

$$V_c = (1 + 2592,6 / 14.315000) \left(1/6 \cdot \sqrt{22,5} \right) 450.650 \cdot 10^{-3} \quad (\text{dari 3.66c})$$

$$= 367,18 \text{ KN}$$

$$1/2 \cdot V_c = 183,59 \text{ KN}$$

Tulangan geser didaerah ujung kolom

$$V_s = 418,85/0,6 - 183,59 = 514,49 \text{ KN}$$

Dipakai sengkang tertutup 4P10, $A_v = 314 \text{ mm}^2$

$$s \leq \frac{314.350.650.10^{-3}}{514,49} = 120 \text{ mm} \quad (\text{dari 3.60k})$$

$$s \leq \frac{1}{4} \cdot 450 = 112,5 \text{ mm} \quad (\text{dari 3.66d})$$

$$s \leq 8.25 = 200 \text{ mm} \quad (\text{dari 3.66e})$$

$$s \leq 100 \text{ mm (menentukan)} \quad (\text{dari 3.66f})$$

Tulangan geser didaerah tengah bentang kolom

$$V_s = 418,85/0,6 - 367,18 = 330,9 \text{ KN}$$

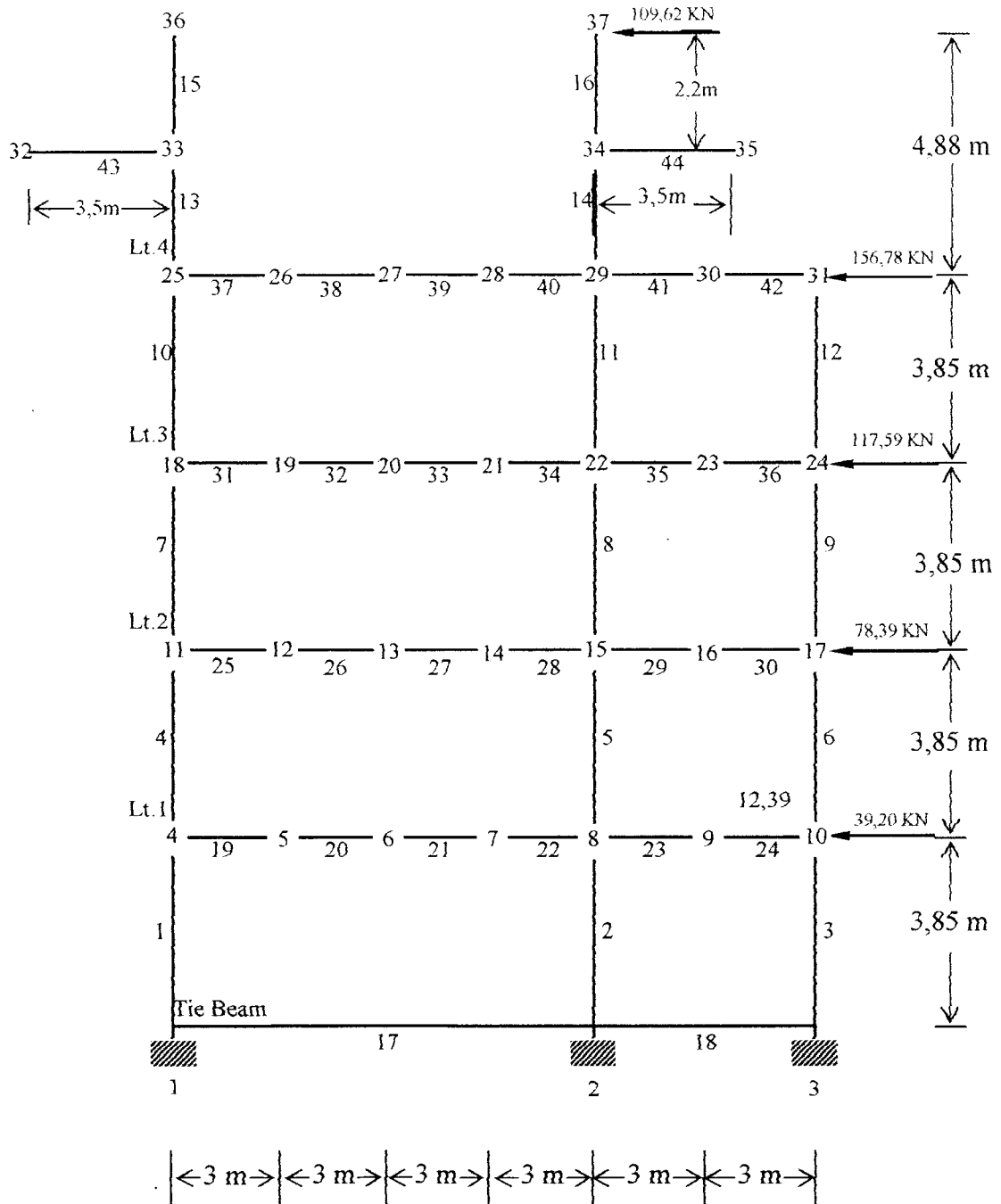
$$s = \frac{314.350.650.10^{-3}}{330,9} = 210 \text{ mm}$$

$$s \leq 200 \text{ mm (menentukan)}$$

Tabel 4.11.d Gaya Geser Rencana Kolom As.9-10 (K=2)

Elm	Jarak (m)	$V_{D,k}$ (KN)	$V_{L,k}$ (KN)	$V_{E,k}$ (KN)	$V_{U,k} =$ $1,05(V_{D,k} + V_{L,k} + \omega_d \cdot V_{E,k})$ (KN)	KET
1	0	-48.83	-15.32	241.47	262.25	KOL BASEMEN
	1.925	-48.83	-15.32	241.47	262.25	
	3.85	-48.83	-15.32	241.47	262.25	
2	0	48.83	15.32	239.35	394.07	KOL BASEMEN
	1.925	48.83	15.32	239.35	394.07	
	3.85	48.83	15.32	239.35	394.07	
3	0	-82.65	-23.31	218.25	186.65	KOLOM LT.1
	1.925	-82.65	-23.31	218.25	186.65	
	3.85	-82.65	-23.31	218.25	186.65	
4	0	82.65	23.31	225.34	418.85	KOLOM LT.1
	1.925	82.65	23.31	225.34	418.85	
	3.85	82.65	23.31	225.34	418.85	
5	0	-80.50	-33.06	201.14	155.32	KOLOM LT.2
	1.925	-80.50	-33.06	201.14	155.32	
	3.85	-80.50	-33.06	201.14	155.32	
6	0	80.50	33.06	168.00	348.56	KOLOM LT.2
	1.925	80.50	33.06	168.00	348.56	
	3.85	80.50	33.06	168.00	348.56	
7	0	-57.43	21.10	53.78	35.26	KOLOM LT.3
	1.925	-57.43	21.10	53.78	35.26	
	3.85	-57.43	21.10	53.78	35.26	
8	0	57.43	-21.10	203.70	316.20	KOLOM LT.3
	1.925	57.43	-21.10	203.70	316.20	
	3.85	57.43	-21.10	203.70	316.20	
9	0	0	0	108.57	148.20	KOLOM LT.4
	1.34	0	0	108.57	148.20	
	2.68	0	0	108.57	148.20	
10	0	0	0	0	0	KOLOM LT.4
	1.34	0	0	0	0	
	2.68	0	0	0	0	
11	0	0	0	0	0	KOLOM LT.4
	1.1	0	0	0	0	
	2.2	0	0	0	0	
12	0	0	0	108.57	148.20	KOLOM LT.4
	1.1	0	0	108.57	148.20	
	2.2	0	0	108.57	148.20	

c. Beban gempa kanan



Gambar 4.12.c Pembebanan gempa kanan Portal As 6 dan As 7

- Beban terpusat nodal 32 & 35

$$P_{1.2 \text{ R perletakan atap}} : 7,166 + 6,304 = 13,461 \text{ KN}$$

- Beban terpusat nodal 36 & 37

$$P_{1.3 \text{ penutup Lt.4}} : 1,75 \cdot (1,5+3) \cdot 3 = 23,625 \text{ KN}$$

c Beban gempa

$$\text{Reaksi atap} : 2 \cdot 28,6 = 57,20 \text{ KN}$$

$$\text{Plat penutup Lt.4} : 2,3,5,6,0,12,24 = 120,96 \text{ KN}$$

$$\text{Kolom} : 2,0,45,0,7,4,88,24 = 72,58 \text{ KN}$$

$$\text{Balok} : 2,0,25,0,4,24,6 = 46,08 \text{ KN}$$

$$\text{Balok} : 4,0,4,0,8,24,6 = 184,32 \text{ KN}$$

$$\text{Beban hidup tereduksi: } 0,6 \cdot (2,3,5,6,3) = 75,60 \text{ KN}$$

$$\text{Dibulatkan } W_{\text{atap}} = 559,74 \text{ KN}$$

- Berat lantai 4 (tipikal dengan lt. 3, 2,1)

$$\text{Lantai} : 6,18,0,12,24 = 311,04 \text{ KN}$$

$$\text{Kolom} : (2,0,45,0,7 + 0,45,0,45) \cdot 3,85,24 = 76,92 \text{ KN}$$

$$\text{Balok} : 11,0,25,0,4,24,6 = 158,40 \text{ KN}$$

$$\text{Balok} : 0,4,0,8,24,30 = 230,40 \text{ KN}$$

$$\text{Tembok} : 2,5,3,85,12 = 115,50 \text{ KN}$$

$$\text{B.hidup tereduksi: } 0,6(6,18,2,5) = 162,00 \text{ KN}$$

$$\text{Dibulatkan } W_4 = 1054,3 \text{ KN}$$

$$W_{\text{Total}} : 559,74 + 4 \cdot 1054,3 = 4776,94 \text{ KN}$$

Lanjutan Tabel 4.14.a Momen Rencana Balok Portal As A-D (K=1)

ELM	Jarak (m)	MD (KNm)	ML (KNm)	M.GEMPA (KNm)		1.2MD + 1.6ML (KNm)	0.9(MD ± ME) (KNm)		1.05(MD+0.6ML ± ME) (KNm)		KET
				KIRI	KANAN		KIRI	KANAN	KIRI	KANAN	
102	0	-28.52	-8.75	59.72	-61.01	-48.22	28.08	-80.57	27.25	-99.51	blk. nok
	3	18.76	5.79	0.59	-0.95	31.77	17.41	16.03	23.96	22.35	
	6	-32.25	-10.06	-58.55	59.11	-54.78	-81.71	24.18	-101.67	21.87	
103	0	-25.69	-7.79	47.82	-48.05	-43.30	19.92	-66.37	18.32	-82.34	blk. nok
	1.5	1.96	1.34	-0.58	0.60	4.51	1.25	2.31	2.30	3.54	
	3	2.61	0.36	-48.97	49.26	3.71	-41.72	46.69	-48.45	54.69	
104	0	-49.92	-10.69	63.26	-63.20	-77.00	12.01	-101.80	7.27	-125.50	blk. nok
	3	25.33	5.06	0.30	-0.29	38.49	23.06	22.54	30.09	29.48	
	6	-47.20	-9.57	-62.67	62.62	-71.95	-98.88	13.68	-121.39	10.16	
105	0	-46.18	-9.40	55.23	-55.23	-70.45	8.14	-91.27	3.58	-112.40	blk. nok
	3	25.19	5.22	-0.12	0.11	38.88	22.56	22.77	29.61	29.86	
	6	-51.22	-10.53	-55.46	55.46	-78.32	-96.02	3.81	-118.66	-2.19	
106	0	-50.78	-11.01	55.55	-55.54	-78.56	4.30	-95.69	-1.92	-118.57	blk. nok
	3	25.12	5.28	0.04	-0.05	38.58	22.64	22.56	29.74	29.65	
	6	-46.77	-8.81	-55.47	55.45	-70.22	-92.01	7.81	-112.90	3.57	
107	0	-45.04	-9.01	60.06	-60.06	-68.46	13.52	-94.58	10.10	-116.03	blk. nok
	3	25.16	4.92	-0.28	0.29	38.06	22.39	22.91	29.22	29.82	
	6	-52.43	-11.53	-60.62	60.64	-81.36	-101.74	7.39	-125.96	1.36	
108	0	-0.32	0.50	42.08	-41.21	0.42	37.59	-37.38	44.17	-43.29	blk. nok
	1.75	6.84	2.11	-1.68	1.30	11.58	4.65	7.33	6.75	9.88	
	3.5	-17.23	-4.32	-45.44	43.81	-27.60	-56.41	23.92	-68.53	25.19	
109	0	-9.56	-2.58	24.17	-23.04	-15.60	13.15	-29.34	13.71	-35.86	blk. atap
	1.5	0.03	0.19	5.23	-5.07	0.34	4.73	-4.53	5.64	-5.17	
	3	-19.00	-8.85	-13.71	12.91	-36.96	-29.44	-5.48	-39.92	-11.97	
110	0	-64.85	-23.37	37.74	-37.32	-115.20	-24.40	-91.94	-43.18	-121.99	blk. atap
	1.5	9.52	3.94	19.45	-19.22	17.74	26.08	-8.72	32.91	-7.69	
	3	55.27	19.44	1.17	-1.12	97.43	50.80	48.74	71.51	69.11	
111	0	55.27	19.44	1.17	-1.12	97.43	50.80	48.74	71.51	69.11	blk. atap
	1.5	10.59	3.58	-17.12	16.98	18.44	-5.88	24.81	-4.60	31.20	
	3	-62.72	-24.09	-35.40	35.08	-113.81	-88.30	-24.87	-118.20	-44.20	
112	0	-43.75	-17.96	26.77	-26.70	-81.23	-15.28	-63.40	-29.14	-85.28	blk. atap
	3	17.42	7.33	-0.37	0.42	32.63	15.35	16.06	22.52	23.35	
	6	-35.89	-14.64	-27.50	27.54	-66.49	-57.06	-7.51	-75.79	-17.99	
113	0	-36.74	-15.26	27.39	-27.65	-68.50	-8.41	-57.95	-19.43	-77.22	blk. atap
	3	18.02	7.28	0.40	-0.34	33.26	16.58	15.91	23.92	23.14	
	6	-41.70	-17.44	-26.59	26.96	-77.95	-61.47	-13.27	-82.70	-26.47	
114	0	-55.55	-25.29	33.69	-34.45	-107.14	-19.68	-81.00	-38.89	-110.44	blk. atap
	1.5	9.54	3.54	15.87	-16.17	17.11	22.87	-5.97	28.91	-4.73	
	3	46.02	20.55	-1.96	2.11	88.11	39.66	43.31	59.22	63.48	
115	0	46.02	20.55	-1.96	2.11	88.11	39.66	43.31	59.22	63.48	blk. atap
	1.5	10.98	5.57	-19.78	20.39	22.08	-7.92	28.23	-5.73	36.44	
	3	-52.69	-21.23	-37.60	38.67	-97.20	-81.26	-12.62	-108.18	-28.10	