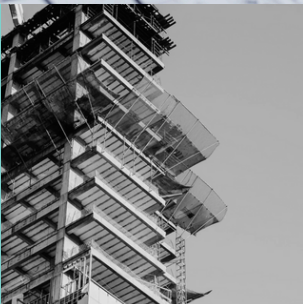
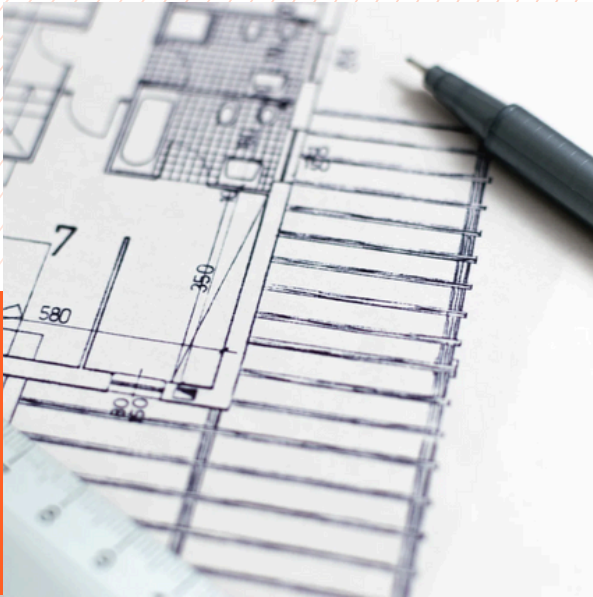
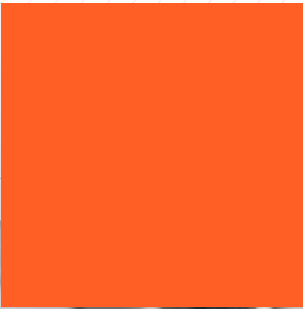




GUIDE TO

# EFFECTIVE DOCUMENTATION

A **GRIHA Council** Publication






© GRIHA Council, 2024  
First Edition 2024


**Developed by:**

GRIHA Council  
Core 1B, 3rd Floor  
India Habitat Centre,  
Lodhi Road  
New Delhi – 110003



Tel: (+91 11) 46444500/24339606-08)  
Email id: [info@grihaindia.org](mailto:info@grihaindia.org)  
Website: [www.grihaindia.org](http://www.grihaindia.org)

**Disclaimer:**

1. All rights on the written and pictorial content are reserved.
  2. No part of this publication may be reproduced in any form or by any means without prior written permission of GRIHA Council.
- 

# PREFACE

We're pleased to introduce the "Guide to Effective Documentation" manual, developed by the GRIHA Council as part of the GRIHA Technical Manual series. In the green building industry, where accurate documentation is key to establishing credibility, this manual serves as a valuable resource for consultants, engineers, architects, and other stakeholders involved in the GRIHA rating process.

The GRIHA rating system requires detailed documentation to demonstrate that projects have implemented all necessary measures to reduce their environmental impact. This manual offers comprehensive guidance on best practices for submitting these documents, helping project teams understand why GRIHA Council requires specific documents. By clarifying these aspects, the manual ensures a smoother evaluation process and assists GRIHA-certified evaluators in their assessments. It covers key topics such as:

1. Why effective documentation is important.
2. The relevance of each type of document.
3. What is to be highlighted in a document
4. How to perform calculations.
5. Types of documents to include (though this list is not exhaustive).

You'll also find examples from a standout project team that has demonstrated exceptional documentation practices and achieved a high rating.

We have a firm commitment to maintaining the highest standards of credibility. In January 2023, we introduced a policy to reinforce this commitment after identifying some instances where documents submitted for evaluation did not meet our expectations.

By working together, we can ensure that we consistently uphold best practices, promote transparency, and foster a culture of integrity, honesty, and care in everything we do. This approach will help us avoid any unintended missteps and keep our focus on truly sustainable practices that benefit the environment.



## Growing Together, Side by Side

Together, let us uphold the highest standards of construction excellence and foster a culture of safety and innovation on every site.

### Sanjay Seth

Vice President &  
Chief Executive Officer

# DEVELOPMENT TEAM



**Shabnam Bassi**

Deputy Chief Executive Officer  
& Secretary



**Akash Deep**

Deputy General Manager  
& Treasurer



**Anupam Buttan**

Senior Manager



**Ankit Bhalla**

Manager



**Shaily Mahera**

Manager



**Arjun C Babu**

Deputy Manager



**Veena N**

Senior Project Officer



**B Vignesh**

Assistant Project Officer

# Table of Contents

Introduction	03
Narrative	07
Drawings	20
Calculations	33
Technical specification sheet	46
Purchase order	64
Test reports	71
Simulation	79

# ACKNOWLEDGEMENT



## Client

Utkarsh Small Finance Bank Ltd.

.....

## DISCLAIMER

---

This **Guide to Effective Documentation Manual** is intended solely for reference purposes. It does not represent the final or comprehensive guidelines for project documentation.

The project team is refer to the various **detailed GRIHA rating variant manuals** to obtain a complete and accurate understanding of the requirements and standards applicable to the project.

---

\*This "Guide to Effective Documentation" acts as base manual for reference purposes and must not be considered as the final documentation for a project. Project specific documentation will vary from project to project while keeping this as base.



## ZERO TOLERANCE POLICY

The GRIHA (Green Rating for Integrated Habitat Assessment) Council has introduced a Zero Tolerance Policy aimed at enhancing the integrity and transparency of the documentation process within its certification framework. The introduction of this Zero Tolerance Policy reflects GRIHA Council's commitment to sustainability and ethical practices in the built environment. By ensuring rigorous documentation standards, GRIHA aims to promote trust and accountability within the certification process.

Recently, the GRIHA Council has observed that some project teams have resorted to dishonest and fraudulent methods to comply with the GRIHA rating criteria. Instances of forged document submissions have been detected during the verification process, where accredited labs confirmed these documents were falsified. This constitutes forgery and represents significant misconduct by the project teams, leading to severe consequences.

The GRIHA Council is introducing the following penalties under its 'Zero-Tolerance Policy' to prevent fraudulent submissions. Upon verifying if any false or forged documents are submitted by the project teams, the following penalties will be enforced:

- A penalty fee equivalent to twice the certification fee will be imposed on the project teams/clients.
- If the criteria pertain to a mandatory compliance requirement, project teams/clients may resubmit the documents upon payment of a penalty fee.
- If the criteria pertain to a non-mandatory compliance requirement, no points will be awarded for that criterion. However, the evaluated rating will be released upon payment of a penalty fee.
- The deadline for fulfilling the penal provisions is one month from the date of notification to the project teams/clients. Failure to comply within this period will result in the cancellation of the rating and forfeiture of the registration fee and any other charges paid to the GRIHA Council.



# Introduction

In the pursuit of sustainable building practices, GRIHA stands as a vital framework guiding project teams towards environmental excellence. As we prepare this manual to assist the project team involved in the GRIHA documentation process, it is essential to emphasize the significance of good documentation practices. Proper documentation not only streamlines the evaluation process but also ensures that claims made during the assessment are credible, transparent, and aligned with GRIHA's appraisal requirements.

## Advantages of good documentation

- **Aids in faster closure of projects which would increase the client confidence in the consultants.**
- **Reduces the time taken by evaluators for completing the review.**
- **Reduces the iterations or multiple submission of documents that may be required.**

A well-structured documentation, clearly articulates the project team's objectives for each criterion and detailing how their strategies align with GRIHA's requirements. Accompanying this with narrative, CAD drawings etc. play a crucial role in visually substantiating claims made in the documentation. They provide a clear representation of design intent, ensuring that calculations and narratives are in line with the appraisal requirement. Furthermore, quantifying performance through calculations is vital; it transforms subjective claims into objective metrics that demonstrate compliance with GRIHA standards.

Supporting documents, such as technical specification sheets, purchase orders, test reports, and simulation results for energy and daylight, further enhance the credibility of the submission. These documents provide the necessary data to substantiate claims made in the narrative and calculations, ensuring that all aspects of the project are backed by solid evidence. This guidebook aims to equip you with the knowledge and tools to navigate the GRIHA documentation process effectively, ultimately contributing to the creation of sustainable habitats that align with our collective environmental goals.

---

## Understanding the Key Components of GRIHA Document Submission

The GRIHA rating variant is structured into various parameters, which are organized into different sections and sub-sections. These sub-sections are referred to as criteria. Each criterion includes its intent, appraisal the requirements for evaluation and compliance. In the context of submitting documents for the GRIHA certification, a comprehensive understanding of each criterion's Intent, Appraisal, and Compliance is imperative. Each of these elements are important to comprehend and demonstrate project teams commitment to sustainable practices.



### Intent

Refers to the purpose or reason why the particular criterion has been included to be part of the rating.

### Appraisal

Enlists the criterion requirements. It explains what needs to be demonstrated under a particular criterion to attain points under the rating.



### Compliance

Enlists the supporting documents that are required to prove that the project is in line with the appraisal requirements.

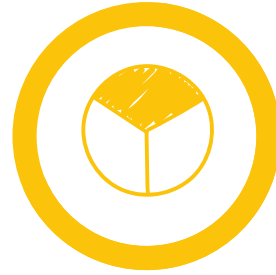
# Types of Appraisals

Types of appraisals helps in categorizing the criteria based on their **importance and applicability to a project**. These classifications help **streamline the assessment process** and guide projects in achieving sustainable design and construction practices.



## Mandatory

**These appraisals are essential and must be fulfilled for a project to qualify for GRIHA rating. They ensure conformity with various Government standards, National and International standards.**



## Partly mandatory

In partly mandatory appraisal, some points are mandatory while others are optional or can be attempted for additional points



## Optional

As the name suggests, these appraisals are optional and can be attempted for additional points. The more optional appraisals a team attempts, it showcases the extra mile they've made to demonstrate their commitment to sustainability.



## Applicability Check

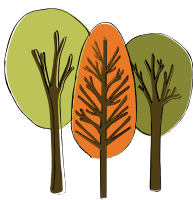
Certain appraisals may not apply to a particular project due to its typology, usage, site conditions etc. Such appraisals comes with an applicability check.

# Understanding Applicability check through some examples

Non-applicability clauses in GRIHA allow projects to exclude certain appraisals that are not relevant to their specific context. Here are a few examples to illustrate this:



1



**If there are no existing mature trees on site at the time of site allotment.**

In order to claim non-applicability, the project team is required to submit initial site survey plan. This document along with date stamped photographs will help verify the conditions of the site prior to commencement of any construction activity.

2

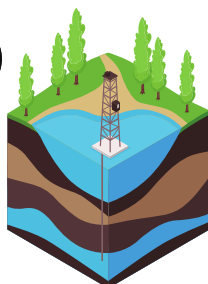


**If the topsoil is not fertile before commencement of construction activities and can't be made fertile through organic means.**

In order to claim non-applicability, the project team is required to submit topsoil test report to assess the various parameters depicting the soil fertility. In case its a redevelopment project, date-stamped photographs and initial site survey plan are required to demonstrate compliance.



3



**If the ground water table is high and ground water recharging is not feasible.**

In order to claim non-applicability, the project team is required to submit extract from CGWB norms confirming the high water table in that particular project locality or Geotechnical investigation report indicating water table level.





# Narrative



# Narrative

The narrative is a crucial part of GRIHA documentation. It strengthens the credibility of the submission by justifying strategies and demonstrating alignment with appraisal requirements. A well-structured narrative ensures transparency by detailing calculations, methodologies, and design decisions, making it easier for \*evaluators to assess compliance. Far from being just an add-on, a strong narrative gives clarity in vision, specifies the number of points attempted, and enhances the clarity. This streamlined approach significantly reduces the time required for the review process, benefiting all stakeholders involved in the project as they work towards achieving GRIHA certification.



## Supporting Assessment and Verification

A well-structured narrative enables GRIHA evaluators to assess the project effectively by organizing and linking various documents. It simplifies navigation through extensive documentation, ensuring that relevant sections are easily accessible. Highlighting key details helps prevent crucial information from being overlooked during the review process.



## Facilitating Communication

The narrative serves as a communication tool among project team and GRIHA Council. It ensures a unified understanding of the project's sustainability goals for each appraisal.



## Holistic Overview

The narrative provides a clear description of the project's objectives, strategies, and outcomes, placing the technical documentation in context. It helps reviewers understand the project's intent and design philosophy, clarifies discrepancies in technical submissions, and illustrates how various elements align to meet GRIHA compliance.

\*Evaluators: Evaluators are working professionals with extensive knowledge of the GRIHA rating. They are chosen after passing an examination that focuses on specific aspects of the GRIHA rating system. The purpose of having third-party evaluators is to ensure transparency and uphold an unbiased approach in the project evaluation process.

## Points to remember while writing a narrative

- 01 | Describe the project strategy or approach in alignment with the criterion requirements and specify any cross-references to other criteria if applicable.
- 02 | List all documents submitted under a criterion in the online panel, such as Excel sheets, photographs, technical sheets, and other relevant documents.
- 03 | Include excerpts of supporting documents or calculations where necessary.

## Sample Documentation : 1

### Site Selection

Project Name	Utkarsh Small Finance Bank Ltd.
Project Code	19GR0053
Site Area	7,205.18 sqm
Built up area	17,250 sqm
Typology	Commercial
Occupancy	1,726
Max. points	1
Attempted points	1
Not applicable points	0

- The project is located in Varanasi, Uttar Pradesh.
- The project has been constructed as per the approved sanctioned drawings which are in conformity with the development plan/master plan/URDPFI guidelines.
- Project has complied with all statutory norms as stipulated in the building bye law.
- The project has obtained all necessary NOCs from concerned departments and has obtained occupancy certificate
- The following documents have been enclosed to demonstrate compliance
  - Approved site plan
  - Occupancy Certificate
  - Water NOC
  - Fire NOC
- At least 5 basic services are in house or at 500 m walking distance from the main entrance of project

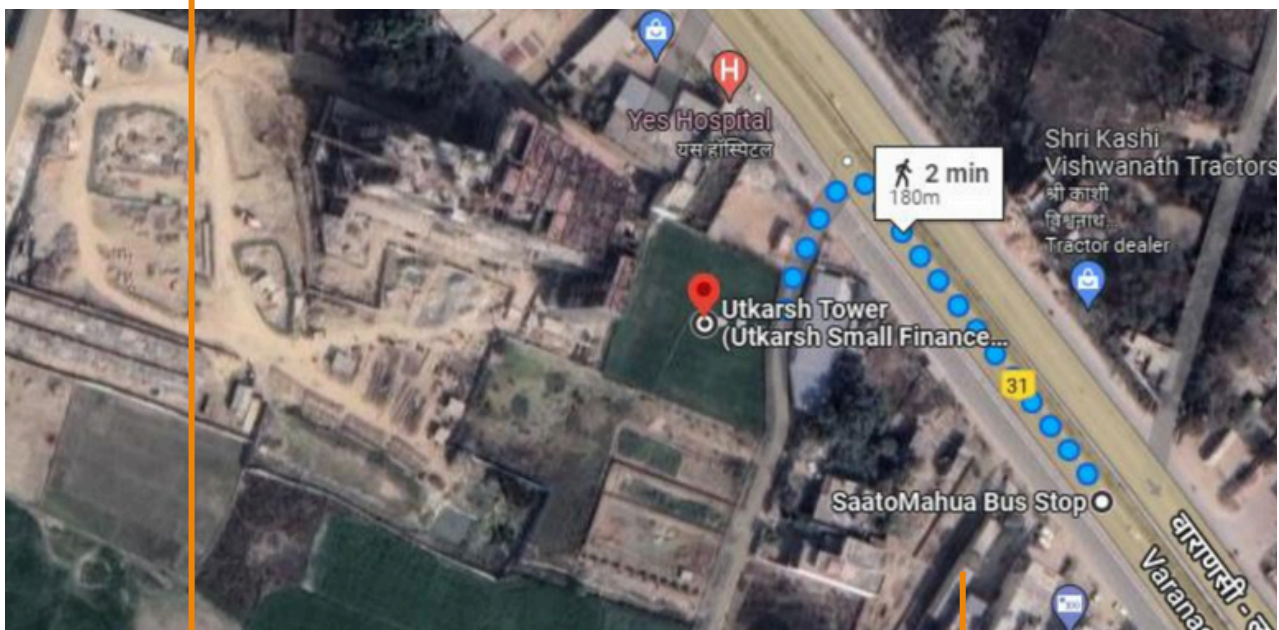
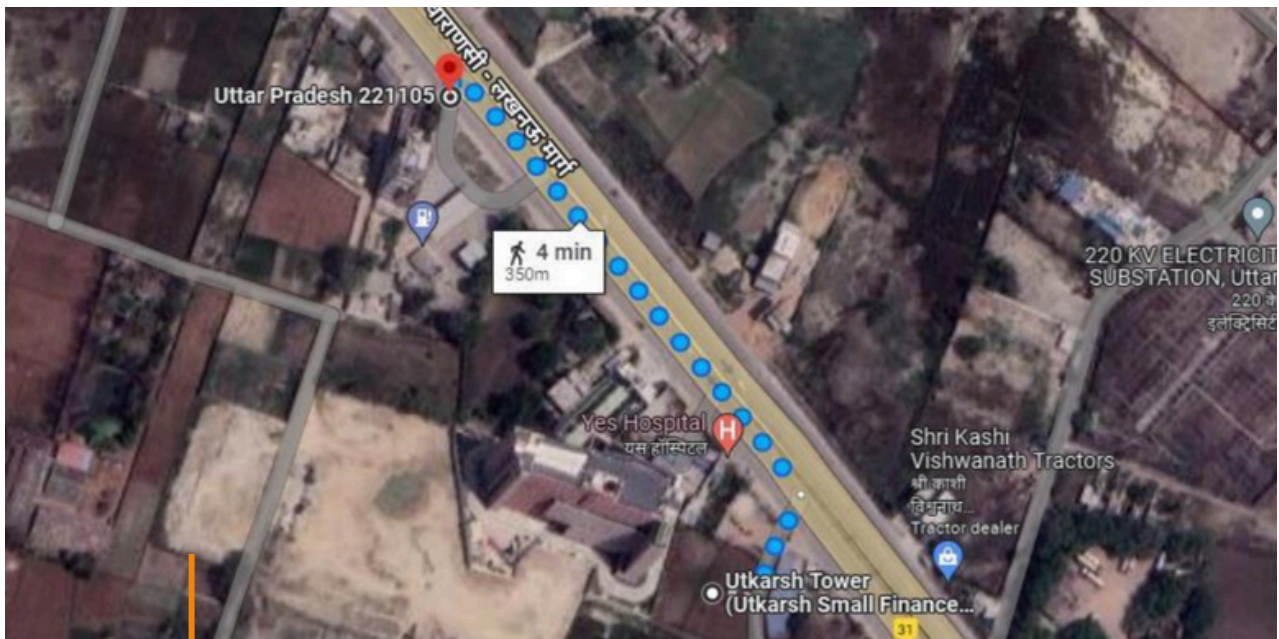
S1 No	Type of amenity	Distance from site entrance
1	Healthcare/ Pharmacy	350 m
2	Bus stop	180 m
3	Grocery Store	350 m
4	Restaurant	In house, 3 <sup>rd</sup> Floor
5	Bank/ATM	In house, Ground floor

**Extract of narrative submitted by the Project team for 'site selection'.**

The above narrative clearly mentions the basic details of the project, its alignment with the appraisal requirement and clearly enlisting the supporting documents submitted in the online panel.



## Sample Documentation : 1



**\*Google Earth image indicating location of nearby amenities submitted as part of the narrative in support of it.**

## Sample Documentation : 1



**\*Photographs depicting the amenities located from the main entrance of the project. Grocery store (left) and photograph of the bus stop (right).**

\*Likewise screenshots of Google maps and photographs of the all the 5 basic amenities that are claimed by the project team have to be submitted to demonstrate compliance.

## Sample Documentation : 2

Design to mitigate UHIE	
Project Name	Utkarsh Small Finance Bank Ltd.
Project Code	19GR0053
Site Area	7,205.18 sqm
Built up area	17,250 sqm
Typology	Commercial
Occupancy	1,726
Max. points	2
Attempted points	2
Not applicable points	0

- The project is using mixed strategies to mitigate the Urban Heat Island Effect.
- The extract of the calculation below indicates that **59.3 %** of the total site surface visible to sky (including the roofs but not the landscape area) are covered with high SRI tiles (SRI >0.5) on roof and non-roof areas are shaded by trees and cantilevered roofs.

Site area (sq.m.)	7205.84
Landscape area (sq.m.)	1838.64
<b>Net site area</b>	<b>5367.20</b>
Total area under :	
a.Area shaded with trees (sq.m.)	994.40
b.Non roof area, shaded under cantilevered roof (sq.m.)	468.70
c.Building roof area under high SRI tiles (sq.m.)	1496.33
d.Building roof area under Solar PV (sq.m.)	224.37
<b>Total treated area (sq.m.)</b>	<b>3183.80</b>
<b>Percentage treated area (%)</b>	<b>59.3%</b>

The following documents have been attached to demonstrate compliance:

1. Landscape plan and site plan highlighting various surface finishes
2. Purchase order and technical specification sheet of high SRI tiles used on terrace
3. Photographs of treated areas (roof and tree shade area)
4. Calculation for tree canopy area
5. Detailed calculation in excel sheet

### Extract of narrative submitted by the Project team to demonstrate reduction in UHIE

- The narrative above outlines the different strategies implemented on-site to reduce Urban Heat Island Effect (UHIE).
- It includes a consolidated calculation showing the treated areas and their percentages relative to the total treated area.
- It lists the supporting documents submitted through the online panel, such as specification sheets, purchase orders, detailed calculations, and photographs, to demonstrate compliance.

## Sample Documentation : 2



**Photograph indicating the installation of high SRI tiles on the terrace areas submitted in support of the narrative.**

## Sample Documentation : 2



**Photograph indicating the terrace area shaded by solar PV panels submitted in support of the narrative.**

## Sample Documentation : 3

Smart metering and monitoring	
Project Name	Utkarsh Small Finance Bank Ltd.
Project Code	19GR0053
Site Area	7,205.18 sqm
Built up area	17,250 sqm
Typology	Commercial
Occupancy	1,726
Max. points	8
Attempted points	5
Not applicable points	0

**Basic Metering**

To comply with the mandatory requirements the following basic meters have been installed:

- **Energy Meters**
  - Utility Grid
  - DG Set
  - On site Renewable Energy System
- **Water Meters**
  - Bore Well
  - Treated Water outlet from STP

**Sub -Metering/Extended metering**

- **Energy Meters**
  - Lighting indoor and outdoor
  - Central HVAC and /or distributed units
  - Chillers (BTU meters)
  - Basement Lighting
  - UPS
  - Lighting
- **Water Meters**
  - Irrigation
  - STP/WTP/ETP
  - Cooling Tower

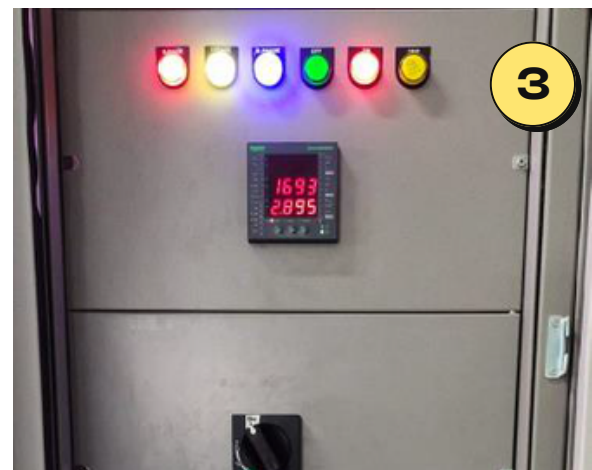
**Smart metering and monitoring system** capable tracking energy and water consumption through a web hosted portal and capable of the following:

- Hourly data reporting in near-real-time (no more than 15-minute delay)
- Energy mix breakdown and consumption patterns.
- Water consumption patterns from various sources.
- Ability to set energy & water consumption targets, alarms and pricing.
- Ability to compare historical trends and benchmark data.
- Real time monitoring with user interface which operates even in mobile devices.

### Extract of narrative submitted by the Project team indicating location and type of meters installed in the project

- The narrative above clearly enlists the different types of energy and water meters installed in the project under various categories.
- This gives a clear idea to the evaluator on the various meters installed in the project, this will in turn help in saving time as the evaluator will now only need to verify the locations of these meters against the submitted Single Line Diagrams (SLD's).

## Sample Documentation : 4



Photographs from clockwise direction indicating the installation of digital meters for utility grid, DG set and On-site renewable energy system submitted in support of the narrative.

## Sample Documentation : 4



Photographs indicating the installation of digital water meters at the necessary point sources in the project submitted in support of the narrative.

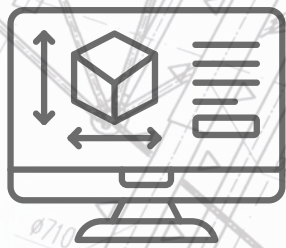
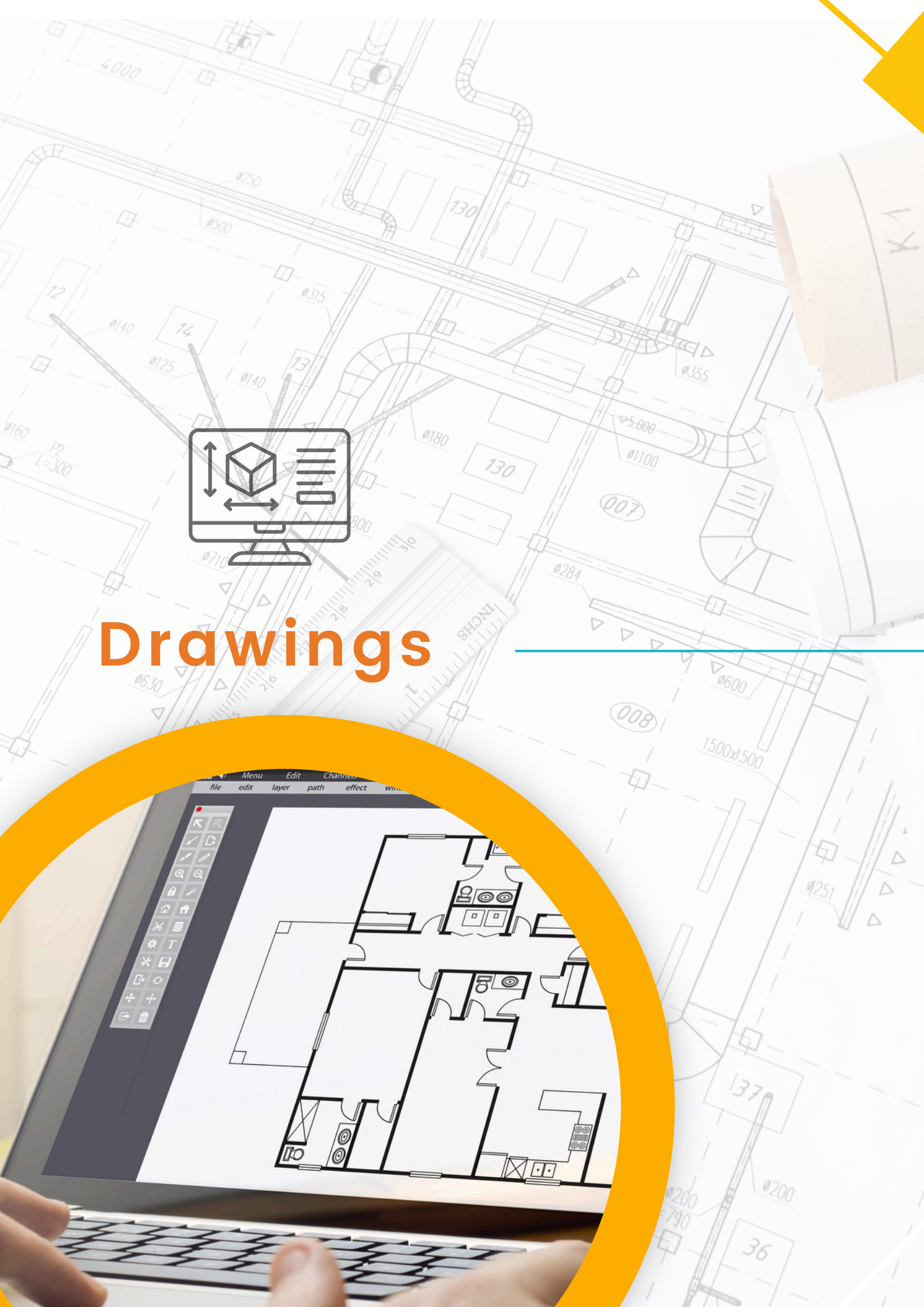


---

## Possible errors in the narrative

---

- Possible inconsistencies between the number of points attempted on the online panel and what is stated in the narrative.
  - Inconsistency in the area / project specific details mentioned in the narrative from the actual site specifications.
  - Documents listed in the narrative may have been overlooked and not uploaded to the panel or vice versa.
-



# Drawings

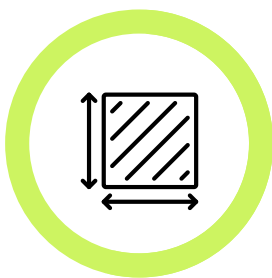


# Drawings

Drawings are crucial for GRIHA document submissions as they provide an accurate representation of the building's design, layout, construction elements, and the location of various systems installed on-site. This makes it easier for evaluators to understand and verify the claims in the documentation.

The following types of drawings are typically expected in GRIHA evaluation:

- Good for construction drawings
- Landscape drawings
- Site plan drawings
- Site Plumbing layouts
- External and internal lighting layouts
- Floor plans
- HVAC fresh air layout
- Wet riser diagram
- Rainwater harvesting detail drawings
- Elevation and section drawings, including door/window schedules
- Electrical Single-line diagram drawings



## Area verification

Accurate verification of project areas is essential for assessing elements such as virtual boundaries, landscaping areas, building footprints, and terrace areas.



## Design

Drawings provide valuable insight into the design, including the number of floors, building morphology, fenestration details, and other architectural elements. They help third-party evaluators gain a comprehensive understanding of the project.



## Location & Identification

In certain strategies, it is necessary to specify the exact locations within the project where specific actions are implemented.

## Points to remember while making drawings

01

The drawings should be complete and readable, with appropriate legends and a clear north orientation demarcated.

02

Ensure the drawing units are set correctly before starting the work.

03

Different layers must be used to distinguish various finishes or components in the drawings.

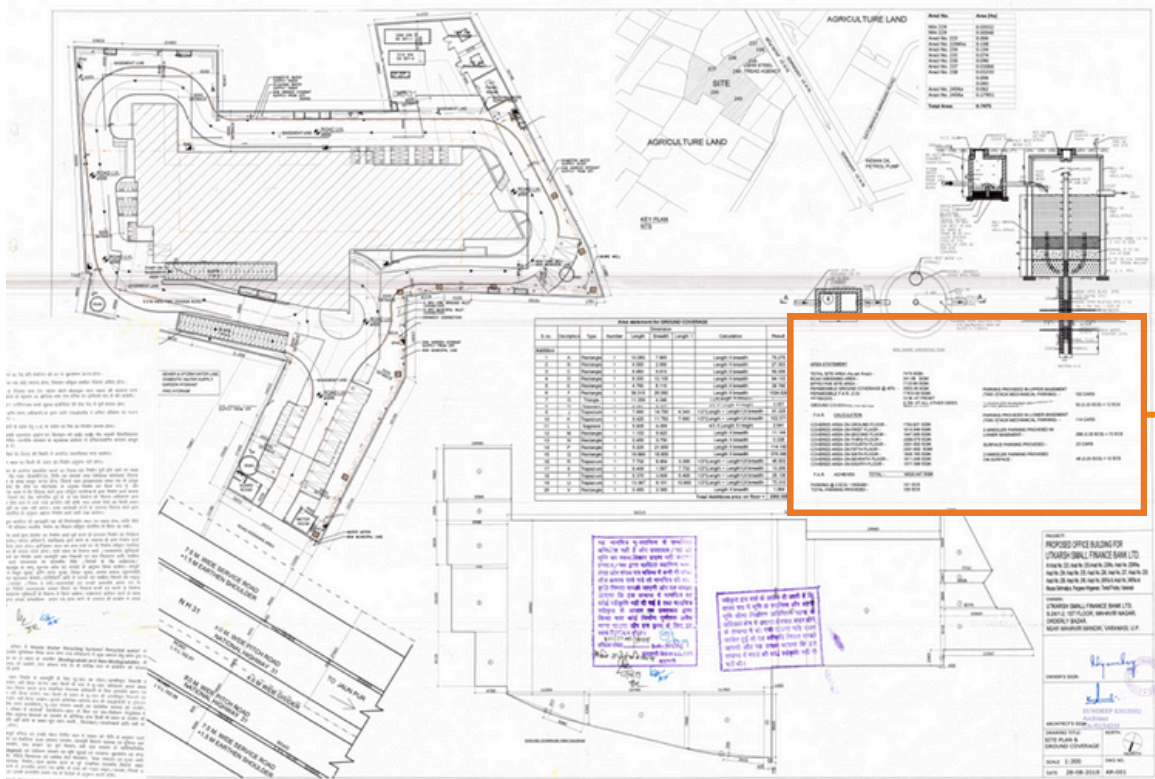
04

To verify the areas, provide clear hatching or polylines with corresponding legends for each.

05

It is recommended that all the supporting drawings are submitted in CAD format.

# Sample Documentation : 1



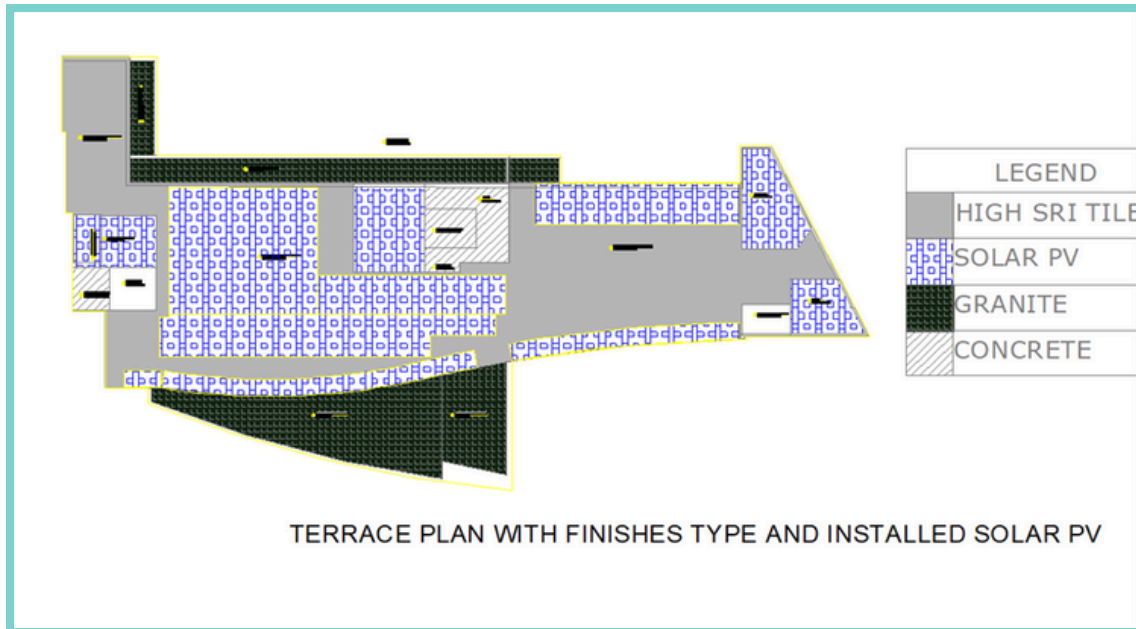
AREA STATEMENT	
TOTAL SITE AREA (As per Arazi) -	7475 SQM.
ROAD WIDENING AREA -	341.56 SQM.
EFFECTIVE SITE AREA -	7133.60 SQM.
PERMISSIBLE GROUND COVERAGE @ 40% -	2853.38 SQM.
PERMISSIBLE F.A.R. (2.5)-	17833.60 SQM..
5FTBACKS -	12 M. AT FRONT
GROUND COVERAGE ACHIEVED	& 9M. AT ALL OTHER SIDES
<b>F.A.R. CALCULATION</b>	
COVERED AREA ON GROUND FLOOR -	1783.621 SQM.
COVERED AREA ON FIRST FLOOR -	1614.548 SQM.
COVERED AREA ON SECOND FLOOR -	1947.006 SQM.
COVERED AREA ON THIRD FLOOR -	2088.079 SQM.
COVERED AREA ON FOURTH FLOOR -	2051.692 SQM.
COVERED AREA ON FIFTH FLOOR -	2051.692 SQM.
COVERED AREA ON SIXTH FLOOR -	1800.165 SQM.
COVERED AREA ON SEVENTH FLOOR -	1611.248 SQM.
COVERED AREA ON EIGHTH FLOOR -	1577.398 SQM.
<b>F.A.R. ACHIEVED</b>	<b>TOTAL - 16525.447 SQM</b>
PARKING @ 2 ECS / 100SQM -	331 ECS
TOTAL PARKING PROVIDED -	335 ECS

SECTION A-A	
PARKING PROVIDED IN UPPER BASEMENT (TWO STACK MECHANICAL PARKING) -	102 CARS
5 WHEELER PARKING PROVIDED IN UPPER BASEMENT -	50 (0.25 ECS) = 12 ECS
PARKING PROVIDED IN LOWER BASEMENT (TWO STACK MECHANICAL PARKING) -	114 CARS
2 WHEELER PARKING PROVIDED IN LOWER BASEMENT -	288 (0.25 ECS) = 72 ECS
SURFACE PARKING PROVIDED -	23 CARS
2 WHEELER PARKING PROVIDED ON SURFACE -	48 (0.25 ECS) = 12 ECS

Approval drawing indicating the permission acquired to construct the proposed number of the floors along with the BUA.

## Sample Documentation : 2



**Terrace plan demarcating the various areas where different strategies are used for mitigating UHIE.**

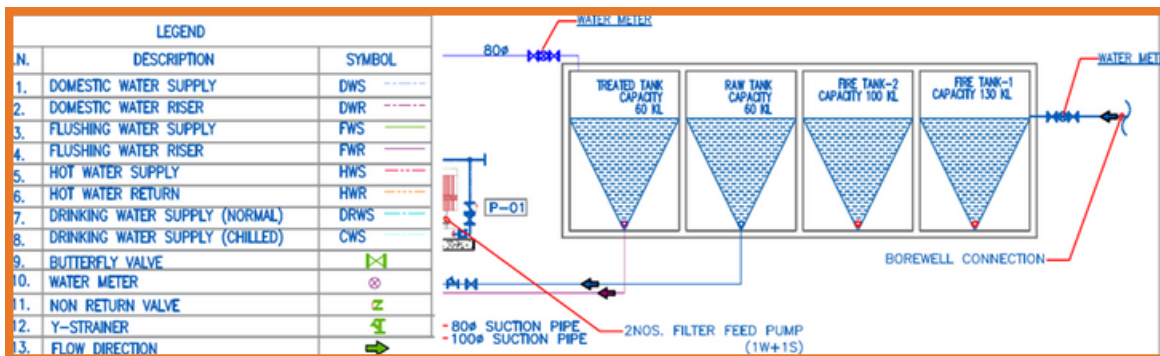
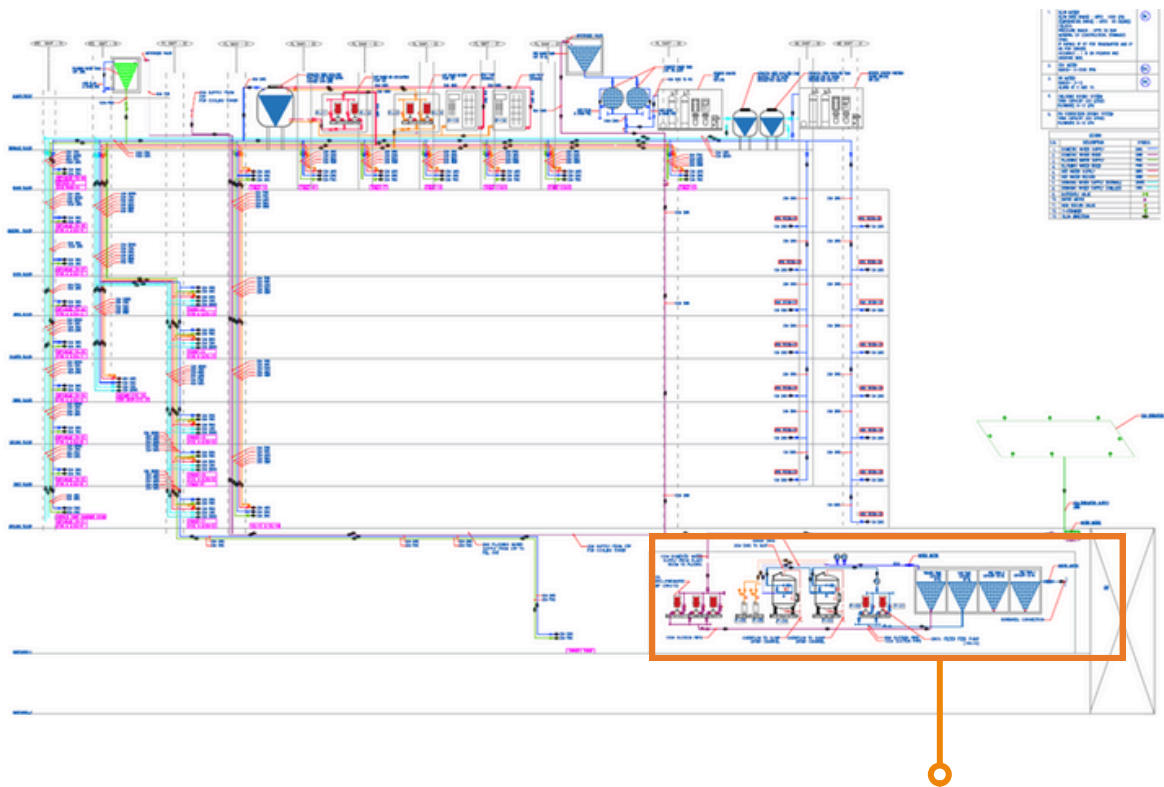
## Sample Documentation : 3



**Landscape drawing demarcating the different layers and types of plants proposed to be planted, along with a detailed legend.**

- BUDDHA BELLY BAMBOO CC 0.3M HT-1.8M
- IXORA MINI 0.3M HT-0.45M
- HELICONIA PSITTACORUM 0.3M HT-0.3M
- IRIS 0.3M HT-0.3M
- CALLUS LILLY 0.3M HT-0.3M
- TRADESCANTIA PALLIDA 0.3M HT-0.3M
- SYNGONIUM PODOPHYLUM 0.3M HT- 0.3M
- AGLONEMA COMMUTATUM RED 0.3M HT- 0.3M
- LAWN

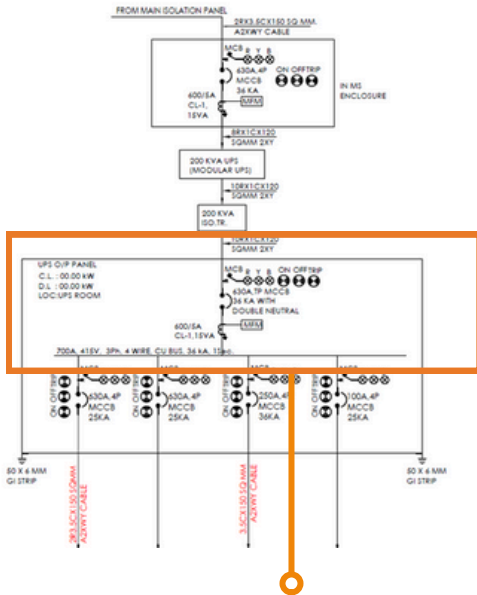
## Sample Documentation : 4



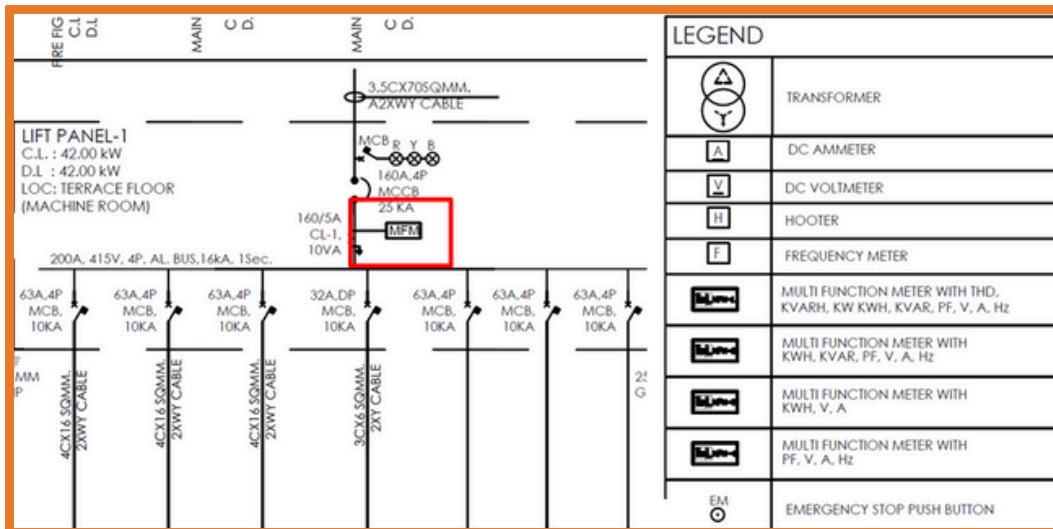
Water riser diagram demarcating the various plumbing lines and meters along with a detailed legend.



# Sample Documentation : 5



LEGEND	
	TRANSFORMER
	DIESEL GENERATOR (DG)
	VACUUM CIRCUIT BREAKER
	EARTH
	CURRENT TRANSFORMER
	EARTH SWITCH
	INDICATION LAMPS
	SC - SPRING CHANGED
	SP - SERVICE POSITION
	TP - TEST POSITION
	TCH - TRIP CIRCUIT HEALTHY
	DCH - DC HEALTHY
	R-PHASE
	Y-PHASE
	B-PHASE
	T - ANN. TEST PUSH BUTTON
	A - ANN. ACCEPT PUSH BUTTON
	R - ANN. RESET PUSH BUTTON
	EM - EMERGENCY PUSH BUTTON
	DC AMMETER

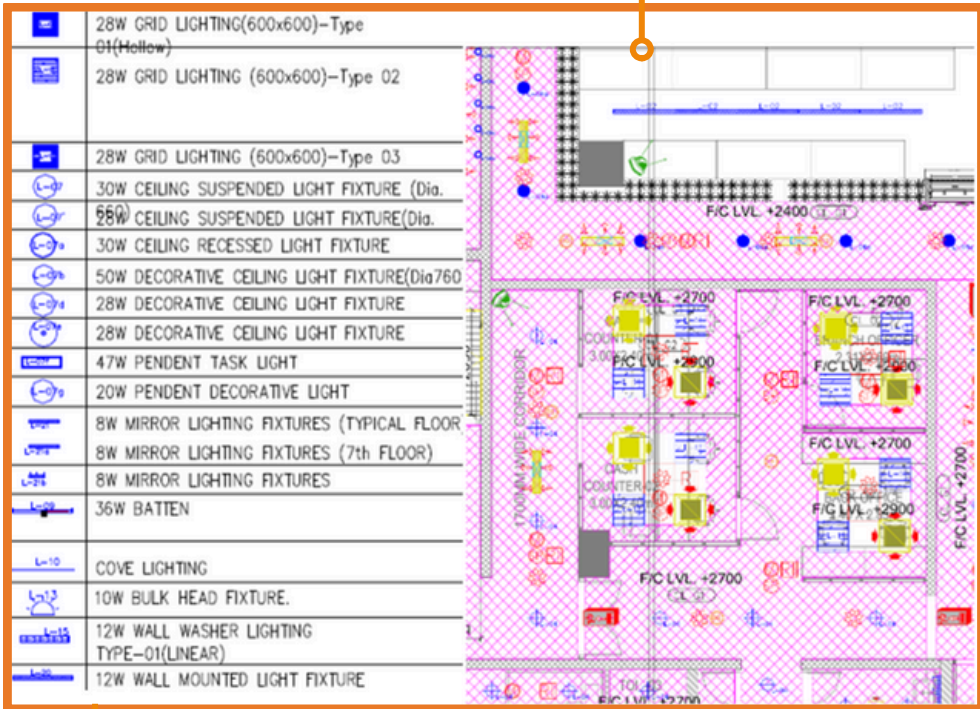


SLD diagram demarcating the electrical lines and meters along with a detailed legend.

# Sample Documentation : 6

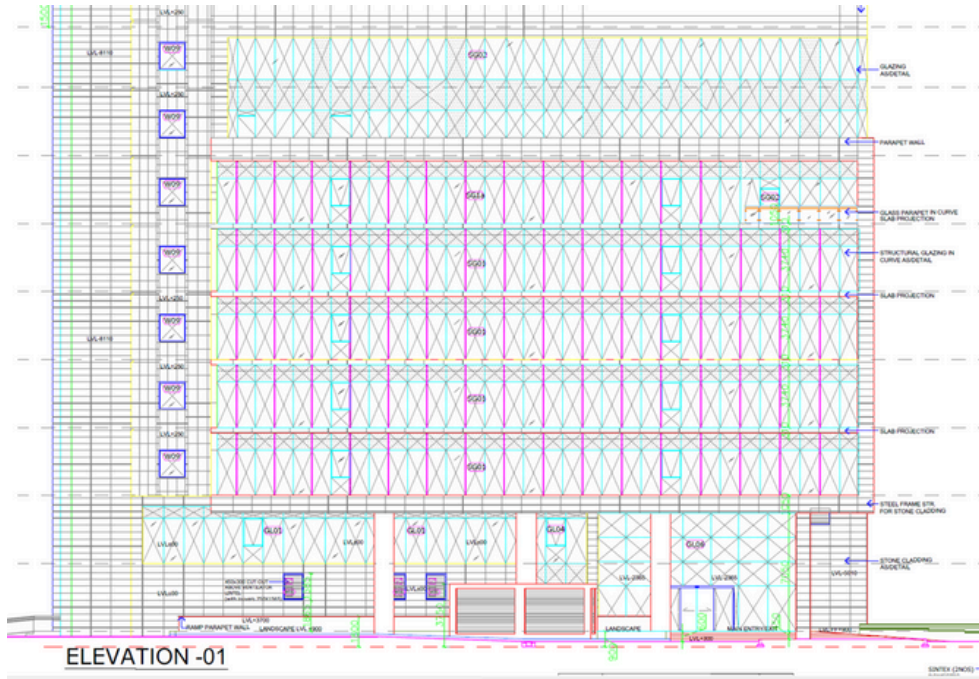


## GROUND FLOOR



Interior lighting layout, floor wise, along with detailed fixtures legend.

# Sample Documentation : 7



CIVIL OPENING SCHEDULE - FIFTH FLOOR				
01. DOORS				
NO.	WIDTH	SILL	LINTEL	LOCATION
D02	1500	—	2400	Lobby of Ele. & AHU room
D03	1050	—	2400	Differently abled Toilet
D05	900	—	2400	Pantry & Store room
D5a	900	—	2400	Toi.'s Entry (Toi. no-13)
D06	750	—	2400	Toi.'s Entry (Toi.no-14)
D06a	600	—	2400	Janitor Closet
FD01	1630	—	2400	Staircases Entry/Exit
FD02	1630	—	2400	Ele. & AHU Room
SD03	600	600	2100	Service shaft-01
02. VENTILATORS				
V02	1500	2100	2700	Rear side Toilets & Pantry
V03	2400	2100	2700	Male & Female Toi. 13
		2100	2700	
03. WINDOWS				
W01	3500	1050	2700	Office Space
W03	2510	1050	2700	Office Space
W07	2400	1050	2700	2m wide corridor
W08	1850	1050	2700	2m wide corridor
W09	1650	1050	2700	Office Space
W12	1000	1050	2700	Office Space

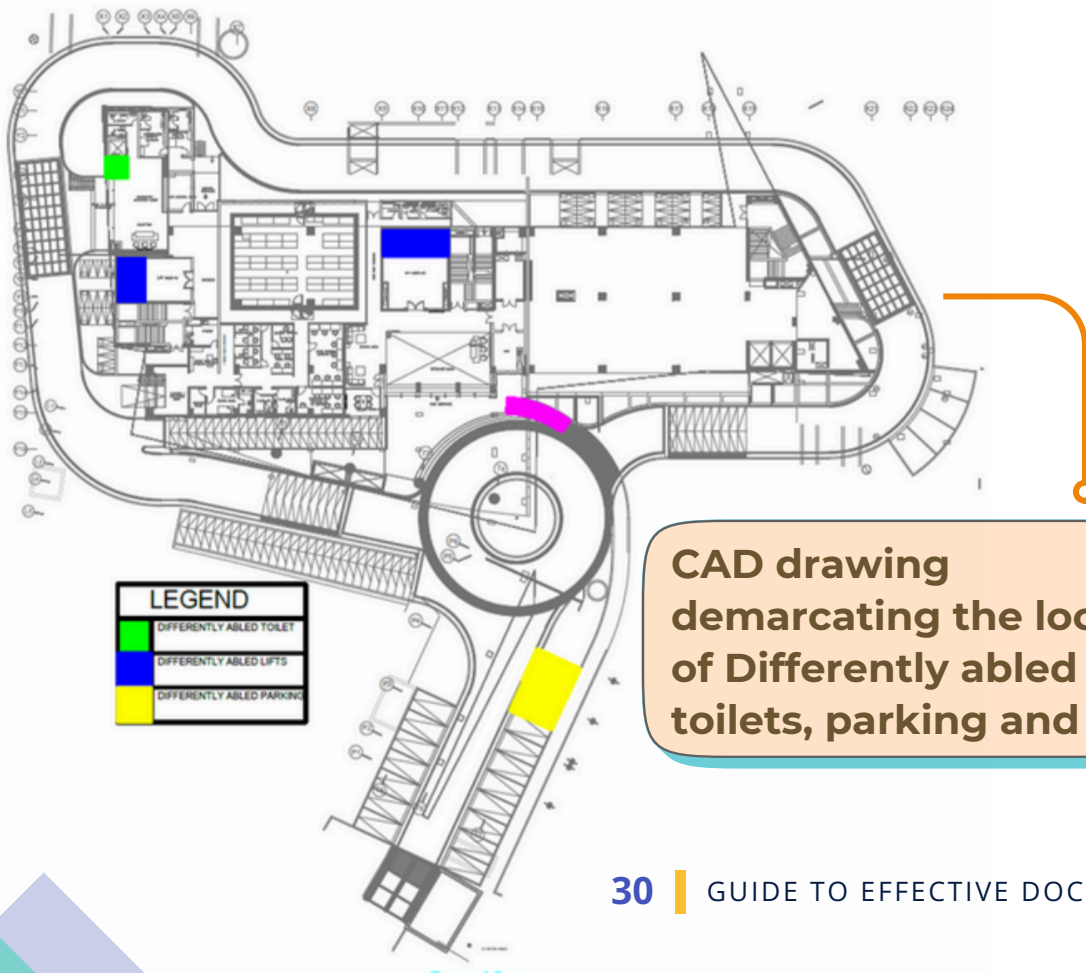
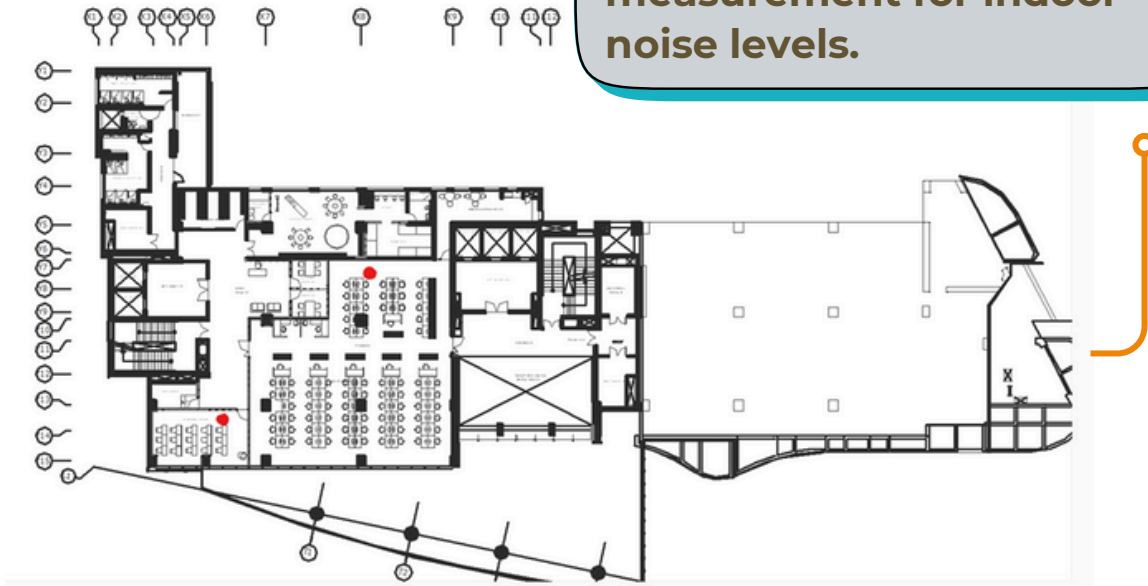
**Detailed drawing of the building elevation drawing indicating the legends of door & window schedules.**

**\*CAD of the elevation drawing indicating the legends of door & window schedules.**

\*Elevation drawings of all orientations in AutoCAD format are required to be submitted.

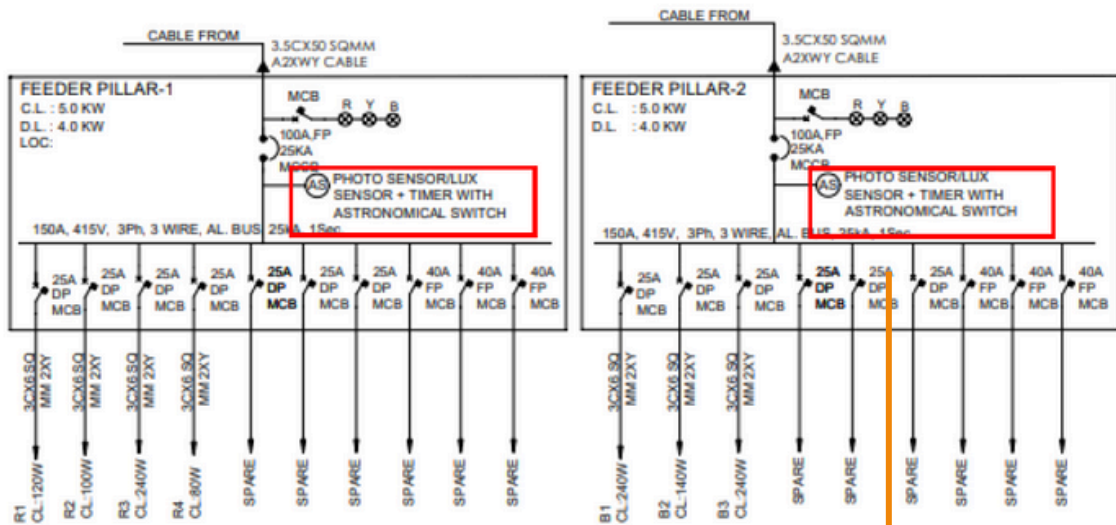
## Sample Documentation : 8

CAD drawing demarcating the location of measurement for indoor noise levels.



CAD drawing demarcating the location of Differently abled (DA) toilets, parking and lifts.

## Sample Documentation : 9



SLD drawing demarcating the location of Astronomical timer switch

## Possible errors in the drawing

- Drawings may be submitted in PDF format, making it difficult to verify areas and other details.
- Absence of legends in the drawings leads to difficulty in interpreting drawings by the evaluator.
- Files may sometimes be corrupted or have missing links.
- There could be overlapping areas, potentially leading to double counting.
- Blocks and hatches might be exploded in the drawings, may cause the file size to become too large to view.



# Calculations



58.703	Planner
to Report Date	
Other Forecast	
1.1	
1.2	
1.3	
1.4	
1.5	
1.6	
1.7	
1.8	
1.9	
2.0	
2.1	
2.2	
2.3	
2.4	
2.5	
2.6	
2.7	
2.8	
2.9	
3.0	
3.1	
3.2	
3.3	
3.4	
3.5	
3.6	
3.7	
3.8	
3.9	
4.0	
4.1	
4.2	
4.3	
4.4	
4.5	
4.6	
4.7	
4.8	
4.9	
5.0	
5.1	
5.2	
5.3	
5.4	
5.5	
5.6	
5.7	
5.8	
5.9	
6.0	
6.1	
6.2	
6.3	
6.4	
6.5	
6.6	
6.7	
6.8	
6.9	
7.0	
7.1	
7.2	
7.3	
7.4	
7.5	
7.6	
7.7	
7.8	
7.9	
8.0	
8.1	
8.2	
8.3	
8.4	
8.5	
8.6	
8.7	
8.8	
8.9	
9.0	
9.1	
9.2	
9.3	
9.4	
9.5	
9.6	
9.7	
9.8	
9.9	
10.0	



$$F = \begin{bmatrix} -WL/2 \\ -WL^2/12 \end{bmatrix} \cdot \begin{bmatrix} \frac{12EI}{L^3} & -\frac{6EI}{L^2} \\ -\frac{6EI}{L^2} & \frac{4EI}{L} \end{bmatrix} \begin{bmatrix} D_3 \\ D_4 \end{bmatrix}$$

$$\begin{aligned} & \left( \frac{3}{2L} \right) \frac{-6EI}{L^2} D_3 + \dots \\ & = \frac{-WL^4}{8EI} \end{aligned}$$

$$K \cdot D = S$$

$\Phi$  is same

$$-\frac{WL}{2}$$

$$-D_4 = \frac{WL^2}{12}$$

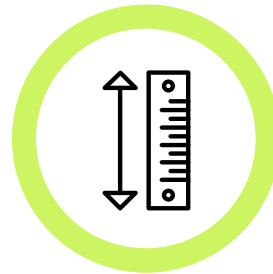
# Calculations

Calculations play a crucial role in the submission of documents for GRIHA rating, as they provide a clear and quantifiable assessment of a building's performance in various sustainability aspects. Accurate calculations ensure that the project's adherence to GRIHA's benchmarks is transparently demonstrated, facilitating a thorough evaluation of energy efficiency, water conservation, and waste management practices. Moreover, these calculations serve as a foundation for justifying design choices and material selections, helping to identify areas for improvement.



## Justify

*Use calculations to justify the impact of the design, providing evidence to support the narrative statement. This also helps in awarding points based on the appraisal criteria and point distribution slabs.*



## Quantify

*Based on the building's unique design, occupancy, and typology, the impact of sustainable measures implemented by the team can be accurately assessed.*



## Points to remember while submitting calculations

01

Calculations help in quantifying the building performance after adopting various sustainability strategies.

02

It is recommended to use the in built calculator in the online panel to the extent possible.

03

The values and areas used in the calculations should correspond with the numbers specified in the specification sheet or supporting drawings.

04

Providing backend excel sheet calculations for the values used in the online calculator can help the evaluator understand the rationale behind the consolidated numbers displayed in the online panel.

## Sample Documentation : 1

Fields highlighted in grey are the parameters that needs to be fed in the online calculator

### Calculation for percentage hard paved area treated on site

Site Area (sq.m) *	7205.84
Landscape Area (sq.m) *	1838.64
<b>Net Site Area</b>	<b>5367.2</b>
Total area under *:	
Soft Paving (sq.m)	0
Paving with vegetated roof/trees/Solar Panels (sq.m)	1687.47
Paved area with SRI>0.5 (sq.m)	0
Building roof area under Terrace Garden/High SRI finished/China Mosaic (sq.m)	1496.33
<b>Total treated area (sq.m)</b>	<b>3183.8</b>
* The areas entered above should not overlap.	
<b>Percentage treated areaa (%)</b>	<b>59.32</b>
<a href="#">Save</a>	

[Exit Calculator](#)

Screenshot of the online calculator demonstrating the percentage area treated. This value will determine the points attempted for this criterion.

## Sample Documentation : 1

\*Excel reference calculation submitted by project team for percentage of hard paved area treated on site

S.No.	Spaces	Area(Sq.m)
1	Total Site boundary	7205.84
2	Building Footprint	2241.61
3	Building Ground Coverage	1772.91
4	Total ground coverage	1834.60
5	Total hard paved area	3113.45
6	Total soft scape/Landscape	1838.64
<b>Non Roof</b>		<b>4902.54</b>
<b>Softscape</b>		<b>1838.64</b>
1	Total trees area	994.40
2	Shrubs area	155.52
3	Plants area	414.29
4	Grass pavers area(100%)	274.43
<b>Hardscape</b>		<b>3063.89</b>
1	Area of services area	510.04
2	Area of boundary wall	106.31
3	Two wheeler Parking area	144.80
4	Road and Ramp area (excluding building footprint)	1998.04
5	50% of Grass pavers area/Visitors four wheeler parking	0.00
6	Granite pavement	304.70
<b>Building footprint/Roof</b>		<b>2303.302</b>
1	Building footprint	2241.61
2	Area of guard room	31.34
3	Area of meter room	30.35
Site area (sq.m.)		7205.84
Landscape area (sq.m.)		1838.64
<b>Net site area</b>		<b>5367.20</b>
Total area under :		
a.Area shaded with trees (sq.m.)		994.40
b.Non roof area, shaded under cantilevered roof (sq.m.)		468.70
c.Building roof area under high SRI tiles (sq.m.)		1496.33
d.Building roof area under Solar PV (sq.m.)		224.37
<b>Total treated area (sq.m.)</b>		<b>3183.80</b>
<b>Percentage treated area (%)</b>		<b>59.3%</b>

\*The values indicated against each surface finishes will be verified with the supporting AutoCAD drawings submitted in the documentation.

## Sample Documentation : 2

Extract of online calculator for percentage water reduction in building

This field indicates the typology of the project

Fields highlighted in grey are the parameters that needs to be fed in the online calculator

Commercial/Academic Daytime

No. of uses\* (In case of Water closets and urinals) =number of usage per person/per day

No. of uses\* (In case of faucets) = duration of use \* number of usage per person/per day

Please specify Total Building occupancy, female occupants, male occupants.

Female	863
Male	863
Building Occupancy (x)	1726
Working Days	269

Present design case

Fixtures		Design Case	Base Case
Water Closets(solids)	Flow rates (lpf)	4.2	9
	Total users *	0.1	
	Water Consumption (l)	724.92	1553.4
Kitchen Faucets	Flow rates (lpm)	1.23	10
	Total users *	0.5	
	Water Consumption (l)	1061.49	8630

Exit Calculator

## Sample Documentation : 2

Base case parameters are pre fed in the calculator based on the typology of the project

Calculations for Criterion 14

Present design case		Design Case	Base Case
Water Closets(solids)	Flow rates (lpf)	4.2	9
	Total users *	0.1	
	Water Consumption (l)	724.92	1553.4
Kitchen Faucets	Flow rates (lpm)	1.23	10
	Total users *	0.5	
	Water Consumption (l)	1061.49	8630
Water Closets(liquid)	Flow rates (lpf)	2.5	9
	Total users *	3	
	Water Consumption (l)	6472.5	23301
Urinals / Sensor Based Urinals / Waterless Urinals	Flow rates (lpf)	1.5	4
	Total users *	3	
	Water Consumption (l)	3883.5	10356
Lavatory faucets	Flow rates (lpm)	1.23	10
	Total users *	0.75	
	Water Consumption (l)	1592.24	12945
Others (please mention) ⊕	Flow rates (lpf/lpm)		

Exit Calculator

This number is pre fed based on the typology of the project

## Sample Documentation : 2

Extract of the online calculator for percentage water reduction in the building

Fixtures that are not listed in the online calculator may be added under this category

	Water Consumption (l)	1592.24	12945
Others (please mention) <input type="text"/>	Flow rates (lpf/lpm)	<input type="text"/>	<input type="text"/>
	Total users *	<input type="text"/>	
	Water Consumption (l)	0	0
Daily water consumption (l)		13734.65	56785.4
Annual water consumption (l)		3694620.85	15275272.6

Project Water use Reduction (%) ▶ 75.81

Formula Used:  $\text{Water use reduction (\%)} = \frac{\text{Annual water demand (Base case)} - \text{Annual water demand (design case)}}{\text{Annual water demand (Base case)}} \times 100$

Save

Exit Calculator

Screenshot of the online calculator demonstrating the percentage reduction in building water demand

## Sample Documentation : 3

Extract of the online calculator for percentage water reduction in landscape design

Dropdown in the online calculator to select a month for showcasing landscape water demand

Dropdown in the online calculator to select the type of irrigation system

Evapotranspiration rate (m/day) 0.0062 (between 0.00005 and 0.3)

Month January

**Design Case**

Lawns (On ground/podium)	Plant Factor	1
	Lawn area(sq. m)	274.43
	Irrigation System	Select Irrigation System
	Water requirement (kipd)	
Native/Naturalised shrubs (On ground/podium)	Plant Factor	
	Total canopy area(sq. m)	
	Irrigation System	Select Irrigation System
	Water requirement (kipd)	0.00
Exotic shrubs	Plant Factor	0.7
	Total canopy area(sq. m)	
	Irrigation System	Select Irrigation System

Exit Calculator

## Sample Documentation : 3

Fields highlighted in grey are parameters that needs to be fed in the online calculator

Design Case		
Lawns (On ground/podium)	Plant Factor	1
	Lawn area(sq. m)	274.43
	Irrigation System	Multiple sprinkler
	Water requirement (kipd)	2.27
Native/Naturalised shrubs (On ground/podium)	Plant Factor	0.4
	Total canopy area(sq. m)	100.77
	Irrigation System	Micro-drip
	Water requirement (kipd)	0.29
Exotic shrubs	Plant Factor	0.7
	Total canopy area(sq. m)	90.19
	Irrigation System	Micro-drip
	Water requirement (kipd)	0.46
	Plant Factor	0
	Total canopy area(sq. m)	1373.26

Exit Calculator



## Sample Documentation : 3

Field indicating design case landscape water requirement for the month of \*January

The screenshot displays a software interface for calculating landscape water requirements. It is divided into two main sections: 'Others' and 'Base Case'.

**Others Section:**

Plant Factor	
Total canopy area(sq. m)	
Irrigation System	Select Irrigation System
Water requirement (kipd)	0.00
Total daily water requirement (kl)	3.02
Total monthly water requirement (kl)	93.62

**Base Case Section:**

Plant Factor	1
Lawn area(sq. m)	1838.65
Irrigation system Efficiency	0.75
Water requirement (kipd)	15.2
Total monthly water requirement (kl)	471.2

Buttons for 'Save' and 'Exit Calculator' are visible at the bottom of the interface.

Field indicating base case landscape water requirement for the month of January

\*The same step must be carried out for every month to calculate the total annual landscape water demand.

## Sample Documentation : 4

Extract of the online calculator for percentage of water reused in the project

Fields highlighted in grey are the parameters that needs to be fed in the online calculator as per the water balance chart

Water Demand	
Annual Water requirement of the building *	<input type="text" value="3695"/>
Annual landscape Water requirement (kl) *	<input type="text" value="3000"/>
Annual Miscellaneous Water requirement (kl) *	<input type="text" value="0"/>
<b>Annual Water Demand (kl)</b>	<b>6695</b>
Water Supply	
Annual treated Water being used on site (kl) *	<input type="text" value="3325"/>
Annual Rain Water captured and Reused on site (kl) *	<input type="text" value="0"/>
<b>Total annual water recycle and reuse (kl)</b>	<b>3325</b>
<b>Onsite water reused (%)</b>	<b>49.66</b>

Screenshot of the online calculator demonstrating the percentage of water reused in building

## Possible errors in the calculation

- The area-specific numbers used in the online calculations may not align with the measured areas from the submitted CAD drawings.
- The project team may sometimes overlook submitting back end calculations for the consolidated numbers utilized in the online calculator.
- The project teams may sometimes submit two calculations in the form of online calculator and excel sheet calculations. Confusion can arise if these two calculations do not match.
- The units utilized in the calculation might not be consistent.
- Use of incorrect formulas in the excel sheet calculators.
- Typo errors in calculations: mistakes that occur due to incorrect data entry or misinterpretation of numbers. These errors can arise from transposed numbers, misplaced decimals or incorrect entry of digits.



# Technical Specification Sheet

---



# Technical Specification sheet

The technical specification sheet is a crucial component of GRIHA documentation submission as it provides detailed information about the materials, systems, and technologies used in a project. This document highlights why specific materials are energy-efficient or environmentally friendly compared to their counterparts in the market.



## Transparency

*It ensures that all aspects of the project's design and construction are clearly documented, allowing for a transparent assessment of sustainability measures.*



## Compliance Verification

*These approved values help in assessing whether the products/materials meet the standards set by GRIHA, ensuring their compliance with the required environmental and sustainability benchmarks.*



## Performance Standards

*Technical specification sheets provide tested values or properties of products/materials, which are essential for assessing their environmental performance and sustainability.*

## Points to remember while submitting Technical Specification sheet

01

Ensure that the that the make, model name / number is a part of the submitted technical specification sheet.

02

Ensure each technical sheet includes the necessary specifications related to the product and criterion requirements.

03

Highlight the relevant sections in the specification sheets so that the same can be easily identified by the evaluators.

# Way of Submitting technical details of material / system installed

The technical specification sheet of various materials / systems can be submitted using the following types of documents.

## TECHNICAL SPECIFICATION SHEETS

Technical Properties	Test Standard	Specification
Temperature Range - Max. Surface Temp	Test according to EN 14706, EN 14707 & EN 14304	+105° C
Temperature Range - Max. Temp. for Flat Surface	Test according to EN 14706, EN 14707 & EN 14304	+83° C
Min. Surface Temp	Test according to EN 14706, EN 14707 & EN 14304	-50° C
Thermal Conductivity 0° C	Test according to EN ISO 8497 for Tube / EN 12667 for Sheet	0.035 W/M.K
Thermal Conductivity 20° C	Test according to EN ISO 8497 for Tube / EN 12667 for Sheet	0.037 W/M.K
Thermal Conductivity 40° C	Test according to EN ISO 8497 for Tube / EN 12667 for Sheet	0.039 W/M.K
Water Vapour Permeability	Test according to EN 13469 for Tube and EN 12086 for Sheet	(MOISTURE DIFFUSION RESISTANCE FACTOR) MU > 7000
Water Absorption - By volume	Test according to ASTM C209	0.3 % AVERAGE/0.5 % MAXIMUM
Fire Propagation	Surface Spread Of Flame acc to BS 476 Part 7 : 1997, Fire Propagation Index acc to BS 476 Part 6: 1989	CLASS 1- THE FLAME SPREAD AFTER 1.5&10 MIN MUST BE<165MM TOTAL INDEX PERFORMANCE<12 S&10 INDEX<0.8
Fire Performance	As per building regulations (England & Wales)	CLASS 0 FIRE CATEGORY (UL 94-BB) (V-0) APPROVED
Reaction to Fire	Surface Spread Of Flame acc to BS 476 Part 7 : 1997, Fire Propagation Index acc to BS 476 Part 6: 1989	SELF-EXTINGUISHING, DOES NOT SPREAD FLAME, DOES NOT DRIP
Resistance to Building Material		VERY GOOD
Resistance to Ozone		VERY GOOD
Rating		ZERO

## WEBSITE SCREENSHOTS

The screenshot shows the Archidply website interface. At the top, there's a navigation menu with options: Introduction, USP, Standard Size, Application, and Technical Specification. Below the menu, there's a section titled 'Introduction' with a sub-heading 'Archidply brings you BWR with Toxin Check Technology, India's first eco-friendly plywood, which is specially treated to reduce levels of dangerous chemical emissions, making your home and office safer for you to live in. Archidply BWR'. There are also images of a living room and a hospital bed.

## PRODUCT BROCHURES

The brochure features a large image of a white thermal barrier system installed on a roof. The text 'THERMATEK® ThermalBarriers' is prominently displayed in the center. There are also smaller images showing the product being applied to a surface.

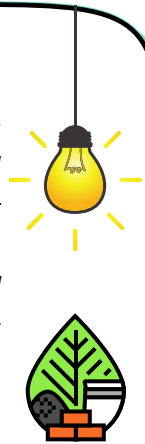
## GRIHA PRODUCT CERTIFICATE

The certificate is issued by idilite Industries Ltd. for two products: DR. FIXIT RAINCOAT COOL and DR. FIXIT COOL ROOF COATING. It lists the GRIHA V 2015 : 3 B rating, the dates of the assessment (2021-09-29 and 2023-09-28), and the product descriptions: 'High SRI external paints/ tiles/ cool roof coating'. The certificate also includes contact information for idilite Industries Ltd. in Mumbai.

## GRIHA PRODUCT CATALOGUE

- The catalogue serves as a guide for **identifying materials, systems, and technologies** that align with GRIHA's sustainability criteria. It helps stakeholders make informed choices that can enhance the sustainability rating of their projects.
- Products listed in the **catalogue have been evaluated against GRIHA's benchmarks**, ensuring they meet specific environmental and performance standards.

Web link to access the GRIHA product catalogue:  
<https://www.grihaindia.org/productscatalogue>



## Sample Documentation : 1

INDIAN Transformers and Electricals Pvt. Ltd. Gurgaon		ITE <sup>®</sup> INDIAN TRANSFORMERS GURGAON	
An ISO 9001 :2015 UNIT			
38 K.M. STONE, NH - 8, BEHRAMPUR ROAD, SECTOR - 34, GURGAON - 122004			
COPPER WOUND DISTRIBUTION TRANSFORMER			
3 PHASE TRANSFORMER			
STANDARD	IS 1180(Pl.-1)	ENERGY EFFICIENCY LEVEL	2
KVA	1250	MAX TOTAL LOSSES AT 50% RATED LOAD	W 3300
VOLTS AT NO LOAD	HV 11000 LV 415	MAX TOTAL LOSSES AT 100% RATED LOAD	W 9200
BIL	HV 75KVP/28KV LV - /3KV	TEMP RISE	OIL °C 40 WDG °C 45
AMPERES	HV 65.61 LV 1739	MASS OF CORE & WDG.	kg 2640
FREQUENCY	Hz 50	MASS OF OIL	kg 1390
VECTOR GROUP	Dyn 11	TOTAL MASS	kg 5740
IMPEDANCE VOLT %	5.0	VOL OF OIL	Ltrs. 1640
TAPPINGS FOR HV VARIATION	OLTC	MONTH & YEAR OF MFG.	2021
	[1.25]% STEPS FROM [-15]% TO [+5]%	SERIAL NO.	ITE/G/
CUSTOMER			
ORDER NUMBER			
MADE IN INDIA			

Technical specification of transformer highlighting its total load losses at 50% and 100%



## Sample Documentation : 2

Highlighting conductivity values / resistance values of insulation materials required to meet ECBC standards.

**armacell**

ARMACELL INDIA PRIVATE LIMITED,  
GATE No 744,745 VILLAGE LONIKAND NAGAR ROAD,  
PUNE 412216, INDIA  
Email:India.Office@armacell.com  
Tele. No:(0091)-020-66782000  
Telefax No:(0091)-020-66782020  
GSTIN: 27AAFCA1528D1Z4  
PAN No: AAFCA1528D  
CIN No. U24293PN2005FTC131939

INVOICE NO : 2891081547  
DATE: 16.08.2021

ITEM CODE	DESCRIPTION OF ITEM CODE
ICOFA32500701	COA-32MM/E

**CERTIFICATE OF CONFIRMATION**

This is to certify that Armacell makes insulation supplied is having following technical properties:

Technical Properties	Test Standard	Specification
Temperature Range - Max. Surface Temp	Test according to EN 14706 , EN 14707 & EN 14304	+105° C
Temperature Range - Max. Temp. for Flat Surface	Test according to EN 14706 , EN 14707 & EN 14304	+85° C
Min. Surface Temp	Test according to EN 14706 , EN 14707 & EN 14304	-50° C
Thermal Conductivity 0°C	Test according to EN ISO 8497 for Tube / EN 12667 for Sheet	0.035 W/M K
Thermal Conductivity 20°C	Test according to EN ISO 8497 for Tube / EN 12667 for Sheet	0.037 W/M K
Thermal Conductivity 40 °C	Test according to EN ISO 8497 for Tube / EN 12667 for Sheet	0.039 W/M K
Water Vapour Permeability	Test according to EN 13469 for Tube and EN 12086 for Sheet	(MOISTURE DIFFUSION RESISTANCE FACTOR) MU > 2000
Water Absorption - By volume	Test according to ASTM C209	0.3 % AVERAGE,0.5 % MAXIMUM
Fire Propagation	Surface Spread Of Flame acc to BS 476 Part 7 : 1997, Fire Propagation Index acc to BS 476 Part 6: 1989)*	CLASS1:THE FLAME SPREAD AFTER 1.5&10 MIN MUST BE<165MM.TOTAL INDEX PERFORMANCE(I)<12 SUB INDEX(II)<6
Fire Performance	As per building regulations (England & Wales)	CLASS O FIRE CATEGORY :UL 94-HB,V-0,FM APPROVED
Reaction to Fire	Surface Spread Of Flame acc to BS 476 Part 7 : 1997, Fire Propagation Index acc to BS 476 Part 6: 1989)	SELF-EXTINGUISHING, DOES NOT SPREAD FLAME, DOES NOT DRIP.
Resistance to	Building Material	VERY GOOD
Resistance to	Chemicals	VERY GOOD
ODP Rating		ZERO
GWP Rating		ZERO
Health Aspects		DUST & FIBRE FREE
Dimensions		STANDARD TUBE LENGTH-2.0M,CONTINUOUS SHEET WIDTH-1.0MOR 1.2M
Density (Foam + Covering)		40-55 KG/M3
Artificial Weathering - UV Testing	(Test according to EN ISO 4892-2 Method A)	NA
Antimicrobial Properties	DIN EN ISO 846 METHOD A.	NA
Antimicrobial Properties	DIN EN ISO 846 METHOD C.	NA
Covering Material		NA

Technical specifications of insulation material highlighting its ODP and GWP parameters

## Sample Documentation : 3

ensavior		xylem Let's Solve Water	
TAG		SECONDARY WATER PUMP	
Brand / Manufacturer		Bell & Gossett / Xylem (Formerly Known as ITT) ✓	
Authorised Distributor		Ensavior Technologies Pvt Ltd ✓	
Type		End Suction split case type (Close Coupled) ✓	
Flowrate	GPM	480	✓
Head	Mtr	35	✓
Qty		3	✓
Pump Model		1532, 3AC	
Pump Efficiency	%	79.89	
BHP		17.49	
Motor Power	HP	20	✓
Liquid handled		Water ✓	
No. of Stages		Single ✓	
Type of Motor		TEFC ✓	
Motor Make		Xylem (OEM) Branded	
No. of Poles		2	
Electrical Characteristics		415 volt/50 hz/3 ph	
Motor Efficiency class		IE3	
Class of insulation		F	
Protection of motor		IP55	
PN Rating		12	
Sealing Arrangement		Mechanical seal	
Impeller Material		SS	
Casing material		Cast Iron	
Shaft material		High tensile strength steel	
Base frame		Yes	

**Technical specifications of motors highlighting its efficiency and class.**

## Sample Documentation : 4


### Neutrals

GLASS DETAILS			LIGHT FACTORS			ENERGY FACTORS		
COLOUR SHADE	BRAND	CODE	TRANSMISSION (%)	REFLECTION (%)		SOLAR FACTOR SHGC / SF	SHADING CO-EFFICIENT SC	U-VALUE (W/Sq.m K)
				EXTERNAL	INTERNAL			
<b>Single Glazed Unit (6mm thick, coating face 2)</b>								
Sparkling Ice	Antello Plus	ST 167	67	19	19	0.68	0.78	5.6
Dew Drop	Cool-Lite	ST 150	51	18	17	0.56	0.64	5.6
Graphite	Cool-Lite	ST 136	37	22	18	0.43	0.50	5.5
Sparkling Silver	Cool-Lite	ST 120	33	22	27	0.33	0.35	5.2
Platinum	Cool-Lite	ST 108	9	43	34	0.14	0.16	3.6
Clear	Evo-Lite	ET II 150	39	15	11	0.39	0.38	3.9
Clear	Evo Plus	ET II 135	34	23	8	0.34	0.39	3.9
Clear Cosmos	Evo	ET II 125	28	28	9	0.29	0.34	3.8
Clear	Horizon	SCN 145	45	22	4	0.44	0.51	4.9
<b>Double Glazed Unit (outer: 6mm with coating Face 2 - 12mm Air Gap - inner 6mm Clear)</b>								
Sparkling Ice	Antello Plus	ST 167	60	22	23	0.60	0.68	2.8
Dew Drop	Cool-Lite	ST 150	46	20	22	0.47	0.54	2.8
Graphite	Cool-Lite	ST 136	34	23	23	0.35	0.40	2.7
Sparkling Silver	Cool-Lite	ST 120	18	32	30	0.21	0.25	2.6
Platinum	Cool-Lite	ST 108	8	43	36	0.10	0.11	1.9
Clear	Evo-Lite	ET II 150	45	15	17	0.42	0.48	2.6
Clear	Evo Plus	ET II 135	31	24	14	0.28	0.32	2.1
Clear Cosmos	Evo	ET II 125	25	29	15	0.23	0.27	2.0
Clear	Horizon	SCN 145	40	24	12	0.37	0.42	2.5
Pristine White	Planitherm	PLTT	75	12	12	0.57	0.66	1.8
Winter Mist	Nano	KT 164	57	14	10	0.47	0.54	1.9
Moonshine	Nano	KT 155	47	17	11	0.38	0.43	1.9
Icy Menthol	Nano	KT II 140	37	23	12	0.29	0.33	1.8
Zephyr	Nano	KT II 130	31	22	14	0.25	0.29	1.8
Clear	Harmony	Harmony II	24	23	16	0.21	0.24	1.7
Clear	Blu De	Blu De II	46	31	24	0.30	0.35	1.9
Chroma	Nano Silver	KS II 146	42	33	19	0.29	0.34	1.6
Shine	Nano Silver	KS II 138	36	38	20	0.26	0.30	1.6
Clear	Nano Silver Plus	KS II 130	30	43	19	0.22	0.25	1.6
Clear	Envision Plus	SKN II 176	69	13	15	0.37	0.43	1.5
Lunina	Envision Plus	SKN II 165	60	16	18	0.34	0.39	1.5
Magma	Envision	SKN II 154	51	18	22	0.28	0.33	1.5
Iris	Envision	SKN II 144	41	20	15	0.24	0.27	1.6
Nebula	Equinox	Equinox II N	30	13	10	0.19	0.22	1.6
Clear	Quartz	Quartz II	40	11	11	0.25	0.29	1.6
Clear	Xtreme	XT II 70/33	69	11	13	0.33	0.38	1.5
Clear	Xtreme	XT II 60/28	60	14	17	0.28	0.33	1.5
Clear	Xtreme	XT II 50/22	46	16	18	0.22	0.25	1.5

Technical specifications of glazing unit highlighting its SHGC, VLT, U-value and model number

## Sample Documentation : 5

**SIEMENS**



**Duct air quality sensors QPM11x4**

---

- Maintenance-free CO<sub>2</sub> sensing element based on optical infrared absorption measurement (NDIR = non dispersive infrared)
- No recalibrations required

**Use**

In air ducts of ventilation and air conditioning plant to enhance room comfort and to optimize energy consumption by providing demand-controlled ventilation. The sensor acquires CO<sub>2</sub> concentrations and temperature.

**Important!**

The sensors may not be deployed as safety devices, e.g. as gas or smoke warning devices!

**Type summary**

Type	Order number	Designation
QPM1104	S55720-S455	Duct sensor CO <sub>2</sub>
QPM1164	S55720-S456	Duct sensor CO <sub>2</sub> /T

The sensor is supplied complete with mounting flange and cable entry gland M16.

**Engineering notes**

The sensor must be powered by a transformer for safety extra low-voltage (SELV) with separate windings, suited for 100 % duty.

**Cable routing and cable selection**

On applications with EMC problems, use shielded cables. For secondary power lines and signal lines, use twisted-pair cables.

**Mounting notes**

**Mounting location and orientation**

To ensure degree of protection IP54, the sensor must be fitted with the cable entry pointing downward.

Technical specification of sensors highlighting its model name and monitoring capabilities

# Sample Documentation : 6

Conforms to ISI/IGBC & GRIHA Specifications



## BISON

ACRYLIC INTERIOR EMULSION



**Product Description**  
 Bison Emulsion is an acrylic based matt finish interior emulsion. The product is an ideal choice for price conscious customer. It has twice the durability of a distemper and is suitable for a wide variety of surfaces. It is formulated with special colour fast pigments with excellent anti-fading properties.

**Recommended Use**  
 Sand-cement plaster surface, asbestos, brickwork, concrete block and fiberboard

Product Attributes



**Value for money**  
Better finish than distemper at almost the same cost



**Coverage**  
Spreads twice as much as distemper thereby covers twice the wall space



**XP Advanced Range**  
Bison XP Advanced gives better whiteness, lower smell and higher coverage compared to regular Bison emulsion



**Anti-fungal**  
Resists growth of algae, fungus and moulds



**Green Pro Certified**  
Validates our effort in striving towards cleaner, more sustainable future

Colour Range



10,000 shades

Finish

HIGH

MEDIUM

SMOOTH ✓

MATT ✓

Smooth and stylish matt finish

Toxicity



VOC - 50 gm/L  
Dry film is non-toxic, with no added lead and arsenic

**Coverage**  
 130-150 sqft/lt/2 coats  
 (Coverage may depend on factors like surface conditions, surface preparation, application skill, weather conditions, dilution etc.)

**Recommended Undercoats**  
**Primer:** For wall/ plastered surfaces – BP Cement Primer WT (Alkali Resistant)  
**Putty:** For wall/ plastered surfaces – Bison Wall Putty / Happy Wall Putty

**Number of Coats:**  
 2 coats of emulsion for re-painting provided the colour is same.  
 3 coats of emulsion if fresh painting is required to give a rich matt look.

Application Method



Brush / Roller / Spray

Recommended Thinner / Cleaner



Potable water

Dilution Ratio



**For Brush application:** 500 ml of water/ L of emulsion  
 In case of N base shades, no dilution is advised to ensure proper colour depth.

Drying Time



SD: 15 - 25 min depending on weather conditions  
 HD: 6 - 8 hours

Technical specification sheet of interior paint highlighting its VOC content

# Sample Documentation : 7

DIGITAL FLOW METER



Our digital flow meter necessarily has a flow sensor with a magnetic multi-bladed spinning rotor (impeller) mounted inside at right angles to the flow. The rotational speed of the impeller is proportional to the velocity of fluid. The pulse generated is transmitted and converted into a volumetric measurement. Our digital flow meters are individually calibrated to give reliable flow measurement.



**KEY ATTRIBUTES**

- Digital Flow Meter measuring flow rate from **0.05 m<sup>3</sup>/hr to 500 m<sup>3</sup>/hr**
- Optional computer interface with **RS 485** or **4-20mA** output
- **DUAL SENSOR**, dual line, single meter

**OUR METER FUNCTIONS AS**

- **BATCHER & TOTALISER**  
Relay gets energized after a fixed quantity of water passes through the sensor. The batcher has an auto reset, manual reset and dual relay operation facility. Batch quantity counts downwards till zero value
- **FLOW COMPARATOR**  
The meter is supplied with two sensors for RO permeate and inlet/reject line. The meter displays both the flow rates and also calculates percentage recovery.
- The setting is done on **PERCENTAGE RECOVERY** if plant recovery is increased by the client to get more permeate, plant will trip thereby safeguarding expensive membranes
- **RATE SWITCH MODE**  
The relay is programmed to energize whenever actual flow falls below the set value. Display shows 'LOW FLOWRATE'
- **PULSER**  
Meter can be configured to suit any metering/dosing pump. Chemical dosing can be done online proportional to flow.
- **OPTIONAL DATA LOGGER**  
The flow meter is available with data logger option where flow rate & total flow with date & time is stored in a 2GB Memory card

**INDICATOR FT- 650**

Physical dimensions	105 x 105 x 120mm
Cut-out size	92 x 92mm
Enclosure	Abs weather proof P-65
Mounting	Field / Panel
Supply power	230 V.A.C./ 110 V.A.C./ 24 V (200mA) D.C.
Max. Total Count	0-999999.9 m <sup>3</sup> / 0-99999999 litres
Accuracy	± 2% FSD
Alarms/Control Relay	One, 5A @ 230 VAC
Calibration/set point	Using front panel keypad
Input	From sensor
Output	Relay output for batch quantity 4-20 mA (optional) RS 485 (optional)

**APPLICATIONS**

Beverage

Water Treatment

Pharma & Chemical

Dairy Plant

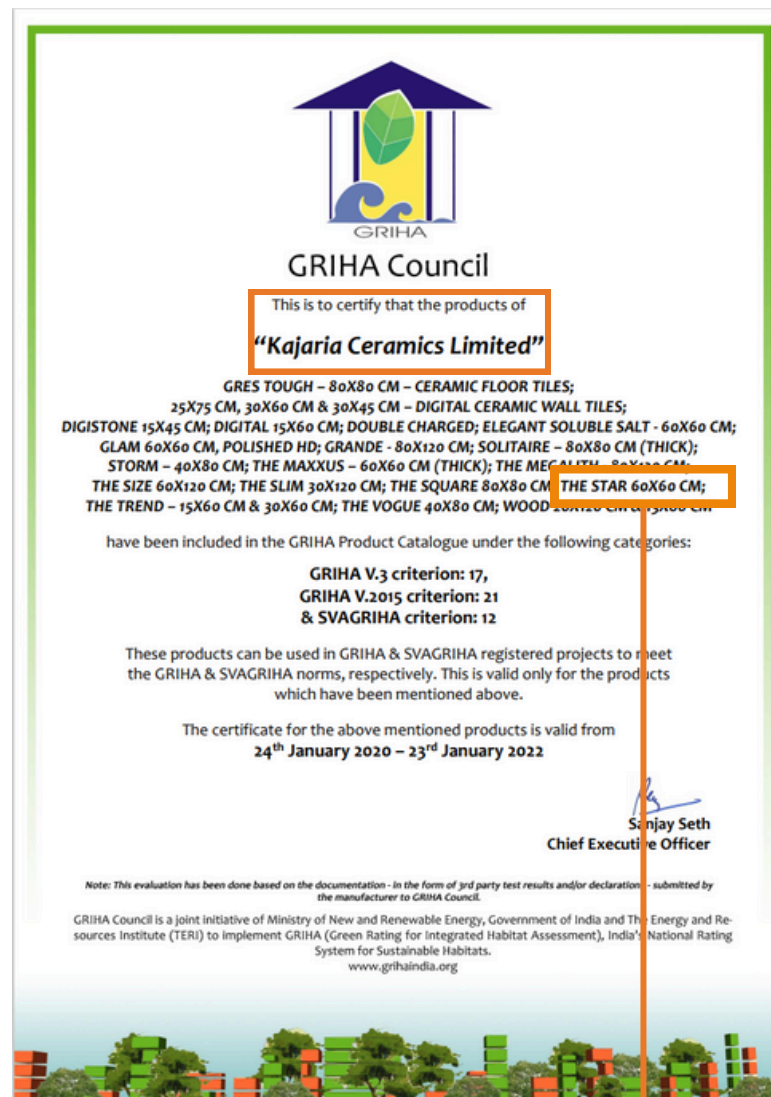
Bottling

Boiler

Cooling Tower

Technical specification sheet of digital water meter highlighting its capabilities

## Sample Documentation : 8



**GRIHA Product certificate highlighting the enlisted \*product installed/procured on site along with model name.**

\*Material / system highlighted in the GRIHA product certificate should match with the model name mentioned in the purchase order

# Sample Documentation : 9






EPD declaration sheet highlighting the EPD number of the material.



## Sample Documentation : 10



**JAQUAR & CO. PVT. LTD.**  
 SP-53, RIICO Industrial Area, Bhiwadi-301019  
 Distt. Alwar, Rajasthan (India)  
 Tel. No. 91-1493-246808, Fax: 91-1493-246815  
 Website: www.jaquar.com

**PRODUCT CERTIFICATE**

DATE: 14.01.2022

<p>PRODUCT CODE FINISHED OF PRODUCT(S)</p> <p><b>1. MATERIAL COMPOSITION</b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">CONSITTUENTS</th> <th style="text-align: left;">BRASS ROD</th> <th style="text-align: left;">ABS</th> </tr> </thead> <tbody> <tr> <td>1.1 COPPER</td> <td>% 56.0 – 59.0</td> <td>Specific Gravity (g/cm<sup>3</sup>)</td> </tr> <tr> <td>1.2 LEAD</td> <td>% 2.0 - 3.5</td> <td>1.06 - 1.10</td> </tr> <tr> <td>1.3 IRON</td> <td>% 0.0 - 0.35</td> <td>Melt Mass Flow Rate (g/10 min.)</td> </tr> <tr> <td>1.4 TOTAL IMPURITY</td> <td>% 0.0 - 0.7</td> <td>20 - 26</td> </tr> <tr> <td>1.5 ZINC</td> <td>% REMAINDER</td> <td>Rockwell Hardness</td> </tr> <tr> <td></td> <td></td> <td>95 - 115</td> </tr> <tr> <td></td> <td></td> <td>DTUL @ 66 psi (0.45 MPa) (°C)</td> </tr> <tr> <td></td> <td></td> <td>78 - 102</td> </tr> </tbody> </table> <p><b>2. FINISH</b></p> <p><b>3. WATER TIGHTNESS</b></p> <p><b>4. MECHANICAL STRENGTH</b></p> <p><b>5. PRESSURE RESISTANCE</b></p> <p><b>6. HYDRAULIC CHARACTERISTIC</b></p> <p><b>7. RECOMMENDED WORKING PRESSURE</b></p>	CONSITTUENTS	BRASS ROD	ABS	1.1 COPPER	% 56.0 – 59.0	Specific Gravity (g/cm <sup>3</sup> )	1.2 LEAD	% 2.0 - 3.5	1.06 - 1.10	1.3 IRON	% 0.0 - 0.35	Melt Mass Flow Rate (g/10 min.)	1.4 TOTAL IMPURITY	% 0.0 - 0.7	20 - 26	1.5 ZINC	% REMAINDER	Rockwell Hardness			95 - 115			DTUL @ 66 psi (0.45 MPa) (°C)			78 - 102	<p style="text-align: center;">: OHS-1619GA</p> <p style="text-align: center;">: BCH</p> <p style="text-align: center;">: CERTIFIED</p> <p style="text-align: center;">Grade-I of IS : 319-1989</p> <p>SALT SPRAY                      PASS</p> <p>ADHESION                        PASS</p> <p>1.6 M Pa                         N.A.</p> <p>0.4 M Pa                         PASS</p> <p>60 ± 2N                         PASS</p> <p>0.5 M Pa                         PASS</p> <p style="text-align: center;">FLOW RATE AT 0.3 M Pa (3Bar)    6.0 (±10%) LPM</p> <p>1.0Bar - 3.0Bar</p>	
CONSITTUENTS	BRASS ROD	ABS																											
1.1 COPPER	% 56.0 – 59.0	Specific Gravity (g/cm <sup>3</sup> )																											
1.2 LEAD	% 2.0 - 3.5	1.06 - 1.10																											
1.3 IRON	% 0.0 - 0.35	Melt Mass Flow Rate (g/10 min.)																											
1.4 TOTAL IMPURITY	% 0.0 - 0.7	20 - 26																											
1.5 ZINC	% REMAINDER	Rockwell Hardness																											
		95 - 115																											
		DTUL @ 66 psi (0.45 MPa) (°C)																											
		78 - 102																											

**Technical specification sheet of fixture indicating the flow rate, at 3 bar pressure and model name**

\*Model name and product code indicated in the technical specification sheet/test report should match with the purchase order.

# Sample Documentation : 11

The screenshot displays the Magicrete Building Solutions website. On the left is a contact information sidebar for Surat. The main area is titled 'Products (10)' and features a grid of product cards. One card, 'AAC WALL PANELS', is highlighted with an orange border. An orange line connects this card to a callout box below.

**magicrete**  
magic behind happy homes

**Magicrete Building Solutions**  
Surat

Contact Person  
Ms Khushbu Patel

Address  
101-102, Ritz Square, Near Narmad Library, Ghod Dod Road, Surat-395001 Gujarat - INDIA

Contact Number  
8070408010

Email-ID  
info@magicrete.in

**Products (10)**

Product Name	Specifications
AAC BLOCKS- 100MM.	Griha V 2015 : 19 20 8 Griha V 2/3 : 14 15 16 19 SVAGriha : 11 5 2024-03-05 2026-03-04 Fly-ash bricks/AAC Blocks
AAC BLOCKS- 150 MM.	SVAGriha : 11 5 Griha V 2015 : 19 20 8 Griha V 2/3 : 14 15 16 19 2024-03-05 2026-03-04 Fly-ash bricks/AAC Blocks
AAC BLOCKS- 200 MM.	SVAGriha : 11 5 Griha V 2015 : 19 20 8 Griha V 2/3 : 14 15 16 19 2024-03-05 2026-03-04 Fly-ash bricks/AAC Blocks
MAGICRETE STANDARD + TILE ADHESIVE	GRIHA V 2019 : 12 Griha V 2015 : 13 2024-05-14 2026-05-13 Adhesives
MAGICRETE ELITE TILE ADHESIVE	GRIHA V 2019 : 12 Griha V 2015 : 13 2024-05-14 2026-05-13 Adhesives
<b>AAC WALL PANELS</b>	<b>SVAGriha : 12</b> <b>Griha V 2015 : 21</b> 2024-06-18 2026-06-17 Panelling

**Screenshot from the GRIHA Product catalogue highlighting the enlisted \*product installed/procured on site and the product name.**



\*Material / system highlighted in the GRIHA product catalogue should match with the model name mentioned in the purchase order

## Sample Documentation : 12



Environmental certification for green cleaning product from Green seal.

## Sample Documentation : 13



### TASKI R7 Floor Cleaner Concentrate

TASKI R7 is an effective floor cleaner. It can be used for both wet mopping as well as scrubbing with a machine.

#### Features and Benefits

- ▶ Concentrated for economy of use.  
When used as recommended (for normal soiling), **TASKI R7** will cost less than **Rs. 2/- per litre** of user solution.
- ▶ Can be used for manual cleaning as well as machine cleaning.
- ▶ Pleasant Room Care fragrance.
- ▶ Colour and alpha-numeric codes to prevent application mistakes.
- ▶ Neutral Cleaner

#### Use Overview

##### Directions for use

**Recommended dilution is:**  
Normal soiling : 20 ml. in 1 litre of water.  
Heavy soiling : 50 ml. in 1 litre of water.

For wet mopping, take the solution in bucket and mop, taking care to rinse the mop frequently.  
Alternatively, scrub the floor using either a scrubber-drier (like TASKI combimat 500E) or a scrubber (like TASKI ergodisc).  
Pickup the dirty solution using a wet vacuum cleaner.

##### Technical data\*

Description		Packaging
Colour	Green	2 X 5 litre
Appearance	Clear liquid	
pH (1% solution)	7 - 8	
Density @ 25°C	0.95 - 1.07 gm/cm <sup>3</sup>	

\* The above data is typical of normal production and should not be taken as a specification

##### Safe Handling and Storage Information

TASKI R7 is neutral cleaner in RTU concentration. For sensitive skin, gloves are recommended. In case of eye contact, rinse immediately with plenty of water and seek medical advice.  
Store in a cool, dry cleaner away from direct sunlight.

Technical specification of green house keeping chemical.

## Possible errors in the technical specification sheet



A manufacturer declaration letter may be submitted in place of the technical sheet.



Occurrences where only portions of specification sheets are submitted may lead to the absence of key information

**For example 1** model number and other technical details of the material/system installed might be missing.



The technical specification sheets provided may lack the specific details necessary to meet GRIHA criteria requirements, presenting irrelevant information that does not align with the specific requirements outlined by GRIHA.

**For example 1** the paint might be low VOC , however information regarding the exact VOC content of a paint might be absent in the technical specification sheet.

**For example 2** submitting compressive strength report of an AAC block instead of a technical specification sheet / batch mix report of an AAC block to indicate its fly ash content.



The GRIHA product certificate may have expired and may not fall within the project's registration period.



# Purchase Order



# Purchase Order

In the GRIHA rating system, the submission of Purchase Orders (POs) or any other proof of purchase such as tax Invoices, delivery challans or material receipt notes of goods or services are crucial to demonstrate that a particular product / system has been used/installed in the project.



## Proof of Procurement

*They serve as formal evidence of materials and services purchased.*



## Transparency and Auditing

*They enhance transparency in procurement, facilitating audits and ensuring accountability.*



## Alignment with other documents

*Ensures accurate cross-verification of the claims made in other document submissions.*

## Points to remember while submitting purchase orders

- 01 | Must include all product names enlisted in other supporting documents, such as the narrative and technical specification sheet.
- 02 | The model names should match those highlighted in the technical specification sheet.
- 03 | Must include details such as the authorized signature, delivery address, and date for verification.



# Sample Documentation : 1

**Utkarsh Small Finance Bank**  
*Apki Ummeed Ka Khaata*

**PURCHASE ORDER**

PO Date : 28-Jun-2021  
PO No : PO-22-06-007737

**To**  
INDIAN TRANSFORMERS AND ELECTRICALS PRIVATE  
38th KM Stone NH-8 BEHRAMPUR ROAD SECTOR-34  
GURGAON GURGAON HARYANA 122004 ,  
GURGAON,  
122004.

**Correspondence Address,**  
Utkarsh Small Finance Bank,  
S-24/1-2, 1st Floor, Mahavir Nagar,  
Orderly Bazaar, Varanasi, Uttar  
Pradesh,  
VARANASI-221002  
INDIA

Vendor Contact Primary Email id : info@indiantransformers.com  
Vendor Contact Branch Email id : info@indiantransformers.com  
Vendor Contact No. :  
Vendor GSTIN No. : 06AAECI8568E1ZD  
Vendor State. : HARYANA


USFB Head Office - 1 : S-24, 1-2, 1st Floor, Mahavir Nagar, Orderly Bazar, Varanasi, Uttar Pradesh - 221002  
GSTIN NO : 09AABCU9355J1ZS

Sr. No.	Material Description	Delivery Date	Qty	UoM	Unit Rate (In INR)	Location	Amount (In INR)
1	Transformer: Transformer HSN/SAC CODE:8504 Taxes: CGST Credit Available UP (9.0000%), SGST Credit Available UP (9.0000%)	03-Jul-2021	1.000	Number		USFB Head Office - 1	
Net Amount							
					Taxes		
					CGST Credit Available UP		
					SGST Credit Available UP		
					Total Tax		
					Grand Total		

AMOUNT (in words): Rupees Twenty Five Lakh Seventy Two Thousand Four Hundred Only

**Purchase order of transformer highlighting the model name**

## Sample Documentation : 2




**TRANE**

**TAX INVOICE**

Rule 46, Sec 31 of The Central Goods and Services Tax Act, 2017

**ORIGINAL FOR RECIPIENT**

Page 1 of 2



**Trane Technologies India Private Limited**  
 (Formerly Ingersoll-Rand Climate Solutions Pvt. LTD.)  
 Kharsa No. 44/14/2, 17, 24, 47/4, 5, 6, 7,  
 Village - Taj Nagar, Palauli Road, Jamalpur, Gurgaon,  
 Haryana - 122 503  
 INDIA

**Branch Address:**  
 Trane Technologies India Private Limited  
 11th Floor, Building 5A,  
 DLF Cyber City, DLH Phase III  
 HR,  
 GURGAON,  
 INDIA

Invoice No.: HR-SO-2122100713  
 Invoice Date.: 30-SEP-21  
 Ack No.: 132111327572410  
 Ack Date: 2021-09-30 15:54:00  
 IRN:  
 24a8b3ac7c8c05d8884f185e4ab8c3cd3c8fa  
 14dc3a2af8070d5fb0121fc4daa

<b>BILL TO: 919900</b>	<b>CONSIGNEE: 919900</b>
M/S. UTKARSH SMALL FINANCE BANK LIMITED S-24/1-2 FIRST FLOOR MAHAVIR NAGAR ORDERLY BAZAR VARANASI, UP (09) 221002 INDIA	UTKARSH BANK S24/12 FIRST FLOORMAHAVIR NAGAR ORDERLY BAZAR VARANASI UTTAR PRADESH 221002 VARANASI, UP (09) 221002 INDIA
Contact Name: Jagat singh Contact No: 9718876297 GST No.: 09AABCU9355J1ZS	Contact Name: Jagat singh Contact No: 9718876297


<b>TRANE TECHNOLOGIES TAX REGISTRATION</b>
GST.: 06AACCS9663E127 PAN: AACCS9663E CIN :U24233KA1996PTC093425 IEC :396008372

S. No.	Sales Order#/ Cust PO #	Part #/ Serial No	Description/ HSN Code	Qty	Unit Price (Rs.)	Amount (Rs.)	Disc %	Other Charges	Taxable Amount	GST Tax %	Tax Amount
	/PO-22-04-0 05712	SI SL# G21G02481	Series R (TM) - China - CRTHD 84186990				0.00	0.00		IGST18	
2	28806410 /PO-22-04-0 05712	RTHDCTE1F1C SI SL# G21G02459	WATER COOLED SCREW CHILLER 84186990	1 EA			0.00	0.00		IGST18	

Note: The tax value appearing in invoice is inclusive of tax applicable on Packing & Forwarding, Freight and Insurance if applicable on the material.

**Tax invoice for chiller highlighting its model name and delivery address.**

## Sample Documentation : 3

 <b>CANI MERCHANDIZING PVT. LTD.</b>						
GN-2, First Floor, Shivaji Enclave, New Delhi-110027, India Tel. : 91-11-25107261, 25107266 E-mail:enquire@cani.co.in www.canico.in						
Godown: 57 Small Industrial Area, GT Karnal Road, Opp. Jhangirpuri, New Delhi.						
CIN No: U52190DL2001PTC110486 GSTIN No: 07AABCC6128M1ZJ PAN:AABCC6128M						
<b>TAX INVOICE</b>						
Original/Duplicate/Triplicate						
INVOICE No.: CMER/D/21-22/060 Date : 23.07.2021 Reverse Charges [Y/N]: N State Code: '07	Transporter Mode : By Road (Self Pickup by Consignee) Vehicle No./ GR No.: HR38T7915 Date of Supply : 23.07.2021 Place of Supply : Haryana					
<b>Bill To</b> M/s Anemo Projects Pvt. Ltd. Plot No -462, Pace City -II, Sector-37 Gurugram - 122012 Party GSTIN No. : 06AAQCA4513P1Z9 State : Haryana State Code : 06	<b>Ship To</b> M/s Anemo Projects Pvt. Ltd. C/o Utkarsh Small Finance Bank Ltd, Mauza Salempur Pargana Athgawan, Tehshil-Pindara, Varanasi UP- 221003 Contact Person: Sanjeev Mishra - 7303780583 Party GSTIN No. : 06AAQCA4513P1Z9 State : Haryana State Code : 06					
Purchase Order No.: R1-M-1285-APPL-GGN-CMPL-UTKARSH BANK Date 19.07.2021						
S.NO.	Description of Goods	HSN Code	Quantity	Unit	Rate	Amount
1	CANI-Open Cell Acoustic Insulation Material 16M x 1.25M x 85 Rolls 25mm thick open cell Acoustic material			Sq		
Total Amount Before Tax						1,696,600.00
Freight Charges						-
Add CGST Rate						0%

Tax invoice for insulation highlighting its model name and delivery address.

## Possible errors in purchase orders

- The submitted purchase order may be missing details or have an illegible model name.
  - The address listed in the purchase order may not correspond to the project address.
  - A work order or BOQ may be submitted instead of the relevant purchasing proof like invoice/bill/purchase order.
-



# Test Reports

---



# Test Reports

Test reports help to verify that the materials, systems, or products used in a project comply with required quality, safety, and performance standards. These reports provide reliable data to confirm adherence to industry regulations and project-specific criteria. By offering an objective assessment of technical properties, they substantiate product or material performance claims with credible evidence.

In cases where the technical sheet provided by the manufacturer lacks relevant data, a third-party test report serves as a reliable source of information.



## Credibility and Transparency

*They provide verifiable evidence that the project meets the required sustainability standards, enhancing trust among stakeholders.*



## Regulatory Compliance

*They demonstrate adherence to legal and regulatory standards, ensuring the project is compliant with environmental laws.*



## Validation of Claims

*Test reports provide empirical evidence that sustainability measures implemented in the project meet specific performance standards.*

## Points to remember while submitting test reports

- 01 | Third-party testing is mandatory when obtaining test reports, to maintain transparency and credibility.
- 02 | The labs must be NABL or ICAR accredited, as per the relevant testing requirements.
- 03 | The appropriate codes must be used during testing, and the relevant parameters must be checked for the respective appraisal requirement.

# Sample Documentation : 1

**केन्द्रीय मृदा एवं पादप परीक्षण प्रयोगशाला**  
**CENTRAL LABORATORY FOR SOIL AND PLANT ANALYSIS**  
**मृदा विज्ञान एवं कृषि रसायन विज्ञान संभाग**  
**Division of Soil Science and Agricultural Chemistry**  
**आकृञ्जुप-भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली-110 012**  
**ICAR-INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI-110 012**  
 (Phone: 011-25841494, Email: soilhealth.ssac04@gmail.com)  
**मृदा परीक्षण रिपोर्ट / SOIL TEST REPORT**  
 (Receipt No. 301370, dated 13-12-2021, Rs. 600/-)

नाम व पता / Name & Address: M/s Classic Civil Engineers, Pvt. Ltd. Babatpur Airport Road Beside, Reliance Petrol Pump, Sehmalpur, Varanasi-221105

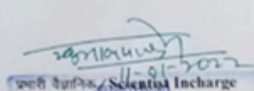
क्र.सं. S. No.	नमूना चिह्न Sample mark	प्रयोगशाला संख्या Lab. No.	अम्लिकता pH (1:2)	विद्युत चालकता EC (1:2) (dS/m)	जैविक कार्बन Organic C (%)	Available Nutrients	
						फॉस्फोरस P (kg/ha)	पोटैशियम K (kg/ha)
1.	Soil	C-780/21	8.36	0.26	0.25 L	7.78 L	159 M

*L=Low, M=Medium*

**टिप्पणियाँ** - 1. मृदा सामान्य है और जैविक कार्बन व उपलब्धता का स्तर निम्न है तथा फॉस्फोरस का स्तर भी कम है। जैविक द्रव्यों का स्तर भी कम है। इसी कारण इन सभी के साथ उर्वरकों की संतुलित मात्रा उपयोग करें। 2. फल-सब्जी, शाक-सहकारी तथा फूलों की फसलों के बारे में अधिक जानकारी के लिए फल एवं सब्जी विज्ञान प्रौद्योगिकी, सफल/सहकारी फसल सफल/सुप विज्ञान सफल, भारतीय कृषि अनुसंधान संस्थान (एआरआई), नई दिल्ली से संपर्क करें।

**Recommendations:** 1. Soil is normal with low in organic carbon and available P and medium available K content, as indicated above. Use balanced fertilizers along with good quality manures. 2. For fruit crops, vegetable and flower crops, the concerned specialists may be consulted for specific recommendations at Division of Fruits and Horticulture Technology/ Vegetables Crops / Floriculture, IARI, New Delhi.

नोट : यह रिपोर्ट केवलिक उद्देश्यों के लिए प्रमाण-पत्र के रूप में प्रयोग नहीं की जा सकती।  
**Note: This report can not be used as a certificate for legal purpose.**

  
**प्रमुख वैज्ञानिक / Scientist Incharge**  
 मृदा विज्ञान एवं कृषि रसायन विज्ञान संभाग  
 Soil Science & Agricultural Chemistry  
 आकृञ्जुप-भारतीय कृषि अनुसंधान संस्थान  
 I. A. R. I., New Delhi-110012

Topsoil test report from an ICAR accredited lab indicating soil characteristics like NPK values, Organic Carbon (C) and pH value of the soil.



# Sample Documentation : 2



**DELHI TEST HOUSE**  
A-62/3, G.T. Karnal Road, Industrial Area, Opp. Hans Cinema, Azadpur, Delhi-110 033 (INDIA)  
Phone : +91-11-47075555 (30 Lines) Fax : +91-11-47075550  
e-mail : info@delhitesthouse.com



---

**Issued to:** The Project Manager  
Classic Engineer  
Utkarsh Small Finance Bank Sehmalpur  
Varanasi U.P.-221002

**Sample Description:** DRINKING WATER

**Marks:** CONSTRUCTION OF HEAD OFFICE BUILDING FOR UTKARSH SMALL FINANCE BANK AT VARANASI (U.P.), M/S CLASSIC ENGINEERS

**Report No:** 20141200917GEN2517  
**Date:** 24-06-2020  
**Date of Receipt:** 17-09-2020  
**Party Ref No:** CE/DTHUSFB/2019-2015 & LETTER DATE-15 09 2020

**TEST REPORT**

S/No	Tests	Test Values	Test Method	Requirement
<b>1. CHEMICAL TESTING, (WATER)</b>				
1	COLOUR HAZEN UNITS	2	IS-3025(P-4)-1983	5 Max Desirable Limit, 15 Max Rejection Limit
3	TASTE	Agreeable	IS-3025(P-7)-1984	Agreeable
4	TURBIDITY, NTU	< 1	IS-3025(P-10)-1984	1 Max Desirable Limit, 5 Max Rejection Limit
5	pH	7.38	IS-3025(P-11)-1983	6.5-8.5 No Relaxation Rejection Limit
6	TOTAL HARDNESS as CaCO <sub>3</sub> , mg/l	127.3	IS-3025(P-21)-2009	200 Max Desirable Limit, 600 Max Rejection Limit
7	IRON as Fe, mg/l	Not detected (0.01)	IS-3025(P-53)-2003	1.0 Max Desirable Limit, No Relaxation Rejection Limit
8	CHLORIDE as Cl, mg/l	53.2	IS-3025(P-32)-1988	250 Max Desirable Limit, 1000 Max Rejection Limit
9	TOTAL DISSOLVED SOLIDS, mg/l	370	IS-3025(P-16)-1984	500 Max Desirable Limit, 2000 Max Rejection Limit
10	FLUORIDE as F, mg/l	0.35	IS-3025(P-60)-2008	1.0 Max Desirable Limit, 1.5 Max Rejection Limit
<b>2. BIOLOGICAL TESTING, (WATER)</b>				
1	COLIFORM ORGANISMS/100 ml. at 37°C	Absent	IS-15165-2016	Absent
2	E. COLI/100 ml.	Absent	IS-15165-2016	Absent

**Remarks:** THE SAMPLE CONFORMS TO THE IS-10500:2012 WITH RESPECT TO ABOVE TEST ONLY.

Any deviation from the Standard Test Method / Specification - Nil

MAN-SAW-170143-RR-662001112688 doublec 17-SEP-20-24-SEP-20- ULR-TC 64112000007855F



**G. D. GOEL**  
Authorised Signatory - Director

**ISO - 9001 : 2015 CERTIFIED LABORATORY** Director-Tech  
Other Lab : Plot No. 50 & 65, Phase - IV, Sector-57, HSIDC Industrial Area, Behind Parnami Hospital, Kundi, Sonapat-131028 (Haryana)

Drinking water test report highlighting the parameters as per IS 10500 : 2012

## Sample Documentation : 3



**EKO PRO**  
ENGINEERS PVT. LTD.  
SAVE THE ENVIRONMENT



TC-5063

Contact : +91 - 9810243870

**EKO PRO ENGINEERS PVT. LTD.**  
Environmental Consultants and Analytical Laboratory  
(An ISO 9001:2015 Certified Company)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.  
Contact No.: 9711159210, 9810240837, 9810240678 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

---

### TEST REPORT

#### Noise Monitoring

<b>Test Report No. :</b> EKO/E-501/220523	<b>Issued To :</b> UTKARSH SMALL FINANCE BANK S-24/1-2, First Floor, Mahavir Nagar Orderly Bazar Varansi, U.P.	<b>Issue Date :</b> 22/05/2023
---	---	--------------------------------

---

Sample Description	: Indoor Noise
Sample Drawn on	: 20/05/2023
Sample Drawn by	: EPEPL (Mr. Dharamveer Yadav)
Sample Received on	: 22/05/2023
Sampling Location	: 1st Floor (HR And Training IT Area)
Sampling Plan & Procedure	: SOP-N/01
Analysis Duration	: 22/05/2023 To 22/05/2023
Weather Condition	: Normal
Remark (if any)	: NA

---

#### RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per NBC
1	Leq	IS:9989	45.7	dB (A)	45-50

**Notes :**

1. The results given above are related to the tested sample, as received & mentioned parameters.
2. The customer asked for the above tests only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
4. The test report will not be used for any publicity/legal purpose.
5. Responsibility of the Laboratory is limited to the invoiced amount only.

**\*\*End of Report\*\***




For EKO PRO ENGINEERS PVT. LTD.  
★ PURNIMA CHAURAN  
TECHNICAL MANAGER  
(Authorised Signatory)

**\*Noise audit report highlighting the noise decibel results achieved as per NBC norms in an office space.**


\*The NABL accreditation logo must be visible on the report or letterhead, or a separate certificate from the testing lab should be provided.

## Sample Documentation : 4



### ITS LABORATORY

Laboratory: A-91, Sector-80, Phase-2, Noida, Gautam Budh Nagar - 201301, (U.P)  
M.: 09911659800, 9305780312, 09958849764, 07210888634  
Website: www.itslab.in, Email: contact@itslab.in, info@itslab.in, itrlclub@gmail.com  
An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory



Report Code: WW-020722-07 Page 01 to 02

**TEST REPORT**  
**STP Water Sample Analysis**

Report Code: WW-020722-07

Issue Date: 05/07/2022

Sample Received On

Sample Submitted By

Sample Description

Sample Quantity

Environment Conditions

Analysis Duration

: 02/07/2022

: Customer

: Received Seal & Sing STP Treated Water  
Sample after ACF Filter

: 1 ltr.

: Normal

: 02/07/2022 To 05/07/2022

**TEST RESULTS**



CHECKED BY



AUTHORIZED SIGNATORY

STP outlet water test report indicating the water quality, tested as per relevant standards

## Possible errors in test reports

- The submitted test results may not reflect the necessary technical parameters required for compliance with the respective IS code. For example, drinking water test reports may be missing microbiological parameters.
- 
- The report may lack essential details such as the date of testing and the project name.
- Test reports may not be from an accredited third-party lab and instead conducted in-house, which is not accepted.
- There may be deviations from the applicable IS code, such as using IS 456:2000 instead of IS 10500:2012 for drinking water tests.
- A partial report may have been submitted instead of the complete report.



# Simulations

---



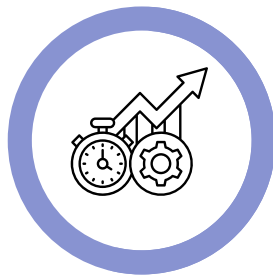
# Simulation

Simulation plays a crucial role in the green building certification process by providing detailed predictions of a building's energy performance, thermal comfort, daylighting, and other sustainability metrics. Submitting simulation documents is essential for verifying the claims made in green building projects, as they serve as objective proof that the proposed strategies will deliver the expected environmental benefits.



## Performance Prediction

*Simulations provide insights into how a building will perform in terms of energy consumption and natural lighting, allowing teams to optimize designs before construction begins.*



## Design Optimization

*Simulations allow architects and engineers to explore different design options and materials, leading to better decision-making regarding building orientation, window placement, shading strategies, etc.*



## Integrated Approach

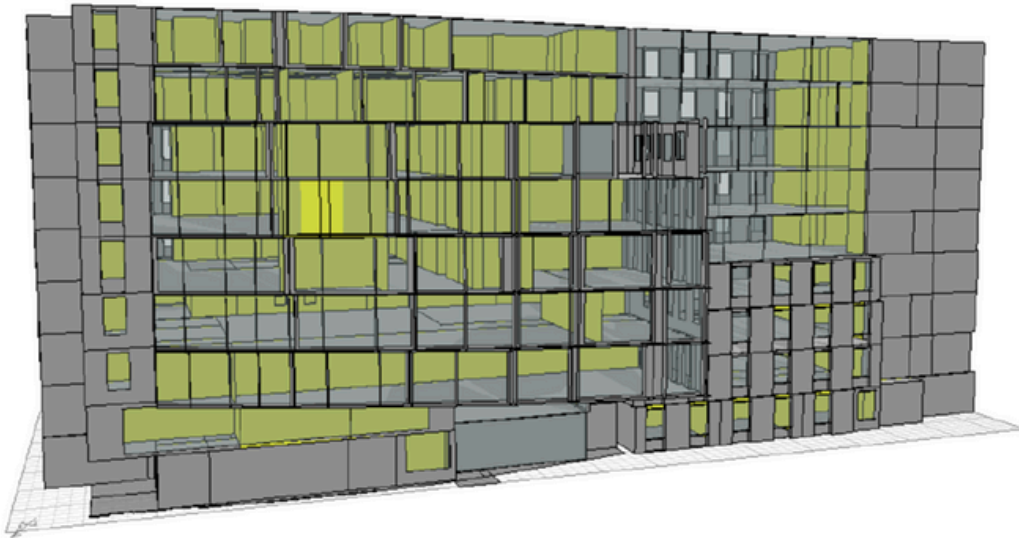
*Facilitates a holistic view of the building's performance, considering the interplay between energy use, daylight availability, and occupant comfort.*

## Points to remember while submitting simulations

- 01 | Simulations must be conducted using validated software to ensure accuracy and reliability.
- 02 | Include shading devices and obstructions such as neighbouring buildings, trees or any other building elements in the simulation model that may affect sunlight, daylighting, and energy consumption.
- 03 | Occupancy schedules, lighting usage, and HVAC operation hours should reflect real-world conditions.
- 04 | Ensure accurate definition of material properties (e.g., thermal conductivity, insulation) and proper application in the simulation.
- 05 | Zone and simulate the relevant parts of the building based on the specific appraisal requirements.

## Sample Documentation : 1

The project is located in Varanasi, Uttar Pradesh and consists of a Commercial Bank building. It comprises of Ground Floor, First Floor, Second Floor, Third Floor, Fourth Floor, Fifth Floor, Sixth Floor, Seventh Floor and Eighth Floor. Also, project is having two basement floors which is used for parking purpose.



**A snippet of the daylighting simulation report, providing general information on the 3D modeling conducted for a project.**



## Sample Documentation : 2

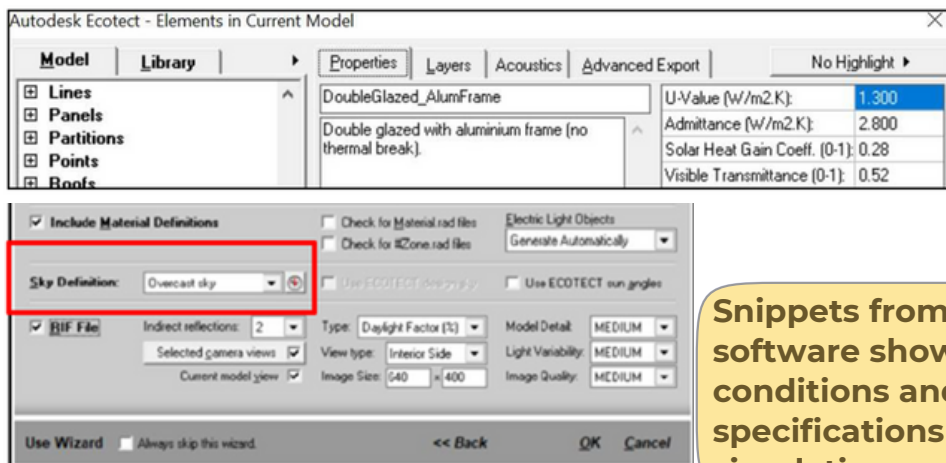
ECOTECT tool has been used in this project for creating 3-D model and analysis purpose. The Simulation is carried out with the help of radiance software and following strategies has been adopted while performing simulation.

1. Simulation is carried out by considering that- Sky is clear, Date and time: 21st September 12 noon at a working plane of 0.750 meter.
2. Orientation has been set up as according to architectural drawing.
3. Windows and doors have been placed as according to Door-Window Schedule.
4. **The Alternative 1/Path 1 has been chosen in order to meet the compliance for the project.**
5. Specification of glazing are as follows

Table 2: Specification of Glazing

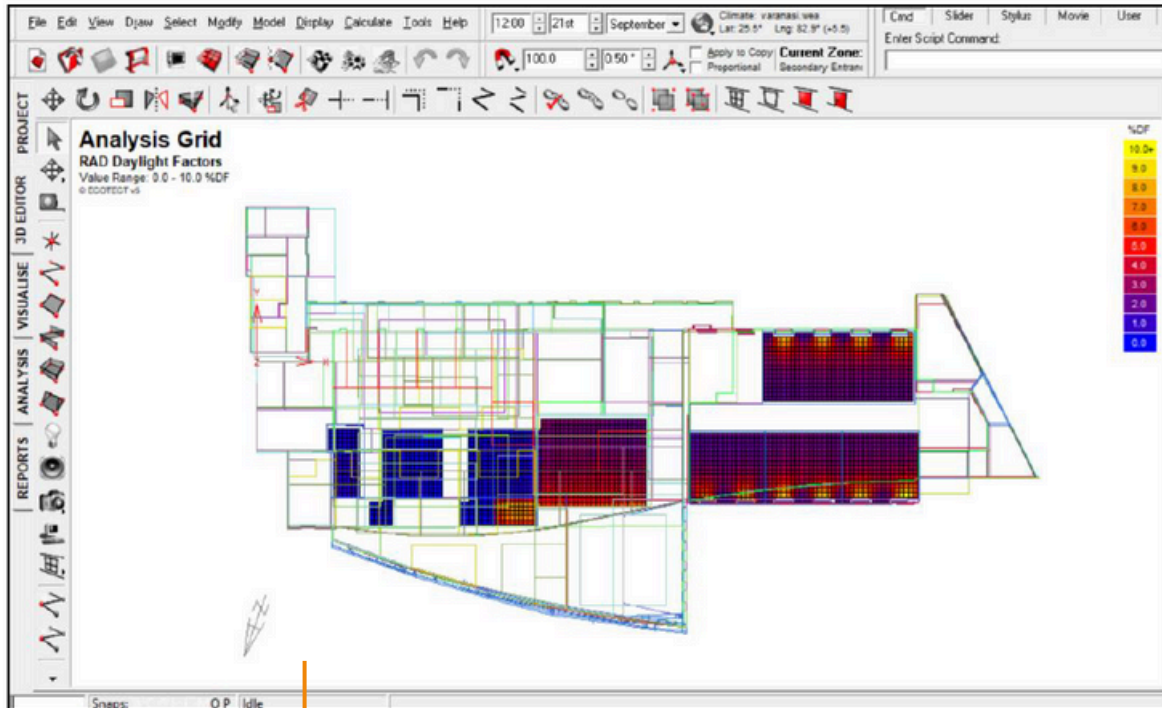
Description	Properties Type Single Glazed
VLT (%)	52
SHGC	0.28
Shading Coefficient	0.32
U- Value (W/m2 K)	1.3

A snippet from the daylighting simulation report, including general information outlining the settings used for daylighting analysis.



Snippets from the simulation software showing the sky conditions and glass specifications used in the simulation.

## Sample Documentation : 3

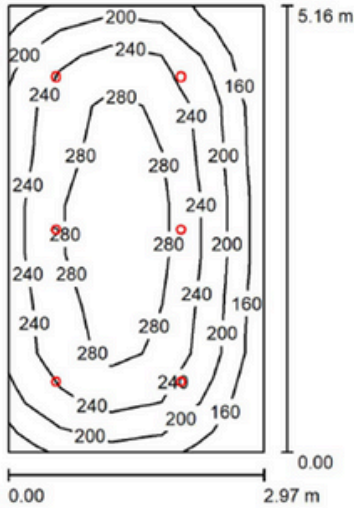


**\*Simulation result for one floor plate indicating all regularly occupied areas simulated with the daylight contour bands.**

\*Simulation results must be shared for all the regularly occupied areas in the project to demonstrate compliance.

# Sample Documentation : 4

## MAINTENANCE STAFF G -TOILET / Summary



**\*Artificial lighting simulation report for a space indicating all parameters such as, reflectance values, work plane height, grid size, Illuminance levels and uniformity ratio.**

Height of Room: 2.700 m, Mounting Height: 2.700 m, Light loss factor: 0.80

Values in Lux, Scale 1:67

Surface	$\rho$ [%]	$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$u0$
Workplane	/	240	129	314	0.539
Floor	10	238	80	316	0.336
Ceiling	50	15	11	18	0.734
Walls (4)	30	47	8.57	179	/

**Workplane:**

Height: 0.80 m  
 Grid: 5 x 9 Points  
 Boundary Zone: 0.000 m

**UGR** Lengthways- Across to luminaire axis  
 Left Wall 16 16  
 Lower Wall 16 16  
 (CIE, SHR = 0.25.)

Illuminance Quotient (according to LG7): Walls / Working Plane: 0.195, Ceiling / Working Plane: 0.063.

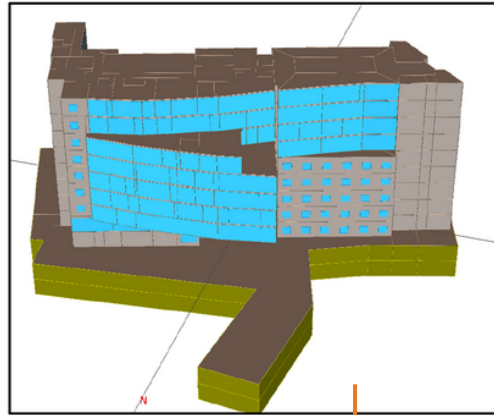
**Luminaire Parts List**

No.	Pieces	Designation (Correction Factor)	$\Phi$ (Luminaire) [lm]	$\Phi$ (Lamps) [lm]	P [W]
1	6	Philips DN590B M LED10S-4000 PSU WH MB (1.000)	1009	1010	8.2
Total:			6052	6060	49.4

Specific connected load: 3.22 W/m<sup>2</sup> = 1.34 W/m<sup>2</sup>/100 lx (Ground area: 15.34 m<sup>2</sup>)

\*Artificial lighting simulation results must be shared for all the spaces in the project to demonstrate compliance.

## Sample Documentation : 5



**3D building model reference**

Description	Proposed	Unit
Wall U-value	0.11	Btu/h-ft <sup>2</sup> -F
Roof U-value	0.07	Btu/h-ft <sup>2</sup> -F
Glazing U-value	0.23	Btu/h-ft <sup>2</sup> -F
Glazing SHGC	0.28	
Glazing VLT	52%	
HVAC System Type	Chilled water system & VRV units	
No of Chillers	2 Water Cooled Screw	
Capacity	400 TR & 200 TR	
No of Cooling Tower	2	
Capacity	350 TR each	
No of cells per tower	2	
Chiller COP	6.2 for 400TR and 6 for 200TR	
VRV COP	4.1	
Lighting Power Density	<ul style="list-style-type: none"> <li>• Basement: 0.11</li> <li>• 1<sup>st</sup> floor (24 Hr. operating call center): 0.32</li> <li>• GF &amp; 2<sup>nd</sup> to 8<sup>th</sup> floor: 0.37</li> </ul>	W/ ft <sup>2</sup>
Zone Cooling set point	75	deg F

**General information on input parameters used for energy analysis.**

## Sample Documentation : 6

```

Uttkarsh Bank
DOE-2.2-50a 7/27/2022 10:32:09 BDL RUN 1
REPORT- BEPU Building Utility Performance WEATHER FILE- EPW Allahabad,Uttar

```

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	144554.	0.	577791.	2148.	470623.	7391.	250003.	134984.	0.	0.	0.	7081.	1594574.
Base ELECTRICITY KWH	32304.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	32304.
FM1 NATURAL-GAS THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL ELECTRICITY		1626878. KWH		11.236 KWH		/SQFT-YR GROSS-AREA		11.236 KWH		/SQFT-YR NET-AREA			
PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.37 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00 HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 68 HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 62 NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.													

Excerpt from output file indicating the various energy consumptions in the project

Excerpt from the Energy output file (BEPU) indicating the percentage hours plant load not satisfied for thermal comfort analysis.

# Sample Documentation : 7

```

INPUT ..

$ -----
$          Abort, Diagnostics
$ -----

$ -----
$          Global Parameters
$ -----

PARAMETER
"LPD"          = 0.2553 ..
PARAMETER
"LPD 1F"       = 0.2104 ..
PARAMETER
"LPD Basement" = 0.1143 ..
PARAMETER
"EPD"         = 1.5 ..

$ -----
$          Title, Run Periods, Design Days, Holidays
$ -----

TITLE
LINE-1        = *Uttkarsh Bank*
..

"Entire Year" = RUN-PERIOD-PD
BEGIN-MONTH   = 1
BEGIN-DAY     = 1
BEGIN-YEAR    = 2022
END-MONTH     = 12
END-DAY       = 31
END-YEAR      = 2022
..
    
```

Excerpt of the Input file that is required to be submitted.

Excerpt of the Output file that is required to be submitted.

Jttkarsh Bank DOE-2.2-50a 2/14/2023 15:12:11 BDL RUN 1

REPORT- LV-M DOE-2.2 Units Conversion Table WEATHER FILE- EPW Allahabad,Uttar

	ENGLISH	MULTIPLIED BY	GIVES	METRIC	MULTIPLIED BY	GIVES	ENGLISH
1			1.000000			1.000000	
2			1.000000			1.000000	
3	BTU		0.293000	WH		3.412969	BTU
4	BTU/HR		0.293000	WATT		3.412969	BTU/HR
5	BTU/LB-F	4183.830078		J/KG-K	0.000239		BTU/LB-F
6	BTU/HR-SQFT-F	5.678260		W/M2-K	0.176110		BTU/HR-SQFT-F
7	DEGREES		1.000000	DEGREES		1.000000	DEGREES
9	SQFT		0.092903	M2	10.763915		SQFT
10	CUFT		0.028317	M3	35.314724		CUFT
11	LB/HR		0.453592	KG/HR	2.204624		LB/HR
12	LB/CUFT		16.018459	KG/M3	0.062428		LB/CUFT
13	MPH		0.447040	M/S	2.236936		MPH
14	BTU/HR-F		0.527178	W/K	1.896893		BTU/HR-F
15	FT		0.304800	M	3.280840		FT
16	BTU/HR-FT-F		1.730735	W/M-K	0.577789		BTU/HR-FT-F
17	BTU/HR- SQFT		3.152480	WATT /M2	0.317211		BTU/HR- SQFT
18	IN		2.540000	CM	0.393701		IN
19	UNITS/IN		0.393700	UNITS/CM	2.540005		UNITS/IN
20	UNITS		1.000000	UNITS	1.000000		UNITS
21	LB		0.453592	KG	2.204624		LB
22	FRAC. OR MULT.		1.000000	FRAC. OR MULT.	1.000000		FRAC. OR MULT.
23	HOURS		1.000000	HRS	1.000000		HOURS
24	PERCENT-RH		1.000000	PERCENT-RH	1.000000		PERCENT-RH
25	CFM		1.699010	M3/H	0.588578		CFM
26	IN-WATER		25.400000	MM-WATER	0.039370		IN-WATER
27	LB/SQFT		4.882400	KG/M2	0.204817		LB/SQFT
28	KW		1.000000	KW	1.000000		KW
29	W/SQFT		10.763920	W/M2	0.092903		W/SQFT
30	THERMS		25.000000	THERMIES	0.040000		THERMS
31	KNOTS		0.514440	M/SEC	1.943861		KNOTS

# Sample Documentation : 8



Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at <https://sam.nrel.gov>) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

Disclaimer: The PVWatts® Model ("Model") is provided by the National Renewable Energy Laboratory ("NREL"), which is operated by the Alliance for Sustainable Energy, LLC ("Alliance") for the U.S. Department of Energy ("DOE") and may be used for any purpose whatsoever.

The names DOE/NREL/ALLIANCE shall not be used in any representation, advertising, publicity or other manner whatsoever to endorse or promote any entity that adopts or uses the Model. DOE/NREL/ALLIANCE shall not provide any support, consulting, training or assistance of any kind with regard to the use of the Model or any updates, revisions or new versions of the Model.

YOU AGREE TO INDEMNIFY DOE/NREL/ALLIANCE AND ITS AFFILIATES, OFFICERS, AGENTS AND EMPLOYEES AGAINST ANY CLAIM OR DEMAND, INCLUDING REASONABLE ATTORNEY'S FEES, RELATED TO YOUR USE, RELIANCE, OR ADOPTION OF THE MODEL FOR ANY PURPOSE WHATSOEVER. THE MODEL IS PROVIDED BY DOE/NREL/ALLIANCE "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. IN NO EVENT SHALL DOE/NREL/ALLIANCE BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO CLAIMS ASSOCIATED WITH THE LOSS OF DATA OR PROFITS, WHICH MAY RESULT FROM ANY ACTION IN CONTRACT, NEGLIGENCE OR OTHER TORTIOUS CLAIM THAT ARISES OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE MODEL.

## RESULTS

**206,941 kWh/Year\***

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )	Value ( \$ )
January	4.95	16,460	N/A
February	5.97	17,250	N/A
March	6.92	21,426	N/A
April	6.89	19,899	N/A
May	6.77	20,050	N/A
June	5.59	16,283	N/A
July	4.84	15,343	N/A
August	4.64	14,860	N/A
September	5.63	17,131	N/A
October	5.41	16,957	N/A
November	5.04	15,793	N/A
December	4.67	15,488	N/A
<b>Annual</b>	<b>5.61</b>	<b>206,940</b>	<b>0</b>

### Location and Station Identification

Requested Location	varanasi
Weather Data Source	Lat, Lon: 25.33, 83.02 0.9 mi
Latitude	25.33° N
Longitude	83.02° E

### PV System Specifications (Commercial)

DC System Size	140 kW
Module Type	Standard
Array Type	Fixed (open rack)

Snippet of PV watts simulation report indicating Solar energy generation potential for a particular location

## Possible errors in simulation

- The project team may not submit the complete input and output files required to verify the simulation results.
- Input parameters in the simulation report may not align with the details in the input file.
- The simulated building parameters may not accurately reflect the actual building typology. For instance, a building may be simulated as a daytime-only facility, whereas it operates 24/7, which could significantly impact the simulation results.
- The technical specifications or capacities of products or equipment used in the simulation may not match those installed in the project.
- The simulation may not be conducted using validated or industry-accepted software, which is crucial for reliable results.
- The simulation may use incorrect values for occupancy, lighting, or equipment loads, affecting energy consumption estimates.
- HVAC systems or renewable energy setups may not be correctly modeled, leading to unreliable energy performance results.
- Incorrect zoning or misrepresentation of space usage can lead to unrealistic energy or daylighting performance predictions.



# Documentation checklist for GRIHA version 2015

S.NO.	CRITERIA	NARRATIVE	DRAWINGS	CALCULATIONS	TECHNICAL SPECIFICATION SHEET	PURCHASE ORDER	TEST REPORT	PHOTOGRAPHS
1	Site Selection	✓	✓					✓
2	Low Impact design	✓	✓	✓				✓
3	Design to Mitigate UHIE	✓	✓	✓	✓	✓	✓	✓
4	Site Imperviousness Factor	✓	✓	✓				✓
5	Air and water pollution control	✓	✓		✓	✓		✓
6	Preserve and protect landscape during construction	✓	✓	✓	✓	✓	✓	✓
7	Construction Management Practices	✓	✓	✓	✓	✓		✓
8	Energy efficiency	✓		✓	✓	✓		✓
9	Renewable energy utilization	✓	✓	✓	✓	✓		✓
10	Low ODP and GWP Materials	✓			✓	✓		✓
11	Achieving indoor comfort requirements (visual/thermal/acoustic)	✓	✓	✓	✓	✓		
12	Maintaining good IAQ	✓	✓	✓	✓	✓		
13	Use of low-VOC paints and other compounds in building interiors	✓			✓	✓	✓	✓
14	Use of low-flow fixtures and systems	✓		✓	✓	✓	✓	✓
15	Reducing landscape water demand	✓	✓	✓	✓	✓		✓
16	Water Quality	✓		✓	✓	✓	✓	✓
17	On-site water reuse	✓	✓	✓				✓
18	Rainwater Recharge	✓	✓	✓				✓
19	Utilization of BIS recommended waste materials in building structure	✓			✓	✓	✓	✓
20	Reduction in embodied energy of building structure	✓	✓	✓		✓		

# Documentation checklist for GRIHA version 2015

S.NO.	CRITERIA	NARRATIVE	DRAWINGS	CALCULATIONS	TECHNICAL SPECIFICATION SHEET	PURCHASE ORDER	TEST REPORT	PHOTOGRAPHS
21	Use of low-environmental impact materials in building interiors	✓	✓	✓	✓	✓		✓
22	Avoided post-construction landfill	✓	✓	✓				✓
23	Treat organic waste on site	✓	✓	✓	✓	✓		✓
24	Labour safety and sanitation	✓						✓
25	Design for Universal Accessibility	✓	✓					✓
26	Dedicated facilities for service staff	✓	✓	✓				✓
27	Increase in environmental awareness	✓						✓
28	Smart metering and monitoring	✓	✓		✓	✓		✓
29	Operation, Maintenance Protocols	✓			✓			✓
30	Performance Assessment for Final Rating	✓						✓
31	Innovation	✓	✓	✓	✓	✓		✓