

# BEMM Society Limited BEAM Pro Training and Examination Introduction, Building Certification Procedure and Innovation

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#### What is BEAM?

BEAM =

**Building Environmental** 

Assessment Method

A renowned green building labelling tool in HK to evaluate the environmental performance of buildings



#### **BEAM Evolution**

- First standards launched in 1996
- Revised in 1999, 2003, 2005, 2009 and 2012 with widespread technical input from Hong Kong professionals (advisory panels, peer review, weighting surveys)









#### BEMM

#### **BEAM Plus**

#### BEAM Plus is the 5<sup>th</sup> generation of BEAM

- First Launched: Nov 2009
- Commencement: Apr 2010
- Official registration for project assessment: Aug 2010
- Launch of Version 1.2:
   July 2012
- Mandatory Use of Version 1.2
   Jan 1 2013





#### **BEAM Plus Interiors**

- Benchmarking sustainability in the fit-out, renovation and refurbishment of non-domestic, occupied interior spaces.
- First initiated in 1996, BEAM Plus is one of the most widely used voluntary green building certification schemes in the world.
- The BSL commissioned the creation of BEAM Plus Interiors in 2012





# Hong Kong Green Building Council (HKGBC)

In 2009, four industry leaders united to establish the HKGBC











# Hong Kong Green Building Council (HKGBC)

http://www.hkgbc.org.hk

HKGBC devotes its energies to initiating the market transformation to green building

- Green Building Certification and Promulgation
- Influencing & Advising on the Drive for Green Building Growth
- Leading the Community to Adopt Green Building Practices
- Protecting the Environment in an Urban Context
- Reducing Carbon Emissions



# **BEAM Society Limited**

http://www.beamsociety.org.hk

BEAM Society Limited is a non-profit organization which is committed to promote, and develop the BEAM assessment tools, assessing green buildings and training professionals.

#### The mission of the BEAM Society is to:

- Improve the environmental performance of buildings across their life cycle;
- Provide healthier, higher quality, more durable and efficient working and living environments for building occupants;
- Contribute significantly towards sustainable development in Hong Kong;
- Build capacity in the industry to move quickly towards;
- Educate the Hong Kong community to the concepts of eco-efficiency and sustainability;
- Extend these sound practices beyond Hong Kong, and into the Asia Pacific region.



# BEAM Professionals (BEAM Pro) 綠建專才

- The key roles of BEAM Pro are to integrate the green building standards and practices into everyday building planning, design, construction & operation, and to assist the clients to achieve the desired green building rating level.
- BEAM Society Limited organizes BEAM Pro Trainings.



# BEAM Affiliate (BA) 綠建通才

A **BEAM Affiliate** is a person accredited by the Hong Kong Green Building Council (HKGBC) as being competent to support green building design, construction and operations.

In a typical project setting, BEAM Affiliates work under a BEAM Pro to support the green building certification process.



#### **BEAM Assessors**

2 groups of BEAM Assessors

Initial Group of Expert BEAM Assessors Recurring Group of BEAM Assessors

Initial Group of Expert BEAM Assessors

Recurring Group of BEAM Assessors

10

about 30

Ready to support the BEAM Plus project assessment



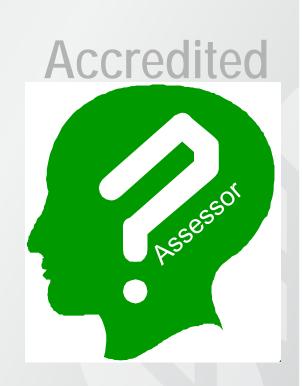
#### **Recurring Group of BEAM Assessors**

- Academic qualification meeting the requirement of BEAM Professional (BEAM Pro); AND
- Minimum ten (10) years relevant post-graduate working experience in the building sector; AND
- Sufficient technical involvement in previous BEAM / BEAM Plus certification projects, completing at least one (1) BEAM / BEAM Plus Gold project at point of application.



# **BEAM Assessors for Project Assessment**

- Under BEAM Plus rating scheme, BEAM Assessors are anonymous to clients and applicants.
- BEAM Society will assign respective BEAM Assessor to undertake project assessments based on the profile of the experts.
- could involve more than one BEAM Assessor for one project.





# 2010

~30 BEAM Assessors

~150+ Candidates per BEAM Pro Training Session

~3,200+ Candidates have been trained on BEAM Pro

~2,400+ Candidates have been accredited as BEAM Pro

~500+ Accredited BEAM Pro in the year of 2013

~530+ BEAM Plus projects registered

More BEAM Plus NB, EB and BEAM Plus Interiors Projects!

7/2014



#### **BEAM Plus NB**

- BEAM Plus covers all building types
- New Building New Buildings or Buildings involving major retrofitting works( 50% rule)
- Examples Revitalization of Industrial Buildings to Commercial Building or A&A works with majority of façade and building services equipment being upgraded or replaced.





#### **BEAM Plus EB**

 Existing Building – evaluate the performance of Existing Buildings (need 3 year maintenance records).





# **Updates**

- BEAM Plus version 1.2 of New Buildings and Existing Buildings launched on 3 July 2012 covering Passive design and amendment to Version 1.1.
- BEAM Plus version 1.2 of New Buildings and Existing Buildings is mandatory from 1 January 2013.
- BEAM Plus Interiors is officially launched on 14 August 2013.



#### **BEAM Plus Interiors - Application & Eligibility**

BEAM Plus Interiors targets the most frequently encountered non-domestic interior fit-out projects in Hong Kong, namely:

- •office premises;
- •retail premises;
- •restaurants;
- hotels, functional rooms & serviced apartments;
- •educational facilities and libraries;
- •institutional facilities including clinics, etc.







# **BEAM Plus Assessment Scope**

# "Whole-Life" Approach

- Planning
- Design
- Construction
- Commissioning
- Completion
- Operation
- Maintenance
- Management



#### **Exclusions**



- Excludes process related equipment and services associated with specialist design and operational requirements.
- e.g. IT server rooms; water meter cabinets; auditoria; swimming pools, cold rooms; car parks and loading bays.
- Applicant can exempt certain discrete area less than 20m² of the total assessed floor area.

# Type of air conditioning applicable



#### **Eligible Premises:**

- Served by a central air-conditioning system
- Served by de-centralised equipment provided by landlord / tenants
- Naturally ventilated (i.e. with operable windows)
- Combination of the above

#### Coverage



#### Some key areas interface with its surroundings:

- The overall sustainability attributes of the host building and its location.
- The control of nuisance to adjacent premises during the renovation works.
- The host buildings' envelope and types of building services.
- Potable water quality in the host building.
- Thermal comfort, visual comfort, aural comfort and indoor air quality aspects influenced by the host buildings' centralized systems.

All others are confined to the footprint or boundary of the space being occupied or leased.



# **BEAM Plus Assessment Scope**

#### For NB and EB

Site Aspects

Materials Aspects

Energy Use

Water Use

**IEQ** 

#### **For Interiors**

**Green Building Attributes** 

Management

Energy Use

Water Use

Materials Aspects

IEQ

**Innovation** 

Nov 2009:12.00am



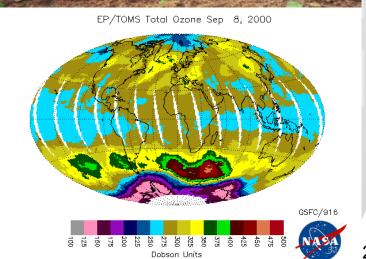
# **BEAM Plus Prerequisites**

- Minimum Landscaping Area (20%) (NB)
- Environmentally Purchasing Plan (EB)
- No Virgin forest products for temporary works (NB)
- No CFC-based refrigerants in HVAC&R systems

**Ozone Depletion** 

GEN:253/2000





Dark Gray < 100, Red > 500 DU



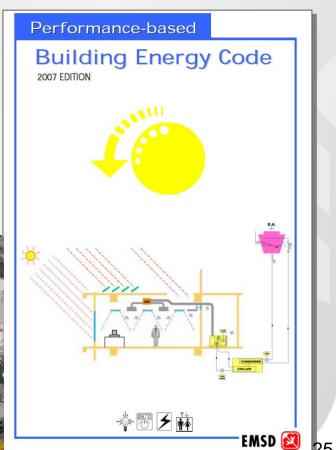
# **BEAM Plus Prerequisites**

- Implementation of construction waste management plan (NB)
- **Provision of waste recycle** facilities

**Compliance with Building Energy** 

Codes (BEC)





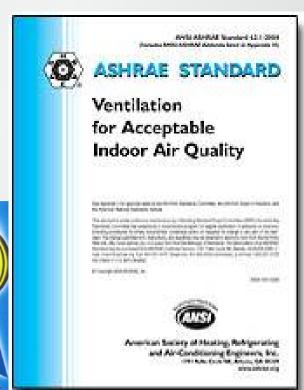


# **BEAM Plus Prerequisites**

- Water quality (WSD)
- 10% annual water saving
- Water Conservation Plan (EB)
- Compliance with minimum ventilation requirement for acceptable air quality

(ASHRAE 62.1-2007)







#### **BEAM Plus Interiors Prerequisites**

MAN P1 - A Safety Management Plan has been implemented and updated during construction and fit-out activities.

MA P1 - Using no chlorofluorocarbon (CFC)-based refrigerants in HVAC&R or other equipment which is installed by the Applicant.

MA P2 — Provide storage facilities at prominent location for the collection and recycling of paper, plastic and metal waste.

MA P3 - All timber used for temporary works shall originate from sustainable sources or re-used from other sites.



# **Area Weighting**

- Area weighting shall be applied to cater for a mixed building types of residential, clubhouse, retail, carpark).
- It shall be applied to EU and IEQ only. (EU1 and EU2 as total building energy has to be considered)
- Credits are weighted according to the <u>Construction Floor Area</u> or normally occupied floor area.
- Under BEAM Plus version 1.1, a building type with area less than 10% of total CFA of the complex premises will be exempted.
- Under BEAM Plus Version 1.2, above exemption will NOT be applied, for detail please refer to the Manual – Section 1.2 Assessable Area – Discrete Areas Excluded From Assessment.



# **Area Weighting Example**

 Residential Development using split type units with a Shopping Arcade using water-cooled chillers?

CFA Ratio: **70%** vs **30%** 

 Commercial Building using centralised A/C system with Carpark using mechanical ventilation?

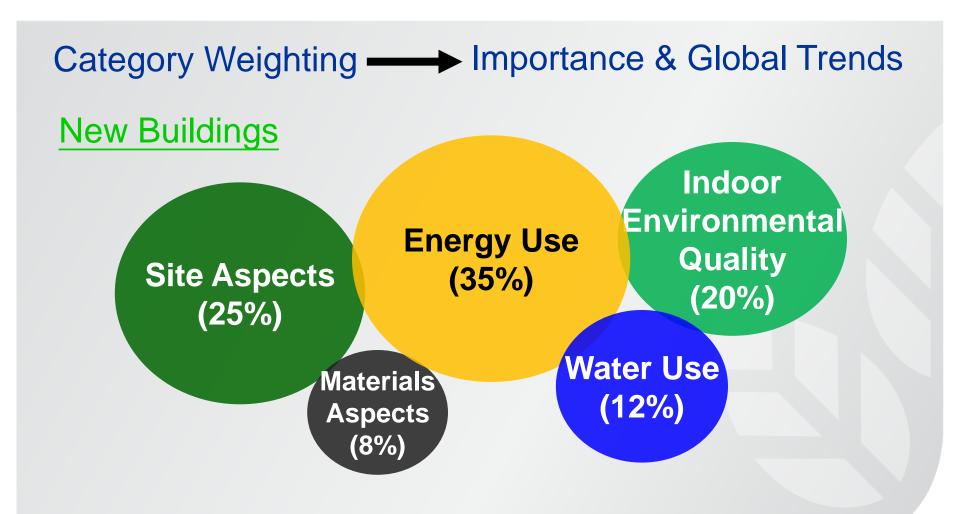
CFA Ratio: 95% vs 5%

Composite development with a Hotel, Commercial tower,
 Shopping Arcade and Underground Carpark?

CFA Ratio: **35%** vs **35%** vs **15%** vs **15%** 

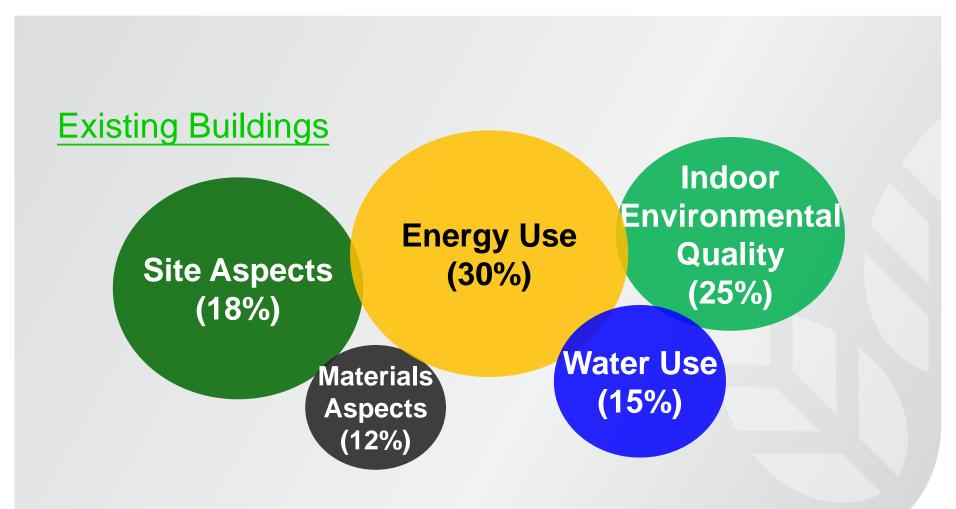


# **Category Weighting - NB**



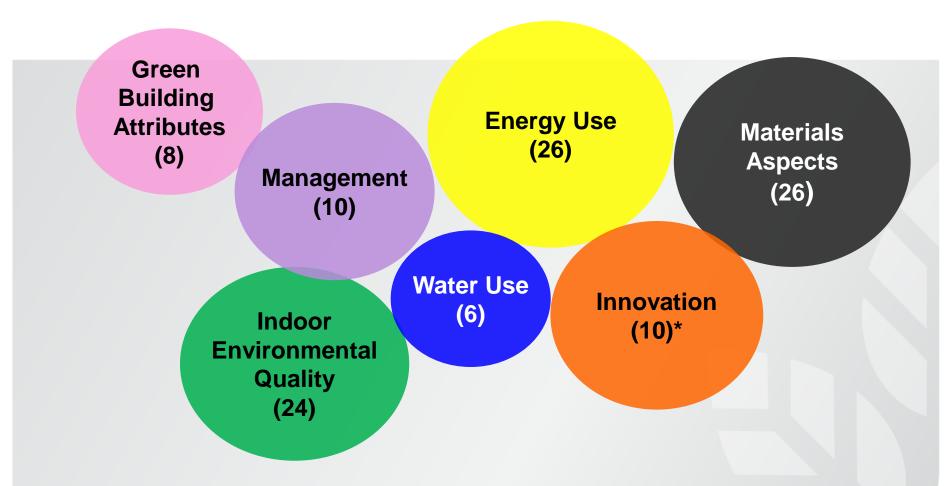


# **Category Weighting - EB**



# **Category Weighting - Interiors**





\*Note: Any points gained under the Innovation category shall be regarded as 'Innovation' counting towards the total number of points obtained but not towards the total points obtainable.



# **BEAM Plus Minimum Scoring**

	Overall	Site	Energy	IEQ	IA (credit)
PLATINUM	75%	70%	70%	70%	3
GOLD	65%	60%	60%	60%	2
SILVER	55%	50%	50%	50%	1
BRONZE	40%	40%	40%	40%	-



# **BEAM Plus Interiors Minimum Credit Scoring**

	Overall (100)	Materials (26)	Energy (26)	IEQ (24)
PLATINUM	75	15	18	17
GOLD	65	13	16	15
SILVER	55	11	12	12
BRONZE	40	9	10	10



# Weighting & Grading

#### Sample Marking Scheme:

					i I	
BEAM Plus for New Buildings Category	Credit Mark Earned (A)	Credit Mark Applicable (B)	% of Credit Marks Earned (C=100*A/B)	Weighting	Weighted Category Mark (E=C*D)	Category Grade
Site Aspect	19	22	86%	0.25	22%	Platinum
Water Use	7	22	32%	0.08	3%	-
Energy Use	30	42	71%	0.35	25%	Platinum
Material Use	8	9	89%	0.12	11%	-
Indoor Environment Quality	25	32	78%	0.20	16%	Platinum
Total Weighted Category Mark					77%	
Innovation Credit Mark Earned					3	Platinum
			80%	Platinum		
			Overall	Platinum		

Note: For BEAM Plus Interiors, all credits are applicable, there is no exclusions.



# **Scoring Example - NB**

Category	Applicable Credits	Achieved Credits	% of Achieved Credits	Category Weight Factor	Weighted Achieved Score	Achieved Sub- Rating
Site Aspects	21	14	67%	25%	16.7	Gold
Materials Aspects	18	8	44%	8%	3.6	
Energy Use	40	15	38%	35%	13.1	Uncertified
Water Use	7	4	57%	12%	6.9	
Indoor Environmental Quality	32	27	84%	20%	16.9	Platinum
Innovation and Additions	1	3	300%		3.0	Platinum
				Overall Rating	60.1	Uncertified



### **Scoring Example - EB**

Category	Applicable Credits	Achieved Credits	% of Achieved Credits	Category Weight Factor	Weighted Achieved Score	Achieved Sub- Rating	
Site Aspects	21	16	76%	18%	13.7	Platinum	
Materials Aspects	18	15	83%	12%	10.0		
Energy Use	40	30	75%	30%	22.5	Platinum	
Water Use	7	4	57%	15%	8.6		
Indoor Environmental Quality	32	27	84%	25%	21.1	Platinum	
Innovation and Additions	1.0	3	600%		3.0	Platinum	
				Overall Rating	78.9	Platinum	

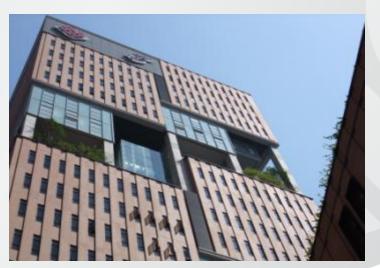


### **BEAM Plus Certification Procedures**











### **BEAM Plus Certification Procedures**

#### **DEFINITIONS**

- "Applicant" means client, project team members or BEAM Pro
- "BEAM Pro" means BEAM Professional(s)
- "Contract" means the Agreement between BEAM Society Limited and the Applicant to conduct the BEAM Plus Assessment
- "CIR" means Credit Interpretation Request
- "FA" means Final Assessment
- "PA" means Provisional Assessment
- "TRC" means Technical Review Committee



### **BEAM Plus Certification Procedures**





### **General Notes**

- BEAM Society will assign BEAM Assessor(s) to handle the project.
- Once registered, the PA/ FA results will be disclosed.
- There is only 1 chance of assessment and 1 opportunity for clarification if asked for each PA and FA stage.
- The validity period for all BEAM Plus certificates is 5 years from the date of issue. For BEAM Plus Interiors, the certificate shall also expire if the tenant leaves the premises before the expiry of the 5 years.



### **Operation of BEAM Plus Certification**

### **HKGBC**

**Green Labelling Committee** 

**Accreditation** of BEAM Assessors

Certification of BEAM Plus Rating

**Adjudication** of Final Appeal



**Technical Review Committee** 

**Engagement** of BEAM Assessors

**Recommendation** of Rating

Response of CIR

**Adjudication** of First Appeal



### **Operation of BEAM Plus Certification**

## **HKGBC**

Green Labelling Committee (GLC)

Project Registration for BEAM Plus



Technical Review Committee (TRC)

- Appointment of BEAM Assessors Team
- Response to CIRs
- Provisional Assessment Report

Certification of BEAM Plus Rating



Final Assessment



### **BEAM Plus Assessment Process**

The Assessment fee scale can be found on the following page

Please visit the link below for up-to-date information:

http://www.beamsociety.org.hk/en\_beam\_assessment\_project\_1.php



### **BEAM Plus Assessment Process**

- For NB Projects (Two-step approach)
  - The Assessment Fee covers
    - Provisional Assessment
    - Final Assessment
- For EB Projects (One-step approach)
  - The Assessment Fee covers
    - Final Assessment



### **BEAM Plus Interiors Assessment Process**

### **Single-stage Certification**:

Upon completion of fit-out works and associated testing and commissioning.

Emphasize the importance of "as-built" performance in addition to good design and construction practices.

Applicants able to indicate their achievements at the earliest opportunity.



### Other process and charges

- Apart from the assessment fee, there are other charges including:
- Credit Interpretation Request CIR is not used for adjusting the assessment system. The argument on the applicability of the credits will not be entertained. The Applicant may apply for CIR between project registration and submission for assessment. CIR applications after submission (or partial submission) will not be entertained.
- Appeal When the Applicant disagrees with or does not accept the decision, the Applicant is entitled to submit an Appeal.



### **Appeal System**

### The following rules and condition shall be addressed:

- The First Appeal should be submitted in writing to BSL within 30 calendar days after receiving the PA result from BSL. Appeal response shall be issued within 60 calendar days;
- Only credits can be appealed.
- The First Appeal submission will be reviewed by the TRC of BSL.
- The Final Appeal will be addressed by HKGBC. A Final Appeal Panel will be formed. Feedback shall be issued within 90 calendar days after the formation of the Panel.
- Repeated submission of the same item will not be entertained.



### **BEAM Circular Letters**

- Any update on BEAM
   Plus assessment
   criteria will be
   announced to BEAM
   Pro via BEAM circular
   letters.
- All circular letters shall be uploaded to BEAM Society website.



Please visit the following webpage http://www.beamsociety.org.hk/en\_beam\_assessment\_project\_2.php



### **BEAM Circular Letter 2011.101**

### **Assessor Site Verification**

This circular letter announces the change of verification method from visual site inspection to documentary submission by Applicant as the prescribed methodology for demonstrating compliance with individual credit requirements.

The existing BEAM Plus guide books contain several clauses stating that the BEAM Assessor will visit the site to verify certain criteria and conditions have been achieved. Under the new regime, assessments shall be undertaken anonymously and therefore the Assessor will not physically visit the site; therefore the Applicant must submit all necessary evidence, in the form of but not limited to, documents or photographic records to demonstrate compliance with relevant criteria to the satisfaction of the Assessor.

Signed:

Chair of Technical Review Committee



### **BEAM Plus Interiors Site Audit**

- BEAM Society Limited (BSL) reserves the right to conduct on-site inspection(s) at any time without advance notice to verify and validate Applicants' submission.
- The outcome of this audit shall be used for assessment purposes.







Last review date: 20 July 2010

Home

What's New

#### Practice Notes

About us

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Tender Notices

Links





- Practice Notes for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers
- Practice Notes for Registered Contractors

SEARCH

Joint Practice Notes



### **PNAP APP-130**

### **Lighting & Ventilation Requirements Performance-based Approach**

### a) Natural Lighting

Room of domestic building	Vertical Daylight Factor (VDF) <sup>1</sup> (measurement taken on the centre of the window pane)				
Habitable Room	8%				
Kitchen	4%				

### b) Natural Ventilation

Room of domestic building	Air Change per Hour (ACH)				
Habitable Room	1.5 (natural means)				
Kitchen	1.5 (natural means) plus 5 (mechanical means)				

Achieve 40% of EU and IEQ on BEAM Plus PA



## PNAP APP-150 Wholesale Conversion of Industrial Buildings

- Exemption/modification to natural lighting & Ventilation
- Meet 40% of BEAM Plus certification, PA on Energy Use (EU) and Indoor Environmental Quality (IEQ)





# PNAP APP-151 Building Design to Foster a Quality and Sustainable Built Environment

Effective 1st April 2011, BEAM Plus will be applied to measure new buildings development which include the following:

 require BEAM Plus green building certification process as a prerequisite for 10% gross floor area (GFA) concessions for green / amenity features and non-mandatory / non-essential plant rooms and services in new building developments.



# PNAP APP-152 Sustainable Building Design Guidelines

- Buildings with special functional requirements cannot fulfill the building separation requirements.....
- Can be considered exempting by
  - a) Fulfill BEAM Plus NB SA 8c (AVA); AND
  - b) Either BEAM Plus NB SA 8a or SA 8b.



- Bonus credits in the rest of the sections are counted in this section.
- All innovative credits will be reviewed and approved by TRC.
- Innovative Techniques Advance practices and new techniques not yet been widely adopted in Hong Kong or even elsewhere.
- Performance Enhancements Strategies and techniques perform significantly better than BEAM requirements.



		Credits Applicable	Credit(s) Achieved	Possible Credit(s)	Remark	
3	MATERIALS ASPECTS					
3.P	PREREQUISITE					
MA P1	TIMBER USED FOR TEMPORARY WORKS					
	Virgin forest products are not used for temporary works during construction.	Pre-requisite				
MA P2	USE OF NON-CFC BASED REFRIGERANTS					
	Using no chlorofluorocarbon (CFC)-based refrigerants in HVAC&R systems.	Pre-requisite				
ма Рз	CONSTRUCTION/DEMOLITION WASTE MANAGEMENT PLAN					
	Implementation with proof of documentation of awaste management system that provides for the sorting, recycling and proper disposal of construction / demolition materials.	Pre-requisite				
	EXCLUSIONS: Project where demolition is not required or is not under the Client's control.					
MA P4	WASTE RECYCLING FACILITIES					
WAT 4	Provision of facilities for the collection, sorting, storage and disposal of waste and recovered materials.	Pre-requisite				
3.1	EFFICIENT USE OF MATERIALS					
MA 1	BUILDING REUSE					
	1 credit for the reuse of 30% or more of existing sub-structure or shell.	1	1			
<u> </u>	2 gradite for the rayed of 60% or more of existing sub-structure or shall	1	1			
	additional BONUS credit for use of 90% or more of existing substructure or shell.	Bonus	1			
	EXCLUSIONS: Buildings on reclaimed land or Greentield sites.					
MA 2	MODULAR AND STANDARDISED DESIGN					
	credit for demonstrating the application of modular and standardized design.	1	1			
MA 3	PREFABRICATION					
	credit when the manufacture of 20% of listed prefabricated building elements has been off-site.	1	0			
	2 credits where the manufacture of 40% of listed prefabricated building elements has been off-site.	1	0			
MA 4	ADAPTABILITY AND DECONSTRUCTION					
	Spatial adaptability     credit for designs providing spatial flexibility that can adapt spaces for different uses, and allows for expansion to permit additional spatial requirements to be accommodated.	1	1			
	b) Flexible engineering services 1 credit for flexible design of services that can adapt to changes of layout and use.	1	1			



### Counted in Innovations & Additions Category

L	<u> </u>					
		Credits Applicable	Credit(s) Achieved	Possible Credit(s)	Remark	
7	INNOVATIONS AND ADDITIONS					
SA 1	CONTAMINATED LAND	Bonus	0	0		
SA 4	BONUS credit for 100% of relevant sub-items of the Urban Design Guidelines are achieved.	Bonus	0	0		
SA 5	ECOLOGICAL IMPACT	Bonus	1	0		
MA 1	1 BONUS credit for use of 90% or more of existing substructure or shell.	Bonus	1	0		
EU 3	BONUS credit for demonstrating the major materials with low embodied energy are used in the project utilizing the LCA results.	Bonus	0	0		
EU 10e	Independent Commissioning Authority	Bonus	1	0		
WU 4c	A combination of rainwater and grey water	Bonus	0	0		
IEQ 12	Use of natural ventilation	Bonus	0	0		
IEQ 16	1 BONUS credit where provision of automatic control of artificial lighting such as	Bonus	0	0		
IEQ 19	For residential development only,  1 BONUS credit for demonstrating impact noise isolation between floors meets the prescribed criteria.	Bonus	0	0		
IA 1	INNOVATIVE TECHNIQUES	Bonus	0	0		
IA 2	PERFORMANCE ENHANCEMENTS	Bonus	0	0		
IA 3	BEAM PROFESSIONAL	1	1	0		
	Sub-Total Number of Innovative/Performance Enhancement and Bonus Credits	1	4	0		



If you want to apply for innovation, please provide:

- System design details
- Quantified environmental benefit



### **Examples:**

- Better daylight factor performance
- More greenery







### Join In!!!



YOU are One of stakeholders.

Sustainable / Green Design **Movement** in Hong Kong





### Can visitors see a greener H.K. in 5 years time?



YES.



### **Steps to Green**





### **Our Thinking Process**

SAVE energy

SAVE water

SAVE resources





### **Our Living**



Role Model / Set Example







Min. Food Wastes



### **Our Family**

### **Grow A Green Family**



Buy Less Stuff



**Use Green Cleaning** 

Appreciate & Love Nature





Have a Healthy Life

Discuss on GREEN Issues

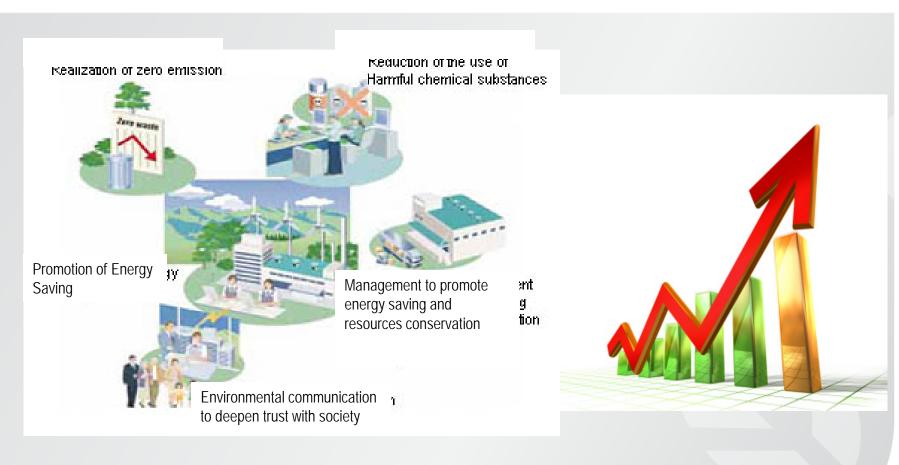


Climate Changes



### **Our Work Place**

Green Management – GREEN your Office



SAVE \$\$, GAIN Reputation, EARN Profit



### **Our Project**



- Exceed BEAM Plus

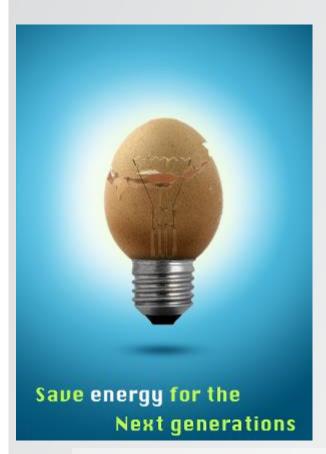






### **Our Project**

### Benefits of Saving in Energy & Resources







SAVE Resources SAVE Money SAVE Life

### BEMM

# Thank you

BEAM Society Limited 建築環保評估協會有限公司

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