



Green Building Handbook

For Building Users

Co-funded by

In partnership with











Developed by:	Agence Française de Développement (AFD)
Co-funded by:	European Union (EU)
In partnership with:	National Housing Bank (NHB)
Designed by:	Green Rating for Integrated Habitat Assessment (GRIHA) Council







FOREWORD

NHB, AFD and EU came together to create this guidebook with the support of CRISIL and GRIHA Council team. Green building guide for new building has been developed as one of the communication products, under the aegis of the Sunref India Programme. The guidebook will be useful for low- and mid-scale developers aspiring to go green in their new and existing affordable housing projects and it will serve as a ready reference book of environment-friendly strategies in the affordable housing sector. It covers in detail the green building components and strategies for existing housing project. This guide provides simple and easy-to-understand strategies for all those in charge of the processes of managing/renovation/ upgradation to have a common and clear understanding of incorporating green building practices.

The information provided in the green building guide will be valuable to all those who intend to learn about the various aspects that makes up affordable housing green and environment friendly. It will cover green building details related to various thematic areas and its sub-criteria. It will acquaint the reader about green building strategies, systems, components, materials, and technologies as applicable to existing buildings. The idea is to create a quick checklist of easy-to-implement and cost-effective green building strategies and solutions for existing buildings. Each thematic section contains the introduction of each theme and details on each sub-criterion, its green building strategies, and benefits.

The existing green building guide includes section on the following green building themes and criteria:

- Sustainable site planning including criteria on eco-friendly practices, mitigate urban heat island effects, preserving biodiversity, and promoting universal accessibility
- Energy management including criteria on energy-efficient lighting, energy-efficient equipment, and utilization of renewable energy
- Water conservation measures including criteria on building water management, landscape water management, rainwater management, wastewater management, and water quality
- Occupant comfort and well-being including criteria on visual comfort, thermal comfort, and maintaining air quality
- Performance metering and monitoring including criteria on building audit and monitoring operation and maintenance
- Social strategies including criteria on occupant well-being and recreation, facilities for domestic and service staff.

MESSAGES



Agence Française de Développement (AFD), European Union (EU) and the National Housing Bank (NHB) have agreed to enter a partnership, in July 2017, through the Sunref India Programme, aiming at supporting the development of green and affordable housing in India, in line with AFD's & EU's mandate in India and NHB's strategy and involvement towards a greener economy. This programme focuses on making green housing more affordable to low- and middle-income households, promoting the existing local green labels for housing, and demonstrating the market potential and relevance of green housing in the Indian context. Adopting green building practices in affordable housing sector in India, would significantly create a higher positive impact on the environment.

The AFD's EURO 100 million credit line under the Sunref India programme is supporting the NHB's institutional capacities in the emerging green housing market. It is also supporting the NHB's refinancing operations to provide primary lending institutions (such as banks or housing finance companies) and housing developers with technical and financial assistance to facilitate the scaling up of the green affordable housing industry. Given the strategic importance of the green housing sector in India, an additional grant of EURO 12 million from the EU to reduce the cost of the credit line and support the green labelling of projects; as well as create awareness and build capacity of various stakeholders.

This guide has been developed under the aegis of the Sunref India Programme, with the intent to create a ready reference document for small/ mid-size developers aspiring to go green in their new and upcoming affordable housing projects. We appreciate the efforts put in by the NHB, CRISIL & GRIHA team in developing this guidebook and are confident that it will help small/ mid-scale developers in adopting green building concepts in upcoming new affordable housing projects.

MESSAGES

European Union



The Sunref India Programme has been supported by the European Union since 2017, in cooperation with the Agence Française de Development (AFD) and the National Housing Bank (NHB). Sunref aims at reducing the impact of the housing industry on the environment, through the efficient use of energy, water and building material. The European Union contributes to the programme with a grant of EUR 12 million, in addition to AFD's credit line of EUR 100 Million to the NHB. The EU grant is geared towards increasing the availability of green certified housing units for lower income households in India, working closely with housing finance companies. Furthermore, the technical skills of stakeholders are being enhanced under this project.

I congratulate AFD, NHB, CRISIL and GRIHA for this publication, which I trust will contribute towards the promotion, adoption and implementation of affordable green housing in India.

National Housing Bank



AFD launched the Sunref India Programme in partnership with the National Housing Bank (NHB), India's apex financial institution in housing finance, with support from the European Union (EU). Under this programme, banks and housing finance companies have access to competitive funding opportunities to finance green and affordable housing projects. The Bank, in 2010-11, in partnership with KfW, Germany had also launched the Energy Efficient Housing Refinance Scheme, aimed at encouraging energy efficiency in the residential sector. Green building guide for new and existing building is developed as one of the communication products, under the aegis of the Sunref India Programme. The intent of these guides is to serve as a ready reference book of green building strategies in the affordable housing sector. It covers in detail, various green building criteria applicable to new and existing housing projects and accordingly propose strategies.

We appreciate the support of AFD and EU for giving us the opportunity to implement Sunref India Programme and be a part of its success. We also thank GRIHA Council and CRIS TA for the efforts that they have put in for the development of this guidebook. We hope that this guidebook will help to enhance awareness among affordable housing developers to understand the key components and criteria of a green building concept and implement it in their existing and new projects.

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ABBREVIATIONS

AMC	Annual Maintenance Contract
BEE	Bureau of Energy Efficiency
C ₂ HCl ₃	Trichloroethylene
C_6H_6	Benzene
C ₈ H ₁₀	Xylene
CFL	Compact Fluorescent Lamps
CH₂O	Formaldehyde
CO	Carbon Monoxide
CO ₂	Carbon dioxide
LED	Light-emitting Diode
PV	Photovoltaic
RWA	Resident Welfare Association
SHGC	Solar Heat Gain Coefficient
SRI	Solar Reflective Index
VLT	Visible Light Transmittance
VOC	Volatile Organic Compound

DEFINITION

Biodiversity: It refers to the variety of plant and animal species on earth or in a specific ecosystem.

Biogas: It is generated when organic waste is broken down by microbes in the absence of oxygen.

Carbon Emissions: Emissions of greenhouse gases—carbon dioxide, nitrous oxide, methane, and others into the atmosphere.

Conduction: This is the form of heat transfer that happens through surface contact.

Convection: This is the form of heat transfer that happens through fluids (could be air or liquid).

Desilting Chamber: Chamber used to remove silt and other floating impurities from rainwater .

Flow Rate: It is the volume of water that passes through a specific fixture per unit time.

Greenhouse Gas (GHG): Greenhouse gas refers to any gas that by virtue of its properties, absorbs infrared radiation, that is, net heat energy emitted from the earth's surface and re-radiates it back to the earth's surface, thus contributing to the greenhouse effect.

Radiation: This is the form of heat transfer that happens through vacuum or transparent medium (could be solid or liquid).

Rainwater Harvesting: It is collecting the run-off from roof surfaces and other impervious surfaces from site in order to store it for later use or recharge to the ground water aquifer.

Solar reflective Index: The index is a measure of the ability of constructed surface to reflect solar heat as shown by a small temperature rise.

VOC: These are the carbon compounds that vaporize at normal room temperatures and participate in atmospheric photochemical reactions. This doesn't include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.

Water Factor Limit (WFL): Amount of water consumed (in gallons) by a dishwasher or washing machine to complete one full cycle and is is measured in Litre/cycle.

Incorporating and encouraging eco-friendly practices in a housing development plays a crucial role in lowering the carbon emissions from vehicles. Simple strategies like car pooling, incorporating auto stands within the site, shuttle to nearest public transport facility, etc. are effective strategies for promoting a healthy and sustainable lifestyle.

STRATEGIES



BENEFITS



MITIGATE URBAN HEAT ISLAND EFFECT

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The urban fabric consists of materials such as concrete and asphalt which absorb a high percentage of solar radiation and dissipate it to the air at night. This phenomenon causes higher night-time air temperature in cities in contrast to rural environments that rapidly cool down. This results in heat islands in urban areas which are 3-10°C hotter than neighbouring rural areas.^{1,2}



1 US EPA O Heat Island Effect. https://19january2017snapshot.epa.gov/heat-islands. Accessed 14 Jun 2022 (2016)

2 Causes, Effects and Solutions To Urban Heat Island - Conserve Energy Future. https://www.conserve-energy-future.com/effects-solutions-urban-heat-island.php. Accessed 14 Jun 2022

1.3

Biodiversity is the key indicator of the health of an ecosystem and we must ensure that we do not disturb the existing biodiversity of the site, for e.g. birds, plants, etc. The inappropriate use of artificial lighting without considering the environment leads to environmental degradation and loss of biodiversity. The residential building sector contributes to light pollution through a variety of sources, including architectural and landscape lighting, interior nighttime lighting, and security lighting.





biodiversity.



BENEFITS

Pleasant spaces for social interaction in the built environment.

PROMOTING UNIVERSAL ACCESSIBILITY

Persons with special needs, that arise due to age or medical conditions, experience day-to-day struggles in their activities due to barriers in accessing public buildings and other infrastructure. These barriers include inadequate sizing of doorways, corridors and toilets, surface level differences with no alternative accessible path of travel, lack of seating, handrails, grab-bars, signages, and sensory aids amongst others



BENEFITS



Social inclusiveness for all, hence creating an independent environment.



Safe and secure environment for all.

Lighting accounts for about 20% of the total power consumption in a building. Opting for energy efficient lighting measures greatly enhances the opportunities for energy conservation.³



Table: Features of different types of lighting fixtures.⁴

	LED	CFL	INCANDESCENT
EFFICIENCY	80% less energy use than an incandescent	75% less energy used than an incandescent	90% of energy is wasted as heat
AVG. LIFE SPAN (hours)	50,000	10,000	1,000
ANNUAL OPERATING COST	Low	Medium-low	High

^{3.} International Institute for Applied Systems Analysis (IIASA). n.d. Energy End-Use: Buildings. Details available at https://iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/GEA_CHapter10_buildings_lowres.pdf, last accessed on July 22, 2020.

^{4.} Constellation (2016) LED vs. CFL Bulbs: Which Is More Energy-Efficient? In: Constellation Residential and Small Business Blog. https://blog.constellation.com/2016/03/25/led-vs-cflbulbs/. Accessed 14 Jun 2022

Home appliances consume a huge amount of energy. Therefore, it is ideal if we could take advantage of technological innovations, and shift to more energy-efficient practices and systems. This will help in saving money and energy, protecting the environment, and improving lifestyle.



Common Appliances Used at Home

USER BEHAVIOUR

Shut off appliances not in use. Prevent phantom / Vampire loads "Vampire load is electricity that is used by devices that are turned off but are still plugged into an electrical outlet keeping the device on standby."



3. Avoid using unnecessary equipment during peak demand hours.



PURCHASE/ REPLACEMENT

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- Upgrade equipments to BEE star rated ones. Higher the star rating, greater its efficiency.
- Replace equipment components with higher energy efficient parts during maintenance or in case of breakdown.



OPERATION & MAINTENANCE

- Get an Annual Maintenance Contract (AMC) for home appliances, which will help in:
 - Savings on cost in case the equipment malfunctions.
 - Prolonged life of equipment.
 - Regular maintenance for best performance.



After reducing the amount of energy required in a building, we must offset the conventional energy (derived from fossil fuels) with renewable energy. Renewable energy is energy derived from natural sources that is constantly replenished and does not contribute to green house gas emissions



Types of renewable energy

PURCHASE / REPLACEMENT

Solar photovoltaic : Solar PV can be installed over rooftops of common areas and buildings.

Solar street lamps: These can be used for lighting pathways and roads which offsets the building operation energy demand.

Biogas plant: Biogas can be produced at community scale from the organic waste generated on site.

Solar water heater: These can be installed in buildings for having hot water to produce hot water for domestic and other uses.

Roof top wind turbines: Small scale wind turbines installed on rooftops can be used to generate and store electricity at community scale.

Solar lanterns: These can be used at individual and home level for emergency and power backup.



MAINTENANCE

Ensure regular cleaning of solar PV panels to ensure maximum efficiency.

Ensure cleaning of biogas plant such as removal of

debris and organic matter.

Checking and

tightening bolts and

electrical connections.

CON	TRACT	
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Get an AMC for installed renewable energy system.



Checking for corrosion and worn out turbine blades.



BUILDING WATER MANAGEMENT

Building water demand in a household constitutes of water required for essential day to day activities like drinking, cooking, washing clothes and utensils, cleaning, bathing and flushing. Using low flow plumbing fixtures and efficient washing equipment in a building can reduce the building water demand by upto 30-40% in comparison with conventional plumbing fixtures.⁵ Efficiency of plumbing fixtures can be measured in 'flow rates' and that of washing appliances can be measured in terms of 'water factor limit'. Lower the flow rate or water factor limit, greater is the water saving of the fixture or appliance.



Efficiencies of typical plumbing fixtures and washing appliances present in a household are defined as flow rate or water factor limit.

PURCHASE / REPLACEMENT



can be bought and installed without changing the faucet. Aerators are equipped with mesh screens that divide the flow of water into multiple small streams by adding air in between, hence reducing the volume of water coming out of the faucet.

OPERATION & MAINTENANCE



Plumbing fixtures should be regularly cleaned with a simple brush to prevent grime deposits. Additionally, sponge filters can be placed at two locations, either at the source from where municipal water is being supplied to the apartment or at the inlet of the receiving water tank.



An annual maintenance contract (AMC) should be signed for all cleaning equipment to maintain their efficiency over time.

USER BEHAVIOUR



For activities such as brushing, shaving or washing utensils, turn off water when not required to avoid wastage.



Leakages should be checked regularly and repaired as needed.



Efficient method like using buckets, water sprinkling cans should be used for showers and washing cars.

^{5.} Salehi M, Abouali M, Wang M, et al (2018) Case study: Fixture water use and drinking water quality in a new residential green building. Chemosphere 195:80–89. https://doi. org/10.1016/j.chemosphere.2017.11.070

LANDSCAPE WATER MANAGEMENT

An efficient landscape design not only reduces the water consumption of a project, but helps mitigate environmental hazards like urban flooding and urban heat island effect. The key strategies to reduce the landscape water demand in any project includes sustainable planning and zoning of vegetation and, use of efficient irrigation practices and systems.



Plant Selection for Water Conservation

Replace grass/lawn with shrubs and trees as they require less amount of water for maintenance. Trees especially drought tolerant/ adaptive/ local species, once mature, require the least amount of water and hence should be preferred while designing landscape. Only native species of grass, shrubs and trees should be planted as exotic varieties are much less likely to survive and require a lot of water to sustain.

OPERATION & MAINTENANCE

Irrigation systems should be regularly cleaned with pressurised means to get rid of the deposits and maintain their efficiency.

USER BEHAVIOUR

Recommendation: Coconut husk / pebbles should be added to soil as they can help retain moisture in soil for longer, hence reducing losses due to evaporation.

RAINWATER MANAGEMENT

Rainwater is one of the purest freely available forms of freshwater. It can easily be used for cleaning, landscaping and flushing purposes. In case a project cannot install infrastructure to store and reuse rainwater, it should be redirected to an aquifer or landscape area to recharge ground water.

PURCHASE / REPLACEMENT



Replace impervious hard surfaces with pervious materials like grass pavers to minimize water logging and ensure percolation of rainwater into the ground.



Plant more trees in the landscape as they minimize runoff of rainwater due to their large water bearing capacity.

OPERATION & MAINTENANCE



Filter media of the desilting chamber, recharge pit and the RW pipe from the roof should be regularly cleaned. In case of the recharge pit, the filter media should be put back after cleaning the silt out of it.



Area around the desilting chamber and RWH pit should be kept clean and accessible.



Rainwater can be directed to a pond/small waterbody on site, surrounded by trees to allow for natural filtration of water. The water body can be designed as a landscape feature and an interactive public space in the project.



Rainwater harvesting tank can be designed to store and re-use water with its overflow directed into a recharge pit.



RW storage tanks, and catchment areas like terraces and pathways should be cleaned before monsoon commences to avoid contamination of harvested rainwater. The RWH pit can be cleaned manually or by using a pressure based system due to which the sludge rises up and can be skimmed off



The first rainfall of the monsoon carries the dirt and contaminants from catchment areas and should not enter the storage tank. A first flush diverter should be used to divert the first rain into stormwater drains or the landscape.

Landscape area and terraces should be kept clean and free of litter like plastic bottles, wrappers etc., as it can lead to clogging of rainwater drains hence, reducing the efficiency of the rainwater harvesting system. Signages should be installed at the project site to ensure the same.

USER BEHAVIOUR



WASTEWATER MANAGEMENT AND WATER QUALITY

As there is a lack of finite fresh water sources, it is essential to treat and reuse waste water and become self sufficient. All the sources of water for a household including water from municipality, ground water, treated water should be tested before consumption for potable and non potable purposes.



Instead of individual RO systems, societies / townships / housing developments should install water treatment plants at society scale for better management of wastewater.

OPERATION & MAINTENANCE



Filter media inside the STP should be changed and cleaned regularly. Sludge from the sludge holding tank should be regularly removed.



Quality of STP should be as per local norms.



An AMC should be signed for annual servicing of the Sewage Treatment Plant and the Water Treatment Plant on site.

USER BEHAVIOUR





Upon installation of a community scale water treatment system like RO, any waste water should reused for flushing by directly connecting it with the WC flush tank supply line.



Water from all sources should be regularly tested and should meet the local norms.



Signages should be placed at the outlet of the STP stating that STP water should not be used for domestic purposes.

VISUAL COMFORT

Δ

Visual comfort in a building is defined as the occupants satisfaction due to the right quantity and quality of light being available in the building/room for the tasks being performed.



ASPECTS TO CONSIDER FOR VISUAL COMFORT

Types of lighting in buildings



Artifical lighting and Daylighting

To ensure visual comfort recomended range for habitable spaces.

Table: Illuminance level for different spaces⁶

REQUIREMENTS	SPACES	ILLUMINANCE (LUX)
Low	Living	100-150-200
Moderate	Bedroom/dining	100-150
Moderate to high	Study/Reading/Kitchen counter	200-300-500

^{6.} National Building Code of India (NBC) (2016). http://www.bis.org.in/sf/nbc.htm

VISUAL COMFORT CONTD...

STRATEGIES TO ENHANCE VISUAL COMFORT

PURCHASE/ REPLACEMENT - DAYLIGHT

Windows: Select glass and/or solar films considering Visible Light Transmittance (VLT) values while balancing it with Solar Heat Gain Coefficient (SHGC) as per the climate.

Higher VLT, more light

Lower VLT, lesser light



Higher SHGC, higher heat gain Lower SHGC, lesser heat gain

Shading: Use of blinds/curtains to control glare and optimize daylight.



OPERATION & MAINTENANCE

When painting the interiors, selecting light colours with minimum textures helps in better lit indoors as compared to dark surfaces.



Cleaning of glazing of doors and windows to maximize daylight inside.

Cleaning of luminaires to avoid loss of light from the luminaire.



PURCHASE/ REPLACEMENT - ARTIFICIAL LIGHT

Designing of internal light should be based on task and function of the site.





Task light

Cove light Scone light

Select luminaire such as LEDs with minimum wattage and maximum lumen output



USER BEHAVIOUR

Preference 1: Maximize use of daylight during daytime before switching on artificial lights.

Preference 2: Task light over general lights if requirement is task specific.



THERMAL COMFORT

Thermal comfort is defined as that condition of mind which expresses satisfaction with the thermal environment. Thermal energy (heat/cold) can be transferred by three means which together with moisture changes influence our perception of the environment. An overall balanced thermal environment is key to feeling comfortable.



Transfer of energy

OPERATION & MAINTENANCE

Preference 1: Install solar films or external shades for windows. Preference 2: Install high Solar Reflective Index (SRI) coating or tile on roof top



OPERATION & MAINTENANCE

Preference 1: Regular cleaning of fans, exhausts and AC filters. Preference 2: Regular preventive maintenance for fans, exhausts and AC filters.

Preference 3: Cleaning door and window mosquito nets and glazing.







USER BEHAVIOUR

Preference 1: Use of clothing as per climate



Preference 2: Take advantage of outdoor favorable climate



Preference 3: Operate air conditioners at 24-25°C



Preference 4: Installing appropriate curtains/blinds



Outdoor and indoor air carry a lot of pollutants that affect the human health. The health effects of the air quality could be immediate, seen after single or repeated exposures, or could be long term and show up after a certain duration. Therefore, treatment of air becomes a cornerstone for a healthy living.



WASTE MANAGEMENT

Solid waste is generated due to various anthropogenic activities. The quantum and type of waste generated is largely dependant on the building typology and its use. Residential units generate domestic waste that includes waste items such as: food wastes, paper, cardboard, plastics, textiles, batteries, lighting fixtures and household hazardous wastes.



Types of domestic waste generate from households

Waste can be pose serious short term and long term threats to the environment and human health if not managed strategically. When not managed at source, most of the household waste find its place in the landfill. Common waste management practices followed in residential units are:

No segregation of waste at source Unhygienic waste storage Uncovered garbage being taken to landfill Image: Construction of waste at source Image: Construction of waste Image: Construction of waste Image: Construction of waste Image: Construction of waste Image: Constructio of waste Image: Construction o

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DOMESTIC WASTE MANAGEMENT

The issues created by poor waste management can be easily tackled if simple strategies are adopted by every stakeholder involved in the chain. If management happens at source, then a large part of the domestic waste can be converted into resource and can be put to useful purposes. The following steps can be followed for domestic waste management at individual residences and society level for efficient management and safe disposal of waste.



Efficient management of existing infrastructure for waste

STRATEGIES TO MANAGE DOMESTIC WASTE AT HOUSEHOLD LEVEL

PURCHASE/ REPLACEMENT

Use multi coloured bins to segregate household waste.



Community level collection facility should be provided for hazardous waste and waste generated in lesser quantities in individual household such as e-waste, for better management

OPERATION & MAINTENANCE

Proper labelling of waste bins helps people to dispose waste in a segregated manner.



Use recyclable composting bags for the bins



USER BEHAVIOUR

Use eco friendly lifestyle to reduce consumption. Eg: Use cloth bags instead of polythene bags.



Educate your family.



Building audits are carried out on existing buildings to determine if they are still fit for purpose and if they need remedial work done to rectify any issues.



Remember

6.1

For achieving higher saving, consult an energy auditor to check your home for more inefficiencies .

BUILDING AUDIT & MONITORING CONTD...

Metering helps in measuring consumption and analyzing abnormal usage patterns. Further the data can be utilized to reduce consumption. Metering in existing building can happen for two resources i.e. energy and water. To manage these resources properly, resource consumption can be tracked at a basic level or an advanced level. Resource management is the key to resource efficiency.

BASIC METERING	ADVANCED METERING	
Municipality supply	Flushing	
Bore well	Domestic	
Treated water outlet	Irrigation	
Captured Rainwater	HVAC	

WATED METEDING

BASIC METERING	ADVANCED METERING
Utility Grid	Basement Parking Lighting
On Site Renewable Energy	Community/ recreation center
Diesel / gas generator	Water Pumping
	Outdoor lighting
	Lifts and common areas

ENERGY METERING

STRATEGIES FOR METERING AND MONITORING

PURCHASE/ REPLACEMENT

Analog meters should be replaced with digital meters

Installed energy meters should be replaced with smart meters

OPERATION & MAINTENANCE

All meters should be regularly checked to prevent errors and erratic reading.

Replace malfunctioning meters.

USER BEHAVIOUR

Observe energy and water consumption over months and compare them with previous data.

Optimize energy and water use by comparing data.

BUILDING AUDIT & MONITORING CONTD...



WHAT IS BMS?

A Building Management System is a computer-based smart metering system installed in buildings to manage and monitor equipment such as air-conditioning, heating, ventilation, lighting, power systems, security devices, sensors, and utility meters.

OPERATION & MAINTENANCE

O&M include a broad spectrum of services, competencies, processes, and tools that ensures proper functioning of the built environment to meet the design objectives. O&M typically include day-to-day activities necessary for the building, its systems and equipment, and occupants/users to perform the intended function.



COMMON BUILDING EQUIPMENT THAT ARE INSTALLED AT SITE LEVEL AND NEED REGULAR MAINTENANCE OR CHECKUPS ARE:



The requirements of O&M will vary for each user. As the number of services, variety, and complexity of facilities increase, the complexities of O&M activities increases. Refer to annexure for a sample O&M checklist.

OCCUPANTS WELL BEING AND RECREATION

7.1

Cities are growing rapidly and resulting in shrinking green and recreational spaces. With evolving lifestyles and work patterns, the need for these spaces has become essential for physical and mental wellbeing.



Diminishing green space and community living around the world impacting mental and physical health

RECREATIONAL FEATURES TO ENHANCE OCCUPANTS WELL BEING



FACILITIES FOR DOMESTIC & SUPPORT STAFF

7.2

In our day-to-day life, domestic and support staff play a major role. However, often times their basic needs are not met such as access to clean toilets, drinking water facility, comfortable shelter for resting and first-aid facilities at their work places. This leads to increased stress, unsafe environment and reduced work efficiency, and calls for thoughtful considerations for them.



Environmental awareness that includes the social and economic well being of occupants is a necessary requirement of environmental protection and sustainable development.



Awareness and knowledge creation on sustainable living begins at individual scale. Steps should be taken to ensure sustainability first at individual and home level. Further, environmental education and ideas can be incorporated at a community level by RWA activities.





ANNEXURE I

LIST OF PLANTS FOR IMPROVED AIR QUALITY

PLANTS	POTHOS	SNAKE PLANT	SPIDER PLAN
Oxygen levels	1500 ml (approx.)	900 ml (approx.)	950 ml (approx.)
Absorbs	CO ₂ , CH ₂ O, CO, C ₆ H ₆	CO ₂	CO ₂ , CO,

PLANTS	PEACE LILY	TULSI	WEEPING FIG
Oxygen levels	950 ml (approx.)	1050 ml (approx.)	1200 ml (approx.)
Absorbs	CO ₂ , CH ₂ O, CO,	CO ₂ , CH ₂ O, CO	C2HCl3, C ₈ H ₁₀ , CH ₂ O, CO ₂

VOC LIMITS OF PAINTS

PAINT APPLICATION	TYPE OF FINISH	VOC Limit (g/L)
Interior contings	Flat	<50
Interior coatings	Non-flat	<150
Exterior coatings	Flat	<200
	Non-flat	<100
Anti-corrosive	Gloss/semi-gloss/flat	<250

DISCLAIMER

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