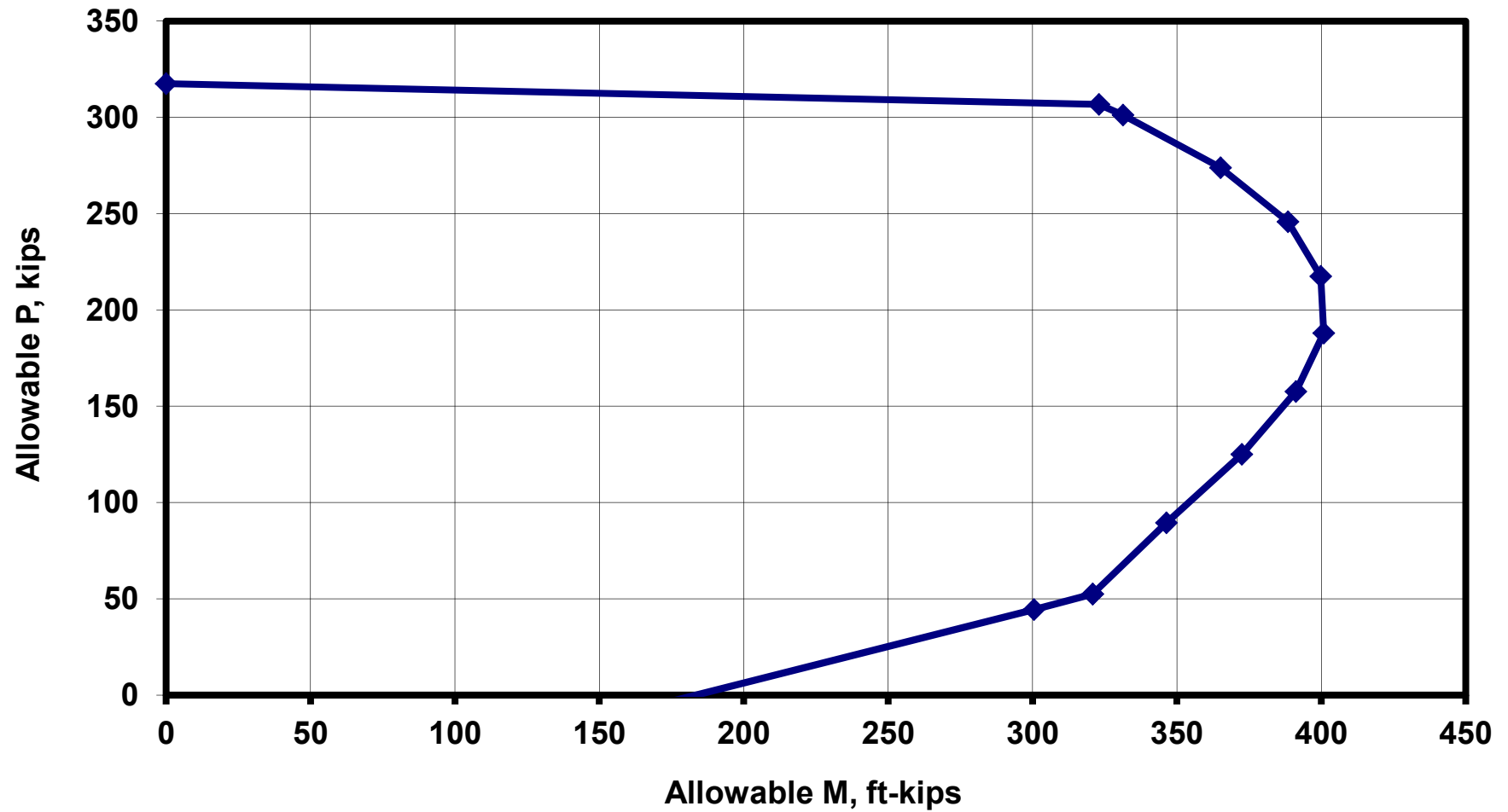


Allowable-Stress Interaction Diagram by Spreadsheet
CMU Masonry Shear Wall
 $f'_m=1900$ psi, 7'-4" ft long, 8 in. thick, #6 bars @16"



Spreadsheet for calculating allowable-stress moment-axial force interaction diagram for shear wall

depth	88	<i>total wall length</i>
f'm	1.9	<i>masonry compressive strength</i>
E _m	1710	<i>masonry elastic modulus (900*f'm for CMU, 700*f'm for clay)</i>
F _b	0.855	
E _s	29000	<i>steel elastic modulus</i>
F _s	32	<i>allowable steel stress</i>
d	84	<i>depth to furtherest tension bar</i>
k _{balanced}	0.311828	
width	7.625	<i>masonry width (actual width)</i>

steel layers are counted from the extreme compression fiber to the extreme tension fiber
distances are measured from the extreme compression fiber
reinforcement is assumed to be placed in the end cells, and at 16-in intervals in the interior
compression in masonry and reinforcement is taken as positive
stress in compressive reinforcement is set to zero, because the reinforcement is not laterally supported

Row of Reinforcement	distance	Area	
1	4.00	0.44	<i>set distance and area to zero if no bar exists</i>
2	20.00	0.44	
3	36.00	0.44	
4	52.00	0.44	
5	68.00	0.44	
6	84.00	0.44	
7	0.00	0.00	

	k	kd	fb	C _{mas}	fs(1)	fs(2)	fs(3)	fs(4)	fs(5)	fs(6)	fs(7)	Moment	Axial Force
pure axial load												0	317
Points controlled by masonry	1.12	94.08	0.86	307	0.00	0.00	0.00	0.00	0.00	0.00	0.00	323	307
	1.1	92.40	0.86	301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	331	301
	1	84.00	0.86	274	0.00	0.00	0.00	0.00	0.00	0.00	0.00	365	274
	0.9	75.60	0.86	246	0.00	0.00	0.00	0.00	0.00	-1.61	-1.61	388	246
	0.8	67.20	0.86	219	0.00	0.00	0.00	0.00	-0.17	-3.63	-3.63	400	217
	0.7	58.80	0.86	192	0.00	0.00	0.00	0.00	-2.27	-6.21	-6.21	401	188
	0.6	50.40	0.86	164	0.00	0.00	0.00	-0.46	-5.06	-9.67	-9.67	391	158
	0.5	42.00	0.86	137	0.00	0.00	0.00	-3.45	-8.98	-14.50	-14.50	372	125
	0.4	33.60	0.86	110	0.00	0.00	-1.04	-7.94	-14.85	-21.75	-21.75	346	89
	0.311828	26.19	0.86	85	0.00	0.00	-5.43	-14.29	-23.14	-32.00	-32.00	321	52
Points controlled by steel	0.311828	26.19	0.86	85	0.00	0.00	-5.43	-14.29	-23.14	-32.00	-32.00	321	52
	0.3	25.20	0.81	78	0.00	0.00	-5.88	-14.59	-23.29	-32.00	-32.00	300	44
	0.2	16.80	0.47	30	0.00	-1.52	-9.14	-16.76	-24.38	-32.00	-32.00	166	-7
	0.1	8.40	0.21	7	0.00	-4.91	-11.68	-18.46	-25.23	-32.00	-32.00	90	-34
	0.01	0.84	0.02	0	-1.22	-7.37	-13.53	-19.69	-25.84	-32.00	0.00	63	-44