

**BUILDING ENERGY
EFFICIENCY & ENVIRONMENT
RATING (BEEER)
for
DESIGN AND CONSTRUCTION
OF BUILDINGS**

**Version-1, revised- 4
Date: 29 November 2020**

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List of Abbreviations

Acronyms	Abbreviation
AC	Air Conditioner
AHU	Air Handling Unit
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ATM	Automated Teller Machine
BED	Building Envelope Design
BEEER	Building Energy Efficiency and Environment Rating
BFRI	Bangladesh Forest Research Institute
BMS	Building Management System
BNBC	Bangladesh National Building Code
BOD	Biological Oxygen Demand
BRT	BUS RAPID TRANSIT
BRTA	Bangladesh Road Transport Authority
BUET	Bangladesh University of Engineering and Technology
CH	Construction Health
CM	Construction Material
CNG	Compressed Natural Gas
COP	Coefficient of Performance
CSR	Corporate Social Responsibility
DAP	Detailed Area Plan
DD	Demand Draft
DOE	Department of Environment
DU	Dhaka University
EAA	Energy Audit and Accreditation
EE&C	Energy Efficiency and Conservation
EECMP	Energy Efficiency and Conservation Master Plan
EM	Energy Management
EMS	Energy Monitoring System
EPD	Environmental Product Development
ETP	Effluent Treatment Plant
GPS	Global Positioning System
GWP	Global Warming Potential
HBRI	Housing and Building Research Institute
HCFC	Hydrogen Chloro- Fluro Carbon
HVAC	Heating Ventilation and Air Conditioning
IAB	Institute of Architects Bangladesh
IE	Indoor Environment
IFC	International Finance Corporation
LCA	Life Cycle Assessment
LED	Light Emitting Diode
LPD	Light Power Density
MAP	Management and Planning
MGC	Maximum Ground Coverage
MJ	Mega- Joule
MRT	Mass Rapid Transit

NFPA	National Fire Protection Association
NOC	No Objection Certificate
ODS	Ozone Depleting Substances
PV	Photo Voltaic
RAJUK	Rajdhani Unnayan Kartripakkha
REHAB	Real Estate and Housing Association of Bangladesh
RE	Renewable Energy
RMC	Ready-Mix Concrete
RWTP	Recycled Water Treatment Plant
SC	Shading Coefficient
SHGC	Solar Heat Gain Coefficient
SM	Site Management
SREDA	Sustainable and Renewable Energy Development Authority
SRI	Solar Reflectance Index
STP	Sewage Treatment Plant
TOR	Terms of Reference
TR	Ton of Refrigeration
UPVC	Unplasticised polyvinyl chloride
VFD	Variable Frequency Drive
VLT	Visible Light Transmittance
VOC	Volatile Organic Compounds
VRF	Variable Refrigerant Flow
VRV	Variable Refrigerant Volume
VVVF	Variable- Voltage and Variable- Frequency
WPC	Wood Plastic Composite
WWR	Window-Wall Ratio
WWTP	wastewater treatment plant

1. Background

Bangladesh is a country highly prone to natural disasters and greatly exposed to the impacts of climate change (e.g. sea-level rise, cyclone, flood and rising temperatures) leading to increased stress on and vulnerability of various sectors. Particularly, the construction and building sector is seriously affected by rising temperatures and strongly determines the country's pathway towards sustainable development. A considerable amount of resources (energy, water, material etc.) is being consumed both during the construction and operations phase of buildings. Bangladesh's residential sector constituted more than 40% of the total electricity consumption, and the demand has increased ever since. Rising temperatures add further stress on the building sector resulting in higher energy demand and consumption in private and public buildings, as well as in increasing emission of GHG. Consequently, the saving of energy and resources during both the construction and consumption process in the building sector should be given high priority to cost-effectively reduce GHG emissions, ensure energy security and promote sustainable growth.

Experiences from neighbouring countries, such as India, rating or labeling systems for green buildings are an effective tool for incentivizing the construction sector and material suppliers to become greener by applying more sustainable building practices. In Bangladesh, green rating of buildings is still in a nascent stage due to the absence of a specific standard/ scheme that could help in promoting a wide-ranging application. The introduction of the green building concept is further hampered by the fact that the financial advantages of using more sustainable building practices and materials become only visible in the long run due to high investment costs. Conveying the immediate benefits and establishing a demand for green buildings thus requires a multi-dimensional approach. Aspects, such as raising awareness on pay-back periods, creating technical expertise of green building and their construction, or access to finance need to be considered and addressed. However, present construction systems in Bangladesh are not energy and water efficient which leads to high energy and water demand in the building sector. Electricity supply and consumption in the country has almost tripled in last decade. The main source of electricity is fossil fuels, accounting for 96% of the total output (Source Bangladesh Power Development Board (BPDB), leading to high GHG and intensive power generation. The energy consumption projection also depicts the required energy generation to be used in different sector.

1.1 Existing Policies:

The Dhaka Mahanagar Imarat Nirman Bidhimala -2008 mainly enforcing the building set back, floor area ratio, maximum ground coverage, mandatory open space which are mostly passive approach to reduce the energy use in building. But the buildings are not regulated or inspected for any active energy or water saving measures to reduce the demand.

The following are some examples of how poor building design leads to higher energy and water consumption:

- Window selection is not based on the glass properties.
- The air conditioning units are not regulated
- Lighting systems are not designed with energy efficiency. Some buildings have excessive lights installed with no daylight control, which leads to lights

remaining on in a day-lit room. Electric lighting generates heat which leads to more air conditioning load in buildings.

- Water fittings such as taps and toilet flushes are not water efficient and lead to high water consumption with no added value.
- In last decade the apartment units in Dhaka has increased almost 600%. The increase in the demand of new buildings mainly in the residential sector shows the potential impact of Energy and water use.

Presently there is no designated green building rating system for Bangladesh. Now a day's developers and factory owners are intents to having a green and energy efficient building. USGBC LEED certification is becoming popular rating system for high-end commercial and compliance textile factory building. More than 100 buildings already registered under USGBC LEED certification. Bangladesh Bank is promoting energy efficiency in buildings with soft loan facilities under their refinancing scheme. Single digit loan (maximum 9%) facilities are available for LEED certified factories. On the other hand Bangladesh National Building Code (BNBC) is being updated. The BNBC is mandatory and legal document for Buildings construction firm and owners, Architect, Engineers. The BNBC provides regulation and/or minimum requirement of building type (office, residence, commercial building, etc.), size (height, floor area), structure strength, indoor condition, construction material, etc.

The updated version of BNBC is proposed with addition of energy efficiency requirement of buildings in near future BNBC will be the core program for promoting EE&C in Buildings and contain the following requirement on building energy efficiency:

- a. Heat insulation and/or ventilation performance of building envelope
- b. Energy efficiency of building equipment (HVAC, lighting, fans, hot water supply, lift, escalator, renewable energy options)
- c. Water efficiency and management and Sanitation
- d. Roof gardening and vegetation.

On the other hand, The Housing and Building Research Institute developed a Recommendation for Green Building Code at 2012 with the technical assistance of IFC. Its target is not only on energy/water use efficiency but also on reduction of environmental impact caused by building construction, use and decommissioning. The survey for the Recommendation of Green Building Code it is found that the baseline energy consumption of Dhaka is about 277 kw/h/m²/ year. According to this study the Green Building Rating for upcoming new buildings will save 300MW energy per year which is equal to save setup of one power plant in each year.

1.2 SREDA:

In May 2014 the government has established the Sustainable & Renewable Energy Development Authority (SREDA) as a national nodal organization for promoting Energy Efficiency and Conservation (EE&C) in the country. As per the mandate, SREDA addressing the area of energy efficiency and renewable energies for the building sector, and is hence natural partner for the project and the activities. It is able to ensure access to relevant governmental bodies, as well as to financing institutions.

1.3 Sustainable and Renewable Energy Development Authority Act 2012:

The Sustainable and Renewable Energy Development Authority Act 2012 has provision for assisting the government in making and implementation of rules/codes relating to energy efficient building construction

1.4 EE&C Master Plan up to 2030

In 2016, SREDA has developed the Energy Efficiency & Conservation Master plan up to 2030. The Energy Efficiency & Conservation master Plan (EECMP) is a supreme plan of Bangladesh's initiative on energy efficiency and conservation, of which preparation requirement is stipulated in the Energy Efficiency and Conservation Rules

(2016). Under the EECMP, all the policies, programs, legal documents (Act, Rules, Regulations, Circulars or Standards etc.) and frameworks are to be established. The Master plan's aims to achieve this target through the adoption and implementation of EE&C regulatory measures: Energy Management Program (Energy Audit Program), EE Labeling Program and EE&C Buildings Program, and EE&C Financial Incentive Programs.

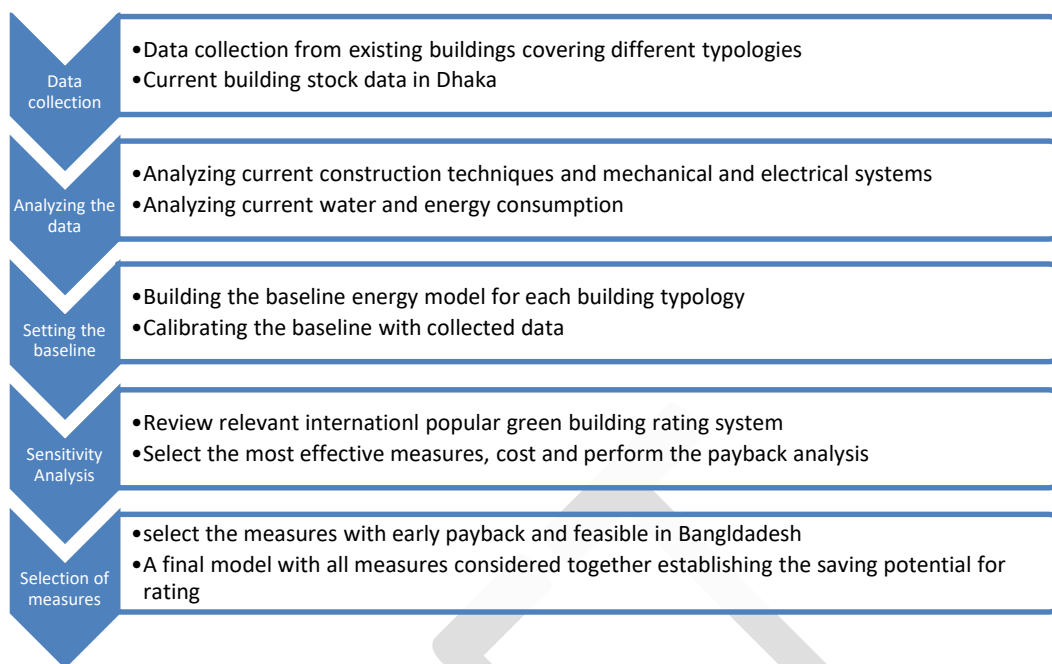
1.5 Energy Efficiency & Conservation Buildings Program:

To ensure the energy efficiency in buildings, SREDA has developed the rating system for buildings and act as the implementation and execution body for the Building Energy Efficiency & Environment Rating (BEEER). The rating system will be voluntary at the initial stage. Moreover, it is based on certain baselines and calculation procedures in order to evaluate their impacts and to compare them. The rating systems that has been designed as a holistic approach to green buildings by taking the entire environmental footprint of buildings (e.g. water waste, resources) into account. In addition, social standards and working conditions will be assessed and aspects of, for instance, gender equality and rights of minorities and low-skilled workers will be rated. At present, poor working and safety conditions are prevalent in the construction sector, which primarily employs low-skilled workers and forces women to carry out labour intense and physically demanding tasks on the construction side. Through the consideration of social standards and working conditions, the BEEER will help to counteract these practices and transform the construction sector in a sustainable manner. In addition, training sessions and information for architects, developers, as well as for construction companies and suppliers will be provided to address the existing lack of awareness and know-how and build capacity. To ensure a comprehensive “greening” of Bangladesh’s building sector the program will support the integration and mainstreaming of green building considerations into national and municipal policies as well as public procurement. Furthermore, dialogues and cooperation between policy makers and financial institutions will be facilitated and financial institutions will be advised on the provision of green loan products for buildings.

The objective to which the program aims to contribute is to:

- Promote green and sustainable building practices on the supply and demand side of Bangladesh’s construction sector;
- Contribute to climate change mitigation by saving resources in the building sector while enhancing economic prosperity and competitiveness, as well as alleviating poverty by considering both green and social standards;
- Establish a building energy efficiency and environmental rating systems serving as a standard/reference for green building construction practices;
- Enhance sustainable consumption in the building sector through a rating system, providing consumer information and a distinctive grade for sustainable buildings;
- Mobilize and capacitate key stakeholders to get involved in green building design and construction.
- Promote green equipment and construction materials, fixtures and make the market ready.
- Develop the capacity of architects and Engineers, Energy Managers & Energy Auditors in Green Construction.
- Provide access to soft and subsidize loan facilities for green building developer and consumers.

2. Methodology



3. Rating and reference Points and Label Design

Certification level	Points
★	40-50
★ ★	51-60
★ ★ ★	61-70
★ ★ ★ ★	71-99
★ ★ ★ ★ ★	100- 145
	145 points

4 Rating Guideline

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Building Energy Efficiency &
Environment Rating

5 Shapla
110 Points

**Building Energy &
Environment Rating**

Name of the Building	SREDA Bhaban
Location	Agargoan, Dhaka
Category	Office
Type	Air Conditioned
Built up area	42000 sft
Annual Energy Consumption	10 kwh/sft/year
Validity Period	December 2021

SREDA বীর
Sustainable and Resilient Energy Performance Rating

Management and Planning

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01	:	
Credit Title	:	Management and Planning
Credits Points		Recognized Professional
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	MAP-1
Points for Credit	:	2
Point options	:	
Goal	:	Proper Documentation, Submission, and Evaluation
Eligibility	:	At least One Professional Recognized to be involved in the rating application submission and Audit. <ul style="list-style-type: none"> • Eligible Professional will have minimum graduation degree in Engineering (Civil, Electrical or Mechanical) or Architecture with 2 (two) years of Working Experience in Building Design and Construction field • Should have Membership of Institute of Engineers or Institute of Architects of Bangladesh or Any International Similar Recognized Organization
Required Documentation	:	Enlistment Certificate
Remarks	:	Mandatory Credit Point

02	:	
Credit Title	:	Management and Planning
Credits Points		Planning, Design & Approval
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	MAP-2
Points for Credit	:	2
Point options	:	
Goal	:	To avoid unethical practice
Eligibility	:	<ul style="list-style-type: none"> • All Design of the project must done by registered Professionals (Architects, Engineers, Planners, site supervisor) as per BNBC • All Design must be approved by concerned development authorities or local bodies
Required Documentation	:	<ul style="list-style-type: none"> • Membership certificates of Professional bodies • Approved drawings by concerned authorities. • Land Use Clearance
Remarks	:	Mandatory Credit Point

Project Site Management

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03	:	
Credit Title	:	Project Site Management
Credits Points	:	Assessment of the Site and Surroundings
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 1
Points for Credit	:	2
Point options	:	
Goal	:	To ensure proper utilization of site considering the surrounding context
Eligibility	:	Analysis of the Site condition for proper design (Ecology, Hydrology, Vegetation, Flora and Fauna, Flood level and intensity, Climatic condition. Topography. Soils, transportation facilities, all kinds of sources of pollution)
Required Documentation	:	Site Survey, Site Map, Drawings, Contour Map, Underground Water Quality Test, Climate Data, Observations from the adjacent properties, Photographs etc.
Remarks	:	

04	:	
Credit Title	:	Project Site Management
Credits Points	:	Site selection
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 2
Points for Credit	:	2
Point options	:	
Goal	:	To encourage development in the planned area (Developed or Planned area means: Land developed by government or private development agency, company or by any person as per land development rule and approved by the concerned government organization)
Eligibility	:	
Required Documentation	:	Project Plan, Approval Documents, Photo Proof, Site management Plan, Land Use Clearance.
Remarks	:	

05	:	
Credit Title	:	Project Site Management
Credits Points	:	Site Improvement & Protect/Restore Habitat
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 3
Points for Credit	:	2
Point options	:	comply at least 2 options
Goal	:	To ensure proper utilization of site preserving the natural quality
Eligibility	:	<ul style="list-style-type: none"> • Preserve Top Soil as per soil test report • Protect existing Plants and trees with barriers & Fence • Use Native or adapted vegetation • Restore at least 50% of existing site (except building foot print area) which are disturbed during construction
Required Documentation	:	Photo Proof, Site management Plan, Soil Test Report
Remarks	:	

06	:	
Credit Title	:	Project Site Management
Credits Points	:	Open Space Management
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 4
Points for Credit	:	1
Point options	:	
Goal	:	To ensure proper utilization of site considering more openness, that encourages interaction with the environment and physical activities
Eligibility	:	Provide minimum 10% more of Mandatory open area at Ground (without having any basement) (50% of the mandatory open area must be green or permeable paving)
Required Documentation	:	landscape plan in detail, plant specifications submission
Remarks	:	

07	:	
Credit Title	:	Project Site Management
Credits Points	:	Rainwater Management During Construction at Site
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New)

Credit Number	:	SM5
Points for Credit	:	2
Point options	:	
Goal	:	Manage the Rainwater during pre-construction
Eligibility	:	<ul style="list-style-type: none"> • Prepare Rainwater drainage plan for the site • Make drain and sedimentation tank for construction period • The construction site may cover with tent or Temporary shading during basement construction and Earth Cutting to reduce the Water pumping.
Required Documentation	:	<ul style="list-style-type: none"> • Drawings • Photo Evidence • Periodic Inspection report by the enlisted consultants
Remarks	:	

08	:	
Credit Title	:	Project Site Management
Credits Points	:	Outdoor Light Control at Site & Surrounding
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 7
Points for Credit	:	1
Point options	:	
Goal	:	Reduction of Light Pollution
Eligibility	:	<ul style="list-style-type: none"> • Prepare Exterior lighting Layout plan • Manufacturing data of lighting fixture • Maintain LPD maximum 1.6 W/m² in open outdoor area (Except Signage & Security lighting) or • Lighting simulation report with the maximum LPD of 1.6 W/m²
Required Documentation	:	<ul style="list-style-type: none"> • Design and Drawings • Lighting Test report • Manufacturers Data sheet
Remarks	:	

09	:	
Credit Title	:	Project Site Management
Credits Points	:	Easy Access to the site
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 8
Points for Credit	:	1
Point options	:	
	:	

Goal	:	To Reduce CO₂ foot print from daily life transportation
Eligibility	:	<ul style="list-style-type: none"> Public transportation facilities (CNG auto Rickshaw Stoppage, Bus Stoppage, boat/ Ferry, Electrical vehicle stoppage) within 0.5 km walking distance from campus boundary. Rail station, Water vehicle terminal, MRT or BRT station within 1 km walking distance from campus boundary. Pedestrian access to the facility with provision for persons with special needs
Required Documentation	:	<ul style="list-style-type: none"> Layout plan with surrounding transportation facilities (location and detail bus lines, numbers and frequencies) Satellite Maps Photo evidence
Remarks	:	

10	:	
Credit Title	:	Project Site Management
Credits Points	:	Bicycle Parking
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 9
Points for Credit	:	2
Point options	:	
Goal	:	To Reduce CO₂ foot print from daily life transportation
Eligibility	:	<ul style="list-style-type: none"> Provision of at least 50% bicycle parking facilities of regular car parking requirements of commercial or residential buildings Or Provision of bicycle facilities for * % of regular worker of a factory or industry *(30% for up to 1000 worker, 15% up to 5000 workers and 10% for 10000 or more workers) Changing room with shower facilities (for both Male and Female) as per BNBC
Required Documentation	:	<ul style="list-style-type: none"> Layout plan with demarcation of bicycle parking area Floor plan with shower and changing room Demarcation of bicycle network within the site Occupancy details or Car parking details Photographs
Remarks	:	

11	:	
Credit Title	:	Project Site Management
Credits Points	:	Car Parking
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 10
Points for Credit	:	1+1 = 2

Point options	:	One point for each eligibility criteria
Goal	:	To Reduce CO₂ foot print from daily life transportation and promote sharing of resources.
Eligibility	:	<ul style="list-style-type: none"> Keeping parking facilities within minimum requirements by as set out in BNBC & Dhaka Mahanagar Imarat Nirman Bidhimala-2008 <p>A. Provide 10% common parking area for Low Emission Vehicle /Electric Car (Charging option will be integrated with the BMS network)</p> <p>B. Provide 10% parking area for Low Emission Vehicle at car pool (Low Emission Vehicle means Electric Vehicles which are approved by BRTA or electric vehicle of Industrial/commercial use)</p>
Required Documentation	:	<ul style="list-style-type: none"> Drawings with Car parking layout for New Construction Photo Evidence for Existing Project
Remarks	:	

12	:	
Credit Title	:	Project Site Management
Credits Points	:	Community services
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 11
Points for Credit	:	1- 2
Point options	:	<ul style="list-style-type: none"> 1 point for 5 facilities 2 points for 10 facilities.
Goal	:	Encourage to select the site near to the existing Community facilities to save transportation energy
Eligibility	:	<ul style="list-style-type: none"> A) at least 5 different facilities within 0.5 km radius Or B) at least 10 different facilities within 1 km radius <p>Facilities are School, Health Facilities, Fire and Ambulance Service, swimming pool, ATM booth, Bank, Post office/ Courier service, Grocery shop, Medicine Shop, Medical Centre, Market Place, Super Mall, Park, Play ground, Child care, Mosque, Community Center.</p>
Required Documentation	:	<ul style="list-style-type: none"> site plan locating facilities Photo evidence Satellite images indicating distance.
Remarks	:	

Building Envelope Design

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13	:							
Credit Title	:	Building Envelope Design						
Credits Points		Daylight						
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)						
Credit Number	:	BED 1						
Points for Credit	:	2-4						
Point options	:	<table border="1"> <thead> <tr> <th>Point</th> <th>Window Opening [Percentage of Window Opening/Net Floor Area(Room Area)]</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>25%</td> </tr> <tr> <td>4</td> <td>50%</td> </tr> </tbody> </table>	Point	Window Opening [Percentage of Window Opening/Net Floor Area(Room Area)]	2	25%	4	50%
Point	Window Opening [Percentage of Window Opening/Net Floor Area(Room Area)]							
2	25%							
4	50%							
Goal	:	To ensure optimum daylight performance and save energy						
Eligibility	:	Minimum 50 Lux level Natural daylight at regular workable area under clear sky. The daylight level should not create glare or over light. Option 1: Daylight Modeling through annual computer simulations that spatial daylight autonomy for regularly occupied floor area. Option 2: Data collection by using data logger in a existing space or building						
Required Documentation	:	<ul style="list-style-type: none"> • Architectural Drawings • Glazing Details or Manufacture data sheet • Door window schedule • Day Lighting simulation report • Data logging Report 						
Remarks	:							

14	:	
Credit Title	:	Building Envelope Design
Credits Points		Naturally Ventilated Spaces for Passive Design Building
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	BED 2
Points for Credit	:	6
Point options	:	
Goal	:	To maximize naturally ventilated spaces and comfortable indoor environment

Eligibility	:	<p>Summer. For Passive Design the indoor air temperature must maintain 4-3°C below outdoor temperature in summer with Relative Humidity Maximum 70%.</p> <p>Winter For Passive Design the indoor air temperature must maintain upper than 15 C</p> <ul style="list-style-type: none"> • Determine the outdoor air opening and space configuration requirements using the natural ventilation procedure – cross ventilation, stack ventilation, double opening ventilation, wind-induced ventilation, etc. • Monitor CO2 concentrations within all densely occupied spaces. CO2 monitors must be between 3 and 6 feet above the floor
Required Documentation	:	<ul style="list-style-type: none"> • Natural ventilation design calculations. • Measurement Data in Both Summer and winter/ Simulation Report • Occupancy Information
Remarks	:	Optional Points and Only applicable For Passive Design

15	:	
Credit Title	:	Building Envelope Design
Credits Points	:	Building Orientation
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	BED 3
Points for Credit	:	1
Point options	:	
Goal	:	To emphasize on Building Orientation for maximum exposure to natural wind flow and daylight
Eligibility	:	<ul style="list-style-type: none"> • Determine the building orientation. The general orientation is north-south, ensuring that all major openings are in line with
Required Documentation	:	<ul style="list-style-type: none"> • Architectural Drawings
Remarks	:	Optional Points and Only applicable For Passive Design

Water Management

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16	:	
Credit Title	:	Water Management
Credits Points		Water Metering
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	WM1
Points for Credit	:	1
Point options	:	
Goal	:	To measure water consumption to reduce energy and resource footprint.
Eligibility	:	Install water meter/ prepaid water meter for the Building.
Required Documentation	:	Water Consumption data Monthly basis for at least 3 months.
Remarks	:	Mandatory

17	:	
Credit Title	:	Water Management
Credits Points		Water Use Reduction in Outdoor
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	WM2
Points for Credit	:	1-2
Point options	:	<ul style="list-style-type: none"> • 1 point for water use reduction • 2 points for using recycled water
Goal	:	To Reduce water use in Outdoor and reuse of water
Eligibility	:	<ul style="list-style-type: none"> • Provide proper drainage system • Prevent leakage during irrigation • Reduce water demand in 50% by using native and less maintenance plants & landscape over the baseline case • Use recycle water from STP or WWTP • Minimize storm water run-off from site by reducing hard paving on site
Required Documentation	:	<ul style="list-style-type: none"> • Detail landscape plan • List of landscape species • Data of Drip irrigation system • Plumbing drawings showing the recycled water for Irrigation • STP/ETP/WWTP Design
Remarks	:	

18	:	
Credit Title	:	Water Management

Credits Points	Water Use Reduction in Indoor																				
Credit Number	: WM3																				
Points for Credit	: 1-8																				
Point options	:	<table border="1"> <thead> <tr> <th>Percentage reduction</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>25%</td> <td>2</td> </tr> <tr> <td>30%</td> <td>3</td> </tr> <tr> <td>35%</td> <td>4</td> </tr> <tr> <td>40%</td> <td>5</td> </tr> <tr> <td>45%</td> <td>6</td> </tr> <tr> <td>50%</td> <td>8</td> </tr> </tbody> </table>	Percentage reduction	Points	25%	2	30%	3	35%	4	40%	5	45%	6	50%	8					
Percentage reduction	Points																				
25%	2																				
30%	3																				
35%	4																				
40%	5																				
45%	6																				
50%	8																				
Goal	:	To reduce water use in Indoor																			
Eligibility	:	<p>Water consumption reduction by % of total consumption from the baseline. Base calculations on the volumes and flow rates shown in Table</p> <table border="1"> <thead> <tr> <th>Fixture or Fitting</th> <th>Baseline (SI units)</th> </tr> </thead> <tbody> <tr> <td>Toilet (water closet)</td> <td>8/6 lpf (Duel Flush)</td> </tr> <tr> <td>Urinal</td> <td>4 lpf</td> </tr> <tr> <td>Public Toilet faucet</td> <td>3 lpm at 400 kPa</td> </tr> <tr> <td>Private Toilet faucet</td> <td>9 lpm at 400 kPa</td> </tr> <tr> <td>Kitchen faucet</td> <td>9 lpm at 400 kPa</td> </tr> <tr> <td>Faucet for Ablution</td> <td>3 lpm at 400 kPa</td> </tr> <tr> <td>Shower head</td> <td>12 lpm at 500 kPa per shower stall</td> </tr> <tr> <td>Hand Shower</td> <td>8 lpm at 415 kPa</td> </tr> </tbody> </table> <p>* Standards for appliances: SREDA Rated Appliance / Equipments or equivalent ** Standards for appliances (Kitchen ware, Commercial washing Machine, Lavatory Equipments) Reference standards (Any Internationally Accepted Green Building Rating System)</p>		Fixture or Fitting	Baseline (SI units)	Toilet (water closet)	8/6 lpf (Duel Flush)	Urinal	4 lpf	Public Toilet faucet	3 lpm at 400 kPa	Private Toilet faucet	9 lpm at 400 kPa	Kitchen faucet	9 lpm at 400 kPa	Faucet for Ablution	3 lpm at 400 kPa	Shower head	12 lpm at 500 kPa per shower stall	Hand Shower	8 lpm at 415 kPa
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Hand Shower	8 lpm at 415 kPa																				
Required Documentation	:	<ul style="list-style-type: none"> Manufacturers Cut Sheet indicating flow/flush rates Plumbing drawings showing the recycled water for Flushing STP / ETP / WWTP Design 																			
Remarks	:	Mandatory																			

19	:	
Credit Title	:	Water Management
Credits Points		Water Reduction in Cooling Towers & Air conditioners
Applicability	:	Building Type (Residential/Commercial/Factory/Industry)

		Building Stage (New/Existing)
Credit Number	:	WM4
Points for Credit	:	1
Point options	:	
Goal	:	To reduce potable water in building services
Eligibility	:	Use a minimum 20% (of demand) recycled non potable water in cooling tower. The water quality must maintain as per the requirements of the building service system
Required Documentation	:	<ul style="list-style-type: none"> • Plumbing drawings showing the recycled water for cooling tower • STP/ETP/WWTP Design
Remarks	:	

20	:	
Credit Title	:	Water Management
Credits Points	:	Rain Water Harvesting from Building and Recharging
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	WM5
Points for Credit	:	3
Point options	:	
Goal	:	To utilize naturally available water
Eligibility	:	<ul style="list-style-type: none"> • Rain water harvesting system design with the consideration of runoff from the roof as well as the project site (hardscape). The run-off from a roof or concrete shall be a maximum of 80-90% <p>Consider 80% of Rainwater Storage Facilities commensurate with the size of Roof Area Roof Area (*) % of collected rain (daily average for the whole year)</p> <p>*Roof Area Up to 5000 sft 10% , Upto 10000 sft 5% , Upto 50000 sft 2%, Up to 100000 sft 1%, more than 100000 sft 0.5%</p> <ul style="list-style-type: none"> • Use collected rainwater in Toilet flush, Gardening, Fire fighting water storage. and • Recharge rain water to below ground with filtration or grease/oil trapping system
Required Documentation	:	<ul style="list-style-type: none"> • Plumbing drawings showing the rain water collection and use in buildings • RWTP Design • Layout plan and Design of Recharge well/Rainwater Storage Tank
Remarks	:	

Energy Management

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21	:	
Credit Title	:	Energy Management
Credits Points	:	Energy Metering
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	EM1
Points for Credit	:	1
Point options	:	
Goal	:	To Measure the Energy Consumptions
Eligibility	:	Install smart Energy meter for the Building/ Unit/Tenant basis
Required Documentation	:	Connection Certificate form Electricity Utility Agency/ Companies.
Remarks	:	Mandatory

22	:	
Credit Title	:	Energy Management
Credits Points	:	Minimum Energy Performance
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	EM2
Points for Credit	:	5
Point options	:	
Goal	:	To perform minimum level of energy efficiency
Eligibility	:	Minimum Energy Saving of 5 % from building system and envelopes. Compared with the baseline (Renewable Energy is Excluded). Comply minimum requirements of BNBC preferably Or ASHRAE Standard 90.1-2010.
Required Documentation	:	<ul style="list-style-type: none"> • Mechanical, Electrical and Plumbing Design • Power and Energy Load Calculation • Single line Diagram for STP/ETP/WWTP • Bus Bar energy saving comparative and calculation • Chiller capacity and AHUs Capacity (if any) • Steam Load calculation (if any) • Chiller gas detail information • Details of VFD installed on AHUs • Calculation and backup for energy efficient process for machines equipment etc. • Lighting floor plan and cut sheet of interior lighting fixtures • Technical details/ manufacturer data sheet for chillers, AHU, Boiler etc • Updated HVAC layout with details of the systems
Remarks	:	Mandatory

23	:	
Credit Title	:	Energy Management
Credits Points	:	Heat Island Effect Reduction at Site / Roof
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	SM 6
Points for Credit	:	1 + 1 = 2
Point options	:	One point for A, One point for B & 2 point for both A&B
Goal	:	To reduce Heat gain from horizontal surfaces.
Eligibility	:	<p>Eligibility :</p> <p>A) Non roof</p> <ul style="list-style-type: none"> • Use plants that provide shade over paving areas (including playgrounds) • Provide shade with solar PV/ Water Heater panels • Provide shade with architectural devices • shade with vegetated • Use at least 50% of pavement area open-grid pavement system <p>B) Roof</p> <ul style="list-style-type: none"> • Use roofing materials or roof paint that have an SRI equal to or greater than 80. • 70% of open roof area should be vegetated roof or solar thermal collectors, photovoltaic Covering <p>Or</p> <p>A minimum of 75% of outdoor parking area cover by energy generation systems, such as solar thermal collectors, photovoltaic, etc.</p>
Required Documentation	:	<ul style="list-style-type: none"> • Submit the Lab Data sheet of Materials for SRI Value • Submit Drawings and Photo evidence of Vegetation or covered area
Remarks	:	

24	:	
Credit Title	:	Energy Management
Credits Points	:	Measurement and Verifications
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	EM3
Points for Credit	:	3
Point options	:	
Goal	:	To ensure compliance of desired requirement of performance
Eligibility	:	Complete the commissioning process activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies in accordance with BNBC, Part-8, Chapter-2 (Air-condition, Heating

		<p>and Ventilation) preferably</p> <p>Or</p> <p>ASHRAE Guideline 0–2005 and ASHRAE Guideline 1.1–2007 for HVAC & R systems, as they relate to energy, water, indoor environmental quality, and durability.</p> <p>M&V agency must complete the following:</p> <ul style="list-style-type: none"> • Review contractor submittals • Verify inclusion of systems manual requirements in construction documents • Verify inclusion of operator and occupant training requirements in construction documents • Verify systems manual updates and delivery • Verify operator and occupant training delivery and effectiveness • Verify seasonal testing • Review building operations 6 months after substantial completion • Develop an on-going commissioning plan <p>Measurement and Verification should be done by any third party Measurement and verification agency or SREDA Certified Energy Auditor and will check the following issues.</p> <ul style="list-style-type: none"> • Mechanical, Electrical and Plumbing Design • Power and Energy Load Calculation • Single line Diagram for STP/ETP/WWTP • Bus Bar energy saving comparative and calculation • Chiller capacity and AHUs Capacity (if any) • Steam Load calculation (if any) • Chiller gas detail information • Details of VFD installed on AHUs • Calculation and backup for energy efficient process for machines equipment etc. • Lighting floor plan and cut sheet of interior lighting fixtures • Technical details/ manufacturer data sheet for chillers, AHU, Boiler etc • Updated HVAC layout.
Required Documentation	:	<ul style="list-style-type: none"> • M&V Reports • Audit Reports
Remarks	:	

25	:	
Credit Title	:	Energy Management
Credits Points	:	Advanced Energy performance
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	EM4

Points for Credit	:	6-20																														
Point options	:	<table border="1"> <tr> <td>6%</td> <td>6</td> </tr> <tr> <td>7%</td> <td>7</td> </tr> <tr> <td>8%</td> <td>8</td> </tr> <tr> <td>9%</td> <td>9</td> </tr> <tr> <td>10%</td> <td>10</td> </tr> <tr> <td>15%</td> <td>11</td> </tr> <tr> <td>20%</td> <td>12</td> </tr> <tr> <td>24%</td> <td>13</td> </tr> <tr> <td>28%</td> <td>14</td> </tr> <tr> <td>30%</td> <td>15</td> </tr> <tr> <td>34%</td> <td>16</td> </tr> <tr> <td>38%</td> <td>17</td> </tr> <tr> <td>42%</td> <td>18</td> </tr> <tr> <td>46%</td> <td>19</td> </tr> <tr> <td>50%</td> <td>20</td> </tr> </table> <p>Optimize the energy performance by</p> <ul style="list-style-type: none"> • Interior and Exterior Lighting power Density (LPD) reduction • Improvement of Thermal performance of building envelope • Energy efficient HVAC systems 	6%	6	7%	7	8%	8	9%	9	10%	10	15%	11	20%	12	24%	13	28%	14	30%	15	34%	16	38%	17	42%	18	46%	19	50%	20
6%	6																															
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46%	19																															
50%	20																															
Goal	:	To achieve higher levels of energy performance.																														
Eligibility	:	Follow the criteria Minimum Energy Performance to demonstrate a percentage improvement in the proposed building performance rating compared with the baseline. Points are awarded according to Table																														
Required Documentation	:	<ul style="list-style-type: none"> • Reports of efficiency measures during the design process and account for the results in design decision making. • Energy simulation Report of Efficiency • Analyze efficiency measures, focusing on load reduction and HVAC-related strategies (passive measures are acceptable) appropriate for the facility. 																														
Remarks	:	Only Applicable for Air Conditioned Space / Building																														

26	:	
Credit Title	:	Energy Management
Credits Points	:	Demand Response
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	EM5

Points for Credit	:	5
Point options	:	
Goal	:	To encourage the technologies and programs that make energy generation and distribution systems more efficient
Eligibility	:	Use BMS for day to day building monitoring (a Building Management System(BMS), otherwise known as a Building Automation System(BAS), is a computer based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, renewable energy and security systems.)
Required Documentation	:	<ul style="list-style-type: none"> • Real time BMS Data of performance • BMS manufacturer data sheet
Remarks	:	

27	:															
Credit Title	:	Energy Management														
Credits Points	:	Renewable Energy Incorporation														
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)														
Credit Number	:	EM6														
Points for Credit	:	1- 10														
Point options	:	<table border="1"> <thead> <tr> <th>Generation Percentage of Demand Load</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>5%-9%</td> <td>1</td> </tr> <tr> <td>10%-19%</td> <td>2</td> </tr> <tr> <td>20%-29%</td> <td>3</td> </tr> <tr> <td>30%- 49%</td> <td>4</td> </tr> <tr> <td>50% - 99 %</td> <td>5</td> </tr> <tr> <td>100% (Net Zero Building)</td> <td>10</td> </tr> </tbody> </table>	Generation Percentage of Demand Load	Points	5%-9%	1	10%-19%	2	20%-29%	3	30%- 49%	4	50% - 99 %	5	100% (Net Zero Building)	10
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100% (Net Zero Building)	10															
Goal	:	To reduce the environmental and economic harms associated with fossil fuel														
Eligibility	:	Generate on site or Invest Energy using renewable sources (Solar PV, Wind, Bio gas, Hydro, Waste to Energy) by using roof top, Walls, Vacant land etc.														
Required Documentation	:	<ul style="list-style-type: none"> • Annual energy usage and cost information • Proof of load sanction by utilities • Investment information and generation of energy from Renewable sources 														
Remarks	:	Mandatory														

28	:																																														
Credit Title	:	Energy Management																																													
Credits Points		Management of Refrigeration & Air-conditioning system																																													
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)																																													
Credit Number	:	EM7																																													
Points for Credit	:	3																																													
Point options	:																																														
Goal	:	To reduce the environmental and economic harms associated with GHG emission.																																													
Eligibility	:	<p>Air-conditioning accounts for more than 50% of the total electricity costs in a centrally air-conditioned building. Hence the efficiency of a HVAC system is of prime importance. The heart of the HVAC system is the chiller and hence it is important to procure an efficient chiller system. Refrigerant used for the cooling system should be non-CFC and non-HCFC and with low Global Warming potential (GWP).</p> <p>The cooling equipment shall meet or exceed the minimum efficiency requirement as stated in the table below.</p> <p>Table–Minimum energy efficiency requirements for chilling packages</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Capacity</th> <th>Input kW/TR</th> </tr> </thead> <tbody> <tr> <td>Air cooled chillers including condenser</td> <td>All Capacities</td> <td>1.25</td> </tr> <tr> <td>Air cooled chillers without condenser</td> <td>All Capacities</td> <td>1.13</td> </tr> <tr> <td>Water cooled, electrical operated positive displacement (Reciprocating) chillers</td> <td>All capacities</td> <td>0.83</td> </tr> <tr> <td rowspan="3">Water cooled electrical operated positive displacement (rotary screw and scroll) chillers</td> <td><150 TR</td> <td>0.79</td> </tr> <tr> <td>≥150 TR and 300 TR</td> <td>0.71</td> </tr> <tr> <td>≥300 TR</td> <td>0.64</td> </tr> <tr> <td rowspan="3">Water cooled electrically operated centrifugal chillers</td> <td><150 TR</td> <td>0.70</td> </tr> <tr> <td>≥150 TR and 300 TR</td> <td>0.63</td> </tr> <tr> <td>≥300 TR</td> <td>0.57</td> </tr> <tr> <td>Air cooled absorption single effect chillers</td> <td>All Capacities</td> <td>N/A</td> </tr> <tr> <td>Water cooled absorption single effect chillers</td> <td>All Capacities</td> <td>N/A</td> </tr> <tr> <td>Water cooled absorption double effect (indirect fired) chillers</td> <td>All Capacities</td> <td>N/A</td> </tr> <tr> <td>Water cooled absorption double effect (Direct fired) Chillers</td> <td>All Capacities</td> <td>N/A</td> </tr> <tr> <td rowspan="3">Air-cooled air conditioner</td> <td><5.4 TR</td> <td>1.23</td> </tr> <tr> <td>≥ 5.4 TR and < 11.4 TR</td> <td>1.10</td> </tr> <tr> <td>≥ 11.4 TR and < 20 TR</td> <td>1.15</td> </tr> </tbody> </table>	Description	Capacity	Input kW/TR	Air cooled chillers including condenser	All Capacities	1.25	Air cooled chillers without condenser	All Capacities	1.13	Water cooled, electrical operated positive displacement (Reciprocating) chillers	All capacities	0.83	Water cooled electrical operated positive displacement (rotary screw and scroll) chillers	<150 TR	0.79	≥150 TR and 300 TR	0.71	≥300 TR	0.64	Water cooled electrically operated centrifugal chillers	<150 TR	0.70	≥150 TR and 300 TR	0.63	≥300 TR	0.57	Air cooled absorption single effect chillers	All Capacities	N/A	Water cooled absorption single effect chillers	All Capacities	N/A	Water cooled absorption double effect (indirect fired) chillers	All Capacities	N/A	Water cooled absorption double effect (Direct fired) Chillers	All Capacities	N/A	Air-cooled air conditioner	<5.4 TR	1.23	≥ 5.4 TR and < 11.4 TR	1.10	≥ 11.4 TR and < 20 TR	1.15
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			≥ 20 TR	1.28
		Evaporating water-cooled air conditioners	<5.4 TR	1.04
			≥ 5.4 TR and < 11.4 TR	1.03
			≥ 11.4 TR and 20 TR	1.08 1.15
			≥ 20 TR	1.29
		Air-cooled condenser units	≥ 11.4 TR	1.18
		Water-cooled or evaporating condenser units	≥ 11.4 TR	0.911
		For AC systems above 5.4 TR in capacity it is recommended that a refrigerant leakage check record book is kept and Maximum 10% of leakage per annum is allowable		
Required Documentation	:	<ul style="list-style-type: none"> • Performance data sheet • Catalogs • Refrigerant leakage check record 		
Remarks	:			

29	:							
Credit Title	:	Energy Management						
Credits Points	:	Green power						
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)						
Credit Number	:	EM8						
Points for Credit	:	1-2						
Point options	:	<table border="1"> <thead> <tr> <th>% Green Power</th> <th>Point</th> </tr> </thead> <tbody> <tr> <td>20 % to 49 %</td> <td>1</td> </tr> <tr> <td>50 % ~</td> <td>2</td> </tr> </tbody> </table>	% Green Power	Point	20 % to 49 %	1	50 % ~	2
% Green Power	Point							
20 % to 49 %	1							
50 % ~	2							
Goal	:	To reduce the environmental and economic harms associated with conventional power system.						
Eligibility	:	A minimum 5 years contract of purchasing green power from any government or private utility company/ supplier.						
Required Documents for Submission:	:	<ul style="list-style-type: none"> • Contract document • BMS report 						
Remarks	:							

Indoor Environment Quality

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30	:	
Credit Title	:	Indoor Environment
Credits Points	:	Ventilation
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	IE 1
Points for Credit	:	1
Point options	:	
Goal	:	To ensure proper ventilation and comfortable indoor environment.
Eligibility	:	All living space should have proper ventilation for Active mode. <ol style="list-style-type: none"> 1. For Active ventilation comply minimum requirements of BNBC, Part-8, Chapter-2 (Air-condition, Heating and Ventilation) preferably Or ASHRAE Standard 62.1, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata) 2. Monitor CO₂ concentrations within all densely occupied spaces. CO₂ monitors must be between 3 and 6 feet above the floor
Required Documentation	:	<ul style="list-style-type: none"> • Design and Ventilation Calculation Data • Occupancy information
Remarks	:	

31	:	
Credit Title	:	Indoor Environment
Credits Points	:	Tobacco / Smoke Control
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	IE 2
Points for Credit	:	1
Point options	:	
Goal	:	To ensure Tobacco pollution free indoor space
Eligibility	:	<ul style="list-style-type: none"> • Zero exposure to tobacco smoke for non-smokers • Exclusive ventilation for smoking rooms with proper awareness and signage as per Government law and Policy
Required Documentation	:	<ul style="list-style-type: none"> • Put a signage of non-smoking at visual level • Design and layout of smoke zone • Photo evidence.
Remarks	:	

32	:							
Credit Title	:	Indoor Environment						
Credits Points		Less Emitting Materials						
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)						
Credit Number	:	IE 3						
Points for Credit	:	1- 2						
Point options	:	<table border="1"> <thead> <tr> <th>Point</th> <th>Percentage of Low Emitting Material Used out of total quantity</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>50%-79%</td> </tr> <tr> <td>2</td> <td>80%-100%</td> </tr> </tbody> </table>	Point	Percentage of Low Emitting Material Used out of total quantity	1	50%-79%	2	80%-100%
Point	Percentage of Low Emitting Material Used out of total quantity							
1	50%-79%							
2	80%-100%							
Goal	:	To ensure Low VOC in Indoor Environment						
Eligibility	:	<ul style="list-style-type: none"> • All interior finishing products (Paint, Tiles, Veneer wood, Particle Board) <ul style="list-style-type: none"> ○ Paint - Maximum VOC level 10g/L ○ Veneer & particle board- Free of Added urea formal dehydrate ○ Adhesive/Sealants - Maximum VOC level 10g/L <p>All products must have the VOC free certification from any Internationally accredited lab.</p>						
Required Documentation	:	<ul style="list-style-type: none"> • Manufacturer data sheet • Lab report (VOC emission) of Product. • Materials inventory 						
Remarks	:							

33	:	
Credit Title	:	Indoor Environment
Credits Points		Lighting at Interior Space
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	IE5
Points for Credit	:	1
Point options	:	
Goal	:	To ensure minimum required light use and save energy
Eligibility	:	<ul style="list-style-type: none"> • For at least 90% of individual occupant spaces, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences, with at least three lighting levels or scenes (on, off, midlevel). (Midlevel is 30% to 70% of the maximum illumination level) • Day light contributions are excluded.

		<ul style="list-style-type: none"> • For all shared multi occupant spaces, meet the following requirements. <ul style="list-style-type: none"> ○ Have in place multi zone control systems that enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes (on, off, midlevel).
Required Documentation	:	Design information of lighting control- Location, specifications
Remarks	:	

34	:	
Credit Title	:	Indoor Environment
Credits Points		Acoustics Quality
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	IE 7
Points for Credit	:	1
Point options	:	
Goal	:	To Restrict noise generation form appliances
Eligibility	:	BNBC, Part-8, Chaper-2 (Air-condition, Heating and Ventilation) and Chapter-3 (Building Acoustics) Or <ul style="list-style-type: none"> • Provide Proper Insulation for noise protection from Generator, Air-conditioning Unit, the maximum limit of noise is 15 dB for Indoor space.
Required Documentation	:	<ul style="list-style-type: none"> • Noise level measurement data • Insulation design and Documents
Remarks	:	

35	:	
Credit Title	:	Indoor Environment
Credits Points		Clean Cooking (Homes)
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	IE 8
Points for Credit	:	1
Point options	:	
Goal	:	To Restrict Indoor Environment Pollution

Eligibility	:	<ul style="list-style-type: none"> • Use tire 4 cooking solution on Indoor space • Use Fuel free of SOx and NOx • For Gas and Fire Fuel, Use proper exhaust system both for cook stove and cooking place • For Electric Cooker the maximum wattage for single burner will be less than 1.2 kw • Comply the ventilation and thermal comfort requirements of BNBC, Part-8, Chaper-2 (Air-condition, Heating and Ventilation)
Required Documentation	:	<ul style="list-style-type: none"> • Manufacturer Data Sheet of Cook stoves • Efficiency and pollution level lab test reports of the stove
Remarks	:	

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Construction Materials Management

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36	:									
Credit Title	:	Construction Materials Management								
Credits Points		Reuse of Existing Building Materials								
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)								
Credit Number	:	CM 1								
Points for Credit	:	1-5								
Point options	:	5 points for option A 4 Points for option B 1-3 Points for option C 5 Points for option D								
Goal	:	Reuse or preserve construction materials to reduce energy footprint for materials production								
Eligibility	:	<p>A. Full Preservation / Restoration/ Revitalization of Existing Heritage Building which are declared Heritage Building by appropriate Authority (City Development Authorities, City Corporations, Municipalities, Department of Archeology.)</p> <p>B. Keep at least 70%, by surface area, of the existing building structure, envelop, and interior. The building must be renovated to a state of productive use</p> <p>C. Reuse or salvage building materials from off site or on site as a percentage of the surface area, as listed in Table.</p> <table border="1" data-bbox="587 1263 1070 1518"> <thead> <tr> <th>Percentage of Reused materials</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>25%</td> <td>1</td> </tr> <tr> <td>40%</td> <td>2</td> </tr> <tr> <td>60%</td> <td>3</td> </tr> </tbody> </table> <p>D. For new buildings, conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in following impact categories listed below, one of which must be global warming potential.</p> <p>Select at least three of the following impact categories for reduction:</p> <ul style="list-style-type: none"> • global warming potential (greenhouse gases), in CO₂; • depletion of the stratospheric ozone layer, in kg CFC-11; • formation of tropospheric ozone, in kg NO_x, kg O₃ eq, or kg ethane; and • depletion of nonrenewable energy resources, in MJ. 	Percentage of Reused materials	Points	25%	1	40%	2	60%	3
Percentage of Reused materials	Points									
25%	1									
40%	2									
60%	3									

Required Documentation	:	<p>A.</p> <ul style="list-style-type: none"> Evidence of Historic project Design & Drawings Photo evidence <p>B.</p> <ul style="list-style-type: none"> Design & Drawings Photo evidence Calculation Sheet <p>C.</p> <ul style="list-style-type: none"> Design & Drawings Photo evidence Calculation Sheet <p>D.</p> <ul style="list-style-type: none"> LCA Documents
Remarks	:	

37	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Certified Building Materials
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 2
Points for Credit	:	3+1=4
Point options	:	<ul style="list-style-type: none"> 2 points for eligibility A 1 point for eligibility B 1 point for compliance of both eligibility
Goal	:	To encourage Cleaner production of Construction materials
Eligibility	:	<p>A . For New Construction : At least Four main construction material itself have the life cycle Assessment or Environmental Product Development (EPD) Certified Materials Certification (at least 50 years life cycle) Brick, Tile, Cement, RMC, Steel, Wood, Particle Board, Glass</p> <p style="text-align: center;">Or</p> <p>For interior space and Existing Building, 5 types of furniture (5 no each type) should have EPD certificate</p> <p>B. At least Four main construction material should be procured from BEEER or Similar International green rated Factory.</p>
Required Documentation	:	<ul style="list-style-type: none"> EPD Certificate evidence of the Materials or Lifecycle assessment report of materials B Certification proof of the Factory and materials porches agreement copy.
Remarks	:	

38	:	
Credit Title	:	Construction Materials Management
	:	

Credits Points	:	Energy Efficient Building Construction Materials						
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)						
Credit Number	:	CM 3						
Points for Credit	:	2						
Point options	:	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Percentage of energy efficient material used (according to material type)</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">40%</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">60%</td> <td style="text-align: center;">2</td> </tr> </tbody> </table>	Percentage of energy efficient material used (according to material type)	Points	40%	1	60%	2
Percentage of energy efficient material used (according to material type)	Points							
40%	1							
60%	2							
Goal	:	To encourage use of energy efficient environment friendly building construction materials						
Eligibility	:	<ul style="list-style-type: none"> • Use of low energy/energy efficient technologies and construction materials. Alternative Bricks, Compressed Stabilized Earth Blocks, Thermal Blocks, Low Emission Glass, Photovoltaic Glass, etc. 						
Required Documentation	:	<ul style="list-style-type: none"> • Manufacturer cut sheet • Lab test reports of the product • Quantity 						
Remarks	:							

39	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Efficient Construction Technology
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 4
Points for Credit	:	2
Point options	:	30% of total Material
Goal	:	To reduce the time of construction by adopting efficient technology
Eligibility	:	<ul style="list-style-type: none"> • Pre-cast construction • Ready mix concrete
Required Documentation	:	<ul style="list-style-type: none"> • Bill of Quantities (BOQ) • Schedule of Requirements • Measurement book
Remarks	:	

40	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Construction and Demolition Waste Management
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 5
Points for Credit	:	1-2
Point options	:	<ul style="list-style-type: none"> • 1 point for 50% waste Recycling • 2 Points for 75% of Waste Recycling
Goal	:	To encourage reduction in waste and use of recycled building materials during construction
Eligibility	:	Recycle the Generated waste during construction of a project or Building. (the generated construction waste must be less than 1000 kg/ft ² of built up area)
Required Documentation	:	<ul style="list-style-type: none"> • Inventory of the generated waste and recycling quantity • Photo evidence
Remarks	:	

41	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Recycle Content of Materials
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 6
Points for Credit	:	1 + 1 = 2
Point options	:	<ul style="list-style-type: none"> • 1 point for minimum 10% of Recycle content of total cost of the Construction Materials (cement, steel, glass, plastic materials, etc.) (Recycle content refers to the construction materials produced with 10% of recycled ingredients when it was produced. Example: Fly Ash based cement, rod with recycled steel raw materials, Glass with recycled raw materials, particle board with waste materials, etc.) • 1 Point for 10% recycle materials of total construction materials should be used in construction (cost based) (use of construction waste materials i.e. Brick, Steel, Wood as recycled materials)
Goal	:	To encourage use of recycle elements for construction materials production
Eligibility	:	<ul style="list-style-type: none"> • Use Construction Materials Produced with Recycling Process or Content of Fly ash or similar materials • Use waste construction material that produce during construction
Required Documentation	:	<ul style="list-style-type: none"> • Manufacturer cut sheet • Lab test reports of the product • Document relating to cost of material
Remarks	:	

42	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Mercury & Lead Pollution Reduction
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 7
Points for Credit	:	1
Point options	:	
Goal	:	To encourage use of non hazardous construction materials
Eligibility	:	<ul style="list-style-type: none"> Use of Mercury free Light and Bulbs and Lead free Paint materials. (90% of total lighting load and all interior and exterior paint except heat proof coating and special paint and sealants)
Required Documentation	:	<ul style="list-style-type: none"> Manufacturer cut sheet Lab test reports of the product Quantity Purchase document
Remarks	:	

43	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Rapidly Renewable Materials
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 8
Points for Credit	:	1
Point options	:	
Goal	:	To encourage use of rapid growing plants and protect forest
Eligibility	:	<ul style="list-style-type: none"> Use materials with rapidly growing plants Particle Board, WPC, veneer boards etc made without Urea Formal de hydrate (Full quantity of particle or veneer boards with minimum quantity of 500 sft) and certified from Bangladesh Forest Research Institute (BFRI) or any International Similar Organization).
Required Documentation	:	<ul style="list-style-type: none"> Manufacturer cut sheet Lab test reports of the product Quantity
Remarks	:	

44	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Certified Wood
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 9
Points for Credit	:	1

Point options	:	
Goal	:	To encourage use of wood which are supplied from wood firm and short life cycle and protect Natural Forest
Eligibility	:	<ul style="list-style-type: none"> Wood Certified from Bangladesh Forest Research institute or any International Similar Organization (The Plant Maturity Life is within 15 Years) (80% of door / window frame plank)
Required Documentation	:	<ul style="list-style-type: none"> Certificate form concerned authority Quantity
Remarks	:	

45	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Local and Regional Materials
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 10
Points for Credit	:	1-2
Point options	:	<ul style="list-style-type: none"> 1 point for 30% Regional Materials of total construction materials value 2 point for 60% Regional Materials of total construction materials value
Goal	:	To encourage use of regional and local construction materials to reduce the energy costs of transportation
Eligibility	:	Use Regional Construction Materials (materials manufactured / assembled within Bangladesh)
Required Documentation	:	<ul style="list-style-type: none"> Factory Location and Information
Remarks	:	

46	:	
Credit Title	:	Construction Materials Management
Credits Points	:	Whole Building Lifecycle Assessment
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	CM 11
Points for Credit	:	5
Point options	:	
Goal	:	Ensure Less Environmental Impact of the Building from the Construction Period to the Demolition
Eligibility	:	<ul style="list-style-type: none"> Perform LCA of The Building
Required Documentation	:	<ul style="list-style-type: none"> LCA Certificate
Remarks	:	

Construction Health and Safety

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47	:	
Credit Title	:	Construction Health and Safety
Credits Points	:	Safety Equipments, Signage and Emergency Equipments at Site
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New)
Credit Number	:	CH 1
Points for Credit	:	1-2
Point options	:	1 point for compliance of any one option 2 points for compliance of both options
Goal	:	Ensure Safety during the construction process
Eligibility	:	<p>A</p> <ul style="list-style-type: none"> • Provide all kinds of Safety vest, noise & welding protection equipment to all construction workers • Preserve instant firefighting equipment and first aid box at site • Arrange safety training for worker at least once in every 3 month • Mark with safety and quotation signage, emergency light, emergency exit during construction • Provide temporary railing or barrier to stair, lift core, parapet area. • Assign a Physician for regular health checkup once in a month and emergency response period. • Provide Fencing around the site of 3 m height • Provide safety Net both horizontal and Vertical direction for construction above 20ft height, <p>B</p> <ul style="list-style-type: none"> • Provide Group Insurance for all construction workers
Required Documentation	:	<p>A</p> <ul style="list-style-type: none"> • Location and Layout drawings • Equipment lists <p>B</p> <ul style="list-style-type: none"> • Worker lists • Photo evidence • Proof of group Insurance policy documents
Remarks	:	MANDATORY

48	:	
Credit Title	:	Construction Health and Safety
Credits Points	:	On site Accommodation during Construction
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New)
Credit Number	:	CH 2
Points for Credit	:	1-2
Point options	:	1 point for compliance of any one option 2 points for compliance of any two out of the four option
Goal	:	Ensure Less Environmental Impact of the Building from Construction Period to Demolition

Eligibility	:	<ul style="list-style-type: none"> • Provide separate accommodation for Regular Construction workers or 20% of Pick Required Construction Worker • Provide separate accommodation for female construction worker with separate latrines and urinals as per applicable standards (10% of Regular worker) • Provide onsite cooking and Dining facilities for workers • Provide clean drinking water
Required Documentation	:	<ul style="list-style-type: none"> • Worker lists • Photo evidence • Layout plan of accommodation, toilet and dining facilities
Remarks	:	Applicable for building floor area more than 20000 sft

49	:	
Credit Title	:	Construction Health and Safety
Credits Points	:	Operation and maintenance Safety
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New)
Credit Number	:	CH 3
Points for Credit	:	1+1= 2
Point options	:	1 point for compliance of eligibility 1 and 1 point for compliance of eligibility 2
Goal	:	Ensure Safety during the Operation Period of the building
Eligibility	:	<ol style="list-style-type: none"> 1. Design Fire Safety information (Drawings) as Per BNBC part 4 / NFPA 2. Regular Fire Drill and Use non-ODS and non-HFC fire fighting equipments
Required Documentation	:	<ul style="list-style-type: none"> • Equipment Lists with Supplier Cut sheet • Detail Drawings and Design of Safety • Safety Signs as per Drawings and List with Photographs. • Fire Drill Report (not more than 3 month old) from Fire Service and Civil Defense Department.
Remarks	:	MANDATORY

Innovation

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50	:	
Credit Title	:	Innovation
Credits Points	:	Innovation
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (Existing)
Credit Number	:	I
Points for Credit	:	5
Point options	:	
Goal	:	Ensure Safety during the Operation Period of the building
Eligibility	:	Innovative activities
Required Documentation	:	<ul style="list-style-type: none"> a. Environmental Awareness Program at 5 Schools b. National and International Seminar and Workshop c. Display and of EE&C activities d. Use of Innovative Technique and Technology e. Innovation Transportation f. Information Collection and Discrimination g. ETC.
Remarks	:	

Bonus Points

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51	:	
Credit Title	:	Bonus Points
Credits Points		CSR
Applicability	:	Building Type (Residential/Commercial/Factory/Industry) Building Stage (New/Existing)
Credit Number	:	BP
Points for Credit	:	2
Point options	:	
Goal	:	Encourage Social Responsibility
Eligibility	:	CSR activities on EE&C/RE
Required Documentation	:	1. CSR Plan 2. Activity Photo Proof 3. Write-up
Remarks	:	

Total 145 points

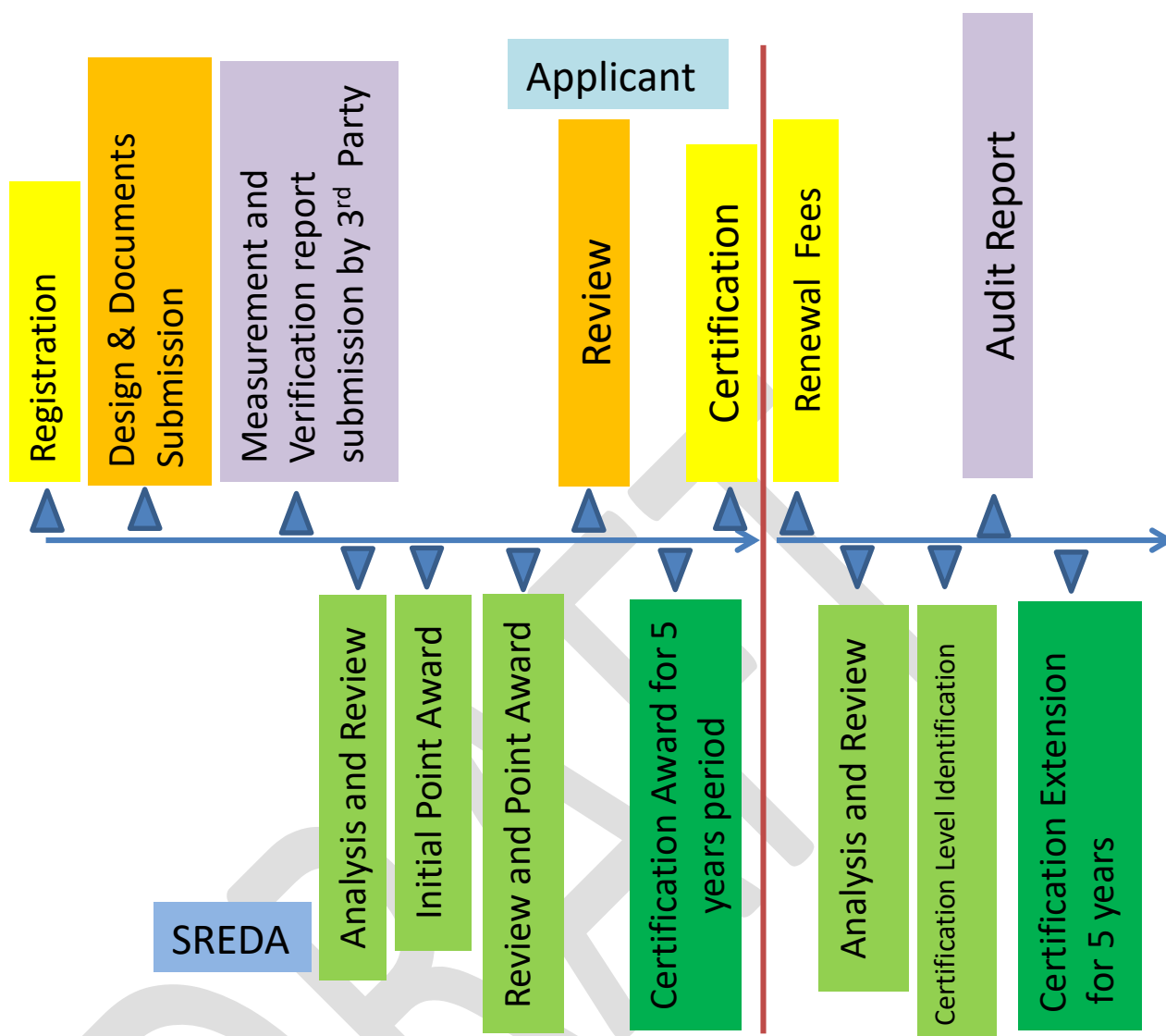
BEEER Criteria and Points for Credit – At a Glance

The rating system is comprised of 51 credits divided in 10 categories. Each credit defines a specific requirement for the building and assigns credit points based on compliance level. The total value of aggregated credit points is 145. Score by category is the following:

Category	Credit No.	Description	Points	Remarks
Management and Planning	1	Recognized Professional	2	Mandatory
	2	Planning, Design & Approval	2	Mandatory
Project Site Management	3	Assessment of the Site and Surroundings	2	
	4	Site Selection	2	
	5	Site Improvement & Protect/Restore Habitat	2	
	6	Open Space Management	1	
	7	Rainwater Management during Construction at Site	2	
	8	Outdoor Light Control at Site & Surrounding	1	
	9	Easy Access to the site	1	
	10	Bicycle Parking	2	
	11	Car Parking	1+1=2	
	12	Community services	1-2	
Building Envelope Design	13	Daylight	2- 4	
	14.	Naturally Ventilated Spaces for Passive Design Building	6	
	15.	Building Orientation for Passive Design Building	1	
Water Management	16	Water Metering	1	Mandatory
	17	Water Use Reduction in Outdoor	1-2	
	18	Water Reduction in Indoor	1-8	Mandatory
	19	Water Reduction in Cooling Towers & Air conditioners	1	
	20	Rain Water Harvesting from Building and Recharging	3	
Energy Management	21	Energy Metering	1	Mandatory
	22	Minimum Energy Performance	5	Mandatory
	23	Heat Island Effect Reduction at Site / Roof	1+1=2	
	24	Measurement and Verifications	3	
	25	Advanced Energy Performance	6-20	
	26	Demand Response	5	
	27	Renewable Energy Incorporation	1-10	Mandatory
	28	Management of Refrigeration & Air-conditioning system	3	
	29	Green power	1-2	
Indoor Environment	30	Ventilation	1	
	31	Tobacco / Smoke Control	1	
	32	Less Emitting Materials	1-2	
	33	Lighting at Interior Space	1	
	34	Acoustics Quality	1	
	35	Clean Cooking (Homes)	1	

Category	Credit No.	Description	Points	Remarks
Construction Materials Management	36	Reuse of Existing Building Materials	1-5	
	37	Certified Building Materials	3+1=4	
	38	Energy Efficient Construction Materials	2	
	39	Efficient Construction Technology	2	
	40	Construction and Demolition Waste Management	1-2	
	41	Recycle Content of Materials	1+1=2	
	42	Mercury & Lead Pollution Reduction	1	
	43	Rapidly Renewable Materials	1	
	44	Certified Wood	1	
	45	Local and Regional Construction Materials	1-2	
	46	Whole Building Lifecycle Assessment	5	
Construction Health and Safety	47	Safety Equipments, Signage and Emergency Equipments at Site	1-2	Mandatory
	48	On site Accommodation during Construction	1-2	
	49	Operation and maintenance Safety	1+1=2	Mandatory
Innovation	50	Innovation	5	
Bonus Points	51	CSR	2	
Total			145	

10. BEEER Certification Process



A. For new construction

Sl	Activity	Responsibility	Remarks
1	Registration	Applicant	Online registration
2	Design & Documents Submission	Applicant	
3	Measurement and Verification report submission by 3 rd Party	Independent SREDA Enlisted Auditor appointed by Applicant	
4	Certification Fees	Applicant	
5	Analysis and Review	SREDA Designated Institute	
6	Initial Point Award	BEEER Secretariat, SREDA	
7	Review Application (If any)	Applicant	
8	Review and Final Point Award	BEEER Technical Committee, SREDA	
9	BEEER Certification Award with	SREDA	

B. For Existing Building or Certification Extension

Sl	Activity	Responsibility	Remarks
1	Registration & Certification Fees (If New Application) or Renewal Fees for Existing Certified Building	Applicant	
2	1 (One) Day Training	Applicant	
3	Design & Documents Submission	Applicant	New Application
4	Measurement and Verification report submission by 3 rd Party	Independent SREDA Enlisted Auditor appointed by Applicant	Existing Building & New Application
5	Analysis and Review for Certification	SREDA Designated Institute	
6	Initial Point Award	BEEER Secretariat, SREDA	
7	Review Application (If any)	Applicant	
8	Review and Final Point Award	BEEER Technical Committee, SREDA	
9	BEEER Certification Award with Stars for next 5 Years Period	SREDA	

Evaluation Procedure;

1. BEEER assessment team will have a preliminary meeting with the project team to brief on the assessment process and criteria
2. Request for relevant reports and documentary proofs to substantiate the subsequent submissions.
3. Commence actual assessment which will include design and documentary reviews as well as site verification.
4. Documentary evidences are to be submitted at the end of the assessment.
5. Upon completion of the assessment, the Panel of Assessors will make recommendation to the BEEER Accreditation Board on the level of certification to be awarded to the project.
6. The BEEER Accreditation Board after making their own assessment and will recommend to the Board of Directors of the BEER to award appropriate level of rating.

Enlistment of Professionals:

There will be two types of Professionals for BEEER

1. Certified Professional
2. Accredited Professionals

Certified Professionals:

Professionals from any discipline may have a short training on BEEER and sit for a 25 marks exam. Certified professionals will only take part the knowledge sharing and best practice

Accredited Professionals: Professional from Engineering or Architecture Background

Fees:

1. 10,000.00 Registration Fees
2. 1 tk per sft. up to 2 lac sft floor area
3. 0.5 tk per sft floor area more then 2 lac sft.
4. Minimum certification fees 1lac taka.

Steering Committee:

There shall be a Steering Committee for BEEER

1. Chairman, Sustainable and Renewable Energy Development Authority (Chair)
2. Representative from Power Division
3. Representative from Ministry of Housing and Public Works
4. Representative from **Ministry of Environment, Forest and Climate Change**
5. Representative from **Local Government Division**
6. Representative **from** Bangladesh Bank
7. Representative Institute of Architects Bangladesh
8. Representative Institute of Engineers Bangladesh
9. Representative from Bangladesh Institute of Planners
10. Representative from REHAB
11. Director, Sustainable and Renewable Energy Development Authority (Member Secretary)

TOR of Steering Committee:

1. Decide a Fee Structure
2. Endorse the Rating
3. Recommend incentives and awards to the Government
4. Endorse modifications/upgrades periodically

Technical Committee

1. Member (EE&C), Sustainable and Renewable Energy Development Authority (Chair)
2. **Representative from Department of Environment**
3. Representative from Department of Architecture, Government of Bangladesh
4. Representative from Public Works Department, Government of Bangladesh
5. Representative from RAJUK, Government of Bangladesh
6. Representative from City Corporations
7. Representative from Institute of Energy, University of Dhaka
8. Representative from Department of Architecture, BUET
9. Representative from Mechanical Engineering Department, BUET
10. Representative from EEE Department, BUET
11. Representative form **Housing and Building Research Institute (HBRI)**, Dhaka.
12. Representative from ASHRAE, Bangladesh, Chapter
13. Representative from SREDA (Member Secretary)

TOR of Technical Committee:

Provide technical advice on modification and upgradation of the BEEER Framework

Application Reviewers:

SREDA will prepare and Maintain a List of Reviewer, The Eligibility Criteria of Reviewer is same as the SREDA Accredited Professional. A Single Project will be Reviewed by at least Three and Maximum Five Professionals (Architect, Mechanical Engineer & Electrical Engineer)

Annexure 1: Project Registration Form

Building Energy and Environment Rating BEEER System: Project Registration

General Project Information

Project Name:

Address:

Post Code:

GPS Coordinate:

Project Details

Site Area:

Total Built-up Area
(excluding Parking Area):

No. of buildings within site:

Date of Construction Commencement :

Date of Construction Completion:

No. of Buildings:

Developer/ Owner's Contact Information

Primary Contact

Name:

Designation:

Organization:

Office Address:

Post Code:
Telephone Number:
Mobile Number:
Email ID:
Membership No:

Project Coordinator Contact Information

Name:
Designation:
Organization:
Address :

Post Code:
Telephone Number:
Mobile Number:
Primary Email ID :
Secondary Email ID :

Architect Contact Information

Name:
Organization:
*Address:
Telephone Number:
*Mobile Number:
*Email ID:
Website:
IAB Membership No:

Green Building Consultant Contact Information

Name:
Organisation / Copmany :

Address:
Telephone Number:
Mobile Number:
Email ID :
Website:

*SREDA Registration Number:

Annexure-2

Green Building Materials & Technologies (Examples):





	Equipment Name	Specification
	Air Conditioning System	<p>Chillers with COP\geq5.</p> <p>Cooling towers and closed circuit fluid coolers: These shall have variable speed drives for controlling the fans.</p> <p>Hydronic System Design and Control: HVAC hydronic systems having a total pump system power exceeding 7.5 kW shall have variable speed drives.</p> <p>Air handling units: The air handling units which are more than 7.5 kW shall be designed with variable speed drives with variable air volumes boxes.</p> <p>VRV or VRF system</p> <p>Provision for Fresh air supply</p>
	Low- E-Glass	<p>* Double Glazing</p> <p>* Solar Heat Gain Coefficient</p> <p>* Visible Light Transmittance (VLT)</p> <p>LCA Certificate</p>
	Lift / Escalator	<p>Escalator—the escalator must be fitted with controls to reduce speed or to stop when no traffic is detected. Escalators shall be designed with one of the energy saving features as described below:</p> <ol style="list-style-type: none"> 1. Reduced speed control: The escalator shall change to a slower speed when no activity has been detected for a period of a maximum of three (3) minutes. Detection shall be by photocell activation at the top and bottom landing areas. 2. Use on demand: The escalator shall shut down when no activity has been detected for a period of a maximum of fifteen (15) minutes. Use on demand escalators must be designed with energy efficient soft start technology. The escalator shall start automatically when required; the activation shall be by photocells installed in the top and bottom landing areas. <p>B. Elevator (lift) - Elevator (lift) must be provided with controls to reduce the energy demand. To meet this requirement, the following features must be incorporated in traction drive elevators:</p> <ol style="list-style-type: none"> 1. Use of AC Variable-Voltage and Variable-Frequency (VVVF) drives on non-hydraulic elevators. 2. The lift car uses energy-efficient lighting and display lighting i.e. an average lamp efficacy, across all fittings in the car, of >55 lamp lumens/ circuit watt and lighting switches off after the lift has been







		<p>inactive for a period of a maximum of five (5) minutes.</p> <p>3. The lifts operate in a stand-by condition during off-peak periods. For example, the power side of the lift controller and other operating equipment such as lift car lighting, user displays, and ventilation fans switch off when the lift has been inactive for a period of a maximum of five (5) minutes.</p> <p>LCA Certificate</p>
	Solar power system	
	STP	Improved and Automated Sewerage treatment Plant
	Fresh air supply & mechanical Vent	<p>Mechanical ventilation and Blower in Basement Floors and Fresh air supply system in habitable floor</p> <p>*Variable speed derive fan & motor unit</p>
	Hot Water system	Solar Water Heater
	Water Fixture	<p>Water efficient fittings include faucets, showerheads and flushes that use less water in order to perform the same function of cleaning as effectively as standard models. Water efficiency is an important aspect, especially as fresh water resources are increasingly getting depleted at a rate faster that they are replenished.</p> <p>Use of efficient plumbing fixtures, sensors, auto control valves, aerators, flow control and pressure-reducing devices can result in significant reduction in water consumption.</p>
	lighting	<p>LED lights</p> <p>Limitation of Lighting Power Density (LPD) will help to design the lighting system in the most efficient way and reduce the lighting and cooling load in the buildings.</p>
	Sensors	Occupancy Sensors , Day light sensors
	Automation	<p>*Building Monitoring System (BMS) or</p> <p>* Energy Monitoring System (EMS)</p>
	Masonry Materials	<p>Concrete Hollow Blocks, Interlocking Concrete Block, light weight Cellular Concrete</p> <p>And with EPD Certification</p>
	Paint	Low Volatile Organic Compounds (VOC) paint (VOC level <10g/L) with EPD Certification
	Steel	<p>Reinforcement steel from the energy efficient factories</p> <ul style="list-style-type: none"> • The Factory should have energy audit report from national / International Certifying agency • <10% Recycle Materials content <p>And with EPD Certification</p>
	Ready mix concrete	<ul style="list-style-type: none"> • Natural Stone chips as course aggregate • Gross emission level per kg of production should > 1.5 kg of Carbone • The Factory should have energy audit report from national / International Certifying agency • Should have recycle content or fly ash. <p>And with EPD Certification</p>
	Wood	Certified Wood (Plant life less than 15 years) From BFRl




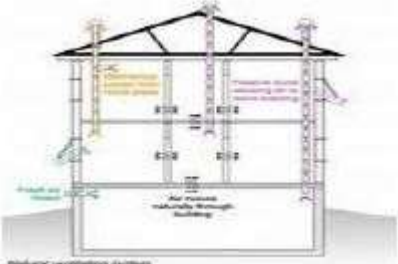


	UPVC window frame	Window frame made of UPVC (Curtain and Sliding windows) And with EPD Certification
	Insulation	Roof top Insulation & heat reflective paint or insulation blokes Solar Radiation Index value >78 And with EPD Certification

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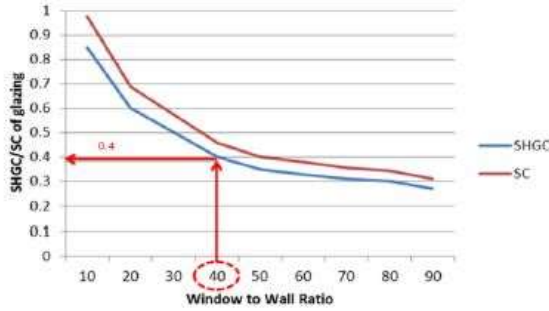
Annexure-3 General guideline for Construction

ক্রম	কার্যাবলী (Activities)	চিত্র (Figure)
১	প্রকল্প স্থান নির্বাচন (selection of project Place) ডাপ ও রাজউক কর্তৃক ভূমি ব্যবহার নীতিমালা অনুসরণ করতে হবে। Have to follow the rules of DAP and RAJUK	
২	প্রকল্প এলাকাতে বিদ্যমান ভবন সহ অন্যান্য স্থাপনার ধরণ সহ বৃক্ষের বিবরণ সহ সাইট প্ল্যান প্রস্তুত করণ এবং এ সংক্রান্ত ছবি সংরক্ষণ। Preparation of site plan containing the information of the existing buildings/ establishments, trees of the project area and saving the related photos	
৩	প্রকল্পে প্রবেশ পথ সহ রাস্তার অবস্থান সাইট প্লানে সংযোজন করতে হবে এবং প্রকল্পের ন্যূনতম ১০০ মিঃ রেডিয়াসে বিদ্যমান সকল স্থাপনা ও প্রাকৃতির লে আউট প্লান দিতে হবে। Layout of the roads with the entrance of the project area will be included in the site plan and Layout of the establishments situated within the minimum 100 m radius of the project area will/should be included in the site plan	
	প্রকল্প এলাকাতে বিদ্যমান গাছ যতটা সম্ভব সংরক্ষণ করতে হবে নির্মাণ কাজের সময় নিরাপত্তা বেষ্টিত প্রদান করতে হবে Trees in the project area should be preserved as much as possible and the security fence surrounding the site should be provided	
৪	প্রকল্প এলাকাতে মাটি খননের সময় উপরিভাগের উর্বর মাটি সংরক্ষণ করতে হবে এবং তা ঢেকে রাখতে হবে। পরবর্তীতে বাগান করার সময় কাজে লাগাতে হবে। During soil excavation in the project area, fertile soil should be preserved and covered properly for the future use of doing gardening in the site	
৫	সাইটের জলাবদ্ধতা নিরসনে যথাযথ পানি নিষ্কাশন ব্যবস্থা রাখতে হবে এবং প্রয়োজনে সেডিমেন্টেশন ট্যাংক নির্মাণ করতে হবে To resolve the water logging of the site, Water drainage system should be kept and sedimentation tank should be built if necessary	
৬	সাইট হতে মাটি পরিবহনের সময় ঢেকে পরিবহন করতে হবে এবং চাকা পরিষ্কার করে পরিবহন করতে হবে যাতে করে রাস্তায় মাটি না পড়ে। Soil from the site should be transported by covering it properly. To keep the road clean, during transit wheels of the vehicle should be properly cleaned up	

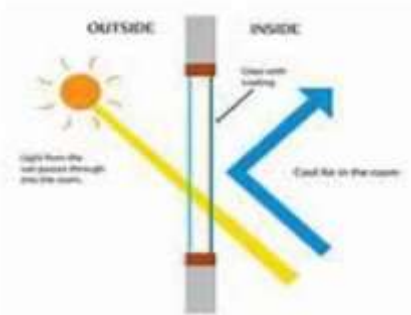
<p>৭</p>	<p>নির্মাণ সামগ্রী রাস্তা ও ফুটপাথে রাখা যাবে না সাইটে নির্দিষ্ট স্থানে রাখতে হবে। নিরাপত্তা সূচক নির্দেশনা রাখতে হবে।</p> <p>Construction materials should be kept at specific places not on the road and pavement sites. Security instructions should be kept in the site.</p>	
<p>৮</p>	<p>পুণ্য ব্যবহার যোগ্য নির্মাণ সামগ্রী পৃথক ভাবে সংরক্ষণ, ব্যবহার ও পুণ্য ব্যবহারের জন্য বিক্রয় করতে হবে। এ সংক্রান্ত তথ্য সংরক্ষণ করতে হবে।</p> <p>Reusable building materials should be kept separately for future use or sell. Information regarding those should be registered properly.</p>	
<p>৯</p>	<p>আবর্জনা ধরণ অনুযায়ী পৃথক ভাবে সাইটে সংরক্ষণ করতে হবে</p> <p>According to the garbage type, the garbage should be stored separately</p>	
<p>১০</p>	<p>পরিবেশ বান্ধব নির্মাণ সামগ্রী যেমন, ফ্লাইএস মিশ্রিত জ্বালানী সাশ্রয়ী পোড়ানো ইট, কংক্রিট হলোব-ক, ফ্লাইএস মিশ্রিত সিমেন্ট, ইত্যাদি ব্যবহার করতে হবে</p> <p>Environmentally friendly building materials, such as fuel saving fly ash mixed bricks, concrete hollow block, fly ash ,mixed cement etc. should be used.</p>	
<p>১১</p>	<p>যথা সম্ভব স্থানীয় (৫০০ কিমি এর মধ্যে) ভাবে প্রাপ্য নির্মাণ সামগ্রী ব্যবহার করতে হবে এবং পরিবহন ব্যয় হ্রাস করতে হবে।</p> <p>As far as possible, local (within about 500 km) building and construction materials should be used and the transportation cost should be reduced.</p>	
<p>১২</p>	<p>নির্মাণ কাজে নিরাপত্তা বেষ্টনী দিতে হবে এবং সকল কর্মী কে হেলমেট, বুট ও সেফটি বেষ্ট সরবরাহ করতে হবে।</p> <p>The security fence should be provided during construction period and all the workers should be provided with helmets, boots and safety belts.</p>	

<p>১৩</p>	<p>নির্মাণ শ্রমিক ও কর্মচারীদের জন্য স্বাস্থ্য সম্মত টয়লেট, গোসলখানা ও বিশ্রামাগারের ব্যবস্থা রাখতে হবে।</p> <p>Arrangements of healthy/ hygienic bathrooms and restrooms should be provided for construction workers and employees</p>	
<p>১৪</p>	<p>নির্মাণ কাজের সময় শব্দ দূষণ রোধ কল্পে ব্যবস্থা গ্রহণ করতে হবে এবং পরিবেশ আইন অনুযায়ী মান মাত্রার মধ্যে রাখতে হবে। (টাইলস, রড ইত্যাদি কাটার সময় শব্দহ্রাসের ব্যবস্থা গ্রহণ করতে হবে।)</p> <p>During the construction work, measures have to be taken for the purpose of preventing sound pollution and to be kept in standard level according to environmental law. (Necessary steps should be taken to reduce sound pollution during cutting tiles, rods etc.)</p>	
<p>১৫</p>	<p>বাইরের আবশ্যিক উন্মুক্ত স্থান সমূহ ঘাস ও স্থানীয় গাছ দ্বারা আচ্ছাদিত করতে হবে।</p> <p>The outer open spaces must be covered by grass and local trees.</p>	
<p>১৬</p>	<p>ভবনের বেসমেন্টে আলোবাতাসের ব্যবস্থা রাখতে হবে এবং নক্সায় সংযুক্ত করতে হবে।</p> <p>The basement of the building should be ventilated with proper lighting system & the layout of the basement should be included in the design.</p>	
<p>১৭</p>	<p>ভবনের পয়নিষ্কাশন ব্যবস্থা অকুপেন্ট লোড অনুযায়ী নক্সায় সংযুক্ত করতে হবে এবং তরল পদার্থে মানমাত্রা বিওডি ৫০ এর মধ্যে রাখতে হবে। (সেপটিক ট্যাংক/ এসটিপি) স্থপন করতে হবে।</p> <p>Building sanitation system should be attached to the drawing accordance with occupant load and the amount of fluid content should be kept within the BOD 50. (Septic tank / STP)</p>	
<p>১৮</p>	<p>ভবনে পরিবেশ বান্ধব যান বাহন যেমন বাই সাইকেল, ইলেকট্রিক কার এর পার্কিং এর ব্যবস্থা রাখতে হবে।</p> <p>Parking for environment friendly vehicles (like Bicycle, electric car) should be provided in the building premise.</p>	

১৯ ভবনের পশ্চিম, পূর্ব ও দক্ষিণ পাশের বহির্দেয়ালে কাচ ব্যবহার করলে তা যেন কম তাপ পরিবাহী হয় সে ভাবে লাগাতে হবে। প্রয়োজনে সান সেড ব্যবহার করা যেতে পারে অথবা কাচের দেয়ালের পরিমাণ অনুসারে কাচের সোলার হিট গেইন কোইফিসেন্ট অথবা শেডিং কোইফিসেন্ট এর উপর ভিত্তি করে কাচের ব্যবহার করতে হবে।



WWR	SHGC	SC
10	0.85	0.98
20	0.6	0.69
30	0.5	0.57
40	0.4	0.46
50	0.35	0.4
60	0.33	0.38
70	0.31	0.36
80	0.3	0.34
90	0.27	0.31



Window to Wall Ratio (WWR) and Solar Heat Gain Coefficient of Glass

Equation: Solar Heat Gain Coefficient and Shading Coefficient Calculations

$$SHGC = SC \times 0.87$$

In order to keep the flexibility with the design team with regard to WWR, **Error! Reference source not found.** and **Error! Reference source not found.** show how the WWR and Glazing performance must be selected in all building types.

For example if a building has 40% WWR then the corresponding Solar Heat Gain Coefficient (SHGC) of the glazing must be lower than 0.40.





২০ ভবনে কাঠের ব্যবহার যথাসম্ভব কম করতে হবে এবং যেসকল উদ্ভিদের জীবন কাল কম সে সকল কাঠ ব্যবহার করতে হবে। এ ছাড়া পার্টিকেল বোর্ড, ভিনিয়ার বোর্ড, ইউপিভিসি দরজা, জানালার ফ্রেম ব্যবহার করা যেতে পারে।

The use of wood in the building should be as low as possible and the wood of trees having short life span should be used. Apart from this, particle board, veneer board, UPVC door, window frame can be used.



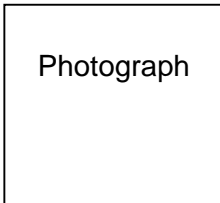
২১ ভবনের ছাদ হতে বৃষ্টির পানি সংরক্ষণ করতে হবে এবং তা পরিশোধন করে সেচ, গাড়ি ধোয়া ও টয়লেট ফ্লাসে ব্যবহার করা যেতে পারে। এ সংক্রান্ত বিস্তারিত নব্বা আবেদনের সময় সংযুক্ত করতে হবে।

	<p>Rain water should be stored from the roof of the building and it can be used for irrigation, car wash and toilets. Detailed design related to this should be attached during the application.</p>																
২২	<p>ভবনে পানি সশ্রয়ী ফিকচার ব্যবহার করতে হবে। Water saving fixtures should be used</p> <table border="1" data-bbox="255 560 826 869"> <thead> <tr> <th>Type of fixtures</th> <th>Quantity</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Water closets</td> <td>Dual Flush (6/4)</td> <td>liters/flushing cycle (full/low)</td> </tr> <tr> <td>Shower</td> <td>9.5</td> <td>liters/min at 500 kPa</td> </tr> <tr> <td>Hand wash taps</td> <td>6</td> <td>liters/min at 400 kPa</td> </tr> <tr> <td>Shen/pantry faucets</td> <td>6</td> <td>liters/min at 400 kPa</td> </tr> </tbody> </table>	Type of fixtures	Quantity	Unit	Water closets	Dual Flush (6/4)	liters/flushing cycle (full/low)	Shower	9.5	liters/min at 500 kPa	Hand wash taps	6	liters/min at 400 kPa	Shen/pantry faucets	6	liters/min at 400 kPa	
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২৩	<p>অভ্যন্তরে কম ভল্যাটাইল অর্গানিক কম্পাউন্ড এর রং, সিলেন্ট ইত্যাদি ব্যবহার করতে হবে। Low VOC contained Paint, Cement should be used</p>																
২৪	<ul style="list-style-type: none"> - ভবনে বিদ্যুৎ সশ্রয়ী বাতি ব্যবহার করতে হবে এবং বাইরে নিম্নমুখি সেড সহকারে ব্যবহার করতে হবে যাতে করে আলোদূষণ না ঘটে। - প্রয়োজনে অকুপেন্সি সেন্সর সংযোজন করতে হবে। - এল ই ডি বাতি ব্যবহার করতে হবে। - Energy Efficient lighting systems should be used and to avoid light pollution, downward canopy/shed may be used with the light. - Occupancy sensor should be used if necessary - LED lights should be used 																
২৫	<p>ভবনে শিততাপ নিয়ন্ত্রণ যন্ত্র ও লিফট মেশিন বিদ্যুৎ সশ্রয়ী হতে হবে। এবং এ সংক্রান্ত তথ্য ও পরিবেশ গত ছাড়পত্র গ্রহণের পূর্বে দাখিল করতে হবে।</p> <p>Energy Efficient Air Conditioning system and Lift should be installed in the building and related information should be submitted before getting the environmental NOC from DOE</p>																
২৬	<p>ভবনের ছাদে তাপ প্রতিরোধক ব্যবস্থা রাখতে হবে।</p> <ul style="list-style-type: none"> - হিটপ্রুফ কোটিং - জলছাদ - হলো ব- ক ব্যবহার <p>The heat resistant system should be kept in the ceiling of the building.</p> <ul style="list-style-type: none"> - Heat proof coating - Water Roof - Use of hollow block 																

<p>২৭</p>	<p>ভবনের ছাদে উন্মুক্ত স্থানে বাগান করতে হবে। Gardening should be done in the open spaces of the rooftop of the building</p>	
<p>২৮</p>	<p>ভবনে ব্যবহৃত বিদ্যুৎ জেনারেটর হতে শব্দ দূষণ ও বায়ু দূষণ প্রতিরোধক ব্যবস্থা গ্রহণ করতে হবে। Preventive system should be kept to avoid sound and air pollution from generator system (for electricity)</p>	
<p>২৯</p>	<p>প্রয়োজনে বিকল্প রিনিউএবল এনার্জি বা সৌরশক্তি ব্যবহার করা যেতে পারে। If necessary, alternative fuel like renewable energy & solar energy can be used</p>	

DRAFT

Annexure 4: Application for the Reviewer



1.	Title	Reviewer
2.	Name of the Applicant:	(FirstName).....(MiddleName).....(Last Name)
3.	Father's Name :	..... .....
4.	Mother's Name:	..... .....
5.	Present Address :	Village/House/ Flat No. _____ Road/Block/Sector _____ Police Station _____ Post Office District _____ Post Code _____ Contact Number (land line) _____ (cell phone) _____ e-mail Address _____
6.	Permanent Address:	Village/House/FlatNo. _____ Road/Block/S ector _____ Police Station _____ Post Office District _____ Post Code _____ Contact Number (land line) _____
7.	Date of Birth	...../...../.....(dd/mm/yyyy)
8.	Nationality :	.....
9.	National ID number:	
10.	Sex:	Male () / Female () / Other ()
11.	Employment Status:	Employed () Self Employed () Unemployed ()
12.	Present Job information (if any):	Designation..... Organization (Company) Name..... Contact Telephone (Office)..... Fax....., Office Address:.....
13.	Total Work Experience	:.....Years Months
14.	Written Examination Centre preferred:	.....

15. Academic Qualification:

Sl.No.	Name of Degree	Subjects/Branch	Year of Passing	Board/ University

16. Work Experience (s):

Sl.	Name of Employer/	Designation	Year	Name of Work (Max.

No.	Organization			50 characters Only)
			From	To

17. DD. No.: Amount (Taka):Date: Bank Name:

DECLARATION BY THE CANDIDATE

I hereby declare that all the information given in the application form and enclosures are true to the best of my knowledge. I agree to the condition that if any information or any statement is found to be incorrect, my admission to the examination would be cancelled or may liable to cancellation of my Certificate afterwards. I also abide by the examination rules and conditions as mentioned in the prospectus.

Date:

 Signature
 Name

* **Note:** supporting duplicate documents must be enclosed with the Form

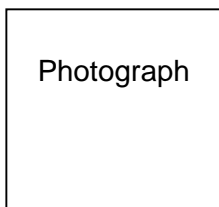
For Office Use Only

Received on:..... Sl.No:Received by (Signature):.....
 Examined the Filled in Form and the attached documents and found correct or liable for rejection for the following reasons:

.....

Examined by: (Name& Signature)

Annexure 5: Application for the Energy Auditors/ M&V Professionals



1.	Title	Energy Auditors/ M&V Professionals
2.	Name of the Applicant:	(FirstName).....(MiddleName).....(Last Name)
3.	Father's Name :	..... .....
4.	Mother's Name:	..... .....
5.	Present Address :	Village/House/ Flat No..... Road/Block/Sector..... Police Station..... Post Office District..... Post Code..... Contact Number (land line)..... (cell phone)..... e-mail Address
6.	Permanent Address:	Village/House/FlatNo..... Road/Block/Sector..... Police Station..... Post Office District..... Post Code..... Contact Number (land line).....
7.	Date of Birth	...../...../.....(dd/mm/yyyy)
8.	Nationality :	.....
9.	National ID number:	
10.	Sex:	Male () / Female () / Other ()
11.	Employment Status:	Employed () Self Employed () Unemployed ()
12.	Present Job information (if any):	Designation..... Organization (Company)Name..... Contact Telephone (Office)..... Fax.....,Office Address:.....
13.	Total Work Experience	:..... Years Months
14.	Written Examination Centre preferred:	.....

15. Academic Qualification:

Sl.No.	Name of Degree	Subjects/Branch	Year of Passing	Board/ University

16. Work Experience (s):

Sl. No.	Name of Employer/ Organization	Designation	Year	Name of Work (Max. 50 characters Only)

			From	To	

17. DD. No.: Amount (Taka):Date: Bank Name:

DECLARATION BY THE CANDIDATE

I hereby declare that all the information given in the application form and enclosures are true to the best of my knowledge. I agree to the condition that if any information or any statement is found to be incorrect, my admission to the examination would be cancelled or may liable to cancellation of my Certificate afterwards. I also abide by the examination rules and conditions as mentioned in the prospectus.

Date:

 Signature
 Name

*** Note:** supporting duplicate documents must be enclosed with the Form

For Office Use Only

Received on:..... SI.No:Received by (Signature):.....
 Examined the Filled in Form and the attached documents and found correct or liable for rejection for the following reasons:

.....

Examined by: (Name & Signature)