+12
1122.	2448000.	0.00				
15.9800	-0.00107	146296.	-21793.	-6.74E-05	0.00	1.14E+12
1288.	2448000.	0.00				
16.1500	-0.00121	104526.	-18997.	-6.72E-05	0.00	1.14E+12
1453.	2448000.	0.00				
16.3200	-0.00135	68800.	-15867.	-6.70E-05	0.00	1.14E+12
1617.	2448000.	0.00				
16.4900	-0.00148	39802.	-12401.	-6.69E-05	0.00	1.14E+12
1781.	2448000.	0.00				
16.6600	-0.00162	18215.	-8601.	-6.69E-05	0.00	1.14E+12
1945.	2448000.	0.00				
16.8300	-0.00176	4721.	-4468.	-6.69E-05	0.00	1.14E+12



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 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 192
Project Name: Lee's Summit Market Plaza		

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2108. 2448000. 0.00
      17.0000 -0.00189 0.00 0.00 -6.69E-05 0.00 1.14E+12
2272. 1224000. 0.00
  
```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 2:

```

Pile-head deflection      = 0.03135470 inches
Computed slope at pile head = -0.00030240 radians
Maximum bending moment    = 1757030. inch-lbs
Maximum shear force       = -31847. lbs
Depth of maximum bending moment = 5.10000000 feet below pile head
Depth of maximum shear force = 14.62000000 feet below pile head
Number of iterations      = 14
Number of zero deflection points = 1
  
```

----- Computed Values of Pile Loading and Deflection for Lateral Loading for LRFD Load Case Number 3 -----

Load Case No. 3: LRFD: 1.2D + 1.6S + 0.5W

Depth Res.	Soil Spr.	Deflect. Distrib.	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
X	y	Lat. Load						
Es*h								
feet	inches	lb/inch	in-lbs	lbs	radians	psi*	in-lb^2	
lb/inch	lb/inch	lb/inch						
0.00	0.4399	5670755.	28979.	-0.00432	0.00	1.15E+12		
-245.3765	568.9047	0.00						
0.1700	0.4311	5730272.	28477.	-0.00431	0.00	1.15E+12		
-246.9748	1169.	0.00						
0.3400	0.4224	5788759.	27971.	-0.00430	0.00	8.28E+11		



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 193
Project Name: Lee's Summit Market Plaza		

-248.5278	1200.	0.00				
0.5100	0.4136	5846209.	27463.	-0.00428	0.00	5.12E+11
-250.0358	1233.	0.00				
0.6800	0.4049	5902613.	26951.	-0.00425	0.00	3.28E+11
-251.5007	1267.	0.00				
0.8500	0.3963	5957963.	26437.	-0.00421	0.00	3.22E+11
-252.9262	1302.	0.00				
1.0200	0.3877	6012253.	25919.	-0.00417	0.00	3.20E+11
-254.3116	1338.	0.00				
1.1900	0.3792	6065476.	25399.	-0.00414	0.00	3.18E+11
-255.6565	1375.	0.00				
1.3600	0.3708	6117626.	24876.	-0.00410	0.00	3.17E+11
-256.9605	1414.	0.00				
1.5300	0.3625	6168700.	24351.	-0.00406	0.00	3.16E+11
-258.2231	1453.	0.00				
1.7000	0.3543	6218690.	23823.	-0.00402	0.00	3.15E+11
-259.4440	1494.	0.00				
1.8700	0.3461	6267592.	23292.	-0.00398	0.00	3.14E+11
-260.6226	1536.	0.00				
2.0400	0.3380	6315400.	22760.	-0.00394	0.00	3.14E+11
-261.7585	1580.	0.00				
2.2100	0.3301	6362111.	22224.	-0.00389	0.00	3.13E+11
-262.8512	1625.	0.00				
2.3800	0.3222	6407719.	21687.	-0.00385	0.00	3.12E+11
-263.9003	1671.	0.00				
2.5500	0.3143	6452220.	21148.	-0.00381	0.00	3.12E+11
-264.9053	1719.	0.00				
2.7200	0.3066	6495610.	20606.	-0.00377	0.00	3.11E+11
-265.8656	1769.	0.00				
2.8900	0.2990	6537885.	20063.	-0.00373	0.00	3.11E+11
-266.7807	1820.	0.00				
3.0600	0.2914	6579040.	19518.	-0.00368	0.00	3.11E+11
-267.6499	1874.	0.00				
3.2300	0.2839	6619072.	18971.	-0.00364	0.00	3.10E+11
-268.4731	1929.	0.00				
3.4000	0.2766	6657977.	18423.	-0.00360	0.00	3.10E+11
-269.2494	1986.	0.00				
3.5700	0.2693	6695753.	17873.	-0.00355	0.00	3.09E+11
-269.9783	2045.	0.00				
3.7400	0.2621	6732396.	17321.	-0.00351	0.00	3.09E+11
-270.6592	2107.	0.00				
3.9100	0.2550	6767903.	16768.	-0.00346	0.00	3.09E+11
-271.2915	2171.	0.00				
4.0800	0.2479	6802272.	16214.	-0.00342	0.00	3.08E+11
-271.8746	2237.	0.00				
4.2500	0.2410	6835500.	15659.	-0.00337	0.00	3.08E+11
-272.4078	2306.	0.00				
4.4200	0.2342	6867585.	15103.	-0.00333	0.00	3.07E+11
-272.8906	2377.	0.00				
4.5900	0.2274	6898524.	14546.	-0.00328	0.00	3.07E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 194
Project Name: Lee's Summit Market Plaza		

-273.3221	2452.	0.00				
4.7600	0.2208	6928316.	13988.	-0.00324	0.00	3.07E+11
-273.7017	2529.	0.00				
4.9300	0.2142	6956960.	13429.	-0.00319	0.00	3.07E+11
-274.0287	2609.	0.00				
5.1000	0.2078	6984453.	12870.	-0.00314	0.00	3.06E+11
-274.3023	2693.	0.00				
5.2700	0.2014	7010795.	12310.	-0.00310	0.00	3.06E+11
-274.5218	2781.	0.00				
5.4400	0.1951	7035985.	11750.	-0.00305	0.00	3.06E+11
-274.6864	2872.	0.00				
5.6100	0.1890	7060022.	11189.	-0.00300	0.00	3.06E+11
-274.7953	2967.	0.00				
5.7800	0.1829	7082905.	10629.	-0.00296	0.00	3.05E+11
-274.8475	3066.	0.00				
5.9500	0.1769	7104634.	10068.	-0.00291	0.00	3.05E+11
-274.8423	3169.	0.00				
6.1200	0.1710	7125210.	9508.	-0.00286	0.00	3.05E+11
-274.7787	3278.	0.00				
6.2900	0.1652	7144632.	8947.	-0.00281	0.00	3.05E+11
-274.6557	3391.	0.00				
6.4600	0.1596	7162901.	8387.	-0.00276	0.00	3.05E+11
-274.4725	3509.	0.00				
6.6300	0.1540	7180017.	7827.	-0.00272	0.00	3.04E+11
-274.2279	3634.	0.00				
6.8000	0.1485	7195982.	7268.	-0.00267	0.00	3.04E+11
-273.9209	3764.	0.00				
6.9700	0.1431	7210797.	6710.	-0.00262	0.00	3.04E+11
-273.5504	3900.	0.00				
7.1400	0.1378	7224464.	6152.	-0.00257	0.00	3.04E+11
-273.1153	4044.	0.00				
7.3100	0.1326	7236983.	5596.	-0.00252	0.00	3.04E+11
-272.6142	4195.	0.00				
7.4800	0.1275	7248358.	5040.	-0.00247	0.00	3.04E+11
-272.0461	4353.	0.00				
7.6500	0.1225	7258590.	4486.	-0.00243	0.00	3.04E+11
-271.4094	4521.	0.00				
7.8200	0.1176	7267683.	3933.	-0.00238	0.00	3.04E+11
-270.7029	4697.	0.00				
7.9900	0.1128	7275639.	3381.	-0.00233	0.00	3.04E+11
-269.9251	4882.	0.00				
8.1600	0.1081	7282461.	2831.	-0.00228	0.00	3.04E+11
-269.0745	5079.	0.00				
8.3300	0.1035	7288153.	2284.	-0.00223	0.00	3.04E+11
-268.1494	5286.	0.00				
8.5000	0.09898	7292719.	1738.	-0.00218	0.00	3.03E+11
-267.1482	5506.	0.00				
8.6700	0.09458	7296163.	1194.	-0.00213	0.00	3.03E+11
-266.0690	5739.	0.00				
8.8400	0.09028	7298489.	652.0264	-0.00208	0.00	3.03E+11



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 195
Project Name: Lee's Summit Market Plaza		

-264.9100	5986.	0.00				
9.0100	0.08608	7299702.	112.8756	-0.00203	0.00	3.03E+11
-263.6692	6249.	0.00				
9.1800	0.08198	7299807.	-423.6583	-0.00199	0.00	3.03E+11
-262.3444	6528.	0.00				
9.3500	0.07798	7298811.	-957.4016	-0.00194	0.00	3.03E+11
-260.9334	6826.	0.00				
9.5200	0.07408	7296718.	-1488.	-0.00189	0.00	3.03E+11
-259.4337	7144.	0.00				
9.6900	0.07028	7293535.	-2016.	-0.00184	0.00	3.03E+11
-257.8427	7485.	0.00				
9.8600	0.06658	7289269.	-2540.	-0.00179	0.00	3.04E+11
-256.1578	7849.	0.00				
10.0300	0.06298	7283927.	-3061.	-0.00174	0.00	3.04E+11
-254.3758	8240.	0.00				
10.2000	0.05948	7277515.	-3578.	-0.00169	0.00	3.04E+11
-252.4938	8660.	0.00				
10.3700	0.05608	7270043.	-4091.	-0.00164	0.00	3.04E+11
-250.5081	9113.	0.00				
10.5400	0.05278	7261517.	-4600.	-0.00159	0.00	3.04E+11
-248.4151	9602.	0.00				
10.7100	0.04958	7251948.	-5104.	-0.00154	0.00	3.04E+11
-246.2108	10131.	0.00				
10.8800	0.04647	7241344.	-5604.	-0.00150	0.00	3.04E+11
-243.8906	10706.	0.00				
11.0500	0.04347	7229714.	-6099.	-0.00145	0.00	3.04E+11
-241.4499	11331.	0.00				
11.2200	0.04057	7217069.	-6589.	-0.00140	0.00	3.04E+11
-238.8833	12013.	0.00				
11.3900	0.03776	7203420.	-7074.	-0.00135	0.00	3.04E+11
-236.1850	12759.	0.00				
11.5600	0.03506	7188778.	-7553.	-0.00130	0.00	3.04E+11
-233.3486	13579.	0.00				
11.7300	0.03245	7173155.	-8026.	-0.00125	0.00	3.05E+11
-230.3668	14484.	0.00				
11.9000	0.02994	7156563.	-8492.	-0.00121	0.00	3.05E+11
-227.2315	15484.	0.00				
12.0700	0.02752	7139015.	-8953.	-0.00116	0.00	3.05E+11
-223.9338	16597.	0.00				
12.2400	0.02521	7120525.	-9406.	-0.00111	0.00	3.05E+11
-220.4633	17841.	0.00				
12.4100	0.02299	7101108.	-9852.	-0.00106	0.00	3.05E+11
-216.8082	19237.	0.00				
12.5800	0.02087	7080778.	-10290.	-0.00102	0.00	3.05E+11
-212.9549	20816.	0.00				
12.7500	0.01885	7059552.	-10721.	-9.69E-04	0.00	3.06E+11
-208.8875	22612.	0.00				
12.9200	0.01692	7037447.	-11142.	-9.22E-04	0.00	3.06E+11
-204.5874	24671.	0.00				
13.0900	0.01508	7014480.	-29814.	-8.75E-04	0.00	3.06E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 196
Project Name: Lee's Summit Market Plaza		

-18101.	2448000.	0.00				
13.2600	0.01335	6916175.	-64613.	-8.29E-04	0.00	3.07E+11
-16016.	2448000.	0.00				
13.4300	0.01170	6751209.	-95274.	-7.83E-04	0.00	3.09E+11
-14044.	2448000.	0.00				
13.6000	0.01015	6527788.	-122023.	-7.40E-04	0.00	3.11E+11
-12181.	2448000.	0.00				
13.7700	0.00869	6253668.	-145078.	-6.98E-04	0.00	3.15E+11
-10422.	2448000.	0.00				
13.9400	0.00730	5936166.	-164647.	-6.59E-04	0.00	3.23E+11
-8763.	2448000.	0.00				
14.1100	0.00600	5582187.	-180925.	-6.35E-04	0.00	1.15E+12
-7196.	2448000.	0.00				
14.2800	0.00471	5198258.	-194032.	-6.26E-04	0.00	1.15E+12
-5653.	2448000.	0.00				
14.4500	0.00344	4790802.	-204013.	-6.17E-04	0.00	1.15E+12
-4133.	2448000.	0.00				
14.6200	0.00219	4366145.	-210914.	-6.09E-04	0.00	1.15E+12
-2633.	2448000.	0.00				
14.7900	9.60E-04	3930529.	-214776.	-6.01E-04	0.00	1.15E+12
-1152.	2448000.	0.00				
14.9600	-2.59E-04	3490114.	-215634.	-5.95E-04	0.00	1.15E+12
311.1292	2448000.	0.00				
15.1300	-0.00147	3050994.	-213522.	-5.89E-04	0.00	1.15E+12
1760.	2448000.	0.00				
15.3000	-0.00266	2619194.	-208468.	-5.84E-04	0.00	1.15E+12
3195.	2448000.	0.00				
15.4700	-0.00385	2200690.	-200499.	-5.80E-04	0.00	1.15E+12
4619.	2448000.	0.00				
15.6400	-0.00503	1801405.	-189634.	-5.76E-04	0.00	1.14E+12
6033.	2448000.	0.00				
15.8100	-0.00620	1427226.	-175893.	-5.73E-04	0.00	1.14E+12
7439.	2448000.	0.00				
15.9800	-0.00737	1084005.	-159289.	-5.71E-04	0.00	1.13E+12
8839.	2448000.	0.00				
16.1500	-0.00853	777570.	-139833.	-5.69E-04	0.00	1.13E+12
10235.	2448000.	0.00				
16.3200	-0.00969	513726.	-117535.	-5.68E-04	0.00	1.13E+12
11626.	2448000.	0.00				
16.4900	-0.01085	298267.	-92400.	-5.67E-04	0.00	1.13E+12
13016.	2448000.	0.00				
16.6600	-0.01200	136975.	-64431.	-5.67E-04	0.00	1.13E+12
14404.	2448000.	0.00				
16.8300	-0.01316	35627.	-33631.	-5.67E-04	0.00	1.13E+12
15792.	2448000.	0.00				
17.0000	-0.01432	0.00	0.00	-5.67E-04	0.00	1.13E+12
17179.	1224000.	0.00				

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 197
Project Name: Lee's Summit Market Plaza		

are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 3:

Pile-head deflection = 0.43994019 inches
 Computed slope at pile head = -0.00432098 radians
 Maximum bending moment = 7299807. inch-lbs
 Maximum shear force = -215634. lbs
 Depth of maximum bending moment = 9.18000000 feet below pile head
 Depth of maximum shear force = 14.96000000 feet below pile head
 Number of iterations = 50
 Number of zero deflection points = 1

Computed Values of Pile Loading and Deflection for Lateral Loading for LRFD Load Case Number 4

Load Case No. 4: LRFD: 1.2D + 1.0W + 0.5S

Depth Res. X Es*h feet lb/inch	Soil Spr. y Lat. Load inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil p
0.00	0.3973	5369048.	25368.	-0.00386	0.00	1.15E+12	
-239.1953	614.1691	0.00					
0.1700	0.3894	5420842.	24879.	-0.00386	0.00	1.15E+12	
-240.7657	1261.	0.00					
0.3400	0.3815	5471633.	24386.	-0.00385	0.00	1.15E+12	
-242.2928	1296.	0.00					
0.5100	0.3737	5521415.	23890.	-0.00384	0.00	1.15E+12	
-243.7755	1331.	0.00					
0.6800	0.3659	5570180.	23391.	-0.00383	0.00	1.15E+12	
-245.2127	1367.	0.00					
0.8500	0.3581	5617924.	22890.	-0.00382	0.00	1.15E+12	



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 198
Project Name: Lee's Summit Market Plaza		

-246.6034	1405.	0.00				
1.0200	0.3503	5664640.	22385.	-0.00381	0.00	1.15E+12
-247.9462	1444.	0.00				
1.1900	0.3425	5710323.	21878.	-0.00380	0.00	1.15E+12
-249.2399	1484.	0.00				
1.3600	0.3348	5754967.	21368.	-0.00379	0.00	1.15E+12
-250.4832	1526.	0.00				
1.5300	0.3271	5798567.	20856.	-0.00377	0.00	6.38E+11
-251.6747	1570.	0.00				
1.7000	0.3194	5841118.	20342.	-0.00374	0.00	3.00E+11
-252.8163	1615.	0.00				
1.8700	0.3118	5882610.	19825.	-0.00370	0.00	2.95E+11
-253.9155	1661.	0.00				
2.0400	0.3043	5923040.	19306.	-0.00366	0.00	2.94E+11
-254.9720	1709.	0.00				
2.2100	0.2969	5962404.	18784.	-0.00362	0.00	2.94E+11
-255.9854	1759.	0.00				
2.3800	0.2895	6000696.	18261.	-0.00358	0.00	2.93E+11
-256.9551	1810.	0.00				
2.5500	0.2823	6037913.	17736.	-0.00354	0.00	2.93E+11
-257.8808	1864.	0.00				
2.7200	0.2751	6074051.	17209.	-0.00349	0.00	2.93E+11
-258.7618	1919.	0.00				
2.8900	0.2680	6109106.	16680.	-0.00345	0.00	2.92E+11
-259.5978	1976.	0.00				
3.0600	0.2610	6143075.	16150.	-0.00341	0.00	2.92E+11
-260.3880	2035.	0.00				
3.2300	0.2541	6175954.	15618.	-0.00337	0.00	2.92E+11
-261.1321	2096.	0.00				
3.4000	0.2473	6207741.	15085.	-0.00332	0.00	2.92E+11
-261.8296	2160.	0.00				
3.5700	0.2406	6238432.	14550.	-0.00328	0.00	2.91E+11
-262.4798	2226.	0.00				
3.7400	0.2339	6268024.	14014.	-0.00324	0.00	2.91E+11
-263.0821	2294.	0.00				
3.9100	0.2274	6296515.	13477.	-0.00319	0.00	2.91E+11
-263.6361	2365.	0.00				
4.0800	0.2209	6323903.	12938.	-0.00315	0.00	2.91E+11
-264.1410	2439.	0.00				
4.2500	0.2145	6350185.	12399.	-0.00310	0.00	2.90E+11
-264.5963	2516.	0.00				
4.4200	0.2082	6375360.	11859.	-0.00306	0.00	2.90E+11
-265.0013	2596.	0.00				
4.5900	0.2020	6399426.	11318.	-0.00301	0.00	2.90E+11
-265.3554	2679.	0.00				
4.7600	0.1959	6422382.	10776.	-0.00297	0.00	2.90E+11
-265.6579	2766.	0.00				
4.9300	0.1899	6444225.	10234.	-0.00292	0.00	2.90E+11
-265.9080	2856.	0.00				
5.1000	0.1840	6464956.	9691.	-0.00288	0.00	2.90E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 199
Project Name: Lee's Summit Market Plaza		

-266.1052	2950.	0.00				
5.2700	0.1782	6484572.	9148.	-0.00283	0.00	2.90E+11
-266.2486	3048.	0.00				
5.4400	0.1725	6503074.	8605.	-0.00279	0.00	2.89E+11
-266.3375	3150.	0.00				
5.6100	0.1668	6520462.	8062.	-0.00274	0.00	2.89E+11
-266.3711	3257.	0.00				
5.7800	0.1613	6536734.	7518.	-0.00269	0.00	2.89E+11
-266.3486	3369.	0.00				
5.9500	0.1558	6551892.	6975.	-0.00265	0.00	2.89E+11
-266.2692	3486.	0.00				
6.1200	0.1505	6565935.	6432.	-0.00260	0.00	2.89E+11
-266.1320	3608.	0.00				
6.2900	0.1452	6578864.	5889.	-0.00256	0.00	2.89E+11
-265.9361	3736.	0.00				
6.4600	0.1401	6590679.	5347.	-0.00251	0.00	2.89E+11
-265.6805	3870.	0.00				
6.6300	0.1350	6601383.	4805.	-0.00246	0.00	2.89E+11
-265.3644	4010.	0.00				
6.8000	0.1300	6610975.	4264.	-0.00242	0.00	2.89E+11
-264.9866	4158.	0.00				
6.9700	0.1251	6619459.	3724.	-0.00237	0.00	2.89E+11
-264.5463	4313.	0.00				
7.1400	0.1204	6626834.	3185.	-0.00232	0.00	2.89E+11
-264.0422	4476.	0.00				
7.3100	0.1157	6633105.	2647.	-0.00227	0.00	2.89E+11
-263.4733	4647.	0.00				
7.4800	0.1111	6638272.	2110.	-0.00223	0.00	2.89E+11
-262.8384	4828.	0.00				
7.6500	0.1066	6642339.	1575.	-0.00218	0.00	2.88E+11
-262.1363	5018.	0.00				
7.8200	0.1022	6645309.	1041.	-0.00213	0.00	2.88E+11
-261.3656	5219.	0.00				
7.9900	0.09786	6647184.	508.3971	-0.00209	0.00	2.88E+11
-260.5252	5431.	0.00				
8.1600	0.09366	6647968.	-22.1443	-0.00204	0.00	2.88E+11
-259.6135	5655.	0.00				
8.3300	0.08954	6647665.	-550.7519	-0.00199	0.00	2.88E+11
-258.6292	5892.	0.00				
8.5000	0.08552	6646280.	-1077.	-0.00195	0.00	2.88E+11
-257.5706	6144.	0.00				
8.6700	0.08160	6643816.	-1602.	-0.00190	0.00	2.88E+11
-256.4363	6411.	0.00				
8.8400	0.07778	6640278.	-2123.	-0.00185	0.00	2.89E+11
-255.2245	6694.	0.00				
9.0100	0.07405	6635671.	-2643.	-0.00181	0.00	2.89E+11
-253.9334	6996.	0.00				
9.1800	0.07041	6630002.	-3159.	-0.00176	0.00	2.89E+11
-252.5612	7317.	0.00				
9.3500	0.06687	6623274.	-3673.	-0.00171	0.00	2.89E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 200
Project Name: Lee's Summit Market Plaza		

-251.1060	7660.	0.00				
9.5200	0.06343	6615495.	-4184.	-0.00166	0.00	2.89E+11
-249.5656	8027.	0.00				
9.6900	0.06008	6606671.	-4691.	-0.00162	0.00	2.89E+11
-247.9379	8419.	0.00				
9.8600	0.05683	6596808.	-5195.	-0.00157	0.00	2.89E+11
-246.2205	8839.	0.00				
10.0300	0.05367	6585914.	-5696.	-0.00152	0.00	2.89E+11
-244.4110	9290.	0.00				
10.2000	0.05061	6573997.	-6192.	-0.00148	0.00	2.89E+11
-242.5068	9776.	0.00				
10.3700	0.04764	6561064.	-6685.	-0.00143	0.00	2.89E+11
-240.5051	10299.	0.00				
10.5400	0.04476	6547123.	-7174.	-0.00139	0.00	2.89E+11
-238.4030	10864.	0.00				
10.7100	0.04199	6532184.	-7658.	-0.00134	0.00	2.89E+11
-236.1972	11476.	0.00				
10.8800	0.03930	6516255.	-8137.	-0.00129	0.00	2.89E+11
-233.8845	12141.	0.00				
11.0500	0.03671	6499347.	-8612.	-0.00125	0.00	2.89E+11
-231.4612	12863.	0.00				
11.2200	0.03421	6481469.	-9081.	-0.00120	0.00	2.90E+11
-228.9234	13651.	0.00				
11.3900	0.03180	6462632.	-9546.	-0.00116	0.00	2.90E+11
-226.2670	14513.	0.00				
11.5600	0.02949	6442847.	-10004.	-0.00111	0.00	2.90E+11
-223.4876	15459.	0.00				
11.7300	0.02727	6422125.	-10457.	-0.00107	0.00	2.90E+11
-220.5802	16500.	0.00				
11.9000	0.02514	6400479.	-10904.	-0.00102	0.00	2.90E+11
-217.5398	17649.	0.00				
12.0700	0.02311	6377922.	-11345.	-9.76E-04	0.00	2.90E+11
-214.3605	18923.	0.00				
12.2400	0.02116	6354466.	-11779.	-9.31E-04	0.00	2.90E+11
-211.0364	20341.	0.00				
12.4100	0.01931	6330126.	-12206.	-8.86E-04	0.00	2.91E+11
-207.5608	21926.	0.00				
12.5800	0.01755	6304915.	-12625.	-8.42E-04	0.00	2.91E+11
-203.9264	23706.	0.00				
12.7500	0.01588	6278850.	-13038.	-7.98E-04	0.00	2.91E+11
-200.1253	25715.	0.00				
12.9200	0.01429	6251946.	-13442.	-7.54E-04	0.00	2.91E+11
-196.1491	27995.	0.00				
13.0900	0.01280	6224219.	-29309.	-7.10E-04	0.00	2.91E+11
-15360.	2448000.	0.00				
13.2600	0.01140	6132565.	-58924.	-6.67E-04	0.00	2.92E+11
-13674.	2448000.	0.00				
13.4300	0.01008	5983997.	-85208.	-6.25E-04	0.00	2.93E+11
-12094.	2448000.	0.00				
13.6000	0.00885	5785093.	-108371.	-5.95E-04	0.00	6.67E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 201
Project Name: Lee's Summit Market Plaza		

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-10615. 2448000. 0.00
 13.7700 0.00765 5542010. -128562. -5.81E-04 0.00 1.15E+12
-9180. 2448000. 0.00
 13.9400 0.00647 5260722. -145850. -5.72E-04 0.00 1.15E+12
-7769. 2448000. 0.00
 14.1100 0.00532 4947103. -160281. -5.63E-04 0.00 1.15E+12
-6380. 2448000. 0.00
 14.2800 0.00418 4606931. -171902. -5.54E-04 0.00 1.16E+12
-5013. 2448000. 0.00
 14.4500 0.00305 4245897. -180754. -5.47E-04 0.00 1.16E+12
-3666. 2448000. 0.00
 14.6200 0.00195 3869608. -186876. -5.39E-04 0.00 1.16E+12
-2337. 2448000. 0.00
 14.7900 8.54E-04 3483594. -190304. -5.33E-04 0.00 1.16E+12
-1024. 2448000. 0.00
 14.9600 -2.27E-04 3093315. -191071. -5.27E-04 0.00 1.16E+12
272.8114 2448000. 0.00
 15.1300 -0.00130 2704172. -189205. -5.22E-04 0.00 1.16E+12
1557. 2448000. 0.00
 15.3000 -0.00236 2321506. -184732. -5.18E-04 0.00 1.15E+12
2829. 2448000. 0.00
 15.4700 -0.00341 1950611. -177674. -5.14E-04 0.00 1.15E+12
4091. 2448000. 0.00
 15.6400 -0.00445 1596740. -168050. -5.11E-04 0.00 1.15E+12
5344. 2448000. 0.00
 15.8100 -0.00549 1265110. -155876. -5.08E-04 0.00 1.15E+12
6591. 2448000. 0.00
 15.9800 -0.00653 960909. -141164. -5.06E-04 0.00 1.14E+12
7832. 2448000. 0.00
 16.1500 -0.00756 689303. -123925. -5.05E-04 0.00 1.13E+12
9069. 2448000. 0.00
 16.3200 -0.00859 455439. -104165. -5.04E-04 0.00 1.13E+12
10303. 2448000. 0.00
 16.4900 -0.00961 264452. -81890. -5.03E-04 0.00 1.13E+12
11535. 2448000. 0.00
 16.6600 -0.01064 121469. -57103. -5.03E-04 0.00 1.13E+12
12766. 2448000. 0.00
 16.8300 -0.01166 31612. -29806. -5.03E-04 0.00 1.13E+12
13996. 2448000. 0.00
 17.0000 -0.01269 0.00 0.00 -5.02E-04 0.00 1.13E+12
15226. 1224000. 0.00

```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.



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Revision:	Date:	Sheet No. 202
Project Name: Lee's Summit Market Plaza		

Output Summary for Load Case No. 4:

Pile-head deflection = 0.39725092 inches
 Computed slope at pile head = -0.00386488 radians
 Maximum bending moment = 6647968. inch-lbs
 Maximum shear force = -191071. lbs
 Depth of maximum bending moment = 8.16000000 feet below pile head
 Depth of maximum shear force = 14.96000000 feet below pile head
 Number of iterations = 114
 Number of zero deflection points = 1

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for LRFD Load Case Number 5

Load Case No. 5: LRFD: 0.9D + 1.0W

Depth Res. X feet lb/inch	Deflect. Soil Spr. y inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil p
0.00	0.1364	4231473.	19158.	-0.00114	0.00	1.16E+12	
-183.1161	1369.	0.00					
0.1700	0.1341	4270270.	18783.	-0.00113	0.00	1.16E+12	
-184.4543	2806.	0.00					
0.3400	0.1318	4308298.	18405.	-0.00112	0.00	1.16E+12	
-185.7693	2875.	0.00					
0.5100	0.1295	4345553.	18025.	-0.00111	0.00	1.16E+12	
-187.0610	2946.	0.00					
0.6800	0.1273	4382028.	17642.	-0.00111	0.00	1.16E+12	
-188.3292	3018.	0.00					
0.8500	0.1250	4417719.	17257.	-0.00110	0.00	1.16E+12	
-189.5736	3093.	0.00					
1.0200	0.1228	4452620.	16869.	-0.00109	0.00	1.16E+12	
-190.7939	3169.	0.00					
1.1900	0.1206	4486727.	16478.	-0.00108	0.00	1.16E+12	
-191.9900	3248.	0.00					
1.3600	0.1184	4520034.	16085.	-0.00107	0.00	1.16E+12	



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 203
Project Name: Lee's Summit Market Plaza		

-193.1615	3328.	0.00				
1.5300	0.1162	4552537.	15690.	-0.00107	0.00	1.16E+12
-194.3082	3411.	0.00				
1.7000	0.1140	4584230.	15292.	-0.00106	0.00	1.16E+12
-195.4299	3496.	0.00				
1.8700	0.1119	4615109.	14893.	-0.00105	0.00	1.16E+12
-196.5263	3583.	0.00				
2.0400	0.1098	4645170.	14491.	-0.00104	0.00	1.16E+12
-197.5970	3673.	0.00				
2.2100	0.1076	4674408.	14087.	-0.00103	0.00	1.16E+12
-198.6419	3765.	0.00				
2.3800	0.1055	4702818.	13680.	-0.00103	0.00	1.16E+12
-199.6605	3859.	0.00				
2.5500	0.1035	4730397.	13272.	-0.00102	0.00	1.16E+12
-200.6527	3957.	0.00				
2.7200	0.1014	4757140.	12862.	-0.00101	0.00	1.16E+12
-201.6180	4057.	0.00				
2.8900	0.09934	4783043.	12449.	-0.00100	0.00	1.16E+12
-202.5562	4160.	0.00				
3.0600	0.09730	4808103.	12035.	-9.92E-04	0.00	1.16E+12
-203.4669	4266.	0.00				
3.2300	0.09529	4832315.	11619.	-9.84E-04	0.00	1.16E+12
-204.3499	4375.	0.00				
3.4000	0.09329	4855676.	11201.	-9.75E-04	0.00	1.16E+12
-205.2047	4487.	0.00				
3.5700	0.09131	4878182.	10782.	-9.66E-04	0.00	1.16E+12
-206.0310	4603.	0.00				
3.7400	0.08935	4899830.	10361.	-9.58E-04	0.00	1.16E+12
-206.8284	4722.	0.00				
3.9100	0.08740	4920617.	9938.	-9.49E-04	0.00	1.16E+12
-207.5965	4845.	0.00				
4.0800	0.08547	4940539.	9514.	-9.41E-04	0.00	1.16E+12
-208.3349	4972.	0.00				
4.2500	0.08357	4959593.	9088.	-9.32E-04	0.00	1.16E+12
-209.0433	5103.	0.00				
4.4200	0.08167	4977776.	8661.	-9.23E-04	0.00	1.16E+12
-209.7210	5238.	0.00				
4.5900	0.07980	4995086.	8233.	-9.14E-04	0.00	1.16E+12
-210.3679	5378.	0.00				
4.7600	0.07794	5011520.	7803.	-9.05E-04	0.00	1.16E+12
-210.9832	5522.	0.00				
4.9300	0.07611	5027075.	7372.	-8.97E-04	0.00	1.16E+12
-211.5666	5671.	0.00				
5.1000	0.07429	5041749.	6940.	-8.88E-04	0.00	1.16E+12
-212.1176	5825.	0.00				
5.2700	0.07248	5055539.	6506.	-8.79E-04	0.00	1.16E+12
-212.6356	5985.	0.00				
5.4400	0.07070	5068444.	6072.	-8.70E-04	0.00	1.16E+12
-213.1201	6149.	0.00				
5.6100	0.06893	5080461.	5637.	-8.61E-04	0.00	1.16E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 204
Project Name: Lee's Summit Market Plaza		

-213.5705	6320.	0.00				
5.7800	0.06719	5091588.	5201.	-8.52E-04	0.00	1.16E+12
-213.9861	6497.	0.00				
5.9500	0.06546	5101825.	4764.	-8.43E-04	0.00	1.16E+12
-214.3665	6681.	0.00				
6.1200	0.06375	5111168.	4326.	-8.34E-04	0.00	1.16E+12
-214.7109	6871.	0.00				
6.2900	0.06206	5119617.	3888.	-8.25E-04	0.00	1.16E+12
-215.0186	7069.	0.00				
6.4600	0.06038	5127170.	3449.	-8.16E-04	0.00	1.16E+12
-215.2889	7274.	0.00				
6.6300	0.05873	5133827.	3010.	-8.07E-04	0.00	1.16E+12
-215.5210	7487.	0.00				
6.8000	0.05709	5139586.	2570.	-7.98E-04	0.00	1.16E+12
-215.7142	7708.	0.00				
6.9700	0.05547	5144446.	2129.	-7.89E-04	0.00	1.16E+12
-215.8676	7939.	0.00				
7.1400	0.05387	5148408.	1689.	-7.80E-04	0.00	1.16E+12
-215.9802	8179.	0.00				
7.3100	0.05229	5151470.	1248.	-7.71E-04	0.00	1.16E+12
-216.0512	8429.	0.00				
7.4800	0.05073	5153631.	807.5644	-7.62E-04	0.00	1.16E+12
-216.0796	8690.	0.00				
7.6500	0.04918	5154893.	366.7778	-7.52E-04	0.00	1.16E+12
-216.0642	8962.	0.00				
7.8200	0.04766	5155255.	-73.9318	-7.43E-04	0.00	1.16E+12
-216.0040	9246.	0.00				
7.9900	0.04615	5154718.	-514.4716	-7.34E-04	0.00	1.16E+12
-215.8978	9544.	0.00				
8.1600	0.04466	5153281.	-954.7465	-7.25E-04	0.00	1.16E+12
-215.7442	9855.	0.00				
8.3300	0.04319	5150945.	-1395.	-7.16E-04	0.00	1.16E+12
-215.5420	10181.	0.00				
8.5000	0.04174	5147712.	-1834.	-7.07E-04	0.00	1.16E+12
-215.2897	10522.	0.00				
8.6700	0.04031	5143582.	-2273.	-6.98E-04	0.00	1.16E+12
-214.9857	10881.	0.00				
8.8400	0.03889	5138556.	-2711.	-6.89E-04	0.00	1.16E+12
-214.6283	11258.	0.00				
9.0100	0.03749	5132637.	-3149.	-6.80E-04	0.00	1.16E+12
-214.2157	11655.	0.00				
9.1800	0.03612	5125825.	-3585.	-6.71E-04	0.00	1.16E+12
-213.7461	12073.	0.00				
9.3500	0.03476	5118123.	-4021.	-6.62E-04	0.00	1.16E+12
-213.2173	12514.	0.00				
9.5200	0.03342	5109533.	-4455.	-6.53E-04	0.00	1.16E+12
-212.6270	12980.	0.00				
9.6900	0.03209	5100057.	-4888.	-6.44E-04	0.00	1.16E+12
-211.9727	13474.	0.00				
9.8600	0.03079	5089698.	-5320.	-6.35E-04	0.00	1.16E+12



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Revision:	Date:	Sheet No. 205
Project Name: Lee's Summit Market Plaza		

-211.2519	13997.	0.00				
10.0300	0.02950	5078460.	-5750.	-6.26E-04	0.00	1.16E+12
-210.4615	14552.	0.00				
10.2000	0.02824	5066345.	-6178.	-6.17E-04	0.00	1.16E+12
-209.5984	15143.	0.00				
10.3700	0.02699	5053356.	-6605.	-6.08E-04	0.00	1.16E+12
-208.6590	15773.	0.00				
10.5400	0.02576	5039499.	-7030.	-5.99E-04	0.00	1.16E+12
-207.6394	16446.	0.00				
10.7100	0.02454	5024777.	-7452.	-5.90E-04	0.00	1.16E+12
-206.5353	17167.	0.00				
10.8800	0.02335	5009194.	-7872.	-5.81E-04	0.00	1.16E+12
-205.3421	17942.	0.00				
11.0500	0.02217	4992757.	-8290.	-5.73E-04	0.00	1.16E+12
-204.0542	18776.	0.00				
11.2200	0.02101	4975469.	-8705.	-5.64E-04	0.00	1.16E+12
-202.6658	19677.	0.00				
11.3900	0.01987	4957337.	-9117.	-5.55E-04	0.00	1.16E+12
-201.1701	20654.	0.00				
11.5600	0.01875	4938367.	-9525.	-5.46E-04	0.00	1.16E+12
-199.5595	21716.	0.00				
11.7300	0.01764	4918566.	-9931.	-5.38E-04	0.00	1.16E+12
-197.8253	22877.	0.00				
11.9000	0.01655	4897941.	-10332.	-5.29E-04	0.00	1.16E+12
-195.9575	24150.	0.00				
12.0700	0.01548	4876500.	-10730.	-5.20E-04	0.00	1.16E+12
-193.9445	25554.	0.00				
12.2400	0.01443	4854251.	-11123.	-5.12E-04	0.00	1.16E+12
-191.7729	27112.	0.00				
12.4100	0.01339	4831203.	-11512.	-5.03E-04	0.00	1.16E+12
-189.4269	28850.	0.00				
12.5800	0.01238	4807366.	-11896.	-4.95E-04	0.00	1.16E+12
-186.8876	30805.	0.00				
12.7500	0.01138	4782751.	-12275.	-4.86E-04	0.00	1.16E+12
-184.1324	33021.	0.00				
12.9200	0.01039	4757369.	-12647.	-4.78E-04	0.00	1.16E+12
-181.1338	35558.	0.00				
13.0900	0.00943	4731232.	-24369.	-4.70E-04	0.00	1.16E+12
-11310.	2448000.	0.00				
13.2600	0.00848	4658025.	-46280.	-4.61E-04	0.00	1.16E+12
-10171.	2448000.	0.00				
13.4300	0.00754	4542489.	-65887.	-4.53E-04	0.00	1.16E+12
-9052.	2448000.	0.00				
13.6000	0.00663	4389283.	-83231.	-4.45E-04	0.00	1.16E+12
-7952.	2448000.	0.00				
13.7700	0.00573	4202984.	-98350.	-4.38E-04	0.00	1.16E+12
-6871.	2448000.	0.00				
13.9400	0.00484	3988088.	-111284.	-4.31E-04	0.00	1.16E+12
-5808.	2448000.	0.00				
14.1100	0.00397	3749020.	-122066.	-4.24E-04	0.00	1.16E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 206
Project Name: Lee's Summit Market Plaza		

-4763.	2448000.	0.00				
14.2800	0.00311	3490129.	-130733.	-4.17E-04	0.00	1.16E+12
-3734.	2448000.	0.00				
14.4500	0.00227	3215700.	-137315.	-4.12E-04	0.00	1.16E+12
-2719.	2448000.	0.00				
14.6200	0.00143	2929955.	-141841.	-4.06E-04	0.00	1.16E+12
-1719.	2448000.	0.00				
14.7900	6.09E-04	2637057.	-144340.	-4.01E-04	0.00	1.16E+12
-730.7342	2448000.	0.00				
14.9600	-2.05E-04	2341117.	-144834.	-3.97E-04	0.00	1.16E+12
245.8396	2448000.	0.00				
15.1300	-0.00101	2046201.	-143347.	-3.93E-04	0.00	1.16E+12
1212.	2448000.	0.00				
15.3000	-0.00181	1756329.	-139897.	-3.90E-04	0.00	1.16E+12
2170.	2448000.	0.00				
15.4700	-0.00260	1475487.	-134501.	-3.87E-04	0.00	1.16E+12
3120.	2448000.	0.00				
15.6400	-0.00339	1207631.	-127173.	-3.84E-04	0.00	1.15E+12
4064.	2448000.	0.00				
15.8100	-0.00417	956686.	-117926.	-3.83E-04	0.00	1.15E+12
5002.	2448000.	0.00				
15.9800	-0.00495	726559.	-106768.	-3.81E-04	0.00	1.14E+12
5937.	2448000.	0.00				
16.1500	-0.00572	521139.	-93707.	-3.80E-04	0.00	1.14E+12
6868.	2448000.	0.00				
16.3200	-0.00650	344300.	-78749.	-3.79E-04	0.00	1.14E+12
7797.	2448000.	0.00				
16.4900	-0.00727	199909.	-61897.	-3.79E-04	0.00	1.14E+12
8724.	2448000.	0.00				
16.6600	-0.00804	91825.	-43154.	-3.78E-04	0.00	1.14E+12
9651.	2448000.	0.00				
16.8300	-0.00881	23904.	-22522.	-3.78E-04	0.00	1.14E+12
10577.	2448000.	0.00				
17.0000	-0.00959	0.00	0.00	-3.78E-04	0.00	1.14E+12
11503.	1224000.	0.00				

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 5:

Pile-head deflection	=	0.13643192 inches
Computed slope at pile head	=	-0.00113600 radians
Maximum bending moment	=	5155255. inch-lbs
Maximum shear force	=	-144834. lbs



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 207
Project Name: Lee's Summit Market Plaza		

Depth of maximum bending moment = 7.82000000 feet below pile head
 Depth of maximum shear force = 14.96000000 feet below pile head
 Number of iterations = 11
 Number of zero deflection points = 1

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for LRFD Load Case Number 6

Load Case No. 6: ASD: D (Doubled for Deflection Check)

Depth Res.	Soil X Es*h feet lb/inch	Deflect. Spr. y Lat. Load inches lb/inch	Bending Distrib. Moment in-lbs lb/inch	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil p
	0.00	0.00975	811616.	4506.	-1.19E-04	0.00	1.15E+12	
-94.7389		9914.	0.00					
	0.1700	0.00951	820621.	4312.	-1.18E-04	0.00	1.15E+12	
-95.2411		20440.	0.00					
	0.3400	0.00927	829230.	4117.	-1.16E-04	0.00	1.15E+12	
-95.7257		21073.	0.00					
	0.5100	0.00903	837441.	3922.	-1.15E-04	0.00	1.15E+12	
-96.1924		21728.	0.00					
	0.6800	0.00880	845251.	3725.	-1.13E-04	0.00	1.15E+12	
-96.6411		22406.	0.00					
	0.8500	0.00857	852658.	3527.	-1.12E-04	0.00	1.15E+12	
-97.0718		23108.	0.00					
	1.0200	0.00834	859662.	3329.	-1.10E-04	0.00	1.15E+12	
-97.4842		23836.	0.00					
	1.1900	0.00812	866260.	3130.	-1.09E-04	0.00	1.15E+12	
-97.8782		24590.	0.00					
	1.3600	0.00790	872450.	2930.	-1.07E-04	0.00	1.15E+12	
-98.2537		25372.	0.00					
	1.5300	0.00768	878231.	2729.	-1.06E-04	0.00	1.15E+12	
-98.6105		26183.	0.00					
	1.7000	0.00747	883602.	2527.	-1.04E-04	0.00	1.15E+12	
-98.9485		27024.	0.00					
	1.8700	0.00726	888561.	2325.	-1.02E-04	0.00	1.15E+12	



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 208
Project Name: Lee's Summit Market Plaza		

-99.2676	27897.	0.00				
2.0400	0.00705	893106.	2122.	-1.01E-04	0.00	1.15E+12
-99.5676	28804.	0.00				
2.2100	0.00685	897237.	1919.	-9.92E-05	0.00	1.15E+12
-99.8484	29746.	0.00				
2.3800	0.00665	900953.	1715.	-9.76E-05	0.00	1.15E+12
-100.1099	30725.	0.00				
2.5500	0.00645	904251.	1510.	-9.60E-05	0.00	1.15E+12
-100.3518	31742.	0.00				
2.7200	0.00626	907132.	1306.	-9.44E-05	0.00	1.15E+12
-100.5741	32800.	0.00				
2.8900	0.00606	909594.	1100.	-9.28E-05	0.00	1.15E+12
-100.7765	33901.	0.00				
3.0600	0.00588	911637.	894.4002	-9.12E-05	0.00	1.15E+12
-100.9590	35047.	0.00				
3.2300	0.00569	913260.	688.2781	-8.96E-05	0.00	1.15E+12
-101.1215	36241.	0.00				
3.4000	0.00551	914461.	481.8453	-8.79E-05	0.00	1.15E+12
-101.2636	37484.	0.00				
3.5700	0.00533	915241.	275.1433	-8.63E-05	0.00	1.15E+12
-101.3854	38780.	0.00				
3.7400	0.00516	915599.	68.2137	-8.47E-05	0.00	1.15E+12
-101.4867	40131.	0.00				
3.9100	0.00499	915534.	-138.9012	-8.31E-05	0.00	1.15E+12
-101.5672	41541.	0.00				
4.0800	0.00482	915046.	-346.1591	-8.14E-05	0.00	1.15E+12
-101.6268	43012.	0.00				
4.2500	0.00466	914136.	-553.5171	-7.98E-05	0.00	1.15E+12
-101.6654	44549.	0.00				
4.4200	0.00449	912802.	-760.9324	-7.82E-05	0.00	1.15E+12
-101.6828	46154.	0.00				
4.5900	0.00434	911045.	-968.3613	-7.66E-05	0.00	1.15E+12
-101.6789	47833.	0.00				
4.7600	0.00418	908864.	-1176.	-7.50E-05	0.00	1.15E+12
-101.6534	49588.	0.00				
4.9300	0.00403	906261.	-1383.	-7.34E-05	0.00	1.15E+12
-101.6061	51425.	0.00				
5.1000	0.00388	903234.	-1590.	-7.17E-05	0.00	1.15E+12
-101.5370	53349.	0.00				
5.2700	0.00374	899785.	-1797.	-7.01E-05	0.00	1.15E+12
-101.4457	55365.	0.00				
5.4400	0.00360	895913.	-2004.	-6.86E-05	0.00	1.15E+12
-101.3322	57478.	0.00				
5.6100	0.00346	891620.	-2211.	-6.70E-05	0.00	1.15E+12
-101.1962	59695.	0.00				
5.7800	0.00332	886905.	-2417.	-6.54E-05	0.00	1.15E+12
-101.0375	62023.	0.00				
5.9500	0.00319	881770.	-2623.	-6.38E-05	0.00	1.15E+12
-100.8558	64468.	0.00				
6.1200	0.00306	876214.	-2828.	-6.23E-05	0.00	1.15E+12



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 209
Project Name: Lee's Summit Market Plaza		

-100.6510	67038.	0.00				
6.2900	0.00294	870240.	-3034.	-6.07E-05	0.00	1.15E+12
-100.4228	69741.	0.00				
6.4600	0.00282	863848.	-3238.	-5.92E-05	0.00	1.15E+12
-100.1710	72587.	0.00				
6.6300	0.00270	857039.	-3442.	-5.76E-05	0.00	1.15E+12
-99.8953	75586.	0.00				
6.8000	0.00258	849813.	-3646.	-5.61E-05	0.00	1.15E+12
-99.5954	78747.	0.00				
6.9700	0.00247	842174.	-3849.	-5.46E-05	0.00	1.15E+12
-99.2710	82084.	0.00				
7.1400	0.00236	834121.	-4051.	-5.31E-05	0.00	1.15E+12
-98.9218	85608.	0.00				
7.3100	0.00225	825656.	-4252.	-5.16E-05	0.00	1.15E+12
-98.5475	89333.	0.00				
7.4800	0.00215	816781.	-4453.	-5.02E-05	0.00	1.15E+12
-98.1477	93275.	0.00				
7.6500	0.00205	807497.	-4653.	-4.87E-05	0.00	1.15E+12
-97.7220	97451.	0.00				
7.8200	0.00195	797807.	-4851.	-4.73E-05	0.00	1.15E+12
-97.2700	101879.	0.00				
7.9900	0.00185	787712.	-5049.	-4.59E-05	0.00	1.15E+12
-96.7911	106579.	0.00				
8.1600	0.00176	777213.	-5246.	-4.45E-05	0.00	1.15E+12
-96.2850	111575.	0.00				
8.3300	0.00167	766314.	-5442.	-4.31E-05	0.00	1.15E+12
-95.7510	116891.	0.00				
8.5000	0.00158	755016.	-5637.	-4.18E-05	0.00	1.15E+12
-95.1886	122556.	0.00				
8.6700	0.00150	743323.	-5831.	-4.04E-05	0.00	1.14E+12
-94.5970	128600.	0.00				
8.8400	0.00142	731235.	-6023.	-3.91E-05	0.00	1.14E+12
-93.9755	135059.	0.00				
9.0100	0.00134	718756.	-6214.	-3.78E-05	0.00	1.14E+12
-93.3232	141972.	0.00				
9.1800	0.00127	705888.	-6404.	-3.66E-05	0.00	1.14E+12
-92.6393	149384.	0.00				
9.3500	0.00119	692635.	-6592.	-3.53E-05	0.00	1.14E+12
-91.9226	157347.	0.00				
9.5200	0.00112	679000.	-6779.	-3.41E-05	0.00	1.14E+12
-91.1720	165917.	0.00				
9.6900	0.00105	664984.	-6964.	-3.29E-05	0.00	1.14E+12
-90.3860	175161.	0.00				
9.8600	9.87E-04	650593.	-7147.	-3.17E-05	0.00	1.14E+12
-89.5630	185158.	0.00				
10.0300	9.23E-04	635829.	-7326.	-3.06E-05	0.00	1.14E+12
-85.9584	189934.	0.00				
10.2000	8.62E-04	620707.	-7497.	-2.95E-05	0.00	1.14E+12
-80.8119	191244.	0.00				
10.3700	8.03E-04	605248.	-7656.	-2.84E-05	0.00	1.14E+12



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 210
Project Name: Lee's Summit Market Plaza		

-75.7999	192553.	0.00				
10.5400	7.46E-04	589474.	-7806.	-2.73E-05	0.00	1.14E+12
-70.9216	193862.	0.00				
10.7100	6.92E-04	573405.	-7946.	-2.63E-05	0.00	1.14E+12
-66.1756	195171.	0.00				
10.8800	6.39E-04	557060.	-8076.	-2.53E-05	0.00	1.14E+12
-61.5605	196480.	0.00				
11.0500	5.89E-04	540459.	-8197.	-2.43E-05	0.00	1.14E+12
-57.0744	197789.	0.00				
11.2200	5.40E-04	523620.	-8309.	-2.33E-05	0.00	1.14E+12
-52.7155	199098.	0.00				
11.3900	4.94E-04	506562.	-8412.	-2.24E-05	0.00	1.14E+12
-48.4814	200408.	0.00				
11.5600	4.49E-04	489302.	-8507.	-2.15E-05	0.00	1.14E+12
-44.3698	201717.	0.00				
11.7300	4.06E-04	471857.	-8593.	-2.07E-05	0.00	1.14E+12
-40.3778	203026.	0.00				
11.9000	3.64E-04	454244.	-8672.	-1.98E-05	0.00	1.14E+12
-36.5027	204335.	0.00				
12.0700	3.25E-04	436480.	-8742.	-1.90E-05	0.00	1.14E+12
-32.7411	205644.	0.00				
12.2400	2.87E-04	418578.	-8806.	-1.83E-05	0.00	1.14E+12
-29.0898	206953.	0.00				
12.4100	2.50E-04	400556.	-8861.	-1.75E-05	0.00	1.14E+12
-25.5451	208262.	0.00				
12.5800	2.15E-04	382428.	-8910.	-1.68E-05	0.00	1.14E+12
-22.1033	209572.	0.00				
12.7500	1.81E-04	364207.	-8952.	-1.62E-05	0.00	1.14E+12
-18.7603	210881.	0.00				
12.9200	1.49E-04	345908.	-8986.	-1.55E-05	0.00	1.14E+12
-15.5119	212190.	0.00				
13.0900	1.18E-04	327545.	-9147.	-1.49E-05	0.00	1.14E+12
-141.6490	2448000.	0.00				
13.2600	8.81E-05	308592.	-9399.	-1.44E-05	0.00	1.14E+12
-105.7698	2448000.	0.00				
13.4300	5.94E-05	289199.	-9580.	-1.38E-05	0.00	1.14E+12
-71.2379	2448000.	0.00				
13.6000	3.16E-05	269509.	-9691.	-1.33E-05	0.00	1.14E+12
-37.9688	2448000.	0.00				
13.7700	4.90E-06	249661.	-9736.	-1.29E-05	0.00	1.14E+12
-5.8764	2448000.	0.00				
13.9400	-2.09E-05	229789.	-9716.	-1.25E-05	0.00	1.14E+12
25.1260	2448000.	0.00				
14.1100	-4.59E-05	210021.	-9634.	-1.21E-05	0.00	1.14E+12
55.1250	2448000.	0.00				
14.2800	-7.02E-05	190483.	-9492.	-1.17E-05	0.00	1.14E+12
84.2071	2448000.	0.00				
14.4500	-9.37E-05	171295.	-9292.	-1.14E-05	0.00	1.14E+12
112.4574	2448000.	0.00				
14.6200	-1.17E-04	152575.	-9034.	-1.11E-05	0.00	1.14E+12



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 211
Project Name: Lee's Summit Market Plaza		

139.9599	2448000.	0.00				
14.7900	-1.39E-04	134438.	-8721.	-1.08E-05	0.00	1.14E+12
166.7962	2448000.	0.00				
14.9600	-1.61E-04	116994.	-8354.	-1.06E-05	0.00	1.14E+12
193.0455	2448000.	0.00				
15.1300	-1.82E-04	100354.	-7934.	-1.04E-05	0.00	1.14E+12
218.7840	2448000.	0.00				
15.3000	-2.03E-04	84625.	-7462.	-1.03E-05	0.00	1.14E+12
244.0843	2448000.	0.00				
15.4700	-2.24E-04	69911.	-6939.	-1.01E-05	0.00	1.14E+12
269.0151	2448000.	0.00				
15.6400	-2.45E-04	56317.	-6365.	-1.00E-05	0.00	1.14E+12
293.6407	2448000.	0.00				
15.8100	-2.65E-04	43944.	-5741.	-9.92E-06	0.00	1.14E+12
318.0204	2448000.	0.00				
15.9800	-2.85E-04	32896.	-5067.	-9.85E-06	0.00	1.14E+12
342.2082	2448000.	0.00				
16.1500	-3.05E-04	23271.	-4345.	-9.80E-06	0.00	1.14E+12
366.2524	2448000.	0.00				
16.3200	-3.25E-04	15171.	-3573.	-9.77E-06	0.00	1.14E+12
390.1950	2448000.	0.00				
16.4900	-3.45E-04	8694.	-2753.	-9.75E-06	0.00	1.14E+12
414.0713	2448000.	0.00				
16.6600	-3.65E-04	3941.	-1884.	-9.73E-06	0.00	1.14E+12
437.9097	2448000.	0.00				
16.8300	-3.85E-04	1009.	-966.2242	-9.73E-06	0.00	1.14E+12
461.7309	2448000.	0.00				
17.0000	-4.05E-04	0.00	0.00	-9.73E-06	0.00	1.14E+12
485.5477	1224000.	0.00				

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 6:

Pile-head deflection	=	0.00974682 inches
Computed slope at pile head	=	-0.00011909 radians
Maximum bending moment	=	915599. inch-lbs
Maximum shear force	=	-9736. lbs
Depth of maximum bending moment	=	3.74000000 feet below pile head
Depth of maximum shear force	=	13.77000000 feet below pile head
Number of iterations	=	12
Number of zero deflection points	=	1



250 NE Mulberry St., Suite 201
 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 212
Project Name: Lee's Summit Market Plaza		

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for LRFD Load Case Number 7

Load Case No. 7: ASD: D + S (Doubled for Deflection Check)

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
Res. Soil	Spr. Distrib.	Moment	Force	S	Stress	Stiffness	p
X	y						
Es*h	Lat. Load						
feet	inches	in-lbs	lbs	radians	psi*	in-lb^2	
lb/inch	lb/inch	lb/inch					
0.00	0.3374	4874944.	26644.	-0.00302	0.00	1.15E+12	
-229.6216	694.2374	0.00					
0.1700	0.3312	4929596.	26174.	-0.00302	0.00	1.15E+12	
-231.2211	1424.	0.00					
0.3400	0.3251	4983284.	25701.	-0.00301	0.00	1.15E+12	
-232.7841	1461.	0.00					
0.5100	0.3189	5036000.	25224.	-0.00300	0.00	1.15E+12	
-234.3099	1499.	0.00					
0.6800	0.3128	5087739.	24745.	-0.00299	0.00	1.15E+12	
-235.7976	1538.	0.00					
0.8500	0.3067	5138495.	24262.	-0.00298	0.00	1.15E+12	
-237.2464	1578.	0.00					
1.0200	0.3007	5188261.	23777.	-0.00297	0.00	1.15E+12	
-238.6556	1619.	0.00					
1.1900	0.2946	5237031.	23289.	-0.00296	0.00	1.15E+12	
-240.0242	1662.	0.00					
1.3600	0.2886	5284800.	22798.	-0.00295	0.00	1.15E+12	
-241.3513	1706.	0.00					
1.5300	0.2826	5331562.	22304.	-0.00294	0.00	1.15E+12	
-242.6359	1752.	0.00					
1.7000	0.2766	5377312.	21808.	-0.00293	0.00	1.15E+12	
-243.8770	1799.	0.00					
1.8700	0.2706	5422045.	21309.	-0.00292	0.00	1.15E+12	
-245.0735	1847.	0.00					
2.0400	0.2647	5465755.	20808.	-0.00291	0.00	1.15E+12	
-246.2243	1898.	0.00					
2.2100	0.2587	5508438.	20304.	-0.00290	0.00	1.15E+12	
-247.3282	1950.	0.00					
2.3800	0.2528	5550090.	19799.	-0.00289	0.00	1.15E+12	



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 213
Project Name: Lee's Summit Market Plaza		

-248.3840	2004.	0.00				
2.5500	0.2469	5590705.	19291.	-0.00288	0.00	1.15E+12
-249.3903	2060.	0.00				
2.7200	0.2410	5630279.	18781.	-0.00287	0.00	1.15E+12
-250.3458	2119.	0.00				
2.8900	0.2352	5668810.	18270.	-0.00286	0.00	1.15E+12
-251.2489	2179.	0.00				
3.0600	0.2294	5706292.	17756.	-0.00285	0.00	1.15E+12
-252.0980	2242.	0.00				
3.2300	0.2235	5742722.	17241.	-0.00284	0.00	1.12E+12
-252.8917	2308.	0.00				
3.4000	0.2178	5778097.	16724.	-0.00283	0.00	6.09E+11
-253.6282	2376.	0.00				
3.5700	0.2120	5812412.	16206.	-0.00280	0.00	3.48E+11
-254.3113	2447.	0.00				
3.7400	0.2063	5845660.	15687.	-0.00277	0.00	3.43E+11
-254.9488	2521.	0.00				
3.9100	0.2007	5877837.	15166.	-0.00273	0.00	3.40E+11
-255.5401	2597.	0.00				
4.0800	0.1952	5908943.	14644.	-0.00270	0.00	3.38E+11
-256.0847	2677.	0.00				
4.2500	0.1897	5938973.	14121.	-0.00266	0.00	3.37E+11
-256.5822	2759.	0.00				
4.4200	0.1843	5967926.	13598.	-0.00263	0.00	3.36E+11
-257.0321	2845.	0.00				
4.5900	0.1790	5995800.	13073.	-0.00259	0.00	3.36E+11
-257.4337	2934.	0.00				
4.7600	0.1737	6022594.	12547.	-0.00255	0.00	3.35E+11
-257.7864	3027.	0.00				
4.9300	0.1686	6048305.	12021.	-0.00252	0.00	3.35E+11
-258.0895	3123.	0.00				
5.1000	0.1635	6072933.	11494.	-0.00248	0.00	3.35E+11
-258.3424	3224.	0.00				
5.2700	0.1585	6096477.	10967.	-0.00244	0.00	3.34E+11
-258.5444	3328.	0.00				
5.4400	0.1535	6118934.	10440.	-0.00240	0.00	3.34E+11
-258.6947	3438.	0.00				
5.6100	0.1487	6140306.	9912.	-0.00237	0.00	3.33E+11
-258.7926	3552.	0.00				
5.7800	0.1439	6160591.	9384.	-0.00233	0.00	3.33E+11
-258.8373	3670.	0.00				
5.9500	0.1391	6179789.	8856.	-0.00229	0.00	3.33E+11
-258.8282	3795.	0.00				
6.1200	0.1345	6197900.	8328.	-0.00225	0.00	3.32E+11
-258.7643	3924.	0.00				
6.2900	0.1300	6214924.	7800.	-0.00222	0.00	3.32E+11
-258.6448	4060.	0.00				
6.4600	0.1255	6230862.	7273.	-0.00218	0.00	3.32E+11
-258.4689	4202.	0.00				
6.6300	0.1211	6245715.	6745.	-0.00214	0.00	3.32E+11



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 214
Project Name: Lee's Summit Market Plaza		

-258.2356	4351.	0.00				
6.8000	0.1167	6259483.	6219.	-0.00210	0.00	3.31E+11
-257.9440	4507.	0.00				
6.9700	0.1125	6272168.	5693.	-0.00206	0.00	3.31E+11
-257.5931	4671.	0.00				
7.1400	0.1083	6283771.	5168.	-0.00202	0.00	3.31E+11
-257.1820	4843.	0.00				
7.3100	0.1042	6294294.	4644.	-0.00198	0.00	3.31E+11
-256.7095	5024.	0.00				
7.4800	0.1002	6303738.	4121.	-0.00195	0.00	3.31E+11
-256.1745	5214.	0.00				
7.6500	0.09631	6312107.	3599.	-0.00191	0.00	3.30E+11
-255.5760	5414.	0.00				
7.8200	0.09246	6319401.	3078.	-0.00187	0.00	3.30E+11
-254.9127	5625.	0.00				
7.9900	0.08869	6325625.	2559.	-0.00183	0.00	3.30E+11
-254.1833	5847.	0.00				
8.1600	0.08500	6330781.	2041.	-0.00179	0.00	3.30E+11
-253.3865	6082.	0.00				
8.3300	0.08139	6334872.	1525.	-0.00175	0.00	3.30E+11
-252.5210	6330.	0.00				
8.5000	0.07785	6337903.	1011.	-0.00171	0.00	3.30E+11
-251.5853	6592.	0.00				
8.6700	0.07440	6339876.	498.6545	-0.00167	0.00	3.30E+11
-250.5779	6870.	0.00				
8.8400	0.07103	6340797.	-11.4220	-0.00163	0.00	3.30E+11
-249.4971	7165.	0.00				
9.0100	0.06774	6340669.	-519.2173	-0.00159	0.00	3.30E+11
-248.3414	7479.	0.00				
9.1800	0.06453	6339497.	-1025.	-0.00155	0.00	3.30E+11
-247.1088	7812.	0.00				
9.3500	0.06140	6337287.	-1527.	-0.00152	0.00	3.30E+11
-245.7976	8167.	0.00				
9.5200	0.05835	6334045.	-2027.	-0.00148	0.00	3.30E+11
-244.4056	8545.	0.00				
9.6900	0.05538	6329775.	-2524.	-0.00144	0.00	3.30E+11
-242.9309	8949.	0.00				
9.8600	0.05249	6324483.	-3018.	-0.00140	0.00	3.30E+11
-241.3711	9381.	0.00				
10.0300	0.04967	6318178.	-3509.	-0.00136	0.00	3.30E+11
-239.7238	9845.	0.00				
10.2000	0.04694	6310865.	-3996.	-0.00132	0.00	3.30E+11
-237.9864	10342.	0.00				
10.3700	0.04429	6302551.	-4480.	-0.00128	0.00	3.31E+11
-236.1563	10877.	0.00				
10.5400	0.04172	6293244.	-4960.	-0.00124	0.00	3.31E+11
-234.2304	11454.	0.00				
10.7100	0.03922	6282953.	-5436.	-0.00120	0.00	3.31E+11
-232.2056	12077.	0.00				
10.8800	0.03681	6271686.	-5907.	-0.00116	0.00	3.31E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 215
Project Name: Lee's Summit Market Plaza		

-230.0785	12752.	0.00				
11.0500	0.03447	6259451.	-6374.	-0.00113	0.00	3.31E+11
-227.8453	13484.	0.00				
11.2200	0.03221	6246258.	-6837.	-0.00109	0.00	3.32E+11
-225.5021	14280.	0.00				
11.3900	0.03003	6232116.	-7294.	-0.00105	0.00	3.32E+11
-223.0445	15150.	0.00				
11.5600	0.02793	6217037.	-7747.	-0.00101	0.00	3.32E+11
-220.4678	16101.	0.00				
11.7300	0.02591	6201030.	-8194.	-9.73E-04	0.00	3.32E+11
-217.7667	17146.	0.00				
11.9000	0.02396	6184107.	-8635.	-9.35E-04	0.00	3.33E+11
-214.9354	18297.	0.00				
12.0700	0.02210	6166280.	-9070.	-8.97E-04	0.00	3.33E+11
-211.9677	19569.	0.00				
12.2400	0.02031	6147561.	-9500.	-8.59E-04	0.00	3.33E+11
-208.8564	20983.	0.00				
12.4100	0.01859	6127964.	-9922.	-8.22E-04	0.00	3.34E+11
-205.5938	22560.	0.00				
12.5800	0.01695	6107501.	-10338.	-7.84E-04	0.00	3.34E+11
-202.1709	24327.	0.00				
12.7500	0.01539	6086187.	-10747.	-7.47E-04	0.00	3.34E+11
-198.5777	26320.	0.00				
12.9200	0.01391	6064037.	-11148.	-7.10E-04	0.00	3.35E+11
-194.8028	28578.	0.00				
13.0900	0.01250	6041067.	-26641.	-6.73E-04	0.00	3.35E+11
-14994.	2448000.	0.00				
13.2600	0.01116	5955688.	-55594.	-6.37E-04	0.00	3.37E+11
-13391.	2448000.	0.00				
13.4300	0.00990	5814570.	-81368.	-6.01E-04	0.00	3.46E+11
-11877.	2448000.	0.00				
13.6000	0.00871	5624015.	-104139.	-5.79E-04	0.00	1.15E+12
-10447.	2448000.	0.00				
13.7700	0.00753	5389981.	-124016.	-5.70E-04	0.00	1.15E+12
-9041.	2448000.	0.00				
13.9400	0.00638	5118320.	-141050.	-5.60E-04	0.00	1.15E+12
-7658.	2448000.	0.00				
14.1100	0.00525	4814786.	-155286.	-5.51E-04	0.00	1.15E+12
-6298.	2448000.	0.00				
14.2800	0.00413	4485038.	-166768.	-5.43E-04	0.00	1.15E+12
-4959.	2448000.	0.00				
14.4500	0.00303	4134651.	-175538.	-5.35E-04	0.00	1.15E+12
-3639.	2448000.	0.00				
14.6200	0.00195	3769117.	-181634.	-5.28E-04	0.00	1.15E+12
-2337.	2448000.	0.00				
14.7900	8.77E-04	3393855.	-185091.	-5.22E-04	0.00	1.15E+12
-1052.	2448000.	0.00				
14.9600	-1.82E-04	3014213.	-185941.	-5.16E-04	0.00	1.15E+12
218.6821	2448000.	0.00				
15.1300	-0.00123	2635479.	-184213.	-5.11E-04	0.00	1.14E+12



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 216
Project Name: Lee's Summit Market Plaza		

1476.	2448000.	0.00					
15.3000	-0.00227	2262888.	-179930.	-5.07E-04	0.00	1.14E+12	
2722.	2448000.	0.00					
15.4700	-0.00330	1901625.	-173116.	-5.03E-04	0.00	1.14E+12	
3958.	2448000.	0.00					
15.6400	-0.00432	1556833.	-163789.	-5.00E-04	0.00	1.13E+12	
5186.	2448000.	0.00					
15.8100	-0.00534	1233622.	-151964.	-4.98E-04	0.00	1.13E+12	
6407.	2448000.	0.00					
15.9800	-0.00635	937074.	-137655.	-4.96E-04	0.00	1.13E+12	
7622.	2448000.	0.00					
16.1500	-0.00736	672246.	-120870.	-4.94E-04	0.00	1.13E+12	
8834.	2448000.	0.00					
16.3200	-0.00837	444180.	-101617.	-4.93E-04	0.00	1.13E+12	
10042.	2448000.	0.00					
16.4900	-0.00937	257904.	-79901.	-4.93E-04	0.00	1.13E+12	
11248.	2448000.	0.00					
16.6600	-0.01038	118439.	-55725.	-4.92E-04	0.00	1.13E+12	
12453.	2448000.	0.00					
16.8300	-0.01138	30800.	-29091.	-4.92E-04	0.00	1.13E+12	
13658.	2448000.	0.00					
17.0000	-0.01239	0.00	0.00	-4.92E-04	0.00	1.13E+12	
14863.	1224000.	0.00					

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 7:

Pile-head deflection	=	0.33736887 inches
Computed slope at pile head	=	-0.00302430 radians
Maximum bending moment	=	6340797. inch-lbs
Maximum shear force	=	-185941. lbs
Depth of maximum bending moment	=	8.84000000 feet below pile head
Depth of maximum shear force	=	14.96000000 feet below pile head
Number of iterations	=	103
Number of zero deflection points	=	1

Computed Values of Pile Loading and Deflection
for Lateral Loading for LRFD Load Case Number 8



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 Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 217
Project Name: Lee's Summit Market Plaza		

Load Case No. 8: ASD: D + 0.6W (Doubled for Deflection Check)

Depth Res. Soil	Deflect. Spr.	Bending Distrib.	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
X Es*h feet lb/inch	y Lat. Load inches lb/inch	Moment in-lbs lb/inch	lbs	radians	psi*	in-lb^2	

0.00	0.4035	5451111.	25062.	-0.00397	0.00	1.15E+12	
-240.1335	606.9987	0.00					
0.1700	0.3954	5502300.	24571.	-0.00396	0.00	1.15E+12	
-241.6959	1247.	0.00					
0.3400	0.3874	5552481.	24076.	-0.00395	0.00	1.15E+12	
-243.2140	1281.	0.00					
0.5100	0.3793	5601649.	23578.	-0.00394	0.00	1.15E+12	
-244.6867	1316.	0.00					
0.6800	0.3713	5649797.	23078.	-0.00393	0.00	1.15E+12	
-246.1130	1352.	0.00					
0.8500	0.3633	5696919.	22574.	-0.00392	0.00	1.15E+12	
-247.4915	1390.	0.00					
1.0200	0.3553	5743010.	22068.	-0.00391	0.00	1.15E+12	
-248.8212	1429.	0.00					
1.1900	0.3473	5788065.	21559.	-0.00390	0.00	6.41E+11	
-250.1005	1469.	0.00					
1.3600	0.3394	5832075.	21048.	-0.00387	0.00	3.00E+11	
-251.3314	1511.	0.00					
1.5300	0.3315	5875034.	20534.	-0.00383	0.00	2.96E+11	
-252.5206	1554.	0.00					
1.7000	0.3237	5916937.	20017.	-0.00379	0.00	2.94E+11	
-253.6680	1598.	0.00					
1.8700	0.3161	5957778.	19499.	-0.00375	0.00	2.94E+11	
-254.7732	1644.	0.00					
2.0400	0.3085	5997553.	18978.	-0.00371	0.00	2.94E+11	
-255.8357	1692.	0.00					
2.2100	0.3009	6036257.	18455.	-0.00366	0.00	2.93E+11	
-256.8551	1741.	0.00					
2.3800	0.2935	6073887.	17930.	-0.00362	0.00	2.93E+11	
-257.8308	1792.	0.00					
2.5500	0.2862	6110437.	17403.	-0.00358	0.00	2.93E+11	
-258.7625	1845.	0.00					
2.7200	0.2789	6145905.	16874.	-0.00354	0.00	2.92E+11	
-259.6495	1899.	0.00					
2.8900	0.2717	6180286.	16344.	-0.00349	0.00	2.92E+11	



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 218
Project Name: Lee's Summit Market Plaza		

-260.4914	1956.	0.00				
3.0600	0.2647	6213577.	15812.	-0.00345	0.00	2.92E+11
-261.2877	2014.	0.00				
3.2300	0.2577	6245774.	15278.	-0.00341	0.00	2.92E+11
-262.0378	2075.	0.00				
3.4000	0.2508	6276875.	14742.	-0.00336	0.00	2.91E+11
-262.7413	2137.	0.00				
3.5700	0.2439	6306876.	14206.	-0.00332	0.00	2.91E+11
-263.3974	2203.	0.00				
3.7400	0.2372	6335774.	13668.	-0.00327	0.00	2.91E+11
-264.0058	2270.	0.00				
3.9100	0.2306	6363568.	13129.	-0.00323	0.00	2.91E+11
-264.5657	2341.	0.00				
4.0800	0.2240	6390254.	12588.	-0.00318	0.00	2.91E+11
-265.0766	2414.	0.00				
4.2500	0.2176	6415831.	12047.	-0.00314	0.00	2.90E+11
-265.5378	2490.	0.00				
4.4200	0.2112	6440296.	11505.	-0.00309	0.00	2.90E+11
-265.9488	2568.	0.00				
4.5900	0.2050	6463648.	10962.	-0.00305	0.00	2.90E+11
-266.3088	2651.	0.00				
4.7600	0.1988	6485885.	10419.	-0.00300	0.00	2.90E+11
-266.6172	2736.	0.00				
4.9300	0.1927	6507007.	9874.	-0.00296	0.00	2.90E+11
-266.8733	2825.	0.00				
5.1000	0.1867	6527011.	9330.	-0.00291	0.00	2.90E+11
-267.0763	2918.	0.00				
5.2700	0.1808	6545897.	8785.	-0.00287	0.00	2.90E+11
-267.2256	3015.	0.00				
5.4400	0.1750	6563665.	8240.	-0.00282	0.00	2.89E+11
-267.3203	3116.	0.00				
5.6100	0.1693	6580314.	7694.	-0.00277	0.00	2.89E+11
-267.3598	3221.	0.00				
5.7800	0.1637	6595843.	7149.	-0.00273	0.00	2.89E+11
-267.3431	3331.	0.00				
5.9500	0.1582	6610253.	6604.	-0.00268	0.00	2.89E+11
-267.2694	3447.	0.00				
6.1200	0.1528	6623545.	6058.	-0.00263	0.00	2.89E+11
-267.1378	3567.	0.00				
6.2900	0.1474	6635718.	5514.	-0.00259	0.00	2.89E+11
-266.9475	3693.	0.00				
6.4600	0.1422	6646773.	4969.	-0.00254	0.00	2.89E+11
-266.6976	3826.	0.00				
6.6300	0.1371	6656712.	4426.	-0.00249	0.00	2.89E+11
-266.3869	3964.	0.00				
6.8000	0.1320	6665536.	3883.	-0.00245	0.00	2.89E+11
-266.0146	4110.	0.00				
6.9700	0.1271	6673246.	3340.	-0.00240	0.00	2.89E+11
-265.5795	4263.	0.00				
7.1400	0.1223	6679844.	2799.	-0.00235	0.00	2.89E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 219
Project Name: Lee's Summit Market Plaza		

-265.0807	4423.	0.00				
7.3100	0.1175	6685332.	2259.	-0.00230	0.00	2.89E+11
-264.5168	4592.	0.00				
7.4800	0.1128	6689713.	1720.	-0.00226	0.00	2.89E+11
-263.8868	4770.	0.00				
7.6500	0.1083	6692989.	1182.	-0.00221	0.00	2.89E+11
-263.1895	4958.	0.00				
7.8200	0.1038	6695163.	646.1587	-0.00216	0.00	2.89E+11
-262.4234	5156.	0.00				
7.9900	0.09947	6696238.	111.6677	-0.00212	0.00	2.89E+11
-261.5873	5365.	0.00				
8.1600	0.09520	6696217.	-421.0446	-0.00207	0.00	2.89E+11
-260.6797	5586.	0.00				
8.3300	0.09103	6695106.	-951.8311	-0.00202	0.00	2.89E+11
-259.6992	5820.	0.00				
8.5000	0.08696	6692906.	-1481.	-0.00197	0.00	2.89E+11
-258.6441	6068.	0.00				
8.6700	0.08298	6689624.	-2007.	-0.00193	0.00	2.89E+11
-257.5129	6331.	0.00				
8.8400	0.07910	6685263.	-2531.	-0.00188	0.00	2.89E+11
-256.3037	6610.	0.00				
9.0100	0.07531	6679829.	-3053.	-0.00183	0.00	2.89E+11
-255.0149	6908.	0.00				
9.1800	0.07163	6673327.	-3571.	-0.00178	0.00	2.89E+11
-253.6443	7224.	0.00				
9.3500	0.06803	6665763.	-4087.	-0.00174	0.00	2.89E+11
-252.1901	7562.	0.00				
9.5200	0.06454	6657142.	-4600.	-0.00169	0.00	2.89E+11
-250.6500	7923.	0.00				
9.6900	0.06114	6647472.	-5110.	-0.00164	0.00	2.89E+11
-249.0218	8309.	0.00				
9.8600	0.05783	6636759.	-5616.	-0.00160	0.00	2.89E+11
-247.3029	8723.	0.00				
10.0300	0.05462	6625010.	-6119.	-0.00155	0.00	2.89E+11
-245.4909	9168.	0.00				
10.2000	0.05151	6612233.	-6618.	-0.00150	0.00	2.89E+11
-243.5830	9647.	0.00				
10.3700	0.04849	6598435.	-7113.	-0.00146	0.00	2.89E+11
-241.5761	10163.	0.00				
10.5400	0.04557	6583626.	-7603.	-0.00141	0.00	2.89E+11
-239.4672	10720.	0.00				
10.7100	0.04274	6567813.	-8090.	-0.00136	0.00	2.89E+11
-237.2529	11324.	0.00				
10.8800	0.04001	6551007.	-8571.	-0.00132	0.00	2.89E+11
-234.9294	11980.	0.00				
11.0500	0.03737	6533216.	-9048.	-0.00127	0.00	2.90E+11
-232.4928	12693.	0.00				
11.2200	0.03482	6514451.	-9520.	-0.00123	0.00	2.90E+11
-229.9390	13471.	0.00				
11.3900	0.03237	6494723.	-9986.	-0.00118	0.00	2.90E+11



250 NE Mulberry St., Suite 201
Lee's Summit, MO 64086
816.444.3144
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 220
Project Name: Lee's Summit Market Plaza		

-227.2632	14323.	0.00				
11.5600	0.03001	6474042.	-10447.	-0.00113	0.00	2.90E+11
-224.4604	15259.	0.00				
11.7300	0.02774	6452421.	-10902.	-0.00109	0.00	2.90E+11
-221.5251	16290.	0.00				
11.9000	0.02557	6429872.	-11350.	-0.00104	0.00	2.90E+11
-218.4514	17429.	0.00				
12.0700	0.02349	6406407.	-11793.	-9.98E-04	0.00	2.90E+11
-215.2326	18695.	0.00				
12.2400	0.02150	6382040.	-12228.	-9.53E-04	0.00	2.91E+11
-211.8614	20105.	0.00				
12.4100	0.01960	6356785.	-12657.	-9.08E-04	0.00	2.91E+11
-208.3296	21685.	0.00				
12.5800	0.01779	6330657.	-13078.	-8.64E-04	0.00	2.91E+11
-204.6284	23464.	0.00				
12.7500	0.01607	6303671.	-13492.	-8.20E-04	0.00	2.91E+11
-200.7475	25478.	0.00				
12.9200	0.01445	6275843.	-13897.	-7.76E-04	0.00	2.91E+11
-196.6756	27772.	0.00				
13.0900	0.01291	6247190.	-29899.	-7.32E-04	0.00	2.92E+11
-15492.	2448000.	0.00				
13.2600	0.01146	6154062.	-59729.	-6.88E-04	0.00	2.92E+11
-13754.	2448000.	0.00				
13.4300	0.01010	6003689.	-86122.	-6.46E-04	0.00	2.94E+11
-12121.	2448000.	0.00				
13.6000	0.00883	5802867.	-109288.	-6.06E-04	0.00	3.05E+11
-10591.	2448000.	0.00				
13.7700	0.00763	5557966.	-129429.	-5.81E-04	0.00	1.15E+12
-9155.	2448000.	0.00				
13.9400	0.00645	5274963.	-146666.	-5.72E-04	0.00	1.15E+12
-7744.	2448000.	0.00				
14.1100	0.00530	4959732.	-161047.	-5.63E-04	0.00	1.15E+12
-6355.	2448000.	0.00				
14.2800	0.00416	4618052.	-172617.	-5.54E-04	0.00	1.16E+12
-4988.	2448000.	0.00				
14.4500	0.00303	4255611.	-181419.	-5.47E-04	0.00	1.16E+12
-3641.	2448000.	0.00				
14.6200	0.00193	3878015.	-187492.	-5.39E-04	0.00	1.16E+12
-2312.	2448000.	0.00				
14.7900	8.34E-04	3490795.	-190872.	-5.33E-04	0.00	1.16E+12
-1001.	2448000.	0.00				
14.9600	-2.47E-04	3099410.	-191590.	-5.27E-04	0.00	1.16E+12
296.3259	2448000.	0.00				
15.1300	-0.00132	2709258.	-189676.	-5.22E-04	0.00	1.15E+12
1580.	2448000.	0.00				
15.3000	-0.00238	2325679.	-185156.	-5.17E-04	0.00	1.15E+12
2852.	2448000.	0.00				
15.4700	-0.00343	1953967.	-178052.	-5.14E-04	0.00	1.15E+12
4113.	2448000.	0.00				
15.6400	-0.00447	1599372.	-168383.	-5.11E-04	0.00	1.15E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 221
Project Name: Lee's Summit Market Plaza		

5366.	2448000.	0.00					
15.8100	-0.00551	1267110.	-156164.	-5.08E-04	0.00	1.14E+12	
6613.	2448000.	0.00					
15.9800	-0.00654	962367.	-141408.	-5.06E-04	0.00	1.14E+12	
7853.	2448000.	0.00					
16.1500	-0.00758	690307.	-124126.	-5.04E-04	0.00	1.13E+12	
9090.	2448000.	0.00					
16.3200	-0.00860	456076.	-104324.	-5.03E-04	0.00	1.13E+12	
10323.	2448000.	0.00					
16.4900	-0.00963	264807.	-82008.	-5.03E-04	0.00	1.13E+12	
11555.	2448000.	0.00					
16.6600	-0.01065	121625.	-57181.	-5.02E-04	0.00	1.13E+12	
12785.	2448000.	0.00					
16.8300	-0.01168	31650.	-29845.	-5.02E-04	0.00	1.13E+12	
14015.	2448000.	0.00					
17.0000	-0.01270	0.00	0.00	-5.02E-04	0.00	1.13E+12	
15245.	1224000.	0.00					

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 8:

Pile-head deflection	=	0.40352007 inches
Computed slope at pile head	=	-0.00397156 radians
Maximum bending moment	=	6696238. inch-lbs
Maximum shear force	=	-191590. lbs
Depth of maximum bending moment	=	7.99000000 feet below pile head
Depth of maximum shear force	=	14.96000000 feet below pile head
Number of iterations	=	167
Number of zero deflection points	=	1

Computed Values of Pile Loading and Deflection
for Lateral Loading for LRFD Load Case Number 9

Load Case No. 9: ASD: D + 0.45W + 0.75S (Doubled for Deflection Check)



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 222
Project Name: Lee's Summit Market Plaza		

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
Res. Soil	Spr. Distrib.						
X	y	Moment	Force	S	Stress	Stiffness	p
Es*h	Lat. Load						
feet	inches	in-lbs	lbs	radians	psi*	in-lb^2	
lb/inch	lb/inch	lb/inch					
0.00	0.6231	7338733.	36526.	-0.00607	0.00	3.16E+11	
-267.6859	438.1777	0.00					
0.1700	0.6108	7414236.	35979.	-0.00603	0.00	3.16E+11	
-269.4447	899.9364	0.00					
0.3400	0.5985	7488605.	35427.	-0.00598	0.00	3.14E+11	
-271.1626	924.2001	0.00					
0.5100	0.5864	7561833.	34872.	-0.00593	0.00	3.14E+11	
-272.8394	949.1732	0.00					
0.6800	0.5744	7633913.	34314.	-0.00588	0.00	3.13E+11	
-274.4744	974.8843	0.00					
0.8500	0.5624	7704838.	33753.	-0.00583	0.00	3.12E+11	
-276.0673	1001.	0.00					
1.0200	0.5506	7774601.	33188.	-0.00578	0.00	3.12E+11	
-277.6177	1029.	0.00					
1.1900	0.5388	7843196.	32620.	-0.00573	0.00	3.11E+11	
-279.1250	1057.	0.00					
1.3600	0.5272	7910616.	32049.	-0.00568	0.00	3.10E+11	
-280.5888	1086.	0.00					
1.5300	0.5157	7976855.	31475.	-0.00562	0.00	3.10E+11	
-282.0086	1116.	0.00					
1.7000	0.5043	8041908.	30898.	-0.00557	0.00	3.09E+11	
-283.3838	1146.	0.00					
1.8700	0.4930	8105767.	30319.	-0.00552	0.00	3.08E+11	
-284.7141	1178.	0.00					
2.0400	0.4818	8168428.	29737.	-0.00546	0.00	3.08E+11	
-285.9989	1211.	0.00					
2.2100	0.4707	8229884.	29152.	-0.00541	0.00	3.07E+11	
-287.2377	1245.	0.00					
2.3800	0.4597	8290132.	28565.	-0.00535	0.00	3.07E+11	
-288.4298	1280.	0.00					
2.5500	0.4488	8349165.	27975.	-0.00530	0.00	3.06E+11	
-289.5749	1316.	0.00					
2.7200	0.4381	8406978.	27384.	-0.00524	0.00	3.06E+11	
-290.6722	1354.	0.00					
2.8900	0.4274	8463568.	26789.	-0.00519	0.00	3.05E+11	
-291.7213	1392.	0.00					
3.0600	0.4169	8518929.	26193.	-0.00513	0.00	3.05E+11	
-292.7214	1432.	0.00					
3.2300	0.4065	8573058.	25595.	-0.00507	0.00	3.05E+11	
-293.6722	1474.	0.00					
3.4000	0.3962	8625949.	24995.	-0.00501	0.00	3.04E+11	



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 223
Project Name: Lee's Summit Market Plaza		

-294.5729	1517.	0.00				
3.5700	0.3860	8677600.	24393.	-0.00496	0.00	3.04E+11
-295.4228	1561.	0.00				
3.7400	0.3760	8728007.	23790.	-0.00490	0.00	3.03E+11
-296.2214	1607.	0.00				
3.9100	0.3661	8777166.	23185.	-0.00484	0.00	3.03E+11
-296.9679	1655.	0.00				
4.0800	0.3562	8825074.	22578.	-0.00478	0.00	3.03E+11
-297.6616	1705.	0.00				
4.2500	0.3466	8871727.	21970.	-0.00472	0.00	3.02E+11
-298.3019	1756.	0.00				
4.4200	0.3370	8917125.	21361.	-0.00466	0.00	3.02E+11
-298.8880	1809.	0.00				
4.5900	0.3275	8961263.	20751.	-0.00460	0.00	3.02E+11
-299.4191	1865.	0.00				
4.7600	0.3182	9004139.	20140.	-0.00454	0.00	3.01E+11
-299.8945	1923.	0.00				
4.9300	0.3090	9045752.	19528.	-0.00448	0.00	3.01E+11
-300.3133	1982.	0.00				
5.1000	0.3000	9086099.	18915.	-0.00442	0.00	3.01E+11
-300.6747	2045.	0.00				
5.2700	0.2910	9125180.	18301.	-0.00435	0.00	3.00E+11
-300.9779	2110.	0.00				
5.4400	0.2822	9162992.	17687.	-0.00429	0.00	3.00E+11
-301.2219	2178.	0.00				
5.6100	0.2735	9199534.	17072.	-0.00423	0.00	3.00E+11
-301.4059	2248.	0.00				
5.7800	0.2649	9234807.	16457.	-0.00417	0.00	3.00E+11
-301.5289	2322.	0.00				
5.9500	0.2565	9268808.	15842.	-0.00410	0.00	3.00E+11
-301.5898	2399.	0.00				
6.1200	0.2482	9301538.	15227.	-0.00404	0.00	2.99E+11
-301.5876	2479.	0.00				
6.2900	0.2400	9332997.	14611.	-0.00398	0.00	2.99E+11
-301.5214	2563.	0.00				
6.4600	0.2320	9363185.	13996.	-0.00391	0.00	2.99E+11
-301.3899	2651.	0.00				
6.6300	0.2240	9392102.	13382.	-0.00385	0.00	2.99E+11
-301.1919	2743.	0.00				
6.8000	0.2162	9419749.	12768.	-0.00379	0.00	2.99E+11
-300.9264	2839.	0.00				
6.9700	0.2086	9446128.	12154.	-0.00372	0.00	2.98E+11
-300.5920	2940.	0.00				
7.1400	0.2011	9471239.	11541.	-0.00366	0.00	2.98E+11
-300.1873	3046.	0.00				
7.3100	0.1937	9495084.	10929.	-0.00359	0.00	2.98E+11
-299.7111	3157.	0.00				
7.4800	0.1864	9517665.	10319.	-0.00353	0.00	2.98E+11
-299.1618	3274.	0.00				
7.6500	0.1793	9538985.	9709.	-0.00346	0.00	2.98E+11



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Revision:	Date:	Sheet No. 224
Project Name: Lee's Summit Market Plaza		

-298.5380	3397.	0.00				
7.8200	0.1723	9559046.	9101.	-0.00340	0.00	2.98E+11
-297.8380	3526.	0.00				
7.9900	0.1654	9577850.	8494.	-0.00333	0.00	2.98E+11
-297.0601	3663.	0.00				
8.1600	0.1587	9595402.	7889.	-0.00326	0.00	2.97E+11
-296.2027	3807.	0.00				
8.3300	0.1521	9611704.	7285.	-0.00320	0.00	2.97E+11
-295.2637	3960.	0.00				
8.5000	0.1457	9626760.	6684.	-0.00313	0.00	2.97E+11
-294.2413	4121.	0.00				
8.6700	0.1393	9640575.	6085.	-0.00307	0.00	2.97E+11
-293.1334	4292.	0.00				
8.8400	0.1331	9653153.	5488.	-0.00300	0.00	2.97E+11
-291.9376	4473.	0.00				
9.0100	0.1271	9664499.	4894.	-0.00293	0.00	2.97E+11
-290.6518	4665.	0.00				
9.1800	0.1212	9674619.	4302.	-0.00287	0.00	2.97E+11
-289.2733	4870.	0.00				
9.3500	0.1154	9683518.	3714.	-0.00280	0.00	2.97E+11
-287.7995	5088.	0.00				
9.5200	0.1098	9691202.	3128.	-0.00273	0.00	2.97E+11
-286.2275	5320.	0.00				
9.6900	0.1042	9697678.	2546.	-0.00267	0.00	2.97E+11
-284.5543	5569.	0.00				
9.8600	0.09887	9702953.	1967.	-0.00260	0.00	2.97E+11
-282.7766	5835.	0.00				
10.0300	0.09363	9707034.	1392.	-0.00253	0.00	2.97E+11
-280.8907	6120.	0.00				
10.2000	0.08853	9709929.	821.4723	-0.00247	0.00	2.97E+11
-278.8929	6427.	0.00				
10.3700	0.08356	9711646.	254.6869	-0.00240	0.00	2.97E+11
-276.7790	6757.	0.00				
10.5400	0.07873	9712195.	-307.6631	-0.00233	0.00	2.97E+11
-274.5445	7113.	0.00				
10.7100	0.07404	9711584.	-865.3266	-0.00227	0.00	2.97E+11
-272.1844	7499.	0.00				
10.8800	0.06948	9709823.	-1418.	-0.00220	0.00	2.97E+11
-269.6932	7918.	0.00				
11.0500	0.06506	9706922.	-1966.	-0.00213	0.00	2.97E+11
-267.0651	8374.	0.00				
11.2200	0.06078	9702893.	-2508.	-0.00207	0.00	2.97E+11
-264.2934	8871.	0.00				
11.3900	0.05663	9697747.	-3044.	-0.00200	0.00	2.97E+11
-261.3707	9415.	0.00				
11.5600	0.05262	9691497.	-3574.	-0.00193	0.00	2.97E+11
-258.2889	10014.	0.00				
11.7300	0.04874	9684154.	-4097.	-0.00187	0.00	2.97E+11
-255.0387	10674.	0.00				
11.9000	0.04500	9675734.	-4614.	-0.00180	0.00	2.97E+11



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 225
Project Name: Lee's Summit Market Plaza		

-251.6097	11406.	0.00				
12.0700	0.04140	9666249.	-5124.	-0.00173	0.00	2.97E+11
-247.9900	12221.	0.00				
12.2400	0.03793	9655715.	-5626.	-0.00167	0.00	2.97E+11
-244.1659	13134.	0.00				
12.4100	0.03459	9644148.	-6120.	-0.00160	0.00	2.97E+11
-240.1216	14161.	0.00				
12.5800	0.03139	9631565.	-6605.	-0.00154	0.00	2.97E+11
-235.8385	15326.	0.00				
12.7500	0.02833	9617983.	-7082.	-0.00147	0.00	2.97E+11
-231.2947	16657.	0.00				
12.9200	0.02540	9603422.	-7549.	-0.00140	0.00	2.97E+11
-226.4636	18191.	0.00				
13.0900	0.02260	9587902.	-31489.	-0.00134	0.00	2.97E+11
-23245.	2098131.	0.00				
13.2600	0.01994	9475630.	-78745.	-0.00127	0.00	2.98E+11
-23085.	2361860.	0.00				
13.4300	0.01741	9267272.	-123601.	-0.00121	0.00	3.00E+11
-20892.	2448000.	0.00				
13.6000	0.01501	8971955.	-163282.	-0.00115	0.00	3.02E+11
-18011.	2448000.	0.00				
13.7700	0.01273	8601667.	-197238.	-0.00109	0.00	3.04E+11
-15279.	2448000.	0.00				
13.9400	0.01057	8167779.	-225764.	-0.00103	0.00	3.08E+11
-12688.	2448000.	0.00				
14.1100	0.00852	7681075.	-249141.	-9.79E-04	0.00	3.12E+11
-10230.	2448000.	0.00				
14.2800	0.00658	7151785.	-267627.	-9.31E-04	0.00	3.18E+11
-7894.	2448000.	0.00				
14.4500	0.00473	6589632.	-281463.	-8.88E-04	0.00	3.26E+11
-5671.	2448000.	0.00				
14.6200	0.00296	6003869.	-290867.	-8.49E-04	0.00	3.35E+11
-3548.	2448000.	0.00				
14.7900	0.00126	5403329.	-296032.	-8.26E-04	0.00	1.15E+12
-1516.	2448000.	0.00				
14.9600	-4.12E-04	4796480.	-297074.	-8.17E-04	0.00	1.15E+12
493.8668	2448000.	0.00				
15.1300	-0.00207	4191684.	-294038.	-8.09E-04	0.00	1.15E+12
2482.	2448000.	0.00				
15.3000	-0.00371	3597217.	-286964.	-8.02E-04	0.00	1.15E+12
4453.	2448000.	0.00				
15.4700	-0.00534	3021279.	-275887.	-7.96E-04	0.00	1.15E+12
6407.	2448000.	0.00				
15.6400	-0.00696	2472004.	-260836.	-7.91E-04	0.00	1.14E+12
8349.	2448000.	0.00				
15.8100	-0.00857	1957473.	-241835.	-7.87E-04	0.00	1.14E+12
10280.	2448000.	0.00				
15.9800	-0.01017	1485721.	-218904.	-7.84E-04	0.00	1.13E+12
12202.	2448000.	0.00				
16.1500	-0.01176	1064746.	-192059.	-7.82E-04	0.00	1.13E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 226
Project Name: Lee's Summit Market Plaza		

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14117.  2448000.  0.00
      16.3200  -0.01336  702521.  -161310.  -7.80E-04  0.00  1.13E+12
16028.  2448000.  0.00
      16.4900  -0.01495  406997.  -126667.  -7.79E-04  0.00  1.13E+12
17936.  2448000.  0.00
      16.6600  -0.01653  186116.  -88134.  -7.78E-04  0.00  1.13E+12
19842.  2448000.  0.00
      16.8300  -0.01812  47807.  -45714.  -7.78E-04  0.00  1.13E+12
21747.  2448000.  0.00
      17.0000  -0.01971  0.00  0.00  -7.78E-04  0.00  1.13E+12
23071.  1193941.  0.00
  
```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 9:

```

Pile-head deflection      = 0.62312534 inches
Computed slope at pile head = -0.00607315 radians
Maximum bending moment    = 9712195. inch-lbs
Maximum shear force       = -297074. lbs
Depth of maximum bending moment = 10.54000000 feet below pile head
Depth of maximum shear force  = 14.96000000 feet below pile head
Number of iterations      = 38
Number of zero deflection points = 1
  
```

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for LRFD Load Case Number 10

Load Case No. 10: ASD: 0.6D + 0.6W (Doubled for Deflection Check)

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
Res. Soil Spr. Distrib.							
X	y	Moment	Force	S	Stress	Stiffness	p
Es*h	Lat. Load						
feet	inches	in-lbs	lbs	radians	psi*	in-lb^2	



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 227
Project Name: Lee's Summit Market Plaza		

lb/inch	lb/inch	lb/inch				
0.00	0.3503	5126465.	23260.	-0.00332	0.00	1.16E+12
-231.7836	674.9717	0.00				
0.1700	0.3435	5173787.	22785.	-0.00331	0.00	1.16E+12
-233.3348	1386.	0.00				
0.3400	0.3367	5220136.	22308.	-0.00330	0.00	1.16E+12
-234.8457	1423.	0.00				
0.5100	0.3300	5265508.	21827.	-0.00330	0.00	1.16E+12
-236.3156	1461.	0.00				
0.6800	0.3233	5309895.	21344.	-0.00329	0.00	1.16E+12
-237.7435	1500.	0.00				
0.8500	0.3166	5353291.	20857.	-0.00328	0.00	1.16E+12
-239.1283	1541.	0.00				
1.0200	0.3099	5395692.	20368.	-0.00327	0.00	1.16E+12
-240.4691	1583.	0.00				
1.1900	0.3033	5437090.	19876.	-0.00326	0.00	1.16E+12
-241.7646	1626.	0.00				
1.3600	0.2966	5477482.	19382.	-0.00325	0.00	1.16E+12
-243.0139	1671.	0.00				
1.5300	0.2900	5516861.	18885.	-0.00324	0.00	1.16E+12
-244.2155	1718.	0.00				
1.7000	0.2834	5555223.	18385.	-0.00323	0.00	1.16E+12
-245.3683	1766.	0.00				
1.8700	0.2768	5592563.	17884.	-0.00322	0.00	1.16E+12
-246.4709	1816.	0.00				
2.0400	0.2703	5628875.	17380.	-0.00321	0.00	1.16E+12
-247.5219	1868.	0.00				
2.2100	0.2638	5664157.	16874.	-0.00320	0.00	1.16E+12
-248.5197	1922.	0.00				
2.3800	0.2572	5698403.	16366.	-0.00319	0.00	1.16E+12
-249.4628	1978.	0.00				
2.5500	0.2507	5731611.	15856.	-0.00318	0.00	1.16E+12
-250.3493	2037.	0.00				
2.7200	0.2443	5763775.	15344.	-0.00317	0.00	1.15E+12
-251.1776	2098.	0.00				
2.8900	0.2378	5794893.	14831.	-0.00315	0.00	6.49E+11
-251.9456	2161.	0.00				
3.0600	0.2314	5824960.	14317.	-0.00312	0.00	2.88E+11
-252.6558	2227.	0.00				
3.2300	0.2251	5853972.	13800.	-0.00308	0.00	2.87E+11
-253.3198	2296.	0.00				
3.4000	0.2188	5881924.	13283.	-0.00304	0.00	2.86E+11
-253.9370	2367.	0.00				
3.5700	0.2127	5908816.	12764.	-0.00300	0.00	2.85E+11
-254.5068	2442.	0.00				
3.7400	0.2066	5934644.	12245.	-0.00296	0.00	2.84E+11
-255.0287	2518.	0.00				
3.9100	0.2006	5959406.	11724.	-0.00291	0.00	2.84E+11



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Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 228
Project Name: Lee's Summit Market Plaza		

-255.5021	2598.	0.00				
4.0800	0.1947	5983100.	11202.	-0.00287	0.00	2.83E+11
-255.9266	2682.	0.00				
4.2500	0.1889	6005725.	10680.	-0.00283	0.00	2.83E+11
-256.3015	2768.	0.00				
4.4200	0.1831	6027278.	10157.	-0.00278	0.00	2.83E+11
-256.6264	2858.	0.00				
4.5900	0.1775	6047759.	9633.	-0.00274	0.00	2.82E+11
-256.9006	2952.	0.00				
4.7600	0.1720	6067165.	9109.	-0.00270	0.00	2.82E+11
-257.1234	3050.	0.00				
4.9300	0.1665	6085498.	8584.	-0.00265	0.00	2.82E+11
-257.2942	3152.	0.00				
5.1000	0.1611	6102754.	8059.	-0.00261	0.00	2.82E+11
-257.4123	3259.	0.00				
5.2700	0.1559	6118935.	7534.	-0.00257	0.00	2.82E+11
-257.4771	3370.	0.00				
5.4400	0.1507	6134039.	7008.	-0.00252	0.00	2.82E+11
-257.4879	3486.	0.00				
5.6100	0.1456	6148068.	6483.	-0.00248	0.00	2.82E+11
-257.4438	3608.	0.00				
5.7800	0.1406	6161020.	5958.	-0.00243	0.00	2.82E+11
-257.3443	3735.	0.00				
5.9500	0.1357	6172896.	5433.	-0.00239	0.00	2.82E+11
-257.1885	3868.	0.00				
6.1200	0.1308	6183697.	4909.	-0.00234	0.00	2.82E+11
-256.9756	4007.	0.00				
6.2900	0.1261	6193424.	4385.	-0.00230	0.00	2.82E+11
-256.7048	4153.	0.00				
6.4600	0.1215	6202078.	3861.	-0.00225	0.00	2.82E+11
-256.3754	4306.	0.00				
6.6300	0.1169	6209660.	3339.	-0.00221	0.00	2.82E+11
-255.9864	4467.	0.00				
6.8000	0.1124	6216172.	2817.	-0.00216	0.00	2.82E+11
-255.5370	4636.	0.00				
6.9700	0.1081	6221616.	2296.	-0.00212	0.00	2.81E+11
-255.0263	4814.	0.00				
7.1400	0.1038	6225994.	1777.	-0.00207	0.00	2.81E+11
-254.4533	5001.	0.00				
7.3100	0.09962	6229308.	1258.	-0.00203	0.00	2.81E+11
-253.8171	5197.	0.00				
7.4800	0.09553	6231560.	741.1621	-0.00198	0.00	2.81E+11
-253.1168	5405.	0.00				
7.6500	0.09154	6232755.	225.5846	-0.00194	0.00	2.81E+11
-252.3513	5624.	0.00				
7.8200	0.08763	6232895.	-288.3636	-0.00189	0.00	2.81E+11
-251.5195	5855.	0.00				
7.9900	0.08382	6231983.	-800.5465	-0.00185	0.00	2.81E+11
-250.6205	6100.	0.00				
8.1600	0.08010	6230023.	-1311.	-0.00180	0.00	2.81E+11



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 229
Project Name: Lee's Summit Market Plaza		

-249.6531	6359.	0.00				
8.3300	0.07647	6227019.	-1819.	-0.00176	0.00	2.81E+11
-248.6163	6633.	0.00				
8.5000	0.07293	6222976.	-2325.	-0.00171	0.00	2.81E+11
-247.5088	6923.	0.00				
8.6700	0.06948	6217899.	-2829.	-0.00167	0.00	2.81E+11
-246.3295	7232.	0.00				
8.8400	0.06613	6211791.	-3330.	-0.00162	0.00	2.82E+11
-245.0771	7560.	0.00				
9.0100	0.06287	6204658.	-3829.	-0.00158	0.00	2.82E+11
-243.7506	7909.	0.00				
9.1800	0.05970	6196507.	-4324.	-0.00153	0.00	2.82E+11
-242.3485	8281.	0.00				
9.3500	0.05662	6187342.	-4817.	-0.00149	0.00	2.82E+11
-240.8697	8678.	0.00				
9.5200	0.05364	6177169.	-5307.	-0.00144	0.00	2.82E+11
-239.3130	9102.	0.00				
9.6900	0.05074	6165996.	-5794.	-0.00140	0.00	2.82E+11
-237.6769	9556.	0.00				
9.8600	0.04794	6153829.	-6277.	-0.00135	0.00	2.82E+11
-235.9602	10042.	0.00				
10.0300	0.04522	6140676.	-6756.	-0.00131	0.00	2.82E+11
-234.1616	10563.	0.00				
10.2000	0.04260	6126543.	-7232.	-0.00126	0.00	2.82E+11
-232.2800	11123.	0.00				
10.3700	0.04007	6111439.	-7704.	-0.00122	0.00	2.82E+11
-230.3141	11726.	0.00				
10.5400	0.03763	6095372.	-8172.	-0.00118	0.00	2.82E+11
-228.2627	12376.	0.00				
10.7100	0.03527	6078350.	-8635.	-0.00113	0.00	2.82E+11
-226.1249	13078.	0.00				
10.8800	0.03301	6060382.	-9094.	-0.00109	0.00	2.82E+11
-223.8996	13837.	0.00				
11.0500	0.03084	6041478.	-9549.	-0.00104	0.00	2.82E+11
-221.5862	14659.	0.00				
11.2200	0.02875	6021646.	-9998.	-0.00100	0.00	2.83E+11
-219.1840	15551.	0.00				
11.3900	0.02676	6000899.	-10443.	-9.57E-04	0.00	2.83E+11
-216.6928	16521.	0.00				
11.5600	0.02485	5979244.	-10882.	-9.13E-04	0.00	2.83E+11
-214.1127	17578.	0.00				
11.7300	0.02303	5956695.	-11316.	-8.71E-04	0.00	2.84E+11
-211.4440	18730.	0.00				
11.9000	0.02130	5933260.	-11745.	-8.28E-04	0.00	2.85E+11
-208.6873	19990.	0.00				
12.0700	0.01965	5908953.	-12168.	-7.85E-04	0.00	2.85E+11
-205.8443	21368.	0.00				
12.2400	0.01809	5883784.	-12585.	-7.43E-04	0.00	2.86E+11
-202.9172	22880.	0.00				
12.4100	0.01662	5857767.	-12995.	-7.02E-04	0.00	2.86E+11



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 230
Project Name: Lee's Summit Market Plaza		

-199.9093	24540.	0.00				
12.5800	0.01523	5830913.	-13400.	-6.60E-04	0.00	2.87E+11
-196.8255	26364.	0.00				
12.7500	0.01393	5803235.	-13798.	-6.19E-04	0.00	2.88E+11
-193.6721	28371.	0.00				
12.9200	0.01271	5774747.	-14190.	-5.88E-04	0.00	5.90E+11
-190.4579	30579.	0.00				
13.0900	0.01153	5745465.	-28493.	-5.73E-04	0.00	1.16E+12
-13832.	2448000.	0.00				
13.2600	0.01037	5658619.	-55291.	-5.63E-04	0.00	1.16E+12
-12441.	2448000.	0.00				
13.4300	0.00923	5519997.	-79278.	-5.53E-04	0.00	1.16E+12
-11075.	2448000.	0.00				
13.6000	0.00811	5335284.	-100502.	-5.44E-04	0.00	1.16E+12
-9733.	2448000.	0.00				
13.7700	0.00701	5110065.	-119012.	-5.34E-04	0.00	1.16E+12
-8414.	2448000.	0.00				
13.9400	0.00593	4849830.	-134853.	-5.26E-04	0.00	1.16E+12
-7117.	2448000.	0.00				
14.1100	0.00487	4559977.	-148070.	-5.17E-04	0.00	1.16E+12
-5841.	2448000.	0.00				
14.2800	0.00382	4245816.	-158703.	-5.10E-04	0.00	1.16E+12
-4584.	2448000.	0.00				
14.4500	0.00279	3912577.	-166792.	-5.02E-04	0.00	1.16E+12
-3346.	2448000.	0.00				
14.6200	0.00177	3565411.	-172373.	-4.96E-04	0.00	1.16E+12
-2125.	2448000.	0.00				
14.7900	7.66E-04	3209402.	-175477.	-4.90E-04	0.00	1.16E+12
-918.9990	2448000.	0.00				
14.9600	-2.28E-04	2849568.	-176136.	-4.84E-04	0.00	1.16E+12
273.0497	2448000.	0.00				
15.1300	-0.00121	2490870.	-174376.	-4.80E-04	0.00	1.16E+12
1453.	2448000.	0.00				
15.3000	-0.00218	2138217.	-170220.	-4.76E-04	0.00	1.16E+12
2622.	2448000.	0.00				
15.4700	-0.00315	1796475.	-163688.	-4.72E-04	0.00	1.16E+12
3782.	2448000.	0.00				
15.6400	-0.00411	1470470.	-154799.	-4.69E-04	0.00	1.15E+12
4934.	2448000.	0.00				
15.8100	-0.00507	1164997.	-143565.	-4.67E-04	0.00	1.15E+12
6079.	2448000.	0.00				
15.9800	-0.00602	884823.	-130000.	-4.65E-04	0.00	1.14E+12
7220.	2448000.	0.00				
16.1500	-0.00696	634696.	-114112.	-4.64E-04	0.00	1.14E+12
8357.	2448000.	0.00				
16.3200	-0.00791	419346.	-95908.	-4.63E-04	0.00	1.14E+12
9491.	2448000.	0.00				
16.4900	-0.00885	243491.	-75392.	-4.62E-04	0.00	1.14E+12
10623.	2448000.	0.00				
16.6600	-0.00979	111845.	-52568.	-4.62E-04	0.00	1.14E+12



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 231
Project Name: Lee's Summit Market Plaza		

```

11754. 2448000. 0.00
      16.8300 -0.01074 29113. -27437. -4.62E-04 0.00 1.14E+12
12884. 2448000. 0.00
      17.0000 -0.01168 0.00 0.00 -4.62E-04 0.00 1.14E+12
14015. 1224000. 0.00
  
```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 10:

```

Pile-head deflection      = 0.35026551 inches
Computed slope at pile head = -0.00332321 radians
Maximum bending moment    = 6232895. inch-lbs
Maximum shear force       = -176136. lbs
Depth of maximum bending moment = 7.82000000 feet below pile head
Depth of maximum shear force  = 14.96000000 feet below pile head
Number of iterations      = 162
Number of zero deflection points = 1
  
```

Summary of Pile Responses for LRFD Analyses

Load Case No.	Maximum Pile-head Shear in Pile lbs	Maximum Pile-head Moment Rotation in-lbs radians	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in Pile in-lbs
1	3154.	568131.	29852.	0.00505274	628757.
2	-5781.	-0.00007110	46421.	0.03135470	1757030.
3	8238.	1502802.	103408.	0.43994019	7299807.
4	-31847.	-0.00030240	68731.	0.39725092	6647968.
5	28979.	5670755.	41501.	0.13643192	5155255.
	-215634.	-0.00432098			
	25368.	5369048.			
	-191071.	-0.00386488			
	19158.	4231473.			
	-144834.	-0.00113600			



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 232
Project Name: Lee's Summit Market Plaza		

6	4506.	811616.	42646.	0.00974682	915599.
	-9736.	-0.00011909			
7	26644.	4874944.	125978.	0.33736887	6340797.
	-185941.	-0.00302430			
8	25062.	5451111.	69418.	0.40352007	6696238.
	-191590.	-0.00397156			
9	36526.	7338733.	125224.	0.62312534	9712195.
	-297074.	-0.00607315			
10	23260.	5126465.	52360.	0.35026551	6232895.
	-176136.	-0.00332321			

Maximum pile-head deflection = 0.6231253407 inches

Maximum pile-head rotation = -0.0060731508 radians = -0.347966 deg.

 LRFD Performance by Load Case Combination

		Factored	Maximum	Fact. Mom.	Pass/Fail	
Maximum	Resistance	Moment	Moment	Fraction	for LRFD	
Load	Pile-top	Pile-top				
Shear	Factor	Capacity	Developed	Developed	Moment	
Case Section	Deflection	Rotation				
Developed	for Moment	of Section	in Section	in Section	of Section	
No. No.	Developed	Developed	Name of	Load Case	Combination	
Section		in-lbs	in-lbs			
lbs	inches	Radians				

1	1	0.90	21156009.	0.019710	9.3164E-10	Pass
-5781.	0.005053	-0.0000711	LRFD: 1.4D			
2	1	0.90	21412949.	1757030.	0.082055	Pass
-31847.	0.031355	-0.0003024	LRFD: 1.2D + 0.5S			
3	1	0.90	22255096.	7299807.	0.328006	Pass
-215634.	0.439940	-0.004321	LRFD: 1.2D + 1.6S + 0.5W			
4	1	0.90	21747794.	6647968.	0.305685	Pass
-191071.	0.397251	-0.003865	LRFD: 1.2D + 1.0W + 0.5S			
5	1	0.90	21336894.	5155255.	0.241612	Pass
-144834.	0.136432	-0.001136	LRFD: 0.9D + 1.0W			
6	1	1.00	23653974.	915599.	0.038708	Pass
-9736.	0.009747	-0.0001191	ASD: D (Doubled for Deflection Check)			
7	1	1.00	24888279.	6340797.	0.254770	Pass
-185941.	0.337369	-0.003024	ASD: D + S (Doubled for Deflection Check)			
8	1	1.00	24061276.	6696238.	0.278299	Pass
-191590.	0.403520	-0.003972	ASD: D + 0.6W (Doubled for Deflection Check)			
9	1	1.00	24877379.	9712195.	0.390403	Pass
-297074.	0.623125	-0.006073	ASD: D + 0.45W + 0.75S (Doubled for Deflectio			
10	1	1.00	23804224.	6232895.	0.261840	Pass



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 233
Project Name: Lee's Summit Market Plaza		

-176136. 0.350266 -0.003323 ASD: 0.6D + 0.6W (Doubled for Deflection Chec

All LRFD load combinations have passed for all pile sections.

The load case and pile section with the greatest level of developed moment capacity:

LRFD Load Case No. = 9
Pile Section No. = 1

The analysis ended normally.



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 234
Project Name: Lee's Summit Market Plaza		

CANOPY BASEPLATES

Project item CON1

Design

Name	CON1
Description	
Analysis	Stress, strain/ simplified loading
Design code	AISC - LRFD (2016)

The check for concrete breakout in tension has been disabled for this calculation. Supplemental reinforcing has been provided to control this case.

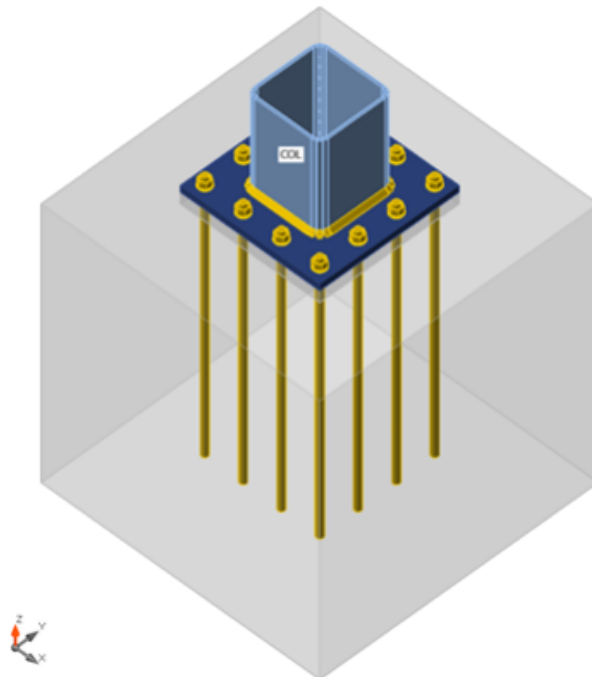
Members

Geometry

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [in]	Offset ey [in]	Offset ez [in]
COL	2 - HSS(Im)16X16X5/8	0.00	90.00	0.00	0.000	0.000	0.000

Supports and forces

Name	Support	Forces in	X [in]
COL / end		Node	0.000



Cross-sections

Name	Material
2 - HSS(Im)16X16X5/8	A500, Gr. C, shaped



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 235
Project Name: Lee's Summit Market Plaza		

Anchors

Name	Bolt assembly	Diameter [in]	f_u [ksi]	Gross area [in ²]
1 3/8 F1554 Gr.105	1 3/8 F1554 Gr.105	1.375	124.99	1.485

Load effects (Equilibrium not required)

Name	Member	N [kip]	V _y [kip]	V _z [kip]	M _x [kip.ft]	M _y [kip.ft]	M _z [kip.ft]
LE1	COL / End	36.830	-18.620	-0.190	0.000	8.190	-326.430

Foundation block

Item	Value	Unit
CB 1		
Dimensions	60.000 x 60.000	in
Depth	60.000	in
Anchor	1 3/8 F1554 Gr.105	
Anchoring length	54.000	in
Shear force transfer	Anchors	
Mortar joint	2.500	in

Check

Summary

Name	Value	Check status
Analysis	100.0%	OK
Plates	0.61 < 5.00%	OK
Anchors	68.8 < 100%	OK
Welds	86.7 < 100%	OK
Concrete block	17.5 < 100%	OK
Buckling	Not calculated	

Plates

Name	Material	t_p [in]	Loads	σ_{Ed} [ksi]	ϵ_{pl} [%]	$\sigma_{c,Ed}$ [ksi]	Status
COL	A500, Gr. C, shaped	5/8	LE1	42.22	0.04	0.00	OK
BP1	A36	1*1/2	LE1	32.58	0.61	0.00	OK

Design data

Material	F_y [ksi]	ϵ_{lim} [%]
A500, Gr. C, shaped	50.00	5.00
A36	36.00	5.00

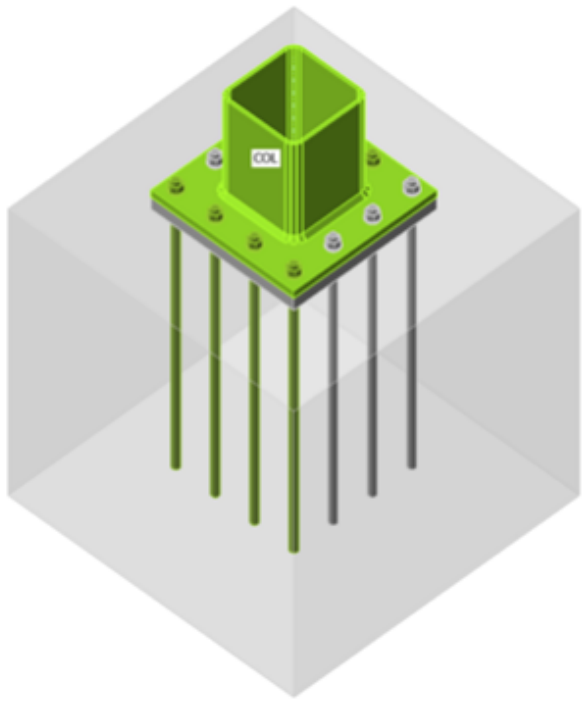


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Revision:	Date:	Sheet No. 236
Project Name: Lee's Summit Market Plaza		

Symbol explanation

t_p	Plate thickness
σ_{Ed}	Equivalent stress
ϵ_{pl}	Plastic strain
$\sigma_{c,Ed}$	Contact stress
F_y	Yield strength
ϵ_{lim}	Limit of plastic strain



Overall check, LE1



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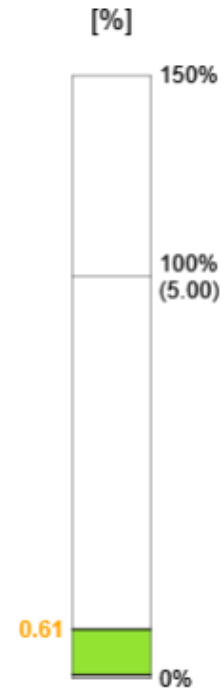
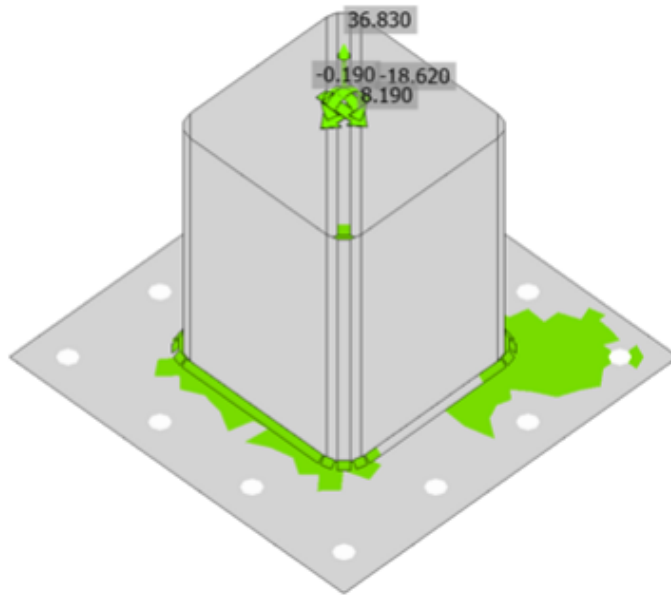
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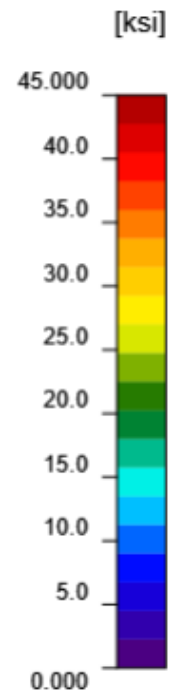
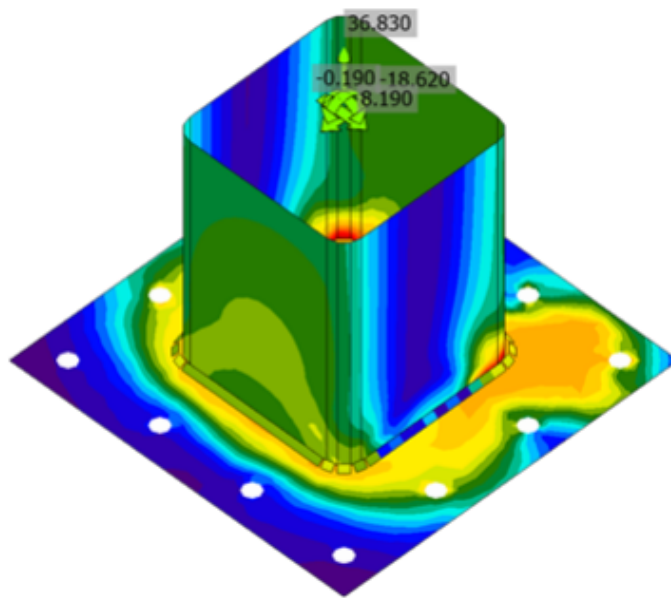
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Sheet No. 237

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Strain check, LE1



Equivalent stress, LE1



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Revision:	Date:	Sheet No. 238
Project Name: Lee's Summit Market Plaza		

Anchors

Shape	Item	Loads	N _f [kip]	V [kip]	φV _{cbg} [kip]	φV _{cp} [kip]	U _t [%]	U _s [%]	U _{ts} [%]	Status
	A17	LE1	10.491	1.730	54.886	229.265	10.40	11.31	4.95	OK
	A18	LE1	68.214	1.964	-	229.265	67.64	8.12	53.64	OK
	A19	LE1	10.757	1.745	-	229.265	10.67	8.12	3.92	OK
	A20	LE1	69.387	1.971	-	229.265	68.81	8.12	55.15	OK
	A21	LE1	51.980	1.416	54.886	229.265	51.54	11.31	35.78	OK
	A22	LE1	54.561	1.440	-	229.265	54.10	8.12	37.45	OK
	A23	LE1	0.046	1.262	54.886	229.265	0.05	11.31	2.65	OK
	A24	LE1	2.214	1.252	-	229.265	2.20	8.12	1.69	OK
	A25	LE1	0.000	1.483	27.485	229.265	0.00	67.75	52.26	OK
	A26	LE1	0.000	1.720	27.485	229.265	0.00	67.75	52.26	OK
	A27	LE1	0.000	1.461	27.485	229.265	0.00	67.75	52.26	OK
	A28	LE1	0.000	1.709	27.485	229.265	0.00	67.75	52.26	OK

Design data

Grade	φN _{sa} [kip]	φV _{sa} [kip]
1 3/8 F1554 Gr.105 - 1	100.846	44.949

Symbol explanation

N _f	Tension force
V	Resultant of bolt shear forces V _y and V _z in shear planes
φV _{cbg}	Concrete breakout strength in shear – ACI 318-14 – 17.5.2
φV _{cp}	Concrete pryout strength in shear – ACI 318-14 – 17.5.3
U _t	Utilization in tension
U _s	Utilization in shear
U _{ts}	Utilization in tension and shear
φN _{sa}	Steel strength of anchor in tension - ACI 318-14 – 17.4.1
φV _{sa}	Steel strength of anchor in shear - ACI 318-14 – 17.5.1

Detailed result for A20

Anchor tensile resistance (ACI 318-14 – 17.4.1)

$$\phi N_{sa} = \phi \cdot A_{se,N} \cdot f_{uta} = 100.846 \text{ kip} \geq N_f = 69.387 \text{ kip}$$

Where:

$$\phi = 0.700 \quad \text{– resistance factor}$$

$$A_{se,N} = 1.155 \text{ in}^2 \quad \text{– tensile stress area}$$

$$f_{uta} = 124.73 \text{ ksi} \quad \text{– specified tensile strength of anchor steel:}$$

- $f_{uta} = \min(125 \text{ ksi}, 1.9 \cdot f_{ya}, f_u)$, where:
 - $f_{ya} = 105.00 \text{ ksi}$ – specified yield strength of anchor steel
 - $f_u = 124.99 \text{ ksi}$ – specified ultimate strength of anchor steel



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Revision:	Date:	Sheet No. 239
Project Name: Lee's Summit Market Plaza		

Shear resistance (ACI 318-14 – 17.5.1)

$$\phi V_{sa} = r_m \cdot \phi \cdot 0.6 \cdot A_{se,V} \cdot f_{uta} = 44.949 \text{ kip} \geq V = 1.971 \text{ kip}$$

Where:

$r_m = 0.8$ – reduction factor for steel strength in shear in case of mortar joint

$\phi = 0.650$ – resistance factor

$A_{se,V} = 1.155 \text{ in}^2$ – tensile stress area

$f_{uta} = 124.73 \text{ ksi}$ – specified tensile strength of anchor steel:

- $f_{uta} = \min(125 \text{ ksi}, 1.9 \cdot f_{ya}, f_u)$, where:
 - $f_{ya} = 105.00 \text{ ksi}$ – specified yield strength of anchor steel
 - $f_u = 124.99 \text{ ksi}$ – specified ultimate strength of anchor steel

Concrete pryout resistance (ACI 318-14 – 17.5.3)

The check is performed for group of anchors on common base plate

$$\phi V_{cp} = \phi \cdot k_{cp} \cdot N_{cp} = 229.265 \text{ kip} \geq V_g = 18.615 \text{ kip}$$

Where:

$\phi = 0.650$ – resistance factor

$k_{cp} = 2.000$ – concrete pry-out factor

$N_{cp} = 176.358 \text{ kip}$ – concrete cone tension break-out resistance in case all anchors are in tension

$V_g = 18.615 \text{ kip}$ – sum of shear forces of anchors on common base plate

Interaction of tensile and shear forces (ACI 318-14 – R17.6)

$$U_{tt}^{5/3} + U_{ts}^{5/3} = 0.551 \leq 1.0$$

Where:

$U_{tt} = 0.688$ – maximum ratio of factored tensile force and tensile resistance determined from all appropriate failure modes

$U_{ts} = 0.081$ – maximum ratio of factored shear force and shear resistance determined from all appropriate failure modes

Supplementary reinforcement (ACI 318-14 – 17.4.2.9)

Supplementary reinforcement should resist force of 267.650 kip in tension.

Welds

Item	Edge	Xu	t _w [in]	w [in]	L [in]	L _c [in]	Loads	F _n [kip]	ΦR _n [kip]	Ut [%]	Status
BP1	COL	E70xx	▲ 5/8	▲ 7/8	58.540	0.810	LE1	13.687	15.788	86.69	OK



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Revision:	Date:	Sheet No. 240
Project Name: Lee's Summit Market Plaza		

Symbol explanation

t_w	Throat thickness of weld
w	Leg size of weld
L	Length of weld
L_c	Length of weld critical element
F_n	Force in weld critical element
ϕR_n	Weld resistance - AISC 360-16 – J2-4
U_t	Utilization
$\blacktriangle$	Fillet weld

Detailed result for BP1 / COL

Weld resistance check (AISC 360-16 – J2-4)

$$\phi R_n = \phi \cdot F_{nw} \cdot A_{we} = 15.788 \text{ kip} \geq F_n = 13.687 \text{ kip}$$

Where:

$F_{nw} = 42.00 \text{ ksi}$ – nominal stress of weld material:

- $F_{nw} = 0.6 \cdot F_{EXX}$, where:
 - $F_{EXX} = 70.00 \text{ ksi}$ – electrode classification number, i.e. minimum specified tensile strength
 - Directional strength increase is not used for HSS welds

$A_{we} = 0.501 \text{ in}^2$ – effective area of weld critical element

$\phi = 0.75$ – resistance factor for welded connections

Concrete block

Item	Loads	A_1 [in ²]	A_2 [in ²]	σ [ksi]	$\phi f_{p,max}$ [ksi]	U_t [%]	Status
CB 1	LE1	313.120	3294.007	0.77	4.42	17.48	OK

Symbol explanation

A_1	Loaded area
A_2	Supporting area
σ	Average stress in concrete
$\phi f_{p,max}$	Concrete bearing resistance
U_t	Utilization



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Revision:	Date:	Sheet No. 241
Project Name: Lee's Summit Market Plaza		

Detailed result for CB 1

Concrete block compressive resistance check (AISC 360-16 – J8)

$$\phi_c f_{p,max} = 4.42 \text{ ksi} \geq \sigma = 0.77 \text{ ksi}$$

Where:

$f_{p,max} = 6.80 \text{ ksi}$ – concrete block design bearing strength:

- $f_{p,max} = 0.85 \cdot f'_c \cdot \sqrt{\frac{A_2}{A_1}} \leq 1.7 \cdot f'_c$, where:
 - $f'_c = 4.00 \text{ ksi}$ – concrete compressive strength
 - $A_1 = 313.120 \text{ in}^2$ – base plate area in contact with concrete surface
 - $A_2 = 3294.007 \text{ in}^2$ – concrete supporting surface

$\phi_c = 0.650$ – resistance factor for concrete

Buckling

Buckling analysis was not calculated.

Code settings

Item	Value	Unit	Reference
Friction coefficient - concrete	0.400	-	ACI 349-01 – B.6.1.4
Friction coefficient in slip-resistance	0.300	-	AISC 360-16 – J3.8
Limit plastic strain	0.050	-	
Detailing	No		
Distance between bolts [d]	2.660	-	AISC 360-16 – J3.3
Distance between bolts and edge [d]	1.250	-	AISC 360-16 – J3.4
Concrete breakout resistance check	Shear		
Base metal capacity check at weld fusion face	No		AISC 360-16 – J2-2
Deformation at bolt hole at service load is design consideration	Yes		AISC 360-16 – J3.10
Cracked concrete	Yes		ACI 318-14 – 17
Local deformation check	No		
Local deformation limit	0.030	-	CIDECT DG 1, 3 - 1.1
Geometrical nonlinearity (GMNA)	Yes		Analysis with large deformations for hollow section joints

Software info

Application: IDEA StatiCa Connection
Version: 23.0.1.1401
Developed by: IDEA StatiCa



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Revision:	Date:	Sheet No. 242
Project Name: Lee's Summit Market Plaza		

TENSION ANCHOR SUPPLEMENTAL REINFORCING

Tension Anchor Supplemental Reinforcing

Design Process per ACI 318-14

This spreadsheet checks the reinforcing required to control tension breakout on a cast-in-place anchor.

Design Data

Anchor Tension Force, T	70 kips
Tension Reinforcing Size	#10
Number of Bars	1
Distance from anchor to bar, g	6 in
Steel Strength, F_y	60 ksi
Cover to Top of Concrete, c_c	1.5 in
Development, l_d from ACI 25.4.2.3	36.14 in

Required Anchor Embedment, $h_{ef} = l_e + c_c + g/1.5$ 52.58 in

Effective lap length, $l_e = T(1.3l_d/nA_s\phi F_y)$ 48.08 in

Area of Steel, A_s 1.267 in²

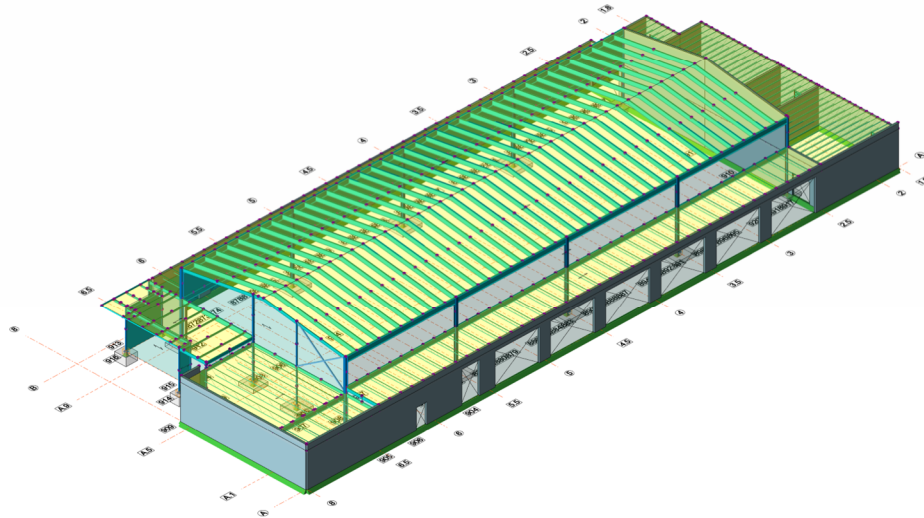
$\phi_{tension}$ 0.9



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Revision:	Date:	Sheet No. 243
Project Name: Lee's Summit Market Plaza		

TSD OUTPUT



Structure

Structure

Action Codes

General Loading	ASCE7 (2016)
Wind Loading	ASCE7 (2016)
Snow Loading	ASCE7 (2016)
Seismic Loading	ASCE7 (2016)
Combinations	ASCE7 (2016)

Resistance Codes

Steel Design	AISC 360/341 LRFD (2016)
Concrete Design	ACI 318 (2019)
Composite Design	AISC 360/341 LRFD (2016)
Timber Design	NDS ASD (2018)
Masonry Design	MSJC (2013)
Foundation Design	No Design Code
Seismic Design and Detailing	ASCE7 (2016)
Steel Fire Design	No Design Code

Combinations

Name	Class	Active	Strength	Service
1 LRFD ₁ -1.4D	Gravity	•	•	•
2 LRFD _{1.1} -1.4D+NL _{Dir1} +	Lateral	•	•	•
3 LRFD _{1.2} -1.4D+NL _{Dir1} -	Lateral	•	•	•
4 LRFD _{1.3} -1.4D+NL _{Dir2} +	Lateral	•	•	•



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Revision:	Date:	Sheet No. 244
Project Name: Lee's Summit Market Plaza		

Name	Class	Active	Strength	Service
5 LRFD _{1.4} -1.4D+NL _{Dir2}	Lateral	•	•	•
6 LRFD _{1.1} -1.4D+MLL _{A Dir1+}	Lateral	•	•	•
7 LRFD _{1.2} -1.4D+MLL _{A Dir1-}	Lateral	•	•	•
8 LRFD _{1.3} -1.4D+MLL _{A Dir2+}	Lateral	•	•	•
9 LRFD _{1.4} -1.4D+MLL _{A Dir2-}	Lateral	•	•	•
10 LRFD ₂ -1.2D+1.6L	Gravity	•	•	•
11 LRFD ₃ -1.2D+1.6L+0.5Lr	Gravity	•	•	•
12 LRFD _{4.1} -1.2D+1.6L+0.5S	Gravity	•	•	•
13 LRFD _{4.2} -1.2D+1.6L+0.5S	Gravity	•	•	•
14 LRFD _{4.3} -1.2D+1.6L+0.5S	Gravity	•	•	•
15 LRFD _{4.4} -1.2D+1.6L+0.5S	Gravity	•	•	•
16 LRFD ₅ -1.2D+L+1.6Lr	Gravity	•	•	•
17 LRFD _{5.1} -1.2D+L+1.6Lr+NL _{Dir1+}	Lateral	•	•	•
18 LRFD _{5.2} -1.2D+L+1.6Lr+NL _{Dir1-}	Lateral	•	•	•
19 LRFD _{5.3} -1.2D+L+1.6Lr+NL _{Dir2+}	Lateral	•	•	•
20 LRFD _{5.4} -1.2D+L+1.6Lr+NL _{Dir2-}	Lateral	•	•	•
21 LRFD _{5.1} -1.2D+L+1.6Lr+MLL _{A Dir1+}	Lateral	•	•	•
22 LRFD _{5.2} -1.2D+L+1.6Lr+MLL _{A Dir1-}	Lateral	•	•	•
23 LRFD _{5.3} -1.2D+L+1.6Lr+MLL _{A Dir2+}	Lateral	•	•	•
24 LRFD _{5.4} -1.2D+L+1.6Lr+MLL _{A Dir2-}	Lateral	•	•	•
25 LRFD _{6.1} -1.2D+L+1.6S	Gravity	•	•	•
26 LRFD _{6.2} -1.2D+L+1.6S+NL _{Dir1+}	Lateral	•	•	•
27 LRFD _{6.3} -1.2D+L+1.6S+NL _{Dir1-}	Lateral	•	•	•
28 LRFD _{6.4} -1.2D+L+1.6S+NL _{Dir2+}	Lateral	•	•	•
29 LRFD _{6.5} -1.2D+L+1.6S+NL _{Dir2-}	Lateral	•	•	•
30 LRFD _{6.6} -1.2D+L+1.6S	Gravity	•	•	•
31 LRFD _{6.7} -1.2D+L+1.6S+NL _{Dir1+}	Lateral	•	•	•
32 LRFD _{6.8} -1.2D+L+1.6S+NL _{Dir1-}	Lateral	•	•	•
33 LRFD _{6.9} -1.2D+L+1.6S+NL _{Dir2+}	Lateral	•	•	•
34 LRFD _{6.10} -1.2D+L+1.6S+NL _{Dir2-}	Lateral	•	•	•
35 LRFD _{6.11} -1.2D+L+1.6S	Gravity	•	•	•
36 LRFD _{6.12} -1.2D+L+1.6S+NL _{Dir1+}	Lateral	•	•	•
37 LRFD _{6.13} -1.2D+L+1.6S+NL _{Dir1-}	Lateral	•	•	•
38 LRFD _{6.14} -1.2D+L+1.6S+NL _{Dir2+}	Lateral	•	•	•
39 LRFD _{6.15} -1.2D+L+1.6S+NL _{Dir2-}	Lateral	•	•	•
40 LRFD _{6.16} -1.2D+L+1.6S	Gravity	•	•	•
41 LRFD _{6.17} -1.2D+L+1.6S+NL _{Dir1+}	Lateral	•	•	•
42 LRFD _{6.18} -1.2D+L+1.6S+NL _{Dir1-}	Lateral	•	•	•
43 LRFD _{6.19} -1.2D+L+1.6S+NL _{Dir2+}	Lateral	•	•	•
44 LRFD _{6.20} -1.2D+L+1.6S+NL _{Dir2-}	Lateral	•	•	•
45 LRFD _{6.1} -1.2D+L+1.6S+MLL _{A Dir1+}	Lateral	•	•	•
46 LRFD _{6.2} -1.2D+L+1.6S+MLL _{A Dir1-}	Lateral	•	•	•
47 LRFD _{6.3} -1.2D+L+1.6S+MLL _{A Dir2+}	Lateral	•	•	•
48 LRFD _{6.4} -1.2D+L+1.6S+MLL _{A Dir2-}	Lateral	•	•	•
49 LRFD _{6.5} -1.2D+L+1.6S+MLL _{A Dir1+}	Lateral	•	•	•
50 LRFD _{6.6} -1.2D+L+1.6S+MLL _{A Dir1-}	Lateral	•	•	•
51 LRFD _{6.7} -1.2D+L+1.6S+MLL _{A Dir2+}	Lateral	•	•	•
52 LRFD _{6.8} -1.2D+L+1.6S+MLL _{A Dir2-}	Lateral	•	•	•
53 LRFD _{6.9} -1.2D+L+1.6S+MLL _{A Dir1+}	Lateral	•	•	•
54 LRFD _{6.10} -1.2D+L+1.6S+MLL _{A Dir1-}	Lateral	•	•	•



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Revision:	Date:	Sheet No. 245
Project Name: Lee's Summit Market Plaza		

Name	Class	Active	Strength	Service
55 LRFD _{6.11} -1.2D+L+1.6S+MLL _{A Dir2+}	Lateral	•	•	•
56 LRFD _{6.12} -1.2D+L+1.6S+MLL _{A Dir2-}	Lateral	•	•	•
57 LRFD _{6.13} -1.2D+L+1.6S+MLL _{A Dir1+}	Lateral	•	•	•
58 LRFD _{6.14} -1.2D+L+1.6S+MLL _{A Dir1-}	Lateral	•	•	•
59 LRFD _{6.15} -1.2D+L+1.6S+MLL _{A Dir2+}	Lateral	•	•	•
60 LRFD _{6.16} -1.2D+L+1.6S+MLL _{A Dir2-}	Lateral	•	•	•
61 LRFD _{7.1} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
62 LRFD _{7.2} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
63 LRFD _{7.3} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
64 LRFD _{7.4} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
65 LRFD _{7.5} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
66 LRFD _{7.6} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
67 LRFD _{7.7} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
68 LRFD _{7.8} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
69 LRFD _{7.9} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
70 LRFD _{7.10} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
71 LRFD _{7.11} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
72 LRFD _{7.12} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
73 LRFD _{7.13} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
74 LRFD _{7.14} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
75 LRFD _{7.15} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
76 LRFD _{7.16} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
77 LRFD _{7.17} -1.2D+1.6Lr+0.5W	Lateral	•	•	•
78 LRFD _{8.1} -1.2D+1.6S+0.5W	Lateral	•	•	•
79 LRFD _{8.2} -1.2D+1.6S+0.5W	Lateral	•	•	•
80 LRFD _{8.3} -1.2D+1.6S+0.5W	Lateral	•	•	•
81 LRFD _{8.4} -1.2D+1.6S+0.5W	Lateral	•	•	•
82 LRFD _{8.5} -1.2D+1.6S+0.5W	Lateral	•	•	•
83 LRFD _{8.6} -1.2D+1.6S+0.5W	Lateral	•	•	•
84 LRFD _{8.7} -1.2D+1.6S+0.5W	Lateral	•	•	•
85 LRFD _{8.8} -1.2D+1.6S+0.5W	Lateral	•	•	•
86 LRFD _{8.9} -1.2D+1.6S+0.5W	Lateral	•	•	•
87 LRFD _{8.10} -1.2D+1.6S+0.5W	Lateral	•	•	•
88 LRFD _{8.11} -1.2D+1.6S+0.5W	Lateral	•	•	•
89 LRFD _{8.12} -1.2D+1.6S+0.5W	Lateral	•	•	•
90 LRFD _{8.13} -1.2D+1.6S+0.5W	Lateral	•	•	•
91 LRFD _{8.14} -1.2D+1.6S+0.5W	Lateral	•	•	•
92 LRFD _{8.15} -1.2D+1.6S+0.5W	Lateral	•	•	•
93 LRFD _{8.16} -1.2D+1.6S+0.5W	Lateral	•	•	•
94 LRFD _{8.17} -1.2D+1.6S+0.5W	Lateral	•	•	•
95 LRFD _{8.18} -1.2D+1.6S+0.5W	Lateral	•	•	•
96 LRFD _{8.19} -1.2D+1.6S+0.5W	Lateral	•	•	•
97 LRFD _{8.20} -1.2D+1.6S+0.5W	Lateral	•	•	•
98 LRFD _{8.21} -1.2D+1.6S+0.5W	Lateral	•	•	•
99 LRFD _{8.22} -1.2D+1.6S+0.5W	Lateral	•	•	•
100 LRFD _{8.23} -1.2D+1.6S+0.5W	Lateral	•	•	•
101 LRFD _{8.24} -1.2D+1.6S+0.5W	Lateral	•	•	•
102 LRFD _{8.25} -1.2D+1.6S+0.5W	Lateral	•	•	•
103 LRFD _{8.26} -1.2D+1.6S+0.5W	Lateral	•	•	•
104 LRFD _{8.27} -1.2D+1.6S+0.5W	Lateral	•	•	•



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 246
Project Name: Lee's Summit Market Plaza		

Name	Class	Active	Strength	Service
105 LRFD _{8.28} -1.2D+1.6S+0.5W	Lateral	•	•	•
106 LRFD _{8.29} -1.2D+1.6S+0.5W	Lateral	•	•	•
107 LRFD _{8.30} -1.2D+1.6S+0.5W	Lateral	•	•	•
108 LRFD _{8.31} -1.2D+1.6S+0.5W	Lateral	•	•	•
109 LRFD _{8.32} -1.2D+1.6S+0.5W	Lateral	•	•	•
110 LRFD _{8.33} -1.2D+1.6S+0.5W	Lateral	•	•	•
111 LRFD _{8.34} -1.2D+1.6S+0.5W	Lateral	•	•	•
112 LRFD _{8.35} -1.2D+1.6S+0.5W	Lateral	•	•	•
113 LRFD _{8.36} -1.2D+1.6S+0.5W	Lateral	•	•	•
114 LRFD _{8.37} -1.2D+1.6S+0.5W	Lateral	•	•	•
115 LRFD _{8.38} -1.2D+1.6S+0.5W	Lateral	•	•	•
116 LRFD _{8.39} -1.2D+1.6S+0.5W	Lateral	•	•	•
117 LRFD _{8.40} -1.2D+1.6S+0.5W	Lateral	•	•	•
118 LRFD _{8.41} -1.2D+1.6S+0.5W	Lateral	•	•	•
119 LRFD _{8.42} -1.2D+1.6S+0.5W	Lateral	•	•	•
120 LRFD _{8.43} -1.2D+1.6S+0.5W	Lateral	•	•	•
121 LRFD _{8.44} -1.2D+1.6S+0.5W	Lateral	•	•	•
122 LRFD _{8.45} -1.2D+1.6S+0.5W	Lateral	•	•	•
123 LRFD _{8.46} -1.2D+1.6S+0.5W	Lateral	•	•	•
124 LRFD _{8.47} -1.2D+1.6S+0.5W	Lateral	•	•	•
125 LRFD _{8.48} -1.2D+1.6S+0.5W	Lateral	•	•	•
126 LRFD _{8.49} -1.2D+1.6S+0.5W	Lateral	•	•	•
127 LRFD _{8.50} -1.2D+1.6S+0.5W	Lateral	•	•	•
128 LRFD _{8.51} -1.2D+1.6S+0.5W	Lateral	•	•	•
129 LRFD _{8.52} -1.2D+1.6S+0.5W	Lateral	•	•	•
130 LRFD _{8.53} -1.2D+1.6S+0.5W	Lateral	•	•	•
131 LRFD _{8.54} -1.2D+1.6S+0.5W	Lateral	•	•	•
132 LRFD _{8.55} -1.2D+1.6S+0.5W	Lateral	•	•	•
133 LRFD _{8.56} -1.2D+1.6S+0.5W	Lateral	•	•	•
134 LRFD _{8.57} -1.2D+1.6S+0.5W	Lateral	•	•	•
135 LRFD _{8.58} -1.2D+1.6S+0.5W	Lateral	•	•	•
136 LRFD _{8.59} -1.2D+1.6S+0.5W	Lateral	•	•	•
137 LRFD _{8.60} -1.2D+1.6S+0.5W	Lateral	•	•	•
138 LRFD _{8.61} -1.2D+1.6S+0.5W	Lateral	•	•	•
139 LRFD _{8.62} -1.2D+1.6S+0.5W	Lateral	•	•	•
140 LRFD _{8.63} -1.2D+1.6S+0.5W	Lateral	•	•	•
141 LRFD _{8.64} -1.2D+1.6S+0.5W	Lateral	•	•	•
142 LRFD _{8.65} -1.2D+1.6S+0.5W	Lateral	•	•	•
143 LRFD _{8.66} -1.2D+1.6S+0.5W	Lateral	•	•	•
144 LRFD _{8.67} -1.2D+1.6S+0.5W	Lateral	•	•	•
145 LRFD _{8.68} -1.2D+1.6S+0.5W	Lateral	•	•	•
146 LRFD _{9.1} -1.2D+L+0.5Lr+W	Lateral	•	•	•
147 LRFD _{9.2} -1.2D+L+0.5Lr+W	Lateral	•	•	•
148 LRFD _{9.3} -1.2D+L+0.5Lr+W	Lateral	•	•	•
149 LRFD _{9.4} -1.2D+L+0.5Lr+W	Lateral	•	•	•
150 LRFD _{9.5} -1.2D+L+0.5Lr+W	Lateral	•	•	•
151 LRFD _{9.6} -1.2D+L+0.5Lr+W	Lateral	•	•	•
152 LRFD _{9.7} -1.2D+L+0.5Lr+W	Lateral	•	•	•
153 LRFD _{9.8} -1.2D+L+0.5Lr+W	Lateral	•	•	•
154 LRFD _{9.9} -1.2D+L+0.5Lr+W	Lateral	•	•	•



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 247
Project Name: Lee's Summit Market Plaza		

Name	Class	Active	Strength	Service
155 LRFD _{9.10} -1.2D+L+0.5Lr+W	Lateral	•	•	•
156 LRFD _{9.11} -1.2D+L+0.5Lr+W	Lateral	•	•	•
157 LRFD _{9.12} -1.2D+L+0.5Lr+W	Lateral	•	•	•
158 LRFD _{9.13} -1.2D+L+0.5Lr+W	Lateral	•	•	•
159 LRFD _{9.14} -1.2D+L+0.5Lr+W	Lateral	•	•	•
160 LRFD _{9.15} -1.2D+L+0.5Lr+W	Lateral	•	•	•
161 LRFD _{9.16} -1.2D+L+0.5Lr+W	Lateral	•	•	•
162 LRFD _{9.17} -1.2D+L+0.5Lr+W	Lateral	•	•	•
163 LRFD _{10.1} -1.2D+L+0.5S+W	Lateral	•	•	•
164 LRFD _{10.2} -1.2D+L+0.5S+W	Lateral	•	•	•
165 LRFD _{10.3} -1.2D+L+0.5S+W	Lateral	•	•	•
166 LRFD _{10.4} -1.2D+L+0.5S+W	Lateral	•	•	•
167 LRFD _{10.5} -1.2D+L+0.5S+W	Lateral	•	•	•
168 LRFD _{10.6} -1.2D+L+0.5S+W	Lateral	•	•	•
169 LRFD _{10.7} -1.2D+L+0.5S+W	Lateral	•	•	•
170 LRFD _{10.8} -1.2D+L+0.5S+W	Lateral	•	•	•
171 LRFD _{10.9} -1.2D+L+0.5S+W	Lateral	•	•	•
172 LRFD _{10.10} -1.2D+L+0.5S+W	Lateral	•	•	•
173 LRFD _{10.11} -1.2D+L+0.5S+W	Lateral	•	•	•
174 LRFD _{10.12} -1.2D+L+0.5S+W	Lateral	•	•	•
175 LRFD _{10.13} -1.2D+L+0.5S+W	Lateral	•	•	•
176 LRFD _{10.14} -1.2D+L+0.5S+W	Lateral	•	•	•
177 LRFD _{10.15} -1.2D+L+0.5S+W	Lateral	•	•	•
178 LRFD _{10.16} -1.2D+L+0.5S+W	Lateral	•	•	•
179 LRFD _{10.17} -1.2D+L+0.5S+W	Lateral	•	•	•
180 LRFD _{10.18} -1.2D+L+0.5S+W	Lateral	•	•	•
181 LRFD _{10.19} -1.2D+L+0.5S+W	Lateral	•	•	•
182 LRFD _{10.20} -1.2D+L+0.5S+W	Lateral	•	•	•
183 LRFD _{10.21} -1.2D+L+0.5S+W	Lateral	•	•	•
184 LRFD _{10.22} -1.2D+L+0.5S+W	Lateral	•	•	•
185 LRFD _{10.23} -1.2D+L+0.5S+W	Lateral	•	•	•
186 LRFD _{10.24} -1.2D+L+0.5S+W	Lateral	•	•	•
187 LRFD _{10.25} -1.2D+L+0.5S+W	Lateral	•	•	•
188 LRFD _{10.26} -1.2D+L+0.5S+W	Lateral	•	•	•
189 LRFD _{10.27} -1.2D+L+0.5S+W	Lateral	•	•	•
190 LRFD _{10.28} -1.2D+L+0.5S+W	Lateral	•	•	•
191 LRFD _{10.29} -1.2D+L+0.5S+W	Lateral	•	•	•
192 LRFD _{10.30} -1.2D+L+0.5S+W	Lateral	•	•	•
193 LRFD _{10.31} -1.2D+L+0.5S+W	Lateral	•	•	•
194 LRFD _{10.32} -1.2D+L+0.5S+W	Lateral	•	•	•
195 LRFD _{10.33} -1.2D+L+0.5S+W	Lateral	•	•	•
196 LRFD _{10.34} -1.2D+L+0.5S+W	Lateral	•	•	•
197 LRFD _{10.35} -1.2D+L+0.5S+W	Lateral	•	•	•
198 LRFD _{10.36} -1.2D+L+0.5S+W	Lateral	•	•	•
199 LRFD _{10.37} -1.2D+L+0.5S+W	Lateral	•	•	•
200 LRFD _{10.38} -1.2D+L+0.5S+W	Lateral	•	•	•
201 LRFD _{10.39} -1.2D+L+0.5S+W	Lateral	•	•	•
202 LRFD _{10.40} -1.2D+L+0.5S+W	Lateral	•	•	•
203 LRFD _{10.41} -1.2D+L+0.5S+W	Lateral	•	•	•
204 LRFD _{10.42} -1.2D+L+0.5S+W	Lateral	•	•	•



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 248
Project Name: Lee's Summit Market Plaza		

Name	Class	Active	Strength	Service
205 LRFD _{10.43} -1.2D+L+0.5S+W	Lateral	•	•	•
206 LRFD _{10.44} -1.2D+L+0.5S+W	Lateral	•	•	•
207 LRFD _{10.45} -1.2D+L+0.5S+W	Lateral	•	•	•
208 LRFD _{10.46} -1.2D+L+0.5S+W	Lateral	•	•	•
209 LRFD _{10.47} -1.2D+L+0.5S+W	Lateral	•	•	•
210 LRFD _{10.48} -1.2D+L+0.5S+W	Lateral	•	•	•
211 LRFD _{10.49} -1.2D+L+0.5S+W	Lateral	•	•	•
212 LRFD _{10.50} -1.2D+L+0.5S+W	Lateral	•	•	•
213 LRFD _{10.51} -1.2D+L+0.5S+W	Lateral	•	•	•
214 LRFD _{10.52} -1.2D+L+0.5S+W	Lateral	•	•	•
215 LRFD _{10.53} -1.2D+L+0.5S+W	Lateral	•	•	•
216 LRFD _{10.54} -1.2D+L+0.5S+W	Lateral	•	•	•
217 LRFD _{10.55} -1.2D+L+0.5S+W	Lateral	•	•	•
218 LRFD _{10.56} -1.2D+L+0.5S+W	Lateral	•	•	•
219 LRFD _{10.57} -1.2D+L+0.5S+W	Lateral	•	•	•
220 LRFD _{10.58} -1.2D+L+0.5S+W	Lateral	•	•	•
221 LRFD _{10.59} -1.2D+L+0.5S+W	Lateral	•	•	•
222 LRFD _{10.60} -1.2D+L+0.5S+W	Lateral	•	•	•
223 LRFD _{10.61} -1.2D+L+0.5S+W	Lateral	•	•	•
224 LRFD _{10.62} -1.2D+L+0.5S+W	Lateral	•	•	•
225 LRFD _{10.63} -1.2D+L+0.5S+W	Lateral	•	•	•
226 LRFD _{10.64} -1.2D+L+0.5S+W	Lateral	•	•	•
227 LRFD _{10.65} -1.2D+L+0.5S+W	Lateral	•	•	•
228 LRFD _{10.66} -1.2D+L+0.5S+W	Lateral	•	•	•
229 LRFD _{10.67} -1.2D+L+0.5S+W	Lateral	•	•	•
230 LRFD _{10.68} -1.2D+L+0.5S+W	Lateral	•	•	•
231 LRFD _{12.1} -0.9D+W	Lateral	•	•	•
232 LRFD _{12.2} -0.9D+W	Lateral	•	•	•
233 LRFD _{12.3} -0.9D+W	Lateral	•	•	•
234 LRFD _{12.4} -0.9D+W	Lateral	•	•	•
235 LRFD _{12.5} -0.9D+W	Lateral	•	•	•
236 LRFD _{12.6} -0.9D+W	Lateral	•	•	•
237 LRFD _{12.7} -0.9D+W	Lateral	•	•	•
238 LRFD _{12.8} -0.9D+W	Lateral	•	•	•
239 LRFD _{12.9} -0.9D+W	Lateral	•	•	•
240 LRFD _{12.10} -0.9D+W	Lateral	•	•	•
241 LRFD _{12.11} -0.9D+W	Lateral	•	•	•
242 LRFD _{12.12} -0.9D+W	Lateral	•	•	•
243 LRFD _{12.13} -0.9D+W	Lateral	•	•	•
244 LRFD _{12.14} -0.9D+W	Lateral	•	•	•
245 LRFD _{12.15} -0.9D+W	Lateral	•	•	•
246 LRFD _{12.16} -0.9D+W	Lateral	•	•	•
247 LRFD _{12.17} -0.9D+W	Lateral	•	•	•
248 Effective Seismic Weight	Modal Mass	•	•	
249 LRFD _{11.1} -1.2D+L+0.2S+E	Seismic	•	•	•
250 LRFD _{11.2} -1.2D+L+0.2S+E	Seismic	•	•	•
251 LRFD _{11.3} -1.2D+L+0.2S+E	Seismic	•	•	•
252 LRFD _{11.4} -1.2D+L+0.2S+E	Seismic	•	•	•
253 LRFD _{11.5} -1.2D+L+0.2S+E	Seismic	•	•	•
254 LRFD _{11.6} -1.2D+L+0.2S+E	Seismic	•	•	•



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 249
Project Name: Lee's Summit Market Plaza		

Name	Class	Active	Strength	Service
255 LRFD _{11.7} -1.2D+L+0.2S+E	Seismic	•	•	•
256 LRFD _{11.8} -1.2D+L+0.2S+E	Seismic	•	•	•
257 LRFD _{11.9} -1.2D+L+0.2S+E	Seismic	•	•	•
258 LRFD _{11.10} -1.2D+L+0.2S+E	Seismic	•	•	•
259 LRFD _{11.11} -1.2D+L+0.2S+E	Seismic	•	•	•
260 LRFD _{11.12} -1.2D+L+0.2S+E	Seismic	•	•	•
261 LRFD _{11.13} -1.2D+L+0.2S+E	Seismic	•	•	•
262 LRFD _{11.14} -1.2D+L+0.2S+E	Seismic	•	•	•
263 LRFD _{11.15} -1.2D+L+0.2S+E	Seismic	•	•	•
264 LRFD _{11.16} -1.2D+L+0.2S+E	Seismic	•	•	•
265 LRFD _{13.1} -0.9D+E	Seismic	•	•	•
266 LRFD _{13.2} -0.9D+E	Seismic	•	•	•
267 LRFD _{13.3} -0.9D+E	Seismic	•	•	•
268 LRFD _{13.4} -0.9D+E	Seismic	•	•	•
269 LRFD _{13.5} -0.9D+E	Seismic	•	•	•
270 LRFD _{13.6} -0.9D+E	Seismic	•	•	•
271 LRFD _{13.7} -0.9D+E	Seismic	•	•	•
272 LRFD _{13.8} -0.9D+E	Seismic	•	•	•

1 LRFD₁-1.4D

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000

2 LRFD_{1.1}-1.4D+NL_{Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
NL _{Dir1+}	1.000	1.000

3 LRFD_{1.2}-1.4D+NL_{Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
NL _{Dir1-}	1.000	1.000

4 LRFD_{1.3}-1.4D+NL_{Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
NL _{Dir2+}	1.000	1.000

5 LRFD_{1.4}-1.4D+NL_{Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 250
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
NL _{Dir2-}	1.000	1.000

6 LRFD_{1.1}-1.4D+MLL_{A Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
7 Min Lateral Load _{A Dir1+}	1.000	1.000

7 LRFD_{1.2}-1.4D+MLL_{A Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
8 Min Lateral Load _{A Dir1-}	1.000	1.000

8 LRFD_{1.3}-1.4D+MLL_{A Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
9 Min Lateral Load _{A Dir2+}	1.000	1.000

9 LRFD_{1.4}-1.4D+MLL_{A Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.400	1.000
2 Slab self weight	1.400	1.000
3 Dead	1.400	1.000
10 Min Lateral Load _{A Dir2-}	1.000	1.000

10 LRFD₂-1.2D+1.6L

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.600	1.000

11 LRFD₃-1.2D+1.6L+0.5Lr

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.600	0.750
5 Roof Live	0.500	0.750

12 LRFD_{4.1}-1.2D+1.6L+0.5S



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 251
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.600	0.750
6 Snow	0.500	0.750

13 LRFD_{4,2}-1.2D+1.6L+0.5S

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.600	0.750
28 Balanced Snow Load	0.500	0.750

14 LRFD_{4,3}-1.2D+1.6L+0.5S

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.600	0.750
29 Unbalanced Snow Load 1	0.500	0.750

15 LRFD_{4,4}-1.2D+1.6L+0.5S

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.600	0.750
30 Drift Snow Load 1	0.500	0.750

16 LRFD₅-1.2D+L+1.6Lr

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000

17 LRFD_{5,1}-1.2D+L+1.6Lr+NL_{Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
NL _{Dir1+}	1.000	1.000

18 LRFD_{5,2}-1.2D+L+1.6Lr+NL_{Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 252
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
NL _{Dir1-}	1.000	1.000

19 LRFD_{5,3}-1.2D+L+1.6Lr+NL_{Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
NL _{Dir2+}	1.000	1.000

20 LRFD_{5,4}-1.2D+L+1.6Lr+NL_{Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
NL _{Dir2-}	1.000	1.000

21 LRFD_{5,1}-1.2D+L+1.6Lr+MLL_{A Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
7 Min Lateral Load _{A Dir1+}	1.000	1.000

22 LRFD_{5,2}-1.2D+L+1.6Lr+MLL_{A Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
8 Min Lateral Load _{A Dir1-}	1.000	1.000

23 LRFD_{5,3}-1.2D+L+1.6Lr+MLL_{A Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
9 Min Lateral Load _{A Dir2+}	1.000	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 253
Project Name: Lee's Summit Market Plaza		

24 LRFD_{5.4}-1.2D+L+1.6Lr+MLL_{A Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
5 Roof Live	1.600	1.000
10 Min Lateral Load _{A Dir2-}	1.000	1.000

25 LRFD_{6.1}-1.2D+L+1.6S

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000

26 LRFD_{6.2}-1.2D+L+1.6S+NL_{Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000
NL _{Dir1+}	1.000	1.000

27 LRFD_{6.3}-1.2D+L+1.6S+NL_{Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000
NL _{Dir1-}	1.000	1.000

28 LRFD_{6.4}-1.2D+L+1.6S+NL_{Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000
NL _{Dir2+}	1.000	1.000

29 LRFD_{6.5}-1.2D+L+1.6S+NL_{Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 254
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
6 Snow	1.600	1.000
NL _{Dir2-}	1.000	1.000

30 LRFD_{6,6-1.2D+L+1.6S}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000

31 LRFD_{6,7-1.2D+L+1.6S+NL_{Dir1+}}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
NL _{Dir1+}	1.000	1.000

32 LRFD_{6,8-1.2D+L+1.6S+NL_{Dir1-}}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
NL _{Dir1-}	1.000	1.000

33 LRFD_{6,9-1.2D+L+1.6S+NL_{Dir2+}}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
NL _{Dir2+}	1.000	1.000

34 LRFD_{6,10-1.2D+L+1.6S+NL_{Dir2-}}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
NL _{Dir2-}	1.000	1.000

35 LRFD_{6,11-1.2D+L+1.6S}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 255
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000

36 LRFD_{6.12}-1.2D+L+1.6S+NL_{Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
NL _{Dir1+}	1.000	1.000

37 LRFD_{6.13}-1.2D+L+1.6S+NL_{Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
NL _{Dir1-}	1.000	1.000

38 LRFD_{6.14}-1.2D+L+1.6S+NL_{Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
NL _{Dir2+}	1.000	1.000

39 LRFD_{6.15}-1.2D+L+1.6S+NL_{Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
NL _{Dir2-}	1.000	1.000

40 LRFD_{6.16}-1.2D+L+1.6S

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000

41 LRFD_{6.17}-1.2D+L+1.6S+NL_{Dir1+}



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 256
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
NL _{Dir1+}	1.000	1.000

42 LRFD_{6.18}-1.2D+L+1.6S+NL_{Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
NL _{Dir1-}	1.000	1.000

43 LRFD_{6.19}-1.2D+L+1.6S+NL_{Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
NL _{Dir2+}	1.000	1.000

44 LRFD_{6.20}-1.2D+L+1.6S+NL_{Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
NL _{Dir2-}	1.000	1.000

45 LRFD_{6.1}-1.2D+L+1.6S+MLL_{A Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000
7 Min Lateral Load _{A Dir1+}	1.000	1.000

46 LRFD_{6.2}-1.2D+L+1.6S+MLL_{A Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 257
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
8 Min Lateral Load _{A Dir1-}	1.000	1.000

47 LRFD_{6,3}-1.2D+L+1.6S+MLL_{A Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000
9 Min Lateral Load _{A Dir2+}	1.000	1.000

48 LRFD_{6,4}-1.2D+L+1.6S+MLL_{A Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
6 Snow	1.600	1.000
10 Min Lateral Load _{A Dir2-}	1.000	1.000

49 LRFD_{6,5}-1.2D+L+1.6S+MLL_{A Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
7 Min Lateral Load _{A Dir1+}	1.000	1.000

50 LRFD_{6,6}-1.2D+L+1.6S+MLL_{A Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
8 Min Lateral Load _{A Dir1-}	1.000	1.000

51 LRFD_{6,7}-1.2D+L+1.6S+MLL_{A Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
9 Min Lateral Load _{A Dir2+}	1.000	1.000

52 LRFD_{6,8}-1.2D+L+1.6S+MLL_{A Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 258
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
28 Balanced Snow Load	1.600	1.000
10 Min Lateral Load _{A Dir2-}	1.000	1.000

53 LRFD_{6.9}-1.2D+L+1.6S+MLL_{A Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
7 Min Lateral Load _{A Dir1+}	1.000	1.000

54 LRFD_{6.10}-1.2D+L+1.6S+MLL_{A Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
8 Min Lateral Load _{A Dir1-}	1.000	1.000

55 LRFD_{6.11}-1.2D+L+1.6S+MLL_{A Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
9 Min Lateral Load _{A Dir2+}	1.000	1.000

56 LRFD_{6.12}-1.2D+L+1.6S+MLL_{A Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
29 Unbalanced Snow Load 1	1.600	1.000
10 Min Lateral Load _{A Dir2-}	1.000	1.000

57 LRFD_{6.13}-1.2D+L+1.6S+MLL_{A Dir1+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
7 Min Lateral Load _{A Dir1+}	1.000	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 259
Project Name: Lee's Summit Market Plaza		

58 LRFD_{6.14}-1.2D+L+1.6S+MLL_{A Dir1-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
8 Min Lateral Load _{A Dir1-}	1.000	1.000

59 LRFD_{6.15}-1.2D+L+1.6S+MLL_{A Dir2+}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
9 Min Lateral Load _{A Dir2+}	1.000	1.000

60 LRFD_{6.16}-1.2D+L+1.6S+MLL_{A Dir2-}

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.000
30 Drift Snow Load 1	1.600	1.000
10 Min Lateral Load _{A Dir2-}	1.000	1.000

61 LRFD_{7.1}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
11 Wind +X', GCpi 0.18, -Cp	0.500	0.500
5 Roof Live	1.600	1.000

62 LRFD_{7.2}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
12 Wind +X', GCpi 0.18, +Cp	0.500	0.500
5 Roof Live	1.600	1.000

63 LRFD_{7.3}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
13 Wind +X'+Y', GCpi 0.18	0.500	0.500
5 Roof Live	1.600	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 260
Project Name: Lee's Summit Market Plaza		

64 LRFD_{7,4}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
14 Wind +Y',GCpi 0.18,-Cp	0.500	0.500
5 Roof Live	1.600	1.000

65 LRFD_{7,5}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
15 Wind +Y',GCpi 0.18,+Cp	0.500	0.500
5 Roof Live	1.600	1.000

66 LRFD_{7,6}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
16 Wind -X'+Y',GCpi 0.18	0.500	0.500
5 Roof Live	1.600	1.000

67 LRFD_{7,7}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
17 Wind -X',GCpi 0.18,-Cp	0.500	0.500
5 Roof Live	1.600	1.000

68 LRFD_{7,8}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
18 Wind -X',GCpi 0.18,+Cp	0.500	0.500
5 Roof Live	1.600	1.000

69 LRFD_{7,9}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
19 Wind -X'-Y',GCpi 0.18	0.500	0.500
5 Roof Live	1.600	1.000

70 LRFD_{7,10}-1.2D+1.6Lr+0.5W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 261
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
20 Wind -Y', GCpi 0.18, -Cp	0.500	0.500
5 Roof Live	1.600	1.000

71 LRFD_{7.11}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
21 Wind -Y', GCpi 0.18, +Cp	0.500	0.500
5 Roof Live	1.600	1.000

72 LRFD_{7.12}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
22 Wind +X'-Y', GCpi 0.18	0.500	0.500
5 Roof Live	1.600	1.000

73 LRFD_{7.13}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
23 Wind +X' - Min Design Load	0.500	0.500
5 Roof Live	1.600	1.000

74 LRFD_{7.14}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
24 Wind +X'+Y' - Min Design Load	0.500	0.500
5 Roof Live	1.600	1.000

75 LRFD_{7.15}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
25 Wind +Y' - Min Design Load	0.500	0.500
5 Roof Live	1.600	1.000

76 LRFD_{7.16}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 262
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
3 Dead	1.200	1.000
26 Wind -X'+Y' - Min Design Load	0.500	0.500
5 Roof Live	1.600	1.000

77 LRFD_{7,17}-1.2D+1.6Lr+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
27 Wind -X' - Min Design Load	0.500	0.500
5 Roof Live	1.600	1.000

78 LRFD_{8,1}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
11 Wind +X',GCpi 0.18,-Cp	0.500	0.500
6 Snow	1.600	1.000

79 LRFD_{8,2}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
12 Wind +X',GCpi 0.18,+Cp	0.500	0.500
6 Snow	1.600	1.000

80 LRFD_{8,3}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
13 Wind +X'+Y',GCpi 0.18	0.500	0.500
6 Snow	1.600	1.000

81 LRFD_{8,4}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
14 Wind +Y',GCpi 0.18,-Cp	0.500	0.500
6 Snow	1.600	1.000

82 LRFD_{8,5}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
15 Wind +Y',GCpi 0.18,+Cp	0.500	0.500



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 263
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
6 Snow	1.600	1.000

83 LRFD_{8.6}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
16 Wind -X'+Y',GCpi 0.18	0.500	0.500
6 Snow	1.600	1.000

84 LRFD_{8.7}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
17 Wind -X',GCpi 0.18,-Cp	0.500	0.500
6 Snow	1.600	1.000

85 LRFD_{8.8}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
18 Wind -X',GCpi 0.18,+Cp	0.500	0.500
6 Snow	1.600	1.000

86 LRFD_{8.9}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
19 Wind -X'-Y',GCpi 0.18	0.500	0.500
6 Snow	1.600	1.000

87 LRFD_{8.10}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
20 Wind -Y',GCpi 0.18,-Cp	0.500	0.500
6 Snow	1.600	1.000

88 LRFD_{8.11}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
21 Wind -Y',GCpi 0.18,+Cp	0.500	0.500
6 Snow	1.600	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 264
Project Name: Lee's Summit Market Plaza		

89 LRFD_{8.12}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
22 Wind +X'-Y', GCpi 0.18	0.500	0.500
6 Snow	1.600	1.000

90 LRFD_{8.13}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
23 Wind +X' - Min Design Load	0.500	0.500
6 Snow	1.600	1.000

91 LRFD_{8.14}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
24 Wind +X'+Y' - Min Design Load	0.500	0.500
6 Snow	1.600	1.000

92 LRFD_{8.15}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
25 Wind +Y' - Min Design Load	0.500	0.500
6 Snow	1.600	1.000

93 LRFD_{8.16}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
26 Wind -X'+Y' - Min Design Load	0.500	0.500
6 Snow	1.600	1.000

94 LRFD_{8.17}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
27 Wind -X' - Min Design Load	0.500	0.500
6 Snow	1.600	1.000

95 LRFD_{8.18}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 265
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
11 Wind +X',GCpi 0.18,-Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

96 LRFD_{8.19}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
12 Wind +X',GCpi 0.18,+Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

97 LRFD_{8.20}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
13 Wind +X'+Y',GCpi 0.18	0.500	0.500
28 Balanced Snow Load	1.600	1.000

98 LRFD_{8.21}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
14 Wind +Y',GCpi 0.18,-Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

99 LRFD_{8.22}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
15 Wind +Y',GCpi 0.18,+Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

100 LRFD_{8.23}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
16 Wind -X'+Y',GCpi 0.18	0.500	0.500
28 Balanced Snow Load	1.600	1.000

101 LRFD_{8.24}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 266
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
17 Wind -X', GCpi 0.18,-Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

102 LRFD_{8.25}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
18 Wind -X', GCpi 0.18,+Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

103 LRFD_{8.26}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
19 Wind -X'-Y', GCpi 0.18	0.500	0.500
28 Balanced Snow Load	1.600	1.000

104 LRFD_{8.27}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
20 Wind -Y', GCpi 0.18,-Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

105 LRFD_{8.28}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
21 Wind -Y', GCpi 0.18,+Cp	0.500	0.500
28 Balanced Snow Load	1.600	1.000

106 LRFD_{8.29}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
22 Wind +X'-Y', GCpi 0.18	0.500	0.500
28 Balanced Snow Load	1.600	1.000

107 LRFD_{8.30}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
23 Wind +X' - Min Design Load	0.500	0.500
28 Balanced Snow Load	1.600	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 267
Project Name: Lee's Summit Market Plaza		

108 LRFD_{8.31}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
24 Wind +X'+Y' - Min Design Load	0.500	0.500
28 Balanced Snow Load	1.600	1.000

109 LRFD_{8.32}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
25 Wind +Y' - Min Design Load	0.500	0.500
28 Balanced Snow Load	1.600	1.000

110 LRFD_{8.33}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
26 Wind -X'+Y' - Min Design Load	0.500	0.500
28 Balanced Snow Load	1.600	1.000

111 LRFD_{8.34}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
27 Wind -X' - Min Design Load	0.500	0.500
28 Balanced Snow Load	1.600	1.000

112 LRFD_{8.35}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
11 Wind +X',GCpi 0.18,-Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

113 LRFD_{8.36}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
12 Wind +X',GCpi 0.18,+Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

114 LRFD_{8.37}-1.2D+1.6S+0.5W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 268
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
13 Wind +X'+Y',GCpi 0.18	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

115 LRFD_{8.38}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
14 Wind +Y',GCpi 0.18,-Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

116 LRFD_{8.39}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
15 Wind +Y',GCpi 0.18,+Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

117 LRFD_{8.40}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
16 Wind -X'+Y',GCpi 0.18	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

118 LRFD_{8.41}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
17 Wind -X',GCpi 0.18,-Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

119 LRFD_{8.42}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
18 Wind -X',GCpi 0.18,+Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

120 LRFD_{8.43}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 269
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
3 Dead	1.200	1.000
19 Wind -X'-Y',GCpi 0.18	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

121 LRFD_{8.44}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
20 Wind -Y',GCpi 0.18,-Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

122 LRFD_{8.45}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
21 Wind -Y',GCpi 0.18,+Cp	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

123 LRFD_{8.46}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
22 Wind +X'-Y',GCpi 0.18	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

124 LRFD_{8.47}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
23 Wind +X' - Min Design Load	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

125 LRFD_{8.48}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
24 Wind +X'+Y' - Min Design Load	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

126 LRFD_{8.49}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
25 Wind +Y' - Min Design Load	0.500	0.500



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 270
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
29 Unbalanced Snow Load 1	1.600	1.000

127 LRFD_{8.50}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
26 Wind -X'+Y' - Min Design Load	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

128 LRFD_{8.51}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
27 Wind -X' - Min Design Load	0.500	0.500
29 Unbalanced Snow Load 1	1.600	1.000

129 LRFD_{8.52}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
11 Wind +X',GCpi 0.18,-Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

130 LRFD_{8.53}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
12 Wind +X',GCpi 0.18,+Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

131 LRFD_{8.54}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
13 Wind +X'+Y',GCpi 0.18	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

132 LRFD_{8.55}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
14 Wind +Y',GCpi 0.18,-Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 271
Project Name: Lee's Summit Market Plaza		

133 LRFD_{8.56}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
15 Wind +Y',GCpi 0.18,+Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

134 LRFD_{8.57}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
16 Wind -X'+Y',GCpi 0.18	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

135 LRFD_{8.58}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
17 Wind -X',GCpi 0.18,-Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

136 LRFD_{8.59}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
18 Wind -X',GCpi 0.18,+Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

137 LRFD_{8.60}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
19 Wind -X'-Y',GCpi 0.18	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

138 LRFD_{8.61}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
20 Wind -Y',GCpi 0.18,-Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

139 LRFD_{8.62}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 272
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
21 Wind -Y', GCpi 0.18,+Cp	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

140 LRFD_{8.63}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
22 Wind +X'-Y', GCpi 0.18	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

141 LRFD_{8.64}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
23 Wind +X' - Min Design Load	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

142 LRFD_{8.65}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
24 Wind +X'+Y' - Min Design Load	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

143 LRFD_{8.66}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
25 Wind +Y' - Min Design Load	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

144 LRFD_{8.67}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
26 Wind -X'+Y' - Min Design Load	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

145 LRFD_{8.68}-1.2D+1.6S+0.5W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 273
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
27 Wind -X' - Min Design Load	0.500	0.500
30 Drift Snow Load 1	1.600	1.000

146 LRFD_{9,1}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
11 Wind +X',GCpi 0.18,-Cp	1.000	0.450
5 Roof Live	0.500	0.750

147 LRFD_{9,2}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
12 Wind +X',GCpi 0.18,+Cp	1.000	0.450
5 Roof Live	0.500	0.750

148 LRFD_{9,3}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
13 Wind +X'+Y',GCpi 0.18	1.000	0.450
5 Roof Live	0.500	0.750

149 LRFD_{9,4}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
14 Wind +Y',GCpi 0.18,-Cp	1.000	0.450
5 Roof Live	0.500	0.750

150 LRFD_{9,5}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
15 Wind +Y',GCpi 0.18,+Cp	1.000	0.450
5 Roof Live	0.500	0.750

151 LRFD_{9,6}-1.2D+L+0.5Lr+W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 274
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
16 Wind -X'+Y',GCpi 0.18	1.000	0.450
5 Roof Live	0.500	0.750

152 LRFD_{9,7}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
17 Wind -X',GCpi 0.18,-Cp	1.000	0.450
5 Roof Live	0.500	0.750

153 LRFD_{9,8}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
18 Wind -X',GCpi 0.18,+Cp	1.000	0.450
5 Roof Live	0.500	0.750

154 LRFD_{9,9}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
19 Wind -X'-Y',GCpi 0.18	1.000	0.450
5 Roof Live	0.500	0.750

155 LRFD_{9,10}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
20 Wind -Y',GCpi 0.18,-Cp	1.000	0.450
5 Roof Live	0.500	0.750

156 LRFD_{9,11}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
21 Wind -Y',GCpi 0.18,+Cp	1.000	0.450



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 275
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
5 Roof Live	0.500	0.750

157 LRFD_{9,12}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
22 Wind +X'-Y', GCpi 0.18	1.000	0.450
5 Roof Live	0.500	0.750

158 LRFD_{9,13}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
23 Wind +X' - Min Design Load	1.000	0.450
5 Roof Live	0.500	0.750

159 LRFD_{9,14}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
24 Wind +X'+Y' - Min Design Load	1.000	0.450
5 Roof Live	0.500	0.750

160 LRFD_{9,15}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
25 Wind +Y' - Min Design Load	1.000	0.450
5 Roof Live	0.500	0.750

161 LRFD_{9,16}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
26 Wind -X'+Y' - Min Design Load	1.000	0.450
5 Roof Live	0.500	0.750

162 LRFD_{9,17}-1.2D+L+0.5Lr+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 276
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
27 Wind -X' - Min Design Load	1.000	0.450
5 Roof Live	0.500	0.750

163 LRFD_{10.1}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
11 Wind +X',GCpi 0.18,-Cp	1.000	0.450
6 Snow	0.500	0.750

164 LRFD_{10.2}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
12 Wind +X',GCpi 0.18,+Cp	1.000	0.450
6 Snow	0.500	0.750

165 LRFD_{10.3}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
13 Wind +X'+Y',GCpi 0.18	1.000	0.450
6 Snow	0.500	0.750

166 LRFD_{10.4}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
14 Wind +Y',GCpi 0.18,-Cp	1.000	0.450
6 Snow	0.500	0.750

167 LRFD_{10.5}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
15 Wind +Y',GCpi 0.18,+Cp	1.000	0.450
6 Snow	0.500	0.750



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 277
Project Name: Lee's Summit Market Plaza		

168 LRFD_{10.6}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
16 Wind -X'+Y',GCpi 0.18	1.000	0.450
6 Snow	0.500	0.750

169 LRFD_{10.7}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
17 Wind -X',GCpi 0.18,-Cp	1.000	0.450
6 Snow	0.500	0.750

170 LRFD_{10.8}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
18 Wind -X',GCpi 0.18,+Cp	1.000	0.450
6 Snow	0.500	0.750

171 LRFD_{10.9}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
19 Wind -X'-Y',GCpi 0.18	1.000	0.450
6 Snow	0.500	0.750

172 LRFD_{10.10}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
20 Wind -Y',GCpi 0.18,-Cp	1.000	0.450
6 Snow	0.500	0.750

173 LRFD_{10.11}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 278
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
21 Wind -Y', GCpi 0.18,+Cp	1.000	0.450
6 Snow	0.500	0.750

174 LRFD_{10.12}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
22 Wind +X'-Y', GCpi 0.18	1.000	0.450
6 Snow	0.500	0.750

175 LRFD_{10.13}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
23 Wind +X' - Min Design Load	1.000	0.450
6 Snow	0.500	0.750

176 LRFD_{10.14}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
24 Wind +X'+Y' - Min Design Load	1.000	0.450
6 Snow	0.500	0.750

177 LRFD_{10.15}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
25 Wind +Y' - Min Design Load	1.000	0.450
6 Snow	0.500	0.750

178 LRFD_{10.16}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
26 Wind -X'+Y' - Min Design Load	1.000	0.450
6 Snow	0.500	0.750

179 LRFD_{10.17}-1.2D+L+0.5S+W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 279
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
27 Wind -X' - Min Design Load	1.000	0.450
6 Snow	0.500	0.750

180 LRFD_{10.18}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
11 Wind +X', GCpi 0.18, -Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

181 LRFD_{10.19}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
12 Wind +X', GCpi 0.18, +Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

182 LRFD_{10.20}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
13 Wind +X'+Y', GCpi 0.18	1.000	0.450
28 Balanced Snow Load	0.500	0.750

183 LRFD_{10.21}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
14 Wind +Y', GCpi 0.18, -Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

184 LRFD_{10.22}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
15 Wind +Y', GCpi 0.18, +Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 280
Project Name: Lee's Summit Market Plaza		

185 LRFD_{10.23}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
16 Wind -X'+Y',GCpi 0.18	1.000	0.450
28 Balanced Snow Load	0.500	0.750

186 LRFD_{10.24}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
17 Wind -X',GCpi 0.18,-Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

187 LRFD_{10.25}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
18 Wind -X',GCpi 0.18,+Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

188 LRFD_{10.26}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
19 Wind -X'-Y',GCpi 0.18	1.000	0.450
28 Balanced Snow Load	0.500	0.750

189 LRFD_{10.27}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
20 Wind -Y',GCpi 0.18,-Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

190 LRFD_{10.28}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 281
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
4 Live	1.000	0.750
21 Wind -Y', GCpi 0.18,+Cp	1.000	0.450
28 Balanced Snow Load	0.500	0.750

191 LRFD_{10.29}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
22 Wind +X'-Y', GCpi 0.18	1.000	0.450
28 Balanced Snow Load	0.500	0.750

192 LRFD_{10.30}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
23 Wind +X' - Min Design Load	1.000	0.450
28 Balanced Snow Load	0.500	0.750

193 LRFD_{10.31}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
24 Wind +X'+Y' - Min Design Load	1.000	0.450
28 Balanced Snow Load	0.500	0.750

194 LRFD_{10.32}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
25 Wind +Y' - Min Design Load	1.000	0.450
28 Balanced Snow Load	0.500	0.750

195 LRFD_{10.33}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
26 Wind -X'+Y' - Min Design Load	1.000	0.450
28 Balanced Snow Load	0.500	0.750

196 LRFD_{10.34}-1.2D+L+0.5S+W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 282
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
27 Wind -X' - Min Design Load	1.000	0.450
28 Balanced Snow Load	0.500	0.750

197 LRFD_{10.35}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
11 Wind +X', GCpi 0.18, -Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

198 LRFD_{10.36}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
12 Wind +X', GCpi 0.18, +Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

199 LRFD_{10.37}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
13 Wind +X'+Y', GCpi 0.18	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

200 LRFD_{10.38}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
14 Wind +Y', GCpi 0.18, -Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

201 LRFD_{10.39}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
15 Wind +Y', GCpi 0.18, +Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 283
Project Name: Lee's Summit Market Plaza		

202 LRFD_{10.40}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
16 Wind -X'+Y',GCpi 0.18	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

203 LRFD_{10.41}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
17 Wind -X',GCpi 0.18,-Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

204 LRFD_{10.42}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
18 Wind -X',GCpi 0.18,+Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

205 LRFD_{10.43}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
19 Wind -X'-Y',GCpi 0.18	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

206 LRFD_{10.44}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
20 Wind -Y',GCpi 0.18,-Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

207 LRFD_{10.45}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 284
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
4 Live	1.000	0.750
21 Wind -Y', GCpi 0.18,+Cp	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

208 LRFD_{10.46}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
22 Wind +X'-Y', GCpi 0.18	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

209 LRFD_{10.47}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
23 Wind +X' - Min Design Load	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

210 LRFD_{10.48}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
24 Wind +X'+Y' - Min Design Load	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

211 LRFD_{10.49}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
25 Wind +Y' - Min Design Load	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

212 LRFD_{10.50}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
26 Wind -X'+Y' - Min Design Load	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

213 LRFD_{10.51}-1.2D+L+0.5S+W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 285
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
27 Wind -X' - Min Design Load	1.000	0.450
29 Unbalanced Snow Load 1	0.500	0.750

214 LRFD_{10.52}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
11 Wind +X',GCpi 0.18,-Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

215 LRFD_{10.53}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
12 Wind +X',GCpi 0.18,+Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

216 LRFD_{10.54}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
13 Wind +X'+Y',GCpi 0.18	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

217 LRFD_{10.55}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
14 Wind +Y',GCpi 0.18,-Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

218 LRFD_{10.56}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
15 Wind +Y',GCpi 0.18,+Cp	1.000	0.450



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 286
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
30 Drift Snow Load 1	0.500	0.750

219 LRFD_{10.57}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
16 Wind -X'+Y',GCpi 0.18	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

220 LRFD_{10.58}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
17 Wind -X',GCpi 0.18,-Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

221 LRFD_{10.59}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
18 Wind -X',GCpi 0.18,+Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

222 LRFD_{10.60}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
19 Wind -X'-Y',GCpi 0.18	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

223 LRFD_{10.61}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
20 Wind -Y',GCpi 0.18,-Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

224 LRFD_{10.62}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 287
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
21 Wind -Y', GCpi 0.18, +Cp	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

225 LRFD_{10.63}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
22 Wind +X'-Y', GCpi 0.18	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

226 LRFD_{10.64}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
23 Wind +X' - Min Design Load	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

227 LRFD_{10.65}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
24 Wind +X'+Y' - Min Design Load	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

228 LRFD_{10.66}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
25 Wind +Y' - Min Design Load	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

229 LRFD_{10.67}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
26 Wind -X'+Y' - Min Design Load	1.000	0.450
30 Drift Snow Load 1	0.500	0.750



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 288
Project Name: Lee's Summit Market Plaza		

230 LRFD_{10.68}-1.2D+L+0.5S+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.200	1.000
2 Slab self weight	1.200	1.000
3 Dead	1.200	1.000
4 Live	1.000	0.750
27 Wind -X' - Min Design Load	1.000	0.450
30 Drift Snow Load 1	0.500	0.750

231 LRFD_{12.1}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
11 Wind +X',GCpi 0.18,-Cp	1.000	0.600

232 LRFD_{12.2}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
12 Wind +X',GCpi 0.18,+Cp	1.000	0.600

233 LRFD_{12.3}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
13 Wind +X'+Y',GCpi 0.18	1.000	0.600

234 LRFD_{12.4}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
14 Wind +Y',GCpi 0.18,-Cp	1.000	0.600

235 LRFD_{12.5}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
15 Wind +Y',GCpi 0.18,+Cp	1.000	0.600

236 LRFD_{12.6}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
16 Wind -X'+Y',GCpi 0.18	1.000	0.600



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 289
Project Name: Lee's Summit Market Plaza		

237 LRFD_{12.7}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
17 Wind -X', GCpi 0.18, -Cp	1.000	0.600

238 LRFD_{12.8}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
18 Wind -X', GCpi 0.18, +Cp	1.000	0.600

239 LRFD_{12.9}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
19 Wind -X'-Y', GCpi 0.18	1.000	0.600

240 LRFD_{12.10}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
20 Wind -Y', GCpi 0.18, -Cp	1.000	0.600

241 LRFD_{12.11}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
21 Wind -Y', GCpi 0.18, +Cp	1.000	0.600

242 LRFD_{12.12}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
22 Wind +X'-Y', GCpi 0.18	1.000	0.600

243 LRFD_{12.13}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
23 Wind +X' - Min Design Load	1.000	0.600

244 LRFD_{12.14}-0.9D+W



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 290
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
24 Wind +X'+Y' - Min Design Load	1.000	0.600

245 LRFD_{12.15}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
25 Wind +Y' - Min Design Load	1.000	0.600

246 LRFD_{12.16}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
26 Wind -X'+Y' - Min Design Load	1.000	0.600

247 LRFD_{12.17}-0.9D+W

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.900	0.600
2 Slab self weight	0.900	0.600
3 Dead	0.900	0.600
27 Wind -X' - Min Design Load	1.000	0.600

248 Effective Seismic Weight

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.000	1.000
2 Slab self weight	1.000	1.000
3 Dead	1.000	1.000
6 Snow	0.200	0.200

249 LRFD_{11.1}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
31 Seismic Dir1	1.000	0.700
33 Seismic Torsion Dir1	1.000	0.700

250 LRFD_{11.2}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 291
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
31 Seismic Dir1	1.000	0.700
33 Seismic Torsion Dir1	-1.000	-0.700

251 LRFD_{11.3}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
31 Seismic Dir1	-1.000	-0.700
33 Seismic Torsion Dir1	-1.000	-0.700

252 LRFD_{11.4}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
31 Seismic Dir1	-1.000	-0.700
33 Seismic Torsion Dir1	1.000	0.700

253 LRFD_{11.5}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
32 Seismic Dir2	1.000	0.700
34 Seismic Torsion Dir2	1.000	0.700

254 LRFD_{11.6}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
32 Seismic Dir2	1.000	0.700
34 Seismic Torsion Dir2	-1.000	-0.700

255 LRFD_{11.7}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
32 Seismic Dir2	-1.000	-0.700



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 292
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
34 Seismic Torsion Dir2	-1.000	-0.700

256 LRFD_{11.8}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
6 Snow	0.200	0.000
32 Seismic Dir2	-1.000	-0.700
34 Seismic Torsion Dir2	1.000	0.700

257 LRFD_{11.9}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
31 Seismic Dir1	1.000	0.700
33 Seismic Torsion Dir1	1.000	0.700

258 LRFD_{11.10}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
31 Seismic Dir1	1.000	0.700
33 Seismic Torsion Dir1	-1.000	-0.700

259 LRFD_{11.11}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
31 Seismic Dir1	-1.000	-0.700
33 Seismic Torsion Dir1	-1.000	-0.700

260 LRFD_{11.12}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
31 Seismic Dir1	-1.000	-0.700



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 293
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
33 Seismic Torsion Dir1	1.000	0.700

261 LRFD_{11.13}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
32 Seismic Dir2	1.000	0.700
34 Seismic Torsion Dir2	1.000	0.700

262 LRFD_{11.14}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
32 Seismic Dir2	1.000	0.700
34 Seismic Torsion Dir2	-1.000	-0.700

263 LRFD_{11.15}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
32 Seismic Dir2	-1.000	-0.700
34 Seismic Torsion Dir2	-1.000	-0.700

264 LRFD_{11.16}-1.2D+L+0.2S+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	1.217	1.012
2 Slab self weight	1.217	1.012
3 Dead	1.217	1.012
4 Live	1.000	0.000
28 Balanced Snow Load	0.200	0.000
32 Seismic Dir2	-1.000	-0.700
34 Seismic Torsion Dir2	1.000	0.700

265 LRFD_{13.1}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
31 Seismic Dir1	1.000	0.700
33 Seismic Torsion Dir1	1.000	0.700



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 294
Project Name: Lee's Summit Market Plaza		

266 LRFD_{13.2}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
31 Seismic Dir1	1.000	0.700
33 Seismic Torsion Dir1	-1.000	-0.700

267 LRFD_{13.3}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
31 Seismic Dir1	-1.000	-0.700
33 Seismic Torsion Dir1	-1.000	-0.700

268 LRFD_{13.4}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
31 Seismic Dir1	-1.000	-0.700
33 Seismic Torsion Dir1	1.000	0.700

269 LRFD_{13.5}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
32 Seismic Dir2	1.000	0.700
34 Seismic Torsion Dir2	1.000	0.700

270 LRFD_{13.6}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
32 Seismic Dir2	1.000	0.700
34 Seismic Torsion Dir2	-1.000	-0.700

271 LRFD_{13.7}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
32 Seismic Dir2	-1.000	-0.700
34 Seismic Torsion Dir2	-1.000	-0.700

272 LRFD_{13.8}-0.9D+E

Loadcase Title	Strength	Service
1 Self weight - excluding slabs	0.883	0.588



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Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 295
Project Name: Lee's Summit Market Plaza		

Loadcase Title	Strength	Service
2 Slab self weight	0.883	0.588
3 Dead	0.883	0.588
32 Seismic Dir2	-1.000	-0.700
34 Seismic Torsion Dir2	1.000	0.700

Wind Data

General

Method
ASCE/SEI 7-16 : Directional Procedure Part 1

Site Details

Site Ground Level	0"	ft, in
Orientation of Principal Axes relative to Global axes	0.0000	Â°
Mean Roof Height, h	25' 0"	ft, in
Level of Highest Opening in Building (Use Mean Roof Height)	25' 0"	ft, in
Overall Building X' Dimension	214' 0"	ft, in
Overall Building Y' Dimension	83' 0"	ft, in
Torsion Design Pressure Factor	75.00	%
Torsion Eccentricity	15.00	%
Basic Wind Speed, V	120.00	mph
Directionality Factor, K _d	0.850	
Ground Elevation above Sea Level, z _g	0	ft
Ground Elevation Factor, K _e	1.000	
Enclosure Classification	Enclosed	
Gust Effect factor, G	0.850	
Principal Axis	+X'	
Exposure Category	B	
Topographic Feature	None	
Principal Axis	+Y'	
Exposure Category	B	
Topographic Feature	None	
Principal Axis	-X'	
Exposure Category	B	
Topographic Feature	None	
Principal Axis	-Y'	
Exposure Category	B	
Topographic Feature	None	

Intermediate Factors

+X'		
Height above ground, z	13' 0"	ft, in
Exposure Coefficient, K _z	0.575	
Topographic Factor, K _{zt}	1.000	
Height above ground, z	14' 6"	ft, in
Exposure Coefficient, K _z	0.575	
Topographic Factor, K _{zt}	1.000	
Height above ground, z	15' 0"	ft, in
Exposure Coefficient, K _z	0.575	
Topographic Factor, K _{zt}	1.000	
Height above ground, z	20' 0"	ft, in
Exposure Coefficient, K _z	0.624	



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Revision:	Date:	Sheet No. 296
Project Name: Lee's Summit Market Plaza		

Topographic Factor, K_{zt} 1.000
Height above ground, z 25' 0" ft, in
Exposure Coefficient, K_z 0.665
Topographic Factor, K_{zt} 1.000
Height above ground, z 29' 10" ft, in
Exposure Coefficient, K_z 0.699
Topographic Factor, K_{zt} 1.000

+Y'

Height above ground, z 13' 0" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 14' 6" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 15' 0" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 20' 0" ft, in
Exposure Coefficient, K_z 0.624
Topographic Factor, K_{zt} 1.000
Height above ground, z 25' 0" ft, in
Exposure Coefficient, K_z 0.665
Topographic Factor, K_{zt} 1.000
Height above ground, z 29' 10" ft, in
Exposure Coefficient, K_z 0.699
Topographic Factor, K_{zt} 1.000

-X'

Height above ground, z 13' 0" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 14' 6" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 15' 0" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 20' 0" ft, in
Exposure Coefficient, K_z 0.624
Topographic Factor, K_{zt} 1.000
Height above ground, z 25' 0" ft, in
Exposure Coefficient, K_z 0.665
Topographic Factor, K_{zt} 1.000
Height above ground, z 29' 10" ft, in
Exposure Coefficient, K_z 0.699
Topographic Factor, K_{zt} 1.000

-Y'

Height above ground, z 13' 0" ft, in
Exposure Coefficient, K_z 0.575



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 297
Project Name: Lee's Summit Market Plaza		

Topographic Factor, K_{zt} 1.000
Height above ground, z 14' 6" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 15' 0" ft, in
Exposure Coefficient, K_z 0.575
Topographic Factor, K_{zt} 1.000
Height above ground, z 20' 0" ft, in
Exposure Coefficient, K_z 0.624
Topographic Factor, K_{zt} 1.000
Height above ground, z 25' 0" ft, in
Exposure Coefficient, K_z 0.665
Topographic Factor, K_{zt} 1.000
Height above ground, z 29' 10" ft, in
Exposure Coefficient, K_z 0.699
Topographic Factor, K_{zt} 1.000

Velocity Pressures

+X'

Height above ground, z 13' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 14' 6" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 15' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 20' 0" ft, in
Velocity Pressure, q_z 19.5 psf
Height above ground, z 25' 0" ft, in
Velocity Pressure, q_z 20.8 psf
Height above ground, z 29' 10" ft, in
Velocity Pressure, q_z 21.9 psf

+Y'

Height above ground, z 13' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 14' 6" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 15' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 20' 0" ft, in
Velocity Pressure, q_z 19.5 psf
Height above ground, z 25' 0" ft, in
Velocity Pressure, q_z 20.8 psf
Height above ground, z 29' 10" ft, in
Velocity Pressure, q_z 21.9 psf

-X'

Height above ground, z 13' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 14' 6" ft, in
Velocity Pressure, q_z 18.0 psf



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 298
Project Name: Lee's Summit Market Plaza		

Height above ground, z 15' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 20' 0" ft, in
Velocity Pressure, q_z 19.5 psf
Height above ground, z 25' 0" ft, in
Velocity Pressure, q_z 20.8 psf
Height above ground, z 29' 10" ft, in
Velocity Pressure, q_z 21.9 psf

-Y'

Height above ground, z 13' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 14' 6" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 15' 0" ft, in
Velocity Pressure, q_z 18.0 psf
Height above ground, z 20' 0" ft, in
Velocity Pressure, q_z 19.5 psf
Height above ground, z 25' 0" ft, in
Velocity Pressure, q_z 20.8 psf
Height above ground, z 29' 10" ft, in
Velocity Pressure, q_z 21.9 psf

Minimum Design Wind Loads

Roof panels: All windward roof panels have 8 psf applied to them. The load is applied to the area of the panel projected at right angles to the wind direction.

Wall panels: All windward wall panels have 16 psf applied to them. The load is applied to the area of the panel projected at right angles to the wind direction.

Generated Loadcases

22 Wind +X'-Y', GCpi 0.18

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft ²]	Applied Load [kip]
WI 1	LY	-9.5	1600	-15.1
WI 3	WY20	7.2	800	5.7
	WY25	7.8	800	6.2
WI 13	LY	-9.5	60	-0.6
WI 12	LX	-6.4	337	-2.2
WI 14	LX	-6.4	146	-0.9
WI 15	LY	-9.5	189	-1.8
WI 16	LX	-6.4	71	-0.5
WI 31	LY	-9.5	2660	-25.1
WI 18	LX	-6.4	803	-5.1
WI 20	WX15	6.4	166	1.1
WI 22	WX13	6.4	154	1.0
WI 23	LY	-9.5	104	-1.0
WI 24	WX13	6.4	925	5.9
WI 25	LY	-9.5	117	-1.1
WI 26	LX	-6.4	588	-3.8
WI 27	LX	-6.4	24	-0.2
WI 28	WY15	6.4	34	0.2



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 299
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 32	WY15	6.4	3102	19.8
WI 33	WX20	7.2	296	2.1
	WX25	7.8	296	2.3
	WX30	8.4	143	1.2

Average Wall Loads

Windward 6.8 psf
 Leeward -8.6 psf
 Left 0.0 psf
 Right 0.0 psf

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	-6.9	22.0	-29' 7 5/8"	9' 3 3/8"
St. 0.9 (LOWEST ROOF)	-7.9	24.8	-30' 4 1/4"	9' 8 3/4"
St. 1 (LOW ROOF)	-5.1	16.2	-31' 8 5/8"	9' 11 1/4"
St. 2 (BOT HIGH ROOF)	-5.6	13.7	-27' 2 5/8"	11' 1 1/4"
St. 3 (TOP HIGH ROOF)	-0.7	0.0	0"	-19' 0"
Total	-26.2	76.6	-	-

Total Loads

X -26.2 kip
 Y 76.6 kip
 Z 0.0 kip

21 Wind -Y', GCpi 0.18, +Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	L	-12.6	1600	-20.2
WI 3	W20	9.5	800	7.6
	W25	10.4	800	8.3
WI 13	L	-12.6	60	-0.8
WI 12	S	-16.1	337	-5.4
WI 14	S	-16.1	146	-2.4
WI 15	L	-12.6	189	-2.4
WI 16	S	-16.1	71	-1.2
WI 31	L	-12.6	2660	-33.5
WI 18	S	-16.1	803	-13.0
WI 20	S	-16.1	166	-2.7
WI 22	S	-16.1	154	-2.5
WI 23	L	-12.6	104	-1.3
WI 24	S	-16.1	925	-14.9
WI 25	L	-12.6	117	-1.5
WI 26	S	-16.1	588	-9.5
WI 27	S	-16.1	24	-0.4
WI 28	W15	8.5	34	0.3
WI 32	W15	8.5	3102	26.3
WI 33	S	-16.1	736	-11.9



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 300
Project Name: Lee's Summit Market Plaza		

Average Wall Loads

Windward 9.0 psf
 Leeward -12.6 psf
 Left -16.1 psf
 Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-6.9	1897	-13.2
RI 9	1	-6.9	1897	-13.2
RI 8	1	-6.9	2026	-14.1
	2	-6.9	2026	-14.1
	3	-6.9	753	-5.2
RI 7	3	-6.9	3300	-22.9
	4	-6.9	1505	-10.4
RI 11	1	-6.9	213	-1.5
	2	-6.9	213	-1.5
	3	-6.9	217	-1.5
RI 14	1	-6.9	325	-2.3
	2	-6.9	325	-2.3
	3	-6.9	527	-3.7
RI 25	1	-6.9	350	-2.4
	2	-6.9	350	-2.4
	3	-6.9	700	-4.9
	4	-6.9	829	-5.8

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	0.0	29.3	-38' 6"	0"
St. 0.9 (LOWEST ROOF)	0.0	33.1	-39' 6 7/8"	-3/8"
St. 1 (LOW ROOF)	0.2	21.5	-41' 1/4"	-3 3/4"
St. 2 (BOT HIGH ROOF)	0.0	18.2	-39' 6"	0"
St. 3 (TOP HIGH ROOF)	0.0	0.0	-	-
Total	0.2	102.2	-	-

Total Loads

X 0.2 kip
 Y 102.2 kip
 Z -120.2 kip

20 Wind -Y', GCpi 0.18, -Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	L	-12.6	1600	-20.2
WI 3	W20	9.5	800	7.6
	W25	10.4	800	8.3
WI 13	L	-12.6	60	-0.8
WI 12	S	-16.1	337	-5.4



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 301
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 14	S	-16.1	146	-2.4
WI 15	L	-12.6	189	-2.4
WI 16	S	-16.1	71	-1.2
WI 31	L	-12.6	2660	-33.5
WI 18	S	-16.1	803	-13.0
WI 20	S	-16.1	166	-2.7
WI 22	S	-16.1	154	-2.5
WI 23	L	-12.6	104	-1.3
WI 24	S	-16.1	925	-14.9
WI 25	L	-12.6	117	-1.5
WI 26	S	-16.1	588	-9.5
WI 27	S	-16.1	24	-0.4
WI 28	W15	8.5	34	0.3
WI 32	W15	8.5	3102	26.3
WI 33	S	-16.1	736	-11.9

Average Wall Loads

Windward 9.0 psf
 Leeward -12.6 psf
 Left -16.1 psf
 Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-19.7	1897	-37.3
RI 9	1	-19.7	1897	-37.3
RI 8	1	-19.7	2026	-39.9
	2	-19.7	2026	-39.9
	3	-12.6	753	-9.5
RI 7	3	-12.6	3300	-41.6
	4	-9.1	1505	-13.6
RI 11	1	-19.7	213	-4.2
	2	-19.7	213	-4.2
	3	-12.6	217	-2.7
RI 14	1	-19.7	325	-6.4
	2	-19.7	325	-6.4
	3	-12.6	527	-6.6
RI 25	1	-19.7	350	-6.9
	2	-19.7	350	-6.9
	3	-12.6	700	-8.8
	4	-9.1	829	-7.5

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	0.0	29.3	-38' 6"	0"
St. 0.9 (LOWEST ROOF)	0.0	33.1	-39' 6 7/8"	-3/8"
St. 1 (LOW ROOF)	0.2	21.5	-41' 1/4"	-3 3/4"
St. 2 (BOT HIGH ROOF)	0.0	14.8	-39' 6"	0"
St. 3 (TOP HIGH ROOF)	0.0	-2.1	-39' 6"	0"



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 302
Project Name: Lee's Summit Market Plaza		

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
Total	0.2	96.7	-	-

Total Loads

X 0.2 kip
Y 96.7 kip
Z -277.9 kip

19 Wind -X'-Y', GCpi 0.18

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	LY	-9.5	1600	-15.1
WI 3	WY20	7.2	800	5.7
	WY25	7.8	800	6.2
WI 13	LY	-9.5	60	-0.6
WI 12	WX15	6.4	337	2.1
WI 14	WX15	6.4	146	0.9
WI 15	LY	-9.5	189	-1.8
WI 16	WX15	6.4	71	0.5
WI 31	LY	-9.5	2660	-25.1
WI 18	WX20	7.2	363	2.6
	WX25	7.8	296	2.3
	WX30	8.4	143	1.2
WI 20	LX	-6.4	166	-1.1
WI 22	LX	-6.4	154	-1.0
WI 23	LY	-9.5	104	-1.0
WI 24	LX	-6.4	925	-5.9
WI 25	LY	-9.5	117	-1.1
WI 26	WX13	6.4	588	3.7
WI 27	WX15	6.4	24	0.2
WI 28	WY15	6.4	34	0.2
WI 32	WY15	6.4	3102	19.8
WI 33	LX	-6.4	736	-4.7

Average Wall Loads

Windward 6.8 psf
Leeward -8.6 psf
Left 0.0 psf
Right 0.0 psf

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	6.9	22.0	-40' 5 3/4"	-12' 8 1/4"
St. 0.9 (LOWEST ROOF)	8.0	24.8	-41' 4 1/4"	-13' 3 1/2"
St. 1 (LOW ROOF)	5.1	16.2	-42' 4 1/8"	-13' 4 1/8"
St. 2 (BOT HIGH ROOF)	5.6	13.7	-40' 6 1/8"	-16' 6 1/4"
St. 3 (TOP HIGH ROOF)	0.7	0.0	0"	-19' 0"
Total	26.2	76.6	-	-



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 303
Project Name: Lee's Summit Market Plaza		

Total Loads

X 26.2 kip
Y 76.6 kip
Z 0.0 kip

18 Wind -X', GCpi 0.18, +Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	S	-16.1	1600	-25.8
WI 3	S	-16.1	1600	-25.8
WI 13	S	-16.1	60	-1.0
WI 12	W15	8.5	337	2.9
WI 14	W15	8.5	146	1.2
WI 15	S	-16.1	189	-3.0
WI 16	W15	8.5	71	0.6
WI 31	S	-16.1	2660	-42.9
WI 18	W20	9.5	363	3.5
	W25	10.4	296	3.1
	W30	11.1	143	1.6
WI 20	L	-8.5	166	-1.4
WI 22	L	-8.5	154	-1.3
WI 23	S	-16.1	104	-1.7
WI 24	L	-8.5	925	-7.9
WI 25	S	-16.1	117	-1.9
WI 26	W13	8.5	588	5.0
WI 27	W15	8.5	24	0.2
WI 28	S	-16.1	34	-0.5
WI 32	S	-16.1	3102	-50.1
WI 33	L	-8.5	736	-6.3

Average Wall Loads

Windward 9.2 psf
Leeward -8.5 psf
Left -16.1 psf
Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-6.9	148	-1.0
	2	-6.9	148	-1.0
	3	-6.9	296	-2.1
	4	-6.9	1304	-9.0
RI 9	1	-6.9	148	-1.0
	2	-6.9	148	-1.0
	3	-6.9	296	-2.1
	4	-6.9	1304	-9.0
RI 8	1	-6.9	375	-2.6
	2	-6.9	375	-2.6
	3	-6.9	751	-5.2
	4	-6.9	3304	-22.9
RI 7	1	-6.9	375	-2.6



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 304
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	2	-6.9	375	-2.6
	3	-6.9	751	-5.2
	4	-6.9	3303	-22.9
RI 11	1	-6.9	472	-3.3
	2	-6.9	170	-1.2
RI 14	1	-6.9	566	-3.9
	2	-6.9	566	-3.9
	3	-6.9	45	-0.3
RI 25	1	-6.9	1038	-7.2
	2	-6.9	978	-6.8
	3	-6.9	213	-1.5

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	9.2	0.0	0"	-19' 0"
St. 0.9 (LOWEST ROOF)	10.6	-0.0	1/4"	-18' 9 1/4"
St. 1 (LOW ROOF)	6.8	-0.1	2 3/4"	-16' 10 7/8"
St. 2 (BOT HIGH ROOF)	7.4	0.0	0"	-19' 0"
St. 3 (TOP HIGH ROOF)	0.9	0.0	0"	-19' 0"
Total	35.0	-0.1	-	-

Total Loads

X 35.0 kip
Y -0.1 kip
Z -120.2 kip

17 Wind -X', GCpi 0.18, -Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	S	-16.1	1600	-25.8
WI 3	S	-16.1	1600	-25.8
WI 13	S	-16.1	60	-1.0
WI 12	W15	8.5	337	2.9
WI 14	W15	8.5	146	1.2
WI 15	S	-16.1	189	-3.0
WI 16	W15	8.5	71	0.6
WI 31	S	-16.1	2660	-42.9
WI 18	W20	9.5	363	3.5
	W25	10.4	296	3.1
	W30	11.1	143	1.6
WI 20	L	-8.5	166	-1.4
WI 22	L	-8.5	154	-1.3
WI 23	S	-16.1	104	-1.7
WI 24	L	-8.5	925	-7.9
WI 25	S	-16.1	117	-1.9
WI 26	W13	8.5	588	5.0
WI 27	W15	8.5	24	0.2
WI 28	S	-16.1	34	-0.5
WI 32	S	-16.1	3102	-50.1



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 305
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 33	L	-8.5	736	-6.3

Average Wall Loads

Windward 9.2 psf
 Leeward -8.5 psf
 Left -16.1 psf
 Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-19.7	148	-2.9
	2	-19.7	148	-2.9
	3	-12.6	296	-3.7
	4	-9.1	1304	-11.8
RI 9	1	-19.7	148	-2.9
	2	-19.7	148	-2.9
	3	-12.6	296	-3.7
	4	-9.1	1304	-11.8
RI 8	1	-19.7	375	-7.4
	2	-19.7	375	-7.4
	3	-12.6	751	-9.5
	4	-9.1	3304	-29.9
RI 7	1	-19.7	375	-7.4
	2	-19.7	375	-7.4
	3	-12.6	751	-9.5
	4	-9.1	3303	-29.9
RI 11	1	-19.7	472	-9.3
	2	-19.7	170	-3.3
RI 14	1	-19.7	566	-11.1
	2	-19.7	566	-11.1
	3	-12.6	45	-0.6
RI 25	1	-19.7	1038	-20.4
	2	-19.7	978	-19.3
	3	-12.6	213	-2.7

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	9.2	0.0	0"	-19' 0"
St. 0.9 (LOWEST ROOF)	10.6	-0.0	1/4"	-18' 9 1/4"
St. 1 (LOW ROOF)	6.8	-0.1	2 3/4"	-16' 10 7/8"
St. 2 (BOT HIGH ROOF)	7.4	0.0	0"	-19' 0"
St. 3 (TOP HIGH ROOF)	0.9	0.0	0"	-19' 0"
Total	35.0	-0.1	-	-

Total Loads

X 35.0 kip
 Y -0.1 kip
 Z -227.5 kip



250 NE Mulberry St., Suite 201
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 306
Project Name: Lee's Summit Market Plaza		

16 Wind -X'+Y', GCpi 0.18

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	WY20	7.2	800	5.7
	WY25	7.8	800	6.2
WI 3	LY	-9.5	1600	-15.1
WI 13	WY15	6.4	60	0.4
WI 12	WX15	6.4	337	2.1
WI 14	WX15	6.4	146	0.9
WI 15	WY15	6.4	189	1.2
WI 16	WX15	6.4	71	0.5
WI 31	WY15	6.4	2660	16.9
WI 18	WX20	7.2	363	2.6
	WX25	7.8	296	2.3
	WX30	8.4	143	1.2
WI 20	LX	-6.4	166	-1.1
WI 22	LX	-6.4	154	-1.0
WI 23	WY13	6.4	104	0.7
WI 24	LX	-6.4	925	-5.9
WI 25	WY13	6.4	117	0.7
WI 26	WX13	6.4	588	3.7
WI 27	WX15	6.4	24	0.2
WI 28	LY	-9.5	34	-0.3
WI 32	LY	-9.5	3102	-29.3
WI 33	LX	-6.4	736	-4.7

Average Wall Loads

Windward 6.8 psf
 Leeward -8.6 psf
 Left 0.0 psf
 Right 0.0 psf

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	6.9	-22.0	-29' 7 5/8"	9' 3 3/8"
St. 0.9 (LOWEST ROOF)	8.0	-24.8	-30' 4"	9' 9"
St. 1 (LOW ROOF)	5.1	-16.2	-31' 9 1/4"	10' 0"
St. 2 (BOT HIGH ROOF)	5.6	-13.7	-27' 2 5/8"	11' 1 1/4"
St. 3 (TOP HIGH ROOF)	0.7	0.0	0"	-19' 0"
Total	26.2	-76.7	-	-

Total Loads

X 26.2 kip
 Y -76.7 kip
 Z 0.0 kip

15 Wind +Y', GCpi 0.18, +Cp

Wall Zone Loads



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Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 307
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	W20	9.5	800	7.6
	W25	10.4	800	8.3
WI 3	L	-12.6	1600	-20.2
WI 13	W15	8.5	60	0.5
WI 12	S	-16.1	337	-5.4
WI 14	S	-16.1	146	-2.4
WI 15	W15	8.5	189	1.6
WI 16	S	-16.1	71	-1.2
WI 31	W15	8.5	2660	22.6
WI 18	S	-16.1	803	-13.0
WI 20	S	-16.1	166	-2.7
WI 22	S	-16.1	154	-2.5
WI 23	W13	8.5	104	0.9
WI 24	S	-16.1	925	-14.9
WI 25	W13	8.5	117	1.0
WI 26	S	-16.1	588	-9.5
WI 27	S	-16.1	24	-0.4
WI 28	L	-12.6	34	-0.4
WI 32	L	-12.6	3102	-39.1
WI 33	S	-16.1	736	-11.9

Average Wall Loads

Windward 9.0 psf
 Leeward -12.6 psf
 Left -16.1 psf
 Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-6.9	1897	-13.2
RI 9	1	-6.9	1897	-13.2
RI 8	3	-6.9	3301	-22.9
	4	-6.9	1505	-10.4
RI 7	1	-6.9	2026	-14.1
	2	-6.9	2026	-14.1
	3	-6.9	752	-5.2
RI 11	1	-6.9	213	-1.5
	2	-6.9	213	-1.5
	3	-6.9	217	-1.5
RI 14	1	-6.9	325	-2.3
	2	-6.9	325	-2.3
	3	-6.9	527	-3.7
RI 25	1	-6.9	250	-1.7
	2	-6.9	250	-1.7
	3	-6.9	500	-3.5
	4	-6.9	660	-4.6
	1	-6.9	100	-0.7
	2	-6.9	100	-0.7
	3	-6.9	200	-1.4
	4	-6.9	169	-1.2



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 308
Project Name: Lee's Summit Market Plaza		

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	0.0	-29.3	-38' 6"	0"
St. 0.9 (LOWEST ROOF)	0.0	-33.1	-39' 6 1/4"	3/8"
St. 1 (LOW ROOF)	0.2	-21.6	-40' 5 1/4"	3 3/4"
St. 2 (BOT HIGH ROOF)	0.0	-18.2	-39' 6"	0"
St. 3 (TOP HIGH ROOF)	0.0	0.0	-	-
Total	0.2	-102.2	-	-

Total Loads

X 0.2 kip
Y -102.2 kip
Z -120.2 kip

14 Wind +Y', GCpi 0.18, -Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	W20	9.5	800	7.6
	W25	10.4	800	8.3
WI 3	L	-12.6	1600	-20.2
WI 13	W15	8.5	60	0.5
WI 12	S	-16.1	337	-5.4
WI 14	S	-16.1	146	-2.4
WI 15	W15	8.5	189	1.6
WI 16	S	-16.1	71	-1.2
WI 31	W15	8.5	2660	22.6
WI 18	S	-16.1	803	-13.0
WI 20	S	-16.1	166	-2.7
WI 22	S	-16.1	154	-2.5
WI 23	W13	8.5	104	0.9
WI 24	S	-16.1	925	-14.9
WI 25	W13	8.5	117	1.0
WI 26	S	-16.1	588	-9.5
WI 27	S	-16.1	24	-0.4
WI 28	L	-12.6	34	-0.4
WI 32	L	-12.6	3102	-39.1
WI 33	S	-16.1	736	-11.9

Average Wall Loads

Windward 9.0 psf
Leeward -12.6 psf
Left -16.1 psf
Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-19.7	1897	-37.3
RI 9	1	-19.7	1897	-37.3



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Lee's Summit, MO 64086
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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 309
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 8	3	-12.6	3301	-41.6
	4	-9.1	1505	-13.6
RI 7	1	-19.7	2026	-39.9
	2	-19.7	2026	-39.9
	3	-12.6	752	-9.5
RI 11	1	-19.7	213	-4.2
	2	-19.7	213	-4.2
	3	-12.6	217	-2.7
RI 14	1	-19.7	325	-6.4
	2	-19.7	325	-6.4
	3	-12.6	527	-6.6
RI 25	1	-19.7	250	-4.9
	2	-19.7	250	-4.9
	3	-12.6	500	-6.3
	4	-9.1	660	-6.0
	1	-19.7	100	-2.0
	2	-19.7	100	-2.0
	3	-12.6	200	-2.5
	4	-9.1	169	-1.5

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	0.0	-29.3	-38' 6"	0"
St. 0.9 (LOWEST ROOF)	0.0	-33.1	-39' 6 1/4"	3/8"
St. 1 (LOW ROOF)	0.2	-21.6	-40' 5 1/4"	3 3/4"
St. 2 (BOT HIGH ROOF)	0.0	-14.8	-39' 6"	0"
St. 3 (TOP HIGH ROOF)	0.0	2.1	-39' 6"	0"
Total	0.2	-96.7	-	-

Total Loads

X 0.2 kip
Y -96.7 kip
Z -277.9 kip

13 Wind +X'+Y', GCpi 0.18

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	WY20	7.2	800	5.7
	WY25	7.8	800	6.2
WI 3	LY	-9.5	1600	-15.1
WI 13	WY15	6.4	60	0.4
WI 12	LX	-6.4	337	-2.2
WI 14	LX	-6.4	146	-0.9
WI 15	WY15	6.4	189	1.2
WI 16	LX	-6.4	71	-0.5
WI 31	WY15	6.4	2660	16.9
WI 18	LX	-6.4	803	-5.1
WI 20	WX15	6.4	166	1.1
WI 22	WX13	6.4	154	1.0



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 310
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft ²]	Applied Load [kip]
WI 23	WY13	6.4	104	0.7
WI 24	WX13	6.4	925	5.9
WI 25	WY13	6.4	117	0.7
WI 26	LX	-6.4	588	-3.8
WI 27	LX	-6.4	24	-0.2
WI 28	LY	-9.5	34	-0.3
WI 32	LY	-9.5	3102	-29.3
WI 33	WX20	7.2	296	2.1
	WX25	7.8	296	2.3
	WX30	8.4	143	1.2

Average Wall Loads

Windward 6.8 psf
 Leeward -8.6 psf
 Left 0.0 psf
 Right 0.0 psf

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	-6.9	-22.0	-40' 5 3/4"	-12' 8 1/4"
St. 0.9 (LOWEST ROOF)	-7.9	-24.8	-41' 4 5/8"	-13' 3 1/8"
St. 1 (LOW ROOF)	-5.1	-16.2	-42' 5 1/2"	-13' 3 1/2"
St. 2 (BOT HIGH ROOF)	-5.6	-13.7	-40' 6 1/8"	-16' 6 1/4"
St. 3 (TOP HIGH ROOF)	-0.7	0.0	0"	-19' 0"
Total	-26.2	-76.7	-	-

Total Loads

X -26.2 kip
 Y -76.7 kip
 Z 0.0 kip

12 Wind +X', GCpi 0.18, +Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft ²]	Applied Load [kip]
WI 1	S	-16.1	1600	-25.8
WI 3	S	-16.1	1600	-25.8
WI 13	S	-16.1	60	-1.0
WI 12	L	-8.5	337	-2.9
WI 14	L	-8.5	146	-1.3
WI 15	S	-16.1	189	-3.0
WI 16	L	-8.5	71	-0.6
WI 31	S	-16.1	2660	-42.9
WI 18	L	-8.5	803	-6.9
WI 20	W15	8.5	166	1.4
WI 22	W13	8.5	154	1.3
WI 23	S	-16.1	104	-1.7
WI 24	W13	8.5	925	7.9
WI 25	S	-16.1	117	-1.9
WI 26	L	-8.5	588	-5.0



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 311
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 27	L	-8.5	24	-0.2
WI 28	S	-16.1	34	-0.5
WI 32	S	-16.1	3102	-50.1
WI 33	W20	9.5	296	2.8
	W25	10.4	296	3.1
	W30	11.1	143	1.6

Average Wall Loads

Windward 9.1 psf
 Leeward -8.5 psf
 Left -16.1 psf
 Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-6.9	148	-1.0
	2	-6.9	148	-1.0
	3	-6.9	296	-2.1
	4	-6.9	1304	-9.0
RI 9	1	-6.9	148	-1.0
	2	-6.9	148	-1.0
	3	-6.9	296	-2.1
	4	-6.9	1304	-9.0
RI 8	1	-6.9	375	-2.6
	2	-6.9	375	-2.6
	3	-6.9	751	-5.2
	4	-6.9	3304	-22.9
RI 7	1	-6.9	375	-2.6
	2	-6.9	375	-2.6
	3	-6.9	751	-5.2
	4	-6.9	3303	-22.9
RI 11	1	-6.9	472	-3.3
	2	-6.9	170	-1.2
RI 14	1	-6.9	566	-3.9
	2	-6.9	566	-3.9
	3	-6.9	45	-0.3
RI 25	1	-6.9	148	-1.0
	2	-6.9	89	-0.6
	1	-6.9	889	-6.2
	2	-6.9	889	-6.2
	3	-6.9	213	-1.5

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	-9.2	0.0	0"	-19' 0"
St. 0.9 (LOWEST ROOF)	-10.6	-0.0	-1/4"	-19' 1 1/2"
St. 1 (LOW ROOF)	-6.8	-0.1	-3 3/8"	-20' 4 5/8"
St. 2 (BOT HIGH ROOF)	-7.4	0.0	0"	-19' 0"
St. 3 (TOP HIGH ROOF)	-0.9	0.0	0"	-19' 0"



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 312
Project Name: Lee's Summit Market Plaza		

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
Total	-34.9	-0.1	-	-

Total Loads

X -34.9 kip
Y -0.1 kip
Z -120.2 kip

11 Wind +X', GCpi 0.18, -Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 1	S	-16.1	1600	-25.8
WI 3	S	-16.1	1600	-25.8
WI 13	S	-16.1	60	-1.0
WI 12	L	-8.5	337	-2.9
WI 14	L	-8.5	146	-1.3
WI 15	S	-16.1	189	-3.0
WI 16	L	-8.5	71	-0.6
WI 31	S	-16.1	2660	-42.9
WI 18	L	-8.5	803	-6.9
WI 20	W15	8.5	166	1.4
WI 22	W13	8.5	154	1.3
WI 23	S	-16.1	104	-1.7
WI 24	W13	8.5	925	7.9
WI 25	S	-16.1	117	-1.9
WI 26	L	-8.5	588	-5.0
WI 27	L	-8.5	24	-0.2
WI 28	S	-16.1	34	-0.5
WI 32	S	-16.1	3102	-50.1
WI 33	W20	9.5	296	2.8
	W25	10.4	296	3.1
	W30	11.1	143	1.6

Average Wall Loads

Windward 9.1 psf
Leeward -8.5 psf
Left -16.1 psf
Right -16.1 psf

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 10	1	-19.7	148	-2.9
	2	-19.7	148	-2.9
	3	-12.6	296	-3.7
	4	-9.1	1304	-11.8
RI 9	1	-19.7	148	-2.9
	2	-19.7	148	-2.9
	3	-12.6	296	-3.7
	4	-9.1	1304	-11.8



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 313
Project Name: Lee's Summit Market Plaza		

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 8	1	-19.7	375	-7.4
	2	-19.7	375	-7.4
	3	-12.6	751	-9.5
	4	-9.1	3304	-29.9
RI 7	1	-19.7	375	-7.4
	2	-19.7	375	-7.4
	3	-12.6	751	-9.5
	4	-9.1	3303	-29.9
RI 11	1	-19.7	472	-9.3
	2	-19.7	170	-3.3
RI 14	1	-19.7	566	-11.1
	2	-19.7	566	-11.1
	3	-12.6	45	-0.6
RI 25	1	-19.7	148	-2.9
	2	-19.7	89	-1.8
	1	-19.7	889	-17.5
	2	-19.7	889	-17.5
	3	-12.6	213	-2.7

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. Base (Base)	-9.2	0.0	0"	-19' 0"
St. 0.9 (LOWEST ROOF)	-10.6	-0.0	-1/4"	-19' 1 1/2"
St. 1 (LOW ROOF)	-6.8	-0.1	-3 3/8"	-20' 4 5/8"
St. 2 (BOT HIGH ROOF)	-7.4	0.0	0"	-19' 0"
St. 3 (TOP HIGH ROOF)	-0.9	0.0	0"	-19' 0"
Total	-34.9	-0.1	-	-

Total Loads

X -34.9 kip
Y -0.1 kip
Z -227.5 kip

27 Wind -X' - Min Design Load

Wind Walls

Reference	Effective Area [ft²]	Area Load [psf]	Wind Force [kip]
WI 12	337.1	16.0	5.4
WI 14	146.3	16.0	2.3
WI 16	71.3	16.0	1.1
WI 18	802.9	16.0	12.8
WI 26	588.3	16.0	9.4
WI 27	23.7	16.0	0.4

Total Loads

X 31.5 kip
Y 0.0 kip
Z 0.0 kip



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Made by: ACO/RAH

Date: 11/01/2023

Job No. 23-23

Revision:

Date:

Sheet No. 314

Project Name: Lee's Summit Market Plaza

26 Wind -X'+Y' - Min Design Load

Wind Walls

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
WI 1	1131.4	16.0	18.1
WI 13	42.4	16.0	0.7
WI 12	238.4	16.0	3.8
WI 14	103.4	16.0	1.7
WI 15	133.3	16.0	2.1
WI 16	50.4	16.0	0.8
WI 31	1880.9	16.0	30.1
WI 18	567.7	16.0	9.1
WI 23	73.5	16.0	1.2
WI 25	82.7	16.0	1.3
WI 26	416.0	16.0	6.7
WI 27	16.8	16.0	0.3

Roofs

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
RI 7	546.8	8.0	4.4

Total Loads

X 56.7 kip

Y -56.7 kip

Z 0.0 kip

25 Wind +Y' - Min Design Load

Wind Walls

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
WI 1	1600.0	16.0	25.6
WI 13	60.0	16.0	1.0
WI 15	188.5	16.0	3.0
WI 31	2660.0	16.0	42.6
WI 23	104.0	16.0	1.7
WI 25	117.0	16.0	1.9

Roofs

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
RI 7	773.3	8.0	6.2

Total Loads

X 0.0 kip

Y -81.9 kip

Z 0.0 kip

24 Wind +X'+Y' - Min Design Load

Wind Walls



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 315
Project Name: Lee's Summit Market Plaza		

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
WI 1	1131.4	16.0	18.1
WI 13	42.4	16.0	0.7
WI 15	133.3	16.0	2.1
WI 31	1880.9	16.0	30.1
WI 20	117.4	16.0	1.9
WI 22	109.0	16.0	1.7
WI 23	73.5	16.0	1.2
WI 24	654.0	16.0	10.5
WI 25	82.7	16.0	1.3
WI 33	520.5	16.0	8.3

Roofs

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
RI 7	546.8	8.0	4.4

Total Loads

X -56.8 kip
Y -56.8 kip
Z 0.0 kip

23 Wind +X' - Min Design Load

Wind Walls

Reference	Effective Area [ft ²]	Area Load [psf]	Wind Force [kip]
WI 20	166.0	16.0	2.7
WI 22	154.1	16.0	2.5
WI 24	924.9	16.0	14.8
WI 33	736.1	16.0	11.8

Total Loads

X -31.7 kip
Y 0.0 kip
Z 0.0 kip

Snow Data

General

Method ASCE7

Basic data

Ground Snow Load, p_g 20.0 psf ASCE7-16 Clause 7.2
Terrain Category B (urban, suburban, wooded)
Exposure Partially exposed
Exposure Factor, C_e 1.000 ASCE7-16 Clause 7.3.1
Thermal Condition All except below
Thermal Factor, C_t 1.000 ASCE7-16 Clause 7.3.2
Risk Category III
Snow Importance Factor, I_s 1.100



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 316
Project Name: Lee's Summit Market Plaza		

Flat Roof Snow Load, p_f 15.4

psf ASCE7-16 Clause 7.3

Snow load cases

Minimum Snow Load No
 Balanced Snow Load Yes
 Unbalanced Snow Load Yes
 Drift Snow Load Yes
 Rain on Snow Surcharge No

Seismic Loading Summary

General

Method ASCE7

Structure details

Height to highest level 29' 10" ft, in

Ignore seismic in floor (and below) St. Base (Base)

Number of storeys 2

Max earthquake spectral response

S_s short (0.2 s) period (mapped) 10.00 % g

S_1 1.0 s period (mapped) 6.80 % g

Site Class C - Very dense soil/soft rock ASCE7-16 Table 20.3-1

Risk Category III ASCE7-16 Table 1.5-1

Design spectral response acceleration

S_{DS} short (0.2 s) period 8.67 % g ASCE7-16 Clause 11.4-3

S_{D1} 1.0 s period 6.80 % g ASCE7-16 Clause 11.4-4

Seismic Importance Factor, I_e 1.250 ASCE7-16 Table 1.5-2

Seismic Design Category B ASCE7-16 Clause 11.6

T_L long period transition period 12.000 sec

T_s (S_{D1}/S_{DS}) 0.785 sec

Effective Seismic Weight, W 1069.7 kip ASCE7-16 Clause 12.7.2

Structure Type ASCE7-16 Table 12.8-2

Direction Dir1 All other structural systems

Direction Dir2 All other structural systems

Basic seismic force resisting system ASCE7-16 Table 12.2-1

Direction Dir1 A. Bearing Wall Systems

9. Ordinary reinforced masonry shear walls

Direction Dir2 A. Bearing Wall Systems

9. Ordinary reinforced masonry shear walls

Direction Dir1 Direction Dir2

Response Modification Factor, R 2.000 2.000

System Over-Strength Factor, Ω_0 2.500 2.500

Deflection Amplification Factor, C_d 1.750 1.750

Redundancy Factor, p 1.000 1.000 ASCE7-16 Clause 12.3.4.2

Approximate fundamental period, T_a [sec] 0.256 0.256 ASCE7-16 Clause 12.8.2.1

Exponent related to structural period k 1.000 1.000

Seismic response coefficient, C_s 0.054 0.054 ASCE7-16 Clause 12.8.1.1

Seismic base shear, V [kip] **57.9** **57.9**

Scaling Factor for Forces ($1.00 V/V_t$) - - ASCE7-16 Clause 12.9.1.4.1

Scaling Factor for Drifts - - ASCE7-16 Clause 12.9.1.4.2

Structure Plan Irregularities - User Defined ASCE7-16 Table 12.3-1

Plan irreg 1a - torsion No

Plan irreg 1b - extreme torsion No

Plan irreg 2 - re-entrant corners No



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 317
Project Name: Lee's Summit Market Plaza		

Plan irreg 3 - diaphragm discontinuity No
 Plan irreg 4 - out of plane No
 Plan irreg 5 - Non parallel systems No

Structure Vertical Irregularities - User Defined

ASCE7-16 Table 12.3-2

Vert irreg 1a - soft story No
 Vert irreg 1b - extreme soft story No
 Vert irreg 2 - weight mass No
 Vert irreg 3 - geometric No
 Vert irreg 4 - in plane No
 Vert irreg 5a - weak story No
 Vert irreg 5b - extreme weak story No

Equivalent Lateral Force Procedure is permitted (ASCE7-16 12.8)

Reference	Level [ft, in]	Weight [kip]	Direction Dir1			Direction Dir2		
			C _v	F [kip]	Ecc [ft, in]	C _v	F [kip]	Ecc [ft, in]
St. 3 (TOP HIGH ROOF)	29' 10"	4.4	0.007	0.4	4' 1 3/4"	0.007	0.4	10' 8 3/8"
	29' 2 7/8"	4.4	0.007	0.4	4' 1 3/4"	0.007	0.4	10' 8 3/8"
St. 2.2 (2.2)	29' 2 5/8"	6.0	0.009	0.5	4' 1 3/4"	0.009	0.5	10' 8 3/8"
	28' 7 3/4"	4.4	0.007	0.4	4' 1 3/4"	0.007	0.4	10' 8 3/8"
	28' 5/8"	4.4	0.006	0.4	4' 1 3/4"	0.006	0.4	10' 8 3/8"
St. 2.0.2 (2.0.2)	27' 10 5/8"	1.4	0.002	0.1	4' 1 3/4"	0.002	0.1	10' 8 3/8"
	27' 5 1/2"	4.4	0.006	0.4	4' 1 3/4"	0.006	0.4	10' 8 3/8"
	26' 10 3/8"	4.4	0.006	0.4	4' 1 3/4"	0.006	0.4	10' 8 3/8"
	26' 3 1/4"	4.4	0.006	0.4	4' 1 3/4"	0.006	0.4	10' 8 3/8"
	25' 8 1/8"	4.4	0.006	0.3	4' 1 3/4"	0.006	0.3	10' 8 3/8"
	25' 1"	4.4	0.006	0.3	4' 1 3/4"	0.006	0.3	10' 8 3/8"
St. 2 (BOT HIGH ROOF)	25' 0"	327.2	0.429	24.8	4' 1 3/4"	0.429	24.8	10' 8 3/8"
St. 1 (LOW ROOF)	15' 0"	275.7	0.217	12.6	4' 1 3/4"	0.217	12.6	10' 8 3/8"
St. 0.9 (LOWEST ROOF)	13' 0"	419.8	0.286	16.6	4' 1 3/4"	0.286	16.6	10' 8 3/8"

Analysis procedure to be used:

Equivalent Lateral Force Procedure



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 318
Project Name: Lee's Summit Market Plaza		

Steel

Beam Design

Beam Design Summary

Static

Member Reference	Group Ref.	Span	Section	Grade	Length [ft, in]	No. Connectors	Camber	Utilization	Status
SB 1/A.9/6.5-1/A.9/5.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.930	✓ Pass
SB 1/A.9/5.5-1/A.9/4.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.932	✓ Pass
SB 1/B/6.5-1/A.9/6.5	SBR17	1	W 12x19	A992-50	4' 9"		0.00	0.311	✓ Pass
SB 1/B/6.5-1/A.9/6.5	SBR17	2	W 12x19	A992-50	7' 1 1/4"		0.00	0.323	✓ Pass
SB 1/A.1/6.5-1/A.6.5	SBR14	1	W 12x19	A992-50	11' 10 1/4"		0.00	0.108	✓ Pass
SB 1/A.1/5.5-1/A.1/4.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.824	✓ Pass
SB 1/A.1/4.5-1/A.1/3.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.824	✓ Pass
SB 1/A.1/3.5-1/A.1/2.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.824	✓ Pass
SB 2/A.1/6.5-2/A.1/5.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.690	✓ Pass
SB 2/A.1/5.5-2/A.1/4.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.727	✓ Pass
SB 2/A.1/4.5-2/A.1/3.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.726	✓ Pass
SB 2/A.1/3.5-2/A.1/2.5	SBR52	1	W 24x76	A992-50	40' 0"		0.00	0.867	✓ Pass
SB 2/A.9/3.5-2/A.9/2.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.890	✓ Pass
SB 2/A.9/6.5-2/A.9/5.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.690	✓ Pass
SB 2/A.9/5.5-2/A.9/4.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.727	✓ Pass
SB 2/A.9/4.5-2/A.9/3.5	SBR51	1	W 24x76	A992-50	40' 0"		0.00	0.726	✓ Pass
SB IP 3/A.1/6.5-IP 3/6.5/#4677	SBR25	1	W 12x19	A992-50	17' 10 3/4"		0.00	0.130	✓ Pass
SB IP 5/A.9/6.5-IP 5/6.5/#6122	SBR50	1	W 12x19	A992-50	26' 2 7/8"		0.00	0.215	✓ Pass
SB 1/6.5/#4674-1/A.9/6.5	SBR22	1	W 18x35	A992-50	25' 10 3/4"		0.00	0.961	✓ Pass
SB 0.9/A.1/6.5-0.9/A.1/8	SBR31	1	W 21x44	A992-50	26' 0"		0.00	0.979	✓ Pass
SB 1/A.9/4.5-1/A.9/3.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.932	✓ Pass
SB 1/A.1/6.5-1/A.1/5.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.824	✓ Pass
SB 1/A.9/3.5-1/A.9/2.5	SBR51	1	W 21x44	A992-50	40' 0"		0.00	0.927	✓ Pass
SB 0.9/6.5/#4676-0.9/6.5/#4675	SBR23	1	W 12x19	A992-50	15' 8 3/4"		0.00	0.607	✓ Pass
SB 0.9/6.5/#4675-0.9/A.1/6.5	SBR24	1	W 12x19	A992-50	17' 8"		0.00	0.785	✓ Pass
SB 0.9/6.5/#4676-0.9/909/915	SBR32	1	W 14x26	A992-50	17' 0"		0.00	0.850	✓ Pass
SB 0.9/A.1/6.5-0.9/A.6.5	SBR33	1	W 12x19	A992-50	11' 10 1/4"		0.00	0.067	✓ Pass
SB 1/909/915-1/6.5/#4674	SBR32	1	W 12x19	A992-50	17' 0"		0.00	0.046	✓ Pass
SB 1/909/915-1/914/915	SBR34	1	W 12x19	A992-50	9' 9"		0.00	0.242	✓ Pass
SB 1/914/915-1/913/914	SBR35	1	W 12x19	A992-50	4' 0"		0.00	0.004	✓ Pass
SB 1/913/914-1/913/916	SBR36	1	W 10x54	A992-50	23' 3"		0.00	0.940	✓ Pass
SB 1/913/916-1/6.5/916	SBR37	1	W 10x12	A992-50	13' 0"		0.00	0.619	✓ Pass
SB 1/6.5/#6112-1/#4783/#6112	SBR39	1	C 7x9.8	A36-36	13' 0"		0.00	0.300	✓ Pass
SB 1/6.5/#6112-1/#4783/#6112	SBR39	2	C 7x9.8	A36-36	4' 0"		0.00	0.457	✓ Pass
SB 1/6.5/#6111-1/#4783/#6111	SBR53	1	C 7x9.8	A36-36	17' 0"		0.00	0.092	✓ Pass
SB 1/6.5/#6110-1/#4783/#6110	SBR53	1	C 7x9.8	A36-36	17' 0"		0.00	0.030	✓ Pass
SB IP 3/6.5/#4677-IP 3/6.5/#721	SBR48	1	W 12x19	A992-50	12' 1 5/8"		0.00	0.131	✓ Pass
SB IP 5/6.5/#2986-IP 5/6.5/#6122	SBR49	1	W 12x19	A992-50	3' 9 1/2"		0.00	0.555	✓ Pass
SB 1/6.5/#6113-1/#4783/#6113	SBR42	1	C 7x9.8	A36-36	13' 0"		0.00	0.631	✓ Pass
SB 1/6.5/#6113-1/#4783/#6113	SBR42	2	C 7x9.8	A36-36	4' 0"		0.00	0.994	✓ Pass
SB 1/6.5/#6114-1/#4783/#6114	SBR42	1	C 7x9.8	A36-36	13' 0"		0.00	0.494	✓ Pass
SB 1/6.5/#6114-1/#4783/#6114	SBR42	2	C 7x9.8	A36-36	4' 0"		0.00	0.768	✓ Pass



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Revision:	Date:	Sheet No. 319
Project Name: Lee's Summit Market Plaza		

Member Reference	Group Ref.	Span	Section	Grade	Length [ft, in]	No. Connectors	Camber	Utilization	Status
SB 1/B/#6429-1/%827	SBR43	1	C 7x12.25	A36-36	4' 9"		0.00	0.800	✓ Pass
SB 1/B/#6429-1/%827	SBR43	2	C 7x12.25	A36-36	3' 0"		0.00	0.800	✓ Pass
SB 1/B/#6117-1/%825	SBR45	1	C 7x9.8	A36-36	4' 9"		0.00	0.212	✓ Pass
SB 1/B/#6117-1/%825	SBR45	2	C 7x9.8	A36-36	3' 0"		0.00	0.212	✓ Pass
SB 1/B/#6118-1/%826	SBR43	1	C 7x9.8	A36-36	4' 9"		0.00	0.151	✓ Pass
SB 1/B/#6118-1/%826	SBR43	2	C 7x9.8	A36-36	3' 0"		0.00	0.151	✓ Pass
SB 1/B/6.5-1/B/#4783	SBR47	1	L 4x4x1/2	A992-50	17' 0"		0.00	0.966	✓ Pass
SB 1/B/#4783-1/914/915	SBR46	1	L 4x4x3/8	A992-50	28' 0"		0.00	0.937	✓ Pass
SB 1/B/#6423-1/%823	SBR55	1	C 7x12.25	A36-36	4' 9"		0.00	0.939	✓ Pass
SB 1/B/#6423-1/%823	SBR55	2	C 7x12.25	A36-36	3' 0"		0.00	0.939	✓ Pass
SB 1/6.5/#6427-1/%822	SBR39	1	C 7x14.75	A36-36	13' 0"		0.00	0.966	✓ Pass
SB 1/6.5/#6427-1/%822	SBR39	2	C 7x14.75	A36-36	4' 0"		0.00	0.973	✓ Pass
SB 1/6.5/#6115-1/#4783/#6115	SBR39	1	C 7x9.8	A36-36	13' 0"		0.00	0.475	✓ Pass
SB 1/6.5/#6115-1/#4783/#6115	SBR39	2	C 7x9.8	A36-36	4' 0"		0.00	0.659	✓ Pass

Column Design

Column Design Summary

Static

Member Reference	Group Ref.	Stack	Section	Grade	Length [ft, in]	Utilization	Status
SC A.1/3.5	SCR87	1	W 10x68	A992-50	15' 0"	0.254	✓ Pass
SC A.1/3.5	SCR87	2	W 10x68	A992-50	10' 0"	0.170	✓ Pass
SC A.1/4.5	SCR82	1	W 10x68	A992-50	15' 0"	0.181	✓ Pass
SC A.1/4.5	SCR82	2	W 10x68	A992-50	10' 0"	0.152	✓ Pass
SC A.1/5.5	SCR82	1	W 10x68	A992-50	15' 0"	0.180	✓ Pass
SC A.1/5.5	SCR82	2	W 10x68	A992-50	10' 0"	0.156	✓ Pass
SC A.1/6.5	SCR88	1	W 10x68	A992-50	13' 0"	0.184	✓ Pass
SC A.1/6.5	SCR88	2	W 10x68	A992-50	2' 0"	0.172	✓ Pass
SC A.1/6.5	SCR88	3	W 10x68	A992-50	10' 0"	0.152	✓ Pass
SC A.9/2.5	SCR91	1	HSS 6x6x5/8	A500B-46	13' 0"	0.291	✓ Pass
SC A.9/2.5	SCR91	2	HSS 6x6x5/8	A500B-46	2' 0"	0.291	✓ Pass
SC A.9/2.5	SCR91	3	HSS 6x6x5/8	A500B-46	10' 0"	0.291	✓ Pass
SC A.9/6.5	SCR89	1	W 10x68	A992-50	15' 0"	0.213	✓ Pass
SC A.9/6.5	SCR89	2	W 10x68	A992-50	10' 0"	0.151	✓ Pass
SC A.9/5.5	SCR83	1	W 10x68	A992-50	15' 0"	0.269	✓ Pass
SC A.9/5.5	SCR83	2	W 10x68	A992-50	10' 0"	0.168	✓ Pass
SC A.9/4.5	SCR15	1	W 10x68	A992-50	15' 0"	0.270	✓ Pass
SC A.9/4.5	SCR15	2	W 10x68	A992-50	10' 0"	0.163	✓ Pass
SC A.1/2.5	SCR90	1	HSS 6x6x5/8	A500B-46	15' 0"	0.160	✓ Pass
SC A.1/2.5	SCR90	2	HSS 6x6x5/8	A500B-46	10' 0"	0.247	✓ Pass
SC 6.5/916	SCR38	1	HSS 4x4x1/8	A500B-46	15' 0"	0.004	✓ Pass
SC B/6.5	SCR56	1	HSS 4x4x3/8	A500B-46	15' 0"	0.216	✓ Pass
SC 6.5/#4669	SCR97	1	HSS 4-1/2x4-1/2x3/8	A500B-46	13' 0"	0.872	⚠ Warning



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Revision:	Date:	Sheet No. 320
Project Name: Lee's Summit Market Plaza		

Member Reference	Group Ref.	Stack	Section	Grade	Length [ft, in]	Utilization	Status
SC 6.5/#4669	SCR97	2	HSS 4-1/2x4-1/2x3/8	A500B-46	14' 10 5/8"	0.917	Warning
SC 6.5/909	SCR95	1	HSS 6x6x3/8	A500B-46	13' 0"	0.591	Warning
SC 6.5/909	SCR95	2	HSS 6x6x3/8	A500B-46	2' 0"	0.701	Warning
SC 6.5/909	SCR95	3	HSS 6x6x3/8	A500B-46	14' 2 5/8"	0.769	Warning
SC A.9/3.5	SCR83	1	W 10x68	A992-50	15' 0"	0.270	Pass
SC A.9/3.5	SCR83	2	W 10x68	A992-50	10' 0"	0.175	Pass
SC 913/914	SCR77	1	HSS 4x4x3/8	A500B-46	15' 0"	0.849	Pass
SC 913/916	SCR98	1	HSS 4-1/2x4-1/2x3/8	A500B-46	15' 0"	0.892	Pass
SC 914/915	SCR56	1	HSS 4x4x3/8	A500B-46	15' 0"	0.240	Pass
SC 909/915	SCR99	1	HSS 4x4x1/2	A500B-46	13' 0"	0.645	Pass
SC 909/915	SCR99	2	HSS 4x4x1/2	A500B-46	2' 0"	0.869	Pass

Brace Design

Brace Design Summary

Static

Member Reference	Group Ref.	Span	Section	Grade	Length [ft, in]	Utilization	Status
SBR 2/A.1/6.5-0.9/6.5/#4669	SBrR10	1	HSS 4x4x1/8	A500B-46	21' 4 1/4"	0.489	Pass
SBR FRM 6.5/#708/#4669-0.9/A.1/6.5	SBrR13	1	HSS 4x4x3/16	A500B-46	23' 1 1/8"	0.594	Pass

Concrete

Slab/Mat Design

Slab/Mat Design Summary

Static & RSA

Level	Slab	Reference	Type	Thickness [in]	Grade	Utilization	Status
St. Base (Base) : 0"ft, in	MF 1	SI 1	Foundation mat	36	4000 psi	0.037	Warning

Slab/Mat Design per Plane

St. Base (Base)

Slab/Mat Panels

Mat: MF 1, Panel: SI 1

Static & RSA Design Summary

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in ² /ft]	Area Required [in ² /ft]	Utilization
Bottom-X	#8-12-B2	0.79	0.04	0.045
Bottom-Y	#8-12-B1	0.79	0.03	0.042
Top-X	#8-12-T2	0.79	0.01	0.008
Top-Y	#8-12-T1	0.79	0.01	0.010

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	2.04	2.40	Pass	0.848

Pad Base Design



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Revision:	Date:	Sheet No. 321
Project Name: Lee's Summit Market Plaza		

Pad Base Group Design Summary

Static

Reference	No. in Group	Critical Member	Size [in]	Grade	Max. UR	Status
PBG14	5	-	No critical member set			

Reference	Size [in]	Grade	Max. UR	Status
PB 1	4' 0" Å— 4' 0" (Depth =	4000 psi	0.861	✓ Pass
PB 4	4' 2" Å— 4' 2" (Depth =	4000 psi	0.964	✓ Pass
PB 5	6' 0" Å— 6' 0" (Depth =	4000 psi	0.942	✓ Pass
PB 7	3' 0" Å— 3' 0" (Depth =	4000 psi	0.526	✓ Pass
PB 15	7' 0" Å— 7' 0" (Depth =	4000 psi	0.807	✓ Pass
PB 11	5' 0" Å— 5' 0" (Depth =	4000 psi	0.663	✓ Pass
PB 12	5' 0" Å— 5' 0" (Depth =	4000 psi	0.721	✓ Pass
PB 16	7' 0" Å— 7' 0" (Depth =	4000 psi	0.970	✓ Pass
PB 17	6' 0" Å— 6' 0" (Depth =	4000 psi	0.323	✓ Pass
PB 18	5' 4" Å— 5' 4" (Depth =	4000 psi	0.967	✓ Pass

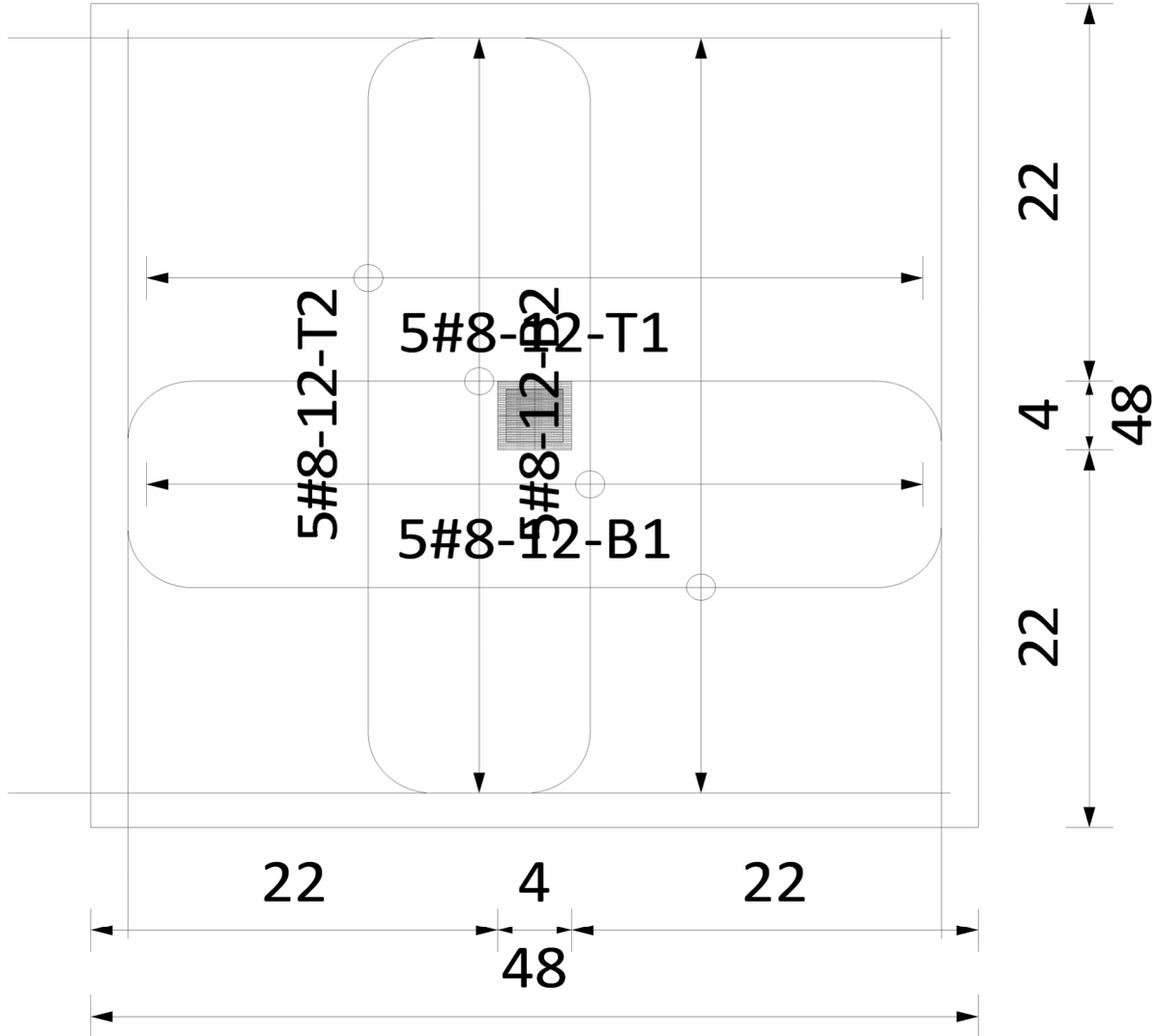
PB 1



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Revision:	Date:	Sheet No. 322
Project Name: Lee's Summit Market Plaza		

4' 0" × 4' 0" (Depth = 36in)



PB 1

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	Grillage Chase Down	3D Building Analysis
Combination	145 LRFD _{8.68} -1.2D+1.6S+0.5W	234 LRFD _{12.4} -0.9D+W
P	37.1 kip	1.7 kip
F _{x,sup}	-0.2 kip	0.3 kip



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Revision:	Date:	Sheet No. 323
Project Name: Lee's Summit Market Plaza		

F _{y,sup}	-0.1 kip	0.1 kip
M _{x,sup}	0.0 kip ft	0.0 kip ft
M _{y,sup}	0.0 kip ft	0.0 kip ft
Added Loads		
F _{swt}	7.2 kip	
F _{soil}	0.0 kip	
F _{dl,sur}	0.0 kip	
F _{ll,sur}	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	4' 0" Å— 4'
Overall Depth	36 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	4' 0" Å— 4' 0"
Analysis	Grillage Chase Down
Combination	145 LRFD _{8.68} -1.2D+1.6S+0.5W
q _{max}	2.07 ksf
q _{a,g}	2.40 ksf
Ratio	0.860

Bending Capacity

Summary

Direction	X-Bot	Y-Bot	X-Top	Y-Top
Analysis	Grillage Chase Down	Grillage Chase Down	3D Building Analysis	3D Building Analysis
Combination	145 LRFD _{8.68} -1.2D+1.6S+0.5W	145 LRFD _{8.68} -1.2D+1.6S+0.5W	234 LRFD _{12.4} -0.9D+W	234 LRFD _{12.4} -0.9D+W
m _u	3.9 kip-ft/ft	4.0 kip-ft/ft	0.7 kip-ft/ft	0.7 kip-ft/ft
d	33 in	34 in	33 in	34 in
R _n / R _{nt}	0.004	0.004	0.001	0.001
A _{s,reqd}	0.03 in ² /ft	0.03 in ² /ft	0.00 in ² /ft	0.00 in ² /ft
A _{s,prov}	0.79 in ² /ft	0.79 in ² /ft	0.79 in ² /ft	0.79 in ² /ft
A _{s,min}	0.78 in ² /ft	0.78 in ² /ft	0.78 in ² /ft	0.78 in ² /ft
Ratio	0.033	0.033	0.006	0.006
Reinforcement	Deformed # 8 @ 12-B2	Deformed # 8 @ 12-B1	Deformed # 8 @ 12-T2	Deformed # 8 @ 12-T1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D	1 LRFD ₁ -1.4D
v _u	0.000 ksi	0.000 ksi
φ _{shear} Å— v _n	0.047 ksi	0.048 ksi
Ratio	0.000	0.000



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Revision:	Date:	Sheet No. 324
Project Name: Lee's Summit Market Plaza		

Punching Shear

Summary

Analysis	Combination	b _o [in]	v _u [ksi]	v _n [ksi]	Ratio	Status
3D Building Analysis	40 LRFD _{6.16} -1.2D+L+1.6S	85 1/2	0.003	0.190	0.014	✓ Pass

Uplift

Summary

Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000

PB 4



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Job No. 23-23

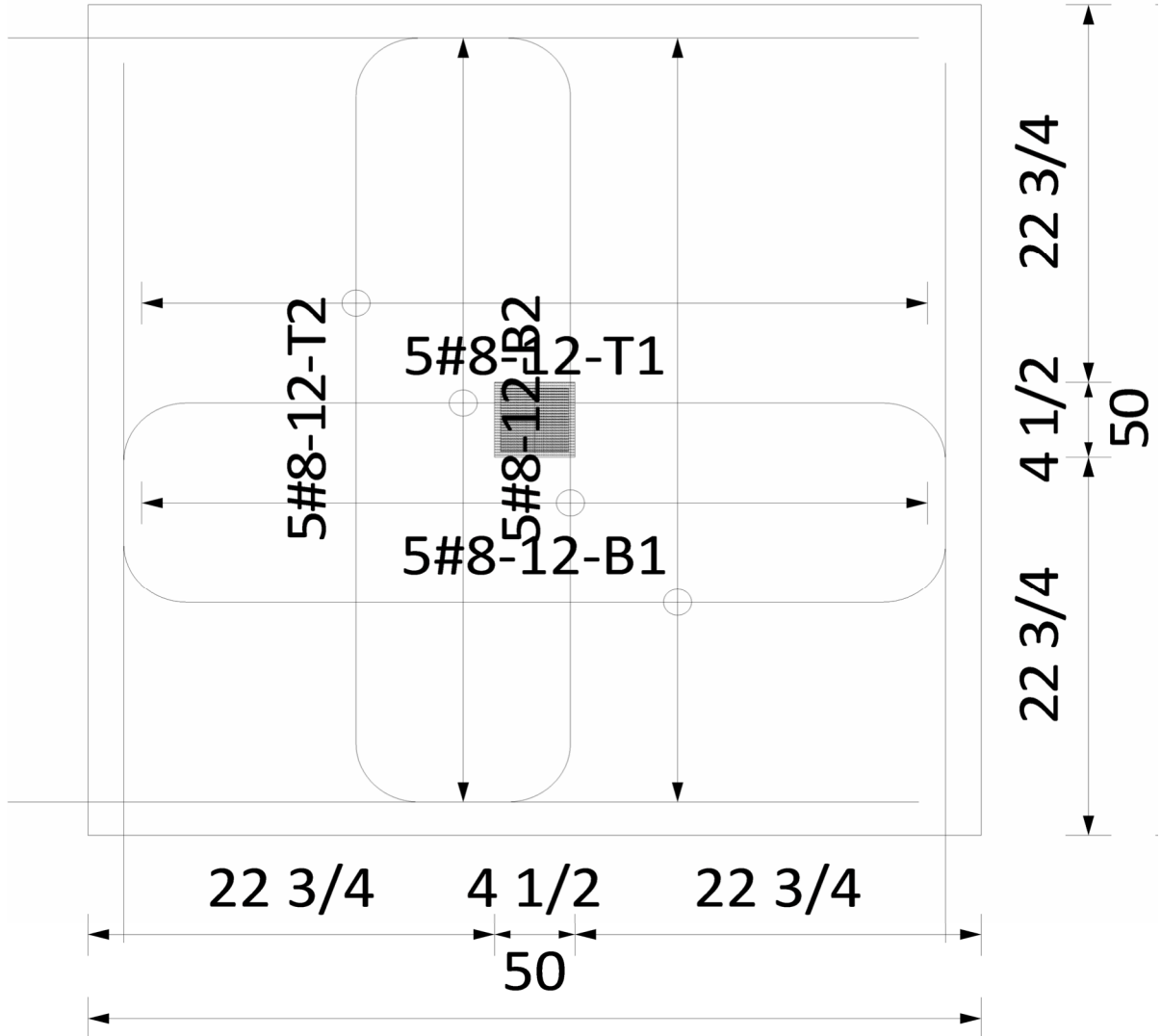
Revision:

Date:

Sheet No. 325

Project Name: Lee's Summit Market Plaza

4' 2" × 4' 2" (Depth = 36in)



PB 4

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	Grillage Chase Down
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	234 LRFD _{12.4} -0.9D+W
P	41.2 kip	2.3 kip
F _{x,sup}	-0.6 kip	0.8 kip



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Revision:	Date:	Sheet No. 326
Project Name: Lee's Summit Market Plaza		

F _{y,sup}	0.5 kip	0.2 kip
M _{x,sup}	0.0 kip ft	0.0 kip ft
M _{y,sup}	0.0 kip ft	0.0 kip ft
Added Loads		
F _{swt}	7.8 kip	
F _{soil}	0.0 kip	
F _{dl,sur}	0.0 kip	
F _{ll,sur}	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	4' 2" $\bar{A}$ — 4'
Overall Depth	36 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	4' 2" $\bar{A}$ — 4' 2"
Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W
q _{max}	2.31 ksf
q _{a,g}	2.40 ksf
Ratio	0.964

Bending Capacity

Summary

Direction	X-Bot	Y-Bot	X-Top	Y-Top
Analysis	3D Building Analysis	3D Building Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	145 LRFD _{8.68} -1.2D+1.6S+0.5W	149 LRFD _{9.4} -1.2D+L+0.5Lr+W	149 LRFD _{9.4} -1.2D+L+0.5Lr+W
m _u	4.4 kip-ft/ft	4.5 kip-ft/ft	1.0 kip-ft/ft	1.0 kip-ft/ft
d	33 in	34 in	33 in	34 in
R _n / R _{nt}	0.005	0.005	0.001	0.001
A _{s,reqd}	0.03 in ² /ft	0.03 in ² /ft	0.01 in ² /ft	0.01 in ² /ft
A _{s,prov}	0.79 in ² /ft	0.79 in ² /ft	0.79 in ² /ft	0.79 in ² /ft
A _{s,min}	0.78 in ² /ft	0.78 in ² /ft	0.78 in ² /ft	0.78 in ² /ft
Ratio	0.038	0.037	0.008	0.008
Reinforcement	Deformed # 8 @ 12-B2	Deformed # 8 @ 12-B1	Deformed # 8 @ 12-T2	Deformed # 8 @ 12-T1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D	1 LRFD ₁ -1.4D
v _u	0.000 ksi	0.000 ksi
φ _{shear} $\bar{A}$ — v _n	0.047 ksi	0.048 ksi
Ratio	0.000	0.000



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Revision:	Date:	Sheet No. 327
Project Name: Lee's Summit Market Plaza		

Punching Shear

Summary

Analysis	Combination	b _o [in]	v _u [ksi]	v _n [ksi]	Ratio	Status
3D Building Analysis	144 LRFD _{8.67-1.2D+1.6S+0.5W}	87 1/2	0.003	0.190	0.017	✓ Pass

Uplift

Summary

Analysis	3D Building Analysis
Combination	1 LRFD _{1-1.4D}
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000

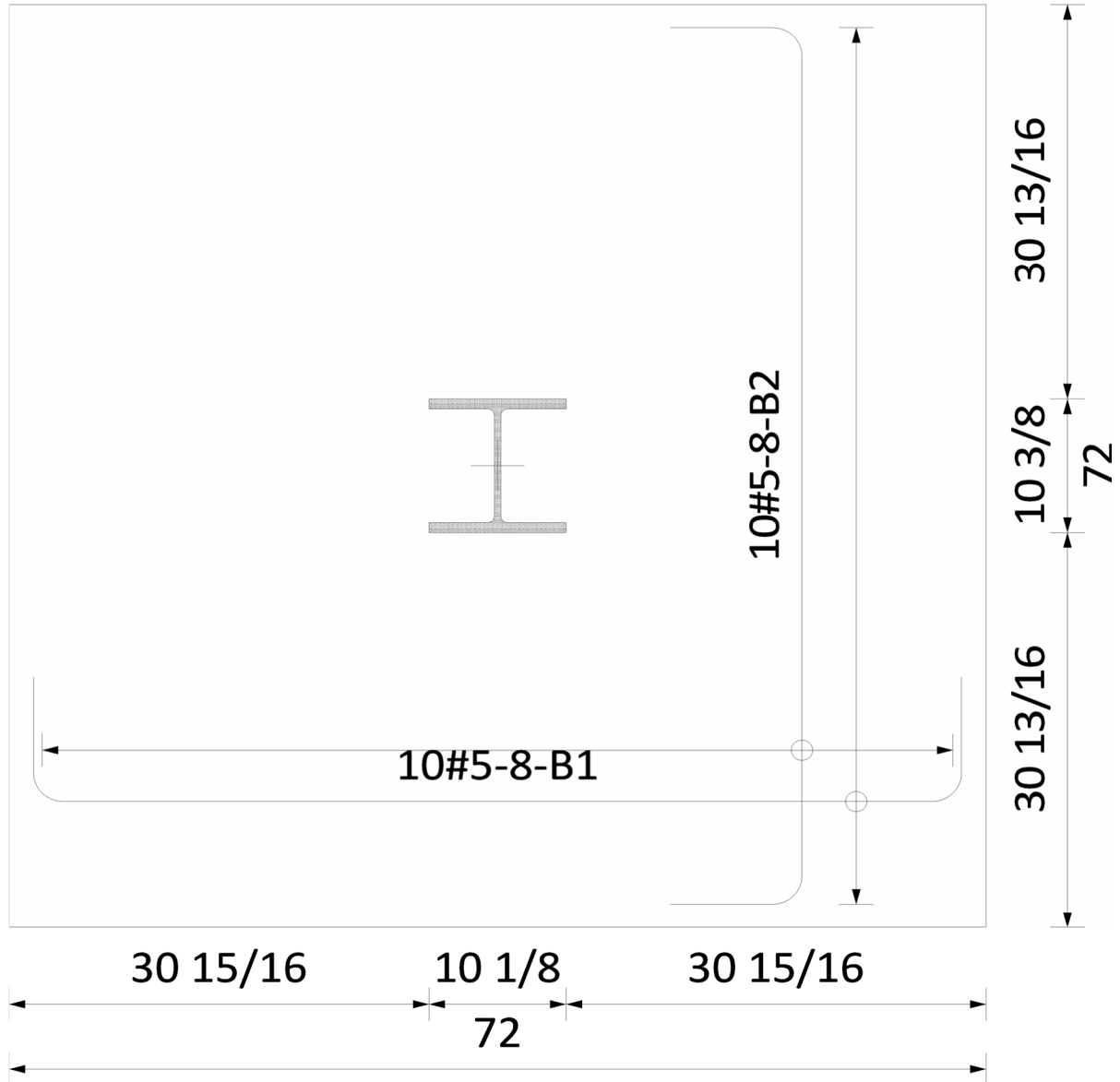
PB 5



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Made by: ACO/RAH	Date: 11/01/2023	Job No. 23-23
Revision:	Date:	Sheet No. 328
Project Name: Lee's Summit Market Plaza		

6' 0" × 6' 0" (Depth = 16in)



PB 5

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	144 LRFD _{8.67} -1.2D+1.6S+0.5W
P	93.3 kip	67.4 kip



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Revision:	Date:	Sheet No. 329
Project Name: Lee's Summit Market Plaza		

$F_{x,sup}$	0.2 kip	0.2 kip
$F_{y,sup}$	-0.7 kip	-0.7 kip
$M_{x,sup}$	0.0 kip ft	0.0 kip ft
$M_{y,sup}$	0.0 kip ft	0.0 kip ft
Added Loads		
F_{swt}	7.2 kip	
F_{soil}	0.0 kip	
$F_{dl,sur}$	0.0 kip	
$F_{ll,sur}$	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	6' 0" $\bar{\bar{A}}$ — 6'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	6' 0" $\bar{\bar{A}}$ — 6' 0"
Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W
q_{max}	2.10 ksf
$q_{a,g}$	2.40 ksf
Ratio	0.877

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	134 LRFD _{8.57} -1.2D+1.6S+0.5W
m_u	8.6 kip-ft/ft	8.6 kip-ft/ft
d	13 9/16 in	14 3/16 in
R_n / R_{nt}	0.057	0.053
$A_{s,reqd}$	0.14 in ² /ft	0.14 in ² /ft
$A_{s,prov}$	0.47 in ² /ft	0.47 in ² /ft
$A_{s,min}$	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.305	0.293
Top	-	-
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	134 LRFD _{8.57} -1.2D+1.6S+0.5W	144 LRFD _{8.67} -1.2D+1.6S+0.5W
v_u	0.021 ksi	0.023 ksi
$\phi_{shear} \bar{\bar{A}}$ — v_n	0.053 ksi	0.054 ksi



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Revision:	Date:	Sheet No. 330
Project Name: Lee's Summit Market Plaza		

Ratio	0.402	0.428
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Punching Shear

Summary

Analysis	Combination	b _o [in]	v _u [ksi]	v _n [ksi]	Ratio	Status
3D Building Analysis	143 LRFD _{8.66} -1.2D+1.6S+0.5W	95 5/16	0.063	0.190	0.331	✓ Pass

Uplift

Summary

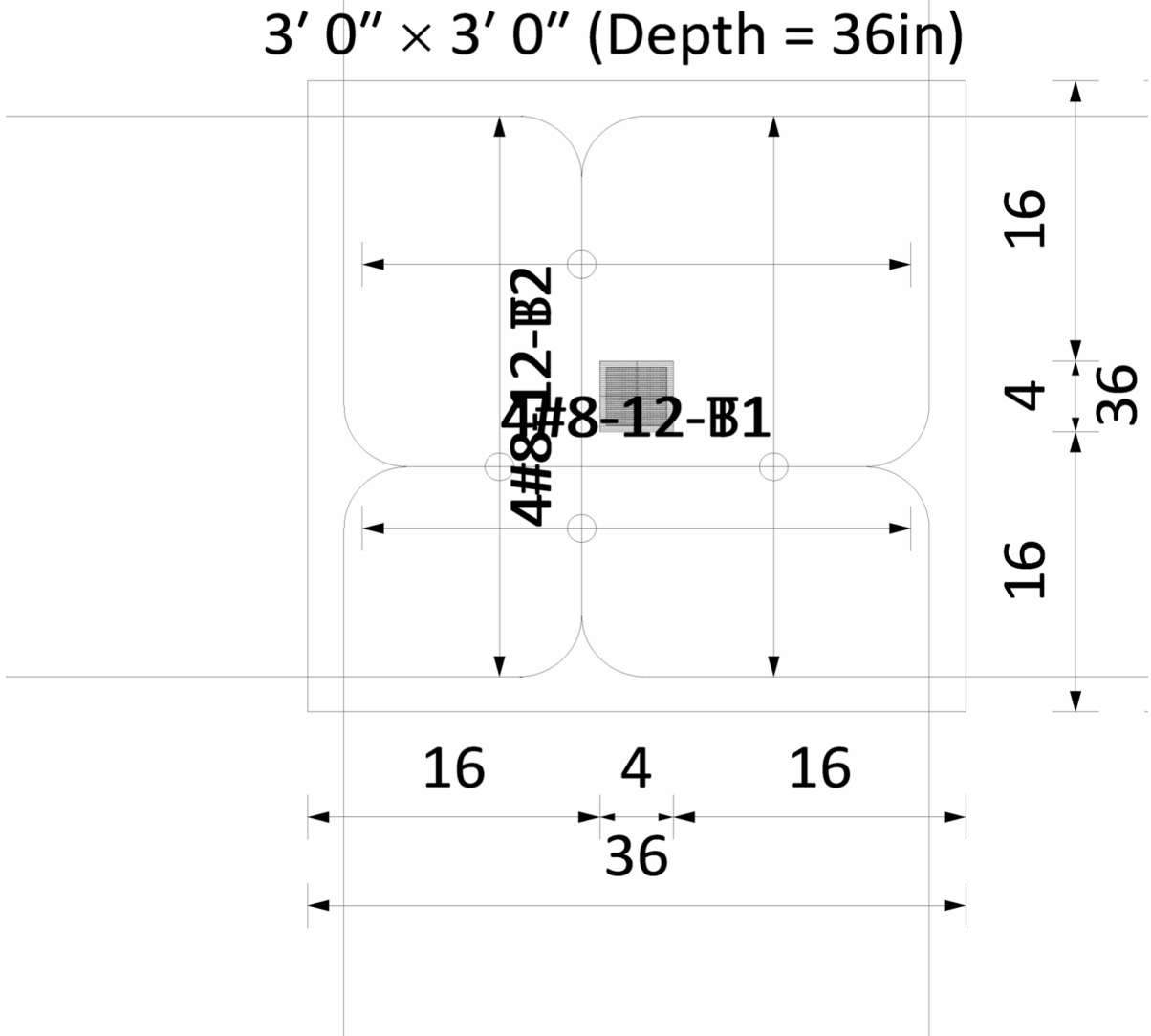
Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000

PB 7



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Revision:	Date:	Sheet No. 331
Project Name: Lee's Summit Market Plaza		



PB 7

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	234 LRFD _{12.4} -0.9D+W
P	9.3 kip	0.5 kip



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Revision:	Date:	Sheet No. 332
Project Name: Lee's Summit Market Plaza		

$F_{x,sup}$	-0.1 kip	0.2 kip
$F_{y,sup}$	0.1 kip	0.0 kip
$M_{x,sup}$	0.0 kip ft	0.0 kip ft
$M_{y,sup}$	0.0 kip ft	0.0 kip ft
Added Loads		
F_{swt}	4.1 kip	
F_{soil}	0.0 kip	
$F_{dl,sur}$	0.0 kip	
$F_{ll,sur}$	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	3' 0" $\tilde{\sim}$ 3'
Overall Depth	36 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	3' 0" $\tilde{\sim}$ 3' 0"
Analysis	Grillage Chase Down
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W
q_{max}	1.26 ksf
$q_{a,g}$	2.40 ksf
Ratio	0.526

Bending Capacity

Summary

Direction	X-Bot	Y-Bot	X-Top	Y-Top
Analysis	3D Building Analysis	3D Building Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	145 LRFD _{8.68} -1.2D+1.6S+0.5W	149 LRFD _{9.4} -1.2D+L+0.5Lr+W	149 LRFD _{9.4} -1.2D+L+0.5Lr+W
m_u	1.0 kip-ft/ft	1.0 kip-ft/ft	0.5 kip-ft/ft	0.5 kip-ft/ft
d	33 in	34 in	33 in	34 in
R_n / R_{nt}	0.001	0.001	0.001	0.001
$A_{s,reqd}$	0.01 in ² /ft	0.01 in ² /ft	0.00 in ² /ft	0.00 in ² /ft
$A_{s,prov}$	0.79 in ² /ft	0.79 in ² /ft	0.79 in ² /ft	0.79 in ² /ft
$A_{s,min}$	0.78 in ² /ft	0.78 in ² /ft	0.78 in ² /ft	0.78 in ² /ft
Ratio	0.008	0.008	0.004	0.004
Reinforcement	Deformed # 8 @ 12-B2	Deformed # 8 @ 12-B1	Deformed # 8 @ 12-T2	Deformed # 8 @ 12-T1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D	1 LRFD ₁ -1.4D
v_u	0.000 ksi	0.000 ksi
$\phi_{shear} \tilde{\sim} v_n$	0.047 ksi	0.048 ksi
Ratio	0.000	0.000



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Revision:	Date:	Sheet No. 333
Project Name: Lee's Summit Market Plaza		

Uplift

Summary

Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000

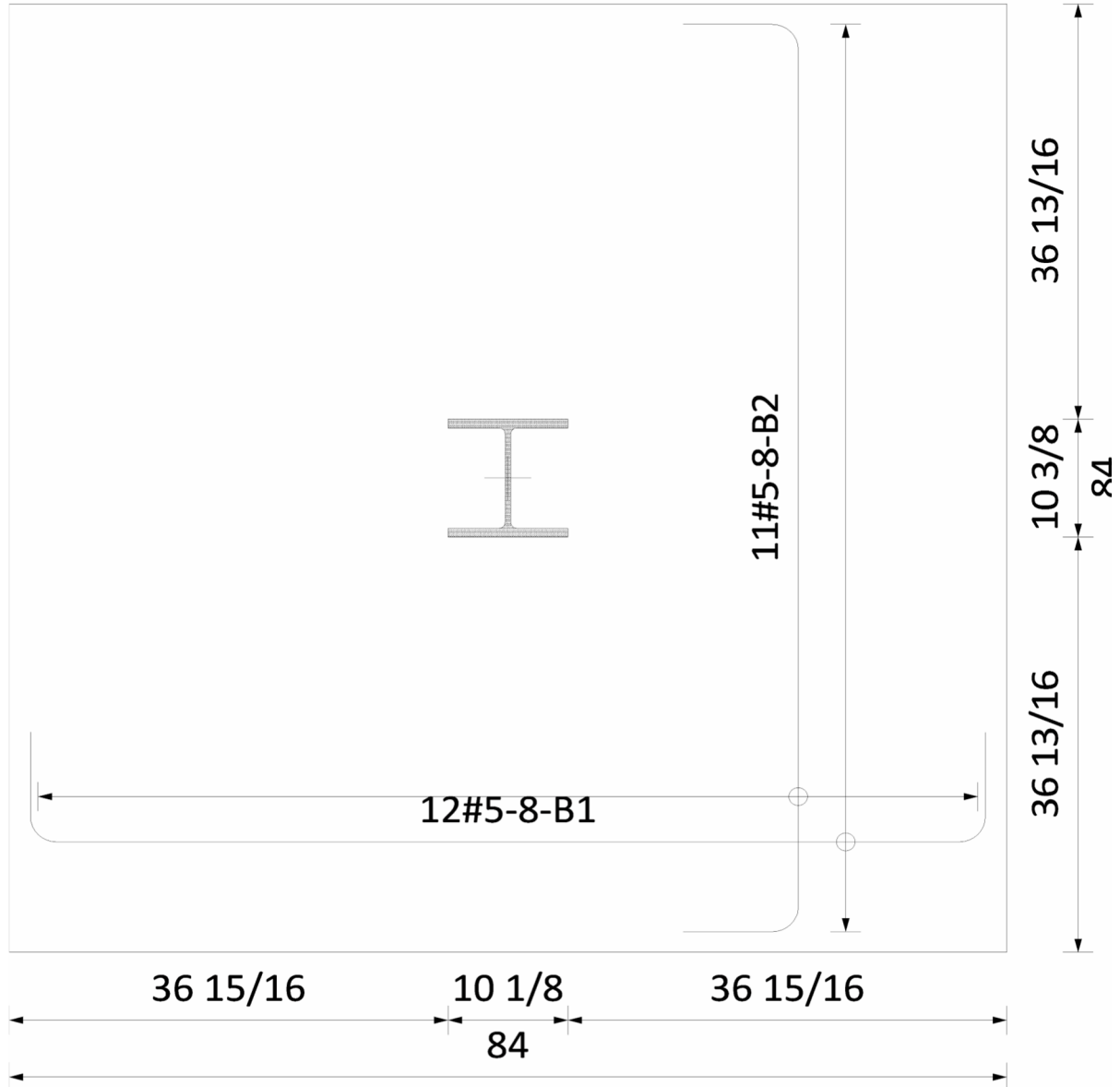
PB 15



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Project Name: Lee's Summit Market Plaza		

7' 0" × 7' 0" (Depth = 16in)



PB 15

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	137 LRFD _{8.60} -1.2D+1.6S+0.5W	137 LRFD _{8.60} -1.2D+1.6S+0.5W
P	113.1 kip	84.3 kip



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Revision:	Date:	Sheet No. 335
Project Name: Lee's Summit Market Plaza		

$F_{x,sup}$	0.2 kip	0.1 kip
$F_{y,sup}$	-0.8 kip	-0.7 kip
$M_{x,sup}$	0.0 kip ft	0.0 kip ft
$M_{y,sup}$	0.0 kip ft	0.0 kip ft
Added Loads		
F_{swt}	9.8 kip	
F_{soil}	0.0 kip	
$F_{dl,sur}$	0.0 kip	
$F_{ll,sur}$	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	7' 0" $\bar{\bar{A}}$ — 7'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	7' 0" $\bar{\bar{A}}$ — 7' 0"
Analysis	3D Building Analysis
Combination	137 LRFD _{8.60} -1.2D+1.6S+0.5W
q_{max}	1.94 ksf
$q_{a,g}$	2.40 ksf
Ratio	0.808

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	3D Building Analysis	3D Building Analysis
Combination	137 LRFD _{8.60} -1.2D+1.6S+0.5W	137 LRFD _{8.60} -1.2D+1.6S+0.5W
m_u	10.9 kip-ft/ft	11.0 kip-ft/ft
d	13 9/16 in	14 3/16 in
R_n / R_{nt}	0.073	0.067
$A_{s,reqd}$	0.18 in ² /ft	0.17 in ² /ft
$A_{s,prov}$	0.47 in ² /ft	0.47 in ² /ft
$A_{s,min}$	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.389	0.372
Top	-	-
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	137 LRFD _{8.60} -1.2D+1.6S+0.5W	137 LRFD _{8.60} -1.2D+1.6S+0.5W
v_u	0.026 ksi	0.028 ksi
$\phi_{shear} \bar{\bar{A}}$ — v_n	0.053 ksi	0.054 ksi



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Revision:	Date:	Sheet No. 336
Project Name: Lee's Summit Market Plaza		

Ratio	0.486	0.513
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Punching Shear

Summary

Analysis	Combination	b _o [in]	v _u [ksi]	v _n [ksi]	Ratio	Status
3D Building Analysis	137 LRFD _{8.60} -1.2D+1.6S+0.5W	91 47/64	0.082	0.190	0.434	✓ Pass

Uplift

Summary

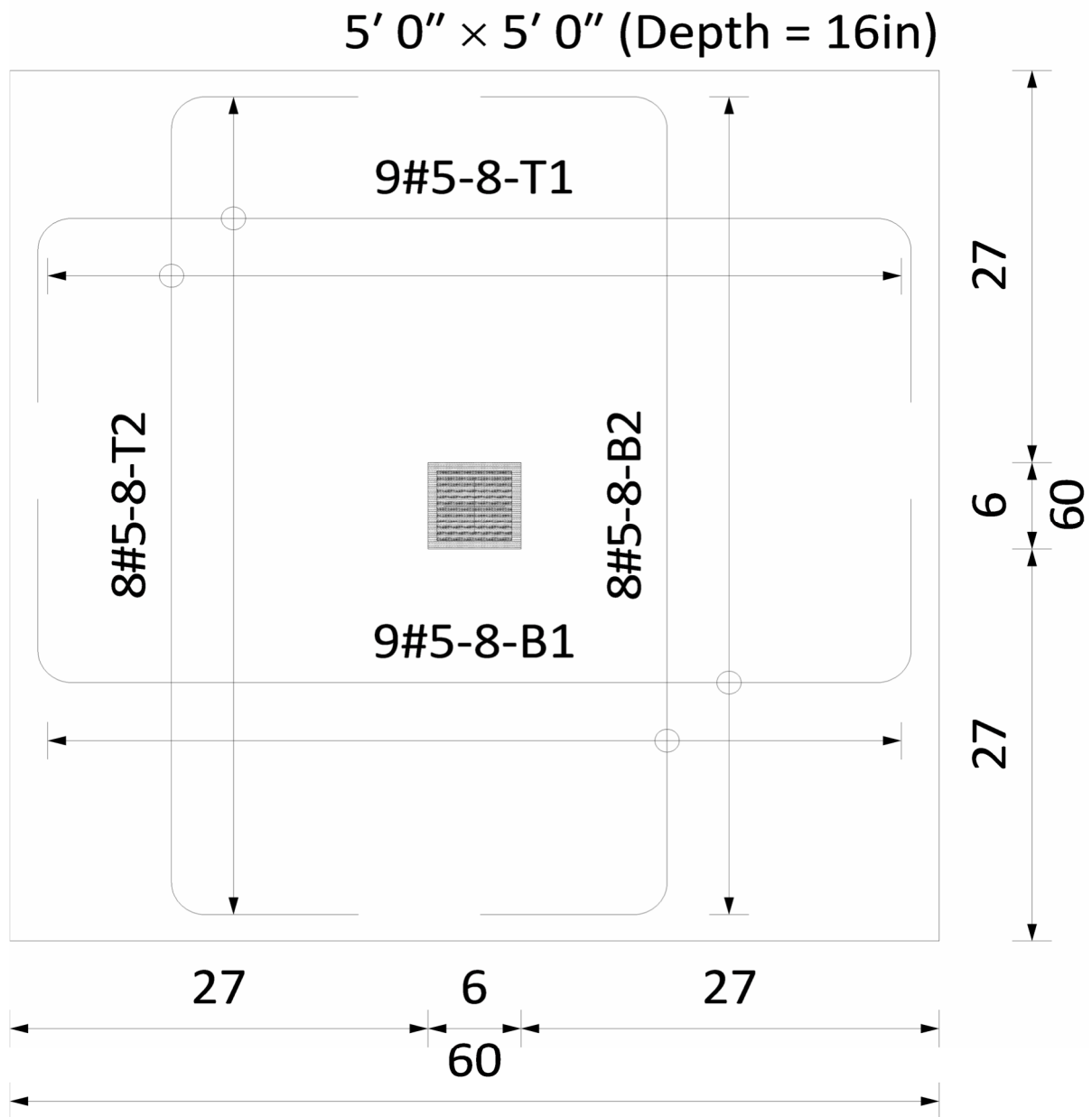
Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000

PB 11



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Project Name: Lee's Summit Market Plaza		



PB 11

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	142 LRFD _{8.65} -1.2D+1.6S+0.5W	268 LRFD _{13.4} -0.9D+E



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Revision:	Date:	Sheet No. 338
Project Name: Lee's Summit Market Plaza		

P	35.4 kip	13.6 kip
F _{x,sup}	-0.0 kip	-0.0 kip
F _{y,sup}	-2.7 kip	-1.5 kip
M _{x,sup}	0.0 kip ft	0.0 kip ft
M _{y,sup}	0.0 kip ft	0.0 kip ft
Added Loads		
F _{swt}	5.0 kip	
F _{soil}	0.0 kip	
F _{dl,sur}	0.0 kip	
F _{ll,sur}	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	5' 0" Å— 5'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	5' 0" Å— 5' 0"
Analysis	3D Building Analysis
Combination	142 LRFD _{8.65} -1.2D+1.6S+0.5W
q _{max}	1.41 ksf
q _{a,g}	2.40 ksf
Ratio	0.588

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	3D Building Analysis	3D Building Analysis
Combination	142 LRFD _{8.65} -1.2D+1.6S+0.5W	142 LRFD _{8.65} -1.2D+1.6S+0.5W
m _u	3.9 kip-ft/ft	3.6 kip-ft/ft
d	13 9/16 in	14 3/16 in
R _n / R _{nt}	0.026	0.022
A _{s,reqd}	0.06 in ² /ft	0.06 in ² /ft
A _{s,prov}	0.47 in ² /ft	0.47 in ² /ft
A _{s,min}	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.138	0.121
Top	Deformed # 5 @ 8-T2	Deformed # 5 @ 8-T1
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	142 LRFD _{8.65} -1.2D+1.6S+0.5W	142 LRFD _{8.65} -1.2D+1.6S+0.5W
v _u	0.009 ksi	0.011 ksi



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Revision:	Date:	Sheet No. 339
Project Name: Lee's Summit Market Plaza		

$\Phi_{\text{shear}} \bar{A} - v_n$	0.053 ksi	0.054 ksi
Ratio	0.168	0.198

Punching Shear

Summary

Analysis	Combination	b_o [in]	v_u [ksi]	v_n [ksi]	Ratio	Status
3D Building Analysis	142 LRFD _{8.65} -1.2D+1.6S+0.5W	79 1/2	0.029	0.190	0.151	 Pass

Uplift

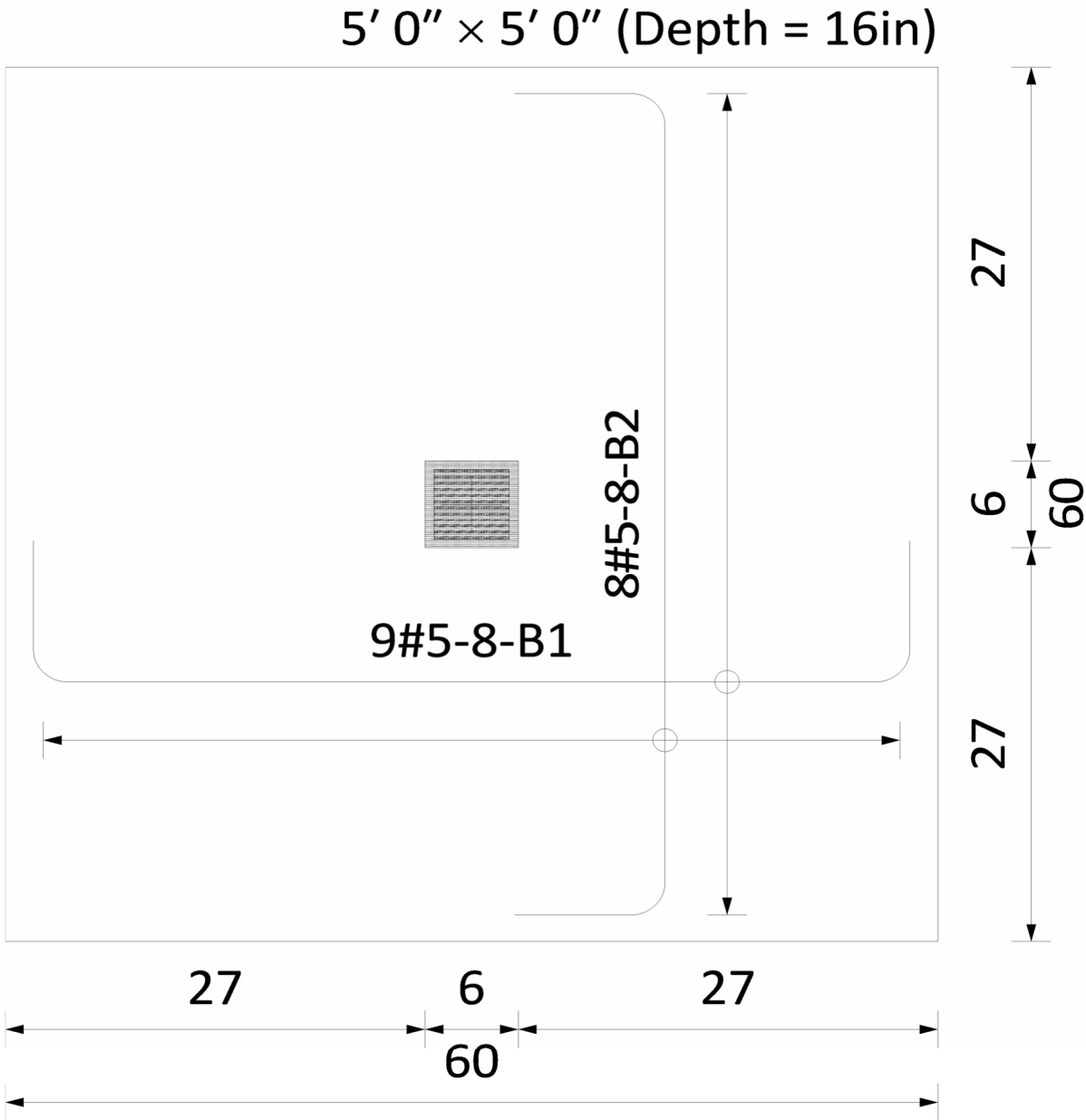
Summary

Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
$F_{dl, stb}$	0.0 kip
Ratio	0.000



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Revision:	Date:	Sheet No. 340
Project Name: Lee's Summit Market Plaza		



PB 12

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	144 LRFD _{8.67} -1.2D+1.6S+0.5W



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Revision:	Date:	Sheet No. 341
Project Name: Lee's Summit Market Plaza		

P	48.7 kip	36.3 kip
F _{x,sup}	-0.0 kip	-0.0 kip
F _{y,sup}	-0.2 kip	-0.2 kip
M _{x,sup}	0.0 kip ft	0.0 kip ft
M _{y,sup}	0.0 kip ft	0.0 kip ft
Added Loads		
F _{swt}	5.0 kip	
F _{soil}	0.0 kip	
F _{dl,sur}	0.0 kip	
F _{ll,sur}	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	5' 0" Å— 5'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	5' 0" Å— 5' 0"
Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W
q _{max}	1.66 ksf
q _{a,g}	2.40 ksf
Ratio	0.692

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	3D Building Analysis	3D Building Analysis
Combination	144 LRFD _{8.67} -1.2D+1.6S+0.5W	140 LRFD _{8.63} -1.2D+1.6S+0.5W
m _u	4.9 kip-ft/ft	4.9 kip-ft/ft
d	13 9/16 in	14 3/16 in
R _n / R _{nt}	0.033	0.030
A _{s,reqd}	0.08 in ² /ft	0.08 in ² /ft
A _{s,prov}	0.47 in ² /ft	0.47 in ² /ft
A _{s,min}	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.175	0.167
Top	-	-
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	140 LRFD _{8.63} -1.2D+1.6S+0.5W	144 LRFD _{8.67} -1.2D+1.6S+0.5W
v _u	0.012 ksi	0.013 ksi



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Revision:	Date:	Sheet No. 342
Project Name: Lee's Summit Market Plaza		

$\Phi_{\text{shear}} \bar{A} - v_n$	0.053 ksi	0.054 ksi
Ratio	0.231	0.250

Punching Shear

Summary

Analysis	Combination	b_o [in]	v_u [ksi]	v_n [ksi]	Ratio	Status
3D Building Analysis	140 LRFD _{8.63} -1.2D+1.6S+0.5W	79 1/2	0.039	0.190	0.207	 Pass

Uplift

Summary

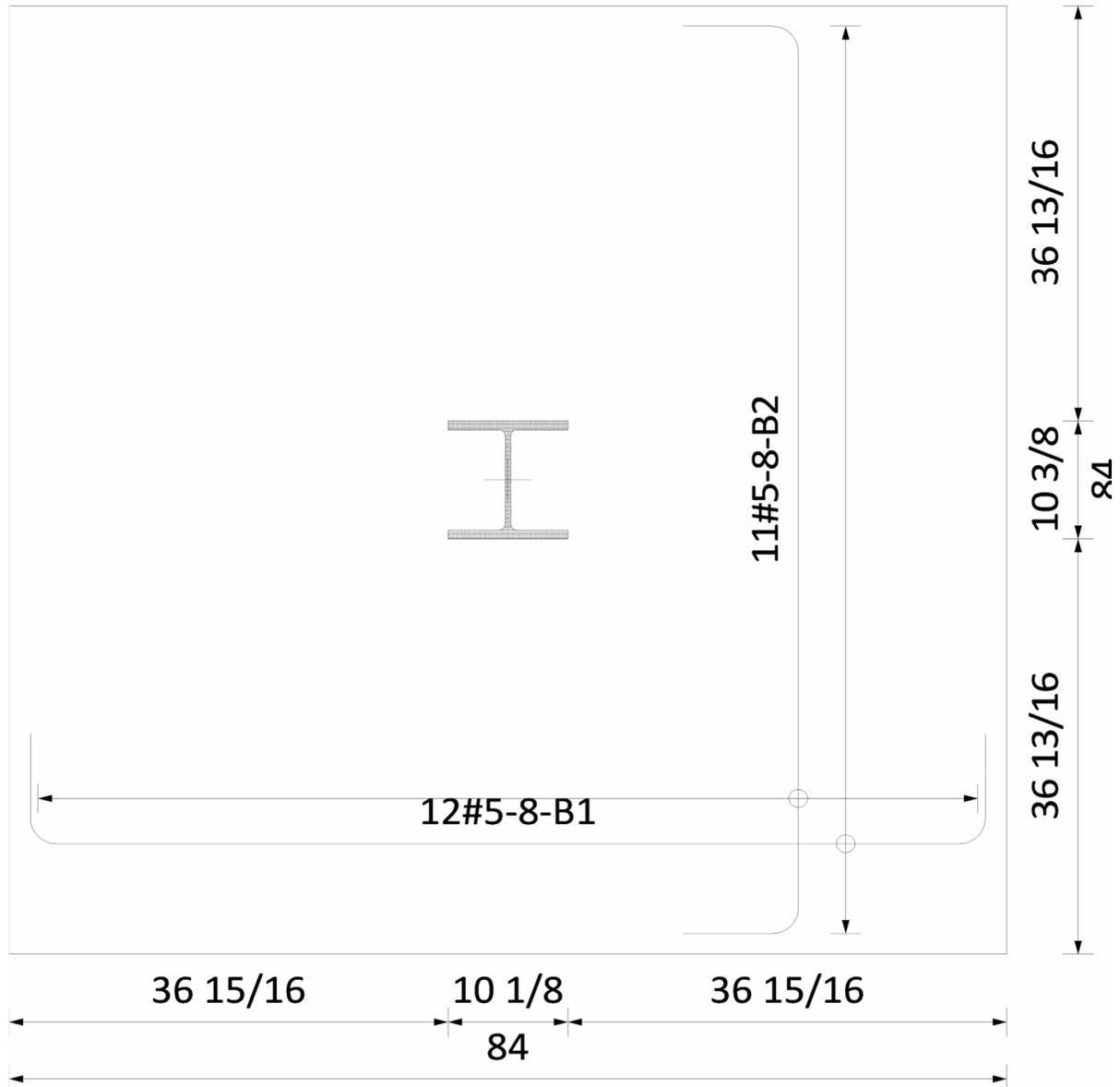
Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
$F_{dl, \text{stb}}$	0.0 kip
Ratio	0.000



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Project Name: Lee's Summit Market Plaza		

7' 0" × 7' 0" (Depth = 16in)



PB 16

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	Grillage Chase Down	Grillage Chase Down
Combination	143 LRFD _{8.66} -1.2D+1.6S+0.5W	143 LRFD _{8.66} -1.2D+1.6S+0.5W
P	127.8 kip	92.3 kip



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Revision:	Date:	Sheet No. 344
Project Name: Lee's Summit Market Plaza		

$F_{x,sup}$	0.1 kip	0.1 kip
$F_{y,sup}$	-0.0 kip	-0.0 kip
$M_{x,sup}$	0.0 kip ft	0.0 kip ft
$M_{y,sup}$	0.0 kip ft	0.0 kip ft
Added Loads		
F_{swt}	9.8 kip	
F_{soil}	0.0 kip	
$F_{dl,sur}$	0.0 kip	
$F_{ll,sur}$	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	7' 0" $\bar{A}$ — 7'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	7' 0" $\bar{A}$ — 7' 0"
Analysis	Grillage Chase Down
Combination	143 LRFD _{8.66} -1.2D+1.6S+0.5W
q_{max}	2.09 ksf
$q_{a,g}$	2.40 ksf
Ratio	0.870

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	Grillage Chase Down	Grillage Chase Down
Combination	143 LRFD _{8.66} -1.2D+1.6S+0.5W	143 LRFD _{8.66} -1.2D+1.6S+0.5W
m_u	12.3 kip-ft/ft	12.4 kip-ft/ft
d	13 9/16 in	14 3/16 in
R_n / R_{nt}	0.082	0.076
$A_{s,reqd}$	0.20 in ² /ft	0.20 in ² /ft
$A_{s,prov}$	0.47 in ² /ft	0.47 in ² /ft
$A_{s,min}$	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.437	0.421
Top	-	-
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	Grillage Chase Down	Grillage Chase Down
Combination	143 LRFD _{8.66} -1.2D+1.6S+0.5W	143 LRFD _{8.66} -1.2D+1.6S+0.5W
v_u	0.029 ksi	0.031 ksi
$\phi_{shear} \bar{A} - v_n$	0.053 ksi	0.054 ksi



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Revision:	Date:	Sheet No. 345
Project Name: Lee's Summit Market Plaza		

Ratio	0.548	0.577
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Punching Shear

Summary

Analysis	Combination	b _o [in]	v _u [ksi]	v _n [ksi]	Ratio	Status
Grillage Chase Down	143 LRFD _{8.66} -1.2D+1.6S+0.5W	91 47/64	0.093	0.190	0.490	✓ Pass

Uplift

Summary

Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000

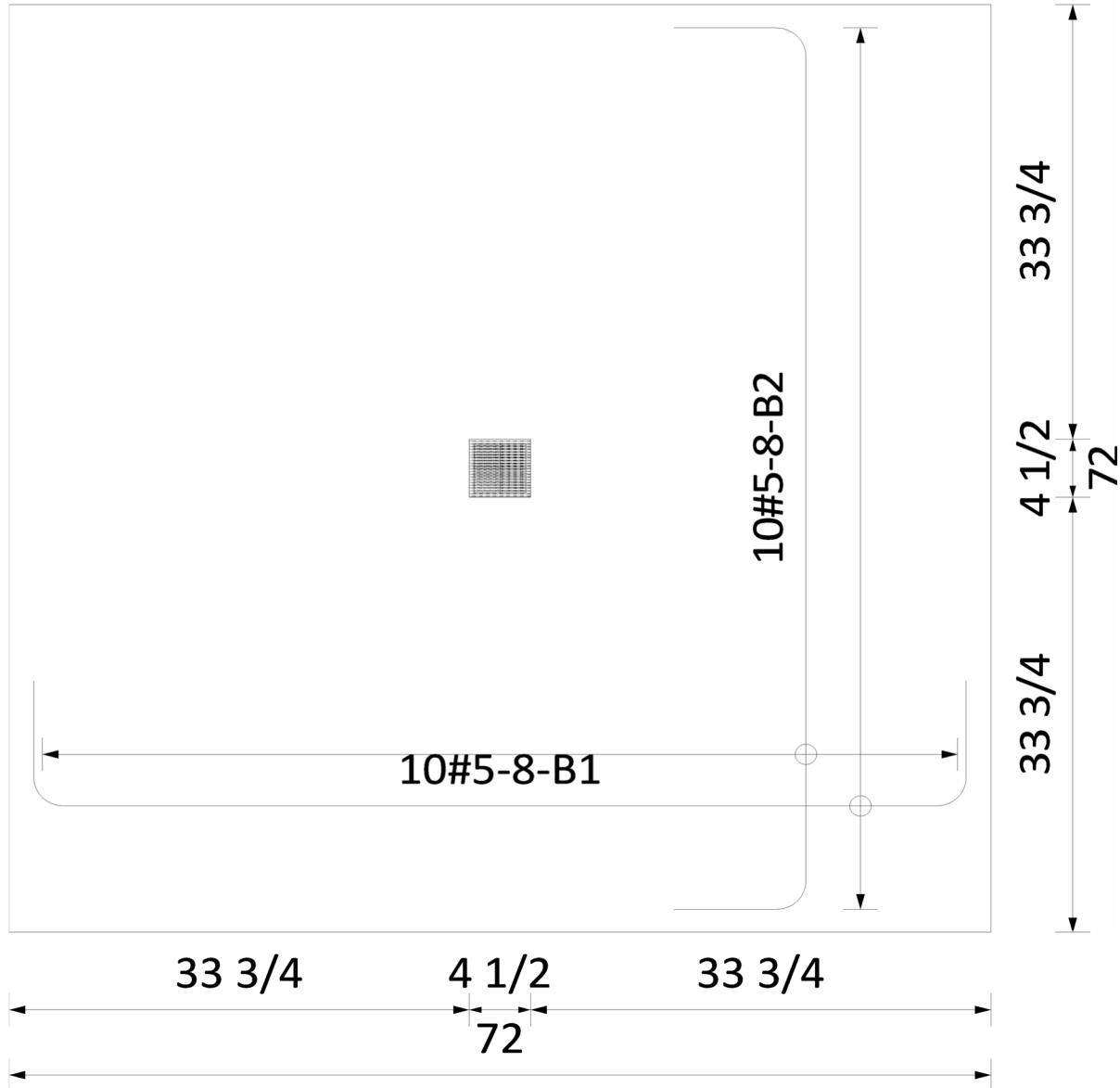
PB 17



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Project Name: Lee's Summit Market Plaza		

6' 0" × 6' 0" (Depth = 16in)



PB 17

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	254 LRFD _{11.6} -1.2D+L+0.2S+E	254 LRFD _{11.6} -1.2D+L+0.2S+E
P	26.1 kip	20.4 kip



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Revision:	Date:	Sheet No. 347
Project Name: Lee's Summit Market Plaza		

$F_{x,sup}$	0.0 kip	0.0 kip
$F_{y,sup}$	-0.0 kip	-0.0 kip
$M_{x,sup}$	0.0 kip ft	0.0 kip ft
$M_{y,sup}$	0.0 kip ft	0.0 kip ft
Added Loads		
F_{swt}	7.2 kip	
F_{soil}	0.0 kip	
$F_{dl,sur}$	0.0 kip	
$F_{ll,sur}$	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	6' 0" $\bar{\bar{A}}$ — 6'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	6' 0" $\bar{\bar{A}}$ — 6' 0"
Analysis	3D Building Analysis
Combination	254 LRFD _{11.6} -1.2D+L+0.2S+E
q_{max}	0.77 ksf
$q_{a,g}$	2.40 ksf
Ratio	0.321

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	3D Building Analysis	3D Building Analysis
Combination	254 LRFD _{11.6} -1.2D+L+0.2S+E	254 LRFD _{11.6} -1.2D+L+0.2S+E
m_u	2.9 kip-ft/ft	2.9 kip-ft/ft
d	13 9/16 in	14 3/16 in
R_n / R_{nt}	0.019	0.018
$A_{s,reqd}$	0.05 in ² /ft	0.05 in ² /ft
$A_{s,prov}$	0.47 in ² /ft	0.47 in ² /ft
$A_{s,min}$	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.101	0.097
Top	-	-
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	254 LRFD _{11.6} -1.2D+L+0.2S+E	254 LRFD _{11.6} -1.2D+L+0.2S+E
v_u	0.007 ksi	0.008 ksi
$\phi_{shear} \bar{\bar{A}}$ — v_n	0.053 ksi	0.054 ksi



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Revision:	Date:	Sheet No. 348
Project Name: Lee's Summit Market Plaza		

Ratio	0.131	0.139
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Punching Shear

Summary

Analysis	Combination	b _o [in]	v _u [ksi]	v _n [ksi]	Ratio	Status
3D Building Analysis	254 LRFD _{11.6} -1.2D+L+0.2S+E	71 1/2	0.025	0.190	0.130	✓ Pass

Uplift

Summary

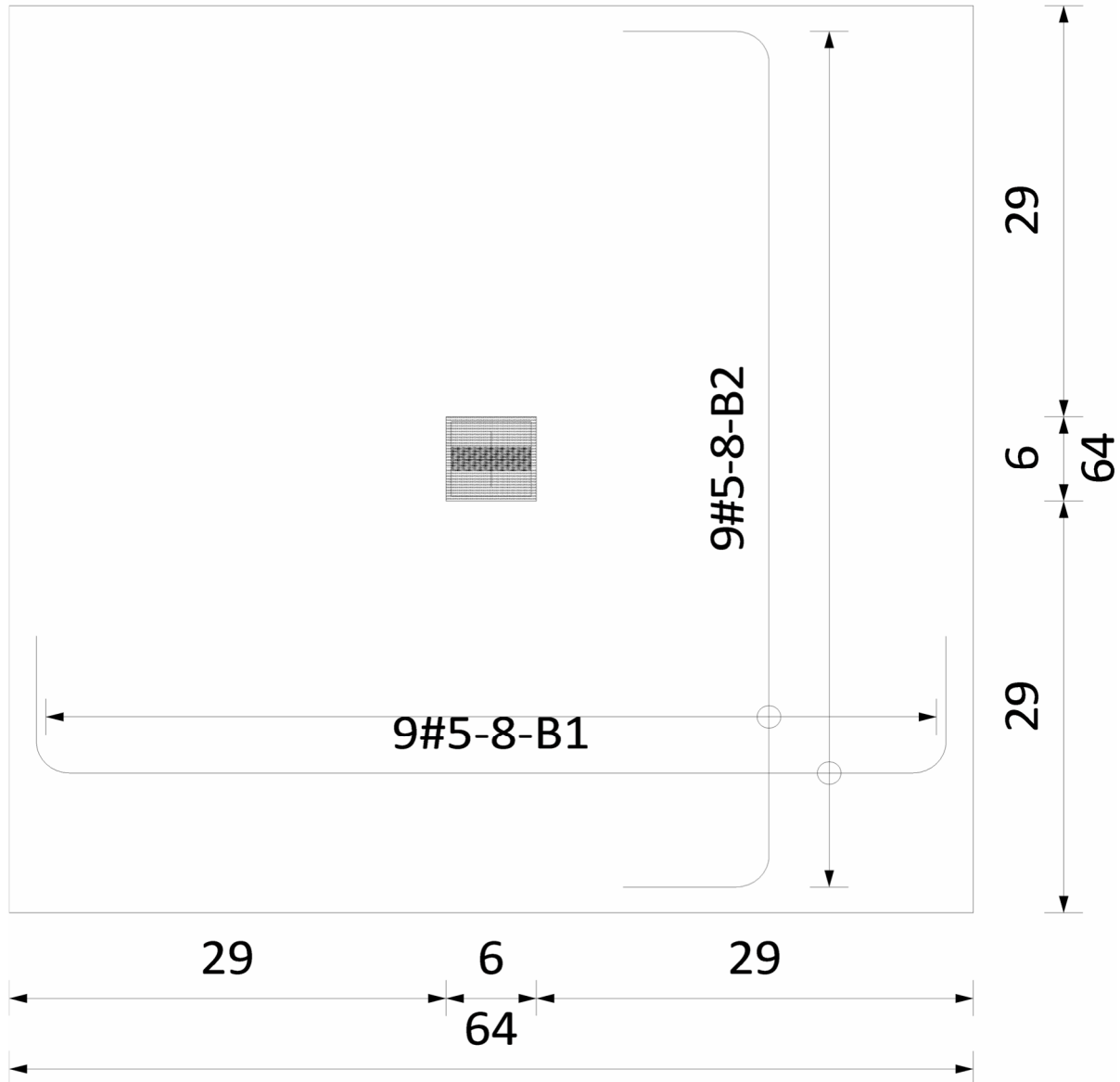
Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
F _{d, stb}	0.0 kip
Ratio	0.000



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Revision:	Date:	Sheet No. 349
Project Name: Lee's Summit Market Plaza		

5' 4" × 5' 4" (Depth = 16in)



PB 18

Static & RSA Design Summary

Applied Loads Summary

	Strength	Service
Analysis	3D Building Analysis	3D Building Analysis
Combination	140 LRFD _{8.63} -1.2D+1.6S+0.5W	140 LRFD _{8.63} -1.2D+1.6S+0.5W



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Revision:	Date:	Sheet No. 350
Project Name: Lee's Summit Market Plaza		

P	82.8 kip	58.8 kip
F _{x,sup}	0.1 kip	0.1 kip
F _{y,sup}	0.6 kip	0.4 kip
M _{x,sup}	0.0 kip ft	0.0 kip ft
M _{y,sup}	0.0 kip ft	0.0 kip ft
Added Loads		
F _{swt}	5.7 kip	
F _{soil}	0.0 kip	
F _{dl,sur}	0.0 kip	
F _{ll,sur}	0.0 kip	

Foundation Details

Foundation Type	Pad Base
Concrete Class	4000 psi
Size	5' 4" Å— 5'
Overall Depth	16 in
Top Cover	1 1/2 in
Bottom Cover	1 1/2 in
Side Cover	1 1/2 in
Depth From Surface	0 in

Bearing Capacity - Critical

Summary

Size	5' 4" Å— 5' 4"
Analysis	3D Building Analysis
Combination	140 LRFD _{8.63} -1.2D+1.6S+0.5W
q _{max}	2.29 ksf
q _{a,g}	2.40 ksf
Ratio	0.955

Bending Capacity

Summary

Direction	X-Bot	Y-Bot
Analysis	3D Building Analysis	3D Building Analysis
Combination	140 LRFD _{8.63} -1.2D+1.6S+0.5W	140 LRFD _{8.63} -1.2D+1.6S+0.5W
m _u	8.6 kip-ft/ft	8.5 kip-ft/ft
d	13 9/16 in	14 3/16 in
R _n / R _{nt}	0.057	0.052
A _{s,reqd}	0.14 in ² /ft	0.13 in ² /ft
A _{s,prov}	0.47 in ² /ft	0.47 in ² /ft
A _{s,min}	0.35 in ² /ft	0.35 in ² /ft
Ratio	0.304	0.289
Top	-	-
Bottom	Deformed # 5 @ 8-B2	Deformed # 5 @ 8-B1

Shear Capacity

Summary

Direction	X	Y
Analysis	3D Building Analysis	3D Building Analysis
Combination	140 LRFD _{8.63} -1.2D+1.6S+0.5W	140 LRFD _{8.63} -1.2D+1.6S+0.5W
v _u	0.021 ksi	0.023 ksi



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Revision:	Date:	Sheet No. 351
Project Name: Lee's Summit Market Plaza		

$\Phi_{\text{shear}} \bar{A} - v_n$	0.053 ksi	0.054 ksi
Ratio	0.398	0.431

Punching Shear

Summary

Analysis	Combination	b_o [in]	v_u [ksi]	v_n [ksi]	Ratio	Status
3D Building Analysis	140 LRFD _{8.63} -1.2D+1.6S+0.5W	71 1/2	0.077	0.190	0.406	✓ Pass

Uplift

Summary

Analysis	3D Building Analysis
Combination	1 LRFD ₁ -1.4D
P	0.0 kip
$F_{d, \text{stb}}$	0.0 kip
Ratio	0.000



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Revision:	Date:	Sheet No. 352
Project Name: Lee's Summit Market Plaza		

Steel

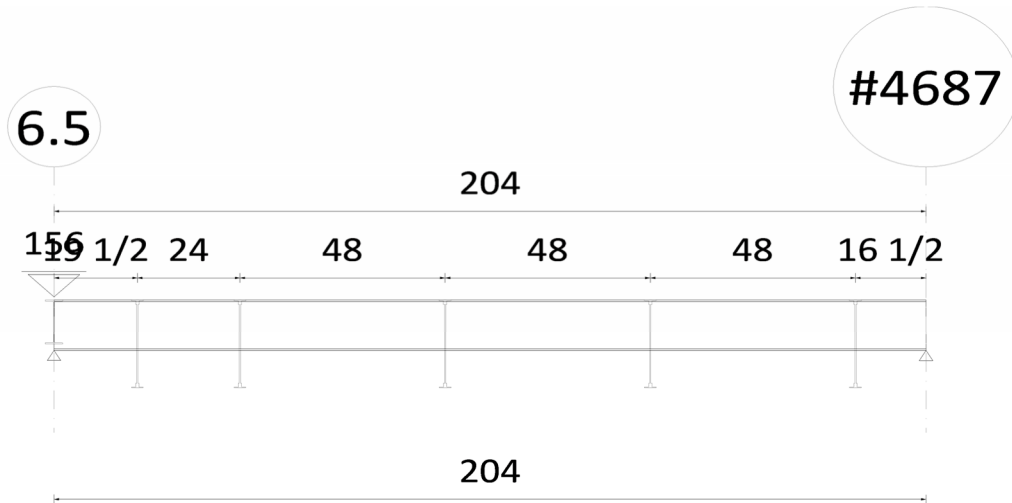
Beam Design

Beams

Non-Composite

Rolled

SB 0.9/6.5/#4676-0.9/909/915



St. 0.9 (LOWEST ROOF): SB 0.9/6.5/#4676-0.9/909/915 -
W 14x26 A992-50

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	1' 7 1/2"	•	1.000		1.000		1.000		1.000
member	1' 7 1/2"	•						•	
sub-beam	2' 0"	•	1.000		1.000		1.000		1.000
member	3' 7 1/2"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	7' 7 1/2"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	11' 7 1/2"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	15' 7 1/2"	•						•	
sub-beam	1' 4 1/2"	•	1.000		1.000		1.000		1.000
support	17' 0"	•		•		•		•	

Static Design Summary

Summary W 14x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	7	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass



Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	131	28.0	106.3	kip	0.263	✓ Pass
Shear Minor	246	-1.5	114.1	kip	0.013	✓ Pass
Flexure Major	140	121.2	150.7	kip ft	0.804	✓ Pass
Flexure Minor	246	2.1	20.8	kip ft	0.101	✓ Pass
Axial Tension	162	-1.9	346.1	kip	0.006	✓ Pass
Axial Compression	235	2.8	157.9	kip	0.018	✓ Pass
Combined Forces	144	-	-	-	0.850	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.0	-	in	-	-
Deflection Dead	249	0.1	0.6	in	0.162	✓ Pass
Deflection Live	16	0.1	0.6	in	0.160	✓ Pass
Deflection Wind	231	-0.1	1.0	in	0.053	✓ Pass
Deflection Total	131	0.6	0.9	in	0.696	✓ Pass

St. 0.9 (LOWEST ROOF): SB 0.9/A.1/6.5-0.9/A.1/8 - 1
W 21x44 A992-50

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	●		●		●		●	
sub-beam	1' 7 1/2"	●	1.000		1.000		1.000		1.000
member	1' 7 1/2"	●						●	
sub-beam	1' 4 1/2"	●	1.000		1.000		1.000		1.000
member	3' 0"	●						●	
sub-beam	7 1/2"	●	1.000		1.000		1.000		1.000
member	3' 7 1/2"	●						●	
sub-beam	3' 4 1/2"	●	1.000		1.000		1.000		1.000
member	7' 0"	●						●	
sub-beam	7 1/2"	●	1.000		1.000		1.000		1.000
member	7' 7 1/2"	●						●	
sub-beam	3' 4 1/2"	●	1.000		1.000		1.000		1.000
member	11' 0"	●						●	
sub-beam	7 1/2"	●	1.000		1.000		1.000		1.000



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Project Name: Lee's Summit Market Plaza		

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
member	11' 7 1/2"	•						•	
sub-beam	3' 4 1/2"	•	1.000		1.000		1.000		1.000
member	15' 0"	•						•	
sub-beam	7 1/2"	•	1.000		1.000		1.000		1.000
member	15' 7 1/2"	•						•	
sub-beam	3' 4 1/2"	•	1.000		1.000		1.000		1.000
member	19' 0"	•						•	
sub-beam	7 1/2"	•	1.000		1.000		1.000		1.000
member	19' 7 1/2"	•						•	
sub-beam	3' 4 1/2"	•	1.000		1.000		1.000		1.000
member	23' 0"	•						•	
sub-beam	7 1/2"	•	1.000		1.000		1.000		1.000
member	23' 7 1/2"	•						•	
sub-beam	2' 4 1/2"	•	1.000		1.000		1.000		1.000
support	26' 0"	•		•		•		•	

Static Design Summary

Summary W 21x44

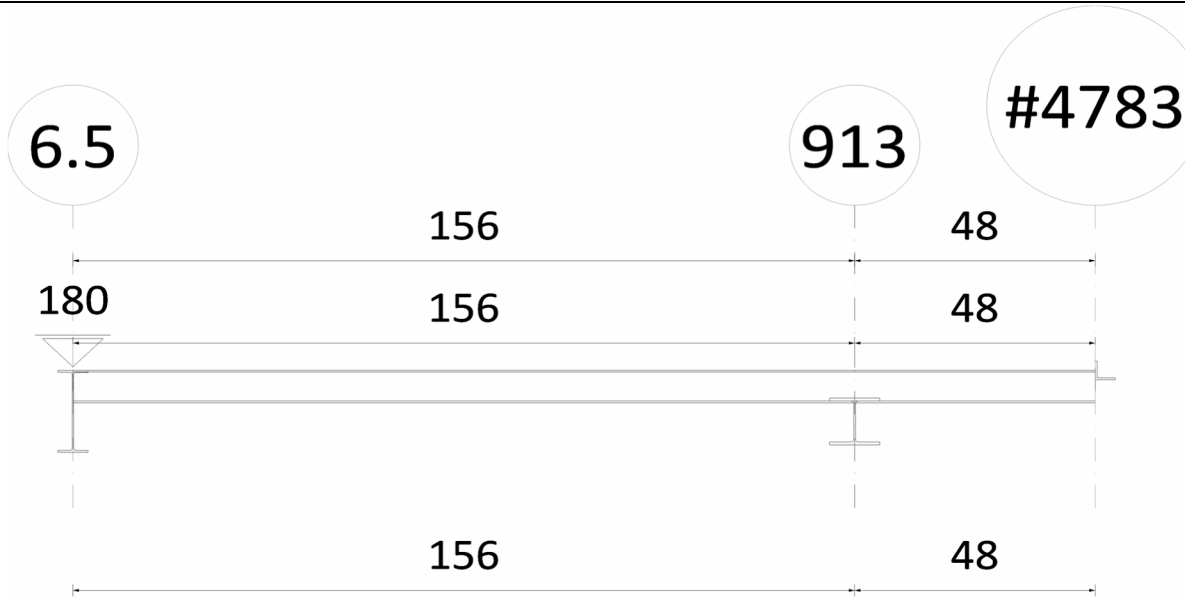
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	40	54.6	217.4	kip	0.251	✓ Pass
Shear Minor	229	-1.7	158.0	kip	0.011	✓ Pass
Flexure Major	145	342.6	357.7	kip ft	0.958	✓ Pass
Flexure Minor	246	-1.4	38.2	kip ft	0.036	✓ Pass
Axial Tension	241	-2.1	585.0	kip	0.004	✓ Pass
Axial Compression	162	2.5	175.7	kip	0.014	✓ Pass
Combined Forces	144	-	-	-	0.979	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.1	-	in	-	-
Deflection Dead	249	0.2	0.9	in	0.225	✓ Pass
Deflection Live	16	0.2	0.9	in	0.222	✓ Pass
Deflection Wind	231	-0.1	1.6	in	0.073	✓ Pass
Deflection Total	145	1.2	1.3	in	0.885	✓ Pass

SB 1/6.5/#6112-1/#4783/#6112



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Project Name: Lee's Summit Market Plaza		



St. 1 (LOW ROOF): 1 St. 1 (LOW ROOF):
C 7x9.8 #36 #36 12-1/#4783/#36236

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	13' 0"	•	1.000		1.000		1.000		1.000
support	13' 0"	•		•		•		•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
support	17' 0"	•		•		•		•	

Static Design Summary

Summary C 7x9.8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	67	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	137	1.0	28.6	kip	0.036	✓ Pass
Shear Minor		No Significant Forces		kip	-	Not required
Flexure Major	145	-4.2	15.7	kip ft	0.270	✓ Pass
Flexure Minor	230	-0.3	2.7	kip ft	0.112	✓ Pass
Axial Tension	131	-0.6	93.0	kip	0.007	✓ Pass
Axial Compression	247	0.5	8.9	kip	0.061	✓ Pass
Combined Forces	145	-	-	-	0.306	✓ Pass
Torsion		No Significant Forces		-	-	Not required
Deflection Self weight	249	0.0	-	in	-	-
Deflection Slab	249	-0.0	0.2	in	0.107	✓ Pass

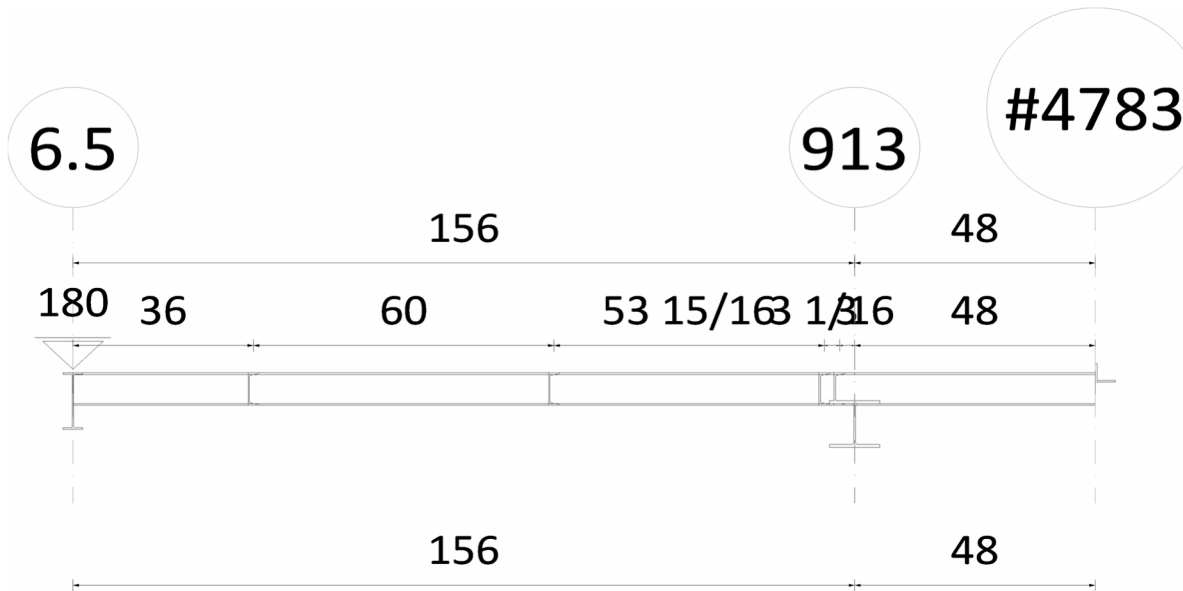


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Project Name: Lee's Summit Market Plaza		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Live	16	0.0	0.3	in	0.070	✓ Pass
Deflection Wind	237	-0.0	0.3	in	0.043	✓ Pass
Deflection Total	145	0.2	0.4	in	0.457	✓ Pass

SB 1/6.5/#6427-1/%822



St. 1 (LOW ROOF): 1 St. 1 (LOW ROOF):
C 7x14.75 A36-36 #6427-1/%822 A36-36

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	3' 0"	•	1.000		1.000		1.000	•	1.000
member	3' 0"	•						•	
sub-beam	5' 0"	•	1.000		1.000		1.000		1.000
member	8' 0"	•						•	
sub-beam	4' 6"	•	1.000		1.000		1.000		1.000
member	12' 6"	•						•	
sub-beam	3"	•	1.000		1.000		1.000		1.000
member	12' 9"	•						•	
sub-beam	3"	•	1.000		1.000		1.000		1.000
support	13' 0"	•		•		•		•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
support	17' 0"	•		•		•		•	

Static Design Summary
Summary C 7x14.75

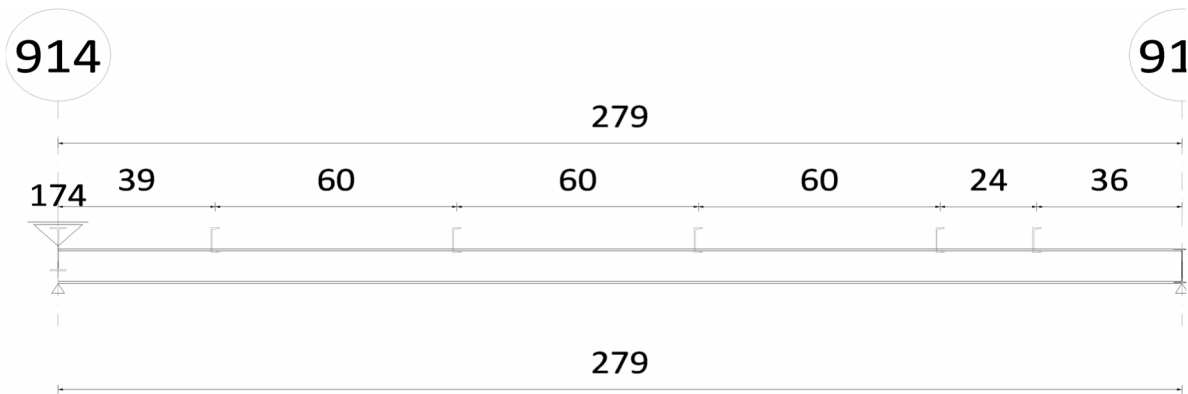


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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	40	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	144	8.3	57.0	kip	0.146	✓ Pass
Shear Minor	139	0.9	32.7	kip	0.028	✓ Pass
Flexure Major	145	-14.9	16.4	kip ft	0.911	✓ Pass
Flexure Minor	139	0.6	3.3	kip ft	0.187	✓ Pass
Axial Tension	145	-0.3	140.3	kip	0.002	✓ Pass
Axial Compression	224	0.3	109.5	kip	0.003	✓ Pass
Combined Forces	144	-	-	-	0.966	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.0	-	in	-	-
Deflection Live	16	0.0	0.3	in	0.174	✓ Pass
Deflection Wind	237	-0.0	0.3	in	0.104	✓ Pass
Deflection Total	145	0.4	0.4	in	0.973	✓ Pass

SB 1/913/914-1/913/916



St. 1 (LOW ROOF): SB 1/913/914-1/913/916 - 1
W 10x54 A992-50

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	3' 3"	•	1.000		1.000		1.000		1.000
member	3' 3"	•						•	
sub-beam	5' 0"	•	1.000		1.000		1.000		1.000
member	8' 3"	•						•	
sub-beam	5' 0"	•	1.000		1.000		1.000		1.000
member	13' 3"	•						•	
sub-beam	5' 0"	•	1.000		1.000		1.000		1.000
member	18' 3"	•						•	
sub-beam	2' 0"	•	1.000		1.000		1.000		1.000
member	20' 3"	•						•	
sub-beam	3' 0"	•	1.000		1.000		1.000		1.000



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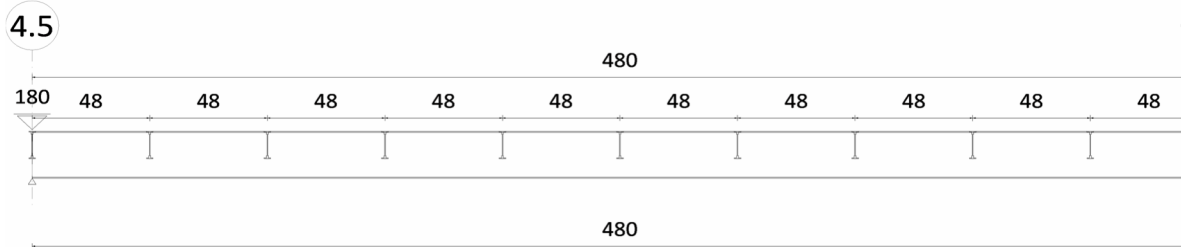
Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	23' 3"	•		•		•		•	

Static Design Summary

Summary W 10x54

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	134	25.5	112.1	kip	0.228	✓ Pass
Shear Minor	224	-1.1	332.1	kip	0.003	✓ Pass
Flexure Major	145	148.0	249.7	kip ft	0.593	✓ Pass
Flexure Minor	224	4.1	117.4	kip ft	0.035	✓ Pass
Axial Tension	240	-0.7	711.0	kip	0.001	✓ Pass
Axial Compression	144	1.6	527.6	kip	0.003	✓ Pass
Combined Forces	145	-	-	-	0.609	✓ Pass
Torsion	139	-	-	-	0.711	✓ Pass
Deflection Self weight	249	0.1	-	in	-	-
Deflection Slab	249	-0.0	1.2	in	0.001	✓ Pass
Deflection Dead	249	0.2	0.8	in	0.233	✓ Pass
Deflection Live	16	0.1	0.8	in	0.193	✓ Pass
Deflection Wind	231	-0.1	1.4	in	0.063	✓ Pass
Deflection Total	145	1.1	1.2	in	0.940	✓ Pass
Torsion	Design Check Applied Forces Only					-

SB 1/A.1/4.5-1/A.1/3.5



St. 1 (LOW ROOF): SB 1/A.1/4.5-1/A.1/3.5 - 1 (W 21x44 A992-50)

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	4' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	8' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	12' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	16' 0"	•						•	



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Project Name: Lee's Summit Market Plaza		

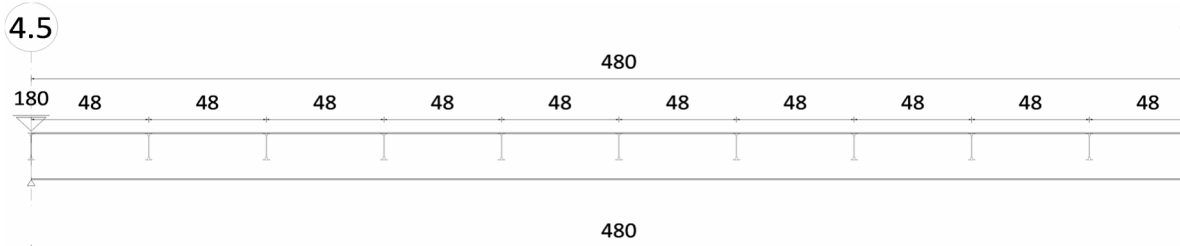
Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	20' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	24' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	28' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	32' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	36' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
support	40' 0"	•		•		•		•	

Static Design Summary

Summary W 21x44

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	40	18.3	217.4	kip	0.084	✓ Pass
Shear Minor		No Significant Forces		kip	-	Not required
Flexure Major	140	196.6	357.7	kip ft	0.550	✓ Pass
Flexure Minor	65	-0.4	38.2	kip ft	0.011	✓ Pass
Axial Tension	240	-4.9	585.0	kip	0.008	✓ Pass
Axial Compression	256	12.0	133.2	kip	0.090	✓ Pass
Combined Forces	134	-	-	-	0.599	✓ Pass
Torsion		No Significant Forces		-	-	Not required
Deflection Self weight	249	0.1	-	in	-	-
Deflection Dead	249	0.7	1.3	in	0.551	✓ Pass
Deflection Live	16	0.3	1.3	in	0.210	✓ Pass
Deflection Wind	234	-0.2	2.4	in	0.069	✓ Pass
Deflection Total	140	1.6	2.0	in	0.824	✓ Pass

SB 1/A.9/4.5-1/A.9/3.5



St. 1 (LOW ROOF): SB 1/A.9/4.5-1/A.9/3.5 - 1 (W 21x44 A992-50)

Restraints



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Project Name: Lee's Summit Market Plaza		

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	4' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	8' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	12' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	16' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	20' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	24' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	28' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	32' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	36' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
support	40' 0"	•		•		•		•	

Static Design Summary

Summary W 21x44

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	40	20.9	217.4	kip	0.096	✓ Pass
Shear Minor	160	0.3	158.0	kip	0.002	✓ Pass
Flexure Major	143	225.8	357.7	kip ft	0.631	✓ Pass
Flexure Minor	160	0.9	38.2	kip ft	0.023	✓ Pass
Axial Tension	245	-7.3	585.0	kip	0.012	✓ Pass
Axial Compression	69	12.3	133.2	kip	0.092	✓ Pass
Combined Forces	137	-	-	-	0.681	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.1	-	in	-	-
Deflection Dead	249	0.7	1.3	in	0.551	✓ Pass
Deflection Live	16	0.3	1.3	in	0.210	✓ Pass
Deflection Wind	240	-0.2	2.4	in	0.069	✓ Pass
Deflection Total	143	1.9	2.0	in	0.932	✓ Pass

SB 1/B/#6423-1/%823



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Project Name: Lee's Summit Market Plaza		



St. 1 (LOW SLOPE ROOF): 2
C 7x12.25 @ 36" o.c. 1/4" A82336

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	4' 9"	•	1.000		1.000		1.000		1.000
support	4' 9"	•		•		•		•	
sub-beam	3' 0"		1.000		1.000		1.000		1.000
support	7' 9"	•		•		•		•	

Static Design Summary
Summary C 7x12.25

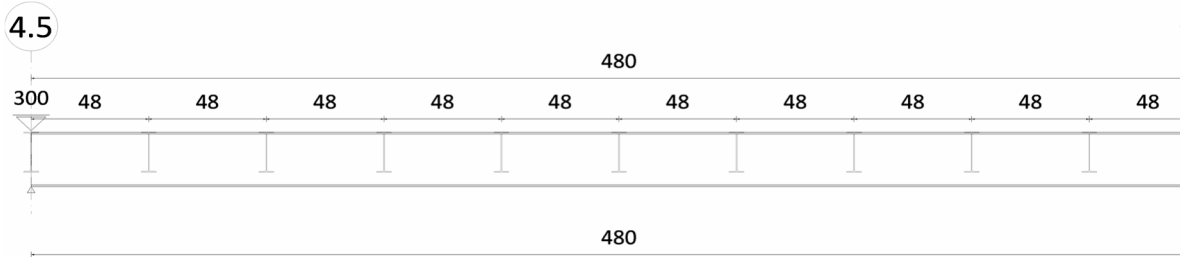


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Revision:	Date:	Sheet No. 362
Project Name: Lee's Summit Market Plaza		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	144	6.4	42.7	kip	0.149	✓ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	145	-18.5	20.5	kip ft	0.906	✓ Pass
Flexure Minor	224	0.1	3.0	kip ft	0.035	✓ Pass
Axial Tension	246	-0.2	116.3	kip	0.002	✓ Pass
Axial Compression	145	1.7	68.4	kip	0.024	✓ Pass
Combined Forces	145	-	-	-	0.939	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.0	-	in	-	-
Deflection Dead	249	0.1	0.3	in	0.350	✓ Pass
Deflection Live	16	0.0	0.3	in	0.145	✓ Pass
Deflection Wind	237	-0.0	0.3	in	0.086	✓ Pass
Deflection Total	144	0.4	0.5	in	0.802	✓ Pass

SB 2/A.1/4.5-2/A.1/3.5



St. 2 (BOT HIGH ROOF): SB 2/A.1/4.5-2/A.1/3.5 - 1 (W 24x76 A992-50)

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	4' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	8' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	12' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	16' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	20' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	24' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	28' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	32' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000



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Revision:	Date:	Sheet No. 363
Project Name: Lee's Summit Market Plaza		

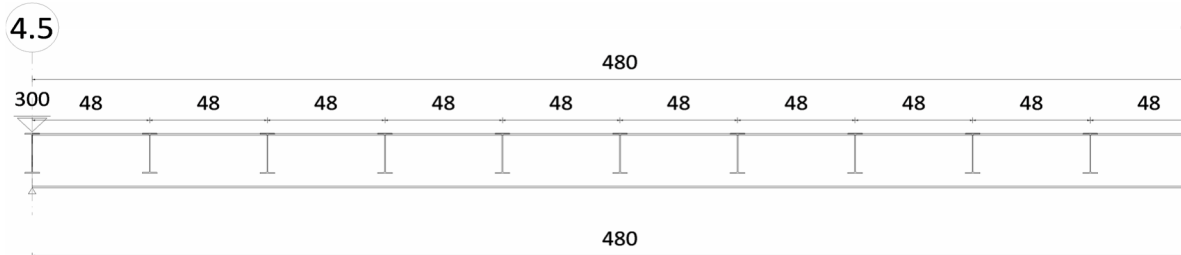
Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
member	36' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
support	40' 0"	•		•		•		•	

Static Design Summary

Summary W 24x76

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	69	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	69	37.5	315.5	kip	0.119	✓ Pass
Shear Minor	153	-0.6	330.1	kip	0.002	✓ Pass
Flexure Major	69	409.6	750.0	kip ft	0.546	✓ Pass
Flexure Minor	153	-2.3	107.2	kip ft	0.022	✓ Pass
Axial Tension	150	-12.3	1008.0	kip	0.012	✓ Pass
Axial Compression	270	8.4	353.9	kip	0.024	✓ Pass
Combined Forces	66	-	-	-	0.567	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.3	-	in	-	-
Deflection Dead	249	0.6	1.3	in	0.429	✓ Pass
Deflection Live	16	0.6	1.3	in	0.424	✓ Pass
Deflection Wind	240	-0.3	2.4	in	0.121	✓ Pass
Deflection Total	69	1.5	2.0	in	0.726	✓ Pass

SB 2/A.9/4.5-2/A.9/3.5



St. 2 (BOT HIGH ROOF): SB 2/A.9/4.5-2/A.9/3.5 - 1 (W 24x76 A992-50)

Restraints

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	4' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	8' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	12' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	16' 0"	•						•	



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Revision:	Date:	Sheet No. 364
Project Name: Lee's Summit Market Plaza		

Source	Distance / Length	LTB Top / Sub-Beam	LTB Top Factor	LTB Btm / Sub-Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	20' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	24' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	28' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	32' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
member	36' 0"	•						•	
sub-beam	4' 0"	•	1.000		1.000		1.000		1.000
support	40' 0"	•		•		•		•	

Static Design Summary

Summary W 24x76

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	56	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	66	37.5	315.5	kip	0.119	✓ Pass
Shear Minor	153	0.6	330.1	kip	0.002	✓ Pass
Flexure Major	69	409.6	750.0	kip ft	0.546	✓ Pass
Flexure Minor	153	2.4	107.2	kip ft	0.022	✓ Pass
Axial Tension	156	-11.9	1008.0	kip	0.012	✓ Pass
Axial Compression	245	9.0	353.9	kip	0.025	✓ Pass
Combined Forces	69	-	-	-	0.565	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	249	0.3	-	in	-	-
Deflection Dead	249	0.6	1.3	in	0.429	✓ Pass
Deflection Live	16	0.6	1.3	in	0.424	✓ Pass
Deflection Wind	234	-0.3	2.4	in	0.121	✓ Pass
Deflection Total	66	1.5	2.0	in	0.726	✓ Pass

Column Design

Columns

Rolled

SC 6.5/909



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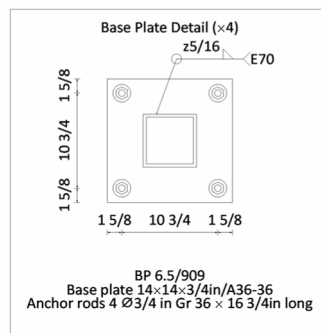
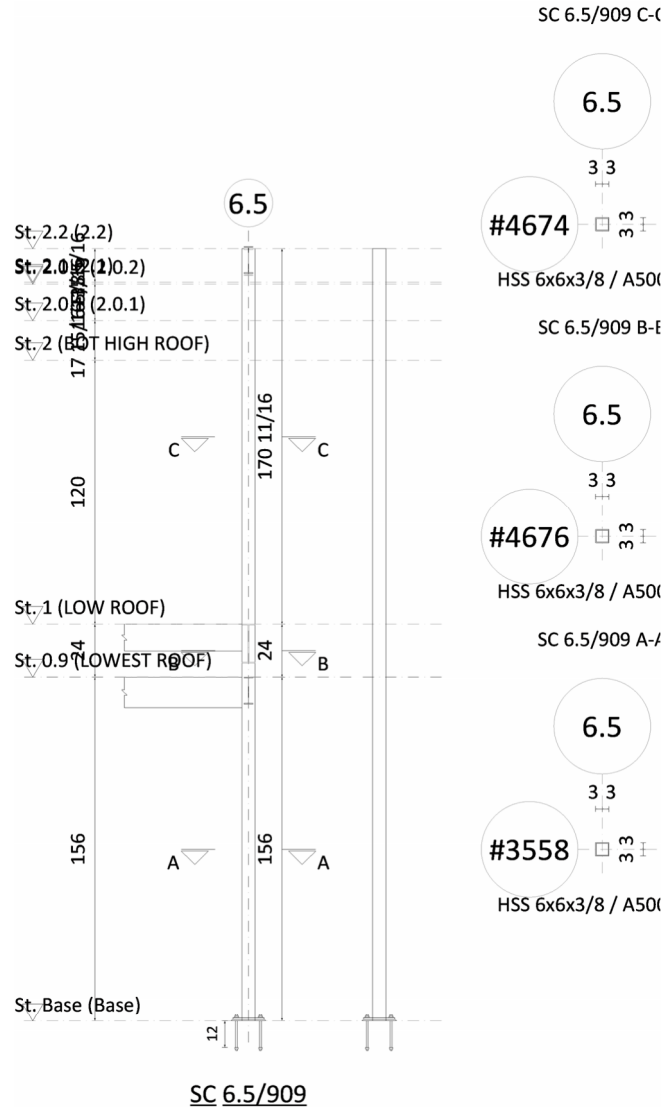
Job No. 23-23

Revision:

Date:

Sheet No. 365

Project Name: Lee's Summit Market Plaza



Lateral Restraints



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Revision:	Date:	Sheet No. 366
Project Name: Lee's Summit Market Plaza		

Level	Source	DistanceÂ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained/ Sub-stack continuous	Face C factor
4	floor	29' 2 5/8"	No		No	
	sub-beam	14' 2 5/8"	No	1.000	No	1.000
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	Yes		Yes	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Strut Restraints

Level	Source	DistanceÂ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
4	floor	29' 2 5/8"	Yes		No	
	sub-beam	14' 2 5/8"	No	1.000	No	1.000
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	Yes		Yes	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary HSS 6x6x3/8 (A500B-46)

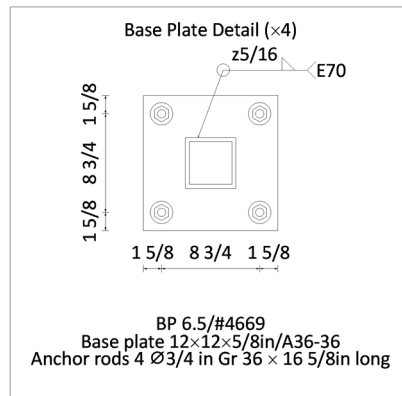
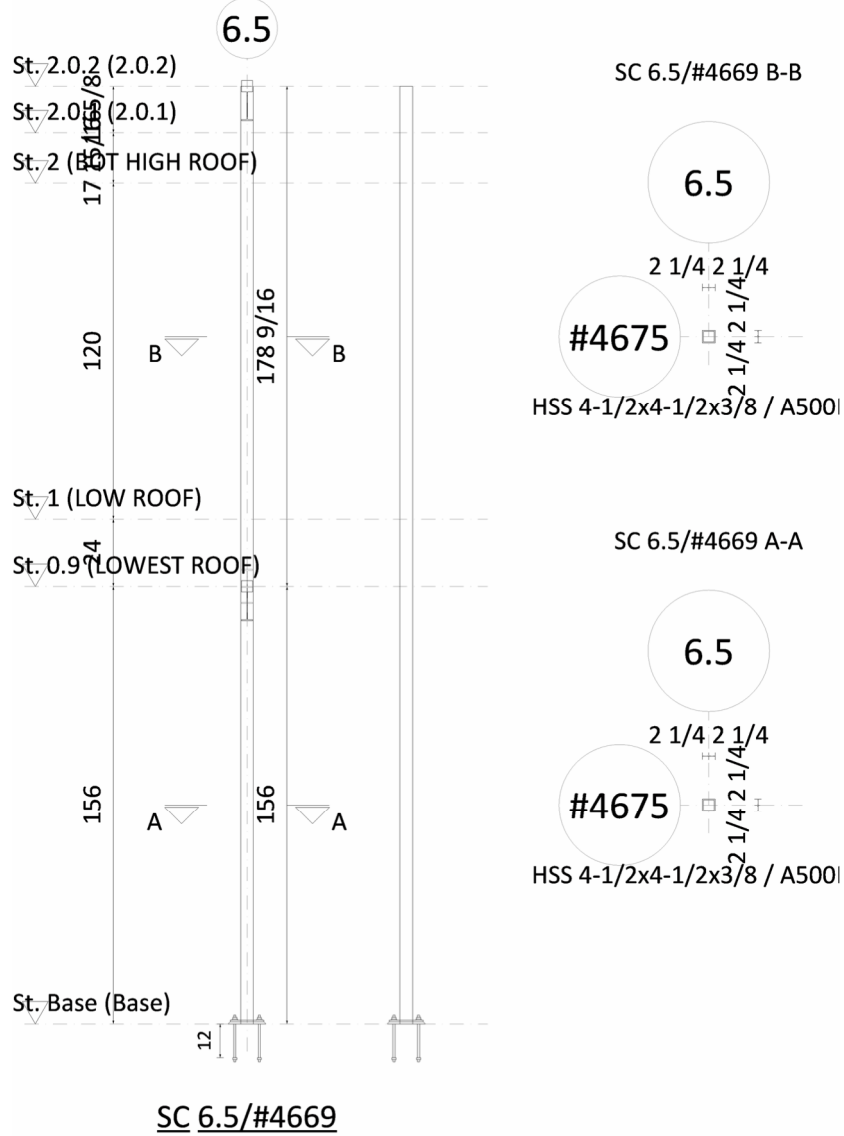
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	256	12.5	85.9	kip	0.145	✓ Pass
Shear Minor	150	-2.7	85.9	kip	0.031	✓ Pass
Flexure Major	72	37.1	54.5	kip ft	0.681	✓ Pass
Flexure Minor	145	-14.2	54.5	kip ft	0.260	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	140	82.8	229.0	kip	0.362	✓ Pass
Combined Forces	71	-	-	-	0.769	✓ Pass
Design Note	Top & Bottom Flanges Laterally Restrained					⚠ Warning
Design Note	Major and/or Minor Axes Strut Restrained					⚠ Warning

SC 6.5/#4669



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Revision:	Date:	Sheet No. 367
Project Name: Lee's Summit Market Plaza		





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Revision:	Date:	Sheet No. 368
Project Name: Lee's Summit Market Plaza		

Lateral Restraints

Level	Source	DistanceÂ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained / Sub-stack continuous	Face C factor
3	floor	27' 10 5/8"	No		No	
	sub-beam	14' 10 5/8"	No	1.000	No	1.000
2	floor	13' 0"	No		No	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Strut Restraints

Level	Source	DistanceÂ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
3	floor	27' 10 5/8"	Yes		No	
	sub-beam	14' 10 5/8"	No	1.000	No	1.000
2	floor	13' 0"	Yes		No	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary HSS 4-1/2x4-1/2x3/8 (A500B-46)

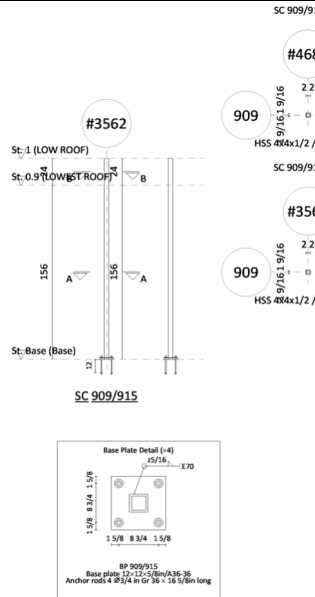
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	246	-1.1	59.9	kip	0.018	✓ Pass
Shear Minor	162	2.2	59.9	kip	0.037	✓ Pass
Flexure Major	161	-3.0	28.8	kip ft	0.104	✓ Pass
Flexure Minor	247	5.8	28.8	kip ft	0.200	✓ Pass
Axial Tension	256	-5.3	226.9	kip	0.024	✓ Pass
Axial Compression	254	26.1	30.8	kip	0.846	✓ Pass
Combined Forces	254	-	-	-	0.917	✓ Pass
Design Note	Top & Bottom Flanges Laterally Restrained					⚠ Warning
Design Note	Major and/or Minor Axes Strut Restrained					⚠ Warning

SC 909/915



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Revision:	Date:	Sheet No. 369
Project Name: Lee's Summit Market Plaza		



Lateral Restraints

Level	Source	Distance $\hat{A}$ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained / Sub-stack continuous	Face C factor
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	Yes		Yes	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Strut Restraints

Level	Source	Distance $\hat{A}$ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	No		Yes	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary HSS 4x4x1/2 (A500B-46)

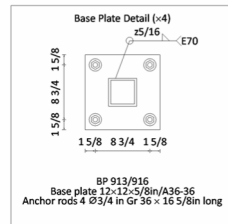
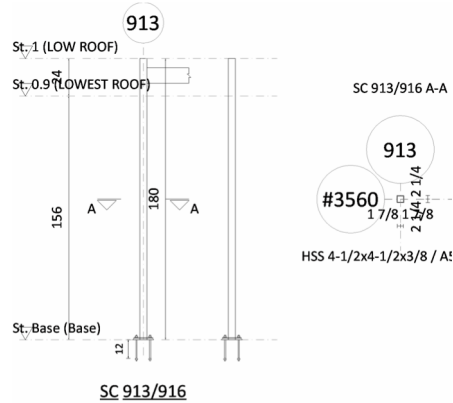
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	246	-2.0	60.2	kip	0.032	✓ Pass
Shear Minor	162	1.5	60.2	kip	0.025	✓ Pass
Flexure Major	139	-4.5	26.6	kip ft	0.170	✓ Pass
Flexure Minor	142	8.8	26.6	kip ft	0.330	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	40	37.1	83.5	kip	0.445	✓ Pass
Combined Forces	139	-	-	-	0.869	✓ Pass



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Revision:	Date:	Sheet No. 370
Project Name: Lee's Summit Market Plaza		

SC 913/916



Lateral Restraints

Level	Source	Distance $\hat{A}$ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained / Sub-stack continuous	Face C factor
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Strut Restraints

Level	Source	Distance $\hat{A}$ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary HSS 4-1/2x4-1/2x3/8 (A500B-46)

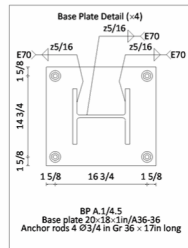
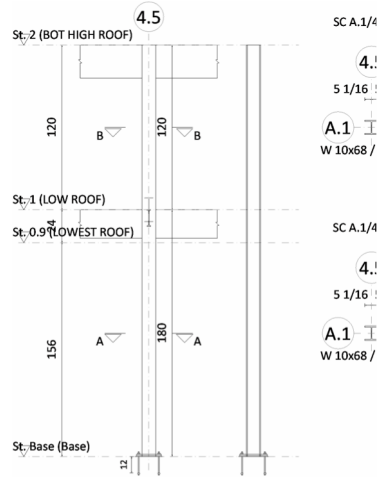
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	246	-1.1	59.9	kip	0.018	✓ Pass
Shear Minor	230	1.4	59.9	kip	0.023	✓ Pass
Flexure Major	144	7.0	28.8	kip ft	0.244	✓ Pass
Flexure Minor	145	-9.1	28.8	kip ft	0.314	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	145	41.2	103.8	kip	0.397	✓ Pass
Combined Forces	144	-	-	-	0.892	✓ Pass



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Revision:	Date:	Sheet No. 371
Project Name: Lee's Summit Market Plaza		

SC A.1/4.5



Lateral Restraints

Level	Source	Distance $\hat{A}$ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained / Sub-stack continuous	Face C factor
3	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Strut Restraints

Level	Source	Distance $\hat{A}$ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
3	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary W 10x68 (A992-50)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	238	1.7	146.6	kip	0.011	✓ Pass



Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	249	1.6	420.0	kip	0.004	✓ Pass
Flexure Major	238	-16.7	319.9	kip ft	0.052	✓ Pass
Flexure Minor	249	-16.2	150.4	kip ft	0.108	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	137	113.9	628.8	kip	0.181	✓ Pass
Combined Forces	249	-	-	-	0.173	✓ Pass

Figure 10: Details of the base plate for the column. The figure includes a side elevation view of the column base and a detailed view of the base plate. The side elevation shows the column with a base plate at the bottom. Key dimensions include: 120 inches for the height from the base to the first floor line (St. 1), 120 inches for the height from the first floor line to the second floor line (St. 2), 156 inches for the height from the base to the second floor line, and 24 inches for the height from the base to the third floor line (St. 3). The base plate is shown with a thickness of 1/2 inch. The detailed view of the base plate shows a rectangular plate with a width of 16 3/4 inches and a height of 15 5/8 inches. It features four anchor bolts with a diameter of 3/4 inch and a length of 17 inches. The plate is labeled "Base plate (20 1/2 x 16 3/4 x 3/4)" and "Anchor rods (4 #3/4 in. Gr 36 x 17 in. long)".

Level	Source	DistanceÂ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained/ Sub-stack continuous	Face C factor
4	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	Yes		Yes	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Level	Source	DistanceÂ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
4	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	Yes		Yes	
	sub-beam	13' 0"	No	1.000	No	1.000



Strut Restraints



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Revision:	Date:	Sheet No. 374
Project Name: Lee's Summit Market Plaza		

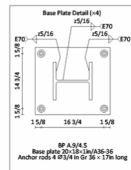
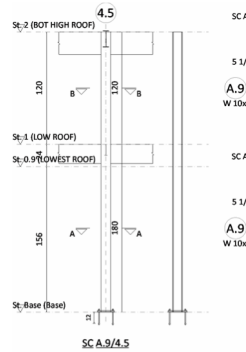
Level	Source	DistanceÂ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
4	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
3	floor	15' 0"	Yes		Yes	
	sub-beam	2' 0"	No	1.000	No	1.000
2	floor	13' 0"	Yes		No	
	sub-beam	13' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	246	-7.2	122.9	kip	0.059	✓ Pass
Shear Minor	153	4.0	122.9	kip	0.032	✓ Pass
Flexure Major	252	-18.4	80.0	kip ft	0.229	✓ Pass
Flexure Minor	153	7.3	80.0	kip ft	0.091	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	143	50.4	304.8	kip	0.165	✓ Pass
Combined Forces	68	-	-	-	0.291	✓ Pass

SC A.9/4.5



Lateral Restraints

Level	Source	DistanceÂ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained/ Sub-stack continuous	Face C factor
3	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	



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Revision:	Date:	Sheet No. 375
Project Name: Lee's Summit Market Plaza		

Strut Restraints

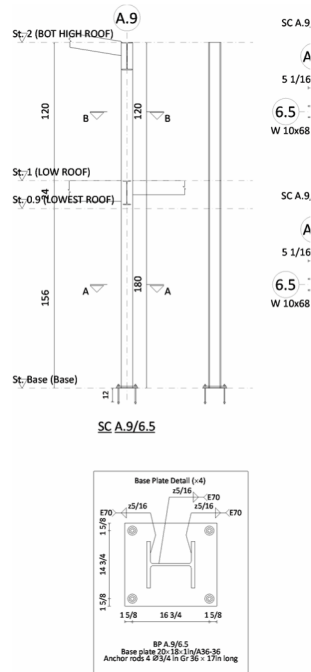
Level	Source	Distance $\hat{A}$ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
3	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary W 10x68 (A992-50)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	160	7.3	146.6	kip	0.050	✓ Pass
Shear Minor	161	2.4	420.0	kip	0.006	✓ Pass
Flexure Major	160	-41.1	319.9	kip ft	0.128	✓ Pass
Flexure Minor	250	-16.6	150.4	kip ft	0.110	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	143	119.8	628.8	kip	0.191	✓ Pass
Combined Forces	143	-	-	-	0.270	✓ Pass

SC A.9/6.5



Lateral Restraints

Level	Source	Distance $\hat{A}$ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained / Sub-stack continuous	Face C factor
3	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
2	floor	15' 0"	Yes		Yes	



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Revision:	Date:	Sheet No. 376
Project Name: Lee's Summit Market Plaza		

Level	Source	DistanceÂ /	Face A restrained / Sub-stack continuous	Face A factor	Face C restrained/ Sub-stack continuous	Face C factor
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Strut Restraints

Level	Source	DistanceÂ /	Major restrained / Sub-stack continuous	Major factor	Minor restrained / Sub-stack continuous	Minor factor
3	floor	25' 0"	Yes		Yes	
	sub-beam	10' 0"	No	1.000	No	1.000
2	floor	15' 0"	Yes		Yes	
	sub-beam	15' 0"	No	1.000	No	1.000
1	floor	0"	Yes		Yes	

Static Design Summary

Summary W 10x68 (A992-50)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	250	-4.4	146.6	kip	0.030	✓ Pass
Shear Minor	160	1.7	420.0	kip	0.004	✓ Pass
Flexure Major	250	46.2	319.9	kip ft	0.145	✓ Pass
Flexure Minor	140	-7.0	150.4	kip ft	0.047	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	143	93.3	628.8	kip	0.148	✓ Pass
Combined Forces	144	-	-	-	0.213	✓ Pass

Brace Design

Braces

Rolled

SBR 2/A.1/6.5-0.9/6.5/#4669



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Revision:	Date:	Sheet No. 377
Project Name: Lee's Summit Market Plaza		

301 5/8



FRM 6.5: SBR 2/A.1/6.5-0.9/6.5/#4669 - 1
HSS 4x4x1/8 A500B-46

Static Design Summary

Summary HSS 4x4x1/8(A500B-46)

Design Condition	Combination Name	Design Value	Design Capacity	Units	U.R.	Status
Classification	71	Non-slender	-	-	-	✓ Pass
Axial Compression	270	7.4	15.2	kip	0.489	✓ Pass
Axial Tension	256	-10.2	73.3	kip	0.139	✓ Pass

SBR FRM 6.5/#708/#4669-0.9/A.1/6.5



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Revision:	Date:	Sheet No. 378
Project Name: Lee's Summit Market Plaza		

336 1/16



FRM 6.5: SBR FRM 6.5/#708/#4669-0.9/A.1/6.5 -
HSS 4x4x3/16 A500B-46

Static Design Summary

Summary HSS 4x4x3/16(A500B-46)

Design Condition	Combination Name	Design Value	Design Capacity	Units	U.R.	Status
Classification	1	Non-slender	-	-	-	✓ Pass
Axial Compression	256	10.8	18.2	kip	0.594	✓ Pass
Axial Tension	270	-8.5	106.8	kip	0.080	✓ Pass

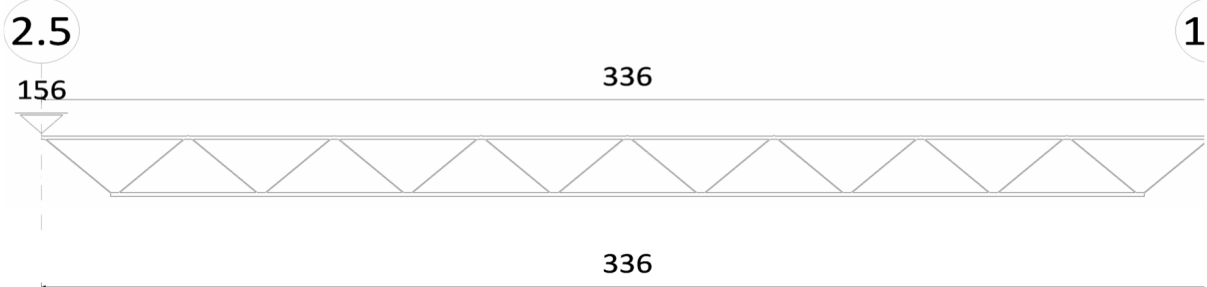
Steel Joists

SJ 0.9/2.5/#6570-0.9/1.8/#6571



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Revision:	Date:	Sheet No. 379
Project Name: Lee's Summit Market Plaza		



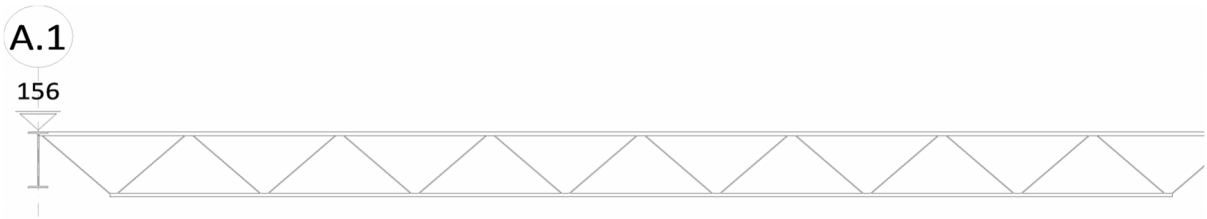
St. 0.9 (LOWEST ROOF): SJ 0.9/2.5/#6570-0.9/1.8/#6571 - 1
20KCS4 A992-50

Static Design Summary

Summary 20KCS4 (A992-50)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Min. Joist Depth	-	20	14	in	0.700	✓ Pass
Shear Major	40	8.9	11.9	kip	0.752	✓ Pass
Flexure Major	136	0.79	0.82	kip ft	0.956	✓ Pass
Deflection Dead	249	0.2	-	in	-	-
Deflection Live	40	0.5	0.9	in	0.536	✓ Pass
Deflection Total	40	0.7	1.7	in	0.419	✓ Pass

SJ 0.9/A.1/#6436-0.9/%843



St. 0.9 (LOWEST ROOF): SJ 0.9/A.1/#6436-0.9/%843 - 1 (24KCS5 A992-50)

Static Design Summary

Summary 24KCS5 (A992-50)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Min. Joist Depth	-	24	16 45/64	in	0.696	✓ Pass
Shear Major	40	11.0	13.4	kip	0.821	✓ Pass
Flexure Major	40	0.76	0.82	kip ft	0.919	✓ Pass
Deflection Dead	249	0.2	-	in	-	-
Deflection Live	40	0.6	1.1	in	0.554	✓ Pass
Deflection Total	40	0.8	2.0	in	0.403	✓ Pass

SJ 1/A.1/#909-1/A/#910