

SEISMIC EVALUATION AND RETROFIT OF CONCRETE BUILDINGS

Table 9-6. Modeling Parameters for Nonlinear Procedures—Reinforced Concrete Beams

Component Type			Modeling Parameters ³		
			Plastic Rotation Angle, rad		Residual Strength Ratio
			a	b	c
1. Beams controlled by flexure¹					
$\frac{p-p}{p_{bal}}$	Transverse Reinforcement ²	$\frac{v}{b_w d \sqrt{f_c}}$ ⁴			
≤ 0.0	C	≤ 3	0.025	0.05	0.2
≤ 0.0	C	≥ 6	0.02	0.04	0.2
≥ 0.5	C	≤ 3	0.02	0.03	0.2
≥ 0.5	C	≥ 6	0.015	0.02	0.2
≤ 0.0	NC	≤ 3	0.02	0.03	0.2
≤ 0.0	NC	≥ 6	0.01	0.015	0.2
≥ 0.5	NC	≤ 3	0.01	0.015	0.2
≥ 0.5	NC	≥ 6	0.005	0.01	0.2
2. Beams controlled by shear¹					
stirrup spacing ≤ d/2			0.0	0.02	0.2
stirrup spacing > d/2			0.0	0.01	0.2
3. Beams controlled by inadequate development or splicing along the span¹					
stirrup spacing ≤ d/2			0.0	0.02	0.0
stirrup spacing > d/2			0.0	0.01	0.0
4. Beams controlled by inadequate embedment into beam-column joint¹					
			0.015	0.03	0.2

- When more than one of the conditions 1, 2, 3, and 4 occur for a given component, use the minimum appropriate numerical value from the table.
- Under the heading "transverse reinforcement," "C" and "NC" are abbreviations for conforming and non-conforming details, respectively. A component is conforming if within the flexural plastic region: 1) closed stirrups are spaced at ≤ d/3, and 2) for components of moderate and high ductility demand the strength provided by the stirrups (V) is at least three-fourths of the design shear. Otherwise, the component is considered non-conforming.
- Linear interpolation between values listed in the table is permitted.
- V = design shear force
- For lightweight concrete, use 75 percent of tabulated values (see Section 9.5.2.2).

SEISMIC EVALUATION AND RETROFIT OF CONCRETE BUILDINGS

Table 9-7. Modeling Parameters for Nonlinear Procedures—Reinforced Concrete Columns

Component Type			Modeling Parameters ^a		
			Plastic Rotation Angle, rad		Residual Strength Ratio
			a	b	c
1. Columns controlled by flexure¹					
$\frac{P}{A_g f_c}$ ⁵	Transverse Reinforcement ²	$\frac{V}{b_w d \sqrt{f_c}}$ ⁶			
≤ 0.1	C	≤ 3	0.02	0.03	0.2
≤ 0.1	C	≥ 6	0.015	0.025	0.2
≥ 0.4	C	≤ 3	0.015	0.025	0.2
≥ 0.4	C	≥ 6	0.01	0.015	0.2
≤ 0.1	NC	≤ 3	0.01	0.015	0.2
≤ 0.1	NC	≥ 6	0.005	0.005	-
≥ 0.4	NC	≤ 3	0.005	0.005	-
≥ 0.4	NC	≥ 6	0.0	0.0	-
2. Columns controlled by shear^{1,3}					
Hoop spacing ≤ d/2, or $\frac{P}{A_g f_c}$ ⁵ ≤ 0.1			0.0	0.015	0.2
other cases			0.0	0.0	0.0
3. Columns controlled by inadequate development or splicing along the clear height^{1,3}					
Hoop spacing ≤ d/2			0.01	0.02	0.4
Hoop spacing > d/2			0.0	0.01	0.2
4. Columns with axial loads exceeding 0.70 P_o^{1,3}					
Conforming reinforcement over the entire length			0.015	0.025	0.02
All other cases			0.0	0.0	0.0

- When more than one of the conditions 1, 2, 3, and 4 occur for a given component, use the minimum appropriate numerical value from the table.
- Under the heading "transverse reinforcement," "C" and "NC" are abbreviations for conforming and non-conforming details, respectively. A component is conforming if within the flexural plastic hinge region: 1) closed hoops are spaced at ≤ d/3, and 2) for components of moderate and high ductility demand the strength provided by the stirrups (V) is at least three-fourths of the design shear. Otherwise, the component is considered non-conforming.
- To qualify, 1) hoops must not be lap spliced in the cover concrete, and 2) hoops must have hooks embedded in the core or must have other details to ensure that hoops will be adequately anchored following spalling of cover concrete.
- Linear interpolation between values listed in the table is permitted.
- P = Design axial load
- V = Design shear force
- For lightweight concrete, use 75 percent of tabulated values (see Section 9.5.2.2).

SEISMIC EVALUATION AND RETROFIT OF CONCRETE BUILDINGS

Table 9-12. Modeling Parameters for Nonlinear Procedures—Coupling Beams

Component Type	Modeling Parameters ⁵			
	Chord Rotation, rad		Residual Strength Ratio	
	d	e	c	
1. Coupling beams controlled by flexure				
Longitudinal reinforcement and transverse reinforcement ¹	$\frac{V}{b_w d \sqrt{f'_c}}^2$			
Conventional longitudinal reinforcement with	≤ 3	0.025	0.040	0.75
conforming transverse reinforcement	≥ 6	0.015	0.030	0.50
Conventional longitudinal reinforcement with non-	≤ 3	0.020	0.035	0.50
conforming transverse reinforcement	≥ 6	0.010	0.025	0.25
Diagonal reinforcement	N/A.	0.030	0.050	0.80
2. Coupling beams controlled by shear				
Longitudinal reinforcement and transverse reinforcement ¹	$\frac{V}{b_w d \sqrt{f'_c}}^2$			
Conventional longitudinal reinforcement with	≤ 3	0.018	0.030	0.60
conforming transverse reinforcement	≥ 6	0.012	0.020	0.30
Conventional longitudinal reinforcement with non-	≤ 3	0.012	0.025	0.40
conforming transverse reinforcement	≥ 6	0.008	0.014	0.20

1. Conventional longitudinal steel consists of top and bottom steel parallel to the longitudinal axis of the beam. The requirements for conforming transverse reinforcement are: 1) closed stirrups are to be provided over the entire length of the beam at spacing not exceeding $d/3$; and 2) the strength provided by the stirrups (V_s) should be at least three-fourths of the design shear.
2. V = the design shear force on the coupling beam in pounds, b_w = the web width of the beam, d = the effective depth of the beam, and f'_c = concrete compressive strength in psi.
3. Linear interpolation between values listed in the table is permitted.
4. For lightweight concrete, use 75 percent of tabulated values (see Section 9.5.2.2).

Tabel 3 Faktor daktilitas maksimum, faktor reduksi gempa maksimum, faktor tahanan lebih struktur dan faktor tahanan lebih total beberapa jenis sistem dan subsistem struktur gedung

Sistem dan subsistem struktur gedung	Urutan sistem pemikul beban gempa	μ_n	R_n Pers. (6)	f Pers. (39)
1. Sistem dinding penutup (Sistem struktur yang tidak memiliki rangka ruang pemikul beban gravitasi secara lengkap. Dinding penutup atau sistem bresing memikul hampir semua beban gravitasi. Beban lateral dipikul dinding geser atau rangka bresing).	1. Dinding geser beton bertulang	2.7	4.5	2.8
	2. Dinding penutup dengan rangka baja riang dan bresing tarik	1.8	2.8	2.2
	3. Rangka bresing di mana bresingnya memikul beban gravitasi			
	a. Baja	2.8	4.4	2.2
	b. Beton bertulang (tidak untuk Wilayah 5 & 6)	1.8	2.8	2.2
2. Sistem rangka gedung (Sistem struktur yang pada dasarnya memiliki rangka ruang pemikul beban gravitasi secara lengkap. Beban lateral dipikul dinding geser atau rangka bresing).	1. Rangka bresing eksentris baja (RBE)	4.3	7.0	2.8
	2. Dinding geser beton bertulang	3.3	5.5	2.8
	3. Rangka bresing biasa			
	a. Baja	3.6	5.6	2.2
	b. Beton bertulang (tidak untuk Wilayah 5 & 6)	3.6	5.6	2.2
	4. Rangka bresing konsentrik khusus			
	a. Baja	4.1	6.4	2.2
5. Dinding geser beton bertulang berangkai daktail	4.0	6.5	2.8	
3. Sistem rangka pemikul momen (Sistem struktur yang pada dasarnya memiliki rangka ruang pemikul beban gravitasi secara lengkap. Beban lateral dipikul rangka pemikul momen terutama melalui mekanisme lentur)	6. Dinding geser beton bertulang kantilever daktail penuh	3.6	6.0	2.8
	7. Dinding geser beton bertulang kantilever daktail parsial	3.3	5.5	2.8
	1. Rangka pemikul momen khusus (SRPMK)			
	a. Baja	5.2	8.5	2.8
4. Sistem ganda (Terdiri dari: 1) rangka ruang yang memikul seluruh beban gravitasi; 2) pemikul beban lateral berupa dinding geser atau rangka bresing dengan rangka pemikul momen. Rangka pemikul momen harus direncanakan secara terpisah mampu memikul sekurang-kurangnya 25% dari seluruh beban lateral; 3) kedua sistem harus direncanakan untuk memikul secara bersama-sama seluruh beban lateral dengan memperhatikan interaksi sistem ganda)	b. Beton bertulang	5.2	8.5	2.8
	2. Rangka pemikul momen menengah beton (SRPMM)	3.3	5.5	2.8
	3. Rangka pemikul momen biasa (SRPMB)			
	a. Baja	2.7	4.5	2.8
	b. Beton bertulang	2.1	3.5	2.8
	4. Rangka batang baja pemikul momen khusus (SRBPMK)	4.0	6.5	2.8
	1. Dinding geser			
	a. Beton bertulang dengan SRPMK beton bertulang	5.2	8.5	2.8
5. Sistem struktur gedung kolom kantilever. (Sistem struktur yang memanfaatkan kolom kantilever untuk memikul beban lateral)	b. Beton bertulang dengan SRPMB baja	2.6	4.2	2.8
	c. Beton bertulang dengan SRPMM beton bertulang	4.0	6.5	2.8
	2. RBE baja			
	a. Dengan SRPMK baja	5.2	8.5	2.8
	b. Dengan SRPMB baja	2.6	4.2	2.8
	3. Rangka bresing biasa			
	a. Baja dengan SRPMK baja	4.0	6.5	2.8
	b. Baja dengan SRPMB baja	2.6	4.2	2.8
	c. Beton bertulang dengan SRPMK beton bertulang (tidak untuk Wilayah 5 & 6)	4.0	6.5	2.8
	d. Beton bertulang dengan SRPMM beton bertulang (tidak untuk Wilayah 5 & 6)	2.6	4.2	2.8
	4. Rangka bresing konsentrik khusus			
	a. Baja dengan SRPMK baja	4.6	7.5	2.8
b. Baja dengan SRPMB baja	2.6	4.2	2.8	
6. Sistem interaksi dinding geser dengan rangka	Sistem struktur kolom kantilever	1.4	2.2	2
	Beton bertulang biasa (tidak untuk Wilayah 3, 4, 5 & 6)	3.4	5.5	2.8
7. Subsistem tunggal (Subsistem struktur bidang yang membentuk struktur gedung secara keseluruhan)	1. Rangka terbuka baja	5.2	8.5	2.8
	2. Rangka terbuka beton bertulang	5.2	8.5	2.8
	3. Rangka terbuka beton bertulang dengan balok beton pratekan (bergantung pada indeks baja tonil)	3.3	5.5	2.8
	4. Dinding geser beton bertulang berangkai daktail penuh	4.0	6.5	2.8
Sistem dan subsistem struktur gedung	Urutan sistem pemikul beban gempa	μ_n	R_n Pers. (6)	f Pers. (39)
	5. Dinding geser beton bertulang kantilever daktail parsial	3.3	5.5	2.8

Table 3-1 Values for Effective Mass Factor C_m ¹

No. of Stories	Concrete Moment Frame	Concrete Shear Wall	Concrete Pier-Spandrel	Steel Moment Frame	Steel Concentric Braced Frame	Steel Eccentric Braced Frame	Other
1-2	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3 or more	0.9	0.8	0.8	0.9	0.9	0.9	1.0

1. C_m shall be taken as 1.0 if the fundamental period, T , is greater than 1.0 second

Table 3-2 Values for Modification Factor C_0 ¹

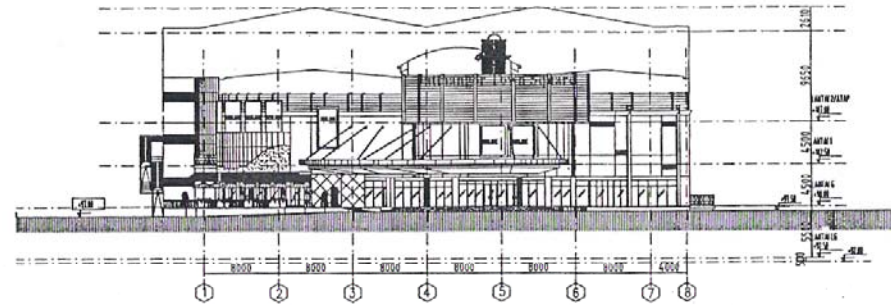
Number of Stories	Shear Buildings ²		Other Buildings
	Triangular Load Pattern (1.1, 1.2, 1.3)	Uniform Load Pattern (2.1)	Any Load Pattern
1	1.0	1.0	1.0
2	1.2	1.15	1.2
3	1.2	1.2	1.3
5	1.3	1.2	1.4
10+	1.3	1.2	1.5

- Linear interpolation should be used to calculate intermediate values
- Buildings in which, for all stories, interstory drift decreases with increasing height.

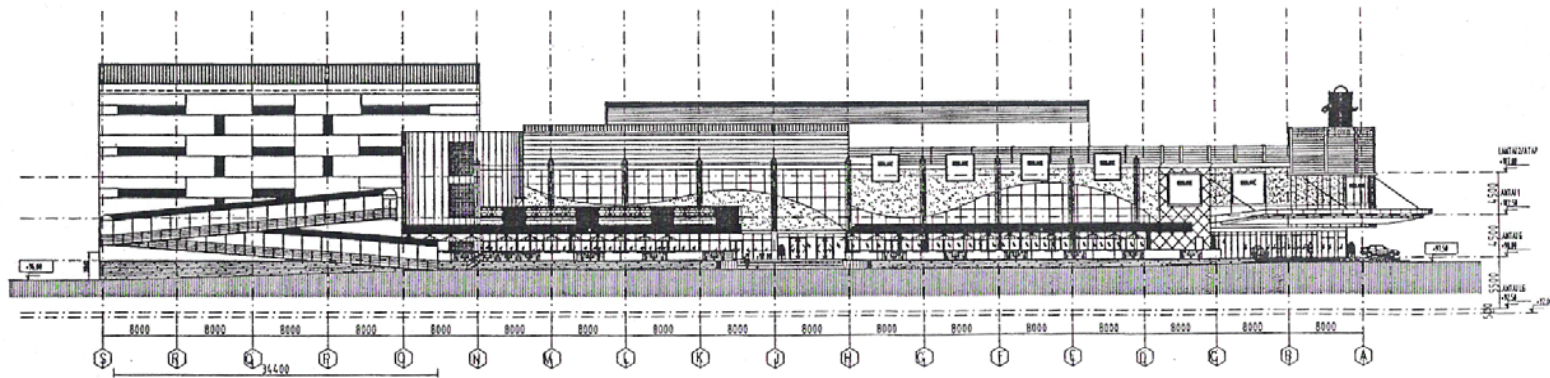
Table 3-3 Values for Modification Factor C_2

Structural Performance Level	$T \leq 0.1$ second ³		$T > T_s$ second ³	
	Framing Type 1 ¹	Framing Type 2 ²	Framing Type 1 ¹	Framing Type 2 ²
Immediate Occupancy	1.0	1.0	1.0	1.0
Life Safety	1.3	1.0	1.1	1.0
Collapse Prevention	1.5	1.0	1.2	1.0

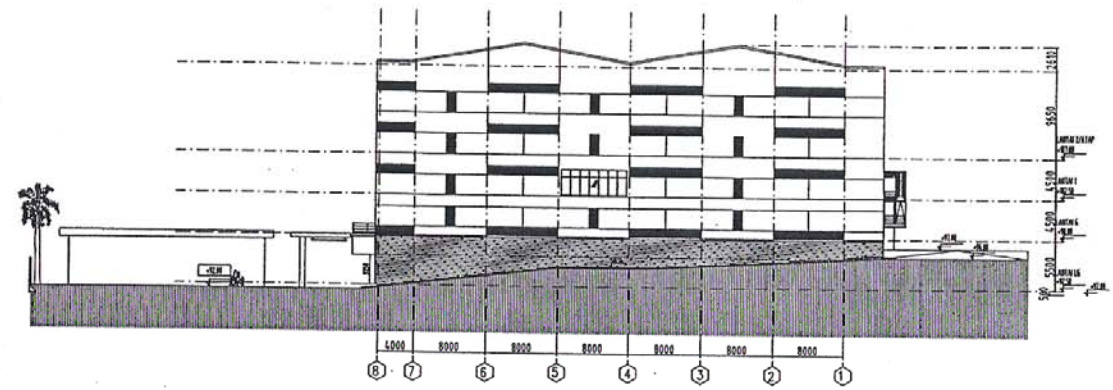
- Structures in which more than 30% of the story shear at any level is resisted by any combination of the following components, elements or frames; ordinary moment-resisting, concentrically-braced frames, frames with partially-restrained connections, tension-only braces, unreinforced masonry walls, shear-critical, piers and spandrels of reinforced concrete or masonry.
- All frames not assigned to Framing Type 1.
- Linear interpolation shall be used for intermediate values of T



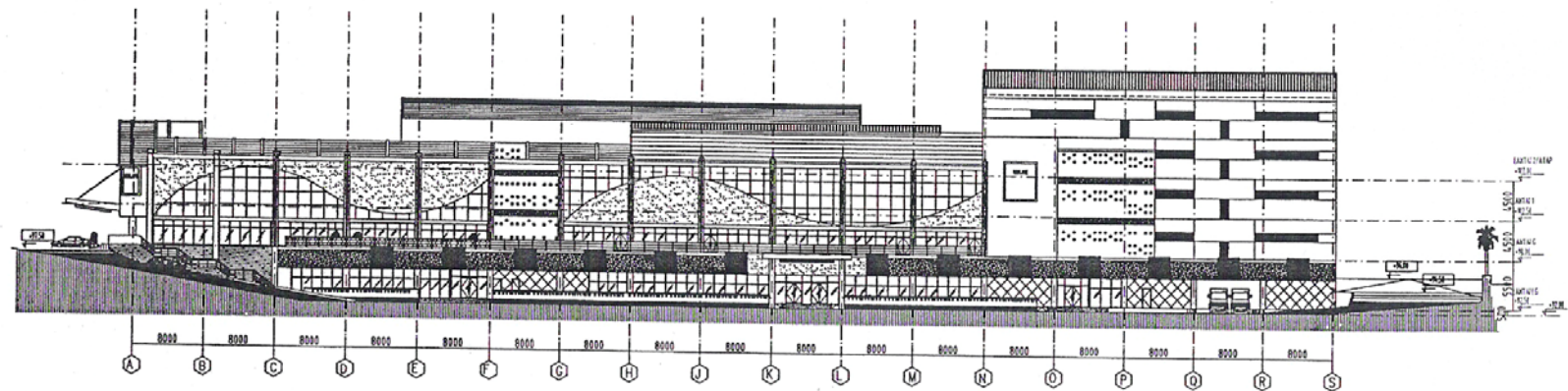
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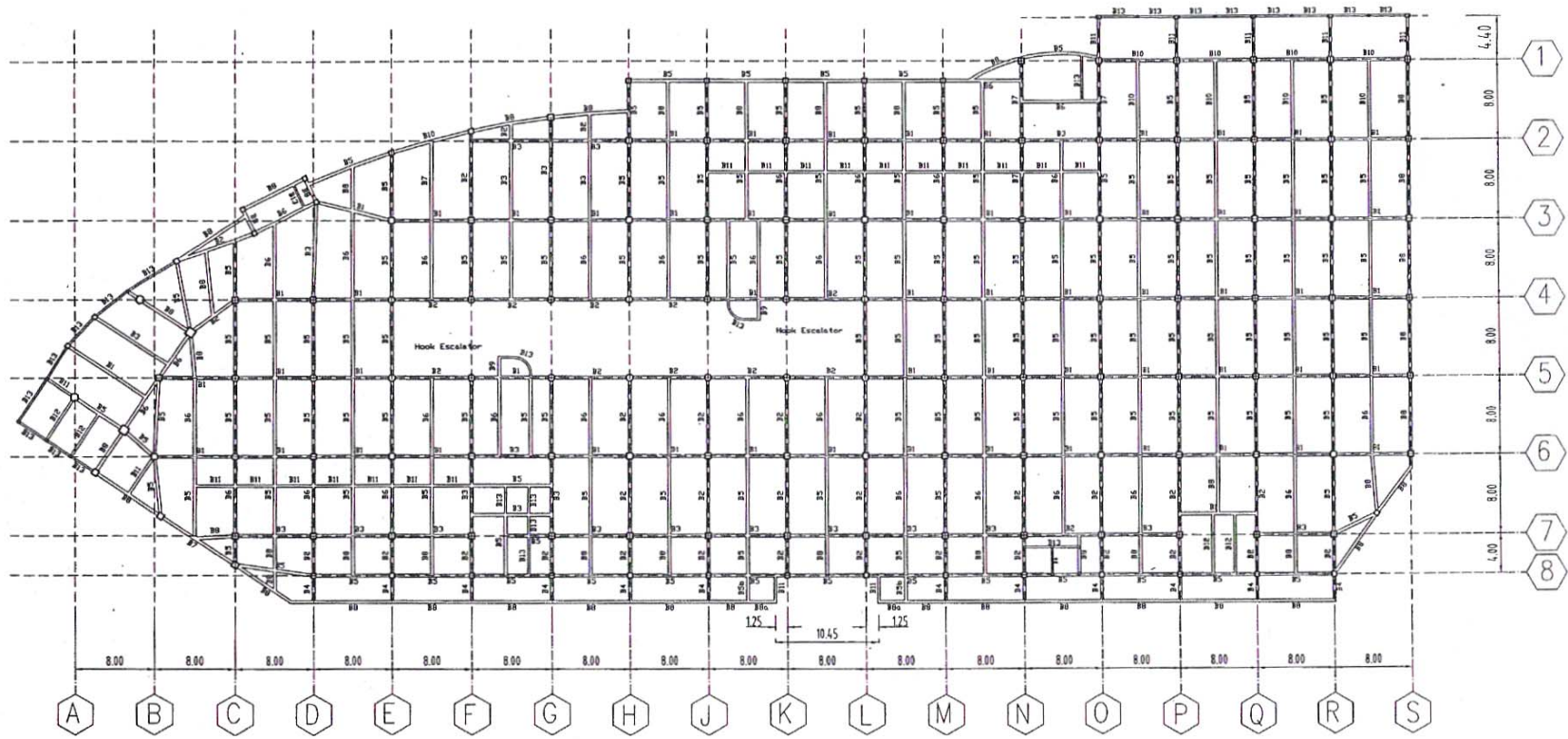
TAMPAK TIMUR



TAMPAK SELATAN



TAMPAK BARAT

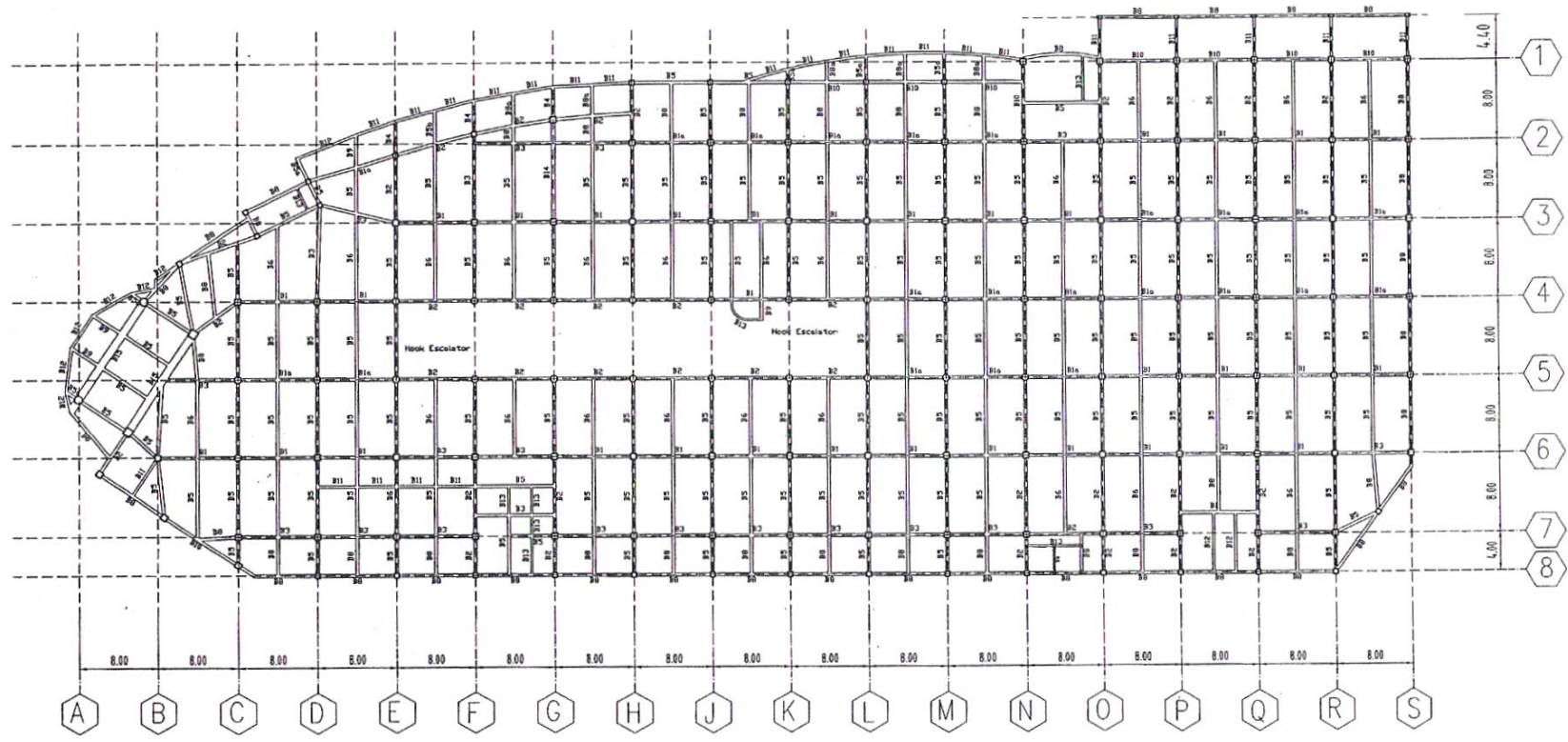


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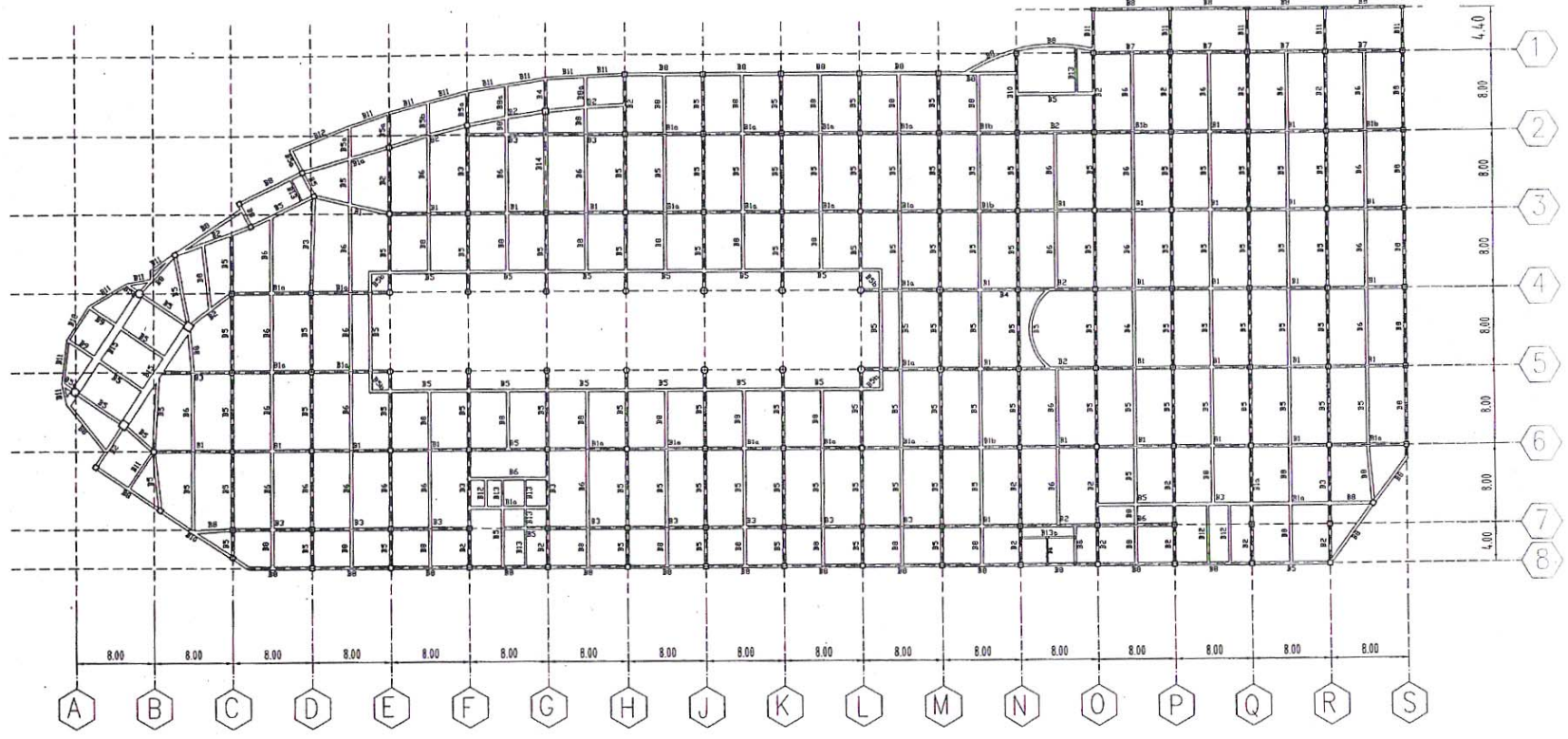


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DENAH TIPE DETAIL BALOK LT. G 
SKALA 1 : 250

Elevasi Struktur Level = +102.45

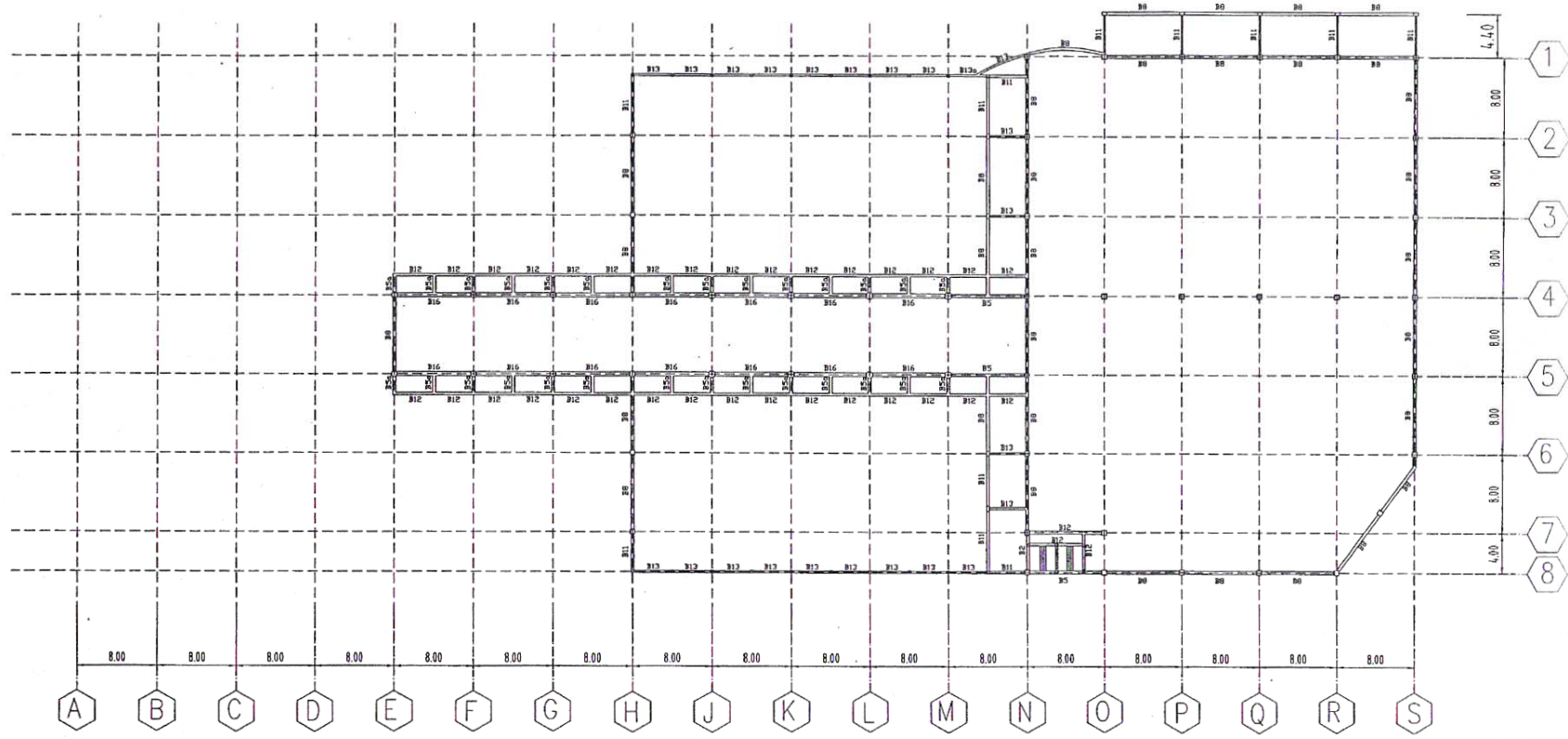


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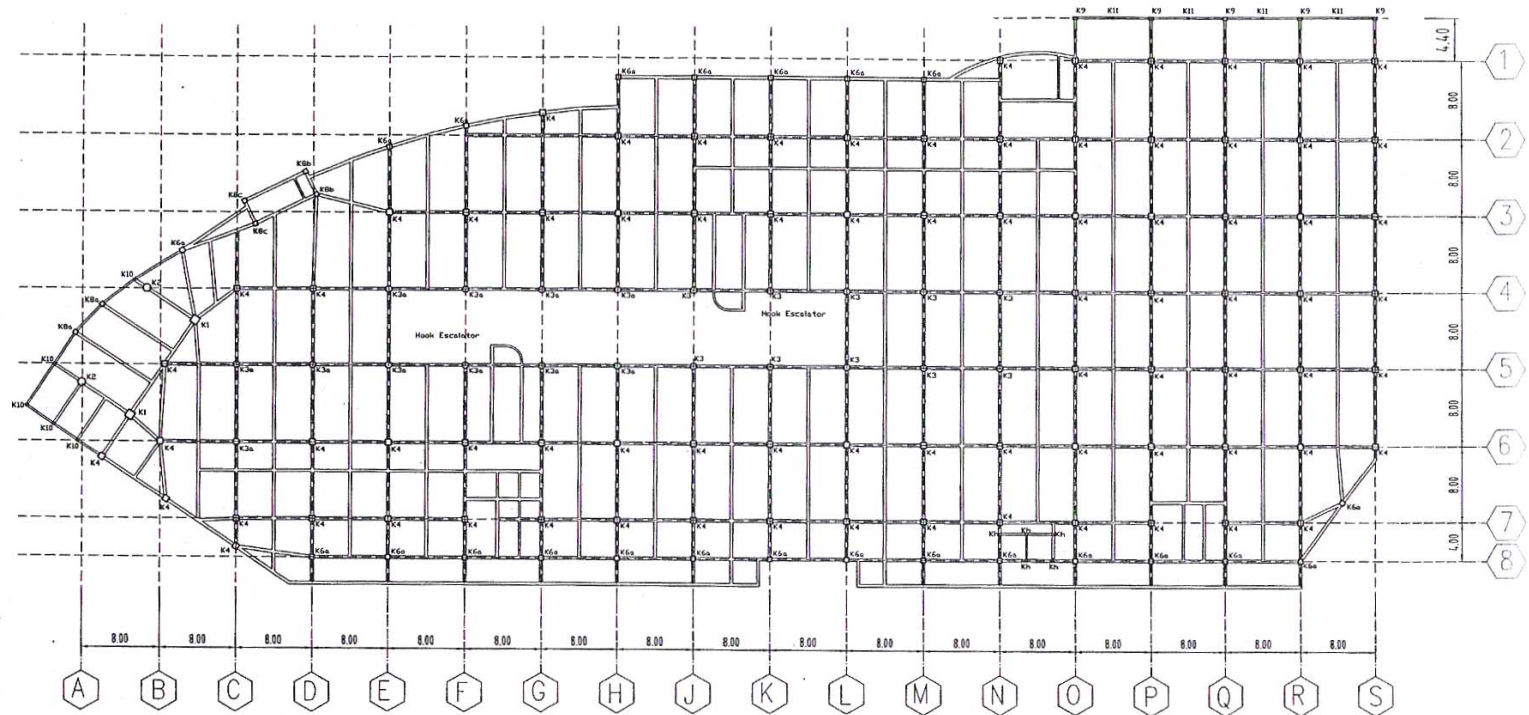
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Elevasi Struktur Level = +106.95



DENAH TIPE DETAIL BALOK LT. ATAP ○
SKALA 1: 250



Elevasi Struktur Level = +97.95

DENAH TIPE DETAIL KOLOM LTJUG
SKALA 1:250

Calatan :
Tulangan Sengkang Kolom = D10
Tumpuan = D10-100
Lapangan = D10-200

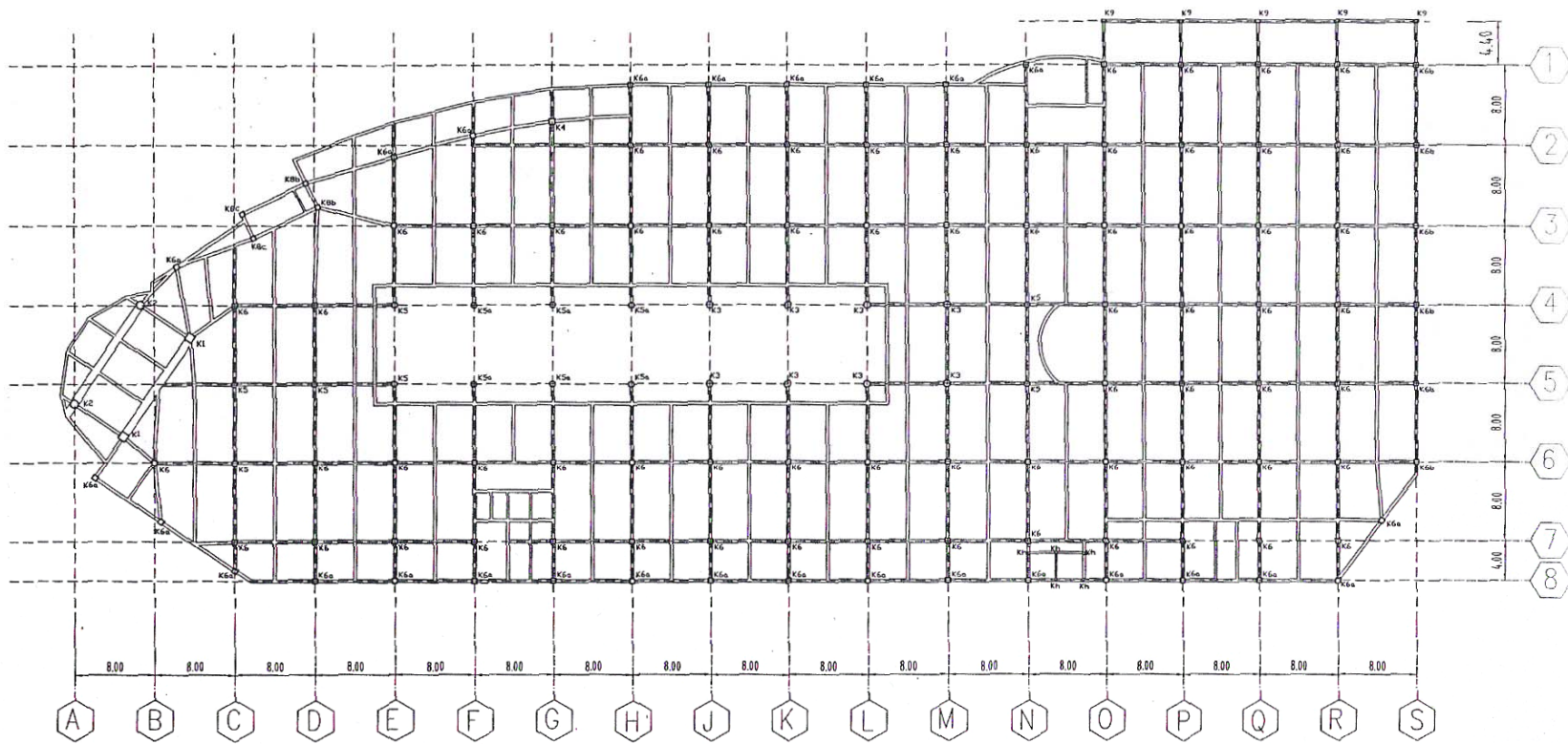


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DENAH TIPE DETAIL KOLOM LT. G 

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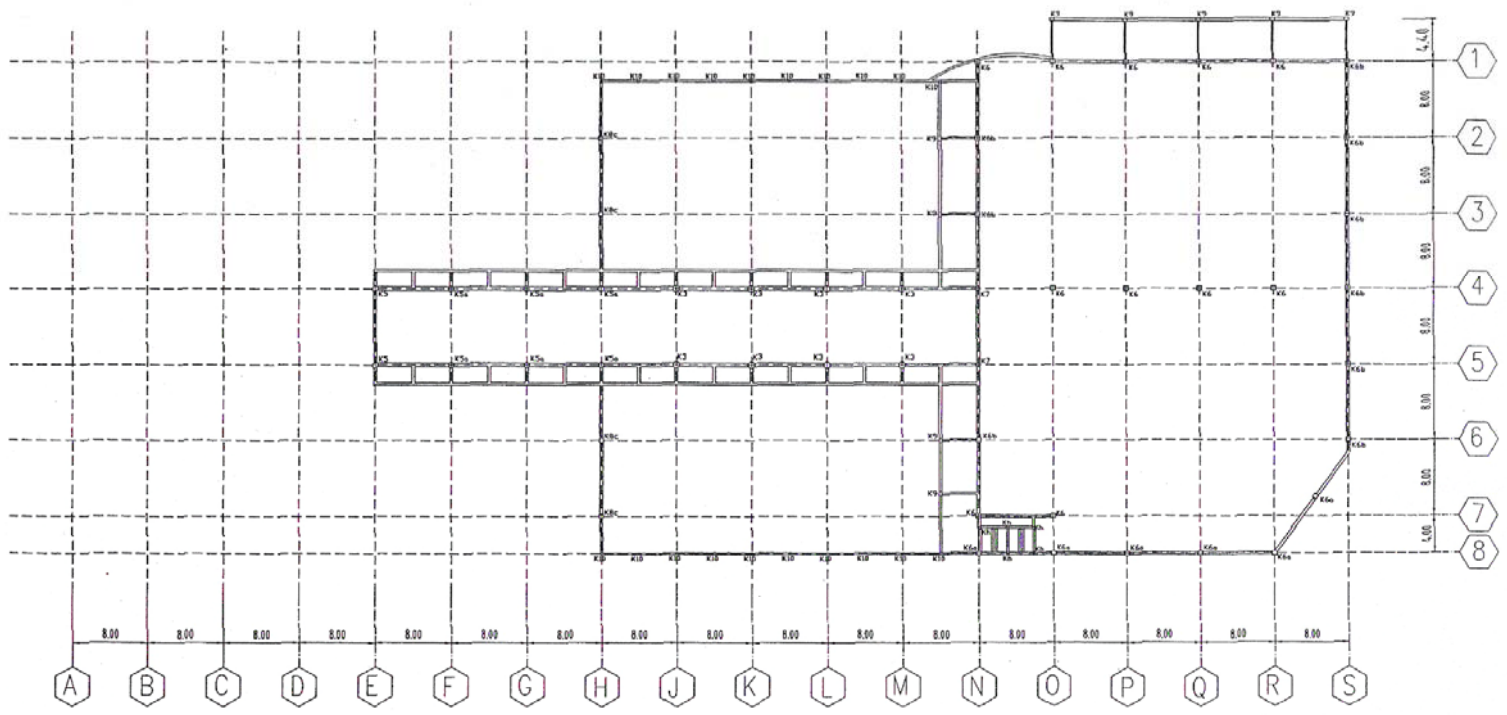
Catatan :
 Tulangan Sengkok Kolom = D10
 Tumpuan = D10-100
 Lapangan = D10-200



Elevasi Struktur Level = +106.95

DENAH TULANGAN KOLOM LT. 1
 SKALA 1 : 250

Catatan :
 Tulangan Senggang Kolom = D10
 Tumpuan = D10-100
 Lapangan = D10-200



DENAH TULANGAN KOLOM LT. ATAP
SKALA 1: 250

Catatan :
Tulangan Senggang Kolom = D10
Tumpuan = D10-100
Lapangan = D10-200

JUU

DETAIL BALOK B1, 30x60			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	7 D25	4 D25	7 D25
BOT REBAR	4 D25	7 D25	4 D25
STIRRUPS	D10-100	D10-100	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B2, 30x60			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	7 D25	3 D25	7 D25
BOT REBAR	4 D25	6 D25	4 D25
STIRRUPS	D10-100	D10-200	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B3, 30x60			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	7 D25	4 D25	7 D25
BOT REBAR	4 D25	7 D25	4 D25
STIRRUPS	D10-100	D10-100	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B5, 30x60			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	6 D25	2 D25	6 D25
BOT REBAR	3 D25	4 D25	3 D25
STIRRUPS	D10-100	D10-200	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B2, 30x60			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	6 D25	3 D25	6 D25
BOT REBAR	3 D25	5 D25	3 D25
STIRRUPS	D10-100	D10-200	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B4, 30x60			
TYPE	SUPPORT	MIDSPAN	RELEASE
SECTION			
TOP REBAR	6 D25	6 D25	6 D25
BOT REBAR	3 D25	3 D25	3 D25
STIRRUPS	D10-100	D10-100	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B4, 30x60			
TYPE	SUPPORT	MIDSPAN	RELEASE
SECTION			
TOP REBAR	7 D25	7 D25	5 D25
BOT REBAR	4 D25	4 D25	4 D25
STIRRUPS	D10-100	D10-100	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B5, 30x50			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	6 D22	2 D22	6 D22
BOT REBAR	3 D22	4 D22	3 D22
STIRRUPS	D10-100	D10-200	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B5, 30x50			
TYPE	SUPPORT	MIDSPAN	RELEASE
SECTION			
TOP REBAR	5 D22	3 D22	5 D22
BOT REBAR	3 D22	3 D22	3 D22
STIRRUPS	D10-100	D10-100	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B6, 30x50			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	5 D22	3 D22	5 D22
BOT REBAR	3 D22	3 D22	3 D22
STIRRUPS	D10-100	D10-100	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B6, 30x50			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	8 D22	3 D22	0 D22
BOT REBAR	4 D22	3 D22	4 D22
STIRRUPS	D10-100	D10-210	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B7, 30x50			
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)
SECTION			
TOP REBAR	6 D22	4 D22	6 D22
BOT REBAR	3 D22	7 D22	3 D22
STIRRUPS	D10-100	D10-200	D10-100
NSIDE_TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19

DETAIL BALOK B0, 20x50				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	6 D19	2 D19	6 D19	
BOT REBAR	3 D19	4 D19	3 D19	
STIRRUPS	D10-100	D10-200	D10-100	
NSIDE,TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19	

DETAIL BALOK B0a, 20x50				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	4 D19	4 D19	4 D19	
BOT REBAR	2 D19	2 D19	2 D19	
STIRRUPS	D10-100	D10-200	D10-100	
NSIDE,TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19	

DETAIL BALOK B0, 20x50				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	RELEASE
SECTION				
TOP REBAR	8 D22	8 D22	8 D22	
BOT REBAR	4 D22	4 D22	4 D22	
STIRRUPS	D10-100	D10-100	D10-100	
NSIDE,TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19	

DETAIL BALOK B10, 20x50				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	8 D22	3 D22	8 D22	
BOT REBAR	4 D22	6 D22	4 D22	
STIRRUPS	D10-100	D10-200	D10-100	
NSIDE,TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19	

DETAIL BALOK B11, 25x40				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	4 D19	2 D19	4 D19	
BOT REBAR	2 D19	2 D19	2 D19	
STIRRUPS	D10-100	D10-200	D10-100	

DETAIL BALOK B10, 25x40				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	5 D19	2 D19	5 D19	
BOT REBAR	3 D19	4 D19	3 D19	
STIRRUPS	D10-100	D10-200	D10-100	

DETAIL BALOK B13, 20x30				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	4 D16	2 D16	4 D16	
BOT REBAR	2 D16	3 D16	2 D16	
STIRRUPS	D10-100	D10-200	D10-100	

DETAIL BALOK B13a, 20x30				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	5 D16	3 D16	5 D16	
BOT REBAR	3 D16	5 D16	3 D16	
STIRRUPS	D10-100	D10-200	D10-100	

DETAIL BALOK B14, 40x60				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	6 D29	2 D29	6 D29	
BOT REBAR	2 D29	4 D29	2 D29	
STIRRUPS	D10-100	D10-200	D10-100	
NSIDE,TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19	

DETAIL BALOK B15, 80x40, L=12000				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	10 D29	4 D29	10 D29	
BOT REBAR	5 D29	8 D29	5 D29	
STIRRUPS	D10-100	D10-200	D10-100	
NSIDE,TORSI	2 D10, 0 D19	2 D10, 0 D19	2 D10, 0 D19	

Sengking tembakon
 Neryaku dg sengking utana
 Sapanjang 2x600x1200 mm dari tunggun

DETAIL BALOK B16, 40x40				
TYPE	SUPPORT (LEFT)	MIDSPAN	SUPPORT (RIGHT)	
SECTION				
TOP REBAR	5 D22	3 D22	5 D22	
BOT REBAR	3 D22	3 D22	3 D22	
STIRRUPS	D10-100	D10-200	D10-100	
NSIDE,TORSI	0 D22, 2 D22	0 D22, 4 D22	0 D22, 2 D22	

TYPE	DETAIL KOLOM K1, 80x80	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	12 D29	12 D29
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K2, C80	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	10 D29	10 D29
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K3, C70	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	10 D25	10 D25
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K3a, C70	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	8 D25	8 D25
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K4, 60x60	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	12 D22	12 D22
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K5, C60	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	9 D22	9 D22
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K5a, C60	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	8 D25	8 D25
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K6, 50x50	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	12 D19	12 D19
STIRRUPS	D10-100	D10-200

KOLOM TEPI AS 1 DAN 8		
TYPE	DETAIL KOLOM K6a, 50x50	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	10 D19	10 D19
STIRRUPS	D10-100	D10-200

KOLOM TEPI AS 3		
TYPE	DETAIL KOLOM K6b, 50x50	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	10 D19	10 D19
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K7, C50	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	6 D22	6 D22
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K8a, 45x45	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	12 D22	12 D22
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K8b, 45x45	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	12 D19	12 D19
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K8c, 45x45	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	6 D19	6 D19
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K9, 30x50	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	8 D16	8 D16
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K10, 25x25	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	4 D16	4 D16
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K11, 20x20	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	4 D13	4 D13
STIRRUPS	D10-100	D10-200

TYPE	DETAIL KOLOM K12, 20x30	
POSITION	SUPPORT	MIDSPAN
SECTION		
REBAR	6 D13	6 D13
STIRRUPS	D10-100	D10-200



DETAIL BEBAN MERATA LTUG

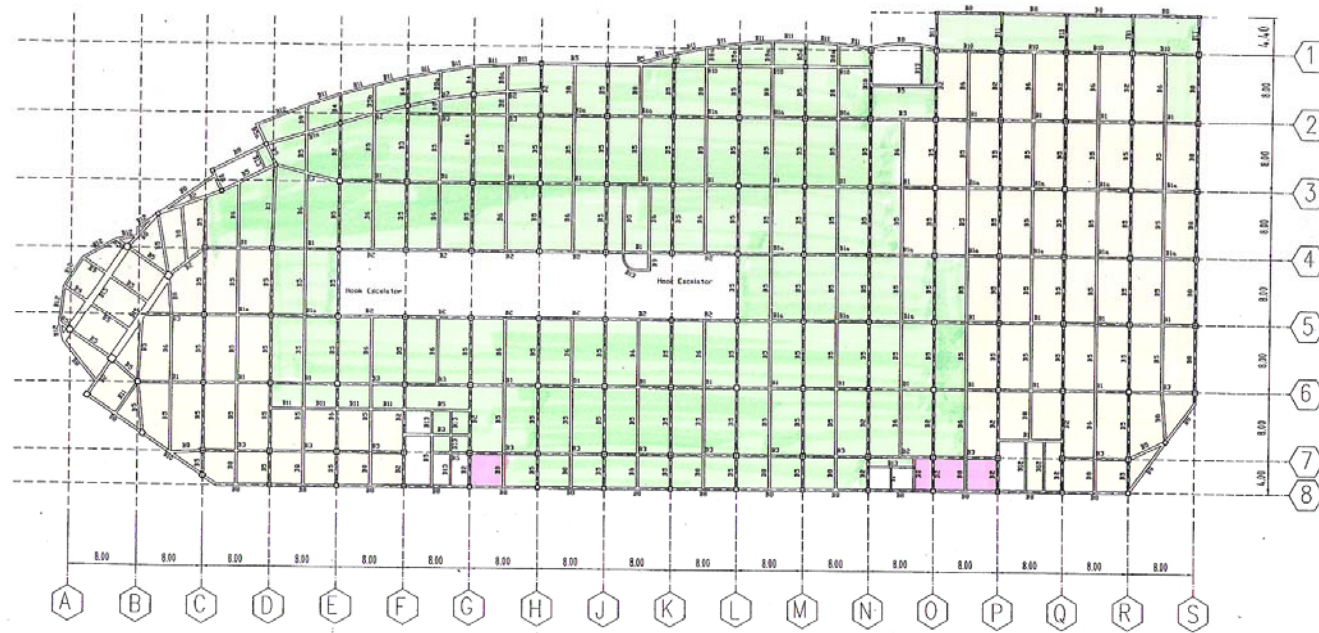
Elevasi Struktur Level = +97.95

Keterangan :

tebal pelat = 15 cm
 DL = 150 kg/m²
 LL = 300 kg/m²

tebal pelat = 15 cm
 DL = 150 kg/m²
 LL = 250 kg/m²

tebal pelat = 15 cm
 DL = 150 kg/m²
 LL = 300 kg/m²



DETAIL BEBAN MERATA LT. G

Elevasi Struktur Level = +102,45

Keterangan :

- tebal pelat = 15 cm
- DL = 150 kg/m²
- LL = 400 kg/m²
- tebal pelat = 15 cm
- DL = 150 kg/m²
- LL = 350 kg/m²

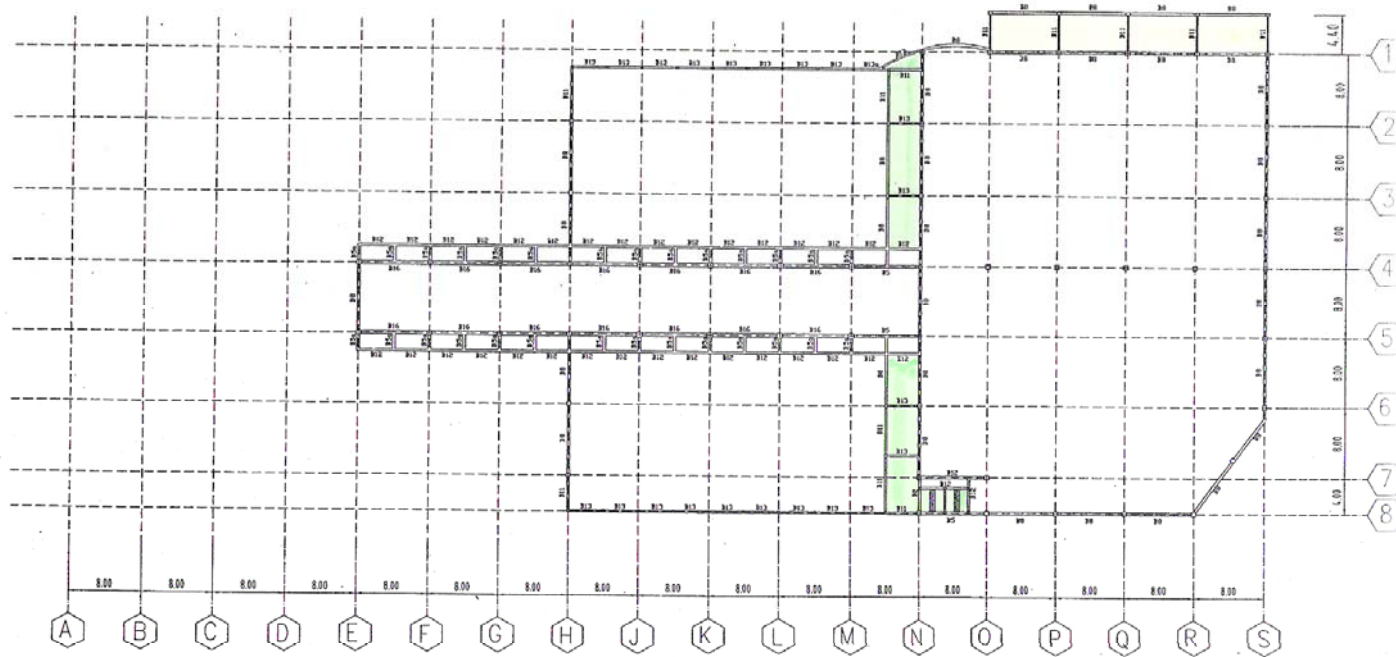
- tebal pelat = 15 cm
- DL = 150 kg/m²
- LL = 300 kg/m²



DETAIL BEBAN MERATA LT. 1

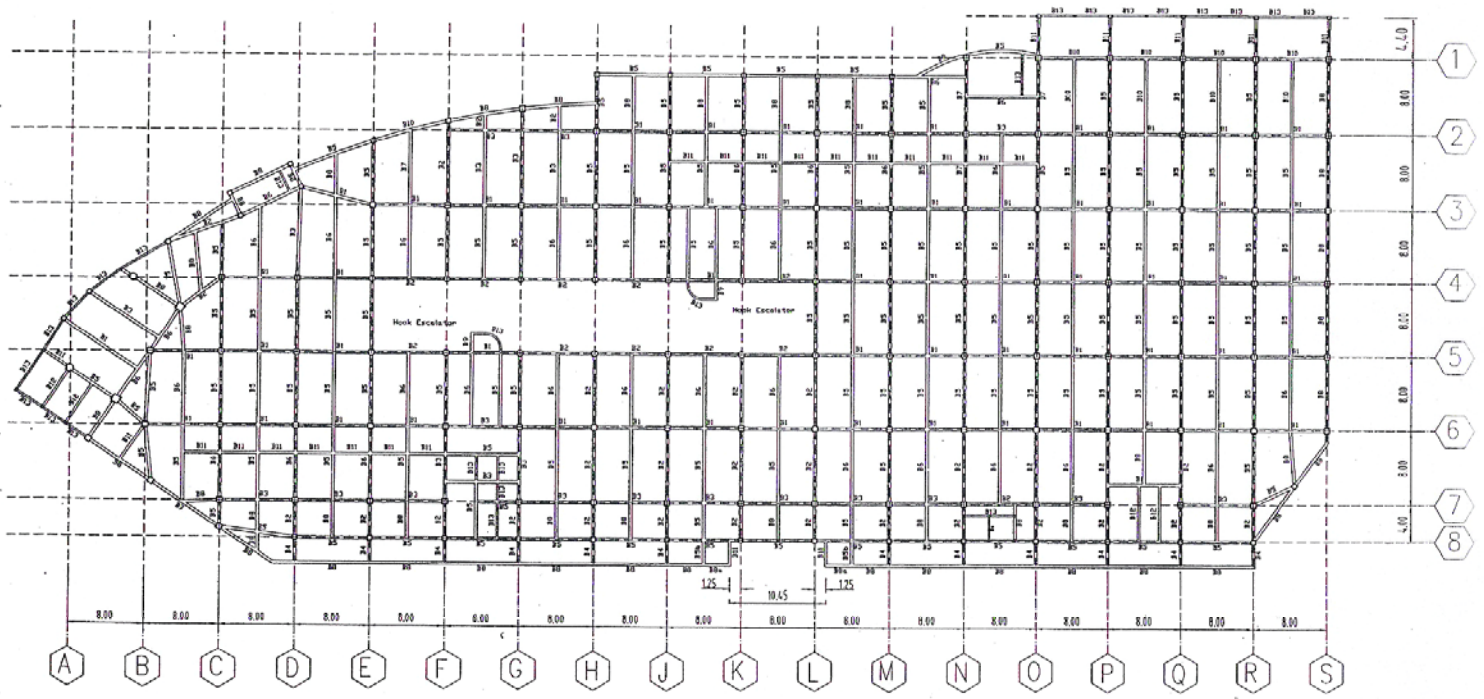
Elevasi Struktur Level = +106.95

- Penerangan :**
- tebal pelat = 15 cm
DL = 150 kg/m²
LL = 500 kg/m²
 - tebal pelat = 15 cm
DL = 150 kg/m²
LL = 350 kg/m²
 - tebal pelat = 15 cm
DL = 150 kg/m²
LL = 300 kg/m²



DETAIL BEBAN MERATA LT. ATAP

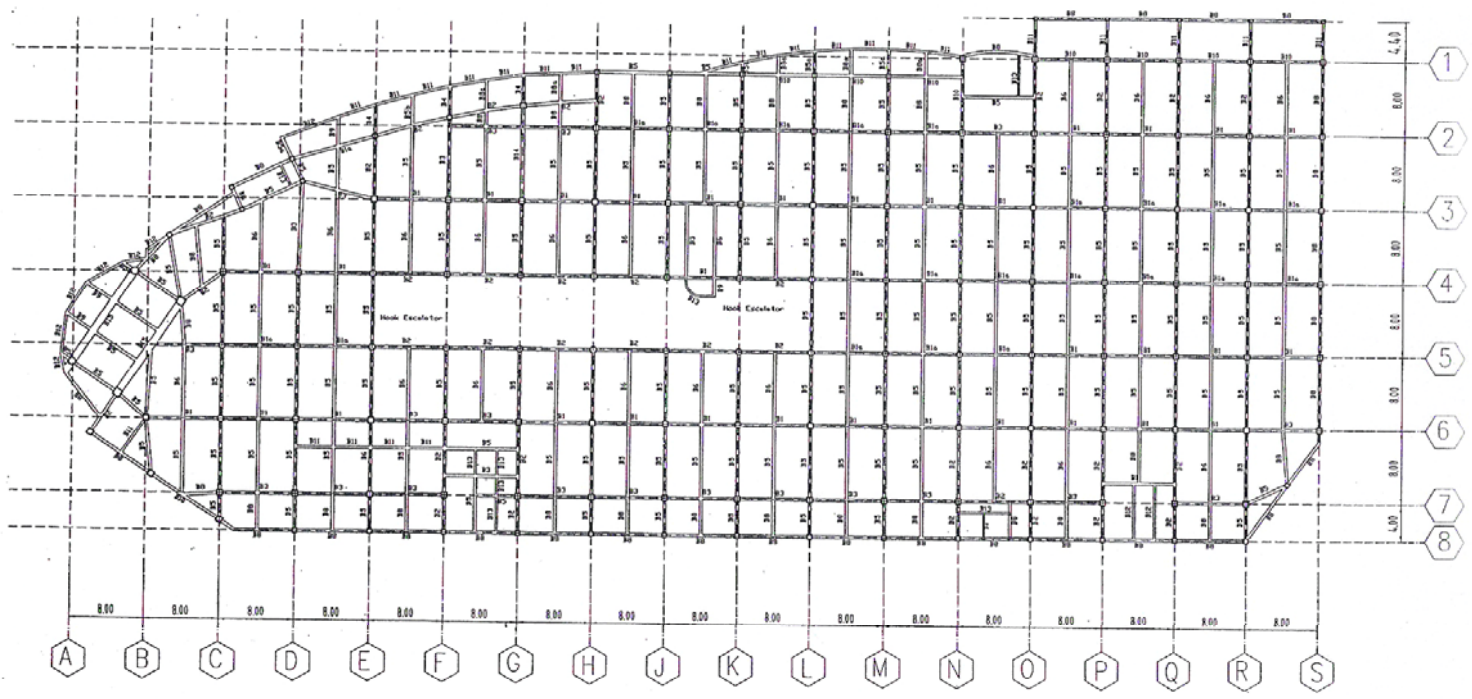
- eterangan :
- tebal pelat = 15 cm
DL = 150 kg/m²
LL = 250 kg/m²
 - tebal pelat = 12 cm
DL = 150 kg/m²
LL = 250 kg/m²



DETAIL BEBAN TERPUSAT LT.UG

Elevasi Struktur Level = +97.95

*keterangan :
tidak ada beban terpusat*



DETAIL BEBAN TERPUSAT LT. G

○ Elevasi Struktur Level = +102.45

Keterangan :
tidak ada beban terpusat



DETAIL BEBAN TERPUSAT LT. 1

Elevasi Struktur Level = +106,95

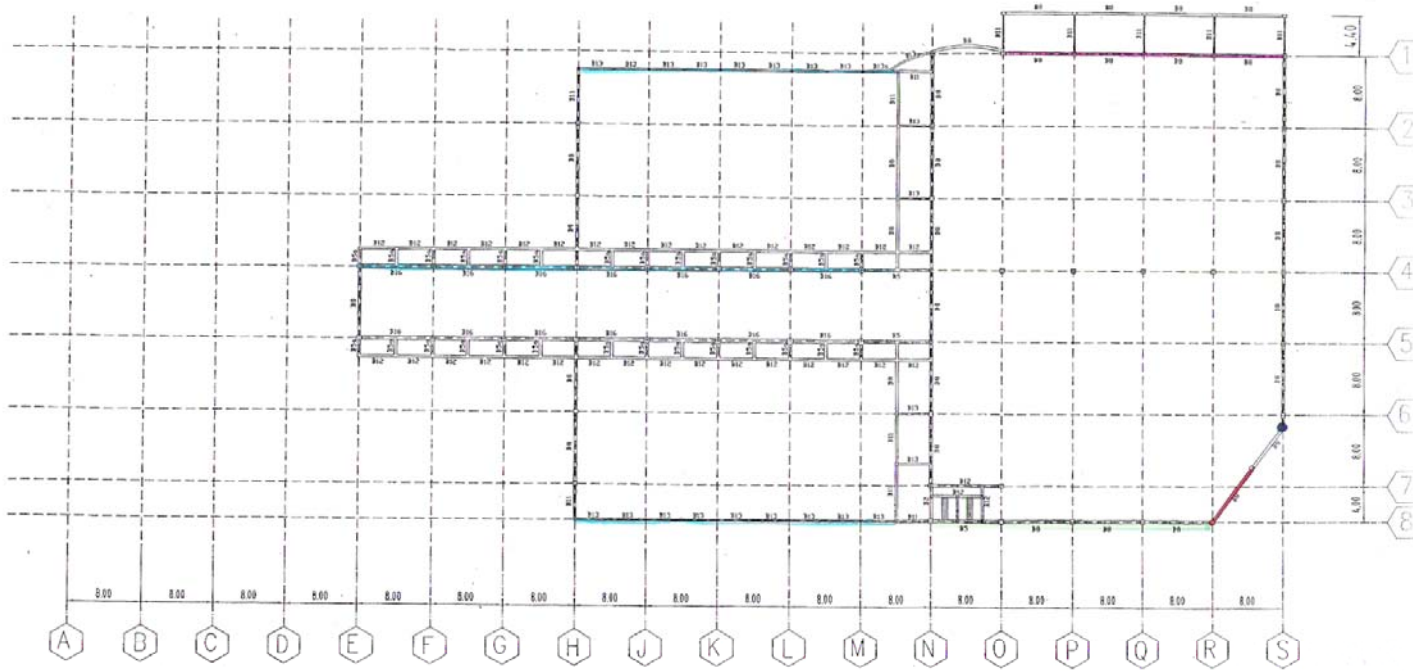
Keterangan :

DL = 6000 kg (5 titik)

DL = 3500 kg

DL = 2450 kg (4 titik)

DL = 4000 kg



DETAIL BEBAN TERPUSAT LT. ATAP

keterangan :

- DL = 7400 kg (8 titik)
- DL = 1395 kg (9 titik)
- DL = 3700 kg (8 titik)
- DL = 4000 kg (di tengah)
- DL = 4400 kg (6 titik)
- DL = 3700 kg