



GEM

Sustainability Certification Rating for Green Warehouse and Logistics Campus



REFERENCE GUIDE

1st EDITION



GEM

Sustainability Certification Rating for Green Warehouse and Logistics Campus

REFERENCE GUIDE

1st EDITION

2020

THE ASSOCIATED CHAMBERS OF COMMERCE AND INDUSTRY OF INDIA

4th Floor, YMCA Cultural and Library Building, 1 Jai Singh Road, New Delhi-110001
Tel: +91-11-46550555 (Hunting Line) • Fax: +91-11- 23017008/09

www.green-assochem.com | www.assochem.org

www.assochem.org

©2020, ASSOCHAM. All Rights Reserved

All rights reserved. No portion of this book may be reproduced in any form without permission from the publisher, except as permitted by ASSOCHAM copyright law. For permissions contact:

Deepak Sood
Secretary General
sg@assochem.com

For more details, visit us on
www.green-assochem.com
www.assochem.org



Vineet Agarwal

President, ASSOCHAM

Managing Director, Transport Corporation of India Limited

Message

Conventional methods of construction of a building are thoroughly dependent on raw material and natural resources. Most of the approaches use non-renewable footprints. The global impact of these approaches is detrimental to human lives. The call of the hour is upon us to embrace strategies that are sustainable and planet friendly. Sustainable buildings reduce harmful impacts and are also healthier and cost-effective in terms of the payback period.

The sustainable building design is a practical and climate-conscious approach that ensures minimum harm to the environment while constructing and operating the building. It can function to avail an optimum amount of energy and water, conserve virgin and natural resources, generate less waste, and create spaces for healthy and comfortable living compared to conventional buildings.

The public authorities should consider promoting the design and construction of such sustainable buildings to create a green zone, providing a much healthier environment. India made steadfast progress in the last decade in energy and water efficiency. There has been public outcry as well, in support of planet-friendly construction and related policies. We have miles to cross before we stop. The aim is to create many eco-friendly cities, villages, suburbs, smart cities, and real estates, which would help the communities and, therefore, build them green.

ASSOCHAM is working incessantly to create a sustainable nation aligned with 'United Nations Sustainable Development Goals – 2030'. As a leap towards the vision, ASSOCHAM executes the 'GEM Green Building Rating System' for the buildings. I would like to congratulate the 'Council for Green and Eco-friendly Movement' and its state chapters, executive body and certified professionals for the exemplary work and wish good luck in the endeavor.

A handwritten signature in black ink that reads "V. Agarwal". The signature is written in a cursive style and is underlined with a horizontal line.

Vineet Agarwal



Deepak Sood

Secretary General
ASSOCHAM

Message

Buildings have a tremendous impact on people and the planet. Every component of a building, starting from pre-design to the operation phase, relies on natural resources. The responsibility is upon us to make it sustainable, leveraging optimised natural resources. It ensures water-efficient and energy-efficient implementations and has a much smaller carbon footprint. It also ensures that the surrounding ecosystem is protected. Sustainability is the way to lead life and construct buildings.

ASSOCHAM, the century-old organisation, has taken up the sustainability movement to a new high. It initiated its responsibility to care for the mother earth by executing its sustainability certification program called 'Green and Eco-Friendly Movement (GEM)', with the support of regional chambers, over 4.5 lac large, medium & small-scale industries and over 65 National Councils.

It is commonly believed that sustainable buildings are costlier than regular buildings. However, it has been effectively proven that the overall costs are much lesser than the conventional buildings. Green Buildings have been proven to have a positive impact on the health of residents as well. Since these buildings provide a balanced and optimal ecosystem for residents, they positively affect the productivity and well-being of the occupants.

Since its launch, the GEM program has made rapid strides in the sector. I congratulate the entire team for initiating the GEM Movement across sectors and urge the industry to take a step towards building our planet green.

Deepak Sood



Pankaj Dharkar

Chairman, ASSOCHAM National Council for
Green & Eco-Friendly Movement (CGEM)

Message

Sustainable building design is about building the future, not just a structure. Sustainability is a form of development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Effective sustainable design of a building is a comprehensive approach to select and integrate design, planning, products, and processes that account for consumer satisfaction and environmental conservation.

Studies show that the buildings account for 18% of total CO₂ emissions. According to a report from the United Nations Environment Program, if construction keeps growing at the present rate, the emissions will double by 2050. While buildings are a major contributing factor to global emissions, they also hold significant potential to contribute to deductions, if we start focusing on building it green. India is undergoing rapid urbanisation and the urban population is set to rise from 33% of India's population to 52% by 2030. This will put a lot of strain on our natural resources. It is high time to act.

ASSOCHAM has taken an initiative to care for the mother earth and designed the Sustainable Building Design and Construction Program called 'Green and Eco-Friendly Movement (GEM)'. Since its inception, it evolved as an indigenous, intent driven green building rating system. The Council for Green and Eco-friendly movement signed MoUs with major organisations and universities, with the sole vision of spreading awareness across the country. Mission 100 stands out as a sustainability drive to prepare young minds in the academical phase. Apart from that, GEM certified projects proudly witnessed the impact of sustainability in design and construction of the building. As a collaborative approach, GEM Certified Professionals (GEM CP) are marching hand in hand with the council.

I am sure that ASSOCHAM being the Apex and Oldest Industrial Chamber of India, will efficiently lead this sustainability movement. I wish all the best to the entire team for the noble cause.

A handwritten signature in blue ink, appearing to be 'Pankaj Dharkar', written in a cursive style.

Pankaj Dharkar



Ar. Gaurav Varmani

Chairman, GEM Green Warehouse Certification Rating Program
Council for Green and Eco-friendly Movement (CGEM)

Message

The Logistics sector in India is expanding at an unmatched pace, as per recent data available the warehousing market in India was valued at Rs 1,501.2 billion in 2019 and is expected to reach Rs 2,821.1 billion by 2024, expanding at a CAGR of ~13.57 per cent during the 2020-2024 period.

Advancements in digital technologies, changing consumer preferences due to eCommerce, government reforms, and shift in service sourcing strategies are expected to lead the transformation of the Indian logistics and warehousing market.

It becomes so very pertinent to continually innovate and create self-sustaining built environments which not only cater to the present day needs of the industry but also continue to grow and adapt to complex dynamics of growth to come in future times ahead.

In order to provide a clear path & vision to progress in this direction, ASSOCHAM has borne the mantle to responsibly lead this initiative towards creating Safe and Sustainable Warehouses and Logistics hubs in the country.

As a vital solution of adding sustainability to the very fabric of the building materials & technology, ASSOCHAM GEM Warehouse rating system integrates and provides three major aspects, that are often overlooked:

1. First is, integrating the policies of the management for the operation and maintenance phase of the premises at design stage.
2. Second is, alignment of the Building Owners & Users needs & processes to the long-term commitment of Government of India's Sustainability Goals & United Nations Sustainability Development Goals – 2030.
3. Third is, ease of going green, without increasing the burden on the designer and promoters.

Under the dynamic leadership of ASSOCHAM, the Council has been able to formulate sustainability protocols, with a thorough idea of sensitizing a movement in the logistics industry and drive the industry professionals to work towards a better, comfortable, efficient, and committed ecosystem.

I whole heartedly support the Initiatives of The Council for Green and Eco-friendly Movement.

A handwritten signature in black ink that reads "G. Varmani". The signature is written in a cursive style with a horizontal line underneath the name.

Ar. Gaurav Varmani

ACKNOWLEDGMENT

- **Mr. Abasaheb P. Kale**, Member, GEM Maharashtra Chapter & CEO, Sahyadri Farms Sustainable Grassroots Initiatives Limited
- **Ar. Abin Chaudhuri**, Co-Chairman, GEM West Bengal Chapter & Founder, Abin Design Studio
- **Ms. Aditi Patel**, Secretary, GEM Chhattisgarh Chapter & Director, Adira Innovations
- **Mr. Aditya Prabhu**, Member, GEM Maharashtra Chapter & Group CEO, Secutech Automation India Pvt. Ltd.
- **Prof. Dr. Ajai Chandran. C. K.**, Secretary, GEM Karnataka Chapter & Principal, BGS School of Architecture & Planning
- **Ar. Anand Tatu**, Chairman, GEM Gujarat Chapter & Chairman, M/s. Anand Tatu Architects
- **Ar. Anirban Bhaduri**, Program Chair, GEM West Bengal Chapter & Founder Partner, INNATE
- **Ar. Anupam Mittal**, Chairman, GEM UP Chapter and Government Advocacy Committee & Principal Architect, ARINEM Consultancy Services
- **Ar. Anurag Bajpai**, Co-Chairman, GEM UP Chapter & Director, GreenTree Global
- **Mr. Arijit Mandal**, Advisor, Public Engagement, GEM Karnataka Chapter & Director & Intervention Specialist, Progress Factor
- **Mr. Ashu Gupta**, Chairman, GEM Projects Committee and Co-Chair, Professional Societies Collaborations and MoU Committee & Managing Partner, Design2Occupancy Services LLP
- **Er. Balkar Singh**, Co-Chairman, GEM Punjab Chapter and Joint Director (Retd.), PEDA
- **Ar. Bindi Saolapurkar**, Co-Chairperson, GEM Karnataka Chapter & Founding Partner & Architect M/s. Saolapurkar & Associates
- **Ar. Charanjit Shah**, Joint Chairman, Institutional Collaborations and Trainings Committee for GEM & Chairman, Smart Habitat Foundation and Founder Principal, Creative Group
- **Ar. Debatosh Sahu**, Chairman, GEM West Bengal Chapter & Principal Architect and Partner, ESPACE
- **Mr. Deepak Wani**, Member, GEM Maharashtra Chapter & Founder, Pioneer Industrial Instruments
- **Ar. Dinesh Bhagat**, Co-Chairman, GEM Punjab Chapter
- **Er. Dipen Mehta**, Secretary, GEM Gujarat Chapter & Managing Director, PCS Project Management Pvt. Ltd.

- **Mr. Ganesh Shenoy**, Advisor, Engineer & ICF Coach, GEM Karnataka Chapter & Director, Mparadigm
- **Ar. Gaurav Agrawal**, Co-Chairman, GEM Rajasthan Chapter & Principal Architect, Gaurav Agrawal Design Studio
- **Ar. Gaurav Shorey**, Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) & Director, Psi Energy Pvt. Ltd.
- **Ar. Gaurav Varmani**, Chairman, GEM Green Warehouse Certification Rating Program Council for Green and Eco-friendly Movement (GEM) & Founder, Studio LINEDESIGN
- **Ar. Glory Srivastava**, Program Chair, GEM UP Chapter & Principal Architect & Founder, Buildgreen Design
- **Mr. Kushagra Juneja**, Co-Chairman, GEM Rating Programs & Managing Partner, Design2Occupancy Services LLP
- **Ar. Leena Kumar**, Chairperson, GEM Karnataka Chapter & Principal Architect and Partner, Kumar Consultants
- **Ar. Lokendra Balasaria**, Co-Chairman, GEM Gujarat Chapter & Architect & Urban Planner, LaSpazio
- **Ar. Manu Malhotra**, Chairman, GEM Green Healthcare Certification Rating Program Council for Green and Eco-friendly Movement (GEM) & Director, RSMS Architects Pvt. Ltd.
- **Mr. Mayank Kumar Sharma**, Member, GEM Rajasthan Chapter & Founder, Oon Track Solutions
- **Mr. Money Khanna**, Co-Chairman, GEM Events and Expo Committee
- **Ar. (Prof.) Mustufa Ahmed**, Member, GEM Chhattisgarh Chapter & HOD, School of Architecture Planning & Design, ITM University
- **Ar. Navin Sharma**, Chairman, GEM Chhattisgarh Chapter & Principal Architect, Navin Sharma & Associates
- **Ar. Neena Raicha**, Member, GEM Chhattisgarh Chapter
- **Mr. Neeraj Arora**, Senior Director, ASSOCHAM
- **Ar. Nischal Jain**, Co-Chairman, GEM Rajasthan Chapter & Professor, MNIT, Jaipur
- **Mr. Pankaj Dharkar**, Chairman, ASSOCHAM National Council for Green & Eco-Friendly Movement (GEM) and President, Pankaj Dharkar & Associates
- **Mr. Pinaki Dasgupta**, Co-Chairman, Global Collaborations and State Chapter of ASSOCHAM GEM & General Manager, C. P. Consultant Pvt. Ltd.

- **Dr. Prakash Barjatia**, Senior Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) & Director, Education & Training, ISLE
- **Ar. Punit Sethi**, Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) & Principal Architect, IAD Studio
- **Ar. Raj Prajapati**, Co-Chairman, GEM Chhattisgarh Chapter & Principal Architect, Cubicles
- **Ar. Rajeev Taishete**, Secretary, GEM Maharashtra Chapter & Principal Architect, Rajeev Taishete & Associates
- **Mr. Rajnish Aggarwal**, Chairman, GEM Events and Expo Committee & Managing Partner, Pankaj Dharkar & Associates
- **Dr. Ravi Goyal**, Education Chair, GEM Rajasthan Chapter & Pro-President at Nirwan University
- **Ar. Ravish Mehra**, Chairman, GEM Green Interior Rating Program & Partner, RMDK Architects
- **Mr. Richie Mittal**, Chairman, Professional Societies Collaborations and MoU Committee for GEM & Managing Director - Overdrive Engineering Pvt. Ltd.
- **Ar. Roshni Udyavar Yehuda**, Co-Chairperson, GEM Maharashtra Chapter & Director, Roshni Udyavar and Associates
- **Mr. Sachin Gupte**, Member, GEM Maharashtra Chapter & Head Category Management MEP, Pidilite Industries Ltd.
- **Mr. Sagar Desai**, Member, GEM Maharashtra Chapter & Managing Director, Greengrid Renewables Pvt. Ltd.
- **Mr. Sameer Saxena**, Secretary General, Global Association for Corporate Services
- **Ms. Samhita. M.**, Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) & MD, Ela Green Buildings & Infrastructure Consultants Pvt. Ltd.
- **Mr. Sandeep Narang**, Co-Chairman, GEM Committee for Students Activities & Sr. Consultant, Sustainable Construction
- **Prof. Sangram Mohanty**, Co-Chairman, GEM Odisha Chapter & Architect, MEP/ Green Consultant
- **Mr. Sanjay Kumar Varshney**, Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) & Executive Director, Signature Global
- **Mr. Shakti Leekha**, Advisor, Builder/ Developer, GEM Maharashtra Chapter & Sr. GM & Head - Marketing- Illumination, Bajaj Electricals Ltd.
- **Ar. Shweta Choudhary**, Member, GEM Rajasthan Chapter & Centre Head, CODE, Centre for Design Excellence, VGU

- **Mr. Sivakumar Venugopal**, Program Chair, GEM Karnataka Chapter & Group Director & Member of the Management Board Nuernberg Messe India Pvt. Ltd.
- **Prof. Sonia Gupta**, Secretary, GEM West Bengal Chapter & Principal, Amity School of Architecture and Planning, Amity University, Kolkata
- **Ar. Soumyendu S Ray**, Chairman, GEM Odisha Chapter & Director, School of Architecture and Planning KIIT University
- **Mr. Sudhir Mathur**, Secretary, GEM Rajasthan Chapter & MEP Consultant, Shreshtha Consultants
- **Mr. Suresh Menon**, Advisor, GEM Maharashtra Chapter & National President, FSAI
- **Ar. Surinder Bahga**, Chairman, GEM Punjab Chapter & Principal Architect, Saakaar Foundation
- **Ar. Tushar Sogani**, Chairman, GEM Rajasthan Chapter and Global Collaborations and State Chapters Committee & Managing Director, Tushar Sogani Designs Pvt. Ltd.
- **Ar. Vijay Garg**, Joint Chairman, Institutional Collaborations and Trainings Committee for GEM & Managing Director, Vastuki Consultants
- **Ar. Vilas Avachat Vasant**, Chairman, GEM Maharashtra Chapter & Managing Director, M/s. Vilas Avachat & Associates
- **Mr. Vinay Joshi**, Advisor, GEM Rajasthan Chapter and Chairman, Rajasthan Affordable Housing Developers Association
- **Mr. Virendra Borade**, Program Chair, GEM Maharashtra Chapter, Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) and IBMS Expert
- **Mr. Vishal Kapoor**, Senior Member, ASSOCHAM National Council for Green & Eco-friendly Movement (GEM) & Managing Director, Meho – HCP Air Systems Pvt. Ltd.



Care for the Mother Earth

ASSOCHAM has taken a Green Initiative to Care for the Mother Earth and formed a **Council for Green and Eco-friendly Movement (CGEM)** that executes the '**GEM Sustainability Certification Program**' with the objective to promote environment friendly green building design and construction.

Through this initiative, ASSOCHAM awards the Sustainability Certification Rating to Housing, Urban Development, Residential, Commercial, Hotels, Offices, Schools, Colleges, Universities, Factory buildings, Warehouses, Logistics Hubs, Hospitals and related developments.

All existing, under construction or upcoming projects can register for this certification rating program.

ASSOCHAM is now in the process of opening for various options and suggestions such that we create a new country and do not create western imitated world by calling Green as Red but opt to propagate Green as Green and be part of nature and managing them professionally and looking beyond net-zero human settlements.

GEM Sustainability Certification Rating Program aims to address the sustainability of a given development throughout its lifecycle from design through construction to operation. GEM Sustainability Certification Reference Guide provides design guidance and detailed requirements for rating a project's potential performance.

GEM Sustainable Warehouse and Logistics Hub Certification Program has been organized into **Thirty-Two Principles** that are fundamental to a more sustainable development.





These Principles include –

1. Natural landscape and tree plantation - Conserving, preserving and restoring the regional natural environment and habitat
2. Fire and Life Safety requirements integration
3. Use of Passive Design Strategies
4. Save energy - Targeting energy conservation through improved building envelop, reduced demand, energy efficiency and renewable sources
5. Save water - Reducing water demand, encouraging efficient distribution, water treatment, reuse of treated water and alternative resources of water
6. Regional and recycled materials – Considering regional and recycled materials when selecting and specifying materials. Reduce the use of virgin materials.
7. Natural light and fresh air - Improving quality and connectivity of outdoor and indoor spaces
8. Training and capacity building - Inter-disciplinary teamwork and training to deliver sustainable and quality product throughout the life of the project
9. Going the extra mile in building design and construction






GEM Sustainable Warehouse and Logistics Hub Certification Rating levels

There are some Essential and Suggested requirements of each Principle. Points are awarded for each Suggested requirement achieved.

There is a 0-127 points scale. Project will achieve **GEM 1 to GEM 5** rating levels as per the requirements fulfilled and scores achieved by the project. This depends upon the project design which includes building architectural and elevation design, materials used during construction, HVAC, lighting and plumbing system designs, water and energy consumption of the building.

To achieve the **GEM Sustainable Warehouse and Logistics Hub Certification Rating**, all Essential Principle requirements must be fulfilled along with a minimum number of Principle points. GEM 5 will be the highest achievable rating level in this program.

This rating program is applicable to Industrial, Warehouses, Logistic Parks, Cold Storages and related developments. The rating shall also be applicable for major renovation (existing or new interior) execution. Project team can go for a **Certification of Intent (Provisional Certification)** rating during pre-design, design or construction stages of the project and **Final Certification** rating when the building is complete.

S. No.	Points Scored	GEM Levels	GEM
1	All essential requirements and 40 - 49 points	GEM 1	
2	All essential requirements and 50 - 64 points	GEM 2	
3	All essential requirements and 65 - 84 points	GEM 3	
4	All essential requirements and 85 - 104 points	GEM 4	
5	All essential requirements and 105 points or above	GEM 5	

Note: If the requirements prescribed by local competent authority are more stringent, those will be followed



Key benefits of the certification –

1. Review of all design documents such as Architectural, Mechanical, Electrical, Plumbing and Landscape by Sustainability experts for further value addition from green building perspective.
2. Energy and water efficient building design that will reduce the energy and water consumption of the building.
3. Design of a building that will utilize maximum daylight, fresh air and provide healthy environment to the building occupants.
4. Sustainability Certification rating will give additional marketing mileage to the projects over other conventional buildings.

Time frame for the award of rating

- A. **Pre-certification/Provisional Certification/Certification of Intent Rating:** Council will firmly evaluate the documentation within Twenty day timeframe.
- B. **Final Certification Rating:** Council will firmly evaluate the documentation within Thirty days timeframe.

ASSOCHAM Vision

① QUALITY AND VALUE ADDITION

To add best quality and value to the projects we certify!

② TIMELINE

*We value the precious time,
Expedite the process of Quality Check!*

③ GREEN AT LOW COST

*Green should not be the choice of elite only
Everyone should complement in the mission of Sustainability
No hidden charges, Green for all at lowest cost!*

④ QUICK RESPONSE

*Resolving the queries is the top priority
Quick response to the queries from project team and consultants!*



Table of Contents

GEM Sustainable Warehouse and Logistics Hub Certification Program – Points list.....	08
Pre-certification / Provisional Certification / Certification of Intent Rating Process.....	10
Final Certification Rating Process.....	11
Principle-1: Government Approved Plans.....	12
Principle-2: Construction Management Best Practices.....	14
Principle-3: Fire and Life Safety in Sustainable Buildings.....	17
Principle-4: Parking for Building Occupants.....	19
Principle-5: Preserve and Plant Trees Onsite.....	20
Principle-6: No Smoking Facility/ Zone.....	21
Principle-7: Amenities for Fundamental Needs and Daily Commute.....	23
Principle-8: Effective and Efficient Management of Traffic.....	26
Principle-9: Setting Up Efficient Loading Unloading Bay.....	32
Principle-10: Surveillance System.....	35
Principle-11: Electric Vehicles and Electric Charging Facilities.....	39
Principle-12: Install Low Flow Water Fixtures.....	42
Principle-13: Rainwater Harvesting: Recharge and/ or Reuse.....	44
Principle-14: On-site Treatment of Grey and Black Water.....	46
Principle-15: Measurement of Water Consumption.....	48
Principle-16: Energy Management Best Practices.....	49



Principle-17: Efficient Electric Equipment and Systems	52
Principle-18: Use of Imperishable Energy Resources	54
Principle-19: Measurement of Energy Consumption	56
Principle-20: No Use of Halogenated Hydrocarbons.....	57
Principle-21: Sustainable Development of Construction Engineering.....	58
Principle-22: Local Sourcing of Construction Materials.....	60
Principle-23: High Albedo Materials - Roof and Non-roof	62
Principle-24: Post-occupancy Waste Management.....	64
Principle-25: Sustainable Packaging Supply Chain.....	66
Principle-26: Best Practices for Universal Building Design.....	68
Principle-27: Optimal Use of Natural Light.....	69
Principle-28: Healthy Indoor Air Quality	72
Principle-29: Reduced Exposure to VOC	75
Principle-30: Training and Capacity Building of Project Team.....	77
Principle-31: Activities for Corporate Social Responsibility.....	78
Principle-32: Going the Extra Miles	80
Glossary	82

GEM Sustainable Warehouse and Logistics Hub Certification Program – Points list

S. No.	Principles	Description	Maximum Points
1	Principle-1	Government Approved Plans	E
2	Principle-2	Construction Management Best Practices	E
3	Principle-3	Fire and Life Safety in Sustainable Buildings	E
4	Principle-4	Parking for Building Occupants	E
5	Principle-5	Preserve and Plant Trees Onsite	E
6	Principle-6	No Smoking Facility/ Zone	E
7	Principle-7	Amenities for Fundamental Needs and Daily Commute	6
8	Principle-8	Effective and Efficient Management of Traffic	4
9	Principle-9	Setting Up Efficient Loading and Unloading Bay	4
10	Principle-10	Surveillance System	3
11	Principle-11	Electric Vehicles and Electric Charging Facilities	4
12	Principle-12	Install Low Flow Water Fixtures	7
13	Principle-13	Rainwater Harvesting – Recharge and/ or Reuse	4
14	Principle-14	On-site Treatment of Grey & Black Water & Reuse for Flushing	6
15	Principle-15	Measurement of Water Consumption	2
16	Principle-16	Energy Management Best Practices	12

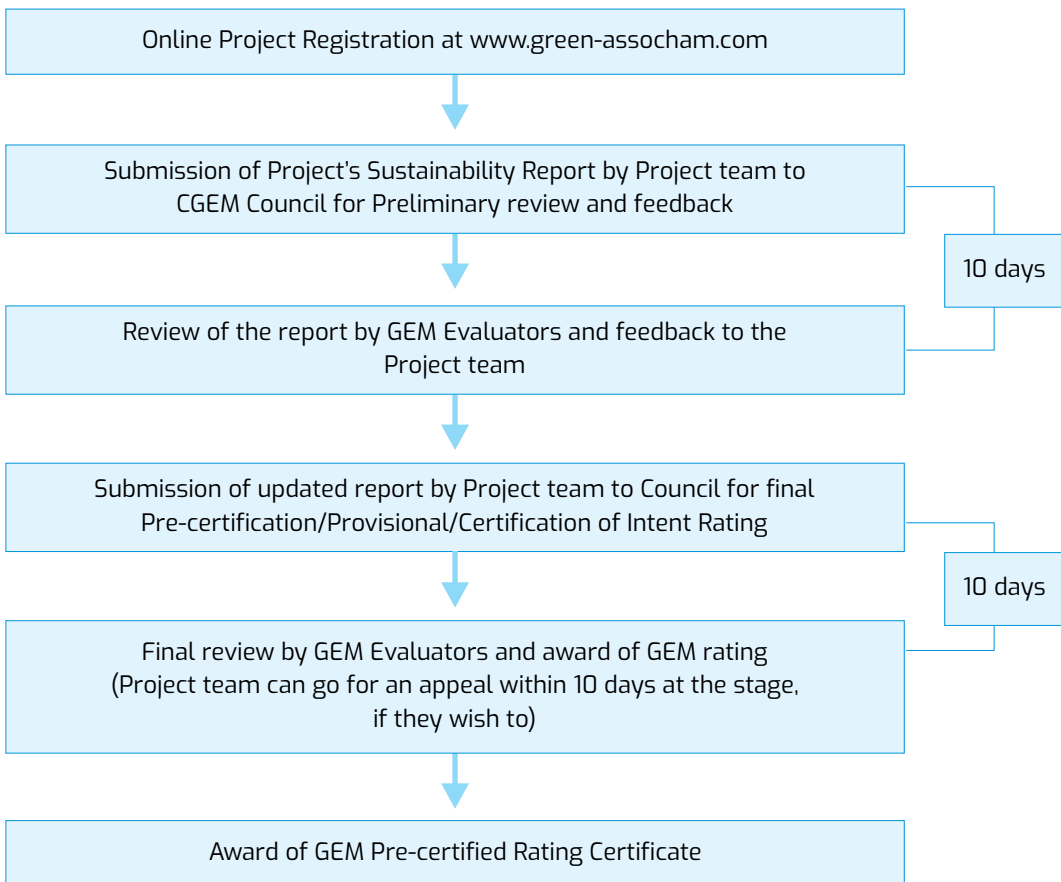


17	Principle-17	Efficient Electric Equipment and Systems	5
18	Principle-18	Use of Imperishable Energy Resources	8
19	Principle-19	Measurement of Energy Consumption	2
20	Principle-20	No Use of Halogenated Hydrocarbons	2
21	Principle-21	Sustainable Development of Construction Engineering	12
22	Principle-22	Local Sourcing of Construction Materials	6
23	Principle-23	High Albedo Materials - Roof and Non-roof	6
24	Principle-24	Post-occupancy Waste Management	4
25	Principle-25	Sustainable Packaging Supply Chain	2
26	Principle-26	Best Practices for Universal Building Design	5
27	Principle-27	Optimal Use of Natural Light	6
28	Principle-28	Healthy Indoor Air Quality	6
29	Principle-29	Reduced Exposure to VOC	2
30	Principle-30	Training and Capacity Building of Project Team	2
31	Principle-31	Activities for Corporate Social Responsibility	2
32	Principle-32	Going the Extra Miles	5
		TOTAL POINTS	127

Pre-certification/ Provisional Certification/ Certification of Intent Rating Process

Council will firmly evaluate the documentation within Twenty-days' timeframe.

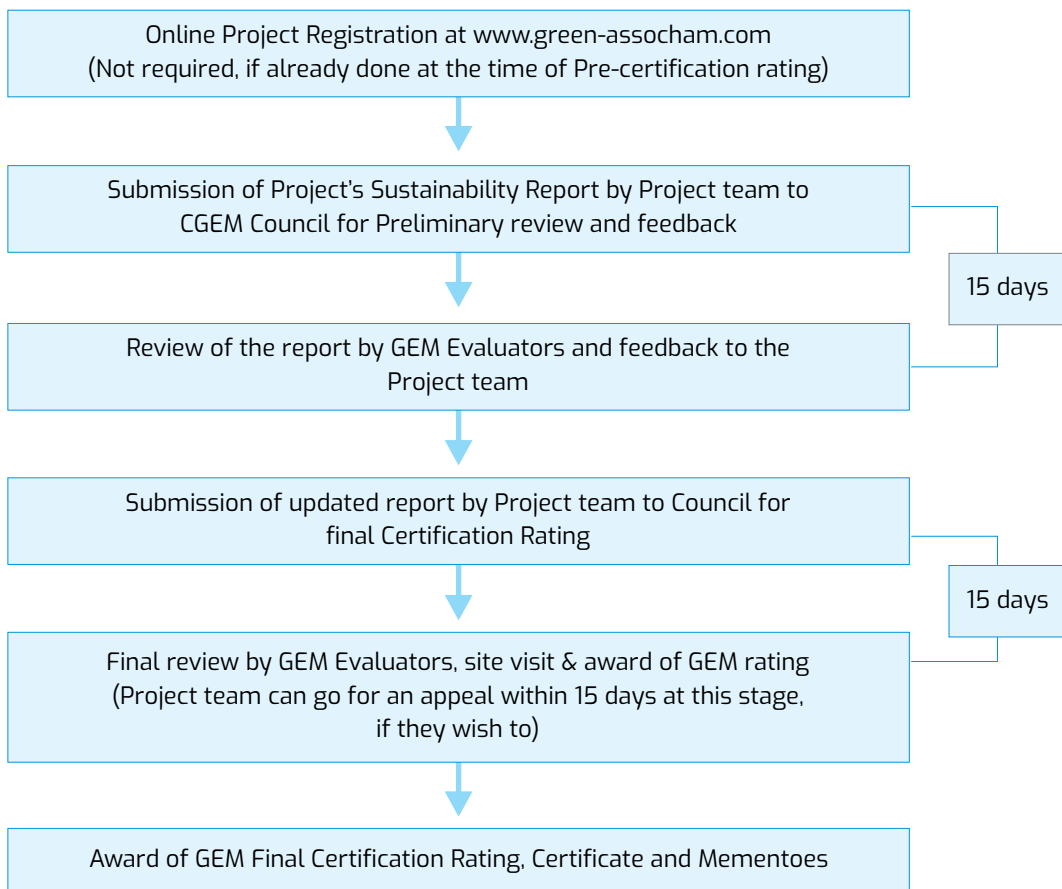
Pre-certification/Provisional Certification/Certification of Intent Rating



Final Certification Rating Process

Council will firmly evaluate the documentation within Thirty days timeframe.

Final Certification Rating Process



Principle 1: Government Approved Plans

Essential

Aim: Project must have all necessary statutory approvals from applicable/competent government authorities.

Requirements: (Essential)

Document to be provided at the time of Certification of Intent (Provisional/Pre-Certification) rating -

1. Land allotment letter
2. Government approved site plan with Site area, Built-up/FAR area and Parking details

In case, the government approval is not available at the time of Certification of Intent (Provisional/Pre-Certification) rating, following details can be submitted:

- a. Site plan with all the details and an acknowledgement letter from a competent government authority regarding the submission of site plans for approval

OR

- b. Site plan with all the details and a letter from the project owner confirming the project details. Government approved site plan with all the details can be submitted as soon as it is received by the project team prior to occupancy.

3. Approved building plans / clearance from Chief Fire Officer or local competent authority as applicable

Document to be provided at the time of Final Certification rating -

1. Government approved final site plan with Site area, Built-up/FAR area and Parking details.
2. Fit for occupancy certificate from the project Architect
3. No Objection Certificate from Chief Fire Officer or local competent authority as applicable
4. Environmental Clearance Certificate / Environmental Impact Assessment report from competent authority as applicable



Calculations and Methodology

Site area, Built-up area (BUA), Floor area ratio (FAR) and Parking details mentioned in the Government approved site plan must be used for all respective Principles.

The building plans shall be clearly marked and indicate the complete fire protection arrangements and the means of access/escape for the proposed building with suitable legend along with Principle signs and symbols on the drawings. The same shall be duly signed/certified by a licensed Fire Consultant/Architect.

Documents to be submitted

As listed in the Requirements above

Principle 2: Construction Management Best Practices

Essential

Aim: Minimize hazardous effects of construction on existing soil conditions, existing trees, micro-climate and drainage system and follow best management practices during construction and post occupancy for the control of soil erosion from project site.

Requirements: (Essential)

1. Conduct site survey to show existing vegetation including shrubs, grass covers, trees – preserved, transplanted and / or removed
2. Prepare and implement soil erosion and sedimentation control plan at site during construction
3. Refer National Building Code of India 2016, Volume 2, PART 10, Section 1 and Chapter 5
4. Provide the following including but not limited to –
 - a. Site boundary around the project site
 - b. Gravel road at the main entrance and exit of the site
 - c. If the top soil is fertile and suitable for landscape use, stockpile the Top soil of the site with temporary vegetation and/or cover.
 - d. Sediment basin(s) at the lowermost level of the site from where the site storm water will run-off
5. Prepare and implement spill prevention and control plans at site during construction.

Calculations and Methodology

1. Excavation and soil erosion prevention measures shall be sequenced during non-rainy months as possibilities of soil erosion are the lowest during non-rainy months. In case, excavation is unavoidable during rainy months, slope protection techniques shall be used to control erosion.
2. Upper 200-300 mm thick layer of top soil can be removed from disturbed areas such as building footprint, driveways, walkways and external services, preserved and reapplied



to site during future landscape. Topsoil shall be separated from other constructed activities. Reuse the fertile soil for future landscape. The soil can be donated to other sites, nurseries and / or farmers for landscaping and agricultural purposes. Project is exempted from this requirement if the top soil is not fertile.

3. Implement site measures such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps, and sediment basins, as applicable. Open areas where no construction activity is going on can be landscaped with native grass, trees and shrubs. Provide site barricading provisions and wheel washing at the entrance.
4. Preserve existing site vegetation in order to avoid bare soil exposure to construction activity.
5. Sediment basins, rain water runoff diversions and drainage systems can be installed before excavation activity. Earth dike, swale and temporary drainage channels shall be constructed in a manner to channel storm water runoff to a desired location.
6. Hazardous wastes spill prevention and control plans shall be prepared and implemented at site. Hazardous wastes include (but not limited to) pesticides, paints, cleaners, petroleum products, fertilizers and solvents.
7. Sedimentation basin is a temporary basin so constructed at the lowest point of the site that it can trap and collect the sediment present in the storm water runoff. This slows down the flow and allows most of the sediments to settle before the runoff is directed towards the outfall.
8. Paved areas can be installed with permeable paving. For hardscape impermeable surfaces, divert all rain water run-offs towards rain water collection pits and / or sediment basins.
9. If the project has received environment clearance and above practices are already included and implemented at the project site through regular compliance report submission to EC/MoEF&CC, then the project will be exempted from above requirements.

Documents to be submitted

1. Soil Erosion Control plan signed by the project Architect for pre-construction, during construction and post occupancy



2. Site layout with all soil erosion control measures including both prior to and during construction
3. Site photographs of all soil erosion control measures implemented at site
4. Site survey plan showing existing vegetation including shrubs, grass covers, trees – preserved, transplanted and / or removed.
5. Spill prevention and control plans prepared and implemented at site along with site photographs.
6. Project environment clearance report along with compliance reports as applicable

Principle 3: Fire and Life Safety in Sustainable Buildings

Essential

Aim: Ensure Fire and Life Safety in Sustainable Buildings per National Building Codes 2016 (Part 4) and requirements prescribed by local competent for the authority.

Requirements

Follow National Building Codes 2016 (Part 4) and requirements prescribed by local competent for the authority and obtain Fire No Objection Certificate from the competent authority for the facility.

Calculations and Methodology

Implement strategies and techniques for fire prevention and using appropriate Operation and Maintenance strategies, fire detection and alarm systems.

Ensure flawless operation of firefighting system at the time of any fire incident.

Develop a coordinated fire safety sprinkler system plan.

Fire safe design of HVAC system in the facility.

Fire rating of the materials used in the facility should be as per the requirements prescribed by local competent for the authority.

Prepare the evacuation plan of the occupants in case of any fire incident.

Prepare a training plan & fire drills for the facility team and occupants of the facility.

Refer FSAI Suraksha Index (FSI), a technical reference guide created by Fire and Security Association of India for details.

Refer NFPA/NBC requirements for each component of fire safety; from fire alarms to fire extinguishers.

Documents to be submitted

1. No Objection Certificate from local competent authority.
2. All approved floor plans, sections and elevations.
3. Plans highlighting the locations of firefighting equipment and systems.
4. Evacuation plan with signages, clearly marked exit routes for the occupants in case of any fire incident.
5. Actual photographs of the firefighting equipment and systems along with signage.
6. Manufacturer catalogue or cut sheet of the HCFC/CFC free firefighting equipment and systems.
7. Fire rating of the materials used in the facility.
8. Training plan for the facility team and occupants of the facility. –

Principle 4: Parking for Building Occupants

Essential

Aim: Project must meet or exceed the parking requirements as per local parking bye-laws.

Requirements: (Essential)

1. Provide the parking as per local parking bye-laws and Government approved site / parking plans
2. Project can meet or exceed the parking requirements as per local parking bye-laws
3. In places where local parking bye-laws do not exist, follow National Building Code (NBC) of India, 2016

Calculations and Methodology

Project must provide the parking as per local parking bye-laws and Government approved site / parking plans. National Building Code (NBC) of India, 2016 can be followed to calculate the parking numbers and parking design where local parking bye-laws do not exist.

Parking details mentioned in the Government approved site / parking plans must be used in all respective Principles. Dedicated parking shall be provided for bicycles, two wheelers and four wheelers, as per the local parking bye-laws.

Documents to be submitted:

1. Government approved site plan with parking details
2. Copy of local parking bye-laws
3. Photographs of the parking at the time of final certification

Principle 5: Preserve and Plant Trees Onsite

Essential

Aim: Onsite preservation of developed trees and plantation of more native / adaptive trees.

Requirements

1. Do not cut any existing developed tree onsite. Transplant developed trees within the site. Ensure the survival of all transplanted trees. In case it becomes necessary to cut trees, plant 3 trees for every 1 tree cut of the similar species. This point is not applicable if there is no developed tree onsite. **(essential)**
2. Plant tree saplings onsite as per following criteria that can develop into grown up trees:(2 points)
 - a. At least 5 for site area up to 500 m²
 - b. At least 5 for every additional 500 m² site area or part thereof

Calculations and Methodology

Project team should plant native / adaptive trees and tree saplings to meet the requirements of this Principle. Potted plants cannot be considered for the compliance of this Principle.

Documents to be submitted

1. Site plan showing the existing developed trees onsite
2. Site photographs of tree transplantation process
3. Landscape plan showing the location and list of all trees (transplanted and new saplings) as applicable.
4. Photographs of all trees (transplanted and new saplings)

Principle 6: No Smoking Facility/ Zone

Essential

Aim: To prevent exposure of building occupants, indoor surfaces, and ventilation air distribution systems to secondary environmental tobacco smoke.

Requirements

1. No Smoking Zone/Area (essential)

Essential for both (existing and new) warehouse and Logistics Hubs

- a. Indoor spaces – Indoor space must be No Smoking.
- b. Outer Smoking Zone(s)/Area(s) (if any)

Calculations and Methodology

There are three approaches that can be followed to meet the Principle compliance:

1. No Smoking Zone/Area:

1. Indoor spaces – must be No Smoking:

To reduce adverse health consequences arising due to passive smoking, illustrate that smoking is injurious to health and is prohibited in the campus.

2. Outer Smoking Zone(s)/Area(s): (if any)

In case the campus has any outer smoking zone/area, which area must be located at least 10 meters away from all outdoor/fresh air intakes and building openings.

These spaces can be doors, window openings, fresh air unit's intake etc.

Note: The compliance shall be in accordance with the regulations of related government departments as applicable. If the requirements prescribed by local competent authority are more stringent, those will be followed.



Documents to be submitted

1. Drawings showing location of any outer smoking zone/area
2. Signages highlighting NO SMOKING on all floors
3. Supporting photographs confirming all the facilities referred for the project



Principle 7: Amenities for Fundamental Needs and Daily Commute

6 Points

Aim: Encourage the project to provide the amenities for fundamental needs and develop the sites near to such facilities; To promote cleanliness and basic hygiene practices in the Warehouse(s) and Logistics Hubs and focuses on personal habits which in turn help in maintaining a good health to reduce the risk of any infection practices in the campus and surroundings.

Requirements

1. Primary Facilities for the warehouse / Logistics Hubs (2 Points; 1 point for minimum two facilities)
2. Develop the site near to the necessary facilities (within 1.5 km distance from the main entrance of the site) - **(2 Points; 1 point for minimum two facilities)**
3. Primary Facilities for Construction Workers (Not applicable to existing warehouse / Logistics Hubs) **(2 Points; 1 point for minimum two facilities)**

The project may follow NBC of India 2016, Part 7 - Constructional Practices and Safety, Section 4 for further details. The facilities should be in accordance to the guidelines of The Building and other Construction Workers Act, 1996 & Rules, 1998.

Calculations and Methodology:

1. Facilities provided within the site must be significantly sized to meet project's requirements.
2. Facilities outside the site must be accessible to all occupants of the project.
3. A shared transport or car pool facilities must be incorporated in travel plan. E-buses or electric fleets should be preferred.

There are few approaches that can be followed to meet the Principle compliance:

1. Primary Facilities for the warehouse / Logistics Hubs:

The following primary facilities should be provided within the Warehouse(s) and Logistics Hubs that can be easily approachable to all the employees as well as to the other helping staff to promote a healthy and hygienic working environment.

- a. Medical Facilities (First-Aid) and Health Check-up room
- b. Hygienic Drinking Water & Canteen facilities
- c. Hygienic Toilets/washrooms & bathrooms (Should be provided separately for men & women)
- d. Dormitories/ Restrooms for helping staff (drivers)
- e. Common hall / Break out room
- f. Games room
- g. Gymnasium
- h. Yoga / Meditation Room
- i. Playground for activity

Note: Above primary facilities must be provided within the premise / campus and must be operational at the time of completion of the project.

2. Develop the site near to the following necessary facilities (within 1.5 km distance from the main entrance of the site):

- a. Public park/Garden
- b. ATM/Bank
- c. Hospital / Clinic
- d. Bus stop / Auto stand
- e. Metro station
- f. Super Market / Shopping Mall
- g. Car/ Van pool/ Bus shuttle services provided for at least 20% of regular occupants by the project owner / developer.

3. Primary Facilities for Construction Workers: (as applicable)

Primary facilities must be provided to promote welfare of the construction workers by providing safe, healthy and hygienic work conditions.



- a. Dust suppression measures must be implemented and air quality indicators should be provided at site.
- b. Sufficient hygienic drinking water facilities should be provided for the workforce.
- c. Emergency and Medical facilities (first aid) should be provided within the premise.
- d. Emergency indicators must be provided (such as alarms, bells, sensors etc.) at site. To include signs for uneven flooring, elevation, height indicators for each rack used for shelving, drives safety notices and signs.
- e. Adequate safety equipment must be provided to the workforce (protective clothing, helmets, goggles, or other garments) by supervisor/ owner / contractor.
- f. Significant accommodation to be provided to the workforce
- g. Lighting levels for construction workplace must be as per the guidelines
- h. Sanitary facilities, toilets and urinals should be provided for the workers as prescribed by local competent authority
- i. Changing room with adequate lockers facility should be provided.
- j. Adequate child care facilities should be provided within the premise (if, more than 45 female workers are employed)

Note: *If the requirements prescribed by local competent authority are more stringent, those will be followed. The project may follow NBC of India 2016, Part 7 - Constructional Practices and Safety, Section 4 for further details. The facilities should be in accordance to the guidelines of The Building and other Construction Workers Act, 1996 & Rules, 1998.*

Documents to be submitted

1. Site plan showing the location of primary facilities provided for construction workforce
2. Floor layouts showing the location of primary facilities provided for employees
3. Supporting photographs confirming all the facilities referred for the project
4. Drawings confirming the location of all facilities provided within the site
5. Photographs of all the facilities referred for the project
6. Pedometer map highlighting the distance and location of the facilities referred for the project



Principle 8: Effective and Efficient Management of Traffic

4 Points

Aim: Various policies and procedures to be adopted to make efficient traffic plan that can ensure green and safe working environment for the people on site and at work areas as well as for moving vehicles and material handling equipment.

Requirements

1. Organized Vehicle Routes: **(1 Point)**
 - a. Minimizing vehicle movements
 - b. Choosing the correct route surface
 - c. Proper route design, lane width and turns
2. Proper Sign Indications: **(1 Point)**
 - a. Safety signs with instructions
3. Public and Vehicle Safety: **(1 Point)**
 - a. Public/Pedestrian Safety
 - b. Safe Crossings
 - c. Vehicle Safety
4. Information, Training, Instruction and Supervision: **(1 Point)**
 - a. Information
 - b. Training
 - c. Instruction
 - d. Supervision

Calculations and Methodology

There are five key factors of Traffic Management that should be followed to meet the Principle compliance:



1. Organized Vehicle Routes:

a. Minimizing vehicle movements:

- Provide suitable traffic route lanes with separate entry and exit points for large vehicles.
- Ensure that all deliveries and collections must be planned and timed, and there should be no holding area hindering traffic, which can cause Vehicles/Lorries to wait to enter the campus.

b. Choosing the correct route surface:

Choose the well-drained surface to increase grip and prevent slippage so that the vehicle route is free from hazards such as oil, slippery material, pits, or other surface-damage.

c. Proper route design, lane width and turns:

To minimize risk of accidents and collisions, during reversing of vehicles, loading/unloading goods, the routes should be well-organized and managed with the adequacy of internal road design, width, and turning radius along with proper visibility of lanes.

Note: This compliance should meet Construction (Health, Safety and Welfare) Regulations 1996 as applicable

2. Proper Sign Indications:

a. Safety signs with instructions:

Clear Sign Indications signifies instructions with safety signs which include mandatory signs, safe condition signs, prohibition signs, hazards signs, and fire equipment signs must be used to alert pedestrians as well as drivers to:

- Exclusion zones where entry and actions are prohibited
- Provide general information like parking/no parking zones
- Provide directions for speed limits, pedestrian crossings, vehicle crossings
- Pay attention on health and safety hazards like blind corners, steep gradients and other known hazards

- Remind employees when and where personal protective equipment must be worn
- Indicate where emergency devices are located

Note: This compliance should meet Health & Safety (Safety Signs & Signals) Regulations 1996 as applicable.

3. Public and Vehicle Safety:

Public and vehicle safety should be of great importance at workplace to be maintained by:

a. Public/Pedestrian Safety:

- Considering physical barriers like Pedestrian barriers, Traffic control barricades, Cones, between walkways and roadways to separate pedestrians' zone from vehicles/powered mobile vehicles routes
- Using safety guardrails, bollards, chains to prevent pedestrians from stepping out into traffic from 'blind spots'.
- Provide separate zones for pedestrians as "vehicle's exclusion zone".
- Ensure high-visibility or reflective clothing is worn by workers, plant operators, and pedestrians at the workplace.
- Prohibiting non-essential workers such as office staff from entering areas where heavy vehicles like powered mobile plants are operating and being loaded or unloaded.

b. Safe Crossings:

- Construct safe 'green routes' including crossover, overhead walkways to ensure safe segregation between all vehicles and pedestrians/ construction operatives.
- At busy crossing locations, use traffic lights, zebra crossings and barriers with the use of inward opening gates and gates with warning devices.

c. Vehicle Safety:

- Limit vehicles on the road during peak hours.
- Provide a clear view to drivers around the vehicle to see both sides of the roadways along with the pedestrian walkway by using traffic controllers, stop



signs, mirrors, reversing cameras, sensors, for the sake of public as well as vehicle safety.

- Install high-visibility markings and visual warning devices like flashing lights for powered mobile plant.
- Bump-rails or rub-rails can be used to reduce wear on structural features of a vehicle, extending the lives of the vehicles or parts that cause the rubbing.
- Provide separate zones for vehicles as “pedestrian’s exclusion zone”.

Note: This compliance should meet Construction (Health, Safety and Welfare) Regulations 1996 as applicable.

4. Information, Training, Instruction and Supervision:

a. Information:

- It is necessary that every person who enters the workplace understands and have information about the traffic management plan.
- Workers, including contractors, need to know and understand traffic rules, safety policies, and procedures for the workplace.
- Visitors or visiting drivers must be aware and have information to:
 - Site traffic safety rules and procedures.
 - Restrictions on the size and type of vehicles before making delivery to the site.
 - Take proper care of their own health and safety as well as not affecting others health and safety.

b. Training:

- Always provide a trained person or supervisor to guide the visitors and to ensure their safety and protection while navigating the warehouse.
- Appoints a trained person to control workplace activities i.e. while hiring, the qualification and ability of the contractor or operator must be checked.
- To ensure that all workers are alerted to the risks, remain protected from hazards:
 - Training must be provided to all the workers on the correct way to operate the vehicles and machines.

- All workers know the safety precaution when conducting the construction work.
- Special training must be given to the workers with specific responsibilities.

c. Instructions:

- Instructions about health and safety must be indicated at workplace either on a signboard, or by an illuminated sign or colors, or by acoustic signal, verbal communication or hand signal.
- Drivers must have the necessary license to operate vehicles
- Clearly visible instructions and signs about various zones, work on progress, entry and exit points, etc. must be mentioned.
- Provides clear warning signs showing heavy powered mobile vehicles operates in this region.
- To ensure that workers, visiting drivers and other pedestrians wear high-visibility or reflective clothing.

d. Supervision:

- Owner/Supervisor has a duty to ensure that workers, drivers, public and other staff are not exposed to any health and safety risks arising from the business or undertaking.
- Owner/Supervisor/Contractors should include a traffic management plan with green environmental conditions taking account of WHS (Work, Healthy and Safety) at workplace.
- Displaying site maps of the workplace to indicate traffic flow.
- Includes implementing control measures to prevent people being injured by moving vehicles at the workplace.
- Manage the movements of visitors as well as visiting/incoming drivers.
- The traffic management plan should be monitored and regularly reviewed to ensure that it is effective and takes into account of any changes at the workplace.

Note: This compliance should meet the legislation for labour welfare, known as the Factories Act, 1948 as applicable.



Documents to be submitted

1. Site plan indicating proper route design, lane width and turns for vehicles.
2. Photographs showing various sign indications with instructions as mentioned for the project.
3. Proof regarding proper training and qualification of workers and drivers, drivers license proof is also mandatory.
4. Supporting evidential proof regarding various health and safety equipment to be provided to the workers at site.
5. Site maps of the workplace to indicate traffic flow as referred for the project.



Principle 9: Setting Up Efficient Loading Unloading Bay

4 Points

Aim: To ensure sufficient number of loading unloading bay to optimize material handling and reduce the lead time and helps to improve throughput speed as well as the efficiency of operations while reducing operating costs and ensuring health and safety compliance.

Requirements

The loading-unloading bay (dock) should be equipped with the following requirements to facilitate safe and efficient operations:

1. **Inward and Outward Actions (2 Points)**
2. **Storage Area within warehouse (2 Points)**

Calculations and Methodology

An efficient loading unloading bay is important component of any warehouse/logistic park, which can facilitate a smooth and optimize the lead time of the facility.

1. Inward and Outward Actions:

- a. Determine Docking Bay quantity required:

Warehouse must be designed with a sufficient number of docking bays, which can handle both inward and outward logistics.

There must be appropriate number of docking bays within the warehouse according to the following formula:

$$\text{Docking Bay Quantity Required} = [(V * H) / L] * SF$$

V= Daily Vehicles (Trucks/Trailers, etc.) Throughput

H= Average loading/unloading hours per vehicle

L= Length of work hours/shift

SF=Safety Factor



Notes:

- Working hours/shift (W), can be derived by the product of number of days of working actions with number of hours of working in a day (e.g. W for 200 days of working action and 2 hours of working a day; $W = 200 \times 2 = 400$ hours/year).
- For multiple service vehicles with different loading-unloading times (H) within the warehouse, the computation for the least number of docking bays will be an aggregation of all service vehicles.
- The safety factor (SF) is project-specific. The safety factor can be justified by the project team. If the safety factor is unavailable, the project team may consider a default safety factor of 30%.

b. Right Specification & safety standards of:

Following specifications must be designed keeping in mind number of docking bays, area required to load-unload goods and the type of vehicle entering the bay (e.g. trucks, forklifts, etc.)

- Dock height,
- Dock approach,
- Door size and width

c. Dock Levelers:

Providing different dock levelers as per the need for the project ensures safe transfer of goods by bridging the gap between the dock vehicle and the loading bay.

- Mechanical (Spring) Systems,
- Hydraulic Systems,
- Air Powered Systems

d. Wheel guides & dock bumpers:

- Wheel guides should be provided to ensure the correct position for aligning and loading-unloading of vehicles. Tubular steel yellow powder coated wheel guides can also be used to increase visibility while reversing vehicle, helping to protect vehicle, staff and premises.

- Dock bumpers with specially designed cushioning pads that are highly resistant to impact and frictional forces should be used to prevent and minimize impact damage between vehicles and premises.

e. Dock shelters & Dock seals:

- Constructing dock shelters protect goods from the elements and maintain the correct building temperature while doors are open for the necessary loading-unloading of goods. Hygiene, efficiency, insulation and safety all improve immediately with dock shelters.
- Applying dock seals provide a seal against the top and sides of the vehicle, to avoid spoilage of goods during loading-unloading, and help prevent rain, snow, and other weather conditions from entering the warehouse.

f. Dock light:

- Dock lights must be used to illuminate the entire length of truck trailers that increase safety during loading and unloading. It can also be supplied with its own control box to enhance its user-friendliness and can also be integrated into the dock leveler, dock shelter or industrial door control box.

2. Material Storage Area within warehouse (2 Points)

There must be sufficient quantity of docking bays in the warehouse as per the project. The project must provide at least 1 docking bay for every 11,000 sq. ft. of the warehousing storage area.

Docking Area required = (Docking Bay Quantity Required) * (size of Inventory) * (area occupied per pallet)

Documents to be submitted

1. Calculation showing the number of loading unloading bay in the project.
2. Site plan showing the location of loading unloading bays in the project.
3. Supporting photographs confirming the number of bays referred for the project

Principle 10: Surveillance System

3 Points

Aim: Helps in the management and optimization of warehouse and logistic operations, provides security as well as maximum access control over the campus, and to make sure that green practices and standards should meet with extremely high-reliability rates so as to ensure a secure and safe environment for occupants and assets.

Requirements

1. **Video Surveillance: (1 Point)**
 - a. Ensure Quality Assurance
 - b. Surveillance of Goods Transportation
2. **Security Access Control and Monitoring: (1 Point)**
 - a. Manual Approach
 - b. Automated Approach
3. **Smart Cameras:(1 Point)**
 - a. Alarm Monitoring
 - b. Monitor Space management
 - c. Monitor Staff behavior/Human resource utilization

Calculations and Methodology

Security Systems are important aspect of any facility. There are few approaches/methods that can be followed to meet the Principle compliance:

1. **Video Surveillance:**
 - a. Ensure Quality Assurance:
Through video surveillance,
 - The implementation of quality control of various products is really necessary to ensure better positioning of products i.e. they must be slated or allocated properly or not.

- In addition, a regular inspection of various components of the vehicle is also essential. Damaged components also need to be replaced with suitable alternatives to prevent any accidents.

b. Surveillance of Goods Transportation:

Through surveillance, timely dispatch of goods can definitely be checked i.e. whether the goods are arriving on time or shipped from your warehouse so as to reach the customers' satisfaction.

Note: *This compliance ensures that they are not in breach of critical safety standards.*

2. Security Access Control and Monitoring:

a. Manual Approach

- To implement screening and security protocols at the point of entry/exit by guards.
- Physical barriers like walls, fences (topped with barbed wire, razor wire, or metal spikes), and fence lighting prevent infiltration by defining the perimeter of the facility.
- Access control systems such as swipe cards / RFID / biometric systems or bar codes and number plates can help identify who went in and who went out.

Note: *Swipe cards / RFID / biometric systems or bar codes and number plates used for access control can slow down the warehousing process and increase the cost of warehouse maintenance.*

b. Automated Approach

- Multiple site audit : Surveillance service can help to monitor not only one but various warehouse sites of the campus from a centralized control room which makes it remarkably easy for a business to ensure the security of all their assets simultaneously.
- 24*7 live monitoring: By properly managed outsourcing surveillance, a backend team can constantly monitor the warehouse activities by 24*7 and can report any suspicious activity and send real-time alerts in the event of any incident or crime.



- Fire Safety Alarms: Ensure that the correct class of fire alarm is specified and installed according to the activities carried out and the goods stored in the warehouse and also ensure that the fire detection devices are appropriate for the environment or not and are positioned in such a way that they will accurately signal real indicators of a fire so that the fire alarm detectors are triggered in time. These indicators must include indication for smoke, heat, gas, air changes and flame.

3. Smart Cameras:

a. Alarm Monitoring:

- Smart surveillance cameras are integrated with your warehouse security alarm system which adds a layer of security to your warehouse by automatically recording all break-ins.
- It lets you receive break-in alerts; identify intruders, and record legal evidence
- Warehouse alarms can also be paired with a cloud-based smartphone app, allowing you to receive remote alerts automatically wherever you are.

b. Monitor Space management:

- Warehouse surveillance can be used to monitor whether your warehouse space is being utilized optimally and also fulfilling the standards of the green environment.
- If any area is not being utilized properly, it would be reported and necessary steps would be taken to optimize space utilization.

c. Monitor Staff behavior/Human resource utilization:

- Surveillance systems like smart cameras make it easier for management to observe the behavior of employees to ensure that they are fulfilling their responsibilities on time and can also check whether they are handling sensitive goods with proper care or not.
- Monitoring also plays an important role in knowing whether the campus is understaffed or overstaffed and the Staff is being utilized properly or not, so as to take the necessary corrective action.

Note: *Compliance with company policies and their punctuality can also be monitored.*



Documents to be submitted

1. Specifications for Video Surveillance Equipment, Smart Cameras, and Fire & Safety Alarms must be provided.
2. Site plan determining geographical position for applying fencing and fence lighting.
3. Supporting evidential proof regarding various equipment i.e. they are environmental friendly or not.
4. Drawings showing location of security facilities that are deployed in the project.
5. Supporting photographs confirming all the facilities referred for the project.



Principle 11: Electric Vehicles and Electric Charging Facilities

4 Points

Aim: To promote the use of Electric Vehicles as sustainable logistics, a 'greener' solution to address climate change, improves air quality and reduces fossil fuel dependency.

Requirements

1. Electric Vehicles and their Parking Locations (1 Point)

For operating services within the warehouse and premise, electric vehicles should be used and their parking locations should be easily accessible from the entrance of the campus

2. Electric Charging Points (1 Point)

Set up Electric Charging points for electric vehicles.

3. Reduce Vehicles Idling (1 Point)

Provide industrial electrical sockets/connections to limit vehicle idling.

4. Battery Facilities (1 Point)

Set up a battery switching station for refueling of vehicles of all parking spaces.

Calculations and Methodology

There are few approaches/methods that can be followed to meet the Principle compliance:

1. Electric Vehicles and their Parking Locations

- a. For operating minimum 12% services within the warehouse and logistic hub, electric vehicles must be used to promote as green vehicles.
- b. Clearly identify, design, and reserve a minimum of 6% of all parking locations as preferred parking for electric vehicles used by the project, which must be distributed proportionally among the various parking classes.

- c. A minimum of 30% of the discounted rate for preferred parking of electric vehicles must be posted publicly at the entrance of the parking area and be permanently available to each eligible vehicle.

Notes:

- *Warehouse / logistics hub using alternative fuels may also be considered to demonstrate compliance.*
- *Preferred parking space should be easily accessible from the entrance of the campus.*
- *Electric vehicles on a contract basis may also be considered by warehouse owners to show credit compliance.*
- *The electric powered vehicles can be owned or sourced through a third-party agency on an annual contract.*

2. Electric Charging Points

Set up Electric Charging points for electric vehicles within the logistic hub/ warehouse, to serve a minimum of 30% of the overall parking capacity.

Notes:

- *Electric Charging points can be managed through a third-party service provider.*
- *The number and the geographical position of Electric Charging points must be determined.*
- *Capacity of Electric Charging points should be determined.*

3. Reduce Vehicles Idling

Provide minimum 40% of industrial electrical sockets/connections to limit vehicle idling at the dock.

Note:

- *Electric charging points should have industrial electrical sockets/connections*

4. Battery Facilities

Set up a battery switching station which can refuel a minimum of 3% of vehicles per day of all parking spaces.



Notes:

- *Technology of recharging stations i.e. low or fast recharge must be clearly determined.*
- *There must be a clear decision between swapping and recharging of batteries.*

Project team should provide electric vehicles for indoor operations as well as for occupants along with charging facilities. Hubs/ Warehouses which use CNG powered vehicles or vehicles operated on Bio-diesels can also be considered to demonstrate compliance.

Documents to be submitted

1. Drawings showing the design of Electric Charging points.
2. Site plan determining geographical position of easily accessible parking spaces for Electric Vehicles.
3. Supporting evidential proof of highlighting the capacity of Electric Charging points referred for the project.
4. Photographs showing industrial electrical socket/connection locations at loading dock doors as well as for battery facilities.

Principle 12: Install Low Flow Water Fixtures

7 Points

Aim: Project should install low flow water fixtures to reduce the demand of potable as well as non-potable water.

Requirements

1. Install efficient water fixtures with flow rates not more than the values listed below: (1 point for each product)
 - I. Water Closets should be dual flush type with flush rates 4.6 LPF and 2.6 LPF
 - II. Health Faucets = 6.5 LPM at a design pressure of 3 bar
 - III. Kitchen Sink Faucets = 4.5 LPM at a design pressure of 3 bar
 - IV. Wash Basin Faucets = 4.5 LPM at a design pressure of 3 bar
 - V. Showers (all types) = 6.5 LPM at a design pressure of 3 bar
 - VI. Urinals = 1.5 LPF
2. Install sensor-based water fixtures (sink / basin faucets / urinals) with above flow rates in the common area applications. **(1 point)**

All other water fixtures that are intended to fill the bucket and / or bath tub can be excluded from above requirements.

Calculations and Methodology

Install low flow and flush water fixtures in the project to reduce the potable and non-potable water demand. Water flow restrictors / aerators can also be installed in the high flow fixtures to make them appropriate as per the Principle requirements mentioned above.

Documents to be submitted

1. Trade catalogue or brochure of water fixtures



2. Trade catalogue or brochure of aerators and sensors installed in the water fixtures if applicable
3. Purchase bills / Invoice of water fixtures with exact make and codes of the products at the time of final certification
4. Site photographs of water fixtures confirming the installation at the time of final certification

Principle 13: Rainwater Harvesting – Recharge and/ or Reuse

4 Points

Aim: Utilize collected rainwater within the premises of the building to reduce post occupancy water demand and / or recharge the aquifers.

Requirements

1. Install a suitably designed rain water storage system and / or recharge pit to cater to roof and non-roof rain water.
2. Store and / or recharge at least 30% of daily rain water collected from roof surfaces.
(Essential)
3. Store and / or recharge more than 60% of daily rain water collected from roof surfaces.
(2 points)
4. Store and / or recharge more than 90% of daily rain water collected from roof surfaces.
(4 points)
5. Use the stored rain water for landscape / flushing applications as applicable.
6. If any competent government authority says that the ground water table is high and ground water recharging is not required, then the project shall provide a storage system to cater to rain water from roof surfaces only and reuse it for landscape / flushing / domestic applications as applicable. **(essential + 4 points)**
7. Quality of rain water should meet the standards of landscape / flushing / domestic use as applicable.

Calculations and Methodology

Recharge rain water from all surfaces by spreading or impounding water on the site to increase the infiltration through soil and percolation to the aquifers or inject water by bore wells directly into the aquifers. If ground water recharge is not feasible or not recommended by competent government authority, rain water storage can also be provided.

Provide de-silting chamber and oil and grease trap before intake of rain water harvesting system. Overflow of rain water harvesting system can go into the municipal drainage system.



Use following steps to estimate total volume of rain water generated within the premises of the building:

1. Take annual rainfall data (mm) occurred in last four consecutive years. Project team can add average monthly rainfall data for twelve months to get annual rainfall data for that year.
2. Take annual number of rainy days of respective years
3. Divide annual rainfall (mm) by number of rainy days of that year
4. **One day average** rain fall for four consecutive years will be available
5. Take arithmetic average of these four **One day average** rainfall values
6. This would be the **average one day rain fall** for estimating rain water runoff volume generated within the premises of the building
7. Use recognized information source for monthly and annual rainfall data and number of rainy days
8. The days that recorded any amount of rainfall can be considered as Rainy Days.
9. Total runoff volume can be estimated by multiplying surface area with respective surface runoff coefficient and rainfall intensity of that place
10. Refer National Building Code of India (NBC), PART 9 for surface runoff coefficient and PART 11 for further details

Documents to be submitted

1. Site drawings clearly showing all surface types
2. Rain water runoff volume calculation
3. Plumbing design brief report for rain water harvesting system design
4. Site storm water layout showing roof and non-roof rain water harvesting system
5. Rain water storage tank and / or recharge pit cross sectional drawings
6. Plumbing drawings confirming the use of rain water (as applicable)
7. Site photographs of rain water collection, storage tank and / or recharge pit
8. Hydrology Report confirming the level of groundwater in that area.
9. Water Balance Chart

Principle 14: On-site Treatment of Grey and Black Water

6 Points

Aim: Implement strategies for onsite treatment of Grey and Black water and reduce the potable water demand for flushing.

Requirements

1. Install on-site waste water treatment system and treat entire grey and black water from the project. Quality of treated water must meet the norms of Central / State Pollution Control Board (CPCB / SPCB) as applicable. **(2 points)**
2. Provide dual plumbing in all toilets for flushing in all the spaces, private toilet units and common area toilets as applicable. **(2 points)**
3. Use treated water for flushing such that at least 75% of total flushing water demand is fulfilled by the treated water. **(1 point)**

OR

If more than 95% of total flushing water demand shall be fulfilled by the treated water **(2 points)**

Note: Project can use localized common public STP where it is mandated by the local competent authority. 2 points shall be awarded to the project in that case. In this case, project can use the treated water from other resources. Points will be awarded accordingly.

Calculations and Methodology

Install onsite grey and black water treatment system of capacity recommended by project's plumbing consultant in the plumbing design basis report (DBR). Provide dual plumbing in all toilets for flushing in all in all the spaces, private toilet units and common area toilets as applicable.

Use treated / rain water for flushing such that at least 75% of flushing water demand can be fulfilled by the treated / rain water.



An additional point will be awarded if at least 95% of flushing water demand is fulfilled by the treated / rain water.

Documents to be submitted

1. Plumbing Design Basis Report for on-site waste water treatment system capacity
2. Plumbing water single line diagram (SLD) confirming the dual plumbing line in all toilets
3. Trade catalogue or brochure of waste water treatment system
4. Purchase bills / Invoice of waste water treatment system at the time of final certification
5. Site photographs of waste water treatment system at the time of final certification
4. Treated water quality test report meeting the norms of Central / State Pollution Control Board (CPCB / SPCB) as applicable.

Principle 15: Measurement of Water Consumption

2 Points

Aim: Project should install meters to measure water consumptions of the project on daily/ monthly basis.

Requirements

1. Provide water meters on following water end usages: (2 points for three meters)
 - a. Domestic water
 - b. Flushing water
 - c. Irrigation water
 - d. Main municipal water
 - e. Bore well water
 - f. STP
 - g. Water fountain, washing (car, road, pavements and façade, ramps, docking areas, etc.)

Calculations and Methodology

Water metering should be deployed at the entrance of the facility and should be calibrated to give reliable and consistent readings.

Documents to be submitted

1. Provide plumbing metering single line diagrams (SLD) showing the above meters as applicable.
2. Provide following for water meters:
 - a. Trade catalogue or brochure
 - b. Purchase bills / invoices
3. Site photographs confirming the installation of energy and water meters



Principle 16: Energy Management Best Practices

12 Points

Aim: Implement energy management best practices in the project to achieve energy savings.

Requirements

1. Refer Energy Conservation Building Code (ECBC) 2017 for energy efficient design and construction of buildings. Facilities shall comply with the following –
 - a. Mandatory requirements (Sections 4.2, 5.2, 6.2 and 7.2), irrespective of the compliance path
 - b. Additionally, any one of the following compliance paths
 - i. PATH-1 - Prescriptive method (Sections 4.3, 5.3, 5.4, 5.5 and 6.3)

OR

PATH-2 - Whole building performance method (Section 9), all mandatory requirements (Sections 4.2, 5.2, 6.2 and 7.2) shall be met

2. PATH-1

Facility that shows the compliance using Prescriptive method (Sections 4.3, 5.3, 5.4, 5.5 and 6.3) shall be awarded the points as per below. All mandatory requirements (Sections 4.2, 5.2, 6.2 and 7.2) shall be met. **(Mandatory + 12 points)**

- a. Section 4.3 **(2 points)**
- b. Section 5.3 **(2 points)**
- c. Section 5.4 **(2 points)**
- d. Section 5.5 **(3 points)**
- e. Section 6.3 **(3 points)**

OR

PATH-2

Facility that shows the compliance using Whole building performance method (Section 9) shall be awarded the points as per below:

- a. Energy Performance Index (EPI) ratio is equal to 1 (**mandatory**)
- b. Energy Performance Index (EPI) ratio is equal to 0.95 (**6 points**)
- c. Energy Performance Index (EPI) ratio is equal to 0.9 (**8 points**)
- d. Energy Performance Index (EPI) ratio is equal to 0.85 (**10 points**)
- e. Energy Performance Index (EPI) ratio is equal to 0.8 (**12 points**)

Note: Compliance with ECBC 2017 shall be ensured. Buildings in the states which have notified their own ECBC, shall comply with the State ECBC.

Calculations and Methodology

1. Energy Performance Index (EPI) = Annual energy consumption (kWh) / Total built up area of the facility
2. Energy Performance Index (EPI) ratio = EPI of Proposed Building / EPI of Standard Building (Source ECBC)
3. Proposed building will be modeled as per “as is” actual building design and standard baseline building will be modeled as per ECBC 2017
4. In case of multiple buildings in a project, each building should meet the requirements mentioned above.
5. Energy generated by on-site and / or off-site renewable energy resources can be deducted from the Proposed “as is” design model to get energy savings over standard baseline design model.
6. Energy saving due to solar hot water system cannot be considered for the energy savings under this Principle.

Documents to be submitted

1. All architectural floor plans, elevations, sections
2. Building site plan with exterior developments such as parking, driveways and landscape



3. Mechanical, Electrical and Plumbing design basis reports with all process and non-process load details
4. Interior and exterior lighting floor plans with lighting fixtures make and models
5. Lighting power density calculations for proposed “as is” design as well as standard design
6. HVAC floor plans with HVAC equipment details (as applicable)
7. Trade catalogue/ brochure of Envelope (wall & roof assembly insulation, fenestration specifications), lighting fixtures, HVAC equipment, pumps and motors, renewable energy systems installed in the project. For existing warehouse or warehouse interior fit-out rating, the specifications of envelop components can be referred from ECBC Appendix mentioning specifications of non-rated materials and equipment capacity & efficiency can be referred from site images of metal data plates.
8. Copy of purchase bills / invoices of lighting fixtures, HVAC equipment, pumps and motors, renewable energy systems installed in the project
9. Energy simulation output reports



Principle 17: Efficient Electric Equipment and Systems

5 Points

Aim: Install energy efficient electric equipment and systems to reduce electricity consumption of the project.

Requirements

1. Install Energy Conservation Building Code (ECBC) compliant power transformers of suitable rating and design in the project. Permissible total loss values for power transformers shall not exceed the ECBC minimum acceptable efficiency at 50% and full load rating. **(2 points)**
2. Install energy efficient motors in the project as per details listed below: **(3 points)**
 - a. Motors of International Efficiency IE2 (high efficiency) / EFF1 class / BEE 3 star rated **(1 point)**
OR
 - b. Motors of IE3 (premium efficiency) / BEE 4 star rated **(2 points)**
OR
 - c. Motors of IE4 (super premium efficiency) / BEE 5 star rated **(3 points)**

Note: For industrial projects, consider the motors installed for non-process applications only.

Calculations and Methodology

Install energy efficient electric equipment and systems in the project as applicable to reduce electricity consumption of the project.

Documents to be submitted

1. Trade catalogue / brochure of power transformers and motors installed in the project
2. Copy of purchase bills / invoices of power transformers and motors



3. Factory test report of power transformers meeting ECBC minimum acceptable efficiency at 50% and full load rating.
4. Design calculation for the distribution losses and load calculations up to panel level
5. Site photographs / photographs of nameplate of electrical equipment confirming the above installation

Principle 18: Use of Imperishable Energy Resources

8 Points

Aim: Use resources of imperishable energy in the project to reduce the dependency on exhaustible fossil fuels.

Requirements

1. Install onsite imperishable energy systems to offset a part of non-process electric contract demand of the project.

% Contract Demand of the Project	Points
5	1
10	2
15	3
20	4
25	5

2. Install offsite imperishable energy systems to offset a part of non-process electric contract demand of the project.

% Contract Demand of the Project	Points
10	1
20	2
30	5

Calculations and Methodology

Determine the contract demand of the project from electrical design brief report. This can also be determined from the sanctioned electric load from competent government authority. Contract demand is the maximum demand in kilowatt (kW) agreed to be sanctioned by the utility. This is consumer's sanctioned load by electricity provider.



Install onsite renewable energy system for at least 5% of contract demand of the project. This includes solar PV system, wind turbines, biogas system, geothermal etc as applicable. Solar hot water systems cannot be considered as power generation source.

Either the project owns the offsite renewable energy system or has signed a contract with the off-site renewable energy developer for a period of at least 3 years. The offsite renewable energy system should be located within the same utility service area as the facility claiming the use.

Documents to be submitted

1. Electrical design brief report, contract demand or consumer's sanctioned load by electricity provider
2. Drawings showing location of onsite renewable energy system
3. Trade catalogue / brochure of onsite renewable energy system
4. Copy of purchase bills / invoices of onsite renewable energy system
5. Site photographs confirming the above installation
6. Project ownership documents of offsite renewable energy system or signed contract with the off-site renewable energy developer for a period of at least 3 years
7. Details of off-site renewable energy system capacity dedicated to this project
8. Monthly and annual electricity generation report of off-site renewable energy system

Principle 19: Measurement of Energy Consumption

2 Points

Aim: Project should install meters to measure Energy consumptions of the project on daily/ monthly basis.

Requirements

1. Installation of Power Quality Meter at coupling points between Discoms and consumers **(essential)**
2. Provide following energy meters: **(2points for fourmeters)**
 - a. Each department level in case of industrial projects as applicable
 - b. Separate meters for Interior lighting and HVAC applications for industrial projects
 - c. Exterior area lighting (landscape, surface parking, driveways)
 - d. Onsite renewable energy system
 - e. Onsite waste water treatment system

Calculations and Methodology

Energy meters should be capable of monitoring kWh, kW and Power factor.

Documents to be submitted

1. Provide following metering single line diagrams (SLD) showing the above meters as applicable
 - a. Electrical metering
2. Provide following for meters:
 - a. Trade catalogue or brochure
 - b. Purchase bills / invoices
3. Site photographs confirming the installation of meters



Principle 20: No Use of Halogenated Hydrocarbons

2 Points

Aim: Reduction in the emission of Halogenated Hydrocarbons (CFC, HCFC and Halons) to reduce the depletion of Ozone layer.

Requirements

1. Use Chlorofluorocarbon (CFC) free HVAC and refrigeration systems in the project **(essential)**
2. Fire extinguishers and suppression systems installed in the project must be free from halons **(essential)**
3. Use Hydro chlorofluorocarbon (HCFC) free HVAC and refrigeration systems in the project **(2 points)**

Calculations and Methodology

Emissions of halogenated hydrocarbons substances such as CFCs, HCFCs and halons lead to ozone layer depletion. Such substances are found in refrigerants also. All these ozone depleting substances remain stable in the lower atmospheric region, but as they reach the stratosphere, they get exposed to the ultra violet rays. This leads to their breakdown and releasing of free chlorine atoms which reacts with the ozone gas, thus leading to the depletion of the ozone layer.

Documents to be submitted

1. Trade catalogue or brochure of Fire extinguishers and suppression systems, HVAC and refrigeration systems
2. Purchase bills / invoices of Fire extinguishers and suppression systems, HVAC and refrigeration systems
3. Site photographs confirming the installation of CFCs, HCFCs and halons free Fire extinguishers and suppression systems, HVAC and refrigeration systems. Photographs of name plate with model and make to be distinctive and visible.

Principle 21: Sustainable Development of Construction Engineering

12 Points

Aim: Utilization of alternatives of basic materials being used in construction industry to conserve the precious natural resources and prevent valuable recyclable materials going to landfills as waste.

Requirements

1. Use façade glass, door and window glass with recycled content of more than 15% **(2 points)**
2. Use Portland Pozzolana Cement (PPC) cement for masonry and plaster work.
 - a. 50% of masonry and plaster work – **1 point**
 - b. 75% of masonry and plaster work – **2 points**
3. Use fly ash bricks or AAC blocks or similar products for brick work.
 - a. 40% of brick work – **1 point**
 - b. 80% of brick work – **2 points**
4. Use fly ash in concrete mix / ready mix concrete **(2 points)**
5. Use steel bars / structure steel / PEB with recycled content of more than 25% **(2 points)**
6. Use covering shades with recycled content of more than 25% **(2 points)**

Calculations and Methodology

Recycling is very important for sustainable development of construction industry as it reduces the demand for virgin materials and diverts valuable wastes going to landfills.

Steel bars / structure steel / PEB, concrete, bricks, cement, glass and tiles constitute a major portion of building construction materials bill of quantity (civil BOQ). Hence, attempt to use those materials with recycled contents as far as possible, avoid use of virgin materials and prevent useful materials going to landfills.



PPC cement has Pozzolan materials such as fly ash, volcanic ash. Fly ash bricks, AAC blocks and similar products constitute at least 35% of fly ash. Do not use conventional red clay bricks.

New Thermo Mechanically Treated (TMT) steel is mostly made up of a combination of pre-consumer waste steel, post-consumer waste steel and virgin steel. Similarly, tiles and glass are also made up of pre-consumer waste steel, post-consumer waste and virgin materials.

All calculations for this Principle will be done on the basis of quantities (either weight, volume, counts etc. as applicable) of the materials used in the project, not on the costs.

Documents to be submitted

1. Building construction materials BOQ with total quantities of above materials (glass, steel, cement, bricks, concrete / RMC, tiles)
2. Owner declaration confirming the total quantities of above materials (glass, steel, cement, bricks, concrete / RMC, tiles)
3. Trade catalogue / brochure / manufacturer letter confirming the recycled content percentage in the product as applicable.
4. Copy of purchase bills / invoices of respective building construction materials



Principle 22: Local Sourcing of Construction Materials

6 Points

Aim: Utilize locally available building construction materials manufacturers / suppliers for buying materials to reduce environmental pollution and transportation cost.

Requirements

1. Use locally sourced (excavated and / or manufactured) sand, stones, aggregates, bricks, paver blocks and concrete as applicable. Source distance from project site should not be more than 250 km. **(2 points)**
2. Use locally sourced (excavated and / or manufactured) cement, glass, wood products and tiles as applicable. Source distance from project site should not be more than 550 km. **(2 points)**
3. Use locally sourced (excavated and / or manufactured) steel (all types) / PEB as applicable. Source distance from project site should not be more than 850 km. **(2 points)**

Note: Distance mentioned above is not the radial distance. It can be rail or road distance.

Calculations and Methodology

Local sourcing is finding the closet available manufacturers and suppliers of building construction materials as applicable and using them. It is recommended to source as much of the construction materials as possible from the local region to reduce the environmental pollution and transportation cost.

Main benefit of local sourcing of materials is the reduced environmental impact due to shorter distance travelled by the materials.

Local sourcing is most effective with simple materials such as sand, stones, aggregates, bricks, cement, wood products, paver blocks and concrete as there are often several suppliers / manufacturers within a regional area. However with more complicated materials, this strategy may not work as there may be very few suppliers / manufacturers of such materials.



All calculations will be done on the quantities and not on the costs.

Documents to be submitted

1. Building construction materials BOQ with total quantities of above materials
2. Owner declaration confirming the total quantities of above materials
3. Manufacturer letter confirming the local sourcing of above materials
4. Copy of purchase bills / invoices of respective building construction materials



Principle 23: High Albedo Materials - Roof and Non-roof

6 Points

Aim: Use high albedo materials on exposed roof and non-roof hardscape areas to reduce the heat island effect as well as cooling energy consumption.

Principle requirements

Provide the following –

1. At least 40% of parking in the basement or stilt floor or covered with high albedo material **(1 point)**
OR
More than 60% of parking in the basement or stilt floor or covered with high albedo material for an additional point **(2 points)**
2. Open grid grass pavers and / or shade giving trees to cover at least 40% area of open surface parking, driveways and walkways **(2 points)**
3. Roof vegetation or high albedo materials or combination of both for more than 70% of exposed roof areas. Exposed roof does not include the areas covered by services provided on the roof. **(2 points)**

Calculations and Methodology

Roof vegetation and high albedo materials can save cooling energy use by directly reducing the heat gain through a building envelope and also by lowering the urban air temperature in the neighborhood of the building.

Roof vegetation and high albedo materials can be used on the rooftops, exposed surfaces of parking lots. Parking can be provided in the basement or stilt floor.

Open grid grass pavers and / or shade giving trees can be provided to cover at least 40% area of open surface parking, driveways and walkways.

Materials that look white reflect most of the radiations and have a high albedo whereas materials that appear dark absorb most of the radiation have a low albedo.

Use reflective coating with SRI more than 80 for low-slope surfaces with a slope of 2:12 or less and 30 to 65 for steep-slope surfaces with a slope of greater than 2:12. Solar Reflective Index (SRI) of perfectly black surface and a perfectly white surface can be considered as 0 and 100 respectively.

Documents to be submitted

1. Drawings showing areas of application where roof vegetation / high albedo materials/ reflective roof coatings / open grid grass pavers / shade giving trees are used in the project
2. Trade catalogue / brochure / test certificate of reflective roof coating used in the project
3. Copy of purchase bills / invoices of reflective roof coating
4. Site photographs confirming the above requirements

Principle 24: Post-occupancy Waste Management

4 Points

Aim: Implement a strategy for post-occupancy waste collection, segregation and disposal.

Requirements

1. Provide separate waste bins for biodegradable and non-biodegradable wastes at each building level or floor level as applicable **(2 points)**
2. Provide central waste collection yard(s) for collection of biodegradable and non-biodegradable wastes from the entire project. **(2 points)**

Calculations and Methodology

Separate waste bins must be provided for at least four major waste items to be collected from the site as applicable.

Separate bins must be provided for lamps, batteries and e-wastes as applicable.

Implement strategies for suitable disposal of the waste. Wastes must not be sent to the landfill.

Total solid waste generated by the project occupants can be estimated at the rate listed below as per NBC 2016:

- I. Commercial refuse : 0.1 to 0.2 kg/person/day
- II. Institutional refuse : 0.05 to 0.2 kg/person/day

Out of the total solid waste generated, 40% may be taken as organic waste and 60% as inorganic waste.

Total number of occupants can be taken from the project's Mechanical/Electrical/Plumbing design basis reports (MEP DBRs) or as prescribed by project design team.

Recycle Plan: Describe tracking process of the waste diverted from landfill. Calculate annual average diversion rate and provide narration for the same.



Recycling Policy(s) Development

Devise or develop policies for environmental purchasing and everyday recycling capability of the warehouse. It should assess and address the waste generated from excessive plastic, packaging and storage material.

Documents to be submitted

1. Complete site plan and all typical floor plans showing the locations of waste bins
2. Site photographs confirming the installation of waste bins at site
3. OWC for organic waste – size, capacity and location with proper exhaust system and ventilation in place. – Highlight this in the site layout plan properly.
4. List of waste diverted from landfill and recycled, invoices, weight of commodity sold, reports from service providers, documentation for cost benefits achieved (if any)
5. Recycling policy(s) and Plan
6. Climate impact report – assessing the plastic and non-biodegradable waste reduction/elimination on-site AND waste biodegradable waste diverted from landfills and utilized on-site.



Principle 25: Sustainable Packaging Supply Chain

2 Points

Aim: To promote a green packaging supply chain so as to reduce stress on natural resources and also this sustainable packaging, diminishes energy use and reduces the harmful impacts of packaging on the environment.

Requirements

1. Sustainable Packaging Supply Chain Policy (2 Points)

Applicable for both (existing and new) Warehouse and Logistics Hubs.

The policy shall emphasize reduction in tertiary packaging material by optimizing specific consumption, substitution and use of certified packaging material, with clearly specified short-term (1 to 3 years) & long-term (more than 3 years) targets.

There must be any one of the following material to be used for Sustainable Packaging:

- a. Recycled and Reusable Packing Materials
- b. Recycled Plastic
- c. Biodegradable Packing Materials.
- d. Eco-Friendly Fillers
- e. Mushroom-Based Packaging.
- f. Organic Fabrics.
- g. Organic materials.

Calculations and Methodology

Project team should implement a green packaging policy in place demonstrating a responsible packaging and procurement process. Sustainable procurement steams from pollution prevention principles and activities. Also known as sustainable or environmental purchasing, sustainable procurement compares price, technology, quality and the environmental impact



of the product, service or contract. Sustainable procurement policies are applicable to all organizations, regardless of size so as to:

- a. Diminished the use of fossil fuels as possible to reduce the carbon footprint of packaging manufacturing.
- b. Reduced use of natural resources by designing minimal packaging, Sustainable packaging manufacturers help reduce the consumption of natural resources.
- c. Increased use of recycled products enhancing energy and resource utilization efficiency.
- d. More energy-efficient manufacturing methods, like the use of alternative power, such as wind or solar energy.
- e. Increased use of renewable resources

Notes:

- *As per ISO 21067-1:2016, tertiary packaging is designed to contain one or more articles (item or commodity) or packages (and its contents), or bulk material, for the purpose of transport, handling and/or distribution. (as applicable)*
- *The packaging material shall eliminate the use of non-hazardous packaging material and chlorine & halogenated bleaching agents, and avoid the use of optical brighteners. (as applicable)*
- *ASTM D6868 2019: Standard Specification for Labelling of End Items that Incorporate Plastics and Polymers as Coatings or Additives with Paper and Other Substrates Designed to be Aerobically Composted in Municipal or Industrial Facilities. (as applicable)*

Documents to be submitted

1. Policy document stating the green packaging and green procurement processes
2. Supporting photographs confirming to the requirements of the adopted green packaging policy for the project.

Principle 26: Best Practices for Universal Building Design

5 Points

Aim: Encourage developers and designers to be innovative and think creatively about solutions that meet the needs of differently abled.

Requirements

Include but not limited to following features for differently abled. All features must be designed as per National Building Code (NBC) of India 2016.

1. Ramps with handrails at the main entrance and exit of each building. **(essential)**
2. Handrails, Audio and Braille facilities in the lifts **(1 point;** point will be awarded if not applicable)
3. Preferred parking nearest to the main entrance of the building. Provide at least one designated accessible parking space for every 50 equivalent car units (ECUs) provided in the project as per local parking bye-laws and part thereof. **(2 points)**
4. Provide at least one toilet per floor designed for differently abled **(2 points)**

Calculations and Methodology

1. Architects and developers should include the design features that can support differently abled
2. Refer National Building Code of India 2016, Volume 1, PART 3, Section 13, Annexure B for details.

Documents to be submitted

1. Drawings confirming the inclusion of such features in the building design
2. Trade catalogue or brochure of features installed in the project
3. Photographs of the features provided for differently abled



Principle 27: Optimal Use of Natural Light

6 Points

Aim: Optimal utilization of natural light to reduce the reliance on artificial lighting and saving lighting energy.

Requirements

Ensure that the project meets ECBC 2017 Daylighting requirements as per Chapter 4 Building Envelope, Section 4.2.3 Daylighting. There are two approaches that can be followed to meet the Principle compliance:

1. Simulation approach:

- I. Ensure through computer simulation that at least 40% area of any occupied space comply with the daylighting requirements listed in ECBC 2017, Chapter 4, Section 4.2.3.1 **(essential)**
- II. Ensure through computer simulation that at least 60% area of any occupied space comply with the daylighting requirements listed in ECBC 2017, Chapter 4, Section 4.2.3.1 **(2 points)**
- III. Ensure through computer simulation that at least 80% area of any occupied space comply with the daylighting requirements listed in ECBC 2017, Chapter 4, Section 4.2.3.1 **(4 points)**

OR

2. Manual approach:

- I. Ensure that at least 40% area of any occupied space comply with the daylighting requirements listed in ECBC 2017, Chapter 4, Section 4.2.3.2 **(essential)**
- II. Ensure that at least 60% area of any occupied space comply with the daylighting requirements listed in ECBC 2017, Chapter 4, Section 4.2.3.2 **(2 points)**
- III. Ensure that at least 80% area of any occupied space comply with the daylighting requirements listed in ECBC 2017, Chapter 4, Section 4.2.3.2 **(4 points)**

AND

3. Daylight / occupancy sensors / Timers on exterior lighting:

Office spaces, common areas such as corridors, lift lobbies, reception, canteen, parking and exterior lighting etc. as applicable and integrate it with the artificial lighting.
(2 points)

Calculations and Methodology

For the purpose of daylight design, only sky illumination shall be considered as contributing to illumination of the building interiors. Direct solar illuminance shall not be considered. Openings shall be provided with overhangs, shades, balcony, louvre system or other shading devices to reduce direct sunlight entering the room as far as possible.

Overhangs, shades, balcony, louvre system, etc., reduce the effective height of opening. Wide and low height openings are easier to shade against sunlight entry. Direct sunlight increases the inside illuminance.

Window design should be done very carefully as good window design can be the significant way of saving lighting energy by reducing the dependency on artificial lighting. Window orientation, occupancy patterns, task and position of windows with respect to surrounding buildings and other obstruction should be considered.

Space environment should be designed to avoid glare and it should be possible to adjust both natural and artificial light. Glare results from excessive contrast of illumination or from an excess of illumination in the field of view. Glare can be reduced by overhangs, shades, balcony or louvre system. Internal screening can also be provided by louvres or blinds.

Suitably designed interior layout and / or re-orientation of glazing to avoid entry of direct solar radiation can be done to eliminate glare.

Glare can be reduced or eliminated by installation of windows in more than one wall to increase the background lux levels. Lower the sill height of windows to allow increased illumination to enter in the space which increases the adaptation level.

Diffusing glazing should be used properly within the normal field of view as it can cause direct incident solar beam to be scattered diffusely. It can cause uncomfortable high brightness.

Documents to be submitted

1. All architectural floor plans, elevations, sections
2. Window door schedules with opening details
3. Daylight simulation output report and / or manual calculation to confirm the above requirements
4. Trade catalogue / brochure of glazing installed at site
5. Copy of purchase bills / invoices of glazing installed at site
6. Site photographs of building elevations, external windows and doors
7. Manufacturer cutsheet/brochure highlighting the glazing specifications – VLT, SHGC, etc, which are used in the daylight simulation report.



Principle 28: Healthy Indoor Air Quality

6 Points

Aim: Ensure minimum delivery and quality of outdoor fresh air supplied into the indoor spaces for ventilation.

Requirements

Mechanical Ventilation System and projects where centralized chilled water system is installed:

1. Ensure that all occupied spaces in the building comply with the minimum requirements set out in ASHRAE 62.1:2010 using the ventilation rate procedure. If a local code is applicable and is more stringent, the same will be applicable. **(essential)**
2. Install outside fresh air filtering media with at least MERV 8 (Minimum Efficiency Reporting Value) or higher rating, in the fresh air unit supplying outside air to air handling units (AHUs) or fan coil units (FCUs). MERV 8 or equivalent filters can also be installed at the fresh air intake points of AHUs or FCUs as applicable. **(essential)**
3. Outdoor fresh air intakes as well as openings required for natural ventilation system shall be located such that the shortest distance from the intake to any outdoor contaminant source shall be equal to or greater than the separation distance mentioned in ASHRAE 62.1:2010 Table 5-1. **(essential)**
4. Ensure that all occupied spaces in the building comply with an increase in outdoor air ventilation of 20% above the outdoor air ventilation rates established in the above essential requirement. **(3 points)**
5. Install permanent carbon dioxide (CO₂) monitoring and alarm systems to ensure the adequate supply of outside fresh air at all times. CO₂ sensor can be installed at the return air duct / path. CO₂ level should not exceed 900 ppm. **(3 points)**

Natural Ventilation and when Mechanical Ventilation is not operational during occupied time, projects where split / window AC / VRF system is installed:

1. The openable area of operable wall openings must be at least 8% of the net occupiable floor area. For kitchen, this can be 4%. **(essential)**



2. Additional points:
 - a. If the openable area of operable wall openings shall be at least 9% of the net occupiable floor area. For kitchen, this shall be at least 4.5%. **(3 points)**
 - b. If the openable area of operable wall openings shall be at least 10% of the net occupiable floor area. For kitchen, this shall be at least 5%. **(6 points)**
3. The occupiable spaces must be permanently open to operable wall openings directly to the outdoors and within 28 feet of operable wall openings to the outdoors.
4. Where interior occupiable spaces without direct openings to the outdoors are ventilated through adjoining rooms, the opening between occupiable spaces shall be permanently unobstructed (operable wall openings such as sliding / operable doors / windows are not acceptable) and have an opening of at least 10% of the area of the interior occupiable space nor less than 21 ft².
5. The operable openings must be readily accessible to building occupants
6. Occupiable space does not include the spaces that are occupied upon occasion and for very limited periods of time such as toilet, inactive storage, stairs, electrical and mechanical rooms.
7. If openings are covered with louvers or other obstructions, the openable area shall be the net free unobstructed area through the opening.

Calculations and Methodology

Ventilation rate procedure is described in ASHRAE 62.1:2010.

Documents to be submitted

1. All HVAC and fresh air drawings to show the distances between air intake points and exhaust air points
2. Describe HVAC, fresh air and CO₂ monitoring and alarm systems design meeting the Principle requirements.
3. Calculations of fresh air ventilation rates based on the ventilation rate procedure for all mechanically ventilated occupied spaces.



4. Calculations of fresh air ventilation as per natural ventilation system described above.
5. HVAC and fresh air system third party commissioning verification results demonstrating compliance with minimum fresh air ventilation rate requirements. The third party must not be directly or indirectly associated with the HVAC and fresh air system design.

Principle 29: Reduced Exposure to VOC

2 Points

Aim: Limiting VOC content in interior paints, adhesives, sealants and coatings to protect indoor air quality and occupational health.

Requirements

1. Specify and use low-emitting or non-emitting products that will significantly reduce the strength of VOC exposure to indoors.
2. Architectural paints and coatings must not exceed the following limits. **(1 point)**

Paints and Coatings	VOC Limit gm/lit Less Water
Flat (Mat) paints	50
Non-flat (Glossy) paints	150
Varnish	350

3. Adhesives and sealants must not exceed the following limits. **(1 point)**

Adhesives	VOC Limit gm/lit Less Water
Wood flooring	100
Carpet	50
Glazing	100
Wood	30
HVAC duct insulation	850
Tile	65

Calculations and Methodology

Paints, coatings and adhesives are significant contributors to indoor air pollution. Many of these products contain volatile organic compounds (VOCs) that can have health effects.



Exposure to VOCs can cause acute reactions, such as eye, nose, and throat irritation to chronic health problems such as asthma, chronic obstructive pulmonary disease, and cancer. Higher concentrations of VOCs are typically found indoors because of reduced air ventilation and various other sources of VOCs.

This Principle limits VOC for on-site wet-applied products to avoid environmental damage and protect the people who apply these products or are exposed to them during installation. This Principle covers architectural paints, coatings and adhesives that are applied on-site to indoor surfaces and finishes.

Increase ventilation when using products that emit VOCs, meet or exceed any label precautions and do not store opened containers of unused paints and similar materials to reduce exposure to VOCs.

Documents to be submitted

1. Area of application of each low-emitting and non-emitting product used
2. Trade catalogue / brochure / test certificate / Material Safety Data Sheets of each such product used
3. Copy of purchase bills / invoices of each such product used



Principle 30: Training and Capacity Building of Project Team

2 Points

Aim: Encourage the project team and facility management team to create awareness about green rating program, energy and water efficiency measures implemented in the project on a continuous basis.

Requirements

Design and implement a detailed training and capacity building program to encourage and aware the project team and facility management team regarding the green rating program, energy and water efficiency strategies implemented in the project on a continuous basis.

Training and capacity building program must be designed and conducted for following four phases of the project:

1. Pre-design phase
2. Design phase
3. Construction phase
4. Post-occupancy phase

Calculations and Methodology

Training and capacity building program must be conducted for the developers, architect, structure, mechanical, electrical, plumbing, landscape and BMS design teams, post-occupancy facility management teams involved in the project as applicable.

Documents to be submitted

1. Detailed training and capacity building program along with training materials for all four phases of the project
2. Duly signed attendance sheet of all participants along with the name, contact number, email ID, roles and responsibilities and designation
3. Photographs of the training sessions conducted



Principle 31: Activities for Corporate Social Responsibility

2 Points

Aim: Encourage the organization to take social, cultural and environmental responsibilities for positive environmental change and social welfare of the community.

Requirements

Perform one or more of the following activities as per the applicability and suitability to the organization:

1. Eradicating hunger, poverty and malnutrition, promoting preventive health care and sanitation and making available safe drinking water to the community
2. Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly and differently abled and livelihood enhancement projects
3. Promoting gender equality, empowering women, setting up homes and hostels for women and orphans; setting up old age homes, daycare centers and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward
4. Ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water
5. Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries; promotion and development of traditional art and handicrafts
6. Measures for the benefit of armed forces veterans, war widows and their dependents
7. Training to promote rural sports, nationally recognized sports, Paralympics sports and Olympic sports
8. Contributions or funds provided to technology incubators located within academic institutions which are approved by the Central Government



9. Rural development projects
10. Slum area development
11. PM National Relief Fund / National Defense Fund / Chief Minister Relief Fund

Calculations and Methodology

Corporate social responsibility can involve incurring short-term costs that do not provide an immediate financial benefit to the company, but instead promote positive social and environmental change.

Contribute to the Prime Minister's National Relief Fund or any other fund set up by the Central / State Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women.

Documents to be submitted

1. Supporting evidential proof of implementation of above measures



Principle 32: Going the Extra Miles

5 Points

Aim: Encouragement for showing spectacular performance towards Eco-friendly and Sustainable development in the project and going the extra miles.

Requirements

1. Going the Extra Miles (GEM) points 1 to 3 – **(3 points)**
2. AGEM Certified Professional (GEM CP) should be involved in the process. **(1 point)**

OR

Involve two or more strategies in the sustainability certification process of the project.
(2 points)

Calculations and Methodology

Recommended strategies (including but not limited to) for Going the Extra Miles (GEM) points –

1. Green wall / vertical garden / hydroponic gardens
2. Urban gardening
3. Electric charging points for electric vehicles within the site boundary (At least 3% of total parking capacity approved as per government norms)
4. Implement strategies onsite to save paper (post occupancy)
5. Implement strategies onsite to save water (during construction)
6. Project team can adopt public parks and wastelands and convert them into beautiful parks
7. Project team can participate in any of the Government's National Programs or Missions such as Build Toilets in Rural or needy areas, Adopt and maintain a street or village or colony for cleanliness



8. Install onsite imperishable energy systems to offset 50% of electric contract demand of the project. (non-process loads only)
9. Install offsite imperishable energy systems to offset 50% of electric contract demand of the project. (non-process loads only)
10. Install major energy and water meters on BMS for monitoring and necessary corrective actions
11. Install CFC free HVAC insulation materials in the project

Documents to be submitted

1. Supporting evidential proof of implementation of Going the Extra Miles (GEM) strategies in the project
2. Copy of GEM CP certificate of the concerned person(s) involved in the green certification process

Glossary

1. Albedo = Albedo is a measure of how much radiation that hits a surface is reflected without being absorbed.
2. Black water = Waste water and sewage from toilets
3. CFC = Chlorofluorocarbons
4. CPCB = Central Pollution Control Board
5. ECBC = Energy Conservation Building Code
6. Erosion of soil is a process by which soil is loosened, worn away and transferred by wind or water.
7. Grey water = Waste water from baths, wash basins, kitchen sinks and other kitchen appliances and washing machines
8. HCFC = Hydro chlorofluorocarbons
9. HVAC = Heating Ventilation and Air Conditioning
10. LPF = Liters per Flush; LPM = Liters per Minute
11. NBC = National Building Code of India
12. SLD = Single Line Diagram
13. SPCB = State Pollution Control Board
14. VOC = Volatile Organic Compound



ABOUT ASSOCHAM

THE KNOWLEDGE ARCHITECT OF CORPORATE INDIA

EVOLUTION OF VALUE CREATOR

ASSOCHAM initiated its endeavour of value creation for Indian industry in 1920. Having in its fold more than 400 Chambers and Trade Associations, and serving more than 4,50,000 members from all over India. It has witnessed upswings as well as upheavals of Indian Economy, and contributed significantly by playing a catalytic role in shaping up the Trade, Commerce and Industrial environment of the country.

Today, ASSOCHAM has emerged as the fountainhead of Knowledge for Indian industry, which is all set to redefine the dynamics of growth and development in the technology driven cyber age of 'Knowledge Based Economy'.

ASSOCHAM is seen as a forceful, proactive, forward looking institution equipping itself to meet the aspirations of corporate India in the new world of business. ASSOCHAM is working towards creating a conducive environment of India business to compete globally.

ASSOCHAM derives its strength from its Promoter Chambers and other Industry/Regional Chambers/Associations spread all over the country.

VISION

Empower Indian enterprise by inculcating knowledge that will be the catalyst of growth in the barrierless technology driven global market and help them upscale, align and emerge as formidable player in respective business segments.

MISSION

As a representative organ of Corporate India, ASSOCHAM articulates the genuine, legitimate needs and interests of its members. Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development. We believe education, IT, BT, Health, Corporate Social responsibility and environment to be the critical success factors.

MEMBERS – OUR STRENGTH

ASSOCHAM represents the interests of more than 4,50,000 direct and indirect members across the country. Through its heterogeneous membership, ASSOCHAM combines the entrepreneurial spirit and business acumen of owners with management skills and expertise of professionals to set itself apart as a Chamber with a difference.



Currently, ASSOCHAM has more than 100 National Councils covering the entire gamut of economic activities in India. It has been especially acknowledged as a significant voice of Indian industry in the field of Aerospace and Defence, Auto and Auto Ancillaries, Corporate Social Responsibility, Environment & Safety, HR & Labour Affairs, Corporate Governance, Information Technology, Luxury and Lifestyle, Biotechnology, Telecom, Banking & Finance, Company Law, Corporate Finance, Economic and International Affairs, Mergers & Acquisitions, Tourism, Civil Aviation, Infrastructure, Energy & Power, Education, Legal Reforms, Real Estate and Rural Development, Competency Building & Skill Development to mention a few.

INSIGHT INTO 'NEW BUSINESS MODELS'

ASSOCHAM has been a significant contributory factor in the emergence of new-age Indian Corporates, characterized by a new mindset and global ambition for dominating the international business. The Chamber has addressed itself to the key areas like India as Investment Destination, Achieving International Competitiveness, Promoting International Trade, Corporate Strategies for Enhancing Stakeholders Value, Government Policies in sustaining India's Development, Infrastructure Development for enhancing India's Competitiveness, Building Indian MNCs, Role of Financial Sector the Catalyst for India's Transformation.

ASSOCHAM derives its strengths from the following Promoter Chambers: Bombay Chamber of Commerce & Industry, Mumbai; Cochin Chambers of Commerce & Industry, Cochin; Indian Merchant's Chamber, Mumbai; The Madras Chamber of Commerce and Industry, Chennai; PHD Chamber of Commerce and Industry, New Delhi.

Together, we can make a significant difference to the burden that our nation carries and bring in a bright, new tomorrow for our nation.

Deepak Sood

Secretary General, ASSOCHAM
sg@assochem.com

THE ASSOCIATED CHAMBERS OF COMMERCE AND INDUSTRY OF INDIA

ASSOCHAM Corporate Office:

4th Floor, YMCA Cultural and Library Building, 1 Jai Singh Road, New Delhi-110001

Tel: +91-11-46550555 (Hunting Line) · Fax: +91-11- 23017008/09

Email: assocham@nic.in · Website: www.assochem.org



THE ASSOCIATED CHAMBERS OF COMMERCE AND INDUSTRY OF INDIA

4th Floor, YMCA Cultural and Library Building, 1 Jai Singh Road, New Delhi-110001

Tel: +91-11-46550555 (Hunting Line) • Fax: +91-11- 23017008/09

www.green-assochem.com | www.assochem.org