IGBC Rating System for Green Service Buildings

(Including Small Office Buildings)

Pilot Version

Abridged Reference Guide

May 2020

IGBC

Confederation of Indian Industry
125 Years: 1895-2020

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Foreword from the Indian Green Building Council (IGBC)

The Indian Construction sector is witnessing tremendous growth in infrastructure and buildings. As the sector is growing rapidly, preserving the environment poses a host of challenges. To enable the construction industry environmentally sensitive, CII-Sohrabji Godrej Green Business Centre has established the Indian Green Building Council (IGBC). IGBC, is a consensus driven not-for-profit Council, represents the building industry, consisting of more than 1,712 committed members. The Council encourages, builders, developers, owners, architects and consultants to design & construct green buildings, thereby enhancing the economic and environmental performance of buildings.

The Green Building Movement in India has been spearheaded by IGBC since 2001, by creating awareness amongst the stakeholders. Thus far, the Council has been instrumental in enabling 7.13 Billion sq.ft. of green buildings in the country. The Council's activities have enabled a market transformation with regard to the green building materials and technologies.

IGBC continuously works to provide tools that facilitate the adoption of green building practices in India. The development of IGBC Green Service Buildings rating system is another important step in this direction.

Acknowledgements

The IGBC Green Service Buildings rating system Abridged Reference Guide has been made possible through the efforts of many dedicated volunteers, staff members and others in the IGBC community. Excellent inputs came in during 'Call for Public Comments' in February & March 2020. IGBC places on record its sincere thanks to the participating organisations and individuals who enthusiastically volunteered in development of the rating system.

IGBC would like to thank the following Organisations (as on April 2020) for their participation and contribution in developing the rating programme:

- Adani Electricity
- AEON Integrated Building Design Consultants LLP
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- ECO 360
- Enviro Consultancy LLP
- Environmental Design Solutions Pvt. Ltd. (EDS Global)
- Design2Occupancy Services LLP
- Godrej & Boyce Mfg. Co. Ltd.
- Indian Oil Corporation Limited
- Kalpakrit Sustainable Environments Pvt. Ltd.
- Kamal Cogent Energy Pvt. Ltd.
- Larsen & Toubro
- Meinhardt EPCM India Private Limited
- PEC solutions Green Designs Private Ltd
- Reliance Petroleum Limited
- Studio SA

I. Introduction

The building sector in India is growing at a rapid pace and contributing immensely to the growth of the economy. This augurs well for the country and now there is an imminent need to introduce green concepts & techniques in this sector, to optimise the use of resources and aid growth in a sustainable manner.

The green concepts and techniques in the building sector can help address national issues like water efficiency, energy efficiency and reduction in fossil fuel use for commuting, handling of consumer waste and conserving natural resources. Most importantly, these concepts can enhance occupant health, productivity and well-being.

Against this background, the Indian Green Building Council (IGBC) has launched 'IGBC Green Service Buildings rating system' (Pilot Version) to address these priorities in service buildings (such as Petro stations, Police stations, Sub stations, Bus stations, Fire stations) and small office buildings.

II. Benefits of Green Service Buildings

IGBC Green Service Buildings rating programme is a simplified tool which enables the projects to apply green concepts and reduce environmental impacts.

The service buildings including small office buildings can have excellent benefits, both tangible and intangible. The most tangible benefits are the reduction in water and energy consumption right from day one of occupancy. The energy savings could range from 20-30% and potable water savings around 30-40%. The intangible benefits include enhanced air quality, excellent daylighting, awareness on green concepts and conservation of scarce national resources.

III. IGBC Green Service Buildings Rating System

A. Features

The objective of IGBC Green Service Buildings rating system is to facilitate a holistic approach to make service buildings and small office buildings environment friendly, through architectural design, water conservation, energy efficiency, effective handling of waste, sustainable building materials and health & well-being of occupants.

The rating system evaluates certain mandatory requirements & credit points using simplified calculations.

B. Scope

- IGBC Green Service Buildings rating system is designed for both new & existing buildings with built-up area:
    - Petro stations, Police stations, Sub stations, Bus stations, Fire stations: ≤ 2,500 sq.m and 3 floors (habitable) or less, for each building.
    - Offices, Banks, Healthcare, Retail, Mixed-use office buildings: ≤ 1,500 sq.m and 3 floors (habitable) or less, for each building.
        - Healthcare buildings with out-patient services only

  Note: Projects which comply with IGBC Service Buildings or other suitable IGBC rating systems (E.g. New Buildings, Existing Buildings, etc), such projects can opt for a most suitable IGBC rating system.
- Service Buildings include (but are not limited to) Petro/Gas stations, Receiving sub stations, Police Stations, Bus stations, Fire stations, Offices, Retail, Banks, Healthcare.
    - Building types such as residential, schools, factory buildings, etc. will be covered under other suitable IGBC rating programmes.
- The rating system is applicable to owner-occupied/ mixed-use permanent buildings with at least one occupant.
    - Tenant occupied areas in mixed-use buildings (such as retail spaces and residential areas) shall not be more than 35% of the built-up area.
- The rating awarded to the project would be based on the building typology.
  E.g. for Petro Stations - "IGBC Green Petro Station" and the same would be mentioned on Plaque and Certificates
- Precertification is not offered under this rating system.
- New buildings are those which are in operation for less than one year.
- Existing buildings are those which are in operation for more than one year.
- Major renovation in buildings includes, but not limited to, major renovation of external façade (wall and glazing), interiors, lighting and HVAC systems.
- The rating system is applicable for buildings with enclosed and habitable spaces.

C. Validity

The rating awarded for IGBC Green Service Buildings would be valid for a period of 3 years. Thereafter, the building has to apply for re-certification with the prevailing version. The building can also apply for re-certification/ renewal within 3 years of award of the rating for a superior rating, if new green features are implemented or existing green features are enhanced in the building. The recertification/ renewal of new projects will be considered under Existing Buildings category.

IV. The Future of IGBC Green Service Buildings Rating System

Many new green building materials, equipment and technologies are being introduced in the market. With continuous upgradation and introduction of newer green technologies and products, it is important that the rating programme also keeps pace with current standards and technologies.

Therefore, the rating programme will undergo periodic revisions to incorporate the latest advancements and changes. It is important to note that the project teams applying for IGBC Green Service Buildings rating system should register their projects with the latest version of the rating system. During the course of implementation, projects have an option to transit to the latest version of the rating system.

IGBC will highlight new developments on its website (www.igbc.in).

V. Overview and Process

IGBC Green Service Buildings rating system (Pilot version) addresses green features under the following categories:

- Site Planning and Design
- Water Conservation
- Energy Efficiency
- Building Materials and Resources
- Health and Well-being
- Green Measures Beyond the Fence
- Innovation and Performance

The guidelines detailed under each mandatory requirement & credit, enables the design, construction and renovation of new & existing buildings (as defined in scope). Different levels of green building certification are awarded based on the total credits earned. However, every service building/ small office building should meet certain mandatory requirements, which are non-negotiable.

The various levels of rating awarded are as below:

Certification Level
Certified
Silver
Gold
Platinum

A. When to use IGBC Green Service Buildings Rating System

IGBC Green Service Buildings rating system (Pilot version) is designed primarily for service buildings upto 2,500 sq.m built-up area and small office buildings upto 1,500 sq.m built-up area. For further details on when to use this rating systems, please refer the Scope in introduction.

The project team can evaluate all the possible points to apply under the rating system using a suitable checklist i.e. New buildings and Existing buildings. The project can apply for IGBC Green Service Buildings rating system certification, if the project can meet all mandatory requirements and achieve the minimum required points.

B. Registration

Organisations interested in registering their projects under IGBC Green Service Buildings rating system Certification are advised to first register with IGBC. The website includes information on registration fee for IGBC member organisations as well as non-members.

Registration is the first step which helps establish initial contact with IGBC and provides access to the required documents and important communications, along with other necessary information. IGBC website provides all important details on IGBC Green Service Buildings rating system registration & certification - process, timeline and fee.

C. Certification

To achieve the IGBC Green Service Buildings rating, the project must satisfy all the mandatory requirements and the minimum number of credit points.

The project team is expected to provide supporting documents at preliminary and final stage of submission, for all the mandatory requirements and the credits attempted.

The project needs to submit the following:

1. General information about project, including
   a. Project brief stating project type, different type of spaces, occupancy (permanent & transient), number of floors, area statement, etc.,
   b. General drawings (in PDF format only):
      i. Master/ Site plan
      ii. Parking plans
      iii. Floor plans
      iv. Elevations
      v. Sections

c. Photographs taken at various stages of the project

2. Narratives and supporting documentation such as drawings, calculations (in excel sheets), declarations/ contract documents, purchase invoices, manufacturer data sheets/ letters/ material test reports, etc., for each mandatory requirement and credit.

The project documentation is submitted in two phases - Preliminary submittal and Final submittal.

Preliminary phase involves submission of all documents, which shall include the mandatory requirements and the minimum number of credits. After the preliminary submission, review is done by third-party assessors and review comments would be provided within 30 calendar days. The next phase involves submission of clarifications to preliminary review queries and final submittal. This review will be provided within 25 calendar days, after which the rating is awarded.

It is important to note that the mandatory requirements and credits earned at the preliminary review are only considered as expected. These mandatory requirements and credits are not awarded until the final documents are submitted, along with additional documents showing implementation of design, construction and operational features, as applicable. If there are changes in any 'expected credits' after preliminary review, these changes need to be documented and resubmitted during the final review. Before the release of final review along with the IGBC rating, a site visit is carried out by IGBC to verify the green features implemented in the project.

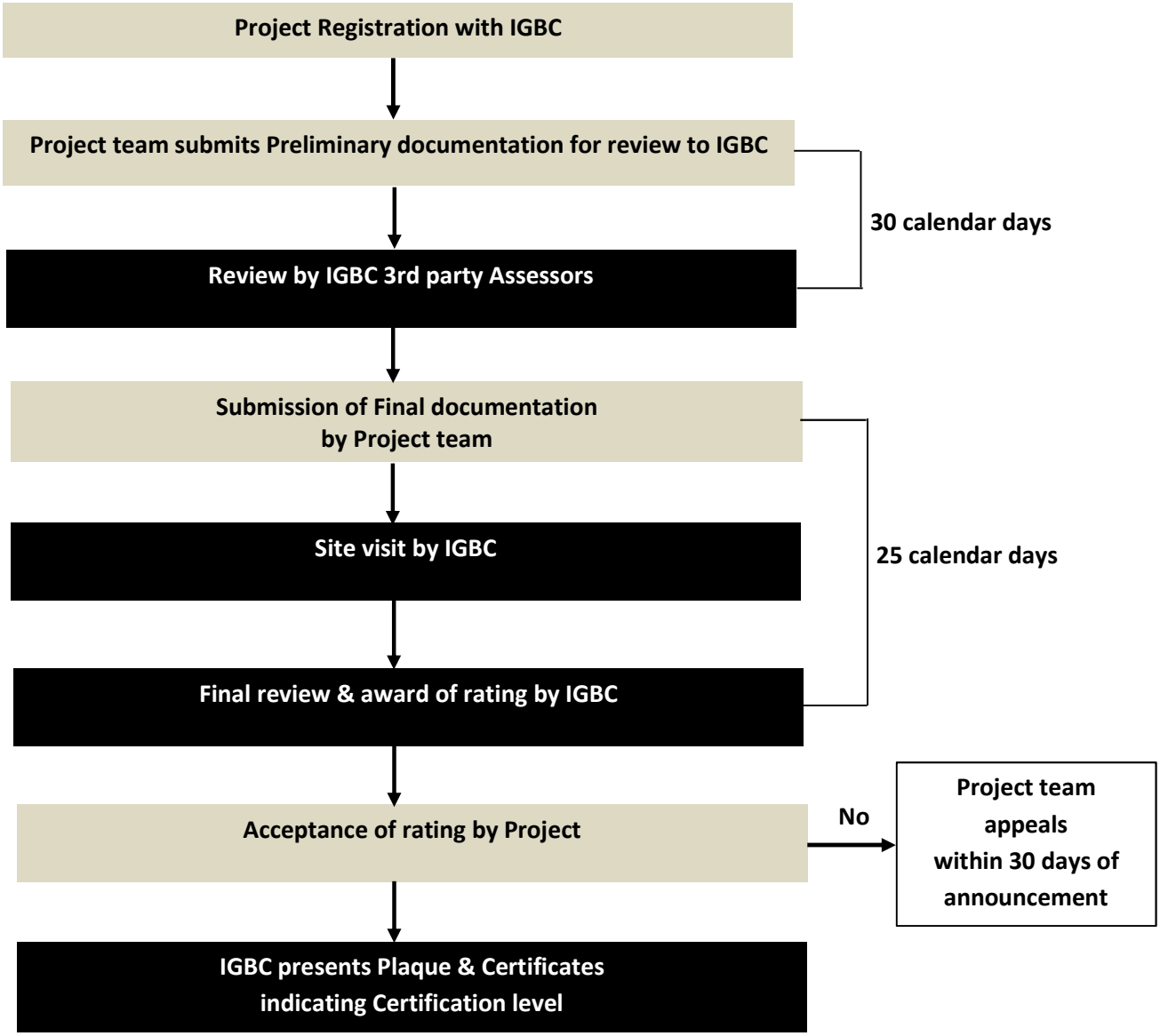
The threshold criteria for certification levels are as under:

Certification Level	New Buildings	Existing Buildings
Certified	30 - 35	25 – 29
Silver	36 - 41	30 - 34
Gold	42 – 50	35 – 42
Platinum	51 - 60	43 - 50

IGBC will recognise Green Service Buildings which achieve one of the rating levels with a formal letter of certification and a mountable plaque.

Note: The rating awarded to the project would be based on the building typology.
E.g. for Petro Stations - "IGBC Green Petro Station" and the same would be mentioned on Plaque and Certificates

Certification Process



D. Credit Interpretation Ruling (CIR)

In some instances, there is a possibility that the design/ construction/ operations team may encounter certain challenges in applying or interpreting a mandatory requirement or a credit. It can also happen in cases where the project can opt to achieve the same intent through a different compliance route.

To address this, IGBC uses the process of Credit Interpretation Ruling (CIR) to ensure that interpretations are consistent and applicable to other projects as well.

The following are the steps to be followed in case the project team encounters any difficulty:

- Refer the Abridged Reference Guide for description of the credit intent and compliance options.
- Review the intent of the mandatory requirement / credit and self-evaluate whether the project satisfies the intent.
- Review the Credit Interpretation Ruling web page for previous CIR's, if available, on the relevant mandatory requirement or credit. All projects registered under IGBC Green Service Buildings rating system will have access to this page.
- If a similar CIR has not been addressed or does not answer the question sufficiently, submit a credit interpretation request. Only registered projects are eligible to post credit interpretation request. Two CIRs are answered without levying any fee, and for any CIR beyond the first two CIRs, a fee is levied.

E. Appeal

In rare cases, mandatory requirements/ credits get denied due to misinterpretation of the intent. On receipt of the final review and if the project team feels that sufficient grounds exist to appeal a credit denied in the final review, the project has an option to appeal to IGBC for reassessment of denying mandatory requirements/ credits. The documentation of the mandatory requirements/ credits seeking appeal may be resubmitted to IGBC along with necessary fees. IGBC will take 15 calendar days to review such documentation. If an appeal is pursued, please note that a different review team will be assessing the appeal documentation. The following documentation should be submitted:

1. General information about project, including
   a. Project brief stating project type, different type of spaces, occupancy, number of floors, area statement, etc.,
   b. General drawings (in PDF format only):
      i. Master/ Site plan
      ii. Parking plans
      iii. Floor plans
      iv. Elevations
      v. Sections
   c. Photographs taken at various stages of construction

2. Resubmittal and appeal submittal documentation for only those mandatory requirements / credits that the project is appealing for. Also, include a narrative for each appealed mandatory requirement / credit to describe how the documents address the reviewers comments and concerns.

F. Fee

Registration and Certification fee details are available on the IGBC website (www.igbc.in) or can be obtained from IGBC (igbc@cii.in).

G. Updates and Addenda

As the rating system continues to improve and evolve, updates, addenda and errata to the abridged reference guide will be made available through IGBC website. The additions thereof will be suitably incorporated in the next version of the rating system.

CHECKLIST

IGBC Green Service Buildings Rating System Checklist		Points Available	
		New Buildings	Existing Buildings
Modules		**60**	**50**
Site Planning and Design		**7**	**7**
SPD MR 1	Local Building Regulations	Mandatory	Mandatory
SPD Credit 1	Erosion and Sedimentation Control	1	1
SPD Credit 2	Sustainable Landscape	3	3
SPD Credit 3	Heat Island Reduction, Non-roof and Roof	2	2
SPD Credit 4	Green Education	1	1
Water Conservation		**8**	**7**
WC MR 1	Rainwater Harvesting, Roof	Mandatory	Mandatory
WC MR 2	Water Efficient Plumbing Fixtures	Mandatory	Mandatory
WC Credit 1	Rainwater Harvesting, Roof	4	3
WC Credit 2	Water Efficient Plumbing Fixtures	3	3
WC Credit 3	Water Metering	1	1
Energy Efficiency		**20**	**20**
EE MR 1	Minimum Energy Efficiency	Mandatory	Mandatory
EE Credit 1	Passive Architecture	3	3
EE Credit 2	Enhanced Energy Efficiency	10	10
EE Credit 3	On-site Renewable Energy	5	5
EE Credit 4	Energy Saving Appliances	1	1
EE Credit 5	Energy Metering	1	1
Building Materials and Resources		**8**	**1**
BMR MR 1	Segregation of Waste, Post-occupancy	Mandatory	Mandatory
BMR Credit 1	Green Procurement Policy	NA	1
BMR Credit 2	Use of Eco-labelled Building Materials, Products & Equipment	3	NA
BMR Credit 3	Alternative Construction Technologies & Materials	3	NA
BMR Credit 4	Alternate Wood-based Materials	1	NA
BMR Credit 5	Handling of Waste Materials, During Construction	1	NA

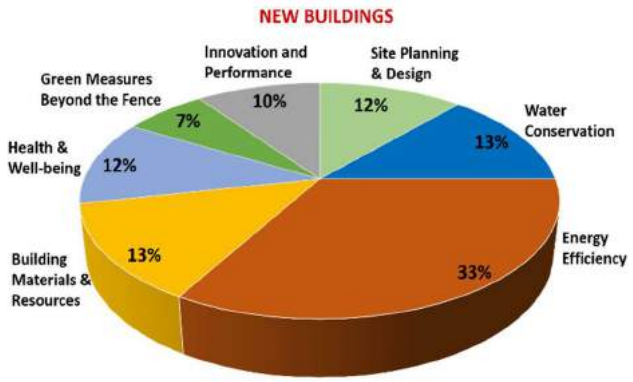
** NA - Not Applicable*

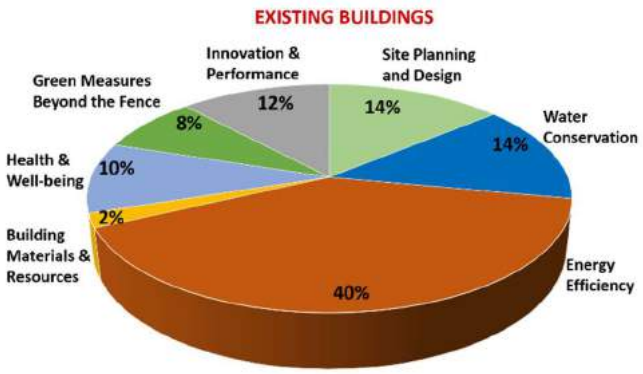
Health and Well-being		**7**	**5**
HWB MR 1	Minimum Fresh Air Ventilation	Mandatory	Mandatory
HWB MR 2	No Smoking Premises	Mandatory	Mandatory
HWB Credit 1	Daylighting	2	2
HWB Credit 2	Low-emitting Materials	1	NA
HWB Credit 3	Eco-friendly Housekeeping Chemicals	1	1
HWB Credit 4	Access to Quality Drinking Water	1	1
HWB Credit 5	Eco-friendly Refrigerants	1	NA
HWB Credit 6	Universal Design	1	1
Green Measures Beyond the Fence		**4**	**4**
GM Credit 1	Green Measures Beyond the Fence	4	4
Innovation and Performance		**6**	**6**
IP Credit 1	Innovation in Design Process	4	4
IP Credit 2	Water and Energy Performance	NA	1
IP Credit 3	Green Measures Cost Analysis	1	NA
IP Credit 4	IGBC Accredited Professional	1	1

** NA - Not Applicable*

The threshold criteria for Certification levels are as under:

Certification Level	New Buildings	Existing Buildings
Certified	30 - 35	25 - 29
Silver	36 - 41	30 - 34
Gold	42 - 50	35 - 42
Platinum	51 - 60	43 - 50





SITE PLANNING AND DESIGN

Local Building Regulations

SPD Mandatory Requirement 1

Intent:

Ensure that the building complies with necessary statutory and regulatory codes.

Compliance Options:

The project shall comply with following statutory approvals from the Government of India or State Government authorities, as applicable:

- Approved site plan and building plans for construction
- Occupancy certificate from Local Authority (OR) Status of completion or Completion certificate signed by Architect

Erosion and Sedimentation Control Points: 1

SPD Credit 1

Intent:

Control soil erosion and sedimentation, thereby, reducing negative impacts to the site and surroundings.

Compliance Options:

Implement the following measures, as applicable:

- Soil erosion control measures taken before, during and after construction (post-occupancy) must conform to the best management practices highlighted in the National Building Code (NBC) of India 2016, Part 10 - Landscape Development, Signs and Outdoor Display Structures, Section 1 - Landscape Planning and Design and Development, Chapter 11 - Protection of Landscape During Construction
- Fertile topsoil (10-20 cm) to be stockpiled prior to construction, for future reuse or donation, as per NBC 2016 guidelines. *(Not applicable for existing buildings)*
- Develop appropriate measures to address soil erosion, such as desilting chambers, sediment traps, after occupancy.
    - Install oil and grease traps at petrol stations, bus stations and other buildings, as applicable, to prevent the water contamination.

Notes:

- *If the topsoil in the project is not fertile (or) suitable for preservation, in such a case the project may provide relevant justification.*
- *Donation of substantial quantity of fertile topsoil could be to other projects, nurseries and farmers.*

Sustainable Landscape Points: 3

SPD Credit 2

Intent:

Minimise disturbances or restore the site so as to reduce long-term negative environmental impacts, thereby promoting habitat and biodiversity.

Compliance Options:

Case A: Natural Topography and Vegetation (2 points)

Avoid disturbance to the site by retaining natural topography (and/ or) design vegetated spaces on the ground and/ or over built structures, including vertical gardening, for at least 12.5% of the site area.

Points are awarded as below:

Percentage of Site Area with Natural topography/ Vegetation on the ground and over built structures	Points
≥ 12.5%	1
≥ 15%	2

Notes:

- *Retaining 'Natural Topography' in its broad sense means preserving the natural features of the terrain such as exposed natural rocks, water body, etc.,*
- *Development footprint includes building footprint and other hardscapes areas such as parking, footpaths, walkways, roads, grass medians, grass pavers, etc.,*
- *Only native/ adaptive vegetation shall be considered for the areas covered with shrubs and trees, for this credit calculation. However, area covered with turf should be limited to 25% of the vegetated area.*
- *Vegetation/ Soft landscape shall not be designed with monoculture plant species, since such species would not promote habitat and biodiversity.*
- *Vegetation on the ground as well as vegetation over built structures such as roofs, basement, podiums, etc., can be considered.*
- *Vertical Landscaping on the external walls can also be considered for this credit calculation. Plantation of Creepers would not be considered, as creepers are not permanent throughout the year unlike trees/ shrubs.*
- *Partially vegetated areas and disturbed site areas such as grass pavers, grass medians are considered as site disturbances and shall not be considered.*
- *Potted plants shall not be considered as vegetation.*
- *Artificial vegetation shall not be considered.*

(And/ Or)

Case B: Plantation of Tree Saplings (1 point)

Plant tree saplings that can mature into grown-up trees with medium to large canopy in the next 5 to 8 years on the project site, as per the criteria given below.

Note:

- *The project team can consider existing and transplanted trees within the project site to demonstrate compliance.*

Criteria for Plantation of Tree Saplings
(Including existing and transplanted trees)

Site Area	Number of Tree Saplings (Including Existing and Transplanted Trees)
For every 500 sq.m	4 or more

Exemplary Performance:

The project is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if more than 17.5% of the site area is restored and/ or designed with vegetated spaces on the ground and over built structures including vertical gardening.

Heat Island Reduction, Non-Roof and Roof Points: 2

SPD Credit 3

Intent:

Minimise heat island effect so as to reduce negative impact on micro-climate.

Compliance Options:

❖ **Case A: Non-roof Impervious Areas (1 point)**

Provide one or combination of the following, for at least 50% of exposed non-roof impervious areas within the project site:

- Shade from existing tree cover/ newly planted saplings that can mature into grown-up trees with medium to large canopy in the next 5 to 8 years
- Open grid pavers or grass pavers
- Hardscape materials with SRI of at least 29 (and not higher than 64)

Points are awarded as below:

Non-roof Impervious Area as a Percentage of Total Non-roof Area	Points
≥ 50%	1

Notes:

- *Non-roof impervious areas include, but not limited to, footpaths, pathways, roads, driveways, uncovered surface parking, and other impervious areas.*
- *Trees / Saplings shall be in place at the time of occupancy.*
- *SRI values of reflectance materials shall be as per ASTM Standards.*
- *SRI materials that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC, can be used by the project to show compliance.*
- *Exposed non-roof area need not include service areas such as DG sets, transformer, STP etc.,*

(And/ Or)

❖ Case B: Roof Area (1 point)

Use material with a high solar reflective index (and/ or) vegetation to cover at least 95% of the exposed roof area, including covered parking.

Note:

- *Material with high solar reflectance index (SRI) include white / light coloured broken China mosaic tiles or white cement tiles or other high reflective materials / coatings.*

Minimum Solar Reflective Index (SRI) values for different roof types are provided below:

Table 1 - Solar Reflective Index (SRI) values for different roof types

Roof Type	Slope	Minimum SRI Value	Maximum SRI Value
Low-sloped roof	≤ 2:12	78	-
Steep-sloped roof	> 2:12	29	64

Points are awarded as below:

Percentage of roof area covered with High Reflective Material and/ or Vegetation	Points
≥ 95%	1

Notes:

- *All roof areas, including podium, covered surface parking, utility blocks and areas covered with solar photovoltaic & solar water heaters, which are exposed to the sky (at and above ground level) shall be considered for this credit calculation.*
- *Exposed roof area need not include equipment platforms, skylights, driveways, roads, play areas, etc.*
- *The compliance for SRI value shall be for a newly coated paint.*
- *Artificial vegetation shall not be considered.*
- *SRI values of high reflectance materials shall be as per ASTM Standards. Broken China mosaic tiles are exempted from showing SRI value.*
- *SRI materials that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC, can be used by the project to show compliance.*

Exemplary Performance:

The project is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if more than:

- 95% of exposed non-roof impervious areas are under tree cover (and / or) with open grid pavers / grass pavers (and / or) hardscape materials with an SRI of at least 29 (and not higher than 64).

  (Or)

- 95% of the exposed roof area is covered with vegetation only.

Green Education Points: 1

SPD Credit 4

Intent:

Promote green education by involving building occupants and visitors, to increase awareness levels on eco-friendly practices.

Compliance Options:

- Demonstrate compliance through atleast two of the following green education activities/ programmes, to increase awareness on eco-friendly practices to the building occupants and visitors:
  - Develop promotional materials (posters, brochures, etc.,) and information portal with green concepts
  - Install permanent educational signage in common areas of the building with green concepts such as Go green, save earth; Water is precious, save it; Turn off lights, when not in use; Say no to mixed waste; Plant a tree, save the environment, etc.
  - Organise atleast two outreach/ educational programmes in a year on eco-friendly practices/ green initiatives.

    The outreach/ educational programmes can include, but not limited to, clean & green, water conservation, energy conservation, waste segregation & recycling, use bio-degradable plastic/ avoid single use plastic, air pollution, world green building week and earth hour.

(And)

- Constitute a formal sustainability committee/ team within the organisation/ project team, to identify and implement green initiatives within and/or outside the project.
- Develop project specific green building renovation guidelines providing information that helps facilities team to implement green features, during the building renovation process.

Exemplary Performance:

This credit is not eligible for exemplary performance.

WATER CONSERVATION

Rainwater Harvesting, Roof

WC Mandatory Requirement 1

Intent:

Enhance ground water table and reduce municipal water demand through effective rainwater management.

Compliance Options:

❖ **Case A: Rainwater Harvesting, Roof**

Design rainwater harvesting system to capture at least 'one-day rainfall*' runoff volume from roof areas.

** One-day rainfall can be derived from 'percentage of average peak month rainfall' given in Table - 2.*

Rainfall Information:

- *For rainfall information, refer Indian Metrological Department data → Customized Rainfall Information System (CRIS) → Rainfall Statistics → District Wise Rainfall Last 5 years* http://hydro.imd.gov.in/hydrometweb/(S(vcenta45dxa4dpbpffd3ud3g))/DistrictRaifall.aspx
  - *Choose the state and district from the dropdown boxes, to populate the rainfall data of the district (project's location)*
  - *To arrive at average peak month rainfall, consider an average of minimum last 5 years peak month rainfall (of the respective year).*

Table 2 - Criteria to arrive at 'One-day Rainfall'

S No	Average Peak Month Rainfall (in mm)	One-day Rainfall (% of Average Peak Month Rainfall)
1	Upto 250	9%
2	251 – 350	7.5%
3	351 – 500	6%
4	501 – 700	4.5%
5	701 & above	3%

❖ **Case B: High Ground Water Table**

In areas where the Central / State Ground Water Board does not recommend artificial rainwater recharge (or) if the groundwater table is less than 8 meters, the project is required to provide justification for not implementing rainwater harvesting system.

Notes:

- *Consider Rainwater Harvesting Guidelines from the National Building Code (NBC) of India 2016, Part 11 - Approach to Sustainability, Section 7.2 - Rainwater Harvesting-Surface Runoff.*
- *In areas where the water percolation is limited, collection tanks may be provided to meet the above requirement.*
- *Filtering of suspended solids/ sediments shall be ensured by providing suitable filtering media before letting the water into the collection tanks, water bodies, municipal storm water drains.*

Run-off co-efficient for typical surface types are listed below:

Table 3 - Run-off co-efficient for Typical Surface Types (Roof areas)

S No	Surface Type	Run-off Co-efficient
1	Cemented / Tiled Roof	0.95
2	Corrugated GI Sheets	0.95
3	Roof Garden (<100 mm thickness)	0.5
4	Roof Garden (100 – 200 mm thickness)	0.3
5	Roof Garden (201 – 500 mm thickness)	0.2
6	Roof Garden (> 500 mm thickness)	0.1

Water Efficient Plumbing Fixtures

WC Mandatory Requirement 2

Intent:

Enhance efficiency of plumbing fixtures, thereby minimising potable water use.

Compliance Options:

Use water efficient plumbing fixtures (as applicable) whose flow rates meet the baseline criteria in aggregate. The total annual water consumption from the plumbing fixtures should not exceed the total base case water consumption computed.

Note:

- *Use of treated wastewater/ captured rainwater shall not be considered to show water savings.*

The baseline criteria is as below:

Table 4 - Baseline Flow Rates / Consumption for Plumbing Fixtures

Fixture Type	Maximum Flow Rate / Consumption	Duration	Estimated Daily Uses per FTE **
Water Closets (Full-flush)	6 LPF	1 flush	1 for male; 1 for female
Water Closets (Half-flush)	3 LPF	1 flush	2 for female
Urinals	4 LPF	1 flush	2 for male
Faucets / Taps*	6 LPM	15 seconds	4
Health Faucet*	6 LPM	15 seconds	1
Showerhead / Handheld Spray*	10 LPM	8 minutes	0.1

Source: Uniform Plumbing Code – India

* *Reporting pressure for these fixtures shall be at 3 bar.*

*** Full Time Equivalent (FTE) represents a regular building occupant who spends 8 hrs per day in the building. Part-time or overtime occupants have FTE values based on their hrs per day divided by 8.*

Notes:

- *Water fixtures do not include irrigation systems.*
- *Faucets / Taps installed for hand wash in rest rooms and canteen shall be considered; whereas, faucets / taps installed for dish washing and washing clothes need not be considered.*
- *In existing buildings, flow rates of the water fixtures can be measured on-site through weighted average approach and report the flow rates.*
- *Rain showers (if any) need to be considered in the calculations under Showerhead.*
- *If the project has residential space with showerheads, in such case the daily use per occupant shall be considered as 1.*
- *The baseline flows can be demonstrated at a flowing water pressure of 3 bar. Flowing water pressure of 3 bar does not mean that the water supply in the building is at 3 bar. The building fixtures can operate at lower pressures; however, to show compliance under this credit, the design flow rates are to be submitted at 3 bar.*
- *Default occupancy shall be considered as 50% for male and female.*
- *FTE occupancy shall be considered in the calculation, including visitors.*
- *Plumbing fixtures that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC, can be used by the project to show compliance.*

Rainwater Harvesting, Roof

Points: 4 for New Buildings
Points: 3 for Existing Buildings

WC Credit 1

Intent:

Enhance ground water table and reduce municipal water demand through effective rainwater management.

Compliance Options:

❖ **Case A: Rainwater Harvesting, Roof**

Design rainwater harvesting system to capture at least 'one-day rainfall*' runoff volume from roof areas.

** One-day rainfall can be derived from 'percentage of average peak month rainfall' given in Table - 5.*

Table 5 - Criteria to arrive at 'One-day Rainfall'

S No	Average Peak Month Rainfall (in mm)	One-day Rainfall (% of Average Peak Month Rainfall)		
		2 points	3 points	4 points*
1	Upto 250	12%	15%	18%
2	251 – 350	10%	12.5%	15%
3	351 – 500	8%	10%	12%
4	501 – 700	6%	7.5%	9%
5	701 & above	4%	5%	6%

**Not Applicable for Existing buildings*

❖ **Case B: High Ground Water Table**

Design rainwater harvesting system to capture at least 'one-day rainfall*' runoff volume from roof areas.

** One-day rainfall can be derived from 'percentage of average peak month rainfall' given in Table - 6.*

Rainfall Information:

- *For rainfall information, refer Indian Metrological Department data → Customized Rainfall Information System (CRIS) → Rainfall Statistics → District Wise Rainfall Last 5 years http://hydro.imd.gov.in/hydrometweb/(S(vcenta45dxa4dpbpffd3ud3g))/DistrictRaifall.aspx*
  - *Choose the state and district from the dropdown boxes, to populate the rainfall data of the district (project's location)*
  - *To arrive at average peak month rainfall, consider an average of at least last 5 years peak month rainfall (of the respective year).*

Table 6 - Criteria to arrive at 'One-day Rainfall'

S No	Average Peak Month Rainfall (in mm)	One-day Rainfall (% of Average Peak Month Rainfall)		
		2 points	3 points	4 points*
1	Upto 250	6%	9%	12%
2	251 – 350	5%	7.5%	10%
3	351 – 500	4%	6%	8%
4	501 – 700	3%	4.5%	6%
5	701 & above	2%	3%	4%

**Not Applicable for Existing buildings*

Notes:

- *Consider Rainwater Harvesting Guidelines (as and when available) from the National Building Code (NBC) of India 2016, Part 11 - Approach to Sustainability, Section 7.2 - Rainwater Harvesting-Surface Runoff.*
- *In areas where the water percolation is limited, collection tanks may be provided to meet the above requirement.*
- *Filtering of suspended solids/ sediments shall be ensured by providing suitable filtering media before letting the water into the collection tanks, water bodies, municipal storm water drains.*

Exemplary Performance:

This credit is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if rainwater runoff from roof areas is captured and / or recharged, as listed below:

New Buildings:

Table 7 - Criteria to arrive at 'One-day Rainfall' for Exemplary Performance

S No	Average Peak Month Rainfall (in mm)	One-day Rainfall (% of Average Peak Month Rainfall)	
		Case A	Case B
1	Upto 250	21%	15%
2	251 – 350	17.5%	12.5%
3	351 – 500	14%	10%
4	501 – 700	10.5%	7.5%
5	701 & above	7%	5%

Existing Buildings:

Table 8 - Criteria to arrive at 'One-day Rainfall' for Exemplary Performance

S No	Average Peak Month Rainfall (in mm)	One-day Rainfall (% of Average Peak Month Rainfall)	
		Case A	Case B
1	Upto 250	18%	12%
2	251 – 350	15%	10%
3	351 – 500	12%	8%
4	501 – 700	9%	6%
5	701 & above	6%	4%

Water Efficient Plumbing Fixtures Points: 3

WC Credit 2

Intent:

Enhance efficiency of plumbing fixtures, thereby minimising potable water use.

Compliance Options:

Use water efficient plumbing fixtures (as applicable) whose flow rates are at least 15% less than the baseline criteria given Table - 4, in aggregate.

Note:

- *Use of treated wastewater/ captured rainwater shall not be considered to show water savings.*

The baseline criteria is as below:

Table 4 - Baseline Flow Rates / Consumption for Plumbing Fixtures

Fixture Type	Maximum Flow Rate/ Consumption	Duration	Estimated Daily Uses per FTE **
Water Closets (Full-flush)	6 LPF	1 flush	1 for male; 1 for female
Water Closets (Half-flush)	3 LPF	1 flush	2 for female
Urinals	4 LPF	1 flush	2 for male
Faucets / Taps*	6 LPM	15 seconds	4
Health Faucet*	6 LPM	15 seconds	1
Showerhead / Handheld Spray*	10 LPM	8 minutes	0.1

Source: Uniform Plumbing Code – India

* *Reporting pressure for these fixtures shall be at 3 bar.*

** *Full Time Equivalent (FTE) represents a regular building occupant who spends 8 hours per day in the building. Part-time or overtime occupants have FTE values based on their hours per day divided by 8.*

Points are awarded as below:

Water Efficient Plumbing Fixtures (Individually or in aggregate)	Points
20% less than baseline criteria	1
25% less than baseline criteria	2
30% less than baseline criteria	3

Notes:

- *Water fixtures do not include irrigation systems.*
- *Faucets / Taps installed for hand wash in rest rooms and canteen shall be considered; whereas, faucets / taps installed for dish washing and washing clothes need not be considered.*
- *In existing buildings, flow rates of the water fixtures can be measured on-site through weighted average approach and report the flow rates.*
- *Rain showers (if any) need to be considered in the calculations under Showerhead.*
- *If the project is a mixed-use building and has residential space with showerheads, in such case the daily use per occupant shall be considered as 1.*
- *The baseline flows can be demonstrated at a flowing water pressure of 3 bar. Flowing water pressure of 3 bar does not mean that the water supply in the building is at 3 bar. The building fixtures can operate at lower pressures; however, to show compliance under this credit, the design flow rates are to be submitted at 3 bar.*
- *Default occupancy shall be considered as 50% for male and female.*
- *FTE occupancy shall be considered in calculation, including visitors.*
- *Plumbing fixtures that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC can be used by the project to show compliance.*

Exemplary Performance:

This credit is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if water consumption is 35% lesser than the baseline criteria.

Water Metering Points: 1

WC Credit 3

Intent:

Encourage sub-metering and continuous monitoring to identify improvement opportunities in the buildings' water performance, thereby reducing potable water consumption.

Compliance Options:

Demonstrate compliance for the following measures:

- Separate water meter for each of the building within the project site
- Separate water meter for process requirements
- Sub-metering for at least two of the following major water use applications, as applicable:
  - Municipal water supply
  - Bore water consumption
  - Water consumption for landscape requirements
  - Water consumption for flushing
  - Any other major source of water consumption

Exemplary Performance:

This credit is not eligible for exemplary performance.

ENERGY EFFICIENCY

Minimum Energy Efficiency

EE Mandatory Requirement 1

Intent:

Optimise energy consumption, to reduce negative environmental impacts from excessive energy use.

Compliance Options:

The project can choose any one of the following options, to demonstrate compliance:

- Option 1 - Simulation Approach
- Option 2 - Prescriptive Approach

Note: *Service Buildings could opt Option 1: Simulation Approach or Option 2: Prescriptive Approach irrespective of the air-conditioned area in the building; whereas, other buildings which have air-conditioned area more than 25% of the regularly occupied area shall comply with Option 1: Simulation Approach only.*

Option 1: Simulation Approach (For air-conditioned buildings)

Design the building to comply with ASHRAE Standard 90.1-2013, Appendix - G or Energy Conservation Building Code 2017 (ECBC Code Compliant Building requirements) through Whole building simulation. Simulation is to be carried out at comfort temperatures of 24 ± 2 deg C.

The total annual energy consumption of the building should not exceed the total base case energy consumption computed.

Note: *Existing buildings shall demonstrate compliance through Calibrated Simulation Approach by considering schedules and equipment loads as per actuals in both base case & proposed case. Rest all parameters shall be as per the protocol defined in the Standard/ Code.*

General Notes:

- ***Project with multiple buildings (including projects with common basement) must independently meet the Minimum Energy Performance criteria for each building.***
- ***For mandatory requirement, projects that use on-site renewable energy sources (such as solar energy, wind power, biomass, etc.,) shall demonstrate compliance without considering renewable energy.***
- *Projects that use solar hot water systems can model the systems in the proposed case, as compared to electrical heaters in the base case, to show energy savings.*
- *Projects (such as substations, offices with server areas etc.,) which have process loads (including cooling/ heating, lighting) not related to building operations should be considered during simulation. While reporting, such loads can be excluded from the base case and proposed case annual energy consumption. The process loads which are excluded shall be justified with a narrative.*

- *The default process energy is 25% of the total energy for the baseline building. If the building's process energy is less than 25% of the baseline building energy, the submittal must include documentation substantiating that process energy inputs are appropriate.*
- *Energy efficient materials, products and equipment that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC can be used by the project to show compliance.*

Option 2: Prescriptive Approach (For Non air-conditioned buildings)

Non air-conditioned buildings are those which are not serviced and will not be serviced in the future, either through central air-conditioned systems or unitary air-conditioners.

- *Air-conditioning may be considered for critical areas, not more than 25% of the total regularly occupied area.*
- *Spaces with unitary air-conditioners shall comply with IEQ Mandatory Requirement 1 – Fresh Air Ventilation, Non air-conditioned buildings criteria.*

The project shall meet the following prescriptive measures, as applicable:

1) Lighting:

❖ **Lighting Power Density:**

The Lighting Power Density (LPD) in the building interior, exterior and parking areas shall be reduced by minimum 10% over ASHRAE Standard 90.1 – 2013 (Section 9) or ECBC 2017 (Section 6, ECBC Building) base case.

Notes:

- *Compliance for the lighting power density shall be shown either through 'Building Area Method' or 'Space-by-Space Method'/ 'Space Function Method'. If 'Building Area Method' is considered, compliance for parking area lighting shall be shown separately.*
- *Exterior areas illuminated by lighting only should be considered for lighting power density calculations.*
- *The LPD should include power consumption of complete fixture, including lamps and ballasts.*

2) Air-conditioning Systems:

For projects having air-conditioners, compliance shall be demonstrated as per ASHRAE Standard 90.1 - 2013 or the ECBC 2017 (ECBC Building) base case criteria given below:

❖ **Unitary/ Split/ Packaged Air-conditioners:**

Unitary/Split/Packaged air-conditioners should meet or exceed the requirements mentioned in ECBC 2017, Chapter 5 - Comfort Systems and Controls, Section 5.2.2.2 - Minimum Space Conditioning Equipment Efficiencies, Table 5.3 Minimum Requirements for Unitary, Split, Packaged Air Conditioners in ECBC Building.

Cooling Capacity (kWr)	Water Cooled	Air Cooled
≤ 10.5	NA	BEE 3 Star
> 10.5	3.3 COP	2.8 COP

❖ **Variable Refrigerant Flow:**

Variable Refrigerant Flow (VRF) systems shall meet or exceed the efficiency requirements specified in Table 5-6 as per the ANSI/AHRI Standard 1230 while the Indian Standard on VRF is being developed. BEE Standards and Labelling requirements for VRF shall take precedence over the current minimum requirement.

For cooling			
Type	**Size category (kWr)**	**EER**	**IEER**
VRF Air Conditioners, Air cooled	< 40	3.28	4.36
	≥ 40 and < 70	3.26	4.34
	≥ 70	3.02	4.07

* The revised EER and IEER values as per Indian Standard for VRF corresponding to values in this table will supersede as and when the revised standards are published.

❖ **Chillers:**

Chillers should meet or exceed the requirements mentioned in ECBC 2017, Chapter 5 - Comfort Systems and Controls, Section 5.2.2.1 - Minimum Space Conditioning Equipment Efficiencies, Table 5.1 & 5.2 Minimum Energy Efficiency Requirements for Water-cooled and Air-cooled chillers in ECBC Building.

Minimum Energy Efficiency Requirements for Water-cooled chillers

Chiller Capacity (kWr)	COP	IPLV
< 260	4.7	5.8
≥ 260 & < 530	4.9	5.9

Minimum Energy Efficiency Requirements for Air-cooled chillers

Chiller Capacity (kWr)	COP	IPLV
< 260	2.8	3.5
≥ 260	3	3.7

***Note**: For details of ASHRAE Standard 90.1 – 2013, refer Section 6.8, Minimum Equipment Efficiency Tables. Reference tables for Unitary air conditioners, Chillers and VRF systems are appended below:*

- *TABLE 6.8.1A Electronically Operated Unitary Air Conditioners and Condensing Units-Minimum Efficiency Requirements*
- *TABLE 6.8.11 Electrically Operated Variable Refrigerant Flow Air Conditioners Minimum Efficiency Requirements*
- *TABLE 6.8.1 C Water Chilling Packages-Efficiency Requirements*

3) Fans:

All fans installed in the building shall have an efficiency equivalent to BEE 3-star rating or better.

Passive Architecture Points: 3

EE Credit 1

Intent:

Adopt passive architectural design features to minimise negative environmental impacts.

Compliance Options:

Option 1: Simulation Approach

Demonstrate that the passive architecture measures implemented in the project has resulted in atleast 2% energy savings of total annual energy consumption (through whole building simulation approach).

The approach shall address the following aspects, but not limited to:

- Climate-responsive passive concepts and design features

  (E.g. orientation, courtyard, shaded corridors, skylights, light shelves, shading devices, pergolas, punched windows, bay windows, Trombe wall, high thermal mass, cavity walls, hollow brick walls, roof garden, vertical landscaping on exterior building walls, cross ventilation)

- Passive cooling / heating technologies
  (E.g. wind tower, earth tunnel, geothermal technologies)

Points are awarded as below:

Percentage of Energy Savings achieved through Passive Architecture	Points
≥ 2%	1
≥ 3%	2
≥ 4%	3

Option 2: Prescriptive Approach

(Note: This approach is applicable only for those projects which attempt EE MR1: Minimum Energy Efficiency through Option 2: Prescriptive approach)

Demonstrate that the project has implemented at least one of the following Climate Responsive Passive Design measures as listed in table 9:

(1 point for each passive design measure; maximum 3 points)

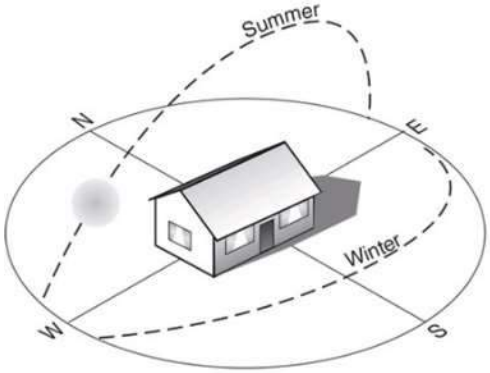
Table 9: List of Climate Responsive Passive Design measures

Concept	Criteria
Orientation & Internal zoning	Zoning of buffer areas and regularly occupied areas as per the Sun path analysis. (Refer figure no. 1)
Skylight	Skylights shall comply with the maximum U-factor and maximum SHGC requirements as prescribed in Energy Conservation Building Code 2017 (ECBC), Section 4.3.4-Skylights, Table 4-15: Skylight U-Factor and SHGC Requirements. SRR shall be limited to a maximum of 5% for each building. The maximum U-factor and SHGC values for all climatic zones should be 4.25 and 0.35 respectively.
Courtyard	Design building with at least one courtyard. The courtyard's shorter side should not be more than 2.5 times the height of the abutting walls to ensure self-shading while permitting diffused light.
Shading corridors	Design corridors that are exposed to ambient climatic conditions so as to achieve 75% shading during daytime
Exterior Openings	At least 75% of the exterior openings (fenestration) have a Projection Factor* of 0.3 or more (with overhangs or vertical fins)
Windows (Punched/ Bay)	Design atleast 75% of the windows as per climatic zone and orientation
Light shelves	Design light shelves for 50% of the windows/ glazed areas, as per climatic zone and orientation
Walls	Design 75% of the external walls (Trombe wall, High thermal mass, Cavity walls, Hollow brick walls) by surface area as per climatic zone
Roof garden	Design 50% of net roof area with roof garden, as defined in SPD Credit 3, Heat Island Reduction for Roof areas
Vertical landscaping on exterior building walls	Design 25% of the exterior building walls, excluding glazing, with vertical landscaping
Cross ventilation	Design 50% of the unconditioned regularly occupied spaces so as to achieve cross ventilation. *Note: This criteria is applicable only for naturally ventilated buildings.*
Passive Cooling / Heating Technologies	Wind tower, Earth tunnel, Geothermal technologies, etc.

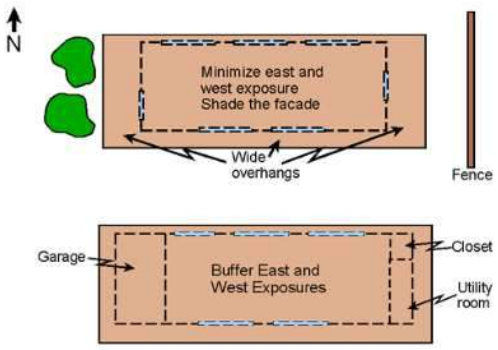
***Notes*:**

- *Roof area covered with Solar PV will not be considered as a passive design measure, for this credit*
- *Points to consider for Skylight:*
  - *SRR: Skylight Roof Ratio which is the ratio of the total skylight area of the roof, measured to the outside of the frame, to the gross exterior roof.*
  - *All enclosed roof areas, including podium/ basement areas can also be considered for credit calculations.*
  - *Covered surface parking and utility blocks need not be considered for this credit calculation.*
- *Point to consider for Exterior Openings:*
  - *Projection Factor is a ratio of the length of overhang projection divided by height from window sill to the bottom end of the overhang (must be permanent). For more details, please refer Energy Conservation Building Code (ECBC).*
- *Points to consider for Cross Ventilation:*
  - *The doors/ windows should not have any obstruction within 2 m from outside surface. In case the doors open into internal corridors, then such corridors should not be enclosed as there would not be air movement.*
  - *The opening considered should meet HWB Mandatory Requirement 1 – Minimum Fresh Air Ventilation, Case B: Non Air-conditioned Spaces criteria.*
  - *Regularly occupied spaces with an opening to the outdoors only in one orientation can also be considered for calculations, if there is a permanent opening to the adjoining room which meets cross ventilation criteria (refer figure no.2).*
    - *Room 1 as shown in figure no. 2.1 and 2.2 would comply with the cross ventilation requirements as the room is designed with window's and/ or door on adjacent or opposite side; whereas the Room 1 in figure 2.3 and 2.4 does not comply as the room is designed with only one door and window & door on same side.*
    - *Room 1 and 2 as shown in figure 2.5 would comply with the cross-ventilation requirements as the rooms are designed with permanent opening in between the rooms with window's and/ or door on adjacent or opposite side.*

Fig. 1: Orientation & Internal zoning



Orientation



Internal Zoning

Fig. 2: Cross Ventilation

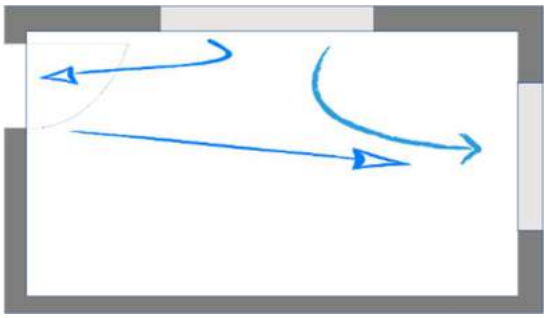


Figure 2.1

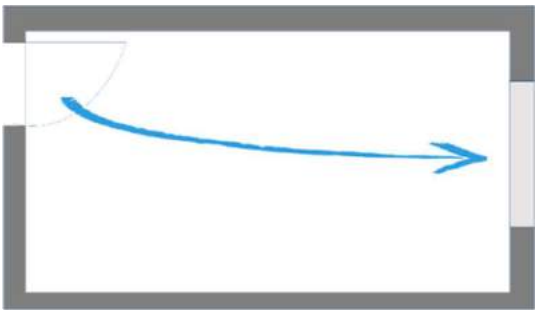


Figure 2.2

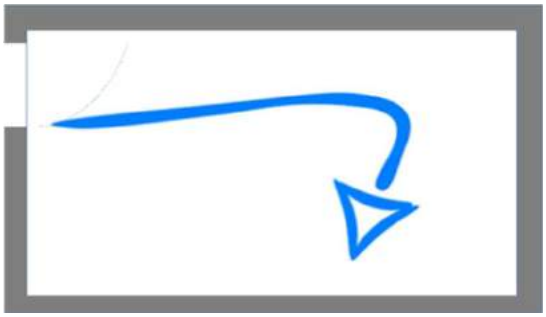


Figure 2.3

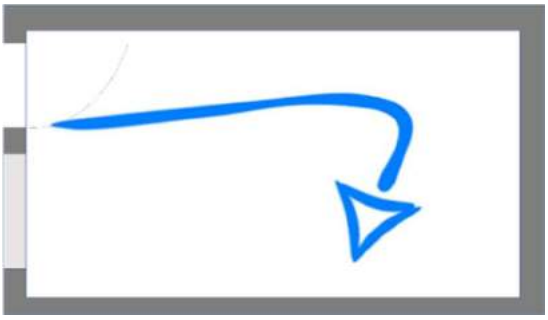


Figure 2.4

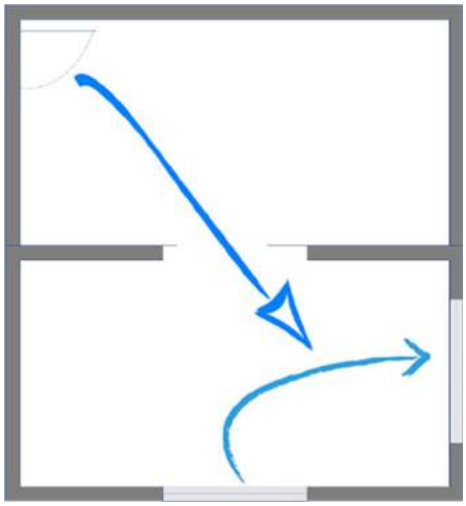


Figure 2.5

Exemplary Performance:

This credit is not eligible for exemplary performance.

Enhanced Energy Efficiency Points: 10
EE Credit 2

Intent:

Optimise energy consumption, to reduce negative environmental impacts from excessive energy use.

Compliance Options:

The project can choose any one of the following options, to demonstrate compliance:

- Option 1 - Simulation Approach
- Option 2 – Prescriptive Approach

Note: *Service Buildings could opt Option 1: Simulation Approach or Option 2: Prescriptive Approach irrespective of the air-conditioned area in the building; whereas, other buildings which have air-conditioned area more than 25% of the regularly occupied area shall comply with Option 1: Simulation Approach only.*

Option 1: Simulation Approach (For air-conditioned buildings)

Design the building to comply with ASHRAE Standard 90.1-2013, Appendix - G or Energy Conservation Building Code 2017 (ECBC Building) through Whole building simulation is to be carried out at comfort temperatures of 24 ± 2 deg C.

Note: *Existing buildings shall demonstrate compliance through Calibrated Simulation Approach by considering schedules and equipment loads as per actuals in both base case & proposed case. Rest all parameters shall be as per the protocol defined in the Standard/ Code.*

General Notes:

- ***Projects that use on-site renewable energy sources (such as solar energy, wind power, biomass, etc.,) can deduct renewable energy generated from the total annual energy consumption of the proposed case, to show energy savings.***
- *Projects that use solar hot water systems can model the systems in the proposed case, as compared to electrical heaters in the base case, to show energy savings.*
- *Projects (such as substations, offices with server areas etc.,) which have process loads (including cooling/ heating, lighting) not related to building operations should be considered during simulation. While reporting, such loads can be excluded from the base case and proposed case annual energy consumption. The process loads which are excluded shall be justified with a narrative.*
- *The default process energy is 25% of the total energy for the baseline building. If the building's process energy is less than 25% of the baseline building energy, the submittal must include documentation substantiating that process energy inputs are appropriate.*

- *Energy efficient materials, products and equipment that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC can be used by the project to show compliance.*

Points are awarded based on energy cost percentage savings as detailed below:

Percentage of Energy Cost Savings over ASHRAE Standard 90.1-2013 Appendix G or Energy Conservation Building Code 2017 Base case		**Points**
New Buildings	**Existing Buildings (Including Major Renovations)**	
14%	10%	1
16%	12%	2
18%	14%	3
20%	16%	4
22%	18%	5
24%	20%	6
26%	22%	7
28%	24%	8
30%	26%	9
32%	28%	10

Notes:

- *Existing Buildings: To demonstrate compliance, projects should be in operation for atleast one year.*
- *Major Renovation: Includes, but not limited to, major renovation of external façade (wall and glazing), lighting and HVAC systems.*

Option 2: Prescriptive Approach (For Non air-conditioned buildings)

Non air-conditioned buildings are those which are not serviced and will not be serviced in the future, either through central air-conditioned systems or unitary air-conditioners.

- *Air-conditioning may be considered for critical areas, not more than 25% of the total regularly occupied area.*
- *Spaces with unitary air-conditioners shall comply with IEQ Mandatory Requirement 1 – Fresh Air Ventilation, Non air-conditioned buildings criteria.*

The project shall meet or exceed the following prescriptive measures, as applicable:

(Maximum 8 points)

1) Building Envelope: *(3 Points)*

The project must ensure that at least three of the following building envelope measures meet the baseline criteria as outlined in Appendix – II. (1 point for each measure)

- ❖ Glazing Solar Heat Gain Coefficient (SHGC)*
- ❖ Glazing U-value
- ❖ Overall Wall Assembly U-value
- ❖ Overall Roof Assembly U-value

Notes:

- *For Climatic Zones of India as per NBC 2016, please refer Appendix - I.*
- **Low SHGC value can be achieved through chajjas or other sun shading devices or efficient fenestration or a combination of both. For details, refer ECBC 2017 Section 4.3.3 – Vertical Fenestration, Exception to ECBC 2017.*
- *If Window-to-Wall ratio (WWR) is more than 40%, then the points for glazing would not be applicable.*

2) Lighting:

❖ **Lighting Power Density: (*3 Points*)**

The lighting power density in the building interior, exterior and parking areas shall be reduced by minimum 20% over ASHRAE Standard 90.1 – 2013 or ECBC 2017 (Section 6, ECBC Building) base case.

Points are awarded as below:

Reduction in Lighting Power Density	Points
≥ 20 %	1
≥ 30 %	2
≥ 40 %	3

Notes:

- *Compliance for the lighting power density shall be shown either through 'Building Area Method' or 'Space-by-Space Method'/ 'Space Function Method'. If 'Building Area Method' is considered, compliance for parking area lighting shall be shown separately.*
- *Exterior areas illuminated by lighting only should be considered for lighting power density calculations.*
- *The LPD should include power consumption of complete fixture, including lamps and ballasts.*

❖ **Lighting Controls:** ***(1 point)***

All non-emergency exterior & common area lighting such as staircases, corridors, façade, pathways, landscaping, surface and covered parking, driveways, street lighting, should have at least one of the following:

- Daylight sensor
- Occupancy / Motion sensor
- Timers / Dimmer

❖ **Air-conditioning Systems:** ***(2 Points)***

For projects having air-conditioners, the points would be awarded as below:

➢ **Unitary Air-conditioners:**
(Applicable only if air-conditioned area is less than 25% of the regularly occupied area)

BEE Star Rating/ equivalent	No of Points
4 star rated	1
5 star rated	2

➢ **Variable Refrigerant Flow:**

Efficiency of VRF systems over ECBC 2017 (ECBC Building) baseline	No of Points
≥ 5%	1
≥ 10%	2

➢ **Chillers:**

Efficiency of Chillers over ECBC 2017 (ECBC Building) baseline	No of Points
≥ 5%	1
≥ 10%	2

Notes*: For details of ASHRAE Standard 90.1 – 2013, refer Section 6.8, Minimum Equipment Efficiency Tables. Reference tables for Unitary air conditioners, Chillers and VRF systems are appended below:*

- *TABLE 6.8.1A Electronically Operated Unitary Air Conditioners and Condensing Units-Minimum Efficiency Requirements*
- *TABLE 6.8.11 Electrically Operated Variable Refrigerant Flow Air Conditioners Minimum Efficiency Requirements*
- *TABLE 6.8.1 C Water Chilling Packages-Efficiency Requirements*

3) **Fans:** ***(2 Points)***

- Atleast 75% of the fans installed in the building shall have an efficiency equivalent to BEE 5-star rating (1 point).
- Atleast 75% of the fans installed in the building shall have DC motors (2 points).

4) **Hot water Systems:** ***(1 Point)***

Projects having any one of the following efficient hot water systems for 100% requirement:

- Solar powered
- Heat pump with minimum CoP of 3.2

5) **Pumps & Motors:** ***(2 Points)***

- Pumps (1 Point): BEE 5-star rated Pumps (or) IE 3 class (or) Minimum 70% efficiency for Pumps of capacity greater than 3 HP and ISI certified pumps for others.
- Motors (1 Point): BEE 5-star rated (or) IE 3 class (or) Minimum 85% efficiency for Motors of capacity greater than 3 HP and ISI certified motors for others.

Note:

- *Energy efficient materials, products and equipment that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC can be used by the project to show compliance.*

Exemplary Performance:

This credit is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if:

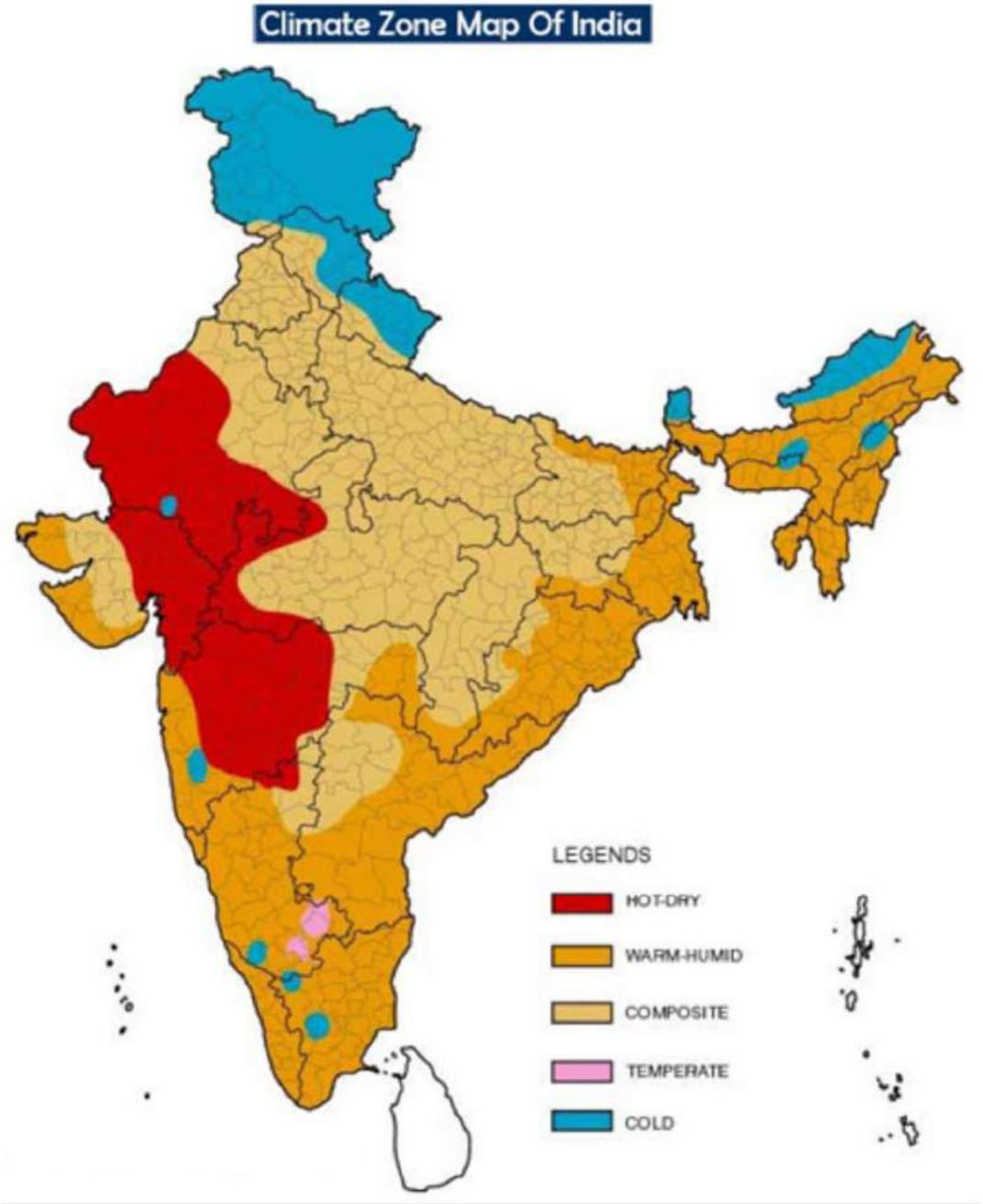
Option 1: Simulation Approach

- New buildings: Energy cost savings are more than 34% when compared to the ASHRAE Standard 90.1-2013, Appendix - G or ECBC 2017 (ECBC Building) base case.
- Existing/ Major Renovation buildings: Energy cost savings are more than 30% when compared to the ASHRAE Standard 90.1-2013, Appendix - G or ECBC 2017 (ECBC Building) base case.

Option 2: Prescriptive Approach

- Lighting Power Density: The lighting power density in the building interior, exterior and parking areas is reduced by minimum 50% over ASHRAE Standard 90.1 – 2013 or ECBC 2017 (Section 6, ECBC Building) base case.

Appendix - I: Climate Zone Map of India
(Source: ECBC 2017)



Appendix - II: EE Credit 2 Enhanced Energy Efficiency Baseline Criteria for Building Envelope Measures under Option 2: Prescriptive Approach

1) **Envelope Measures:**
   (* For Climatic Zones of India, please refer Appendix - I)

❖ **Glazing - SHGC value**

Climate Zone	Maximum SHGC Value
	WWR ≤ 40%
Hot and Dry	0.32
Warm and Humid	0.32
Composite	0.32
Temperate	0.40
Cold	0.8

❖ **Glazing U- value**

Climate Zone	Maximum SHGC Value
	WWR ≤ 40%
Hot and Dry	3.3
Warm and Humid	3.3
Composite	3.3
Temperate	5.7
Cold	3.3

❖ **Wall Assembly U- value**

Climate Zone	Maximum U-value of the overall wall assembly (W/m2K)
Hot and Dry	1.8
Warm and Humid	1.8
Composite	1.8
Temperate	1.8
Cold	0.8

❖ **Roof Assembly U- value**

Climate Zone	Maximum U-value of the overall roof assembly (W/m2K)
Hot and Dry	0.5
Warm and Humid	0.5
Composite	0.5
Temperate	0.75
Cold	0.5

On-site Renewable Energy Points: 5

EE Credit 3

Intent:

Encourage the use of on-site renewable technologies, to minimise the environmental impacts associated with the use of fossil fuel energy.

Compliance Options:

Demonstrate on-site renewable energy generation for at least 4% of total annual energy consumption of the building (including interior & exterior areas).

Points are awarded as below:

Percentage of On-site Renewable Energy Generated to the Total Annual Energy Consumption of the Building	Points
≥ 4 %	1
≥ 6 %	2
≥ 8 %	3
≥ 10 %	4
≥ 12 %	5

Notes:

- *Renewable energy sources include solar energy, wind power, biomass, etc.*
- *Solar hot water systems cannot be considered as power generation source and cannot be subtracted from the total annual energy consumption of the proposed case.*
- *The total annual energy consumption can be arrived either through Prescriptive approach or Performance based approach.*
    - *Projects following prescriptive approach should estimate the total annual energy consumption of the building by calculating the energy consumption of all mechanical and electrical equipment & systems based on the number of hours of operation per day.*
- *Projects (such as substations, offices with server areas etc.,) which have process loads (including cooling/ heating, lighting) not related to building operations need not be considered. The process loads which are excluded shall be justified with a narrative.*

Exemplary Performance:

This credit is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if On-site renewable energy generation is at least 14% of total annual energy consumption.

Energy Saving Appliances Points: 1

EE Credit 4

Intent:

Conserve energy by using the energy saving appliances, thereby reducing environmental impacts.

Compliance Options:

Demonstrate that the building uses minimum BEE 3 star rated or equivalent appliances for atleast 50% of the total rated power. The appliances, as applicable, to be considered are as below:

- Air purifiers
- Coffee Brewers
- Desert Coolers
- Electric Geysers
- Oven
- Printers
- Projectors
- Refrigerator
- Television
- Vending machines
- Water Dispenser
- Any other rated appliances

Exemplary Performance:

This credit is not eligible for exemplary performance.

Energy Metering Points: 1

EE Credit 5

Intent:

Encourage sub-metering and continuous monitoring to identify improvement opportunities in the buildings' energy performance, thereby reducing energy consumption.

Compliance Options:

Demonstrate compliance for the following measures:

- Separate energy meter for each of the building within the project site
- Separate energy meter for process requirements
- Sub-metering for at least three of the following major energy use applications, as applicable:
  - Interior lighting
  - Exterior lighting
  - Air-conditioning
  - Municipal water pumping
  - Ground water pumping
  - Renewable energy generation
  - Power backup systems (Generators sets, etc.,)
  - Any other energy consuming equipment and systems

Exemplary Performance:

This credit is not eligible for exemplary performance.

BUILDING MATERIALS AND RESOURCES

Segregation of Waste, Post-occupancy

BMR Mandatory Requirement 1

Intent:

Facilitate segregation of waste at source to encourage reuse or recycling of materials, thereby avoiding waste being sent to landfills.

Compliance Options:

- Provide separate bins to collect dry waste (paper, plastic, metals, glass, etc.,) and wet waste (organic), at all the floors and common areas of the building, as applicable. Divert the collected waste to a centralised facility, which is easily accessible for hauling.

  (AND)

- In addition to dry and wet waste bins, provide separate bins for safe disposal of plastic and the following hazardous waste, at the centralised facility:
  - Plastic
  - Batteries
  - 'e' waste
  - Lamps
  - Medical waste, if any

Note:

- *For hazardous waste, the project has to follow the Hazardous Waste Management Rules 2016, as prescribed by the Ministry of Environment & Forest (MoEF), Government of India.*

Green Procurement Policy Points: 1
(Not Applicable for New Buildings)

BMR Credit 1

Intent:

Demonstrate the commitment to purchase products or services with lowest environmental impact.

Compliance Options:

Have a policy and procurement guidelines in place to purchase building products & materials which are eco-labelled and have lower impact on the environment. The following aspects to be addressed while purchasing the products & materials, as applicable:

- Higher recycled content
- Greater energy efficiency
- Eco-friendly refrigerants
- Reduced water consumption
- Material emitting fewer toxic substances during installation or use and upon disposal

  (E.g. Low VOC materials, Eco-friendly housekeeping chemicals)
- Avoid single use plastic for regular operations
- Alternate wood-based material

  (E.g. Salvaged wood, Composite wood free from added urea formaldehyde, Rapidly renewable wood, Certified wood)

The Green Procurement Policy shall be valid for a period of three years or more.

Exemplary Performance:

This credit is not eligible for exemplary performance.

Use of Eco-labelled Building Materials Products & Equipment Points: 3
(Not Applicable for Existing Buildings)

BMR Credit 2

Intent:

Use eco-labelled green building materials, products, and equipment, so as to reduce dependence on materials that have associated negative environmental impacts.

Compliance Options:

New Buildings/ Major Renovation: (3 points)

Ensure that the project uses passive or active green building materials, products, and equipment that are eco-labelled/ certified by:

- CII Green Product Certification Programme (GreenPro)
- Other Eco-labelling programs

Points are awarded as below:

Number of Eco-labelled/ Certified Green Products used	Points
1	1
2	2
3	3

Notes:

- *The list of GreenPro certified products can be accessed at https://ciigreenpro.com/*
- *Passive Products & Materials include glazing, insulation, paints & coatings, adhesives & sealants, flyash blocks, cement, concrete, composite wood, certified new wood, housekeeping chemicals, false ceiling materials, flooring materials, furniture, gypsum based products, high reflective materials & coatings, etc.,*
- *Active Products include Electrical systems (Lighting Systems & Controls, Pumps & Motors, etc.,), Mechanical systems (unitary air conditioners, etc.,), Plumbing Fixtures (faucets, showers, etc.,)*
- *The materials, products and equipment (eg. high reflective materials, water fixtures, lighting fixtures, carpets, etc.,) certified by CII under Green Product Certification Programme (GreenPro) or any third party agency will be accepted to show credit compliance*

Exemplary Performance:

This credit is not eligible for exemplary performance.

Use of Alternative Construction Technologies & Materials Points: 3
(Not Applicable for Existing Buildings)

BMR Credit 3

Intent:

Use alternative construction technologies & materials in the building, while maintaining structural integrity, thereby saving natural resources.

Compliance Options:

- **Alternative Construction Technologies: (2 Points)**

  Ensure that the project uses a comprehensive approach in designing the building using any one or combination of the following alternative construction technologies, as applicable:

  - Precast concrete construction for super structures
  - Glass Fibre Reinforced Gypsum (GFRG)
  - Panel building system
  - Filler slabs
  - Any other innovative technologies

- **Alternative Construction Materials: (1 Point)**

  Ensure that the project uses a comprehensive approach in designing the building using any one or combination of the following alternative construction materials, as applicable:

  - Ground-granulated blast-furnace slag (GGBS or GGBFS)
  - Fly ash based cement/ concrete/ blocks
  - Fibre reinforced concrete
  - Slag sand/ artificial sand
  - Compressed stabilized earth blocks
  - Any other alternative construction materials

Exemplary Performance:

This credit is not eligible for exemplary performance.

Alternate Wood-based Materials Points: 1
(Not Applicable for Existing Buildings)

BMR Credit 4

Intent:

Minimise the use of new wood-based materials, thereby reducing impacts of deforestation.

Compliance Options:

Ensure that hard and composite wood-based materials (by cost) used in the building, including wooden furniture, with one or combination of the following:

- Salvaged wood
- Recycled waste/ composite wood (free from added urea formaldehyde)
- Rapidly renewable wood
- Certified wood

Points are awarded as below:

Percentage of alternate wood-based materials to the total cost of wood	Points
≥ 50%	1

Notes:

- *Salvaged or reused wood-based materials are buildings materials recovered from existing buildings or construction sites and reused. Common salvaged materials include furniture, doors, cabinetry.*
- *Recycled Waste wood examples include (but not limited to) MDF boards, particle boards, linoleum boards etc.*
- *Rapidly renewable materials are those that can be harvested and used within a ten-year cycle. Example: Bamboo, Eucalyptus, Bagasse based materials, Jute based materials, cotton blinds; rubber wood*
- *Certified wood shall be compliant with Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC) or equivalent system. For a list of certified wood suppliers and product manufacturers, visit the official website of respective certification bodies.*
- *Wood based Materials that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC can be used by the project to show compliance.*

Exemplary Performance

This credit is eligible for exemplary performance under IP Credit 1 - Innovation in Design Process, if more than 75% of the wood-based materials sourced are Salvaged/ Recycled waste/ Composite wood/ Rapidly renewable/ Certified wood.

Handling of Waste Materials, During Construction *(Not Applicable for Existing Buildings)* Points: 1

BMR Credit 5

Intent:

Facilitate segregation of construction and demolition waste at source to encourage reuse or recycling of materials, thereby avoiding waste being sent to landfills.

Compliance Options:

Demonstrate that at least 75% of waste generated during construction is diverted from landfills, for reuse or recycling. Use consistent metrics, either weight or volume, to show compliance.

Points are awarded as below:

Percentage of construction waste diverted to the total quantity of construction waste generated	Points
≥ 75%	1

Notes:

- *Construction waste here refers to civil & interior building waste, including packaging.*
- *Excavated earth & stones should not be considered under this credit, as these are natural resources.*
- *Temporary materials such as materials used for formwork, scaffolding, etc., shall not be considered for this credit calculation.*
- *If the project uses technologies such as prefab construction which generates minimal waste, then such projects can justify the generation of less waste.*

Exemplary Performance

This credit is not eligible for exemplary performance.

HEALTH AND WELL-BEING

Minimum Fresh Air Ventilation

HWB Mandatory Requirement 1

Intent:

Provide adequate outdoor air ventilation, to avoid pollutants affecting indoor air quality.

Compliance Options:

- **Case A: Mechanically Ventilated Spaces**

  Demonstrate that the fresh air ventilation in all regularly occupied areas to meet the minimum ventilation rates, as prescribed in ASHRAE Standard 62.1 - 2013.

  Notes:

  - *Projects with unitary air conditioning system catering less than 25% of the total regularly occupied area can show compliance for minimum fresh air ventilation through the criteria defined for Non Air-conditioned Spaces in EE MR 2, 'Case - 2'.*
  - *Regularly occupied spaces which are equal to or less than 50 sq.m can demonstrate compliance through air-conditioners that are in sync with inline fans. The CFM of such inline fans shall meet the ASHRAE 62.1 2013 requirements.*
  - *Regularly occupied spaces which are more than 50 sq.m shall use treated fresh air to demonstrate compliance.*

  (And/ Or)

- **Case B: Non Air-conditioned Spaces**

  Provide operable windows and / or doors to the exteriors, in all regularly occupied areas, such that the operable area is designed to meet the criteria as outlined in the Table 10 below:

Table 10 - Design Criteria for Openable Windows and / or Doors to the Exteriors

Category	Percentage of Openable Area to the Total Carpet Area
Regularly Occupied Area (≤ 100 sq.m)	8%
Regularly Occupied Area (> 100 sq.m)	12%

Notes:

- *Windows / doors should not have any obstruction within 2 meters from the exterior surface. Shading devices can be excluded.*
- *For sliding windows / doors, only openable area to the exteriors shall be considered in calculations.*

General Notes:

- *Regularly occupied areas are those where people sit or stand as they work, irrespective of the number of days occupied in a year. Regularly occupied areas shall include only enclosed spaces.*
- *Regularly occupied areas include workstations, cabins, meeting rooms, conference rooms, waiting areas, cafeteria, etc.,*
- *Non-regularly occupied areas include toilets, storerooms, etc.,*
- *Non enclosed spaces shall be considered as Non-regularly occupied spaces.*

No Smoking Premises

HWB Mandatory Requirement 2

Intent:

Minimise exposure of non-smokers to the adverse health impacts arising due to passive smoking in the building.

Compliance Options:

Demonstrate that smoking is prohibited in the project, in accordance with the regulations of Ministry of Health & Family Welfare, Government of India.

The project shall place 'no smoking' signage at the building entries, common interior & exterior areas, parking, etc.

Daylighting Points: 2

HWB Credit 1

Intent:

Ensure connectivity between the interior and the exterior environment, by providing adequate daylighting.

Compliance Options:

The project can choose any one of the following options or a combination, to show compliance:

- Option 1 - Simulation Approach
- Option 2 - Measurement Approach

Option 1: Simulation Approach

Demonstrate through computer simulation that 75% of the regularly occupied spaces in the building achieve daylight illuminance levels for a minimum of 110 Lux (and a maximum of 2,200 Lux) in a clear sky condition on 21st September at 12 noon, at working plane.

Areas with 2,200 Lux or more daylight illumination levels should not be considered.

Option 2: Measurement Approach

Demonstrate through daylight illuminance measurement that at least 75% of the regularly occupied spaces in the building achieve daylight illuminance levels for a minimum of 110 Lux. Areas with 2,200 Lux or more daylight illumination levels shall be not considered.

Measurements shall be taken after installation of furniture, equipment & systems at work plane height at 9 am, 12 pm, and 3 pm, on a 10-foot square grid. To show compliance, consider the average of the measurements taken at 9 am, 12 pm and 3 pm. The daylight measurement shall be taken using a lux meter.

Points are awarded as below:

Percentage of Regularly Occupied Areas with Daylighting	Points
$\geq$ 75%	1
$\geq$ 95%	2

Notes:

- *Regularly occupied areas are those where people sit or stand as they work, irrespective of the number of days occupied in a year. Regularly occupied areas shall include only enclosed spaces.*
- *Regularly occupied areas include workstations, cabins, meeting rooms, etc.; whereas, areas with audio-visual facilities such as conference rooms, etc., can be excluded from this credit calculation, with justification and supporting documents.*
- *Non-regularly occupied areas include toilets, storerooms, etc.,*
- *Non enclosed spaces shall be considered as Non-regularly occupied spaces.*
- *Regularly occupied areas which are used for multi-purposes, such as cafeteria-cum-meeting room, can be considered as separate spaces based on the function. The room boundary need not be a physical boundary.*
- *Projects with multiple buildings must independently meet the daylighting criteria for each building.*

Exemplary Performance:

This credit is not eligible for exemplary performance.

Low-emitting Materials Points: 1
(Not Applicable for Existing Buildings)

HWB Credit 2

Intent:

Encourage use of materials with low VOC emissions, to reduce adverse health impacts on building occupants.

Compliance Options:

Demonstrate that the project complies with the following categories:

- **Paints & Coatings:**

  Use paints and coatings (including primers) with low or no VOC content (as specified in Table - 11 given below) for 95% of interior wall and ceiling surface area.

Table 11 - VOC Limits for Paints & Coatings

Type of Paints & Coatings	VOC Limit (g/L less water)
Non-flat (Glossy)	150
Flat (Mat)	50
Metallic/ Anti-corrosive/ Anti-rust	250
Clear Wood Finish: Varnish	350
Clear Wood Finish: Lacquer	550
Floor Coatings	100

(And)

- **Adhesives & Sealants**:

  For adhesives used within the interiors, ensure that the VOC content does not exceed the limits as specified in Table-12 given below.

Table 12 - VOC Limits for Adhesives

Type of Adhesives	VOC Limit (g/L less water)
Glazing adhesives	100
Ceramic tile adhesives	65
Drywall and panel adhesives	50
Wood substrata adhesives	30
Wood flooring adhesives	100
HVAC duct insulation	350
Indoor Carpet adhesives	50
Multipurpose construction adhesives	70

Notes:

- *Volatile organic compounds (VOCs) are carbon compounds that participate in atmospheric photochemical reactions (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates, and ammonium carbonate). The compounds vaporise at normal room temperatures.*
- *If the project has used small quantities of non-complying paints & coatings and / or adhesives, a VOC budget can be calculated to demonstrate that the weighted average VOC of all products (based on litres of each applied) is below the allowed limit, by each type.*
- *Paints & coatings and Adhesives & sealants that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by IGBC can be used by the project to show compliance.*

Exemplary Performance:

This credit is not eligible for exemplary performance.

Eco-friendly Housekeeping Chemicals Points: 1

HWB Credit 3

Intent:

Encourage use of eco-friendly housekeeping chemicals, to reduce adverse health impacts on building occupants.

Compliance Options:

Demonstrate that the project has green housekeeping policy, housekeeping plan and uses eco-friendly housekeeping chemicals for regular operations.

Notes:

- *The eco-friendly housekeeping chemicals should be bio-degradable or certified by CII under Green Product Certification Programme (GreenPro) or Green Seal Standard – 37 or by a third-party agency approved by IGBC can be used by the project to show compliance.*
- *The location where eco-friendly housekeeping chemicals are stored should have an exhaust system.*
- *Exhaust rates of the housekeeping chemicals storage room shall meet ASHRAE Standard 62.1 - 2013, Table 6.5 Minimum Exhaust Rates. The exhaust rate for janitor closet is 1 cfm/ sq.ft.*

Exemplary Performance:

This credit is not eligible for exemplary performance.

Access to Quality Drinking Water Points: 1

HWB Credit 4

Intent:

Ensure the building occupants & visitors have access to quality drinking water, thereby to minimise the risk of water borne diseases.

Compliance Options:

Install a water purifying system in the project to remove bacteria and other impurities from the water.

The treated water shall cater to all the building occupants & visitors and comply with the drinking water specifications as per IS 10500- 2012 'Drinking Water- Specification Standard'.

Exemplary Performance:

This credit is not eligible for exemplary performance.

Eco-friendly Refrigerants **Points: 1**

(Not Applicable for Existing Buildings)

HWB Credit 5

Intent:

Encourage use of eco-friendly refrigerants in the building, thereby minimising impact on the ozone layer.

Compliance Options:

Demonstrate that refrigerants used in the buildings Heating, Ventilation & Air-conditioning (HVAC) equipment are HFC (Hydrofluorocarbon) (Or) the Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) values of the refrigerant should be 0 and lesser than 750 respectively.

Note: *Small HVAC units (containing less than 0.25 kg of refrigerant) need not be considered in calculation.*

Exemplary Performance:

This credit is not eligible for exemplary performance.

Universal Design Points: 1

HWB Credit 6

Intent:

Ensure that the building design caters to differently abled and senior citizens.

Compliance Options:

Design the building to provide the following, as applicable, for differently abled and senior citizens in accordance with the guidelines of the National Building Code (NBC) of India 2016.

- Preferred car park space having an easy access to the main entrance or closer to the lift lobby *(Provide at least one preferred car park space or as defined by the local byelaw, in an easily accessible location)*
- Easy access to the main entrance of the building
- Non-slippery ramp, with handrails on at least one side *(as applicable)*
- Braille and audio assistance in lifts for visually impaired people *(as applicable)*
- Uniformity in floor level for hindrance-free movement in common areas & exterior areas
- Restroom (toilet) in common areas designed for differently abled people
  (Provide at least one restroom in the building or as defined by the local byelaw, in an easily accessible location)
- Main walkways / pathways with adequate width in exterior areas
- Visual warning signage in common areas & exterior areas

Exemplary Performance:

This credit is not eligible for exemplary performance.

GREEN MEASURES BEYOND THE FENCE

Green Measures Beyond the Fence — Points: 4

GM Credit 1

Intent:

Encourage green measures beyond the fence for social and well-being of occupants in nearby communities and villages, thereby improving the standard of living and reducing the associated negative environmental impacts.

Compliance Options:

Demonstrate that the project/ organisation has implemented at least one of the following green measures beyond the fence within 250 km radial distance from the project site. *(4 points)*

- **Rainwater Harvesting**

  Install rainwater harvesting system in any public building such as government school / college, community centre, etc. to capture 100% of the runoff from roof areas of respective building.

  Note: The approach and methodology to demonstrate compliance shall be as defined in WC MR1: Rainwater harvesting, Roof.

- **Sewage Treatment Plant**

  Install sewage treatment plant and maintain for a period of atleast one year in any public building such as government school/ college, community centre, etc. to treat 100% of the waste water generated in the respective building.

- **Water Body**

  Adopt and maintain water body for a minimum period of three years. The surface area of water body should be equal to or greater than the built-up area of the building (applying for certification).

- **Public Parks/Avenues**

  Adopt and maintain public parks or avenues for a minimum period of three years. The area of park/ avenue should be atleast two times the built-up area of the building (applying for certification).

- **Mass Plantation**

  Organise or be part of a plantation drive to plant at least 10,000 tree saplings in one year, for a period of three years.

Notes:

- *The saplings should not be monocultured species.*
- *The plantation should not be for commercial purpose.*

❖ **Renewable Energy**

Install renewable energy systems such as solar PVs, wind turbines, biogas plant, etc. in any public building such as government school/ college, community centre, etc., equivalent to or more than the total annual energy consumption of the respective building.

❖ **Basic Facilities**

Provide atleast three of the following basic amenities at any government school/ village and maintain for a period of at least one year:

- Bus shelters
- Street lighting
- Public toilets
- Play area and sports kit
- Tot-lot
- Drinking water purifier
- Organic waste management
- Other basic facilities

❖ **Other Green Measures**

Identify the intent & requirements of other green measures which are similar to the green measures listed in this credit and provide documentation to demonstrate compliance.

The green measure identified by the project team has to be approved by IGBC before applying for certification.

General Notes:

- *The green measures can be aligned with UN Sustainability Development Goals/ Central/ State Government initiatives; in case if such initiatives are mandatory to be adopted, then those measures should be over and above the mandatory clauses.*
- *To demonstrate compliance for this credit, the green measures considered for one project cannot be shown for another project, unless the measures/ impacts are significantly higher than the credit requirement.*
- *In case the project/ organisation has already implemented green measures, document only those measures which have been implemented in the last 3 years from the date of project registration with IGBC.*

INNOVATION AND PERFORMANCE

Innovation in Design Process Points: 4

IP Credit 1

Intent:

Encourage project design, construction and facility teams to showcase innovative concepts in green building categories, not specifically addressed by the IGBC Green Service Building rating system, and exemplary performance above the requirements.

Compliance Options:

- **Case A: Innovation (1 Point for each measure; maximum 2 points)**

  Identify the intent of proposed innovation credit, proposed requirement for compliance, and proposed documentation to demonstrate compliance, and the design approach used to meet the required measures.

  Note: Refer Table - 13 for illustrative list of credits eligible for innovation.

  (And/ Or)

- **Case B: Exemplary Performance (1 Point for each measure; maximum 2 points)**

  The project is eligible for exemplary performance, if the design and / or construction measures greatly exceed the credit requirements of the IGBC Green Service Buildings rating system.

  Note: Refer Table - 14 for list of base credits eligible for exemplary performance.

Table 13 – Illustrative List of Credits eligible for Innovation	
Innovation Credit	**Requirement**
On-site Wastewater Treatment	100% of wastewater generated in the project
Wastewater Reuse	Use treated wastewater for 100% of the landscaping and flushing water requirements
On-site Organic Waste Management	Treat 95% of the landscape and food waste
Low-emitting Vehicles	Use of electric vehicles for atleast 25% of permanent occupants (Or) Install electric charging stations (with industrial sockets) in atleast 2 car park spaces or for 6 two-wheelers
Irrigation Systems	95% of landscape area with Drip/ Sprinkler Irrigation (applicable if the landscape area is atleast 20% of the site area)
Energy Management System	Install an energy management system and/ or decentralised panels to monitor & control HVAC & Lighting systems.
Health and Hygiene of Occupants & Workers	Implement Health and Hygiene guidelines for the welfare of Occupants & Workers

Table 14 - List of Base Credits eligible for Exemplary Performance	
Credit	**Requirement**
Site Planning and Design	
SPD Credit 2: Sustainable Landscape	≥ 17.5% of site area is restored and/ or designed with vegetated spaces
SPD Credit 3: Heat Island Reduction, Non-Roof and Roof	• 95% of exposed non-roof impervious areas are under tree cover (and / or) with open grid pavers / grass pavers (and / or) hardscape materials with an SRI of at least 29 (and not higher than 64). • 95% of net roof area covered with vegetation
Water Conservation	
WC Credit 1: Rainwater Harvesting, Roof & Non-roof	Rainwater Harvesting, Roof & Non-roof (*as defined in credit*)
WC Credit 2: Water Efficient Plumbing Fixtures	≥ 35% reduction in potable water use
Energy Efficiency	
EE Credit 2: Enhanced Energy Efficiency	Option 1: Simulation Approach • New Building: ≥ 34% Energy cost savings • Existing Building: ≥ 30% Energy cost savings Option 2: Prescriptive Approach • Lighting Power Density: ≥ 50% reduction
EE Credit 3: On-site renewable Energy	≥ 14% of total annual energy consumption
Building Materials and Resources	
BMR Credit 3: Alternate Wood-based Materials	≥ 75% of total cost of wood-based material

Water and Energy Performance — Points: 1

(Not Applicable for New Buildings)

IP Credit 2

Intent:

Optimise energy and water consumption in the building, to reduce negative environmental impacts.

Compliance Options:

- Develop a comprehensive plan to enhance the performance of energy and water consuming systems in the building, in the next 3 years.
  - The plan shall include systems such as high-performance glass, lighting, HVAC, pumps & motors, appliances, building automation, rainwater harvesting, water fixtures, wastewater treatment, energy and water meters, irrigation systems, etc.
  - The plan shall address existing & proposed energy and water conservation measures.

  (And)

- Commit to provide the annual total building water and energy consumption data to IGBC for a period of 3 years.

Green Measures Cost Analysis Points: 1

IP Credit 3

Intent:

Optimise design, construction and operational efficiency of green features in the building, so as to analyse the incremental/ decremental cost and the return on investment.

Compliance Options:

Develop a matrix to compute incremental/ decremental cost of the project for the green features implemented.

The matrix shall include green features, conventional cost, incremental/ decremental cost, tentative benefits/ estimated savings and return on investment.

***Note*:**

- *The cost for the green features implemented beyond the fence shall not be considered for this credit calculation. The project shall consider only green features implemented within the site for this credit calculation.*

IGBC Accredited Professional **Points: 1**

IP Credit 4

Intent:

Support and encourage involvement of IGBC Accredited Professional in the project, so as to integrate appropriate design, construction & operational measures and streamline the certification process.

Compliance Options:

Atleast one participant of the project team shall be IGBC Accredited Professional.

ANNEXURE
Documentation Required for
IGBC Green Service Building Rating System

GENERAL SUBMITTALS

General Submittals

- Project brief stating project type, different type of spaces, number of floors, etc.,
    - General drawings (in PDF format only):
    - Master/ Site plan
    - Parking plans
    - Floor plans
    - Elevations
    - Sections
- Area Statement
    - Site, Building, Air-conditioned/ Non air-conditioned areas, Regularly/ Non-regularly occupied areas
- Occupancy (permanent & transient)
    - FTE calculations
- Photographs taken at various stages of the project
- Project Checklist with attempted and not attempted points

SITE PLANNING AND DESIGN

SPD Mandatory Requirement 1: Local Building Regulations

- **As-built drawings** (site plan, floor plans, elevations, sections, etc.,) approved by local Government authority.
- **Occupancy certificate** from Local Authority (or) **Completion certificate** signed by Architect
- **Photographs** of the site and building taken at various stages of construction.

SPD Credit 1: Erosion and Sedimentation Control

- **Narrative** describing the Erosion and Sedimentation Control (ESC) measures implemented, during construction and post occupancy.
- **Site drawings** highlighting ESC measures implemented on-site, during construction and post occupancy.
- **Photographs** showing ESC measures taken at various stages of construction, before construction, during construction and post occupancy.

SPD Credit 2: Sustainable Landscape

Case A: Natural Topography and/or Vegetation:

- **Site drawing** highlighting the area with natural topography (and /or) vegetation.
- **Calculations** indicating the total area with natural topography (and / or) vegetation on the ground and/ or over built structures to the total site area, in percentage.
- **Photographs** showing the site area with natural topography (and / or) vegetation.

Case B: Plantation of Tree Saplings

- **Narrative** describing the strategies implemented to preserve existing trees/ transplant trees/ plant new saplings, within the project site.
- **Site survey drawing**/ Satellite images highlighting the existing trees that will be preserved and/ or transplanted before and after construction, within the project site.
- **Landscape drawing** highlighting the preserved trees/ or transplanted and new tree saplings.
- **Calculations** indicating the total site area (in acres), number of preserved trees, transplanted trees and new tree saplings planted.
- **Photographs** showing the existing trees (before/ after construction), transplanted trees (before/ during construction) and new tree saplings (after construction).

SPD Credit 3: Heat Island Reduction

Case A: Non-roof Impervious Areas

- **Narrative** describing the strategies to reduce heat island effect from non-roof areas.
- **Site drawing** highlighting the non-roof impervious (hardscape) areas and the areas covered with shade from tree cover within 5 years, (and/ or) open grid pavers, including grass pavers (and/ or) hardscape materials with SRI of atleast 29 (and not higher than 64).
- **Calculations** indicating the area covered with shade from tree cover, (and/ or) open grid pavers, including grass pavers (and/ or) hardscape materials with SRI of atleast 29 (and not higher than 64) to the total exposed non-roof impervious area, in percentage.
- **List** of the existing trees/ plant species which can mature into grown up trees for shading, within the next 5 years.
- **Purchase invoice/ Payment receipt** of the reflective materials, if sourced.
- **Manufacturer brochures** indicating the Solar Reflective Index (SRI) of the reflective materials.
- **Photographs** showing the measures implemented to reduce heat island effect from non-roof areas.

Case B: Roof Area

- **Narrative** describing the strategies implemented to reduce heat island effect from roof areas.
- **Calculations** indicating the roof area covered with high reflective roof materials and / or vegetation to the total exposed roof area (excluding service & utility areas), in percentage.
- **Roof plans** highlighting the area covered with high reflective materials and / or vegetation installed in the project.
- **Declaration letter** from the project head stating that the vegetated areas on the roof surfaces will be retained for life, if applicable.
- **Purchase invoice/ Payment receipt** of the high reflective roof materials sourced for the project.
- **List** of the native/ drought tolerant plant species proposed on the roof.
- **Manufacturer letters/ brochures** indicating the Solar Reflective Index (SRI) of high reflective roof materials used in the project.
- **Photographs** showing the measures to reduce heat island effect from roof areas.

SPD Credit 4: Green Education

- **Narrative** describing the measures implemented for Green Education program.
- **Details** of promotional material and photographs showing signage and posters placed in the project showing green concepts.
- **Details** of outreach/ educational programmes on eco-friendly practices/ green initiatives.
- **Details** of the Green tour for visitors (tour stop description drawing).
- **Presentation** on green features of the project and how the green features were incorporated, for occupants and visitors training programme.

  (And)

- **List** of the formal sustainability committee/ team members, to identify and implement green initiatives within and/or outside the project. Supporting documents describing the implementation of eco-friendly practices/ green initiatives such as minutes of the meetings, photographs, bulletins, etc.,
- **Roles & responsibilities** of the formal sustainability committee/ team allocated for implementation of eco-friendly practices/ green initiatives
- **Copy of project specific green building renovation guidelines** providing information which helps the facilities team to implement the green features, during building renovation process.

WATER CONSERVATION

WC Mandatory Requirement 1: Rainwater Harvesting, Roof

Case A: Rainwater Harvesting, Roof

- **Narrative** describing the strategies implemented to capture/ harvest rain water from roof areas.
- **Calculations** indicating the run-off volume from roof areas and the volume of rainwater harvesting pits/ tanks.
- **External storm water drain layout** highlighting the location of rain water harvesting - ponds, pits, storage tanks, etc., as applicable, including cross-sectional drawings of rain water harvesting systems.
- **Soil test report** indicating the percolation rate of the soil, as applicable.
- **Photographs** of rain water harvesting systems, taken during and after construction.

Case B: High Ground Water Table

- **Hydrology report** (approved by third-party) indicating the level of water table within the project site.

WC Mandatory Requirement 2: Water Efficient Plumbing Fixtures

- **Calculations** indicating the reduction in potable water due to efficient plumbing fixtures (flow and flush) installed in the project.
- **List** of plumbing fixtures (flow and flush) installed in the project, with respective make & model and flow rates.
- **FTE occupancy calculations** for the building occupants and visitors.
- **Manufacturer cut-sheets/ brochures/ letters** indicating the flow rates of the plumbing fixtures (flow and flush) at 3 bar flowing water pressure.

  ***Note**: The manufacturer letters should be project specific.*
- **Purchase invoice** of plumbing fixtures (flow and flush) with make & model.

WC Credit 1: Rainwater Harvesting, Roof

Case A: Rainwater Harvesting, Roof

Please refer to the 'Documentation required' under WC Mandatory Requirement 1 – Rainwater Harvesting, Roof.

Case B: High Ground Water Table

- **Hydrology report (approved by third-party) indicating the level of water table** within the project site.
- **Narrative** describing the strategies implemented to capture/ harvest rain water from roof areas.
- **Calculations** indicating the run-off volume from roof areas and the volume of rainwater harvesting pits/ tanks.
- **External storm water drain layout** highlighting the location of rain water harvesting - ponds, pits, storage tanks, etc., as applicable, including cross-sectional drawings of rain water harvesting systems.
- **Soil test report** indicating the percolation rate of the soil, as applicable.
- **Photographs** of rain water harvesting systems, taken during and after construction.

WC Credit 2: Water Efficient Plumbing Fixtures

Please refer to the 'Documentation required' under WC Mandatory Requirement 2 – Water Efficient Plumbing Fixtures.

WC Credit 3: Water Metering

- **Narrative** describing the water meters installed in the project.
- **Schematic diagram** showing the location of water meters installed in the project.
- **Manufacturer cut-sheets/ brochures** of the installed water meters.
- **Purchase invoices and Photographs** of the installed water meters.

ENERGY EFFICIENCY

EE Mandatory Requirement: Minimum Energy Efficiency

Option 1: Simulation Approach (For air-conditioned buildings):

- Building simulation analysis with the following information, as applicable:

  The baselines should be as per Energy Conservation Building Code 2017 (Or) ASHRAE Standard 90.1-2013 (without amendments).

  - Narrative stating the climate zone and the list of Energy Conservation Measures (ECMs) implemented in the project.

    Note: The list should include all ECMs that differ from the baseline building performance to proposed building performance.

  - Window-to-wall ratio (WWR) calculations for each building.
  - Comparison between the baseline building performance and the proposed building performance with percentage improvement.
  - The schedules for lighting power, thermostat set-point, HVAC system, miscellaneous equipment power, etc., for the proposed building, as determined by the designer.
  - Input and output report(s) from the simulation program or compliance software including a breakdown of energy usage for the following components, but not limited to: interior lighting and exterior lighting, space cooling & heat rejection equipment, space heating equipment, fans, other HVAC equipment (such as pumps), internal and external equipment loads, etc., The output reports should also show the unmet hours by the HVAC system, for both the proposed design and baseline building design.
  - An explanation of any error messages noted in the simulation program output.

- Details of the glazing along with the specifications (SHGC value, U-value and VLT).
- Construction details and sectional drawings of the wall assembly (including wall insulation material, etc.,), along with the U-value of the overall wall assembly.
- Construction details and sectional drawings of the roof assembly (including roof insulation material, etc.,), along with the U-value of the overall roof assembly.
- Details of the lighting systems and controls including the list of interior and exterior lighting fixtures, with make and model.
  - LPD calculations, as per 'Building Area Method' or 'Space-by-Space method / Space function method'.
  - Interior and exterior lighting layouts.
- Details of the air-conditioning system indicating the COP/ EER values, along with make and model.
- Details of hot water system such as make & model, calculations and plans showing location of solar water heating system & heat pump.

- Details of other Energy Conservation Measures (ECMs).
- Manufacturer brochures/ cut-sheets/ letters indicating the efficiency parameters for glazing (SHGC value, U-value and VLT), wall and roof insulation materials, lighting fixtures & controls, air-conditioning system, solar water heating system, as applicable.
- Purchase invoices of energy conservation measures implemented in the project such as glass, wall and roof insulation, lighting systems, chillers, heat recovery wheel, solar hot water system, etc., as applicable.

Additional document required for Existing Buildings:

- Projects attempting through calibrated simulation approach submit monthly energy bills of last one year

Option 2: Prescriptive Approach (For Non air-conditioned buildings):

Document the prescriptive measures outlined in the rating system, as applicable:

Lighting

- Details of the lighting systems including the list of interior and exterior lighting fixtures, along with make and model.
    - LPD calculations, as per 'Building Area Method' or 'Space function method'.
    - Interior and exterior lighting layouts.

Air-conditioning Systems

- Details of the air-conditioning systems indicating the COP/ EER values or BEE star rating, along with make and model.

Fans

- Details of the fans indicating the BEE star rating or efficiency, along with make and model.

Other Supporting Documents

- Manufacturer brochures/ cut-sheets/ letters indicating the efficiency parameters for lighting fixtures, air-conditioning system, fans, as applicable.
- Purchase invoices of energy conservation measures implemented in the project such as lighting fixtures, air-conditioning systems, fans, as applicable.

EE Credit 1: Passive Architecture

Option 1: Simulation Approach

- **List** of the passive architectural measures proposed in the building.
- **Draft simulation report** indicating the energy savings achieved (in percentage) through passive architectural measures.
    - The energy savings shall be documented through passive architectural concepts only and not through materials. E.g. Use of Hollow brick wall (or) double brick wall.
    - The type and capacity of active systems shall be same in both base case and proposed case; however, the end use energy consumption for active systems may vary in the proposed case from base case, based on the impact of passive architectural features. E.g. Energy savings in cooling due to hollow brick wall.
- **Drawings/ sketches/ rendered images** (such as site plan, floor plans, sections & elevations, images, as applicable) showing the passive architectural features.
- **Photographs** showing the passive architectural features.

Option 2: Prescriptive Approach

- **Narrative** describing the strategies proposed to design passive architecture measures, as applicable.
- **Drawings/ sketches/ rendered images** (such as site plan, floor plans, sections & elevations, images, as applicable) showing the passive architectural features.
- **Photographs** showing the passive architectural features.

Orientation & Internal zoning

- **Site plan** indicating north along with sun path diagram.
- **Floor plans** indicating the concept adopted for zoning regularly and non-regularly occupied areas.

Skylights:

- **Calculations** indicating the roof area with skylights to the total roof area, in percentage.
- **Roof plan** highlighting the skylight area.
- **Comparison** of skylight U-factor and SHGC values vis-à-vis Energy Conservation Building Code 2017 (ECBC).
- **Manufacturer brochure/ cut-sheet/ letter** of the skylight installed in the project showing the U – factor and SHGC.

Courtyard:

- **Site plan and elevations** highlighting the courtyard dimensions.
- **Photographs** of the courtyard.

Shading Corridors:

- **Floor plans and sections/ sketches** highlighting the shaded corridors.
- **Photographs** showing the shaded corridors.

Exterior Openings (Projection Factor):

- **Calculations** indicating the number of exterior openings (fenestration) having a Projection Factor of 0.3 or more to the total number of the exterior openings (fenestration), in percentage.
- **Elevations and Sections** highlighting the dimensions of the window and projection factor, along with window schedule.
- **Photographs** showing the exterior openings.

Windows:

- **Calculations** indicating the number of punched/ bay windows to the total number of the windows, in percentage.
- **Elevations and Sections** highlighting the punched/ bay windows, along with window schedule.
- **Photographs** showing the punched/ bay windows.

Light shelves:

- **Calculations** indicating the number of windows having light shelves to the total number of the windows, in percentage.
- **Sections/ Sketches** highlighting the light shelves and the light induced in the space, along with dimensions.
- **Manufacturer data sheet** for the light shelves indicating its reflectivity, etc.
- **Photographs** showing the light shelves.

Walls:

- **Narrative** describing the type of wall.
- **Calculations** indicating the total surface area of the wall and thermally efficient passive walls, in percentage.
- **Floor plans** highlighting the type of walls.
- **Sections** of the thermally efficient passive walls, with dimensions.
- **Photographs** showing the thermally efficient passive walls, during construction.

Roof Garden:

- **Roof area calculations** indicating the total area covered with vegetation to the total exposed roof area (excluding service & utility areas), in percentage.
- **Roof plans** highlighting the area covered with vegetation in the project.
- **Declaration** letter from the project head stating that the vegetated areas on the roof surfaces will be retained for life.
- **List** of the native/ drought tolerant plant species proposed on the roof.
- **Photographs** showing the roof garden.

Vertical landscaping on exterior building walls:

- **Calculations** indicating the wall area covered with vertical landscaping to the total wall area, in percentage.
- **Elevations** highlighting the area covered with vertical landscaping in the project.
- **Declaration** letter from the project head stating that the vertical landscaping will be retained for life.
- **List** of the native/ drought tolerant plant species proposed for vertical landscaping.
- **Photographs** showing the vertical landscaping.

Cross Ventilation:

- **Floor plans** with door and window schedule.
- **Calculations** indicating the regularly occupied spaces compliant with cross ventilation.

Passive Cooling / Heating Technologies:

- **Narrative** describing the passive cooling / heating technologies, along with drawings and other supporting documents.

EE Credit 2: Enhanced Energy Efficiency

Case 1 – Simulation Approach (For air-conditioned buildings):

Please refer to the 'Documentation required' under EE Mandatory Requirement 2 – Minimum Energy Efficiency: Case 1 – Air-conditioned Buildings, Option 1-Performance Based Approach (Whole Building Simulation).

Case 2 – Prescriptive Approach (For Non air-conditioned buildings):

Document the prescriptive measures outlined in the rating system, as applicable:

- Narrative stating the climate zone and the list of Energy Conservation Measures (ECMs) implemented in the project.
- Window-to-wall ratio (WWR) calculations for each building.
- Comparison between the baseline building parameters and the proposed building parameters. For baseline criteria of building envelope measures, refer Annexure – I.

Building Envelope

- Details of the glazing along with the specifications (SHGC value, U-value and VLT).
- Construction details and sectional drawings of the wall assembly (including wall insulation material, etc.,), along with the U-value of the overall wall assembly.
- Construction details and sectional drawings of the roof assembly (including roof insulation material, etc.,), along with the U-value of the overall roof assembly.

Lighting

- Details of the lighting systems and controls including the list of interior and exterior lighting fixtures, along with make and model.
    - LPD calculations, as per 'Building Area Method' or 'Space function method'.
    - Interior and exterior lighting layouts.

Air-conditioning Systems

- Details of the air-conditioning systems indicating the COP/ EER values or BEE star rating, along with make and model.

Fans

- Details of the fans indicating the BEE star rating or efficiency, along with make and model.
- Details of the fans with DC motors, along with make and model.

Hot Water Systems

- Details of hot water system such as make & model, calculations and plans showing location of solar water heating system & heat pump.

Pumps & Motors

- Details of the pumps & motors indicating the BEE star rating, IE class or efficiency, along with make and model.

Other Supporting Documents

- Manufacturer brochures/ cut-sheets/ letters indicating the efficiency parameters for glazing (SHGC value, U-value and VLT), wall & roof insulation materials, lighting fixtures, air-conditioning system, hot water systems, fans, pumps & motors, as applicable.
- Purchase invoices of energy conservation measures implemented in the project such as glass, wall & roof insulation, lighting controls, air-conditioning systems, hot water systems, fans, pumps & motors, as applicable.

EE Credit 3: On-site Renewable Energy

- **Narrative** describing the installed renewable energy systems, along with the technical details.
- **Drawing** showing the location of installed renewable energy systems.
- **Calculations** indicating the total annual energy generation from the on-site renewable energy systems (kWh) to the total annual energy consumption (kWh) of the building (interior & exterior areas), in percentage. Also, provide the details of capacity of the renewable energy system (kW).
- **Purchase invoice/ Payment receipts** of the installed renewable energy systems.
- **Photographs** showing the renewable energy systems.

EE Credit 4: Energy Saving Appliances

- **Narrative** describing the list of installed star rated appliances and non-compliant appliances.
- **Calculations** indicating the name & capacity of all compliant appliances, make & model no., no. of appliances, rated power of each appliance, total rated power of all appliances.
- **Purchase invoice/ Payment receipts** of the installed star rated appliances.
- **Photographs** showing the star rated appliances.

EE Credit 5: Energy Metering

- **Narrative** describing the energy meters installed in the project.
- **Single line drawing** showing the energy meters.
- **Photographs** showing the installed energy meters for various applications.

BUILDING MATERIALS AND RESOURCES

BMR Mandatory Requirement 1: Segregation of Waste, Post-occupancy

- **Narrative** describing the strategies implemented to:
  - Segregate and divert dry waste (paper, plastic, metals, glass, etc.,) and wet waste from the building(s), to the easily accessible common facility.
  - Divert dry & wet waste and other waste such as plastic, batteries, e-waste, lamps, and medical waste (if any), from the common facility.
- **Floor plans** showing the location of waste bins at floor level and common areas, as applicable.
- **Site/ floor plan** showing the location of the centralised facility for segregation of waste.
- **Photographs** showing the waste bins provided at floor level and centralised facility with permanent signage.

BMR Credit 1: Green Procurement Policy

(Not Applicable for New Buildings)

- **Green Procurement Policy** signed by the Director or Head of the organisation for sourcing the following:
  - GreenPro / Third-party eco-labelled green building materials, products, and equipment
  - Materials with higher recycled content
  - Equipment with higher energy efficiency
  - HVAC systems with eco-friendly refrigerants
  - Products with reduced water consumption
  - Material emitting fewer toxic substances during installation or use and upon disposal
  - Avoid single use plastic for regular operations
  - Alternate wood-based material

BMR Credit 2: Use of Eco-labelled Building Materials, Products & Equipment

(Not Applicable for Existing Buildings)

- **Narrative** describing the strategies to source passive or active green building materials, products, and equipment, that are certified by IGBC under Green Product Certification Programme or by a third-party agency approved by IGBC.

  Note: The narrative should also include the list of passive or active green building materials, products, and equipment, with certification details.

- **Purchase Invoices** and **Test certificates/ reports** of the passive or active green building materials, products and equipment.

BMR Credit 3: Alternative Construction Technologies & Materials

(Not Applicable for Existing Buildings)

- **Narrative** describing the alternative construction technologies & materials used in the project.
- **Purchase Invoices** and **manufacturer data sheets** (as applicable) of the alternative construction technologies & materials used in the project.

Additional Documents required for Alternative Construction Technologies

- **Building drawings** approved by the Structural consultant.
- **Photographs** showing alternative construction technologies.

Additional Documents required for Alternative Construction Materials

- **Mix design report** for alternative construction materials**.**

BMR Credit 4: Alternate Wood-based Materials
(Not Applicable for Existing Buildings)

- **Narrative** describing the strategies implemented to source salvaged wood/ recycled waste wood / composite wood/ rapidly renewable wood/ certified wood in the project.
- **Calculations** indicating the cost of salvaged wood/ recycled waste wood / composite wood/ rapidly renewable wood/ certified wood by FSC/ (PEFC)/ equivalent to the total cost of new wood in the project, in percentage.
- **List** of applications where salvaged wood/ recycled waste wood / composite wood/ rapidly renewable wood/ certified wood are used.
- **Purchase invoices** of the sourced salvaged wood/ recycled waste wood / composite wood/ rapidly renewable wood/ certified wood.
- If certified wood is sourced, provide manufacturer **Chain-of-Custody (CoC)** certificate and purchase invoices from the manufacturers indicating the CoC number and the type of wood e.g. pure, mixed, etc.
- **Photographs** showing applications of wood based materials.

BMR Credit 5: Handling of Waste Materials, During Construction *(Not Applicable for Existing Buildings)*

- **Narrative** describing the strategies implemented to handle construction waste.

  Note: The narrative shall also include the following:

  - *List of construction waste materials generated and diverted for reuse, recycle & land-fill.*
  - *Applications of construction waste materials diverted for reuse, within or outside the project.*

- **Site plan** highlighting the construction waste management yard.
- **Calculations** indicating the quantity of construction waste generated to the total quantity of construction waste reused, recycled and sent to landfill, in percentage.
- **Letters** from scrap dealers/ contractors stating the type and quantity of construction waste received/ reused from the project site, for recycling/ reuse.
- **Photographs** taken at various stages of the project showing the construction waste management yard.

HEALTH AND WELL-BEING

HWB Mandatory Requirement 1: Minimum Fresh Air Ventilation

Case A: Mechanically Ventilated Spaces

- **Narrative** stating the buildings' fresh air ventilation design in the project.
- **Calculations** indicating fresh air intake volumes in all regularly occupied spaces, for each zone, as per Ventilation Rate Procedure prescribed in ASHRAE Standard 62.1 - 2010.
- **Floor plans** indicating the location of AHU's and TFA's.

Case B: Non Air-conditioned Spaces

- **Floor plans** with window and door schedule.
- **Building elevations** showing operable windows and doors.
- **Calculations** indicating the openable area of windows and doors to the carpet area, for each of the regularly occupied spaces in percentage.
- **Photographs** showing the operable windows and doors to the exteriors, in all the regularly occupied areas.

HWB Mandatory Requirement 2: No Smoking Premises

- **Copy of organisation's policy on 'no smoking'** (or) **Declaration letter** from the project head stating that 'smoking' will be prohibited in the project.
- **Narrative** describing the strategies (eg. signages, posters, brochures, building guidelines, etc.,) to communicate 'no smoking policy' to all the building occupants and visitors.
- **Photographs** showing 'no smoking' signages installed in the project.

HWB Credit 1: Daylighting

Option 1: Simulation Approach

- **Daylight simulation report** with sky conditions (such as date & month; time; ambient Lux levels) and wall, floor & roof reflectance properties, for all the regularly occupied spaces in the building. During simulation, consider shading devices and 'shadow effect' of adjacent buildings.
- **Site/ master plan** showing all the buildings.
- **Floor/ roof plans** with window and skylight schedule.
- **Manufacturer brochure/ datasheet/ letter** of the glass installed showing the Visual Light Transmittance (VLT).
- **Photographs** showing the building elevations (all sides) and interiors spaces at different floors.

Option 2: Measurement Approach

- **Daylight analysis report** indicating daylight illuminance levels measured at work plane height, for all the regularly occupied spaces in the building.
- **Site/ master plan** showing all the buildings.
- **Floor/ roof plans** with window and skylight schedule.
- **Manufacturer brochure/ datasheet/ letter** of the glass installed showing the Visual Light Transmittance (VLT).
- **Details of lux meter** (make & model, specifications).
- **Photographs** showing the building elevations (all sides) and interiors spaces at different floors.

HWB Credit 2: Low-emitting Materials
(Not Applicable for Existing Buildings)

Paints & Coatings:

- **List** of low VOC content paints & coatings (make & model) used in the building interiors, along with the VOC content (in g/L, less water).
- **Test certificate (or) Manufacturer data sheets/ Brochures/ Materials Safety Data Sheet** (MSDS), indicating the VOC content (in g/L, less water) of the paints & coatings sourced.

Adhesives:

- **List** of low VOC content adhesives (make & model) used in the building interiors, along with the VOC content (in g/L, less water).
- **Test certificate (or) Manufacturer data sheets/ Brochures/ Materials Safety Data Sheet** (MSDS), indicating the VOC content (in g/L, less water) of the adhesives sourced.

HWB Credit 3: Eco-friendly Housekeeping Chemicals

- **Green housekeeping policy & plan** signed by the project head (or) **housekeeping contract agreement** signed by the project head with the facilities team.
- **List** of eco-friendly housekeeping chemicals that will be used along with its MSD sheets. *Kindly note that the housekeeping chemicals should be bio-degradable or meet CII Green Product Certification Programme (GreenPro) or Green Seal 37 standards.*
- **Purchase invoice** of the procured eco-friendly housekeeping chemicals.
- **Photographs** showing the location of storage of eco-friendly housekeeping chemicals.
- **Details** of exhaust system & exhaust rates of the housekeeping chemicals storage room.

HWB Credit 4: Access to Quality Drinking Water

- **Details** of RO plant and the characteristics of treated drinking water.
- **Site plan** highlighting the location of RO plant.
- **Photographs** showing RO plant.

HWB Credit 5: Eco-friendly Refrigerants

(Not Applicable for Existing Buildings)

- **Declaration letter** signed by the project head/ HVAC consultant stating the type of refrigerants installed in the HVAC systems.
- **Manufacturer datasheet/ brochure** of HVAC systems installed in the project indicating the type of refrigerant and its ODP & GWP value.

HWB Credit 6: Universal Design

- **Narrative** describing the measures implemented in the building for differently abled people and senior citizens. In case the project is unable to comply with any of the measures, as listed in the credit requirement, the project team should provide a justification.
- **Drawings** highlighting the measures implemented, with dimensions, for differently abled people and senior citizens.
- **Photographs** showing all the measures implemented.
- **Manufacturer brochures** for the measures implemented.

GREEN MEASURES BEYOND THE FENCE

BFM Credit 1: Green Measures Beyond the Fence

- **Narrative** describing the strategies adopted to implement green measures beyond the fence.
- **Site vicinity map** highlighting the radial distance from the project site to site where green measures are implemented.
- **Supporting document** highlighting the involvement of the Project/ Organisation to implement the green measures, along with scope of work.

Rainwater Harvesting

- **Narrative** describing the strategies implemented to capture/ harvest rain water from roof areas.
- **Calculations** indicating the run-off volume captured/ harvested from roof areas.
- **Photographs** showing the rainwater harvesting system.

Sewage Treatment Plant

- **Narrative** describing the on-site waste water treatment system implemented in the project, along with capacity of STP and quality standards of the treated waste water.
- **Photographs** showing STP.

Water Body

- **Narrative** describing the measures undertaken to adopt & maintain the water body.
- **Photographs** showing the actual conditions before and after adoption.
- **Declaration** from the project head stating that the water body would be maintained for atleast three years.

Public Parks/Avenues

- **Narrative** describing the measures undertaken to adopt & maintain the public parks/ avenues.
- **Photographs** showing the actual conditions before and after adoption.
- **Declaration** from the project head stating that the public parks/ avenues would be maintained for atleast three years.

Mass Plantation

- **Narrative** describing the measures adopted for mass plantation.
- **List** of plant species.
- **Purchase invoice/ payment receipt** indicating the number of trees procured.
- **Photographs** of the mass plantation drive.
- **Declaration** from the project head stating that the mass plantation would be carried for atleast three years.

Renewable Energy

- **Narrative** describing the installed renewable energy systems, along with the technical details.
- **Drawing** showing the location of installed renewable energy systems.
- **Calculations** indicating the total annual energy generation from the on-site renewable energy systems (kWh) to the total annual energy consumption (kWh) of the building (interior & exterior areas), in percentage. Also, provide the details of capacity of the renewable energy system (kW).
- **Purchase invoice/ Payment receipts** of the installed renewable energy systems.
- **Photographs** showing the renewable energy systems.

Basic Facilities

- **Narrative** describing the measures adopted for provision of basic facilities.
- **Photographs** showing the basic facilities provided.
- **Declaration** from the project head stating that the basic facilities would be maintained for a period of atleast one year.

Other Green Measures

- **Narrative** describing requirements, potential strategies and technologies proposed to achieve the innovation credit. Strategies adopted must be significantly better than standard sustainable design practices.
- **Calculations** indicating quantitative performance improvements, comparing baseline and design case.
- **Other supporting documents** such as drawings, illustrations, datasheets, test reports, photographs, etc., as applicable.

Notes:

- *The green measures can be aligned with Central/ State Government initiatives, which are not mandatory for the project to adopt.*
- *To demonstrate compliance for this credit, the green measures considered for one project cannot be shown for another project, unless the measures/ impacts are significantly higher than the credit requirement.*
- *In case the project/ organisation has already implemented green measures, document only those measures which have been implemented in the last 3 years from the date of project registration with IGBC.*

INNOVATION AND PERFORMANCE

IP Credit 1: Innovation in Design Process

Innovation:

- **Narrative** describing intent, requirements, potential strategies and technologies proposed to achieve the innovation credit. Strategies adopted must be significantly better than standard sustainable design practices.
- **Calculations** indicating quantitative performance improvements, comparing baseline and design case.
- **Other supporting documents** such as drawings, illustrations, datasheets, test reports, photographs, etc., as applicable.

Exemplary Performance:

- **Narrative** describing the strategies proposed to achieve exemplary performance in the respective base credit.

  Note: Provide supporting documents in the respective base credit folder.

IP Credit 2: Water and Energy Performance

- **Building systems performance plan** describing the existing systems and proposed strategies that would be undertaken to enhance the performance of energy and water consuming systems in the next 3 years. The plan shall be signed by the project head.
- Commitment to share annual total building water and energy consumption data for a period of 3 years.

IP Credit 3: Green Measures Cost Analysis

- **Incremental/ Decremental cost analysis report**, indicating the conventional cost vs the incremental/ decremental cost, tentative benefits/ estimated savings and return on investment, signed by the project head.

IP Credit 4: IGBC Accredited Professional

- **IGBC Accredited Professional certificate** of the principal participant involved in the project.

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About CII
(Confederation of Indian Industry)

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society through working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry.

Founded in 1895 and celebrating 125 years in 2020, India's premier business association has more than 9,100 members, from the private as well as public sectors, and an indirect membership of over 300,000 enterprises from around 291 national and regional sectoral industry bodies.

With 68 offices, including 9 Centres of Excellence in India, and 11 overseas offices in Australia, China, Egypt, France, Germany, Indonesia, Singapore, South Africa, UAE, UK and USA, as well as institutional partnerships with 394 counterpart organizations in 133 countries, CII serves as a reference point for Indian Industry and the international business community.

About IGBC
(Indian Green Building Council)

The Indian Green Building Council (IGBC), part of the Confederation of Indian Industry (CII) was formed in the year 2001. The vision of the council is, "To enable a sustainable built environment for all and facilitate India to be one of the global leaders in the sustainable built environment by 2025".

The council offers a wide array of services which include developing new green building rating programmes, certification services and green building training programmes. The council also organises Green Building Congress, its annual flagship event on green buildings.

The council is committee-based, member-driven and consensus-focused. All the stakeholders of construction industry comprising of architects, developers, product manufacturers, corporate, Government, academia and nodal agencies participate in the council activities through local chapters. The council also closely works with several State Governments, Central Government, World Green Building Council, bilateral multi-lateral agencies in promoting green building concepts in the country.

IGBC

Confederation of Indian Industry
125 Years: 1895-2020

Confederation of Indian Industry
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