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PLANNING AND ANALYSIS YOGYA TEGAL TOSERBA STRUCTURE

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ABSTRACT

The strategic geographical location of Tegal City supports the development of business and services. YOGYA Group is a Supermaket and Department Store company. In building construction there is a structural analysis that is used as a method or system to achieve development as planned.

The method used in this research is qualitative method. Literature method by collecting data, studying and identifying.Observation method by conducting a survey to the research location. Adhering to the guidelines of SNI 2847: 2013 (Requirements for structural concrete for buildings), SNI 1727: 2013 (Minimum load for building design and other structures), Guidelines for house planning and building loading (PPURG 1987) and SNI 1726: 2012 (earthquake resistance planning procedures for buildings and non-building structures).

This analysis obtained a result of dimension data and the number of beam reinforcement, column, plate and the number of pile needs for the YogyaTegal department store building.

Keyword : Analysis, Building, Concrete, SNI, Strategic

I. INTRODUCTION

1.1. BACKGROUND

Tegal city is a city located in the north of Central Java Province, with a total area of 39.5 km^2 and is divided into 4 districts and 27 villages that are directly adjacent to the sea. Lately, Tegal City has a fairly rapid development in the field of business and services. With the support of a very strategic Geografis location, the city that connects the district consisting of Brebes Regency, Pemalang Regency, not only that as the main driving force for economic activity in the city of Tegal.

Yogya Group is a modern Indonesian retail company. YOGYA Group is a retail company with Supermaket and Department Store formats. In building construction there is a structural analysis that is used as a way or system to achieve development as planned.

On the basis of criteria of safety and prime service, the loading planning process must be in accordance with SNI 1727 - 2013 and the structure planning of this building must refer to SNI - 2847-2013 reinforced concrete, which is the latest regulation adapted to the development of the latest material technology with reference to AISC, besides that in the calculation of earthquake engineering must also refer to SNI 1726 - 2012.

1.2. FOCUS OF THE PROBLEM

In this study focused on designing with concrete structures and analyzing the building of Yogya Tegal Department Store using reinforced concrete structures.

1.3. PROBLEM FORMULATION AND PROBLEM IDENFICATION

1.3.1. PROBLEM FORMULATION

1. How to design Yogya Tegal Toserba using concrete structures (SNI 2847: 2013)?
2. How to plan the dimensions of the plate, beam and column?
3. How to analyze using Etabs?
4. How to plan the foundation for the construction of the Yogya Tegal Department Store?

1.3.2. PROBLEM IDENFICATION

This problem identification is focused on designing and analyzing the building structure of Yogya Tegal Toserba using concrete structures with the help of Etabs application

1.4. PURPOSE AND OBJECTIVES

1.4.1. PURPOSE

The thesis proposal entitled " ANALYSIS STRUCTURE AND DESIGN YOGYA TEGAL TOSERBA " will explain building planning with concrete structures.

1.4.2. OBJECTIVES

1. To redesign Yogya Tegal Toserba by using a concrete structure.
2. To find out the details of dimensions, plates, beams, columns and foundations accordingly.
3. calculate the cost of the budget only in the building structure.

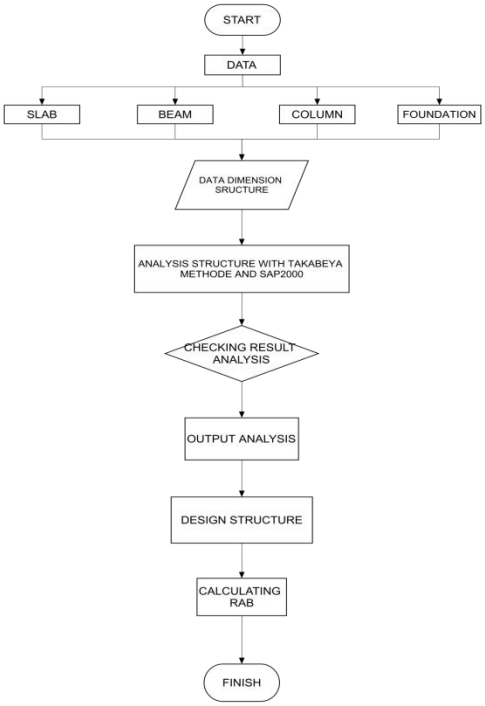
1.5. LIMITATION OF PROBLEM

In the thesis with the title " PLANNING AND ANALYSIS YOGYA TEGAL TOSERBA STRUCTURE" there is a writing limitation that aims for the preparation of the Thesis, the limitation of the problems raised as follows :

1. Only plan and design the construction of the Yogya Tegal Toserba building in accordance with SNI 2847: 2013 Reinforced concrete and SNI 1727: 2013 for loading.
2. Planning the plate, beam, column structure using reinforced concrete structures.
3. Don’t plan the structure of stairs and shear walls, or retaining walls.
4. Planning the Pile foundation
5. Don’t plan electrical installations, drainage, pavement.
6. Visualize through 2D drawing.
7. Calculate the Budget Plan (RAB) only on the structure.
8. Don’t calculate the budget for architectural and plumbing work.

9. Analyzing building structures using only the Etabs application.

1.6. FRAMEWORK



Picture 1. Formwork

1.7. RESEARCH LOCATION

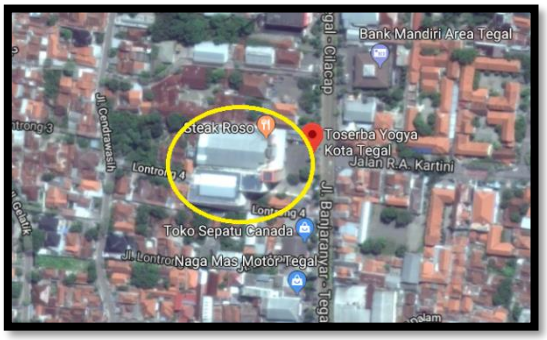


Figure 2. research location

II. THEORETICAL BASIS

2.1. THEORETICAL BASIS

2.1.1. Structure Analysis

Structural analysis is a process which is needed in a building construction, and bridges to determine the strength of the structure. Analysis can be done with the help of manual counts and application assistance such as SAP2000, ETABS and so on.

2.1.2. Basic Planning

Building analysis or building planning must have guidelines or regulations that apply in Indonesia, including :

1. Requirements for structural concrete for buildings (SNI 2847: 2013).
2. Minimum load for building design and other structures (SNI 1727: 2013).
3. Guidelines for planning the loading of houses and buildings (PPURG 1987).
4. Procedures for planning earthquake resistance for structures of buildings and non-buildings (SNI 1726: 2012).

2.1.3. Structure Planning

The Structure is an element which is united which is able to accept its own load or load received from outside, the criteria for good structure are :

1. Fire resistant
2. Sturdy or strong
3. Economic
4. Safe and comfortable

2.1.4. Classification of Loading

The loads received by the structure are:

a. Dead Load
b. Live Load
c. Earthquake Load
d. Wind Load
e. Load Combination

Structural elements must be planned to bear the worst possible load combination. The following are, the load combination that referes to load minimum :

1. 1,4D
2. 1,2D + 1,6L +0.5 (Lr atau Satau R)
3. 1,2D + 1,6 (Lr atau S atau R) + (L atau 0,5W)
4. 1,2D + 1,0W + L + 0.5 (Lr atau S atau R)
5. 1,2D + 1,0E + L + 0.2S
6. 0,9D + 1,0W
7. 0,9D + 1,0E

Where :

D =Dead Load
L = Live Load
R = Rain Load
W = Wind Load
E = Earthquake Load
Lr = Roof Load
S = Snow Load

2.1.5. Basic Planning of Reinforced Concrete Building Structures

The following is the basis for planning reinforced concrete structural elements according to SNI 2847-2013:

1. Plate Planning
   a. One-way Plate

If the Ly / Lx value> 2 then the plate is considered a one-way plate.

Table 4. Minimum thickness of non-prestressed beams or one-way plates if deflection is not calculated

structure component	Minimum Thick, h			
	Two pedestals Simple	one end continuous	second end continuous	Cantilever
	Components that don't hold or are not incorporated into partitions Or Other constructions that might be damaged by large deflections			
One-way massive plate	L/20	L/24	L/28	L/10
Beams / ribs one way	L/16	L/18,5	L/21	L/8

NOTE :
The inner span length (mm) of the given value must be used directly for structural components with normal concrete and reinforcement fy 240 Mpa. For other conditions, the above values must be modified as follows:
a. For lightweight concrete structures with equilibrium density, between 1440 and 1840 kg / cm3, the value must be multiplied by (1,65 - 0,003 wc) but not less than 1,09.
b. For fu other than 240 Mpa, the value is multiplied by (0.4 + fy/700).

* Source: Procedure for Planning Reinforced Concrete Structure of Buildings (SNI - 2847 - 2013).

b. Two-way Plate

If the Ly / Lx value is ≤ 2, then the plate is considered a two-way plate.

- Determine Plate Thickness (h)

$$h = \frac{Ln \cdot \left(0{,}8 + \frac{fy}{1400}\right)}{36 + 5 \cdot \frac{Ly}{Lx} \cdot \left[2 - 0{,}12 \cdot \left(1 + \frac{1}{\frac{Ly}{Lx}}\right)\right]}$$

In accordance with SNI – 2847 – 2013 concerning the rules for determining (h) the thickness of the plates as follows :
hmin roof plate (dak)= 90 mm
hmin pelat lantai = 125 mm
Keterangan :
h = Plate Thickness
ln = Clean span length
ly = Long span of direction y
lx = Long span of direction y

- Counting Moments that work in the X and Y directions

• $Ml_x^{(+)} = 0{,}001 \cdot Qu \cdot l_x^2 \cdot Clx$
• $Ml_y^{(+)} = 0{,}001 \cdot Qu \cdot l_x^2 \cdot Cly$
• $Mt_x^{(-)} = -0{,}001 \cdot Qu \cdot l_x^2 \cdot Ctx$
• $Mt_y^{(-)} = -0{,}001 \cdot Qu \cdot l_x^2 \cdot Cty$

Keterangan :
Ml_x = Momen of direction x
Ml_y = Momen of direction y
L_x = short span length

Clx = moment field direction coefficient x
Cly = moment field direction coefficient y
Ctx = moment support direction coefficient x
Cty = moment support direction coefficient x

- Calculate the As needed (area of reinforcement)

Mn = $\frac{Mu}{bd^2}$

ρ = $\frac{0.8fy - \sqrt{(0.8fy)^2 - 4(0.4704 \frac{fy^2}{f'c})(\frac{Mu}{bd^2})}}{2\ x\ (0.4704\ \frac{fy^2}{f'c})}$

ρ_{min} = $\frac{1}{fy}$

ρ_{maks} = 0,75 x $\rho_{balance}$

$\rho_{balance}$ = βi . $\left(\frac{0,85\ .\ fc}{fy}\right)\ x\ \left(\frac{600}{600+fy}\right)$

if fc' ≤ 30 Mpa then βi = 0,85
jika 30 ≤ fc' ≤ 55 then :

βi = 0,85 − $\frac{0,85\ .\ (fc-30)}{7}$

βi = 0,85 – 0,007 (fc' − 30)
if fc' > 55 Mpa then βi = 0,65
Terms :
jika $\rho_{min} \leq \rho \leq \rho_{maks}$ (then the value is taken ρ)
jika ρ > ρ_{min} (then the value is taken ρ)
jika ρ < ρ_{min} (then the value is taken ρ_{min})
jika ρ > ρ_{maks} (then the value is taken ρ_{maks})
So :
As perlu = ρ x b x d

- Calculate reinforcement distance :

The distance between reinforcement (s) = $\frac{\frac{\pi}{4} \text{x } d^2 \text{ x } b}{As}$

2. Beams
   - Calculate the effective height of the beam and width (b) the cross section concrete
     d = h – p – Ø stirrup – (1/2 Ø main reinforcement)
   - Calculate the latitude style of beam design
     U = 1,2 D + 1,6 L
   - Calculate the maximum beam design moment
     Mu = 1,2 M_{DL} + 1,6 M_{LL}
   - Determine the quality of concrete and reinforcing steel: :
     f'c ≤ 30MPa then β1=0,85Mpa
     f'c ≥ 30MPa then β1=0,65 Mpa
   - Determine the reinforcement and reinforcement ratio
     Mn = $\frac{Mu}{ø}$
     ϕ = 0,8
     Rn = $\frac{Mn}{bd^2}$ (b = beam width)

ρ = $\frac{0,85\ x\ fc'}{fy}\ x\ \left(1 - \sqrt{1 - \frac{2Rn}{0,85\ x\ fc'}}\right)$

ρ_{min} = $\frac{\sqrt{fc'}}{4\ .\ fy}$

ρ_{maks} = 0,75 x $\rho_{balance}$

$\rho_{balance}$ = βi . $\left(\frac{0,85\ .\ fc}{fy}\right)\ x\ \left(\frac{600}{600+fy}\right)$

if fc' ≤ 30 Mpa then βi = 0,85
if 30 ≤ fc' ≤ 55 then :

βi = 0,85 − $\frac{0,85\ .\ (fc-30)}{7}$

βi = 0,85 – 0,007 (fc' − 30)
if fc' > 55 Mpa then βi = 0,65
Terms :
if $\rho_{min} \leq \rho \leq \rho_{maks}$ (then the value is takenρ)
if ρ > ρ_{min} (then the value is taken ρ)
if ρ < ρ_{min} (then the value is taken ρ_{min})
if ρ > ρ_{maks} (then the value is taken ρ_{maks})
so :
As = ρ x b x d

Pililh tulangan dengan dasar As terpasang ≥ As diperlukan.

- Plan shear re

  Vc = ϕ $\left(\frac{1}{6}\sqrt{fc'}\right)$ $x\ b\ x\ d$

  ϕ = 0,6 (sliding reduction factor)

  Vu ≤ 0,5ϕVc (then there is no need for shear reinforcement)

  Vu > 0,5ϕVc (then a shear reinforcement is needed)

  Vs perlu = $\frac{Vu}{\phi} - Vc$

  Vn = Vc + Vs.

3. Column

Here, are the steps of planning the appropriate column SNI - 2847 - 2013:

- Calculate the necessary reinforcement area
  AS = ρ xbxh
- Calculating the amount of reinforcement used
  n = As / (π x D2 / 4)
- Calculating the wear reinforcement Size
  As = (nx π x D2) / 2
- Checking Pu of the load balanced
  OPN = 0.80 Ø (0.85 x fc 'x ab xb + As' x fs' - As x fy)
- Maximum nominal axial force
  ϕPn = 0.8 * ϕ * (0.85 * fc * (Ag-As) + (fy * As)).
- Planning reinforcement confinement \ SNI Section 21.6.4.4 Menyataka hoops that the total cross-sectional area of not less than one of the greatest of:

$$\text{Ash} = 0.3.\text{-}1\ \left(\frac{s.bc.fc\prime}{fyt}\right)\left(\frac{Ag}{Ach}\right)$$

And

$$Ash = \frac{0.09.s.bc.fc'}{fyt}$$

- Nominal shear strength

$$Vc = \frac{\sqrt{Fc'}\ x\ b\ x\ d}{6}$$

- Gayar shear reinforcement stirrup bear

$$jika\ \left(\frac{Vu}{\emptyset shear} - vc\right) \leq 0\ maka\ nilai\ vs = 0KN$$

$$jika\ \left(\frac{Vu}{\emptyset shear} - vc\right) \geq 0\ maka\ nilai\ vs = \left(\frac{Vu}{\emptyset shear} - vc\right)$$

- The maximum stirrup distance

  If the Smaks = d / 2 $Vs\ < \frac{Vc}{3}$

  If the Smaks = d / 4 $Vs\ > \frac{Vc}{3}$

- Calculate the area of reinforcement stirrups need

$$Av\ perlu = \frac{\frac{1}{3}\ b\ x\ s}{Fys}$$

- Calculate the area of reinforcement stirrup wear

  Av wear = nx 0.25πD2

Table 5. Thick concrete covers minimum, for reinforced concrete

type Concrete	Concrete Blanket Minimum Thickness (mm)
a) Cast concrete on top and always in touch with the ground.	75
b) Concrete weather-related: - D57 D19 rod hinggan - D16 wire rod M16 threaded or plain and smaller.	 50 40
c) Concrete that is not related to the weather or in connection with the land: - Reinforcement rods D44 and D57 - Reinforcement rods and a smaller D36.	 40 20
d) Beams, columns: Main reinforcement, binder, stirrups and spiral.	40
e) Components shell structure, spiral stirrups: - Reinforcement rods and larger D19 - D16 reinforcement rods, wire M16 threaded or plain, and smaller.	 20 13

* Source: Planning Procedures for Concrete Structures Building (SNI - 2847 to 2013).

4. Foundation

   In planning the foundation using piles of data to use the data sondir Tegal area Yogya Department Store project. Sondir necessary data is data and data qc JHL

III. METHODS RESEARCH

3.1. METHODS Research

3.1.1 Design The research

The research design begins with collecting data and literature related to planning. The data used in this study are as follows:

1. Existing data in the form of land area and building area and the function of the building to be planned.
2. Building image data of Yogya Tegal Toserba
3. Literature study by collecting references from books and the internet, which are intended as preparation for the thesis.
4. SNI - 2847 - 2013 (Structural concrete requrements for buildings)
5. SNI - 1726 - 2012 (Procedures for earthquake resistance planning for building structures and Non-buildings)
6. SNI - 1727 - 2013 (Minimum load for building design and other structures)
7. PPIURG 1987 (Guidelines for Loading Plans for Home and Building)

3.1.2 Research Methods Used

The research methods used are quantitative methods and qualitative methods, the explanation is as follows:

1. Quantitative method is a method which studies existing literature for the preparation of a thesis.
2. Qualitative method is a method that is carried out by collecting data from research objects for the preparation of a thesis.

3.1.3 Types of Data and Sources of Data

Types of data types and sources are as follows:

1. Primary Data

   In this study primary data collection is by conducting a field survey, on the object of research in Yogya Tegal Toserba Building.
2. Secondary Data

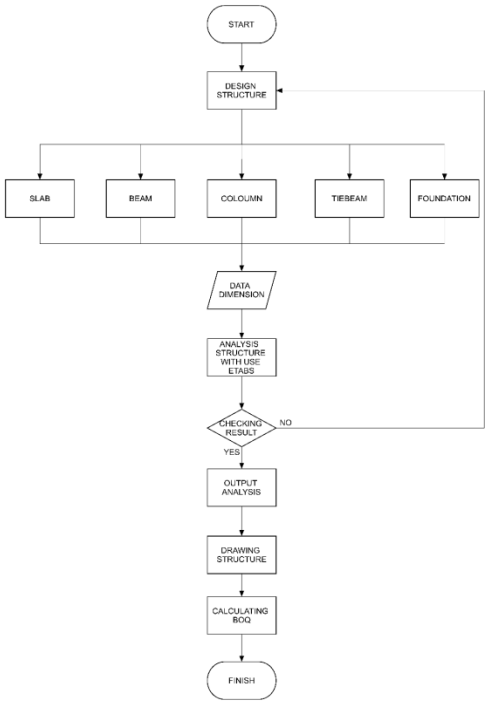
   Secondary data is data obtained from sources or references from books and the internet relating to building planning.

3.1.4 Data Collection Method

Data collection methods used are literature and methodology methods, the explanation is as follows

1. The literature methode
   The literature is a method carried out by collecting, studying, and identifying literature from books and the internet, which are related to building planning.
2. Metode Observation
   Observation method is a method obtained from the survey results directly to the location or object of research. With a survey to the location of the study, it can be known and obtained data from the planning of the building structure of Yogya Tegal Toserba.

3.2. THE THOUGHT METHODOLOGY



Picture 3. Flowchart Thought methodology

3.3. OBJECT OF RESEARCH

Yogya Tegal Toserba development project is located on the Tegal-Cilacap road or more precisely the AR HAKIM road.

Picture 4. Project location of building Yogya Tegal Toserba

IV. DISCUSSION AND RESULTS

4.1 PLANNING STRUCTURE

4.1.1 Building specifications

a. building functions :Mall
b. Building area :
c. Building height : 25m
d. elevation Building
   - Rooftop : + 22M
   - 4th floor : + 16m
   - 3rd floor : + 10m
   - 2nd Floor : + 5m
   - 1st floor : + 0m
   - Basement : - 3m

4.1.2 Material specifications

a. quality Concrete
   - Plate : K 300-350 kg / cm2, Fc '= 25-30 mpa
   - Beam : K 350-400 kg / cm^2, Fc '= 30-35 mpa
   - Column : K 350-400 kg / cm^2, Fc '= 30-35 mpa
   - Foundation : K 350 kg / cm^2, Fc '= 30 mpa

b. Quality Steel in Concrete
   - Plate type 1: ⦰12-13, fy = 240 mpa
   - Beam : D14-22, fy = 400 mpa
     : ⦰8-16, fy = 310mpa
   - Column : D14-22, fy = 400 mpa
     : ⦰8-16, fy = 310mpa
   - Foundation : D16, fy = 400 mpa

4.2.3. Planning Dimensions

a. Plate

Table 6. Dimensional structure plan for

Plate	Thickness	
plates Roofs	125 mm	
Floor plates	150 mm	140 mm

b. Beams and Columns

Table 7. Dimensional structure plan for floor beams 1-4

floor	Type of Beam	Dimensions	
		b (mm)	h (mm)
-Fourth First Floor	B1	600	750
	B2	500	700
	B3	550	750
	B4	550	650
	BA1	350	450
	BA2	400	500

Table 8. Dimensional floor plan structure for the roof beams

floor	Type of Beam	Dimensions	
		b (mm)	h (mm)
Roof Floor	B1	400	500
	BA1	200	350

Table 9. Dimensional structure plan for column

floor	Elevation	name	Dimension	
			b (mm)	h (mm)
Roof-fourth Floor	+ 22m to + 16m	K1	400	400
		K2	550	550
Fourth-Third Floor	+ 16m to + 10m	K1	550	550
		K2	600	600
		K3	650	650
Third-Second floor	+ 10m to 5m	K1	550	550
		K2	600	600
		K3	650	650
Second-First Floor	+ 5m to + 0m	K1	550	550
		K2	600	600
		K3	650	650
First-Basement Floor	+ 0m to -3m	K1	600	600
		K2	650	650
		K3	700	700

4.2. PLANNING STRUCTURE PLAN

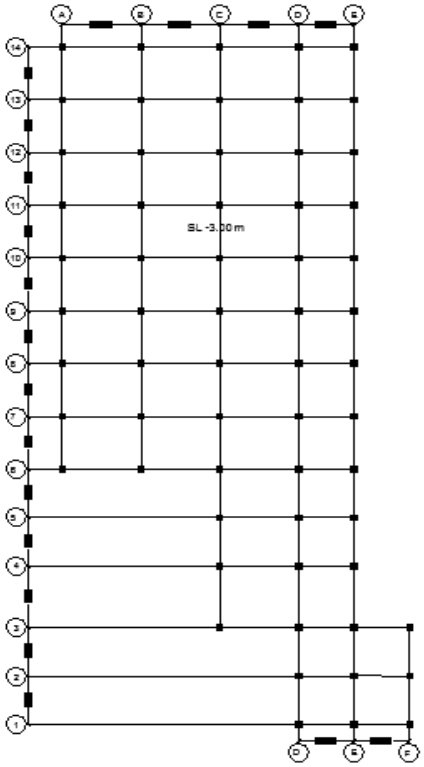


Figure 5. Plan building looks on

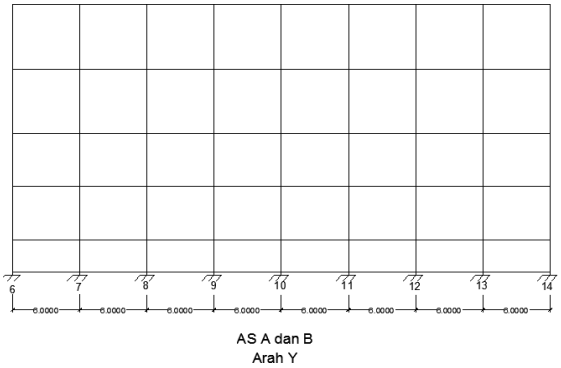


Figure 6. As Plan As A and B direction Y

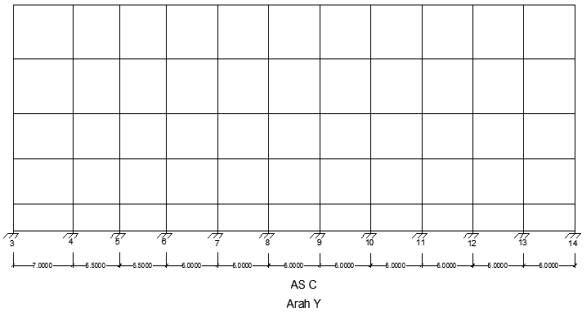


Figure 7. As Plan C direction Y

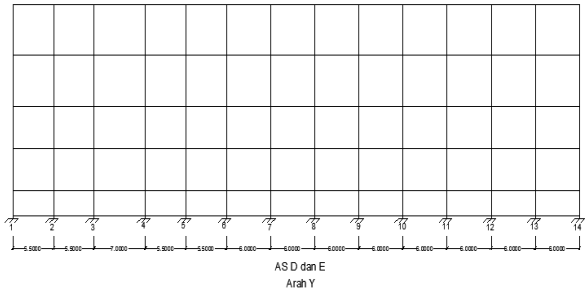


Figure 8. As the US Plan D and E directions Y

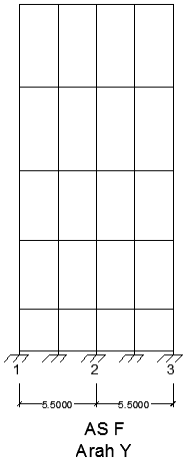


Figure 9. As Plan F direction Y

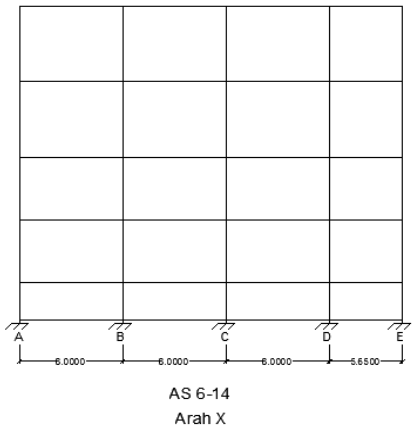


Figure 10. As Plan 6-14 x direction

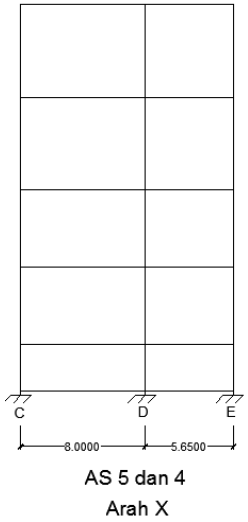


Figure 11. As Plan 5-4 x direction

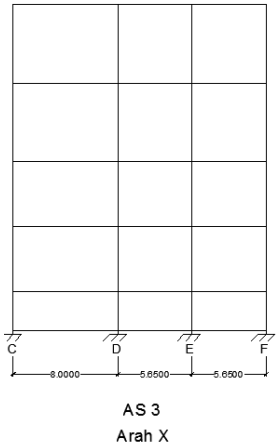


Figure 12. Plan As 3 directions x

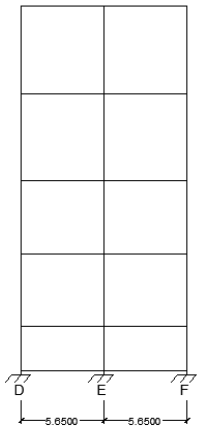


Figure 13. As sketch 1-2 directions x

V. CONCLUSION

From the results of Tegal Yogya Department Store Building planning using concrete structure is obtained dimensions of each work its structure. Such as beams, columns, plates, and tiebeam. For the calculation of the initial dimensional search using the ISO 2847-2013 with the help of ETABS, and his pembebenan using ISO 1727-2013, ISO 1726-2012, and PPIURG 1987.

For the results of the planning and reinforcement plates obtained its dimensions are:

Table 10. Dimensional structure plan for the roof slab plate

Type Plates	Dimensions (mm)		Thickness (mm)	pedestal		Field	
	Lx	Ly		directions x	directions Y	directions x	directio Y
A	3000	4000	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 – 1
B	2825	3000	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 – 1
C	2750	4000	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 – 1
D	2750	2825	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 – 1
E	3500	4000	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 – 1
F	2825	3500	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 – 1

Table 11. Dimensional structure plan for floor slab

Type Plates	Dimensions (mm)		Thickness (mm)	pedestal		Field	
	Lx	Ly		directions x	directions Y	directions x	directi Y
A	3000	4000	135	∅ 13 – 150	∅ 13 – 150	∅ 13 – 150	∅ 13 –
B	2825	3000	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 –
C	2750	4000	135	∅ 13 – 200	∅ 13 – 200	∅ 13 – 200	∅ 13 –
D	2750	2825	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 –
E	3500	4000	135	∅ 13 – 150	∅ 13 – 150	∅ 13 – 150	∅ 13 –
F	2825	3500	125	∅ 12 – 150	∅ 12 – 150	∅ 12 – 150	∅ 12 –

For the results of the planning and reinforcement beams obtained its dimensions are:

Table 12. Dimensional structure plan for beam support area

floor	name	Dimension (mm)		reinforcement		
		b	h	Support		begel
				Top	Bottom	
Beam Floor 1-4	B1	600	750	6D25	4D25	⦰16-350
				2D25	-	
	B2	500	700	7D25	5D25	⦰16-150
				2D25	-	
	B3	550	750	7D29	5D29	⦰16-150
				2D29	-	
	B4	550	650	7D29	4D29	⦰16-150
				-	-	
	BA1	350	450	4D16	2D16	⦰10-150
	BA2	400	500	6D19	3D19	⦰12-200
Floor Roof Beam	B1	400	500	4D22	4D22	⦰10-200
				2D22	-	
	BA1	200	350	4D16	3D16	⦰8-100

Table 13. Dimensional field beam structure plan for the area

floor	name	Dimension (mm)		reinforcement		
		b	h	field		begel
				Top	Bottom	
Beam Floor 1-4	B1	650	750	3D22	4D22	⦰16-350
	B2	500	700	3D22	3D22	⦰16-150
	B3	700	700	4D22	6D22	⦰16-150
	B4	550	650	4D22	4D22	⦰16-150
	BA1	350	450	2D16	4D16	⦰10-200
	BA2	350	450	2D19	3D19	⦰12-200
Floor Roof	B1	400	500	2D22	2D22	⦰10-200

Table 14. Dimensional field beam structure plan for the area

floor	Elevation	name	Dimension (mm)		reinforcement		
			b	h	Major	begel	Confinement
Floor roof - Fourth Floor	+ 22m to + 16m	K1	400	400	4D22	⦰16-150	
		K2	550	550	8D22	⦰16-200	2D16-100
Fourth Floor - Third Floor	+ 16m to + 10m	K1	550	550	8D22	⦰16-200	2D16-100
		K2	600	600	8D22	⦰16-250	2D16-125
		K3	650	650	10D22	⦰16-100	3D16-50
Third Floor - Second Floor	+ 10m to + 5m	K1	550	550	8D22	⦰16-200	2D16-100
		K2	600	600	8D22	⦰16-250	2D16-125
		K3	650	650	10D22	⦰16-100	3D16-50
Second Floor - First Floor	+ 5m to + 0m	K1	550	550	8D22	⦰16-200	2D16-100
		K2	600	600	8D22	⦰16-250	2D16-125
		K3	650	650	10D22	⦰16-100	3D16-50
First Floor - Basement Floor	+ 0m to - 3m	K1	600	600	8D22	⦰16-250	2D16-125
		K2	650	650	10D22	⦰16-200	3D16-100
		K3	700	700	12D22	⦰16-150	4D16-75

Store use sondir method with the data. For the results of planning the foundation found the number of poles at 1 pilecap namely:

Table 15. Dimensional field beam structure plan for the area

location	Number of TP per 1 pilecap
zone 1	2 poles
zone 2	5 poles
zone 3	6 poles

Table 16. Dimensional structure plan for Tiebeam support area

floor	Elevation	name	Dimension (mm)		reinforcement		
			b	h	Support		begel
					Top	Bottom	
floor BS	- 3 m	T1	300	400	7D22	4D22	⦰16-50

Table 17. Dimensional structure plan for Tiebeam support area

floor	Elevation	name	Dimension (mm)		reinforcement		
			b	h	field		begel
					Top	Bottom	
floor BS	- 3 m	T1	300	400	2D22	6D22	⦰16-50

For budget cost of the building structure Yogya Department Store Tegal, with a total building area is 8375.8 m2. With this budget in its square meter worth Rp.**17.077.790.226** Rp. 2.038.944,37

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