BEAM Plus

Existing Data Centres

Version 1.0 (2021.09)

HKGBC 香港綠色建築議會

BEAM 建築環保評估協會

Table of Contents

1 Introduction

1.1 Overview

BEAM

Building Environmental Assessment Method (BEAM) Plus is a comprehensive environmental assessment tool for buildings which is carried out on a voluntary basis. It defines the best practice criteria for a range of sustainability issues across the whole life-cycle of buildings and projects, such as how buildings should be designed, constructed and operated, etc. Recognised as one of the world's leading green building assessment tools, it provides a comprehensive set of performance standards that can be pursued by developers and owners.

Owned and operated by the BEAM Society Limited (BSL), BEAM Plus Existing Data Centres (EDC) is one of the BEAM Plus rating tools that covers the operation and maintenance of EDC.

Based on the credit point achievement where the standard or defined performance criteria are satisfied, the project will be graded Platinum, Gold, Silver or Bronze, to reflect the overall performance.

BEAM Plus Existing Data Centres Version 1.0 (EDC V1.0)

The BEAM Plus Existing Data Centres Version 1.0 (EDC V1.0) aims to be practical, clear and standardised in defining the key elements of green DC including management, use of materials and waste recycling practice, energy efficiency, potable water consumption, health and wellbeing, etc. During the development process, the following fundamentals were established:

Above Statutory Requirements – Requirements for prerequisites and credits should be set above the statutory requirements.

Adaptability – Requirements are better defined with more assurance of the applicability of the criteria.

Certainty – Requirements should be clearly defined to reduce ambiguity and promote better certainty in the assessment process. Submittal requirements should be standardised as far as practicable.

Practicality – Standards should be achievable with respect to state-of-the-art of the building industry to promote wider adoption of green DC practices yet pose reasonable challenges for better quality, performance and cost-effectiveness.

BEAM Plus EDC V1.0 aims to embrace more participation in "Green" existing data centres, encourage more energy saving towards net zero emissions, and educate and induce behavioural change. The BEAM Plus EDC is introduced to encourage existing data centres to consider holistic green enhancements for more energy efficient and sustainable operation.

BEAM Plus EDC V1.0 includes the following features:

i. Take into account of the local climate and ecosystems (e.g. the limited space in most local existing data centres);
ii. Take into consideration the latest advancements in data centre technology such as aisle containment for cooling (and hence encourage existing data centres to adopt);
iii. Credit criteria are set to encourage the use of energy efficient and environmentally friendly systems and equipment;
iv. Credits are awarded to encourage change in behaviour to sustain green operation;

v. Echoes the government environmental policy such as the Energy Saving Plan; and
vi. Existing data centre can seek different options to be certified, e.g. to address with priority the most urgent business needs;

There are two (2) major schemes under BEAM Plus EDC Version 1.0, i.e. BEAM Plus EDC and BEAM Plus EDC (Individual Category). BEAM Plus EDC adopts the 'Plan-Do-Check-Act' approach for the continual improvement while BEAM Plus EDC (Individual Category) embraces the 'Better than yesterday' principal to recognise the enhancement efforts to be made by the management of existing data centres.

BEAM Society Limited (BSL)

BEAM is owned and operated by BSL, an independent non-profit public body whose membership is drawn from many professional and interest groups in Hong Kong's building construction and real estate sectors. BSL is committed to developing and implementing the BEAM assessment tools, assessing green buildings and training professionals.

Hong Kong Green Building Council (HKGBC)

HKGBC was established in 2009 as Hong Kong's industry body that coordinates efforts towards green building. HKGBC certifies BEAM Plus projects, accredits BEAM Professional (BEAM Pro), BEAM Affiliate (BA) and BEAM Assessors (BAS).

Development of BEAM Plus EDC V1.0

The development of BEAM Plus EDC V1.0 was led by a BSL Steering Committee comprising industry practitioners and experts. Industry stakeholders have been consulted via engagement workshops for feedback and opinion on areas including but not limited to the overall framework, assessment criteria, performance categories and their relative importance, submission requirement and grading methodology. The Steering Committee comprises:

Convener – Ir Victor Cheung

Members – Ir Alvin Lo; Dr Anthony Lo; Mr Ben Tam; Dr Benny Chow; Ms Carmen KM Wong; Mr Charles Lee; Ir Colin Chung; Ms Grace Kwok; Mr Herbert Chan; Mr Ho Wing Hung; Ir Sr Jonathan Lee; Mr Keith Chung; Ir Kenneth Li; Sr Kenneth Yun; Ir Kim Tang Cheuk; Mr KM So; Dr Luo Xiaowei; Mr Martin Chan; Ir Sr Martin Wan; Ir Michael Waye; Mr MK Leung; Mr Paul Chong; Ir Raymond Choi; Mr Taylor Man; Prof Wang Shengwei; Ms Yvonne Ieong

Advisors –Ir Ernest Yeung; Mr KC Mak; Mr Patrick KK Chan; Ms Pelene Ng

Disclaimer

BEAM Plus EDC has been prepared with the assistance and participation of many individuals and representatives from various organisations. The outcome represents a general consensus, but unanimous support from each and every organisation and individual consulted is not implied. The BEAM Plus EDC documentation shall be revised on a regular basis and as frequently as necessary. BSL reserves the right to amend, update and change this Manual from time to time without prior notice. Where changes in regulations necessitate changes to the assessment criteria, they will be issued to all parties involved in an assessment and will be announced in the BSL's website. An appropriate transitional period shall be allowed for projects undergoing assessment process.

It should be noted that none of the parties involved in the funding of BEAM, including BSL and its members, provide any warranties or assume any liability or responsibility to the users of BEAM, or any third parties for the accuracy, completeness or use of, or reliance on, any information contained

in BEAM, or from any injuries, losses, or damages arising out of such use or reliance.

As a condition of use, users covenant not to sue, and agree to waive and release BSL, its members and Steering Committee members from any and all claims, demands and causes of actions for any injuries, losses and damages that users may now or hereafter have a right to assert against such parties as a result of the use of, or reliance of BEAM.

Limitations

BSL does not endorse any self-assessed grading awarded by the use of BEAM Plus EDC.

HKGBC offers a formal certification process of grading, this service provides independent third-party review of credits claimed to ensure all credits can be demonstrated to be achieved by the provision of the necessary documentary evidence. The use of BEAM Plus EDC without formal certification does not entitle the user or any other party to promote any grading awarded.

Application and Eligibility

Assessed DC must be with floor area not less than 500 m^2. Typically, DC refers to any space containing banks of data storage equipment, i.e. servers, data storage, etc., plus any supporting spaces (e.g. switch rooms, UPS rooms, battery rooms). The primary function of the DC must be for housing physical or virtual storage, management, and dissemination of data and information as generally perceived and accepted by the industry. The data halls and any related plant space should make up a significant majority of the floor area of the assessed DC.

Assessed DC associated function areas must not be larger than 25% of floor area under assessment. The DC associated function areas refer to the building functions/spaces that are provided for the use of staff running the facility:

i. Reception and waiting areas;
ii. Office areas (including meeting and training rooms);
iii. Building management offices;
iv. Staff restaurant and/or kitchen facilities;
v. Pantry;
vi. Staff gym;
vii. Restrooms, WCs and changing facilities;
viii. Circulation areas;
ix. Guard/ Security room;
x. Staging rooms; and
xi. Command centres, etc.

The above list is not exhaustive, but serves to indicate the type of areas covered by the scope of this BEAM Plus DC.

DC certification area must be separable from other mixed-use elements of the buildings.

EDC with at least ONE year (i.e. counted from the completion of Test and Commissioning) of operation data.

BEAM Plus EDC V1.0 covers the management, operation, maintenance, etc., of all types of EDC installations, including DC occupied a whole building or DC installed in part of a building.

DC with BEAM Plus certificate is encouraged to renew their certificates by participating in this Scheme.

Newly completed DC that have not been certified by BEAM Plus are also encouraged to participate in this Scheme. However, it is essential for the building and DC management to have at least one-year operational data (i.e. counted from the completion of Test and Commissioning) of the DC before registration.

DC with building services upgrades or minor renovations without changing the use of the building can also be assessed under this Scheme.

DC undergone major renovation with structural alternations (such as the revitalisation of the entire industrial buildings, change of building use or the types of Alterations and additions (A&A) works are recommended to adopt the NDC assessment.

BEAM Plus, and hence BEAM Plus EDC, does not assess any unauthorised or any unauthorised portions of any buildings, i.e. any buildings or building works not complying with the Buildings Ordinance. In case any non-compliance works or unauthorised portions in a building are reported, both HKGBC and BSL reserve the right to deprive the awarded rating from the Applicant.

Assessment Boundaries

The Applicant shall define the project boundary to undergo the BEAM Plus EDC assessment. The project boundary needs not necessarily follow the site boundary of the premises, which however, should be consistent throughout the project assessment.

Under normal circumstances, BEAM Plus EDC V1.0 only assesses those areas which are under the control of the Applicant. It is understood that the involvement of tenants also plays an important role in improving the building's environmental performance. Therefore, additional or Bonus credits could be awarded when the Applicant can demonstrate that their tenants are also getting involved in the assessment. Details can be referred to the assessment criteria of individual credit criteria.

Certification Framework

BEAM Plus EDC V1.0 provides Applicants with more flexibility to participate in this green assessment to suit their program, budget and technical capability. An assessment framework with 2 Schemes are designed and presented in Figure 1.1, including:

i. BEAM Plus EDC (Comprehensive Scheme A)

   All aspects under this methodology are assessed in one-go and one full certificate is offered if the requirements are fulfilled.

ii. BEAM Plus EDC (Comprehensive Scheme B)

   Combination of aspects assessment is allowed. Intermediate result(s) for the assessed aspect(s) will be issued. The Applicant is required to update the necessary information of the assessed aspect(s) and submit the remaining aspect(s) within 3 years of the issuance of first intermediate result. Those documentation required to be updated are marked with [#] in the BEAM Plus EDC Manual. Please note that MAN and EU aspects under the Manual must be assessed first at the first stage for the Intermediate results.

   An example of submission timeline is illustrated in Figure 1.2

Step-wise approach is designed for DC that need to be upgraded in order to achieve BEMA Plus EDC certification. DC owners management may not have the full budget and sufficient time to upgrade all the systems in one go. The intermediate certificate can recognise their effort in improving their DC performance in certain area before the final full certification. DC will be assessed and graded with the same standard under One-step approach (Comprehensive Scheme A).

iii. BEAM Plus EDC (Selective Scheme)

It is an individual aspect assessment approach, and certificate will be issued for each individual assessed aspect. In view of the importance of energy efficient and on-going management for an existing DC, BEAM Plus EDC Individual Category (Selective Scheme) specifies EU and MAN aspects are the mandatory aspect to be assessed, and the two aspects must be assessed at the same time. Should the same project completed the assessment of all 6 aspects, “Record of Achievement” may be issued upon request by Applicant to document the result of each aspect assessed.

Existing DC owners may choose to apply BEAM Plus EDC Individual Category (Selective Scheme) certification if they do not intend to achieve the performance requirements for all aspects via Comprehensive Scheme. DC will be assessed and graded with the same standard under One-step (Comprehensive Scheme A) and Step-wise (Comprehensive Scheme B) approaches.

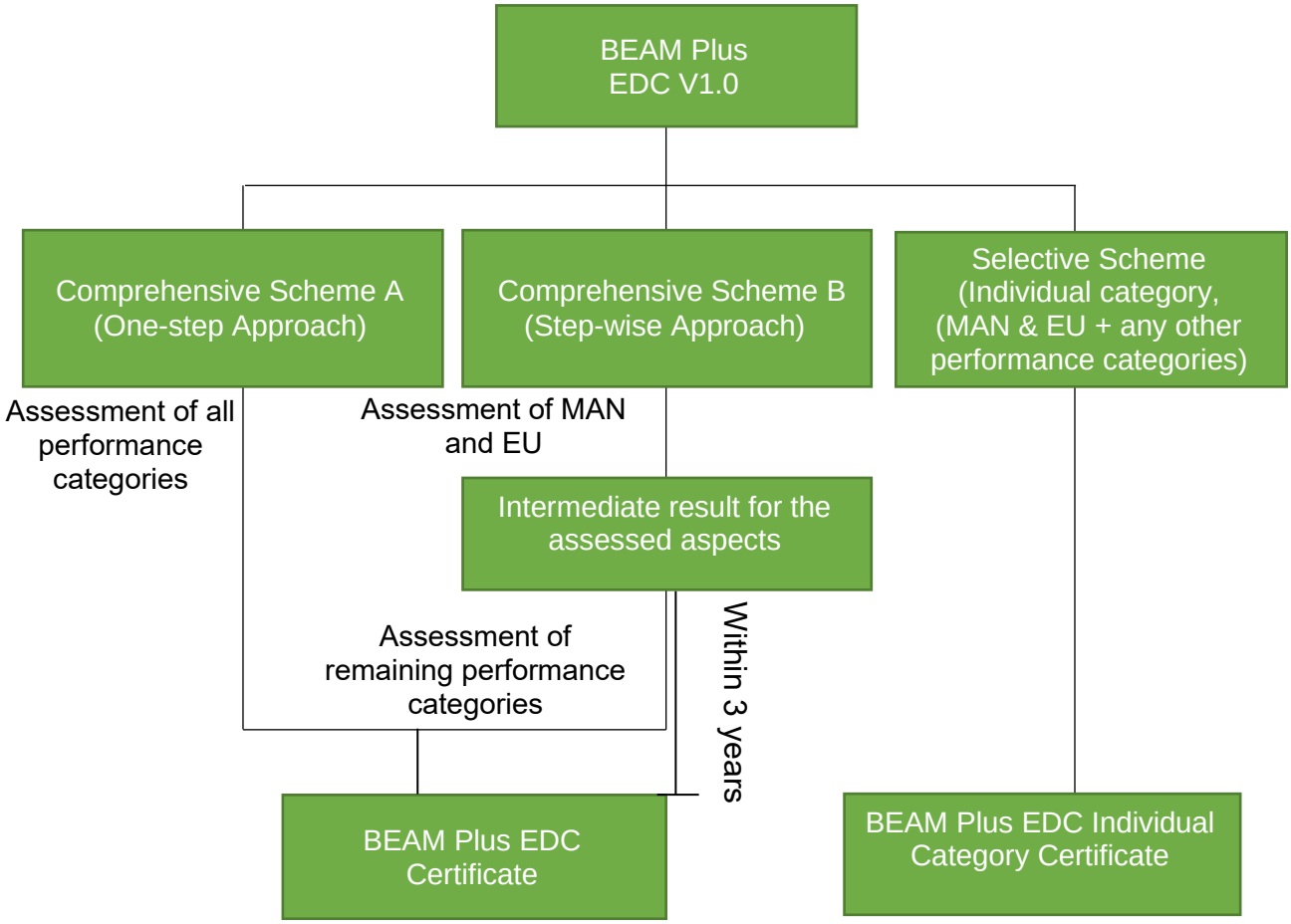


Figure 1.1 Assessment Flowchart of BEAM Plus EDC Version 1.0.

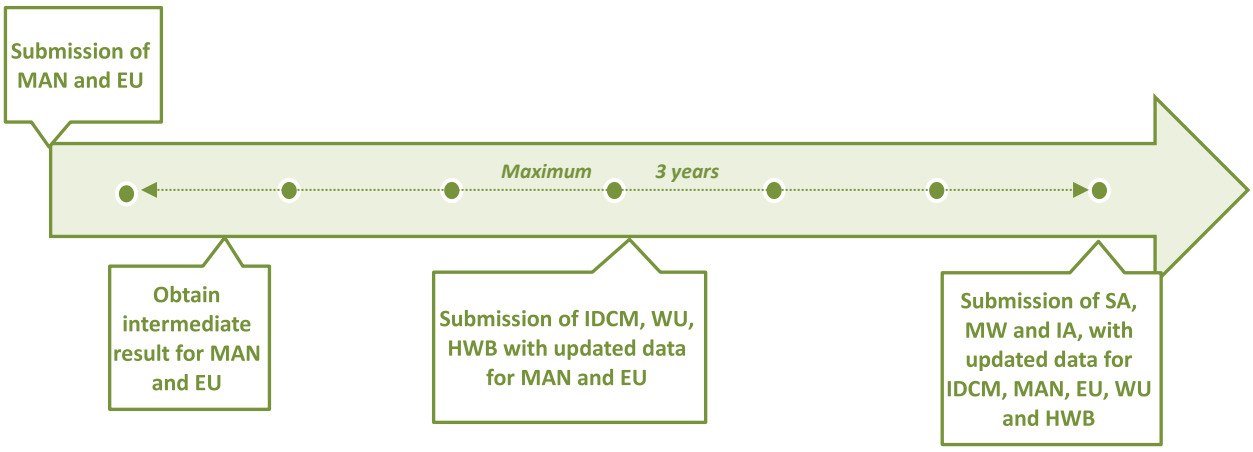


Figure 1.2 Example of submission timeline for BEAM Plus EDC –Step-wise Approach (Comprehensive Scheme B)

Certification Process	Independent BEAM Assessors (BAS) or BSL in-house BAS would be assigned to each project to undertake the assessment works. The Technical Review Committee (TRC) of BSL will review the assessment reports done by the BAS and endorse the assessment results, followed by the issuance of certification by the HKGBC. Detail assessment procedures can be found in the BEAM Plus Project Assessment Procedures Manual which is available in HKGBC and BSL websites.
BEAM Professional/ Affiliate	BEAM Professional (BEAM Pro)/ Affiliate mentioned in this manual should process the valid credential for BEAM Plus EDC V1.0for facilitating the certification process and to ensure the compliance of relevant credit requirements.
Documentation	The Applicant has the obligation to provide evidence to demonstrate credit compliance. In EDC V1.0, only sufficient amount of material (by way of example) is required to be submitted. However, the Applicant must make sure all supporting information is timely collected and properly documented. Just in case when the BEAM assessor considers it necessary to demand additional material of the same sort for clarification, the Applicant is obligated to produce such material upon request.
Certification Fee	BEAM Plus EDC certification fee comprises 2 parts, namely Registration Fee and Assessment Fee which are payable to HKGBC and BSL respectively. Certification fees for BEAM Plus EDC V1.0 Comprehensive Scheme depend on the size and complexity of the project as determined by the HKGBC and BSL. Submission of credit interpretation request (CIR) and Appeals are subject to separate published charges. Details on the fee structure can be found in the HKGBC and BSL websites.
Credit Interpretation Request (CIR)	CIR is designed to allow project teams to obtain specific guidance on whether certain BEAM Plus credits can be fulfilled pertaining to the special design of a project. Details on CIR can be found in HKGBC and BSL websites
Appeal	The Applicants may submit an appeal on an individual credit if they disagree to and/ or do not accept the decision made by the BSL. More details can be found in the HKGBC and BSL websites.

1.2 Framework

Credit Performance Categories

Different assessment methods assign their credits under different performance categories according to the preferences of the tool developer. In BEAM Plus EDC V1.0, credits are grouped into the following categories:

i. Management (MAN);
ii. Integrated Design and Construction Management (IDCM);
iii. Sustainable Site (SS);
iv. Materials and Waste (MW);
v. Energy Use (EU);
vi. Water Use (WU);
vii. Health and Wellbeing (HWB); and
viii. Innovations and Additions (IA).

While BEAM Plus EDC V1.0 adopts similar categories in other BEAM Plus tools, the number and nature of credits within each category are specific to the context of Hong Kong and EDC projects.

Management (MAN)

MAN assesses the policies, procedures and strategies implemented to ensure DC are operated in a sustainable manner:

i. Green procurement;
ii. Environmental, Health and Safety (EHS), and energy management;
iii. Environmental, social and governance (ESG) disclosure;
iv. Staff training; and
v. Operation and maintenance.

Integrated Design and Construction Management (IDCM)

IDCM assesses integration design management which maximises the opportunities for integrated and cost-effective green design approaches and construction methodologies; improvement in user's health and wellbeing; smart technologies and innovative approaches for green design and construction.

i. Commissioning;
ii. Green construction/ Renovation
iii. Smart Design and Technologies; and
iv. Design for Engagement and Education on Green Buildings.

Sustainable Site (SS)

In general, the location of the DC determines the extent of its environmental aspects. SS include:

i. Neighbourhood Integration;
ii. Ecologically Responsible Design;
iii. Bioclimatic Design; and
iv. Climate Resilience and Adaptability.

Materials and Waste (MW)

MW focuses on materials in (green purchasing) and out (waste disposal) of the DC. MW include:

i. Minimum waste handling facilities;
ii. Use of materials;
iii. Selection of materials; and
iv. Waste management and reduction.

Energy Use (EU)

Assessments of EU in a DC contain variety of uses, energy sources and building services systems or equipment, which are complex processes given the number of influencing variables. By comparing with the benchmarks derived from audits of similar type of buildings, and/or a computational approach, the energy uses, in addition to features known to have impact on overall performance will be determined. EU includes:

i. Energy Performance;
ii. Energy Reduction and Control
iii. Renewable and Alternative Energy Generation;
iv. Energy Efficient Equipment;
v. Energy management and analysis; and
vi. Energy efficient improvement.

Water Use (WU)

Assessments under WU include quality and features that improve the utilisation and reduce effluent. WU includes:

i. Water conservation;
ii. Effluent water management;
iii. Water harvesting and recycling; and
iv. Water management.

Health and Wellbeing (HWB)

Health and Wellbeing issues include those aspects of building performance that impact on the health, comfort, or well-being of the occupants, as well as aspects of performance that improve quality and functionality. HWB includes:

i. Minimum ventilation performance;
ii. Design for Green Living
iii. Inclusive Design; and
iv. Indoor Environmental Quality;

Innovations and Additions (IA)

In this section, Applicants are encouraged to submit proposals for BSL consideration where the project:

i. Introduces innovative designs, construction or operational provisions that enhance performance and are not hitherto found in Hong Kong; or
ii. Achieves performance enhancements that greatly exceed the prevailing requirements in BEAM Plus EDC.

In such cases Applicants can submit proposals that:

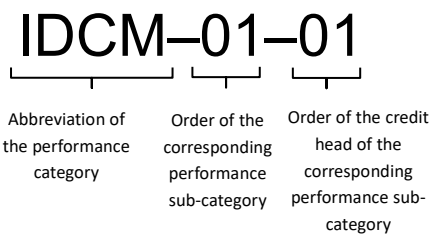
i. Detail the proposed technology/ practice;
ii. Demonstrate how the technology/ practice is implemented; and
iii. Quantify the environmental benefits.

Credit Allocation

Credits have been broadly allocated to each assessment criterion by taking into account the other internationally recognised green building assessment tools as well as the sensitivity analysis and the comments received during the stakeholder engagement workshops.

Credit Code

All BEAM Plus tools will adopt the same nomenclature. The classification of each credit is divided into three levels which includes: i) Performance category, ii) Performance sub-category and iii) Credit head.



The coding system of each credit consist of English letters and Arabic numbers. The first level of the coding system is the performance category which will adopt the abbreviation. The second level is coded by Arabic numbers to present the corresponding performance sub-category. The third level represents the order of credit head.

Category Weighting

Having reviewed the local and international assessment schemes and other relevant information, a percentage of weighting for each environmental performance category has been determined to reflect its importance as follows:

Category	Weighting
MAN	15%
IDCM	15%
SS	5%
MW	5%
EU	40%
WU	10%
HWB	10%

Extent of Application

Extent of Applications specify the applicable credit to different types of DC installation, i.e. Whole building DC or DC installed in part of the building

Prerequisites

The Applicant must demonstrate that all the pre-requisites are achieved. Otherwise, the project will be graded as “Prerequisite(s) Not Achieved”.

Bonus Credit & Additional Bonus Credit

The Bonus credits and additional Bonus credits, as applicable in Existing DC V1.0, are counted under the corresponding categories. A factor of 1.2 is applied in score calculation for the attainment of Bonus credits and additional Bonus credits.

Bonus credits are independent from the normal credit(s) under the same credit item. They can be achieved regardless of the success or failure in attaining the normal credit(s). Whereas the additional Bonus credits are dependent on the normal credit(s) under the same credit item. The award of normal credit(s) is the prerequisite for attaining the additional Bonus credits.

The maximum possible score under each category is 100%.

IA Credit

The IA credits in EDC V1.0 are counted towards the total number of credits qualifying for an award classification. A maximum of 10 IA credits could be submitted for achieving a higher score in the assessment.

Determination of Overall Grade

The final certificate grading awarded to projects certified under BEAM Plus EDC V1.0 for One-step (Comprehensive Scheme A), Step-wise (Comprehensive Scheme B) and Individual Category (Selective Scheme) assessment is subject to the following conditions:

BEAM Plus EDC (Comprehensive Scheme A & B) (One-step and Step-wise approach)

i. Satisfying all pre-requisites;
ii. Achieving total score percentage (%) of credits; and
iii. Obtaining minimum percentage (%) of credits for MAN and EU.

Grade	Minimum Percentage for MAN and EU	Total Score Percentage
Platinum	70%	≥ 75%
Gold	60%	≥ 65%
Silver	50%	≥ 55%
Bronze	40%	≥ 40%

The intermediate results for projects certified under BEAM Plus EDC V1.0 (Comprehensive Scheme B) (Step-wise approach) is subject to the following conditions:

i. Satisfying all pre-requisites of assessed category(ies); and
ii. Obtaining minimum percentage (%) for assessed category(ies) listed above.

If a project can comply with all the applicable pre-requisites but cannot reach the threshold of Bronze rating, it will be graded as “Pre-requisites Achieved”. In case the project fails to demonstrate compliance with any one of the applicable pre-requisites, it will be graded as “Pre-requisite(s) Not Achieved”.

BEAM Plus EDC (Selective Scheme) (Individual Category)

i. Satisfying all pre-requisites of the assessed category; and
ii. Achieving overall percentage (%) of credits achieved of the assessed category.

Grade	Overall percentage (%) of credits achieved in the assessed performance category
Platinum	≥ 70%
Gold	≥ 60%
Silver	≥ 50%
Bronze	≥ 40%

1.3 Summary of Credit Heads

	Section	Credit Requirement	Extent of Application	Credit point(s)
2	**Management (MAN)**			**15 + 3 Bonus**
MAN-00-P1	Green Purchasing Plan	Demonstrate that green purchasing plan and procedures (including both materials and services) either follow their internal company guideline or other international standards, shall be in place.	All DC	Required
MAN-01-01	EHS And Energy Management System	1 credit point where the DC management operates an Environmental Management System (EMS) certified to ISO 14001. 1 credit point where the DC management operates an Occupational Health and Safety System (OHSAS). 1 credit point where the DC management operates an Energy Management System (EnMS). 1 Bonus credit point where DC management operates an OHSAS certified to ISO 45001. 1 Bonus credit point where the DC management operates an EnMS certified to ISO 50001.	All DC	3 + 2 Bonus
MAN-02-01	Environmental, Social and Governance (ESG) Disclosure	**(a) Disclosure of Sustainability Policy and Target** 1 credit point where the DC Owner/ DC Management Company discloses sustainability policy and targets to the public. **(b) ESG Reporting** 1 Bonus credit point where the Building Owner/ Building Management Company follows Global Reporting Initiative (GRI) Sustainability Reporting Standards and discloses the G4 sustainability report to the public.	All DC	1 + 1 Bonus
MAN-03-01	Staff Training and Resources	**(a) Staff and Technical Resources** 1 credit point for having adequate staff and technical resources to meet the O&M requirements of the DC. **(b) Staff Training** 1 credit point for providing adequate and periodic training for the staff responsible for the O&M of the DC.	All DC	2

	Section	Credit Requirement	Extent of Application	Credit point(s)
MAN-03-02	Building and Site Operation and Maintenance	**(a) DC Building Maintenance** 1 credit point for demonstrating the operation of a planned programme of regular inspection, cleaning and maintenance of the DC building's fabric and structure under the control of the Applicant.	All DC with building's fabric and structure that are controlled by the Applicant	2
		(b) External Areas and Facilities 1 credit point for demonstrating the operation of a planned programme of regular inspection, cleaning and maintenance of external areas and facilities.	All DC with external areas and facilities that are controlled by the Applicant	
MAN-03-03	Building Services Operation and Maintenance	**(a) Central Heating Ventilation and Air-Conditioning (HVAC) Plant** 2 credit points for demonstrating the operation of a planned programme of regular inspection and maintenance of the central HVAC plant.	All DC with central HVAC plant that is controlled by the Applicant	7
		(b) Other Engineering Systems Maximum 4 credit points for demonstrating the operation of a planned programme of regular inspection and maintenance of the following listed systems. i. Air-conditioning system except HVAC plant; ii. Electrical system; iii. Lighting system; and iv. Plumbing and drainage system.	All DC with systems that are controlled by the Applicant.	
		(c) Assessment of Operation & Maintenance Practice 1 credit point for having undertaken an audit of the effectiveness of the O&M practices for all building services engineering systems.	All DC	

	Section	Credit Requirement	Extent of Application	Credit point(s)
3	**Integrated Design and Construction Management (IDCM)**			**11 + 21 Bonus**
IDCM-00-P1	Sustainability Champions – Project	Prerequisite achieved for demonstrating that an accredited BEAM Professional (BEAM Pro) with a valid credential for BEAM Plus DC is engaged as the Project BEAM Pro of the consultant team	All DC	Required
IDCM-00-P2	Environmental Management Plan	*This prerequisite is not applicable under BEAM Plus EDC.*		
IDCM-00-P3	Timber Used for Temporary Works	*This prerequisite is not applicable under BEAM Plus EDC.*		
IDCM-01-01	Sustainability Champions - Design	**(a) BEAM Accredited Personnel** 1 credit point for having at least 2 members from the on-site team are accredited BEAM Professional with DC credential, with the members employed with the building management team for at least 6 months prior to the time of first assessment submission. ***Alternatively,*** • *1 credit point for at least 1 key member from the Building Management Company is an accredited BEAM Professional with DC credential and at least 1 member is a certified BEAM Affiliate.* **(b) Professionally Qualified Building Manager** 1 credit point for the DC building-in-charge being an accredited BEAM Professional with DC credential and with at least 1 professional corporate membership qualification (e.g., HKIH, HKIA, HKIE, HKIS (BS/PFM), RICS (BS/FM), IFMA, HKIFM, BSOMES, or equivalent).	All DC	2
IDCM-01-02	Complimentary Certification	**(a) BEAM Plus Neighbourhood (ND)** 1 Bonus credit point where the project is certified by BEAM Plus Neighbourhood (ND) certification.	All DC	3 Bonus

	Section	Credit Requirement	Extent of Application	Credit point(s)
		(b) BEAM Plus New Buildings/ New Data Centres (NB/ NDC) 1 Bonus credit point where the project is certified by BEAM Plus New Buildings (NB)/ New Data Centres (NDC) certification. **(c) BEAM Plus Interiors (BI)** 1 Bonus credit point for preparing the Project for BEAM Plus Interiors (BI) certification.		
IDCM-01-03	Integrated Design Process	1 credit point for providing at least 3 of listed amenities that improve the operation and maintenance of the building and its engineering services.	All DC	1
IDCM-01-04	Life Cycle Costing	*This credit head is not applicable under BEAM Plus EDC.*		
IDCM-01-05	Commissioning	**(a) Planning and Investigation** 1 Bonus credit point for planning the retro-commissioning (RCx) process and identifying the potential energy saving opportunities (ESOs). **(b) Implementation** Maximum 3 Bonus credit points for implementing the selected ESOs for each of the following systems: i. Air-conditioning system; ii. Electrical system; iii. Lift and escalator (if any) system; and iv. Plumbing and drainage system. **(c) On-going Commissioning** Maximum 3 Bonus credit points for executing on-going commissioning for each of the following systems: i. Air-conditioning system; ii. Electrical system; iii. Lift and escalator (if any) system; and iv. Plumbing and drainage system. **(d) RCx Professional** 1 Bonus credit point for engaging an accredited RCx Professional to carry out the RCx process.	All DC	8 Bonus

	Section	Credit Requirement	Extent of Application	Credit point(s)
IDCM-02-01	Sustainability Champions – Construction	*This credit head is not applicable under BEAM Plus EDC.*		
IDCM-02-02	Measures to Reduce Site Emissions	*This credit head is not applicable under BEAM Plus EDC.*		
IDCM-02-03	Construction and Demolition Waste Recycling	**(a) Renovation Waste Management Plan** 1 credit point for developing a renovation waste management plan. **(b) Construction Waste Recycling** 1 credit point for demonstrating compliance with the Renovation Waste Management Plan and the application of proactive waste management provisions during renovation (demolition and construction); and recycling of at least 15% of construction waste (demolition and construction).	All DC	2
IDCM-02-04	Construction IAQ Management	**(a) Construction Indoor Air Quality (IAQ) Management Plan** 1 credit point for providing a Construction Indoor Air Quality (IAQ) Management Plan. **(b) Implementation of Construction Indoor Air Quality (IAQ) Management Plan** 1 credit point for providing records that the Construction IAQ Management Plan has been implemented by the DC Owner/ DC Management Company/ tenants during renovation.	All DC	2
IDCM-02-05	Considerate Construction	*This credit head is not applicable under BEAM Plus EDC.*		
IDCM-02-06	Building Management Manuals	1 credit point for providing a fully documented Operations and Maintenance Manual and Energy Management Manual.	All DC	1
IDCM-02-07	Operator Training plus Chemical Storage and Mixing Room	1 credit point for providing training for operations and maintenance staff to the minimum specified; and demonstrating that adequate maintenance facilities are provided for chemical storage and mixing.	All DC	1
IDCM-03-01	Digital Facility Management Interface	1 Bonus credit point for providing a digital interface in addition to the metering provision for DC facility management team to review the building operation performance.	All DC	1 Bonus

	Section	Credit Requirement	Extent of Application	Credit point(s)
IDCM-03-02	Occupant Engagement Platform	1 Bonus credit point for providing a digital interface in addition to the metering provision for DC facility management team to review the building operation performance.	All DC	1 Bonus
IDCM-03-03	Document Management System	1 Bonus credit point for operating an electronic O&M platform by the DC Owner/ DC Management Company.	All DC	1 Bonus
IDCM-03-04	BIM Integration	1 Bonus credit point for BIM application for Facility Management Use.	All DC	1 Bonus
IDCM-04-01	Design for Engagement and Education on Green Buildings	1 to 2 Bonus credit points for providing any two (2) or four (4) education elements to advocate the behavioural change of DC building users. i. Provide users with manuals for all green building design measures and provisions. ii. Provide educational signage system that is integrated with the major communal areas of the project to educate users and visitors about the benefits of the green building design measures and provisions. iii. Provide users a platform for sustainable living showcase demonstration, experience or sharing that are relevant to the enabling design measures and provisions in the project. e.g. websites, regular publications available to the public, newspapers or other means. iv. Organise educational seminar/ promotion campaign; v. Arrange workshop for DC building users to read through and review the building user guide/ manuals; vi. Promote or participate in Hong Kong Green Building Week organised by Constriction Industry Council (CIC) and the Hong Kong Green Building Council Limited (HKGBC); and vii. Additional or alternative education element(s) proposed by the Applicant with substantiation demonstrating strategies compatible with the listed strategies for achieving the credit objective.	All DC	1 Bonus

	Section	Credit Requirement	Extent of Application	Credit point(s)
4	**Sustainable Site (SS)**			**7+ 9 Bonus**
SS-00-P1	Minimum Landscaping Requirements	*This prerequisite is not applicable under BEAM Plus EDC.*		
SS-01-01	Pedestrian-oriented and Low Carbon Transport	**(a) Accessibility to Public Transport** 1 credit point for achieving Accessibility Index of 15 or more for all buildings within a DC development. **(b) Pedestrian-oriented Access** 1 credit point for achieving 50% or more of the pedestrian-oriented transport planning measures. 1 additional Bonus credit point for 100% achievement. **(c) Cycling Facilities and Network Integration** 1 Bonus credit point for providing cycling facilities within the Site and integrating with the public cycling network if a public cycling network exists or has been planned nearby. **(d) Charging Facilities for Electric Vehicle (EV)** 1 Bonus credit point for providing EV medium chargers for at least 50% of all parking spaces and EV charging-enabling for all parking spaces (including visitor car parks).	All DC	2 + 3 Bonus
SS-01-02	Neighbourhood Amenities	1 credit point where adequate amenities for building users are located within the site or 1,000m walking distance/ an equivalent horizontal commuting time from the site entrance(s).	All DC	1
SS-01-03	Building Design for Sustainable Urbanism	*This credit head is not applicable under BEAM Plus EDC.*		
SS-01-04	Neighbourhood Daylight Access	*This credit head is not applicable under BEAM Plus EDC.*		

	Section	Credit Requirement	Extent of Application	Credit point(s)
SS-01-05	Noise Control for Building Equipment	**(a) Provision of Acoustic Treatment** 1 credit point for providing adequate acoustic treatment to the following building services equipment: chillers, cooling towers, ventilation fans with Sound Power Level (SWL) higher than 80 dB(A). **(b) Demonstration of Compliance with HKPSG Criteria** 1 credit point for demonstrating that the level of the intruding noise at the façade of the potential Noise Sensitive Receivers (NSRs) is in compliance with the criteria recommended in the Hong Kong Planning Standards and Guidelines (HKPSG).	All DC with buildings services equipment are controlled by the Applicant	2
SS-02-01	Light Pollution Control	2 credit points if there are no external lightings installed for the DC building. *Alternatively,* • *1 credit point for switching off the DC Owner, DC Management Company's and tenants' (if any) external lightings from 23:00 to 07:00*.	All DC	2
SS-02-02	Biodiversity Enhancement	*This credit head is not applicable under BEAM Plus EDC.*		
SS-03-01	Urban Heat Island Mitigation	**(a) Mitigation Strategy at Primary Zone** 1 Bonus credit point for demonstrating the implementation of any combination of the following strategies for a minimum of 10% of the external non-roof area (i.e. ground floor and podium with less than 15m in height): i. Greenery; ii. Water feature; iii. Green wall or vertical greening; iv. Shading device; and/or v. Paving materials with solar reflectance (SR) of 0.33. 2 Bonus credit points for more than 20% of the external non-roof area covered with the aforesaid features.	Whole Building DC Developments	3 Bonus

	Section	Credit Requirement	Extent of Application	Credit point(s)
		(b) Green Roof 1 Bonus credit point for providing green roof and/or organic farm for at least 20% of the available main roof area.		
SS-03-02	Immediate Neighbourhood Wind Environment	*This credit head is not applicable under BEAM Plus EDC.*		
SS-03-03	Outdoor Thermal Comfort	*This credit head is not applicable under BEAM Plus EDC.*		
SS-04-01	Stormwater Management	1 Bonus credit point for demonstrating that adequate stormwater management measures have been provided to cater the total volume of runoff for one hour corresponding to a design rainfall of at least 30mm/event for the site in its post-developed conditions.	Whole Building DC Developments with a site area of 1,000 m^2 or more	1 Bonus
SS-04-02	Design for Climate Change Adaptation	1 Bonus credit point for studying the projected variation in temperature and rainfall and water level rise/ storm surge of adjacent water bodies due to climate change and its impact on the development and prepare mitigation proposal to improve the climate resilience of the building. 1 additional Bonus credit point for including quantitative calculation to support the resilience design which is technically eligible and cost effective.	Whole Building DC Developments	2 Bonus

	Section	Credit Requirement	Extent of Application	Credit point(s)
4	**Materials and Waste (MW)**			**10 + 3 Bonus**
MW-00-P1	Minimum Waste Handling Facilities	For Whole Buildings DC Developments: Providing spaces for collection, sorting, storage and disposal of waste and recovered materials. For DC Developments located in part of building: Providing storage facilities at prominent location for the collection of paper, plastic and metal waste.	All DC	Required
MW-01-01	Building Re-use	*This credit head is not applicable under BEAM Plus EDC.*		
MW-01-02	Modular and Standardised Design	*This credit head is not applicable under BEAM Plus EDC.*		
MW-01-03	Prefabrication	*This credit head is not applicable under BEAM Plus EDC.*		
MW-01-04	Design for Durability and Resilience	*This credit head is not applicable under BEAM Plus EDC.*		
MW-02-01	Sustainable Forest Products	*This credit head is not applicable under BEAM Plus EDC.*		
MW-02-02	Recycled Materials	*This credit head is not applicable under BEAM Plus EDC.*		
MW-02-03	Ozone Depleting Substances	**(a) Newly Installed and Existing Equipment using Refrigerants** 1. 1 credit point for all the equipment (both newly purchased and existing) using the refrigerants with Global Warming Potential (GWP) ≤ 1,900. *Alternatively,* • *For equipment with refrigerant GWP value > 1,900, credit point can be achieved when the Applicant can demonstrate a phased programme of refrigerant replacement*. 2. 1 credit point for using refrigerants with a combined value less than or equal to the threshold for the combined contributions to ozone depletion and global warming potentials for all new and existing	All the installed equipment using refrigerants, and fire suppression and other materials controlled by the applicant	2

	Section	Credit Requirement	Extent of Application	Credit point(s)
		HVAC&R equipment that under the control of Applicant. **(b) Fire Suppression and Other Materials** 1 credit point for using the fire suppression and other materials that avoids the use of ozone depleting substances in their manufacture, composition or use. *Note:* *For all sections, the newly installed equipment is defined as the equipment that is installed within the past 12 months.*		
MW-02-04	Regional Materials	*This credit head is not applicable under BEAM Plus EDC.*		
MW-02-05	Use of Green Products	**(a) Materials Purchasing Practices** 1 credit point for demonstrating at least 50% of purchased on-going consumables are environmentally friendly products for the past 12 months as minimum. 1 credit point for demonstrating at least 50% of purchased durable goods are environmentally friendly products for the past 12 months as minimum. 1 credit point for demonstrating at least 70% of purchased both on-going consumables and durable goods are environmentally friendly products for the past 12 months. 1 Bonus credit point for demonstrating at least 70% of purchased both on-going consumables and durable goods are environmentally friendly products for the past 24 months. **(b) Use of Green Products** Maximum 2 Bonus credit points for purchasing green products certified by Construction Industry Council (CIC) Green Product Certification or other internationally recognised schemes.	All DC	3 + 3 Bonus
MW-02-06	Life Cycle Assessment	*This credit head is not applicable under BEAM Plus EDC.*		
MW-03-01	Adaptability and Deconstruction	*This credit head is not applicable under BEAM Plus EDC.*		

	Section	Credit Requirement	Extent of Application	Credit point(s)
MW-03-02	Enhanced Waste Handling Facilities	**(a) Waste Management Plan** 1 credit point for developing a waste management plan. **(b) Enhanced Waste Handling Facilities** 1 credit point for providing at least 3 of the following listed on-site recycling facilities and implementing the recyclable materials collection arrangement: i. IT related waste such as, electronic equipment; ii. Plastic recyclable; iii. Metal recyclable; iv. Glass recyclable; v. Paper recyclable; vi. Food waste; vii. Organic landscape waste; and viii. Beverage carton recyclable.	All DC	2
MW-04-01	Best Practice on Material Usage	2 credit points for demonstrating the adoption of at least four (4) best practices relating to the efficient use of materials as mentioned in the Green Data Centre Practice Guide published by BEAM Society Limited (BSL).	All DC	2

	Section	Credit Requirement	Extent of Application	Credit point(s)
5	**Energy Use (EU)**			**32 + 10 Bonus**
EU-00-P1	Minimum Energy Performance	Conducting energy audit in accordance with the Buildings Energy Efficiency Ordinance (Cap 610) requirements for existing buildings.	All DC	Required
EU-01-01	Low Carbon Passive Design	*This credit head is not applicable under BEAM Plus EDC.*		
EU-01-02	Reduction of CO_2 Emissions	*This credit head is not applicable under BEAM Plus EDC.*		
EU-01-03	Peak Electricity Demand Reduction	*This credit head is not applicable under BEAM Plus EDC.*		
EU-01-04	Metering and Monitoring	**(a) Meters for Electrical Loads** 1 credit point for sub-metering systems for the following electrical loads where applicable: i. Central AC plant - Water Side; ii. Central AC plant - Air Side; and iii. Lighting. **(b) BMS Logging** 1 credit point for having Building Management System (BMS) to log operation data (e.g. pressure, temperature, flow rate, on/off status) for monitoring operation and function of the system including the following as a minimum: i. Central AC plant - Water side; ii. Central AC plant - Air side; iii. Cooling load; and iv. Lighting control. **(c) PUE Monitoring** 1 credit point for energy metering to provide total facility power and energy usage and total IT equipment power and energy at each output of Power Distribution Unit (PDU) for determining instantaneous and average Power Usage Effectiveness (PUE) data.	All DC	3

	Section	Credit Requirement	Extent of Application	Credit point(s)
EU-02-01	Renewable and Alternative Energy Systems	**(a) Solar Energy Feasibility Study** 1 credit point for evaluating the building roof's potential for harnessing solar energy. **(b) Renewable Energy Application** 1 Bonus credit point where at least 0.2% of DC energy consumption in communal area is obtained from renewable energy sources.	All DC	1 + 1 Bonus
EU-03-01	Air-conditioning Units	*This credit head is not applicable under BEAM Plus EDC.*		
EU-03-02	Clothes Drying Facilities	*This credit head is not applicable under BEAM Plus EDC.*		
EU-03-03	Energy Efficient Appliances	**(a) Use of Efficient UPS** 1 credit point for demonstrating that the Uninterruptible Power Supplies (UPS) is procured in accordance with certified energy efficient products scheme. **(b) Use of Sustainable IT Equipment** 1 credit point for demonstrating that the IT Equipment for the running and operating of the DC of is procured in accordance with certified energy efficient products scheme.	All DC DC with operational control over the IT Equipment	2
EU-03-04	Cooling System Efficiency	*This credit head is not applicable under BEAM Plus EDC.*		
EU-03-05	Air Management System	**(a) Air Management System** 1 credit point for demonstrating the total air flow efficiency in all data halls, from supply to return, is of 0.9 kW/m^3/s. **(b) Data Hall Supply Air Temperature Control** 1 credit point for demonstrating the data hall supply air temperature for 24 °C and above.	All DC	2

	Section	Credit Requirement	Extent of Application	Credit point(s)
EU-04-01	Best Practices on Energy Use	1. 1 credit point for incorporating at least 2 best practices under each of the listed aspects in the Green DC Practice Guide published by BEAM Society Limited. 3 credit points for incorporating the best practices under any 3 of the following aspects. i. Cooling System; ii. Air Flow Management; iii. Operating at Higher Temperature and Humidity; iv. Cooling Management; and v. Power System. 2. 2 credit points for incorporating at least 6 best practices from the following aspects as listed in the Green DC Practice Guide published by BEAM Society Limited: i. Design of Resilience; ii. Monitoring and Managing Energy Efficiency; iii. IT Equipment Deployment; iv. IT Application System and IT Service Deployment; and v. Telecommunications and Network Cabling.	All DC	5
EU-04-02	Energy Management	**(a) Energy Management Policy** 1 credit point for an energy management policy endorsed by top management. **(b) Energy Saving Target** 1 to 2 credit point(s) for energy management plan covering less than 3 year/ 3 years or more, respectively. **(c) Energy Action Plan** 1 to 2 credit point(s) for energy action plan covering less than 3 year/ 3 years or more, respectively. **(d) Appointment of Energy Warden** 1 credit point for appointing an Energy Warden in the DC Management Company.	All DC	6

<table>
<tr><th></th><th>Section</th><th>Credit Requirement</th><th>Extent of Application</th><th>Credit point(s)</th></tr>
<tr><td>EU-04-03</td><td>Energy Analysis</td><td>(a) Data Collection Record

1 to 2 credit point(s) for providing energy consumption data record of at least 1 year/ more than 3 years for major electrical loads.

(b) Data Analysis

1. 1 credit point for calculating the EUI of the following services in data analysis:

i. Air-conditioning system; and

ii. Lighting.

2. 1 credit point for calculating and recording the PUE (Level 2) for 1 year.

(c) Energy Audit Report

2 credit points for filling up the entire Template 1 on Additional Information to Executive Summary of Energy Audit Report.

(d) Carbon Audit Report

1 credit point for conducting carbon audit in accordance with the requirements as stipulated in the guideline issued by the Authority.</td><td></td><td>7</td></tr>
<tr><td>EU-05-01</td><td>Energy Benchmarking and System Improvement</td><td>Credit point(s) can be achieved based on the Operating PUE value

<table><tr><td>No. of Credit point(s)</td><td>1</td><td>2</td><td>4</td><td>6</td><td>8</td><td>1 Bonus</td><td>2 Bonus</td></tr><tr><td>PUE</td><td>2.0</td><td>1.9</td><td>1.8</td><td>1.7</td><td>1.6</td><td>1.5</td><td>≤1.4</td></tr></table></td><td>All DC</td><td>8 + 2 Bonus</td></tr>
<tr><td>EU-05-02</td><td>Enhancements</td><td>Maximum of 1 Bonus credit point for each energy conservation approach is allowed but the award of credit point is subject to the final approval of BEAM Society Limited (BSL)’s Technical Review Committee (TRC) based on the estimated energy reduction, justification and/or the innovation of the proposed approaches.

Note: Energy saving measures that rely on DC user’s behaviour or manual control (such as turning up the set temperature manually for air-conditioning; turning off lighting by hand in accordance with staff energy management manual) will not be considered energy saving features in this section.</td><td>All DC</td><td>6 Bonus</td></tr>
</table>

Section	Credit Requirement	Extent of Application	Credit point(s)
	Some of the prescriptive approaches include: 1. Research and Development in Energy 1 Bonus credit point for conducting research and development or participating in competition with published paper related to energy aspects for DC. 2. Compliance with the BEC Maximum 4 Bonus credit points for compliance with the latest version of the following listed BEC: i. Energy Efficiency Requirements for Air-Conditioning Installations; ii. Energy Efficiency Requirements for Electrical Installations; iii. Energy Efficiency Requirements for Lighting Installations; and/or iv. Energy Efficiency Requirements for Lift and Escalator Installations. 3. Separate Energy Charges 1 Bonus credit point where separate charges are made for energy use. 4. Other Approaches Maximum 6 Bonus credit points for adopting other energy conservation approaches not prescribed above.		

<table>
<tr><th></th><th>Section</th><th>Credit Requirement</th><th>Extent of Application</th><th>Credit point(s)</th></tr>
<tr><td>6</td><td>Water Use (WU)</td><td></td><td></td><td>12 + 7 Bonus</td></tr>
<tr><td>WU-00-P1</td><td>Minimum Water Saving Performance</td><td>This prerequisite is not applicable under BEAM Plus EDC.</td><td></td><td></td></tr>
<tr><td>WU-01-01</td><td>Annual Water Use</td><td>Credit point(s) can be achieved based on the estimated aggregate annual saving by the use of water efficient devices.

<table><tr><td>No. of Credit point(s)</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Estimated aggregate annual fresh water saving</td><td>10%</td><td>15%</td><td>20%</td><td>25%</td></tr></table></td><td>All DC</td><td>4</td></tr>
<tr><td>WU-01-02</td><td>Water Efficient Irrigation</td><td>This credit head is not applicable under BEAM Plus EDC.</td><td></td><td></td></tr>
<tr><td>WU-01-03</td><td>Water Efficient Appliances</td><td>This credit head is not applicable under BEAM Plus EDC.</td><td></td><td></td></tr>
<tr><td>WU-01-04</td><td>Water Leakage Detection</td><td>1 Bonus credit point for installing water leakage detection systems in all data halls and all municipal potable water tank rooms (if applicable).</td><td>All DC</td><td>1 Bonus</td></tr>
<tr><td>WU-01-05</td><td>Twin Tank System</td><td>1 Bonus credit point for providing twin tank for either potable or flushing water supply system.

2 Bonus credit points for providing twin tank for both potable and flushing water supply system.</td><td>All DC (including DC with centralised/ shared tank that is outside the assessment boundary)</td><td>2 Bonus</td></tr>
<tr><td>WU-01-06</td><td>Cooling Tower Water</td><td>1 credit point for reducing fresh water consumption by installing water treatment system which can achieve minimum 7 cycles of concentration with acceptable water quality.

1 additional Bonus credit point for 8 or more cycles of concentration with acceptable water quality are achieved.</td><td>All DC equipped with cooling tower using fresh water as makeup water.</td><td>1 + 1 Bonus</td></tr>
<tr><td>WU-02-01</td><td>Effluent Discharge to Foul Sewers</td><td>1 credit point for installing dual flush for the water closets.

1 credit point for installing urinal with WELS Grade 2 or above.</td><td>All DC with flushing system</td><td>2</td></tr>
</table>

<table>
<tr><th></th><th>Section</th><th>Credit Requirement</th><th>Extent of Application</th><th>Credit point(s)</th></tr>
<tr><td>WU-03-01</td><td>Water Harvesting and Recycling</td><td>1 Bonus credit point for harvesting rainwater and/or recycling grey water that leads to a reduction of at least 2.5% in the consumption of potable water.

2 Bonus credit points for achieving a reduction of 5% or above.</td><td>All DC</td><td>2 Bonus</td></tr>
<tr><td>WU-04-01</td><td>Smart Water Metering</td><td>1 credit point for demonstrating provision of permanent smart water meter for cooling towers water use and Indoor plumbing fixtures and fitting, and at least two (2) of the other water systems, which able to display metered data, treading of water consumption and relevant parameters:

i. Irrigation (if applicable);
ii. Cleansing;
iii. Water features/ pools; and
iv. Other process water.</td><td>All DC with more than one water system</td><td>1</td></tr>
<tr><td>WU-04-02</td><td>Water Saving Management</td><td>Credit point(s) can be achieved based on the reduction percentage by comparing water bill/ metering data. (Reference year can be any year in the past 5 years).

<table><tr><th>No. of Credit point(s)</th><th>1</th><th>2</th><th>3</th><th>4</th><th>Bonus</th></tr><tr><td>Annual fresh water use reduction</td><td>3%</td><td>6%</td><td>9%</td><td>12%</td><td>15%</td></tr></table></td><td>All DC</td><td>4 +1 Bonus</td></tr>
</table>

	Section	Credit Requirement	Extent of Application	Credit point(s)
7	**Health and Wellbeing**			**13 + 2 Bonus**
HWB-00-P1	Minimum Ventilation Performance	**(a) On-site Outdoor Air Quality** To measure outdoor air pollutants at selected intake location(s). **(b) Minimum Ventilation** To demonstrate the project is in compliance with the minimum ventilation quantity in accordance with of ANSI/ASHRAE Standard 62.1-2019. *Alternatively,* • *In case of the minimum ventilation rate of ANSI/ASHRAE Standard 62.1-2019 is not complied due to the physical constraints of the existing ventilation system, demonstrate that the system is operated at maximum outdoor air delivery rate and provide not less than 5 l/s per person of combined outdoor air rate*.	All DC	Required
HWB-01-01	Healthy and Active Living	1 Bonus credit point for scoring at least 3 items of all applicable design measures for healthy and active living.	All DC	1 Bonus
HWB-01-02	Biophilic Design	*This credit head is not applicable under BEAM Plus EDC*		
HWB-02-01	Inclusive Design	1 credit point for providing at least three (3) applicable enhanced provisions as stipulated in the “Recommended Design Requirements” of BFA 2008.	All DC	1
HWB-03-01	Enhanced Ventilation	**(a) Fresh Air Provision** 1 credit point for demonstrating that 90% of not normally occupied spaces in the DC are provided with adequate ventilation. **(b) Exhaust Air** 1 credit point for the provision of an effective ventilation system for spaces where significant indoor pollution sources are generated.	All DC	2
HWB-03-02	Waste Odour Control	*This credit head is not applicable under BEAM Plus EDC.*		

	Section	Credit Requirement	Extent of Application	Credit point(s)
HWB-03-03	Acoustics and Noise	**(a) Background Noise in Data Hall** 1 credit point for demonstrating the internal noise levels at data hall areas are maintained at an appropriate level. **(b) Room Acoustics** 1 credit point for demonstrating that the mid-frequency reverberation time in applicable rooms meets the prescribed criteria of different types of premises. **(c) Noise Isolation** 1 credit point for demonstrating airborne noise isolation between rooms, spaces and premises fulfils the prescribed criteria.	All DC	3
HWB-03-04	Indoor Vibration	1 Bonus credit point for ensuring that vibration levels do not exceed the prescribed criteria.	All DC	1 Bonus
HWB-03-05	Indoor Air Quality	1 to 2 credit point(s) for the whole DC is certified by the Good Class **or** Excellent Class of 'Indoor Air Quality Certification Scheme for Offices and Public Places'.	All DC	2
HWB-03-06	Thermal Comfort	**(a) Temperature Profile in Data Hall** 1 credit point for sustaining the air temperature at the design value within ±2.0°C when the air side system is operating at steady state under normal operation periods. **(b) Thermal Comfort in Normally Occupied Spaces** 1 credit point for demonstrating an appropriate temperature (i.e. ≤25.5°C), relative humidity (i.e. ≤70%) and air velocity (≤0.3 m/s) in normally occupied spaces.	All DC	2
HWB-03-07	Artificial Lighting	**(a) Artificial lighting in Data halls** 1 credit point for achieving the prescribed lighting performance in Data halls. **(b) Artificial lighting in normally occupied spaces, not normally occupied spaces and unoccupied spaces** 1 credit point for achieving the prescribed lighting performance in normally occupied spaces, not normally occupied spaces and unoccupied spaces.	All DC	2

	Section	Credit Requirement	Extent of Application	Credit point(s)
HWB-03-08	Daylight	*This credit head is not applicable under BEAM Plus EDC*		
HWB-03-09	Biological Contamination	1 credit point for complying with the recommendations given in the Code of Practice for Prevention of Legionnaires' Disease 2021 Edition in respect of Water Supply Systems, HVAC Systems and other Water Features.	All DC	1
	Innovations and Additions (IA)			**Max.10 Bonus**
IA-01-01	Innovations and Additions	Present evidence of the application of new practices, technologies and/ or techniques that are (1) not described in this manual; or (2) not market mainstream implementation; or (3) multiple aspect achievement; and the associated benefits in addressing sustainability objectives for EDC.	All DC	Maximum 10 Bonus

2 Management (MAN)

An effective management of DC operations and maintenance is the key factor for better environmental performance of the building, especially for existing DC. The 'Management' category assesses the overarching management system, policies and procedures put in place, staffing and resources to ensure DC are operating in their maximum sustainable potential.

2 Management **MAN-00** **Prerequisite**

MAN-00-P1 **Green Purchasing Plan**

Extent of Application All DC

Objective To encourage the purchase of products used in the Operation and Maintenance (O&M) of DC with reducing environmental impacts through the formulation of procedures or plans.

Credit Point(s) Attainable Prerequisite

Credit Requirement Demonstrate that green purchasing plan and procedures (including both materials and services) either follow their internal company guideline or other international standards shall be in place.

Assessment

1. The Applicant shall provide documentary evidence that purchasing plans and procedures endorsed by top management are in place for governing the procurement of materials, products and equipment, which shall have no significant negative impacts on the environment and the safety and health of employees and building users.

2. The green purchasing plan may include the procurement of:

    2.1. Durable goods, products and equipment; materials with low embodied energy;

    2.2. Locally produced materials where available;

    2.3. Wood products from well-managed sources;

    2.4. Products which do not use CFCs, HCFCs, halons;

    2.5. Salvaged materials and components;

    2.6. Rapidly renewable materials;

    2.7. Durable materials;

    2.8. Finishes; paints, adhesives, etc., with low levels of emissions;

    2.9. Minimal packaging and/ or recyclable packaging;

    2.10. Products having high recyclable content;

    2.11. Products that are recyclable;

    2.12. Energy efficient appliances and equipment; and

    2.13. Water efficient appliances, etc.

3. The above list is not exhaustive and it is not necessary to include all the abovementioned procurement items into the green purchasing plan. The Applicant shall compose their green purchasing plan that suits their own operational needs.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-00-P1_00	BEAM Plus EDC submission template for MAN-00-P1	✓	✓
MAN-00-P1_01	Green purchasing plan endorsed by top management	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

MW-02-03 Ozone Depleting Substances

The related credit head encourages the avoidance of releasing ozone depletion substances into the atmosphere.

MW-02-05 Use of Green Products

The related credit head encourages purchasing practices which reduce the environmental impacts of products used by implementing Green Purchasing Plan and the purchase of certified green products that have low environmental impacts.

2 Management MAN-01 EHS and Energy Management

MAN-01-01 EHS and Energy Management System

Extent of Application

All DC

Objective

To encourage the building management to implement systematic management systems that embrace quality, environmental, health, safety, and energy.

Credit Point(s) Attainable

3 + 2 Bonus

Credit Requirement

1 credit point where the DC management operates an Environmental Management System (EMS) certified to ISO 14001 [1].

1 credit point where the DC management operates an Occupational Health and Safety System (OHSAS) [2].

1 credit point where the DC management operates an Energy Management System (EnMS).

1 Bonus credit point where DC management operates an OHSAS certified to ISO 45001 [3].

1 Bonus credit point where the DC management operates an EnMS certified to ISO 50001 [4].

Assessment

1. The Applicant shall provide the documentation such as the manuals, operation procedures, policies and audit records to demonstrate that the DC Management Company is operating the EMS, OHSAS and EnMS.

   Note: Only internal audit records for the OHSAS and EnMS are required when the Applicant does not intend to attempt the BONUS credit points.

2. Bonus credit point(s) can be achieved when the Applicant provides the ISO 45001 and/ or ISO 50001 certificates. The name of the DC should be stated in the certificates. Credit points will not be granted if only the head office operation of the DC Management Company is awarded with the certificates.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-01-01_00	BEAM Plus EDC submission template for MAN-01-01	✓	✓
MAN-01-01_01	A valid ISO 14001 certificate of the DC [#]	✓	✓
MAN-01-01_02	Internal audit records of the OHSAS and EnMS of the DC* [#]	✓	✓
MAN-01-01_03	A valid ISO 45001 certificate of the DC [#]	✓	✓
MAN-01-01_04	A valid ISO 50001 certificate of the DC[#]	✓	✓
* If the Applicant has provided the ISO 45001 and ISO 50001 certificate, it is not necessary for the Applicant to provide the documentations MAN-01-01_02 above.			

Remarks

(a) Additional Information

[1] International Organization for Standardization. ISO 14001:2015 Environmental management systems – Requirements with guidance for use. [ONLINE]. Available at:
https://www.iso.org/standard/60857.html
[Accessed Aug 2021].

[2] BSI Group. Getting Started with BS OHSAS 18001 Occupational Health and Safety Management. [ONLINE]. Available at:
http://www.bsigroup.com/en-GB/ohsas-18001-occupational-health-and-safety/Introduction-to-BS-OHSAS-18001
[Accessed Aug 2021].

[3] International Organization for Standardization. ISO 45001:2018 Occupational health and safety management systems — Requirements with guidance for use. [ONLINE]. Available at:
https://www.iso.org/standard/63787.html
[Accessed Aug 2021].

[4] International Organization for Standardization. ISO 50001:2018 Energy management systems – Requirements with guidance for use. [ONLINE]. Available at
https://www.iso.org/standard/69426.html
[Accessed Aug 2021].

(b) Related Credit Heads

EU-04-02 Energy Management

The related credit head encourages high level management to involve in the improvement of energy efficiency and conservation.

2 Management MAN-02 ESG Disclosure

MAN-02-01 Environmental, Social and Governance (ESG) Disclosure

Extent of Application

All DC

Objective

To encourage DCs Owner/ DCs Management Company to have ESG reporting and disclose its operational performance to the public.

Credit Point(s) Attainable

1 + 1 Bonus

Credit Requirement

(a) Disclosure of Sustainability Policy and Target

1 credit point where the DC Owner/ DC Management Company discloses sustainability policy and targets to the public.

(b) ESG Reporting

1 Bonus credit point where the Building Owner/ Building Management Company follows Global Reporting Initiative (GRI) Sustainability Reporting Standards and discloses the G4 sustainability report to the public.

Assessment

(a) Disclosure of Sustainability Policy and Targets

1. The Applicant shall provide the sustainability policy and targets of the Building Owner/ Building Management Company. The scope of the sustainability policy is not regulated but it should cover at least the environmental issues.

(b) ESG Reporting

2. The ESG report shall be composed under the Reporting Principles and either "Core" or "Comprehensive" options of the GRI Standards shall be adopted.

Submittals

(a) Disclosure of Sustainability Policy and Targets

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-02-01a_00	BEAM Plus EDC submission template for MAN-02-01a	✓	✓
MAN-02-01a_01	Sustainability policy and targets and evidence showing such information is disclosed to public	✓	✓

(b) ESG Reporting

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-02-01b_00	BEAM Plus EDC submission template for MAN-02-01b	✓	✓
MAN-02-01b_01	The ESG report of the Building Owner/ Building Management Company that follows the GRI Standards [#]	✓	✓
MAN-02-01b_02	Evidence showing the ESG report is publicly available	✓	✓

Remarks

(a) Additional Information

Business Environment Council Handbook: Understanding Materiality for Environmental, Social and Governance Reporting. [ONLINE]. Available at: https://bec.org.hk/sites/default/files/publications/BEC_ESG_Handbook_web.pdf
[Accessed Aug 2021].

Global Reporting Initiative. G4 Sustainability Reporting Guidelines. [ONLINE]. Available at:
https://www.globalreporting.org/standards/
[Accessed Aug 2021].

(b) Related Credit Heads

None

2 Management MAN-03 Staff Training

MAN-03-01 Staff Training and Resources

Extent of Application

All DC

Objective

To ensure the staff training and technical resources are adequate for the Operation and Maintenance (O&M) of the DC.

Credit Point(s) Attainable

2

Credit Requirement

(a) Staff and Technical Resources

1 credit point for having adequate staff and technical resources to meet the O&M requirements of the DC.

(b) Staff Training

1 credit point for providing adequate and periodic training for the staff responsible for the O&M of the DC.

Assessment

(a) Staff and Technical Resources

1. The Applicant shall provide the organisation chart (O-chart) clearly indicating the responsibility and job duties of each building management staff for the O&M of the DC. If the O&M of a certain system is outsourced, the Applicant shall provide the tender/ contract documents requiring the sub-contractor to have sufficient resources for the works. The DC Manager shall also provide a statement stating the staffing and resources are adequate for the O&M of the building.

(b) Staff Training

1. The Applicant shall provide the training records for the staff members responsible for O&M for the past 12 months. The topics of the training are not regulated but the training shall be related to the operation of the DC. The minimum training requirements are 15 hours and 6 hours per year for the DC Manager and other staff respectively.

2. Only staff members of the Building Management Company are included in the assessment. Staff members of sub-contractors are excluded from the assessment.

Submittals

(a) Staff and Technical Resources

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-01a_00	BEAM Plus EDC submission template for MAN-03-01a	✓	✓
MAN-03-01a_01	Tender/ contract documents requiring the sub-contractor to have sufficient resources for the O&M works (if any)	✓	✓
MAN-03-01a_02	Statement stating the staffing and resources are adequate for the O&M of the building	✓	✓
MAN-03-01a_03	Job duties and responsibilities of the staff responsible for O&M	✓	✓

(b) Staff Training

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-01b_00	BEAM Plus EDC submission template for MAN-03-01b	✓	✓
MAN-03-01b_01	Staff training records for the past 12 months [#]	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

2 Management MAN-03 Operation and Maintenance

MAN-03-02 Building and Site Operation and Maintenance

Extent of Application

Part (a) - All DC with building's fabric and structure that are controlled by the Applicant.

Part (b) - All DC with external areas and facilities that are controlled by the Applicant.

Objective

To encourage planned inspection, maintenance and repairing of the building fabric, structure, and external areas in order to enhance safety and reduce environmental impacts.

Credit Point(s) Attainable

2

Credit Requirement

(a) DC Building Maintenance

1 credit point for demonstrating the operation of a planned programme of regular inspection, cleaning and maintenance of the DC building's fabric and structure under the control of the Applicant.

(b) External Areas and Facilities

1 credit point for demonstrating the operation of a planned programme of regular inspection, cleaning and maintenance of external areas and facilities.

Assessment

(a) DC Building Maintenance

1. The Applicant shall provide documentation to demonstrate that the system of inspections, cleaning, maintenance and general repairs to the DC building fabric and structural elements are effective in maintaining reliability and prolonging service life of the building. DC building fabric and structure shall include:

    i. Building façade;

    ii. Curtain wall; and

    iii. External cladding.

(b) External Areas and Facilities

1. The following external areas and facilities which are under the control of the Applicant shall be assessed:

    i. Roads and pavements

    ii. Hard and soft landscape areas;

    iii. Stairs and ramps; and

    iv. Recreational facilities.

For both (a) and (b), the Applicant shall provide the planned programme of regular inspection, cleaning and maintenance of the external areas and facilities. The frequency of these activities is not regulated and it is subject to the Applicant's operation requirement. The Applicant shall provide the undertaking letter signed by

the DC building-in-charge stating that the frequency for inspection, cleaning and maintenance is sufficient.

Submittals

(a) Building Maintenance

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-02a_00	BEAM Plus EDC submission template for MAN-03-02a	✓	✓
MAN-03-02a_01	A list of all the elements of the building fabric and structure subject to regular inspection, cleaning and maintenance	✓	✓
MAN-03-02a_02	Maintenance procedures of the elements	✓	✓
MAN-03-02a_03	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-02a_04	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓
MAN-03-02a_05	The planned inspection, maintenance and repairs programme for the next 12 months	✓	✓
MAN-03-02a_06	Undertaking letter signed by the building-in-charge	✓	✓

(b) External Areas and Facilities

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-02b_00	BEAM Plus EDC submission template for MAN-03-02b	✓	✓
MAN-03-02b_01	A list of all the elements of the external areas and facilities subject to regular inspection, cleaning and maintenance	✓	✓
MAN-03-02b_02	Maintenance procedures of the elements	✓	✓
MAN-03-02b_03	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-02b_04	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓
MAN-03-02b_05	The planned inspection, maintenance and repairs programme for the next 12 months	✓	✓
MAN-03-02b_06	Undertaking letter signed by the building-in-charge	✓	✓

Remarks

(a) Additional Information
None

(b) Related Credit Heads
None.

2 Management MAN-03 Operation and maintenance

MAN-03-03 Building Services Operation and Maintenance

Extent of Application

Part (a) – All DC with central HVAC plant that is controlled by the Applicant
Part (b) – All DC with systems that are controlled by the Applicant
Part (c) – All DC

Objective

To encourage proper and efficient operation of the engineering systems by operation and maintenance programme.

Credit Point(s) Attainable

7

Credit Requirement

(a) Central Heating Ventilation and Air-Conditioning (HVAC) Plant

2 credit points for demonstrating the operation of a planned programme of regular inspection and maintenance of the central HVAC plant.

(b) Other Engineering Systems

Maximum 4 credit points for demonstrating the operation of a planned programme of regular inspection and maintenance of the following listed systems:

i. Air-conditioning system except HVAC plant;

ii. Electrical system;

iii. Lighting system; and

iv. Plumbing and drainage system.

(c) Assessment of Operation & Maintenance Practice

1 credit point for having undertaken an audit of the effectiveness of the O&M practices for all building services engineering systems.

Assessment

(a) Central Heating Ventilation and Air-Conditioning (HVAC) Plant

1. The Applicant shall provide the planned programme for regular inspection and maintenance of the central HVAC plant. The frequency of these activities is not regulated and is subject to the Applicant's operation requirement. The Applicant shall provide the undertaking letter stating that the frequency for inspection and maintenance is sufficient.

(b) Other Engineering Systems

1. Demonstrate the operation of a planned programme for each of the below listed items.:

   1.1. Air-conditioning system except HVAC plant;

   1.2. Electrical system;

   1.3. Lighting system; and

   1.4. Plumbing and drainage system

2. The Applicant shall provide the planned programme of regular inspection and maintenance of the air-conditioning (except central HVAC plant), electrical, lighting and plumbing & drainage system. The frequency of these activities is not regulated and is subject to the Applicant's operation requirement. The Applicant shall provide the undertaking letter stating that the frequency for inspection and maintenance is sufficient.

(c) Assessment of Operation & Maintenance Practice

1. The Applicant shall provide a report detailing the steps taken, outcomes and actions taken or planned (with appropriate budget information) for improvements in the building services operation and maintenance practices. The audit approach should follow the details in BSRIA's guide [1] or similar equivalent approaches. The effectiveness audit shall be conducted every 5 years.

Submittals

(a) Central Heating Ventilation and Air-Conditioning (HVAC) Plant

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-03a_00	BEAM Plus EDC submission template for MAN-03-03a	✓	✓
MAN-03-03a_01	Frequencies of cleaning and inspection of the applicable system(s)	✓	✓
MAN-03-03a_02	Maintenance procedures of the central HVAC plant	✓	✓
MAN-03-03a_03	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-03a_04	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓
MAN-03-03a_05	The planned inspection, maintenance and repairs programme for the next 12 months	✓	✓

(b) Other Engineering Systems

Air-conditioning system except HVAC plant

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-03b_00	BEAM Plus EDC submission template for MAN-03-03b	✓	✓
MAN-03-03b_01	Frequencies of cleaning and inspection of the applicable system(s)	✓	✓
MAN-03-03b_02	Maintenance procedures of the air-conditioning system except HVAC plant	✓	✓
MAN-03-03b_03	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-03b_04	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓

Electrical system

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-03b_00	BEAM Plus EDC submission template for MAN-03-03b	✓	✓
MAN-03-03b_05	Frequencies of cleaning and inspection of the applicable system(s)	✓	✓
MAN-03-03b_06	Maintenance procedures of the electrical system	✓	✓
MAN-03-03b_07	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-03b_08	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓
MAN-03-03b_09	The planned inspection, maintenance and repairs programme for the next 12 months	✓	✓

Lighting system

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-03b_00	BEAM Plus EDC submission template for MAN-03-03b	✓	✓
MAN-03-03b_10	Frequencies of cleaning and inspection of the applicable system(s)	✓	✓
MAN-03-03b_11	Maintenance procedures of the lighting system	✓	✓
MAN-03-03b_12	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-03b_13	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓
MAN-03-03b_14	The planned inspection, maintenance and repairs programme for the next 12 months	✓	✓

Plumbing and drainage system

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-03b_00	BEAM Plus EDC submission template for MAN-03-03b	✓	✓
MAN-03-03b_15	Frequencies of cleaning and inspection of the applicable system(s)	✓	✓
MAN-03-03b_16	Maintenance procedures of the plumbing and drainage system	✓	✓
MAN-03-03b_17	Personnel that are responsible for the inspection, cleaning and maintenance	✓	✓
MAN-03-03b_18	Records of inspection, maintenance and repairs for the past 12 months [#]	✓	✓
MAN-03-03b_19	The planned inspection, maintenance and repairs programme for the next 12 months	✓	✓

(c) Assessment of Operation & Maintenance Practice

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MAN-03-03c_00	BEAM Plus EDC submission template for MAN-03-03c	✓	✓
MAN-03-03c_01	Audit report showing the effectiveness of the O&M practice	✓	✓

Remarks

(a) Additional **Information**

[1] Building Services Research and Information Association. BG 24/2012 Asset Management and Maintenance Audits. BSRIA 2012.

(b) Related Credit Heads

None

3 Integrated Design and Construction Management (IDCM)

This section focuses on the integration design management which maximises the opportunities for integrated and cost-effective green design approaches and construction methodologies; improvement in user's health and wellbeing; smart technologies and innovative approaches for green design and construction.

3	**Integrated Design and Construction Management**	**IDCM-00**	**Prerequisite**

IDCM-00-P1 Sustainability Champions - Project

Extent of Application

All DC

Objective

Facilitate the application of the BEAM Plus certification process and to ensure the compliance of relevant requirements of the BEAM Plus Manual.

Credit point(s) Attainable

Prerequisite

Credit Requirement

1. Prerequisite achieved for demonstrating that an accredited BEAM Professional (BEAM Pro) with a valid credential for BEAM Plus Existing Data Centres is engaged as the Project BEAM Pro of the consultant team.

2. The Project BEAM Pro shall:

    2.1. Act as the point of contact with the Hong Kong Green Building Council and the BEAM Society Limited for administrative matters relating to BEAM Plus certification;

    2.2. Participate as one of the key project team members to oversee the submission materials are in compliance with relevant requirements of the BEAM Plus Manual. The Project BEAM Pro may also assume other roles in the consultant team of the project (The Project BEAM Pro, Design BEAM Pros under IDCM-01-01 and Construction BEAM Pros under IDCM-02-01 must be different personnel);

    2.3. Create a BEAM Plus EDC Certification Checklist including project goals, performance and BEAM Plus target rating;

    2.4. Provide guidance to the project and DCs facility management teams regarding BEAM Plus principles, structure, timing, certification process and requirements of credits; and

    2.5. Advise the Applicant on relevant professionals or parties on respective tasks to address relevant BEAM Plus certification requirements.

Assessment

1. Complete the prescribed form with qualification details, appointment information and confirmation of appointment of the Project BEAM Pro. The appointed Project BEAM Pro should provide valid credentials from appointment to completion of the certification process. If more than 1 Project BEAM Pro was employed for the project, the applicant should clearly document the works for each BEAM Pro and how the works are handed over and the timeline for their involvement.

2. Provide a BEAM Plus EDC Certification Checklist which shall include the following:

    2.1. Determine the BEAM Plus certification level to pursue;

    2.2. Select the BEAM Plus credits to meet the targeted certification level;

    2.3. Identify the responsible parties to ensure the BEAM Plus requirements for each prerequisite and selected credits are met; and

2.4. Changes between PA and FA stage should be recorded and a summary should be submitted to report the changes in submission

3. Provide a copy of the meeting minute (date and content of the minute will be reviewed for compliance) showing the participation of the Project BEAM Pro. Confidential or sensitive project information in the minute is not required and could be covered:

3.1. Introductory workshop/ meeting;

3.2. Highlight the attendance of Project BEAM Pro(s) and the section of providing guidance to the project team/ DCs facility management team regarding BEAM Plus principles, structure, timing, certification processes and BEAM Plus requirements. Indicate the inclusion of Design BEAM Pros (and Affiliates, if any) as defined under IDCM-00-01, if any; and

3.3. Review meeting(s) with the project team/ DCs facility management team.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-00-P1_00	BEAM Plus EDC submission template for IDCM-00-P1	✓	✓
IDCM-00-P1_01	BEAM Plus EDC Certification Checklist	✓	✓
IDCM-00-P1_02	A copy of the meeting minute of introductory workshop/ meeting	✓	-
IDCM-00-P1_03	A copy of the meeting minute of review meeting(s) with project team/ facility management team	✓*	✓
IDCM-00-P1_04	Supporting documents showing how the works are handed over and the timeline for their involvement, if applicable (e.g. Declaration letter from the employer of the Project BEAM Pro)	✓	✓

Remarks

(a) Additional Information

Hong Kong Green Building Council publishes the latest registers of BEAM Professionals and BEAM Affiliates on its website. [ONLINE].
Available at: https://practitioner2.hkgbc.org.hk/index.php?r=Beam/Directory [Accessed Aug 2021].

(b) Related Credit Heads

IDCM-01-01 Sustainability Champions – Design

The related credit encourages the engagement of BEAM Pros and/ or Affiliates engaged by respective core design disciplines to integrate BEAM standards and practices into the Management, Operation and Maintenance of the DC.

3	**Integrated Design and Construction Management**	**IDCM-00**	**Prerequisite**
		IDCM-00-P2	**Environmental Management Plan**

This credit head is not applicable under BEAM Plus EDC.

3	**Integrated Design and Construction Management**	**IDCM-00**	**Prerequisite**

IDCM-00-P3 Timber Used for Temporary Works

This credit head is not applicable under BEAM Plus EDC.

3 Integrated Design and Construction Management

IDCM-01 Integrated Design Process

IDCM-01-01 Sustainability Champions - Design

Extent of Application All DC

Objective To facilitate the application for the BEAM Plus certification process and ensure the operation of the DC complies with the BEAM Plus EDC requirements.

Credit point(s) Attainable 2

Credit Requirement

(a) BEAM Accredited Personnel

1 credit point for having at least 2 members from the on-site team are an accredited BEAM Professional with EDC credential, with the members employed with the building management team for at least 6 months prior to the time of first assessment submission.

Alternatively,

- *1 credit point for at least 1 key member from the Building Management Company is an accredited BEAM Professional with EDC credential and at least 1 member is an accredited BEAM Affiliate, with such members employed with the DC building management team for at least 6 months prior to the time of first assessment submission.*

(b) Professionally Qualified Building Manager

1 credit point for the DC building-in-charge being an accredited BEAM Professional with EDC credential and with at least 1 professional corporate membership qualification (e.g. HKIH, HKIA, HKIE, HKIS (BS/PFM), RICS (BS/FM), IFMA, HKIFM, BSOMES, or equivalent).

Assessment

(a) BEAM Accredited Personnel

1. The Applicant shall provide evidence to demonstrate that at least 2 members from the on-site team are an accredited BEAM Professional (and Affiliates, if any) with EDC credential, with such member employed with the DC building management team for at least 6 months prior to the time of first assessment submission.

2. He/ she shall be accredited as BEAM Professional with EDC credential/ an accredited BEAM Affiliate at the time of submission.

3. He/ she shall not be in the BEAM Professional/ BEAM Affiliate suspension list throughout the entire BEAM Plus certification period.

(b) Professionally Qualified Building Manager

1. The Applicant shall provide evidence that Building Manager is a certified BEAM Professional with EDC credential and with at least 1 professional corporate membership qualification (e.g. HKIH, HKIA, HKIE, HKIS (BS/PFM), RICS (BS/FM), IFMA, HKIFM, BSOMES, or equivalent), with

such person having to be employed as the Building manager for at least 6 months prior to the time of first assessment submission.

2. The Building Manager shall be accredited as BEAM Professional with EDC credential/ BEAM Affiliate at the time of submission.

3. The Building Manager shall not be in the BEAM Professional/ BEAM Affiliate suspension list throughout the entire BEAM Plus certification period.

4. The Building Manager shall have obtained the BEAM Professional with EDC credential and professional corporate membership qualification at least 12 months prior to the time of first assessment submission.

Submittals

(a) BEAM Accredited Personnel

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-01a_00	BEAM Plus EDC submission template for IDCM-01-01a	✓	✓
IDCM-01-01a_01	The organisation chart showing the name of the on-site personnel stationed at the DC	✓	✓
IDCM-01-01a_02	Screen capture from HKGBC practitioner directory to show that the personnel stationed at the DC in the building portfolio is either a BEAM Professional with EDC credential or BEAM Affiliate on active qualification status	✓	✓
IDCM-01-01a_03	Documents such as meeting minutes, memo, internal emails, internal contact list, etc. showing the personnel has been stationed at the particular building/building in the building portfolio for at least 6 months	✓	✓

(b) Professionally Qualified Building Manager

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-01b_00	BEAM Plus EDC submission template for IDCM-01-01b	✓	✓
IDCM-01-01b_01	CV of the Building Manager	✓	✓
IDCM-01-01b_02	Screen capture from HKGBC practitioner directory to show that the Building Manager is either a BEAM Professional with EDC credential on active qualification status	✓	✓
IDCM-01-01b_03	BEAM Pro/ Professional certificate of the Building Manager valid at the time of the first assessment submission	✓	✓
IDCM-01-01b_04	Documents such as meeting minutes, memo, internal emails etc. showing the	✓	✓

	involved personal has been working in the Building Management Company for at least 6 months		
IDCM-01-01b_05	Organisation chart to demonstrate the line of authority of the Building Manager	✓	✓

Remarks **(a) Additional information**

Hong Kong Green Building Council Limited. BEAM Professionals. [ONLINE]. Available at:
https://www.practitioner.hkgbc.org.hk/beam-professional
[Accessed Aug 2021].

Hong Kong Green Building Council Limited. BEAM Affiliate. [ONLINE]. Available at:
https://www.practitioner.hkgbc.org.hk/beam-affiliate
[Accessed Aug 2021].

(b) Related Credit Heads

None

3 Integrated Design and Construction Management

IDCM-01 Integrated Design Process

IDCM-01-02 Complimentary Certification

Extent of Application

All DC

Objective

Encourage to pursue green building practices from planning, building design, construction, interior fitting-out to operation.

Credit point(s) Attainable

3 Bonus

Credit Requirement

(a) BEAM Plus Neighbourhood (ND)

1 Bonus credit point where the project is certified by BEAM Plus Neighbourhood (ND) certification.

(b) BEAM Plus New Buildings/ New Data Centres (NB/ NDC)

1 Bonus credit point where the project is certified by BEAM Plus New Buildings (NB)/ New Data Centres (NDC) certification.

(c) BEAM Plus Interiors (BI)

1 Bonus credit point for preparing the Project for BEAM Plus Interiors (BI) certification.

Assessment

(a) BEAM Plus Neighbourhood (ND)

1. Provide a copy of valid BEAM Plus Neighbourhood Certificate at the time of the first submission of Provisional Assessment of the BEAM Plus New DCs (NDC) certification.

2. Provide evidence demonstrating that site planning is aligned with and is essentially the same as the Master Plan defined in the ND certification.

(b) BEAM Plus EDC (EDC)

1. Provide a copy of valid BEAM Plus New Buildings/ New Data Centres Certificate (s) at the time of the first submission of Provisional/ Final Assessment of the BEAM Plus Existing DC (NDC) certification.

(c) BEAM Plus Interiors (BI)

1. Provide justification of the extent of eligible areas of the project. Definition of eligible areas shall refer to the latest BEAM Plus Interiors Manual.

2. Provide a report demonstrating the prerequisite compliance for at least 50% of total Internal Floor Area (IFA) of all eligible premises in BEAM Plus BI certification.

3. Declaration letter signed by the Project Owner/ Developer in attaining the Bonus credit is accepted as an alternative to the above-mentioned evidence for Provisional Assessment (if applicable).

Submittals

(a) BEAM Plus Neighbourhood (ND)

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-02a_00	BEAM Plus EDC submission template for IDCM-01-02a	✓	✓
IDCM-01-02a_01	BEAM Plus Neighbourhood (ND) certificate	✓	✓

(b) BEAM Plus New Buildings (NB)/ New Data Centres (NDC)

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-02b_00	BEAM Plus EDC submission template for IDCM-01-02b	✓	✓
IDCM-01-02b_01	BEAM Plus New Buildings (NB)/ New Data Centres certificate(s)	✓	✓

(c) BEAM Plus Interiors (BI)

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-02c_00	BEAM Plus EDC submission template for IDCM-01-02c	✓	✓
IDCM-01-02c_01	Justification of the extent of eligible non-domestic premises	✓*	✓
IDCM-01-02c_02	Report to demonstrate prerequisite compliance for BI [or] Declaration letter signed by the Project Owner/ Developer (alternative evidence)	✓ ✓	✓ ✓
* Evidence of credit compliance is required if declaration letter signed by the Project Owner/ Developer is not available.			

p

Remarks

(a) Additional Information

BEAM Society Limited – BEAM Plus Interiors Manual v1.0. [ONLINE]. Available at: http://www.beamsociety.org.hk/files/Manual/BEAM%20Plus%20Interiors%20Manual.pdf [Accessed Aug 2021].

The latest manuals of BEAM Plus Neighbourhood, BEAM Plus Interiors and BEAM Plus Existing Buildings are available on Hong Kong Green Building Council's website. [ONLINE]. Available at: https://www.hkgbc.org.hk/eng/BPRef-manuals_assessment.aspx [Accessed Aug 2021].

(b) Related Credit Heads

None

3 Integrated Design and Construction Management

IDCM-01 Integrated Design Process

IDCM-01-03 Integrated Design Process

Extent of Application All DC

Objective To facilitate the DC building users and maintenance staff in carrying out operation and maintenance of the building and its engineering services.

Credit point(s) Attainable 1

Credit Requirement 1 credit point for providing at least 3 of the listed amenities that improve the operation and maintenance of the building and its engineering services.

Assessment

1. Provide evidence that the design has considered the long-term operation and maintenance needs for the DC and its engineering services by providing at least 3 of the following features:

   i. Aerial working platform;

   ii. Building Management System (BMS);

   iii. Cat ladder;

   iv. Davit arm system;

   v. External pipe duct;

   vi. Fall arrest system;

   vii. Gondola system;

   viii. Guard room;

   ix. Maintenance platform;

   x. Maintenance workshop;

   xi. Movable platform, and

   xii. Others, to be proposed by the Applicant with justification.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-03c_00	BEAM Plus EDC submission template for IDCM-01-03c	✓	✓
IDCM-01-03c_01	Summary report listing each type of amenities and their locations	✓	✓
IDCM-01-03c_02	Dated photo records	✓	✓

Remarks

(a) Additional Information

Buildings Department – PNAP ADV-14, Facilities for External Inspection and Maintenance of Buildings. [ONLINE]. Available at: https://www.bd.gov.hk/doc/en/resources/codes-and-references/practice-notes-and-circular-letters/pnap/ADV/ADV014.pdf [Accessed Aug 2021].

Buildings Department – Appendix A2 of PNAP ADV-33, Essential Information in Plan Submissions. [ONLINE]. Available at: https://www.bd.gov.hk/doc/en/resources/codes-and-references/practice-notes-and-circular-letters/pnap/ADV/ADV033.pdf [Accessed Aug 2021].

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(b) Related Credit Heads

None

3 Integrated Design and Construction Management

IDCM-01 Integrated Design Process

IDCM-01-04 Life Cycle Costing

This credit head is not applicable under BEAM Plus EDC.

3 Integrated Design and Construction Management **IDCM-01 Integrated Design Process**

IDCM-01-05 Commissioning

Extent of Application All DCs

Objective To use the retro-commissioning process to improve building energy performance.

Credit point(s) Attainable 8 Bonus

Credit Requirement

(a) Planning and Investigation

1 Bonus credit point for planning the retro-commissioning (RCx) process and identifying the potential energy saving opportunities (ESOs).

(b) Implementation

1 o 3 Bonus credit points for implementing the selected ESOs for each of the following systems:

i. Air-conditioning system;

ii. Electrical system;

iii. Lift and escalator (if any) system; and

iv. Plumbing and drainage system.

(c) On-going Commissioning

1 to 3 Bonus credit points for executing on-going commissioning for each of the following systems:

i. Air-conditioning system;

ii. Electrical system;

iii. Lift and escalator (if any) system; and

iv. Plumbing and drainage system.

(d) RCx Professional

1 Bonus credit point for engaging an accredited RCx Professional to carry out the RCx process.

Assessment

(a) Planning and Investigation

1. The Applicant shall provide an action plan of the RCx process addressing the following:

1.1. Summary of findings during the information collection and preliminary analysis of operating data, and plan for subsequent activities in RCx for optimising the existing DCs; and

1.2. List of potential ESOs, cost/ benefit analysis on the proposed ESOs, implementation details, measurement and verification methods, and any anticipated disturbance to normal services operation to discuss with the relevant stakeholders.

2. The action plan should at minimum cover the building services systems to be attempted in subsequent part of credit heads.

(b) Implementation

1. 1 Bonus credit point can be achieved by implementing the selected ESOs for each of the listed system.

2. The Applicant shall provide a report describing the outcomes of the implemented ESOs, energy saving verification for the implemented ESOs, records of implementation and testing and commissioning records following changes to systems and equipment (if any).

(c) On-going Commissioning

1. 1 Bonus credit point can be achieved by carrying out on-going commissioning for each of the listed system.

2. The Applicant shall provide on-going commissioning plan and records for at least the past 12 months at the time of first assessment submission, which detailing:

2.1. Person-in-charge;

2.2. Monitoring requirement (i.e. type of measurement, measurement device, monitoring frequency and duration and acceptable values);

2.3. Record of measured parameters; and

2.4. Reference used to evaluate performance

3. The work records required to demonstrate the implementation of ongoing commissioning shall follow the on-going commissioning plan.

(d) RCx Professional

1. The Applicant shall provide evidence showing that the appointed personnel is with valid RCx Professional credential. The submitted plan(s) and report(s) on the RCx process shall be endorsed by the appointed RCx Professional(s).

2. To achieve the credit, the scope of RCx process carried out by the RCx Professional should at least cover planning, investigation and implementation stages.

Submittals

(a) Planning and Investigation

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-05a_00	BEAM Plus EDC submission template for IDCM-01-05a	✓	✓
IDCM-01-05a_01	An action plan of the RCx process	✓	✓

(b) Implementation

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-05b_00	BEAM Plus EDC submission template for IDCM-01-05b	✓	✓
IDCM-01-05b_01	Report summarises the implementation of ESOs	✓	✓
IDCM-01-05b_02	Implementation records (e.g. delivery order, contract document, record photographs)	✓	✓
IDCM-01-05b_03	Testing and commissioning records following changes to systems and equipment (if any)	✓	✓

(c) On-going Commissioning

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-05c_00	BEAM Plus EDC submission template for IDCM-01-05c	✓	✓
IDCM-01-05c_01	On-going commissioning plan	✓	✓
IDCM-01-05c_02	On-going commissioning records for the past 12 months (e.g. reports, measured data, record photographs, etc.)	✓	✓
IDCM-01-05c_03	Undertaking letter endorsed by Building Manager showing the commitment of carrying out on-going commissioning within the next 5 years	✓	✓

(d) RCx Professional

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-01-05d_00	BEAM Plus EDC submission template for IDCM-01-05d	✓	✓
IDCM-01-05d_01	Name of the personnel appointed as the RCx Professional	✓	✓
IDCM-01-05d_02	Screen capture from the HKGBC RCx directory showing the engaged RCx Professional with active qualification status	✓	✓
IDCM-01-05d_03	Plan(s) and report(s) endorsed by the RCx Professional(s)	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

3 Integrated Design and Construction Management

IDCM-02 Green Construction Practices

IDCM-02-01 Sustainability Champions - Construction

This credit head is not applicable under BEAM Plus EDC.

3 Integrated Design and Construction Management

IDCM-02 Green Construction Practices

IDCM-02-02 Measures to Reduce Site Emissions

This credit head is not applicable under BEAM Plus EDC.

3	**Integrated Design and Construction Management**	**IDCM-02**	**Green Construction Practices**
		IDCM-02-03	**Construction and Demolition Waste Recycling**

Extent of Application

All DC

Objective

To promote and encourage construction waste reduction during DCs Renovation

Credit point(s) Attainable

2

Credit Requirement

(a) Renovation Waste Management Plan

1 credit point for developing a Renovation Waste Management Plan for renovation.

(b) Renovation Waste Recycling

1 credit point for demonstrating compliance with the Renovation Waste Management Plan and the application of proactive waste management provisions during construction (demolition and construction); and recycling of at least 15% of construction waste (demolition and construction).

Assessment

(a) Construction Waste Management Plan

1. Develop a construction waste management plan for renovation with the following structure:
    i. Objectives;
    ii. Responsibility;
    iii. Construction waste minimisation programme;
    iv. Construction Waste recycle/ reuse programme;
    v. Policy on addressing safe storage, collection, recycling and diversion of waste associated with renovation activities;
    vi. Procedure for creating an individual plan for each project;
    vii. Communication channel; and
    viii. Reporting to top management.
2. For each renovation project, specific waste diversion goals, target five materials for diversion, approximate the volume of waste anticipated and identify waste diversion strategies to be used should be included in the plan.
3. The plan shall be endorsed by top management of Building Owner/ Building Management Company and reviewed regularly.

(b) Construction Waste Recycling

1. Provide reports and records to demonstration the implementation of the Construction Waste Management Plan under IDCM-02-03 and proactive waste management provision.

2. Provide summary report demonstrating recycling of at least 15% of construction waste (demolition and construction).

3. Furniture and furnishings that pose human health concerns (e.g., mold) as well as components not considered base building elements; mechanical, electrical, and plumbing components; and specialty items, such as elevators should be excluded.

Submittals

(a) Construction Waste Management Plan

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-02-03a_00	BEAM Plus EDC submission template for IDCM-02-03a	✓	✓
IDCM-02-03a_01	Endorsed Construction Waste Management Plan	✓	✓

(b) Construction Waste Recycling

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-02-03b_00	BEAM Plus EDC submission template for IDCM-02-03b	✓	✓
IDCM-02-03b_01	Documents substantiating the compliance (e.g. records, record photographs etc.)	✓	✓
IDCM-02-03b_02	Waste flow table for each renovation project	✓	✓
IDCM-02-03b_03	Summary calculation of the percentage of construction waste recycled	✓	✓
IDCM-02-03b_04	All waste and recycling record for each renovation project	✓	✓
IDCM-02-03b_05	Collection organisation/ recycler information	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

3 Integrated Design and Construction Management **IDCM-02 IAQ Management for Renovation**

IDCM-02-04 Construction IAQ Management

Extent of Application All DC

Objective To reduce the potential for having indoor air quality problems caused by renovation, fit-out and decoration and where applicable demolition, with the consideration of the benefit of workers and adjacent neighbours.

Credit point(s) Attainable 2

Credit Requirement

(a) Construction Indoor Air Quality (IAQ) Management Plan

1 credit point for providing a Construction Indoor Air Quality (IAQ) Management Plan.

(b) Implementation of Construction Indoor Air Quality (IAQ) Management Plan

1 credit point for providing records that the Construction IAQ Management Plan has been implemented by the DC Owner/ DC Management Company/ tenants during renovation.

Assessment

(a) Construction Indoor Air Quality (IAQ) Management Plan

1. The Applicant shall provide a Construction IAQ Management Plan including but not limited to the following items:

1.1. Procedures adopted in enhancing the IAQ during renovation, fit-out or decoration and occupancy stage;

1.2. Measures to avoid contamination of adjacent normally occupied areas and common areas;

1.3. Contaminant source controls;

1.4. Provision of adequate outside air during installation of materials and finishes;

1.5. Measures to protect the air ducts, on-site storage or protection of installed absorptive materials;

1.6. Measures to protect the IT equipment;

1.7. Cleaning procedures to be employed;

1.8. Procedures for building flush-out; and

1.9. Replacement of filtration media used on permanent MVAC equipment at completion of work.

(b) Implementation of Construction IAQ Management Plan

1. The Applicant shall also provide site records, including checklist and on-site photo records, to demonstrate the Construction IAQ Management Plan is properly implemented.

Submittals

(a) Construction Indoor Air Quality (IAQ) Management Plan

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-02-04a_00	BEAM Plus EDC submission template for IDCM-02-04a	✓	✓
IDCM-02-04a_01	Construction IAQ Management Plan	✓	✓

(b) Implementation of Construction IAQ Management Plan

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-02-04a_00	BEAM Plus EDC submission template for IDCM-02-04a	✓	✓
IDCM-02-04a_01	Records showing the Construction IAQ Management Plan is properly implemented during renovation, fit-out and decoration	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

3 Integrated Design and Construction Management

IDCM-02 Green Construction Practices

IDCM-02-05 Considerate Construction

This credit head is not applicable under BEAM Plus EDC.

3 Integrated Design and Construction Management

IDCM-02 Green Construction Practices

IDCM-02-06 Building Management Manuals

Extent of Application All DCs

Objective Encourage the provision of a fully documented operations and maintenance manual to enable DC operators to implement the design intent and a fully documented energy management manual containing instructions that enables systems to operate at a high level of energy efficiency.

Credit point(s) Attainable 1

Credit Requirement 1 credit point for providing a fully documented Operations and Maintenance Manual and Energy Management Manual.

Assessment

1. Building Operations and Maintenance Manual (O&M Manual)

1.1. The O&M Manual shall include all of the following:

1.1.1. the design intent;

1.1.2. the basis of design; and

1.1.3. full sequences of operation for all equipment and systems, including HVAC&R systems and associated controls, light and daylighting controls, hot water systems and renewable energy systems; all of which must meet the legal requirements and industry wide standards.

1.2. The description of the design intent shall include all of the following:

1.2.1. space temperature and humidity criteria;

1.2.2. levels operator and/ or occupant control over HVAC systems;

1.2.3. ventilation requirements and related indoor air quality criteria;

1.2.4. performance criteria related to energy efficiency;

1.2.5. environmental responsiveness of the facility; and

1.2.6. commissioning criteria.

1.3. The basis of design shall include all of the following:

1.3.1. details of occupancy;

1.3.2. space activity and any process requirements;

1.3.3. applicable regulations, codes, and standards;

1.3.4. design assumptions;

1.3.5. performance standards and benchmarks; and

1.3.6. control system appropriate for the skill of the operations and maintenance staff.

1.4. The O&M Manual must include for each piece of equipment and each system:

1.4.1. the name and contact information of the manufacturer or vendor and installing contractor;

1.4.2. submittal data; and

1.4.3. operations and maintenance instructions with the models and features for the subject site clearly marked.

1.5. The O&M Manual shall include only data for equipment that is actually installed, and include the following:

1.5.1. instructions for installation, maintenance, replacement, start-up;

1.5.2. special maintenance requirements and sources for replacement parts/ equipment;

1.5.3. parts list and details of any special tooling requirements;

1.5.4. performance data; and

1.5.5. warranty information.

1.6. The O&M Manual shall include an as-built documentation package for controls covering all of the following:

1.6.1. control drawings and schematics;

1.6.2. normal operation;

1.6.3. shutdown;

1.6.4. unoccupied operation;

1.6.5. seasonal changeover;

1.6.6. manual operation;

1.6.7. controls set-up and programming;

1.6.8. troubleshooting;

1.6.9. alarms; and

1.6.10. final sequences of operation

2. Energy Management Manual (EMM)

2.1. The EMM for all energy-related systems shall include the following:

2.1.1. Descriptions of the final design intent and basis of design, including brief descriptions of each system;

2.1.2. Final sequences of operations for all equipment;

2.1.3. Procedures for seasonal start-up and shutdown, manual and restart operation;

2.1.4. As-built control drawings;

2.1.5. For all energy-saving features and strategies, rationale description, operating instructions, and caveats about their function and maintenance relative to energy use;

2.1.6. Recommendations and brief method for appropriate accounting of energy use of the whole DC building;

2.1.7. Specifications of re-calibration frequency of sensors and actuators by type and use;

2.1.8. Recommendations for continuous commissioning or recommended frequency for re-commissioning by equipment type, with reference to tests conducted during initial commissioning;

2.1.9. Recommendations regarding seasonal operational issues affecting energy use;

2.1.10. List of all user-adjustable set points and reset schedules, with a discussion of the purpose of each and the range of reasonable adjustments with energy implications;

2.1.11. Schedules of frequency of reviewing the various set points and reset schedules to ensure that they are still near optimum;

2.1.12. List of time-of-day schedules and a frequency of reviewing them for relevancy and efficiency;

2.1.13. Guidelines for establishing and tracking benchmarks for DC building energy use and primary plant equipment efficiencies;

2.1.14. Guidelines for ensuring that future renovations and equipment upgrades will not result in decreased energy efficiency and will maintain the design intent;

2.1.15. List of diagnostic tools, with a description of their use, that will assist facility staff of the DC in operating equipment more efficiently;

2.1.16. A copy of the commissioning report; and

2.1.17. Index of all commissioning documents with notation of their location

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-02-06_00	BEAM Plus EDC submission template for IDCM-02-06	✓	✓
IDCM-02-06_01	Operations and maintenance manual adequately cover the major energy consuming building services systems and equipment where the manual includes the details given in the assessment criteria	✓	✓
IDCM-02-06_02	A dedicated Energy Management Manual meeting the requirements as stipulated in the assessment criteria	✓	✓

Remarks

(a) Additional Information

American Society of Heating, Air-conditioning, and Refrigerating Engineers (ASHRAE), Preparation of Operating and Maintenance Documentation for Building Systems, ASHRAE Guideline 4. Atlanta. [ONLINE]. Available at: https://www.ashrae.org/
[Accessed Aug 2021].

J H Armstrong, Building Services Research and Information Association (BSRIA), Operating and Maintenance Manuals for Building Services Installations, Application Guide 1/87, Dec. 1990. [ONLINE]. Available at: https://www.bsria.co.uk/
[Accessed Aug 2021].

(b) Related Credit Heads

None

3 Integrated Design and Construction Management **IDCM-02 Green Construction Practices**

IDCM-02-07 Operator Training plus Chemical Storage and Mixing Room

Extent of Application All DC

Objective Encourage the provision of training for operations and maintenance staff to the minimum specified and demonstrate adequate maintenance facilities are provided for chemical storage and mixing.

Credit point(s) Attainable 1

Credit Requirement 1 credit point for providing training for operations and maintenance staff to the minimum specified; and demonstrating that adequate maintenance facilities are provided for chemical storage and mixing.

Assessment

1. Operator Training

1.1. The training program shall cover as a minimum the items listed below.

1.1.1. General purpose of each building system including basic theory of operation, capabilities and limitations, and modes of control and sequences of operation;

1.1.2. Review of control drawings and schematics;

1.1.3. Procedures for start-up, shutdown, seasonal changeover, normal operation, unoccupied operation and manual operation;

1.1.4. Controls set-up and programming;

1.1.5. Troubleshooting;

1.1.6. Alarms;

1.1.7. Interactions with other systems;

1.1.8. Operational monitoring and record keeping requirements, and the use of data for analysing system performance;

1.1.9. Adjustments and optimising methods for energy conservation;

1.1.10. Any relevant health and safety issues;

1.1.11. Inspection, service, and maintenance requirements for each system, including any need for specialised services;

1.1.12. Sources for replacement parts/ equipment; and

1.1.13. Any tenant interaction issues.

1.2. The demonstration portion of the training program shall include the following.

1.2.1. Typical operation examples of each system;

1.2.2. Start-up and shutdown procedures;

1.2.3. Operation under all specified modes of control and sequences of operation;

1.2.4. Procedures under emergency or abnormal conditions; and

1.2.5. Procedures for effective operational monitoring.

1.3. Verify that the training of the DC's operations and maintenance staff was undertaken for all commissioned systems and major equipment, using the operations and maintenance manual, and the energy management manual as the basis for the training.

1.4. A permanent room for training is not necessary. Evidence of carrying out operator training (e.g., record of attendance) is required.

2. Chemical Storage Room

2.1. A centralised chemical storage and mixing room for each individual building on the site (i.e., janitor and central storage area) should be provided where DCs include provision of housekeeping and chemical products that create odour during their mixing processes (non-domestic spaces which will be managed and maintained for multiple occupant's usage). Chemical products include HVAC and cleaning relates (e.g. refrigerants, cleansing chemicals) for all DC's future operation and maintenance items and equipment:

2.2. No size requirement for the chemical storage room.

2.3. Submit details in the form of drawings and a report with ventilation calculation to demonstrate the compliance of the following functional requirements of chemical storage and/ or mixing provision where applicable:

2.3.1. A drainage point and a water supply point (where chemical mixing is required);

2.3.2. An exhaust route for ventilation system to vent out (e.g. separate outside venting or exhaust route to centralised exhaust riser with non-return damper at the branched duct for the designated room) and maintain negative pressure with respect to adjacent spaces when the doors to the room are closed (where chemical mixing is required);

2.3.3. A separate area with self-closing and lockable door (where chemical storage is required); and

2.3.4. Full height-partitions (where chemical mixing is required).

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-02-07_00	BEAM Plus EDC submission template for IDCM-02-07	✓	✓
IDCM-02-07_01	Copies of Training program (e.g. PowerPoint presentation, training manual, etc.) which cover the items listed in the assessment criteria.	✓	✓
IDCM-02-07_02	Evidence of operator training (e.g. sample record of attendance) verifying that training of the DC's operations and maintenance staff was undertaken for all commissioned systems and major equipment, using the operations and maintenance manual, and the energy management manual as the basis for the training.	✓	✓
IDCM-02-07_03	Drawing(s) to show the required drainage point and water supply points are provided	✓	✓
IDCM-02-07_04	Drawing(s) and calculation demonstrating that chemical storage room is equipped with the required ventilation provisions	✓	✓
IDCM-02-07_05	Drawing(s) to show the chemical storage room with self-enclosing and lockage door and/ or full-height partitions	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

3 Integrated Design and Construction Management

IDCM-03 Smart Design and Technologies

IDCM-03-01 Digital Facility Management Interface

Extent of Application All DC

Objective Encourage provision of digital interfaces to enable facility management teams to review the building operation performance.

Credit point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for providing a digital interface in addition to the metering provision for DC facility management team to review the building operation performance.

Assessment

1. To demonstrate the provision of a digital interface for DC facility management team to review data collected by the electricity metering system installed in the building. The assessment focuses on the interface provision for providing vision regarding operation characteristics. This is for the implementation of first class (Cat I) energy management opportunities (EMOs), with reference to the Code of Practice for Building Energy Audit 2018 [1]. Metering system design and hardware quality is not assessed in this credit head.

2. The interface should be a provisional media, providing the information below for the future facility management team to review the building operation. The format and media used for the interface is not restricted provided the credit objectives are achieved by meeting the requirements below:

    2.1. Providing charts and summaries for **hourly** data collected. **Minimum** data required should refer to below table.

System (if applicable)	Data point for Performance Auditing
Outdoor Condition	• Air Temperature (°C) • Humidity (RH) • Daylight (Lux)
Building	• PUE, Level 2 • Total Energy Use Intensity (kWh/m^2) [Daily, Monthly & Annual] • Total HVAC Energy Use Intensity (kWh/m^2) [Daily, Monthly & Annual] • Total Lighting Energy Use Intensity (kWh/m^2) [Daily, Monthly & Annual]

System (if applicable)		Data point for Performance Auditing
HVAC System	Each Equipment in HVAC (Water Side) - Chillers - Heat pumps - Pumps - Heat Rejection	• Electricity (kW and kWh) • Operation Hour • Supply & Return Water temperature (°C) • Water Flow rate (m^3/s)
	Each Equipment in HVAC (Water Side) - Absorption Chiller - Boiler	• Fuel (kW and kWh) • Operation Hour • Supply & Return Water temperature (°C) • Water Flow rate (m^3/s)
	Each Equipment in HVAC (Air Side) - Primary Air/ Air Handling Unit Fans - Return Air Fans - Free Cooling Fans	• Electricity (kW and kWh) • Operation Hour • Each service zone's temperature (°C) • Supply & Return Air temperature (°C) • Flow rate (m^3/s)
	VRV and Unitary System	• Electricity (kW and kWh)
	Ventilation System - Carpark Ventilation - Toilet Ventilation (≥ 2.5kW each)	• Electricity (kW and kWh) • Operation Hour • CO / NO_x concentration level (if applicable)
Lift and Escalators System	Each Lift and Escalators	• Electricity (kW and kWh)

2.2. Keeping inventories and records of the identified systems, including manuals, technical brochures indicating their configurations and characteristics.

2.3. Enabling a trend of total building electricity use reporting for the last 12 months.

2.4. Enabling a trend of total electricity costs reporting for the last 12 months.

2.5. As-built drawing and system schematic that shows the layouts of energy consuming equipment and systems, and drawings showing the layout of the building.

2.6. Providing Operation and Maintenance programmes that include the timing of major alterations, additions or replacements for the building.

2.7. Provide users a platform for sustainable living showcase demonstration, experience or sharing that are relevant to the enabling design measures and provisions in the project. e.g. websites, regular publications available to the public, newspapers or other means.

3. Achievement of EU-01-04 is not required as the basic requirement in assessing this credit head.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-03-01_00	BEAM Plus EDC submission template for IDCM-03-01	✓	✓
IDCM-03-01_02	Schematics of interface demonstrating compliance with the requirements	✓	✓
IDCM-03-01_03	Evidence (e.g. Screenshots of the system) showing that the interface is capable of providing the information as prescribed in the assessment requirement items (1) to (2)	✓	✓

Remarks

(a) Additional information

[1] Electrical and Mechanical Services Department – Code of Practice for Building Energy Audit 2018. [ONLINE]. Available at: https://www.emsd.gov.hk/beeo/en/pee/EAC_2018.pdf [Accessed Aug 2021].

(b) Related Credit Heads

EU-01-04 Metering and Monitoring

This credit head may act as a platform gathering and processing the data collected in EU-01-04 Metering and Monitoring.

3 Integrated Design and Construction Management **IDCM-03 Smart Design and Technologies**

IDCM-03-02 Occupant Engagement Platform

Extent of Application All DC

Objective Encourage the provision of digital platforms to connect building occupants and the building status to drive behaviour change.

Credit point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for providing a digital platform to engage building occupants.

Assessment

1. To demonstrate the provision of a digital platform for future occupants to understand the building status. The platform shall contain information to be reviewed by the respective occupant only. The digital platform should contain data referenced to the EU-01-04 part (a) requirement and provide the following information:

   1.1. Description of green measures implemented in the building;

   1.2. Energy consumption in the occupants' respective leased spaces;

   1.3. Recommendations to conserve energy use in the building; and

   1.4. Healthy lifestyle tips.

2. The digital platform should be in a form of one of the following:

   2.1. Digital displays in at least one common area(s) accessible by all occupants;

   2.2. Mobile applications accessible by all occupants; or

   2.3. Web-based applications accessible by all occupants.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-03-02_00	BEAM Plus EDC submission template for IDCM-03-02	✓	✓
IDCM-03-02_01	Operation manual or other evidence (e.g. screenshot, user interface) showing that the digital platform can provide the information as prescribed in the credit requirement	✓	✓

Remarks

(a) Additional information

None

(b) Related Credit Heads

EU-01-04 Metering and Monitoring

This credit head may act as a platform to present the data collected in EU-01-04 Metering and Monitoring in a simple way for occupants to understand the building status.

3 Integrated Design and Construction Management **IDCM-03 Smart Design and Technologies**

IDCM-03-03 Document Management System

Extent of Application All DC

Objective Encourage tidy and digital documentation throughout the design and construction process for the ease of handing over to facility management teams.

Credit point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for operating an electronic O&M platform by the DC Owner/ DC Management Company.

Assessment

1. The document management system should perform the following functions:
    - 1.1. Storage of documents;
    - 1.2. Spare storage for future documents;
    - 1.3. Allow update of existing documents;
    - 1.4. Accessible online;
    - 1.5. Support multiple users access and different level of access rights; and
    - 1.6. Security protection by passwords.
2. The document management system should store the following documents:
    - 2.1. Approved drawings by all government departments;
    - 2.2. All documents submitted to government bodies;
    - 2.3. As-built drawings;
    - 2.4. Equipment schedules of the MVAC, plumbing & drainage, electrical and lift & escalator system (if any);
    - 2.5. O&M manuals of the aforesaid systems;
    - 2.6. Energy management manual;
    - 2.7. Waste management manual;
    - 2.8. Water management manual;
    - 2.9. Warranty of building equipment;
    - 2.10. Tenant fitting out guide;
    - 2.11. Tenancy green guide; and
    - 2.12. Tenant feedback procedures notes and records.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-03-03_00	BEAM Plus EDC submission template for IDCM-03-03	✓	✓
IDCM-03-03_01	Description of the document management platform	✓	✓
IDCM-03-03_02	Screenshots showing the required documentations are uploaded to the document management platform	✓	✓

Remarks

(a) Additional information

Hong Kong Green Building Council – Hong Kong Green Office Guide. [ONLINE]. Available at: https://www.hkgbc.org.hk/eng/engagement/guidebooks/green-office-guide/index.jsp
[Accessed Aug 2021].

Hong Kong Green Building Council – Green Tenancy Driver For Office Buildings. [ONLINE]. Available at: https://www.hkgbc.org.hk/eng/engagement/guidebooks/green-tenancy-driver/index.jsp
[Accessed Aug 2021].

The Hong Kong Institute of Surveyors - Green Property Management Practices. [ONLINE]. Available at: https://www.hkis.org.hk/ufiles/gpmp2015.pdf
[Accessed Aug 2021].

(b) Related Credit Heads

EU-01-04 Metering and Monitoring

This credit head may act as a platform to present the data collected in EU-01-04 Metering and Monitoring in a simple way for occupants to understand the building status.

3 Integrated Design and Construction Management

IDCM-03 Smart Design and Technologies

IDCM-03-04 BIM Integration

Extent of Application All DC

Objective Encourage tidy and digital documentation for facility management teams.

Credit point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for BIM application for Facility Management Use.

Assessment Demonstrate the application of BIM model for Facility Management Use and the BIM model has been updated to the as-built condition including fixtures, finishes and equipment data.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-03-04_00	BEAM Plus EDC submission template for IDCM-03-04	✓	✓
IDCM-03-04b_01	Descriptions of the BIM software	✓	✓
IDCM-03-04b_02	Screenshot of the BIM model demonstrating that the model has been updated to the as-built condition including fixtures, finishes and equipment data	✓	✓

Remarks

(a) Additional information

Hong Kong Construction Industry Council, CIC BIM Standards. [ONLINE]. Available at: https://www.bim.cic.hk/en/resources/publications?cate=3&keyword= [Accessed Aug 2021].

(b) Related Credit Heads

IDCM-01-03 Integrated Design Process

The use of BIM is a valuable add-on to IDCM-01-03 Integrated Design Process as it facilitates integrative design by strengthening the coordination within the project team.

3 Integrated Design and Construction Management **IDCM-04 Design for Engagement and Education on Green Buildings**

IDCM-04-01 Design for Engagement and Education on Green Buildings

Extent of Application All DC

Objective Encourage public education that focuses on strategies and solutions applied to the green buildings.

Credit point(s) Attainable 2 Bonus

Credit Requirement 1 to 2 Bonus credit points for providing any two (2) or four (4) education elements to advocate the behavioural change of DC building users.

i. Provide users with manuals for all green building design measures and provisions.

ii. Provide educational signage system that is integrated with the major communal areas of the project to educate users and visitors about the benefits of the green building design measures and provisions.

iii. Provide users a platform for sustainable living showcase demonstration, experience or sharing that are relevant to the enabling design measures and provisions in the project. e.g. websites, regular publications available to the public, newspapers or other means.

iv. Organise educational seminar/ promotion campaign;

v. Arrange workshop for DC building users to read through and review the building user guide/ manuals;

vi. Promote or participate in Hong Kong Green Building Week organised by Constriction Industry Council (CIC) and the Hong Kong Green Building Council Limited (HKGBC); and

vii. Additional or alternative education element(s) proposed by the Applicant with substantiation demonstrating strategies compatible with the listed strategies for achieving the credit objective.

Assessment Present evidence of the education elements provided to the users and/ or visitors within the past 12 months prior to the time of first assessment submission.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IDCM-04-01_00	BEAM Plus EDC submission template for IDCM-04-01	✓	✓
IDCM-04-01_01	User manual	✓	✓
IDCM-04-01_02a	Educational signage plan	✓	✓
IDCM-04-01_02b	Record photos of educational signage	✓	✓

IDCM-04-01_03a	Supporting document of education platform(s) provided, e.g. pdf of the website or pdf of the electronic newsletter, etc.	✓	✓
IDCM-04-01_04a	Promotional materials such posters, notice of the programme together with indication describing the name and date of the event	✓	✓
IDCM-04-01_04b	Record photographs	✓	✓
IDCM-04-01_05a	Other supporting document(s) for the additional or alternative education element(s) proposed by applicant	✓	✓
IDCM-04-01_05b	Record photos of additional or alternative education element(s) proposed by applicant	✓	✓

Remarks

(a) Additional information

None

(b) Related Credit Heads

None

4 Sustainable Site (SS)

The assessment criteria in this category focus on the location of the DC, emissions from the site, microclimate enhancement to the surroundings and amenities provisions. Site location is important with regard to adequacy of local amenities and public transport provisions, reduction of travel needs and reliance on private vehicles. There is often an opportunity to enhance the quality of buildings through more thoughtful 'greening' and other features. The impacts on neighbouring developments and various discharges and emissions from the site can be significant throughout a building's lifetime.

4	**Sustainable Site**	**SS-00-P1**	**Prerequisite**

SS-00-P1 Minimum Landscaping Requirements

This Prerequisite is not applicable under BEAM Plus EDC.

3 Sustainable Site **SS-01 Neighbourhood Integration**

SS-01-01 Pedestrian-oriented and Low Carbon Transport

Extent of All DC

Objective Encourage the use of pedestrian-oriented, low carbon and/ or public transport, with an aim to create a safer, more sustainable and appealing environment that promotes human interaction, a sense of place as well as integration with the surrounding pedestrian transport network.

Credit Point(s) Attainable 2 + 3 Bonus

Credit Requirement

(a) Accessibility to Public Transport

1 credit point for achieving Accessibility Index of 15 or more for all buildings within the DC development.

(b) Pedestrian-oriented Access

1 credit point for achieving 50% or more of the pedestrian-oriented transport planning measures.

1 additional Bonus credit point for 100% achievement.

(c) Cycling Facilities and Network Integration

1 Bonus credit point for providing cycling facilities within the Site and integrating with the public cycling network if a public cycling network exists or has been planned nearby.

(d) Charging Facilities for Electric Vehicle (EV)

1 Bonus credit point for providing EV medium chargers for at least 50% of all parking spaces and EV charging-enabling for all parking spaces (including visitor car parks).

Assessment

(a) Accessibility to Public Transport

1. Indicate the distances shown alongside unhampered walking routes within a walking distance of 1,000m from the site main entrance(s) to each public transport [1] stop or the main entrance of each station in vicinity on an A3-sized scaled drawing.

2. Provide evidence of service frequencies of the public transport.

3. Calculate the Accessibility Index (AI) [2] for all buildings of a development using the prescribed form:

   3.1. Use service frequency data at peak periods for the calculation of waiting time; and

   3.2. Adopt a walking speed of 80m per minute for the calculation of walk time.

   3.3. For a walking route using mechanical means to assist pedestrian movement, provide evidence to demonstrate:

3.3.1. The mechanical means shall be in operation either at least between 7am to 7pm every day or a period that meets the specific needs of building users (occupancy pattern of the project to be justified by the Applicant);

3.3.2. Mapping of the start and end points of the mechanical means shall be shown on a scaled drawing, and

3.3.3. Calculation of the combined horizontal commuting time (walk times) plus horizontal commuting time of the mechanical means to the public transport services, wait time for vertical transportation to be excluded, with substantiation by supplier's information on the commuting speed of the mechanical installation. The combined horizontal commuting time to the public transport services shall not be more than 13 minutes.

4. Provide evidence issued by a government agency or a quasi-government body for the targeted operation date of any future public transport services/ facilities. Future services/ facilities provisions not operable at the time of building completion will be accepted if they will be in operation no later than one year after the occupation of the proposed development.

5. For a site served by dedicated shuttle service vehicles for the development and to be considered under the AI method, provide the following:

5.1. Notification of services provisions by the service provider to building users confirming that:

5.1.1. Routes and stops of the shuttle services providing connection links to the public transport;

5.1.2. Capacity of the shuttle service vehicles;

5.1.3. Locations of the shuttle service drop-off/ pick-up points; and

5.1.4. Operating frequency of the services.

5.2. Justification of the adequacy of the service if the capacity of the shuttle service vehicles is below 16 passengers.

5.3. An undertaking letter by the developer/ property owner for the provision of the shuttle service for a minimum of 5 years. A minimum of 1 year rolling contract in place with the service provider submitted.

(b) Pedestrian-oriented Access

1. Demonstrate compliance for the applicable pedestrian-oriented transport planning measures using the following score table.

2. Complete the prescribed form to indicate whether the following sub-items are achieved or not.

3. Provide justifications for each of the achieved sub-item and descriptions with illustrations, drawings and photos of measures adopted.

4. Provide justifications for each of the non-applicable sub-item.

Safe Environment		**Score**
a	Segregation between main pedestrian pathways and vehicular traffic for private cars/ taxis within the Site if there is no speed limit or the targeted speed is higher than 20 km/h; **OR**	1
	Vehicular traffic calming measures adopted and speed limit signs provided for a speed of no more than 20 km/h for over 50% of roads within the Site; **OR**	1
	Vehicular traffic calming measures adopted and speed limit signs provided for a speed of no more than 20 km/h for 100% of roads within the Site.	2
b	Whole length of main pedestrian access pathways to be overlooked from any normally occupied spaces of buildings within or outside the site.	1
c	Lighting of the illuminance of all pedestrian pathways within the *site* is at least 50 lux.	1
Convenient Environment		**Score**
d	Short and direct pathways as compared to the vehicular access/ pathways.	1
e	Minimised level changes for pathways meeting recommended design requirements of barrier-free access in Chapter 4 of BFA 2008.	1
f	Widths of the street furniture and greening zones along the main pedestrian pathways meeting recommended widths of HKPSG Chapter 8.	1
g	Widths for the main pedestrian pathways meeting recommended widths of HKPSG Chapter 8.	1
h	Clear and easily understood wayfinding signage is sited prominently and in predictable locations within the Site.	1
Pleasant Environment		**Score**
i	Car parking spaces not exceeding the minimum requirement from the government, excluding parking for shuttle service vehicles; **OR**	1
	No car parking is provided other than provisions intended for use by people with a disability and for shuttle service vehicles.	2
j	Planting zone of a minimum width of 1m along the main pedestrian pathways.	1
k	Main pedestrian pathways under covered or shaded by trees.	1
l	Pedestrian pathways designed with high architectural/ landscape quality, with design features intended for human delight/ celebration of culture or public art.	1
Note: Main pedestrian pathways are defined as pathways of width not less than 2m for pedestrian circulation from building main entrance(s) to site entrance(s) or amenities within the site.		

5. The following assessment requirements for car parking facilities shall be fulfilled for scoring the first point under Pleasant Environment:

    5.1. The car parking spaces not exceeding the minimum requirement from the government (lease/ engineering conditions). If no requirement is stipulated in lease/ engineering conditions, the lower bound number of any recommended range in HKPSG Chapter 8 or Transport Department (TD)'s advice shall be followed.

5.2. Simultaneous free flow of vehicles in and out of the car park at the point of access; and

5.3. Provisions to avoid ground contamination from oil run-off by:

5.3.1. For covered parking spaces: Petrol interceptors, and;

5.3.2. For open parking spaces: Petrol interceptors or, if there is no open transport interchange/ vehicular servicing area, pervious paving and construction with a maximum gradient of 1:20, a depth of at least 600mm from top surface of paving to anticipated highest water table, and a permeability rate of at least 0.1mm/sec.

6. Demonstrate that the width of each horizontal screen, covered walkway or trellis over main pedestrian pathways shall be at least 2m.

7. If shading for main pedestrian pathways is provided by trees at-grade, demonstrate by an ecologist or a landscape architect that:

7.1. The shade provided should be a continuous strip of trees planted along the pedestrian route;

7.2. Suitable species of broadleaved trees (not palms conifers) with sufficient anticipated crown diameters are provided to offer shade;

7.3. The tree coverage shall be measured using the estimated crown diameters of 10 years after landscape installation, with evidence of crown measurement of the species taken in similar local growing conditions;

7.4. A shaded pedestrian route of a minimum width of 2m under the trees shall be demonstrated on plan.

(c) Cycling Facilities and Network Integration

1. Demonstrate that there is a public cycling network within 500m walking distance from the perimeter of the site, either existing or planned (to be in operation no later than one year after the occupation for the proposed Project).

2. Demonstrate that the following facilities are provided by means of layout and drawings, supplementary calculations and photos of the installed facilities:

2.1. Cycling tracks and parking facilities complying with the requirements in Section 6 – Cycling of Internal Transport Facilities presented in the Chapter 8 of HKPSG [3] or Transport Department (TD)'s requirements

2.2. The cycling tracks comply with the following conditions:

2.2.1. A continuous cycling network within the Site and the existing/ planned public cycling network if the public cycling network is immediately adjacent to the Site; and

2.2.2. The cycling network within the Site shall have physically designated in-/ off-street cycle tracks or are integrated with roads designed for a target speed of 20 km/h or slower.

2.3. Shower and changing facilities of at least one shower for the first 100 regular building occupants (excluding occasional visitors) and one additional shower facility for every additional 150 regular building occupants.

(d) Charging Facilities for Electric Vehicles (EV)

1. For both Indoor parking and outdoor parking space, basic EV charging-enabling/ facilities requirements are as follows:

   1.1. Provide descriptions with illustrations, schematic drawings and photos of the EV charging-enabling for ALL the carparking spaces with reference to the requirements in Technical Guidelines for Electric Vehicle (EV) Charging-enabling for Car Parks of New Building Developments [4].

2. Demonstrate that 50% of all the carparking spaces are provided with EV charging facilities that meet the following requirements:

   2.1. Installation of medium chargers with output power not less than 7kW;

   2.2. Sockets/ connectors provided are widely applicable for various EV brands/ types of the market;

   2.3. Medium chargers with both American SAE standard and European IEC standard sockets/ connectors shall be provided for all visitor car parks; and

   2.4. For outdoor EV chargers, safety requirement in IEC 60364- 7-722 is required with protection of at least IPX4.

Submittals **(a) Accessibility to Public Transport**

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-01a_00	BEAM Plus EDC submission template for SS-01-01a	✓	✓
SS-01-01a_01	Calculation for Accessibility Index (AI)	✓	✓
SS-01-01a_02	Scaled drawing on an A3-sized sheet indicating the distances alongside unhampered walking routes from site entrance(s) to stops/ stations of public transport services	✓	✓
SS-01-01a_03	Evidence of service frequencies of public transport	✓	✓
SS-01-01a_04	Evidence for the operating hours and required information of mechanical means to assist pedestrian movement, and calculation of the combined horizontal commuting time (If a walking route uses a mechanical means to assist pedestrian movement)	✓	✓

SS-01-01a_05	Evidence issued by a government agency or a quasi-government body for the targeted operation dates of any future public transport services/ facilities	✓	✓
SS-01-01a_06	Evidence showing the actual occupation date of the proposed development	✓	✓
SS-01-01a_07	Scaled building layout plans for drop- off/ pick-up point(s) of shuttle service vehicles	✓	✓
SS-01-01a_08	Notification of shuttle service provisions by the service provider to building users confirming that: Routes and stops that provide connection links to the public transport; Capacity of the shuttle service vehicles; Locations of the shuttle service drop-off/ pick-up points, and Fixed operating frequency of the services	-	✓
SS-01-01a_09	Justification for the adequacy of services (if the capacity of shuttle service vehicles is below 16 passengers)	-	✓
SS-01-01a_10	Undertaking letter by the developer/ property owner that the shuttle services will be provided for a minimum of 5 years.	-	✓
SS-01-01a_11	A minimum of 1 year rolling contract in place with the service provider information.	-	✓
SS-01-01a_12	Evidence of shuttle services in project completion	-	✓

(b) Pedestrian-oriented Access

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-01b_00	BEAM Plus EDC submission template for SS-01-01b	✓	✓
SS-01-01b_01	Drawings and descriptions on the relevant pedestrian-oriented features	✓	✓
SS-01-01b_02	Relevant parts of the lease conditions/ engineering conditions on the car park provisions (If applicable)	✓	✓
SS-01-01b_03	Extracts of HKPSG's recommended minimum car park provisions, or Transport Department advice on minimum car park provisions (If applicable and there is no requirement stipulated for car park provision in the lease or engineering conditions)	✓	✓
SS-01-01b_04	Layout plan showing the locations and types of car parking spaces (If applicable)	✓	✓

SS-01-01b_05	Calculation of minimum car park provision (If applicable)	✓	✓
SS-01-01b_06	Swept path diagram to show simultaneous free flow of vehicles in and out of the car park at the point of access (If applicable)	✓	✓
SS-01-01b_07	Drawings showing the provisions of petrol interceptor in the carpark to avoid ground contamination from oil run-off (If applicable)	✓	✓
SS-01-01b_08	Plans showing a shaded pedestrian route under trees for main pedestrian pathways; and Report on species of trees and anticipated crown diameters 10 years after landscape installation (If applicable and shading for main pedestrian pathways is provided by trees at-grade)	✓	✓
SS-01-01b_09	Evidence of pedestrian-oriented features in project completion	-	✓

(c) Cycling Facilities and Network Integration

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-01c_00	BEAM Plus EDC submission template for SS-01-01c	✓	✓
SS-01-01c_01	Scaled drawing on an A3-sized sheet indicating the nearby public cycling network	✓	✓
SS-01-01c_02	Drawings and calculations of cycling tracks, parking and other facilities within the site meeting stipulated requirements	✓	✓
SS-01-01c_03	Extracts of HKPSG's recommended cycling facilities provisions, or Transport Department advice on cycling facilities provisions	✓	✓
SS-01-01c_04	Evidence of cycling facilities in project completion	-	✓
SS-01-01c_05	Drawings demonstrating the shower and changing facilities (for non-residential projects or non-residential portion of mixed-use projects)	✓	✓

(d) Charging Facilities for EV

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-01d_00	BEAM Plus EDC submission template for SS-01-01d	✓	✓
SS-01-01d_01	Drawings and description of EV charging facility provisions	✓	✓
SS-01-01d_02	Evidence of EV charging facilities in project completion	-	✓

Remarks **(a) Additional Information**

[1] Public transport includes railways, bus (franchised bus/ non-franchised public bus), green minibus (GMB), tram and ferry

[2] Transport for London. Public Transport Accessibility Levels. [ONLINE]. Available at:
https://data.london.gov.uk/dataset/public-transport-accessibility-levels
[Accessed Aug 2021].

[3] Planning Department. Hong Kong Planning Standards and Guidelines. Chapter 8: Internal Transport Facilities. [ONLINE]. Available at:
https://www.pland.gov.hk/pland_en/tech_doc/hkpsg/sum/pdf/sum_ch8_en.pdf
[Accessed Aug 2021].

[4] Technical Guidelines for Electric Vehicle (EV) Charging-enabling for Car Parks of New Building Developments [ONLINE]. Available at:
https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/prob_solutions/files/guidelines_on_enabling_eng.pdf
[Accessed Aug 2021].

Recommended design requirements for barrier free access are published in the Design Manual for Barrier Free Access 2008 of the Buildings Department HKSAR.

Civil Engineering and Development Department, HKSAR publishes projects on the latest and on-going cycle track networks in its website.

Transport Department, Public Transport in Hong Kong. [ONLINE]. Available at: http://www.td.gov.hk/en/transport_in_hong_kong/public_transport/
[Accessed Aug 2021].

(b) Related Credit Heads

SS-01-02 Neighbourhood Amenities

The related credit head promotes a good pedestrian accessibility to amenities within and in the vicinity of the Site. Better integration of the surrounding pedestrian networks and pedestrian pathways within the site will achieve enhanced accessibility for DC building users and/ or the public.

SS-03-01 Urban Heat Island Mitigation

The related credit head encourages a higher overall site coverage of greenery and stipulates minimum site coverage of greenery in the Primary Zone (the 15m vertical zone of a site along the abutting street level). The enhanced greenery in the Primary Zone will contribute to a more pleasant pedestrian environment.

SS-04-01 Stormwater Management

The related credit head considers the hardscape and softscape provided with the site for infiltration and detention in stormwater management that may contribute to the design of a pleasant environment for pedestrians and the pervious construction to avoid ground contamination from oil run-off for open carpark.

3 Site Aspects **SS-01 Neighbourhood Integration**

SS-01-02 Neighbourhood Amenities

Extent of Application All DC

Objective Encourage building development that is integrated within, and an asset to, the immediate neighbourhood.

Credit Point(s) Attainable 1

Credit Requirement 1 credit point where adequate amenities for building users are located within the site or 1000m walking distance/ an equivalent horizontal commuting time from the site entrance(s).

Assessment

1. Provide a summary based on a survey of the immediate neighbourhood and the development itself to demonstrate that at least 5 amenities for building users are located within the site or 1000m walking distance from the site entrance(s) to the main entrances of the amenities or the common entrance of a collective amenity (a complex comprising 2 or more amenities).

    1.1. Restaurants/ cafes/ food & beverage outlets;

    1.2. Vending machines for snacks and drinks;

    1.3. Banks or Automated Teller Machines (ATM);

    1.4. Medical/ health facilities (including dental clinic);

    1.5. Place for worship;

    1.6. Active recreational facilities or open spaces; and

    1.7. Passive recreational facilities or open spaces.

2. Indicate lines and distances shown alongside of unhampered walking routes from the site entrance(s) to the main entrance of each amenity or each collective amenity in vicinity on an A3-sized scaled drawing.

    2.1. When there are multiple site entrances in a development, the one having the least numbers of amenities complying with the credit requirements shall be demonstrated for compliance; and

    2.2. Count 2 or more amenities of the same type as 2 amenities.
    Example 1: 3 cafes and 2 ATMs shall be counted as 4 amenities.
    Example 2: 3 cafes, 2 ATMs and 3 public toilets shall be counted as 6 amenities

3. For a walking route using a mechanical means to assist pedestrian movement, provide evidence to demonstrate

    3.1. The mechanical means having no restricted operating hour or in operation when the counted amenities are opened;

    3.2. Mapping of the start and end points of the mechanical means to be shown on a scaled drawing, and

3.3. Calculation of combined horizontal commuting time (walk times plus horizontal commuting times on the mechanical means to amenities being no more than 7 minutes (wait time for vertical transportation to be excluded; walking speed of 80m per minute to be adopted for calculation of walk time)), with substantiation by supplier's information on the commuting speed of the mechanical installation.

4. Provide justifications to count amenities that are not listed in this credit for consideration. The justification shall be considered based on the individual merits of the amenities, basic necessity, psychological and/or physical wellbeing of the immediate neighbourhood.

5. Provide evidence for the targeted opening schedules for future amenities provisions not operable at the time of building completion. The amenities can be counted if they will be in operation no later than one year after the occupation of the proposed development

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-02_00	BEAM Plus EDC submission template for SS-01-02	✓	✓
SS-01-02_01	Scaled drawing on an A3-sized sheet indicating the distances alongside unhampered walking routes from the site's entrance(s) to amenities	✓	✓
SS-01-02_02	Evidence for the operating hours and required information of the mechanical means to assist pedestrian movement, and detailed account of combined horizontal commuting time (If a walking route uses a mechanical means to assist pedestrian movement)	✓	✓
SS-01-02_03	Justifications on the needs of building users/public to count amenities that are not listed (If applicable)	✓	✓
SS-01-02_04	Evidence for the targeted opening schedules for future amenities provisions (If applicable)	✓	✓
SS-01-02_05	Evidence of the actual occupation date of the proposed development (If future amenities with known targeted opening schedules are counted)	-	✓
SS-01-02_06	Evidence of the amenities identified in the vicinity within 1000m walking distance	✓	✓

Remarks

(a) Additional Information

Public entertainment means any entertainment to which the general public is admitted with or without payment (ref. to Cap 172 Places of Public Entertainment Ordinance, HKSAR)

Planning Department. Hong Kong Planning Standards and Guidelines. Chapter 3: Community Facilities [ONLINE]. Available at:

https://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/pdf/ch3.pdf [Accessed Aug 2021].

Planning Department. Hong Kong Planning Standards and Guidelines. Chapter 4: Recreation, Open Space and Greening. [ONLINE]. Available at: https://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/pdf/ch4.pdf [Accessed Aug 2021].

(b) Related Credit Heads

SS-01-01 Pedestrian-oriented and Low Carbon Transport

The related credit head promotes good pedestrian accessibility to public transport. Better integration of the surrounding pedestrian networks and pedestrian pathways within the site will achieve enhanced accessibility for building users and/ or the public

3	**Sustainable Site**	**SS-01**	**Neighbourhood Integration**
		SS-01-03	**Building Design for Sustainable Urbanism**

This credit head is not applicable under BEAM Plus EDC.

3	**Sustainable Site**	**SS-01**	**Neighbourhood Integration**
		SS-01-04	**Neighbourhood Daylight Access**

This credit head is not applicable under BEAM Plus EDC.

3 Site Aspects SS-01 Neighbourhood Integration

SS-01-05 Noise Control for Building Equipment

Extent of Application

All DC with building services equipment controlled by the Applicant

Objective

To reduce the noise nuisance to neighbours caused by building services equipment

Credit Point(s) Attainable

2

Credit Requirement

(a) Provision of Acoustic Treatment

1 credit point for providing adequate acoustic treatment to the following building services equipment: chillers, cooling towers, ventilation fans with Sound Power Level (SWL) higher than 80 dB(A).

(b) Demonstration of Compliance with HKPSG Criteria

1 credit point for demonstrating that the level of the intruding noise at the façade of the potential Noise Sensitive Receivers (NSRs) is in compliance with the criteria recommended in the Hong Kong Planning Standards and Guidelines (HKPSG) [1].

Assessment

(a) Provision of Acoustic Treatment

1. Demonstrate the provision of adequate acoustic treatment to chillers, cooling towers, ventilation fans with SWL higher than 80 dB(A). For examples:

   i. Chillers are being enclosed in an acoustic enclosure or plantroom or are installed with discharge/ intake silencer;

   ii. Erection of a barrier or installation of silencer for cooling tower; and

   iii. Installation of silencer at major fan discharge outlets (for exhaust fans) or at air inlets (for intake fans).

Alternatively,

- *in case of no acoustic treatment is required and the Applicant can demonstrate the Acceptable Noise Levels (ANLs) at the nearest NSRs comply with the statutory requirements, this credit can be excluded. If the Applicant can demonstrate the ANLs are at least 1 dB(A) lower than the statutory requirements, the credit is also achieved*.

(b) Demonstration of Compliance with HKPSG Criteria

1. Demonstrate the level of the intruding noise at the façade of the potential NSRs is in compliance with the criteria recommended in HKPSG.

2. Assessment shall be made at the façade of the potential NSRs.

3. When assessed in accordance with the Technical Memorandum [2], the level of the intruding noise at the façade of the NSR shall be at least 5 dB(A) below the appropriate ANL shown in Table 3 of the Technical Memorandum

or, in the case of the background being 5 dB(A) lower than the ANL, shall not be higher than the background, in accordance with paragraph 4.2.13, Chapter 9 of the Hong Kong Planning and Standards Guidelines. The Applicant shall provide evidence in form of detailed analysis, appropriate calculations and/ or measurements supporting that the building complies with the assessment criteria. In cases where a Noise Abatement Notice has been served, evidence of full compliance with the required remedial action shall also be presented.

Submittals

(a) Provision of Acoustic Treatment

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-05a_00	BEAM Plus EDC submission template for SS-01-05a	✓	✓
SS-01-05a_01	Equipment catalogues (with SWLs), operation schedule, drawings showing the provision of acoustic treatment for chillers, cooling towers, ventilation fans with SWL larger than 80 dB(A)	✓	✓
SS-01-05a_02	Record photographs of the acoustic treatment.	✓	✓

(b) Demonstration of Compliance with HKPSG Criteria

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-01-05b_00	BEAM Plus EDC submission template for SS-01-05b	✓	✓
SS-01-05b_01	Summary table listing the nearest NSRs, building equipment sound level, quantities, ANL and noise level at the façade of the nearest NSRs	✓	✓
SS-01-05b_02	Location plan to indicate the positions of the NSRs and building equipment	✓	✓
SS-01-05b_03	Equipment catalogues	✓	✓
SS-01-05b_04	Calculation or measurement	✓	✓

Remarks

(a) Additional Information

[1] Planning Department. Hong Kong Planning and Standards Guidelines, Chapter 9 Environment. [ONLINE]. Available at: https://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/pdf/ch9.pdf [Accessed Aug 2021].

[2] Environmental Protection Department - Technical Memorandum for the Assessment of Noise from Places Other than Domestic Premises, Public Places or Construction Sites. [ONLINE]. Available at: https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/noise/guide_ref/files/tm_nondomestic.pdf [Accessed Aug 2021].

British Standards Institution. Method for rating industrial noise affecting mixed residential and industrial areas. British Standard BS 4142:1997. London, BSI. 1997.

International Standards Organisation. ISO 9613-2. Attenuation of Sound During Propagation Outdoors Part 2. General Method of Calculation 1st ed. 1996.

Environmental Protection Department. Good practices on pumping system noise control. [ONLINE]. Available at: http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/noise/guide_ref/files/Pump_sys_E-06.pdf [Accessed Aug 2021].

Environmental Protection Department. Good practices on ventilation system noise control. [ONLINE]. Available at: http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/noise/guide_ref/files/Vent_sys_E-06.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

4 Sustainable Site **SS-02 Ecologically Responsible Design**

SS-02-01 Light Pollution Control

Extent of Application All DC

Objective To minimise light pollution caused by external lighting.

Credit Point(s) Attainable 2

Credit Requirement 2 credit points if there are no external lightings installed for the DC building.

Alternatively,

- *1 credit point for switching off the DC Owner, DC Management Company's and tenants' (if any) external lightings from 23:00 to 07:00*.

Assessment 2 credit points can be achieved if there are no external lightings, including advertisement boards, façade lightings and video walls, installed on exterior of the building.

***Alternatively*,**

- *1 credit point for switching off the DC Owner, DC Management Company's and tenants' (if any) external lightings from 23:00 to 07:00*.

- *External light management policy endorsed by top management is required. The scope and exemption shall made reference to the Document for Engaging Stakeholders and the Public set up by the Task Force on External Lighting clauses 38 to 43*.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-02-01_00	BEAM Plus EDC submission template for SS-02-01	✓	✓
SS-02-01_01	Record photographs of external area and exterior of the building	✓	✓
SS-02-01_02	Layouts/ building services drawings demonstrating that there are no external lightings installed for the building	✓	✓
SS-02-01_03	Summary table listing the quantities and operation schedule of all external lightings	✓	✓
SS-02-01_04	Location plan to indicate the external lightings	✓	✓
SS-02-01_05	External light management policy endorsed by top management	✓	✓
	Signed agreement between Building Owner/ Building Management Company	✓	✓

	and tenants for switching off the external light (if any)		
SS-02-01_06	Record photographs of Building Owner/ Building Management Company's and tenants' external lighting in both switch-on and switch-off state	✓	✓

Remarks

(a) Additional Information

Task Force on External Lighting. Document for Engaging Stakeholders and the Public. [ONLINE]. Available at: http://www.enb.gov.hk/sites/default/files/pdf/ExternalLightingEng.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

4 Sustainable Site SS-02 Ecologically Responsible Design

SS-02-02 Biodiversity Enhancement

This credit head is not applicable under BEAM Plus EDC.

4 Sustainable Site **SS-03 Bioclimatic Design**

SS-03-01 Urban Heat Island Mitigation

Extent of Application Whole building DC developments

Objective To ensure the microclimate has been adequately considered, and where appropriate, suitable mitigation measures are provided.

Credit Point(s) Attainable 3 BONUS

Credit Requirement

(a) Mitigation Strategy at Primary Zone

1 to 2 Bonus credit points for demonstrating the implementation of any combination of the following strategies for a minimum of 10% or 20% of the external non-roof area (i.e. ground floor and podium with less than 15m in height):

i. Greenery;

ii. Water feature;

iii. Green wall or vertical greening;

iv. Shading device; and/or

v. Paving materials with solar reflectance (SR) of 0.33.

(b) Green Roof

1 Bonus credit point for providing green roof and/ or organic farm for at least 20% of the available main roof area.

Assessment

(a) Mitigation Strategy at Primary Zone

1. Demonstrate the use of any combination of the below listed strategies (in terms of area) of the external non-roof area, including both ground floor and podium with less than 15m in height.

   1.1. Greenery;

   1.2. Water feature;

   1.3. Green wall or vertical greening;

   1.4. Shading device; and/or

   1.5. Paving materials with solar reflectance (SR) of 0.33.

2. All greenery areas shall be measured based on the soil areas as shown on the drawings. Greenery in movable pots shall not be accounted. Reduction factor is not necessary for water feature.

3. Green roof and/ or organic farm shall cover at least 20% of available main roof area. Areas occupied by mechanical equipment shall be excluded from total main roof area.

(b) Green Roof

Demonstrate the provision of green roof and/ or organic farm for at least 20% of the available main roof area. All green roof and/ or organic farm areas shall be measured horizontally based on the soil areas as shown on the plan. Greenery in movable pots shall not be accounted.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-03-01_00	BEAM Plus EDC submission template for SS-03-01	✓	✓
SS-03-01_01	Narrative of the strategies and the combination (if any);	✓	✓
SS-03-01_02	Layouts and calculations	✓	✓
SS-03-01_03	Record photographs of green walls, vertical greenings, green roof/ organic farm or shading devices	✓	✓
SS-03-01_04	Catalogue or laboratory test reports on solar reflectance (SR) of paving materials	✓	✓

Remarks

(a) Additional Information

Agriculture, Fisheries and Conservation Department. Organic Farming. [ONLINE]. Available at: https://www.afcd.gov.hk/english/agriculture/agr_orgfarm/agr_orgfarm.html [Accessed Aug 2021].

Development Bureau. Greening, Landscape and Tree Management Section. [ONLINE]. Available at: http://www.greening.gov.hk/en/home/index.html [Accessed Aug 2021].

USGBC. LEED v4.1 for Building Operations and Maintenance.

(b) Related Credit Heads

None

4	**Sustainable Site**	**SS-03**	**Bioclimatic Design**
		SS-03-02	**Immediate Neighbourhood Wind Environment**

This credit head is not applicable under BEAM Plus EDC.

4	**Sustainable Site**	**SS-03**	**Bioclimatic Design**
		SS-03-03	**Outdoor Thermal Comfort**

This credit head is not applicable under BEAM Plus EDC.

3 Sustainable Site **SS-04 Climate Resilience and Adaptability**

SS-04-01 Stormwater Management

Extent of Application Whole Building DC Developments with a site area of 1,000 m^2 or more

Objective Encourage a high standard of stormwater management to reduce the risk of flooding and promote groundwater recharge.

Credit Point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for demonstrating that adequate stormwater management measures have been provided to cater the total volume of runoff for one hour corresponding to a design rainfall of at least 30mm/event for the site in its post-developed conditions.

Assessment

1. Calculate the stormwater detention storage volume on site required to cater the total volume of runoff for one hour using the following formula:

$$V = 10 \times H \times \sum_{\varphi} \times A / 10{,}000$$

V: Stormwater storage volume on site required (in m^3)

H: Rainfall intensity (30mm per event)

φ: Runoff coefficients of various surfaces/ substrates (please refer to the following table)

A: Areas of various surfaces/ substrates (in m^2)

Surfaces/ substrates	**Runoff coefficients**
Water bodies	1
Flat roof/ road/ hardscape with impervious construction	0.85
Flat roof covered with pebbles	0.65
Green roof (soil depth of at least 300mm)	0.35
Earth-covered (soil depth not more than 500mm) basement	0.35
Pervious paving and construction (maximum slope of porous pavement surface to a gradient of 1:20; the minimum permeability coefficient under 15 ℃ for permeable paving / construction should be 1.0 x 10-2 cm/s)	0.25
At-grade softscape	0.15
Earth-covered (soil depth more than 500mm) basement	0.15

Note:

i. The above information has made reference to the design guides for stormwater management/runoff control GB50014 and DB11/685 of PRC.

ii. Alternative runoff coefficients may be proposed and justified by the Applicant which is subject to approval.

2. Calculate the volume of various designed stormwater management facilities such as detention tanks, sunken plaza/ wet ponds/ reservoirs, bioretention facilities, rainwater storage cisterns/ modules, etc.

3. Demonstrate adequate stormwater management measures to meet the credit requirements have been provided by a stormwater management report with a summary of volume/ area calculations, layout drawings and photographic records.

4. Stormwater detention volume will be discharged either by gravity or pumping.

5. It is required to empty the tank within a day to ensure the detention volume is daily available for potential storm event.

6. Stormwater in detention volume will be discharge after 1 hour of rainstorm.

7. For any detention facility with discharge mechanisms, control system is required for discharging the stormwater in order to maintain the daily designed detention volume.

8. Prepare the operation and maintenance checklist for the facilities as stated in Appendices.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-04-01_00	BEAM Plus EDC submission template for SS-04-01	✓	✓
SS-04-01_01	Report for stormwater management with a summary of volume/ area calculations, layout drawings and typical construction details/sections of infiltration measures	✓	✓
SS-04-01_02	Catalogue and test report of surfaces/ substrates (if alternative runoff coefficients are used)	✓	✓

Remarks

(a) Additional Information

Sponge City Construction Technical Guide by Ministry of Housing and Urban-Rural Development of PRC

Technical Guide for On-site Stormwater Detention Tank Systems. [ONLINE]. Available at: https://www.pub.gov.sg/Documents/detentionTank.pdf [Accessed Aug 2021].

Pervious Pavement. [ONLINE]. Available at: http://www.asphaltpavement.org/index.php [Accessed Aug 2021]. Water Permeable Brick (JCT 945 – 2005).

(b) Related Credit Heads

SS-01-01 Pedestrian-oriented and Low Carbon Transport

The related credit head encourages the shading of main pedestrian paths by trees.

WU-03-01 Water Harvesting and Recycling

The related credit head considers harvesting of rainwater provided within the site. Stormwater collected under SS-04-01 could only be discharged

3 Sustainable Site **SS-04 Climate Resilience and Adaptability**

SS-04-02 Design for Climate Change Adaptation

Extent of Application	Whole Building DC Developments
Objective	Encourage reviewing the impact of the projected climate change scenarios on the development and consider strategies to improve climate resilience.
Credit Point(s) Attainable	2 Bonus
Credit Requirement	1 Bonus credit point for studying the projected variation in temperature and rainfall and water level rise/ storm surge of adjacent water bodies due to climate change and its impact on the development and prepare mitigation proposal to improve the climate resilience of the building. 1 additional Bonus credit point for including quantitative calculation to support the resilience design which is technically eligible and cost effective.

Assessment

1. Refer to the projected annual rainfall and changes in annual temperature under the medium-low scenario (mean value) [1] and water level rise/ storm surge of adjacent water bodies, suggest 3 negative issues caused by the projected variations which will have impacts on the building such as its structure, facade, outdoor area or building services system.

2. Prepare a climate resilience proposal including at least 1 strategy for each of the above-mentioned negative issue. The strategies should be supported by preliminary design description and expected outcome on resolving the respective negative issue. If necessary, assume a building life cycle of 50-years to outline the possible benefits. No simulations are required for the first BONUS credit. Additional BONUS is granted if applicant demonstrated that the design is cost effective.

3. Note that no obligation is required to implement the proposal.

4. Relevant measures that have been implemented in the design in other credits may be included to demonstrate compliance for this credit.

5. Climate Resilience proposal should include a minimum of 10 A4 pages with sections below:

    5.1. Description of project annual climate change;

    5.2. Impact Identification;

    5.3. Proposal of the Climate Resilience Strategies;

    5.4. Effectiveness of the proposed strategies; and

    5.5. Cost effectiveness (for additional BONUS credit point).

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
SS-04-02_00	BEAM Plus EDC submission template for SS-04-02	✓	✓
SS-04-02_01	Climate resilience proposal	✓	✓

Remarks

(a) Additional Information

[1] Hong Kong Observatory - Climate Projections for Hong Kong. [ONLINE]. Available at: https://www.hko.gov.hk/en/climate_change/future_climate.htm [Accessed Aug 2021].

GovHK – Global Environment Climate Change. [ONLINE]. Available at: http://www.gov.hk/en/residents/environment/global/climate.htm [Accessed Aug 2021].

Environment Bureau - Hong Kong Climate Change Report 2015. [ONLINE]. Available at: http://www.enb.gov.hk/sites/default/files/pdf/ClimateChangeEng.pdf [Accessed Aug 2021].

EPD – Climate Change. [ONLINE]. Available at: http://www.epd.gov.hk/epd/english/climate_change/ [Accessed Aug 2021].

Hong Kong Observatory - Climate Projections for Hong Kong. [ONLINE]. Available at: https://www.hko.gov.hk/en/climate_change/future_climate.htm [Accessed Aug 2021].

(b) Related Credit Heads

None

5 Materials and Waste (MW)

The amount and the types of materials used and the waste generated in the operation and maintenance and fitting-out of buildings represents a significant use of natural resources. There are opportunities to reduce environmental impacts through interior design methods and choice of materials and products, in terms of extracted raw materials, emissions, and the embodied energy. Discussion on waste management in Hong Kong is more critical than before. It is important to encourage the stakeholders to recognise the importance of the waste management for existing DCs in Hong Kong.

5 Materials and Waste **MW-00** **Prerequisite**

MW-00-P1 **Minimum Waste Handling Facilities**

Extent of Application All DC

Objective To reduce pressure on landfill sites and help to preserve non-renewable resources by promoting recycling of waste materials.

Credit Point(s) Attainable Prerequisite

Credit Requirement

For Whole Buildings DC Developments:
Providing spaces for collection, sorting, storage and disposal of waste and recovered materials.

For DC Developments located in part of building:
Providing storage facilities at prominent location for the collection of paper, plastic and metal waste.

Assessment

For Whole Buildings DC Developments:

1. **Scenario 1** – If the Project is assessed under BEAM Plus New Buildings (NB) or New Data Centres (DC) in any version, this prerequisite is automatically fulfilled. Certification under BEAM 4/04 or any other versions shall not be deemed as fulfilling the requirement and should follow Scenarios 2 or 3.

   Alternatively,

   - ***Scenario 2*** *– Otherwise, the Project shall comply with the prevailing regulation in respect of refuse collection chamber and/ or material recovery room at the time of building completion. (Note: It is not necessary to comply with the latest version of PNAP APP-35)*.

   - ***Scenario 3*** *– For aged DC buildings which are not required to provide any refuse collection chamber and/ or material recovery room as per Government's requirements, storage facilities shall be provided at prominent locations (i.e. cannot be located in car park or other non-occupied areas) for the collection of paper, plastic and metal waste for recycling. Collection agreement is required*.

For DC Developments located in part of building:

1. The Applicant shall provide at least 1 storage facility with the capacity for paper, plastic and metal materials. The facility shall be placed in prominent location (i.e. cannot be located in a car park or other non-occupied areas), but not necessarily within the project space. The storage facility size, and collection frequency are not regulated.

2. A waste collection firm employed by either the Applicant or property management company shall collect all materials. Where the host building provides such a facility at prominent location, the Applicant is not required to

duplicate the provision if the host building management could provide the required information for Assessment

3. Minimum types of recyclables to be collected should include:

3.1. Metal;

3.2. Plastics;

3.3. Paper/ Cardboard and

3.4. Glass

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-00-P1_00	BEAM Plus EDC submission template for MW-00-P1	✓	✓
For Whole Building DC Developments, please provide the followings:			
For Scenario 1			
MW-00-P1_01	BEAM Plus NB/ NDC certificate or assessment result	✓	✓
MW-00-P1_02	Photographs of the as-built recycling facilities and refuse collection room(s)	✓	✓
For Scenario 2			
MW-00-P1_03	Latest location plan, equipment details and record photographs to illustrate the compliance with the prevailing regulation at the time of building completion	✓	✓
For Scenario 3			
MW-00-P1_04	Latest location plan, equipment details and record photographs to illustrate the compliance with the prevailing regulation at the time of building completion	✓	✓
MW-00-P1_05	Summary table listing the quantities of various waste type and locations of the recycling facilities	✓	✓
MW-00-P1_06	Location plan to indicate the recycling facilities	✓	✓
MW-00-P1_07	Record photographs	✓	✓
MW-00-P1_08	Collection organisation/ recycler information, including: a. Company name and address; b. Collection frequency; and c. Collection agreement, signed by Building Owner/ Building Management Company.	✓	✓

For DC Developments located in part of building, please provide the followings:			
MW-00-P1_09	Information of responsible person	✓	✓
MW-00-P1_10	Drawings showing the locations of the waste handling facilities in host building	✓	✓
MW-00-P1_11	As-fitted drawings	✓	✓
MW-00-P1_12	Record photographs	✓	✓
MW-00-P1_13	Collection organisation/ recycler information, including: a. Company name, address and contact information; b. Collection frequency; and c. Collection agreement signed by the Recycling firm and Applicant. Where the Applicant adopts the host building facility, the host building Collection Agreement (or an equivalent letter by the Property Manages organisation)	✓	✓

Remarks

(a) Additional Information

Buildings Department. Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineer. PNAP APP-35 on requirements for Refuse Storage and Material Recovery Chambers, Material Recovery Chambers.

Environmental Protection Department. Waste Data & Statistics. [ONLINE]. Available at: http://www.wastereduction.gov.hk/en/assistancewizard/waste_red_sat.htm [Accessed Aug 2021].

(b) Related Credit Heads

MW-03-02 Enhanced Waste Handling Facilities

This credit encourages enhanced provisions for recyclables collection, recycling facilities and waste treatment equipment.

5 Materials and Waste **MW-01 Use of Materials**

MW-01-01 Building Re-use

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-01 Use of Materials**

MW-01-02 Modular and Standardised Design

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-01 Use of Materials**

MW-01-03 Prefabrication

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-01 Use of Materials**

MW-01-04 Design for Durability and Resilience

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-02 Selection of Materials**

MW-02-01 Sustainable Forest Products

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-02 Selection of Materials**

MW-02-02 Recycled Materials

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-02 Selection of Materials**

MW-02-03 Ozone Depleting Substances

Extent of Application All the installed equipment using refrigerants, and fire suppression and other materials controlled by the applicant

Objective To reduce the release of harmful ozone-depleting substances into the atmosphere

Credit Point(s) Attainable 3

Credit Requirement

(a) Newly Installed and Existing Equipment using Refrigerants

1 credit point for all the equipment (both newly purchased and existing) using the refrigerants with Global Warming Potential (GWP) ≤ 1,900.

Alternatively,

- *For equipment with refrigerant GWP value > 1,900, credit point can be achieved when the Applicant can demonstrate a phased programme of refrigerant replacement*.

1 credit point for using refrigerants with a combined value less than or equal to the threshold for the combined contributions to ozone depletion and global warming potentials for all new and existing HVAC&R equipment that under the control of Applicant.

(b) Fire Suppression and Other Materials

1 credit point for using the fire suppression and other materials that avoids the use of ozone depleting substances in their manufacture, composition or use.

Assessment

(a) Newly Installed and Existing Equipment using Refrigerants

1. 1 credit point for newly and existing installed equipment using refrigerants with GWP less than 1,900.

   Alternatively,

   - *For* equipment with refrigerant GWP value > 1,900, credit can be achieved if the Applicant can demonstrate that a phased programme of refrigerant replacement is planned with budget reserved for implementation.

2. 1 credit point for the newly and existing installed equipment using refrigerants that do not exceed the maximum threshold for the combined contributions to ozone depletion and global warming potentials. The threshold can be determined using the following formula:

   LCGWP + LCODP x 105 ≤ 13, where:

LCGWP	=	[GWPr x (Lr x Life + Mr) x Rc] / Life
LCODP	=	[ODPr x (Lr x Life + Mr) x Rc] / Life
GWPr	=	Global Warming Potential of Refrigerant (0 to 12,000kg CO_2/kg r)
ODPr	=	Ozone Depletion Potential of Refrigerant (0 to 0.2kg CFC 11/kg r)
Lr	=	Refrigerant Leakage Rate (2.0%)
Mr	=	End-of-life Refrigerant Loss (10%)
Rc	=	Refrigerant Charge (0.065 to 0.65kg of refrigerant per kW of AHRI rated or Eurovent Certified cooling capacity.)
Life	=	Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated.)

(b) Fire Suppression and Other Materials

All portable fire extinguishers shall avoid the use of ozone depleting substances (ODS) in their manufacturing process, composition or use. For permanent system/ equipment (e.g. replacement of fire suppressants, thermal insulations, and other applications), only newly installed materials would be assessed.

Note:
For all sections, the newly installed equipment is defined as the equipment that is installed within the past 12 months.

Submittals

(a) Newly Installed and Existing Equipment using Refrigerants

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-02-03a_00	BEAM Plus EDC submission template for MW-02-03a	✓	✓
MW-02-03a_01	Summary table listing the newly and existing installed equipment, type, model number and refrigerant type [#]	✓	✓
	[or]		
	Phased programme of refrigerant replacement	✓	✓
MW-02-03a_02	Calculation [#]	✓	✓
MW-02-03a_03	Equipment catalogue/ technical sheets [#]	✓	✓
MW-02-03a_04	Record photographs [#]	✓	✓

(b) Fire Suppression and Other Materials

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-02-03b_00	BEAM Plus EDC submission template for MW-02-03b	✓	✓
MW-02-03b_01	Summary table listing the quantity and types of portable fire extinguishers and fixed fire protection system [#]	✓	✓
MW-02-03b_02	Equipment catalogue/ technical sheets [#]	✓	✓
MW-02-03b_03	Phase out plan (for intermediate stage only)	✓	✓

Remarks

(a) Additional Information

Environmental Protection Department. A Concise Guide to the Ozone Layer Protection Ordinance. [ONLINE]. Available at: http://www.epd.gov.hk/epd/english/laws_regulations/comp_guides/files/cgto_olpo_eng.pdf
[Accessed Aug 2021].

Environmental Protection Department. A Concise Guide to the Ozone Layer Protection (Controlled Refrigerants) Regulation. [ONLINE]. Available at: http://www.epd.gov.hk/epd/english/laws_regulations/comp_guides/files/cgt_olp_cr_eng.pdf
[Accessed Aug 2021].

Environmental Protection Department. Ozone Layer Protection. [ONLINE]. Available at: http://www.epd.gov.hk/epd/english/environmentinhk/air/ozone_layer_protection/wn6_info.html
[Accessed Aug 2021].

Environmental Protection Department. Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong. [ONLINE]. Available at: http://www.epd.gov.hk/epd/sites/default/files/epd/english/climate_change/files/Guidelines_English_2010.pdf
[Accessed Aug 2021].

USGBC. LEED v4 for Building Operations and Maintenance.

(b) Related Credit Heads

None

5 Materials and Waste **MW-02 Selection of Materials**

MW-02-04 Regional Materials

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-02 Selection of Materials**

MW-02-05 Use of Green Products

Extent of Application All DC

Objective To encourage purchasing practices which reduce the environmental impact of products used by implementing Green Purchasing Plan, as well as the certified green products that have low environmental impacts.

Credit Point(s) Attainable 3 + 3 Bonus

Credit Requirement

(a) Materials Purchasing Practices

1 credit point for demonstrating at least 50% of purchased on-going consumables are environmentally friendly products for the past 12 months as minimum.

1 credit point for demonstrating at least 50% of purchased durable goods are environmentally friendly products for the past 12 months as minimum.

1 credit point for demonstrating at least 70% of purchased both on-going consumables and durable goods are environmentally friendly products for the past 12 months.

1 Bonus credit point for demonstrating at least 70% of purchased both on-going consumables and durable goods are environmentally friendly products for the past 24 months.

(b) Use of Green Products

Maximum 2 Bonus credit points for purchasing green products certified by Construction Industry Council (CIC) Green Product Certification or other internationally recognised schemes.

Assessment

(a) Materials Purchasing Practices

1. The Applicant shall quantify the procurement in dollar values. The items of environmentally friendly on-going consumables/ durable goods shall be listed in the endorsed Green Purchasing Plan under section MAN-00-P1.

(b) Use of Green Products

1. 1 Bonus credit points of having 5% of the green products in any one of the product categories as specified in CIC Green Product Certification or other internationally recognised schemes.

2. 2 Bonus credit points for having 5% of certified green products for at least 3 product categories (each category should have at least 5%) as specified in CIC Carbon Labelling Scheme/ HK G-PASS or other internationally recognised schemes.

3. The percentage calculation can be in mass, volume, quantity, area or dollar's value. All items including existing and newly purchased items shall be included in the calculation.

4. For any green products which have been certified under other internationally recognised schemes, the Applicant shall provide the technical information of the product with justification for TRC consideration.

Submittals

(a) Materials Purchasing Practices

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-02-05a_00	BEAM Plus EDC submission template for MW-02-05a	✓	✓
MW-02-05a_01	Summary table listing the product type, manufacturer, quantities, and environmental attribute [#]	✓	✓
MW-02-05a_02	Calculations [#]	✓	✓
MW-02-05a_03	Documents showing the environmental attributes [#]	✓	✓
MW-02-05a_04	Purchase records [#]	✓	✓
MW-02-05a_05	Record photographs [#]	✓	✓

(b) Use of Green Products

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-02-05b_00	BEAM Plus EDC submission template for MW-02-05b	✓	✓
MW-02-05b_01	Summary table listing the product type, manufacturer, certification body, environmental attribute [#]	✓	✓
MW-02-05b_02	Calculations [#]	✓	✓
MW-02-05b_03	Certificate(s) of the green products [#]	✓	✓
MW-02-05b_04	Purchase records [#]	✓	✓
MW-02-05b_05	Record photographs [#]	✓	✓

Remarks

(a) Additional Information

Hong Kong Green Building Council Limited. Green Product Accreditation and Standards. [ONLINE]. Available at:
http://hkgpass.hkgbc.org.hk/nindex.php
[Accessed Aug 2021].

(b) Related Credit Heads

None

5 Materials and Waste **MW-02 Selection of Materials**

MW-02-06 Life Cycle Assessment

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-03 Waste Reduction**

MW-03-01 Adaptability and Deconstruction

This credit head is not applicable under BEAM Plus EDC.

5 Materials and Waste **MW-03 Waste Reduction**

MW-03-02 Enhanced Waste Handling Facilities

Extent of Application All DC

Objective To encourage best practice for the management of waste, including sorting, recycling and disposal of waste

Credit Point(s) Attainable 2

Credit Requirement

(a) Waste Management Plan

1 credit point for developing a waste management plan.

(b) Enhanced Waste Handling Facilities

1 credit point for providing at least 3 of the following listed on-site recycling facilities and implementing the recyclable materials collection arrangement:

i. IT related waste such as, electronic equipment;

ii. Plastic recyclable;

iii. Metal recyclable;

iv. Glass recyclable;

v. Paper recyclable;

vi. Food waste;

vii. Organic landscape waste; and

viii. Beverage carton recyclable.

Assessment

(a) Waste Management Plan

1. The Applicant shall provide a waste management plan including but not limited to the following items:

1.1. Objectives;

1.2. Responsibility;

1.3. Waste minimisation programme;

1.4. Waste recycle/ reuse programme;

1.5. Waste data collection system;

1.6. Influence on building users (e.g. training/ workshop/ campaign);

1.7. Resource allocation;

1.8. Training for staff; and

1.9. Reporting to top management.

2. The plan shall be endorsed by top management of DC Building Owner/ DC Building Management Company and reviewed regularly.

3. The Applicant shall evaluate the implementation of the waste management plan and it is not necessary to complete all targeted actions. Regular review and recommendation for continual improvement are required.

(b) Enhanced Waste Handling Facilities

1. In-house recycling facilities should be provided for the storage of the above listed recyclables. Same type of provision in multiple locations can only be counted once.

2. For each waste stream, provide at least one storage bin/ storage area for recycling. The recycling facilities shall be located at prominent locations(s) (i.e. cannot be located in car park or other non-occupied areas). The size and collection frequency are not regulated.

3. The collection organisation/ recycler shall be employed by either DC Owner or DC Management Company.

Submittals

(a) Waste Management Plan

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-03-02a_00	BEAM Plus EDC submission template for MW-03-02a	✓	✓
MW-03-02a_01	Endorsed Waste Management Plan	✓	✓
MW-03-02a_02	Documents substantiating the compliance (e.g. records, record photographs etc.) [#]	✓	✓
MW-03-02a_03	Regular review and recommendation for continual improvement	✓	✓

(b) Enhanced Waste Handling Facilities

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-03-02b_00	BEAM Plus EDC submission template for MW-03-02b	✓	✓
MW-03-02b_01	Summary table to illustrate the quantities and locations of facilities	✓	✓
MW-03-02b_02	Drawings showing the locations of the waste handling facilities	✓	✓
MW-03-02b_03	As-fitted drawings	✓	✓

MW-03-02b_04	Record photographs	✓	✓
MW-03-02b_05	Collection organisation/ recycler information, including: i. Company name, address and contact information; ii. List of recycled material; iii. Collection frequency; and iv. Collection agreement signed by the Recycling firm and Applicant. Where the Applicant adopts the host building facility, the host building Collection Agreement (or an equivalent letter by the Property Manages organisation)	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

MW-00-P1 Minimum Waste Handling Facilities

The Prerequisite requires the minimum provisions of waste recycle facilities for the collection, sorting, storage, recycling (recovered material) and disposal (waste).

5 Materials and Waste **MW-04 Best Practice on Material Usage**

MW-04-01 Best Practice on Material Usage

Extent of Application All DC

Objective Encourage the efficient use of material through adoption of green DC best practices

Credit Point(s) Attainable 2

Credit Requirement 2 credit points for demonstrating the adoption of at least 4 best practices relating to the efficient use of materials as mentioned in the Green Data Centre Practice Guide published by BEAM Society Limited (BSL).

Assessment

1. Demonstrate the adoption of best practice on efficient use of material as mentioned in the Green DC Practice Guide.

2. The adopted best practice should be from the following aspects as listed in the Green DC Practice Guide:

   2.1. Green Construction; and

   2.2. Green Disposal.

3. Prepare a technical report detailing the following:

   3.1. List of each adopted best practice;

   3.2. Detailed description of each adopted best practice and explanation on how it could benefit the DC development; and

   3.3. Evidences showing the adoption of the best practice including specifications specifying the application of the best practice, on-site photograph records, drawings, calculation, etc.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
MW-04-01_00	BEAM Plus EDC submission template for MW-04-01	✓	✓
MW-04-01_01	Technical report summarising the adopted best practice	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

6 Energy Use

The Information and Communication Technology (ICT) sector including DCs generates up to 2% of the global CO_2 emissions and data centres are estimated to have the fastest growing carbon footprint from across the whole ICT sector, mainly due to new business such as cloud computing and the rapid growth of the use of Internet services.

An objective of BEAM Plus DCs is to encourage thorough evaluation of the performance of DC and services system designs, and greater investments into measures that will help to improve the energy performance of Light, so as to reduce energy consumption and the associated environmental impacts, and to reduce summer peak electricity demand.

The assessment of the building and engineering systems is performance based as far as possible, but credits are also given for features which have proven to contribute to energy efficiency and conservation. Credits are given where management, operation and maintenance practices are such as to seek continual improvements in energy performance

6 Energy Use **EU-00** **Prerequisite**

EU-00-P1 **Minimum Energy Performance**

Extent of Application All DC

Objective To establish the minimum level of energy performance for the data centre.

Credit point(s) Attainable Prerequisite

Credit Requirement Conducting energy audit in accordance with the Buildings Energy Efficiency Ordinance (Cap 610) requirements.

Assessment

1. The Applicant shall provide an energy audit report confirming that an energy audit has been completed in accordance with the Buildings Energy Efficiency Ordinance (Cap 610) requirements.

2. The energy audit report shall meet the following requirements:

   2.1. Conducted within the past 5 years from the date of submission;

   2.2. Endorsed by a Registered Energy Assessor (REA) with REA registration number stated in the report; and

   2.3. Include all elements as stipulated in the Code of Practice for Building Energy Audit issued by Electrical and Mechanical Services Department (EMSD).

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-00-P1_00	BEAM Plus EDC submission template for EU-00-P1	✓	✓
EU-00-P1_01	An energy audit report fulfilling the assessment criteria stated above	✓	✓

Remarks

(a) Additional Information

Electrical and Mechanical Services Department, Code of Practice for Building Energy Audit 2018 Edition (EAC 2018). [ONLINE]. Available at: https://www.emsd.gov.hk/beeo/en/pee/EAC_2018.pdf [Accessed Aug 2021].

Electrical and Mechanical Services Department, Technical Guidelines on Energy Audit Code 2018 Edition (TG-EAC 2018). [ONLINE]. Available at: https://www.emsd.gov.hk/beeo/en/pee/TG-EAC_2018.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

6 Energy Use EU-01 Energy Use Reduction and Control

EU-01-01 Low Carbon Passive Design

This credit head is not applicable under BEAM Plus EDC.

6 Energy Use EU-01 Energy Use Reduction and Control

EU-01-02 Reduction of CO_2 Emissions

This credit head is not applicable under BEAM Plus EDC.

6 Energy Use EU-01 Energy Use Reduction and Control

EU-01-03 Peak Electricity Demand Reduction

This credit head is not applicable under BEAM Plus EDC.

5 Energy Use **EU-01 Energy Use Reduction and Control**

EU-01-04 Metering and Monitoring

Extent of Application All DC

Objective Encourage the wider application of renewable energy sources in DCs.

Credit point(s) Attainable 3

Credit Requirement

(a) Meters for Electrical Loads

1 credit point for sub-metering systems for the following electrical loads where applicable:

i. Central AC plant - Water Side;
ii. Central AC plant - Air Side; and
iii. Lighting.

(b) BMS Logging

1 credit point for having Building Management System (BMS) to log operation data (e.g. pressure, temperature, flow rate, on/ off status) for monitoring operation and function of the system including the following as a minimum:

i. Central AC plant - Water side;
ii. Central AC plant - Air side;
iii. Cooling load; and
iv. Lighting control.

(c) PUE Monitoring

1 credit point for energy metering to provide total facility power and energy usage and total IT equipment power and energy at each output of Power Distribution Unit (PDU) for determining instantaneous and average Power Usage Effectiveness (PUE) data.

Assessment

1. To provide the description of the sub-metering system and/ or BMS installed and data record sample, in order to demonstrate that electricity use pattern and/ or operation data for 3 or more major systems can be adequately monitored for audit purposes.

2. Metering shall provide record at intervals of one hour or less and capable to record both consumption and demand (i.e. kW, kVA, kWh). The whole facilities (i.e. meters, BMS, computer) are capable to store all meter data for at least 36 months.

3. Monitoring system for central chiller plant shall allow the overall performance of the plant and individual chillers to be determined for all operating modes and range of operating conditions. As a minimum, temperature, flow rate and pressure measurements shall be monitored.

4. Energy metering should be provided to monitor and record total facility power and energy usage and total IT equipment power and energy at each output of Power Distribution Unit (PDU) for determining instantaneous and average Power Usage Effectiveness (PUE) data.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-01-04_00	BEAM Plus EDC submission template for EU-01-04	✓	✓
EU-01-04 Data Collection Facilities - For Sub-metering System			
EU-01-04a_01	Drawings, as-built electrical schematic	✓	✓
EU-01-04a_02	Manufacturer technical specification, technical data sheets for meter, transducers, and sensors	✓	✓
EU-01-04a_03	Operation manual	✓	✓
EU-01-04a_04	Testing and commissioning records	✓	✓
EU-01-04a_05	Data record samples	✓	✓
EU-01-04a_06	Record photographs	✓	✓
EU-01-04 Data Collection Facilities - For BMS			
EU-01-04b_01	Drawings, as-built schematic, point schedule	✓	✓
EU-01-04b_02	Manufacturer technical specification, technical data sheets for meter, transducers, and sensors	✓	✓
EU-01-04b_03	Operation manual	✓	✓
EU-01-04b_04	Record photographs	✓	✓
EU-01-04 Data Collection Facilities - For PUE			
EU-01-04c_01	Drawings, as-built electrical schematic	✓	✓
EU-01-04c_02	Manufacturer technical specification, technical data sheets for meter, transducers, and sensors	✓	✓
EU-01-04c_03	Operation manual	✓	✓
EU-01-04c_04	Testing and commissioning records	✓	✓
EU-01-04c_05	Data record samples	✓	✓
EU-01-04c_06	Record photographs	✓	✓

Remarks

(a) Additional Information

Code of Practice for Building Energy Audit – Electrical and Mechanical Services Department HKSAR, 2018

British Standard BS EN 62053-11:2003. Electricity metering equipment (a.c.). Particular requirements. Electromechanical meters for active energy (classes 0.5, 1 and 2)

ASHRAE. Standard 114-1986: Energy Management Control Systems Instrumentation, American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., USA. 1987.

(b) Related Credit Heads

IDCM-03-01 Digital Facility Management Interface

While this credit head assesses the electricity consumption metering and monitoring system in the building, IDCM-03-01 encourages processing the data collected to useful information for facility managers' and occupants' use.

6 Energy Use **EU-02 Renewable and Alternative Energy Generation**

EU-02-01 Renewable and Alternative Energy Systems

Extent of Application All DC

Objective Encourage the wider application of renewable energy sources in DC.

Credit point(s) Attainable 1 + 1 Bonus

Credit Requirement

(a) Solar Energy Feasibility Study

1 credit point for evaluating the building roof's potential for harnessing solar energy.

(b) Renewable Energy Application

1 Bonus credit point where at least 0.2% of DC energy consumption in communal area is obtained from renewable energy sources.

Assessment

(a) Solar Energy Feasibility Study

1. Conduct a feasibility study to evaluate the potential of standalone and building-integrated installation in harnessing solar energy including photovoltaic and solar water heating. The feasibility study report should include the following contents.

    1.1. Consideration of PV, BIPV or Solar thermal potential installation

        1.1.1. Number of potential surfaces;

        1.1.2. Potential surfaces area;

        1.1.3. Height variation between roofs;

        1.1.4. Potential shading from the surroundings including trees and adjacent buildings;

        1.1.5. Potential shading from on-site building services equipment; and

        1.1.6. Other (proposed)

    1.2. Technical generation potential of solar energy

        1.2.1. Expected solar peak capacity;

        1.2.2. Expected annual yield; and

        1.2.3. Project DC building PUE and the estimated percentage of reduction.

    1.3. Economics of solar energy

        1.3.1. Upfront installation costs;

        1.3.2. Anticipated maintenance cost;

1.3.3. Anticipated annual electricity bills;

1.3.4. Anticipated cost saving; and

1.3.5. Payback period

1.4. Conclusions

1.4.1. Conclude whether the harnessing of solar energy is feasible for the project.

1.5. Roll-out plan (if concluded to be feasible)

1.5.1. Propose access and safety measures if solar energy is to be harnessed; and

1.5.2. Propose recommendations to refine the roof design to maximise the usable roof space for M&E equipment;

2. The feasibility should be endorsed by a locally qualified professional who has at least 3 years of relevant experience in renewable energy.

3. Note that the feasibility study imposes no obligation for implementation but encourages consideration of solar energy harnessing

(b) Renewable Energy Application

1. The Applicant shall provide the narrative of the renewable energy system. In order to demonstrate the amount of renewable energy generation, the following shall be provided:

1.1. Calculation shall be provided for system operating with less than 1 year; or

1.2. Measurement shall be provided for system operating for more than 1 year.

2. In the case of systems that generate electricity from renewable sources (e.g. photovoltaic panels), the estimated amount of electricity that will be generated by the system for use by equipment in the building, either instantaneously or from an associated storage system shall be included.

3. In the case of using systems that produce services directly from renewable sources, which will otherwise require the use of fuel or electricity to produce those services (e.g. hot water supply from solar panels or chilled water supply from absorption chillers powered by solar heat), the equivalent amount of electricity use that will be avoided shall be included.

4. The calculation/ measurement shall take due account of the diurnal and seasonal variations in the external environmental conditions (e.g. solar intensity and wind speed and direction) and in the demand for the electricity and/or services generated by the systems. Any energy use and losses by the systems shall be discounted from their output.

5. The total building energy consumption (excluding the energy usage in data hall areas) in communal areas (i.e. in charged by the Applicant) shall be referenced to the electricity bills and Towngas bills (if applicable) in any one selected year over the past 5 years.

Submittals **(a) Solar Energy Feasibility Study**

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-02-01a_00	BEAM Plus EDC submission template for EU-02-01a	✓	✓
EU-02-01a_01	Endorsed Feasibility study report.	✓	✓
EU-02-01a_02	CV of the professional as per requirements in the assessment	✓	✓

(b) Renewable Energy Application

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-02-01b_00	BEAM Plus EDC submission template for EU-02-01b	✓	✓
EU-02-01b_01	Manufacturer specification/ catalogue, as-built drawings, record photographs of the renewable energy system, etc.	✓	✓
EU-02-01b_02	Results of calculated/ measured energy generation or energy reduction	✓	✓
EU-02-01b_03	Electricity bills and Towngas bills (if applicable)	✓	✓

Remarks **(a) Additional Information**

None

(b) Related Credit Heads

None

6 Energy Use EU-03 Energy Efficient Equipment

EU-03-01 Air-conditioning Units

This credit head is not applicable under BEAM Plus EDC.

6 Energy Use **EU-03** **Energy Efficient Equipment**

EU-03-02 **Clothes Drying Facilities**

This credit head is not applicable under BEAM Plus EDC.

6 Energy Use EU-03 Energy Efficient Equipment

EU-03-03 Energy Efficient Appliances

Extent of Application
EU-03-03a: All DCs
EU-03-03b: DCs with operational control over the IT Equipment.

Objective
To recognise and encourage the procurement of energy-efficient equipment to ensure optimum performance and energy savings.

Credit point(s) Attainable
2

Credit Requirement

(a) Use of Efficient UPS

1 credit point for demonstrating that the Uninterruptible Power Supplies (UPS) is procured in accordance with certified energy efficient products scheme.

(b) Use of Sustainable IT Equipment

1 credit point for demonstrating that the IT Equipment for the running and operating of the DC of is procured in accordance with certified energy efficient products scheme.

Assessment

(a) Use of efficient UPS

1. Demonstrate all the installed Uninterruptible Power Supplies (UPS) have achieved USEPA ENERGY STAR Rated or certified under an equivalent labelling scheme.

2. Provide a schedule of UPS including the location, quantity, model and the rated power.

(b) Use of Sustainable IT Equipment

1. This credit assesses only the IT Equipment provided by the developer.

2. Demonstrate at least 80% of total rated power of the installed IT Equipment listed below have achieved USEPA ENERGY STAR Rated or certified under an equivalent labelling scheme.

   2.1. Servers;

   2.2. Data Centre Storage;

   2.3. Small Network Equipment; and

   2.4. Large Network Equipment.

3. Provide a schedule of all IT Equipment including the location, quantity, model and the rated power.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-03-03_00	BEAM Plus EDC submission template for EU-03-03	✓	✓
EU-03-03_01	Schedule of all UPS	✓	✓
	Schedule of all IT Equipment	✓	✓
EU-03-03_02	Catalogues of all IT Equipment highlighting the compliance of USEPA Energy Star	✓	✓
EU-03-03_03	Electrical schematic drawing(s) highlighting all IT efficient appliances	✓	✓
EU-03-03_04	Justification report for the equivalent label used in the assessment	✓	✓
EU-03-03_05	Photographic evidence confirming installation of compliant IT equipment	✓	✓

Remarks

(a) Additional Information

USEPA ENERGY STAR website. [ONLINE]. Available at: https://www.energystar.gov/products/data_center_equipment/uninterruptible_power_supplies
[Accessed Aug 2021].

USEPA ENERGY STAR website. [ONLINE]. Available at: https://www.energystar.gov/products/data_center_equipment
[Accessed Aug 2021].

(b) Related Credit Heads

None

6 Energy Use EU-03 Energy Efficient Equipment

EU-03-04 Cooling System Efficiency

This credit head is not applicable under BEAM Plus EDC.

6 Energy Use **EU-03** **Energy Efficient Equipment**

EU-03-05 **Air Management System**

Extent of Application All DC

Objective Encourage the use of high efficiency air distribution system to minimise the energy consumption.

Credit point(s) Attainable 2

Credit Requirement

(a) Air Management System

1 credit point for demonstrating the total air flow efficiency in all data halls, from supply to return, is of 0.9 kW/m^3/s.

(b) Data Hall Supply Air Temperature Control

1 credit point for demonstrating the data hall supply air temperature is 24 °C or above.

Assessment

(a) Air Management System

1. Measurement of the total fan power and total fan airflow at each data hall should be provided.

2. The calculation air flow efficiency should include both the supply and return air flows serving each data hall, and expressed in the following:

$$Airflow\ efficiency = \frac{\text{Total fan power (supply and return), kW}}{\text{Total fan airflow, (supply and return), } \mathrm{m^3/s}}$$

(b) Data Hall Supply Air Temperature Control

Measurement of supply air temperature at each data hall should be provided.

Submittals

(a) Air Management System

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-03-05a_00	BEAM Plus EDC submission template for EU-03-05a	✓	✓
EU-03-05a_01	Endorsed air flow and fan power Measurement report	✓	✓
EU-03-05a_02	Detail Calculation for the air flow efficiency	✓	✓

(b) Data Hall Supply Air Temperature Control

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-03-05a_00	BEAM Plus EDC submission template for EU-03-05b	✓	✓
EU-03-05a_01	Endorsed data hall supply air temperature Measurement report	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

6 Energy Use **EU-04 Energy Management and Monitoring**

EU-04-01 Best Practices on Energy Use

Extent of Application All DC

Objective Encourage the adoption of green DC best practices to achieve better energy-efficiency DC.

Credit Point(s) Attainable 5

Credit Requirement

(a) Best Practices for Major Controls

1 to 3 credit points for incorporating at least 2 best practices under each of the following aspect in the Green DC Practice Guide published by BEAM Society Limited:

i) Cooling System;

ii) Air Flow Management;

iii) Operating at Higher Temperature and Humidity;

iv) Cooling Management; and

v) Power System.

(b) Best Practices for Other Controls

2 credit points for incorporating at least 6 best practices across the following aspects as listed in the Green DC Practice Guide published by BEAM Society Limited:

i) Design of Resilience;

ii) Monitoring and Managing Energy Efficiency;

iii) IT Equipment Deployment;

iv) IT Application System and IT Service Deployment; and

v) Telecommunications and Network Cabling.

Assessment

(a) Best Practices for Major Controls

1. At least 2 best practices under each of the following individual aspect as listed in the Green DC Practice Guide published by BEAM Society Limited:

   i) Cooling System;

   ii) Air Flow Management;

   iii) Operating at Higher Temperature and Humidity;

   iv) Cooling Management; and

   v) Power System.

2. 1 credit point will be awarded for successfully demonstrating at least 2 best practices from individual aspect. Maximum 3 credit points will be awarded for this section.

3. Prepare a technical report detailing the following:

   3.1. List of each adopted best practice;

   3.2. Detailed description of each adopted best practice and explanation on how it could benefit the DC development; and

   3.3. Evidences showing the adoption of the best practice including specifications specifying the application of the best practice, on-site photograph records, drawings, calculation, etc.

(b) Best Practices for Other Controls

1. At least 6 best practices should be adopted across the following aspects as listed in the Green DC Practice Guide published by BEAM Society Limited:

   i) Design of Resilience;

   ii) Monitoring and Managing Energy Efficiency;

   iii) IT Equipment Deployment;

   iv) IT Application System and IT Service Deployment; and

   v) Telecommunications and Network Cabling.

2. 2 credit points will be awarded for successfully demonstrating at least 6 best practices from the abovementioned aspects.

3. Prepare a technical report detailing the following:

   3.1. List of each adopted best practice;

   3.2. Detailed description of each adopted best practice and explanation on how it could benefit the DC development; and

   3.3. Evidences showing the adoption of the best practice including specifications specifying the application of the best practice, on-site photograph records, drawings, calculation, etc.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-01_00	BEAM Plus EDC submission template for EU-04-01	✓	✓
EU-04-01_01	Technical report summarising the adopted best practice	✓	✓

Remarks **(a) Additional Information**

None

(b) Related Credit Heads

None

5 Energy Use **EU-04 Energy Management and Analysis**

EU-04-02 Energy Management

Extent of Application All DC

Objective To encourage high level management to involve in the improvement of energy efficiency and conservation.

Credits Point(s) Attainable 6

Credit Requirement

(a) Energy Management Policy

1 credit point for an energy management policy endorsed by top management.

(b) Energy Saving Target

1 to 2 credit points for energy management plan covering less than 3 year/ 3 years or more, respectively.

(c) Energy Action Plan

1 to 2 credit points for energy action plan covering less than 3 year/ 3 years or more, respectively.

(d) Appointment of Energy Warden

1 credit point for appointing an Energy Warden in the DC Management Company.

Assessment

(a) Energy Management Policy

To provide an energy management policy endorsed by the top management of DCs Owner/ DCs Management Company to demonstrate the commitment.

(b) Energy Saving Target

To provide an energy management plan containing the following elements as a minimum:

i) Objective and Target; and

ii) Reporting to top management on progress.

(c) Energy Action Plan

To provide action plan for energy performance improvement including the following as a minimum:

i) Budget;

ii) Upgrading/ retrofitting works;

iii) Projected saving and payback;

iv) Target implementation date;

v) Monitoring & Verification on completed works; and

vi) Records (e.g. delivery order, contract, record photographs) shall also be provided to demonstrate the implementation of improvement works covering the claimed periods.

(d) Appointment of Energy Warden

1. To provide evidence of appointment of at least one Energy Warden as key member in the DC management team for the DC. The scope of work for the energy warden shall also be indicated.

2. The energy warden shall meet all of the following requirements:

   i) An employee of the DC Management Company; and

   ii) Participated in more than 80% of the DC management meetings.

Submittals

(a) Energy Management Policy

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-02a_00	BEAM Plus EDC submission template for EU-04-02a	✓	✓
EU-04-02a_01	An energy management policy endorsed by the top management of Building Owner/ Building Management Company.	✓	✓

(b) Energy Saving Target

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-02b_00	BEAM Plus EDC submission template for EU-04-02b	✓	✓
EU-04-02b_01	An energy management plan endorsed by the top management of Building Owner/ Building Management Company.	✓	✓

(c) Energy Action Plan

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-02c_00	BEAM Plus EDC submission template for EU-04-02c	✓	✓
EU-04-02c_02	An energy action plan	✓	✓
EU-04-02c_03	Implementation records	✓	✓

(d) Appointment of Energy Warden

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-02d_00	BEAM Plus EDC submission template for EU-04-02d	✓	✓
EU-04-02d_01	Appointment of Energy Warden: i. Scope of the work for the energy warden(s); ii. Resume of energy warden(s); and iii. Meeting minutes showing the attendance and/ or action items by the appointed energy warden.	✓	✓

Remarks **(a) Additional Information**

None

(b) Related Credit Heads

None

5 Energy Use **EU-04 Energy Management and Analysis**

EU-04-03 Energy Analysis

Extent of Application All DCs

Objective To enable and encourage building operators to measure, record, monitor and analyse energy performance of the building's engineering systems, particularly concerning energy use.

Credit point(s) Attainable 7

Credit Requirement

(a) Data Collection Record

1 to 2 credit point(s) for providing energy consumption data record of at least 1 year/ more than 3 years for major electrical loads.

(b) Data Analysis

1 credit point for calculating the EUI of the following services in data analysis:

i) Air-conditioning system; and

ii) Lighting.

1 credit point for calculating and recording the PUE (Level 2) for 1 year.

(c) Energy Audit Report

2 credits for filling up the entire Template 1 on Additional Information to Executive Summary of Energy Audit Report.

(d) Carbon Audit Report

1 credit point for conducting carbon audit in accordance with the requirements as stipulated in the guideline issued by the Authority.

Assessment

(a) Data Collection Record

1. The Applicant shall provide record of energy consumption data for major electrical loads in order to demonstrate that proper record keeping practice has been implemented. It is a good practice to have energy consumption data record separately for different system types of major electrical load. However, this is not an assessment criterion for this credit (i.e. one electrical meter that records several different system types of major electrical load can be accepted in this credit.).

(b) Data Analysis

1. To provide EUI data for the air-conditioning system, and lighting system. If energy consumption for the systems required cannot be provided separately according to system types due to lack of sub-metering provision, then calculation based on technical data (e.g. manufacturer technical specification, testing and commissioning records, measured power, power calculated based on measured voltage, ampere, flow rate, pressure drop, etc.) can be accepted for this credit sub-head.

2. To calculate and record the monthly PUE (Level 2) for 1 year.

    2.1. The IT equipment energy shall be measured at Power Distribution Unit (PDU) Output, i.e. PUE Level 2.

(c) Energy Audit Report

1. To complete entire Template 1 on Additional Information to Executive Summary of Energy Audit Report. Relevant calculation and/or measured data as supporting to the filled data in Template 1 should also be provided. The report shall be endorsed by a Registered Energy Assessor (REA).

(d) Carbon Audit Report

1. The Applicant shall provide a carbon audit or Greenhouse Gas (GHG) Emissions audit report in accordance with the latest Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or institutional Purposes) in Hong Kong, issued by Electrical & Mechanical Services Department (EMSD) and Environmental Protection Department (EPD). The report shall be endorsed by a Qualified Service Provider (QSP).

Submittals

(a) Data Collection Record

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-03a_00	BEAM Plus EDC submission template for EU-04-03a	✓	✓
EU-04-03a_01	Energy consumption data record for major electrical loads (e.g. BMS log data, metering log data, manually recorded data)	✓	✓
EU-04-03a_02	Spreadsheet summarising the energy consumption data according to major systems with monthly bar chart plotted	✓	✓

(b) Data Analysis

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-03b_00	BEAM Plus EDC submission template for EU-04-03b	✓	✓
EU-04-03b_01	Spreadsheet summarising EUI for the required systems	✓	✓
EU-04-03b_02	Calculation and/ or measured data as supporting to the EUI	✓	✓
EU-04-03b_03	Spreadsheet summarising PUE	✓	✓
EU-04-03b_04	Calculation and/ or measured data as supporting to the PUE	✓	✓

(c) Energy Audit Report

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-03c_00	BEAM Plus EDC submission template for EU-04-03c	✓	✓
EU-04-03c_01	An energy audit report endorsed by REA	✓	✓
EU-04-03c_02	Completed Template 1 on Additional Information to Executive Summary of Energy Audit Report and submission record to EMSD	✓	✓
EU-04-03c_03	Calculation and/or measured data as supporting to the data filled in the template 1	✓	✓

(d) Carbon Audit Report

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-04-03d_00	BEAM Plus EDC submission template for EU-04-03d	✓	✓
EU-04-03d _01	A carbon audit or GHG emission audit report endorsed by a QSP	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

5 Energy Use **EU-05** **Energy Efficient Improvement**

EU-05-01 **Energy Benchmarking and System Improvement**

Extent of Application All DC

Objective To reduce the consumption of non-renewable energy resources and the consequent harmful emissions of carbon dioxide (CO_2) to the atmosphere and encourage energy conservation and methods to reduce peak electricity demand.

Credit point(s) Attainable 8 + 2 Bonus

Credit Requirement Credit point(s) can be achieved based on the Operating PUE value

Credit point (s)	PUE
1	2.00
2	1.90
4	1.80
6	1.70
8	1.60
8 + 1B	1.50
8 + 2B	≤ 1.40

Assessment

1. The DC shall provide the operating PUE and Operating IT load using 12 months of tread-logged data.

$$Opearting\ PUE = \frac{\text{Annual facility energy consumption, kWh}}{\text{Annual IT equipment energy consumption, kWh}}$$

2. Total facility energy should include all kinds of energy used by the assessed DC and IT equipment energy should be measured at Power Distribution Unit (PDU) Output (PUE Level 2).

3. Total facility energy consumption, IT equipment energy consumption and operating PUE for the past 12 months should be submitted.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-05-01_00	BEAM Plus EDC submission template for EU-05-01	✓	✓
EU-05-01_01	Detail Calculation of the Operating PUE	✓	✓
EU-05-01_02	PUE value for the past 12 months	✓	✓

Remarks

(a) Additional Information

EMSD – HK RE Net. [ONLINE]. Available at: http://re.emsd.gov.hk/english/gen/overview/over_intro.html [Accessed Aug 2021].

EMSD – Energy Land. [ONLINE]. Available at: http://www.energyland.emsd.gov.hk/en/energy/energy_use/application.html [Accessed Aug 2021].

EMSD – New & Renewable Energy. [ONLINE]. Available at: http://www.emsd.gov.hk/en/energy_efficiency/new_renewable_energy/ [Accessed Aug 2021].

GovHK – Renewable Energy. [ONLINE]. Available at: https://www.gov.hk/en/residents/environment/renewable/index.htm

Scheme of Control
Hongkong Electric Co. Ltd. and HK Electric Investments Ltd.(PDF version) (1 January 2019 to 31 December 2033). [ONLINE]. Available at: http://www.enb.gov.hk/sites/default/files/en/node66/new_HKE_SCA_eng.pdf [Accessed Aug 2021].

CLP Power Hong Kong Ltd. and Castle Peak Power Company Ltd.(PDF version) (1 October 2018 to 31 December 2033). [ONLINE]. Available at: http://www.enb.gov.hk/sites/default/files/en/node66/new_CLP_SCA_eng.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

5 Energy Use **EU-05 Energy Efficient Improvement**

EU-05-02 Enhancements

Extent of Application All DC

Objective To encourage adoption of practices, new technologies and techniques that have yet to find application in Hong Kong or provision for performance enhancements over and above stated performance criteria in BEAM Plus EDC.

Credit point(s) Attainable 6 Bonus

Credit Requirement Maximum of 6 Bonus credit points are attainable under this credit head.

(a) Research and Development in Energy

1 Bonus credit point for conducting research and development or participating in competition with published paper related to energy aspects for DCs.

(b) Compliance with the BEC

1 to 4 Bonus credit points for compliance with the latest version of the following listed:

i) Energy Efficiency Requirements for Air-Conditioning Installations;

ii) Energy Efficiency Requirements for Electrical Installations;

iii) Energy Efficiency Requirements for Lighting Installations; and/or

iv) Energy Efficiency Requirements for Lift and Escalator Installations.

(c) Separate Energy Charges

1 Bonus credit point where separate charges are made for energy use.

(d) Other Approaches

1 to 6 Bonus credit points for adopting other energy conservation approaches not prescribed above.

Assessment **(a) Research and Development in Energy**

1. The Applicant shall provide brief description of how the published paper has positive impact on building energy aspect, a copy of the published paper and evidence showing the paper is published in one of the recognised channels.

2. Recognised channels include but not limited to:

   i) CPD events organised by professional institutes (conference, seminar, workshop, competition, etc.);

   ii) World Sustainable Building Conference;

iii) Professional institute journal (e.g. HKIE monthly journal);

iv) Educational journal (e.g. Building and Environment Journal).

(b) Compliance with the BEC

1. 1 Bonus credit point can be achieved for the compliance with each of the above listed codes.

2. The Applicant shall provide Form of Compliance (FOC) endorsed by a REA to demonstrate compliance with the latest version of the BEC.

(c) Separate Energy Charges

1. The Applicant shall provide evidence to demonstrate that building users pay for their own energy consumption cost within their spaces, including air-conditioning, lighting, small power, etc.

(d) Other Approaches

1. Despite the listed approaches above, BEAM Plus also encourages the Applicant to adopt other types of approach that can improve the energy performance of the subject building or advance the industry's knowledge or movement.

2. Maximum of 1 Bonus credit point for each energy conservation approach is allowed but the award of credit point is subject to the final approval of BEAM Society Limited (BSL)'s Technical Review Committee (TRC) based on the estimated energy reduction, justification and/ or the innovation of the proposed approaches.

3. In order to demonstrate substantial environmental benefits by the adoption of the claimed approach, the Applicant shall provide evidence of the application of new practices, technologies and techniques and the associated benefits. The benefits related to lower energy use, support of new technology, are all encouraged.

4. The Applicant shall also provide calculation showing the estimated energy saving achieved by the adoption of each or all the proposed approaches. In the case of non-quantifiable benefit resulted from the approach, justification should be provided.

5. The Applicant's submission shall identify the intent of the proposed innovative approach, the proposed criteria for assessing compliance, and the assessment criteria. The Assessor shall refer the proposal to BSL's TRC who will consider each application on its merit.

6. Bonus credit point in this section shall be granted at the sole discretion of BSL's TRC.

7. Energy saving measures that rely on DC user's behaviour or manual control (such as turning up the set temperature manually for air-conditioning; turning off lighting by hand in accordance with staff energy management manual) will not be considered energy saving features in this section.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
EU-05-02_00	BEAM Plus EDC submission template for EU-05-02	✓	✓
Research and Development in Energy:			
EU-05-02a_01	Brief description of how the published paper has positive impact on building energy aspect	✓	✓
EU-05-02a_02	A copy of the published paper	✓	✓
EU-05-02a_03	Evidence to demonstrate the publication (e.g. letter from editor of the journal, copy of the publication)	✓	✓
Research and Development in Energy:			
EU-05-02b_01	FOC forms endorsed by REA	✓	✓
Separate Energy Charges:			
EU-05-02c_01	As-built electrical schematic, as-built MVAC water side schematic, location layouts	✓	✓
EU-05-02c_02	Consumption records, meter readings, logbook or printed output (sensitive information can be blacked out if needed, such as tenant's name)	✓	✓
EU-05-02c_03	Payment records showing that building users pay for their own energy consumption within their spaces	✓	✓
EU-05-02c_04	Manufacturer's technical specification, technical data sheets for the tenant electricity meters and/or thermal energy meters for chilled water sub-metering	✓	✓
EU-05-02c_05	Record photographs showing meter installation	✓	✓
Other Approaches:			
EU-05-02d_01	Description and intent of the approach	✓	✓
EU-05-02d_02	Proposed criteria for assessing compliance and the assessment criteria	✓	✓
EU-05-02d_03	Quantified environmental benefits	✓	✓
EU-05-02d_04	Other types of supporting (e.g. manufacturer specification/ catalogue, laboratory report, calculation, published papers, project reference, etc.)	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

7 Water Use (WU)

In Hong Kong, WSD ensures that the quality of drinking water provided to customers complies fully with the Hong Kong Drinking Water Standards, currently being the corresponding guideline values or provisional guideline values in the fourth edition of the World Health Organization's Guidelines for Drinking-water Quality published in 2011 (WHO Guidelines). Drinking water quality, however, can be affected by the condition of the building's inside services. To safeguard tap water quality, property owners and building managers are advised to carry out proper maintenance of inside service and regular cleaning of water storage tanks. While water quality satisfying WSD's requirement is the mandatory requirement, water conservation is another focus area under water category.

7 Water Use WU-00 Prerequisite

WU-00-P1 Minimum Water Saving Performance

This prerequisite is not applicable under BEAM Plus EDC.

7 Water Use WU-01 Water Conservation

WU-01-01 Annual Water Use

Extent of Application All DC

Objective To reduce the consumption of fresh water through the application of water saving devices that have proven performance and reliability.

Credit Point(s) Attainable 4

Credit Requirement Credit point(s) can be achieved based on the estimated aggregate annual saving by the use of water efficient devices.

No. of Credit point(s)	1	2	3	4
Estimated aggregate annual fresh water saving	10%	15%	20%	25%

Assessment

1. Calculation shall be provided to determine the annual fresh water saving at the locations under the control of the Applicant is at least 5% lower than the BEAM Plus baseline value. The calculation shall take into account the number of persons, the number of operational days per annum, operating pressure and limited to the water usage from the water taps and shower heads (if any).

2. In case the flow rate of the water fixture is unavailable, on-site measurement data shall also be accepted in evaluating the actual performance.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-01-01_00	BEAM Plus EDC submission template for WU-01-01	✓	✓
WU-01-01_01	Schedule of water taps and shower heads for bathing (if any) installed at the locations under the control of the Applicant	✓	✓
WU-01-01_02	Manufacturer specification or catalogues of water taps and shower heads for bathing (if any) [or] On-site measurement data	✓ ✓	✓ ✓
WU-01-01_03	Annual water saving calculations (baseline values can be found in Appendix 10.2) which take into account of the water pressure	✓	✓
WU-01-01_04	On site photographs of the water fixtures	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

WU-04-10 Water Saving Performance

The related credit encourages continual improvements in reducing fresh water consumption.

7 Water Use WU-01 Water Conservation

WU-01-02 Water Efficient Irrigation

This credit head is not applicable under BEAM Plus EDC.

6 Water Use WU-01 Water Conservation

WU-01-03 Water Efficient Appliances

This credit head is not applicable under BEAM Plus EDC.

7 Water Use WU-01 Water Conservation

WU-01-04 Water Leakage Detection

Extent of Application All DC

Objective To identify water leakage once detected for the arrangement of maintenance work.

Credit Point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for installing water leakage detection systems in all data halls and all municipal potable water tank rooms (if applicable).

Assessment

1. To demonstrate that water leakage detection systems are installed in all data halls and all municipal potable water tank rooms. Other locations include rooms comprising potable water tank, irrigation tank and cleansing water tank, and flush water tank if using fresh water for flushing (if applicable).
2. Water tank room, which consists of only non-potable water tank and/ or fire services tank, are not assessed.
3. Water tank room which has multiple water tanks should have at least one leakage detection system.
4. The detection systems should have the capability to automatically alert the operator or the security guard and identify the room with leakage when leakage occurs.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-01-04_00	BEAM Plus EDC submission template for WU-01-04	✓	✓
WU-01-04_01	System description of the water leakage system	✓	✓
WU-01-04_02	Plumbing schematic drawing(s) and plumbing layout drawings, highlighting the provisions of water leakage detection systems in all water tank rooms	✓	✓
WU-01-04_03	Equipment catalogues of the water leakage detectors	✓	✓
WU-01-04_04	On-site photographs of the water leakage detectors (if any)	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

7 Water Use WU-01 Water Conservation

WU-01-05 Twin Tank System

Extent of Application

All DC (including DC with centralised/ shared tank that is outside the assessment boundary)

Objective

To reduce the water wastage during the maintenance or cleaning of the water tanks and provide an uninterrupted potable and flush water supply to building users.

Credit Point(s) Attainable

2 Bonus

Credit Requirement

1 Bonus credit point for providing twin tank for either potable or flushing water supply system.

2 Bonus credit points for providing twin tank for both potable and flushing water supply system.

Assessment

1. Twin tanks are installed for potable and flushing supply water systems for all buildings in the assessment boundary.

2. Two compartment tank and two separate identical tanks are accepted as twin tank.

3. Each compartment/ tank of the twin-tank shall be equipped with:

   3.1. A duplicated set of inlet, outlet and associated overflow and drainage pipework;

   3.2. A stop valve at the inlet of each tank compartment to ensure that water will not get into the compartment when it is being cleaned; and

   3.3. An automatic pump control switch at the downstream side of each sump pump to protect the up-feed system particularly when the stop valve for the tank compartment is closed.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-01-05_00	BEAM Plus EDC submission template for WU-01-05	✓	✓
WU-01-05_01	Plumbing schematic drawing(s) and plumbing layout drawings, highlighting the provisions of the twin tank system for potable water and flush water systems, and the associated installations as stated in items (1) to (3) in the assessment criteria.	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

6 Water Use WU-01 Water Conservation

WU-01-06 Cooling Tower Water

Extent of Application

All DC with cooling tower using fresh water as makeup water.

Objective

To reduce the potable water consumption for cooling tower makeup.

Credit Point(s) Attainable

1 + 1 Bonus

Credit Requirement

1 credit point for reducing fresh water consumption by installing water treatment system which can achieve minimum **7** cycles of concentration with acceptable water quality.

1 additional BONUS credit point for **8** or more cycles of concentration with acceptable water quality.

Assessment

1. The ratio between the concentration of dissolved solids in the cooling tower and the make-up water should be 7 or more. Demonstrate that the corresponding make-up water pumps can provide sufficient flow rate and pressure to sustain the specified cycle of concentration.

2. All cooling tower using potable water within the assessment boundary should comply with this requirement.

3. Submit cooling tower water treatment proposal developed in accordance to the latest EMSD Code of Practice for Fresh Water Cooling Tower [1] to demonstrate minimum cycles of concentration of 7 or more is designed and adopted.

4. After project completion, submit EMSD Form EE CT3 regarding the cooling water sampling results and the associated water sampling test report to substantiate satisfactory cooling water quality.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-01-06_00	BEAM Plus EDC submission template for WU-01-06	✓	✓
WU-01-06_01	Water treatment proposal highlighting the design cycles of concentration	✓	✓
WU-01-06_02	Catalogues of cooling tower, water treatment equipment and make-up water pumps	✓	✓
WU-01-06_03	EMSD Form EE CT3 and associated water sampling test report	✓	✓

Remarks

(a) Additional Information

[1] Electrical and Mechanical Services Department – Code of Practice for Fresh Water Cooling Towers CoP (FWCT). [ONLINE]. Available at: http://www.emsd.gov.hk/en/energy_efficiency/fwct_scheme/publications/index.html
[Accessed August 2021].

(b) Related Credit Heads

None

7 Water Use **WU-02 Effluent**

WU-02-01 Effluent Discharge to Foul Sewers

Extent of Application All DC with flushing system

Objective To reduce the volumes of sewage discharged from DCs thereby reducing burdens on municipal sewage services and treatment facilities.

Credit Point(s) Attainable 2

Credit Requirement

(a) Water Closets

1 credit point for installing dual flush for the water closets.

(b) Urinals

1 credit point for installing urinals with WELS Grade 2 or above.

Assessment The Applicant shall demonstrate that the flushing systems are water efficient with the following criteria:

i. 80% of toilets are furnished with dual flush system; and

ii. 80% of the urinals are certified with Water Efficiency Labelling Scheme Grade 2 or above. Alternatively, if the urinals are not certified by WELS, the Applicant can provide a calculation to demonstrate the installed urinals have equivalent performance with the WELS Grade 2 certified products.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-02-01_00	BEAM Plus EDC submission template for WU-02-01	✓	✓
WU-02-01_01	Schedule of the water closets and urinals installed	✓	✓
WU-02-01_02	Catalogues of the dual flush system and the urinals with flow rate data indicated (if any)	✓	✓
WU-02-01_03	On-site photographs of the water efficient flushing system	✓	✓
WU-02-01_04	The WELS certificate	✓	✓
WU-02-01_05	On-site photographs of the flushing system with WELS Grade 2 or above	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

7 Water Use WU-03 Water Harvesting and Recycling

WU-03-01 Water Harvesting and Recycling

Extent of Application All DC

Objective To encourage harvesting of rainwater and recycling of grey water in order to reduce the consumption of potable water.

Credit Point(s) Attainable 2 Bonus

Credit Requirement 1 or 2 Bonus credit points for harvesting rainwater and/ or recycling grey water that leads to a reduction of at least 2.5% or 5% in the consumption of potable water.

Assessment

1. The Applicant shall provide details on the rainwater harvesting and/ or grey water systems including the drawings showing the general arrangement and the schematic diagrams. The calculation of the expected potable water saving shall also be provided.

2. Where it can be demonstrated that the savings in potable water use is at least 2.5% or more of the total amount of potable water consumption, the BONUS credit point(s) can be achieved.

3. The potable water saving can be determined by the meter reading of amount of rainwater harvested and/ or grey water recycled per year divided by the amount of potable water meter reading from the building per year (m^3).

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-03-01_00	BEAM Plus EDC submission template for WU-03-01	✓	✓
WU-03-01_01	Drawing and schematic diagrams of the rainwater harvesting and/or grey water recycling systems	✓	✓
WU-03-01_02	Calculation on the potable water saving	✓	✓
WU-03-01_03	On-site photographs of the water recycling system(s)	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

7 Water Use WU-04 Water Management

WU-04-01 Smart Water Metering

Extent of Application

All DC with more than one water system

Objective

To provide opportunity to reduce the fresh water use by tracking the water consumption records on different water systems.

Credit Point(s) Attainable

1

Credit Requirement

1 credit point for demonstrating the provision of permanent smart water meter for cooling towers water use and indoor plumbing fixtures and fitting, **and**

at least 2 of the other water systems which are able to display metered data, treading of water consumption and relevant parameters.

Assessment

1. Permanent installation of smart water meters for cooling towers water and indoor plumbing fixtures and fittings **and**

   at least 2 of the follow water systems:

   1.1. Irrigation (if applicable);

   1.2. Cleansing;

   1.3. Water features/ pools; and

   1.4. Other process water.

2. The smart meters should be able to display metered data, trending of water consumption and relevant parameters, and with data logging capability/ connected to Building Management System (BMS).

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU-04-01_00	BEAM Plus EDC submission template for WU-04-01	✓	✓
WU-04-01_01	Narrative of the water sub-metering system	✓	✓
WU-04-01_02	Plumbing schematic diagrams or layout drawings showing the provisions of the water metering for at least two water sub-systems	✓	✓
WU-04-01_03	Data logging records [#]	✓	✓
WU-04-01_04	On-site photographs of the water meters	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

7 Water Use **WU-04 Water Management**

WU-04-02 Water Saving Management

Extent of Application All DC

Objective To reduce the consumption of fresh water through the application of water saving devices that have proven performance and reliability as well as operation management measures.

Credit Point(s) Attainable 4 + 1 Bonus

Credit Requirement Credit point(s) can be achieved based on the reduction percentage by comparing water bill/ metering data. (Reference year can be any year in the past 5 years).

No. of Credit point(s)	1	2	3	4	4 + 1 Bonus
Annual fresh water use reduction	3%	6%	9%	12%	15%

Assessment

1. The Applicant shall compute the reduction of water consumption by the water bills or metering data. The numerator shall be the water consumption to be compared against the baseline year and it has to be the current year data. The denominator could be any years within 5 years at the time of submission.

2. A ratio indicator by a certain operational measuring unit (such as the number of building users) could be applied to allow for such comparison.

3. The Applicant shall also demonstrate what management initiatives (rather than changes in occupancy or use) or hardware upgrade have been implemented to reduce the water consumption.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
WU -04-02_00	BEAM Plus EDC submission template for WU -04-02	✓	✓
WU -04-02_01	Water bills/ metering data for the baseline year and current year [#]	✓	✓
WU -04-02_02	Water reduction calculation	✓	✓
WU -04-02_03	Narratives on the management initiatives or evidence of hardware upgrade in reducing fresh water consumption	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

WU-01-01 Annual Water Use

The related credit encourages the application of water saving devices.

8 Health and Wellbeing (HWB)

This section assesses the provision for green living, inclusive design as well as the DC occupants' health and wellbeing. Indoor environmental quality (IEQ) includes indoor air quality and ventilation provisions that safeguard health. Considerations of these issues include thermal comfort, lighting, acoustics and noise, impact on well-being, comfort and productivity.

8 Health and Wellbeing **HWB-00 Prerequisite**

HWB-00-P1 Minimum Ventilation Performance

Extent of Application All normally occupied spaces in DC, except the naturally ventilated spaces.

Objective To assess the quality of on-site outdoor air and demonstrate that a minimum quantity of outdoor air is supplied to all normally occupied spaces in the project in order to safeguard the health and comfort of DC users.

Credit Point(s) Attainable Prerequisite

Credit Requirement

(a) On-site Outdoor Air Quality

To measure outdoor air pollutants at selected intake location(s).

(b) Minimum Ventilation

To demonstrate the project is in compliance with the minimum ventilation quantity in accordance with of ANSI/ASHRAE Standard 62.1-2019.

Alternatively,

- *In case of the minimum ventilation rate of ANSI/ASHRAE Standard 62.1-2019 is not complied due to the physical constraints of the existing ventilation system, demonstrate that the system is operated at maximum outdoor air delivery rate and provide not less than 5 l/s per person of combined outdoor air rate*.

Assessment

(a) On-site Outdoor Air Quality

1. Engage an IAQ Certificate Issuing Body [1] to measure the quality of outdoor air at the selected intake location(s) or representative location(s) of the DC if there is accessibility issue. Measurements should be taken for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3) and respirable suspended particulates (PM_{10}).

2. The samples should be taken when no construction activities were ongoing on the day of measurement. All parameters at one sampling location should be taken on the same day.

3. Prepare a narrative to benchmark the measurement results against the Good Class limits as stipulated in the latest version of A Guide on IAQ Certification Scheme for Offices and Public Spaces. Note that the measurement results are not required to comply with the limits and should be served as reference only.

4. Due to site constraints, it may not be practicable to take 8-hour continuous measurement. In these circumstances, surrogate measurement (i.e. an

intermittent measurement strategy based on the average of half-an-hour measurements conducted at four time slots) is also accepted.

(b) Minimum Ventilation

1. Prepare a schedule of all spaces present in the DC. Categorise the spaces into normally occupied, not normally occupied and unoccupied according to the space type matrix in Appendix 10.3 of this Manual.

2. Provide a report demonstrating compliance with the minimum ventilation rate stipulated in ASHRAE Standard 62.1-2019 [2] in all normally occupied spaces.

Alternatively,

- *In case of the minimum ventilation rate of ANSI/ASHRAE Standard 62.1-2019 is not complied due to the physical constraints of the existing ventilation system, a report endorsed by a Registered Professional Engineer (R.P.E.) in Building Services, Environmental or Mechanical discipline shall be submitted to provide the details of the system's maximum ventilation rate, and demonstrate that the system is operated at maximum capacity to deliver outdoor air into the space and provide not less than 5 l/s per person of combined outdoor air rate*.

Submittals

(a) On-site Outdoor Air Quality

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-00-P1a_00	BEAM Plus EDC submission template for HWB-00-P1a	✓	✓
HWB-00-P1a_01	Outdoor air pollutants measurement report endorsed by IAQ CIB	✓	✓

(b) Minimum Ventilation

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-00-P1b_00	BEAM Plus EDC submission template for HWB-00-P1b	✓	✓
HWB-00-P1b_01	Schedule of all spaces present in the DC	✓	✓
HWB-00-P1b_02	Report demonstrating compliance with the minimum ventilation rate stipulated in ASHRAE Standard 62.1-2019 in all normally occupied spaces	✓	✓
HWB-00-P1b_03	MVAC fan schedule and air side schematics	✓	✓
HWB-00-P1b_04	MVAC layout plan	✓	✓

Remarks

(a) Additional Information

[1] IAQ Certificate Issuing Body Accreditation [ONLINE]. Available at: https://www.iaq.gov.hk/en/iaq-certification-scheme/certificate-issuing-body-accreditation.aspx
[Accessed Aug 2021].

[2] ANSI/ASHRAE Standard 62.1-2019. Ventilation for Acceptable Indoor Air Quality. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

(b) Related Credit Heads

HWB-03-01 Enhanced Ventilation

The related credit awards project demonstrating enhanced ventilation performance in normally occupied spaces and not normally occupied spaces.

HWB-03-05 Indoor Air Quality

Carrying out on-site outdoor analysis provides useful information for the operation of ventilation system to ensure a good air quality provision.

8 Health and Wellbeing **HWB-01 Design for Green Living**

HWB-01-01 Healthy and Active Living

Extent of Application All DC

Objective To encourage building environment for healthy and active living by improving living and/ or working experience of building users and integrating physical activities in the design for an active lifestyle.

Credit Point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for scoring at least 3 items of all applicable design measures for healthy and active living.

Assessment Provide a report demonstrating compliance of at least 3 of all relevant applicable design measures for healthy and active living at indoor/ semi-outdoor communal areas of building development as listed in below item 1.1, 2.1-2.3 and 3:

1. Improving living and / or working experience of communal use by building occupants

    1.1. Integration of public art in indoor communal areas at the building main entrance and core circulation lobbies at main access level to have at least one artwork respectively. The public artwork should be of scale reasonably proportional to space/ venue it locates. A narrative or infographics of the art piece should also be available for users and visitors.

2. Integrating physical activities in the design for an active lifestyle

    2.1. Install way-finding signage and/ or info graphics at point-of-decision to encourage stair use (at least one at the building main entrance and all core circulation lobbies with lift provisions).

    2.2. Install at least 1 circulation stair in communal area meeting the following requirements:

        2.2.1. Riser to be not more than 150mm and tread to be at least 300mm;

        2.2.2. Individual flight of stair not to exceed 1800mm nor a total of more than 12 risers;

        2.2.3. Placed visually before lifts upon entering the building main entrance;

        2.2.4. Connecting at least 3 storeys; and

        2.2.5. Stair width to be at least 1350mm.

    2.3. Install at least 1 provision for physical activities in communal areas, for example exercise stations, jogging tracks, cycling etc.

3. Additional or alternative design features may be included. Justification on achievement in credit objectives should be demonstrated.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-01-01_00	BEAM Plus EDC submission template for HWB-01-01	✓	✓
HWB-01-01_01	Drawings showing design measures and/or amenity features	✓	✓
HWB-01-01_02	Report showing justifications and details for each design measures and/or amenity features provided	✓	✓
HWB-01-01_03	Catalogues/ information of design measures provided OR Photograph	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

SS-01-01 Pedestrian-oriented and Low Carbon Transport
The related credit promotes cycling facilities within the Site and integrating with the public cycling network if a public cycling network exists or has been planned nearby. Changing/ shower facilities for non-residential buildings are required.

SS-01-02 Neighbourhood Amenities
The related credit encourages DC developments to have adequate amenities for its users within or in the vicinity of the Site.

8 Health and Wellbeing

HWB-01 Design for Green Living

HWB-01-02 Biophilic Design

This credit head is not applicable under BEAM Plus EDC.

8 Health and Wellbeing **HWB-02 Inclusive Design**

HWB-02-01 Inclusive Design

Extent of Application All DC

Objective To encourage user-friendliness in the DC design for outdoor or semi-outdoor communal/ private space design at various levels of a building.

Credit Point(s) Attainable 1

Credit Requirement 1 credit point for providing at least 3 applicable enhanced provisions as stipulated in the "Recommended Design Requirements" of BFA 2008 [1].

Assessment Provide a report detailing at least 3 applicable enhanced provisions as stipulated in the "Recommended Design Requirements" of BFA 2008.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-02-01_00	BEAM Plus EDC submission template for HWB-02-01	✓	✓
HWB-02-01_01	Summary table listing the enhanced provisions and their locations	✓	✓
HWB-02-01_02	Location plan to indicate the enhanced provisions	✓	✓
HWB-02-01_03	Record photographs	✓	✓

Remarks

(a) Additional Information

[1] Buildings Department. Design Manual: Barrier Free Access 2008. [ONLINE]. Available at: https://www.bd.gov.hk/doc/en/resources/codes-and-references/code-and-design-manuals/BFA2008_e.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

8 Health and Welling **HWB-03 Indoor Environmental Quality**

HWB-03-01 Enhanced Ventilation

Extent of Application All DC

Objective To maintain effective ventilation and prevent exposure to concentrated indoor pollutant sources to support occupants' health and wellbeing.

Credit Point(s) Attainable 2

Credit Requirement

(a) Fresh Air Provision

1 credit point for demonstrating that 90% of not normally occupied spaces in the DC are provided with adequate ventilation.

(b) Exhaust Air

1 credit point for the provision of an effective ventilation system for spaces where significant indoor pollution sources are generated.

Assessment

(a) Fresh Air Provision

1. Prepare a schedule of all spaces present in the DC. Categorise the spaces into normally occupied, not normally occupied and unoccupied according to the space type matrix in Appendix 10.3 of this Manual.

2. Provide a report demonstrating compliance with the minimum ventilation rate stipulated in ASHRAE Standard 62.1-2019 [1] in 90% of not normally occupied spaces.

(b) Exhaust Air

1. Prepare a schedule of all spaces where significant indoor pollution sources are generated.

2. Provide design criteria that have been adopted and the details of the ventilation system designs providing local exhaust where concentrated pollutant sources are likely to be present.

3. Submit exhaust air rate calculation demonstrating the compliance of design criteria. ANSI/ASHARE Standard 62.1 – 2019 and CIBSE Guide B 2016 are accepted references for this credit. Justification is needed for other references.

Submittals **(a) Fresh Air Provision**

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-01a_00	BEAM Plus EDC submission template for HWB-03-01a	✓	✓
HWB-03-01a_01	The design criteria adopted for the not normally occupied spaces	✓	✓
HWB-03-01a_02	The report of methodology and results of calculations to demonstrate compliance	✓	✓

(b) Exhaust Air

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-01b_00	BEAM Plus EDC submission template for HWB-03-01b	✓	✓
HWB-03-01b_01	Schedule of all spaces provided with local exhaust, highlighting the exhaust rate	✓	✓
HWB-03-01b_02	A summary table detailing the design criteria and the ventilation system designs providing local exhaust	✓	✓
HWB-03-01b_03	Drawings showing the locations with significant indoor pollution sources and associated ventilation system layouts	✓	✓
HWB-03-01b_04	Calculation indicating that the exhaust rate is achieved	✓	✓
HWB-03-01b_05	Photographs or drawings showing the location of the exhaust point	✓	✓

Remarks **(a) Additional Information**

[1] ANSI/ASHRAE Standard 62.1-2019. Ventilation for Acceptable Indoor Air Quality. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

(b) Related Credit Heads

HWB-03-05 Indoor Air Quality
Indoor air quality can be improved via dilution resulted by maintaining suitable ventilation rate.

8 Health and Wellbeing **HWB-03 Indoor Environmental Quality**

HWB-03-02 Waste Odour Control

This credit head is not applicable under BEAM Plus EDC.

8 Health and Wellbeing **HWB-03 Indoor Environmental Quality**

HWB-03-03 Acoustics and Noise

Extent of Application All DC

Objective To ensure the interior spaces of the DC are in comfortable acoustic environment.

Credit Point(s) Attainable 3

Credit Requirement

(a) Background Noise in Data Hall

1 credit point for demonstrating the internal noise levels at data hall areas are maintained at an appropriate level.

(b) Room Acoustics

1 credit point for demonstrating that the mid-frequency reverberation time in applicable rooms meets the prescribed criteria of different types of premises.

(c) Noise Isolation

1 credit point for demonstrating airborne noise isolation between rooms, spaces and premises fulfils the prescribed criteria.

Assessment

(a) Background Noise in Data Hall

1. Demonstrate that the internal noise level at data hall area is maintained at an appropriate level and meets the below criteria.

    1.1. 5 dB(A) better than First Action Level - a daily personal noise exposure (LEP, d) of 85 dB(A).

2. Compliance should be demonstrated by measurements depending on the applicant's preference. The acoustic measurement report should be endorsed by a Corporate Member of Hong Kong Institute of Acoustics or equivalent.

3. Site measurements should include all data halls, taking account into the worst case condition of exposure to noise sources to the space, and undertaken during periods appropriate to the usage pattern for the data hall.

4. Measurements shall conform to ISO 3382 or equivalent. The measurement locations should be evenly distributed within the data hall. Data hall without design (e.g. finishes, system) should provide endorsed acoustic calculation to support the potential achievement in both PA and FA submission.

5. The assessment should take into account noise from all IT equipment and building services equipment installed in data hall, under normal operation mode.

6. Compliance should be demonstrated by detailed calculations or measurements depending on the applicant's preference. The acoustic simulation, calculation or measurement report should be endorsed by:

   6.1. a Corporate Member of Hong Kong Institute of Acoustics; or

   6.2. a corporate/ certified/ full member of other international acoustic institution; or

   6.3. a member of HKIE (Building Services, Mechanical or Environmental discipline) with relevant experience in Acoustic/ Vibration Design

(b) Room Acoustics

1. The average reverberation time at office type premises for mid frequencies (500Hz, 1 kHz and 2 kHz), shall be 0.4 to 0.6s.

2. In case where criteria appropriate to the type and use of premises/ spaces are not stated herein, the Applicant shall provide evidence as to the suitability of the criteria adopted.

3. Compliance shall be demonstrated by detailed calculations or measurements depending on the Applicant's preference. The measurement report and/ or acoustic calculations shall be endorsed by a Corporate Member of Hong Kong Institute of Acoustics or equivalent.

4. The reverberation time shall be assessed using Sabine's formula or similar alternative taking into account the room details and appropriate assumptions about the materials in the space. Measurements during commissioning shall use the method given in ISO 3382 or equal equivalent. The assessment shall include at least one sample of each type of occupied space.

5. Compliance should be demonstrated by detailed calculations or measurements depending on the applicant's preference. The acoustic simulation, calculation or measurement report should be endorsed by:

   5.1. a Corporate Member of Hong Kong Institute of Acoustics; or

   5.2. a corporate/ certified/ full member of other international acoustic institution; or

   5.3. a member of HKIE (Building Services, Mechanical or Environmental discipline) with relevant experience in Acoustic/ Vibration Design

(c) Noise Isolation

1. Compliance shall be demonstrated by a) computer simulation, b) detailed calculations, or c) measurements depending on the Applicant's preference. The performance of the weighted Sound Reduction Index (SRI)/ Level Difference shall fulfil the requirements as stated in below table. The measurement report and/or acoustic calculations shall be endorsed by a Corporate Member of Hong Kong Institute of Acoustics or equivalent.

Type of Premises	Weighted SRI	Level Difference
Between offices/ conference rooms	R_w 44	$D_{nT,w}$ 38

2. In case where criteria appropriate to the type and use of premises/ spaces are not stated herein, the Applicant shall provide evidence as to the suitability of the criteria adopted.

3. Compliance should be demonstrated by detailed calculations or measurements depending on the applicant's preference. The acoustic simulation, calculation or measurement report should be endorsed by:

   3.1. a Corporate Member of Hong Kong Institute of Acoustics; or

   3.2. a corporate/ certified/ full member of other international acoustic institution; or

   3.3. a member of HKIE (Building Services, Mechanical or Environmental discipline) with relevant experience in Acoustic/ Vibration Design

(a) Background Noise in Data Hall

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-03a_00	BEAM Plus EDC submission template for HWB-03-03a	✓	✓
HWB-03-03a_01	Endorsed Data hall noise measurement report at representative locations with supporting documents including noise data of the installed IT equipment and Building Service Equipment in data hall	✓	✓
HWB-03-03a_02	Data hall noise measurement protocol	✓	✓
HWB-03-03a_03	CV of the professional as per requirements in the assessment	✓	✓

(b) Room Acoustics

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-03b_00	BEAM Plus EDC submission template for HWB-03-03b	✓	✓
HWB-03-03b_01	Endorsed Reverberation time measurement or calculation at representative locations with supporting documents of the absorption coefficients	✓	✓
HWB-03-03b_02	CV of the professional as per requirements in the assessment	✓	✓

(c) Noise Isolation

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-03c_00	BEAM Plus EDC submission template for HWB-03-03c	✓	✓
HWB-03-03c_01	Layout plan/ elevation drawings showing the location of the partition walls	✓	✓
HWB-03-03c_02	Construction details of the partition walls	✓	✓
HWB-03-03c_03	Endorsed Calculations/ Computer simulation results/ Field test measurement report endorsed by a Corporate Member of Hong Kong Institute of Acoustics or equivalent	✓	✓
HWB-03-03c_04	CV of the professional as per requirements in the assessment	✓	✓

Remarks

(a) Additional Information

Labour Department. Guidance Notes on Factories and Industrial Undertakings (Noise at Work) Regulation. [ONLINE] Available at: https://www.labour.gov.hk/eng/public/os/C/FIUNR.pdf [Accessed Aug 2021].

International Standard Organization – ISO 3382:2009 - Acoustics -- Measurement of room acoustic parameters.

British Standards Institution BS 8233 – Sound insulation and noise reduction for buildings – Code of Practice.

(b) Related Credit Heads

None.

8 Indoor Environmental Quality **HWB-03 Indoor Environmental Quality**

HWB-03-04 Indoor Vibration

Extent of Application All DC

Objective To avoid excessive vibration from building services, IT equipment and other external sources within the project boundary.

Credit Point(s) Attainable 1 Bonus

Credit Requirement 1 Bonus credit point for demonstrating the vibration levels not exceeding the prescribed criteria.

Assessment

1. Vibration generated from the building services system and IT equipment shall be in compliance with the criteria given in ISO 2631-2:2003 [1], BS 6472-1:2008 [2], BS 6472-2:2008 [3], Department of Environment and Conservation of NSW - Assessing Vibration: a technical guideline [4] or equivalent standard.

2. Measurements should be carried out at representative normally occupied spaces. The selection of sampling points shall be determined by the suitably qualified person. Vibration from emergency generator is excluded from assessment.

3. The level of vibration in terms of root mean square acceleration shall be determined by on-site measurement. Vibration source identified in the report should be justified. External sources that might impact a DC may include nearby railway, underground tunnel etc.

4. Calculation or measurement report should be endorsed by:

   4.1. a Corporate Member of Hong Kong Institute of Acoustics; or

   4.2. a corporate/ certified/ full member of other international acoustic institution; or

   4.3. a member of HKIE (Building Services, Mechanical or Environmental discipline) with relevant experience in Acoustic/ Vibration Design.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-04_00	BEAM Plus EDC submission template for HWB-03-04	✓	✓
HWB-03-04_01	Vibration measurement report with valid calibration certificate of instrumentations to demonstrate compliance	✓	✓

Remarks

(a) Additional Information

[1] International Standard Organisation. ISO 2631-2. Evaluation of human exposure to whole-body vibration – Part 2: Continuous and shock-induced vibration in buildings (1 to 80Hz).

[2] British Standard. BS 6472-1:2008. Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting.

[3] British Standard. BS 6472-2:2008. Guide to evaluation of human exposure to vibration in buildings Part 2: Blast-induced vibration.

[4] Department of Environment and Conservation of NSW Assessing Vibration: a technical guideline or equivalent standard 2006. [ONLINE]. Available at: http://www.epa.nsw.gov.au/resources/noise/vibrationguide0643.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

8 Health and Wellbeing **HWB-03 Indoor Environmental Quality**

HWB-03-05 Indoor Air Quality

Extent of Application All DC

Objective To demonstrate that airborne contaminants do not give rise to unacceptable levels of air pollution in the DCs.

Credit Point(s) Attainable 2

Credit Requirement 1 to 2 credit points for submitting a valid IAQ Certification Scheme, Good Class or Excellent Class certificate issued by the Environmental Protection Department (EPD) covering the whole DC.

Assessment Compliance shall be demonstrated by measurements by an IAQ Certificate Issuing Body (CIB) [1]. The measurement protocol, i.e. the measuring equipment used, duration of measurements, number of the sampling points, shall be made with reference to the latest version of the Environmental Protection Department (EPD)'s IAQ Certification Scheme.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-05_00	BEAM Plus EDC submission template for HWB-03-05	✓	✓
HWB-03-05_01	Valid IAQ Certificate covering the whole DC issued by EPD	✓	✓

Remarks

(a) Additional Information

[1] Indoor Air Quality Information Centre, Certificate Issuing Body Accreditation. [ONLINE]. Available at: http://www.iaq.gov.hk/en/iaq-certification-scheme/certificate-issuing-body-accreditation.aspx [Accessed Aug 2021].

Indoor Air Quality Management Group, the Government of the Hong Kong Special Administrative Region. Guidance Notes for the Management of Indoor Air Quality in Offices and Public Places. [ONLINE]. Available at: https://www.iaq.gov.hk/media/65346/new-iaq-guide_eng.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

8 Health and Wellbeing **HWB-03 Indoor Environmental Quality**

HWB-03-06 Thermal Comfort

Extent of Application All DC

Objective To ensure the specified thermal comfort conditions can be achieved under conditions of normal occupancy.

Credit Point(s) Attainable 2

Credit Requirement

(a) Temperature Profile in Data Hall

1 credit point for sustaining the air temperature at the design value within ±2.0°C when the air side system is operating at steady state under normal operation periods.

(b) Thermal Comfort in Normally Occupied Spaces

1 credit point for demonstrating an appropriate temperature (i.e. ≤25.5°C), relative humidity (i.e. ≤70%) and air velocity (≤0.3 m/s) in normally occupied spaces.

Assessment The measurement report shall be endorsed by an accredited Indoor Air Quality Certificate Issuing Bodies (CIB). The measurement protocols such as the equipment used, measurement methodologies, number of points required and the contents of the report shall in accordance with the latest version of Guidance Notes for the Management of Indoor Air Quality in Offices and Public Places issued by the Government of the Hong Kong Special Administrative Region.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-06_00	BEAM Plus EDC submission template for HWB-03-06	✓	✓
HWB-03-06_01	Measurement report endorsed by a CIB	✓	✓
HWB-03-06_02	Drawings showing the location of measurement locations and ventilation system layouts	✓	✓

Remarks

(a) Additional Information

Indoor Air Quality Management Group, the Government of the Hong Kong Special Administrative Region. Guidance Notes for the Management of Indoor Air Quality in Offices and Public Places. [ONLINE]. Available at: https://www.iaq.gov.hk/media/65346/new-iaq-guide_eng.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

7 Health and Wellbeing **HWB-03 Indoor Environmental Quality**

HWB-03-07 Artificial Lighting

Extent of Application All DC

Objective Promote indoor lighting design which is comfortable for occupants' indoor activities.

Credit Point(s) Attainable 2

Credit Requirement

(a) Artificial lighting in Data halls

1 credit point for achieving the prescribed lighting performance in Data halls.

(b) Artificial lighting in normally occupied spaces, not normally occupied spaces and unoccupied spaces

1 credit point for achieving the prescribed lighting performance in normally occupied spaces, not normally occupied spaces and unoccupied spaces.

Assessment

(a) Artificial lighting in Data halls

1. This credit head only assesses data hall areas with permanently installed lighting fixtures provided by the project owner. Data halls with fixtures, which are temporarily installed for Occupation Permit (OP) inspection purposes and out of the project owner's fit-out scope, are not assessed.

2. Demonstrate the achievement of the prescribed lighting performance in normally occupied spaces regarding the lighting performance criteria adopted based on The SLL Code for Lighting 2012 Section 2.2 [1]. If the task area is unknown by the time of design, assume the entire space, with 0.5m from walls, is the task area.

3. Demonstrate compliance with the assessment criteria including **maintained illuminance** and **Unified Glare Rating limit** either by measurements using a standardised measurement protocol appropriate to the parameter being assessed, or by modelling.

4. The following typical surface reflectance can be adopted. If different values are adopted, supporting documents (cut sheets / catalogues / laboratory reports) showing the corresponding information are required for justification.

Table HWB-03-07-1

Surfaces	Reflectance of surfaces
Ceiling	0.6
Walls	0.3
Working planes	0.2
Floor	0.1

5. Submit an Artificial Lighting Performance Report, including the following content:

    5.1. Technical details of the installed lighting systems;

    5.2. Design criteria for data hall; and

    5.3. Results of measurements or simulation.

(b) Artificial lighting in normally occupied spaces, not normally occupied spaces and unoccupied spaces

1. This credit only assesses indoor normally occupied spaces, not normally occupied spaces and unoccupied spaces with permanently installed lighting fixtures provided by the project owner. Spaces with fixtures, which are temporarily installed for Occupation Permit (OP) inspection purposes and out of the project owner's fit-out scope, are not assessed.

2. Demonstrate the achievement of the prescribed lighting performance in normally occupied spaces, not normally occupied spaces and unoccupied spaces regarding the lighting performance criteria adopted based on The SLL Code for Lighting 2012 Section 2.2.

3. Demonstrate compliance with the assessment criteria including maintained **illuminance, Unified Glare Rating limit and minimum illuminance uniformity** (requirement of illuminance uniformity only applicable to normally occupied spaces) either by measurements using a standardised measurement protocol appropriate to the parameter being assessed, or by modelling.

4. The following typical surface reflectance can be adopted. If different values are adopted, supporting documents (cut sheets / catalogues / laboratory reports) showing the corresponding information are required for justification.

5. Submit an Artificial Lighting Performance Report, including the following content:

    5.1. Technical details of the installed lighting systems;

    5.2. Design criteria for data hall; and

    5.3. Results of measurements or simulation.

Submittals **(a) Artificial Lighting in Data Hall**

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-07a_00	BEAM Plus EDC submission template for HWB-03-07a	✓	✓
HWB-03-07a_01	Summary of Artificial Lighting in data hall	✓	✓
HWB-03-07a_02	Lighting layout plan	✓	✓
HWB-03-07a_03	Catalogues or other supporting documents showing that the colour rendering index of the lighting system	✓	✓
HWB-03-07a_04	Lighting fitting schedule	✓	✓
HWB-03-07a_05	Artificial Lighting Performance Report	✓	✓

(b) Artificial Lighting in normally occupied spaces, not normally occupied spaces and unoccupied spaces

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-07b_00	BEAM Plus EDC submission template for HWB-03-07b	✓	✓
HWB-03-07b_01	Summary of Artificial Lighting in Normally Occupied Spaces, Not Normally Occupied Spaces and Unoccupied Spaces	✓	✓
HWB-03-07b_02	Lighting layout plan	✓	✓
HWB-03-07b_03	Catalogues or other supporting documents showing the reflectance value	✓	✓
HWB-03-07b_04	Light fitting schedule	✓	✓
HWB-03-07b_05	Artificial Lighting Performance Report	✓	✓

Remarks **(a) Additional Information**

[1] The Chartered Institution of Building Services Engineers (CIBSE) – The SLL Code for Lighting 2012

(b) Related Credit Heads

None

8 Health and Wellbeing **HWB-03 Indoor Environmental Quality**

HWB-03-08 Daylight

This credit head is not applicable under BEAM Plus EDC.

Health and Wellbeing	**HWB-03**	**Indoor Environmental Quality**
	HWB-03-09	**Biological Contamination**

Extent of Application All DC

Objective To reduce the risk of biological contamination from the operation of the HVAC and water systems.

Credit Point(s) Attainable 1

Credit Requirement 1 credit point for complying with the recommendations given in the Code of Practice for Prevention of Legionnaires' Disease 2021 Edition in respect of Water Supply Systems, HVAC Systems and other Water Features.

Assessment

Water Supply Systems

1. Demonstrate compliance, if relevant items are present, with the following sections of the Code of Practice for Prevention of Legionnaires' Disease 2021 Edition [1]:

    1.1. Centralised Hot Water Supply Systems – Section 4.4

    1.2. Cold Water Supply Systems – Section 4.5

HVAC Systems

2. Demonstrate compliance, if relevant items are present, with the following sections of the Code of Practice for Prevention of Legionnaires' Disease 2021 Edition:

    2.1. Cooling Tower – Section 4.2;

    2.2. Air Handling Unit / Fan Coil Unit – Section 4.3.1;

    2.3. Air Duct and Air Filters – Section 4.3.2;

    2.4. Humidifiers – Section 4.3.3; and

    2.5. Air Washers – Section 4.3.4.

Other Water Features

3. Demonstrate compliance, if relevant items are present, with the following sections of the Code of Practice for Prevention of Legionnaires' Disease 2021 Edition:

    3.1. Architectural Foundations – Section 4.6.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
HWB-03-09_00	BEAM Plus EDC submission template for HWB-03-09	✓	✓
HWB-03-09_01	Specifications of Water Supply Systems	✓	-
HWB-03-09_02	Schematic diagram of Water Supply Systems	✓	✓
HWB-03-09_03	Specifications of HVAC Systems	✓	-
HWB-03-09_04	Schematic diagram of HVAC Systems	✓	✓
HWB-03-09_05	Specifications of Other Water Features	✓	✓
HWB-03-09_06	Schematic diagram of Other Water Features with mark-up narratives	✓	✓
HWB-03-09_07	Drawing of installation details	-	✓

Remarks

(a) Additional Information

[1] Prevention of Legionnaires' Disease Committee, EMSD. Code of Practice for the Prevention of Legionnaires' Disease in Hong Kong 2021 Edition. [ONLINE]. Available at: https://www.emsd.gov.hk/filemanager/en/content_645/COP-PLD_2021_en.pdf [Accessed Aug 2021].

(b) Related Credit Heads

None

9 Innovations and Additions (IA)

BEAM Plus encourages innovative and/ or new techniques that are yet to find in the mainstream application in Hong Kong which address the sustainability objectives for EDC.

This section allows the Applicant to submit for consideration for the award of Bonus credit point(s) on any innovative techniques or performance enhancements which could create environmental benefits in addition to those already covered in this Manual.

The Applicant shall be solely responsible to submit quantitative evidence for BSL TRC review and approval.

Generally, the submission materials shall comprehensively detail the benefits, environmental impact averted, or exemplary performance achieved compared to existing criteria.

Note: The Applicant shall expressly state the full extent, scope, and coverage of the intended innovation submission.

9 Innovations and Additions **IA-01 Innovations and Additions**

IA-01-01 Innovations and Additions

Extent of Application All DC

Objective To encourage innovative and/ or new techniques/ practices/ design that are yet to find in the mainstream application in Hong Kong which address the sustainability objectives for existing DC.

Credit Point(s) Attainable Max. 10 Bonus

Assessment Present evidence of the application of new practices, technologies and/ or techniques that are (1) not described in this Manual; or (2) not market mainstream implementation; or (3) multiple aspect achievement; and the associated benefits in addressing sustainability objectives for existing DCs:

i) Identify the sustainability objectives addressed by the proposed innovative applications;

ii) Detail the method and criteria evaluating the benefits and effectiveness of the applications (quantifiable performance indicators to be proposed if applicable);

iii) Justify the number of Bonus credit points for the proposed applications;

iv) Provide evidence of the implementation of the applications; and

v) Evaluate preliminary achievements and any suggestion for improvement for the applications.

Submittals

Supporting Documents *Please provide softcopies with filename prefix as indicated on the leftmost column below.*		**PA**	**FA**
IA-01-01_00	BEAM Plus EDC submission template for IA-01-01	✓	✓
IA-01-01_01	A report on the objectives, evaluating method and criteria, and proposed number of BONUS credit points for the innovative techniques	✓	✓
IA-01-01_02	A report on the evidence of implementation and evaluation of preliminary achievements / proposed improvements for the innovative techniques	-	✓
IA-01-01_03	Relevant technical documents, if necessary (e.g. drawings, specifications, product catalogues, test reports, etc.)	✓	✓

Remarks

(a) Additional Information

None

(b) Related Credit Heads

None

10 Appendices 10.1 Glossary

Baseline
A line serving as the basis for comparison in Performance-based approach.

Building Management System
BMS uses computer-based monitoring to coordinate, organise, and optimise building control subsystems, including HVAC, lighting, equipment scheduling, and alarm reporting. Sometimes known as Building Automation System.

Chloro-fluorocarbons
CFCs cause ozone depletion when released into the atmosphere.

Commissioning
The process of putting building services systems into active service. This includes testing and adjusting HVAC, electrical, plumbing and other systems to assure proper balancing and adherence to design criteria, and instructing building representatives in their use.

FSC Certification
A certification system for timber products which confirms that timber has been harvested in a sustainable manner.

Global Warming Potential (GWP)
GWP provides a measure of the potential for damage that a chemical substance has relative to one unit of carbon dioxide, the primary greenhouse gas

Hydro-chlorofluorocarbons (HCFC)
HCFCs cause ozone depletion when released into the atmosphere.

Hydro-fluorocarbons (HFC)
HFCs are commonly used to replace HCFC refrigerants to reduce the Ozone Depleting Potential. However, HFCs refrigerants have a higher GWP.

Infiltration
Infiltration is uncontrolled air leakage into conditioned spaces through unintentional openings in ceilings, floors, and walls from unconditioned spaces or the outdoors.

MVAC
Mechanical ventilation and air-conditioning installations.

Normally Occupied Spaces
Normally occupied spaces are enclosed spaces where people normally stay more than 1 hour there. Examples include activity room, auditorium, classroom, conference room, exhibition hall, hotel guest room, hotel lobby, indoor sport hall, lecture theatre, library, office, restaurant, retail shop etc.

Not Normally Occupied Spaces

Not normally occupied areas are enclosed spaces where people normally stay less than 1 hour there. Examples include corridors, entrance and lift lobby, locker room, etc.

Ozone Depleting Potential (ODP)
ODP of a chemical compound is the relative amount of degradation to the ozone layer it can cause.

Potable Water
Water that is safe enough to be consumed by human beings, or used with low risk of immediate or long-term harm. Although the quality of water supplied to buildings in Hong Kong is strictly controlled, the quality of water drawn from consumers' taps may sometimes be affected by the condition of the inside plumbing system such as discolouration from rusty pipes. Consumers are responsible for proper maintenance of internal plumbing system and are required to engage a licensed plumber if the water quality is found to be affected due to the defects in the plumbing system.

Variable refrigerant flow
Variable refrigerant volume flow in a unitary air-conditioner where the cooling supply to the conditioned space is adjusted by modulating the flow of refrigerant.

Variable speed drive
A motor drive that controls the motor speed over a continuous range. This usually refers to the motor drive for HVAC's fans or pumps

10 Appendices

10.2 Assumptions and Baselines for Water Consumption

The following details the default assumptions for the calculation of the reduction in water use of the project building when compared with an equivalent baseline building.

Number of Working or Operational Days
The number of operational days per annum (Nop) should be obtained from the design brief or OPR.

The number of non-operational days is equal to 365 - Nop.

The same values of operational and non-operational days will be used for both the project building and the baseline building.

Occupancy Considerations
The number of occupants shall be taken from the design brief, or OPR. If the data is not obtainable then, in the absence of any other data, the occupant space allowance should be taken as 9m^2/person. [1]

The male to female ratio should be determined from the design brief or OPR. If the data is not available then the default assumptions shall refer to the latest version of PNAP ADV-28 [2].

The percentage of the disable persons inside the building can make reference to the latest data available from the Census and Statistics Department [3].

The same occupancy load shall apply to the project building and the baseline building.

Flow Rate Considerations
For the baseline value, the flow rate of the water appliance should be read as an absolute figure irrespective of the working pressure in predicting the water consumption. For the as-built case, working pressure should be considered when determining the flow rate of the water fixtures.

Hand Washing in Rest Rooms

i. Number of hand wash operations per occupant per day = 5
ii. Hand washing time = 10 seconds

For the baseline value, the tap flow rate is 6 litres/min.

1 Buildings Department. Code of Practice for Fire Safety in Buildings. 2011
2 Buildings Department. Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers. PNAP ADV-28 Provision of Sanitary Fitments in Offices, Shopping Arcades, Department Stores, Places of Public Entertainment, Cinemas and Other Public Places.
3 Census and Statistics Department. Social data Collected via the General Household Survey: Special Topics Report - Report No.62. Persons with disabilities and chronic diseases. Retrieved 1 August 2021, from http://www.censtatd.gov.hk/hkstat/sub/sp380.jsp?productCode=C0000055

Note that to obtain significant savings the project building would need to install automatic controls such as proximity sensors to reduce the tap operation time to less than the default assumption of 10 seconds per hand washing operation.

Water Use in Pantries/ Kitchen

i. Number of pantry tap operations per occupant per day = 1
ii. Baseline faucet flow rate for non-mixer taps shall be 6 litres/min
iii. Baseline faucet flow rate for mixing taps shall be 9 litres/min
iv. Duration of use = 15 seconds
v. Utensil washing operation carried out by hand = 6 litres of water per operation

Showers

i. Number of use of shower per occupant per day = 0.1
ii. The baseline shower flow rate = 9.5 litres/min
iii. The baseline bath pillar tap/ bath mixer tap flow rate = 15 litres/min
iv. Shower duration = 5 minutes (300 seconds)

Other Appliances/ Equipment

Justification for capacities of appliance/ equipment used in the benchmark building shall be provided by making reference to regulations, standards, guides and other publication published by relevant authorities.

The format of water saving calculation shall align with example below:

Device (Reference catalogue[(A)])	Duration of each operation (seconds)	Daily number of uses per occupant	Rated flow rate (litres/minute)		Estimated daily consumption per occupant (litres)	
			Baseline	As-built	Baseline	As-built
Toilet Tap (Model 123)	10	5	6	5	5	4.2
Pantry Mixing Tap (Model 456)	15	1	9	6	2.3	1.5
Estimated total daily consumption per occupant (litres)					7.3	5.7
Number of occupants[(B)]					30	
Number of day					365	
Estimated total annual consumption (litres)					79,388	62,050
% of water saving:					21.8%	
Credit Anticipated:					3 credits	

Note:

(A) Reference catalogues or manufacturer specification should show device type, model number, flow rate and WELS label (if provided) as substantiation to the information filled in the calculation, where important information in the reference catalogues or manufacturer specification shall be highlighted or circled for easy identification.

(B) The number of occupants shall be taken from the design brief or OPR. If this data is not obtainable then, in the absence of any other data, the occupant space allowance should be reference to the Occupancy Considerations as shown above.

In the calculation, each type of water using device shall be listed and all data used shall be referenced to the source. The calculation shall include water taps for basin, pantry, kitchen, bath and also shower heads but exclude water closet, urinal, water features, appliance and irrigation. There should be separate entries for water use in male and female facilities.

10 Appendices

10.3 Space Type

BEAM Plus considers indoor environmental quality (IEQ) as a key to sustain occupants' health and wellbeing. To assist the applicant in designing a more thorough and satisfactory IEQ strategies, BEAM Plus imposes high requirements on indoor environmental quality covering ventilation, air quality, acoustics and lighting.

As the impacts of IEQ are dependent on the level of interaction between the occupants and the indoor spaces where they spend their time in, it is crucial for the applicant to understand and identify the level of usage of each indoor space. To facilitate assessment, the applicant should prepare a schedule including all spaces present within the building and their respective location. The spaces should be categorised into the following three space types (refer to Glossary for definitions):

- *Normally occupied spaces*
- *Not normally occupied spaces*
- *Unoccupied spaces*

Listed below are some examples of each space type. These examples are not exhaustive. If a space present in the Applicant's DC is not included below, the applicant should identify similar examples or categorise the space type according to the definition.

Justification is required should the Applicant believes a space cannot be categorised according to the space type definitions.

Space Usage of *normally occupied spaces*

- Auditorium
- Concourse
- Conference room
- Kitchens (commercial)
- Food and beverage dining area
- Front desk
- Gymnasium
- Meeting room
- Open office
- Private office
- Reception
- Gallery area
- Information desk

Space Usage of *not normally occupied spaces*

- Break room
- Copy rooms
- Corridor
- Entrance lobby (other than hotel)
- Staircases
- Lift lobby
- Pantry
- Toilet

Space Usage of *Unoccupied spaces*

- Emergency exit corridor
- Mechanical and electrical rooms
- Car park
- Store room
- Warehouse