WEBINAR

New Normal Low Carbon City

Sustainable Building Design

1ST Session | 01 September 2020

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by Ar. Mustapha Kamal Zulkarnain

UIA WORLD CONGRESS, DURBAN 2014

DECLARATION 2050 IMPERATIVE

Recalling the Chicago Declaration of Interdependence for a Sustainable Future (18-21 June 1993) which recognized our ecological interdependence with the whole natural environment and committing to place environmental and social sustainability at the core of our practice and professional responsibilities.

Also recognizing the importance of the Post-2015 Development Agenda and the Sustainable Development Goals process to achieve a sustainable future; in particular, supporting a standalone goal to “make cities and human settlements inclusive, safe, resilient and sustainable".

Recalling the United Nations Framework Convention on Climate Change (UNFCCC) conference that will reconvene in Paris in 2015 with the goal of reaching a new agreement on phasing out CO2 emissions from worldwide power and industrial sectors by 2050, and all GHG emissions from energy systems by the second half of the 21st century.

UIA WORLD CONGRESS, DURBAN 2014

DECLARATION 2050 IMPERATIVE

Recognising that urban areas are responsible for over 70% of global energy consumption and CO2 emissions, mostly from buildings. Over the next two decades, an area roughly equal to 60% of the total building stock of the world is projected to be built and rebuilt in urban areas worldwide. This provides an unprecedented opportunity to reduce fossil fuel CO2 emissions by setting the global building sector on a path to phase out CO2 emissions by 2050.

We recognize our responsibility to seize this unique opportunity to influence ethical and socially responsible development throughout the world: to plan and design sustainable, resilient, carbon-neutral and healthy built environments that protect and enhance natural resources and wildlife habitats, provide clean air and water, generate on-site renewable energy, and advance more liveable buildings and communities.

By adopting the 2050 IMPERATIVE at the International Union of Architects (UIA) World Congress in Durban, the UIA and its member organizations and partners will send a strong message to the Parties of the UNFCCC, and to the world, that we are committed to a truly sustainable and

UIA WORLD CONGRESS, DURBAN 2014

DECLARATION 2050 IMPERATIVE

Recognizing the architects' central role in planning and designing the built environment, and the need to reduce carbon emissions to zero by 2050 and provide equal access to shelter, we commit to promote the following actions;

- Plan and design cities, towns, urban developments and new buildings to be carbon neutral, meaning they use no more energy over the course of a year than they produce, or import, from renewable energy sources.
- Renovate and rehabilitate existing cities, towns, urban redevelopments and buildings to be carbon neutral whilst respecting cultural and heritage values.
- In those cases where reaching carbon neutral is not feasible or practical, plan and design cities, towns, urban developments, new buildings and renovations to be highly efficient with the capability to produce, or import, all their energy from renewable energy sources in the future.

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DECLARATION 2050 IMPERATIVE

- We commit to the principle of engaging in research and setting targets towards meeting the 2050 goal.
- Advocate and promote socially responsible architecture for the community, develop and deliver equitable access to the information and tools needed to:
  - plan and design sustainable, resilient, inclusive and low-carbon/zero carbon built environments.
  - design no-cost/low-cost on-site renewable energy and natural resources systems (e.g., passive heating and cooling, water catchment and storage, solar hot water, daylighting, and natural ventilation systems).

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DECLARATION 2050 IMPERATIVE

Supporting Organization: Architecture 2030
Signatories:

UIA - International Union of Architects
UIA Young Architects
ARCASIA - Architects Regional Council Asia
AUA - Africa Union of Architects
ACE - Architects Council of Europe
FPAA - Federacion Panamericana de Asociaciones de Arquitectos
CAA - Commonwealth Association of Architects
UMAR - Union Mediterraneenne des Architectes
CIALP - Conselho Internacional dos Arquitectos de Lingua Portuguesa
DoCoMoMo - Docomomo International
ICOMOS International Council of Monuments and sites

Manifesto for responsible architecture

Architects commitment to the climate of the future

We, - architects of the world - have called consistently upon international institutions and national governments for many years to be aware of the impact of the construction industry on climate change and the solutions that architecture can provide.

By virtue of our training and experience, we, architects of the world are the instigators of urban development proposals aimed at housing populations in safe, healthy, supportive and humane conditions. We have the skills necessary to design low-carbon, energy efficient, resilient, healthy and inclusive built environments that contribute to mitigate the effects of climate change and to adapt our cities and buildings to its side effects.

Without a doubt, the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP-21) is the last chance!

As key players in the built environment, we, - architects of the world - are convinced that everything is still possible if concrete and innovative steps are undertaken to promote a more low-carbon environment adapted to the new climatic conditions.

Consequently, in our daily professional practice and regardless of the project size, we - architects of the world - are committed to promote the following measures with both public and private clients.

For a sustainable and resilient city

Put people at the centre of urban development

The sustainable city is above all friendly and supportive. Its primary purpose is to create communal living conditions and facilitate social inclusion for present and future generations. The sustainable city is not one of closed groups and confinement but a lively city where public spaces belong to the citizens.

Promote the compact city to encourage social and functional diversity

The low-carbon sustainable city combines density and intensity in a balanced way and harmoniously integrates housing, offices, shops and community facilities. Access and mobility are its defining elements. To live well is to live near jobs, services and public transport.

Favour urban regeneration

Above all, the low-carbon city should be an inventible city that can rebuild itself from within. Whilst respecting heritage conservation, let's favour urban renewal and, whenever possible, avoid the development as orbits of new towns.

Establish governance mechanisms shared by all

Sustainable urban development is collaborative planning that involves all urban developers: councillors, residents, architects and the entire built environment team. Their action should be based on governance mechanisms shared by all.

Design, first and foremost, in sustainable buildings

Favour innovative proposals

A project designed around communal architecture should aim for a more rational use of resources. During the design of new buildings or renovation operations, let's encourage innovative solutions that favour shared spaces and facilities that can adapt to multiple uses.

Give value to design studies

The environmental performance of a building should be closely linked to architectural solutions from the preliminary design stage. The building orientation and its compactness are just as important as the thermal performance of materials and systems.

Favour the use of local resources and solutions for construction

Use local resources adapted to context, delivered through short supply chains to significantly reduce the building's carbon footprint and promote the "ownership" of the project by residents. Architecture is also an "emancipation process". Priority should also be given to the environment by focusing on locally proven technical solutions.

Construct buildings that satisfy needs and anticipate their future adaptation

Sustainable construction requires buildings designed to correspond to the needs of the region and end-users. To live well is to live in energy efficient housing that is fit for purpose and future changes in family composition. The obsolescence of commercial buildings and public facilities can be slowed down by anticipating the future requirements of end users.

Study the life cycle and demolition of buildings

Sustainable and responsible construction is to study buildings throughout their life cycle, to pay attention to recycling and the reuse of building materials. It also considers waste and takes into consideration building demolition.

Renovate existing building stock

Large-scale renovation of the existing building stock is an important prerequisite to achieve the overall objective of reducing greenhouse gas emissions. Consequently, the extensive renovation of the existing building stock should be at the heart of public policy.

Architecture is a powerful force, both in the medium-term and at low-cost, to reduce greenhouse gas emissions and adapt our societies to the inevitable side effects of climate change. Through her comprehensive approach that takes into consideration economic, social, environmental, political and cultural factors during the design of urban operations, architects contribute to the global commitment to sustainability.

To live better together tomorrow, we - architects of the world - call for the implementation of decisive policies to stop the uncontrolled growth of cities, to eradicate the injustice related to the allocation of resources, to slow down climate exodus, to anticipate exposure to natural or industrial risks and to put an end to the depletion of natural resources across the planet.

Paris, 30th November 2015

As of now, together, we - architects of the world - are committed to the climate of the future!

Sustainable Architecture – a Manifesto

We see the process of construction as irrevocable. Materials used – so the general public believes – are a part of our buildings forever. In real life it is different, of course. On average, we use our houses no more than 25 years for their originally intended purpose. More than a third of the rubbish in our dumpsites comes from the construction industry. We need roughly 40% of the total energy expenditure for living in our buildings and emit 35% of the climate damaging CO_2 in the process. Furthermore, we seal off and clutter up more and more vital agricultural areas – areas we should be using for our future food, resources and energy production. We really need to change our approach radically.

Architectural construction and form design will not be limited to and focused on the building alone, but actively influence the entire life cycle – from the origin and production of resources, over the construction and deconstruction of buildings, all the way to the reintegration of materials into the resource cycle. Responsible architecture must look beyond the mere building of houses. It has to dismiss the notion that all constructions are timeless, thereby facing the fact that they too are born and pass away. It is a flowing reality, a fundamental idea of the new paradigm of sustainable development.

Sustainable Architecture – a Manifesto

Sustainable architecture starts with the selection of resources

- favours renewable resources from a sustainable agriculture and forestry system
- biogenic raw materials are the starting point for the development of numerous biodegradable resources
- abstains from or minimises the use of raw materials with “heavy ecological baggage“
- consciously reduces the CO_2 emission during the entire life cycle
- utilises recycled materials

Sustainable Architecture adapts to the resources on location

- minimising transport and guaranteeing resource efficient packaging
- makes sure to close the cycle of materials as locally as possible

Sustainable Architecture – a Manifesto

Sustainable Architecture plans/designs resource efficient buildings, thereby securing energy efficiency

- building envelopes should be designed to guarantee the best energy production level possible – acting as small power plants, which do not only produce energy for thermal services such as room conditioning and water cooling, but also supply energy for lights, feed information technology components and contribute to mobility needs
- windproof facades, a good insulation, energy recycling systems, daylight focusing and other measures can minimise power demand and lead to a reduction of CO_2 emissions

Sustainable Architecture creates buildings with high usage flexibility

- construction components such as the envelope, the static structure and the general infrastructure are designed to expand durability – intermediate walls, installations and surfaces should not obstruct the rapid changes of needs

Sustainable Architecture – a Manifesto

Sustainable Architecture favourably positions buildings on areas with low importance to agricultural and forestry systems, compensates for soil sealing with the creation of alternative spaces (such as vegetated roofs), builds on plots with an enhanced energy influx (facing south), constructs on plots that are already connected to local infrastructure, remains nature-related despite a high population density and guarantees both quality of life and individualisation options for inhabitants.

Sustainable Architecture focuses on the efficient use of resources, makes use of the latest bionics findings to save materials, substitutes lengthy cabling with BUS or radio circuits, favours constructive component protection and avoids chemical component protection.

Sustainable Architecture – a Manifesto

S.A. applies closed material circle (CMC) technologies

It incorporates the deconstruction of the building into the initial planning phase, thereby securing that all used resources are reintegrated into the cycle of materials – the public authorities are supplied with the deconstruction plans at the same time as the approval plans for the construction project.

Sustainable architecture uses technical and biogenic materials in a manner that facilitates separation during the deconstruction process, uses as many homogeneous technical materials as possible and abstains from using composite materials to ensure an easy recycling process. It makes sure that all biogenic materials are biodegradable.

- Green building is not just for those with means - Integrating smart design in residential units to minimize energy requirements for a more sustainable living environment.

- New breakthroughs in technology to produce hyper-efficient that can make city living more affordable, productive and adaptable to lifestyles.

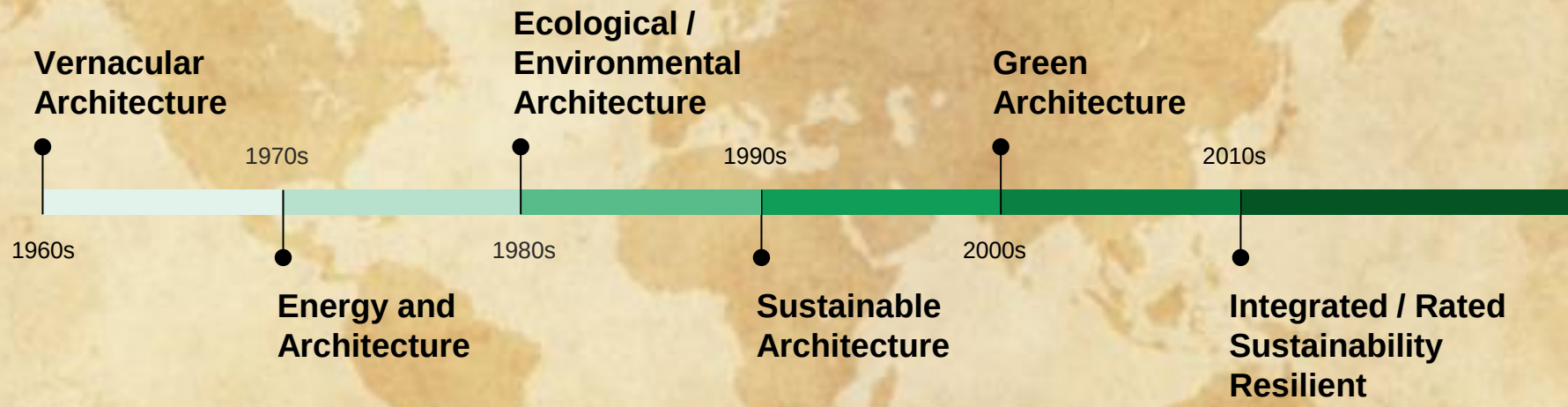
- Dealing with the underlying issues of affordable housing; under maintenance, poor design and inefficient social facilities.

    - How could design be critically re-imagined for the existing image and expectation of affordable housing in Malaysia?

    - How can good design and architecture uplift and enhance relationships within a affordable housing community?

ARCHITECTURE TIMELINE

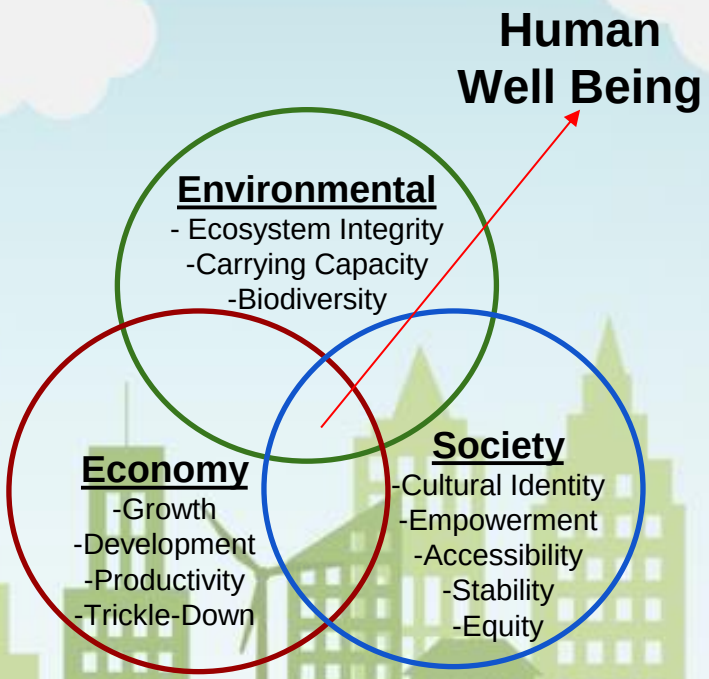
Historical Development



SUSTAINABLE ARCHITECTURE

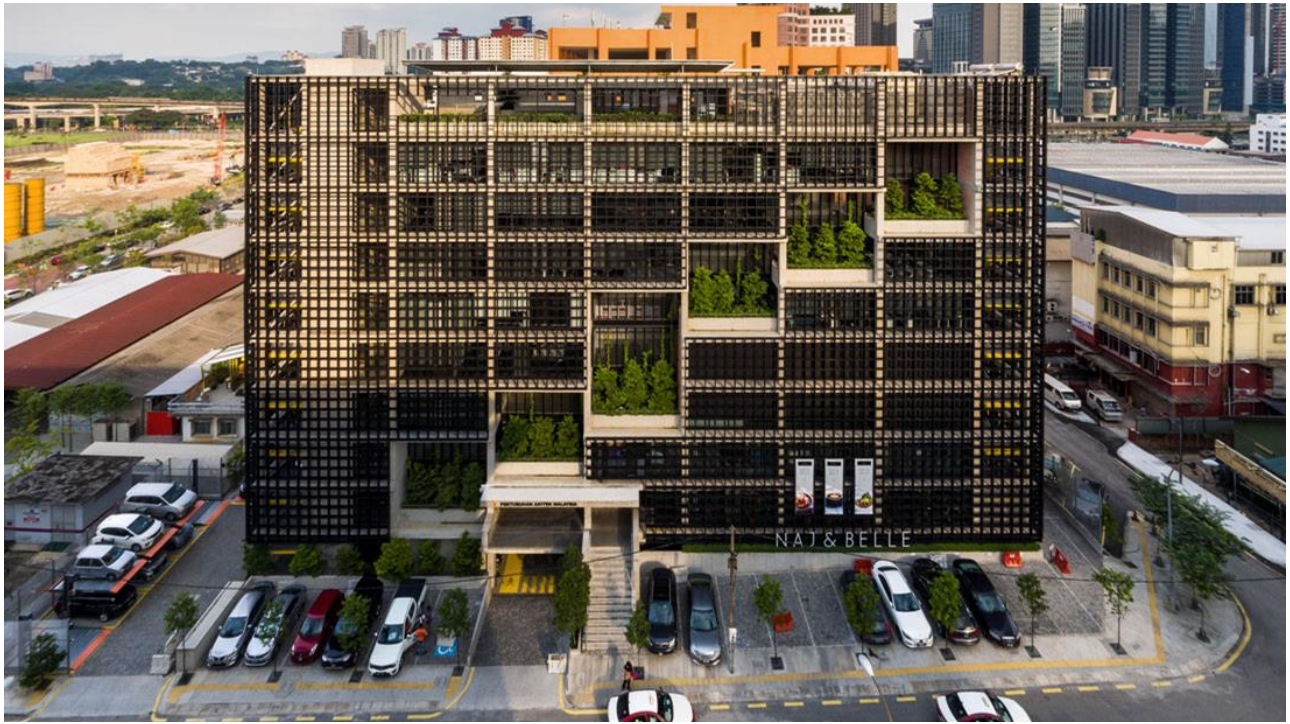
"Sustainable design integrates consideration of resource and energy efficiency, healthy buildings and materials, ecologically and social, sensitive land use and an aesthetic that inspires, affirms and enables."

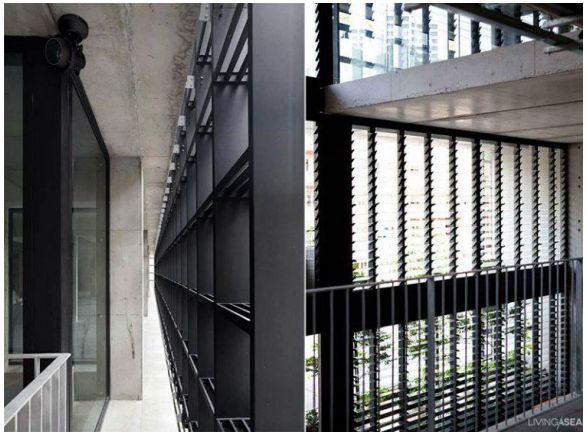
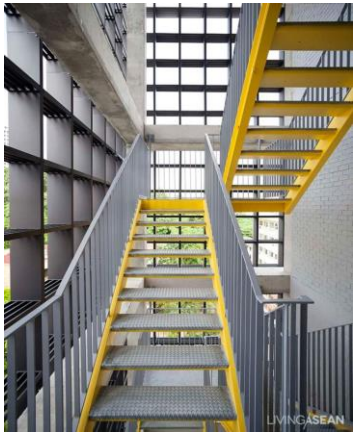
- Union Internationale des Architectes' Declaration of Interdependence for a Sustainable Future, Chicago, 1993

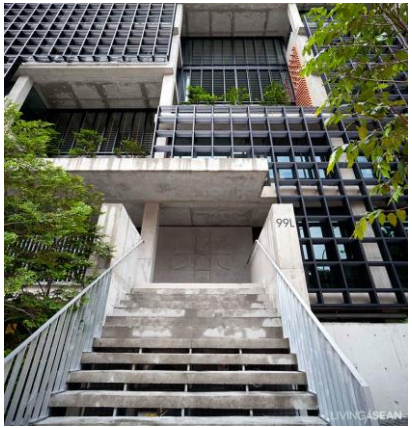


Sustainable Design Building in Malaysia

PAM Building, Bangsar



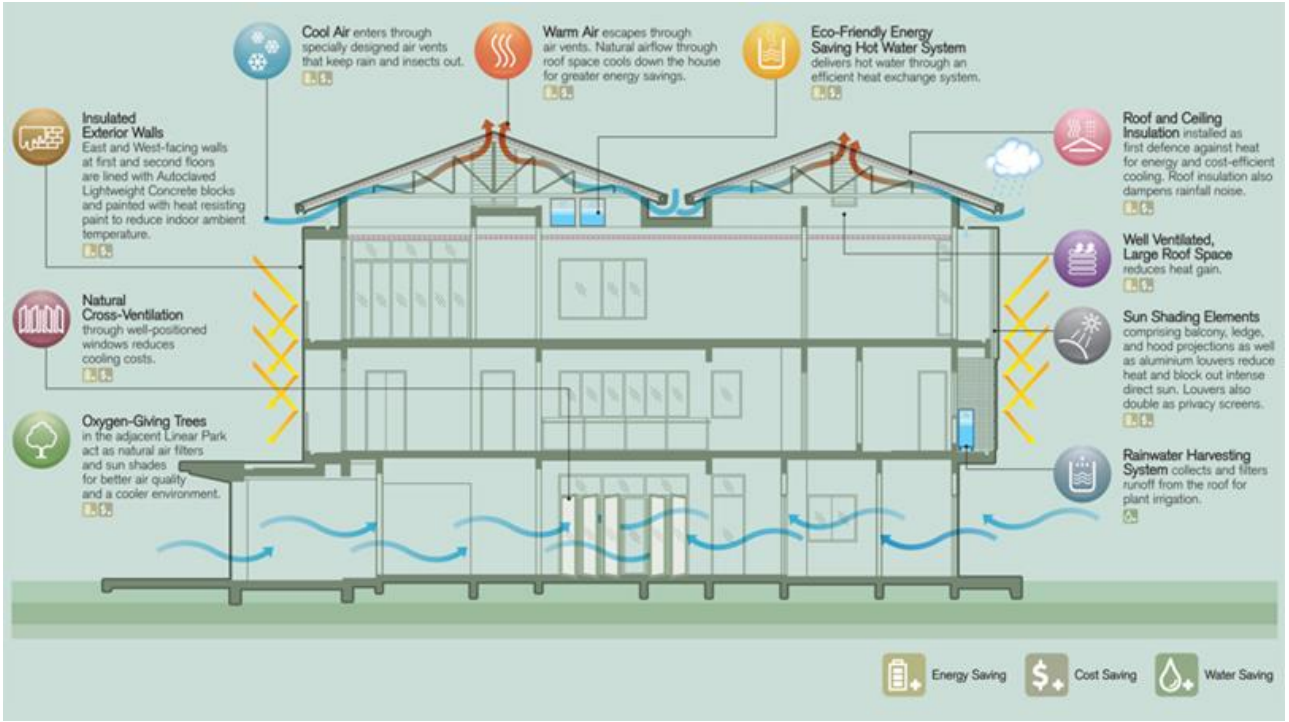





Sustainable Design Building in Malaysia

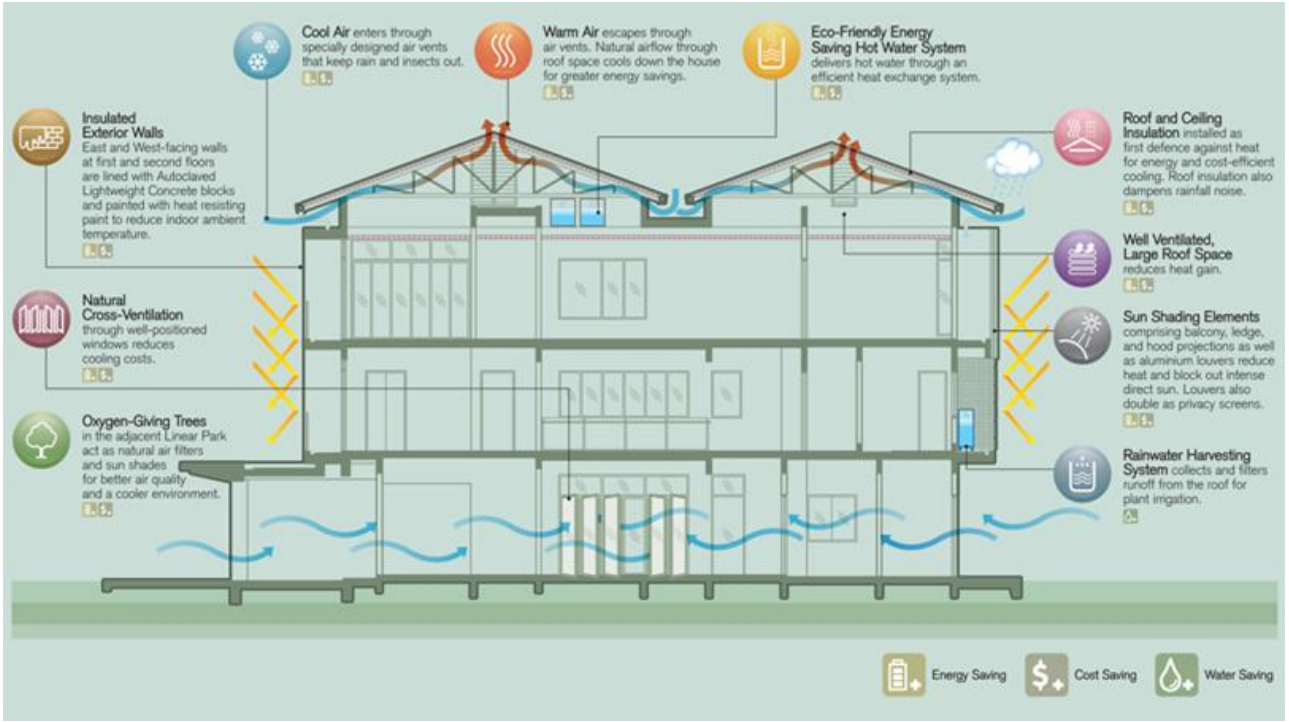
Sejati Residence, Cyberjaya

- 249 houses / 40 acres
- Bungalow, Courtyard Villa, Semi-Detached, Superlink Home
- Double volume ceiling
- Wide doorways
- Ventilated roofs
- Expansive windows
- Natural sun-shading green wall
- Vertical creeper plant
- Natural, low-maintenance sun-shade



Sustainable Design Building in Malaysia

Sejati Residence, Cyberjaya



GREEN ARCHITECTURE

- Green architecture or green design is an approach to building that minimizes harmful effects on human health and the environment.
- The principles of Green Building:
  - The green building design process begins with an intimate understanding of the site in all its beauties and complexities.
  - Designers can create features in their buildings that mimic the functions of particular eco-systems.
  - Creating new habitat on structures in urbanized areas is especially important to support biodiversity and a healthy ecosystem.

Sustainable Design **VS** Green Design

Sustainable Design

Sustainability is defined as meeting the needs of the current generations without impairing the future generations.

Green Design

Green design focuses on reducing the environmental impacts of energy, water and material usage.

SUSTAINABLE design is not always GREEN design

What Can Be Done For Future Affordable Housing?

Guidelines/Requirements of Affordable Housing should be revised or revamped

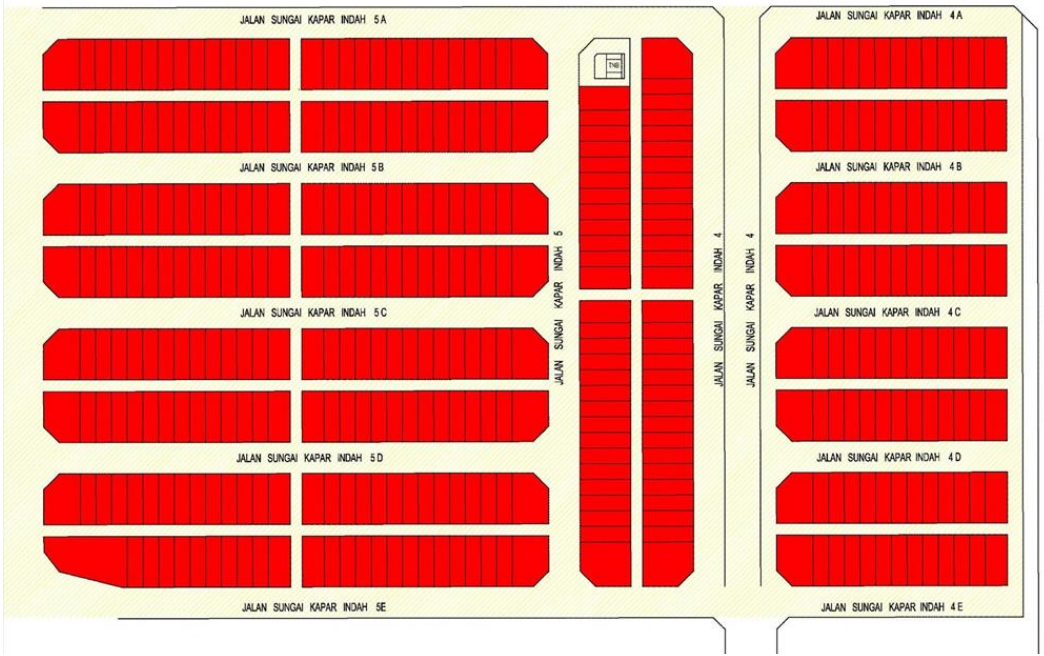
Total square area

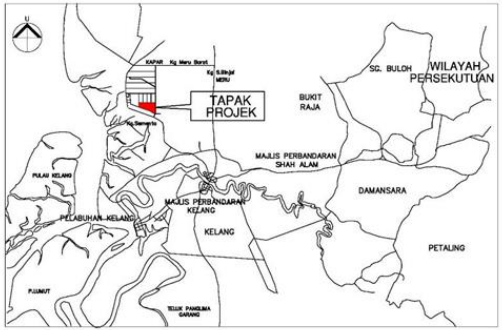
- Negative spaces should be removed
  - Setback
    - can minimise maintenance cost
  - Parking
    - one parking lot should be enough
    - millennials like to carpooling or take public transport to reduce the expenses of driving car
- Number of rooms can also be reduced
  - - millennials are likely to have small family


MASTER PLAN
SG KAPAR INDAH

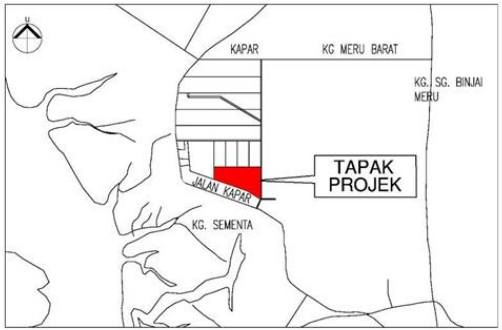
SUNGAI KAPAR PHASE 2A

KELUASAN TAPAK	93,606 SQM	23.13 EKAR
JUMLAH UNIT	383 UNIT	
DENSITY (GROSS)	16.55 UNIT / EKAR	
KELUASAN LOT	51,464.70 SQM	12.717 EKAR
DENSITY (NETT)	30 UNIT / EKAR	
INFRASTRUKTUR	42,141.30 SQM	10.413 EKAR





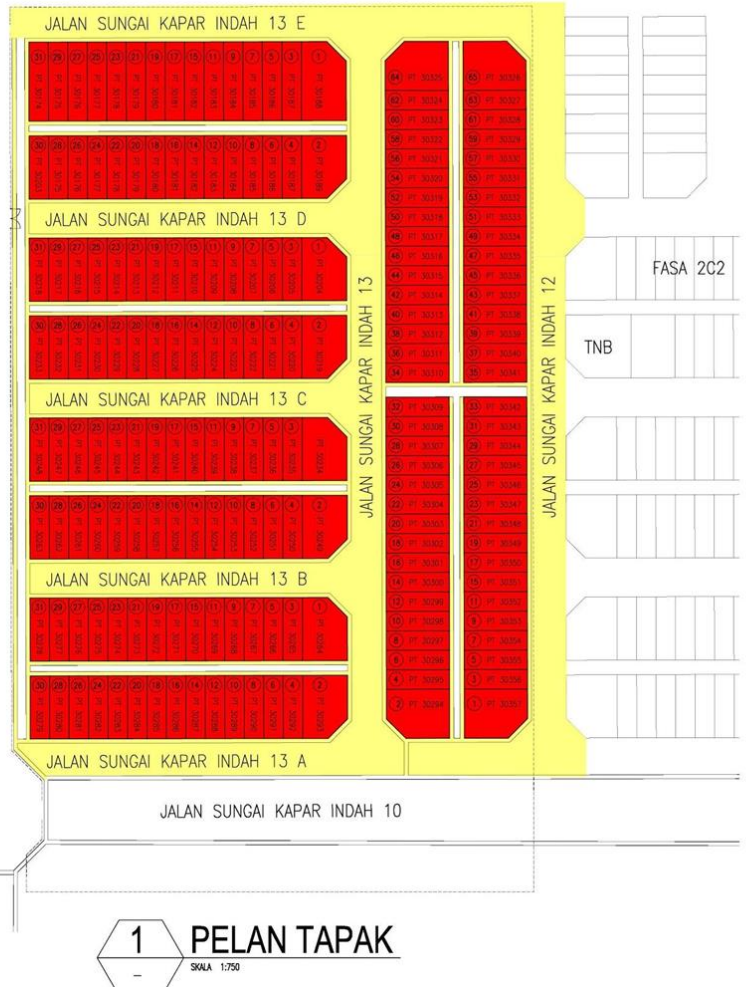
2 PELAN KUNCI
TANPA SKALA



3 PELAN LOKASI
TANPA SKALA

	GUNATANAH	UNIT	%	EKAR	%
PERUMAHAN					
	Perumahan Kos Rendah Teres (15' X 55') (1)	538	35.4	12.2	2.1
	Perumahan Kos Sederhana Teres 20' X 65'	980	64.6	35.6	6.1
Jumlah Kecil		1518	100	47.8	8.2
PERINDUSTRIAN					
	Industri Perkhidmatan (Kos Rendah) (20' X 80')	68	21.5	2.7	0.4
	Industri Perkhidmatan (Kos Sederhana (24' X 90')	82	26.0	4.5	0.8
A	Lot Industri (0.3 – 1.0 ac)	110	34.8	43.7	7.6
B	Lot Industri (1.0 – 2.0 ac)	12	3.8	12.8	2.2
C	Lot Industri (2.0 – 3.0 ac)	35	11.1	73.0	12.6
D	Lot Industri (> 3.0 ac)	9	2.8	57.1	9.9
Jumlah Kecil		316	100	193.8	33.5
PERDAGANGAN					
	Rumah Kedai Kos Rendah 20' X 65'	77	43.8	2.7	0.5
	Rumah Kedai Kos Tinggi 24' X 75'	91	51.7	4.5	0.8
	Pam Minyak	2	1.1	1.5	0.2
	Kompleks Perdagangan/ Tapak Pejabat	1	0.6	6.6	1.1
	Medan Selera/Terminal Bas/Teksi/ Tempat Letak Kereta	5	2.8	8.5	1.5
Jumlah Kecil		176	100	23.8	4.1

	GUNATANAH	UNIT	%	EKAR	%
INSTITUSI					
	Pusat Penyelidikan	1	–	40.0	7.0
	Sekolah Rendah	1	–	6.0	1.0
	Dewan/Surau/Tadika Rezab Lain–Lain (RR)	5	–	2.5	0.4
Jumlah Kecil		7	-	48.5	8.4
INFRASTRUKTUR					
	Kawasan Lapang / Rezab Pemisah	–	–	66.6	9.8
	Telekom	–	–	2.0	0.3
	Pencawang Kecil TNB (35' X 70')	–	–	0.6	0.1
	Pencawang TNB (150' X 150')	–	–	0.5	0.1
RP	Rezab Pembentungan	–	–	5.7	1.0
	Rezab Parit	–	–	19.2	3.3
	Tlk / Gerai	–	–	3.5	0.6
	Rezab Jalan (2)	–	–	166.9	28.8
Jumlah Kecil		-	-	265.0	45.8
Jumlah Keseluruhan		-	-	578.9	100

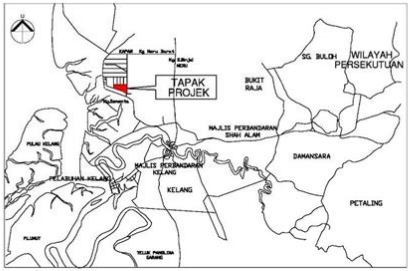


1 PELAN TAPAK

SKALA 1:750

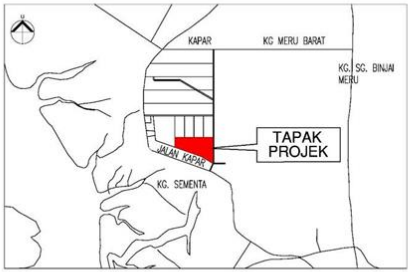
SUNGAI KAPAR PHASE 2C/1

KELUASAN TAPAK	41,225 SQM	10.187 EKAR
JUMLAH UNIT	184 UNIT	
DENSITY (GROSS)	18 UNIT / EKAR	
KELUASAN LOT	24,113.42 SQM	5.96 EKAR
DENSITY (NETT)	30.88 UNIT / EKAR	
INFRASTRUKTUR	17,111.58 SQM	4.227 EKAR



2 PELAN KUNCI

TANPA SKALA

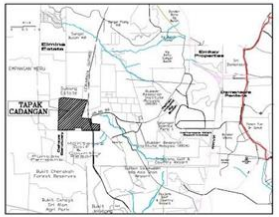


3 PELAN LOKASI

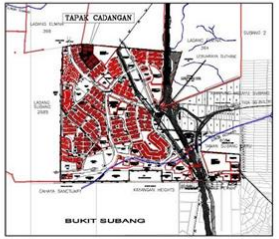
TANPA SKALA

DENAI ALAM - i8

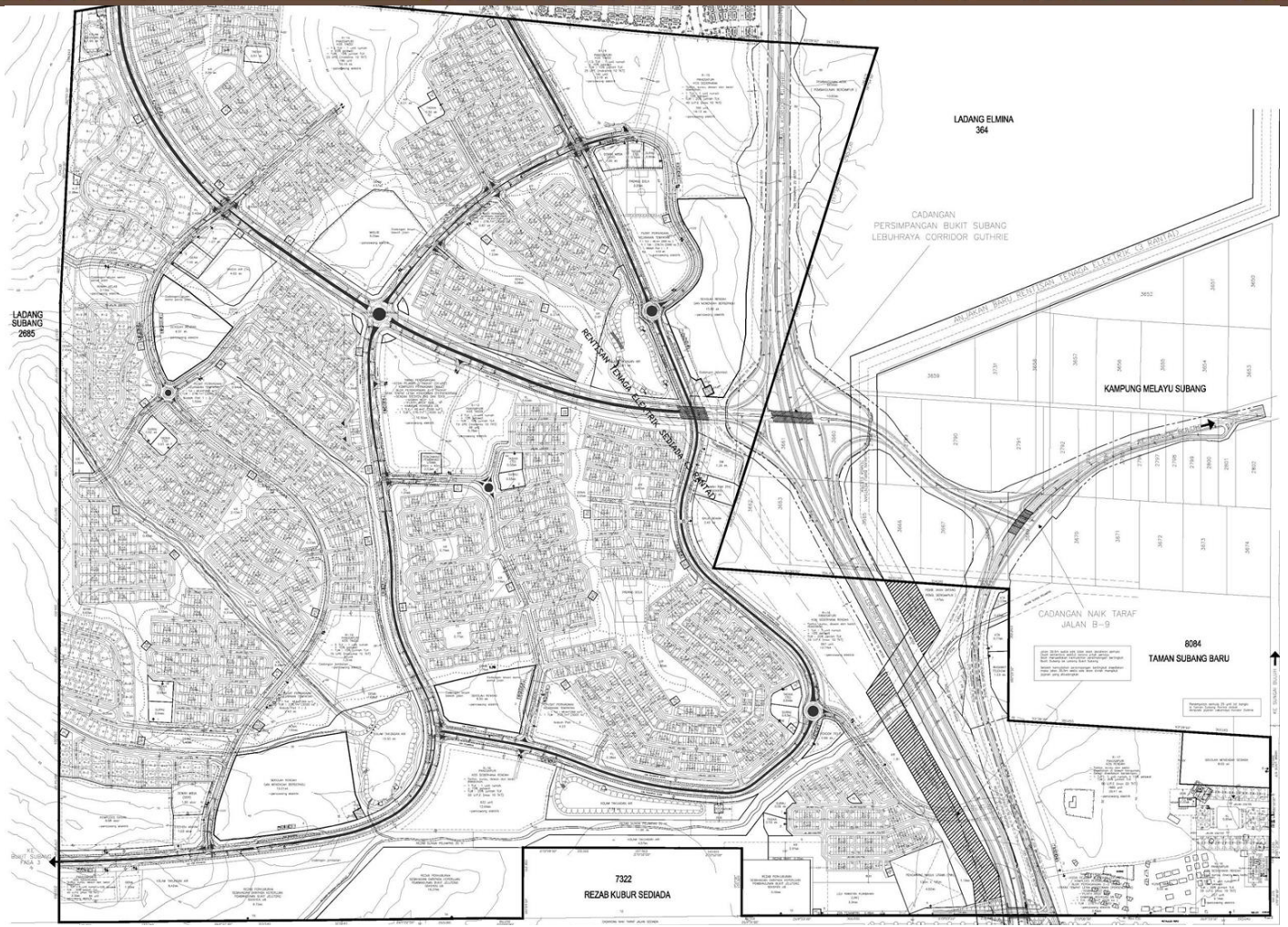
KELUASAN TAPAK	69,834 SQM	17.26 EKAR
JUMLAH UNIT	132 UNIT	
DENSITY (GROSS)	7.6 UNIT / EKAR	
KELUASAN LOT	29,304 SQM	7.24 EKAR
DENSITY (NETT)	18.23 UNIT / EKAR	
INFRASTRUKTUR	24,073.09 SQM	5.94 EKAR
KAWASAN LAPANG	16,456.91 SQM	4.07 EKAR



PELAN KUNCI

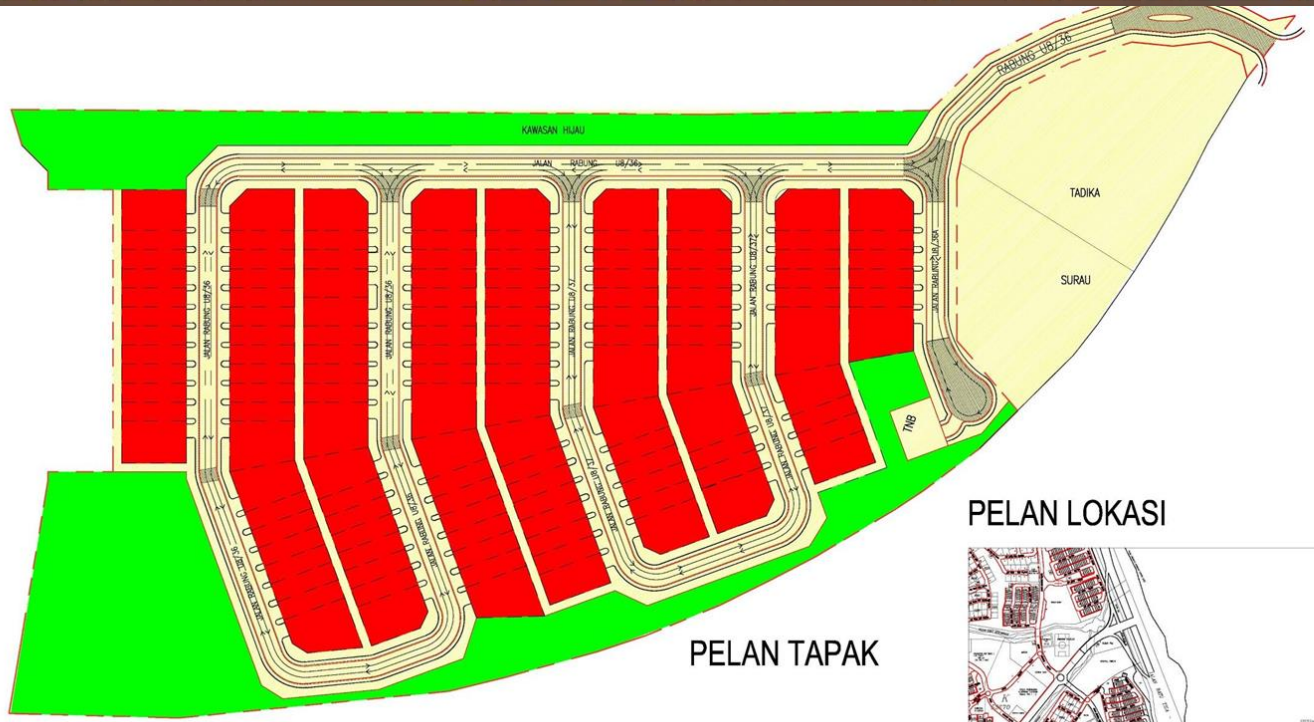


PELAN LOKASI


LADANG ELMINA
364
CADANGAN
PERSIMPANGAN BUKIT SUBANG
LEBUHRAYA CORRIDOR GUTHRIE
LADANG
SUBANG
2685
KAMPUNG MELAYU SUBANG
CADANGAN NAIK TARAF
JALAN B-9
8084
TAMAN SUBANG BARU
7322
REZAB KUBUR SEDIADA

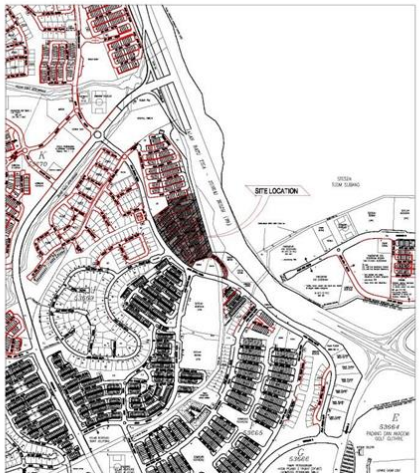
	JADUAL GUNATANAH		Unit	%	Ekar	%
	PERUMAHAN					
R1	Sesebuah 10,000 kp (minima)		38	0.52	15.26	1.52
R2	Sesebuah 5,400 kp (minima)		97	1.32	15.77	1.57
R3	Berkembar	2 hingga 3 tingkat	54	0.74	6.96	0.69
R4	Teres 30' x 80'	2 hingga 3 tingkat	104	1.42	6.82	0.68
R5	Teres 26' x 80'	2 hingga 3 tingkat	120	1.64	7.44	0.74
R6	Teres 24' x 80'	2 hingga 3 tingkat	434	5.92	23.94	2.39
R7	Teres 22' x 100'	2 hingga 3 tingkat	10	0.14	0.67	0.07
R8	Teres 22' x 90'	2 hingga 3 tingkat	194	2.65	11.32	1.13
R9	Teres 22' x 80'	2 hingga 3 tingkat	1287	17.55	68.36	6.82
R10	Teres 22' x 75'	2 hingga 3 tingkat	416	5.67	21.87	2.18
R11	Teres 20' x 70'	2 hingga 3 tingkat	282	3.85	11.48	1.15
R12	Teres 20' x 65'	2 hingga 3 tingkat	190	2.59	7.43	0.74
R13	Pangsapuri Mewah	15 unit/ekar	100	1.36	14.09	1.41
R14	Pangsapuri Mewah	25 unit/ekar	340	4.64	32.34	3.23
	Jumlah Kecil		**3666**	**50.00**	**243.75**	**24.32**
	PERUMAHAN MAMPU MILIK					
R15	Rumah Kos Sederhana	40 unit/ekar	734	10.00	21.43	2.14
R16	Rumah Kos Sederhana Rendah	50 unit/ekar	1466	20.00	31.50	3.14
R17	Rumah Kos Rendah	60 unit/ekar	1466	20.00	28.41	2.83
	Jumlah Kecil		**3666**	**50.00**	**81.34**	**8.12**
			7332	**100.00**		
	Keperluan Perumahan Dari Bukit Jelutong					
	Rumah Kos Rendah		220	20.00		
	Rumah Kos Sederhana Rendah		110	10.00		
	Rumah Kos Sederhana		110	10.00		
	Jumlah Kecil		**440**	**40.00**		
	JUMLAH PEMB. PERUMAHAN KESELURUHAN		**7772**		**325.09**	**32.44**
	PERDAGANGAN					
	Pusat Perniagaan Kedai Kejiranan		13	59.09	13.45	1.34
	Taman Perdagangan (2&3 Tingkat / Mall)		2	9.09	14.41	1.44
SM	Stesen Minyak		3	13.64	3.36	0.34
	Rumah Kelab		1	4.55	3.13	0.31
	Gerai		2	9.09	2.00	0.20
	Klinik Swasta		1	4.55	5.00	0.50
	Jumlah Kecil		**22**	**100.00**	**41.35**	**4.13**

	JADUAL GUNATANAH	Unit	%	Ekar	%
	KAWASAN LAPANG & REKREASI AWAM				
	Kompleks Sukan	1		9.58	0.96
KL	Kawasan Lapang / Hijau			28.68	2.86
KR	Kawasan Rekreasi			42.79	4.27
KTA	Kolam Takungan Air			41.12	4.10
	Lingkaran Denai			33.98	3.39
	Zon Penampan			39.49	3.94
	Jumlah Kecil			**195.64**	**19.52**
	KEMUDAHAN AWAM				
SB	Sekolah Rendah Dan Menengah Bersepadu	2		30.01	2.99
SM	Sekolah Menengah Kebangsaan (Sediada)	1		6.00	0.60
SR	Sekolah Rendah kebangsaan	2		12.51	1.25
M	Masjid	1		9.05	0.90
S	Surau	6		3.40	0.34
TD	Tadika	8		4.46	0.44
DOR	Dewan MBSA	2		2.50	0.25
	Balai Bomba	1		2.40	0.24
	Pondok Polis	1		0.89	0.09
	Jumlah Kecil	**24**		**71.22**	**7.11**
	INFRASTRUKTUR				
PMU	Pencawang Masuk Utama	1		4.52	0.45
PPU	Pencawang Pembahagi Utama	1		0.53	0.05
PE	Pencawang Elektrik	44		3.14	0.31
	Tapak Ibusawat Telekom	1		1.23	0.12
TA	Tangki Air	1		4.02	0.40
LRK	Loji Rawatan Kumbahan	1		3.34	0.33
PA	Rumah Pam Air	1		1.10	0.11
PS	Rumah Pam Kumbahan	6		0.73	0.07
	Rezab Parit Berlandskap			9.20	0.92
	Rezab Sungai			15.35	1.53
	Rezab Jalan Raya			207.90	20.74
	Jumlah Kecil	**56**		**251.06**	**25.05**
	JUMLAH LUAS KAWASAN PERANCANGAN			**884.36**	**88.24**
	Rezab Perkuburan Sebahagian Dari Keperluan Pembangunan Bukit Jelutong			30.00	2.99
	Rezab Talian Elektrik			11.60	1.16
	Rezab Paip PUAS Sediada			1.59	0.16
	Rezab Koridor Guthrie			46.35	4.62
	Rezab Jalan Batu 3 Sg. Buluh (B9)			15.51	1.55
	Pembangunan Akan Datang			12.86	1.28
	Jumlah Kecil			**117.91**	**11.76**
	JUMLAH LUAS KESELURUHAN PEMBANGUNAN			**1002.26**	**100.00**



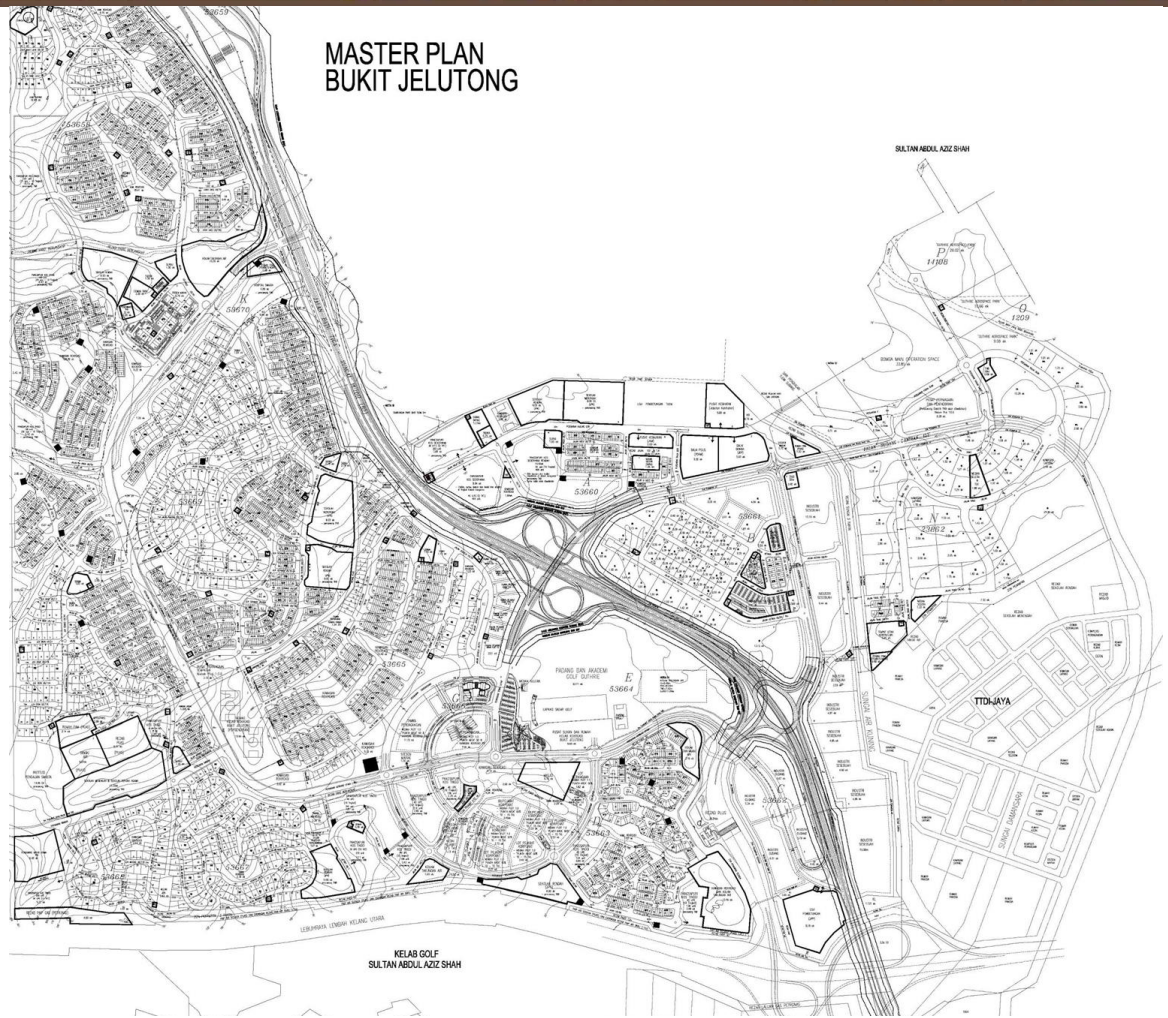
PELAN TAPAK

PELAN LOKASI



BUKIT JELUTONG

KELUASAN TAPAK	61,492.99 SQM	15.195 EKAR
JUMLAH UNIT	128 UNIT	
DENSITY (GROSS)	8.4 UNIT / EKAR	
KELUASAN LOT	25,854.44 SQM	6.388 EKAR
DENSITY (NETT)	20 UNIT / EKAR	
INFRASTRUKTUR	21,635.88 SQM	5.347 EKAR
KAWASAN LAPANG	14,002.67 SQM	3.46 EKAR


MASTER PLAN
BUKIT JELUTONG
SULTAN ABDUL AZIZ SHAH
TTDI JAYA
KELAB GOLF
SULTAN ABDUL AZIZ SHAH

Jadual Gunatanah

		Bil. Unit	%	Ekar	%
PERUMAHAN					
RS	LOT SESEBUAH (6,000-20,000 kp)	645	8.047	128.22	5.815
RB1	RUMAH BERKEMBAR 60' x 100' (2 TINGKAT)	22	0.274	3.33	0.151
RB2	RUMAH BERKEMBAR 60' x 90' (2 TINGKAT)	62	0.774	9.45	0.429
RB3	RUMAH BERKEMBAR 50' x 90' (2 TINGKAT)	14	0.175	2.17	0.098
RB4	RUMAH BERKEMBAR 65' x 100' (2 TINGKAT)	30	0.374	5.50	0.249
RB5	RUMAH BERKEMBAR 65' x 90' (2 TINGKAT)	38	0.474	6.12	0.278
RT1	RUMAH TERES 26' X 100' (2 TINGKAT)	72	0.898	6.27	0.284
RT2	RUMAH TERES 26' X 70' (2 TINGKAT)	24	0.299	1.42	0.064
RT3	RUMAH TERES 25' x 90' (2 TINGKAT)	22	0.274	1.86	0.084
RT4	RUMAH TERES 24' x 80' (2 TINGKAT)	1045	13.038	59.77	2.711
RT5	RUMAH TERES 24' x 75' (2 TINGKAT)	30	0.374	1.18	0.054
RT6	RUMAH TERES 22' x 75' (2 TINGKAT)	1792	22.358	86.22	3.910
RT7	RUMAH TERES 20' x 70' (2 TINGKAT)	120	1.497	5.04	0.229
RT8	RUMAH TERES 24' x 100' (2 TINGKAT)	49	0.611	3.56	0.161
RT9	RUMAH TERES 24' x 90' (2 TINGKAT)	282	3.518	17.60	0.798
RT10	RUMAH TERES 22' x 100' (2 TINGKAT)	21	0.262	1.47	0.067
RT11	RUMAH TERES 22' x 90' (2 TINGKAT)	102	1.273	7.02	0.318
	PANGSAPURI KOS TINGGI (20-40 upe)	2141	26.712	75.63	3.430
	PANGSAPURI KOS SEDERHANA (40 upe)	704	8.784	17.33	0.786
	RUMAH PANGSA KOS SEDERHANA RENDAH (50 upe)	800	9.981	14.49	0.657
	JUMLAH KECIL	8015	100.00	453.65	20.574
PERNIAGAAN/PERDAGANGAN					
	TAMAN PERDAGANGAN (PEMBANGUNAN AKAN DATANG)			19.26	0.873
	LOT IBUPEJABAT KORPORAT	2		5.52	0.250
	LOT PEJABAT KORPORAT	4		10.93	0.496
	LOT PERNIAGAAN	1		1.62	0.074
	PUSAT PERNIAGAAN DAN PENTADBIRAN	1		8.38	0.380
	PUSAT PERNIAGAAN TEMPATAN	1		3.15	0.143
	TAMAN PEJABAT	7		11.16	0.506
KP3	KEDAI PEJABAT 3 TINGKAT (24'x75')	26		1.65	0.075
	KEDAI PEJABAT 2/3 TINGKAT (24' x 80')			3.44	0.156
KP2	KEDAI PEJABAT 2 TINGKAT (32' x 82')	34		2.52	0.114
KKR	KEDAI KOS RENDAH 1 TINGKAT (20' x 65')	37		1.44	0.065
	KEDAI KEJIRANAN			0.77	0.035
	MEDAN SELERA	4		6.08	0.276
	STESEN MINYAK	5		6.23	0.283
	HOSPITAL SWASTA	1		6.89	0.312
	JUMLAH KECIL	123		89.28	4.049
INDUSTRI					
IS	INDUSTRI SESEBUAH	61		199.59	9.052
IG	INDUSTRI GUDANG	4		21.11	0.957
IB	KILANG BERKEMBAR	40		16.82	0.763
PRKR	KILANG TERES KOS RENDAH (20'x80')	22		0.87	0.040
GAP	`GUTHRIE AEROSPACE PARK'			45.76	2.075
IPA	INDUSTRI PENERBANGAN AM	7		18.14	0.823
	BOMBA MAIN OPERATION SPACE	1		33.85	1.535
	JUMLAH KECIL	135		336.14	15.244

INSTITUSI DAN KERAJAAN					
	TADIKA	7		6.04	0.273
	SEKOLAH RENDAH	5		29.68	1.346
	SEKOLAH MENENGAH	2		18.00	0.816
	SEKOLAH RENDAH & MENENGAH AGAMA	1		12.32	0.558
	INSTITUSI PENGAJIAN SWASTA	1		14.46	0.656
	SURAU	4		3.83	0.174
	MASJID	1		5.12	0.232
	DEWAN MBSA	4		3.86	0.175
	DEWAN SIVIK	1		2.00	0.091
	PUSAT KEBAJIKAN	1		2.00	0.091
	BALAI BOMBA	1		5.00	0.227
	BALAI POLIS	1		5.00	0.227
	PUSAT KESIHATAN	1		5.00	0.227
	JUMLAH KECIL	30		112.31	5.093
KAWASAN LAPANG DAN REKREASI KEGUNAAN AWAM					
	KAWASAN REKREASI	-		146.49	6.643
	KAWASAN LAPANG/HIJAU	-		91.89	4.167
	KOLAM TAKUNGAN AIR	4		25.92	1.176
	ZON PENAMPAN	-		57.18	2.593
	JUMLAH KECIL	4		321.48	14.579
KAWASAN LAPANG DAN REKREASI SWASTA					
	AKADEMI GOLF GUTHRIE (AGG)			63.71	2.889
	RUMAH KELAB AGG / PEJABAT PENTADBIRAN			6.60	0.299
	PUSAT SUKAN DAN KELAB REKREASI BUKIT JELUTONG			6.66	0.302
	KELAB REKREASI BUKIT JELUTONG			13.94	0.632
	KELAB REKREASI PERSENDIRIAN			1.07	0.049
	JUMLAH KESELURUHAN REKREASI			91.98	4.171
INFRASTRUKTUR					
	REZAB TANGKI AIR & PAIP PUAS SEDIADA	-		23.31	1.057
	TANGKI AIR	2		6.24	0.283
	RUMAH PAM (PUAS)	2		4.14	0.188
	REZAB PARIT BERLANSKAP	-		27.52	1.248
	REZAB PARIT	-		20.06	0.910
	REZAB SUNGAI	-		5.33	0.242
	REZAB PERKHIDMATAN	-		0.23	0.010
	REZAB PAIP GAS	-		4.60	0.209
	PENCAWANG MASUK UTAMA	1		6.48	0.294
	PENCAWANG PEMBAHAGI UTAMA (33KV)	4		2.44	0.111
TNB	PENCAWANG ELEKTRIK TNB	90		7.40	0.336
	LOJI PEMBETUNGAN NAJIS	1		9.18	0.416
	RUMAH PAM (PEMBETUNGAN)	2		2.17	0.098
	REZAB PLUS	-		32.24	1.462
	TEMPAT LETAK KERETA	3		2.43	0.110
	TEMPAT LETAK KERETA/LORI	1		3.49	0.158
	TERMINAL BAS/LORI/TLK	1		5.01	0.227
	REZAB JALANRAYA DAN TLK	-		628.67	28.511
	JUMLAH KECIL	106		790.94	35.870
PEMBANGUNAN AKAN DATANG					
	PEMBANGUNAN AKAN DATANG			9.58	0.434
	JUMLAH KECIL			9.58	0.434
	JUMLAH KESELURUHAN	8412		2205.03	100.000

PELAN KUNCI
TIDAK BERSKALA

PELAN LOKASI
TIDAK BERSKALA

PPAM PHASE 2 - CENGKIH

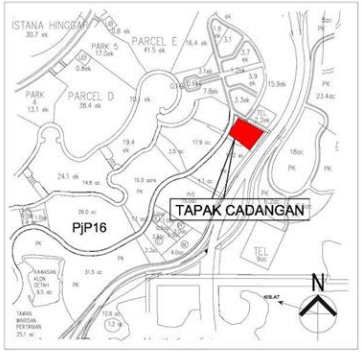
KELUASAN TAPAK	11,493.07 SQM	2.84 EKAR
JUMLAH UNIT	500 UNIT	
DENSITY (GROSS)	176 UNIT / EKAR	
PLINTH APARTMENT	2,851.99 SQM	0.70 EKAR
INFRASTRUKTUR	9,189.92 SQM	2.27 EKAR
KAWASAN LAPANG	2,303.15 SQM	0.57 EKAR

PT 12217
PPA1M SADERI

PELAN TAPAK
SCALE 1 :500

SITE PLAN
SCALE 1 :300

PELAN KUNCI
TIDAK BERSKALA



PELAN LOKASI
TIDAK BERSKALA

PPAM PHASE 1- JINTAN

KELUASAN TAPAK	23,188.48 SQM	5.73 EKAR
JUMLAH UNIT	517 UNIT	
DENSITY (GROSS)	90.22 UNIT / EKAR	
PLINTH APARTMENT	3,969.09 SQM	0.98 EKAR
INFRASTRUKTUR	18,171.48 SQM	4.49 EKAR
KAWASAN LAPANG	5,017.00 SQM	1.24 EKAR

PELAN KUNCI
TIDAK BERSKALA

PELAN LOKASI
TIDAK BERSKALA

PPAM PHASE 2 - PT 12217

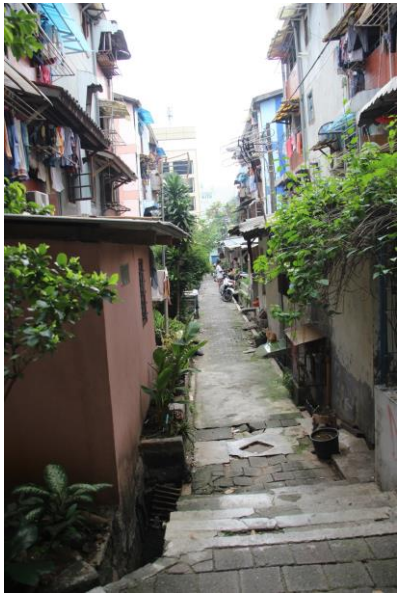
KELUASAN TAPAK	39,740.13 SQM	9.82 EKAR
JUMLAH UNIT	1100 UNIT (PPAM) , 316 UNIT (OPEN)	
DENSITY (GROSS)	148 UNIT / EKAR	
PLINTH APARTMENT	8,062.95 SQM	1.99 EKAR
INFRASTRUKTUR	24,638.88 SQM	6.09 EKAR
KAWASAN LAPANG	15,101.25 SQM	3.73 EKAR

CITY

Value Variety Vibrant Vitality

- A place where many people live together.
- It has many buildings and streets.
- An extensive systems for housing, transportation, sanitation, utilities, land use, and communication.
- City usually has a ‘city centre’ where government and business take place, and places called suburbs where people live around the outside of the centre.

Rumah Susun Kebon Kacang, Jakarta



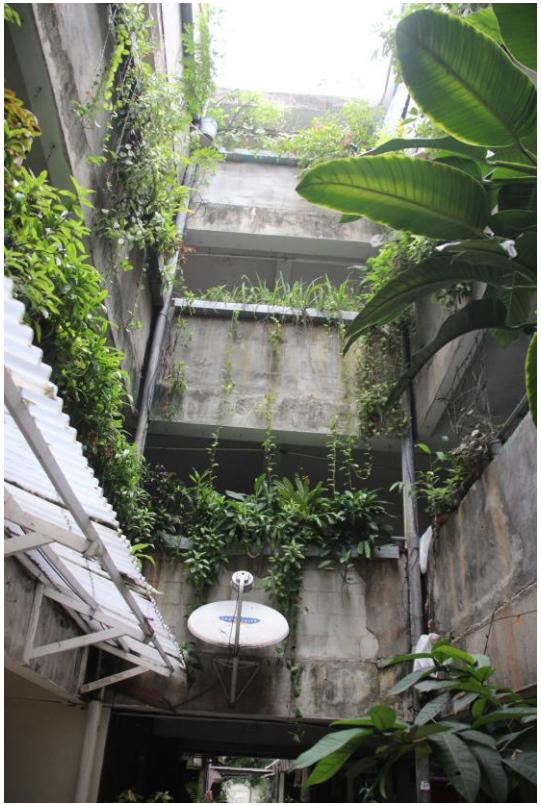
Back lane in between blocks.

Courtyard.

Back lane.

Setback.

Main stairs are used for plants and interactive space.



Greeneries along corridors.

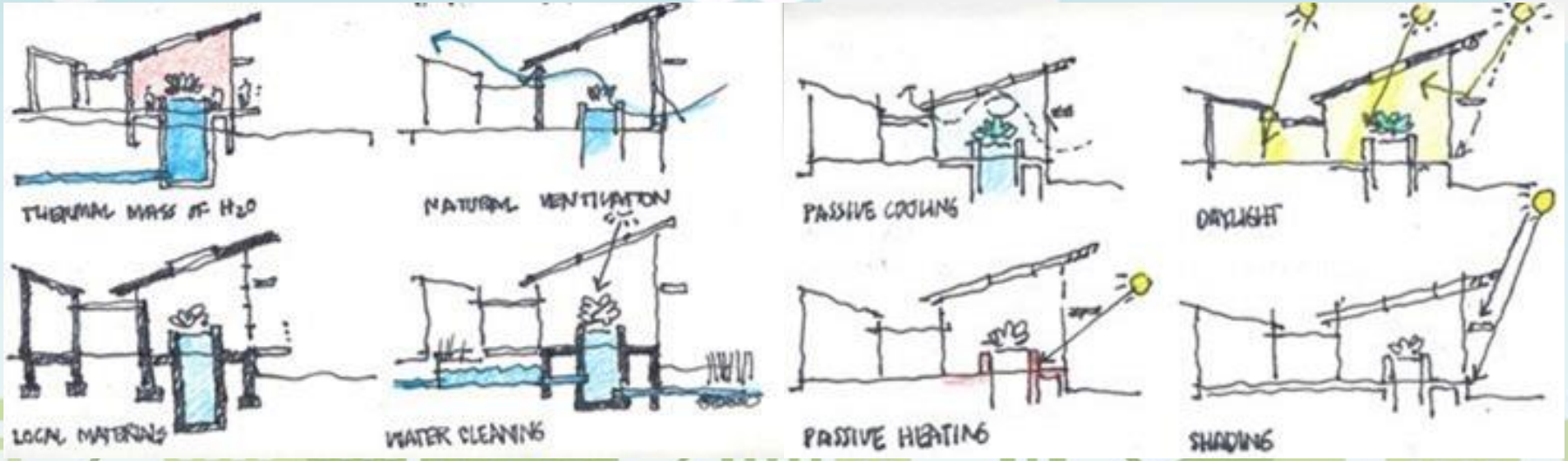
Emergency staircase.

Threshold space between outside and inside a house.

Common space used as study area for students.

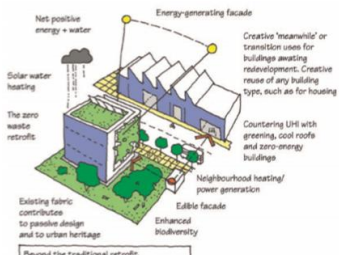
Common space used as resting area.

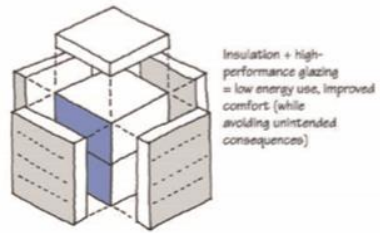
Basic Principles of Sustainable Architecture

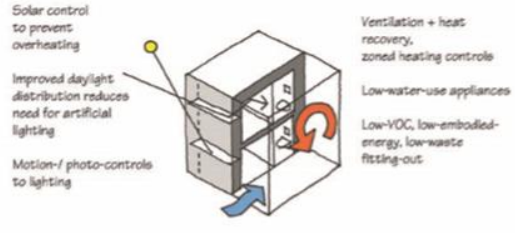


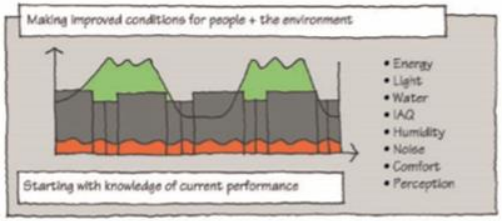
6 Strategic Rules For Sustainable Retrofit

- Begin with building performance: how well it works tells us whats need to be done.
- Employ integrated thinking: reduce energy use while improving comfort and health.
- Inventiveness beats wastefulness: employ creative ideas for empty and under-occupied buildings and to eliminate wasteful fitting-out practices.
- Embodied energy recurs: minimise or eliminate the extra embodied energy associated with each re-fit.
- Avoid unintended consequences: whether sealing and insulation can lead to moisture damage, poor IAQ and overheating.
- Reject ‘greenwash’: be wary of false promises of environmental performance.



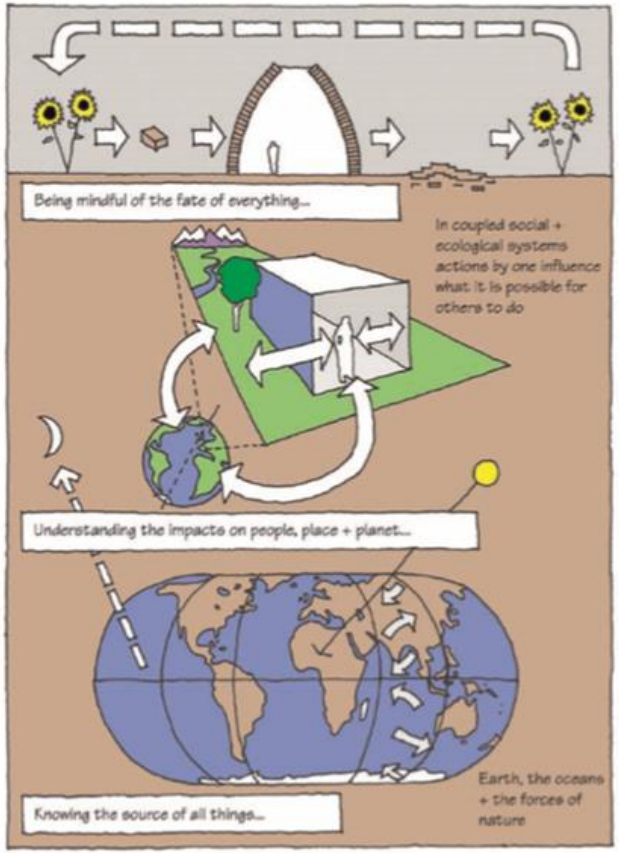






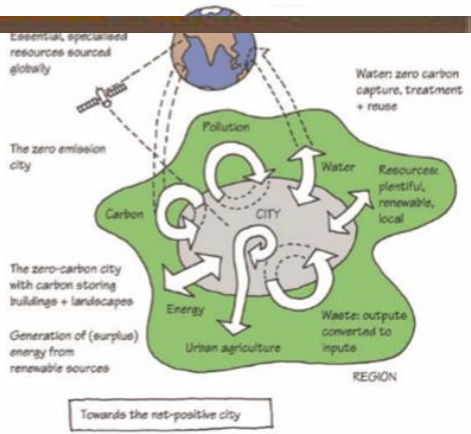
6 Strategic Rules For Sustainable Architecture

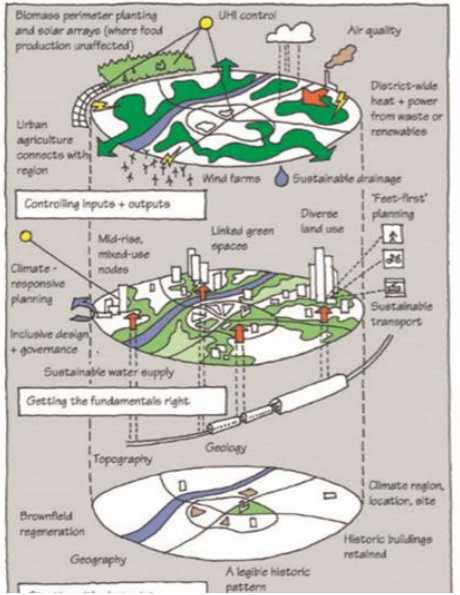
- Think big: the focus must be simultaneously on people, place and planet.
- Think small: the goal is to reduce resource use, waste and ecological footprint.
- Think positive: beyond just energy, could a building put back more than it takes out? This would be a ‘net positive’ outcome.
- Be mindful of the fate of buildings: we know demountable, recyclable, reusable - but what about reversible, exchangeable, compostable, mobile, edible?
- Be responsible: take on board the ecological, social, ethical and aesthetic responsibilities.
- Be sensible: apply common sense at all times and do not be tempted by ‘eco-bling’.



6 Strategic Rules For Sustainable Cities

- Nature is the starting point: let place, climate and the forces of nature influence the form of urban (re)development.
- Think high-density/low-impact: the goal is a compact city with a compact environmental footprint.
- Re-establish links between city and region: a symbiotic relationship between the city and its environs benefits citizens, ecology and the environment.
- Could the city contribute more than it consumes with innovative, ‘net-positive’ solutions to energy, waste, carbon and water?
- Demand beauty and diversity in the public realm: the liveable city id varied, attractive, biodiverse, walkable, inclusive, connected, clean and safe.
- Go ‘feet first’: give priority to cycling and walking in the city.





Affordable Housing should be integrated with Rain Water Harvesting System

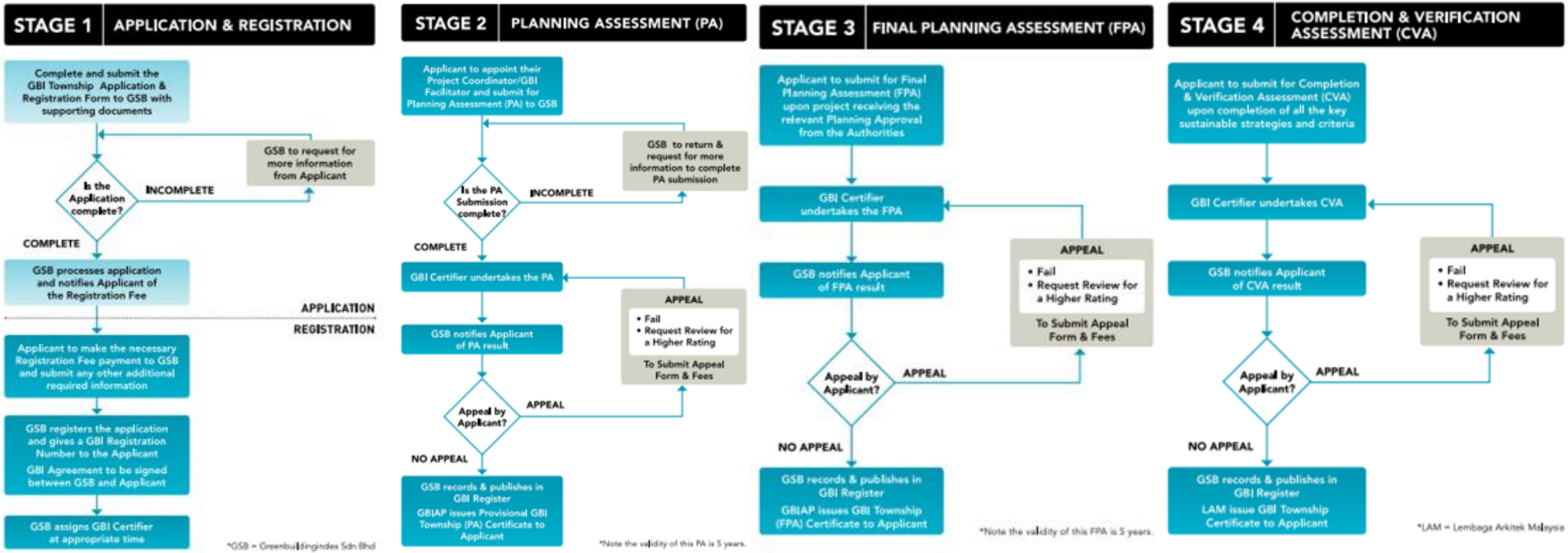
- Water supply in Malaysia is on going.
- The rain that is collected using this system can be use for toilets and gardening purposes.
- It also can be directly connected to the main pipe in case of water shortage occasionally.
- Complement to RIBA - 101 Rules Of Thumbs For Sustainable Buildings And Cities

GBI TOWNSHIP REFERENCE GUIDE

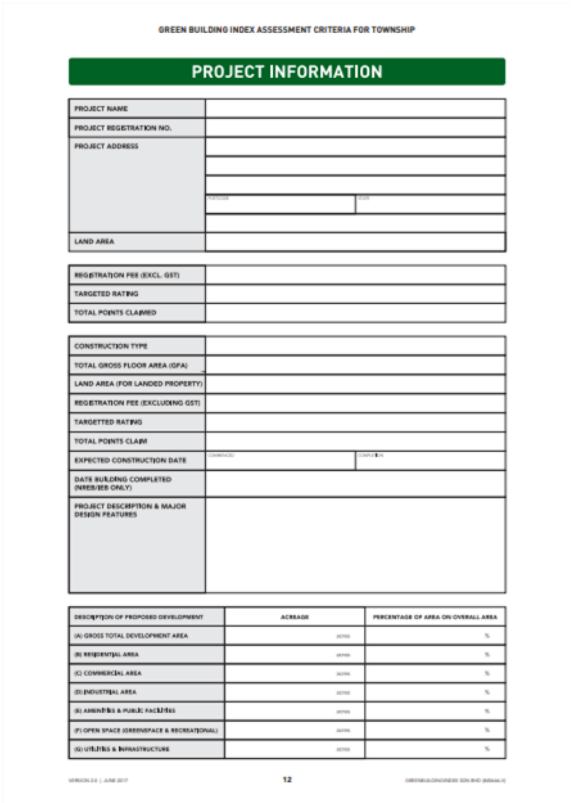
To attain the Green Building Index Township, the procedures are as follows:

- Stage 1 Application & Registration
- Stage 2 Planning Assessment (PA)
- Stage 3 Final Planning Assessment (FPA)
- Stage 4 Completion & Verification Assessment (CVA)

GBI TOWNSHIP REFERENCE GUIDE



GBI TOWNSHIP REFERENCE GUIDE



GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR TOWNSHIP

PROJECT INFORMATION

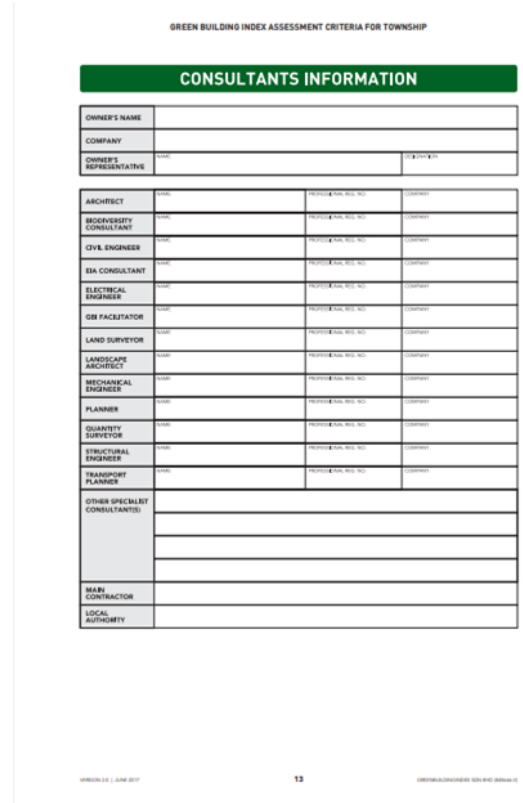
PROJECT NAME	
PROJECT REGISTRATION NO.	
PROJECT ADDRESS	
LAND AREA	

REGISTRATION FEE (EXCL. GST)	
TARGETED RATING	
TOTAL POINTS CLAIMED	

CONSTRUCTION TYPE	
TOTAL GROSS FLOOR AREA (GFA)	
LAND AREA (FOR LANDED PROPERTY)	
REGISTRATION FEE (EXCLUDING GST)	
TARGETTED RATING	
TOTAL POINTS CLAIM	
EXPECTED CONSTRUCTION DATE	
DATE BUILDING COMPLETED (NRES/IBS ONLY)	
PROJECT DESCRIPTION & MAJOR DESIGN FEATURES	

DESCRIPTION OF PROPOSED DEVELOPMENT	ACREAGE	PERCENTAGE OF AREA ON OVERALL AREA
(A) GROSS TOTAL DEVELOPMENT AREA		%
(B) RESIDENTIAL AREA		%
(C) COMMERCIAL AREA		%
(D) INDUSTRIAL AREA		%
(E) AMENITIES & PUBLIC FACILITIES		%
(F) OPEN SPACE (GREENSPACE & RECREATIONAL)		%
(G) UTILITIES & INFRASTRUCTURE		%

12



GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR TOWNSHIP

CONSULTANTS INFORMATION

OWNER'S NAME	
COMPANY	
OWNER'S REPRESENTATIVE	NAME / DESIGNATION

ARCHITECT	NAME	PROFESSIONAL REG. NO.	COMPANY
BIODIVERSITY CONSULTANT	NAME	PROFESSIONAL REG. NO.	COMPANY
CIVIL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
EIA CONSULTANT	NAME	PROFESSIONAL REG. NO.	COMPANY
ELECTRICAL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
GBI FACILITATOR	NAME	PROFESSIONAL REG. NO.	COMPANY
LAND SURVEYOR	NAME	PROFESSIONAL REG. NO.	COMPANY
LANDSCAPE ARCHITECT	NAME	PROFESSIONAL REG. NO.	COMPANY
MECHANICAL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
PLANNER	NAME	PROFESSIONAL REG. NO.	COMPANY
QUANTITY SURVEYOR	NAME	PROFESSIONAL REG. NO.	COMPANY
STRUCTURAL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
TRANSPORT PLANNER	NAME	PROFESSIONAL REG. NO.	COMPANY
OTHER SPECIALIST CONSULTANT(S)			
MAIN CONTRACTOR			
LOCAL AUTHORITY			

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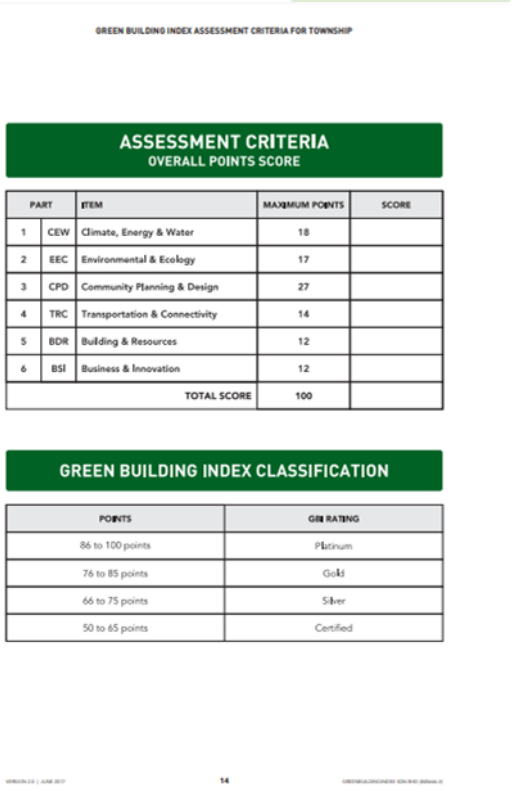

GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR TOWNSHIP

ASSESSMENT CRITERIA
OVERALL POINTS SCORE

PART		ITEM	MAXIMUM POINTS	SCORE
1	CEW	Climate, Energy & Water	18	
2	EEC	Environmental & Ecology	17	
3	CPD	Community Planning & Design	27	
4	TRC	Transportation & Connectivity	14	
5	BDR	Building & Resources	12	
6	BSI	Business & Innovation	12	
		TOTAL SCORE	100	

GREEN BUILDING INDEX CLASSIFICATION

POINTS	GBI RATING
86 to 100 points	Platinum
76 to 85 points	Gold
66 to 75 points	Silver
50 to 65 points	Certified

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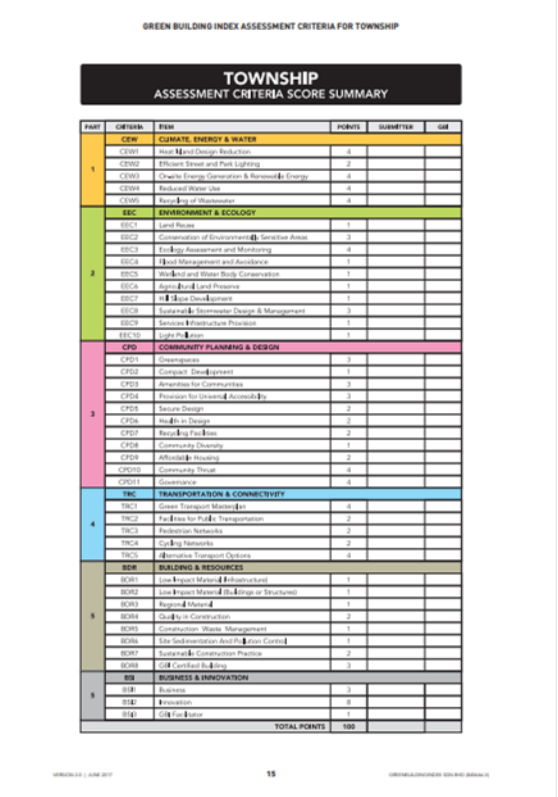
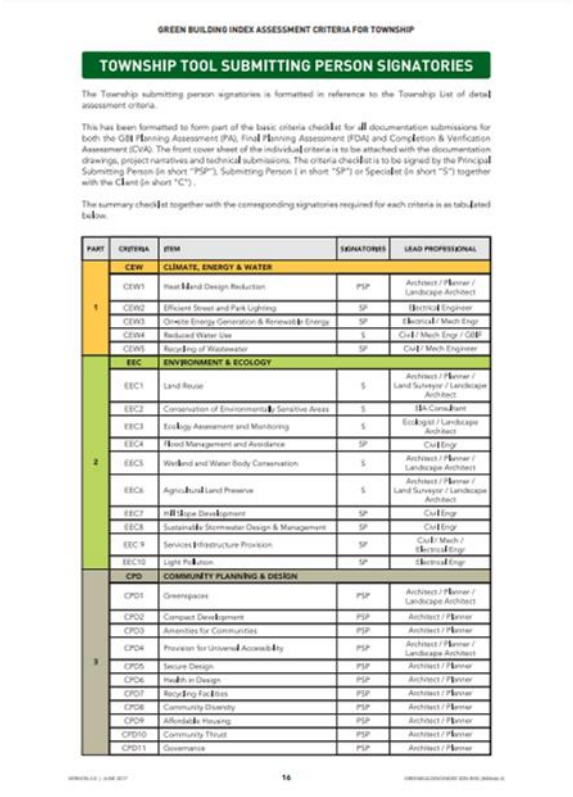
GBI TOWNSHIP REFERENCE GUIDE



GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR TOWNSHIP

TOWNSHIP
ASSESSMENT CRITERIA SCORE SUMMARY

PART	CRITERIA	ITEM	POINTS	SUBMITTER	GSB
1	CEW	CLIMATE, ENERGY & WATER			
	CEW1	Heat Island Design Reduction	4		
	CEW2	Efficient Street and Park Lighting	2		
	CEW3	Onsite Energy Generation & Renewable Energy	4		
	CEW4	Reduced Water Use	4		
	CEW5	Recycling of Wastewater	4		
2	EEC	ENVIRONMENT & ECOLOGY			
	EEC1	Land Reuse	1		
	EEC2	Conservation of Environmentally Sensitive Areas	3		
	EEC3	Ecology Assessment and Monitoring	4		
	EEC4	Flood Management and Avoidance	1		
	EEC5	Wetland and Water Body Conservation	1		
	EEC6	Agricultural Land Preserve	1		
	EEC7	Hill Slope Development	1		
	EEC8	Sustainable Stormwater Design & Management	3		
	EEC9	Services Infrastructure Provision	1		
	EEC10	Light Pollution	1		
3	CPD	COMMUNITY PLANNING & DESIGN			
	CPD1	Greenspaces	3		
	CPD2	Compact Development	1		
	CPD3	Amenities for Communities	3		
	CPD4	Provision for Universal Accessibility	3		
	CPD5	Secure Design	2		
	CPD6	Health in Design	2		
	CPD7	Recycling Facilities	2		
	CPD8	Community Diversity	1		
	CPD9	Affordable Housing	2		
	CPD10	Community Thrust	4		
	CPD11	Governance	4		
4	TRC	TRANSPORTATION & CONNECTIVITY			
	TRC1	Green Transport Masterplan	4		
	TRC2	Facilities for Public Transportation	2		
	TRC3	Pedestrian Networks	2		
	TRC4	Cycling Networks	2		
	TRC5	Alternative Transport Options	4		
5	BDR	BUILDING & RESOURCES			
	BDR1	Low Impact Material (Infrastructure)	1		
	BDR2	Low Impact Material (Buildings or Structures)	1		
	BDR3	Regional Material	1		
	BDR4	Quality in Construction	2		
	BDR5	Construction Waste Management	1		
	BDR6	Site Sedimentation And Pollution Control	1		
	BDR7	Sustainable Construction Practice	2		
	BDR8	GBI Certified Building	3		
6	BIQ	BUSINESS & INNOVATION			
	BIQ1	Business	3		
	BIQ2	Innovation	8		
	BIQ3	GBI Facilitator	1		
		TOTAL POINTS	100		



GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR TOWNSHIP

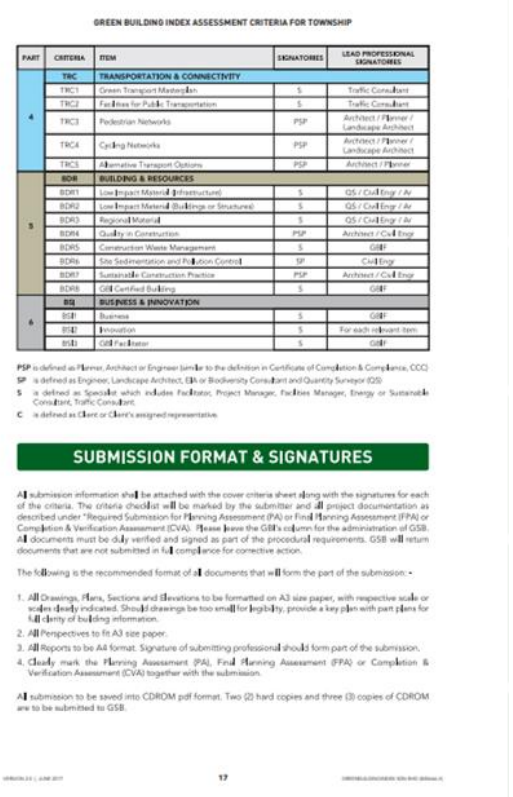
TOWNSHIP TOOL SUBMITTING PERSON SIGNATORIES

The Township submitting person signatories is formatted in reference to the Township List of detail assessment criteria.

This has been formatted to form part of the basic criteria checklist for all documentation submissions for both the GBI Planning Assessment (PA), Final Planning Assessment (FDA) and Completion & Verification Assessment (CVA). The front cover sheet of the individual criteria is to be attached with the documentation drawings, project narratives and technical submissions. The criteria checklist is to be signed by the Principal Submitting Person (in short "PSP"), Submitting Person (in short "SP") or Specialist (in short "S") together with the Client (in short "C") .

The summary checklist together with the corresponding signatories required for each criteria is as tabulated below.

PART	CRITERIA	ITEM	SIGNATORIES	LEAD PROFESSIONAL
1	CEW	CLIMATE, ENERGY & WATER		
	CEW1	Heat Island Design Reduction	PSP	Architect / Planner / Landscape Architect
	CEW2	Efficient Street and Park Lighting	SP	Electrical Engineer
	CEW3	Onsite Energy Generation & Renewable Energy	SP	Electrical / Mech Engr
	CEW4	Reduced Water Use	S	Civil / Mech Engr / GBIF
	CEW5	Recycling of Wastewater	SP	Civil/ Mech Engineer
2	EEC	ENVIRONMENT & ECOLOGY		
	EEC1	Land Reuse	S	Architect / Planner / Land Surveyor / Landscape Architect
	EEC2	Conservation of Environmentally Sensitive Areas	S	EIA Consultant
	EEC3	Ecology Assessment and Monitoring	S	Ecologist / Landscape Architect
	EEC4	Flood Management and Avoidance	SP	Civil Engr
	EEC5	Wetland and Water Body Conservation	S	Architect / Planner / Landscape Architect
	EEC6	Agricultural Land Preserve	S	Architect / Planner / Land Surveyor / Landscape Architect
	EEC7	Hill Slope Development	SP	Civil Engr
	EEC8	Sustainable Stormwater Design & Management	SP	Civil Engr
	EEC 9	Services Infrastructure Provision	SP	Civil/ Mech / Electrical Engr
	EEC10	Light Pollution	SP	Electrical Engr
3	CPD	COMMUNITY PLANNING & DESIGN		
	CPD1	Greenspaces	PSP	Architect / Planner / Landscape Architect
	CPD2	Compact Development	PSP	Architect / Planner
	CPD3	Amenities for Communities	PSP	Architect / Planner
	CPD4	Provision for Universal Accessibility	PSP	Architect / Planner / Landscape Architect
	CPD5	Secure Design	PSP	Architect / Planner
	CPD6	Health in Design	PSP	Architect / Planner
	CPD7	Recycling Facilities	PSP	Architect / Planner
	CPD8	Community Diversity	PSP	Architect / Planner
	CPD9	Affordable Housing	PSP	Architect / Planner
	CPD10	Community Thrust	PSP	Architect / Planner
	CPD11	Governance	PSP	Architect / Planner



GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR TOWNSHIP

PART	CRITERIA	ITEM	SIGNATORIES	LEAD PROFESSIONAL SIGNATORIES
4	TRC	TRANSPORTATION & CONNECTIVITY		
	TRC1	Green Transport Masterplan	S	Traffic Consultant
	TRC2	Facilities for Public Transportation	S	Traffic Consultant
	TRC3	Pedestrian Networks	PSP	Architect / Planner / Landscape Architect
	TRC4	Cycling Networks	PSP	Architect / Planner / Landscape Architect
	TRC5	Alternative Transport Options	PSP	Architect / Planner
5	BDR	BUILDING & RESOURCES		
	BDR1	Low Impact Material (Infrastructure)	S	QS / Civil Engr / Ar
	BDR2	Low Impact Material (Buildings or Structures)	S	QS / Civil Engr / Ar
	BDR3	Regional Material	S	QS / Civil Engr / Ar
	BDR4	Quality in Construction	PSP	Architect / Civil Engr
	BDR5	Construction Waste Management	S	GBIF
	BDR6	Site Sedimentation and Pollution Control	SP	Civil Engr
	BDR7	Sustainable Construction Practice	PSP	Architect / Civil Engr
	BDR8	GBI Certified Building	S	GBIF
6	BIQ	BUSINESS & INNOVATION		
	BIQ1	Business	S	GBIF
	BIQ2	Innovation	S	For each relevant item
	BIQ3	GBI Facilitator	S	GBIF

PSP is defined as Planner, Architect or Engineer (similar to the definition in Certificate of Completion & Compliance, CCC)
SP is defined as Engineer, Landscape Architect, EIA or Biodiversity Consultant and Quantity Surveyor (QS)
S is defined as Specialist which includes Facilitator, Project Manager, Facilities Manager, Energy or Sustainable Consultant, Traffic Consultant.
C is defined as Client or Client's assigned representative.

SUBMISSION FORMAT & SIGNATURES

All submission information shall be attached with the cover criteria sheet along with the signatures for each of the criteria. The criteria checklist will be marked by the submitter and all project documentation as described under "Required Submission for Planning Assessment (PA) or Final Planning Assessment (FPA) or Completion & Verification Assessment (CVA). Please leave the GBI's column for the administration of GSB. All documents must be duly verified and signed as part of the procedural requirements. GSB will return documents that are not submitted in full compliance for corrective action.

The following is the recommended format of all documents that will form the part of the submission: -

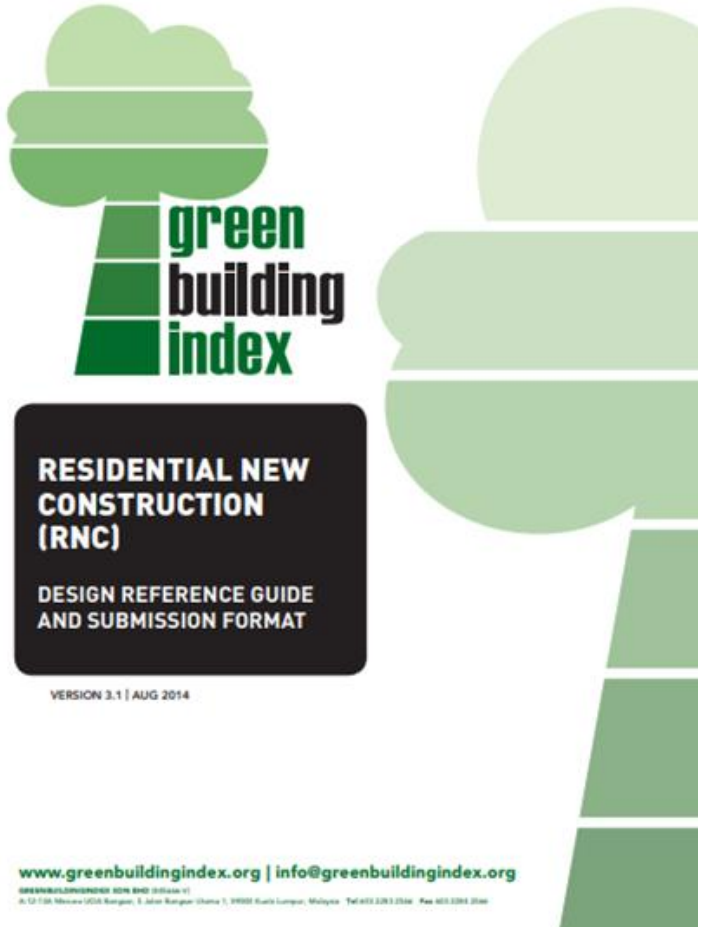
1. All Drawings, Plans, Sections and Elevations to be formatted on A3 size paper, with respective scale or scales clearly indicated. Should drawings be too small for legibility, provide a key plan with part plans for full clarity of building information.
2. All Perspectives to fit A3 size paper.
3. All Reports to be A4 format. Signature of submitting professional should form part of the submission.
4. Clearly mark the Planning Assessment (PA), Final Planning Assessment (FPA) or Completion & Verification Assessment (CVA) together with the submission.

All submission to be saved into CDROM pdf format. Two (2) hard copies and three (3) copies of CDROM are to be submitted to GSB.

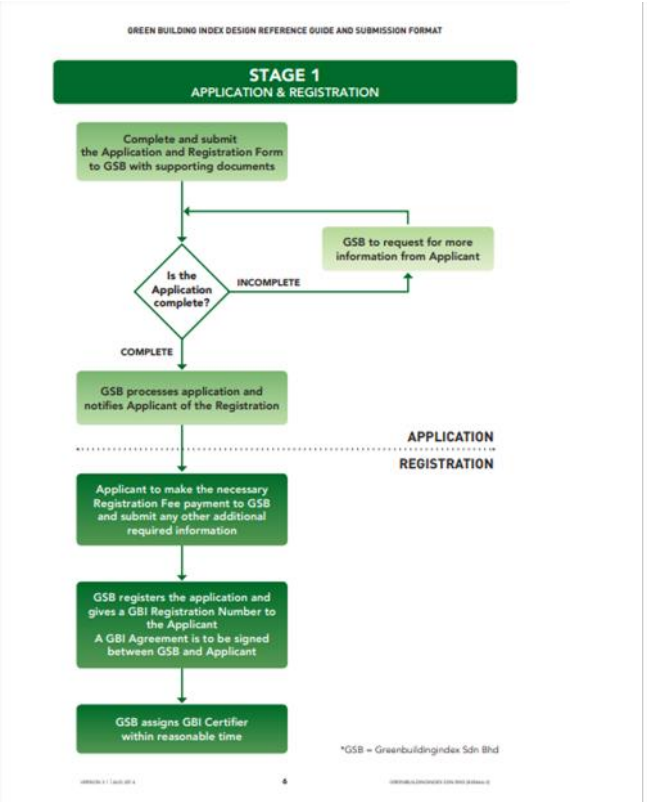
GBI RESIDENTIAL NEW CONSTRUCTION (RNC)

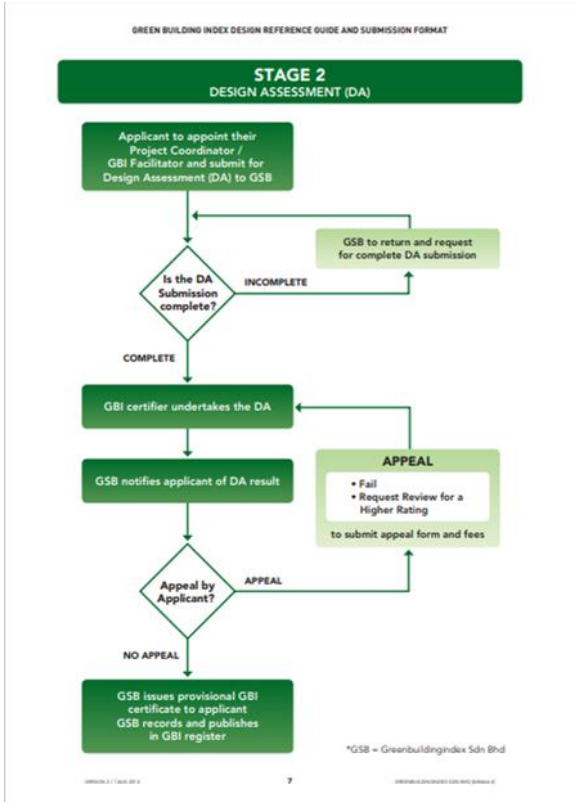
To attain the Green Building Index certification, the procedures are as follows:

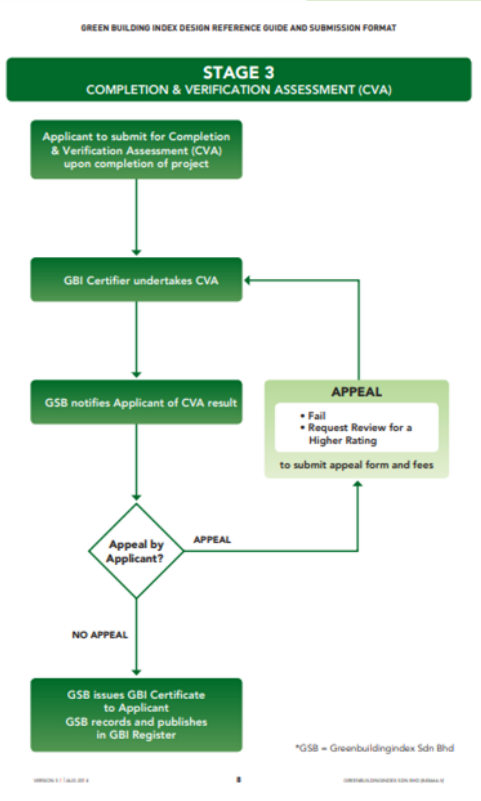
- Stage 1 Application & Registration
- Stage 2 Design Assessment
- Stage 3 Completion & Verification Assessment



GBI RESIDENTIAL NEW CONSTRUCTION (RNC)







GBI RESIDENTIAL NEW CONSTRUCTION (RNC)

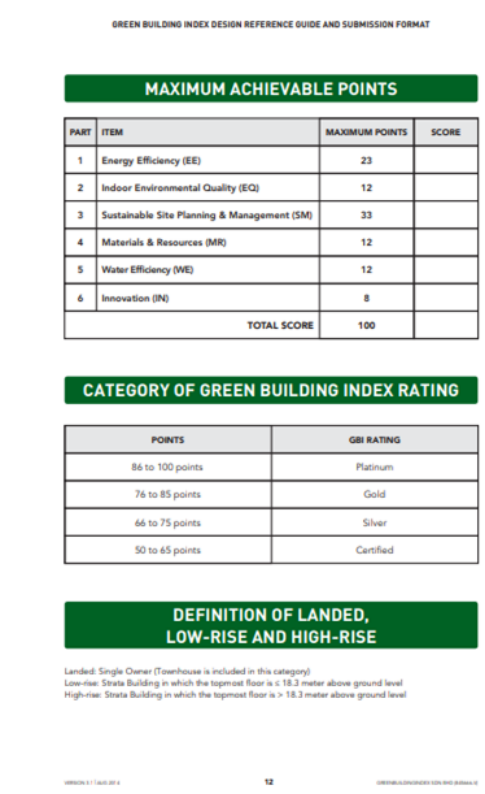
PROJECT INFORMATION

PROJECT NAME	
PROJECT REGISTRATION NO.	
PROJECT ADDRESS	
CONSTRUCTION TYPE	
TOTAL GROSS FLOOR AREA (GFA)	
LAND AREA (FOR LANDED PROPERTY)	
REGISTRATION FEE (EXCLUDING SERVICE TAX)	
TARGETED RATING	
TOTAL POINTS CLAIMED	
EXPECTED CONSTRUCTION DATES	
DATE BUILDING COMPLETED (NRE&TER ONLY)	
PROJECT DESCRIPTION & MAJOR DESIGN FEATURES	

PROJECT TEAM INFORMATION

OWNER'S NAME			
COMPANY			
OWNER'S REPRESENTATIVE			
ARCHITECT			
CIVIL ENGINEER			
STRUCTURAL ENGINEER			
MECHANICAL ENGINEER			
ELECTRICAL ENGINEER			
QUANTITY SURVEYOR			
LAND SURVEYOR			
LANDSCAPE ARCHITECT			
GBI FACILITATOR			
OTHER SPECIALIST CONSULTANT(S)			
MAIN CONTRACTOR			
LOCAL AUTHORITY			

GBI RESIDENTIAL NEW CONSTRUCTION (RNC)



GREEN BUILDING INDEX DESIGN REFERENCE GUIDE AND SUBMISSION FORMAT

MAXIMUM ACHIEVABLE POINTS

PART	ITEM	MAXIMUM POINTS	SCORE
1	Energy Efficiency (EE)	23	
2	Indoor Environmental Quality (EQ)	12	
3	Sustainable Site Planning & Management (SM)	33	
4	Materials & Resources (MR)	12	
5	Water Efficiency (WE)	12	
6	Innovation (IN)	8	
	TOTAL SCORE	100	

CATEGORY OF GREEN BUILDING INDEX RATING

POINTS	GBI RATING
86 to 100 points	Platinum
76 to 85 points	Gold
66 to 75 points	Silver
50 to 65 points	Certified

DEFINITION OF LANDED, LOW-RISE AND HIGH-RISE

Landed: Single Owner (Townhouse is included in this category)
Low-rise: Strata Building in which the topmost floor is ≤ 18.3 meter above ground level
High-rise: Strata Building in which the topmost floor is > 18.3 meter above ground level

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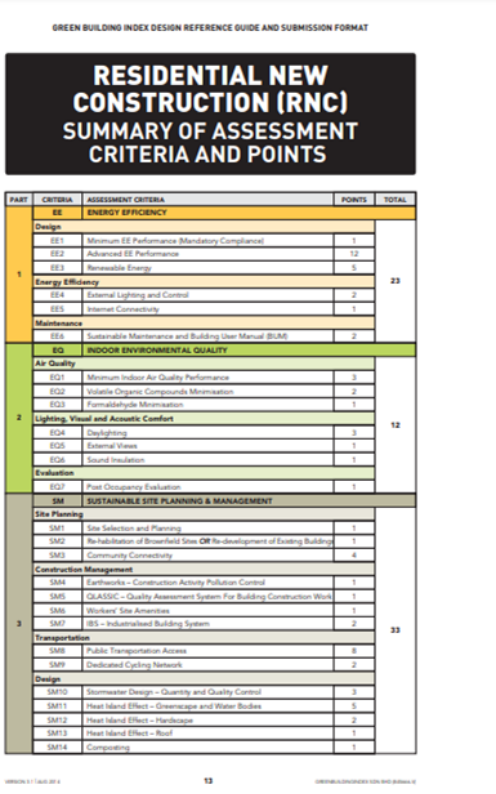

GREEN BUILDING INDEX DESIGN REFERENCE GUIDE AND SUBMISSION FORMAT

RESIDENTIAL NEW CONSTRUCTION (RNC)
SUMMARY OF ASSESSMENT CRITERIA AND POINTS

PART	CRITERIA	ASSESSMENT CRITERIA	POINTS	TOTAL
1	EE	ENERGY EFFICIENCY		23
	Design			
	EE1	Minimum EE Performance (Mandatory Compliance)	1	
	EE2	Advanced EE Performance	12	
	EE3	Renewable Energy	5	
	Energy Efficiency			
	EE4	External Lighting and Control	2	
	EE5	Internet Connectivity	1	
	Maintenance			
	EE6	Sustainable Maintenance and Building User Manual (BUM)	2	
2	EQ	INDOOR ENVIRONMENTAL QUALITY		12
	Air Quality			
	EQ1	Minimum Indoor Air Quality Performance	3	
	EQ2	Volatile Organic Compounds Minimisation	2	
	EQ3	Formaldehyde Minimisation	1	
	Lighting, Visual and Acoustic Comfort			
	EQ4	Daylighting	3	
	EQ5	External Views	1	
	EQ6	Sound Insulation	1	
	Evaluation			
	EQ7	Post Occupancy Evaluation	1	
3	SM	SUSTAINABLE SITE PLANNING & MANAGEMENT		33
	Site Planning			
	SM1	Site Selection and Planning	1	
	SM2	Re-habilitation of Brownfield Sites OR Re-development of Existing Buildings	1	
	SM3	Community Connectivity	4	
	Construction Management			
	SM4	Earthworks – Construction Activity Pollution Control	1	
	SM5	GLASSIC – Quality Assessment System For Building Construction Work	1	
	SM6	Workers' Site Amenities	1	
	SM7	IBS – Industrialised Building System	2	
	Transportation			
	SM8	Public Transportation Access	8	
	SM9	Dedicated Cycling Network	2	
	Design			
	SM10	Stormwater Design – Quantity and Quality Control	3	
	SM11	Heat Island Effect – Greenscape and Water Bodies	5	
	SM12	Heat Island Effect – Hardscape	2	
	SM13	Heat Island Effect – Roof	1	
	SM14	Composting	1	

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GREEN BUILDING INDEX DESIGN REFERENCE GUIDE AND SUBMISSION FORMAT

PART	CRITERIA	ASSESSMENT CRITERIA	POINTS	TOTAL
4	MR	MATERIALS & RESOURCES		12
	Reused and Recycled Materials			
	MR1	Materials Reuse and Selection	2	
	MR2	Recycled Content Materials	2	
	Sustainable Resources			
	MR3	Regional Materials	2	
	MR4	Sustainable Timber	2	
	Waste Management			
	MR5	Storage and Collection of Recyclables	2	
	MR6	Construction Waste Management	2	
5	WE	WATER EFFICIENCY		12
	Water Harvesting and Recycling			
	WE1	Rainwater Harvesting	4	
	WE2	Waste Water Recycling	2	
	Increased Efficiency			
	WE3	Water Efficient Irrigation and Landscaping	2	
	WE4	Water Efficient Fittings	4	
6	IN	INNOVATION		8
	IN1	Innovation in Design and Environmental Design Initiatives	7	
	IN2	Green Building Index Facilitator (GBIF)	1	
		TOTAL POINTS		100

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GBI RESIDENTIAL NEW CONSTRUCTION (RNC)

GREEN BUILDING INDEX DESIGN REFERENCE GUIDE AND SUBMISSION FORMAT

CRITERIA SIGNATORIES

The Reference guide has been formatted to form part of the basic criteria checklist for all documentation submissions for both the Design Assessment (DA) and Completion & Verification Assessment (CVA). The cover sheet of the individual criteria shall be attached with the documentation drawings, project narratives and technical submissions. The cover sheets shall be signed by the respective Lead Professional.

The table below lists out the corresponding signatories required for each criteria.

PART	CRITERIA	ITEM	LEAD PROFESSIONAL SIGNATORIES
1	EE	ENERGY EFFICIENCY	
	EE1	Minimum EE Performance	Architect
	EE2	Advanced EE Performance	Architect
	EE3	Renewable Energy	GBIF / Architect
	EE4	External Lighting and Control	Electrical Engineer
	EE5	Internet Connectivity	Electrical Engineer
	EE6	Sustainable Maintenance and Building User Manual (BUM)	GBIF
2	EQ	INDOOR ENVIRONMENTAL QUALITY	
	EQ1	Minimum Indoor Air Quality (IAQ) Performance	Architect
	EQ2	Volatile Organic Compounds Minimisation	GBIF / Architect
	EQ3	Formaldehyde Minimisation	GBIF / Architect
	EQ4	Daylighting	GBIF / Architect
	EQ5	External Views	Architect
	EQ6	Sound Insulation	GBIF / Architect
	EQ7	Post Occupancy Evaluation	GBIF
3	SM	SUSTAINABLE SITE PLANNING & MANAGEMENT	
	SM1	Site Selection and Planning	Architect
	SM2	Re-habilitation of Brownfield Sites OR Re-development of Existing Buildings	GBIF / Architect
	SM3	Community Connectivity	Architect
	SM4	Earthwork – Construction Activity Pollution Control	Civil Engineer
	SM5	CLASSIC – Quality Assessment System For Building Construction Works	Architect
	SM6	Worker's Site Amenities	Architect
	SM7	IBS – Industrialised Building System	Architect
	SM8	Public Transportation Access	Architect
	SM9	Dedicated Cycling Network	Architect
	SM10	Stormwater Design – Quantity and Quality Control	Civil Engineer
	SM11	Heat Island Effect – Greenscape and Water Bodies	Architect
	SM12	Heat Island Effect – Hardscape	Architect
	SM13	Heat Island Effect – Roof	Architect
	SM14	Composting	Architect

GREEN BUILDING INDEX DESIGN REFERENCE GUIDE AND SUBMISSION FORMAT

PART	CRITERIA	ITEM	LEAD PROFESSIONAL SIGNATORIES
4	MR	MATERIALS & RESOURCES	
	MR1	Materials Reuse and Selection	Architect
	MR2	Recycled Content Materials	Architect
	MR3	Regional Materials	Architect
	MR4	Sustainable Timber	Architect
	MR5	Storage & Collection of Recyclables	GBIF / Architect
	MR6	Construction Waste Management	GBIF / Architect
5	WE	WATER EFFICIENCY	
	WE1	Rainwater Harvesting	GBIF / Architect
	WE2	Waste Water Recycling	GBIF / Mechanical Engineer
	WE3	Water Efficient Irrigation and Landscaping	GBIF / Architect
	WE4	Water Efficient Fittings	Architect
6	IN	INNOVATION	
	IN1	Innovation in Design and Environmental Design Initiatives	GBIF
	IN2	Green Building Index Facilitator (GBIF)	GBIF

SUBMISSION FORMAT

All submission information shall be attached to the cover criteria sheet along with the signatures for each of the criteria. The criteria checklist will be marked by the submitter and all project documentation as described under "Required Submission for Design Assessment (DA)" or "Required Submission for Completion & Verification Assessment (CVA)". All documents must be duly verified and signed as part of the submission requirements. GSB will return documents that are not submitted in full compliance for corrections.

The following is the recommended format of all documents that will form the Design Assessment (DA) and Completion & Verification Assessment (CVA) submissions:

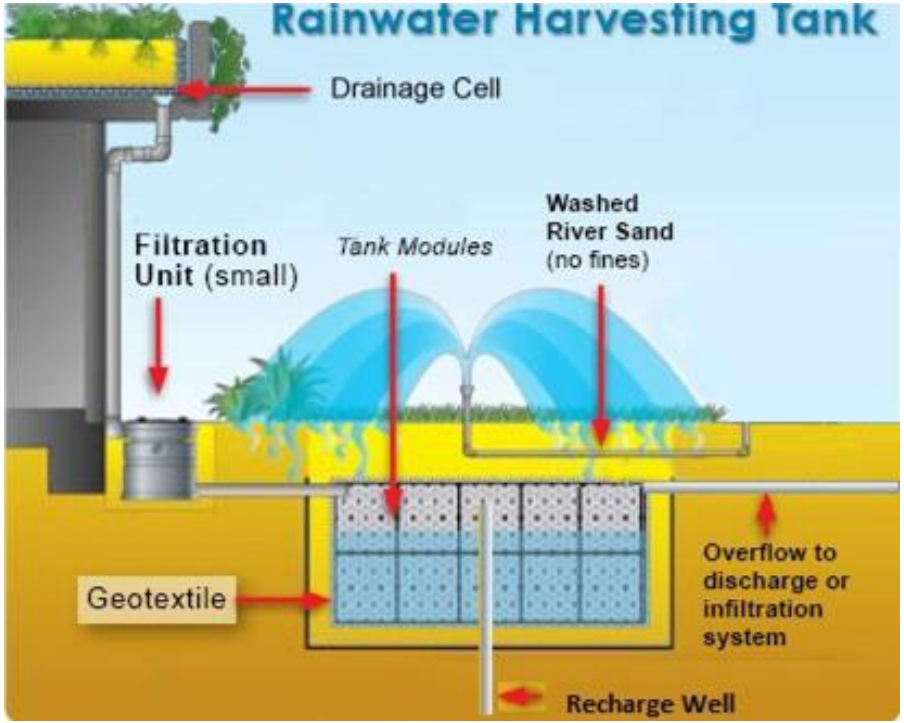
1. All Drawings, Plans, Sections and Elevations to be formatted on A3 size paper, with their respective scales clearly indicated. Should the drawings be too small to be legible, provide a key plan with part plans for clarity of building information.
2. All Perspectives to fit into A3 size paper.
3. All Reports to be in A4 format. Signatures of qualified submitting professional should form part of the submission.
4. Clearly mark the Design Assessment Checklist or Completion & Verification Checklist on the submission of documentations together with a Design Submission form.

All submission to be saved in pdf format into a CDROM. Two (2) hard copies and two (2) soft copies in CDROMs are to be submitted to GSB.

Rain Water Harvesting System

RAIN WATER HARVESTING SYSTEM

- A technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff).
- One method of rainwater harvesting is rooftop harvesting.
- What: Rainwater harvesting will improve water supply, food production, and ultimately food security.
- Who: Water insecure households or individuals in rural areas will benefit the most from rainwater harvesting systems.
- How: Since rainwater harvesting leads to water supply which leads to food security, this will greatly contribute to income generation.



- There are three major aspects to rainwater harvesting – catchment, conveyance and storage.
- Areas that are ideal for collecting water, such as rooftops and paved areas, can serve as catchments.
- The conveyance system (consisting of pipes or conduits) transports the collected water to the storage area.
- Ground level or underground tanks, large lakes or ponds can be used as storage options for the rain water.
- Rain water is not pure and therefore, it needs to be filtered before storage and use. Silt and suspended impurities needs to be removed using filtration methods.

RAIN WATER HARVESTING SYSTEM IN PENANG

Although Penang is not facing any critical water shortage, it would be great to teach our students to utilize natural resources and save water.

- Pn Ang of Methodist Girls School, Penang.

Smart water solution

Company plans to donate three rain harvesting systems in Penang

IPOH-BASED Green Master Harvest Sdn Bhd (GMH) is looking to give away three sets of its Voda rainwater harvesting system to needy folk in Penang.

GMH (previously known as Synergy Contract Sdn Bhd) co-founder and director Low Pui San said they hoped to give the rainwater harvesting systems to non-governmental organisations or any institutions in Penang that was not getting enough water to meet its daily needs.

"We are looking to donate and help set up three sets of Voda for people in need.

"If you know of a place within Penang, be it an orphanage, school, old folks home or any place that is not getting enough water to meet daily needs, feel free to suggest a nominee to us," she said in a press statement.

The Voda rainwater harvesting system is a uniquely designed wall-mounted "water tank" that utilises gravity to function and it could be used for flushing toilets or gardening.

Low said GMH wants to give back to the community through the give-away.

"We were inspired to do so after an NGO had donated our rainwater harvesting system to a school in Sitiawan," she said.

Low said its aim was to start in places where water shortages are a concern.

"Penang, Johor, Selangor and East Malaysia were among the states we had in mind.

"Given our geographical closeness with Penang, it was natural for us to start with Penang. Furthermore, Penang has been very active in cultivating green practices," she said.

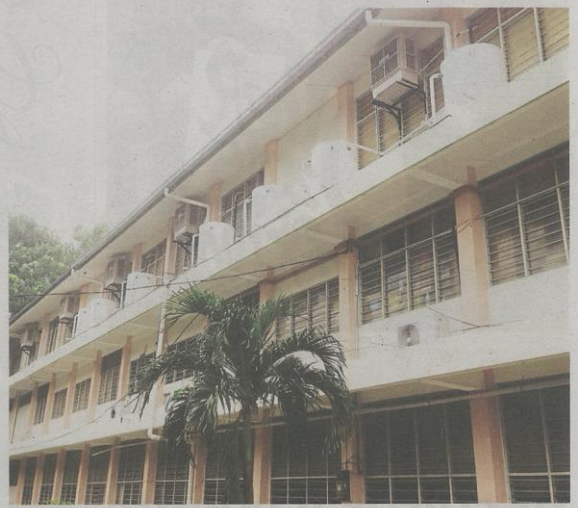
"As we advance, we hope to be able to expand these efforts to other states in Malaysia in the future," she added.

Low said its selection criteria are based on two objectives.

"The first is to be able to help assist in meeting daily water needs or save treated water among NGOs that do not have enough water to meet daily demands or would like to reduce the amount they spend on water bills.

"The second would be the effectiveness of the venues in promoting the importance and use of rain harvesting," she said, adding that recipients could include schools, kindergartens, universities, water conservation advocates or landmarks.

For more information, go to http://vodarainwaterharvesting.com, www.facebook.com/SynergyContract, or email admin@synergy-contract.com



The containers installed at SMJK Dindings in Sitiawan are used to collect rain water.

References

- https://www.slideshare.net/ymahgoub/integrating-sustainability-15842951/4-Historical_Development4_1960s_Vernacular_Architecture
- http://www.pam.org.my/
- http://www.starproperty.my/index.php/articles/property-news/breathing-new-life-into-cyberjaya/
- https://www.slideshare.net/ymahgoub/integrating-sustainability-15842951/26-Green_vs_Sustainable_Sustainable_Design
- https://olympiamanagement.net/2017/08/difference-affordable-housing-public-housing/
- http://moodle.nptcgroup.ac.uk/pluginfile.php/1048385/mod_resource/content/1/Sustainable%20buildings%20and%20cities.pdf
- https://loanstreet.com.my/learning-centre/malaysia-affordable-housing-guide-2016-2017-part-1
- https://loanstreet.com.my/learning-centre/malaysia-affordable-housing-guide-2016-2017-part-2
- https://en.wikipedia.org/wiki/City
- https://www.slideshare.net/nyaklich/millennial-overview-49124068
- http://new.greenbuildingindex.org/Files/Resources/GBI%20Tools/GBI%20Design%20Reference%20Guide%20-%20Township%20V2.0.pdf
- http://new.greenbuildingindex.org/Files/Resources/GBI%20Tools/RNC%20Reference%20Guide%20V3.1.pdf

References

- https://www.slideshare.net/ymahgoub/integrating-sustainability-15842951/4-Historical_Development4_1960s_Vernacular_Architecture
- http://www.pam.org.my/
- http://www.starproperty.my/index.php/articles/property-news/breathing-new-life-into-cyberjaya/
- https://www.slideshare.net/ymahgoub/integrating-sustainability-15842951/26-Green_vs_Sustainable_Sustainable_Design
- https://olympiamanagement.net/2017/08/difference-affordable-housing-public-housing/
- http://moodle.nptcgroup.ac.uk/pluginfile.php/1048385/mod_resource/content/1/Sustainable%20buildings%20and%20cities.pdf
- https://loanstreet.com.my/learning-centre/malaysia-affordable-housing-guide-2016-2017-part-1
- https://loanstreet.com.my/learning-centre/malaysia-affordable-housing-guide-2016-2017-part-2
- https://en.wikipedia.org/wiki/City
- https://www.slideshare.net/nyaklich/millennial-overview-49124068

Thank You!

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