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GOVERNMENT OF KERALA

Abstract

Public Works Department- Green Building Policy- Approved- Orders Issued.

PUBLIC WORKS (E) DEPARTMENT

G.O.(Ms)No. 28/2013/PWD

Dated, Thiruvananthapuram, 07.03.2013

Read:- Letter No. CA-242/GL/2011 dated 30.10.2012 from the Chief Architect, Public Works Department, Thiruvananthapuram.

ORDER

In the Revised Budget Speech for 2011-12, it was announced that a new Construction Policy will be evolved in the state as part of the implementation of the Green Building Policy which is environment friendly. It was mentioned therein that the pilot project will be implemented under the Chief Architect, for the implementation of training, technical excellence and quality maintenance. The financial assistance will be made available from the Department of Non-Conventional Energy. Accordingly, the Chief Architect, Public Works Department prepared and submitted draft policy on "Green Building" for consideration and approval of Government.

2). Main objectives for the implementation of Green Building policy are the following:

i. Conserve the natural resources, reducing the soil waste or improved air and water quality, protection of ecosystem and biodiversity thereby mitigating the adverse impact of the built environment on human health.

ii. By adopting these we aim to reduce the consumption of electricity by 40 to 60% in these buildings as compared to the conventional buildings and water consumption by 40 to 80%

iii. By using solar thermal panels and other source of non-conventional energy, the green building attempt to work towards on-site energy generation and thus reduce energy consumption cost.

iv. By employing waste management strategies these buildings aim to minimize the burden on municipal waste management facilities.

v. Limiting the all kind of pollution during and after construction is also aimed at to ensure reduced impact on surrounding environment.

vi. These buildings ensure proper safety on health and sanitation facilities for labourers and occupants.

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vii. By adopting the policy, Government aim to give a face lift to the building sector under Government and thus improve the image of the concerned departments.

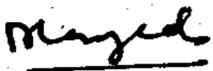
3). Government after examining the policy in detail are pleased to approve "Green Building Policy" as appended to this order.

By Order of the Governor,
T.O.SOORAJ
Secretary to Government.

To

The Chief Engineer, PWD (Buildings), Thiruvananthapuram.
The Chief Architect, Public Works Department, Thiruvananthapuram.
The Secretary, Kerala Legislature Secretariat, Thiruvananthapuram.
The Principal Accountant General (Audit), Kerala, Thiruvananthapuram.
The Accountant General (A&E), Kerala, Thiruvananthapuram.
The General Administration (SC) Department.
The Local Self Government Department
The Finance Department
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Section Officer

Copy to :- PS to Chief Minister
PS to Minister (Works).
PA to Secretary, PWD.

GREEN BUILDING POLICY

1 PREAMBLE

1.1 The Background

The Building Industry plays a leading role in our country's fast growing economy. In Kerala also, the construction sector contributes a major share to our economy. But this uncontrolled growth poses grave challenges for us and the environment. Large quantities of natural resources like forest, soil cover, water and energy are extensively used in building industry. The use of energy intensive materials is constantly eroding the quality of our environment. Globally, buildings are responsible for at least 40% of energy use. Almost 70% of the energy consumed in building is for lighting, air conditioning and water heating with over 40% of the global water consumption claimed by the construction industry, water is becoming a scare commodity.

Building operations and inhabitant activities generate huge quantity of waste also. Almost 48 % of all solid waste is generated by buildings. This quantum of waste over stresses the waste management system. The mixed waste produced by the building contains 5-15% recyclable materials which can be further utilized.

Building activities are directly contributing to almost 50% of the air and water pollution. Urbanisation has resulted in the rapid decrease of green vegetation cover, thus contributing to global warming due to the increased use of air conditioners and emission of greenhouse gases.

To prevent energy loss and to decrease the energy supply demand gap, the Central Government has enacted the 'Energy Conservation Building Code' (ECBC) in 2001 and has constituted 'Bureau of Energy Efficiency' under the Ministry of Power. The 'Indian Green Building Council' (IGBC) started in 2001 has been able to create awareness in the national level in this direction. They have given many suggestions to achieve energy savings and environment friendliness in the building sector.

1.2 Green Concepts

The green concept and techniques are aimed to achieve energy efficiency, effective waste management, conservation of natural resources and minimum use of fossil fuels. Construction methodology based on these concepts promotes to the health and well-being of the individual and the society at large. These buildings consume minimum energy, water and other resources during its entire life cycle.

1.3 Relevance of Green Concepts in Kerala Scenario

Kerala being an environmentally sensitive geographic region with resource deficiency, it is imperative to promote the green building technology in an organised way. A Green building policy has to be formulated by the Government of Kerala to provide guidelines for the various organisations in the building sector. While energy performance of the building is the primary focus in green building context, water conservation and the use of sustainable materials also needs foremost attention considering the peculiar characteristics of our state.

2. THE POLICY

The policy initiatives delineated here comprise strategies aimed to:

2.1 Constructing self-sustainable buildings which consume minimum energy, water and other resources during the entire life cycle and cause the least adverse impact on the environment without compromising the standard comfort levels.

2.2 Popularise and implement Green Building concepts, considering the negative impact and exploitation of natural resources caused by conventional buildings both in its construction stage and operation stage.

2.3 Issuing guide lines to various organisations in the building sector to adopt the Green building policy in the construction of new building and its implementation in existing buildings.

2.4 Implementation energy conservation codes, results in reduced operations costs and improves the employees productivity and satisfactory by providing comfortable interior and exterior spaces.

2.5 Enhance occupant's health and comfort by facilitating adequate air, thermal and acoustic conditions and thereby minimizing the strain on local infrastructure.

2.6 Minimize the demand on non- renewable sources.

2.7 Maximize the use of efficient building materials and construction practices.

2.8 Maximise re-use, recycling and utilisation of renewable resources.

2.9 Reduce the environmental damage we cause and undertake necessary corrective measures for the benefit of Mother Earth and thus contribute to the well-being of our future generations.

3. OBJECTIVES

The Government have set the following immediate objectives for the implementation of Green building policy in the state.

3.1 Green building techniques shall be implemented in buildings which shall be classified into suitable groups based on the plinth area.

3.2 Since there are no existing mandatory directions for Governmental and non-governmental organisations to implement Green building policy guide lines in buildings, the policy has to cover both existing and new buildings.

3.3 Priority shall be given to large buildings in urban and semi urban areas with emphasis on retrofitting of existing buildings.

3.4 Conserve the natural resources, reducing the soil waste or zero discharge of waste, improved air and water quality, protection of

ecosystem and biodiversity, thus mitigating the adverse impact of the built environment on human health.

3.4.1 Establish a building system which relies on passive architectural interventions in the building design, high efficiency materials, and latest engineering technology. By adopting these we aim to reduce the consumption of electricity by 40 to 60% and water consumption by 40 to 80%.

3.4.2 On-site energy generation

By using solar thermal panels and other sources of nonconventional energy, the green buildings attempt to work towards on-site energy generation. This can reduce the dependence on the power grid.

3.4.3 By employing waste management strategies, these buildings aim to minimise the burden on municipal waste management system.

3.4.4 Aims to limit all kinds of pollution during and after construction to ensure reduced impact on surrounding environment. These buildings ensure proper safety, health and sanitation facilities for labours and occupants.

3.4.5 As Green Buildings are perceived as socially responsible, environment friendly and sustainable, Government aim to bring about a paradigm shift in the building sector under the Government and thus reiterate its commitment to create eco-friendly, sustainable and energy efficient built environment.

4. SCOPE

Buildings shall be grouped under different categories based on plinth area.

Building with plinth area less than 2500Sq.m shall be treated as small buildings provided there is no future expansion. Buildings with more than 2500 sqm plinth area shall be treated as large for the purpose of Green building classification. In addition to above classification, large campus development projects with built up

area more than 150000Sq.m shall be treated under a special category.

Building Type	Area	Features
Small	Below 2500Sq.m	Minimum requirement for a 3star under SVAGRIHA
Large	2500 Sq.m and above	Minimum requirement for 4Star under GRIHA
Campus	More than 150000Sq.m	5 Star under GRIHA

5. IMPLEMENTATION

5.1 Government Buildings under PWD

PWD Buildings have to play an important role by demonstrating its commitment by fully adopting the green building technologies in all new buildings. A core team including trained members from various disciplines and experts from outside PWD may be formed to guide all units in planning, designing and implementation of projects. Assistance of experienced consultants may be availed in some initial projects. Ratings from GRIHA may be adopted to ensure that the processes are compliant with the standard practices. Rates and specifications of some items for construction required to be adopted to accommodate green features has to be included in the Data book and the Schedule of Rates to facilitate the preparation of estimates. Post occupancy evaluation may be carried out by internal teams suitably trained for this purpose.

5.2 Other Government Buildings

Buildings constructed by other public organizations (other than those taken up by PWD) need to be brought under the green building policy making them committed through internal initiatives. It is advisable to make the rating from GRIHA mandatory for the building projects undertaken by such organizations. In case of difficulty, they may be advised to take the guidance of the core committee for green building compliance. The approval by the local body for such buildings may be linked to the commitment to certification by GRIHA or by the specific recommendations of the core committee.

5-3 Private Buildings

Private Buildings other than residential buildings with plinth area less than 500Sq.m in individual plots may have to go for ratings under GRIHA with appropriate levels of certification applicable based on the decisions of the local body. Local bodies can enter into MOU's with the rating agencies for speedy implementation at affordable costs. For small residential buildings, minimum criteria may be single star under SVAGRIHA, and local body approval can be linked to certification of licensed Engineers in green building practices.

5-4 Existing Buildings

A different strategy is required for converting the existing buildings into green buildings. Only buildings with plinth area more than 2500Sq.m may be considered for this purpose. Since it is difficult to consider the private buildings, only public buildings may be targeted. Buildings with plinth area more than stipulated above may be surveyed by experienced team under the supervision and guidance of the core committee and only technically and financially feasible buildings shall be chosen. Action plan to convert the buildings may be developed considering the availability of funds. Government may consider the possibility of central assistance through MNRE for taking up such projects.

5-5 Green Building Regulatory Committee

It has been proposed to constitute a Green building regulatory committee to regulate and coordinate Green building activities under PWD with The Secretary to Government, PWD as the Chairman and Chief Engineer (Buildings), Chief Architect, Chief Engineer(LSGD) as members.

This core committee shall be entrusted with task of overseeing the entire implementation of the green building policy by providing necessary technical advises and directions to various organizations and local bodies in addition to their role in ensuring that all PWD buildings are built incorporating green principles. The review of the policy may be carried out based on the inputs by the committee as and when required.

5-6 Green Building Guidance Team.

It has been proposed to constitute a team for Green Building Guidance under Green Building Regulatory Committee (GBRC) to

give guidance in the design and construction of buildings under the Government of Kerala with a built up area of 5000 Sq.m or below.

5-6-1 Structure of the Green Building Guidance Team

- i. Deputy Architect deputed by the Chief Architect, PWD.
- ii. Landscape Architect deputed by the Chief Architect, PWD
- iii. Assistant Executive Engineer (Electrical) ,PWD
- iv. A Green Building Expert nominated by GBRC.

The members of the team shall have the necessary qualifications and expertise to evaluate the green building projects under their discipline for basic evaluation and submission.

5-6-2 Duties and Responsibilities of Green Building Guidance Team

Deputy Architect, Office of the Chief Architect, PWD

The officer shall give guidance in the architectural parameters of the design mentioned in the rating system, such as conformity to existing bye laws, proper preservation of natural landscape and efficient planning of utilities.

He shall also ensure that the design is climate responsive and has adequate day lighting and efficient usage of water, energy and materials.

The Landscape Architect, Office of the Chief Architect, PWD

The officer shall give guidance in the preservation of existing vegetation, top soil preservation and stabilization, minimisation of hard paved areas and parking. He shall ensure that appropriate measures shall be taken for the prevention of soil erosion.

Assistant Executive Engineer (Electrical), PWD

The Officer shall give guidance regarding compliance with respect to the implementation of ECBC norms, and comfort levels as per NBC and utilizations of renewable energy for the energy needs of the building and its occupants. He shall also give guidance on the optimisation of energy performance, by ensuring adequate day lighting and avoiding over design of lighting system.

5-7 Post Occupancy Evaluation

Government have proposed to utilize the services of Green Building Evaluation Team for a critical analysis on energy performance of existing important buildings. Necessary technical and non-technical remedies shall be adopted to reduce the energy consumption in these buildings by a margin of 15-25% within a time span of 3 years. For this, appropriate direction shall be given to concerned departments/authorities to adopt relevant sections of ECBC. The mandatory provisions of ECBC shall be strictly followed.

5-8 Awareness Campaign

Government shall take necessary action to propagate Green Building ideas, concepts and construction techniques through various media in co-operation with concerned Government departments, agencies and with private firms and individuals in the field. Government aims to create and maintain a green ambience in the society by creating awareness among all the groups engaged in building industry. This includes all the technical persons engaged, labours, contractors, client departments and the common public.

5-9 Training activities:

Government shall take necessary steps to equip all concerned departments in Green building technology and methods by the end of 2013. Series of workshops and seminars shall be arranged to enable PWD officials to gain expertise in the technology and the process has already started. Consequently district wise training programme for workmen and contractors shall be arranged to create large pool of trained manpower.

5-10 Promotional activities:

All kinds of promotional activities announced by MNRE and other central agencies shall also be followed here. This shall include annual cash award and citation for green buildings rated from 3 star and above

5-10-1 Incentives to Local Bodies:

The Government shall announce an annual award and citation for local bodies (LSGIs) including Municipalities, corporations and

other urban local bodies who are involved in Green building activities efficiently.

5-10-2 Tax Exemption:

Government shall announce a rebate on property tax and building tax for energy efficient buildings listed under any rating criteria.

Government shall announce a rebate in property tax and building tax separately for efficiency in

- i. Energy utilization
- ii. Waste treatment
- iii. Non conventional energy

5-10-3 Memorandum of Understanding

Government shall take necessary steps to sign an MoU with GRIHA Secretariat in the presence of MNRE for large scale promotion of green building in the state to get all the new and important buildings rated.

5-10-4 Subsidy for Solar Photovoltaic installations

It has been proposed to support SPV systems through subsidy which shall be made available under MNRE for urban areas.

5-10-5 Incentives to Architects/Engineers/Design consultants/contractors:

To encourage Architects/Engineers/Design consultants/contractors and Design Firms to design buildings in Green Architectural concepts and get them rated, incentives shall be announced annually.

5-10-6. Building Owners: Reimbursement of 90% of the registration cum rating fee for projects up to 5000 Sqm with a minimum 3 Star rating and for projects with a built up area more than 5000Sq.m with a minimum 4 Star rating shall be announced as per GRIHA norms.

5-10-7 Relaxation in F A R: Rule No. 31 of Kerala Municipality Building Rules (KMBR) which specifies the floor area ratio shall be suitably modified to promote Green buildings. Suitable relaxation in fee shall be provided for Green Buildings with 4 and 5 star ratings under GRIHA.

5-11 Rating System:

It has been proposed to adopt a rating system for Green buildings which is an evaluation tool, that measures the environmental impact of a building throughout its life cycle. GRIHA is the rating system developed by TERI, endorsed by The Ministry of New and Renewable Energy (MNRE), Government of India and has been adopted for buildings with a built up area of more than 2500Sq.m and SVA GRIHA, a modified but simplified version of GRIHA has been adopted for buildings with a built up area less than 2500 Sqm. The rating system LEED which is adopted by the Indian Green Building Council can also be used for rating wherever applicable.

5-11-1 Classification of Green Buildings

The classification specified in the GRIHA rating system and LEED rating system shall be adopted here also.

5-12 Revision of PWD Schedule

Government shall take necessary steps to update the PWD schedule of Rates and Specifications to include necessary items which are needed for Green Building activities, referring relevant data books and codes and schedule of rates and specifications of Central Government agencies.

5-13 Waste Management

In the absence of proper and scientific methods of collection and treatment of municipal solid waste and other waste,our state faces severe health and environmental problems. To manage this acute situation, Government have proposed to implement multi-level waste management system, so that the state will become ZERO waste discharge state by the end of 2015.

Following are the main objectivesfor managing waste in a sustainable way

- i. Minimization and reuse of waste
- ii. Recovery and recycling of waste
- iii. Safe and final disposal of waste

5-13-1 Action Plan

To achieve this, a three-pronged strategy shall be implemented as follows:

- i. Mass awareness campaign:-Organise mass awareness programme to propagate information and educate the public on cleanliness in the neighbourhood.
- ii. Cleanliness campaign:-Government shall announce a week long campaign with the slogan 'CLEAN KERALA' to be conducted every year before monsoon.
- iii. Public participation:-'CLEAN KERALA' programme shall be conducted by the participation of general public, school, and college students, NSS, youth cadets, youth organisations, Government servants, NGOs, political parties, residential associations, environmental activists etc.

5-13-2 Implementation

Steps shall be taken to make provision for waste treatment plant mandatory for all types of buildings, sufficient subsidy for waste treatment plants shall be made available through various agencies.

For the successful execution of 'CLEAN KERALA' mission, a multi level waste management system shall be implemented within a span of two years as detailed below:

- i. Appropriate waste treatment system shall be installed in all dwelling units with financial help from Government or other agencies.
- ii. Waste treatment system shall be made mandatory for community centres, housing colonies, canteens, hotels, apartments etc.
- iii. Waste treatment plant and biogas plant shall be made compulsory in all market places.
- iv. MSW (municipal solid waste) treatment plant shall be installed in all major municipalities as first phase.
- v. E-Toilets shall be installed in all public places.
- vi. Mobile incinerators and permanent incinerators shall be provided wherever it is needed.
- vii. Untreatable waste shall be used as landfill for road construction.
- viii. Plastic waste shall be shredded and used as ingredient in bitumen and used for paving the roads.

5-14 Periodical Evaluation:

The implementing agencies shall make arrangements to monitor and evaluate the projects every 5 years and shall furnish progress report to the concerned Rating Agency

5-15 Pilot Projects

As the first step in the implementation of the Green Building Policy, Government have proposed to execute a Green Project in each District on an experimental basis. The concerned Division offices of PWD (Buildings) shall be equipped with necessary knowledge, technology and man power required for the successful execution of these projects.

CONCLUSION

Building tradition in Kerala has all along been evolved by adopting sustainable green building practices. Since sustainable construction is gaining prominence in the backdrop of present day construction scenario, the Government endeavours to promote Green Building concepts and practices in a planned manner. This Policy document is envisaged as an evolving framework of green building technology which may be improved suited to the present and future requirements.