FLSmidth

CALCULATION COVER SHEET

JOB NUMBER	CLIENT	PROJECT	CALC. NUMBER
11021	CC&V	High Grade Ore	C-005a

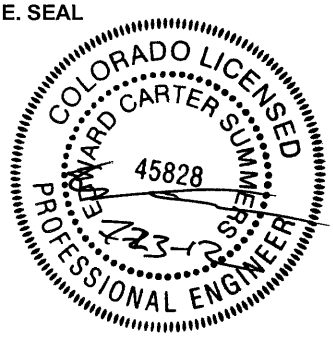
TITLE/SUBJECT:

Grinding Area - Interior Foundations

STATEMENT OF PROBLEM:

Design spread footings for Operating Platform columns, Sump, and Sump Pumps.

P.E. SEAL



SOURCES OF DATA, FORMULA & REFERENCES:

Autodesk Robot Structural Analysis 2012
IBC 2009
ACI 318-08
ASCE 7-05
AMEC Mill Foundation Recommendations letter dated February 29, 2012
Foundation 3d V. 5.8.2

CONCLUSIONS & RECOMMENDATIONS:

See details in report

REV	DATE	DESCRIPTION/STATUS	CALC BY	CHKD BY	DWG./SPECS REVISED	QA REVIEW
A	5/2/2012	Ready for Check	ECS	WC		
0	7/16/2012	Issued for Permit	ECS	WC		

FLSmidth

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11021	CC&V	High Grade Ore	C-005a

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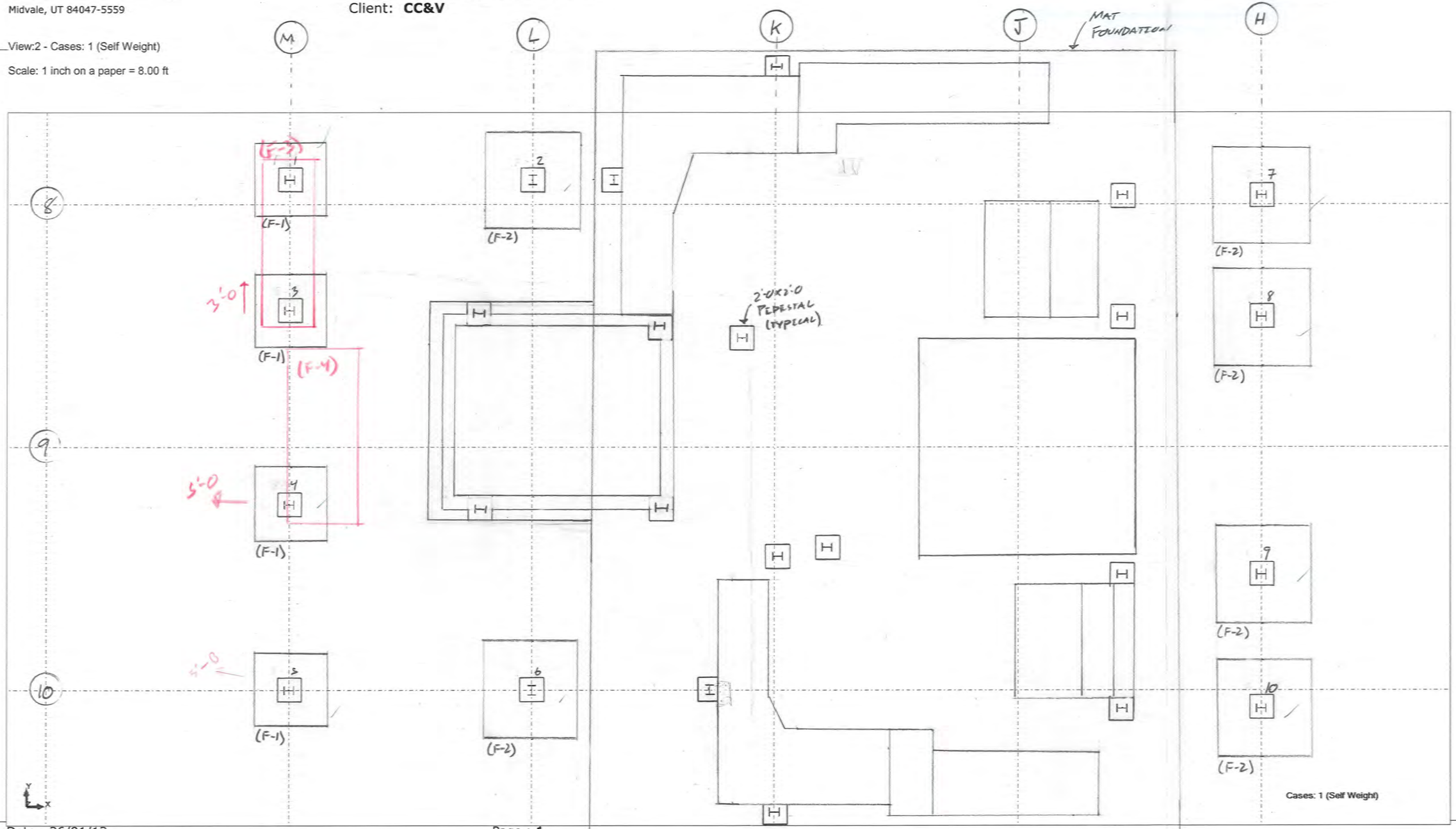
FLSmidth

7158 S. FLSmidth Drive
Midvale, UT 84047-5559

Engineer: **Ed Summers**
Calc No..: C-005 Job.:**11021**
Project: **Operating Platform rev 4**
Client: **CC&V**

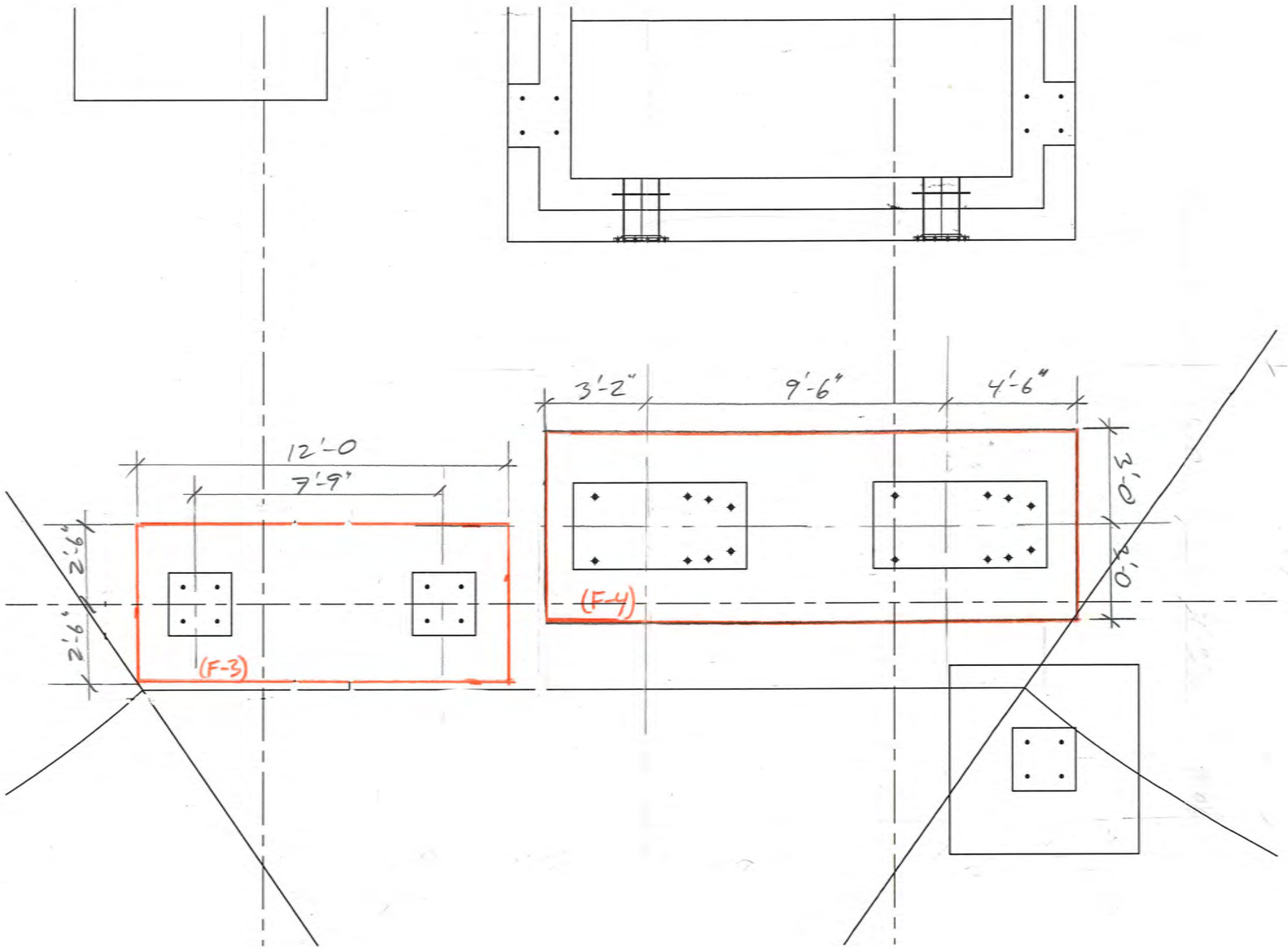
View:2 - Cases: 1 (Self Weight)

Scale: 1 inch on a paper = 8.00 ft



Cases: 1 (Self Weight)

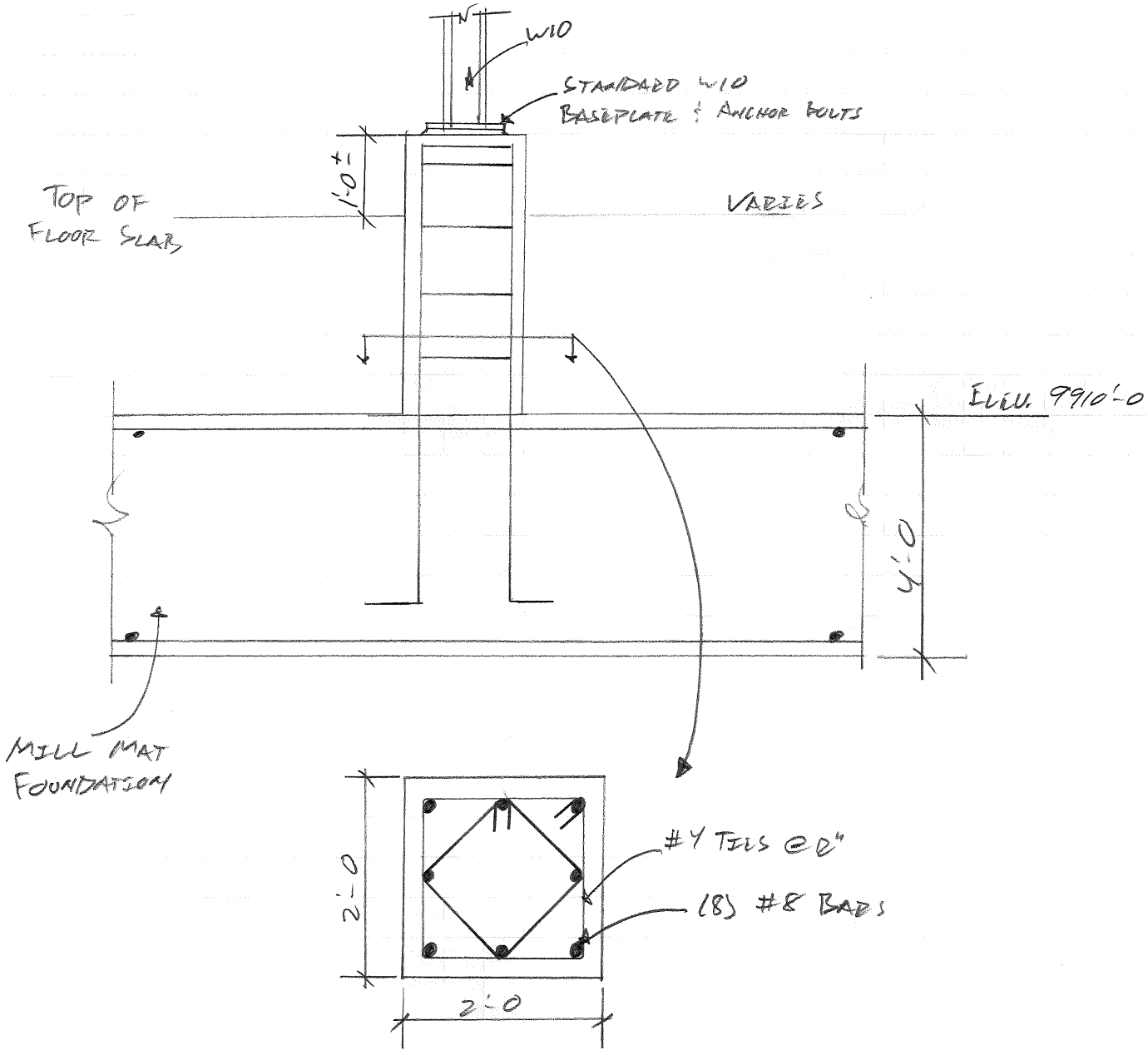
Date : 26/01/12
File: **Operating Platform rev 4.rtd**



1/4" = 1'-0

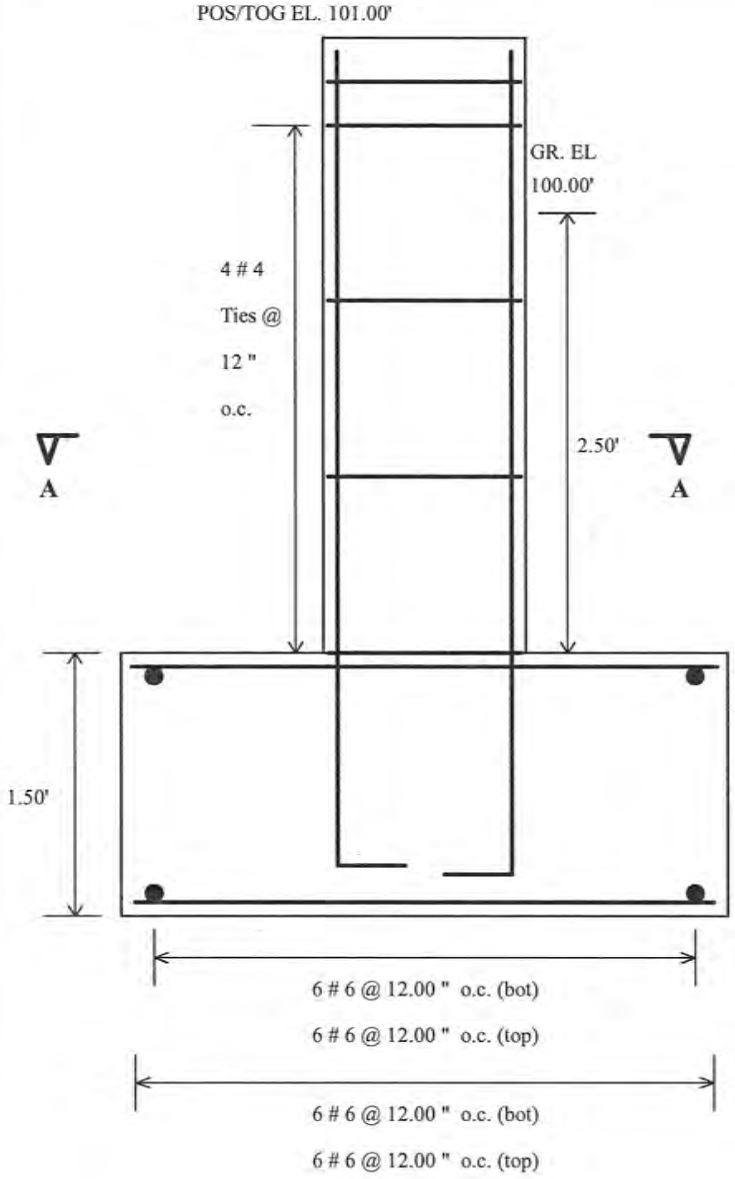
FLSmidth	PROJECT CCIV High Grade Mill	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT Grinding Area Interior Footings	BY TCS DATE 7-19-12
		CHK DATE
		SHEET OF REV

TYPICAL W10 COLUMN SUPPORTED ON MILL MAT FOUNDATION

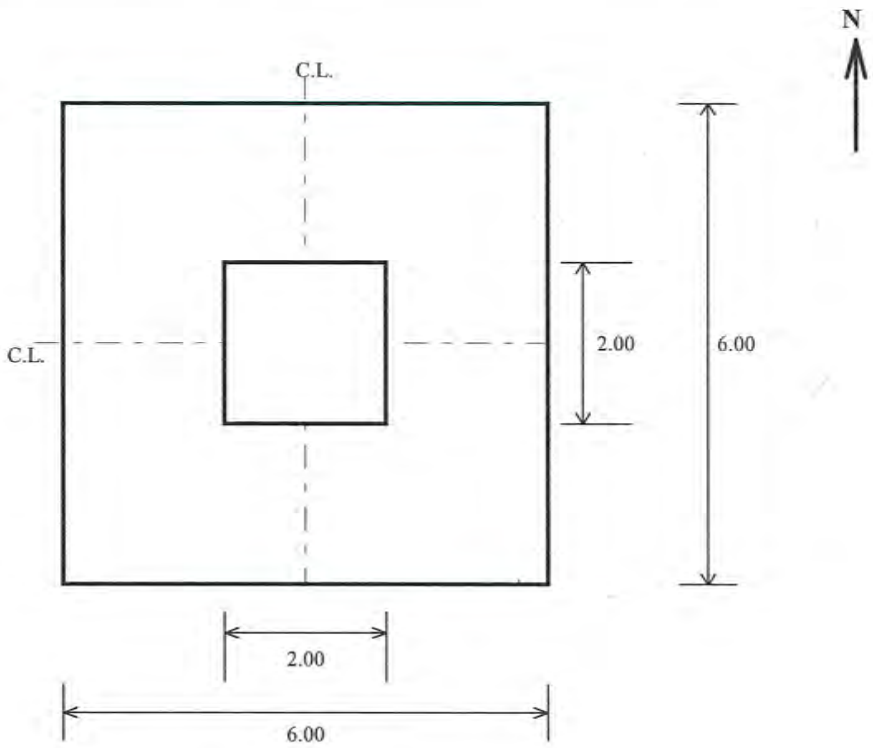


FOUNDATION PLAN AND ELEVATION P:\11021\116 - CALCULATIONS\116.D - ARCH_CIVIL_STRUC\C-005 GRINDING AREA CONCRETE\OPERATING FLOOR COLUMNS\F-1 (NODE 3).MCS

Proj. No.: 11021 Engr: ECS Date: 1/26/2012 Checker: _____ Date: _____



ELEVATION LOOKING NORTH



PLAN (1 REQD.) (All dimensions in ft)

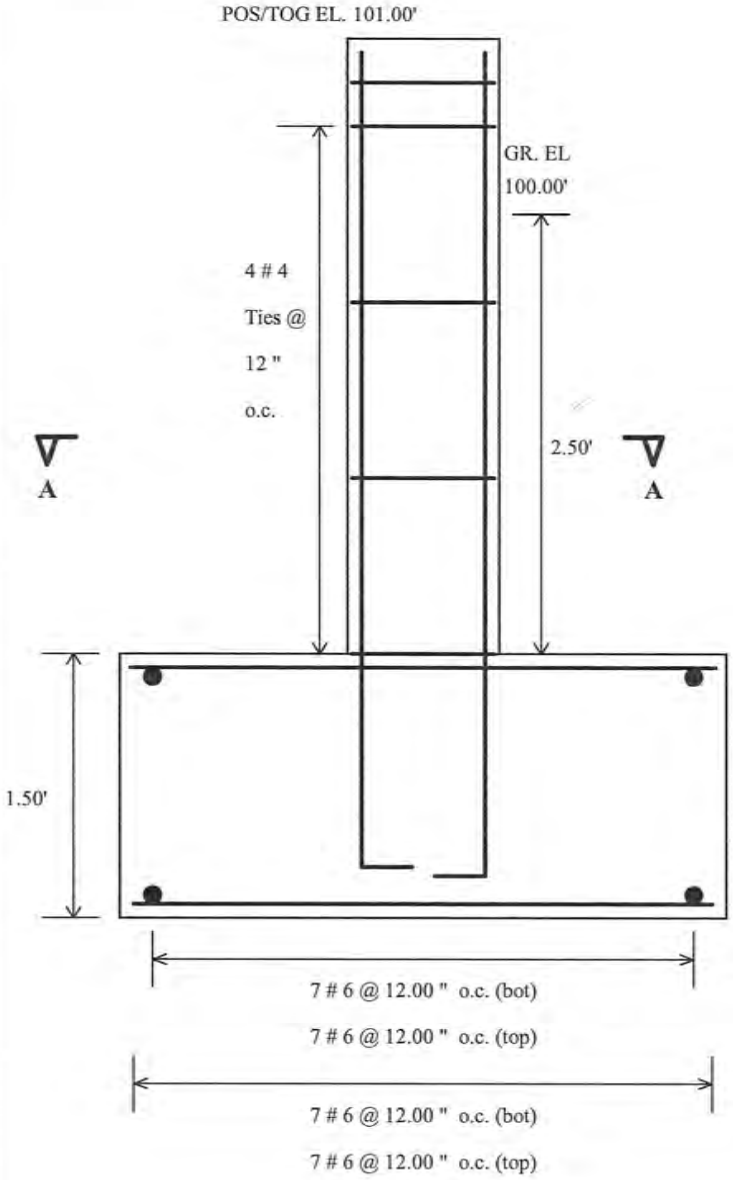
SECT A-A

MATERIAL QUANTITIES			
CONCRETE	2.5 (CY)	GROUT	0.307 (CF)
FORMWORK	64.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	335.6 (LB)		
EXCAVATION	30.8 (CY)	ABOVE GRADE FINISH	8.0 (SF)

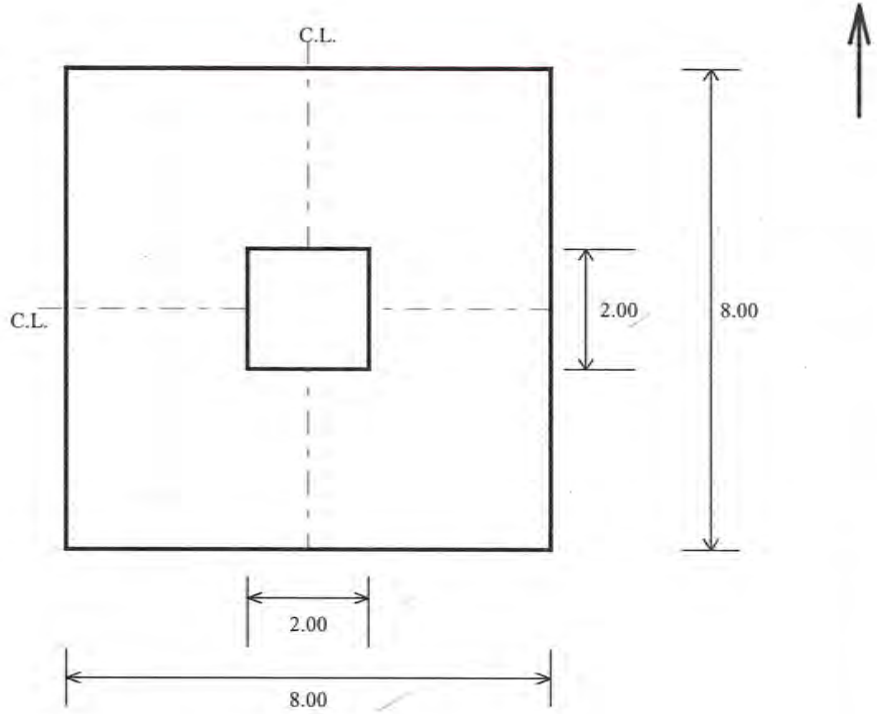
FOUNDATION PLAN & ELEV FOR F-1 (NODE 3)

FOUNDATION PLAN AND ELEVATION P:\11021\116 - CALCULATIONS\116.D - ARCH_CIVIL_STRUC\C-005 GRINDING AREA CONCRETE\OPERATING FLOOR COLUMNS\F-2 (NODE 2).MCS

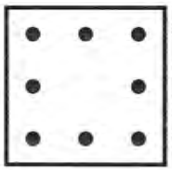
Proj. No.: 11021 Engr: ECS Date: 1/26/2012 Checker: _____ Date: _____



ELEVATION LOOKING NORTH



PLAN (1 REQD.) (All dimensions in ft)



SECT A-A

MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	452.9 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-2 (NODE 2)

FLSmidth

7158 S. FLSmidth Drive
Midvale, UT 84047-5559

Engineer: **Ed Summers**
Calc No..: **S-006** Job.:**11021**
Project: **Operating Platform rev 4**
Client: **CC&V**

Reactions in the coordinate system: global - Cases: 13to18
Values
1

Filtering	Node	Case
Full list	1to21 23to54 59to376 379to485 488to599 639to641 650to652 634 643 3049 3050 3870to3874 3876to3886 3891to3900By3 3893 389-8 3901	1to68
Selection	1to10	13to18
Total number	623	68
Selected number	10	6

Node/Case		FX (kip)	FY (kip)	FZ (kip)
1/ 13	Ex	-0.03	0.44	-1.43
1/ 14	Ex	0.03	-0.44	1.43
1/ 15	Ey	0.0	-0.42	1.24
1/ 16	E-y	0.0	0.42	-1.24
1/ 17 (C)	D	-0.00	-0.17	7.46
1/ 18 (C)	L	-0.00	-0.71	38.58
2/ 13	Ex	-3.32	0.00	-16.46
2/ 14	E-x	3.32	-0.00	16.44
2/ 15	Ey	-0.39	-0.03	-1.97
2/ 16	E-y	0.39	0.03	1.97
2/ 17 (C)	D	0.45	-0.00	7.92
2/ 18 (C)	L	2.07	-0.00	41.64
3/ 13	Ex	-0.03	0.47	1.43
3/ 14	E-x	0.03	-0.47	-1.43
3/ 15	Ey	-0.00	-0.44	-1.24
3/ 16	E-y	0.00	0.44	1.24
3/ 17 (C)	D	-0.00	0.63	4.92
3/ 18 (C)	L	-0.00	3.43	23.57
4/ 13	Ex	-0.04	-0.15	0.30
4/ 14	E-x	0.04	0.15	-0.30
4/ 15	Ey	-0.00	-0.53	1.02
4/ 16	E-y	0.00	0.53	-1.02
4/ 17 (C)	D	-0.39	-0.81	8.66
4/ 18 (C)	L	-1.98	-4.48	43.20
5/ 13	Ex	-0.04	-0.12	-0.30
5/ 14	E-x	0.04	0.12	0.30
5/ 15	Ey	-0.00	-0.48	-1.02
5/ 16	E-y	0.00	0.48	1.02
5/ 17 (C)	D	-0.89	0.20	14.49
5/ 18 (C)	L	-4.89	0.83	77.91

FLSmidth

7158 S. FLSmidth Drive
Midvale, UT 84047-5559

Engineer: **Ed Summers**
Calc No..: **S-006** Job.:**11021**
Project: **Operating Platform rev 4**
Client: **CC&V**

Node/Case	FX (kip)	FY (kip)	FZ (kip)
6/ 13 Ex	-6.24	0.00	-14.13
6/ 14 E-x	6.24	-0.00	14.12
6/ 15 Ey	-1.01	-0.04	-2.29
6/ 16 E-y	1.01	0.04	2.29
6/ 17 (C) D	0.78	-0.00	17.24
6/ 18 (C) L	3.55	-0.00	93.23
7/ 13 Ex	-0.03	0.10	-0.20
7/ 14 E-x	0.03	-0.10	0.20
7/ 15 Ey	0.01	-0.53	1.62
7/ 16 E-y	-0.01	0.53	-1.62
7/ 17 (C) D	-0.09	-1.68	30.89
7/ 18 (C) L	-0.27	-3.54	79.26
8/ 13 Ex	-0.51	0.03	-1.22
8/ 14 E-x	0.50	-0.03	1.21
8/ 15 Ey	0.02	-0.53	-1.67
8/ 16 E-y	-0.02	0.53	1.67
8/ 17 (C) D	-0.00	2.52	39.11
8/ 18 (C) L	-0.02	6.92	92.59
9/ 13 Ex	-0.33	-0.01	-0.03
9/ 14 E-x	0.33	0.01	0.04
9/ 15 Ey	0.02	-0.56	1.53
9/ 16 E-y	-0.02	0.56	-1.53
9/ 17 (C) D	-0.03	-1.72	43.04
9/ 18 (C) L	-0.06	-4.81	100.33
10/ 13 Ex	-0.03	-0.01	0.02
10/ 14 E-x	0.03	0.01	-0.02
10/ 15 Ey	-0.01	-0.55	-1.46
10/ 16 E-y	0.01	0.55	1.46
10/ 17 (C) D	-0.08	2.36	27.43
10/ 18 (C) L	-0.20	5.27	69.56

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 1)			Time	3:19:02 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 1).mcs				

DETAIL REPORT FOR F-1 (node 1)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind 33.33 Earthquake 33.33 Test 20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 1)			Time	3:19:02 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 1).mcs				

DETAIL REPORT FOR F-1 (node 1)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	7.46	0.00	0.00	-0.17	0.00
2 - Live	38.58	0.00	0.00	-0.71	0.00
3 - Earthquake X	-1.43	-0.03	0.00	-0.44	0.00
4 - Earthquake Y	1.24	0.00	0.00	0.42	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	7.46	0.00	0.00	-0.17	0.00
2 - Dead + Live	46.04	0.00	0.00	-0.88	0.00
3 - Dead + 0.7Earthquake X	6.46	-0.02	0.00	-0.48	0.00
4 - Dead + 0.7Earthquake Y	8.33	0.00	0.00	0.12	0.00
5 - 0.6Dead + 0.7Earthquake X	3.48	-0.02	0.00	-0.41	0.00
6 - 0.6Dead + 0.7Earthquake Y	5.34	0.00	0.00	0.19	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	10.44	0.00	0.00	-0.24	0.00
2 - 1.2Dead + 1.6Live	70.68	0.00	0.00	-1.34	0.00
3 - 1.2Dead + Live + Earthquake X	46.10	-0.03	0.00	-1.35	0.00
4 - 1.2Dead + Live + Earthquake Y	48.77	0.00	0.00	-0.49	0.00
5 - 0.9Dead + Earthquake X	5.28	-0.03	0.00	-0.59	0.00
6 - 0.9Dead + Earthquake Y	7.95	0.00	0.00	0.27	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.78	4.48	0.03	0.00	0.00	0.85	
2 - Dead + Live	1.95	4.48	0.07	0.00	0.00	4.40	
3 - Dead + 0.7Earthquake X	0.80	5.81	0.09	0.00	0.11	2.39	
4 - Dead + 0.7Earthquake Y	0.80	5.81	0.02	0.00	0.00	0.62	
5 - 0.6Dead + 0.7Earthquake X	0.49	5.81	0.13	0.01	0.11	2.05	
6 - 0.6Dead + 0.7Earthquake Y	0.51	5.81	0.06	0.00	0.00	0.96	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	96.21	100.00	1.50	100.00	100.00	1.50	
2 - Dead + Live	44.89	100.00	1.50	52.13	100.00	1.50	
3 - Dead + 0.7Earthquake X	32.96	100.00	1.50	54.56	100.00	1.50	
4 - Dead + 0.7Earthquake Y	100.00	100.00	1.50	100.00	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	22.47	100.00	1.50	50.32	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	53.83	100.00	1.50	100.00	100.00	1.50	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 1)			Time	3:19:02 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 1).mcs				

DETAIL REPORT FOR F-1 (node 1)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	6.00
N-S Dim (ft)	6.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	4.07	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	4.36	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	51.77	24.33	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	0.83	1.86	1.84	94.87	
2 - 1.2Dead + 1.6Live	5.17	-10.17	10.09	94.87	
3 - 1.2Dead + Live + Earthquake X	0.83	6.77	6.72	94.87	
4 - 1.2Dead + Live + Earthquake Y	5.17	-7.12	7.07	94.87	
5 - 0.9Dead + Earthquake X	0.83	1.01	1.01	94.87	
6 - 0.9Dead + Earthquake Y	5.17	-1.37	1.36	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	0.83	2.00	1.99	94.87	
2 - 1.2Dead + 1.6Live	0.83	10.97	10.88	94.87	
3 - 1.2Dead + Live + Earthquake X	0.83	7.56	7.50	94.87	
4 - 1.2Dead + Live + Earthquake Y	0.83	7.42	7.36	94.87	
5 - 0.9Dead + Earthquake X	0.83	1.35	1.34	94.87	
6 - 0.9Dead + Earthquake Y	5.17	-1.53	1.52	94.87	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 1)			Time	3:19:02 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 1).mcs				

DETAIL REPORT FOR F-1 (node 1)

PIER/BASE PLATE DESIGN INFORMATION

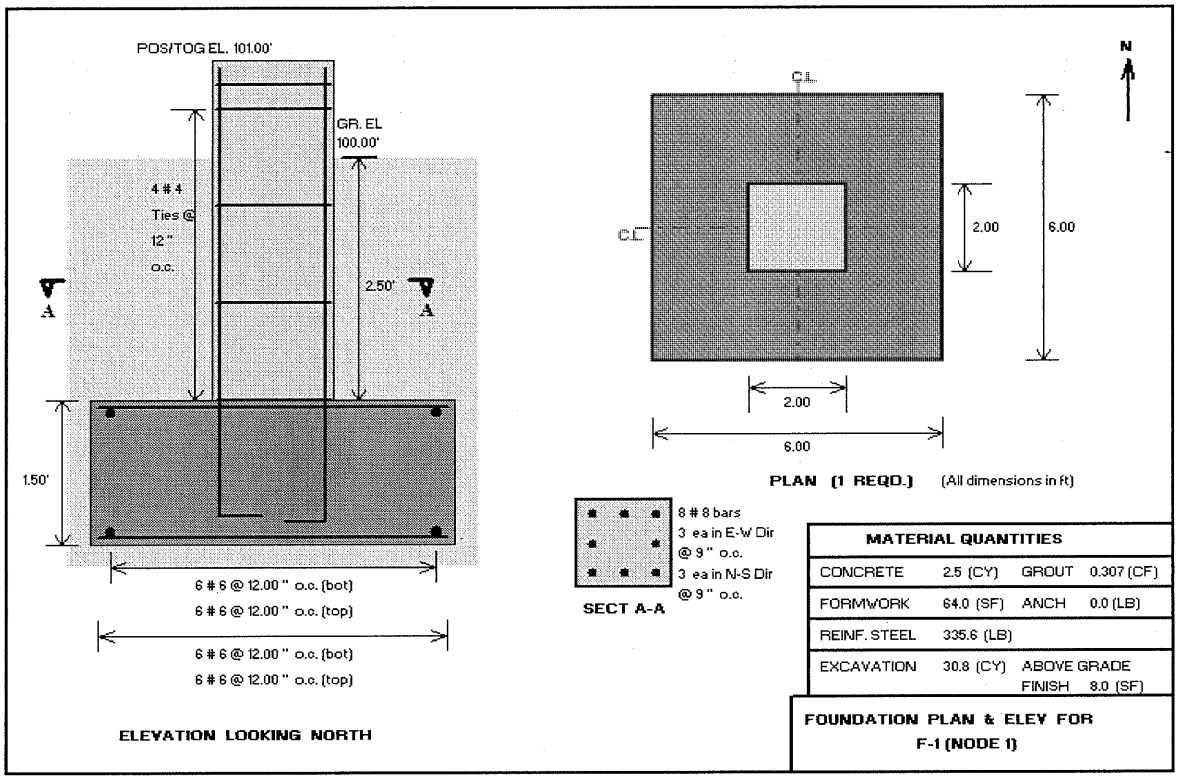
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	13.38	1203.30	1.47	132.38	1.47	132.38	
2 - 1.2Dead + 1.6Live	73.20	1203.30	8.05	132.38	8.05	132.38	
3 - 1.2Dead + Live + Earthquake X	48.62	1203.30	5.35	132.38	5.35	132.38	
4 - 1.2Dead + Live + Earthquake Y	51.29	1203.30	5.64	132.38	5.64	132.38	
5 - 0.9Dead + Earthquake X	7.17	1123.25	0.79	230.50	2.08	121.26	
6 - 0.9Dead + Earthquake Y	9.84	1128.32	1.08	227.53	1.08	121.27	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 1)			Time	3:19:02 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 1).mcs				

DETAIL REPORT FOR F-1 (node 1)



MATERIAL QUANTITIES			
CONCRETE	2.5 (CY)	GROUT	0.307 (CF)
FORMWORK	64.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	335.6 (LB)		
EXCAVATION	30.8 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-1 (NODE 1)

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 2)			Time	3:28:09 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 2).mcs				

DETAIL REPORT FOR F-2 (node 2)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 2)			Time	3:28:09 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 2).mcs				

DETAIL REPORT FOR F-2 (node 2)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	7.92	0.45	0.00	0.00	0.00
2 - Live	41.64	2.07	0.00	0.00	0.00
3 - Earthquake X	-16.46	-3.32	0.00	0.00	0.00
4 - Earthquake Y	1.97	0.39	0.00	0.03	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	7.92	0.45	0.00	0.00	0.00
2 - Dead + Live	49.56	2.52	0.00	0.00	0.00
3 - Dead + 0.7Earthquake X	-3.60	-1.87	0.00	0.00	0.00
4 - Dead + 0.7Earthquake Y	9.30	0.72	0.00	0.02	0.00
5 - 0.6Dead + 0.7Earthquake X	-6.77	-2.05	0.00	0.00	0.00
6 - 0.6Dead + 0.7Earthquake Y	6.13	0.54	0.00	0.02	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	11.09	0.63	0.00	0.00	0.00
2 - 1.2Dead + 1.6Live	76.13	3.85	0.00	0.00	0.00
3 - 1.2Dead + Live + Earthquake X	34.68	-0.71	0.00	0.00	0.00
4 - 1.2Dead + Live + Earthquake Y	53.11	3.00	0.00	0.03	0.00
5 - 0.9Dead + Earthquake X	-9.33	-2.92	0.00	0.00	0.00
6 - 0.9Dead + Earthquake Y	9.10	0.80	0.00	0.03	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.69	4.48	0.00	0.05	2.25	0.00	
2 - Dead + Live	1.46	4.48	0.00	0.15	12.60	0.00	
3 - Dead + 0.7Earthquake X	0.59	5.81	0.00	0.30	9.37	0.00	
4 - Dead + 0.7Earthquake Y	0.73	5.81	0.00	0.08	3.62	0.11	
5 - 0.6Dead + 0.7Earthquake X	0.34	5.81	0.00	0.74	10.27	0.00	
6 - 0.6Dead + 0.7Earthquake Y	0.45	5.81	0.00	0.10	2.72	0.11	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	100.00	75.41	1.50	100.00	85.51	1.50	
2 - Dead + Live	100.00	26.69	1.50	100.00	23.53	1.50	
3 - Dead + 0.7Earthquake X	100.00	5.80	1.50	100.00	17.46	1.50	
4 - Dead + 0.7Earthquake Y	100.00	48.46	1.50	100.00	54.18	1.50	
5 - 0.6Dead + 0.7Earthquake X	100.00	2.22	1.50	100.00	11.80	1.50	
6 - 0.6Dead + 0.7Earthquake Y	100.00	39.53	1.50	100.00	56.51	1.50	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 2)			Time	3:28:09 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-2 (node 2).mcs				

DETAIL REPORT FOR F-2 (node 2)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	8.00
N-S Dim (ft)	8.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake X	7	6	12	0.44	0.02	-1.1	E-W
0.9Dead + Earthquake X	7	6	12	0.44	0.01	-0.52	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	7	6	12	0.44	0.39	6.29	E-W
1.2Dead + 1.6Live	7	6	12	0.44	0.39	5.53	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	65.11	30.60	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	6.17	-3.63	2.70	94.87	
2 - 1.2Dead + 1.6Live	6.17	-20.58	15.31	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	9.00	6.69	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-14.74	10.97	94.87	
5 - 0.9Dead + Earthquake X	6.17	3.64	2.71	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-3.05	2.27	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.83	3.22	2.39	94.87	
2 - 1.2Dead + 1.6Live	1.83	18.02	13.41	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	8.53	6.34	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-12.77	9.50	94.87	
5 - 0.9Dead + Earthquake X	6.17	1.71	1.27	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-2.54	1.89	94.87	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 2)			Time	3:28:09 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 2).mcs				

DETAIL REPORT FOR F-2 (node 2)

PIER/BASE PLATE DESIGN INFORMATION

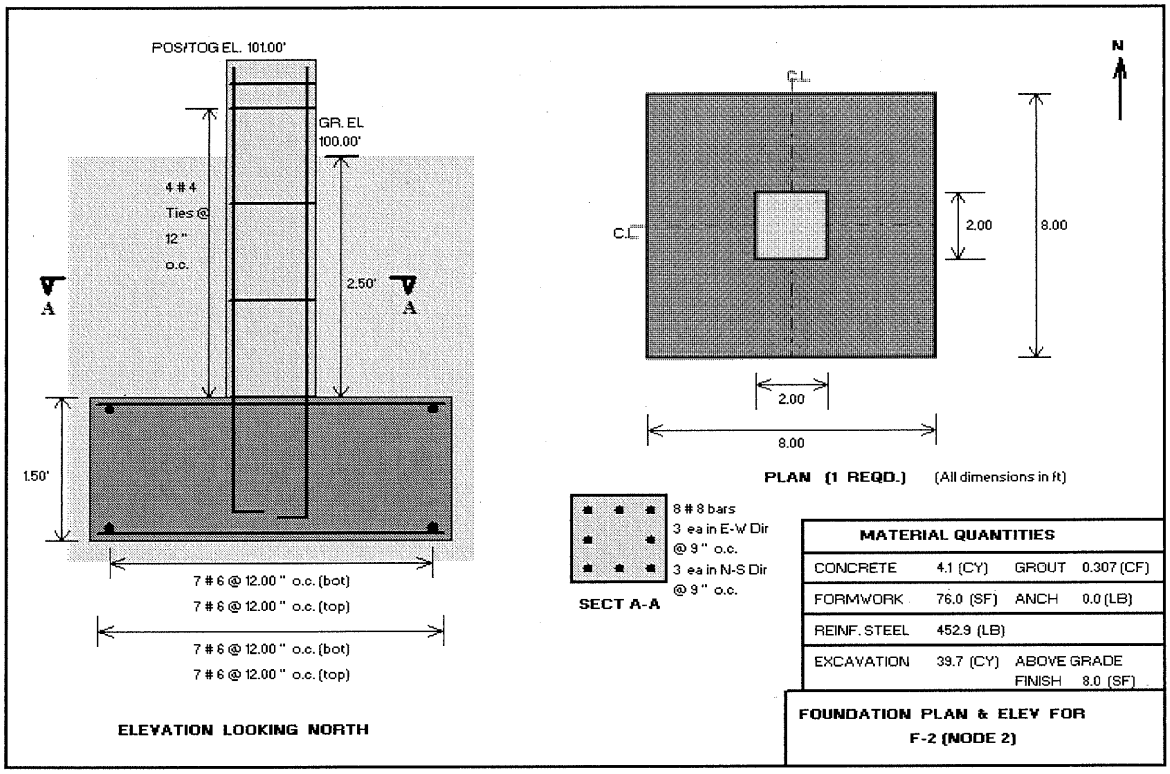
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	14.03	1183.46	2.21	183.68	1.54	130.75	
2 - 1.2Dead + 1.6Live	78.65	1187.56	13.48	192.71	8.65	117.31	
3 - 1.2Dead + Live + Earthquake X	37.20	711.19	4.09	394.84	4.09	78.16	
4 - 1.2Dead + Live + Earthquake Y	55.63	1203.30	10.50	132.38	6.12	132.38	
5 - 0.9Dead + Earthquake X	-7.44	-111.55	10.20	195.54	-0.82	-12.28	
6 - 0.9Dead + Earthquake Y	10.99	875.89	2.78	348.95	1.21	96.55	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 2)			Time	3:28:09 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 2).mcs				

DETAIL REPORT FOR F-2 (node 2)



MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	452.9 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-2 (NODE 2)

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 3)			Time	3:20:22 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 3).mcs				

DETAIL REPORT FOR F-1 (node 3)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 3)			Time	3:20:22 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 3).mcs				

DETAIL REPORT FOR F-1 (node 3)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	4.92	0.00	0.00	0.63	0.00
2 - Live	23.57	0.00	0.00	3.43	0.00
3 - Earthquake X	-1.43	-0.03	0.00	-0.47	0.00
4 - Earthquake Y	1.24	0.00	0.00	0.44	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	4.92	0.00	0.00	0.63	0.00
2 - Dead + Live	28.49	0.00	0.00	4.06	0.00
3 - Dead + 0.7Earthquake X	3.92	-0.02	0.00	0.30	0.00
4 - Dead + 0.7Earthquake Y	5.79	0.00	0.00	0.94	0.00
5 - 0.6Dead + 0.7Earthquake X	1.95	-0.02	0.00	0.05	0.00
6 - 0.6Dead + 0.7Earthquake Y	3.82	0.00	0.00	0.69	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	6.89	0.00	0.00	0.88	0.00
2 - 1.2Dead + 1.6Live	43.62	0.00	0.00	6.24	0.00
3 - 1.2Dead + Live + Earthquake X	28.04	-0.03	0.00	3.72	0.00
4 - 1.2Dead + Live + Earthquake Y	30.71	0.00	0.00	4.63	0.00
5 - 0.9Dead + Earthquake X	3.00	-0.03	0.00	0.10	0.00
6 - 0.9Dead + Earthquake Y	5.67	0.00	0.00	1.01	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.77	4.48	0.13	0.00	0.00	3.15	
2 - Dead + Live	1.91	4.48	0.42	0.00	0.00	20.30	
3 - Dead + 0.7Earthquake X	0.70	5.81	0.06	0.00	0.11	1.51	
4 - Dead + 0.7Earthquake Y	0.84	5.81	0.18	0.00	0.00	4.69	
5 - 0.6Dead + 0.7Earthquake X	0.39	5.81	0.02	0.01	0.11	0.25	
6 - 0.6Dead + 0.7Earthquake Y	0.53	5.81	0.22	0.00	0.00	3.43	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	23.54	100.00	1.50	40.18	100.00	1.50	
2 - Dead + Live	7.14	100.00	1.50	9.14	100.00	1.50	
3 - Dead + 0.7Earthquake X	47.28	100.00	1.50	82.43	100.00	1.50	
4 - Dead + 0.7Earthquake Y	16.37	100.00	1.50	27.45	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	100.00	100.00	1.50	100.00	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	13.73	100.00	1.50	30.32	100.00	1.50	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 3)			Time	3:20:22 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\				
Filename:	Operating Floor Columns\F-1 (node 3).mcs				

DETAIL REPORT FOR F-1 (node 3)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	6.00
N-S Dim (ft)	6.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	2.56	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	3.91	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	32.25	15.15	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	5.17	-1.37	1.35	94.87	
2 - 1.2Dead + 1.6Live	5.17	-6.41	6.36	94.87	
3 - 1.2Dead + Live + Earthquake X	0.83	4.26	4.23	94.87	
4 - 1.2Dead + Live + Earthquake Y	0.83	4.62	4.58	94.87	
5 - 0.9Dead + Earthquake X	0.83	0.70	0.69	94.87	
6 - 0.9Dead + Earthquake Y	5.17	-1.05	1.04	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	5.17	-1.89	1.88	94.87	
2 - 1.2Dead + 1.6Live	5.17	-10.14	10.06	94.87	
3 - 1.2Dead + Live + Earthquake X	5.17	-6.47	6.42	94.87	
4 - 1.2Dead + Live + Earthquake Y	5.17	-7.38	7.32	94.87	
5 - 0.9Dead + Earthquake X	5.17	-0.74	0.73	94.87	
6 - 0.9Dead + Earthquake Y	5.17	-1.65	1.64	94.87	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 3)			Time	3:20:22 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 3).mcs				

DETAIL REPORT FOR F-1 (node 3)

PIER/BASE PLATE DESIGN INFORMATION

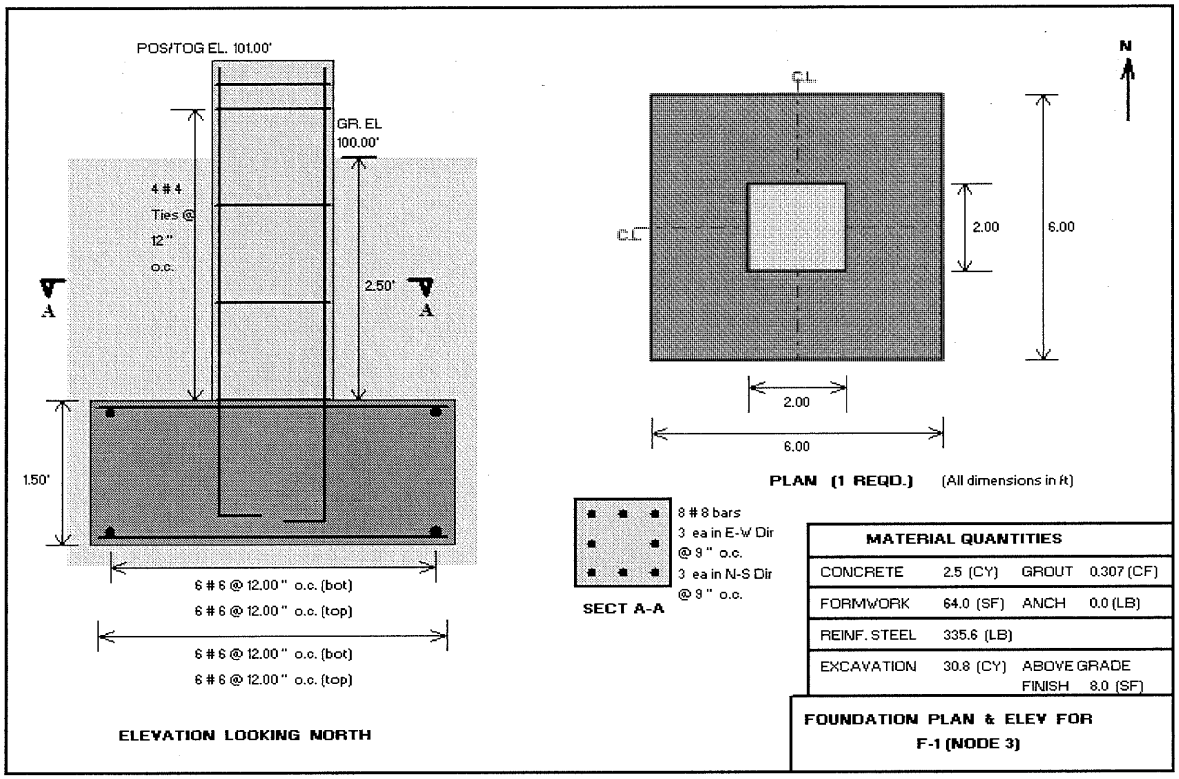
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	9.83	981.71	1.08	107.95	3.09	307.78	
2 - 1.2Dead + 1.6Live	46.14	794.34	5.07	87.33	21.85	374.77	
3 - 1.2Dead + Live + Earthquake X	30.56	847.55	3.36	93.39	13.01	358.64	
4 - 1.2Dead + Live + Earthquake Y	33.23	780.23	3.66	85.77	16.19	378.58	
5 - 0.9Dead + Earthquake X	4.89	1203.30	0.54	132.38	0.54	132.38	
6 - 0.9Dead + Earthquake Y	7.56	802.15	0.83	88.19	3.52	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 3)			Time	3:20:22 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 3).mcs				

DETAIL REPORT FOR F-1 (node 3)



MATERIAL QUANTITIES			
CONCRETE	2.5 (CY)	GROUT	0.307 (CF)
FORMWORK	64.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	335.6 (LB)		
EXCAVATION	30.8 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-1 (NODE 3)

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 4)			Time	3:22:38 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 4).mcs				

DETAIL REPORT FOR F-1 (node 4)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions FOUNDATION3D		Version 5.8.2		Date	1/26/2012
Foundation Name	F-1 (node 4)			Time	3:22:38 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 4).mcs				

DETAIL REPORT FOR F-1 (node 4)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	8.66	-0.39	0.00	-0.81	0.00
2 - Live	43.20	-1.98	0.00	-4.48	0.00
3 - Earthquake X	-0.30	-0.04	0.00	-0.15	0.00
4 - Earthquake Y	1.02	0.00	0.00	0.53	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	8.66	-0.39	0.00	-0.81	0.00
2 - Dead + Live	51.86	-2.37	0.00	-5.29	0.00
3 - Dead + 0.7Earthquake X	8.45	-0.42	0.00	-0.92	0.00
4 - Dead + 0.7Earthquake Y	9.37	-0.39	0.00	-0.44	0.00
5 - 0.6Dead + 0.7Earthquake X	4.99	-0.26	0.00	-0.59	0.00
6 - 0.6Dead + 0.7Earthquake Y	5.91	-0.23	0.00	-0.12	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	12.12	-0.55	0.00	-1.13	0.00
2 - 1.2Dead + 1.6Live	79.51	-3.64	0.00	-8.14	0.00
3 - 1.2Dead + Live + Earthquake X	53.29	-2.49	0.00	-5.60	0.00
4 - 1.2Dead + Live + Earthquake Y	54.61	-2.45	0.00	-4.92	0.00
5 - 0.9Dead + Earthquake X	7.49	-0.39	0.00	-0.88	0.00
6 - 0.9Dead + Earthquake Y	8.81	-0.35	0.00	-0.20	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.96	4.48	0.14	0.07	1.95	4.05	
2 - Dead + Live	3.05	4.48	0.37	0.17	11.85	26.45	
3 - Dead + 0.7Earthquake X	0.97	5.81	0.16	0.07	2.09	4.58	
4 - Dead + 0.7Earthquake Y	0.93	5.81	0.08	0.07	1.95	2.20	
5 - 0.6Dead + 0.7Earthquake X	0.59	5.81	0.18	0.08	1.31	2.96	
6 - 0.6Dead + 0.7Earthquake Y	0.54	5.81	0.03	0.07	1.17	0.58	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	21.08	43.78	1.50	33.56	69.70	1.50	
2 - Dead + Live	8.13	18.14	1.50	9.22	20.58	1.50	
3 - Dead + 0.7Earthquake X	18.52	40.55	1.50	29.59	64.78	1.50	
4 - Dead + 0.7Earthquake Y	39.87	44.88	1.50	62.73	70.61	1.50	
5 - 0.6Dead + 0.7Earthquake X	17.12	38.62	1.50	36.18	81.62	1.50	
6 - 0.6Dead + 0.7Earthquake Y	92.82	45.62	1.50	100.00	93.36	1.50	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 4)			Time	3:22:38 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 4).mcs				

DETAIL REPORT FOR F-1 (node 4)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	6.00
N-S Dim (ft)	6.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	5.34	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	6.32	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	58.14	27.32	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	0.83	2.42	2.40	94.87	
2 - 1.2Dead + 1.6Live	0.83	13.57	13.46	94.87	
3 - 1.2Dead + Live + Earthquake X	0.83	9.24	9.17	94.87	
4 - 1.2Dead + Live + Earthquake Y	0.83	9.40	9.32	94.87	
5 - 0.9Dead + Earthquake X	0.83	1.54	1.53	94.87	
6 - 0.9Dead + Earthquake Y	0.83	1.70	1.68	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	0.83	2.77	2.75	94.87	
2 - 1.2Dead + 1.6Live	0.83	16.26	16.13	94.87	
3 - 1.2Dead + Live + Earthquake X	0.83	11.10	11.01	94.87	
4 - 1.2Dead + Live + Earthquake Y	0.83	10.88	10.79	94.87	
5 - 0.9Dead + Earthquake X	0.83	1.83	1.81	94.87	
6 - 0.9Dead + Earthquake Y	0.83	1.61	1.59	94.87	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 4)			Time	3:22:38 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 4).mcs				

DETAIL REPORT FOR F-1 (node 4)

PIER/BASE PLATE DESIGN INFORMATION

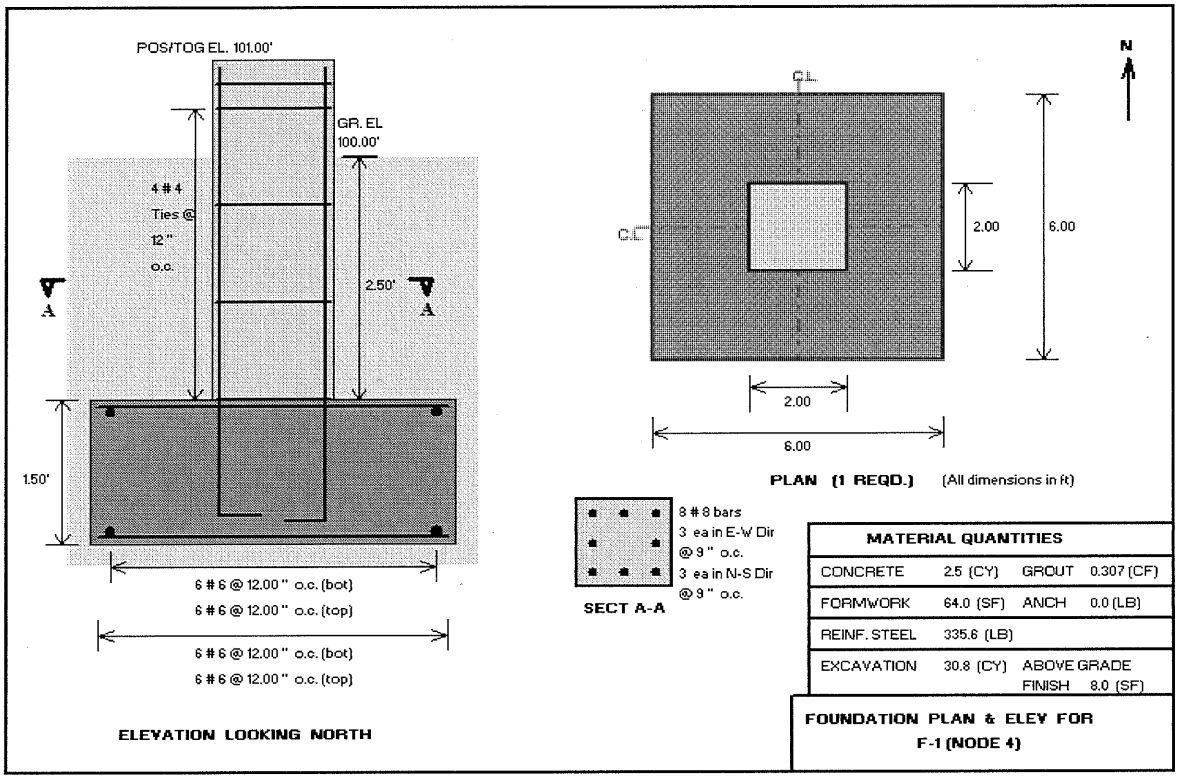
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	15.06	981.71	1.91	107.95	3.97	307.78	
2 - 1.2Dead + 1.6Live	82.03	794.34	12.73	87.33	28.49	374.77	
3 - 1.2Dead + Live + Earthquake X	55.81	847.55	8.71	93.39	19.61	358.64	
4 - 1.2Dead + Live + Earthquake Y	57.13	780.23	8.57	85.77	17.23	378.58	
5 - 0.9Dead + Earthquake X	9.38	1203.30	1.37	132.38	3.08	132.38	
6 - 0.9Dead + Earthquake Y	10.70	802.15	1.23	88.19	1.18	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 4)			Time	3:22:38 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 4).mcs				

DETAIL REPORT FOR F-1 (node 4)



MATERIAL QUANTITIES			
CONCRETE	2.5 (CY)	GROUT	0.307 (CF)
FORMWORK	64.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	335.6 (LB)		
EXCAVATION	30.8 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-1 (NODE 4)

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 5)			Time	3:25:48 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\				
Filename:	Operating Floor Columns\F-1 (node 5).mcs				

DETAIL REPORT FOR F-1 (node 5)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 5)			Time	3:25:48 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 5).mcs				

DETAIL REPORT FOR F-1 (node 5)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	14.49	-0.89	0.00	0.20	0.00
2 - Live	77.91	-4.89	0.00	0.83	0.00
3 - Earthquake X	-0.30	-0.04	0.00	-0.12	0.00
4 - Earthquake Y	1.02	0.00	0.00	0.48	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	14.49	-0.89	0.00	0.20	0.00
2 - Dead + Live	92.40	-5.78	0.00	1.03	0.00
3 - Dead + 0.7Earthquake X	14.28	-0.92	0.00	0.12	0.00
4 - Dead + 0.7Earthquake Y	15.20	-0.89	0.00	0.54	0.00
5 - 0.6Dead + 0.7Earthquake X	8.48	-0.56	0.00	0.04	0.00
6 - 0.6Dead + 0.7Earthquake Y	9.41	-0.53	0.00	0.46	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	20.29	-1.25	0.00	0.28	0.00
2 - 1.2Dead + 1.6Live	142.04	-8.89	0.00	1.57	0.00
3 - 1.2Dead + Live + Earthquake X	95.00	-6.00	0.00	0.95	0.00
4 - 1.2Dead + Live + Earthquake Y	96.32	-5.96	0.00	1.55	0.00
5 - 0.9Dead + Earthquake X	12.74	-0.84	0.00	0.06	0.00
6 - 0.9Dead + Earthquake Y	14.06	-0.80	0.00	0.66	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	1.10	4.48	0.03	0.13	4.45	1.00	
2 - Dead + Live	4.06	4.48	0.05	0.26	28.90	5.15	
3 - Dead + 0.7Earthquake X	1.09	5.81	0.02	0.13	4.59	0.58	
4 - Dead + 0.7Earthquake Y	1.17	5.81	0.08	0.13	4.45	2.68	
5 - 0.6Dead + 0.7Earthquake X	0.65	5.81	0.01	0.14	2.81	0.18	
6 - 0.6Dead + 0.7Earthquake Y	0.73	5.81	0.11	0.13	2.67	2.28	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	100.00	23.12	1.50	100.00	33.82	1.50	
2 - Dead + Live	65.36	11.65	1.50	67.04	11.95	1.50	
3 - Dead + 0.7Earthquake X	100.00	22.27	1.50	100.00	32.67	1.50	
4 - Dead + 0.7Earthquake Y	39.18	23.60	1.50	56.82	34.22	1.50	
5 - 0.6Dead + 0.7Earthquake X	100.00	21.74	1.50	100.00	41.16	1.50	
6 - 0.6Dead + 0.7Earthquake Y	28.01	23.92	1.50	51.75	44.19	1.50	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 5)			Time	3:25:48 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 5).mcs				

DETAIL REPORT FOR F-1 (node 5)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	6.00
N-S Dim (ft)	6.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	9.95	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	8.37	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	103.26	48.52	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	0.83	3.97	3.94	94.87	
2 - 1.2Dead + 1.6Live	0.83	25.40	25.19	94.87	
3 - 1.2Dead + Live + Earthquake X	0.83	17.13	17.00	94.87	
4 - 1.2Dead + Live + Earthquake Y	0.83	17.29	17.15	94.87	
5 - 0.9Dead + Earthquake X	0.83	2.54	2.52	94.87	
6 - 0.9Dead + Earthquake Y	0.83	2.69	2.67	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	5.17	-3.39	3.37	94.87	
2 - 1.2Dead + 1.6Live	5.17	-21.02	20.85	94.87	
3 - 1.2Dead + Live + Earthquake X	5.17	-14.11	14.00	94.87	
4 - 1.2Dead + Live + Earthquake Y	5.17	-14.65	14.54	94.87	
5 - 0.9Dead + Earthquake X	5.17	-2.07	2.05	94.87	
6 - 0.9Dead + Earthquake Y	5.17	-2.61	2.59	94.87	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 5)			Time	3:25:48 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-1 (node 5).mcs				

DETAIL REPORT FOR F-1 (node 5)

PIER/BASE PLATE DESIGN INFORMATION

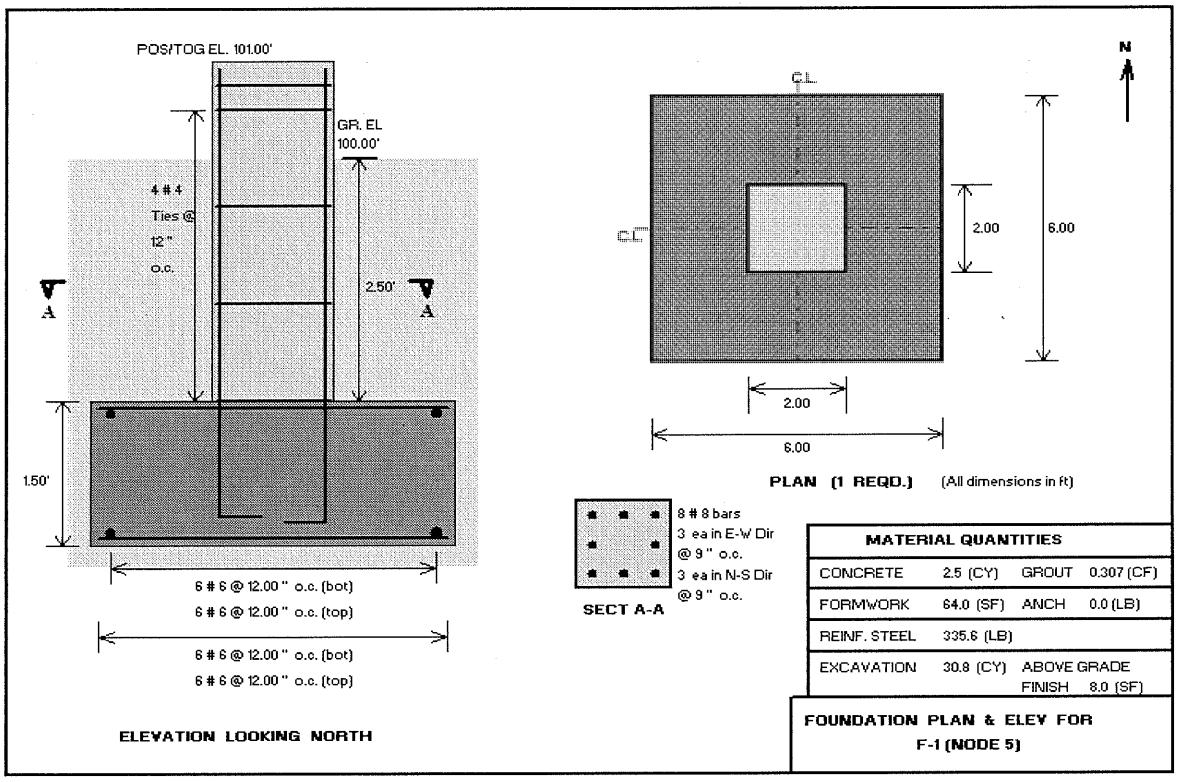
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	23.23	981.71	4.36	107.95	2.55	307.78	
2 - 1.2Dead + 1.6Live	144.56	794.34	31.12	87.33	15.90	374.77	
3 - 1.2Dead + Live + Earthquake X	97.52	847.55	20.99	93.39	10.73	358.64	
4 - 1.2Dead + Live + Earthquake Y	98.84	780.23	20.85	85.77	10.87	378.58	
5 - 0.9Dead + Earthquake X	14.63	1203.30	2.94	132.38	1.61	132.38	
6 - 0.9Dead + Earthquake Y	15.95	802.15	2.80	88.19	2.31	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-1 (node 5)			Time	3:25:48 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-1 (node 5).mcs				

DETAIL REPORT FOR F-1 (node 5)



MATERIAL QUANTITIES			
CONCRETE	2.5 (CY)	GROUT	0.307 (CF)
FORMWORK	64.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	335.6 (LB)		
EXCAVATION	30.8 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-1 (NODE 5)

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 6)			Time	3:29:14 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-2 (node 6).mcs				

DETAIL REPORT FOR F-2 (node 6)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 6)			Time	3:29:14 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\				
Filename:	Operating Floor Columns\F-2 (node 6).mcs				

DETAIL REPORT FOR F-2 (node 6)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	17.24	0.78	0.00	0.00	0.00
2 - Live	93.23	3.55	0.00	0.00	0.00
3 - Earthquake X	-14.13	-6.24	0.00	0.00	0.00
4 - Earthquake Y	2.29	1.01	0.00	0.04	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	17.24	0.78	0.00	0.00	0.00
2 - Dead + Live	110.47	4.33	0.00	0.00	0.00
3 - Dead + 0.7Earthquake X	7.35	-3.59	0.00	0.00	0.00
4 - Dead + 0.7Earthquake Y	18.84	1.49	0.00	0.03	0.00
5 - 0.6Dead + 0.7Earthquake X	0.45	-3.90	0.00	0.00	0.00
6 - 0.6Dead + 0.7Earthquake Y	11.95	1.18	0.00	0.03	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	24.14	1.09	0.00	0.00	0.00
2 - 1.2Dead + 1.6Live	169.86	6.62	0.00	0.00	0.00
3 - 1.2Dead + Live + Earthquake X	99.79	-1.75	0.00	0.00	0.00
4 - 1.2Dead + Live + Earthquake Y	116.21	5.50	0.00	0.04	0.00
5 - 0.9Dead + Earthquake X	1.39	-5.54	0.00	0.00	0.00
6 - 0.9Dead + Earthquake Y	17.81	1.71	0.00	0.04	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.85	4.48	0.00	0.08	3.90	0.00	
2 - Dead + Live	2.52	4.48	0.00	0.15	21.65	0.00	
3 - Dead + 0.7Earthquake X	0.86	5.81	0.00	0.43	17.94	0.00	
4 - Dead + 0.7Earthquake Y	0.92	5.81	0.00	0.14	7.44	0.14	
5 - 0.6Dead + 0.7Earthquake X	0.56	5.81	0.00	0.92	19.50	0.00	
6 - 0.6Dead + 0.7Earthquake Y	0.58	5.81	0.00	0.18	5.88	0.14	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	100.00	53.07	1.50	100.00	55.31	1.50	
2 - Dead + Live	100.00	26.78	1.50	100.00	20.73	1.50	
3 - Dead + 0.7Earthquake X	100.00	9.33	1.50	100.00	10.64	1.50	
4 - Dead + 0.7Earthquake Y	100.00	28.70	1.50	100.00	29.55	1.50	
5 - 0.6Dead + 0.7Earthquake X	100.00	4.34	1.50	100.00	7.14	1.50	
6 - 0.6Dead + 0.7Earthquake Y	100.00	22.23	1.50	100.00	28.59	1.50	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 6)			Time	3:29:14 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 6).mcs				

DETAIL REPORT FOR F-2 (node 6)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	8.00
N-S Dim (ft)	8.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake X	6	6	12	0.44	0.02	-0.86	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	13.43	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	12.12	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	144.15	67.74	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	6.17	-6.93	5.16	94.87	
2 - 1.2Dead + 1.6Live	6.17	-43.89	32.65	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	24.61	18.31	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-30.85	22.95	94.87	
5 - 0.9Dead + Earthquake X	1.83	4.42	3.29	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-5.65	4.20	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	6.17	-6.21	4.62	94.87	
2 - 1.2Dead + 1.6Live	6.17	-39.50	29.39	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	23.45	17.45	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-27.24	20.26	94.87	
5 - 0.9Dead + Earthquake X	1.83	0.75	0.56	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-4.54	3.38	94.87	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 6)			Time	3:29:14 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 6).mcs				

DETAIL REPORT FOR F-2 (node 6)

PIER/BASE PLATE DESIGN INFORMATION

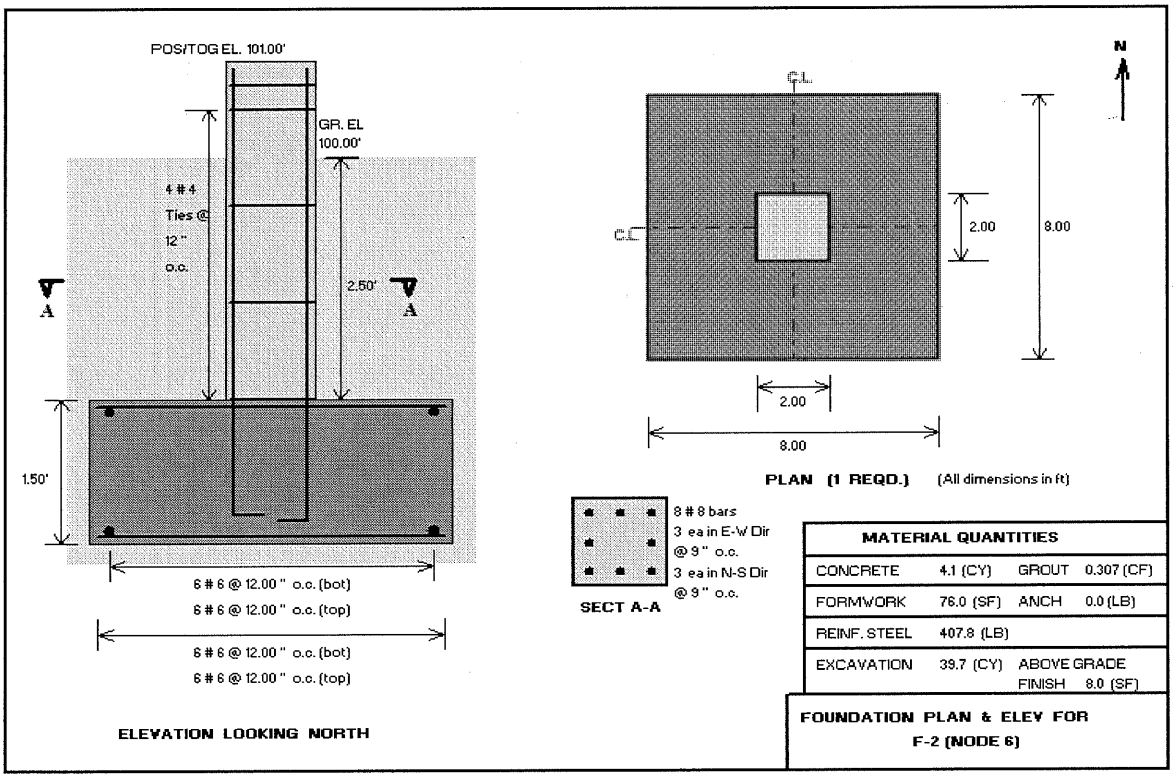
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	27.08	981.71	3.82	107.95	2.98	307.78	
2 - 1.2Dead + 1.6Live	172.38	794.34	23.16	87.33	18.96	374.77	
3 - 1.2Dead + Live + Earthquake X	102.31	847.55	11.25	93.39	11.25	358.64	
4 - 1.2Dead + Live + Earthquake Y	118.73	780.23	19.24	85.77	13.06	378.58	
5 - 0.9Dead + Earthquake X	3.28	1203.30	19.38	132.38	0.36	132.38	
6 - 0.9Dead + Earthquake Y	19.70	802.15	5.99	88.19	2.17	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 6)			Time	3:29:14 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 6).mcs				

DETAIL REPORT FOR F-2 (node 6)



MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	407.8 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-2 (NODE 6)

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 7)			Time	3:30:36 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 7).mcs				

DETAIL REPORT FOR F-2 (node 7)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 7)			Time	3:30:36 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\				
Filename:	Operating Floor Columns\F-2 (node 7).mcs				

DETAIL REPORT FOR F-2 (node 7)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	30.89	-0.09	0.00	-1.68	0.00
2 - Live	79.26	-0.27	0.00	-3.54	0.00
3 - Earthquake X	-0.20	-0.03	0.00	-0.10	0.00
4 - Earthquake Y	1.62	0.01	0.00	0.53	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	30.89	-0.09	0.00	-1.68	0.00
2 - Dead + Live	110.15	-0.36	0.00	-5.22	0.00
3 - Dead + 0.7Earthquake X	30.75	-0.11	0.00	-1.75	0.00
4 - Dead + 0.7Earthquake Y	32.02	-0.08	0.00	-1.31	0.00
5 - 0.6Dead + 0.7Earthquake X	18.39	-0.08	0.00	-1.08	0.00
6 - 0.6Dead + 0.7Earthquake Y	19.67	-0.05	0.00	-0.64	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	43.25	-0.13	0.00	-2.35	0.00
2 - 1.2Dead + 1.6Live	163.88	-0.54	0.00	-7.68	0.00
3 - 1.2Dead + Live + Earthquake X	116.13	-0.41	0.00	-5.66	0.00
4 - 1.2Dead + Live + Earthquake Y	117.95	-0.37	0.00	-5.03	0.00
5 - 0.9Dead + Earthquake X	27.60	-0.11	0.00	-1.61	0.00
6 - 0.9Dead + Earthquake Y	29.42	-0.07	0.00	-0.98	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	1.12	4.48	0.13	0.01	0.45	8.40	
2 - Dead + Live	2.59	4.48	0.18	0.01	1.80	26.10	
3 - Dead + 0.7Earthquake X	1.13	5.81	0.13	0.01	0.56	8.75	
4 - Dead + 0.7Earthquake Y	1.12	5.81	0.10	0.01	0.42	6.55	
5 - 0.6Dead + 0.7Earthquake X	0.68	5.81	0.14	0.01	0.38	5.39	
6 - 0.6Dead + 0.7Earthquake Y	0.67	5.81	0.08	0.01	0.24	3.19	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	31.14	100.00	1.50	29.74	100.00	1.50	
2 - Dead + Live	22.17	100.00	1.50	17.16	100.00	1.50	
3 - Dead + 0.7Earthquake X	29.83	100.00	1.50	28.51	100.00	1.50	
4 - Dead + 0.7Earthquake Y	40.66	100.00	1.50	38.60	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	29.01	100.00	1.50	34.15	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	50.70	100.00	1.50	58.80	100.00	1.50	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 7)			Time	3:30:36 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 7).mcs				

DETAIL REPORT FOR F-2 (node 7)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	8.00
N-S Dim (ft)	8.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	11.81	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	13.22	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	139.12	65.37	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.83	10.67	7.94	94.87	
2 - 1.2Dead + 1.6Live	1.83	38.49	28.64	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	27.46	20.43	94.87	
4 - 1.2Dead + Live + Earthquake Y	1.83	27.85	20.72	94.87	
5 - 0.9Dead + Earthquake X	1.83	6.83	5.08	94.87	
6 - 0.9Dead + Earthquake Y	1.83	7.22	5.37	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.83	12.14	9.03	94.87	
2 - 1.2Dead + 1.6Live	1.83	43.22	32.16	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	30.94	23.02	94.87	
4 - 1.2Dead + Live + Earthquake Y	1.83	30.94	23.02	94.87	
5 - 0.9Dead + Earthquake X	1.83	7.83	5.82	94.87	
6 - 0.9Dead + Earthquake Y	1.83	7.83	5.82	94.87	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 7)			Time	3:30:36 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 7).mcs				

DETAIL REPORT FOR F-2 (node 7)

PIER/BASE PLATE DESIGN INFORMATION

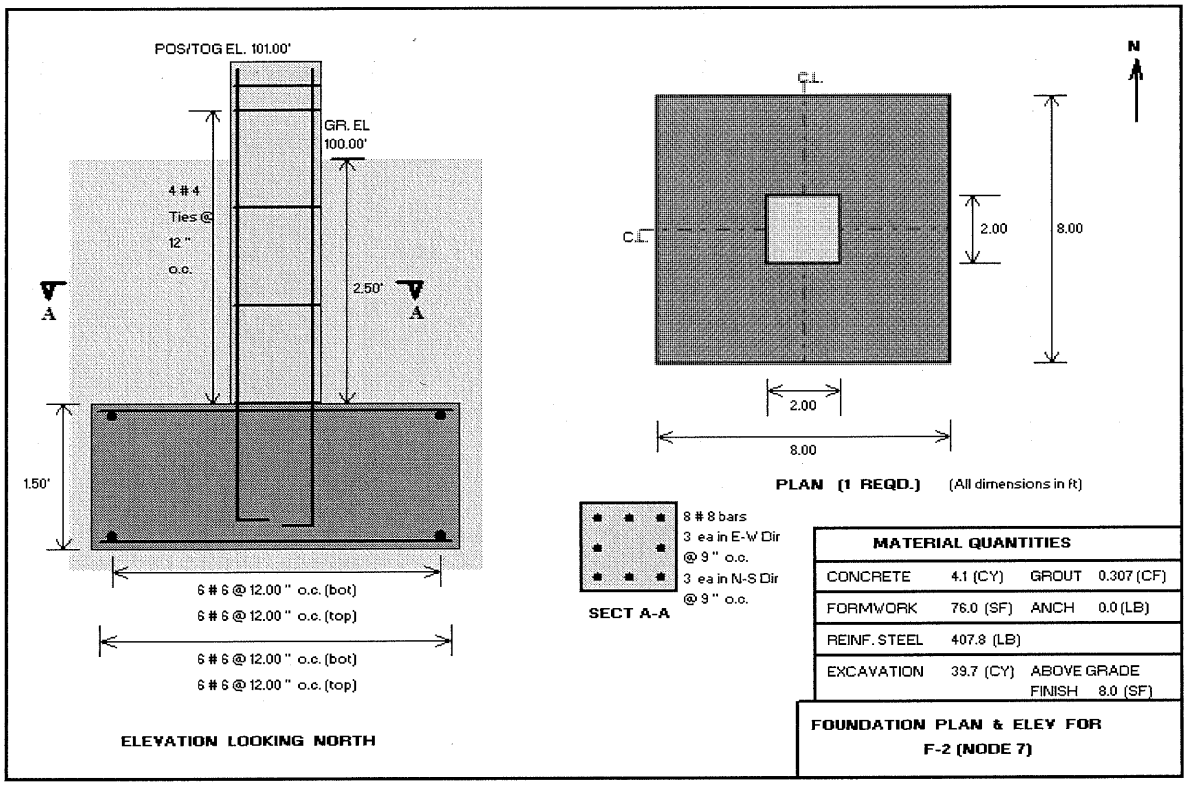
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	46.19	981.71	5.08	107.95	8.23	307.78	
2 - 1.2Dead + 1.6Live	166.40	794.34	18.30	87.33	26.88	374.77	
3 - 1.2Dead + Live + Earthquake X	118.65	847.55	13.05	93.39	19.80	358.64	
4 - 1.2Dead + Live + Earthquake Y	120.47	780.23	13.25	85.77	17.59	378.58	
5 - 0.9Dead + Earthquake X	29.49	1203.30	3.24	132.38	5.64	132.38	
6 - 0.9Dead + Earthquake Y	31.31	802.15	3.44	88.19	3.44	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 7)			Time	3:30:36 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\				
Filename:	Operating Floor Columns\F-2 (node 7).mcs				

DETAIL REPORT FOR F-2 (node 7)



MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	407.8 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-2 (NODE 7)

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 8)			Time	3:31:25 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 8).mcs				

DETAIL REPORT FOR F-2 (node 8)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 8)			Time	3:31:25 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 8).mcs				

DETAIL REPORT FOR F-2 (node 8)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	39.11	0.00	0.00	2.52	0.00
2 - Live	92.59	-0.02	0.00	6.92	0.00
3 - Earthquake X	-1.22	-0.51	0.00	-0.03	0.00
4 - Earthquake Y	1.67	0.02	0.00	0.53	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	39.11	0.00	0.00	2.52	0.00
2 - Dead + Live	131.70	-0.02	0.00	9.44	0.00
3 - Dead + 0.7Earthquake X	38.26	-0.36	0.00	2.50	0.00
4 - Dead + 0.7Earthquake Y	40.28	0.01	0.00	2.89	0.00
5 - 0.6Dead + 0.7Earthquake X	22.61	-0.36	0.00	1.49	0.00
6 - 0.6Dead + 0.7Earthquake Y	24.64	0.01	0.00	1.88	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	54.75	0.00	0.00	3.53	0.00
2 - 1.2Dead + 1.6Live	195.08	-0.03	0.00	14.10	0.00
3 - 1.2Dead + Live + Earthquake X	138.30	-0.53	0.00	9.91	0.00
4 - 1.2Dead + Live + Earthquake Y	141.19	0.00	0.00	10.47	0.00
5 - 0.9Dead + Earthquake X	33.98	-0.51	0.00	2.24	0.00
6 - 0.9Dead + Earthquake Y	36.87	0.02	0.00	2.80	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	1.30	4.48	0.17	0.00	0.00	12.60	
2 - Dead + Live	3.15	4.48	0.28	0.00	0.10	47.20	
3 - Dead + 0.7Earthquake X	1.30	5.81	0.17	0.02	1.79	12.50	
4 - Dead + 0.7Earthquake Y	1.34	5.81	0.19	0.00	0.07	14.46	
5 - 0.6Dead + 0.7Earthquake X	0.79	5.81	0.17	0.04	1.79	7.46	
6 - 0.6Dead + 0.7Earthquake Y	0.82	5.81	0.21	0.00	0.07	9.42	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	23.37	100.00	1.50	21.46	100.00	1.50	
2 - Dead + Live	14.08	100.00	1.50	10.63	100.00	1.50	
3 - Dead + 0.7Earthquake X	23.29	100.00	1.50	21.47	100.00	1.50	
4 - Dead + 0.7Earthquake Y	20.69	100.00	1.50	18.91	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	23.24	97.06	1.50	26.11	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	19.26	100.00	1.50	21.21	100.00	1.50	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 8)			Time	3:31:25 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 8).mcs				

DETAIL REPORT FOR F-2 (node 8)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	8.00
N-S Dim (ft)	8.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	13.89	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	16.68	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	165.42	77.74	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	6.17	-13.22	9.84	94.87	
2 - 1.2Dead + 1.6Live	1.83	45.28	33.69	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	32.62	24.27	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-32.93	24.50	94.87	
5 - 0.9Dead + Earthquake X	1.83	8.56	6.37	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-8.90	6.62	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	6.17	-15.56	11.58	94.87	
2 - 1.2Dead + 1.6Live	6.17	-54.62	40.64	94.87	
3 - 1.2Dead + Live + Earthquake X	6.17	-38.84	28.90	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-39.87	29.67	94.87	
5 - 0.9Dead + Earthquake X	6.17	-9.70	7.22	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-10.74	7.99	94.87	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 8)			Time	3:31:25 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 8).mcs				

DETAIL REPORT FOR F-2 (node 8)

PIER/BASE PLATE DESIGN INFORMATION

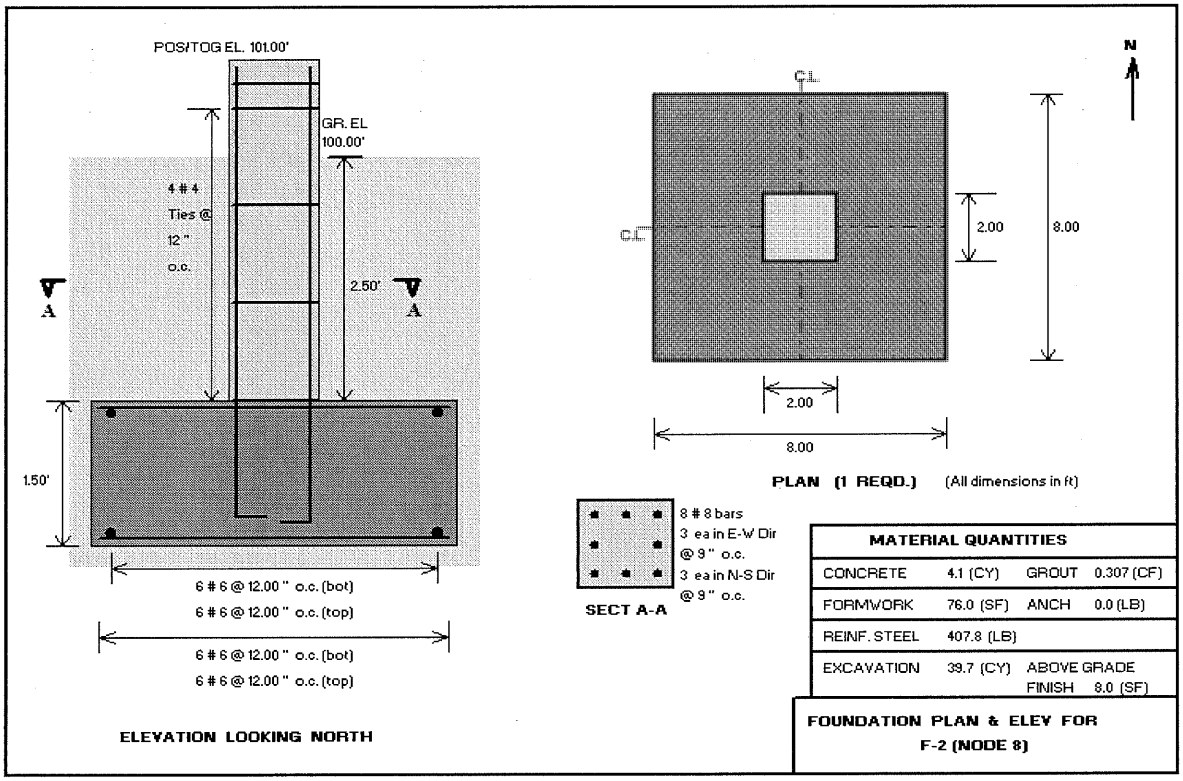
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	57.69	981.71	6.35	107.95	12.35	307.78	
2 - 1.2Dead + 1.6Live	197.60	794.34	21.74	87.33	49.34	374.77	
3 - 1.2Dead + Live + Earthquake X	140.82	847.55	15.49	93.39	34.70	358.64	
4 - 1.2Dead + Live + Earthquake Y	143.71	780.23	15.81	85.77	36.66	378.58	
5 - 0.9Dead + Earthquake X	35.87	1203.30	3.95	132.38	7.83	132.38	
6 - 0.9Dead + Earthquake Y	38.76	802.15	4.26	88.19	9.79	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 8)			Time	3:31:25 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 8).mcs				

DETAIL REPORT FOR F-2 (node 8)



MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	407.8 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-2 (NODE 8)

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 9)			Time	3:32:54 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 9).mcs				

DETAIL REPORT FOR F-2 (node 9)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 9)			Time	3:32:54 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\				
Filename:	Operating Floor Columns\F-2 (node 9).mcs				

DETAIL REPORT FOR F-2 (node 9)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	43.04	-0.03	0.00	-1.72	0.00
2 - Live	100.33	-0.06	0.00	-4.81	0.00
3 - Earthquake X	-0.03	-0.33	0.00	-0.01	0.00
4 - Earthquake Y	1.53	0.02	0.00	0.56	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	43.04	-0.03	0.00	-1.72	0.00
2 - Dead + Live	143.37	-0.09	0.00	-6.53	0.00
3 - Dead + 0.7Earthquake X	43.02	-0.26	0.00	-1.73	0.00
4 - Dead + 0.7Earthquake Y	44.11	-0.02	0.00	-1.33	0.00
5 - 0.6Dead + 0.7Earthquake X	25.80	-0.25	0.00	-1.04	0.00
6 - 0.6Dead + 0.7Earthquake Y	26.90	0.00	0.00	-0.64	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	60.26	-0.04	0.00	-2.41	0.00
2 - 1.2Dead + 1.6Live	212.18	-0.13	0.00	-9.76	0.00
3 - 1.2Dead + Live + Earthquake X	151.95	-0.43	0.00	-6.88	0.00
4 - 1.2Dead + Live + Earthquake Y	153.51	-0.08	0.00	-6.31	0.00
5 - 0.9Dead + Earthquake X	38.71	-0.36	0.00	-1.56	0.00
6 - 0.9Dead + Earthquake Y	40.27	-0.01	0.00	-0.99	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	1.31	4.48	0.11	0.00	0.15	8.60	
2 - Dead + Live	3.16	4.48	0.18	0.00	0.45	32.65	
3 - Dead + 0.7Earthquake X	1.33	5.81	0.11	0.02	1.31	8.64	
4 - Dead + 0.7Earthquake Y	1.31	5.81	0.08	0.00	0.08	6.64	
5 - 0.6Dead + 0.7Earthquake X	0.80	5.81	0.11	0.03	1.25	5.20	
6 - 0.6Dead + 0.7Earthquake Y	0.78	5.81	0.07	0.00	0.02	3.20	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	36.07	100.00	1.50	32.58	100.00	1.50	
2 - Dead + Live	21.79	100.00	1.50	16.26	100.00	1.50	
3 - Dead + 0.7Earthquake X	35.91	100.00	1.50	32.44	100.00	1.50	
4 - Dead + 0.7Earthquake Y	47.36	100.00	1.50	42.60	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	35.81	100.00	1.50	39.00	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	59.49	100.00	1.50	64.17	100.00	1.50	

Dimensional Solutions FOUNDATION3D		Version 5.8.2		Date	1/26/2012
Foundation Name	F-2 (node 9)			Time	3:32:54 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 9).mcs				

DETAIL REPORT FOR F-2 (node 9)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	8.00
N-S Dim (ft)	8.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	15.12	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	17.03	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	179.84	84.51	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.83	14.51	10.80	94.87	
2 - 1.2Dead + 1.6Live	1.83	49.29	36.67	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	35.68	26.55	94.87	
4 - 1.2Dead + Live + Earthquake Y	1.83	35.81	26.64	94.87	
5 - 0.9Dead + Earthquake X	1.83	9.54	7.10	94.87	
6 - 0.9Dead + Earthquake Y	1.83	9.66	7.19	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.83	16.08	11.96	94.87	
2 - 1.2Dead + 1.6Live	1.83	55.67	41.42	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	39.96	29.73	94.87	
4 - 1.2Dead + Live + Earthquake Y	1.83	39.94	29.72	94.87	
5 - 0.9Dead + Earthquake X	1.83	10.34	7.69	94.87	
6 - 0.9Dead + Earthquake Y	1.83	10.32	7.68	94.87	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 9)			Time	3:32:54 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 9).mcs				

DETAIL REPORT FOR F-2 (node 9)

PIER/BASE PLATE DESIGN INFORMATION

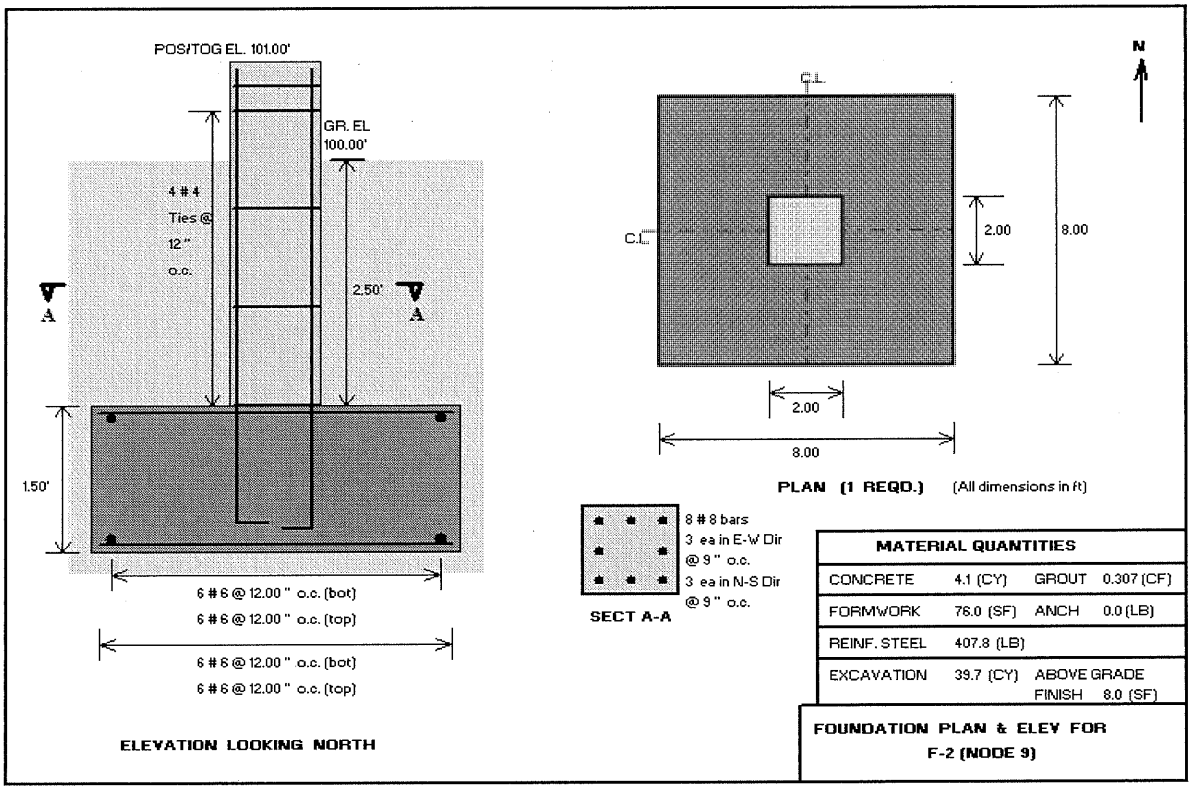
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	63.20	981.71	6.95	107.95	8.43	307.78	
2 - 1.2Dead + 1.6Live	214.70	794.34	23.62	87.33	34.16	374.77	
3 - 1.2Dead + Live + Earthquake X	154.47	847.55	16.99	93.39	24.09	358.64	
4 - 1.2Dead + Live + Earthquake Y	156.03	780.23	17.16	85.77	22.10	378.58	
5 - 0.9Dead + Earthquake X	40.60	1203.30	4.47	132.38	5.45	132.38	
6 - 0.9Dead + Earthquake Y	42.16	802.15	4.64	88.19	4.64	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 9)			Time	3:32:54 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 9).mcs				

DETAIL REPORT FOR F-2 (node 9)



MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	407.8 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

FOUNDATION PLAN & ELEV FOR F-2 (NODE 9)

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 10)			Time	3:33:34 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 10).mcs				

DETAIL REPORT FOR F-2 (node 10)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind	33.33	Earthquake	33.33	Test	20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 10)			Time	3:33:34 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 10).mcs				

DETAIL REPORT FOR F-2 (node 10)

APPLIED LOADS

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	27.43	-0.08	0.00	2.36	0.00
2 - Live	69.56	-0.20	0.00	5.27	0.00
3 - Earthquake X	-0.02	-0.03	0.00	-0.01	0.00
4 - Earthquake Y	1.46	0.01	0.00	0.55	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	27.43	-0.08	0.00	2.36	0.00
2 - Dead + Live	96.99	-0.28	0.00	7.63	0.00
3 - Dead + 0.7Earthquake X	27.42	-0.10	0.00	2.35	0.00
4 - Dead + 0.7Earthquake Y	28.45	-0.07	0.00	2.75	0.00
5 - 0.6Dead + 0.7Earthquake X	16.44	-0.07	0.00	1.41	0.00
6 - 0.6Dead + 0.7Earthquake Y	17.48	-0.04	0.00	1.80	0.00

FACTORED (ULTIMATE) LOAD COMBINATIONS

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	38.40	-0.11	0.00	3.30	0.00
2 - 1.2Dead + 1.6Live	144.21	-0.42	0.00	11.26	0.00
3 - 1.2Dead + Live + Earthquake X	102.46	-0.33	0.00	8.09	0.00
4 - 1.2Dead + Live + Earthquake Y	103.94	-0.29	0.00	8.65	0.00
5 - 0.9Dead + Earthquake X	24.67	-0.10	0.00	2.11	0.00
6 - 0.9Dead + Earthquake Y	26.15	-0.06	0.00	2.67	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	1.11	4.48	0.19	0.01	0.40	11.80	
2 - Dead + Live	2.52	4.48	0.29	0.01	1.40	38.15	
3 - Dead + 0.7Earthquake X	1.11	5.81	0.19	0.01	0.51	11.77	
4 - Dead + 0.7Earthquake Y	1.14	5.81	0.22	0.01	0.37	13.73	
5 - 0.6Dead + 0.7Earthquake X	0.67	5.81	0.19	0.01	0.35	7.05	
6 - 0.6Dead + 0.7Earthquake Y	0.70	5.81	0.24	0.01	0.21	9.01	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	20.99	100.00	1.50	20.44	100.00	1.50	
2 - Dead + Live	13.79	100.00	1.50	10.88	100.00	1.50	
3 - Dead + 0.7Earthquake X	21.05	100.00	1.50	20.50	100.00	1.50	
4 - Dead + 0.7Earthquake Y	18.35	100.00	1.50	17.76	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	21.09	100.00	1.50	25.44	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	16.96	100.00	1.50	20.19	100.00	1.50	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 10)			Time	3:33:34 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 10).mcs				

DETAIL REPORT FOR F-2 (node 10)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	8.00
N-S Dim (ft)	8.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	E-W
0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	6	12	0.44	0.39	10.4	E-W
1.2Dead + 1.6Live	6	6	12	0.44	0.39	12.54	N-S

PUNCHING SHEAR

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	122.53	57.58	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.83	9.55	7.10	94.87	
2 - 1.2Dead + 1.6Live	1.83	33.90	25.22	94.87	
3 - 1.2Dead + Live + Earthquake X	1.83	24.27	18.06	94.87	
4 - 1.2Dead + Live + Earthquake Y	1.83	24.59	18.29	94.87	
5 - 0.9Dead + Earthquake X	1.83	6.15	4.58	94.87	
6 - 0.9Dead + Earthquake Y	1.83	6.47	4.81	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	6.17	-11.66	8.68	94.87	
2 - 1.2Dead + 1.6Live	6.17	-41.09	30.57	94.87	
3 - 1.2Dead + Live + Earthquake X	6.17	-29.42	21.89	94.87	
4 - 1.2Dead + Live + Earthquake Y	6.17	-30.13	22.42	94.87	
5 - 0.9Dead + Earthquake X	6.17	-7.49	5.57	94.87	
6 - 0.9Dead + Earthquake Y	6.17	-8.20	6.10	94.87	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 10)			Time	3:33:34 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 10).mcs				

DETAIL REPORT FOR F-2 (node 10)

PIER/BASE PLATE DESIGN INFORMATION

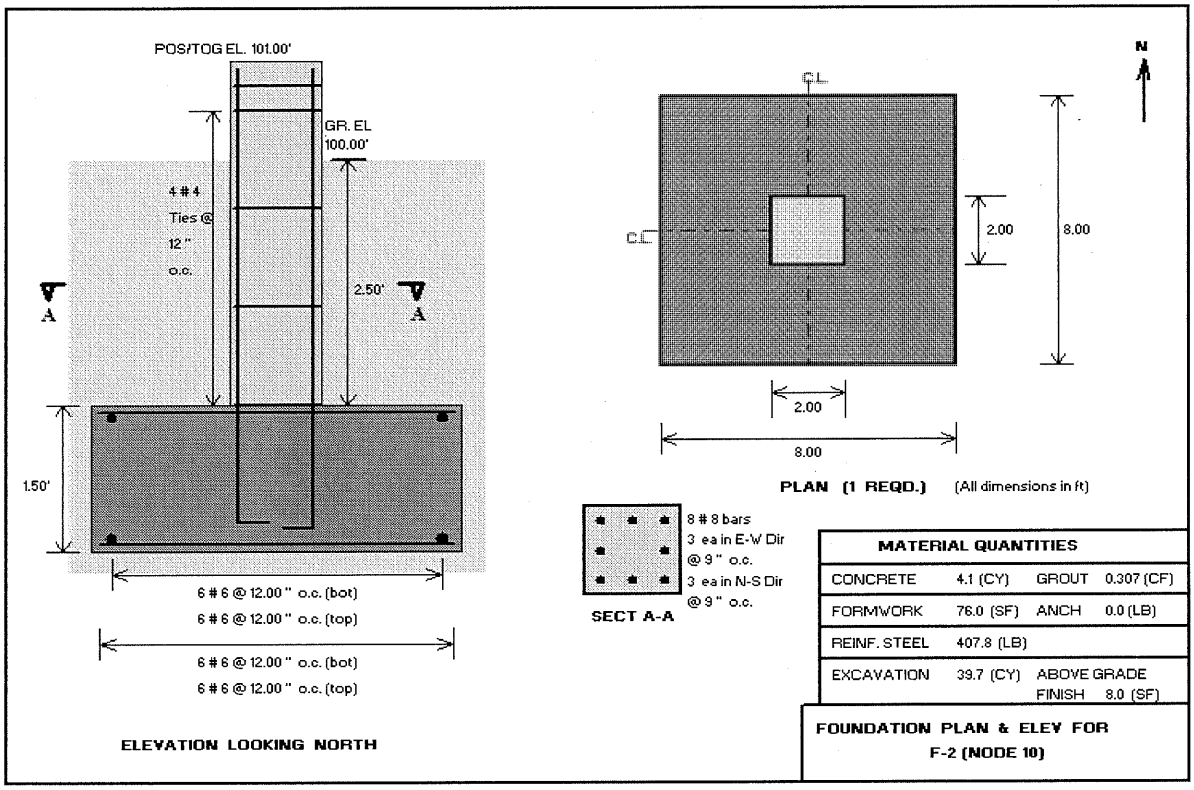
E-W Dim (ft)	2.00
N-S Dim (ft)	2.00
Height above grade (ft)	1.00
E-W Offset (ft)	0.00
N-S Offset (ft)	0.00
Requested Reinft. Ratio	0.0050
Provided Reinft. Ratio	0.0109
Long Bar Size	8
Bars in E-W Dir	3
Bars in N-S Dir	3
Total Long Bars	8
Tie Bar Size	4
Total No. of Ties	5
Major Tie Spacing (in)	12

PIER ULTIMATE LOAD CAPACITIES

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	41.34	981.71	4.55	107.95	11.56	307.78	
2 - 1.2Dead + 1.6Live	146.73	794.34	16.14	87.33	39.42	374.77	
3 - 1.2Dead + Live + Earthquake X	104.98	847.55	11.55	93.39	28.32	358.64	
4 - 1.2Dead + Live + Earthquake Y	106.46	780.23	11.71	85.77	30.28	378.58	
5 - 0.9Dead + Earthquake X	26.56	1203.30	2.92	132.38	7.40	132.38	
6 - 0.9Dead + Earthquake Y	28.04	802.15	3.08	88.19	9.36	372.58	

Dimensional Solutions	FOUNDATION3D	Version	5.8.2	Date	1/26/2012
Foundation Name	F-2 (node 10)			Time	3:33:34 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-2 (node 10).mcs				

DETAIL REPORT FOR F-2 (node 10)

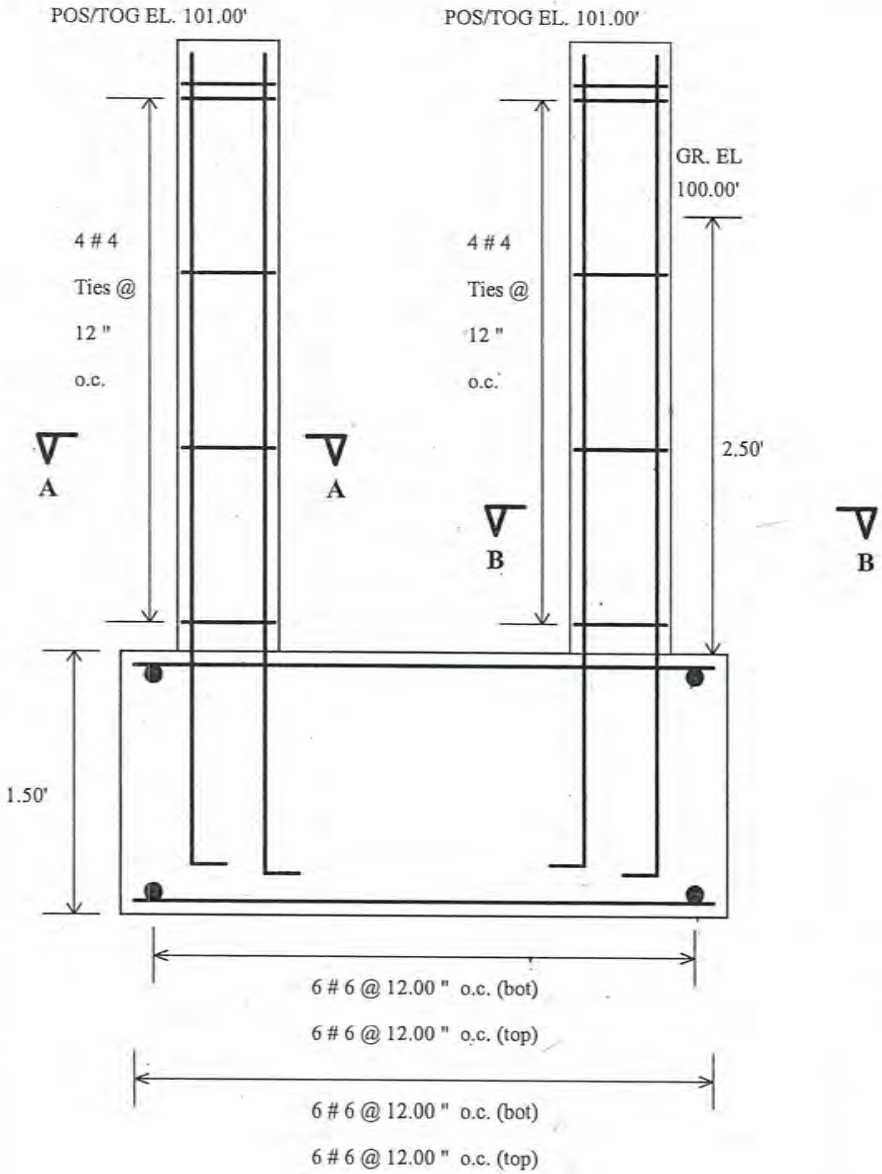


MATERIAL QUANTITIES			
CONCRETE	4.1 (CY)	GROUT	0.307 (CF)
FORMWORK	76.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	407.8 (LB)		
EXCAVATION	39.7 (CY)	ABOVE GRADE FINISH	8.0 (SF)

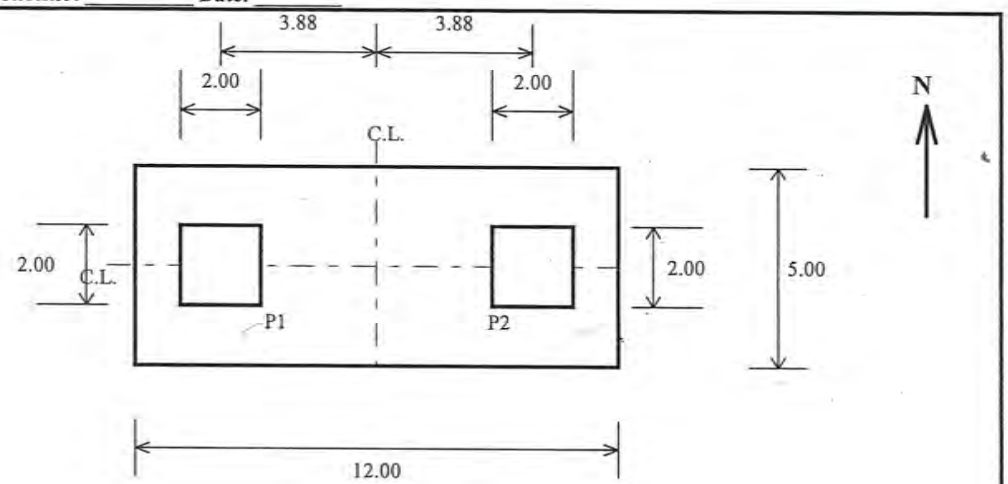
FOUNDATION PLAN & ELEV FOR F-2 (NODE 10)

FOUNDATION PLAN AND ELEVATION P:\11021\116 - CALCULATIONS\116.D - ARCH_CIVIL_STRUC\C-005 GRINDING AREA CONCRETE\OPERATING FLOOR COLUMNS\F-3 (NODES 1,3).MCS

Proj. No.: 11021 Engr: ECS Date: 3/30/2012 Checker: _____ Date: _____



ELEVATION LOOKING NORTH



PLAN (1 REQD.) (All dimensions in ft)

8 # 8 bars
3 ea in E-W Dir
@ 9 " o.c.
3 ea in N-S Dir
@ 9 " o.c.

SECT A-A

8 # 8 bars
3 ea in E-W Dir
@ 9 " o.c.
3 ea in N-S Dir
@ 9 " o.c.

SECT B-B

MATERIAL QUANTITIES			
CONCRETE	4.4 (CY)	GROUT	0.307 (CF)
FORMWORK	107.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	563.0 (LB)		
EXCAVATION	40.1 (CY)	ABOVE GRADE FINISH	16.0 (SF)

FOUNDATION PLAN & ELEV FOR F-3 (NODES 1&3)

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind 33.33 Earthquake 33.33 Test 20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

APPLIED LOADS

P1

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	6.87	0.00	0.00	-0.65	0.00
2 - Live	34.63	0.00	0.00	-3.09	0.00
3 - Earthquake X	-1.53	-0.03	0.00	0.35	0.00
4 - Earthquake Y	1.25	0.00	0.00	-0.31	0.00

P2

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	5.79	0.00	0.00	0.63	0.00
2 - Live	27.53	0.00	0.00	3.38	0.00
3 - Earthquake X	-1.53	0.03	0.00	-0.36	0.00
4 - Earthquake Y	1.25	0.00	0.00	0.32	0.00

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

P1

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	6.87	0.00	0.00	-0.65	0.00
2 - Dead + Live	41.50	0.00	0.00	-3.74	0.00
3 - Dead + 0.7Earthquake X	5.80	-0.02	0.00	-0.41	0.00
4 - Dead + 0.7Earthquake Y	7.75	0.00	0.00	-0.87	0.00
5 - 0.6Dead + 0.7Earthquake X	3.05	-0.02	0.00	-0.15	0.00
6 - 0.6Dead + 0.7Earthquake Y	5.00	0.00	0.00	-0.61	0.00

P2

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	5.79	0.00	0.00	0.63	0.00
2 - Dead + Live	33.32	0.00	0.00	4.01	0.00
3 - Dead + 0.7Earthquake X	4.72	0.02	0.00	0.38	0.00
4 - Dead + 0.7Earthquake Y	6.67	0.00	0.00	0.85	0.00
5 - 0.6Dead + 0.7Earthquake X	2.40	0.02	0.00	0.13	0.00
6 - 0.6Dead + 0.7Earthquake Y	4.35	0.00	0.00	0.60	0.00

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

FACTORED (ULTIMATE) LOAD COMBINATIONS

P1

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	9.62	0.00	0.00	-0.91	0.00
2 - 1.2Dead + 1.6Live	63.65	0.00	0.00	-5.72	0.00
3 - 1.2Dead + Live + Earthquake X	41.34	-0.03	0.00	-3.52	0.00
4 - 1.2Dead + Live + Earthquake Y	44.12	0.00	0.00	-4.18	0.00
5 - 0.9Dead + Earthquake X	4.65	-0.03	0.00	-0.24	0.00
6 - 0.9Dead + Earthquake Y	7.43	0.00	0.00	-0.90	0.00

P2

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	8.11	0.00	0.00	0.88	0.00
2 - 1.2Dead + 1.6Live	51.00	0.00	0.00	6.16	0.00
3 - 1.2Dead + Live + Earthquake X	32.95	0.03	0.00	3.78	0.00
4 - 1.2Dead + Live + Earthquake Y	35.73	0.00	0.00	4.46	0.00
5 - 0.9Dead + Earthquake X	3.68	0.03	0.00	0.21	0.00
6 - 0.9Dead + Earthquake Y	6.46	0.00	0.00	0.89	0.00

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.80	4.48	0.00	0.09	4.15	0.10	
2 - Dead + Live	2.09	4.48	0.01	0.29	31.52	1.35	
3 - Dead + 0.7Earthquake X	0.76	5.81	0.00	0.09	4.15	0.14	
4 - Dead + 0.7Earthquake Y	0.83	5.81	0.00	0.09	4.14	0.07	
5 - 0.6Dead + 0.7Earthquake X	0.44	5.81	0.00	0.10	2.49	0.09	
6 - 0.6Dead + 0.7Earthquake Y	0.51	5.81	0.00	0.08	2.48	0.02	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	36.32	100.00	1.50	100.00	100.00	1.50	
2 - Dead + Live	14.41	100.00	1.50	100.00	100.00	1.50	
3 - Dead + 0.7Earthquake X	55.03	100.00	1.50	100.00	100.00	1.50	
4 - Dead + 0.7Earthquake Y	28.50	100.00	1.50	100.00	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	88.57	100.00	1.50	100.00	100.00	1.50	
6 - 0.6Dead + 0.7Earthquake Y	100.00	100.00	1.50	100.00	100.00	1.50	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

FOOTING DESIGN INFORMATION

E-W Dim (ft)	12.00
N-S Dim (ft)	5.00
Thickness (ft)	1.50

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
2. 1.2Dead + 1.6Live	6	6	12	0.44	0.2	-10.5	E-W
6. 0.9Dead + Earthquake Y	6	6	12	0.44	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
2. 1.2Dead + 1.6Live	6	6	12	0.44	0.39	1.5	E-W
2. 1.2Dead + 1.6Live	6	6	12	0.44	0.39	2.28	N-S

PUNCHING SHEAR

P1

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	45.21	21.25	189.74	

P2

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	35.19	16.54	189.74	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	4.29	-3.45	4.11	94.87	
2 - 1.2Dead + 1.6Live	4.29	-17.76	21.15	94.87	
3 - 1.2Dead + Live + Earthquake X	4.29	-11.78	14.02	94.87	
4 - 1.2Dead + Live + Earthquake Y	4.29	-12.57	14.96	94.87	
5 - 0.9Dead + Earthquake X	4.29	-1.78	2.12	94.87	
6 - 0.9Dead + Earthquake Y	4.29	-2.57	3.07	94.87	

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	0.33	1.58	0.79	94.87	
2 - 1.2Dead + 1.6Live	4.67	-8.14	4.04	94.87	
3 - 1.2Dead + Live + Earthquake X	4.67	-5.38	2.67	94.87	
4 - 1.2Dead + Live + Earthquake Y	4.67	-5.76	2.86	94.87	
5 - 0.9Dead + Earthquake X	0.33	0.82	0.41	94.87	
6 - 0.9Dead + Earthquake Y	0.33	1.18	0.58	94.87	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

PIER/BASE PLATE DESIGN INFORMATION

	P1	P2
E-W Dim (ft)	2.00	2.00
N-S Dim (ft)	2.00	2.00
Height above grade (ft)	1.00	1.00
E-W Offset (ft)	-3.88	3.88
N-S Offset (ft)	0.00	0.00
Requested Reinft. Ratio	0.0050	0.0050
Provided Reinft. Ratio	0.0109	0.0109
Long Bar Size	8	8
Bars in E-W Dir	3	3
Bars in N-S Dir	3	3
Total Long Bars	8	8
Tie Bar Size	4	4
Total No. of Ties	5	5
Major Tie Spacing (in)	12	12

PIER ULTIMATE LOAD CAPACITIES

P1

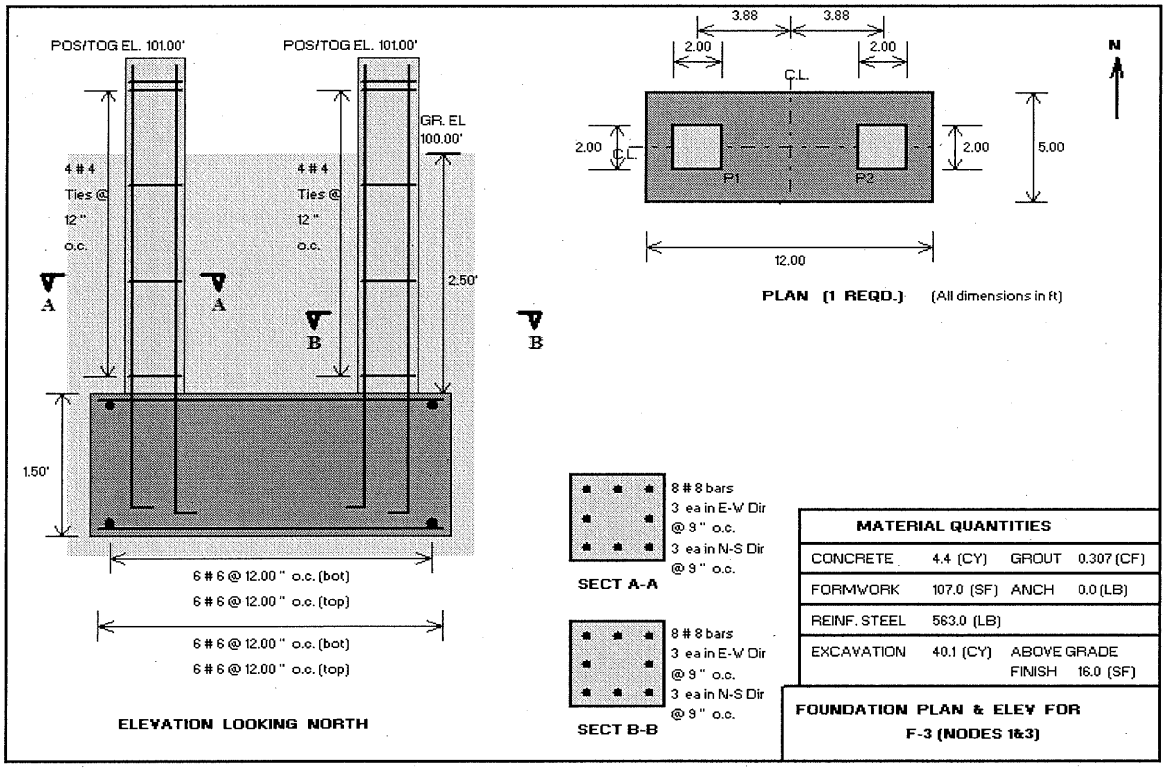
Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	12.56	1057.86	1.38	116.78	3.19	268.23	
2 - 1.2Dead + 1.6Live	66.17	1023.60	7.28	98.94	20.03	293.54	
3 - 1.2Dead + Live + Earthquake X	43.86	1023.22	4.83	112.74	12.32	287.03	
4 - 1.2Dead + Live + Earthquake Y	46.64	982.27	5.13	108.01	14.63	307.51	
5 - 0.9Dead + Earthquake X	6.54	1203.30	0.72	144.36	0.82	153.60	
6 - 0.9Dead + Earthquake Y	9.32	954.94	1.03	104.94	3.13	320.09	

P2

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	11.05	1024.99	1.22	112.95	3.09	286.10	
2 - 1.2Dead + 1.6Live	53.52	873.15	5.89	96.25	21.57	349.92	
3 - 1.2Dead + Live + Earthquake X	35.47	911.09	3.90	100.13	13.22	338.44	
4 - 1.2Dead + Live + Earthquake Y	38.25	867.84	4.21	95.67	15.60	351.78	
5 - 0.9Dead + Earthquake X	5.57	1203.30	0.61	138.66	0.72	154.58	
6 - 0.9Dead + Earthquake Y	8.35	912.11	0.92	100.25	3.10	338.04	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	3/30/2012
Foundation Name	F-3 (nodes 1&3)			Time	2:37:15 PM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\ Operating Floor Columns\F-3 (nodes 1,3).mcs				

DETAIL REPORT FOR F-3 (nodes 1&3)

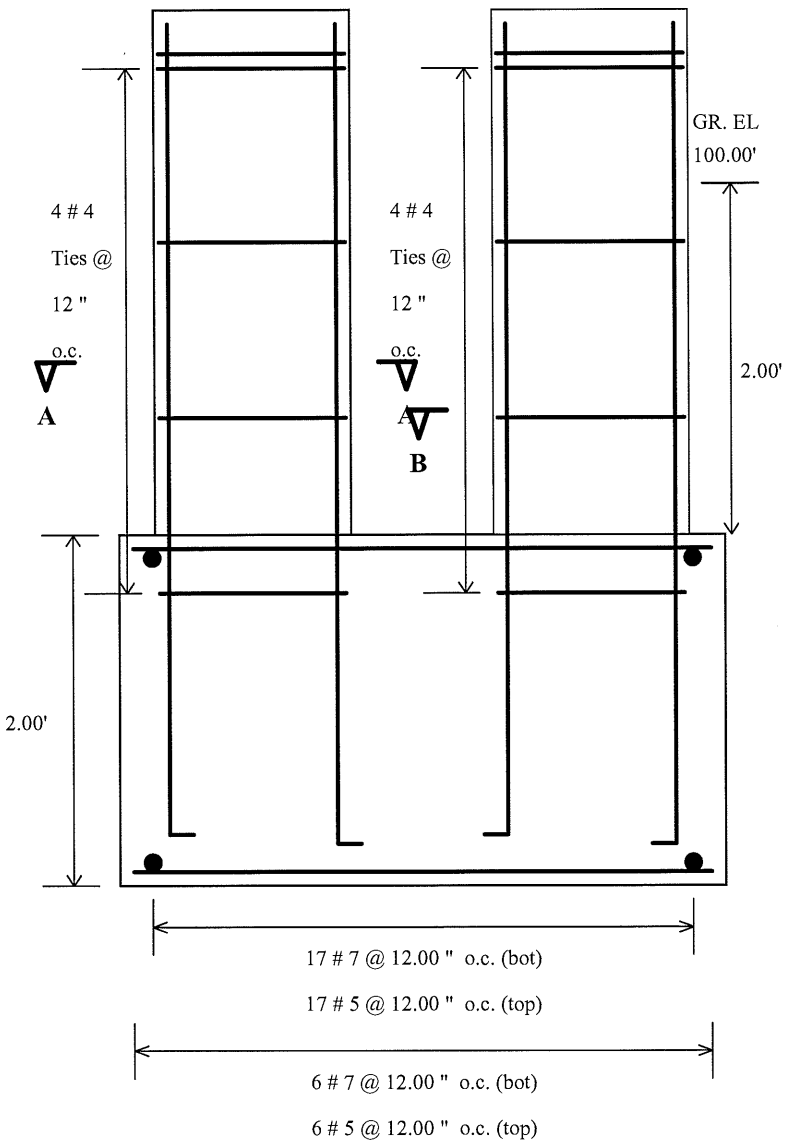


MATERIAL QUANTITIES			
CONCRETE	4.4 (CY)	GROUT	0.307 (CF)
FORMWORK	107.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	563.0 (LB)		
EXCAVATION	40.1 (CY)	ABOVE GRADE FINISH	16.0 (SF)

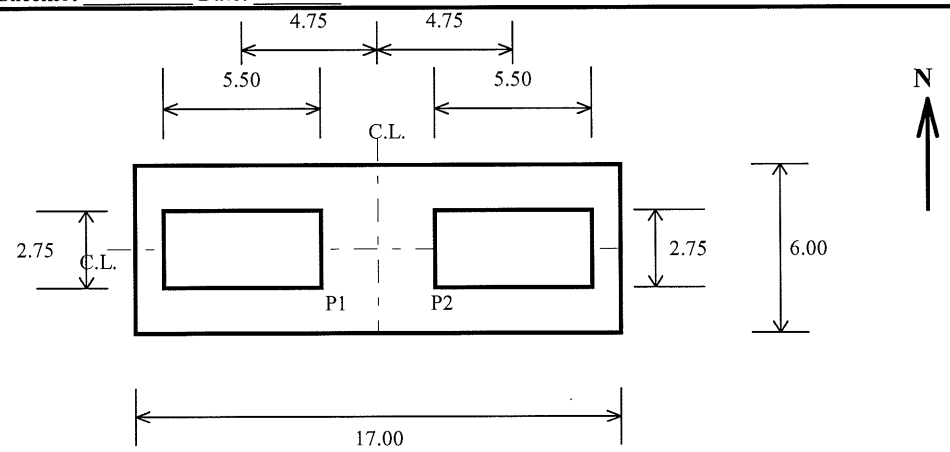
FOUNDATION PLAN & ELEV FOR F-3 (NODES 1&3)

FOUNDATION PLAN AND ELEVATION P:\11021\116 - CALCULATIONS\116.D - ARCH_CIVIL_STRUC\C-005 GRINDING AREA CONCRETE\OPERATING FLOOR COLUMNS\F-4 (PRIMARY SUMP PUMPS).MC!

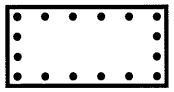
Proj. No.: 11021 Engr: ECS Date: 7/16/2012 Checker: _____ Date: _____



ELEVATION LOOKING NORTH

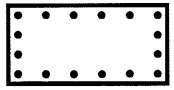


PLAN (1 REQD.) (All dimensions in ft)



SECT A-A

16 # 8 bars
6 ea in E-W Dir
@ 12 " o.c.
4 ea in N-S Dir
@ 9 " o.c.



SECT B-B

16 # 8 bars
6 ea in E-W Dir
@ 12 " o.c.
4 ea in N-S Dir
@ 9 " o.c.

MATERIAL QUANTITIES			
CONCRETE	10.8 (CY)	GROUT	1.204 (CF)
FORMWORK	191.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	1154.1 (LB)		
EXCAVATION	53.3 (CY)	ABOVE GRADE FINISH	33.0 (SF)

FOUNDATION PLAN & ELEV FOR F-4 (PRIMARY SUMP PU

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	7/16/2012
Foundation Name	F-4 (Primary Sump Pu			Time	8:20:31 AM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-4 (Primary Sump Pumps).mcs				

DETAIL REPORT FOR F-4 (Primary Sump Pu

PROJECT INFORMATION

Project Name: CC&V HIgh Grade Mill
Project Number: 11021
Client: CC&V
Project Location Victor CO
Foundation Description FOUNDATION

DESIGN CODE ACI 318 - 2008 **INPUT UNITS** English **OUTPUT UNITS** English

CONCRETE PARAMETERS:

Compressive Strength (psi)	4000
Unit Weight (pcf)	150
Pier Concrete Cover - E-W Dir (in)	2
Pier Concrete Cover - N-S Dir (in)	2
Footing Side Concrete Cover - E-W Dir (in)	3
Footing Side Concrete Cover - N-S Dir (in)	3
Footing Top Concrete Cover (in)	2
Footing Bottom Concrete Cover - X Dir (in)	3

REINFORCING STEEL PARAMETERS:

Yield Strength (ksi)	60
Unit Weight (pcf)	490
Modulus of Elasticity (ksi)	29000
Pier Min Rebar Spacing (in)	3
Footing Min Rebar Spacing (in)	6
Footing Max Rebar Spacing (in)	18

SOIL PARAMETERS:

Unit Weight (pcf)	120
Allowable Net Bearing Capacity (psf)	4000
Bearing Capacity Method	Linear Soil Pressure
Soil Type	Granular
Passive Pressure Coefficient Kp	3.69
Soil To Concrete Friction f	0.5

Allowable Increase in Soil Pressure due to Short Term Loads (%)

Wind 33.33 Earthquake 33.33 Test 20

Erection Stability Ratio	1.5
Operation Stability Ratio	1.5
Test Stability Ratio	1.5
Safety Factor against Lateral Forces	1.5

REBAR PARAMETERS:

Max Long Bar Size	10
Min Long Bar Size	7
Max Tie Bar Size	4
Min Tie Bar Size	3
Max Ftg Bar Size	18
Temp & Shrinkage Steel Ratio	0.0018

MINIMUM FOUNDATION CRITERIA:

Depth of Footing Below Grade (ft)	4
Minimum Soil Cover (ft)	0
Grade Elevation (ft)	100

BUOYANCY CRITERIA:

Consider Buoyancy:	No
Consider soil for buoyancy:	No
Water table below grade (ft)	0

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	7/16/2012
Foundation Name	F-4 (Primary Sump Pu			Time	8:20:31 AM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-4 (Primary Sump Pumps).mcs				

DETAIL REPORT FOR F-4 (Primary Sump Pu

APPLIED LOADS

P1

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	17.45	0.00	0.00	0.00	0.00
2 - Live	0.00	3.88	8.30	0.00	0.00
3 - Earthquake X	0.00	1.29	2.60	0.00	0.00
4 - Earthquake Y	1.25	0.00	0.00	1.29	2.60

P2

Load Case	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	17.45	0.00	0.00	0.00	0.00
2 - Live	0.00	3.88	8.30	0.00	0.00
3 - Earthquake X	0.00	1.29	2.60	0.00	0.00
4 - Earthquake Y	1.25	0.00	0.00	1.29	2.60

UNFACTORED (ALLOWABLE) LOAD COMBINATIONS

P1

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	17.45	0.00	0.00	0.00	0.00
2 - Dead + Live	17.45	3.88	8.30	0.00	0.00
3 - Dead + 0.7Earthquake X	17.45	0.90	1.82	0.00	0.00
4 - Dead + 0.7Earthquake Y	18.33	0.00	0.00	0.90	1.82
5 - 0.6Dead + 0.7Earthquake X	10.47	0.90	1.82	0.00	0.00
6 - 0.6Dead + 0.7Earthquake Y	11.35	0.00	0.00	0.90	1.82

P2

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - Dead	17.45	0.00	0.00	0.00	0.00
2 - Dead + Live	17.45	3.88	8.30	0.00	0.00
3 - Dead + 0.7Earthquake X	17.45	0.90	1.82	0.00	0.00
4 - Dead + 0.7Earthquake Y	18.33	0.00	0.00	0.90	1.82
5 - 0.6Dead + 0.7Earthquake X	10.47	0.90	1.82	0.00	0.00
6 - 0.6Dead + 0.7Earthquake Y	11.35	0.00	0.00	0.90	1.82

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	7/16/2012
Foundation Name	F-4 (Primary Sump Pu			Time	8:20:31 AM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-4 (Primary Sump Pumps).mcs				

DETAIL REPORT FOR F-4 (Primary Sump Pu

FACTORED (ULTIMATE) LOAD COMBINATIONS

P1

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	24.43	0.00	0.00	0.00	0.00
2 - 1.2Dead + 1.6Live	20.94	6.20	13.28	0.00	0.00
3 - 1.2Dead + Live + Earthquake X	20.94	5.17	10.90	0.00	0.00
4 - 1.2Dead + Live + Earthquake Y	22.19	3.88	8.30	1.29	2.60
5 - 0.9Dead + Earthquake X	15.71	1.29	2.60	0.00	0.00
6 - 0.9Dead + Earthquake Y	16.96	0.00	0.00	1.29	2.60

P2

Load Comb	Axial (kips)	Shear E-W (kips)	Mom N-S (kip ft)	Shear N-S (kips)	Mom E-W (kip ft)
1 - 1.4Dead	24.43	0.00	0.00	0.00	0.00
2 - 1.2Dead + 1.6Live	20.94	6.20	13.28	0.00	0.00
3 - 1.2Dead + Live + Earthquake X	20.94	5.17	10.90	0.00	0.00
4 - 1.2Dead + Live + Earthquake Y	22.19	3.88	8.30	1.29	2.60
5 - 0.9Dead + Earthquake X	15.71	1.29	2.60	0.00	0.00
6 - 0.9Dead + Earthquake Y	16.96	0.00	0.00	1.29	2.60

BEARING CAPACITY - LINEAR SOIL PRESSURE METHOD

Load Comb	Max Pressure (ksf)	All Pressure (ksf)	Ecc N/S Dir (ft)	Ecc E/W Dir (ft)	Moment N/S axis (kip-ft)	Moment E/W axis (kip-ft)	Rem
1 - Dead	0.94	4.48	0.00	0.00	0.00	0.00	
2 - Dead + Live	1.14	4.48	0.00	0.57	55.35	0.00	
3 - Dead + 0.7Earthquake X	0.99	5.81	0.00	0.13	12.67	0.00	
4 - Dead + 0.7Earthquake Y	1.09	5.81	0.13	0.00	0.00	12.67	
5 - 0.6Dead + 0.7Earthquake X	0.61	5.81	0.00	0.22	12.67	0.00	
6 - 0.6Dead + 0.7Earthquake Y	0.71	5.81	0.21	0.00	0.00	12.67	

STABILITY RATIO / SLIDING SAFETY FACTOR

Load Comb	S.R. N/S Dir	S.R. E/W Dir	All S.R.	Sliding FS - N/S	Sliding FS - E/W	All FS	Remarks
1 - Dead	100.00	100.00	1.50	100.00	100.00	1.50	
2 - Dead + Live	100.00	14.79	1.50	100.00	8.27	1.50	
3 - Dead + 0.7Earthquake X	100.00	64.63	1.50	100.00	35.50	1.50	
4 - Dead + 0.7Earthquake Y	23.22	100.00	1.50	52.16	100.00	1.50	
5 - 0.6Dead + 0.7Earthquake X	100.00	38.78	1.50	100.00	24.83	1.50	
6 - 0.6Dead + 0.7Earthquake Y	14.10	100.00	1.50	41.50	100.00	1.50	

Dimensional Solutions FOUNDATION3D		Version 5.8.2		Date	7/16/2012
Foundation Name	F-4 (Primary Sump Pu			Time	8:20:31 AM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-4 (Primary Sump Pumps).mcs				

DETAIL REPORT FOR F-4 (Primary Sump Pu

FOOTING DESIGN INFORMATION

E-W Dim (ft)	17.00
N-S Dim (ft)	6.00
Thickness (ft)	2.00

Top Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	5	12	0.31	0.05	-3.84	E-W
0.9Dead + Earthquake Y	17	5	12	0.31	0	0	N-S

Bottom Steel

Governing Combination	No of Bars	Bar Size	Bar Spac (in)	Area Prov (sq in/ft)	Area Req (sq in/ft)	Moment (kip ft/ft)	Direction
1.2Dead + 1.6Live	6	7	12	0.6	0.52	1.27	E-W
1.2Dead + Live + Earthquake Y	17	7	12	0.6	0.52	0.98	N-S

PUNCHING SHEAR

P1

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.2Dead + 1.6Live	14.81	2.66	189.74	

P2

Control Comb	Net Ult Load (kips)	Punch. Stress (psi)	All Stress (psi)	Rem
1.4Dead	10.96	1.97	189.74	

MAXIMUM SHEAR - E-W DIRECTION

Load Comb	Left Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	1.00	4.00	2.78	94.87	
2 - 1.2Dead + 1.6Live	8.17	-8.94	6.21	94.87	
3 - 1.2Dead + Live + Earthquake X	8.17	-7.61	5.29	94.87	
4 - 1.2Dead + Live + Earthquake Y	8.17	-6.07	4.21	94.87	
5 - 0.9Dead + Earthquake X	16.00	-2.92	2.03	94.87	
6 - 0.9Dead + Earthquake Y	1.00	2.72	1.89	94.87	

Dimensional Solutions FOUNDATION3D		Version 5.8.2		Date	7/16/2012
Foundation Name	F-4 (Primary Sump Pu			Time	8:20:31 AM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-4 (Primary Sump Pumps).mcs				

DETAIL REPORT FOR F-4 (Primary Sump Pu

MAXIMUM SHEAR - N-S DIRECTION

Load Comb	Bottom Dist (ft)	Max Shear (kips)	Shear Stress (psi)	All Stress (psi)	Rem
1 - 1.4Dead	4.38	-18.40	4.51	94.87	
2 - 1.2Dead + 1.6Live	4.38	-15.77	3.87	94.87	
3 - 1.2Dead + Live + Earthquake X	4.38	-15.77	3.87	94.87	
4 - 1.2Dead + Live + Earthquake Y	4.38	-20.02	4.91	94.87	
5 - 0.9Dead + Earthquake X	1.63	11.83	2.90	94.87	
6 - 0.9Dead + Earthquake Y	4.38	-16.08	3.94	94.87	

PIER/BASE PLATE DESIGN INFORMATION

	P1	P2
E-W Dim (ft)	5.50	5.50
N-S Dim (ft)	2.75	2.75
Height above grade (ft)	1.00	1.00
E-W Offset (ft)	-4.75	4.75
N-S Offset (ft)	0.00	0.00
Requested Reinft. Ratio	0.0050	0.0050
Provided Reinft. Ratio	0.0058	0.0058
Long Bar Size	8	8
Bars in E-W Dir	6	6
Bars in N-S Dir	4	4
Total Long Bars	16	16
Tie Bar Size	4	4
Total No. of Ties	5	5
Major Tie Spacing (in)	12	12

PIER ULTIMATE LOAD CAPACITIES

P1

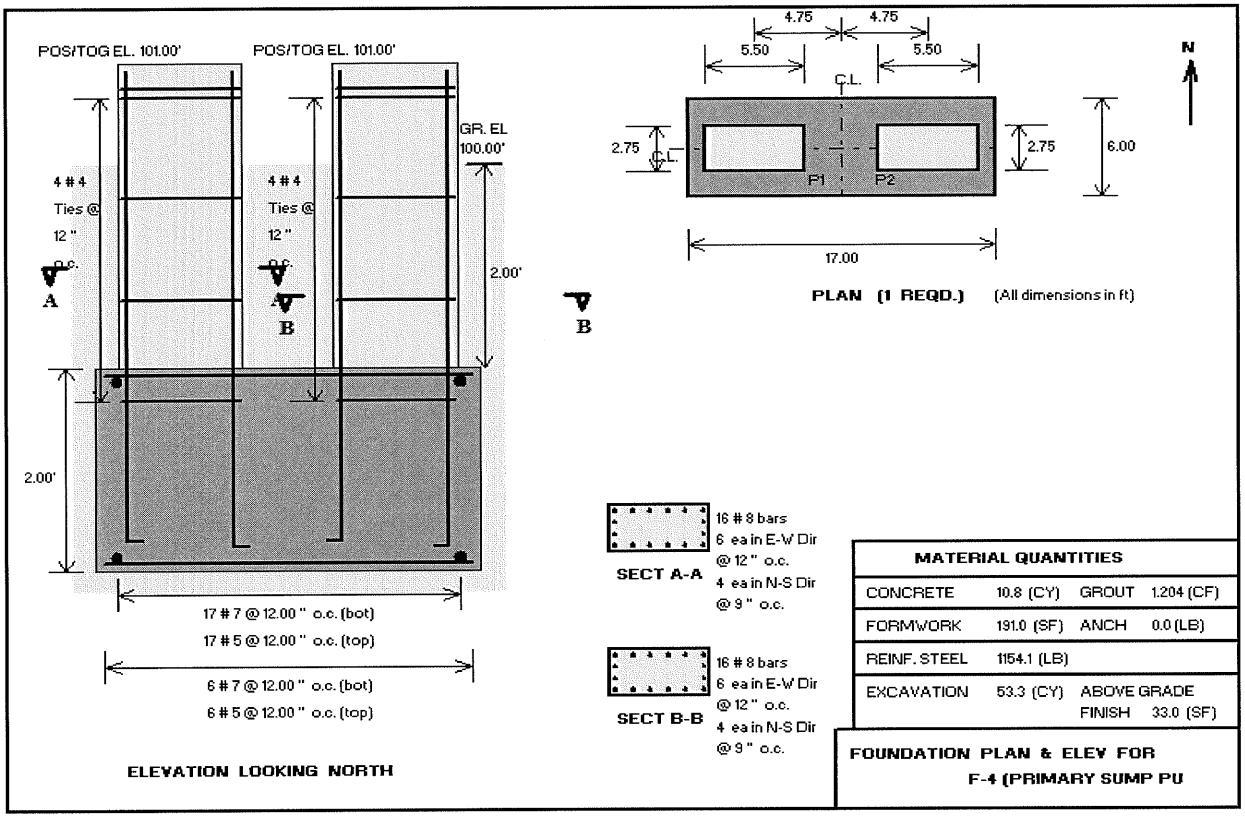
Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	33.96	4220.58	7.30	2388.93	4.50	1480.09	
2 - 1.2Dead + 1.6Live	29.11	111.94	31.88	720.28	3.86	816.84	
3 - 1.2Dead + Live + Earthquake X	29.11	196.07	26.40	832.02	3.86	894.18	
4 - 1.2Dead + Live + Earthquake Y	30.36	197.42	19.93	761.16	6.47	905.32	
5 - 0.9Dead + Earthquake X	21.83	4220.58	6.47	1332.06	2.89	590.66	
6 - 0.9Dead + Earthquake Y	23.08	4065.34	4.96	878.77	6.47	1137.69	

P2

Load Comb	Axial Load (kips)	Axial Capa. (kips)	Mom N-S (kip ft)	Mom N-S Capa (kip ft)	Mom E-W (kip ft)	Mom E-W Capa (kip ft)	Rem
1 - 1.4Dead	33.96	4220.58	7.30	2388.93	4.50	1480.09	
2 - 1.2Dead + 1.6Live	29.11	4220.58	31.88	2388.93	3.86	1480.09	
3 - 1.2Dead + Live + Earthquake X	29.11	4220.58	26.40	2457.57	3.86	1473.08	
4 - 1.2Dead + Live + Earthquake Y	30.36	4220.58	19.93	877.02	6.47	941.37	
5 - 0.9Dead + Earthquake X	21.83	4220.58	6.47	1332.06	2.89	590.66	
6 - 0.9Dead + Earthquake Y	23.08	4065.34	4.96	878.77	6.47	1137.69	

Dimensional Solutions FOUNDATION3D		Version	5.8.2	Date	7/16/2012
Foundation Name	F-4 (Primary Sump Pu			Time	8:20:31 AM
Designed By:	FLSmidth Salt Lake City	Engineer	ECS	Checker	
Filename:	P:\11021\116 - Calculations\116.d - Arch_Civil_Struc\C-005 Grinding Area Concrete\Operating Floor Columns\F-4 (Primary Sump Pumps).mcs				

DETAIL REPORT FOR F-4 (Primary Sump Pu



MATERIAL QUANTITIES			
CONCRETE	10.8 (CY)	GROUT	1.204 (CF)
FORMWORK	191.0 (SF)	ANCH	0.0 (LB)
REINF. STEEL	1154.1 (LB)		
EXCAVATION	53.3 (CY)	ABOVE GRADE FINISH	33.0 (SF)

FOUNDATION PLAN & ELEV FOR F-4 (PRIMARY SUMP PU

FLSmidth	PROJECT CC&V High Grade Ore	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT Primary Feed Sump Foundation	BY ECS DATE 3-30-12
		CHK DATE
		SHEET OF REV

LOADS — SUMP PUMP

1. DEAD LOAD:

= 17,452 #

2. LIVE LOAD:

SHEAR LOAD = 3,875 #

MOMENT X = 3,875 # (23.59")

= 8.3 K-FT

3. SEISMIC

C_s = 0.071

SHEAR = 0.071 (17,452 #) = 1239 #

= 154 # / BOLT

MOMENT = (1239 #)(25.6") = ± 2.6 K-FT

FLSmidth	PROJECT CCIV High Grade Ore	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT Primary Feed Sump Foundations	BY ECS DATE 3-30-12
		CHK DATE
		SHEET OF REV

Foundation Mass Verification

Pump + Motor = 10141# + 3,700# = 13,841#

Foundation = (2'-0)(17'-0)(6'-0) = 204 FT^3

Weight = (204 FT^3)(150 pcf) = 30,600#

Pedestal = (5'-6")(2'-9")(3'-0) = 45.4 FT^3

Weight = (45.4 FT^3)(150 pcf) = 6,810#

Total Weight = 37,410#

Total Weight / Pump Weight = $\frac{37,410\#}{13,841\#}$ = 2.70

Foundation Mass > 2.5 Pump Mass OK

1) DIMENSIONS SHOWN * INCLUDE COMPRESSION OF WARMAN RUBBER JOINT RING.
2) DIMENSIONS SHOWN ⊙ ARE GIVEN WITH WARMAN RUBBER JOINT RING UNCOMPRESSED.
3) DIMENSIONS SHOWN [ ] ARE IN INCHES.
4) FOR ADDITIONAL PUMP DIMENSIONS, SEE OUTLINE DRAWING A385023.
5) BELT GUARD SHEAVE SIZES:
PUMP - Φ1448 [57.0] MAX.
MOTOR - Φ635 [25.0] MAX
SHEAVE WIDTH - 295 [11.6] MAX.
6) ALL MOUNTING BOLT TORQUES MUST BE VERIFIED BEFORE OPERATION AS FACTORY TORQUES CAN CHANGE DURING SHIPMENT.
7) PUMP WILL REQUIRE SUBBASE OF 216 [8.5] MIN. FOR WET END & GUARD TO CLEAR FLOOR.

GLAND SEAL WATER REQUIRED
12-24 GPM ⊙ 62.8 PSI *
(* OR 5 PSI GREATER THAN DISCHARGE PRESSURE)
1" NPT GLAND SEAL CONNECTION
AT STUFFING BOX
FOR G.W.S. LOCATION REF. DWG. A385023
CLEAN SEAL FLUSH WATER WITH A RECOMMENDED MAXIMUM 50 PPM SUSPENDED SOLIDS AND A MAXIMUM SOLID PARTICLE SIZE OF 40 MICRONS. IF SUSPENDED SOLIDS ARE SOFT IN NATURE, A MAXIMUM 200 PPM MAY BE TOLERATED.

No.	QTY.	DESCRIPTION	PART No.
1	1	MOTOR SUPPORT	Z0HG391771
2	2	ADJUSTING BOLT	ST066M391784E62
3	1	PUMP SHAFT GUARD	ZSG389260
4	1	BELTGUARD	ZBG391796
5	2	BELTGUARD SUPPORT HARDWARE	M12U1-40VU
6	8	BELTGUARD MOUNTING HARDWARE	M12H2-60VJ
7	2	BELTGUARD MOUNTING BRACKET	ZGB84890
8	1	MOTOR: 300 HP, 1800 RPM, 5009B TECO, IEEE-841	ZMTT1379924-300
9	4	MOTOR HARDWARE	M20H1-100VJ
10	1	MOTOR SHEAVE	VW8V13.2X8K
	1	MOTOR BUSHING	VWJ-3.875
11	1	PUMP SHEAVE	VW8V53.0X8
	1	PUMP BUSHING	VWP-120MM
12	8	V-BELT	VW8V2240
13	1	STRADDLE BASE	ZSB391783A
14	4	STRADDLE BASE ADJUSTING STUDS	ZAJ67840MBF
TAG	1	TAG KIT - NOT SHOWN (REF. DWG. A389916)	ZTAGKITHORZGA

NOTE: STANDARD NEMA MOTOR SHOWN. ACTUAL MOTOR MAY VARY IN SIZE AND SHAPE. BUYER IS RESPONSIBLE TO ENSURE ADEQUATE DISCHARGE PIPE CLEARANCE AROUND ANY OBSTRUCTIONS.

WEIR MINERALS NORTH AMERICA
MADISON, WISCONSIN

■ CERTIFIED FOR APPROVAL ONLY
DRAWINGS MUST BE RETURNED WITHIN (2) WEEKS OF RECEIPT TO MAINTAIN CURRENT LEAD TIME
☐ CERTIFIED FOR CONSTRUCTION
CUSTOMER INITIATED CHANGES MAY AFFECT CURRENT LEAD TIME AND/OR RESULT IN ADDITIONAL CHARGES, INCLUDING BUT NOT LIMITED TO, ENGINEERING AND/OR MATERIAL RESTOCKING CHARGES.
☐ FOR INFORMATION ONLY

CUST. ORD. NO. 186662-000 0A
WSG CO. NO. 1379924
DATE MAR.14,2012 BY K. BREE

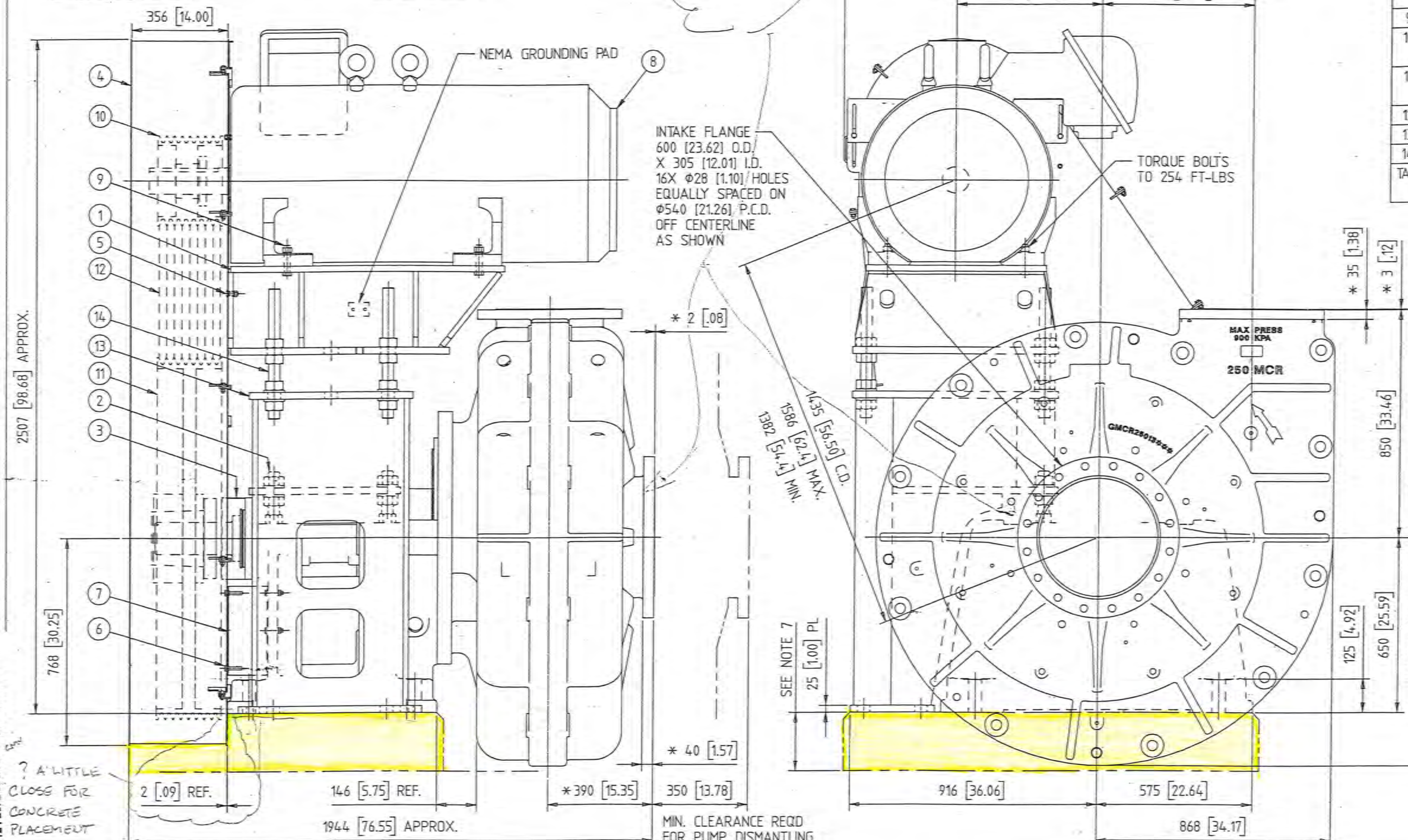
ANGLOGOLD -
CRIPPLE CREEK & VICTOR

S/N: MDS41717-M, MDS41718-M
EQ: 1210-647-001A, 1210-647-001B

APPLICATION: PRIMARY CYCLONE FEED PUMPS	
FLOW (GPM): 4933	
HEAD (FT): 90.2	CORRECTED HEAD (FT): 95.1
EFF (%): 71.7	POWER (BHP): 231.9 S.G.: 1.48
CORRECTED RPM: 450	V-DRIVE RPM: 445.3

WEIGHT	
PUMP	10141
MOTOR	3700
MOTOR SUPPORT	882
ADJUSTING BOLTS	93
BELTGUARD	423
V-DRIVE	1210
STRADDLE BASE	1003
ESTIMATED WEIGHT	17452 LBS

REC'D 3-21-12



No.	DESCRIPTION	BY	DATE	CHK
E				
D				
C				
B				
A	INITIAL RELEASE			

REVISIONS

APP.	A.SCHMIT
CHECK	J.STAVENESS
DRN.	A.WIRTH
DATE	MAR.14,2012
SCALE	

PRODUCT: WARMAN® Centrifugal Slurry Pumps

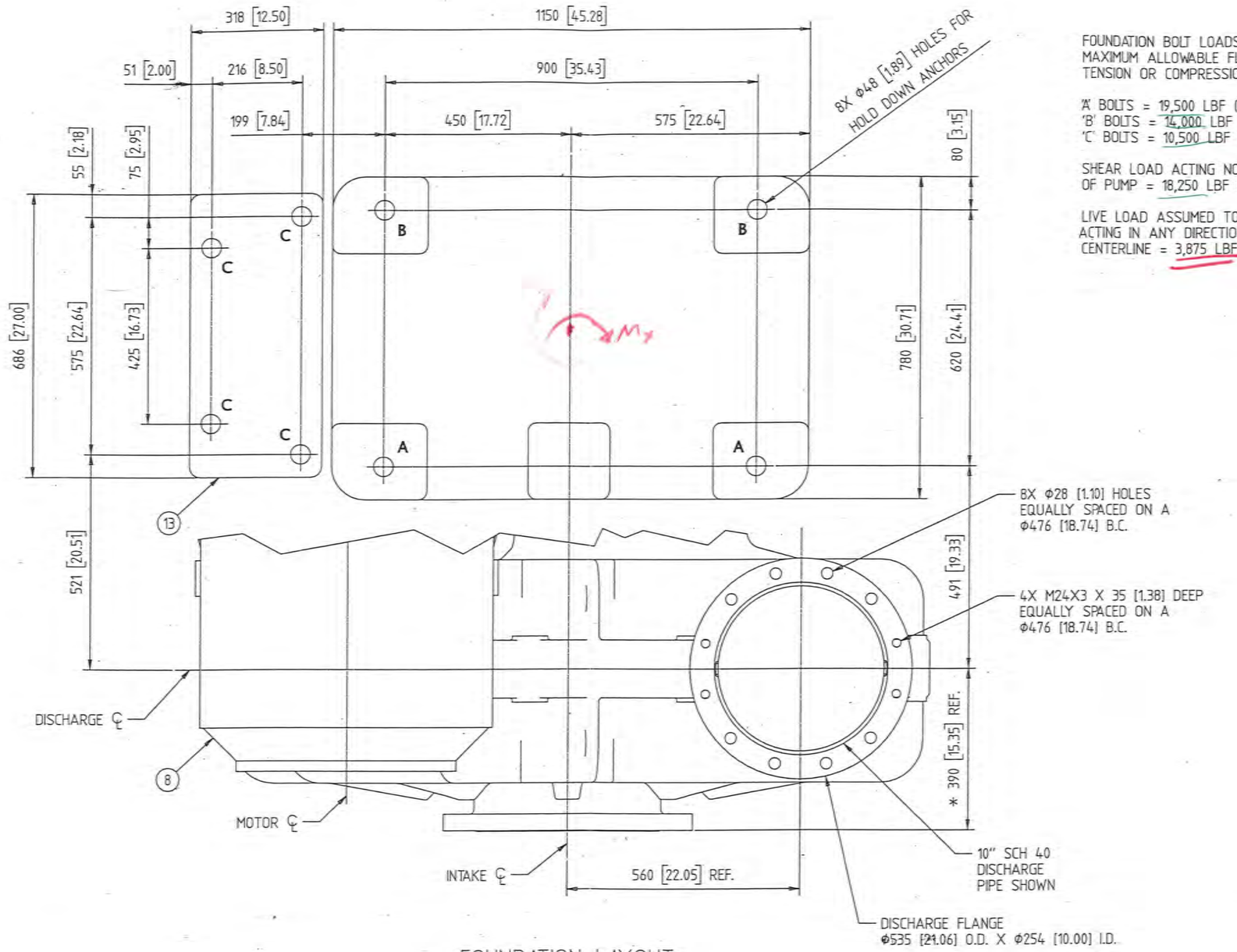
DESIGN CENTRE OF ORIGIN: MADISON

TITLE: 250 MCR, "CV" HALF STRADDLE ARRG. "A" DISCHARGE
300 HP, 1800 RPM, 5009B FRAME MOTOR, K25SY025STM9924

WEIR MINERALS

DRAWING No. 1379924-010 REV. A
SHEET 1 OF 2

Scan for E-Filing



FOUNDATION LAYOUT

FOUNDATION BOLT LOADS AS A RESULT OF APPLYING MAXIMUM ALLOWABLE FLANGE LOADS IN EITHER TENSION OR COMPRESSION AS FOLLOWS:

'A' BOLTS = 19,500 LBF (EACH BOLT)
'B' BOLTS = 14,000 LBF (EACH BOLT)
'C' BOLTS = 10,500 LBF (EACH BOLT)

SHEAR LOAD ACTING NORMAL TO SUCTION SIDE OF PUMP = 18,250 LBF OVER (8) ANCHOR BOLTS

SHORT TERM LOADING FOR ANCHOR BOLT CALC.

LIVE LOAD ASSUMED TO BE 20% EQUIPMENT WEIGHT ACTING IN ANY DIRECTION NORMAL TO PUMP SHAFT CENTERLINE = 3,875 LBF

USE FOR FOUNDATION STABILITY

RECD 3-21-12

No.	DESCRIPTION	BY	DATE	CHK
E				
D				
C				
B				
A	INITIAL RELEASE			

REVISIONS

APP.	A.SCHMIT
CHECK	J.STAVENESS
DRN.	A.WIRTH
DATE	MAR.14,2012
SCALE	

PRODUCT :

WARMAN®

Centrifugal Slurry Pumps

DESIGN CENTRE OF ORIGIN :

MADISON

TITLE :

250 MCR, "CV" HALF STRADDLE ARRG. "A" DISCHARGE

300 HP, 1800 RPM, 5009B FRAME MOTOR, K25SY025STM9924

DRAWING No. 1379924-010

REV. A

SHEET 2 OF 2

N

MAT FDN

7'-0"

3'-0"

7'-0"

℄ SUMP

SUMP WALLS

9'-0

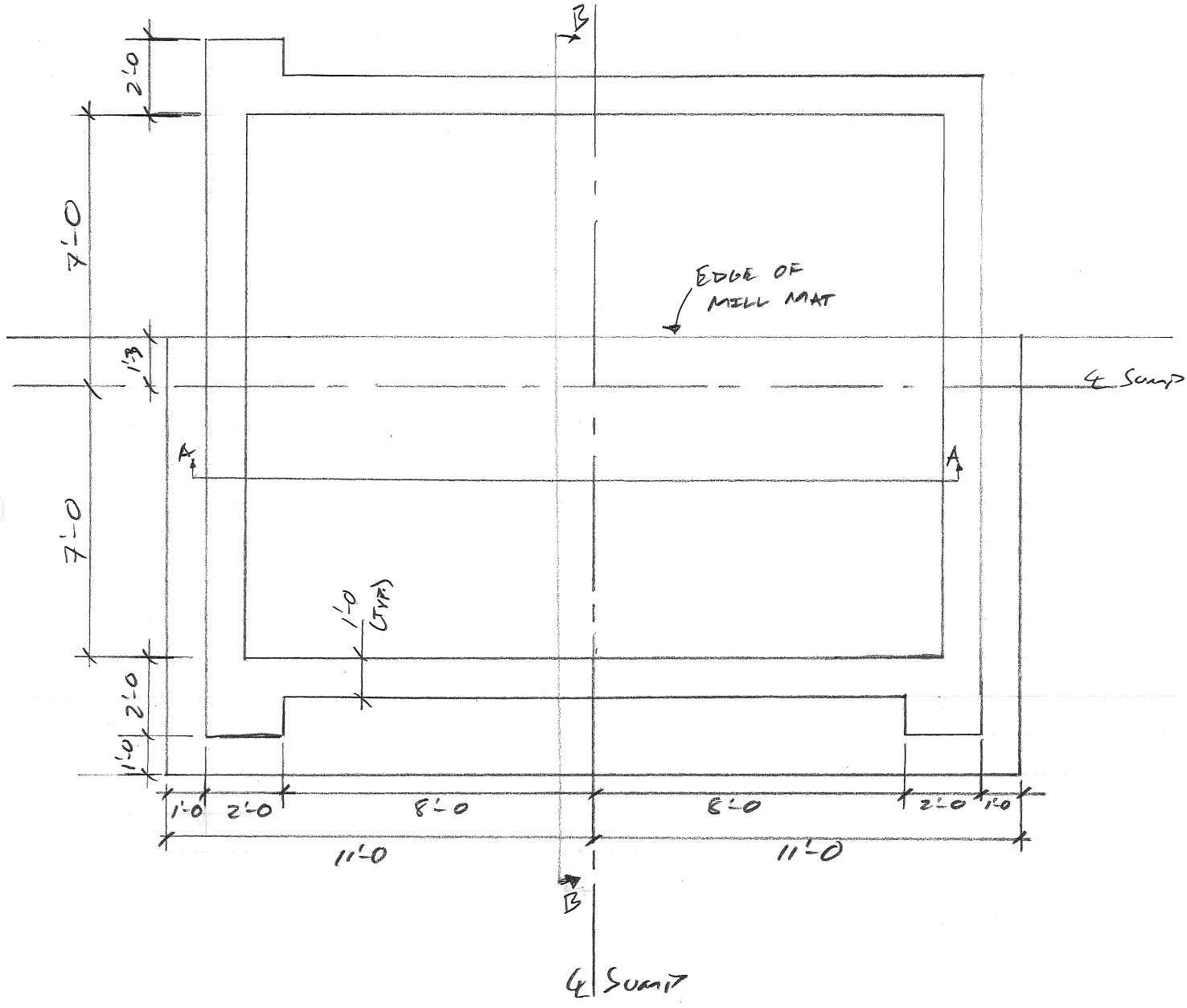
9'-0

SUMP FDN

℄ SUMP & MAT

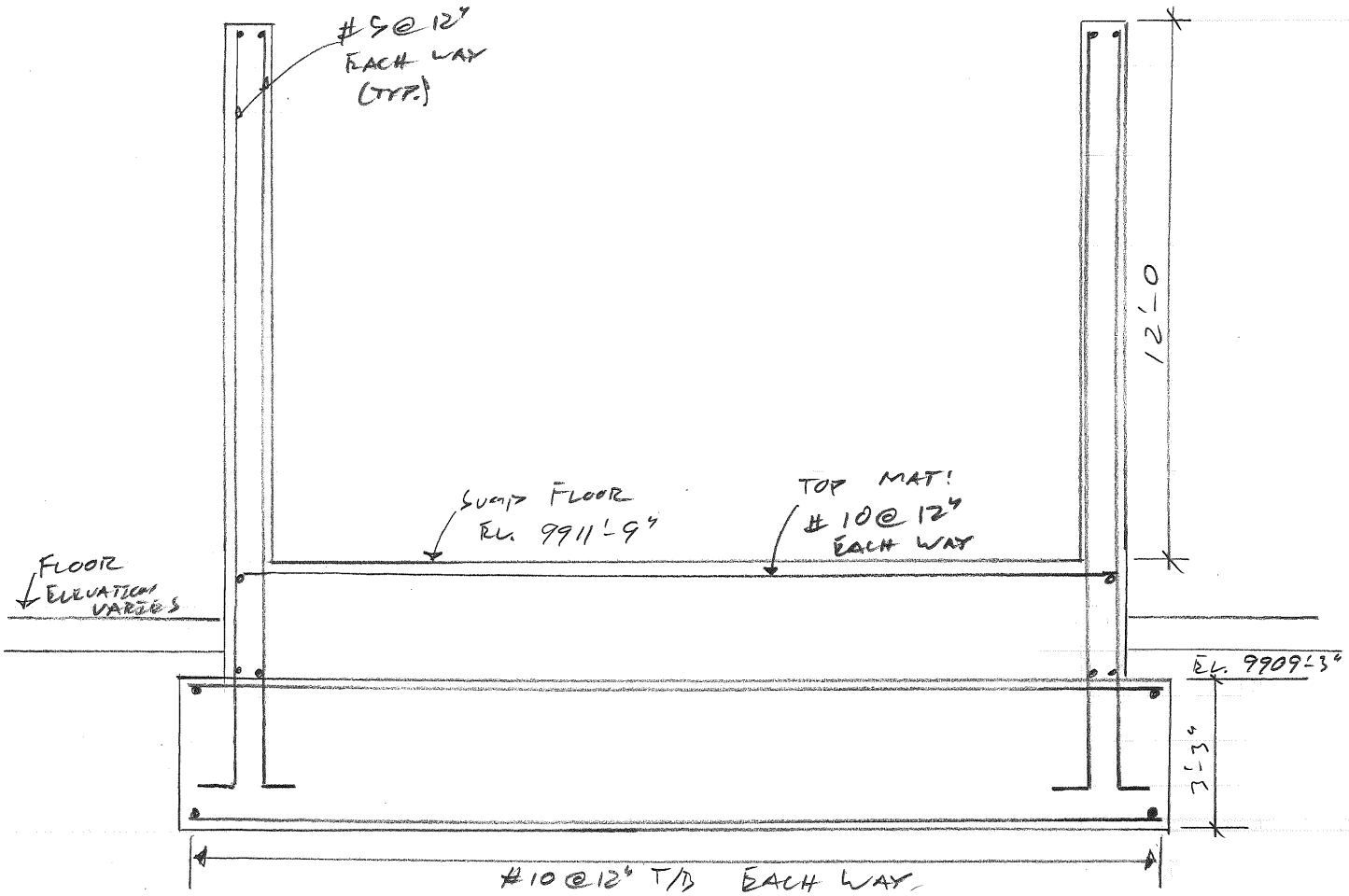
3/16" : 1'-0

FLSmidth	PROJECT CCIV High Grade Ore	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT Sump Design	BY ELS DATE 11-8-11
		CHK DATE
		SHEET OF REV

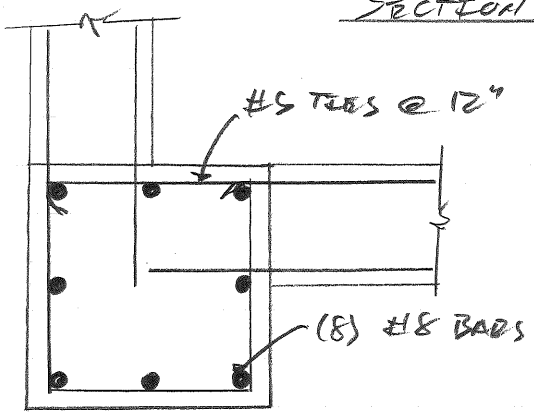


Sump - Plan

FLSmidth	PROJECT CCIV High Grade Ore	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT Sump Design	BY ECS DATE 11-8-11
		CHK DATE
		SHEET OF REV

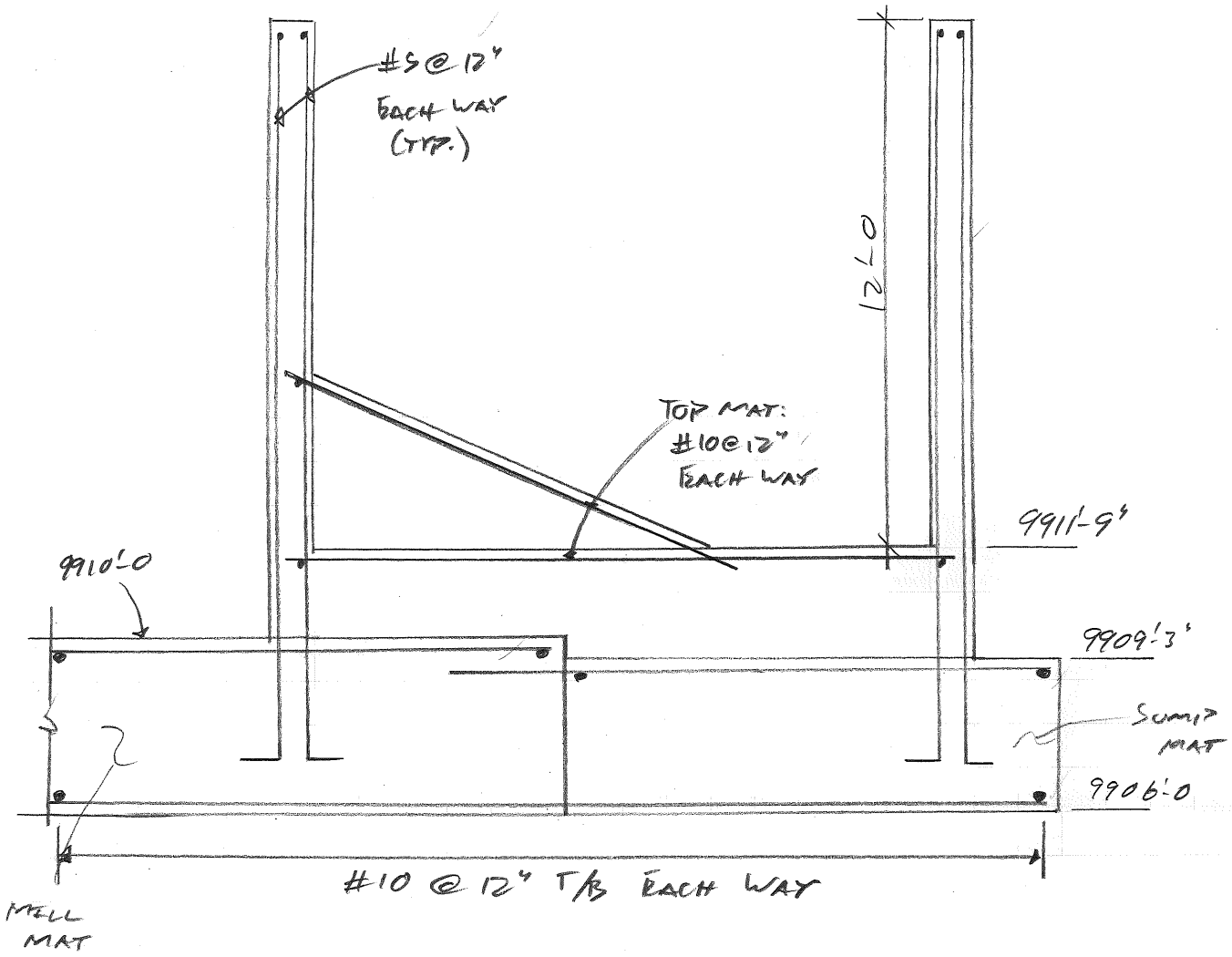


SECTION A-A



TYPICAL PEDESTAL

FLSmidth	PROJECT CCJV HIGH GRADE CORE	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT SUMP DESIGN	BY ECS DATE 11-8-11
		CHK DATE
		SHEET OF REV



SECTION B-B

Edward Summers

From: Michael Thomas
Sent: Monday, November 07, 2011 11:30 AM
To: Edward Summers
Subject: CC & V - SPECIFIC GRAVITY

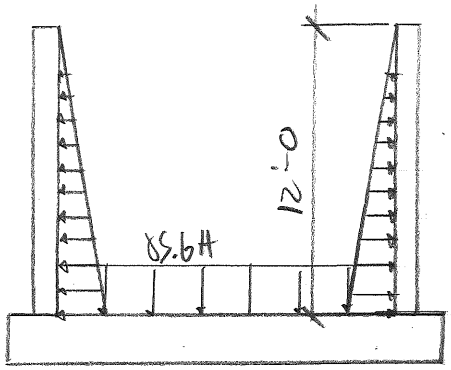
Ed
There are (3) water sources feeding the primary cyclone feed sump the specific gravity goes, 1.68 sg ball mill discharge, rod mill discharge 1.73 sg, and the primary cyclone feed 1.48 sg. If you need anything else let me know
Mike T.

FLSmidth	PROJECT CC&V HIGH GRADE ORE	PROJ NO. 11021
		CALC NO. C-005
	SUBJECT GRINDING AREA SUMP	BY ECS DATE 11-7-11
		CHK DATE
		SHEET OF REV

LOADS:

USE S.G. = 1.7

LIVE LOAD



$(\gamma)(S.G.)(H) = (62.4\ PCF)(1.7)(12'-0) = 1273\ PSF$

$= (62.4\ PCF)(1.7)(8'-0) = 850\ PSF$

SEISMIC:

SEE MATHCAD SHEET FOR SLOSHING FORCES

Primary Sump Seismic Sloshing Forces

per ACI 350.3, ASCE 7-05

Tank Properties:

$L := 18ft$	Tank Length
$B := 14ft$	Tank Width
$H := 12ft$	Height of Wall
$H_L := 12ft$	Height of Liquid
$t_w := 12in$	Wall Thickness
$SG := 1.7$	Liquid Specific Gravity
$\gamma := SG \cdot 62.4pcf = 106.08 \cdot pcf$	Liquid unit Weight
$\gamma_c := 150pcf$	Concrete unit Weight
$f_c := 4ksi$	Concrete Strength

Seismic Properties:

$S_a := 0.213$	Spectral Acceleration (% of g)
$I := 1.0$	Importance Factor
$R := 3$	Response Factor
$u_v := .043$	Vertical Acceleration (% of g)

Material Properties:

$W_L := B \cdot L \cdot H_L \cdot \gamma = 320.786 \cdot kip$ Weight of Material

$W_w := 2(B + L) \cdot t_w \cdot \gamma_c \cdot H_L = 115.2 \cdot kip$ Weight of Wall

$$W_{iL} := \frac{\tanh\left(0.866 \cdot \frac{L}{H_L}\right) \cdot W_L}{0.866 \cdot \left(\frac{L}{H_L}\right)} = 212.737 \cdot kip$$ Weight of Impulsive Material (Long Side)

$$W_{iB} := \frac{\tanh\left(0.866 \cdot \frac{B}{H_L}\right) \cdot W_L}{0.866 \cdot \left(\frac{B}{H_L}\right)} = 243.177 \cdot kip$$ Weight of Impulsive Material (Short Side)

$$W_{cL} := 0.264 \cdot \left(\frac{L}{H_L}\right) \cdot \tanh\left(3.16 \cdot \frac{H_L}{L}\right) \cdot W_L = 123.327 \cdot kip$$ Weight of Convective Material (Long Side)

$$W_{cB} := 0.264 \cdot \left(\frac{B}{H_L}\right) \cdot \tanh\left(3.16 \cdot \frac{H_L}{B}\right) \cdot W_L = 97.929 \cdot kip$$ Weight of Convective Material (Short Side)

Center of Gravity:

$h_w := \frac{H}{2} = 6 \cdot ft$ Wall Center of Gravity

$h_{iL} := 0.375 \cdot H_L = 4.5 \cdot ft$ Impulsive Center of Gravity (Long Side)

$h_{iB} := 0.5 \cdot H_L - 0.09375 \cdot B = 4.688 \cdot ft$ Impulsive Center of Gravity (Short Side)

$$h_{cL} := \left[1 - \frac{\cosh\left(3.16 \cdot \frac{H_L}{L}\right) - 1}{3.16 \cdot \left(\frac{H_L}{L}\right) \cdot \sinh\left(3.16 \cdot \frac{H_L}{L}\right)}\right] \cdot H_L = 7.539 \cdot ft$$ Convective Center of Gravity (Long Side)

$$h_{cB} := \left[1 - \frac{\cosh\left(3.16 \cdot \frac{H_L}{B}\right) - 1}{3.16 \cdot \left(\frac{H_L}{B}\right) \cdot \sinh\left(3.16 \cdot \frac{H_L}{B}\right)}\right] \cdot H_L = 8.123 \cdot ft$$ Convective Center of Gravity (Short Side)

Normal Forces: (modified per ASCE 7 15.7.7.3)

$$\varepsilon := \min\left[0.0151\left(\frac{L}{H_L}\right)^2 - 0.1908\cdot\left(\frac{L}{H_L}\right) + 1.021, 1\right] = 0.769$$ Effective Mass Coefficient

$$P_w := \frac{S_a\cdot I\cdot\varepsilon\cdot W_w}{1.4R} = 4.491\cdot kip$$ Normal Force due to Wall

$$P_{iL} := \frac{S_a\cdot I\cdot W_{iL}}{1.4R} = 10.789\cdot kip$$ Normal Force due to Impulsive (Long Side)

$$P_{iB} := \frac{S_a\cdot I\cdot W_{iB}}{1.4R} = 12.333\cdot kip$$ Normal Force due to Impulsive (Short Side)

$$P_{cL} := \frac{S_a\cdot I\cdot W_{cL}}{1.4R} = 6.254\cdot kip$$ Normal Force due to Convective (Long Side)

$$P_{cB} := \frac{S_a\cdot I\cdot W_{cB}}{1.4R} = 4.966\cdot kip$$ Normal Force due to Convective (Short Side)

$$V_L := \sqrt{\left(P_{iL} + P_w\right)^2 + P_{cL}^2} = 16.511\cdot kip$$ Total Base Shear (Long Side)

$$V_B := \sqrt{\left(P_{iB} + P_w\right)^2 + P_{cB}^2} = 17.542\cdot kip$$ Total Base Shear (Short Side)

Overturning Forces:

$$M_w := P_w\cdot h_w = 26.948\cdot kip\cdot ft$$ Bending Force due to Wall

$$M_{iL} := P_{iL}\cdot h_{iL} = 48.55\cdot kip\cdot ft$$ Bending Force due to Impulsive (Long Side)

$$M_{iB} := P_{iB}\cdot h_{iB} = 57.809\cdot kip\cdot ft$$ Bending Force due to Impulsive (Long Side)

$$M_{cL} := P_{cL}\cdot h_{cL} = 47.154\cdot kip\cdot ft$$ Bending Force due to Convective (Long Side)

$$M_{cB} := P_{cB}\cdot h_{cB} = 40.343\cdot kip\cdot ft$$ Bending Force due to Convective (Long Side)

$$M_{bL} := \sqrt{\left(M_{iL} + M_w\right)^2 + M_{cL}^2} = 89.014\cdot kip\cdot ft$$ Total Overturning Moment (Long Side)

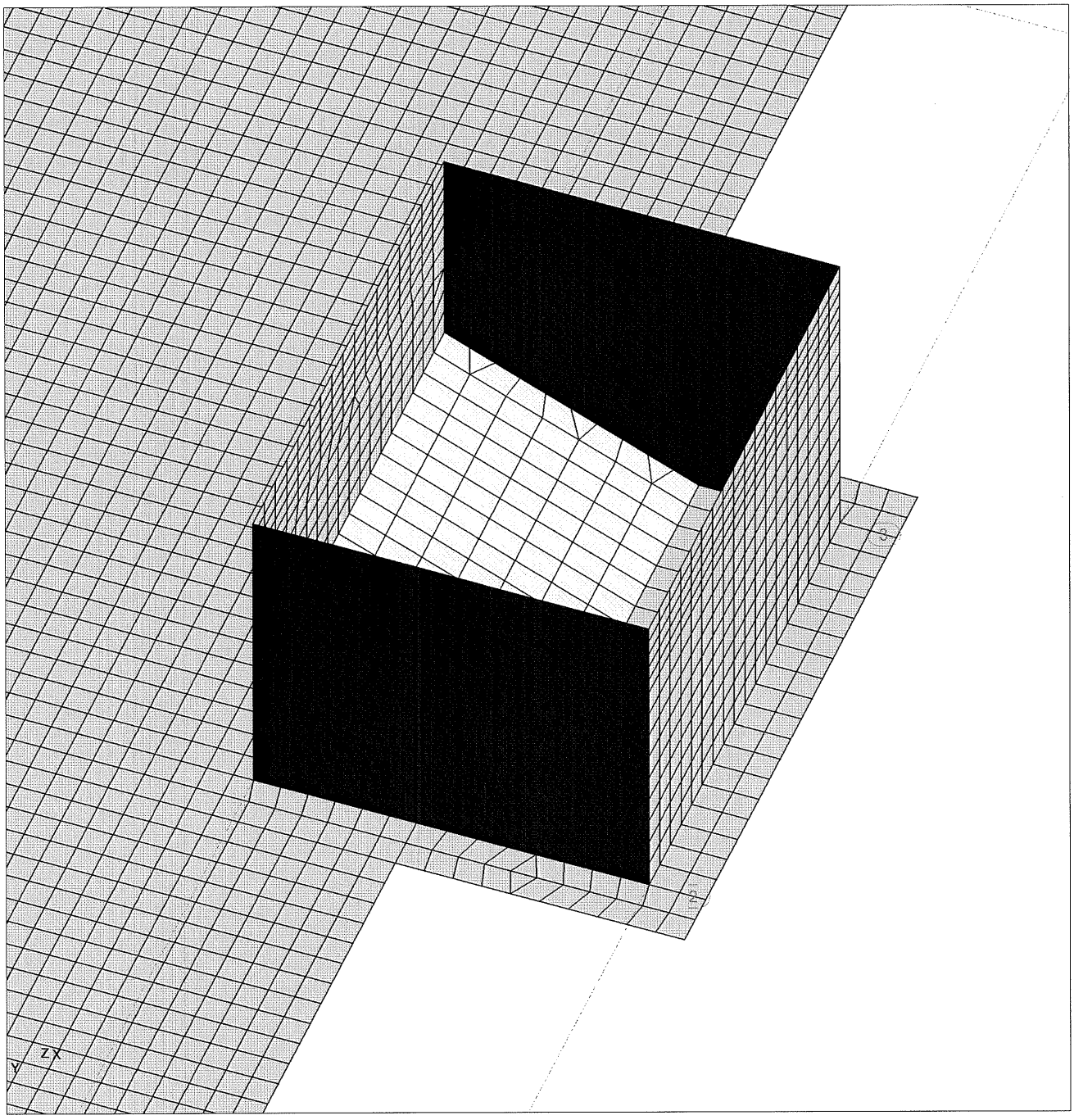
$$M_{bB} := \sqrt{\left(M_{iB} + M_w\right)^2 + M_{cB}^2} = 93.869\cdot kip\cdot ft$$ Total Overturning Moment (Long Side)

FLSmidth

7158 S. FLSmidth Drive
Midvale, UT 84047-5559

Engineer: **Ed Summmers**
Calc No..: **C-005** Job.:**11021**
Project: **Sump Rev 2**
Client: **CC&V**

View - Cases: 1 (Self Weight)



Date : 16/07/12
File: **Sump Rev 2.rtd**

FLSmidth

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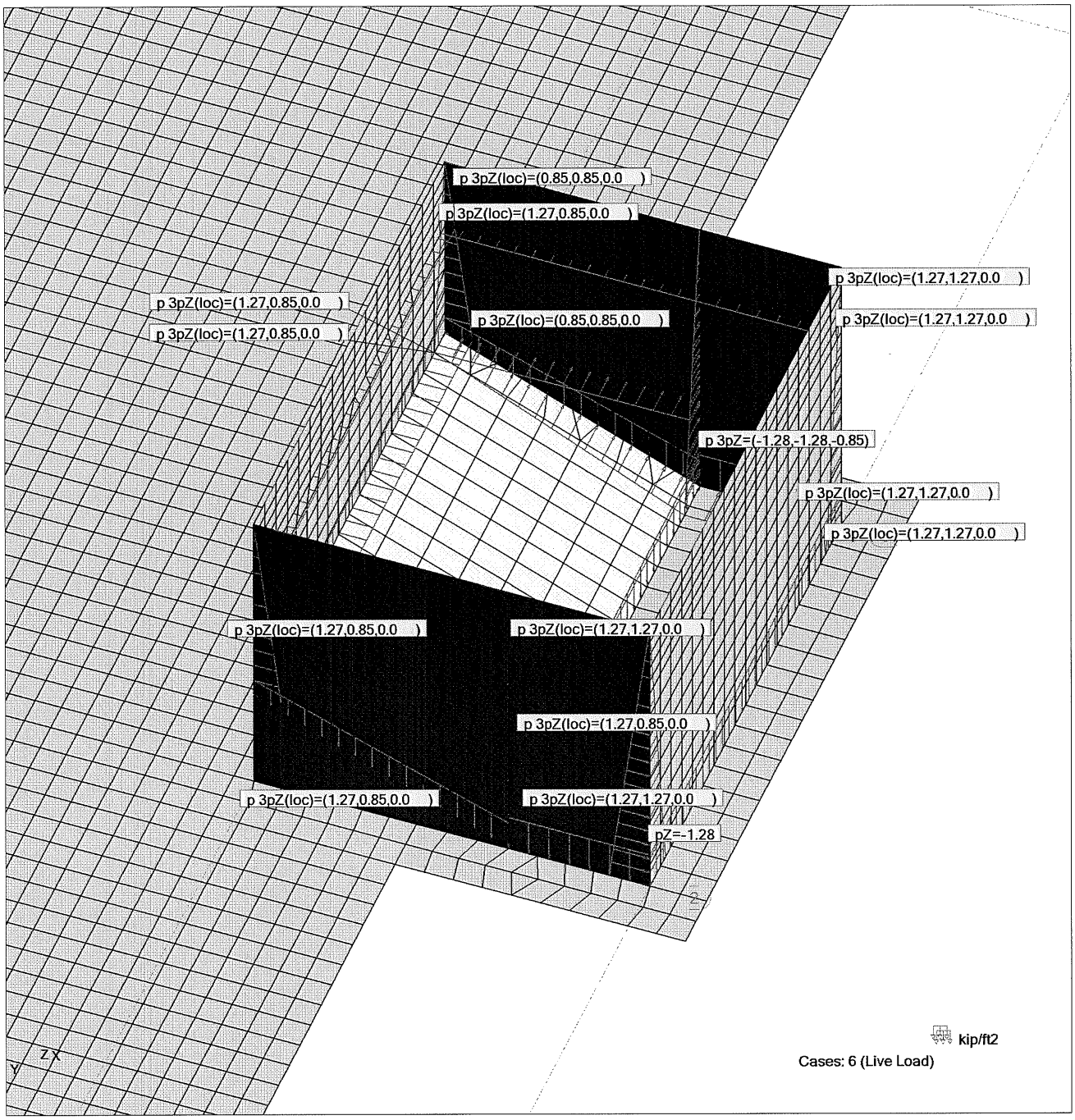
View -



FLSmidth

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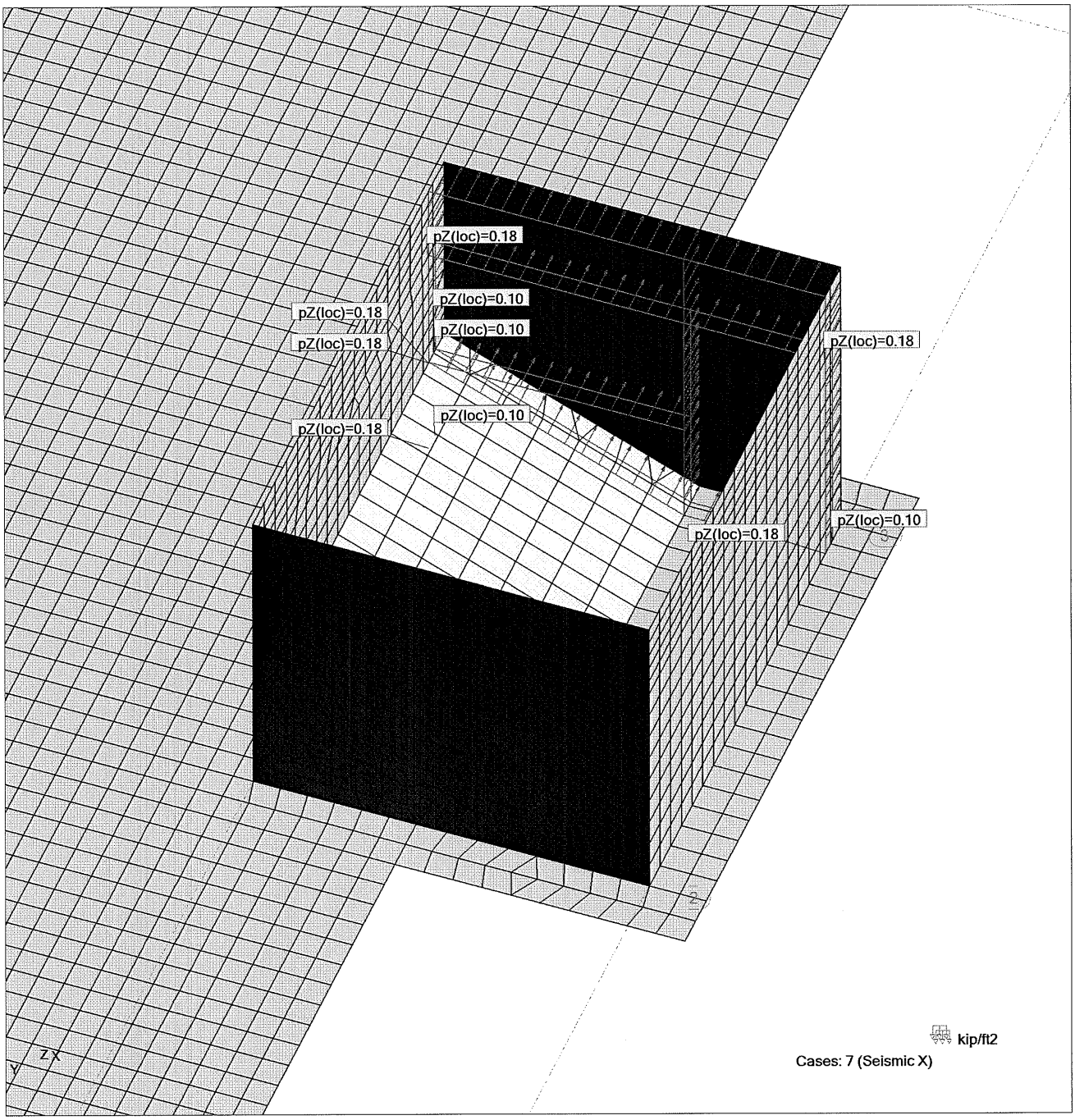
View -



FLSmidth

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Engineer: **Ed Summmers**
Calc No..: **C-005** Job.:**11021**
Project: **Sump Rev 2**
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View -