






LAMPIRAN






STUDI PRESEDEN 1

1. REST AREA 429 A

Table 15 Fasilitas Rest Area KM 429 A

Sumber : Dokumentasi Pribadi, 2019

NO.	GAMBAR	KETERANGAN
1.		<p>Pintu Masuk Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
2.		<p>Fasilitas Pujasera Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
3.		<p>Fasilitas Angkringan Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
4.		<p>Fasilitas Masjid Rest Area Ungaran.</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
5.		<p>Fasilitas ATM Center Rest Area Ungaran.</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>

6.		<p>Fasilitas Restaurant Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
7.		<p>Fasilitas SPBU Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
8.		<p>Fasilitas Minimarket Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
9.		<p>Fasilitas Toilet Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>
10.		<p>Fasilitas Ruang Genset Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2019</p>

1. Akses Pencapaian

Letak *Rest Area* ini berada pada KM 429 A yang dapat ditemukan sebelum persimpangan pintu keluar tol Ungaran. Namun jalur percepatan pada *Rest Area* yang begitu pendek dan

curam membuat pengunjung *Rest Area* ini sedikit kesusahan untuk menjangkau *Rest Area* ini.



Gambar 56 Akses Pencapaian *Rest Area* Ungaran.

Sumber : Google earth

STUDI PRESEDEN 2

2. REST AREA 456 A

NO.	GAMBAR	KETERANGAN
1.		<p>Pintu Masuk <i>Rest Area</i> 456 Sumber : Dokumentasi Pribadi, 2020</p>
2.		<p>Fasilitas Area Parkir <i>Rest Area</i> 456 A Sumber : Dokumentasi Pribadi, 2020</p>

E		<p>Fasilitas Foodcourt Rest Area 456 A</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>
4.		<p>Fasilitas Musholla Rest Area 456 A.</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>
5.		<p>Fasilitas ATM Center Rest Area Ungaran.</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>
6.		<p>Fasilitas Restaurant Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>
7.		<p>Fasilitas Minimarket Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>
9.		<p>Fasilitas Toilet Rest Area Ungaran</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>
10.		<p>Fasilitas Ruang Genset Rest Area 456 A</p> <p>Sumber : Dokumentasi Pribadi, 2020</p>

3. PERHITUNGAN EDGE



EDGE Assessment: v2.1.5

Downloaded date & time: 2020-09-07 07:47

Project Name: Rest Area di Ruas Tol Semarang - Solo
 Subproject Name: Rest Area di Ruas Tol Semarang - Solo

32.77% | 77.07% | 15.73%

Project Details

Project Name	Address Line1
Rest Area di Ruas Tol Semarang - Solo	Jalan Tol Semarang - Solo
Number of Distinct Buildings	Address Line2
2	
Number of EDGE Subproject(s) associated	City
1	Boyolali
Total Project Floor Area (m ²)	State/ Province
6,011	
Project Owner Name	Postal Code
Unika Soegijapranata Semarang	
Project Owner Email	Country
rezasofyan3198@gmail.com	
Project Owner Phone	Project Number
Mobile 62 - 82135624445	1000684121
Share with Investor(s) or Bank(s)?	
No	

Associated Subproject(s)
 Rest Area di Ruas Tol Semarang - Solo

Subproject Details

Subproject Name	Address Line1
Rest Area di Ruas Tol Semarang - Solo	Jalan Tol Semarang - Solo
Retail Store Name	Address Line2
Rest Area	
Subproject Multiplier for the Project	City
1	Boyolali
Certification Stage	State/ Province
Preliminary	
Status	Postal Code
Self-Review	
Auditor	Country
	Indonesia
Certifier	Subproject Type
	New Building

Created By: Reza Sofyan
 Downloaded By: Reza Sofyan

File Number: 20090610092619
 Project Number: 1000684121

01



Location Data



Basic Parameters

Type of Retail
Small Food Retail

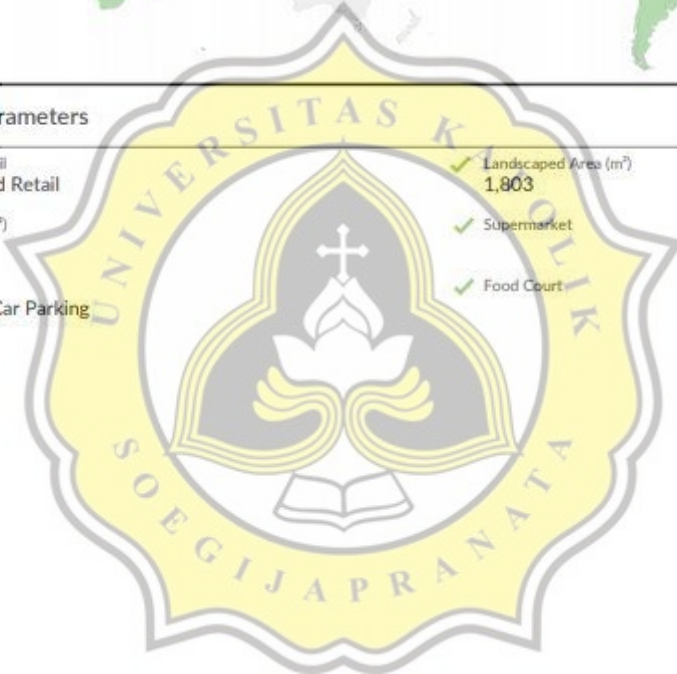
Site Area (m²)
17,000

Car Parking
Outdoor Car Parking

Landscaped Area (m²)
1,803

✓ Supermarket

✓ Food Court



Building Data

Floors Above Ground (no.)	Floor to Floor Height (m)
2	5
Floors Below Ground (no.)	Gross Internal Area (m ²)
0	6,011

Default	User Entry
---------	------------

Gross Internal Area (m ²)	6,011
General Sales Area (m ²)	3,006
Refrigerated Area (m ²)	401
Frozen Section (m ²)	334
Dry Storage (m ²)	468
Cold Storage Area (m ²)	334
Bathrooms (m ²)	200
Mechanical & Electrical Room (m ²)	668
Food Court (m ²)	267
Supermarket (m ²)	334



Building Orientation

Default	User Entry	Building Lengths Default	User Entry
Floor Plan Depth*** (m)		North	
-	6,011	6,011.0	1,663
Main Orientation***		South	
South		6,011.0	1,663
		East	
		0.5	1,663
		West	
		0.5	1,663
		Northeast	
		-	
		Northwest	
		-	
		Southeast	
		Southwest	

*** 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.

Building Systems

Does the building design include an AC system?

Yes

Does the building design include a space heating system?

Yes



Key Assumptions for the Base Case

Default	User Entry	Default	User Entry
Fuel Used for Electric Generator			
Diesel	Diesel		
Fuel Used for Hot Water Generation			
Electricity	Electricity	Jan	
Fuel Used for Cooking		26.2	
Electricity	Electricity	Feb	
Fuel Used for Space Heating		26.2	
Electricity	Electricity	Mar	
% of Electricity Generation Using Diesel (% Ave. Yrly)		26.2	
5.00%		Apr	
Cost of Electricity (Thousand Rp/kWh)		26.6	
1,441		May	
Cost of Diesel Fuel (Thousand Rp/L)		26.7	
6.42		Jun	
Cost of Natural Gas (Thousand Rp/L)		26.3	
3.80		Jul	
Cost of Water (Thousand Rp/kL)		25.7	
7.86		Aug	
CO ₂ Emissions from Electricity Generation (g/kWh)		25.8	
891.00		Sep	
Window to Wall Ratio (%)		26.6	
30.00%		Oct	
Solar Reflectivity for Paint - Wall (%)		27.3	
30.00%		Nov	
Solar Reflectivity for Paint - Roof (%)		27.0	
30.00%		Dec	
Roof U-value (W/m ² .K)		26.5	
1.99		Latitude (Deg)	
Wall U-value (W/m ² .K)		7.56	
1.86		Average Annual Rainfall (mm)	
Glass U-value (W/m ² .K)		1,736.00	
5.75			
Glass SHGC (Factor)			
0.50			
Cooling System			
ASHRAE 90.1.2007	ASHRAE 90.1.2007		
AC System Efficiency (COP)			
2.83			
Heating System			
ASHRAE 90.1.2007	ASHRAE 90.1.2007		
Heating System Efficiency (Eff.)			
1.00			

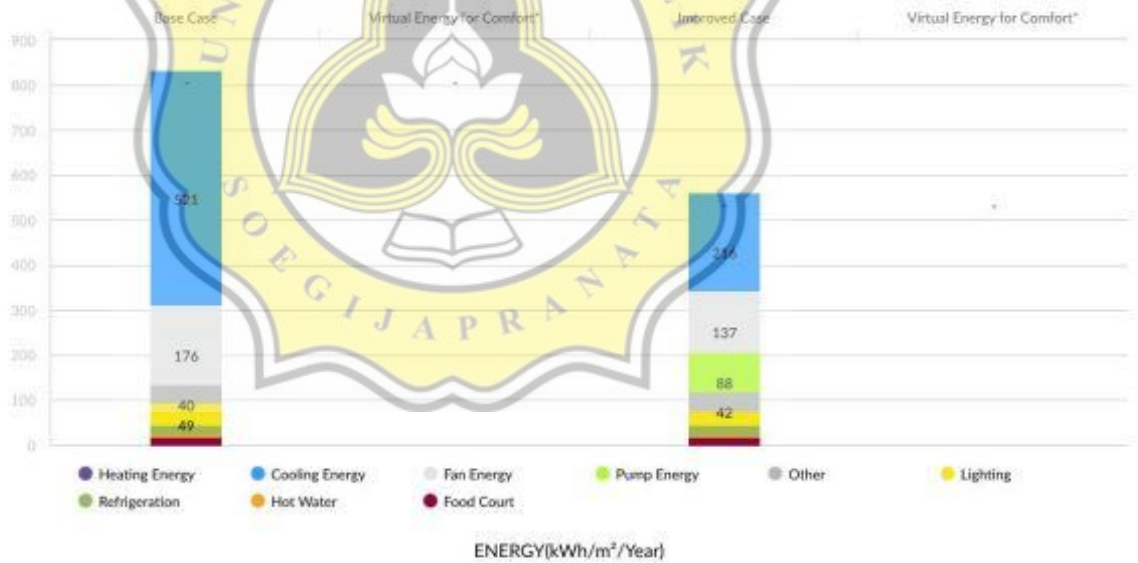
Results

Final Energy Use (kWh/Month)	280,199.94	Operational CO ₂ Savings (tCO ₂ /Year)	1,439.50
Final Water Use (m ³ /Month)	466.24	Embodied Energy Savings (MJ/m ²)	3,401.30
Base Case Utility Cost (Thousand Rp/Month)	618,532.91	Incremental Cost (Thousand Rp)	12,719,380.83
Utility Cost Reduction (Thousand Rp/Month)	209,758.00	Payback in Years (Yrs.)	5.05
Energy Savings (MWh/Year)	1,638.70	Water Savings (m ³ /Year)	19,071.44
Embodied Energy in Materials Savings (GJ)	20,445.22	Total Subproject Floor Area (m ²)	6,011
Carbon Emissions (tCO ₂ /Year)	2,953.66		

ENERGY SAVINGS

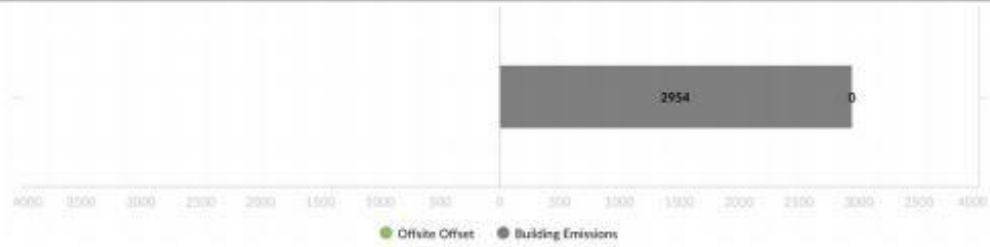
Energy Efficiency Measures 32.77%

Meets EDGE energy standard



* Virtual energy is the amount of energy that will be required based on the assumption that the retail will eventually install air conditioning or heating.

Carbon Emissions: 2953.66 tCO₂/Year



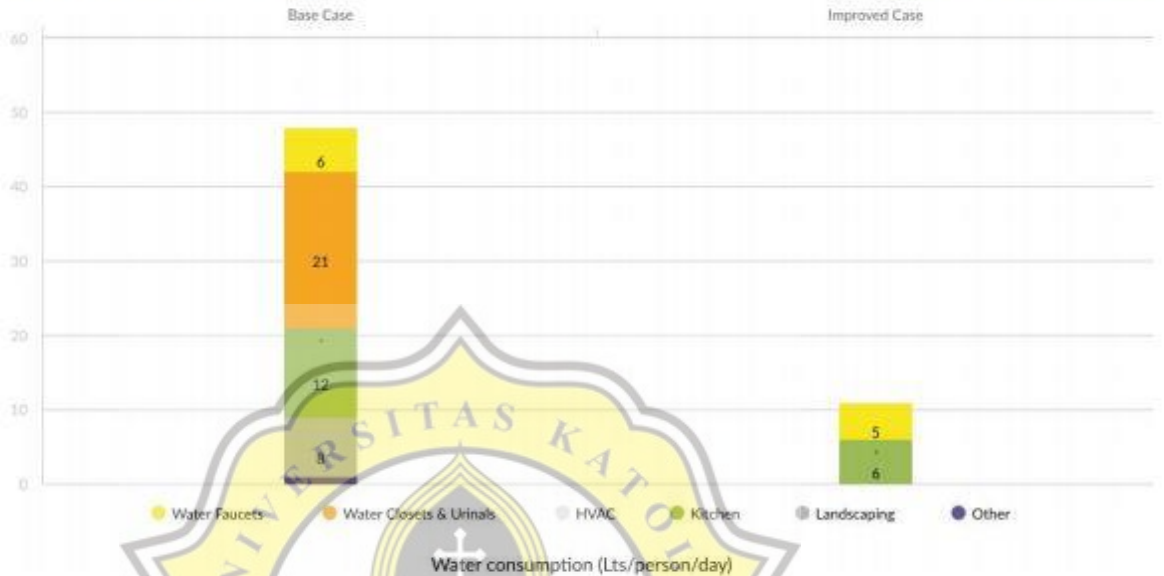
Energy Efficiency Measures 32.77%

RTE01 Reduced Window to Wall Ratio - WWR of 20%	RTE21 High-Efficiency Condensing Boiler for Space Heating - Efficiency of 90%
RTE02 Reflective Paint/Tiles for Roof - Solar Reflectivity (albedo) of 0.7	RTET2 Room Heating Controls With Thermostatic Valves
RTE03 Reflective Paint for External Walls - Solar Reflectivity (albedo) of 0.7	RTE22 High-Efficiency Boiler for Water Heating - Efficiency of 90%
RTE04 External Shading Devices - Annual Average Shading Factor (AASF) of 1	✓ RTE23 Energy-Saving Light Bulbs - Sales Area
✓ RTE05 Insulation of Roof : U-value of 0.442	✓ RTE24 Energy-Saving Light Bulbs - Corridors and Common Areas
✓ RTE06 Insulation of External Walls : U-value of 0.435	✓ RTE25 Energy-Saving Light Bulbs - External Spaces
RTE07 Low-E Coated Glass : U-value of 3 W/m ² .K and SHGC of 0.45	RTE26 Occupancy Sensors in Bathrooms
RTE08 Natural Ventilation with Operable Windows for Corridors, Atrium, and Common Areas	RTE27 Higher Efficiency Refrigerated Cases
RTE11 Reduce Envelope Area Infiltration by 50%	RTE28 Solar Hot Water Collectors - 50% of Hot Water Demand
RTE09 Air Economizers During Favorable Outdoor Conditions	RTE29 Solar Photovoltaics - 25% of Total Energy Use
✓ RTE10 Variable Refrigerant Flow (VRF) Cooling System - COP of 3.5	✓ RTE30 Skylight(s) to Provide Daylight to 50% of Top Floor Area
✓ RTE11 Air Conditioning with Air Cooled Screw Chiller - COP of 3.63	RTE31 Other Renewable Energy for Electricity Generation
✓ RTE12 Air Conditioning with Water Cooled Chiller - COP of 6.71	RTE32 Offsite Renewable Energy Procurement - Equal to 100% of total Operational CO ₂
RTE13 Ground Solarce Heat Pump - COP of 4.65	RTE33 Carbon Offset - 100% of Total CO ₂
RTE14 Absorption Chiller Powered by Waste Heat - COP of 0.7	RTET3 Consumption Based Energy Meters for Both Cooling and Heating Energy
RTE15 Recovery of Waste Heat from the Generator for Space Heating	RTET4 Smart Energy Meters for Electrical Energy
RTE16 Variable Speed Drives on the Fans of Cooling Towers	
RTE17 Variable Frequency Drives in AHUs	
RTE18 Variable Speed Drives Pumps	
RTE19 Sensible Heat Recovery from Exhaust Air - Efficiency of 60%	
✓ RTE20 CO ₂ Sensor/Demand-Controlled Ventilation for Fresh Air Intake	

WATER SAVINGS

Water Efficiency Measures 77.07%

Meets EDGE Water Standard



- | | |
|--|--|
| <ul style="list-style-type: none"> ✓ RTW01 Dual Flush for Water Closets in All Bathrooms - 6 L/first flush and 3 L/second flush RTW02 Water-Efficient Urinals in All Bathrooms - 2 L/flush RTW03 Aerators and Auto Shut-off Faucets in All Bathrooms - 2 L/min ✓ RTW04 Water-Efficient Kitchen Faucets - 4 L/min ✓ RTW05 Water-Efficient Dishwashers - 2 L/Rack | <ul style="list-style-type: none"> RTW06 Pre-Rinse Valve for Rinsing Operation - 6 L/min ✓ RTW07 Water-Efficient Landscaping - 3 L/m²/day RTW08 Condensate Water Recovery ✓ RTW09 Rainwater Harvesting System - 50% of Roof Area Used for Rainwater Collection ✓ RTW10 Grey Water Treatment and Recycling System ✓ RTW11 Black Water Treatment and Recycling System |
|--|--|

Embodied Energy Savings

Materials Efficiency Measures 15.73%



		Proportion %	Thickness (mm)	Steel Rebar (kg/m ²)
RTM01	Floor Slabs In-Situ Reinforced Concrete Slab 350 mm Steel : 35 kg/m ²			
	In-Situ Reinforced Concrete Slab			
RTM02	Roof Construction In-Situ Reinforced Concrete Slab 350 mm Steel : 35 kg/m ²	Type 1		100 %
	In-Situ Reinforced Concrete Slab			
RTM03	External Walls Common Brick Wall with Internal & External Plaster 200 mm	Type 1		100 %
	Common Brick Wall with Internal & External Plaster			
RTM04	Internal Walls Common Brick Wall with Plaster on Both Sides 100 mm	Type 1		100 %
	Common Brick Wall with Plaster on Both Sides			
RTM05	Flooring Ceramic Tile	Type 1		100 %
	Ceramic Tile			
RTM06	Window Frames Aluminium Single Glazing	Type 1		100 %
	Aluminium Clad Timber: Aluminium			Single Glazing
RTM07	Wall Insulation No Insulation U: - 1.86 W/m ² K			
	Glass Wool			
RTM08	Roof Insulation No Insulation U: - 1.99 W/m ² K			
	Glass Wool			



EDGE Certification Checklist

Building Type	Certification Stage	Subproject Name
Retail	Preliminary	Rest Area di Ruas Tol Semarang - Solo
Energy Measures		Preliminary Audit Requirements
RTE05	Insulation of Roof	<ul style="list-style-type: none"> ✓ A roof construction detail drawing showing the type and thickness of insulation material. Ideally the roof detail drawing should be annotated with the U Value of the roof. ✓ Calculations of U value either using the formula or U value calculators. ✓ Manufacturer's data sheet of specified insulation material for the roof.
RTE06	Insulation of External Walls	<ul style="list-style-type: none"> ✓ External walls construction detail drawing showing the type and thickness of the insulation material. Ideally the external walls detail drawing should be annotated with the U Value of the external walls. ✓ Calculations of U value either using the formula or U value calculators. ✓ Manufacturer's data sheet of specified insulation material for the external walls.
RTE10	Variable Refrigerant Volume (VRV) Cooling System	<ul style="list-style-type: none"> ✓ Manufacturer's data sheets for the VRV cooling system specifying COP information. ✓ For systems including more than one chiller unit, the design team must provide the average COP calculation. ✓ Mechanical drawings showing the location of the external and internal units.
RTE11	Air Conditioning with Air Cooled Screw Chiller	<ul style="list-style-type: none"> ✓ Manufacturer's data sheets for the Air cooled screw chiller system specifying COP information. ✓ For systems including more than one chiller unit, the design team must provide the ton-weighted average COP calculation. ✓ Mechanical layout drawings showing the location of the external and internal units.
RTE12	Air Conditioning with Water Cooled Chiller	<ul style="list-style-type: none"> ✓ Mechanical drawings with air conditioning schematics for all floors. ✓ Manufacturer's data sheets for the Water cooled chiller system specifying COP information. ✓ For systems including more than one chiller unit, the design team must provide the ton-weighted average COP calculation. ✓ Mechanical layout drawings/schematic showing the location of the external and internal units.
RTE20	CO2 Sensor / Demand-Controlled Ventilation for Fresh Air Intake	<ul style="list-style-type: none"> ✓ HVAC layout drawings showing the location of the CO2 sensors including the mounting height. ✓ Specification of the sensors from manufacturer.
RTE23	Energy Saving Light Bulbs- Sales Area	<ul style="list-style-type: none"> ✓ Lighting schedule listing type and number of bulbs specified. ✓ Electrical layout drawings showing the location and type of all installed bulbs.

RTW11 Black Water Treatment and Recycling System ✓ Calculations for: 1. Designed capacity of the black water treatment system (m³/day) 2. Quantity of black water available daily to recycle (litres/day) 3. Efficiency of the black water system to produce treated water (litres/day) 4. Water balance chart

Material Measures		Preliminary Audit Requirements
RTM01	Floor Slabs	<ul style="list-style-type: none"> ✓ Floor sections showing build-up of the floor; or ✓ Manufacturer's data sheet for specified building material if applicable; or ✓ Bill of quantities with the floor slab specification clearly highlighted.
RTM02	Roof Construction	<ul style="list-style-type: none"> ✓ A section drawing of roof showing the materials and thicknesses; or ✓ Manufacturer's data sheet for specified building material; or ✓ Bill of quantities with the materials used for roof construction clearly highlighted.
RTM03	External Walls	<ul style="list-style-type: none"> ✓ Façade drawings clearly marking the external wall specification selected; and ✓ Drawings of the external wall sections; or ✓ Manufacturer's data sheet for specified building material; or ✓ Bill of quantities with the materials used for the external wall clearly highlighted.
RTM04	Internal Walls	<ul style="list-style-type: none"> ✓ Drawings of the internal wall sections; or ✓ Manufacturer's data sheet for building materials used for internal wall specifications if available; or ✓ Bill of quantities with the materials used for the internal wall clearly highlighted.
RTM05	Flooring	<ul style="list-style-type: none"> ✓ Drawings clearly marking the flooring specification selected; or ✓ Manufacturer's data sheet for building materials used for floor specifications; or ✓ Bill of quantities with the materials used for the flooring clearly highlighted.
RTM06	Window Frames	<ul style="list-style-type: none"> ✓ Façade drawings clearly marking the window frame(s) specification; or ✓ Manufacturer's data sheet for glazing specified; or ✓ Bill of quantities with the windows, window frames clearly highlighted.
RTM07	Wall Insulation	<ul style="list-style-type: none"> ✓ Drawings clearly marking the insulation specification selected; or ✓ Manufacturer's data sheet for insulation specified; or ✓ Bill of quantities with the insulation materials clearly highlighted.
RTM08	Roof Insulation	<ul style="list-style-type: none"> ✓ Drawings clearly marking the insulation specification selected; or ✓ Manufacturer's data sheet for insulation specified; or ✓ Bill of quantities with the insulation materials clearly highlighted.

RTW11	Black Water Treatment and Recycling System	✓ Calculations for: 1. Designed capacity of the black water treatment system (m3/day) 2. Quantity of black water available daily to recycle (litres/day) 3. Efficiency of the black water system to produce treated water (litres/day) 4. Water balance chart
Material Measures		Preliminary Audit Requirements
RTM01	Floor Slabs	✓ Floor sections showing build-up of the floor; or ✓ Manufacturer's data sheet for specified building material if applicable; or ✓ Bill of quantities with the floor slab specification clearly highlighted.
RTM02	Roof Construction	✓ A section drawing of roof showing the materials and thicknesses; or ✓ Manufacturer's data sheet for specified building material; or ✓ Bill of quantities with the materials used for roof construction clearly highlighted.
RTM03	External Walls	✓ Façade drawings clearly marking the external wall specification selected; and ✓ Drawings of the external wall sections; or ✓ Manufacturer's data sheet for specified building material; or ✓ Bill of quantities with the materials used for the external wall clearly highlighted.
RTM04	Internal Walls	✓ Drawings of the internal wall sections; or ✓ Manufacturer's data sheet for building materials used for internal wall specifications if available; or ✓ Bill of quantities with the materials used for the internal wall clearly highlighted.
RTM05	Flooring	✓ Drawings clearly marking the flooring specification selected; or ✓ Manufacturer's data sheet for building materials used for floor specifications; or ✓ Bill of quantities with the materials used for the flooring clearly highlighted.
RTM06	Window Frames	✓ Façade drawings clearly marking the window frame(s) specification; or ✓ Manufacturer's data sheet for glazing specified; or ✓ Bill of quantities with the windows/window frames clearly highlighted.
RTM07	Wall Insulation	✓ Drawings clearly marking the insulation specification selected; or ✓ Manufacturer's data sheet for insulation specified; or ✓ Bill of quantities with the insulation materials clearly highlighted.
RTM08	Roof Insulation	✓ Drawings clearly marking the insulation specification selected; or ✓ Manufacturer's data sheet for insulation specified; or ✓ Bill of quantities with the insulation materials clearly highlighted.

HASIL PLAGIASI LTP



0.26% PLAGIARISM
APPROXIMATELY

Report #11280002

BABI PENDAHULUAN Latar Belakang Dengan meningkatnya penduduk dan mobilisasi antar kota khususnya pada pulau Jawa di Indonesia, jalan Bebas Hambatan atau jalan TOL menjadi solusi untuk menyelesaikan permasalahan tersebut. Jalan Tol Trans Jawa, merupakan jalan yang menghubungkan kota-kota di pulau Jawa dimulai dari km 0 yakni TOL Cawang sebagai awal penentuan kilometer hingga titik km 840 pada TOL Pasuruan- Probolinggo. Tol trans jawa termasuk kedalam program yang direncanakan pemerintah yang diatur dalam dokumen RPJMN 2015-2019 yakni perencanaan jalan tol meliputi 1.150 km. Jalan Bebas Hambatan atau Jalan Tol merupakan jalan umum yang dimana pengguna jalan tol jika memasuki kawasan ini diwajibkan membayar menurut Peraturan Pemerintah No. 15 pasal 1 tahun 2005. Menurut peraturan presiden 65 pasal 5 tahun 2006 pembangunan Jalan Bebas Hambatan (Jalan TOL) yang dilakukan oleh pemerintah bertujuan untuk kepentingan masyarakat umum. Dalam waktu 4 tahun terakhir terhitung dari tahun 2010 2013 pemerintah hanya membangun 43,48 km. Pada masa pemerintahan Presiden Jokowi Tol Trans Jawa meneruskan pembangunan Jalan Tol Trans Jawa dalam kurun waktu 2015-2018. Rest Area atau Tempat Istirahat dan Pelayanan (TIP) adalah sarana pelayanan umum yang dibangun untuk pengguna jalan tol sebagai tempat peristirahatan

REPORT CHECKED
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