

BAB IV ANALISA RUANG & ANALISA EDGE

4.1. Building Data

Luas total bangunan sebesar 5.248 m². Bangunan ini memiliki 9 lantai keatas, dan 3 basement.

Building Data

Gross Internal Area Excluding Car Parking	<input type="text" value="5,248"/>	m ²
Floors Above Grade	<input type="text" value="9"/>	no.
Floors Below Grade	<input type="text" value="3"/>	no.
Floor-to-Floor Height	<input type="text" value="4.3"/>	m

- Food Court
Cellular Office

	Default	User Entry
Open Plan Office	2,185	<input type="text" value="2,799"/> m ²
Private/Closed Office	482	<input type="text" value="393"/> m ²
Corridors	251	<input type="text" value="999"/> m ²
Conference Rooms	298	<input type="text" value="185"/> m ²
Lobby	403	<input type="text" value="337"/> m ²
Bathrooms	141	<input type="text" value="180"/> m ²
M&E Rooms, Store **		<input type="text" value="232"/> m ²
Food Court	141	<input type="text" value="123"/> m ²
Gross Internal Area		5,248 m ²

Gambar 4. 1 building data
(Sumber : <https://app.edgebuildings.com>)

Dengan rincian ruang ruang sebagai berikut

Gross Internal Area		Lantai 1	
		Lobby	337 m2
Lantai 1	748	food court	123 m2
Lantai 2	660	fotocopy	32 m2
Lantai 3	660	minimarket	32 m2
Lantai 4	530	bathrooms	20
Lantai 5	530	koridor	123 m2
Lantai 6	530	ME	87 m2
Lantai 7	530	lantai 2	
lantai 8	530	mushola	84 m2
Lantai 9	530	conferennce room	377 m2
	5248	me	87 m2
		bathrooms	20 m2
		koridor	92 m2

Lantai 3	
mushola	48 m2
me	87 m2
bathrooms	20 m2
koridor	112 m2
privat office	393 m2
lantai 4-9	
koridor	112 m2
me	87 m2
bathrooms	20 m2
open plan	311 m2

Gambar 4. 2 building data

4.2. Building Orientation

Tapak menghadap jalan , yang berorientasi di Timur laut

Bangunan menghadap ke arah

- Utara
- Selatan
- Timur
- Barat
- Timur Laut

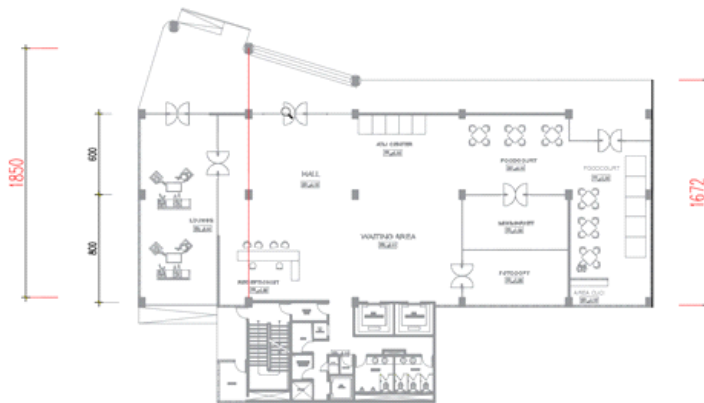
Setelah data tersebut satu persatu dimasukkan ke dalam *platform* EDGE didapatkan *saving energy terbesar* yaitu pada orientasi utara dan selatan. Berikut merupakan tabel hasil *saving energy* berdasarkan orientasi

ORIENTATION	
NORTH	1,63%
SOUTH	1,63%
NORTHEAST	- 0,35%
EAST	- 1,08%
WEST	- 1,08%

Gambar 4. 3 saving energy from building orientation

4.3. Building Depth

Perhitungan building depth pada bangunan ini ialah sebagai berikut



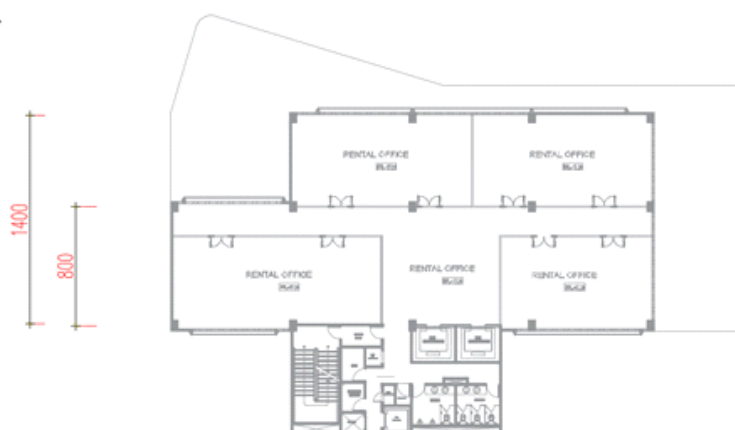
BD 1

$18,5 + 17 = 35,5 : 2 = 17,75 \text{ m}$ $17,75 \times 1 = 17,5$



BD 2

$18,5 + 14 = 32,5 : 2 = 16,25 \text{ m}$ $16,5 \times 2 = 33$



BD 3

$18,5 + 14 = 32,5 : 2 = 16,25 \text{ m}$ $16,25 \times 6 = 97,5$

BD RATA RATA

$148 : 9 = 16,44 \text{ M}$

Building Orientation

Floor Plan Depth*** m
 Main Orientation***

*** These parameters will be used to estimate building dimensions. If the exact details of the dimensions and orientation are available, then complete the User Entry fields in the Building Lengths section. The orientation of the building will have a direct effect on energy consumption.

Gambar 4. 4 building data
 (Sumber : <https://app.edgebuildings.com>)

Saving Energy yang di dapat setelah perhitungan *building depth* sebesar **8,81%**.

4.4. Dashboard Energy

1. WWR (*window to wall ratio*)



Utara

Glazing area : 379,6 m²
 Wall area : 987,6 m²
 Ratio : 38,44 %

Selatan

Glazing area : 263 m²
 Wall area : 1289 m²
 Ratio : 20,40 %



Timur Laut

Glazing area : 66 m²
 Wall area : 124 m²
 Ratio : 53,23 %

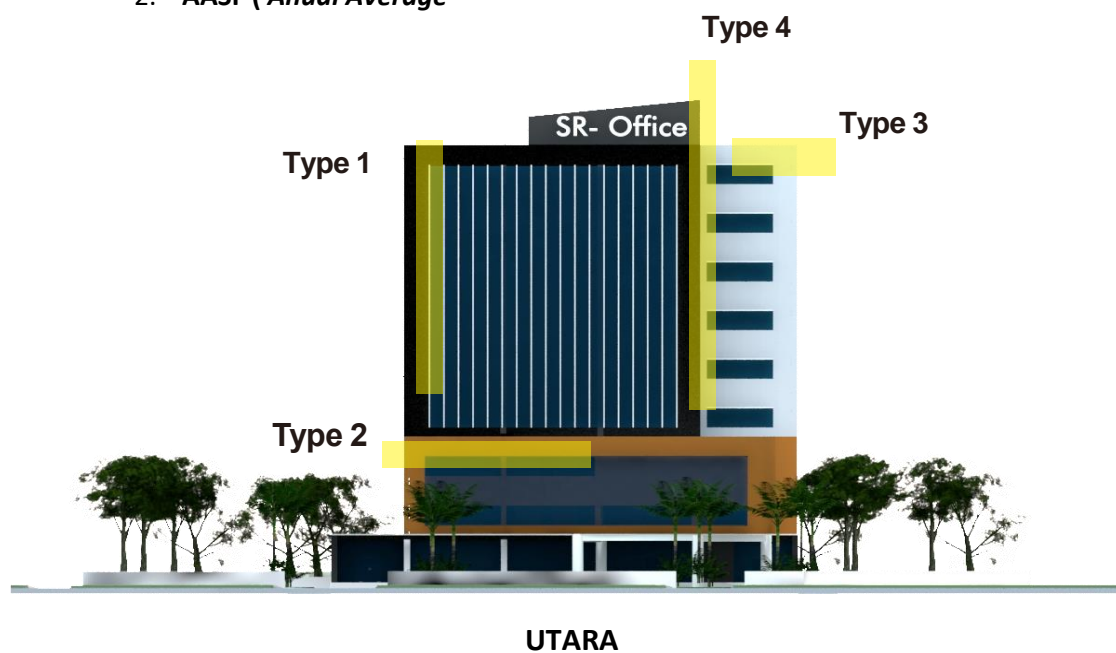
OFE01 - Reduced Window-to-Wall Ratio Calculator

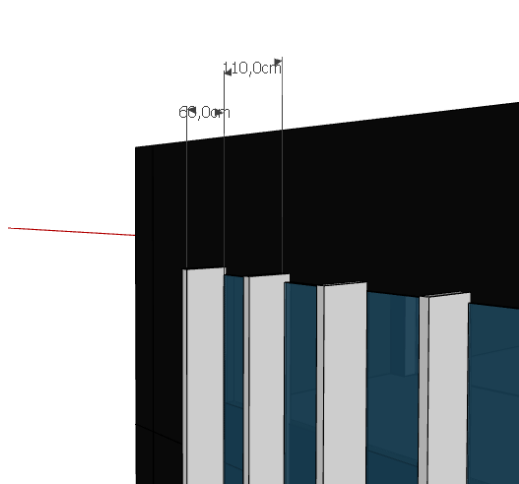
Orientation	Wall Area (m ²) Example: 120	Glazing Area (m ²) Example: 60	Ratio in %
North	987.60	379.60	38.44
South	1289.00	263.00	20.40
East	810.00	0.00	0.00
West	810.00	0.00	0.00
Northeast	124.00	66.00	53.23
Northwest	66.00	0.00	0.00
Southeast	0.00	0.00	
Southwest	0.00	0.00	
Total	4,086.60	708.60	
		WWR	17.34%

Gambar 4. 5 WWR
(Sumber :<https://app.edgebuildings.com>)

Kemudian hasil dari perhitungan WWR di setiap orientasi dikalkulasikan di dapatkan WWR sebesar 17,34 % . Dari perhitungan tersebut di dapatkan **saving energy** sebesar **26,15 %**.

2. AASF (*Anual Average*





Type 1

$60 : 110 = 0,54$



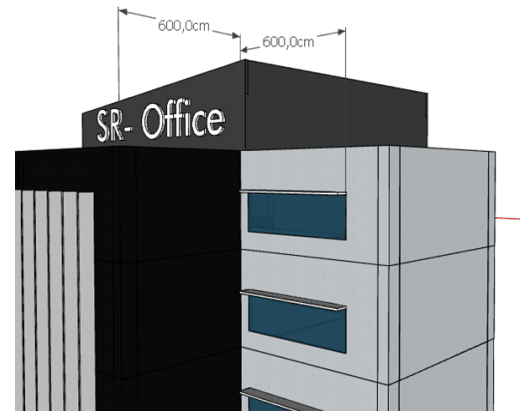
Type 2

$60 : 170 = 0,35$



Type 3

$60 : 170 = 0,35$



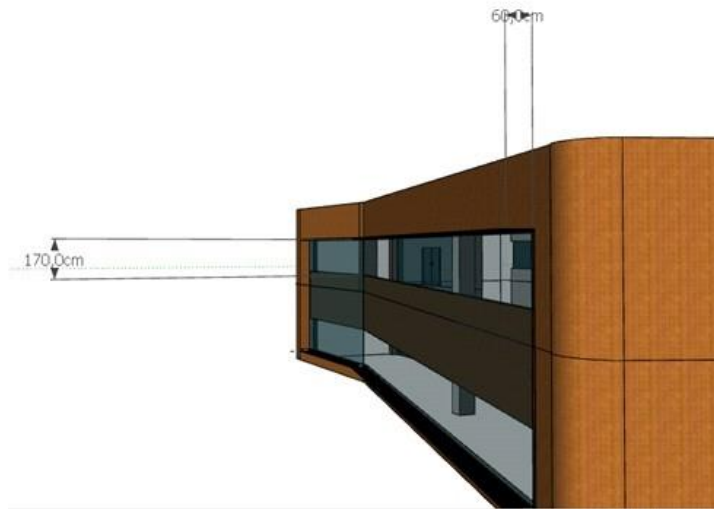
Type 4

$60 : 60 = 1$



Type 1

TIMUR LAUT

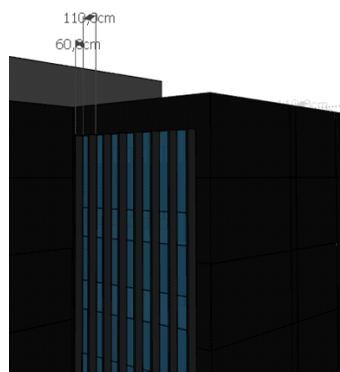


Type 1

$$60 : 170 = 0,35$$

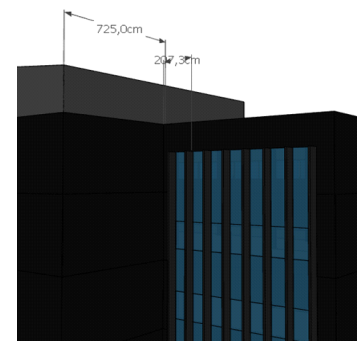


SELATAN



Type 1

$$60 : 110 = 0,54$$



Type 2

$$710 : 100 = 7$$

Window Type	Window Orientation	Window Area (m ²)	Overhang Type	Overhang Depth	AASF
Type 1	North	11.13	Horizontal Overhang	Dh=H/3 (window overhang depth=1/3 window height)	0.39
Type 2	North	1.7	Vertical Overhang	Dv=W/2 (window overhang depth=1/2 window width)	0.21
Type 3	North	9.2	Horizontal Overhang	Dh=H/3 (window overhang depth=1/3 window height)	0.39
Type 4	North	9.2	Vertical Overhang	Dv=W/1 (window overhang depth=window width)	0.23
Type 5	Northeast	35.3	Horizontal Overhang	Dh=H/3 (window overhang depth=1/3 window height)	0.34
Type 6	South	1.7	Vertical Overhang	Dv=W/2 (window overhang depth=1/2 window width)	0.22
Type 7	South	1.7	Vertical Overhang	Dv=W/1 (window overhang depth=window width)	0.23

Gambar 4.6 AASF
(Sumber :<https://app.edgebuildings.com>)

Kemudian hasil dari perhitungan AASF di setiap orientasi dikalkulasikan di dapatkan AASF sebesar 0,33 . Dari perhitungan tersebut di dapatkan **saving energy** sebesar **30,02 %**.

4.5. Dashboard Water



Gambar 4.7 Dashboard Water
(Sumber :<https://app.edgebuildings.com>)

Dari perhitungan tersebut di dapatkan **saving water** sebesar **26,7 %**.

Selanjutnya, yaitu perhitungan NLA office tersebut. Berikut merupakan tabel perhitungan NLA

Net Lettable Area	m ²	4.000
Asumsi jumlah pegawai =	Orang	334
Jam operasional	jam/hari	10

NLA sebesar 4000m², di dapatkan jumlah pegawai sebesar 334 orang dengan jam operasional 10 jam.

- Kebutuhan Kapasitas *Grey Water Tank*

GREY WATER TANK			
NO	SUMBER AIR DAUR ULANG	VOLUME (Liter)**)	
		Hari Hujan	Hari Kering
1	Keran Air	694	694
2	Wudhu	835	835
3	Shower	501	501
4	air kondensasi	173	173
	GREY WATER	2.203	2.203
	HUJAN	24.166	0
	total air daur ulang	26.370	2.203

Gambar 4.8 neraca air grey water tank

Dari tabel tersebut di dapatkan besar kapasitas *grey watertank* yaitu sebesar 26 m³, yang berasal dari air keran, air wudhu, shower, dan air kondensasi.

- Kebutuhan Kapasitas *Rain Water Tank*

RAIN WATER HARVESTING	
luas atap	1.630,00
curah hujan harian rata2	15,61
koefisien limpasan atap	0,95
RAIN WATER HARESTING	24.172,09

Gambar 4.9 neraca air rain water harvesting

Dari tabel tersebut di dapatkan besar kapasitas *rain watertank* yaitu sebesar 25 m³

- Kebutuhan Kapasitas *Grey water tank + rain water harvesting*

RAIN WATER + GREY WATER		50.541,59 L
Rainwater Harvesting		
Kapasitas tanki yang direncanakan	52000	Liter
Curah Hujan (I)	15,61	mm
Koefisien Limpasan (C)	0,95	
Luas atap (A)	1630	m ²
Volume penampungan ideal	50.541,59	Liter
Persentase kemampuan penampungan	103%	
LUAS TANKI YANG DIRENCANAKAN		52 m3

Gambar 4.10 Neraca air *Rain water harvesting*

- OFW06 Rainwater Harvesting System - 100% of Roof Area Used for Collection
 % of Roof Area Used
[Upload Document\(s\)](#)
- OFW07 Grey Water Treatment and Recycling System
[Upload Document\(s\)](#)

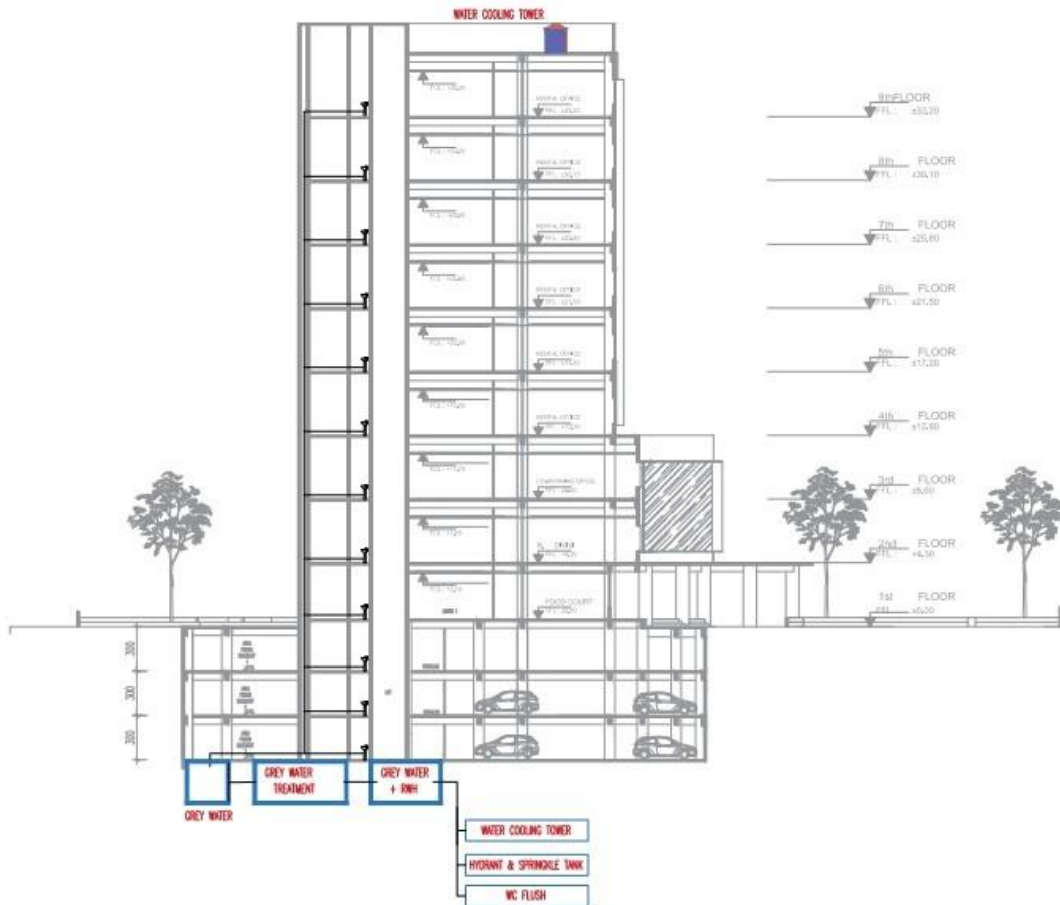
Gambar 4.11

(Sumber :<https://app.edgebuildings.com>)

Dari tabel tersebut di dapatkan besar kapasitas tanki yang direncanakan dari *grey water* yang telah ditambah dengan *rainwater harvesting* sebesar 52 m3. Dari perhitungan tersebut di dapatkan ***saving water*** sebesar **37,38 %**.



Gambar 4.12 Denah Perletakan Grey water tank dan rain water harvesting



Gambar 4.13 skema grey water

4.6. Dashboard Material

Berikut merupakan material-material yang digunakan pada bangunan ini

Materials Efficiency Measures

Choose building material options to achieve savings of at least 20%, indicating thickness.

Ref	Building Material	Improved Case Selection	Proportion %	Thickness	Steel Rebar
OFM01*	Floor Slabs Upload Document(s)	In-Situ Reinforced Concrete Slab		120 mm	kg/m ²
OFM02*	Roof Construction Upload Document(s)	Type 1 In-Situ Reinforced Concrete Slab	100 %	120 mm	kg/m ²
OFM03*	External Walls Upload Document(s)	Type 1 Ferrocement Wall Panel	70 %	150 mm	
		Type 2 Aluminum-Clad Sandwich Panel	30 %		
OFM04*	Internal Walls Upload Document(s)	Type 1 Ferrocement Wall Panel	70 %	150 mm	
		Type 2 Common Brick Wall with Plaster on Both Sides	30 %	150 mm	
OFM05*	Flooring Upload Document(s)	Type 1 Ceramic Tile	100 %		
OFM06*	Window Frames Upload Document(s)	Type 1 Aluminium	100 %	Single Glazing	

Gambar 4.14 Dashboard Material
(Sumber : <https://app.edgebuildings.com>)



internal Walls :

- Common brick Wall with plaster 30%
- Ferrocement Wall Panel 150mm 70%



Floor Slabss & Roof Construction :
 In-situ Reinforced Concrete Slabs
 120mm



Gambar 4.15 Perspektif Bangunan



External Walls :

- Alumunium Clad Sandwich Panel 30%
- Ferrocement Wall Panel 150mm 70%



Flooring :

Ceramic tile 100%

Kemudian dari pemilihan material tersebut di dapatkan *saving material* sebesar **42,49 %**