

PROFESSIONAL TRAINING REPORT

Submitted in partial fulfillment of the requirements for the award of
Master of Architecture degree in Sustainable Architecture

By

R.POORNI / 41890011



SCHOOL OF BUILDING AND ENVIRONMENT
DEPARTMENT OF ARCHITECTURE

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited with Grade

A by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI

600 119



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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

PROFESSIONAL TRAINING (S89APT)

JUL 2022 - AUG 2022

Name of the Student : R.Poorni

Semester : III

Reg No. : 41890011

Batch : 2021-2023



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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

BONAFIDE CERTIFICATE

This is to certify that the Professional Training Report (S89APT) is the work of **R.POORNI / 41890011** who had undergone training in **GREEN SKETCH CONSULTANTS** and has been monitored by the continuous assessment during July 2022 to Aug 2022.

Dr. Devyani Gangopadhyay

HOD AND DEAN

Submitted for Viva voce Examination held on 20/12/2022

Internal Examiner

External Examiner



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DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

DECLARATION

I **R.Poorni** hereby declare that this Professional Training Report **07 July 2022 to 18 August 2022** done by me under the guidance of **Ar.Krithikha Muthukrishnan** / **GREEN SKETCH CONSULTANTS** is submitted in partial fulfillment of the requirements for the completion of practical training session.

DATE : 20/12/2022

PLACE : CHENNAI



SIGNATURE OF CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA INSTITUTE OF SCIENCE & TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. Devyani Gangopadhyay Dean, School of building and Environment** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to **Ar.Krithikha Muthukrishnan / GREEN SKETCH CONSULTANTS** for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my Training.

I would also like to express my sincere thanks to Ar. Catherine Selvaraj (Internal Coordinator) for her valuable guidance, during the entire Professional Training period.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of Architecture who were helpful in many ways for the completion of the project.

(Also thank Architect of the firm), **Ar.Krithikha Muthukrishnan, Green Sketch Consultants, Thoraipakkam, Chennai 600009**

GSC/Intern/2022-23/002

07 Jul 2022

To,

The Dean
School of Building & Environment
Sathyabama Institute of Science and Technology,
Chennai - 600 119,
Tamil Nadu

Subject: Confirmation for joining our firm for practical training as Internship

Ref: Your reference dated 30.05.2022

Respected Madam,

This is to confirm that **Ms. Poorni R**, Registration No: **41890011** pursuing 3rd semester M.Arch - Sustainable Architecture, Department of Architecture, Sathyabama Institute of Science and Technology, has joined in our firm for her practical training on 07 Jul 2022 for a period of 30 working days.

Thanks & Regards,

For GREEN SKETCH CONSULTANTS

Krithika Muthukrishnan
Authorised Signatory



Krithika Muthukrishnan
Partner & Principal Consultant,
Mobile: 9940174586/e-Mail: krithika@greensketch.in
for Green Sketch Consultants
Address:
Plot No. 123, 3rd Main Road
Chandrasekaran Avenue, Thorapakkam
Chennai - 600009

Plot #: 123, 3rd Main Road, Chandrasekaran Avenue, Thorapakkam, Chennai - 600 097.
+91 44 4850 5858 / +91 9940174586 / +91 9677173959; enquiry@greensketch.in

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Krithika Muthukrishnan
Partner & Principal Consultant,
Mobile: 9940174586/e-Mail: krithika@greensketch.in
for Green Sketch Consultants
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SCHOOL OF BUILDING & ENVIRONMENT, DEPARTMENT OF ARCHITECTURE M. Arch (Sustainable Architecture) Batch 2021-2023 Continuous Assessment Report for Professional training

(Continuous progress report of the trainee architect/Project Manager for the period of 15 working days in the office to be submitted to HOD)

1. Name of the office / organization :	Green Sketch Consultants
2. Address & Contact Number :	Thoraipakkam, Chennai 044 48505858
3. Name of the student :	Poorni, R
4. Duration :	From 07-07-2022 To 18-08-2022
5. Total No. of days :	32
6. Evaluation of Performance criteria shall be on	

* Note: Kindly grade the student as per his/her overall performance in the office during the assessment month.

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of office culture	✓				
Skills related to project management	✓				
Design Management					✓
Understanding the Triple Constraints	✓				
Observation during Site Visits	✓				
Understanding of construction details	✓				
Understanding of Construction sequences	✓				
Site Supervision / Discussion with clients					✓
Adherence to Time schedule	✓				
Quantitative aptitude	✓				
Documentation skills	✓				
Coordination with other consultants	✓				

Overall Grading*	A
------------------	---

(A - 8.0, B - 7.0, C - 6.0, D - 5.5, E - 5.0, F - <5)

7. Any other Remarks : Good consistent work

8. Signature of the Head of the Office / Organization (With Seal) :
For GREEN SKETCH CONSULTANTS
Authorized Signatory



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Overall Grading*	A
------------------	---

(A - 8.0, B - 7.0, C - 6.0, D - 5.5, E - 5.0, F - <5)

7. Any other Remarks : Good Job! Keep it up!

8. Signature of the Head of the Office / Organization (With Seal) :
For GREEN SKETCH CONSULTANTS
Authorized Signatory



GREEN SKETCH CONSULTANTS - R.POORNI (Intern)			
Internship Duration - 7.July.2022'to 18.August .2022			
IGBC PROJECT			
1. ITPC-Pinnacle - Final Documentation	Site & Facility Management	SF Credit 1 - Eco-friendly Commuting Practices : 25%, 50% SF Credit 3.1 - Heat Island Reduction, Non-roof: 50%, 75%	
	Water Efficiency	WE Mandatory Requirement- Water Efficient Fixtures WE Credit 1 - Water Efficient Fixtures: 20%, 30%, 40% WE Credit 2 - Rain Water Harvesting: 25%, 50%	
		Energy Efficiency	Power Consumption Data
	Health & Comfort	HC Mandatory Requirement 1- Tobacco Smoke Control HC Credit 1- Carbon dioxide Monitoring & Control HC Credit 3 - Eco-friendly Housekeeping Chemicals HC Credit 4 - Thermal Comfort, Indoor Temperature & RH HC Credit 5- Facilities for Differently Aabled People HC Credit 6 - Occupant Well-being Facilities	
		Innovation Category	INN CR1.1 - Automatic waste Generator
2. One Day Site Visit - ITPC - Pinnacle Crest Zenith			
- GRIHA PROJECT			
3. ICMR - Final Documentation	Site Planning	CR.1 - Site Selection	
	Socio-Economic Strategies	CR.24 - Labour safety and sanitation CR.26 - Dedicated facilities for service staff	
		Energy model - CAD DWG	
LEED PROJECT			
4. PALMYRA	Water Efficiency Site	WE Prerequisite 1-Water Use Reduction z4. PALMYRA - Final Documentation	
REVIT MODEL - DAYLIGHT - Final Documentation			
5. MES Villa	Construction of Family Welfare Center		
	Construction of Complaint Cell		
	Construction of OR's Institute		
	Construction of Power House		
6. AARAA	Only Pump House		
	HAL -T7 & T17		
	HAL -T11 & T12		
	HAL -T13 HAL -T18		

For GREEN SKETCH CONSULTANTS



CHIEF ARCHITECT SIGNATURE :
OFFICE SEAL:

For GREEN SKETCH CONSULTANTS
M. K. Rithide
Authorised Signatory

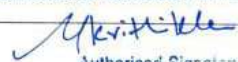


GREEN SKETCH CONSULTANTS

Plot No.123, 3rd Main Road, Chandrasekaran Avenue' Thoraipakkam, Chennai - 600097

Student Name	R.POORNI
College Name	SATHYABAMA UNIVERSITY - Sustainable Architecture
Date	Topics Learnt/Discussed
07-07-2022	IGBC & LEED Codebook study KNit asia site photos
08-07-2022	MES Villa - Allied facilities Revit file Rain Water Cal -ITPC
09-07-2022	Palmyra -water fixtures & fitting
10-07-2022	Sunday - leave
11-07-2022	Palmyra -water fixtures & fitting(LEED) ITPC - Pinnacle - water fixtures & fitting(IGBC)
12-07-2022	Revit model-Allied utility blockes (Lighting analysis) ITPC - Pinnacle - water fixtures & fitting(IGBC)
13-07-2022	Revit model-Allied utility blockes (Lighting analysis) ITPC - Pinnacle - water fixtures & fitting(IGBC)
14-07-2022	ITPC Pinnacle - Health & Comfort 1,3, HC - CR
15-07-2022	ITPC Pinnacle - Health & Comfort 5,6,7,8 HC - CR
16-07-2022	Saturday - Leave
17-07-2022	Sunday - leave
18-07-2022	ITPC Pinnacle - Health & Comfort New file-Thermal comfort
19-07-2022	ITPC Pinnacle - SITE - Eco-friendly Commuting Practices
20-07-2022	ITPC Pinnacle - SITE - Heat Island Reduction, Roof CAD & Narrative
21-07-2022	ITPC Pinnacle - Innovation
22-07-2022	ITPC Pinnacle - Power Consumption data
23-07-2022	ITPC Crest & Zenith - Power Consumption data
24-07-2022	Sunday - leave
25-07-2022	AARAA (Daylighting) - Revit model -T11 &T12
26-07-2022	leave

For GREEN SKETCH CONSULTANTS


 Authorised Signatory


CHIEF ARCHITECT SIGNATURE :

OFFICE SEAL:

27-07-2022	AARAA (Daylighting) - Revit model -T13
28-07-2022	AARAA (Daylighting) - Revit model - T18
29-07-2022	AARAA (Daylighting) - Revit model -T7&T17
30-07-2022	Daylighting & Energy Software Class(Green Building Certificate) - Revit (insight,Solar) Flow Ret screen NREL DIALux E Quest
31-07-2022	Sunday - leave
01-08-2022	ICMR - Site Selection
02-08-2022	ITPB - Preliminary Review
03-08-2022	ITPC site visit - Crest & Zenith (full day)
04-08-2022	ITPC (Crest & Zenith) -Site photos IGBC-EB-checklist (Site,Innovation and Health care)
05-08-2022	IGBC-EB-checklist (Health care & Water EF)
06-08-2022	Saturday - Leave
07-08-2022	Sunday - leave
08-08-2022	GRIHA v2015 -ICMR-checklist (File Arrangement)
09-08-2022	GRIHA v2015 -ICMR- Site Planning -CR.1 - Site Selection
10-08-2022	GRIHA v2015 -ICMR- Socio-Economic Strategies - CR.24 - Labour safety and sanitation & CR.26 - Dedicated facilities for service staff
11-08-2022	leave
12-08-2022	GRIHA v2015 -ICMR- CAD DWG (P-line for Energy model)
13-08-2022	Saturday - Leave
14-08-2022	Sunday - leave
15-08-2022	Monday - Independence Day
16-08-2022	GRIHA v2015 -ICMR- CAD DWG (P-line for Energy model) - LPD Calculation for Ground floor
17-08-2022	LEED v4 - PALMYRA - Rainwater Calculation
18-08-2022	LEED v4 - PALMYRA - Rainwater Calculation

CHIEF ARCHITECT SIGNATURE :
OFFICE SEAL:

For GREEN SKETCH CONSULTANT'S

[Signature]
Authorised Signatory



Date: 18 Aug 2022

CONSOLIDATED CERTIFICATE (EXPERIENCE)

To,

The Head of the Department,
Department of Architecture
Sathyabama Institute of Science and Technology,
Chennai - 600 119,
Tamil Nadu

Subject: Trainee confirmation for Jul 2022 to Aug 2022

Respected Madam,

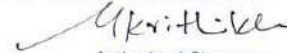
This is to certify that **Poorni R** bearing Registration No.: 41890011 pursuing 3rd semester M.Arch - Sustainable Architecture, Department of Architecture, Sathyabama Institute of Science and Technology, has successfully completed one month professional training in our firm. She was associated with our firm as an intern for the period of 31 working days between 07 Jul 2022 to 18 Aug 2022.

She excelled in her professional as a trainee in our firm during the above said period.

Best of luck from Green Sketch Consultants

Thanks & Regards

For GREEN SKETCH CONSULTANTS


Authorised Signatory



Krithikha Muthukrishnan

Partner & Principal Consultant,

Mobile: 9940174586/e-Mail: krithikha@greensketch.in

for Green Sketch Consultants

Address:

Plot No. 123, 3rd Main Road

Chandrasekaran Avenue, Thoraipakkam

Chennai - 600009

Plot #: 123, 3rd Main Road, Chandrasekaran Avenue, Thoraipakkam, Chennai - 600 097.
+91 44 4850 5858 / +91 9940174586 / +91 9677173959; enquiry@greensketch.in

ABOUT THE FIRM

- Green Sketch is a green building design and consultancy firm that aims to provide cutting edge sustainability solutions and services in the industry of sustainable development. Our services include green building design, green building certification, energy modeling including daylight and shadow analysis, existing buildings greening and green building performance analysis.
 - We are dedicated to simplifying green building services, ease the documentation process and give you substantial savings in energy and other building operating costs.
- ❑ Vision - To create a green building design process that is simple, approachable and effective.
 - ❑ Founded - 2014
 - ❑ Specialties - Green Building Design, Existing Buildings- Greening, Green Building Certification, Energy modeling and simulation, Architecture, Sustainability, LEED, IGBC, GRIHA, and EDGE

Energy Modeling

Green Sketch helps you determine projected energy savings with Comprehensive Energy Modeling Services.

Daylight Simulation

Does your design allow adequate daylight inside. Do you meet with Daylighting requirements of LEED, IGBC or GRIHA.

Certifications

- **LEED Certification**
- **IGBC Certification**
- **GRIHA Certification**
- **EDGE Certification**
- **ECO Housing Certification**
- **WELL Standard Certification**
- **BEE Certification**
- **GREEN PRO Certification**

Services

Sustainable Building and Environment Design Service
Auditing service

Greening Existing Building Service
Building simulation and analysis service
Performance analysis service
Complete building energy simulation service

Energy analysis service
Daylighting analysis service
Artificial lighting design service
Water use calculation service
Shading analysis service
Fenestration analysis design service

<https://in.linkedin.com/company/green-sketch-consultants>

<http://www.greensketch.in/index.php#blog>

<https://www.indiamart.com/green-sketch-consultants/services.html>



SUSTAINABLE SCOPE OF WORK

- **IGBC Rating system**
- **GRIHA Rating system**
- **LEED Rating system**

REVIT MODEL - DAYLIGHT ANALYSIS

PROJECT -MES Villa - Construction of Family welfare Centre
Construction of Complaint Cell
Construction of OR's Institute
Construction of Power House
Only Pump House

PROJECT - AARAA - HAL -T7 &T17
HAL - T11 & T12
HAL - T13
HAL - T18

LABORATORY COMPLEX CENTRE OF EXCELLENCE FOR GEOLOGICAL SURVEY OF INDIA

Daylight Analysis Report - 01



This Report Contains:

1. A Brief Summary of the Requirements under GRIHA 2015 with Regards to Daylight Autonomy.
2. About Insight Lighting Analysis Software.
3. Daylight Analysis 3D Model Images.
4. Daylight Zone Distribution.
5. Glazing Specifications and thermal Properties.
6. Results of Daylight Analysis to Achieve Required Daylight Autonomy.
7. Summary of Daylight Autonomy Results.
8. Conclusion of Daylight Autonomy Result.

Appendix A: Site Exterior & Interior Photographs.

Appendix B: Antelio Plus ST 767 - Glass Specification Test Certificate.

Appendix C: Screen Shots of Input Values Given in Daylight Model.

Client: Central Public Works Department

Project: Laboratory Complex Centre of Excellence

Location: Bengaluru – Karnataka

Building Type: Commercial

Rating System: GRIHA - 2015



1. A Brief Summary of the Requirements under GRIHA 2015 with Regards to Daylight Autonomy:

Criterion 11: Achieving Indoor Comfort Requirement (Visual / Thermal / Acoustic)

The intent of this criterion is to ensure that the building spaces are designed to deliver visual, thermal and acoustical comfort to building occupants. (Maximum Points: 6)

Appraisals: 11.1.1: Demonstrate compliance with either of the alternatives mentioned – Partly Mandatory

Alternative: 2

- Demonstrate that the mean DA requirements (**300 lux or more**) are met over the total living area for at least **25%** of total annual analysis hours (area-weighted) – **Mandatory.**
- Demonstrate that the mean DA requirements (**3000 lux or more**) are never exceeded over the total living area for across the total annual analysis hours – **Mandatory.**
- Demonstrate that the mean DA requirements (**300 lux or more**) are met over the total living area for at least **50%/75%** of total annual analysis hours (area-weighted) – **2/4 points.**

annual analysis hours – 8:00 to 18:00 each day

Percentage of Daylight Autonomy space should meet	Points
25%	Mandatory
50%	2
75%	4

2. About Insight Lighting Analysis Software:

Insight Lighting Analysis with Revit provides in context daylighting and lighting analysis results and automated scheduling to help you document light levels throughout your design. The plugin provides automated settings for specific study types, as well as customizable options. The following analysis types are currently available:

Insight Lighting Analysis with Revit leverages the A360 Rendering service, a cloud based rendering service, to provide quick and accurate lighting analysis results. The diagram below represents how Insight Lighting Analysis with Revit works.



Analysis	Description
Illuminance Analysis	Full custom control over date, time, threshold, and analysis plane height
Daylight Factor (Beta)	Full custom control over threshold, and analysis plane height
LEED 2009 IEQc8 – Option 1	Automated settings for LEED 2009 IEQc8 opt1 settings
LEED v4 EQc7 – Option 1	Automated settings for LEED v4 EQc7 opt1 (sDA & ASE)
LEED v4 EQc7 – Option 2	Automated settings for LEED v4 EQc7 opt2 settings
Solar Access	Customizable hours of sun study

3. Daylight Analysis 3D Model Images:



FIG 01: NORTH – EAST PRESPECTIVE VIEW



FIG 02: SOUTH – EAST PRESPECTIVE VIEW



FIG 03: SOUTH – WEST PRESPECTIVE VIEW



FIG 04: NORTH – FRONT VIEW

3. Daylight Analysis 3D Model Images:



FIG 05: NORTH ELEVATION



FIG 08: WEST ELEVATION



FIG 06: EAST ELEVATION



FIG 07: SOUTH ELEVATION

4. Daylight Zone Distribution:



L1 GROUND FLOOR ■ REGULARLY OCCUPIED

GROUND FLOOR DAYLIGHTED ZONE



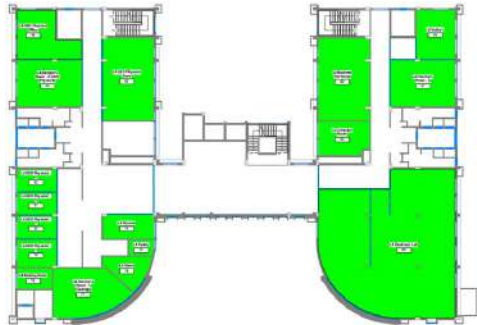
L2 FIRST FLOOR ■ REGULARLY OCCUPIED

FIRST FLOOR DAYLIGHTED ZONE



L3 SECOND FLOOR ■ REGULARLY OCCUPIED

SECOND FLOOR DAYLIGHTED ZONE



L4 THIRD FLOOR ■ REGULARLY OCCUPIED

THIRD FLOOR DAYLIGHTED ZONE



L5 FOURTH FLOOR ■ REGULARLY OCCUPIED

FOURTH FLOOR DAYLIGHTED ZONE

5. Glazing Specifications and thermal Properties:

Brand : SAINT-GOBAIN
Product: Antelio Plus
Colour Shade: Blue Ray
Glass Code: ST 767 (6mm Thick)

Saint-Gobain's products conform to:



GLASS DETAILS			LIGHT FACTORS			ENERGY FACTORS	
COLOUR SHADE	BRAND	CODE	TRANSMISSION (%)	REFLECTION (%)		SOLAR FACTOR SHGC / SF	U-VALUE (W/Sq.m K)
				EXTERNAL	INTERNAL		

Single Glazed Unit (6mm thick, Coating Face 2)

Blue Isle	Cool Lite	ST 708	5	21	38	0.15	3.6
Tranquil Blue	Cool Lite	ST 720	13	16	27	0.26	5.2
Blue Breeze	Cool Lite	ST 736	24	12	18	0.34	5.5
Royale Blue	Cool Lite	ST 750	33	10	16	0.40	5.6
Blue Ray	Antelio Plus	ST 767	42	11	18	0.47	5.6
Titanium Blue	Cool Lite	STB 120	22	21	29	0.32	5.2



Iris [SKN 144 II] | Magma [SKN 154 II]
Futura [SKN 444 II] | Nebula [SKN 454 II]
Lumosa [SKN 744 II] | Quasar [SKN 754 II]



Available in 6 and 8 mm thicknesses (10 mm and 12 mm available on request for SKN 144 II and SKN 154 II) allowing for large-sized high-specification units.



sgg ENVISION® not only conforms to the exacting norms of green buildings- LEED, IGBC and TERI-GRIHA, but also surpasses the laid down standards. It is the ideal glazing solution for energy efficient sustainable green building design requirements for every season. The product is engineered exclusively for green buildings that need a seamless balance of natural lighting and solar control.



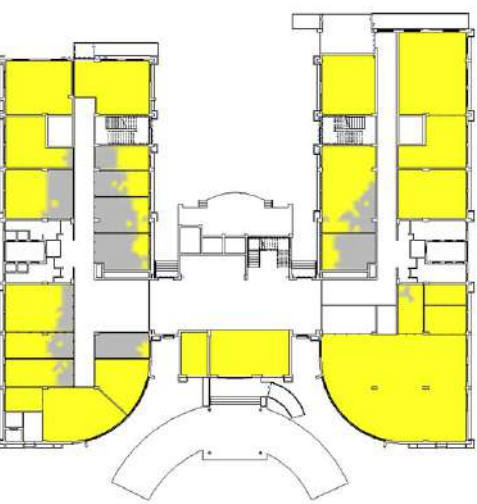
As the world leader in glass manufacturing for the construction market, Saint-Gobain worldwide has set its sights on providing innovative solutions to two key challenges of the future:

- Environmental protection
- Energy savings

Analytical Properties	Double Glaze Unit
Visual Light Transmittance (VLT)	42
Shading Co efficient (SC)	0.55
Solar Heat Gain Coefficient (SHGC)	0.47
Heat Transfer Coefficient W/(m².K)	5.6

6. Results of Daylight Analysis to Achieve Required Daylight Autonomy:

Level 01 - Ground Floor
Regular area – 12401 ft²
Percentage of DA Meet – 85.72 %
Area of DA Meet – 10630 ft²



Level 02 - First Floor
Regular area – 8898 ft²
Percentage of DA Meet – 80.88 %
Area of DA Meet – 7197 ft²



Level 03 - Second Floor
Regular area – 8768 ft²
Percentage of DA Meet – 73.53 %
Area of DA Meet – 6447 ft²

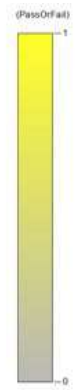
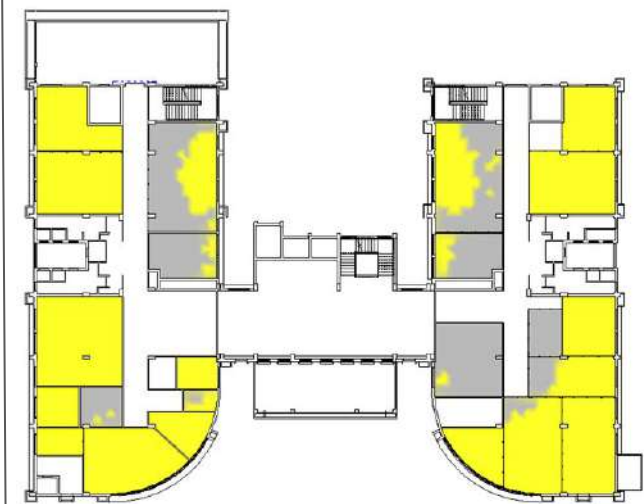


FIG 14: GROUND FLOOR – DAYLIGHT AUTONOMY RESULT

FIG 15: FIRST FLOOR – DAYLIGHT AUTONOMY RESULT

FIG 16: SECOND FLOOR – DAYLIGHT AUTONOMY RESULT

Lighting sDA Pass/Fail

6. Results of Daylight Analysis to Achieve Required Daylight Autonomy:

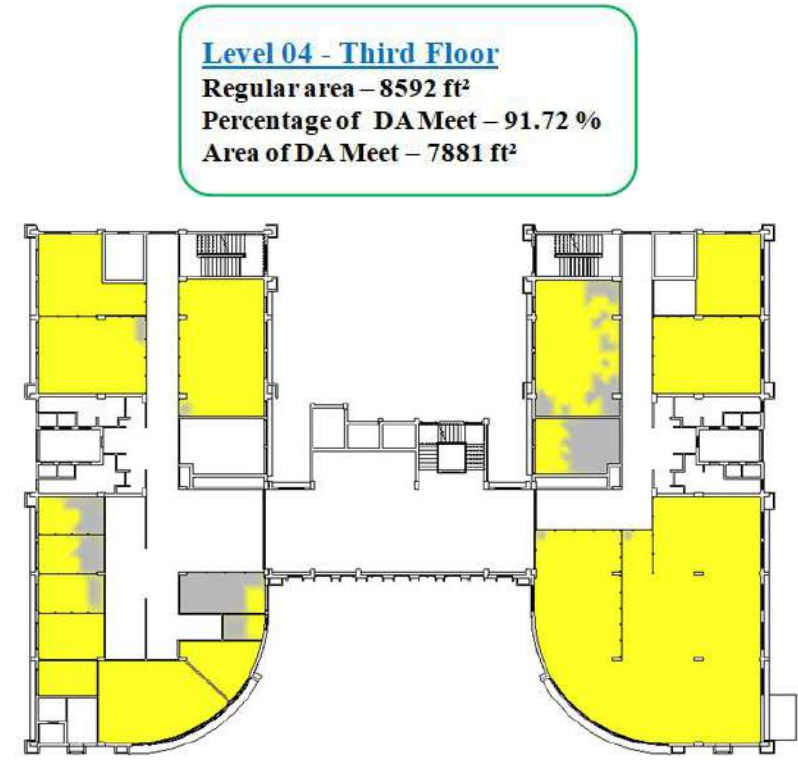


FIG 17: THIRD FLOOR – DAYLIGHT AUTONOMY RESULT

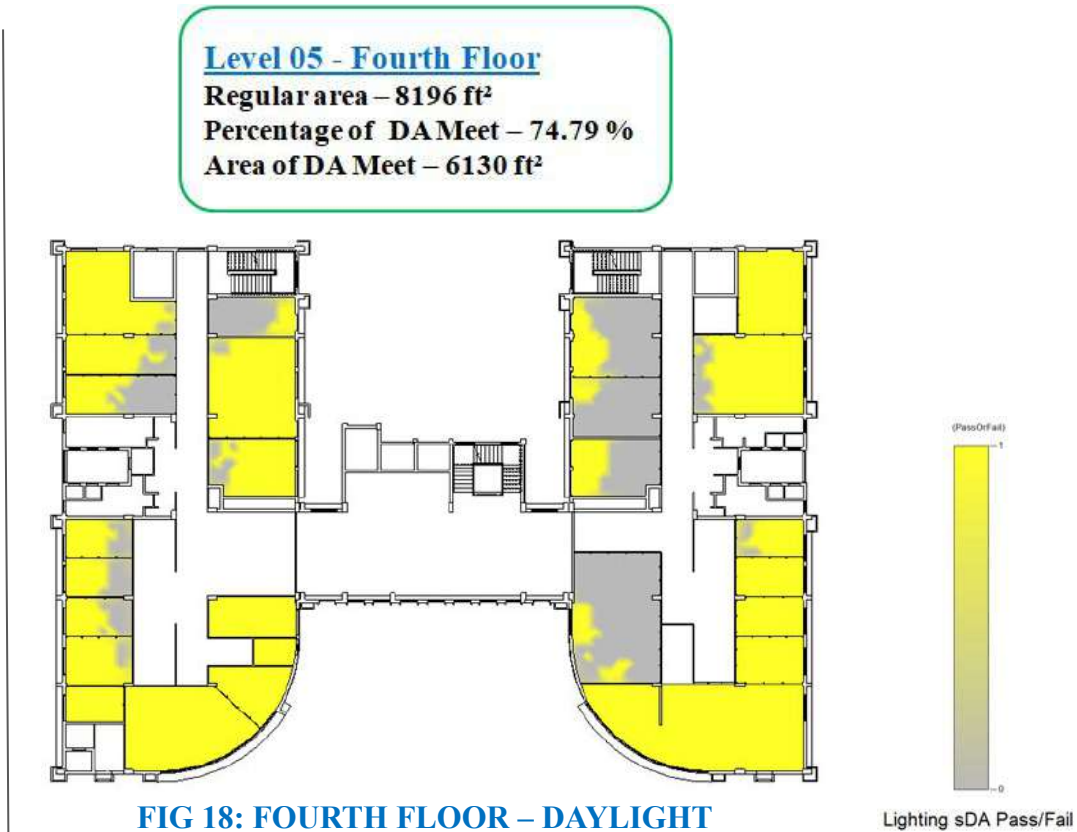


FIG 18: FOURTH FLOOR – DAYLIGHT AUTONOMY RESULT

LABORATORY COMPLEX CENTRE OF EXCELLENCE FOR GSI

Daylight Autonomy (DA Preview) Results Summary: Kumaraswamy Layout, India - 719105

Building scores 4 GRIHA points with 81.71% Building area passing thresholds

S.No	Level	Area (ft²)	sDA 300/50	
			%	Area (ft²)
1	L1 Ground Floor	12401	85.72	10630
2	L2 First Floor	8898	80.88	7197
3	L3 Second Floor	8768	73.53	6447
4	L4 Third Floor	8592	91.72	7881
5	L5 Fourth Floor	8196	74.79	6130
Total Daylighted Area (ft²)		46855	81.71	38285

In Computer Simulation this project is meeting with 87.71% of the regularly Occupied spaces in the building to achieve Daylight Autonomy. So this project is meet the Mandatory and eligible to achieve 4 points as per GRIHA Criterion:11 Achieving Indoor Comfort Requirement.



Appendix A: Site Exterior & Interior Photographs:



Appendix B: Antelio Plus ST 767 - Glass Specification Test Certificate:

ANTHELIO PLUS
ST 767
GLASS

TEST CERTIFICATE FOR MAGNETRON COATED GLASS

PRODUCT CODE: ST767

MARKET SEGMENT: SGG COOL-LITE BLUE RAY

INVOICE DETAILS: 8003160347

PRODUCTION CAMPAIGN: From 24.09.2016 - 18:55 hrs. to 16.10.2016

SL-NO	PARAMETERS	Specification Single glazed unit	Tolerances	Actual
1	LIGHT FACTORS	Transmission (%)	± 3	42.7
		Reflection External (%)	± 3	11.6
		Reflection Internal (%)	± 3	17.4
2	PERFORMANCE FACTORS	Solar Factor	± 0.02	0.47
		Shading Coefficient	± 0.02	0.55
		U - Value (W/m².K)		5.99

Sign

M. Rajkumar

R. Sathish

V. Srinivasan

Name

Team Member - Quality

Team Member - Quality

Team Leader - Cooper

Designation

Team Member - Quality

Team Member - Quality

Team Leader - Cooper

Date

21.06.2017

21.06.2017

21.06.2017

Glazing RGB Calculator by color and desired Visible Transmittance (Tvis)

F 0.9216

p 5 panes modeled

d 6 mm modeled thickness

42

Tvis 42%

R

G

B

Target color

1

1

1

RGB adjusted for TVis

118

118

118

118,118,118

Glazing RGB Calculator by color and desired Visible Transmittance (Tvis)

F 0.9216

p 5 panes modeled

d 6 mm modeled thickness

42

Tvis 42%

R

G

B

Target color

1

1

1

RGB adjusted for TVis

118

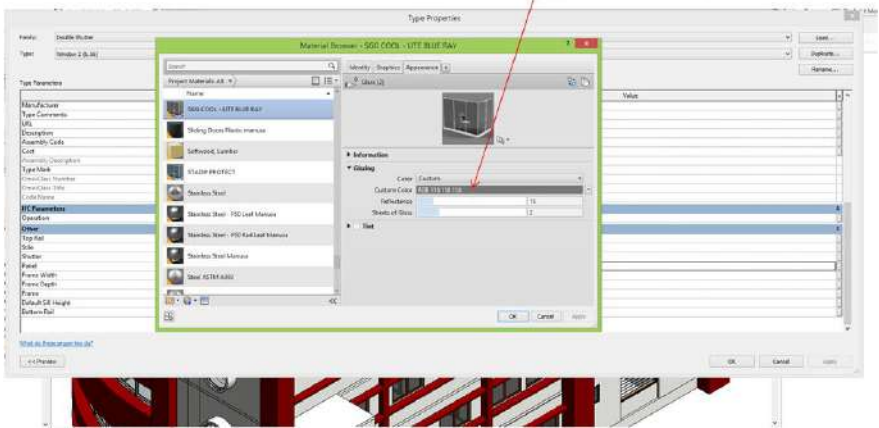
118

118

118,118,118

Use these values for the RGB custom color of the Glazing/Glass Appearance Asset

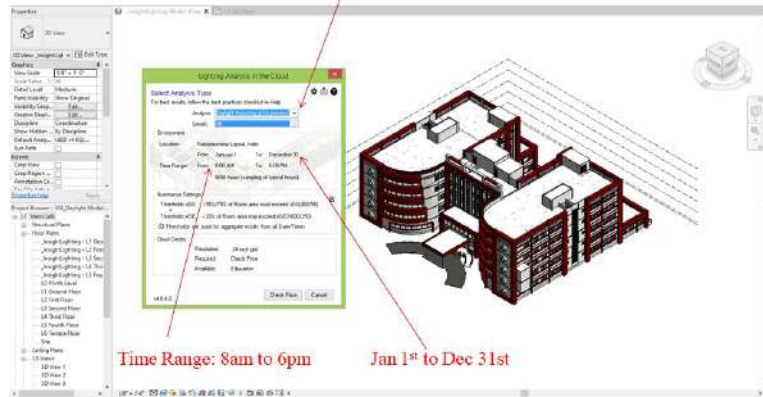
RGB Values given for 42% VLT Glass



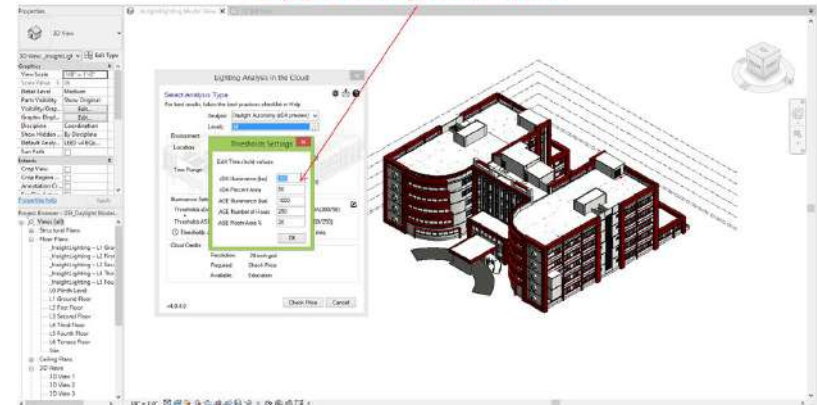
Appendix B: Antelio Plus ST 767 - Glass Specification Test Certificate:



Daylight Autonomy Method



Daylight Autonomy Thresholds Value



Scope of work

IGBC PROJECT

Project name : ITPC - Pinnacle
Typology : Office

Topics covered for this project :

- **Site & facility management**

SF Credit 1 - Eco-friendly commuting practices : 25%,50%
SF Credit 3.1 - Heat Island Reduction,Non-roof : 50%,75%

- **Water efficiency**

WE Mandatory Requirement- Water efficient fixtures
WE Credit 1 - Water Efficient Fixtures : 20%,30%,40%
WE Credit 2 - Rain Water Harvesting :25%,50%

- **Energy efficiency**

Power Consumption Data

- **Health & Comfort**

HC Mandatory Requirement 1- Tobacco Smoke Control
HC Credit 1 - Carbon dioxide Monitoring & Control
HC Credit 3 - Eco-friendly Housekeeping Chemicals
HC Credit 4 - Thermal Comfort, Indoor Temperature & RH
HC Credit 5 - Facilities for Differently Abled People
HC Credit 6 - Occupant Well-being Facilities

- **Innovation Category**

INN CR1.1 - Automatic Waste Generator

- **Site Visit**

https://drive.google.com/drive/folders/1DnQ1fJVXhviL2EJFdInFTMaTgGINHHto?usp=share_link

INTRODUCTION



- International Tech Park Chennai (ITPC) is the icon of India's IT success story. Located along Chennai IT Corridor, the International Tech Park Chennai (ITPC) is a fine successor to Ascendas' iconic flagship, the International Tech Park Bangalore.
- ITPC is the choice location for quality business space, reliable solutions and an international lifestyle second to none. These advantages are conveniently packaged by Ascendas, Asia's best IT park brand behind successful IT parks in India, China and Singapore.

PROJECT DETAILS

Project Name	ITPC - Pinnacle, Chennai
Rating	IGBC Green Existing Building, Operation & Maintenance
Location	Chennai, Tamilnadu - 600113

This Report Contains:

- 1.Requirement Under IGBC Green EB O&M for SF-CR 01
- 2.Narrative

NARRATIVE

An agreement has been signed between RELX India Pvt Ltd (“Customer” or “Elsevier”) and COMFORT CAR RENTAL SERVICE (“Service Provider”) and is subject to the Elsevier Standard Terms of Purchase for Service Providers.

The agreement quotes that the Services shall be provided on all regular Customer working days at the Offices.

The current period of agreement is between 01/11/2020 to 31/10/2022, with an option to extend for one additional year, unless terminated earlier pursuant to the Agreement.



4+1 seater CAB



12 +1 seater VAN

Site & Facility Management - SF Credit 1 - Eco-friendly commuting practices : 25%,50%

Type of Vehicle	No. of vehicles	number of employees	total number of employees
4+1 seater cab	103	4	412
6+1 seater cab	89	6	534
12+1 seater van	77	12	924
total number of employees catered by cab service			1870
total employees working in the facility			3250
percentage of employees catered by cab service			57.5

Currently around 57.5 % of the employees are availing this service.
Hence the project claims 4 points.

Intent

Adopt eco-friendly landscaping practices to minimise the impact of chemicals on ecology.

Narrative

Hence the project claims 02 points.

- The project applicability to attempt this credit is that, the project should have more than 15% of landscape area.
- As the project landscape area is 15%, hence the project becomes eligible to attempt this credit.
- The project also uses only organic fertilisers.
- The quantity of organic fertilisers used for the past three years are attached for reference.
- With regard to the type of species, the project has around 12 % of native species. The type of species has also been attached for reference.
- The facility uses organic fertilizers to 100% of the available landscape area.





C	Fertilizers to be used					Total
1	Farmyard Manure	Load/ year	17	15	16	48
2	Complex (20X20x20)	Bags/year	25	23	24	72
3	Gypsum (yearly Qty.)	Bags/year	7	8	6	21
4	Neem Cake	Bags / Year	19	20	18	57
5	Vermi Compost	Bags / Year	25	23	24	72

Description	Area
	(Sq.ft)
Landscape with Native adaptive Species, Scrubs & Trees	24225
Landscape with Turf area	6121
Overall Landscape area	30346
Percentage of Trees & Species area	79.83
Percentage of Turf area	20.17

Description	Area
	(Sq.ft)
Total Site Area (ft²)	200887
Overall Landscape area	30346
Percentage of Landscape area	15.11



Intent

Minimise heat island effect to reduce impact on microclimate.

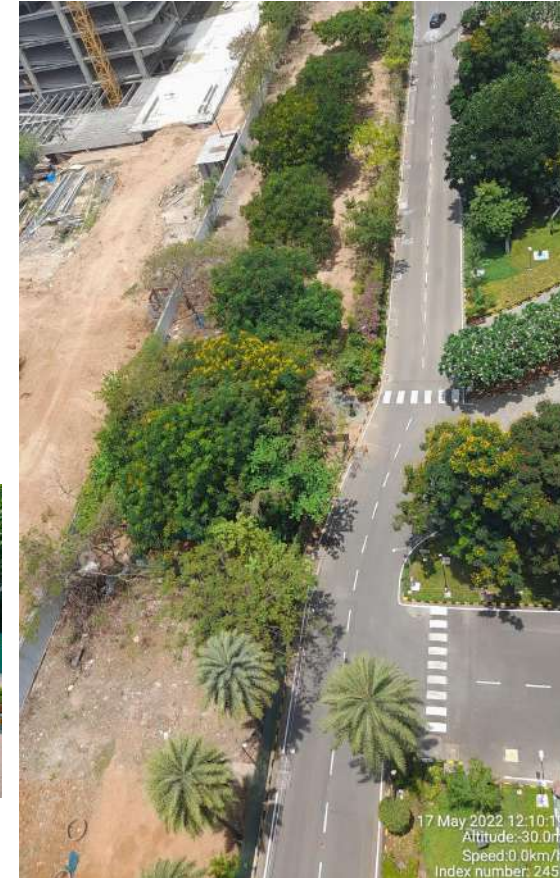
Compliance Options

For exposed non-roof hardscape - Shade from the existing tree canopy areas -

- Open grid pavers, including grass pavers
- Shade from solar panels
- Structured surface parking

Points are awarded as below:

Percentage of shaded non- roof hardscape areas	Points
50%	2
75%	4



S.No	Surface Finish	Description	SRI	Shaded By	Area
		As per Research Paper			(Sq.ft)
Driveways 1	Asphalt	-	-	Partly shaded by Trees	33,670
Driveways 2	Paver	Ash Grey	55	Partly shaded by Trees	7,713
Driveways 3	Paver	Light Stone	58	Partly shaded by Trees	5,807
Pathways Tile	Tile	Slate Grey	41	Partly shaded by Trees	22,953
Parking space Paver	Paver	Light Stone	58	Partly shaded by Trees	17,871
Total Non-Roof Area					88,014
Total Non-Roof Area - Compliant to minimize UHIE					54,344
Percentage of Non-Roof Area - Compliant to minimize UHIE					61.74
As per IGBC, if treated area is above 50%, then the project shall be awarded					02 points

Reference research paper

Solar Reflectance Index (SRI) by Color

Solar reflectivity or reflectance is the ability of a material to reflect solar energy from its surface back into the atmosphere. The SR value is a number from 0 to 1.0. A value of 0 indicates that the material absorbs all solar energy and a value of 1.0 indicates total reflectance. **Energy Star** requires an initial SR value of 0.25 or higher for steep slope (>2:12) roofs and 0.15 or greater after three years. Low slope roofs require an initial SR value of 0.65 or higher and 0.50 or greater after three years.

The **Solar Reflectance Index** is used for compliance with **LEED requirements** and is calculated according to ASTM E 1980 using values for reflectance and emissivity. Emissivity is a material's ability to release absorbed energy. To meet LEED requirements a roofing material must have a SRI of 29 or higher for steep slope (>2:12) roofing and a SRI value of 78 or higher for low slope roofing.

Thus the project claims 02 points.

Narrative :

- The project has included driveways, pathways and parking as part of non-roof hardscape area.
- The non-roof hardscape areas have been treated to reduce heat island reduction by combination of tree shade and use of high SRI materials.
- The SRI values have been taken from reference research paper according to color.
- The reference SRI calculation in the research paper is calculated according to ASTM E 1980.

REFERENCE – SRI BY COLOR

Reference research paper - SRI values according to colors

Color		R	SRI
Aluminum Zinc (GL)		0.68 (initial) 0.55 (aged)	55 (initial) 28 (aged)
Oyster White (WH)		0.52	59
Polar White (PW)		0.58	69
Light Stone (LS)		0.50	58
Hawaiian Blue (BL)		0.32	33
Sahara Tan (ST)		0.36	38
Ash Grey (AS)		0.47	55
Burnished Bronze (BR)		0.28	29
Colony Green (GR)		0.34	36
Fern Green (FG)		0.27	27
Almond (AL)		0.63	76
Snow White (SW)		0.65	79
Brownstone (BS)		0.47	54
Copper Metallic (CM)		0.46	51
Scarlet Red (SR)		0.42	47
Harbor Blue (HB)		0.28	30
Hunter Green (HG)		0.35	39
Roman Blue (RB)		0.32	33
Colonial Red (CR)		0.34	37
Everglade (EG)		0.33	36
Slate Grey (SG)		0.37	41



Water Efficiency - WC MR 01 & CR 01 – Water Efficient Fixtures: 20%, 30%, 40%

Intent: To enhance water use efficiency and minimise the use of potable water

CALCULATIONS

International Tech Park - CHENNAI - PINNACLE										
S.No	Fixture Type	Make	Model No	Duration per Use	Estimated Daily Uses	Total Number of Occupants / Building	Basecase		Proposed case	
				(Minutes)	(per person /per day)		Flow Rate / Capacity	Total Daily Water Use	Flow Rate / Capacity	Total Daily Water Use
							(LPF/LPM)	(liters)	(LPF/LPM)	(liters/day)
1	Water Closets (Full-flush) - Male	JAQUAR	1085	1	1	1698.5	6	10,191.00	4	6,794.00
2	Water Closets (Full-flush) - Female	JAQUAR	1085	1	1	1698.5	6	10,191.00	4	6,794.00
3	Water Closets (Half-flush) - Female	JAQUAR	1085	1	2	1698.5	3	10,191.00	2	6,794.00
4	Urinals - Male	HINDWARE / UTECH	500964 / 11 D	1	2	1698.5	4	13,588.00	2	6,794.00
5	Toilet Faucet - Basin Taps	JAQUAR	PRS-CHR-031	0.25	4	3397	8	27,176.00	4	13,588.00
6	Pantry Faucet - Basin Taps	JAQUAR	CON-021-KN	0.25	4	3397	8	27,176.00	4	13,588.00
7	Health Faucet	JAQUAR	HFG-563	0.25	4	3397	8	27,176.00	4	13,588.00
International Tech Park - CHENNAI - PINNACLE								125,689.00	-	67,940.00
Difference in total daily water use between base case and proposed case (in liters)										57,749.00
Percentage of daily potable water savings over baseline (in liters)										45.95
CREDIT COMPLIANCE				Percentage of daily potable water savings over baseline (in liters) > 40 %						06 POINTS
MANDATORY COMPLIANCE				Uses water efficient plumbing fixtures whose flow rates meet the baseline criteria, individually.						Complied

Water Efficiency - WC MR 01 & CR 01 – Water Efficient Fixtures

NARRATIVE

Difference in total daily water use between base case and proposed case (in liters)		57,749.00
Percentage of daily potable water savings over baseline (in liters)		45.95
CREDIT COMPLIANCE	Percentage of daily potable water savings over baseline (in liters) > 40 %	06 POINTS
MANDATORY COMPLIANCE	Uses water efficient plumbing fixtures whose flow rates meet the baseline criteria, individually.	Complied

TOTAL OCCUPANTS	3397
female (50% of total occupants)	1698.5
male (50% of total occupants)	1698.5

The following documents are attached for reference :

- Excel Calculation
- Jaquar Brochure
- Water Audit Video

WATER CLOSET



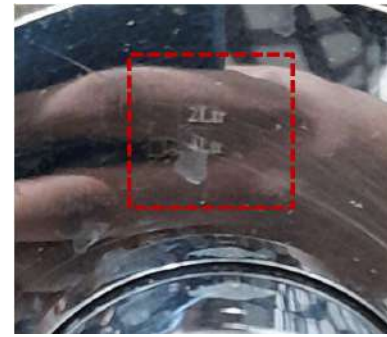
HEALTH FAUCET



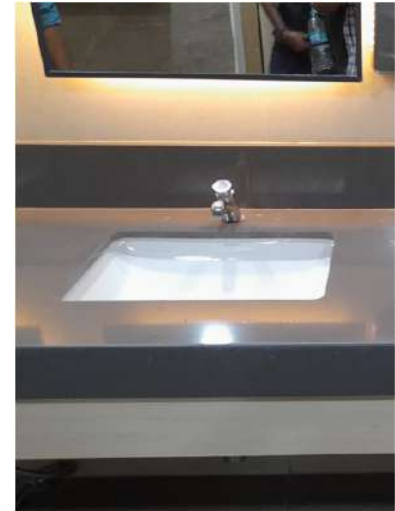
URINAL



DUAL FLUSH



HAND WASH BASIN

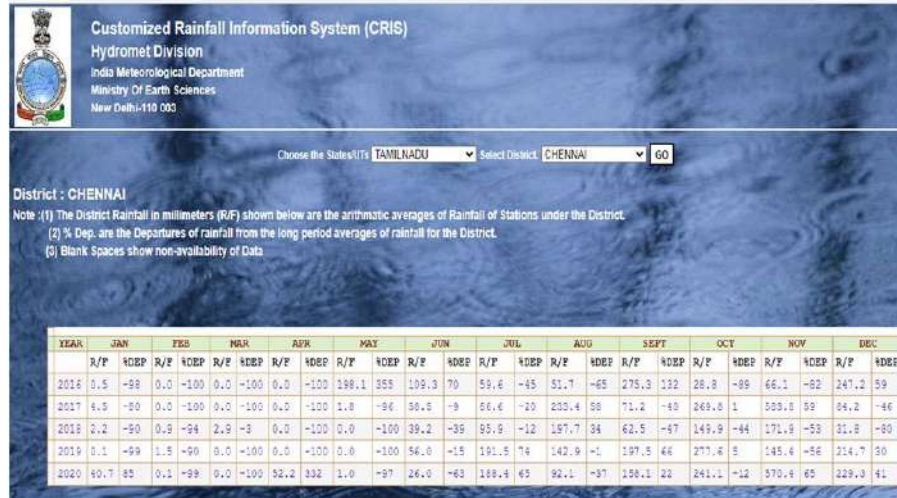


Water Efficiency - WE CR 02 – Rain Water Harvesting

Intent:

Recharge the local aquifer or capture rain water to reduce potable water consumption.

NARRATIVE



The peak monthly average rainfall data is taken from CRIS for the period between 2016-2020.

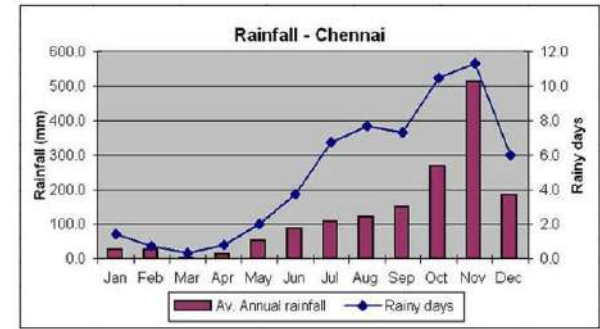
RAINFALL DATA - NO. OF RAINY DAYS

← → ↻ ⚠ Not secure | rainwaterharvesting.org/rainfall_html/chennai.htm

Mail - Niveetha N... VENDOR REPORTS...

25 years average (1982-2006)

Months	Av. Annual Rainfall (mm)	Rainy Days
Jan	27.0	1.4
Feb	26.4	0.8
Mar	3.6	0.3
Apr	11.9	0.8
May	51.6	2.0
Jun	85.7	3.7
Jul	106.9	6.8
Aug	120.3	7.7
Sep	151.0	7.3
Oct	268.1	10.5
Nov	512.5	11.3
Dec	184.8	6.0
Total	1549.9	58.6



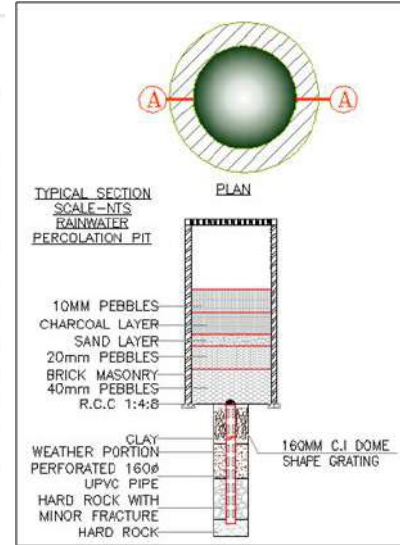
DATA SOURCE

<http://www.rainwaterharvesting.org/>
http://www.rainwaterharvesting.org/rainfall_html/chennai.htm

RAINFALL DATA AND PERCOLATION PIT DETAILS

Average Peak Rainfall Calculated as per Normal Rainfall per day					
S.No	Year	Peak Month	Peak Monthly Avg Rainfall in mm	No. of Rainy Days	Normal rainfall per day in mm
1	2016	September	275.3	7.3	37.71
2	2017	November	583.8	11.3	51.66
3	2018	August	197.7	7.7	25.68
4	2019	October	277.6	10.5	26.44
5	2020	November	570.4	11.3	50.48
Last 5 years average peak rainfall in mm					38.39
Last 5 years average peak rainfall in m					0.0384
Hence, One day Rainfall in m (here, 50% of average peak month rainfall for 04 points)					0.0192

Months	Av. Annual Rainfall (mm)	Rainy Days
Jan	27.0	1.4
Feb	26.4	0.8
Mar	3.6	0.3
Apr	11.9	0.8
May	51.6	2.0
Jun	85.7	3.7
Jul	106.9	6.8
Aug	120.3	7.7
Sep	151.0	7.3
Oct	268.1	10.5
Nov	512.5	11.3
Dec	184.8	6.0
Total	1549.9	58.6



PERCOLATION PIT DETAILS

The entire storm water from the site would be disposed off through suitable underground drainage system to the rain water recharge pits and the excess is diverted to the existing Rainwater Collection Tank.

Rainwater Harvesting Calculation

The project has the capacity to harvest more than 50 % of rainfall harvested onsite.

Hence **the project claims 04 points from credit compliance.**

Rainwater Recharge through percolation pits

Percolation Rate - Medium	12.50	mm / hr
	24.00	hrs
Percolation Rate - Medium	300.00	mm / day
Percolation Rate - Medium	0.30	m / day
Surface Area	3.01	m ² / day
Volume Harvested by Percolation Rate – FOR 01 PIT	0.90	m ³ / day
Total Volume of Percolation Pit	2.12	m ³
Void Ratio	0.75	-
NET Volume of Percolation Pit - FOR 01 PIT	1.59	m ³
TOTAL Volume harvested	2.49	m ³ / day
Total number of pits	20.00	-
Total Volume Harvested From 20 pits	50	m ³ / day

PERCOLATION PIT DETAILS

DIA	160.00	mm
RADIUS	80.00	mm
HEIGHT	6000.00	mm
PERIMETER	502.40	mm
SURFACE AREA	3014400.00	Sq.mm.
SURFACE AREA	3.01	<u>Sq.meter</u>

ITPC - PINNACLE - Rainwater Harvesting Calculation

S.No	Description	Area (Sq.ft.)	Surface Type	Run-off Coefficient	Impervious Area (Sq.ft.)
1	Pinnacle Building Footprint	77954	Cement / Tiled Roof	0.95	74,056.65
2	Service Blocks Footprint	2858	Cement / Tiled Roof	0.95	2,715.57
3a	Driveways - Hardscape - Asphalt	33670	Concrete Pavement	0.95	31,986.73
3b	Driveways - Hardscape - Paver-Grey	7713	Concrete Pavement	0.95	7,327.17
3b	Driveways - Hardscape - Paver	5807	Concrete Pavement	0.95	5,517.04
4	Pathways - Hardscape	22953	Concrete Pavement	0.95	21,805.48
5	Parking space - Hardscape	17871	Concrete Pavement	0.95	16,976.98
6a	Landscape with Native adaptive Species, Scrubs & Trees	24225	Cement / Tiled Roof	0.95	23,014.08
6b	Landscape with Turf area	6121	Vegetation, Flat (0-1% slope)	0.10	612.06
7	Water Body	1714	Turf, Hilly (1-3% slope)	0.35	599.81
Total Site Area (ft ²)		200,887			184,611.58
Total Site Area (m ²)		18,662.98			17,150.97
(Considering 50% of average peakfall rain)		Last 5 years average peak rainfall		m	0.0192
		Total roof & non-roof run-off volume		cu.m	329.24
		ITPB total water storage Capacity		cu.m	341.00

More than 50% of rainwater is harvested onsite from roof & non - roof areas

04 points



Health & Comfort - HC MR 1 - TOBACCO SMOKE CONTROL

Intent:

Minimise exposure of non-smokers to the adverse health impacts arising due to passive smoking in the building.

Narrative:

Smoking Zone Photo



- Smoking is Prohibited inside the **Ascendas International park Chennai building**
- No smoking signage is provided in Entrance and Common areas.
- Declaration Letter from Capita land regarding Smoking Prohibition inside the building is submitted.
- Separate outdoor smoking zone is provided in the site.
- The provision of outdoor smoking is provided at a distance more than 7.6 meters as per IGBC guidelines.



Scope of work

GRIHA PROJECT

Project name : Indian Council of Medical Research

Topics covered for this project : Site Planning

CR.1 - Site Selection

Socio-Economic Strategies

CR.24 - Labour safety and sanitation

CR-25-ICMR_Design for Universal Accessibility

CR.26 - Dedicated facilities for service staff

Energy Model - CAD DWG

INTRODUCTION



PROJECT DETAILS

Project Name	ICMR-Belagavi
Rating	GRIHA New building
Location	Belagavi,Karnataka - 590010

- ICMR-NITM has a 25-acre campus with a Herbal Garden and a Museum of Ethno medicinal Plants of the Western Ghats with a description of the plants available through QR-coded digitized display boards and online through an in-house developed Database available as a Citizen Charter.
- NITM houses laboratories catering to Ethno medicine, Natural Product Chemistry, Plant Biotechnology, Experimental Pharmacology with Animal House, Microbiology (including the COVID-19 testing facility), Molecular Biology, Cell Culture, Bioinformatics inside its campus and will shortly shift to new research building soon.

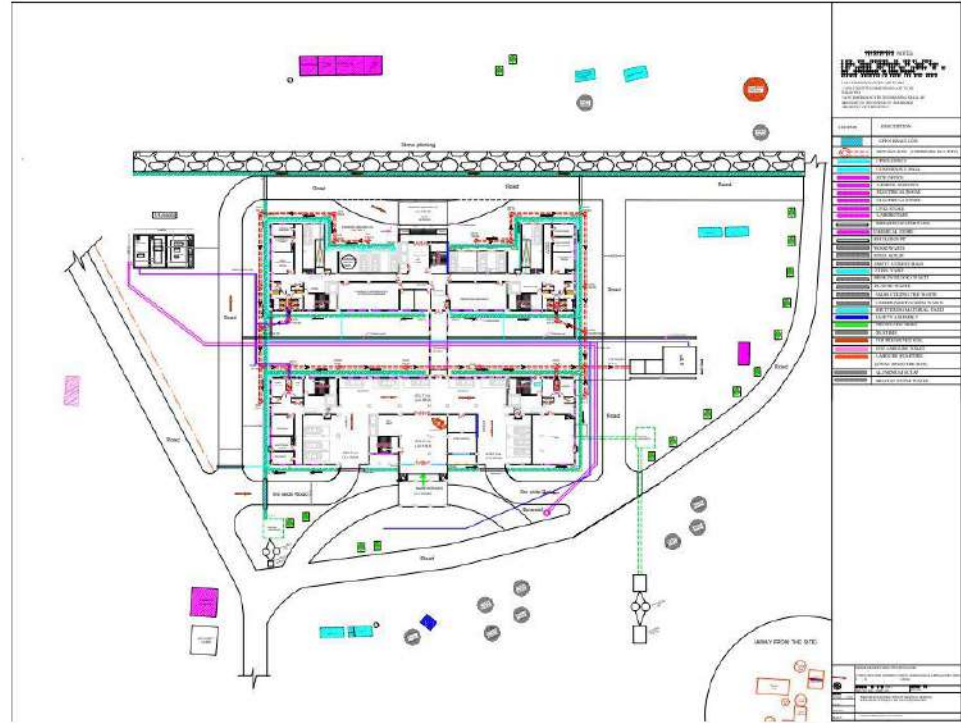
SITE PLANNING - CRITERION 1 : SITE SELECTION

Intent:

Site selection is the first step to a sustainable habitat and needs to be done prudently. The intent of this criterion is to ensure that the site meets the relevant master plan/local development plans.

1.1.2: The project site is a brownfield site OR a redevelopment project OR there are at least 5 services (from the list given below) within the campus or within 500m walking distance from main entrance of project – 1 point

- **Services:** Grocery store, pharmacy, Bank/ATM, Park, Restaurant, Community Centre, School, Gym, Metro Station/Public transit stop
- Ensure that the average distance of at least 5 basic public amenities/services as per the building typology (defined on the next slides) from the main entrance of the project, is less than the GRIHA base case as per the table below



Google Maps

15.8888432, 74.5223960 to CANARA BANK ATM, KLE HOSPITAL EXTN, Nehru Nagar, Belagavi, Karnataka 590010 Drive 350 m, 2 min
ICMR - Canara Bank ATM - 350m



Imagery ©2022 CNES / Airbus, Maxar Technologies, Map data ©2022 50 m

via unnamed roads 2 min
Fastest route now due to traffic conditions 350 m

Explore CANARA BANK ATM

01/06/2022, 13:13

Google Maps

RMRC ICMR Layout, Nehru Nagar, Belagavi, Karnataka 590010 to HDFC Bank ATM, KLE Hospital Shops, Nehru Nagar, Belagavi, Karnataka 590010 Drive 350 m, 2 min
ICMR - HDFC Bank ATM - 350m



Map data ©2022 50 m

via unnamed roads 2 min
Fastest route now due to traffic conditions 350 m

Explore HDFC Bank ATM

01/08/2022, 14:01

RMRC ICMR Layout, Nehru Nagar, Belagavi, Karnataka 590010 to Chikkana Mobile Canteen(veg) - Google Maps

Google Maps

RMRC ICMR Layout, Nehru Nagar, Belagavi, Karnataka 590010 to Chikkana Mobile Canteen(veg), Basavaranna Kolla, Belagavi, Karnataka 590010 Drive 500 m, 2 min
ICMR - Chikkana Mobile Canteen - 500m



Map data ©2022 100 m

via unnamed roads 2 min
Fastest route now due to traffic conditions 500 m

Explore Chikkana Mobile Canteen(veg)

28/07/2022, 17:01

Google Maps

RMRC ICMR Layout, Nehru Nagar, Belagavi, Karnataka 590010 to RMRC ICMR Layout, Nehru Nagar, Belagavi, Karnataka 590010 Drive 400 m, 1 min
ICMR site - RMRC Bus stand - 400m



Imagery ©2022 CNES / Airbus, Maxar Technologies, Map data ©2022 50 m

RMRC ICMR Layout
Nehru Nagar, Belagavi, Karnataka 590010

Note:

- Radial distances are not acceptable, walking distance has to be calculated.
- GRIHA base case has been predefined in the Proximity to Amenities calculator (600m for all amenities)



ICMR - Belagavi, Karnataka - 2022-06-22 17:40

This Report Contains:

- 1.Requirement Under GRIHA - LS&S for SE CR24 : Labour Safety and Sanitation
- 2.Narrative for Labour Safety and Sanitation
- 3.Photographs for Labour Safety and Sanitation

Intent

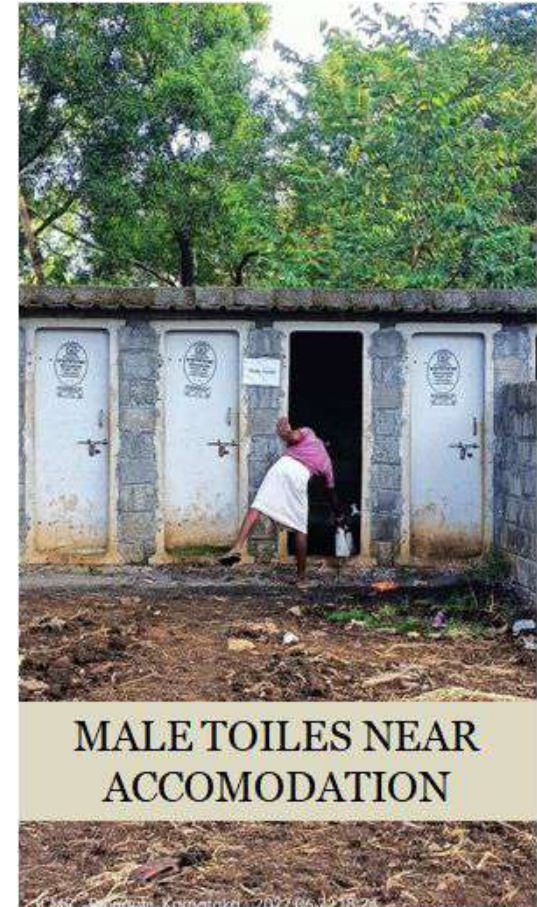
The intent of this criterion is to ensure safe, healthy and hygienic working, and living conditions for construction workers involved in the project.

Ensure compliance with the requirements of [NBC 2016](#) for all of the following:

Part 1: Provision of necessary safety equipment/gears and safety measures for construction workers.

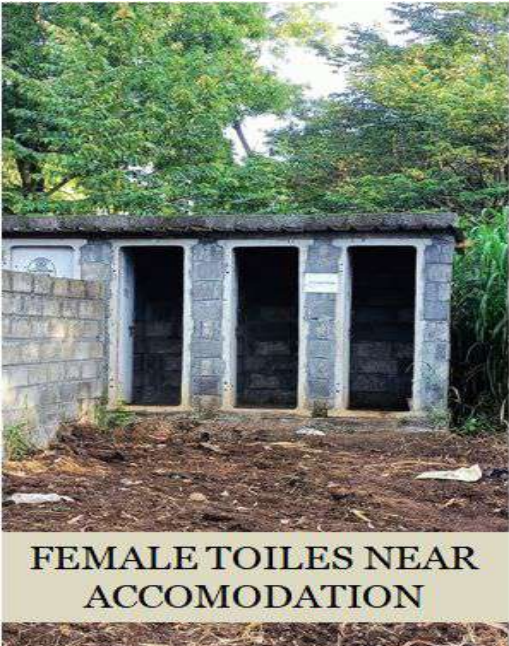
Part 2: Provision of clean drinking water, hygienic working and living conditions, and sanitation facilities for the workers.

Part 3: Provision of crèche facility for children of construction workers in case their families are allowed to work/live at the construction site.



Narrative:

- Only men were employed for site work.
- Hence the necessity of crèche facility was not required.
- Water quality test report of drinking water used on site for construction workers meters are attached.
- Site photographs with description are provided.



Water quality test report of drinking water used on site for construction workers

1983 / 1978



KLE DR M S Sheshgiri
College of Engineering and Technology
Udyambag, Belagavi - 590 005.
(Approved by AICTE New Delhi & Affiliated to VTU, Belagavi)
Department of Civil Engineering
Accredited by NSA, New Delhi

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Ref: KLE/CED/ENV/TR-115/2020/

ANALYSIS REPORT OF FRESH WATER QUALITY

Name of the location : Belagavi
Name of the project : Construction of building for Regional Medical Research Centre (ICMR) of Belagavi in EPC mode (Design & Built Basis) including internal water supply, sanitary installation, drainage, STP (50 RPD), DG sets, substation, pump set lift, firefighting & fire alarm system, split type air conditioner, street lighting, UPS, BMU, IIT metering, development & bulk services etc.

Sample collected by : Clients
Date of collection : 19.05.2020
Particulars of sample collected : Grab
Date of receipt of sample : 19.05.2020
Report to be sent : Sukhdevraj Sharma Engineers & Contractors Pvt. Ltd.

Sl. No.	Parameter	Protocol	Unit	Results	Standard Desirable	Standard Permissible limits in absence of alternate source
1	pH	pH meter	—	7.69	6.5-8.5	No relaxation
2	Conductivity (µS/cm)	Conductivity meter	µS/cm	89	500	500
3	Total Dissolved Solids	Grav / Titration	mg/L	46	500	500
4	Turbidity (NTU)	Nephelometer	NTU	0.00	1.0	5.00
5	Chlorides (Cl)	Titrimetric	mg/L	17	250.00	1000.00
6	Sulfates (SO ₄)	Spectrophotometric	mg/L	12	200.00	400.00
7	Total Hardness as CaCO ₃	Titrimetric	mg/L	50	300.00	600.00
8	Calcium as Ca	by Calculations	mg/L	14	75.00	300.00
9	Magnesium as Mg	by Calculations	mg/L	03	30.00	100.00
10	Total Alkalinity as CaCO ₃	Titrimetric	mg/L	48	300.00	600.00

Inference : As per IS:10500-2012
Report Status: The results are within limits as per the above parameters.

Tested By: 
Sud. Joyceton H.

Dr. P. A. Gharpade

HOD CIVIL ENGG

PRINCIPAL

Typical Requirements for Workers' Accommodation

S. No.	Area Requirements for Construction Workers Habitat	
1.	Minimum floor area per person	3.6 m ²
2.	Maximum number of persons per room	10
3.	Minimum height of the room	2.7 m; if two tier beds are provided then minimum height to be 3m
4.	Minimum area of kitchen per person	0.60 m ²
5.	Number of lavatories	Min 1 per 10 persons
6.	Number of bathrooms	Min 1 unit per 15 persons
7.	Number of urinals	Min 1 per 25 persons





Scope of work

LEED PROJECT

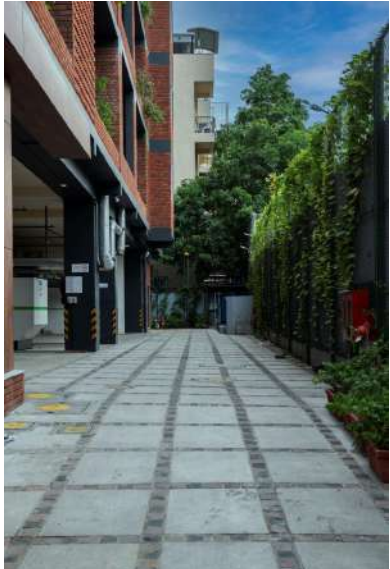
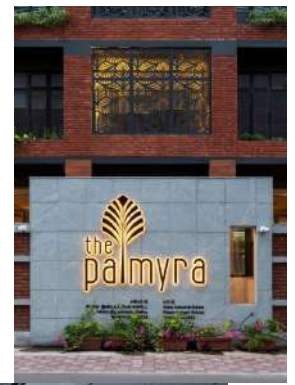
Project name : Palmyra

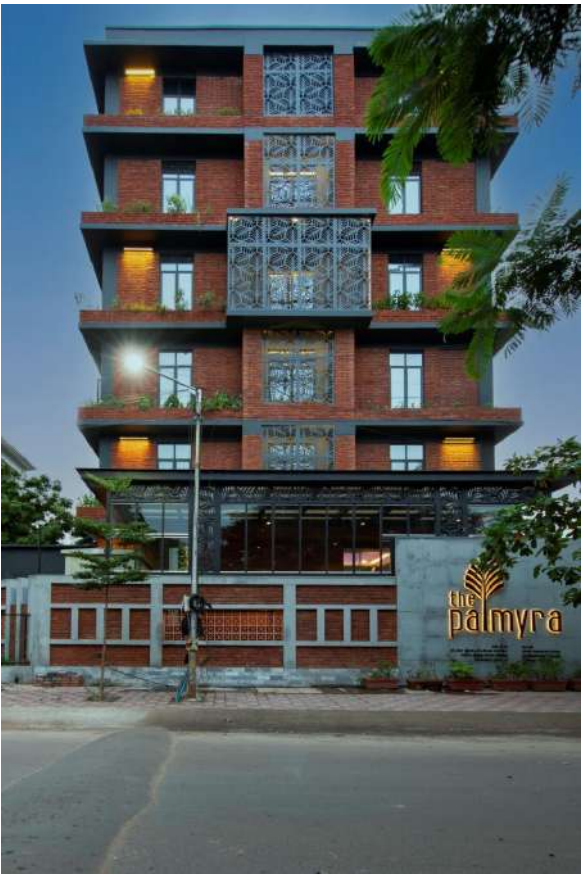
Topics covered for this project : Sustainable sites CREDIT

SS .Credit - Rainwater Management

Water Efficiency

WE Prerequisite 1 - Water Use Reduction





SUSTAINABLE SITES - SS Credit : Rainwater Management



Rainfall Events Calculator

LEED v4 for D+C and O+M - SS Credit Rainwater Management
LEED v4 for ND - GIB Credit Rainwater Management

Step 1.

Enable macros.

Note: This calculator is for use with Excel for Mac 2011 and Excel 2007 or later.

Step 2.

Unit of measurement

Note: This selection must match the unit of measurement chosen during project registration.

P-units

Step 3.

Complete the Historical Data and Strategies tabs.

Step 4.

Upload the completed spreadsheet to LEED Online. Complete any related summary fields in the LEED credit form with the results of the calculator.

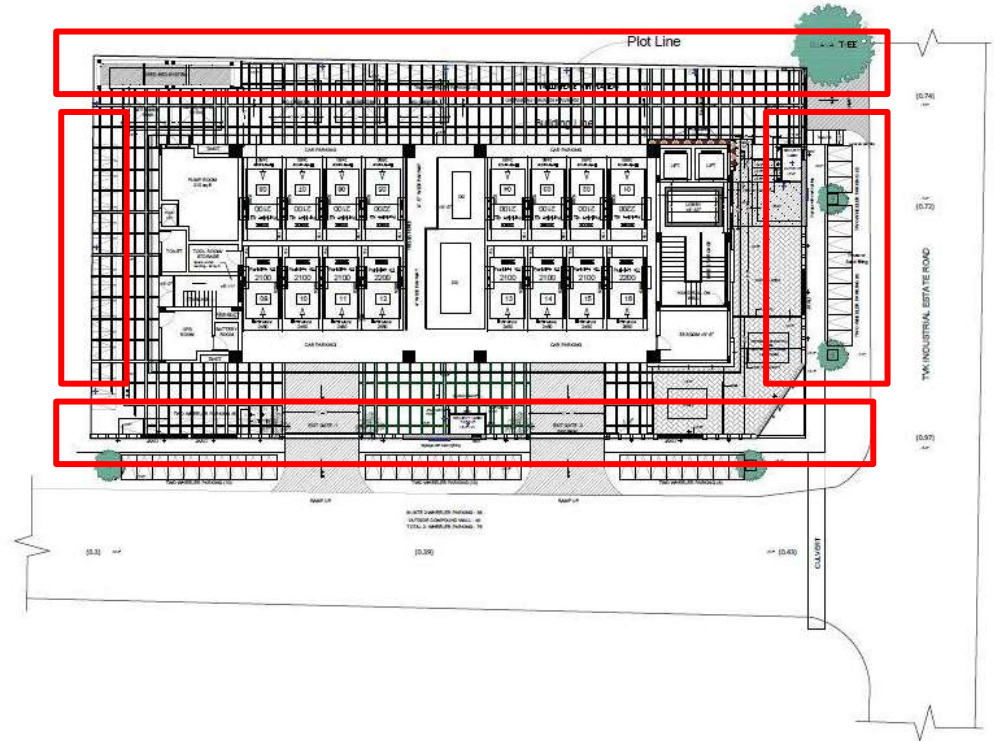
Historical Data

Total rainfall from the 80th percentile storm event (in)	0.16
Total rainfall from the 85th percentile storm event (in)	0.23
Total rainfall from the 90th percentile storm event (in)	0.35
Total rainfall from the 95th percentile storm event (in)	0.65
Total rainfall from the 98th percentile storm event (in)	1.17
Total rainfall from the 100th percentile storm event (in)	5.26

Historical Data

Enter historical rainfall data to calculate the total rainfall from the selected percentile storm. A minimum of 10 years of precipitation record data is needed to determine the percentile event for the project. Thirty years or more is recommended.

Date	Recording Time	Location (Monitoring Station)	Total Precipitation(in)
January 1, 2012	10:00 AM	Location: Latitude 12.9509 Longitude 80.1582	0.375165
January 2, 2012	10:00 AM	Location: Latitude 12.9509 Longitude 80.1582	0.038112
January 3, 2012	10:00 AM	Location: Latitude 12.9509 Longitude 80.1582	0.005558



SUSTAINABLE SITES - SS Credit : Rainwater Management

Summary for Operations and Maintenance Rating Systems

Note: All information on this tab is READ-ONLY. To edit, see previous tabs.

Runoff volume required to be managed onsite (cu ft)

0.00

Total rainfall from the 95th percentile storm event (in)

0.65

Total runoff volume captured and treated onsite (cu ft)

0.00

Summary for Neighborhood Development Rating Systems

Note: All information on this tab is READ-ONLY. To edit, see previous tabs.

Runoff volume required to be managed onsite (cu ft)

0.00

Total runoff volume managed onsite (cu ft)

0.00

Total rainfall from the 80th percentile storm event (in)

0.16

Total rainfall from the 85th percentile storm event (in)

0.23

Total rainfall from the 90th percentile storm event (in)

0.35

Total rainfall from the 95th percentile storm event (in)

0.65

Total rainfall from the 100th percentile storm event (in)

5.26