INTERIM REPORT
EDGE (IFC, WORLD BANK GROUP)

La Vista Villas

Location:Chalong, Muang Phuket, Phuket

Owner: Layan Green Park

ARDOR GREEN (LEED / LOTUS / EDGE / FITWEL)

- BOARD MEMBER OF VIETNAM GREEN BUILDING COUNCIL
- VICE PRESIDENT OF HCMC GREEN
- SINTALI-SGS EDGE EXPERT

Office:
- HCMC: 216/1/1 Nguyen Van Huong, Thao Dien, District 2
- Da Nang: Lv7, PVcombank , 214 30/4, Hai Chau District
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EXCELLENCE IN DESIGN FOR GREATER EFFICIENCIES

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LA VISTA VILLAS – GREEN CERTIFICATE EDGE

Energy Efficiency Measures			
HME01*	Reduced Window to Wall Ratio		✓
HME02	Reflective Paint/Tiles for Roof - Solar Reflectivity (albedo)	×	
HME03	Reflective Paint for External Walls - Solar Reflectivity (albedo)	×	
HME04	External Shading Devices - Annual Average Shading Factor (AASF)		✓
HME05	Insulation of Roof : U-value		✓
HME06	Insulation of External Walls : U-value		✓
HME07	Low-E Coated Glass : U-value and SHGC	×	
HME08	Higher Thermal Performance Glass : U-value and SHGC	×	
HME09	Natural Ventilation	×	
HME10	Ceiling Fans in All Habitable Rooms		✓
HME11*	Air Conditioning System - COP		✓
HME12	High-Efficiency Boiler for Space Heating	×	
HMET3	Sensible Heat Recovery from Exhaust Air	×	
HME13	High-Efficiency Boiler for Hot Water	×	
HME14	Heat Pump for Hot Water	×	
HME15	Energy-Efficient Refrigerators and Clothes Washing Machines	×	
HME16	Energy-Saving Light Bulbs - Internal Spaces		✓
HME17	Energy-Saving Light Bulbs - Common Areas and Outdoor Areas		✓
HME18	Lighting Controls for Outdoor Lighting	×	
HME19	Solar Hot Water Collectors - 50% of Hot Water Demand	×	
HME20	Solar Photovoltaics - 25% of Total Energy Use	×	
HME21	Smart Energy Meters for Electrical Energy	×	
HMET4	Consumption Based Energy Meters for Both Cooling and Heating Energy	×	
HME22	Other Renewable Energy for Electricity Generation	×	

Water Efficiency Measures			
HMW01*	Low-Flow Showerheads		✓
HMW02*	Low-Flow Faucets for Kitchen Sinks		✓
HMW03*	Low-Flow Faucets in All Bathrooms		✓
HMW04*	Dual Flush for Water Closets in All Bathrooms		✓
HMW05*	Single Flush for Water Closets	×	
HMW06	Rainwater Harvesting System	×	
HMW07	Recycled Grey Water for Flushing	×	
HMW08	Recycled Black Water for Flushing	×	

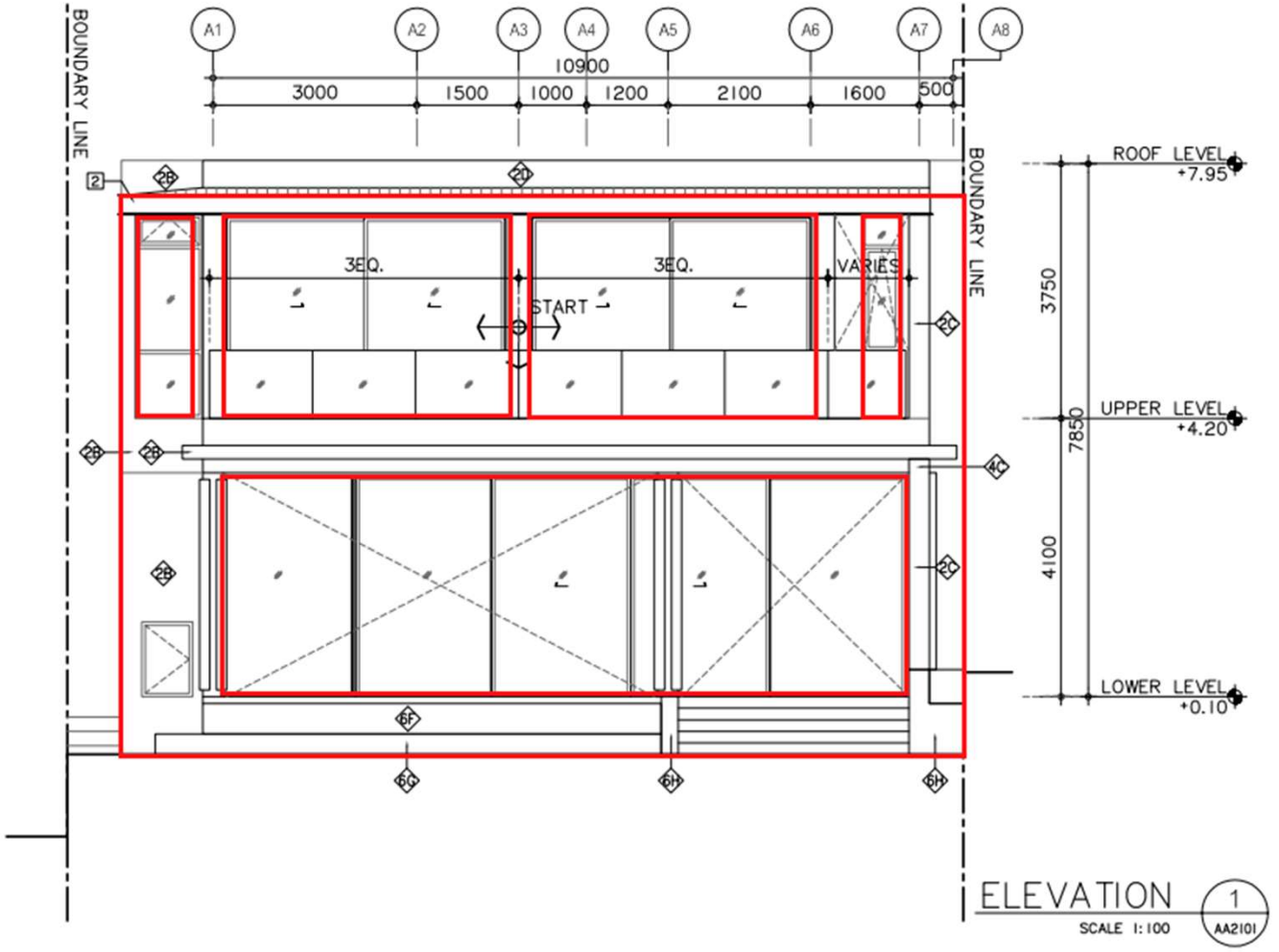
Materials Efficiency Measures			
HMM01*	Floor Slabs		✓
HMM02*	Roof Construction		✓
HMM03*	External Walls		✓
HMM04*	Internal Walls		✓
HMM05*	Flooring		✓
HMM06*	Window Frames		✓
HMM07	Wall Insulation	×	
HMM08	Roof Insulation		✓

Preliminary Assessment – La Vista Villas

TYPE A

TYPE A - WINDOW TO WALL RATIO

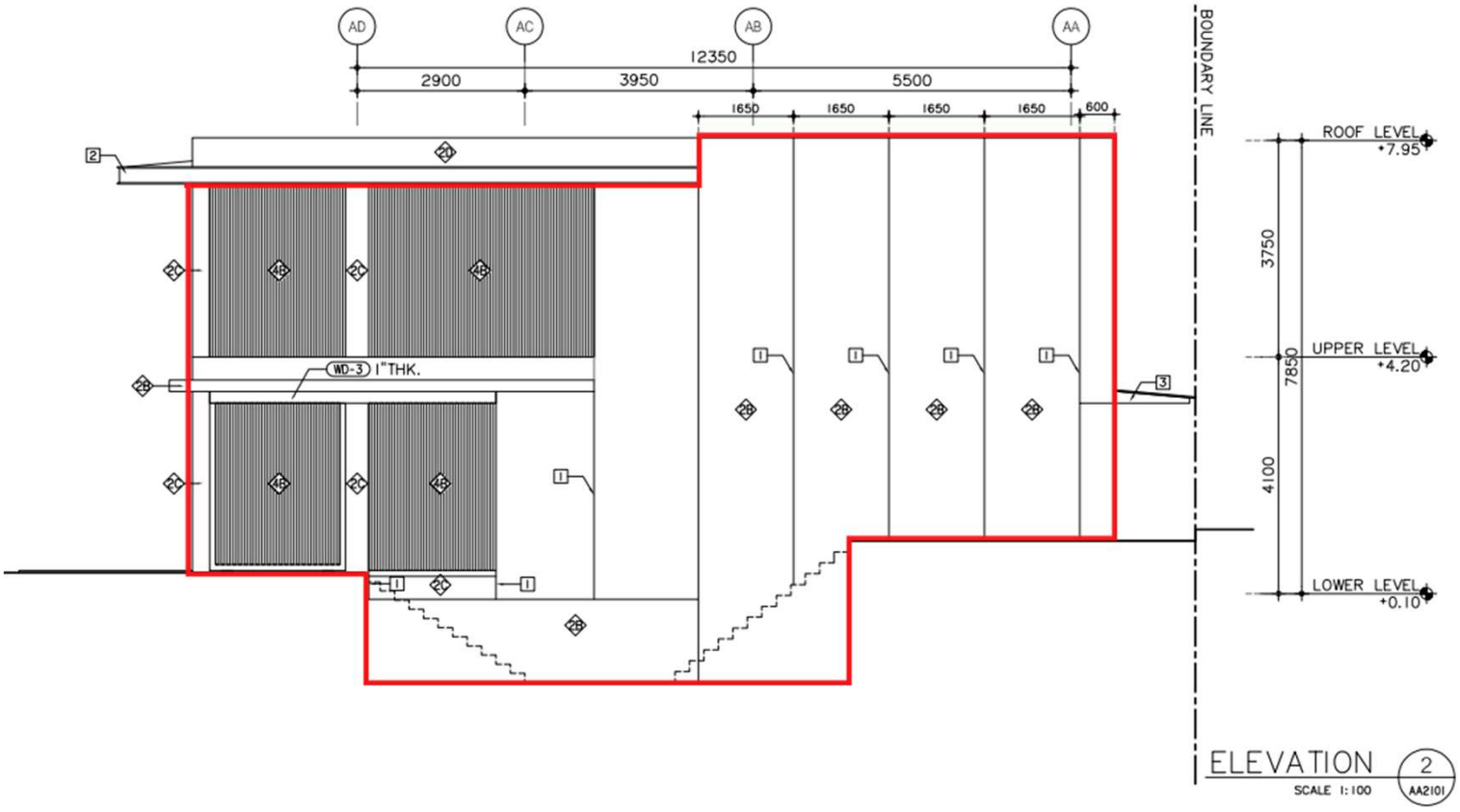
EAST ELEVATION



	Area (m^2)
Window	63.72
Wall	96.72
WWR_E = 65.88%	

TYPE A - WINDOW TO WALL RATIO

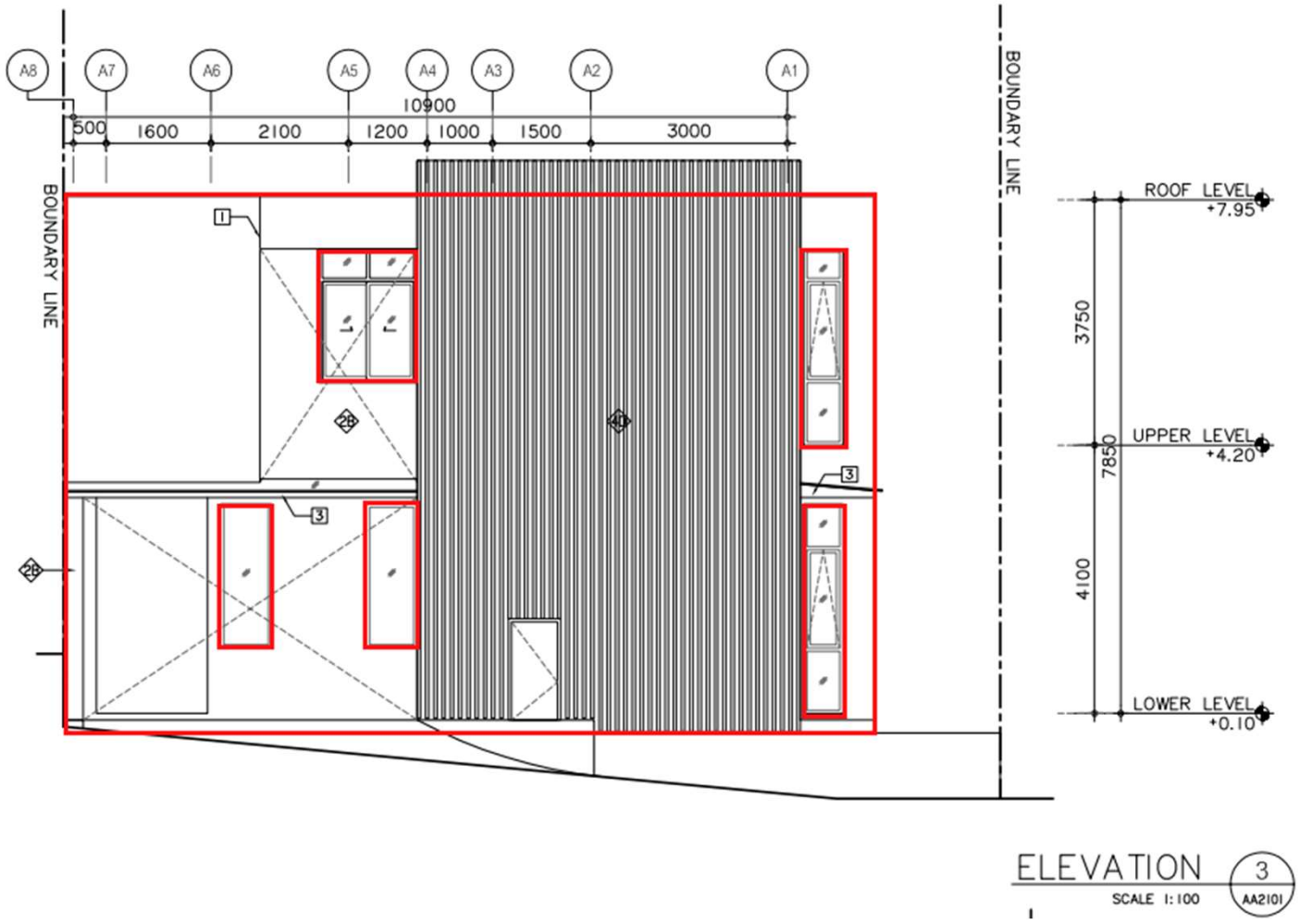
NORTH ELEVATION



	Area (m^2)
Window	5.10
Wall	95.12
WWR_N = 5.36%	

TYPE A - WINDOW TO WALL RATIO

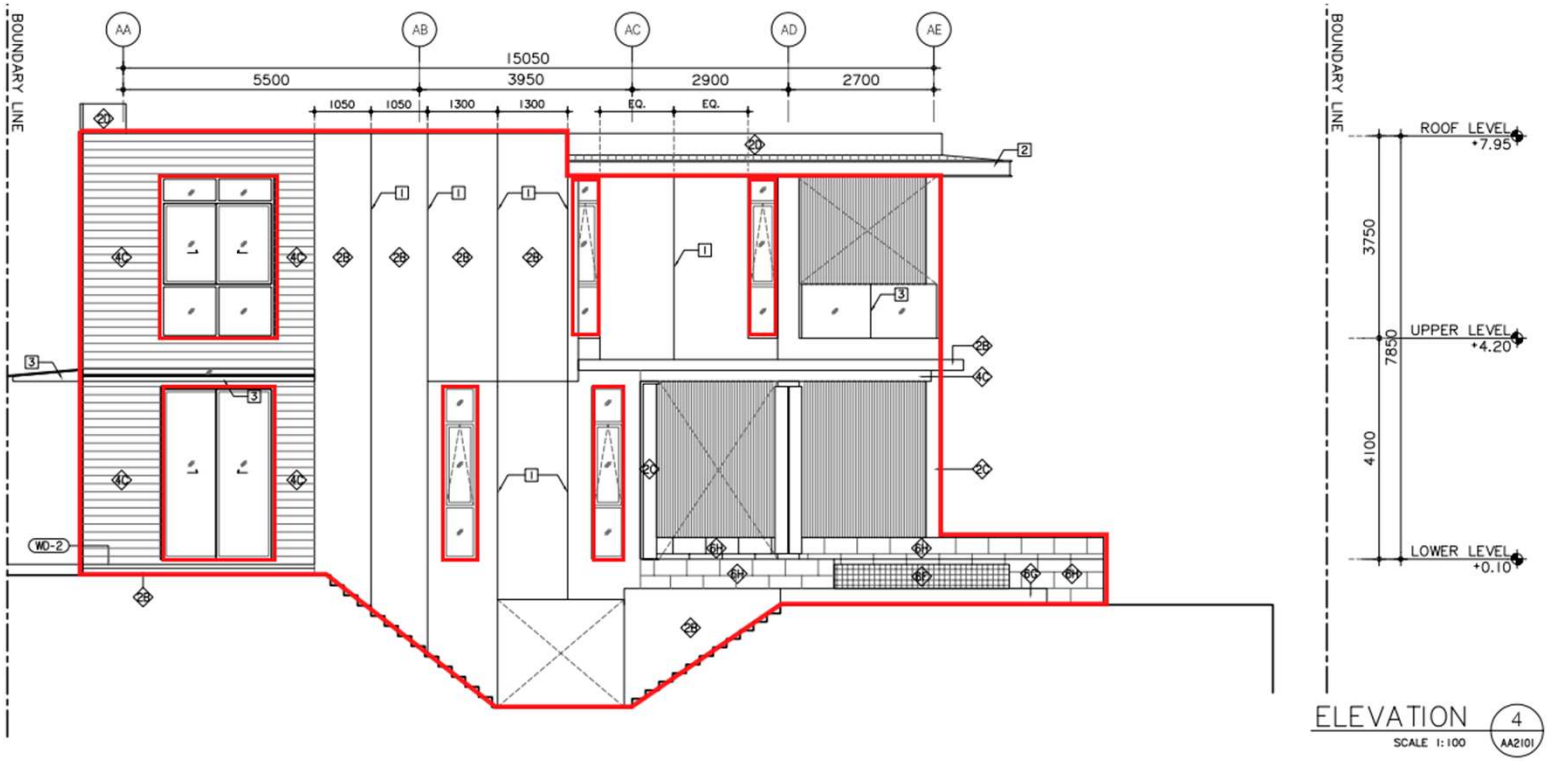
WEST ELEVATION



	Area (m^2)
Window	10.13
Wall	96.72
WWR_W = 10.47%	

TYPE A - WINDOW TO WALL RATIO

SOUTH ELEVATION



	Area (m^2)
Window	23.33
Wall	95.12
WWR_S = 24.53%	

TYPE A - WINDOW TO WALL RATIO

WWR (%)				
No.	**Orientation**	**Total Wall Area (m^2)**	**Total Window Area (m^2)**	**WWR (%)**
1	North	95.12	5.10	5.36
2	South	95.12	23.33	24.53
3	East	96.72	63.72	65.88
4	West	96.72	10.13	13.93
Tổng		**383.68**	**102.28**	**26.66**

ENERGY SAVINGS
TYPE A

Technical Information		
Criteria	**Energy Efficiency**	**Current Design**
HME01	Reduced WWR	WWR = 26.66%
HME04	External Shading Device	AASF = 0.36
HME05	Insulation of Roof	Reinforced Concrete -230mm **Rockwool Layer – 50mm** Cement Mortar – 50 mm U-value = 1.35W/m^2K
HME06	Insulation of External Walls	AAC Blocks – 70mm Cerment mortar – 30mm U-value = 1.79W/m^2K
HME10*	Ceiling Fans in All Habitable Rooms	**Yes**
HME11	Air Conditioning System	**COP = 3.50**
HME16-17	Energy saving light bulbs	LED
Energy Efficiency(%)		**49.02%**

Note:
- **Updated Window to Wall Ratio;**
- **Updated Annual Average Shading Factor;**

WATER SAVINGS
TYPE A

Technical Informaton		
Criteria	**Water Efficiency**	**Curent Design**
HMW01	Low-flow Showerheads	**7.5 L/min**
HMW02	Low-flow Faucets for Kitchen Sinks	**5.10 L/min**
HMW03	Low-flow Faucets in All Bathrooms	**7.90 L/min**
HMW04	Dual Flush for Water Closets in All Bathrooms	**4.50 - 3.00 L/flush**
Water Efficiency (%)		**26.33%**

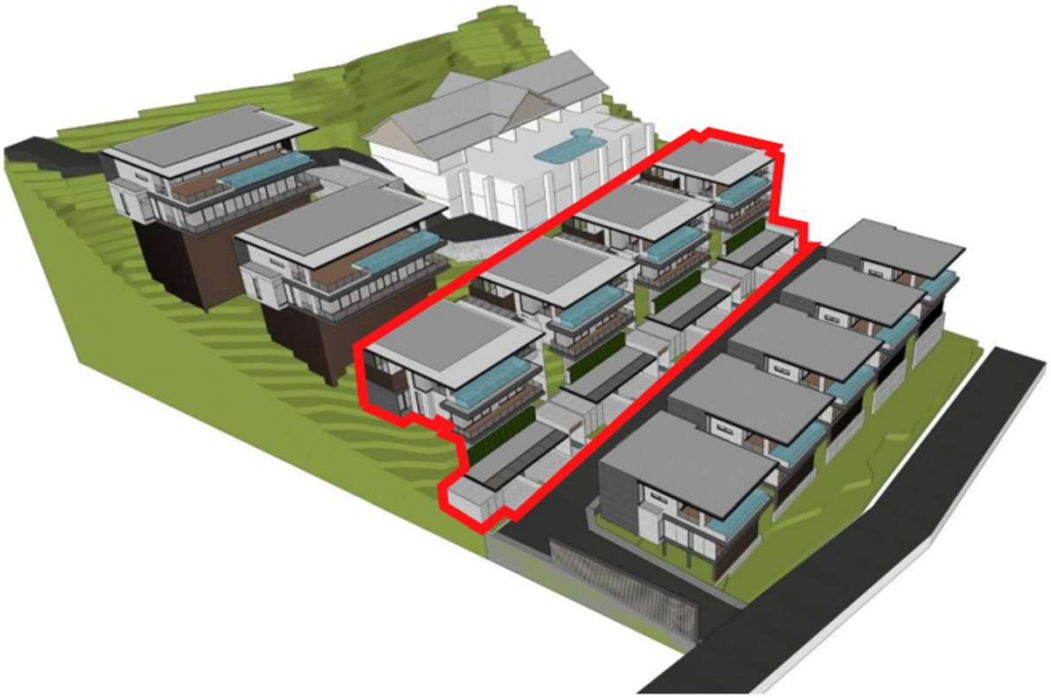
Note:
- **Based on the Waterfixture datasheet**

LESS EMBODIED ENERGY IN MATERIALS
TYPE A

Technical Information		
Criteria	**Material Efficiency**	**Current Design**
HMM01	Floor Slabs	Thickness = 300mm Steel Rebar = 30.00kg/m2
HMM02	Roof Construction	Reinforced Concrete Slab- 100% Thickness = 230mm Steel Rebar = 24.92 kg/m2
HMM03	External Walls	AAC Blocks - 70mm - 100%
HMM04	Internal Walls	Common Brick - 70mm - 100%
HMM05	Flooring	Ceramic tiles – 74.29% Wooden – 25.71%
HMM06	Window Frame	Aluminium - 100%
HMM07	Wall Insulation	No Insulation
HMM08	Roof Insulation	Rockwool – 50mm
Material Efficiency (%)		**33.30%**

Note:
- **Updated Thickness of Floor and Roof Slab;**
- **Updated Rebar Ratio.**

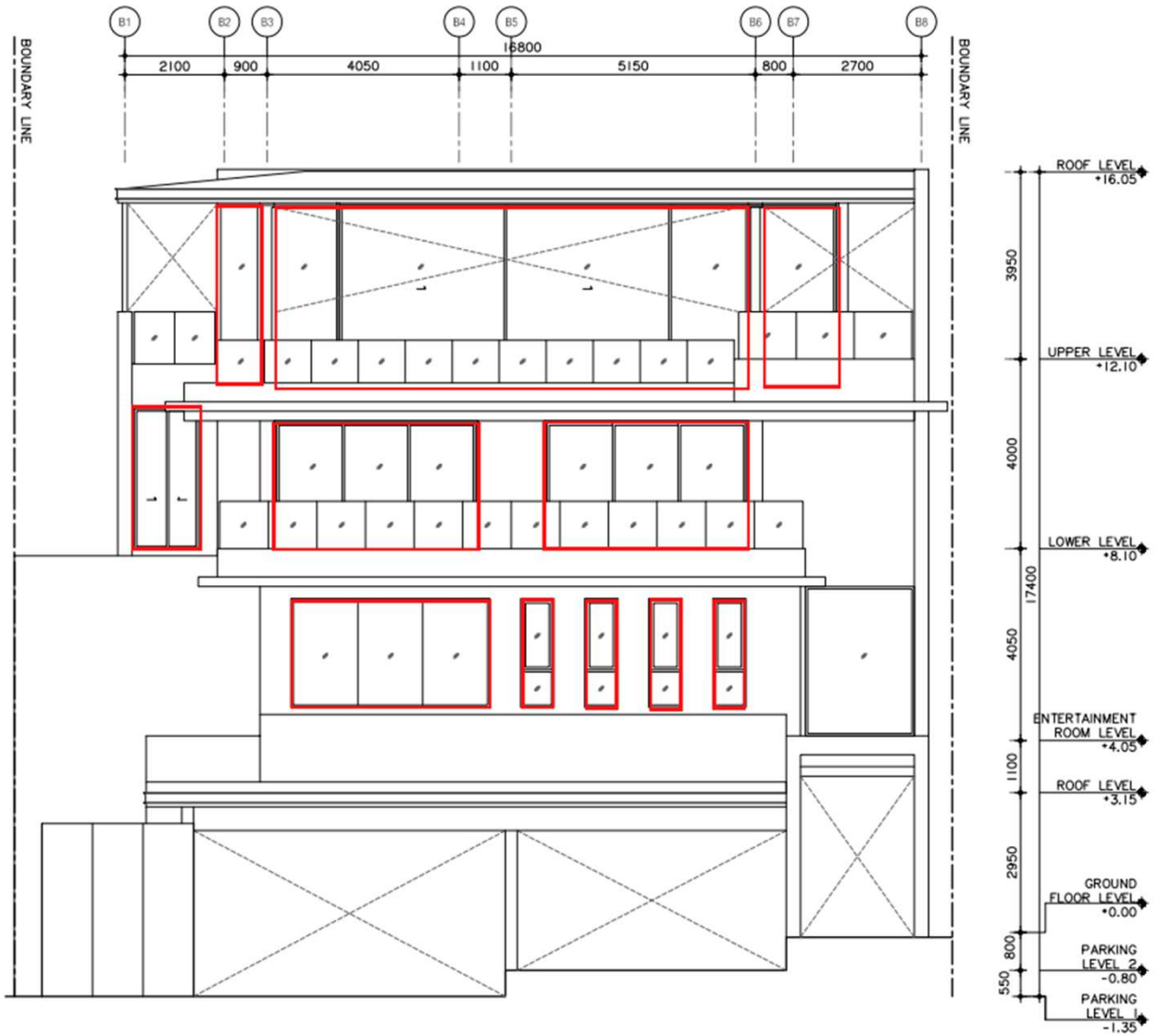
Preliminary Assessment – La Vista Villas



TYPE B

TYPE B - WINDOW TO WALL RATIO

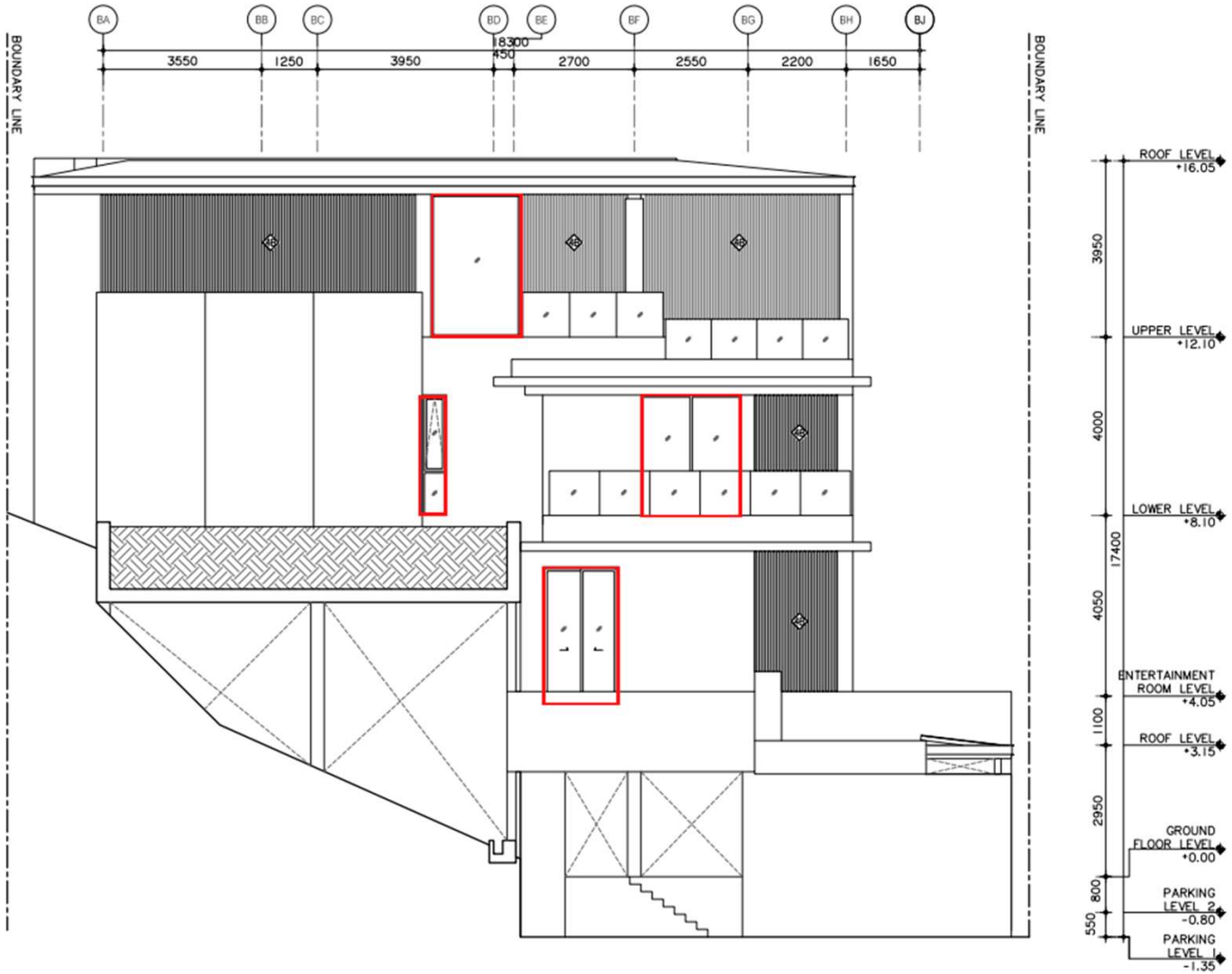
EAST ELEVATION



	Area (m^2)
Window	100.78
Wall	209.19
WWR_E = 48.18%	

TYPE B - WINDOW TO WALL RATIO

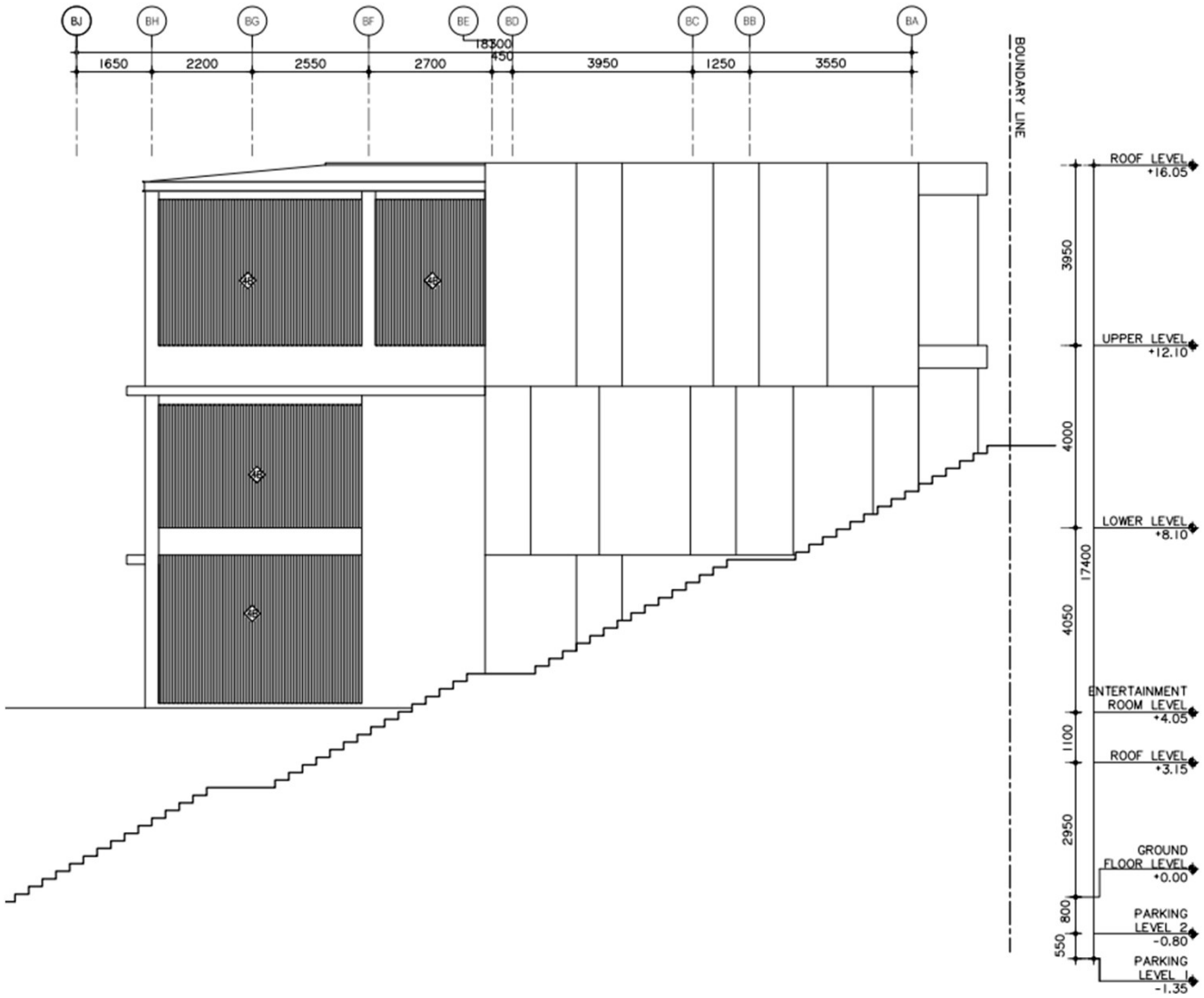
SOUTH ELEVATION



	Area (m^2)
Window	27.21
Wall	226.68
WWR_N = 12.00 %	

TYPE B - WINDOW TO WALL RATIO

NORTH ELEVATION



	Area (m^2)
Window	6.08
Wall	196.52
WWR_W = 5.69%	

TYPE B - WINDOW TO WALL RATIO

WEST ELEVATION

	Area (m^2)
Window	36.65
Wall	127.65
WWR_S =28.71 %	

TYPE B - WINDOW TO WALL RATIO

WWR (%)				
No.	**Orientation**	**Total Wall Area (m^2)**	**Total Window Area (m^2)**	**WWR (%)**
1	North	196.52	6.08	3.09
2	South	226.68	27.21	12.00
3	East	209.19	100.78	48.18
4	West	127.65	36.65	28.71
Tổng		**760.03**	**170.71**	**22.46**

ENERGY SAVINGS
TYPE B

Technical Information		
Criteria	**Energy Efficiency**	**Current Design**
HME01	Reduced WWR	WWR = 22.46%
HME04	External Shading Device	AASF = 0.28
HME05	Insulation of Roof	Reinforced Concrete -150mm **Rockwool Layer – 50mm** Cement Mortar – 50 mm U-value = 1.64W/m^2K
HME06	Insulation of External Walls	AAC Blocks – 90mm Cerment mortar – 10mm U-value = 1.59W/m^2K
HME10*	Ceiling Fans in All Habitable Rooms	No
HME011	Air Conditioning System	**COP = 3.50**
HME16-17	Energy saving light bulbs	LED
Energy Efficiency(%)		**55.26%**

WATER SAVINGS
TYPE B

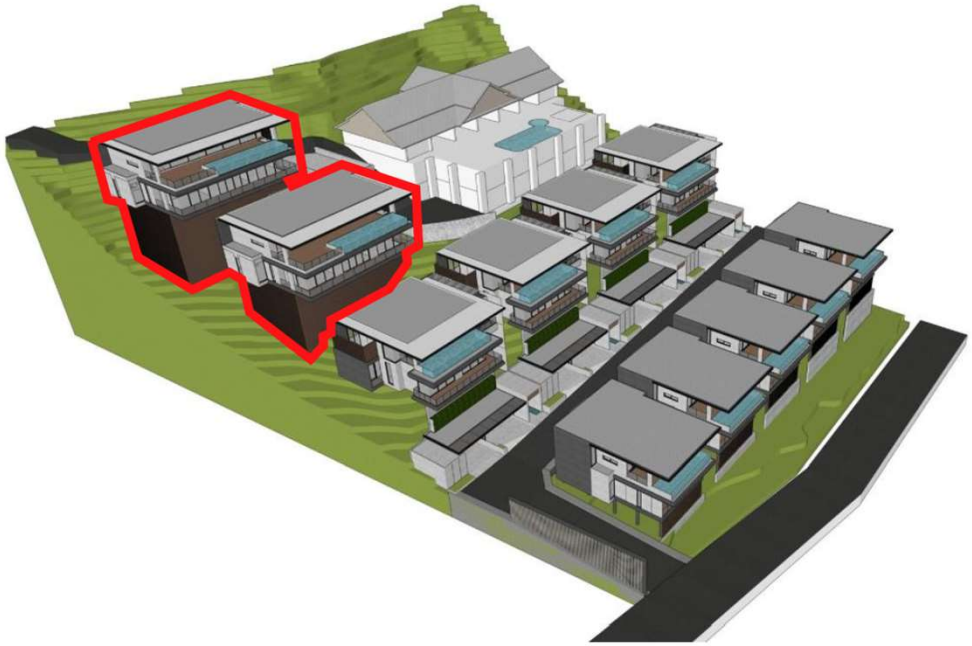
Technical Informaton		
Criteria	**Water Efficiency**	**Curent Design**
HMW01	Low-flow Showerheads	**7.5 L/min**
HMW02	Low-flow Faucets for Kitchen Sinks	**5.10 L/min**
HMW03	Low-flow Faucets in All Bathrooms	**7.90 L/min**
HMW04	Dual Flush for Water Closets in All Bathrooms	**4.50 - 3.00 L/flush**
Water Efficiency (%)		**26.33%**

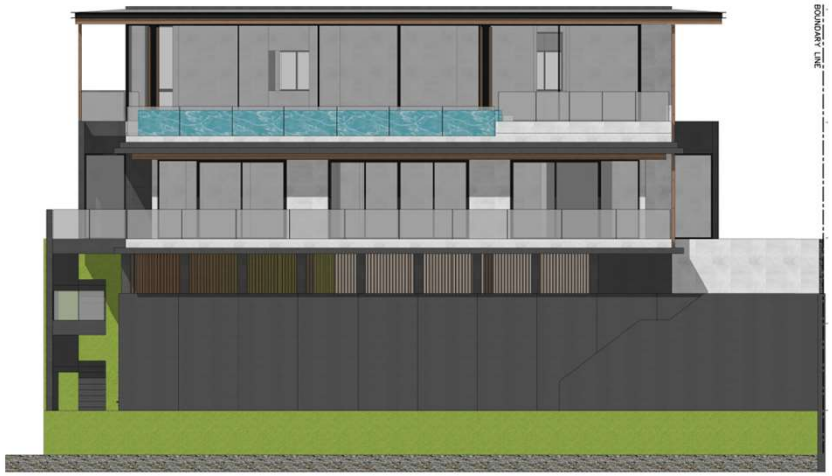
Note:
(*) Based on Water fixture used for Type A

LESS EMBODIED ENERGY IN MATERIALS
TYPE B

Technical Information		
Criteria	**Material Efficiency**	**Current Design**
HMM01*	Floor Slabs	Thickness = 300mm Steel Rebar = 30.00kg/m2
HMM02*	Roof Construction	Reinforced Concrete Slab- 100% Thickness = 230mm Steel Rebar = 30.00kg/m2
HMM03	External Walls	AAC Blocks - 90mm - 100%
HMM04	Internal Walls	Common Brick - 90mm - 100%
HMM05	Flooring	Ceramic tiles – 83.27% Wooden – 16.73%
HMM06*	Window Frame	Aluminium - 100%
HMM07	Wall Insulation	No Insulation
HMM08	Roof Insulation	Rockwool – 50mm
Material Efficiency (%)		**31.40%**

Preliminary Assessment – La Vista Villas





TYPE C

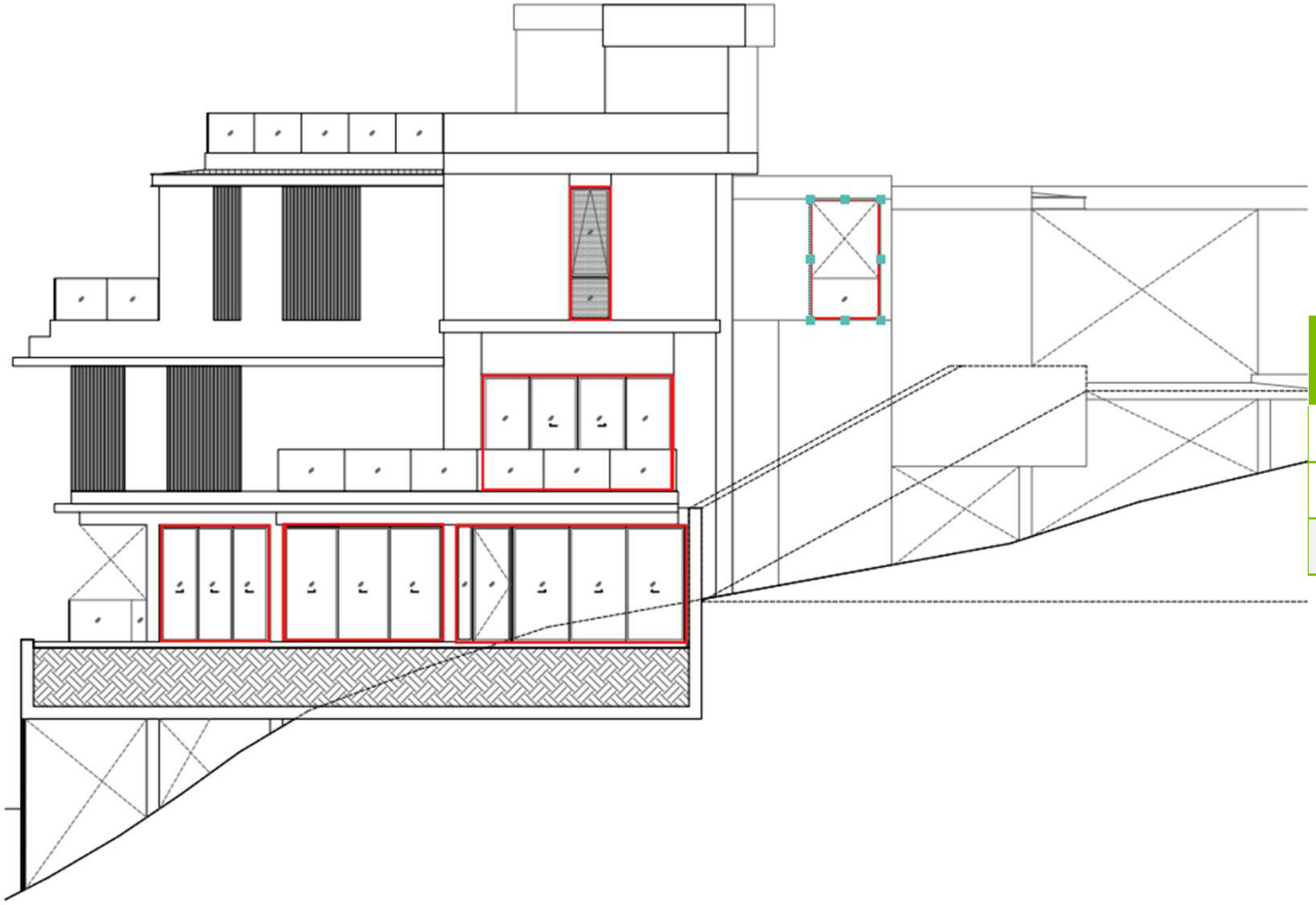
TYPE C - WINDOW TO WALL RATIO

EAST ELEVATION

	Area (m^2)
Window	101.45
Wall	312.45
WWR_E = 43.77%	

TYPE C - WINDOW TO WALL RATIO

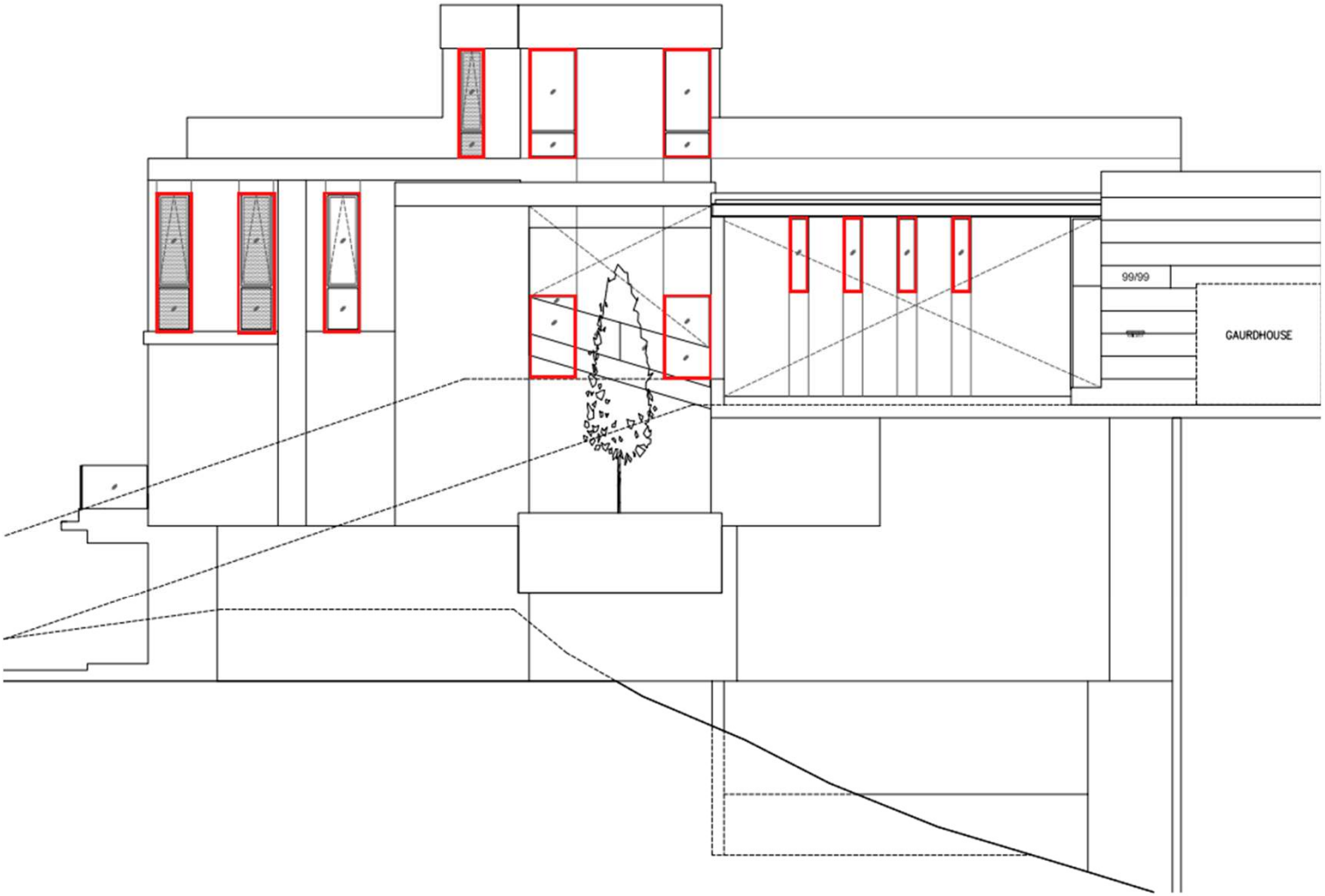
NORTH ELEVATION



	Area (m^2)
Window	22.61
Wall	149.84
WWR_N = 15.09%	

TYPE C - WINDOW TO WALL RATIO

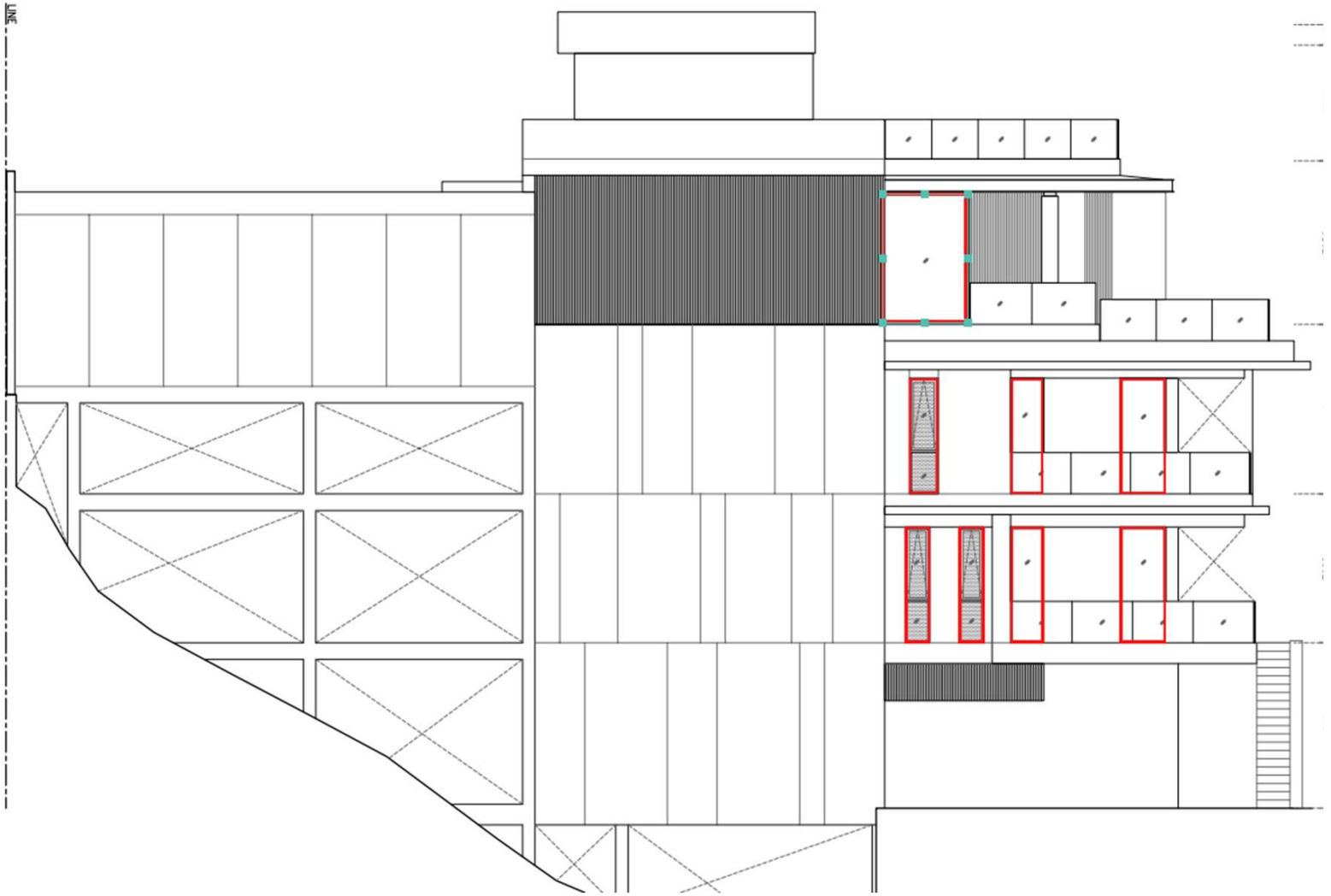
WEST ELEVATION



	Area (m^2)
Window	12.31
Wall	154.14
WWR_W = 7.99%	

TYPE C - WINDOW TO WALL RATIO

SOUTH ELEVATION



	Area (m^2)
Window	22.84
Wall	171.87
WWR_S = 17.78%	

TYPE C - WINDOW TO WALL RATIO

WWR (%)				
No.	**Orientation**	**Total Wall Area (m^2)**	**Total Window Area (m^2)**	**WWR (%)**
1	North	203.61	52.04	25.56
2	South	244.95	45.15	18.43
3	East	241.16	192.99	80.02
4	West	266.38	29.50	11.07
Tổng		**956.10**	**319.68**	**33.44**

ENERGY SAVINGS
TYPE C

Technical Information		
Criteria	**Energy Efficiency**	**Current Design**
HME01	Reduced WWR	WWR = 33.44%
HME04	External Shading Device	AASF = 0.35
HME05	Insulation of Roof	Reinforced Concrete - 230mm **Rockwool Layer – 50mm** Cement Mortar – 50 mm U-value = 3.06 W/m^{2}K
HME06	Insulation of External Walls	AAC Blocks – 90mm Cerment mortar – 10mm U-value = 1.59W/m^{2}K
HME10*	Ceiling Fans in All Habitable Rooms	No
HME011	Air Conditioning System	**COP = 3.50**
HME16-17	Energy saving light bulbs	LED
Energy Efficiency(%)		**54.87%**

WATER SAVINGS
TYPE C

Technical Informaton		
Criteria	**Water Efficiency**	**Curent Design**
HMW01*	Low-flow Showerheads	**7.5 L/min**
HMW02*	Low-flow Faucets for Kitchen Sinks	**5.10 L/min**
HMW03*	Low-flow Faucets in All Bathrooms	**7.90 L/min**
HMW04*	Dual Flush for Water Closets in All Bathrooms	**4.50 - 3.00 L/flush**
Water Efficiency (%)		**26.33%**

Note:
(*) Based on Water fixture used for Type A

LESS EMBODIED ENERGY IN MATERIALS
TYPE C

Technical Information		
Criteria	**Material Efficiency**	**Curent Design**
HMM01*	Floor Slabs	Thickness = 300mm Steel Rebar = 30.00kg/m2
HMM02*	Roof Construction	Reinforced Concrete Slab- 100% Thickness = 230mm Steel Rebar = 30.00kg/m2
HMM03	External Walls	AAC Blocks - 90mm - 100%
HMM04	Internal Walls	Common Brick - 90mm - 100%
HMM05	Flooring	Ceramic tiles – 73.99% Wooden – 26.01%
HMM06*	Window Frame	Aluminium - 100%
HMM07	Wall Insulation	No Insulation
HMM08	Roof Insulation	Rockwool – 50mm
Material Efficiency (%)		**24.11%**

Note:
(*) Assumption are made by Ardor

CHALONG LUXURY VILLAS - SUMARY

TYPE	OPTION	ENERGY SAVING (%)	WATER SAVING (%)	MATERIAL EMBODIED ENERGY SAVING (%)	RESULT
TYPE A	CURRENT DESIGN	49.02	26.33	33.30	EDGE ADVANCED
TYPE B	CURRENT DESIGN	55.26	26.33	31.40	EDGE ADVANCED
TYPE C	CURRENT DESIGN	54.87	26.33	24.11	EDGE ADVANCED

INTERIM REPORT
EDGE (IFC, WORLD BANK GROUP)

THANK YOU

ARDOR GREEN (LEED / LOTUS / EDGE / FITWEL)

- BOARD MEMBER OF VIETNAM GREEN BUILDING COUNCIL
- VICE PRESIDENT OF HCMC GREEN
- SINTALI-SGS EDGE EXPERT

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