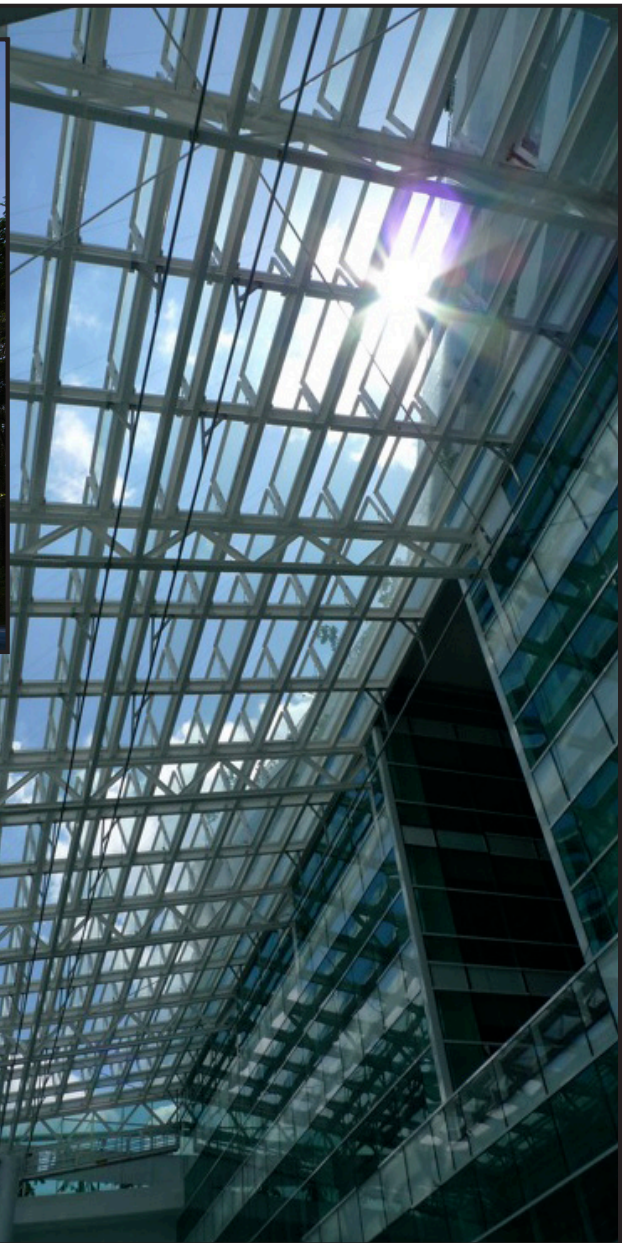


• designing for energy & water cost savings

Solaris, Singapore (Green Mark Platinum)



annual energy savings

Items	Baseline	Proposed	Saving
1. AHU and FCU Fans	2,861.45 MWh/yr	1,313.58 MWh/yr	54.09%
2. Split Cooling Unit	5.14 MWh/yr	3.96 MWh/yr	23.01%
3. Mechanical Fans	699.87 MWh/yr	98.95 Wh/yr	65.79%
4. Chilled Water Pumps	239.50 MWh/yr	43.54 MWh/yr	58.68%
5. Domestic Pump	43.54 MWh/yr	43.54 MWh/yr	0%
6. Exterior Lighting	191.39 MWh/yr	65.21 MWh/yr	65.93%
7. Office Receptacle	1,845.84 MWh/yr	1,845.84 MWh/yr	0%
8. Retail Receptacle	41.14 MWh/yr	41.01MWh/yr	0%
9. Water Heater	17.33 MWh/yr	17.32 MWh/yr	0%
10. Lifts	647.62 MWh/yr	582.86 MWh/yr	10%
11. Lighting	2,348.98 MWh/yr	1,410.84 MWh/yr	39.92%
Total	8,940.98 MWh/yr	5,662.52 MWh/yr	36.67%
Cooling Load Reduction	1,998.55 tons	1,667.65 tons	16.56%

daylight central atrium



continuous vertical linear park

annual water savings

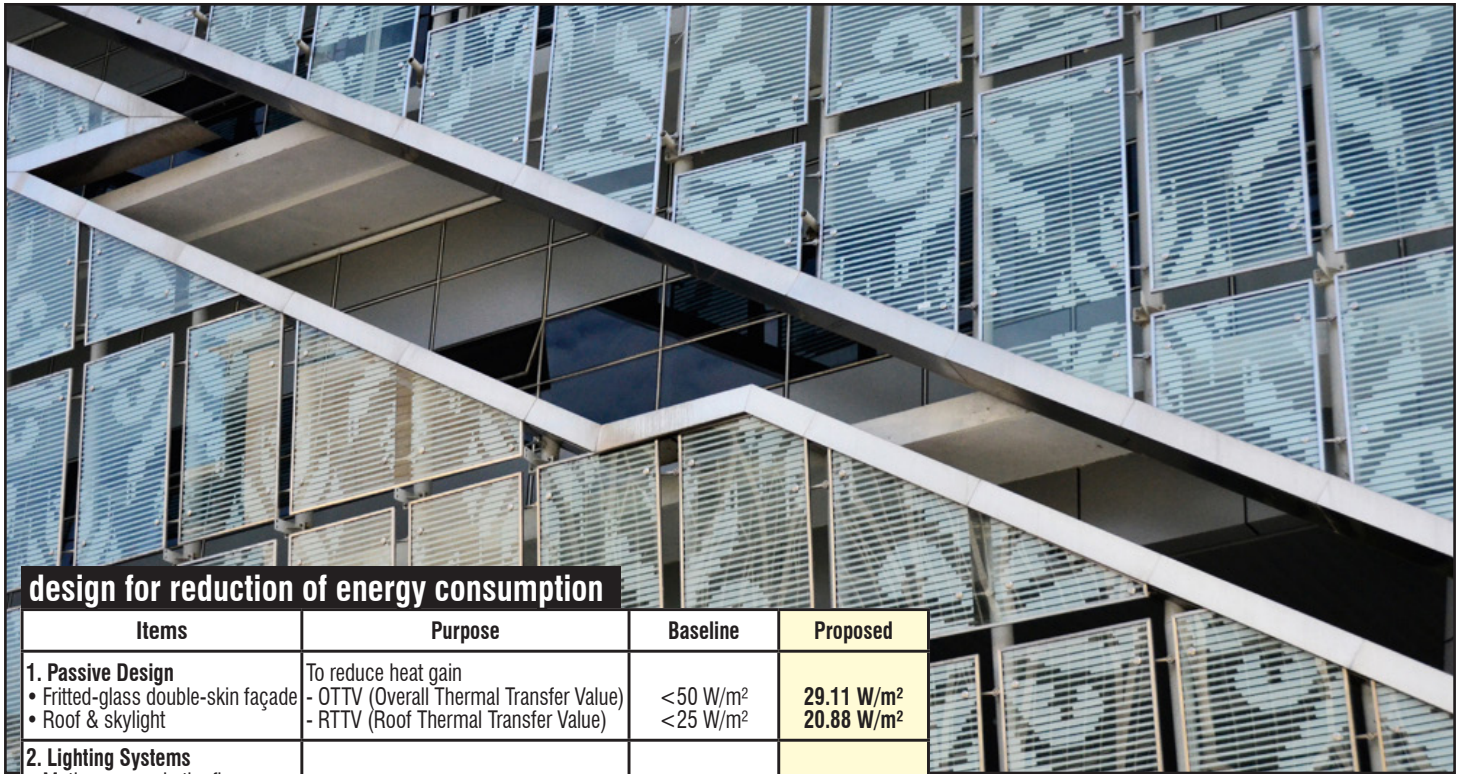
Items	Baseline	Proposed	Saving
1. Water Efficient Fitting	54,752 m³/yr	42,970 m³/yr	111,782 m³/yr
2. Rain Water Harvesting Tank (RWHT) System	-	-3,105 m³/yr	3,105 m³/yr
3. AHU Condensate	-	-904 m³/yr	904 m³/yr
Total	54,752 m³/yr	38,961 m³/yr	15,791 m³/yr

estimated annual energy & water savings

SGD 655,692 + **SGD 36,335** = **SGD 692,047**
 (energy) (water) (USD 530,000)

designing for energy & water cost savings

Suasana Putrajaya, Malaysia (Green Building Index Silver rating)



design for reduction of energy consumption

Items	Purpose	Baseline	Proposed
1. Passive Design <ul style="list-style-type: none"> Fritted-glass double-skin façade Roof & skylight 	To reduce heat gain <ul style="list-style-type: none"> - OTTV (Overall Thermal Transfer Value) - RTTV (Roof Thermal Transfer Value) 	$< 50 \text{ W/m}^2$ $< 25 \text{ W/m}^2$	29.11 W/m² 20.88 W/m²
2. Lighting Systems <ul style="list-style-type: none"> Motion sensor in the fire staircase & toilets; Lighting zoning & photocell sensor in the office area; LED & T5 light fitting in the office, common areas & façade lighting. 	To reduce energy consumption <ul style="list-style-type: none"> - LEI (Lighting Energy Intensity) 	38.55kWh/yr/m ²	30.21 kWh/yr/m²
3. Mechanical Systems <ul style="list-style-type: none"> combination of AHU fan & motor power can generate 60% efficiency 	To achieve thermal comfort level of <ul style="list-style-type: none"> - $> 24^\circ\text{C}$ & humidity level of 55% - ACMV (Air Conditioning & Mechanical Ventilation System) 	92.57kWh/yr/m ²	58.57 kWh/yr/m²
4. Building Control Systems <ul style="list-style-type: none"> smart power strips to cut off power of the un-used devices use devices with higher energy efficiency ratings 	To reduce energy consumption <ul style="list-style-type: none"> - PLEI (Plug Load Energy Intensity) 	72.4kWh/yr/m ²	40.40 kWh/yr/m²
5. Low Energy & Carbon Neutral Systems <ul style="list-style-type: none"> passive-mode mixed-mode full-mode productive-mode 	To encourage enhancement of building EE performance & reducing CO ₂ emission <ul style="list-style-type: none"> - BEI (Building Energy Intensity) 	$< 150 \text{ kWh/yr/m}^2$	136.0 kWh/yr/m²

fritted-glass double-skin facade



ecocell



verandah with fritted-glass canopy

design for reduction of water consumption

Items	Purpose	Baseline	Proposed
1. Water efficient fitting <ul style="list-style-type: none"> water regulator or flow controller 	To minimize water flow rate for toilet fittings	55,477 m ³ /yr	32,900 m³/yr
2. Rain Water Harvesting Tank (RWHT) System	To harvest rainwater for landscape irrigation	-	11,055 m³/yr
3. Condensate Water recovery System	To harvest clean water for landscape irrigation	-	6,000 m³/yr
4. Landscape irrigation system <ul style="list-style-type: none"> Auto-control dripping system instead of sprinkler system 	To reduce potable water consumption	$> 50.00\%$	30,879 m³/yr 55.00%