DESIMONE

Foundation Permit Submittal

Volume IV – Mid-Rise Design and Appendix

301 Mission Street
San Francisco, CA

Prepared for:

San Francisco Department of Building Inspection
1660 Mission Street 2nd Floor
San Francisco, CA 94103

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DeSimone Project #4069

May 24, 2005

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VOLUME IV - MID-RISE DESIGN AND APPENDIX

SECTION 9 – MID-RISE SUPERSTRUCTURE DESIGN

9.1 Lateral Load Resisting System

9.1.1 Shear Walls

Load - Seismic load cases control the design of the shear walls. RSA analysis results are used to obtain seismic (E) forces. These forces have been increased to account for ρ and torsion. Load combos are per UBC 1612.2.1, with equation 12-6 controlling for all walls. All shear walls except the basement perimeter walls see a significant drop of force below the ground level. This is due to the Ground to Level B4 diaphragms transferring force from the core to the perimeter. This drop in force is ignored for the below ground shear wall designs, and instead the reinforcement required above the ground is simply continued down to the mat.

Vertical Steel Design - The mid-rise has two main concrete cores, and 2 straight walls that run continuously from the mat foundation to the top of the structure. The rectangular walls on the west (both north and south) side are designed as single pieces. This methodology assumes plain section remains plain for the whole rectangular shape and is justified by looking at the shell stress distributions for the rectangular cores. On line 13 and 14 two other straight walls exist that do not run up the full height of the structure. The perimeter basement walls also act as shear walls for the structure, but there main steel is controlled by soil pressure (See basement wall sections.)

The ETABS pier definitions are set as required to extract the total force in each core and each of the two straight walls. PCA column is used to determine the quantity and placement of vertical steel.

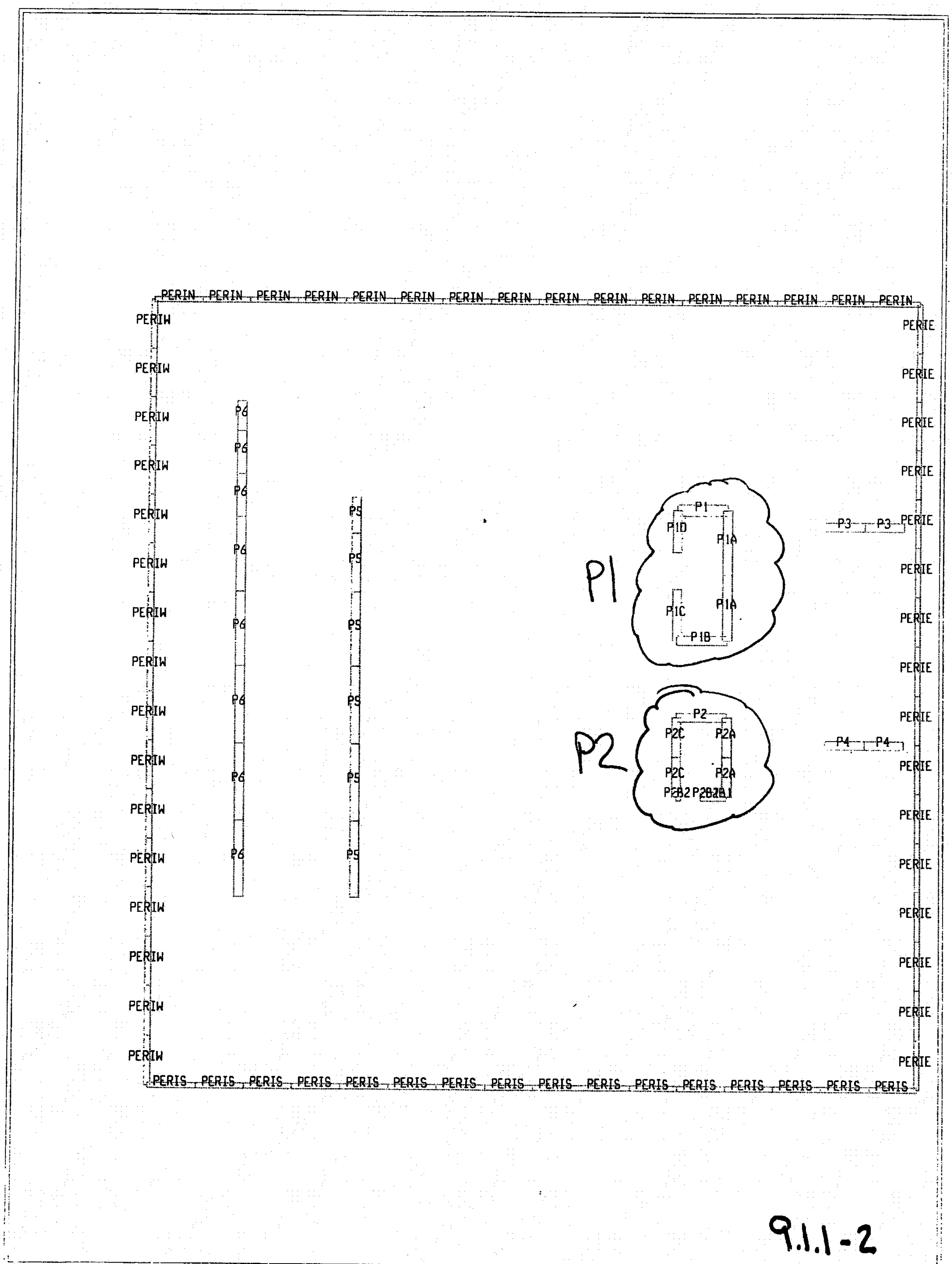
Horizontal Steel – Shear forces come directly from $V_u = V_E$ from ETABS. Pier definitions are set for each wall individually in order to extract design shears for each wall. That is, a previously defined 4-sided single core is re-defined to obtain 4 straight wall definitions. A ϕ of 0.6 was used for Foundation Permit design of the walls between mat and ground level. A more detailed calculation of flexural over-strength will be made in order to see if shear over-strength is in excess of the flexural over-strength. If so, the ϕ of 0.85 will be used. The perimeter basement walls shear reinforcing is controlled by seismic shear and the calculations are in the basement wall section of this report.

The excel spreadsheet shows calculations for the below ground walls (included in foundation permit) and above ground portion of the building (not included in foundation permit.)

Boundary Zone – UBC 1921.6.6.4 methodology was used for foundation permit boundary element length for walls from mat to ground level. 25% is the maximum length of boundary element required by code, and is what is provided at the lower floors.

The excel spreadsheet shows calculations for the below ground walls (included in foundation permit) and above ground portion of the building (not included in foundation permit.)

ETABS



ETABS v8.5.0 - File: 4069-20050413-7.05a-CD - April 14,2005 17:11
Plan View - B1 - Elevation -192 - Kip-in Units

Print Date 4/22/2005

Unit Wt.	0.150	kcf
Min trib area from group	2096	ft^2 (For Tension)
Max trib area from group	2125	ft^2 (For Compression)

dlf	dlf	dlf
1.0	1.0	1.0

P1

Floor	Usage	Flr. Ht. ft.	Elevation ft.	Width in	Length in	Min Trib A. sq. ft	Min Cum Trib A. sq. ft	Max Trib A. sq. ft	Max Cum Trib A. sq. ft	Floor DL psf	Red. LL psf	Total Link Beams Trib Length incl. Embed ft	Wt. klf	Beam DL kips	Self Wt kips	Min Total DL kips	Min Cum DL kips	Max Total DL kips	Max Cum DL kips	Cum Reducible LL kips	LL % multiplier	Cum Red. LL kips	Min Cum Service kips	Max Cum Service kips	1.42(dlf)D+0.5L Design kips	0.9*D Design kips	1.4(dlf)D+1.7L Design kips
13	Cap	12.75	141.3	98	136	955	955	1501	1501	131	20				178	303	303	374	374	19	1.00	19	322	393	541	273	556
12	Roof	12.83	128.6	136	136	1967	2922	1996	3497	189	50	8.43	0.800	7	248	626	929	632	1006	117	0.53	62	991	1068	1459	836	1514
11	Typ	10.75	115.8	136	136	1967	4890	1996	5494	150.5	50	8.43	0.800	7	207	510	1439	515	1521	216	0.46	100	1540	1621	2209	1295	2299
10	Typ	10.75	105.0	136	136	1967	6857	1996	7490	150.5	50	8.43	0.800	7	207	510	1950	515	2035	314	0.43	135	2085	2171	2958	1755	3080
9	Typ	10.75	94.3	136	136	1967	8825	1996	9486	150.5	50	8.43	0.800	7	207	510	2460	515	2550	413	0.41	169	2629	2719	3705	2214	3857
8	Typ	10.75	83.5	136	136	1967	10792	1996	11483	150.5	50	8.43	0.800	7	207	510	2970	515	3064	511	0.40	204	3174	3269	4454	2673	4638
7	Typ	10.75	72.8	136	136	1967	12759	1996	13479	150.5	50	8.43	0.800	7	207	510	3480	515	3579	609	0.40	244	3724	3823	5204	3132	5425
6	Typ	10.75	62.0	136	136	1967	14727	1996	15475	150.5	50	8.43	0.800	7	207	510	3991	515	4094	708	0.40	283	4274	4377	5955	3591	6212
5	Typ	10.75	51.3	136	136	1967	16694	1996	17472	150.5	50	8.43	0.800	7	207	510	4501	515	4608	806	0.40	322	4823	4931	6705	4051	7000
4	Typ	10.75	40.5	136	136	1967	18661	1996	19468	150.5	50	8.43	0.800	7	207	510	5011	515	5123	904	0.40	362	5373	5485	7455	4510	7787
3	Public	13.42	29.6	136	136	1967	20629	1996	21465	188	100	8.43	0.800	7	259	635	5647	641	5764	1101	0.40	440	6087	6204	8405	5082	8818
2	Public	17.33	16.3	136	136	1967	22596	1996	23461	188	100	8.43	0.800	7	334	711	6358	717	6480	1298	0.40	519	6877	7000	9462	5722	9955
1	Public	15.00	-1.0	136	136	1967	24563	1996	25457	188	100	8.43	0.800	7	289	666	7024	671	7152	1495	0.40	598	7621	7750	10455	6321	11029
B1	Parking	9.00	-16.0	136	136	1967	26531	1996	27454	155	50	8.43	0.800	7	174	485	7509	490	7642	1593	0.40	637	8146	8279	11170	6758	11782
B2	Parking	9.00	-25.0	136	136	1967	28498	1996	29450	155	50	8.43	0.800	7	174	485	7994	490	8132	1691	0.40	677	8671	8808	11885	7195	12534
B3	Parking	9.00	-34.0	136	136	1967	30466	1996	31446	155	50	8.43	0.800	7	174	485	8480	490	8621	1790	0.40	716	9196	9337	12600	7632	13287
B4	Parking	9.00	-43.0	136	136	1967	32433	1996	33443	155	50	8.43	0.800	7	174	485	8965	490	9111	1888	0.40	755	9720	9866	13316	8068	14040
Base		0.00	-52.0																								
														108	3662												

9.1.1-3

Print Date 4/22/2005

Unit Wt.	0.150	kcf
Min trib area from group	1450	ft^2 (For Tension)
Max trib area from group	1570	ft^2 (For Compression)

dif	dif	dif
1.0	1.0	1.0

P2

Floor	Usage	Flr. Ht. ft.	Elevation ft.	Width in	Length in	Min Trib A. sq. ft	Min Cum Trib A. sq. ft	Max Trib A. sq. ft	Max Cum Trib A. sq. ft	Floor DL psf	Red. LL ib psf	Total Link Beams Length incl. Embed ft	Wt. klf	Self Wt kips
13	Cap	12.75	141.3	122	122	621	621	1073	1073	141	20	5	0.800	199
12	Roof	12.83	128.6	129	129	1334	1955	1454	2528	189	50	0	0.800	223
11	Typ	10.75	115.8	122	122	1346	3301	1466	3993	150.5	50	5	0.800	168
10	Typ	10.75	105.0	122	122	1346	4647	1466	5459	150.5	50	5	0.800	168
9	Typ	10.75	94.3	122	122	1346	5993	1466	6925	150.5	50	5	0.800	168
8	Typ	10.75	83.5	122	122	1346	7339	1466	8391	150.5	50	5	0.800	168
7	Typ	10.75	72.8	122	122	1346	8685	1466	9857	150.5	50	5	0.800	168
6	Typ	10.75	62.0	122	122	1346	10031	1466	11323	150.5	50	5	0.800	168
5	Typ	10.75	51.3	122	122	1346	11377	1466	12789	150.5	50	5	0.800	168
4	Typ	10.75	40.5	122	122	1346	12723	1466	14255	150.5	50	5	0.800	168
3	Public	13.42	29.8	122	122	1346	14069	1466	15721	188	50	5	0.800	209
2	Public	17.33	16.3	122	122	1346	15415	1466	17187	188	100	5	0.800	271
1	Public	15.00	-1.0	122	122	1346	16761	1466	18653	188	100	5	0.800	234
B1	Parking	9.00	-16.0	122	122	1346	18107	1466	20119	155	50	5	0.800	140
B2	Parking	9.00	-25.0	122	122	1346	19453	1466	21585	155	50	5	0.800	140
B3	Parking	9.00	-34.0	122	122	1346	20798	1466	23051	155	50	5	0.800	140
B4	Parking	9.00	-43.0	122	122	1346	22144	1466	24517	155	50	5	0.800	140
Base		0.00	-52.0											
														3040

Floor	Min Total DL kips	Min Cum DL kips	Max Total DL kips	Max Cum DL kips	Cum Reducible LL kips	LL % multiplier	Cum Red. LL kips	Min Cum Service kips	Max Cum Service kips	1.42(dif)D+0.5L Design kips	0.9*D Design kips	1.4(dif)D+1.7L Design kips
13	291	291	354	354	12	1.00	12	303	367	509	261	517
12	475	766	498	852	79	0.59	47	812	899	1234	689	1272
11	374	1140	392	1245	146	0.51	75	1215	1320	1805	1026	1870
10	374	1514	392	1637	214	0.47	100	1615	1738	2375	1363	2463
9	374	1889	392	2029	281	0.44	125	2014	2154	2944	1700	3053
8	374	2263	392	2422	348	0.43	148	2411	2570	3513	2037	3642
7	374	2637	392	2814	416	0.41	171	2808	2985	4082	2374	4230
6	374	3012	392	3207	483	0.40	193	3205	3400	4650	2711	4818
5	374	3386	392	3599	550	0.40	220	3606	3819	5221	3048	5413
4	374	3760	392	3991	618	0.40	247	4007	4238	5791	3384	6008
3	466	4227	489	4480	685	0.40	274	4501	4754	6499	3804	6738
2	528	4754	550	5031	819	0.40	328	5082	5358	7307	4279	7600
1	491	5246	514	5544	954	0.40	382	5627	5926	8064	4721	8411
B1	353	5599	372	5916	1021	0.40	409	6007	6324	8605	5039	8977
B2	353	5952	372	6288	1089	0.40	435	6387	6723	9146	5357	9543
B3	353	6305	372	6659	1156	0.40	462	6767	7122	9687	5674	10109
B4	353	6658	372	7031	1223	0.40	489	7147	7520	10229	5992	10675

9.1.1-4

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Unit Wt.	0.150	kcf
Min trib area from group	Varies	ft^2 (For Tension)
Max trib area from group	Varies	ft^2 (For Compression)

dlf	dlf	dlf
1.0	1.0	1.0

P3 and P4

Floor	Usage	Flr. Ht. ft.	Elevation ft.	Width in	Length in	Min Trib A. sq. ft	Min Cum Trib A. sq. ft	Max Trib A. sq. ft	Max Cum Trib A. sq. ft	Floor DL psf	Red. LL psf	Total Link Beams Trib Length incl. Embed ft	Wt. klf	Beam DL kips	Self Wt kips	Min Total DL kips	Min Cum DL kips	Max Total DL kips	Max Cum DL kips	Cum Reducible LL kips	LL % multiplier	Cum Red. LL kips	Min Cum Service kips	Max Cum Service kips	1.42(dlf)D+0.5L Design kips	0.9*D Design kips	1.4(dlf)D+1.7L Design kips
13	Cap	12.75	141.3	0	0	0	0	0	0	136	20	0	0.000	0	0	0	0	0	0	0	1.00	0	0	0	0	0	0
12	Roof	12.83	128.6	24	189	457	457	710	710	189	50	0	0.000	0	60	147	147	195	195	23	0.95	22	169	216	287	132	310
11	Typ	10.75	115.8	24	210	453	910	707	1417	150.5	50	0	0.000	0	56	125	271	163	358	45	0.75	34	305	392	525	244	558
10	Typ	10.75	105.0	24	210	453	1363	707	2124	150.5	50	0	0.000	0	56	125	396	163	520	68	0.66	45	441	565	761	356	805
9	Typ	10.75	94.3	24	210	453	1816	707	2831	150.5	50	0	0.000	0	56	125	521	163	683	91	0.60	55	575	738	998	469	1049
8	Typ	10.75	83.5	24	210	453	2269	707	3538	150.5	50	0	0.000	0	56	125	645	163	846	113	0.56	64	709	910	1233	581	1293
7	Typ	10.75	72.8	24	210	453	2722	707	4245	150.5	50	0	0.000	0	56	125	770	163	1009	136	0.54	73	843	1082	1469	693	1537
6	Typ	10.75	62.0	24	210	453	3175	707	4952	150.5	50	0	0.000	0	56	125	894	163	1172	159	0.52	82	976	1254	1705	805	1780
5	Typ	10.75	51.3	24	210	453	3628	707	5659	150.5	50	0	0.000	0	56	125	1019	163	1335	181	0.50	91	1110	1425	1940	917	2022
4	Typ	10.75	40.5	24	210	453	4081	707	6366	150.5	50	0	0.000	0	56	125	1144	163	1497	204	0.48	99	1243	1596	2176	1029	2264
3	Public	13.42	29.8	24	210	453	4534	707	7073	188	50	0	0.000	0	70	156	1299	203	1701	227	0.47	107	1406	1808	2469	1169	2563
2	Public	17.33	16.3	24	210	453	4987	707	7779	188	100	0	0.000	0	91	176	1475	224	1925	272	0.46	126	1601	2050	2796	1328	2908
1	Public	15.00	-1.0	24	210	404	5391	564	8343	188	100	0	0.000	0	79	155	1630	185	2109	312	0.45	142	1772	2251	3066	1467	3194
B1	Parking	9.00	-16.0	24	210	404	5795	564	8907	155	50	0	0.000	0	47	110	1740	135	2244	333	0.45	149	1889	2393	3261	1566	3394
B2	Parking	9.00	-25.0	24	210	404	6200	564	9471	155	50	0	0.000	0	47	110	1850	135	2379	353	0.44	155	2006	2534	3456	1665	3594
B3	Parking	9.00	-34.0	24	210	404	6604	564	10035	155	50	0	0.000	0	47	110	1960	135	2513	373	0.43	162	2122	2676	3650	1764	3794
B4	Parking	9.00	-43.0	24	210	404	7009	564	10599	155	50	0	0.000	0	47	110	2070	135	2648	393	0.43	169	2239	2817	3845	1863	3994
Base		0.00	-52.0																								
														0	941												

9.1.1-5

DODSONNOC00000583

Unit Wt.	0.150	kcf
Min trib area from group	Varies	ft^2 (For Tension)
Max trib area from group	Varies	ft^2 (For Compression)

dlf	dlf	dlf
1.0	1.0	1.0

P5

Floor	Usage	Flr. Ht. ft.	Elevation ft.	Width in	Length in	Min Trib A. sq. ft	Min Cum Trib A. sq. ft	Max Trib A. sq. ft	Max Cum Trib A. sq. ft	Floor DL psf	Red. LL psf	Total Link Beams Trib Length incl. Embed ft	Wt. klf	Beam DL kips	Self Wt kips	Min Total DL kips	Min Cum DL kips	Max Total DL kips	Max Cum DL kips	Cum Reducible LL kips	LL % multiplier	Cum Red. LL kips	Min Cum Service kips	Max Cum Service kips	1.42(dlf)D+0.5L Design kips	0.9*D Design kips	1.4(dlf)D+1.7L Design kips
13	Cap	12.75	141.3	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	1.00	0	0	0	0	0	0
12	Roof	12.83	128.6	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
11	Typ	10.75	115.8	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
10	Typ	10.75	105.0	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
9	Typ	10.75	94.3	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
8	Typ	10.75	83.5	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
7	Typ	10.75	72.8	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
6	Typ	10.75	62.0	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
5	Typ	10.75	51.3	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
4	Typ	10.75	40.5	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
3	Public	13.42	29.8	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
2	Public	17.33	16.3	24	645	1864	1864	3129	3129	347	100	0	0.000	0	280	926	926	1365	1365	186	0.60	111	1037	1476	1994	834	2100
1	Public	15.00	-1.0	24	983	1807	3671	3072	6201	200	100	0	0.000	0	369	730	1656	983	2348	367	0.50	183	1839	2531	3426	1491	3598
B1	Parking	9.00	-16.0	24	1080	1791	5462	3056	9257	155	50	0	0.000	0	243	521	2177	717	3065	457	0.45	207	2384	3272	4455	1959	4642
B2	Parking	9.00	-25.0	24	1080	1791	7253	3056	12313	155	50	0	0.000	0	243	521	2697	717	3782	546	0.43	233	2930	4014	5486	2428	5690
B3	Parking	9.00	-34.0	24	1080	1791	9044	3056	15369	155	50	0	0.000	0	243	521	3218	717	4498	636	0.41	259	3477	4757	6517	2896	6738
B4	Parking	9.00	-43.0	24	1080	1791	10835	3056	18425	155	50	0	0.000	0	243	521	3739	717	5215	725	0.40	290	4029	5505	7550	3365	7794
Base		0.00	-52.0																								
														0	1620												

9.1.1-6

Print Date 4/22/2005

Unit Wt.	0.150	kcf
Min trib area from group	Varies	ft^2 (For Tension)
Max trib area from group	Varies	ft^2 (For Compression)

Note walls, P6A and P6B have been combined at level 2: Use the ratios that follow when individual loads are needed:

P6B	366	36%
P6A	645	64%

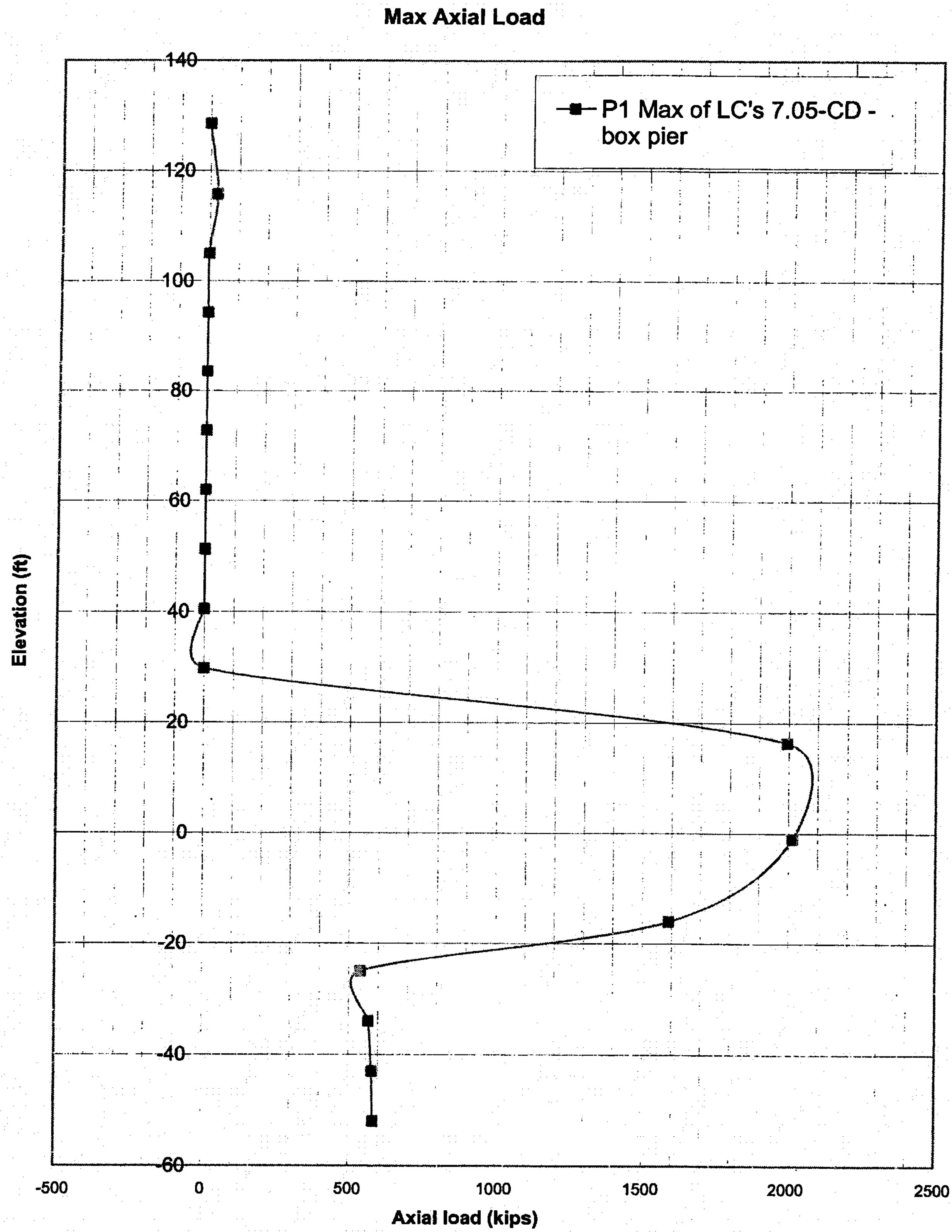
dlf	dlf	dlf
1.0	1.0	1.0

P6

Floor	Usage	Flr. Ht. ft.	Elevation ft.	Width in	Length in	Min Trib A. sq. ft	Min Cum Trib A. sq. ft	Max Trib A. sq. ft	Max Cum Trib A. sq. ft	Floor DL psf	Red. LL psf	Total Link Beams Trib Length incl. Embed ft	Wt. klf	Beam DL kips	Self Wt kips	Min Total DL kips	Min Cum DL kips	Max Total DL kips	Max Cum DL kips	Cum Reducible LL kips	LL % multiplier	Cum Red. LL kips	Min Cum Service kips	Max Cum Service kips	1.42(dlf)D+0.5L Design kips	0.9*D Design kips	1.4(dlf)D+1.7L Design kips
13	Cap	12.75	141.3	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	1.00	0	0	0	0	0	0
12	Roof	12.83	128.6	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
11	Typ	10.75	115.8	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
10	Typ	10.75	105.0	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
9	Typ	10.75	94.3	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
8	Typ	10.75	83.5	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
7	Typ	10.75	72.8	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
8	Typ	10.75	62.0	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
5	Typ	10.75	51.3	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
4	Typ	10.75	40.5	0	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!
3	Public	13.42	29.8	24	366	669	669	1163	1163	250	100	0	0.000	0	123	290	290	414	414	67	0.83	56	346	469	615	261	673
2	Public	17.33	16.3	24	1011	1301	1970	2281	3444	200	100	0	0.000	0	438	698	988	894	1308	197	0.59	116	1104	1424	1915	889	2028
1	Public	15.00	-1.0	24	1392	1879	3848	3286	6729	200	100	0	0.000	0	522	898	1886	1179	2487	385	0.49	189	2075	2676	3626	1697	3803
B1	Parking	9.00	-16.0	24	1341	1817	5665	3178	9907	155	50	0	0.000	0	302	583	2469	794	3281	476	0.45	214	2683	3495	4766	2222	4957
B2	Parking	9.00	-25.0	24	1341	1817	7483	3178	13085	155	50	0	0.000	0	302	583	3053	794	4075	567	0.42	240	3293	4315	5907	2747	6113
B3	Parking	9.00	-34.0	24	1341	1817	9300	3178	16262	155	50	0	0.000	0	302	583	3636	794	4870	657	0.41	267	3903	5136	7048	3272	7271
B4	Parking	9.00	-43.0	24	1341	1817	11117	3178	19440	155	50	0	0.000	0	302	583	4220	794	5664	748	0.40	299	4519	5963	8192	3798	8438
Base		0.00	-52.0																								
														0	2290												

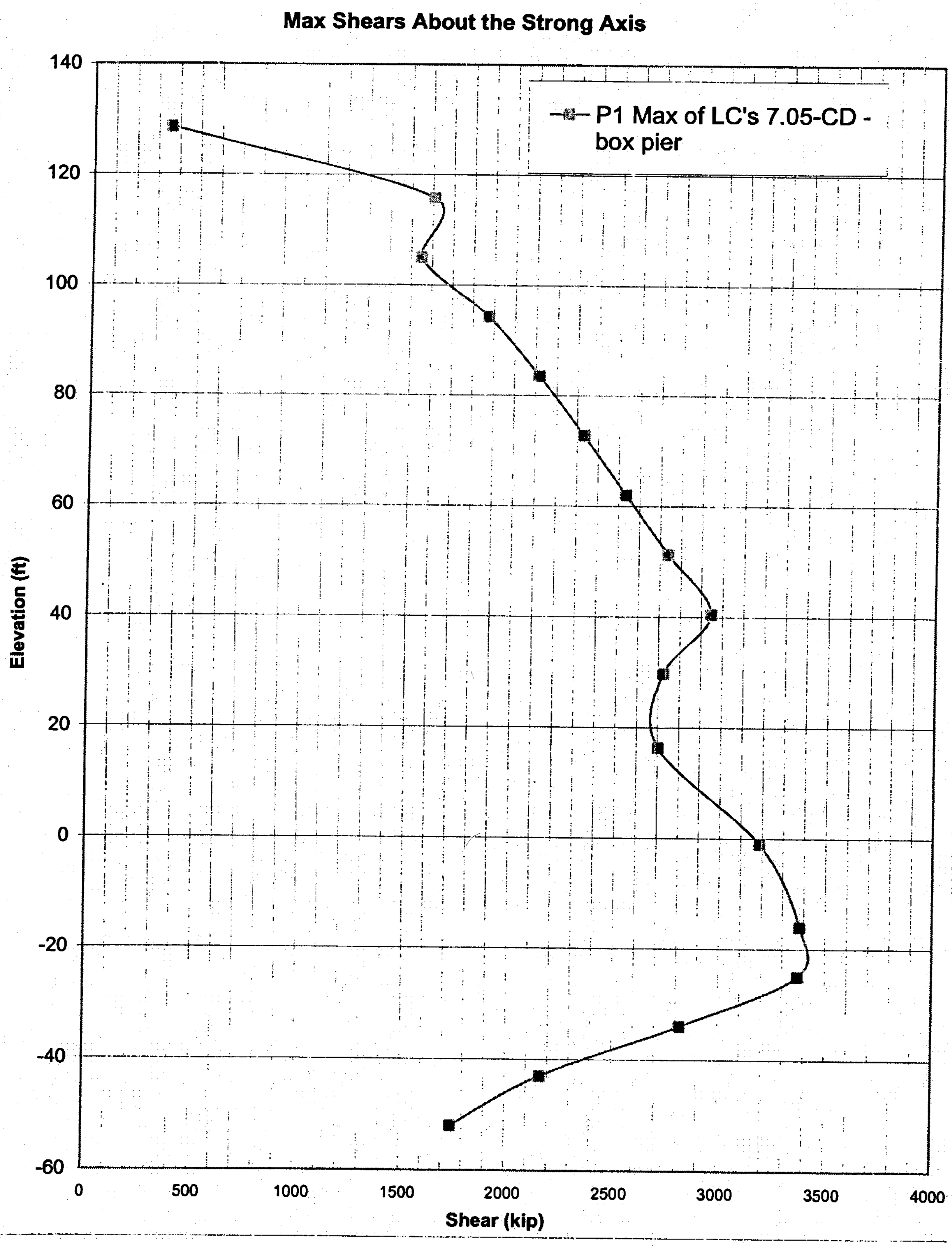
9.1.1-7

DODSONNOC00000585


Max Axial Load
P1 Max of LC's 7.05-CD - box pier
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
-500
0
500
1000
1500
2000
2500
Axial load (kips)

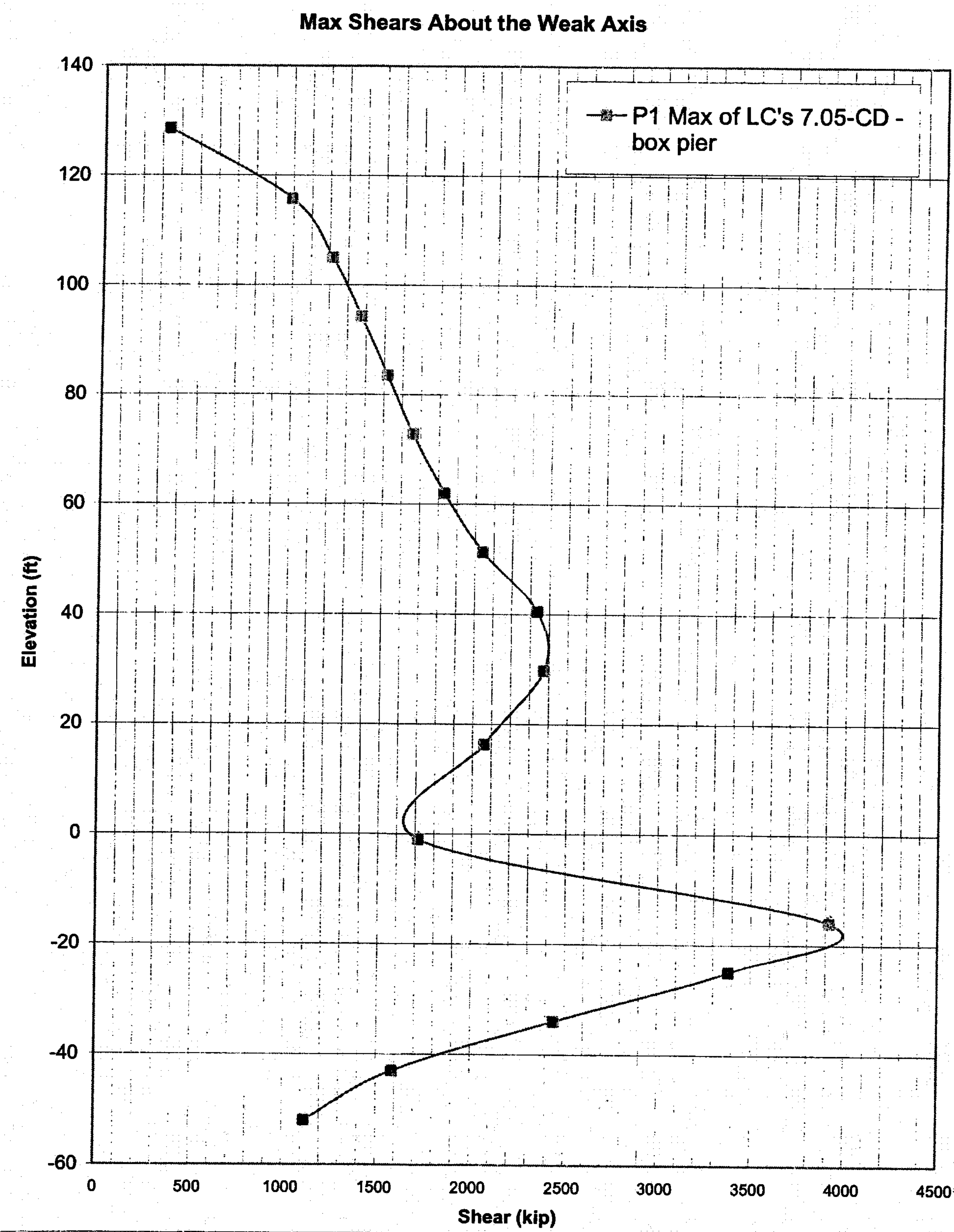
9.1.1-8

Print Date 4/15/2005

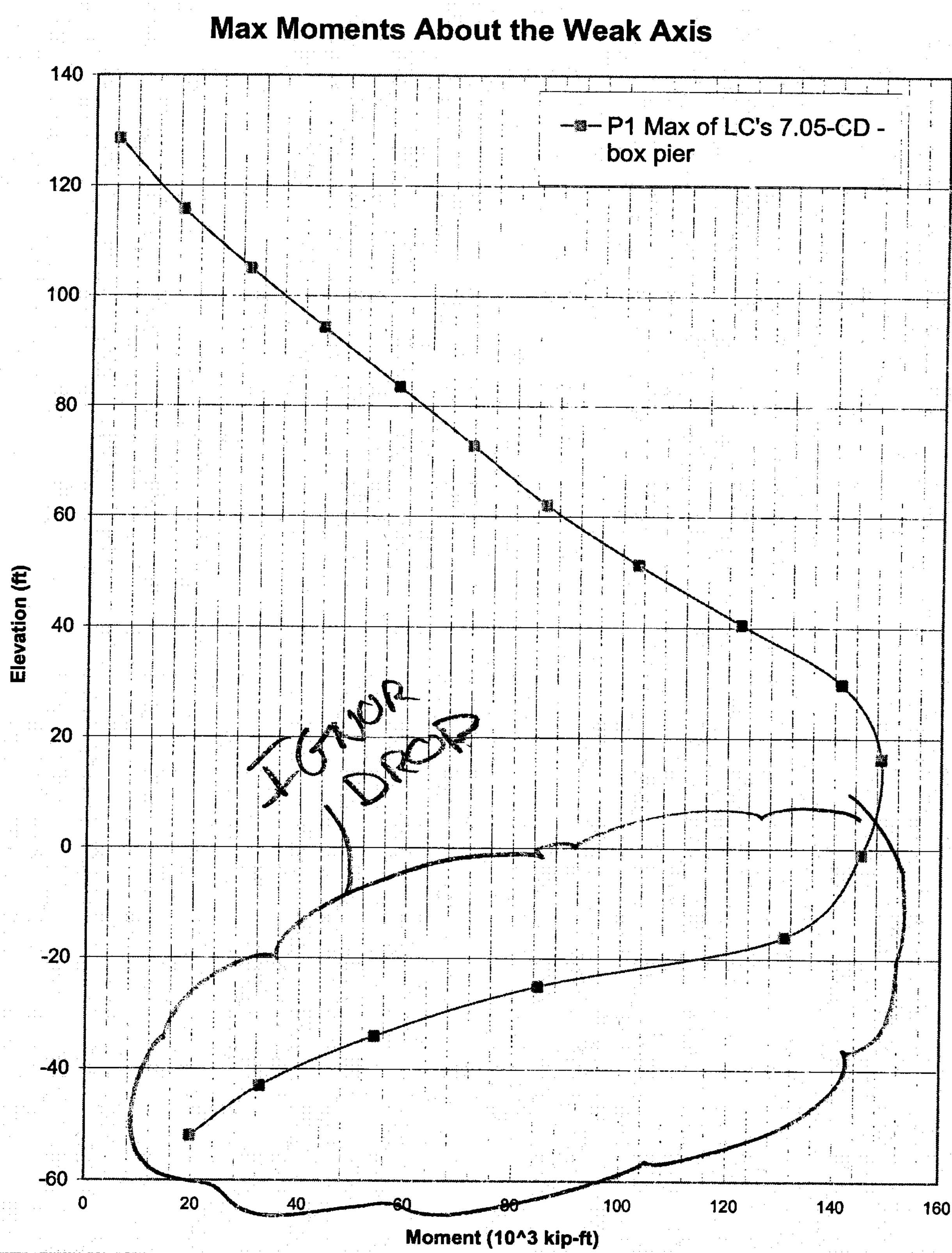


9.1.1-9

DODSONNOC00000587


Max Shears About the Weak Axis
P1 Max of LC's 7.05-CD - box pier
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Shear (kip)

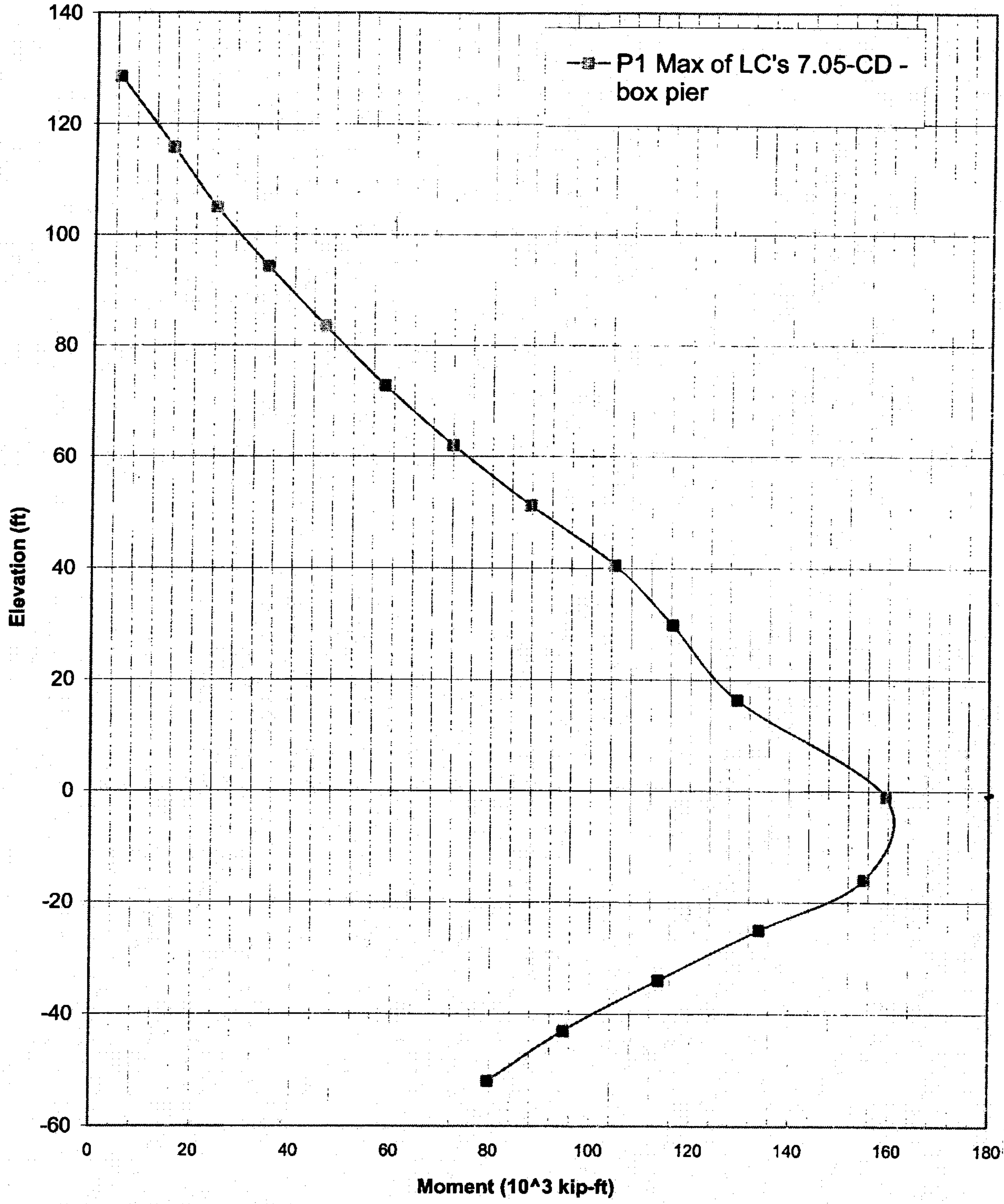
9.1.1-10


Max Moments About the Weak Axis
P1 Max of LC's 7.05-CD - box pier
Elevation (ft)
Moment (10^3 kip-ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
20
40
60
80
100
120
140
160
IGNOR DROP

9.1.1-11

Print Date 4/15/2005

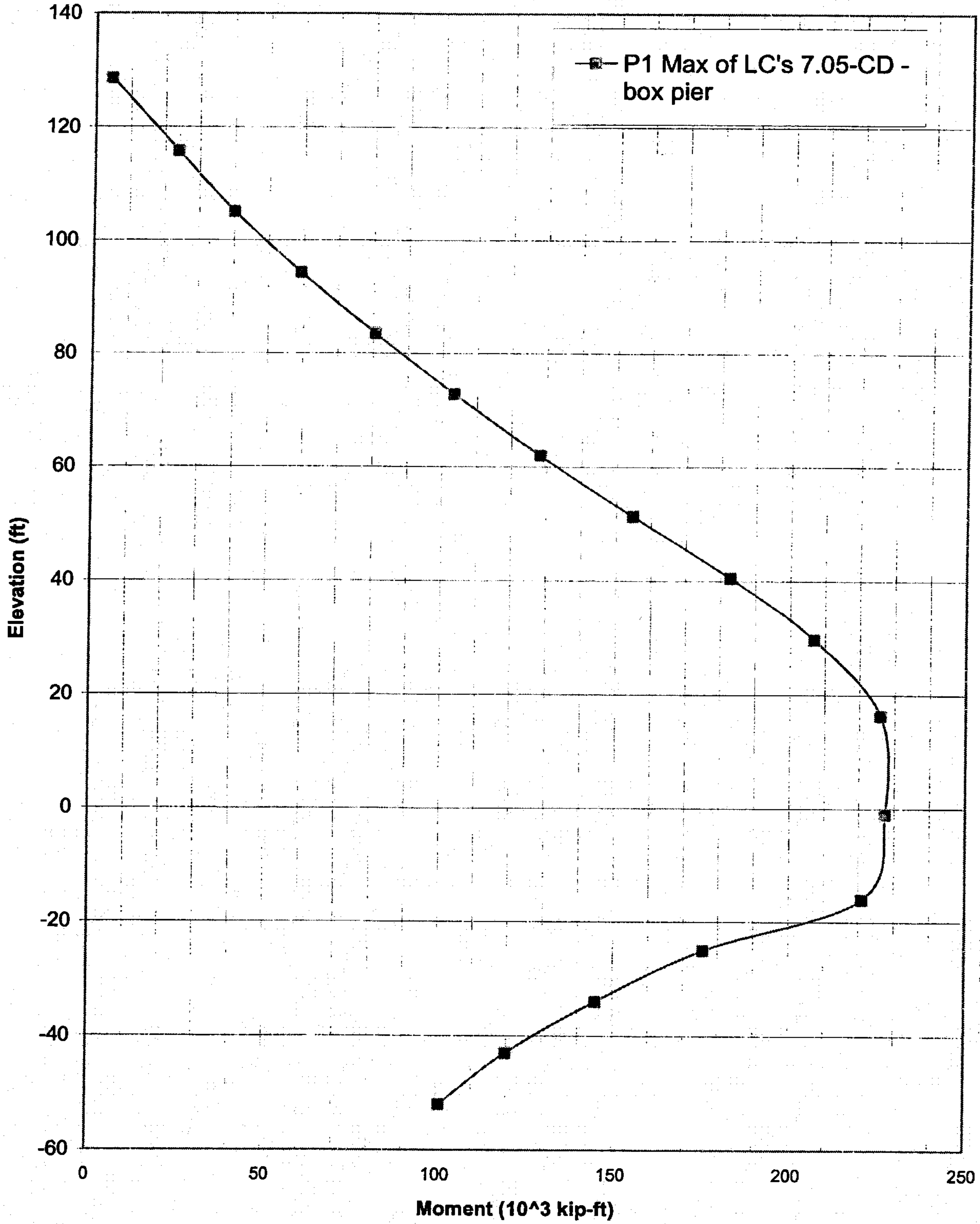
Strong Axis Moments Associated with Max Weak Axis Moments



9.1.1 - 12

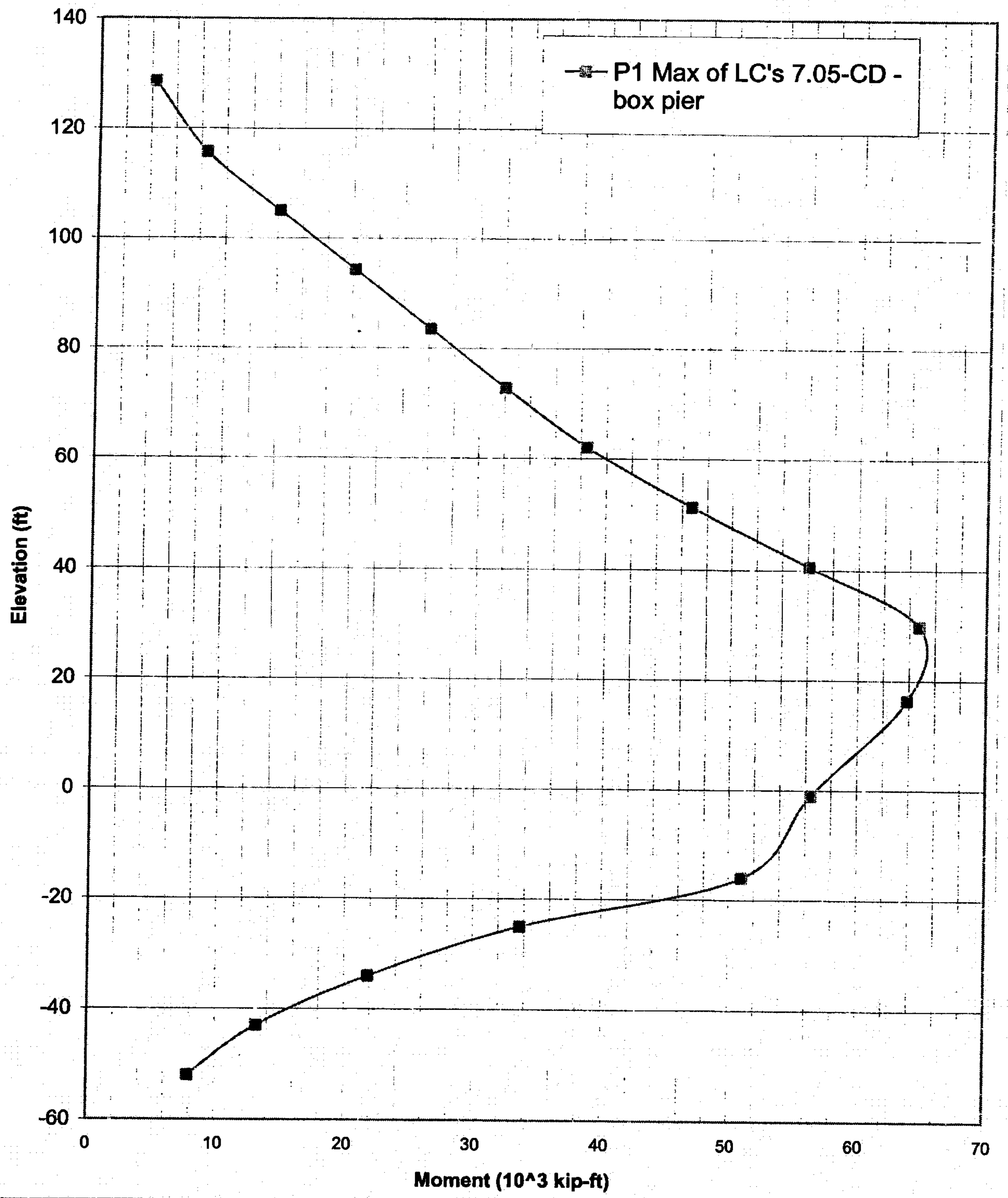
DODSONNOC00000590

Max Moments About the Strong Axis

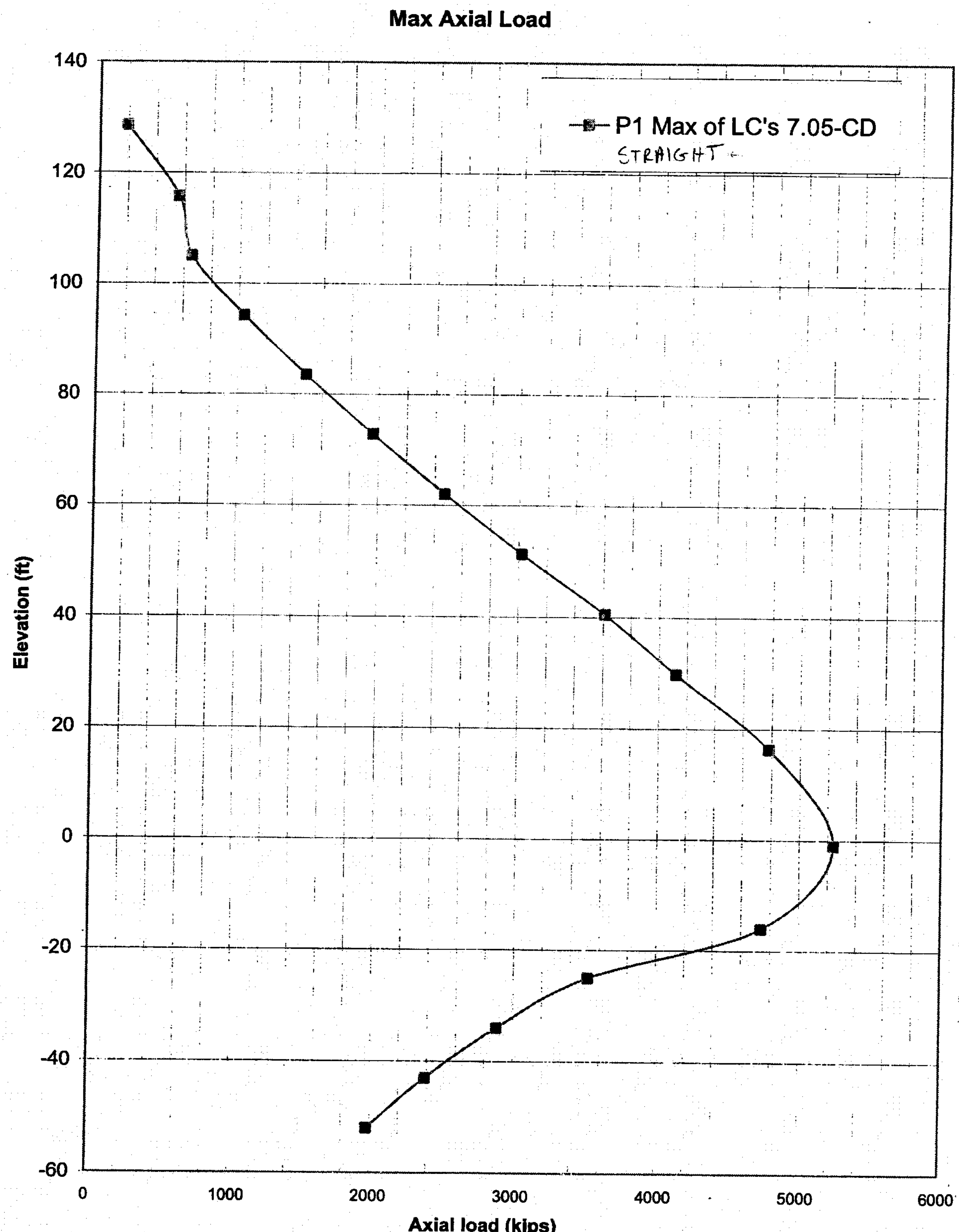


9.1.1-B

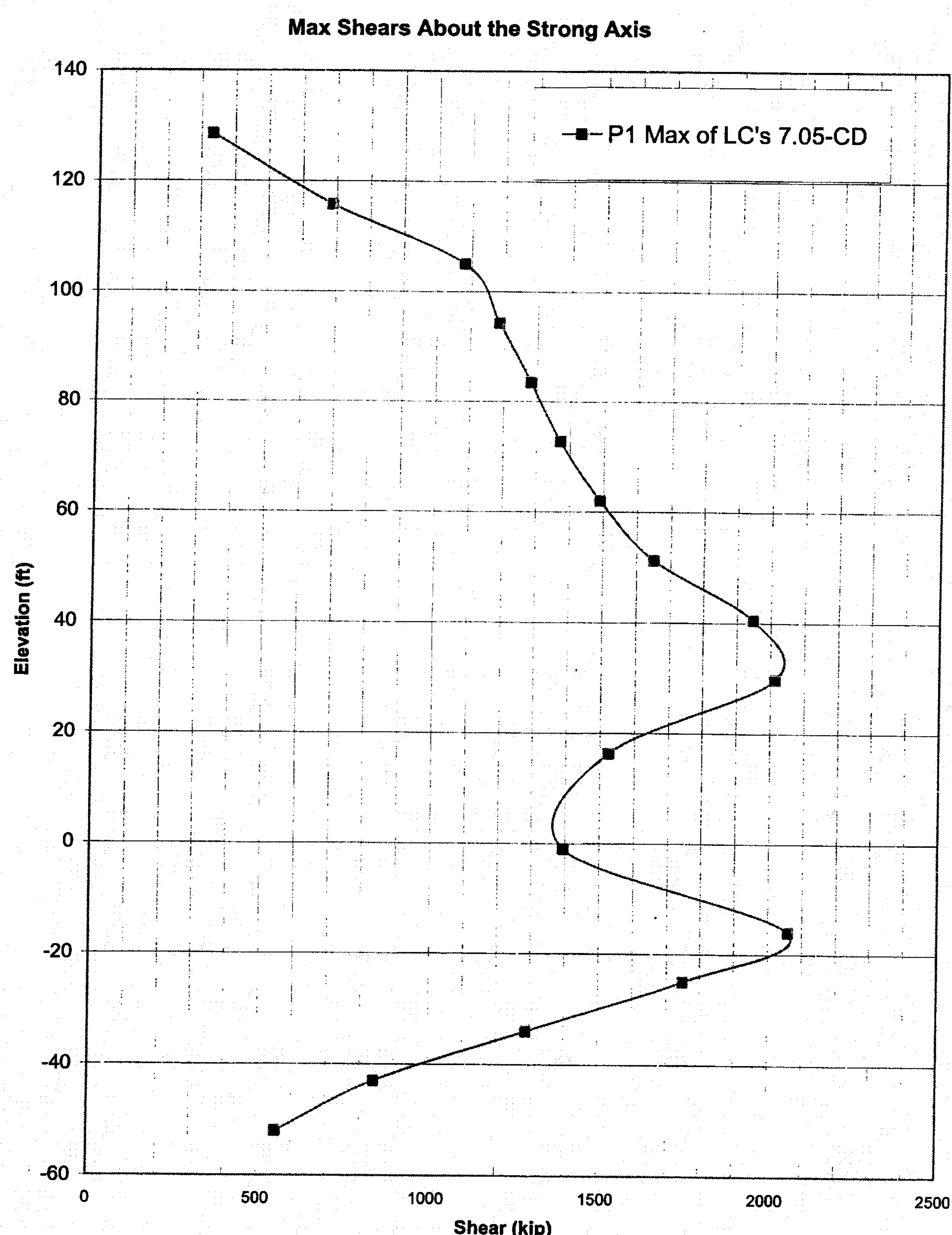
Weak Axis Moments Associated with Max Strong Axis Moments



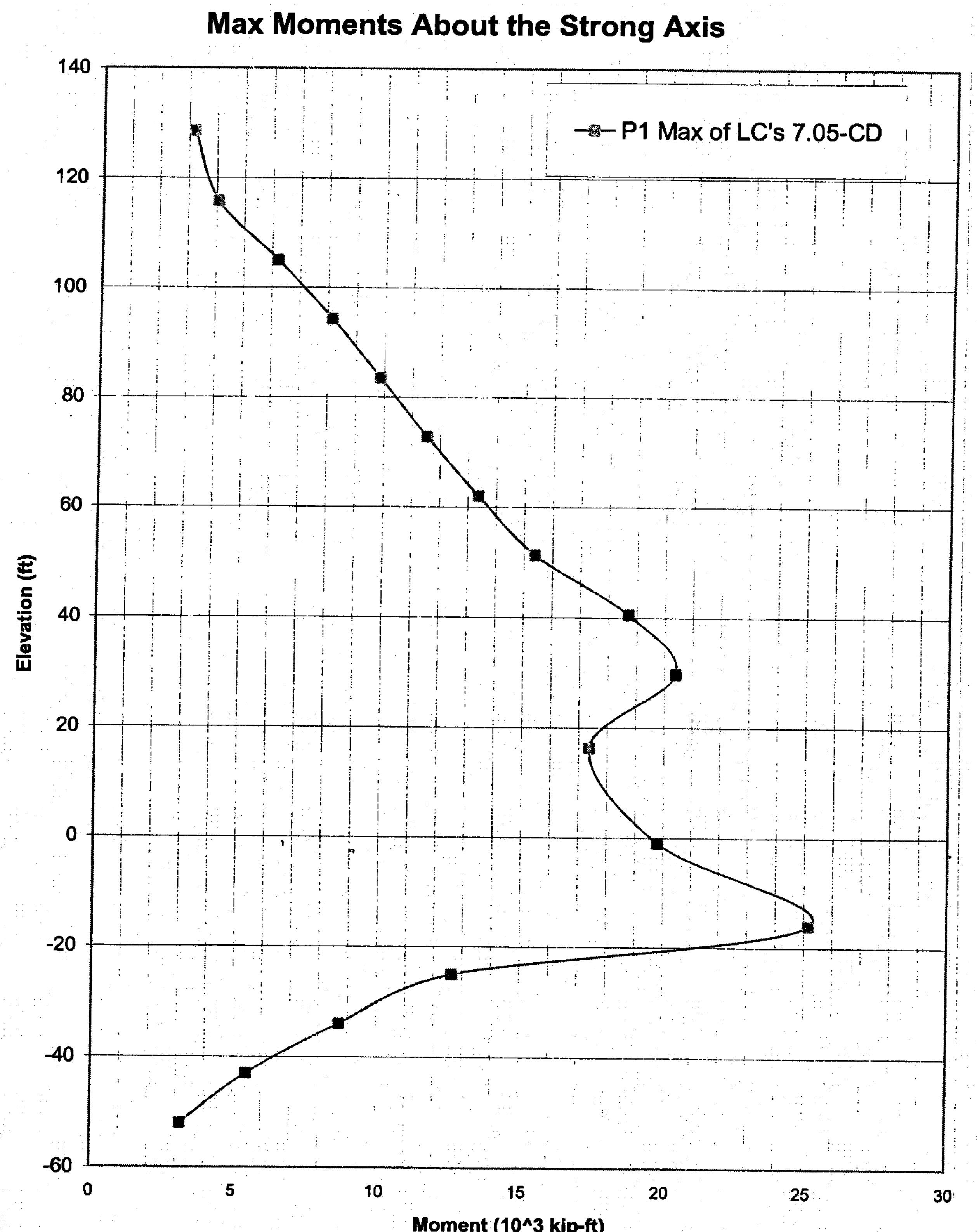
9.1.1 -14


Max Axial Load
140
120
100
80
60
40
20
0
-20
-40
-60
Elevation (ft)
0
1000
2000
3000
4000
5000
6000
Axial load (kips)
P1 Max of LC's 7.05-CD
STRAIGHT

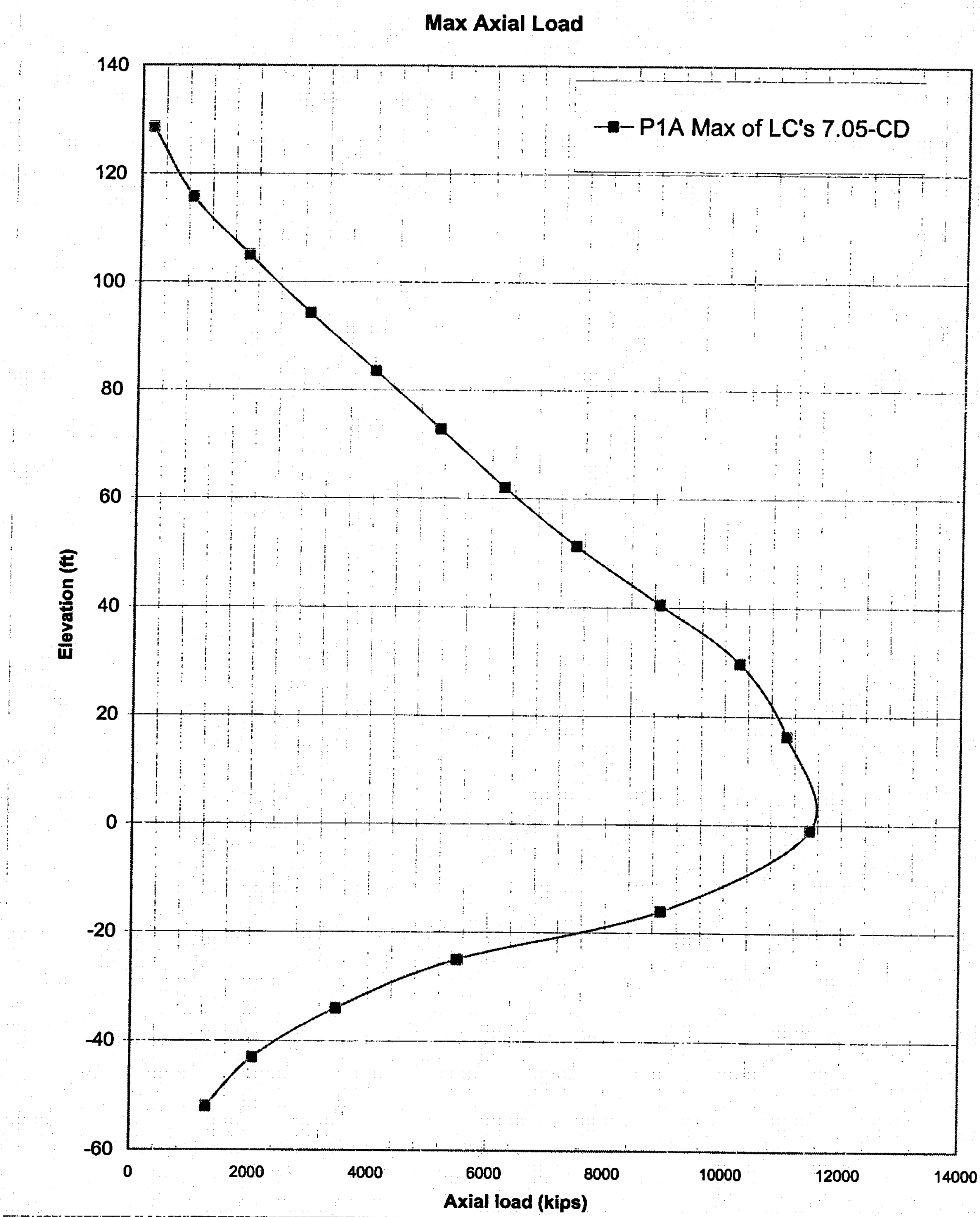
9.1.1-15


Max Shears About the Strong Axis
P1 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
Shear (kip)

9.1.1-16


Max Moments About the Strong Axis
P1 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
5
10
15
20
25
30
Moment (10^3 kip-ft)

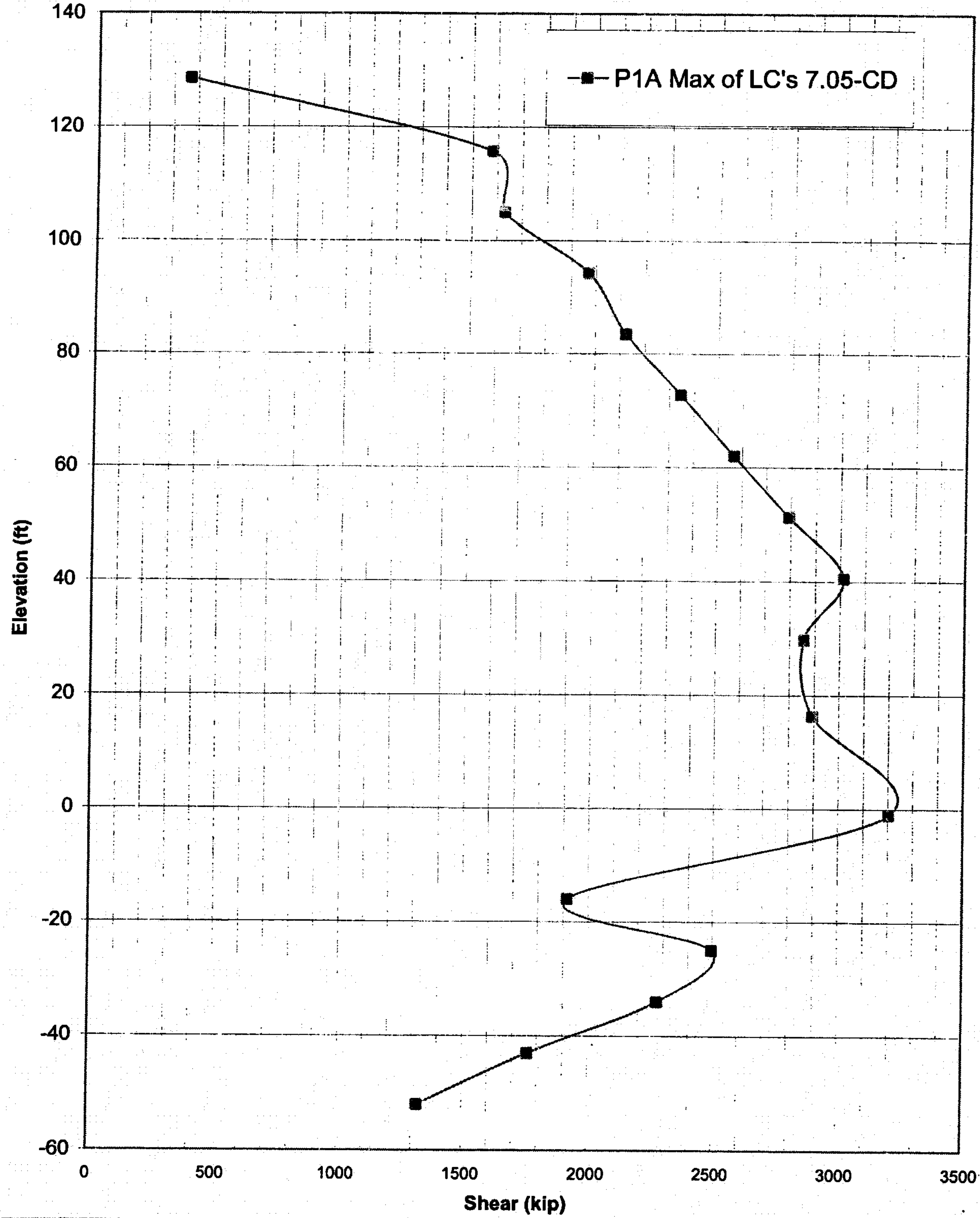
9.1.1 -17


Max Axial Load
P1A Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
2000
4000
6000
8000
10000
12000
14000
Axial load (kips)

9.1.1-18

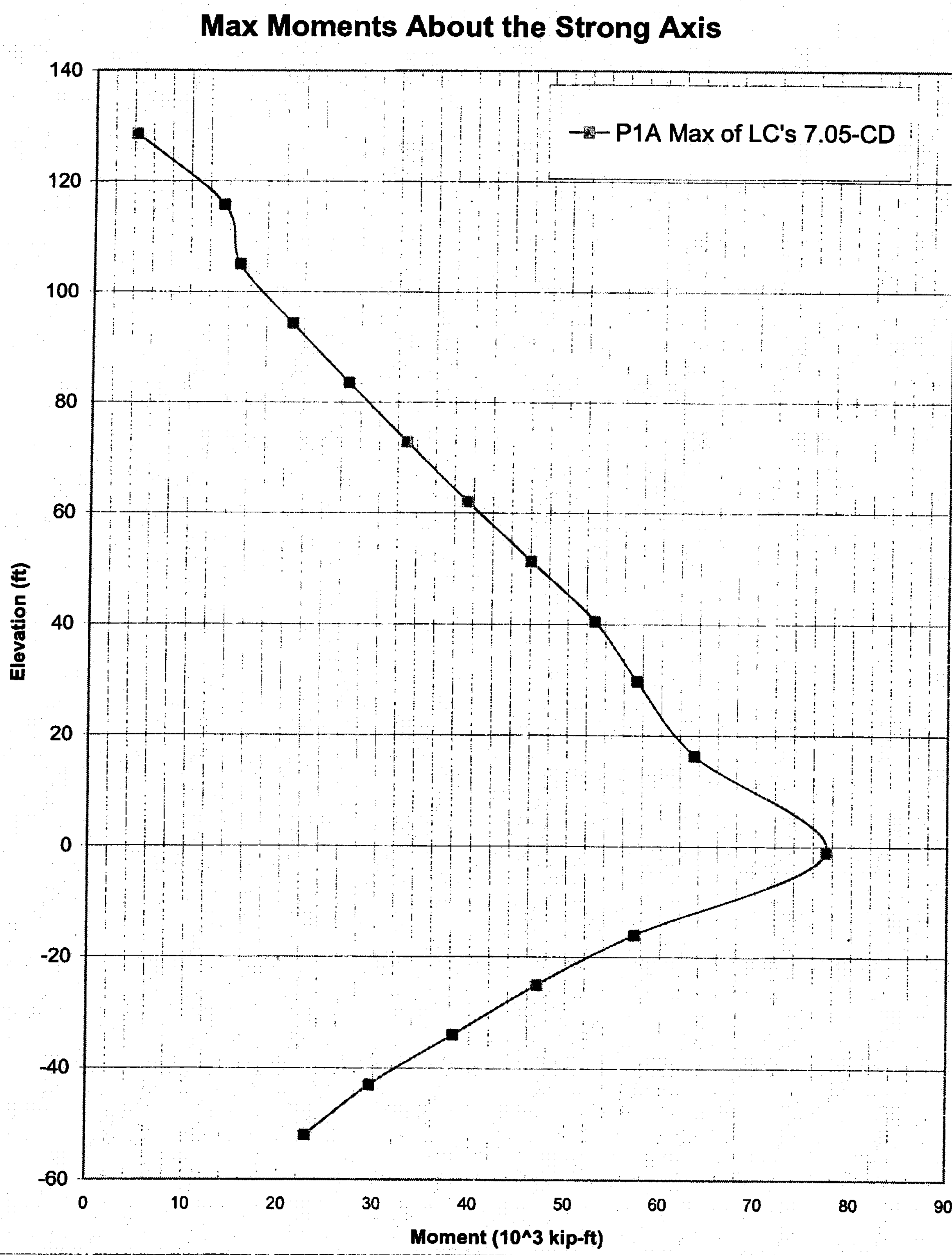
Print Date 4/15/2005

Max Shears About the Strong Axis

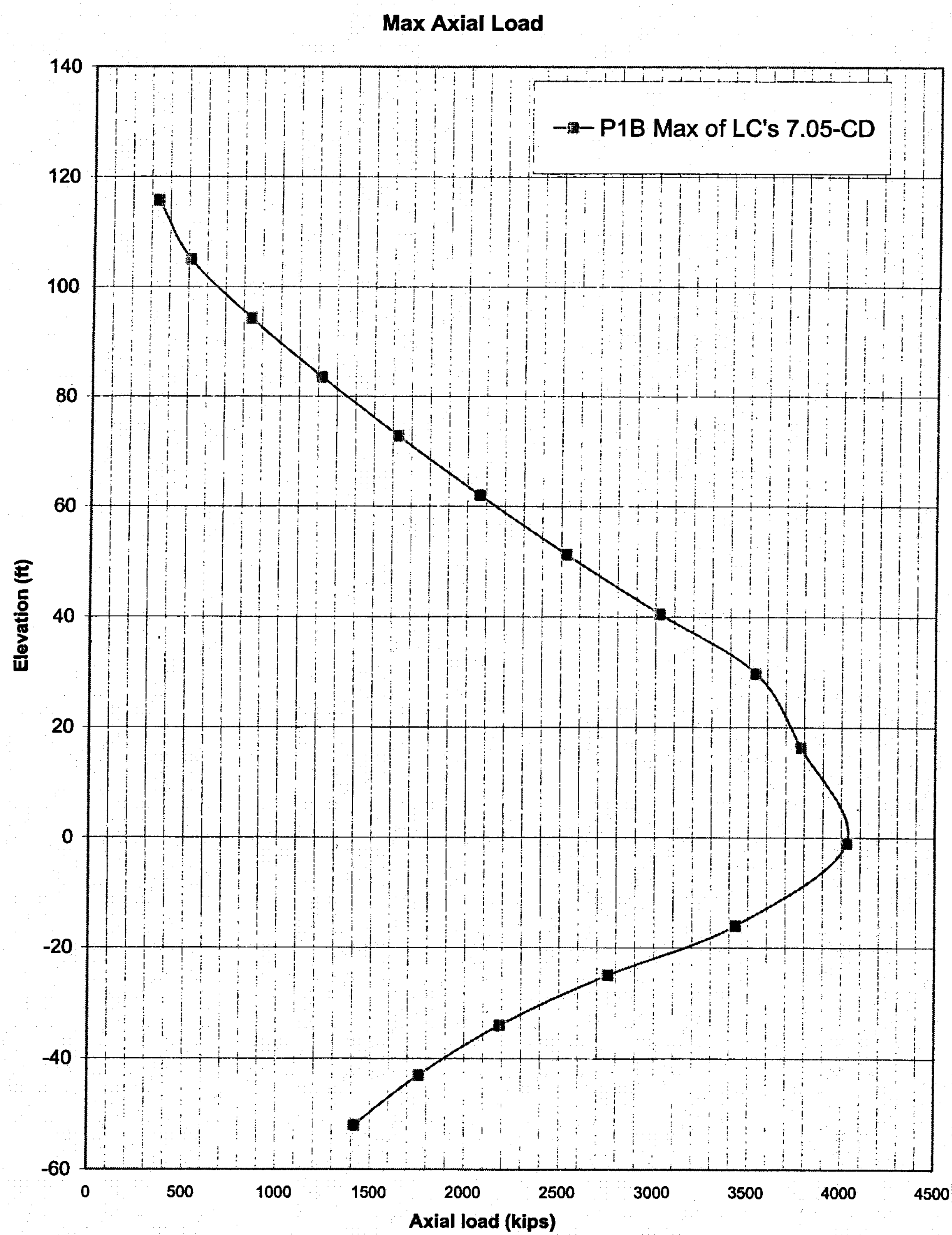


9.1.1-19

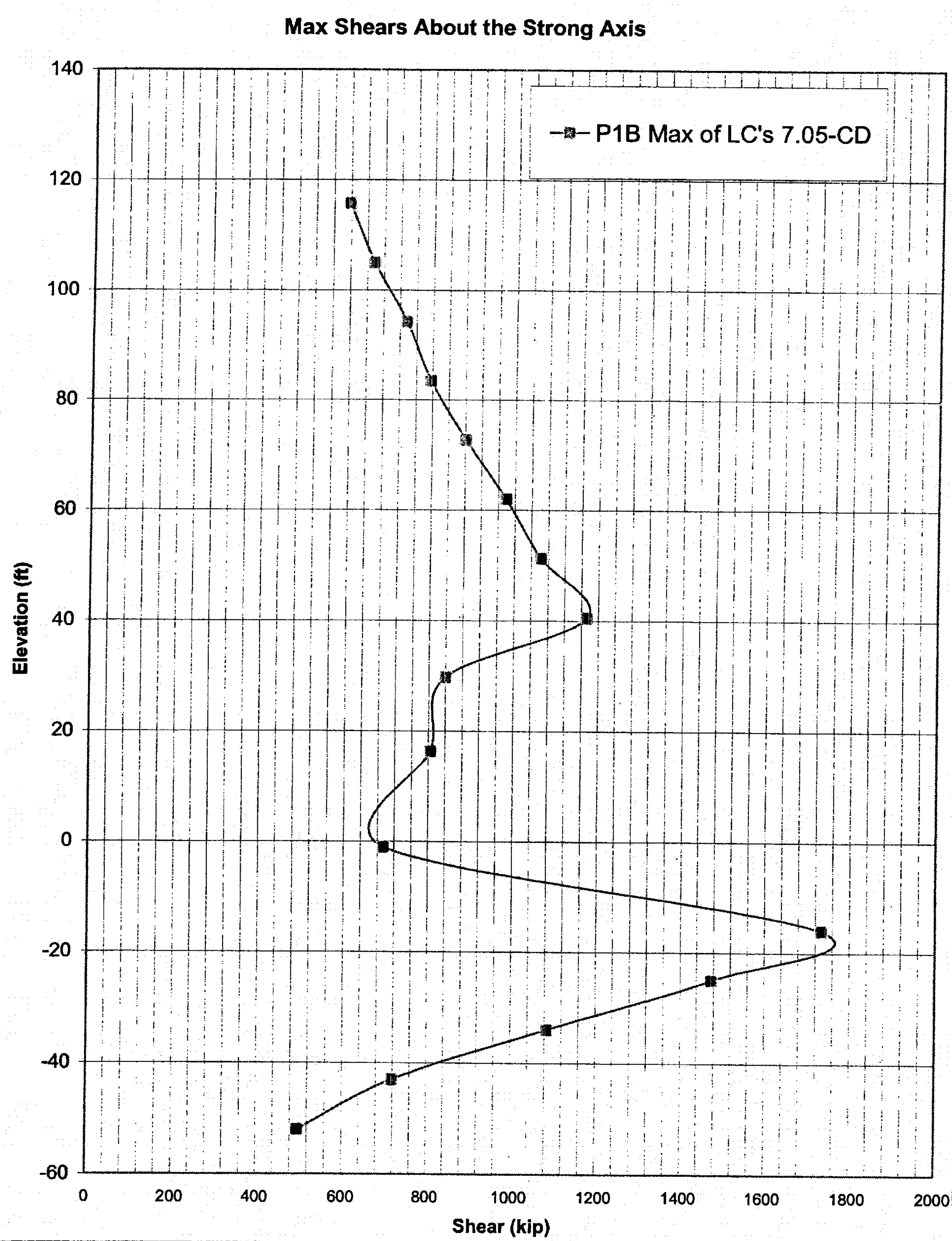
DODSONNOC00000597


Max Moments About the Strong Axis
P1A Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
10
20
30
40
50
60
70
80
90
Moment (10^3 kip-ft)

9.1.1-2c

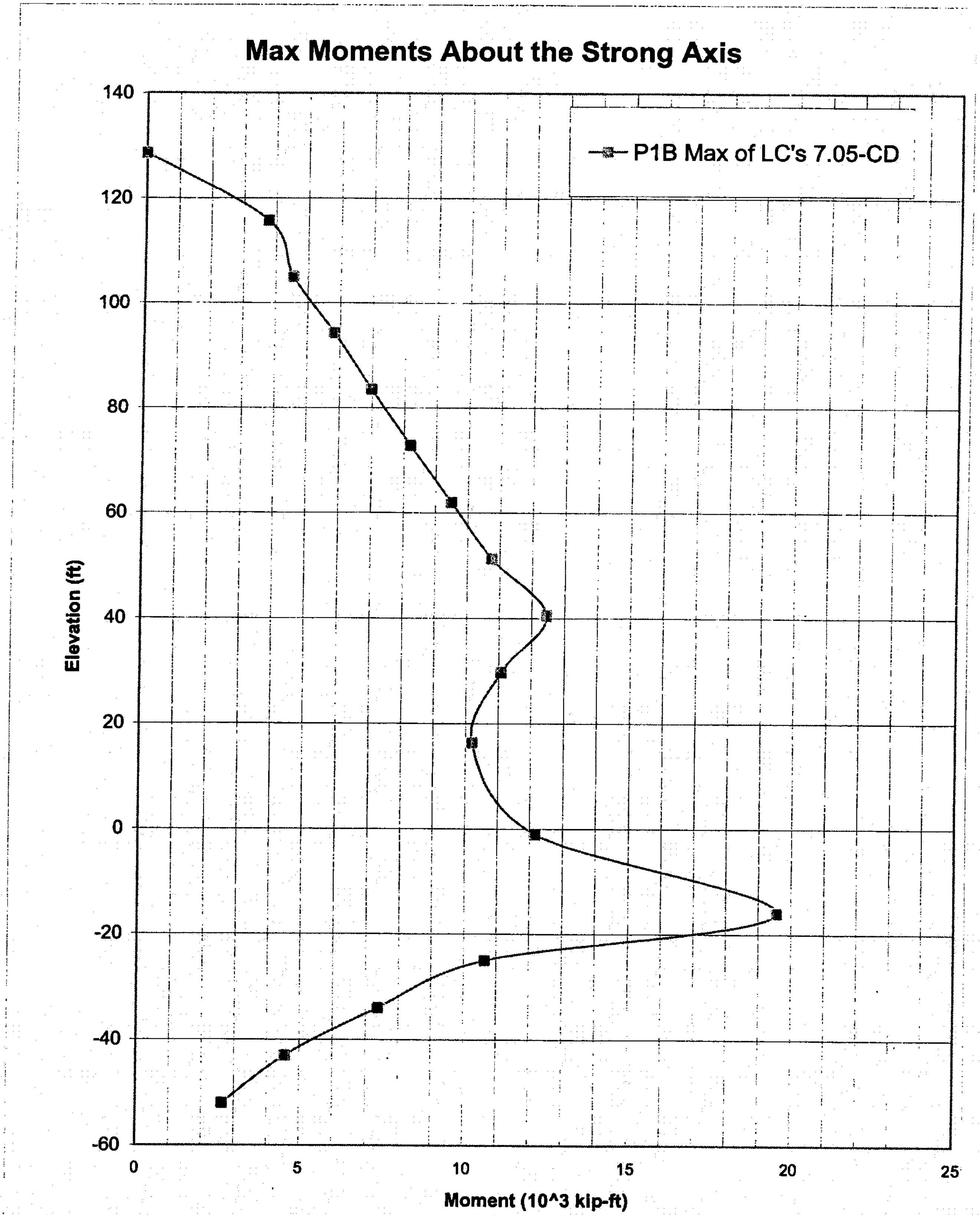

Max Axial Load
P1B Max of LC's 7.05-CD
Elevation (ft)
Axial load (kips)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
3500
4000
4500

9.1.1-21


Max Shears About the Strong Axis
P1B Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Shear (kip)

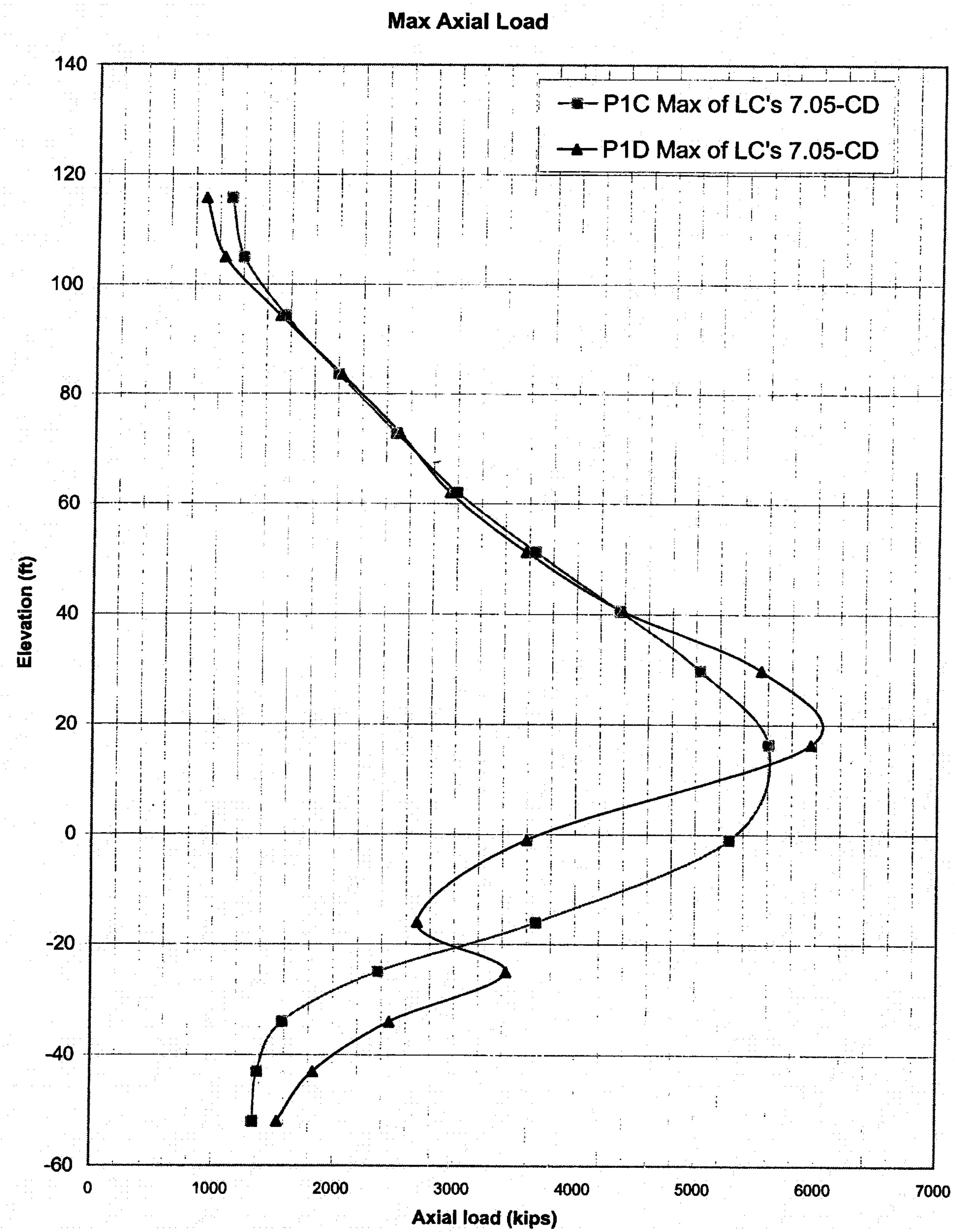
9.1.1-22

Print Date 4/21/2005

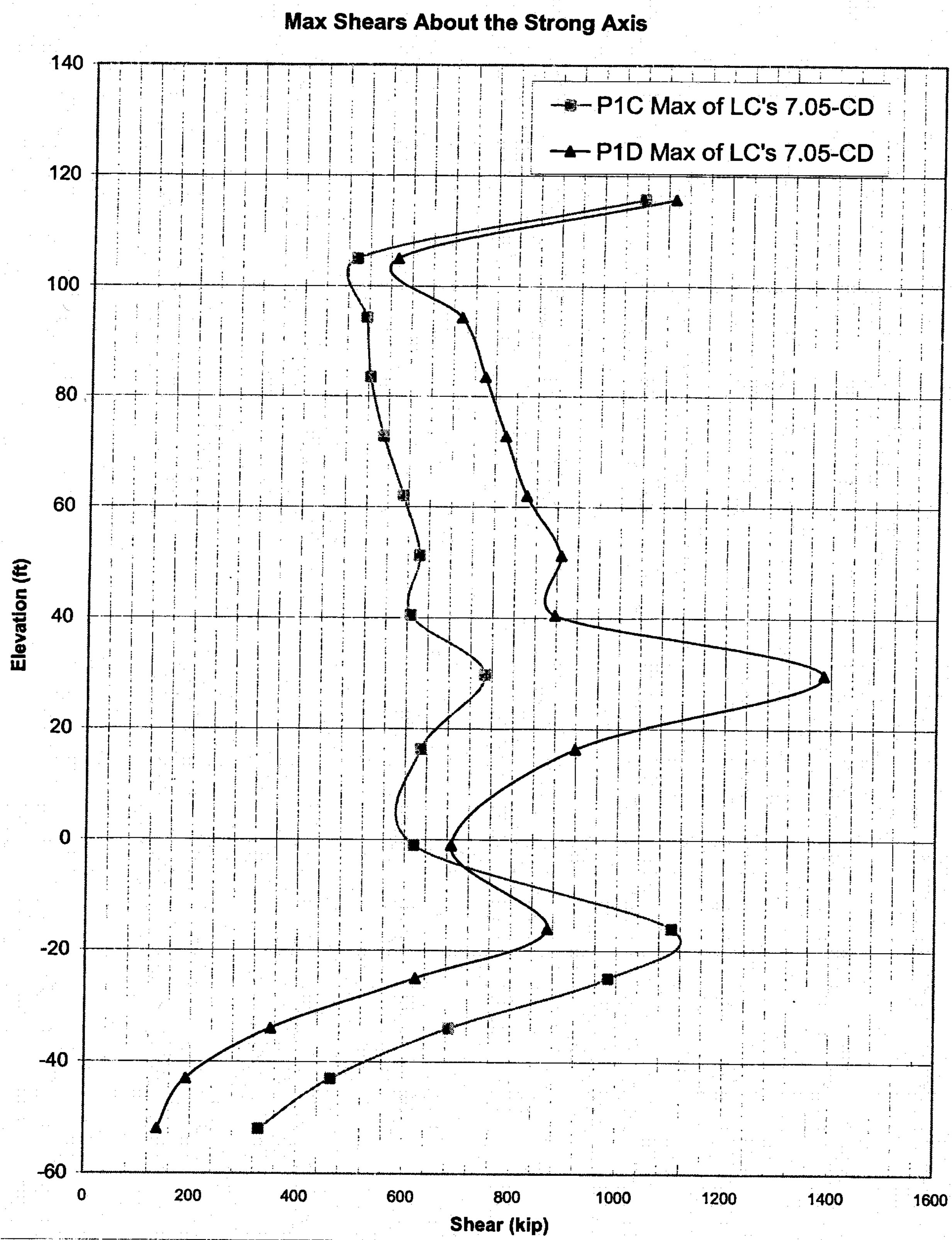


9.1.1-23

DODSONNOC00000601

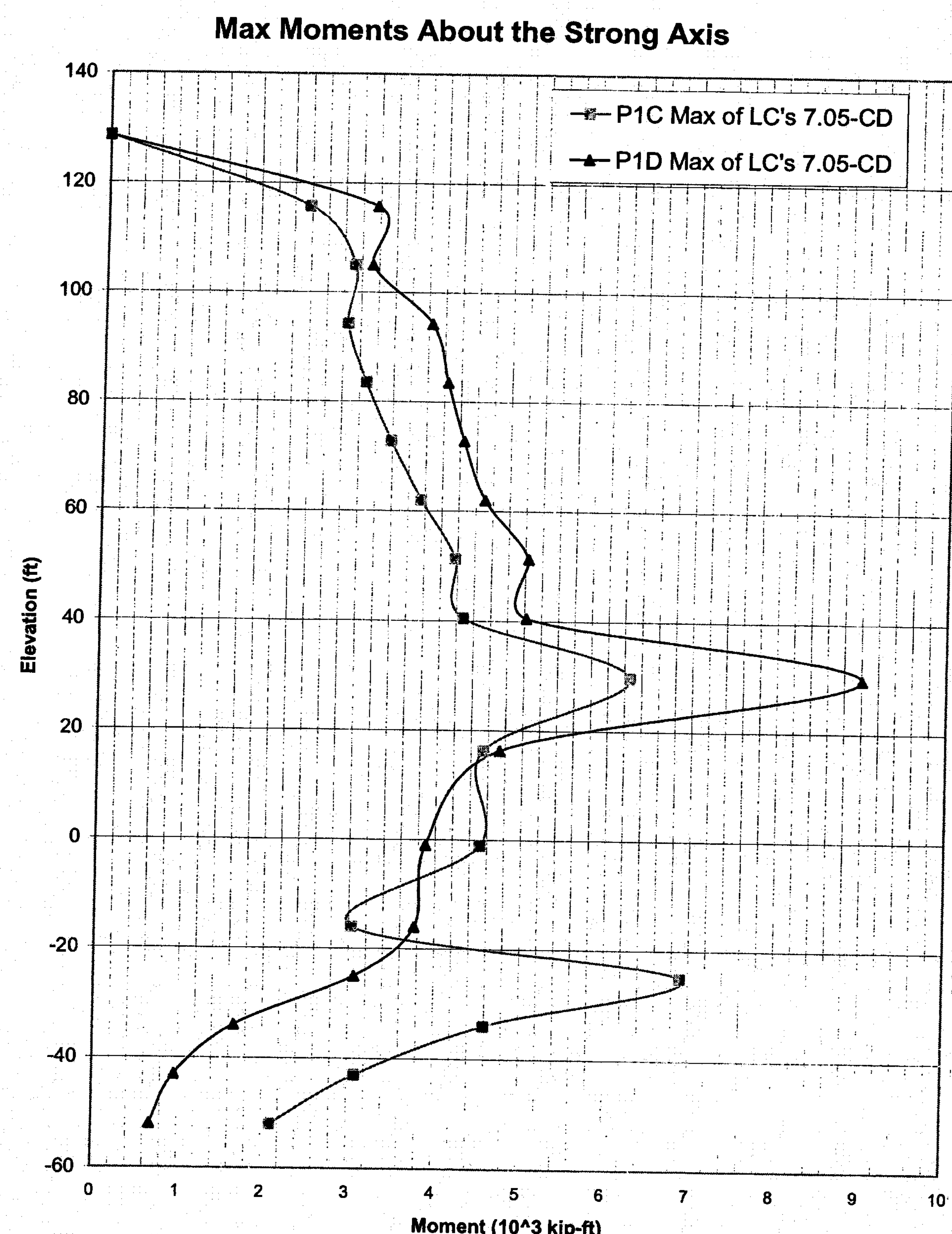

Max Axial Load
P1C Max of LC's 7.05-CD
P1D Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
1000
2000
3000
4000
5000
6000
7000
Axial load (kips)

9.1.1-24


Max Shears About the Strong Axis
P1C Max of LC's 7.05-CD
P1D Max of LC's 7.05-CD
Elevation (ft)
Shear (kip)
140
120
100
80
60
40
20
0
-20
-40
-60
0
200
400
600
800
1000
1200
1400
1600

9.1.1-25

Print Date 4/15/2005



9.1.1-26

DODSONNOC00000604

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
13	P1	E100X30YPR MAX	Top	0	363	340	3129	0	0	541	273	541	273
12	P1	E100X30YPR MAX	Top	26	1111	993	24521	4451	3896	1459	836	1485	810
11	P1	E100X30YPR MAX	Top	0	947	1217	32983	16669	15439	2209	1295	2209	1295
10	P1	E100X30YPR MAX	Top	0	1173	1376	35779	29401	24174	2958	1755	2958	1755
9	P1	E100X30YPR MAX	Top	0	1303	1519	37166	43527	34687	3705	2214	3705	2214
8	P1	E100X30YPR MAX	Top	0	1409	1661	38509	57836	46261	4454	2673	4454	2673
7	P1	E100X30YPR MAX	Top	0	1525	1833	40652	71845	58182	5204	3132	5204	3132
6	P1	E100X30YPR MAX	Top	0	1651	2043	44034	85529	72002	5955	3591	5955	3591
5	P1	E100X30YPR MAX	Top	0	1837	2337	49529	102823	87727	6705	4051	6705	4051
4	P1	E100X30YPR MAX	Top	0	1474	2375	55377	122302	104682	7455	4510	7455	4510
3	P1	E100X30YMR MAX	Top	1995	2691	2039	36614	122551	109238	8405	5082	10400	3087
2	P1	E100X30YPR MAX	Top	2014	3189	1713	39658	130554	123500	9462	5722	11476	3708
1	P1	E100X30YPR MAX	Top	1590	1329	3902	5806	130825	155162	10455	6321	12044	4731
B1	P1	E100X30YMR MAX	Top	538	2249	3382	8630	84659	133768	11170	6758	11708	6220
B2	P1	E100X30YMR MAX	Top	566	2094	2444	9064	54281	113380	11885	7195	12451	6629
B3	P1	E100X30YMR MAX	Top	579	1682	1586	7007	32679	94464	12600	7632	13179	7052
B4	P1	E100X30YMR MAX	Top	583	1367	1119	4370	19741	79507	13316	8068	13899	7485

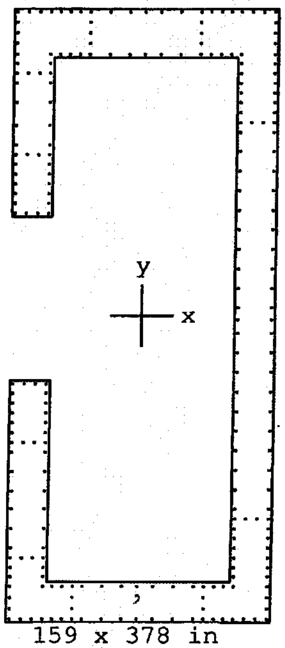
Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
13	P1	E100X30YMR MAX	Bottom	0	363	340	3129	4335	4629	541	273	541	273
12	P1	E100X30YMR MAX	Bottom	0	1129	992	32639	16671	15442	1459	836	1459	836
11	P1	E100X30YMR MAX	Bottom	0	947	1218	32983	29405	24178	2209	1295	2209	1295
10	P1	E100X30YMR MAX	Bottom	0	1173	1376	35779	43533	34690	2958	1755	2958	1755
9	P1	E100X30YMR MAX	Bottom	0	1303	1519	37166	57845	46265	3705	2214	3705	2214
8	P1	E100X30YMR MAX	Bottom	0	1409	1661	38506	71858	58186	4454	2673	4454	2673
7	P1	E100X30YMR MAX	Bottom	0	1525	1833	40644	85548	72005	5204	3132	5204	3132
6	P1	E100X30YMR MAX	Bottom	0	1651	2044	44014	102850	87725	5955	3591	5955	3591
5	P1	E100X30YMR MAX	Bottom	0	1837	2338	49487	122341	104675	6705	4051	6705	4051
4	P1	E100X30YMR MAX	Bottom	0	1472	2376	55292	141268	116307	7455	4510	7455	4510
3	P1	E100X30YPR MAX	Bottom	206	1804	2063	42938	148789	129524	8405	5082	8610	4876
2	P1	E100X30YPR MAX	Bottom	368	3145	1716	39172	145136	159486	9462	5722	9829	5354
1	P1	E100X30YPR MAX	Top	1590	1329	3902	5806	130825	155162	10455	6321	12044	4731
B1	P1	E100X30YPR MAX	Top	537	2245	3379	8621	84771	134114	11170	6758	11707	6221
B2	P1	E100X30YPR MAX	Top	565	2090	2441	9047	54358	113688	11885	7195	12450	6630
B3	P1	E100X30YPR MAX	Top	578	1678	1584	6993	32728	94732	12600	7632	13178	7053
B4	P1	E100X30YPR MAX	Top	582	1364	1118	4362	19773	79744	13316	8068	13898	7486

9.1-28

Summary of Design Loads for Shear Walls

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
13	P1	E100X30YMR MAX	Bottom	0	363	340	3129	4335	4629	541	273	541	273
12	P1	E30X100YMR MAX	Bottom	0	1610	452	16298	8477	23953	1459	836	1459	836
11	P1	E30X100YMR MAX	Bottom	0	1551	563	18320	14203	40120	2209	1295	2209	1295
10	P1	E30X100YMR MAX	Bottom	0	1876	613	21410	20206	59320	2958	1755	2958	1755
9	P1	E30X100YMR MAX	Bottom	0	2119	688	24039	26120	80632	3705	2214	3705	2214
8	P1	E30X100YMR MAX	Bottom	0	2333	787	26888	32095	103442	4454	2673	4454	2673
7	P1	E30X100YMR MAX	Bottom	0	2536	897	29692	38487	128139	5204	3132	5204	3132
6	P1	E30X100YPR MAX	Bottom	0	2740	986	32404	46815	154750	5955	3591	5955	3591
5	P1	E30X100YPR MAX	Bottom	0	2946	1068	35580	56129	182824	6705	4051	6705	4051
4	P1	E30X100YPR MAX	Bottom	0	2724	1021	33916	64774	206871	7455	4510	7455	4510
3	P1	E30X100YPR MAX	Bottom	131	2556	1003	35897	63867	226028	8405	5082	8536	4951
2	P1	E30X100YPR MAX	Bottom	251	2132	1529	28169	56411	227484	9462	5722	9713	5471
1	P1	E30X100YPR MAX	Top	776	2456	1510	10312	51034	220934	10455	6321	11230	5546
B1	P1	E30X100YPR MAX	Top	390	3364	1316	14018	33687	175744	11170	6758	11560	6368
B2	P1	E30X100YPR MAX	Top	415	2813	973	15046	21855	145140	11885	7195	12300	6780
B3	P1	E30X100YPR MAX	Top	428	2158	637	11935	13194	119771	12600	7632	13028	7204
B4	P1	E30X100YPR MAX	Top	432	1741	444	7838	7927	100742	13316	8068	13747	7636

9.1.1-29



Code: ACI 318-95

Units: English

Run axis: Biaxial

Run option: Investigation

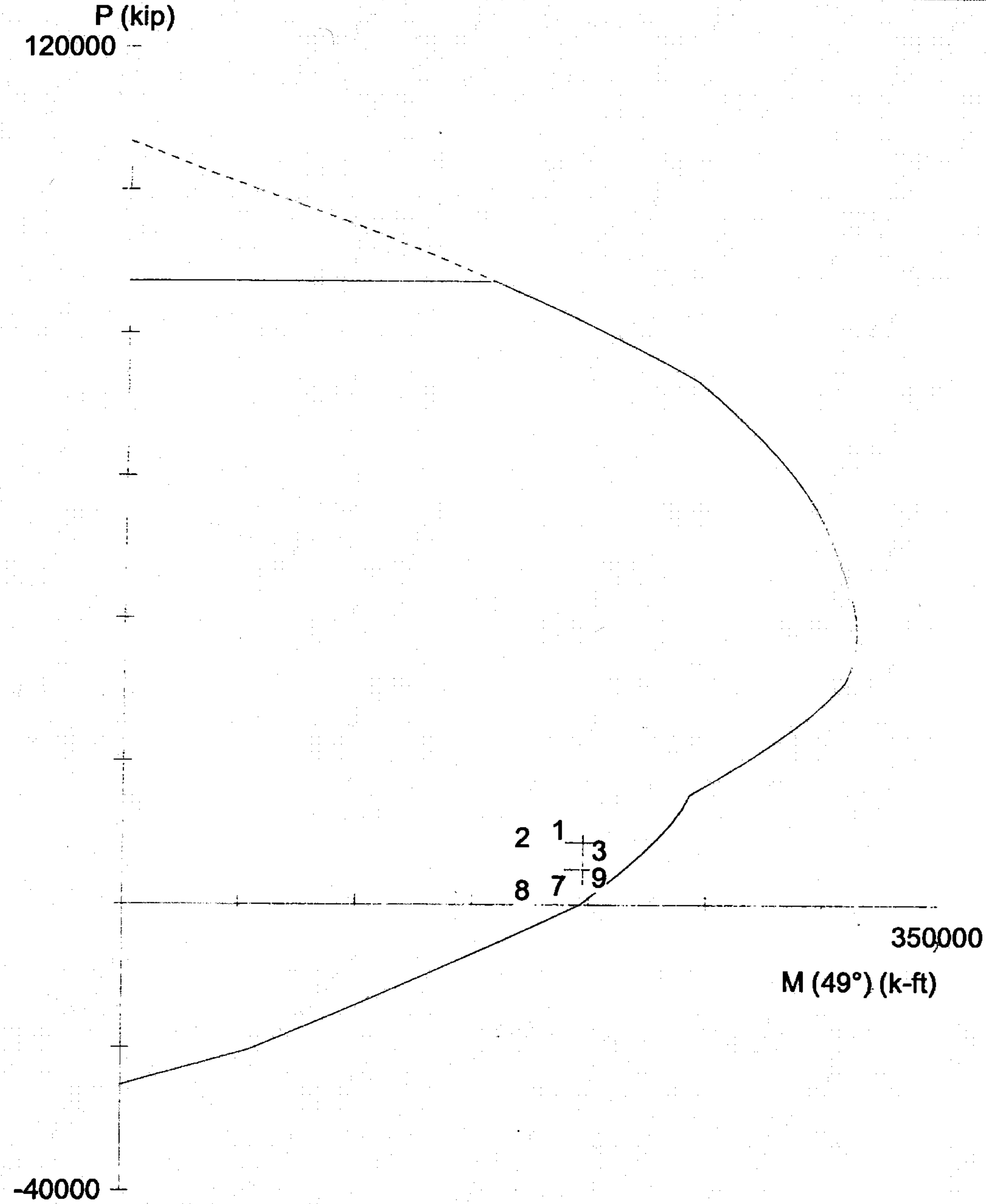
Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/21/05

Time: 11:41:50



PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P113.COL LEVEL 2 MAY

Project:

PIER 1

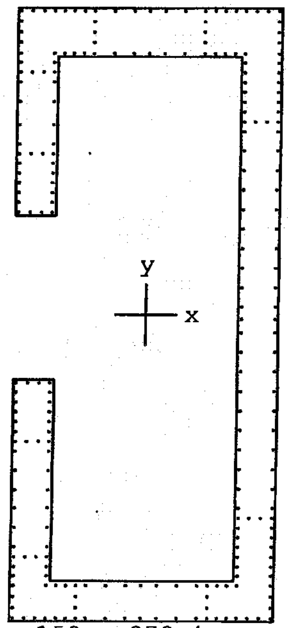
Column: Engineer:

f'c = 7 ksi	fy = 75 ksi	Ag = 21825 in^2	240 #11 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 374.40 in^2	Rho = 1.72%
fc = 5.95 ksi	e_rup = Infinity	Xo = 7.50 in	Ix = 4.01185e+008 in^4
e_u = 0.003 in/in		Yo = 2.94 in	Iy = 7.74205e+007 in^4
Beta1 = 0.7		Clear spacing = 4.59 in	Clear cover = N/A

9.1.1-30

Confinement: Tied phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000608



159 x 378 in

Code: ACI 318-95

Units: English

Run axis: Biaxial

Run option: Investigation

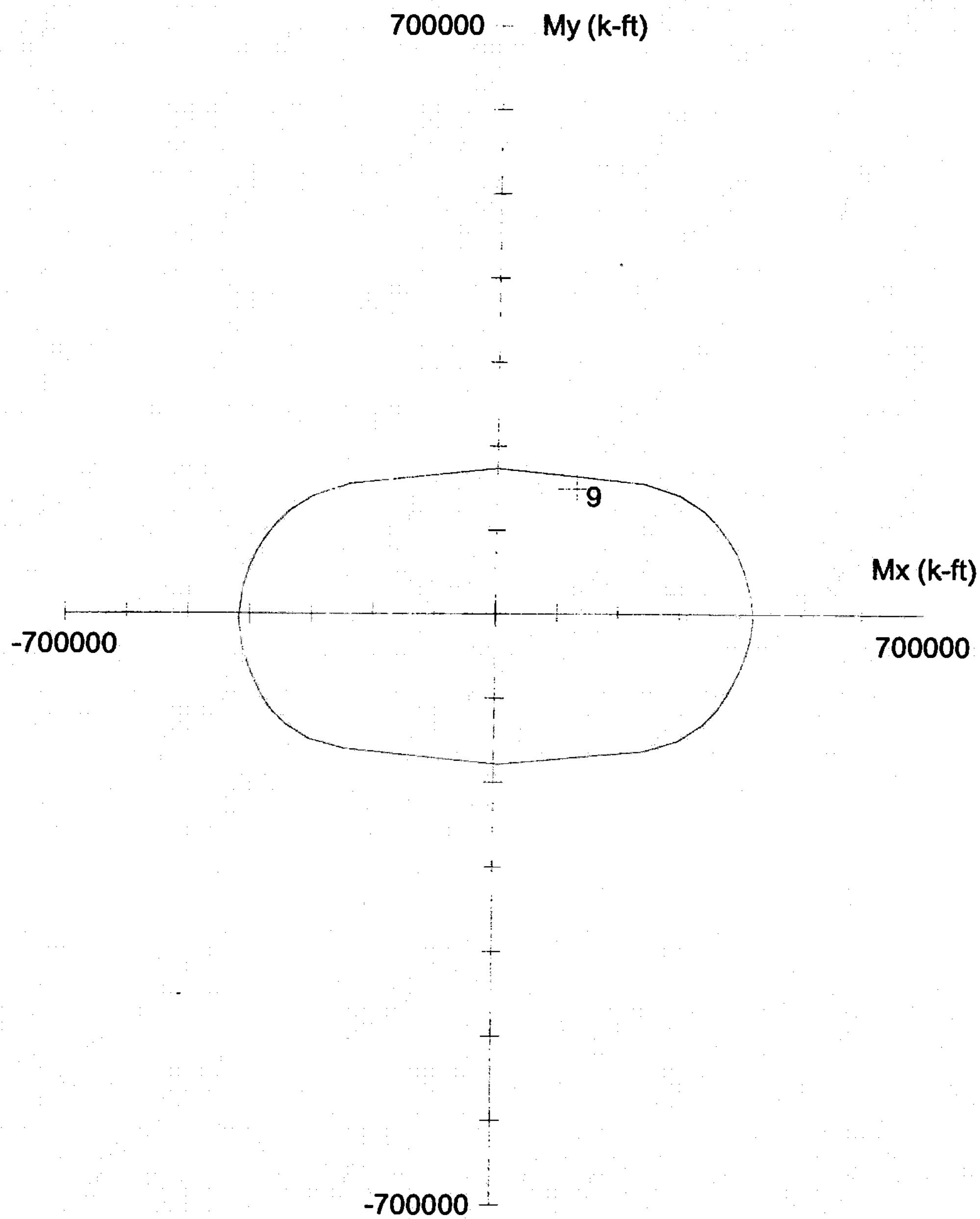
Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/21/05

Time: 11:41:40



P = 4876 kip

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P1L3.COL

Project:

Column:		Engineer:	
f'c = 7 ksi	fy = 75 ksi	Ag = 21825 in^2	240 #11 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 374.40 in^2	Rho = 1.72%
fc = 5.95 ksi	e_rup = Infinity	Xo = 7.50 in	Ix = 4.01185e+008 in^4
e_u = 0.003 in/in		Yo = 2.94 in	Iy = 7.74205e+007 in^4
Beta1 = 0.7		Clear spacing = 4.59 in	Clear cover = N/A
Confinement: Tied	phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7		

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DODSONNOC00000609

General Information:

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P1L3.COL
Project:
Column:
Code: ACI 318-95
Engineer:
Units: English

Run Option: Investigation
Run Axis: Biaxial
Slenderness: Not considered
Column Type: Structural

Material Properties:

f'c = 7 ksi
Ec = 4768.97 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7
fy = 75 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:

Exterior Points

No.	X (in)	Y (in)	No.	X (in)	Y (in)	No.	X (in)	Y (in)
1	-79.5	-189.0	2	79.5	-189.0	3	79.5	189.0
4	-79.5	189.0	5	-79.5	61.0	6	-55.5	61.0
7	-55.5	159.0	8	55.5	159.0	9	55.5	-164.0
10	-55.5	-164.0	11	-55.5	-40.0	12	-79.5	-40.0

Gross section area, Ag = 21825 in^2
Ix = 4.01185e+008 in^4
Iy = 7.74205e+007 in^4
Xo = 7.49691 in
Yo = 2.94069 in

Reinforcement:

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 374.40 in^2 at 1.72%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
1.56	-33.5	174.0	1.56	-33.5	180.5	1.56	-33.5	167.5
1.56	33.5	174.0	1.56	33.5	180.5	1.56	33.5	167.5
1.56	77.5	5.0	1.56	57.5	5.0	1.56	64.2	119.0
1.56	70.8	119.0	1.56	64.2	-125.0	1.56	70.8	-125.0
1.56	39.7	-173.7	1.56	39.7	-180.3	1.56	-39.5	-173.7
1.56	-39.5	-180.3	1.56	-63.9	-149.0	1.56	-70.6	-149.0
1.56	-70.8	-78.0	1.56	-64.2	-78.0	1.56	-0.0	-187.0
1.56	-0.0	-167.0	1.56	-77.5	131.0	1.56	-57.5	131.0
1.56	-77.5	117.0	1.56	-57.5	117.0	1.56	-77.3	-108.0
1.56	-57.5	-108.0	1.56	-77.3	-96.0	1.56	-57.5	-96.0
1.56	-70.8	149.0	1.56	-64.2	149.0	1.56	-70.8	99.0
1.56	-64.2	99.0	1.56	-9.5	161.0	1.56	-9.5	187.0
1.56	-0.0	161.0	1.56	9.5	161.0	1.56	-0.0	187.0
1.56	9.5	187.0	1.56	77.5	-3.0	1.56	57.7	-3.0

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1.56	77.5	-11.0	1.56	57.7	-11.0	1.56	77.5	-23.0
1.56	57.7	-23.0	1.56	77.5	-35.0	1.56	57.7	-35.0
1.56	77.5	-47.0	1.56	57.7	-47.0	1.56	-63.9	-187.0
1.56	-70.6	-187.0	1.56	-9.5	-187.0	1.56	-9.5	-167.0
1.56	-21.5	-187.0	1.56	-21.5	-167.0	1.56	-33.5	-187.0
1.56	-33.5	-167.0	1.56	-39.5	-187.0	1.56	-39.5	-167.0
1.56	-45.5	-187.0	1.56	-45.5	-167.0	1.56	-51.5	-187.0
1.56	-51.5	-167.0	1.56	-77.3	-119.0	1.56	-57.5	-119.0
1.56	-77.3	-131.0	1.56	-57.5	-131.0	1.56	-77.3	-143.0
1.56	-57.5	-143.0	1.56	-77.3	-149.0	1.56	-57.5	-149.0
1.56	-77.3	-155.0	1.56	-57.5	-155.0	1.56	-77.3	-161.0
1.56	-57.5	-161.0	1.56	-77.3	-173.7	1.56	-77.3	-180.3
1.56	-77.3	-167.0	1.56	-57.5	-187.0	1.56	-57.5	-167.0
1.56	-77.3	-187.0	1.56	64.2	-187.0	1.56	70.8	-187.0
1.56	9.7	-187.0	1.56	9.7	-167.0	1.56	21.7	-187.0
1.56	21.7	-167.0	1.56	33.7	-187.0	1.56	33.7	-167.0
1.56	39.7	-187.0	1.56	39.7	-167.0	1.56	45.7	-187.0
1.56	45.7	-167.0	1.56	51.7	-187.0	1.56	51.7	-167.0
1.56	77.5	-59.0	1.56	57.7	-59.0	1.56	77.5	-71.0
1.56	57.7	-71.0	1.56	77.5	-83.0	1.56	57.7	-83.0
1.56	77.5	-95.0	1.56	57.7	-95.0	1.56	77.5	-107.0
1.56	57.7	-107.0	1.56	77.5	-119.0	1.56	57.7	-119.0
1.56	77.5	-125.0	1.56	57.7	-125.0	1.56	77.5	-131.0
1.56	57.7	-131.0	1.56	77.5	-137.0	1.56	57.7	-137.0
1.56	77.5	-143.0	1.56	57.7	-143.0	1.56	77.5	-149.0
1.56	57.7	-149.0	1.56	77.5	-155.0	1.56	57.7	-155.0
1.56	77.5	-161.0	1.56	57.7	-161.0	1.56	77.5	-173.7
1.56	77.5	-180.3	1.56	77.5	-167.0	1.56	57.7	-187.0
1.56	57.7	-167.0	1.56	-77.5	-84.0	1.56	-57.5	-84.0
1.56	-77.5	-72.0	1.56	-57.5	-72.0	1.56	-77.5	-78.0
1.56	-57.5	-78.0	1.56	-77.5	-60.0	1.56	-57.5	-60.0
1.56	-77.5	-66.0	1.56	-57.5	-66.0	1.56	-77.5	-48.0
1.56	-57.5	-48.0	1.56	-77.5	-54.0	1.56	-57.5	-54.0
1.56	-70.8	-42.0	1.56	-64.2	-42.0	1.56	-57.5	-42.0
1.56	-77.5	-42.0	1.56	77.5	-187.0	1.56	77.5	17.0
1.56	57.5	17.0	1.56	77.5	29.0	1.56	57.5	29.0
1.56	77.5	41.0	1.56	57.5	41.0	1.56	77.5	53.0
1.56	57.5	53.0	1.56	77.5	65.0	1.56	57.5	65.0
1.56	77.5	77.0	1.56	57.5	77.0	1.56	77.5	89.0
1.56	57.5	89.0	1.56	77.5	101.0	1.56	57.5	101.0
1.56	77.5	113.0	1.56	57.5	113.0	1.56	21.5	161.0
1.56	33.5	161.0	1.56	39.5	161.0	1.56	45.5	161.0
1.56	51.5	161.0	1.56	21.5	187.0	1.56	33.5	187.0
1.56	39.5	187.0	1.56	45.5	187.0	1.56	51.5	187.0
1.56	70.8	187.0	1.56	64.2	187.0	1.56	57.5	187.0
1.56	77.5	174.0	1.56	77.5	180.5	1.56	77.5	167.5
1.56	77.5	119.0	1.56	57.5	119.0	1.56	77.5	125.0
1.56	57.5	125.0	1.56	77.5	131.0	1.56	57.5	131.0
1.56	77.5	137.0	1.56	57.5	137.0	1.56	77.5	143.0
1.56	57.5	143.0	1.56	77.5	149.0	1.56	57.5	149.0
1.56	77.5	155.0	1.56	57.5	155.0	1.56	77.5	161.0
1.56	57.5	161.0	1.56	77.5	187.0	1.56	-21.5	161.0
1.56	-33.5	161.0	1.56	-39.5	161.0	1.56	-45.5	161.0
1.56	-51.5	161.0	1.56	-21.5	187.0	1.56	-33.5	187.0
1.56	-39.5	187.0	1.56	-45.5	187.0	1.56	-51.5	187.0
1.56	-70.8	187.0	1.56	-64.2	187.0	1.56	-57.5	187.0
1.56	-77.5	174.0	1.56	-77.5	180.5	1.56	-77.5	167.5
1.56	-77.5	105.0	1.56	-57.5	105.0	1.56	-77.5	93.0
1.56	-57.5	93.0	1.56	-77.5	99.0	1.56	-57.5	99.0
1.56	-77.5	81.0	1.56	-57.5	81.0	1.56	-77.5	87.0
1.56	-57.5	87.0	1.56	-77.5	69.0	1.56	-57.5	69.0
1.56	-77.5	75.0	1.56	-57.5	75.0	1.56	-70.8	63.0
1.56	-64.2	63.0	1.56	-77.5	143.0	1.56	-57.5	143.0
1.56	-77.5	149.0	1.56	-57.5	149.0	1.56	-77.5	155.0
1.56	-57.5	155.0	1.56	-77.5	161.0	1.56	-57.5	63.0
1.56	-77.5	63.0	1.56	-57.5	161.0	1.56	-77.5	187.0

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Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Pu kip	Mux k-ft	Muy k-ft	fMnx k-ft	fMny k-ft	fMn/Mu
1	11476.0	123500.0	130554.0	170974.3	180466.5	1.383
2	10399.9	109238.0	122551.1	159703.0	179077.7	1.462
3	8610.5	129523.9	148788.8	152917.3	175184.1	1.179
4	9829.5	159486.2	145135.9	192010.6	174649.6	1.204
5	8535.6	226028.4	63866.9	379428.3	106622.5	1.678
6	9713.0	227484.0	56410.9	395316.9	97302.1	1.737
7	3708.0	123500.0	130554.0	152431.3	161099.8	1.234
8	3086.9	109238.0	122551.1	142484.1	159923.3	1.305
9	4876.3	129523.9	148788.8	143898.3	165348.7	1.111
10	5354.1	159486.2	145135.9	180220.1	163716.5	1.129
11	4951.2	226028.4	63866.9	364337.4	103241.8	1.612
12	5470.6	227484.0	56410.9	378193.8	93659.7	1.662

*** Program completed as requested! ***

9.1.1-34

SHEAR WALL SHEAR CHECK

Etabs model: 7.05-CD-straight
Date: 4/21/2005
By: NJR

phi = 0.6

P1								Shear Reinforcement of Wall							Check design					
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in^2	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}$<(V_u/ϕ)	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in^2	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P1	B5-L7	30	159	7000	60	0.60	2058.58	4770	3991	OK	479	0.009	1.58	5.7	4.5	0.012	4148	3991	0.86	2.01
	L7-T.O.W.	30	159	7000	60	0.60	1371.55	4770	3991	OK	479	0.005	0.88	5.6	5.5	0.005	2325	2325	0.98	1.69
P1A	B5-L7	24	378	7000	60	0.60	3203	9072	7590	OK	911	0.007	0.88	5.2	4.5	0.008	5953	5953	0.90	1.86
	L7-T.O.W.	24	378	7000	60	0.60	2347	9072	7590	OK	911	0.004	0.62	5.9	5.5	0.005	4075	4075	0.96	1.74
P1B	B5-L7	24	159	7000	60	0.60	1734	3816	3193	OK	383	0.010	1.20	5.1	4.5	0.011	3183	3183	0.91	1.84
	L7-T.O.W.	24	159	7000	60	0.60	882	3816	3193	OK	383	0.004	0.62	7.1	5.5	0.005	1714	1714	0.86	1.94
P1C	B5-L7	24	149	7000	60	0.60	1103	3576	2992	OK	359	0.006	0.88	6.3	4.5	0.008	2347	2347	0.78	2.13
	L7-T.O.W.	24	149	7000	60	0.60	1036	3576	2992	OK	359	0.005	0.88	7.0	5.5	0.007	2029	2029	0.85	1.96
P1D	B5-L7	24	128	7000	60	0.60	1386	3072	2570	OK	308	0.010	1.20	5.1	4.5	0.011	2562	2562	0.90	1.85
	L7-T.O.W.	24	128	7000	60	0.60	1094	3072	2570	OK	308	0.007	1.20	7.0	5.5	0.009	2190	2190	0.83	2.00

phi = 0.85

P1								Shear Reinforcement of Wall							Check design					
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in^2	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}$<(V_u/ϕ)	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in^2	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P1	B5-L7	30	159	7000	60	0.85	2058.58	4770	3991	OK	678	0.006	0.88	5.2	4.5	0.007	2664	2664	0.91	1.29
	L7-T.O.W.	30	159	7000	60	0.85	1371.55	4770	3991	OK	678	0.003	0.62	7.3	5.5	0.004	1874	1874	0.86	1.37
P1A	B5-L7	24	378	7000	60	0.85	3203	9072	7590	OK	1290	0.004	0.62	6.2	4.5	0.006	4643	4643	0.81	1.45
	L7-T.O.W.	24	378	7000	60	0.85	2347	9072	7590	OK	1290	0.003	0.40	6.7	5.5	0.003	3167	3167	0.87	1.35
P1B	B5-L7	24	159	7000	60	0.85	1734	3816	3193	OK	543	0.006	0.88	6.0	4.5	0.008	2504	2504	0.81	1.44
	L7-T.O.W.	24	159	7000	60	0.85	882	3816	3193	OK	543	0.003	0.40	6.7	5.5	0.003	1332	1332	0.78	1.51
P1C	B5-L7	24	149	7000	60	0.85	1103	3576	2992	OK	509	0.003	0.40	5.1	4.5	0.004	1393	1393	0.93	1.26
	L7-T.O.W.	24	149	7000	60	0.85	1036	3576	2992	OK	509	0.003	0.40	5.8	5.5	0.003	1249	1249	0.98	1.20
P1D	B5-L7	24	128	7000	60	0.85	1386	3072	2570	OK	437	0.006	0.88	6.1	4.5	0.008	2016	2016	0.81	1.45
	L7-T.O.W.	24	128	7000	60	0.85	1094	3072	2570	OK	437	0.004	0.88	8.7	5.5	0.007	1743	1743	0.74	1.59

9.1.1-35

DODSONNOC0000613

5/2/2005

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c = 27.9 in
Perimeter of wall = 973 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops

Wall ID: P1			Loads based on Max. Axial														
Floor	f'_c	fy	P_E	P_{Grav} 1.42DL+0.5L	P_u	M_u	V_u (k)	A_g	$P_u/(A_g f'_c)$	A_{cv}	Shear l_w	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}*\mathrm{sqrt}(f'_c))$	Conclusion	P_o[1]	P_u/P_o
	psi	ksi	kips	kips	kips	kip-ft	kips	in^2		in^2	in					kips	
13	7000	60	193	88	282	1083	334	4770	0.008	4770	159	1	0.24	0.84	NOT REQ'D	28382	0.01
12	7000	60	562	238	801	2955	688	4770	0.024	4770	159	1	0.32	1.72	NOT REQ'D	28382	0.03
11	7000	60	661	361	1022	2561	493	4770	0.031	4770	159	1	0.39	1.24	NOT REQ'D	28382	0.04
10	7000	60	1040	483	1523	2592	515	4770	0.046	4770	159	1	0.38	1.29	NOT REQ'D	28382	0.05
9	7000	60	1485	605	2090	2976	564	4770	0.063	4770	159	1	0.40	1.41	NOT REQ'D	28382	0.07
8	7000	60	1963	728	2691	3568	656	4770	0.081	4770	159	1	0.41	1.64	NOT REQ'D	28382	0.09
7	7000	60	2471	850	3322	4233	742	4770	0.099	4770	159	1	0.43	1.86	NOT REQ'D	28382	0.12
6	7000	60	3024	973	3997	4845	797	4770	0.120	4770	159	1	0.46	2.00	PROVIDE B.E.	28382	0.14
5	7000	60	3612	1096	4707	5541	881	4770	0.141	4770	159	1	0.47	2.21	PROVIDE B.E.	28382	0.17
4	7000	60	4123	1218	5341	5801	870	4770	0.160	4770	159	1	0.50	2.18	PROVIDE B.E.	28382	0.19
3	7000	60	4781	1373	6155	9138	1074	4770	0.184	4770	159	1	0.64	2.69	PROVIDE B.E.	28382	0.22
2	7000	60	5239	1546	6785	10159	1219	4770	0.203	4770	159	1	0.63	3.05	PROVIDE B.E.	28382	0.24
1	7000	60	4737	1708	6446	10390	809	4770	0.193	4770	159	1	0.97	2.03	PROVIDE B.E.	28382	0.23
B1	7000	60	3522	1825	5347	5418	779	4770	0.160	4770	159	1	0.52	1.95	PROVIDE B.E.	28382	0.19
B2	7000	60	2885	1942	4827	4163	645	4770	0.145	4770	159	1	0.49	1.62	PROVIDE B.E.	28382	0.17
B3	7000	60	2387	2059	4446	2963	452	4770	0.133	4770	159	1	0.49	1.13	PROVIDE B.E.	28382	0.16
B4	7000	60	1978	2176	4154	1895	293	4770	0.124	4770	159	1	0.49	0.73	PROVIDE B.E.	28382	0.15

													Confinement in width					
Floor	Length of B.E. Req'd	A_{sh}/s Req'd	B.E.[2] Length used (h_c)	New A_{sh}/s Req'd	legs	Ash	s (spacing)	Ash/s act	ok/ng	min diam long bars allowed	long spacing of legs	% of Length	A_{sh} Req.	Area of hoops	Legs in addtion to outer hoop	Area of added legs	Ash act	ok/ng
	in	in/in	in	in/in		in^2	in	in/in		in	in		in^2	in^2		in^2	in^2	
13	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
7	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
6	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
5	25	0.26	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
4	27	0.28	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
3	29	0.31	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
2	31	0.32	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
1	30	0.31	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
B1	27	0.28	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
B2	25	0.27	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
B3	24	0.26	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK
B4	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.32	0.31	2	0.44	1.50	OK

5/2/2005

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c = 22.4 in
Perimeter of wall = 973 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops.

Wall ID: P1A

Floor	f'_c	fy	P_E	P_{Grav} 1.42DL+0.5L	P_u	M_u	V_u (k)	A_g	$P_u/(A_g f'_c)$	A_{cv}	Shear l_w	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}*sqrt(f'_c))$	Conclusion	P_o[1]	P_u/P_o
			Loads based on Max. Axial														
	psi	ksi	kips	kips	kips	kip-ft	kips	in^2		in^2	in					kips	
13	7000	60	193	210	403	2799	369	9072	0.006	9072	378	1	0.24	0.49	NOT REQ'D	53978	0.01
12	7000	60	874	567	1441	7356	1580	9072	0.023	9072	378	1	0.15	2.08	NOT REQ'D	53978	0.03
11	7000	60	1850	858	2708	3427	1633	9072	0.043	9072	378	1	0.07	2.15	NOT REQ'D	53978	0.05
10	7000	60	2900	1149	4049	6834	1970	9072	0.064	9072	378	1	0.11	2.60	NOT REQ'D	53978	0.08
9	7000	60	4015	1439	5454	8613	2124	9072	0.086	9072	378	1	0.13	2.80	NOT REQ'D	53978	0.10
8	7000	60	5128	1730	6859	10133	2241	9072	0.108	9072	378	1	0.14	2.95	PROVIDE B.E.	53978	0.13
7	7000	60	6220	2022	8241	12229	2374	9072	0.130	9072	378	1	0.16	3.13	PROVIDE B.E.	53978	0.15
6	7000	60	7454	2313	9768	15797	2544	9072	0.154	9072	378	1	0.20	3.35	PROVIDE B.E.	53978	0.18
5	7000	60	8881	2605	11486	21218	2727	9072	0.181	9072	378	1	0.25	3.59	PROVIDE B.E.	53978	0.21
4	7000	60	10255	2896	13151	26880	2850	9072	0.207	9072	378	1	0.30	3.76	PROVIDE B.E.	53978	0.24
3	7000	60	11066	3265	14331	28769	2879	9072	0.226	9072	378	1	0.32	3.79	PROVIDE B.E.	53978	0.27
2	7000	60	11466	3676	15141	59748	3203	9072	0.238	9072	378	1	0.59	4.22	PROVIDE B.E.	53978	0.28
1	7000	60	8942	4061	13003	36630	1026	9072	0.205	9072	378	1	1.13	1.35	PROVIDE B.E.	53978	0.24
B1	7000	60	5502	4339	9842	35771	1619	9072	0.155	9072	378	1	0.70	2.13	PROVIDE B.E.	53978	0.18
B2	7000	60	3468	4617	8085	30505	1609	9072	0.127	9072	378	1	0.60	2.12	PROVIDE B.E.	53978	0.15
B3	7000	60	2067	4895	6963	24042	1293	9072	0.110	9072	378	1	0.59	1.70	PROVIDE B.E.	53978	0.13
B4	7000	60	1286	5173	6459	18614	982	9072	0.102	9072	378	1	0.60	1.29	PROVIDE B.E.	53978	0.12

Floor	Length of B.E. Req'd	A_{sh}/s Req'd	B.E.[2] Length used (h_c)	New A_{sh}/s Req'd	legs	Ash	s (spacing)	Ash/s act	ok/ng	min diam long bars allowed	long spacing of legs	% of Length	A_{sh} Req.	Area of hoops	Legs in addtion to outer hoop	Area of added legs	Ash act	ok/ng
													Confinement in width					
	in	in/in	in	in/in		in^2	in	in/in		in	in		in^2	in^2		in^2	in^2	
13	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	57	0.60	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
7	57	0.60	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
6	63	0.66	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
5	69	0.72	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
4	74	0.78	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
3	79	0.82	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
2	81	0.85	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
1	74	0.78	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
B1	63	0.66	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
B2	57	0.60	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
B3	57	0.60	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK
B4	57	0.60	84	0.88	14	0.31	4.5	0.96	OK	0.75	6.0	0.22	1.06	0.31	1	0.44	1.06	OK

5/2/2005

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c= 22.4 in
Perimeter of wall = 973 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops.

Wall ID: P1B

Floor	f'_c	fy	P_E (Loads based on Max. Axial)	P_{Grav} 1.42DL+0.5L	P_u	M_u	V_u (k)	A_g	$P_u/(A_g f'_c)$	A_{cv}	Shear l_w	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}$*sqrt(f'_c))	Conclusion	P_o[1]	P_u/P_o
	psi	ksi	kips	kips	kips	kip-ft	kips	in²		in²	in					kips	
13	7000	60	0	88	88	0	0	3816	0.003	3816	159	1	#DIV/0!	0.00	#DIV/0!	22705	0.00
12	7000	60	339	238	577	2820	599	3816	0.022	3816	159	1	0.36	1.87	NOT REQ'D	22705	0.03
11	7000	60	513	361	874	1650	370	3816	0.033	3816	159	1	0.34	1.16	NOT REQ'D	22705	0.04
10	7000	60	843	483	1326	1953	468	3816	0.050	3816	159	1	0.31	1.47	NOT REQ'D	22705	0.06
9	7000	60	1220	605	1826	2276	537	3816	0.068	3816	159	1	0.32	1.68	NOT REQ'D	22705	0.08
8	7000	60	1629	728	2357	2699	608	3816	0.088	3816	159	1	0.33	1.90	NOT REQ'D	22705	0.10
7	7000	60	2065	850	2916	3121	680	3816	0.109	3816	159	1	0.35	2.13	PROVIDE B.E.	22705	0.13
6	7000	60	2528	973	3502	3494	741	3816	0.131	3816	159	1	0.36	2.32	PROVIDE B.E.	22705	0.15
5	7000	60	3023	1096	4118	3805	799	3816	0.154	3816	159	1	0.36	2.50	PROVIDE B.E.	22705	0.18
4	7000	60	3539	1218	4757	3619	599	3816	0.178	3816	159	1	0.46	1.88	PROVIDE B.E.	22705	0.21
3	7000	60	3780	1373	5153	4264	525	3816	0.193	3816	159	1	0.61	1.65	PROVIDE B.E.	22705	0.23
2	7000	60	4028	1546	5574	4883	425	3816	0.209	3816	159	1	0.87	1.33	PROVIDE B.E.	22705	0.25
1	7000	60	3435	1708	5143	7668	724	3816	0.193	3816	159	1	0.80	2.27	PROVIDE B.E.	22705	0.23
B1	7000	60	2759	1825	4584	4146	623	3816	0.172	3816	159	1	0.50	1.95	PROVIDE B.E.	22705	0.20
B2	7000	60	2189	1942	4131	2954	482	3816	0.155	3816	159	1	0.46	1.51	PROVIDE B.E.	22705	0.18
B3	7000	60	1761	2059	3820	1992	338	3816	0.143	3816	159	1	0.45	1.06	PROVIDE B.E.	22705	0.17
B4	7000	60	1419	2176	3595	1259	234	3816	0.135	3816	159	1	0.41	0.73	PROVIDE B.E.	22705	0.16

Floor	Length of B.E. Req'd	A_{sh}/s Req'd	B.E.[2] Length used (h_c)	New A_{sh}/s Req'd	legs	Ash	s (spacing)	Ash/s act	ok/ng	min diam long bars allowed	long spacing of legs	% of Length	A_{sh} Req. (Confinement in width)	Area of hoops	Legs in addtion to outer hoop	Area of added legs	Ash act	ok/ng
	in	in/in	in	in/in		in²	in	in/in		in	in		in²	in²		in²	in²	
13	#DIV/0!	#####		#DIV/0!				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####				#DIV/0!	#####
12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
7	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
6	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
5	26	0.28	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
4	29	0.30	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
3	30	0.31	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
2	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
1	30	0.31	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
B1	28	0.29	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
B2	26	0.28	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
B3	25	0.27	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK
B4	25	0.26	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.06	0.31	1	0.44	1.06	OK

5/2/2005

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c = 22.4 in
Perimeter of wall = 973 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops.

Wall ID: P1C

Floor	f'_c (psi)	fy (ksi)	P_E (kips)	Loads based on Max. Axial: P_{Grav} 1.42DL+0.5L (kips)	P_u (kips)	M_u (kip-ft)	V_u (k) (kips)	A_g (in²)	$P_u/(A_g f'_c)$	A_{cv} (in²)	Shear l_w (in)	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}$*sqrt(f'_c))	Conclusion	P_o[1] (kips)	P_u/P_o
13	7000	60	0	83	83	0	0	3576	0.003	3576	149	1	#DIV/0!	0.00	#DIV/0!	21277	0.00
12	7000	60	1099	223	1322	2383	1036	3576	0.053	3576	149	1	0.19	3.46	NOT REQ'D	21277	0.06
11	7000	60	1203	338	1541	2923	497	3576	0.062	3576	149	1	0.47	1.66	NOT REQ'D	21277	0.07
10	7000	60	1558	453	2011	2857	516	3576	0.080	3576	149	1	0.45	1.72	NOT REQ'D	21277	0.09
9	7000	60	2002	567	2570	2821	524	3576	0.103	3576	149	1	0.43	1.75	PROVIDE B.E.	21277	0.12
8	7000	60	2483	682	3165	3004	552	3576	0.126	3576	149	1	0.44	1.84	PROVIDE B.E.	21277	0.15
7	7000	60	2998	797	3795	3271	589	3576	0.152	3576	149	1	0.45	1.97	PROVIDE B.E.	21277	0.18
6	7000	60	3651	912	4563	3451	622	3576	0.182	3576	149	1	0.45	2.08	PROVIDE B.E.	21277	0.21
5	7000	60	4359	1027	5386	3459	606	3576	0.215	3576	149	1	0.46	2.03	PROVIDE B.E.	21277	0.25
4	7000	60	5035	1142	6177	3336	745	3576	0.247	3576	149	1	0.36	2.49	PROVIDE B.E.	21277	0.29
3	7000	60	5607	1287	6894	3717	628	3576	0.275	3576	149	1	0.48	2.10	PROVIDE B.E.	21277	0.32
2	7000	60	5284	1449	6733	3055	617	3576	0.269	3576	149	1	0.40	2.06	PROVIDE B.E.	21277	0.32
1	7000	60	3679	1601	5280	2465	1103	3576	0.211	3576	149	1	0.18	3.69	PROVIDE B.E.	21277	0.25
B1	7000	60	2371	1710	4081	6892	986	3576	0.163	3576	149	1	0.56	3.29	PROVIDE B.E.	21277	0.19
B2	7000	60	1588	1820	3408	3310	422	3576	0.136	3576	149	1	0.63	1.41	PROVIDE B.E.	21277	0.16
B3	7000	60	1380	1930	3309	2160	290	3576	0.132	3576	149	1	0.60	0.97	PROVIDE B.E.	21277	0.16
B4	7000	60	1343	2039	3382	1413	250	3576	0.135	3576	149	1	0.46	0.84	PROVIDE B.E.	21277	0.16

Floor	Length of B.E. Req'd (in)	A_{sh}/s Req'd (in/in)	B.E.[2] Length used (h_c) (in)	New A_{sh}/s Req'd (in/in)	legs	Ash (in²)	s (spacing) (in)	Ash/s act (in/in)	ok/ng	min diam long bars allowed (in)	long spacing of legs (in)	% of Length	Confinement in width: A_{sh} Req. (in²)	Area of hoops (in²)	Legs in addtion to outer hoop	Area of added legs (in²)	Ash act (in²)	ok/ng
13	#DIV/0!	#####		#DIV/0!				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####				#DIV/0!	#####
12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	22	0.23	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
8	22	0.23	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
7	24	0.26	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
6	27	0.29	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
5	30	0.32	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
4	33	0.34	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
3	35	0.37	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
2	35	0.36	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
1	30	0.31	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
B1	25	0.27	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
B2	23	0.24	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
B3	23	0.24	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK
B4	23	0.24	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.24	1.06	0.31	1	0.44	1.06	OK

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c = 22.4 in
Perimeter of wall = 973 in

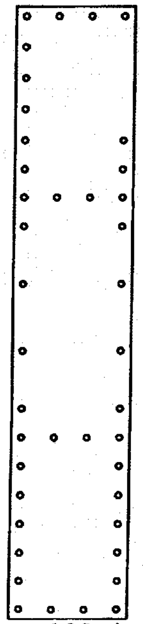
Notes:
1) Needs to verified after flexural design
2) B.E. length is center to center of BE confining hoops

Wall ID: P1D — Loads based on Max. Axial

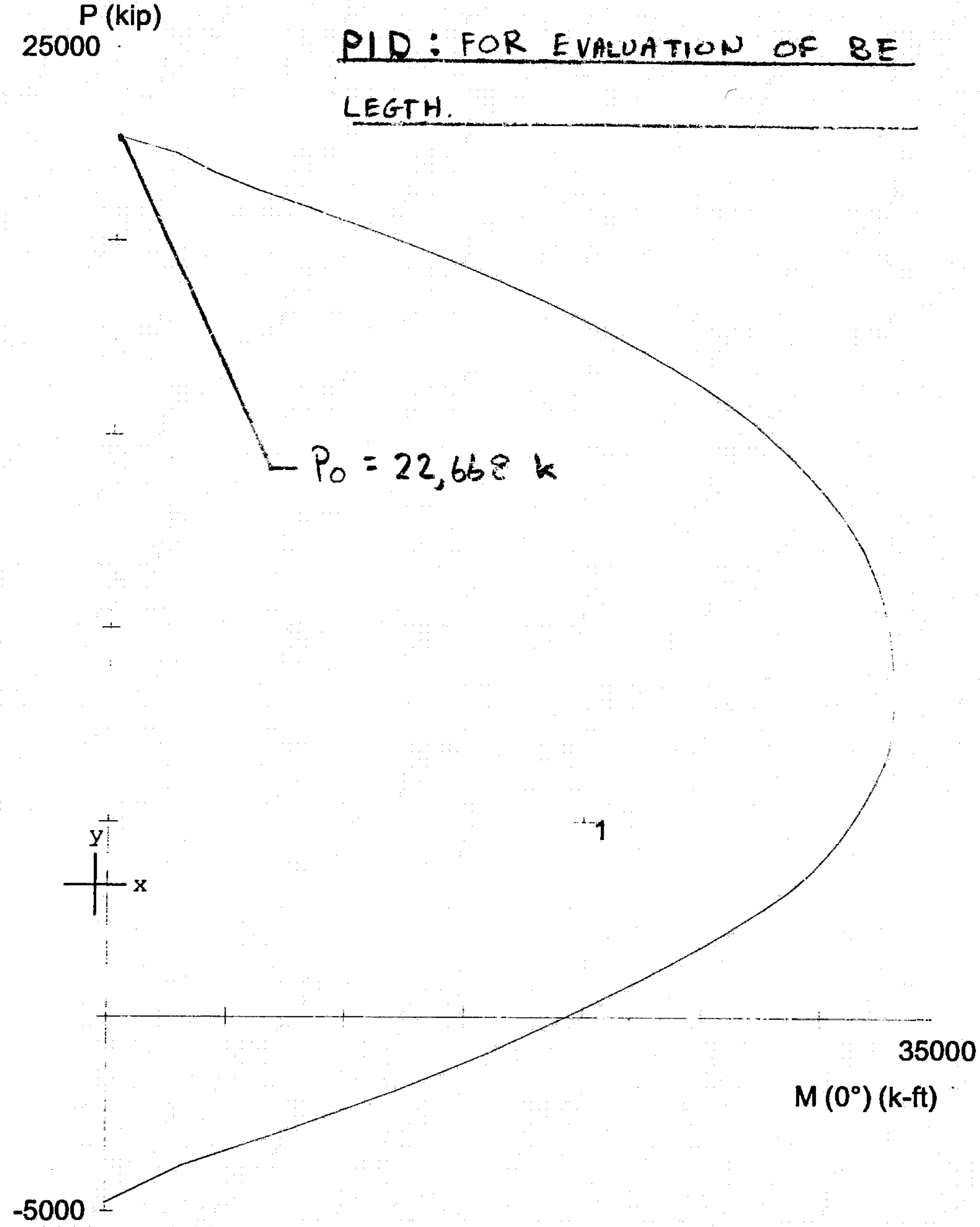
Floor	f'_c (psi)	fy (ksi)	P_E (kips)	P_{Grav} 1.42DL+0.5L (kips)	P_u (kips)	M_u (kip-ft)	V_u (k) (kips)	A_g (in^2)	$P_u/(A_g f'_c)$	A_{cv} (in^2)	Shear l_w (in)	Symmetry 1=sym 0=un-sym
13	7000	60	0	71	71	0	0	3072	0.003	3072	128	1
12	7000	60	889	192	1081	3175	1094	3072	0.050	3072	128	1
11	7000	60	1046	291	1336	3127	573	3072	0.062	3072	128	1
10	7000	60	1517	389	1906	3847	695	3072	0.089	3072	128	1
9	7000	60	2029	487	2516	4046	740	3072	0.117	3072	128	1
8	7000	60	2512	586	3098	4247	780	3072	0.144	3072	128	1
7	7000	60	2937	685	3622	4449	821	3072	0.168	3072	128	1
6	7000	60	3575	783	4358	4716	888	3072	0.203	3072	128	1
5	7000	60	4386	882	5269	4764	877	3072	0.245	3072	128	1
4	7000	60	5542	981	6523	6302	1385	3072	0.303	3072	128	1
3	7000	60	5957	1106	7063	4738	919	3072	0.328	3072	128	1
2	7000	60	6261	1245	7505	1990	555	3072	0.349	3072	128	1
1	7000	60	4770	1375	6146	3004	727	3072	0.286	3072	128	1
B1	7000	60	3437	1469	4907	3070	622	3072	0.228	3072	128	1
B2	7000	60	2470	1563	4034	1545	352	3072	0.188	3072	128	1
B3	7000	60	1843	1658	3500	868	192	3072	0.163	3072	128	1
B4	7000	60	1546	1752	3298	678	138	3072	0.153	3072	128	1

Floor	$M_u/V_u l_w$	$V_u/(A_{cv}$*sqrt(f'_c))	Conclusion	P_o[1] (kips)	P_u/P_o	Length of B.E. Req'd (in)	A_{sh}/s Req'd (in/in)	B.E.[2] Length used (h_c) (in)	New A_{sh}/s Req'd (in/in)	legs	Ash (in^2)	s (spacing) (in)	Ash/s act (in/in)	ok/ng
13	#DIV/0!	0.00	#DIV/0!	18278	0.00	#DIV/0!	#DIV/0!		#DIV/0!				#DIV/0!	#DIV/0!
12	0.27	4.26	NOT REQ'D	18278	0.06	n/a	n/a		n/a				n/a	n/a
11	0.51	2.23	NOT REQ'D	18278	0.07	n/a	n/a		n/a				n/a	n/a
10	0.52	2.70	NOT REQ'D	18278	0.10	n/a	n/a		n/a				n/a	n/a
9	0.51	2.88	PROVIDE B.E.	22668	0.11	19	0.20	36	0.38	6	0.31	4.5	0.41	OK
8	0.51	3.03	PROVIDE B.E.	22668	0.14	19	0.20	36	0.38	6	0.31	4.5	0.41	OK
7	0.51	3.19	PROVIDE B.E.	22668	0.16	20	0.21	36	0.38	6	0.31	4.5	0.41	OK
6	0.50	3.46	PROVIDE B.E.	22668	0.19	22	0.23	36	0.38	6	0.31	4.5	0.41	OK
5	0.51	3.41	PROVIDE B.E.	22668	0.23	24	0.26	36	0.38	6	0.31	4.5	0.41	OK
4	0.43	5.39	PROVIDE B.E.	22668	0.29	28	0.29	36	0.38	6	0.31	4.5	0.41	OK
3	0.48	3.58	PROVIDE B.E.	22668	0.31	30	0.31	36	0.38	6	0.31	4.5	0.41	OK
2	0.34	2.16	PROVIDE B.E.	22668	0.33	31	0.32	36	0.38	6	0.31	4.5	0.41	OK
1	0.39	2.83	PROVIDE B.E.	22668	0.27	27	0.28	36	0.38	6	0.31	4.5	0.41	OK
B1	0.46	2.42	PROVIDE B.E.	22668	0.22	23	0.25	36	0.38	6	0.31	4.5	0.41	OK
B2	0.41	1.37	PROVIDE B.E.	22668	0.18	21	0.22	36	0.38	6	0.31	4.5	0.41	OK
B3	0.42	0.75	PROVIDE B.E.	22668	0.15	19	0.20	36	0.38	6	0.31	4.5	0.41	OK
B4	0.46	0.54	PROVIDE B.E.	22668	0.15	19	0.20	36	0.38	6	0.31	4.5	0.41	OK

Floor	min diam long bars allowed (in)	long spacing of legs (in)	% of Length	Confinement in width: A_{sh} Req. (in^2)	Area of hoops (in^2)	Legs in addtion to outer hoop	Area of added legs (in^2)	Ash act (in^2)	ok/ng
13	#DIV/0!	#DIV/0!	#DIV/0!	#####				#DIV/0!	#####
12	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a	n/a	n/a				n/a	n/a
9	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
8	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
7	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
6	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
5	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
4	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
3	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
2	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
1	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
B1	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
B2	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
B3	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK
B4	0.75	6.0	0.28	1.06	0.31	1	0.44	1.06	OK



24 x 128 in



Code: ACI 318-95

Units: English

Run axis: Biaxial

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 05/02/05

Time: 09:01:58

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P1DL3.COL

Project:

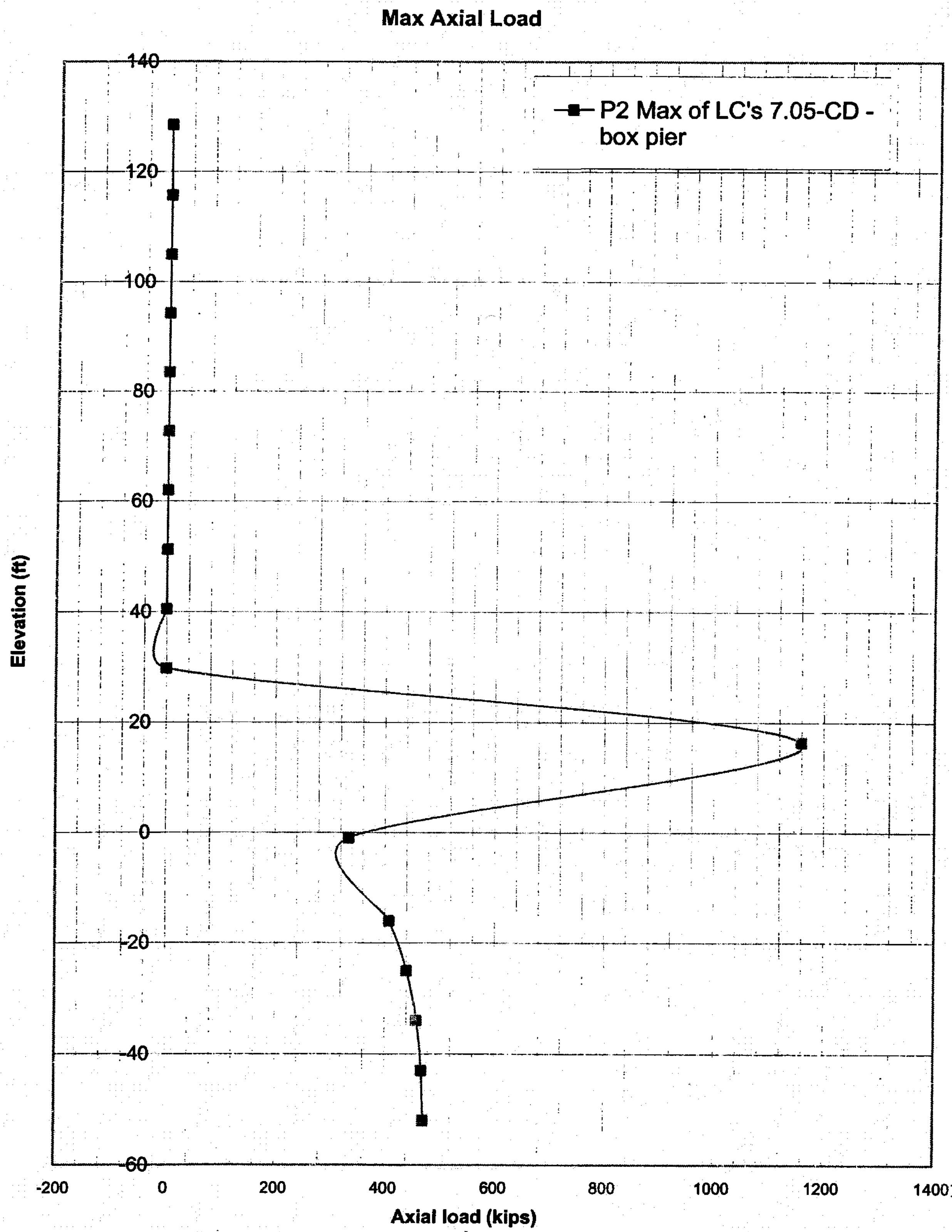
Column: Engineer:

f'c = 7 ksi	fy = 75 ksi	Ag = 3072 in^2	41 #11 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 63.96 in^2	Rho = 2.08%
fc = 5.95 ksi	e_rup = Infinity	Xo = -67.50 in	Ix = 4.1943e+006 in^4
e_u = 0.003 in/in		Yo = 125.00 in	Iy = 147456 in^4
Beta1 = 0.7		Clear spacing = 4.59 in	Clear cover = N/A

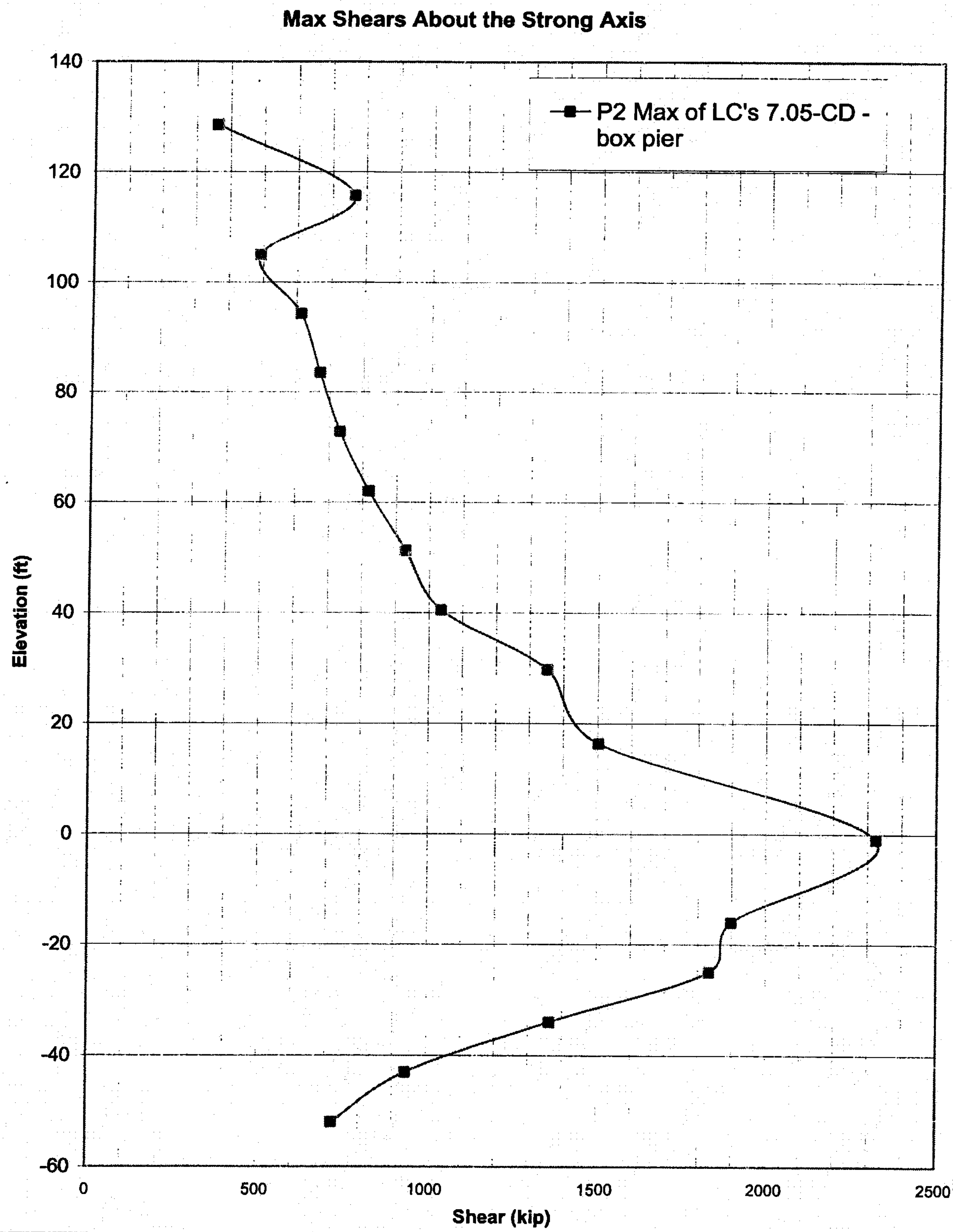
9.1.1-41

Confinement: Other phi(a) = 1, phi(b) = 1, phi(c) = 1

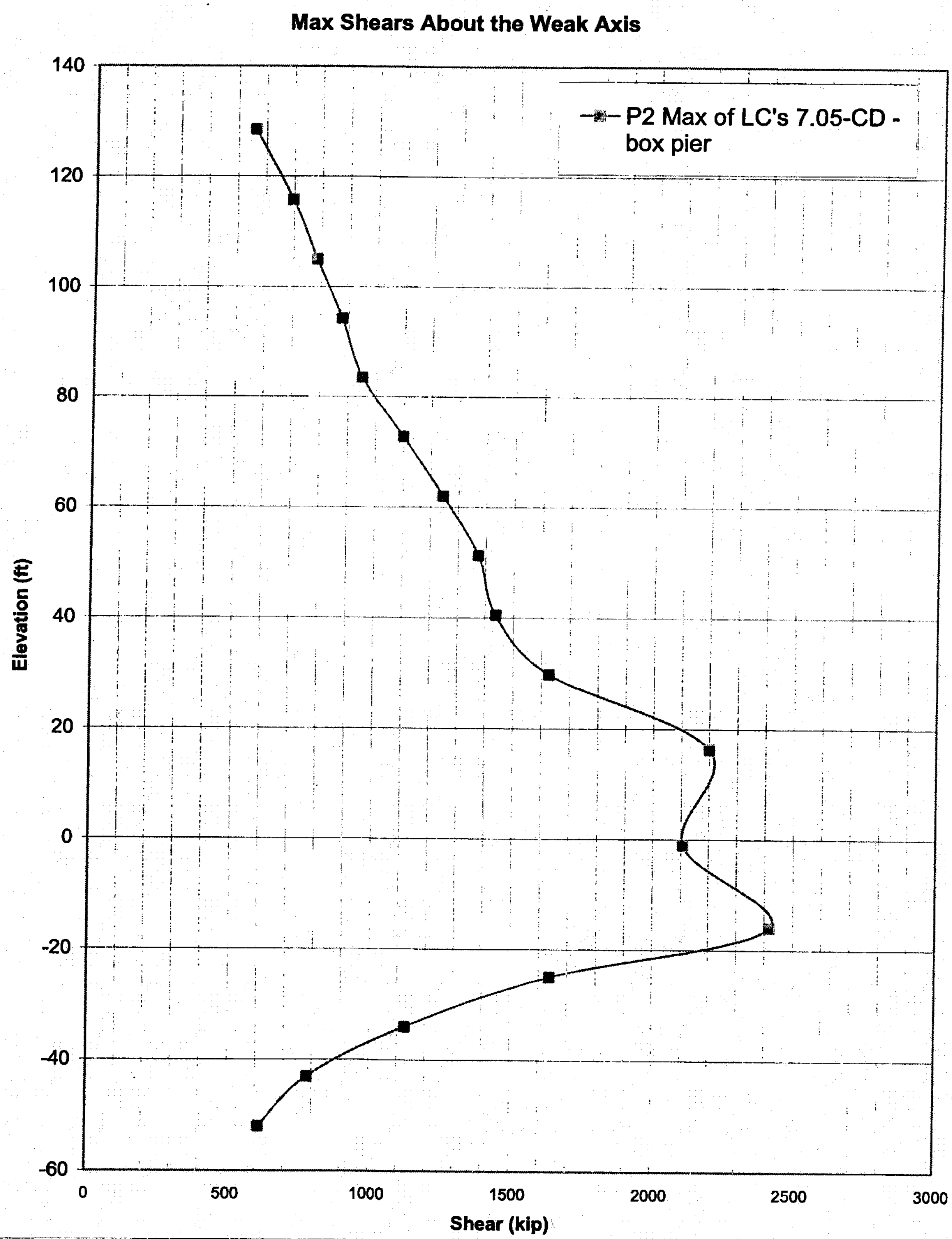
DODSONNOC00000619


Max Axial Load
P2 Max of LC's 7.05-CD - box pier
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
-200
0
200
400
600
800
1000
1200
1400
Axial load (kips)

9.1.1-42

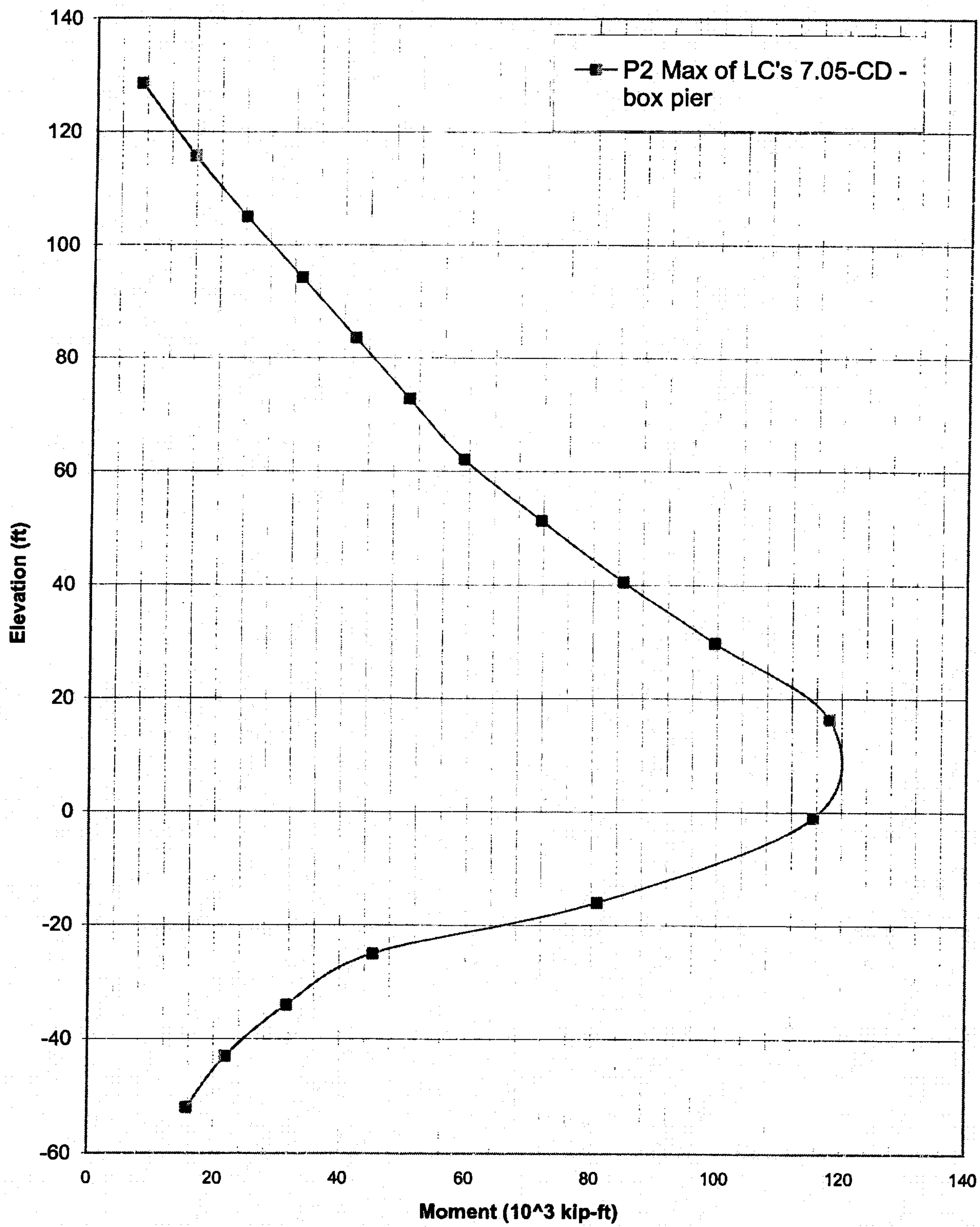

Max Shears About the Strong Axis
P2 Max of LC's 7.05-CD - box pier
Elevation (ft)
Shear (kip)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500

9.1.1-43

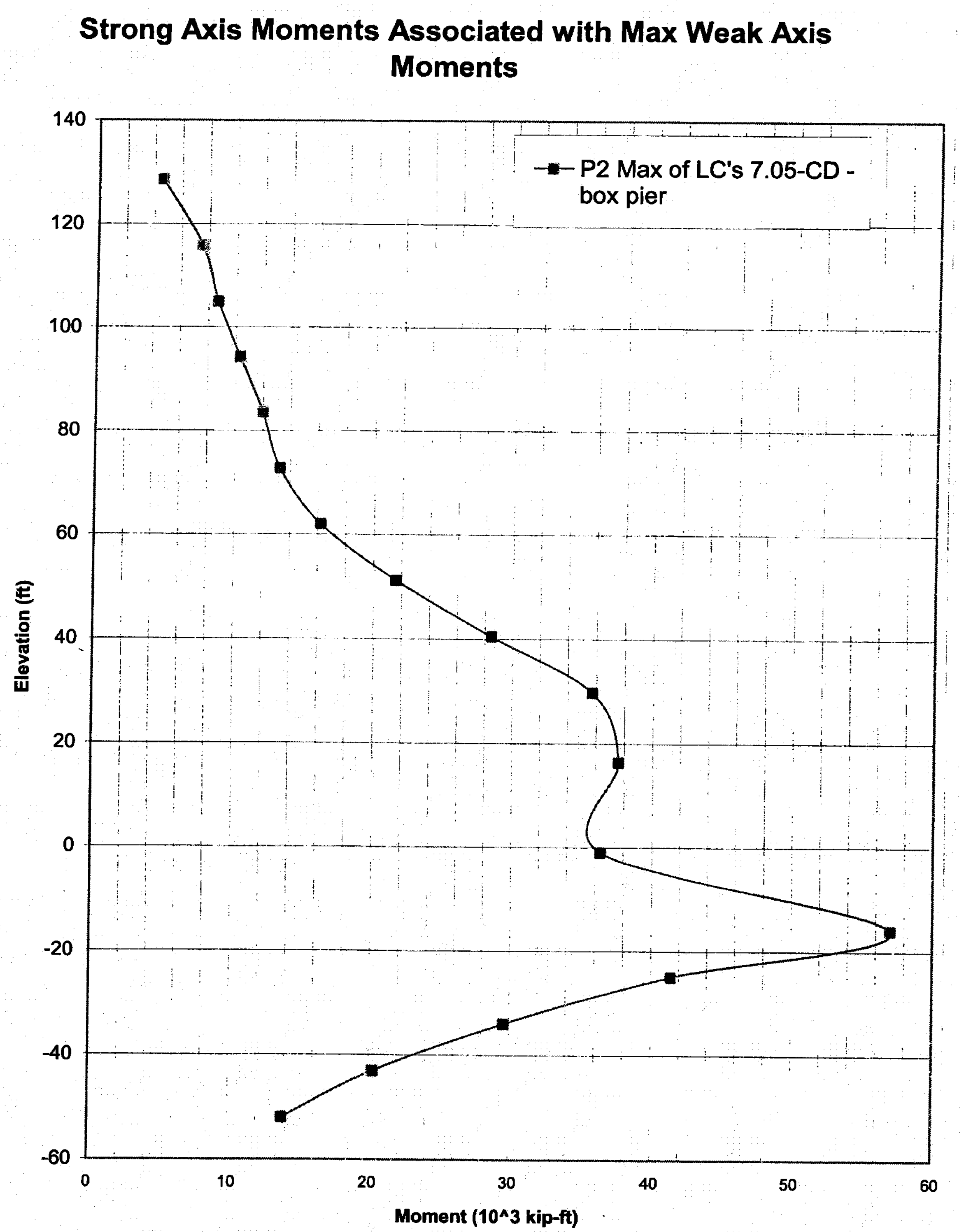

Max Shears About the Weak Axis
P2 Max of LC's 7.05-CD - box pier
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
Shear (kip)

9.1.1-44

Max Moments About the Weak Axis



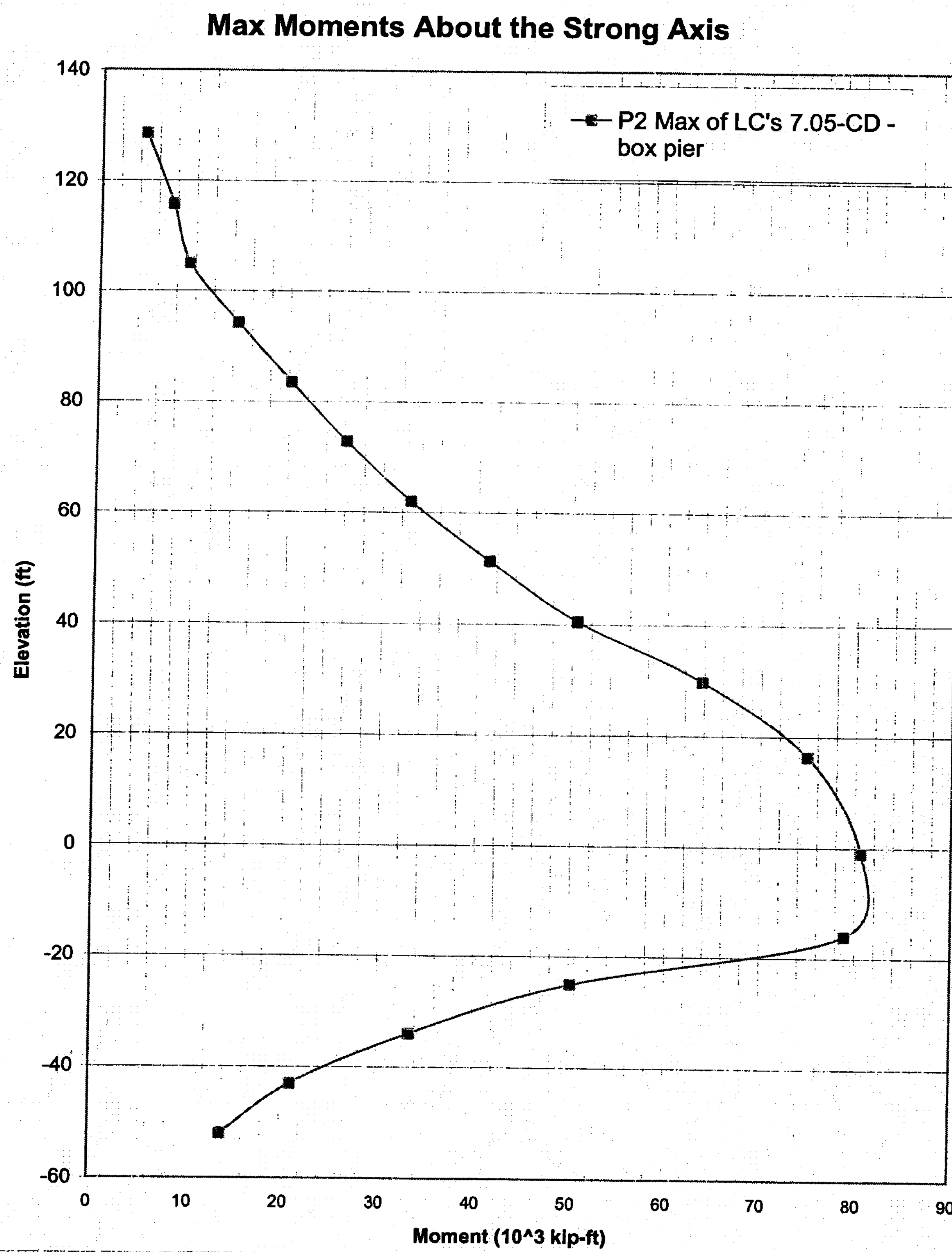
9.1.1-45



Strong Axis Moments Associated with Max Weak Axis Moments
P2 Max of LC's 7.05-CD - box pier
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
10
20
30
40
50
60
Moment (10^3 kip-ft)

9.1.1-46

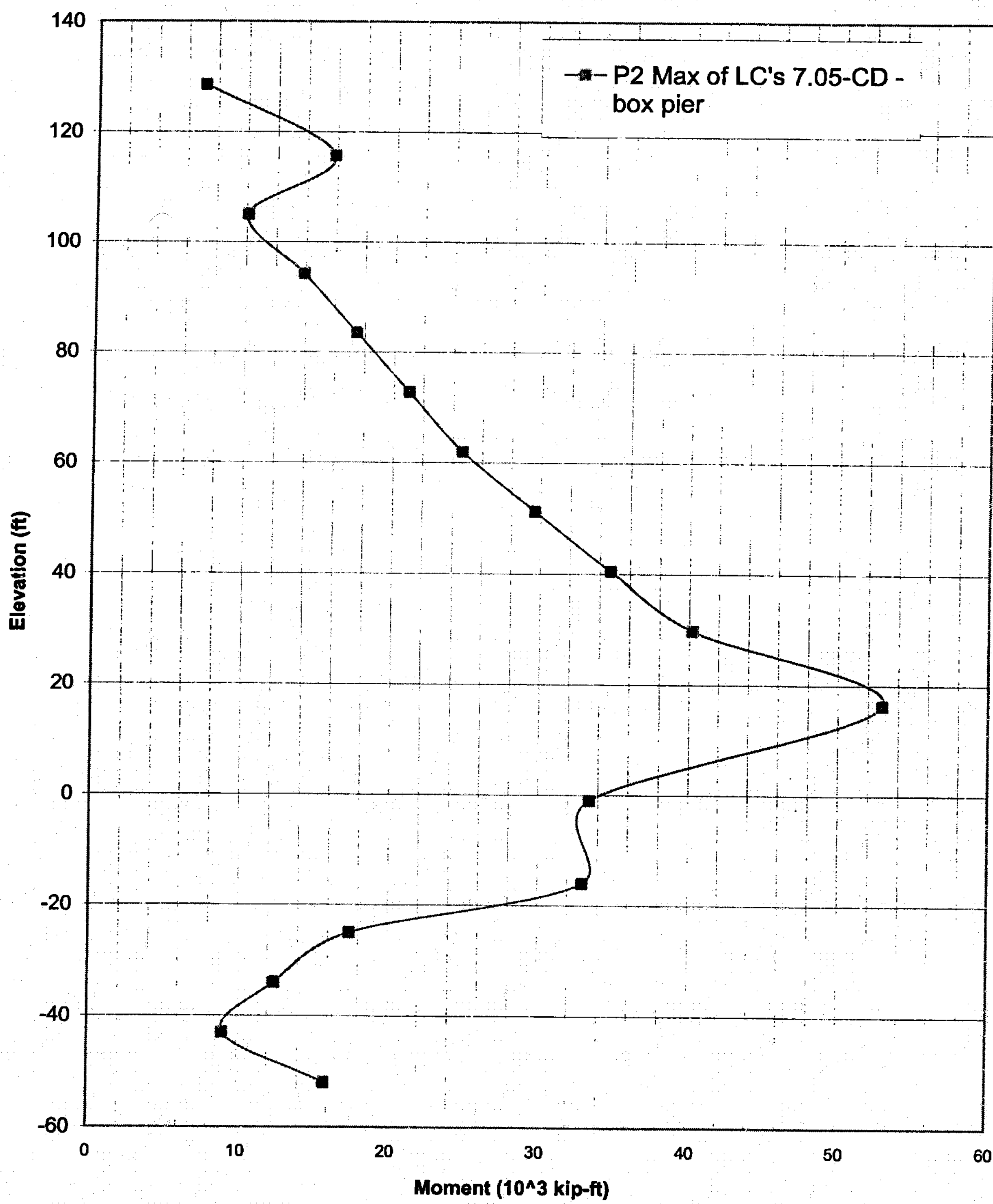
Print Date 4/15/2005



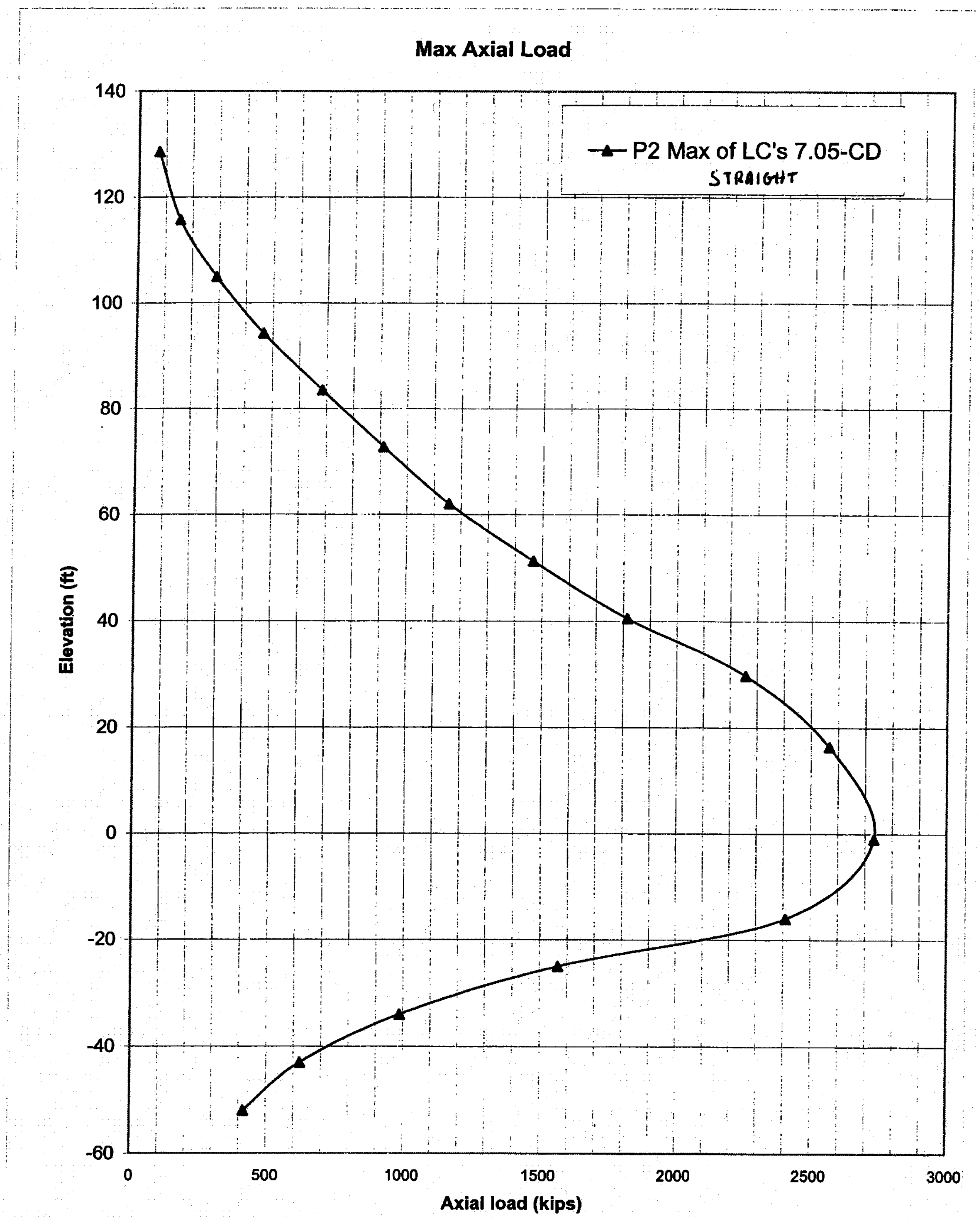
9.1.1-47

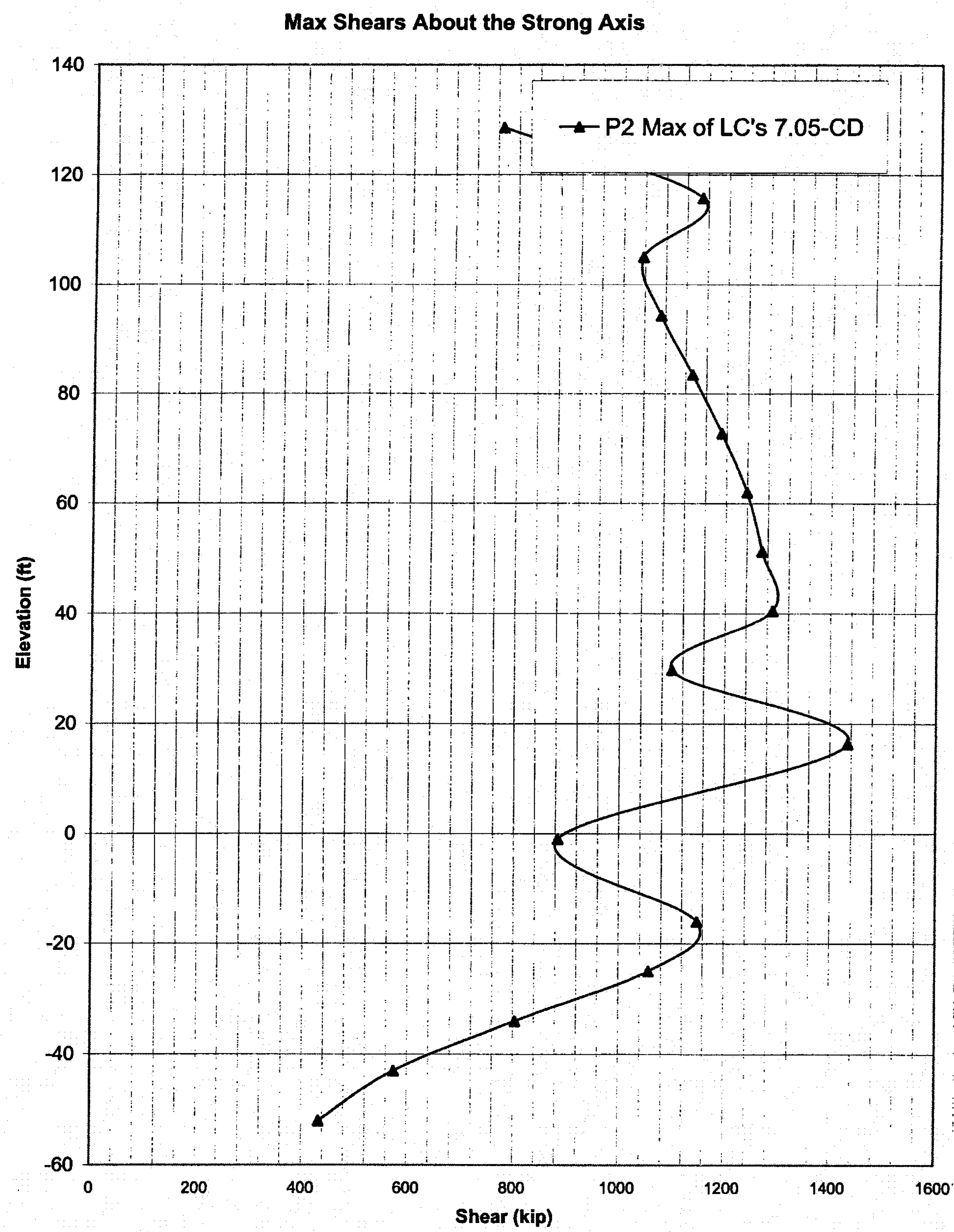
DODSONNOC00000625

Weak Axis Moments Associated with Max Strong Axis Moments



9.1.1-48

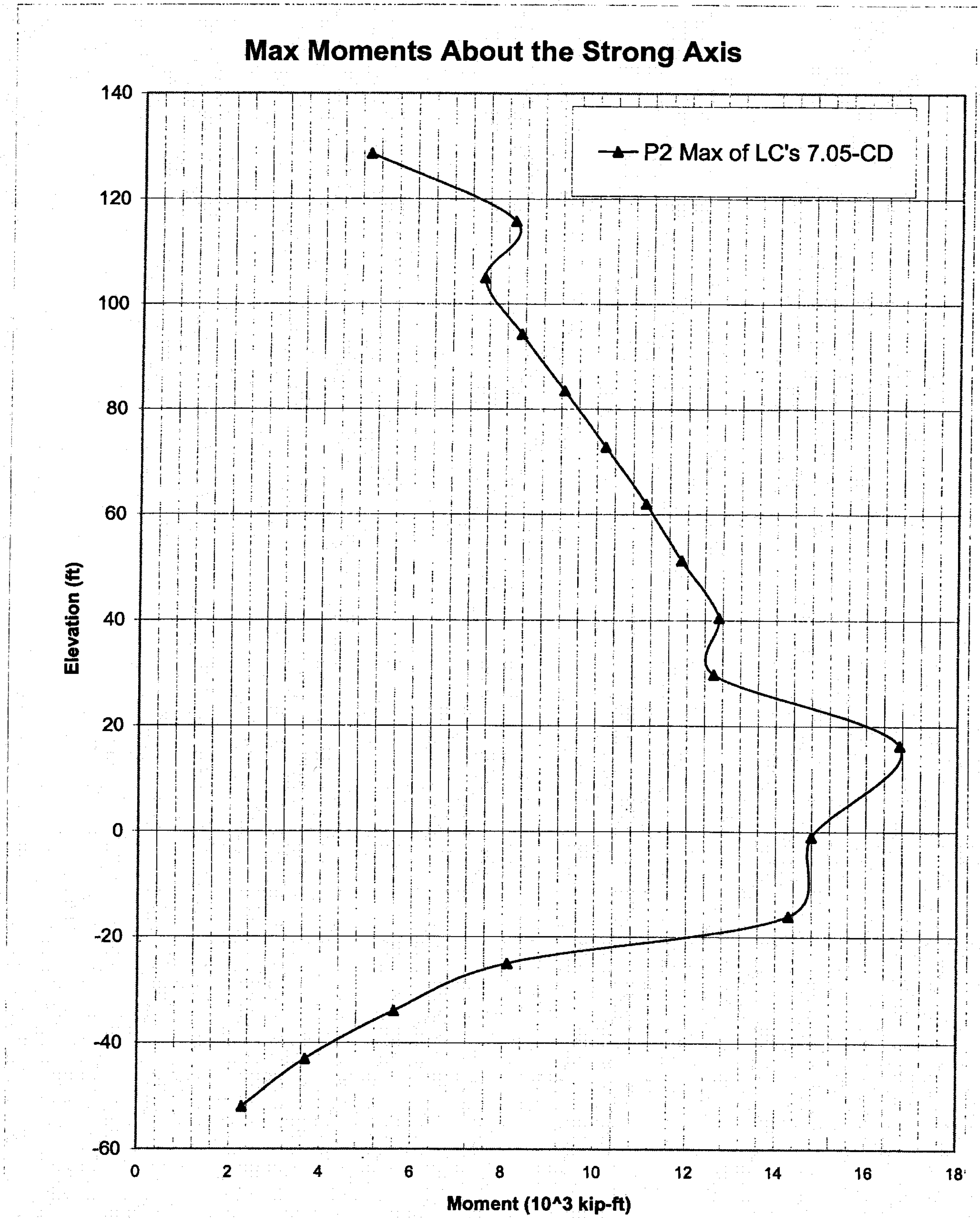

Max Axial Load
P2 Max of LC's 7.05-CD
STRAIGHT
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
Axial load (kips)



Max Shears About the Strong Axis
P2 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
200
400
600
800
1000
1200
1400
1600
Shear (kip)

9.1.1-50

Print Date 4/21/2005

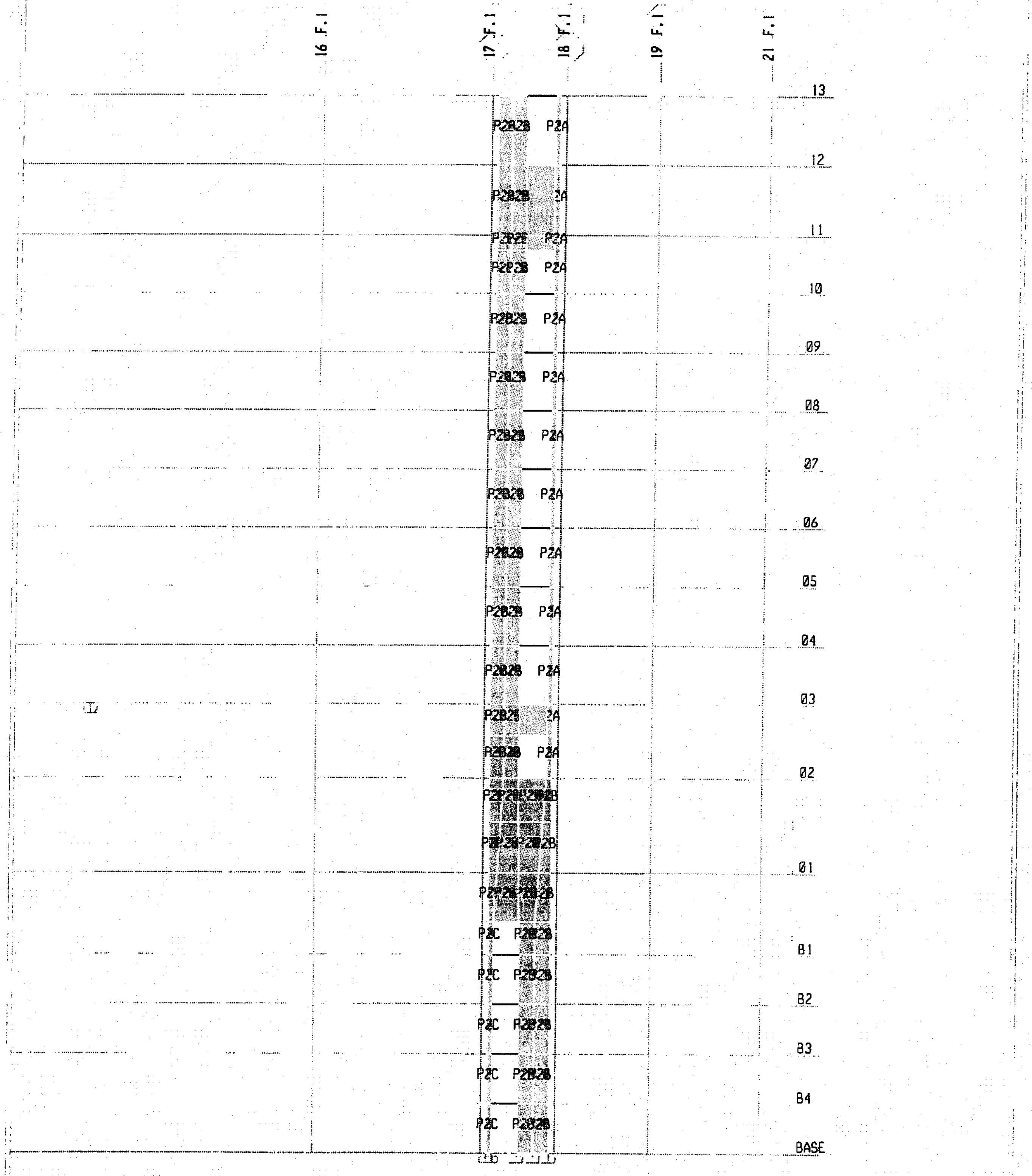


9.1.1-S1

DODSONNOC00000629

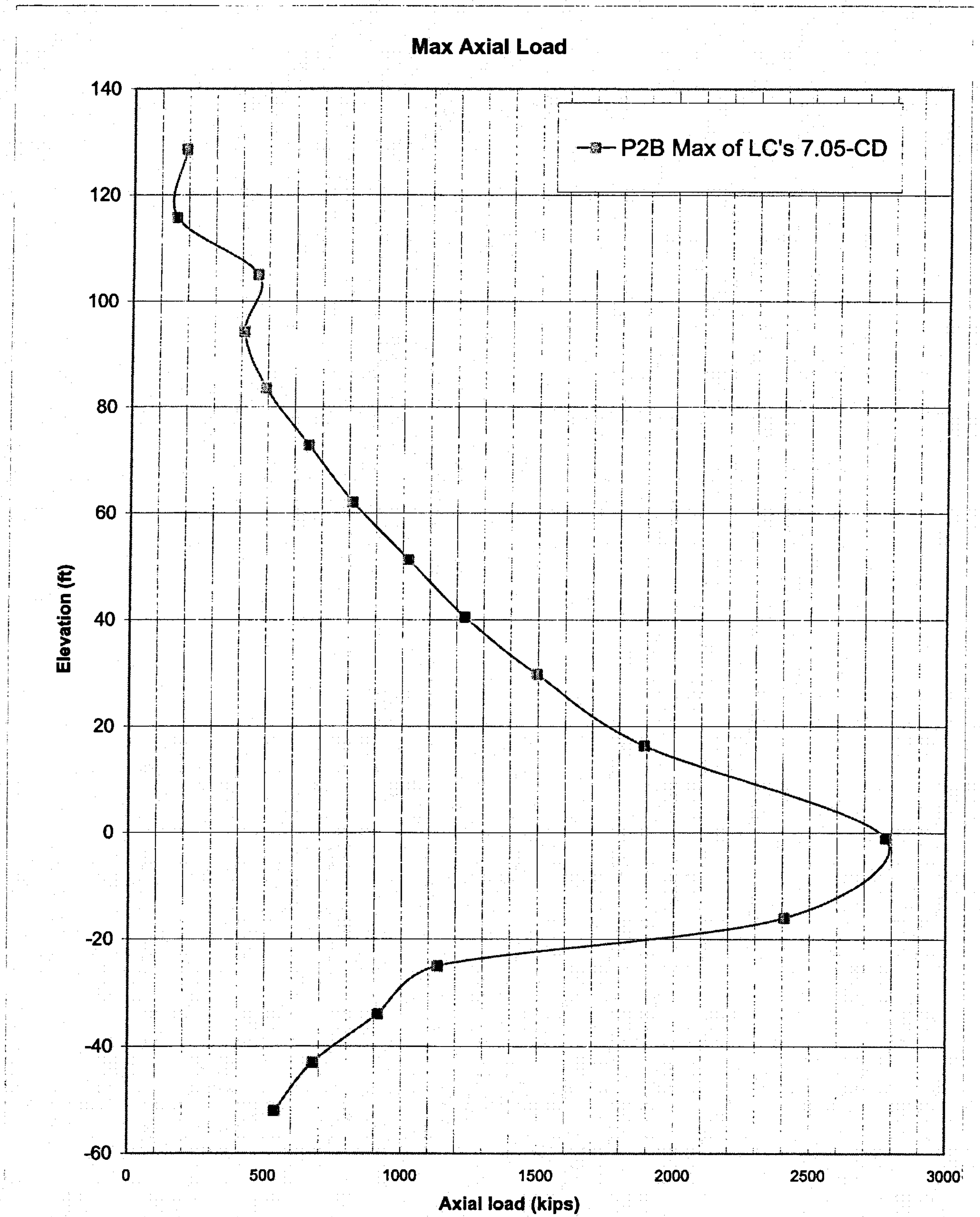
ETABS

DEFINITION OF P2B

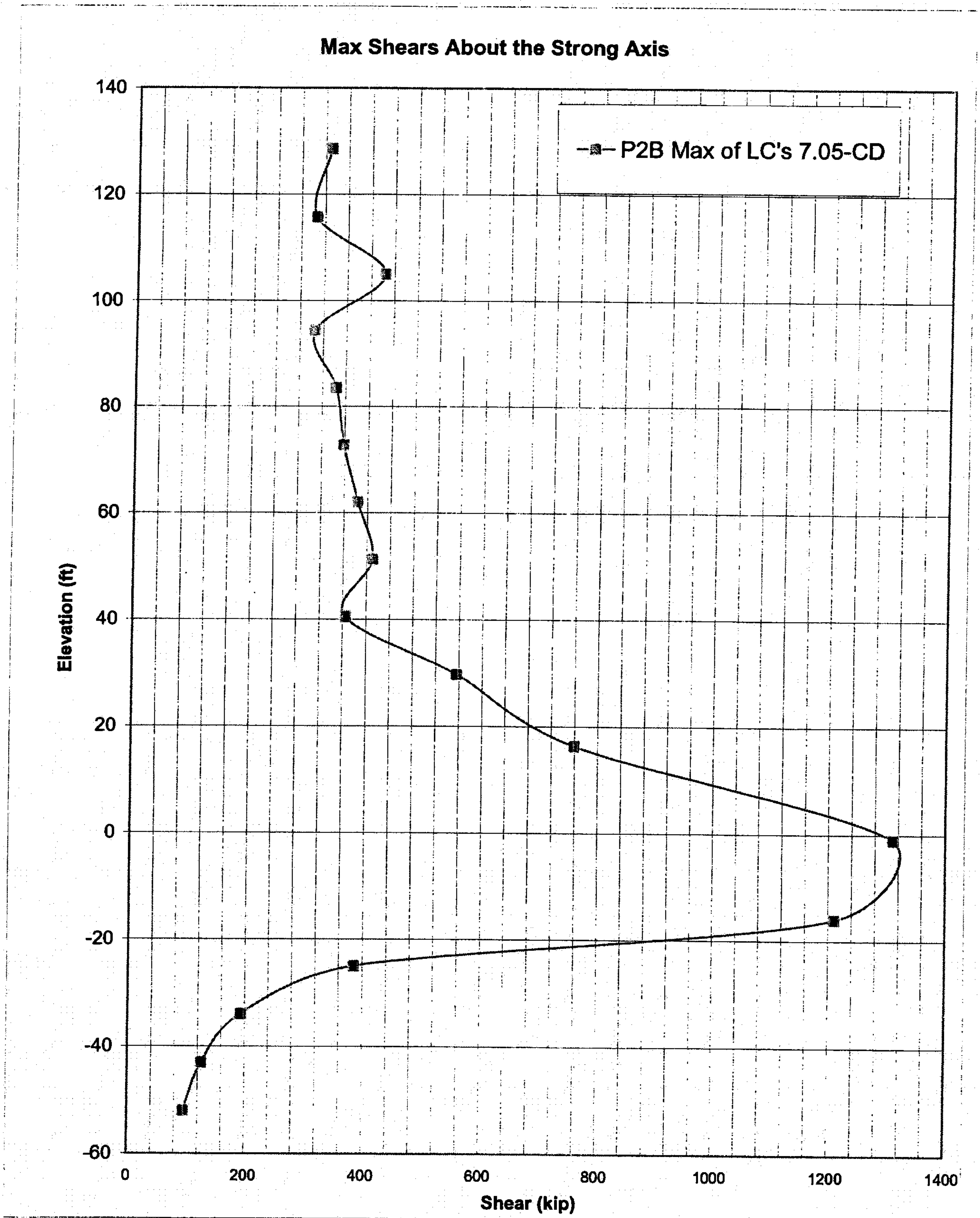


ETABS v8.5.0 - File: 4069-20050413-7.05-CD - straight - April 22,2005 9:40
Elevation View - F.1 - Kip-in Units

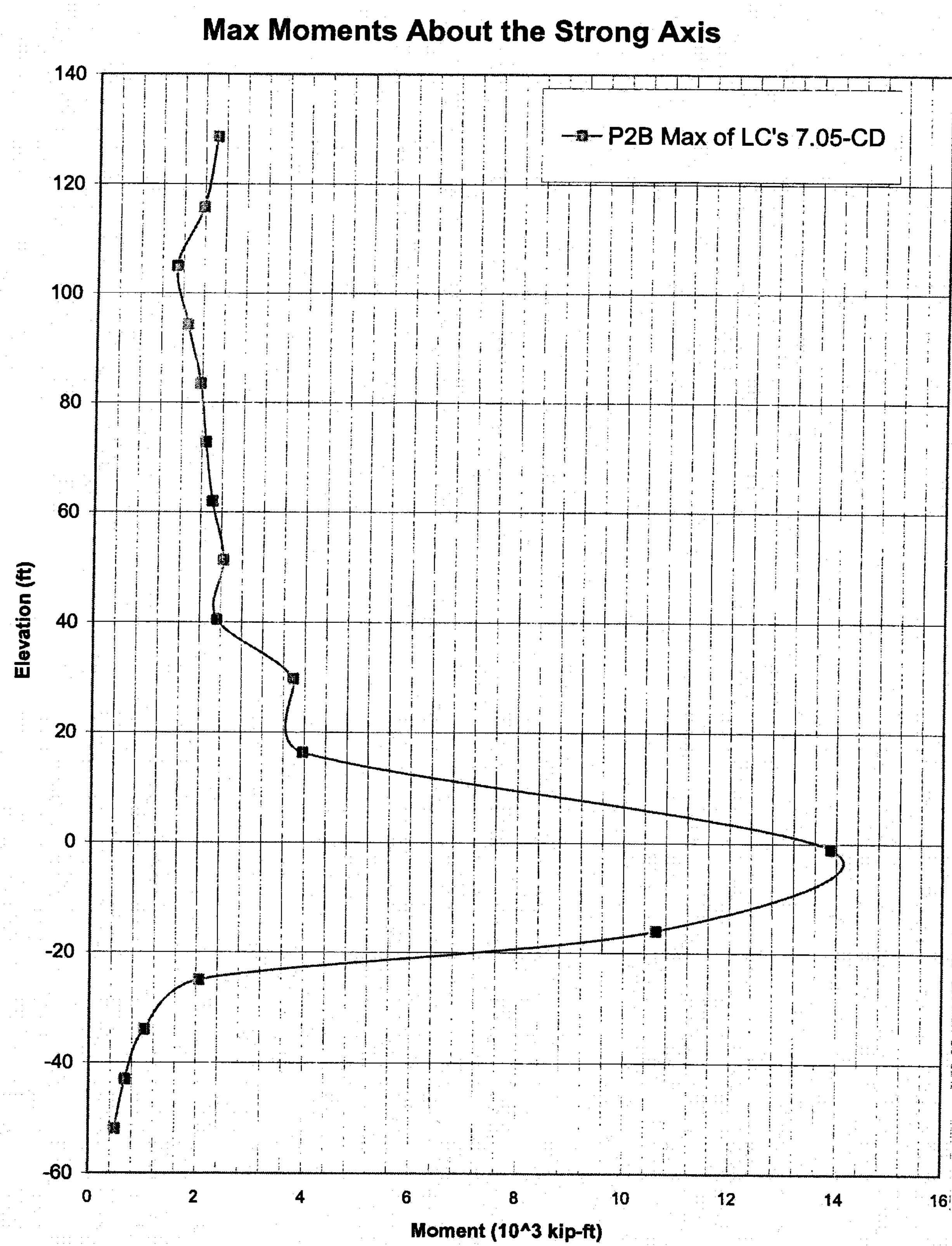
9.1.1-52


Max Axial Load
P2B Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
Axial load (kips)

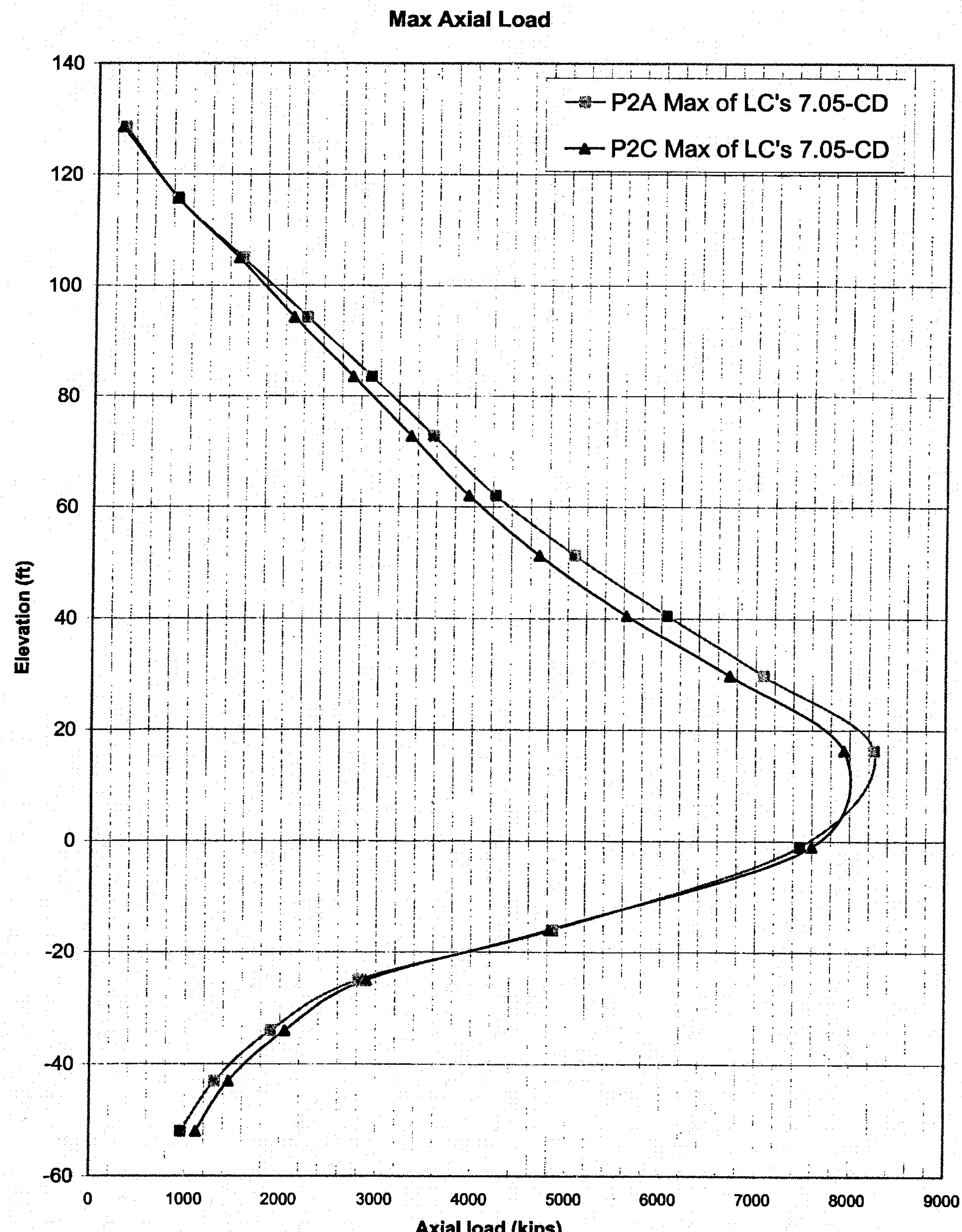
9.1.1-53


Max Shears About the Strong Axis
P2B Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
200
400
600
800
1000
1200
1400
Shear (kip)

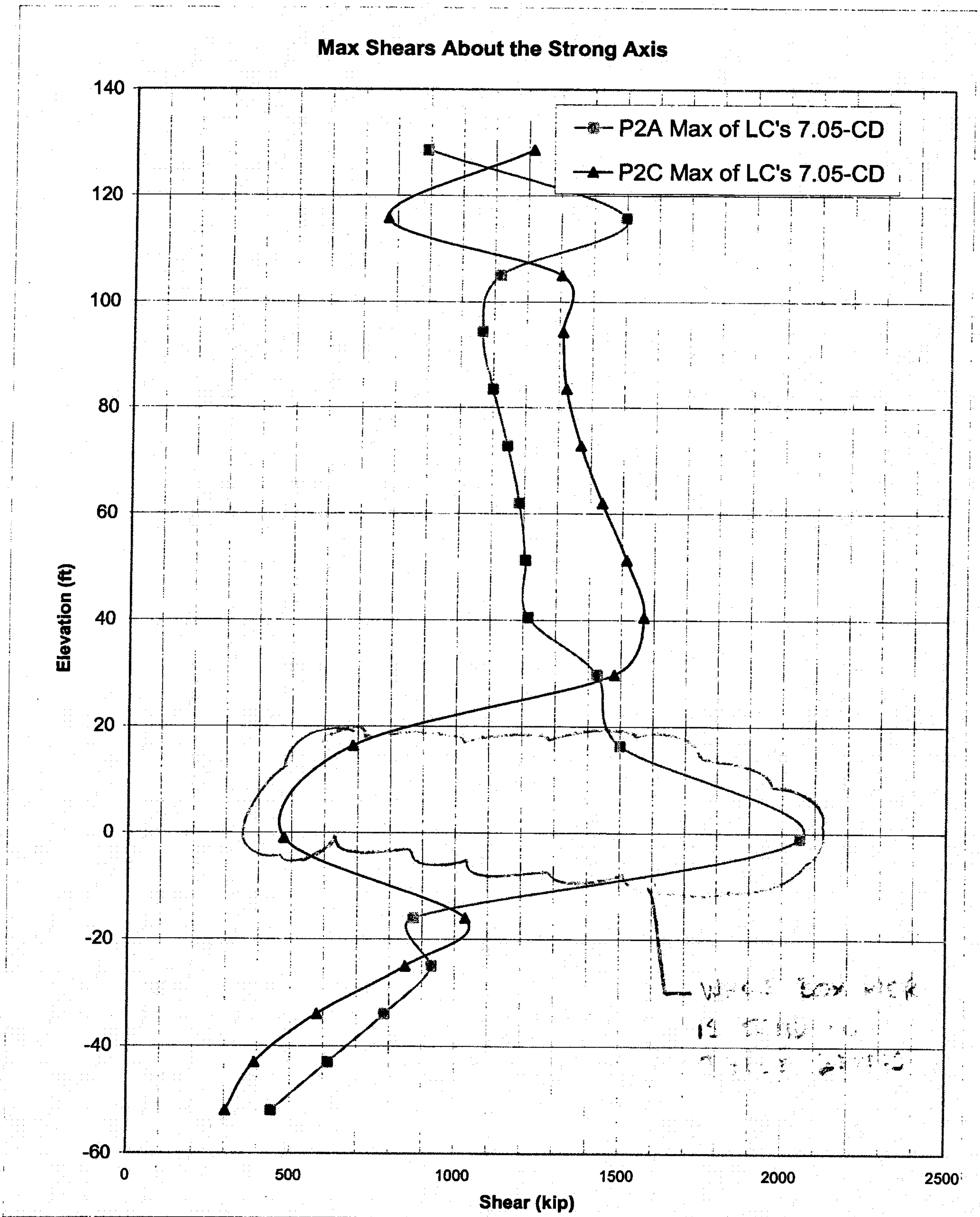
9.1.1-54


Max Moments About the Strong Axis
P2B Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
2
4
6
8
10
12
14
16
Moment (10^3 kip-ft)

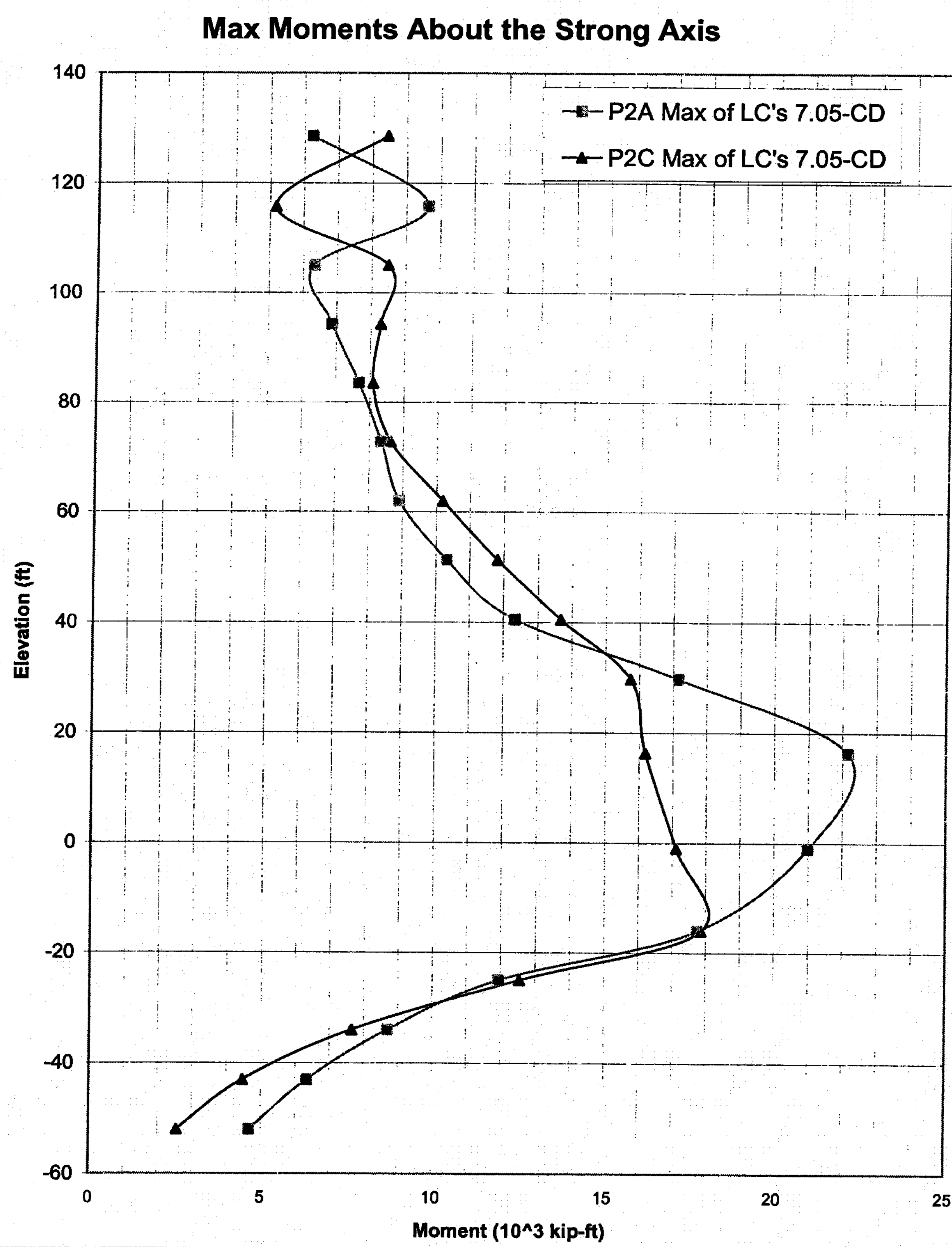
9.1.1-55


Max Axial Load
P2A Max of LC's 7.05-CD
P2C Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Axial load (kips)

9.1.1-56


Max Shears About the Strong Axis
P2A Max of LC's 7.05-CD
P2C Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
Shear (kip)

9.1.1-57


Max Moments About the Strong Axis
140
120
100
80
60
40
20
0
-20
-40
-60
Elevation (ft)
0
5
10
15
20
25
Moment (10^3 kip-ft)
P2A Max of LC's 7.05-CD
P2C Max of LC's 7.05-CD

9.1.1-58

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
13	P2	E100X30YPR MAX	Top	0	362	562	22128	0	0	509	261	509	261
12	P2	E100X30YPR MAX	Top	0	766	697	30826	7172	4618	1234	689	1234	689
11	P2	E100X30YPR MAX	Top	0	297	785	27417	15851	7539	1805	1026	1805	1026
10	P2	E100X30YPR MAX	Top	0	399	878	25602	24134	8696	2375	1363	2375	1363
9	P2	E100X30YPR MAX	Top	0	405	950	26725	33157	10330	2944	1700	2944	1700
8	P2	E100X30YPR MAX	Top	0	446	1100	27630	41869	12008	3513	2037	3513	2037
7	P2	E100X30YPR MAX	Top	0	541	1243	28472	50483	13289	4082	2374	4082	2374
6	P2	E100X30YPR MAX	Top	0	663	1375	29048	59194	16207	4650	2711	4650	2711
5	P2	E100X30YPR MAX	Top	0	790	1433	28917	71606	21604	5221	3048	5221	3048
4	P2	E100X30YPR MAX	Top	0	747	1627	27925	84698	28468	5791	3384	5791	3384
3	P2	E100X30YMR MAX	Top	984	1067	1933	20013	94966	30781	6499	3804	7483	2821
2	P2	E30X100YPR MAX	Top	335	1183	1135	14375	51477	71607	7307	4279	7642	3944
1	P2	E30X100YPR MAX	Top	408	1872	1151	3041	33217	78491	8064	4721	8471	4313
B1	P2	E30X100YPR MAX	Top	440	1820	708	2592	17459	50140	8605	5039	9045	4598
B2	P2	E30X100YPR MAX	Top	459	1356	446	2907	12419	33371	9146	5357	9605	4898
B3	P2	E30X100YPR MAX	Top	468	935	303	2397	9014	21109	9687	5674	10156	5206
B4	P2	E30X100YPR MAX	Top	472	719	239	1717	6823	13281	10229	5992	10700	5520

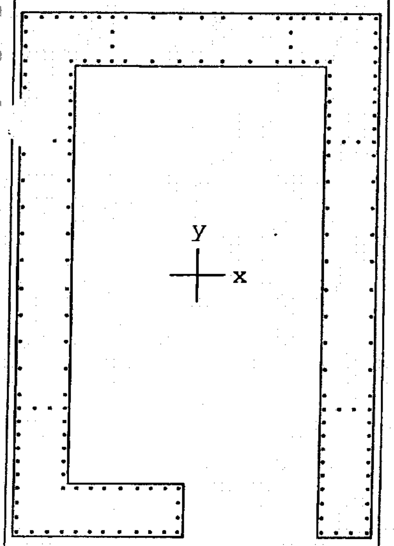
9.1.1-59

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
13	P2	E100X30YPR MAX	Bottom	0	362	562	22129	7172	4618	509	261	509	261
12	P2	E100X30YPR MAX	Bottom	0	766	697	30828	15851	7539	1234	689	1234	689
11	P2	E100X30YPR MAX	Bottom	0	297	785	26941	24134	8696	1805	1026	1805	1026
10	P2	E100X30YPR MAX	Bottom	0	399	878	25606	33157	10330	2375	1363	2375	1363
9	P2	E100X30YPR MAX	Bottom	0	405	950	26729	41869	12008	2944	1700	2944	1700
8	P2	E100X30YPR MAX	Bottom	0	446	1100	27635	50483	13289	3513	2037	3513	2037
7	P2	E100X30YPR MAX	Bottom	0	541	1243	28477	59194	16207	4082	2374	4082	2374
6	P2	E100X30YPR MAX	Bottom	0	663	1375	29053	71606	21604	4650	2711	4650	2711
5	P2	E100X30YPR MAX	Bottom	0	790	1433	28921	84698	28468	5221	3048	5221	3048
4	P2	E100X30YPR MAX	Bottom	0	747	1627	27925	99439	35592	5791	3384	5791	3384
3	P2	E100X30YMR MAX	Bottom	203	1066	2154	21971	117289	37288	6499	3804	6702	3602
2	P2	E100X30YMR MAX	Top	284	2269	2038	22604	114706	36069	7307	4279	7591	3995
1	P2	E100X30YPR MAX	Top	323	1023	2429	4526	81262	56391	8064	4721	8387	4398
B1	P2	E100X30YPR MAX	Top	334	1260	1646	6458	45480	41087	8605	5039	8939	4705
B2	P2	E100X30YPR MAX	Top	338	1015	1134	7466	31698	29447	9146	5357	9484	5018
B3	P2	E100X30YPR MAX	Top	340	733	784	6121	21953	20216	9687	5674	10027	5335
B4	P2	E100X30YPR MAX	Top	339	567	612	4440	15773	13846	10229	5992	10568	5653

9.1.1-60

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
13	P2	E100X30YPR MAX	Bottom	0	362	562	22129	7172	4618	509	261	509	261
12	P2	E100X30YPR MAX	Bottom	0	766	697	30828	15851	7539	1234	689	1234	689
11	P2	E30X100YPR MAX	Bottom	0	493	336	13794	10105	9421	1805	1026	1805	1026
10	P2	E30X100YPR MAX	Bottom	0	614	374	12657	13871	14565	2375	1363	2375	1363
9	P2	E30X100YPR MAX	Bottom	0	671	408	12944	17477	20256	2944	1700	2944	1700
8	P2	E30X100YPR MAX	Bottom	0	732	473	13170	21052	26101	3513	2037	3513	2037
7	P2	E30X100YPR MAX	Bottom	0	819	525	13244	24640	32918	4082	2374	4082	2374
6	P2	E30X100YPR MAX	Bottom	0	930	562	12879	29592	41226	4650	2711	4650	2711
5	P2	E30X100YMR MAX	Bottom	0	1042	580	12036	34680	50586	5221	3048	5221	3048
4	P2	E30X100YMR MAX	Bottom	0	1334	694	13039	40167	63693	5791	3384	5791	3384
3	P2	E30X100YPR MAX	Bottom	195	1470	1333	17619	52519	74405	6499	3804	6694	3610
2	P2	E30X100YPR MAX	Bottom	335	1183	1135	14369	33667	80183	7307	4279	7642	3944
1	P2	E30X100YPR MAX	Top	408	1872	1151	3041	33217	78491	8064	4721	8471	4313
B1	P2	E30X100YPR MAX	Top	440	1820	708	2592	17459	50140	8605	5039	9045	4598
B2	P2	E30X100YPR MAX	Top	459	1356	446	2907	12419	33371	9146	5357	9605	4898
B3	P2	E30X100YPR MAX	Top	468	935	303	2397	9014	21109	9687	5674	10156	5206
B4	P2	E100X30YPR MAX	Top	339	567	612	4440	15773	13846	10229	5992	10568	5653

9.1.1-61



159 x 237 in

Code: ACI 318-95

Units: English

Run axis: Biaxial

Run option: Investigation

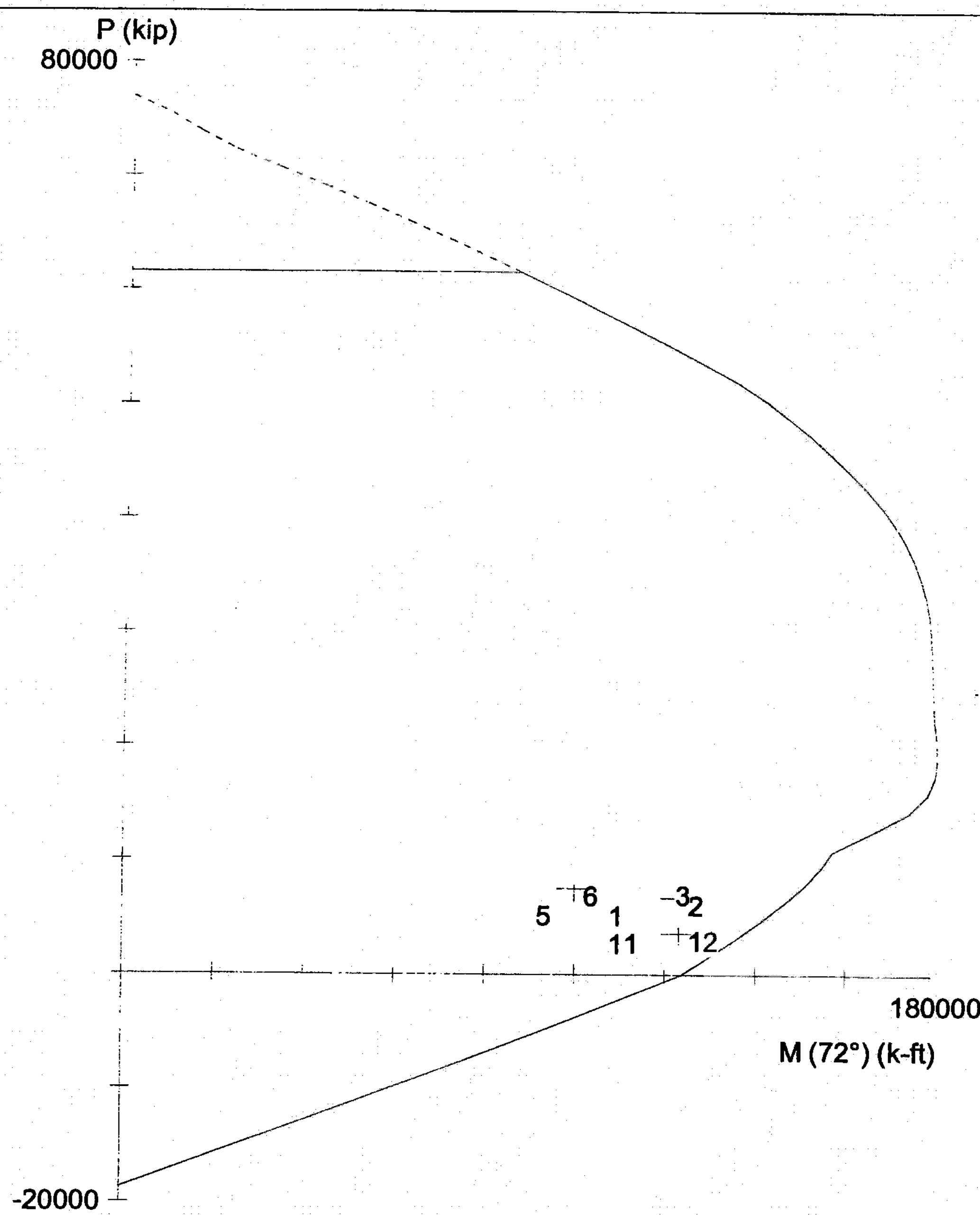
ˈenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/21/05

Time: 11:32:17



PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P2L3.COL

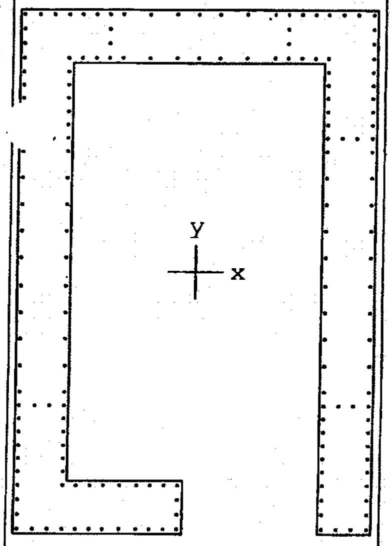
Project:

Column: Engineer:

f'c = 7 ksi	fy = 75 ksi	Ag = 15264 in^2	178 #11 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 277.68 in^2	Rho = 1.82%
fc = 5.95 ksi	e_rup = Infinity	Xo = -2.41 in	Ix = 9.59927e+007 in^4
e_u = 0.003 in/in		Yo = 10.05 in	Iy = 5.63918e+007 in^4
Beta1 = 0.7		Clear spacing = 4.59 in	Clear cover = N/A

91.1-62

Confinement: Tied   phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7



159 x 237 in

Code: ACI 318-95

Units: English

Run axis: Biaxial

Run option: Investigation

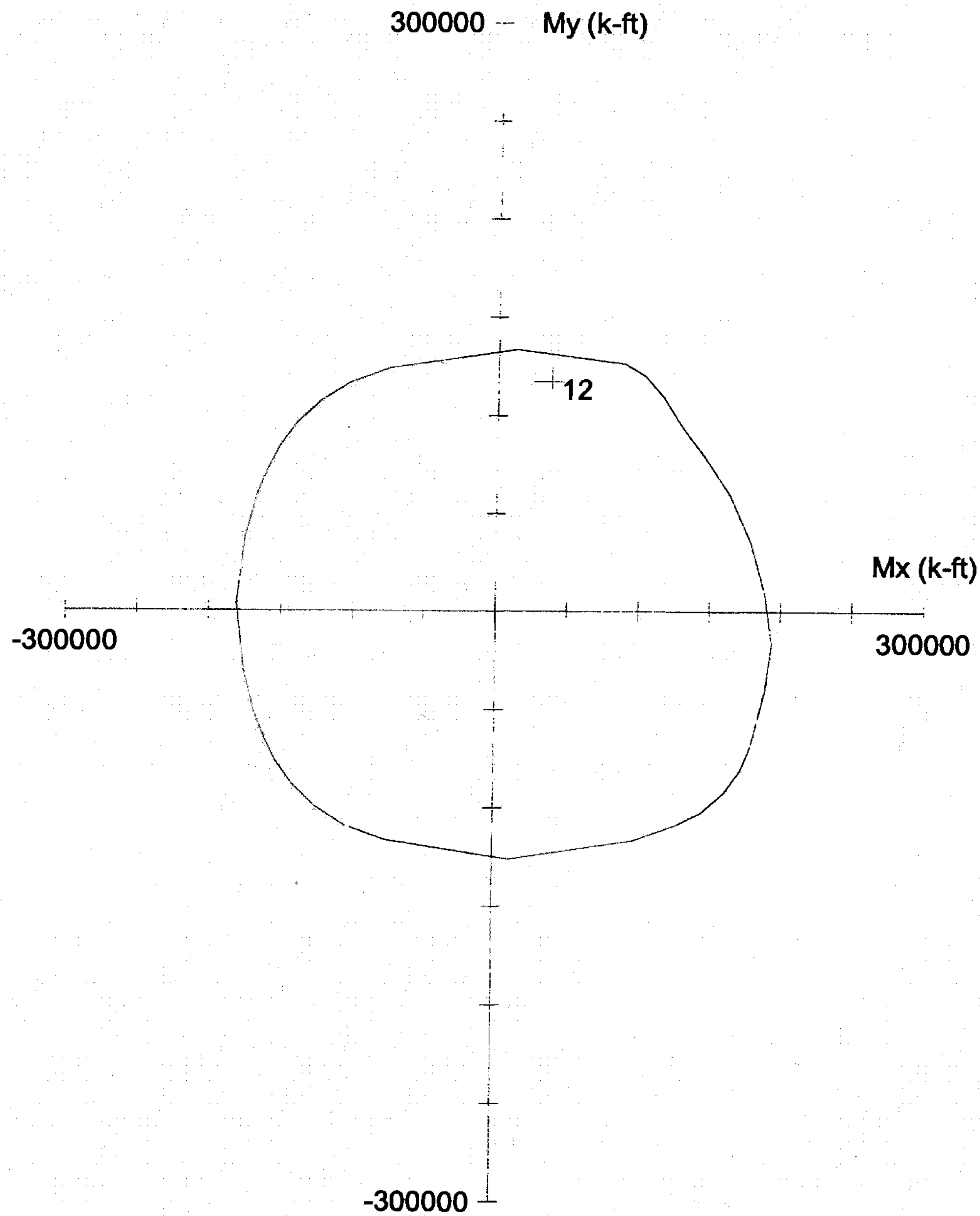
Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/21/05

Time: 11:32:30



P = 3602 kip

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P2L3.COL

Project:

Column:

Engineer:

f'c = 7 ksi | fy = 75 ksi | Ag = 15264 in^2 | 178 #11 bars

Ec = 4769 ksi | Es = 29000 ksi | As = 277.68 in^2 | Rho = 1.82%

fc = 5.95 ksi | e_rup = Infinity | Xo = -2.41 in | Ix = 9.59927e+007 in^4

e_u = 0.003 in/in | | Yo = 10.05 in | Iy = 5.63918e+007 in^4

Beta1 = 0.7 | | Clear spacing = 4.59 in | Clear cover = N/A

9.1.1-63

Confinement: Tied | phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000641

General Information:
====================

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P2L3.COL
Project:
Column:
Code: ACI 318-95

Engineer:
Units: English

Run Option: Investigation
Run Axis: Biaxial

Slenderness: Not considered
Column Type: Structural

Material Properties:
====================

f'c = 7 ksi
Ec = 4768.97 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7

fy = 75 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:
========

Exterior Points

No.	X (in)	Y (in)	No.	X (in)	Y (in)	No.	X (in)	Y (in)
1	-79.5	-118.5	2	-4.5	-118.5	3	-4.5	-94.5
4	-55.5	-94.5	5	-55.5	94.5	6	55.5	94.5
7	55.5	-118.5	8	79.5	-118.5	9	79.5	118.5
10	-79.5	118.5						

Gross section area, Ag = 15264 in^2
Ix = 9.59927e+007 in^4
Xo = -2.40566 in

Iy = 5.63918e+007 in^4
Yo = 10.0472 in

Reinforcement:
=============

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 277.68 in^2 at 1.82%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
1.56	57.5	-109.8	1.56	57.5	-103.2	1.56	9.5	96.5
1.56	9.5	116.5	1.56	21.5	96.5	1.56	21.5	116.5
1.56	33.5	96.5	1.56	33.5	116.5	1.56	77.5	109.8
1.56	77.5	103.2	1.56	39.5	109.8	1.56	39.5	103.2
1.56	39.5	96.5	1.56	39.5	116.5	1.56	45.5	96.5
1.56	45.5	116.5	1.56	51.5	96.5	1.56	51.5	116.5
1.56	64.2	116.5	1.56	70.8	116.5	1.56	64.2	60.5
1.56	70.8	60.5	1.56	77.5	6.5	1.56	57.5	6.5
1.56	77.5	18.5	1.56	57.5	18.5	1.56	77.5	30.5
1.56	57.5	30.5	1.56	77.5	42.5	1.56	57.5	42.5
1.56	77.5	54.5	1.56	57.5	54.5	1.56	77.5	60.5
1.56	57.5	60.5	1.56	77.5	66.5	1.56	57.5	66.5
1.56	77.5	72.5	1.56	57.5	72.5	1.56	77.5	78.5
1.56	57.5	78.5	1.56	77.5	84.5	1.56	57.5	84.5

9.1.1-64

1.56	77.5	90.5	1.56	57.5	90.5	1.56	77.5	96.5
1.56	57.5	96.5	1.56	57.5	116.5	1.56	77.5	116.5
1.56	77.5	-109.8	1.56	77.5	-103.2	1.56	64.2	-116.5
1.56	70.8	-116.5	1.56	64.2	-60.5	1.56	70.8	-60.5
1.56	77.5	-6.5	1.56	57.5	-6.5	1.56	77.5	-18.5
1.56	57.5	-18.5	1.56	77.5	-30.5	1.56	57.5	-30.5
1.56	77.5	-42.5	1.56	57.5	-42.5	1.56	77.5	-54.5
1.56	57.5	-54.5	1.56	77.5	-60.5	1.56	57.5	-60.5
1.56	77.5	-66.5	1.56	57.5	-66.5	1.56	77.5	-72.5
1.56	57.5	-72.5	1.56	77.5	-78.5	1.56	57.5	-78.5
1.56	77.5	-84.5	1.56	57.5	-84.5	1.56	77.5	-90.5
1.56	57.5	-90.5	1.56	77.5	-96.5	1.56	57.5	-96.5
1.56	57.5	-116.5	1.56	77.5	-116.5	1.56	-0.0	96.5
1.56	-0.0	116.5	1.56	-9.5	96.5	1.56	-9.5	116.5
1.56	-21.5	96.5	1.56	-21.5	116.5	1.56	-33.5	96.5
1.56	-33.5	116.5	1.56	-77.5	109.8	1.56	-77.5	103.2
1.56	-39.5	109.8	1.56	-39.5	103.2	1.56	-39.5	96.5
1.56	-39.5	116.5	1.56	-45.5	96.5	1.56	-45.5	116.5
1.56	-51.5	96.5	1.56	-51.5	116.5	1.56	-64.2	116.5
1.56	-70.8	116.5	1.56	-64.2	60.5	1.56	-70.8	60.5
1.56	-77.5	6.5	1.56	-57.5	6.5	1.56	-77.5	18.5
1.56	-57.5	18.5	1.56	-77.5	30.5	1.56	-57.5	30.5
1.56	-77.5	42.5	1.56	-57.5	42.5	1.56	-77.5	54.5
1.56	-57.5	54.5	1.56	-77.5	60.5	1.56	-57.5	60.5
1.56	-77.5	66.5	1.56	-57.5	66.5	1.56	-77.5	72.5
1.56	-57.5	72.5	1.56	-77.5	78.5	1.56	-57.5	78.5
1.56	-77.5	84.5	1.56	-57.5	84.5	1.56	-77.5	90.5
1.56	-57.5	90.5	1.56	-77.5	96.5	1.56	-57.5	96.5
1.56	-57.5	116.5	1.56	-77.5	116.5	1.56	-77.5	-109.8
1.56	-77.5	-103.2	1.56	-6.5	-109.8	1.56	-6.5	-103.2
1.56	-6.5	-96.5	1.56	-6.5	-116.5	1.56	-12.5	-96.5
1.56	-12.5	-116.5	1.56	-18.5	-96.5	1.56	-18.5	-116.5
1.56	-24.5	-96.5	1.56	-24.5	-116.5	1.56	-32.0	-96.5
1.56	-32.0	-116.5	1.56	-39.5	-96.5	1.56	-39.5	-116.5
1.56	-45.5	-96.5	1.56	-45.5	-116.5	1.56	-51.5	-96.5
1.56	-51.5	-116.5	1.56	-64.2	-116.5	1.56	-70.8	-116.5
1.56	-64.2	-60.5	1.56	-70.8	-60.5	1.56	-77.5	-6.5
1.56	-57.5	-6.5	1.56	-77.5	-18.5	1.56	-57.5	-18.5
1.56	-77.5	-30.5	1.56	-57.5	-30.5	1.56	-77.5	-42.5
1.56	-57.5	-42.5	1.56	-77.5	-54.5	1.56	-57.5	-54.5
1.56	-77.5	-60.5	1.56	-57.5	-60.5	1.56	-77.5	-66.5
1.56	-57.5	-66.5	1.56	-77.5	-72.5	1.56	-57.5	-72.5
1.56	-77.5	-78.5	1.56	-57.5	-78.5	1.56	-77.5	-84.5
1.56	-57.5	-84.5	1.56	-77.5	-90.5	1.56	-57.5	-90.5
1.56	-77.5	-96.5	1.56	-57.5	-96.5	1.56	-57.5	-116.5
1.56	-77.5	-116.5						

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)
===

No.	Pu kip	Mux k-ft	Muy k-ft	fMnx k-ft	fMny k-ft	fMn/Mu
1	5791.3	35591.6	99438.6	49565.2	138571.1	1.393
2	6701.8	37287.8	117289.0	44872.8	141768.9	1.208
3	7590.9	36068.9	114706.1	45634.2	144257.6	1.258
4	8386.7	56391.4	81261.9	92736.6	133693.7	1.645
5	5791.3	28467.9	84698.0	46674.0	138791.5	1.639
6	7482.9	30781.2	94966.3	46576.3	143883.1	1.515
7	7642.0	71606.9	51476.9	133183.2	95445.7	1.858
8	6693.8	74404.8	52519.2	133789.2	94391.9	1.798
9	7642.0	80182.5	33667.5	164430.1	68864.9	2.050
10	8471.3	78490.9	33216.6	163973.8	69612.0	2.090
11	3384.4	35591.6	99438.6	46814.7	130537.4	1.313
12	3601.5	37287.8	117289.0	41812.7	131683.0	1.123

9.1.1-65

1.56	77.5	90.5	1.56	57.5	90.5	1.56	77.5	96.5
1.56	57.5	96.5	1.56	57.5	116.5	1.56	77.5	116.5
1.56	77.5	-109.8	1.56	77.5	-103.2	1.56	64.2	-116.5
1.56	70.8	-116.5	1.56	64.2	-60.5	1.56	70.8	-60.5
1.56	77.5	-6.5	1.56	57.5	-6.5	1.56	77.5	-18.5
1.56	57.5	-18.5	1.56	77.5	-30.5	1.56	57.5	-30.5
1.56	77.5	-42.5	1.56	57.5	-42.5	1.56	77.5	-54.5
1.56	57.5	-54.5	1.56	77.5	-60.5	1.56	57.5	-60.5
1.56	77.5	-66.5	1.56	57.5	-66.5	1.56	77.5	-72.5
1.56	57.5	-72.5	1.56	77.5	-78.5	1.56	57.5	-78.5
1.56	77.5	-84.5	1.56	57.5	-84.5	1.56	77.5	-90.5
1.56	57.5	-90.5	1.56	77.5	-96.5	1.56	57.5	-96.5
1.56	57.5	-116.5	1.56	77.5	-116.5	1.56	-0.0	96.5
1.56	-0.0	116.5	1.56	-9.5	96.5	1.56	-9.5	116.5
1.56	-21.5	96.5	1.56	-21.5	116.5	1.56	-33.5	96.5
1.56	-33.5	116.5	1.56	-77.5	109.8	1.56	-77.5	103.2
1.56	-39.5	109.8	1.56	-39.5	103.2	1.56	-39.5	96.5
1.56	-39.5	116.5	1.56	-45.5	96.5	1.56	-45.5	116.5
1.56	-51.5	96.5	1.56	-51.5	116.5	1.56	-64.2	116.5
1.56	-70.8	116.5	1.56	-64.2	60.5	1.56	-70.8	60.5
1.56	-77.5	6.5	1.56	-57.5	6.5	1.56	-77.5	18.5
1.56	-57.5	18.5	1.56	-77.5	30.5	1.56	-57.5	30.5
1.56	-77.5	42.5	1.56	-57.5	42.5	1.56	-77.5	54.5
1.56	-57.5	54.5	1.56	-77.5	60.5	1.56	-57.5	60.5
1.56	-77.5	66.5	1.56	-57.5	66.5	1.56	-77.5	72.5
1.56	-57.5	72.5	1.56	-77.5	78.5	1.56	-57.5	78.5
1.56	-77.5	84.5	1.56	-57.5	84.5	1.56	-77.5	90.5
1.56	-57.5	90.5	1.56	-77.5	96.5	1.56	-57.5	96.5
1.56	-57.5	116.5	1.56	-77.5	116.5	1.56	-77.5	-109.8
1.56	-77.5	-103.2	1.56	-6.5	-109.8	1.56	-6.5	-103.2
1.56	-6.5	-96.5	1.56	-6.5	-116.5	1.56	-12.5	-96.5
1.56	-12.5	-116.5	1.56	-18.5	-96.5	1.56	-18.5	-116.5
1.56	-24.5	-96.5	1.56	-24.5	-116.5	1.56	-32.0	-96.5
1.56	-32.0	-116.5	1.56	-39.5	-96.5	1.56	-39.5	-116.5
1.56	-45.5	-96.5	1.56	-45.5	-116.5	1.56	-51.5	-96.5
1.56	-51.5	-116.5	1.56	-64.2	-116.5	1.56	-70.8	-116.5
1.56	-64.2	-60.5	1.56	-70.8	-60.5	1.56	-77.5	-6.5
1.56	-57.5	-6.5	1.56	-77.5	-18.5	1.56	-57.5	-18.5
1.56	-77.5	-30.5	1.56	-57.5	-30.5	1.56	-77.5	-42.5
1.56	-57.5	-42.5	1.56	-77.5	-54.5	1.56	-57.5	-54.5
1.56	-77.5	-60.5	1.56	-57.5	-60.5	1.56	-77.5	-66.5
1.56	-57.5	-66.5	1.56	-77.5	-72.5	1.56	-57.5	-72.5
1.56	-77.5	-78.5	1.56	-57.5	-78.5	1.56	-77.5	-84.5
1.56	-57.5	-84.5	1.56	-77.5	-90.5	1.56	-57.5	-90.5
1.56	-77.5	-96.5	1.56	-57.5	-96.5	1.56	-57.5	-116.5
1.56	-77.5	-116.5						

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)
==

No.	Pu kip	Mux k-ft	Muy k-ft	fMnx k-ft	fMny k-ft	fMn/Mu
1	5791.3	35591.6	99438.6	49565.2	138571.1	1.393
2	6701.8	37287.8	117289.0	44872.8	141768.9	1.208
3	7590.9	36068.9	114706.1	45634.2	144257.6	1.258
4	8386.7	56391.4	81261.9	92736.6	133693.7	1.645
5	5791.3	28467.9	84698.0	46674.0	138791.5	1.639
6	7482.9	30781.2	94966.3	46576.3	143883.1	1.515
7	7642.0	71606.9	51476.9	133183.2	95445.7	1.858
8	6693.8	74404.8	52519.2	133789.2	94391.9	1.798
9	7642.0	80182.5	33667.5	164430.1	68864.9	2.050
10	8471.3	78490.9	33216.6	163973.8	69612.0	2.090
11	3384.4	35591.6	99438.6	46814.7	130537.4	1.313
12	3601.5	37287.8	117289.0	41812.7	131683.0	1.123

9.1.1-65

SHEAR WALL SHEAR CHECK

Etabs model: 7.05-CD-straight
Date: 4/22/2005
By: NJR

phi = 0.6

Wall ID	Story	Width in	Length in	f'c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in²	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}<(V_u/\phi)$	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in²	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P2								Shear Reinforcement of Wall							Check design					
P2	B5-L7	24	159	7000	60	0.60	1357	3816	3193	OK	383	0.007	0.88	5.2	4.5	0.008	2504	2504	0.90	1.85
	L7-T.O.W.	24	159	7000	60	0.60	1190	3816	3193	OK	383	0.006	0.88	6.2	5.5	0.007	2165	2165	0.92	1.82
P2A	B5-L7	24	237	7000	60	0.60	2004	5688	4759	OK	571	0.007	0.88	5.2	4.5	0.008	3733	3733	0.89	1.86
	L7-T.O.W.	24	237	7000	60	0.60	1500	5688	4759	OK	571	0.005	0.62	5.7	5.5	0.005	2555	2555	0.98	1.70
P2B	B5-B1	24	75	7000	60	0.60	386	1800	1506	OK	181	0.003	0.40	5.3	4.5	0.004	701	701	0.92	1.82
	L1-L2	24	159	7000	60	0.60	1310	3816	3193	OK	383	0.007	1.20	7.4	5.5	0.009	2720	2720	0.80	2.08
	L3-L7	24	75	7000	60	0.60	760	1800	1506	OK	181	0.009	1.20	5.6	5.5	0.009	1283	1283	0.99	1.69
	L7-T.O.W.	24	75	7000	60	0.60	424	1800	1506	OK	181	0.004	0.62	6.9	5.5	0.005	808	808	0.87	1.91
P2C	B5-L7	24	237	7000	60	0.60	1565	5688	4759	OK	571	0.005	0.62	5.3	4.5	0.006	2911	2911	0.90	1.86
	L7-T.O.W.	24	237	7000	60	0.60	1368	5688	4759	OK	571	0.004	0.62	6.6	5.5	0.005	2555	2555	0.89	1.87

phi = 0.85

Wall ID	Story	Width in	Length in	f'c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in²	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}<(V_u/\phi)$	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in²	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P2								Shear Reinforcement of Wall							Check design					
P2	B5-L7	24	159	7000	60	0.85	1357	3816	3193	OK	543	0.004	0.62	6.2	4.5	0.006	1953	1953	0.82	1.44
	L7-T.O.W.	24	159	7000	60	0.85	1190	3816	3193	OK	543	0.003	0.62	7.8	5.5	0.005	1714	1714	0.82	1.44
P2A	B5-L7	24	237	7000	60	0.85	2004	5688	4759	OK	809	0.004	0.62	6.3	4.5	0.006	2911	2911	0.81	1.45
	L7-T.O.W.	24	237	7000	60	0.85	1500	5688	4759	OK	809	0.003	0.44	7.3	5.5	0.003	2089	2089	0.84	1.39
P2B	B5-B1	24	75	7000	60	0.85	386	1800	1506	OK	256	0.003	0.22	3.7	4.5	0.002	521	521	0.87	1.35
	L1-L2	24	159	7000	60	0.85	1310	3816	3193	OK	543	0.004	0.62	6.8	5.5	0.005	1714	1714	0.90	1.31
	L3-L7	24	75	7000	60	0.85	760	1800	1506	OK	256	0.005	0.88	6.7	5.5	0.007	1021	1021	0.88	1.34
	L7-T.O.W.	24	75	7000	60	0.85	424	1800	1506	OK	256	0.003	0.40	6.7	5.5	0.003	628	628	0.79	1.48
P2C	B5-L7	24	237	7000	60	0.85	1565	5688	4759	OK	809	0.003	0.40	6.4	4.5	0.004	2216	2216	0.83	1.42
	L7-T.O.W.	24	237	7000	60	0.85	1368	5688	4759	OK	809	0.003	0.40	6.7	5.5	0.003	1986	1986	0.81	1.45

9.1.1-66

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c = 21.9 in
Perimeter of wall = 762 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops.

Wall ID: P2 — Loads based on Max. Axial

Floor	f'_c (psi)	fy (ksi)	P_E (kips)	P_{Grav} 1.42DL+0.5L (kips)	P_u (kips)	M_u (kip-ft)	V_u (k) (kips)	A_g (in^2)	$P_u/(A_g f'_c)$	A_{cv} (in^2)	Shear l_w (in)	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}$*sqrt(f'_c))	Conclusion	P_o[1] (kips)	P_u/P_o
13	7000	60	74	106	181	4852	767	3816	0.007	3816	159	1	0.48	2.40	NOT REQ'D	22705	0.01
12	7000	60	153	257	411	6697	1152	3816	0.015	3816	159	1	0.44	3.61	NOT REQ'D	22705	0.02
11	7000	60	292	377	669	3747	1037	3816	0.025	3816	159	1	0.27	3.25	NOT REQ'D	22705	0.03
10	7000	60	466	496	962	1735	489	3816	0.036	3816	159	1	0.27	1.53	NOT REQ'D	22705	0.04
9	7000	60	684	614	1299	1757	510	3816	0.049	3816	159	1	0.26	1.60	NOT REQ'D	22705	0.06
8	7000	60	913	733	1646	1762	524	3816	0.062	3816	159	1	0.25	1.64	NOT REQ'D	22705	0.07
7	7000	60	1158	852	2008	1771	530	3816	0.075	3816	159	1	0.25	1.66	NOT REQ'D	22705	0.09
6	7000	60	1467	970	2437	1866	523	3816	0.091	3816	159	1	0.27	1.64	NOT REQ'D	22705	0.11
5	7000	60	1819	1089	2908	2094	516	3816	0.109	3816	159	1	0.31	1.62	PROVIDE B.E.	22705	0.13
4	7000	60	2242	1208	3450	2818	452	3816	0.129	3816	159	1	0.47	1.42	PROVIDE B.E.	22705	0.15
3	7000	60	2658	1356	4014	5648	544	3816	0.150	3816	159	1	0.78	1.70	PROVIDE B.E.	22705	0.18
2	7000	60	2828	1525	4353	3656	660	3816	0.163	3816	159	1	0.42	2.07	PROVIDE B.E.	22705	0.19
1	7000	60	2389	1683	4072	6652	594	3816	0.152	3816	159	1	0.85	1.86	PROVIDE B.E.	22705	0.18
B1	7000	60	1568	1795	3363	3193	439	3816	0.126	3816	159	1	0.55	1.38	PROVIDE B.E.	22705	0.15
B2	7000	60	988	1908	2896	2166	313	3816	0.108	3816	159	1	0.52	0.98	PROVIDE B.E.	22705	0.13
B3	7000	60	620	2021	2642	3692	575	3816	0.099	3816	159	1	0.48	1.80	NOT REQ'D	22705	0.12
B4	7000	60	418	2134	2552	2296	432	3816	0.096	3816	159	1	0.40	1.35	NOT REQ'D	22705	0.11

Floor	Length of B.E. Req'd (in)	A_{sh}/s Req'd (in/in)	B.E.[2] Length used (h_c) (in)	New A_{sh}/s Req'd (in/in)	legs	Ash (in^2)	s (spacing) (in)	Ash/s act (in/in)	ok/ng	min diam long bars allowed (in)	long spacing of legs (in)	% of Length	Confinement in width: A_{sh} Req. (in^2)	Area of hoops (in^2)	Legs in addtion to outer hoop	Area of added legs (in^2)	Ash act (in^2)	ok/ng
13	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
7	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
6	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
5	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
4	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
3	26	0.27	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
2	27	0.29	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
1	26	0.27	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B1	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B2	24	0.25	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B3	n/a	n/a	36	n/a	6	0.31	4.5	n/a	n/a	n/a	n/a	n/a	n/a	0.31	1	0.44	n/a	n/a
B4	n/a	n/a	36	n/a	6	0.31	4.5	n/a	n/a	n/a	n/a	n/a	n/a	0.31	1	0.44	n/a	n/a

Shear wall boundary element check

DCE #: 4069

Date: 5/2/2004 5

Width of BE hoop h_c = 21.9 in

Perimeter of wall = 762 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops.

Wall ID: P2A — Loads based on Max. Axial

Floor	f'_c	fy	P_E	P_{Grav} 1.42DL+0.5L	P_u	M_u	V_u (k)	A_g	$P_u/(A_g f'_c)$	A_{cv}	Shear l_w	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}$*sqrt(f'_c))	Conclusion	P_o[1]	P_u/P_o
	psi	ksi	kips	kips	kips	kip-ft	kips	in^2		in^2	in					kips	
13	7000	60	311	158	469	4997	891	5688	0.012	5688	237	1	0.28	1.87	NOT REQ'D	33844	0.01
12	7000	60	883	384	1267	9663	1500	5688	0.032	5688	237	1	0.33	3.15	NOT REQ'D	33844	0.04
11	7000	60	1614	561	2175	5844	1122	5688	0.055	5688	237	1	0.26	2.36	NOT REQ'D	33844	0.06
10	7000	60	2354	739	3093	5622	1072	5688	0.078	5688	237	1	0.27	2.25	NOT REQ'D	33844	0.09
9	7000	60	3067	916	3982	5726	1102	5688	0.100	5688	237	1	0.26	2.32	PROVIDE B.E.	33844	0.12
8	7000	60	3760	1093	4853	6314	1148	5688	0.122	5688	237	1	0.28	2.41	PROVIDE B.E.	33844	0.14
7	7000	60	4453	1269	5722	7011	1187	5688	0.144	5688	237	1	0.30	2.49	PROVIDE B.E.	33844	0.17
6	7000	60	5354	1446	6801	7774	1210	5688	0.171	5688	237	1	0.33	2.54	PROVIDE B.E.	33844	0.20
5	7000	60	6401	1624	8024	8602	1225	5688	0.202	5688	237	1	0.36	2.57	PROVIDE B.E.	33844	0.24
4	7000	60	7436	1801	9237	9015	1412	5688	0.232	5688	237	1	0.32	2.97	PROVIDE B.E.	33844	0.27
3	7000	60	8773	2021	10794	14054	1442	5688	0.271	5688	237	1	0.49	3.03	PROVIDE B.E.	33844	0.32
2	7000	60	7611	2273	9884	10346	1995	5688	0.248	5688	237	1	0.26	4.19	PROVIDE B.E.	33844	0.29
1	7000	60	4913	2508	7421	12672	481	5688	0.186	5688	237	1	1.33	1.01	PROVIDE B.E.	33844	0.22
B1	7000	60	2818	2676	5494	9279	773	5688	0.138	5688	237	1	0.61	1.62	PROVIDE B.E.	33844	0.16
B2	7000	60	1904	2845	4749	8039	776	5688	0.119	5688	237	1	0.52	1.63	PROVIDE B.E.	33844	0.14
B3	7000	60	1316	3013	4329	6321	611	5688	0.109	5688	237	1	0.52	1.28	PROVIDE B.E.	33844	0.13
B4	7000	60	958	3181	4139	4653	441	5688	0.104	5688	237	1	0.53	0.93	PROVIDE B.E.	33844	0.12

Floor	Length of B.E. Req'd	A_{sh}/s Req'd	B.E.[2] Length used (h_c)	New A_{sh}/s Req'd	legs	Ash	s (spacing)	Ash/s act	ok/ng	min diam long bars allowed	long spacing of legs	% of Length	Confinement in width: A_{sh} Req.	Area of hoops	Legs in addtion to outer hoop	Area of added legs	Ash act	ok/ng
	in	in/in	in	in/in		in^2	in	in/in		in	in		in^2	in^2		in^2	in^2	
13	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	36	0.37	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
8	36	0.37	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
7	38	0.40	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
6	42	0.44	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
5	46	0.48	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
4	50	0.53	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
3	56	0.58	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
2	52	0.55	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
1	44	0.46	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
B1	37	0.39	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
B2	36	0.37	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
B3	36	0.37	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK
B4	36	0.37	60	0.63	10	0.31	4.5	0.69	OK	0.75	6.0	0.25	1.03	0.31	1	0.44	1.06	OK

5/2/2005

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

Width of BE hoop h_c = 21.9 in
Perimeter of wall = 762 in

Notes:
1) Needs to verified after design.
2) B.E. length is center to center of BE confining hoops.

Wall ID: P2B — Loads based on Max. Axial (P_E through V_u)

Floor	f'_c (psi)	fy (ksi)	P_E (kips)	P_{Grav} 1.42DL+0.5L (kips)	P_u (kips)	M_u (kip-ft)	V_u (k) (kips)	A_g (in²)	$P_u/(A_g f'_c)$	A_{cv} (in²)	Shear l_w (in)	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}\cdot sqrt(f'_c))$	Conclusion
13	7000	60	191	48	239	1982	331	1728	0.020	1728	72	1	1.00	2.29	NOT REQ'D
12	7000	60	157	117	273	1956	307	1728	0.023	1728	72	1	1.06	2.12	NOT REQ'D
11	7000	60	461	171	631	1490	424	1728	0.052	1728	72	1	0.59	2.94	NOT REQ'D
10	7000	60	412	224	636	1711	306	1728	0.053	1728	72	1	0.93	2.11	NOT REQ'D
9	7000	60	495	278	773	1972	344	1728	0.064	1728	72	1	0.96	2.38	NOT REQ'D
8	7000	60	652	332	984	1110	195	1728	0.081	1728	72	1	0.95	1.35	NOT REQ'D
7	7000	60	814	386	1200	1149	203	1728	0.099	1728	72	1	0.94	1.41	NOT REQ'D
6	7000	60	1021	439	1460	1131	205	1728	0.121	1728	72	1	0.92	1.42	PROVIDE B.E.
5	7000	60	1231	493	1724	971	173	1728	0.143	1728	72	1	0.93	1.20	PROVIDE B.E.
4	7000	60	1496	547	2043	1281	266	1728	0.169	1728	72	1	0.80	1.84	PROVIDE B.E.
3	7000	60	1891	614	2505	2850	662	1728	0.207	1728	72	1	0.72	4.58	PROVIDE B.E.
2	7000	60	2779	1525	4304	978	530	3816	0.161	3816	159	1	0.14	1.66	PROVIDE B.E.
1	7000	60	2408	1683	4091	4375	535	3816	0.153	3816	159	1	0.62	1.67	PROVIDE B.E.
B1	7000	60	1136	779	1915	2057	386	1656	0.165	1656	69	1	0.93	2.78	PROVIDE B.E.
B2	7000	60	916	828	1744	1032	194	1656	0.150	1656	69	1	0.93	1.40	PROVIDE B.E.
B3	7000	60	678	877	1556	677	126	1656	0.134	1656	69	1	0.93	0.91	PROVIDE B.E.
B4	7000	60	541	926	1467	396	96	1656	0.127	1656	69	1	0.72	0.69	PROVIDE B.E.

Confinement in width: columns A_{sh} Req. through the last ok/ng

Floor	P_o[1] (kips)	P_u/P_o	Length of B.E. Req'd (in)	A_{sh}/s Req'd (in/in)	B.E.[2] Length used (h_c) (in)	New A_{sh}/s Req'd (in/in)	legs	Ash (in²)	s (spacing) (in)	Ash/s act (in/in)	ok/ng	min diam long bars allowed (in)	long spacing of legs (in)	% of Length	A_{sh} Req. (in²)	Area of hoops (in²)	Legs in addition to outer hoop	Area of added legs (in²)	Ash act (in²)	ok/ng
13	10282	0.02	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
12	10282	0.03	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	10282	0.06	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	10282	0.06	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	10282	0.08	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	10282	0.10	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
7	10282	0.12	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
6	10282	0.14	11	0.11	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.50	1.03	0.31	1	0.44	1.06	OK
5	10282	0.17	11	0.12	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.50	1.03	0.31	1	0.44	1.06	OK
4	10282	0.20	13	0.13	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.50	1.03	0.31	1	0.44	1.06	OK
3	10282	0.24	14	0.15	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.50	1.03	0.31	1	0.44	1.06	OK
2	22705	0.19	27	0.28	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
1	22705	0.18	26	0.28	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B1	9853	0.19	12	0.12	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.52	1.03	0.31	1	0.44	1.06	OK
B2	9853	0.18	11	0.12	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.52	1.03	0.31	1	0.44	1.06	OK
B3	9853	0.16	11	0.11	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.52	1.03	0.31	1	0.44	1.06	OK
B4	9853	0.15	10	0.11	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.52	1.03	0.31	1	0.44	1.06	OK

5/2/2005

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2004 5

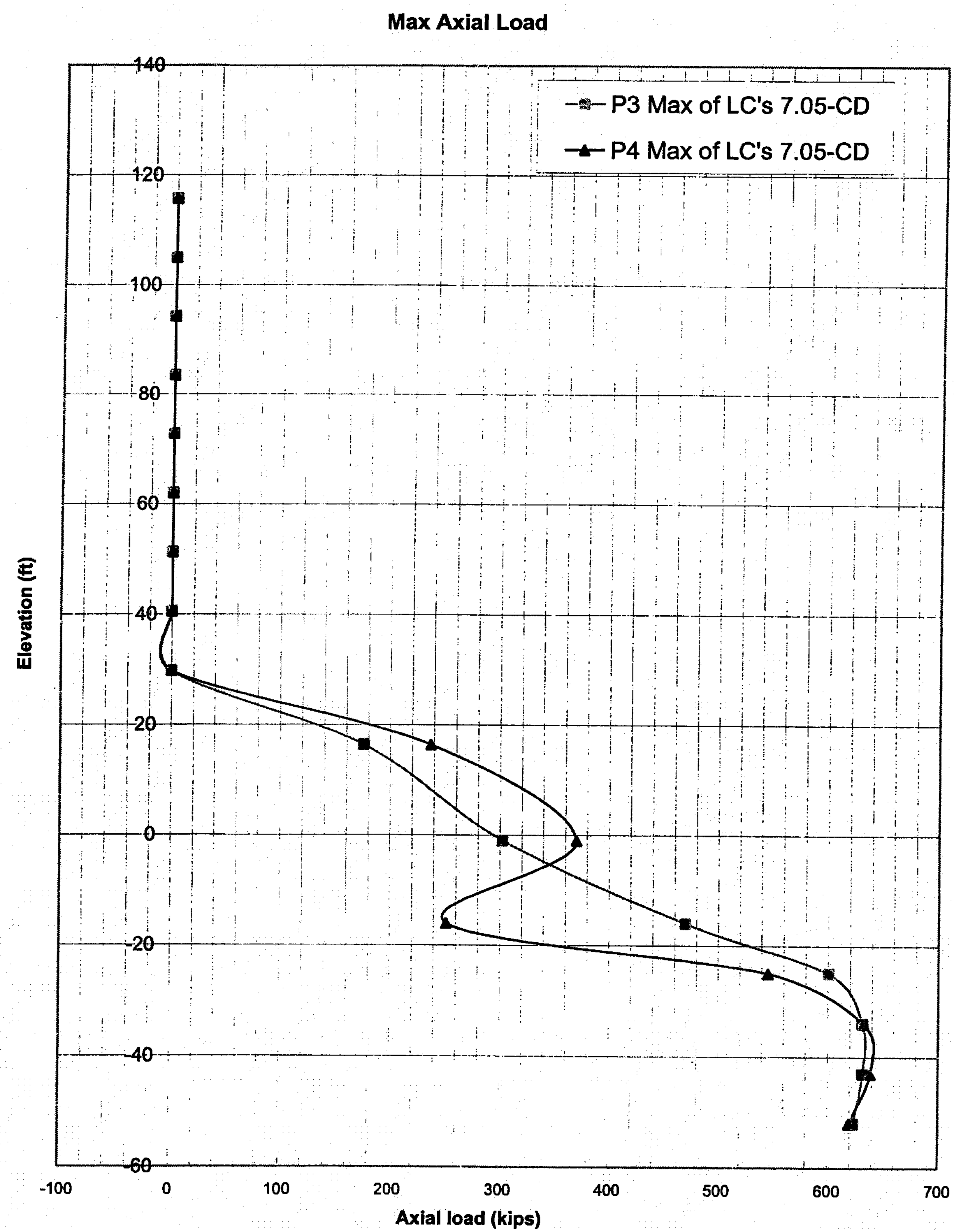
Width of BE hoop h_c = 21.9 in
Perimeter of wall = 762 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops

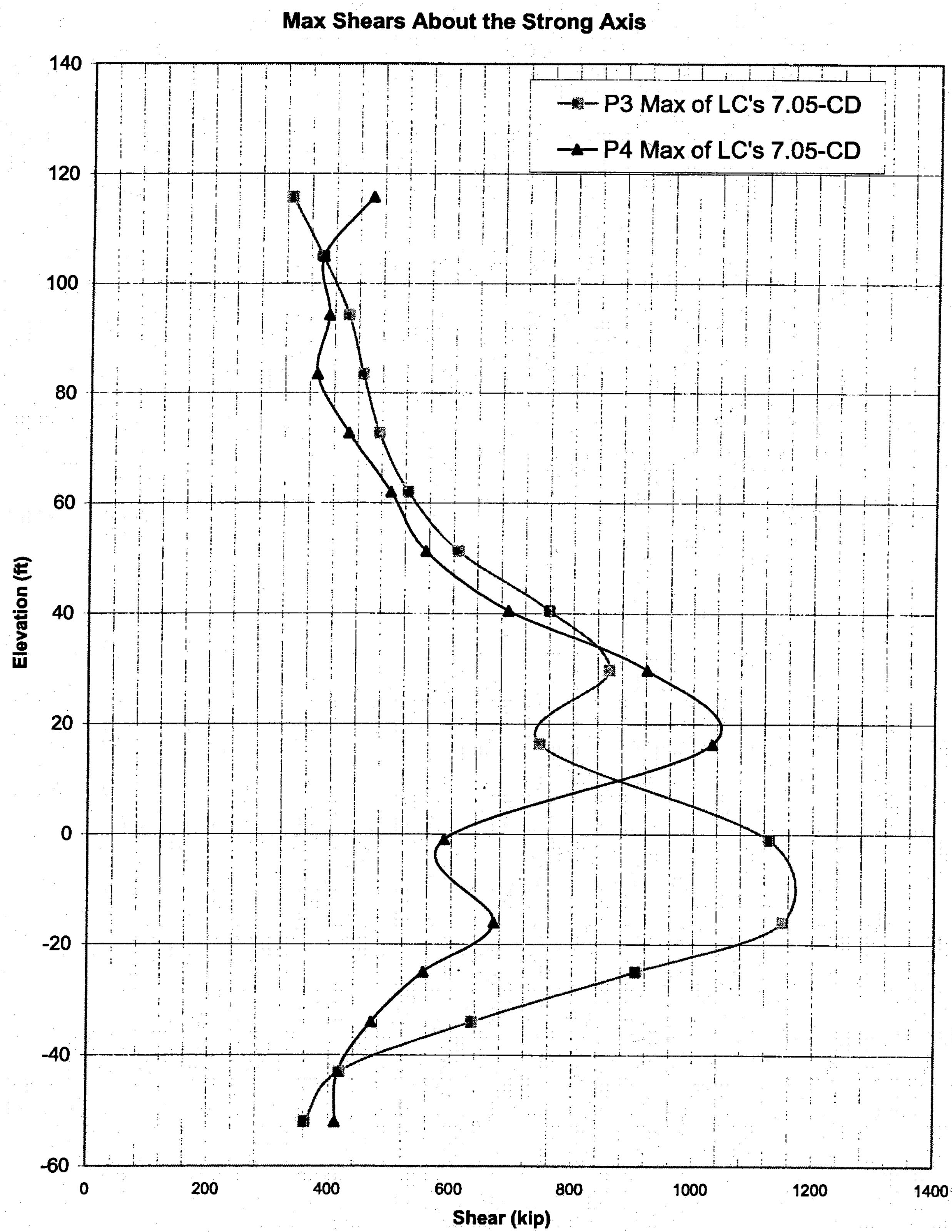
Wall ID: P2C — Loads based on Max. Axial

Floor	f'_c	fy	P_E	P_{Grav} 1.42DL+0.5L	P_u	M_u	V_u (k)	A_g	$P_u/(A_g f'_c)$	A_{cv}	Shear l_w	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}*sqrt(f'_c))$	Conclusion
	psi	ksi	kips	kips	kips	kip-ft	kips	in²		in²	in				
13	7000	60	253	158	411	7043	1215	5688	0.010	5688	237	1	0.29	2.55	NOT REQ'D
12	7000	60	838	384	1222	5163	766	5688	0.031	5688	237	1	0.34	1.61	NOT REQ'D
11	7000	60	1606	561	2167	6647	1314	5688	0.054	5688	237	1	0.26	2.76	NOT REQ'D
10	7000	60	2080	739	2819	8356	1314	5688	0.071	5688	237	1	0.32	2.76	NOT REQ'D
9	7000	60	2711	916	3627	8071	1322	5688	0.091	5688	237	1	0.31	2.78	NOT REQ'D
8	7000	60	3326	1093	4418	8502	1368	5688	0.111	5688	237	1	0.31	2.87	PROVIDE B.E.
7	7000	60	3943	1269	5213	8973	1435	5688	0.131	5688	237	1	0.32	3.01	PROVIDE B.E.
6	7000	60	4686	1446	6132	9410	1511	5688	0.154	5688	237	1	0.32	3.18	PROVIDE B.E.
5	7000	60	5620	1624	7244	9427	1565	5688	0.182	5688	237	1	0.31	3.29	PROVIDE B.E.
4	7000	60	6682	1801	8483	8544	1452	5688	0.213	5688	237	1	0.30	3.05	PROVIDE B.E.
3	7000	60	7977	2021	9998	8482	634	5688	0.251	5688	237	1	0.68	1.33	PROVIDE B.E.
2	7000	60	7771	2273	10044	7526	320	5688	0.252	5688	237	1	1.19	0.67	PROVIDE B.E.
1	7000	60	4865	2508	7373	12115	628	5688	0.185	5688	237	1	0.98	1.32	PROVIDE B.E.
B1	7000	60	3029	2676	5705	10518	480	5688	0.143	5688	237	1	1.11	1.01	PROVIDE B.E.
B2	7000	60	2126	2845	4971	5781	306	5688	0.125	5688	237	1	0.96	0.64	PROVIDE B.E.
B3	7000	60	1520	3013	4533	3076	219	5688	0.114	5688	237	1	0.71	0.46	PROVIDE B.E.
B4	7000	60	1170	3181	4351	1653	161	5688	0.109	5688	237	1	0.52	0.34	PROVIDE B.E.

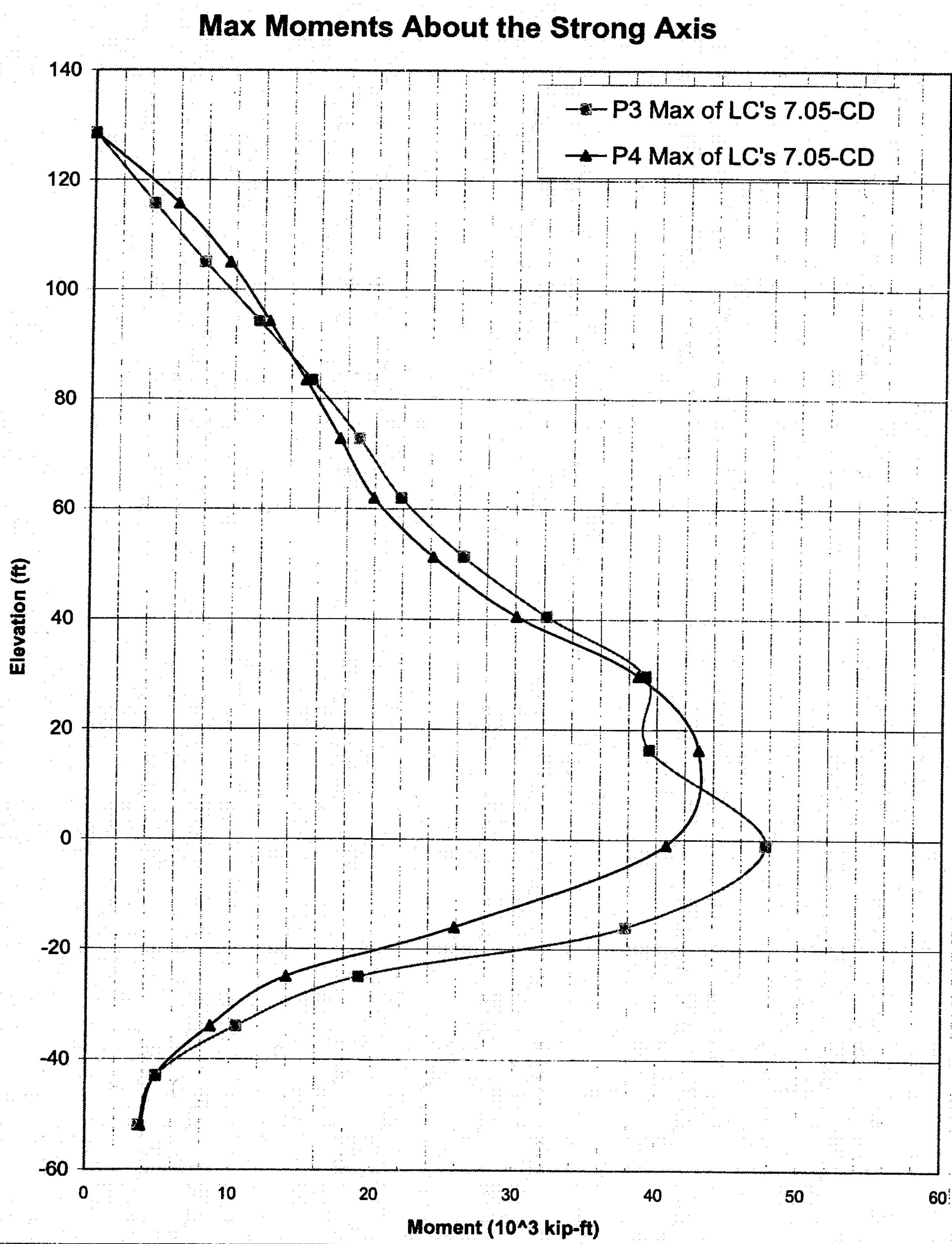
Floor	P_o [1]	P_u/P_o	Length of B.E. Req'd	A_{sh}/s Req'd	B.E.[2] Length used (h_c)	New A_{sh}/s Req'd	legs	Ash	s (spacing)	Ash/s act	ok/ng	min diam long bars allowed	long spacing of legs	% of Length	Confinement in width: A_{sh} Req.	Area of hoops	Legs in addtion to outer hoop	Area of added legs	Ash act	ok/ng
	kips		in	in/in	in	in/in		in²	in	in/in		in	in		in²	in²		in²	in²	
13	33844	0.01	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
12	33844	0.04	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	33844	0.06	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	33844	0.08	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	33844	0.11	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	33844	0.13	36	0.37	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
7	33844	0.15	36	0.38	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
6	33844	0.18	39	0.41	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
5	33844	0.21	43	0.45	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
4	33844	0.25	47	0.50	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
3	33844	0.30	53	0.55	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
2	33844	0.30	53	0.56	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
1	33844	0.22	44	0.46	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B1	33844	0.17	38	0.40	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B2	33844	0.15	36	0.37	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B3	33844	0.13	36	0.37	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK
B4	33844	0.13	36	0.37	54	0.57	9	0.31	4.5	0.62	OK	0.75	6.0	0.23	1.03	0.31	1	0.44	1.06	OK


Max Axial Load
P3 Max of LC's 7.05-CD
P4 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
-100
0
100
200
300
400
500
600
700
Axial load (kips)

9.1.1-71


Max Shears About the Strong Axis
P3 Max of LC's 7.05-CD
P4 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
200
400
600
800
1000
1200
1400
Shear (kip)

9.1.1-72



Max Moments About the Strong Axis
P3 Max of LC's 7.05-CD
P4 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
10
20
30
40
50
60
Moment (10^3 kip-ft)

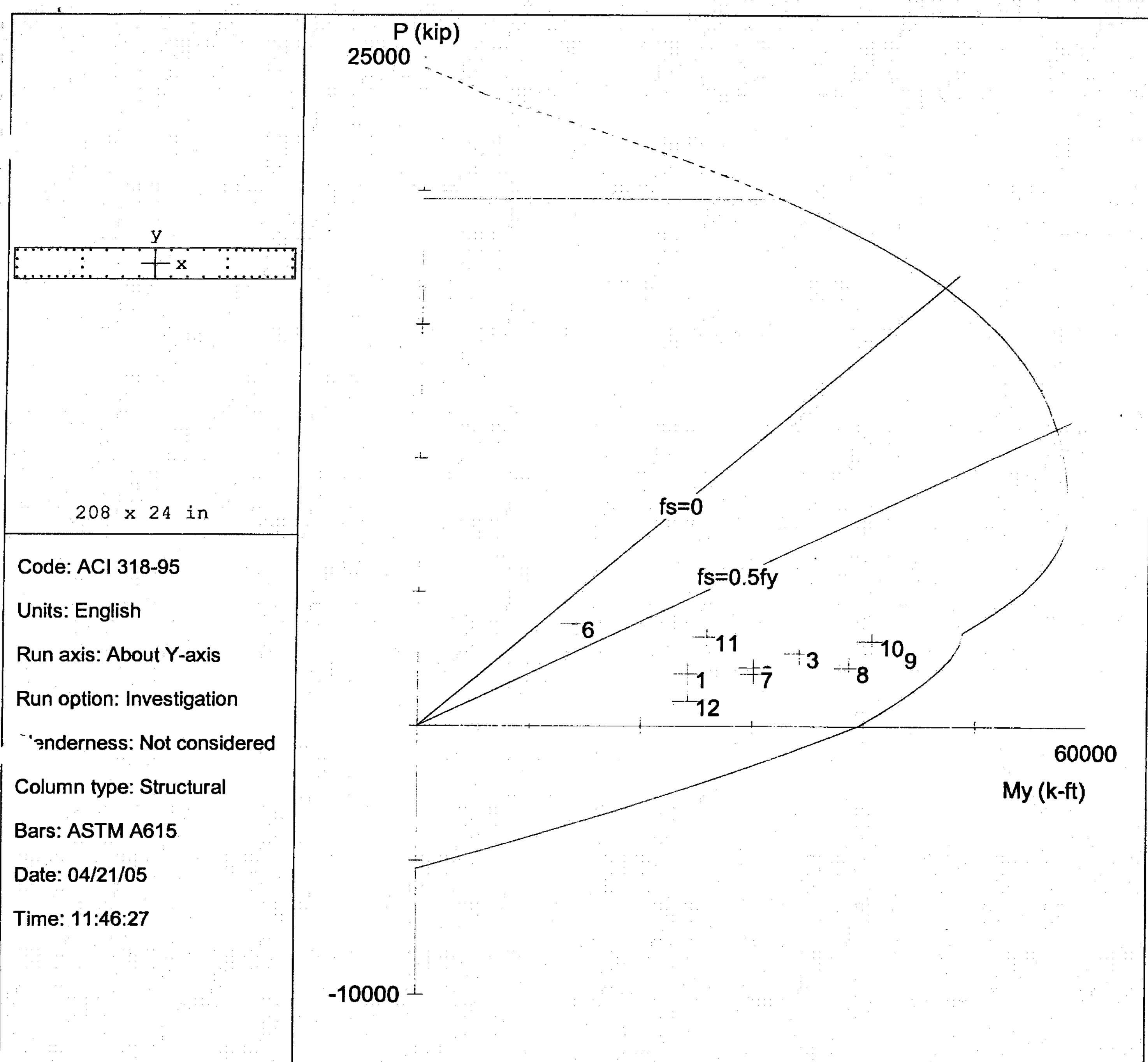
9.1.1-73

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
12	P3	E100X30YPR MAX	Top	0	328	6	200	0	0	287	132	287	132
11	P3	E100X30YPR MAX	Top	0	380	5	278	82	4208	525	244	525	244
10	P3	E100X30YPR MAX	Top	0	423	7	322	102	7845	761	356	761	356
9	P3	E100X30YPR MAX	Top	0	448	4	336	116	11694	998	469	998	469
8	P3	E100X30YPR MAX	Top	0	476	5	346	138	15458	1233	581	1233	581
7	P3	E100X30YPR MAX	Top	0	524	4	352	144	18857	1469	693	1469	693
6	P3	E100X30YPR MAX	Top	0	608	11	360	148	21889	1705	805	1705	805
5	P3	E100X30YPR MAX	Top	0	758	22	337	165	26327	1940	917	1940	917
4	P3	E100X30YPR MAX	Top	0	862	74	386	220	32171	2176	1029	2176	1029
3	P4	E100X30YPR MAX	Top	237	1051	119	234	676	34211	2469	1169	2706	932
2	P4	E100X30YPR MAX	Top	370	605	162	404	1311	40953	2796	1328	3166	958
1	P3	E100X30YMR MAX	Top	470	1149	106	110	1299	37903	3066	1467	3536	997
B1	P3	E100X30YMR MAX	Top	601	905	50	133	354	19132	3261	1566	3862	965
B2	P4	E100X30YMR MAX	Top	633	469	1	17	50	8707	3456	1665	4089	1032
B3	P4	E100X30YMR MAX	Top	639	416	1	16	14	4901	3650	1764	4289	1125
B4	P3	E100X30YMR MAX	Top	624	362	12	41	15	2368	3845	1863	4468	1239

9.1.1-74

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
12	P4	E100X30YMR MAX	Bottom	0	461	6	200	82	5925	287	132	287	132
11	P4	E100X30YMR MAX	Bottom	0	380	5	278	102	9592	525	244	525	244
10	P4	E100X30YMR MAX	Bottom	0	392	7	323	116	12377	761	356	761	356
9	P3	E100X30YPR MAX	Bottom	0	448	4	337	138	15458	998	469	998	469
8	P3	E100X30YPR MAX	Bottom	0	476	5	347	144	18857	1233	581	1233	581
7	P3	E100X30YPR MAX	Bottom	0	524	4	353	148	21889	1469	693	1469	693
6	P3	E100X30YPR MAX	Bottom	0	608	11	361	165	26327	1705	805	1705	805
5	P3	E100X30YPR MAX	Bottom	0	758	22	338	220	32171	1940	917	1940	917
4	P3	E100X30YPR MAX	Bottom	0	862	74	387	693	39207	2176	1029	2176	1029
3	P4	E100X30YPR MAX	Bottom	237	1051	119	234	1146	43219	2469	1169	2706	932
2	P3	E100X30YMR MAX	Bottom	302	1126	149	459	1691	47765	2796	1328	3098	1026
1	P3	E100X30YMR MAX	Top	470	1149	106	110	1299	37903	3066	1467	3536	997
B1	P3	E100X30YMR MAX	Top	601	905	50	133	354	19132	3261	1566	3862	965
B2	P3	E100X30YMR MAX	Top	632	634	3	29	38	10525	3456	1665	4087	1033
B3	P3	E100X30YMR MAX	Top	632	418	3	29	17	4931	3650	1764	4282	1132
B4	P4	E100X30YPR MAX	Bottom	619	411	11	43	95	3837	3845	1863	4464	1244

9.1.1-75



208 x 24 in

Code: ACI 318-95

Units: English

Run axis: About Y-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/21/05

Time: 11:46:27

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P3L3.COL

Project:

Column: Engineer:

f'c = 7 ksi	fy = 75 ksi	Ag = 4992 in^2	62 #10 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 78.74 in^2	Rho = 1.58%
fc = 5.95 ksi	e_rup = Infinity	Xo = 0.00 in	Ix = 239616 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 1.79978e+007 in^4
Beta1 = 0.7		Clear spacing = 4.73 in	Clear cover = 1.35 in

9.1.1-76

Confinement: Tied phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000655

General Information:
====================

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P3L3.COL
Project:
Column: Engineer:
Code: ACI 318-95 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: Y-axis Column Type: Structural

Material Properties:
====================

f'c = 7 ksi fy = 75 ksi
Ec = 4768.97 ksi Es = 29000 ksi
fc = 5.95 ksi Rupture strain = Infinity
Ultimate strain = 0.003 in/in
Beta1 = 0.7

Section:
========

Rectangular: Width = 208 in Depth = 24 in

Gross section area, Ag = 4992 in^2
Ix = 239616 in^4 Iy = 1.79978e+007 in^4
Xo = 0 in Yo = 0 in

Reinforcement:
==============

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 78.74 in^2 at 1.58%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
1.27	54.0	-3.3	1.27	54.0	3.3	1.27	-54.0	-3.3
1.27	-54.0	3.3	1.27	102.0	-3.3	1.27	102.0	3.3
1.27	-0.0	-10.0	1.27	-0.0	10.0	1.27	12.0	-10.0
1.27	12.0	10.0	1.27	24.0	-10.0	1.27	24.0	10.0
1.27	36.0	-10.0	1.27	36.0	10.0	1.27	48.0	-10.0
1.27	48.0	10.0	1.27	54.0	-10.0	1.27	54.0	10.0
1.27	60.0	-10.0	1.27	60.0	10.0	1.27	66.0	-10.0
1.27	66.0	10.0	1.27	72.0	-10.0	1.27	72.0	10.0
1.27	78.0	-10.0	1.27	78.0	10.0	1.27	84.0	-10.0
1.27	84.0	10.0	1.27	90.0	-10.0	1.27	90.0	10.0
1.27	96.0	-10.0	1.27	96.0	10.0	1.27	102.0	-10.0
1.27	102.0	10.0	1.27	-102.0	-3.3	1.27	-102.0	3.3
1.27	-12.0	-10.0	1.27	-12.0	10.0	1.27	-24.0	-10.0
1.27	-24.0	10.0	1.27	-36.0	-10.0	1.27	-36.0	10.0
1.27	-48.0	-10.0	1.27	-48.0	10.0	1.27	-54.0	-10.0
1.27	-54.0	10.0	1.27	-60.0	-10.0	1.27	-60.0	10.0
1.27	-66.0	-10.0	1.27	-66.0	10.0	1.27	-72.0	-10.0
1.27	-72.0	10.0	1.27	-78.0	-10.0	1.27	-78.0	10.0
1.27	-84.0	-10.0	1.27	-84.0	10.0	1.27	-90.0	-10.0
1.27	-90.0	10.0	1.27	-96.0	-10.0	1.27	-96.0	10.0
1.27	-102.0	-10.0	1.27	-102.0	10.0			

9.1.1-77

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Pu kip	Muy k-ft	fMny k-ft	fMn/Mu
1	1940.0	24174.0	46383.6	1.919
2	2176.0	30061.0	46981.9	1.563
3	2705.0	34202.0	48086.3	1.406
4	3166.0	40697.0	48680.0	1.196
5	3318.0	25853.0	48772.9	1.887
6	3806.0	13995.0	50066.3	3.577
7	1940.0	30081.0	46383.6	1.542
8	2176.0	38668.0	46981.9	1.215
9	2705.5	42967.0	48087.1	1.119
10	3165.9	40696.6	48679.9	1.196
11	3317.6	25855.5	48772.7	1.886
12	917.0	24174.0	43101.1	1.783

*** Program completed as requested! ***

SHEAR WALL SHEAR CHECK

Etabs model: 7.05-CD-straight
Date: 4/22/2005
By: NJR

phi = 0.6

P3								Shear Reinforcement of Wall							Check design					
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in^2	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}$<(V_u/ϕ)	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in^2	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P2	B5-L7	24	208	7000	60	0.60	1151	4992	4177	OK	501	0.004	**0.88**	10.1	**9.0**	0.004	2056	2056	0.93	1.79
	L7-T.O.W.	24	208	7000	60	0.60	476	4992	4177	OK	501	0.003	**0.22**	3.7	**11.0**	0.001	1085	1085	0.73	2.28

phi = 0.85
phi = 0.6

P3								Shear Reinforcement of Wall							Check design					
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in^2	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}$<(V_u/ϕ)	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in^2	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P2	B5-L7	24	208	7000	60	0.85	1151	4992	4177	OK	710	0.003	**0.40**	6.7	**9.0**	0.002	1390	1390	0.97	1.21
	L7-T.O.W.	24	208	7000	60	0.85	476	4992	4177	OK	710	0.003	**0.22**	3.7	**11.0**	0.001	1085	1085	0.52	2.28

Shear wall boundary element check
DCE #: 4069
Date: 5/2/2005

Width of BE hoop h_c= 21.9 in

Notes:
1) Needs to verified after design
2) B.E. length is center to center of BE confining hoops

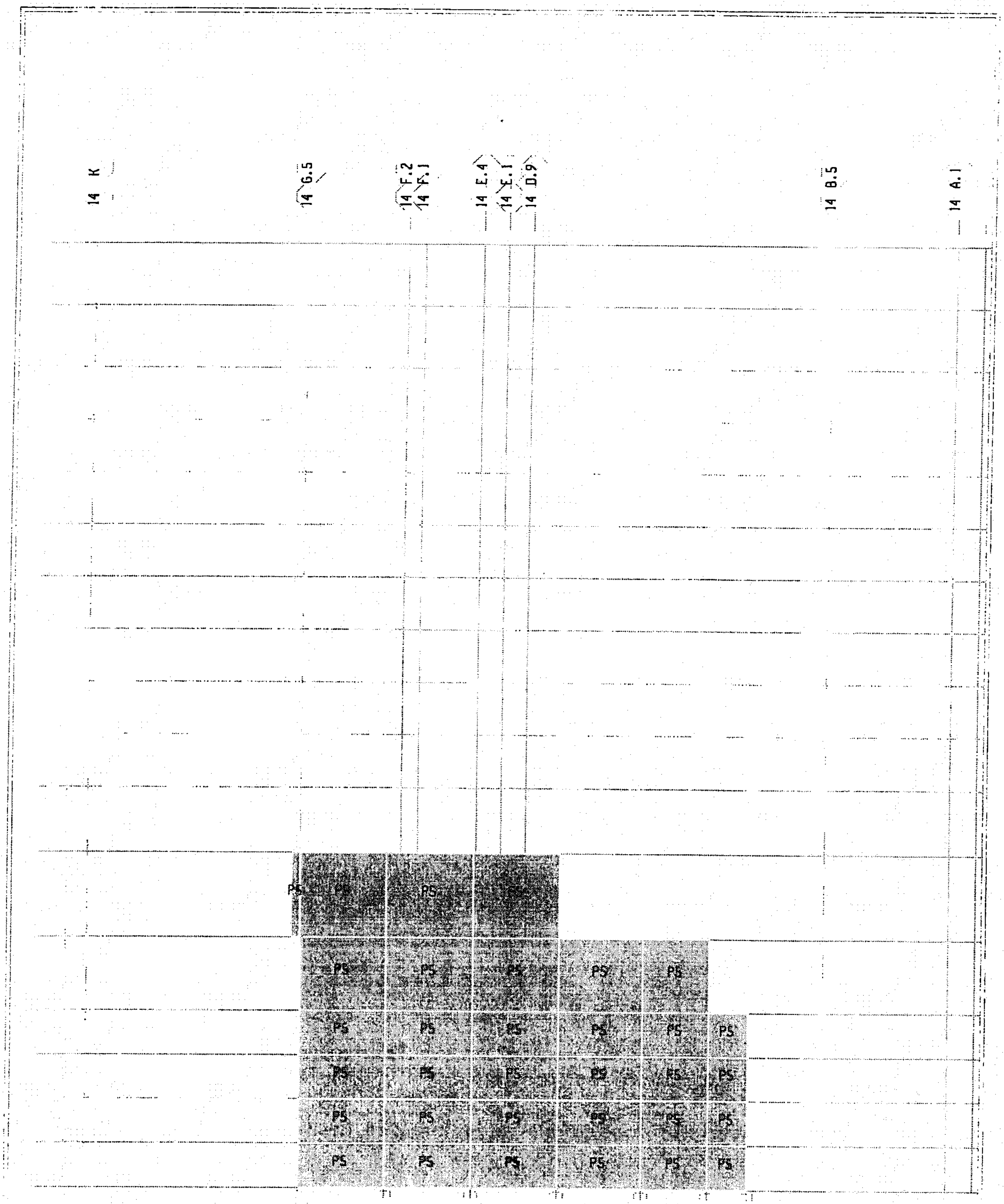
Wall ID: P3 and P4

Floor	f'_c	fy	P_E (Loads based on Max. Axial)	P_{Grav} 1.42DL+0.5L (Loads based on Max. Axial)	P_u (Loads based on Max. Axial)	M_u (Loads based on Max. Axial)	V_u (k) (Loads based on Max. Axial)	A_g	$P_u/(A_g f'_c)$	A_{cv}	Shear l_w	Symmetry 1=sym 0=un-sym	$M_u/V_u l_w$	$V_u/(A_{cv}$*sqrt(f'_c))	Conclusion
	psi	ksi	kips	kips	kips	kip-ft	kips	in^2		in^2	in				
13	7000	60	0	0	0	0	0	4992	0.000	4992	208	1	#DIV/0!	0.00	#DIV/0!
12	7000	60	0	287	287	0	328	4992	0.008	4992	208	1	0.00	0.78	NOT REQ'D
11	7000	60	0	525	525	4208	380	4992	0.015	4992	208	1	0.64	0.91	NOT REQ'D
10	7000	60	0	761	761	7845	423	4992	0.022	4992	208	1	1.07	1.01	NOT REQ'D
9	7000	60	0	998	998	11694	448	4992	0.029	4992	208	1	1.51	1.07	NOT REQ'D
8	7000	60	0	1233	1233	15458	476	4992	0.035	4992	208	1	1.88	1.14	NOT REQ'D
7	7000	60	0	1469	1469	18857	524	4992	0.042	4992	208	1	2.08	1.25	NOT REQ'D
6	7000	60	0	1705	1705	21889	608	4992	0.049	4992	208	1	2.08	1.45	NOT REQ'D
5	7000	60	0	1940	1940	26327	758	4992	0.056	4992	208	1	2.00	1.82	NOT REQ'D
4	7000	60	0	2176	2176	32171	862	4992	0.062	4992	208	1	2.15	2.06	NOT REQ'D
3	7000	60	237	2469	2706	34211	1051	4992	0.077	4992	208	1	1.88	2.52	NOT REQ'D
2	7000	60	370	2796	3166	40953	605	4992	0.091	4992	208	1	3.90	1.45	PROVIDE B.E.
1	7000	60	470	3066	3536	37903	1149	4992	0.101	4992	208	1	1.90	2.75	PROVIDE B.E.
B1	7000	60	601	3261	3862	19132	905	4992	0.111	4992	208	1	1.22	2.17	PROVIDE B.E.
B2	7000	60	633	3456	4089	8707	469	4992	0.117	4992	208	1	1.07	1.12	PROVIDE B.E.
B3	7000	60	639	3650	4289	4901	416	4992	0.123	4992	208	1	0.68	0.99	PROVIDE B.E.
B4	7000	60	624	3845	4468	2368	362	4992	0.128	4992	208	1	0.38	0.87	PROVIDE B.E.

Floor	P_o[1]	P_u/P_o	Length of B.E. Req'd	A_{sh}/s Req'd	B.E.[2] Length used (h_c)	New A_{sh}/s Req'd	legs	Ash	s (spacing)	Ash/s act	ok/ng	min diam long bars allowed	long spacing of legs	% of Length	A_{sh} Req. (Confinement in width)	Area of hoops (Confinement in width)	Legs in addition to outer hoop (Confinement in width)	Area of added legs (Confinement in width)	Ash act (Confinement in width)	ok/ng (Confinement in width)
	kips		in	in/in	in	in/in		in^2	in	in/in		in	in		in^2	in^2		in^2	in^2	
13	29702	0.00	#DIV/0!	#####		#DIV/0!				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####				#DIV/0!	#DIV/0!
12	29702	0.01	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
11	29702	0.02	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
10	29702	0.03	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
9	29702	0.03	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
8	29702	0.04	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
7	29702	0.05	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
6	29702	0.06	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
5	29702	0.07	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
4	29702	0.07	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
3	29702	0.09	n/a	n/a		n/a				n/a	n/a	n/a	n/a	n/a	n/a				n/a	n/a
2	29702	0.11	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.17	1.03	0.31	1	0.44	1.06	OK
1	29702	0.12	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.17	1.03	0.31	1	0.44	1.06	OK
B1	29702	0.13	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.17	1.03	0.31	1	0.44	1.06	OK
B2	29702	0.14	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.17	1.03	0.31	1	0.44	1.06	OK
B3	29702	0.14	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.17	1.03	0.31	1	0.44	1.06	OK
B4	29702	0.15	31	0.33	36	0.38	6	0.31	4.5	0.41	OK	0.75	6.0	0.17	1.03	0.31	1	0.44	1.06	OK

9.1.1-80

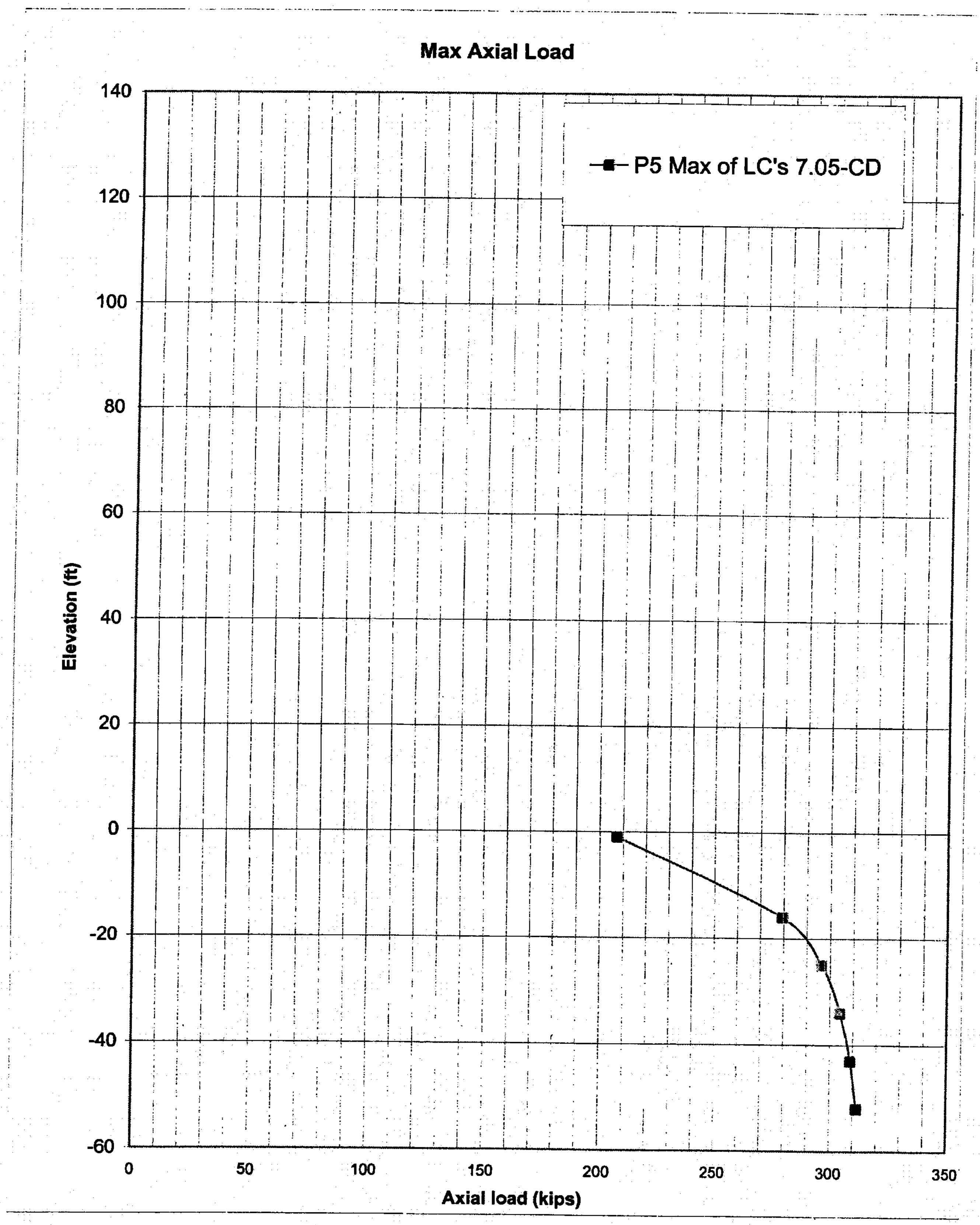
ETABS



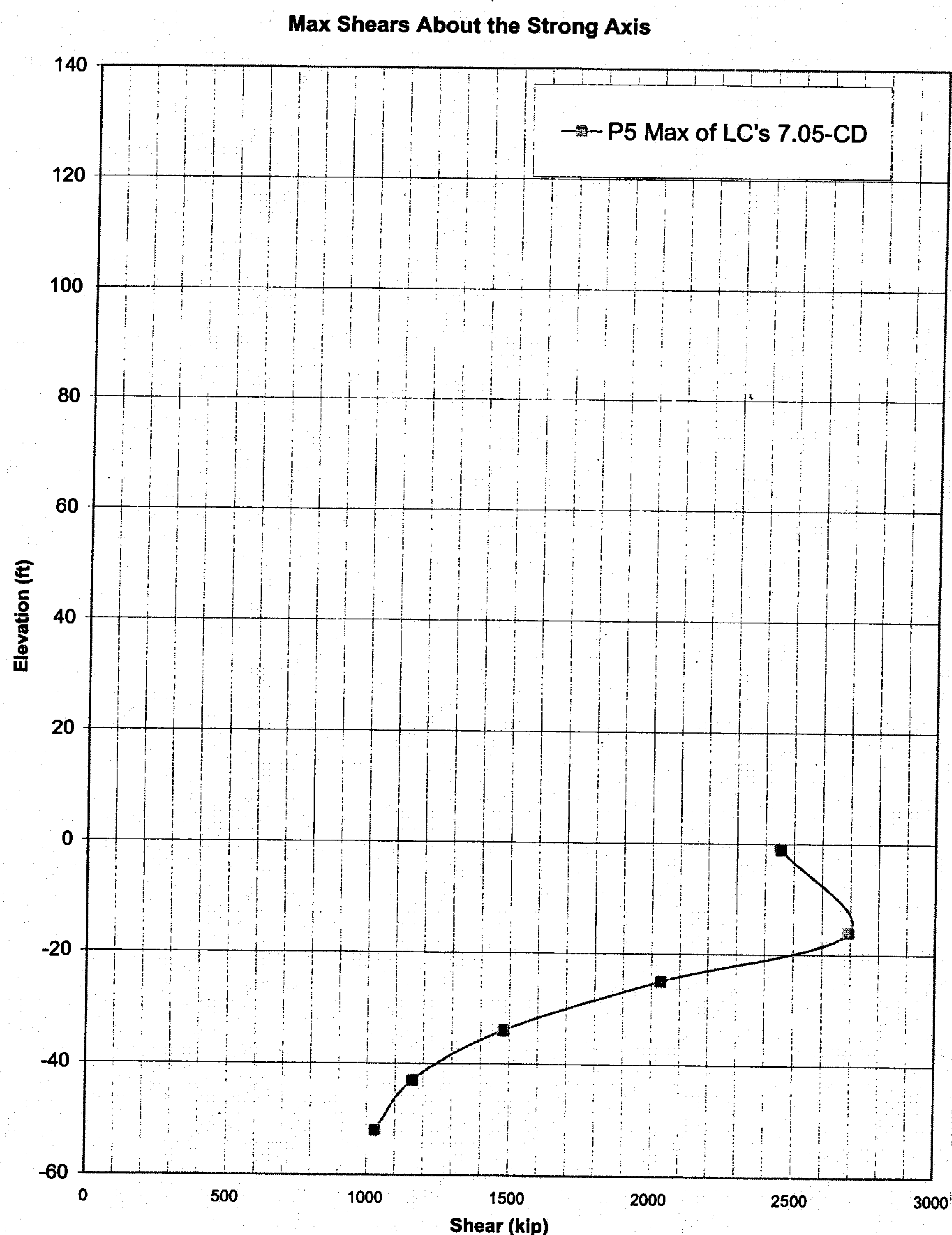
ETABS v8.5.0 - File: 4069-20050413-7.05-CD - straight - April 22,2005 10:32
Elevation View - 14 - Kip-in Units

9.1.1-81

DODSONNOC00000660

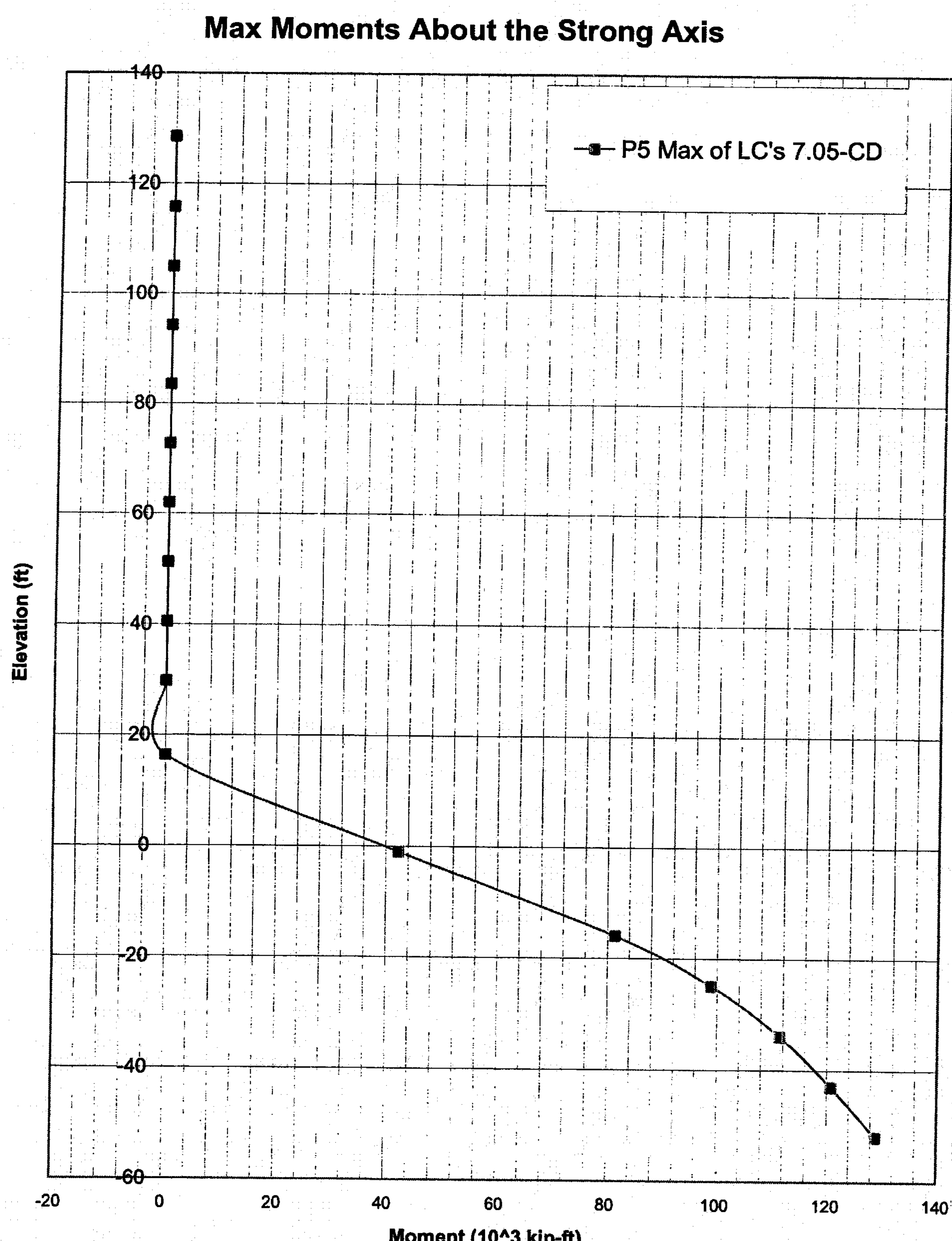

Max Axial Load
P5 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
50
100
150
200
250
300
350
Axial load (kips)

9.1.1-82



Max Shears About the Strong Axis
P5 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
Shear (kip)

9.1.1-83


Max Moments About the Strong Axis
P5 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
-20
0
20
40
60
80
100
120
140
Moment (10^3 kip-ft)

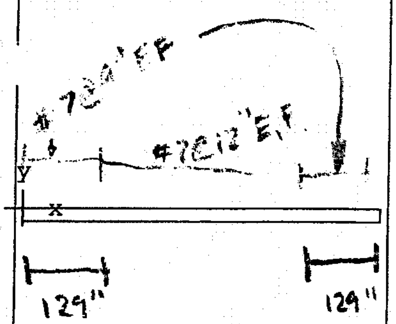
9.1.1-84

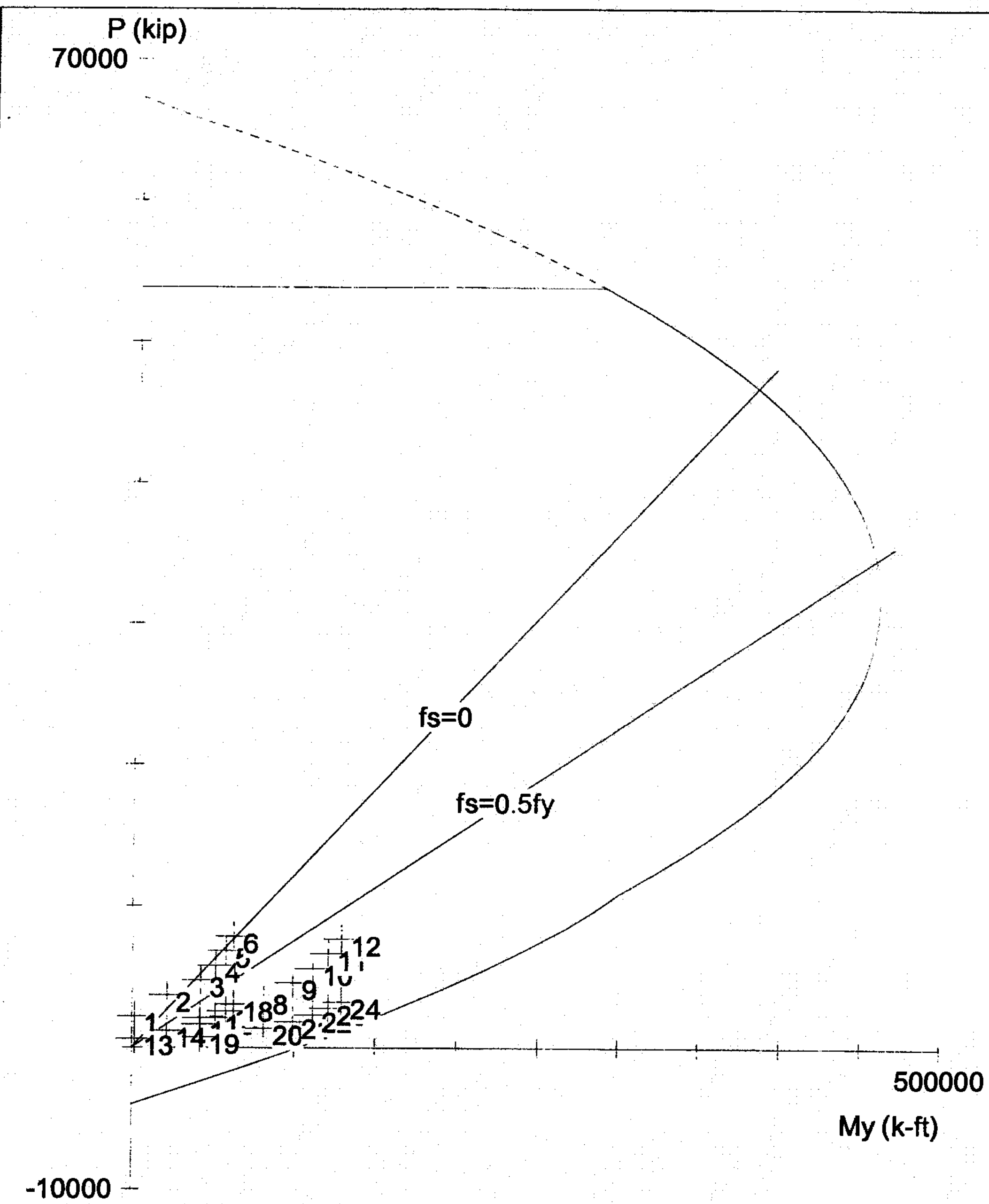
Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
2	P5	E100X30YPR MAX	Top	207	1328	369	2199	2993.7	1722.5	1994	834	2202	626
1	P5	E100X30YPR MAX	Top	279	1428	47.2	3508	1981.6	21643	3426	1491	3705	1211
B1	P5	E100X30YPR MAX	Top	296	1062	62.5	403.9	998.2	42485	4455	1959	4752	1663
B2	P5	E100X30YPR MAX	Top	304	784	29	140.3	352.69	51629	5486	2428	5790	2123
B3	P5	E100X30YPR MAX	Top	309	635	34.4	136.4	219.67	57975	6517	2896	6826	2587
B4	P5	E100X30YPR MAX	Top	312	572	70.2	228.5	202	62804	7550	3365	7862	3053

9.1.1-85

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
2	P5	E30X100YMR MAX	Bottom	79.58	2453	145.9	1116	1359	42254	1994	834	2074	754
1	P5	E30X100YMR MAX	Bottom	106.9	2695	21.16	1471	554.2	81362	3426	1491	3533	1384
B1	P5	E30X100YMR MAX	Bottom	113.5	2034	25.33	178.4	219.5	99010	4455	1959	4569	1846
B2	P5	E30X100YMR MAX	Bottom	116.7	1479	13.29	152.1	131	111474	5486	2428	5603	2311
B3	P5	E30X100YMR MAX	Bottom	118.6	1163	14.03	117.8	122.4	120817	6517	2896	6636	2778
B4	P5	E30X100YMR MAX	Bottom	119.7	1030	28.24	224.7	271.4	128909	7550	3365	7670	3245

9.1.1-86





Code: ACI 318-95

Units: English

Run axis: About Y-axis

Run option: Investigation

'enderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/22/05

Time: 13:46:46

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P5L2.COL

Project:

Column:

Engineer:

f'c = 7 ksi	fy = 60 ksi	Ag = 15480 in^2	124 #7 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 74.40 in^2	Rho = 0.48%
fc = 5.95 ksi	e_rup = Infinity	Xo = 322.50 in	Ix = 743040 in^4
e_u = 0.003 in/in		Yo = -12.00 in	Iy = 5.36672e+008 in^4
Beta1 = 0.7		Clear spacing = 8.13 in	Clear cover = N/A

9.1.1-87

Confinement: Tied phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000666

General Information:

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P5L2.COL
Project:
Column:
Code: ACI 318-95
Engineer:
Units: English

Run Option: Investigation
Run Axis: Y-axis
Slenderness: Not considered
Column Type: Structural

Material Properties:

f'c = 7 ksi
Ec = 4768.97 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7
fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:

Exterior Points

No.	X (in)	Y (in)	No.	X (in)	Y (in)	No.	X (in)	Y (in)
1	0.0	0.0	2	-0.0	-24.0	3	645.0	-24.0
4	645.0	-0.0						

Gross section area, Ag = 15480 in^2
Ix = 743040 in^4
Iy = 5.36672e+008 in^4
Xo = 322.5 in
Yo = -12 in

Reinforcement:

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 74.40 in^2 at 0.48%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
0.60	1.5	-1.5	0.60	1.5	-22.5	0.60	10.5	-1.5
0.60	10.5	-22.5	0.60	19.5	-1.5	0.60	19.5	-22.5
0.60	28.5	-1.5	0.60	28.5	-22.5	0.60	37.5	-1.5
0.60	37.5	-22.5	0.60	46.5	-1.5	0.60	46.5	-22.5
0.60	55.5	-1.5	0.60	55.5	-22.5	0.60	64.5	-1.5
0.60	64.5	-22.5	0.60	73.5	-1.5	0.60	73.5	-22.5
0.60	82.5	-1.5	0.60	82.5	-22.5	0.60	91.5	-1.5
0.60	91.5	-22.5	0.60	100.5	-1.5	0.60	100.5	-22.5
0.60	109.5	-1.5	0.60	109.5	-22.5	0.60	118.5	-1.5
0.60	118.5	-22.5	0.60	127.5	-1.5	0.60	127.5	-22.5
0.60	136.5	-1.5	0.60	136.5	-22.5	0.60	643.5	-1.5
0.60	643.5	-22.5	0.60	634.5	-1.5	0.60	634.5	-22.5
0.60	625.5	-1.5	0.60	625.5	-22.5	0.60	616.5	-1.5
0.60	616.5	-22.5	0.60	607.5	-1.5	0.60	607.5	-22.5
0.60	598.5	-1.5	0.60	598.5	-22.5	0.60	589.5	-1.5
0.60	589.5	-22.5	0.60	580.5	-1.5	0.60	580.5	-22.5

9.1.1-88

0.60	571.5	-1.5	0.60	571.5	-22.5	0.60	562.5	-1.5
0.60	562.5	-22.5	0.60	553.5	-1.5	0.60	553.5	-22.5
0.60	544.5	-1.5	0.60	544.5	-22.5	0.60	535.5	-1.5
0.60	535.5	-22.5	0.60	526.5	-1.5	0.60	526.5	-22.5
0.60	517.5	-1.5	0.60	517.5	-22.5	0.60	508.5	-1.5
0.60	508.5	-22.5	0.60	148.5	-1.5	0.60	148.5	-22.5
0.60	160.5	-1.5	0.60	160.5	-22.5	0.60	172.5	-1.5
0.60	172.5	-22.5	0.60	184.5	-1.5	0.60	184.5	-22.5
0.60	196.5	-1.5	0.60	196.5	-22.5	0.60	208.5	-1.5
0.60	208.5	-22.5	0.60	220.5	-1.5	0.60	220.5	-22.5
0.60	232.5	-1.5	0.60	232.5	-22.5	0.60	244.5	-1.5
0.60	244.5	-22.5	0.60	256.5	-1.5	0.60	256.5	-22.5
0.60	268.5	-1.5	0.60	268.5	-22.5	0.60	280.5	-1.5
0.60	280.5	-22.5	0.60	292.5	-1.5	0.60	292.5	-22.5
0.60	304.5	-1.5	0.60	304.5	-22.5	0.60	316.5	-1.5
0.60	316.5	-22.5	0.60	328.5	-1.5	0.60	328.5	-22.5
0.60	340.5	-1.5	0.60	340.5	-22.5	0.60	352.5	-1.5
0.60	352.5	-22.5	0.60	364.5	-1.5	0.60	364.5	-22.5
0.60	376.5	-1.5	0.60	376.5	-22.5	0.60	388.5	-1.5
0.60	388.5	-22.5	0.60	400.5	-1.5	0.60	400.5	-22.5
0.60	412.5	-1.5	0.60	412.5	-22.5	0.60	424.5	-1.5
0.60	424.5	-22.5	0.60	436.5	-1.5	0.60	436.5	-22.5
0.60	448.5	-1.5	0.60	448.5	-22.5	0.60	460.5	-1.5
0.60	460.5	-22.5	0.60	472.5	-1.5	0.60	472.5	-22.5
0.60	484.5	-1.5	0.60	484.5	-22.5	0.60	496.5	-1.5
0.60	496.5	-22.5						

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Pu kip	Muy k-ft	fMny k-ft	fMn/Mu
1	2202.0	1722.5	151651.0	88.043
2	3705.0	21643.4	182692.4	8.441
3	4752.0	42485.2	203230.2	4.784
4	5790.0	51628.7	222664.9	4.313
5	6826.0	57975.2	241023.5	4.157
6	7862.0	62803.6	258239.0	4.112
7	2074.0	42254.4	148930.1	3.525
8	3533.0	81361.8	179235.4	2.203
9	4569.0	99010.5	199703.6	2.017
10	5603.0	111473.9	219224.0	1.967
11	6636.0	120817.1	237740.7	1.968
12	7670.0	128908.8	255135.2	1.979
13	626.0	1722.5	117268.7	68.082
14	1211.0	21643.4	130238.3	6.017
15	1663.0	42485.2	140091.8	3.297
16	2123.0	51628.7	149974.9	2.905
17	2587.0	57975.2	159772.0	2.756
18	3053.0	62803.6	169447.2	2.698
19	754.0	42254.4	120122.9	2.843
20	1384.0	81361.8	134024.1	1.647
21	1846.0	99010.5	144041.0	1.455
22	2311.0	111473.9	153958.8	1.381
23	2778.0	120817.1	163759.3	1.355
24	3245.0	128908.8	173378.8	1.345

*** Program completed as requested! ***

9.1.1-89

SHEAR WALL SHEAR CHECK

Etabs model: 7.05-CD-straight
Date: 4/22/2005
By: NJR

SHEAR CRITICAL ∴ USE ϕ=0.6

phi = 0.6

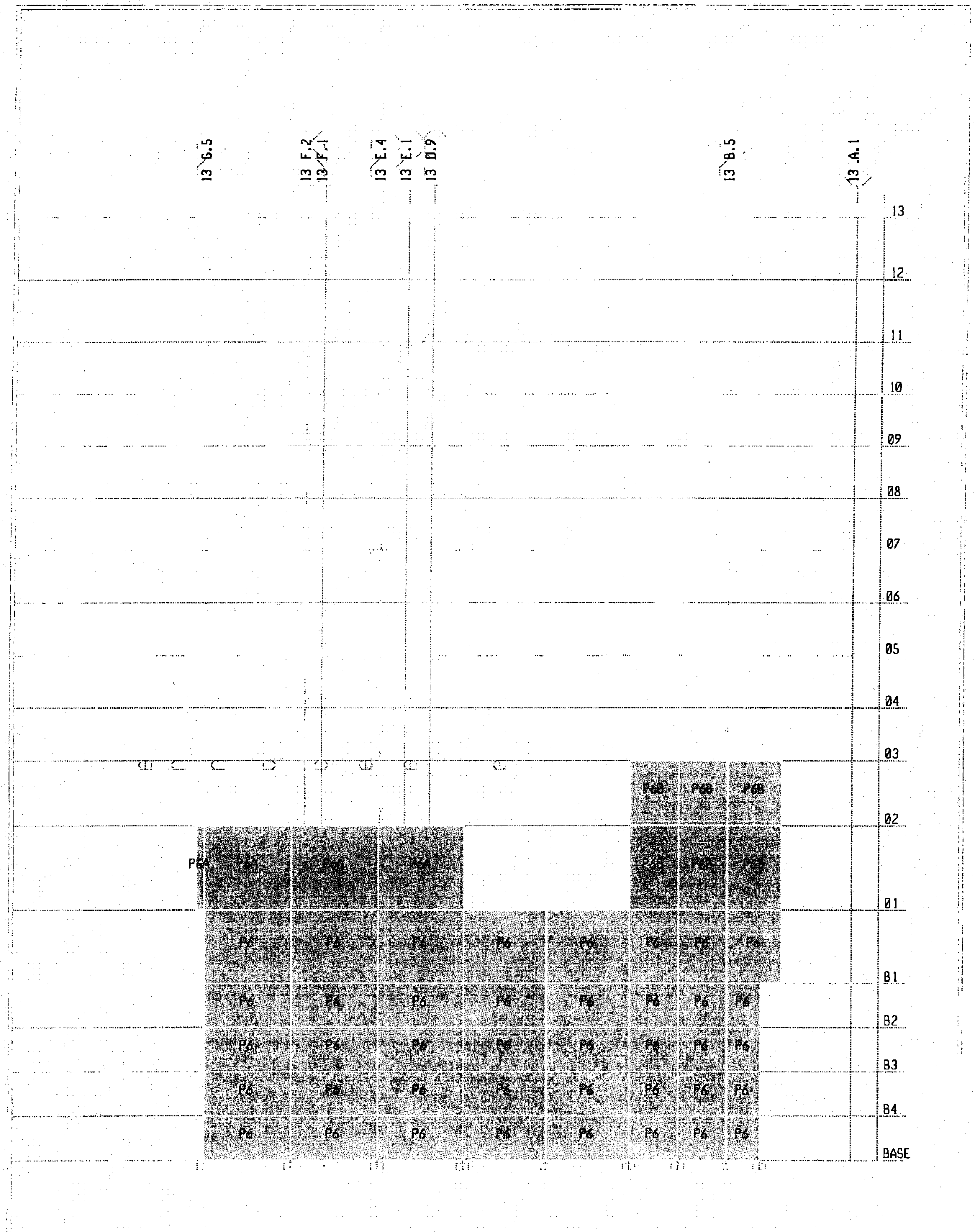
P5								Shear Reinforcement of Wall								Check design						
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in^2	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}<(V_u/\phi)$	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in^2	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P5	L1-L2	24	645	7000	60	0.60	2453	15480	12951	OK	1554	0.0025	0.40	6.7	9.0	0.002	4310	4310	0.95	1.76
	B1-L1	24	983	7000	60	0.60	1428	23592	19738	OK	2369	0.0025	0.22	3.7	18.0	0.001	4669	4669	0.51	3.27
	B5-B1	24	1080	7000	60	0.60	1062	25920	21686	OK	2602	0.0025	0.22	3.7	18.0	0.001	5129	5129	0.35	4.83

~~*phi = 0.85*~~

P5								Shear Reinforcement of Wall								Check design				
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in^2	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}<(V_u/\phi)$	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in^2	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P5	L1-L2	24	645	7000	60	0.85	2453	15480	12951	OK	2202	0.0025	0.22	3.7	18.0	0.001	3063	3063	0.94	1.25
	B1-L1	24	983	7000	60	0.85	1428	23592	19738	OK	3356	0.0025	0.22	3.7	18.0	0.001	4669	4669	0.36	3.27
	B5-B1	24	1080	7000	60	0.85	1062	25920	21686	OK	3687	0.0025	0.22	3.7	18.0	0.001	5129	5129	0.24	4.83

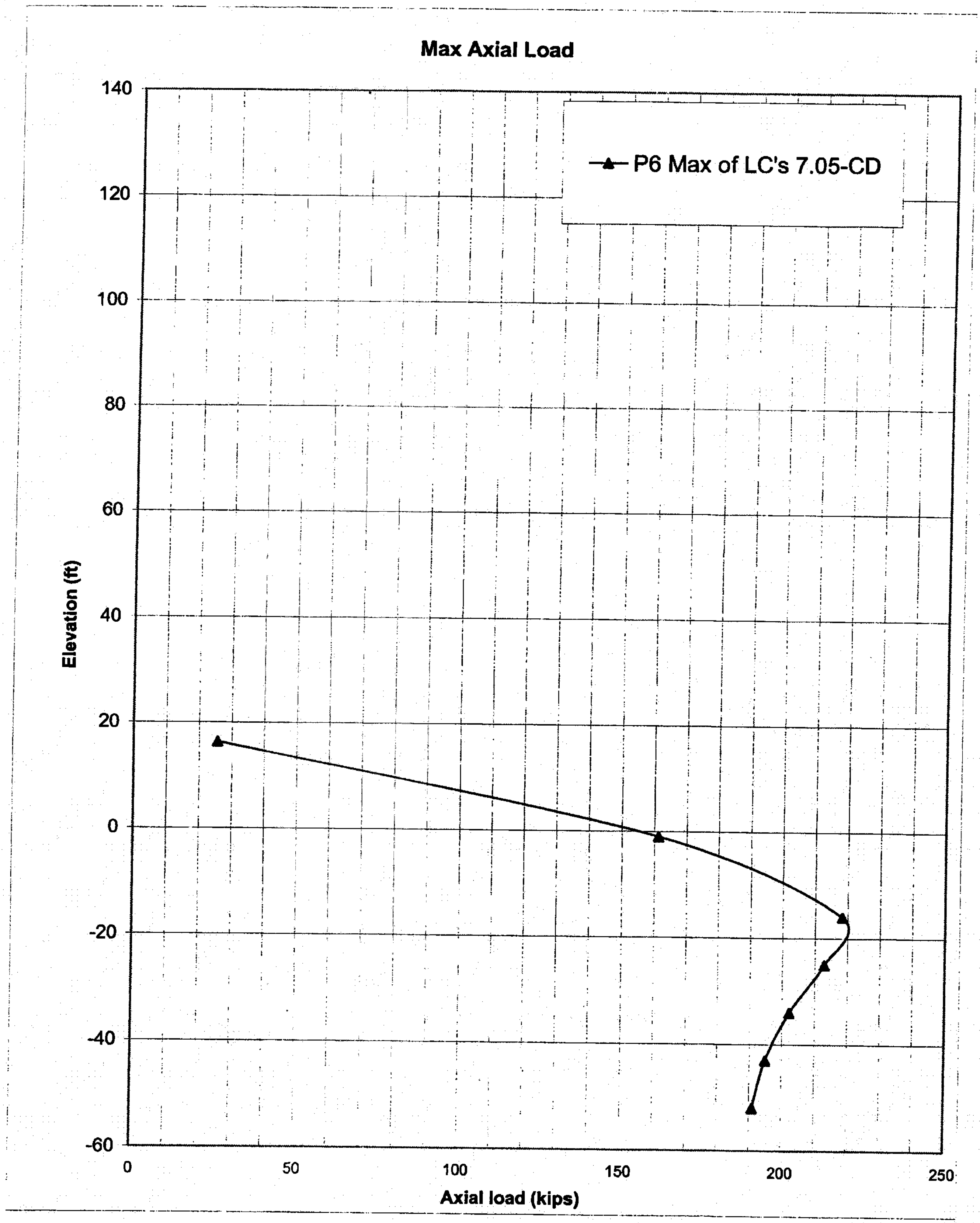
9.1.1-9b

ETABS

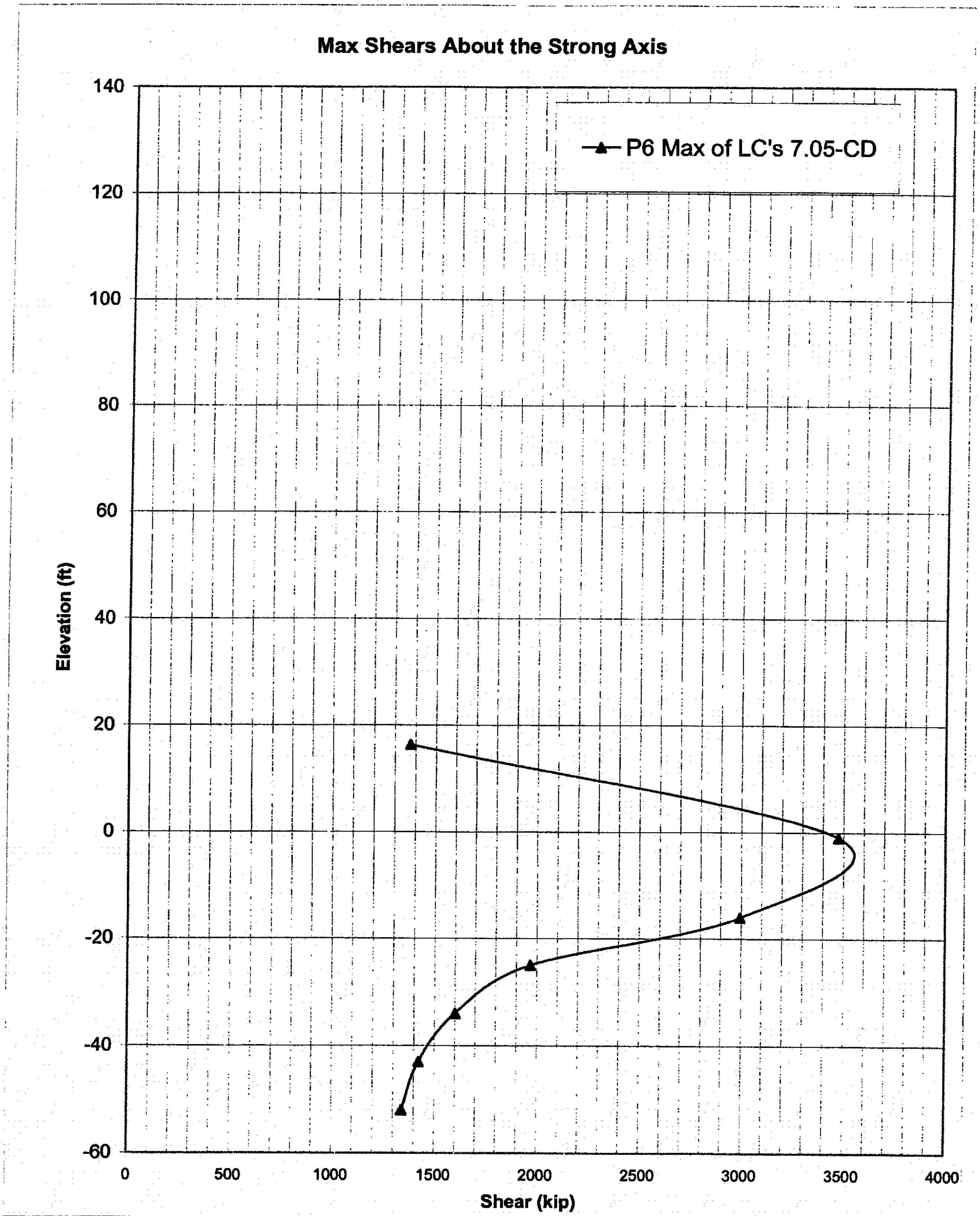


ETABS v8.5.0 - File: 4069-20050413-7.05-CD - straight - April 22,2005 10:36
Elevation View - 13 - Kip-in Units

9.1.1-91

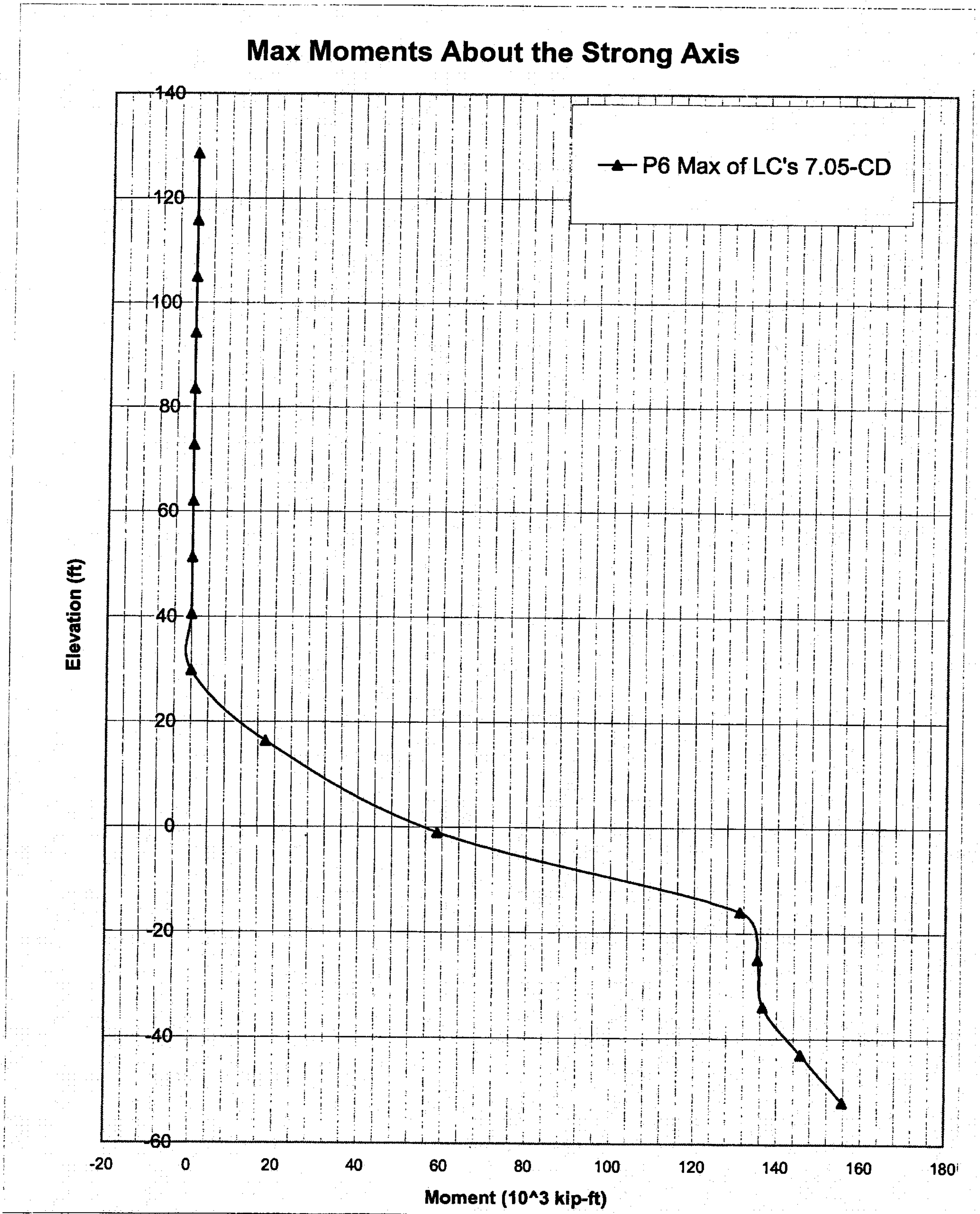

Max Axial Load
P6 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
50
100
150
200
250
Axial load (kips)

9.1.1-92


Max Shears About the Strong Axis
P6 Max of LC's 7.05-CD
Elevation (ft)
140
120
100
80
60
40
20
0
-20
-40
-60
0
500
1000
1500
2000
2500
3000
3500
4000
Shear (kip)

9.1.1-93

Print Date 4/22/2005



9.1.1-94

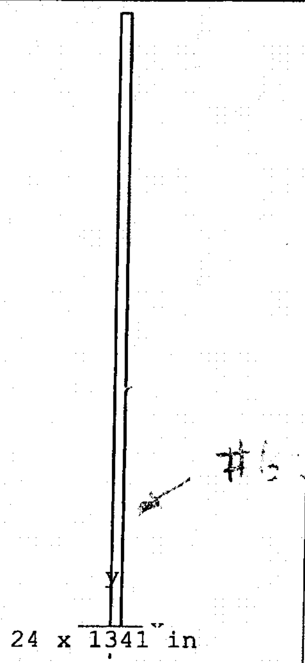
DODSONNOC00000673

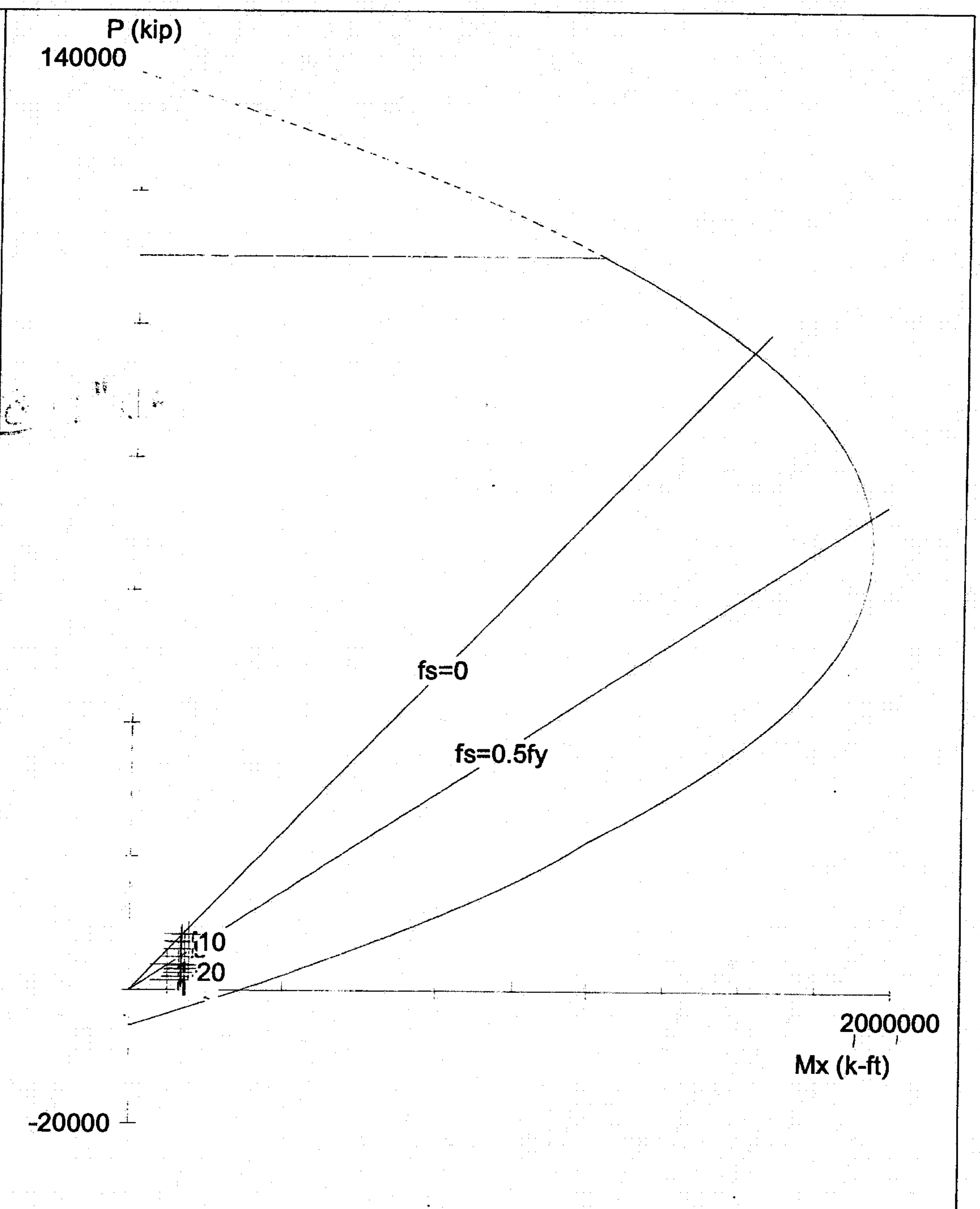
Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
2	P6A	E100X30YMR MAX	Top	161	3475	395	2232	3335.4	1454.5	1222	567	1383	406
1	P6	E100X30YMR MAX	Top	218	2199	234	5314	4700.5	99453	3626	1697	3844	1479
B1	P6	E100X30YMR MAX	Top	213	1019	54.3	2117	765.02	129122	4766	2222	4979	2010
B2	P6	E100X30YMR MAX	Top	202	926	41.1	641.9	389.29	134498	5907	2747	6109	2545
B3	P6	E100X30YMR MAX	Top	195	850	53	360.5	233.39	136089	7048	3272	7243	3078
B4	P6	E100X30YMR MAX	Top	191	775	87.2	511.3	212.55	137533	8192	3798	8383	3607

9.1.1-95

Level	Pier ID	Load Combo	Loc	P (kips)	V2 (kips)	V3 (kips)	T (kip-ft)	M2 (kip-ft)	M3 (kip-ft)	1.42DL+0.5LL (kips)	0.9*DL (kips)	P_{ucomp} (kips)	P_{utens} (kips)
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
0	0	0	0	0	0	0	0	0	0	#N/A	#N/A	#N/A	#N/A
2	P6A	E100X30YMR MAX	Bottom	161.3	3475	394.9	2235	3537	58833	1222	567	1383	406
1	P6	E100X30YMR MAX	Bottom	218.3	2199	233.9	5310	1336	131049	3626	1697	3844	1479
B1	P6	E100X30YMR MAX	Bottom	212.8	1019	54.28	2117	694.3	135303	4766	2222	4979	2010
B2	P6	E100X30YMR MAX	Bottom	202.3	926.2	41.05	641.7	381.7	136619	5907	2747	6109	2545
B3	P6	E30X100YMR MAX	Bottom	75.35	1423	21.18	437	168.5	145659	7048	3272	7124	3197
B4	P6	E30X100YMR MAX	Bottom	73.86	1341	34.29	502.3	342.4	155742	8192	3798	8266	3724

9.1.1-96





Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/22/05

Time: 16:13:36

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6L1.COL   P6 - KJ - L1

Project:

Column:

Engineer:

f'c = 7 ksi	fy = 60 ksi	Ag = 32184 in^2	226 #6 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 99.44 in^2	Rho = 0.31% > .25% OK
fc = 5.95 ksi	e_rup = Infinity	Xo = 12.00 in	Ix = 4.82299e+009 in^4
e_u = 0.003 in/in		Yo = 670.50 in	Iy = 1.54483e+006 in^4
Beta1 = 0.7		Clear spacing = 11.16 in	Clear cover = N/A 9.1.1-97

Confinement: Tied   phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000676

General Information:
====================

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6L1.COL
Project:
Column:
Code: ACI 318-95
Engineer:
Units: English

Run Option: Investigation
Run Axis: X-axis
Slenderness: Not considered
Column Type: Structural

Material Properties:
====================

f'c = 7 ksi
Ec = 4768.97 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7
fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:
========

Exterior Points

No.	X (in)	Y (in)	No.	X (in)	Y (in)	No.	X (in)	Y (in)
1	0.0	0.0	2	24.0	0.0	3	24.0	1341.0

Gross section area, Ag = 32184 in^2
Ix = 4.82299e+009 in^4
Iy = 1.54483e+006 in^4
Xo = 12 in
Yo = 670.5 in

Reinforcement:
==============

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 99.44 in^2 at 0.31%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
0.44	1.5	1.5	0.44	22.5	1.5	0.44	1.5	13.5
0.44	22.5	13.5	0.44	1.5	25.5	0.44	22.5	25.5
0.44	1.5	37.5	0.44	22.5	37.5	0.44	1.5	49.5
0.44	22.5	49.5	0.44	1.5	61.5	0.44	22.5	61.5
0.44	1.5	73.5	0.44	22.5	73.5	0.44	1.5	85.5
0.44	22.5	85.5	0.44	1.5	97.5	0.44	22.5	97.5
0.44	1.5	109.5	0.44	22.5	109.5	0.44	1.5	121.5
0.44	22.5	121.5	0.44	1.5	133.5	0.44	22.5	133.5
0.44	1.5	145.5	0.44	22.5	145.5	0.44	1.5	157.5
0.44	22.5	157.5	0.44	1.5	169.5	0.44	22.5	169.5
0.44	1.5	181.5	0.44	22.5	181.5	0.44	1.5	193.5
0.44	22.5	193.5	0.44	1.5	205.5	0.44	22.5	205.5
0.44	1.5	217.5	0.44	22.5	217.5	0.44	1.5	229.5
0.44	22.5	229.5	0.44	1.5	241.5	0.44	22.5	241.5
0.44	1.5	253.5	0.44	22.5	253.5	0.44	1.5	265.5
0.44	22.5	265.5	0.44	1.5	277.5	0.44	22.5	277.5
0.44	1.5	1339.5	0.44	22.5	1339.5	0.44	1.5	1327.5

9.1.1-98

0.44	22.5	1327.5	0.44	1.5	1315.5	0.44	22.5	1315.5
0.44	1.5	1303.5	0.44	22.5	1303.5	0.44	1.5	1291.5
0.44	22.5	1291.5	0.44	1.5	1279.5	0.44	22.5	1279.5
0.44	1.5	1267.5	0.44	22.5	1267.5	0.44	1.5	1255.5
0.44	22.5	1255.5	0.44	1.5	1243.5	0.44	22.5	1243.5
0.44	1.5	1231.5	0.44	22.5	1231.5	0.44	1.5	1219.5
0.44	22.5	1219.5	0.44	1.5	1207.5	0.44	22.5	1207.5
0.44	1.5	1195.5	0.44	22.5	1195.5	0.44	1.5	1183.5
0.44	22.5	1183.5	0.44	1.5	1171.5	0.44	22.5	1171.5
0.44	1.5	1159.5	0.44	22.5	1159.5	0.44	1.5	1147.5
0.44	22.5	1147.5	0.44	1.5	1135.5	0.44	22.5	1135.5
0.44	1.5	1123.5	0.44	22.5	1123.5	0.44	1.5	1111.5
0.44	22.5	1111.5	0.44	1.5	1099.5	0.44	22.5	1099.5
0.44	1.5	1087.5	0.44	22.5	1087.5	0.44	1.5	1075.5
0.44	22.5	1075.5	0.44	1.5	1063.5	0.44	22.5	1063.5
0.44	1.5	289.4	0.44	22.5	289.4	0.44	1.5	301.3
0.44	22.5	301.3	0.44	1.5	313.2	0.44	22.5	313.2
0.44	1.5	325.1	0.44	22.5	325.1	0.44	1.5	337.0
0.44	22.5	337.0	0.44	1.5	349.0	0.44	22.5	349.0
0.44	1.5	360.9	0.44	22.5	360.9	0.44	1.5	372.8
0.44	22.5	372.8	0.44	1.5	384.7	0.44	22.5	384.7
0.44	1.5	396.6	0.44	22.5	396.6	0.44	1.5	408.5
0.44	22.5	408.5	0.44	1.5	420.4	0.44	22.5	420.4
0.44	1.5	432.3	0.44	22.5	432.3	0.44	1.5	444.2
0.44	22.5	444.2	0.44	1.5	456.1	0.44	22.5	456.1
0.44	1.5	468.0	0.44	22.5	468.0	0.44	1.5	480.0
0.44	22.5	480.0	0.44	1.5	491.9	0.44	22.5	491.9
0.44	1.5	503.8	0.44	22.5	503.8	0.44	1.5	515.7
0.44	22.5	515.7	0.44	1.5	527.6	0.44	22.5	527.6
0.44	1.5	539.5	0.44	22.5	539.5	0.44	1.5	551.4
0.44	22.5	551.4	0.44	1.5	563.3	0.44	22.5	563.3
0.44	1.5	575.2	0.44	22.5	575.2	0.44	1.5	587.1
0.44	22.5	587.1	0.44	1.5	599.0	0.44	22.5	599.0
0.44	1.5	611.0	0.44	22.5	611.0	0.44	1.5	622.9
0.44	22.5	622.9	0.44	1.5	634.8	0.44	22.5	634.8
0.44	1.5	646.7	0.44	22.5	646.7	0.44	1.5	658.6
0.44	22.5	658.6	0.44	1.5	670.5	0.44	22.5	670.5
0.44	1.5	682.4	0.44	22.5	682.4	0.44	1.5	694.3
0.44	22.5	694.3	0.44	1.5	706.2	0.44	22.5	706.2
0.44	1.5	718.1	0.44	22.5	718.1	0.44	1.5	730.0
0.44	22.5	730.0	0.44	1.5	742.0	0.44	22.5	742.0
0.44	1.5	753.9	0.44	22.5	753.9	0.44	1.5	765.8
0.44	22.5	765.8	0.44	1.5	777.7	0.44	22.5	777.7
0.44	1.5	789.6	0.44	22.5	789.6	0.44	1.5	801.5
0.44	22.5	801.5	0.44	1.5	813.4	0.44	22.5	813.4
0.44	1.5	825.3	0.44	22.5	825.3	0.44	1.5	837.2
0.44	22.5	837.2	0.44	1.5	849.1	0.44	22.5	849.1
0.44	1.5	861.0	0.44	22.5	861.0	0.44	1.5	873.0
0.44	22.5	873.0	0.44	1.5	884.9	0.44	22.5	884.9
0.44	1.5	896.8	0.44	22.5	896.8	0.44	1.5	908.7
0.44	22.5	908.7	0.44	1.5	920.6	0.44	22.5	920.6
0.44	1.5	932.5	0.44	22.5	932.5	0.44	1.5	944.4
0.44	22.5	944.4	0.44	1.5	956.3	0.44	22.5	956.3
0.44	1.5	968.2	0.44	22.5	968.2	0.44	1.5	980.1
0.44	22.5	980.1	0.44	1.5	992.0	0.44	22.5	992.0
0.44	1.5	1004.0	0.44	22.5	1004.0	0.44	1.5	1015.9
0.44	22.5	1015.9	0.44	1.5	1027.8	0.44	22.5	1027.8
0.44	1.5	1039.7	0.44	22.5	1039.7	0.44	1.5	1051.6
0.44	22.5	1051.6						

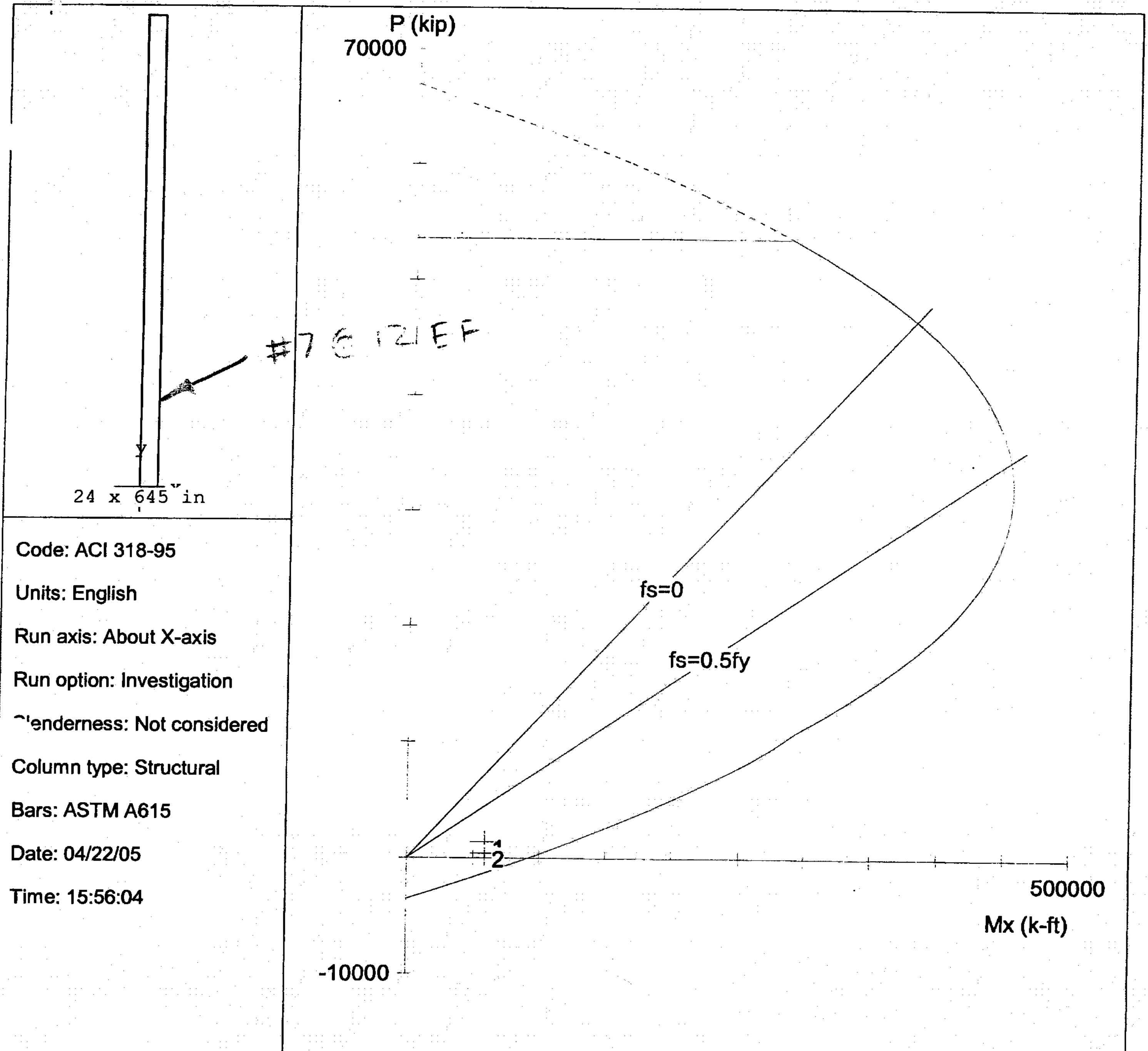
9.1.1-99

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	3844.0	99453.2	479308.6	4.819
2	4979.0	129121.6	532869.1	4.127
3	6109.0	134497.5	585216.5	4.351
4	7243.0	136088.6	636748.4	4.679
5	8383.0	137532.9	687488.6	4.999
6	3844.2	131049.4	479317.7	3.658
7	4978.8	135303.3	532861.6	3.938
8	6109.2	136618.5	585227.4	4.284
9	7123.5	145659.4	631356.6	4.334
10	8266.3	155741.8	682344.4	4.381
11	1479.0	99453.2	364718.0	3.667
12	2010.0	129121.6	390793.8	3.027
13	2545.0	134497.5	416859.6	3.099
14	3078.0	136088.6	442638.6	3.253
15	3607.0	137532.9	468013.1	3.403
16	1479.0	131049.4	364719.1	2.783
17	2009.5	135303.3	390771.2	2.888
18	2545.2	136618.5	416867.5	3.051
19	3197.1	145659.4	448367.3	3.078
20	3723.7	155741.8	473580.2	3.041

*** Program completed as requested! ***

9.1.1-100



Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/22/05

Time: 15:56:04

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6AL2.COL   P6A : L1-L2

Project:

Column: Engineer:

f'c = 7 ksi	fy = 60 ksi	Ag = 15480 in^2	110 #7 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 66.00 in^2	Rho = 0.43% > 0.25%
fc = 5.95 ksi	e_rup = Infinity	Xo = 12.00 in	Ix = 5.36672e+008 in^4
e_u = 0.003 in/in		Yo = 322.50 in	Iy = 743040 in^4
Beta1 = 0.7		Clear spacing = 10.94 in	Clear cover = N/A

9.1.1-101

Confinement: Tied   phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

General Information:
====================

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6AL2.COL
Project:
Column:
Code: ACI 318-95

Engineer:
Units: English

Run Option: Investigation
Run Axis: X-axis

Slenderness: Not considered
Column Type: Structural

Material Properties:
====================

f'c = 7 ksi
Ec = 4768.97 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7

fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:
========

Exterior Points

No.	X (in)	Y (in)	No.	X (in)	Y (in)	No.	X (in)	Y (in)
1	0.0	0.0	2	24.0	0.0	3	24.0	645.0

Gross section area, Ag = 15480 in^2
Ix = 5.36672e+008 in^4
Xo = 12 in

Iy = 743040 in^4
Yo = 322.5 in

Reinforcement:
==============

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 66.00 in^2 at 0.43%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
0.60	1.5	1.5	0.60	22.5	1.5	0.60	1.5	13.5
0.60	22.5	13.5	0.60	1.5	25.5	0.60	22.5	25.5
0.60	1.5	37.5	0.60	22.5	37.5	0.60	1.5	49.5
0.60	22.5	49.5	0.60	1.5	61.5	0.60	22.5	61.5
0.60	1.5	73.5	0.60	22.5	73.5	0.60	1.5	85.5
0.60	22.5	85.5	0.60	1.5	97.5	0.60	22.5	97.5
0.60	1.5	109.5	0.60	22.5	109.5	0.60	1.5	121.5
0.60	22.5	121.5	0.60	1.5	133.5	0.60	22.5	133.5
0.60	1.5	643.5	0.60	22.5	643.5	0.60	1.5	631.5
0.60	22.5	631.5	0.60	1.5	619.5	0.60	22.5	619.5
0.60	1.5	607.5	0.60	22.5	607.5	0.60	1.5	595.5
0.60	22.5	595.5	0.60	1.5	583.5	0.60	22.5	583.5
0.60	1.5	571.5	0.60	22.5	571.5	0.60	1.5	559.5
0.60	22.5	559.5	0.60	1.5	547.5	0.60	22.5	547.5
0.60	1.5	535.5	0.60	22.5	535.5	0.60	1.5	523.5
0.60	22.5	523.5	0.60	1.5	511.5	0.60	22.5	511.5
0.60	1.5	145.3	0.60	22.5	145.3	0.60	1.5	157.1

9.1.1-102

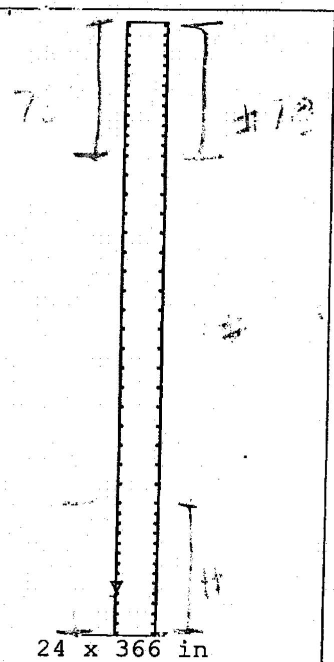
0.60	22.5	157.1	0.60	1.5	168.9	0.60	22.5	168.9
0.60	1.5	180.8	0.60	22.5	180.8	0.60	1.5	192.6
0.60	22.5	192.6	0.60	1.5	204.4	0.60	22.5	204.4
0.60	1.5	216.2	0.60	22.5	216.2	0.60	1.5	228.0
0.60	22.5	228.0	0.60	1.5	239.8	0.60	22.5	239.8
0.60	1.5	251.6	0.60	22.5	251.6	0.60	1.5	263.4
0.60	22.5	263.4	0.60	1.5	275.3	0.60	22.5	275.3
0.60	1.5	287.1	0.60	22.5	287.1	0.60	1.5	298.9
0.60	22.5	298.9	0.60	1.5	310.7	0.60	22.5	310.7
0.60	1.5	322.5	0.60	22.5	322.5	0.60	1.5	334.3
0.60	22.5	334.3	0.60	1.5	346.1	0.60	22.5	346.1
0.60	1.5	357.9	0.60	22.5	357.9	0.60	1.5	369.8
0.60	22.5	369.8	0.60	1.5	381.6	0.60	22.5	381.6
0.60	1.5	393.4	0.60	22.5	393.4	0.60	1.5	405.2
0.60	22.5	405.2	0.60	1.5	417.0	0.60	22.5	417.0
0.60	1.5	428.8	0.60	22.5	428.8	0.60	1.5	440.6
0.60	22.5	440.6	0.60	1.5	452.4	0.60	22.5	452.4
0.60	1.5	464.3	0.60	22.5	464.3	0.60	1.5	476.1
0.60	22.5	476.1	0.60	1.5	487.9	0.60	22.5	487.9
0.60	1.5	499.7	0.60	22.5	499.7			

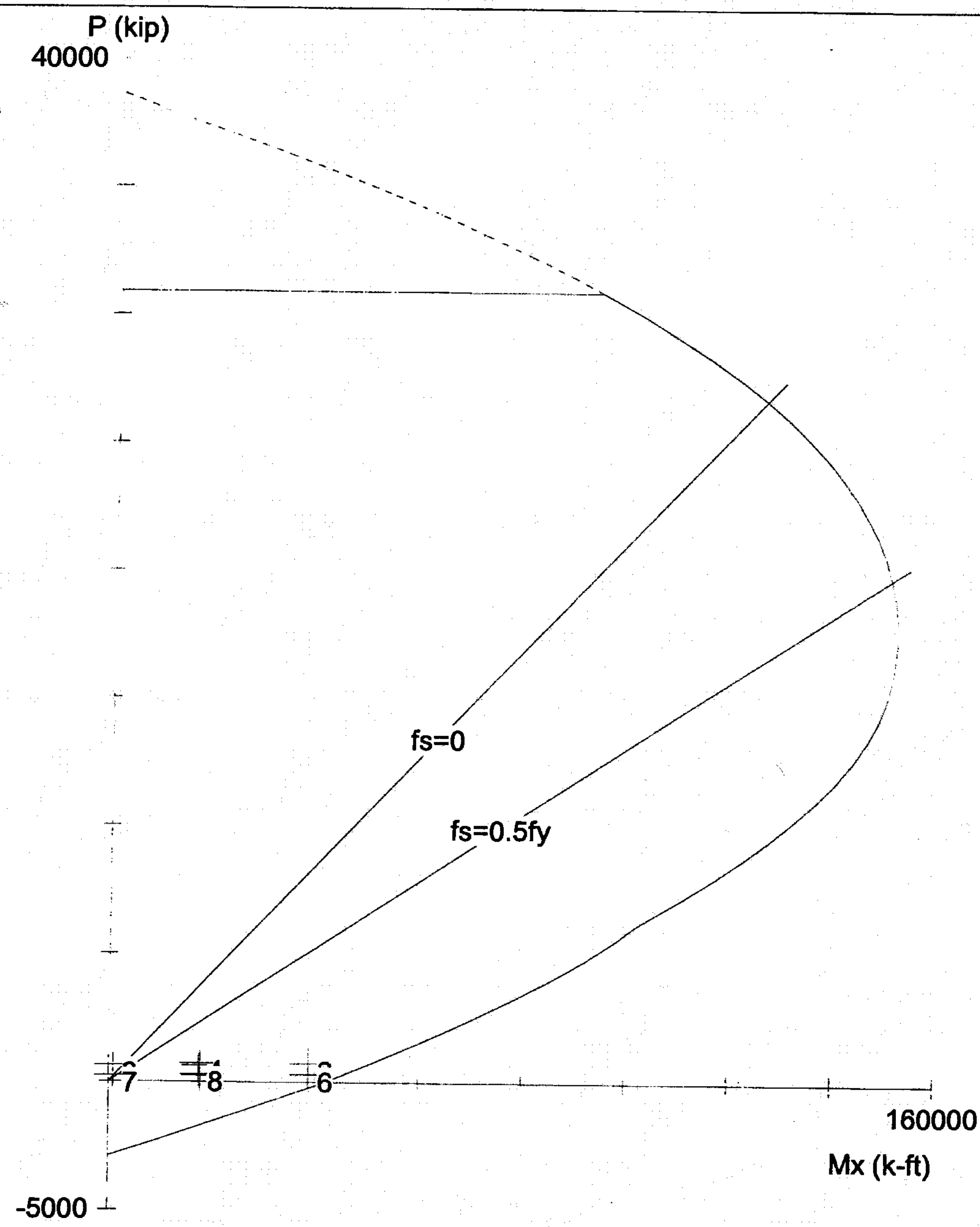
Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	1383.0	58833.0	123398.3	2.097
2	406.0	58833.0	101311.0	1.722

*** Program completed as requested! ***

9.1.1-103





Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/22/05

Time: 16:26:23

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6BL2.COL

Project:

Column:

Engineer:

f'c = 7 ksi	fy = 60 ksi	Ag = 8784 in^2	90 #7 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 54.00 in^2	Rho = 0.61% > 0.25%
fc = 5.95 ksi	e_rup = Infinity	Xo = 12.00 in	Ix = 9.80558e+007 in^4
e_u = 0.003 in/in		Yo = 183.00 in	Iy = 421632 in^4
Beta1 = 0.7		Clear spacing = 5.13 in	Clear cover = N/A

9.1.1-104

Confinement: Tied   phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000683

General Information:
====================

File Name: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6BL2.COL
Project:
Column:
Code: ACI 318-95

Engineer:
Units: English

Run Option: Investigation
Run Axis: X-axis

Slenderness: Not considered
Column Type: Structural

Material Properties:
====================

f'c = 7 ksi
Ec = 4768.97 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7

fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:
========

Exterior Points

No.	X (in)	Y (in)	No.	X (in)	Y (in)	No.	X (in)	Y (in)
1	0.0	0.0	2	24.0	0.0	3	24.0	366.0

Gross section area, Ag = 8784 in^2
Ix = 9.80558e+007 in^4
Iy = 421632 in^4
Xo = 12 in
Yo = 183 in

Reinforcement:
==============

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Pattern: Irregular

Total steel area, As = 54.00 in^2 at 0.61%

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
0.60	1.5	1.5	0.60	22.5	1.5	0.60	1.5	7.5
0.60	22.5	7.5	0.60	1.5	13.5	0.60	22.5	13.5
0.60	1.5	19.5	0.60	22.5	19.5	0.60	1.5	25.5
0.60	22.5	25.5	0.60	1.5	31.5	0.60	22.5	31.5
0.60	1.5	37.5	0.60	22.5	37.5	0.60	1.5	43.5
0.60	22.5	43.5	0.60	1.5	49.5	0.60	22.5	49.5
0.60	1.5	55.5	0.60	22.5	55.5	0.60	1.5	61.5
0.60	22.5	61.5	0.60	1.5	67.5	0.60	22.5	67.5
0.60	1.5	73.5	0.60	22.5	73.5	0.60	1.5	79.5
0.60	22.5	79.5	0.60	1.5	364.5	0.60	22.5	364.5
0.60	1.5	358.5	0.60	22.5	358.5	0.60	1.5	352.5
0.60	22.5	352.5	0.60	1.5	346.5	0.60	22.5	346.5
0.60	1.5	340.5	0.60	22.5	340.5	0.60	1.5	334.5
0.60	22.5	334.5	0.60	1.5	328.5	0.60	22.5	328.5
0.60	1.5	322.5	0.60	22.5	322.5	0.60	1.5	316.5
0.60	22.5	316.5	0.60	1.5	310.5	0.60	22.5	310.5
0.60	1.5	304.5	0.60	22.5	304.5	0.60	1.5	298.5

9.1.1-105

0.60	22.5	298.5	0.60	1.5	292.5	0.60	22.5	292.5
0.60	1.5	286.5	0.60	22.5	286.5	0.60	1.5	91.0
0.60	22.5	91.0	0.60	1.5	102.5	0.60	22.5	102.5
0.60	1.5	114.0	0.60	22.5	114.0	0.60	1.5	125.5
0.60	22.5	125.5	0.60	1.5	137.0	0.60	22.5	137.0
0.60	1.5	148.5	0.60	22.5	148.5	0.60	1.5	160.0
0.60	22.5	160.0	0.60	1.5	171.5	0.60	22.5	171.5
0.60	1.5	183.0	0.60	22.5	183.0	0.60	1.5	194.5
0.60	22.5	194.5	0.60	1.5	206.0	0.60	22.5	206.0
0.60	1.5	217.5	0.60	22.5	217.5	0.60	1.5	229.0
0.60	22.5	229.0	0.60	1.5	240.5	0.60	22.5	240.5
0.60	1.5	252.0	0.60	22.5	252.0	0.60	1.5	263.5
0.60	22.5	263.5	0.60	1.5	275.0	0.60	22.5	275.0

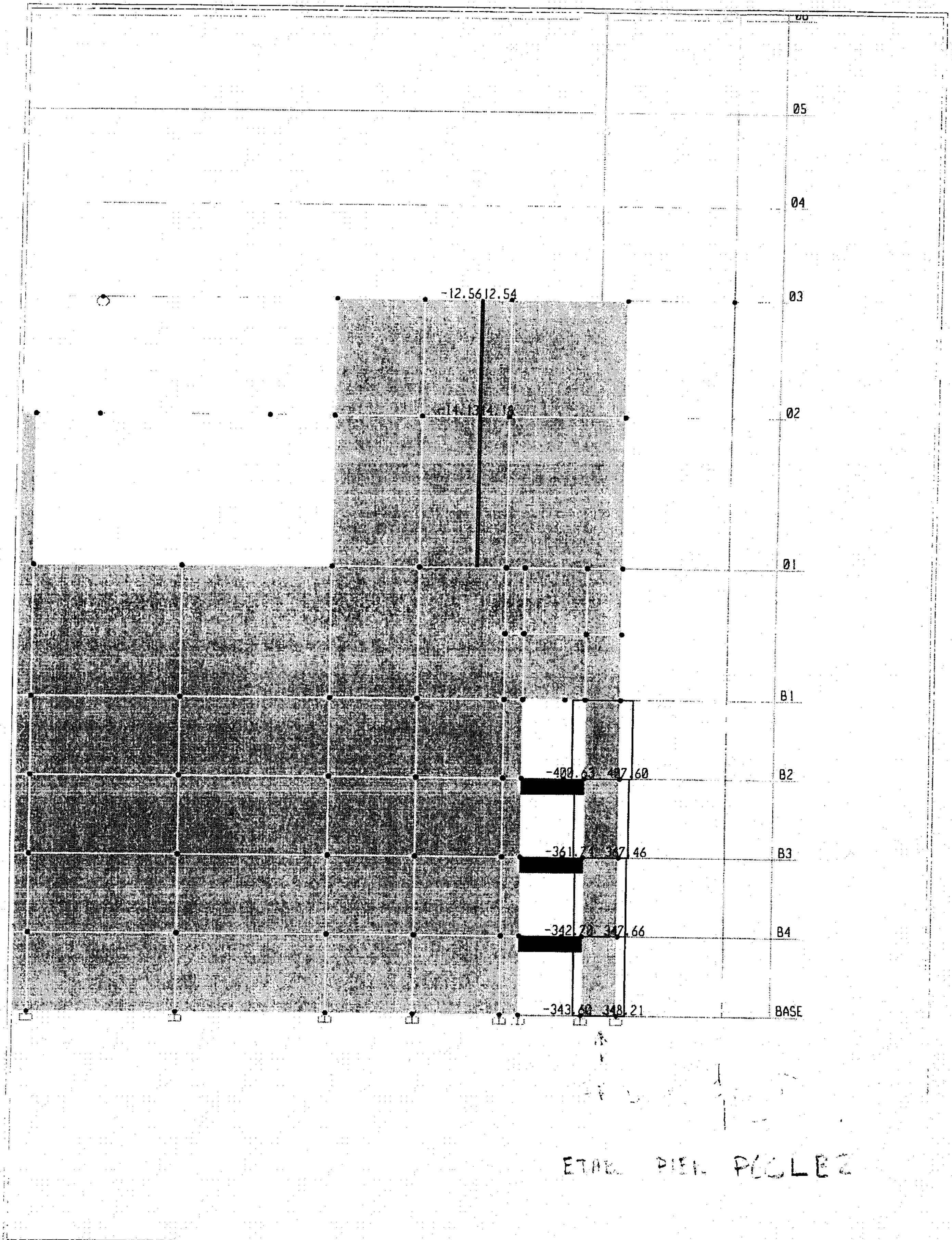
Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	641.0	17772.8	49782.9	2.801
2	717.0	38700.0	50689.4	1.310
3	640.6	840.9	49777.6	59.194
4	717.1	17448.8	50690.3	2.905
5	235.0	17772.8	44884.3	2.525
6	298.0	38700.0	45652.9	1.180
7	235.4	840.9	44889.2	53.381
8	298.1	17448.8	45654.3	2.616

*** Program completed as requested! ***

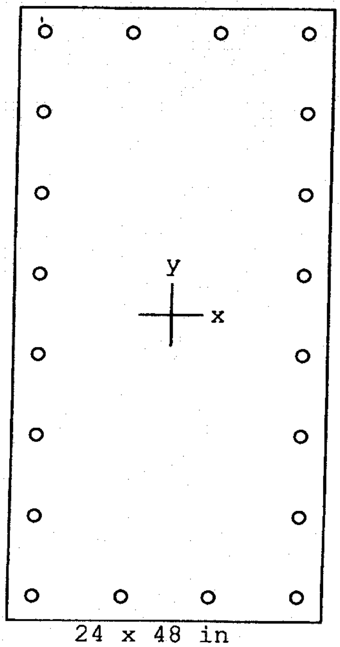
9.1.1-106

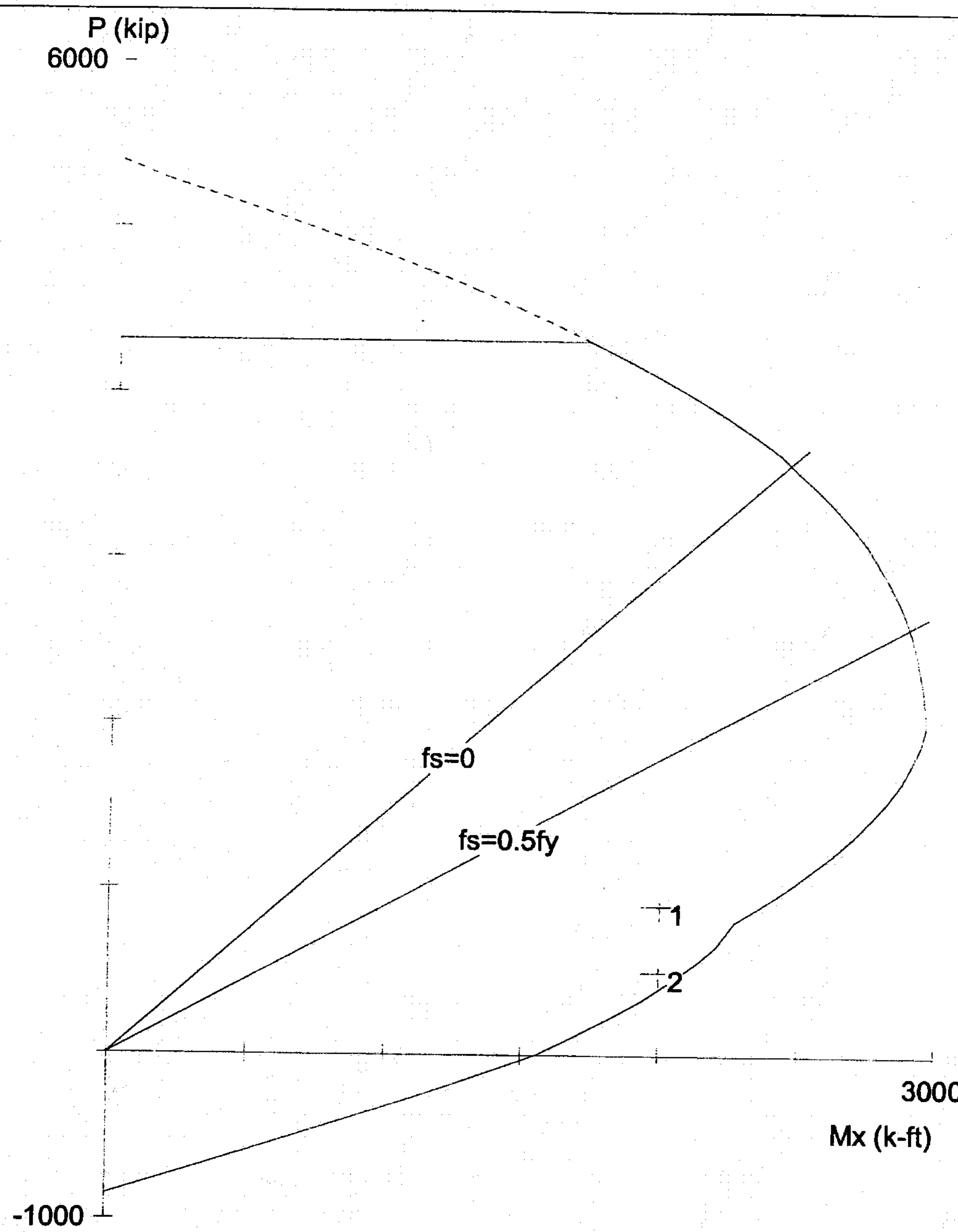
ETABS



ETABS v8.5.0 - File: 4069-20050517-7.06-CD - straight - May 17,2005 15:52
Elevation View - 13 Axial Force Diagram (E30X100YPR) - Kip-in Units

9.1.1-107





Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 05/23/05

Time: 07:52:08

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\14-406~1\P6CLB2.COL

Project:

Column:

Engineer:

f'c = 7 ksi	fy = 60 ksi	Ag = 1152 in^2	20 #8 bars
Ec = 4769 ksi	Es = 29000 ksi	As = 15.80 in^2	Rho = 1.37%
fc = 5.95 ksi	e_rup = Infinity	Xo = 0.00 in	Ix = 221184 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 55296 in^4
Beta1 = 0.7		Clear spacing = 5.32 in	Clear cover = 1.37 in

9.1.1-108

Confinement: Tied phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

DODSONNOC00000687

SHEAR WALL SHEAR CHECK

Etabs model: 7.05-CD-straight
Date: 4/22/2005
By: NJR

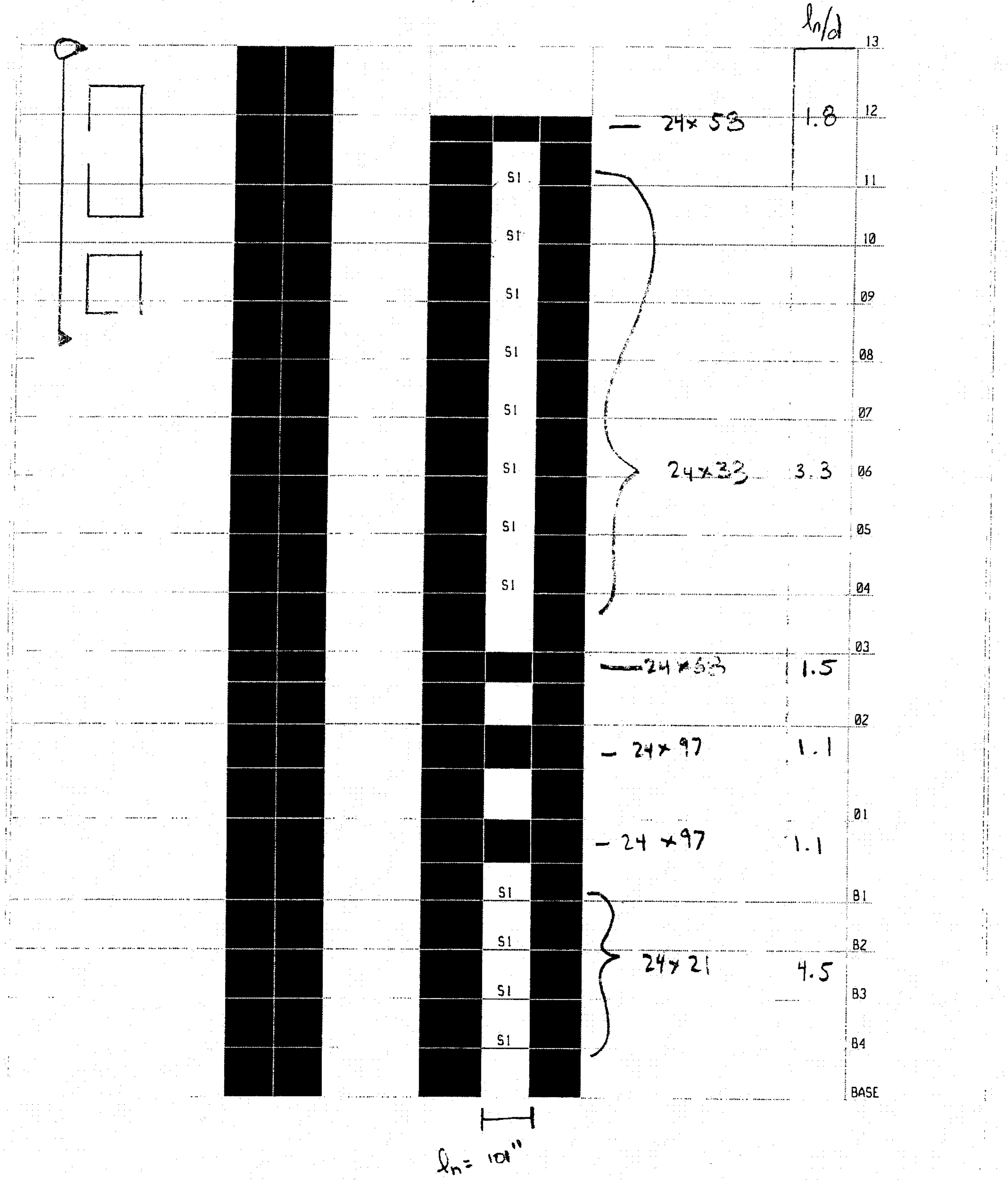
phi = 0.6

P6								Shear Reinforcement of Wall							Check design					
Wall ID	Story	Width in	Length in	f'_c psi	f_{yv} ksi	ϕ	V_u kips	A_{cp} in²	$V_{n\,max}$ = 10Acp*sqrt(f'c) kips	Check size of section $V_{n\,max}<(V_u/\phi)$	ϕV_c kips	$\rho_{req'd}$	Area of steel within spacing in²	Spacing required in	Spacing provided in	$\rho_{provided}$	V_c+V_s kips	V_n = min of V_c+V_s or 10Acp*sqrt(f'c) kips	$V_u/\phi V_n$	Overstrength Provided $(V_c+V_s)/V_u$
P6B	L1-L3	24	366	7000	60	0.60	1375	8784	7349	OK	882	0.0025	0.62	10.3	12.0	0.002	2604	2604	0.88	1.89
P6A	L1-L2	24	645	7000	60	0.60	3475	15480	12951	OK	1554	0.0034	0.88	10.6	9.0	0.004	6374	6374	0.91	1.83
P6	B1-L1	24	1392	7000	60	0.60	2994	33408	27951	OK	3354	0.0025	0.22	3.7	18.0	0.001	6611	6611	0.75	2.21
	B5-B1	24	1341	7000	60	0.60	1969	32184	26927	OK	3231	0.0025	0.22	3.7	18.0	0.001	6369	6369	0.52	3.24

9.1.2 Coupling Beams

Concrete Coupling Beams – Coupling beams in pier definitions P1, P2 and P6 are designed as a SMRF conventionally reinforced beam. Some special conditions for openings occur in the core at the upper levels, and will be addressed at the building permit submittal.

ETABS



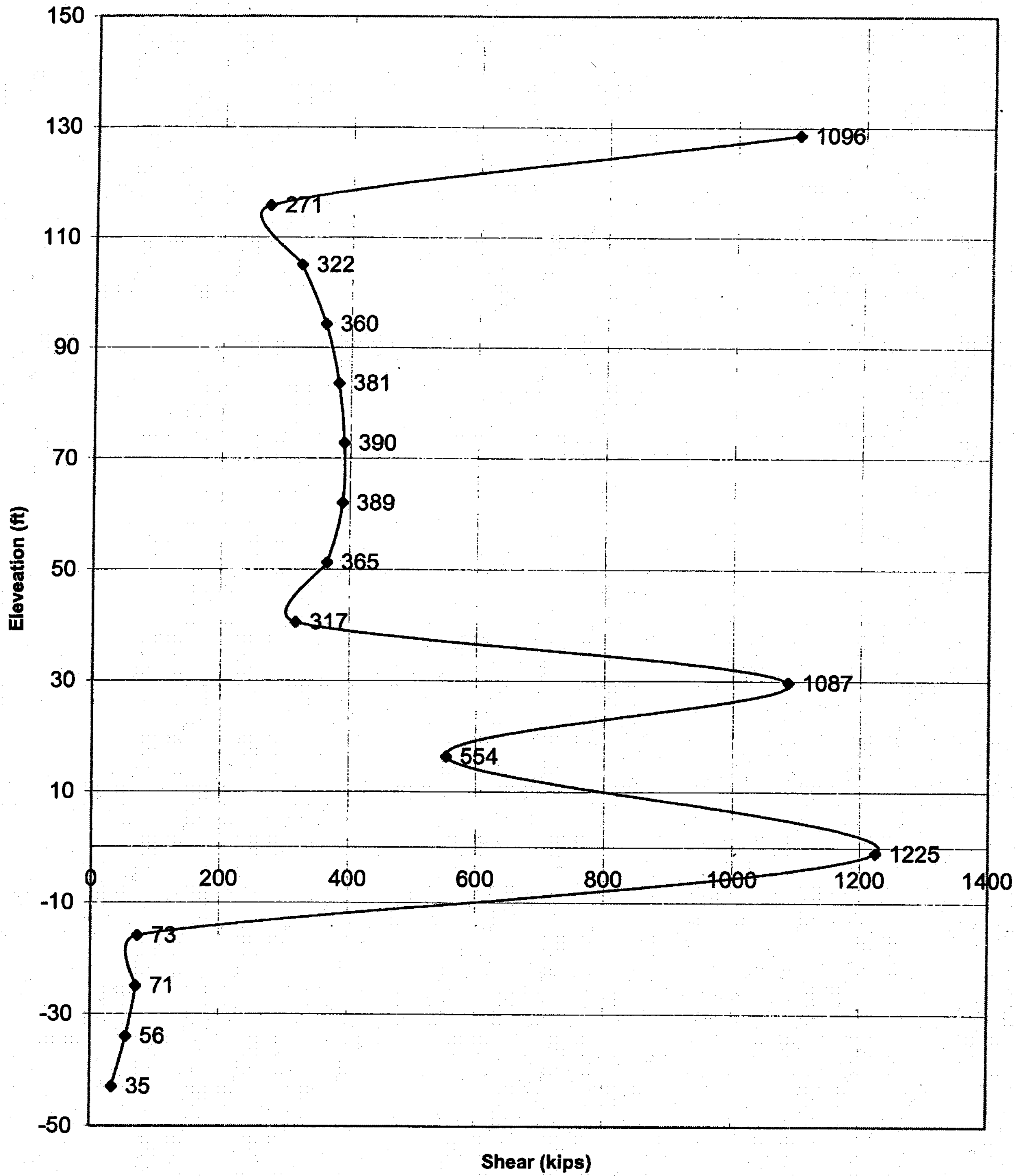
ETABS v8.5.0 - File: 4069-20050413-7.05-CD - straight - April 28,2005 12:48
Elevation View - swA - Kip-in Units

9.1.2-2

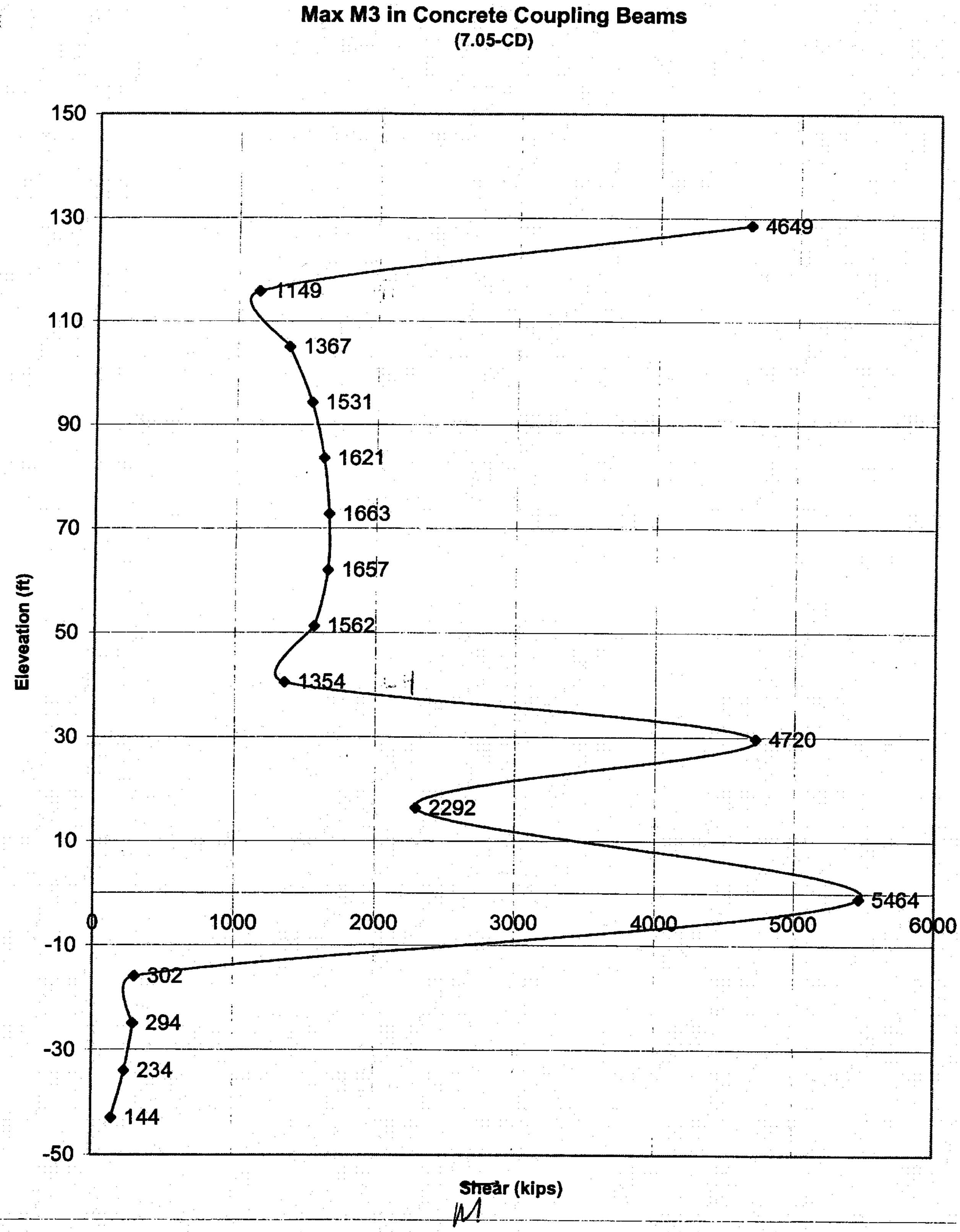
DODSONNOC00000690

Print Date 4/28/2005

Max V2 in Concrete Coupling Beams
(7.05-CD)

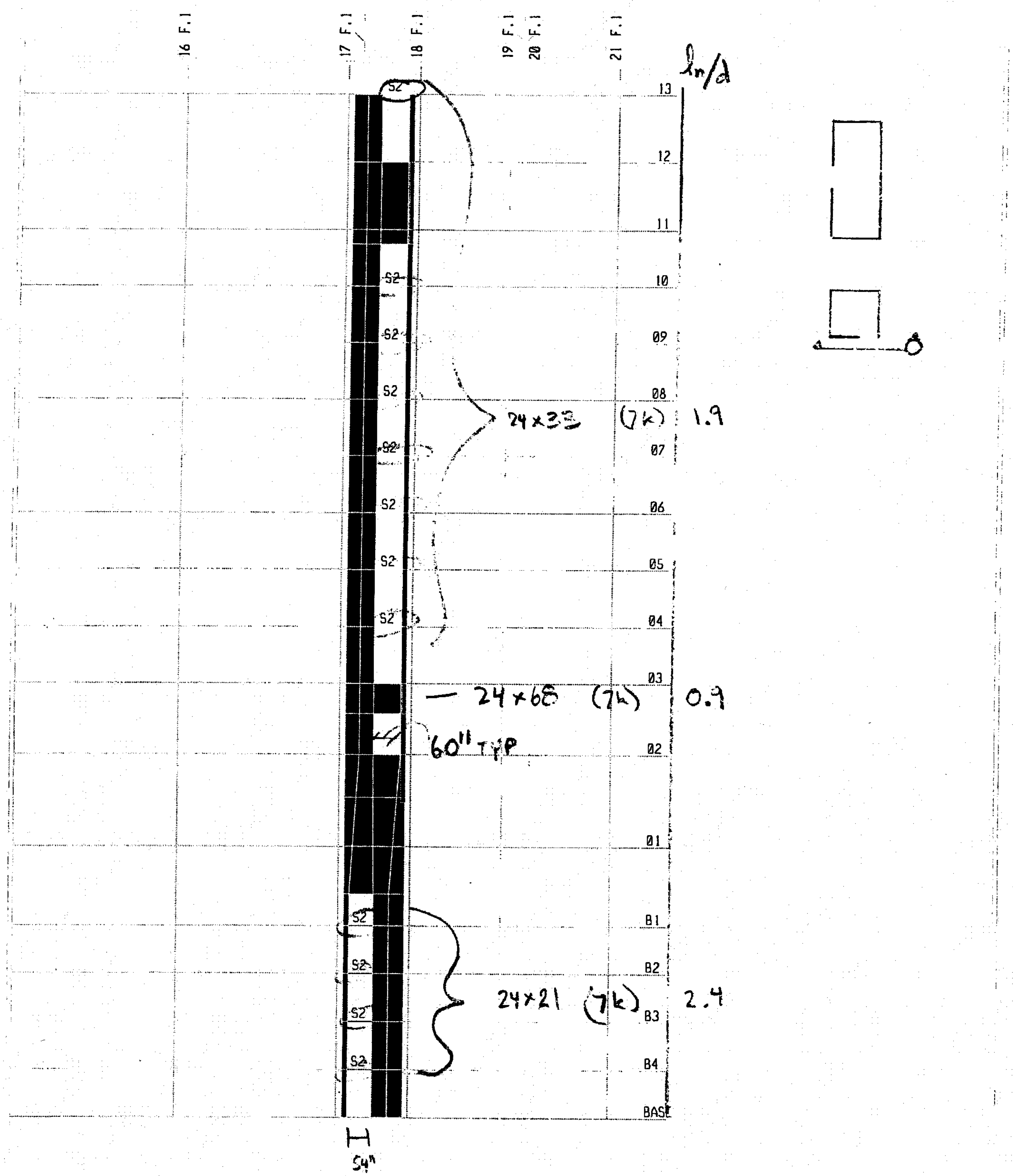


9.1.2-3
S1 Chart 1



9.1.2-4

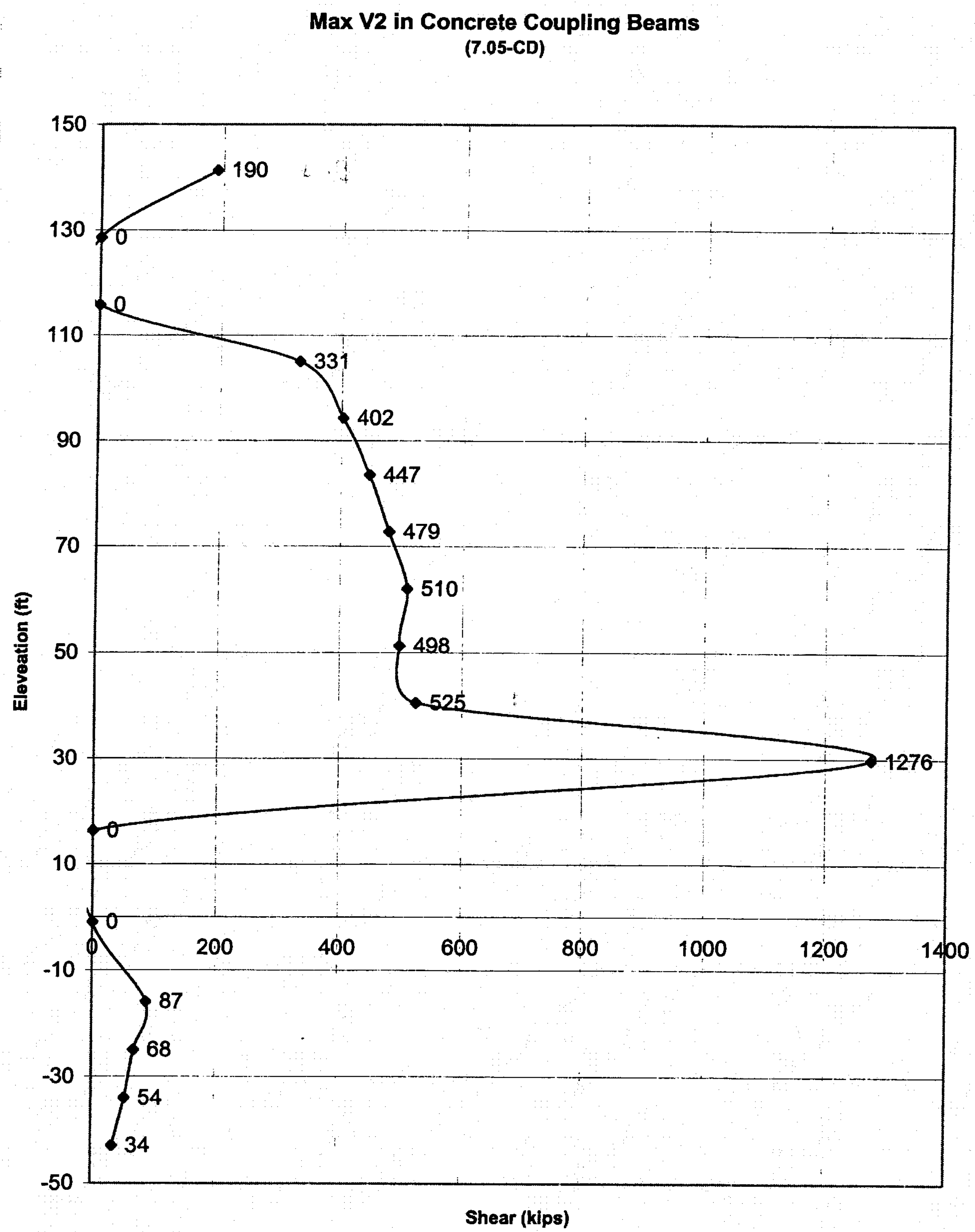
DODSONNOC00000692



9.1.2-S

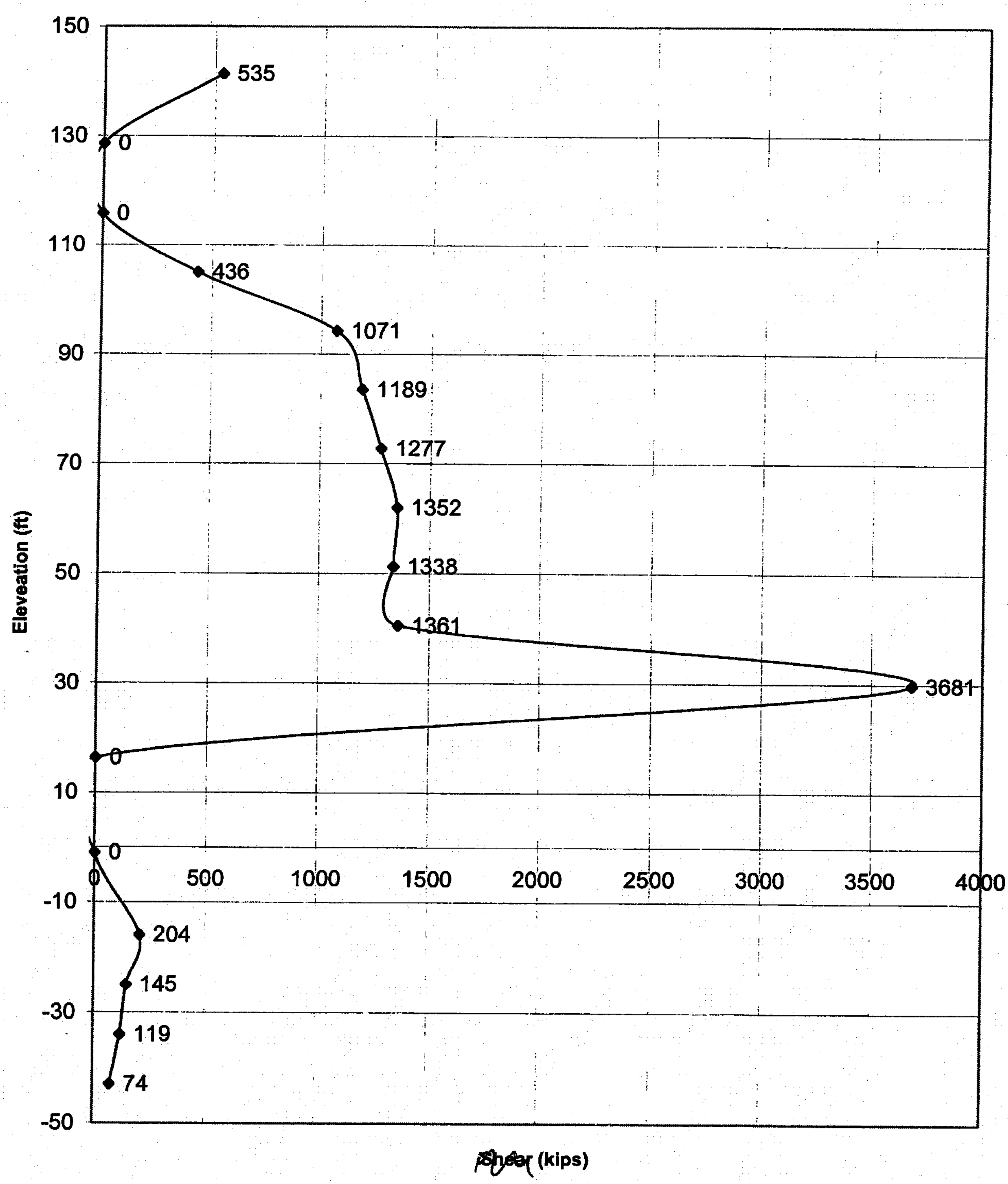
ETABS v8.5.0 - File: 4069-20050413-7.05-CD - straight - April 28,2005 12:49
Elevation View - F.1 - Kip-in Units

Print Date 4/28/2005



9.1.2-6
S2 Chart 1

Max M3 in Concrete Coupling Beams
(7.05-CD)



9.1.2-7

S1 LB4-LB1
AND
S2

Seismic (Y/N)	y				
Mu =	**302**	k-ft	Mu =	3,624	k-in
Width, b =	**24**	in			
Total depth, h =	**21**	in	Stirrup diameter ϕ =	0.625	in
Clear Cover =	**0.75**	in	β_1 =	0.70	
Stirrup size # =	**5**		f_y (for ρ calc only)=	**60**	ksi
f'_c =	7	ksi	ρ_{max} =	2.5%	§1921.3.2
ϕ =	**0.90**		ρ_{min} =	0.4%	§1921.3.2

		§1921.5.1	Required for 1 layer steel				Required for 2 layer steel			
fy (ksi)	Bar	MIN COL h (in)	No.	As	Clear Spacing for 1 row	ρ limits check	No.	As	Clear Spacing for 2 rows	ρ limits check
60	**3**	7.5	**32.7**	3.59	> smin NG	**OK**	33.96	3.74	> smin NG	**OK**
60	**4**	10.0	**18.0**	3.60	> smin NG	**OK**	18.82	3.76	1.97	**OK**
60	**5**	12.5	**11.7**	3.62	1.31	**OK**	12.23	3.79	3.41	**OK**
60	**6**	15.0	**8.3**	3.63	2.08	**OK**	8.68	3.82	5.39	**OK**
60	**7**	17.5	**6.1**	3.64	3.14	**OK**	6.41	3.85	8.36	**OK**
60	**8**	20.0	**4.6**	3.66	4.58	**OK**	4.91	3.88	12.93	**OK**
75	**9**	28.2	**2.9**	2.94	9.27	**OK**	3.13	3.13	34.62	**OK**
75	**10**	31.8	**2.3**	2.95	13.86	**OK**	2.48	3.15	81.50	**OK**
75	**11**	35.3	**1.9**	2.96	20.71	**OK**	2.04	3.18	1018.87	**OK**
75	**14**	42.3	**1.3**	2.98	58.29	**OK**	1.44	3.24	error	**OK**
75	**18**	56.4	**0.8**	3.03	error	**OK**	0.84	3.36	error	**OK**

Check above beam with specific reinforcing

Bar size # =	**8**	d =	19.13	
fy =	**60**	a =	1.99	
No. of bars =	**6.00**	ϕ Mn =	4640	k-in
No. of rows =	**1**		387	k-ft
Diameter =	1.000			
As total =	4.74	Mu/ϕ Mn =	**0.78**	should be less than 1.0 to be OK
ρ	1.03%	Clear Spacing	**3.05**	in
		ρ limits check	**OK**	

fy for overstrength =	1.25	
a =	2.49	
Mpr=	6356	k-in
	530	k-ft

9.1.2-8

Concrete Beam - Shear Reinforcing

b =	24	in.
d =	19.13	in.
f'c =	**7**	ksi
f_y stirrup =	**60**	ksi
clear span (ln) =	**54**	in.

2Mpr/L	235.4	kips			
V_E =	**87.0**	kips	(Force from etabs)		
Vu =	**235.4**	kips			
$V_{n\ req'd} = V_u / \phi$ =	277.0	Kips		ϕ =	**0.85**
V_c =	0.0	Kips	=2*sqrt (f'c) *b*d		
$V_c / 2$ =	0.0	Kips			
V_u max =	261.1	Kips	**Beam Size Ok**		
V_s req'd =	277.0	Kips	**Stirrups Required for Strength**		

Does Vs req'd exceed 4*sqrt(f'c) *b*d = 153.6 Kips ? **Yes**

0.50*d =	9.56	in.
0.25*d =	4.78	in.

				Max. Stirrup Spacing		
Bar Size	**No. Vert. Legs**	**A_V (sq. in)**	**$s_{min}=A_v f_y/50b_w$ (in)**	**11.5.5 (in)**	**11.5.6 (in)**	**Required (in)**
3	**2**	0.22	11.00	4.8	0.9	**0.9**
3	**4**	0.44	22.00	4.8	1.8	**1.8**
4	**2**	0.40	20.00	4.8	1.7	**1.7**
4	**4**	0.80	40.00	4.8	3.3	**3.3**
5	**2**	0.62	31.00	4.8	2.6	**2.6**
5	**4**	1.24	62.00	4.8	5.1	**4.8**

9.1.2-9

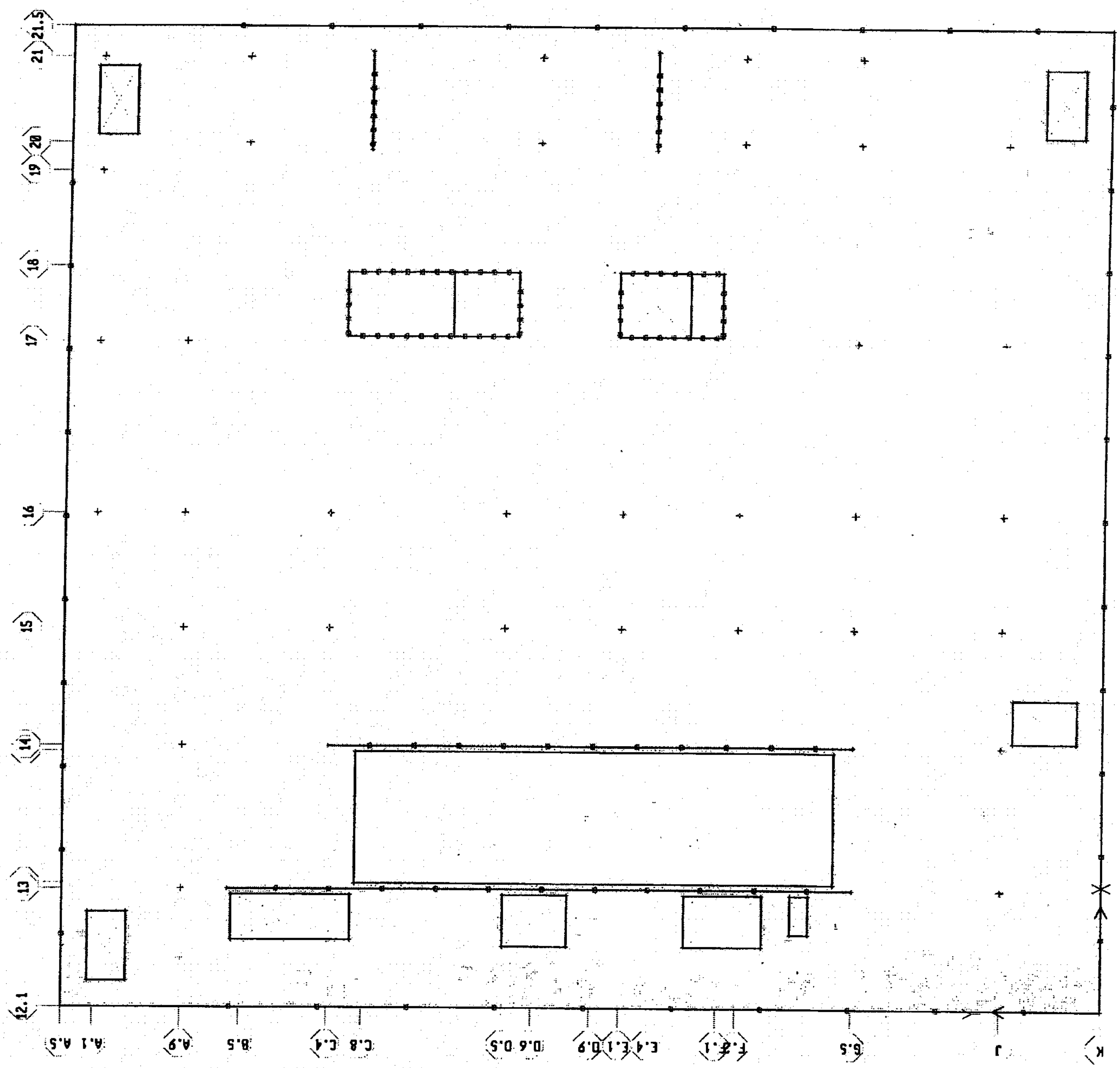
4/28/2005 4:17 PM

9.2 Gravity system

9.2.1 Slabs

Slabs (12" thick) have been modeled in SAFE. Same design model applies to levels B1 through B4.

9.3 SLAB DESIGN B2

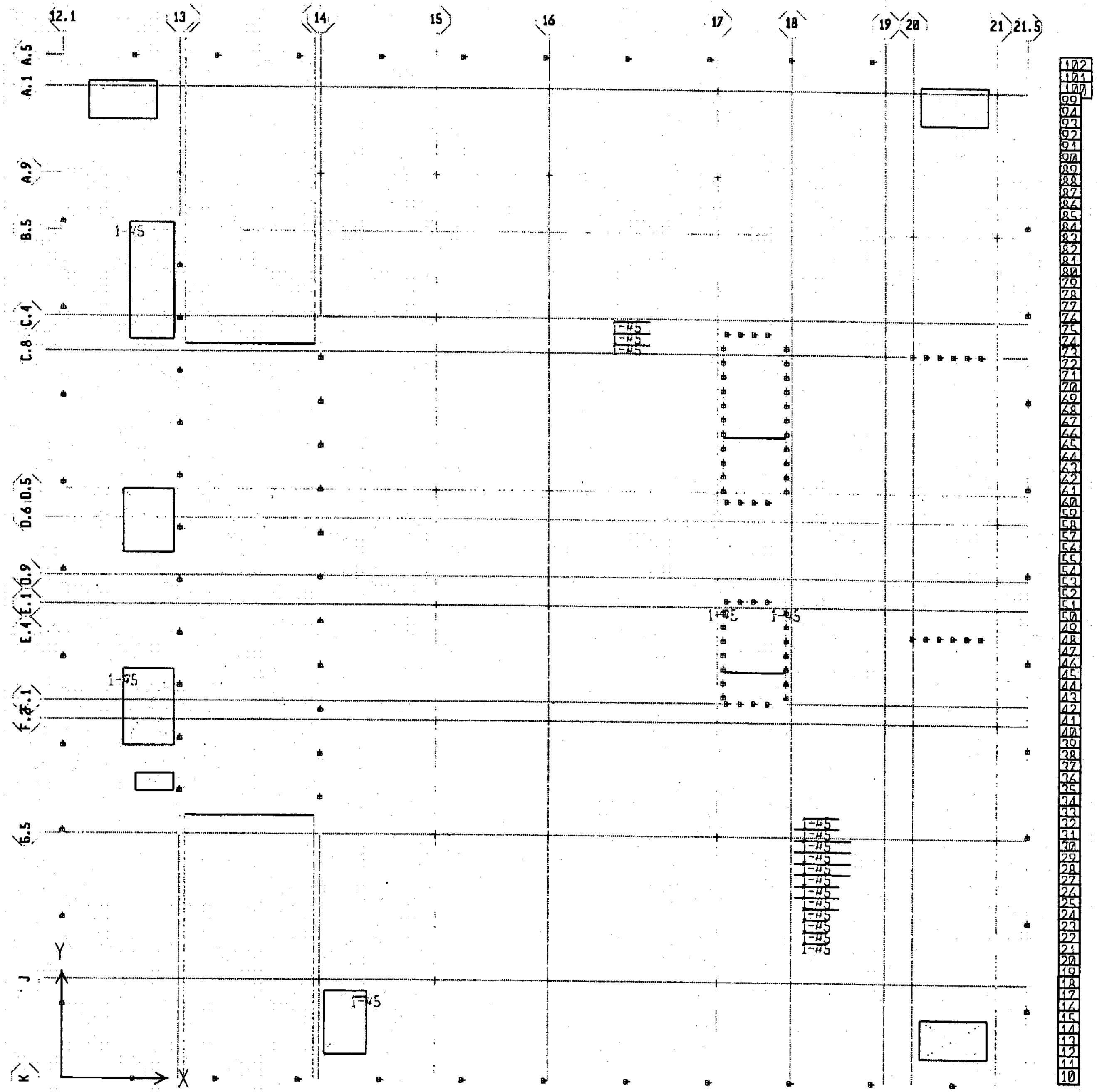


SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 10:11 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

SAFE

9.2.1-2

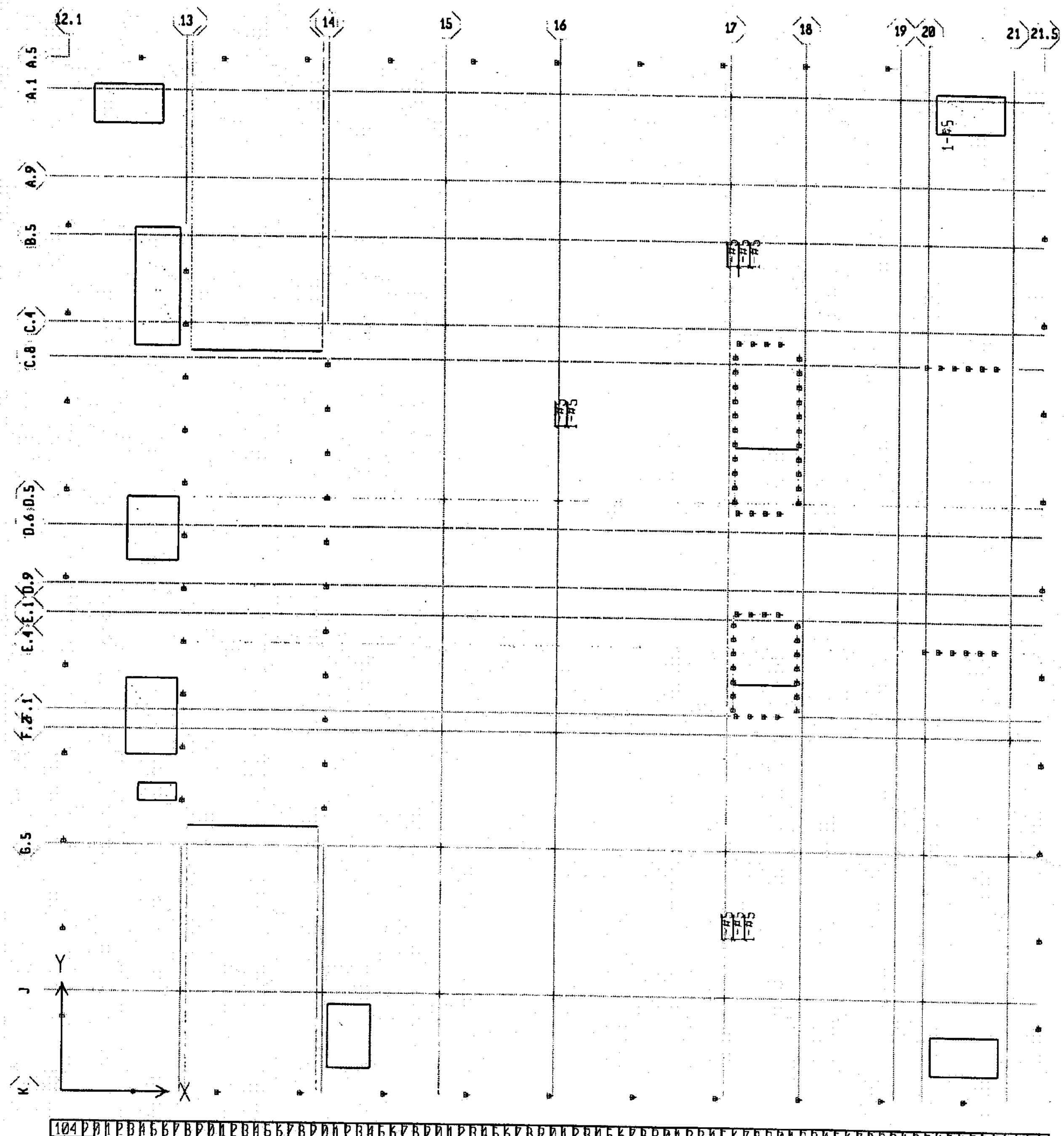
SAFE



9.2.1-3

SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 10:10 - Scale: Fit to Page
Bottom X-Strip Reinforcement (Sq-in) in addition to #5 @ 12.000 (Bot) - Kip-in Units

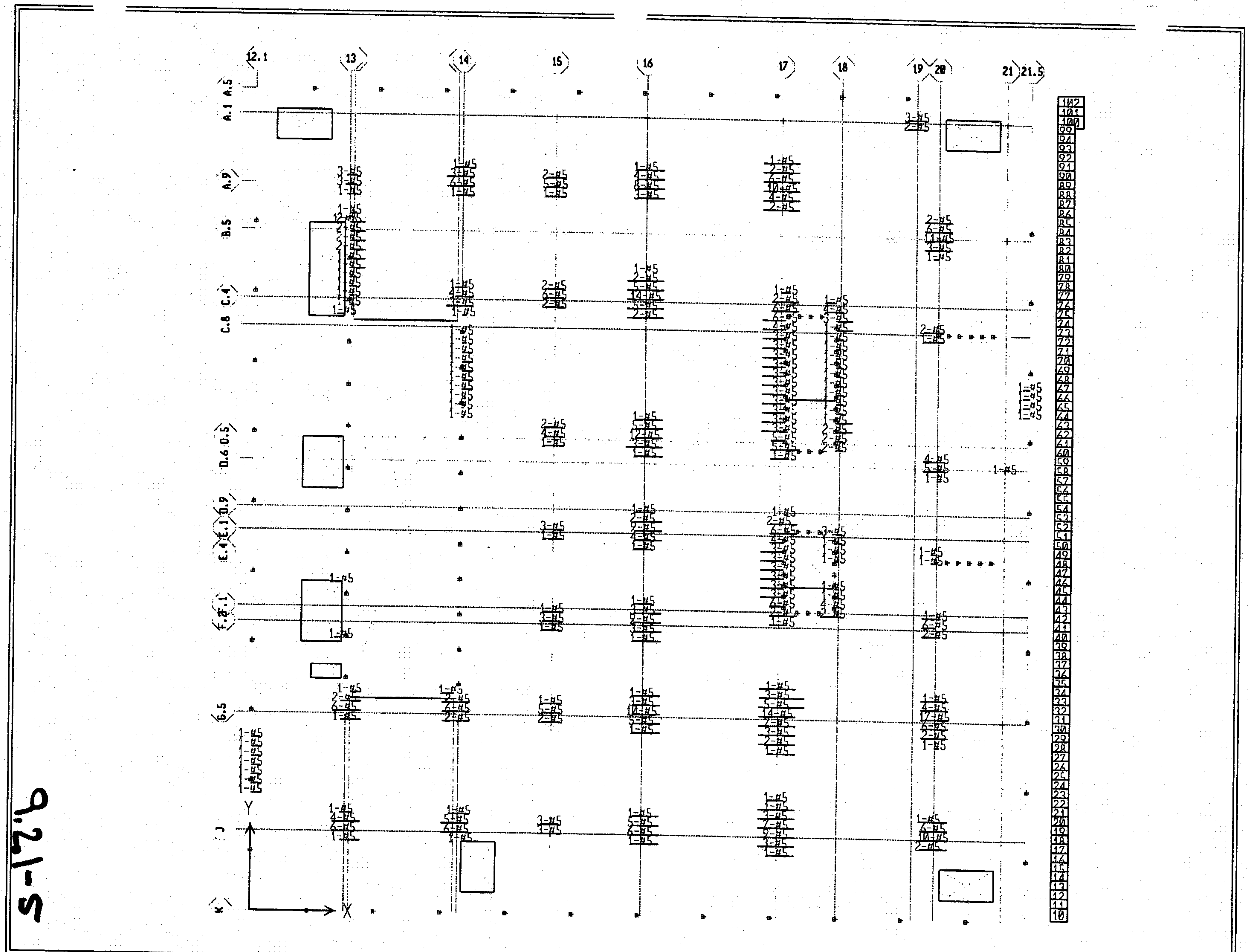
SAFE



SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 10:10 - Scale: Fit to Page
Bottom Y-Strip Reinforcement (Sq-in) in addition to #5 @ 12.000 (Bot) - Kip-in Units

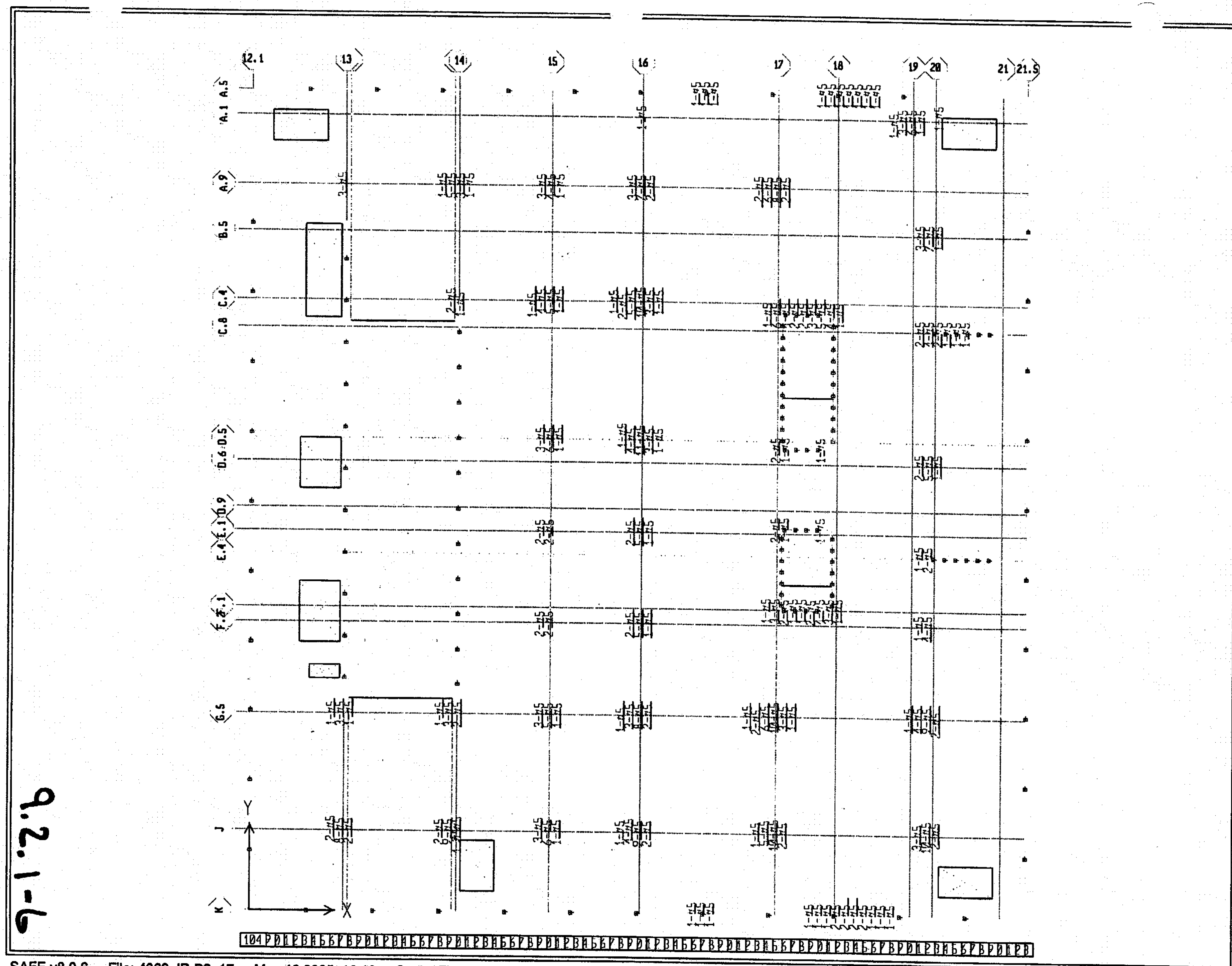
9.2-4

SAFE



SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 10:10 - Scale: Fit to Page
Top X-Strip Reinforcement (Sq-in) in addition to #5 @ 12.000 (Top) - Kip-in Units

SAFE

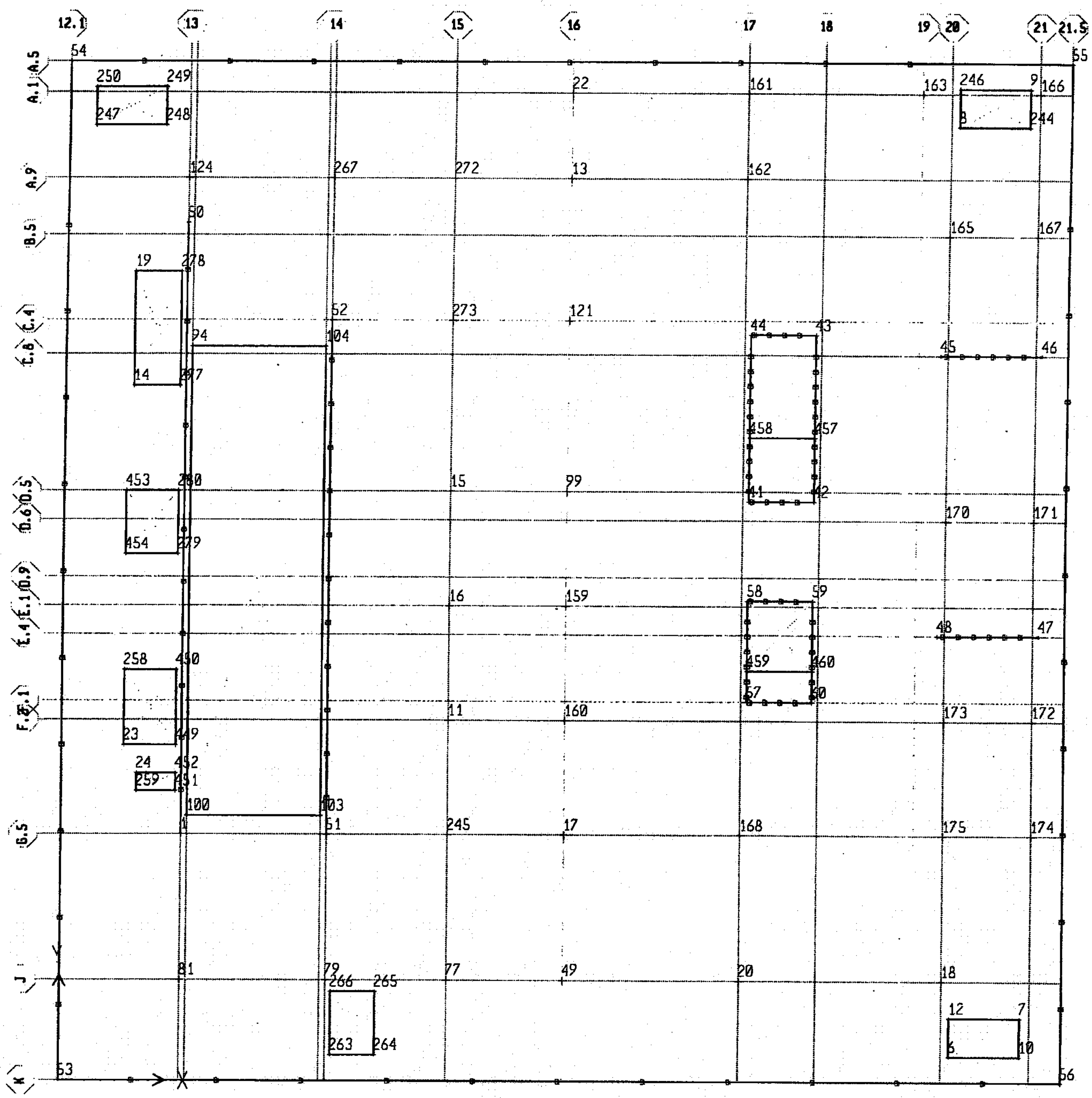


SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 10:10 - Scale: Fit to Page
Top Y-Strip Reinforcement (Sq-in) in addition to #5 @ 12.000 (Top) - Kip-in Units

9.2.1-6

SAFE

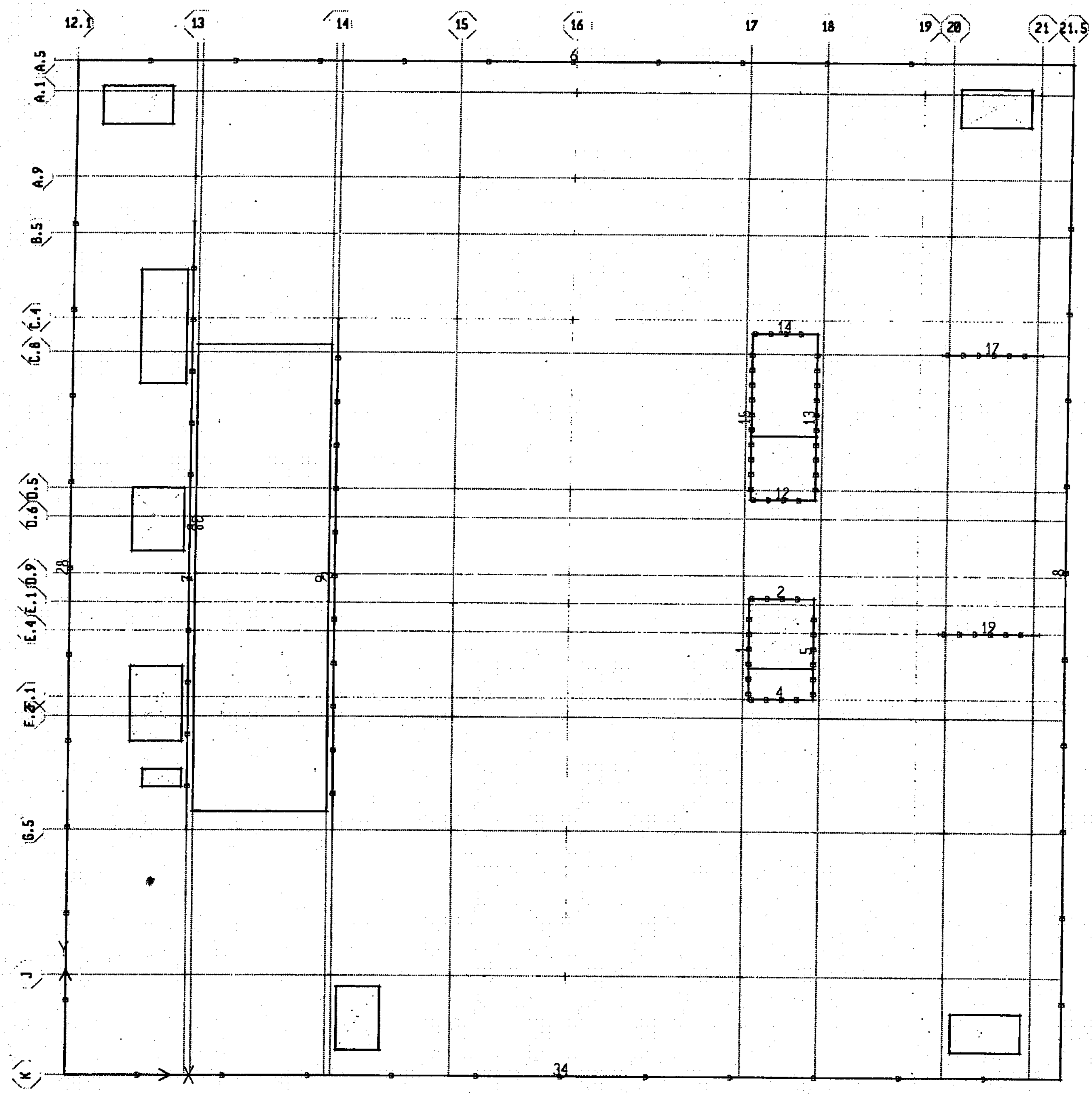
Points



9.2.1-7

SAFE

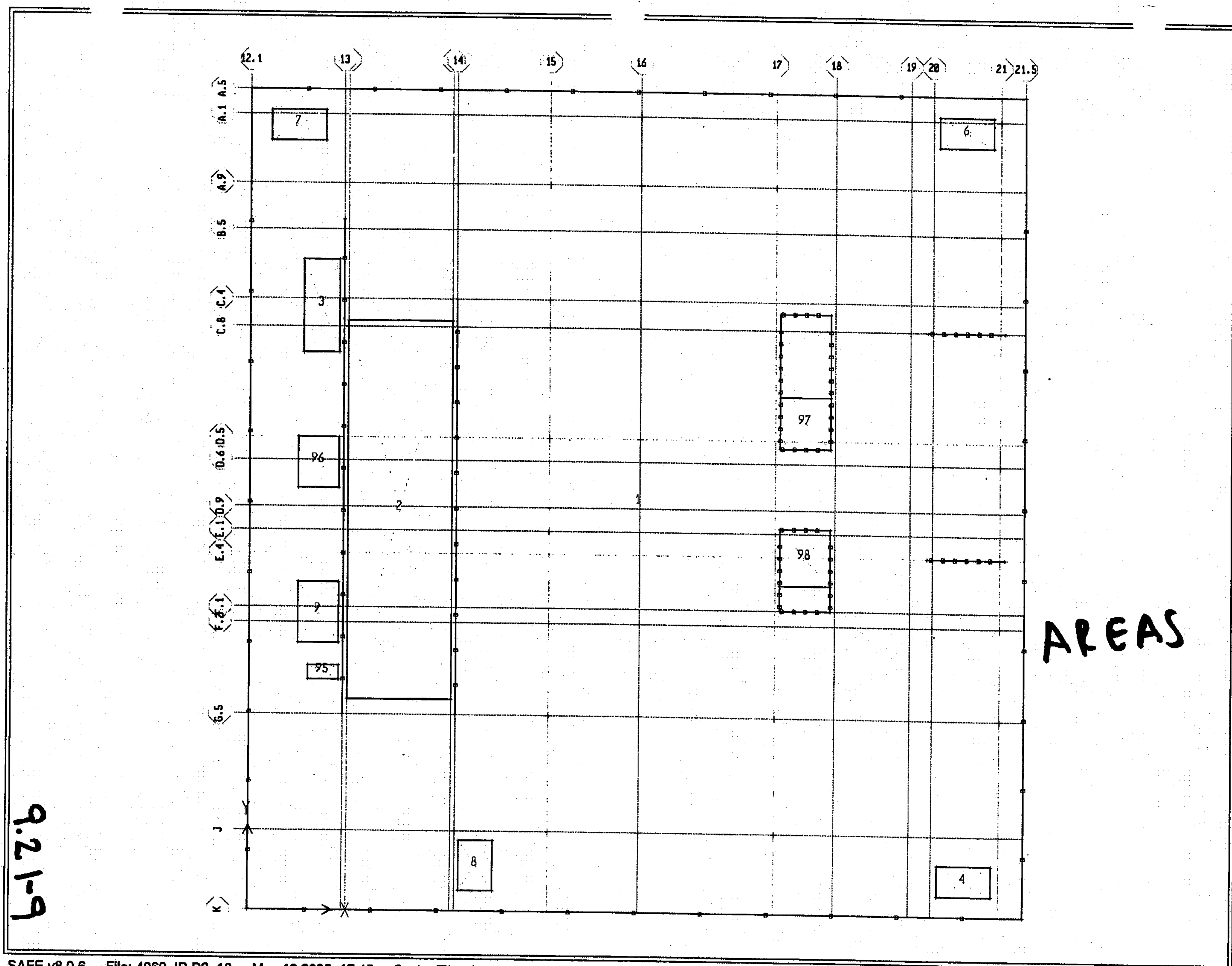
Lines



9.2.1-8

SAFE v8.0.6 - File: 4069-JP-B2_16 - May 16,2005 11:32 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

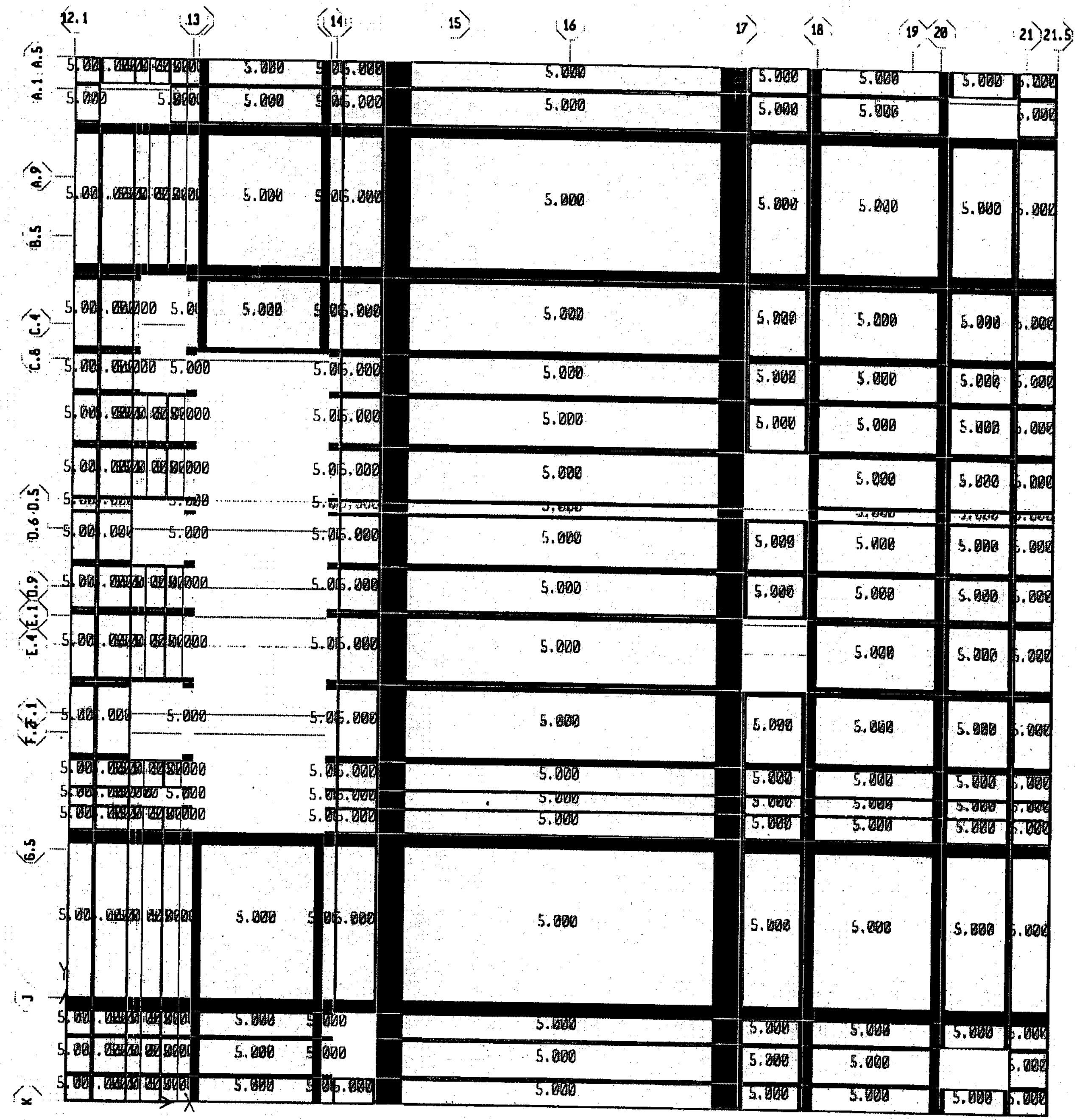
SAFE



SAFE v8.0.6 - File: 4069-JP-B2_16 - May 12,2005 17:45 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

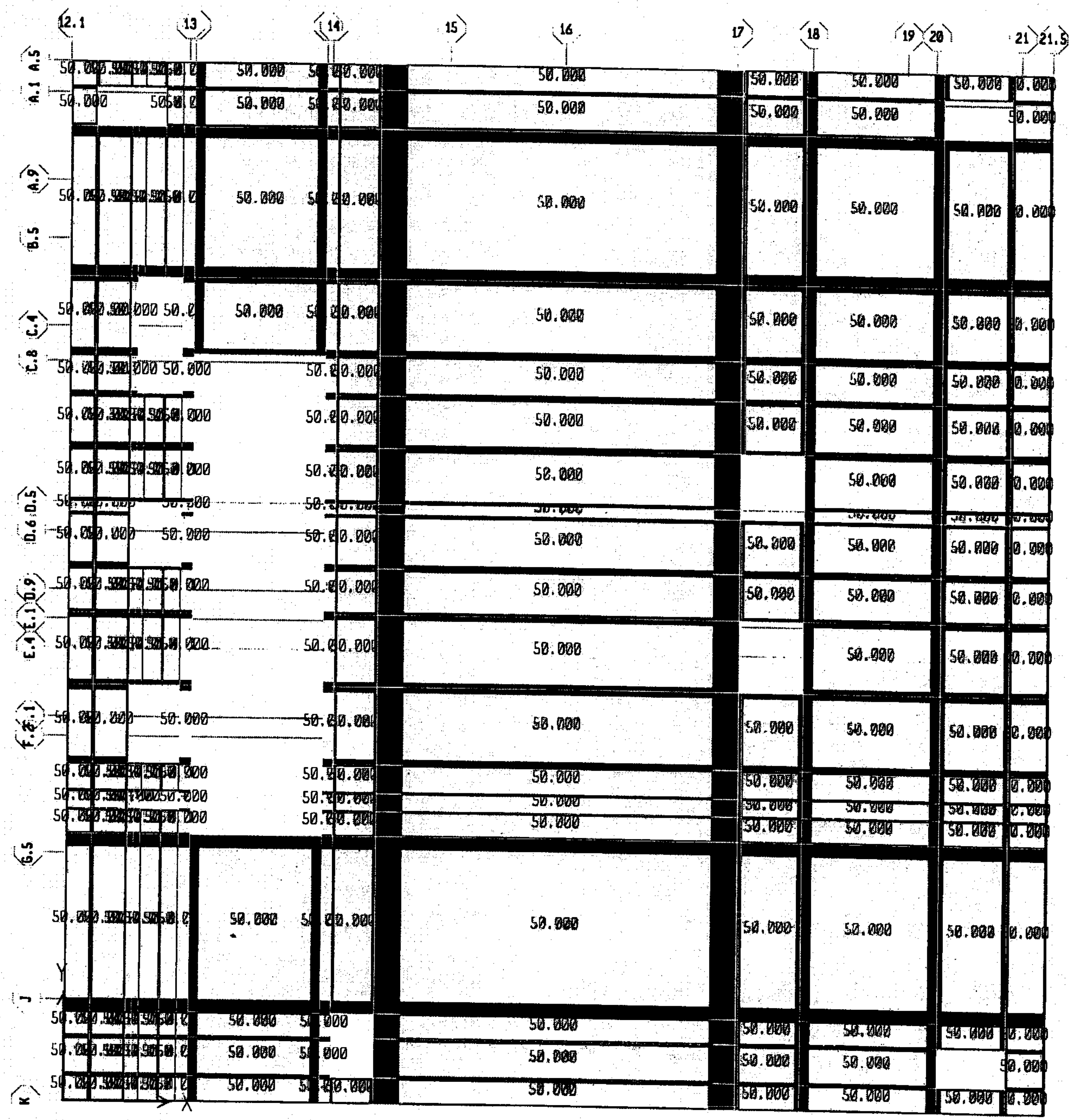
DODSONNOC0000707

SAFE



SAFE v8.0.6 - File: 4069-JP-B2_16 - May 12,2005 17:48 - Scale: Fit to Page
Surface Loading (SDL) - lb-ft Units

SAFE

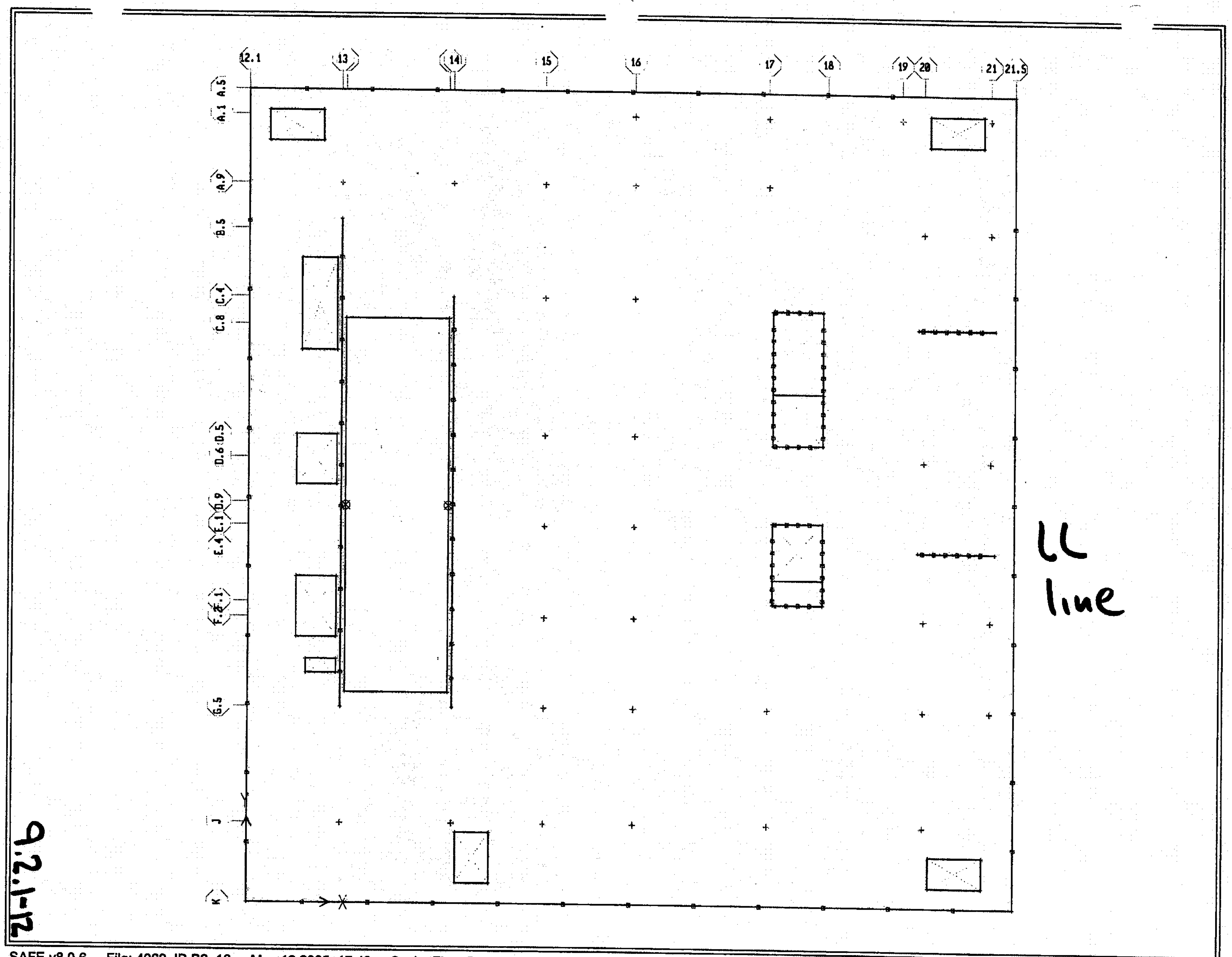


LL

9.2 T-11

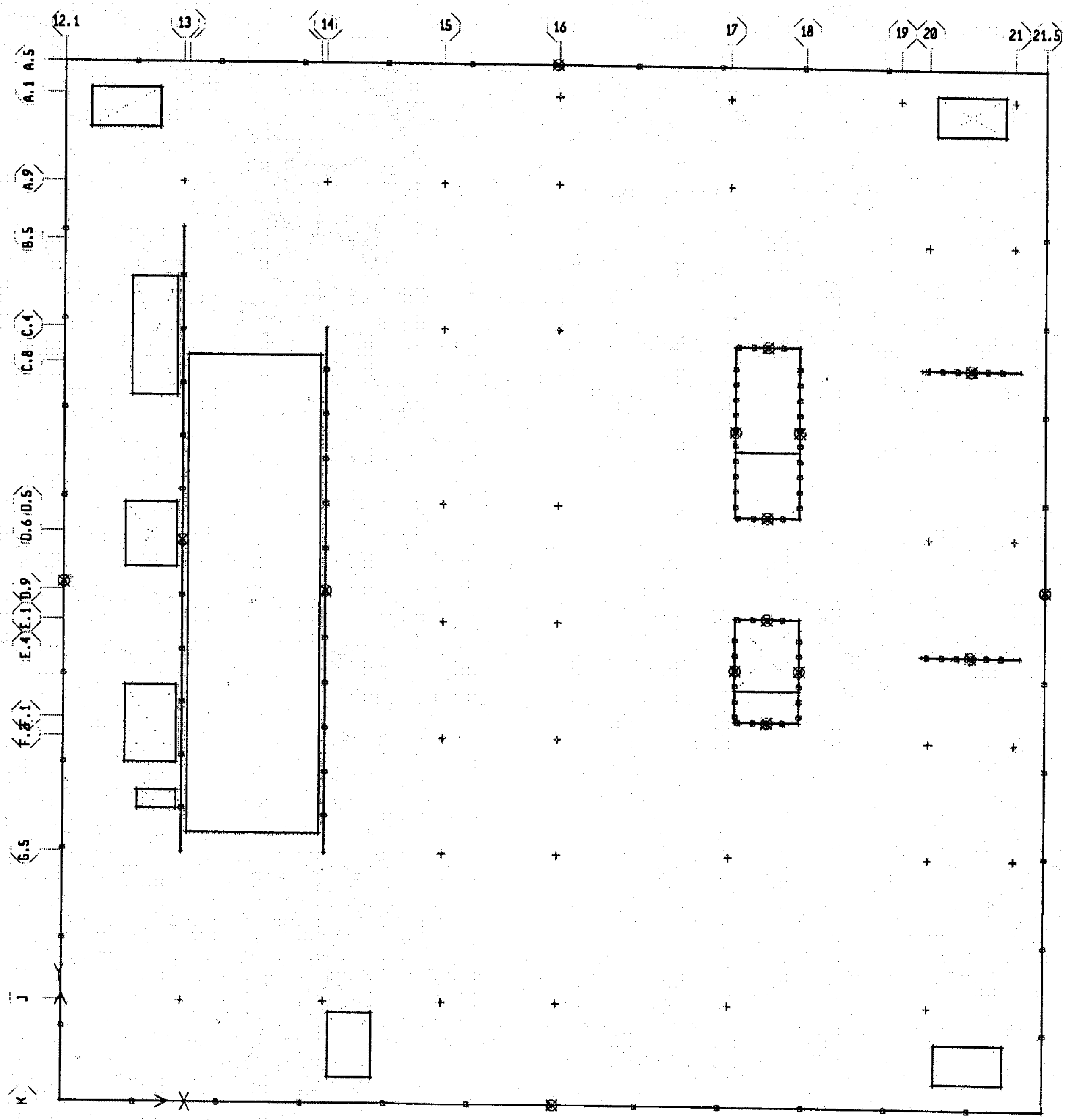
SAFE v8.0.6 - File: 4069-JP-B2_16 - May 12,2005 17:48 - Scale: Fit to Page
Surface Loading (L) - lb-ft Units

SAFE



SAFE v8.0.6 - File: 4069-JP-B2_16 - May 12,2005 17:49 - Scale: Fit to Page
Line Loading (L) - lb-ft Units

SAFE

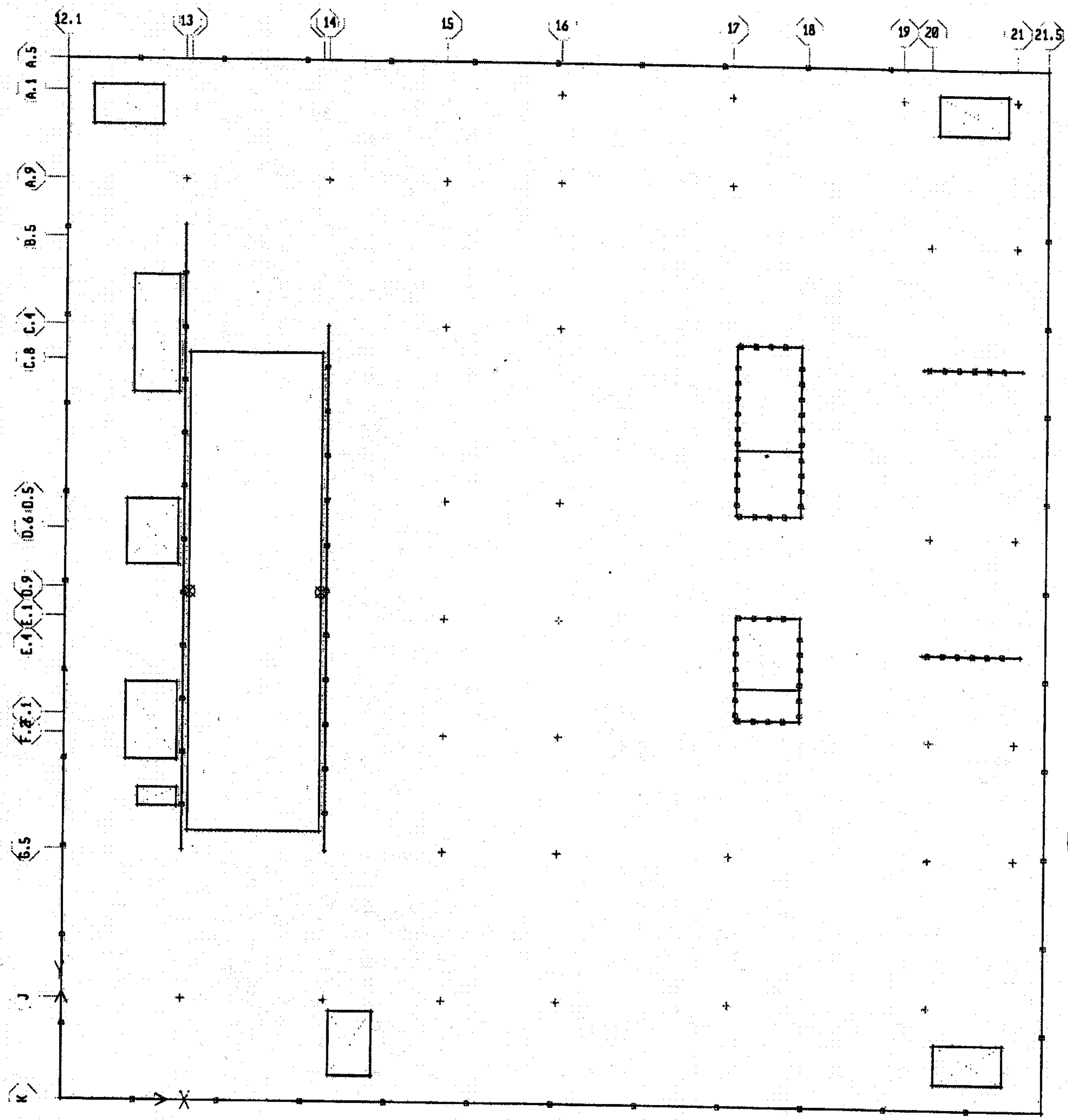


Line load
self w.

9.2.1-13

SAFE v8.0.6 - File: 4069-JP-B2_16 - May 12,2005 17:49 - Scale: Fit to Page
Line Loading (SELF) - lb-ft Units

SAFE

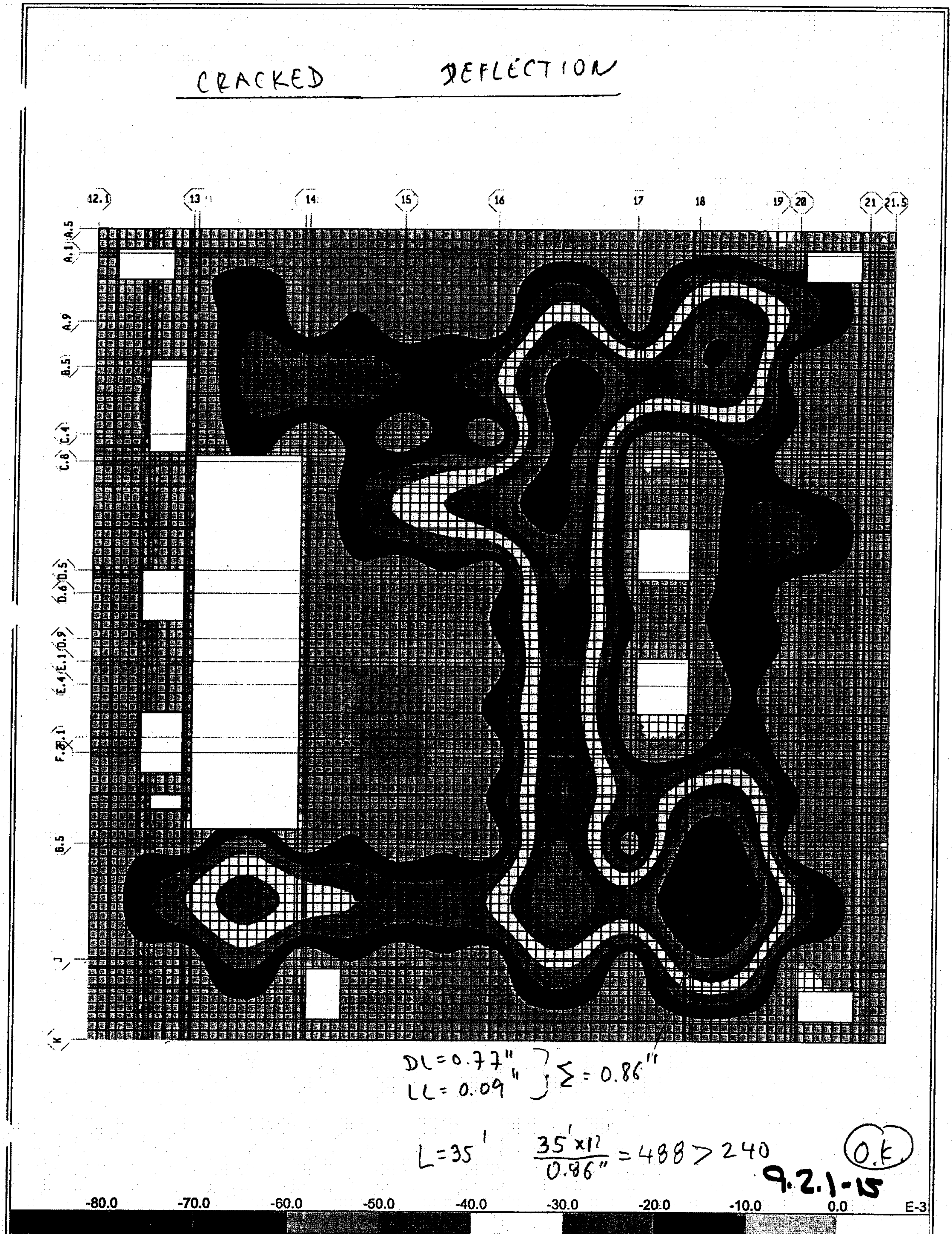


SDL
Line Load

9-21-14

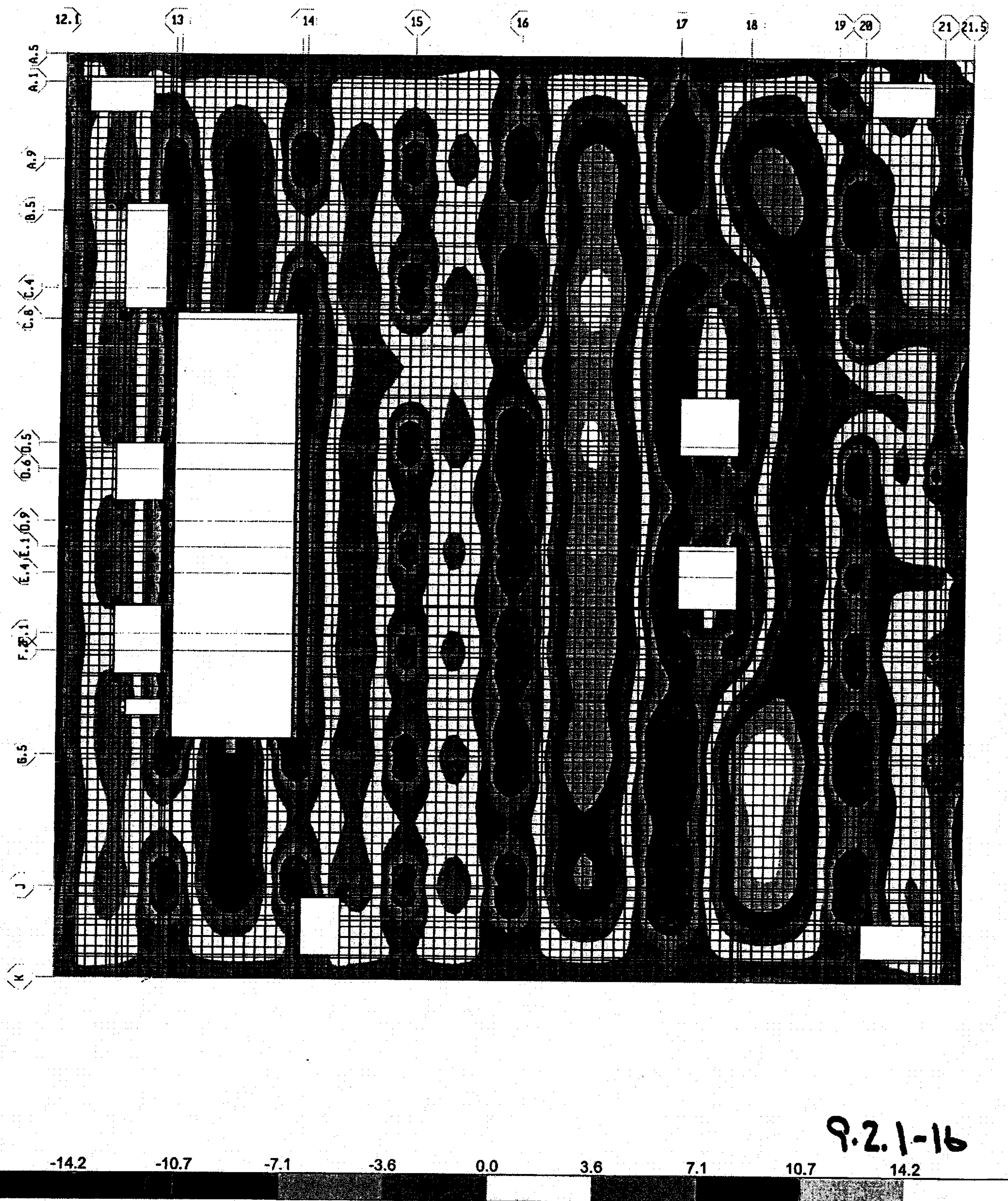
SAFE v8.0.6 - File: 4069-JP-B2_16 - May 12,2005 17:49 - Scale: Fit to Page
Line Loading (SDL) - lb-ft Units

SAFE



SAFE v8.0.6 - File: 4069-JP-B2_17 - May 19,2005 14:11 - Scale: Fit to Page
Cracked Deformed Shape (L) - Kip-in Units

SAFE

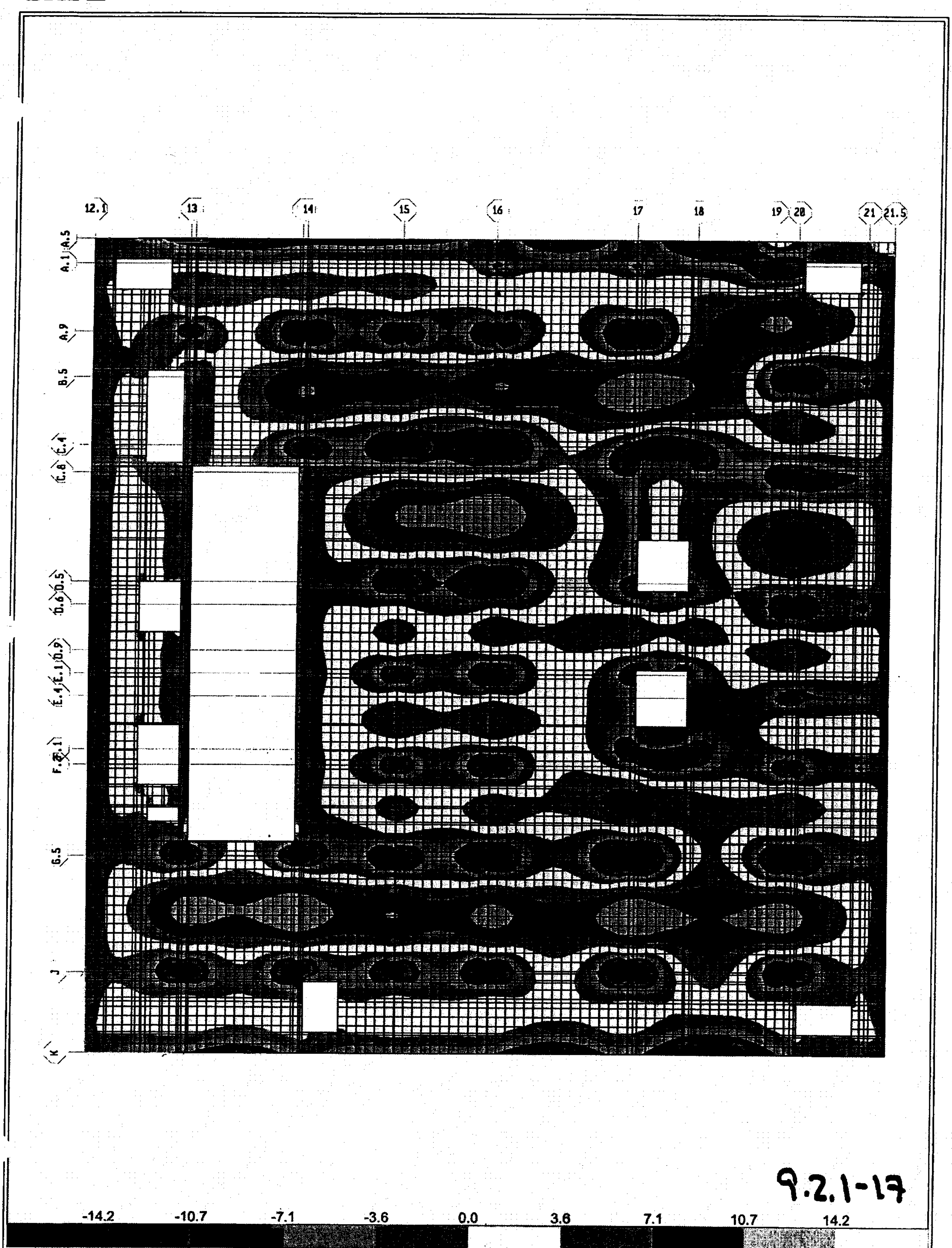


9.2.1-16

SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 17:21 - Scale: Fit to Page
Slab Resultant Mxx Diagram - (14D17L) - Kip-in Units

DODSONNOC00000714

SAFE



SAFE v8.0.6 - File: 4069-JP-B2_17 - May 18,2005 17:22 - Scale: Fit to Page
Slab Resultant Myy Diagram - (14D17L) - Kip-in Units

DODSONNOC00000715

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 1
May 16,2005 11:33

LINE OBJECT DATA

LINE	JNT-1	JNT-2	SECTION	SUPPORT	RELEASES	LENGTH
1	57	58	WALL24			212.000
2	58	59	WALL24			135.000
3	51	52	WALL24		0	1080.000
4	57	60	WALL24			135.000
5	60	59	WALL24			212.000
6	54	.55	WALL24		0	2059.000
7	100	94				984.500
8	56	55	WALL24		0	2140.000
9	103	104				984.500
12	41	42	WALL24			135.000
13	42	43	WALL24			351.000
14	44	43	WALL30		0	135.000
15	41	44	WALL24			351.000
17	45	46	WALL24			207.000
19	48	47	WALL24			207.000
28	53	54	WALL24			2140.000
34	53	56	WALL24		0	2059.004
38	1	50	WALL24		0	1285.000

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 2
May 16,2005 11:33

POINT OBJECT DATA

POINT	GLOBAL-X	GLOBAL-Y	SUPPORT	SPRING	RESTRAINT	RES DIM X	RES DIM Y
1	247.000	515.000					
2	0.000	384.000					
3	0.000	408.000					
4	0.000	432.000					
5	0.000	0.000					
6	1830.000	54.000					
7	1974.000	134.040					
8	1830.000	2006.040					
9	1974.000	2085.960					
10	1974.000	54.000					
11	794.000	755.000	COL24X48				
12	1830.000	134.040					
13	1034.000	1895.000	COL24X48				
14	141.000	1456.000					
15	794.000	1235.000	COL24X48				
16	794.000	995.000	COL24X48				
17	1034.000	515.000	COL24X48				
18	1814.000	210.000	COL24X48				
19	141.000	1697.000					
20	1394.000	210.000	COL24X48				
21	0.000	0.000					
22	1034.000	2075.000	COL30DIA				
23	128.000	702.000					
24	155.000	643.000					
25	0.000	24.000					
26	2059.000	24.000					
27	2059.000	0.000					
28	2059.000	48.000					
29	0.000	48.000					
30	2059.000	72.000					
31	0.000	72.000					
32	2059.000	96.000					
33	0.000	96.000					
34	2059.000	120.000					
35	0.000	120.000					
36	2059.000	144.000					
37	0.000	144.000					
38	2059.000	168.000					
39	0.000	168.000					
40	2059.000	192.000					

9.2.1-18

41	1406.000	1215.000	
42	1541.000	1215.000	
43	1541.000	1566.000	
44	1406.000	1566.000	
45	1799.000	1523.000	
46	2006.000	1523.000	
47	2006.000	935.000	
48	1799.000	935.000	
49	1034.000	210.000	COL24X48
50	247.000	1800.000	
51	547.000	515.000	
52	547.000	1595.000	
53	-0.004	0.000	
54	0.000	2140.000	
55	2059.000	2140.000	
56	2059.000	0.000	
57	1406.000	795.000	
58	1406.000	1007.000	
59	1541.000	1007.000	
60	1541.000	795.000	
61	0.000	192.000	
62	2059.000	216.000	
63	0.000	216.000	
64	2059.000	240.000	
65	0.000	240.000	
66	2059.000	264.000	
67	0.000	264.000	
68	2059.000	288.000	
69	0.000	288.000	
70	2059.000	312.000	
71	0.000	312.000	
72	2059.000	336.000	
73	0.000	336.000	
74	2059.000	360.000	
75	0.000	360.000	
76	2059.000	384.000	
77	794.000	210.000	COL24X48
78	2059.000	408.000	
79	547.000	210.000	COL24X48
80	2059.000	432.000	
81	247.000	210.000	COL24X48
82	2059.000	456.000	
83	0.000	456.000	
84	2059.000	480.000	
85	0.000	480.000	
86	2059.000	504.000	
87	0.000	504.000	
88	2059.000	528.000	
89	0.000	528.000	
90	2059.000	552.000	
91	0.000	552.000	
92	2059.000	576.000	
93	0.000	576.000	
94	259.000	1539.000	
95	2059.000	600.000	
96	0.000	600.000	
97	2059.000	624.000	
98	0.000	624.000	
99	1034.000	1235.000	COL24X48
100	259.000	554.500	
101	2059.000	648.000	
102	0.000	648.000	
103	535.000	554.500	
104	535.000	1539.000	
107	2059.000	672.000	
108	0.000	672.000	
109	2059.000	696.000	
110	0.000	696.000	
111	2059.000	720.000	
112	0.000	720.000	
113	2059.000	744.000	
114	0.000	744.000	
115	2059.000	768.000	

9.2.1-19

116	0.000	768.000	
117	2059.000	792.000	
118	0.000	792.000	
119	2059.000	816.000	
120	0.000	816.000	
121	1034.000	1595.000	COL24X48
124	247.000	1895.000	COL24X48
125	2059.000	840.000	
126	0.000	840.000	
127	2059.000	864.000	
128	0.000	864.000	
129	2059.000	888.000	
130	0.000	888.000	
131	2059.000	912.000	
132	0.000	912.000	
133	2059.000	936.000	
134	0.000	936.000	
135	2059.000	960.000	
136	0.000	960.000	
137	2059.000	984.000	
138	0.000	984.000	
139	2059.000	1008.000	
140	0.000	1008.000	
141	2059.000	1032.000	
142	0.000	1032.000	
143	2059.000	1056.000	
144	0.000	1056.000	
145	2059.000	1080.000	
146	0.000	1080.000	
147	2059.000	1104.000	
148	0.000	1104.000	
149	2059.000	1128.000	
150	0.000	1128.000	
151	2059.000	1152.000	
152	0.000	1152.000	
153	2059.000	1176.000	
154	0.000	1176.000	
155	2059.000	1200.000	
156	0.000	1200.000	
157	2059.000	1224.000	
158	0.000	1224.000	
159	1034.000	995.000	COL24X48
160	1034.000	755.000	COL24X48
161	1394.000	2075.000	COL24DIA
162	1394.000	1895.000	COL24X48
163	1754.000	2075.000	COL30DIA
164	2059.000	1248.000	
165	1814.000	1775.000	COLX48Y24
166	1994.000	2075.000	COL24DIA
167	1994.000	1775.000	COL24DIA
168	1394.000	515.000	COL36DIA
170	1814.000	1175.000	COL30DIA
171	1994.000	1175.000	COL24DIA
172	1994.000	755.000	COL24DIA
173	1814.000	755.000	COL30DIA
174	1994.000	515.000	COLX48Y24
175	1814.000	515.000	COLX48Y24
177	0.000	1248.000	
178	2059.000	1272.000	
179	0.000	1272.000	
180	2059.000	1296.000	
181	0.000	1296.000	
182	2059.000	1320.000	
183	0.000	1320.000	
184	2059.000	1344.000	
185	0.000	1344.000	
186	2059.000	1368.000	
187	0.000	1368.000	
188	2059.000	1392.000	
189	0.000	1392.000	
190	2059.000	1416.000	
191	0.000	1416.000	
192	2059.000	1440.000	

9.2.1-20

193	0.000	1440.000	
194	2059.000	1464.000	
195	0.000	1464.000	
196	2059.000	1488.000	
197	0.000	1488.000	
198	2059.000	1512.000	
199	0.000	1512.000	
200	2059.000	1536.000	
201	0.000	1536.000	
202	2059.000	1560.000	
203	0.000	1560.000	
204	2059.000	1584.000	
205	0.000	1584.000	
206	2059.000	1608.000	
207	0.000	1608.000	
208	2059.000	1632.000	
209	0.000	1632.000	
210	2059.000	1656.000	
211	0.000	1656.000	
212	2059.000	1680.000	
213	0.000	1680.000	
214	2059.000	1704.000	
215	0.000	1704.000	
216	2059.000	1728.000	
217	0.000	1728.000	
218	2059.000	1752.000	
219	0.000	1752.000	
220	2059.000	1776.000	
221	0.000	1776.000	
222	2059.000	1800.000	
223	0.000	1800.000	
224	2059.000	1824.000	
225	0.000	1824.000	
226	2059.000	1848.000	
227	0.000	1848.000	
228	2059.000	1872.000	
229	0.000	1872.000	
230	2059.000	1896.000	
231	0.000	1896.000	
232	2059.000	1920.000	
233	0.000	1920.000	
234	2059.000	1944.000	
235	0.000	1944.000	
236	2059.000	1968.000	
237	0.000	1968.000	
238	2059.000	1992.000	
239	0.000	1992.000	
240	2059.000	2016.000	
241	0.000	2016.000	
242	2059.000	2040.000	
243	0.000	2040.000	
244	1974.000	2006.040	
245	794.000	515.000	COL24X48
246	1830.000	2085.960	
247	54.000	2006.040	
248	198.000	2006.040	
249	198.000	2085.960	
250	54.000	2085.960	
252	2059.000	2064.000	
253	0.000	2064.000	
254	2059.000	2088.000	
255	0.000	2088.000	
256	2059.000	2112.000	
257	0.000	2112.000	
258	128.000	860.000	
259	155.000	606.000	
260	2059.000	2139.996	
261	0.000	2139.996	
263	558.000	54.000	
264	648.000	54.000	
265	648.000	186.000	
266	558.000	186.000	
267	547.000	1895.000	COL30DIA

9.2.1-21

268	0.000	2140.000	
269	24.000	2140.000	
270	24.000	0.000	
272	794.000	1895.000	COL30DIA
273	794.000	1595.000	COL24X48
277	235.000	1456.000	
278	235.000	1697.000	
279	235.000	1103.000	
280	235.000	1235.000	
281	48.000	0.000	
282	48.000	2140.000	
283	72.000	0.000	
284	72.000	2140.000	
285	96.000	0.000	
286	96.000	2140.000	
287	120.000	0.000	
288	120.000	2140.000	
289	144.000	0.000	
290	144.000	2140.000	
291	168.000	0.000	
292	168.000	2140.000	
293	192.000	0.000	
294	192.000	2140.000	
295	216.000	0.000	
296	216.000	2140.000	
297	240.000	0.000	
298	240.000	2140.000	
299	264.000	0.000	
300	264.000	2140.000	
301	288.000	0.000	
302	288.000	2140.000	
303	312.000	0.000	
304	312.000	2140.000	
305	336.000	0.000	
306	336.000	2140.000	
307	360.000	0.000	
308	360.000	2140.000	
309	384.000	0.000	
310	384.000	2140.000	
311	408.000	0.000	
312	408.000	2140.000	
313	432.000	0.000	
314	432.000	2140.000	
315	456.000	0.000	
316	456.000	2140.000	
317	480.000	0.000	
318	480.000	2140.000	
319	504.000	0.000	
320	504.000	2140.000	
321	528.000	0.000	
322	528.000	2140.000	
323	552.000	0.000	
324	552.000	2140.000	
325	576.000	0.000	
326	576.000	2140.000	
327	600.000	0.000	
328	600.000	2140.000	
329	624.000	0.000	
330	624.000	2140.000	
331	648.000	0.000	
332	648.000	2140.000	
333	672.000	0.000	
334	672.000	2140.000	
335	696.000	0.000	
336	696.000	2140.000	
337	720.000	0.000	
338	720.000	2140.000	
339	744.000	0.000	
340	744.000	2140.000	
341	768.000	0.000	
342	768.000	2140.000	
343	792.000	0.000	
344	792.000	2140.000	

9.2.1-22

345	816.000	0.000
346	816.000	2140.000
347	840.000	0.000
348	840.000	2140.000
349	864.000	0.000
350	864.000	2140.000
351	888.000	0.000
352	888.000	2140.000
353	912.000	0.000
354	912.000	2140.000
355	936.000	0.000
356	936.000	2140.000
357	960.000	0.000
358	960.000	2140.000
359	984.000	0.000
360	984.000	2140.000
361	1008.000	0.000
362	1008.000	2140.000
363	1032.000	0.000
364	1032.000	2140.000
365	1056.000	0.000
366	1056.000	2140.000
367	1080.000	0.000
368	1080.000	2140.000
369	1104.000	0.000
370	1104.000	2140.000
371	1128.000	0.000
372	1128.000	2140.000
373	1152.000	0.000
374	1152.000	2140.000
375	1176.000	0.000
376	1176.000	2140.000
377	1200.000	0.000
378	1200.000	2140.000
379	1224.000	0.000
380	1224.000	2140.000
381	1248.000	0.000
382	1248.000	2140.000
383	1272.000	0.000
384	1272.000	2140.000
385	1296.000	0.000
386	1296.000	2140.000
387	1320.000	0.000
388	1320.000	2140.000
389	1344.000	0.000
390	1344.000	2140.000
391	1368.000	0.000
392	1368.000	2140.000
393	1392.000	0.000
394	1392.000	2140.000
395	1416.000	0.000
396	1416.000	2140.000
397	1440.000	0.000
398	1440.000	2140.000
399	1464.000	0.000
400	1464.000	2140.000
401	1488.000	0.000
402	1488.000	2140.000
403	1512.000	0.000
404	1512.000	2140.000
405	1536.000	0.000
406	1536.000	2140.000
407	1560.000	0.000
408	1560.000	2140.000
409	1584.000	0.000
410	1584.000	2140.000
411	1608.000	0.000
412	1608.000	2140.000
413	1632.000	0.000
414	1632.000	2140.000
415	1656.000	0.000
416	1656.000	2140.000
417	1680.000	0.000

9.2.1-23

418	1680.000	2140.000
419	1704.000	0.000
420	1704.000	2140.000
421	1728.000	0.000
422	1728.000	2140.000
423	1752.000	0.000
424	1752.000	2140.000
425	1776.000	0.000
426	1776.000	2140.000
427	1800.000	0.000
428	1800.000	2140.000
429	1824.000	0.000
430	1824.000	2140.000
431	1848.000	0.000
432	1848.000	2140.000
433	1872.000	0.000
434	1872.000	2140.000
435	1896.000	0.000
436	1896.000	2140.000
437	1920.000	0.000
438	1920.000	2140.000
439	1944.000	0.000
440	1944.000	2140.000
441	1968.000	0.000
442	1968.000	2140.000
443	1992.000	0.000
444	1992.000	2140.000
445	2016.000	0.000
446	2016.000	2140.000
447	2040.000	0.000
448	2040.000	2140.000
449	235.000	702.000
450	235.000	860.000
451	235.000	606.000
452	235.000	643.000
453	128.000	1235.000
454	128.000	1103.000
455	2059.000	0.000
456	2059.000	2140.000
457	1541.000	1349.000
458	1406.000	1349.000
459	1406.000	860.000
460	1541.000	860.000

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May 16,2005 11:33

LINE LOADS Load Case SDL

LINE	TOTAL-W	INPLANE-M	OUTPLANE-M
7	146.20	0.000	0.000
9	146.20	0.000	0.000

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May 16,2005 11:33

SURFACE LOADS Load Case SDL

AREA	UNIFORM-W
1	3.472E-05

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 5
May 16,2005 11:33

LINE LOADS Load Case L

LINE	TOTAL-W	INPLANE-M	OUTPLANE-M
7	4.10	0.000	0.000
9	4.10	0.000	0.000

9.2.1-24

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 6
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SURFACE LOADS Load Case L

AREA UNIFORM-W

1 3.472E-04

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 1
May 16,2005 11:33

COLUMN SPRING REACTIONS

COLUMN	GRID I	GRID J	LOAD	FZ	MX	MY
13	57	109	L	26.27	-124.740	-132.886
13	57	109	DL	81.40	-386.889	-412.091
17	57	27	L	29.92	-104.704	-154.748
17	57	27	DL	92.75	-324.381	-479.805
245	46	27	L	22.37	-112.400	37.203
245	46	27	DL	69.36	-348.278	115.641
11	46	42	L	17.60	18.325	23.242
11	46	42	DL	54.53	56.711	72.223
272	46	109	L	21.20	-72.703	36.661
272	46	109	DL	65.73	-224.592	113.721
99	57	72	L	33.07	164.837	-154.871
99	57	72	DL	102.53	511.052	-480.623
15	46	72	L	22.78	126.383	6.199
15	46	72	DL	70.60	391.750	19.370
49	57	13	L	26.27	175.570	-101.716
49	57	13	DL	81.46	542.949	-315.391
77	46	13	L	21.14	146.174	17.059
77	46	13	DL	65.58	451.828	52.954
79	33	13	L	23.37	234.958	109.094
79	33	13	DL	72.46	727.579	338.307
81	18	13	L	25.44	148.635	-89.566
81	18	13	DL	78.93	459.949	-276.930
121	57	93	L	37.51	-77.989	-177.852
121	57	93	DL	116.28	-241.873	-551.811
273	46	93	L	26.18	-40.613	21.979
273	46	93	DL	81.16	-125.907	68.557
267	33	109	L	26.19	-76.121	34.702
267	33	109	DL	81.22	-235.520	107.774
124	18	109	L	16.00	60.631	-64.775
124	18	109	DL	49.78	186.668	-200.240
22	57	119	L	7.10	-51.392	-14.692
22	57	119	DL	22.48	-154.973	-45.421
16	46	56	L	17.57	-20.077	25.869
16	46	56	DL	54.45	-62.227	80.330
159	57	56	L	25.32	-19.983	-160.606
159	57	56	DL	78.50	-61.964	-498.361
160	57	42	L	25.72	12.336	-162.552
160	57	42	DL	79.74	38.259	-504.302

9.2.1-25

161	73	119	L	6.79	-39.224	-6.534
161	73	119	DL	21.50	-118.580	-20.258
162	73	109	L	35.64	-175.368	-17.704
162	73	109	DL	110.47	-544.175	-54.850
163	92	119	L	18.31	-192.384	39.154
163	92	119	DL	57.19	-591.722	121.677
165	96	103	L	29.16	78.010	237.432
165	96	103	DL	90.36	241.510	736.423
166	107	119	L	3.85	-26.234	17.314
166	107	119	DL	12.57	-79.417	50.721
167	107	103	L	5.97	9.676	38.774
167	107	103	DL	18.93	30.249	116.237
168	73	27	L	42.27	-79.553	-62.054
168	73	27	DL	131.05	-245.896	-192.506
20	73	13	L	33.93	198.509	-76.639
20	73	13	DL	105.21	614.242	-237.580
170	96	67	L	23.36	69.331	82.314
170	96	67	DL	72.43	215.076	256.064
171	107	67	L	7.38	12.044	53.424
171	107	67	DL	23.32	37.647	161.619
172	107	42	L	5.45	-5.440	29.695
172	107	42	DL	17.31	-16.935	88.302
173	96	42	L	18.08	-60.746	113.675
173	96	42	DL	56.04	-188.158	353.258
174	107	27	L	5.43	-10.985	33.371
174	107	27	DL	17.33	-34.166	98.537
175	96	27	L	32.36	-99.589	298.682
175	96	27	DL	100.29	-308.709	926.326
18	96	13	L	27.34	196.663	209.670
18	96	13	DL	84.81	608.779	649.458

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WALL REACTIONS

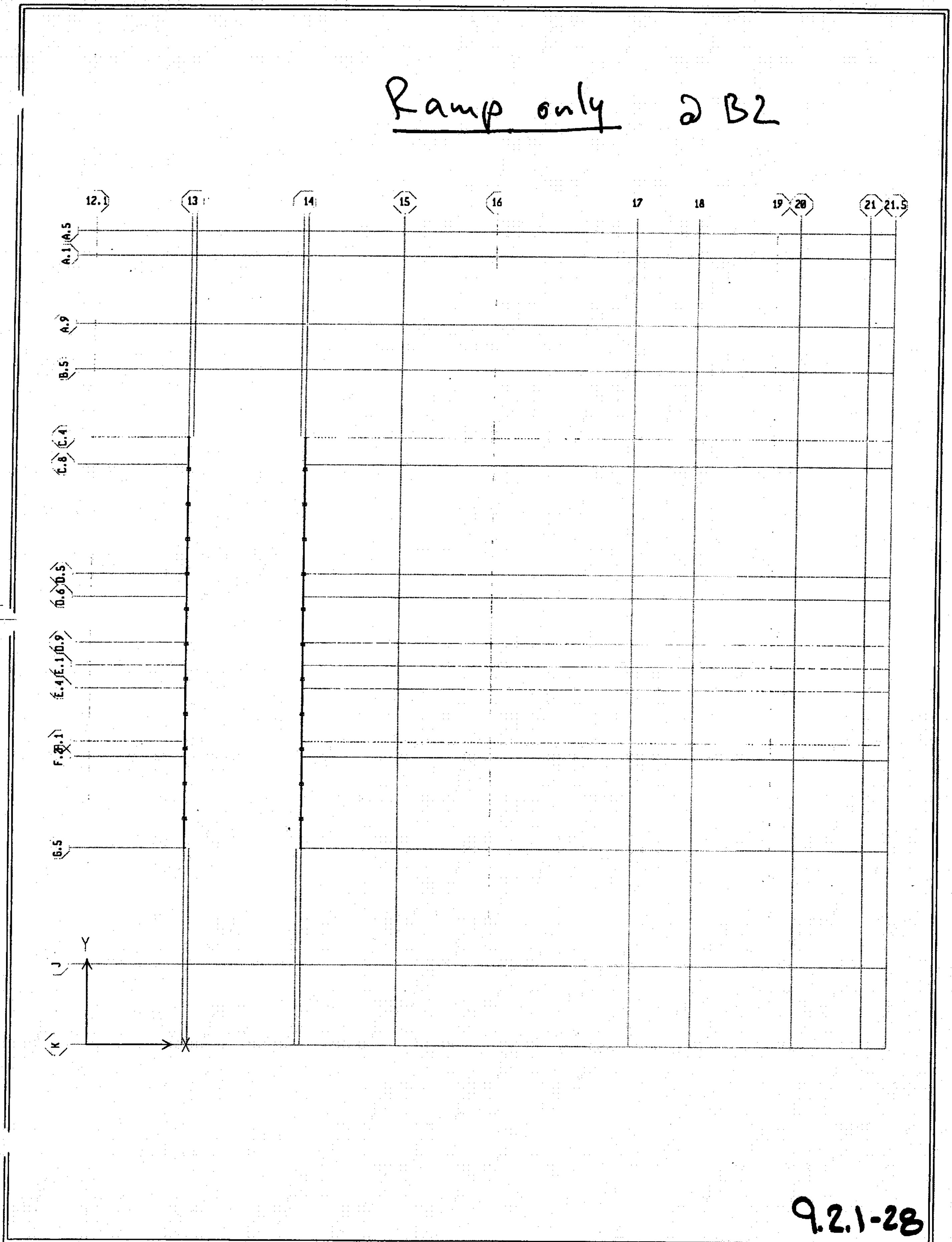
WALL	LOAD	FZ	MX	MY
12	L	8.93	-299.669	66.856
12	DL	58.06	-929.016	207.515
13	L	28.83	290.566	-1146.284
13	DL	167.84	818.587	-3553.610
14	L	20.78	937.780	34.820
14	DL	95.77	2898.009	107.416
15	L	39.91	504.686	1946.086
15	DL	202.20	1483.731	6034.658
17	L	30.11	-239.217	1604.531
17	DL	98.99	-742.497	4932.051
19	L	22.32	145.330	1029.111
19	DL	74.81	451.601	3148.476
38	L	78.39	-1857.360	358.688
38	DL	665.63	-20652.790	-466.155
3	L	90.26	3.298	-1983.153
3	DL	656.37	-1095.146	-4566.869
28	L	84.48	-1611.700	-3661.679
28	DL	743.22	-4984.563	-11336.555
6	L	57.93	-2930.137	10420.936
6	DL	641.19	-9003.162	33006.204

9.2.1-26

8	L	51.17	-1598.716	2007.487
8	DL	637.31	-5350.443	6098.905
34	L	68.56	3003.429	-840.865
34	DL	675.62	9287.256	-2615.612
1	L	25.44	-81.897	1220.891
1	DL	126.54	-253.411	3783.444
2	L	8.30	301.106	56.197
2	DL	56.11	933.473	174.429
4	L	16.11	-627.817	-112.079
4	DL	80.30	-1944.816	-347.384
5	L	17.02	-221.068	-688.445
5	DL	100.43	-685.092	-2131.875

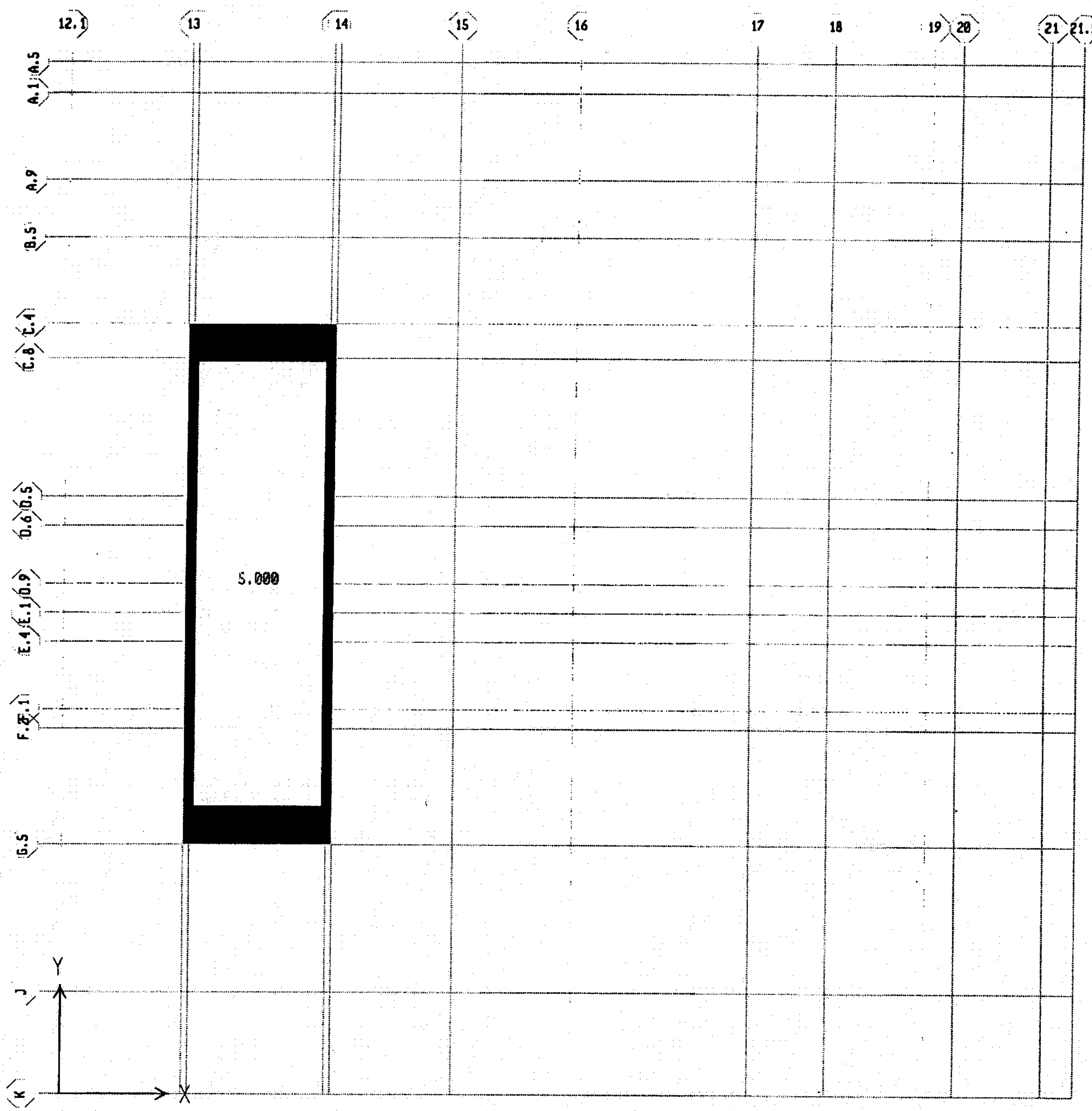
9.2.1-27

SAFE



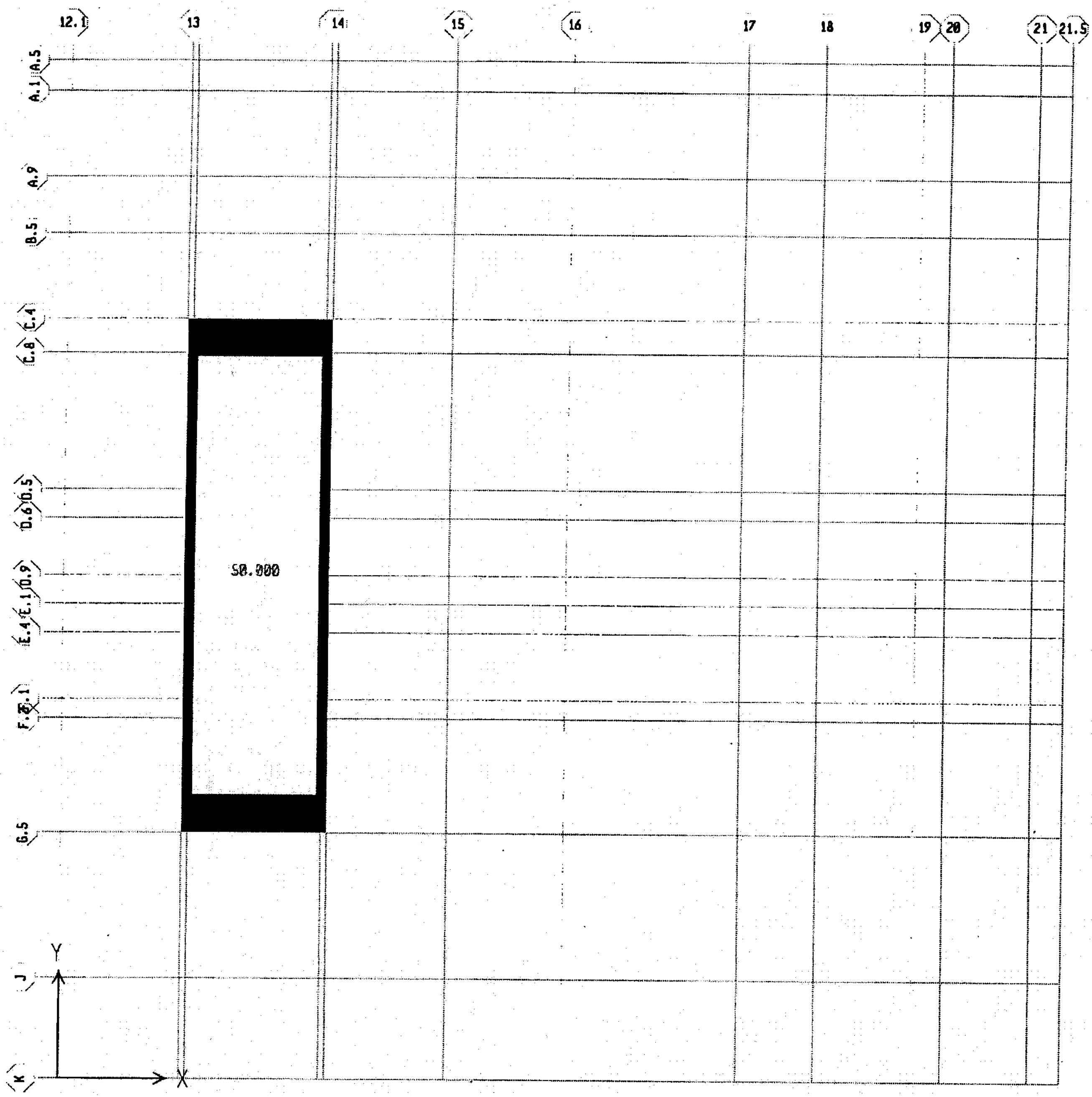
SAFE v8.0.6 - File: 4069-JP-B2_ramp - May 18,2005 12:47 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

SAFE



9.2.1-29

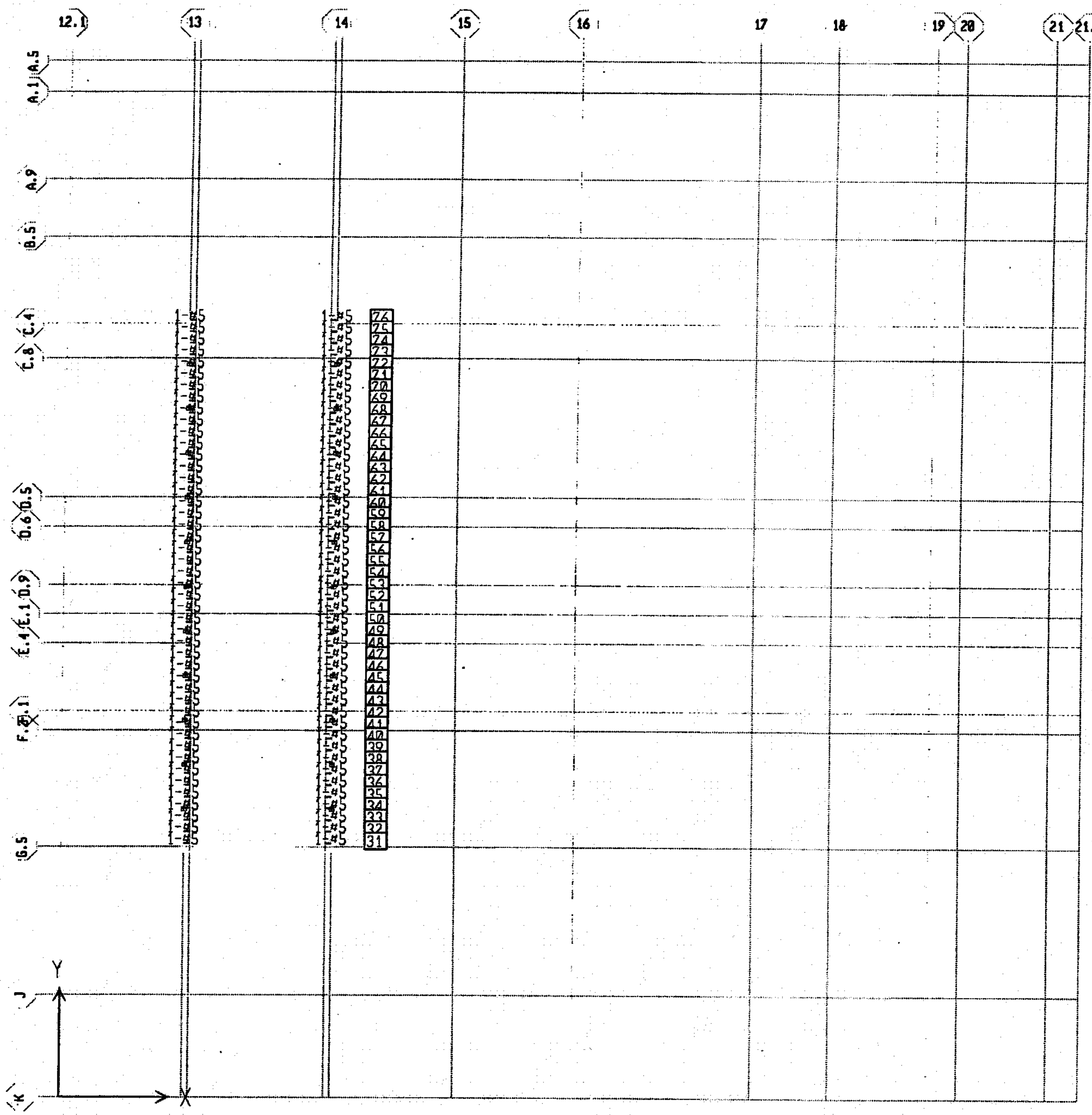
SAFE v8.0.6 - File: 4069-JP-B2_ramp - May 18,2005 12:47 - Scale: Fit to Page
Surface Loading (SDL) - lb-ft Units


12.1
13
14
15
16
17
18
19
20
21
21.5
A.5
A.1
A.9
B.5
C.4
C.8
D.5
D.6
D.9
E.1
E.4
F.1
6.5
J
K
Y
50.000

9.21-30

SAFE

Ramp reinforcement
in addition to #5@12" o.c.



13" + Ld = 13" + 22" = 35" say 3'-0"

9.21-31

DESIMONE

Project 301 MISSION STREET

Project No. 4069

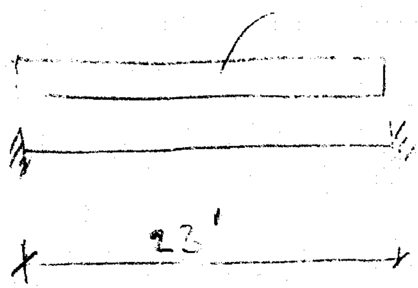
Item

Page ____ Of ____

Date / /2005

By J.P. Ch'kd ____

Ramp Slab



SDL = 5 psf

SW = 150 psf

155 psf

LL = 50 psf

1.4DL + 1.7LL = 302 psf

$M_u = \frac{1}{10} \times 302\,psf \times 23'^2 = 14.2$ k-ft ($\frac{1}{10}$ for not perfectly fixed)

#5 @ 12" TYP. Reinf.

$\phi M_n = 0.9 \times 0.31 \times 60 \times 0.85 \times 12''/12'' = 14.4$ k-ft > 14.2 k-ft

Add #5 at ends not to rely on end fixity.

9.21-32

DESIMONE

Project: 301 MISSION
Project No.: 4069
Item:
Page ____ Of ____
Date: 3/23/05
By: DDR
Ch'kd ____

SUBGRADE DIAPHRAGMS

- ETABS SHOWS MAX DIAPHRAGM FORCE

  $= \frac{1260^k}{170'} = 7.41 \text{ K/FT}$ B1 - LINE 'K'

- CONC DIAPHRAGM = 12"

  $\phi V_c = 0.85(2)(\sqrt{5000})(12)(12)$

  $= 17.3^k/ft >> 7.41^k/ft$

  ∴ CONC. W/ NO REINF. IS OK

- ADD CAPACITY FROM #5 @ 12" O.C. T&B

  $\phi V_s = 0.85(\rho_n f_y)(A_{cv}) = 0.85\left(\frac{2(.31)}{12 \times 12}\right)(60)(12 \times 12)$

  $= 31.6^k/ft$

- TOTAL CAPACITY

  $= \phi V_c + \phi V_s$

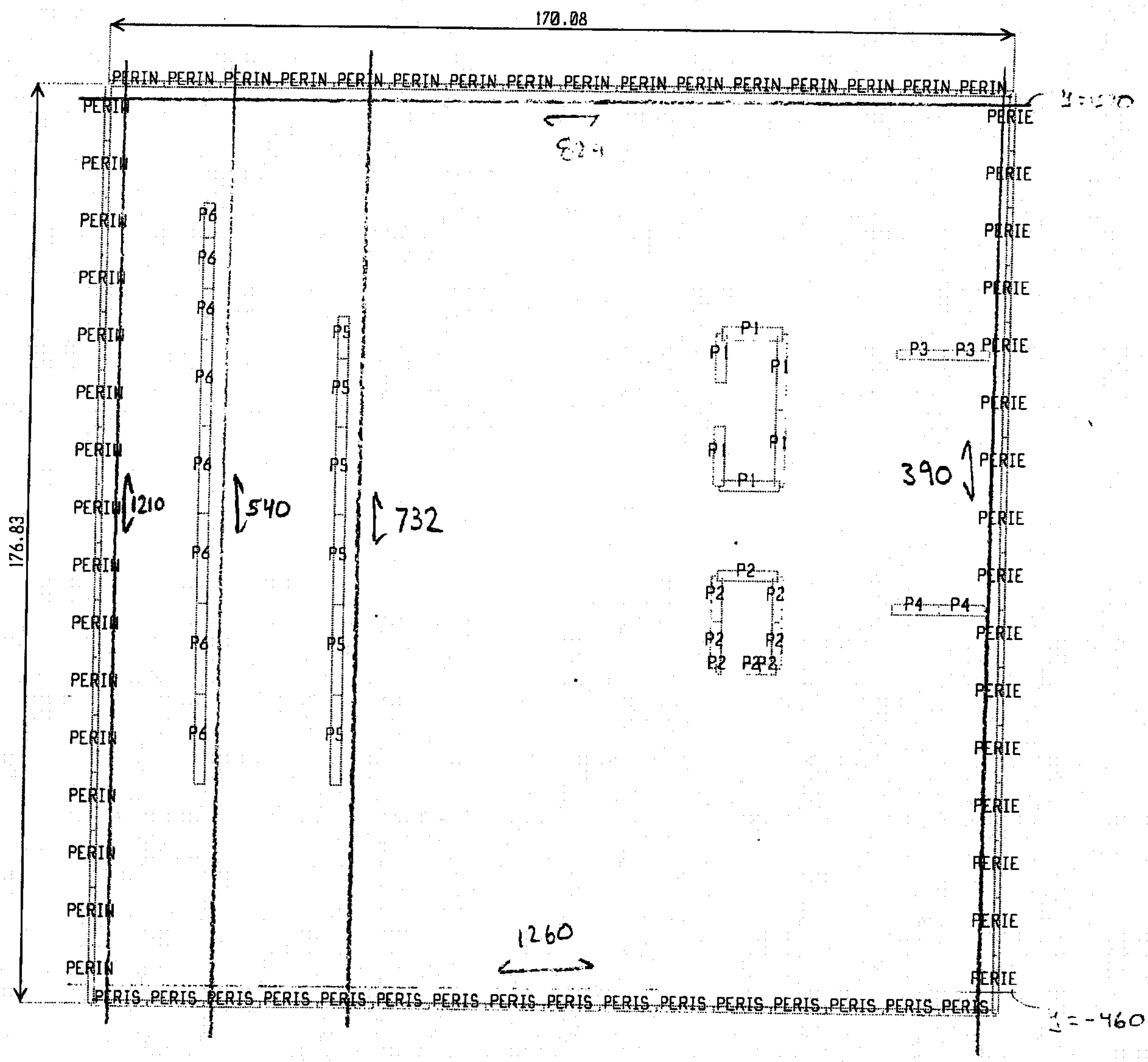
  $= 17.3 + 31.6$

  $= 48.9^k/ft >> 7.4^k/ft$

9.2.1-33

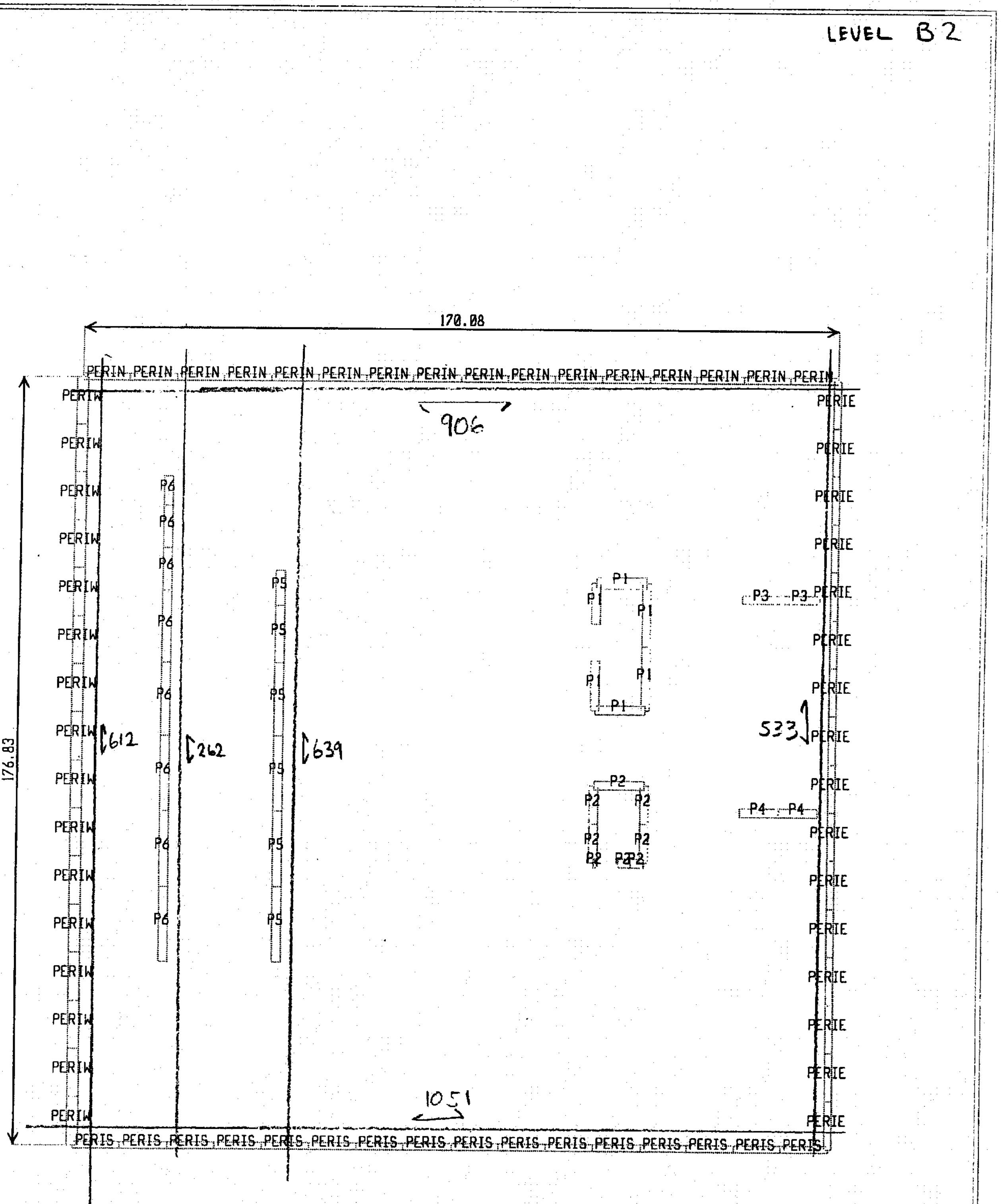
ETABS

LEVEL B1



9.2.1-34

ETABS

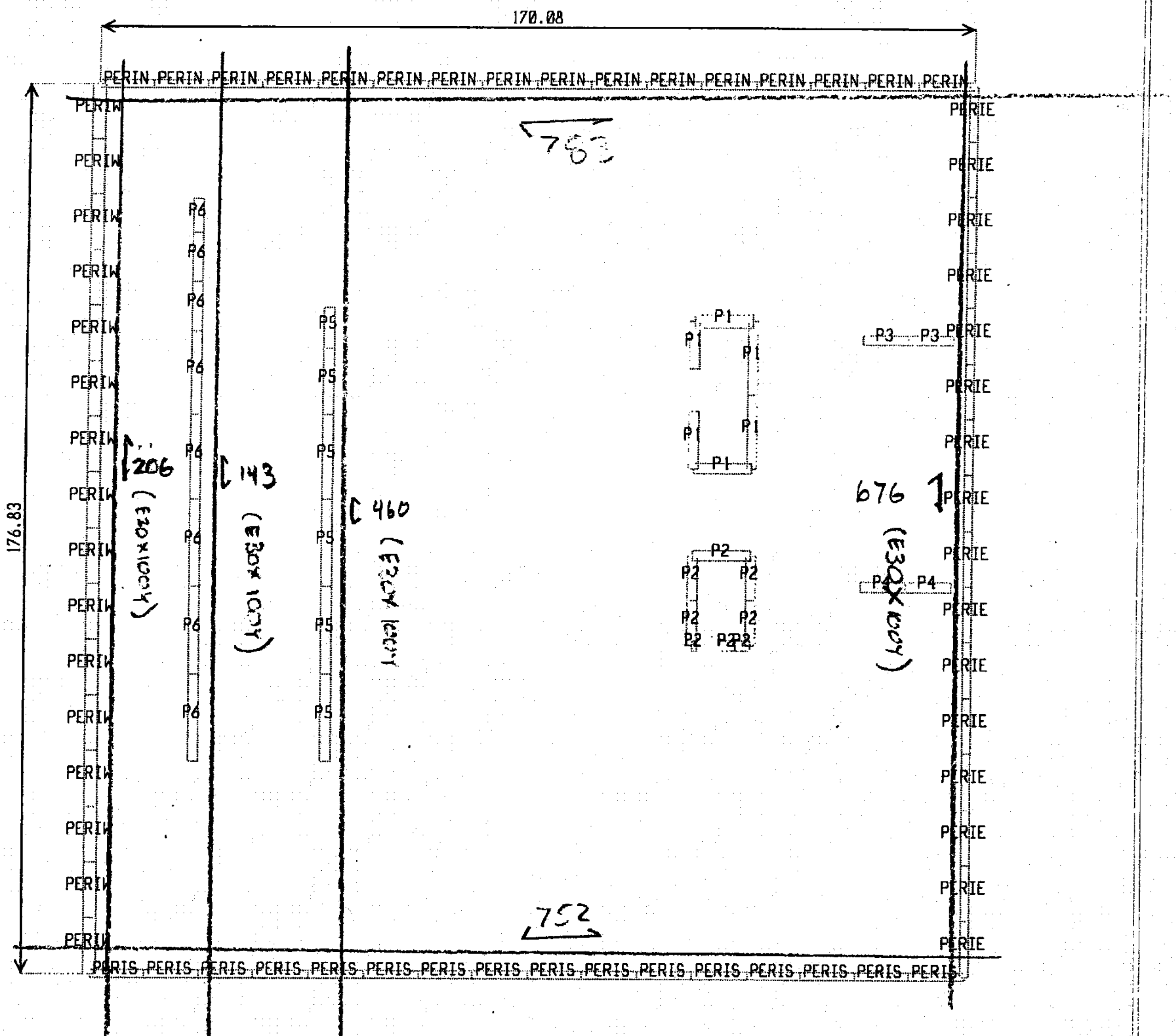


9.2.1-35

ETABS v8.5.0 - File: 4069-20050413-7.05-CD - box pier - April 15,2005 10:22
- Kip-ft Units

ETABS

LEVEL B3

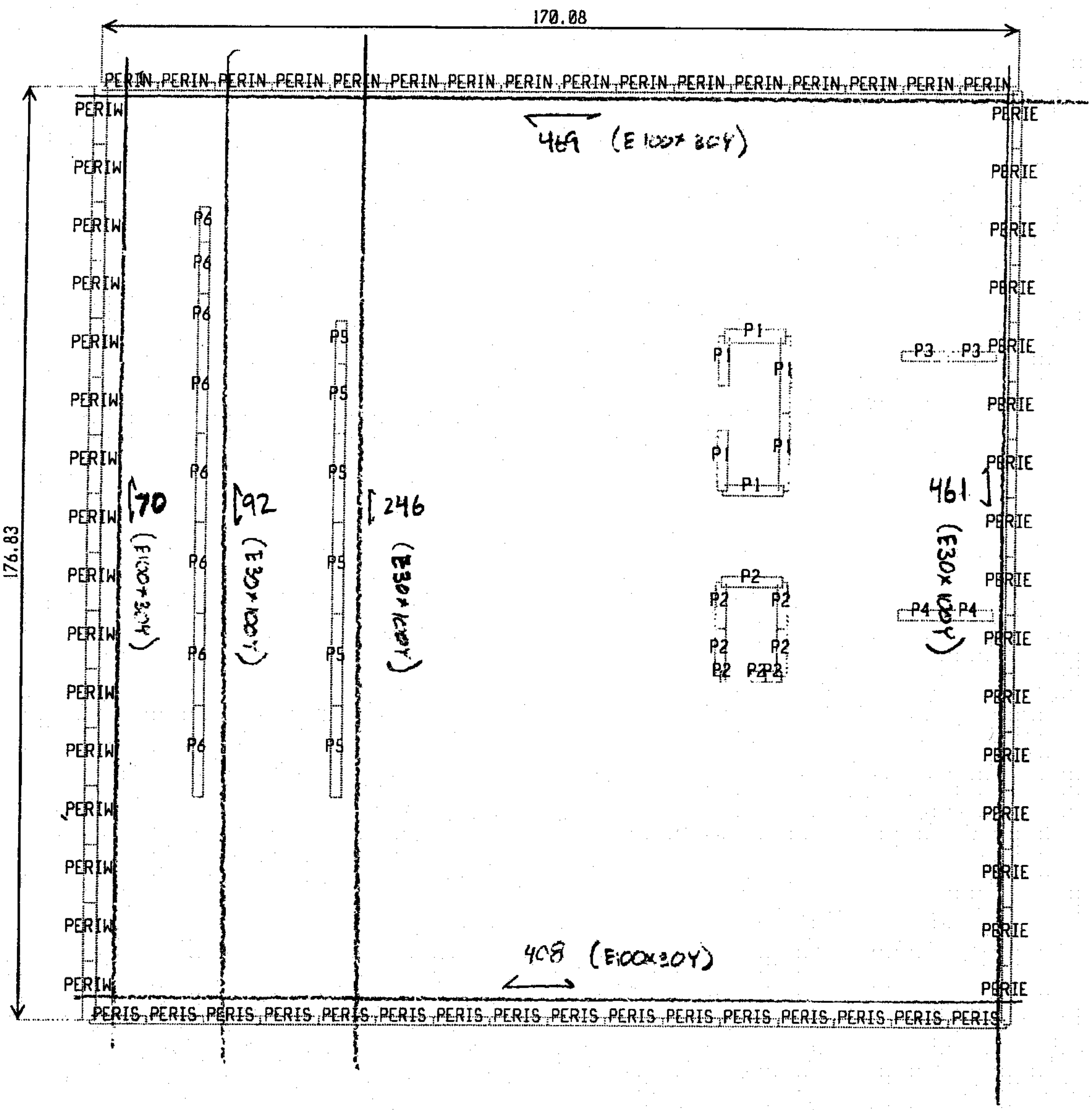


9.21-36

ETABS v8.5.0 - File: 4069-20050413-7.05-CD - box pier - April 15,2005 10:22
- Kip-ft Units

ETABS

LEVEL B4



9.2.1-37

ETABS v8.5.0 - File: 4069-20050413-7.05-CD - box pier - April 15,2005 10:22
- Kip-ft Units

9.2.2 Columns

Columns have been design with PCA column software as slender columns spanning between floor slabs. Load for columns have been taken from SAFE slab analysis including beam transfers at L1, L2 and L3.

DESIMONE CONSU[illegible] ENGINEERS
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T. 415.398.5740
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Job no. : 4069
Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

COLUMN REACTIONS SUMMARY

L4 — COLUMN

I.D.	Shape	Diameter (in)	Section (in2)	Height (ft)	Weight (k)	SAFE FZ DL (k)	SAFE FZ LL (k)
13	COL30DIA	30	709	10	7	53	17
17	COL24DIA	24	454	10	5	32	9
22	COL30DIA	30	709	10	7	23	6
99	COL24DIA	24	454	10	5	63	20
121	COL24DIA	24	454	10	5	72	22
159	COL24DIA	24	454	10	5	49	15
160	COL24DIA	24	454	10	5	54	17
161	COL24DIA	24	454	10	5	40	12
162	COL24DIA	24	454	10	5	119	40
163	COL24DIA	24	454	10	5	59	18
165	COL24DIA	24	454	10	5	92	31
166	COL30DIA	30	709	10	7	25	7
167	COL30DIA	30	709	10	7	30	9
168	COL24X48	N/A	1152	10	12	69	21
170	COL30DIA	30	709	10	7	72	24
171	COL30DIA	30	709	10	7	36	11
172	COL24DIA	24	454	10	5	25	7
173	COL30DIA	30	709	10	7	60	20
174	COL24DIA	24	454	10	5	16	4
175	COL24DIA	24	454	10	5	50	15
SUM:						1039	325

L3 — COLUMN

I.D.	Shape	Diameter (in)	Section (in2)	Height (ft)	Weight (k)	SAFE FZ DL (k)	SAFE FZ LL (k)
13	COL30DIA	30	709	14	11	178	61
14	COL24DIA	24	454	14	7	51	21
17	COL30DIA	30	709	14	11	98	36
20	COL24DIA	24	454	14	7	196	90
22	COL24DIA	24	454	14	7	34	8
49	COL24DIA	24	454	14	7	127	58
50	COL24DIA	24	454	14	7	140	65
51	COL24DIA	24	454	14	7	113	50
52	COL24DIA	24	454	14	7	56	25
53	COL24DIA	24	454	14	7	59	25
54	COL24DIA	24	454	14	7	59	25
99	COL30DIA	30	709	14	11	182	61
121	COL30DIA	30	709	14	11	349	117
124	COL24X48	N/A	1152	14	17	42	17
159	COL30DIA	30	709	14	11	128	49
160	COL30DIA	30	709	14	11	134	52
161	COL24DIA	24	454	14	7	77	19
162	COL30DIA	30	709	14	11	131	34
163.	COL24DIA	24	454	14	7	91	23
165	COL24DIA	24	454	14	7	111	30
166	COL24DIA	24	454	14	7	49	12
167	COL24DIA	24	454	14	7	54	13
168	COL30DIA	30	709	14	11	103	25
170	COL24DIA	24	454	14	7	86	23
171	COL24DIA	24	454	14	7	64	16
172	COL24DIA	24	454	14	7	43	11
173	COL24DIA	24	454	14	7	70	19
174	COL24DIA	24	454	14	7	34	6
175	COL24DIA	24	454	14	7	80	20
						2939	1012

L2 — COLUMN

I.D.	Shape	Diameter (in)	Section (in2)	Height (ft)	Weight (k)	SAFE FZ DL (k)	SAFE FZ LL (k)
7	24X24	N/A	576	16	9	88	25
8	HSS16X16	16	202	16	3	58	21
9	HSS16X16	16	202	16	3	68	24
10	HSS16X16	16	202	16	3	69	26
13	36X36	N/A	1296	16	21	79	40
14	24DIA	24	454	16	7	73	20
15	24DIA	24	454	16	7	178	65
16	24DIA	24	454	16	7	177	62
17	30DIA	30	709	16	12	502	77
22	24DIA	24	454	16	7	46	22
50	24DIA	24	454	16	7	92	36
51	24DIA	24	454	16	7	269	47
52	24DIA	24	454	16	7	21	7
53	24DIA	24	454	16	7	114	35
54	24DIA	24	454	16	7	105	31
99	30DIA	30	709	16	12	129	81
121	36X36	N/A	1296	16	21	110	55
159	30DIA	30	709	16	12	115	52
160	30DIA	30	709	16	12	100	57
161	24DIA	24	454	16	7	82	36
162	30DIA	30	709	16	12	148	75
163	24DIA	24	454	16	7	94	44
165	87X24	N/A	2088	16	34	119	81
166	24DIA	24	454	16	7	56	24
167	24DIA	24	454	16	7	67	30
168	30DIA	30	709	16	12	462	74
170	30DIA	30	709	16	12	91	46
171	24DIA	24	454	16	7	69	31
172	30DIA	30	709	16	12	30	20
173	24DIA	24	454	16	7	40	31
174	24DIA	24	454	16	7	206	28
175	87X24	N/A	2088	16	34	401	62
						4281	1326

L1 — COLUMN

I.D.	Shape	Diameter (in)	Section (in2)	Height (ft)	Weight (k)	SAFE FZ DL (k)	SAFE FZ LL (k)
7	24X24	N/A	576	16	9	180	48
8	HSS16X16	16	202	16	3	101	36
9	HSS16X16	16	202	16	3	118	41
10	HSS16X16	16	202	16	3	134	51
11	24DIA	24	454	16	7	146	49
13	24X48	N/A	1152	16	19	117	54
14	24DIA	24	454	16	7	254	78
15	36DIA	36	1021	16	17	103	37
16	24DIA	24	454	16	7	102	36
17	36DIA	36	1021	16	17	203	41
18	24X48	N/A	1152	16	19	185	18
20	24X48	N/A	1152	16	19	206	19
22	24DIA	24	454	16	7	29	13
49	24X48	N/A	1152	16	19	160	17
52	24DIA	24	454	16	7	121	32
53	24DIA	24	454	16	7	253	74
54	24DIA	24	454	16	7	204	57
77	24X48	N/A	1152	16	19	167	18
79	24X48	N/A	1152	16	19	206	22
81	24X48	N/A	1152	16	19	219	46
99	36DIA	36	1021	16	17	130	61
121	36DIA	36	1021	16	17	141	87
159	30DIA	30	709	16	12	112	52
160	30DIA	30	709	16	12	105	50
161	24DIA	24	454	16	7	27	13
162	30DIA	30	709	16	12	146	73
163	30DIA	30	709	16	12	75	37
165	X48Y24	N/A	1152	16	19	119	59
166	24DIA	24	454	18	7	24	11
167	24DIA	24	454	16	7	24	12
168	36DIA	36	1021	16	17	309	64
170	30DIA	30	709	16	12	96	48
171	24DIA	24	454	16	7	30	14
172	24DIA	24	454	16	7	24	12
173	30DIA	30	709	16	12	68	35
174	X48Y24	N/A	1152	16	19	59	9
175	X48Y24	N/A	1152	16	19	235	46
245	36DIA	36	1021	16	17	307	53
267	30DIA	30	709	16	12	148	53
272	30DIA	30	709	16	12	123	44
273	30DIA	30	709	16	12	102	38
						5633	1634

B2 — COLUMN

I.D.	Shape	Diameter (in)	Section (in2)	Height (ft)	Weight (k)	SAFE FZ DL (k)	SAFE FZ LL (k)
11	COL24X48	N/A	1152	8	10	55	18
13	COL24X48	N/A	1152	8	10	81	26
15	COL24X48	N/A	1152	8	10	71	23
16	COL24X48	N/A	1152	8	10	54	18
17	COL24X48	N/A	1152	8	10	93	30
18	COL24X48	N/A	1152	8	10	85	27
20	COL24X48	N/A	1152	8	10	105	34
22	COL30DIA	30	709	8	6	22	7
49	COL24X48	N/A	1152	8	10	81	26
77	COL24X48	N/A	1152	8	10	66	21
79	COL24X48	N/A	1152	8	10	72	23
81	COL24X48	N/A	1152	8	10	79	25
99	COL24X48	N/A	1152	8	10	103	33
121	COL24X48	N/A	1152	8	10	118	38
124	COL24X48	N/A	1152	8	10	50	16
159	COL24X48	N/A	1152	8	10	79	25
160	COL24X48	N/A	1152	8	10	80	26
161	COL24DIA	24	454	8	4	22	7
162	COL24X48	N/A	1152	8	10	110	36
163	COL30DIA	30	709	8	6	57	18
165	COLX48Y2[illegible]	N/A	1152	8	10	90	29
166	COL24DIA	24	454	8	4	13	4
167	COL24DIA	24	454	8	4	19	6
168	COL36DIA	36	1021	8	9	131	42
170	COL30DIA	30	709	8	6	72	23
171	COL24DIA	24	454	8	4	23	7
172	COL24DIA	24	454	8	4	17	5
173	COL30DIA	30	709	8	6	56	18
174	COLX48Y2[illegible]	N/A	1152	8	10	17	5
175	COLX48Y2[illegible]	N/A	1152	8	10	100	32
245	COL24X48	N/A	1152	8	10	69	22
267	COL30DIA	30	1152	8	10	81	26
272	COL30DIA	30	1152	8	10	68	21
273	COL24X48	N/A	1152	8	10	81	26
						2318	746

9*(L4)+(L3)+(L2)+(L1)+4*(B2) — REACTION AT B5 — FZ

DL (k)	LL (k)	1.4DL+1.7LL (k)	Column I.D.
410	120	777	11
1329	409	2556	13
721	209	1364	15
561	171	1077	16
1584	356	2823	17
582	128	1031	18
887	245	1658	20
520	128	947	22
696	180	1281	49
487	102	855	77
553	116	971	79
592	148	1081	81
1540	493	2994	99
1842	591	3583	121
297	81	553	124
1228	393	2388	159
1261	415	2470	160
713	201	1340	161
2054	682	4036	162
1114	343	2142	163
1678	543	3273	165
507	125	922	166
596	158	1104	167
2201	522	3968	168
1327	426	2582	170
681	185	1269	171
471	129	880	172
1056	337	2052	173
623	104	1049	174
1707	395	3060	175
639	142	1136	245
523	157	1000	267
436	129	830	272
476	140	905	273
31893	9004	59957	0

9.2.2-2 MID-RISE COLUMNS GRAVITY LOAD TAKE DOWN

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Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

WALL REACTIONS SUMMARY

L4				L3				L2				L1				B2				9*(L4)+(L3)+(L2)+(L1)+ 4*(B2) REACTION AT B5			
WALL				WALL				WALL				WALL				WALL				FZ			
		SAFE FZ				SAFE FZ				SAFE FZ				SAFE FZ				SAFE FZ					
I.D.	Type	DL (k)	LL (k)	I.D.	Type	DL (k)	LL (k)	I.D.	Type	DL (k)	LL (k)	I.D.	Type	DL (k)	LL (k)	I.D.	Type	DL (k)	LL (k)	DL (k)	LL (k)	1.4DL+ 1.7LL (k)	Wall I.D.
1	WALL24	147	30	1	WALL24	161	21	1	WALL24	177	51	1	WALL24	264	51	1	WALL24	127	25	2428	495	4240	1
2	WALL24	57	7	2	WALL24	76	8	2	WALL24	84	16	2	WALL24	142	19	2	WALL24	56	8	1041	139	1694	2
								3	WALL24	1271	261	3	WALL24	1710	326	3	WALL24	656	90	5607	949	9462	3
4	WALL24	86	17	4	WALL24	109	18	4	WALL24	83	25	4	WALL24	155	26	4	WALL24	80	16	1447	284	2508	4
5	WALL24	110	18	5	WALL24	136	17	5	WALL24	149	34	5	WALL24	232	34	5	WALL24	100	17	1908	313	3203	5
												6	WALL24	1047	116	6	WALL24	641	58	3612	347	5647	6
												8	WALL24	1115	89	8	WALL24	637	51	3664	293	5628	8
12	WALL24	63	9	12	WALL24	79	9	12	WALL24	66	17	12	WALL24	138	17	12	WALL24	58	9	1100	158	1810	12
13	WALL24	156	21	13	WALL24	198	22	13	WALL24	219	42	13	WALL24	383	57	13	WALL24	168	29	2873	421	4738	13
14	WALL30	90	18	14	WALL30	109	17	14	WALL30	116	31	14	WALL30	170	32	14	WALL30	96	21	1588	322	2770.8	14
15	WALL24	218	41	15	WALL24	238	29	15	WALL24	294	80	15	WALL24	425	78	15	WALL24	202	40	3732	721	6450	15
17	WALL24	157	34	17	WALL24	209	38	17	WALL24	229	75	17	WALL24	248	51	17	WALL24	99	30	2492	588	4488	17
19	WALL24	121	22	19	WALL24	158	25	19	WALL24	187	52	19	WALL24	235	44	19	WALL24	75	22	1967	411	3452	19
																28	WALL24	743	84	2973	338	4736	28
												34	WALL24	1632	117	34	WALL24	678	69	4334	391	6732	34
				38	WALL24	502	157	38	WALL24	1205	151	38	WALL24	1677	240	38	WALL24	866	78	6047	861	9830	38
								47	WALL14ATK	2013	122												
	SUM:	1205	216			1974	360			6113	958			9573	1297			5080	649	46813	7030	77490	

9.2.2-3

Date: 5/16/2005   Time: 9:00 AM   File: 4069-JP-Podium gravity columns and walls.xls

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Job no.	:	4069
Client	:	Handel Architects
Project	:	301 Mission street
Engineer	:	Jiri Pertold
Page No.	:	
Revision	:	

MAX. COLUMN REACTION PER COLUMN TYPE

B2 COLUMN		9*(L4)+(L3)+(L2)+(L1)+ 4*(B2) REACTION AT B5 FZ		
I.D.	Shape	DL (k)	LL (k)	1.4DL+ 1.7LL (k)
161	COL24DIA	713	201	**1340**
171	COL24DIA	681	185	1269
167	COL24DIA	596	158	1104
166	COL24DIA	507	125	922
172	COL24DIA	471	129	880
162	COL24X48	2054	682	**4036**
121	COL24X48	1842	591	3583
99	COL24X48	1540	493	2994
17	COL24X48	1584	356	2823
13	COL24X48	1329	409	2556
160	COL24X48	1261	415	2470
159	COL24X48	1228	393	2388
20	COL24X48	887	245	1658
15	COL24X48	721	209	1364
[illegible]	COL24X48	696	180	1281
[illegible]45	COL24X48	639	142	1136
81	COL24X48	592	148	1081
16	COL24X48	561	171	1077
18	COL24X48	582	128	1031
79	COL24X48	553	116	971
273	COL24X48	476	140	905
77	COL24X48	487	102	855
11	COL24X48	410	120	777
124	COL24X48	297	81	553
170	COL30DIA	1327	426	**2582**
163	COL30DIA	1114	343	2142
173	COL30DIA	1056	337	2052
267	COL30DIA	523	157	1000
22	COL30DIA	520	128	947
272	COL30DIA	436	129	830
168	COL36DIA	2201	522	**3968**
165	COLX48Y24	1678	543	3273
175	COLX48Y24	1707	395	3060
174	COLX48Y24	623	104	1049

9.2.2-4

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LEVEL B2 Reactions include wall self weight and cladding

COLUMN SPRING REACTIONS

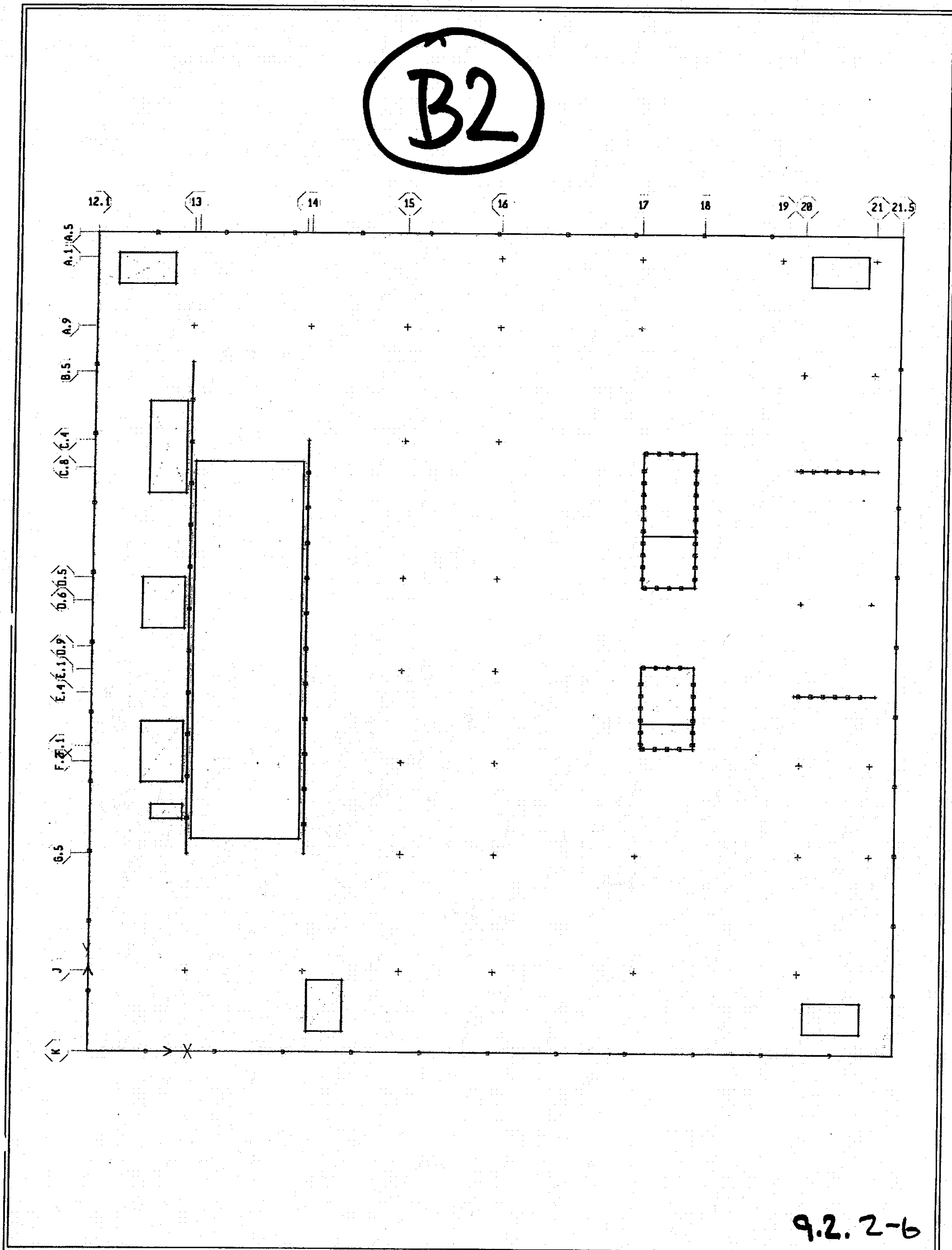
COLUMN		ONE LEVEL B2		THREE LEVELS B2,B3,B4		
		FZ DL (kips)	FZ LL (kips)	FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
11	COL24X48	55	18	164	53	319
13	COL24X48	81	26	244	79	476
15	COL24X48	71	23	212	68	413
16	COL24X48	54	18	163	53	318
17	COL24X48	93	30	278	90	542
18	COL24X48	85	27	254	82	496
20	COL24X48	105	34	316	102	615
22	COL30DIA	22	7	67	21	131
49	COL24X48	81	26	244	79	476
77	COL24X48	66	21	197	63	383
79	COL24X48	72	23	217	70	424
81	COL24X48	79	25	237	76	461
99	COL24X48	103	33	308	99	599
121	COL24X48	116	38	349	113	680
124	COL24X48	50	16	149	48	291
159	COL24X48	79	25	236	76	459
160	COL24X48	80	26	239	77	466
161	COL24DIA	22	7	65	20	125
162	COL24X48	110	36	331	107	646
163	COL30DIA	57	18	172	55	334
165	COLX48Y24	90	29	271	87	528
166	COL24DIA	13	4	38	12	72
167	COL24DIA	19	6	57	18	110
168	COL36DIA	131	42	393	127	766
170	COL30DIA	72	23	217	70	423
171	COL24DIA	23	7	70	22	136
172	COL24DIA	17	5	52	16	100
173	COL30DIA	56	18	168	54	328
174	COLX48Y24	17	5	52	16	100
175	COLX48Y24	100	32	301	97	586
245	COL24X48	69	22	208	67	405
267	COL30DIA	81	26	244	79	475
272	COL30DIA	66	21	197	64	384
273	COL24X48	81	26	243	79	474

WALL REACTIONS including wall SW

WALL		ONE LEVEL		THREE LEVELS		
		FZ DL (kips)	FZ LL (kips)	FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
1	WALL24	127	25	380	76	661
2	WALL24	56	8	168	25	278
3	WALL24	656	90	1969	271	3217
4	WALL24	80	16	241	48	419
5	WALL24	100	17	301	51	509
6	WALL24	641	58	1924	174	2988
8	WALL24	637	51	1912	154	2938
12	WALL24	58	9	174	27	289
13	WALL24	168	29	504	86	852
14	WALL30	96	21	287	62	508
15	WALL24	202	40	607	120	1053
17	WALL24	99	30	297	90	569
19	WALL24	75	22	224	67	428
28	WALL24	743	84	2230	253	3552
34	WALL24	676	69	2027	206	3187
38	WALL24	666	78	1997	235	3195

9.2.2-5

SAFE



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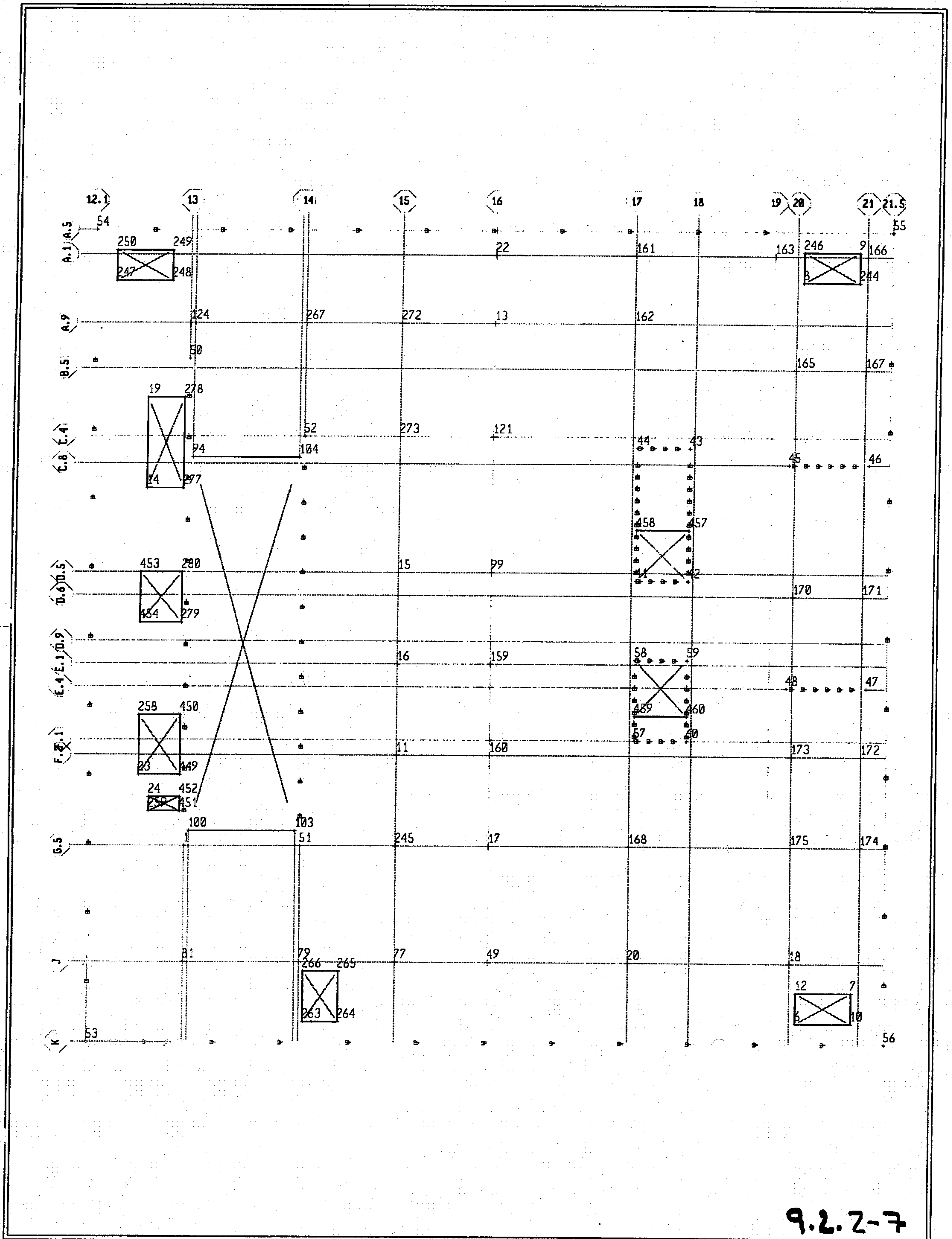
Structural Layer Plan View - Kip-in Units

SAFE



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Structural Layer Plan View - Kip-in Units

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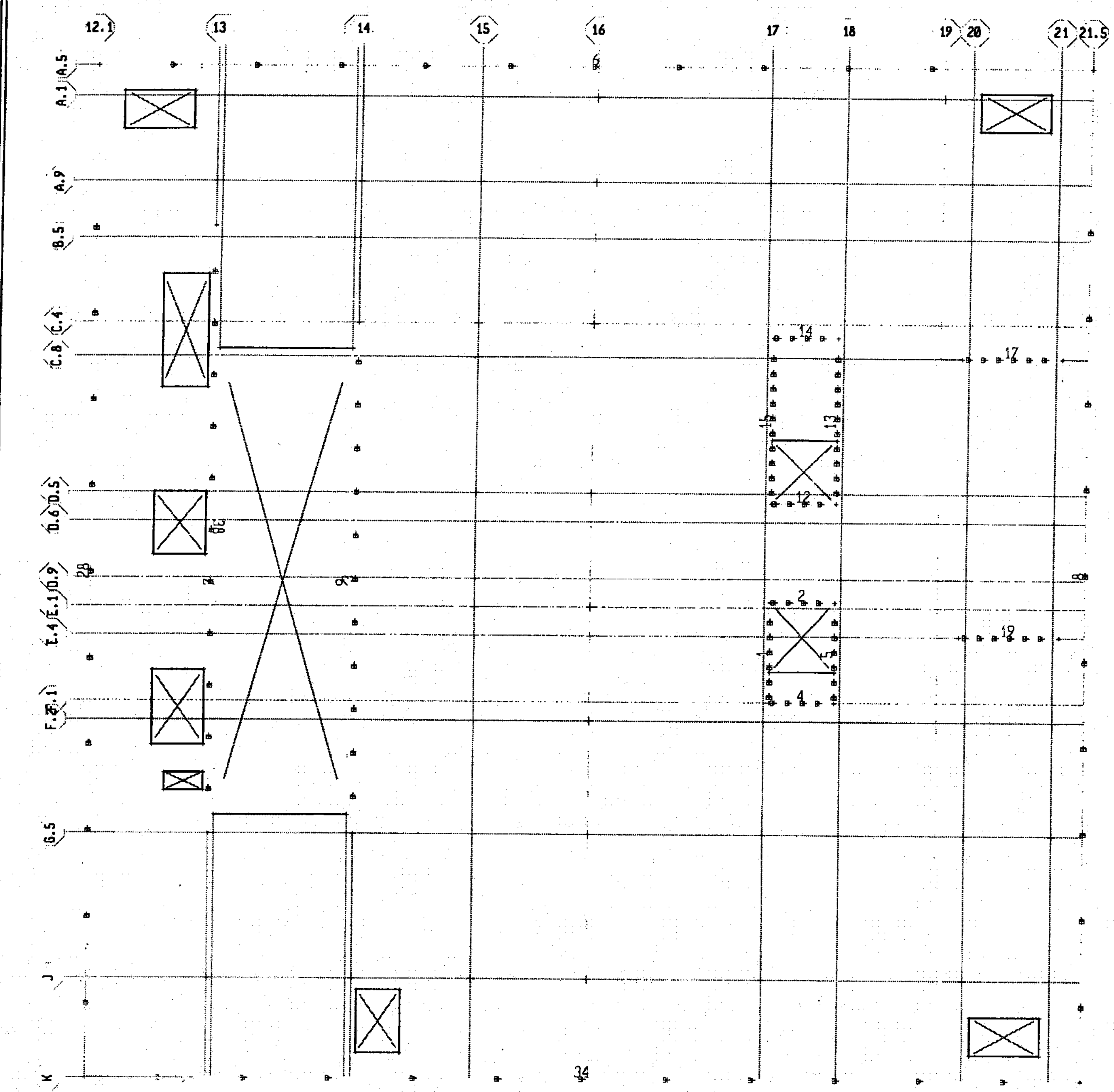

9.2.2-8

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Structural Layer Plan View - Kip-in Units

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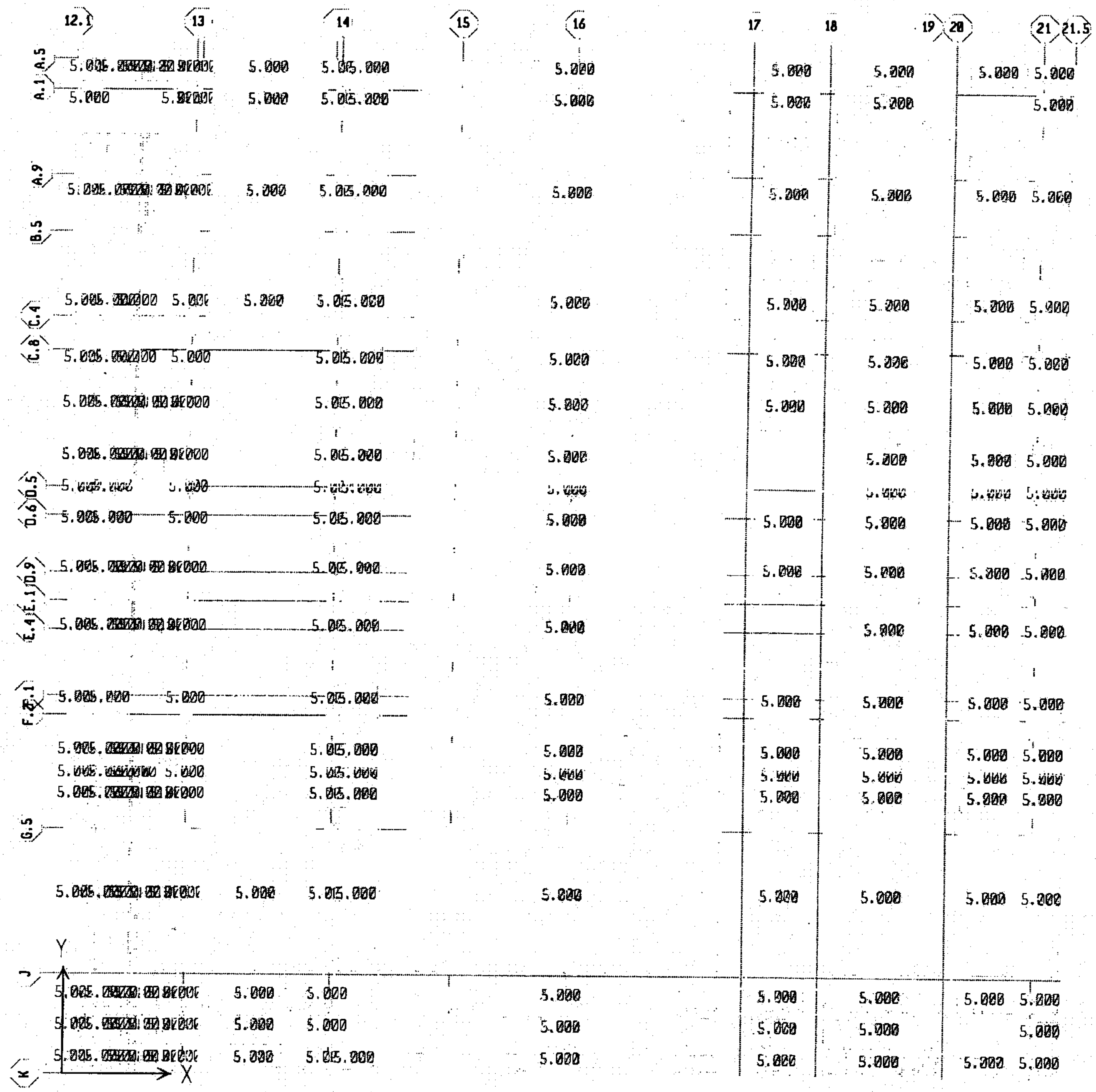
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9.2.2-9

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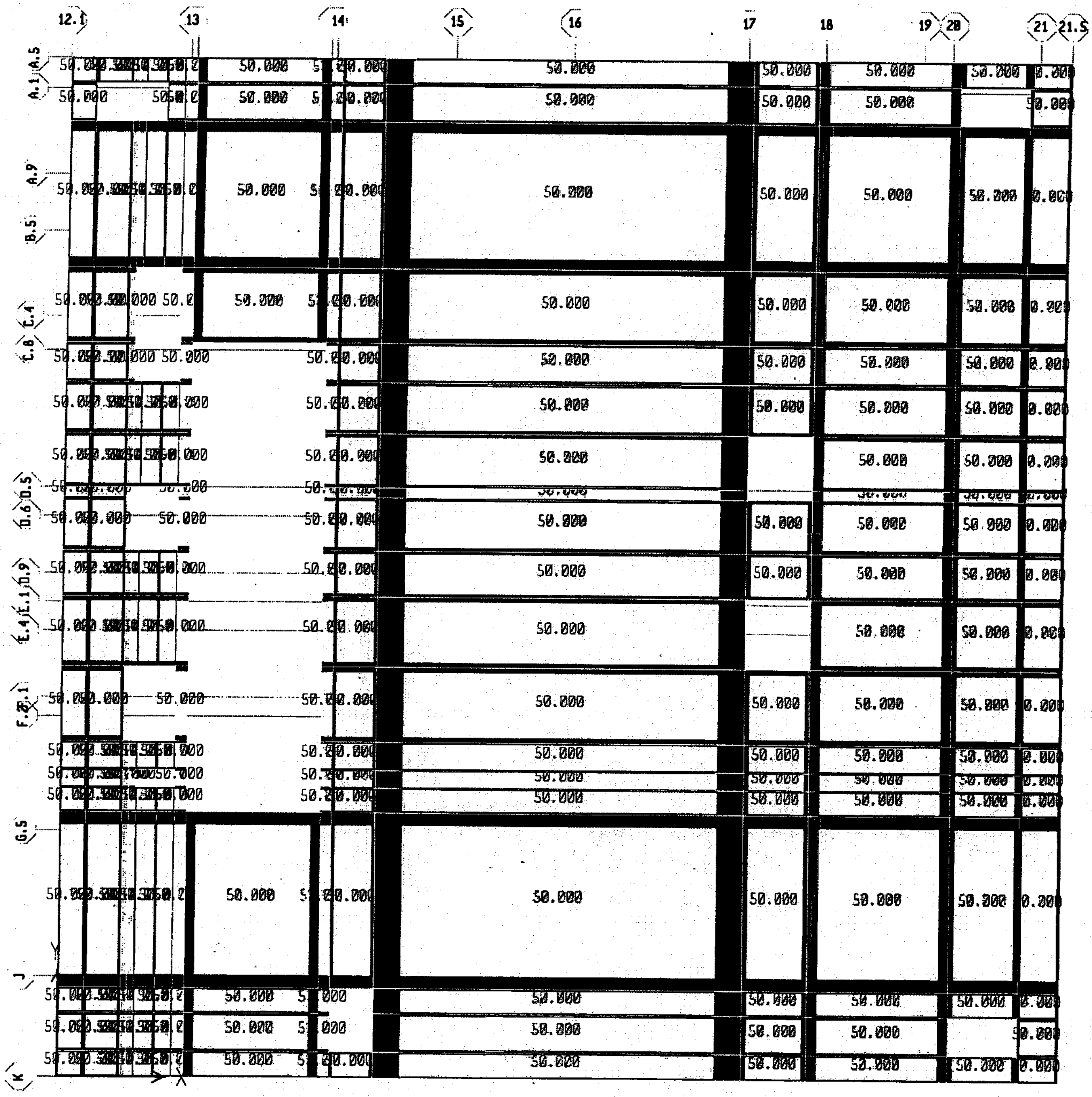

9.22-10

SAFE v8.0.6 - File: 4069-JP-B2_16 - May 16,2005 10:58 - Scale: Fit to Page
Surface Loading (L) - lb-ft Units

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 1
May 16,2005 11:00

COLUMN SPRING REACTIONS

COLUMN	GRID I	GRID J	LOAD	FZ	MX	MY
13	57	109	L	26.27	-124.740	-132.886
13	57	109	DL	81.40	-386.889	-412.091
17	57	27	L	29.92	-104.704	-154.748
17	57	27	DL	92.75	-324.381	-479.805
245	46	27	L	22.37	-112.400	37.203
245	46	27	DL	69.36	-348.278	115.641
11	46	42	L	17.60	18.325	23.242
11	46	42	DL	54.53	56.711	72.223
272	46	109	L	21.20	-72.703	36.661
272	46	109	DL	65.73	-224.592	113.721
99	57	72	L	33.07	164.837	-154.871
99	57	72	DL	102.53	511.052	-480.623
15	46	72	L	22.78	126.383	6.199
15	46	72	DL	70.60	391.750	19.370
49	57	13	L	26.27	175.570	-101.716
49	57	13	DL	81.46	542.949	-315.391
77	46	13	L	21.14	146.174	17.059
77	46	13	DL	65.58	451.828	52.954
79	33	13	L	23.37	234.958	109.094
79	33	13	DL	72.46	727.579	338.307
81	18	13	L	25.44	148.635	-89.566
81	18	13	DL	78.93	459.949	-276.930
121	57	93	L	37.51	-77.989	-177.852
121	57	93	DL	116.28	-241.873	-551.811
273	46	93	L	26.18	-40.613	21.979
273	46	93	DL	81.16	-125.907	68.557
267	33	109	L	26.19	-76.121	34.702
267	33	109	DL	81.22	-235.520	107.774
124	18	109	L	16.00	60.631	-64.775
124	18	109	DL	49.78	186.668	-200.240
22	57	119	L	7.10	-51.392	-14.692
22	57	119	DL	22.48	-154.973	-45.421
16	46	56	L	17.57	-20.077	25.869
16	46	56	DL	54.45	-62.227	80.330
159	57	56	L	25.32	-19.983	-160.606
159	57	56	DL	78.50	-61.964	-498.361
160	57	42	L	25.72	12.336	-162.552
160	57	42	DL	79.74	38.259	-504.302
161	73	119	L	6.79	-39.224	-6.534
161	73	119	DL	21.50	-118.580	-20.258
162	73	109	L	35.64	-175.368	-17.704
162	73	109	DL	110.47	-544.175	-54.850

9.2. 2-11

163	92	119	L	18.31	-192.384	39.154
163	92	119	DL	57.19	-591.722	121.677
165	96	103	L	29.16	78.010	237.432
165	96	103	DL	90.36	241.510	736.423
166	107	119	L	3.85	-26.234	17.314
166	107	119	DL	12.57	-79.417	50.721
167	107	103	L	5.97	9.676	38.774
167	107	103	DL	18.93	30.249	116.237
168	73	27	L	42.27	-79.553	-62.054
168	73	27	DL	131.05	-245.896	-192.506
20	73	13	L	33.93	198.509	-76.639
20	73	13	DL	105.21	614.242	-237.580
170	96	67	L	23.36	69.331	82.314
170	96	67	DL	72.43	215.076	256.064
171	107	67	L	7.38	12.044	53.424
171	107	67	DL	23.32	37.647	161.619
172	107	42	L	5.45	-5.440	29.695
172	107	42	DL	17.31	-16.935	88.302
173	96	42	L	18.08	-60.746	113.675
173	96	42	DL	56.04	-188.158	353.258
174	107	27	L	5.43	-10.985	33.371
174	107	27	DL	17.33	-34.166	98.537
175	96	27	L	32.36	-99.589	298.682
175	96	27	DL	100.29	-308.709	926.326
18	96	13	L	27.34	196.663	209.670
18	96	13	DL	84.81	608.779	649.458

SAFE v8.0.6 File: 4069-JP-B2_16 Kip-in Units PAGE 2
May 16,2005 11:00

WALL REACTIONS

WALL	LOAD	FZ	MX	MY
12	L	8.93	-299.669	66.856
12	DL	58.06	-929.016	207.515
13	L	28.83	290.566	-1146.284
13	DL	167.84	818.587	-3553.610
14	L	20.78	937.780	34.820
14	DL	95.77	2898.009	107.416
15	L	39.91	504.686	1946.086
15	DL	202.20	1483.731	6034.658
17	L	30.11	-239.217	1604.531
17	DL	98.99	-742.497	4932.051
19	L	22.32	145.330	1029.111
19	DL	74.81	451.601	3148.476
38	L	78.39	-1857.360	358.688
38	DL	665.63	-20652.790	-466.155
3	L	90.26	3.298	-1983.153
3	DL	656.37	-1095.146	-4566.869
28	L	84.48	-1611.700	-3661.679
28	DL	743.22	-4984.563	-11336.555
6	L	57.93	-2930.137	10420.936
6	DL	641.19	-9003.162	33006.204
8	L	51.17	-1598.716	2007.487
8	DL	637.31	-5350.443	6098.905

9.2.2-12

34	L	68.56	3003.429	-840.865
34	DL	675.62	9287.256	-2615.612
1	L	25.44	-81.897	1220.891
1	DL	126.54	-253.411	3783.444
2	L	8.30	301.106	56.197
2	DL	56.11	933.473	174.429
4	L	16.11	-627.817	-112.079
4	DL	80.30	-1944.816	-347.384
5	L	17.02	-221.068	-688.445
5	DL	100.43	-685.092	-2131.875

9.2.2-13

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Job no. : 4069
Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

L1

LEVEL L1 Reactions include wall self weight and cladding

COLUMN SPRING REACTIONS

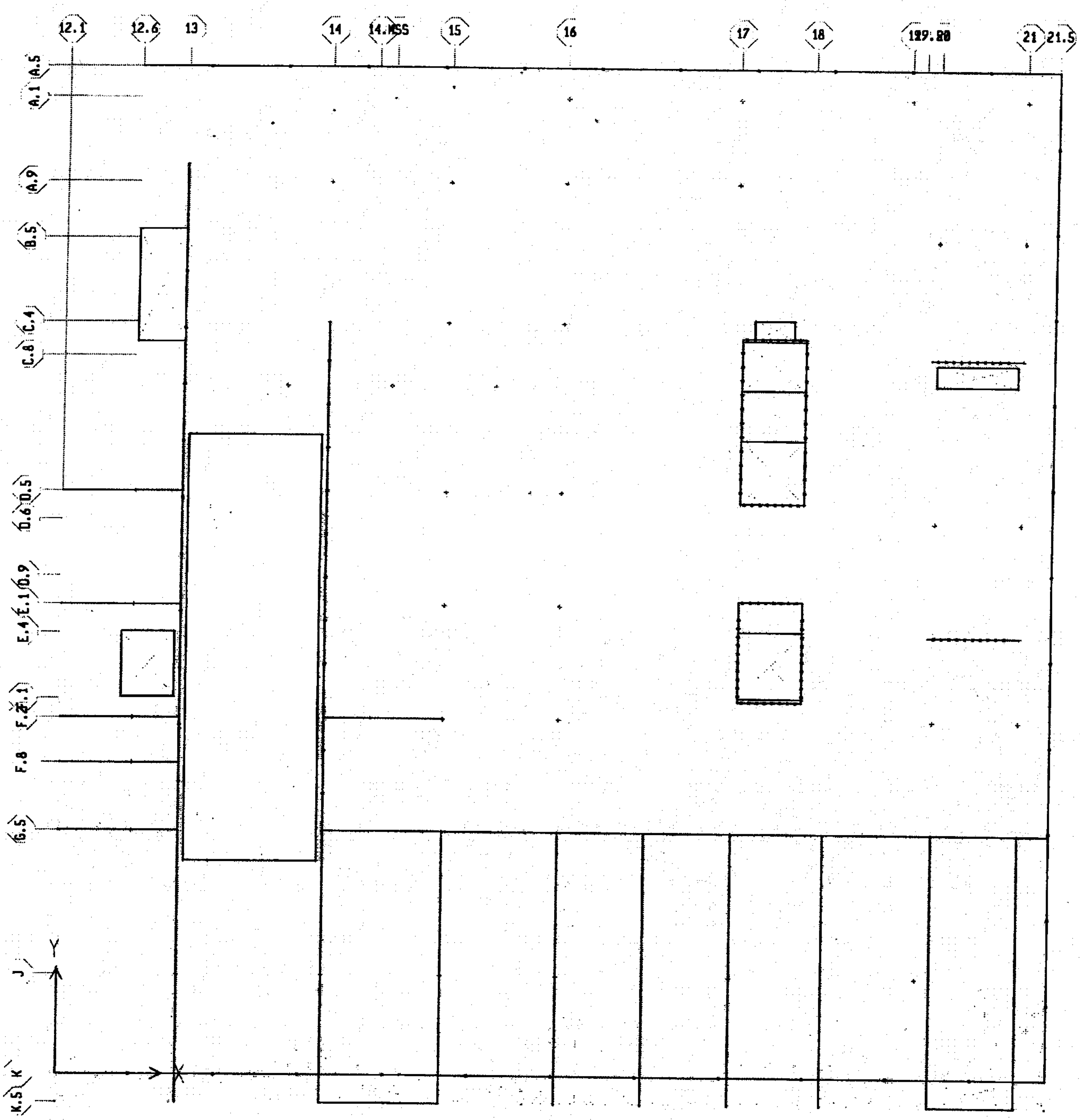
COLUMN	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
7 24X24	180	48	333
8 HSS16X16	101	36	203
9 HSS16X16	116	41	233
10 HSS16X16	134	51	275
11 24DIA	146	49	288
13 24X48	117	54	256
14 24DIA	254	76	485
15 36DIA	103	37	207
16 24DIA	102	36	204
17 36DIA	203	41	353
18 24X48	185	18	290
20 24X48	206	19	321
22 24DIA	29	13	62
49 24X48	180	17	281
52 24DIA	121	32	223
53 24DIA	253	74	481
54 24DIA	204	57	382
77 24X48	167	18	264
79 24X48	206	22	326
81 24X48	219	46	386
99 36DIA	130	61	285
121 36DIA	141	67	312
159 30DIA	112	52	246
160 30DIA	105	50	233
161 24DIA	27	13	60
162 30DIA	146	73	329
163 30DIA	75	37	167
165 X48Y24	119	59	268
166 24DIA	24	11	52
167 24DIA	24	12	53
168 36DIA	309	64	541
170 30DIA	96	48	217
171 24DIA	30	14	67
172 24DIA	24	12	54
173 30DIA	68	35	155
174 X48Y24	59	9	98
175 X48Y24	235	46	407
245 36DIA	307	53	519
267 30DIA	148	53	297
272 30DIA	123	44	248
273 30DIA	102	36	203

WALL REACTIONS

WALL	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
1 WALL24	264	51	457
2 WALL24	142	19	231
3 WALL24	1710	326	2949
4 WALL24	155	26	262
5 WALL24	232	34	383
6 WALL24	1047	116	1663
8 WALL24	1115	89	1711
12 WALL24	138	17	223
13 WALL24	383	57	633
14 WALL30	170	32	292
15 WALL24	425	78	728
17 WALL24	248	51	435
19 WALL24	235	44	404
34 WALL24	1632	117	2483
38 WALL24	1677	240	2755

9.2.2-14

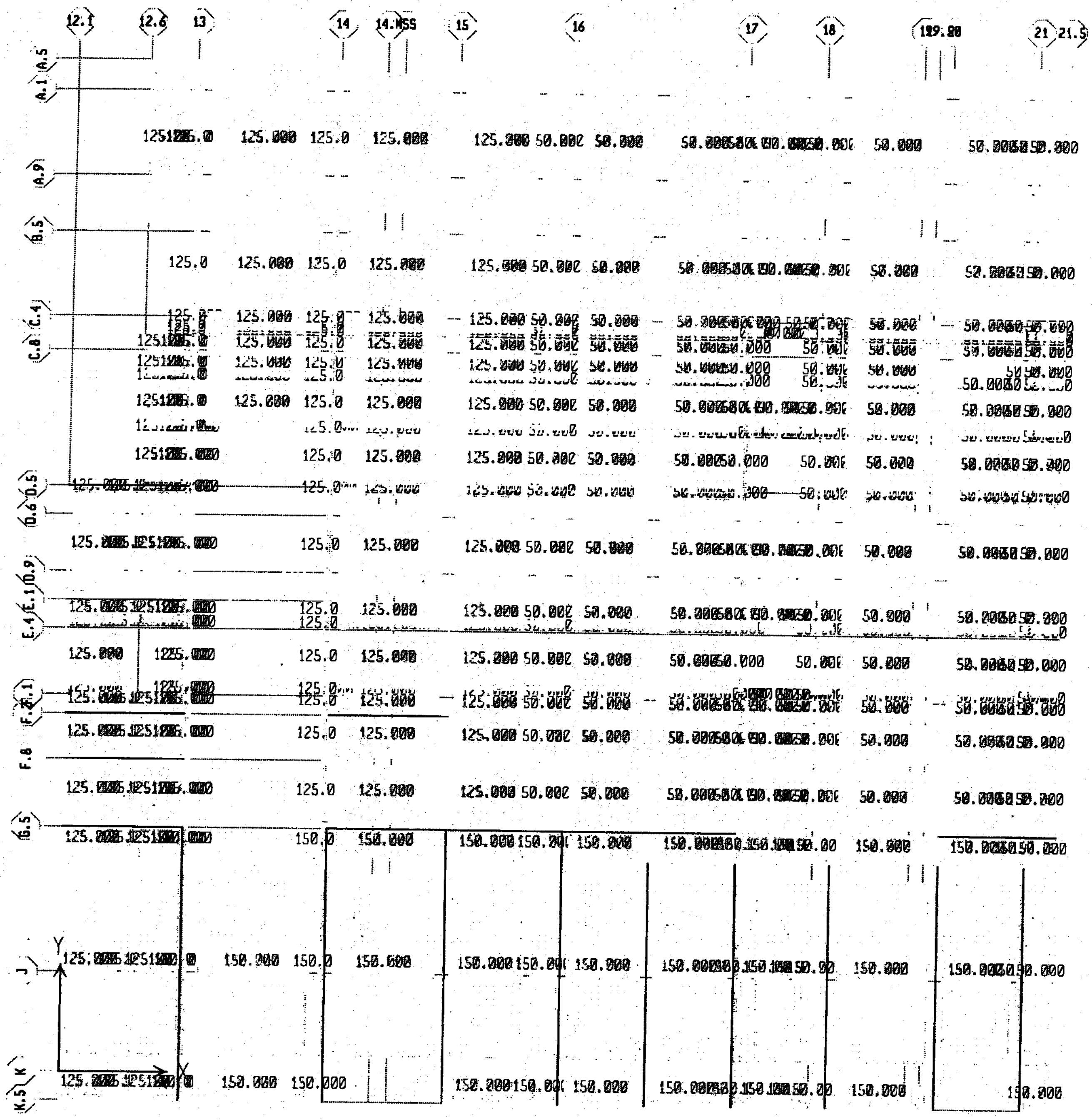
SAFE



9.2.2-15

SAFE v8.0.6 - File: 4069-JP-L1_04 - May 16,2005 10:52 - Scale: Fit to Page
Structural Layer Plan View - lb-ft Units

SAFE



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G.5
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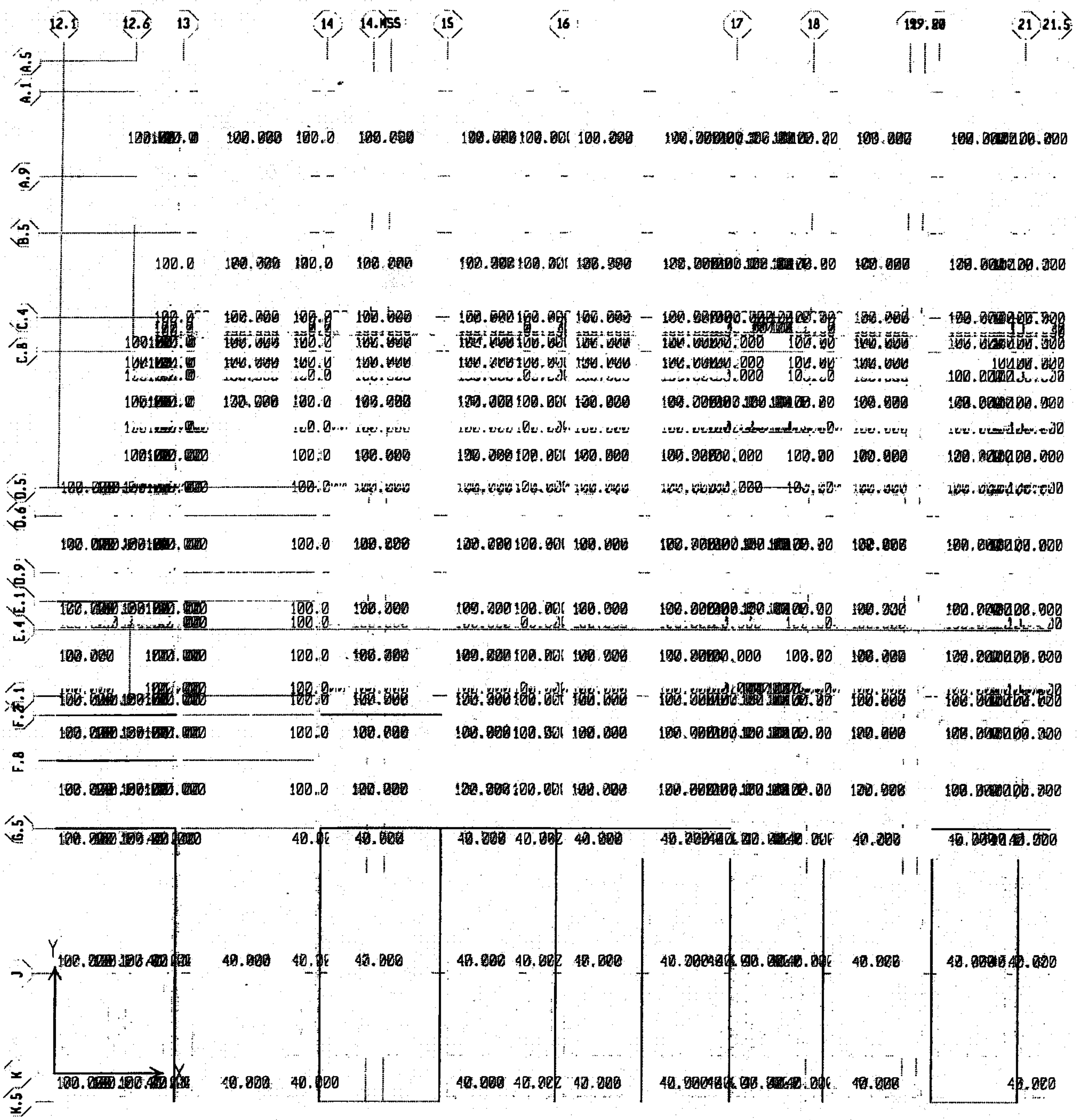
9.2.2-46

SAFE



9.2.2-17

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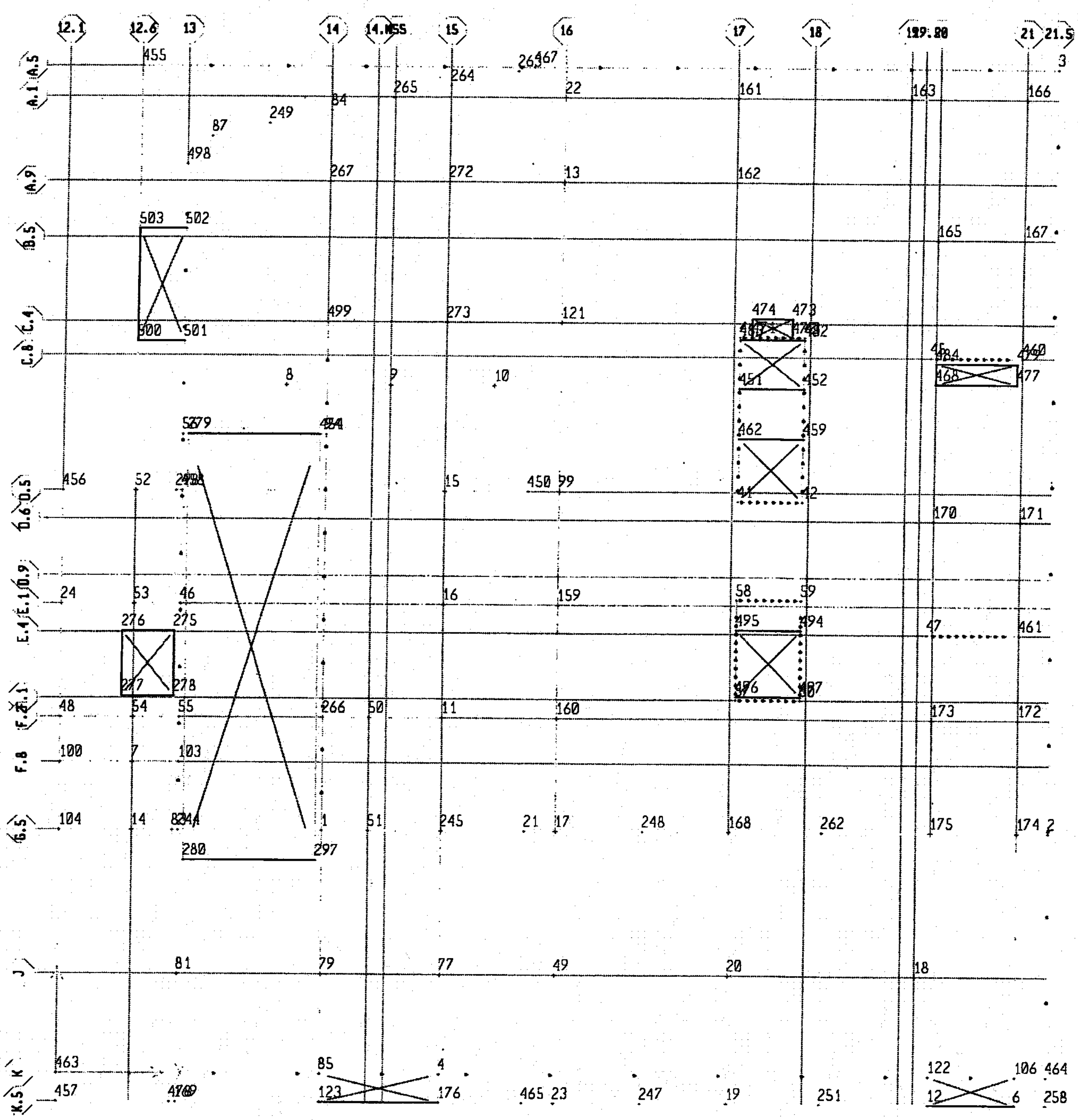
Surface Loading (L) - lb-ft Units

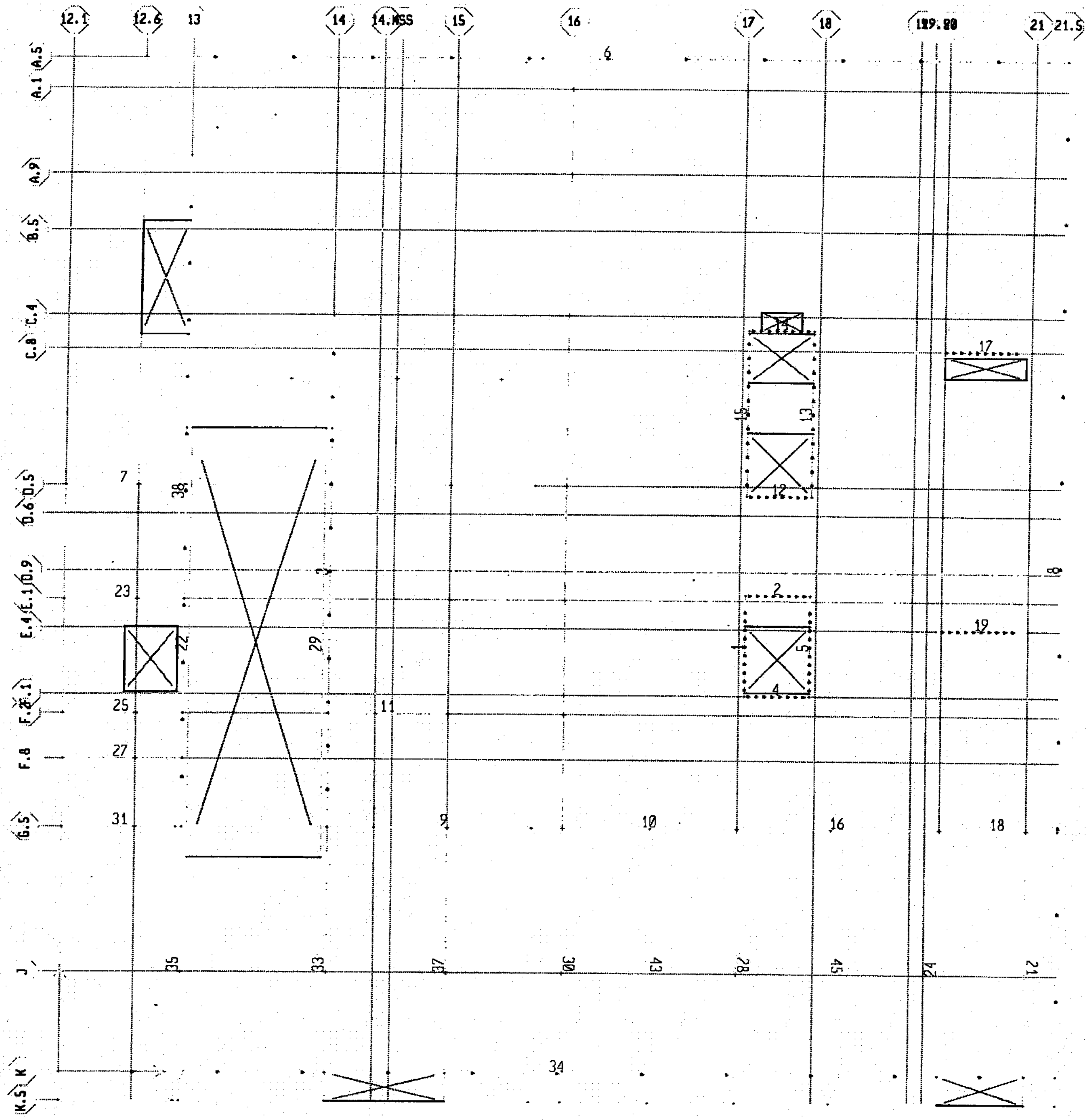
SAFE



9.2.2-18

SAFE v8.0.6 - File: 4069-JP-L1_04 - May 16,2005 10:23 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

SAFE



12.1
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D.5
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D.9
E.1
E.4
F.8
G.5
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K.5

9.2.2-19

SAFE v8.0.6 File: 4069-JP-L1_04 Kip-in Units PAGE 1
May 16,2005 11:00

COLUMN SPRING REACTIONS

COLUMN	GRID I	GRID J	LOAD	FZ	MX	MY
13	63	125	L	54.27	-271.904	-252.007
13	63	125	DL	116.93	-603.808	-350.191
17	63	29	L	40.59	183.931	-518.743
17	63	29	DL	203.18	-2006.552	-2464.208
99	63	75	L	61.09	157.627	-355.111
99	63	75	DL	129.50	313.562	-579.473
121	63	106	L	67.22	68.107	-450.896
121	63	106	DL	141.16	206.890	-792.550
22	63	140	L	12.89	-83.421	-23.753
22	63	140	DL	28.81	-172.162	-18.891
159	63	59	L	52.35	-22.804	-291.906
159	63	59	DL	112.48	-49.996	-444.935
160	63	41	L	50.44	48.894	-230.512
160	63	41	DL	105.37	138.588	-340.376
161	80	140	L	12.96	-77.483	-13.555
161	80	140	DL	27.01	-147.497	-28.641
162	80	125	L	73.34	-349.947	-43.293
162	80	125	DL	146.18	-698.278	-99.682
163	103	140	L	36.72	-372.427	52.976
163	103	140	DL	74.60	-733.666	106.823
165	108	117	L	59.47	153.442	503.849
165	108	117	DL	119.02	302.669	1009.889
166	118	140	L	10.95	-66.752	68.047
166	118	140	DL	23.68	-129.619	132.619
167	118	117	L	11.51	22.056	72.732
167	118	117	DL	24.14	43.938	137.253
168	80	29	L	63.78	293.480	-115.552
168	80	29	DL	309.19	-2396.876	-928.747
170	108	69	L	48.08	151.308	165.461
170	108	69	DL	96.44	300.963	334.831
171	118	69	L	14.44	29.082	104.225
171	118	69	DL	29.99	58.103	200.109
172	118	41	L	11.79	-17.375	69.600
172	118	41	DL	23.92	-25.080	124.451
173	108	41	L	35.04	-80.668	159.115
173	108	41	DL	67.95	-128.728	328.773
174	118	29	L	9.21	-4.459	204.725
174	118	29	DL	59.10	-1046.473	1126.739
175	108	29	L	46.01	75.363	1150.799
175	108	29	DL	234.96	-2113.718	5674.195
14	10	29	L	76.25	-417.523	428.186
14	10	29	DL	254.18	-1317.500	1280.360

9.2.2-20

52	10	75	L	31.64	-181.185	193.656
52	10	75	DL	120.88	-515.809	721.146
53	10	59	L	74.45	8.710	404.839
53	10	59	DL	253.04	21.153	1336.552
54	10	41	L	56.53	121.820	288.882
54	10	41	DL	204.11	344.878	1018.191
7	10	36	L	47.52	-5.598	193.877
7	10	36	DL	180.44	13.936	706.365
8	28	90	L	36.17	8.201	54.613
8	28	90	DL	101.04	23.573	147.298
9	42	90	L	41.23	-22.316	-26.133
9	42	90	DL	116.25	-62.815	-72.577
10	53	90	L	51.15	-75.764	-37.951
10	53	90	DL	134.29	-180.187	-60.332
15	48	75	L	36.55	9.258	43.823
15	48	75	DL	103.37	15.366	91.711
16	48	59	L	35.98	-12.160	32.518
16	48	59	DL	101.84	-33.720	64.115
245	48	29	L	52.60	66.801	690.162
245	48	29	DL	306.60	-1828.096	4174.863
11	48	41	L	49.10	16.372	279.185
11	48	41	DL	145.93	46.460	862.315
18	105	12	L	18.18	34.245	21.708
18	105	12	DL	185.19	396.411	41.938
20	80	12	L	18.89	211.792	-45.576
20	80	12	DL	206.37	2868.825	-278.646
49	63	12	L	17.02	165.831	-74.019
49	63	12	DL	179.86	2257.164	-895.103
77	48	12	L	17.58	218.598	63.643
77	48	12	DL	167.24	2257.345	395.901
79	33	12	L	22.31	461.813	-32.010
79	33	12	DL	205.86	3973.661	119.952
81	15	12	L	46.49	792.437	877.585
81	15	12	DL	219.33	3635.359	1181.508
267	33	125	L	52.57	-162.362	50.600
267	33	125	DL	148.18	-402.491	167.801
272	48	125	L	44.11	-173.831	74.754
272	48	125	DL	123.49	-454.644	191.118
273	48	106	L	35.76	256.434	92.102
273	48	106	DL	101.59	693.370	220.760

SAFE v8.0.6 File: 4069-JP-L1_04 Kip-in Units PAGE 2
May 16,2005 11:00

WALL REACTIONS

WALL	LOAD	FZ	MX	MY
12	L	17.07	-598.972	149.831

9.2.2-21

12	DL	138.24	-1195.723	290.061
13	L	56.96	456.565	-2483.955
13	DL	383.16	711.898	-4963.108
14	L	31.83	1312.272	33.626
14	DL	170.16	2602.069	50.437
15	L	78.42	880.057	3983.181
15	DL	425.01	1552.057	7876.479
17	L	51.07	221.119	2707.318
17	DL	248.48	428.538	5480.827
19	L	44.30	240.485	1845.359
19	DL	234.75	479.789	3755.965
1	L	51.23	197.041	2358.054
1	DL	263.90	487.374	4602.014
2	L	18.86	557.775	146.617
2	DL	141.90	1112.643	283.390
4	L	26.37	-1078.178	46.888
4	DL	155.06	-2094.318	-12.954
5	L	34.33	70.988	-1322.633
5	DL	231.80	150.611	-2634.476
38	L	239.66	42196.192	-1103.576
38	DL	1676.83	94997.564	-2927.905
3	L	326.40	-12314.217	-3617.928
3	DL	1710.23	-119262.961	-11727.131
34	L	116.71	3205.418	21363.317
34	DL	1631.69	21689.921	-30939.348
6	L	115.66	-6018.748	21788.379
6	DL	1047.19	-14889.140	83495.530
8	L	88.58	11401.208	3572.403
8	DL	1114.65	-61346.561	10739.663

9.2.2-22

Date: 5/16/2005 Time: 10:22 AM File: 4069-JP-Podium gravity columns and walls.xls

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Job no. : 4069
Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

L2

LEVEL L2 Reactions include wall self weight and cladding

COLUMN SPRING REACTIONS

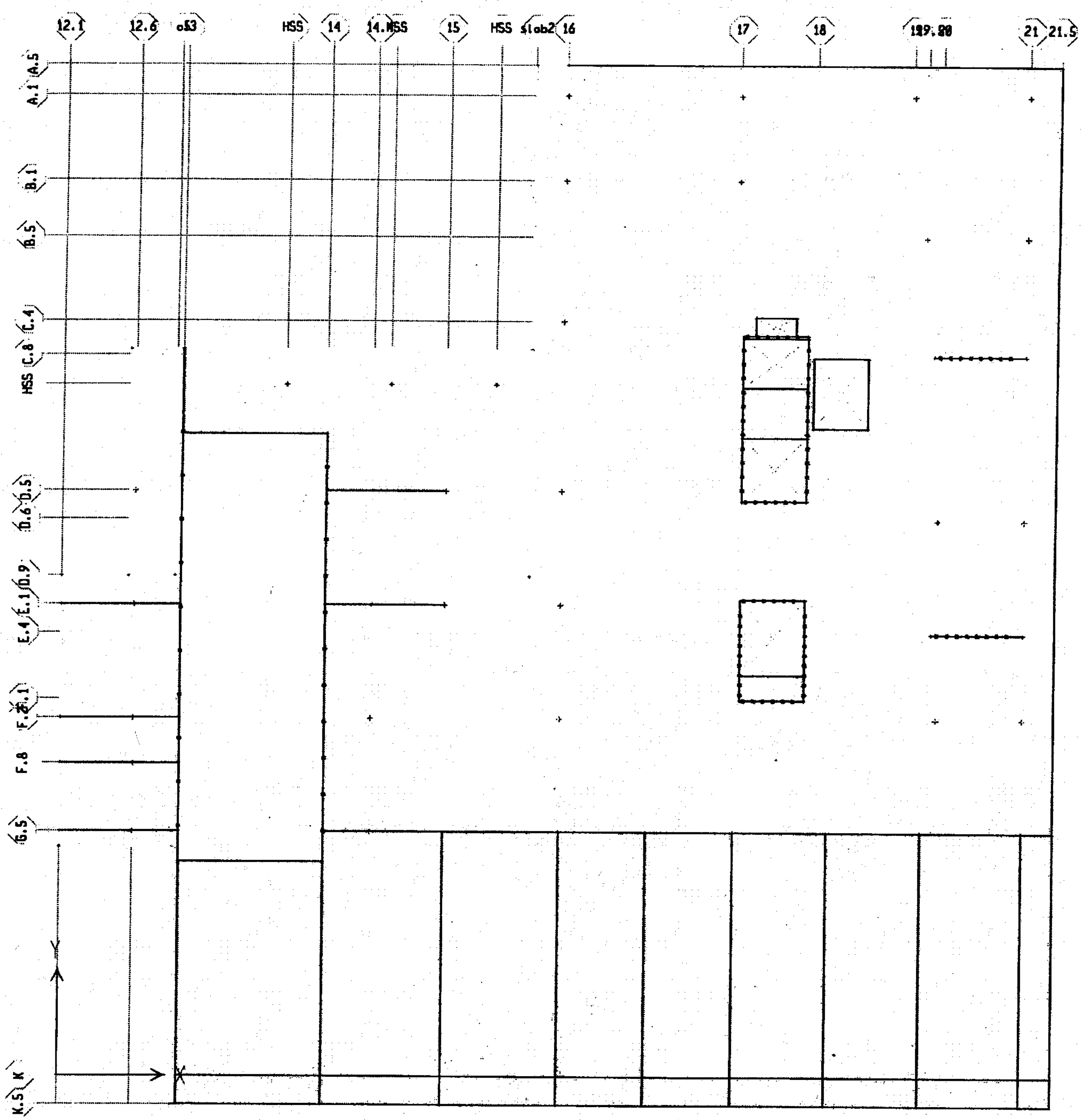
COLUMN	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
7 24X24	88	25	165
8 HSS16X16	58	21	117
9 HSS16X16	68	24	136
10 HSS16X16	69	26	140
13 36X36	79	40	178
14 24DIA	73	20	136
15 24DIA	178	65	359
16 24DIA	177	62	354
17 30DIA	502	77	834
22 24DIA	48	22	104
50 24DIA	92	36	190
51 24DIA	289	47	485
52 24DIA	21	7	41
53 24DIA	114	35	220
54 24DIA	105	31	200
99 30DIA	129	61	284
121 36X36	110	55	247
159 30DIA	115	52	251
160 30DIA	100	57	237
161 24DIA	82	36	177
162 30DIA	148	75	335
163 24DIA	94	44	207
165 87X24	119	61	271
166 24DIA	56	24	118
167 24DIA	67	30	145
168 30DIA	462	74	773
170 30DIA	91	46	207
171 24DIA	69	31	150
172 30DIA	30	20	76
173 24DIA	40	31	108
174 24DIA	206	28	336
175 87X24	401	62	667

WALL REACTIONS

WALL	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
1 WALL24	177	51	333
2 WALL24	84	16	144
3 WALL24	1271	261	2224
4 WALL24	83	25	159
5 WALL24	149	34	267
12 WALL24	86	17	150
13 WALL24	219	42	378
14 WALL30	116	31	215
15 WALL24	294	80	549
17 WALL24	229	75	448
19 WALL24	187	52	350
38 WALL24	1205	151	1944
47 WALL14ATK	2013	122	3025

9.2.2-23

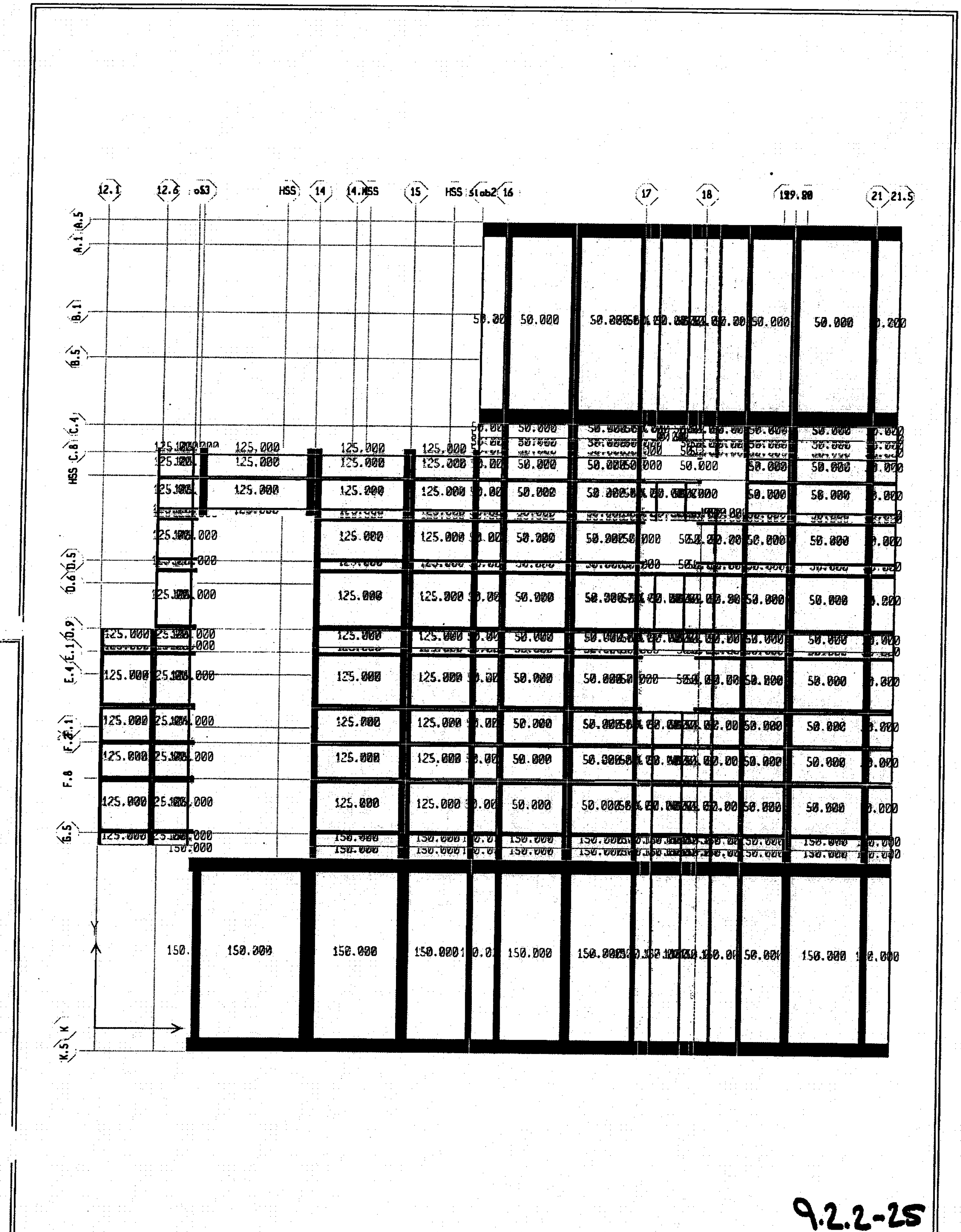
SAFE



9.2.2-24

SAFE v8.0.6 - File: 4069-JP-L2_08 - May 16,2005 10:51 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

SAFE



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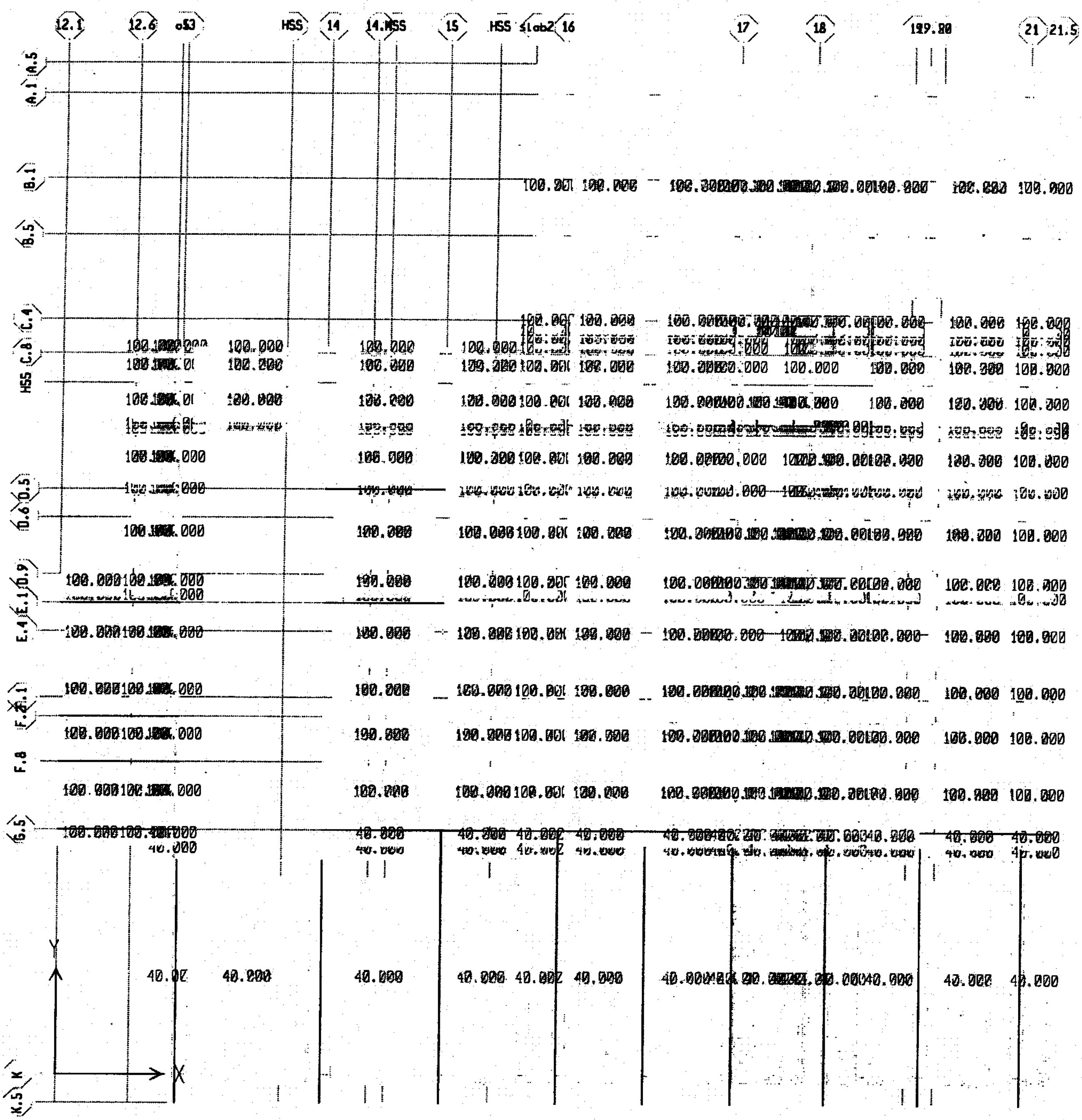
Surface Loading (SDL) - lb-ft Units

SAFE



9.2.2-26

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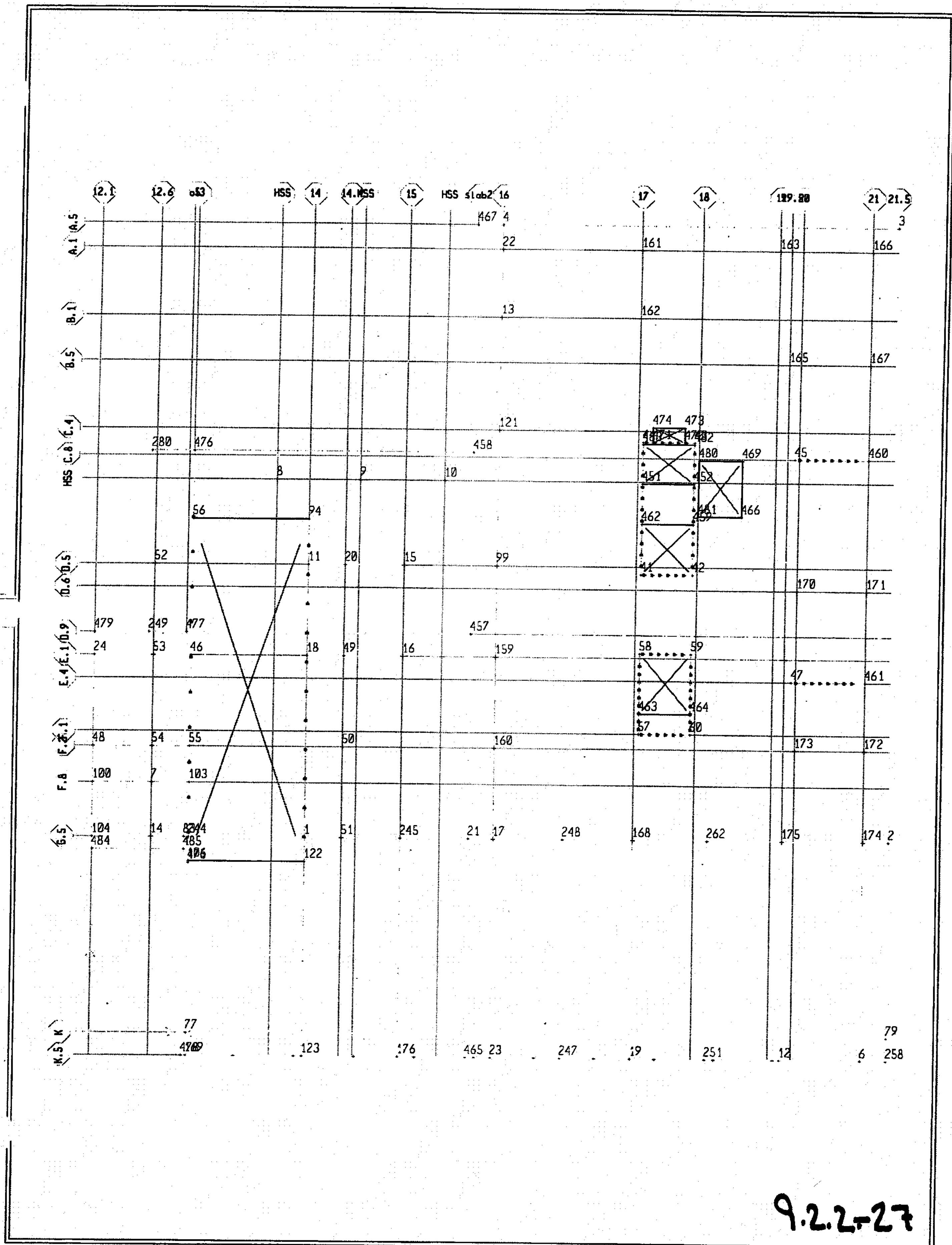
Surface Loading (L) - lb-ft Units

DODSONNOC00000761

SAFE



9.2.2-27

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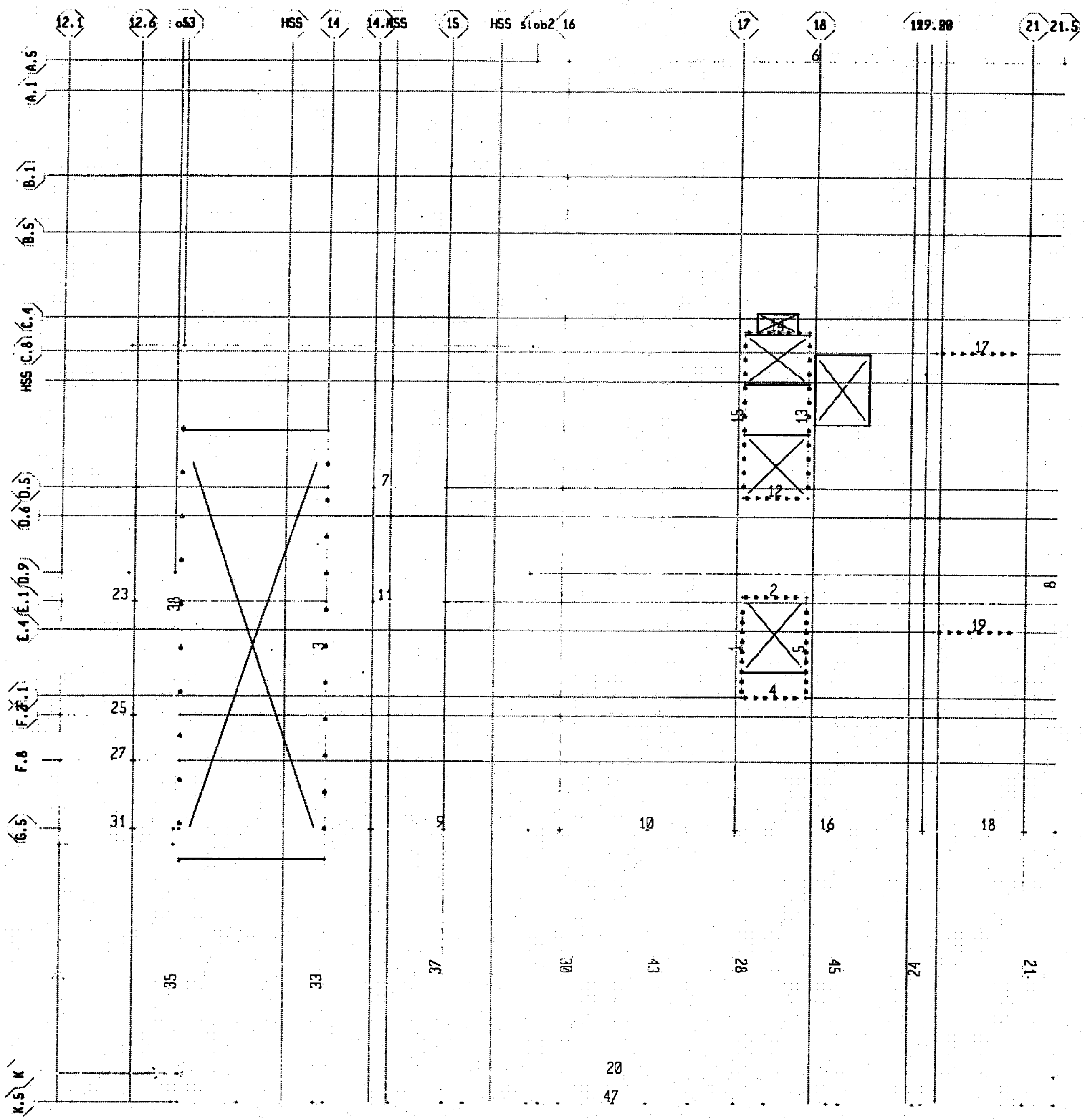
Structural Layer Plan View - Kip-in Units

DODSONNOC00000762

SAFE



9.2.2-28

SAFE v8.0.6 - File: 4069-JP-L2_08 - May 16,2005 10:25 - Scale: Fit to Page
Structural Layer Plan View - Kip-in Units

SAFE v8.0.6 File: 4069-JP-L2_08 Kip-in Units PAGE 1
May 16,2005 11:00

COLUMN SPRING REACTIONS

COLUMN	GRID I	GRID J	LOAD	FZ	MX	MY
13	56	118	L	39.81	-182.666	-830.106
13	56	118	DL	78.56	-377.469	-1684.265
17	56	29	L	77.10	-896.276	222.066
17	56	29	DL	502.37	-13113.549	1543.713
99	56	71	L	60.90	169.269	-330.242
99	56	71	DL	128.83	341.260	-537.728
121	56	100	L	54.90	-60.520	-791.102
121	56	100	DL	109.85	-124.272	-1578.897
22	56	128	L	21.94	16.582	-490.297
22	56	128	DL	48.00	101.849	-1081.315
159	56	55	L	52.48	-49.434	-247.437
159	56	55	DL	115.30	-147.140	-318.690
160	56	41	L	56.69	75.612	-0.300
160	56	41	DL	100.24	514.040	357.370
161	73	128	L	36.27	-36.543	23.888
161	73	128	DL	82.11	26.174	54.500
162	73	118	L	74.95	-313.529	41.455
162	73	118	DL	147.96	-640.983	91.654
163	96	128	L	44.02	-408.317	209.059
163	96	128	DL	94.24	-696.432	467.694
165	98	111	L	60.91	197.040	414.357
165	98	111	DL	119.38	372.579	847.301
166	110	128	L	23.61	-323.478	80.112
166	110	128	DL	55.77	-599.201	82.679
167	110	111	L	30.25	142.681	29.322
167	110	111	DL	66.87	290.029	-51.062
168	73	29	L	73.77	-790.971	-51.298
168	73	29	DL	462.30	-12721.492	-533.454
170	101	65	L	46.39	170.908	158.777
170	101	65	DL	91.28	344.842	334.523
171	110	65	L	30.99	181.532	-6.315
171	110	65	DL	69.48	398.817	-119.873
172	110	41	L	20.10	-44.068	-3.280
172	110	41	DL	30.17	234.148	-121.377
173	101	41	L	31.03	-43.750	122.083
173	101	41	DL	39.79	184.149	203.725
174	110	29	L	27.98	-401.896	-5.050
174	110	29	DL	206.09	-5786.109	-165.166
175	98	29	L	62.11	-1002.825	1364.169
175	98	29	DL	401.28	-14366.903	8329.016
14	9	29	L	20.11	72.661	240.008
14	9	29	DL	72.80	231.910	842.758

9.2.2-29

50	33	41	L	36.18	11.599	-289.372
50	33	41	DL	92.07	86.052	-722.576
51	33	29	L	46.81	-80.478	-306.008
51	33	29	DL	289.41	-2112.781	-1918.941
52	9	71	L	7.34	10.493	-2.624
52	9	71	DL	20.72	25.981	-14.908
53	9	55	L	35.06	-100.333	385.648
53	9	55	DL	114.49	-288.645	1225.889
54	9	41	L	31.41	136.187	353.695
54	9	41	DL	104.58	385.893	1146.314
7	9	36	L	24.89	-25.049	238.768
7	9	36	DL	87.96	-75.487	808.416
8	24	86	L	21.23	9.112	11.781
8	24	86	DL	58.05	28.298	35.698
9	36	86	L	24.23	-37.196	-8.275
9	36	86	DL	67.71	-87.350	-33.216
10	47	86	L	25.63	-114.838	-32.870
10	47	86	DL	68.54	-259.332	-38.138
15	42	71	L	64.66	11.469	533.438
15	42	71	DL	177.77	17.450	1334.658
16	42	55	L	62.15	-137.903	363.171
16	42	55	DL	177.48	-373.801	957.894

SAFE v8.0.6 File: 4069-JP-L2_08 Kip-in Units PAGE 2
May 16,2005 11:00

WALL REACTIONS

WALL	LOAD	FZ	MX	MY
12	L	17.26	-598.152	145.632
12	DL	86.33	-1195.900	280.642
13	L	42.33	-608.418	-1698.494
13	DL	218.59	-1307.878	-3394.679
14	L	31.43	1264.530	121.785
14	DL	115.74	2521.354	239.922
15	L	80.43	1082.812	4200.493
15	DL	294.26	2131.021	8352.267
17	L	74.91	-1098.213	915.948
17	DL	229.01	-2287.365	908.481
19	L	51.72	265.481	998.660
19	DL	187.46	267.599	1362.451
1	L	50.69	-20.197	2364.062
1	DL	176.57	766.741	4337.802
2	L	15.95	602.045	116.423
2	DL	83.82	1204.748	227.910
4	L	25.47	-884.521	25.296
4	DL	82.64	-735.004	-123.437
5	L	34.30	-179.943	-1361.774
5	DL	149.17	16.970	-2635.687
38	L	150.78	14564.408	551.130
38	DL	1205.41	-9142.394	-79.922
3	L	261.41	29784.564	-5901.712
3	DL	1270.96	14708.509	-16712.576
47	L	121.52	0.000	914.540
47	DL	2013.35	0.000	-12067.411

9.2.2-30

Date: 5/16/2005 Time: 10:22 AM File: 4069-JP-Podium gravity columns and walls.xls

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Job no. : 4069
Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

L3

LEVEL L3 Reactions include wall self weight and cladding

COLUMN SPRING REACTIONS

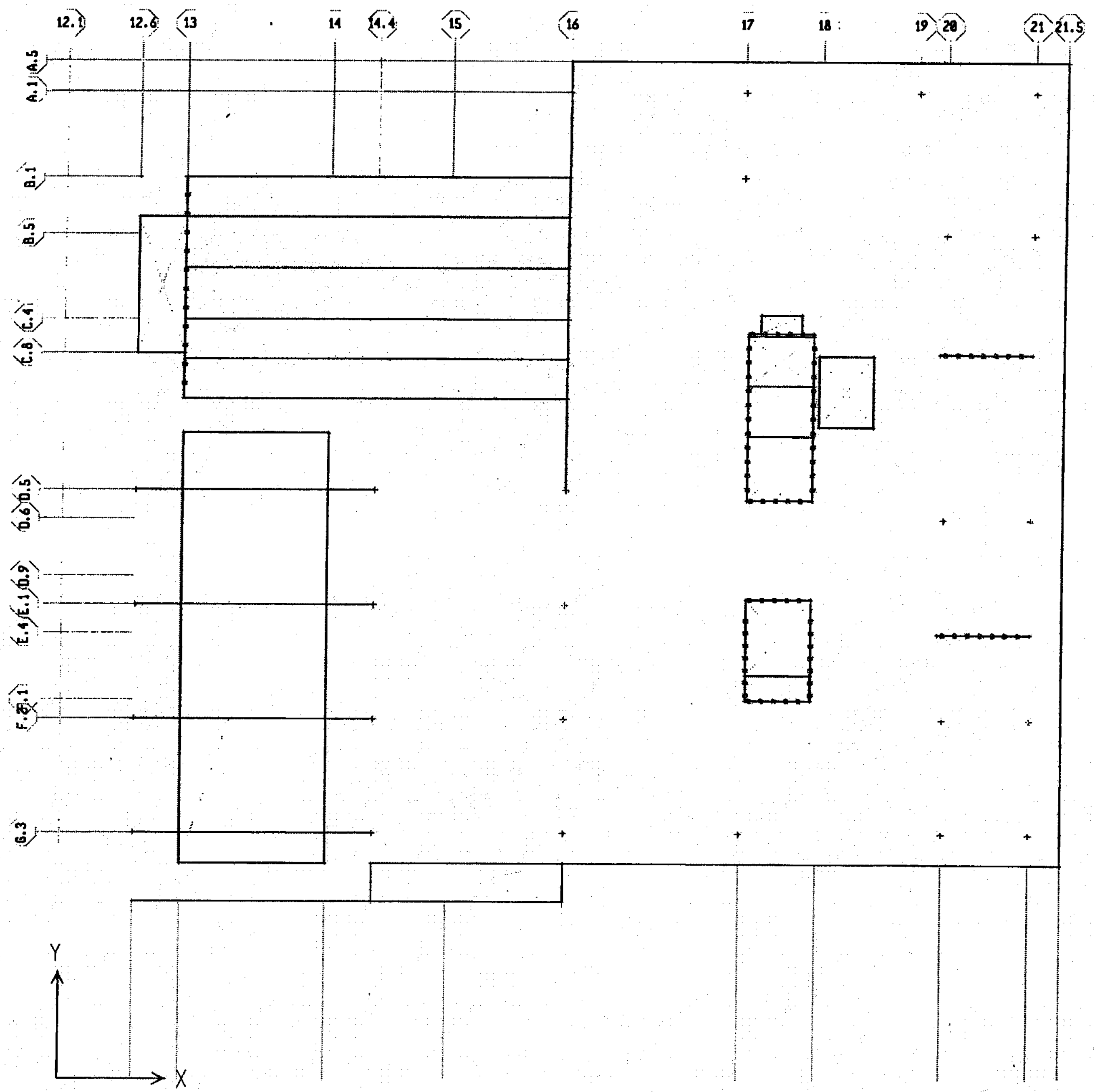
COLUMN	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
13 COL30DIA	178	61	353
14 COL24DIA	51	21	109
17 COL30DIA	98	36	199
20 COL24DIA	196	90	428
22 COL24DIA	34	8	61
49 COL24DIA	127	58	276
50 COL24DIA	140	65	306
51 COL24DIA	113	50	243
52 COL24DIA	56	25	120
53 COL24DIA	59	25	124
54 COL24DIA	59	25	126
99 COL30DIA	182	61	360
121 COL30DIA	349	117	688
124 COL24X48	42	17	87
159 COL30DIA	128	49	262
160 COL30DIA	134	52	276
161 COL24DIA	77	19	140
162 COL30DIA	131	34	241
163 COL24DIA	91	23	166
165 COL24DIA	111	30	206
166 COL24DIA	49	12	88
167 COL24DIA	54	13	98
168 COL30DIA	103	25	186
170 COL24DIA	86	23	160
171 COL24DIA	64	16	115
172 COL24DIA	43	11	79
173 COL24DIA	70	19	130
174 COL24DIA	34	8	60
175 COL24DIA	80	20	146

WALL REACTIONS

WALL	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
1 WALL24	160.88	21.39	262
2 WALL24	75.73	8.33	120
4 WALL24	109.43	17.5	183
5 WALL24	135.75	17.32	219
12 WALL24	78.56	9.02	125
13 WALL24	197.64	21.66	314
14 WALL30	108.59	16.68	180
15 WALL24	238.1	28.9	382
17 WALL24	209.22	37.69	357
19 WALL24	158.1	24.52	263
38 WALL24	502.06	157.17	970

9.2.2-31

SAFE



9.2.2-32

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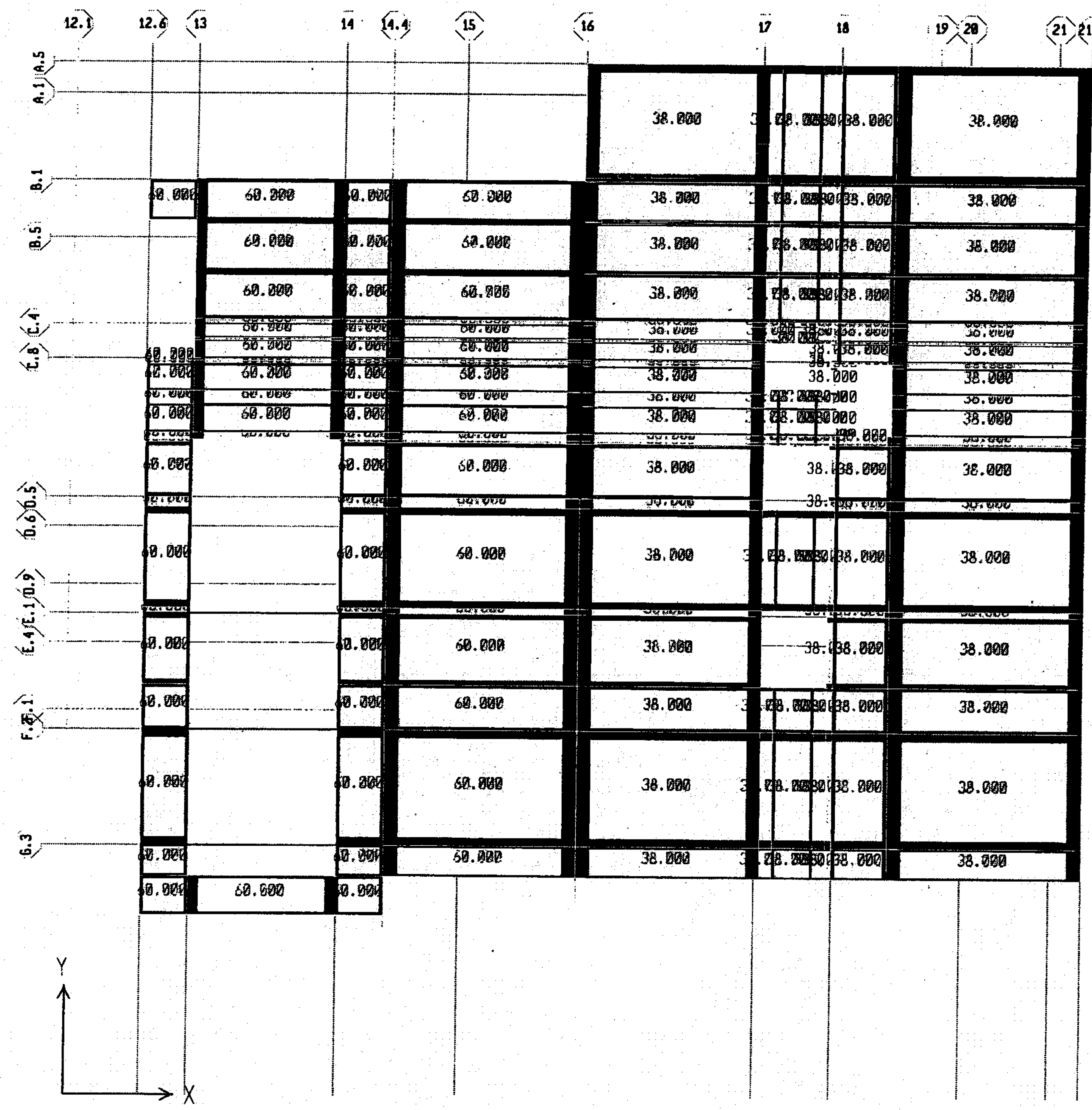
Structural Layer Plan View - lb-ft Units

SAFE



9.2.2-33

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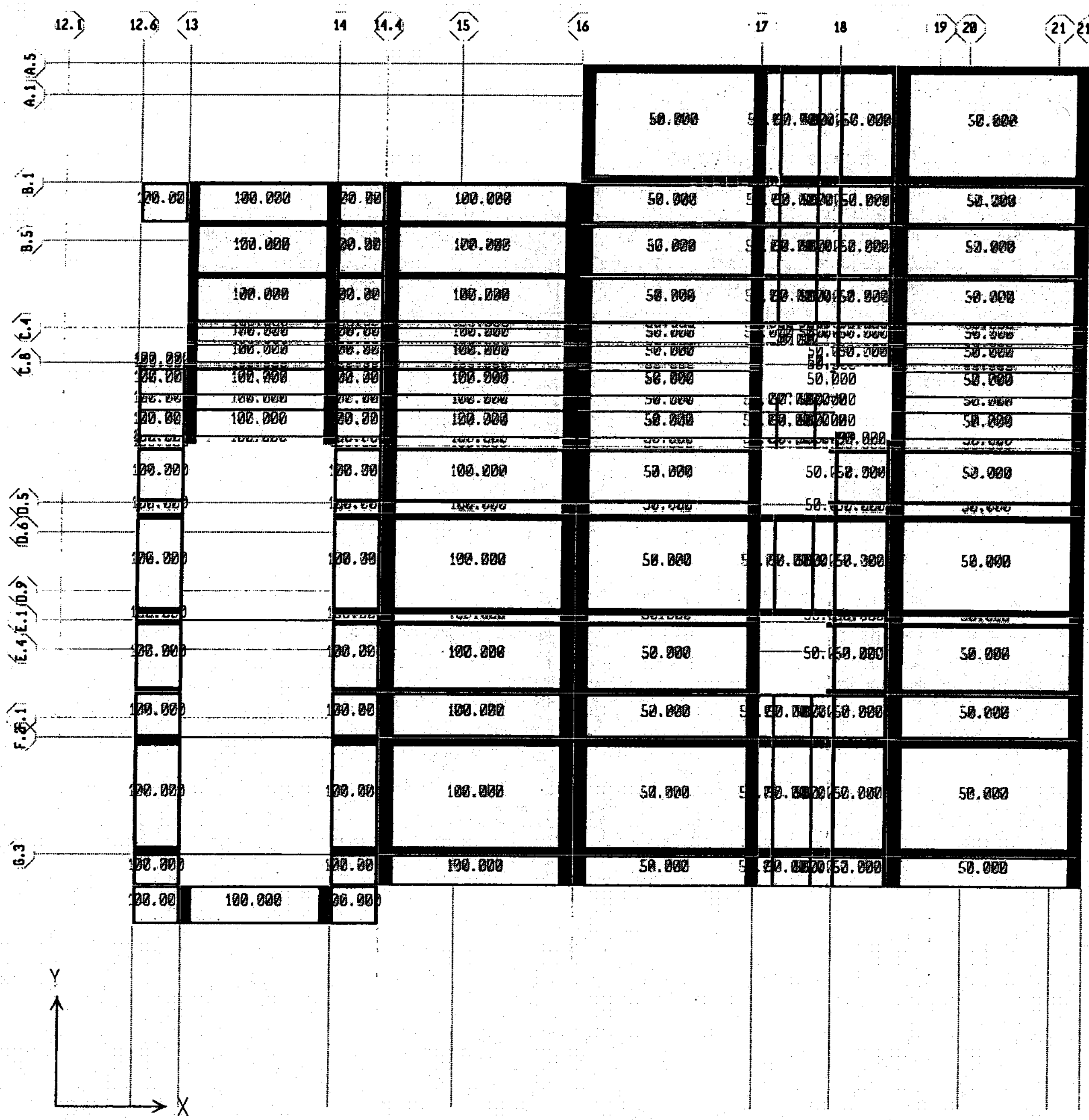
Surface Loading (SDL) - lb-ft Units

SAFE



9.2.2-34

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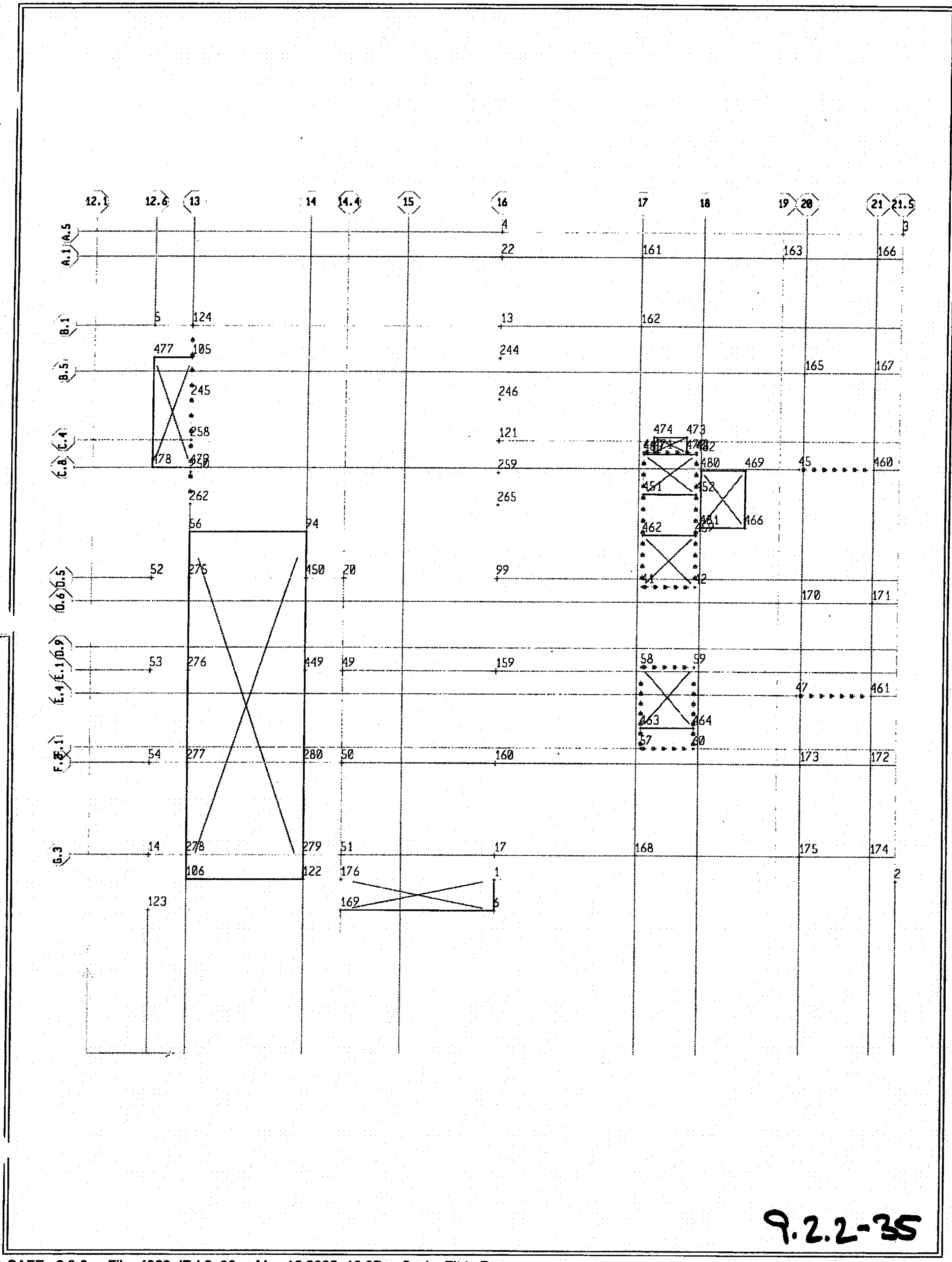
Surface Loading (L) - lb-ft Units

SAFE



9.2.2-35

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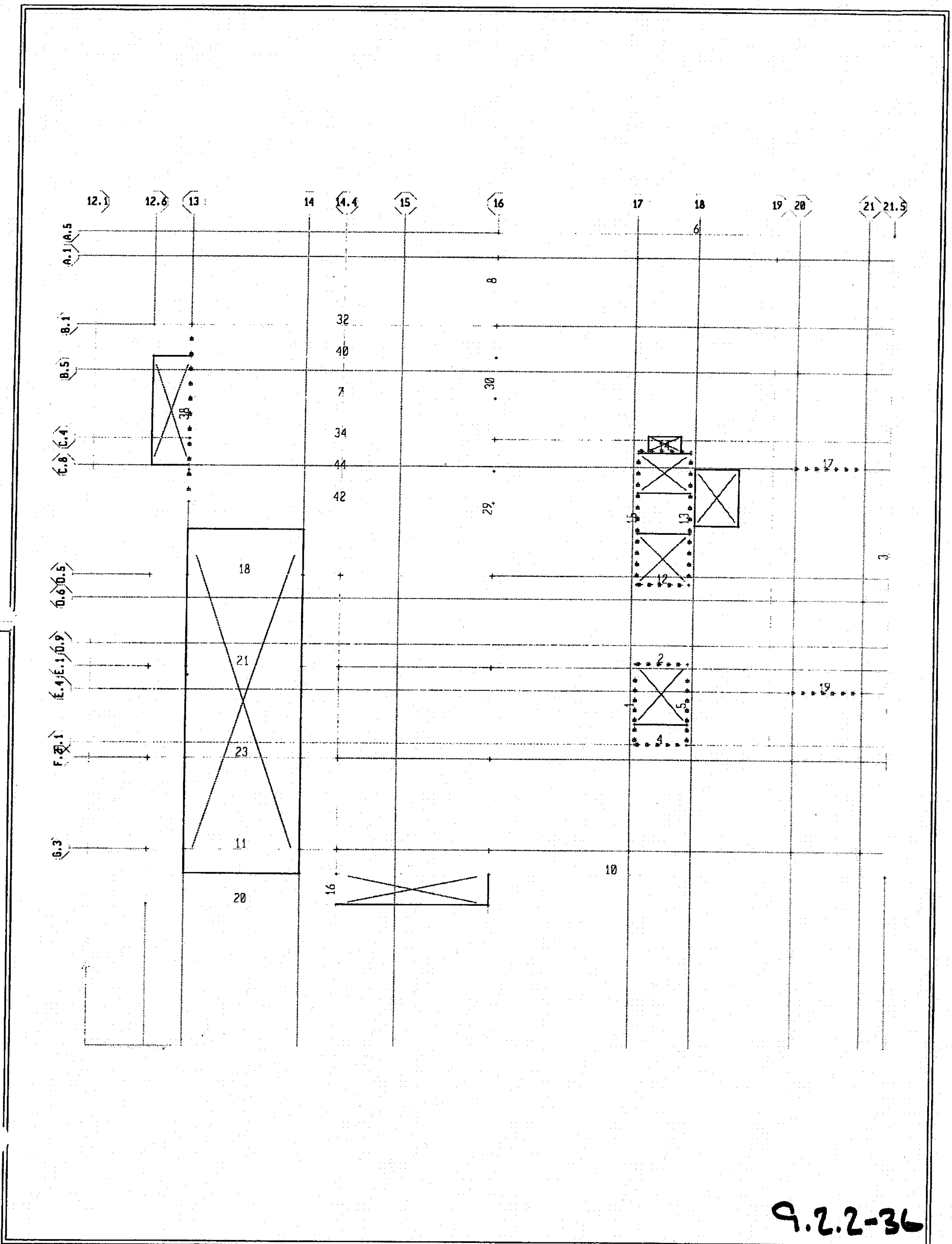
Structural Layer Plan View - lb-ft Units

SAFE



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Structural Layer Plan View - lb-ft Units

SAFE v8.0.6 File: 4069-JP-L3_06 Kip-in Units PAGE 1
May 16,2005 10:59

COLUMN SPRING REACTIONS

COLUMN	GRID I	GRID J	LOAD	FZ	MX	MY
13	50	111	L	60.74	-986.911	4296.530
13	50	111	DL	158.09	-2532.715	6941.313
17	50	25	L	35.24	237.901	405.386
17	50	25	DL	97.34	535.788	369.574
99	50	66	L	64.47	1069.188	1694.678
99	50	66	DL	173.82	2919.005	1695.746
121	50	93	L	122.18	-335.380	5624.298
121	50	93	DL	310.49	-815.452	8524.957
124	13	111	L	19.42	-102.842	-2793.932
124	13	111	DL	41.97	-109.649	-5331.250
22	50	121	L	7.86	19.391	-186.354
22	50	121	DL	34.40	81.824	-828.281
159	50	50	L	50.17	24.059	472.132
159	50	50	DL	130.90	55.487	428.670
160	50	36	L	50.92	-25.362	431.834
160	50	36	DL	132.55	-65.327	341.836
161	66	121	L	18.95	-17.861	-12.857
161	66	121	DL	77.04	-4.092	26.575
162	66	111	L	33.54	-115.016	-157.658
162	66	111	DL	132.32	-518.423	-356.158
163	88	121	L	23.16	-273.932	137.716
163	88	121	DL	90.49	-931.078	536.817
165	92	104	L	30.07	90.854	222.030
165	92	104	DL	110.81	327.731	828.428
166	101	121	L	11.55	-175.684	36.696
166	101	121	DL	49.04	-626.778	88.200
167	101	104	L	13.20	76.994	-16.659
167	101	104	DL	53.99	293.030	-135.271
168	66	25	L	24.78	158.419	-127.937
168	66	25	DL	103.39	543.824	-320.918
170	92	60	L	23.10	79.202	75.607
170	92	60	DL	85.95	299.178	294.031
171	101	60	L	15.59	101.260	-1.732
171	101	60	DL	63.52	404.947	-83.907
172	101	36	L	10.73	-42.872	-14.044
172	101	36	DL	43.48	-158.437	-114.997
173	92	36	L	19.02	-73.246	112.238
173	92	36	DL	70.11	-262.955	431.872
174	101	25	L	7.66	83.392	-32.370
174	101	25	DL	33.57	273.770	-180.313
175	92	25	L	20.23	98.626	222.835
175	92	25	DL	79.79	297.513	885.914

9.2.2-37

14	8	25	L	36.40	-886.821	-1445.337
14	8	25	DL	86.25	-2203.455	-3598.877
20	31	66	L	79.35	531.982	377.908
20	31	66	DL	150.97	656.498	1167.903
49	31	50	L	60.80	-60.308	108.332
49	31	50	DL	134.51	-83.351	713.721
50	31	36	L	60.91	54.551	162.063
50	31	36	DL	131.22	152.663	785.346
51	31	25	L	67.50	-631.764	832.378
51	31	25	DL	155.38	-1716.180	2262.870
52	8	66	L	26.00	77.198	-911.313
52	8	66	DL	55.63	-48.316	-2165.680
53	8	50	L	24.72	-17.491	-793.273
53	8	50	DL	58.86	-19.777	-2107.659
54	8	36	L	23.50	67.658	-797.929
54	8	36	DL	55.16	171.466	-2088.998

WALL REACTIONS

WALL	LOAD	FZ	MX	MY
12	L	9.05	-294.447	22.619
12	DL	78.51	-1123.375	198.756
13	L	21.68	-189.314	-865.511
13	DL	197.61	-833.651	-3257.514
14	L	16.70	620.324	-186.512
14	DL	108.64	2397.282	-454.948
15	L	27.57	-38.933	1055.751
15	DL	239.28	382.412	5509.321
17	L	37.69	-526.606	551.123
17	DL	209.22	-2035.978	1483.043
19	L	24.52	180.192	442.270
19	DL	158.11	687.886	1268.674
1	L	21.12	-139.048	916.695
1	DL	160.56	-490.628	4156.265
2	L	8.35	294.829	12.137
2	DL	75.72	1125.824	145.681
4	L	17.51	-704.262	-131.732
4	DL	109.44	-2636.581	-397.665
5	L	17.32	-237.353	-710.014
5	DL	135.75	-877.304	-2668.295
38	L	155.84	-7774.710	-14576.447
38	DL	423.56	-13019.595	-25903.387

9.2.2-38

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Job no. : 4069
Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

L4

LEVEL L4 Reactions include wall self weight and cladding

COLUMN SPRING REACTIONS

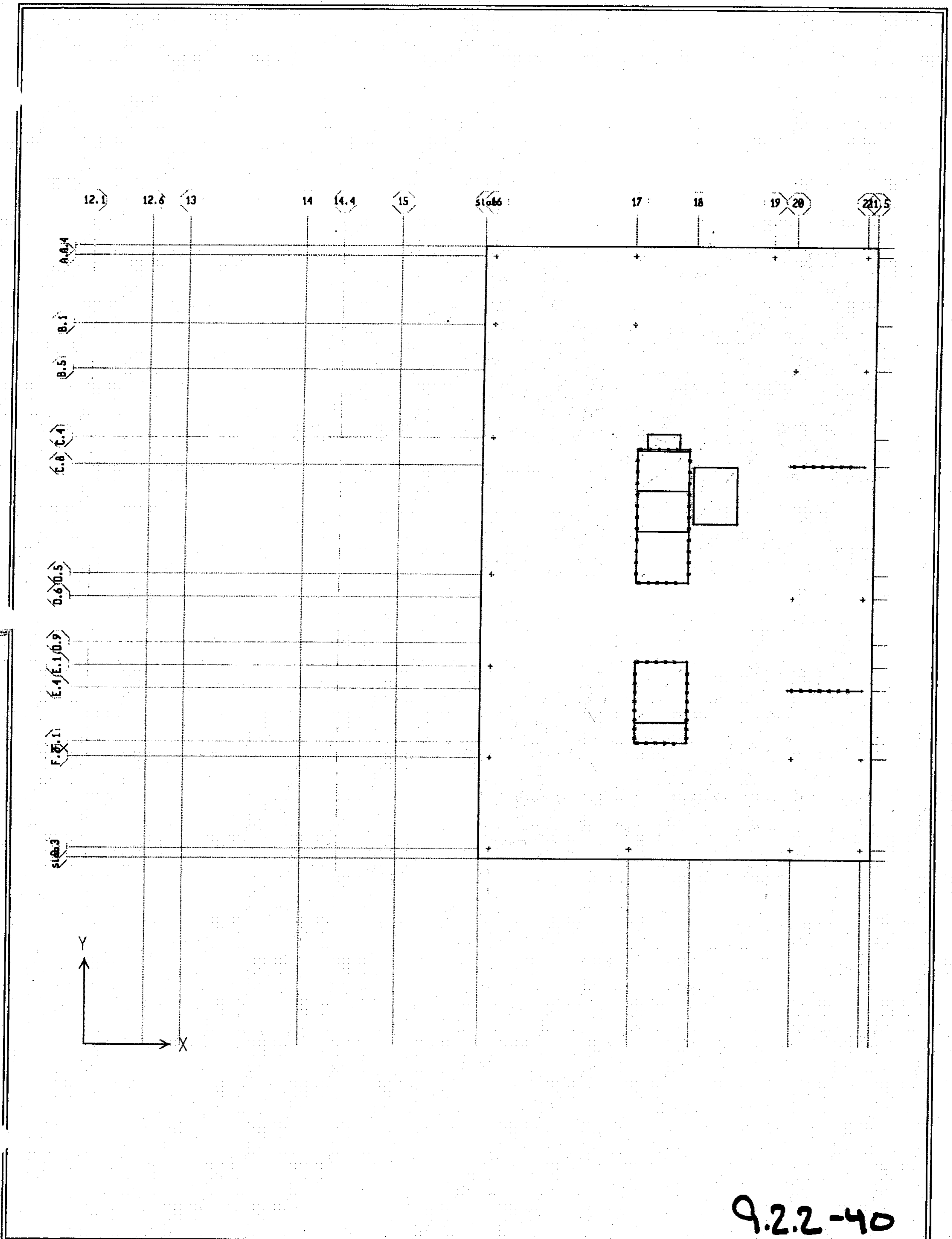
COLUMN	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
13 COL30DIA	53	17	102
17 COL24DIA	32	9	61
22 COL30DIA	23	6	43
99 COL24DIA	63	20	122
121 COL24DIA	72	22	139
159 COL24DIA	49	15	95
160 COL24DIA	54	17	105
161 COL24DIA	40	12	76
162 COL24DIA	119	40	234
163 COL24DIA	59	18	114
165 COL24DIA	92	31	181
166 COL30DIA	25	7	47
167 COL30DIA	30	9	57
168 COL24X48	69	21	133
170 COL30DIA	72	24	141
171 COL30DIA	36	11	68
172 COL24DIA	25	7	47
173 COL30DIA	60	20	118
174 COL24DIA	16	4	29
175 COL24DIA	50	15	96

WALL REACTIONS

WALL	ONE LEVEL FZ DL (kips)	FZ LL (kips)	1.4DL+1.7LL (kips)
1 WALL24	147	30	256
2 WALL24	57	7	92
4 WALL24	86	17	149
5 WALL24	110	18	184
12 WALL24	63	9	103
13 WALL24	156	21	253
14 WALL30	90	18	156
15 WALL24	218	41	376
17 WALL24	157	34	277
19 WALL24	121	22	207

9.2.2-39

SAFE



9.2.2-40

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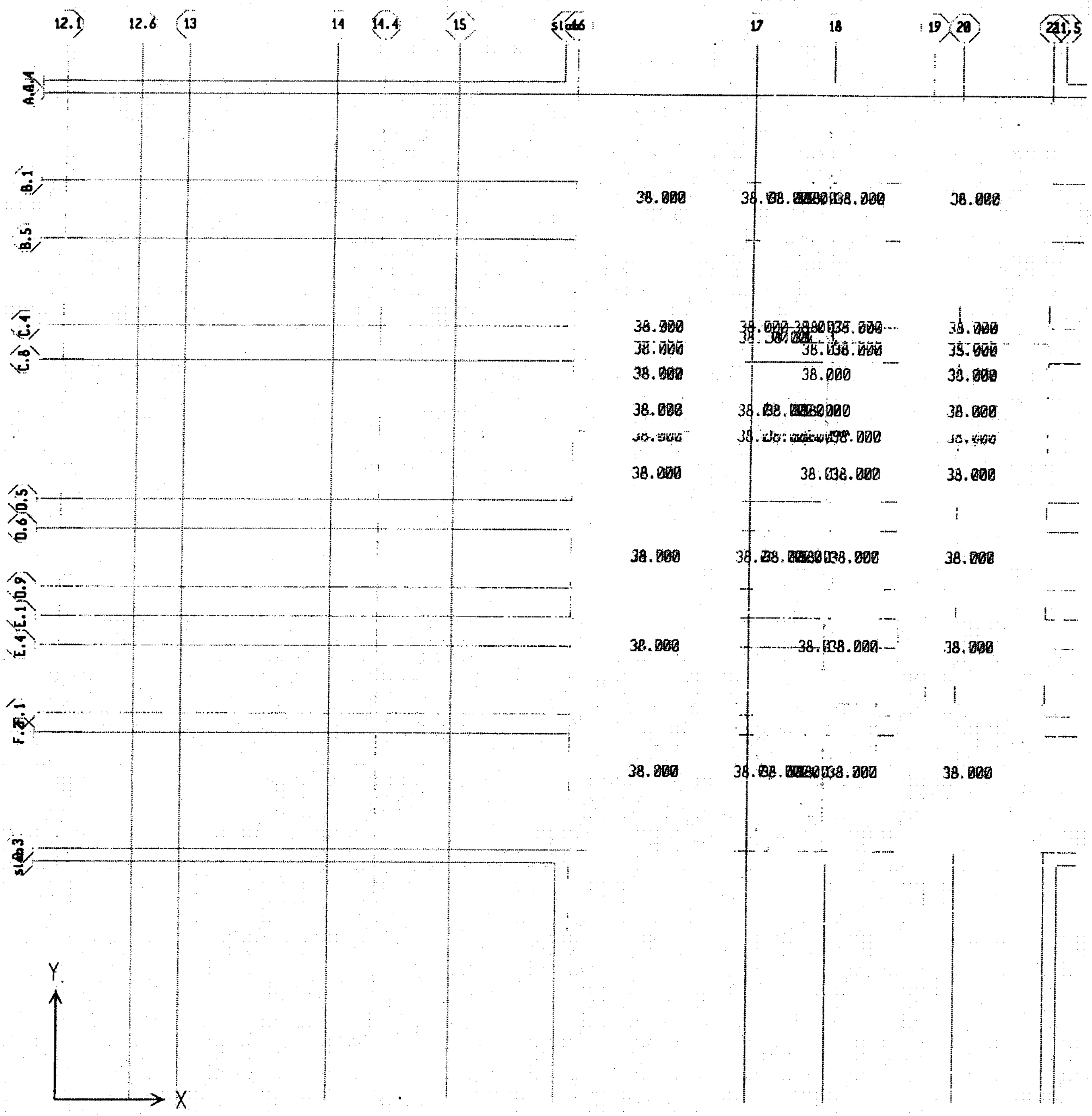
Structural Layer Plan View - Kip-in Units

SAFE



9.2.2-41

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Surface Loading (SDL) - lb-ft Units

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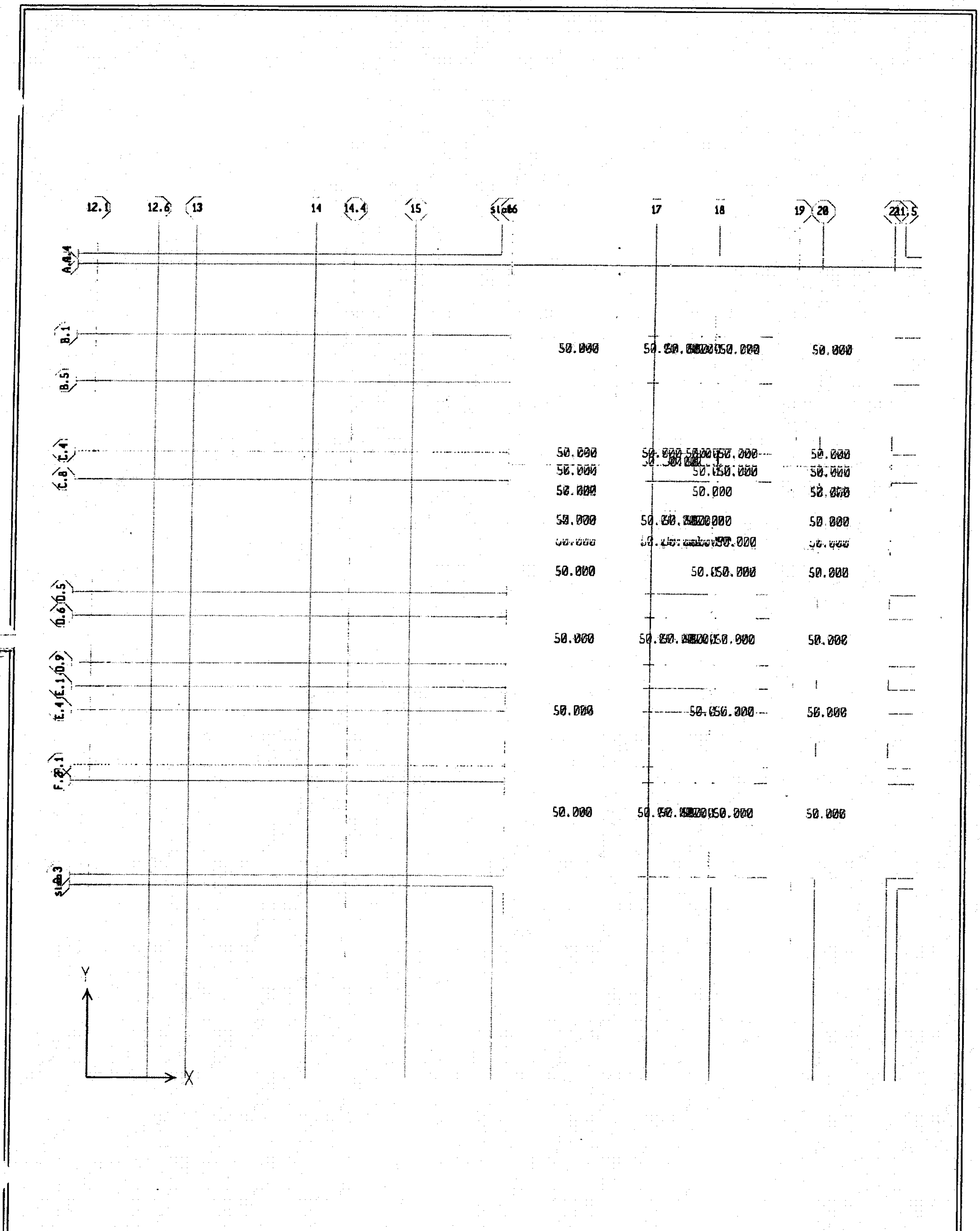
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14
14.4
15
17
18
19
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C.4
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D.6
D.9
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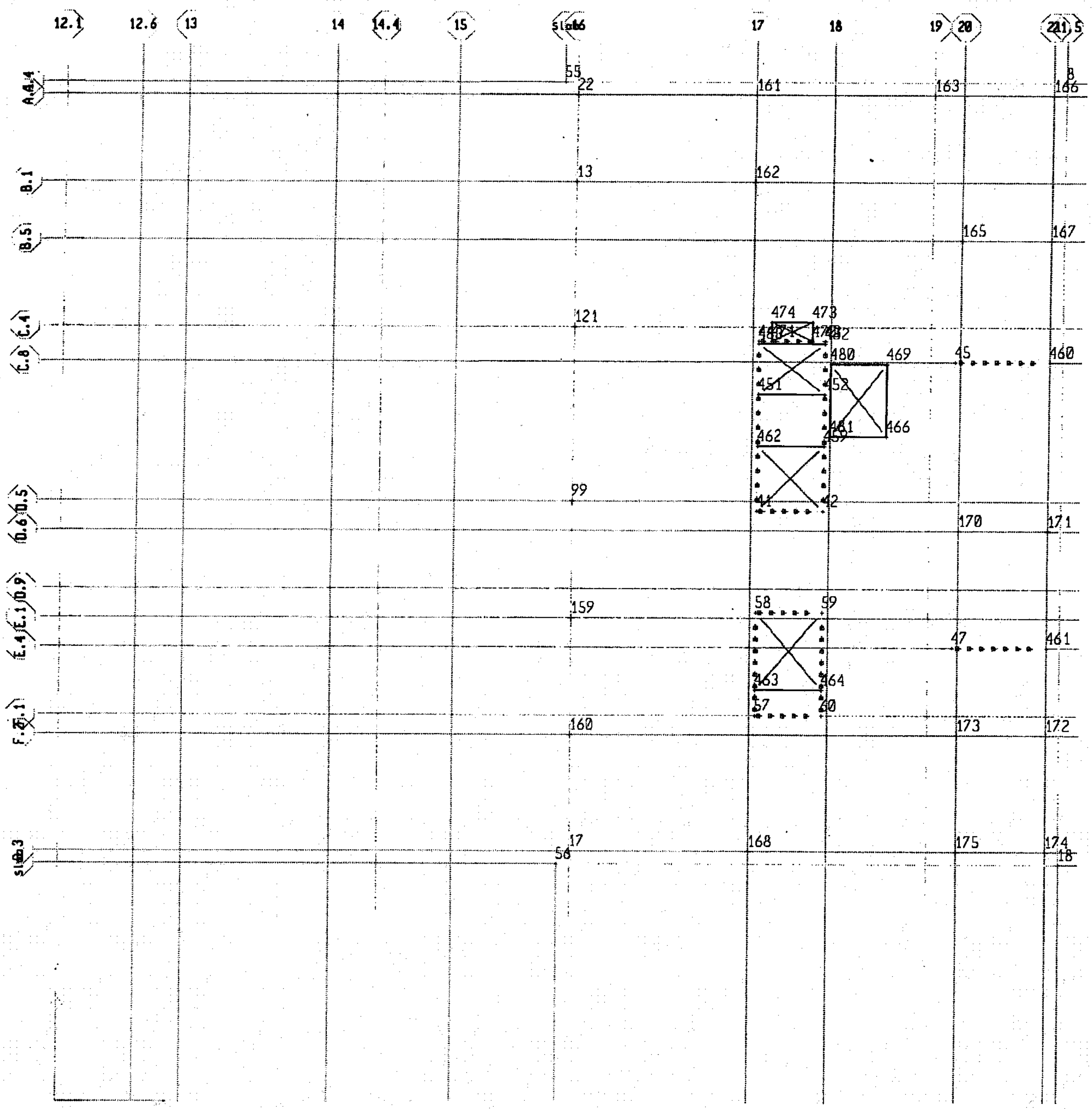
9.2.2-42

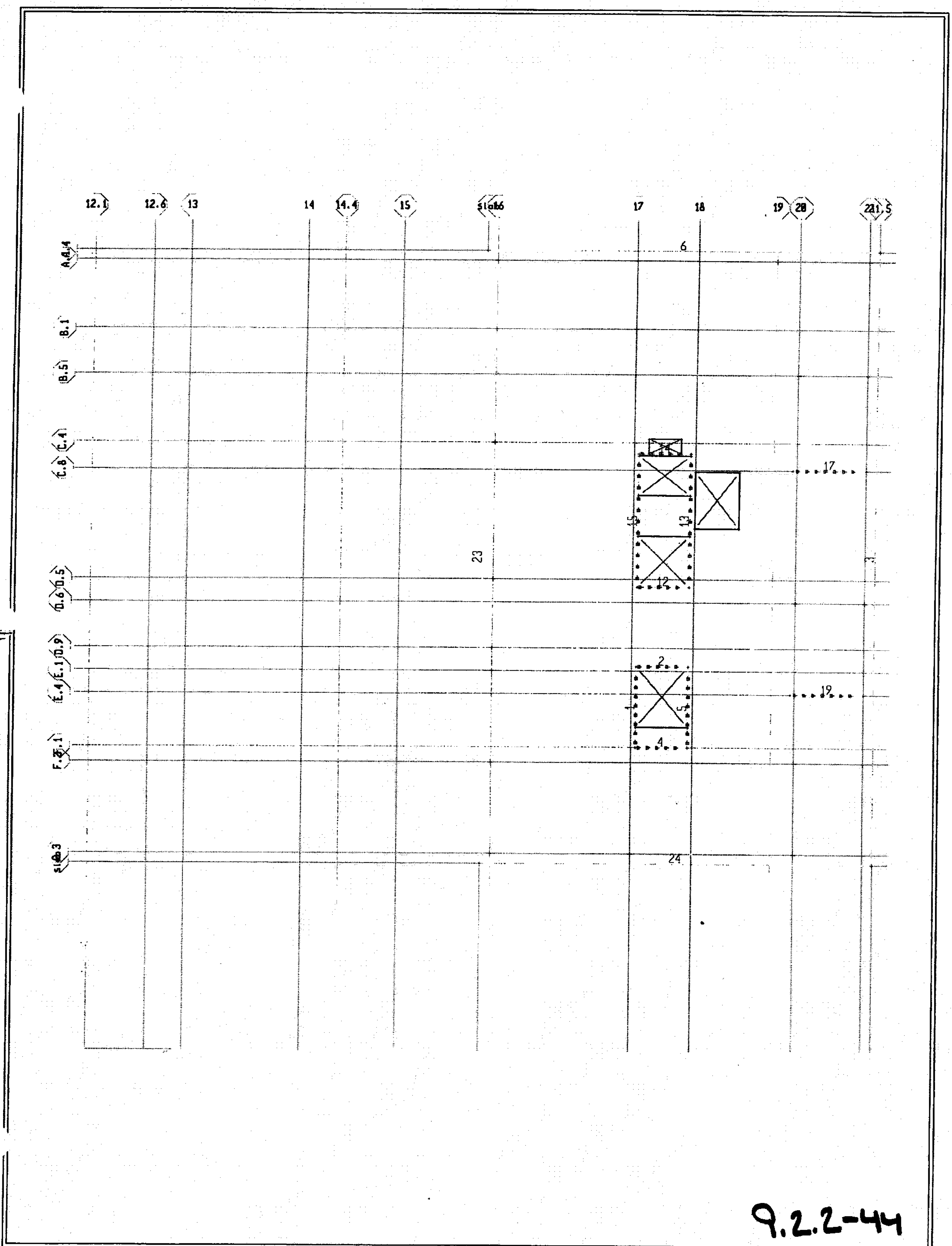
SAFE



9.2.2-43

SAFE v8.0.6 - File: 4069-JP-L4_02 - May 16,2005 10:38 - Scale: Fit to Page
Structural Layer Plan View - lb-ft Units

SAFE



9.2.2-44

SAFE v8.0.6 - File: 4069-JP-L4_02 - May 16,2005 10:39 - Scale: Fit to Page
Structural Layer Plan View - lb-ft Units

SAFE v8.0.6 File: 4069-JP-L4_02 lb-ft Units PAGE 1
May 16,2005 10:59

COLUMN SPRING REACTIONS

COLUMN	GRID I	GRID J	LOAD	FZ	MX	MY
13	50	112	L	16519.42	-6648.717	-41226.344
13	50	112	DL	52752.51	-22083.367	-122496.209
17	50	26	L	9237.80	13701.699	-28426.056
17	50	26	DL	32144.84	41937.829	-89546.302
99	50	67	L	19678.86	10409.759	-41314.794
99	50	67	DL	63294.34	34269.466	-121803.987
121	50	94	L	22413.81	-4476.587	-45858.448
121	50	94	DL	71936.40	-15167.519	-135579.227
22	50	122	L	6361.14	-4437.590	-22382.351
22	50	122	DL	23083.56	-12620.776	-71440.304
159	50	51	L	15368.75	-707.510	-38907.923
159	50	51	DL	49276.90	-2387.119	-114215.782
160	50	37	L	16982.62	-2139.104	-41100.257
160	50	37	DL	54201.81	-6361.428	-121587.094
161	66	122	L	11688.71	-8972.543	179.300
161	66	122	DL	40228.26	-25334.921	526.206
162	66	112	L	39755.47	-14108.737	-280.116
162	66	112	DL	119180.10	-42238.633	-1072.702
163	88	122	L	18376.86	-33123.743	10297.303
163	88	122	DL	59306.31	-97707.157	33561.527
165	92	105	L	30689.19	8736.916	19252.915
165	92	105	DL	91870.80	26273.019	57972.667
166	101	122	L	7013.54	-16786.940	7930.627
166	101	122	DL	25055.08	-53011.897	24372.566
167	101	105	L	8796.03	6078.928	5556.172
167	101	105	DL	30285.87	19350.151	14559.095
168	66	26	L	21159.16	25892.360	960.531
168	66	26	DL	69026.21	76088.747	1118.510
170	92	61	L	23861.96	7316.934	6206.982
170	92	61	DL	71564.25	22410.169	18753.576
171	101	61	L	10521.05	8042.731	7549.738
171	101	61	DL	35768.75	26483.262	20545.617
172	101	37	L	7216.40	-3967.257	4198.741
172	101	37	DL	24570.56	-12653.307	10551.698
173	92	37	L	20004.74	-7361.767	9419.192
173	92	37	DL	59831.91	-22143.303	29068.727
174	101	26	L	4184.34	8968.641	1990.529
174	101	26	DL	15670.83	27977.355	5060.578
175	92	26	L	15198.50	16724.824	16664.916
175	92	26	DL	49890.04	48681.736	55278.593

SAFE v8.0.6 File: 4069-JP-L4_02 lb-ft Units PAGE 2

9.2.2-45

May 16,2005 10:59

WALL REACTIONS

WALL	LOAD	FZ	MX	MY
12	L	8805.33	-24620.662	7816.631
12	DL	62771.59	-74011.392	23157.904
13	L	20551.05	-24958.269	-72584.673
13	DL	155767.32	-79988.533	-218193.660
14	L	17679.54	55570.782	-732.494
14	DL	90044.07	166535.909	-2843.436
15	L	41455.40	31916.015	192165.561
15	DL	218422.85	91403.756	576806.066
17	L	33722.69	-41650.909	94570.464
17	DL	156635.75	-131311.786	247683.460
19	L	22330.77	15377.611	66646.179
19	DL	120832.16	48214.704	174229.704
1	L	29972.38	-16530.866	120379.797
1	DL	146682.81	-48853.683	360173.326
2	L	6967.57	24911.746	5483.551
2	DL	57275.83	74899.203	16249.300
4	L	16673.70	-63289.421	-4087.006
4	DL	86467.50	-191284.259	-14992.215
5	L	17620.40	-18390.855	-58573.228
5	DL	109990.87	-56588.709	-176378.997

9.2.2-46

Date: 5/19/2005 Time: 1:06 PM File: 4069-JP-Podium gravity columns and walls.xls

DESIMONE CONSULTING ENGINEERS
10 United Nations Plaza, Suite 410
San Francisco
CA 94102
T. 415.398.5740
415.398.9834

Job no. : 4069
Client : Handel Architects
Project : 301 Mission street
Engineer : Jiri Pertold
Page No. :
Revision :

MID-RISE COLUMN DESIGN

MAX. COLUMN REACTION PER COLUMN TYPE

B2 COLUMN			9*(L4)+(L3)+(L2)+(L1)+4*(B2) REACTION AT B5 FZ			
I.D.	Shape		DL (k)	LL (k)	1.4DL+1.7LL (k)	
161	COL24DIA		713	201	**1340**	6#9
171	COL24DIA		681	185	1269	
167	COL24DIA		596	158	1104	
166	COL24DIA		507	125	922	
172	COL24DIA		471	129	880	
162	COL24X48		2054	682	**4036**	18#8
121	COL24X48		1842	591	3583	
99	COL24X48		1540	493	2994	
17	COL24X48		1584	356	2823	
13	COL24X48		1329	409	2556	
160	COL24X48		1261	415	2470	
159	COL24X48		1228	393	2388	
20	COL24X48		887	245	1658	
15	COL24X48		721	209	1364	
[illegible]	COL24X48		696	180	1281	
[illegible]5	COL24X48		639	142	1136	
81	COL24X48		592	148	1081	
16	COL24X48		561	171	1077	
18	COL24X48		582	128	1031	
79	COL24X48		553	116	971	
273	COL24X48		476	140	905	
77	COL24X48		487	102	855	
11	COL24X48		410	120	777	
124	COL24X48		297	81	553	
170	COL30DIA		1327	426	**2582**	9#9
163	COL30DIA		1114	343	2142	
173	COL30DIA		1056	337	2052	
267	COL30DIA		523	157	1000	
22	COL30DIA		520	128	947	
272	COL30DIA		436	129	830	
168	COL36DIA		2201	522	**3968**	11#9
165	COLX48Y24		1678	543	3273	
175	COLX48Y24		1707	395	3060	
174	COLX48Y24		623	104	1049	

9.2.2-47

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Computer program for the Strength Design of Reinforced Concrete Sections

Ø24" 6#9

9.2.2-48

General Information:

File Name: F:\PROJECTS\4069\PCA\PODIUM\B5COL\24DIA.COL
Project: 4069
Column: B4 - 24" Dia
Code: ACI 318-95
Engineer: JP
Units: English

Run Option: Investigation
Run Axis: X-axis
Slenderness: Considered
Column Type: Structural

Material Properties:

f'c = 7 ksi
Ec = 3043 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7
fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:

Circular: Diameter = 24 in

Gross section area, Ag = 452.389 in^2
Ix = 16286 in^4
Iy = 16286 in^4
Xo = 0 in
Yo = 0 in

Reinforcement:

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Spiral; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.85, phi(b) = 0.9, phi(c) = 0.75

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area, As = 6.00 in^2 at 1.33%
6 #9 Cover = 1.5 in

Slenderness:

Sway Criteria:

X-axis: Braced column.

Column	Axis	Height ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Design	X	8	24	0	16286	7	3043
Above	X	8	0	0	16286	7	4347
Below	X	8	0	0	16286	7	4347

X-Beams Location	Length ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Above Left	30	36	12	5184	7	1000
Above Right	30	36	12	5184	7	1000
Below Left	30	36	12	5184	7	1000
Below Right	30	36	12	5184	7	1000

9.2.2-49

Effective Length Factors:

Axis	Psi(top)	Psi(bot)	k(Braced)	k(Sway)	klu/r
X	83.078	83.078	1.000	(N/A)	16.00

Moment Magnification Factors:

Stiffness reduction factor, phi(K) = 0.75
Cracked-section coefficients: cI(beams) = 0.35; cI(columns) = 0.7

0.2*Ec*Ig + Es*Ise (X-axis) = 1.79e+007 kip-in^2

X-axis Ld/Comb	Braced Pc(kip)	Braced Betad	Braced Cm	Braced Delta		Sway Pc(kip)	Sway Delta
1 U1	10964	0.745	0.000	1.000	*	--- N/A ---	

* Slenderness need not be considered.

Load Combinations:

U1 = 1.400*Dead + 1.700*Live + 0.000*Lateral

Service Loads:

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bot k-ft	My @ Top k-ft	My @ Bot k-ft
1	Dead	713.0	0.0	0.0	0.0	0.0
	Live	201.0	0.0	0.0	0.0	0.0
	Latl	0.0	0.0	0.0	0.0	0.0

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Load Combo	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	1 U1	1339.9	0.0	472.8	999.999

*** Program completed as requested! ***

9.2.2-50

```
OOOOOOO     OOOOO     OOOOO     OOOOO     OOOOO    OO
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==
Computer program for the Strength Design of Reinforced Concrete Sections
==

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30" ∅ 9#9

9.2.2-51

General Information:

File Name: F:\PROJECTS\4069\PCA\PODIUM\B5COL\30DIA.COL
Project: 4069
Column: B4 - 30" Dia
Code: ACI 318-95

Engineer: JP
Units: English

Run Option: Investigation
Run Axis: X-axis

Slenderness: Considered
Column Type: Structural

Material Properties:

f'c = 7 ksi
Ec = 3043 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7

fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:

Circular: Diameter = 30 in

Gross section area, Ag = 706.858 in^2
Ix = 39760.8 in^4
Xo = 0 in

Iy = 39760.8 in^4
Yo = 0 in

Reinforcement:

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Spiral; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.85, phi(b) = 0.9, phi(c) = 0.75

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area, As = 9.00 in^2 at 1.27%
9 #9 Cover = 1.5 in

Slenderness:

Sway Criteria:

X-axis: Braced column.

Column	Axis	Height ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Design	X	8	30	0	39760.8	7	3043
Above	X	8	0	0	39760.8	7	4347
Below	X	8	0	0	39760.8	7	4347

X-Beams Location	Length ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Above Left	30	30	12	4320	7	1000
Above Right	30	30	12	4320	7	1000
Below Left	30	36	12	5184	7	1000
Below Right	30	36	12	5184	7	1000

9.2.2-52

Effective Length Factors:

Axis	Psi(top)	Psi(bot)	k(Braced)	k(Sway)	klu/r
X	243.393	202.827	1.000	(N/A)	12.80

Moment Magnification Factors:

Stiffness reduction factor, phi(K) = 0.75
Cracked-section coefficients: cI(beams) = 0.35; cI(columns) = 0.7

0.2*Ec*Ig + Es*Ise (X-axis) = 4.48e+007 kip-in^2

X-axis	Braced					Sway	
Ld/Comb	Pc(kip)	Betad	Cm	Delta		Pc(kip)	Delta
1 U1	27894	0.720	0.000	1.000	*	--- N/A ---	

* Slenderness need not be considered.

Load Combinations:

U1 = 1.400*Dead + 1.700*Live + 0.000*Lateral

Service Loads:

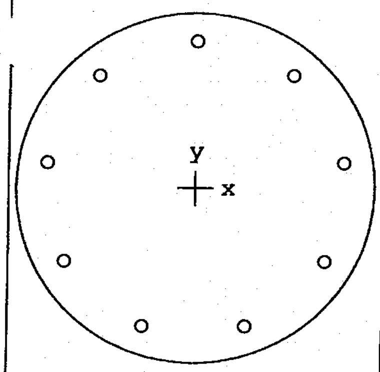
No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bot k-ft	My @ Top k-ft	My @ Bot k-ft
1	Dead	1327.0	0.0	0.0	0.0	0.0
	Live	426.0	0.0	0.0	0.0	0.0
	Latl	0.0	0.0	0.0	0.0	0.0

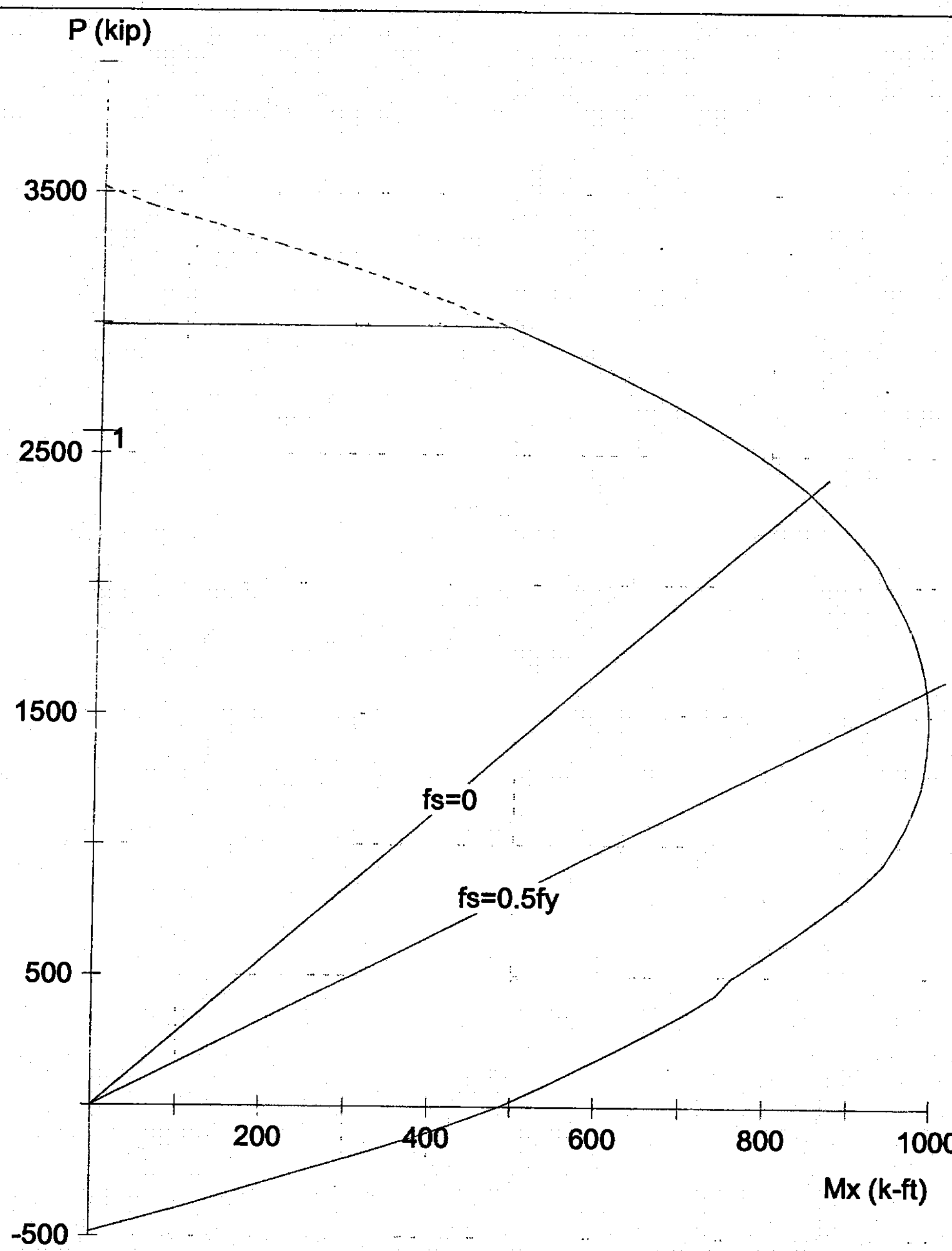
Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Load Combo	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	1 U1	2582.0	0.0	745.7	999.999

*** Program completed as requested! ***

9.2.2-S3





Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Considered

Column type: Structural

Bars: ASTM A615

Date: 05/13/05

Time: 18:08:24

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File: F:\PROJECTS\4069\PCA\PODIUM\B5COL\30DIA.COL

Project: 4069

Column: B4 - 30" Dia

Engineer: JP

f'c = 7 ksi	fy = 60 ksi	Ag = 706.858 in^2	9 #9 bars
Ec = 3043 ksi	Es = 29000 ksi	As = 9.00 in^2	Rho = 1.27%
fc = 5.95 ksi	e_rup = Infinity	Xo = 0.00 in	Ix = 39760.8 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 39760.8 in^4
Beta1 = 0.7		Clear spacing = 7.46 in	Clear cover = 1.88 in

9.2.2-54

Confinement: Spiral phi(a) = 0.85 phi(b) = 0.9 phi(c) = 0.75

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```

Computer program for the Strength Design of Reinforced Concrete Sections

Ø36" 11#9

9.2.2-55

General Information:

File Name: F:\PROJECTS\4069\PCA\PODIUM\B5COL\36DIA.COL
Project: 4069
Column: B4 - 30" Dia
Code: ACI 318-95

Engineer: JP
Units: English

Run Option: Investigation
Run Axis: X-axis

Slenderness: Considered
Column Type: Structural

Material Properties:

f'c = 7 ksi
Ec = 3043 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7

fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:

Circular: Diameter = 36 in

Gross section area, Ag = 1017.88 in^2
Ix = 82448 in^4
Xo = 0 in

Iy = 82448 in^4
Yo = 0 in

Reinforcement:

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Spiral; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.85, phi(b) = 0.9, phi(c) = 0.75

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area, As = 11.00 in^2 at 1.08%
11 #9 Cover = 1.5 in

Slenderness:

Sway Criteria:

X-axis: Braced column.

Column	Axis	Height ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Design	X	8	36	0	82448	7	3043
Above	X	8	0	0	82448	7	4347
Below	X	8	0	0	82448	7	4347

X-Beams Location	Length ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Above Left	30	30	12	4320	7	1000
Above Right	30	30	12	4320	7	1000
Below Left	30	36	12	5184	7	1000
Below Right	30	36	12	5184	7	1000

9.2.2-56

Effective Length Factors:

Axis	Psi(top)	Psi(bot)	k(Braced)	k(Sway)	klu/r
X	504.700	420.583	1.000	(N/A)	10.67

Moment Magnification Factors:

Stiffness reduction factor, phi(K) = 0.75
Cracked-section coefficients: cI(beams) = 0.35; cI(columns) = 0.7

0.2*Ec*Ig + Es*Ise (X-axis) = 8.88e+007 kip-in^2

X-axis	Braced				Sway	
Ld/Comb	Pc(kip)	Betad	Cm	Delta	Pc(kip)	Delta
1 U1	53534	0.776	0.000	1.000 *	--- N/A ---	

* Slenderness need not be considered.

Load Combinations:

U1 = 1.400*Dead + 1.700*Live + 0.000*Lateral

Service Loads:

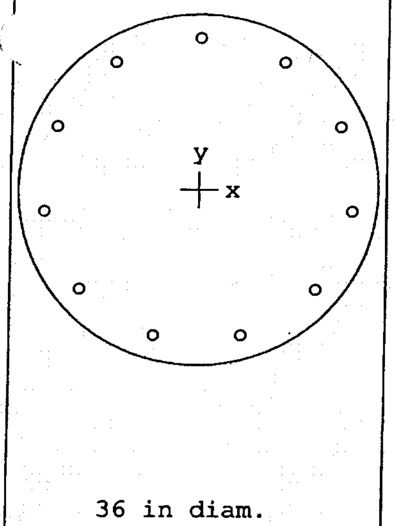
No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bot k-ft	My @ Top k-ft	My @ Bot k-ft
1	Dead	2201.0	0.0	0.0	0.0	0.0
	Live	522.0	0.0	0.0	0.0	0.0
	Latl	0.0	0.0	0.0	0.0	0.0

Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Load Combo	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	1 U1	3968.8	0.0	1058.5	999.999

*** Program completed as requested! ***

9.2.2-57



Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

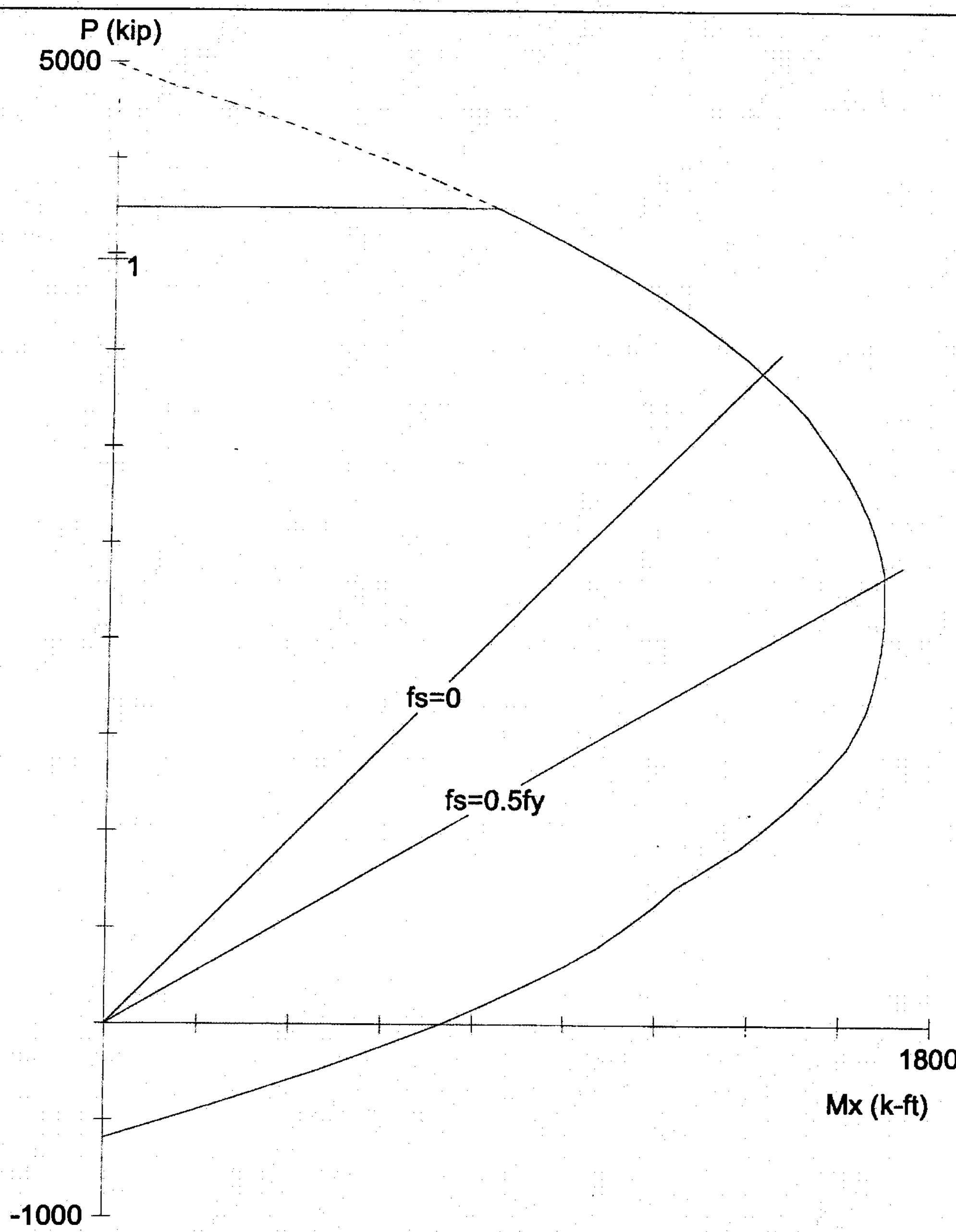
Slenderness: Considered

Column type: Structural

Bars: ASTM A615

Date: 05/16/05

Time: 10:10:20



PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\B5COL\36DIA.COL

Project: 4069

Column: B4 - 30" Dia		Engineer: JP	
f'c = 7 ksi	fy = 60 ksi	Ag = 1017.88 in^2	11 #9 bars
Ec = 3043 ksi	Es = 29000 ksi	As = 11.00 in^2	Rho = 1.08%
fc = 5.95 ksi	e_rup = Infinity	Xo = 0.00 in	Ix = 82448 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 82448 in^4
Beta1 = 0.7		Clear spacing = 7.64 in	Clear cover = 1.88 in
Confinement: Spiral	phi(a) = 0.85, phi(b) = 0.9, phi(c) = 0.75		

9.22-58

DODSONNOC00000793

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Computer program for the Strength Design of Reinforced Concrete Sections

24x48 18#9

9.2.2-59

General Information:
====================

File Name: F:\PROJECTS\4069\PCA\PODIUM\B5COL\24X48.COL
Project: 4069
Column: B4-24x48"
Code: ACI 318-95

Engineer: JP
Units: English

Run Option: Investigation
Run Axis: X-axis

Slenderness: Considered
Column Type: Structural

Material Properties:
====================

f'c = 7 ksi
Ec = 3043 ksi
fc = 5.95 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.7

fy = 60 ksi
Es = 29000 ksi
Rupture strain = Infinity

Section:
========

Rectangular: Width = 24 in

Depth = 48 in

Gross section area, Ag = 1152 in^2
Ix = 221184 in^4
Xo = 0 in

Iy = 55296 in^4
Yo = 0 in

Reinforcement:
==============

Rebar Database: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

Layout: Rectangular
Pattern: Sides Different (Cover to transverse reinforcement)
Total steel area, As = 18.00 in^2 at 1.56%

	Top	Bottom	Left	Right
Bars	4 # 9	4 # 9	5 # 9	5 # 9
Cover(in)	1.5	1.5	1.5	1.5

Slenderness:
============

Sway Criteria:

X-axis: Braced column.

Column	Axis	Height ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Design	X	8	24	48	221184	7	3043
Above	X	8	0	0	221184	7	4347
Below	X	8	0	0	221184	7	4347

9.2.2-6c

X-Beams Location	Length ft	Width in	Depth in	I in^4	f'c ksi	Ec ksi
Above Left	30	30	12	4320	7	1000
Above Right	30	30	12	4320	7	1000
Below Left	30	36	12	5184	7	1000
Below Right	30	36	12	5184	7	1000

Effective Length Factors:

Axis	Psi(top)	Psi(bot)	k(Braced)	k(Sway)	klu/r
X	1353.963	1128.302	1.000	(N/A)	6.93

Moment Magnification Factors:

Stiffness reduction factor, phi(K) = 0.75
Cracked-section coefficients: cI(beams) = 0.35; cI(columns) = 0.7

0.2*Ec*Ig + Es*Ise (X-axis) = 2.72e+008 kip-in^2

X-axis Ld/Comb	Braced Pc(kip)	Braced Betad	Braced Cm	Braced Delta		Sway Pc(kip)	Sway Delta
1 U1	170345	0.713	0.000	1.000	*	--- N/A ---	

* Slenderness need not be considered.

Load Combinations:

U1 = 1.400*Dead + 1.700*Live + 0.000*Lateral

Service Loads:

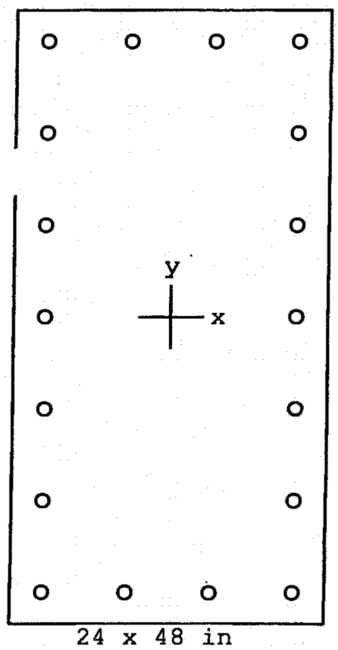
No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bot k-ft	My @ Top k-ft	My @ Bot k-ft
1	Dead	2054.0	0.0	0.0	0.0	0.0
	Live	682.0	0.0	0.0	0.0	0.0
	Latl	0.0	0.0	0.0	0.0	0.0

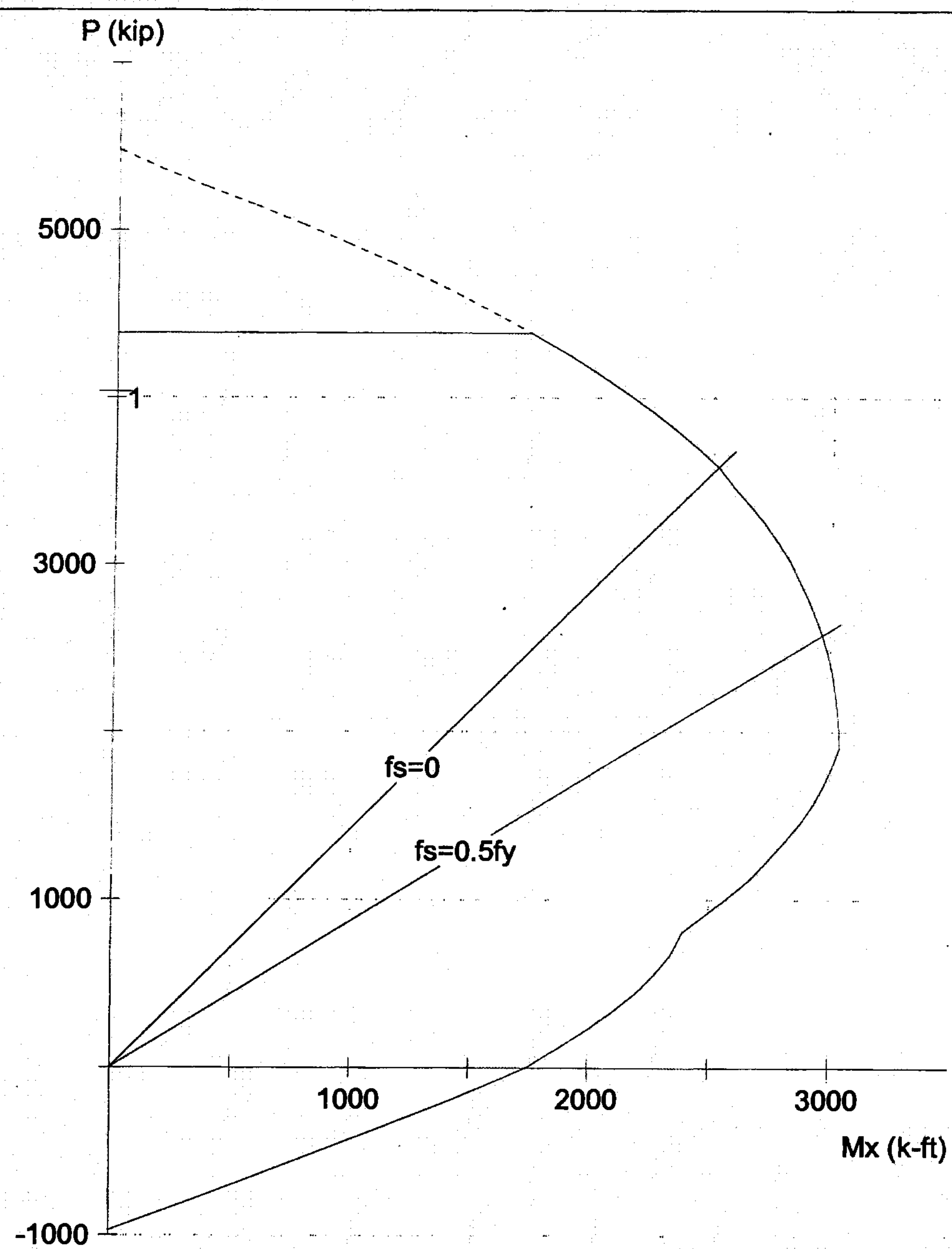
Factored Loads and Moments with Corresponding Capacities: (see user's manual for notation)

No.	Load Combo	Pu kip	Mux k-ft	fMnx k-ft	fMn/Mu
1	1 U1	4035.0	0.0	2129.3	999.999

*** Program completed as requested! ***

9.2.2-61





Code: ACI 318-95

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Considered

Column type: Structural

Bars: ASTM A615

Date: 05/13/05

Time: 18:07:30

PCACOL V3.00 (PCA 1999) - Licensed to: Licensee name not yet specified.

File: F:\PROJECTS\4069\PCA\PODIUM\B5COL\24X48.COL

Project: 4069

Column: B4-24x48"

Engineer: JP

f'c = 7 ksi	fy = 60 ksi	Ag = 1152 in^2	18 #9 bars
Ec = 3043 ksi	Es = 29000 ksi	As = 18.00 in^2	Rho = 1.56%
fc = 5.95 ksi	e_rup = Infinity	Xo = 0.00 in	Ix = 221184 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 55296 in^4
Beta1 = 0.7		Clear spacing = 5.25 in	Clear cover = 1.87 in

9.22-62

Confinement: Tied phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.7

APPENDIX A
MIDDLEBROOK + LOUIE
PEER REVIEW CORRESPONDENCE

Appendix A - Middlebrook + Louie Peer Review Correspondence

DESIMONE

NEW YORK
MIAMI
SAN FRANCISCO

MEMORANDUM

FROM:	**DERRICK D ROORDA**	DATE:	**05-13-2005**
PROJECT NO.:	**4069B**	VIA:	**EMAIL**
PROJECT NAME:	**301 MISSION - STRUCTURAL DESIGN SERVICES**	PAGES:	**18 TOTAL**

TO:

Hardip Pannu	**Middlebrook + Louie Structural Engineers** One Bush Street, Suite 250, San Francisco, CA 94104	**P: (415) 477-9000**	**F: (415) 477-9099**

CC:

Steve Patterson	**Millennium Partners** 735 Market Street, 3rd Floor, San Francisco, CA 94103	**P: (415) 593-2500**	**F: (415) 537-3895**
Jack Moehle	**University of California, Berkeley - Earthquake Engineering Research Center** 1301 South 46th Street, Richmond, CA 94804-4698	**P: (510) 231-9554**	**F: (510) 231-9471**
Chris Cerino	**DeSimone Consulting Engineers, P.L.L.C.**		
Stephen DeSimone	**DeSimone Consulting Engineers, P.L.L.C.**		
Ronald Polivka	**DeSimone Consulting Engineers, P.L.L.C.**		
Nicolas Rodrigues	**DeSimone Consulting Engineers, P.L.L.C.**		

Re: Peer Review Response

The following is a summary of peer review comments by Middlebrook + Louie (M+L) and the corresponding responses made by DeSimone Consulting Engineers (DeSimone). This summary will be amended throughout the peer review process, and will incorporate all comments made by both companies in order to compile all the information in one document. Comment numbers are those identified by M+L.

1.	M+L	2/28/05	The L-shaped columns will be in torsion for frame action along axis 2 and axis 11. Consider torsion for design.
	DeSimone	3/18/05	The design of the L-shaped columns is controlled by the axial forces delivered from the outriggers connected to the building core. Torsional considerations are a minor secondary concern, but will be addressed in the construction document phase.
	M+L	4/13/05	Please provide detailed calculations that account for eccentricity between the center of resistance of column and outriggers and frame beams.

	DeSimone	4/19/05	Our ETABS model uses shell elements for the outrigger column, and includes accurate geometry of the L-shape. We therefore believe this analysis properly captures all forces in this element, including torsion caused by the eccentricity between the shear center of the cross section and the point of load application. Within the height of the outriggers, the outrigger wall braces the column and thereby prevents torsional yielding limit states. It is therefore reasonable to consider torsion only above and below the outrigger levels. The maximum torsion in the outrigger column occurs directly below the bottom outrigger. Our calculations demonstrate that this torsion force can be resisted with 0.16 in² of hoop steel provided at the typical 4" vertical tie spacing. This reinforcing is in addition to the horizontal reinforcing required for shear and will be taken into account in our final design for level 8 and below. At level 17 and below, 23 in² of additional vertical steel must also be provided, as required by ACI minimum torsion reinforcing requirements. Calculations are being transmitted for your review under separate cover.
	M+L	4/25/05	**Resolved.**
2.	M+L	2/28/05	The L-shaped columns support outriggers of the prime lateral system. It should be shown that participation or failure of the more rigid element will not impair the vertical and lateral resisting ability of the gravity load and lateral moment resisting system. (See section 1633.2.4.1).
	DeSimone	3/18/05	UBC Section 1633.2.4.1 is intended insure that any rigidities present in the actual structure that may typically be overlooked for purposes of structural analysis are accounted for in the design. The commentary in 1999 SEAOC Blue Book discusses items such as stairs, ramps, CMU infill walls, etc. As there are no such items in the vicinity of the outrigger columns that have significant stiffness (especially in relation to the outriggers), we believe this section of the code is not relevant. Also, please see the following response to your comment #14 regarding design of the outriggers and supporting columns.
	M+L	4/13/05	Our intent here is that the backup moment frame should not be impaired by the failure of outriggers or shearwalls. Please provide detailed calculations to demonstrate that Moment Frame will be able to take its demand once the shearwalls have failed.
	DeSimone	4/19/05	The outrigger columns are designed to support all tributary gravity loads, as well as the full vertical shear capacity of the link beam portions of the outrigger walls (i.e., the maximum force that could possibly be delivered to them by the lateral system), and still have significant reserve capacity. As failure of these columns has been precluded by the presence of the link beam fuse, it is thereby entirely acceptable for these elements to serve as part of the moment frames comprising the dual system.
	M+L	4/25/05	Please provide detailed calculations for at least one outrigger that shows your design intent completely.
	DeSimone	5/13/05	**The requested calculations will be included with the foundation permit submittal.**
3.	M+L	2/28/05	Low-rise mat show 69 psf reinforce for total area. It looks excessive. (It is #11 @ 4.3" E.W. T & B for 8' mat.)

	DeSimone	3/18/05	We agree that 69 psf is heavy. While we do not believe the amount of steel shown on the SD set was 69 psf, the amount shown on the DD set is significantly less, around 28 psf.
	M+L	4/13/05	**Resolved.**
4.	M+L	2/28/05	At one side of shear wall at line D.5, a ramp that has an opening in the diaphragm. Clarify how the shear will travel to both basement walls at A.1 and K.
	DeSimone	3/18/05	Upon further analysis, we have determined that the shear wall at line D.5 is not required. It is not shown on the DD set.
	M+L	4/13/05	**Resolved.**
5.	M+L	2/28/05	Verify by calculations that ground floor diaphragm behave as a rigid diaphragm transferring forces to the perimeter basement walls and to the core. Possible reverse shear might happen in the basement and in the core walls below.
	DeSimone	3/18/05	The ground floor slab is not being used to transfer the shear from the tower core to the perimeter walls between the ground floor and B1. That is, the core is capable of transmitting the entire shear and overturning from the tower directly to the pile cap, without involving the ground floor slab.
	M+L	4/13/05	We believe that there will be reverse shear and floor needs to be modeled to account for it or property detailed that it is not connected with the shear walls. Please provide detailed calculations as requested above or floor to wall connection details.
	DeSimone	4/19/05	If the ground floor slab is not connected to the perimeter walls between the ground floor and B1, our analysis shows that the maximum drift (Δ_M) of the tower at the ground floor is 3/8". To allow this movement, a 1/2" joint will be provided around the perimeter of the core. This will eliminate any potential shear reversal or significant demands on the ground floor slab. The perimeter shear walls between the ground floor and B1 will therefore be relied upon only to resist the shear associated with the ground floor diaphragm itself.
	M+L	4/25/05	**Resolved.**
6.	M+L	2/28/05	The mid-rise and the high-rise towers are joined at the ground floor and B1 levels. The high-rise tower has mat with piles more rigid than mid-rise 5-story basement. Verify deformation compatibility and amount of base shear that will be resisted by piles.
	DeSimone	3/18/05	The current design reflected on the DD drawings incorporates a construction joint at the ground and B1 levels between the tower and mid-rise buildings. The presence of this joint allows the tower and mid-rise buildings to act as separate structures, both for lateral and gravity load resistance. The lateral capacity of the piles supporting the tower has been evaluated and discussed at length with the geotechnical engineers, Treadwell + Rollo. Their geotechnical report includes lateral load design criteria, which is based on a lateral displacement of 1/2" at the top of each pile.
	M+L	4/13/05	We are generally in agreement with your approach but we would like to get the calculations for lateral loads on piles and any horizontal movement that occurs from the lateral load.

	DeSimone	4/19/05	945 piles are provided under the tower. According to the geotechnical report, each pile has a lateral capacity of 17.3 kips. Thus, the total lateral capacity of the pile group is 16,350 kips, which is greater than the design base shear for the tower, which is approximately 8000 kips (limited by Eq. 30-6). The lateral displacement associated with the pile capacity is 0.5 inches. Since the piles are at about 50% of their lateral capacity, the actual displacement is expected to be approximately 0.25 inches.
	M+L	4/25/05	Please provide calculations for lateral force in a pile farthest away from center of the tower that includes additional shear from ±5% mass eccentricity.
	DeSimone	**5/13/05**	**The requested calculations are included in Table 4. See also Figure 4.**
7.	M+L	2/28/05	There are shear walls surrounded by openings at both sides. Verify collectors requirements to deliver shear to these walls.
	DeSimone	3/18/05	We acknowledge that there are significant openings adjacent the core walls at some levels in the buildings and agree that collectors will be needed. The design of these elements will be addressed during the construction document phase. Preliminary calculations indicate that we should be able to easily reinforce the 9" PT slabs for all collector forces.
	M+L	4/13/05	We agree with your response but would like to have calculations for at least ground floor level.
	DeSimone	4/19/05	Per response to comment 5, the ground floor diaphragm in the tower will not transfer any force from the core to the perimeter walls. The only diaphragms that will have complicated collector and transfer forces will be the ground, 2nd, and 3rd floor levels of the midrise building. If you wish, calculations for these areas will be provided for your review during the CD phase of the project.
	M+L	4/25/05	**It is OK with us to get the calculations during CD phase of the project.**
8.	M+L	2/28/05	Settlement compatibility between high-rise on piles and mid-rise on mat footing total settlement for both could be different, but there is ground floor slab without a joint that could get cracked.
	DeSimone	3/18/05	The DD set incorporates "hinge slabs" between the tower and mid-rise structures at all connected levels. Final coordination of the hinge locations and details will be completed during the construction documents phase.
	M+L	4/13/05	**Resolved.**
9.	M+L	2/28/05	At 9' deep mat on piles, how is the modulus of subgrade reaction applied to pile footings.
	DeSimone	3/18/05	We have met several times with the geotechnical engineers to discuss the analysis of the pile cap and supporting piles. Through several iterations of pile cap analysis using SAFE, we have coordinated with them to determine suitable subgrade moduli for use in the pile cap analysis and design. See Figure 1 for the values used for the design shown on the DD drawings.
	M+L	4/13/05	**Resolved.**
10.	M+L	2/28/05	Is 9' deep pile cap required in full building area? There are areas where depth could be greatly reduced. (K-H for example)

	DeSimone	3/18/05	We agree. On the DD set the pile cap thickness has been reduced to three feet in the area between approximately grid lines H.2 and K.
	M+L	4/13/05	**Resolved.**
11.	M+L	2/28/05	The differential shortening in columns and walls will produce additional significant moments on outrigger beams. Is there a mechanism to relieve them from these forces?
	DeSimone	3/18/05	Our calculations indicate that the shortening in the outrigger columns will be of approximately the same magnitude as that of the core walls. For this reason we believe there will be very little additional moment in the outrigger beam/walls.
	M+L	4/13/05	Please provide detailed stress calculations (moments, shears) that account for shortening of all vertical members.
	DeSimone	4/19/05	The calculations included in Tables 2 and 3 demonstrate that the differential elastic shortening between the core and outrigger columns is 0.04, 0.08, and 0.14 inches at the bottom of the 1st, 2nd, and 3rd outriggers respectively. As the contractor intends to install the outrigger walls after the tower core and column construction is completed, a portion of this deflection will not impose any additional forces on the outriggers. Additional calculations regarding this issue will be provided during the CD phase of the project.
	M+L	**4/25/05**	**There are other columns that have more shortening than column "B", for example column "A". The spreadsheet analysis should include accurate load for each floor and correct area of the members. The member area is different at different levels. Use this information to design outriggers, Beams and slab. This is an important issue and requires detailed calculations. Please submit these calculation for our review.**
12.	M+L	2/28/05	Optimize P/T slab thickness at all locations.
	DeSimone	3/18/05	We believe the 9" slab thickness is appropriate for the tower slab. Any "economy" that may be achieved by making it thinner in some locations, we believe, will be offset by increased costs in formwork and architectural finishes that would be required.
	M+L	4/13/05	This item should be reviewed with the contractor for cost impact.
	DeSimone	4/19/05	If there is any money to be saved by thinning the slabs DeSimone will address it during the CD phase. However, for purposes of peer review, we believe this item should be considered resolved.
	M+L	4/25/05	**Resolved.**
13.	M+L	2/28/05	Main tower moment frames are all single bay frames that are not effective. Some of the bays can't be considered as a frame because clear span to depth is less than 4 – for example B0403.
	DeSimone	3/18/05	The moment frames have been designed for the UBC-required 25% of the base shear. All beams meet the span-to-depth ratio of at least 4.
	M+L	4/13/05	Some beans do not beam span to depth criteria. For example, check the span to depth ratio of beam B3 on third floor.

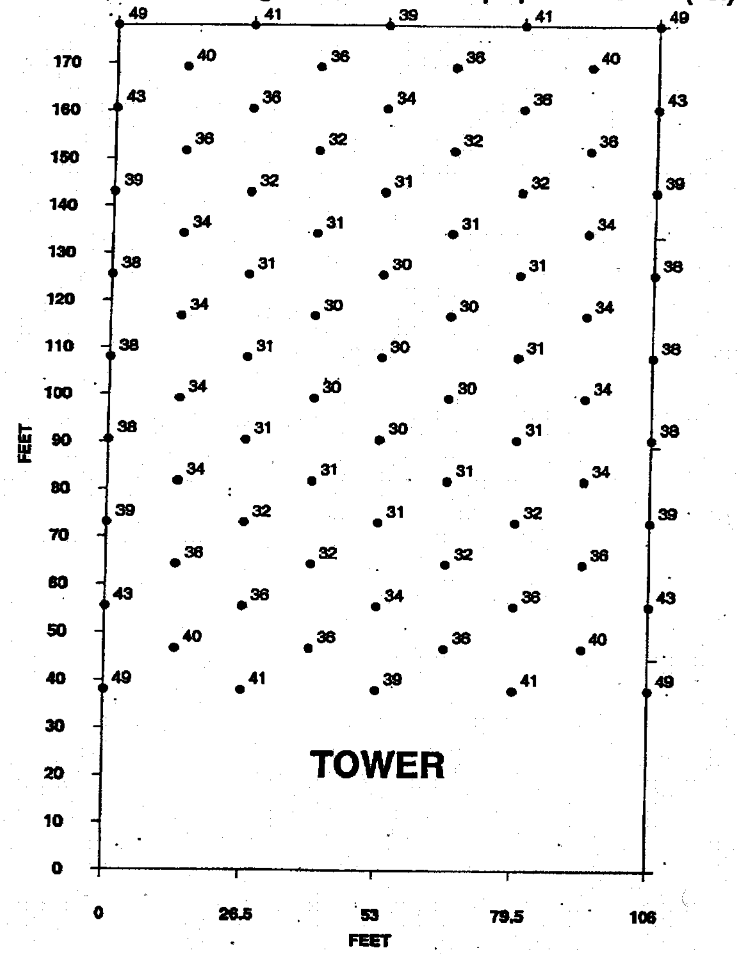
	DeSimone	4/19/05	You are correct about beam B3 at some floor levels. We will work with the architects to revise the beam span or will adjust the beam depth as required. Since this comment does not impact the foundation design, it will be addressed during the CD phase.
	M+L	4/25/05	**We will review the final version during CD phase.**
14.	M+L	2/28/05	Please provide design criteria for outrigger beams. Are they designed as a "deep beam" with a consideration for non-linear strain distribution. What forces will be considered for designing columns that get forces from outriggers?
	DeSimone	3/18/05	1. The outriggers and supporting columns are designed as follows: a. The portions of the outriggers connecting to the columns are designed using forces obtained from ETABS modal analysis. These areas are reinforced as concrete link beams with diagonal bars to insure a ductile response. b. The portions of the outriggers between the core and the link beams are designed for the capacities of the link beams. This will insure the ductility demand is localized in the link beams. c. The columns are also designed for the capacities of the link beams.
	M+L	4/13/05	The capacity of the frame columns should be more than the capacity of outrigger or omega x outrigger forces. Please provide the capacity of the outrigger using non-linear failure analysis of outrigger + shear walls.
	DeSimone	4/19/05	This comment does not impact the foundation design and will be addressed during the CD phase.
	M+L	4/25/05	**We will review the final version during CD phase.**
15.	M+L	2/28/05	a. Column transfer at 2nd floor line H with sloped column at 1st floor will create additional lateral component on both levels that will require beams and slab between frames to be designed for additional axial force. b. Very deep column section – 26' deep will act as a shear wall and attract a lot of additional seismic load to this frame. Careful considerations should be taken to design this transfer column for all applied loads. c. Sloped column should be included in the building model.
	DeSimone	3/18/05	a. The design of the sloping column area has not been finalized on the DD drawings, but we agree with your comment. This will be further addressed in the construction documents phase. b. See response to a. above. We are using a strut and tie methodology to determine reinforcing for the horizontal element. c. The sloped columns are included in our analysis model.

	M+L	4/13/05	a. Please provide calculations when this design is finalized. b. This member does not qualify as frame member. It should be properly modeled in ETABS and designed for omega x seismic forces. Additionally, Beam at level 1 should comply with UBC 1921.3.1.1. c. We agree with your response in concept. Please submit the properties of the sloped column that were used in the ETABS model.
	DeSimone	4/19/05	This comment does not impact the foundation design and will be addressed during the CD phase.
	M+L	4/25/05	**We will review the final version during CD phase.**
16.	M+L	2/28/05	There are 4 or 5 different round column sizes on one level – ground level mid-rise. Please verify if unification of sizes is possible to reduce cost.
	DeSimone	3/18/05	The DD set shows four sizes of round columns: 24", 30", 36", and 42". We have been asked by the owner and contractor to show the minimum sizes required. If further economies can be achieved by making any of the columns larger (re-use of formwork, etc.) we will do so, if requested by the owner or contractor.
	M+L	4/13/05	**Resolved.**
17.	M+L	2/28/05	a. Design criteria on drawings describes dual system, shear wall with SMRF, and R = 8.5. Mid-rise building has no SMRF. This building also has vertical structural irregularities such as discontinuous shear wall that should be considered. b. Code equations 30-6 and 30-7 need not be considered for drift check. c. Drift check should include accidental torsion.
	DeSimone	3/18/05	a. The mid-rise building has no SMRF and has been designed using R=5.5. The shear wall configuration shown on the DD set has no discontinuous shear walls. b. and c. It is true that the 1997 UBC <u>does</u> <u>not</u> require the inclusion of Eq. 30-7 but <u>does</u> require a 5% mass eccentricity when checking building drift. However, opinions and recommendations on this issue differ considerably, especially pertaining to tall buildings. SEAOC has recently recommended the use of the Eq. 30-7 limit <u>and</u> the 5% mass eccentricity. We feel that the SEAOC recommendation is overly conservative and have not considered it for design. However, we want to provide some added degree of safety against large displacements, and have therefore opted to follow the 2003 NEHRP recommendations, which were also suggested for use on this project by Professor Jack Moehle of U.C. Berkeley. Table 1 summarizes the recommendations of various parties for checking drift limits for this project. See Figures 2 and 3 for an explanation of the various force levels and the resulting drifts.
	M+L	4/13/05	a. **Resolved.** b. **Resolved.** c. **Resolved.**

18.	M+L	2/28/05	Please specify wind load design criteria for strength and for drift. Compare wind load and seismic.
	DeSimone	3/18/05	A wind tunnel study report was issued by RWDI on August 20, 2004. The loads from that study have been used to analyze the structure. We determined that: a. The forces are significantly less than those caused by seismic demands. b. The maximum interstory drifts from wind is on the order of H/700, which is well below typical limits for highrise buildings.
	M+L	4/13/05	**Resolved.**
19.	M+L	2/28/05	All outriggers are unusual in shape and can't be clearly designed as a deep beams or discontinuous shear walls. Based on their importance for overall stability of the building non-linear time history analysis should be performed to investigate performance of these important elements and bring factor of safety for them to a desirable level.
	DeSimone	3/18/05	As explained in our response to your comment #14 above, the outriggers are being considered as comprised of different components for which design procedures are well-understood and well-documented. (i.e., concrete link beams, and straight concrete shear walls.) This, in addition to the fact that capacity design methods are being used, provides adequate assurance that the performance of these elements is well understood. We therefore do not believe that time-history analysis, either linear or non-linear, is necessary to design these elements.
	M+L	4/13/05	We reserve our response to this comment till we see the response to comment 14 above.
	DeSimone	4/19/05	This comment does not impact the foundation design and will be addressed during the CD phase.
	M+L	4/25/05	**We will review the final version during CD phase.**
20.	M+L	4/13/05	Provide design calculations and details that account for P/T slab shortening due to concrete shrinkage.
	DeSimone	4/19/05	This comment does not impact the foundation design and will be addressed during the CD phase.
	M+L	4/25/05	**We will review the final version during CD phase.**
21.	M+L	4/13/05	Please provide the detailed design and analysis of W14 steel link beams.
	DeSimone	4/19/05	According to the section of the 2002 AISC Seismic Provisions containing requirements for Special Reinforced Concrete Shear Walls Composite with Structural Steel Elements (C-SRCW), the steel link beams must meet the requirements for the link portion of an Eccentrically Braced Frame (EBF.) The AISC commentary cites research done by Harries, Shahrooz, et al. In EERI Earthquake Spectra, Volume 16, Number 4, November 2000, Harries, Gong, and Shahrooz provide guidance for the design of the embedded region and the mechanism of load transfer. Requirements and provisions set forth in the above references were used in the design.

	M+L	4/25/05	**Please submit design calculations and details for our review during CD phase.**
22.	M+L	4/13/05	Please submit the ETABS model and backup calculations justifying cracked section properties.
	DeSimone	4/19/05	The cracked section properties used in our analysis were recommended for use on the project by Prof. Jack Moehle of UC Berkeley. However, Figure 3 has been updated on 4/18/05 to shows the effect on the code drift check when considering the conservative 0.5EI values for the core walls. The resulting drifts are still significantly below the maximum values allowed by code.
	M+L	4/25/05	Our understanding from you is that after going over the model with us, you will be sending us the ETABS input file.
	DeSimone	5/13/05	**ETABS file was provided to M+L for review and comment on 4/28/05.**
23.	M+L	4/13/05	Please provide calculations for diaphragm design.
	DeSimone	4/19/05	This comment does not impact the foundation design and will be addressed during the CD phase.
	M+L	4/25/05	**We will review the final version during CD phase.**

Modulus of subgrade reaction in kips per cubic feet (kcf)



Note: For a 25 foot excavation - Estimated subgrade modulus calculated by taking a uniform building pressure of 14.8 ksf and dividing by the predicted settlement. Assumes Tower is supported by a pile supported mat foundation (106'x140').

301 MISSION STREET
San Francisco, California
Project No. 3157.02
30 DECEMBER 2004

MODULI OF SUBGRADE REACTION
TREADWELL & ROLLO, INC.

Figure 1. Subgrade Moduli for Tower Pile Cap. (Comment #9)

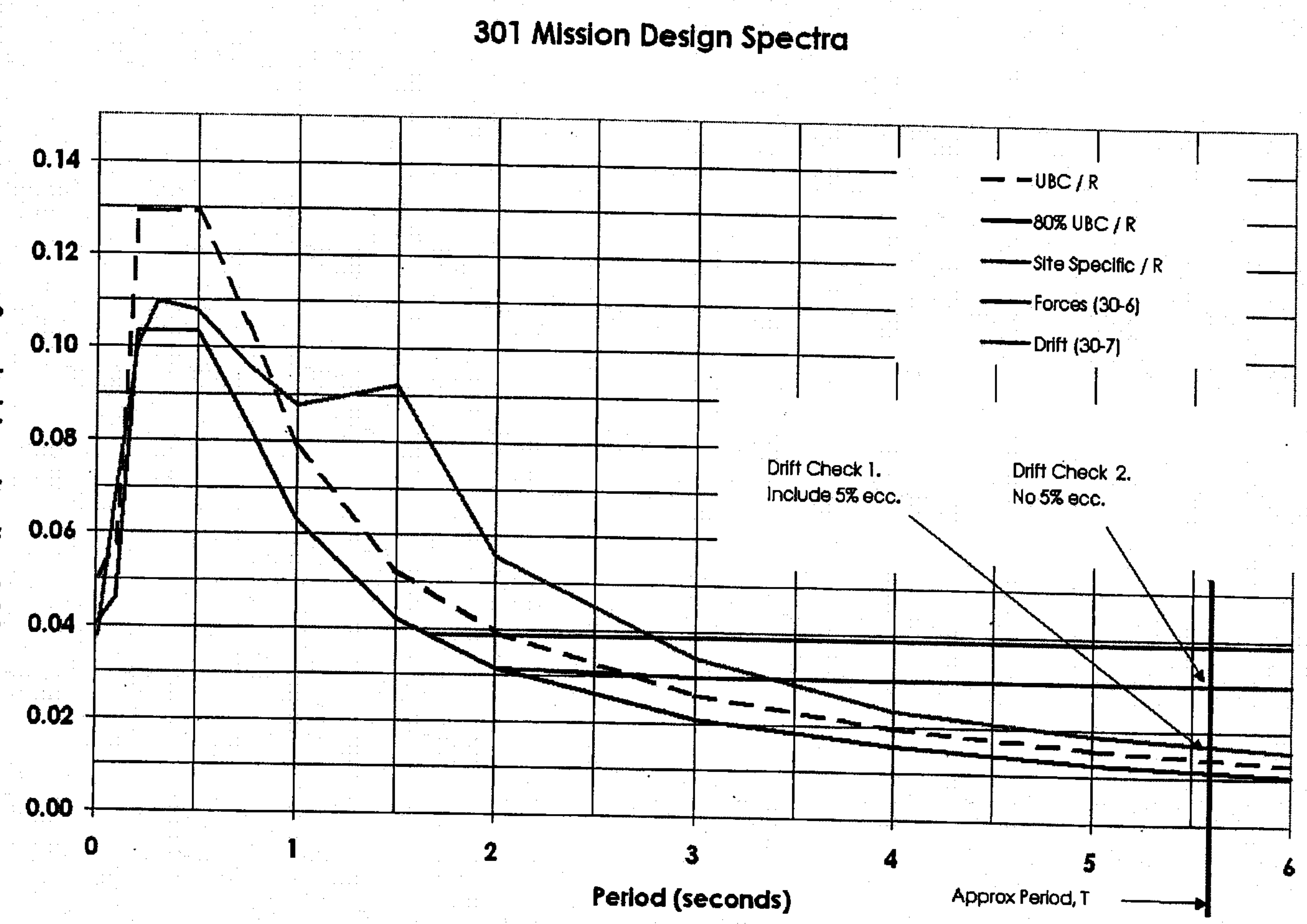


Figure 2. Seismic Design Spectra (Comment #17)

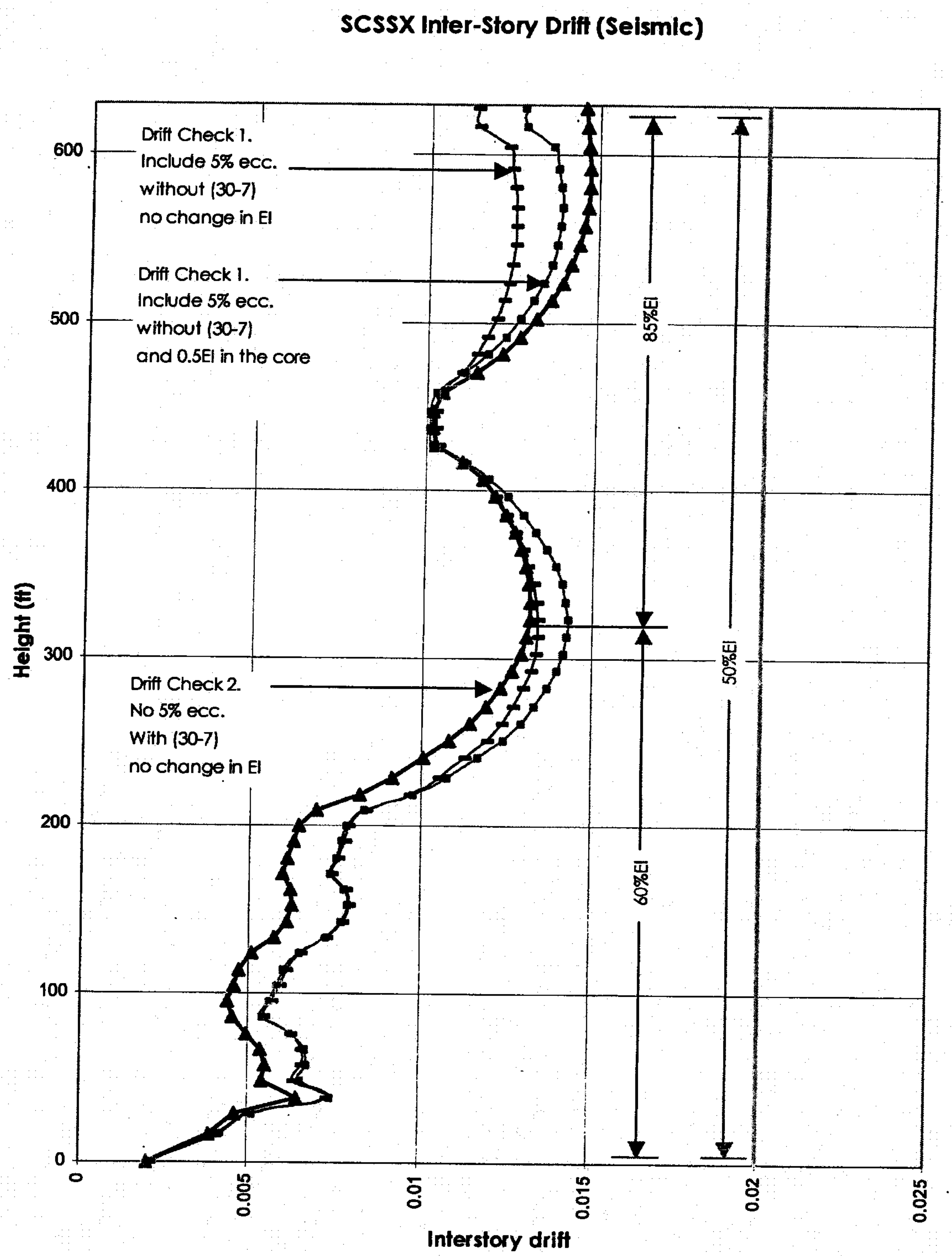


Figure 3. Seismic Building Drifts (Comments #17 & #22)

Table 1. Force/Eccentricity Combinations Considered for Drift (Comment #17)

Drift Case	Considered in design of 301 Mission	Recommended By	Include Eq. 30-7	Include 5% ecc.
1.	Yes	UBC 97 / M+L	No	Yes
2.	Yes	2003 NEHRP[1] / Prof. Jack Moehle	Yes	No
3.	No	SEAOC 2001[2]	Yes	Yes

1. 2003 NEHRP recommendations indicate that drifts should be checked at the center of mass of each diaphragm if the building is fairly regular. See section 4.5.1 of: http://www.bssconline.org/NEHRP2003/provisions/P4.pdf

2. http://www.seaoc.org/Pages/committees/seismpdfs/UBC/30_7.pdf

Table 2. Gravity Forces in Vertical Elements (Comment #11)

Vert. Element	Reaction at Base, P kips	Element Area, A sq. in.	P/A ksi	Check Total Weight Total Elements	kips at Base
Core box walls	**28,800**	**25,560**	**1.13**	**2**	**57,600**
Core straight walls	16,748	12,060	1.39	2	33,496
Col. A	6,093	2,160	2.82	4	24,372
Col. B = outrigger	**5,710**	**6,216**	**0.92**	**4**	**22,840**
Col. C	4,268	2,592	1.65	4	17,072
Col. D.	4,505	2,592	1.74	8	36,040
					191,420

Weight used for lateral design = **207,000**

Reactions listed above are from our most recent column load takedowns, which were based on SAFE analyses used to determine tributary areas for each vertical element. These numbers were used to determine the column reinforcing shown on the DD set.

Table 3. Differential Settlement of Core and Outrigger Columns (Comment #11)

Story No.	Height	Elev	E ksi	Core kips at floor	Core kips total	Core Area sq. in.	Core PL/AE at floor in.	Core PL/AE total in.	Column kips at floor	Column kips total	Column Area sq. in.	Column PL/AE at floor in.	Column PL/AE total in.	Delta PL/AE total in
59	12.8	605.0	4,000	488	488	25,560	0.0007	0.8952	97	97	6,216	0.0006	0.7298	0.1654
58	11.3	592.3	4,000	488	976	25,560	0.0013	0.8945	97	194	6,216	0.0011	0.7292	0.1652
57	12.5	581.0	4,000	488	1,464	25,560	0.0021	0.8932	97	290	6,216	0.0018	0.7282	0.1650
56	10.8	568.5	4,000	488	1,953	25,560	0.0025	0.8910	97	387	6,216	0.0020	0.7264	0.1646
55	10.8	557.8	4,000	488	2,441	25,560	0.0031	0.8886	97	484	6,216	0.0025	0.7244	0.1642
54	12.5	547.0	4,000	488	2,929	25,560	0.0043	0.8855	97	581	6,216	0.0035	0.7219	0.1636
53	10.8	534.5	4,000	488	3,417	25,560	0.0043	0.8812	97	677	6,216	0.0035	0.7184	0.1628
52	10.8	523.8	4,000	488	3,905	25,560	0.0049	0.8769	97	774	6,216	0.0040	0.7149	0.1620
51	10.8	513.0	4,000	488	4,393	25,560	0.0055	0.8720	97	871	6,216	0.0045	0.7109	0.1611
50	10.8	502.3	4,000	488	4,881	25,560	0.0062	0.8664	97	968	6,216	0.0050	0.7063	0.1601
49	10.8	491.5	4,000	488	5,369	25,560	0.0068	0.8603	97	1,065	6,216	0.0055	0.7013	0.1589
48	10.8	480.8	4,000	488	5,858	25,560	0.0074	0.8535	97	1,161	6,216	0.0060	0.6958	0.1577
47	12.5	470.0	4,000	488	6,346	25,560	0.0093	0.8461	97	1,258	6,216	0.0076	0.6898	0.1563
46	10.3	457.5	4,000	488	6,834	25,560	0.0083	0.8368	97	1,355	6,216	0.0068	0.6822	0.1546
45	10.3	447.2	4,000	488	7,322	25,560	0.0089	0.8285	97	1,452	6,216	0.0072	0.6754	0.1531
44	10.3	436.8	4,000	488	7,810	25,560	0.0095	0.8196	97	1,548	6,216	0.0077	0.6682	0.1514
43	10.3	426.5	4,000	488	8,298	25,560	0.0101	0.8101	97	1,645	6,216	0.0082	0.6605	0.1497
42	**10.3**	**416.2**	**4,000**	**488**	**8,786**	**25,560**	**0.0107**	**0.8001**	**97**	**1,742**	**6,216**	**0.0087**	**0.6523**	**0.1478**
41	10.3	405.8	4,500	488	9,275	25,560	0.0100	0.7894	97	1,839	6,216	0.0082	0.6436	0.1458
40	10.3	395.5	4,500	488	9,763	25,560	0.0105	0.7794	97	1,936	6,216	0.0086	0.6354	0.1440
39	10.3	385.2	4,500	488	10,251	25,560	0.0111	0.7689	97	2,032	6,216	0.0090	0.6268	0.1420
38	10.3	374.8	4,500	488	10,739	25,560	0.0116	0.7578	97	2,129	6,216	0.0094	0.6178	0.1400
37	10.3	364.5	4,500	488	11,227	25,560	0.0121	0.7463	97	2,226	6,216	0.0099	0.6084	0.1379
36	10.3	354.2	4,500	488	11,715	25,560	0.0126	0.7342	97	2,323	6,216	0.0103	0.5985	0.1356
35	10.3	343.8	4,500	488	12,203	25,560	0.0132	0.7215	97	2,419	6,216	0.0107	0.5882	0.1333
34	10.3	333.5	4,500	488	12,692	25,560	0.0137	0.7084	97	2,516	6,216	0.0112	0.5775	0.1309
33	10.3	323.2	4,500	488	13,180	25,560	0.0142	0.6947	97	2,613	6,216	0.0116	0.5664	0.1283
32	10.3	312.8	4,500	488	13,668	25,560	0.0147	0.6805	97	2,710	6,216	0.0120	0.5548	0.1257
31	10.3	302.5	4,500	488	14,156	25,560	0.0153	0.6657	97	2,807	6,216	0.0124	0.5428	0.1230
30	10.3	292.2	4,500	488	14,644	25,560	0.0158	0.6505	97	2,903	6,216	0.0129	0.5303	0.1202

Table 3. Differential Settlement of Core and Outrigger Columns (Comment #11)

Story No.	Story Height	Elev	E ksi	Core kips at floor	Core kips total	Core Area sq. in.	Core PL/AE at floor in.	Core PL/AE total in.	Column kips at floor	Column kips total	Column Area sq. in.	Column PL/AE at floor in.	Column PL/AE total in.	Delta PL/AE total in
59	12.8	605.0	4,000	488	488	25,560	0.0007	0.8952	97	97	6,216	0.0006	0.7298	0.1654
58	11.3	592.3	4,000	488	976	25,560	0.0013	0.8945	97	194	6,216	0.0011	0.7292	0.1652
57	12.5	581.0	4,000	488	1,464	25,560	0.0021	0.8932	97	290	6,216	0.0018	0.7282	0.1650
56	10.8	568.5	4,000	488	1,953	25,560	0.0025	0.8910	97	387	6,216	0.0020	0.7264	0.1646
55	10.8	557.8	4,000	488	2,441	25,560	0.0031	0.8886	97	484	6,216	0.0025	0.7244	0.1642
54	12.5	547.0	4,000	488	2,929	25,560	0.0043	0.8855	97	581	6,216	0.0035	0.7219	0.1636
53	10.8	534.5	4,000	488	3,417	25,560	0.0043	0.8812	97	677	6,216	0.0035	0.7184	0.1628
52	10.8	523.8	4,000	488	3,905	25,560	0.0049	0.8769	97	774	6,216	0.0040	0.7149	0.1620
51	10.8	513.0	4,000	488	4,393	25,560	0.0055	0.8720	97	871	6,216	0.0045	0.7109	0.1611
50	10.8	502.3	4,000	488	4,881	25,560	0.0062	0.8664	97	968	6,216	0.0050	0.7063	0.1601
49	10.8	491.5	4,000	488	5,369	25,560	0.0068	0.8603	97	1,065	6,216	0.0055	0.7013	0.1589
48	10.8	480.8	4,000	488	5,858	25,560	0.0074	0.8535	97	1,161	6,216	0.0060	0.6958	0.1577
47	12.5	470.0	4,000	488	6,346	25,560	0.0093	0.8461	97	1,258	6,216	0.0076	0.6898	0.1563
46	10.3	457.5	4,000	488	6,834	25,560	0.0083	0.8368	97	1,355	6,216	0.0068	0.6822	0.1546
45	10.3	447.2	4,000	488	7,322	25,560	0.0089	0.8285	97	1,452	6,216	0.0072	0.6754	0.1531
44	10.3	436.8	4,000	488	7,810	25,560	0.0095	0.8196	97	1,548	6,216	0.0077	0.6682	0.1514
43	10.3	426.5	4,000	488	8,298	25,560	0.0101	0.8101	97	1,645	6,216	0.0082	0.6605	0.1497
42	**10.3**	**416.2**	**4,000**	**488**	**8,786**	**25,560**	**0.0107**	**0.8001**	**97**	**1,742**	**6,216**	**0.0087**	**0.6523**	**0.1478**
41	10.3	405.8	4,500	488	9,275	25,560	0.0100	0.7894	97	1,839	6,216	0.0082	0.6436	0.1458
40	10.3	395.5	4,500	488	9,763	25,560	0.0105	0.7794	97	1,936	6,216	0.0086	0.6354	0.1440
39	10.3	385.2	4,500	488	10,251	25,560	0.0111	0.7689	97	2,032	6,216	0.0090	0.6268	0.1420
38	10.3	374.8	4,500	488	10,739	25,560	0.0116	0.7578	97	2,129	6,216	0.0094	0.6178	0.1400
37	10.3	364.5	4,500	488	11,227	25,560	0.0121	0.7463	97	2,226	6,216	0.0099	0.6084	0.1379
36	10.3	354.2	4,500	488	11,715	25,560	0.0126	0.7342	97	2,323	6,216	0.0103	0.5985	0.1356
35	10.3	343.8	4,500	488	12,203	25,560	0.0132	0.7215	97	2,419	6,216	0.0107	0.5882	0.1333
34	10.3	333.5	4,500	488	12,692	25,560	0.0137	0.7084	97	2,516	6,216	0.0112	0.5775	0.1309
33	10.3	323.2	4,500	488	13,180	25,560	0.0142	0.6947	97	2,613	6,216	0.0116	0.5664	0.1283
32	10.3	312.8	4,500	488	13,668	25,560	0.0147	0.6805	97	2,710	6,216	0.0120	0.5548	0.1257
31	10.3	302.5	4,500	488	14,156	25,560	0.0153	0.6657	97	2,807	6,216	0.0124	0.5428	0.1230
30	10.3	292.2	4,500	488	14,644	25,560	0.0158	0.6505	97	2,903	6,216	0.0129	0.5303	0.1202

29	10.3	281.8	4,500	488	15,132	25,560	0.0163	0.6347	97	3,000	6,216	0.0133	0.5174	0.1173
28	10.3	271.5	4,500	488	15,620	25,560	0.0168	0.6184	97	3,097	6,216	0.0137	0.5041	0.1142
27	10.3	261.2	4,500	488	16,108	25,560	0.0174	0.6015	97	3,194	6,216	0.0142	0.4904	0.1111
26	10.3	250.8	4,500	488	16,597	25,560	0.0179	0.5842	97	3,291	6,216	0.0146	0.4763	0.1079
25	12.3	240.5	4,500	488	17,085	25,560	0.0218	0.5663	97	3,387	6,216	0.0178	0.4617	0.1046
24	9.5	228.3	4,500	488	17,573	25,560	0.0174	0.5445	97	3,484	6,216	0.0142	0.4439	0.1006
23	9.5	218.8	4,500	488	18,061	25,560	0.0179	0.5270	97	3,581	6,216	0.0146	0.4297	0.0974
22	9.5	209.3	4,500	488	18,549	25,560	0.0184	0.5091	97	3,678	6,216	0.0150	0.4151	0.0941
21	9.5	199.8	5,000	488	19,037	25,560	0.0170	0.4908	97	3,774	6,216	0.0138	0.4001	0.0907
20	9.5	190.3	5,000	488	19,525	25,560	0.0174	0.4738	97	3,871	6,216	0.0142	0.3862	0.0875
19	9.5	180.8	5,000	488	20,014	25,560	0.0179	0.4564	97	3,968	6,216	0.0146	0.3720	0.0843
18	9.5	171.3	5,000	488	20,502	25,560	0.0183	0.4385	97	4,065	6,216	0.0149	0.3575	0.0810
17	**9.5**	**161.8**	**5,000**	**488**	**20,990**	**25,560**	**0.0187**	**0.4202**	**97**	**4,162**	**6,216**	**0.0153**	**0.3426**	**0.0776**
16	9.5	152.3	5,000	488	21,478	25,560	0.0192	0.4015	97	4,258	6,216	0.0156	0.3273	0.0742
15	9.5	142.8	5,000	488	21,966	25,560	0.0196	0.3823	97	4,355	6,216	0.0160	0.3117	0.0706
14	9.5	133.3	5,000	488	22,454	25,560	0.0200	0.3627	97	4,452	6,216	0.0163	0.2957	0.0670
13	9.5	123.8	5,000	488	22,942	25,560	0.0205	0.3427	97	4,549	6,216	0.0167	0.2794	0.0633
12	9.5	114.3	5,000	488	23,431	25,560	0.0209	0.3222	97	4,645	6,216	0.0170	0.2627	0.0595
11	9.5	104.8	5,000	488	23,919	25,560	0.0213	0.3013	97	4,742	6,216	0.0174	0.2457	0.0557
10	9.5	95.3	5,000	488	24,407	25,560	0.0218	0.2800	97	4,839	6,216	0.0177	0.2283	0.0517
9	9.5	85.8	5,000	488	24,895	25,560	0.0222	0.2582	97	4,936	6,216	0.0181	0.2105	0.0477
8	**9.5**	**76.3**	**5,000**	**488**	**25,383**	**25,560**	**0.0226**	**0.2360**	**97**	**5,033**	**6,216**	**0.0185**	**0.1924**	**0.0436**
7	9.5	66.8	5,000	488	25,871	25,560	0.0231	0.2134	97	5,129	6,216	0.0188	0.1740	0.0394
6	9.5	57.3	5,000	488	26,359	25,560	0.0235	0.1903	97	5,226	6,216	0.0192	0.1551	0.0352
5	9.5	47.8	5,000	488	26,847	25,560	0.0239	0.1668	97	5,323	6,216	0.0195	0.1360	0.0308
4	9.5	38.3	5,000	488	27,336	25,560	0.0244	0.1428	97	5,420	6,216	0.0199	0.1165	0.0264
3	12.2	28.8	5,000	488	27,824	25,560	0.0318	0.1185	97	5,516	6,216	0.0259	0.0966	0.0219
2	16.6	16.6	5,000	488	28,312	25,560	0.0441	0.0867	97	5,613	6,216	0.0359	0.0707	0.0160
1	15.8	0.0	5,000	488	28,800	25,560	0.0426	0.0426	97	5,710	6,216	0.0347	0.0347	0.0079
	620.8			28,800					5,710					

Table 4. Lateral Force on Piles Below Tower (Comment #6)

Calculate force per pile with no eccentricty

Base shear =	**8,000**	kips
Total Piles =	**945**	
Force per pile =	**8.47**	kips

Calculate the additional force per pile due to 5% mass eccentricity

Tower dimension =	**160**	feet
5% eccentricity =	**8**	feet
M =	**64,000**	k-ft

Note: The eccentricities used below include only the distance from the centroid of the pile cap to the pile in the NS direction. The actual eccentricity should include the component in the EW direction. Increasing the eccentricity of the pile will result in smaller forces. Therefore these calculations are conservative.

See Figure 4 for pile row locations.

Guess force on closest pile (line 14)= **0.07** kips

Pile Row Number	No. piles per row N	ecc. feet E	Force kips P	M = N*n*E*P k-ft
1	26	47.2	1.87	2,291
2	17	43.7	1.73	1,284
3	17	40.2	1.59	1,087
4	28	36.7	1.45	1,492
5	28	33.2	1.31	1,222
6	28	29.7	1.17	978
7	17	26.2	1.04	462
8	17	22.7	0.90	347
9	17	19.2	0.76	248
10	17	15.7	0.62	166
11	17	12.2	0.48	101
12	17	8.7	0.35	51
13	17	5.2	0.21	18
14	**17**	**1.7**	**0.07**	**2**
15	17	1.8	0.07	2
16	17	5.3	0.21	19
17	17	8.8	0.35	52
18	17	12.3	0.48	101
19	17	15.8	0.62	167
20	17	19.3	0.76	249
21	17	22.8	0.90	348
22	17	26.3	1.04	463
23	17	29.8	1.18	595
24	28	33.3	1.31	1,224
25	28	36.8	1.45	1,495
26	28	40.3	1.59	1,793
27	17	43.8	1.73	1,286
28	17	47.3	1.87	1,500
29	26	50.8	2.01	2,647
30	**22**	**75.2**	**2.97**	**4,919**

31	22	70.6	2.79	4,327
32	22	65.9	2.60	3,774
33	22	61.2	2.42	3,258
34	22	56.6	2.23	2,781
35	22	51.9	2.05	2,341
36	9	42.6	1.68	644
37	9	23.9	0.94	203
38	9	19.2	0.76	132
39	9	14.6	0.58	75
40	9	9.9	0.39	35
41	9	5.2	0.21	10
42	9	0.6	0.02	0
43	9	4.1	0.16	6
44	9	8.8	0.35	27
45	9	13.4	0.53	64
46	9	18.1	0.71	116
47	9	22.8	0.90	184
48	9	27.4	1.08	268
49	9	46.1	1.82	755
50	22	55.4	2.19	2,670
51	22	60.1	2.37	3,139
52	22	64.8	2.56	3,645
53	22	69.4	2.74	4,189
54	22	74.1	2.93	4,771
	945			64,027

Add both components	8.47	without considering eccentricity
	2.97	from eccentricity, max at line 30
Maximum force per pile	**11.44**	kips per pile
Per soils report, allowable load is	16	kips per pile
which would give	0.50	inches deflection at pile
Actual expected deflection then is	**0.26**	inches at center of bldg
	0.36	inches max at perimeter

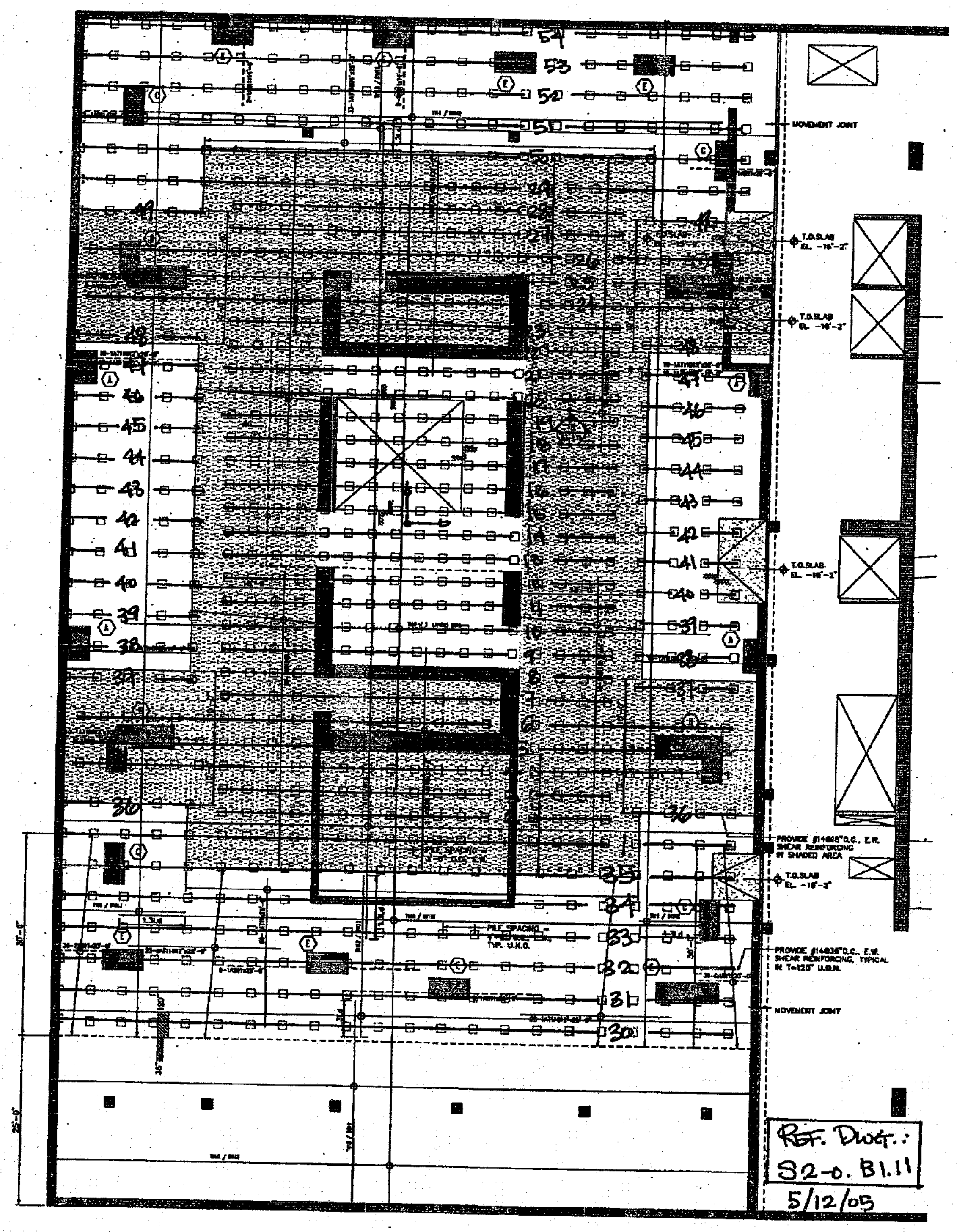


Figure 4. Tower Foundation Plan (Comment #6)