GREEN BUILDING CONSULTANCY
EDGE CERTIFICATION - IFC, WORLD BANK GROUP

LA VISTA VILLAS

EDGE Homes Technical Specifications

Revision 01. Dated 18.05.2022

ARDOR GREEN

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EDGE CERTIFICATION - IFC, WORLD BANK

La VISTA VILLAS , THAILAND

Document:	**EDGE Homes Technical Specifications**
To:	Ms. Anna Danshina - Director of Operations
Address:	Phuket, Thailand
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CONTENT

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CATEGORY

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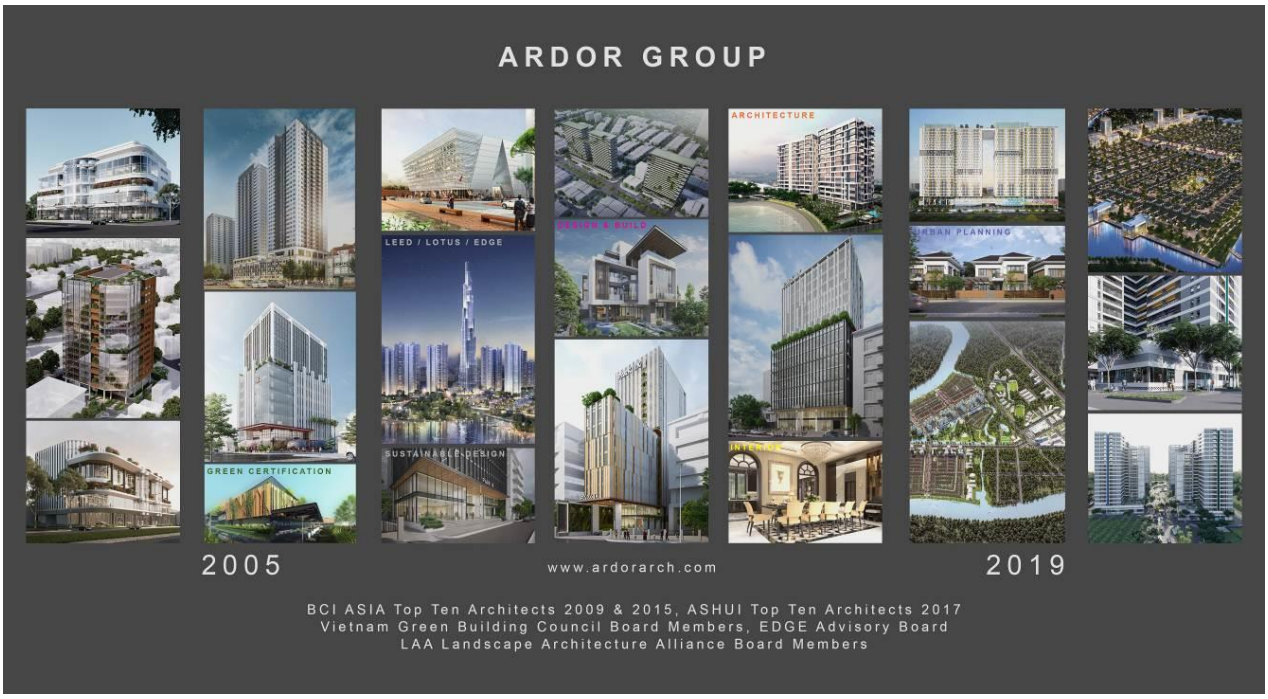
ABOUT US

ARDOR GREEN was an early adopter and leader in sustainable design in Vietnam and currently consults on green building certifications under LEED, LOTUS, and EDGE protocols. Other services include feasibility studies on green building potential, presentations on green building for a wide variety of audiences, full 12-month building energy simulations, HVAC analysis, and sustainable and efficient materials and equipment recommendations. We are currently consulting on the tallest LEED green building certification project for new construction in the world: Landmark 81, HCMC, Vietnam.

We are led by its mission to assist its clients in achievig their highest possible sustainability goals. This typically includes green design including site development, energy efficiency, renewable energy, water efficiency, indoor environment quality, and environmentally sustainable materials. ARDOR's team of both local Vietnamese and international experts (USA, Australia, and South Africa) is ready to assist you. Staff green building project experience extends back to 1995 and includes high tech manufacturing, heathcare, education, F&B, public housing, commercial offices, and residential.



We are highly value and thank you for this opportunity to be a part of your project team. For more information, visit www.ardorarch.com & www.nangluchdxd.xaydung.gov.vn (no. 3770).

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ENERGY

E05*	INSULATION OF ROOF
E06*	INSULATION OF EXTERNAL WALLS
E10*	CEILING FANS IN ALL HABITABLE ROOMS
E15*	VARIABLE REFRIGERANT VOLUME (VRV) COOLING SYSTEM - COP
E33	ENERGY SAVING LIGHT BULBS

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E05* - INSULATION OF ROOF

Mapped to: **HME05**

ARCH LD STR MEP CONS

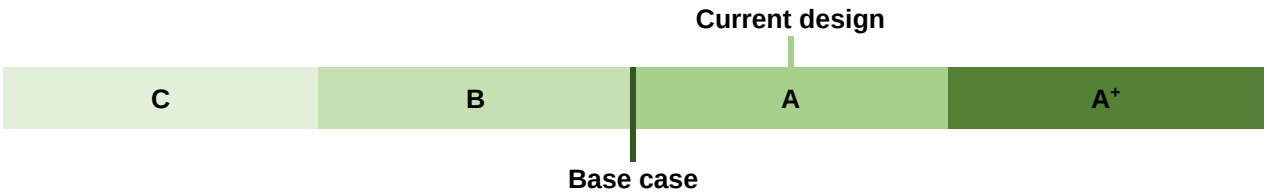
POTENTIAL STRATEGIES

Insulating the roof is potentially the most cost-effective way to reduce the energy used for heating a building. Therefore, in cold or temperate climates there is a strong case for maximizing the insulation before designing the heating ventilation and air conditioning equipment. In hot climates insulating the roof can reduce heat gain, but the effect is relatively minor.

SPECIFICATION

Project Data:

Base case	U = 2.54 W/m²K
Suggested improved case	U < 2.54 W/m²K
Current design	U = 1.65 W/m²K



Different types of insulation are available, and the appropriate type will depend on the application as well as cost and availability. Insulation types can be grouped into four main categories, as shown in table below

Insulation types and typical conductivity range		
Insulation Type	**Thickness**	**Typical Conductivity Range (λ - K Value)**
Matting, Blanket, or Quilt Insulation	This type of insulation is sold in rolls of different thicknesses and is typically made from mineral wool (fiber made from glass or rock). Some common uses include insulating empty lofts, stud walls, and under suspended timber floors. Other materials such as sheep's wool are also available.	0.034 -0.044
Loose-fill Material	Loose-fill material, made of cork granules, vermiculite, mineral wool, or cellulose fiber is usually poured between the joists to insulate lofts. It is ideal for loft spaces with awkward corners or obstructions, or if the joists are irregularly spaced.	0.035 - 0.055
Blown Insulation	Blown insulation is made from cellulose fibers or mineral wool. Spray foam insulation is made from Polyurethane (PUR). Blown insulation should only be installed by professionals, who use special equipment to blow the material into a specific, sectioned-	0.023 - 0.046

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	off area, to the required depth. The material may remain loose if used for loft insulation, but can also bond to a surface (and itself) for insulating stud walls and other spaces.	
Rigid Insulation Boards	Rigid insulation boards are mostly made from foamed plastic such as polystyrene, polyurethane (PUR), or polyisocyanurate (PIR), which can be used to insulate walls, floors, and ceilings. PUR and PIR board are among the best insulation materials commonly used, and so are useful where space is limited. Rigid board must be cut to size, so fitting is often a skilled job.	0.020 - 0.081

For example:

Thickness of insulation required to achieve a U Value of 1.65 W/m² K	
Insulation Type	**Thickness (mm)**
01. Vacuum insulated panels	5 - 10
02. Polyurethane (PU)	20 - 30
03. Polyisocyanurate (PIR)	15 - 20
04. Phenolic foam (PF)	30 - 40
05. Expanded polystyrene	20 - 30
06. Extruded polystyrene	40 - 50
07. Wool and fiber	50 - 60

SUGGESTED PRODUCTS (BY RDM)

Type	Brand	Picture
XPS Foam	**Siam P&T**	

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E06* - INSULATION OF EXTERNAL WALLS

Mapped to: **HTE04**

ARCH LD STR MEP CONS

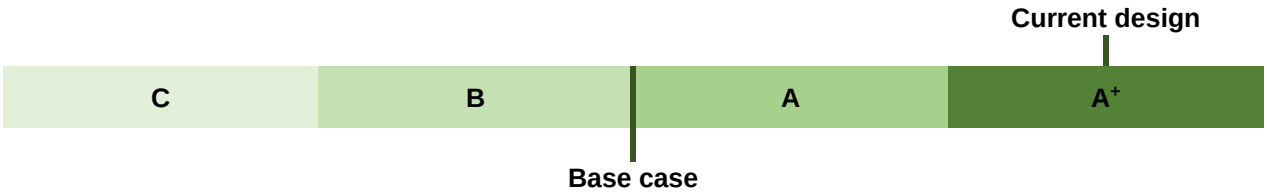
POTENTIAL STRATEGIES

Insulating the external walls is potentially the most cost-effective way to reduce the energy used for heating a building. Therefore, in cold or temperate climates a strong case can be made for maximizing the insulation before designing the heating ventilation and air conditioning equipment. In hot climates insulating the wall can reduce heat gain, but the effect is relatively minor.

SPECIFICATION

Project Data:

Base case	U = 1.86 W/m²K
Suggested improved case	U < 1.86 W/m²K
Current design	U = 1.09 W/m²K (AAC brick 75mm)



Type of Brick	
Type	**U-value *(W/m²K)***
01. Brick, concrete block	2.31-2.98
02. Brick, fired clay	2.71-3.10
03. Brick, hollow clay tile	2.05
04. Brick AAC blocks	1.09

SUGGESTED PRODUCTS (BY RDM)

Type of material	Brand	Picture
AAC Blocks	**Q-con**	

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E10* - CEILING FANS IN ALL HABITABLE ROOMS

Mapped to: **HME10**

ARCH LD STR **MEP** **CONS**

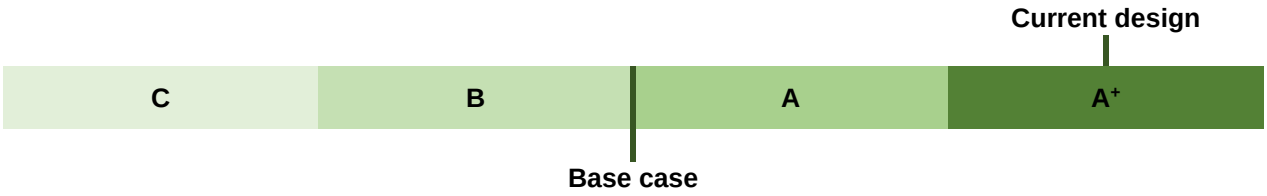
POTENTIAL STRATEGIES

Ceiling fans are normally used to reduce cooling energy requirements by creating greater air movement in rooms. The increased air movement results in occupants feeling comfortable at a relatively higher temperature
set point. To have this effect, the fan must be installed with the raised edge of the blade on the leading edge. The movement of the fan pulls the air towards the ceiling. In cooling mode, the effect is on perceived comfort, so if a room is unoccupied the fans should be switched off to avoid the waste of energy. Ceiling fans can also be used to reduce heating requirements by reducing stratification of the warmer air that tends to rise to the ceiling. In this mode, the raised edge of the blades should be at the trailing edge. The movement of the fan pushes the warm air down towards the room. Fans often have a switch to change from cooling to heating mode, which works by reversing the direction of rotation of the fan motor.

SPECIFICATION

Project Data:

Base case	Not Installed
Suggested improved case	Installed
Current design	Installed Living room: 3 fans, 1.6m diameter Bed room: 1 fan, 1.6m diameter



SUGGESTED PRODUCTS (BY RDM)

Type	Brand	Picture
Ken solid wood 60”	**Mr.Ken**	

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E15* - VARIABLE REFRIGERANT VOLUME (VRV) COOLING SYSTEM

Mapped to: **HTE09**

ARCH LD **STR** **MEP** **CONS**

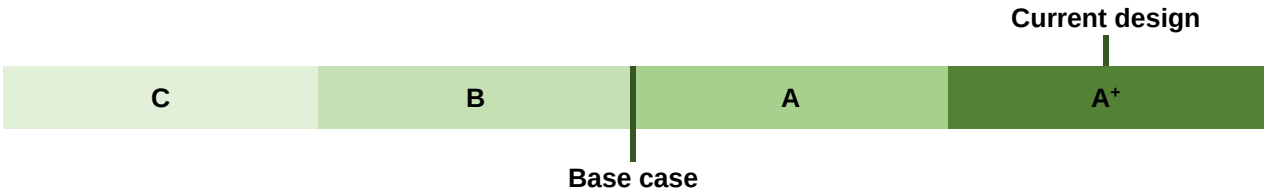
POTENTIAL STRATEGIES

A Variable Refrigerant Flow (VRF) system uses refrigerant as the medium for heat transfer. These systems have one condensing unit with multiple indoor units, each of which can be individually controlled. The system runs by modulating the amount of refrigerant that is sent to each evaporator, running only at the rate needed to deliver the cooling required by each internal unit. VRF systems may be the best for buildings with multiple zones or a wide variance in cooling or heating loads across many different internal zones requiring individual control such as offices, retail buildings, education, healthcare buildings, or hotels and resorts. The outdoor units can be fitted to as many as 48 internal units. Due to the way in which the internal units are connected to the external unit, a breakdown of one internal unit will not compromise the rest of the system. The outdoor units can vary the speed of the compressors and operate in a range of 6% to 100% capacity. Multiple outdoor units can be used if an even greater range of capacity is required.

SPECIFICATION

Project Data:

Base case	COP = 3.50
Suggested improved case	COP > 3.50
Current design	COP = 3.93



Some minimum efficiencies specified by ASHRAE 90.1-2016 are listed in table below, with the Variable Refrigerant Flow (VRF) system highlighted. Note that these are for comparative illustration only; the ASHRAE standard contains several COP values for each system type depending on the details of the equipment such as the capacity and technology.

Type of Cooling System (Air Conditioning)	COP
Through the wall, air-cooled, packaged and split < 9 kW	3.51
Air-cooled, split < 19 kW	3.81
Air-cooled, single package < 19kW DX and heat pumps	4.10
Water-cooled, split and single package < 19kW	3.54
PTAC and PTHP, standard size, all capacities In equation, Capacity = 2.1 kW < Capacity < 4.4.kW	4.10 – (0.300 × Capacity/1000)

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Variable Refrigerant Flow, air-cooled, cooling mode < 19 kW	3.81
Variable Refrigerant Flow, water source, cooling mode < 19kW	3.52
Variable Refrigerant Flow, groundwater source, cooling mode < 40kW	4.75
Variable Refrigerant Flow, ground source, cooling mode < 40kW	3.93
Air Cooled Chiller < 528 kW	2.985 at Full Load (FL) 4.048 at Part Load (IPLV)
Air Cooled Chiller > 528 kW	2.985 at Full Load (FL) 4.137 at Part Load (IPLV)
Water Cooled Chiller, positive displacement <264 kW (Positive displacement = reciprocating, screw and scroll compressors)	4.694 at Full Load 5.867 at Part Load (IPLV)
Water Cooled Chiller, centrifugal < 528 kW	5.771 at Full Load 6.401 at Part Load (IPLV)

SUGGESTED PRODUCTS (BY RDM)

Type	Brand	Picture
Variable Refrigerant Flow **Type A: AVWT-136CKFSE** **Type B: AVWT-190CKFSE** **Type C: AVWT-572CKFSE**	**Hisense**	

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E33 - ENERGY SAVING LIGHT BULBS

Mapped to: **HTE25, HTE26, HTE27.**

ARCH LD STR MEP CONS

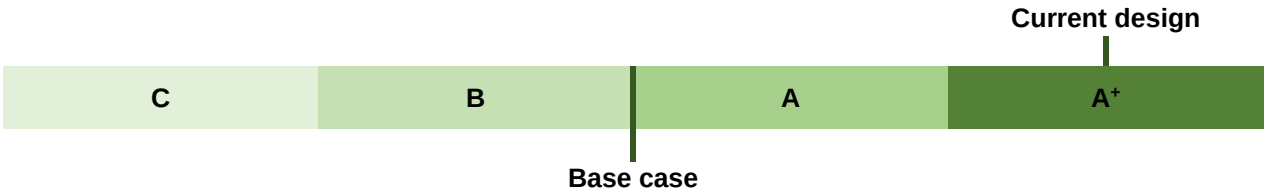
POTENTIAL STRATEGIES

EDGE requires no specific efficacy for CFL, LED or T5 lamps, so the design team only needs to demonstrate that CFL, LED, or T5 lamps have been specified. Both fluorescent (e.g. CFL and T5) and LED bulbs are available with various performance specifications. Other efficient technologies are also available. If another technology is used, documentation must be provided to demonstrate that the light fixtures achieve at least 90 lm/W.

SPECIFICATION

Project Data:

Base case	Conventional light bulbs
Suggested improved case	LED
Current design	LED



Description of technologies (lamp types)	
Lamp Type	**Description**
Compact fluorescent lamps (CFLs)	CFLs are available for most light fittings as a direct replacement for incandescent bulbs. CFLs use a fluorescent tube that has been folded into the shape of the incandescent bulb they have been designed to replace. In comparison to incandescent bulbs, CFLs can last as much as 15 times longer. It should be noted that the service life can be reduced by frequent switching, so CFLs are not always appropriate where lights will be turned on and off frequently. CFLs use only a fraction of the energy of their incandescent alternatives and therefore produce less heat.

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	As with normal fluorescent lamps, CFLs require ballasts in order to operate. Older lamps use magnetic ballasts, but these have largely been replaced with electronic ballasts that operate at a high frequency. Although the efficacy is not affected, electronic ballasts have reduced warm -up times and flickering, which were issues with the earlier CFLs.
Light emitting diode (LED)	LED technology has evolved quickly and there are LED lamps available for most light fittings, and in different color temperatures ranging from warm white to daylight. The efficacy levels of LEDs are much higher than CFLs. The service life of LED lamps can be as much as two to three times the longest life of any available compact fluorescent lamp, and is not affected by frequent on/off cycles. Over the last few years, the performance of LED lamps has improved greatly while prices have dropped sharply, and they are now highly cost-effective.
T5 Lamps	The name of these fluorescent tubes refers to their shape (tubular) and diameter (5 units measured in 1/8s of an inch). T5s have a miniature G5 bi-pin base with 5mm spacing, while T8s and T12s have a G13 bi-pin base with 13mm spacing. Although T8/T12 to T5 conversion kits are available, dedicated T5 luminaires should be specified in new construction projects, as using ballasts designed for T8s and T12s could reduce the service life of T5s

Typical range of efficacies for different lamp types		
Lamp Type	**Typical Range of Efficacy (Lumens/Watt)**	**Rated lifetime (hours)**
Incandescent Tungsten Filament	10-19	750-2,500
Halogen lamp	14-20	2,000-3,500
Tubular Fluorescent	25-92	6,000-20,000
Compact Fluorescent	40-70	10,000
High Pressure Sodium	50-124	29,000
Metal Halide	50-115	3,000-20,000
Light Emitting Diode (LED)	50-100	15,000-50,000

EDGE does not account for lighting quality, illumination (lux or lumen) levels, or lighting layout. These should be handled by the lighting designer using local or international lighting design code requirements. Light bulbs covered by the EDGE lighting measure exclude safety and security lighting.

SUGGESTED PRODUCTS (BY RDM)

Type	Brand	Picture
Interior downlight	**Lamtitude**	
Adjustable downlight	**Lamtitude**	

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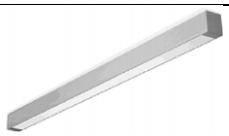
Type	Brand	Picture
Adjustable downlight	**Lamtitude**	
Downlight	**Lamtitude**	
Led strip	**Lamtitude**	
Strip light	**Lamtitude**	
Led tube box	**Lamtitude**	
Downlight	**Lamtitude**	
Steplight	**Lamtitude**	
Underwater lamp	**Lamtitude**	
Downlight	**Lamtitude**	
Wall lamp	**Lamtitude**	
Up light	**Lamtitude**	

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WATER

W01*	LOW-FLOW SHOWERHEADS
W02*	LOW-FLOW FAUCETS FOR KITCHEN SINKS
W03*	LOW-FLOW FAUCETS IN ALL BATHROOMS
W04*	DUAL FLUSH FOR WATER CLOSETS

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W01* - LOW-FLOW SHOWERHEADS

Mapped to: **HMW01.**

ARCH *Kiến trúc* | LD *Cảnh quan* | STR *Kết cấu* | **MEP** *Điện nước* | **CONS** *Thi công*

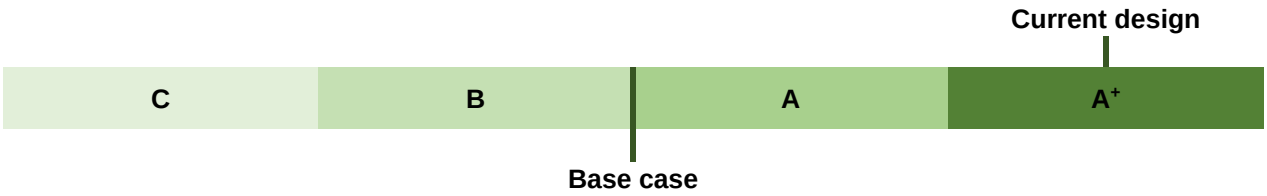
POTENTIAL STRATEGIES

Many different showerheads are available that meet the flow rate required. In order to maintain user satisfaction at the lower flow rates, some manufacturers mix water with air to cause turbulence in the flow; this in turn gives an increased sense of pressure without increasing the flow rate.

SPECIFICATION

Project Data:

Base case	Flowrate = 12.0 litres/minute
Suggested improved case	Flowrate = 8.00 litres/minute
Current design	Flowrate = 6.65 litres/minute



SUGGESTED PRODUCTS (BY RDM)

Water fixture	Brand	Picture
Showerhead: K-28692T	**Kohler**	
Showerhead: K-99946T-CL	**Kohler**	

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W02* - LOW-FLOW FAUCETS FOR KITCHEN SINKS

Mapped to: **HMW02**

ARCH *Kiến trúc* | LD *Cảnh quan* | STR *Kết cấu* | **MEP** *Điện nước* | **CONS** *Thi công*

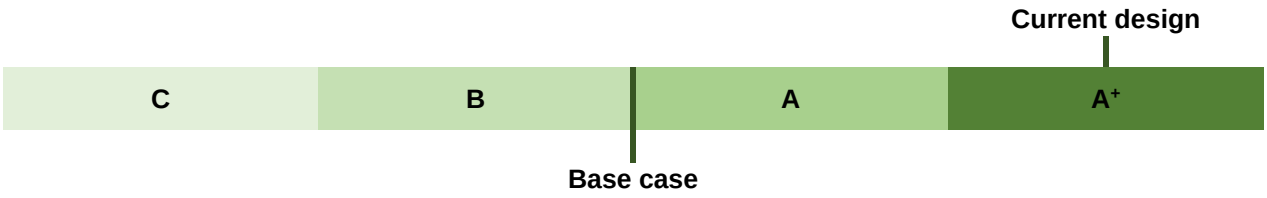
POTENTIAL STRATEGIES

Many different faucets are available that meet the flow rate required. To maintain user satisfaction at the lower flow rates, some manufacturers mix water with air to cause turbulence in the flow; this in turn gives an increased sense of pressure without increasing the flow rate. Flow restrictors or aerators can be added on to the specified faucets to reduce the flow rate, which may be a cheaper alternative to purchasing a low-flow faucet.

SPECIFICATION

Project Data:

Base case	Flowrate = 12.00 litres/minute
Suggested improved case	Flowrate = 10.00 litres/minute
Current design	Flowrate = 5.10 litres/minute



SUGGESTED PRODUCTS (BY RDM)

Water fixture	Brand	Picture
Kitchen faucet: K-74053T	**Kohler**	

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W03* - LOW-FLOW FAUCETS IN ALL BATHROOMS

Mapped to: **HMW03.**

ARCH LD STR MEP CONS

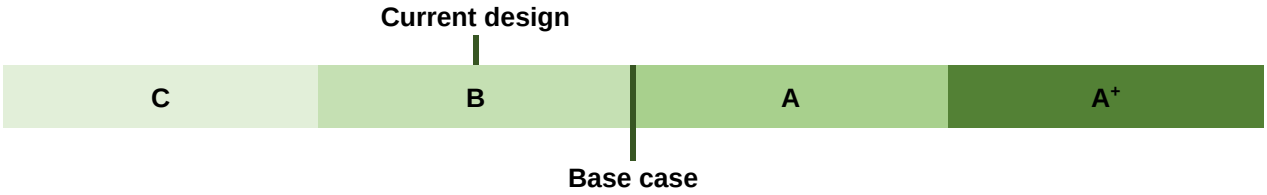
POTENTIAL STRATEGIES

This measure includes two technologies fitted to the faucet – aerators and auto shut-off valves – which must be purchased as one product.
Aerators are small water-saving devices attached to the faucet that maintain user satisfaction at the lower flow rates. They mix water with air to cause turbulence in the flow; this in turn gives an increased sense of pressure without increasing the flow rate. They are also called flow regulators.
Auto shut-off faucets are activated by a push action or electronic sensors that allow the water flow to last for a programmed length of time, usually 15 seconds. After this period the faucet shuts off automatically, which is ideal for public and unsupervised washing areas.
Flow restrictors or aerators can be added on to the specified faucets to reduce the flow rate, which may be a cheaper alternative to purchasing a low-flow faucet.

SPECIFICATION

Project Data:

Base case	8.00 litres/minute
Suggested improved case	6.00 litres/minute
Current design	7.90 litres/minute



SUGGESTED PRODUCTS (BY RDM)

Water fixture	Brand	Picture
Wall-mount lavatory faucet: K-73067X-4	**Kohler**	

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W04* - DUAL FLUSH FOR WATER CLOSETS

Mapped to: **HMW04**

ARCH LD STR MEP CONS

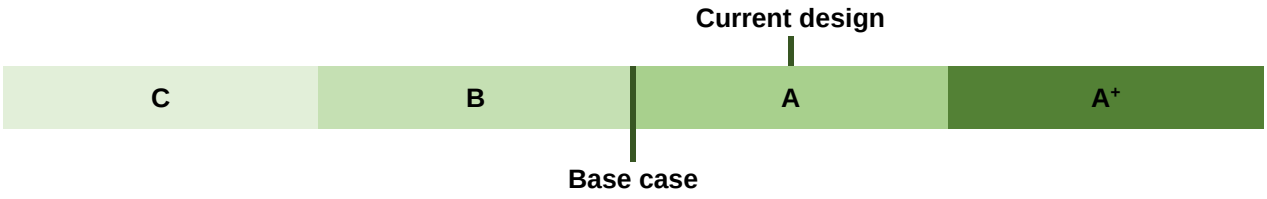
POTENTIAL STRATEGIES

Dual-flush water closets have two flush levers where the smaller volume flush is recommended for liquid waste, and the higher volume flush for solid waste.

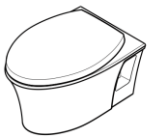
SPECIFICATION

Project Data:

Base case	Flowrate = 8.00 litres/first flush Flowrate = 6.00 litres/first flush
Suggested improved case	Flowrate = 6.00 litres/minute Flowrate = 3.00 litres/first flush
Current design	Flowrate = 4.50 litres/minute Flowrate = 3.00 litres/first flush



SUGGESTED PRODUCTS (BY RDM)

Water fixture	Brand	Picture
Wall-hung toilet with seat: K-31082X-S	**Kohler**	**K-31082X-S** 

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MATERIALS

M03* **EXTERNAL WALLS**

M04* **INTERNAL WALLS**

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M03* - EXTERNAL WALLS

Mapped to: **HMM03**

ARCH LD STR MEP CONS

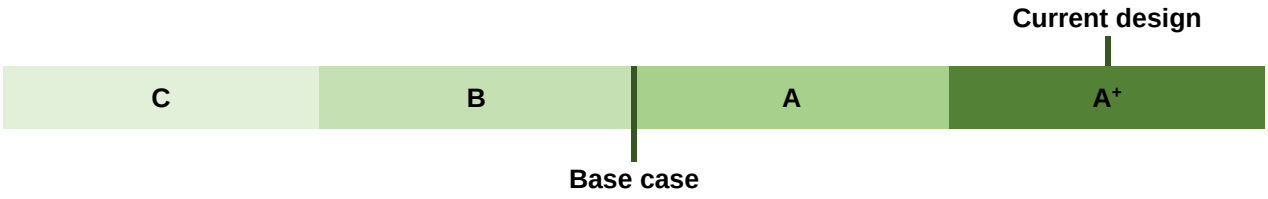
POTENTIAL STRATEGIES

To select an external wall specification with a lower embodied energy than the typical specification. The external walls specification matching the actual building design must be entered in the software.

SPECIFICATION

Project Data:

Base case	Common Brick Wall with Internal & External Plaster, 200mm
Suggested improved case	According to the list of specifications included in EDGE
Current design	Aerated Autoclave Concrete Blocks, 70mm, 73% Facing Brick and Hollow Concrete Blocks, 140mm, 27%



The list of specifications included in EDGE				
Wall type	**Minimum thickness (mm)**	**Default thickness (mm)**	**Maximum thickness (mm)**	**Embodied energy (MJ/m^2)**
01. Common Brick Wall with internal & external plaster	134	200	354	1,616
02. Cored (with holes) bricks with internal & external plaster	134	200	354	814
03. Honeycomb Clay Blocks with internal & external plaster	134	200	354	338
04. Medium Weight Hollow Concrete Blocks	124	200	324	234
05. Solid Dense Concrete Blocks	124	200	324	407
06. Autoclaved Aerated Concrete Blocks	124	200	324	317
07. Fly-Ash Stabilized Soil Blocks	124	200	324	108
08. Compressed Stabilized Earth Blocks	124	200	324	203

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09. GGBS Stabilized Soil Blocks	124	200	324	94
10. Rammed Earth Blocks/Walls	200	200	500	43
11. Precast Concrete Panels	80	200	N/A	907
12. Straw Bale Blocks	200	200	900	63
13. Facing Brick and Timber Stud	200	200	450	1,107
14. Phosphogypsum Panel	200	200	400	218
15. Ferrocement Wall Panel	100	200	200	627
16. In-Situ Reinforced Wall	200	200	400	627
17. Cellular Light Weight Concrete Blocks	200	200	400	232
18. Stone Blocks	200	200	400	2,282
19. FaLG Block	200	200	400	466
20. Steel Profile Cladding	200	200	400	421
21. Aluminium Profile Cladding	200	200	400	862
22. Exposed Brick Wall with internal plaste	200	200	400	1,699
23. Exposed Cored (with holes) bricks with internal plaster	200	200	400	843
24. Facing Brick and Hollow Concrete Blocks	200	200	400	980
25. Facing Brick and Solid Concrete Blocks	200	200	400	1,042
26. Polymeric render on concrete block	200	200	400	181
27. Polymeric render on Brick	200	200	400	1,171
28. Precast Concrete Sandwich panel	200	200	400	672
29. Brick faced precast concrete sandwich panel	200	200	400	1,150
30. Stone faced precast concrete sandwich panel	200	200	400	855
31. Glass fiber reinforced concrete cladding	100	200	200	505

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32. Stone Profile Cladding	100	200	200	501
33. Cement Fibre Boards on Metal Studs	100	200	200	241
34. Cement Fibre Boards on Timber Studs	100	200	200	67
35. Timber Weatherboard on Timber Studs	100	200	200	89
36. UPVC Weatherboard on timber studs	100	200	200	117
37. Clay tiles cladding (or 'Terracotta rainscreen cladding') on metal studs	100	200	200	435
38. Plasterboards on timber studs	100	200	200	102
39. Plasterboards on metal studs	100	200	200	259
40. Curtain walling (opaque element)	100	100	200	1,204
41. 3-D Wire panel with 'shot-crete' both sides	150	200	270	281
42. Aluminum-clad sandwich panel	50	100	200	743
43. Steel-clad sandwich panel	50	100	200	268
44. Re-use of Existing Wall	N/A	N/A	N/A	0
45. Stone Blocks – Hand Cut	200	200	400	239
46. Stone Blocks – Machine Cut and Unpolished	200	200	400	450

- Compare AAC bricks and baked clay bricks, normal red bricks:

Parameter	Autoclaved Aerated	Cored (with holes) bricks	Compare
Density (kg / m3)	500 - 650	1050 - 1150	Reduce structural costs
Compressive strength (Mpa)	3.5 - 4	3 - 8	The compressive strength is more uniform and more stable
Thermal conductivity coefficient (W / m.k)	0.18	1.15	Better insulation
Production materials	Cement, sand, lime, plaster & additives	Clay	Environmentally friendly, recyclable and good for health
Acoustical reduction factor (db)	+38 db	+28 db	Better soundproofing
Fireproof (hours)	4 giờ	1-2 giờ	Safer

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Accuracy (mm)	±1-2	±5	Finishing is easier
Mortars	Dedicated, thin circuit from 1-3 mm	Mixing at construction sites, circuits> 10mm	Reduce construction operations, increase adhesion, save supplies
Number of bricks / m3	83	650	Increase productivity and build speed
Performance (m2 / day / labor)	25	8	Fast construction speed 2-3 times
Loss ratio (cracked, broken, broken)	< 1%	5 – 10%	Reduce damage, easy transportation
Production technology	No burning, autoclave	Burning > 1000oC	Environmentally friendly

Type of material	Density (kg/m^3)	Thermal conductivity coefficient (W/m-K)	Wall section, excluding coating material	
			0.1	0.2
			U value (W/m2-K)	
In-Situ Reinforced Wall	2400	1.55	4.26	3.34
Debris stone concrete	2200	1.28	4.03	3.07
Light weight concrete	1500	0.70	2.42	1.52
Polystyrol	1000	0.40	2.38	1.49
Gypsum slag concrete	1000	0.37	0.37	1.41
Common Brick Wall	2000	0.93	3.60	2.60
Cored (with holes) bricks	1600	0.70	3.20	2.19
AAC	500	0.13	1.30	0.65

SUGGESTED PRODUCTS

Type of material	Brand	Picture
AAC Blocks	**Q-con**	

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M04* - INTERNAL WALLS

Mapped to: **HTM03**

ARCH LD STR MEP CONS

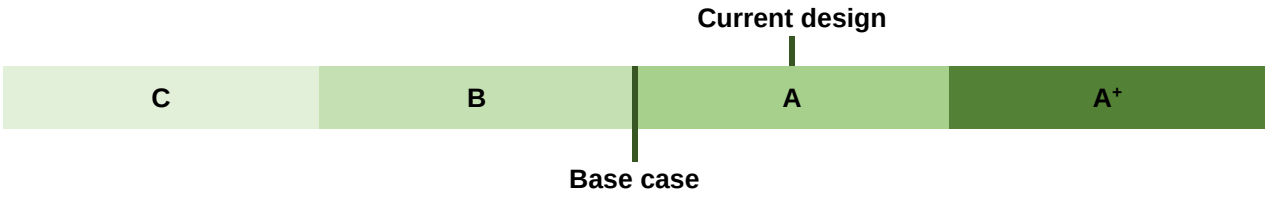
POTENTIAL STRATEGIES

To select an internal wall specification with a lower embodied energy than the typical specification. The internal wall specifications matching the actual building design must be entered in the software in all cases.

SPECIFICATION

Project Data:

Base case	Common Brick Wall with Internal & External Plaster, 200 mm
Suggested improved case	According to the list of specifications included in EDGE
Current design	Common Brick, 85.30 mm



The list of specifications included in EDGE				
Wall type	**Minimum thickness (mm)**	**Default thickness (mm)**	**Maximum thickness (mm)**	**Embodied energy (MJ/m^2)**
01. Common Brick Wall with plaster both side	100	100	354	725
02. Cored (with holes) bricks with plaster both side	100	100	354	379
03. Honeycomb Clay Blocks with plaster both side	100	100	354	173
04. Medium Weight Hollow Concrete Blocks	100	100	324	128
05. Solid Dense Concrete Blocks	100	100	324	203
06. Autoclaved Aerated Concrete Blocks	100	100	324	174
07. Fly-Ash Stabilized Soil Blocks	100	100	324	84
08. Compressed Stabilized Earth Blocks	100	100	324	125

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09. GGBS Stabilized Soil Blocks	100	100	324	78
10. Rammed Earth Blocks/Walls	100	100	500	58
11. Precast Concrete Panels	80	100	150	518
12. Straw Bale Blocks	100	100	900	88
13. Ferrocement Wall Panel	100	100	200	369
14. In-Situ Reinforced Wall	100	100	400	369
15. Cellular Light Weight Concrete Blocks	100	100	400	128
16. Stone Blocks	100	100	400	1,249
17. FaLG Block	100	100	400	228
18. Common Brick Wall no finish	100	100	400	891
19. Cored (with holes) bricks no finish	100	100	400	436
20. Precast Concrete Sandwich panel	100	100	400	283
21. Cement Fibre Boards on Metal Studs	100	100	200	265
22. Cement Fibre Boards on Timber Studs	100	100	200	91
23. Plasterboards on timber studs	100	100	200	150
24. Plasterboards on timber studs with insulation	100	100	200	175
25. Plasterboards on metal studs	100	100	200	324
26. Plasterboards on metal studs with insulation	100	100	200	353
27. 3-D Wire panel with 'shot-crete' both sides	100	100	270	305
28. 3-D Wire panel with 'shot-crete' both sides -- with insulation	100	100	270	387
29. Re-use of Existing Wall	N/A	N/A	N/A	0
30. Stone Blocks – Hand Cut	100	100	400	162
31. Stone Blocks – Machine Cut and Unpolished	200	200	400	450

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