

**Request for Proposal (RFP) for Empanelment of Consultant for
evaluating existing government buildings in Maharashtra**



GRIHA COUNCIL

Contents

1.1	Advestisement	3
1.2	Critical information	4
1.3	Project brief	4
1.4	Scope of work	5
1.5	Time schedule for scope of services	6
1.6	Incidental services	7
1.7	Amendment of EoI	7
1.8	GRIHA Council's responsibility	7
1.9	Deliverables by the consultant	7
1.10	Schedule of payment	7
1.11	Bid processing fee	8
1.12	Procedure for submission of EoI	8
1.13	Minimum eligibility	8
1.14	Documents comprising the EoI	8
1.15	EoI form 1- EoI Letter Proforma	9
1.16	EoI form 2- Minimum Eligibility	11
1.17	EoI form 3- Prior Experience	13
1.18	EoI form 4- Comments and Suggestions	14
1.19	EoI form 5- Declaration Letter	14
1.20	EoI form 6- Financial bid and the scanned copy of the Demand Draft	15
	<i>Annex 1- Energy and water audit</i>	16
	<i>Annex 2- Comfort audit and survey form</i>	19
	<i>Annex 3- Due diligence visit- report format</i>	29

Letter of Invitation

1.1 Advertisement

This Expression of Interest (EoI) document is for the hiring of eligible consultants for providing green building consultancy and rating services for the existing government buildings, owned and/or operated by Public Works Department, Government of Maharashtra. The consultants will be engaged by GRIHA Council until February 2020.

Interested bidders may download the EoI document from the website <http://www.grihaindia.org> or may obtain the same from GRIHA Council, A-260, Bhisham Pitamah Marg, Defence Colony, New Delhi - 110024, India, on payment of Rs.1000 (Rupees One Thousand only), from 25th July 2019 up to 5th August 2019 between 1000 hrs and 1700 hrs on working days. The payment will be accepted in the form of crossed demand draft drawn on any scheduled bank, payable at par in New Delhi in favor of GRIHA Council. The bidders are required to send an acknowledgement at ceo@grihaindia.org in case they download the form from the website. In absence of an acknowledgement the bidder would be deemed as non-responsive.

Last Date for Submission of EoI, 1500 hours (IST) on 15th August 2019. You may contact Ar. Namrata Randive, Manager- *Business Development, Rating Review & Trainings*, Western Zone GRIHA Council, for any clarification.

Tel. - (022) 27580021/27580022 Ext. (114)

Email: namrata.randive@grihaindia.org

1.2 Critical Information

Availability of Invitation for EoI	From 25 th July 2019 up to 5 th August 2019 between 1000 hrs and 1700 hrs on working days.
Last date for receipt of Queries	1500 hours (IST) on 9 th August 2019
Pre-bid Conference(if more than 5 bidders send in a written request)	1500 hours on 12 th August 2019
Last date for receipt of EOI	1500 hours (IST) on 15 th August 2019
Contact person for queries	Ar. Namrata Randive, Manager- <i>Business Development, Rating Review & Trainings</i> , Western Zone, GRIHA Council, for any clarification. Tel. - (022) 27580021/27580022 Ext. (114) Email: namrata.randive@grihaindia.org
Contact person for submission of EOI	Mr. Kamal Kishor, Project Officer, GRIHA Council Tel. - (+91 11) 46444500/24339606-08 Email: kamal.kishor@grihaindia.org

1.3 Project brief:

GRIHA Council and Public Works Department, Government of Maharashtra (PWD, GoM) has signed an agreement to mainstream green building practices in the existing government buildings which are either owned or maintained by PWD, pan Maharashtra, through the GRIHA Existing Building (EB) rating system. Every region would have at least 50 projects registered with GRIHA Council, with an addition of 25 projects in a few regions. Approximately **50 functional government buildings with built up area ranging between 100 sqm to 85,000 sqm, spread across the region**, shall be under the scope of work of the eligible consultant, from one of the below mentioned regions of Maharashtra.

1. Pune (Circles: Pune, Satara, Solapur, Kolhapur and Sangli)
2. Nagpur (Circles: Nagpur, Bhandara, Gondia, Wardha, Chandrapur and Gadchiroli)
3. Mumbai (Circles: Mumbai, Navi Mumbai and Coastal area Mumbai)
4. Konkan (Circles: Thane, Raigad, Ratnagiri and Sindhudurg)
5. Amravati (Circles: Akola, Amaravati, Washim, Buldana and Yavatmal)
6. Aurangabad (Circles: Marathwada: Aurangabad, Jalna, Parbhani, Hingoli, Nanded, Beed, Latur and Osmanabad)
7. Nashik (Circles: Nashik, Dhule, Nandurbar, Ahmednagar and Jalgaon)

1.4 Scope of Work:

The scope of work will consist of the following main disciplines:

- Task 1: Green building consultancy to meet minimum GRIHA EB 3 star rating
- Task 2: Energy, water & comfort audit and due diligence visit
- Task 3: GRIHA documentation and submission to GRIHA Council

Green building consultancy to meet minimum GRIHA EB 3 star rating

The advisory services for the review and finalizing of the strategies to be implemented on the site, to achieve minimum GRIHA EB 3 star rating shall include the following:

- Conduct an orientation workshop for the PWD officials in each circle at their respective circle office.
- Review the primary data shared by PWD, GoM for their respective projects. In case of absence of data, the consultant will have to coordinate with the PWD officers and acquire the required data.
- Based on the preliminary assessment and interactions with the PWD officials, the consultant will recommend to-do activities to achieve minimum 3 star rating, which are cost effective.
- Hand-hold the project team to achieve the to-do activities.

Energy, water & comfort audit and due diligence visit

A quick energy and water audit shall be conducted as per the sample format ([Annex 1](#)) prescribed in the GRIHA EB manual. A detailed comfort audit comprising the thermal, visual and acoustic parameters shall be undertaken as elaborated in the [Annex 2](#). The audit may be extended and termed as 1st due diligence visit which shall also include the remaining criterion requirement of the rating system. Post the visit, the due diligence report shall be prepared by the consultant and uploaded on the online panel. The broad activities include the following:

- Energy, water and comfort audit
- Due diligence visit to check the onsite compliance for GRIHA EB
- Preparation of the due diligence report and uploading on the GRIHA EB online panel as per [Annex 3](#) format.

GRIHA documentation and submission to GRIHA Council

The consultancy service for GRIHA documentation includes collection of design inputs/narratives/ submittals from the respective design team/ consultant/ project management team as per the GRIHA requirements and consolidate the complete data in the format of GRIHA compliances. The consultancy service also includes filtering, cross validation, verification of consistency and adding value to the submittals to ensure correctness of compliances. The final objective of this service is to submit the complete set of document to the GRIHA Council and enable the project team to get the desired final rating.

1.5 Time schedule for scope of services:

The time line for the aforementioned tasks are as mentioned below.

Task	Description	Time line									Jan- Feb 2020
		1 st Sep 2019	15 th Sep	30 th Sep	15 th Oct	31 st Oct	15 th Nov	30 th Nov	15 th Dec	31 st Dec	
1	Green building consultancy to meet minimum GRIHA EB 3 star rating	<i>Immediately as soon as the projects have been allocated. The consultant may touch base with the PWB officials for the orientation workshop & primary data.</i>									
2	Energy, water & comfort audit and due diligence visit			<i>Post receipt of data, within a week's time.</i>							
3	GRIHA documentation and submission to GRIHA Council						<i>Parallel process, to be completed before the calendar year end.</i>				<i>For documentation purposes, if need be.</i>

The Consultant shall start the work immediately after the 'Letter of Award' is issued to the consultant. The consultant shall perform the services to the entire satisfaction of GRIHA Council, and in pace with the progress of the project. In case it is observed that the consultant is delaying in starting the work or not cooperating during the job satisfactorily or suspends the work or delays the completion of work then the action will be taken as per relevant clauses.

The services shall be rendered as per the tentative time schedule of various services in such a fashion that at no point of time planning, execution shall hamper due to the want of details from the consultant. The complete GRIHA EB rating process for the projects allocated shall be completed by **31st December 2019** (starting from mid-September). In case of incompleteness of the documents, re-submission would be done by the consultant, at no extra cost and no later than 29th February 2020.

1.6 Incidental services:

The entire incidental services related with the activities shall be deemed included in the scope of services. No extra payment shall be made for the incidental services.

1.7 Amendment of EoI

At any time prior to the last date for receipt of bids, GRIHA Council, may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Consultant, modify the EoI document by an amendment. In order to provide prospective Consultants reasonable time in which to take the amendment into account in preparing their bids, GRIHA Council may, at its discretion, extend the last date for the receipt of Bids and/or make other changes in the requirements set out in the Invitation for EOI.

1.8 GRIHA Council's responsibility:

GRIHA council shall hold the following responsibilities:

- Make the payments as per the agreed terms and condition.
- Give necessary clearances/sign offs and inputs/feedbacks promptly at various stages.

1.9 Deliverables by the consultant:

Consultant shall hold the following responsibilities:

- Conduct orientation workshops for each circle office.
- Provide green building consultancy for each project as elaborated in the scope of work.
- Conduct due diligence visit and prepare reports for the understanding of project status for the knowledge of both client and GRIHA Council, in the prescribed format.
- Review of primary data, filtering, cross validation, verification of consistency and adding value to the submittals.
- Submit the complete set of document to the GRIHA Council for final rating

1.10 Schedule of payment:

The following would be the terms of payment:

- 25% of the fee payable- on issuing the work order
- 25% of the fee payable- on completion of Task II (*Energy, water & comfort audit and due diligence visit*)
- 25% of the fee payable- on completion of Task III (*GRIHA documentation and submission to GRIHA Council*)
- 25% of the fee payable- on award of final GRIHA EB rating

The rate quoted by consultant shall be inclusive of income tax, sales tax i.e. VAT, consumables, visiting charges, revision, modifications in design etc. complete as scope of work. Nothing extra shall be paid on this account. However service tax shall be reimbursed

on actual basis on production of payment vouchers. The recovery of income tax etc. will be made from the consultant's bills as per applicable rules.

1.11 Bid Processing Fees

All bids must be accompanied by a bid processing fee of INR 5,000 (INR Five Thousand only) in the form of a crossed demand draft drawn on any nationalized/ scheduled bank payable at par in New Delhi, in favour of "GRIHA Council". In case the document is downloaded from the website, bid processing fee of INR 6,000 (INR Six Thousand Only) would be required. The demand draft should reach GRIHA Council, A-260, Bhisham Pitamah Marg, Defence Colony, New Delhi - 110024, India, latest by 15th August 2019.

1.12 Procedure for Submission of EoI

The Consultant should submit their responses to EoI via **EMAIL ONLY**, having two attachments titled as **TECHNICAL-A** and **FINANCIAL-B** and subject line as '**RFP for empanelment of consultant for evaluating existing government buildings in Maharashtra**'. The technical attachment should contain only the EOI forms from 1 to 5. Whereas, the financial attachment should contain the price bid for providing the services to GRIHA Council on a lump- sum basis. The email should be sent on the following address, not later than 1500 hours (IST) on 15th August 2019.

Email: namrata.randive@grihaindia.org & kamal.kishor@grihaindia.org

1.13 Minimum eligibility

The Consultant should have the following minimum eligibility criteria being met.

- i) The applicant should have minimum annual turnover of consultancy fee amounting to INR. 10.00 Lac (INR. Ten Lakh) or more during the last financial year i.e. year 2018-19.
- ii) The applicant firm should have executed at least one project of minimum 3-star GRIHA rating.
- iii) The applicant firm should have at least one BEE certified auditor/manager.

1.14 Documents Comprising the EOI

The proposal prepared by the Consultant shall comprise the following components:

EoI Form 1	EoI Letter Proforma
EoI Form 2	Minimum Eligibility
EoI Form 3	Prior Experience
EoI Form 4	Comments and Suggestions
EoI Form 5	Declaration Letter
EoI Form 6	Financial bid and the scanned copy of the Demand Draft

1.15 EoI Form 1: EoI Letter Proforma

The Chief Executive Officer,
GRIHA Council
A-260, Bhisham Pitamah Marg, Defence Colony, New Delhi – 110024

Respected Sir,

Subject: Hiring of consultant for green building consultancy and documentation service for existing government building.

The undersigned Consultant, having read and examined in detail all the EoI documents in respect of appointment of a Consultant for GRIHA Council, do hereby express their interest to provide Consultancy Services as specified in the scope of work.

Our correspondence details are:

1	Name of the Consultant	
2	Address of the Consultant	
3	Name of the contact person to whom all references shall be made regarding this tender.	
4	Designation of the person to whom all references shall be made regarding this tender.	
5	Address of the person to whom all references shall be made regarding this tender	
6	Telephone (with STD code)	
7	E-Mail of the contact person	
8	Fax No. (with STD code)	

We have attached the following documents:

- i) EoI Form 2 : Minimum Eligibility
- ii) EoI Form 3 : Prior Experience
- iii) EoI Form 4 : Comments and Suggestions
- iv) EoI Form 5 : Declaration Letter
- v) EoI Form 6 : Financial bid and the scanned copy of the Demand Draft



We hereby declare that our EoI is made in good faith and the information contained is true and correct to the best of our knowledge and belief.

Thanking you,

(Signature of the Consultant)

Yours faithfully

Name :

Designation :

Seal :

Date :

Place :

Business Address:

1.16 EoI Form 2: Minimum Eligibility

Sr. No.	Information and documents required	Information and documents to be supplied by the applicant in the following format																
1	Name of Firm/Company																	
2	The applicant should have minimum annual turnover of consultancy fee amounting to INR. 10.00 Lac (INR. Ten Lakh) or more during the last financial year i.e. year 2018-19.	<table border="1"> <tr> <td>Financial year</td><td>Total annual turnover (INR)</td></tr> <tr> <td></td><td></td></tr> </table> <p><i>Note: Audited Profit and Loss Account and Balance Sheet with report of Chartered Accountant shall be enclosed in support of above. Information shall be furnished in the same format. Failure may result in disqualification.</i></p>	Financial year	Total annual turnover (INR)														
Financial year	Total annual turnover (INR)																	
3	The applicant firm should have executed at least one project of minimum 3-star GRIHA rating.	<table border="1"> <tr> <td>Name of the project</td><td></td></tr> <tr> <td>Location</td><td></td></tr> <tr> <td>Built up area in sqm</td><td></td></tr> <tr> <td>Year of completion</td><td></td></tr> <tr> <td>Cost of the project</td><td></td></tr> <tr> <td>Client</td><td></td></tr> <tr> <td>Rating variant</td><td></td></tr> <tr> <td>Star rating achieved</td><td></td></tr> </table> <p><i>Note: Certificate for completion of work shall be enclosed in support of above. Information shall be furnished in the same format. Failure may result in disqualification.</i></p>	Name of the project		Location		Built up area in sqm		Year of completion		Cost of the project		Client		Rating variant		Star rating achieved	
Name of the project																		
Location																		
Built up area in sqm																		
Year of completion																		
Cost of the project																		
Client																		
Rating variant																		
Star rating achieved																		
4	Number of Employees as on March 31, 2019	<table border="1"> <tr> <td>Fixed staff</td><td>Associates</td></tr> <tr> <td></td><td></td></tr> </table>	Fixed staff	Associates														
Fixed staff	Associates																	
5	The applicant firm should have at least one BEE certified auditor/manager	<table border="1"> <tr> <td>Name of the team member</td><td></td></tr> </table>	Name of the team member															
Name of the team member																		

		Position in the organization	
<p><i>Note: Certificate of employment and certificate of BEE shall be enclosed in support of above. Information shall be furnished in the same format. Failure may result in disqualification.</i></p>			

Signature and Seal of the Applicant

Date:

Place:

1.17 EoI Form 3: Prior Experience

[Using the format below, provide information on each assignment for which your firm, and each associate for this assignment, was legally contracted either individually as a corporate entity or as one of the major companies within an association, for carrying out consulting services similar to the ones related to this assignment. The Consultant should give information about **maximum of five on-going projects in the past 2 years and maximum three projects already executed in the last 3 years**. Experience of sub-contractor including parent company may be stated only if the relevant Memorandum of Understanding (MoU) is submitted.]

Name of Consultant/Firm:	
Assignment/job name:	
Nature of Assignment:	
Description of Project:	
Approx. value of the contract (in Rupees):	
Location:	
Duration of Assignment/job (months) :	
Name of Employer:	
Address and contact details:	
Start date (month/year):	
Completion date (month/year):	
Name of associated Consultants, if any:	
Description of actual Assignment/job provided by your staff within the Assignment/job:	

Note: Please attach Letter of Intent or Purchase Order or certificate of successful completion for each project, from the respective Client(s).

Signature and Seal of the Applicant

Date:

Place:

1.18 EoI Form 4: Comments and suggestions (Optional)

[Suggest and justify here any modifications or improvement to the scope of work, tasks to be performed, timeline, deliverables, payment terms and so on to improve performance in carrying out the Assignment. The Consultant can suggest deleting some activity or adding another, or proposing a different phasing of the activities. Such suggestions should be concise and to the point.]

(Maximum two pages).

1.19 EoI Form 5: Declaration letter

[Declaration Letter on official letter head stating the following should be submitted.]

UNDERTAKING

“We certify that no member of our board has been convicted by a Court of Law nor any regulatory authority has indicated for any violation nor have we been ever blacklisted by a department of any Government or its entity. It is further stated that there is no investigation pending against us or our sister concern. It is certified that no conflict of interest exists as on date and in future if such a conflict of interest arises we will intimate the same to the Client.

Signature and Seal of the Applicant

Date:

Place:

1.20 EoI Form 6: Financial bid and the scanned copy of the Demand Draft

[Consultant need to bid for one region only. In case, the consultant wants to bid for more regions, then according only the bid processing fee should be submitted (INR 5000/-).]

Sr. No.	Description	Information and documents to be supplied by the applicant in following format				
1	Preferred region to work, including the circles	Pune/Nagpur/Mumbai/Konkan/Amravati/Aurangabad/Nashik				
2	Undertaking the following tasks for 25 projects : <ul style="list-style-type: none"> Task 1: Green building consultancy to meet minimum GRIHA EB 3 star rating Task 2: Energy, water & comfort audit and due diligence visit Task 3: GRIHA documentation and submission to GRIHA Council 	<table border="1"> <tr> <td>Total contract price for 25 projects in Figures</td><td></td></tr> <tr> <td>Total contract price for 25 projects in Words</td><td></td></tr> </table> <p><i>Note: Price shall be inclusive of all expenses, such as professional cost, stationary, travel and accommodation. Taxes shall be computed over and above. Prices shall be firm and binding throughout the contract period.</i></p>	Total contract price for 25 projects in Figures		Total contract price for 25 projects in Words	
Total contract price for 25 projects in Figures						
Total contract price for 25 projects in Words						
3	Undertaking the following tasks for 50 projects : <ul style="list-style-type: none"> Task 1: Green building consultancy to meet minimum GRIHA EB 3 star rating Task 2: Energy, water & comfort audit and due diligence visit Task 3: GRIHA documentation and submission to GRIHA Council 	<table border="1"> <tr> <td>Total contract price for 50 projects in Figures</td><td></td></tr> <tr> <td>Total contract price for 50 projects in Words</td><td></td></tr> </table> <p><i>Note: Price shall be inclusive of all expenses, such as professional cost, stationary, travel and accommodation. Taxes shall be computed over and above. Prices shall be firm and binding throughout the contract period.</i></p>	Total contract price for 50 projects in Figures		Total contract price for 50 projects in Words	
Total contract price for 50 projects in Figures						
Total contract price for 50 projects in Words						

Signature and Seal of the Applicant

Date:

Place:

Annex 1: Energy and water audit

Energy audit

Sr. No	Description	No. of fixtures changed	Power consumption	Lumen output
1	LED tubes			
2	BEE star rated fans			
3	BEE star rated 1.5 ton window AC			
4	BEE star rated 1.5 ton split AC			
5	LED lamps			
6	Any other EEM implemented			

Sr. No	Name of equipment	Location of installation	Number	Power consumption (kW)/ Size or capacity of system
1.	Electrical system			
1.1.	Transformers			
1.2.	Diesel generator sets			
1.3.	HT, LT panels			
1.4.	Motors			
2.	Mechanical system			
2.1.	AHU			
2.2.	Cooling tower			
2.3.	Chillers			
2.4.	HVAC Pumps			
2.5.	VRF			
2.6.	Ventilation fans			
2.7.	Split AC			
3.	Plumbing system			
3.1.	Piping			
3.2.	Fixtures and fittings			
3.3.	Fire safety pumps			
3.4.	Sprinklers			

4.	Metering and sensors			
4.1.	Energy meters			
4.2.	Water meters			
4.3.	Air quality meters			
5.	Renewable energy systems			
5.1.	Solar PV			
5.2.	Solar thermal			
5.3.	Wind turbines			
5.4.	Bio-gasifiers			
5.5.	Any other as per MNRE guidelines			
6.	Sewage treatment plant			
7.	Waste treatment plant			
8.	Storm water drainage system			
9.	Rainwater harvesting system			

Water audit

Sr. No	Description	Answer
1.	Total number of male occupants	_____Nos.
2.	Total number of female occupants	_____Nos.
3.	Total number of working days in a year	_____Nos.
4.	Are you using any gravity fed system for water supply in the building?	Yes/No
5.	Is water head height in the building less than 5 meters or 17 feet?	Yes/No

Sr.no	Source of water	Supply Quantity (litres/day)
1.	Municipal water	
2.	Bore-well water	
3.	Tanker water	

4.	Treated sewage water	
5.	Harvested rainwater	

Fixtures installed in the building	No. of fixture	flow rates (lpf/lpm)
Water closets (Solids)		
Kitchen faucets No		
Conventional closets/squatting urinals (female)		
Conventional urinals (male)		
Waterless urinals		
Showers		
Lavatory faucets		

Sr.no	Water demand	Quantity (litres/day)
1.	Annual domestic water demand/consumption	
2.	Landscape water demand/consumption	
3.	Other miscellaneous water demand	

Sr.no	Water demand	Quantity (litres/day)
1.	Annual domestic water demand/consumption	
2.	Landscape water demand/consumption	
3.	Other miscellaneous water demand	

Annex 2: Comfort audit and survey form

Procedure designed for verification of on-site measurement of noise level, thermal comfort level, and lighting levels in an existing building.

Purpose:

Purpose of this instruction setup is to acquire the basics of metering of noise, comfort and light levels in all human occupied places for optimum living standards and have consistency in on-site measurement.

DAY LIGHTING AND ARTIFICIAL LIGHTING AUDIT

To ensure good lighting, the auditor is responsible to make a suitable assessment of lighting levels in the workplace.

Illuminance Measuring Instrument

Illuminance is measured by a luxmeter, which is a handy instrument with a sensor. The measured illuminance is directly displayed in lux (lx). In general, luxmeters conforming to internationally recognized specifications, such as BS 667:2005, DIN 5032-7:1985 or CIE Publication 3 No. 69 (1987), should be used. There should be regular calibration, typically once a year, to ensure accurate measurement.

Illuminance Measurement for General Lighting

Illuminance is the measure of the amount of light received on the surface. It is typically expressed in lux (lm/m^2). To measure lux, the work area should first be divided into a number of equal small areas which should be nearly a square. For example, for an ordinary medium sized work area of less than 50m^2 where the lighting is at a height of around 2.5m, the work area is normally divided into a minimum of 16 small squares. For a work area of size up to around 100m^2 , the recommended minimum number of small squares is 25. If the work area is even larger, a minimum number of 36 small squares are recommended.

After setting the small squares, the assessor may take illuminance measurement at the centre of each square with a luxmeter. The results indicate whether the lighting is evenly distributed. In addition, the average value of these measurements represents the average illuminance for the whole work area.

In measuring illuminance at a task position, the following points should be noted:

- Illuminance measurement should be taken at the height of the work plane. In case there is no

specified plane for the task, the measurement should be taken at a horizontal plane at around 0.8m above the floor.

- The light sensor of the luxmeter should be placed on the work plane, which is normally a horizontal plane, but is an inclined plane if the object is to be read on such a plane, e.g. an easel. Similarly, the work plane is a vertical plane if the object is to be read vertically.
- Except for measuring the impact of the operator on the task / activity, the path between the lighting source and the point of measurement should be clear as far as practicable. In particular, the assessor should avoid obstructing the normal light path, and should move sideways, back and forth to ascertain that he / she is not blocking the light falling on the light sensor of the luxmeter.
- Select the lowest measurement range of the luxmeter as appropriate. This gives a more precise reading.
- The measurement points should not be too close to walls or obstructions.
- Daylight should be shielded by blinds or curtains when assessing artificial lighting only.

Record Table:

Sl. No.	Location Name (Floor to be mentioned)	Observed reading from locations					Average reading	Checked by	Verified by (QA)
		L1	L2	L3	L4	L5			
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
15.									
16.									

17.									
18.									
19.									
20.									
21.									
22.									
23.									
24.									
25.									
26.									
27.									
28.									
29.									
30.									

Note: For sampling at least the testing must be done for 25% of living/habitable area.

ACOUSTIC AUDIT

Sound pressure levels are measured in decibels (dB). It is a common practice to sum sound levels over the entire audible spectrum to give an overall sound level. This sound level is weighted to correspond approximately to the hearing response of humans. The resulting "A-weighted" sound level (dBA) is often used as a criterion to indicate a maximum allowable sound level.

The noise data in this report has been given in terms of frequency distribution. The frequency is the number of times in one second that a sound wave oscillates. The levels are grouped into 1/3- octave bands of frequency, typically with centre frequencies at 63, 125, 250, 500, 1000, 2000, 4000 & 8000 Hertz (Hz.).

An additional descriptor used to indicate overall sound levels is the LEQ, or the time average (or integrated) sound level. The LEQ is the constant sound level, which, over a given time period, has the same energy as the actual time varying signal over the same time period. L90 is defined as the sound level exceeded for 90% of the time and is used as an indicator of the "ambient" noise level.

The term "noise intrusion" indicates that a noise event is causing the noise level in a space to increase over the existing steady background level. In this report the noise intrusions are defined in terms of



overall one hour LEQ in dBA.

Sound level meter

A sound level meter is used for acoustic measurements. It is commonly a hand-held instrument with a microphone. The diaphragm of the microphone responds to changes in air pressure caused by sound waves. That is why the instrument is sometimes referred to as a Sound Pressure Level (SPL) Meter. This movement of the diaphragm, i.e. the sound pressure deviation (Pascal Pa), is converted into an electrical signal (volts V).

However, the reading from a sound level meter does not correlate well to human-perceived loudness, which is better measured by a loudness meter. Specific loudness is a compressive nonlinearity that depends on level and also frequency, which can be calculated in a number of different ways.

Classification

- Types
 - The IEC 61672-1 specifies three kinds of sound measuring instruments. They are the "conventional" sound level meter, the integrating-averaging sound level meter, and the integrating sound level meter.
 - The standard sound level meter can be called an exponentially averaging sound level meter as the AC signal from the microphone is converted to DC by a root-mean-square (RMS) circuit and thus it must have a time constant of integration; today referred to as the time-weighting. Three of these time-weightings have been internationally standardized, 'S' (1 s) originally called Slow, 'F' (125 ms) originally called Fast and 'I' (35 ms) originally called Impulse.
 - The output of the RMS circuit is linear in voltage and is passed through a logarithmic circuit to give readout linear in decibels (dB). This is 20 times the base 10 logarithm of the ratio of a given root-mean-square sound pressure to the reference sound pressure. Root-mean square sound pressure being obtained with a standard frequency weighting and standard time weighting. The reference pressure is set by International agreement to be 20 micropascals for airborne sound. It follows that the decibel is, in a sense, not a unit, it is simply a dimensionless ratio; in this case the ratio of two pressures.
- Classes
 - EC standards divide sound level meters into two "classes". Sound level meters of the two classes have the same functionality, but different tolerances for error. Class 1 instruments have a wider frequency range and a tighter tolerance than a lower cost, Class 2 unit. This applies to both the sound level meter itself as well as the associated calibrator.

Procedure

- Set measurement time ("FAST/SLOW")
- Set frequency ("A/C")
- Set measurement range ("Level")
- Always direct the microphone exactly at the sound source to be measured (reference direction).
- Leave the room after placing the meter.
- Save the highest and lowest value via "Max/Min". (Annexure -2)

Precautions

- The meter housing and the person operating the meter may not stand near while taking the readings.
- It is recommended to fit the instrument to a tripod for exact measurements.
- Make sure the room is closed at the time of readings.

Record Table:

Sl. No.	Location	Observed readings from the location	Checked by	Verified By
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				

19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

Note: For sampling at least the testing must be done for 25% of living/habitable area.

THERMAL COMFORT AUDIT

Thermal comfort is the condition of mind that expresses satisfaction with the thermal environment and is assessed by subjective evaluation (ASHRAE Standard 55-2010/ NBC-2005/ Indian Adaptive Comfort Model).

Influencing factors

Since there are large variations from person to person in terms of physiological and psychological satisfaction, it is hard to find an optimal temperature for everyone in a given space. Laboratory and field data have been collected to define conditions that will be found comfortable for a specified percentage of occupants.

There are six primary factors that directly affect thermal comfort that can be grouped in two categories: personal factors - because they are characteristics of the occupants - and environmental factors - which are conditions of the thermal environment. The former are metabolic rate and clothing level, the latter are air temperature, mean radiant temperature, air speed and humidity. Even if all these factors may vary with time, standards usually refer to a steady state to study thermal comfort, just allowing limited temperature variations.

Relative humidity



Relative humidity (RH) is the ratio of the partial pressure of water vapour to the equilibrium vapour pressure of water at a given temperature. Relative humidity depends on temperature and the pressure of the system of interest.

Temperature

The air temperature is the average temperature of the air surrounding the occupant, with respect to location and time. According to ASHRAE 55 standard, the spatial average takes into account the ankle, waist and head levels, which vary for seated or standing occupants. The temporal average is based on three-minute intervals with at least 18 equally spaced points in time. Air temperature is measured with a dry-bulb thermometer and for this reason it is also known as dry-bulb temperature.

Procedure

- The meter will start displaying the RH and temperature levels of the room/space.
- Keep the measuring device away from any heat and water source and such as a room heater or a condensing bottle.
- Measure the readings at 3 sources within a space so temperature anomalies could be observed inside the room.
- Observe the readings and record them by “min/max”.
- The air temperature should be measured at a number of places on a horizontal plane at a vertical height of about 1m above the floor or at working plane - representative of sitting height. One of these points should be at the centre of the room.

Record Table:

Sl. No.	Location Name (Floor & orientation)	Observed reading from locations						Average reading		Checked by	Verified by (QA)
		T1	RH1	T2	RH2	T3	RH3	T _{final}	RH _{final}		
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											

9.											
10.											
11.											
12.											
13.											
14.											
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18.											
19.											
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21.											
22.											
23.											
24.											
25.											
26.											
27.											
28.											
29.											
30.											

Note: For sampling at least the testing must be done for 25% of living/habitable area.

COMFORT SURVEY FORM

This survey is aimed at assessing the thermal, visual and acoustic comfort levels of the occupants in the building. Additionally, areas of improvement in the building systems can be identified through the survey. This is an attempt to make improvements in the systems thereby enhancing the comfort of the occupants, provide a better working environment and increase productivity.

- What is the name of your building?
.....
- How many years have you been working / residing in this building?
 - ☐ Less than 1 year
 - ☐ 1 – 3 years
 - ☐ 3 – 5 years
 - ☐ More than 5 years
- On which floor is your seating area located (if applicable)
.....
- In which orientation is your seating located? (if applicable)
 - ☐ North
 - ☐ South
 - ☐ East
 - ☐ West
- Where does your seating face
 - ☐ Directly facing the window
 - ☐ Side facing towards window
 - ☐ Towards other people
 - ☐ Towards the wall
- Which of the following can you manually control in your workspace? (check all that apply)
 - ☐ Window blinds or shades
 - ☐ Operable window
 - ☐ Room air-conditioning unit
 - ☐ Portable fan
 - ☐ Ceiling fan
 - ☐ Adjustable air vent in wall or ceiling
 - ☐ Adjustable floor air vents (diffuser)
 - ☐ Door to interior space
 - ☐ Door to exterior space
 - ☐ None of the above
 - ☐ Other



- How satisfied are you with the temperature in your workspace? Rate it on the scale of 1 to 5, where 1 is equivalent to Very Dissatisfied and 5 is equivalent to Very satisfied.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- Which of the following controls do you have in your workspace? (check all that apply)
 - ☐ Light switch
 - ☐ Light dimmer
 - ☐ Window blinds or shades Desk (task) light
 - ☐ None of the above
 - ☐ Other:
- How satisfied are you with the lighting (visual comfort, e.g., glare, reflections, contrast)? Rate it on the scale of 1 to 5, where 1 is equivalent to Very Dissatisfied and 5 is equivalent to Very satisfied.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- How satisfied are you with the noise level in your workspace? Rate it on the scale of 1 to 5, where 1 is equivalent to Very Dissatisfied and 5 is equivalent to Very satisfied.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- How would you rate the indoor air quality of this building?
 - ☐ Good ☐ Average ☐ Poor
 - If average or poor then, does the problem occur more frequently during specific seasons of the year?
 - ☐ Yes ☐ No ☐ Don't Know ☐ Not Applicable
 - If "Yes", then rate each season from 1 to 4, where 1 is Worst Case and 4 is Best Case i.e. Best case means no problem with indoor air quality during that particular season.
 - ☐ Winter Season: January – February
 - ☐ Pre Monsoon Season (summer): March – May
 - ☐ Southwest Monsoon Season: June – September
 - ☐ Post Monsoon Season: October – December
 - If "Yes", then, when does the indoor air quality get worst?
 - ☐ Morning ☐ Afternoon ☐ All day ☐ Not applicable

Annex 3: Due diligence visit- report format

Project Name	
Project Code	
Location	
Date	
GRIHA Auditors	

Criteria	Compliance on site and observations																								
SECTION 1: SITE PARAMETERS																									
Criterion 1: Accessibility to Basic Services																									
Availability of at least 5 services within the campus or within 500m walking distance from main entrance of project	<table border="1"> <thead> <tr> <th></th> <th>Grocery</th> <th>Bank/A TM</th> <th>Restaurant</th> <th>Public transit stops</th> <th>Pharmacy</th> <th>Community center</th> <th>Gym</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>No</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Grocery	Bank/A TM	Restaurant	Public transit stops	Pharmacy	Community center	Gym	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Grocery	Bank/A TM	Restaurant	Public transit stops	Pharmacy	Community center	Gym																		
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																		
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																		
Collective transport service to nearest public transportation nodes for building occupants	<table border="1"> <thead> <tr> <th>Description</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>Preferred parking for electric vehicles</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Preferred parking for pooled vehicles</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Bicycle rental/parking</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Shuttle services</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	Description	Yes	No	Preferred parking for electric vehicles	<input type="checkbox"/>	<input type="checkbox"/>	Preferred parking for pooled vehicles	<input type="checkbox"/>	<input type="checkbox"/>	Bicycle rental/parking	<input type="checkbox"/>	<input type="checkbox"/>	Shuttle services	<input type="checkbox"/>	<input type="checkbox"/>									
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Bicycle rental/parking	<input type="checkbox"/>	<input type="checkbox"/>																							
Shuttle services	<input type="checkbox"/>	<input type="checkbox"/>																							
Criterion 2: Microclimatic Impact																									
1 tree per 80 m ² of total site/plot area	Plot area: _____sqm No. of trees on site: _____ Proposed native plantation on site: _____																								
Reduction of urban heat island effect by any application such as grass pavers/ shaded paving/ paving with SRI>50%	Hard paved area on site: _____sqm Hard paved area under shade: _____sqm Soft landscape area: _____sqm Roof area with china mosaic/high SRI paint: _____sqm																								
SECTION 2: MAINTENANCE & HOUSEKEEPING																									
Criterion 3: Maintenance, Green Procurement and Waste Management																									

Maintenance and housekeeping protocols for all systems (Mandatory)	Sr. No	Type of system	Installed on site (Yes/No/NA)	Maintenance (In-house/Out sourced)	Frequency of maintenance (Daily/Weekly/Monthly/Quarterly/Yearly)
	1	Electrical system			
		Transformer			
		Diesel generator sets			
		HT, LT panels			
		Motors			
	2	Mechanical system			
		Air Handling Unit			
		Cooling tower			
		Chillers			
		Pumps			
		VRF			
		Ventilation fans			
		Ducting			
	3	Plumbing system			
		Piping			
		Fixtures and fittings			
		Fire safety pumps			
		Sprinklers			
	4	Metering and sensors			
		Energy meters			
		Water meters			
		Air quality meters			
	5	Renewable energy systems			
		Solar PV			
		Solar thermal			
		Wind turbines			
		Bio-gasifiers			
	6	Sewage treatment plant			
	7	Water treatment plant			
	8	Storm water drainage system			

	9	Rainwater harvesting system							
	10	Any other system installed							
All insulation used in building are CFC and HCFC free (Mandatory)	Insulation is there but no information available								
	Description		Yes	No					
	Extruded Polystyrene (XPS)		<input type="checkbox"/>	<input type="checkbox"/>					
	Expanded Polystyrene (EPS)		<input type="checkbox"/>	<input type="checkbox"/>					
	Glass Wool stuffing		<input type="checkbox"/>	<input type="checkbox"/>					
	Air (Still)		<input type="checkbox"/>	<input type="checkbox"/>					
All HVAC and refrigeration equipment's are CFC free (Mandatory)	Description		Yes	No					
	Building is naturally ventilated		<input type="checkbox"/>	<input type="checkbox"/>					
	HVAC system is installed in the building, if yes, refrigeration used was:								
	R410A		<input type="checkbox"/>	<input type="checkbox"/>					
	R134a		<input type="checkbox"/>	<input type="checkbox"/>					
	R-22		<input type="checkbox"/>	<input type="checkbox"/>					
Firefighting system installed on site does not have halons (Mandatory)	Description		Yes	No					
	Fire extinguisher, if yes, extinguishing agent was:		<input type="checkbox"/>	<input type="checkbox"/>					
	Water		<input type="checkbox"/>	<input type="checkbox"/>					
	Carbon dioxide		<input type="checkbox"/>	<input type="checkbox"/>					
	Dry Chemical		<input type="checkbox"/>	<input type="checkbox"/>					
	Fire hose reels		<input type="checkbox"/>	<input type="checkbox"/>					
	Fire hydrant systems		<input type="checkbox"/>	<input type="checkbox"/>					
	Automatic sprinkler system		<input type="checkbox"/>	<input type="checkbox"/>					
Purchasing policy for environment-friendly cleaning and pest control products for housekeeping materials	<table border="1"> <tr> <td>Yes</td><td>No</td></tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </table>		Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:		
	Yes	No							
<input type="checkbox"/>	<input type="checkbox"/>								
Purchasing policy for appliances with at least 3-star BEE rating	<table border="1"> <tr> <td>Yes</td><td>No</td></tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </table>		Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:		
	Yes	No							
<input type="checkbox"/>	<input type="checkbox"/>								

Multi-coloured bins shall be provided to segregate waste	<table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Organic waste generated on site: _____ kg/day Any other remarks:						
Yes	No											
<input type="checkbox"/>	<input type="checkbox"/>											
Separate space shall be allocated for collection of waste before transfer for recycling	<table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:						
Yes	No											
<input type="checkbox"/>	<input type="checkbox"/>											
Appropriate measures to be taken for zero-waste generation from site	<table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	<table border="1"> <tr> <td>Composting pits/ Vermi-composting</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Bio-gas plant</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Tie-up with agency</td> <td><input type="checkbox"/></td> </tr> </table>	Composting pits/ Vermi-composting	<input type="checkbox"/>	Bio-gas plant	<input type="checkbox"/>	Tie-up with agency	<input type="checkbox"/>
Yes	No											
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Composting pits/ Vermi-composting	<input type="checkbox"/>											
Bio-gas plant	<input type="checkbox"/>											
Tie-up with agency	<input type="checkbox"/>											

Criterion 4: Metering & Monitoring

Basic metering at source level (Mandatory)	Sr. No.	Meters	Installed on site (Yes/No/NA)
	1	Energy meters	
		Utility grid	
		On-site renewable energy system	
		Gas generator sets	
		Diesel generator sets	
	2	Water meters	
		Municipal supply	
		Bore well	
		STP inlet	
		STP outlet	
	3	Advance-metering	
		AHUs	
		Cooling towers	
		Chillers (BTU meters)	
		Distributed units (split/window ACs)	
		Indoor lighting	
		Outdoor lighting	
		Basement parking lighting	
		Community/recreation center	
		Water pumping	
		Irrigation	

		<i>Captured rain water</i>																																
		<i>Fresh water consumption at building level</i>																																
	4	Sensors installed for air quality																																
		<i>Basement or closed parking spaces</i>																																
		<i>All regularly occupied spaces</i>																																
	5	Smart meters																																
		<i>Energy</i>																																
		<i>Water</i>																																
		<i>Air quality</i>																																
Potable water and treated water test report (Mandatory)	Water quality test report was submitted during the due diligence visit. (Yes)		No																															
	<input type="checkbox"/>		<input type="checkbox"/>																															
Advance metering • Energy • Water • Air quality (CO ₂ , temperature and RH sensor)	<table border="1"> <tr> <td>Yes</td><td>No</td></tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </table>		Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:																											
Yes	No																																	
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One-way communicable smart meters and monitoring system	<table border="1"> <tr> <td>Yes</td><td>No</td></tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </table>		Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:																											
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SECTION 3: ENERGY																																		
Criterion 5: Energy Efficiency																																		
Energy consumption data from all major sources for at least one year	<table border="1"> <tr> <th rowspan="2">Sr. No</th><th rowspan="2">Year</th><th colspan="6">Energy consumption (annual)</th></tr> <tr> <th>Electricity grid (kWh)</th><th>PNG (SCM)</th><th>Gas (LPG)</th><th>Diesel (Liters)</th><th>Furnace oil (Liters)</th><th>Coal (kg)</th></tr> <tr> <td>1</td><td>2013-14</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>2</td><td>2014-15</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>				Sr. No	Year	Energy consumption (annual)						Electricity grid (kWh)	PNG (SCM)	Gas (LPG)	Diesel (Liters)	Furnace oil (Liters)	Coal (kg)	1	2013-14							2	2014-15						
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2	2014-15																																	

(Mandatory)	3	2015-16																																																																																																																				
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Implementation of operation and maintenance no cost EEMs	<table border="1"> <tr> <th>Sr. No</th> <th>Description</th> <th>No. of fixtures changed</th> <th>Units consumed</th> </tr> <tr><td>1</td><td>LED tubes</td><td></td><td></td></tr> <tr><td>2</td><td>BEE star rated fans</td><td></td><td></td></tr> <tr><td>3</td><td>BEE star rated 1.5 ton window AC</td><td></td><td></td></tr> <tr><td>4</td><td>BEE star rated 1.5 ton split AC</td><td></td><td></td></tr> <tr><td>5</td><td>LED lamps</td><td></td><td></td></tr> <tr><td>6</td><td>Any other EEM implemented</td><td></td><td></td></tr> </table>								Sr. No	Description	No. of fixtures changed	Units consumed	1	LED tubes			2	BEE star rated fans			3	BEE star rated 1.5 ton window AC			4	BEE star rated 1.5 ton split AC			5	LED lamps			6	Any other EEM implemented																																																																																				
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Building operation schedule	<table border="1"> <tr> <td>Building Type</td> <td colspan="7">Office/Residential/Hospital</td> </tr> <tr> <td>Building operating day</td> <td colspan="7">5 days / 6 days/ 7 days in a week</td> </tr> <tr> <td>Building operating time</td> <td colspan="7"></td> </tr> <tr> <td>Lunch time</td> <td colspan="7"></td> </tr> <tr> <td>Building occupancy</td> <td colspan="7">Total number fixed employees:</td> </tr> <tr> <td></td> <td colspan="7">Visitor occupancy:</td> </tr> </table>								Building Type	Office/Residential/Hospital							Building operating day	5 days / 6 days/ 7 days in a week							Building operating time								Lunch time								Building occupancy	Total number fixed employees:								Visitor occupancy:																																																																				
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	10.	Electrical system			
	10.1	Transformers			
	10.2	Diesel generator sets			
	10.3	HT, LT panels			
	10.4	Motors			
	11.	Mechanical system			
	11.1	AHU			
	11.2	Cooling tower			
	11.3	Chillers			
	11.4	HVAC Pumps			
	11.5	VRF			
	11.6	Ventilation fans			
	11.7	Split AC			
	12.	Plumbing system			
	12.1	Piping			
	12.2	Fixtures and fittings			
	12.3	Fire safety pumps			
	12.4	Sprinklers			
	13.	Metering and sensors			
	13.1	Energy meters			
	13.2	Water meters			
	13.3	Air quality meters			
	14.	Renewable energy systems			
	14.1	Solar PV			
	14.2	Solar thermal			
	14.3	Wind turbines			
	14.4	Bio-gasifiers			
	14.5	Any other as per MNRE guidelines			
	15.	Sewage treatment plant			
	16.	Waste treatment plant			
	17.	Storm water drainage system			
	18.	Rainwater harvesting system			

Criterion 6: Renewable Energy Utilization

Renewable Energy system has been installed on site/off site (specify the sizing of the systems)
(Mandatory)

Capacity installed on site	_____kW
On-site energy generation from renewable energy sources	_____kWh/year

SECTION 4: WATER EFFICIENCY

Criterion 7: Water Footprint

Water audit report
(Mandatory)

Sr. No	Description	Answer
1	Total number of male occupants	_____Nos.
2	Total number of female occupants	_____Nos.
	Total number of working days in a year	_____Nos.
3	Are you using any gravity fed system for water supply in the building?	Yes/No
4	Is water head height in the building less than 5 meters or 17 feet?	Yes/No

Use of low-flow fixtures

Fixtures installed in the building	No. of fixture	flow rates (lpf/lpm)
Water closets (Solids)		
Kitchen faucets No		
Conventional closets/squatting urinals (female)		
Conventional urinals (male)		
Waterless urinals		
Showers		
Lavatory faucets		

Minimizing lawn area and restricting it to 25% of the total landscaped area

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Lawn area on site:_____ sqm

Installation of efficient irrigation systems	<table border="1"> <tr> <th>Description</th> <th>Yes</th> <th>No</th> </tr> <tr> <td>Sprinkler system</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Drip irrigation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Manually with hose pipe</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>			Description	Yes	No	Sprinkler system	<input type="checkbox"/>	<input type="checkbox"/>	Drip irrigation	<input type="checkbox"/>	<input type="checkbox"/>	Manually with hose pipe	<input type="checkbox"/>	<input type="checkbox"/>						
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	Drip irrigation	<input type="checkbox"/>	<input type="checkbox"/>																		
Manually with hose pipe	<input type="checkbox"/>	<input type="checkbox"/>																			
Waste water treatment plant on site	<table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>		Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Waste water generated on site: _____ KLD Type of system installed: _____														
	Yes	No																			
<input type="checkbox"/>	<input type="checkbox"/>																				
Dual plumbing system installed in the building for reuse of recycled water	<table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>		Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:														
	Yes	No																			
<input type="checkbox"/>	<input type="checkbox"/>																				
Provision of storing captured rainwater on site for reuse	<table border="1"> <tr> <th>Description</th> <th>Yes</th> <th>No</th> </tr> <tr> <td>Rain water stored on site for re-use</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Rainwater harvested to recharge the ground water table</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Filtration system in place</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Whether harvesting only roof rainwater?</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Whether harvesting rainwater from 100% of catchment area?</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>			Description	Yes	No	Rain water stored on site for re-use	<input type="checkbox"/>	<input type="checkbox"/>	Rainwater harvested to recharge the ground water table	<input type="checkbox"/>	<input type="checkbox"/>	Filtration system in place	<input type="checkbox"/>	<input type="checkbox"/>	Whether harvesting only roof rainwater?	<input type="checkbox"/>	<input type="checkbox"/>	Whether harvesting rainwater from 100% of catchment area?	<input type="checkbox"/>	<input type="checkbox"/>
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Whether harvesting rainwater from 100% of catchment area?	<input type="checkbox"/>	<input type="checkbox"/>																			
Criterion 8: Reduction in Cumulative Water Performance																					
Reduction in overall water consumption/ Water audit report	<table border="1"> <tr> <th>Sr.no</th> <th>Source of water</th> <th>Supply Quantity (litres/day)</th> </tr> <tr> <td>6.</td> <td>Municipal water</td> <td></td> </tr> <tr> <td>7.</td> <td>Bore-well water</td> <td></td> </tr> <tr> <td>8.</td> <td>Tanker water</td> <td></td> </tr> <tr> <td>9.</td> <td>Treated sewage water</td> <td></td> </tr> <tr> <td>10.</td> <td>Harvested rainwater</td> <td></td> </tr> </table>			Sr.no	Source of water	Supply Quantity (litres/day)	6.	Municipal water		7.	Bore-well water		8.	Tanker water		9.	Treated sewage water		10.	Harvested rainwater	
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SECTION 5: OCCUPANT HEALTH & COMFORT

Criterion 9: Achieving Indoor Comfort Requirements

Ensuring thermal comfort as per NBC 2005 or ASHRAE 55	<table><tr><th rowspan="2">Sr. No</th><th rowspan="2">Location name</th><th colspan="6">Observed readings from the location</th></tr><tr><th>T1</th><th>RH1</th><th>T2</th><th>RH2</th><th>T3</th><th>RH3</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>12</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>13</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>14</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>15</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>16</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>17</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>18</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>20</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>21</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>22</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>23</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>24</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>25</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>26</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>27</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>28</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>29</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>30</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Sr. No	Location name	Observed readings from the location						T1	RH1	T2	RH2	T3	RH3	1							2							3							4							5							6							7							8							9							10							11							12							13							14							15							16							17							18							19							20							21							22							23							24							25							26							27							28							29							30							<table><tr><th rowspan="2">Sr. No</th><th rowspan="2">Location name</th><th colspan="5">Observed readings from the location</th></tr><tr><th>L1</th><th>L2</th><th>L3</th><th>L4</th><th>L5</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Sr. No	Location name	Observed readings from the location					L1	L2	L3	L4	L5	1							2							3							4							5						
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Criterion 10: Maintaining Good IAQ

Smoking is prohibited on site. (or) Necessary provisions shall be provided with respect to mechanical ventilation system by the HVAC consultant. (Mandatory)	<table><tr><td>Yes</td><td>No</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr></table>	Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:
Yes	No					
<input type="checkbox"/>	<input type="checkbox"/>					
Indoor air quality as per CPCB NAAQS norms	<table><tr><td>Yes</td><td>No</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr></table>	Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:
Yes	No					
<input type="checkbox"/>	<input type="checkbox"/>					
Provision for sufficient fresh air	<table><tr><td>Yes</td><td>No</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr></table>	Yes	No	<input type="checkbox"/>	<input type="checkbox"/>	Any other remarks:
Yes	No					
<input type="checkbox"/>	<input type="checkbox"/>					

SECTION 6: SOCIAL ASPECTS

Criterion 11: Universal Accessibility & Environmental Awareness

Building should be differently able friendly and should be in compliance with NBC code			
	Description	Yes	No
	<i>Provision of ramp at the entrance</i>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Preferred parking near the entrance</i>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Toilets for persons with special needs</i>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental awareness			
	Description	Yes	No
	<i>Innovative display on 'Environmental concerns and possible solutions at individual level' in</i>	<input type="checkbox"/>	<input type="checkbox"/>

	<i>common area/lobby.</i>			
	<i>Local outreach through posters, brochures, newspapers, and social media.</i>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Short tours organized</i>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Awareness programs for occupants/ and O & M staff.</i>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>Adopt innovative strategies such as labelling</i>	<input type="checkbox"/>	<input type="checkbox"/>	
	<i>A label for native species or aromatic herbs</i>	<input type="checkbox"/>	<input type="checkbox"/>	

SECTION 7: BONUS POINT

Criterion 12: Bonus Points

Description	Yes	No	Any other remarks:
<i>Net zero water discharge</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Net positive energy/net zero energy—generation of energy from renewable energy sources on-site</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Previously GRIHA certified project</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Urban farming</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Any other strategy that is not covered in the previous section but can significantly improve the sustainability of the project</i>	<input type="checkbox"/>	<input type="checkbox"/>	