

IGBC Green Existing Buildings

Operations & Maintenance

IGBC Green Existing Buildings

O & M Rating System

Version 2.0

Abridged Reference Guide
November 2023



INDIAN GREEN BUILDING COUNCIL

Greening India since 2001

www.igbc.in

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Foreword from the Indian Green Building Council (IGBC)

India is witnessing tremendous growth in infrastructure and construction development. The construction industry in India is one of the largest economic activities and is growing rapidly. As the sector grows rapidly, preserving the environment poses many challenges. To enable the construction industry to be environmentally sensitive, CII has established the Indian Green Building Council (IGBC). IGBC is a consensus driven not-for-profit council representing the building industry, consisting of more than 1400 committed members. The council encourages architects, builders, developers and owners to build green to enhance the economic and environmental performance of buildings.

The Green Building Movement in India has been spearheaded by IGBC since 2001, by creating national awareness. The council's activities have enabled a market transformation regarding green building concepts, materials and technologies.

IGBC continuously works to provide tools that facilitate the adoption of green building practices in India. The development of the IGBC Green Existing Buildings (O&M) Rating System is another important step in this direction.

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I. Introduction

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

Green practices in the existing buildings can help address national issues like water efficiency, energy efficiency, reduction in fossil fuel use in commuting, handling of waste and conserving natural resources. Most importantly, these concepts can enhance occupant health, happiness and well-being. Considering today's environmental concerns, IGBC Green Existing ((O&M)) rating enables facilities to have significant reduction in total carbon foot printing which has become a national goal.

Against this background, the Indian Green Building Council (IGBC) has launched 'IGBC Green Existing Building (O&M) Rating System' to address the National priorities. By applying IGBC Green Existing Building (O&M) criteria, existing buildings can be sustainable over the life cycle of the building. This rating programme enables the building owner/developer to apply green concepts and criteria, so as to reduce the environmental impacts, which are measurable. The programme covers methodologies to cover diverse climatic zones and changing lifestyles.

IGBC Green Existing Building (O&M) was the first rating programme developed in India, exclusively for existing building stock. It is based on accepted environmental principles and strikes a balance between known established practices and emerging concepts. The system is designed to be comprehensive in scope, yet simple in operation.

The rating system was upgraded based on the examples, experiences and concepts introduced/deployed in many existing green buildings nationwide. The new version-2 introduces and defines new performance levels to set/meet environmental performance goals with respect to green buildings, net zero and compliance to new Standards and Codes.

II. Benefits of Green Existing Buildings

IGBC Green existing buildings can have tremendous benefits, both tangible and intangible. The most tangible benefits are the reduction in water & energy consumption. The operational savings through energy & water efficiency could range from 15-30%. The consumer waste generated in the building can also be substantially reduced. Intangible benefits of green existing buildings include enhanced air quality, health & higher satisfaction levels of occupants.

III. National Priorities Addressed in the Rating System

The Green Existing Buildings (O&M) Rating System addresses the most important National priorities which include water conservation, energy efficiency, handling of waste, reduced use of fossil fuels, lesser dependence on usage of virgin materials and health & well-being of occupants.

❖ Water Conservation:

Most of the Asian countries are water stressed and the country like India, the water table has reduced drastically over the decades. Green Existing Buildings (O&M) Rating System encourages use of water in a self-sustainable manner through reducing, recycling and reusing strategies. By adopting this rating programme, green existing buildings can save potable water to an extent of 20-30%.

❖ **Handling of Consumer Waste:**

Handling of waste in existing buildings is extremely difficult as most of the waste generated is not segregated at source and has a high probability of going to landfills. This continues to be a challenge to the municipalities which needs to be addressed. IGBC intends to address this by encouraging green existing buildings to segregate the building waste.

❖ **Energy Efficiency:**

The building sector is a large consumer of electrical energy. Through IGBC Green Existing Building (O&M) rating system, buildings have scope to reduce energy consumption through energy efficient-lighting, air conditioning systems, motors, pumps etc., The operational energy savings that can be realised by adopting this rating programme can be to the tune of 15-40% however, energy savings depend on the building typology, climate, occupancy, usages pattern etc.

❖ **Reduced Dependency on Virgin Materials:**

The rating system encourages projects to use recycled materials, and discourages the use of virgin wood during renovation, thereby addressing environmental impacts associated with extraction and processing of virgin materials.

❖ **Health and Well-being of Occupants:**

Health and well-being of occupants is the most important aspect of Green Existing Buildings. IGBC Green Existing Buildings (O&M) Rating System ensures minimum ventilation aspects, occupant well-being facilities which are critical in a building. The rating system also recognizes measures to minimise indoor air pollutants.

IV. IGBC Green Existing Buildings (O&M)

IGBC has set up the Green Existing Buildings (O&M) Committee to focus on Existing Buildings. The committee includes facility managers, corporate, government, builders, developers, architects, consultants, manufacturers and industry representatives. The varied experience and professions of the members brings in a holistic perspective in the process of developing the rating programme.

A. Evolution of the Rating System

IGBC, in its endeavor to extend green building concepts to all building types, envisioned a rating programme exclusively for Existing Buildings (O&M). The rating system will be subject to review by the committee, every year, to ensure that it is updated and contemporary. The rating system encourages the use of Indian building codes and standards.

B. Features of IGBC Green Existing Buildings (O&M)

IGBC Green Existing Buildings (O&M) Rating System is a voluntary and consensus-based programme. The rating is focused on sustained performance of buildings with respect to the green features. The overarching objective of this rating system is to facilitate building owners & facility managers in the implementation of green strategies, measure their impacts and sustain performance in the long run.

IGBC Green Existing Buildings (O&M) Rating System is fundamentally designed to address national priorities of resource conservation while providing quality of life for occupants. The rating programme uses well accepted National standards and wherever local or National standards are not available, appropriate international benchmarks have been considered.

Some of the unique features of IGBC Green Existing Buildings (O&M) Rating System are as follows:-

- The focus is on implementation and results achieved.
- Documentation requirements are simplified to ease the process of certification
- The rating can be applied to both air-conditioned and non-air-conditioned buildings
- The rating is designed to suit all building types in all climatic zones. Exclusions are residential, Data centers, Hospitals, Schools and Factory buildings for which IGBC's existing ratings can be applied
- Water being of prime national concern, is given higher weightage
- For energy related aspects, Energy Conservation Building Code (ECBC) or the Energy Performance Index (EPI) as recommended by Bureau of Energy Efficiency (BEE), is the reference standard.
- Buildings are all about people. A separate module called 'health and comfort' is included, to address health and wellbeing of occupants in the buildings.

C. When to use IGBC Green Existing Buildings (O&M) Rating

- The version-2 of IGBC Existing Buildings (O&M) rating system is applicable for all types of non-residential buildings including office buildings, IT Parks, BPOs, shopping malls, hotels, airports, banks, etc. Building types such as data centers, hospitals, factory and schools will be covered under respective IGBC rating programmes.
- Buildings that shall be occupied and operational for a minimum of 1 year or more are eligible for certification under IGBC Existing Buildings (O&M) rating.
- Campus projects having multiple buildings can be considered as one single project for registration and certification. However, each building must conform to the energy efficiency, water efficiency and health & comfort mandatory requirements.
- The rating system adopts a 'whole building approach' and shall be used to evaluate the performance of the entire structure with related services.

V. IGBC Green Existing Buildings (O&M) Certification Process

IGBC Green Existing Buildings (O&M) rating system addresses green features under the following categories:

- Site & Facility Management
- Water Efficiency
- Energy Efficiency
- Health & Comfort
- Innovation

a. IGBC Green Existing Buildings (O&M) Registration

Project teams interested in IGBC Green Existing Buildings (O&M) Certification for their project must first register with IGBC. Projects can be registered on IGBC website (www.igbc.in) under 'IGBC Green Existing Buildings (O&M)'. The website includes information on registration fees for IGBC member companies and non-members. Registration is the initial step which helps establish contact with IGBC and provides access to the required documents, templates, important communications, and other necessary information.

IGBC web site will have all important details on IGBC Green Existing Buildings (O&M) registration & certification - process, schedule, and fee.

b. Certification

To achieve the IGBC Green Existing Building (O&M) certification, 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.

Projects need to submit the following:

- a. A brief stating project type, age of building, different type of spaces, number of floors, area statement, occupancy, building photographs etc., General drawings (as applicable - Master/ Site plan, Parking plans, Floor plans, Elevations, Sections)
- b. Filled-in Master Template (in excel format)
- c. Narratives and supporting documentation such as calculations (in excel sheets), plans, declarations/ contract documents, utility bills, purchase invoices, manufacturer cut-sheets/ letters/ material test reports, etc., for each mandatory requirement/ credit.

The necessary details are mentioned in this guide, under each mandatory requirement and credit. Documentation is submitted in two phases—preliminary submittal & final submittal:

- ❖ The preliminary submission involves all mandatory requirements and minimum number of credits. After preliminary submission, review is done by third party assessors and review comments would be provided within 30 working days.
- ❖ The next phase involves submission of clarifications to preliminary review queries and final submittal. The final review will also be provided within 30 working days, indicating the rating achieved.

Note that the mandatory requirements/ credits earned during the preliminary review are considered as anticipated. These mandatory requirements/ credits are not awarded until the final documents are submitted. If there are changes in any 'credit anticipated' after preliminary review, these changes need to be documented and resubmitted during the final review.

The threshold criteria for certification levels are as under:

Certification Level	Points	Recognition
Certified	50-59	Best Practices
Silver	60-69	Outstanding Performance
Gold	70-79	National Excellence
Platinum	80-100	Global Leadership

IGBC will recognize existing buildings that achieve the rating with a formal certificate and a mountable plaque.

c. Validity of IGBC Existing Buildings (O&M) Certification

- IGBC Existing Buildings (O&M) rating is valid for a period of 3 years from the date of issue of the certification.
- For recertification, the projects have to show compliance to the latest version of IGBC Existing Buildings (O&M) rating prevailing at the time of recertification.

d. Credit Interpretation Ruling

In some instances, the project team can face 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 path.

In such cases IGBC uses the process of 'Credit Interpretation Ruling' (CIR) wherein projects post the issue faced and seek clarification. Such clarification is provided in the form of ruling which would be in the public domain and are applicable to other projects as well, effective from the date of ruling.

The following are the steps to be followed in seeking a CIR:

- ❖ Refer the abridged reference guide for description of the mandatory requirement / credit intent, compliance options and documentation requirements
- ❖ Review the intent of the mandatory requirement/ credit and evaluate whether the project satisfies the intent.
- ❖ Review the Credit Interpretation web page for previous CIRs on the relevant mandatory requirement or credit. All projects registered under IGBC Green Existing Building will have access to this page.
- ❖ If a similar CIR has not been addressed or does not sufficiently answer the question, submit a credit interpretation request. Only registered projects are eligible to post CIRs. Two CIRs are answered without levying any fee and for any CIR beyond first two CIRs, a fee is levied to cover the professional administrative fee involved.

e. Appeal

In rare cases, Credits may be denied due to misinterpretation of the intent. On receipt of the final review, 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 denied credit(s).

The documentation for the credit seeking appeal may be resubmitted to IGBC along with the necessary appeal fee, Rs. 20,000 (and applicable government taxes) per Credit. Please note that the project must formally approach IGBC mentioning their intent to appeal within 30 calendar days from issue of the final review report.

If an appeal is pursued, assessment will be carried out by a different Third Party Assessor (TPA) who is not involved previously and IGBC takes 30 days to complete the review process.

f. Fee

Registration and Certification fee details are available on IGBC website (www.igbc.in)

VI. Updates and Addenda

This is version-2 of IGBC Green Existing Building (O&M) Abridged Reference Guide. 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. These additions will be incorporated in the next version of the rating system.

VII. IGBC Existing Buildings (O&M) Checklist

Site & Facility Management		Credit Points
SF Mandatory Requirement 1	Green Policy	Required
SF Mandatory Requirement 2	Waste Management	Required
SF Credit 1	Enhanced Waste Management	3
SF Credit 2	Sustainable Retrofitting	2
SF Credit 3	Urban Heat Island Mitigation	4
SF Credit 4	Eco-friendly Landscaping Practices	2
SF Credit 5	Eco-friendly Commuting Practices	2
SF Credit 6	Green Transportation	2
SF Credit 7	Outdoor Light Pollution Reduction	1
SF Credit 8	Building Operations & Maintenance	2
SF Credit 9	Building Performance Dashboard	6
		24
Water Conservation		
WC Mandatory Requirement 1	Rainwater Harvesting	Required
WC Mandatory Requirement 2	Water Efficient Plumbing Fixtures	Required
WC Credit 1	Enhanced Water Efficiency	3
WC Credit 2	Enhanced Rainwater Harvesting	4
WC Credit 3	Wastewater Treatment	4
WC Credit 4	Alternative Water Performance	3
WC Credit 5	Sustainable Landscape	6
		20
Energy Efficiency		
EE Mandatory Requirement 1	Eco Friendly Refrigerants & Fire Suppression Management System	Required
EE Mandatory Requirement 2	Minimum Energy Performance	Required

EE Credit 1	Enhanced Eco-friendly Refrigerants & Fire Suppression Management System	2
EE Credit 2	Enhanced Energy Performance	14
EE Credit 3	Green Power	14
		30
Health and Comfort		
HC Mandatory Requirement 1	Tobacco Smoke Control	Required
HC Mandatory Requirement 2	Minimum Fresh Air Requirements	Required
HC Credit 1	Enhanced Indoor Environment Quality	10
HC Credit 2	Eco-Friendly Housekeeping Chemicals	4
HC Credit 3	Universal Design	2
HC Credit 4	Occupant Well-being Facilities	4
		20
Innovation and Exemplary Performance		
INN Credit 1.1 – 1.4	Innovation And Exemplary Performance	4
INN Credit 2	IGBC Accredited Professional	1
INN Credit 3	Green Education	1
		6
Total		100

Certification Level	Points	Recognition
Certified	50-59	Best Practices
Silver	60-69	Outstanding Performance
Gold	70-79	National Excellence
Platinum	80-100	Global Leadership

**Site & Facility Management
(Maximum-24 points)**

Green Policy

SF Mandatory Requirement 1

Intent

To adopt green practices for operation & maintenance, and future retrofitting or renovation, thereby reducing the negative environmental impacts.

Compliance Options:

- ❖ The project shall comply with the statutory approvals from the Central or State Government authorities.
- ❖ The project shall adopt an organizational policy which mandates the adoption of green concepts.

Notes:

Project Approval:

- *Approval of the Site Plan (and/or) Building Plan from the competent Government authority.*
- *Approvals for all statutory requirements relating to construction and operation of the project.*
- *Occupancy certificate issued from the competent Government authority.*

Green Procurement:

- *Policy shall include, but not limited to, energy efficiency, Water Conservation, Renewable Energy Integration, Waste Management.*
- *Green Procurement – Provide Green Procurement Policy. Ensure that the project procures GreenPro eco-labelled products & materials for Operation & Maintenance/expansion/retrofitting/ renovation to meet minimum requirement of local material, material with recycle content, use of salvaged material.*
- *Green Education – Incorporate Green Education Policy to enhance continuous education for the building occupants.*

Documentation Required:

- (i) Provide an approved Site Plan (and/or), Building Plan from the competent Government authority.
- (ii) Submit consent to operate letter obtained from the competent authority (Central/ State Pollution Control Board).
- (iii) Submit green procurement policy (following the notes provided) signed by the competent authority along with implementation strategies.

Waste Management

SF Mandatory Requirement 2

Intent

To segregate building waste at source and facilitate waste disposal for recycling or reuse, thereby avoiding such waste being sent to landfills.

Compliance options:

- ❖ Demonstrate waste management of hazardous and non-hazardous wastes within the building/ project.

Notes:

- *Hazardous waste includes e-waste, batteries, lamps etc and non-hazardous waste includes paper, plastic, metals, organic waste, etc. The project shall follow the Hazardous Waste management Guidelines as prescribed by Ministry of Environment & Forest (MoEF), Government of India.*
- *In addition to dry and wet waste bins, provide separate bins for safe disposal of hazardous waste such as Batteries, 'e' waste, Lamps and Medical waste if any.*
- *Policy shall also become the guiding document for organisation to set goal for reduction in waste materials and shall encourage reuse, recycling of materials and safe disposal as per the guidelines from Central/State Pollution Control Board. Policy shall include, but limited to, quantity of waste generated/ recycled/ recused/ disposed on monthly/annual basis.*
- *If local municipalities are involved, please provide details of recycling and responsible environmentally friendly practices followed by them to avoid landfills.*
- *Divert the collected waste to a centralized facility, which is easily accessible for hauling.*

Documentation Required:

- (i) Submit narrative indicating source segregation, centralized waste management, of different type of waste and the process adopted to manage hazardous waste.
- (ii) Provide Certificates / letters from manufacturers/ recyclers indicating the type of waste and quantity received from the project. Or provide a contract with a recycler to demonstrate responsible waste management.
- (iii) Provide photographs of waste bins for segregation on all floors and centralized waste collection yard (demarcated for types of waste to be stored) along with permanent signages installed. Indicate the location on the building schematic drawings.

Enhanced Waste Management**SF Credit 1****Points: 3****Intent**

To minimize waste generation at the building project and to recycle and reuse of waste on site.

Compliance options:**Option-1: Dry Waste Reduction****Credit Point: 1**

Demonstrate reduction in plastic, cardboard and paper waste generation when compared to the quantities of the preceding year.

Percentage (%) reduction in Plastic, Cardboard and Paper waste	Credit Point
20	1

AND/ OR**Option-2: Dry Waste Recycling/ Reuse****Credit Point: 1**

Demonstrate that the facility recycles or reuses 100% of dry waste (plastic, cardboard, paper, and metals) generated on site.

AND/ OR**Option-3: Wet Waste Composting****Credit Point: 1**

Demonstrate that the facility uses natural composting or has installed an Organic Waste Converter (OWC) to convert 100% of the wet waste generated onsite into manure.

Exemplary Performance:

This credit is applicable for exemplary performance under the Innovation category if the project demonstrates that there is a Waste to Energy system/ biogas plant on site.

Documentation Required:

- (i) Submit a list of different types of waste generated and their quantities for the preceding year. Indicate the quantities recycled/reused and composted in the last 1 year.
- (ii) Calculation to demonstrate reduction in the annual waste generation (paper, cardboard, and plastic waste) from the preceding year.
- (iii) Provide photographs and a plan highlighting composting area located on site.

Sustainable Retrofitting**SF Credit 2****Points: 2****Intent**

To use certified green building material, product, equipment, and technology to reduce the negative environmental impacts.

Compliance Options:**Option-1: Use of Eco-Labelled Products****Credit point: 1**

Ensure that the project procures GreenPro eco-labelled products, materials & technologies for building Operation & Maintenance/ Expansion or Retrofitting.

For new expansion or retrofitting:

The purchased quantity of eco-labelled products to be at least 10% of the total cost of retrofitting (material and products).

Percentage of GreenPro Certified Products Procured	Credit Points
$\geq 10\%$	1

OR**For existing building Operation & Maintenance:**

Ensure that the project uses at least five passive or active green building materials, products, and equipment that are certified by GreenPro or an equivalent product certification programme.

Number of Certified Green Products used	Credit Points
5	1

AND/ OR**Option-2: Sustainable Procurement Policy****Credit Point: 1**

Project shall have Sustainable Procurement Policy following IGBC Green Existing Building Rating System (version 2) during any renovation/retrofitting/expansion to meet minimum requirement of local material, material with recycle content, use of salvaged material and green certified products.

Notes:

- *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.*
- *Material/ products procured should be quantifiable with respect to the cost of operation & maintenance.*

Documentation Required:

- (i) Provide a list of procured GreenPro certified items along with quantities and photographs.
- (ii) For retrofitting submit the calculations showcasing the cost of GreenPro certified products and the total cost of materials/products purchased.
- (iii) Submit sustainable procurement policy on the company letterhead signed by Chief Executive of the company or signing authority, highlighting the use of materials as per the IGBC Green Existing Building rating (version 2).

Exemplary Performance:

This credit is not eligible for exemplary performance.

Urban Heat Island Mitigation

SF Credit 3

Points: 4

Intent

To mitigate Urban Heat Island effect to minimize negative impact on the microclimate.

Compliance Options:

Exposed Roof Area

Credit points: 2

Implement green measures to minimize Urban Heat Island effect by covering atleast 60% of the exposed roof area.

Percentage of roof area covered with High Reflective Material/ Vegetation	Credit Points
> 60 %	1
> 100 %	2

Area factor calculation for Exposed roof to minimize the effect of Urban Heat Island

Mitigation Measure	Metal Roof
SRI Coating	0.8
High SRI Tile	1
Vegetation	1.2

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

Notes:

- *High reflective materials: Material with high solar reflectance index (SRI) include white / light colored broken China mosaic tiles or white cement tiles or other high reflective materials / coatings.*
- *Exposed roof area does not include equipment platforms, areas with Solar Photovoltaic (SPV) & Solar Water Heaters (SWH), skylights, etc.*
- *0.8, 1 and 1.2 are coefficients to calculate effective roof area considered for Urban Heat Island mitigation.*
- *Exposed parking area covered with either metal roof or permanent concrete structure would be considered under roof area calculation, else parking area would be considered under non-roof area calculation.*

SITE & FACILITY MANAGEMENT

- *SRI (Solar Reflective Index) value of high reflectance materials should be as per ASTM E1980-11 and ASTM E903-12 Standards.*
- *Lift / staircase mumty shall be considered as exposed roof area.*
- *Project can opt to use a combination of materials with high solar reflective index and vegetation to cover the exposed roof area.*

AND

Non-Roof Area

Option-1: Non-roof Impervious Areas

Credit Points: 2

Implement green measures to minimize Urban Heat Island effect by covering at least 60% of non-roof impervious areas.

- ❖ *Shade from existing tree cover/ newly planted saplings within 5 to 8 years of planting*
- ❖ *Open grid pavers (with thermal break) or grass pavers.*
- ❖ *Shade from solar panels on ground level.*
- ❖ *Hardscape materials (including pavers) with SRI of at least 29 (and not higher than 64).*

Percentage of shaded/covered non-roof area	Credit Points
> 60 %	1
> 80 %	2

Area factor calculation for Non-roof impervious areas to minimize the effect of Urban Heat Island

Mitigation Measure	Non-roof impervious areas
Tree Cover	1.2
Grass Paver/ Open Grid	0.9
Hardscape materials with SRI of atleast 29 (and not higher than 64).	0.8

Notes:

- *Non-roof impervious areas include, but are not limited to, footpaths, pathways, roads, driveways, uncovered surface parking, and other impervious areas.*
- *Base the shade area calculation on mature tree canopy (8-10 years) width superimposed/overlapped on non-roof impervious area underneath at noon.*
- *Newly planted saplings shall not be considered for compliance.*
- *Exposed non-roof area need not include utility areas such as areas covered with DG sets, transformer, STP etc.,*
- *SRI values of reflectance materials shall be as per ASTM E1980-11 and ASTM E903-12 Standards.*

- *Use of SRI coating shall not be considered for footpaths, walkways, and outdoor seating areas.*
- *Showcasing compliance through SRI material for non-roof areas is not eligible for exemplary performance.*
- *Artificial vegetation and potted plants shall not be considered.*
- *All areas, including podium, covered surface parking and utility blocks, which are exposed to the sky (at and above ground level) shall be considered for the credit calculation under roof area.*
- *The exposed roof of the parking shall meet 'Heat Island Effect - Roof' criteria.*
- *The project can demonstrate Urban Heat Island Mitigation through simulation tools (e.g. ENVI-met etc.)*

Documentation Required:

- (i) Provide site plan (roof and non-roof) along with legends, area calculations, the UHI mitigation measures implemented and photographs.
- (ii) Submit a copy of for SRI paints procured and latest test certificate from a NABL certified test laboratory showcasing SRI value.

Exemplary Performance:

- ❖ This credit is eligible for exemplary performance under Innovation category; if 100% of the exposed roof area is covered with high SRI material and (or) vegetation, and if more than 95% of exposed non-roof areas are under tree cover and (or) Open grid pavers (with thermal break) or grass pavers.

Eco-friendly Landscaping Practices

SF Credit 4

Points: 2

Intent

To adopt eco-friendly landscaping practices to minimize the negative environmental impact of chemicals on ecology and promote biodiversity.

Compliance Option:

- ❖ Have in place, eco-friendly landscaping practices such as use of organic fertilizers for 100% of the landscape requirement.

Notes:

- *This credit is applicable for projects wherein the landscape area is greater than or equal to 15% of the overall site area. This can also include roof gardens and fixed vertical landscaping.*
- *Organic fertilizers produced onsite (OWC/ composting) or procured from offsite sources shall be considered for this credit calculation.*
- *Artificial vegetation shall not be considered for this credit calculation.*

Documentation Required:

- (i) Provide landscape plan and calculation along with photographs clearly indicating the site area and area covered with vegetation.
- (ii) Declaration on company letterhead from the authorized signatory (including name, designation) for using organic fertilizer and maintaining the existing landscape area until the next certification.
- (iii) Details and quantities of the organic fertilizers used on-site along with photographs of the fertilizers.

Exemplary Performance:

The project is not eligible for exemplary performance under the Innovation category.

Eco-friendly Commuting Practices

SF Credit 5

Points: 2

Intent

To reduce air pollution and land development impacts from personal automobile use.

Compliance Options:

Option-1: Public Transport

Credit Point: 1

Locate the building within 800 m walking distance from an intra-city railway station (or) a bus-stop (or) metro station, to provide public transport network for 60% building occupants/ employees.

AND/ OR

Option-2: Shuttle Service

Credit Point: 1

Provide a dedicated shuttle service to cater to 60% of the total building occupants/ employees to nearest designated dropping zone.

Notes:

- *For Option-1 the facility must demonstrate that at least 60% of the occupants/ employees are using public transportation.*
- *Transport vehicles like bike, Auto Rikshaw must not be considered.*
- *Carpooling must not be considered.*
- *Shuttle service must include vehicles with a minimum of 15 seating capacity.*
- *For compliance under option-2, the project can consider eco-friendly transport service (non-fossil fueled vehicles however not limited to Compressed Natural Gas – CNG, Liquified Natural Gas – LNG, Hydrogen/ Fuel-cell/ Hybrid vehicle etc.) provided within or outside the site for transport of building occupants. Designate parking spaces for such vehicles within the project premises.*

Documentation Required:

- (i) Conduct survey with all occupants to explore commuting practices (public/private) and calculations to inform on the number of occupants using eco-friendly commute.
- (ii) Provide an aerial map highlighting the distance of public transport (intra-city railway station and permanent Bus Stop) from the main entrance. Details of bus routes and frequency must be aligned with occupant survey responses.
- (iii) Submit a copy of contract signed between project and shuttle service provider clearly indicating type and no. of vehicle along with seating capacity, routes and photographs of shuttle.

Exemplary Performance:

This credit is not eligible for exemplary performance.

Green Transportation

SF Credit 6

Points: 2

Intent

To encourage the use of electric and non-fossil fuel vehicles to reduce pollution from automobile use.

Compliance options:

Electric Vehicle Charging Infrastructure

Credit Points: 2

Provide Electric Vehicle Charging Infrastructure (EVCI)* for electric vehicles within the site as indicated below (including visitor's parking):

Project Location	% EVCI of Total Four-Wheeler Parking Capacity	% EVCI of Total Two-Wheeler Parking Capacity	Credit Points
Tier-1	10	20	1
Tier-2 & 3	5	20	
Tier-1	15	25	2
Tier-2 & 3	10	25	

Notes:

- *The project must follow the latest local building regulations/ byelaws for EVCI recommendations or provide EVCI as per Charging Infrastructure of Electric Vehicle (EV)-Revised consolidates guidelines and standards, Ministry of Power, GOI.

Documentation Required:

- Provide parking plans and calculations indicating no. of car/bike etc. parking allotted on site along with photographs of EVCI (charging points) installed.
- Cut sheet/ specifications and photographs of charging points provided.

Exemplary Performance:

This credit is eligible for exemplary performance if the project provides 30 % EVCI of Total Car Parking Capacity and 50% EVCI of Total Bike Parking Capacity based on the project location (Tier 1, 2 or 3).

Outdoor Light Pollution Reduction

SF Credit 7

Point: 1

Intent

To reduce light pollution from exterior and façade lighting to increase night sky access and enhance nocturnal environment.

Compliance Options:

Option-1: Upward Lighting

No external light should be upward looking.

AND

Option-2: Lighting Power Density

The lighting power density should be reduced by 30% for building facades and exterior areas vis-à-vis the ASHRAE Standard 90.1-2019 baselines.

Notes:

- *Total initial designed fixture Lumens shall be based on the sum total of all fixtures installed on site.*
- *Classify the project under one of the lighting zones, as defined in ASHRAE Standard 90.1-2019, and follow all the requirements of the respective zone. The justification shall be provided for the selected lighting zone.*
- *Exterior light 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.*

Documentation Required:

- (i) Provide lighting layout and type of fixtures installed in the project along with photographs/snapshots of external light fixtures
- (ii) LPD calculations along with the list of the exterior lighting fixtures (make & model).

Exemplary Performance:

This credit is not eligible for exemplary performance.

Building Operations & Maintenance

SF Credit 8

Point: 2

Intent

To ensure sustained performance of the building systems, so as to achieve benefits during the lifetime of the building systems & facility.

Compliance Options:

Option- 1: Operation & Maintenance Plan

Credit Point: 1

Have in place an Operation & Maintenance plan for the following:

- HVAC systems (including chillers, cooling towers etc)
- Wastewater treatment systems
- Onsite renewable energy systems
- Power back-up/Cooling systems (Generator sets, CHP system etc.)
- Elevators and escalators
- Building management systems
- Rainwater Harvesting Structures

AND/ OR

Option- 2: Assessment for Energy & Water

Credit Point: 1

The project shall carry out energy and water assessments, atleast within 3 years from the date of project registration and demonstrate that the water conservation and energy efficiency measures, or recommendations indicated are implemented.

Notes:

- *For project size upto 20,000 sqft., provide O&M plan for HVAC systems, wastewater treatment systems and onsite renewable energy systems.*
- *For a project size more than 20,000 sqft., provide O&M plan for all the systems mentioned above in the compliance option. Project shall have AMC (Annual Maintenance Contract) for all the systems indicated, part of the compliance.*

Documentation Required:

- (i) AMC for all building systems and equipment. In case the maintenance is done in-house, submit a narrative on preventive and corrective actions.
- (ii) Energy & water assessment reports carried out by energy auditor certified by BEE and water auditor certified by CII/NPCI/Uniform Plumbing Council within three years.

Exemplary Performance:

This credit is not eligible for exemplary performance.

Building Performance Dashboard

SF Credit: 9

Points: 6

Intent

To encourage continuous monitoring to implement energy efficiency measures, thereby reducing environmental impacts.

Compliance Options:

Demonstrate that the building management system (BMS)/ central monitoring system is in place to control and monitor the following systems as applicable:

- **Monitoring Energy Consumption** (2 credit points for any of the 6 applications)

Total process/ non-process energy consumption	Energy meter for onsite RE generation
Air Conditioning Energy Usage	Btu meter for chilled water consumption
Internal Lighting Energy Consumption	Pumping system (municipal water, grey water, landscaping water)
External Lighting Energy Consumption	Any individual energy end use that constitutes at least 10% of total energy use

- **Monitoring Water Consumption** (2 credit points for any of the 6 applications)

Total Raw Water Consumption	Water usage in flushing
Total Domestic Water through water fixtures	CT make-up water consumption
Treated Wastewater	Total rainwater captured
Water usage in irrigation	Any other project specific major consumers of water

- **Monitoring Indoor Air Quality** (2 credit points for any of the 4 applications)

CO ₂	TVOC
PM 2.5	Temperature
PM 10	Relative Humidity
CO	Fresh Air Supply

Documentation Required:

- (i) Submit Single line diagram (SLD) schematic of BMS installed along with screenshot indicating total facility energy consumption /water consumption / Indoor Air Quality parameters.
- (ii) Details of real time monitoring system and dashboard in the project.
- (iii) Photographs/ technical cut sheets of the energy meters / water meters/ IAQ sensors installed in the project.
- (iv) Project commitment to share hourly/daily performance (total energy consumption /water consumption/ Indoor Air Quality parameters) data for next three years on half yearly basis.

Exemplary Performance:

This credit is not eligible for exemplary performance under the Innovation category.

Water Conservation
(Maximum-20 points)

Rainwater Harvesting

WC Mandatory Requirement 1

Intent

To recharge the local aquifer, increase the ground water table or to reduce potable water demand through effective and appropriate rainwater management.

Compliance Option:

- ❖ Have in place rainwater harvesting system to capture atleast 20% run-off volumes from the roof and non-roof surfaces.
- ❖ In areas where the Central/ State Ground Water Board does not recommend artificial rainwater recharge (or) if the groundwater table is less than 4 meters, the project is required to provide justification along with the supporting documents for not implementing rainwater harvesting system.

Runoff coefficients for Typical Surface Types

S.No	Surface Type	Runoff Coefficient
1	Cemented / Tiled Roof	0.95
2	Roof Garden (<100 mm thickness)	0.95
3	Roof Garden (100 – 200 mm thickness)	0.30
4	Roof Garden (201 – 500 mm thickness)	0.2
5	Roof Garden (\geq 500 mm thickness)	0.1
6	Turf, Flat (0 – 1% slope)	0.25
7	Turf, Average (1 – 3% slope)	0.35
8	Turf, Hilly (3 – 10% slope)	0.4
9	Turf, Steep (\geq 10% slope)	0.45
10	Vegetation, Flat (0 – 1% slope)	0.1
11	Vegetation, Average (1 – 3% slope)	0.2
12	Vegetation, Hilly (1 – 3% slope)	0.25
13	Vegetation, Steep (\geq 10% slope)	0.3
14	Concrete Pavement	0.95
15	Gravel Pavement	0.75
16	Open –grid Concrete Pavement	0.75
17	Open –grid Concrete Pavement	0.5

Notes:

- For rainfall information, refer Indian Meteorological Department (IMD) at <http://www.imd.gov.in>
- $\text{Runoff volume} = \text{Surface area} \times \text{Runoff Coefficient} \times \text{Peak-day Rainfall}^*$.
- *To arrive at the peak-day rainfall, divide peak month rainfall occurred in each year (for last 5 years) by number of rainy days in the respective month, and calculate average of 5 years peak-day rainfall. Abnormal rainy days like flash floods can be excluded from calculations.
- Consider Rainwater Harvesting Guidelines (as and when available) from the National Building Code (NBC) 2016 of India, Part 11 - Approach to Sustainability, Section 7.2 - Rainwater Harvesting- Surface Runoff.
- Projects which do not have data on the number of rainy days, a maximum of 15 rainy days can be considered to arrive at normal rainfall.
- In areas where the water percolation is limited, rainwater harvesting tank/pond (water body) shall be provided to meet the above requirement.
- Filtering of suspended solids shall be ensured by providing suitable filtering media before letting the water into the collection tanks, water bodies, municipal storm water drains.
- Centralized rainwater harvesting is encouraged in an industrial city, Industrial Park/Corridor/Zone/SEZ projects wherein, the project has approved rainwater/stormwater system.
- Rainwater can be harvested to the extent of 55,000 liters per 100sq. meters area per year from rooftops.

Documentation Required:

- (i) Provide photographs and site plan highlighting location of RWH system (tank/recharge pit/ pond) installed in the project.
- (ii) Provide rainwater harvesting design which shall include roof catchment gutters, down pipes rainwater/ storm water drains, trenches, filter chamber, storage tanks/ pits/ sumps.
- (iii) Provide rainwater harvesting calculation for the project, along with details of number of rainwater harvesting structures and their harvesting volumes.

Water Efficient Plumbing Fixtures

WC Mandatory Requirement 2

Intent

To minimize non-process water usage, enhance water use efficiency and minimise the use of potable water by installing efficient plumbing fixtures.

Compliance Options:

- ❖ Have in place water efficient plumbing fixtures whose flow rates meet the baseline criteria individually or in aggregate. The total annual water consumption of the facility should not exceed the total base case water consumption.

Baseline Water Consumption for Fixtures

S. No	Fixture type	Maximum Flow Rate/ Consumption	Duration	Estimated Daily Uses per FTE **
1	Water Closets (Full-flush)	4.85 LPF	1 Flush	1 for male and female
2	Water Closets (Half-flush)	2.43 LPF	1 Flush	2 for female
3	Urinals	1.89 LPF	1 Flush	2 for male
4	Lavatory Faucets (Residential)	5.68 LPM	15 seconds	4
5	Lavatory Faucets (Other than Residential)	1.89 LPM	15 seconds	4
6	Showers/ Handheld Spray	7.57 LPM	8 minutes	0.1
7	Metering Faucets	0.95 Liter per cycle		
8	Kitchen Faucet (Residential)	6.81 LPM	4 minutes	1

Source: Uniform Illustrated Plumbing Code of India (UIPCI)-2021.

Notes:

- The baseline flows can be demonstrated at flowing water pressure of 4.1 bar. Flowing water pressure of 4.1 bar does not mean that the water supply in the building is at 4.1 bar. The building fixtures can operate at lower pressures but, to show compliance under this credit, the design flow rates are to be submitted at 4.1 bar.
- ** Full Time Equivalent (FTE) represents a regular occupant who spends 8 hours per day in the factory/building. Visitor/part-time or employee working overtime have FTE values based on their hours per day divided by 8.
- Plumbing water fixtures include but not limited to faucets/taps installed for hand washing in rest rooms and canteen, dish washing and washing clothes shall be

WATER CONSERVATION

considered for calculation. However, water fixtures do not include irrigation applications.

- *Default occupancy shall be considered as 50% for male and 50% for female.*
- *For design case, demonstrate that the project has procured the flow fixtures and installed before certification.*

Documentation Required:

- (i) Submit FTE and water saving calculation clearly indicating baseline and actual water consumption for whole building.
- (ii) Provide details/ cut sheet of water fixtures (including flowrate at 4.1 bar pressure) including Closet, Faucet/ Health Faucet/Tap, Shower, Urinals, Faucet installed in Kitchen etc along with list and photographs of water fixtures installed.

Enhanced Water Efficiency

WC Credit 1

Points: 2-3

Intent

To reduce the demand for potable water through water-efficient management techniques.

Compliance Options:

❖ Water Efficiency

Have in place water efficient plumbing fixtures with individual flow and flush rates as indicated in the table below and demonstrate percentage of potable water savings over baseline, individually or in aggregate.

Baseline Flow Rates for Water Fixtures

S. No	Fixture type	Maximum Flow Rate/ Consumption	Duration	Estimated Daily Uses per FTE **
1	Water Closets (Full-flush)	4.85 LPF	1 Flush	1 for male and female
2	Water Closets (Half-flush)	2.43 LPF	1 Flush	2 for female
3	Urinals	1.89 LPF	1 Flush	2 for male
4	Lavatory Faucets (Residential)	5.68 LPM	15 seconds	4
5	Lavatory Faucets (Other than Residential)	1.89 LPM	15 seconds	4
6	Showers/ Handheld Spray	7.57 LPM	8 minutes	0.1
7	Metering Faucets	0.95 Liter per cycle		
8	Kitchen Faucet (Residential)	6.81 LPM	4 minutes	1

Source: Uniform Illustrated Plumbing Code of India (UIPCI)-2021.

* At a flowing water pressure of 4.1 bar.

Percentage of Potable Water Savings over Baseline	Credit Points
≥ 30 %	2
≥ 40 %	3

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Notes:

- *The baseline flows can be demonstrated at flowing water pressure of 4.1 bar. Flowing water pressure of 4.1 bar does not mean that the water supply in the building is at 4.1 bar. The building fixtures can operate at lower pressures but, to show compliance under this credit, the design flow rates are to be submitted at 4.1 bar.*
- *Water fixtures do not include irrigation applications.*
- *Plumbing fixtures that are certified by CII under Green Product Certification Programme (GreenPro) can be used by the project to show compliance.*

Documentation Required:

- (i) Submit calculations indicating the reduction in total water consumption by using the desired water efficient fixtures.

Enhanced Rainwater Harvesting**WC Credit 2****Points: 2-4****Intent**

To enhance ground water table, recharge the local aquifer and reduce water demand through effective rainwater management.

Compliance Option:

- ❖ Have in place rainwater harvesting system (storage/percolation pit/water harvesting pond or combination) to capture run-off volume for atleast 1 day of normal rainfall*.

Runoff coefficients for Typical Surface Types

S.No	Surface Type	Runoff Coefficient
1	Cemented / Tiled Roof	0.95
2	Roof Garden (<100 mm thickness)	0.95
3	Roof Garden (100 – 200 mm thickness)	0.30
4	Roof Garden (201 – 500 mm thickness)	0.2
5	Roof Garden (\geq 500 mm thickness)	0.1
6	Turf, Flat (0 – 1% slope)	0.25
7	Turf, Average (1 – 3% slope)	0.35
8	Turf, Hilly (3 – 10% slope)	0.4
9	Turf, Steep (\geq 10% slope)	0.45
10	Vegetation, Flat (0 – 1% slope)	0.1
11	Vegetation, Average (1 – 3% slope)	0.2
12	Vegetation, Hilly (1 – 3% slope)	0.25
13	Vegetation, Steep (\geq 10% slope)	
14	Concrete Pavement	0.95
15	Gravel Pavement	0.75
16	Open –grid Concrete Pavement	0.75
17	Open –grid Concrete Pavement	0.5

Notes:

- For rainfall information, refer Indian Meteorological Department (IMD) at <http://www.imd.gov.in>
- $\text{Runoff volume} = \text{Surface area} \times \text{Runoff Coefficient} \times \text{Rainfall}$.

WATER CONSERVATION

- To arrive at the normal rainfall, divide peak month rainfall occurred in each year (for last 5 years) by number of rainy days in the respective month, and calculate average of 5 years peak-day rainfall. Abnormal rainy days like flash floods can be excluded from calculations.
- Consider Rainwater Harvesting Guidelines (as and when available) from the National Building Code (NBC) 2016 of India, Part 11 - Approach to Sustainability, Section 7.2 - Rainwater Harvesting- Surface Runoff.
- Projects which do not have data on the number of rainy days, a maximum of 15 rainy days can be considered to arrive at normal rainfall.
- Projects in areas with high water table (less than 4 meter) are not exempted for this credit.
- In areas where the water percolation is limited, rainwater harvesting tank/pond (water body) shall be provided to meet the above requirement.
- Filtering of suspended solids shall be ensured by providing suitable filtering media before letting the water into the collection tanks, water bodies, municipal storm water drains.
- Rainwater can be harvested to the extent of 55,000 liters per 100sq. meters area per year from rooftops.
- If the project opts to demonstrate the compliance using the combination of ground water recharge and water storage, credit points will be awarded on the following basis:
 - Higher category of credit points as per table below will be awarded if the project demonstrates that at least 50% of the run-off volume captured requirement is catered to by water storage for reuse.

Credit Points are awarded based on rainwater harvesting system type and run-off volume captured:

% Run-off volume captured and Credit Points

% Run-off volumes captured from the roof and non-roof surfaces for 1 days of normal rainfall	Credit Points (Ground Water Recharge)	Credit Points (Water Storage for Reuse)
40%	1	2
60%	2	4

Documentation Required:

- Provide photographs and site plan highlighting location of RWH system (tank/recharge pit/ pond) installed in the project.
- Provide rainwater harvesting design & calculation which shall include roof catchment gutters, down pipes rainwater/ storm water drains, trenches, filter chamber, storage tanks/ pits/ sumps.

Exemplary Performance:

The project is eligible for exemplary performance under the Innovation category if the project harvests 100% of rainwater run-off from roof and non-roof areas.

Wastewater Treatment**WC Credit 3****Points: 4****Intent**

To treat wastewater generated on site and make it available for reuse or safe disposal, thereby avoiding pollution in the receiving streams. Treat non-process wastewater either in-situ or in a common effluent treatment plant.

Compliance Option:**❖ Wastewater Treatment**

Have in place an on-site wastewater treatment system to treat 100% of wastewater generated in the building/ project, and ensure the quality is as per the standards prescribed by Central (or) State Pollution Control Board suitable for reuse.

Recycled Water Quality	
Parameters	Threshold Limits
pH	6.5 - 9
BOD (mg/l)	Not more than 10
COD (mg/l)	Not more than 50
TSS (mg/l)	Not more than 20
NH ₄ N (mg/l)	Not more than 5
N-Total (mg/l)	Not more than 10
Fecal Coli form (MPN/100ml)	Not more than 100

Source: CPCB 2015

Physical Parameters	
Characteristic	Requirement (Acceptable Limit)
Colour, Hazen units	5
Odour	Nil
Turbidity, NTU	1
Total dissolved solids	500 (mg/l)

Source: IS 10500: 2012 (Reaffirmed 2018)

Notes:

- *Wastewater here refers to both grey and black water.*
- *The credit point(s) can be claimed only if wastewater treatment system is installed and operational before final certification.*
- *The credit point(s) can be claimed only if the wastewater is treated in-situ.*
- *The treated water reused for flushing, cleaning, car washing and other similar applications with human contact should ensure that the physical parameters are as per CPCB 2015 and IS 10500.*

Documentation Required:

- (i) Provide a detailed water balance for the project along with quantity of wastewater generated and treated on-site.
- (ii) Details of the wastewater treatment systems (description, technical specifications) along with photographs of the system and latest test reports.

Exemplary Performance:

This credit is not eligible for exemplary performance.

Alternative Water Performance**WC Credit 4****Points: 3****Intent**

To use alternate water for various water end use, to reduce raw water demand.

Compliance Options:

- ❖ Demonstrate alternate water used for at least 30% of the total water consumption in the project.

$$\begin{array}{l} \text{\% Use of Alternate water} \\ \text{(Water Performance Ratio)} \end{array} = \frac{\text{Alternate Water Consumption}}{\text{Total Water Consumption}}$$

Water Performance Ratio (% Alternate Water to the Total Water Consumption)	Credit Points
$\geq 30\%$	1
$\geq 40\%$	2
$\geq 50\%$	3

Notes:

- Use of alternate water includes the rainwater (captive use), treated wastewater, condensate water or any purchased treated wastewater for flushing, irrigation, domestic use, cooling tower make-up water, cleaning, etc.
- Treated wastewater sourced from other sites / local authorities through permanent piped connections or other means can also be considered to show compliance for 'alternate water'.
- Water from sources such as bore wells, natural wells, municipal water systems is considered raw water.

Documentation Required:

- (i) Calculation indicating the percentage of alternative water used to the total water consumption of the project for each application in the preceding 1 year.

Exemplary Performance:

This credit is eligible for exemplary performance if the project demonstrates that 100% potable water is replaced with alternate water.

Sustainable Landscape**WC Credit 6****Points: 1-6****Intent**

Have in place sustainable landscape to ensure minimum water consumption and enhance biodiversity.

Compliance Options:**Option-1: Water Efficient Irrigation System****Credit Point: 1-2**

Provide or install water efficient irrigation systems incorporating features mentioned below:
(One credit point for every 2 measures)

- ❖ Central shutoff valve
- ❖ Drip irrigation for atleast 50% of landscape area
- ❖ Automated irrigation system (time and based on soil moisture conditions).

AND/ OR**Option-2: Limit Turf****Credit Point: 1-2**

Limit use of turf on the site to reduce water demand.

Turf area as a percentage of total landscaped area (softscape)	Credit Points
$\leq 30\%$	1
$\leq 20\%$	2

AND/ OR**Option-3: Enhanced Biodiversity through Landscape****Credit Point: 1-2**

Provide landscape areas with drought tolerant/ native/ adaptive species for at least 60% of the landscape area to enhance greenery.

Drought tolerant/ native/ adaptive species area as a percentage of total landscaped area	Credit Points
$\geq 60\%$	1
$\geq 80\%$	2

Notes:

- *This point is applicable only for projects which have 15% of the site area landscaped.*
- *Drought tolerant species are those species that do not require supplemental irrigation. Generally, accepted time frame for temporary irrigation is one to two years.*
- *For the credit, landscape areas over built structures such as basements, podium, roofs, etc., can be considered for landscape area calculations.*
- *Landscape here refers to soft landscaping which includes only pervious vegetation.*
- *For this credit calculation, plotted plants/ temporary installations should not be considered under landscaping.*
- *Areas planted with turf should not exceed a slope of 25 percent (i.e., a 4 to 1 slope).*
- *Vegetation/ Soft landscape shall not be designed with monoculture plant species, since such species would not promote habitat and biodiversity.*

Documentation Required:

- (i) Provide a detailed landscape plan with dimensions and area calculation, highlighting the vegetated and turf area on site.
- (ii) Demonstrate the species are drought tolerant/ native/ adaptive in nature and list the names of the species present on-site.
- (iii) Provide photographs (long shots, close up and birds eye view from terrace) of the landscape on site.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation Category if more than 80% of species planted are drought tolerant/ native/ adaptive and/ or the project has no turf as part of the landscaped area on-site.

Energy Efficiency
(Maximum-30 points)

Eco Friendly Refrigerants & Fire Suppression Management System

EE Mandatory Requirement 1

Intent

To encourage the use of eco-friendly refrigerants and gases that do not deplete ozone.

Compliance Options:

❖ Eco Friendly Refrigerants

Demonstrate that the refrigerant used in Heating, Ventilation & Air-conditioning (HVAC) equipment installed on the project shall be eco-friendly.

Notes:

- *In the existing building project wherein ODP based refrigerant/gases are still used, the complete phase-out plan shall be submitted for the next 3 years.*
- *Replace the refrigerant with one which is free from CFC within the next 3 years.*
- *Create a strategy and a phase out plan for fire suppression systems to ensure that the equipment will be free from halons or other ozone depleting substances within the next 3 years.*
- *Retrofitting/ Renovation/ new structural extension projects shall only use refrigerant/gas which has Zero ODP to demonstrate compliance.*

Documentation Required:

- (i) Provide a comprehensive list of HVAC&R equipment and fire suppression system installed in the building along with the details of the type of refrigerant and gases used.
- (ii) Provide technical cut sheets, and photographs of the equipment on site.
- (iii) Submit declaration letter clearly mentioning that the ODP based refrigerant/gases are not used in HVAC&R equipment and fire suppression system. If old systems are still in place, submit a phase out plan in fire suppression systems to ensure that the equipment will be free from halons or other ozone depleting substances within the next 3 years.

Minimum Energy Performance

Mandatory Requirement 2

Intent

To improve energy efficiency for non-process, use in the existing building to reduce environmental impacts from excessive energy use.

Compliance Options:

Option-1: Prescriptive Approach

Demonstrate that the annual energy consumption in the building is within the EPI (Energy Performance Index) limits as mentioned in the table below:

- Office

Offices	Built-up area
Large Offices	>30,000 sq.m.
Medium Offices	30,000 sq.m – 10,000 sq.m.
Small Offices	<10,000 sq.m.

Source: Bureau of Energy Efficiency (BEE): Schedule for Office Buildings Star Rating

Climatic Zone	Building Category	< EPI Value (kWh/sqm/yr)
Composite	Large Office	$y = 0.95x + 60$
	Medium Office	$y = 1.1x + 60$
	Small Office	$y = 0.65x + 60$
Warm & Humid	Large Office	$y = 0.9x + 65$
	Medium Office	$y = 0.9x + 65$
	Small Office	$y = 0.7x + 65$
Hot & Dry	Large Office	$y = 1.1x + 55$
	Medium Office	$y = 1.25x + 55$
	Small Office	$y = 0.75x + 55$

Source: Bureau of Energy Efficiency (BEE): Schedule for Office Buildings Star Rating

- BPO

Climatic Zone	< EPI Value (kWh/sqm/yr)
Composite	$y = 0.21x + 28$
Hot & Dry	$y = 0.1x + 24$
Warm & Humid	$y = 0.17x + 36$
Temperate	$y = 0.13x + 31$

Source: Bureau of Energy Efficiency (BEE): Schedule for BPO Buildings Star Rating

• Mall

Climatic Zone	EPI Value (kWh/sqm/yr)
Composite	350-300
Hot & Dry	300-250
Temperate	275-250
Warm & Humid	450-400

Source: Bureau of Energy Efficiency (BEE): Scheme for Shopping Mall Buildings Rating

General Notes:

- $y = (a*b) + c$, where 'b' denotes the percentage of AC area out of total built-up area.
- Energy Performance Index (EPI): Electricity purchased & generated divided by built up area in sqm. However, the total electricity would not include electricity generated from on-site renewable sources such as solar photovoltaic etc.
 - [Electricity purchased and generated (excl. generated from on-site RE resources)] ÷ [Built Up Area excluding Basement parking, lawn, roads, etc. (in sqm.)].
 - The Energy Performance Index (EPI, kWh/sq.m.-yr) of the building should exclude the basement/ car park area.
 - EPI band is applicable for the buildings operated 8-9 hours a day and 6 days in a week.
- For a building having multiple tower/floors with non-uniform percentage of AC area and non-uniform operating hours/days in a week, a multiplication factor is to be multiplied with the EPI values obtained by the equations of the Tables above.
- For a building having multiple tower/floors with non-uniform percentage of AC area and non-uniform operating hours/days in a week, then multiplication factor may be derived as follows:

Floor Number	Operating hrs	Working Days in a week	Area	Percentage of AC Area
F1	h1	d1	A1	p1
F2	h2	d2	A2	p2
F3	h3	d3	A3	p3
-	-	-	-	-

- Formula for determining Correction Factor (C.F.) and Weightage Average Percentage AC Area are as follows:

$$C.F. = \frac{\sum (h_i * d_i * A_i)}{(8*6) \sum A_i}$$

$$\text{Weightage Average \% Area} = \frac{\sum (h_i * d_i * A_i * p_i)}{\sum (h_i * d_i * A_i)}$$

- Where, 'h' - Nos. of Operating hours in a day for each floor
'd' - No. of working days in a week for each floor
'p' - Percentage AC area of the floor
'A' - Area of the floor
'i' - Total Nos. of floors (sum of floors of each tower if building have multiple towers)

OR

Option-2: Calibrated Simulation

Demonstrate energy compliance for building/ space through calibrated simulation following M&V Protocols such as IPMVP/FEMP/ASHRAE 14. Simulation model shall be calibrated based on whole building energy consumption and any major energy end use (chiller/ cooling energy consumption/ lighting/ ventilation/ etc.).

Project to develop As Is case and define baseline specifications/ parameters following ASHRAE 90.1 - 2019/ ECBC 2017 to compare energy performance.

Notes:

- *For buildings located in cold climatic zones, other building types such as 24 hrs office buildings, IT parks, hotels, hospitals, airports, banks, and any other building types not mentioned above, follow calibrated simulation approach.*
- *All the process loads are to be factored in both the base and actual (as is) case. However, process loads from Data Centre can be excluded while reporting the building energy savings.*
 - *The Power Usage Effectiveness (PUE) of the existing data center within the building shall not exceed 3.0.*
- *If any ITES building has IT load more than 200 kW, shall submit details of operating IT/ server load along with Power Usage Effectiveness (PUE) calculations.*
- *Onsite Renewable Energy (RE) shall not be considered in energy saving calculation.*
- *Lighting Load shall be submitted separately for Interior and exterior lighting.*
- *For space/ buildings which are occupied by multiple client/ tenants and have diversity in operating schedules shall demonstrate compliance by calibrated simulation approach.*
- *BPO is distinct for information technology (IT) outsourcing, which focuses on hiring third-party company or service provider to do IT-related activities, such as application management and application development, data centre operations, or testing and quality assurance. It may be 24x7, 24x5, 18x7, 16x7 or 16x5 hours of operating building.*

Documentation Required:

- (i) Submit Energy Performance Index (EPI) calculation along with monthly energy consumption for last 3 years (whole building and major energy end use) in the prescribed format.
- (ii) Submit project area details clearly indicating total built up area, total conditioned area, unconditioned area, and basement area.
- (iii) Energy Simulation Report along with specifications of 'as is' case and baseline (building envelope, interior & exterior lighting, HVAC, equipment, actual schedules). Report shall include error limits such as MBE and CvRMSE and at least 5 recommendations proposed/ implemented for energy conservation on monthly basis.

Enhanced Eco-friendly Refrigerants & Fire Suppression Management System**EC Credit 1****Points: 2****Intent**

To encourage use of refrigerant/substances which are eco-friendly and have significantly lower global warming impact.

Compliance Options:

Demonstrate that refrigerants/ substances and Fire Suppression systems used in the building have and Global Warming Potential (GWP) less than 1000

Refrigerants/ Substances/ Fire Suppression Systems with Percentage of GWP	Credit Points
≤ 1000	1
≤ 650	2

Documentation Required:

- (i) Submit lists of refrigerants along with technical cut-sheets, and photographs of the system installed clearly showcasing that the average GWP is less than 1000/650.
- (ii) Submit letter signed by clearly mentioning that any of the cooling system having ODP must be phased out within the certification timeline Zero ODP and GWP less than based refrigerant are used in HVAC&R equipment and fire suppression system.

Exemplary Performance:

This credit is not eligible for exemplary performance under the Innovation category.

Enhanced Energy Performance

EC Credit 2

Points: 14

Intent

To optimize energy efficiency for non-process use in the existing building to reduce environmental impacts from excessive energy consumption.

Compliance Options:

Option-1: Prescriptive Approach

Demonstrate that the annual energy consumption in the building is within the EPI (Energy Performance Index) limits as mentioned in the table below:

- Office

Offices	Built-up area
Large Offices	>30,000 sq.m.
Medium Offices	30,000 sq.m – 10,000 sq.m.
Small Offices	<10,000 sq.m.

Source: Bureau of Energy Efficiency (BEE): Schedule for Office Buildings Star Rating

Climatic Zone	Building Category	4 Credit Points	6 Credit Points	10 Credit Points	14 Credit Points
Composite	Large Office	$y = 0.9x + 50$	$y = 0.85x + 40$	$y = 0.8x + 30$	$y = 0.75x + 20$
	Medium Office	$y = 1.05x + 50$	$y = x + 40$	$y = 0.95x + 30$	$y = 0.9x + 20$
	Small Office	$y = 0.6x + 50$	$y = 0.55x + 40$	$y = 0.5x + 30$	$y = 0.45x + 20$
Warm & Humid	Large Office	$y = 0.85x + 55$	$y = 0.8x + 45$	$y = 0.75x + 35$	$y = 0.7x + 25$
	Medium Office	$y = 0.85x + 55$	$y = 0.8x + 45$	$y = 0.75x + 35$	$y = 0.7x + 25$
	Small Office	$y = 0.65x + 55$	$y = 0.6x + 45$	$y = 0.55x + 35$	$y = 0.5x + 25$
Hot & Dry	Large Office	$y = 1.05x + 45$	$y = x + 35$	$y = 0.95x + 25$	$y = 0.9x + 15$
	Medium Office	$y = 1.2x + 45$	$y = 1.15x + 35$	$y = 1.1x + 25$	$y = 1.05x + 15$
	Small Office	$y = 0.7x + 45$	$y = 0.65x + 35$	$y = 0.6x + 25$	$y = 0.55x + 15$

Source: Bureau of Energy Efficiency (BEE): Schedule for Office Buildings Star Rating

• BPO

Climatic Zone	4 Credit Points	6 Credit Points	10 Credit Points	14 Credit Points
Composite	$y = 0.18x + 24$	$y = 0.15x + 20$	$y = 0.12x + 16$	$y = 0.09x + 12$
Hot & Dry	$y = 0.08x + 20$	$y = 0.06x + 16$	$y = 0.04x + 12$	$y = 0.02x + 8$
Warm & Humid	$y = 0.14x + 32$	$y = 0.11x + 28$	$y = 0.08x + 24$	$y = 0.05x + 20$
Temperate	$y = 0.11x + 27$	$y = 0.09x + 23$	$y = 0.07x + 19$	$y = 0.05x + 15$

Source: Bureau of Energy Efficiency (BEE): Schedule for BPO Buildings Star Rating

• Mall

Climatic Zone	4 Credit Points	6 Credit Points	10 Credit Points	14 Credit Points
Composite	300-250	250-200	200-150	below 150
Hot & Dry	250-200	200-150	150-100	below 100
Temperate	250-225	225-200	200-175	below 175
Warm & Humid	400-350	350-300	300-250	below 250

Source: Bureau of Energy Efficiency (BEE): Scheme for Shopping Mall Buildings Rating

General Notes:

- $y = (a * b) + c$, where 'b' denotes the percentage of AC area out of total built-up area.
- **Energy Performance Index (EPI):** Electricity purchased & generated divided by built up area in sqm. However, the total electricity would not include electricity generated from on-site renewable sources such as solar photovoltaic etc.
 - [Electricity purchased and generated (excl. generated from on-site RE resources)] ÷ [Built Up Area excluding Basement parking, lawn, roads, etc. (in sqm.)].
 - The Energy Performance Index (EPI, kWh/sq.m.-yr) of the building should exclude the basement/ car park area.
 - EPI band is applicable for the buildings operated 8-9 hours a day and 6 days in a week.
- For a building having multiple tower/floors with non-uniform percentage of AC area and non-uniform operating hours/days in a week, a multiplication factor is to be multiplied with the EPI values obtained by the equations of the Tables above.
- For a building having multiple tower/floors with non-uniform percentage of AC area and non-uniform operating hours/days in a week, then multiplication factor may be derived as follows:

Floor Number	Operating hrs	Working Days in a week	Area	Percentage of AC Area
$F1$	$h1$	$d1$	$A1$	$p1$

ENERGY EFFICIENCY

$F2$	$h2$	$d2$	$A2$	$p2$
$F3$	$h3$	$d3$	$A3$	$p3$
-	-	-	-	-

- Formula for determining Correction Factor (C.F.) and Weightage Average Percentage AC Area are as follows:

$$C.F. = \frac{\sum (hi*di*Ai)}{(8*6) \sum Ai}$$

$$\text{Weightage Average \% Area} = \frac{\sum (hi*di*Ai*pi)}{\sum (hi*di*Ai)}$$

- where, 'h' - Nos. of Operating hours in a day for each floor
'd' - No. of working days in a week for each floor
'p' - Percentage AC area of the floor
'A' - Area of the floor
'i' - Total Nos. of floors (sum of floors of each tower if building have multiple towers)

OR

Option-2: Calibrated Simulation Method

Demonstrate compliance for building/ space through calibrated simulation following M&V Protocols such as IPMVP/FEMP/ASHRAE 14. Simulation model shall be calibrated based on whole building energy consumption and any major energy end use (chiller/ cooling energy consumption/ lighting/ ventilation/ etc.) in the building.

Baseline shall be developed following whole building Simulation method with reference to ASHRAE 90.1 - 2016/ ECBC 2017.

Percentage Energy Savings over Basecase and Credit Points

Existing Building	
% Energy Savings over Base Case	Credit Points
10%	2
12.5%	4
15%	6
17.5%	8
20%	10
22.5%	12
25%	14

Notes:

- *For buildings located in cold climatic zones, other building types such as 24 hrs office buildings, IT parks, hotels, hospitals, airports, banks, and any other building types not mentioned above, follow calibrated simulation approach.*
- *All the process loads are to be factored in both the base and actual (as is) case. However, process loads from Data Centre can be excluded while reporting the building energy savings.*
 - *The Power Usage Effectiveness (PUE) of the existing data center within the building shall not exceed 3.0.*
- *If any ITES building has IT load more than 200 kW, shall submit details of operating IT/ server load along with Power Usage Effectiveness (PUE) calculations.*
- *Onsite Renewable Energy (RE) shall not be considered in energy saving calculation.*
- *Lighting Load shall be submitted separately for Interior and exterior lighting.*
- *For space/ buildings which are occupied by multiple client/ tenants and have diversity in operating schedules shall demonstrate compliance by calibrated simulation approach.*
- *BPO is distinct for information technology (IT) outsourcing, which focuses on hiring third-party company or service provider to do IT-related activities, such as application management and application development, data centre operations, or testing and quality assurance. It may be 24x7, 24x5, 18x7, 16x7 or 16x5 hours of operating building.*

Documentation Required:

- (i) Submit calculation demonstrating percentage reduction in EPI Value/ energy savings as compared to the baseline.

Exemplary Performance:

This credit is eligible for exemplary performance under the Innovation category if minimum energy cost savings for buildings is over 27.5% or the reduction in EPI Value as compared to the base case is more than 40%.

Green Power**EC Credit: 3****Points: 14****Intent**

To encourage use of renewable energy sources to reduce dependency on fossil-fuel based energy generation.

Compliance Options:**Option-1: On-site Renewable Energy****Credit Points: 7**

Demonstrate that the project has an on-site renewable energy system to off-set fossil-fuel based energy consumption.

Percentage of on-site renewable energy to total annual energy consumption (process and non-process load)	Credit Points
$\geq 5\%$	2
$\geq 10\%$	3
$\geq 15\%$	4
$\geq 20\%$	5
$\geq 30\%$	6
$\geq 50\%$	7

AND / OR**Option-2: Off-site Renewable Energy****Credit Points: 7**

Demonstrate that the project wheels off-site green power (generated through RE system) to off-set fossil-fuel based energy consumption.

Percentage of off-site renewable energy to total annual energy consumption (process and non-process load)	Credit Points
$\geq 50\%$	2
$\geq 60\%$	3
$\geq 70\%$	4
$\geq 80\%$	5
$\geq 90\%$	6
$\geq 100\%$	7

Notes:

- *On-site energy supply system installation such as fuel cell will be considered as green source of power.*
- *Solar hot water systems cannot be considered as power generation source and cannot be subtracted from the total energy consumed.*
- *Energy through biomass would be considered as green power, project team shall submit calculations to show equivalent energy generation (use).*

Documentation Required:

- (i) Submit manufacturers cut sheets, Purchase Order, photographs of the installed Solar PV, and building layout plan demonstrating the total exposed and unexposed roof as well as non-roof area.
- (ii) Submit copy of PPA (Purchase Power Agreement) signed between the client/ company and service provider.
- (iii) Submit calculations as well as latest copy of utility/ energy bills (renewable and non-renewable) for the preceding year.

Exemplary Performance:

This credit is eligible for exemplary performance under Innovation and Design Process if $\geq 55\%$ of admissible on-site RE installed, Option-1.

Health and Comfort
(Maximum-20 points)

Tobacco Smoke Control

HC Mandatory Requirement 1

Intent

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

Compliance Options:

Option-1: No Smoking

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

AND / OR

Option-2: Outdoor Smoking Areas

In case the project has assigned outdoor smoking areas, demonstrate that such areas are located at a minimum of 7.6 meters from all outdoor air intakes (entrance doors, window openings etc.)

AND / OR

Option-3: Designated Smoking Rooms

Alternately, compliance can be shown through designated smoking rooms which capture and remove tobacco smoke from the building.

Notes:

- *If smoking is not prohibited, the project shall provide designated space for smoking (space can be utilized for another purpose). Compliance can be shown through designated smoking rooms which capture and remove tobacco smoke from the building. At a minimum, the smoking room must be directly exhausted to the outdoors, away from air intakes and building entry paths, with no recirculation of tobacco smoke containing air to nonsmoking areas and enclosed with impermeable deck-to-deck partitions.*
- *The smoking room shall be completely sealed.*
- *The conditioned air entry into the smoking zone shall not return or be transferred to the air-handling units. This air shall be completely exhausted.*
- *The exhaust air louver / duct should be located at least 7.6 meters away from building entry or fresh air intakes.*
- *The smoking room must be operated at a negative pressure, compared with the surrounding spaces, of atleast an average of 5 Pascals (Pa) (0.5 mm of water gauge) and a minimum of 1 Pa (0.025 mm of water gauge) when the doors to the smoking rooms are closed.*

Documentation Required:

- (i) Submit organizational/HR policy signed by the competent authority indicating that smoking is prohibited in the building/ premises.
- (ii) Provide floor/ site plans and photographs indicating locations of no smoking signages permanently installed/displayed at both regularly occupied and non-regularly occupied spaces (at least 4) in the facility to educate occupants and visitors.
- (iii) Provide floor/ site plans, photographs and details of ventilation system indicating separate exhaust ducting of the designated smoking spaces along with details of sealed space.

Minimum Fresh Air Requirements

HC Mandatory Requirement 2

Intent

To provide minimum quality fresh air ventilation rates, to avoid pollutants affecting indoor air quality, that is acceptable to human occupants and that minimizes adverse health effects.

Compliance Options:

Demonstrate that the project has in place ventilation system for all regularly occupied spaces of the building to meet the criteria below:

Case - A: Mechanically Ventilated Spaces

Demonstrate that the fresh air ventilation in all regularly occupied areas meets the minimum ventilation rates, as prescribed in NBC-2016, Part 8, Section- 3, Table 3 (minimum ventilation rate in breathing zone) or ASHRAE 62.1-2022 Table 6-1(minimum ventilation rate in breathing zone).

Notes:

- *Projects with unitary air conditioning system catering less than 10% 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'.*
- *Residential buildings in mixed-use developments (Residential + Commercial) can show compliance for minimum fresh air ventilation through the criteria defined in Non-Air-conditioned Spaces.*
- *Whole Building Approach must be followed for this requirement and all regularly occupied spaces must meet compliance.*
- *The project must provide treated fresh air or demonstrate the air taken in meets permissible thresholds of CO₂ (Max 530 ppm above ambient), PM₁₀ (< 100 µg/m³) and RH 30% - 60%)*
- *Exhaust outlets shall be located at a minimum height of 3 m away from ground level and away from doors, occupied area and operable windows.*
- *Fresh air intake shall be located a least 7.6 m away from exhaust stacks, cooling tower and/or any other polluting sources.*

AND / OR

Case – B: Non-Air-conditioned Spaces

Demonstrate that the project has 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 below:

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

Notes:

- *For sliding windows/ doors, only openable area to the exteriors shall be considered in calculations.*
- *Windows / doors should not have any obstruction within 2 m from the exterior surface. Shading devices can be excluded.*
- *Openings for fresh air intake shall be located at least 7.6 m away from exhaust stacks, parking areas, cooling tower and/or any other polluting sources.*

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, reception, cafeteria, etc.,*
- *Non-regularly occupied areas include toilets, storerooms, etc.,*
- *In case the ambient air quality does not meet the CO₂, PM 10 and RH thresholds, then indicate the measures taken by the facility to meet the required indoor air quality.*

Documentation Required:

Case – A: Mechanically ventilated spaces

- Provide calculations of the fresh air intake volume for each occupied zone to show compliance with the reference Standard such as NBC-2016 or ASHRAE 62.1-2022 whichever is stringent.
- Provide floor plans highlighting a list of regularly occupied spaces, HVAC layouts with details of the mechanical system along with fresh air inlets and exhausts.
- Provide photographs (inlet and outlet) and test results of the system in operation.

Case – B: Non-Air-conditioned Spaces

- Provide floor plans with window and door schedule along with calculations indicating the openable area of windows and doors to the carpet area, for each of the regularly occupied spaces in percentage.
- In case the ambient air quality is inferior, highlight the measures taken to meet the required air quality along with the supporting photographs of the solutions.

Enhanced Indoor Environment Quality**HC Credit 2****Points: 10****Intent**

To ensure that the occupants are satisfied with the comfort conditions and ventilation, thereby enhancing the Well-being and productivity of occupants.

Compliance Options:**Option-1: Enhanced Ventilation****Credit Points: 2**

For Mechanically ventilated buildings, demonstrate that the ventilation rates of the project are higher than those mentioned in HC mandatory requirement 2.

Percentage Improvement over Minimum Fresh Air Requirements	Credit Points
$\geq 20 \%$	1
$\geq 30 \%$	2

For naturally conditioned buildings, comply with the following requirement:

Percentage of Openings to Carpet Area over base case	Credit Points
3 %	1
4 %	2

For buildings with forced ventilation, demonstrate that the project has increased Air Changes per Hour (ACH) than those mentioned in HC mandatory requirement 2.

Percentage Improvement over Minimum Air Changes per Hour*	Credit Points
$\geq 20 \%$	1
$\geq 30 \%$	2

AND / OR

Option-2: Monitor IAQ Parameters**Credit Points: 4**

Demonstrate that the project monitors IAQ parameters in all regularly occupied spaces and ensure that 80% of the measurements are well within the threshold values:

Parameters	Threshold Values			Frequency of Monitoring
	Class A	Class B	Class C	
CO ₂	Max 350 ppm above ambient	Max 500 ppm above ambient	Max 700 ppm above ambient	Daily monitoring
PM 2.5	< 15 µg/m ³	< 25 µg/m ³	< 25 µg/m ³	
PM 10	< 50 µg/m ³	< 100 µg/m ³	< 100 µg/m ³	
CO	< 2 ppm	< 9 ppm	< 9 ppm	
O ₃	< 50 µg/m ³	<100 µg/m ³	-	Quarterly Monitoring
TVOC (equivalent to isobutylene)	< 200 µg/m ³	< 400 µg/m ³	< 500 µg/m ³	
SO ₂	< 40 µg/m ³	< 80 µg/m ³	-	
NO ₂	< 40 µg/m ³	< 80 µg/m ³	-	

Source: 'IGBC Rating Guidelines' and 'Indoor Environment Quality Standard, ISHRAE Standard -10001:2019'

AND / OR**Option-3: Thermal Comfort, Indoor Temperature & RH****Credit Point: 1**

Demonstrate that the building maintained at the requisite temperature and relative humidity conditions, for 90% of the time. The comfort condition to be maintained is 26+ 2 degree C and RH in the range of 30 to 70 %.

AND / OR**Option-4: Access to Daylight****Credit Point: 1**

Demonstrate through measurement approach that atleast 50% of regularly occupied spaces in the building achieves daylight illumination levels of minimum 110 Lux (and a maximum of 2,200 Lux), at horizontal working plane.

AND / OR**Option-5: Acoustical Parameters****Credit Point: 1**

Demonstrate atleast 50% of the regularly occupied space shall meet the recommended levels of Noise Criterion (NC) and Reverberation Time (RT) as per the ISHRAE IEQ Standards 10001:2019.

AND / OR**Option-6: Olfactory Parameters****Credit Point: 1**

Demonstrate that the project has isolated the spaces such as toilets, kitchen/ pantry, corridors, housekeeping areas, janitor rooms and other enclosed service areas from other regularly occupied areas and has provided exhaust systems with an exhaust rate of atleast 0.5 cfm per sq.ft.

Notes:

Threshold values of IAQ Parameters:

- ❖ *Class C (Minimum applicable) - It defines the minimum acceptable value for critical parameters of IAQ elements. The project meeting class C threshold values will gain '2' credit points.*
- ❖ *Class B (Acceptable) - It defines acceptable value of parameters of IAQ elements in space. The project meeting class B threshold values will gain '3' credit points.*
- ❖ *Class A (Aspiration) - It defines aspirational values for parameters of IAQ elements in space. The project meeting class A threshold values will gain '4' credit points.*

Documentation Required:

- (i) Provide calculations of the fresh air intake volume for each occupied zone to show Percentage Improvement over Minimum Fresh Air Requirements/ Minimum Air Changes per Hour.
- (ii) Provide floor plans with window and door schedule along with calculations indicating Percentage of Openings to Carpet Area over base case.
- (iii) Provide Air Quality Report, report highlighting Indoor temperature and RH readings during summer, monsoon and winter, Daylight analysis report (simulation or prescriptive approach), and a detailed occupant survey report (conducted once in 6 months) indicating that 80% of the building occupants are satisfied with thermal, daylight, acoustical, and olfactory parameters.

Exemplary Performance:

This credit is not eligible for exemplary performance under the Innovation category.

Eco-Friendly Housekeeping Chemicals

HC Credit: 3

Points: 4

Intent

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

Compliance Options:

❖ Use of Eco-friendly Housekeeping Chemicals

Credit Points: 4

Demonstrate that the project uses ecofriendly housekeeping chemicals for any of the four applications (1 credit point for each application):

- 1) Floor Cleaning
- 2) Glass Cleaning
- 3) Toilet Bowl Cleaning
- 4) Carpet Cleaning

Documentation Required:

- (i) Provide a list of all building applications where housekeeping chemicals are used .
- (ii) Submit photographs, MSDS (Material Safety Data Sheets)/cut-sheets, and purchase invoices of eco-friendly housekeeping chemicals procured in the past 1 year.

Exemplary Performance:

This credit is not eligible for exemplary performance under the Innovation category.

Universal Design

HC Credit 4

Points: 2

Intent

To ensure that the facility caters to differently abled occupants and senior citizens, thereby addressing their physical comfort.

Compliance Options:

Demonstrate that the facility has provided comfort for differently abled as prescribed in NBC-2016, Part-3 Development Control Rules & General Building Requirement, Section-13 'Requirements for Accessibility in Built Environment for Elders and Persons with Disabilities'

The project should have any six of the following features:

- ❖ Non-slippery ramps for easy access to the main entrance of the building. Such ramps should have with handrails on at least one side
- ❖ Accessible information at the entrance to the site/ building
- ❖ Uniformity in floor level for hindrance-free movement in common areas such as washrooms, canteen and common assembly area
- ❖ Preferred car park space(s) having easy access to the main entrance or closer to the lift lobby and suitable drop-off point near main entrance.
(Provide at least one car park space for the first 100 car park spaces and one additional for every 250 car park spaces thereafter or as defined by local byelaw).
- ❖ Braille and audio assistance in lifts for visually impaired people
- ❖ Restrooms (toilets) in common areas within the building, 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)
- ❖ Important information communicated via two senses or more (tactile, audible and visual)
- ❖ Necessary measures to facilitate safe assisted evacuation/ rescue in emergencies.
- ❖ Conduct an occupant satisfaction survey for differently abled and implement at least one corrective measure to suit their requirement.

Documentation Required:

- (i) Provide supporting photographs of the provisions made for differently abled people in the facility.
- (ii) Site plan/ Floor plan highlighting facilities for differently abled people

Occupant Well-being Facilities

HC Credit: 5

Points: 4

Intent

To enhance occupational health and wellbeing of the occupants.

Compliance Options:

Option-1: Inhouse Occupant Well-being Facilities

Credit Points: 2

Demonstrate that the project has atleast 2 occupant well-being facilities (such as gymnasium, aerobics, yoga, meditation or any indoor / outdoor games) to cater to atleast 10% of building occupants, through the day.

AND/ OR

Option 2: External Fitness Center

Credit Points: 2

Demonstrate that the building has tie up with external fitness centers within the radius of 1 km to cater to minimum 10% of building occupants through the day.

Documentation Required:

- (i) Submit photographs and site/ floor plans to indicate the location of the facilities.
- (ii) Calculations to demonstrate that the facilities provided can cater for atleast 10% of the building occupants.
- (iii) Submit an agreement indicating tie up with an external fitness center as well as google map screenshot highlighting the location of the center from the project site.

Exemplary Performance:

This credit is not eligible for exemplary performance under the Innovation category.

Innovation and Exemplary Performance
(Maximum-06 points)

Innovation And Exemplary Performance

INN Credit 1.1 – 1.4

Maximum Points: 4

Intent

To encourage innovative performance of existing buildings, not specifically addressed by the rating system, so as to reduce environmental impacts and/or provide projects the opportunity to be awarded points for exemplary performance above requirements set by the IGBC Green Existing Building rating system.

Compliance Options: (1 point for each credit)

Credit 1.1: Innovation in Building Performance & Operation

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.

Credit 1.2: Innovation in Building Performance & Operation

Same as credit 1.1

Credit 1.3: Exemplary Building Performance & Operation

The project is eligible for exemplary performance, if the performance measures greatly exceed the credit requirements of the IGBC Green Existing Buildings rating system.

Credit 1.4: Exemplary Performance & Operation

Same as credit 1.3

Notes:

- *As a general rule, points for exemplary performance are awarded for doubling the credit requirements and / or achieving the next incremental percentage threshold.*
- *Eligibility criteria for various credits in the IGBC Green Existing Buildings rating system are defined in respective credits.*
- *The project shall be eligible to 1 credit point if certified under any other IGBC Rating System in the last 1 year.*

The project shall also meet the following criteria for achieving an Innovation point:

- *Quantitative performance improvements (comparing a baseline and design case).*
- *Strategy must be significantly better than standard sustainable design practices.*
- *Measures must be voluntary. Measures that are mandated by the local byelaws and not addressed in the rating system are not eligible for Innovation.*
- *Measures should be implemented both in interior and common areas, as applicable.*
- *Innovation must be impactful and relevant to green building practices.*

Documentation Required:

For each innovation credit, submit the following:

- (i) Intent
- (ii) Strategies adopted
- (iii) Measurable impacts
- (iv) How these measures can be sustained in future

IGBC Accredited Professional

INN Credit 2

Point: 1

Intent

Support and encourage the involvement of IGBC Accredited Professional in the green existing building project, so as integrate appropriate design measures and streamline certification process.

Compliance Options:

- ❖ Atleast one principal participant of the project team shall be an IGBC Accredited Professional.

Note:

IGBC Accredited Professional (AP) shall be one of the participants from the project.

Documentation Required:

- (i) Submit the IGBC AP certificate of atleast one of principal participants in the project.

Green Education

INN Credit 3

Point: 1

Intent

Educate the occupants/visitors to sustain the green features through the life of the building, thereby reducing the negative impacts associated on environment and/or encourage occupants of the building to participate in IGBC's green building initiatives, event, training programs, Seminars etc.

Compliance Options:

Option 1: Awareness (any 2)

- ❖ Demonstrate that the project has permanent signage highlighting measures implemented for protection of environment.
- ❖ Demonstrate that the project has a provision for building tours to visitors/ guest to educate them on green building features in the facility.
- ❖ Demonstrate that the project has brochure and circulars highlighting the green features implemented and green guidelines.
- ❖ Encourage participation (in-house or community level) in events related to green (eg. Green marathons, plantation drives, community welfare initiatives etc)

AND / OR

Option 2: Continues Education on Green: (any two)

- ❖ Organize or participate in workshops/ awareness sessions/ seminars on green buildings or sustainability related topics to sensitize the occupants on green lifestyles.
- ❖ Demonstrate that the occupants are provided with an opportunity to take up courses (online/ offline) on green.
- ❖ Demonstrate that the organization has provided an opportunity to the occupants to visit IGBC's Green Building Congress.
- ❖ Demonstrate that the organization has encouraged occupants to become IGBC Ap's (atleast 2 participants)

Documentation Required:

- (i) Submit Photographs and all relevant documents applicable to the credit.

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 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



Confederation of Indian Industry
CII-Sohrabji Godrej Green Business Centre

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