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RETROFITTING OF EXISTING BUILDING AS PER IGBC EXISTING BUILDING NORMS – A REVIEW

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Abstract: **Retrofitting or renovating an existing facility is most of the time more cost-effective and economic than investing in a new facility. Reducing and conserving energy is not the only purpose for retrofitting existing facilities but the idea should be to create a high-performance facility by adopting the integrated, whole-building design methodology, to the project during the initial phase i.e. Preliminary Design Stage that ensures all important design objectives are met. The unique aspects for retrofit of buildings must be given special importance while designing.**

Keywords: **Retrofitting, Existing Building, IGBC, Green Building, Energy Conservation, Water & Energy Efficiency, Sustainable Building, Human Health.**

I. INTRODUCTION

Green building, which can also be referred or called as sustainable buildings which are designed by keeping objectives such as enhanced occupant health, reduction in energy and water consumption and in return reducing its carbon footprint over the environment It is a chance to utilize the assets effectively while making more advantageous structures that enhance human wellbeing, reduces carbon footprint, and has additional economic advantages. All the improvement ventures lead to over-utilization of normal assets. This ends up as serious environmental issues. Green building idea deals with the optimum use of natural resources for the development of infrastructure. Since Existing Building are larger part of today's built environment in India, IGBC has launched a specific Guideline targeting to turn the Existing Building into Green Buildings.

This paper presents summary of IGBC Existing Building – Operations & Maintenance guideline, certification methodology and discussion of various design parameter it speaks about.

This paper presents a summary of retrofitting ideas that makes a major impact on conservation/proper utilization of resources like land, water, energy, air, material etc. thereby reducing the price of construction in addition to reduction of adverse impacts of global climate change.

II. CERTIFICATION METHODOLOGY

A. IGBC Green Existing Buildings O&M Registration:

Projects which are interested in getting IGBC Green Existing Buildings O&M Certification for their facility must first register with IGBC either on their website (www.igbc.in) under 'IGBC Green Existing Buildings O&M' or offline at IGBC office. All the information regarding registration fee for different categories are mentioned on IGBC website for immediate references. Registration helps in establishing the communication channel with IGBC and also gives Project

teams with access of required documents, templates, communications, process, schedule and fee for IGBC Green Existing Buildings O&M registration & certification.

B. Certification:

In order to achieve the IGBC Green Existing Building O&M certification, proposed project must meet the minimum credit points as well as all the mandatory credits. Proper supporting documents for all mandatory & optional credit achieved should be made available to IGBC during preliminary & final submission stage for validation.

Following documents needs to be submitted to IGBC:

- A brief starting stating Building type, its age, number of floors, area statement, occupancy type, photographs, etc.
- Duly filled Master Template in Excel.
- Other supporting documents/proofs such as declarations, drawings, contract copies, Bill, Purchase invoices, test reports, Calculations etc. for each credits proposed.

All the submittal required for each credits are mentioned in detail under each mandatory requirement and credit. Documents are required to be submitted at two stages – preliminary & final submittals. All documents for mandatory requirements & minimum credit requirements needs to be submitted during preliminary submission. Once preliminary submission is done, a third party review will be conducted and review comments will be submitted to project tem within 30 days of review. In next phase, project team needs to clarify the preliminary review queries and final submittal. Once same is conducted, final review will be done within next 30 days and rating achieved will be communicated.

It should be noted that any mandatory or optional credit earned while Preliminary review are tentative and subjected to change till final submission is done. In case of any changes in tentative credit anticipated after preliminary review, these changes need to be documented and required supporting documents needs to be resubmitted during the final review stage,

The threshold criteria for certification levels given below:

TABLE NO.01: IGBC CERTIFICATION CATEGORY

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

A formal letter of certification & mountable plaque will be given by IGBC to all recognized

C. Validity of IGBC Existing Buildings O&M Certification:

IGBC Existing Buildings O&M rating is valid for tenure of three years from the date of issue of the certification. During recertification, projects needs to comply with latest IGBC standard available for that building category applicable during recertification.

D. Summary:

Every project should meet minimum mandatory requirement and same are non-negotiable. Building can get Certification at four increasingly challenging levels, based on how many credits the building earns during final review stage. The certification issued will be valid from day of receipt of certification for next three years. During recertification after completion of 3 years, projects needs to comply with prevailing latest IGBC standard applicable during recertification.

The various Certification levels based on rating awarded are:

- ‘Certified’ to recognize best practices
- ‘Silver’ to recognize outstanding performance
- ‘Gold’ to recognize national excellence
- ‘Platinum’ to recognize global leadership

IGBC Green factory building rating addresses green features under the following categories:

- Site & Facility Management,
- Water Efficiency,
- Energy Efficiency,
- Health & Comfort,
- Innovation Category.

III. IGBC O&M RATING SYSTEM - AN OVERVIEW

The pilot version of IGBC Existing Buildings O&M rating system is applicable for all types of non-residential buildings including office buildings, IT Parks, BPOs, shopping malls, hotels, hospitals, airports, banks, etc. Building types such as factory and schools will be covered under respective IGBC rating Programmes. Only projects which are operational for at least 1 year & 80% carpet area occupied can apply for the certification as per this guideline.

TABLE NO. 02: IGBC CREDIT SYSTEM

S.No.	Credits	Mandatory Credits	Overall Points
1	Site & Facility Management	2	18
2	Water Efficiency	1	26
3	Energy Efficiency	2	30
4	Health & Comfort	2	14
5	Innovation Category	0	12
	Total	**7**	**100**

Site & Facility Management:

In this section, Green policy & Waste Collection & Disposal Policy are mandatory credits. Other credit includes Heat Island, Eco-friendly Landscaping and commuting, Building Operation & Maintenance and Outdoor light pollution reduction. There are 18 credits for this section.

Eco-friendly Landscaping emphasis on usage of Organic fertilizers for landscaping activity whereas eco-friendly commuting emphasis on usage of Company shuttles, Pool Cars as a mode of transportation. Heat island reduction credit speaks about reduction of Roof / Non Roof Area by wither providing natural vegetation or usage of high SRI material. Outdoor Light Reduction restricts the usage of vertically upward facing lights.

Water Efficiency:

In this section, usage of Water Efficient fixture is mandatory credit. Other credits include waste water treatment, waste water reuse, Rain Water Harvesting, Turf Area Reduction. There are 25 Credits for this section.

It awards credits by reducing the water consumption because of usage of faucets, water closet have minimum Water flow rate per flush as prescribed in IGBC guidelines. In order to collect, store & reuse Rain water as well as recharging the ground water table, Rain water harvesting needs to be implemented. Waste water needs to be treated in STP and treated water from STP should be used in Toilets & Gardening. Installation & Monitoring of Water meter on every incoming & outgoing point is recommended to control usage of water. Turf Area aims in reduction in lawn area in total landscaping area. Reduction in turf areas is to reduce water consumption since lawn consume high amount of water.

Energy Efficiency:

In this section, usage of Eco-Friendly Refrigents and meeting ECBC norms for minimum energy consumption are mandatory credits. There are 30 Credits for this section. Energy performance is one of the credits which aims in reduction in wastage of energy by proper design & installation of lightening fixtures such as CFL, LED, etc. which in turn reduces power consumption. Energy Metering needs to be taken up in order to encourage continuous monitoring of energy consumption. Onsite & off site renewable energy credit encourage usage of renewal energy either by in house generation or buying or investing in renewable energy outside project site.

Health and Comfort

In this section, Tobacco Smoke control & fresh air ventilation are the mandatory credits. There are overall 15 Credits for this section. In this section, methods to improve the health & comfort of occupants are targeted by various means which includes following measures. Carbon Di-Oxide monitoring & controlling, Insolation of polluting equipment's, Eco-friendly Housekeeping Chemicals, Thermal Comfort, Indoor Temperature & RH. It also aims to introduce Facilities for Differently Abled People. One of credit targets about facilities to enhance physical, emotional & spiritual wellbeing of building occupants.

Innovation:

In this section, there are five credit areas under innovation head & one IGBC AP member credit. There are overall 12 Credits for this section. IGBC AP credit is awarded if any IGBC AP certified person is working in the panel, whereas innovation credits are awarded when project has implemented some innovative ideas to reduce the environmental impacts.

IV. CONCLUSION

It can be clearly evidenced that by achieving Green Building certification for Existing building from IGBC, projects are awarded with various tangible & non tangible ben Tangible benefits are that which are received after retrofitting activities are finished, reduced energy & water consumption, less operating & maintenance cost, and overall less impact on environment. Non tangible benefits include increased productivity & improved health, comfort and overall well-being of occupants. Thus in order to achieve an green building certification, an existing building needs to achieve all mandatory requirements as well as other minimum required number of credits from IGBC Exiting Building – Operation & Maintenance Manual.

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