FLSmidth

PLANT SYSTEMS GROUP - SALT LAKE CITY, UTAH

CALCULATION COVER SHEET

JOB NUMBER	CLIENT	PROJECT	CALC. NUMBER
11021	CC&V	High Grade Ore	C-004

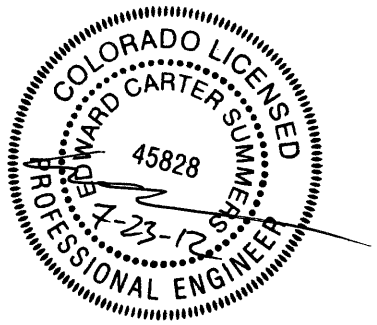
TITLE/SUBJECT:

Office Area Concrete

STATEMENT OF PROBLEM:

Design Concrete Footings, Slab and Decking for Office Area

P.E. SEAL



SOURCES OF DATA, FORMULA & REFERENCES:

GA from Render
Site Specific Design Criteria (Excel Spread Sheet)
ASCE /SEI 7-10 Minimum Design Loads for Buildings and Other Structure
ACI 318-08
ENERCLAC Version 6
AutoDesk Robot Structural Analysis Professional 2012

CONCLUSIONS & RECOMMENDATIONS:

See details in report

REV	DATE	DESCRIPTION/STATUS	CALC BY	CHKD BY	DWG./SPECS REVISED	QA REVIEW
A	Feb-12	Ready for Check	CCK	WC		
0	Jul-12	Issued for Permit	CCK / ECS	WC		

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FLSmidth	PROJECT CC&V	Proj No. 11021	
	Office Area Concrete	Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	of

STORY SHEAR & DIAPHRAGM FORCES

S_{DS}	0.213
S_{D1}	0.104
Importance Factor - I	1.0

Section 12.3 Redundancy

Response Modification - R	3.00
Deflection Amplification -Cd	3.00
Overstrength - Ωo	3.00
Redundancy Factor	1.00

Section 12.8

12.8.1	Base Shear - Qe	26 kips
	Seismic Weight - W	371 kips
	Response Coefficient -Cs	0.071
	Period Building Type	Steel moment-resisting frames

Section 12.8.3: Vertical Distribution of Seismic Forces

Number of Diapragh Levels 2

(12.10-1)

Diapragm/ Floor	Story Height	Diaphragm Area	Diaphragm Weight	Perimeter Wall Length	Perimeter Wall Weight	Seismic Weight	Force @ Floor	Story Shear	Diahpragm Force
Roof	12.0 ft	3200 sqft	58 psf	0 ft	0 plf	186 kips	17 kips	17 kips	17 kips
Level 1	15.0 ft	3200 sqft	58 psf	0 ft	0 plf	186 kips	9 kips	26 kips	13 kips
Base	0.0 ft	0 sqft	0 psf	0 ft	0 plf	0 kips	0 kips	26 kips	0 kips
	TOTAL	6400 sqft	58 psf			371 kips	26 kips	26 kips	

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		CALC NO.
	SUBJECT Diaphragm Shear	BY DATE
		CHK DATE
		SHEET OF REV

Maximum Diaphragm Force: 17 k @ Roof

E-W Direction

$\frac{17\text{ k}}{4\text{ braces}} = 4.25\text{ k/brace}$

$\frac{4.25\text{ k/brace}}{20\text{ Ft/brace}} = 0.213\text{ klf} < 2.065\text{ klf}$ - OK

N-S Direction

$\frac{17\text{ k}}{10\text{ M.F.}} = 1.7\text{ k/M.F.}$

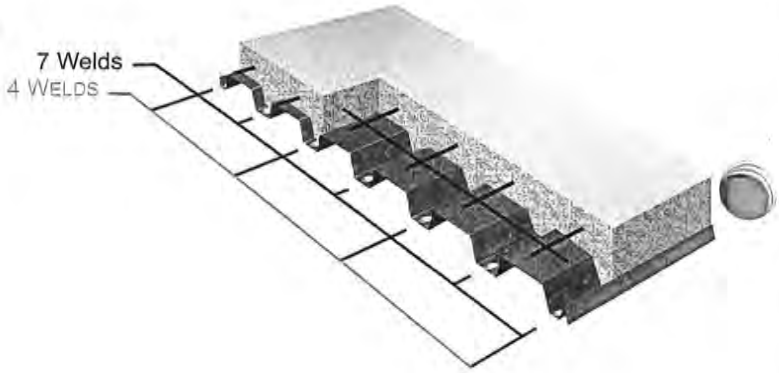
$\frac{1.7\text{ k/M.F.}}{20\text{ Ft/M.F.}} = 0.085\text{ klf} < 2.065\text{ klf}$ - OK

$\rho_{min} = 0.0018$

$A_s = 0.0018(4")(12') = 0.086\text{ in}^2$ - use #4 E.W. ($A_s = 0.2\text{ in}^2$)

PLB™ and B FORMLOK™

- **4 in. (*102 mm*) TOTAL SLAB DEPTH**
- **Normal Weight Concrete**
  - **145 pcf (*2,320 kg/m³*)**
  - **36.6 psf (*1,752 N/m²*)**
- **Galvanized or Phosphatized/Painted**



Deck Weight and Section Properties

Gage	Weight (psf, *N/m²*)		Properties per ft (*m*) of Width			Allowable Reactions per ft (*m*) of Width (lb, *N*)				
						End Bearing			Interior Bearing	
	Galv G60 *Z180*	Phos/ Painted	I in.⁴ *mm⁴*	+S in.³ *mm³*	–S in.³ *mm³*	2" *51 mm*	3" *76 mm*	4" *102 mm*	3" *76 mm*	4" *102 mm*
22	1.9 *91.0*	1.8 *86.2*	0.175 *238,978*	0.187 *10,054*	0.198 *10,645*	487 *7,107*	585 *8,537*	683 *9,968*	1250 *18,242*	1498 *21,862*
20	2.3 *110.1*	2.2 *105.3*	0.216 *294,967*	0.235 *12,634*	0.248 *13,333*	665 *9,705*	784 *11,442*	903 *13,178*	1790 *26,123*	2118 *30,910*

Allowable Superimposed Loads (psf, *kN/m²*)

Gage	Spans	Span (ft-in., *mm*)										
		6'-0" *1,830*	6'-6" *1,980*	7'-0" *2,130*	7'-6" *2,290*	8'-0" *2,440*	8'-6" *2,590*	9'-0" *2,740*	9'-6" *2,900*	10'-0" *3,050*	10'-6" *3,200*	11'-0" *3,350*
22	1	269 *12.9*	231 *11.1*	200 *9.6*	175 *8.4*	153 *7.3*	135 *6.5*	120 *5.7*	107 *5.1*	95 *4.5*	85 *4.1*	76 *3.6*
	2	300 *14.4*	266 *12.7*	200 *9.6*	175 *8.4*	153 *7.3*	135 *6.5*	120 *5.7*	107 *5.1*	95 *4.5*	85 *4.1*	76 *3.6*
	3	300 *14.4*	266 *12.7*	200 *9.6*	175 *8.4*	153 *7.3*	135 *6.5*	120 *5.7*	107 *5.1*	95 *4.5*	85 *4.1*	76 *3.6*
20	1	300 *14.4*	244 *11.7*	212 *10.2*	185 *8.9*	163 *7.8*	144 *6.9*	127 *6.1*	113 *5.4*	101 *4.8*	91 *4.4*	81 *3.9*
	2	300 *14.4*	279 *13.4*	247 *11.8*	220 *10.5*	163 *7.8*	144 *6.9*	127 *6.1*	113 *5.4*	101 *4.8*	91 *4.4*	81 *3.9*
	3	300 *14.4*	279 *13.4*	247 *11.8*	220 *10.5*	163 *7.8*	144 *6.9*	127 *6.1*	113 *5.4*	101 *4.8*	91 *4.4*	81 *3.9*

Shoring required in shaded areas to right of heavy line

Diaphragm Shear Values, q (plf, *kN/m*) and Flexibility Factors, F ((in./lb)x10⁶, (*mm/N*)*x10⁶*)

Gage	Welds	Span (ft-in., *mm*)										
		6'-0" *1,830*	6'-6" *1,980*	7'-0" *2,130*	7'-6" *2,290*	8'-0" *2,440*	8'-6" *2,590*	9'-0" *2,740*	9'-6" *2,900*	10'-0" *3,050*	10'-6" *3,200*	11'-0" *3,350*
22	q4	2065 *30.14*	2025 *29.55*	1995 *29.11*	1965 *28.68*	1940 *28.31*	1915 *27.95*	1900 *27.73*	1880 *27.44*	1865 *27.22*	1850 *27.00*	1835 *26.78*
	F4	0.40 *2.3*	0.41 *2.3*	0.41 *2.3*	0.42 *2.4*	0.42 *2.4*	0.43 *2.5*	0.43 *2.5*	0.44 *2.5*	0.44 *2.5*	0.45 *2.6*	0.45 *2.6*
	q7	2275 *33.20*	2220 *32.40*	2170 *31.67*	2130 *31.09*	2095 *30.57*	2065 *30.14*	2035 *29.70*	2015 *29.41*	1990 *29.04*	1970 *28.75*	1950 *28.46*
	F7	0.36 *2.1*	0.37 *2.1*	0.38 *2.2*	0.39 *2.2*	0.39 *2.2*	0.40 *2.3*	0.40 *2.3*	0.41 *2.3*	0.41 *2.3*	0.42 *2.4*	0.42 *2.4*
20	q4	2130 *31.09*	2085 *30.43*	2045 *29.84*	2010 *29.33*	1980 *28.90*	1955 *28.53*	1930 *28.17*	1910 *27.87*	1890 *27.58*	1875 *27.36*	1860 *27.14*
	F4	0.35 *2.0*	0.36 *2.1*	0.37 *2.1*	0.37 *2.1*	0.38 *2.2*	0.38 *2.2*	0.39 *2.2*	0.39 *2.2*	0.40 *2.3*	0.40 *2.3*	0.40 *2.3*
	q7	2385 *34.81*	2315 *33.78*	2260 *32.98*	2215 *32.33*	2170 *31.67*	2135 *31.16*	2100 *30.65*	2070 *30.21*	2045 *29.84*	2020 *29.48*	1995 *29.11*
	F7	0.32 *1.8*	0.32 *1.8*	0.33 *1.9*	0.34 *1.9*	0.35 *2.0*	0.35 *2.0*	0.36 *2.1*	0.36 *2.1*	0.37 *2.1*	0.37 *2.1*	0.38 *2.2*

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: E , 5

LOADS

	F_X	F_Y	F_Z
Dead	-0.11 k	-0.23 k	15.76 k
Live	-0.14 k	-0.79 k	11.50 k
Snow	-0.01 k	0.21 k	12.32 k
Wind X	-0.02 k	-3.71 k	-10.51 k
Wind -X	0.01 k	-2.75 k	-0.60 k
Wind Y	-0.02 k	-4.06 k	-13.68 k
Wind -Y	-0.02 k	2.41 k	0.04 k
Seismic X	-0.05 k	-0.33 k	-0.77 k
Seismic -X	0.05 k	0.33 k	0.77 k
Seismic Y	0.00 k	-2.67 k	-7.36 k
Seismic -Y	0.00 k	2.67 k	7.36 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	22.06 k	-0.15 k	-0.32 k
2	1.2D+1.6L+0.5S	43.47 k	-0.36 k	-1.44 k
3	1.2D+L+1.6S	50.12 k	-0.29 k	-0.73 k
4	1.2D+L+0.5S+1.6W	36.64 k	-0.26 k	2.90 k
	1.2D+L+0.5S-1.6W	14.68 k	-0.31 k	-7.46 k
5	1.2D+1.0E+L+0.2S	40.24 k	-0.22 k	1.65 k
	1.2D-1.0E+L+0.2S	25.52 k	-0.32 k	-3.69 k
6	0.9D+1.6W	14.25 k	-0.08 k	3.65 k
	0.9D-1.6W	0.50 k	-0.12 k	-4.27 k
7	0.9D+1.0E	21.54 k	-0.05 k	2.46 k
	0.9D-1.0E	6.82 k	-0.15 k	-2.88 k

Design Values

Compression	Pu =	50.12 k
Tension	Tu =	0.50 k
Shear	Vu_X =	0.36 k
	Vu_Y =	7.46 k

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		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
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Column Location: F , 5

LOADS

	F_X	F_Y	F_Z
Dead	-1.04 k	-0.33 k	32.44 k
Live	-0.95 k	-0.50 k	32.44 k
Snow	-0.73 k	0.00 k	23.74 k
Wind X	-9.60 k	-0.87 k	19.91 k
Wind -X	6.69 k	-0.89 k	-14.22 k
Wind Y	-11.12 k	-0.49 k	23.64 k
Wind -Y	-10.93 k	0.52 k	23.07 k
Seismic X	-5.11 k	0.00 k	13.53 k
Seismic -X	5.07 k	0.00 k	-13.43 k
Seismic Y	0.07 k	-0.33 k	-0.34 k
Seismic -Y	-0.07 k	0.33 k	0.34 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	45.42 k	-1.46 k	-0.46 k
2	1.2D+1.6L+0.5S	102.70 k	-3.13 k	-1.20 k
3	1.2D+L+1.6S	109.35 k	-3.37 k	-0.90 k
4	1.2D+L+0.5S+1.6W	121.06 k	8.14 k	-0.06 k
	1.2D+L+0.5S-1.6W	60.49 k	-20.36 k	-2.32 k
5	1.2D+1.0E+L+0.2S	89.65 k	2.73 k	-0.57 k
	1.2D-1.0E+L+0.2S	62.69 k	-7.45 k	-1.23 k
6	0.9D+1.6W	67.02 k	9.77 k	0.54 k
	0.9D-1.6W	14.98 k	-12.06 k	-1.19 k
7	0.9D+1.0E	42.73 k	4.13 k	0.03 k
	0.9D-1.0E	15.77 k	-6.05 k	-0.63 k

Design Values

Compression	Pu =	121.06 k
Tension	Tu =	14.98 k
Shear	Vu_X =	20.36 k
	Vu_Y =	2.32 k

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: E , 6

LOADS

	F_X	F_Y	F_Z
Dead	-0.44 k	-1.10 k	38.39 k
Live	-0.75 k	-0.32 k	35.40 k
Snow	0.13 k	-1.90 k	28.51 k
Wind X	-0.24 k	-1.58 k	-3.63 k
Wind -X	0.16 k	-1.56 k	8.32 k
Wind Y	-0.26 k	-2.76 k	1.16 k
Wind -Y	-0.26 k	2.20 k	-13.97 k
Seismic X	-0.29 k	-0.37 k	0.94 k
Seismic -X	0.29 k	0.36 k	-0.93 k
Seismic Y	0.00 k	-2.98 k	8.50 k
Seismic -Y	0.00 k	2.98 k	-8.50 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	53.75 k	-0.62 k	-1.54 k
2	1.2D+1.6L+0.5S	116.96 k	-1.66 k	-2.78 k
3	1.2D+L+1.6S	127.08 k	-1.07 k	-4.68 k
4	1.2D+L+0.5S+1.6W	109.04 k	-0.96 k	0.93 k
	1.2D+L+0.5S-1.6W	73.37 k	-1.63 k	-7.01 k
5	1.2D+1.0E+L+0.2S	95.67 k	-0.96 k	0.96 k
	1.2D-1.0E+L+0.2S	78.67 k	-1.54 k	-5.00 k
6	0.9D+1.6W	47.86 k	-0.14 k	2.53 k
	0.9D-1.6W	20.58 k	-0.66 k	-3.75 k
7	0.9D+1.0E	43.05 k	-0.11 k	1.99 k
	0.9D-1.0E	26.05 k	-0.69 k	-3.97 k

Design Values

Compression	Pu =	127.08 k
Tension	Tu =	20.58 k
Shear	Vu_X =	1.66 k
	Vu_Y =	7.01 k

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		Calc No.	
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	LRFD Load Combinations	Check	
		Sheet	of

Column Location: F , 6

LOADS

	F_X	F_Y	F_Z
Dead	0.14 k	0.02 k	70.20 k
Live	0.06 k	0.02 k	90.44 k
Snow	0.20 k	0.01 k	28.46 k
Wind X	-0.33 k	-0.01 k	-6.46 k
Wind -X	0.22 k	-0.02 k	4.22 k
Wind Y	-0.36 k	-0.01 k	-6.42 k
Wind -Y	-0.36 k	0.01 k	-6.70 k
Seismic X	-0.33 k	0.00 k	0.31 k
Seismic -X	0.33 k	0.00 k	-0.30 k
Seismic Y	0.00 k	-0.06 k	0.23 k
Seismic -Y	0.00 k	0.06 k	-0.23 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	98.28 k	0.20 k	0.03 k
2	1.2D+1.6L+0.5S	243.17 k	0.36 k	0.06 k
3	1.2D+L+1.6S	220.22 k	0.55 k	0.06 k
4	1.2D+L+0.5S+1.6W	195.66 k	0.68 k	0.07 k
	1.2D+L+0.5S-1.6W	178.19 k	-0.25 k	0.02 k
5	1.2D+1.0E+L+0.2S	180.68 k	0.60 k	0.11 k
	1.2D-1.0E+L+0.2S	180.07 k	-0.06 k	-0.01 k
6	0.9D+1.6W	69.93 k	0.48 k	0.03 k
	0.9D-1.6W	56.48 k	-0.23 k	0.00 k
7	0.9D+1.0E	63.49 k	0.46 k	0.08 k
	0.9D-1.0E	62.88 k	-0.20 k	-0.04 k

Design Values

Compression	Pu =	243.17 k
Tension	Tu =	56.48 k
Shear	Vu_X =	0.68 k
	Vu_Y =	0.11 k

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Column Location: F , 8

LOADS

	F_X	F_Y	F_Z
Dead	-0.06 k	-0.05 k	61.60 k
Live	-0.43 k	-0.17 k	101.62 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	-1.02 k	0.01 k	-1.46 k
Seismic -X	1.02 k	-0.01 k	1.45 k
Seismic Y	0.01 k	-0.48 k	-2.28 k
Seismic -Y	-0.01 k	0.48 k	2.28 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	86.24 k	-0.08 k	-0.07 k
2	1.2D+1.6L+0.5S	236.51 k	-0.76 k	-0.33 k
3	1.2D+L+1.6S	175.54 k	-0.50 k	-0.23 k
4	1.2D+L+0.5S+1.6W	175.54 k	-0.50 k	-0.23 k
	1.2D+L+0.5S-1.6W	175.54 k	-0.50 k	-0.23 k
5	1.2D+1.0E+L+0.2S	177.82 k	0.52 k	0.25 k
	1.2D-1.0E+L+0.2S	173.26 k	-1.52 k	-0.71 k
6	0.9D+1.6W	55.44 k	-0.05 k	-0.05 k
	0.9D-1.6W	55.44 k	-0.05 k	-0.05 k
7	0.9D+1.0E	57.72 k	0.97 k	0.44 k
	0.9D-1.0E	53.16 k	-1.07 k	-0.53 k

Design Values

Compression	Pu =	236.51 k
Tension	Tu =	53.16 k
Shear	Vu_X =	1.52 k
	Vu_Y =	0.71 k

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Column Location: G , 8

LOADS

	F_X	F_Y	F_Z
Dead	0.25 k	0.00 k	30.49 k
Live	0.74 k	0.00 k	53.55 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	-0.56 k	0.01 k	-3.10 k
Seismic -X	0.56 k	-0.01 k	3.09 k
Seismic Y	0.00 k	-0.03 k	-0.01 k
Seismic -Y	0.00 k	0.03 k	0.01 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	42.69 k	0.35 k	0.00 k
2	1.2D+1.6L+0.5S	122.27 k	1.48 k	0.00 k
3	1.2D+L+1.6S	90.14 k	1.04 k	0.00 k
4	1.2D+L+0.5S+1.6W	90.14 k	1.04 k	0.00 k
	1.2D+L+0.5S-1.6W	90.14 k	1.04 k	0.00 k
5	1.2D+1.0E+L+0.2S	93.23 k	1.60 k	0.03 k
	1.2D-1.0E+L+0.2S	87.04 k	0.48 k	-0.03 k
6	0.9D+1.6W	27.44 k	0.23 k	0.00 k
	0.9D-1.6W	27.44 k	0.23 k	0.00 k
7	0.9D+1.0E	30.53 k	0.79 k	0.03 k
	0.9D-1.0E	24.34 k	-0.34 k	-0.03 k

Design Values

Compression	Pu =	122.27 k
Tension	Tu =	24.34 k
Shear	Vu_X =	1.60 k
	Vu_Y =	0.03 k

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: F , 9

LOADS

	F_X	F_Y	F_Z
Dead	-0.07 k	0.19 k	26.24 k
Live	-0.33 k	0.41 k	45.76 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	-0.02 k	-0.01 k	-0.36 k
Seismic -X	0.02 k	0.01 k	0.36 k
Seismic Y	0.00 k	-0.35 k	-1.56 k
Seismic -Y	0.00 k	0.35 k	1.56 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	36.74 k	-0.10 k	0.27 k
2	1.2D+1.6L+0.5S	104.70 k	-0.61 k	0.88 k
3	1.2D+L+1.6S	77.25 k	-0.41 k	0.64 k
4	1.2D+L+0.5S+1.6W	77.25 k	-0.41 k	0.64 k
	1.2D+L+0.5S-1.6W	77.25 k	-0.41 k	0.64 k
5	1.2D+1.0E+L+0.2S	78.81 k	-0.39 k	0.99 k
	1.2D-1.0E+L+0.2S	75.69 k	-0.43 k	0.29 k
6	0.9D+1.6W	23.62 k	-0.06 k	0.17 k
	0.9D-1.6W	23.62 k	-0.06 k	0.17 k
7	0.9D+1.0E	25.18 k	-0.04 k	0.52 k
	0.9D-1.0E	22.06 k	-0.08 k	-0.18 k

Design Values

Compression	Pu =	104.70 k
Tension	Tu =	22.06 k
Shear	Vu_X =	0.61 k
	Vu_Y =	0.99 k

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: G , 9

LOADS

	F_X	F_Y	F_Z
Dead	-0.01 k	0.00 k	15.73 k
Live	0.18 k	0.00 k	29.88 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	0.00 k	0.01 k	-0.44 k
Seismic -X	0.00 k	-0.01 k	0.44 k
Seismic Y	0.00 k	-0.03 k	-0.01 k
Seismic -Y	0.00 k	0.03 k	0.01 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	22.02 k	-0.01 k	0.00 k
2	1.2D+1.6L+0.5S	66.68 k	0.28 k	0.00 k
3	1.2D+L+1.6S	48.76 k	0.17 k	0.00 k
4	1.2D+L+0.5S+1.6W	48.76 k	0.17 k	0.00 k
	1.2D+L+0.5S-1.6W	48.76 k	0.17 k	0.00 k
5	1.2D+1.0E+L+0.2S	49.20 k	0.17 k	0.03 k
	1.2D-1.0E+L+0.2S	48.32 k	0.17 k	-0.03 k
6	0.9D+1.6W	14.16 k	-0.01 k	0.00 k
	0.9D-1.6W	14.16 k	-0.01 k	0.00 k
7	0.9D+1.0E	14.60 k	-0.01 k	0.03 k
	0.9D-1.0E	13.72 k	-0.01 k	-0.03 k

Design Values

Compression	Pu =	66.68 k
Tension	Tu =	13.72 k
Shear	Vu_X =	0.28 k
	Vu_Y =	0.03 k

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: E.8 , 8.8

LOADS

	F_X	F_Y	F_Z
Dead	0.00 k	-0.04 k	0.54 k
Live	0.00 k	-0.08 k	1.21 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	0.00 k	0.00 k	-0.74 k
Seismic -X	0.00 k	0.00 k	0.74 k
Seismic Y	0.00 k	-0.16 k	0.20 k
Seismic -Y	0.00 k	0.16 k	-0.20 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	0.76 k	0.00 k	-0.06 k
2	1.2D+1.6L+0.5S	2.58 k	0.00 k	-0.18 k
3	1.2D+L+1.6S	1.86 k	0.00 k	-0.13 k
4	1.2D+L+0.5S+1.6W	1.86 k	0.00 k	-0.13 k
	1.2D+L+0.5S-1.6W	1.86 k	0.00 k	-0.13 k
5	1.2D+1.0E+L+0.2S	2.60 k	0.00 k	0.03 k
	1.2D-1.0E+L+0.2S	1.12 k	0.00 k	-0.29 k
6	0.9D+1.6W	0.49 k	0.00 k	-0.04 k
	0.9D-1.6W	0.49 k	0.00 k	-0.04 k
7	0.9D+1.0E	1.23 k	0.00 k	0.12 k
	0.9D-1.0E	-0.25 k	0.00 k	-0.20 k

Design Values

Compression	Pu =	2.60 k
Tension	Tu =	-0.25 k
Shear	Vu_X =	0.00 k
	Vu_Y =	0.29 k

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: E.8 , 8.9

LOADS

	F_X	F_Y	F_Z
Dead	0.00 k	0.04 k	0.88 k
Live	0.00 k	0.09 k	1.61 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	0.00 k	0.00 k	0.09 k
Seismic -X	0.00 k	0.00 k	-0.09 k
Seismic Y	0.00 k	-0.16 k	-0.25 k
Seismic -Y	0.00 k	0.16 k	0.25 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	1.23 k	0.00 k	0.06 k
2	1.2D+1.6L+0.5S	3.63 k	0.00 k	0.19 k
3	1.2D+L+1.6S	2.67 k	0.00 k	0.14 k
4	1.2D+L+0.5S+1.6W	2.67 k	0.00 k	0.14 k
	1.2D+L+0.5S-1.6W	2.67 k	0.00 k	0.14 k
5	1.2D+1.0E+L+0.2S	2.92 k	0.00 k	0.30 k
	1.2D-1.0E+L+0.2S	2.42 k	0.00 k	-0.02 k
6	0.9D+1.6W	0.79 k	0.00 k	0.04 k
	0.9D-1.6W	0.79 k	0.00 k	0.04 k
7	0.9D+1.0E	1.04 k	0.00 k	0.20 k
	0.9D-1.0E	0.54 k	0.00 k	-0.12 k

Design Values

Compression	Pu =	3.63 k
Tension	Tu =	0.54 k
Shear	Vu_X =	0.00 k
	Vu_Y =	0.30 k

FLSmidth	PROJECT Cripple Creek & Victor	Proj No. 11021	
		Calc No.	
	SUBJECT Column Load Summary	By CCK	Jul-16-2012
	LRFD Load Combinations	Check	
		Sheet	*of*

Column Location: F , 5.4

LOADS

	F_X	F_Y	F_Z
Dead	0.00 k	0.00 k	1.67 k
Live	0.00 k	0.00 k	2.61 k
Snow	0.00 k	0.00 k	0.00 k
Wind X	0.00 k	0.00 k	0.00 k
Wind -X	0.00 k	0.00 k	0.00 k
Wind Y	0.00 k	0.00 k	0.00 k
Wind -Y	0.00 k	0.00 k	0.00 k
Seismic X	-0.01 k	0.00 k	3.55 k
Seismic -X	0.01 k	0.00 k	-3.55 k
Seismic Y	0.00 k	-0.01 k	-0.13 k
Seismic -Y	0.00 k	0.01 k	0.13 k

LRFD Load Combinations

		Column/Footing Loads		
		Pu	Vu_X	Vu_Y
1	1.4D	2.34 k	0.00 k	0.00 k
2	1.2D+1.6L+0.5S	6.18 k	0.00 k	0.00 k
3	1.2D+L+1.6S	4.61 k	0.00 k	0.00 k
4	1.2D+L+0.5S+1.6W	4.61 k	0.00 k	0.00 k
	1.2D+L+0.5S-1.6W	4.61 k	0.00 k	0.00 k
5	1.2D+1.0E+L+0.2S	8.16 k	0.01 k	0.01 k
	1.2D-1.0E+L+0.2S	1.06 k	-0.01 k	-0.01 k
6	0.9D+1.6W	1.50 k	0.00 k	0.00 k
	0.9D-1.6W	1.50 k	0.00 k	0.00 k
7	0.9D+1.0E	5.05 k	0.01 k	0.01 k
	0.9D-1.0E	-2.05 k	-0.01 k	-0.01 k

Design Values

Compression	Pu =	8.16 k
Tension	Tu =	-2.05 k
Shear	Vu_X =	0.01 k
	Vu_Y =	0.01 k

FLSmidth Salt Lake City, Inc.
7158 South FLSmidth Dr.
Midvale, UT 84047

Title : CC & V HIGH GRADE
Engineer: Clint Karren
Project Desc.:

Job # 11021

Project Notes :

Printed: 23 FEB 2012, 10:22AM

Concrete Column

File: P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-004 Office Area Concrete\office area.ec6
ENERCALC, INC. 1983-2011, Build:6.12.01.12, Ver:6.11.8.31

Lic. # : KW-06000120 — Licensee : flsmidth centry

Description : F,6 Pedestal

General Information

Calculations per ACI 318-08, IBC 2009, CBC 2010, ASCE 7-05

f'c : Concrete 28 day strength	=	4.0 ksi
E =	=	3,605.0 ksi
Density	=	145.0 pcf
β	=	0.850
fy - Main Rebar	=	60.0 ksi
E - Main Rebar	=	29,000.0 ksi
Allow. Reinforcing Limits		*ASTM A615 Bars Used*
Min. Reinf.	=	1.0 %
Max. Reinf.	=	8.0 %

Load Combination 2006 IBC & ASCE 7-05

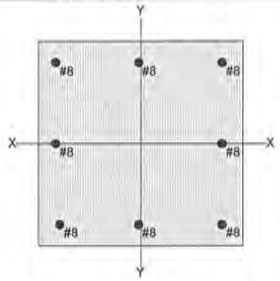
Overall Column Height = 4.0 ft
End Fixity Top Free, Bottom Fixed
ACI Code Year ACI 318-05

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for X-X Axis buckling = 2 ft, K = 1.0
Y-Y (depth) axis :Unbraced Length for Y-Y Axis buckling = 2 ft, K = 1.0

Column Cross Section

Column Dimensions 24.0in Square Column, Column Edge to Rebar Edge Cover = 2.0in

Column Reinforcing : 4 - #8 bars @ corners,, 1.0 - #8 bars top & bottom between corner bars, 1.0 - #8 bars left & right between corner bars



Applied Loads

Entered loads are factored per load combinations specified by user.

Column self weight included : 2,320.0 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 4.0 ft above base, D = 69.960, L = 90.360, S = 26.440, W = 6.440, E = 0.320 k
BENDING LOADS . . .
Lat. Point Load at 4.0 ft creating My-y, D = 0.130, L = 0.050, S = 0.190, W = 0.340, E = 0.310 k
Lat. Point Load at 12.50 ft creating Mx-x, D = 0.010, L = 0.020, S = 0.010, W = 1.250, E = 0.050 k

(Load updated, but no change is required for the design)

DESIGN SUMMARY

Load Combination +1.20D+1.60L+0.50S+1.60H
Location of max.above base 3.973 ft

Maximum Stress Ratio **0.2028 : 1**
Ratio = (Pu^2+Mu^2)^.5 / (PhiPn^2+PhiMn^2)^.5

Pu =	244.53 k	φ * Pn =	1,204.38 k
Mu-x =	-0.1960 k-ft	φ * Mn-x =	0.0 k-ft
Mu-y =	-1.324 k-ft	φ * Mn-y =	0.0 k-ft
Mu Angle =	82.0 deg		
Mu at Angle =	1.338 k-ft	φMn at Angle =	8.220 k-ft

Pn & Mn values located at Pu-Mu vector intersection with capacity curve

Column Capacities . . .

Pnmax : Nominal Max. Compressive Axial Capacity	2,316.11 k
Pnmin : Nominal Min. Tension Axial Capacity	-379.20 k
φ Pn, max : Usable Compressive Axial Capacity	1,204.38 k
φ Pn, min : Usable Tension Axial Capacity	-246.48 k

Maximum SERVICE Load Reactions . .

Top along Y-Y	k	Bottom along Y-Y	k
Top along X-X	k	Bottom along X-X	k

Maximum SERVICE Load Deflections . . .

Along Y-Y 0.000471 in at 4.0 ft above base
for load combination : D+L+W

Along X-X 0.000191 in at 4.0 ft above base
for load combination : D+L+W

General Section Information . φ = 0.650 β = 0.850 θ = 0.80

ρ : % Reinforcing	1.097 % Rebar % Ok
Reinforcing Area	6.320 in^2
Concrete Area	576.0 in^2

Governing Load Combination Results

Governing Factored Load Combination	Dist. from base ft	Axial Load k		Bending Analysis k-ft							Utilization Ratio
		Pu	φ * Pn	δx	δx * Mux	δy	δy * Muy	Alpha (deg)	δ Mu	φ Mn	
+1.40D	3.97	101.19	1,204.38	1.000	-0.06	1.000	-0.73	86.000	0.73	8.07	**0.084**
+1.20D+0.50Lr+1.60L+1.60H	3.97	231.31	1,204.38	1.000	-0.18	1.000	-0.94	79.000	0.96	3.03	**0.192**

Concrete Column

Description : F,6 Pedestal

Governing Load Combination Results

Governing Factored Load Combination	Dist. from base ft	Axial Load k		Bending Analysis k-ft							Utilization Ratio
		Pu	φ * Pn	δx	δx * Mux	δy	δy * Muy	Alpha (deg)	δ Mu	φ Mn	
+1.20D+1.60L+0.50S+1.60H	3.97	244.53	1,204.38	1.000	-0.20	1.000	-1.32	82.000	1.34	8.22	**0.203**
+1.20D+1.60Lr+0.50L	3.97	131.92	1,204.38	1.000	-0.09	1.000	-0.72	83.000	0.73	8.15	**0.109**
+1.20D+1.60Lr+0.80W	3.97	91.89	1,204.38	1.000	-4.05	1.000	-1.71	23.000	4.40	55.97	**0.077**
+1.20D+1.60Lr-0.80W	3.97	81.58	1,204.38	1.000	3.95	1.000	0.46	7.000	3.98	59.10	**0.068**
+1.20D+0.50L+1.60S	3.97	174.22	1,204.38	1.000	-0.15	1.000	-1.94	86.000	1.95	13.81	**0.145**
+1.20D+1.60S+0.80W	3.97	134.19	1,204.38	1.000	-4.11	1.000	-2.93	35.000	5.05	48.44	**0.110**
+1.20D+1.60S-0.80W	3.97	123.89	1,204.38	1.000	3.89	1.000	-0.75	11.000	3.96	40.64	**0.102**
+1.20D+0.50Lr+0.50L+1.60W	3.97	142.22	1,204.38	1.000	-8.09	1.000	-2.90	20.000	8.59	69.36	**0.120**
+1.20D+0.50Lr+0.50L-1.60W	3.97	121.61	1,204.38	1.000	7.91	1.000	1.45	10.000	8.04	79.98	**0.101**
+1.20D+0.50L+0.50S+1.60W	3.97	155.44	1,204.38	1.000	-8.11	1.000	-3.28	22.000	8.75	69.76	**0.128**
+1.20D+0.50L+0.50S-1.60W	3.97	134.83	1,204.38	1.000	7.89	1.000	1.07	8.000	7.96	72.79	**0.111**
+1.243D+0.50L+0.20S+E	3.97	140.60	1,204.38	1.000	-0.30	1.000	-2.14	82.000	2.16	19.20	**0.117**
+1.243D+0.50L+0.20S-1.0E	3.97	139.96	1,204.38	1.000	0.10	1.000	0.34	73.000	0.36	3.16	**0.116**
+0.90D+1.60W+1.60H	3.97	75.36	1,204.38	1.000	-8.04	1.000	-2.64	18.000	8.46	132.51	**0.063**
+0.90D-1.60W+1.60H	3.97	54.75	1,204.38	1.000	7.96	1.000	1.71	12.000	8.15	179.14	**0.045**
+0.8574D+E+1.60H	3.97	62.29	1,204.38	1.000	-0.23	1.000	-1.69	82.000	1.70	32.85	**0.052**
+0.8574D-1.0E+1.60H	3.97	61.65	1,204.38	1.000	0.17	1.000	0.79	78.000	0.81	13.85	**0.051**

Maximum Reactions - Unfactored

Note: Only non-zero reactions are listed.

Load Combination	Reaction along X-X Axis		Reaction along Y-Y Axis		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
D Only	0.010	0.010 k	0.130	k	72.280 k
L Only	0.020	0.020 k	0.050	k	90.360 k
S Only	0.010	0.010 k	0.190	k	26.440 k
W Only	1.250	1.250 k	0.340	k	6.440 k
-W Only	1.250	1.250 k	0.340	k	6.440 k
E Only	0.050	0.050 k	0.310	k	0.320 k
-E Only	0.050	0.050 k	0.310	k	0.320 k
D+L	0.030	0.030 k	0.180	k	162.640 k
D+S	0.020	0.020 k	0.320	k	98.720 k
D+W	1.260	1.260 k	0.470	k	78.720 k
D+L+S	0.040	0.040 k	0.370	k	189.080 k
D+L+W	1.280	1.280 k	0.520	k	169.080 k
D+E	0.060	0.060 k	0.440	k	72.600 k
D-E Only	0.040	0.040 k	0.180	k	71.960 k
D+L+E	0.080	0.080 k	0.490	k	162.960 k
D+L-E Only	0.020	0.020 k	0.130	k	162.320 k

Maximum Deflections for Load Combinations - Unfactored Loads

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	4.000	ft	0.000	in	0.000	ft
L Only	0.0000	in	4.000	ft	0.000	in	0.000	ft
S Only	0.0001	in	4.000	ft	0.000	in	0.000	ft
W Only	0.0001	in	4.000	ft	0.000	in	4.000	ft
-W Only	-0.0001	in	4.000	ft	-0.000	in	4.000	ft
E Only	0.0001	in	4.000	ft	0.000	in	4.000	ft
-E Only	-0.0001	in	4.000	ft	-0.000	in	4.000	ft
D+L	0.0001	in	4.000	ft	0.000	in	4.000	ft
D+S	0.0001	in	4.000	ft	0.000	in	0.000	ft
D+W	0.0002	in	4.000	ft	0.000	in	4.000	ft
D+L+S	0.0001	in	4.000	ft	0.000	in	4.000	ft
D+L+W	0.0002	in	4.000	ft	0.000	in	4.000	ft
D+E	0.0002	in	4.000	ft	0.000	in	4.000	ft
D-E Only	-0.0001	in	4.000	ft	-0.000	in	4.000	ft
D+L+E	0.0002	in	4.000	ft	0.000	in	4.000	ft
D+L-E Only	-0.0000	in	3.973	ft	0.000	in	0.000	ft

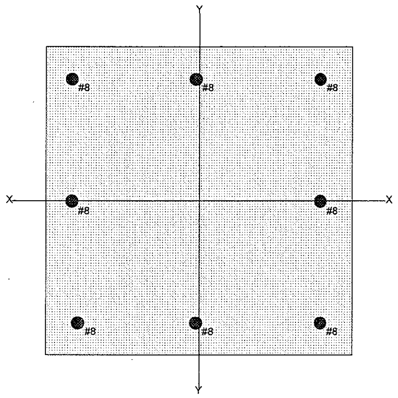
oncrete Column

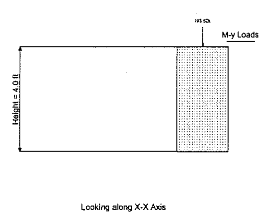
File: P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-004 Office Area Concrete\office area.ec6
ENERCALC, INC. 1983-2011, Build:6.12.01.12, Ver:6.11.8.31

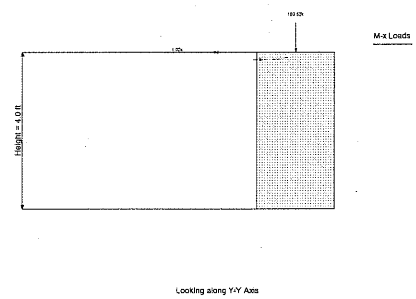
Lic. # : KW-06000120 **Licensee : flsmidth centry**

Description : F,6 Pedestal

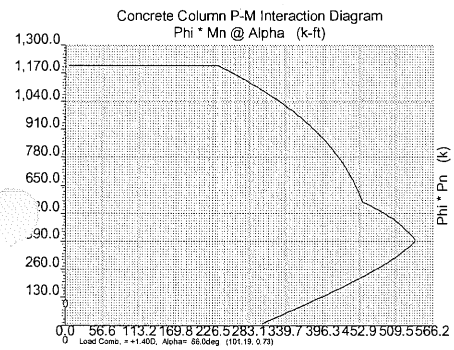
Sketches

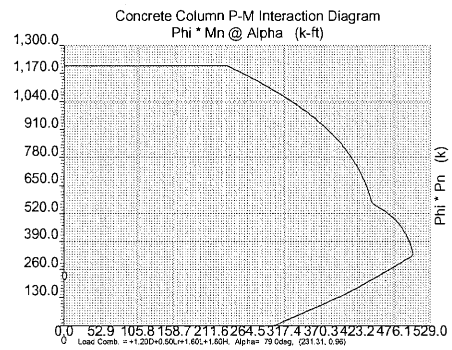


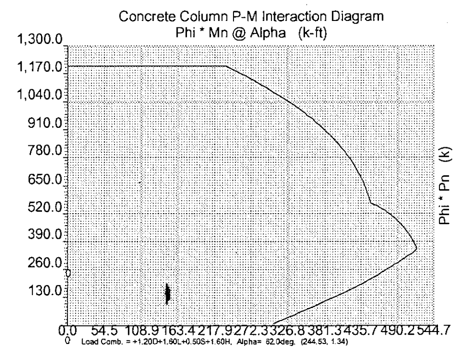


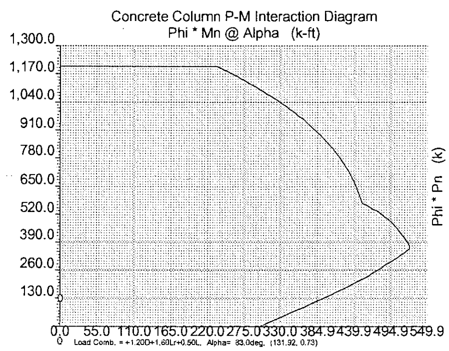


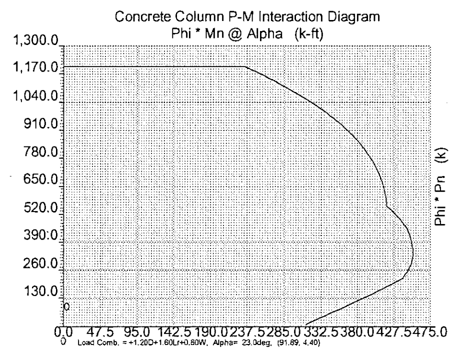
Interaction Diagrams

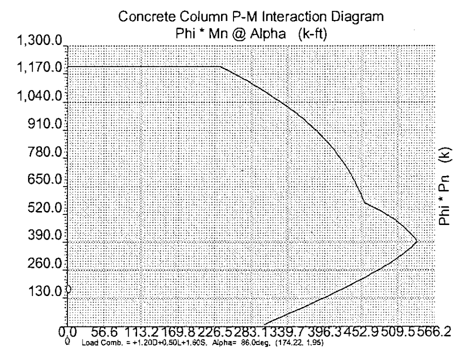


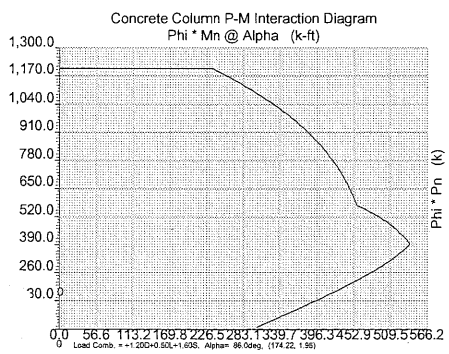


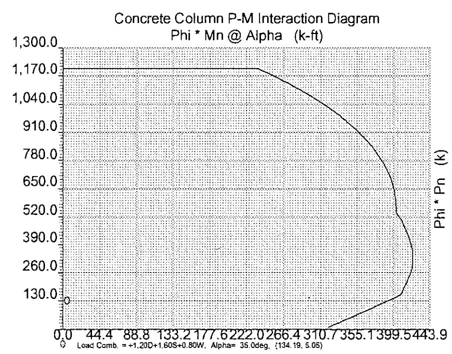


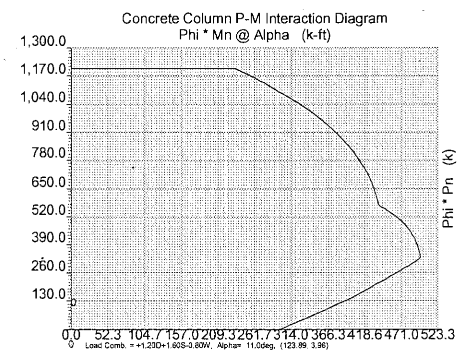












FLSmidth Salt Lake City, Inc.
7158 South FLSmidth Dr.
Midvale, UT 84047

Title : CC & V HIGH GRADE
Engineer: Clint Karren
Project Desc.:

Job # 11021

Project Notes :

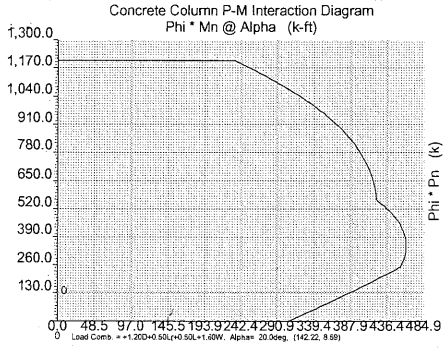
Printed: 23 FEB 2012, 10:22AM

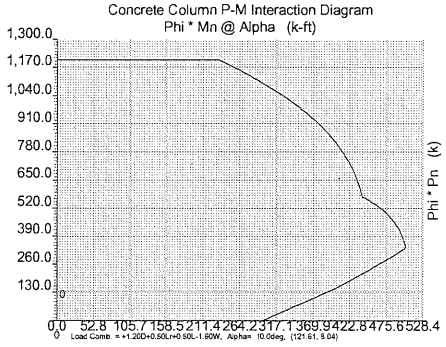
oncrete Column

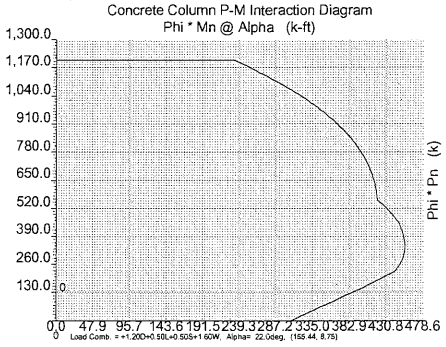
File: P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-004 Office Area Concrete\office area.ec6
ENERCALC, INC. 1983-2011, Build:6.12.01.12, Ver:6.11.8.31

Lic. # : KW-06000120 — Licensee : flsmidth centry

Description : F,6 Pedestal







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Title : CC & V HIGH GRADE
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Project Desc.:

Job # 11021

Project Notes :

General Footing

Lic. # : KW-06000120 — **Licensee : flsmidth centry**

Description : F,5 Spot Footing

General Information

Calculations per ACI 318-08, IBC 2009, CBC 2010, ASCE 7-05

Material Properties

f'c : Concrete 28 day strength	=	4.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,605.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	0.00140
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.50 : 1
Min. Sliding Safety Factor	=	1.50 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Include Pedestal Weight as DL	:	Yes

Soil Design Values

Allowable Soil Bearing	=	5.0 ksf
Increase Bearing By Footing Weight	=	Yes
Soil Passive Resistance (for Sliding)	=	400.0 pcf
Soil/Concrete Friction Coeff.	=	0.40

Increases based on footing Depth

Footing base depth below soil surface	=	3.0 ft
Allowable pressure increase per foot of deptl	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depl	=	ksf
when maximum length or width is greater	=	ft

Dimensions

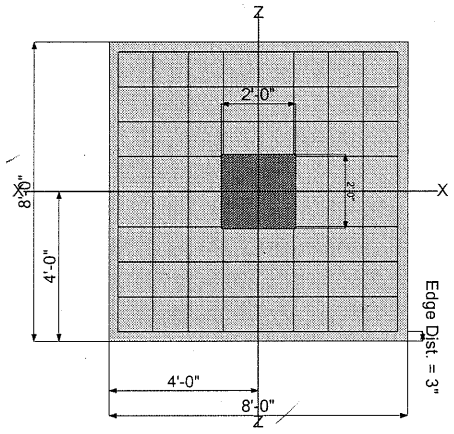
Width parallel to X-X Axis	=	8.0 ft
Length parallel to Z-Z Axis	=	8.0 ft
Footing Thicknes	=	18.0 in

edestal dimensions...

px : parallel to X-X Axis	=	24.0 in
pz : parallel to Z-Z Axis	=	24.0 in
Height	=	48.0 in

Rebar Centerline to Edge of Concrete..

at Bottom of footing	=	3.0 in

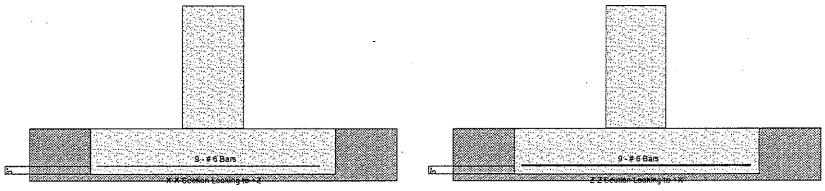


Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	9.0
Reinforcing Bar Size	=	# 6
Bars parallel to Z-Z Axis		
Number of Bars	=	9.0
Reinforcing Bar Size	=	# 6

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	32.530		32.490	25.460	-14.360	13.660		k
OB : Overburden	=	0.180							ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=	-0.830		-0.590	-0.620	6.740	-5.120		k
V-z	=	-0.310	0.0	-0.460	0.0	-0.910	0.290		k

eneral Footing

Description : F,5 Spot Footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4006	Soil Bearing	2.003 ksf	5.0 ksf	+D+0.750L+0.750S+0.5250E+H
PASS	2.253	Overturning - X-X	63.468 k-ft	142.97 k-ft	0.6D+W
PASS	1.542	Overturning - Z-Z	94.510 k-ft	145.71 k-ft	0.6D+W
PASS	3.10	Sliding - X-X	6.242 k	19.353 k	0.6D+W
PASS	17.658	Sliding - Z-Z	1.096 k	19.353 k	0.6D+W
PASS	2.489	Uplift	-14.360 k	35.742 k	+0.60D+W
PASS	0.2129	Z Flexure (+X)	6.940 k-ft	32.602 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.2429	Z Flexure (-X)	7.919 k-ft	32.602 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.2205	X Flexure (+Z)	7.189 k-ft	32.602 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.2353	X Flexure (-Z)	7.671 k-ft	32.602 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.1650	1-way Shear (+X)	15.655 psi	94.868 psi	+1.20D+1.60L+0.50S+1.60H
PASS	0.1650	1-way Shear (-X)	15.655 psi	94.868 psi	+1.20D+1.60L+0.50S+1.60H
PASS	0.1594	1-way Shear (+Z)	15.122 psi	94.868 psi	+1.20D+1.60L+0.50S+1.60H
PASS	0.1706	1-way Shear (-Z)	16.187 psi	94.868 psi	+1.20D+1.60L+0.50S+1.60H
PASS	0.1973	2-way Punching	37.443 psi	189.74 psi	+1.20D+1.60L+0.50S+1.60H

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc	Actual Soil Bearing Stress +Z	+Z	-X	-X	Actual / Allowable Ratio
X-X, +D	5.0	n/a	-0.3435	0.9505	0.9111	n/a	n/a	0.190
X-X, +D+L+H	5.0	n/a	-0.5520	1.487	1.389	n/a	n/a	0.297
X-X, +D+S+H	5.0	n/a	-0.2406	1.348	1.309	n/a	n/a	0.270
X-X, +D+0.750Lr+0.750L+H	5.0	n/a	-0.5150	1.353	1.270	n/a	n/a	0.271
X-X, +D+0.750L+0.750S+H	5.0	n/a	-0.4196	1.652	1.568	n/a	n/a	0.330
X-X, +D+W+H	5.0	n/a	-1.781	0.7840	0.6288	n/a	n/a	0.157
X-X, +1.030D+0.70E+H	5.0	n/a	-0.1082	1.115	1.101	n/a	n/a	0.223
X-X, +1.030D-0.70E+H	5.0	n/a	-0.6656	0.8423	0.7759	n/a	n/a	0.169
X-X, +D+0.750Lr+0.750L+0.750W+H	5.0	n/a	-1.206	1.228	1.058	n/a	n/a	0.246
X-X, +D+0.750L+0.750S+0.750W+H	5.0	n/a	-0.9568	1.527	1.357	n/a	n/a	0.305
X-X, +1.022D+0.750Lr+0.750L+0.5250	5.0	n/a	-0.3639	1.477	1.412	n/a	n/a	0.295
X-X, +1.022D+0.750Lr+0.750L-0.5250	5.0	n/a	-0.6881	1.272	1.169	n/a	n/a	0.254
X-X, +D+0.750L+0.750S+0.5250E+H	5.0	n/a	-0.3011	1.754	1.690	n/a	n/a	0.351
X-X, +D+0.750L+0.750S-0.5250E+H	5.0	n/a	-0.5558	1.549	1.446	n/a	n/a	0.310
X-X, +0.60D+W+H	5.0	n/a	-3.383	0.4038	0.2644	n/a	n/a	0.081
X-X, +0.5702D+0.70E+H	5.0	n/a	0.03979	0.6785	0.6818	n/a	n/a	0.136
X-X, +0.5702D-0.70E+H	5.0	n/a	-1.027	0.4055	0.3572	n/a	n/a	0.081
Z-Z, +D	5.0	-0.9196	n/a	n/a	n/a	0.9836	0.8780	0.197
Z-Z, +D+L+H	5.0	-1.018	n/a	n/a	n/a	1.529	1.348	0.306
Z-Z, +D+S+H	5.0	-1.125	n/a	n/a	n/a	1.421	1.236	0.284
Z-Z, +D+0.750Lr+0.750L+H	5.0	-1.001	n/a	n/a	n/a	1.392	1.231	0.278
Z-Z, +D+0.750L+0.750S+H	5.0	-1.113	n/a	n/a	n/a	1.720	1.499	0.344
Z-Z, +D+W+H	5.0	8.628	n/a	n/a	n/a	0.3306	1.082	0.216
Z-Z, +1.030D+0.70E+H	5.0	-4.131	n/a	n/a	n/a	1.390	0.8257	0.278
Z-Z, +1.030D-0.70E+H	5.0	3.478	n/a	n/a	n/a	0.6356	0.9827	0.197
Z-Z, +D+0.750Lr+0.750L+0.750W+H	5.0	3.412	n/a	n/a	n/a	0.9027	1.384	0.277
Z-Z, +D+0.750L+0.750S+0.750W+H	5.0	2.373	n/a	n/a	n/a	1.231	1.653	0.331
Z-Z, +1.022D+0.750Lr+0.750L+0.5250	5.0	-2.841	n/a	n/a	n/a	1.697	1.191	0.339
Z-Z, +1.022D+0.750Lr+0.750L-0.5250	5.0	1.181	n/a	n/a	n/a	1.131	1.309	0.262
Z-Z, +D+0.750L+0.750S+0.5250E+H	5.0	-2.650	n/a	n/a	n/a	2.003	1.441	0.401
Z-Z, +D+0.750L+0.750S-0.5250E+H	5.0	0.6544	n/a	n/a	n/a	1.437	1.558	0.312
Z-Z, +0.60D+W+H	5.0	19.267	n/a	n/a	n/a	0.0	0.7386	0.148
Z-Z, +0.5702D+0.70E+H	5.0	-6.152	n/a	n/a	n/a	0.9381	0.4221	0.188
Z-Z, +0.5702D-0.70E+H	5.0	8.413	n/a	n/a	n/a	0.1835	0.5791	0.116

verturning Stability

ation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D	1.705 k-ft	238.28 k-ft	139.75	OK
X-X, D+L	4.235 k-ft	368.24 k-ft	86.952	OK

Description : F,5 Spot Footing

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D+L+S	4.235 k-ft	470.08 k-ft	111.0	OK
X-X, D+S	1.705 k-ft	340.12 k-ft	199.48	OK
X-X, 0.6D+L+W	65.998 k-ft	272.93 k-ft	4.135	OK
X-X, 0.6D+L+S+W/2	34.776 k-ft	374.77 k-ft	10.777	OK
X-X, 0.6D+L+W+S/2	65.998 k-ft	323.85 k-ft	4.907	OK
X-X, 0.6D+L+S+0.7E	3.553 k-ft	414.13 k-ft	116.56	OK
X-X, 0.6D+L+S-0.7E	42.918 k-ft	374.77 k-ft	8.732	OK
X-X, 0.6D+W	63.468 k-ft	142.97 k-ft	2.253	OK
X-X, 0.6D+0.7E	1.117 k-ft	182.24 k-ft	163.22	OK
X-X, 0.6D-0.7E	40.388 k-ft	142.97 k-ft	3.540	OK
Z-Z, D	4.565 k-ft	238.28 k-ft	52.197	OK
Z-Z, D+L	7.810 k-ft	368.24 k-ft	47.150	OK
Z-Z, D+L+S	11.220 k-ft	470.08 k-ft	41.897	OK
Z-Z, D+S	7.975 k-ft	340.12 k-ft	42.648	OK
Z-Z, 0.6D+L+W	94.510 k-ft	278.91 k-ft	2.951	OK
Z-Z, 0.6D+L+S+W/2	47.255 k-ft	384.16 k-ft	8.130	OK
Z-Z, 0.6D+L+W+S/2	94.510 k-ft	331.54 k-ft	3.508	OK
Z-Z, 0.6D+L+S+0.7E	29.106 k-ft	413.02 k-ft	14.190	OK
Z-Z, 0.6D+L+S-0.7E	57.960 k-ft	384.16 k-ft	6.628	OK
Z-Z, 0.6D+W	94.510 k-ft	145.71 k-ft	1.542	OK
Z-Z, 0.6D+0.7E	22.451 k-ft	181.22 k-ft	8.072	OK
Z-Z, 0.6D-0.7E	57.960 k-ft	145.71 k-ft	2.514	OK

Sliding Stability

All units k

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
X-X, D	-0.830 k	34.628 k	41.720	OK
X-X, D+L	-1.420 k	47.624 k	33.538	OK
X-X, D+L+S	-2.040 k	57.808 k	28.337	OK
X-X, D+S	-1.450 k	44.812 k	30.905	OK
X-X, 0.6D+L+W	5.652 k	32.349 k	5.723	OK
X-X, 0.6D+L+S+W/2	1.662 k	45.405 k	27.319	OK
X-X, 0.6D+L+W+S/2	5.342 k	37.441 k	7.009	OK
X-X, 0.6D+L+S+0.7E	-5.292 k	52.102 k	9.845	OK
X-X, 0.6D+L+S-0.7E	1.876 k	44.452 k	23.695	OK
X-X, 0.6D+W	6.242 k	19.353 k	3.10	OK
X-X, 0.6D+0.7E	-4.082 k	28.922 k	7.085	OK
X-X, 0.6D-0.7E	3.086 k	21.272 k	6.893	OK
Z-Z, D	-0.310 k	34.628 k	111.70	OK
Z-Z, D+L	-0.770 k	47.624 k	61.849	OK
Z-Z, D+L+S	-0.770 k	57.808 k	75.075	OK
Z-Z, D+S	-0.310 k	44.812 k	144.55	OK
Z-Z, 0.6D+L+W	-1.556 k	32.349 k	20.790	OK
Z-Z, 0.6D+W	-1.096 k	19.353 k	17.658	OK
Z-Z, 0.6D+0.7E	0.0170 k	28.922 k	1,701.27	OK
Z-Z, 0.6D-0.7E	-0.3890 k	21.272 k	54.684	OK
Z-Z, 0.6D+L+S+W/2	-1.101 k	45.405 k	41.240	OK
Z-Z, 0.6D+L+W+S/2	-1.556 k	37.441 k	24.062	OK
Z-Z, 0.6D+L+S+0.7E	-0.4430 k	52.102 k	117.61	OK
Z-Z, 0.6D+L+S-0.7E	-0.8490 k	44.452 k	52.358	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	3.265	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.40D	3.454	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	6.294	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	6.776	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X, +1.20D+1.60L+0.50S+1.60H	7.189	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+1.60L+0.50S+1.60H	7.671	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+1.60Lr+0.50L	3.891	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+1.60Lr+0.50L	4.153	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+1.60Lr+0.80W	1.833	+Z	Bottom	0.39	Bending	0.5	32.602	OK

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Midvale, UT 84047

Title : CC & V HIGH GRADE
Engineer: Clint Karren
Project Desc.:

Job # 11021

Project Notes :

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eneral Footing

Lic. # : KW-06000120 — Licensee : flsmidth centry

Description : F;5 Spot Footing

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.20D+1.60Lr+0.80W	2.311	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+1.60S	6.755	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+1.60S	7.017	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+1.60S+0.80W	4.697	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+1.60S+0.80W	5.175	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50Lr+0.50L+1.60W	1.959	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50Lr+0.50L+1.60W	2.854	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+0.50S+1.60W	2.854	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+0.50S+1.60W	3.749	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+0.20S+E	5.272	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+0.20S+E	5.408	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+0.20S-1.0E	3.225	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +1.20D+0.50L+0.20S-1.0E	3.613	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +0.90D+1.60W+1.60H	0.1669	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +0.90D+1.60W+1.60H	0.9216	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +0.90D+E+1.60H	3.123	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +0.90D+E+1.60H	3.118	-Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +0.90D-1.0E+1.60H	1.076	+Z	Bottom	0.39	Bending	0.5	32.602	OK
X-X, +0.90D-1.0E+1.60H	1.323	-Z	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.40D	3.612	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.40D	3.107	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	6.957	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	6.113	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	7.919	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z, +1.20D+1.60L+0.50S+1.60H	6.94	+X	Bottom	0.39	Bending	0.5	32.602	OK
-Z, +1.20D+1.60Lr+0.50L	4.303	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+1.60Lr+0.50L	3.741	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+1.60Lr+0.80W	1.116	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+1.60Lr+0.80W	3.028	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+1.60S	7.383	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+1.60S	6.39	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+1.60S+0.80W	4.196	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+1.60S+0.80W	5.676	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50Lr+0.50L+1.60W	0.3418	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50Lr+0.50L+1.60W	4.471	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+0.50S+1.60W	1.304	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+0.50S+1.60W	5.299	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+0.20S+E	6.762	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+0.20S+E	3.919	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+0.20S-1.0E	2.614	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +1.20D+0.50L+0.20S-1.0E	4.225	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +0.90D+1.60W+1.60H	1.491	-X	Top	0.39	Bending	0.5	32.602	OK
Z-Z, +0.90D+1.60W+1.60H	2.824	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +0.90D+E+1.60H	4.396	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +0.90D+E+1.60H	1.844	+X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +0.90D-1.0E+1.60H	0.2482	-X	Bottom	0.39	Bending	0.5	32.602	OK
Z-Z, +0.90D-1.0E+1.60H	2.15	+X	Bottom	0.39	Bending	0.5	32.602	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.079 psi	7.079 psi	7.287 psi	6.87 psi	7.287 psi	94.868 psi	0.07682	OK
+1.20D+0.50Lr+1.60L+1.60H	13.769 psi	13.769 psi	14.302 psi	13.236 psi	14.302 psi	94.868 psi	0.1508	OK
+1.20D+1.60L+0.50S+1.60H	15.655 psi	15.655 psi	16.187 psi	15.122 psi	16.187 psi	94.868 psi	0.1706	OK
+1.20D+1.60Lr+0.50L	8.474 psi	8.474 psi	8.764 psi	8.185 psi	8.764 psi	94.868 psi	0.09238	OK
+1.20D+1.60Lr+0.80W	4.366 psi	4.366 psi	4.894 psi	3.837 psi	4.894 psi	94.868 psi	0.05159	OK
+1.20D+0.50L+1.60S	14.509 psi	14.509 psi	14.799 psi	14.22 psi	14.799 psi	94.868 psi	0.156	OK
+1.20D+1.60S+0.80W	10.401 psi	10.401 psi	10.929 psi	9.872 psi	10.929 psi	94.868 psi	0.1152	OK
1.20D+0.50Lr+0.50L+1.60W	5.07 psi	5.07 psi	6.06 psi	4.081 psi	6.06 psi	94.868 psi	0.06388	OK
.20D+0.50L+0.50S+1.60W	6.956 psi	6.956 psi	7.946 psi	5.967 psi	7.946 psi	94.868 psi	0.08376	OK
.20D+0.50L+0.20S+E	11.252 psi	11.252 psi	11.402 psi	11.102 psi	11.402 psi	94.868 psi	0.1202	OK
+1.20D+0.50L+0.20S-1.0E	7.205 psi	7.205 psi	7.634 psi	6.776 psi	7.634 psi	94.868 psi	0.08047	OK
+0.90D+1.60W+1.60H	1.147 psi	1.147 psi	1.981 psi	0.3127 psi	1.981 psi	94.868 psi	0.02088	OK
+0.90D+E+1.60H	6.574 psi	6.574 psi	6.569 psi	6.58 psi	6.58 psi	94.868 psi	0.06936	OK

General Footing

Lic. # : KW-06000120 — Licensee : flsmidth centry

Description : F,5 Spot Footing

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+0.90D-1.0E+1.60H	2.527 psi	2.527 psi	2.801 psi	2.253 psi	2.801 psi	94.868 psi	0.02952	OK

All units k

Punching Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	16.931 psi	189.74 psi	0.08924	OK
+1.20D+0.50Lr+1.60L+1.60H	32.932 psi	189.74 psi	0.1736	OK
+1.20D+1.60L+0.50S+1.60H	37.443 psi	189.74 psi	0.1973	OK
+1.20D+1.60Lr+0.50L	20.269 psi	189.74 psi	0.1068	OK
+1.20D+1.60Lr+0.80W	10.442 psi	189.74 psi	0.05503	OK
+1.20D+0.50L+1.60S	34.703 psi	189.74 psi	0.1829	OK
+1.20D+1.60S+0.80W	24.876 psi	189.74 psi	0.1311	OK
+1.20D+0.50Lr+0.50L+1.60W	12.127 psi	189.74 psi	0.06392	OK
+1.20D+0.50L+0.50S+1.60W	16.638 psi	189.74 psi	0.08769	OK
+1.20D+0.50L+0.20S+E	26.913 psi	189.74 psi	0.1418	OK
+1.20D+0.50L+0.20S-1.0E	17.233 psi	189.74 psi	0.09082	OK
+0.90D+1.60W+1.60H	2.844 psi	189.74 psi	0.01499	OK
+0.90D+E+1.60H	15.725 psi	189.74 psi	0.08288	OK
+0.90D-1.0E+1.60H	6.044 psi	189.74 psi	0.03186	OK

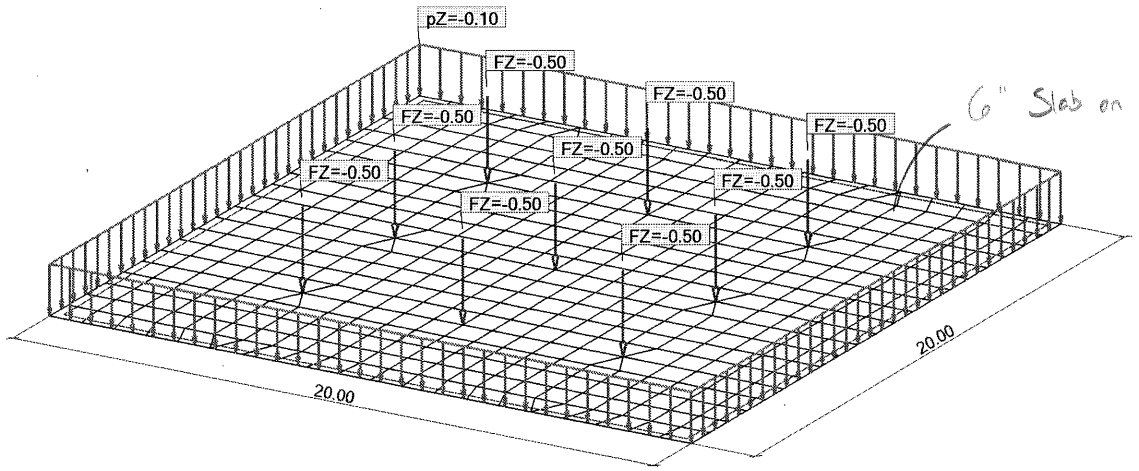
FLSmidth

7158 S. FLSmidth Drive
Midvale, Utah 84047-5559

Engineer: **Clint Karren**
Calc No..: **C-004** Job.:**11021**
Project: **Office Slab**
Client: **CC & V**

View -

Distributed Load: w = 100 psf (ASCE 7 Table 4-1 For Lobbies & 1st Floor Corridors)
Point Loads : p = 0.5 k (Arbitrary)

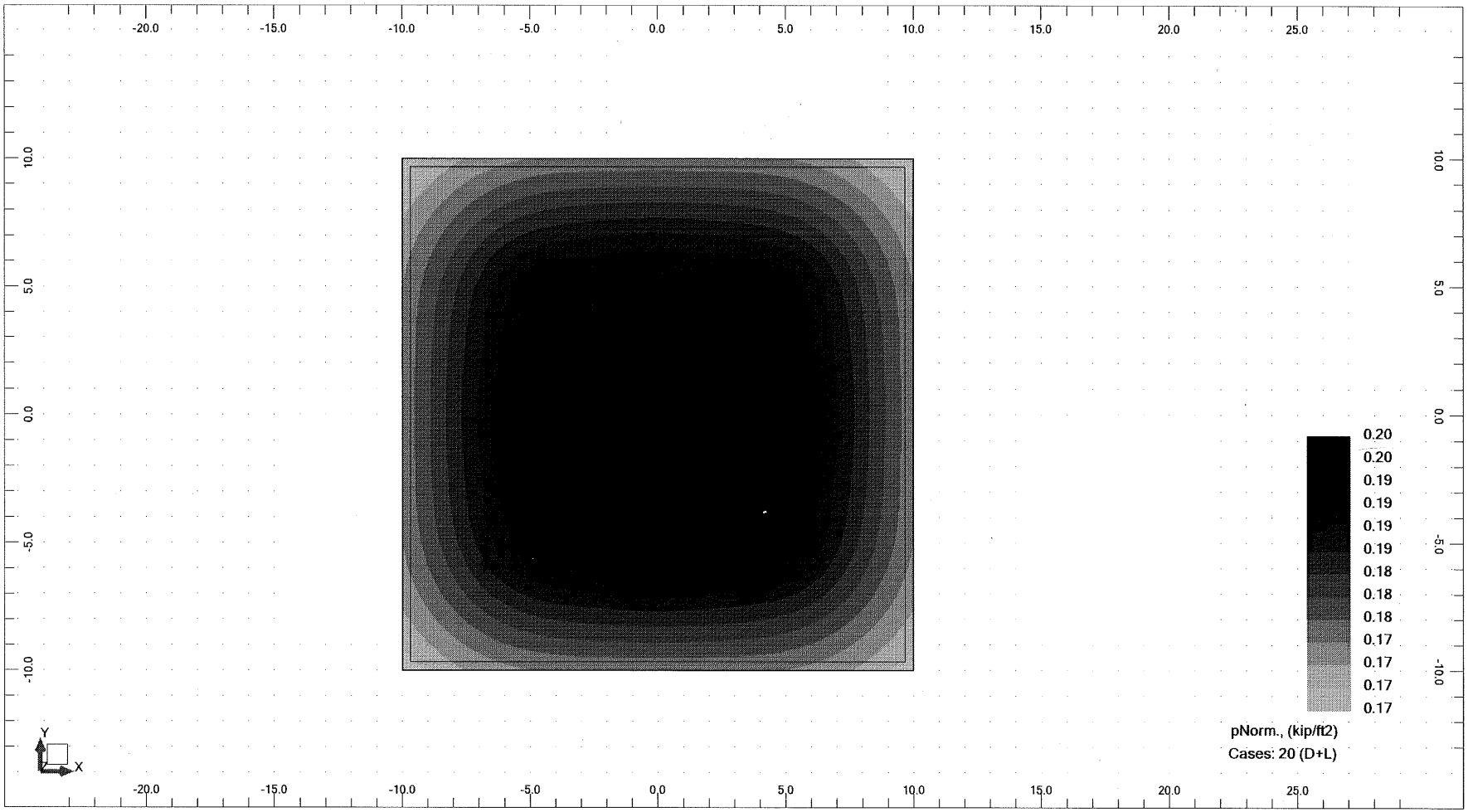


FLSmidth

7158 S. FLSmidth Drive
Midvale, Utah 84047-5559

Engineer: **Clint Karren**
Calc No..: **C-004** Job.:**11021**
Project: **Office Slab**
Client: **CC & V**

View - pNorm. (kip/ft2) Cases: 20 (D+L)



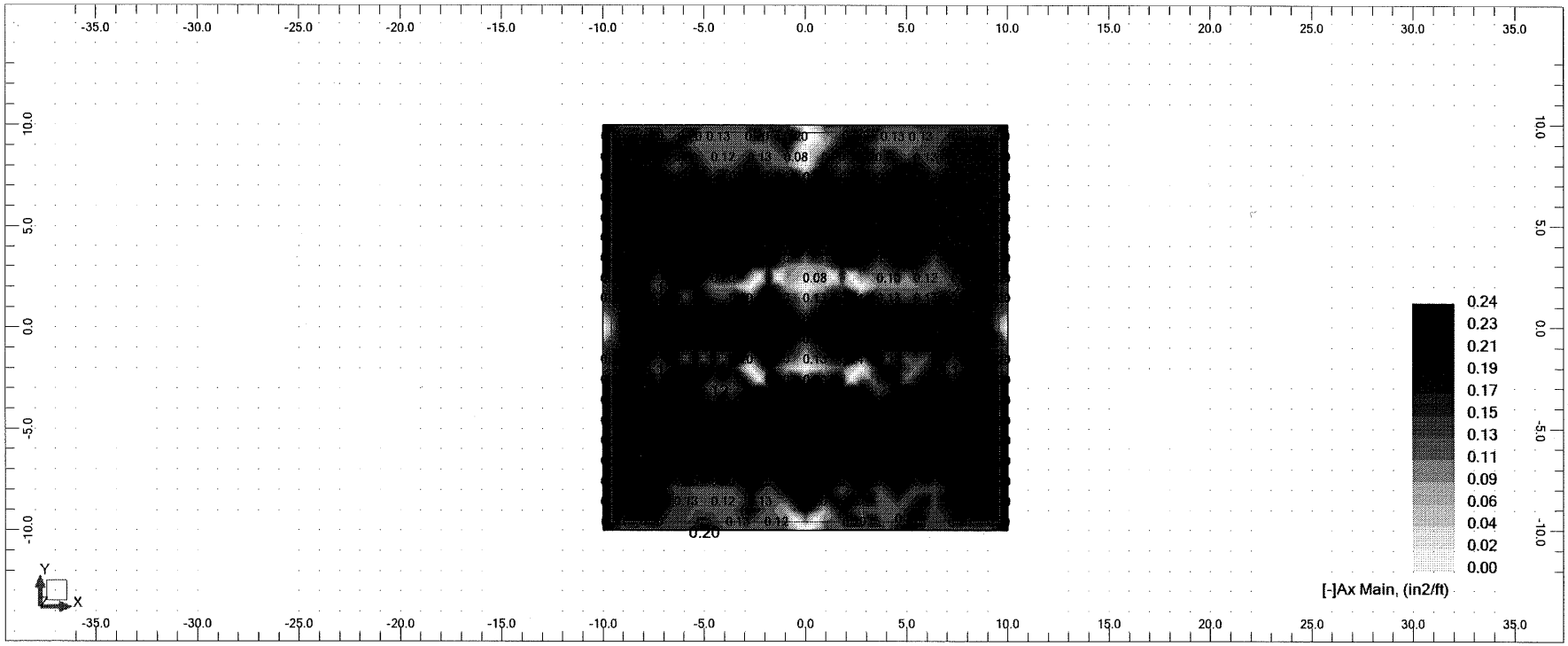
Date : 16/11/11
File: **Office Slab.rtd**

FLSmidth

7158 S. FLSmidth Drive
Midvale, Utah 84047-5559

Engineer: **Clint Karren**
Calc No..: **C-004** Job.:**11021**
Project: **Office Slab**
Client: **CC & V**

View - [-]Ax Main (in2/ft) * For 6" Slab use only 1 layer of rebar



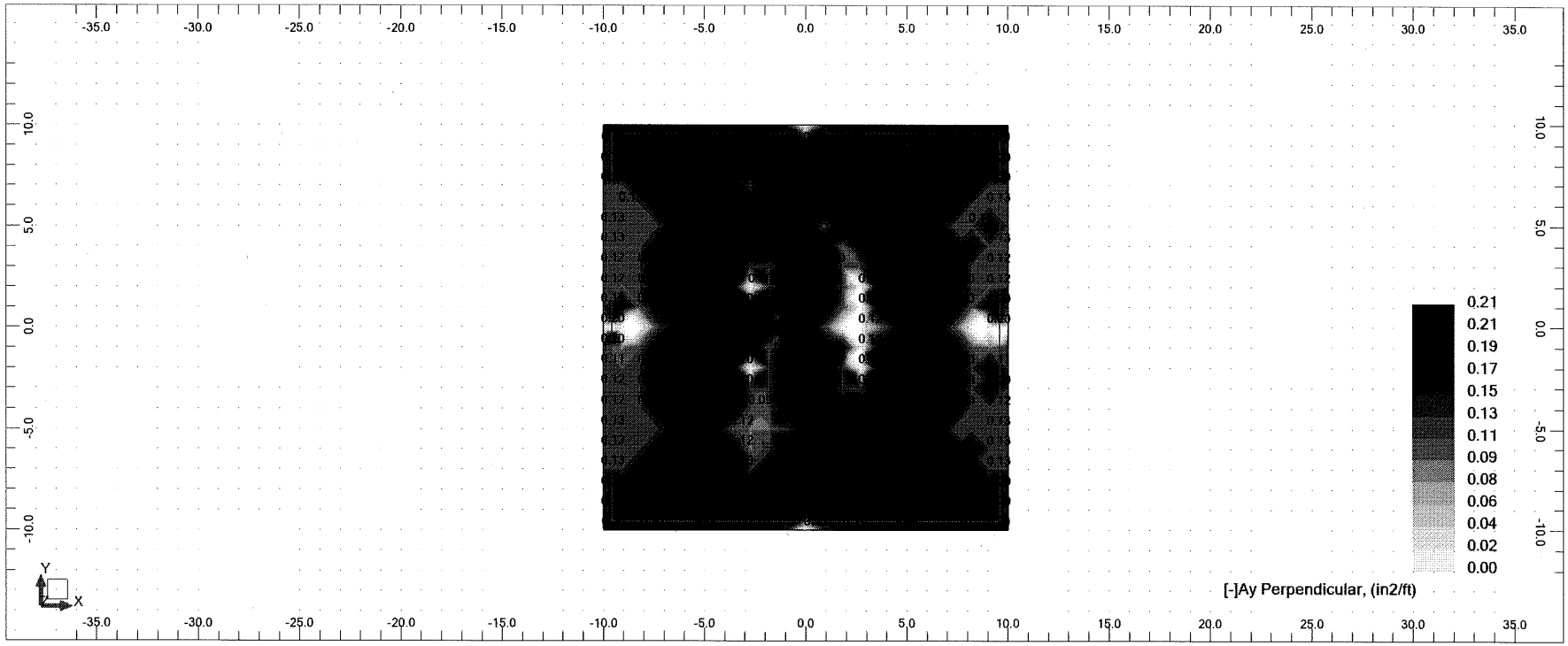
- use # 5 @ 12"

FLSmidth

7158 S. FLSmidth Drive
Midvale, Utah 84047-5559

Engineer: **Clint Karren**
Calc No..: **C-004** Job.:**11021**
Project: **Office Slab**
Client: **CC & V**

View - [-]Ay Perpendicular (in2/ft) * For 6" Slab use only 1 layer of rebar



- use #5 @ 12" -

FLSmidth Salt Lake City, Inc.
7158 South FLSmidth Dr.
Midvale, UT 84047

Title : CC & V HIGH GRADE
Dsgnr: Clint Karren
Project Desc.:

Job # 11021

Project Notes :

Printed: 17 NOV 2011, 2:04PM

antilevered Retaining Wall

File: P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-004 Office Area Concrete\office area.ec6
ENERCALC, INC. 1983-2011, Build:6.11.10.17, Ver:6.11.8.1

Lic. # : KW-06000120 — Licensee : flsmidth centry

Description : Grid-G Retaining Wall

Calculations per ACI 318-08, ACI 530-08, IBC 2009, CBC 2010, ASCE 7-05

Criteria

Retained Height	=	15.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Vertical component of active
Lateral soil pressure options:
NOT USED for Soil Pressure.
NOT USED for Sliding Resistance.
NOT USED for Overturning Resistance.

Soil Data

Allow Soil Bearing	=	4,500.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	30.0 psf/ft
Toe Active Pressure	=	30.0 psf/ft
Passive Pressure	=	250.0 psf/ft
Soil Density, Heel	=	120.00 pcf
Soil Density, Toe	=	120.00 pcf
Friction Coeff btwn Ftg & Soil	=	0.350
Soil height to ignore for passive pressure	=	6.00 in

Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 plf
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Wind on Exposed Stem	=	0.0 psf

Adjacent Footing Load

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

Axial Load Applied to Stem

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

Design Summary

all Stability Ratios

verturning	=	3.25 OK
Sliding	=	1.49 Ratio < 1.5!
Slab Resists All Sliding !		
Total Bearing Load	=	16,108 lbs
...resultant ecc.	=	10.78 in
Soil Pressure @ Toe	=	2,861 psf OK
Soil Pressure @ Heel	=	718 psf OK
Allowable	=	4,500 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	3,380 psf
ACI Factored @ Heel	=	849 psf
Footing Shear @ Toe	=	12.5 psi OK
Footing Shear @ Heel	=	81.9 psi OK
Allowable	=	94.9 psi

Sliding Calcs Slab Resists All Sliding !

Lateral Sliding Force	=	4,446.3 lbs
less 100% Passive Force	= -	972.2 lbs
less 100% Friction Force	= -	5,630.6 lbs
Added Force Req'd	=	0.0 lbs OK
....for 1.5 : 1 Stability	=	59.5 lbs NG

Load Factors

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

Stem Construction

		Top Stem	2nd
		Stem OK	Stem OK
Design Height Above Ftg	ft =	12.50	0.00
Wall Material Above "Ht"	=	Concrete	Concrete
Thickness	in =	8.00	18.00
Rebar Size	=	# 8	# 8
Rebar Spacing	in =	12.00	12.00
Rebar Placed at	=	Center	Edge
Design Data			
fb/FB + fa/Fa	=	**0.021**	**0.594**
Total Force @ Section	lbs =	250.0	5,974.0
Moment....Actual	ft-l =	250.0	31,494.0
Moment.....Allowable	ft-l =	12,148.8	53,031.3
Shear.....Actual	psi =	5.2	32.1
Shear.....Allowable	psi =	94.9	94.9
Wall Weight	psf =	100.0	225.0
Rebar Depth 'd'	in =	4.00	15.50
Lap splice if above	in =	37.19	37.19
Lap splice if below	in =	37.19	4.78
Hook embed into footing	in =	37.19	4.78
Concrete Data			
f'c	psi =	4,000.0	4,000.0
Fy	psi =	60,000.0	60,000.0

FLSmidth Salt Lake City, Inc.
7158 South FLSmidth Dr.
Midvale, UT 84047

Title : CC & V HIGH GRADE
Dsgnr: Clint Karren
Project Desc.:

Job # 11021

Project Notes :

antilevered Retaining Wall

File: P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-004 Office Area Concrete\office area.ec6
ENERCALC, INC. 1983-2011, Build:6.11.10.17, Ver:6.11.8.1

Lic. # : KW-06000120 — Licensee : flsmidth centry

Description : Grid-G Retaining Wall

Footing Dimensions & Strengths

Toe Width	=	2.00 ft
Heel Width	=	7.00
Total Footing Width	=	9.00
Footing Thickness	=	18.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 4,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 3.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel
Factored Pressure	=	3,380	849 psf
Mu' : Upward	=	6,385	0 ft-lb
Mu' : Downward	=	1,004	0 ft-lb
Mu: Design	=	5,381	31,494 ft-lb
Actual 1-Way Shear	=	12.48	81.87 psi
Allow 1-Way Shear	=	94.87	94.87 psi
Toe Reinforcing	=	# 6 @ 18.00 in	
Heel Reinforcing	=	# 6 @ 12.00 in	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
Heel: #4@ 4.25 in, #5@ 6.50 in, #6@ 9.25 in, #7@ 12.50 in, #8@ 16.50 in, #9@ 20.7
Key: No key defined

Summary of Overturning & Resisting Forces & Moments

		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	4,083.8	5.50	22,460.6
Surcharge over Heel	=	412.5	8.25	3,403.1
Toe Active Pressure	=			
Surcharge Over Toe	=	-50.0	1.00	-50.0
Adjacent Footing Load	=			
Added Lateral Load	=			
Load @ Stem Above Soil	=			
Total	=	4,446.3	**O.T.M.** =	25,813.8

Resisting/Overturning Ratio = **3.25**
Vertical Loads used for Soil Pressure = 16,107.5 lbs

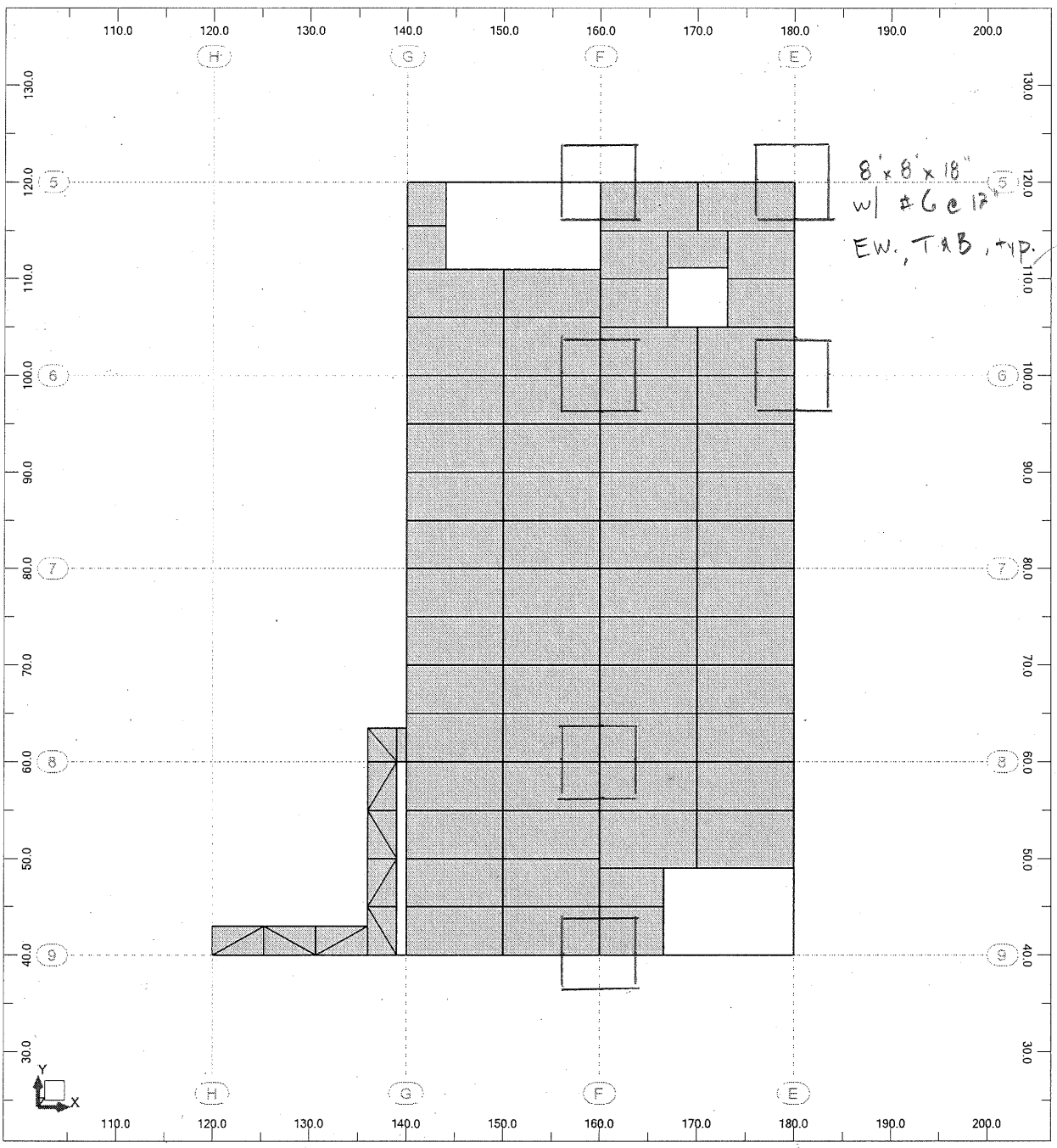
		.....RESISTING..... Force lbs	Distance ft	Moment ft-lb
Soil Over Heel	=	9,900.0	6.25	61,875.0
Sloped Soil Over Heel	=			
Surcharge Over Heel	=	550.0	6.25	3,437.5
Adjacent Footing Load	=			
Axial Dead Load on Stem	=			
* Axial Live Load on Stem	=			
Soil Over Toe	=	120.0	1.00	120.0
Surcharge Over Toe	=	200.0	1.00	200.0
Stem Weight(s)	=	3,062.5	2.72	8,317.7
Earth @ Stem Transitions	=	250.0	3.08	770.8
Footing Weight	=	2,025.0	4.50	9,112.5
Key Weight	=			
Vert. Component	=			
Total =		16,107.5 lbs	**R.M.** =	83,833.5

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

7158 S. FLSmidth Drive
Midvale, UT 84047-5559

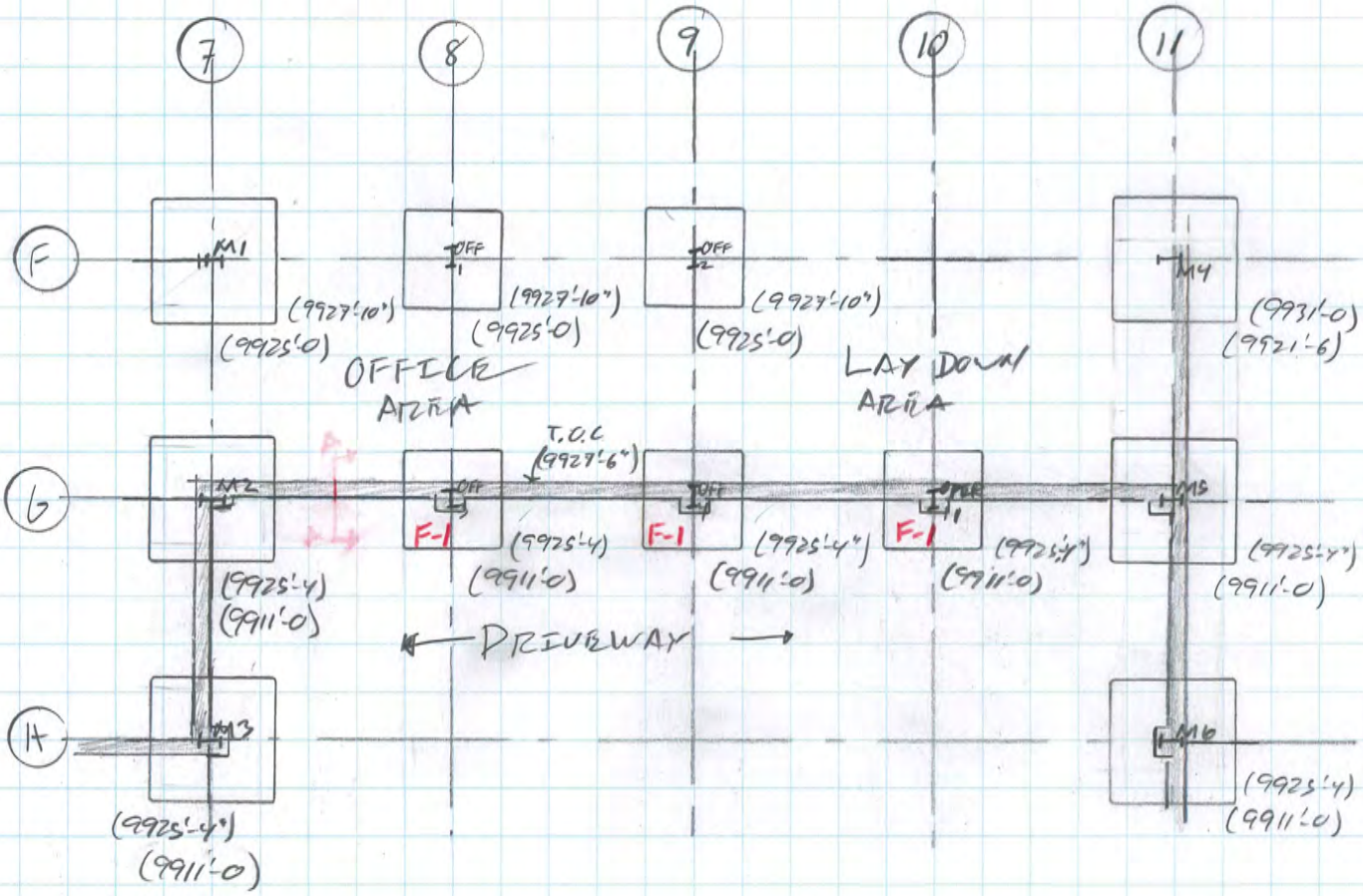
Engineer: **Clint Karren**
Calc No..: **S-005** Job.:**11021**
Project: **Office Area rev 2**
Client: **CC&V**

View - Cases: 1 (Self Weight)



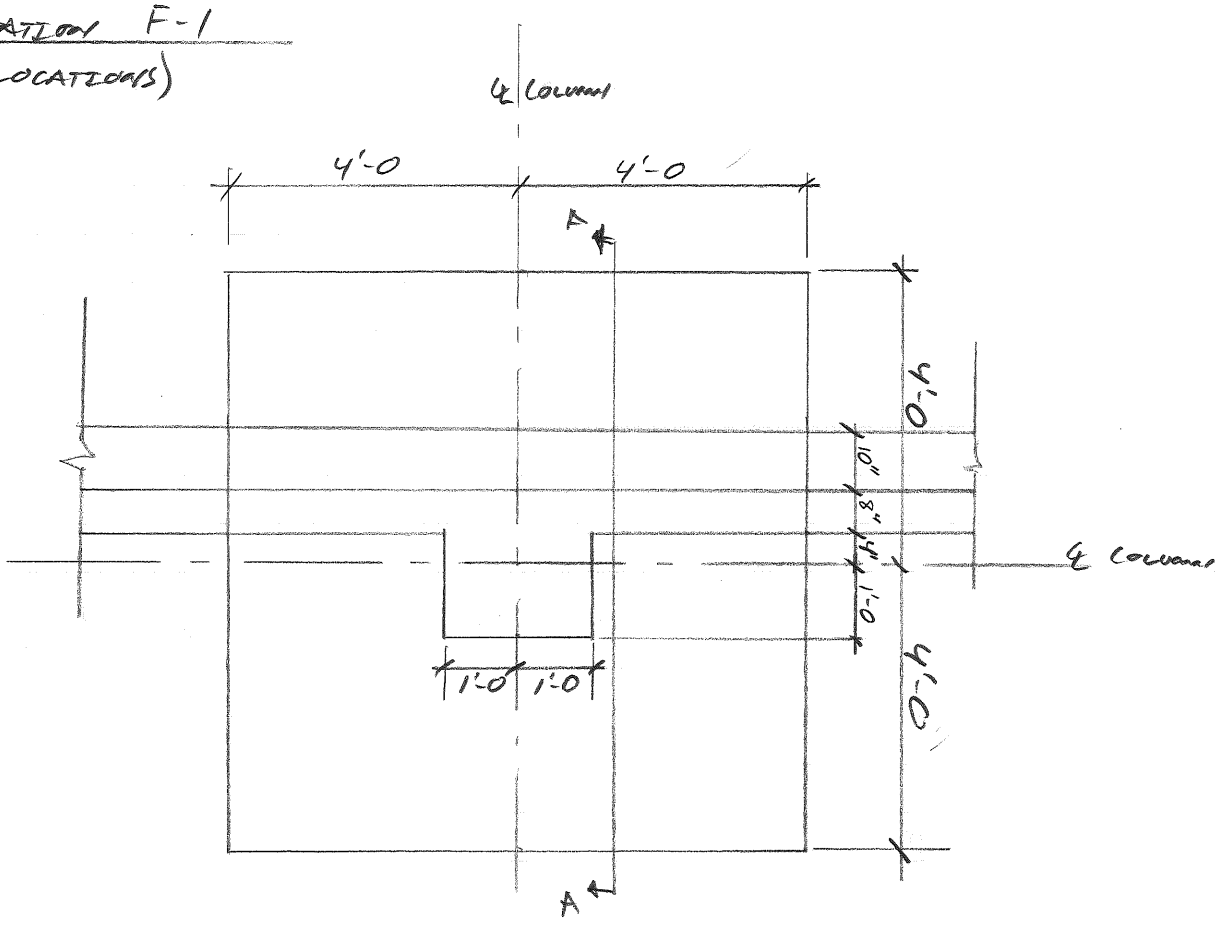
FLSmidth	PROJECT CCIV High Grade Ore	PROJ NO. 11021
		CALC NO. C-004
	SUBJECT Office Area & Driveway Foundations	BY RLS DATE 2-17-12
		CHK DATE
		SHEET OF REV

Foundation Plan

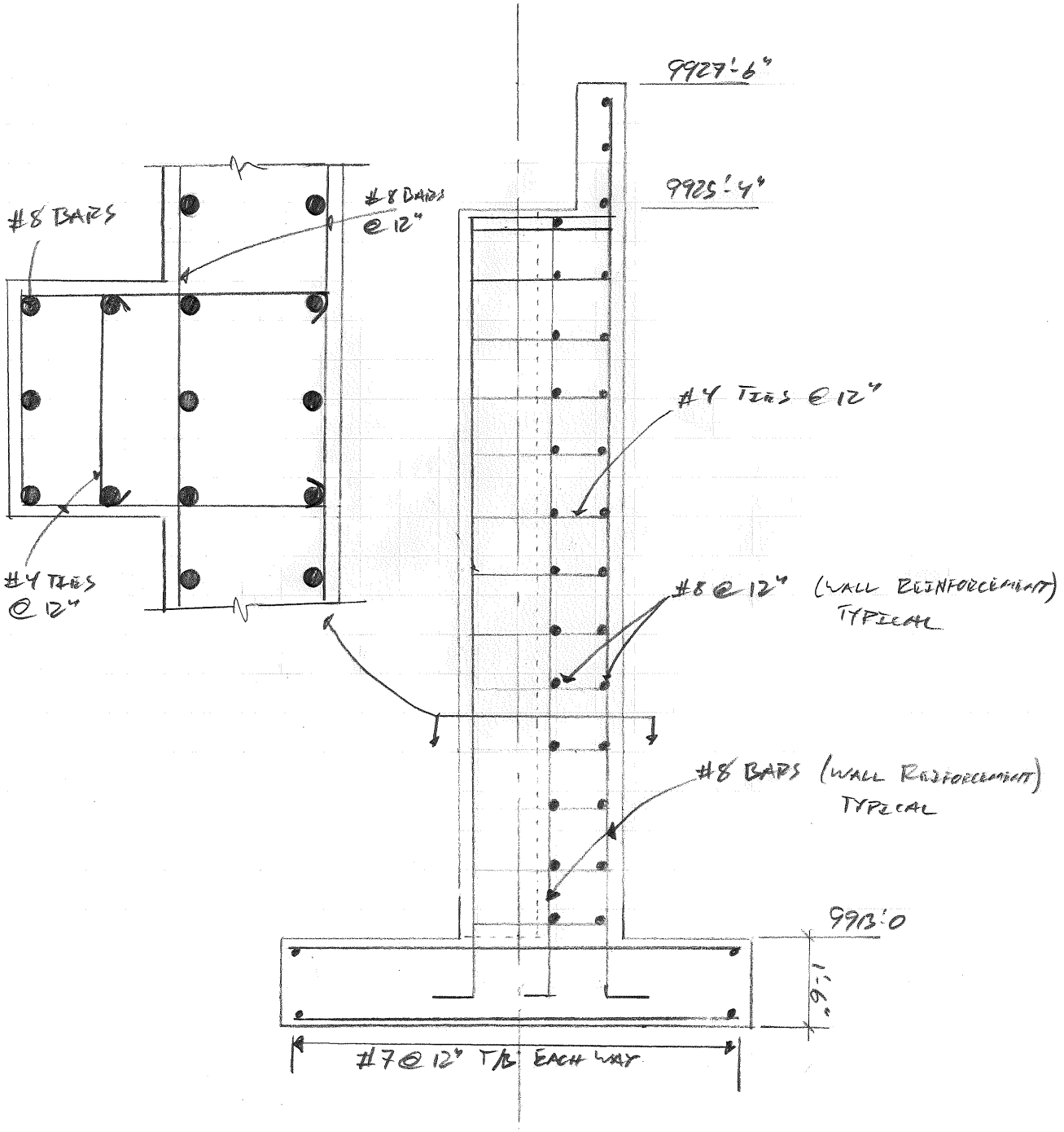


FLSmidth	PROJECT CC&V HIGH GRADE ORE	PROJ NO. 11021
		CALC NO. C-004
	SUBJECT OFFICE AREA & DRIVEWAY FOUNDATIONS	BY ECS DATE 2-20-12
		CHK DATE
		SHEET OF REV

FOUNDATION F-1
(3 LOCATIONS)



FLSmidth	PROJECT CL&V High Grade Oil	PROJ NO. 11021
		CALC NO. C-004
	SUBJECT Office Area & Drumlay Foundations	BY ECS DATE 2-20-12
		CHK DATE
		SHEET OF REV



A-A

FLSmidth	PROJECT CC&V HIGH GRADE ORE	PROJ NO. 11021
		CALC NO. C-004
	SUBJECT OFFICE AREA & DRIVEWAY FOUNDATIONS	BY RCS DATE 2-17-12
		CHK DATE
		SHEET OF REV

SOIL PRESSURES

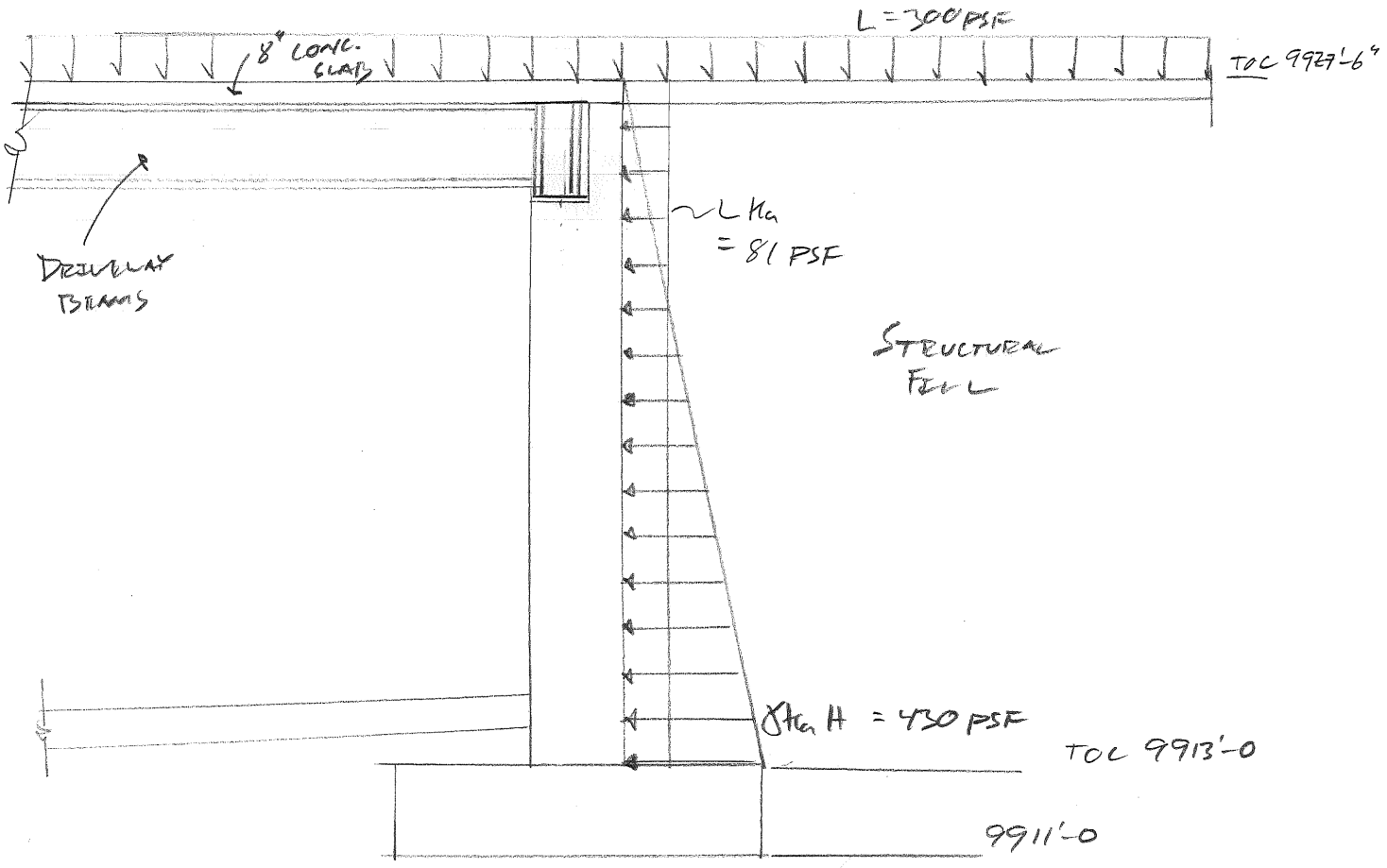
$\phi = 35°$

$K_a = 0.27$

$K_p = 3.69$

$\gamma = 110$ PCF

$L = 300$ PSF (SURCHARGE)



Support Reactions from Robot Models:

Combined Mill Building, Office Area, Operating Platform

Location	Load Case	Fx (kip)	Fy (kip)	Fz (kip)
Office 3	Dead	0.33	-1.12	20.6
	Live	0.75	-2.87	52.13
	Snow	0	0	0
	Wind X	0	0	0
	Wind -X	0	0	0
	Wind Y	0	0	0
	Wind -Y	0	0	0
	Ex	-0.66	1.11	-5
	E-x	0.66	-1.11	4.99
	Ey	0	-2.34	6.07
	E-y	0	2.34	-6.07
Office 4	Dead	0	1.41	12.46
	Live	0.17	3.77	31.26
	Snow	0	0	0
	Wind X	0	0	0
	Wind -X	0	0	0
	Wind Y	0	0	0
	Wind -Y	0	0	0
	Ex	-0.02	0.63	1.04
	E-x	0.02	-0.63	-1.04
	Ey	0	-2.41	-6.09
	E-y	0	2.41	6.09
Operating 1	Dead	0.27	0	25.97
	Live	0.4	0	68.12
	Snow	0	0	0
	Wind X	0	0	0
	Wind -X	0	0	0
	Wind Y	0	0	0
	Wind -Y	0	0	0
	Ex	-7.32	-0.01	0
	E-x	7.31	0.01	0
	Ey	1.59	-3.92	0
	E-y	-1.59	3.92	0
Main Building 2	Dead	0.39	3.48	99.09
	Live	0.52	-9.87	30.14
	Snow	0.04	3.12	49.07
	Wind X	0.09	0.95	-20.74
	Wind -X	-0.08	2.51	53.43
	Wind Y	-0.04	-14.45	-135.41
	Wind -Y	0.04	19.94	158.38
	Ex	-0.12	-0.01	-3.85
	E-x	0.12	0.14	4.96
	Ey	-0.02	-8.69	-47.48
	E-y	0.02	8.69	47.51

Support Reactions from Robot Models:

Combined Mill Building, Office Area, Operating Platform

Location	Load Case	Fx (kip)	Fy (kip)	Fz (kip)
Main Building 3	Dead	-0.15	-0.2	64.99
	Live	-0.14	-2.54	223.94
	Snow	-0.13	-0.38	58.1
	Wind X	-1.54	0.14	-15.34
	Wind -X	1.5	0.19	-27.72
	Wind Y	0.65	-0.03	-32.68
	Wind -Y	0.6	0.42	-10.52
	Ex	-0.4	-0.01	0.28
	E-x	0.41	0	-1.12
	Ey	0	-0.41	0.57
	E-y	0	0.41	-0.57
Main Building 5	Dead	0	0.6	59.76
	Live	0	0.31	90.87
	Snow	0	1.21	26.18
	Wind X	0.01	8.63	-13.81
	Wind -X	-0.01	8.39	-18.71
	Wind Y	0	-8.94	-6.77
	Wind -Y	0	7.14	-10.88
	Ex	-0.06	0.01	0.05
	E-x	0.06	-0.01	-0.03
	Ey	0	-0.38	0.14
	E-y	0	0.38	-0.13
Main Building 6	Dead	-0.13	0.65	62.03
	Live	-0.19	0.86	148.74
	Snow	-0.07	1.34	30.49
	Wind X	-0.58	8.56	-14.98
	Wind -X	0.64	8.35	-20.69
	Wind Y	0.19	-9.1	-10.82
	Wind -Y	0.28	7.13	-11.94
	Ex	-0.2	0.02	0.19
	E-x	0.2	-0.01	-0.17
	Ey	-0.02	-0.4	0.15
	E-y	0.02	0.4	-0.15

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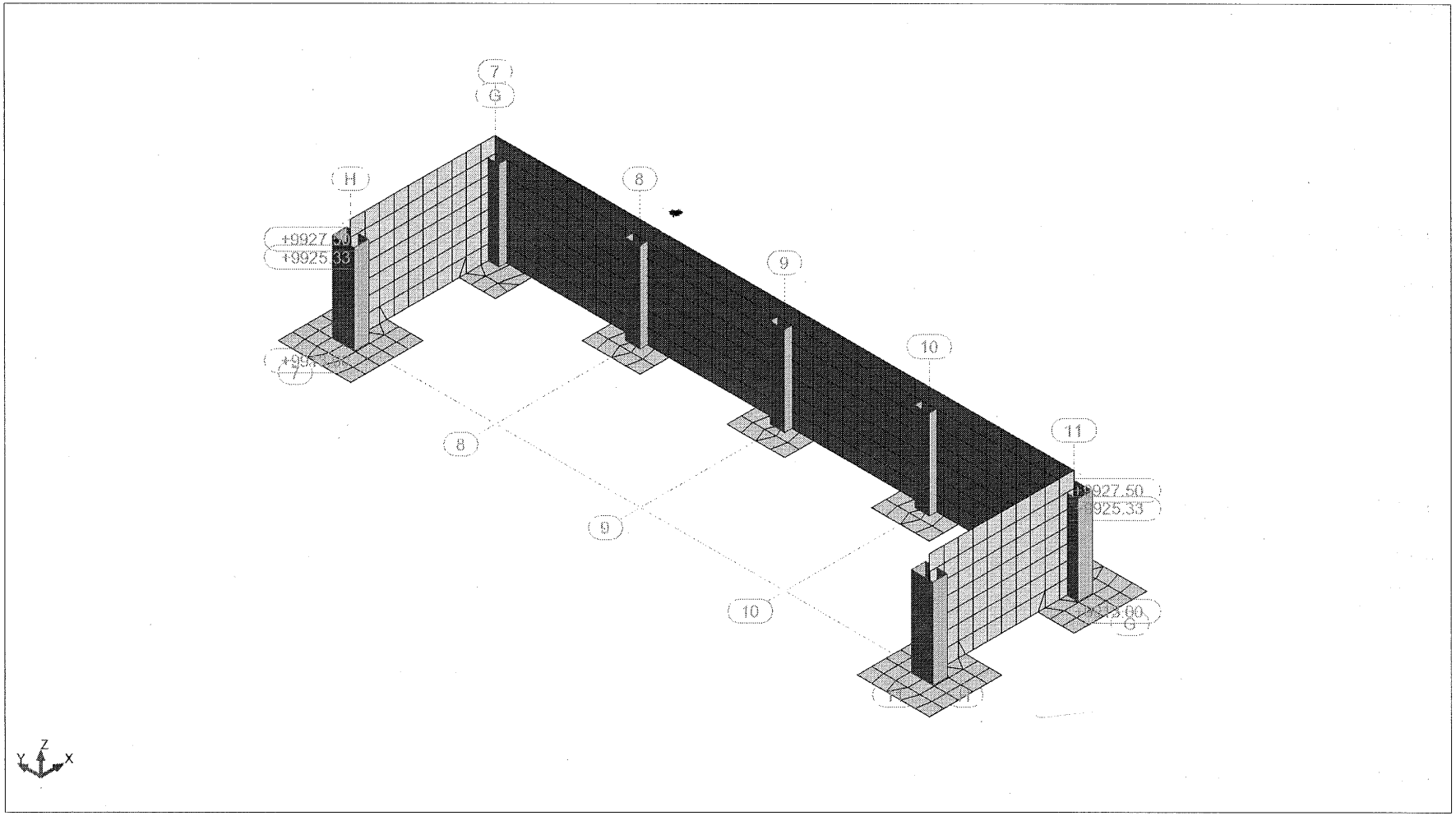
Midvale, UT 84047-5559

Engineer: **Ed Summers**
Calc No..: **C-004** Job.:**11021**
Project: **Office Foundation_Basement Wall**
Client: **CC&V**

View - Cases: 1 (Self Weight)



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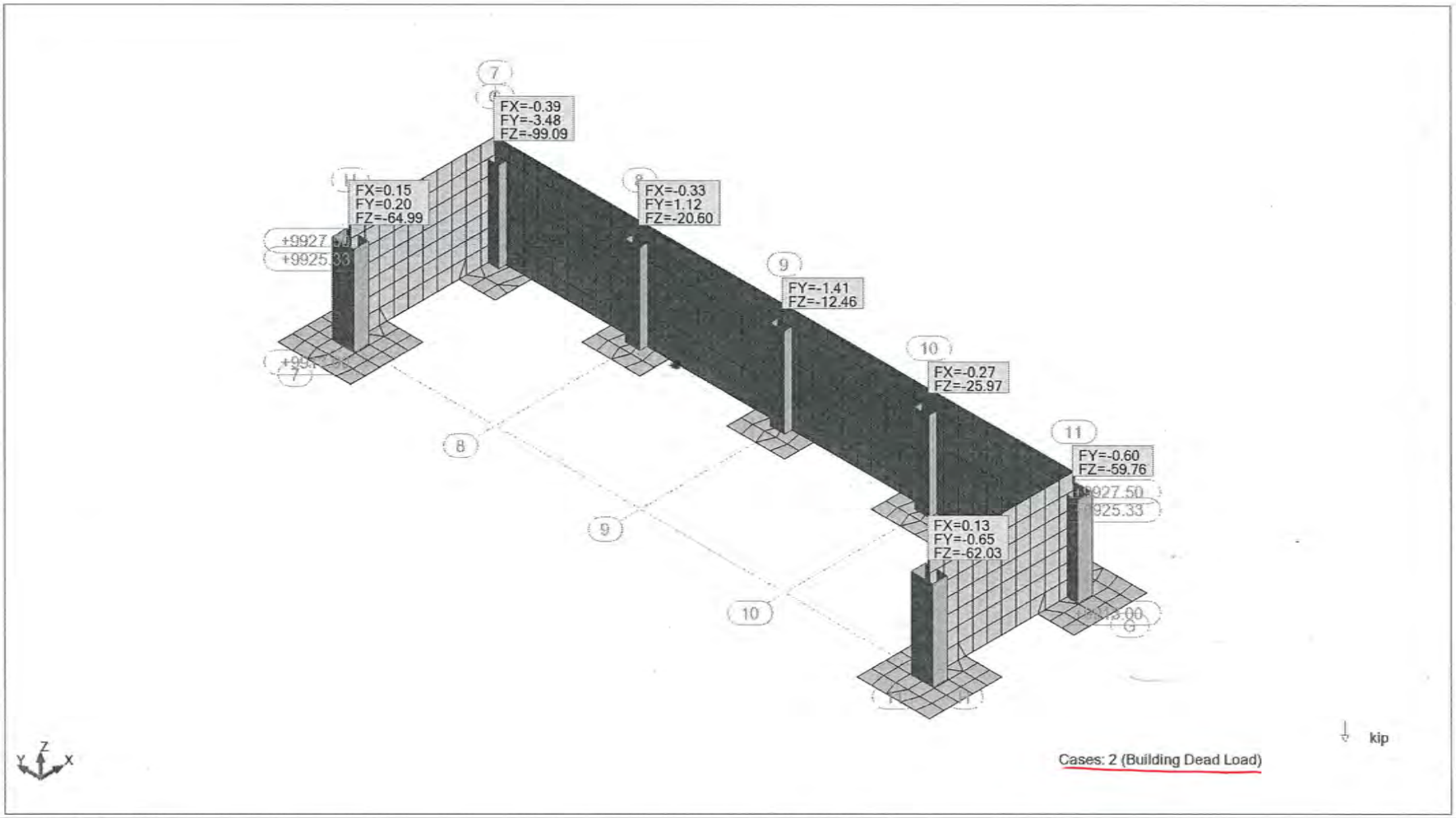
View -



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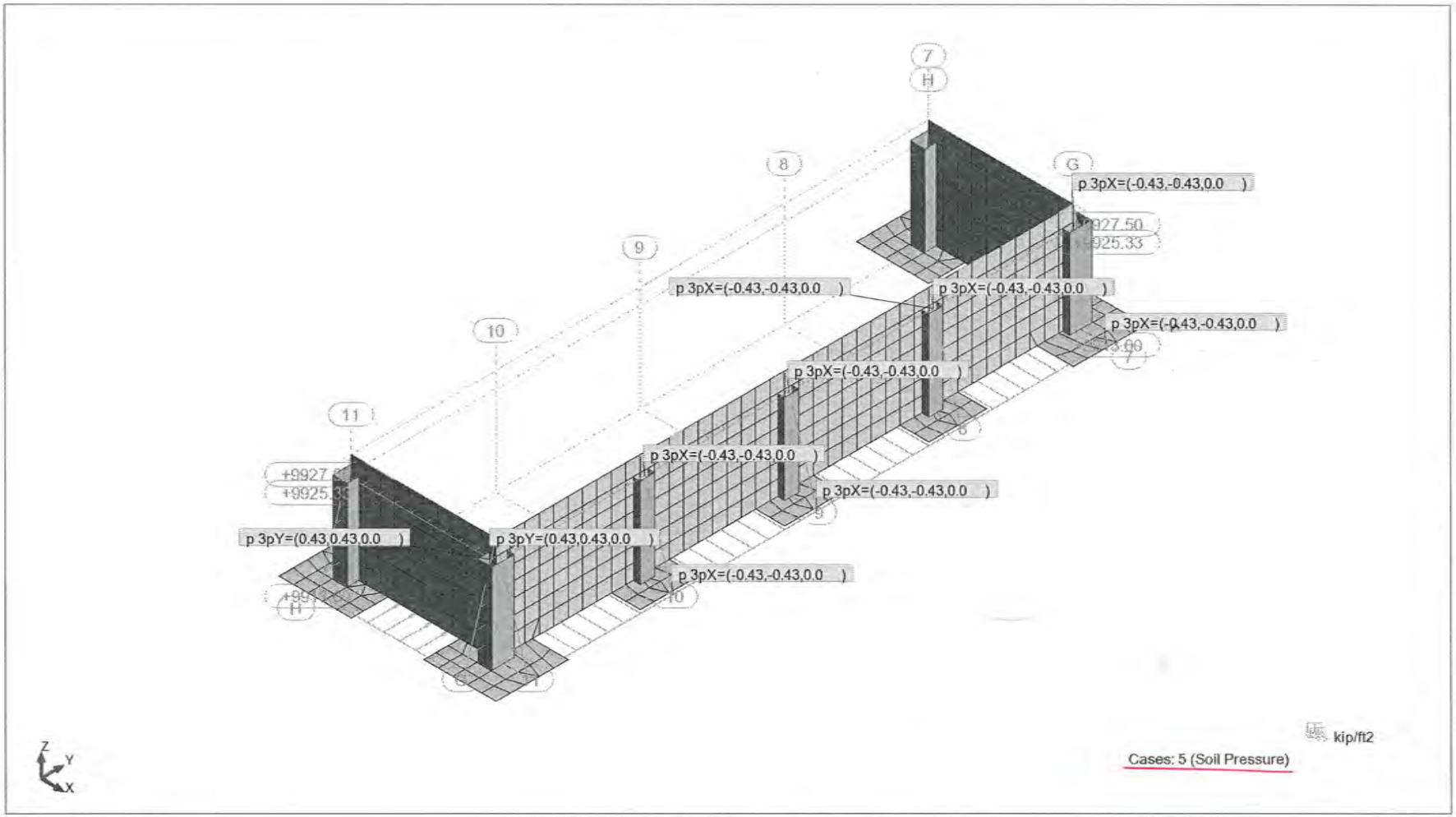
View -



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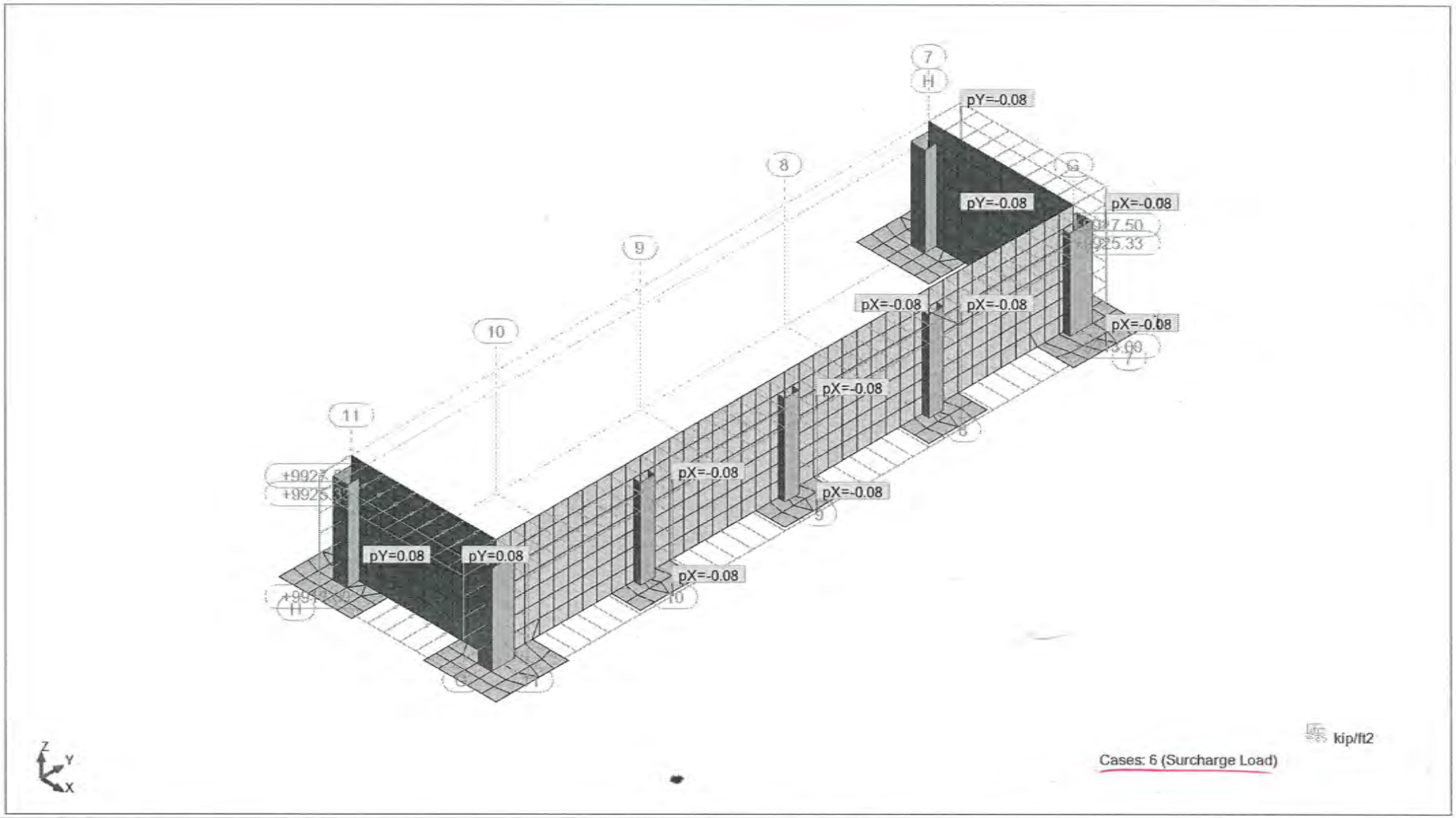
View -



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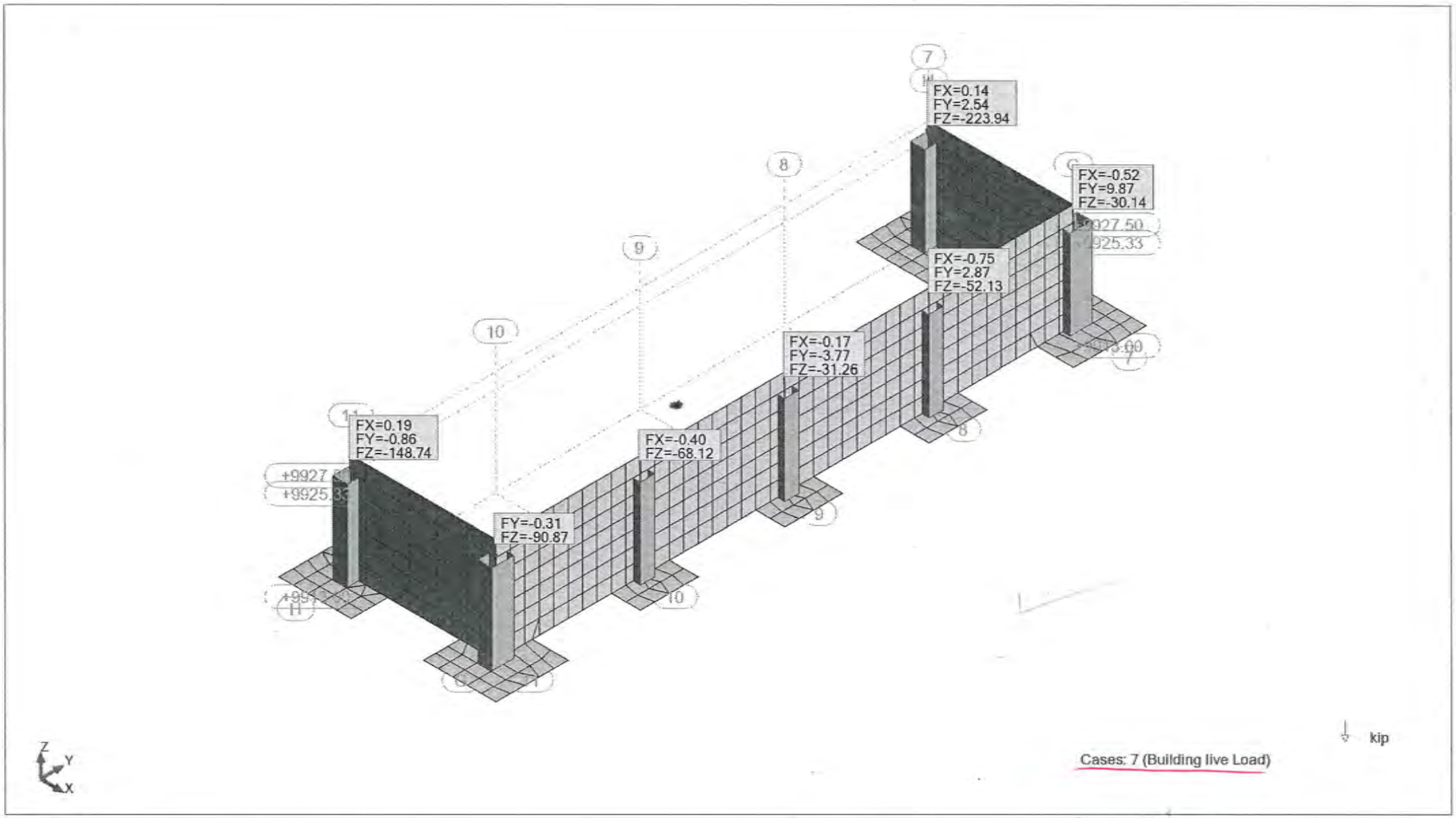
View -



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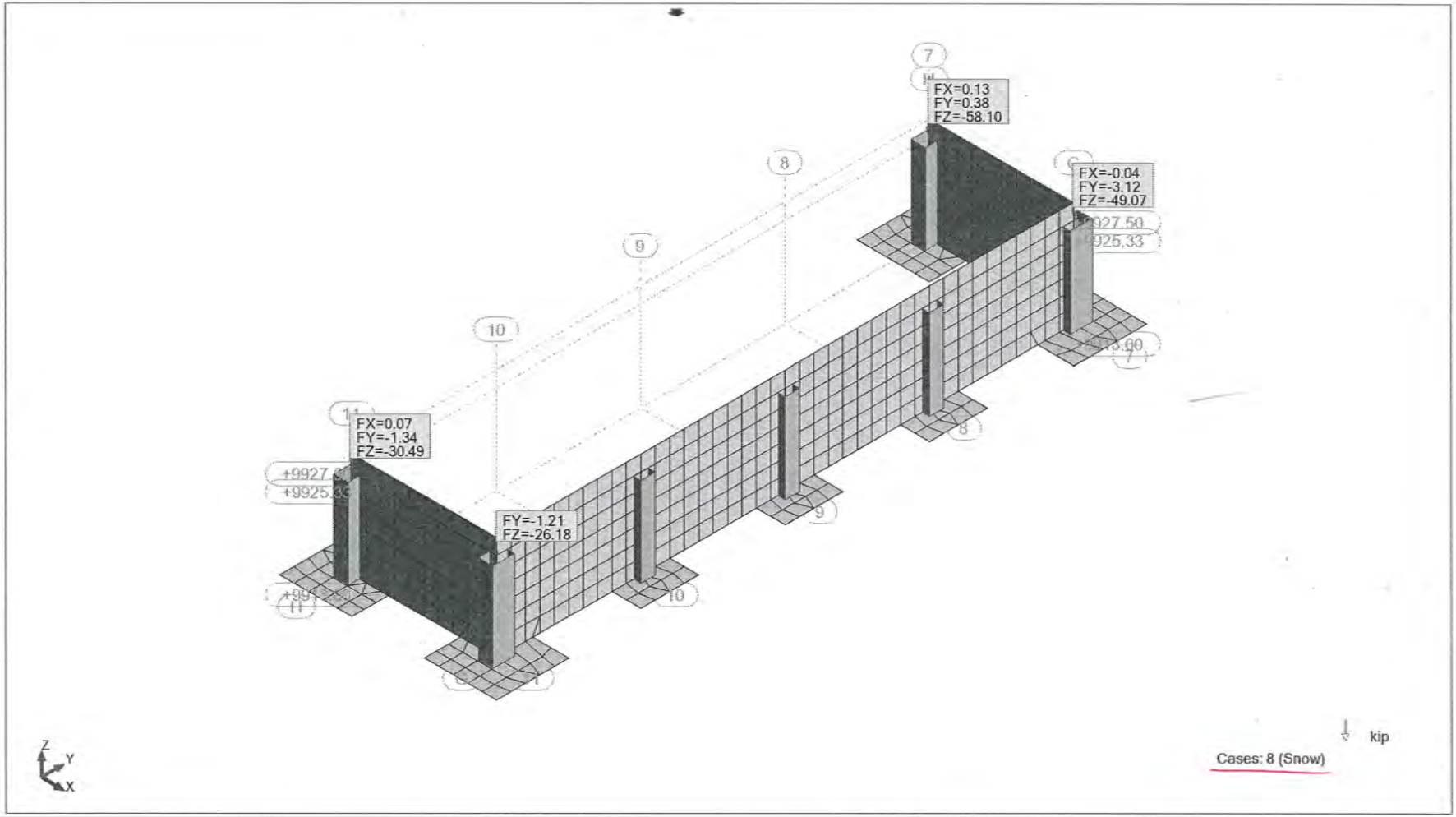
View -



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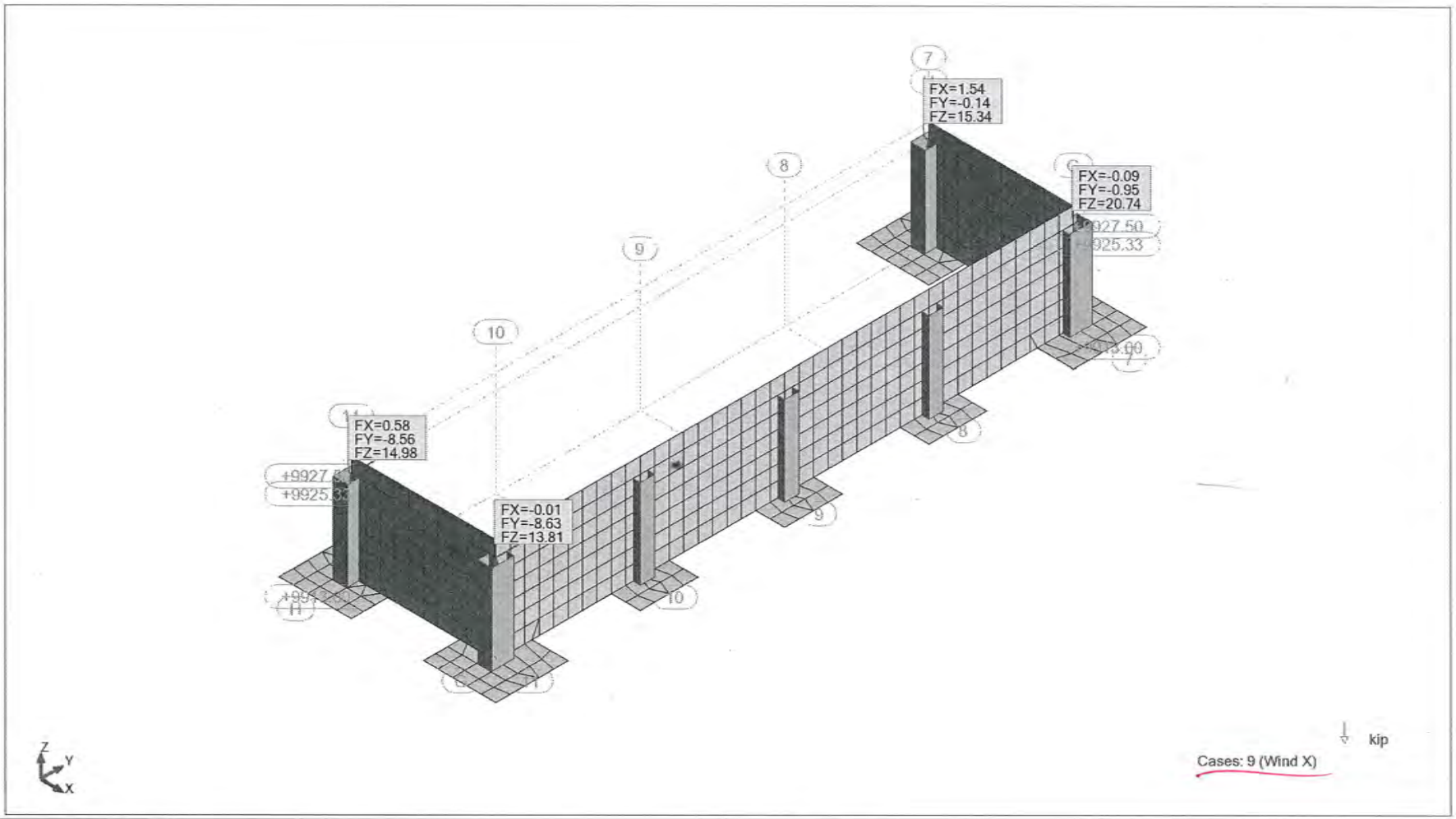
View -



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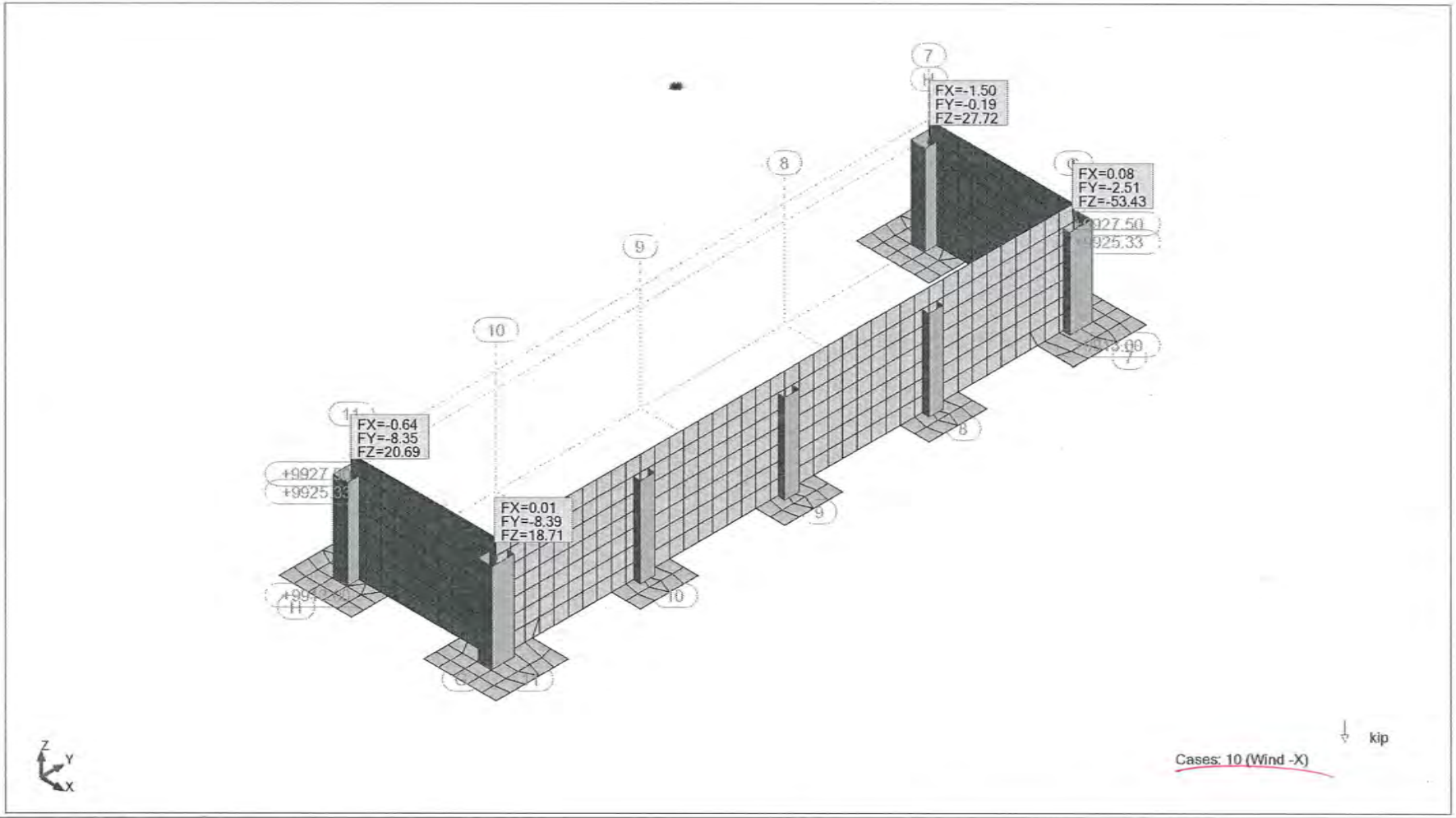
View -



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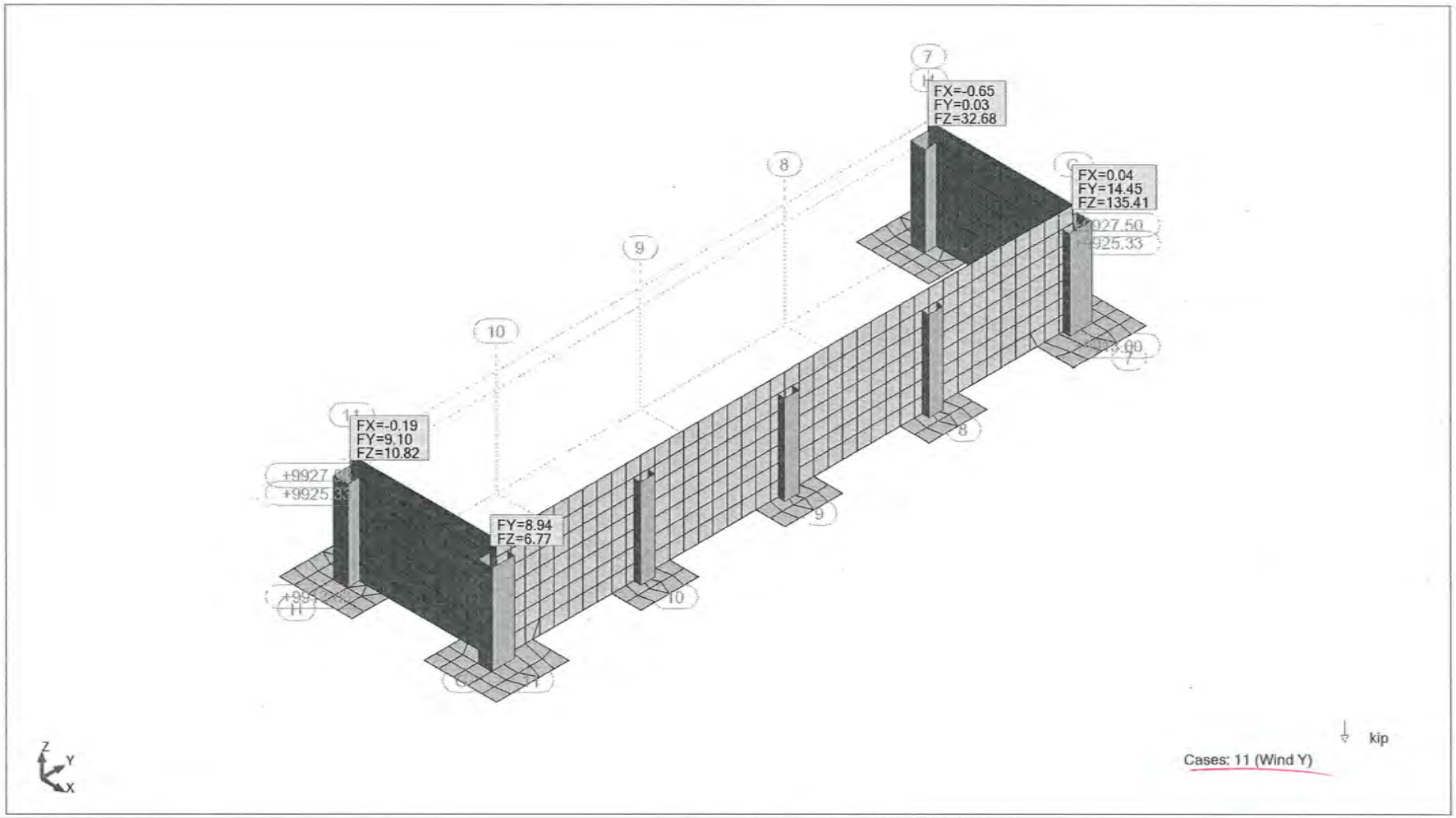
View -



Date : 20/02/12
File: **Office Foundation_Basement Wall.rtd**

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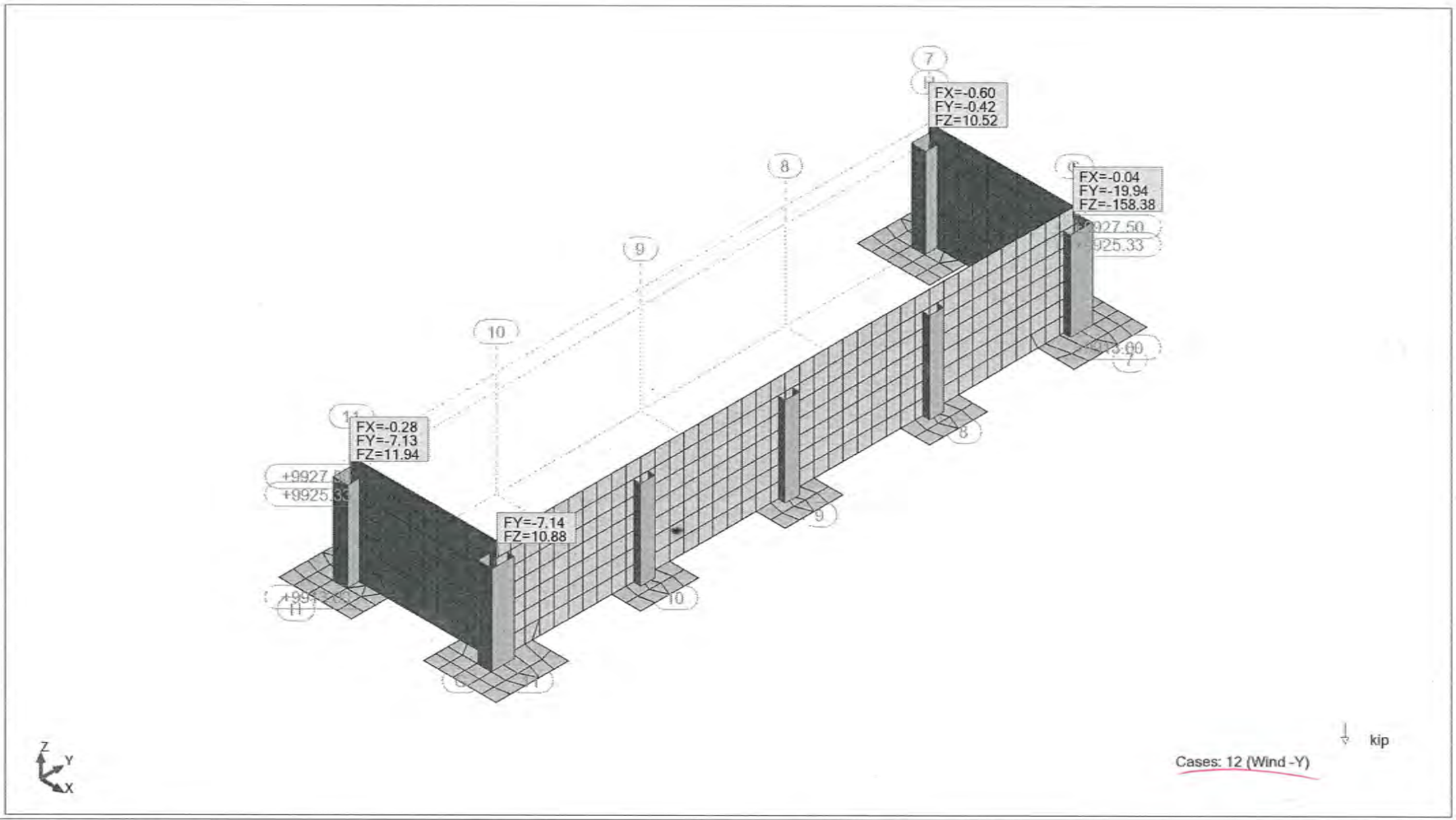
View -



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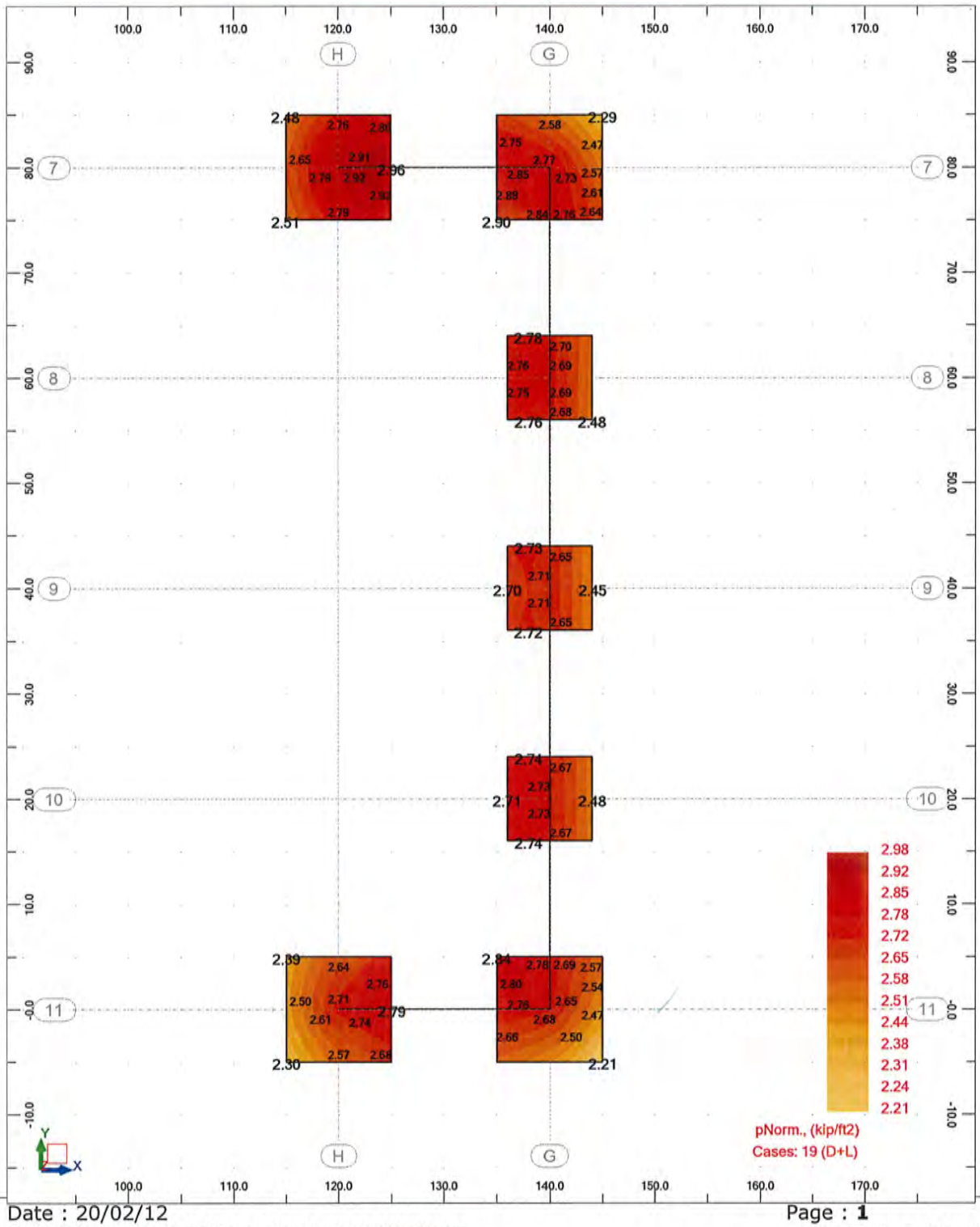
View - pNorm. (kip/ft2) Cases: 19 (D+L)

SOIL PRESSURE



Date : 20/02/12
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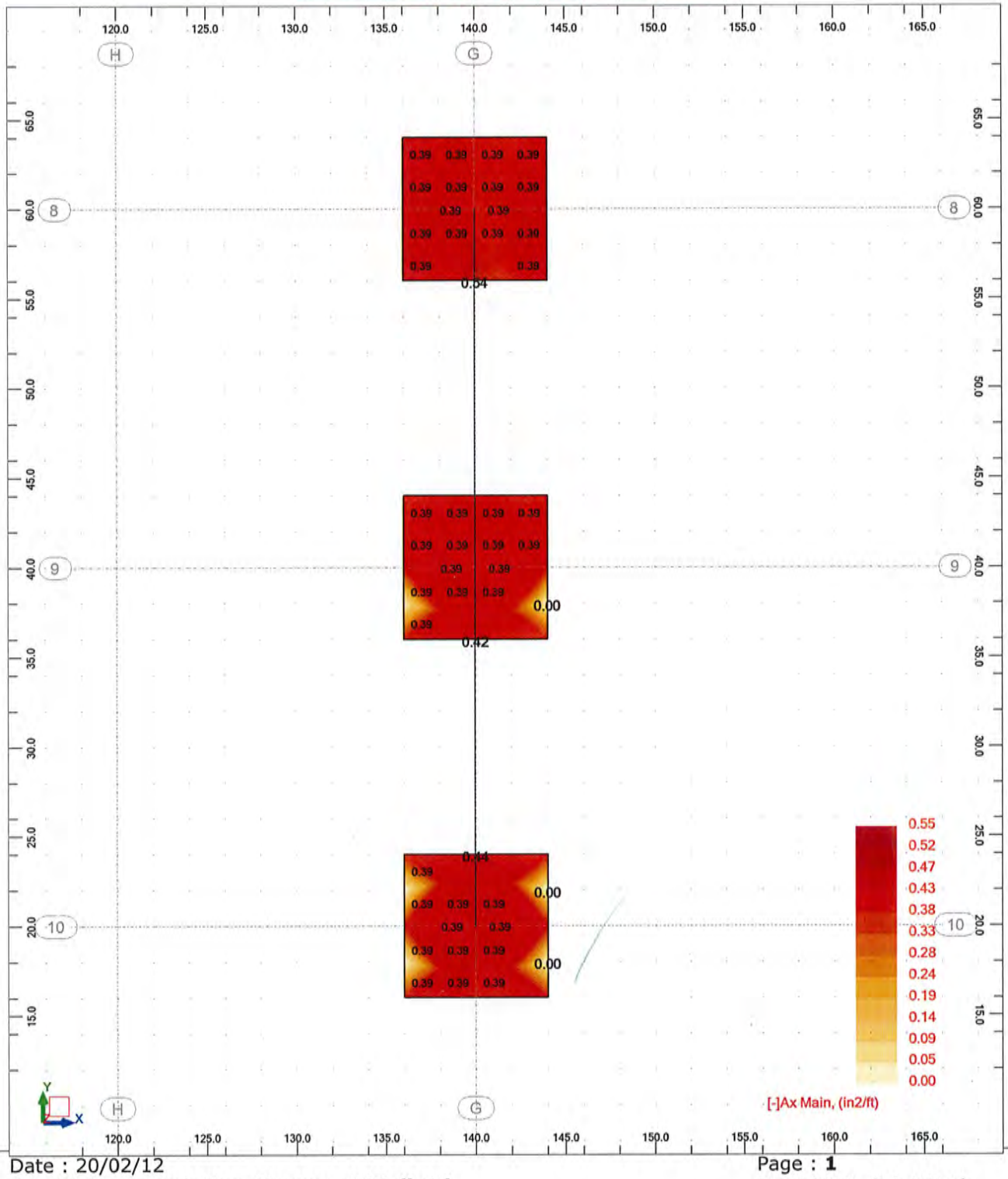
View:1 - [-]Ax Main (in2/ft)

REQ'D REINFORCEMENT - X - BOT.



Date : 20/02/12
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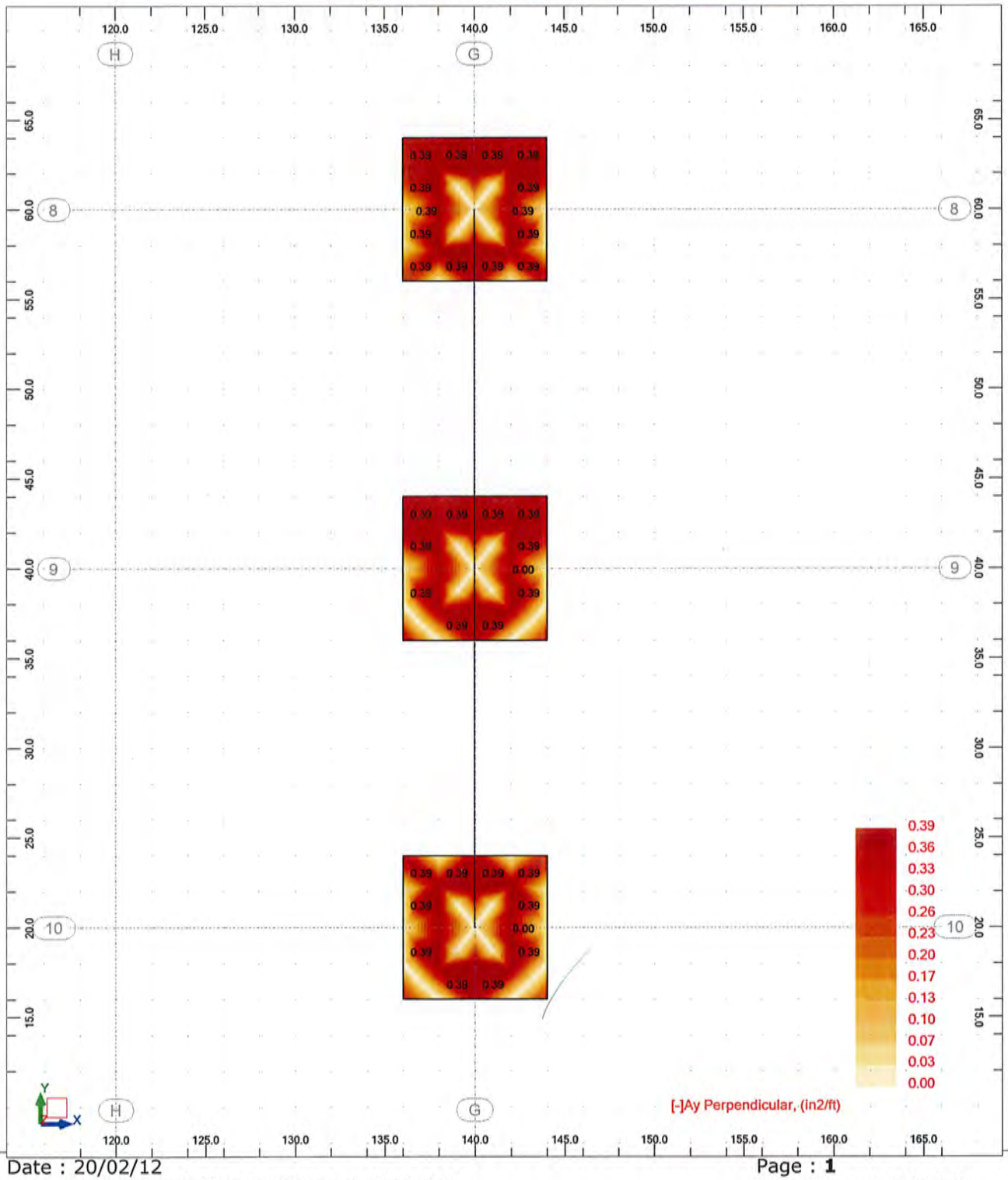
View:1 - [-]Ay Perpendicular (in2/ft)

REQD Reinforcement - Y - Bottom



Date : 20/02/12
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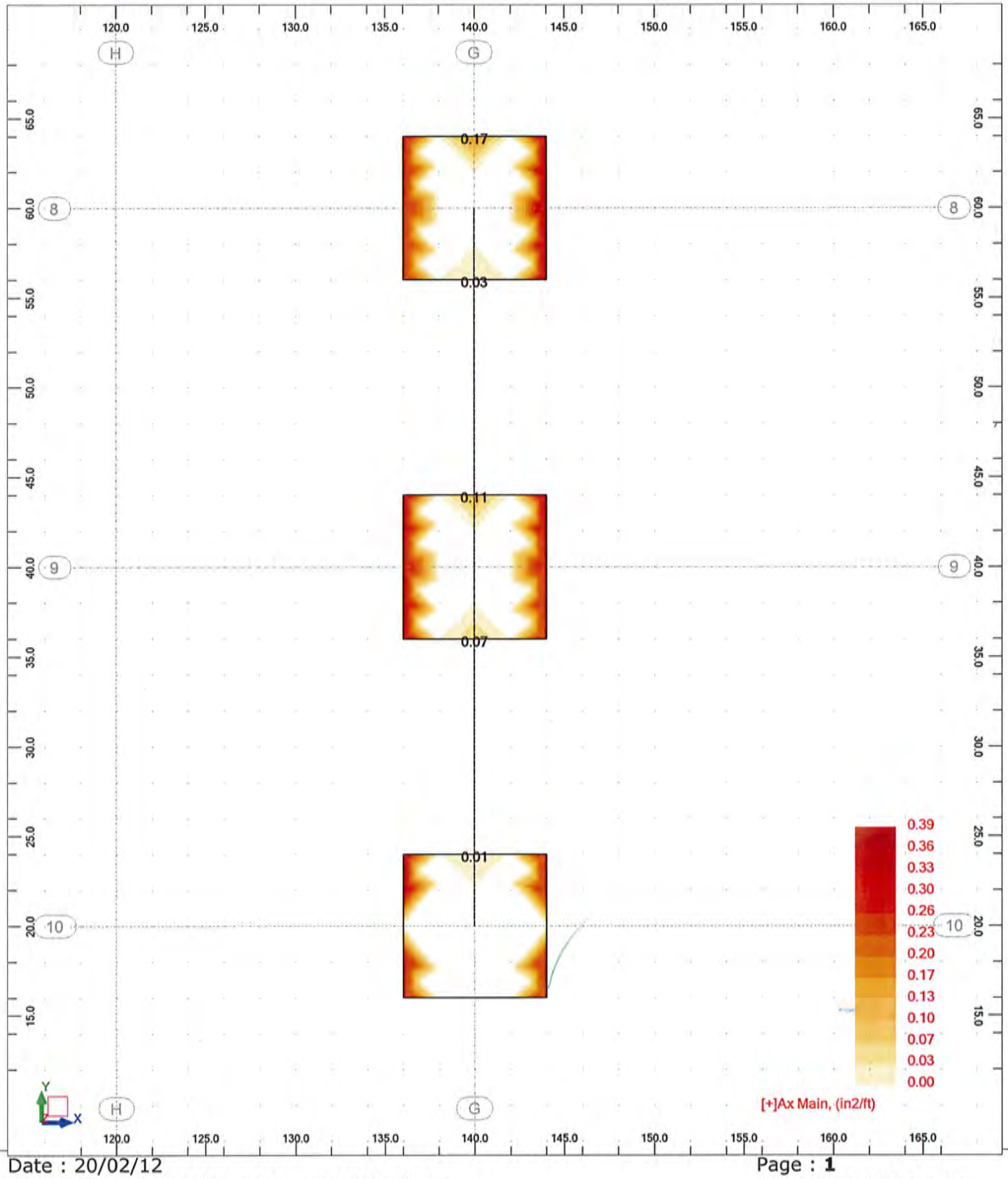
View:1 - [+]Ax Main (in2/ft)

REQ'D REINFORCEMENT - X - TOP



Date : 20/02/12
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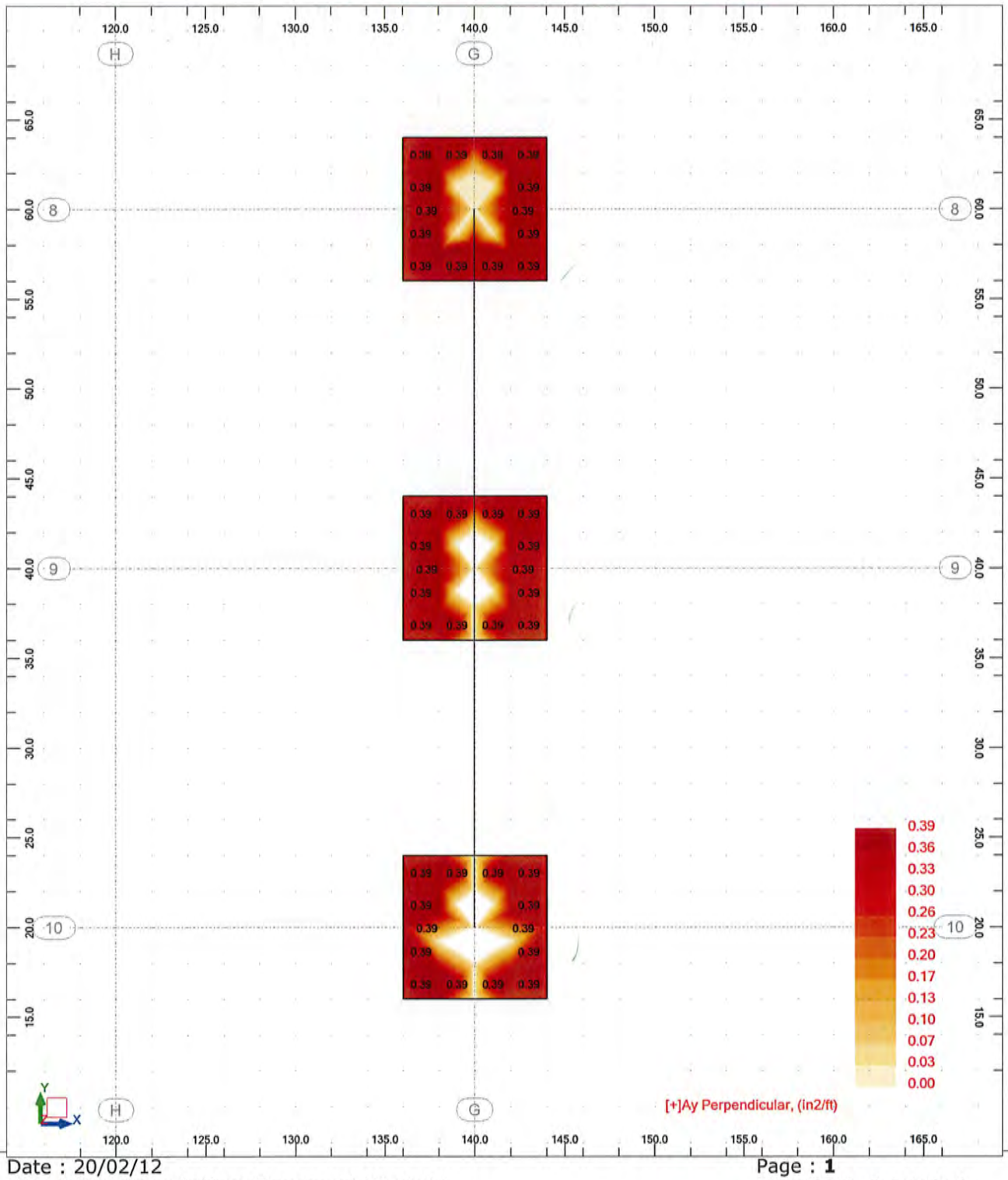
View:1 - [+]Ay Perpendicular (in2/ft)

REQ'D REINFORCEMENT - Y-TOP



Date : 20/02/12
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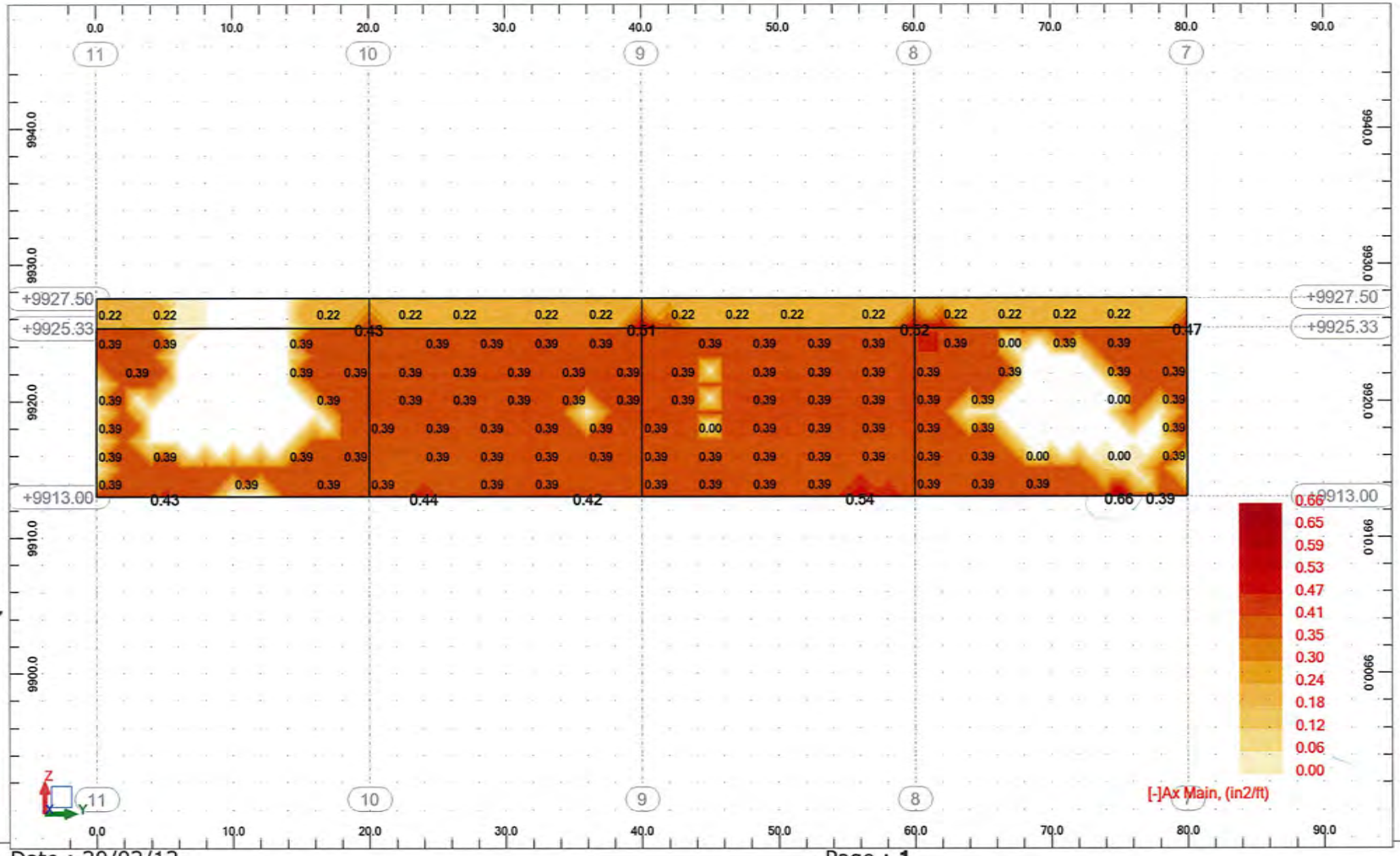
View - [-]Ax Main (in2/ft)

REQ'D REINFORCEMENT - X - BOTTOM



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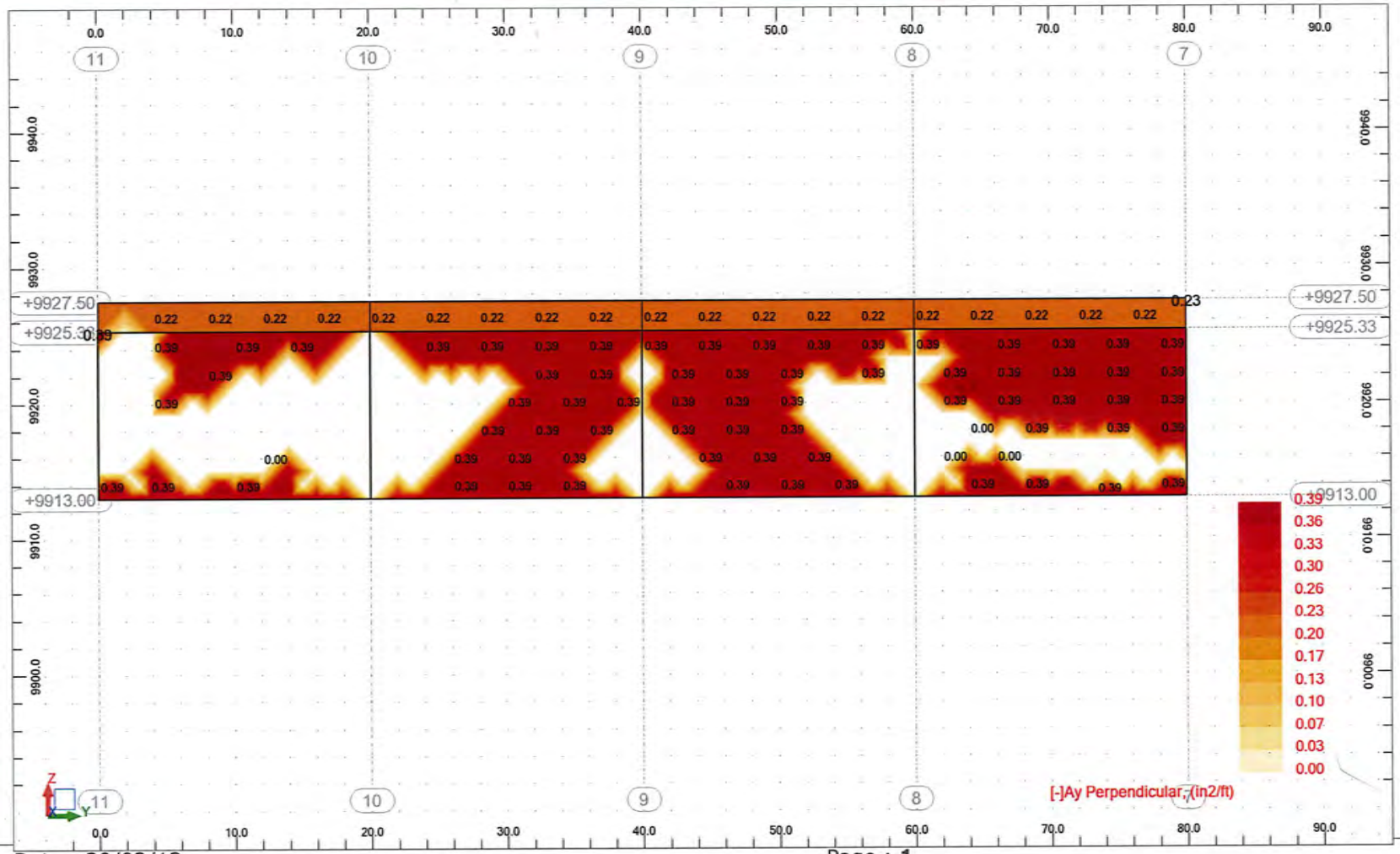
View - [-]Ay Perpendicular (in2/ft)

REQ'D REINFORCEMENT - Y - BOTTOM



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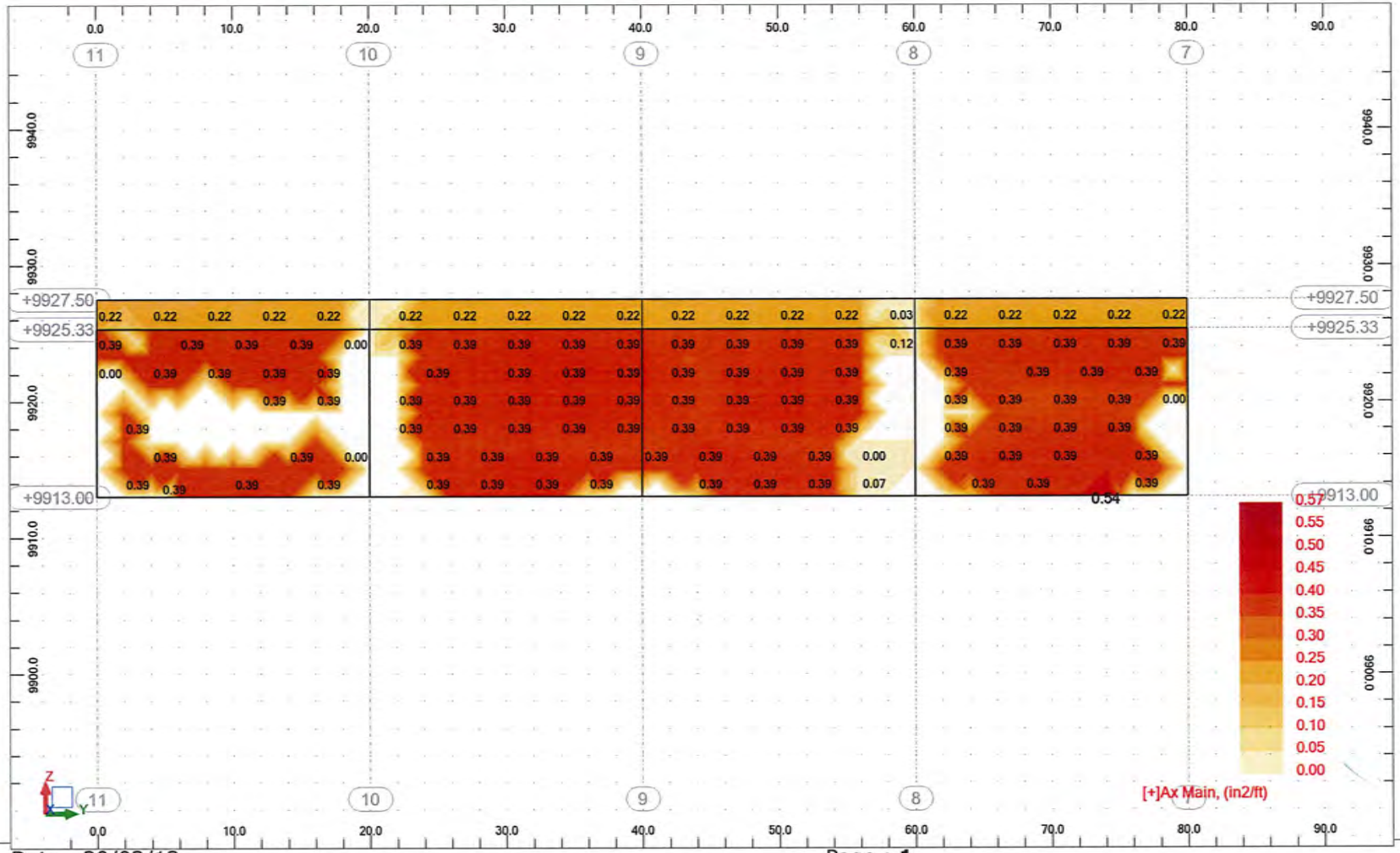
View - [+]Ax Main (in2/ft)

Read Reinforcement - X - Top



Date : 20/02/12
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View - [+]Ay Perpendicular (in2/ft)

REQ'D REINFORCEMENT - Y - TOP