

**WHY  
US?**

**WHY  
US?**



**T. R. Hamzah & Yeang Sdn. Bhd.**

**WHY  
US?**

**our product**

- design ideas
- innovation

# WHY US?

## our product

- design ideas
- innovation

## our promise:

- innovation / ingenuity
- hypergreen / sustainability
- signature / style
- users happiness / well-being
- cost control / viability

# what others say about us?



**Brad Pitt**

“..what if the urban environment itself became a living, breathing organism? To **Ken Yeang** it is..”

in design=e2, PBS documentary, Episode 6

“..**Ken Yeang** has developed a distinctive architectural vocabulary that extends beyond questions of style..”



**Lord Norman Foster**  
(British Architect, Foster & Partners)

# what others say about us?

**The  
Guardian**

..one of the 50 people who  
could save the Planet..

(at conference (UK) sponsored by Infosys)

..Ken, how many of  
these have you built?..

..a few..



**King Charles III**



**WHO  
ARE WE?**

# WHO ARE WE?

T. R. Hamzah & Yeang Sdn. Bhd.



Dato' Dr Ken Yeang



Tengku Robert Hamzah



# WHO ARE WE?

T. R. Hamzah & Yeang Sdn. Bhd.



Dato' Dr Ken Yeang



Tengku Robert Hamzah

..since 1976:  
nearly 50 years..

**WHAT  
WE DO?**

**WHAT  
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**our promise:**

- innovation / ingenuity

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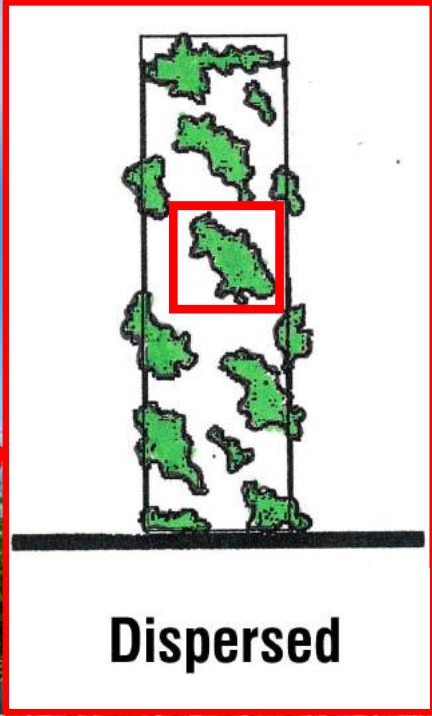
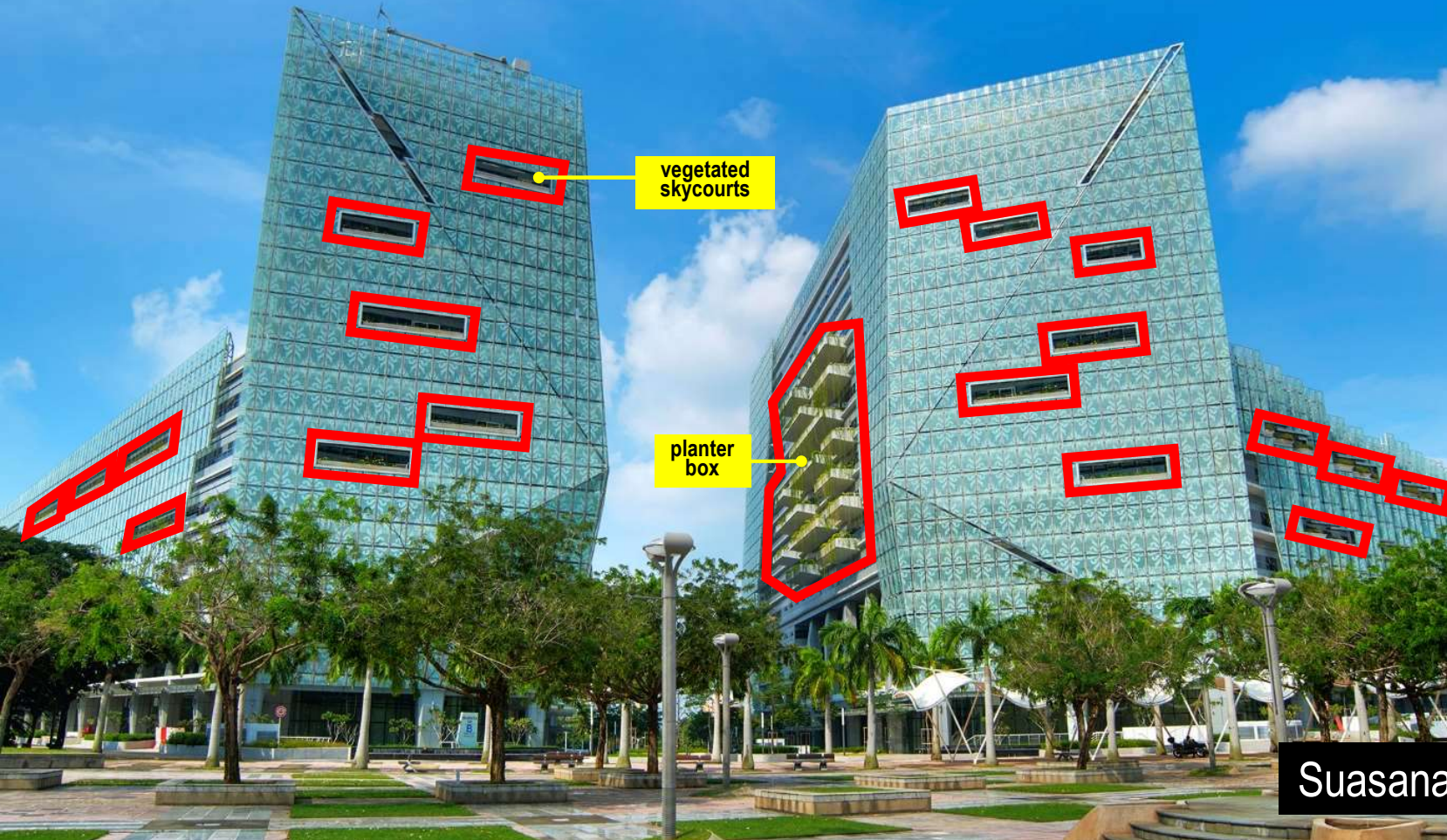




Suasana Putrajaya, Malaysia



vegetated skycourts



Suasana Putrajaya, Malaysia

double skin fritted glass facade

double skin  
fritted glass facade

Suasana Putrajaya, Malaysia



double skin fritted glass facade

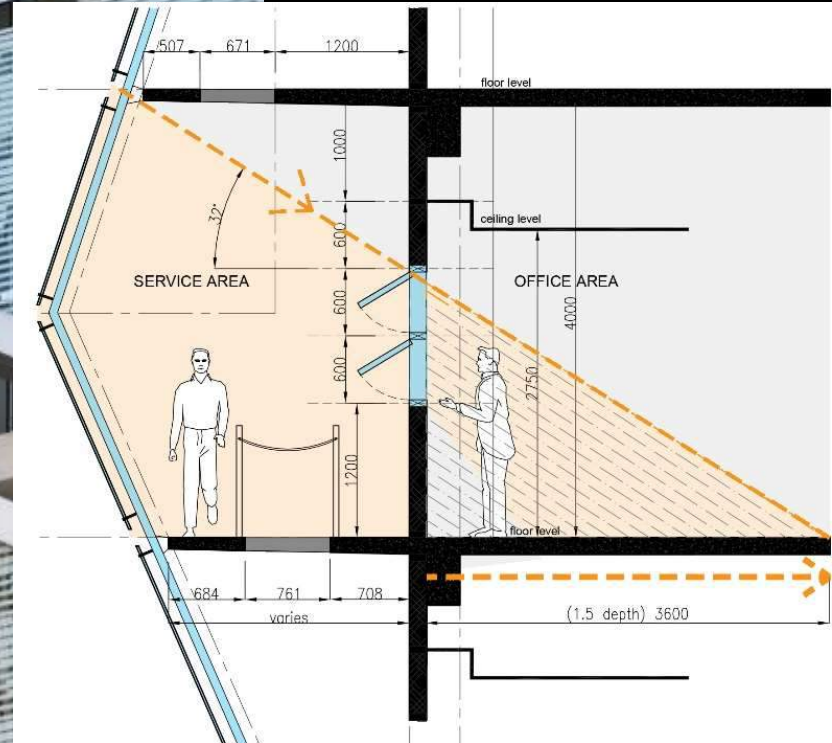
double skin fritted  
glass facade

Suasana Putrajaya, Malaysia



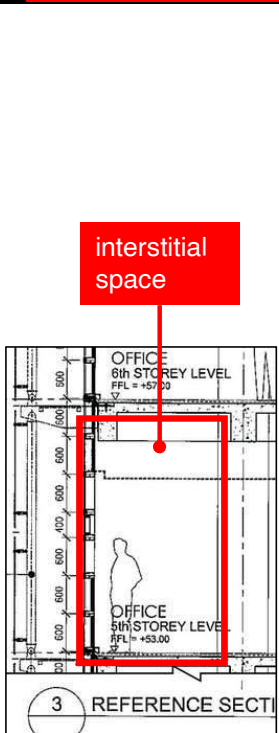
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Suasana Putrajaya, Malaysia

# ventilating and service space between inner-skin and outer-skin



Suasana Putrajaya, Malaysia

building energy intensity is 136.18 kWh / sq.m / annum

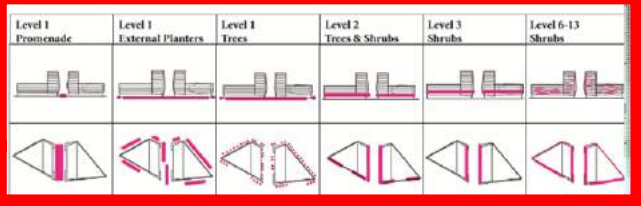
	BEI Building Energy Intensity kWh/m <sup>2</sup> /year	OTTV Overall Thermal Transfer Value W/m <sup>2</sup>	RTTV Roof Thermal Transfer Value W/m <sup>2</sup>	LEI Lighting Energy Intensity kWh/m <sup>2</sup> /year	PLEI Plug Load Energy Intensity kWh/m <sup>2</sup> /year	ACMV Average Cooling Intensity kWh/m <sup>2</sup> /year
Baseline building	210.52	32.81	19.15	38.55	72.40	92.57
Proposed building	136.18	21.67	14.35	30.21	40.40	58.57
Notes:	Common BEI for office is 200-250> kWh/m <sup>2</sup> /year	MS1525 requirement is <50W/m <sup>2</sup>	MS1525 requirement is <25W/m <sup>2</sup>			

Suasana Putrajaya, Malaysia

# creating habitats within development



## Habitats



create habitats

## Target Fauna Species

Species	Level 1 Promenade	Level 1 External Planters	Level 1 Trees	Level 2 Trees & Shrubs	Level 3 Shrubs	Level 6-13 Shrubs
<i>Cynopterus brachyotis</i> Lesser Short-Nosed Fruit Bat			R		F	F
<i>Streptopelia chinensis</i> Spotted Dove			R	B		
<i>Geopelia striata</i> Zebra Dove			R	B	B	
<i>Caprimulgus macrurus</i> Large-tailed Nightjar						F
<i>Apus affinis</i> House Swift						F
<i>Megalaima haemacephala</i> Coppersmith Barbet			B		F	F
<i>Aegithina tiphia</i> Common Iora			F B			
<i>Lanius schach</i> Long-tailed Shrike						B
<i>Pycnonotus goiavier</i> Yellow-vented Bulbul		F	F B	F B	F B	F B
<i>Oriolus chinensis</i> Black-naped Oriole		F	F B	F	F	F
<i>Copsychus saularis</i> Oriental Magpie-robin			F B	F	F	F
<i>Gerygone sulphurea</i> Golden-bellied Gerygone			F B			

## Target Fauna Species

<i>Cynopterus brachyotis</i> Lesser Short-Nosed Fruit Bat	CP	
<i>Streptopelia chinensis</i> Spotted Dove	IA	
<i>Geopelia striata</i> Zebra Dove	IA	
<i>Caprimulgus macrurus</i> Large-tailed Nightjar	IA	
<i>Apus affinis</i> House Swift	US IA	
<i>Megalaima haemacephala</i> Coppersmith Barbet	IA	
<i>Aegithina tiphia</i> Common Iora	IA	
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<i>Copsychus saularis</i> Oriental Magpie-robin	IA	
<i>Gerygone sulphurea</i> Golden-bellied Gerygone	IA	
<i>Orthotomus sutorius</i> Common Tailorbird	IA	
<i>Anthreptes malacensis</i> Brown-throated Sunbird	FS IA	
<i>Anthreptes simplex</i> Plain Sunbird	FS IA	
<i>Cinnyris jugularis</i> Olive-backed Sunbird	FS IA	
<i>Dicaeum cruentatum</i> Scarlet-backed Flowerpecker	FS IA	
<i>Apus libythea olferna</i> Striped Albatross	IA	
<i>Catopsilia pomona pomona</i> Lemon Emigrant	IA	
<i>Chilades pandava</i> Cycad Blue	IA	
<i>Danaus chrysippus chrysippus</i> Plain Tiger	IA	
<i>Delias hyparete metarete</i> Painted Jezebel	IA	
<i>Euploea mulciber mulciber</i> Striped Blue Crow	US IA	
<i>Hypolimnas bolina jacintha</i> Great Eggfly	IA	
<i>Junonia almana javana</i> Peacock Pansy	IA	

## Flora Species

<i>Caesalpinia ferrea</i>	Leopard Tree
<i>Ficus nitida</i>	Indian Laurel Fig
<i>Eucalyptus deglupta</i>	Rainbow eucalyptus
<i>Plumeria obtusa</i>	Frangipani
<i>Zephyranthes candida</i>	Fairy lily
<i>Tristellateia australasica</i>	New Caledonia
<i>Acalypha siamensis</i>	Tea leaf
<i>Ficus pumila</i>	Creeping fig
<i>Phyllanthus myrsinifolius</i>	Mousetail plant
<i>Spathiphyllum canifolium</i>	Peace Lily
<i>Costus speciosus 'Marginatus'</i>	Spiral ginger Var.
<i>Orthosiphon aristatus</i>	Cat's Whiskers
<i>Brunfelsia calycina</i>	Ystrd-Today-Tmrw
<i>Gonna indica</i>	Bunga Tabchi
<i>Vernonia elliptica</i>	Curtain Creeper
<i>Loropetalum</i>	Purple Diamond
<i>Justicia gendarusa</i>	Duan Rasa
<i>Zoysia matrella</i>	Carpet Grass
<i>Axonopus compressus</i>	Cow Grass
<i>Cyathea cooperi</i>	Lacy Fern Tree
<i>Pisonia alba</i>	Moonlight Tree
<i>Allamanda nerifolia</i>	
<i>Angelonia salicariifolia</i>	
<i>Belamcanda chinensis</i>	

## Target Species

1. Priority species for nature conservation
2. Flagship species that could symbolise scheme success
3. Indicator of good populations of small mammals
4. Indicator of good population of small birds
5. Indicator of good populations of fish/amphibians
6. Indicator of good populations of invertebrates
7. Indicator of good water quality
8. Species with special aesthetic qualities or interest to man, eg. conspicuous beauty, song or tendency to use artificial refuges.

## Keys

- R Root
- WO Water Quality
- F Feeding
- DPS Dominant Plant Species
- H Host
- B Breeding

### Species with Social/Amenity/Cultural/Educational Values:

**FS** 'Flagship' - species that champion the biodiversity of the wider landscape in which they are found, often because of their conspicuousness, appealing appearance/behaviour or cultural iconography

**IA** 'Innate Appeal' - Species of above-average value to people in terms of its aesthetic value or curiosity value; for example, a species of bird with particularly melodious song or perhaps a plant with particularly appealing perfume; or species contributing to a valued whole ecosystem aesthetic such as 'lushness' or 'multicoloured beauty' to which society responds positively

**BW** 'Early Warning' - species that may give an early warning of threats to our own health rather like a Canary in a coal mine. Classic examples include the Peregrine Falcon and DDT, lichen assemblages and sulphur dioxide and invertebrate populations in rivers and water pollution

### Species with 'Innate' and 'Ecosystem Support' Values:

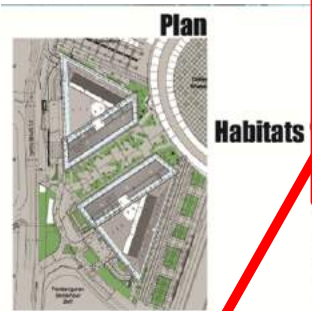
**CP** 'Conservation Priority' - species of innate biodiversity value which may be assessed, for example, on the basis of rarity or value as a particularly high-quality example of its kind.

**KS** 'Keystone' - species having a disproportionate effect in the functioning of the local environment.

**US** 'Umbrella' (US) - species of value in making good conservation refuges.

Suasana Putrajaya, Malaysia

# creating habitats within development



Level 1 Promenade	Level 1 External Planters	Level 1 Trees	Level 2 Trees & Shrubs	Level 3 Shrubs	Level 6-13 Shrubs
Shrubs/Ground covers • Zephyranthes candida • Tristellatia australasiae • Acalypha siamensis • Ficus pumila • Phyllanthus myrtifolius • Spathiphyllum canifolium • Costus speciosus 'Marginatus' • Orthosiphon aristatus • Brunfelsia calycina • Ganna indica • Vernonia elliptica • Loropetalum • Justicia gendarussa • Loro Topiary	• Caesalpinia ferrea • Ficus nitida • Eucalyptus deglupta • Plumeria obtusa	Trees • Cyathea cooperi	Shrubs • Pisonia alba • Brunfelsia calycina	• Angelonia salicariifolia • Belamcanda chinensis • Osmoxylon lineare yellow • Pisonia alba	• Belamcanda chinensis • Osmoxylon lineare yellow • Pisonia alba • Vernonia elliptica

create habitats

select native fauna species to be brought back to locality: for feeding, breeding, refuge from prey

### Target Fauna Species

Cynopterus brachyotis	CP
Lesser Short-Nosed Fruit Bat	CP
Streptopelia chinensis	IA
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Large-tailed Nightjar	IA
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House Swift	IA
Megalaima haemacephala	IA
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Aegithina tiphia	IA
Common Iora	IA
Lanius schach	IA
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Pycnonotus goiavier	IA
Yellow-vented Bulbul	IA
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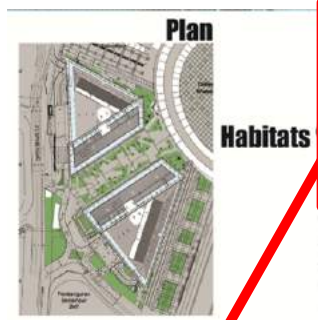
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Feeding	Dominant Plant Species
Host	Breeding

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Suasana Putrajaya, Malaysia



# creating habitats within development



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select non-invasive flora species to attract fauna

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Suasana Putrajaya, Malaysia





vegetated central promenade

retails

central promenade

seating area

Suasana Putrajaya, Malaysia



large baffle roof as sunshading device

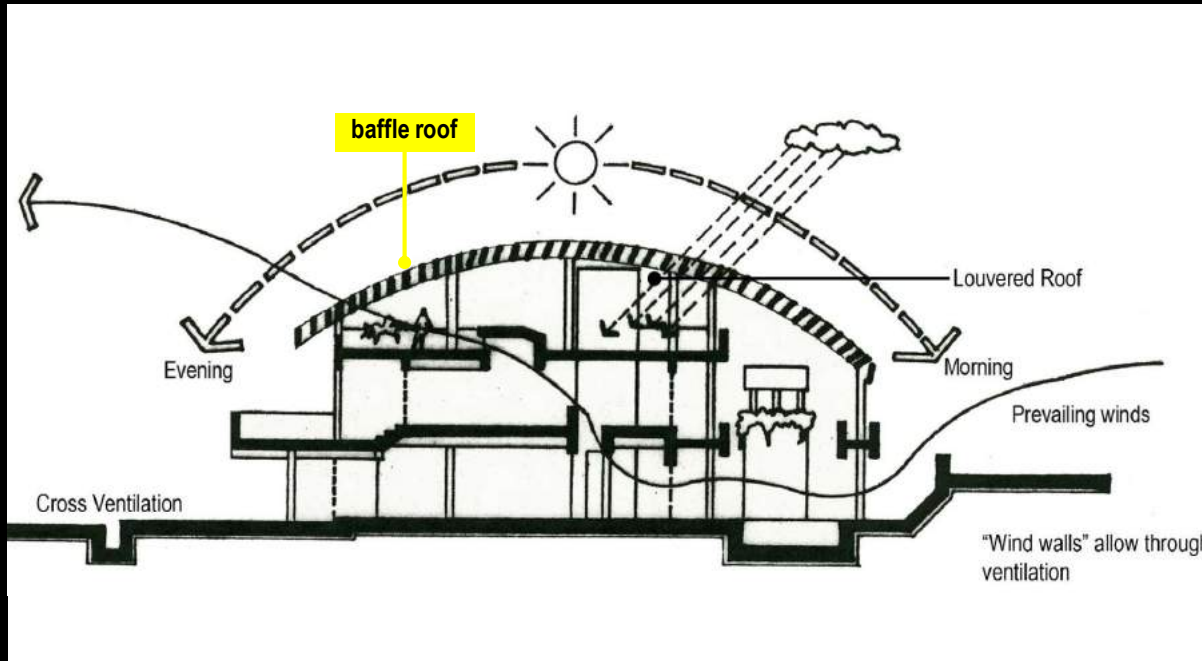
baffle roof

roof terrace



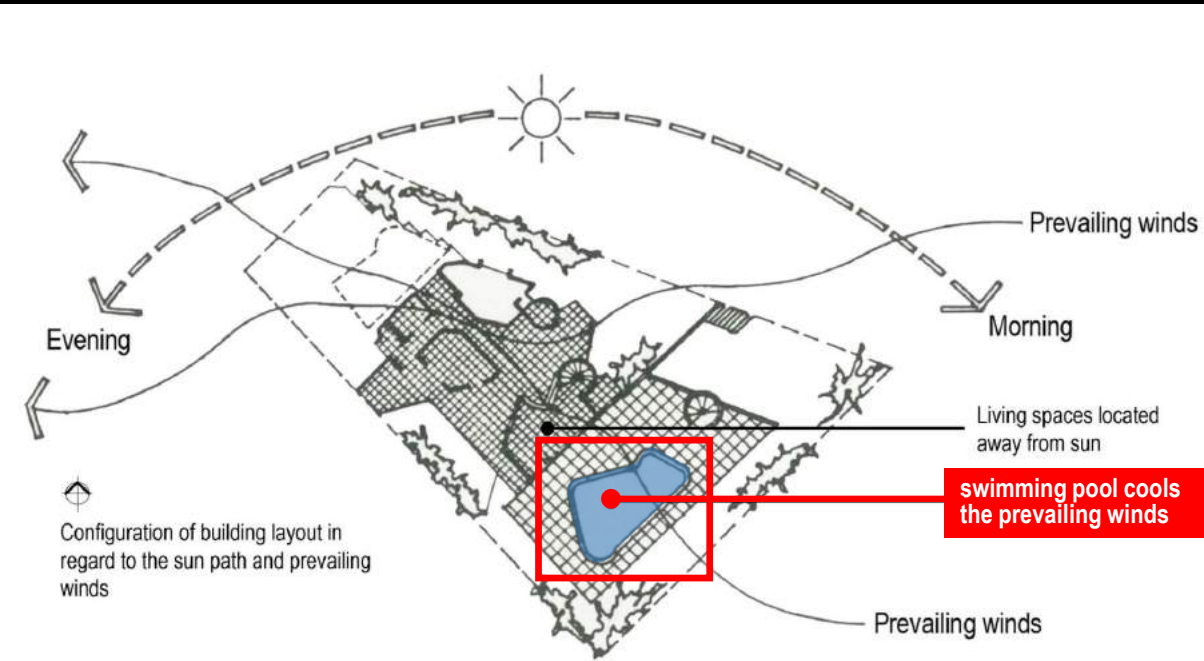
Roof-Rooftop House, Malaysia

large baffle roof as sunshading device



Roof-Roof House, Malaysia

# swimming pool as evaporative cooling system



Roof-Roof House, Malaysia

homeogeneous canopy roof

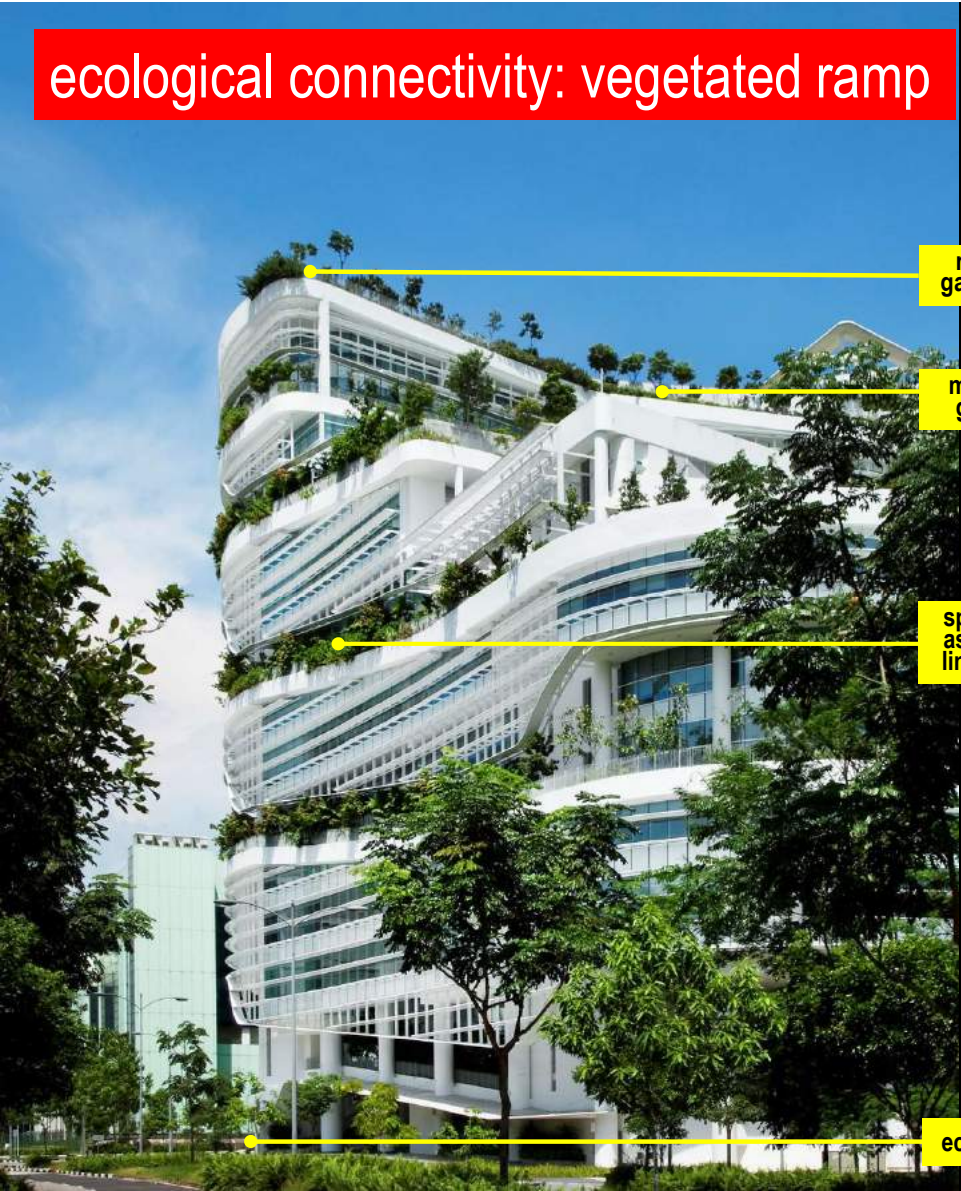
homeogeneous  
canopy roof



Xiong'an Station, China



ecological connectivity: vegetated ramp

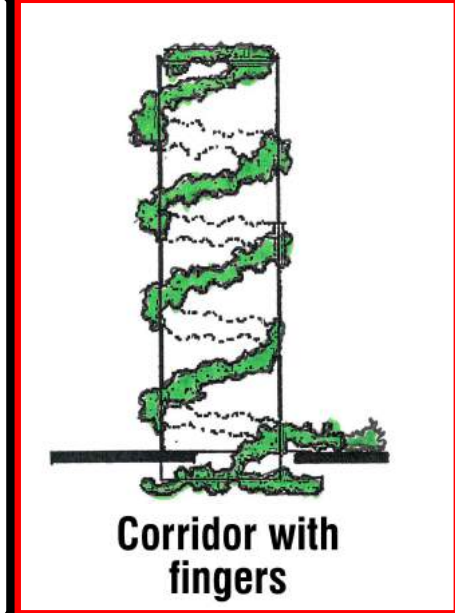
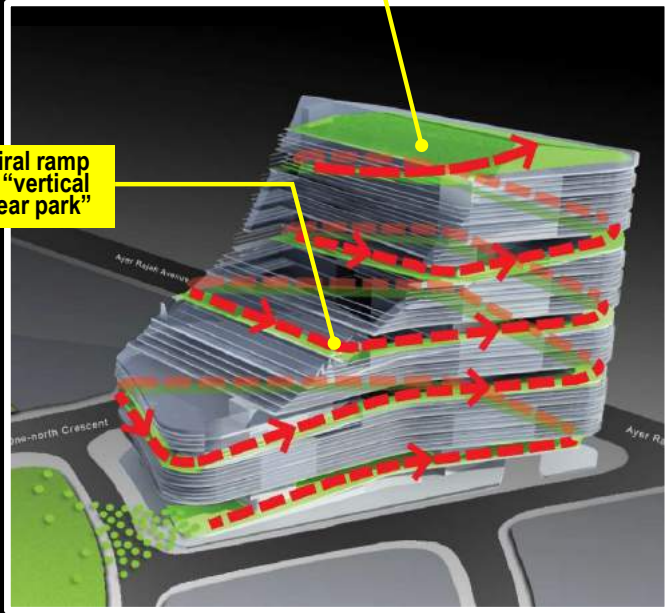


roof garden

mid roof garden

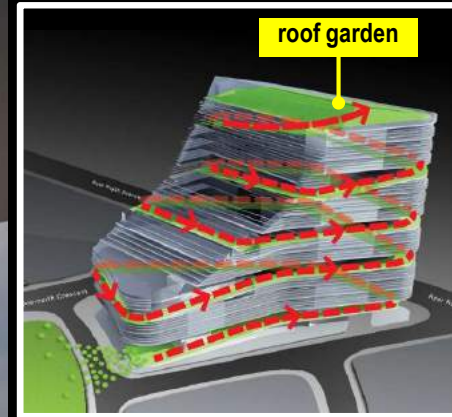
spiral ramp as "vertical linear park"

ecocell



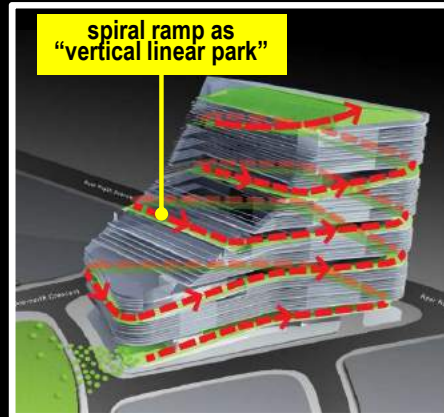
Solaris Building, Singapore

ecological connectivity: roof garden



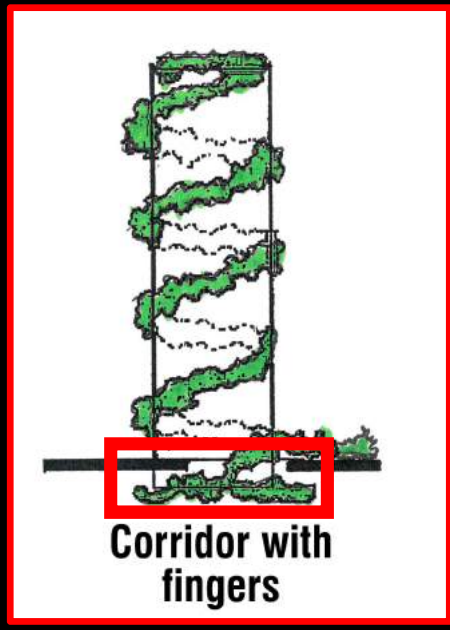
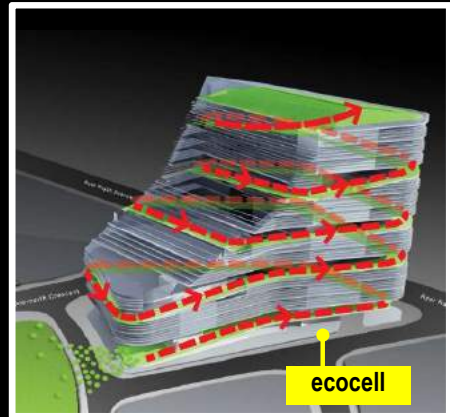
Solaris Building, Singapore

ecological connectivity: vegetated ramp



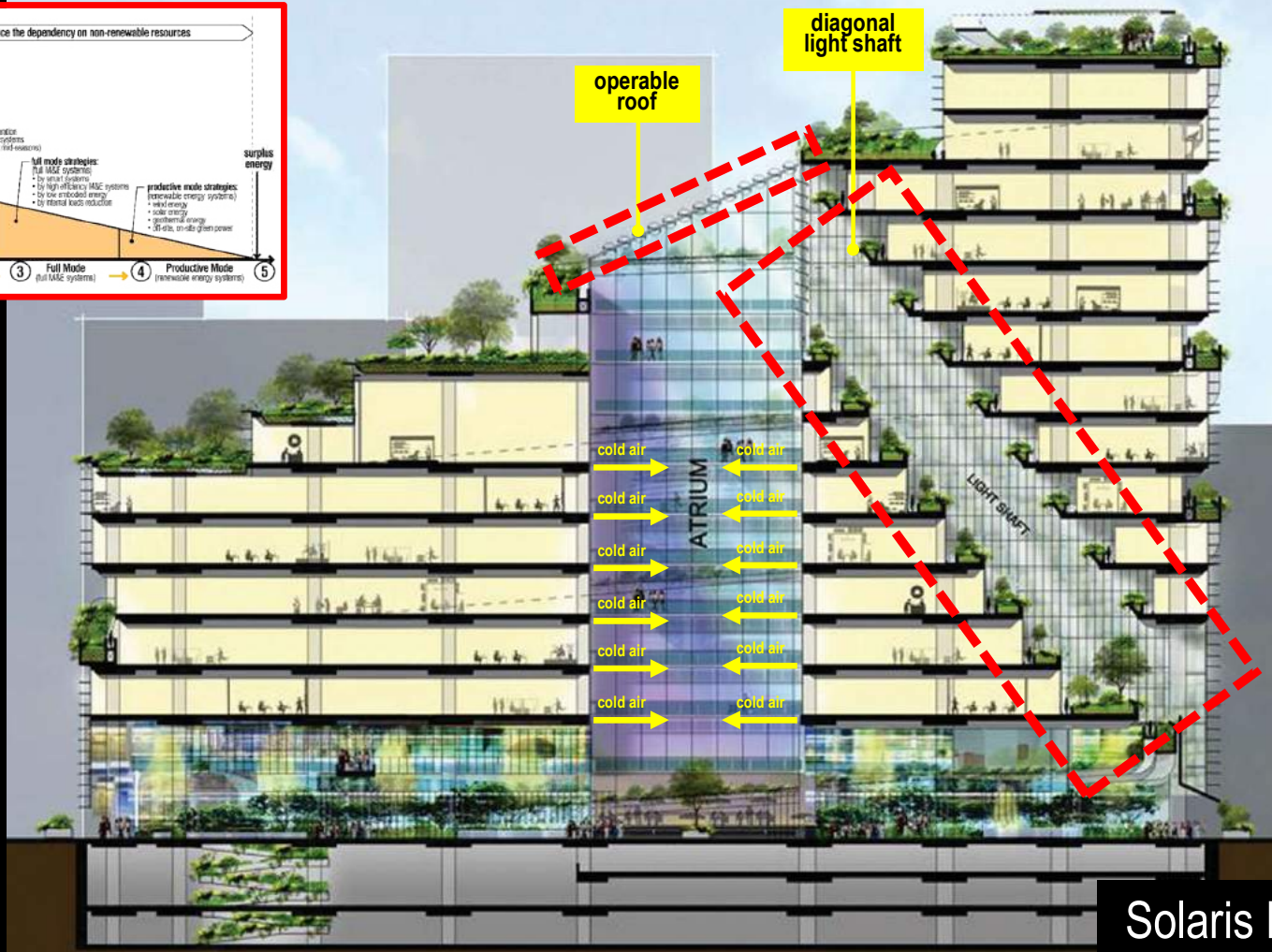
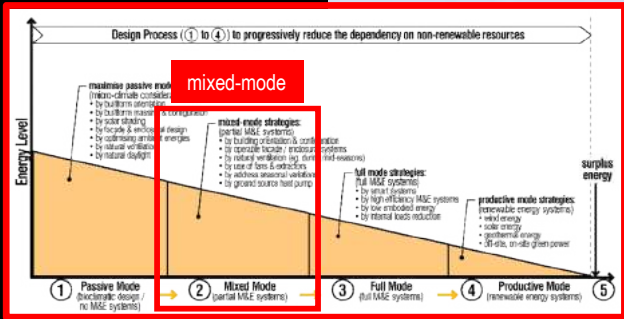
Solaris Building, Singapore

ecological connectivity: ecocell



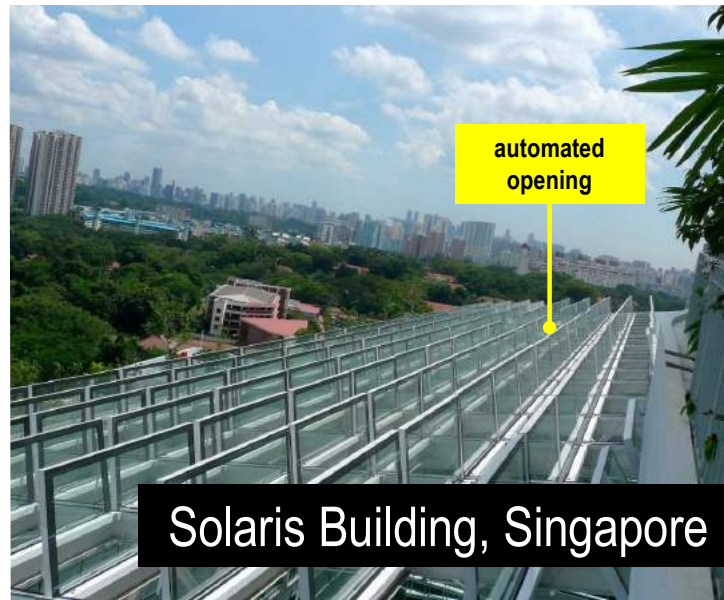
Solaris Building, Singapore

# energy saving (mixed-mode)

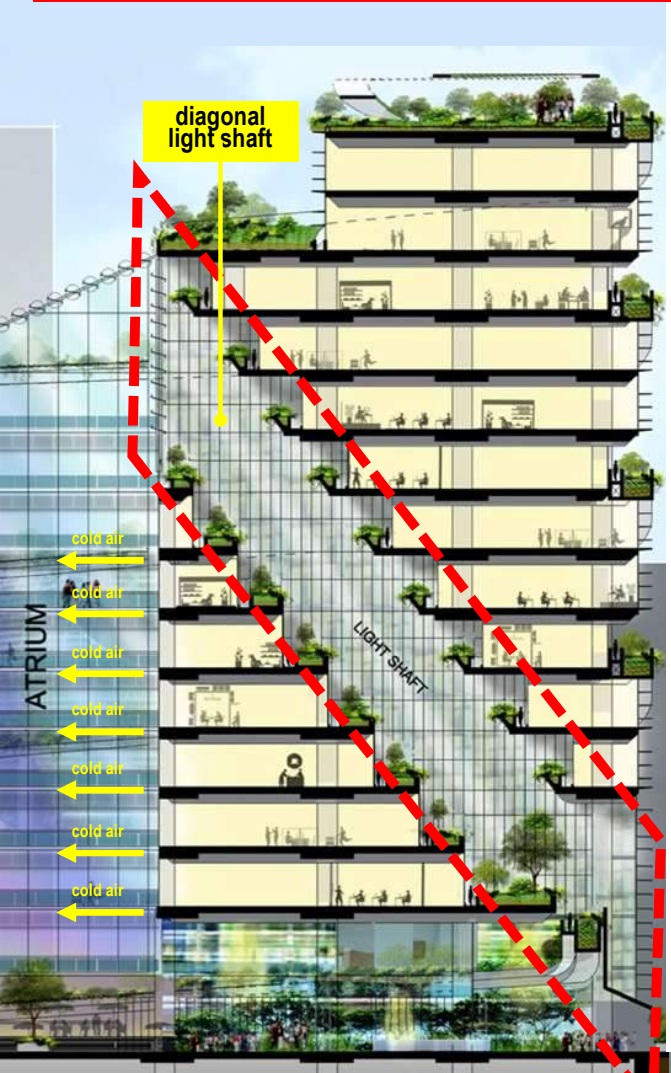


Solaris Building, Singapore

energy saving (operable roof)



energy saving (diagonal light shaft)



Solaris Building, Singapore

energy saving (mixed-mode)



## annual energy saving

Items	Reference(MWh/year)	Proposed (MWh/year)	Energy saving
AHU and FCU Fans	2,861.45	1,313.58	54.09%
Split Cooling Unit	5.14	3.96	23.01%
Mechanical Fans	699.87	239.41	65.79%
Chilled Water Pumps	239.5	98.95	58.68%
Domestic Pump	43.54	43.54	0.00%
Exterior Lighting	191.39	65.21	65.93%
Office Receptacle	1,845.84	1,845.84	0.00%
Retail Receptacle	41.01	41.01	0.00%
Water Heater	17.33	17.32	0.00%
Lifts	647.62	582.86	10.00%
Lighting	2,348.98	1,410.84	39.92%
<b>Total Energy Consumption</b>	<b>8,940.98</b>	<b>5,662.52</b>	<b>36.67%</b>
	<b>Reference (Tons)</b>	<b>Proposed (Tons)</b>	
<b>Cooling load Reduction</b>	<b>1,998.55</b>	<b>1,667.65</b>	<b>16.56%</b>

## annual water saving

Items	Reference(m <sup>3</sup> )	Proposed (m <sup>3</sup> )	Saving (m <sup>3</sup> )
Water efficient fittings	54,752	42,970	111,782
Rainwater collection	0	-3,105	3,105
AHU Condensate	0	-904	904
<b>Total</b>	<b>54,752</b>	<b>38,961</b>	<b>15,791</b>

## estimated annual saving

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

Solaris Building, Singapore

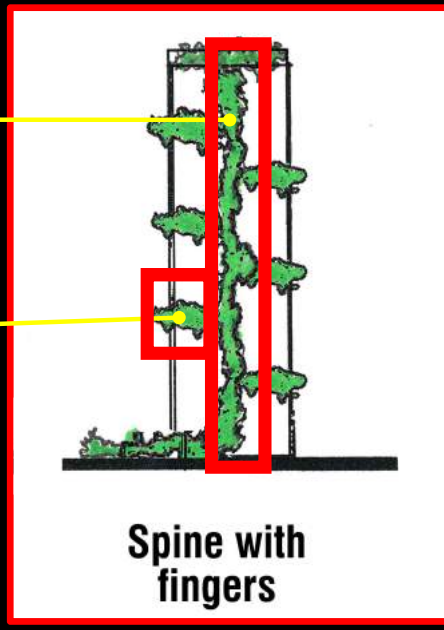


green skycourts



vertical green wall

green skycourt



Spine with fingers

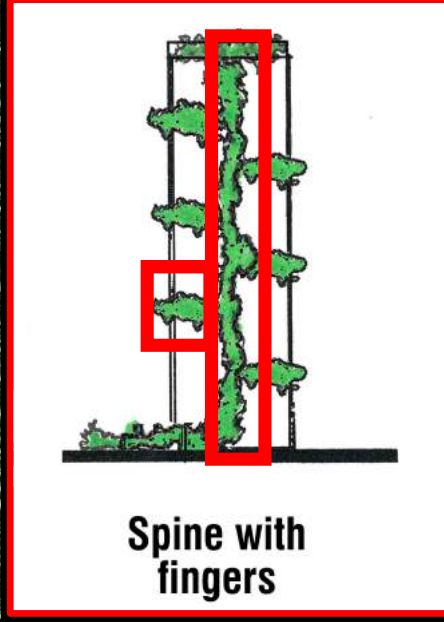
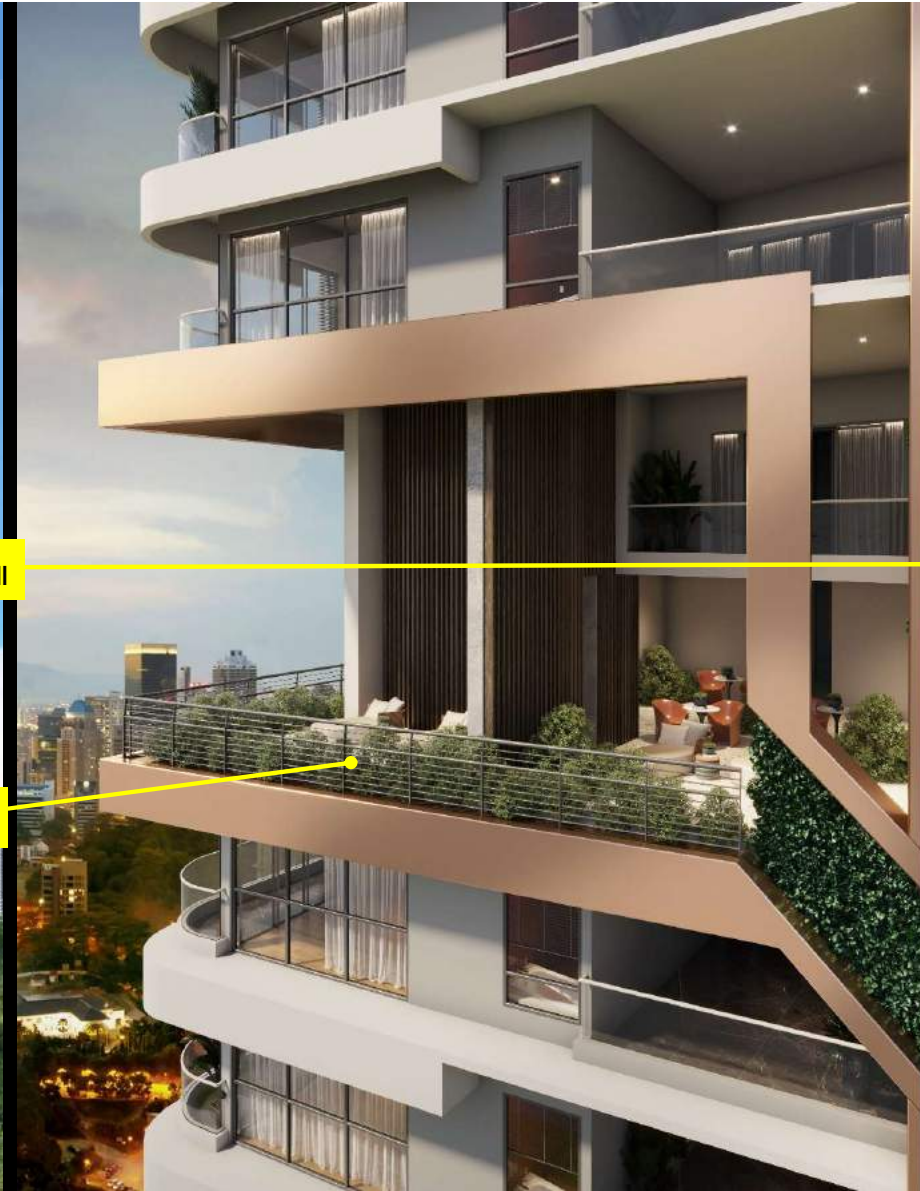
Skylon Residence, Malaysia

green skycourts



vertical green wall

green skycourt



Spine with fingers

Skylon Residence, Malaysia

# creating habitats within development (biodiversity target matrix)

select native fauna species to be brought back to locality

## MIGRATION OBSERVATORY ZONE



Pemis pitlorhynchus, Butastur indicus, Accipiter guaris, Accipiter soloensis, Aviceda leuphotes



Hirundo javanica, Halcyon smyrnensis, Aegithina tiphia, Scotophilus kuhlii Lesser



Pycnonotus goiavier, Pycnonotus erythrogastrus, Rhipidura javanica Red, Oriolus chinensis



Gerygone olivacea, Apus affinis, Orthotomus ruber, Ceryle alcyon, Anthreptes simplex, Geopelia striata

## SONGBIRD ZONE



## BUTTERFLY ZONE



Acraea violae, Catopsilia pomona, Appes lbythea S, Danaus chrystopus, Delias hyparete, Chlisa clytia clyti, Junonia orithya, Pachliopta aristocorachae, Chlides pandava



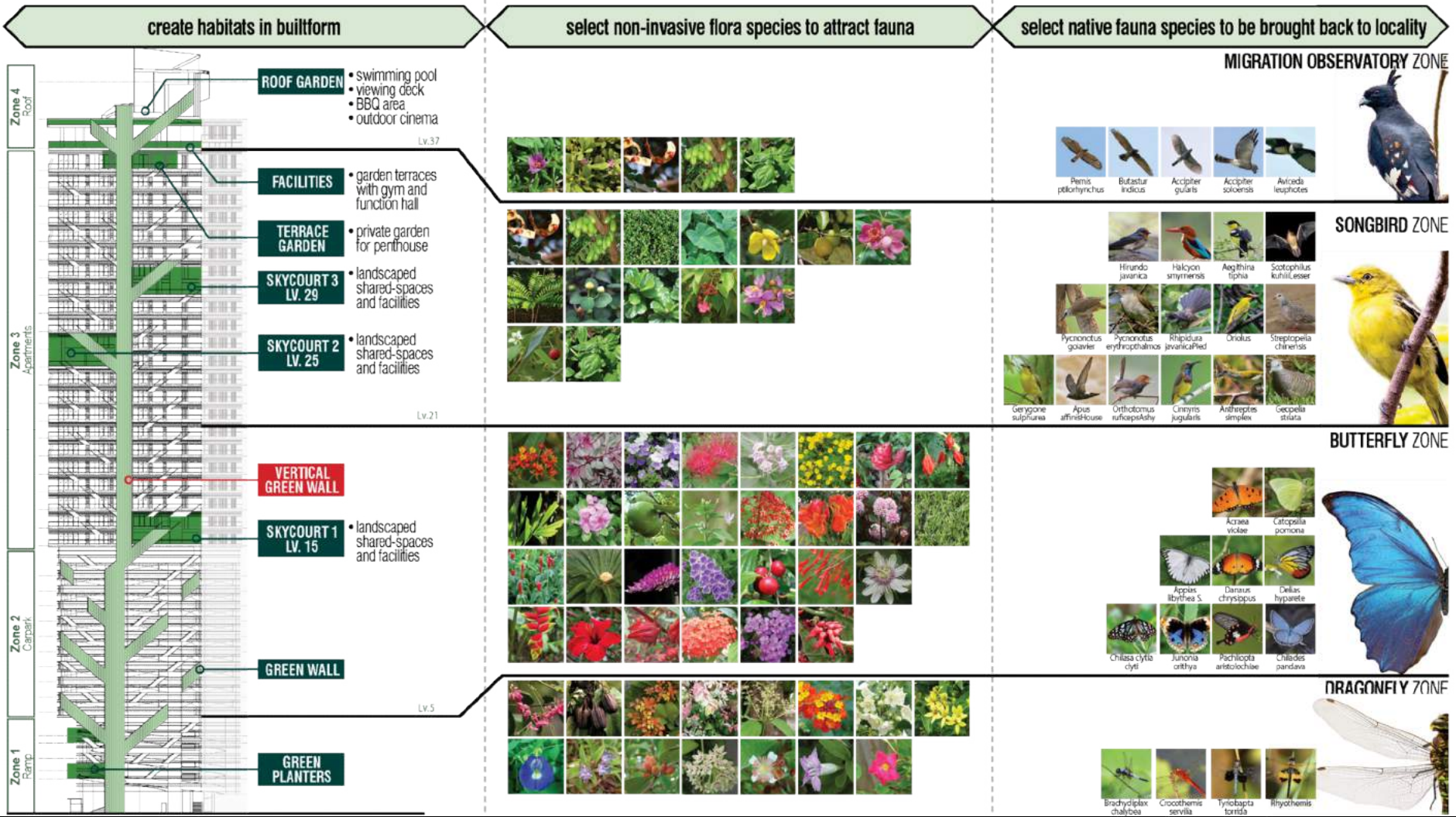
## DRAGONFLY ZONE



Brachydiplax chalybea, Crocothemis servilia, Zygoptera torida, Ilyothemis



# creating habitats within development (biodiversity target matrix)



creating habitats within development (rooftop garden)



ecological connectivity (continuous green wall)

photovoltaic roof



continuous green wall



Digi Technology Operation Centre, Malaysia

ecological connectivity (continuous green wall)

photovoltaic roof



natural ventilation

continuous vertical green wall

ecological connectivity (continuous green wall)

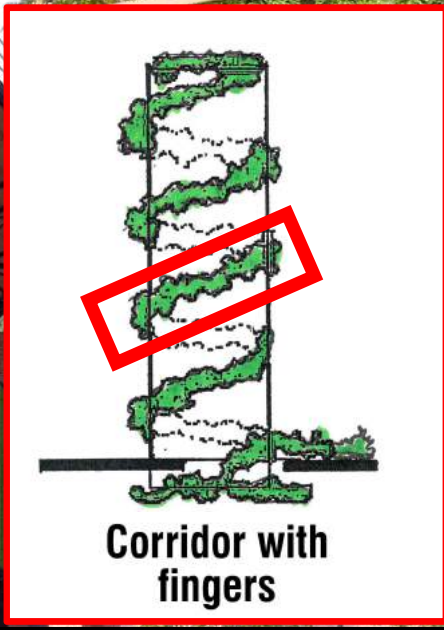
rainwater harvesting tank

solar photovoltaics panels above decking canopy  
Roof Canopy Area >60% of total GFA

green wall

planter box

vertical louvers for AC ledge

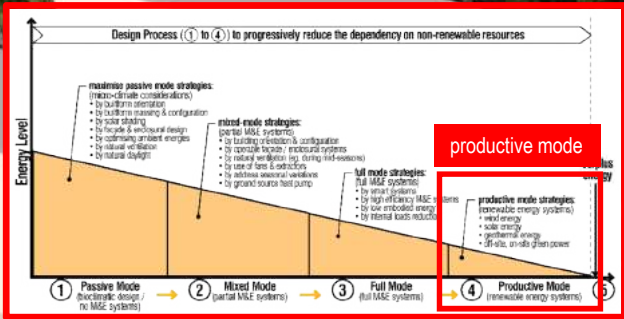


Corridor with fingers

Data Centre, Malaysia



# energy saving (mixed-mode)



photovoltaic canopy



ecological design model

nature



ecological design model

nature

human society

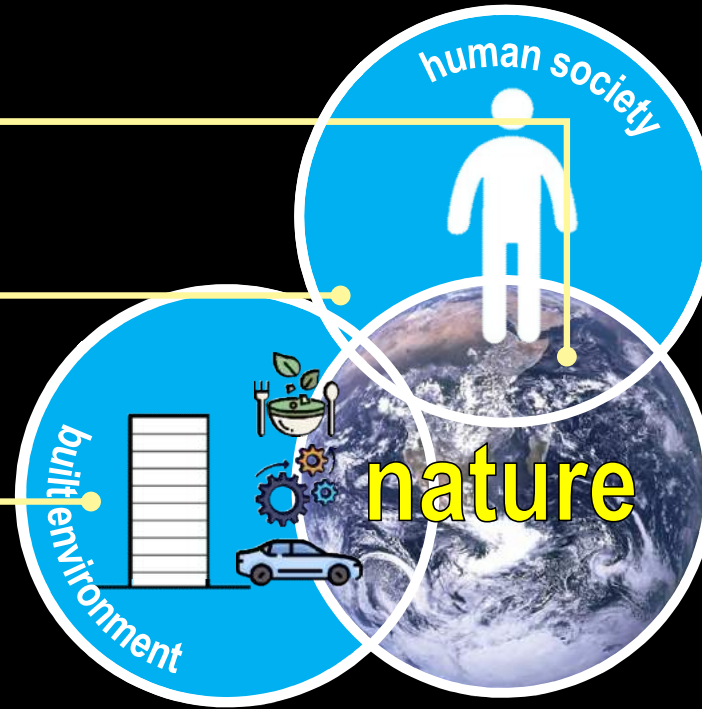


# ecological design model

nature

human society

built system & artefacts



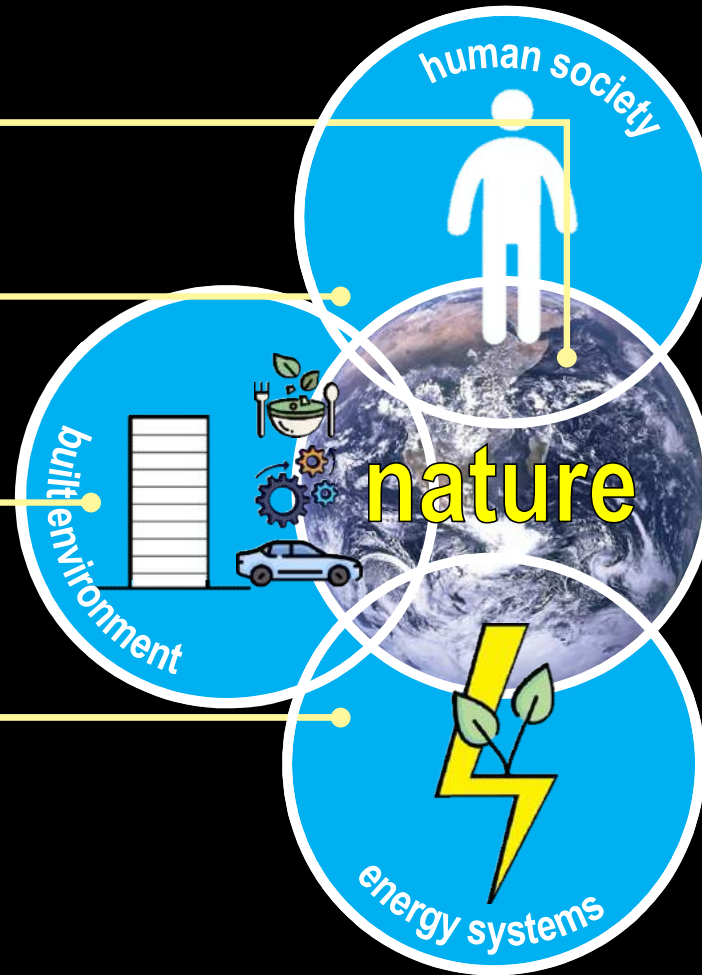
# ecological design model

nature

human society

built system & artefacts

energy systems



ecological design model

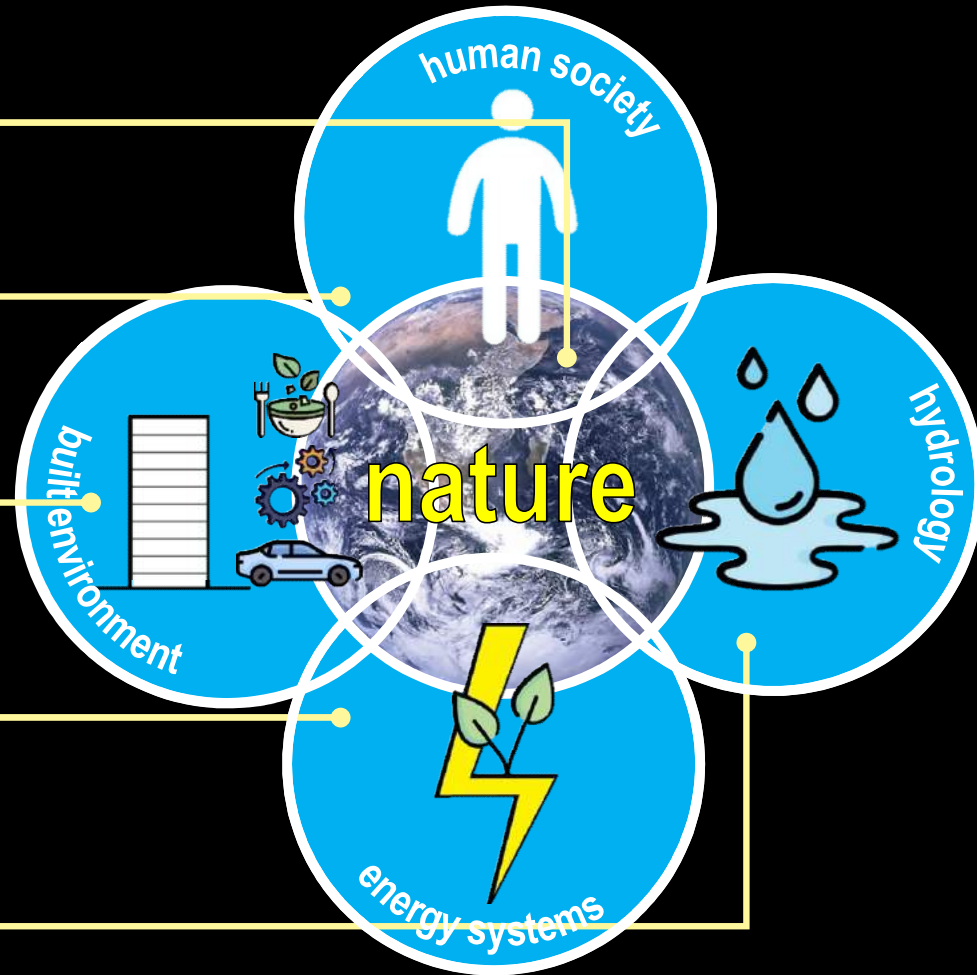
nature

human society

built system & artefacts

energy systems

hydrology



ecological design model

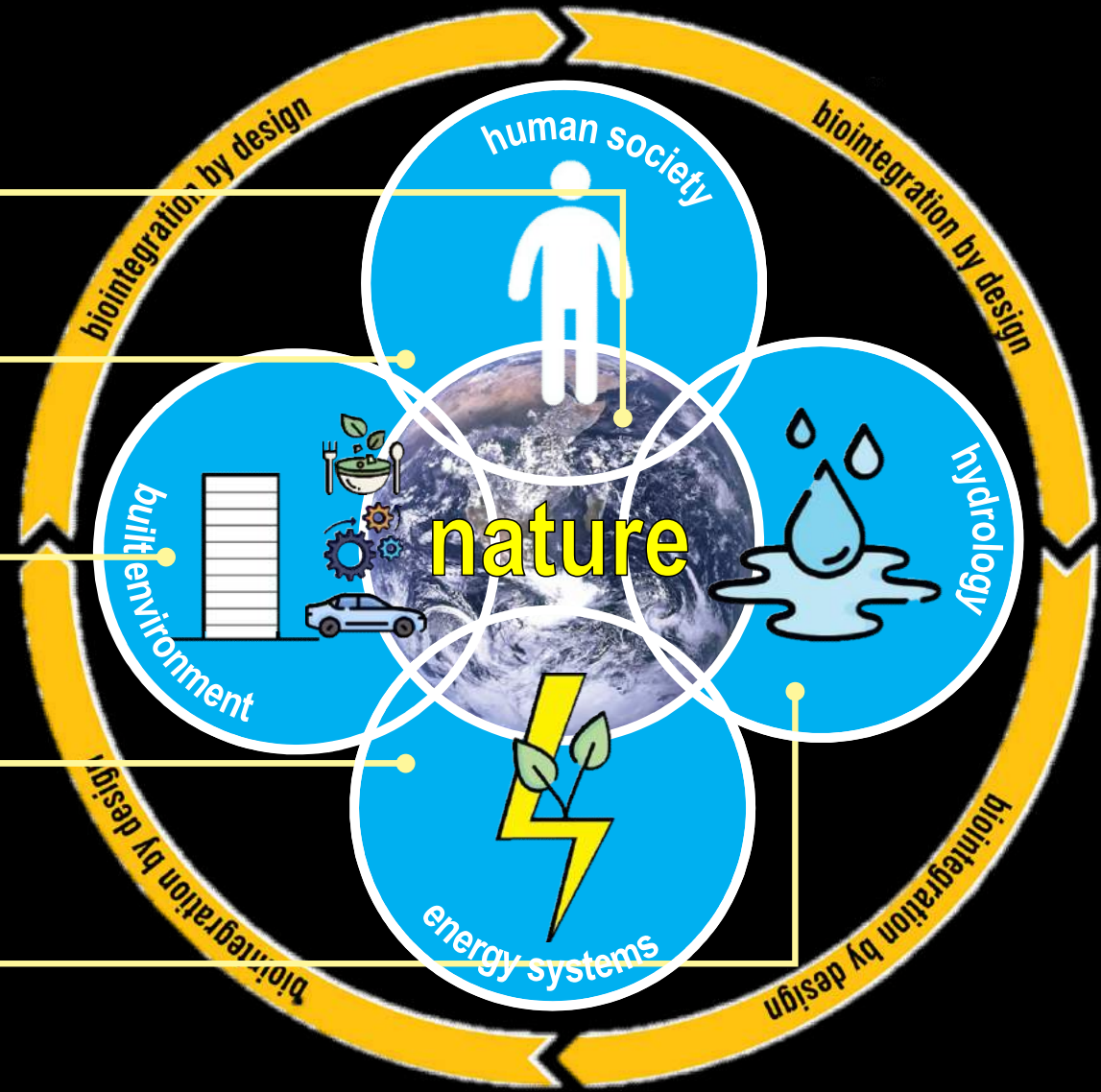
nature

human society

built system & artefacts

energy systems

hydrology



..let us do a project for you  
to show its super-green,  
benefits and values  
enhancing features..



end



“..It’s not easy being green..♪♪”, but we do it.