

## BAB V

### KESIMPULAN DAN SARAN

#### 5.1 Kesimpulan

Tugas Akhir ini telah merancang struktur gedung yang disesuaikan dengan Tata Cara Perhitungan Struktur Beton Untuk Gedung SNI 03-2847-2002 dan Tata Cara Perencanaan Ketahanan Gempa Untuk Bangunan Gedung SNI 03-1726-2002 dengan hasil :

1. Tipe pelat yang digunakan yaitu tipe dua arah, dengan ketebalan 120 mm, untuk penulangan arah  $y$  menggunakan P10-250 dan arah  $x$  P10-250 dengan tulangan pembagi P8-200.
2. Balok berdimensi 500/800 memerlukan tulangan 8D25 pada tumpuan atas dan 5D25 pada tumpuan bawah, tulangan 3D25 pada lapangan atas 5D25 pada lapangan bawah. Untuk tulangan begel pada sendi plastis 3P12-100 dan di luar sendi plastis menggunakan 3P12-150.
3. Kolom lantai 1 dengan dimensi 1300/1300 mampu menahan balok dengan tulangan longitudinal 44D25. Tulangan geser kolom digunakan 4P12-100 untuk di dalam  $\ell_o$  dan di luar  $\ell_o$  digunakan 4P12-150.
4. Dinding geser lantai 1 menggunakan tebal dinding 400 mm, tulangan longitudinal yang digunakan dua lapis tulangan D16-175 dan tulangan geser 3D14-100.

## **5.2 Saran**

1. Faktor daktilitas suatu struktur gedung merupakan dasar penentuan gempa yang bekerja pada struktur gedung.
2. Untuk kemudahan dalam melaksanakan analisis struktur terutama dalam pembuatan model struktur gedung akan lebih mudah jika memakai program analisis struktur ETABS beserta dengan program – program bantu lainnya.
3. Dalam melakukan input data pada program ETABS hendaknya disesuaikan dengan peraturan yang berlaku.

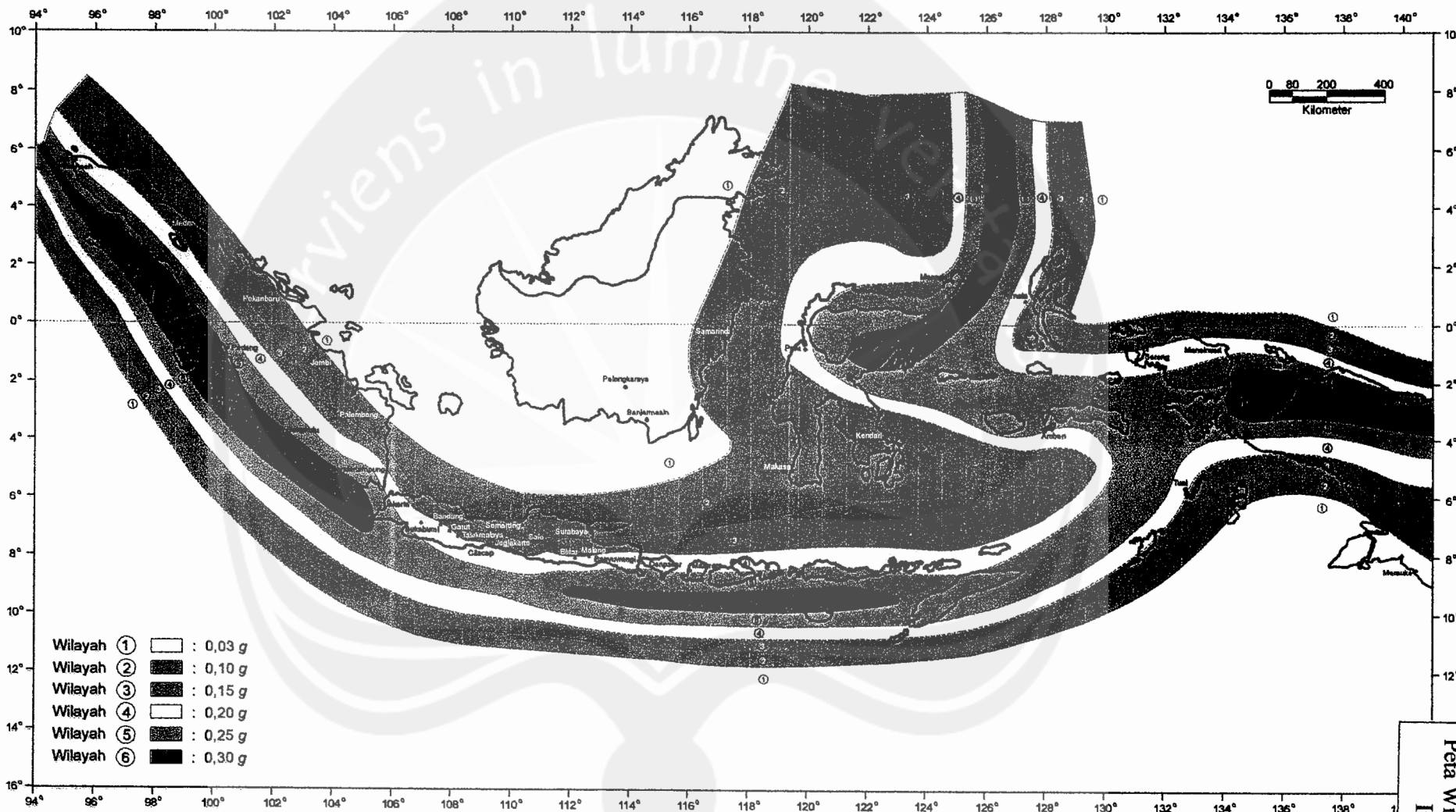
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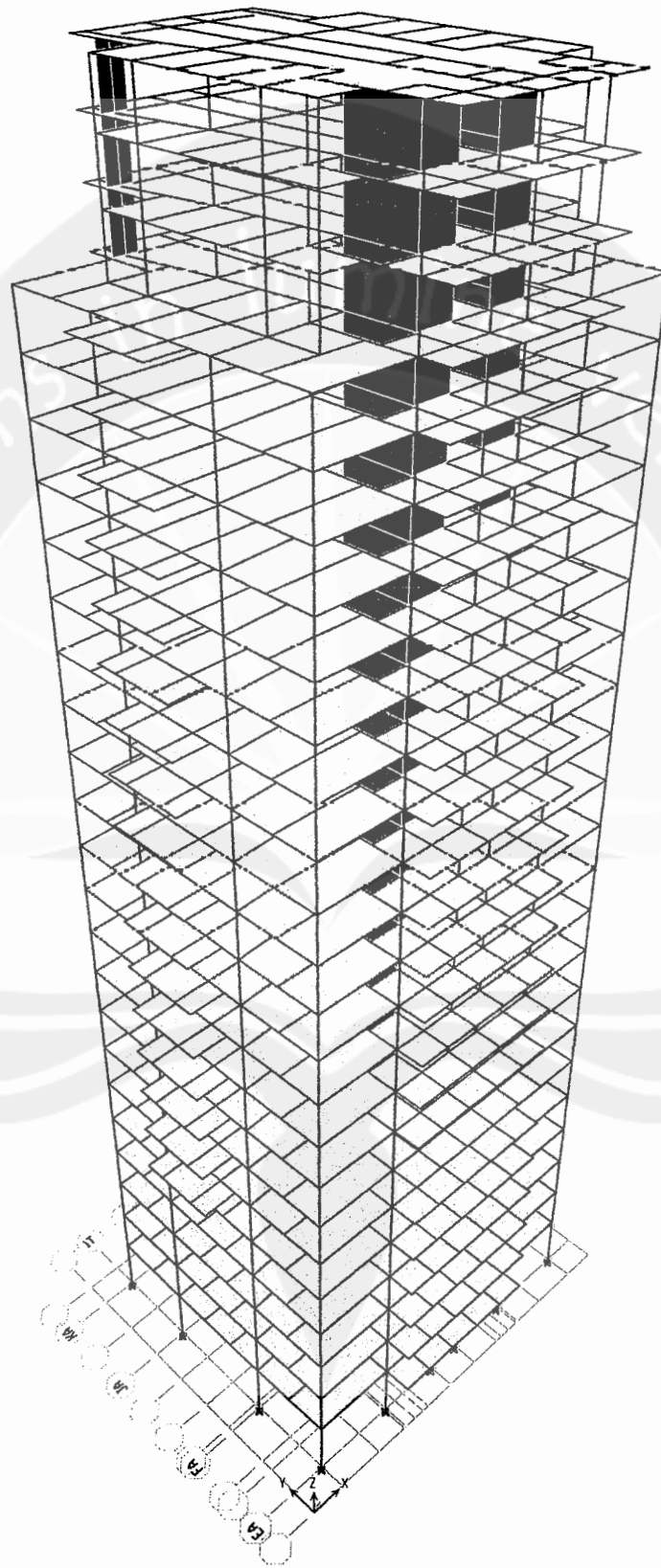
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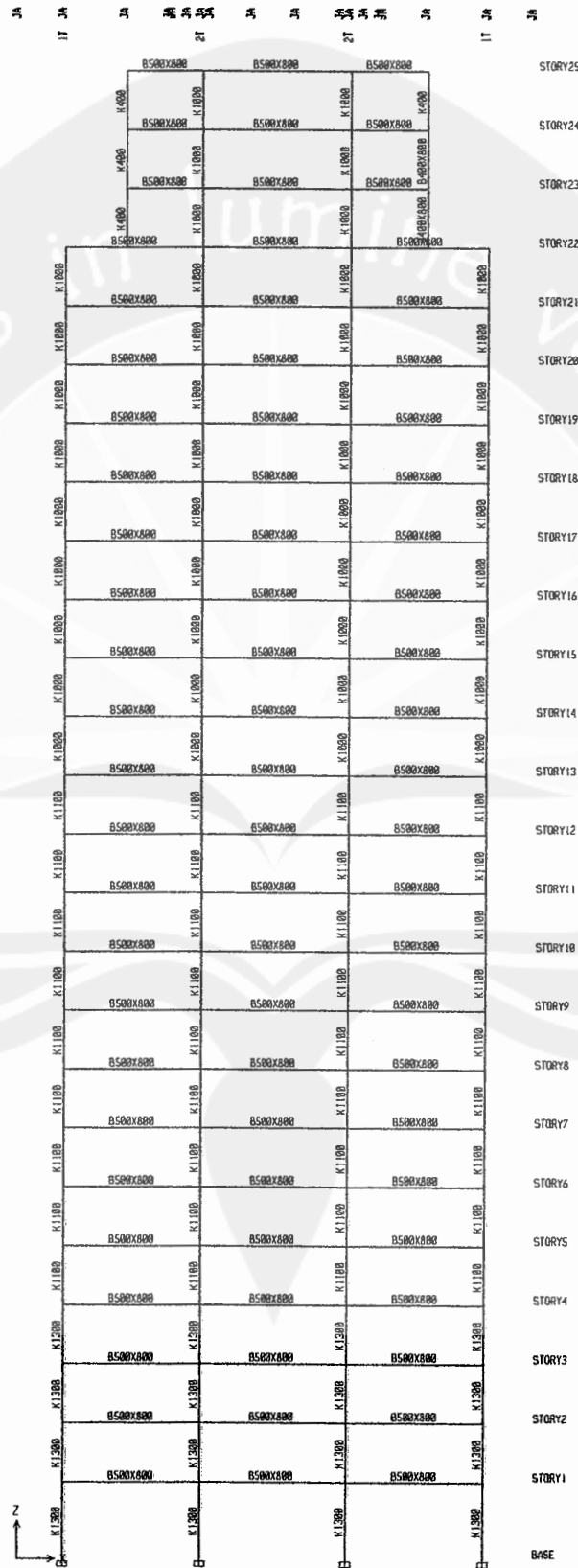


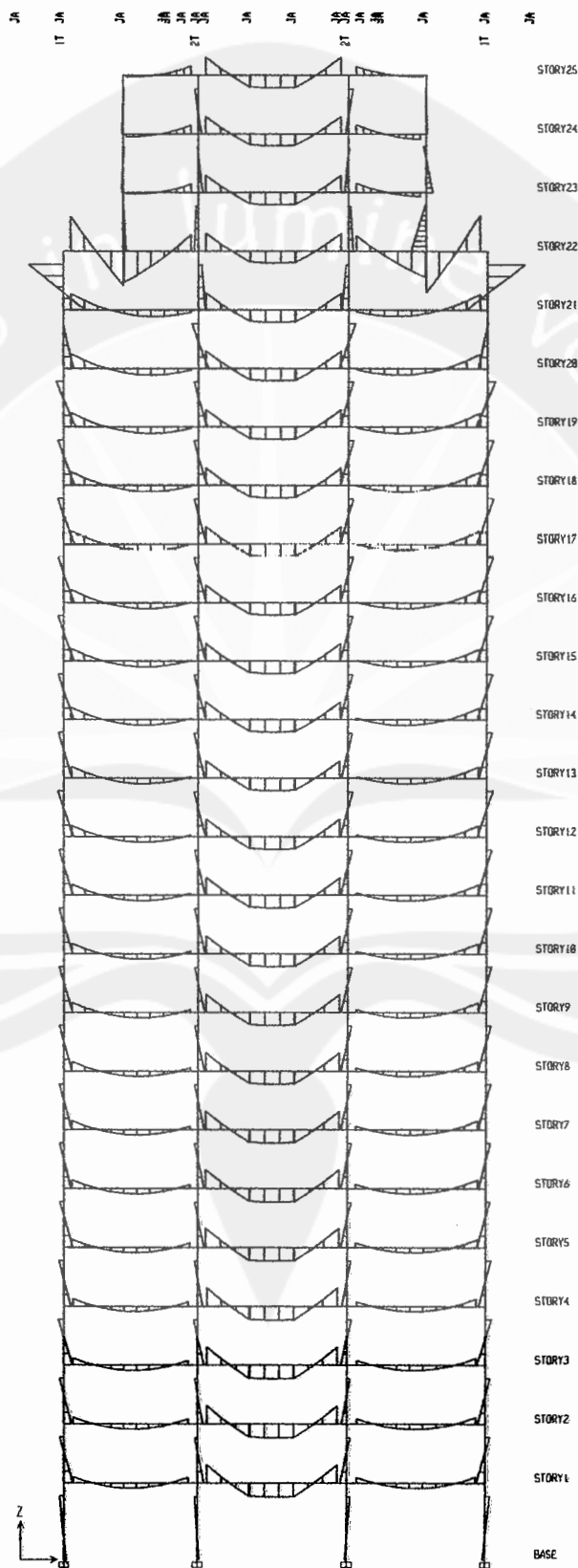


Gambar 2.1. Wilayah Gempa Indonesia dengan percepatan puncak batuan dasar dengan perioda ulang 500 ta

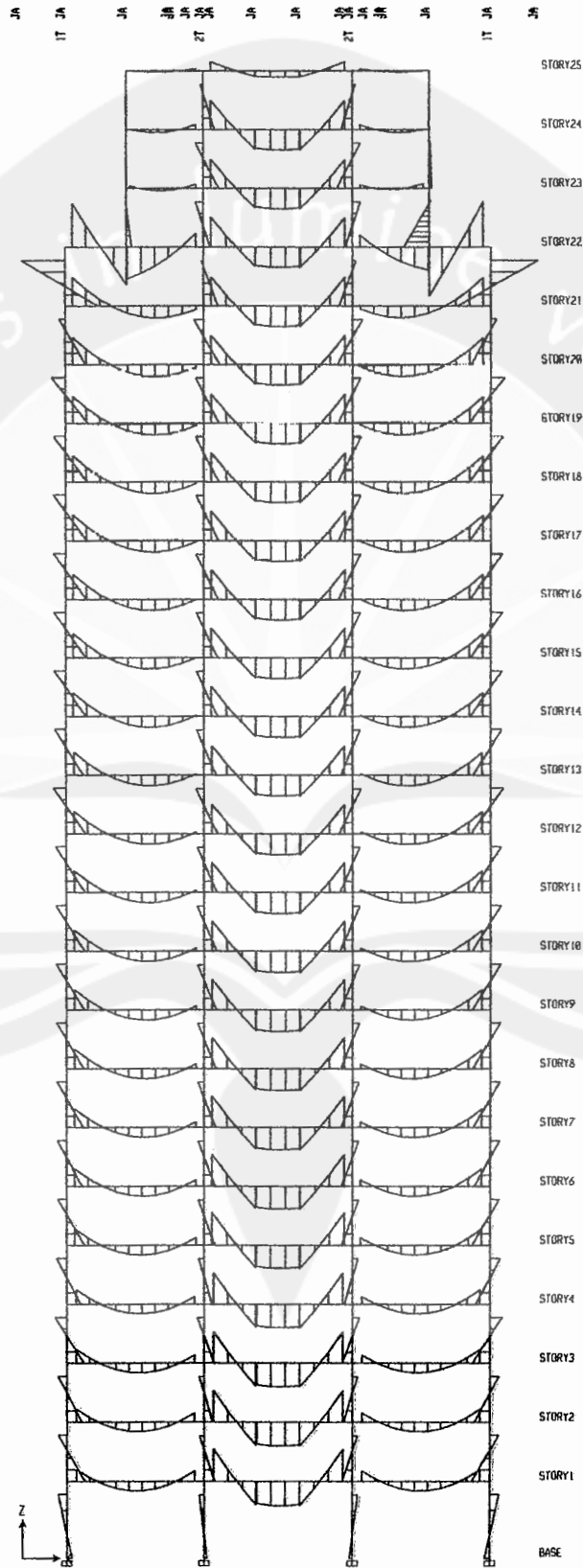
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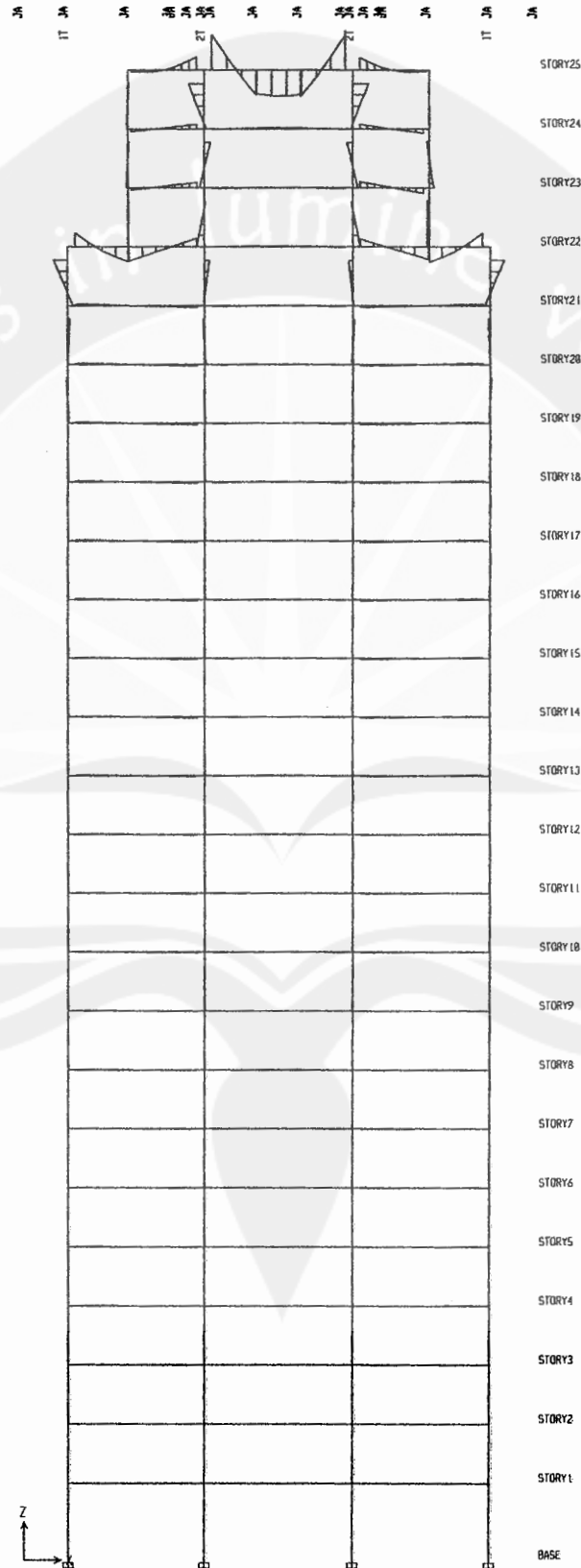


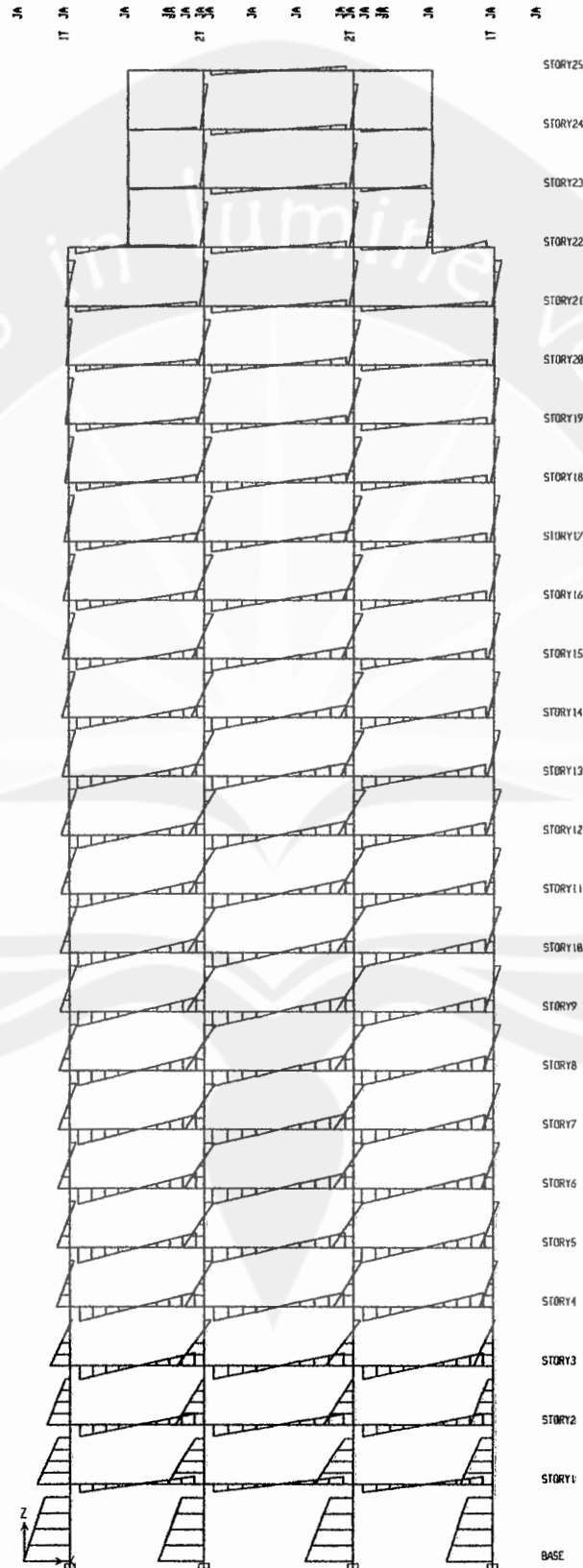


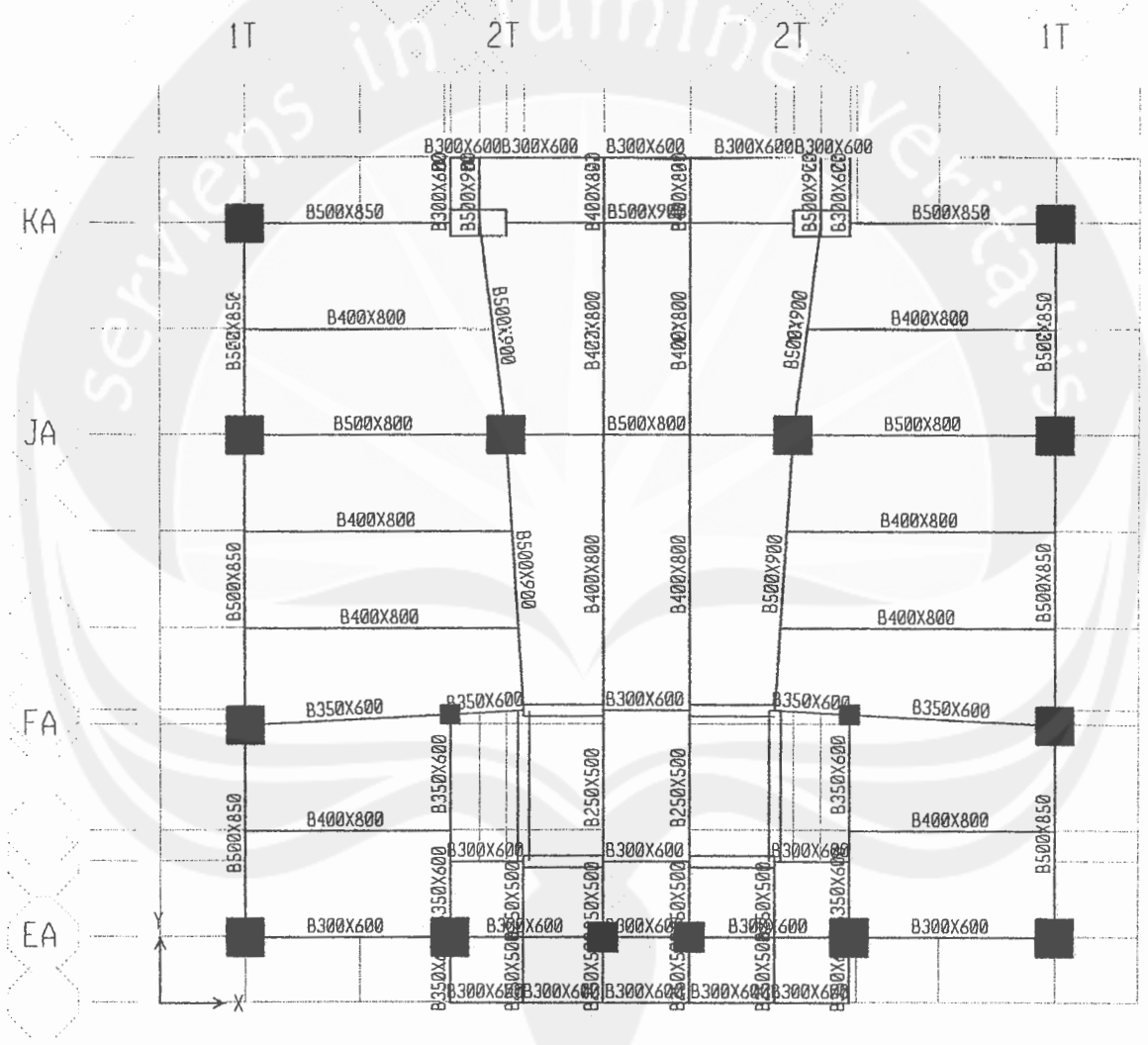


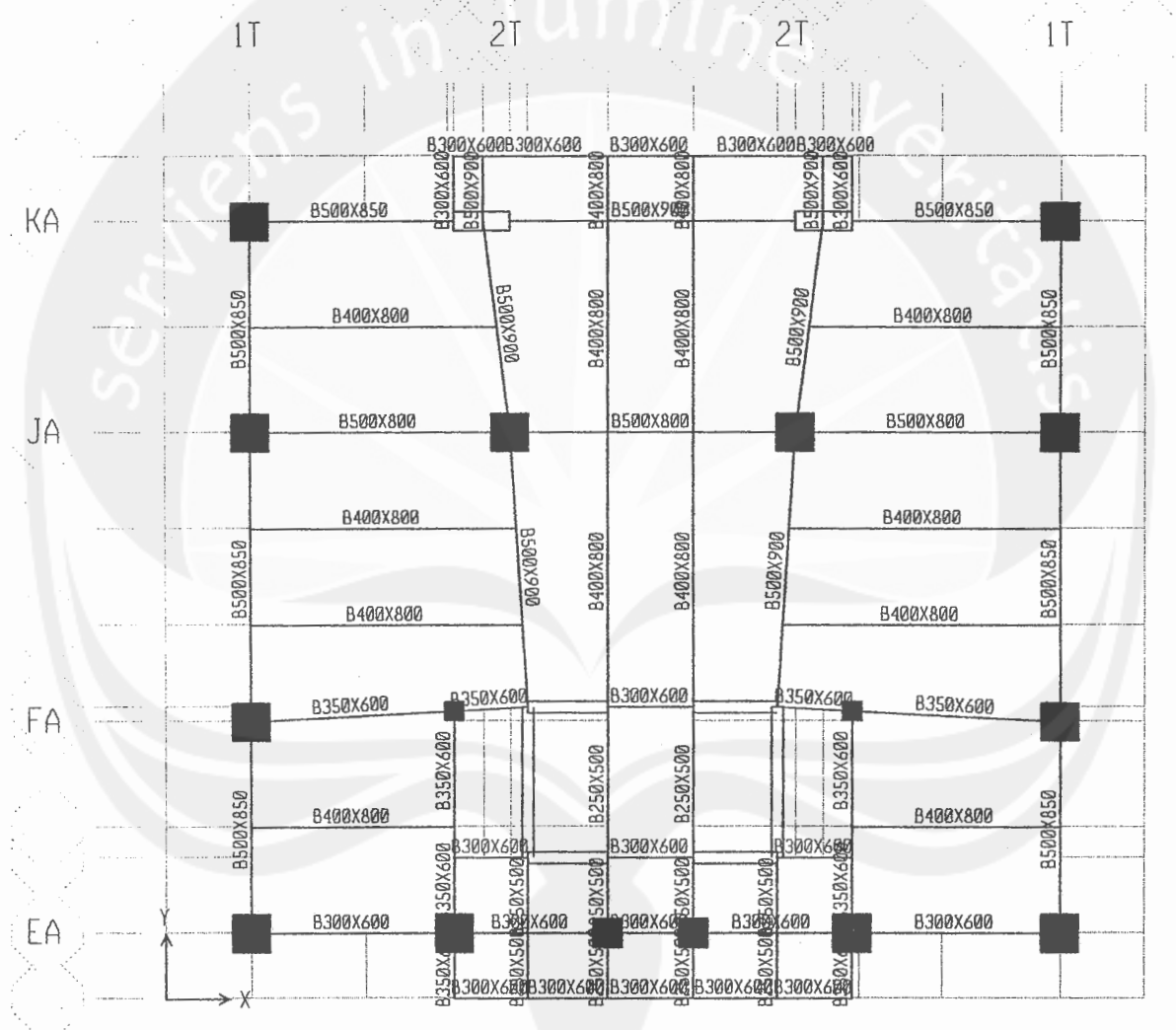


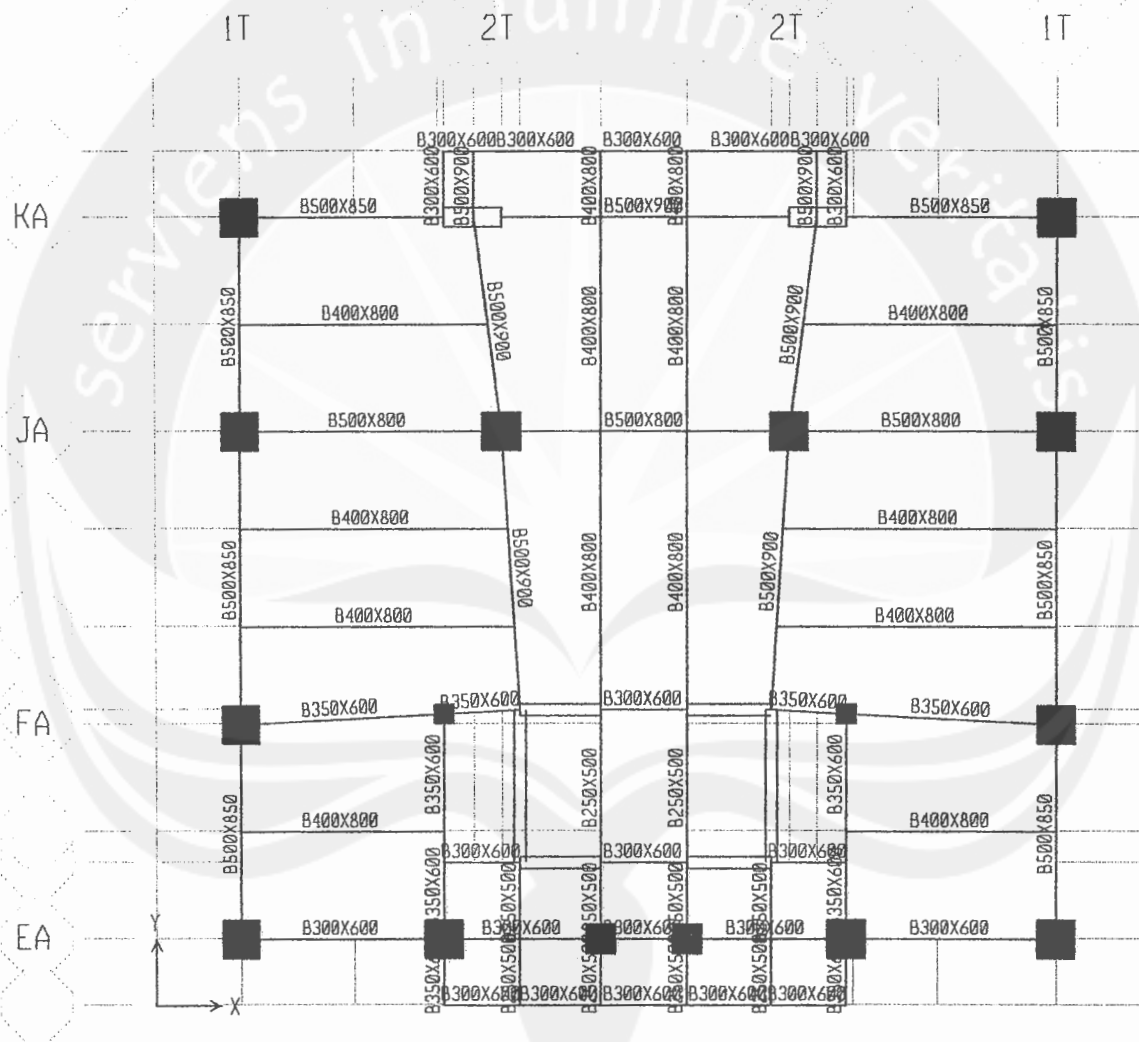


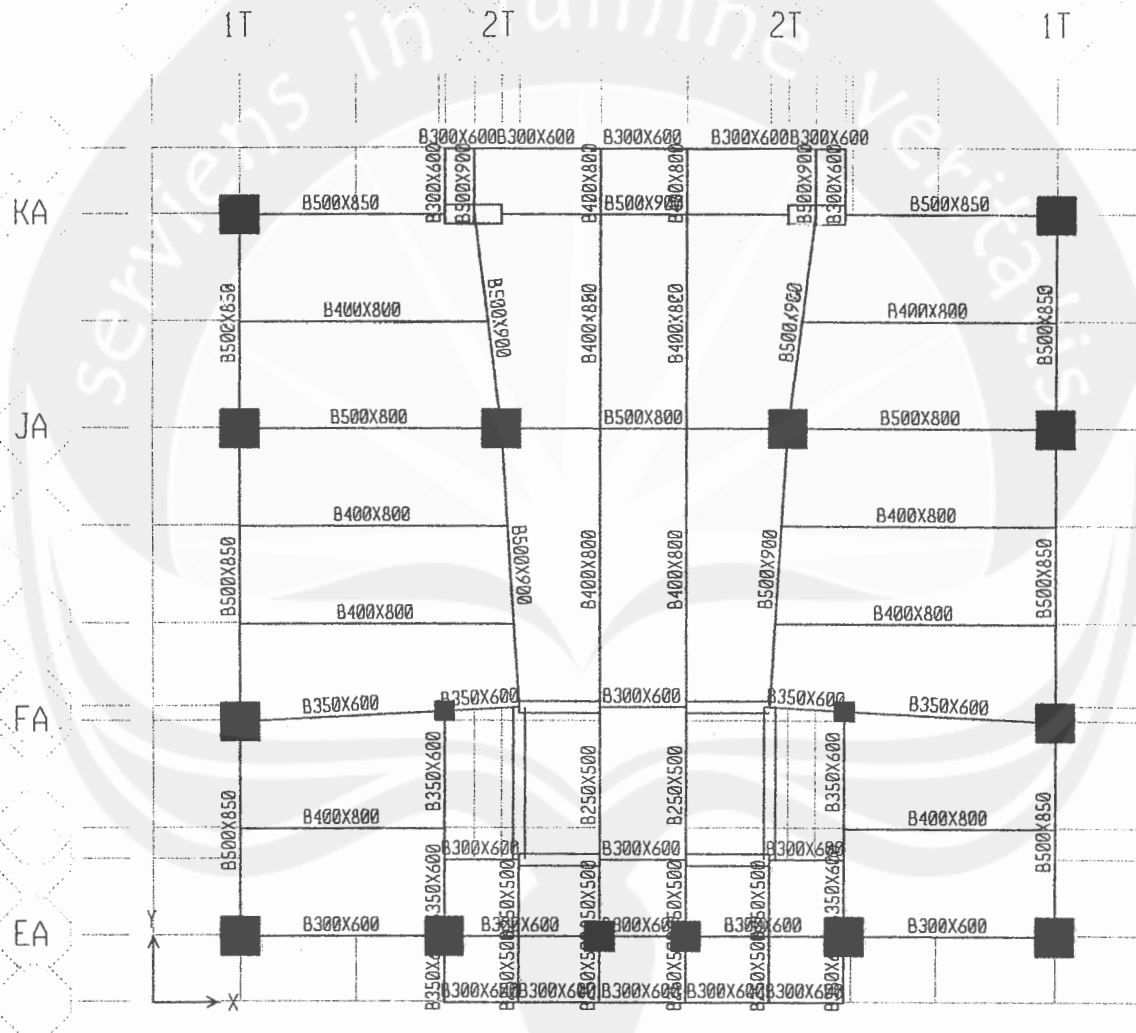


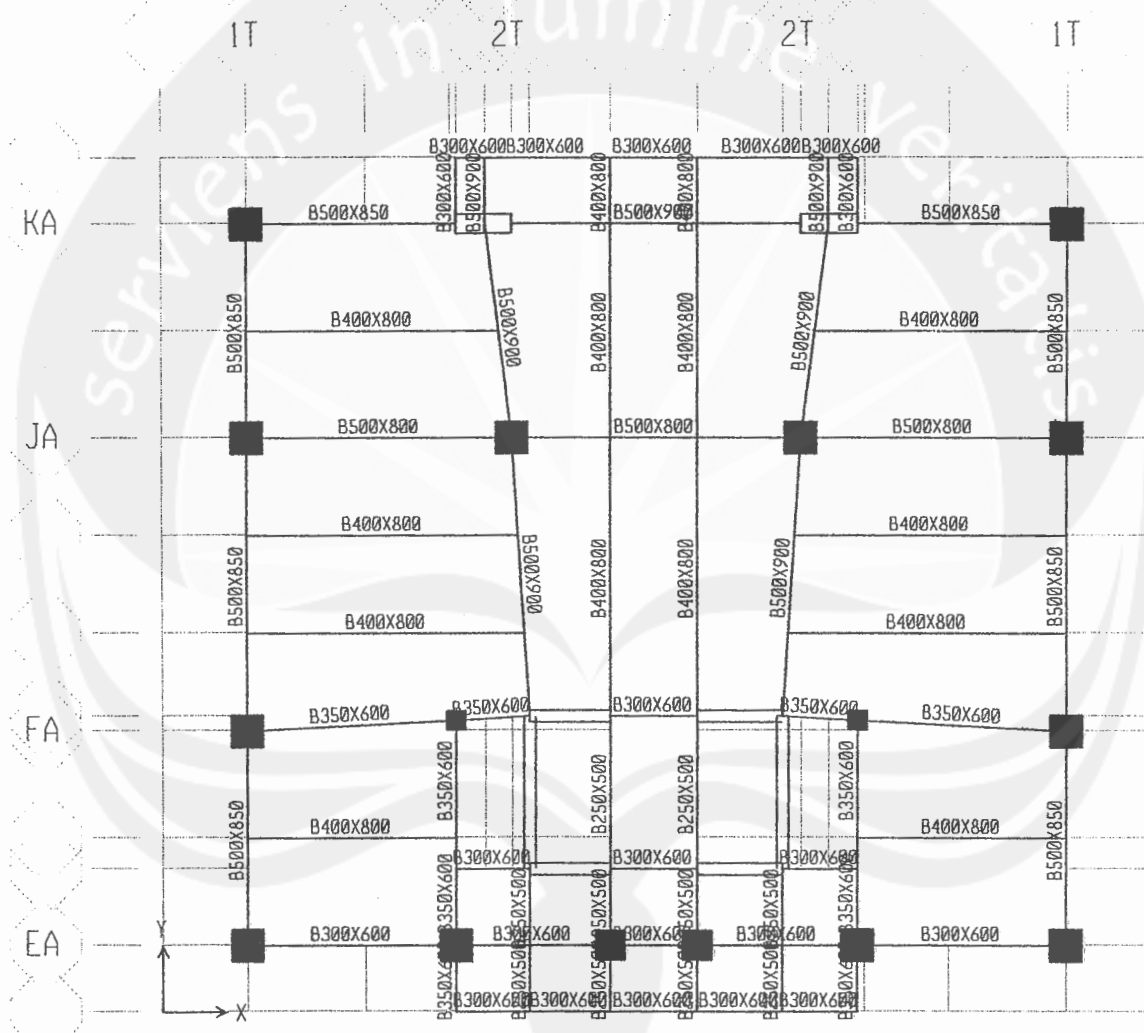






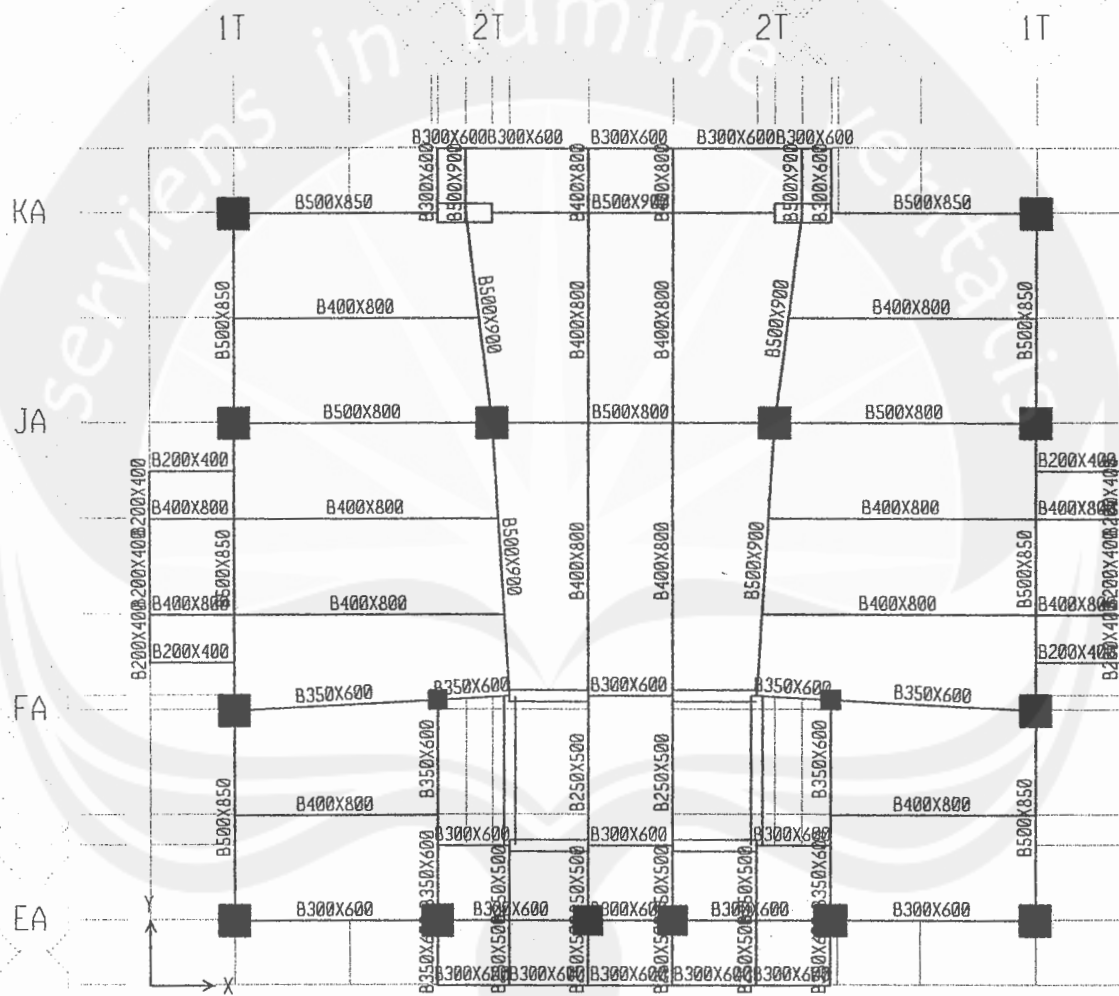








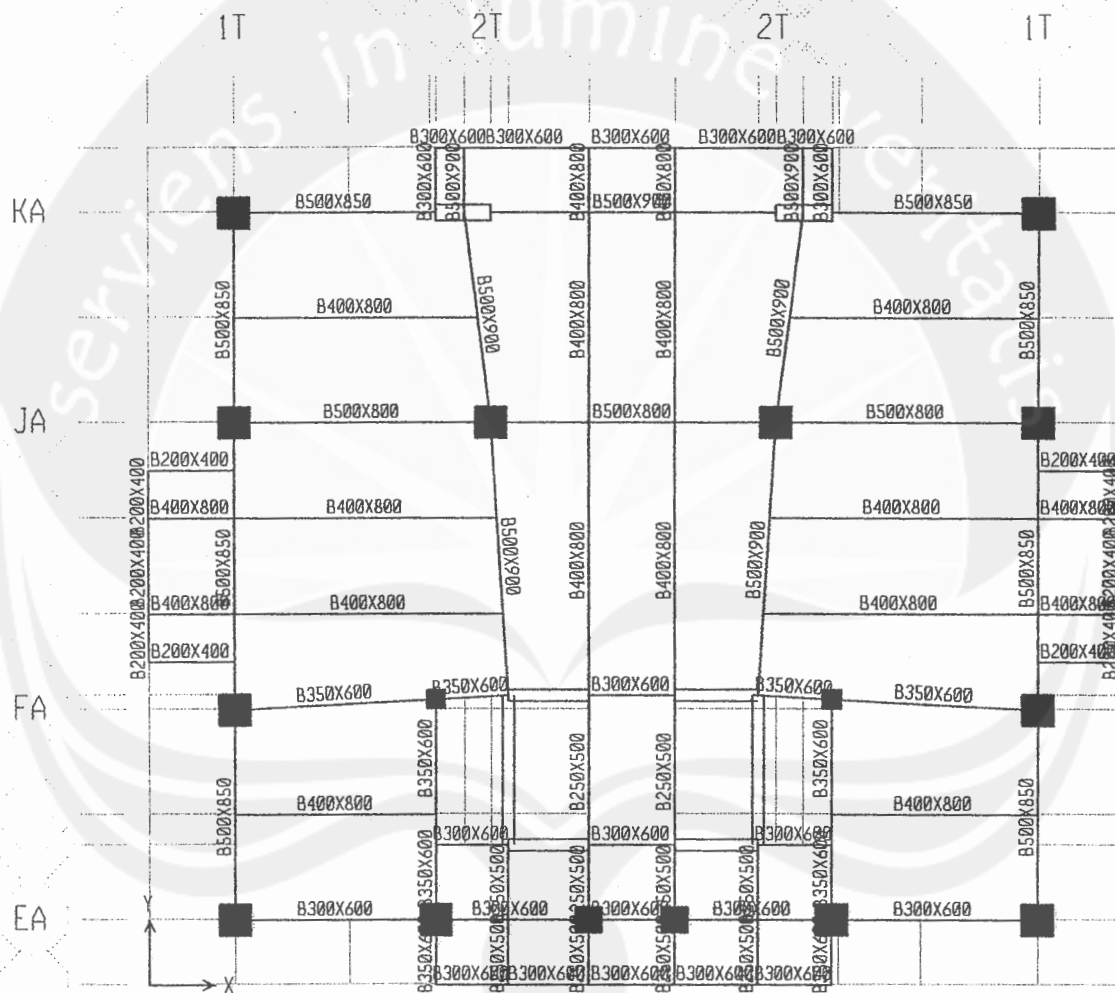


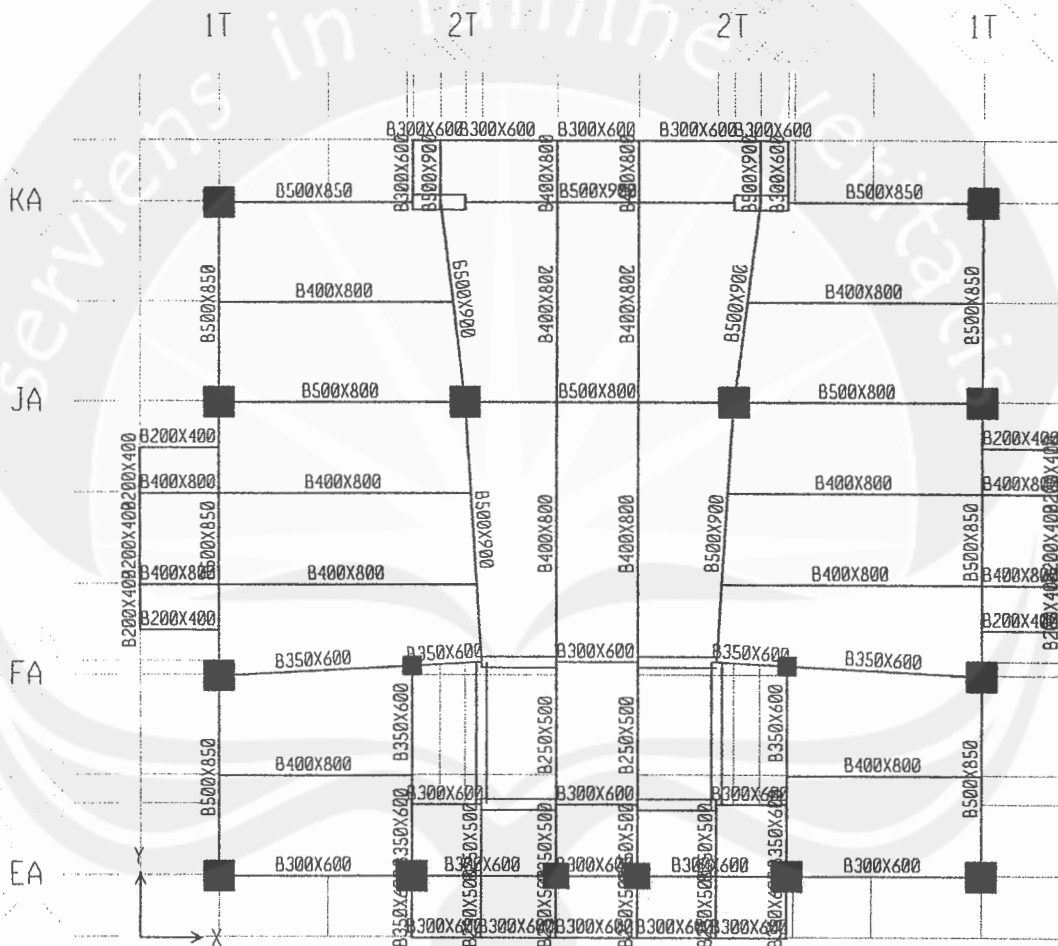


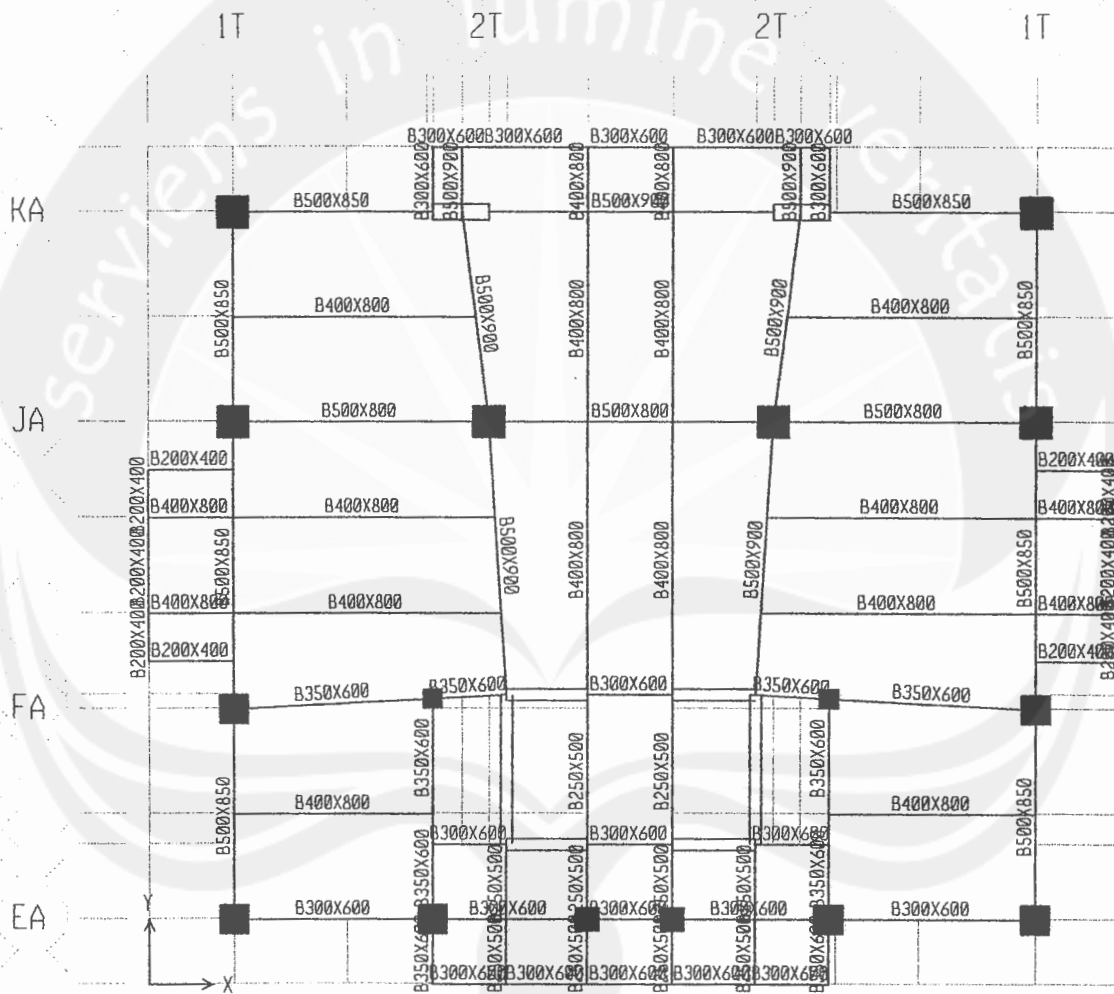




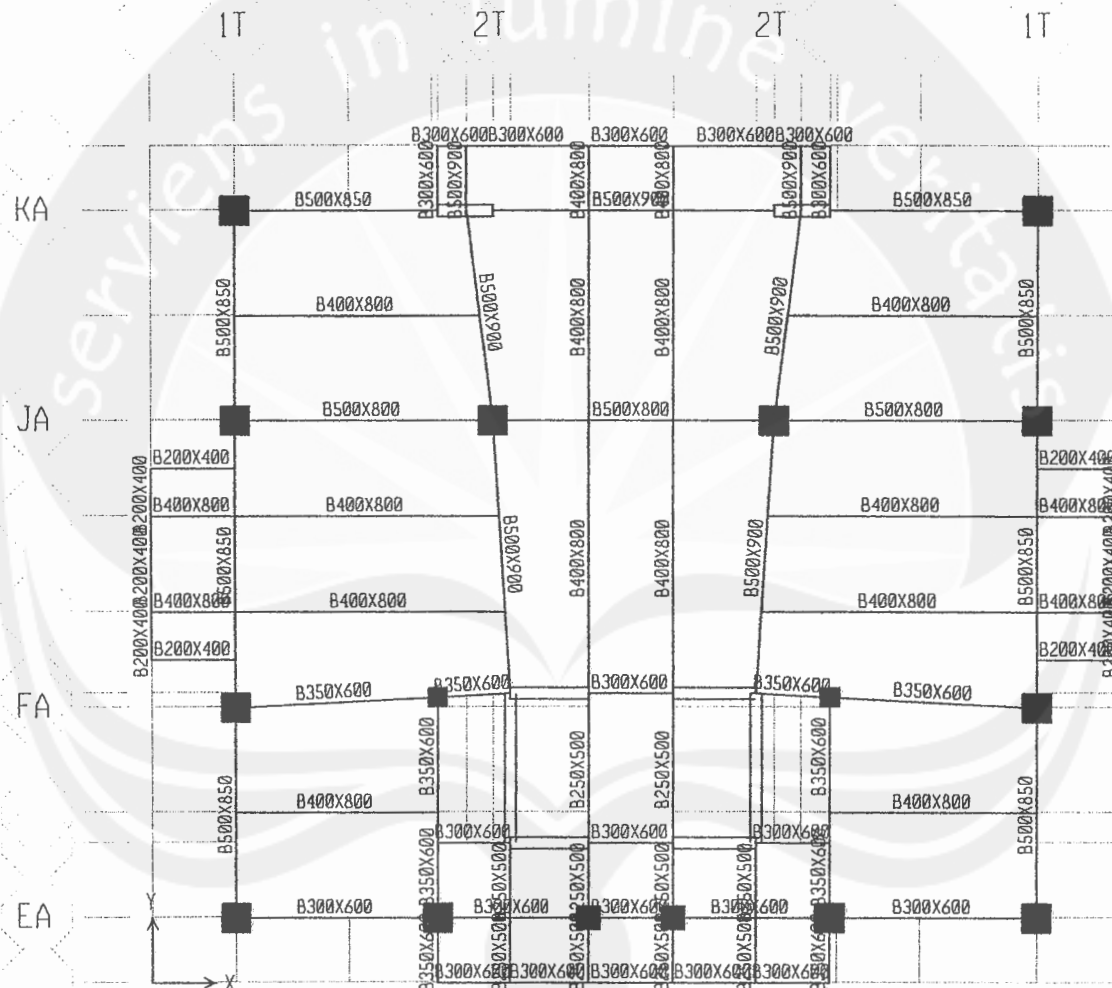




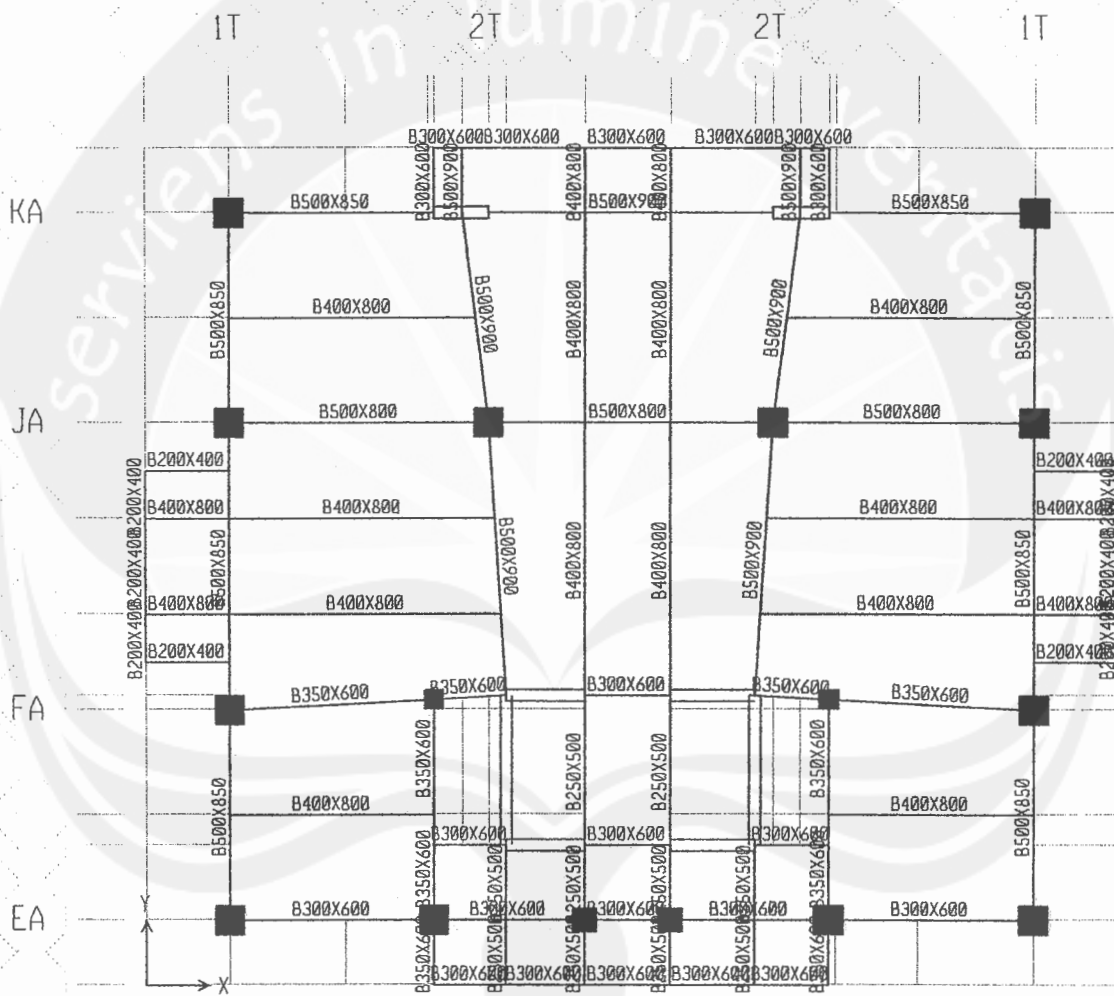




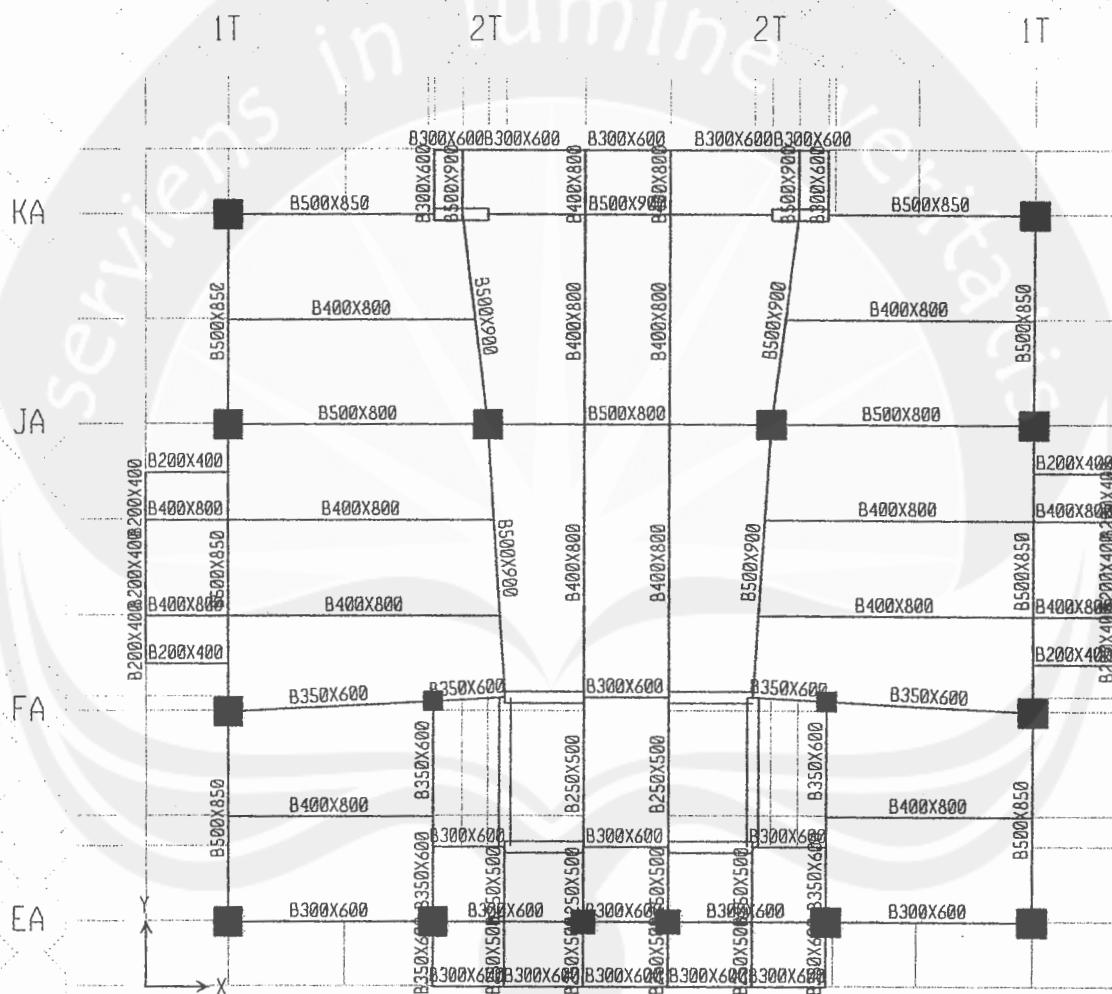


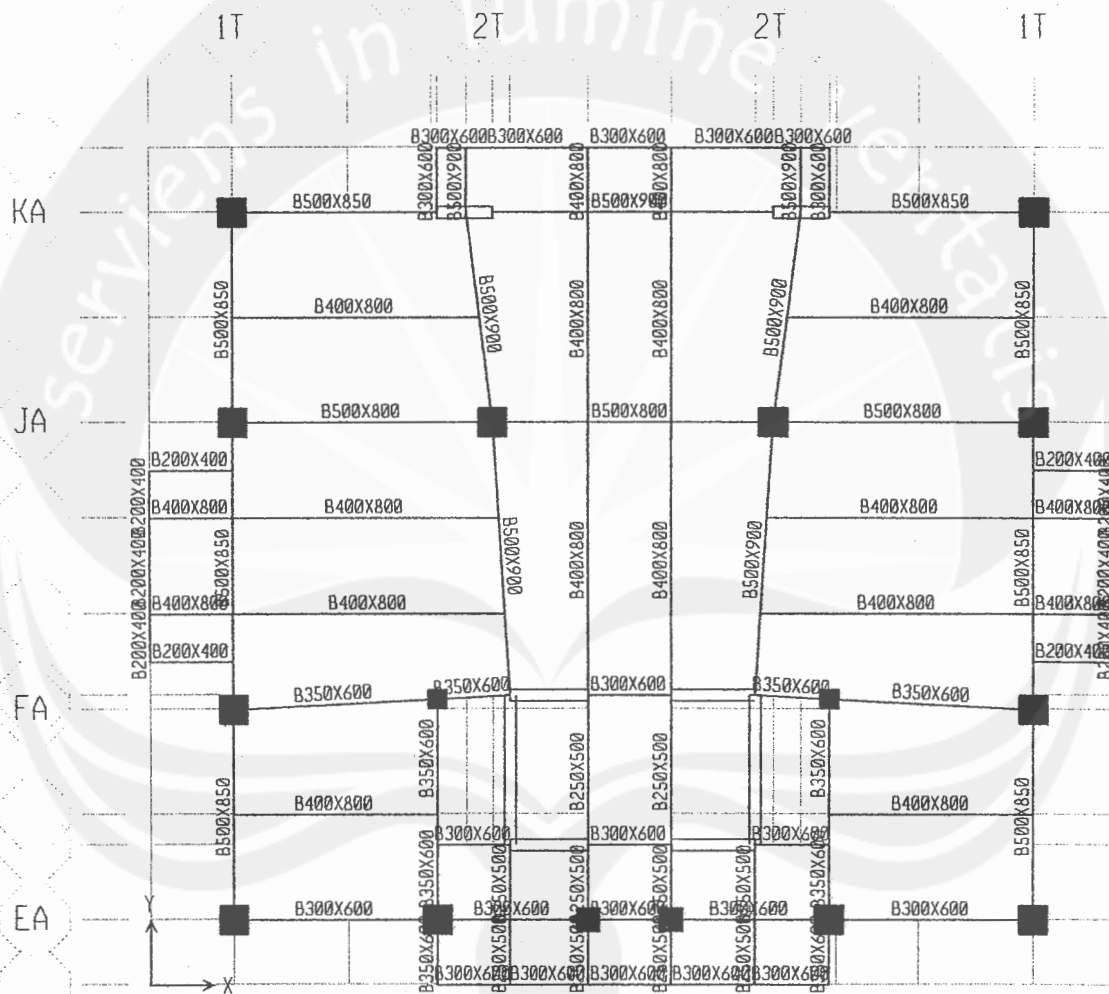












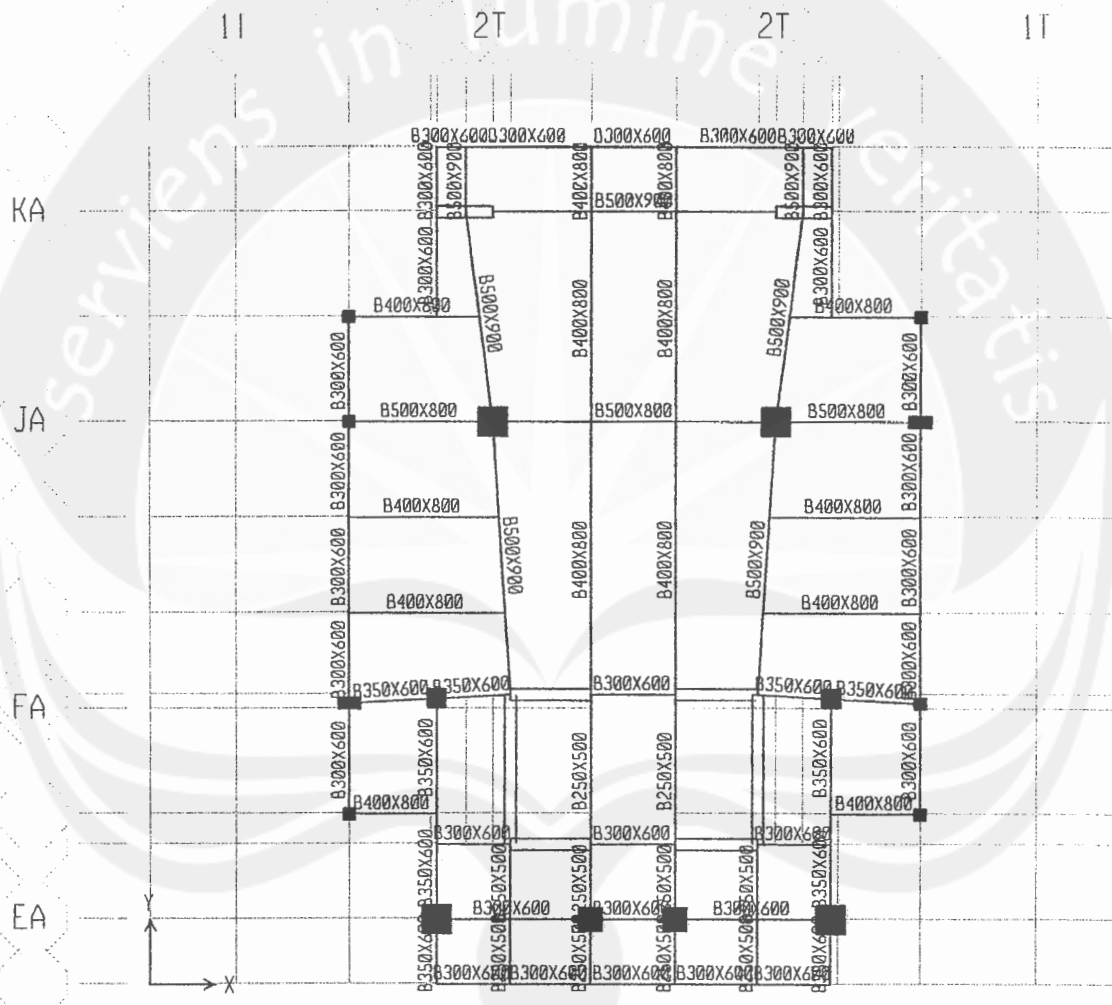


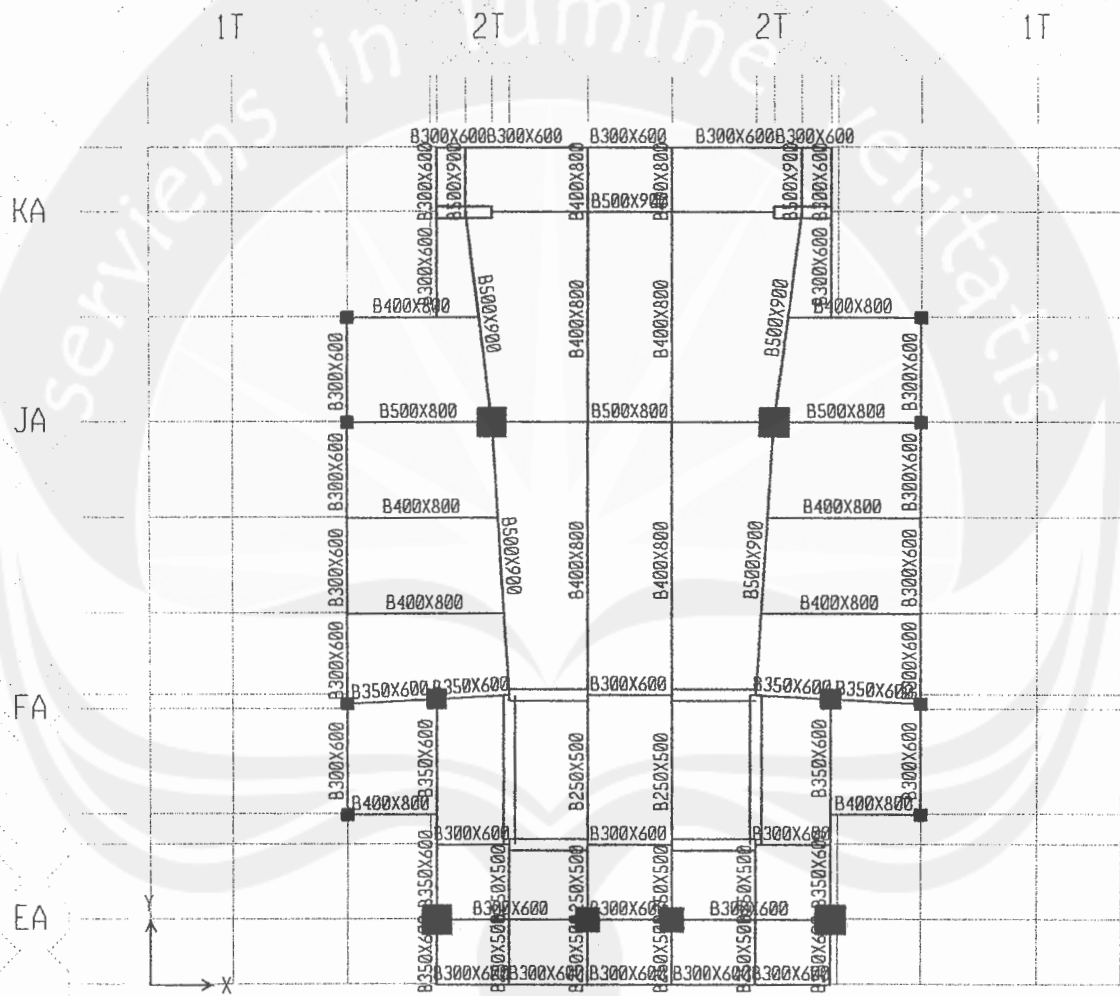












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## COMPUTER

COMB1	ADD	DEAD	Static	1.4000
COMB2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.6000
		RAIN	Static	0.5000
COMB3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	1.0000
		EY	Spectra	0.3000
COMB4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	-1.0000
		EY	Spectra	0.3000
COMB5	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	1.0000
		EY	Spectra	-0.3000
COMB6	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	-1.0000
		EY	Spectra	-0.3000
COMB7	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	0.3000
		EY	Spectra	1.0000
COMB8	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	-0.3000
		EY	Spectra	1.0000
COMB9	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	0.3000
		EY	Spectra	-1.0000
COMB10	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EK	Spectra	-0.3000
		EY	Spectra	-1.0000
COMB11	ADD	DEAD	Static	0.9000
		EK	Spectra	1.0000
		EY	Spectra	0.3000
COMB12	ADD	DEAD	Static	0.9000
		EK	Spectra	-1.0000
		EY	Spectra	0.3000
COMB13	ADD	DEAD	Static	0.9000
		EK	Spectra	1.0000
		EY	Spectra	-0.3000
COMB14	ADD	DEAD	Static	0.9000
		EK	Spectra	-1.0000
		EY	Spectra	-0.3000
COMB15	ADD	DEAD	Static	0.9000
		EK	Spectra	0.3000
		EY	Spectra	1.0000
COMB16	ADD	DEAD	Static	0.9000
		EK	Spectra	-0.3000
		EY	Spectra	1.0000
COMB17	ADD	DEAD	Static	0.9000
		EK	Spectra	0.3000
		EY	Spectra	-1.0000
COMB18	ADD	DEAD	Static	0.9000
		EK	Spectra	-0.3000
		EY	Spectra	-1.0000

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COMPUTER

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
STORY25	C18	Min Value	-729.85	-68.86	-341.41	-26.463	-540.131	-245.439
		Min Case	COMB1	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-340.07	161.85	302.06	25.498	483.853	232.981
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY24	C18	Min Value	-1480.29	-84.57	-239.76	-30.522	-452.719	-158.002
		Min Case	COMB10	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-765.58	152.29	225.77	29.247	441.106	292.279
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY23	C18	Min Value	-2236.02	-126.67	-276.59	-31.560	-524.701	-242.730
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-1205.17	107.10	244.12	31.334	454.137	134.165
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB14
STORY22	C18	Min Value	-3305.14	-95.07	-276.86	-30.974	-494.661	-101.475
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB14	COMB14
		Max Value	-1775.06	152.72	214.77	30.624	414.561	357.606
		Max Case	COMB18	COMB6	COMB18	COMB14	COMB10	COMB6
STORY21	C18	Min Value	-4127.67	-79.12	-286.47	-35.362	-526.089	-373.597
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-2189.09	286.16	256.40	34.764	475.235	473.802
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY20	C18	Min Value	-4960.99	-110.46	-299.43	-39.872	-548.538	-330.478
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-2605.21	277.63	265.01	39.242	502.905	492.856
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY19	C18	Min Value	-5800.60	-127.53	-310.74	-43.810	-573.841	-354.431
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-3025.52	298.25	283.86	43.188	539.819	530.558
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY18	C18	Min Value	-6645.61	-145.86	-321.04	-47.148	-593.943	-360.204
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-3447.05	310.30	300.35	46.546	575.925	561.274
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY17	C18	Min Value	-7498.25	-161.23	-328.98	-49.790	-612.471	-367.803
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-3872.49	322.18	317.13	49.212	611.923	589.775
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY16	C18	Min Value	-8357.71	-174.29	-334.77	-51.778	-624.529	-373.036
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-4300.35	330.70	332.88	51.224	646.127	610.874
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY15	C18	Min Value	-9225.25	-188.23	-341.90	-53.242	-644.113	-377.465
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-4732.49	343.33	351.24	52.715	688.109	644.733
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY14	C18	Min Value	-10101.55	-187.30	-323.00	-54.176	-587.585	-383.516
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-5166.47	327.40	348.46	53.675	667.040	595.232
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY13	C18	Min Value	-11004.42	-219.92	-388.57	-78.739	-712.371	-443.250
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB6
		Max Value	-5626.02	379.32	424.02	78.045	812.936	694.179
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY12	C18	Min Value	-11912.52	-216.53	-366.50	-79.512	-695.685	-404.637
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-6114.12	361.39	406.73	78.859	812.262	684.653
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY11	C18	Min Value	-12831.88	-228.11	-372.90	-81.080	-706.787	-424.667
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-6606.49	372.39	419.47	80.462	838.867	700.520
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6

STORY10	C18	Min Value	-13762.01	-235.40	-369.44	-83.106	-704.686	-440.694
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-7105.09	376.46	422.54	82.525	852.445	711.331
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY9	C18	Min Value	-14704.29	-244.50	-367.83	-85.432	-710.933	-462.564
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-7608.95	382.81	430.37	84.889	879.668	727.295
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY8	C18	Min Value	-15657.55	-248.42	-363.90	-87.565	-712.892	-475.910
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-8124.66	383.80	431.41	87.061	889.697	735.447
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY7	C18	Min Value	-16630.51	-252.72	-355.76	-89.887	-706.074	-491.501
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-8653.82	386.26	422.85	89.423	883.349	747.918
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY6	C18	Min Value	-17625.37	-259.59	-341.04	-91.652	-695.834	-527.087
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-9190.57	391.72	416.25	91.230	900.003	780.734
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY5	C18	Min Value	-18659.72	-240.65	-293.68	-91.416	-602.971	-503.832
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-9745.90	351.65	373.30	91.044	809.269	701.265
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY4	C18	Min Value	-19769.36	-292.38	-332.45	-169.261	-753.732	-707.424
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-10322.44	434.09	436.99	168.639	1051.368	960.761
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY3	C18	Min Value	-20879.48	-242.63	-245.12	-156.431	-710.562	-778.188
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-10931.99	358.28	339.74	155.916	1017.898	997.854
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY2	C18	Min Value	-21988.88	-248.82	-192.97	-129.944	-690.018	-1018.696
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-11545.44	378.72	311.64	129.571	1071.685	1283.921
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6
STORY1	C18	Min Value	-23159.84	-158.01	-175.30	-60.337	-1083.227	-1358.657
		Min Case	COMB2	COMB14	COMB18	COMB6	COMB18	COMB14
		Max Value	-12171.36	206.65	223.89	60.191	1294.216	1432.204
		Max Case	COMB18	COMB6	COMB10	COMB14	COMB10	COMB6

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## COMPUTER

COMB4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	-1.0000
		EY	Spectra	0.3000
COMB6	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	-1.0000
		EY	Spectra	-0.3000
COMB12	ADD	DEAD	Static	0.9000
		EX	Spectra	-1.0000
		EY	Spectra	0.3000
COMB14	ADD	DEAD	Static	0.9000
		EX	Spectra	-1.0000
		EY	Spectra	-0.3000

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## COMPUTER

## COLUMN FORCE ENVELOPES

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
STORY25	C18	Min Value	-704.55	-68.86	-171.02	-26.463	-274.221	-245.439
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-350.80	161.85	131.67	25.498	231.348	232.981
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB14	COMB6
STORY24	C18	Min Value	-1461.47	-84.57	-115.48	-30.522	-219.804	-158.002
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-784.40	152.29	101.49	29.247	208.191	292.279
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY23	C18	Min Value	-2195.65	-126.67	-135.08	-31.560	-261.640	-242.730
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-1238.15	107.10	102.60	31.334	191.075	134.165
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB14
STORY22	C18	Min Value	-3241.51	-95.07	-143.12	-30.974	-252.481	-101.475
		Min Case	COMB6	COMB14	COMB6	COMB6	COMB14	COMB14
		Max Value	-1819.39	152.72	81.04	30.624	174.274	357.606
		Max Case	COMB14	COMB6	COMB14	COMB14	COMB6	COMB6
STORY21	C18	Min Value	-4021.76	-79.12	-135.94	-35.362	-256.355	-373.597
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-2253.98	286.16	105.86	34.764	205.501	473.802
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB14
STORY20	C18	Min Value	-4811.33	-110.46	-142.19	-39.872	-263.010	-330.478
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-2695.61	277.63	107.77	39.242	217.378	492.856
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY19	C18	Min Value	-5602.63	-127.53	-144.43	-43.810	-269.477	-354.431
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-3144.99	298.25	117.56	43.188	235.456	530.558
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY18	C18	Min Value	-6396.43	-145.86	-146.68	-47.148	-272.437	-360.204
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-3599.69	310.30	125.99	46.546	254.418	561.274
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY17	C18	Min Value	-7193.98	-161.23	-147.19	-49.790	-274.450	-367.803
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-4061.69	322.18	135.33	49.212	273.901	589.775
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY16	C18	Min Value	-7995.13	-174.29	-146.47	-51.778	-272.296	-373.036
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-4529.61	330.70	144.58	51.224	293.894	610.874
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6



STORY15	C18	Min Value	-8800.57	-188.23	-146.17	-53.242	-274.009	-377.465
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-5004.58	343.33	155.51	52.715	318.005	644.733
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY14	C18	Min Value	-9611.56	-187.30	-132.47	-54.176	-236.692	-383.516
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-5485.52	327.40	157.94	53.675	316.148	595.232
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY13	C18	Min Value	-10441.13	-219.92	-159.07	-78.739	-286.862	-443.250
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB6
		Max Value	-5983.08	379.32	194.52	78.045	387.426	694.179
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY12	C18	Min Value	-11269.98	-216.53	-146.30	-79.512	-272.827	-404.637
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-6503.56	361.39	186.52	78.859	389.403	684.653
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY11	C18	Min Value	-12106.94	-228.11	-146.57	-81.080	-270.955	-424.667
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-7030.82	372.39	193.14	80.462	403.036	700.520
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY10	C18	Min Value	-12952.13	-235.40	-142.52	-83.106	-263.320	-440.694
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-7564.34	376.46	195.63	82.525	411.079	711.331
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY9	C18	Min Value	-13809.22	-244.50	-138.56	-85.432	-256.694	-462.564
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-8101.98	382.81	201.10	84.889	425.429	727.295
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY8	C18	Min Value	-14679.06	-248.42	-135.49	-87.565	-253.270	-475.910
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-8642.46	383.80	202.99	87.061	430.076	735.447
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY7	C18	Min Value	-15574.79	-252.72	-131.58	-89.887	-247.546	-491.501
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-9185.17	386.26	198.67	89.423	424.820	747.918
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY6	C18	Min Value	-16502.58	-259.59	-124.08	-91.652	-236.313	-527.087
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-9725.92	391.72	199.29	91.230	440.483	780.734
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY5	C18	Min Value	-17475.99	-240.65	-102.31	-91.416	-192.548	-503.832
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-10276.14	351.65	181.93	91.044	398.846	701.265
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY4	C18	Min Value	-18527.88	-292.38	-113.71	-169.261	-230.658	-707.424
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-10840.81	434.09	218.25	168.639	528.294	960.761
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY3	C18	Min Value	-19580.08	-242.63	-81.04	-156.431	-215.551	-778.188
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-11432.90	358.28	175.67	155.916	522.888	997.854
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY2	C18	Min Value	-20626.01	-248.82	-58.61	-129.944	-224.561	-1018.696
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-12026.92	378.72	177.28	129.571	606.228	1283.921
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6
STORY1	C18	Min Value	-21721.28	-158.01	-63.09	-60.337	-456.097	-1358.657
		Min Case	COMB6	COMB14	COMB14	COMB6	COMB14	COMB14
		Max Value	-12633.09	206.65	111.69	60.191	667.086	1432.204
		Max Case	COMB14	COMB6	COMB6	COMB14	COMB6	COMB6

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## COMPUTER

COMB3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	1.0000
		EY	Spectra	0.3000
COMB5	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	1.0000
		EY	Spectra	-0.3000
COMB11	ADD	DEAD	Static	0.9000
		EX	Spectra	1.0000
		EY	Spectra	0.3000
COMB13	ADD	DEAD	Static	0.9000
		EX	Spectra	1.0000
		EY	Spectra	-0.3000

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## COMPUTER

## COLUMN FORCE ENVELOPES

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
STORY25	C18	Min Value	-704.55	-68.86	-171.02	-26.463	-274.221	-245.439
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-350.80	161.85	131.67	25.498	231.348	232.981
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB13	COMB5
STORY24	C18	Min Value	-1461.47	-84.57	-115.48	-30.522	-219.804	-158.002
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-784.40	152.29	101.49	29.247	208.191	292.279
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY23	C18	Min Value	-2195.65	-126.67	-135.08	-31.560	-261.640	-242.730
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-1238.15	107.10	102.60	31.334	191.075	134.165
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB13
STORY22	C18	Min Value	-3241.51	-95.07	-143.12	-30.974	-252.481	-101.475
		Min Case	COMB5	COMB13	COMB5	COMB5	COMB13	COMB13
		Max Value	-1819.39	152.72	81.04	30.624	174.274	357.606
		Max Case	COMB13	COMB5	COMB13	COMB13	COMB5	COMB5
STORY21	C18	Min Value	-4021.76	-79.12	-135.94	-35.362	-256.355	-373.597
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-2253.98	286.16	105.86	34.764	205.501	473.802
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY20	C18	Min Value	-4811.33	-110.46	-142.19	-39.872	-263.010	-330.478
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-2695.61	277.63	107.77	39.242	217.378	492.856
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY19	C18	Min Value	-5602.63	-127.53	-144.43	-43.810	-269.477	-354.431
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-3144.99	298.25	117.56	43.188	235.456	530.558
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY18	C18	Min Value	-6396.43	-145.86	-146.68	-47.148	-272.437	-360.204
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-3599.69	310.30	125.99	46.546	254.418	561.274
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY17	C18	Min Value	-7193.98	-161.23	-147.19	-49.790	-274.450	-367.803
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-4061.69	322.18	135.33	49.212	273.901	589.775
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY16	C18	Min Value	-7995.13	-174.29	-146.47	-51.778	-272.296	-373.036
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-4529.61	330.70	144.58	51.224	293.894	610.874
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5

STORY15	C18	Min Value	-8800.57	-188.23	-146.17	-53.242	-274.009	-377.465
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-5004.58	343.33	155.51	52.715	318.005	644.733
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY14	C18	Min Value	-9611.56	-187.30	-132.47	-54.176	-236.692	-383.516
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-5485.52	327.40	157.94	53.675	316.148	595.232
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY13	C18	Min Value	-10441.13	-219.92	-159.07	-78.739	-286.862	-443.250
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB5
		Max Value	-5983.08	379.32	194.52	78.045	387.426	694.179
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY12	C18	Min Value	-11269.98	-216.53	-146.30	-79.512	-272.827	-404.637
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-6503.56	361.39	186.52	78.859	389.403	684.653
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY11	C18	Min Value	-12106.94	-228.11	-146.57	-81.080	-270.955	-424.667
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-7030.82	372.39	193.14	80.462	403.036	700.520
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY10	C18	Min Value	-12952.13	-235.40	-142.52	-83.106	-263.320	-440.694
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-7564.34	376.46	195.63	82.525	411.079	711.331
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY9	C18	Min Value	-13809.22	-244.50	-138.56	-85.432	-256.694	-462.564
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-8101.98	382.81	201.10	84.889	425.429	727.295
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY8	C18	Min Value	-14679.06	-248.42	-135.49	-87.565	-253.270	-475.910
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-8642.46	383.80	202.99	87.061	430.076	735.447
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY7	C18	Min Value	-15574.79	-252.72	-131.50	-89.887	-247.546	-491.501
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-9185.17	386.26	198.67	89.423	424.820	747.918
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY6	C18	Min Value	-16502.58	-259.59	-124.08	-91.652	-236.313	-527.087
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-9725.92	391.72	199.29	91.230	440.483	780.734
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY5	C18	Min Value	-17475.99	-240.65	-102.31	-91.416	-192.548	-503.832
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-10276.14	351.65	181.93	91.044	398.846	701.265
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY4	C18	Min Value	-18527.88	-292.38	-113.71	-169.261	-230.658	-707.424
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-10840.81	434.09	218.25	168.639	528.294	960.761
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY3	C18	Min Value	-19580.08	-242.63	-81.04	-156.431	-215.551	-778.188
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-11432.90	358.28	175.67	155.916	522.888	997.854
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY2	C18	Min Value	-20626.01	-248.82	-58.61	-129.944	-224.561	-1018.696
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-12026.92	378.72	177.28	129.571	606.228	1283.921
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5
STORY1	C18	Min Value	-21721.28	-158.01	-63.09	-60.337	-456.097	-1358.657
		Min Case	COMB5	COMB13	COMB13	COMB5	COMB13	COMB13
		Max Value	-12633.09	206.65	111.69	60.191	667.086	1432.204
		Max Case	COMB13	COMB5	COMB5	COMB13	COMB5	COMB5

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COMB9	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	0.3000
		EY	Spectra	-1.0000
COMB10	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	-0.3000
		EY	Spectra	-1.0000
COMB17	ADD	DEAD	Static	0.9000
		EX	Spectra	0.3000
		EY	Spectra	-1.0000
COMB18	ADD	DEAD	Static	0.9000
		EX	Spectra	-0.3000
		EY	Spectra	-1.0000

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C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
STORY25	C18	Min Value	-715.27	-47.88	-341.41	-9.044	-540.131	-198.987
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-340.07	140.88	302.06	8.078	483.853	217.250
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY24	C18	Min Value	-1480.29	-53.09	-239.76	-10.487	-452.719	-106.079
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-765.58	120.81	225.77	9.212	441.106	250.917
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY23	C18	Min Value	-2228.63	-88.55	-276.59	-10.403	-524.701	-191.219
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-1205.17	68.98	244.12	10.177	454.137	71.688
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB18
STORY22	C18	Min Value	-3285.84	-57.77	-276.86	-10.318	-494.661	-48.652
		Min Case	COMB10	COMB18	COMB10	COMB10	COMB18	COMB18
		Max Value	-1775.06	115.43	214.77	9.968	414.561	306.872
		Max Case	COMB18	COMB10	COMB18	COMB18	COMB10	COMB10
STORY21	C18	Min Value	-4086.65	-16.60	-286.47	-11.872	-526.089	-271.001
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-2189.09	223.64	256.40	11.274	475.235	390.233
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY20	C18	Min Value	-4901.73	-37.47	-299.43	-13.369	-548.538	-221.264
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-2605.21	204.63	265.01	12.738	502.905	384.185
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY19	C18	Min Value	-5722.10	-43.02	-310.74	-14.658	-573.841	-235.845
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-3025.52	213.74	283.86	14.036	539.819	396.733
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY18	C18	Min Value	-6549.07	-51.24	-321.04	-15.740	-593.943	-234.619
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-3447.05	215.68	300.35	15.138	575.925	403.950
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY17	C18	Min Value	-7383.18	-57.66	-328.98	-16.585	-612.471	-236.476
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-3872.49	218.62	317.13	16.006	611.923	411.068
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY16	C18	Min Value	-8224.40	-63.25	-334.77	-17.208	-624.529	-236.819
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-4300.35	219.67	332.88	16.654	646.127	414.176
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10

STORY15	C18	Min Value	-9072.66	-68.88	-341.90	-17.652	-644.113	-236.733
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-4732.49	223.99	351.24	17.124	688.109	427.341
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY14	C18	Min Value	-9930.62	-68.82	-323.00	-17.920	-587.585	-238.180
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-5166.47	208.92	348.46	17.419	667.040	382.467
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY13	C18	Min Value	-10798.18	-82.20	-388.57	-26.014	-712.371	-274.289
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-5626.02	241.60	424.02	25.320	812.936	444.481
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY12	C18	Min Value	-11659.42	-80.65	-366.50	-26.210	-695.685	-240.881
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-6114.12	226.51	406.73	25.556	812.262	431.767
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY11	C18	Min Value	-12531.28	-84.47	-372.90	-26.679	-706.787	-248.108
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-6606.49	228.75	419.47	26.061	838.867	434.055
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY10	C18	Min Value	-13411.39	-86.48	-369.44	-27.306	-704.686	-245.576
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-7105.09	227.54	422.54	26.726	852.445	433.072
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY9	C18	Min Value	-14302.25	-88.75	-367.83	-28.050	-710.933	-243.977
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-7608.95	227.06	430.37	27.507	879.668	432.829
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY8	C18	Min Value	-15196.86	-89.06	-363.90	-28.746	-712.892	-238.691
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-8124.66	224.43	431.41	28.241	889.697	429.659
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY7	C18	Min Value	-16106.13	-88.37	-355.76	-29.500	-706.074	-233.416
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-8653.82	221.91	422.85	29.035	883.349	426.813
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY6	C18	Min Value	-17037.93	-88.70	-341.04	-30.063	-695.834	-224.074
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-9190.57	220.83	416.25	29.641	900.003	432.178
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY5	C18	Min Value	-18006.24	-79.45	-293.68	-29.963	-602.971	-206.840
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-9745.90	190.44	373.30	29.591	809.269	359.917
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY4	C18	Min Value	-19046.25	-92.07	-332.45	-55.439	-753.732	-225.221
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-10322.44	233.78	436.99	54.817	1051.368	471.475
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY3	C18	Min Value	-20081.00	-72.56	-245.12	-51.158	-710.562	-231.615
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-10931.99	188.21	339.74	50.643	1017.898	451.281
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY2	C18	Min Value	-21107.50	-65.21	-192.97	-42.409	-690.018	-281.602
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-11545.44	195.11	311.64	42.035	1071.685	546.827
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY1	C18	Min Value	-22183.01	-41.84	-175.30	-19.707	-1083.227	-400.488
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-12171.36	90.47	223.89	19.561	1294.216	474.035
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10

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## COMPUTER

COMB9	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	0.3000
		EY	Spectra	-1.0000
COMB10	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Spectra	-0.3000
		EY	Spectra	-1.0000
COMB17	ADD	DEAD	Static	0.9000
		EX	Spectra	0.3000
		EY	Spectra	-1.0000
COMB18	ADD	DEAD	Static	0.9000
		EX	Spectra	-0.3000
		EY	Spectra	-1.0000

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## COMPUTER

## COLUMN FORCE ENVELOPES

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
STORY25	C18	Min Value	-715.27	-47.88	-341.41	-9.044	-540.131	-198.987
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-340.07	140.88	302.06	8.078	483.853	217.250
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY24	C18	Min Value	-1480.29	-53.09	-239.76	-10.487	-452.719	-106.079
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-765.58	120.81	225.77	9.212	441.106	250.917
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY23	C18	Min Value	-2228.63	-88.55	-276.59	-10.403	-524.701	-191.219
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-1205.17	68.98	244.12	10.177	454.137	71.688
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB18
STORY22	C18	Min Value	-3285.84	-57.77	-276.86	-10.318	-494.661	-48.652
		Min Case	COMB10	COMB18	COMB10	COMB10	COMB18	COMB18
		Max Value	-1775.06	115.43	214.77	9.968	414.561	306.872
		Max Case	COMB18	COMB10	COMB18	COMB18	COMB10	COMB10
STORY21	C18	Min Value	-4086.65	-16.60	-286.47	-11.872	-526.089	-271.001
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-2189.09	223.64	256.40	11.274	475.235	390.233
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY20	C18	Min Value	-4901.73	-37.47	-299.43	-13.369	-548.538	-221.264
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-2605.21	204.63	265.01	12.738	502.905	384.185
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY19	C18	Min Value	-5722.10	-43.02	-310.74	-14.658	-573.841	-235.845
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-3025.52	213.74	283.86	14.036	539.819	396.733
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY18	C18	Min Value	-6549.07	-51.24	-321.04	-15.740	-593.943	-234.619
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-3447.05	215.68	300.35	15.138	575.925	403.950
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY17	C18	Min Value	-7383.18	-57.66	-328.98	-16.585	-612.471	-236.476
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-3872.49	218.62	317.13	16.006	611.923	411.068
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY16	C18	Min Value	-8224.40	-63.25	-334.77	-17.208	-624.529	-236.819
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-4300.35	219.67	332.88	16.654	646.127	414.176
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10

STORY15	C18	Min Value	-9072.66	-68.88	-341.90	-17.652	-644.113	-236.733
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-4732.49	223.99	351.24	17.124	688.109	427.341
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY14	C18	Min Value	-9930.62	-68.82	-323.00	-17.920	-587.585	-238.180
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-5166.47	208.92	348.46	17.419	667.040	382.467
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY13	C18	Min Value	-10798.18	-82.20	-388.57	-26.014	-712.371	-274.289
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-5626.02	241.60	424.02	25.320	812.936	444.481
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY12	C18	Min Value	-11659.42	-80.65	-366.50	-26.210	-695.685	-240.881
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-6114.12	225.51	406.73	25.556	812.262	431.767
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY11	C18	Min Value	-12531.28	-84.47	-372.90	-26.679	-706.787	-248.108
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-6606.49	228.75	419.47	26.061	838.867	434.055
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY10	C18	Min Value	-13411.39	-86.48	-369.44	-27.306	-704.686	-245.576
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-7105.09	227.54	422.54	26.726	852.445	433.072
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY9	C18	Min Value	-14302.25	-88.75	-367.83	-28.050	-710.933	-243.977
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-7608.95	227.06	430.37	27.507	879.668	432.829
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY8	C18	Min Value	-15196.86	-89.06	-363.90	-28.746	-712.892	-238.691
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-8124.66	224.43	431.41	28.241	889.697	429.659
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY7	C18	Min Value	-16106.13	-88.37	-355.76	-29.500	-706.074	-233.416
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-8653.82	221.91	422.85	29.035	883.349	426.813
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY6	C18	Min Value	-17037.93	-88.70	-341.04	-30.063	-695.834	-224.074
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-9190.57	220.83	416.25	29.641	900.003	432.178
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY5	C18	Min Value	-18006.24	-79.45	-293.68	-29.963	-602.971	-206.840
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-9745.90	190.44	373.30	29.591	809.269	359.917
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY4	C18	Min Value	-19046.25	-92.07	-332.45	-55.439	-753.732	-225.221
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-10322.44	233.78	436.99	54.817	1051.368	471.475
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY3	C18	Min Value	-20081.00	-72.56	-245.12	-51.158	-710.562	-231.615
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-10931.99	188.21	339.74	50.643	1017.898	451.281
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY2	C18	Min Value	-21107.50	-65.21	-192.97	-42.409	-690.018	-281.602
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-11545.44	195.11	311.64	42.035	1071.685	546.827
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10
STORY1	C18	Min Value	-22183.01	-41.84	-175.30	-19.707	-1083.227	-400.488
		Min Case	COMB10	COMB18	COMB18	COMB10	COMB18	COMB10
		Max Value	-12171.36	90.47	223.89	19.561	1294.216	474.035
		Max Case	COMB18	COMB10	COMB10	COMB18	COMB10	COMB10

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## LOADING COMBINATIONS

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
COMB1	ADD	DEAD	Static	1.4000
COMB2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.6000
		RAIN	Static	0.5000
COMB3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	1.0000
		EY	Static	0.3000
COMB4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	-1.0000
		EY	Static	0.3000
COMB5	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	1.0000
		EY	Static	-0.3000
COMB6	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	-1.0000
		EY	Static	-0.3000
COMB7	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	0.3000
		EY	Static	1.0000
COMB8	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	-0.3000
		EY	Static	1.0000
COMB9	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	0.3000
		EY	Static	-1.0000
COMB10	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		EX	Static	-0.3000
		EY	Static	-1.0000
COMB11	ADD	DEAD	Static	0.9000
		EX	Static	1.0000
		EY	Static	0.3000
COMB12	ADD	DEAD	Static	0.9000
		EX	Static	-1.0000
		EY	Static	0.3000
COMB13	ADD	DEAD	Static	0.9000
		EX	Static	1.0000
		EY	Static	-0.3000
COMB14	ADD	DEAD	Static	0.9000
		EX	Static	-1.0000
		EY	Static	-0.3000
COMB15	ADD	DEAD	Static	0.9000
		EX	Static	0.3000
		EY	Static	1.0000
COMB16	ADD	DEAD	Static	0.9000
		EX	Static	-0.3000
		EY	Static	1.0000
COMB17	ADD	DEAD	Static	0.9000
		EX	Static	0.3000
		EY	Static	-1.0000
COMB18	ADD	DEAD	Static	0.9000
		EX	Static	-0.3000
		EY	Static	-1.0000

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## PIER FORCE ENVELOPES

STORY	PIER	ITEM	P	V2	V3	T	M2	M3
STORY25	P7	Min Value	-954.49	-586.00	-16.71	-16.858	-32.026	-1347.904
		Min Case	COMB5	COMB7	COMB8	COMB10	COMB4	COMB7
		Max Value	-83.18	293.99	-8.41	9.372	37.068	1193.711
		Max Case	COMB12	COMB18	COMB17	COMB15	COMB3	COMB18
STORY24	P7	Min Value	-1915.15	-226.62	-11.45	-13.047	-22.052	-915.512
		Min Case	COMB5	COMB7	COMB3	COMB10	COMB4	COMB15



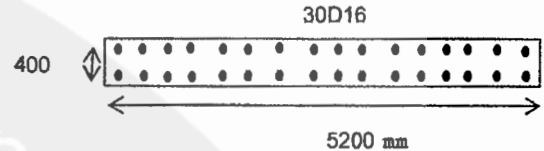
		<b>Max Value</b>	-298.19	28.30	-3.36	7.024	29.762	1233.971
		<b>Max Case</b>	COMB12	COMB18	COMB14	COMB15	COMB3	COMB10
STORY23	P7	<b>Min Value</b>	-2789.89	-258.03	-13.39	-11.224	-25.561	-800.579
		<b>Min Case</b>	COMB5	COMB5	COMB3	COMB10	COMB4	COMB15
		<b>Max Value</b>	-636.02	-36.88	-3.81	8.425	36.021	1976.881
		<b>Max Case</b>	COMB12	COMB12	COMB14	COMB15	COMB3	COMB10
STORY22	P7	<b>Min Value</b>	-3733.51	-778.04	-13.78	-11.241	-28.991	-2265.183
		<b>Min Case</b>	COMB5	COMB7	COMB3	COMB10	COMB4	COMB7
		<b>Max Value</b>	-972.10	-9.70	-4.31	9.689	41.038	2439.106
		<b>Max Case</b>	COMB12	COMB18	COMB14	COMB15	COMB3	COMB9
STORY21	P7	<b>Min Value</b>	-4595.96	-477.11	-18.17	-12.254	-22.435	-1728.759
		<b>Min Case</b>	COMB5	COMB9	COMB3	COMB9	COMB4	COMB7
		<b>Max Value</b>	-1328.04	-68.44	1.00	9.597	52.148	3124.073
		<b>Max Case</b>	COMB12	COMB16	COMB14	COMB16	COMB3	COMB10
STORY20	P7	<b>Min Value</b>	-5310.62	-602.90	-19.89	-13.676	-22.857	-1533.202
		<b>Min Case</b>	COMB5	COMB9	COMB3	COMB9	COMB14	COMB7
		<b>Max Value</b>	-1817.99	45.10	3.09	10.899	55.654	3576.916
		<b>Max Case</b>	COMB12	COMB16	COMB14	COMB16	COMB3	COMB10
STORY19	P7	<b>Min Value</b>	-5967.54	-730.09	-21.94	-15.338	-27.343	-1816.622
		<b>Min Case</b>	COMB5	COMB9	COMB3	COMB9	COMB14	COMB15
		<b>Max Value</b>	-2360.86	185.13	5.46	12.701	59.409	3929.150
		<b>Max Case</b>	COMB12	COMB16	COMB14	COMB16	COMB3	COMB10
STORY18	P7	<b>Min Value</b>	-6568.39	-847.32	-23.76	-17.014	-30.838	-1996.300
		<b>Min Case</b>	COMB5	COMB9	COMB3	COMB9	COMB14	COMB15
		<b>Max Value</b>	-2950.01	309.91	7.61	14.446	62.197	4171.209
		<b>Max Case</b>	COMB12	COMB16	COMB14	COMB16	COMB3	COMB10
STORY17	P7	<b>Min Value</b>	-7122.82	-956.99	-25.44	-18.676	-33.762	-2082.637
		<b>Min Case</b>	COMB5	COMB9	COMB3	COMB9	COMB14	COMB15
		<b>Max Value</b>	-3574.48	426.64	9.62	16.175	64.448	4323.751
		<b>Max Case</b>	COMB12	COMB16	COMB14	COMB16	COMB3	COMB10
STORY16	P7	<b>Min Value</b>	-7865.09	-1060.02	-27.01	-20.291	-37.911	-2084.303
		<b>Min Case</b>	COMB2	COMB9	COMB3	COMB9	COMB5	COMB15
		<b>Max Value</b>	-4228.44	536.39	11.54	17.867	66.246	4397.511
		<b>Max Case</b>	COMB12	COMB16	COMB14	COMB16	COMB3	COMB10
STORY15	P7	<b>Min Value</b>	-8622.48	-1153.33	-28.38	-21.970	-41.930	-2012.186
		<b>Min Case</b>	COMB2	COMB9	COMB3	COMB5	COMB5	COMB15
		<b>Max Value</b>	-4874.83	630.60	13.27	19.533	67.530	4402.843
		<b>Max Case</b>	COMB16	COMB16	COMB14	COMB12	COMB3	COMB10
STORY14	P7	<b>Min Value</b>	-9368.95	-1257.93	-30.19	-24.723	-47.344	-1946.775
		<b>Min Case</b>	COMB2	COMB9	COMB3	COMB5	COMB5	COMB15
		<b>Max Value</b>	-5247.24	775.82	15.48	22.421	69.169	4377.676
		<b>Max Case</b>	COMB11	COMB16	COMB14	COMB12	COMB3	COMB10
STORY13	P7	<b>Min Value</b>	-10103.24	-1324.12	-30.85	-25.013	-50.534	-1412.172
		<b>Min Case</b>	COMB2	COMB9	COMB3	COMB5	COMB5	COMB15
		<b>Max Value</b>	-5381.57	728.50	16.57	22.962	68.397	4120.666
		<b>Max Case</b>	COMB11	COMB16	COMB14	COMB12	COMB3	COMB10
STORY12	P7	<b>Min Value</b>	-10839.33	-1346.21	-31.47	-27.149	-53.279	-1438.052
		<b>Min Case</b>	COMB6	COMB9	COMB5	COMB5	COMB5	COMB17
		<b>Max Value</b>	-5522.20	841.91	17.60	25.015	68.080	3898.214
		<b>Max Case</b>	COMB11	COMB16	COMB12	COMB12	COMB3	COMB10
STORY11	P7	<b>Min Value</b>	-11817.34	-1456.01	-33.07	-29.013	-57.970	-2011.014
		<b>Min Case</b>	COMB6	COMB9	COMB5	COMB5	COMB5	COMB17
		<b>Max Value</b>	-5629.78	966.19	19.58	26.800	69.458	3788.929
		<b>Max Case</b>	COMB11	COMB16	COMB12	COMB12	COMB3	COMB10
STORY10	P7	<b>Min Value</b>	-12826.78	-1539.04	-33.71	-30.887	-61.244	-2613.156
		<b>Min Case</b>	COMB6	COMB9	COMB5	COMB5	COMB5	COMB17
		<b>Max Value</b>	-5693.53	1050.60	20.69	28.739	68.557	3545.700
		<b>Max Case</b>	COMB11	COMB16	COMB12	COMB12	COMB5	COMB10
STORY9	P7	<b>Min Value</b>	-13862.88	-1635.38	-34.88	-32.712	-65.901	-3331.718
		<b>Min Case</b>	COMB6	COMB9	COMB5	COMB5	COMB5	COMB17
		<b>Max Value</b>	-5717.45	1166.70	22.43	30.563	68.402	4357.250
		<b>Max Case</b>	COMB11	COMB16	COMB12	COMB12	COMB5	COMB8
STORY8	P7	<b>Min Value</b>	-14939.01	-1704.93	-35.45	-33.982	-70.040	-4065.651
		<b>Min Case</b>	COMB6	COMB9	COMB5	COMB5	COMB5	COMB17
		<b>Max Value</b>	-5687.56	1248.64	23.62	31.808	66.438	5219.572

		<b>Max Case</b>	COMB11	COMB16	COMB12	COMB12	COMB5	COMB8
STORY7	P7	<b>Min Value</b>	-16061.46	-1803.04	-36.25	-35.509	-75.413	-4963.133
		<b>Min Case</b>	COMB6	COMB9	COMB5	COMB5	COMB5	COMB17
		<b>Max Value</b>	-5594.84	1383.35	25.16	33.302	64.138	6302.984
		<b>Max Case</b>	COMB11	COMB16	COMB12	COMB12	COMB5	COMB8
STORY6	P7	<b>Min Value</b>	-17262.96	-1926.46	-37.18	-36.988	-82.755	-6010.540
		<b>Min Case</b>	COMB6	COMB10	COMB5	COMB5	COMB5	COMB18
		<b>Max Value</b>	-5399.92	1536.70	26.59	34.385	62.497	7532.395
		<b>Max Case</b>	COMB11	COMB15	COMB12	COMB12	COMB12	COMB7
STORY5	P7	<b>Min Value</b>	-18593.09	-2104.03	-38.07	-37.860	-92.473	-7412.197
		<b>Min Case</b>	COMB6	COMB10	COMB5	COMB5	COMB3	COMB18
		<b>Max Value</b>	-5072.00	1736.07	28.11	35.032	73.715	9163.555
		<b>Max Case</b>	COMB11	COMB15	COMB12	COMB12	COMB14	COMB7
STORY4	P7	<b>Min Value</b>	-19978.25	-2076.42	-36.04	-36.088	-97.813	-8449.732
		<b>Min Case</b>	COMB6	COMB10	COMB5	COMB5	COMB3	COMB18
		<b>Max Value</b>	-4656.02	1669.90	26.86	33.582	80.369	10262.805
		<b>Max Case</b>	COMB11	COMB15	COMB12	COMB12	COMB14	COMB7
STORY3	P7	<b>Min Value</b>	-21597.64	-2444.19	-38.88	-34.845	-117.808	-10535.589
		<b>Min Case</b>	COMB6	COMB10	COMB5	COMB5	COMB3	COMB18
		<b>Max Value</b>	-3994.01	2142.73	30.21	32.546	101.347	12716.568
		<b>Max Case</b>	COMB11	COMB15	COMB12	COMB12	COMB14	COMB7
STORY2	P7	<b>Min Value</b>	-23671.25	-2739.34	-39.17	-30.401	-141.794	-12799.554
		<b>Min Case</b>	COMB6	COMB10	COMB5	COMB3	COMB3	COMB18
		<b>Max Value</b>	-2857.53	2447.64	31.97	28.456	128.779	15216.603
		<b>Max Case</b>	COMB11	COMB15	COMB12	COMB14	COMB14	COMB7
STORY1	P7	<b>Min Value</b>	-26702.90	-2599.48	-23.19	-12.606	-166.965	-17037.940
		<b>Min Case</b>	COMB6	COMB10	COMB3	COMB5	COMB3	COMB18
		<b>Max Value</b>	-794.88	2476.19	21.42	12.102	164.067	20002.983
		<b>Max Case</b>	COMB11	COMB15	COMB14	COMB12	COMB14	COMB7

## DESAIN DAN ANALISIS DINDING GESER LANTAI 1

## 1. DATA TAMPANG

Lebar tampang	L =	5200 mm	
Tinggi penampang	H =	400 mm	
Kuat tekan beton	$f_c$ =	30 MPa	
Tegangan leleh baja	$f_y$ =	400 MPa	
Modulus Elastisitas	E =	200000 MPa	
Diameter Tulangan	d =	16 mm	$A_s = 201.1429 \text{ mm}^2$
Tulangan	n =	30D16	
Deret	=	30	
Selimit beton	$d_s$ =	40 mm	
Momen Desain	$M_u$ =	20002.983 KNm	
Gaya Aksial	$P_u$ =	26702.900 KN	

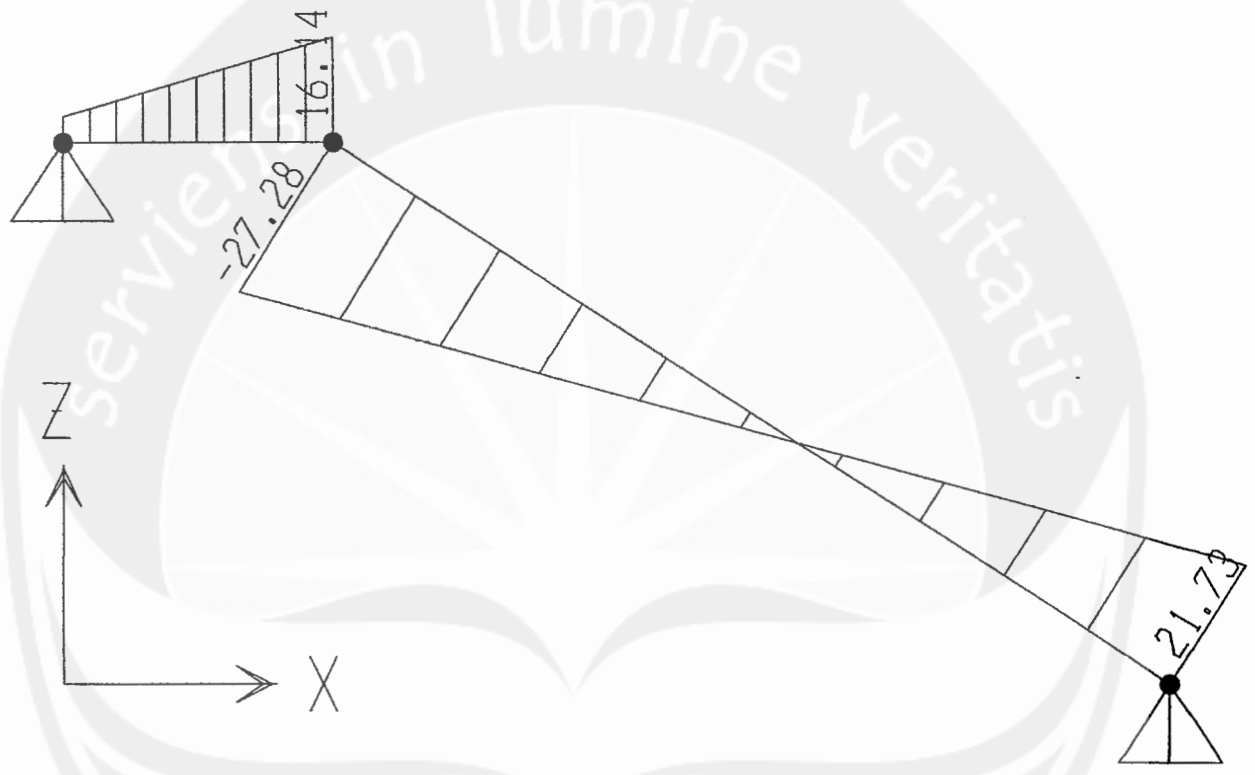


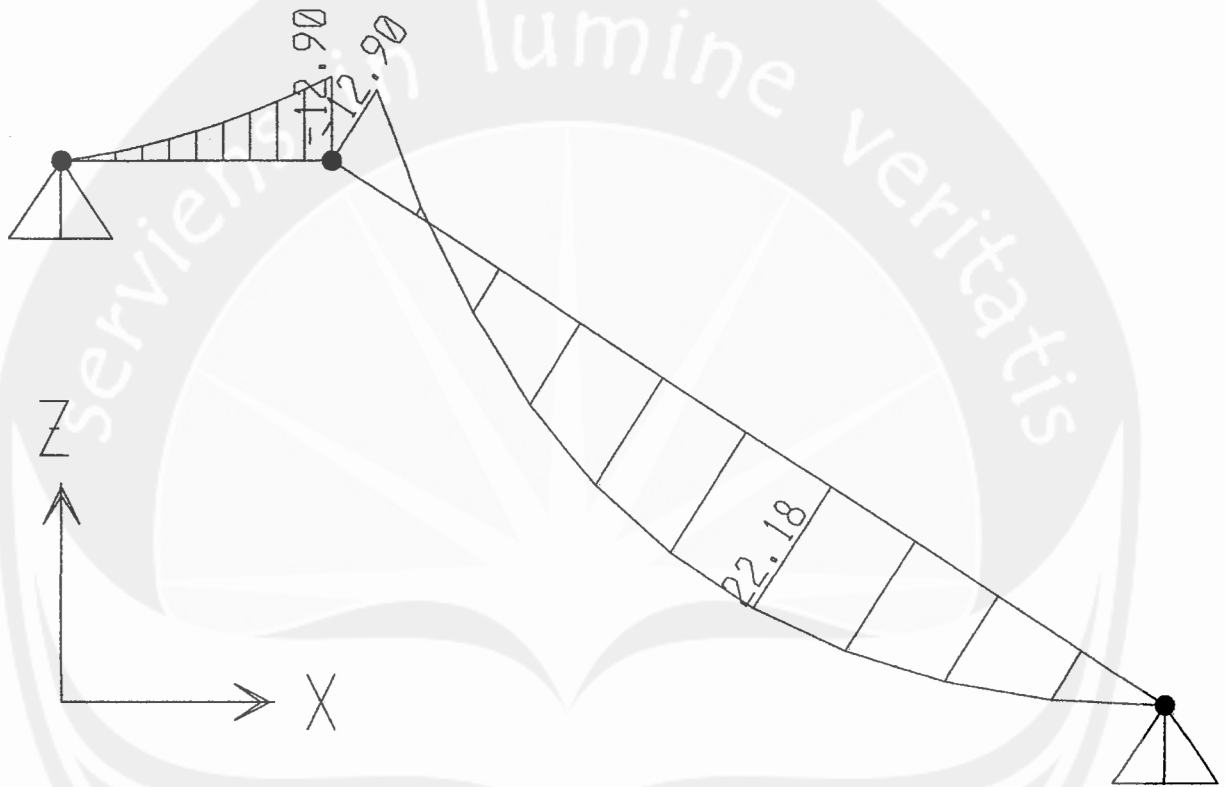
## 2. ANALISIS LENTUR

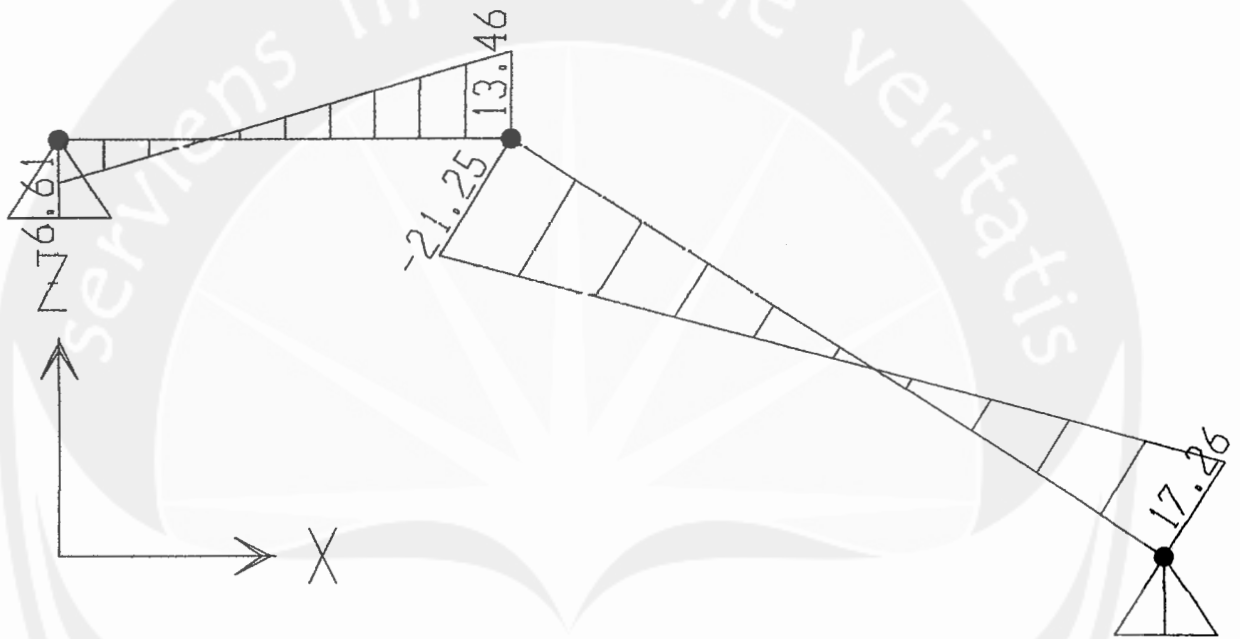
TABULASI PERHITUNGAN  $M_n$ - $P_n$ 

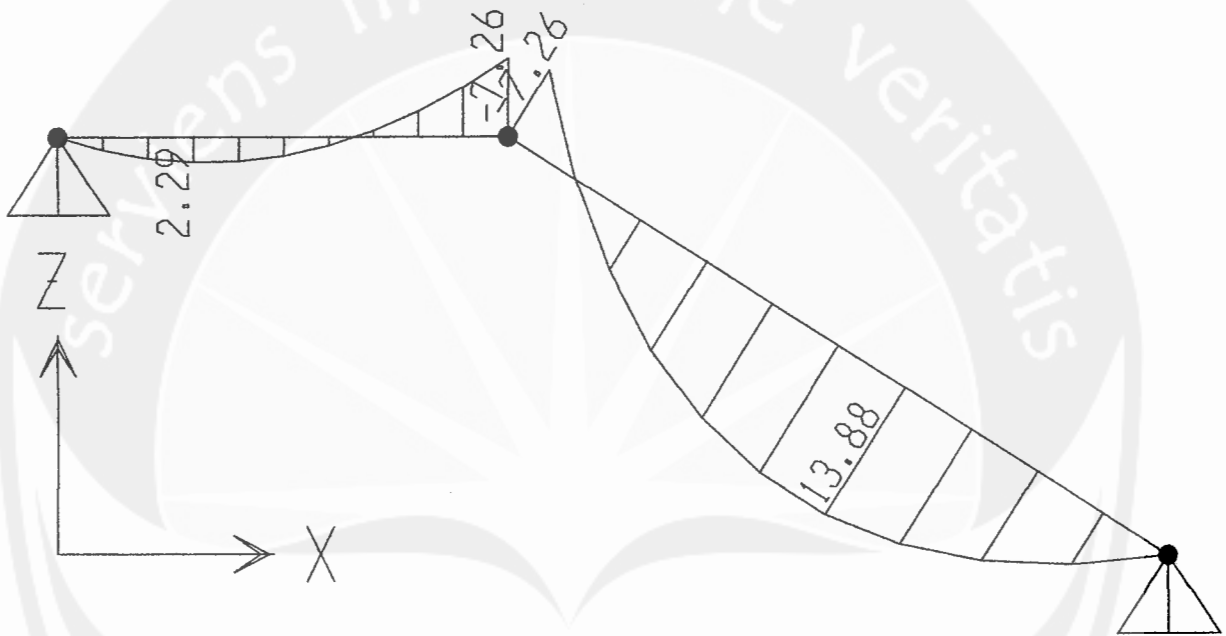
As/deret	c	5200	4680	4160	3640	3120	2600	2080	1560	1040	520	50		
(mm <sup>2</sup> )	a	5200	4420	3978	3536	3094	2652	2210	1768	1326	884	442	43	
603.4	1	es1	0.0030	0.0000	-0.0003	-0.0007	-0.0013	-0.0020	-0.0030	-0.0044	-0.0069	-0.0119	-0.0268	-0.3066
402.3	2	es2	0.0030	0.0001	-0.0002	-0.0006	-0.0011	-0.0018	-0.0028	-0.0042	-0.0066	-0.0114	-0.0258	-0.2961
603.4	3	es3	0.0030	0.0002	-0.0001	-0.0005	-0.0010	-0.0016	-0.0026	-0.0039	-0.0063	-0.0109	-0.0248	-0.2856
402.3	4	es4	0.0030	0.0003	0.0000	-0.0003	-0.0008	-0.0015	-0.0023	-0.0037	-0.0059	-0.0104	-0.0237	-0.2751
402.3	5	es5	0.0030	0.0004	0.0001	-0.0002	-0.0007	-0.0013	-0.0021	-0.0034	-0.0056	-0.0099	-0.0227	-0.2646
402.3	6	es6	0.0030	0.0005	0.0003	-0.0001	-0.0005	-0.0011	-0.0019	-0.0032	-0.0052	-0.0094	-0.0217	-0.2541
402.3	7	es7	0.0030	0.0006	0.0004	0.0000	-0.0004	-0.0010	-0.0017	-0.0029	-0.0049	-0.0089	-0.0207	-0.2436
402.3	8	es8	0.0030	0.0007	0.0005	0.0002	-0.0002	-0.0008	-0.0015	-0.0027	-0.0046	-0.0084	-0.0197	-0.2331
402.3	9	es9	0.0030	0.0008	0.0006	0.0003	-0.0001	-0.0006	-0.0013	-0.0024	-0.0042	-0.0078	-0.0187	-0.2226
402.3	10	es10	0.0030	0.0009	0.0007	0.0004	0.0000	-0.0004	-0.0011	-0.0022	-0.0039	-0.0073	-0.0177	-0.2121
402.3	11	es11	0.0030	0.0010	0.0008	0.0005	0.0002	-0.0003	-0.0009	-0.0019	-0.0036	-0.0068	-0.0167	-0.2016
402.3	12	es12	0.0030	0.0011	0.0009	0.0007	0.0003	-0.0001	-0.0007	-0.0017	-0.0032	-0.0063	-0.0157	-0.1911
402.3	13	es12	0.0030	0.0012	0.0010	0.0008	0.0005	0.0001	-0.0005	-0.0014	-0.0029	-0.0058	-0.0147	-0.1806
402.3	14	es12	0.0030	0.0013	0.0012	0.0009	0.0006	0.0002	-0.0003	-0.0012	-0.0025	-0.0053	-0.0136	-0.1701
402.3	15	es12	0.0030	0.0014	0.0013	0.0010	0.0008	0.0004	-0.0001	-0.0009	-0.0022	-0.0048	-0.0126	-0.1596
402.3	16	es12	0.0030	0.0015	0.0014	0.0012	0.0009	0.0006	0.0001	-0.0007	-0.0019	-0.0043	-0.0116	-0.1491
402.3	17	es12	0.0030	0.0016	0.0015	0.0013	0.0011	0.0007	0.0003	-0.0004	-0.0015	-0.0038	-0.0106	-0.1386
402.3	18	es12	0.0030	0.0017	0.0016	0.0014	0.0012	0.0009	0.0005	-0.0002	-0.0012	-0.0033	-0.0096	-0.1281
402.3	19	es12	0.0030	0.0018	0.0017	0.0016	0.0013	0.0011	0.0007	0.0001	-0.0009	-0.0028	-0.0086	-0.1176
402.3	20	es12	0.0030	0.0019	0.0018	0.0017	0.0015	0.0012	0.0009	0.0004	-0.0005	-0.0023	-0.0076	-0.1071
402.3	21	es12	0.0030	0.0020	0.0019	0.0018	0.0016	0.0014	0.0011	0.0006	-0.0002	-0.0018	-0.0066	-0.0966
402.3	22	es12	0.0030	0.0021	0.0020	0.0019	0.0018	0.0016	0.0013	0.0009	0.0001	-0.0013	-0.0056	-0.0861
402.3	23	es12	0.0030	0.0022	0.0022	0.0021	0.0019	0.0017	0.0015	0.0011	0.0005	-0.0008	-0.0046	-0.0756
402.3	24	es12	0.0030	0.0023	0.0023	0.0022	0.0021	0.0019	0.0017	0.0014	0.0008	-0.0003	-0.0035	-0.0651
402.3	25	es12	0.0030	0.0024	0.0024	0.0023	0.0022	0.0021	0.0019	0.0016	0.0012	0.0002	-0.0025	-0.0546
402.3	26	es12	0.0030	0.0025	0.0025	0.0024	0.0024	0.0022	0.0021	0.0019	0.0015	0.0007	-0.0015	-0.0441
402.3	27	es12	0.0030	0.0026	0.0026	0.0026	0.0025	0.0024	0.0023	0.0021	0.0018	0.0012	-0.0005	-0.0336
603.4	28	es12	0.0030	0.0027	0.0027	0.0027	0.0026	0.0026	0.0025	0.0024	0.0022	0.0017	0.0005	-0.0231
402.3	29	es12	0.0030	0.0029	0.0028	0.0028	0.0028	0.0028	0.0027	0.0026	0.0025	0.0023	0.0015	-0.0126
603.4	30	es12	0.0030	0.0030	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0028	0.0028	0.0025	-0.0021

1	Cs1	241.37	1.81	-38.22	-88.25	-152.58	-238.35	-241.37	-241.37	-241.37	-241.37	-241.37	-241.37
2	Cs2	160.91	9.45	-16.32	-48.53	-89.95	-145.17	-160.91	-160.91	-160.91	-160.91	-160.91	-160.91
3	Cs3	241.37	28.53	-10.75	-57.35	-117.27	-197.15	-241.37	-241.37	-241.37	-241.37	-241.37	-241.37
4	Cs4	160.91	25.93	1.99	-27.93	-66.41	-117.70	-160.91	-160.91	-160.91	-160.91	-160.91	-160.91
5	Cs5	160.91	34.77	11.74	-17.63	-54.64	-103.97	-160.91	-160.91	-160.91	-160.91	-160.91	-160.91
6	Cs6	160.91	42.41	20.30	-7.33	-42.86	-90.24	-156.56	-160.91	-160.91	-160.91	-160.91	-160.91
7	Cs7	160.91	50.65	29.45	2.97	-31.09	-76.50	-140.08	-160.91	-160.91	-160.91	-160.91	-160.91
8	Cs8	160.91	58.89	38.61	13.27	-19.32	-62.77	-123.60	-160.91	-160.91	-160.91	-160.91	-160.91
9	Cs9	160.91	67.13	47.77	23.56	-7.55	-49.04	-107.12	-160.91	-160.91	-160.91	-160.91	-160.91
10	Cs10	160.91	75.37	56.92	33.86	4.22	-35.30	-90.64	-160.91	-160.91	-160.91	-160.91	-160.91
11	Cs11	160.91	83.61	66.08	44.16	15.99	-21.57	-74.16	-153.04	-160.91	-160.91	-160.91	-160.91
12	Cs12	160.91	91.85	75.23	54.46	27.76	-7.84	-57.68	-132.44	-160.91	-160.91	-160.91	-160.91
13	Cs13	160.91	100.09	84.39	64.76	39.53	5.90	-41.20	-111.84	-160.91	-160.91	-160.91	-160.91
14	Cs14	160.91	108.33	93.54	75.06	51.31	19.63	-24.72	-91.24	-160.91	-160.91	-160.91	-160.91
15	Cs15	160.91	116.57	102.70	85.36	63.08	33.36	-8.24	-70.64	-160.91	-160.91	-160.91	-160.91
16	Cs16	160.91	124.81	111.85	95.66	74.85	47.10	8.24	-50.04	-147.18	-160.91	-160.91	-160.91
17	Cs17	160.91	133.05	121.01	105.96	86.62	60.83	24.72	-29.44	-119.71	-160.91	-160.91	-160.91
18	Cs18	160.91	141.29	130.16	116.26	98.39	74.56	41.20	-8.84	-92.25	-160.91	-160.91	-160.91
19	Cs19	160.91	149.53	139.32	126.56	110.16	88.29	57.68	11.76	-64.78	-160.91	-160.91	-160.91
20	Cs20	160.91	157.77	148.48	136.86	121.93	102.03	74.16	32.36	-37.32	-160.91	-160.91	-160.91
21	Cs21	160.91	160.91	157.63	147.16	133.71	115.76	90.64	52.96	-9.85	-135.46	-160.91	-160.91
22	Cs22	160.91	160.91	160.91	157.46	145.48	129.49	107.12	73.56	17.62	-94.26	-160.91	-160.91
23	Cs23	160.91	160.91	160.91	160.91	157.25	143.23	123.60	94.16	45.08	-53.06	-160.91	-160.91
24	Cs24	160.91	160.91	160.91	160.91	160.91	156.96	140.08	114.76	72.55	-11.86	-160.91	-160.91
25	Cs25	160.91	160.91	160.91	160.91	160.91	160.91	156.56	135.36	100.02	29.34	-160.91	-160.91
26	Cs26	160.91	160.91	160.91	160.91	160.91	160.91	160.91	155.96	127.48	70.54	-100.29	-160.91
27	Cs27	160.91	160.91	160.91	160.91	160.91	160.91	160.91	160.91	154.95	111.74	-17.89	-160.91
28	Cs28	241.37	241.37	241.37	241.37	241.37	241.37	241.37	241.37	241.37	229.41	96.76	-241.37
29	Cs29	160.91	160.91	160.91	160.91	160.91	160.91	160.91	160.91	160.91	160.91	146.90	-160.91
30	Cs30	241.37	241.37	241.37	241.37	241.37	241.37	241.37	241.37	241.37	241.37	241.37	72.41
	∑ Csi	2092	568	282	-75	-534	-1146	-1715	-2056	-2092	-2092	-2092	-2092
	Pn	53040	45084	40576	38067	31559	27050	22542	18034	13525	9017	4508	434
	Pn + ∑ Csi	55132	45652	40858	35992	31025	25905	20827	15978	11433	6925	2417	-1658
	Mn	116	14915	21636	26252	28718	28955	27502	24646	20351	14626	7549	213

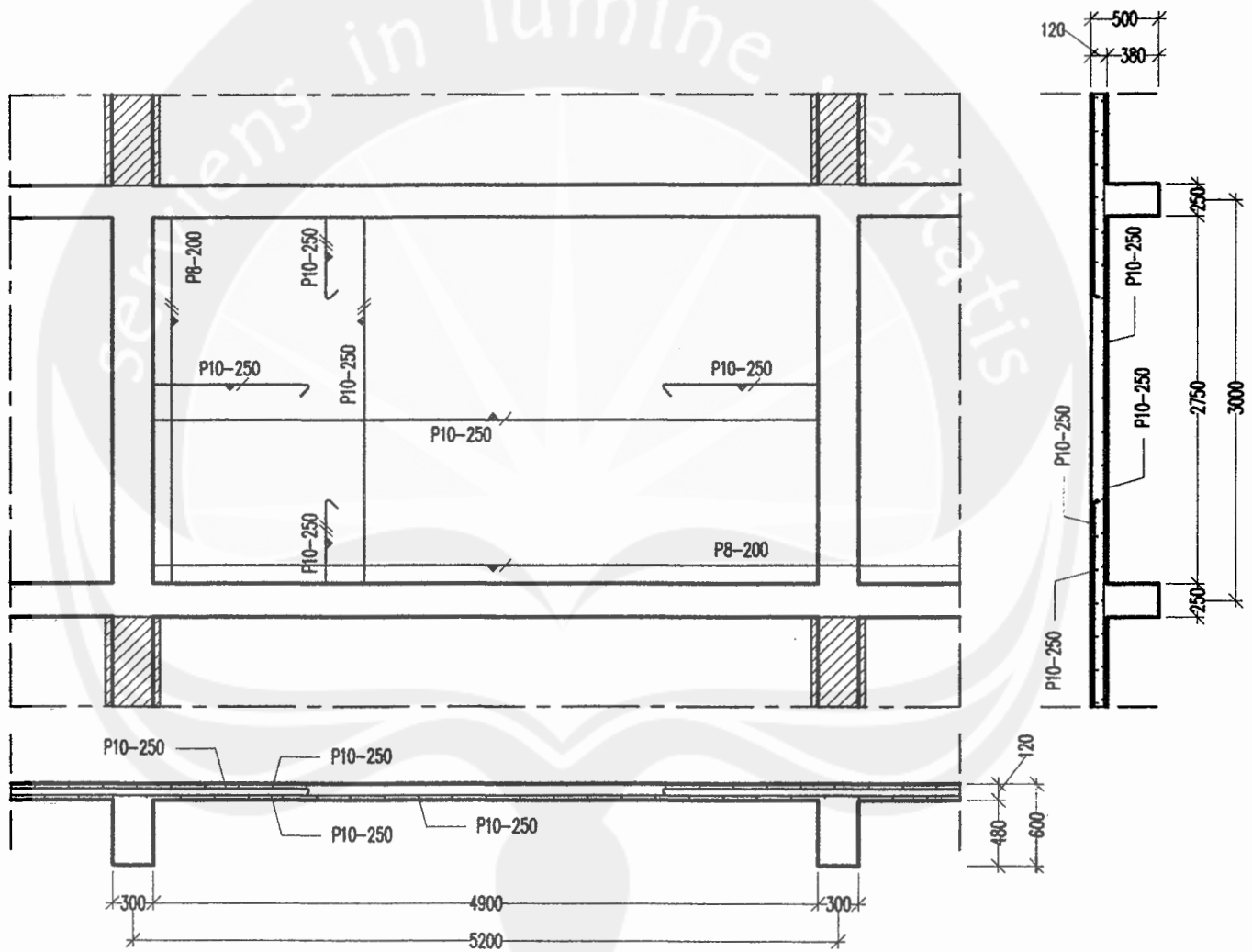




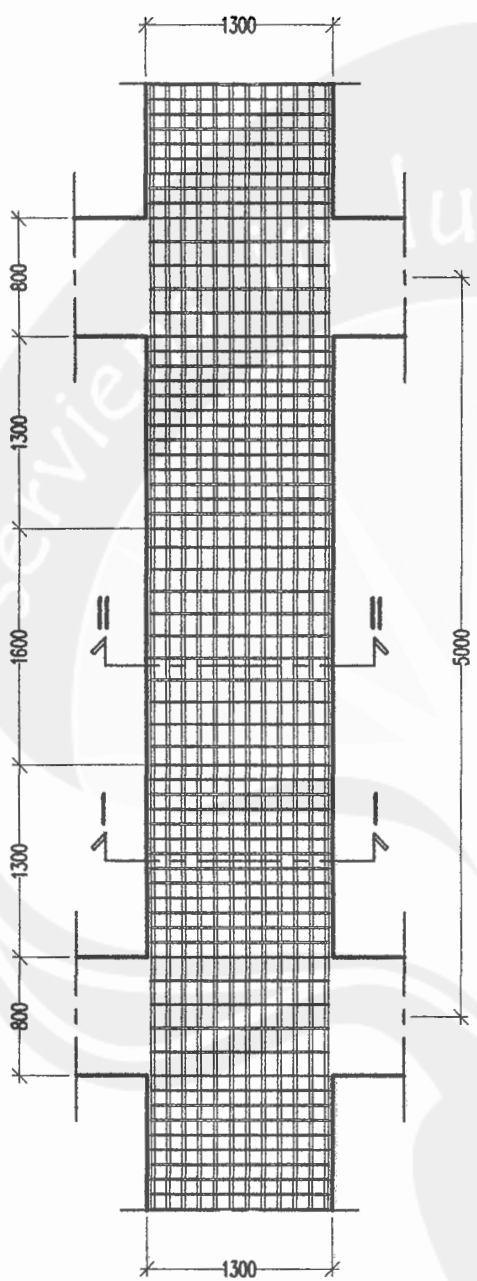




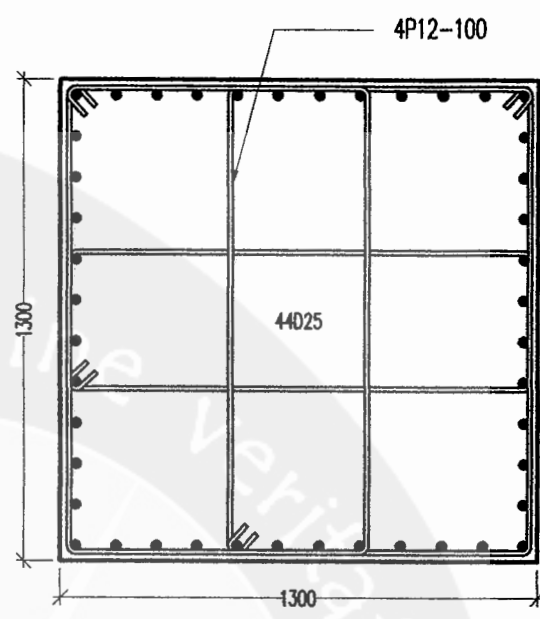




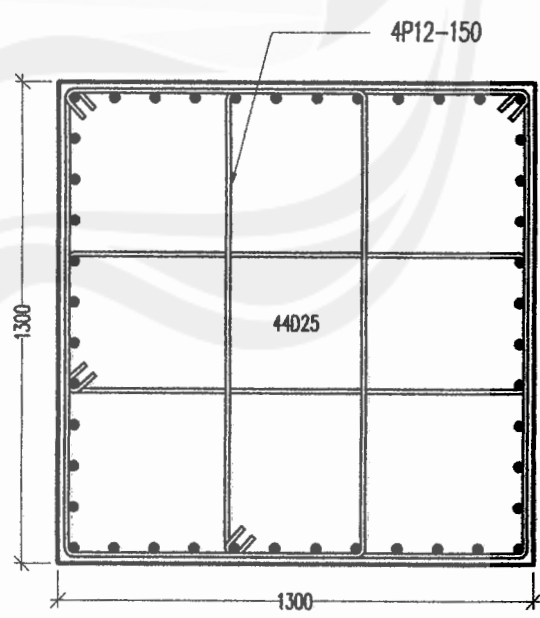
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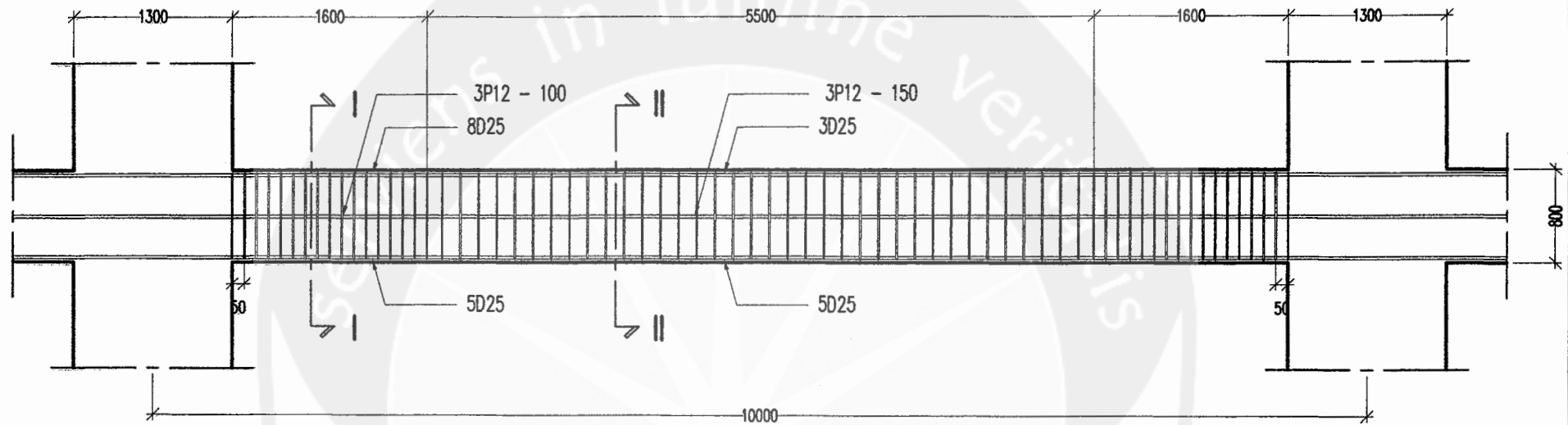
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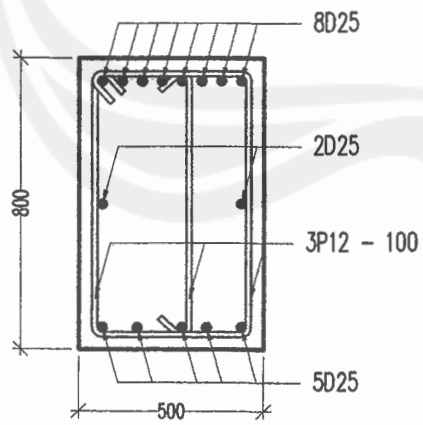
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SKALA 1:20



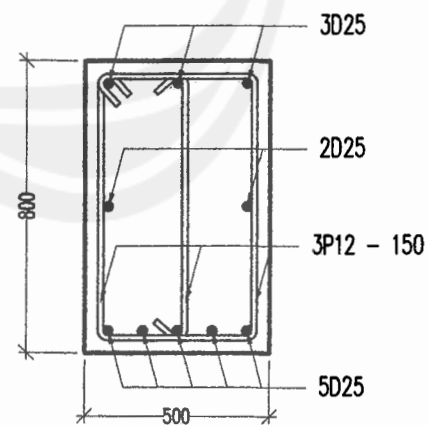
POTONGAN II-II  
SKALA 1:20



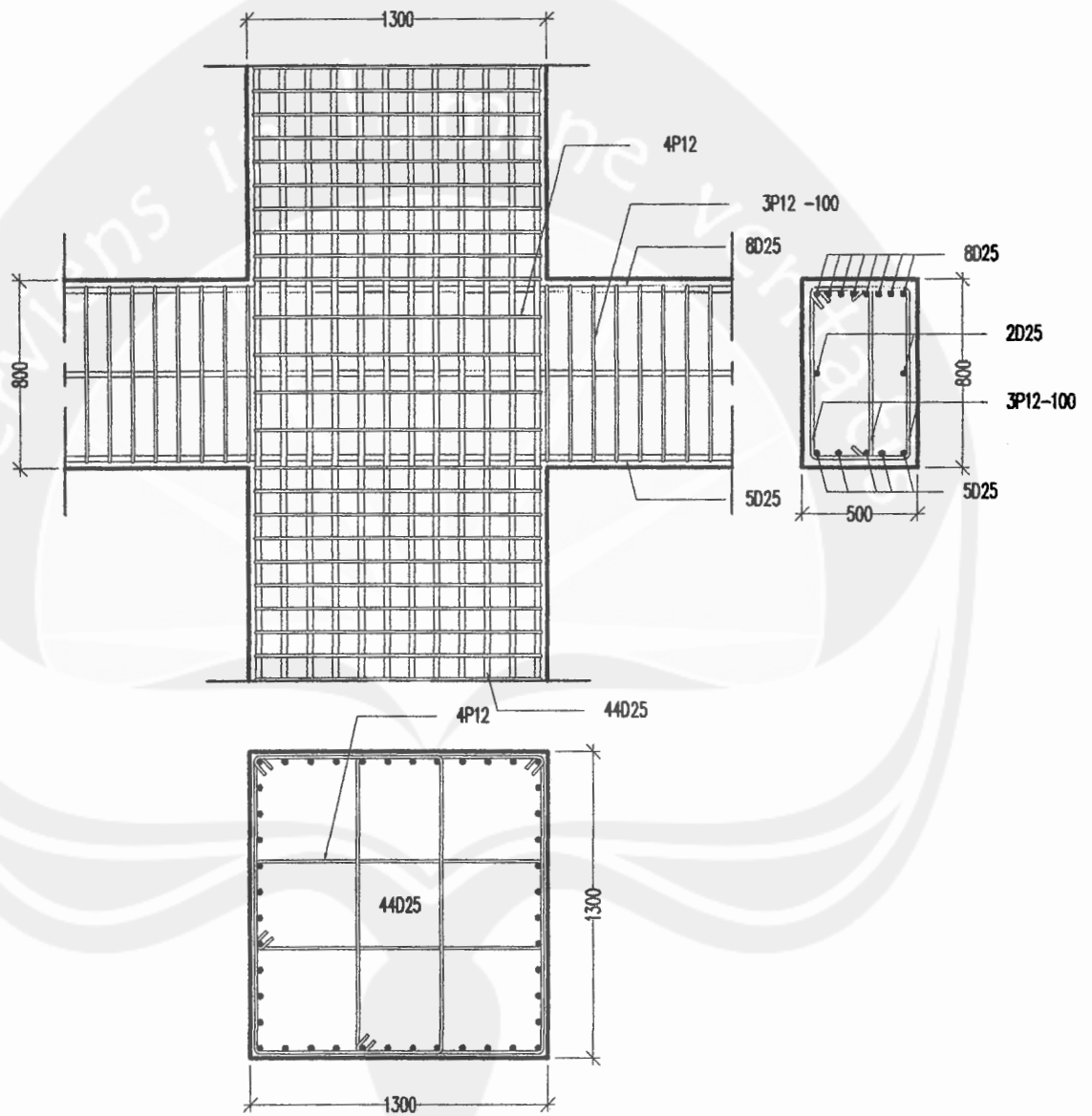
GAMBAR PENULANGAN BALOK  
SKALA 1:50



POTONGAN I-I  
SKALA 1:20

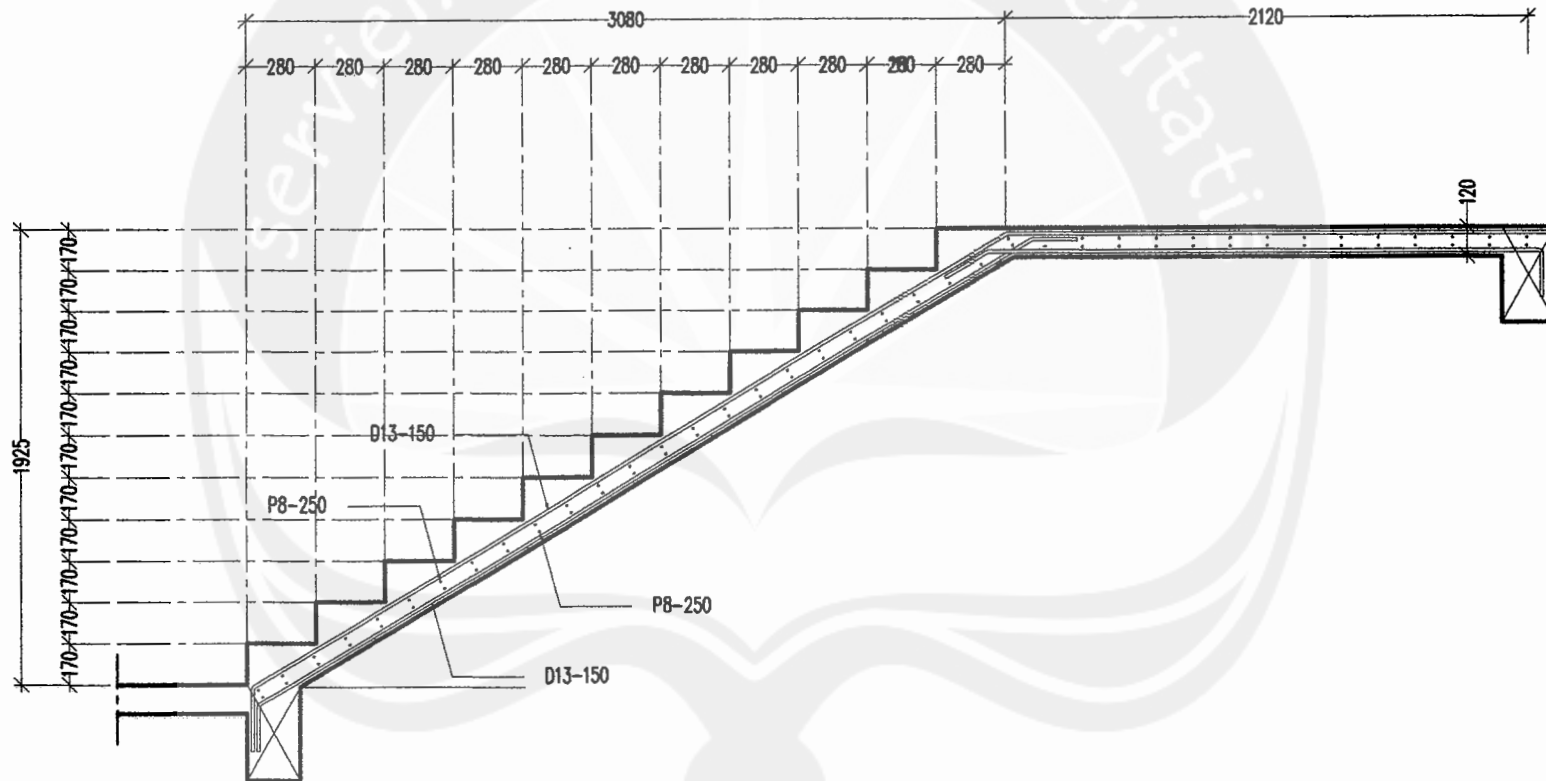


POTONGAN II-II  
SKALA 1:20



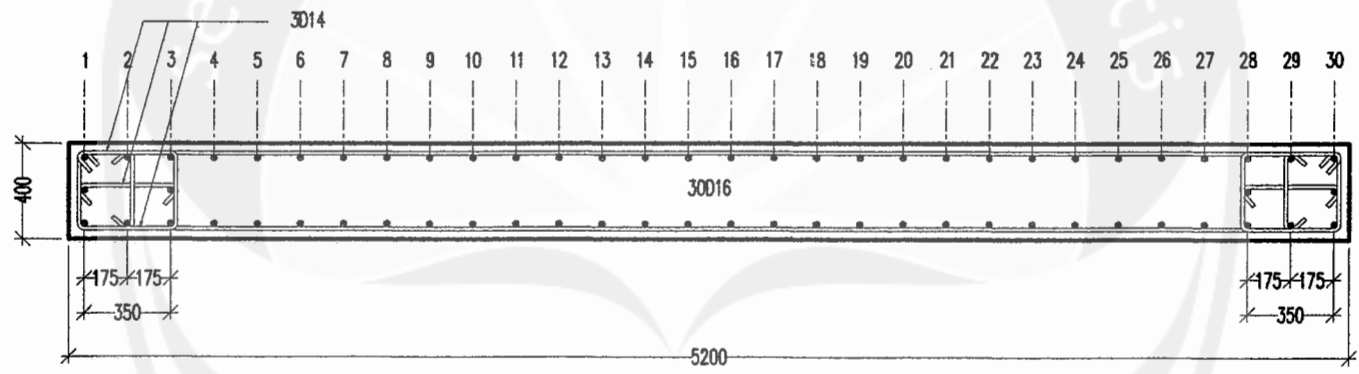
GAMBAR PENULANGAN HUBUNGAN BALOK KOLOM

SKALA 1:30



GAMBAR PENULANGAN TANGGA

SKALA 1:30

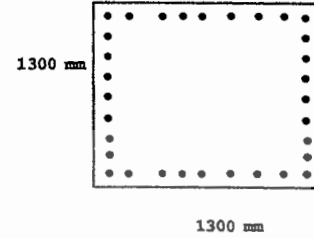


GAMBAR PENULANGAN DINDING GESER  
 SKALA 1:30

**DESAIN DAN ANALISIS KOLOM LANTAI 1**

**1. DATA TAMPANG**

Lebar tampang	L =	1300	mm	
Tinggi penampang	H =	1300	mm	
Kuat tekan beton	$f_c$ =	30	MPa	
Teg. Lelah baja	$f_y$ =	400	MPa	
Modulus Elastisitas	E =	200000	MPa	
Diameter Tulangan	d =	25	mm	$A_s$ = 491.071 mm <sup>2</sup>
Tulangan	n =	44D25		
Deret		12		
Selimit beton	$d_s$ =	64.5	mm	
Momen Desain	$M_u$ =	2403.790	KNm	
Gaya Aksial	$P_u$ =	24644.800	KN	

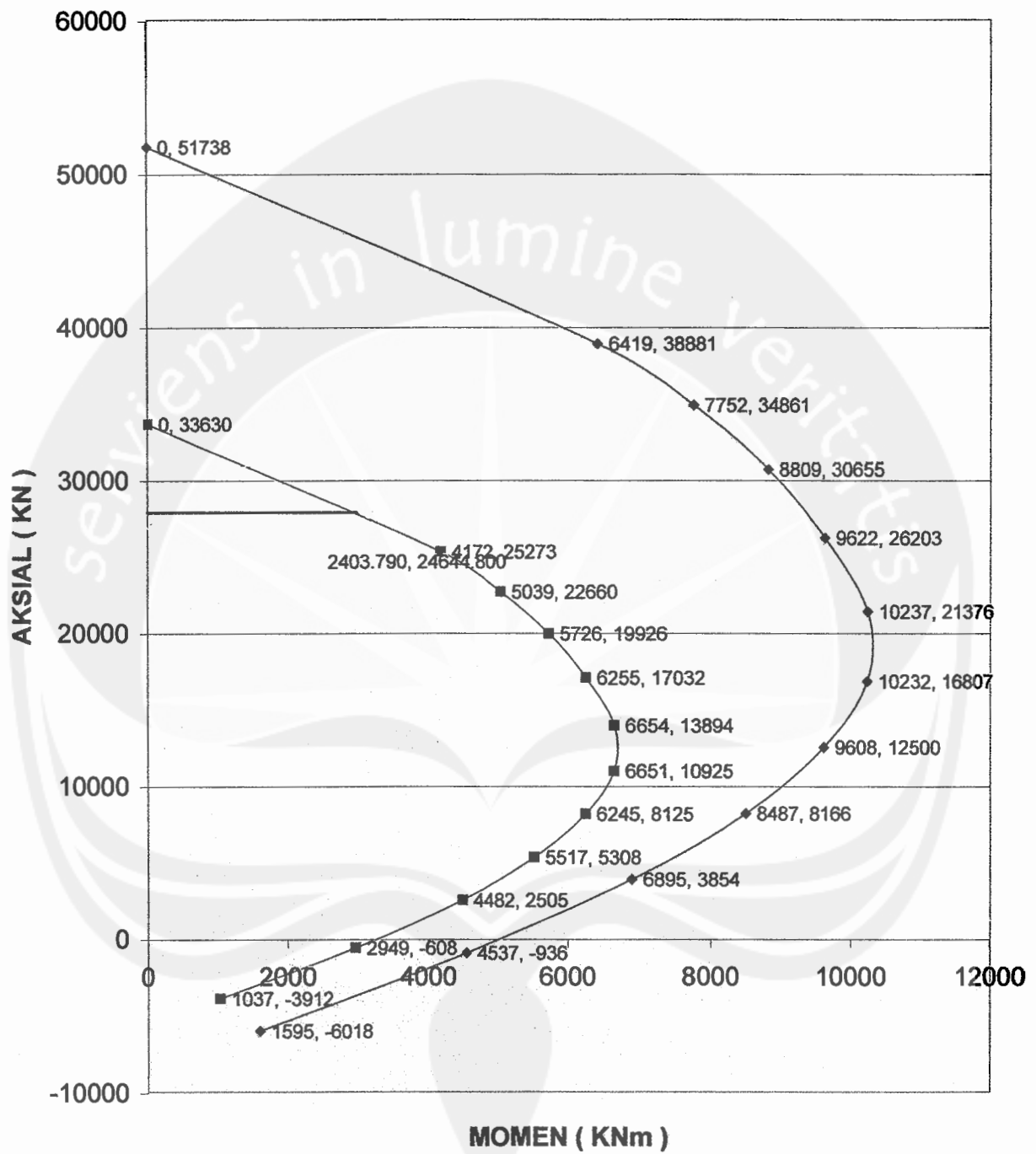


**2. ANALISIS LENTUR**

TABULASI PERHITUNGAN  $M_n - P_n$

$A_s$ /deret (mm <sup>2</sup> )	c		130	130	130	130	130	130	130	130	130	130	130		
	a	1300	1014	913	811	710	608	507	406	304	203	101	39		
5892.9	1	es1	0.0030	0.0001	-0.0002	-0.0006	-0.0011	-0.0018	-0.0027	-0.0041	-0.0065	-0.0113	-0.0255	-0.0711	
982.1	2	es2	0.0030	0.0004	0.0001	-0.0003	-0.0007	-0.0013	-0.0022	-0.0035	-0.0057	-0.0100	-0.0231	-0.0647	
982.1	3	es3	0.0030	0.0006	0.0004	0.0001	-0.0004	-0.0009	-0.0017	-0.0029	-0.0049	-0.0088	-0.0206	-0.0584	
982.1	4	es4	0.0030	0.0009	0.0007	0.0004	0.0000	-0.0005	-0.0012	-0.0023	-0.0040	-0.0076	-0.0181	-0.0520	
982.1	5	es5	0.0030	0.0011	0.0009	0.0007	0.0003	-0.0001	-0.0007	-0.0017	-0.0032	-0.0063	-0.0157	-0.0458	
982.1	6	es6	0.0030	0.0014	0.0012	0.0010	0.0007	0.0003	-0.0002	-0.0011	-0.0024	-0.0051	-0.0132	-0.0392	
982.1	7	es7	0.0030	0.0016	0.0015	0.0013	0.0010	0.0007	0.0002	-0.0004	-0.0016	-0.0039	-0.0108	-0.0328	
982.1	8	es8	0.0030	0.0019	0.0017	0.0016	0.0014	0.0011	0.0007	0.0002	-0.0008	-0.0027	-0.0083	-0.0264	
982.1	9	es9	0.0030	0.0021	0.0020	0.0020	0.0019	0.0017	0.0015	0.0012	0.0008	0.0000	-0.0014	-0.0059	-0.0200
982.1	10	es10	0.0030	0.0024	0.0023	0.0022	0.0021	0.0019	0.0017	0.0014	0.0009	-0.0002	-0.0034	-0.0136	
982.1	11	es11	0.0030	0.0026	0.0026	0.0025	0.0024	0.0023	0.0022	0.0020	0.0017	0.0010	-0.0009	-0.0073	
5892.9	12	es12	0.0030	0.0029	0.0028	0.0028	0.0028	0.0028	0.0027	0.0026	0.0025	0.0023	0.0015	-0.0009	
	1	Cs1	2357.14	175.43	-197.94	-684.65	-1264.70	-2064.77	-2357.14	-2357.14	-2357.14	-2357.14	-2357.14	-2357.14	
	2	Cs2	392.86	77.49	20.63	-50.46	-141.85	-263.70	-392.86	-392.86	-392.86	-392.86	-392.86	-392.86	
	3	Cs3	392.86	125.75	74.24	9.86	-72.91	-183.28	-337.79	-392.86	-392.86	-392.86	-392.86	-392.86	
	4	Cs4	392.86	174.00	127.86	70.18	-3.97	-102.85	-241.28	-392.86	-392.86	-392.86	-392.86	-392.86	
	5	Cs5	392.86	222.26	181.48	130.50	64.96	-22.42	-144.77	-328.28	-392.86	-392.86	-392.86	-392.86	
	6	Cs6	392.86	270.52	235.10	190.82	133.90	58.00	-48.26	-207.64	-392.86	-392.86	-392.86	-392.86	
	7	Cs7	392.86	318.77	288.71	251.14	202.84	138.43	48.26	-87.00	-312.43	-392.86	-392.86	-392.86	
	8	Cs8	392.86	367.03	342.33	311.46	271.77	218.85	144.77	33.64	-151.58	-392.86	-392.86	-392.86	
	9	Cs9	392.86	392.86	392.86	371.78	340.71	299.28	241.28	154.28	9.27	-280.73	-392.86	-392.86	
	10	Cs10	392.86	392.86	392.86	392.86	392.86	379.70	337.79	274.91	170.12	-39.46	-392.86	-392.86	
	11	Cs11	392.86	392.86	392.86	392.86	392.86	392.86	392.86	392.86	330.98	201.82	-185.65	-392.86	
	12	Cs12	2357.14	2357.14	2357.14	2357.14	2357.14	2357.14	2357.14	2357.14	2357.14	2357.14	1781.46	-1025.36	
		$\Sigma Csi$	8643	5267	4608	3764	2674	1207	0	-946	-1918	-2868	-4297	-7311	
		$P_n$	43095	33614	30253	26891	23530	20168	16807	13446	10084	6723	3361	1293	
$P_n + \Sigma Csi$		$P_n$	51738	38881	34861	30655	26203	21376	16807	12500	8166	3854	-936	-6018	
$M_n$		$M_n$	0	6419	7752	8809	9622	10237	10232	9608	8487	6895	4537	1595	
		$P_u$	33630	25273	22660	19926	17032	13894	10925	8125	5308	2505	-608	-3912	
		$M_u$	0	4172	5039	5726	6255	6654	6651	6245	5517	4482	2949	1037	

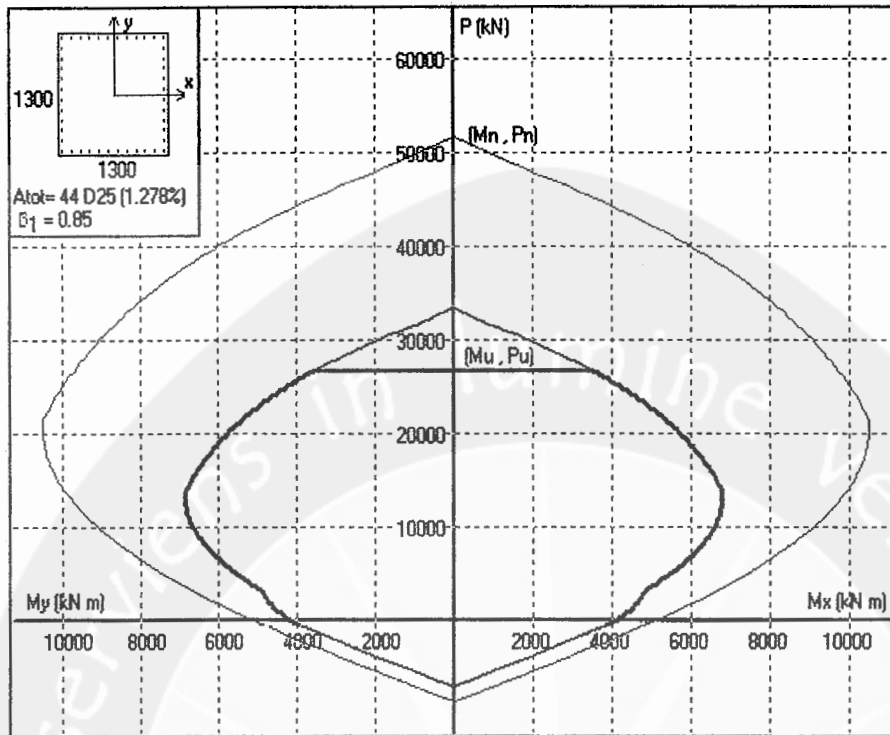
Diagram Interaksi Kolom K 1300





**IKOLAT 2000**

Hak cipta (c) 2001, Haryanto Yoso Wigroho

Kode Kolom : **K1300****Mutu Bahan**Mutu beton  $f'_c$  (MPa) = **30**Mutu baja  $f_y$  (MPa) = **400**Modulus baja  $E_s$  (MPa) = **200000****Penampang Kolom**Lebar tampang  $B$  (mm) = **1300**Tinggi tampang  $H$  (mm) = **1300**Diameter tulangan (mm) = **25**Selimut beton  $d_s$  (mm) = **40**Jumlah baris tul. arah  $H$  = **12**Jumlah baris tul. arah  $B$  = **12****Faktor Reduksi** sengkang biasa  $\phi = 0.65$  sengkang spiral  $\phi = 0.70$