

Terms of reference (ToRs) for the procurement of services below the EU threshold

**Climate Smart Buildings: Replicable Design options for
Thermally Comfortable Affordable Housing**

**Project number:
18.2053.9-001.00**

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List of abbreviations

ASHA	Affordable Sustainable Housing Accelerator – India
ARHC	Affordable Rental Housing Complexes
BIM	Building Information Model
BMZ	German Federal Ministry of Economic Cooperation and Development
BMTPC	Building Material and Technology Promotion Council
BOQ	Bill of Quantities
DHP	Demonstration Housing Projects
ECBC	Energy Conservation Building Code 2017
EERB	Energy Efficiency Residential Building
ENS	Eco-Niwas Samhita
EWS	Economic Weaker Section
GHTC	Global Housing Technology Challenge
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GTCC	General Terms and Conditions of Contract (GTCC) for supplying services and work
IGEN	Indo-German Energy Programme
KPI	Key Performance Indicator
LHP	Light House Projects
LIG	Low-Income Group
MoHUA	Ministry of Housing and Urban Affairs
NBC	National Building Code 2016
PMAY(U)	Pradhan Mantri Awas Yojana - Urban
SDG	Sustainable Development Goal
TCAH	Thermally Comfortable Affordable Housing
TOR	Terms of Reference

1 Context

1.1 Background

India has a rich tradition of climate responsive architecture with varied passive design strategies, from the beginning of the civilization, in order to achieve comfortable indoor living conditions for the inhabitants which were more responsive to the local climatic conditions and geography. Monuments and different heritage buildings/homes were erected with an aim of preservation and sustenance of environment by following the principles of vernacular architecture practices.

In earlier times sustainability and sustainable buildings have been the usual way of life in India. These buildings provided thermal comfort to the occupants. They were designed using passive techniques with minimum external intervention, which in modern times have become quite necessary. However, building houses has changed dramatically in the recent past.

The actual rapid urbanization is creating an unprecedented demand for the construction of buildings, which already account for more than 30 percent of India's total electricity consumption¹. In line with expanding development, the country's building sector is expected to increase five-fold from 2015 to 2050. Projections show that electricity consumption in residential buildings alone is expected to increase seven-fold during the period 2012-2032.

The residential sector will become the largest consumer of electricity in the country with 36.5% share of the total electricity consumed in 2032. India is at a unique crossroads where two-thirds of the commercial and high-rise residential structures that will exist in 2030, are yet to be built. Thus, implementing energy efficiency in buildings that are being constructed in the next ten years, highlights a singular opportunity to reduce the locked in energy, alter future consumption patterns and enhance cost savings for the several decades.

The Sustainable Development Goals, also known as SDGs, were adopted by all United Nations Member States in 2015 as a universal call to action to end the poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. One of the SDG goals, SDG11 depicts human settlements through inclusive, safe, resilient and sustainable cities. The other SDGs relevant to this project are SDG 7, 9 & 13.

SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

¹ Ministry of Statistics and Programme Implementation (MoSPI). 2018. Energy Statistics 2018. New Delhi: MoSPI, Government of India.

SDG 13: Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy

1.2 About Pradhan Mantri Awas Yojana - Urban (PMAY-U)

The Government of India has been implementing its flagship programme- Pradhan Mantri Awas Yojana- Urban (PMAY-U) since 2015 to fulfil the vision of Hon'ble Prime Minister of India to provide 'Housing for All' by 2022. Under the Mission, Ministry of Housing and Urban Affairs (MoHUA), provides Central Assistance to implementing agencies through States and Union Territories for providing houses to all eligible families/beneficiaries by 2022. The Mission is addressing the affordable housing requirement in urban areas through following programme verticals:

- Subsidy for Beneficiary-Led individual house construction/ enhancement. In-situ Slum Redevelopment (ISSR) for Slums
- Affordable Housing in Partnership with Public & Private Sectors
- Promotion of Affordable Housing through Credit Linked Subsidy
- Slum rehabilitation of Slum Dwellers with participation of private developers using land as a resource.

As an outcome of PMAY-U, 11.2 million houses are being constructed within the Mission period. The houses built under the Mission will last at least 50-60 years and thus have a potential to impact resource usage during their life span. Further, the decisions taken during implementation have an impact on the level of comfort that these dwellings provide to its occupants, thus impacting their energy use and costs and the associated carbon emissions over the lifetime of the buildings. A significant portion of the projected electricity demand is expected to come from increased appliance ownership and cooling needs arising from enhanced access to housing, thus making thermal comfort an imperative concept to be considered while designing and building homes.

Currently, work in building thermal comfort has been partially addressed through development of thermal comfort standards for building and development of Eco-Niwas Samhita 2018 (ENS) for multi-storey residential building. However, to achieve the desired level of thermal comfort, enhance ease of understanding of wider citizens of the country, and development of capacity of stakeholders, further efforts are required. GIZ has supported Government of India for the development of Eco-Niwas Samhita, Labelling mechanism for residential buildings, Energy Efficient Building Material Directory, Catalogue of replicable designs for energy efficient residential buildings and the Smart Home program.

1.3 Brief description of the project

The Federal Republic of Germany and the Government of the Republic of India have, under the Indo-German Technical Cooperation, agreed to jointly promote the "Indo-German Energy Programme" (IGEN) with the aim to foster sustainability in built environment in order to use sustainable materials for Thermal comfort and in turn improve the environment and climate conditions. IGEN's programme, Climate Smart Buildings (CSB) proposes to extend technical assistance and cooperation for the following:

- a. Technical assistance in developing thermal comfort action plan for climate resilience building for mass scale application in selected states for Affordable Housing

b. Technical support in implementation of Global Housing Technology Challenge-India (GHTC-India)

The Climate Smart Buildings (CSB) programme is aligned with the commitments made by the Indian Government to meet its objectives submitted under SDG 11.

The objective of this programme is to enhance climate resilience and thermal comfort in buildings by adopting innovative passive measures, local sustainable and low embodied energy material coupled with best available technologies in constructions and buildings in affordable housing. There are various efficient practices that can be adopted such as shading elements, efficient walling materials, insulation, optimum orientation and structured passive design techniques along with local innovative sustainable building material.

Building constructed and operated through innovative technologies and use of appropriate modern products, materials and designs will lead to sustainability in buildings and mitigation of carbon emission in order to optimize the energy use and in turn improve the environment and climate protection.

The main objective is to make a standard on Thermal comfort for affordable housing so that the degree of discomfort hours could be reduced by more than 50% through series of passive design solutions and various passive measures thus improving the quality of livelihood and further to its affordability. Additionally, this will be supported by the development of innovative emerging technologies and construction materials and implementation of ongoing programme of MoHUA.

1.4 About GIZ

For over 60 years, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH has been working jointly with partners in India for sustainable economic, ecological, and social development. Currently, GIZ has over 330 employees in India, of whom 85 per cent are national personnel.

India is fast emerging as an economic and industrial power. It is a member of the 'Group of Twenty' (G20) as well as one of the five major emerging national economies, namely Brazil, Russia, India, China and South Africa (BRICS). Despite the country's rapidly growing economy, poverty and other socio-economic issues remain a challenge. The burgeoning population and accelerated urbanisation in the country have resulted in an environment at risk and greenhouse gas emissions that continue to spiral upwards.

The focal areas of Indo-German cooperation currently are:

- Energy
- Environment, Preservation, and Sustainable Use of Natural Resources
- Sustainable Urban & Industrial Development
- Sustainable Economic Development

The Federal Ministry for Economic Cooperation and Development (BMZ), the Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) as well as the Federal Ministry for Economic Affairs and Energy (BMWi) are the main commissioning parties

of GIZ in India. Other clients include Indian public sector clients, the European Union and foundations.

The Government of India has launched numerous important initiatives to address the country's economic, environmental and social challenges, and GIZ is contributing to some of the most significant ones. For example, it supports key initiatives such as Smart Cities, Clean India and Skill India. GIZ, in close cooperation with Indian partners, devises tailor-made, jointly developed solutions to meet local needs and achieve sustainable and inclusive development.

1.5 Objectives

GIZ seeks to contract a consultant to enhance the skills of the stakeholders, this assignment will focus on Developing a Catalogue of Replicable Design options for Thermally Comfortable Affordable Housing. This will not only enhance awareness of Thermal comfort but also build capacity of Government officials at ULB/State/Centre levels and other stakeholders in various states to promote market transformation. Transformation to climate responsive design and effective use of efficient building materials will contribute to major energy, cost savings and reduction of GHG emissions.

The proposal responding to this tender should contribute to achievement of the following results:

- Enhance knowledge of senior officers at ULB/State/Central government on thermal comfort and support its mainstreaming in affordable housing schemes/policies.
- Equip building design professionals with advanced knowledge on thermal comfort and capacitate them to integrate thermal comfort in upcoming affordable housing projects.

1.6 Target group and other stakeholders

The target group of the consulting work consists of the relevant staff members of MoHUA, BMPTC, State Agencies, CPWD & State PWDs, State Urban Development Ministries, ULBs, City Planners, Building material manufacturers, Architects & Engineers, Financing bodies, Municipalities, and Green Building certification bodies in India.

2 Tasks to be performed by the contractor

The contractor will be required to carry out a study to assess and document the typologies of affordable housing projects constructed under PMAY(U). The assessment shall also focus on the various construction technologies and building materials used in the projects and its correlation with occupant's thermal comfort performance and sustainability. The tender involves coordination with GIZ, MoHUA, PWDs, UDDs, ULBs, etc.

The main activities outlined in this tender document provide a guideline for the envisaged activities, the contractor is expected to adjust flexibly to changing demands for support. The contractor is required to execute the work by involving pool of international and local experts who will be undertaking the desired survey and research activities. The pool must consist of a mix of senior and mid-level experts. A consortium or joint venture can be formed to submit one single bid. A consortium/joint venture needs to appoint one consortium/joint venture leader who will take over all communication and represents the contracted parties in front of GIZ and third parties. No cross-communication to GIZ (via other consortium/joint venture members) will be accepted by GIZ.

The staff members seconded by the Contractor must work closely with the GIZ project coordinator. The contractor will have to submit monthly/quarterly (and on request) project status report to GIZ in the prescribed format (refer annexure A).

2.1 Short description of the work packages

The objective of this assignment is to conduct an extensive study on innovative material and technology to develop climate specific design package for affordable housing. The developed design packages will act as a guide for the developers on how to construct using innovative and cost-effective technology. This will help in achieving enhanced thermal comfort in affordable housing through passive techniques. The scope of work for contractor includes following tasks:

- Develop concept/schematic replicable type designs for Thermally Comfortable Affordable Housing
- Provide solutions to meet the requirements of Eco-Niwas Samhita (ENS)², NBC 2016 for applicable climatic zone
- Provide technical standards and specifications for proposed construction technology and materials
- Provide list of vendors/suppliers for proposed construction technology and materials
- Evaluate building design drawings for code compliance and assess thermal comfort based on simulation
- Develop bill of quantities (BoQ) for proposed construction technology and materials
- Prepare BIM models for the developed design options

² http://www.econiwass.com/pdf/publication/ECBC_BOOK_Web.pdf

- Organize capacity development workshops for the stakeholders to enhance awareness

The proposed designs should be amenable to latest innovative systems of construction technologies for enabling repeatability, fast track and ease in construction (e.g., Light House Projects, Demonstration Housing Projects, etc.).

The overall duration of the assignment is 12 months from the date of signing contract. The entire activity is divided into following work packages:

- WP1: Documentation of architectural typology, construction technology and materials used for affordable housing under PMAY-U
- WP2: Develop Architectural Designs & Specifications of Replicable Design options for Thermally Comfortable Affordable Housing
- WP3: Develop Budget Estimates of Replicable Design options for Thermally Comfortable Affordable Housing
- WP4: Develop BIM and Simulation Models of Replicable Design options for Thermally Comfortable Affordable Housing
- WP5: Organize Awareness Workshops and Event for the Launch of Replicable Design Catalogue for Thermally Comfortable Affordable Housing

A committee may be formulated by MoHUA/GIZ to provide overall guidance and review the deliverables submitted by the contractor.

2.2 Detailed Specifications (Work Packages)

The Consultant will be responsible for successfully executing the following activities and tasks in close consultation with MoHUA and GIZ.

2.2.1 WP1: Documentation of architectural typology, construction technology and materials used for affordable housing under PMAY-U

The contractor will be required to carry out a study to assess and document the typologies of affordable housing projects constructed under PMAY(U). The objective of documentation is to develop a broad framework and establish usefulness of a more detail study and comprehensive work. As a part of this study, a broad review of government funded affordable housing shall be carried out for all climatic zones. The collected data shall be presented in the case study section. The purpose of the study is to:

- understand the present housing typology of the specific climate zone
- understand a broad framework of technology used in these houses
- understand the costing associated with used technology
- assess the thermal performance of the houses through simulation
- establish correlation between used building material, technology and occupants' thermal comfort

This study shall be carried out in specified time frame and aim to develop a broad framework to capture the ground data and develop a basic design model with reference to ground data to analyze the impact of intervention.

Deliverables:

1. Develop a proposal with methodology for assessment and documentation. The methodology should include:
 - desk review of relevant documents to be considered for the study
 - criteria for selection of projects for site visits
 - indicators for assessment of performance
2. Report on documentation of the typologies of affordable housing projects constructed under PMAY(U) highlighting occupant's thermal comfort and above mentioned aspects.
3. Gap analysis document w.r.t thermal comfort and sustainability.

2.2.2 WP2: Develop Architectural Design & Specifications for Replicable Design options for Thermally Comfortable Affordable Housing

The contractor will be responsible to develop a catalogue of replicable design options for Thermally Comfortable Affordable Housing. Based on the study conducted under WP1, the contractor shall develop at least 1000 replicable type designs for mainstreaming thermal comfort in affordable housing for all climatic zones.

The number of design options stated above are the permutation and combination based on different typologies, site conditions and climatic zones. The contractor needs to devise a strategic approach to optimize the number of iterations to arrive at the desired catalogue.

1. Architectural Planning and Design package:
 - a. The Consultant shall prepare the drawings as per the Model Building Bye Laws, 2016. The architectural design shall be carried in terms of specifications of latest editions of Bureau of Indian Standards (BIS) Codes, National Building Code, Eco-Niwas Samhita, CPWD Guidelines etc. and in compliance to various other approvals/guidelines in India applicable to this work.
 - b. The proposed design options shall be developed in consultation with technical committee formulated by MoHUA/GIZ. The consultant is required to submit preliminary design to MoHUA/GIZ for approval.
 - c. Preparation of Building-wise Floor plans in 1:100 scale or any other suitable scale.
 - d. Preparation of Elevations and Sections wherever required in suitable scale.
 - e. Preparation of Typical details in 1:50 or any other suitable scale.
 - f. Preparation of interior design and Room wise Equipment / furniture layout / furnishing. Layout drawings to be at 1:100 scale or any other suitable scale.
 - g. Any other designing and detailing required for comprehensive planning and designing of the proposed building and for obtaining ENS compliance.
2. Technical specification documents:

- a. Preparation of Data sheet showing Room wise and Building wise finishing, flooring and Door window, and other schedules
- b. Preparation of Technical Specification for Consultancy works

Deliverables:

1. Develop a detailed work plan including criteria for selection of architectural typologies, construction technologies and materials
2. Architectural design package and Technical specification documents of all the developed design options for Composite & Hot Dry climate zones.
3. Architectural design package and Technical specification documents of all the developed design options for Warm Humid climate zone.
4. Architectural design package and Technical specification documents of all the developed design options for Temperate climate zone.
5. Architectural design package and Technical specification documents of all the developed design options for Cold climate zone.

2.2.3 WP3: Develop Budget Estimates of Replicable Design options for Thermally Comfortable Affordable Housing

The contractor shall develop the following supporting documents for Estimate and Costing to enhance the usability of the developed design options:

1. Preparation of floor wise area statement, Preliminary cost estimate based on applicable Plinth Area Rates and Market rates for non-schedule items as per the prescribed format of CPWD.
2. Preparation of detailed cost estimate based on CPWD Schedule of Rates & Market rates for non-schedule items. The Detailed Estimate showing details of measurement, BOQ, specifications etc. shall be developed by the contractor.
3. A techno-commercial feasibility statement shall be prepared and submitted by the contractor. The Techno-Commercial Feasibility statement should highlight:
 - Baseline specification and costing
 - Methodology for technical analysis
 - Definition of inputs and assumptions
 - Outputs and results
 - Conclusions and Recommendations
 - Specifications of proposed strategies/technologies
 - Financial feasibility

Deliverables:

1. Preliminary Project cost estimate of all the developed architectural design options for all climate zones.
2. Detailed cost estimate of all the developed architectural design options for all climate zones.

3. Techno-Commercial Feasibility of all the developed architectural design options for all climate zones.

2.2.4 WP4: Develop BIM and Simulation Models of Replicable Design options for Thermally Comfortable Affordable Housing

The agency shall develop Building Information Model (BIM) and Simulation Models to support optimization of the developed design options based on future scenarios:

1. Building Information Model (BIM):
 - 3D BIM model for entire building complex shall be developed on Autodesk Revit software and Co-ordinated construction drawing shall be issued from 3D BIM model for all the services in the building.
2. Simulation Models (Thermal comfort & Daylight):
 - Develop energy simulation model of the buildings on EnergyPlus based Energy Simulation software for detailed analysis and optimization.
 - Develop daylight simulation model of the buildings on Radiance based Lighting Simulation software for detailed analysis and optimization.
3. Development of a navigation Tool for hosting on web-portal³:
 - Develop a database of design options having cost details, energy performance parameters, other selection related parameters, for web-based tool.
 - Develop an intuitive web-based tool to visualize and compare building design options based on performance and other selection criteria. The objective of the tool is to assist the user in taking informed decision.
 - The navigation tool should be optimized for both PC and portable device (mobile/tablet) browsing.

Deliverables:

1. Building Information Model (BIM) of all the developed architectural design options for all climate zones.
2. Energy Simulation Model (including .IDF file) of all the developed architectural design options for all climate zones.
3. Natural & artificial lighting Simulation Model of all the developed architectural design options for all climate zones.
4. Web-based tool to visualize and compare building design options.

³ GIZ shall provide website domain and hosting space for the navigation tool. The proposal shall not include the cost of website domain and hosting space; however, the contractor shall be responsible for all related technical services like uploading the tool on the web portal, ensure its proper functioning, etc.

2.2.5 WP5: Organize Workshops and Event for the Launch of Replicable Design Catalogue for Thermally Comfortable Affordable Housing

The contractor shall organize Awareness Workshops, Stakeholder Consultations and Launch Event to enhance the outreach and acceptability of the developed Replicable Design Catalogue for Thermally Comfortable Affordable Housing. Cost of venue, food etc. for organizing roundtables, workshops, and launch event shall be borne by GIZ separately. All the logistics shall be arranged by the consultant.

The consultant shall organize and lead the following events under the assignments:

1. Round-table Meetings:
 - The consultant shall organize at least four (4) round-table meetings with identified stakeholders (e.g., Developers, Financial Institutions, UDDs, PWDs, ULBs, etc.) and incorporate the feedback received from stakeholders in the proposed activities.
2. Regional Stakeholder Workshops:
 - The consultant shall organize at least four (4) regional stakeholder workshops to present the outcomes under the assignment and incorporate the feedback received from stakeholders.
3. Launch Event:
 - The consultant shall organize an Event for the Launch of Replicable Design Catalogue for Thermally Comfortable Affordable Housing.
4. Training Programs:
 - The consultant shall organize at least two (2) physical training workshops targeting building design professionals and government stakeholders.
 - The consultant shall organize at least two (2) virtual training workshops/webinars targeting building design professionals and government stakeholders.

Deliverables:

1. Prepare concept note, schedule, workshop material, and presentations for round-table meetings with different stakeholders. Submit proceedings of the organized meetings highlighting received feedback/suggestions.
2. Prepare concept note, workshop material, presentations for Regional Stakeholder Workshops. Submit proceedings of the regional stakeholder workshops.
3. Organize an Event for the Launch of Replicable Design Catalogue for Thermally Comfortable Affordable Housing. Printing of 200 coffee table books (Size: 11" x 11", Pages: 300 approx., Paper: 100 GSM Matt, Hard bound with 2.5 mm board duly pasted with matt PLC) including 32 GB, USB drive, equipped with the fully functional tool software for selection and filtration of type design options.
4. Prepare concept note, workshop material, training manual, presentations for training programs for building design professionals. Submit proceedings of the organized training programs and Report on process for capacity building of down the line stakeholders.

Certain milestones, as laid out in the table below, are to be achieved by certain dates during the contract term, and at particular locations:

Milestone	Timeline
Deliverables under WP1	November 2021
Deliverables under WP2, 3 & 4 for composite climatic zone	December 2021
Deliverables under WP2, 3 & 4 for Hot & Dry, Warm & Humid climatic zones	April 2022
Deliverables under WP2, 3 & 4 for Temperate and Cold climatic zones	June 2022
Deliverables under WP5	July 2022

Period of assignment: From 15th July 2021 until 14th July 2022.

3 Concept

In the bid, the bidder is required to show how the objectives defined in Chapter 2 are to be achieved, if applicable under consideration of further specific method-related requirements (technical-methodological concept). In addition, the bidder must describe the project management system for service provision.

3.1 Technical-methodological concept

Strategy [1.1]: The bidder is required to consider the tasks to be performed with reference to the objectives of the services put out to tender (see Chapter 1). Following this, the bidder presents and justifies the strategy with which it intends to provide the services for which it is responsible (see Chapter 2).

The bidder is required to present the actors relevant for the services for which it is responsible and describe the **cooperation [1.2]** with them.

The bidder is required to present and explain its approach to **steering [1.3]** the measures with the project partners and its contribution to the results-based monitoring system.

The bidder is required to describe the key **processes [1.4]** for the services for which it is responsible and create a schedule that describes how the services according to Chapter 2 are to be provided. In particular, the bidder is required to describe the necessary work steps and, if applicable, take account of the milestones and contributions of other actors in accordance with Chapter 2.

The bidder is required to describe its contribution to knowledge management for the partner and GIZ and promote scaling-up effects (**learning and innovation [1.5]**).

3.2 Other specific requirements

- Place special emphasis on the equal participation of gender on the project contract's activities such as skilled technicians training, Incubation centres.
- Ensure that all events organized by the project have the voices of women in one way or another.

3.3 Project management [1.6] of the contractor

The bidder is required to explain its approach for coordination with the GIZ project.

- The contractor is responsible for selecting, preparing, training and steering the experts (international and national, short and long term) assigned to perform the advisory tasks.
- The contractor makes available equipment and supplies (consumables) and assumes the associated operating and administrative costs.
- The contractor manages costs and expenditures, accounting processes and invoicing in line with the requirements of GIZ.
- The contractor reports regularly to GIZ in accordance with the GTCC of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

In addition to the reports required by GIZ in accordance with GTCC, the contractor submits the following reports:

- Inception report
- Contributions to reports to GIZ's commissioning party
- Monthly and quarterly reports on the implementation status of the project activities (refer Annexure A)

The bidder is required to draw up a **personnel assignment plan** with explanatory notes that lists all the experts proposed in the bid; the plan includes information on assignment dates (duration and expert days) and locations of the individual members of the team complete with the allocation of work steps as set out in the schedule.

The bidder is required to describe its backstopping concept. The following services are part of the standard backstopping package, which (like ancillary personnel costs) must be factored into the fee schedules of the staff listed in the bid in accordance with GTCC:

- Service-delivery control
- Managing adaptations to changing conditions
- Ensuring the flow of information between GIZ and field staff
- Contractor's responsibility for seconded personnel
- Process-oriented technical-conceptual steering of the consultancy inputs
- Securing the administrative conclusion of the project
- Ensuring compliance with reporting requirements
- Providing specialist support for the on-site team by staff at company headquarters
- Sharing the lessons learned by the contractor and leveraging the value of lessons learned on site

4 Criteria for Eligibility of firms

4.1 Contractor's profile

The contractor is expected to be familiar with the objectives and Mission guideline of PMAY(U), National Building Code 2016, Energy Conservation Building Code 2017, Eco-Niwas Samhita, and other relevant policies and regulations. The contractor shall also have the following expertise:

- Expert knowledge of sustainable/ energy efficient/ passive/ climate responsive building design for affordable housing
- Experience of building performance analysis (daylight analysis, energy modelling, CFD simulation, etc.)
- Experience of designing energy efficient buildings certified by LEED, GRIHA or similar green building certification systems
- Knowledge of International and national standards/policies on building thermal performance
- Substantive knowledge of national legal framework and strategic documents relating to building sector and affordable housing
- Experience of benchmarking, data collection & analysis, energy savings analysis, GHG impact assessment
- Experience of analytical research on thermal comfort will be considered as an asset
- Familiarity with government administration structure and profiles of public officers; knowledge of the structure and functions of the related government agencies in the country at central, state and local levels.

4.2 Assessment Criteria

Bidders must submit the documentary evidence for the criteria specified below:

I. Commercial Assessment

- Legal Status of Consulting Firm
- In case of bidding consortia: Declaration by consortium
- Average annual turnover for the last three financial years: At least 200,000 Euro
- Number of employees as at 31.12 of the previous year: At least 20 Persons

II. Technical Assessment

The technical assessment is only based on reference projects with a minimum commission value of 20,000 Euro

A. Minimum requirements

- At least 5 Reference projects in Architectural design of thermally comfortable residential buildings in at least 3 climatic zones
- and At least 2 Reference projects in affordable housing in India in the last three years

B. Weighted Criteria

1. Technical Experience
 - Experience of 5 projects in Architectural Design of Thermally Comfortable Residential Buildings
 - Experience of 5 projects in building performance analysis (Energy Modelling, CFD simulation, daylight analysis, etc.)
 - Experience of 3 projects in building information modelling (BIM)
 - Experience of organizing and leading at least 5 stakeholder workshops
2. Regional Experience
 - Experience In different climatic zones of India
3. Experience of development projects (ODA Financed)

4.3 Personnel concept

The bidder is required to provide personnel who are suited to filling the positions described, on the basis of their CVs (see Chapter 7), the range of tasks involved and the required qualifications.

The below specified qualifications represent the requirements to reach the maximum number of points.

4.3.1 Team leader [2.1]

Tasks of the team leader

- Overall responsibility for the advisory packages of the contractor (quality and deadlines)
- Coordinating and ensuring communication with GIZ, partners and others involved in the project
- Personnel management, in particular identifying the need for short-term assignments within the available budget, as well as planning and steering assignments and supporting local and international experts
- Regular reporting in accordance with deadlines

Qualifications of the team leader

- Education/training (2.1.1): Graduation in Architecture and registered with Council of Architecture, India
- Language (2.1.2): Not applicable
- General professional experience (2.1.3): 20 years of professional experience in the architectural consultancy sector
- Specific professional experience (2.1.4): 10 years of experience of passive and climate responsive design and 5 years of experience of designing large scale government and affordable housing projects
- Leadership/management experience (2.1.5): 10 years of experience of managing and implementing large and complex architectural projects wherein co-ordination with multiple stakeholders is required

- Regional experience (2.1.6): Regional experience of architectural projects in 3 different climatic zones (please provide for each of the 3 different climatic zones at least 1 project description/reference)
- Development Cooperation (DC) experience (2.1.7): 5 years of experience within Development Cooperation (DC) with bilateral and multi-lateral agencies
- Other (2.1.8): Proven understanding of building energy standards/codes, and related policy (please provide as prove at least 2 previous relevant project descriptions/references)

4.3.2 Expert 1 – international short-term expert [2.2]

Qualifications of expert 1

- Education/training (2.2.1): Advance degree in Engineering/ Architecture/ Public Policy/ other allied fields relevant for the assignment
- Language (2.2.2): Excellent English language skills (C1 / C2 level)
- General professional experience (2.2.3): 15 years of experience associated with an International research institute
- Specific professional experience (2.2.4): 5 years of experience and knowledge of standards/policies on building thermal performance and affordable housing, and research projects and published papers on related topics
- Leadership/management experience (2.2.5): 5 years of leadership/management experience of similar projects
- Regional experience (2.2.6): 5 years of regional experience of building energy efficiency in Asia
- Development Cooperation (DC) experience (2.2.7): Not applicable
- Other (2.2.8): Not applicable

4.3.3 Expert 2 – Building Performance Analysis [2.3]

Qualifications of expert 2

- Education/training (2.3.1): Advance degree in Engineering or Architecture
- Language (2.3.2): Not applicable
- General professional experience (2.3.3): 10 years of general professional experience as consultant
- Specific professional experience (2.3.4): 5 years of experience and knowledge of building physics, thermal comfort standards and design optimization and 5 years of experience in building thermal performance analysis, energy simulation, daylight analysis and CFD simulation for large residential projects
- Leadership/management experience (2.3.5): 3 years of leadership/management experience of similar projects
- Regional experience (2.3.6): 5 years of regional experience of building performance analysis (energy, occupant comfort, daylight and CFD) in India
- Development Cooperation (DC) experience (2.3.7): Not applicable
- Other (2.3.8): Not applicable

4.3.4 Expert 3 – Building Information Modelling [2.4]

Qualifications of expert 3

- Education/training (2.4.1): Advance degree in Engineering or Architecture
- Language (2.4.2): Not applicable
- General professional experience (2.4.3): 10 years of general professional experience as consultant
- Specific professional experience (2.4.4): 5 years of experience in Building Information Modelling and design documentation
- Leadership/management experience (2.4.5): 3 years of leadership/management experience of similar projects
- Regional experience (2.4.6): 3 years of regional experience of delivering BIM in India
- Development Cooperation (DC) experience (2.4.7): Not applicable
- Other (2.4.8): Not applicable

4.3.5 Short-term expert pool with minimum 6, maximum 8 members [2.6]

The contractor should propose a pool of at least 6 consultants having expertise of the domain supposed to be covered by respective professional in the project context.

Qualifications of the short-term expert pool

- Education/training (2.6.1): University qualification in Engineering or Architecture
- Language (2.6.2): Not applicable
- General professional experience (2.6.3): 5 years of professional experience in project related matter
- Specific professional experience (2.6.4): 3 years of experience in the area of expertise the professional is supposed to cover in the project context
- Regional experience (2.6.5): 3 years of regional experience of similar projects in India
- Development Cooperation (DC) experience (2.6.6): Not applicable
- Other (2.6.7): Not applicable

The bidder must provide a clear overview of all proposed short-term experts and their individual qualifications.

Soft skills of team members

In addition to their specialist qualifications, the following qualifications are required of team members:

- Team skills
- Initiative
- Communication skills
- Sociocultural competence
- Efficient, partner- and client-focused working methods
- Interdisciplinary thinking

Further Requirements

- a. The entire proposal including approach and methodology, including tool and software's proposed, CVs etc., needs to be in English.
- b. All activities including travels, meetings and tasks in different focus areas need to be aligned with the state.
- c. All communication with media (TV, radio, print and other media) related to the assignment has to be approved by the responsible person of GIZ.
- d. All reports, slides, presentations and other media and information material need to be submitted to GIZ in English language in soft copy and in hard copy (at least 3 copies) as required.
- e. The Contractor should at all times of the assignment possess the copyrights (licenses in the case of software packages) of the documents, pictures, technical papers, standards used in the study.
- f. Any data to be purchased from external sources if necessary, for the purpose of execution of the contract shall be purchased by the Contractor on its own expense.
- g. Please collate, collect and retain all the reimbursable invoices properly for seamless reimbursements. Special care for the thermal paper bills. No deviation shall be entertained in absence of prior approval from GIZ and or in absence of amendment of contract if necessary. Cost of venue, food etc. for organizing round-tables, workshops shall be paid by Agency directly and reimbursed by GIZ on submissions of actuals separately. All travel, accommodation, food etc. for the staff of the Contractor has to be borne by them and have to be budgeted in their proposal. Expenses incurred can only be reimbursed after cost proposals have been submitted to and approved by GIZ prior to the acceptance and if sufficient bills / proofs are submitted to GIZ as desired. A snapshot of bank statement as a supporting document in each payment to for physical events in hotels, to be attached with all the invoices.
- h. The bidder should consider all the relevant and related activities, including but not limited to the activities proposed above in the work packages, to ensure the successful completion of all the Work Packages.
- i. All deliverables under Work Package 1 to 5 shall be considered final after incorporating all the comments and Feedbacks from the stakeholders and final approval from GIZ.

5 Costing requirements

5.1 Assignment of personnel

- A. Team Lead: 50 Expert-days in country of assignment
- B. Expert-1 [International]: 5 Expert-days in country of assignment and 25 Expert-days in home country
- C. Expert-2 [Building Performance Analysis]: 50 Expert-days in country of assignment
- D. Expert-3 [Building Information Modelling]: 50 Expert-days in country of assignment
- E. Pool of consultants: 400 Expert-days in country of assignment

The bidder should provide detailed expert-days distribution as per the table of Expert-day schedule and activities below.

Expert-day schedule & activities									
Sr. No.	Expert Category	Expert	Job Description-Activities Involved	Tentative experts-days					Brief Profile Attached
		International /National		WP 1	WP 2	WP 3	WP 4	WP 5	(Yes/No)
1	Team Lead								
2	Expert 1								
3	Expert 2...								
4	Expert								
5	etc.....								

5.2 Travel

The bidder is required to calculate the travel by the specified experts and the experts it has proposed based on the places of performance stipulated in Chapter 2 and list the expenses separately by daily allowance, accommodation expenses, flight costs and other travel expenses.

5.3 Workshops/training courses

The contractor implements the following workshops/ training programs:

The consultant shall organize and lead the following events under the assignments:

1. Round-table Meetings:

- The consultant shall organize at least four (4) round-table meetings with identified stakeholders (e.g., Developers, Financial Institutions, UDDs, PWDs, ULBs, etc.) and incorporate the feedback received from stakeholders in the proposed activities.

2. Regional Stakeholder Workshops:

- The consultant shall organize at least four (4) regional stakeholder workshops to present the outcomes under the assignment and incorporate the feedback received from stakeholders.

3. Launch Event:

- The consultant shall organize an Event for the Launch of Replicable Design Catalogue for Thermally Comfortable Affordable Housing.

4. Training Programs:

- The consultant shall organize at least two (2) physical training workshops targeting building design professionals and government stakeholders.
- The consultant shall organize at least two (2) virtual training workshops/webinars targeting building design professionals and government stakeholders.

The contractor must adhere the GIZ guidelines while organising workshops/events. All relevant evidences needs to be attached with actual invoices for reimbursements. Any deviation from the following shall be formally documented and formal approval from GIZ is mandatory beforehand;

- a) The contractor shall work in close coordination with GIZ while booking the venues for events.
- b) The contractor needs to submit all the actual invoices to GIZ in relation to organisation of any event and it must be within the proposed budget.
- c) The resource personnel for trainings would be paid a daily rate (all inclusive) as per the proposal. The person is entitled for a fixed daily rate for one or more daily trainings. For training activities, the resource person must be different from the main team members. A team member as per the proposal can't claim a trainer fee under any reimbursement head.
- d) The team member's claim shall be for travel related costs only. Rest all can be claimed on actuals with evidence.
- e) *All evidences related to any physical event (signed registration sheet of participants, photos/video/voice recordings) or any video conferencing event (registered participants list, screenshot of the event/webinar, recording of the event must be attached as evidence for reimbursement purpose.*

5.4 Other costs

1. Preparation of Catalogue (printing of coffee table book, handbooks, etc. and USB pen drive) specified in WP5.
2. Software for online training: e.g., MS Team, Cisco, etc. for conducting online/virtual training programs.
3. Visa Cost for International expert

5.4.1 Specific Conditions pertain to Covid- 19 Measures

The specific conditions pertain to Covid- 19 measures are integral part of contract and shall act as binding under special agreement and interpreted along with GTCC.

In addition to the provisions as detailed in clause 09 of The General Terms of Contract governing the delivery of works and services commissioned by **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (local)**, the Consultant confirms that he/she accepts the Consulting engagement with full knowledge and understanding of the travel and other requirements of the engagement including specifically the need, on the part of the

Consultant, to take all required precautions (including prevention and risk mitigation measures) against the risks arising from the ongoing Novel Corona Virus (CoVid - 19) Pandemic.

The Consultant shall provide to the GIZ an RT-PCR Negative Test Report for Novel Corona Virus (CoVid - 19) prior to starting the Consulting Engagement and shall additionally comply with the following at all times in the course of the Consulting Engagement:

1. Obtain Medical and other Insurance Cover in respect of the Novel Corona Virus (CoVid - 19) Infection/Disease and consequences thereof – (GIZ will reimburse the insurance cover up to 5,000 Indian Rupees on lumpsum basis)
2. Strictly follow and comply with the prescribed Mask, Hand Washing/Sanitization and Social Distancing Protocols.
3. Take safe and secure mode of transportation.
4. Observe all local restrictions/precautions as applicable for the specific areas of travel covered by the Consulting Engagement.
5. If eligible, get vaccinated against the Novel Corona Virus (CoVid - 19).
6. Install and maintain as active at all times the Government of India's Arogya Setu App.
7. If exposed to any active case of Novel Corona Virus (CoVid - 19) to take all steps as advised by the Government of India's advisories in such case.
8. If feeling unwell and experiencing any of the symptoms of Novel Corona Virus (CoVid - 19) infection - to take all steps as advised by the Government of India's advisories in such cases including but not limited to getting an RT-PCR Test for Novel Corona Virus (CoVid - 19), self-isolation, notifying the GIZ and also the concerned local Novel Corona Virus (CoVid - 19) isolation/treatment facility.
9. Other compliance as may be notified by the GIZ and the Government of India from time to time in relation to Novel Corona Virus (CoVid - 19) infection/disease.

Furthermore, The Consultant accepts the Consulting Engagement on a best and informed judgement basis with full knowledge of the tasks to be performed, the place of performance and the precautions and safeguards to be reasonably taken try the Consultant to mitigate all types of risks associated with the said Consulting Engagement. The Consultant undertakes the Consulting Engagement at his/her own risk and responsibility and shall not, under any circumstances, and at any time, be entitled to assert any liability or other claims whatsoever against the GIZ, its Management, Officers and Employees for any consequences or risks or harm that may arise to the Consultant in the course of or as a consequence of undertaking the Consulting Engagement or any actions or consequences arising in relation to such Consulting Engagement.

6 Inputs of GIZ or other actors

GIZ and/or other actors are expected to make the following available:

- A committee may be formulated by MoHUA/GIZ to provide overall guidance and review the deliverables submitted by the contractor.
- GIZ shall provide website domain and hosting space for the replicable design navigation tool.

7 Requirements on the format of the bid

The structure of the bid must correspond to the structure of the ToRs. In particular, the detailed structure of the concept (Chapter 3) is to be organised in accordance with the positively weighted criteria in the assessment grid (not with zero). It must be legible (font size 11 or larger) and clearly formulated. The bid is drawn up in English (language).

The complete bid shall not exceed 20 pages (excluding CVs & other supporting company documents).

The CVs of the personnel proposed in accordance with Chapter □ of the ToRs. The CVs shall not exceed 4 pages. The CVs must clearly show the position and job the proposed person held in the reference project and for how long. The CVs should be submitted in English (language) only.

If the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment.

8 Annexes

Annexure A: Sample Template for Progress Report

Annexure A: Sample Template for Progress Report

Activity	Responsible Consultant	Timeline as per work plan	Actual % Work Progress	Status	Remarks
WP 1					
Sub task 1.1					
...					
...					
WP 2					
...					
Brief summary in bullets to justify the status					
	Completed (100%)				
	in progress (26%-99%)				
	Progress less than 25%				