Uttarakhand Energy Conservation Building Code Rules, 2018

Dehradun, ……..... 2018

In exercise of the power conferred in the clause (a) of Section 15 of the Energy Conservation (EC) Act, 2001, the State Government have power to amend energy conservation building codes to suit the regional and local climatic condition, State Government in consultation with the Bureau, hereby makes the following rules, namely:-

1. Short title and commencement. - (1) These rules may be called the Uttarakhand Energy Conservation Building Code Rules, 2018.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions. - (1) In these rules, unless the context otherwise requires, -

(a) "Act" means the Energy Conservation Act, 2001 (52 of 2001);

(b) "Best Practices" means those measures that–

(i) allow for optimisation of efficiencies in the identified components and systems to enhance the energy efficiency of the building; or

(ii) reduce the cost of construction having regard to the safety, stability of the building structure, health and environmental provisions of Central laws or State laws; and

(iii) includes energy conservation measures approved by the Uttarakhand Energy Conservation Building Code Implementation Committee or National Energy Conservation Building Code Implementation Committee;

(c) "Building Complex" means a building or group of buildings constructed in a contiguous area for business, commercial, institutional purposes or assembly of buildings under the single ownership of individuals or group of individuals or under the name of a co-operative group society or on lease and sold as shops or office space or space for other commercial purposes;

(d) "Built-up Area" means the total covered areas on all floors of a building from the basement to all storeys covered by walls and parapet measured at the floor levels excluding parking;

(e) "Bye-laws" means the building bye-laws framed by a State Government or any authority under its control to regulate the building activities in its areas falling in the jurisdiction of-

(i) all Municipal authorities or Committees or Councils;

(ii) all Metropolitan areas or Nagar Panchayats;
(iii) all areas covered under the Development or Planning authorities;
under various development plans notified by a State Government and enforced by such authority in its jurisdiction in which the Uttarakhand Energy Conservation Building Code compliant building shall be located and includes any regulation or rule framed by the State Government or any other SDA established by the State Government;

(f) "Certified Energy Auditor (Building)" means a person who fulfills the eligibility criteria specified in the Energy Conservation (Minimum qualification for Energy Auditors and Energy Managers) Rules 2006 and has qualified National Examination for Energy Conservation Building Codes Compliance;

(g) "Uttarakhand Energy Conservation Building Codes (UKECBC)" means the Uttarakhand Energy Conservation Building Code or its subsequent updated version approved by the Bureau of Energy Efficiency, it will be represented as 'Code' in this document;

(h) "Compliance Documents" mean the forms specified in Appendix D of the Code.

(i) "Connected Load" means the total of the rated wattage of all equipment, appliances and devices to be installed or installed in the building or part of the building or building complexes in terms of kiloWatt (kW) that will be allocated to all applicants for electric power consumption in respect of the proposed building or building complex, as the case may be, on their completion;

(j) "Construction Documents" mean drawings or documents containing information pertaining to building construction processes and approvals, building materials and equipment specification, architectural details required by the SDA;

(k) "Contract Demand" means the maximum demand in kiloWatt (kW) or kilo-Volt Ampere (kVA) (within a consumer's sanctioned load) agreed to be supplied by the electricity provider or utility in the agreement executed between the user and the utility or electricity provider;

(l) "Empanelled ECBC Expert" means a person or firm certified by Bureau of Energy Efficiency to successfully compliance ECBC in the building and need to be empanelled by BEE;

(m) "Energy Conservation Measures" mean the measures incorporated in the building design for saving energy, or enhancing comfort in peak electrical or thermal demand, or reducing cooling or heating load covering any element of a component with any other element of the same or other component of the Code and includes

any such measure incorporated in the said building design of the proposed or existing building;

(n) "Energy Performance Index" means annual energy consumption of a building in kiloWatt-hours per square meter of the area of the building which shall be calculated as per the following formula:

$$\text{Energy Performance Index} = \frac{\text{annual energy consumption in kWh}}{\text{total built up area (excluding storage area and the parking in the basement) in m}^2}$$

(o) "Energy Performance Index Ratio" means the ratio of the energy performance index of the proposed building to the energy performance index of the standard baseline building;

(p) "Establishment" means a business or other organization, or the place where an organization operates and includes a Government establishment and private establishment;

(q) "Form" means the forms appended to these rules;

(r) "Owner" means a person, group of persons, a company, a trust, an institute, registered body, State Government or Central Government and its attached or sub-ordinate departments, undertakings and such other agencies or organizations in whose name the property stands registered in the revenue records for the construction of a building or building complex;

(s) "Proposed Design" means the computerized design of a building consistent with the actual design of a building which complies with all the requirements of the Code either through prescriptive or whole building performance method;

(t) "Standard baseline design" means the standard design that complies with all the mandatory and prescriptive requirements of the Code and has the same built-up area of the proposed building;

(u) "BEE empanelled energy auditors (buildings)" means Empanelled Individual or Firms which will only include "BEE empanelled energy auditors (buildings)".

(v) "Authority" Uttarakhand Housing & Urban Development Authority (UHUDA) and Concerned ULBs is the Authority, they have the authority for plan approval and issuing occupancy certificate.

(w) "SDA" means the "Uttarakhand State Designated Agency" for BEE which shall be responsible for NOC/Compliance certificate and administrative requirements as mentioned in the UKECBC.

(x) "Bureau" means Bureau of Energy Efficiency.

(2) Words and expressions used herein and not defined, but defined in the Act, or in the Code, shall have the meanings respectively assigned to them in the Act or in the said Code.

3. Application. - These rules shall apply to every building except residential buildings, having a connected load of 50 kiloWatt (kW) or above or a contract demand of 60 kilo-Volt Ampere (kVA) or above or having a plot area more than 500 m² with minimum 500 m² as built-up area (excluding basement), such building shall cover the following components, namely:-

(a) building envelope;
(b) comfort systems and controls (heating, ventilation and air conditioning service hot water system);
(c) lighting and controls;
(d) electrical and renewable energy systems;
(e) any other system, as may be specified from time to time by the Bureau:

Provided that these rules shall not apply to equipment, appliances, devices and parts of building that use energy primarily for manufacturing processes:

Provided further that wherever these rules are in conflict with safety, security, health or environmental codes, or Bureau of Energy Efficiency's Standard and Labelling for equipment or appliances and Star Rating Program for buildings and if they are more stringent than the requirement of these rules then they shall prevail over these rules:

Provided also that if any existing building after additions or alterations changes its connected load to 50 kilo-Watt (kW) or above or a contract demand of 60 kilo-Volt Ampere (kVA) or above or having a plot area more than 500 m² with minimum 500 m² as built-up area (excluding basement), shall comply with the provisions referred to in clauses (a) to (e) of this rule.

4. Compliance mechanism. – (i)The compliance of energy performance of a building shall be ensured by the owner by following either of the following methods, namely: -

(a) Prescriptive Method – The building shall comply with the mandatory requirements and prescriptive requirements as specified in the Code for envelope components, comfort systems and controls, lighting and controls, electrical and renewable energy systems;

(b) Whole Building Performance Method – The building shall comply with all mandatory measures and the requirements specified in the whole building performance method of the Code and the energy performance index of the proposed design under this method shall be the same or less than the energy performance index of the standard baseline design of building as follows:

$$\textit{energy performance index ratio} = \frac{\textit{energy performance index of proposed design}}{\textit{energy performance index of standard baseline design}} \leq 1$$

(ii) The summary covering building envelope, comfort systems and controls, lighting and controls, and electrical and renewable energy systems and their checklists under Prescriptive Method and Whole Building Performance Method shall be as specified in the Appendix D of the code.

5. Procedure for erection of Code compliant building. - (1) Every owner who intends to erect or re-erect a building or make alterations or additions in any building under these rules shall submit to the concerned "SDA", an application form (Form I) accompanied by-

(a) documents duly signed by the Owner/Developer and Architect/"BEE empanelled energy auditors (buildings)";

(b) documents shall ensure –

(i) compliance with the applicable building bye-laws in force;

(ii) building design incorporates energy conservation measures and best national and international practices having regard to the climatic conditions of the site and specific needs of the building so as to optimise the energy performance index ratio of the building;

(iii) that all the data, building features, identified energy conservation measures under various building components and systems are shown in detail and in the manner specified in the applicable bye-laws;

(iv) the drawing of plan, colour of plan, dimensions of plan, scale of plan as per requirements of the applicable bye-laws in force;

(v) Compliance forms as Appendix D under Prescriptive Method or Whole Building Performance Method shall be submitted;

(2) The "SDA" may require submission of documents in electronic form or hard copy of the documents, referred to in sub-rule (1).

(3) On receipt of application under sub-rule (1), "SDA" shall follow the following procedure of inspection for issuance of preliminary certificate/NOC for ECBC at the design stage: –

(a) scrutinize the construction documents with respect to–

(i) floor area;

(ii) window area;

(iii) wall area;

(iv) roof area of the building;

(v) built-up area of the proposed design of the building;

(b) scrutinize the Code compliance documents and the check list as specified in the Appendix D of the Code and identify –

(i) the energy conservation measures that are applicable to the proposed design of building;
(ii) insulation quantities in walls and roof, and the construction assemblies, solar heat gain co-efficient, visible light transmittance and thermal transmittance (U-factor) for window assemblies;
(iii) heating, ventilation and air-conditioning component tables for air-handling equipment, refrigeration equipment, condensing equipment and air-flow summaries;
(iv) heating, ventilation and air-conditioning equipment efficiencies and control equipment;
(v) tables showing lighting equipment schedules;
(vi) lighting power density calculations in the design documents;
(vii) lighting controls;
(viii) motor efficiencies and controls;
(ix) findings of the document review to match with the energy model inputs for the proposed building by using the simulation tool approved by the Bureau;

(c) scrutinize energy performance index ratio projected at the design stage;
(d) verify and certify the items from (i) to (ix) of (b) and (c);
(e) fill the check list as specified in the Appendix D of the Code and issue correction list in case the design documents of the proposed design of building provide inadequate information or do not meet the requirements of these rules and shall-
(i) communicate his findings to the owner of the building;
(ii) give specified time to the owner to implement its findings;
(iii) satisfy himself that the communication received from the owner within the specified time, meet the findings and fulfill the shortcomings;
(f) record his approval and complete the checklist conforming compliance with the Code and these rules, and issue the compliance report to the owner

(4) ECBC preliminary certificate/NOC (Form II) will be issued by "SDA" after the scrutiny of documents received from the owner as per sub-rule (3).

(5) The "Authority" on receipt of application under sub-rule (1) for issue of permit for construction of proposed building shall approve the design and sanction building plan only after it has received an ECBC preliminary certificate/NOC from the "SDA."

(6) After receiving the permit, the owner shall-
(a) give notice of his intention to start the construction work of the building;
(b) undertake construction of energy conservation measures incorporated in the construction documents in terms of sub-clause (ii) of clause (b) of sub-rule (1);

(c) have flexibility in constructing the building components and systems covered in the construction documents referred to in clause (a) of sub-rule (1) to most effective use of energy by deploying best practices in such components and systems to optimize the energy performance index ratio;

(d) take approval of the "SDA" before undertaking such construction referred to in clause (c) if the components and systems proposed to be constructed are other than those incorporated in the construction and compliance document.

(7) "SDA", at construction stage, shall review, verify the specifications of the parameters specified in sub-rule (3) and, -

(a) fill out the checklist specified in the Appendix D of the Code, provide comments if the proposed design of building does not meet the construction requirements and specify the shortcomings in compliance to the Code, these rules and sanctioned plan, and shall-

(i) communicate its shortcomings and finding to the owner;

(ii) give specified time to the owner to implement its findings;

(iii) satisfy himself that the communication received thereafter from the owner meets the specified findings and fulfill shortcomings;

(b) record his approval and complete the checklist indicating compliance with the Code and these rules, and issue a compliance certificate to the owner (Form III);

(c) where it is determined at any stage that construction is not proceeding in accordance with the sanctioned plan or is in violation of any of the provisions of the Code and these rules, "SDA" shall notify the owner, and request for additional information with respect to his findings or on the short comings identified by him;

(d) in case the "SDA" is satisfied with the additional information provided by the owner, he shall record the same and issue compliance certificate;

(e) in case the "SDA" is not satisfied with the additional information submitted by the owner, "SDA" shall ensure that all further construction is stayed until correction has been effectuated and a certificate (Form III) has been issued;

(f) The same process as mention in sub-rule (7) will be repeated twice during construction of building. For early stages of construction compliance certificate (Form III) and for later stage of construction compliance certificate (Form IV) will be issued to owner/developer/architect by the "SDA". For later stages all the procedure will be same as mention in sub-rule (7) clause (a) to (e).

(8) Every owner shall submit a notice of completion of the building to the "SDA" on the completion of work including the works related to energy conservation measures specified in the sanctioned permit certifying the completion of the building accompanied by -

(a) the duly completed compliance forms together with check list of various components covered under sub-rule (3) at the completion stage which shall include the followings-

(i) review of heating, ventilation and air-conditioning component tables for air-handling equipment, refrigeration equipment, condensing equipment, air-flow

summaries, tables showing lighting equipment specifications, and tables showing motor specifications;

(ii) inspection of lighting equipment like lamps, ballasts, to confirm fixture wattage and inspection shall include at least random check across according to the type of usage in the building to determine lighting power density;

(iii) review the required lighting controls such as manual switching off perimeter, day lighting circuits, automated occupancy based control, photo sensor controls, and automated timer based controls;

(iv) review of coefficient of performance values of installed heating, ventilation and air-conditioning equipment and control equipment;

(v) review of efficiencies of installed motor and controls;

(vi) review of power factor and power distribution losses;

(vii) review the required check metering and monitoring system.

(b) a list of the energy related building features in the proposed design, if any, which are different from the sanctioned or standard baseline design;

(c) all documents and invoices in support of the construction undertaken with respect to all energy conservation measures including insulation, fenestration, heating, ventilation and air-conditioning, lighting and electrical systems, water heating systems of the building.

(9) If the energy performance index ratio at the completion stage is less than or equal to one as compared to the sanctioned plan of the building, it shall be deemed to have complied with the Code and these rules. In such case, the "SDA" shall issue Final ECBC compliance certificate/NOC (Form V).

(10) If there is deviation in the energy performance index ratio of the sanctioned plan that is it is more than one as compared to the sanctioned plan of the building, "SDA" shall record its findings and communicate the same to the owner and seek compliance of the same through incorporation of additional energy conservation measure. "SDA" shall render technical assistance to the owner to ensure that the proposed design of building becomes compliant with these rules.

(11) The owner shall neither occupy nor allow any other person to occupy the building or part of the building covered under these rules for any purpose until such building or such part thereof has been granted occupancy certificate and final ECBC certificate under the bye-laws of the "Authority".

(12) The owner shall give notice of completion of the building and seek permission for occupancy.

(13) The "Authority" on receipt of such notice by the owner accompanied by the Final ECBC compliance certificate/NOC by the "SDA", issue the occupancy certificate incorporating *inter alia* the following conditions, namely: -

i. that the owner shall submit to the "SDA", an energy performance index report under intimation to Bureau for two consecutive years after the building has been fully operational;

ii. in case the energy performance index ratio of the building is more than one, the "Authority" in consultation with "SDA" may issue a provisional occupancy certificate subject to the condition that the owner shall undertake energy audit of the building to identify additional energy conservation measures to achieve the energy performance index ratio of the building approved in the sanctioned plan or permit within a period of three years;

iii. if the owner fails to achieve the energy performance index ratio as specified in clause (ii) within a period of three years from the date of occupancy of the building the "Authority" shall place the matter before the Uttarakhand Energy Conservation Building Code implementation Committee, which shall hear the owner and the "SDA" and make recommendations in the matter accordingly and the "SDA" shall comply with such recommendations.

(14) The process shall be continued repeatedly till energy performance index ratio of the building comes to less than one or equal to one and "SDA" shall fill and submit the compliance report along with the documents, as specified in Appendix D, of various energy conservation measures at each stage namely, design, construction and completion, to achieve conformity with the Code and these rules.

(15) The simulation tool referred in sub-rule (3) shall be based on the standard method of test for the evaluation of building energy analysis computer program (mentioned in UKECBC code) for Whole Building Performance.

6. Responsibilities and duties of "SDA" - The "SDA" established by every State Government under clause (d) of section 15 of the EC Act, in consultation with Bureau, shall–

(a) coordinate, regulate and enforce provisions of the Code and these rules for efficient use of energy and its conservation under the Act in the State;

(b) ensure every commercial building or establishment having a connected load of 50 kW or above, or contract demand of 60 kVA or above or having a plot area more than 500 m^2 with minimum 500 m^2 as built-up area (excluding basement), be constructed in compliance with these rules;

(c) monitor the performance of the "BEE empanelled energy auditors (buildings)"to improve the quality, consistency and rate of compliance of these rules with a view to make the cadre of the "BEE empanelled energy auditors (buildings)"as effective instruments for promotion of energy efficiency in the building sector in the State;

(d) create a data bank in the State to measure the compliance rates of the Code compliant buildings and accurately account for the energy savings resulting from the compliance of these rules;

(e) also create a data bank on energy use per square meter of area of the building under different zones namely, composite and cold, separately for each category in the State;

(f) take necessary steps to make energy performance index as a measure to comply with these rules in the various categories of buildings and send its recommendations to the Bureau for the formulation of energy consumption norms and standards in respect of various categories of buildings constructed zone-wise in its State;

(g) arrange conduct site visits, if considered necessary, to determine the accuracy of reporting by the "BEE empanelled energy auditors (buildings)", in the State;

(h) prepare a report on performance of the "BEE empanelled energy auditors (buildings)"listing out the projects complying with these rules, projects in violation of compliance with these rules and the level of violation, and provide summary of such violations for each year to the Bureau of Energy Efficiency;

(i) coordinate with the "Authority" to amend their building bye-laws incorporating the provisions of these rules for the purpose of construction of buildings in compliance with the Code and these rules;

7. Responsibilities and duties of the owner. - (1) The owner of the Code compliant building shall carry out the work of the said building in accordance with the requirements of the Code and these rules.

(2) Every owner shall-

(a) develop a compliance report, duly signed by the Owner/Developer/Architect as mention in section 5 sub-rule (1) clause (a), of building design, installation of energy conservation measures and equipment to meet with the requirements of these rules and ensure following, namely:–

(i) finalize the compliance approach relevant for his building project based on the complexity of the building, budget and time constraints;

(ii) finalize the energy conservation measures as per the Code as amended from time to time having regard to the location of the proposed building;

(iii) to integrate the energy conservation measures in the building design in accordance with the provisions of these rules;

(iv) that drawings, specifications and compliance forms are prepared and energy conservation measures are reflected in the building design documents and submitted to the "SDA" in compliance with the requirements of the rules accompanied by a certificate specifying the energy performance index ratio of the building by the "BEE empanelled energy auditors (buildings)" that the documents are as per the requirement of these rules;

(v) notice is given within the validity of sanction to the "Authority" of his intention to start the construction work at the building site;

(vi) commence the work within the period specified by the "Authority" from the date of such notice or seek extension of time for starting the construction work, wherever necessary;

(vii) Ensure that the designed energy conservation measures are deployed in the construction of the building and Installation of its components and systems.

(viii) permit the "SDA" to enter the building or premises at any reasonable time for the purpose of inspection to ensure compliance of building works with rules and regulations under the Act;

(ix) take ECBC compliance certificate/NOC from the "SDA" and submit to the "Authority" with other necessary approvals;

(x) give written notice to the "Authority" intimating the completion of the construction work along with a report from "SDA" to the effect that-

a) the construction of the building has been done in accordance with the sanction of the building permit;
b) all the energy conservation measures have been installed and inspected, and they meet the requirements of the Code and these rules;
c) the building design meet with the provisions of the Code and these rules;

(xi) obtain an occupancy permit from the "Authority" prior to any occupancy of the building or part thereof after completion of the building;

(xii) report the practical difficulties to "SDA", if any, in carrying out the provisions of these rules, who shall take necessary action;

(xiii) on the receipt of the notice, if any, from the "Authority", he shall discontinue such usage within reasonable time as specified in such notice and in no case he shall disregard the provisions of these rules;

(xiv) where he proposes to alter the installation of any system or material or equipment on account of improving the energy efficiency of the building contrary to the system, material or equipment as indicated in the sanction plan he shall use or install such system or material or equipment after obtaining the necessary approval of the "Authority" / "SDA":

Provided that it does not violate the spirit and intent of the provisions of these rules:

Provided further that such change shall not compromise with the building requirements namely, structural stability, safety, health or environmental provisions of Central laws and State laws applicable to the buildings covered under these rules.

(3) The owner may approach the Uttarakhand Energy Conservation Building Code Implementation Committee for redressal of any grievance under the provisions of these rules.

8. Role, responsibilities and duties of the "BEE empanelled energy auditors (buildings)"– The "BEE empanelled energy auditors (buildings)", whose services shall–

(a) verify and certify –

(i) the design of the building keeping in view the design criteria, energy goals of the project, energy systems performance verification plan, and the modeling approach;

(ii) the energy conservation measures based on the design approach for the project under consideration;

(iii) construction documents and compliance documents, compliance forms and checklists specified to ensure that the building complies with the Code and these rules;

(iv) energy performance index ratio of the proposed building;

(b) furnish a certificate under its seal and authorized signature to the effect that drawings, specifications, construction documents, compliance documents and forms prepared covering building envelope, comfort system and controls, lighting and electrical power systems, wherever applicable, and all other Code related documentation to support the "SDA" ensuring compliance with these rules;

(c) inspect the building works from the design stage to its commissioning stage of buildings including their uses under these rules and based on his compliance report, the "Authority" shall issue building permit, approve construction of building, issue completion and occupancy certificates;

(d) the "BEE empanelled energy auditors (buildings)"shall ensure that none of the professionals or employees working under him/her is engaged in any work in connection with the construction or alteration of the concerned building covered under these rules to ensure that there is no conflict of interest with his/her official duties with the interests of the "SDA";

(e) report to "SDA" on such unusual technical issues that may arise due to issue of building permit or construction of building or during occupancy stage;

(f) provide inputs to the National and Uttarakhand Energy Conservation Building Code Implementation Committees to facilitate for better implementation of the Code and these rules;

(g) promote norms and standards specified in the Code.

9. Miscellaneous.– (1) The use of any energy conservation measures or method or design or construction not specifically specified under these rules shall not be prevented by the "SDA" if such energy conservation measures or method or design or construction is found to be satisfactory by the Uttarakhand Energy Conservation Building Code Compliant committee and such energy conservation measures or method or design or construction assist the owner in optimizing the energy performance index ratio in the use of energy on its occupancy.

(2) For the amendment of these rules ECBC committee shall be authorized to make changes as per revision in the Code.

(3) The Code shall be reviewed periodically, at least once in five years, to determine the need for revision or withdrawal of standards specified in the Code, and such standards which in the opinion of the Bureau need no revision or amendment shall be reaffirmed.

Form-I

Application Form for seeking building permit in respect of erection/re-erection/making alteration in the Energy Conservation Building Code compliant building:

Uttarakhand Energy Conservation Building Code 2017 Compliance Form

Project Info	Applicant Name and Address:-
	Project Site Address:-
	Project Built-up Area (m^2):- (without basement)
	Project Climatic Zone:-

Building Classification	☐ Hospitality	☐ Business	☐ Other
	☐ Health Care	☐ Educational	
	☐ Assembly	☐ Shopping Complex	

Project Description	☐ New Building	☐ Addition	☐ Alteration	☐ Other
	☐ Self-occupied	☐ Core and Shell	☐ Mixed-Use	

Compliance is sought for Energy efficiency level	◯ ECBC Compliant	◯ ECBC+ Compliant*	◯ Super ECBC Compliant**
			EPI Ratio

* 20% more Efficient than ECBC Standard Case * *40% more Efficient than ECBC Standard Case
Note: prescriptive compliance as an alternative to WBP compliance is as per UKECBC.

Method of Compliance	◯ Prescriptive Method	◯ Whole Building Performance Method

The following information is necessary to check a building permit application-				
Code Section	Component	Information	Comply	
			Yes	No
9.1.2	Compliance	The estimated EPI ratio is equal to or less than 1 & meets all the mandatory conditions(4.2,5.2,6.2,7.2)		
9.1.3	Annual Energy Use	kilowatt-hours (kWh) of electricity use per year per unit area (m^2) comply as per the code		
9.1.5	Documentation Requirements	Compliance document submitted to the SDA is complete.		

9.3	Simulation Requirements	The simulation program, at a minimum, used have the ability to model as per specified in the code		
9.4	Compliance Report	The WBP compliance report is submitted as per UKECBC Section 9.0		

The following documents are enclosed in support of the above information-

1. Building floor plans and site plan, elevations, sections, & design basis report
2. Prescriptive / WBP (Whole Building Performance) Compliance Report including-
   a) Brief description of the project with location, number of stories, space types, conditioned and unconditioned areas, hours of operation.
   b) List showing compliance with the mandatory requirements of this code.
   c) **For WPB method:** List of the energy efficiency related building features of the Proposed Design. This list shall also document features different from the Standard Design case.
   d) **For WPB method:** The input and output report (s) from the simulation program including a breakdown of energy usage by at least the following components: lights, internal equipment loads, service water heating equipment, space heating equipment, space cooling and heat rejection equipment, fans, and other HVAC equipment (such as pumps). The output reports shall also show the number of hours any loads are not met by the HVAC system for both the Proposed Design and Standard Design.
   e) Compliance forms in Appendix D under Prescriptive Method or Whole Building Performance Method shall be submitted.

3. Fee for preliminary, final evaluation and Site validation (Twice) shall be submitted in the form of NEFT/DD dated-

   a) (i) For building less than 10000 m² built-up area without basement = Rs. 30,000.00
   b) (ii) For building greater than 10000 m² & less than 50000 m² built-up area without basement = Rs. 50,000.00
   c) (iii) For building greater than 50000 m² built-up area without basement = Rs. 70,000.00

Declaration: I hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I undertake to inform you of any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, I am aware that I may be held liable for it.

( )
Name of Architect
License No.

Seal

( )
Name of Owner/Developer
Name of Firm

Seal

Form-II

Preliminary Certificate for Uttarakhand Energy Conservation Building Code compliant building

Certificate No……..

(a) I/We have scrutinized the construction documents, undertaking given by the owner duly signed by the Owner/Developer/Architect showing all the pertinent data and features of the building, equipment and systems in sufficient details covering –

Building component	**Description of items at site**
Building Envelop (Wall, Roof, Glazing, Skylight)	
Comfort Systems & Controls	
Lighting and Controls	
Electrical and Renewable Energy System	
EPI Ratio	

Building design is in accordance with Uttarakhand Energy Conservation Building Code rules, 2018 in respect of proposed building of ……..(Applicant Name and Address) to be constructed on Project site ----------having Built-up Area…….. in the city of _____, in the State of Uttarakhand;

(b) I/We have scrutinized the compliance report by the BEE Empanelled Energy Auditors (Building) with the check- lists to ensure compliance with the bye-laws and the Uttarakhand Energy Conservation Building Code (UKECBC) Rules, 2018.

(c) The compliance documents have been duly inspected by the undersigned.

(d) The Energy Performance Index (EPI) ratio of the building, at the design stage is equal to or less than one and is therefore in compliance with the UKECBC Rules, 2018.

(e) It is certified that all required scrutiny and verification of the documents submitted have been carried out diligently, truthfully and all reasonable professional skill, care and diligence have been taken in scrutinizing and verifying the drawings of the buildings and compliance forms together with check–lists covering the various components of the UKECBC Rules, 2018.

(f) The contents of all the documents submitted along with the application are a true representation of the facts and nothing has been concealed.

There is no objection for issue of building permit in respect of the aforesaid proposed building in so far as requirements of Uttarakhand Energy Conservation Building Code rules, 2018 are concerned. Based on above certificate/observations the NOC is being issued.

Signature

In-charge ECBC Cell / SDA

/Mobile number /Seal

FORM-III

Certificate of compliance of Uttarakhand Energy Conservation Building Code

To,
The Owner
Address

I/We,…….(Name),being an In-charge ECBC Cell/SDA *vide* letter No._____ hereby state that I/we have reviewed the construction works and the construction documents, compliance forms, check-lists, submitted along with progress in construction works in respect of the various elements of the components referred in the approved sanction plan of Uttarakhand Energy Conservation Building Code compliant building at Project site ----------having Built-up Area……. in the city of……and certify that the energy performance index ratio calculation match with the data given in the aforesaid documents. The site visit conducted on……..

Information	Comply		Observations
	Yes	No	
Building Envelop (Wall, Roof, Glazing, Skylight)			
Fenestration rating / WWR as per approved sanctioned plan			
U-factor as per approved sanctioned plan			
SHGC as per approved sanctioned plan			
Opaque U-factors as per approved sanctioned plan			
Daylight (UDI%) as per approved sanctioned plan			
Building envelope sealing as per approved sanctioned plan			
High SRI paint/ glazed tiles/ green roof, solar panel provision			

In case of deviation for the approved sanctioned plan the owner is requested to submit the justification within 15 days to SDA. I/We further certify that all reasonable professional skill, care, and diligence have been taken in verifying the construction work in respect of the various elements of the components covered in Uttarakhand Energy Conservation Building Code rules, 2018

Signature
Name
In-charge ECBC Cell / SDA
/Mobile number /Seal

FORM-IV

Certificate of compliance of Uttarakhand Energy Conservation Building Code

To,
The Owner
Address

I/We,…….(Name),being an In-charge ECBC Cell/SDA *vide* letter/order No._____ hereby state that I/we have reviewed the construction works and the construction documents, compliance forms, check-lists, submitted along with progress in construction works in respect of the various elements of the components referred in the approved sanction plan of Uttarakhand Energy Conservation Building Code compliant building at Project site ----------having Built-up Area……. in the city of……and certify that the energy performance index ratio calculation match with the data given in the aforesaid documents. The site visit conducted on……..

Information	Comply		Observations
	Yes	No	
Lighting and Controls as per approved sanctioned plan			
Comfort Systems & controls (HVAC Type, COP) as per approved sanctioned plan			
Electrical and Renewable energy system as per approved sanctioned plan			

In case of deviation for the approved sanctioned plan the owner is requested to submit the justification within 15 days to SDA. I/We further certify that all reasonable professional skill, care, and diligence have been taken in verifying the construction work in respect of the various elements of the components covered in Uttarakhand Energy Conservation Building Code rules, 2018

Signature
Name
In-charge ECBC Cell / SDA
/Mobile number /Seal

FORM-V

Final Certificate for Uttarakhand Energy Conservation Building Code compliant building
Certificate No……..

(a) I/We have scrutinized the construction documents, undertaking given by the owner duly signed by the Owner/Developer/Architect showing all the pertinent data and features of the building, equipment and systems in sufficient details covering –

Building Envelop (Wall, Roof, Glazing, Skylight)	
Comfort Systems & controls	
Lighting and Controls	
Electrical and Renewable energy system	
EPI Ratio	

Constructed Building is in accordance with Uttarakhand Energy Conservation Building Code rules, 2018 in respect of proposed building of ……..(Applicant Name and Address) at Project site……having Built-up Area……. in the city of……, in the State of Uttarakhand; I/we hereby certify that the said building as per approved sanctioned plans vide No……dated……has been inspected with reference to requirements of Uttarakhand Energy Conservation Building Code Rules, 2018.

(b) I/We have scrutinized the compliance report submitted by the BEE Empanelled Energy Auditors (Building) with the check- lists to ensure compliance with the bye-laws and the Uttarakhand Energy Conservation Building Code (UKECBC) Rules, 2018.

(c) The compliance documents have been duly inspected by the undersigned.

(d) The energy performance index ratio of the constructed building is as per compliance documents, at the completion stage it is equal to or less than one and is therefore in compliance with the Uttarakhand Energy Conservation Building Code Rules, 2018.

(e) It is certified that all required scrutiny and verification of the documents submitted have been carried out diligently, truthfully and all reasonable professional skill, care and diligence have been taken in scrutinizing and verifying the drawings of the buildings and compliance report together with forms and check–lists covering the various components of the Uttarakhand Energy Conservation Building Code rules, 2018.

(f) The contents of all the documents submitted along with the application are a true representation of the facts and nothing has been concealed.

It has been declared by the SDA that the building is an ECBC Compliant building.

Signature
In-charge ECBC Cell / SDA
/Mobile number /Seal

Appendix D: Compliance Forms

Envelope Summary

Energy Conservation Building Code 2017 Compliance Forms

Project Info	Project Address	Date
		For Building Department Use
	Project Built-up Area [m²]	
	Project Above-grade Area [m²]	
	Project Conditioned Area [m²]	
	Applicant Name and Address	
	Project Climatic Zone	

Building Classification	☐ Hospitality	☐ Business
	☐ Health Care	☐ Educational
	☐ Assembly	☐ Shopping Complex

Project Description	☐ New Building	☐ Addition	☐ Alteration
	☐ Self-occupied	☐ Core and Shell	☐ Mixed-Use
Compliance is sought for Energy efficiency level	◯ ECBC Compliant	◯ ECBC+ Compliant	◯ SuperECBC Compliant
		EPI Ratio	

Compliance Approach	Prescriptive Method	Whole Building Performance Method	Building Trade-off Method-Envelope Compliance

Building Envelope				
Vertical Fenestration Area Calculation	Total Vertical Fenestration Area (rough opening) /	Gross Exterior Wall Area	X 100 =	% Window to Wall Ratio (WWR)
			X 100 =	

Skylight Area Calculation	Total Skylight Area (rough opening)	/	Gross Exterior Roof Area	times 100 equals	% Skylight to roof ratio (SRR)
		÷		X 100 =	

Opaque Assembly	
Wall (Minimum Insulation U-factor)	
Roof (Minimum Insulation U-factor)	

Cool Roof	
Solar Reflectance	
Emittance	

Wall Assembly		
Material	R-value	Assembly U-Factor

Daylighting Summary	
% above-grade floor area meeting the UDI requirement for 90% of the potential daylit time in a year	

Fenestration	
Vertical	
Maximum U-factor	
Maximum SHGC (or SC)	
Minimum VLT	
Overhang / Sidefins / Box Frame Projection (yes or no)	
If yes, enter Projection Factor for each orientation and effective SHGC	
Skylight	
Maximum U-factor	
Maximum SHGC (or SC)	

Envelope Checklist

Energy Conservation Building Code 2017 Compliance Forms

Project Address		Date	

Applicability			Code Section	Component	Information Required	Location on Plans	Building Department Notes
Yes	No	N/A					
Mandatory Provisions (Section 4.2)							
			4.2.1	Fenestration			
			4.2.1.1	U-factor	Specify reference standard		
			4.2.1.2	SHGC	Specify reference standard		
			4.2.1.3	Visible light transmittance	Specify reference standard		
			4.2.2	Opaque Construction			
			4.2.2.1	U-factors	Specify reference standard		
			4.2.2.2	Solar Reflectance	Specify reference standard		
			4.2.2.3	Emittance	Specify reference standard		
			4.2.3	Daylighting	Specify simulation approach or prescriptive		
			4.2.4	Building envelope sealing	Indicate sealing, caulking, gasketing, and weather stripping		
Prescriptive Compliance Option (Section 4.3)							
			4.3.1	Roofs	Specify implemeted U factor		
			4.3.1.1	Vegetative cool roof	Specify the solar reflectance, emittance, and reference standards		
			4.3.2	Opaque External Wall	Specify implemeted U factor		
			4.3.3	Vertical fenestration	(1) Indicate U-factors on fenestration schedule. Indicate if values are rated or default. If values are default, then specify frame type, glazing layers, gapwidth, low-e. (2) Indicate SHGC or SC on fenestration schedule. Indicate if values are rated or default. (3) Indicate VLT of fenestration schedule. Indicate if values are rated or default. (4) Indicate if overhangs or side fins or box-frame projection are used for compliance purposes. If so, provide		

					projection factor calculation and equivalent SHGC calculation		
			4.3.3 (a)	fenestration U factor exemption	Specify if applicable, specify unconditioned space percentage, and specify incorporated specifications		
			4.3.4	Skylights	(1) Indicate U-factors on fenestration schedule. Indicate if values are rated or default. If values are default, then specify frame type, glazing layers, gap width, low-e. (2) Indicate SHGC or SC on fenestration schedule. Indicate if values are rated or default.		

Building Envelope Trade-Off Option (Section 4.3.4)							
					Provide calculations		

Comfort System and Control Summary

Energy Conservation Building Code 2017 Compliance Forms

Project Info	Project Address:	Date
		For Building Department Use
	Project Built-up Area (sq.m):	
	Project Above-grade area (sq.m):	
	Project Conditioned Area (sq.m):	
	Applicant Name and Address:	
	Project Climatic Zone:	

Project Description	
Briefly describe comfort system type and features.	Natural ventilation, mechanical Ventilation, Low energy comfort system, heating and cooling mechanical equipment. percentage area distribution for the installed system, and related information

Compliance Option	System efficiency	Prescriptive Method	Whole Building Performance Method

Equipment Schedules	The following information is required to be incorporated with the mechanical equipment schedules on the plans. For projects without plans, fill in the required information below.

Cooling Equipment Schedule

Equip. ID	Brand Name	Model No.	Capacity kW	Testing Standards	OSA CFM or Economizer?	COP	IPLV	Location

Heating Equipment Schedule

Equip. ID	Brand Name	Model No.	Capacity kW	Testing Standards	OSA CFM or Economizer?	Input kW	Output kW	Efficiency

Fan Equipment Schedule

Equipment ID	Brand Name	Model No.	Testing Standards	SP	Efficiency	Flow Control	Location of Service	

Comfort System & Controls Checklist

Energy Conservation Building Code 2017 Compliance Forms

Project Address	Date

The following information is necessary to check a building permit application for compliance with the mechanical requirements in the Energy Conservation Building Code.

Applicability			Code Section	Component	Information Required	Location on Plans	Building Department Notes
Yes	No	N/A					
Comfort Systems and Control							
Mandatory Provisions (Section 5.2)							
			5.2.1	Ventilation	Indicate all habitable spaces are ventilated with outdoor air in accordance with § 5.2.1 and guidelines specified in NBC		
			5.2.2	Minimum Space Conditioning Equipment Efficiencies	Provide equipment schedule with type, capacity, efficiency		
			5.2.3	Controls			
			5.2.3.1	Timeclock	Indicate thermostat with night setback, 3 different day types per week, and 2-hour manual override, capable of retaining programming and time setting during loss of power for a period of at least 10 hours		
			5.2.3.2	Temperature Controls	Indicate temperature control with 3°C deadband minimum if the system provides both heating and cooling.		
					Indicate thermostats are interlocked to prevent simultaneous heating and cooling, where separate heating and cooling systems are there		
					Indicate separate thermostat control for space types mentioned in § 5.2.3.2.(c)		
			5.2.3.3	Occupancy Controls	Indicate occupancy controls for space types mentioned in § 5.2.3.3		
			5.2.3.4	Fan Controls	Indicate two-speed motor, pony motor, or variable speed drive to control the fans and controls shall be capable to reduce the fan speed to at least two third of installed fan power		
			5.2.3.5	Dampers	Indicate all air supply and exhaust equipment's having VFD shall have dampers that automatically close upon the situations mentioned in § 5.2.3.5		
			5.2.4	Piping & ductwork	Indicate sealing, caulking, gasketing, and weatherstripping		
			5.2.4.1	Piping insulation	Indicate R-value of insulation		
			5.2.4.2	Ductwork and Plenum insulation	Indicate R-value of insulation		
			5.2.5	System Balancing	Show written balance report for HVAC systems serving zones with a total conditioned area exceeding 500 m2		
			5.2.6	Condensers	Indicate location of condenser and source of water used for condenser		
			5.2.7	Service Hot Water Heating			
			5.2.7.1	Solar Water Heating	Indicate all Hotels and hospitals have solar water heating equipment installed for hot water design capacity as per § 5.2.9.1		

			5.2.7.2	Heating Equipment Efficiency	Indicate service water heating equipment shall meet the performance and efficiency as per § 5.2.9.2		
			5.2.7.3	Other Water Heating System	Indicate supplementary heating system is designed in consideration with § 5.2.9.3		
			5.2.7.4	Piping Insulation	Indicate the Piping insulation is compliant with § 5.2.6.1.		
			5.2.7.5	Heat Traps	Indicate vertical pipe risers serving water heaters and storage tanks are as per § 5.2.9.5		
			5.2.7.6	Swimming Pools	Indicate the heated pools are provided with a vapor retardent pool cover on the water surface and temperature control and minimum insulation value as per § 5.2.9.6		

Prescriptive Compliance Option (Section 5.3)							
			5.3.1	Chillers	Indicate chiller type, capacity, COP & IPLV		
			5.3.2	Pumps	Indicate pump type (Primary, secondary, and condenser), its total installed capacity and efficiency		
			5.3.3	Cooling Towers	Indicate cooling tower type and installed capacity		
			5.3.4	Boilers	Indicate boiler type, capacity and efficiency		
			5.3.5.1	Air-Economizer (ECBC/ECBC+/SuperECBC)	Indicate air economizer is capable of modulating outside-air and return-air dampers to supply 50% of design supply air quantity as outside-air for respective building type.		
			5.3.5.1	Water-economizer (ECBC/ECBC+/SuperECBC)	Indicate water economizer is capable of providing 50% of the expected system cooling load at outside air temperatures of 10°C dry-bulb/7.2°C wet-bulb and below, if the designed building is a respective building type.		
			5.3.5.2	Partial Cooling	Indicate where required by § 5.3.4 economizers shall be capable of providing partial cooling even when additional mechanical cooling is required to meet the cooling load.		
			5.3.5.3	Economizer Controls	Indicate air economizers are equipped with controls as specified in § 5.3.4.4		
			5.3.5.4	Testing	Indicate air-side economizers have been tested as per the requirement specified		
			5.3.6	Variable Flow Hydronic Systems			
			5.3.6.1	Variable Fluid Flow	Indicate design flow rate of HVAC pumping system		
			5.3.6.2	Isolation Valves	Indicate water cooled air-conditioning have two-way automatic isolation valves and pump motors greater than or equal to 3.7 kW is controlled by variable speed drives		
			5.3.6.3	Variable Speed Drives	Indicate Chilled water or condenser water systems comply with either § 5.3.5.1 or § 5.3.5.2		
			5.3.7	Unitary, Split, Packaged Air-Conditioners	Indicate the type of system, cooling capacity.		
			5.3.8	Controls for ECBC+ & SuperECBC Building			
			5.3.8.1	Centralized Demand Shed Controls	Indicate the building has a Building Management System, with all Mechanical cooling and heating systems having PLC to the zone level shall have the control capabilities mentioned in § 5.2.4.1		
			5.3.8.2	Supply Air temperature reset	Indicate multi zone mechanical cooling and heating systems shall have controls to automatically reset supply air temperature in response to building loads or outdoor air		

					temperature by at least 25% of the difference between design supply air temperature and the design room air temperature.		
			5.3.8.3	Chilled Water Temperature	Indicate chilled water systems exceeding 350 kW shall have controls to automatically reset supply water temperatures by representative building loads or by outdoor air temperature		
			5.3.9	Controls for SuperECBC Building	Indicate that the mechanical systems comply with § 5.2.4 and § 5.2.5		
			5.3.9.1	Variable Air Volume Fan Control	Indicate Fans in VAV systems shall have controls or devices to limit fan motor demand as per § 5.2.5.1		
			5.3.10	Heat Recovery	Indicate for all Hospitality and Healthcare, heat recovery effectiveness, and efficiency of oil and gas fired boilers		
			5.3.11	Service Water Heating	Indicate all Buildings, Hotels and hospitals have solar water heating equipment installed for hot water design capacity as per § 5.3.11		
			5.3.12	Total System Efficiency-Alternate Compliance approach	Attach simulation report		
			5.3.13	Low Energy Comfort Systems	Indicate system type and list the exemption claimed		

Lighting and Controls Summary

Energy Conservation Building Code 2017 Compliance Forms

Project Info	Project Address:	Date
		For Building Department Use
	Project Built-up Area (m^2):	
	Project Above-grade area (m^2):	
	Project Conditioned Area (m^2):	
	Applicant Name and Address:	
	Project Climatic Zone:	

Compliance Option	☐ Space by Space method	☐ Whole Building Method

Maximum Allowed Lighting Power (Interior, Section 6.3.2 or 6.3.3)

Location (floor/room no.)	Occupancy Description	Allowed Watts per m^2 **	Area in m^2	Allowed x Area
		** Document all exceptions	Total Allowed Watts	

Proposed Lighting Power (Interior)

Location (floor/room no.)	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
	Total Proposed Watts may not exceed Total Allowed Watts for Interior		Total Proposed Watts	

Maximum Allowed Lighting Wattage (Exterior, Section 6.3.5)

Location	Description	Allowed Watts per m^2 or per lm	Area in m^2 (or lm for perimeter)	Allowed Watts x m^2 (or x lm)
			Total Allowed Watts	

Proposed Lighting Wattage (Exterior)

Location	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
	Total Proposed Watts may not exceed Total Allowed Watts for Exterior		Total Proposed Watts	

Lighting & Controls Checklist

Energy Conservation Building Code 2017 Compliance Forms

Project Address						Date	
The following information is necessary to check a building permit application for compliance with the lighting requirements in the Energy Conservation Building Code 2017.							
Applicability			Code Section	Component	Information Required		
Yes	No	N/A				Location on Plans	Building Department Notes
Lighting and Controls							
Mandatory Provisions (Section 6.2)							
			6.2.1	Lighting Controls			
			6.2.1.1	Automatic shutoff	Indicate automatic shutoff locations or occupancy sensors		
			6.2.1.2	Space control	Provide schedule with type, indicate locations		
			6.2.1.3	Control in Daylight Areas	Provide manual or automatic control device schedule with type and features, indicate locations		
			6.2.1.4	Ext. lighting control	Indicate photosensor or astronomical time switch		
			6.2.1.5	Additional control	Provide schedule with type, indicate locations		
			6.2.2	Exit signs	Indicate wattage per face of Exit signs		
Prescriptive Interior Lighting Power Compliance Option (Section 6.3)							
			6.3.1	LPD complaince	Indicate whether project is complying with the Building Area Method (6.3.2) or the Space Function Method (6.3.3)		
			6.3.2	Building area method	Provide lighting schedule with wattage of lamp and ballast and number of fixtures. Document all exceptions.		
			6.3.3	Space function method	Provide lighting schedule with wattage of lamp and ballast and number of fixtures. Document all exceptions.		
			6.3.4.1	Luminaire wattage	Indicate the wattage of installed luminaires on the floor plan. In case of luminaires containing permanently installed ballasts, the operating input wattage has to be provided, either from manufacturers catalogs or values from independent testing laboratory reports.		
			6.3.6	Controls_ECBC+ and SuperECBC Buildings	Provide centralized control system schedule with type and features, indicate locations		
Prescriptive Exterior Lighting Power Compliance Option (Section 6.3.5)							
			6.3.5	External light power	Provide lighting schedule with wattage of lamp and ballast and number of fixtures. Document all exceptions.		

Electrical and Renewable Energy Systems Summary

Energy Conservation Building Code 2017 Compliance Forms

Project Info	Project Address	Date
		For Building Department Use
	Project Built-up Area [m^2]	
	Project Above-grade Area [m^2]	
	Project Conditioned Area [m^2]	
	Applicant Name and Address	
	Project Climatic Zone	

Project Description Briefly describe electrical systems and renewable energy installed in the facility	Transformers, Diesel Generator sets, Uninterruptible Power Supply, Renewable Energy Systems and related information

Compliance Approach	Prescriptive Method	Whole Building Performance Method

Transformers			
Type of Transformer	Dry Type Transformer	/	Oil Type Transformer
			X 100 =
Transformer Losses	kVA Rating of Transformer /	Losses at 50% Loading in kW	/ Losses at 100% Loading in kW

Diesel Generator Sets	
Star Rating of DG set	3 Star / 4 Star / 5 Star
Uninterruptible Power Supply	
Efficiency at 100% Load	
Renewable Energy Systems	
Capacity and Type of newable Energy Installed	

Electrical and Renewable Energy Systems Checklist

Energy Conservation Building Code 2017 Compliance Forms

Project Address	Date

The following information is necessary to check a building permit application for compliance with the Electrical and Renewable Energy requirements in the Energy Conservation Building Code.

Applicability			Code Section	Component	Information Required		Location on Plans	Building Department Notes
Yes	No	N/A						
Electrical and Renewable Energy Systems								
Mandatory Provisions (Section 5.2)								
			7.2.1	Transformers				
			7.2.1.1	Maximum Allowable Power Transformer Losses	Provide losses at 50% load and 100% load, capacity and efficiency			
			7.2.1.2	Measurement and Reporting of Transformer Losses	For less than 500 kVA transformer meters are calibrated of 0.5 class accuracy and digital meters			
					For above 500 kVA additional Ct's and PT's are installed			
			7.2.1.3	Voltage Drop	Indicate the Voltage drop for feeders shall not exceed 2% at design load. Voltage drop for branch circuit shall not exceed 3% at design load.			
			7.2.2	Energy Efficient Motors	Indicate the motor class IE2/IE3/IE4.			
					Indicate the motors capacity more than 0.375 kW have efficiency according to the latest version of IS 12615.			
					Motor nameplate indicates nominal full-load motor efficiencies and full-load power factor.			
					Indicate the motor horsepower ratings does not exceed 20% of the calculated maximum load being served.			
			7.2.3	Diesel Generator Sets	Indicate the star rating of the Diesel Generator Set			
			7.2.4	Check-Metering and Monitoring	Indicate the services exceeding 1000 kVA have permanently installed electrical metring to record kVA, kWh and total power factor. And provision for display of current in each phase, voltage between each phase and between each phase and neutral and total harmonic distortion as a percentage of total current.			
					Indicate the services not exceeding 1000 kVA but over 65 kVA shall have permanently installed electric metering to record kW, kWh and power factor or kVARh on hourly basis.			
					Indicate the services not exceeding 65 kVA shall have permanently installed electric metering to record kWh on hourly basis.			

					Indicate in case of tenant based building, for recording metering should be provided at a location from where each tenant could attach the services.
			7.2.5	Power Factor Correction	Indicate that the power factor correction has been maintained at the point of connection.
			7.2.6	Power Distribution System	Indicate the power cable has been sized so that the distribution losses do not exceed the values mentioned in the code.
			7.2.7	Uninterruptible Power Supply	Indicate the UPS meets or exceed the energy efficiency requirements listed in the table 7-4.
			7.2.8	Renewable Energy Systems	Indicate the buildings have provision for installation of renewable energy systems in the future on rooftop or the site.
			7.2.8.1	Renewable Energy Generating Zone	Indicate a dedicated REGZ equivalent to at least 25 % of roof area or area required for generation of energy equivalent to 1% of total peak demand or connected load of the building, whichever is less, shall be provided in all buildings.
					Indicate the REGZ shall is free of any obstructions within its boundaries and from shadows cast by objects adjacent to the zone
			7.2.8.2	Main Electrical Service Panel	Indicate the minimum rating is displayed on the main electrical service panel. And space is reserved for the installation of double pole circuit breaker for future solar electric installation.
			7.2.8.3	Demarcation on Documents	Location for inverters and metering equipment, Pathway for routing of conduit from the REGZ to the point of interconnection with the electrical service, Routing of plumbing from the REGZ to the water-heating system and, Structural design loads for roof dead and live load.