



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

**SCHOOL OF BUILDING AND ENVIRONMENT
DEPARTMENT OF ARCHITECTURE
M. Arch. (Sustainable Architecture)**

**PROFESSIONAL TRAINING REPORT (S89APT)
JUL 2022 - AUG 2022**

Name of the Student : Rejul Kamalakshan

Reg No. : 41890013

Semester : III

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 **REJUL KAMALAKSHAN** who had undergone training in **ELA GREEN BUILDINGS & INFRASTRUCTURE CONSULTANTS PVT. LTD.** and has been monitored by the continuous assessment during **Jul 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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DECLARATION

I, **REJUL KAMALAKSHAN** hereby declare that this Professional Training Report **JULY 11TH, 2022 TO AUGUST 18TH, 2022** done by me under the guidance of **AR. VISALAKSHI CHOCKALINGAM** 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 my professional training and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. Devyani Gangopadhyay, Dean and Head of the Department, School of Building and Environment, Department of Architecture** for providing me necessary support and details at the right time during the progressive training period.

I would like to express my sincere and deep sense of gratitude to **Ar. Visalakshi Chockalingam, Sustainability Analyst, ELA Green Buildings & Infrastructure Consultants Pvt. Ltd.** for her 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 Co-ordinator) 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 professional training.

Also, thanks to all the other staff members of **ELA Green Buildings & Infrastructure Consultants Pvt. Ltd., Pallavaram, Chennai, TN** for their assistance and guidance during my Training period.

JOINING LETTER

Date: 11 July 2022

To,

The Head of the Department

Department of Architecture, School of Building & Environment

Sathyabama Institute of Science and Technology

(Deemed to be University)

Rajiv Gandhi Salai, Jeppiaar Nagar

Chennai - 600 119, Tamil Nadu

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. REJUL KAMALAKSHAN (Reg. No.: 41890013)**, Student of 3rd Semester (M. Arch.- Sustainable Architecture) student from Sathyabama Institute of Science and Technology, Chennai has joined our firm on 11th July, 2022 as part of his professional training.

Organization	Ela Green Buildings & Infrastructure Consultants Private
LimitedAddress	51, Officers Lane, Cantonment, Pallavaram - 600043
Supervisor	Visalakshi, Sustainability Analyst
Intern Name	Rejul Kamalakshan

For Ela Green Buildings & Infrastructure Consultants Private Limited,


Samhita M,
Director



51, Officer's Lane, Pallavaram, Cantonment, Chennai – 600043, Website: elagreenconsultants.com

CONSOLIDATED CERTIFICATE

Date: 18 August 2022

To,

The Head of the Department

Department of Architecture, School of Building & Environment

Sathyabama Institute of Science and Technology

(Deemed to be University)

Rajiv Gandhi Salai, Jeppiaar Nagar

Chennai - 600 119, Tamil Nadu

TO WHOMSOEVER IT MAY CONCERN

SUB: Completion Letter For Professional Training

This is to certify that **Mr. REJUL KAMALAKSHAN (Reg. No.: 41890013)**, Student of 3rd Semester (M. Arch.- Sustainable Architecture) student from Sathyabama Institute of Science and Technology, Chennai was trained in our firm from July 11th, 2022 to August 18th, 2022 for a period of 32 working days.

Organization	Ela Green Buildings & Infrastructure Consultants Private
LimitedAddress	51, Officers Lane, Cantonment, Pallavaram - 600043
Supervisor	Visalakshi, Sustainability Analyst
Intern Name	Rejul Kamalakshan

Wishing him all success.

For Ela Green Buildings & Infrastructure Consultants Private Limited,


Samhita M,
Director



51, Officer's Lane, Pallavaram, Cantonment, Chennai – 600043, Website: elagreenconsultants.com



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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 :	ELA Green Buildings & Infrastructure Consultants Pvt. Ltd.		
2. Address & Contact Number :	No. 51, Officers Lane, Cantonment, Pallavaram, Chennai, TN- 600 043 Contact: +91 9566139566		
3. Name of the student :	Rejul Kamalakshan		
4. Duration :	From 11/7/2022	To 28/7/2022	
5. Total No. of days :	15		
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		✓			
Skillsets 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*

7.5

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

7. Any other Remarks

Candidate was very co-operative during the tenure of internship

8. Signature of the Head of the Office / Organization (With Seal)



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2. Address & Contact Number :	No. 51, Officers Lane, Cantonment, Pallavaram, Chennai, TN- 600 043 Contact: +91 9566139566		
3. Name of the student :	Rejul Kamalakshan		
4. Duration :	From 29/7/2022	To 16/8/2022	
5. Total No. of days :	15		
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		✓			
Skillsets 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*

8.0

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

7. Any other Remarks

8. Signature of the Head of the Office / Organization (With Seal)



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DAY	PROJECT	WORK DONE
1 - (11/7/2022)	Hospital at Bellary, Karnataka	3D Modeling for Solar Insolation Simulation
2 - (12/7/2022)	Hospital at Bellary, Karnataka	3D Modeling & Solar Insolation Simulation in FormIT
3 - (13/7/2022)	Hospital at Bellary, Karnataka	Base Case Calculation, Revit Simulation for Solar Insolation for design' Base & Proposed Cases comparison
4 - (14/7/2022)	Hospital at Bellary, Karnataka	Entering solar radiation value on respective facades & tabulation of simulated values for design' Base & Proposed Cases comparison
5 - (15/7/2022)	Hospital at Bellary, Karnataka	Marking & color-coding of Hospital Utility Spaces in Floor Plans
6 - (16/7/2022)	Hospital at Bellary, Karnataka	Revision in marking of Hospital Utility Spaces in Floor Plans
7 - (18/7/2022)	Hospital at Bellary, Karnataka	Revision in marking & dimensioning of Hospital' Utility Spaces in Floor Plans
8 - (19/7/2022)	Hospital at Bellary, Karnataka	Calculation & tabulation of exposed wall surface areas of Utility Spaces w.r.t orientation
9 - (20/7/2022)	Hospital at Adilabad, Telangana	3D Modeling for Solar Insolation Simulation
	Factory at Kaniyalampalayam, TN	3D Modeling & Internal CFD Simulation in DesignBuilder
10 - (21/7/2022)	Factory at Kaniyalampalayam, TN	3D Modeling & Internal CFD Simulation in Autodesk Flow Design
	Hospital at Adilabad, Telangana	3D Modeling for Solar Insolation Simulation
11 - (22/7/2022)	Hospital at Adilabad, Telangana	3D Modeling for Solar Insolation Simulation
12 - (25/7/2022)	Hospital at Adilabad, Telangana	Base Case Calculation, Solar Insolation Simulation in FormIT & Revit for design' Base & Proposed Cases comparison
13 - (26/7/2022)	Hospital at Adilabad, Telangana	Entering solar radiation values on respective facades & tabulation of simulated values for design' Base & Proposed Cases comparison
14 - (27/7/2022)	Hospital at Adilabad, Telangana	Interior 3D Modeling for Internal CFD Simulation Experimenting Internal CFD Analysis in DesignBuilder with abstract model

15 - (28/7/2022)	Hospital at Adilabad, Telangana	Interior 3D Modeling for Internal CFD Simulation
16 - (29/7/2022)	Hospital at Adilabad, Telangana	Interior 3D Modeling for Internal CFD Simulation
17 - (30/7/2022)	Alliance Homes at Shamirpet, Hyderabad	3D Modeling of East-facing Villas & Internal CFD Simulation in Autodesk Flow Design
18 - (1/8/2022)	Alliance Homes at Shamirpet, Hyderabad	3D Modeling of West-facing Villas & Internal CFD Simulation in Autodesk Flow Design
19 - (2/8/2022)	Hospital at Adilabad, Telangana	Interior 3D Modeling for Internal CFD Simulation
20 - (3/8/2022)	Hospital at Adilabad, Telangana	Interior 3D Modeling for Internal CFD Simulation
21 - (4/8/2022)	Hospital at Adilabad, Telangana	Internal & External CFD Simulation in Autodesk Flow Design
	Dining Hall at Nagpur, Maharashtra	3D Modeling & Simulation for Spatial Daylight Autonomy (sDA) in LightStanza
22 - (5/8/2022)	Director Bungalow at Kalyani, West Bengal	3D Modeling for Daylighting Simulation
23 - (6/8/2022)	Director Bungalow at Kalyani, West Bengal	Simulation for Spatial Daylight Autonomy (sDA) in DesignBuilder
24 - (8/8/2022)	Super-speciality Hospital at Warangal, Telangana	3D Modeling for External CFD Simulation
25 - (9/8/2022)	Super-speciality Hospital at Warangal, Telangana	External CFD Simulation in DesignBuilder
26 - (10/8/2022)	Super-speciality Hospital at Warangal, Telangana	External CFD Simulation in DesignBuilder
	Alliance Homes at Shamirpet, Hyderabad	3D Modeling of East-facing Villas for Internal CFD, Daylighting Simulation in DesignBuilder
27 - (11/8/2022)	Super-speciality Hospital at Alappuzha, Kerala	Demarcation of Surface Finishes on Hospital' Landscape Plan

28 - (12/8/2022)	Super-speciality Hospital at Alappuzha, Kerala	Calculation & tabulation of areas of surface finishes on Hospital' Landscape Plan
29 - (13/8/2022)	Dining Hall at Nagpur, Maharashtra	3D Modeling and Simulation for Spatial Daylight Autonomy (sDA) in DesignBuilder
30 - (16/8/2022)	Super-speciality Hospital at Kozhikode, Kerala	Demarcation of Surface Finishes on Hospital' Landscape Plan
31 - (17/8/2022)	Alliance Homes at Shamirpet, Hyderabad	3D Modeling of East-facing Villas for Internal CFD, Daylighting Simulation in DesignBuilder
32 - (18/8/2022)	Super-speciality Hospital at Kozhikode, Kerala	Calculation & tabulation of areas of Surface Finishes on Hospital' Landscape Plan

Chief Architect Signature:

Office Seal:

<u>SL. NO.</u>	<u>PROJECT</u>	<u>WORKS</u>
1.	Hospital at Bellary, Karnataka	Solar Insolation Analysis Utility spaces' exposed wall area calculation w.r.t Building Orientation
2.	Hospital at Adilabad, Telangana	Solar Insolation Analysis External CFD Analysis
3.	Alliance Homes at Shamirpet, Hyderabad	Internal CFD Analysis
4.	Dining Hall at Nagpur, Maharashtra	Spatial Daylight Autonomy Analysis
5.	Director Bungalow at Kalyani, West Bengal	Spatial Daylight Autonomy Analysis
6.	Super-speciality Hospital at Warangal, Telangana	External CFD Analysis
7.	Super-speciality Hospital at Alappuzha, Kerala	Landscape Surface Finishes Demarcation
8.	Super-speciality Hospital at Kozhikode, Kerala	Landscape Surface Finishes Demarcation

INTRODUCTION

- Green Building Design Consultancy firm founded by Ar. Samhita M.
- Strives to promote “Green” as a lifestyle instead of a mere design approach.
- Emphasizes low-impact, sustainable design solutions for creating an energy-efficient design with minimum expenditures & better longevity.
- Undertakes green building rating commitments for various project typologies all over India.



HOW THE FIRM ADDRESSES SUSTAINABLE DESIGN

- **INTEGRATED DESIGN PROCESS**- holistic design from project infancy till execution.



- Involves multi-disciplinary professionals at subsequent design stages.
- Sensitizes to the local environmental context, constraints & incorporates them into the design.
- Bears in mind passive building design as a contributor to energy reduction.
- Considers precedent Energy Building Codes, globally accredited standards to help make informed decisions.
- Utilizes energy simulation software to arrive at an iterative optimized design solution.

SERVICES OFFERED

a) Project Compliance:



- Utilizes guidelines for making smart choices on equipment, materials and building configuration.

b) Energy Auditing:

- Perform preliminary project documentation & address identified energy related concerns.

c) Building Performance Simulation:

- Utilizes simulation data for performance analysis & prepares analysis report for client discussion.
- Collects client feedback report for design optimization.

d) Project Commissioning:

- Calibration of operational equipment on-site during occupancy to ensure efficient performance.
- Undertakes commissioning for both fresh and existing projects.
- Prioritizes achieving occupant thermal comfort levels in a budget-friendly, resource-economic manner.

- e) Conducts **nation-wide training programs** on implementing mandatory Energy Conservation Codes

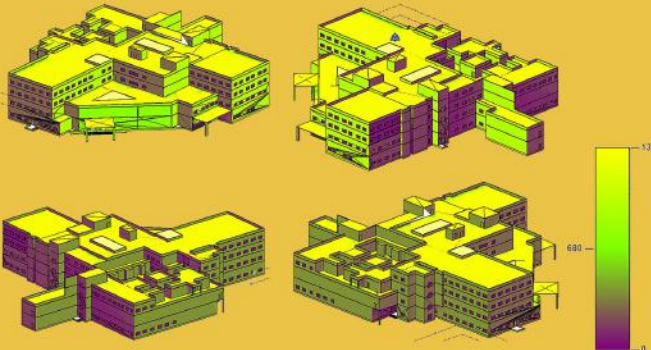
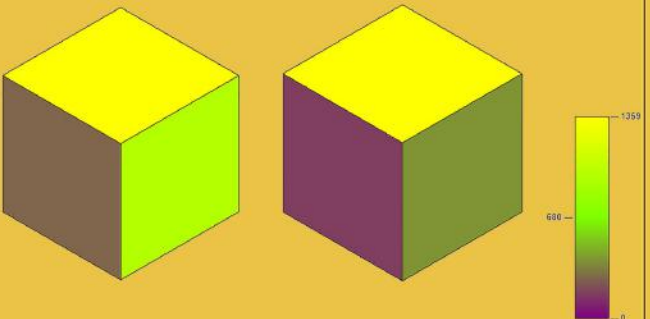
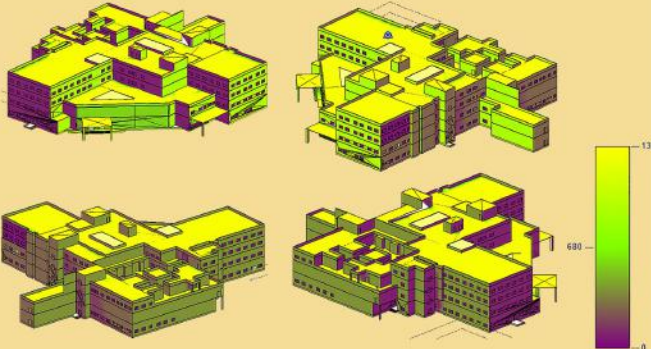
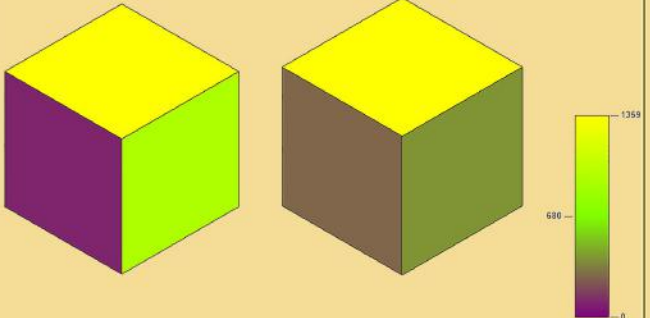
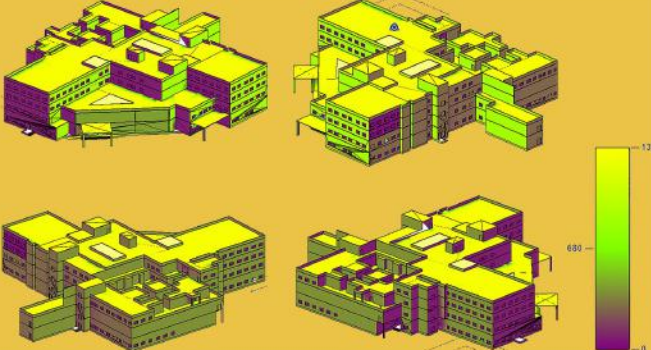
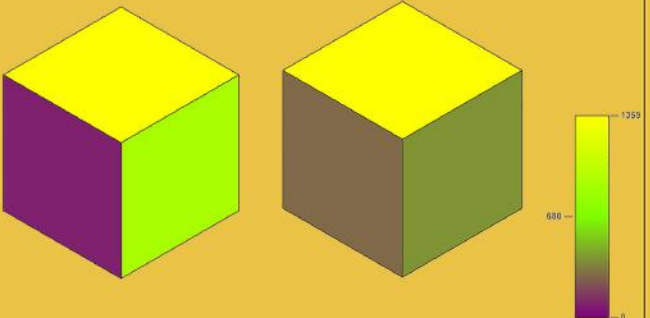
PERSONAL INVOLVEMENT IN FIRM'S PROJECTS

- Projects involved- Hospitals, Residence, Dining Hall
- Solar Insolation Analysis (Base vs Proposed Case Comparison)
- Calculation of exposed utility spaces with respect to the project
- Internal & External CFD Simulation
- Spatial Daylighting Autonomy Simulation
- Demarcation of surface materials in landscape plan

MONTHLY PEAK SOLAR INSOLATION ANALYSIS

SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m2)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
1	JANUARY		4,884 kWh for 15,912 m2 0.30 kWh/m2		5,283 kWh for 17,427 m2 0.30 kWh/m2
2	FEBRUARY		5,626 kWh for 15,912 m2 0.35 kWh/m2		5,959 kWh for 17,427 m2 0.34 kWh/m2
3	MARCH		6,157 kWh for 15,912 m2 0.38 kWh/m2		6,313 kWh for 17,427 m2 0.36 kWh/m2

MONTHLY PEAK SOLAR INSOLATION ANALYSIS

SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m2)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
4	APRIL		6,045 kWh for 15,912 m2 0.38 kWh/m2		6,087 kWh for 17,427 m2 0.35 kWh/m2
5	MAY		5,852 kWh for 15,912 m2 0.36 kWh/m2		5,887 kWh for 17,427 m2 0.34 kWh/m2
6	JUNE		5,539 kWh for 15,912 m2 0.34 kWh/m2		5,659 kWh for 17,427 m2 0.32 kWh/m2

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MONTHLY PEAK SOLAR INSOLATION ANALYSIS

SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m2)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
7	JULY		5,645 kWh for 15,912 m2 0.35 kWh/m2		5,704 kWh for 17,427 m2 0.33 kWh/m2
8	AUGUST		5,842 kWh for 15,912 m2 0.36 kWh/m2		5,842 kWh for 17,427 m2 0.34 kWh/m2
9	SEPTEMBER		6,038 kWh for 15,912 m2 0.38 kWh/m2		6,115 kWh for 17,427 m2 0.35 kWh/m2

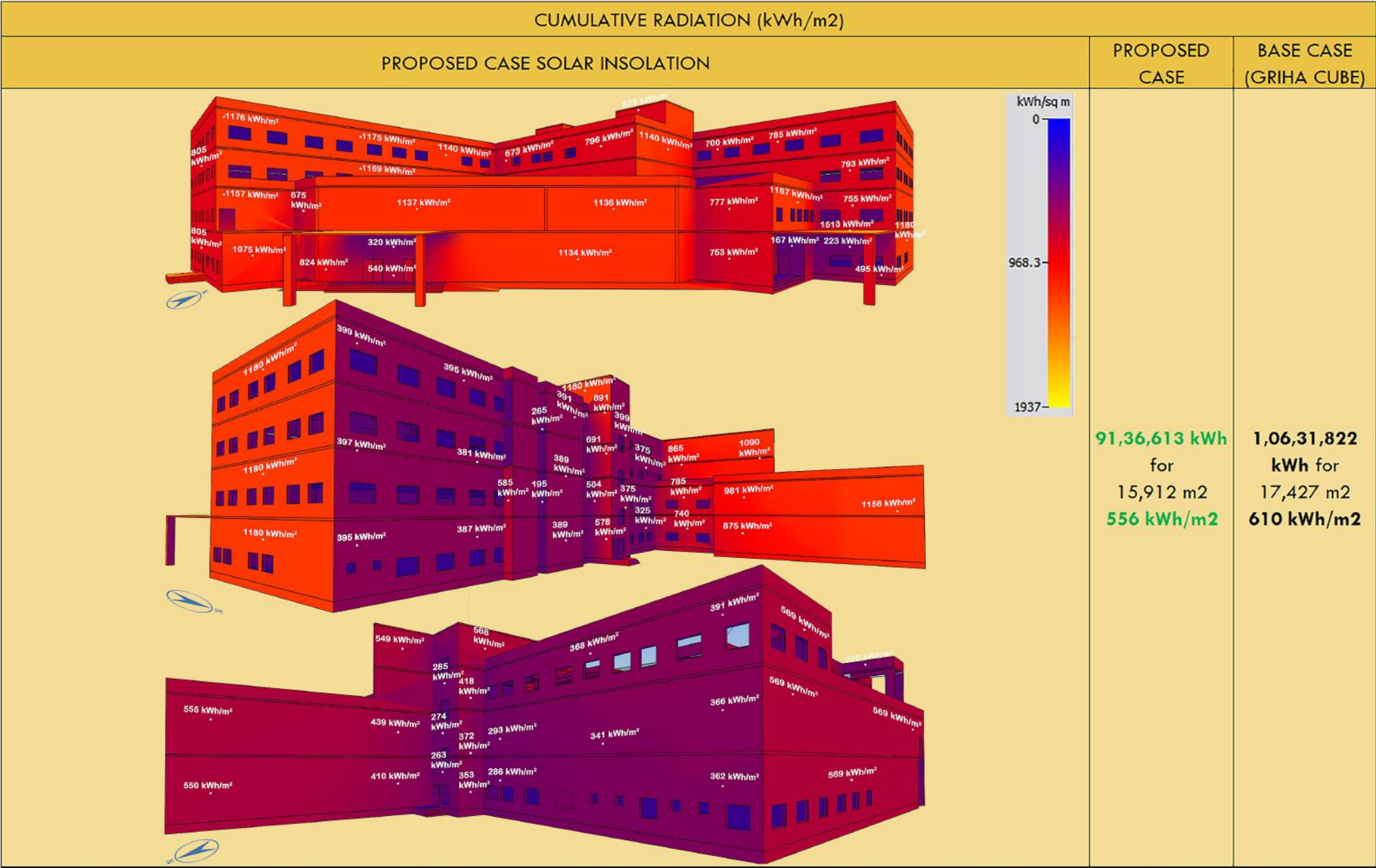
MONTHLY PEAK SOLAR INSOLATION ANALYSIS

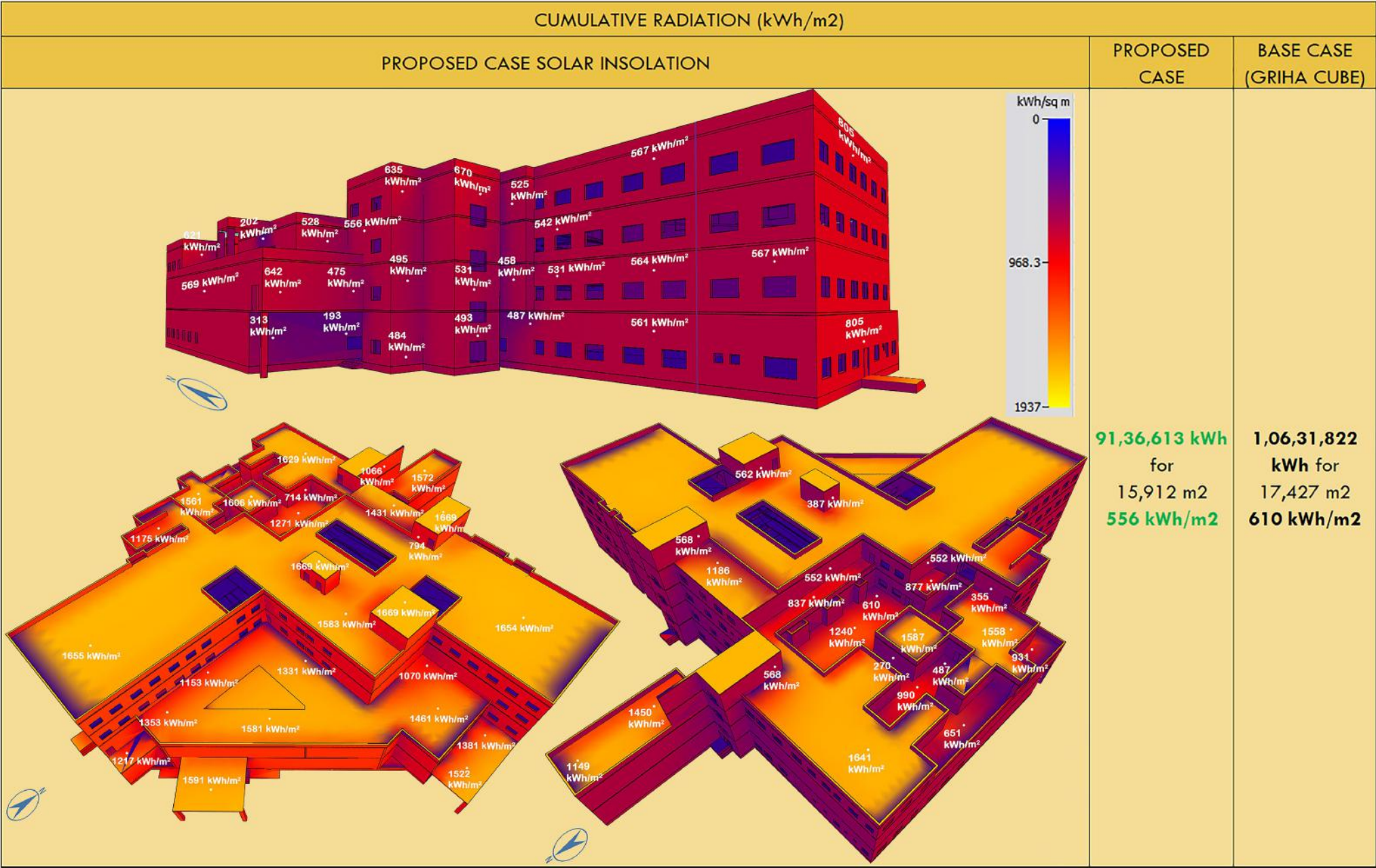
SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m2)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
10	OCTOBER		5,855 kWh for 15,912 m2 0.36 kWh/m2		6,137 kWh for 17,427 m2 0.35 kWh/m2
11	NOVEMBER		5,102 kWh for 15,912 m2 0.32 kWh/m2		5,490 kWh for 17,427 m2 0.32 kWh/m2
12	DECEMBER		4,444 kWh for 15,912 m2 0.28 kWh/m2		4,865 kWh for 17,427 m2 0.28 kWh/m2

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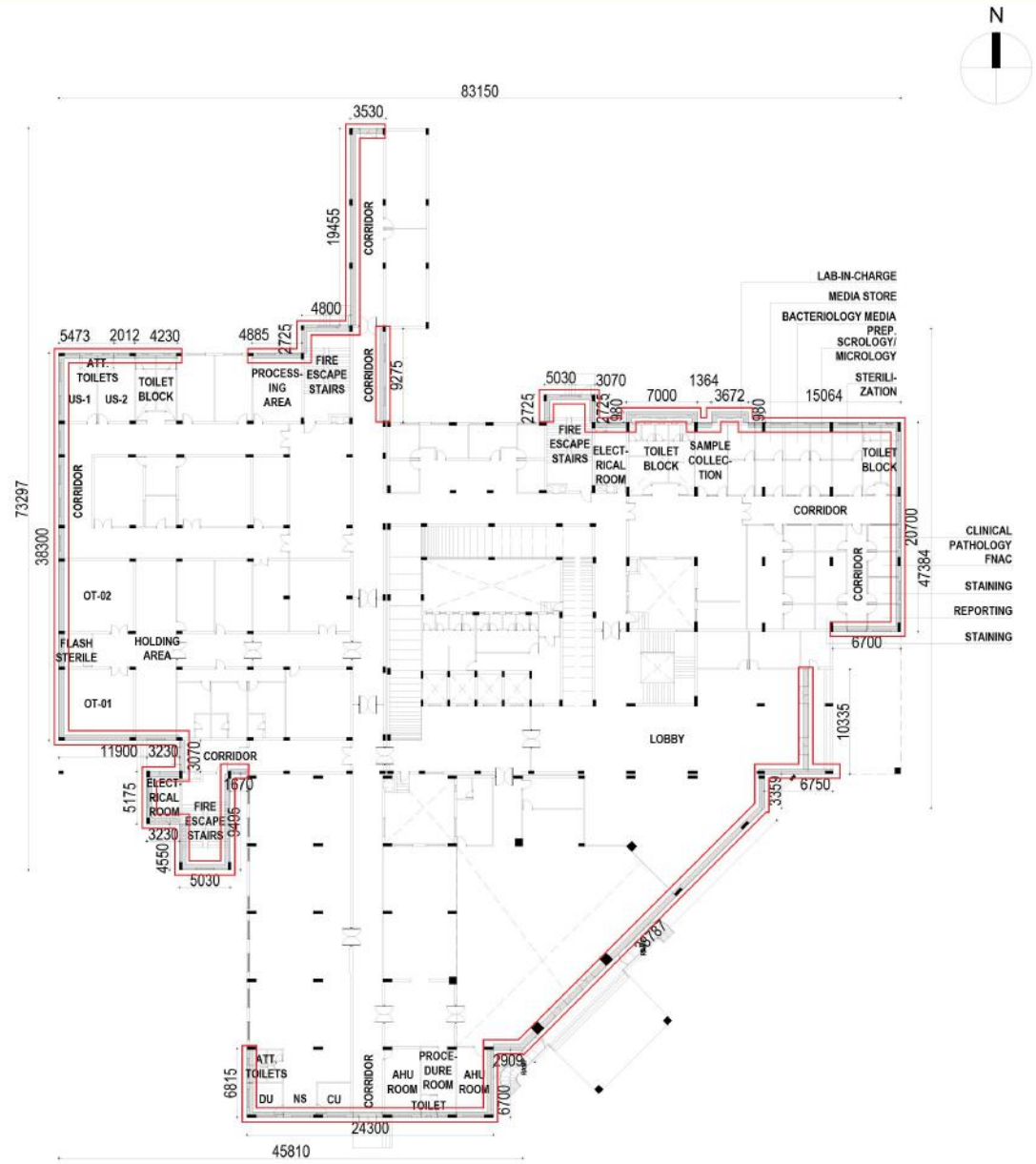
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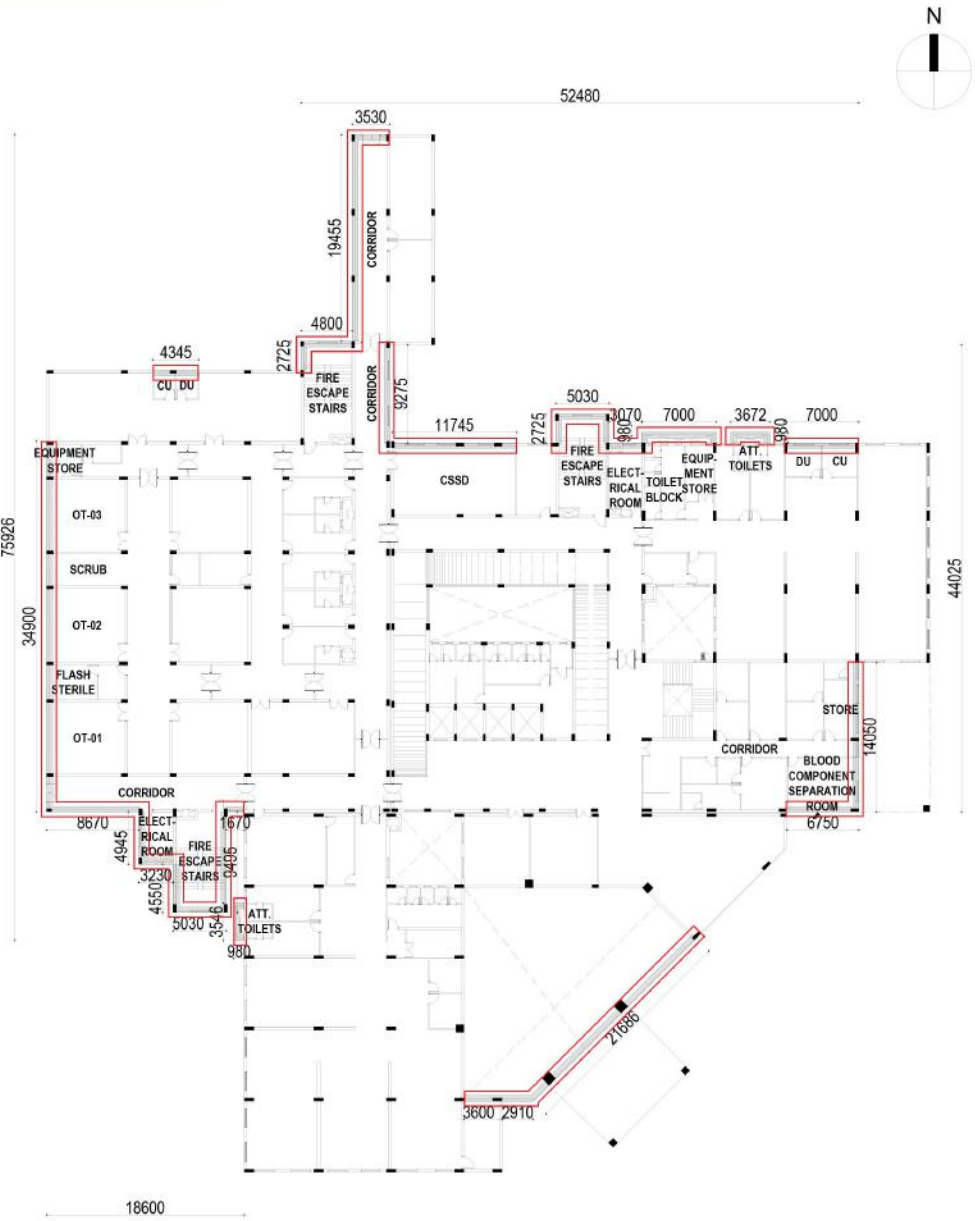




CALCULATION OF EXPOSED WALL SURFACE AREAS OF UTILITY SPACES

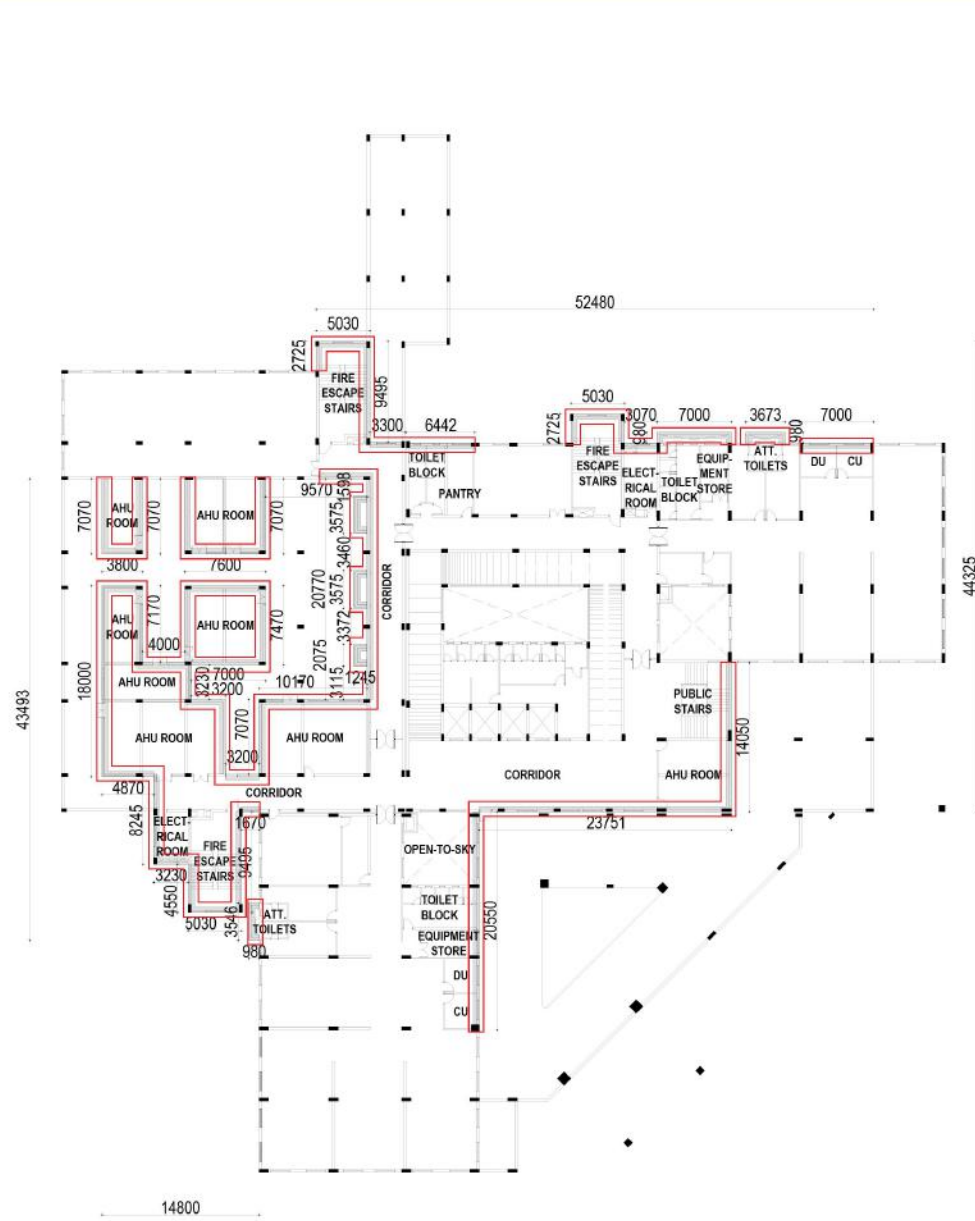


GROUND FLOOR PLAN
HIGHLIGHTING EXPOSED UTILITY SPACES

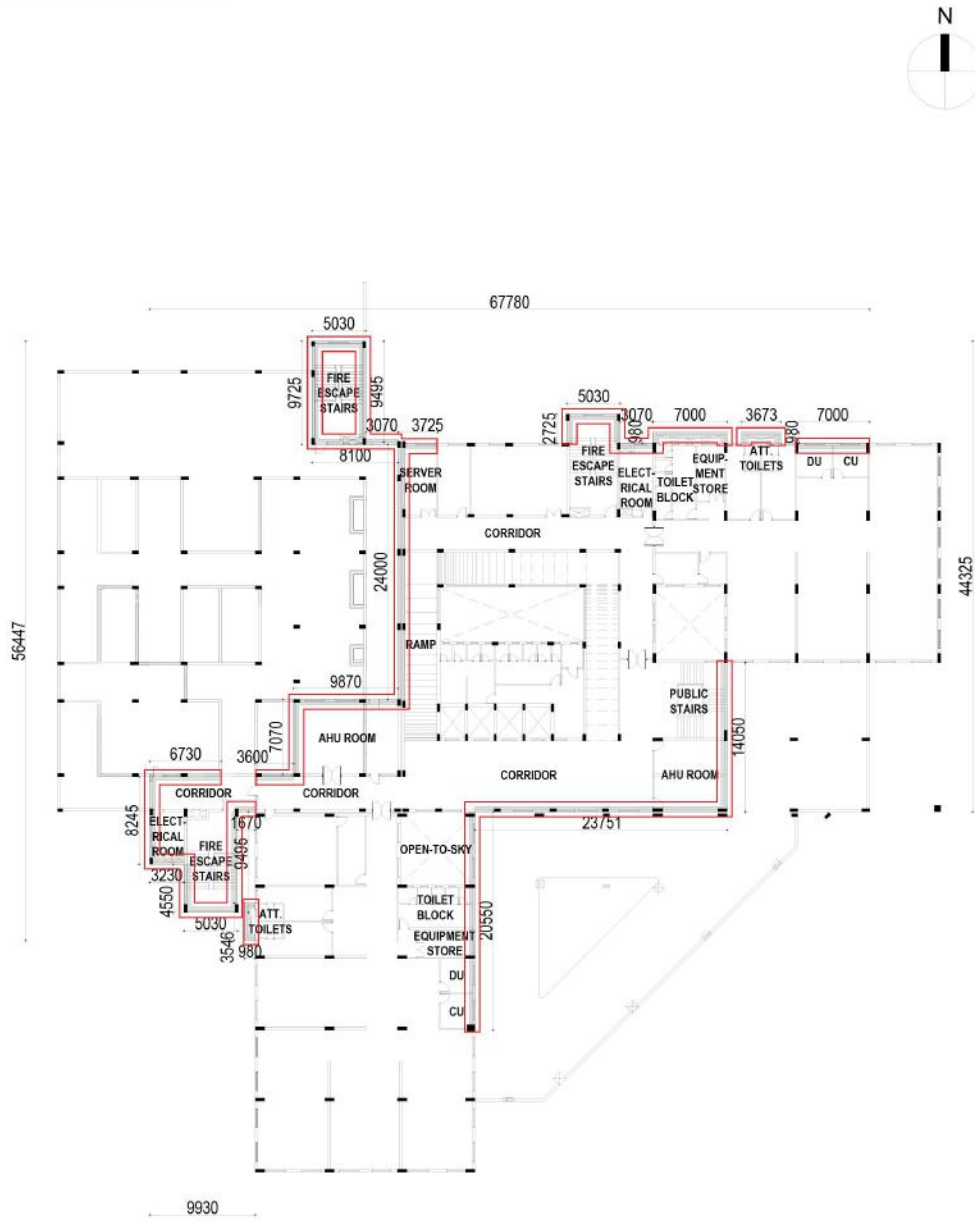


FIRST FLOOR PLAN
HIGHLIGHTING EXPOSED UTILITY SPACES

HOSPITAL AT BELLARY



SECOND FLOOR PLAN
HIGHLIGHTING EXPOSED UTILITY SPACES



THIRD FLOOR PLAN
HIGHLIGHTING EXPOSED UTILITY SPACES

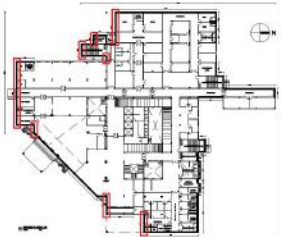
NORTH FAÇADE EXPOSED UTILITY SPACES

SL. NO.	FLOOR LEVEL	TOTAL LENGTH (M)	FLOOR HEIGHT (M)	TOTAL WALL SURFACE AREA (Sq. M)	NORTH FAÇADE							TOTAL LENGTH (M)	FLOOR HEIGHT (M)	WALL AREA ABUTTED BY UTILITY / SERVICES (Sq.M)
1	GROUND FLOOR	93	4.75	441.75	US-1	US-2	ATT.TOILETS	TOILET BLOCK	PROCESSING AREA	FIRE ESCAPE STAIRCASE	CORRIDOR	65.75	4.75	312.31
					2.13	2.01	3.35	4.23	4.89	4.8	3.53			
					FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	DUCT WALL-1	SAMPLE COLLECTION	DUCT WALL-2	LAB-IN-CHARGE	MEDIA STORE			
					5.03	3.07	7	1.36	3.67	0.64	2.81			
					BACTERIO- LOGY MEDIA PREP.	SCROLOGY /MICRO- BIOLOGY	STERILIZA- TION	TOILET BLOCK	ELECTRICAL ROOM	LOBBY ENTRANCE				
					2.6	2.3	2.91	3.79	3.23	2.4				
2	FIRST FLOOR	88.12	4.2	370.14	CU	DU	FIRE ESCAPE STAIRCASE	CORRIDOR	CSSD	FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	51.16	4.2	214.87
					2.23	2.11	4.8	3.53	11.74	5.03	3.07			
					DUCT WALL-1	DUCT WALL-2	DUCT WALL-3	DU	CU					
					7	3.67	0.98	3.44	3.56					
3	SECOND FLOOR	119.81	3.75	449.29	FIRE ESCAPE STAIRCASE	CORRIDOR	TOILET BLOCK	PANTRY	FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	DUCT WALL-1	77.22	3.75	289.57
					5.03	3.3	3.8	2.65	5.03	3.07	7			
					DUCT WALL-2	DUCT WALL-3	OUTDOOR AHU ROOMS	OUTDOOR AHU DUCTS	DU	CU				
					3.67	0.98	31.97	3.72	3.44	3.56				
4	THIRD FLOOR	80.35	3.75	301.31	CORRIDOR	CORRIDOR	OUTDOOR AHU ROOMS	FIRE ESCAPE STAIRCASE	EXTRA WALL BESIDES FIRE ESCAPE STAIRCASE	SERVER ROOM	FIRE ESCAPE STAIRCASE	58.39	3.75	218.96
					6.73	3.6	6.8	5.03	3.07	3.34	5.03			
					ELECTRICAL ROOM	DUCT WALL-1	DUCT WALL-2	DU	CU	DUCT WALL-3	CORRIDOR BESIDES OUT-DOOR AHU			
					3.07	7	3.67	3.44	3.56	0.98	3.07			
5	TERRACE FLOOR	17.66	3.75	66.22	LIFT CORE	FIRE ESCAPE STAIRCASE	PUBLIC STAIRCASE					17.66	3.75	66.22
					5.63	5.03	7							
GRAND TOTAL				1628.71										1101.93
% OF WALL AREA ABUTTING SERVICE ZONE														67.65%

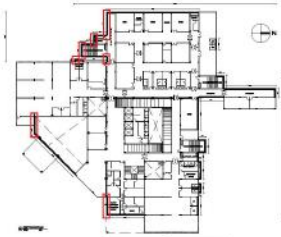


SOUTH FACADE EXPOSED UTILITY SPACES

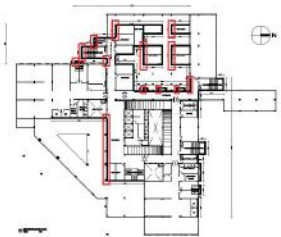
SL. NO.	FLOOR LEVEL	TOTAL LENGTH (M)	FLOOR HEIGHT (M)	TOTAL WALL SURFACE AREA (Sq. M)	SOUTH FAÇADE							TOTAL LENGTH (M)	FLOOR HEIGHT (M)	WALL AREA ABUTTED BY UTILITY/ SERVICES (Sq.M)
1	GROUND FLOOR	66.72	4.75	316.92	OT-01	HOLDING AREA	ELECTRICAL ROOM	FIRE ESCAPE STAIRCASE	CORRIDOR	DU	NS	62.49	4.75	296.83
					7.6	4.3	3.23	5.03	1.67	3.6	3.25			
					CU	CORRIDOR	AHU ROOM	TOILET	PROCEDURE ROOM	AHU ROOM	LOBBY			
					3.55	3	3.77	1.61	1.92	3.6	2.91 + 6.75			
					STAINING	CORRIDOR	REPORTING							
					1.37	2	3.33							
2	FIRST FLOOR	64.47	4.2	270.77	CORRIDOR	ELECTRICAL ROOM	FIRE ESCAPE STAIRCASE	CORRIDOR	DUCT WALL-3	LOBBY	BLOOD COMPONENT SEPARATION ROOM	32.84	4.2	137.93
					8.67	3.23	5.03	1.67	0.98	6.51	6.75			
3	SECOND FLOOR	119.82	3.75	449.32	OUTDOOR AHU ROOMS	ELECTRICAL ROOM	FIRE ESCAPE STAIRCASE	CORRIDOR	DUCT WALL-3	CORRIDOR	AHU ROOM	66.22	3.75	248.32
					23.27	3.23	5.03	1.67	0.98	16.75	7			
					OUTDOOR AHU DUCTS	CORRIDOR								
					3.72	4.57								
4	THIRD FLOOR	83.56	3.75	313.35	ELECTRICAL ROOM	FIRE ESCAPE STAIRCASE	CORRIDOR	DUCT WALL-3	CORRIDOR	AHU ROOM	FIRE ESCAPE STAIRCASE	42.76	3.75	160.35
					3.23	5.03	1.67	0.98	16.75	7	5.03			
					EXTRA WALL BESIDES FIRE ESCAPE STAIR-									
					3.07									
5	TERRACE FLOOR	17.66	3.75	66.22	LIFT CORE	FIRE ESCAPE STAIRCASE	PUBLIC STAIRCASE					17.66	3.75	66.22
					5.63	5.03	7							
GRAND TOTAL				1416.58										909.65
% OF WALL AREA ABUTTING SERVICE ZONE														64.21%



GROUND FLOOR KEY PLAN



FIRST FLOOR KEY PLAN



SECOND FLOOR KEY PLAN



THIRD FLOOR KEY PLAN



TERRACE FLOOR KEY PLAN

EAST FACADE EXPOSED UTILITY SPACES

SL. NO.	FLOOR LEVEL	TOTAL LENGTH (M)	FLOOR HEIGHT (M)	TOTAL WALL SURFACE AREA (Sq. M)	EAST FAÇADE							TOTAL LENGTH (M)	FLOOR HEIGHT (M)	WALL AREA ABUTTED BY UTILITY/ SERVICES (Sq.M)
1	GROUND FLOOR	121.8	4.75	578.55	AHU ROOM	LOBBY	REPORTING	STAINING	FNAC	CLINICAL PATHOLOGY	CORRIDOR	98.33	4.75	467.06
					6.7	47.48	2.73	2.6	2.6	2.7	2.77			
					TOILET BLOCK	DUCT WALL- 1 & 2	FIRE ESCAPE STAIRCASE	CORRIDOR	FIRE ESCAPE STAIRCASE					
					7.3	1.96	2.72	9.27	9.5					
2	FIRST FLOOR	121.8	4.2	511.56	LOBBY	BLOOD COMPONENT SEPARATION ROOM	CORRIDOR	STORE	DUCT WALL- 1 & 2	FIRE ESCAPE STAIRCASE	CORRIDOR	59.19	4.2	248.6
					21.69	5.2	1.5	7.35	1.96	2.72	9.27			
					FIRE ESCAPE STAIRCASE									
					9.5									
3	SECOND FLOOR	131.46	3.75	492.98	CU	DU	EQUIPMENT STORE	TOILET BLOCK	OPEN-TO-SKY WALL	AHU ROOM	PUBLIC STAIRCASE	97.37	3.75	365.14
					3.56	3.26	2.69	4.13	6.92	6.93	7.12			
					DUCT WALL- 1 & 2	FIRE ESCAPE STAIRCASE	FIRE ESCAPE STAIRCASE	FIRE ESCAPE STAIRCASE	OUTDOOR AHU ROOMS					
					1.96	2.72	9.5	9.5	39.08					
4	THIRD FLOOR	92.38	3.75	346.42	CU	DU	EQUIPMENT STORE	TOILET BLOCK	OPEN-TO-SKY WALL	AHU ROOM	PUBLIC STAIRCASE	58.29	3.75	218.58
					3.56	3.26	2.69	4.13	6.92	6.93	7.12			
					DUCT WALL- 1 & 2	FIRE ESCAPE STAIRCASE	FIRE ESCAPE STAIRCASE	FIRE ESCAPE STAIRCASE						
					1.96	2.72	9.5	9.5						
5	TERRACE FLOOR	20.76	3.75	77.85	LIFT CORE	FIRE ESCAPE STAIRCASE	PUBLIC STAIRCASE					20.76	3.75	77.85
					3.46	9.72	7.58							
GRAND TOTAL				2007.36										1377.23
% OF WALL AREA ABUTTING SERVICE ZONE														68.61%



GROUND FLOOR KEY PLAN



FIRST FLOOR KEY PLAN



SECOND FLOOR KEY PLAN



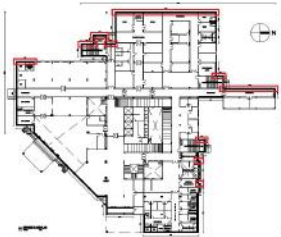
THIRD FLOOR KEY PLAN



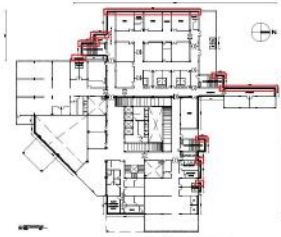
TERRACE FLOOR KEY PLAN

WEST FACADE EXPOSED UTILITY SPACES

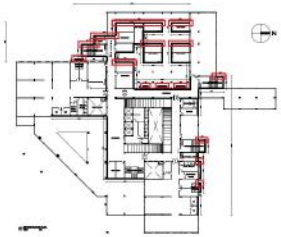
SL. NO.	FLOOR LEVEL	TOTAL LENGTH (M)	FLOOR HEIGHT (M)	TOTAL WALL SURFACE AREA (Sq. M)	WEST FAÇADE							TOTAL LENGTH (M)	FLOOR HEIGHT (M)	WALL AREA ABUTTED BY UTILITY / SERVICES (Sq.M)	
1	GROUND FLOOR	111.9	4.75	531.52	DU	ATTACHED TOILETS	FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	CORRIDOR	OT-01	FLASH STERILE	84.76	4.75	402.61	
					3.43	3.38	4.55	5.18	3.07	7.3	3.23				
					OT-02	CORRIDOR	US-1	FIRE ESCAPE STAIRCASE	CORRIDOR	FIRE ESCAPE STAIRCASE	DUCT WALL- 1 & 2				
					7.47	13.3	7	2.72	19.45	2.72	1.96				
2	FIRST FLOOR	111.9	4.2	469.98	DUCT WALL- 3	FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	CORRIDOR	OT-01	FLASH STERILE	OT-02	74.79	4.2	314.12	
					3.55	4.55	4.94	3.3	7.3	3.23	7.47				
					SCRUB	OT-03	EQUIPMENT STORE	FIRE ESCAPE STAIRCASE	CORRIDOR	FIRE ESCAPE STAIRCASE	DUCT WALL- 1 & 2				
					3	7.3	3.3	2.72	19.45	2.72	1.96				
3	SECOND FLOOR	131.51	3.75	493.16	DUCT WALL- 3	FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	CORRIDOR	OUTDOOR AHU ROOMS	OUTDOOR AHU DUCTS	CORRIDOR	90.87	3.75	340.76	
					3.55	4.55	5.17	3.07	46.38	9.21	11.54				
					FIRE ESCAPE STAIRCASE	FIRE ESCAPE STAIRCASE	DUCT WALL- 1 & 2								
					2.72	2.72	1.96								
4	THIRD FLOOR	92.46	3.75	346.72	DUCT WALL- 3	FIRE ESCAPE STAIRCASE	ELECTRICAL ROOM	CORRIDOR	OUTDOOR AHU ROOMS	RAMP, CORRIDOR, SERVER	FIRE ESCAPE STAIRCASE	62.04	3.75	232.65	
					3.55	4.55	5.17	3.3	7.07	24	9.72				
					FIRE ESCAPE STAIRCASE	DUCT WALL- 1 & 2									
					2.72	1.96									
5	TERRACE FLOOR	20.76	3.75	77.85	LIFT CORE	FIRE ESCAPE STAIRCASE	PUBLIC STAIRCASE					20.76	3.75	77.85	
					3.46	9.72	7.58								
GRAND TOTAL				1919.23											1368
% OF WALL AREA ABUTTING SERVICE ZONE															71.27%



GROUND FLOOR KEY PLAN



FIRST FLOOR KEY PLAN



SECOND FLOOR KEY PLAN

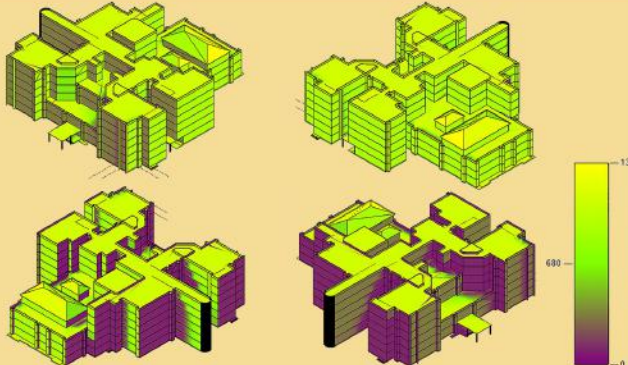
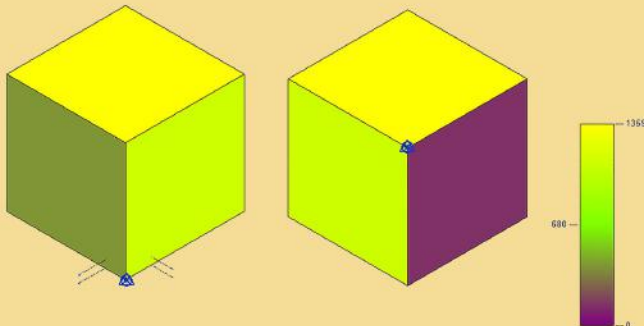
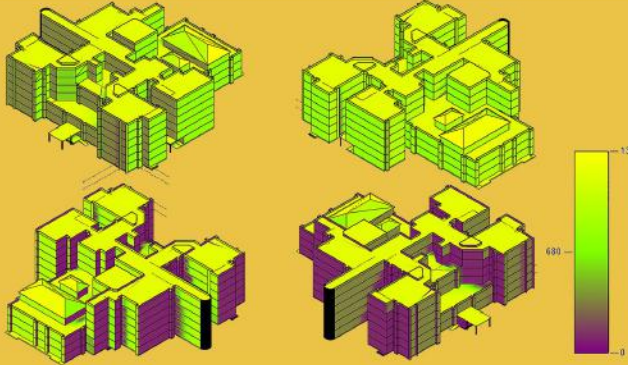
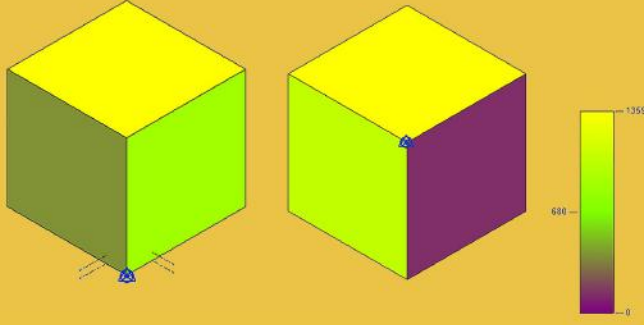
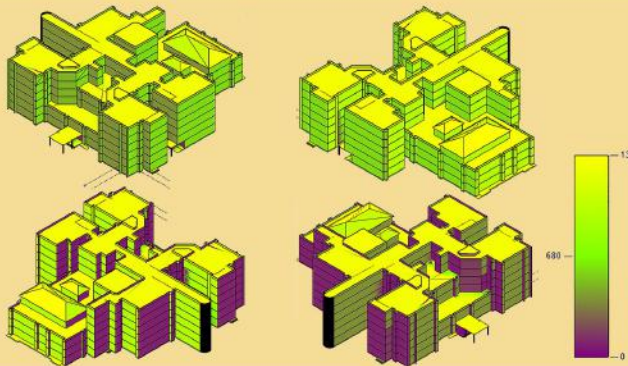
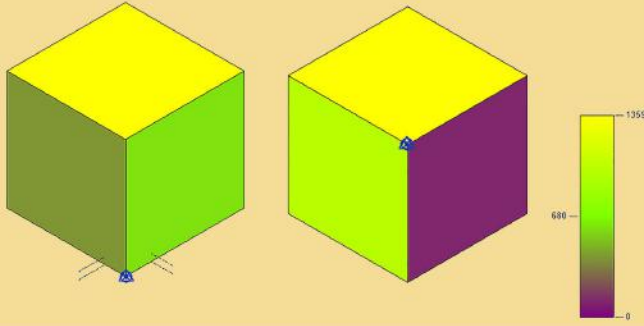


THIRD FLOOR KEY PLAN

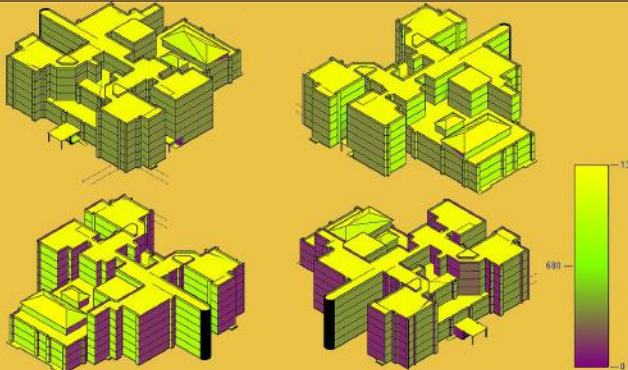
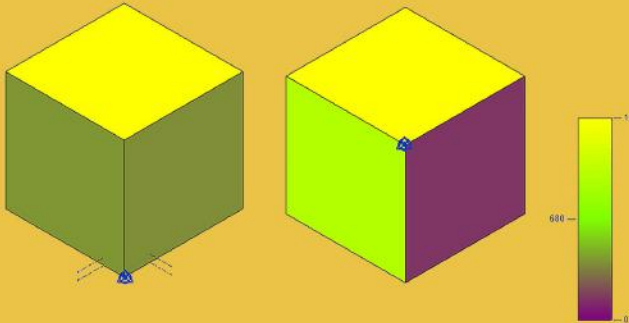
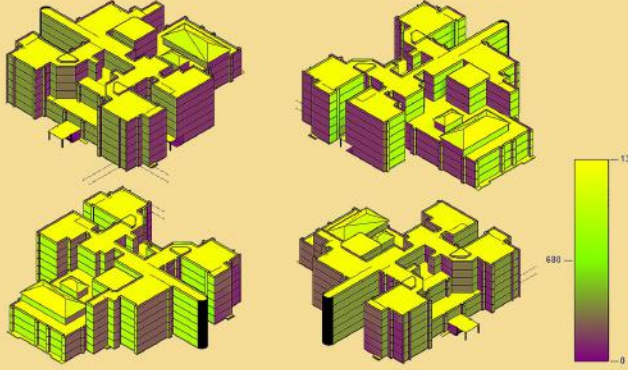
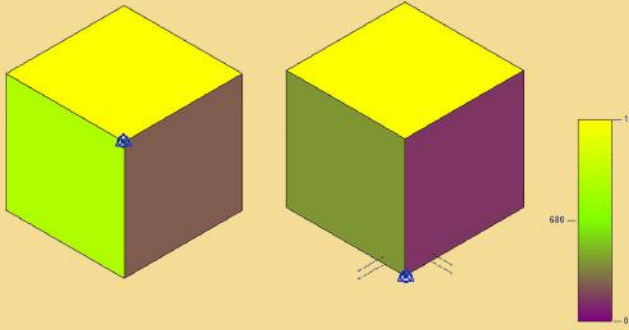
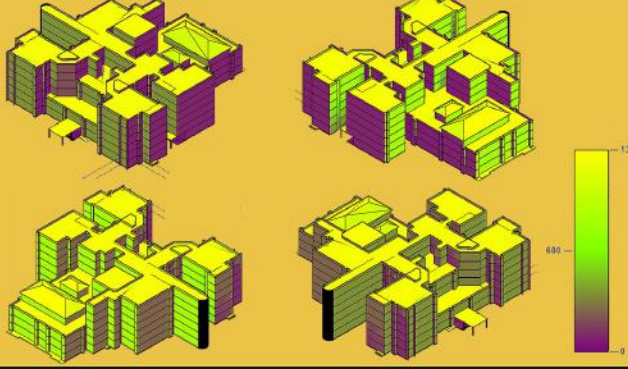
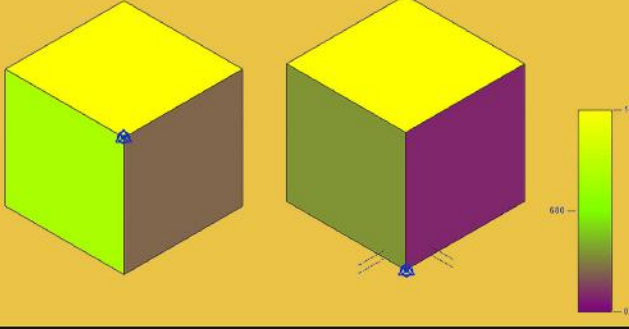


TERRACE FLOOR KEY PLAN

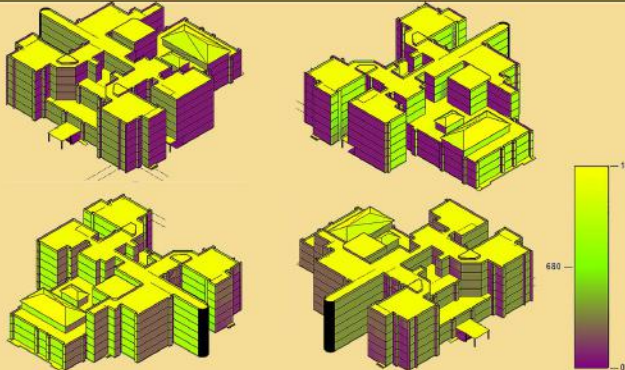
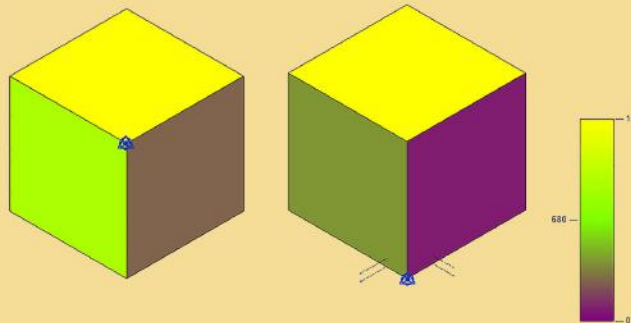
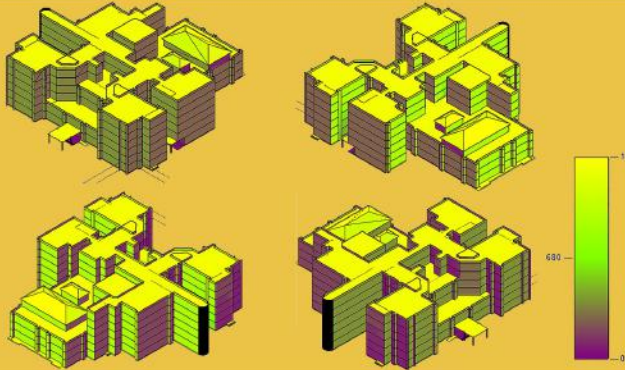
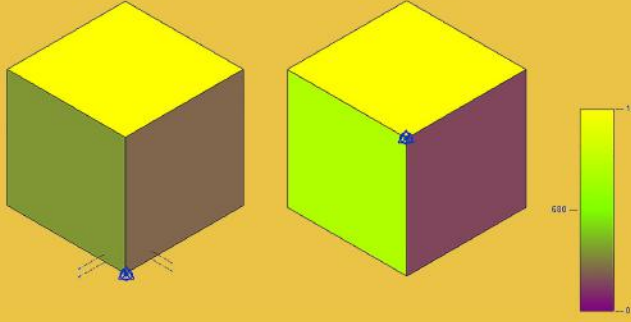
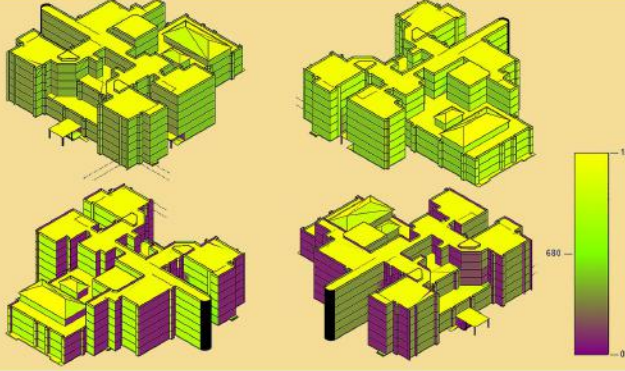
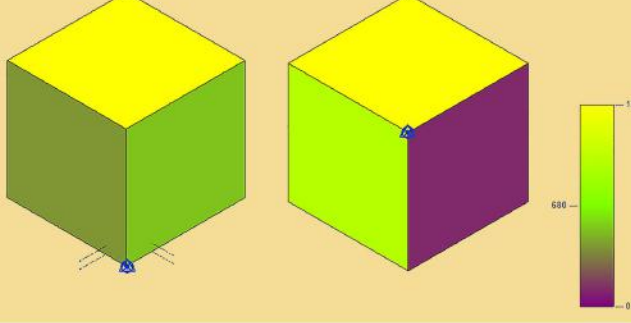
MONTHLY PEAK SOLAR INSOLATION ANALYSIS

SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m2)					
		PROPOSED CASE SOLAR INSOLATION		PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)	
1	JANUARY			6,030 kWh for 27,038 m2 0.22 kWh/m2			7,539 kWh for 27,031 m2 0.28 kWh/m2
2	FEBRUARY			7,357 kWh for 27,038 m2 0.27 kWh/m2			8,751 kWh for 27,031 m2 0.32 kWh/m2
3	MARCH			8,682 kWh for 27,038 m2 0.32 kWh/m2			9,586 kWh for 27,031 m2 0.35 kWh/m2

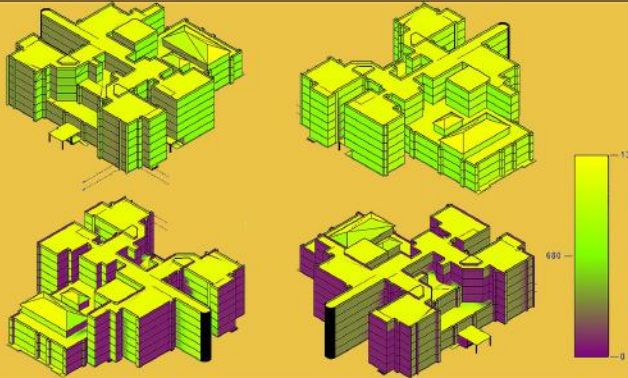
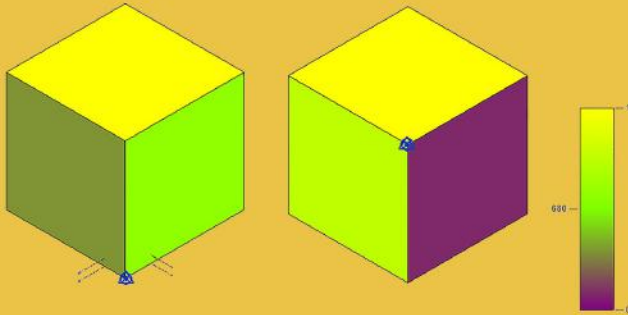
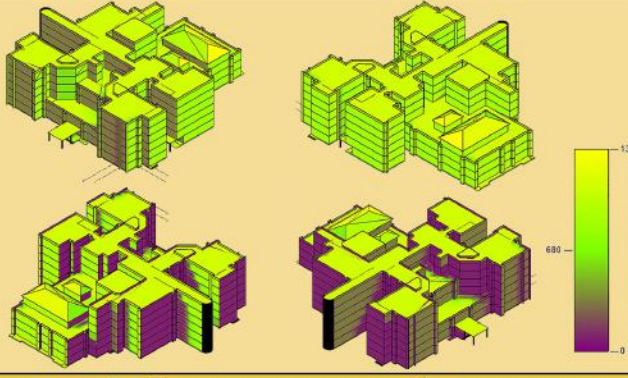
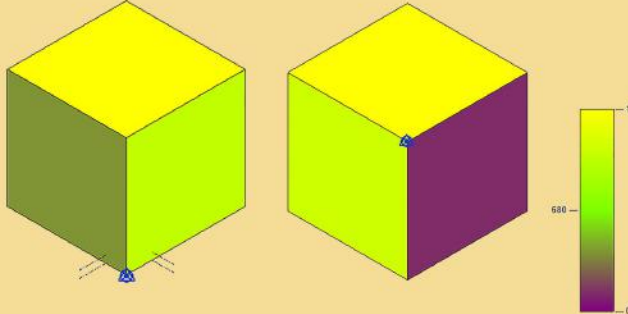
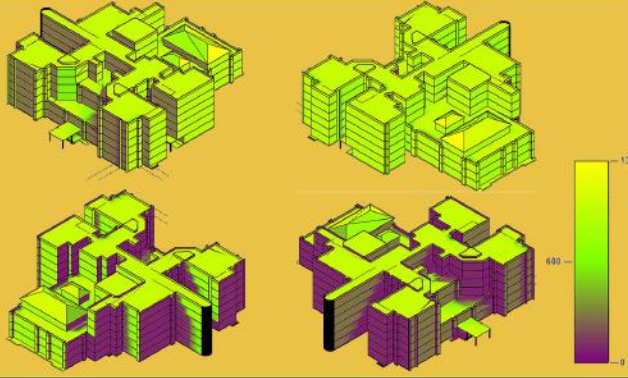
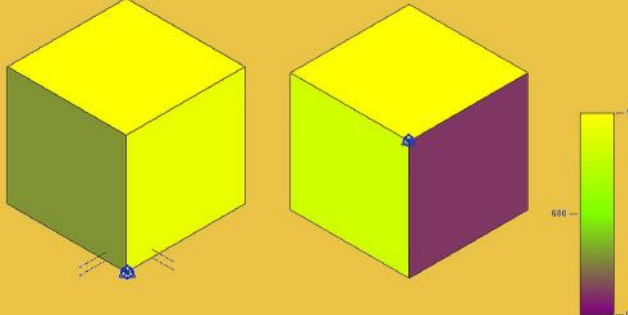
MONTHLY PEAK SOLAR INSOLATION ANALYSIS

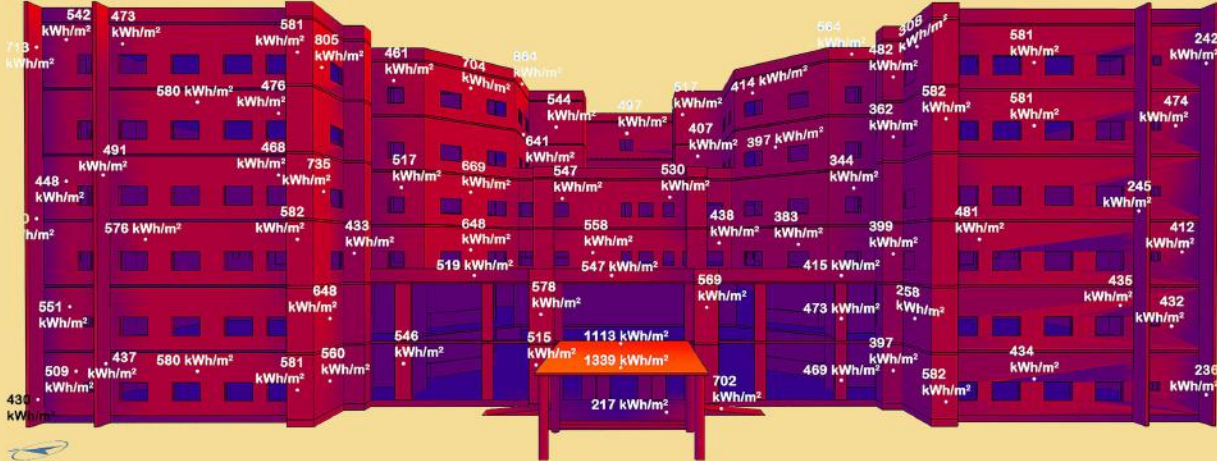
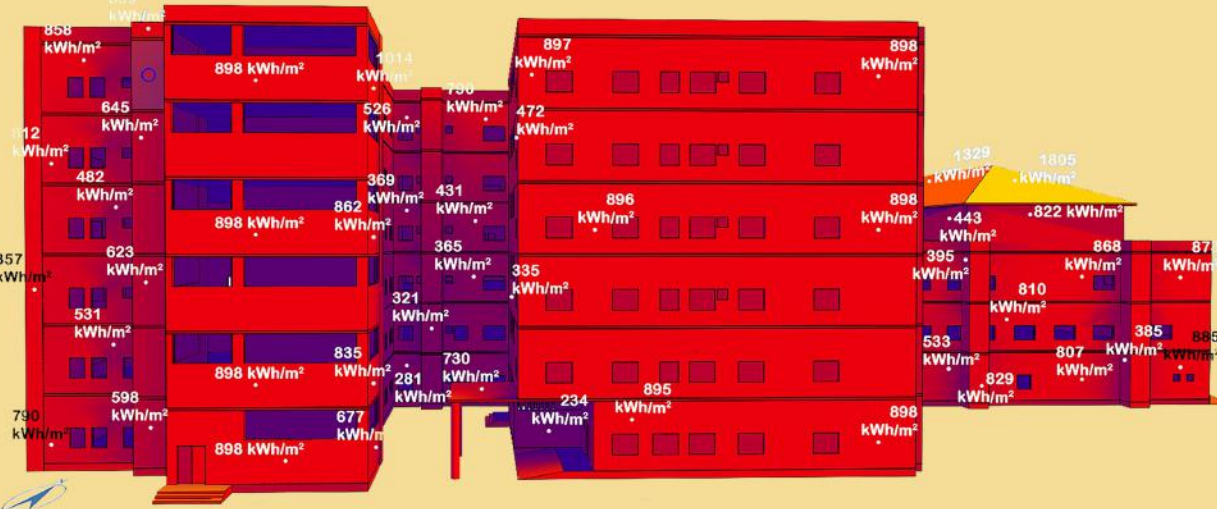
SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m ²)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
4	APRIL		9,246 kWh for 27,038 m ² 0.34 kWh/m ²		9,531 kWh for 27,031 m ² 0.35 kWh/m ²
5	MAY		9,103 kWh for 27,038 m ² 0.34 kWh/m ²		9,163 kWh for 27,031 m ² 0.34 kWh/m ²
6	JUNE		8,716 kWh for 27,038 m ² 0.32 kWh/m ²		8,905 kWh for 27,031 m ² 0.33 kWh/m ²

MONTHLY PEAK SOLAR INSOLATION ANALYSIS

SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m2)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
7	JULY		8,822 kWh for 27,038 m2 0.33 kWh/m2		8,822 kWh for 27,031 m2 0.33 kWh/m2
8	AUGUST		9,093 kWh for 27,038 m2 0.34 kWh/m2		9,226 kWh for 27,031 m2 0.34 kWh/m2
9	SEPTEMBER		8,907 kWh for 27,038 m2 0.33 kWh/m2		9,566 kWh for 27,031 m2 0.35 kWh/m2

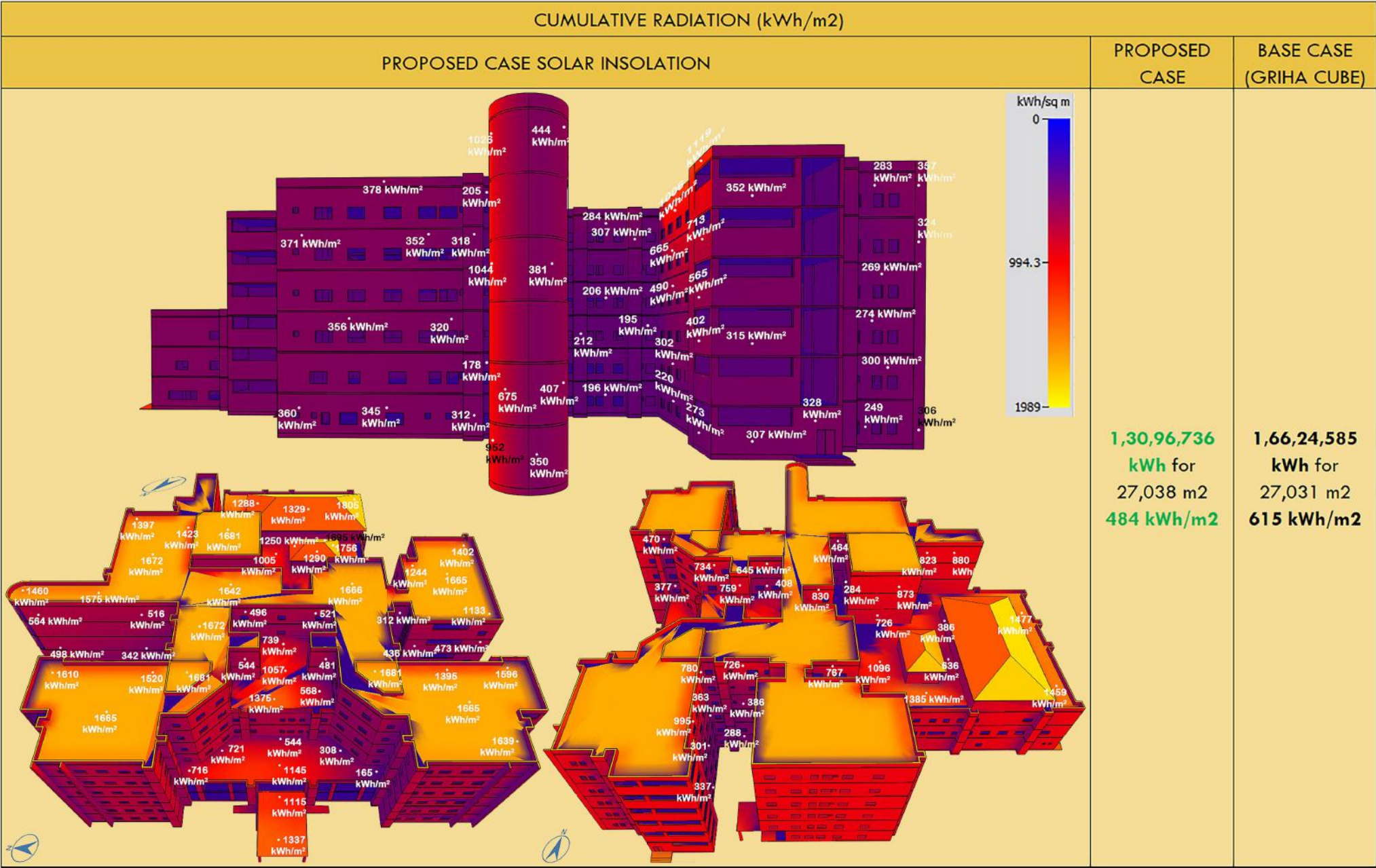
MONTHLY PEAK SOLAR INSOLATION ANALYSIS

SL. NO.	MONTH	MONTHLY PEAK RADIATION (kWh/m ²)			
		PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE SOLAR INSOLATION	BASE CASE (GRIHA CUBE)
10	OCTOBER		7,753 kWh for 27,038 m ² 0.29 kWh/m ²		9,018 kWh for 27,031 m ² 0.33 kWh/m ²
11	NOVEMBER		6,345 kWh for 27,038 m ² 0.23 kWh/m ²		7,809 kWh for 27,031 m ² 0.29 kWh/m ²
12	DECEMBER		5,373 kWh for 27,038 m ² 0.20 kWh/m ²		6,873 kWh for 27,031 m ² 0.25 kWh/m ²

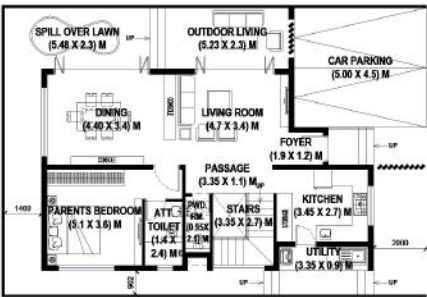
CUMULATIVE RADIATION (kWh/m2)		
PROPOSED CASE SOLAR INSOLATION	PROPOSED CASE	BASE CASE (GRIHA CUBE)
 1,30,96,736 kWh for 27,038 m2 484 kWh/m2  1,66,24,585 kWh for 27,031 m2 615 kWh/m2		

HOSPITAL AT ADDILABAD

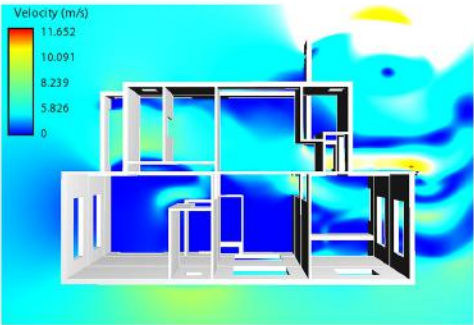
CUMULATIVE RADIATION (kWh/m ²)		PROPOSED CASE	BASE CASE (GRIHA CUBE)
PROPOSED CASE SOLAR INSOLATION The image displays two 3D architectural models of a building facade, illustrating cumulative solar radiation. The top model shows a larger building with a flat roof, while the bottom model shows a smaller building with a sloped roof. Both models are color-coded to represent radiation levels, with a color scale on the right ranging from 0 (blue) to 1989 (red). The top model's radiation values range from 1084 to 1214 kWh/m², while the bottom model's values range from 301 to 1214 kWh/m². A color scale on the right indicates the radiation intensity, with 0 being blue and 1989 being red. The scale has a midpoint at 994.3.		1,30,96,736 kWh for 27,038 m² 484 kWh/m²	1,66,24,585 kWh for 27,031 m² 615 kWh/m²



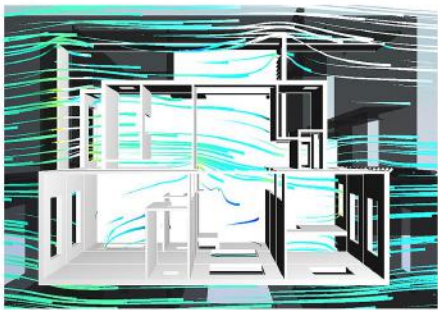
TYPE-1 EAST FACING VILLAS



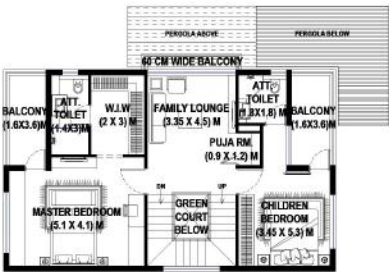
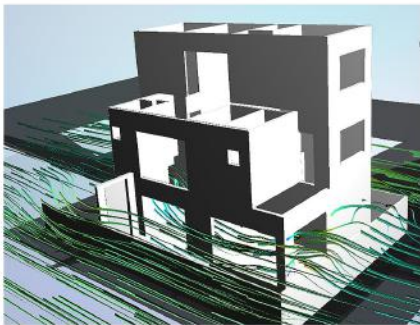
GROUND FLOOR PLAN



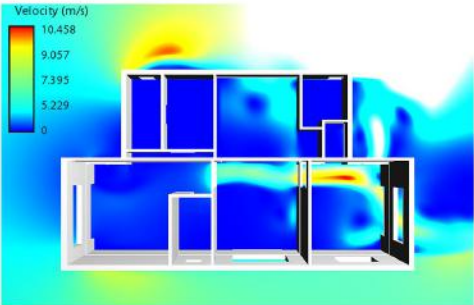
AIR FLOW PLANE



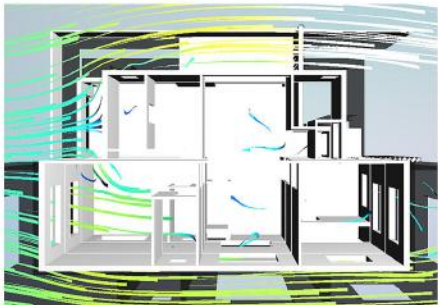
AIR FLOW PATTERN



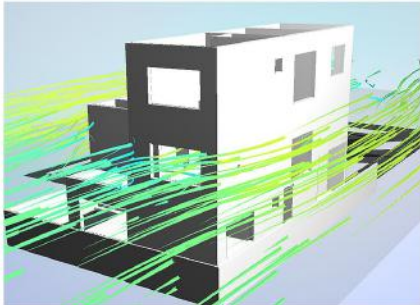
FIRST FLOOR PLAN



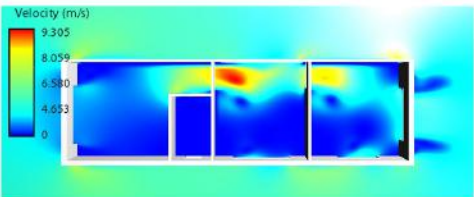
AIR FLOW PLANE



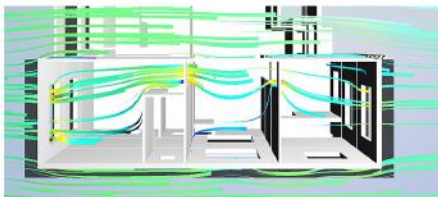
AIR FLOW PATTERN



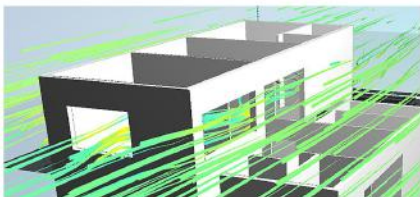
SECOND FLOOR PLAN



AIR FLOW PLANE



AIR FLOW PATTERN



The floor plan shows the following rooms and areas:

- SPILL OVER LAWN**: (5.9 X 2.9) M
- OUTDOOR LIVING**: (4.8 X 2.9) M
- CAR PARKING**: (5 X 5) M
- DINING**: (4.3 X 3.4) M
- LIVING ROOM**: (4.8 X 3.4) M
- FOYER**: (2.35 X 1.3) M
- PASSAGE**: (3.35 X 1.8) M
- KITCHEN**: (3.95 X 3) M
- GUEST BEDROOM**: (4.6 X 4.5) M
- ATT. TOILET**: (2.7 X 1.5) M
- BED CHAM.**: (3.05 X 1.8) M
- STAIRS**: (3.35 X 2.9) M
- MAID ROOM**: (1.95X1.4) M
- UTILITY**: (1.9X1.5) M

Other features include a staircase labeled "DOWN", a door labeled "UP", and a dimension of 1000 units indicated on the left side.



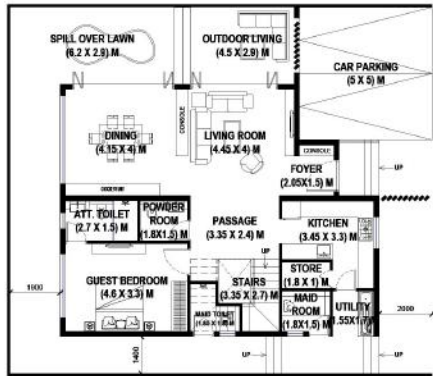
Velocity (m/s)

10.581
9.164
7.482
5.291
0

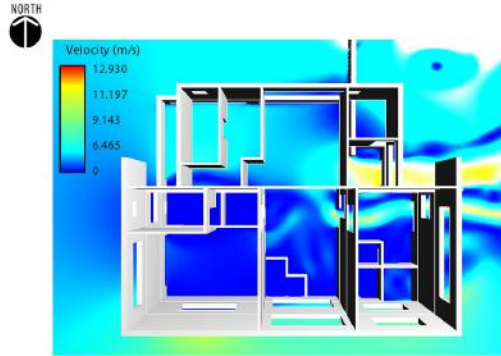
The image shows a velocity contour plot for a multi-chambered system. A color bar on the left indicates velocity in m/s, with values ranging from 0 (blue) to 10.581 (red). The plot shows high-velocity regions (yellow/red) concentrated in the upper right chamber and the central connecting passage, with lower velocities (blue) in the other chambers and the lower portions of the central passage.



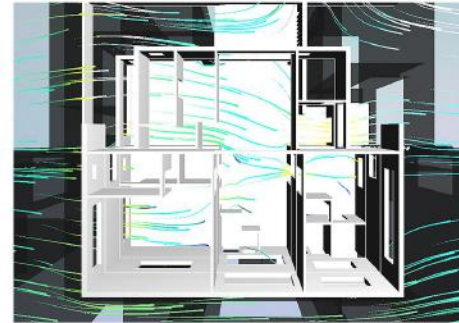
TYPE-3 EAST FACING VILLAS



GROUND FLOOR PLAN



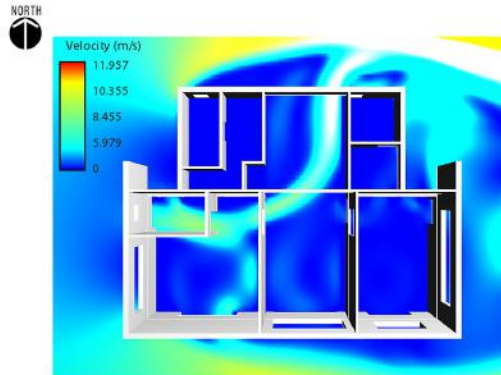
AIR FLOW PLANE



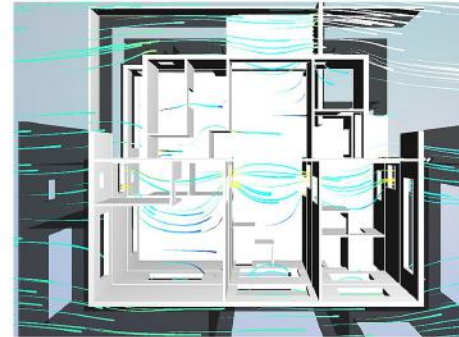
AIR FLOW PATTERN



FIRST FLOOR PLAN



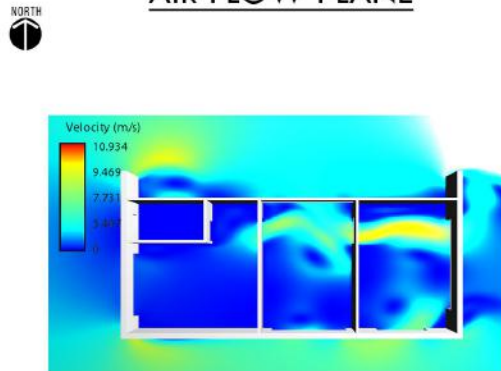
AIR FLOW PLANE



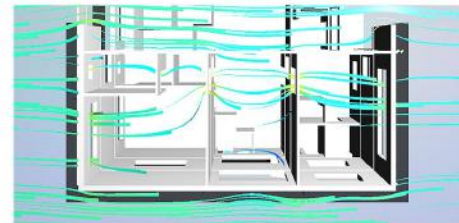
AIR FLOW PATTERN



SECOND FLOOR PLAN

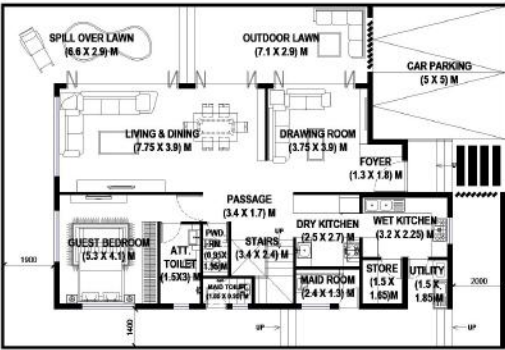


AIR FLOW PLANE

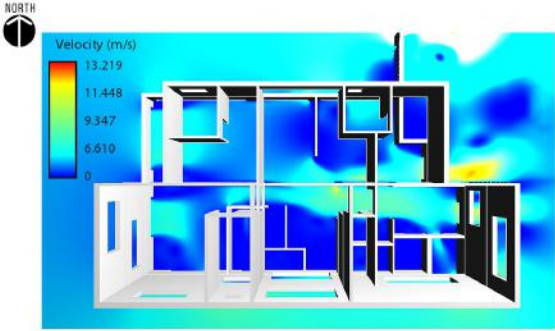


AIR FLOW PATTERN

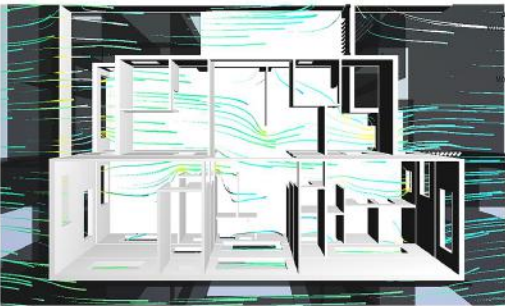
TYPE-4 EAST FACING VILLAS



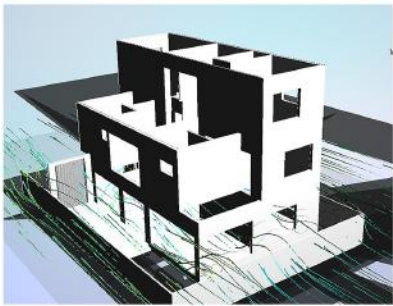
GROUND FLOOR PLAN



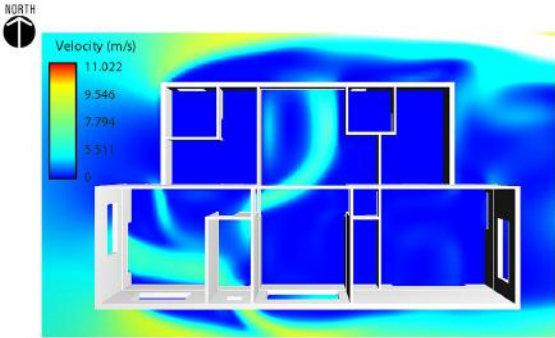
AIR FLOW PLANE



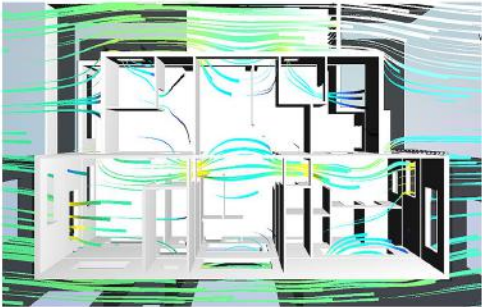
AIR FLOW PATTERN



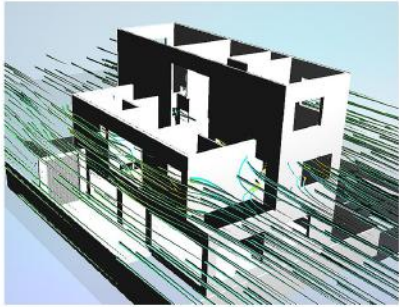
FIRST FLOOR PLAN



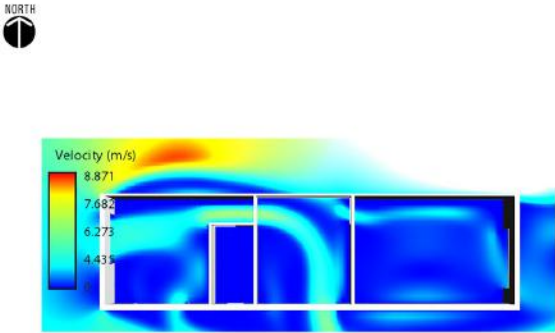
AIR FLOW PLANE



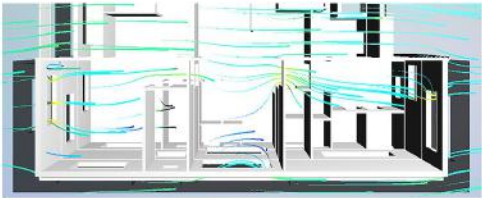
AIR FLOW PATTERN



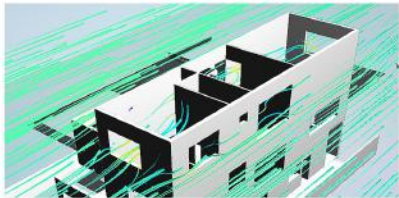
SECOND FLOOR PLAN



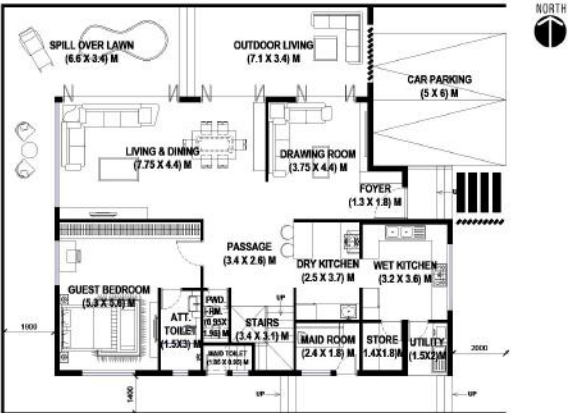
AIR FLOW PLANE



AIR FLOW PATTERN



TYPE-5 EAST FACING VILLAS



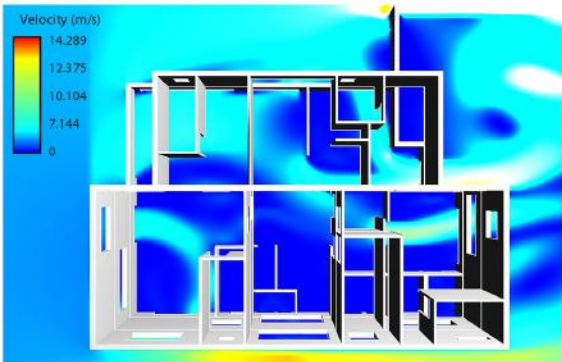
GROUND FLOOR PLAN



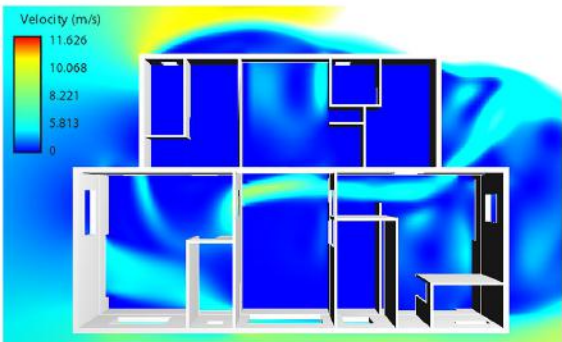
FIRST FLOOR PLAN



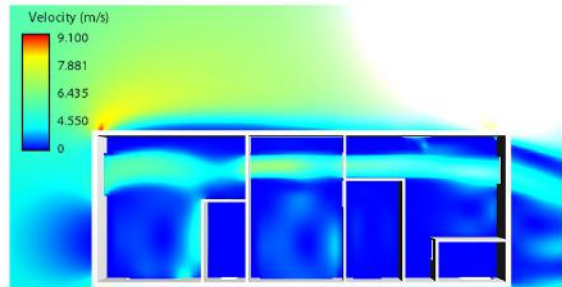
SECOND FLOOR PLAN



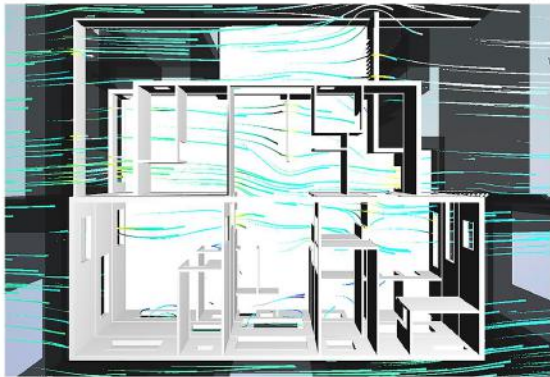
AIR FLOW PLANE



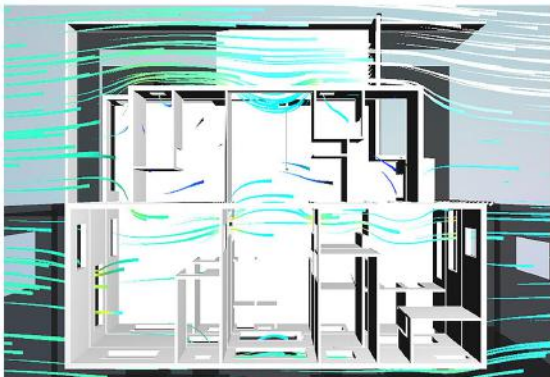
AIR FLOW PLANE



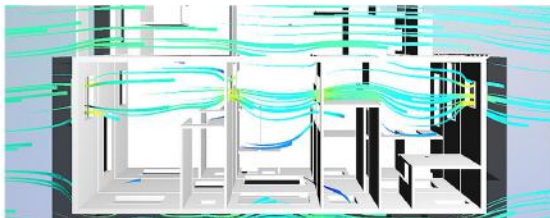
AIR FLOW PLANE



AIR FLOW PATTERN

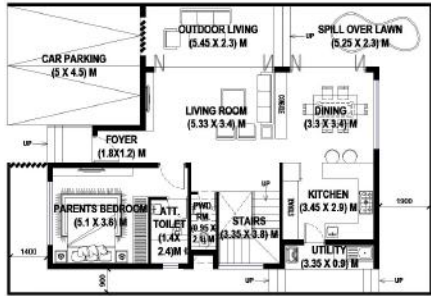


AIR FLOW PATTERN

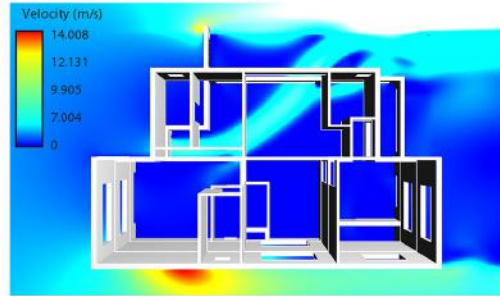


AIR FLOW PATTERN

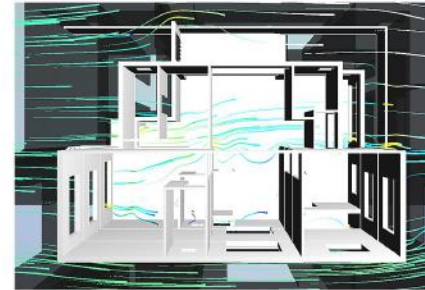
TYPE-1 WEST FACING VILLAS



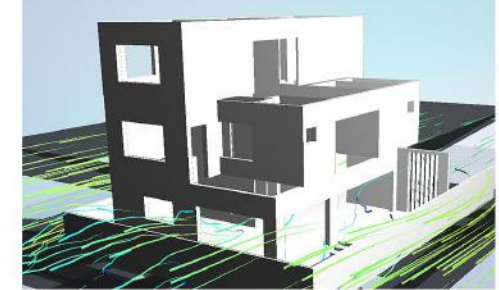
GROUND FLOOR PLAN



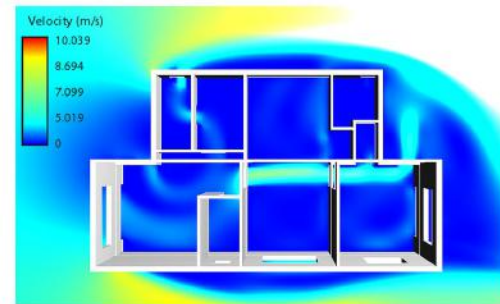
AIR FLOW PLANE



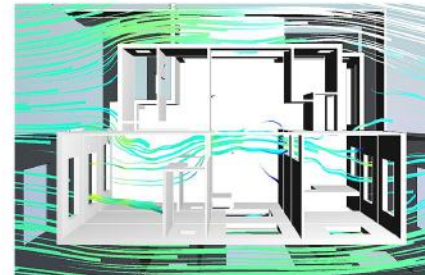
AIR FLOW PATTERN



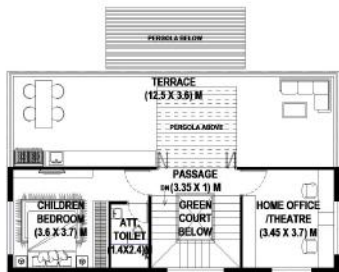
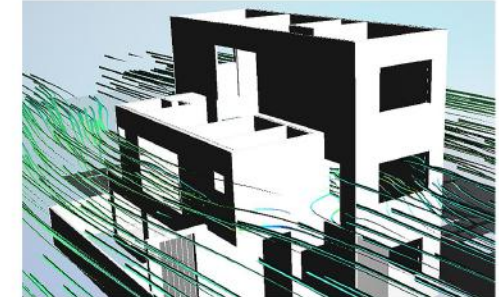
FIRST FLOOR PLAN



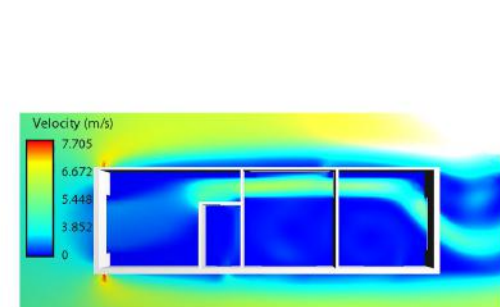
AIR FLOW PLANE



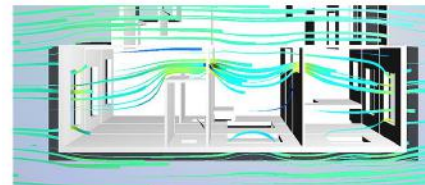
AIR FLOW PATTERN



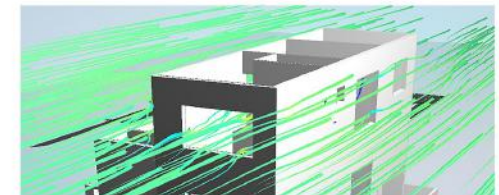
SECOND FLOOR PLAN



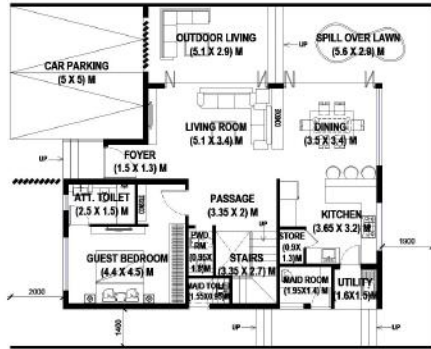
AIR FLOW PLANE



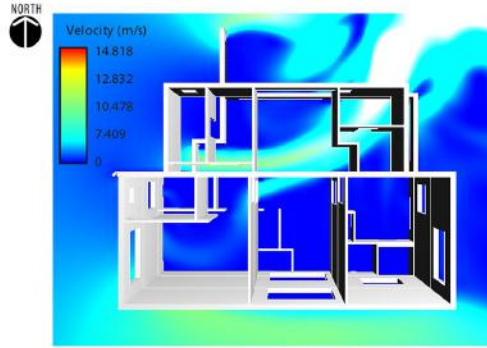
AIR FLOW PATTERN



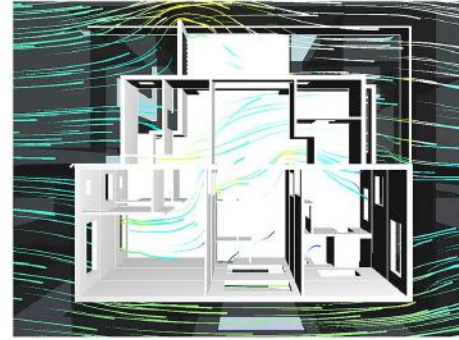
TYPE-2 WEST FACING VILLAS



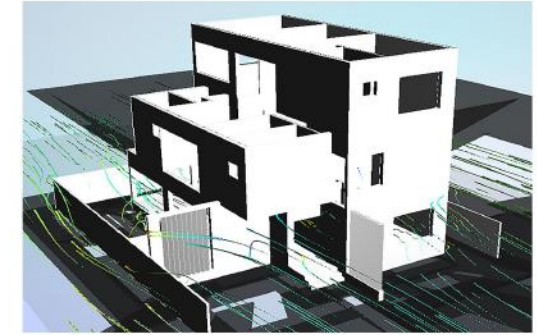
GROUND FLOOR PLAN



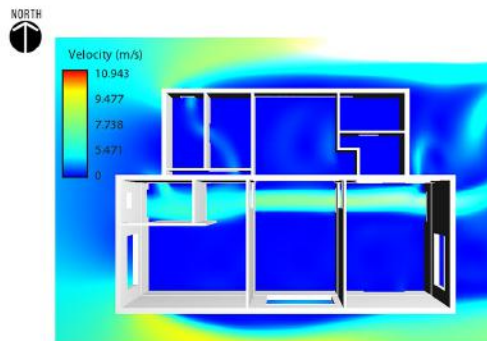
AIR FLOW PLANE



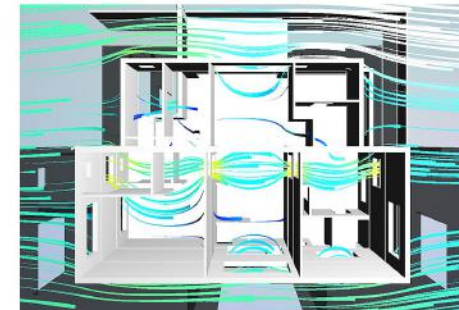
AIR FLOW PATTERN



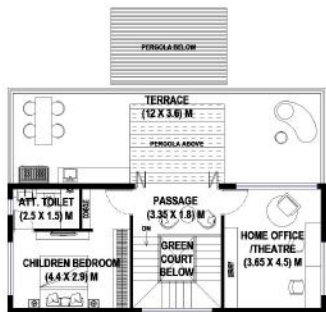
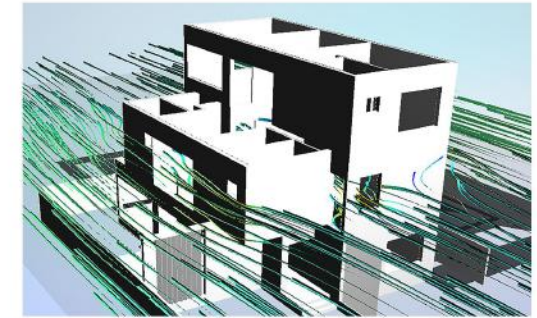
FIRST FLOOR PLAN



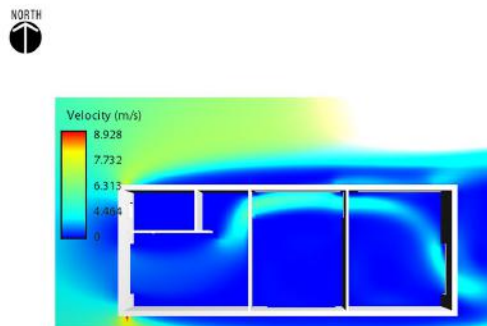
AIR FLOW PLANE



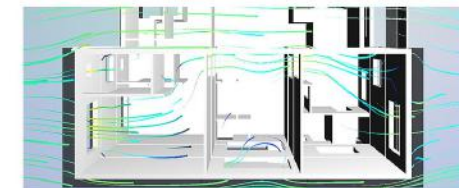
AIR FLOW PATTERN



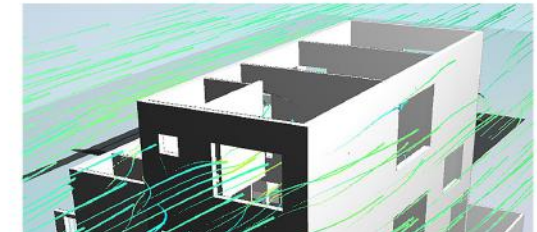
SECOND FLOOR PLAN



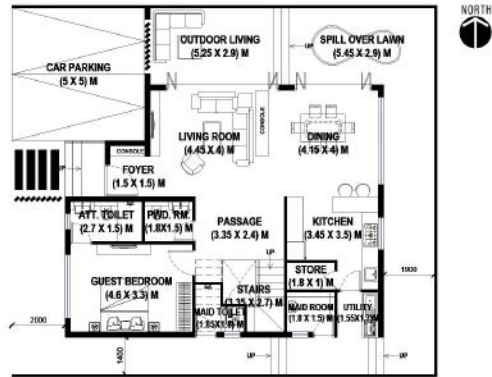
AIR FLOW PLANE



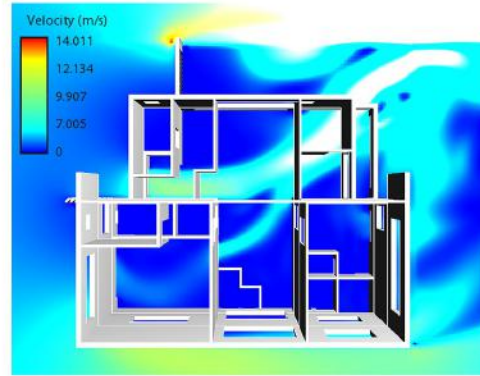
AIR FLOW PATTERN



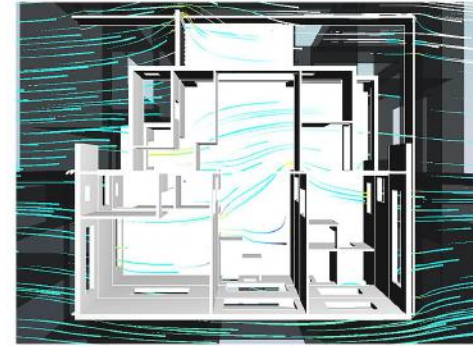
TYPE-3 WEST FACING VILLAS



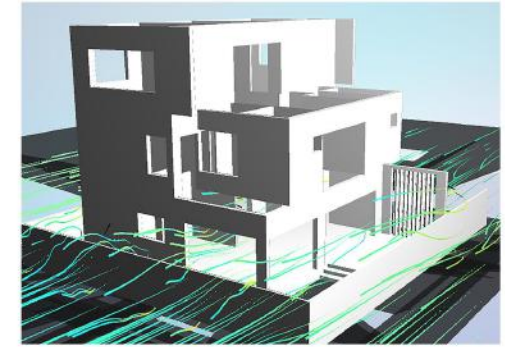
GROUND FLOOR PLAN



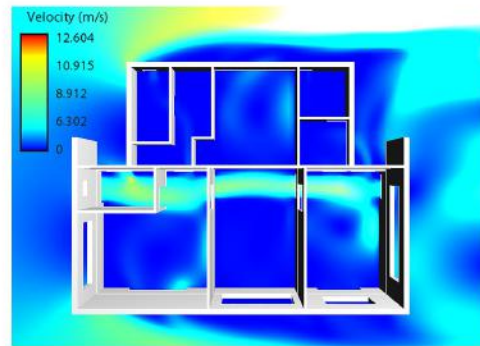
AIR FLOW PLANE



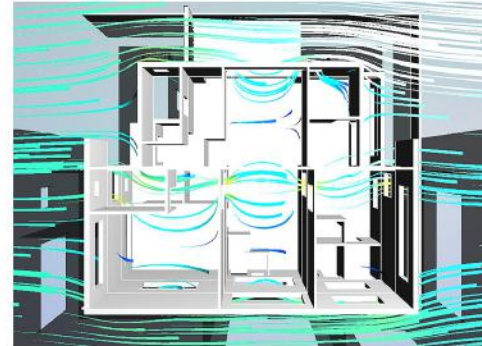
AIR FLOW PATTERN



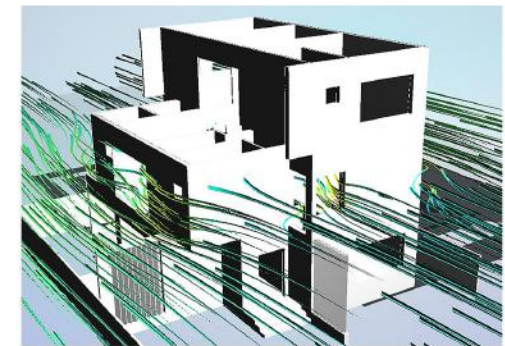
FIRST FLOOR PLAN



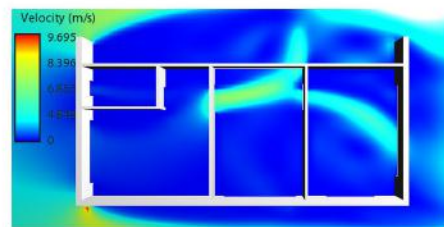
AIR FLOW PLANE



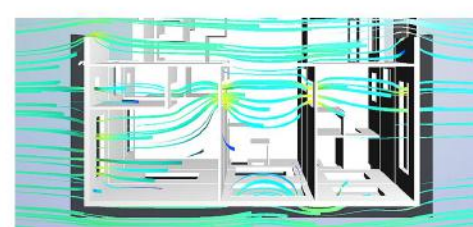
AIR FLOW PATTERN



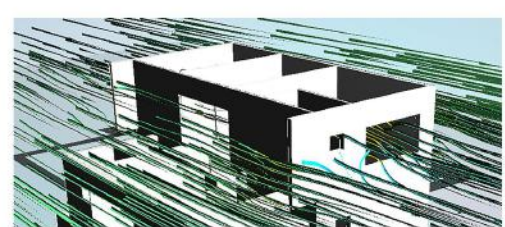
SECOND FLOOR PLAN



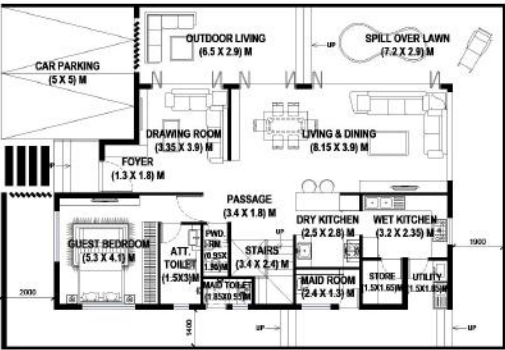
AIR FLOW PLANE



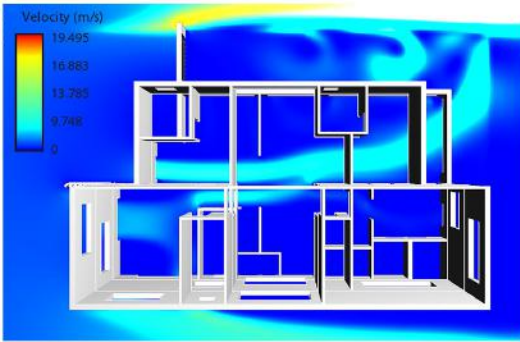
AIR FLOW PATTERN



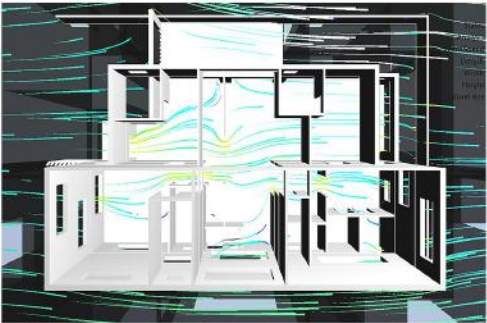
TYPE-4 WEST FACING VILLAS



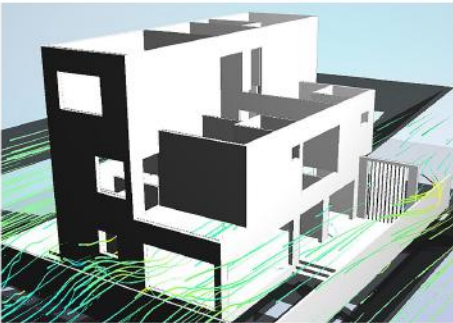
GROUND FLOOR PLAN



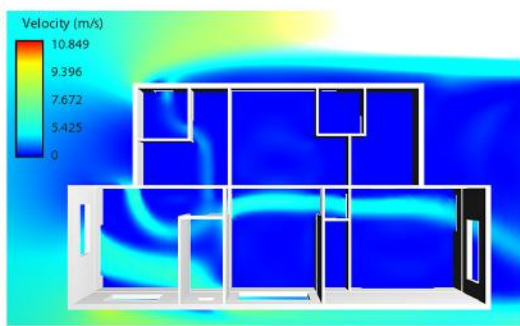
AIR FLOW PLANE



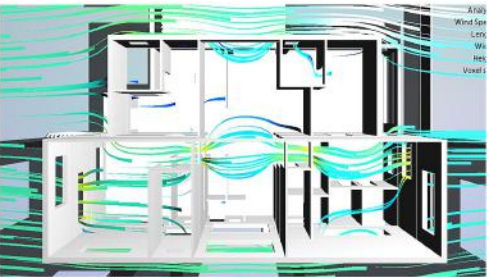
AIR FLOW PATTERN



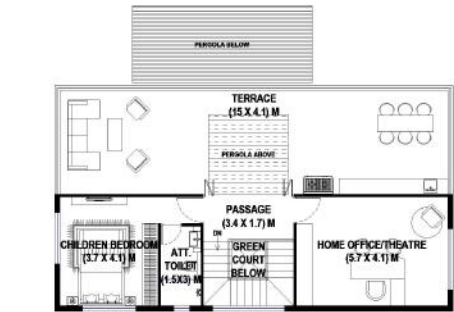
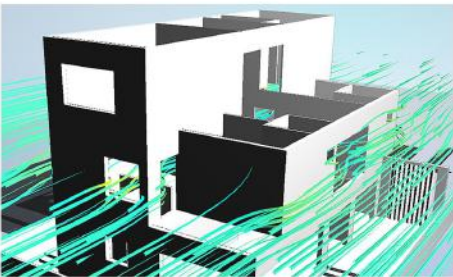
FIRST FLOOR PLAN



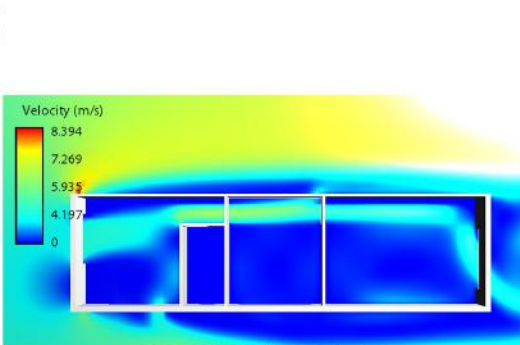
AIR FLOW PLANE



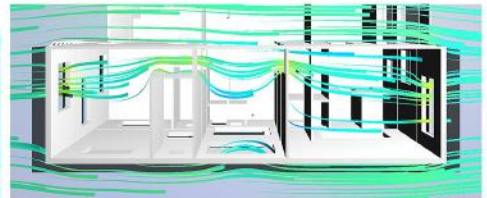
AIR FLOW PATTERN



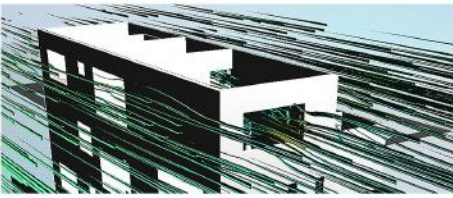
SECOND FLOOR PLAN



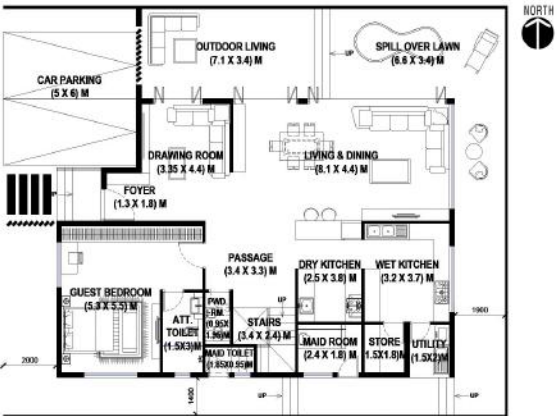
AIR FLOW PLANE



AIR FLOW PATTERN



TYPE-5 WEST FACING VILLAS



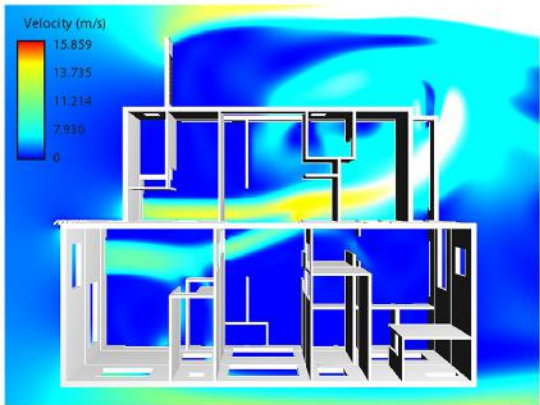
GROUND FLOOR PLAN



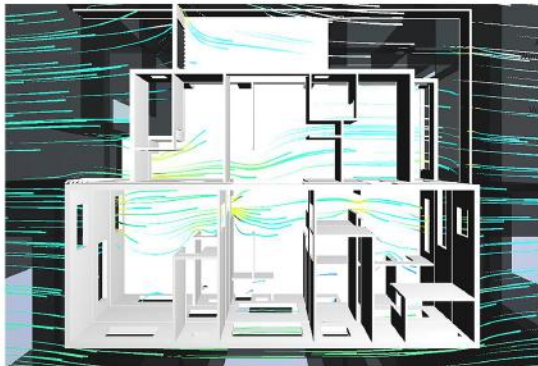
FIRST FLOOR PLAN



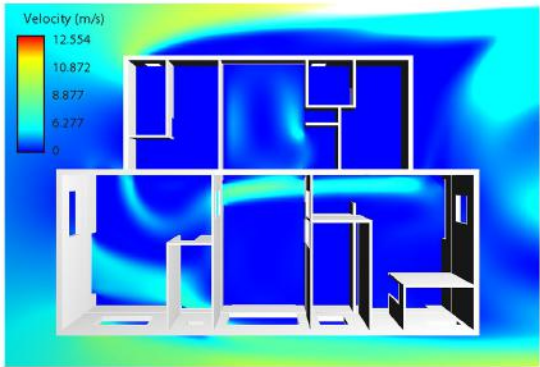
SECOND FLOOR PLAN



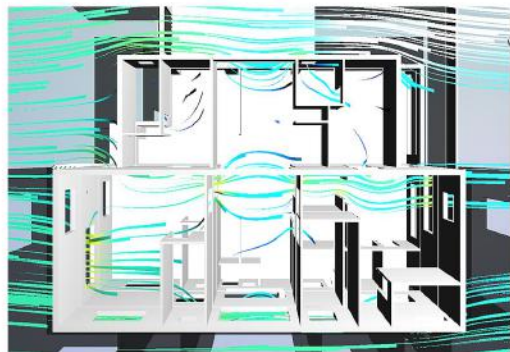
AIR FLOW PLANE



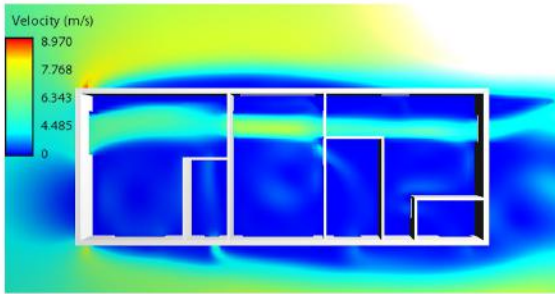
AIR FLOW PATTERN



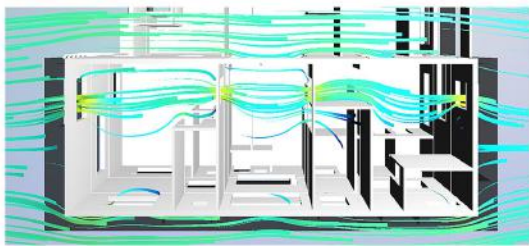
AIR FLOW PLANE



AIR FLOW PATTERN

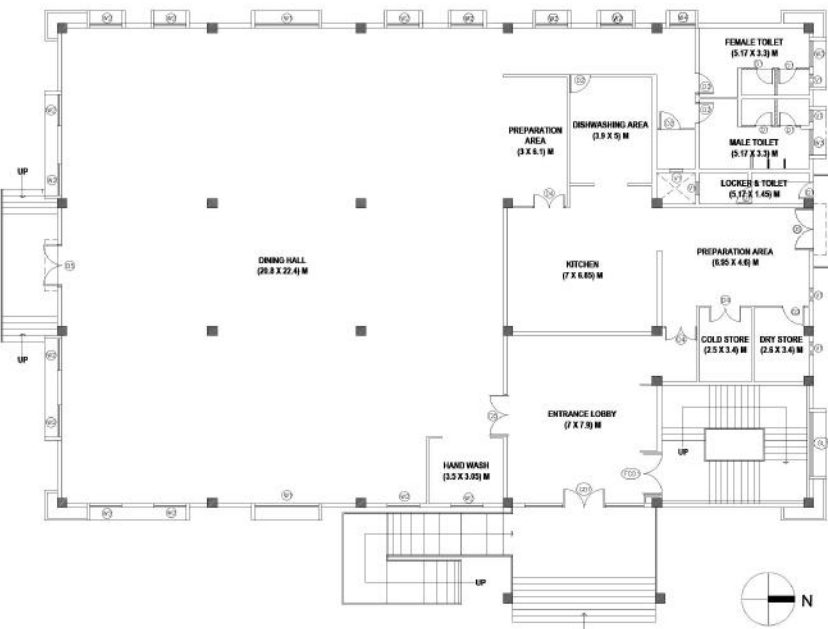


AIR FLOW PLANE

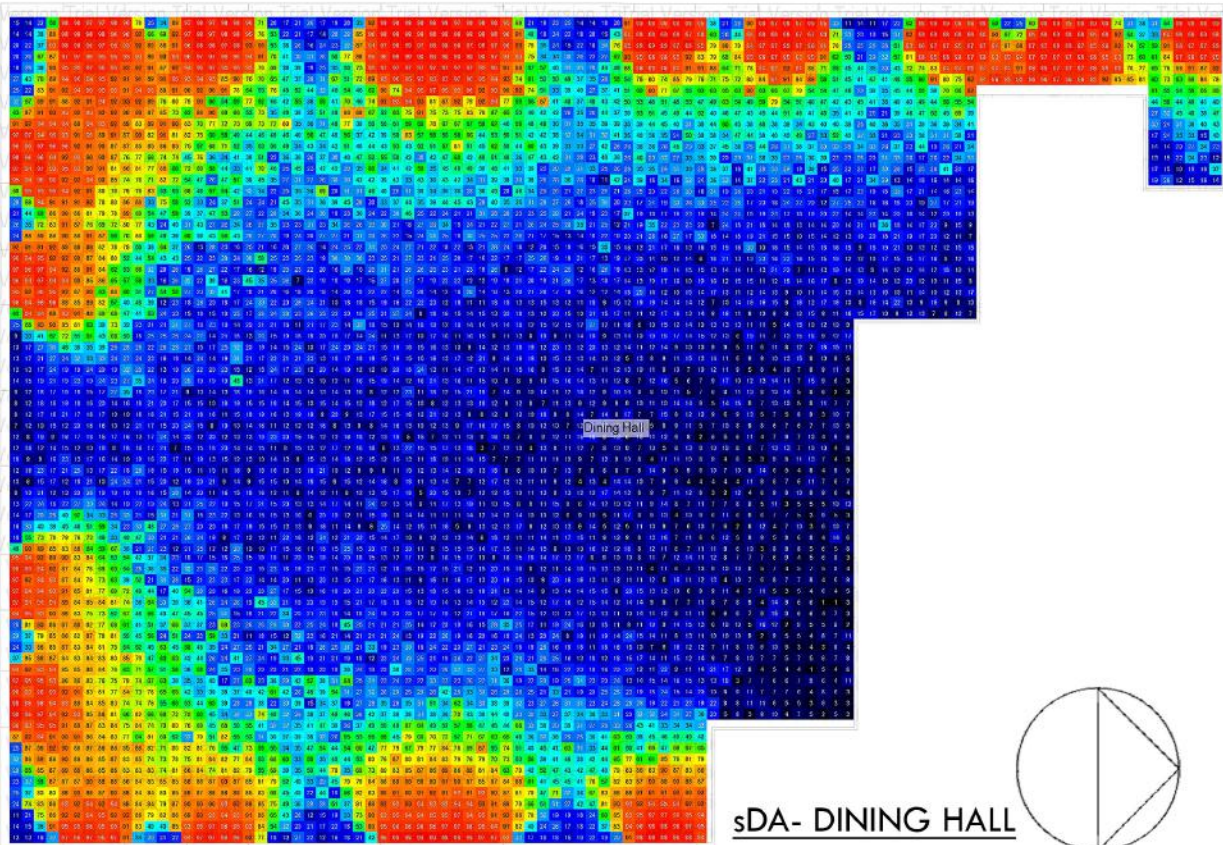


AIR FLOW PATTERN

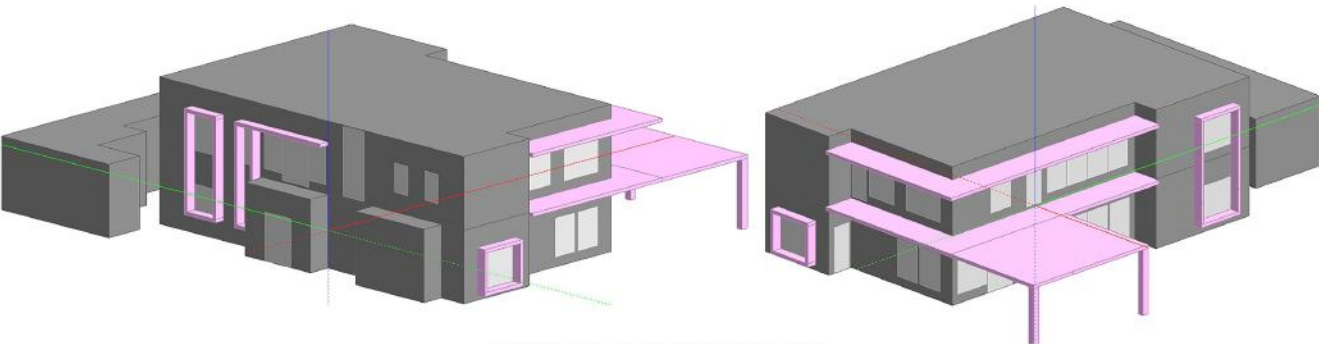
SPATIAL DAYLIGHT AUTONOMY- DINING HALL				
SL. NO.	SPACE	FLOOR AREA (Sq. m)	AREA ACHIEVING THRESHOLD LUX LEVEL (Sq. m)	% AREA ACHIEVING THRESHOLD LUX LEVEL
1	DINING HALL	495.47	145.89	29.44



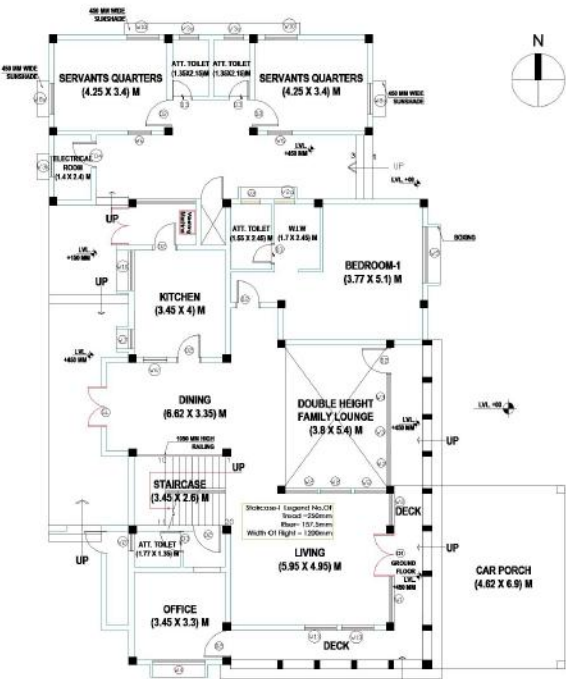
DINING HALL FLOOR PLAN



SPATIAL DAYLIGHT AUTONOMY SIMULATION USING DESIGNBUILDER



RESIDENCE 3D VIEWS

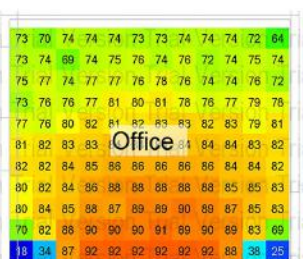


GROUND FLOOR PLAN

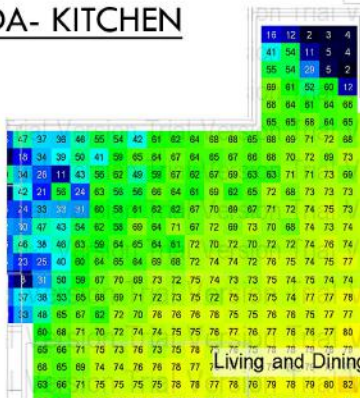
SPATIAL DAYLIGHT AUTONOMY- GROUND FLOOR				
SL. NO.	SPACE	FLOOR AREA (Sq. m)	AREA ACHIEVING THRESHOLD LUX LEVEL (Sq. m)	% AREA ACHIEVING THRESHOLD LUX LEVEL
1	OFFICE	12.33	11.95	96.95
2	LIVING	29.45	89.81	81.757
	DINING	15.66		
	COURTYARD + CORRIDOR + STAIRCASE	44.7		
3	BEDROOM-1	25.65	12.01	46.82
4	KITCHEN	13.87	8.05	58.01
TOTAL		141.66 (excl. toilet spaces)	121.82	85.99%



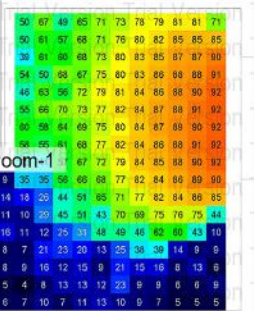
sDA- KITCHEN



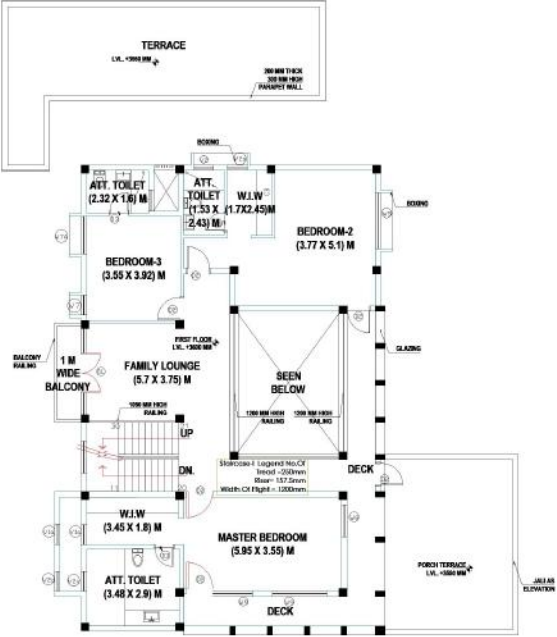
sDA- OFFICE



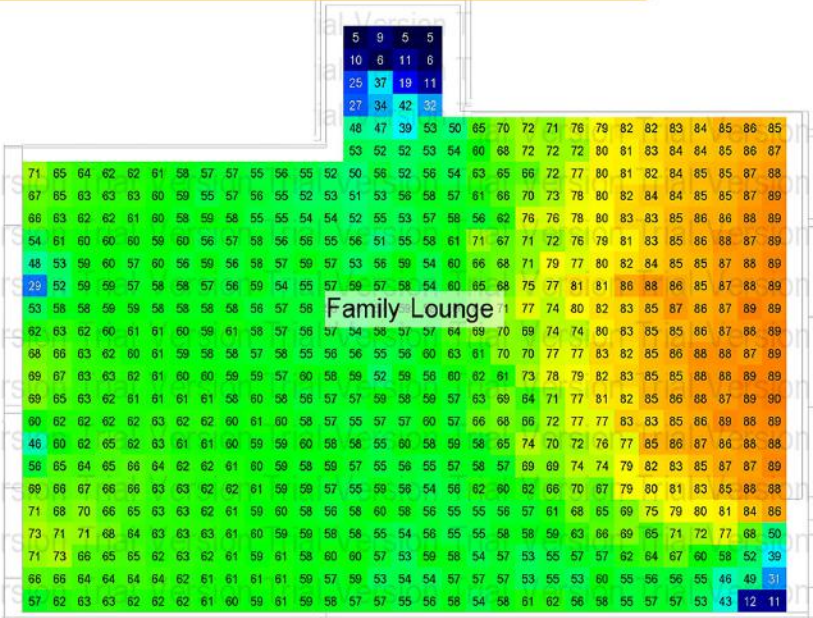
sDA- LIVING & DINING



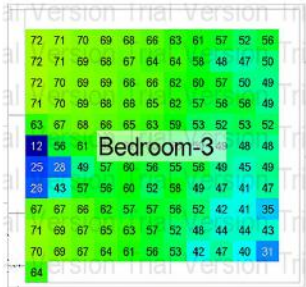
sDA- BEDROOM-1



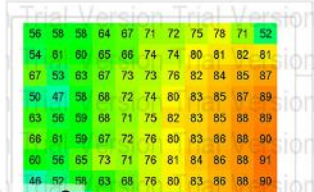
FIRST FLOOR PLAN



sDA- FAMILY LOUNGE



sDA- BEDROOM-3



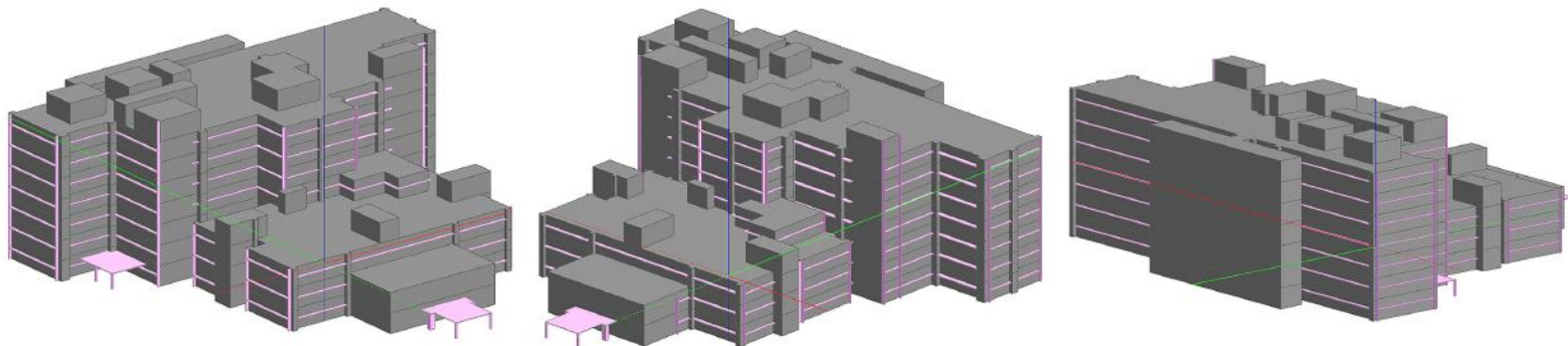
sDA- BEDROOM-2



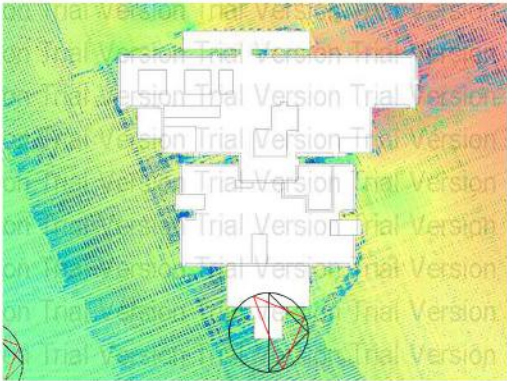
sDA- MASTER BEDROOM

SPATIAL DAYLIGHT AUTONOMY- FIRST FLOOR				
SL. NO.	SPACE	FLOOR AREA (Sq. m)	AREA ACHIEVING THRESHOLD LUX LEVEL (Sq. m)	% AREA ACHIEVING THRESHOLD LUX LEVEL
1	FAMILY LOUNGE	21.37	33.61	95.83
	CORRIDOR	13.65		
2	MASTER BEDROOM	21.5	21.5	100
3	BEDROOM-2	25.65	11.5	44.84
4	BEDROOM-3	13.87	10.2	73.56
TOTAL		96.04 (excl. toilet spaces)	76.81	79.97%
GRAND TOTAL		237.66 (excl. toilet spaces)	198.63	83.57%





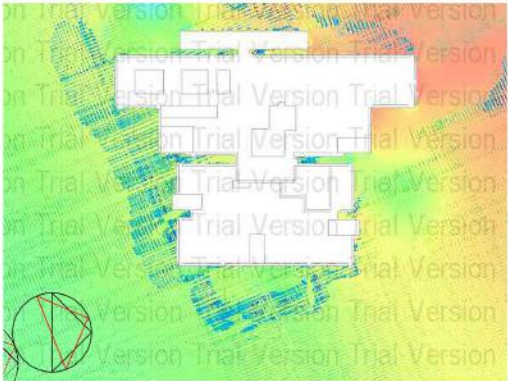
3D MODEL VIEWS OF HOSPITAL DESIGN



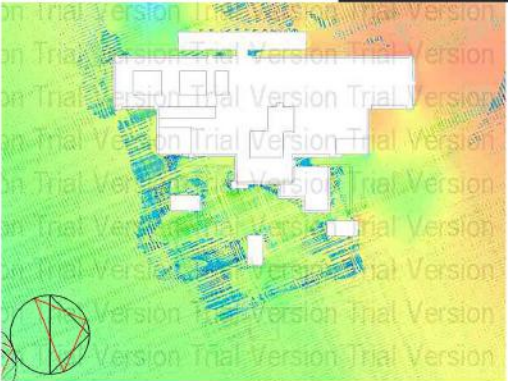
EXT. AIR FLOW @ 1.5 M LVL.



EXT. AIR FLOW @ 5.6 M LVL.



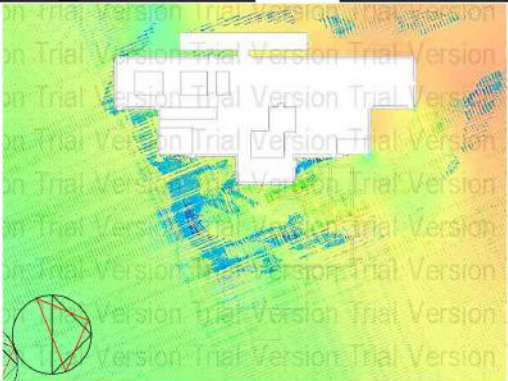
EXT. AIR FLOW @ 9.6 M LVL.



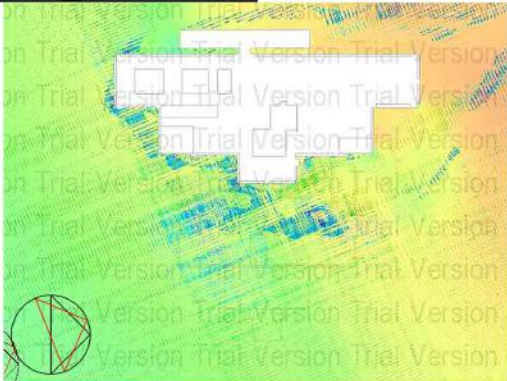
EXT. AIR FLOW @ 13.7 M LVL.



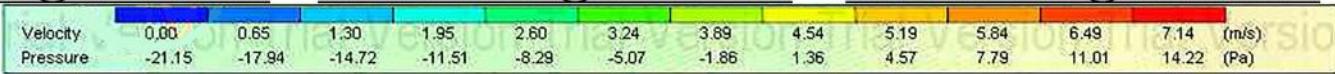
EXT. AIR FLOW @ 17.7 M LVL.

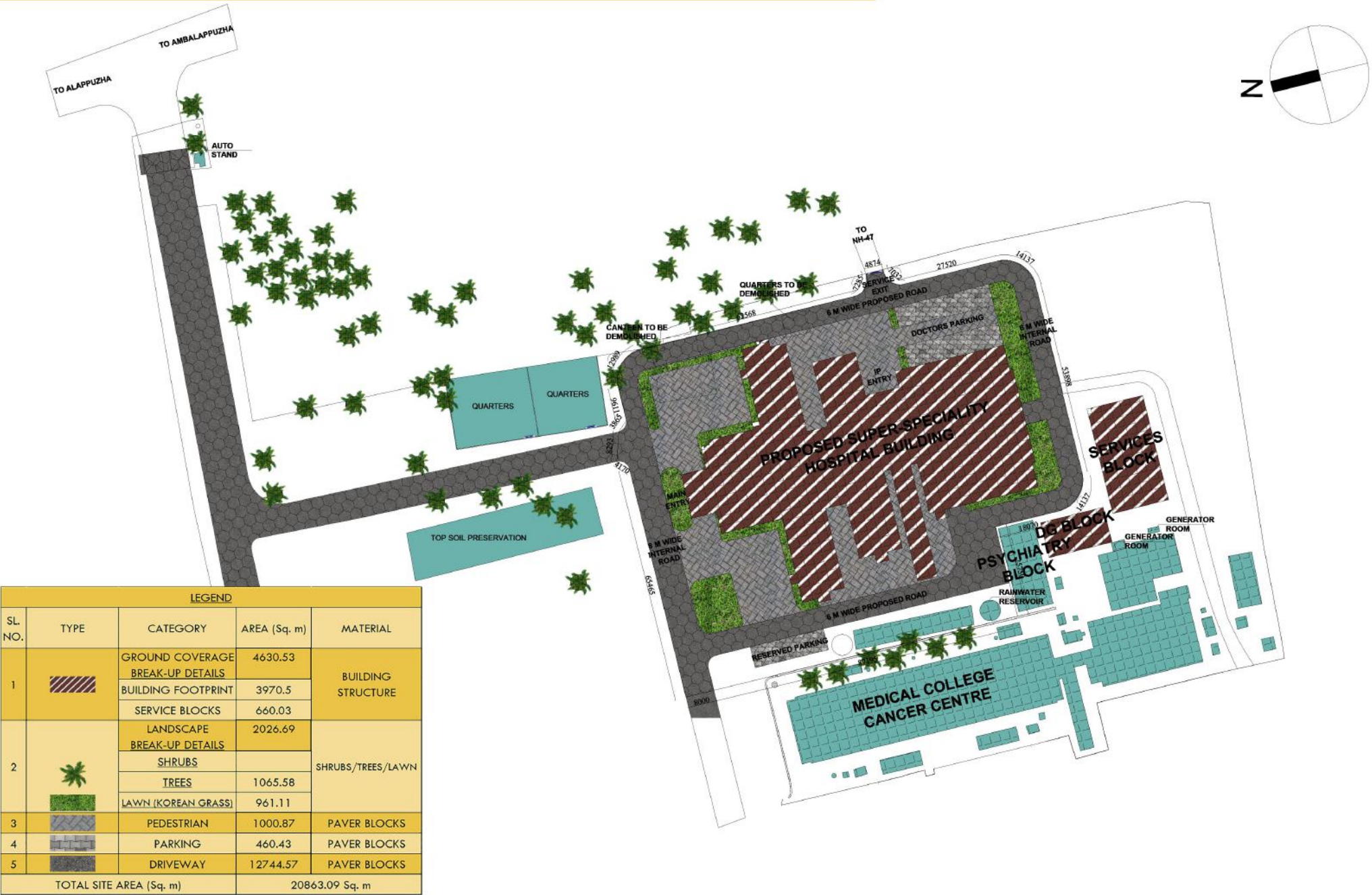


EXT. AIR FLOW @ 21.8 M LVL.

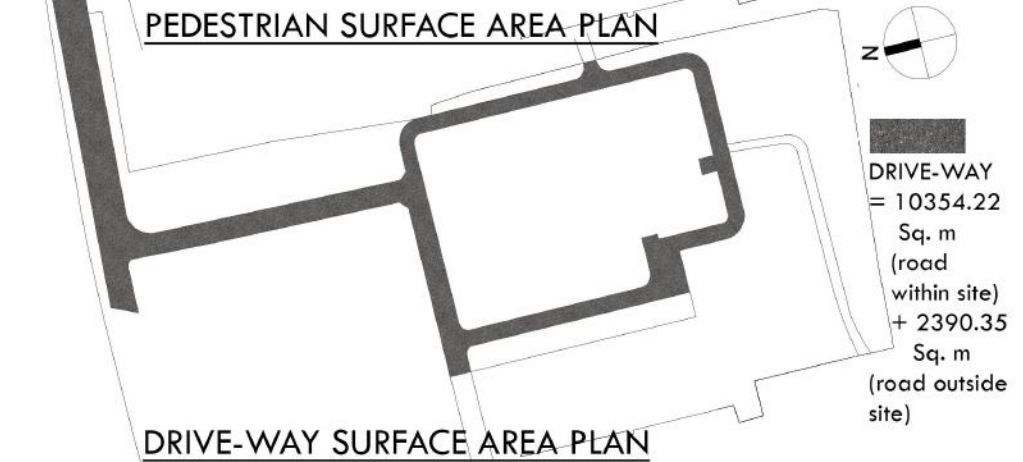
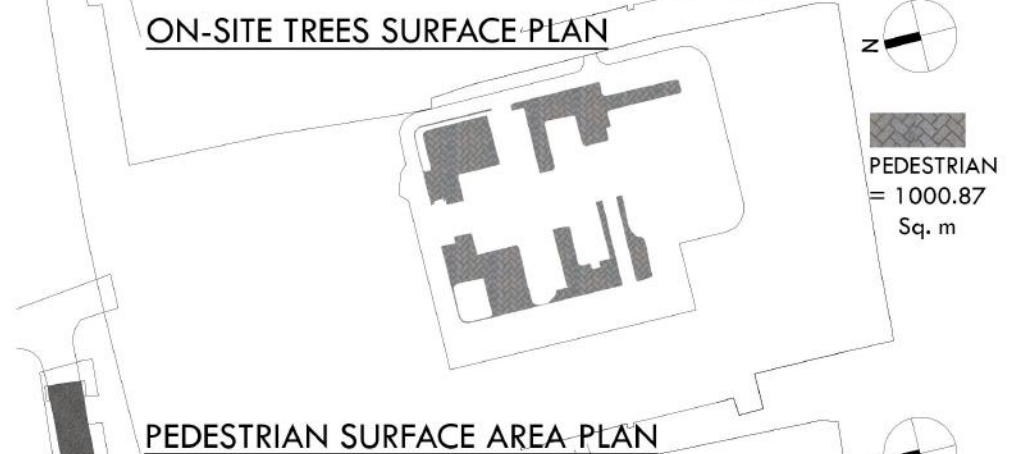
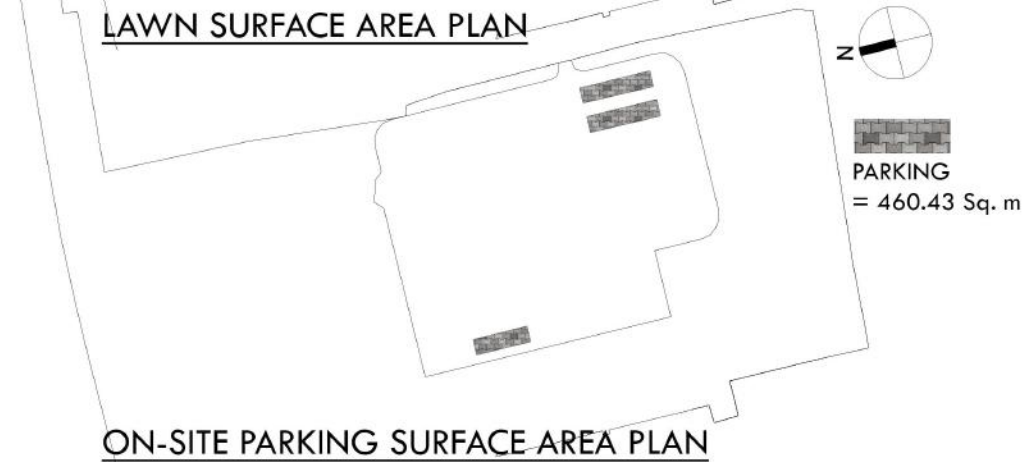
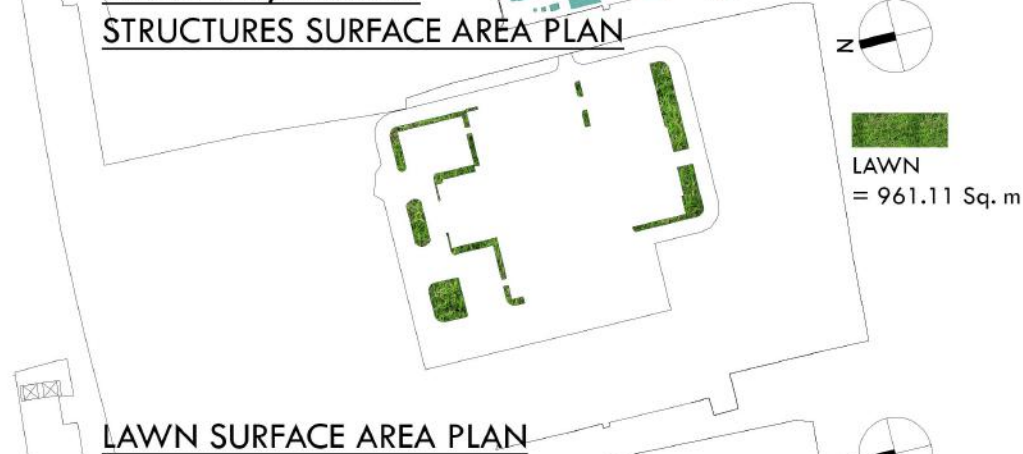
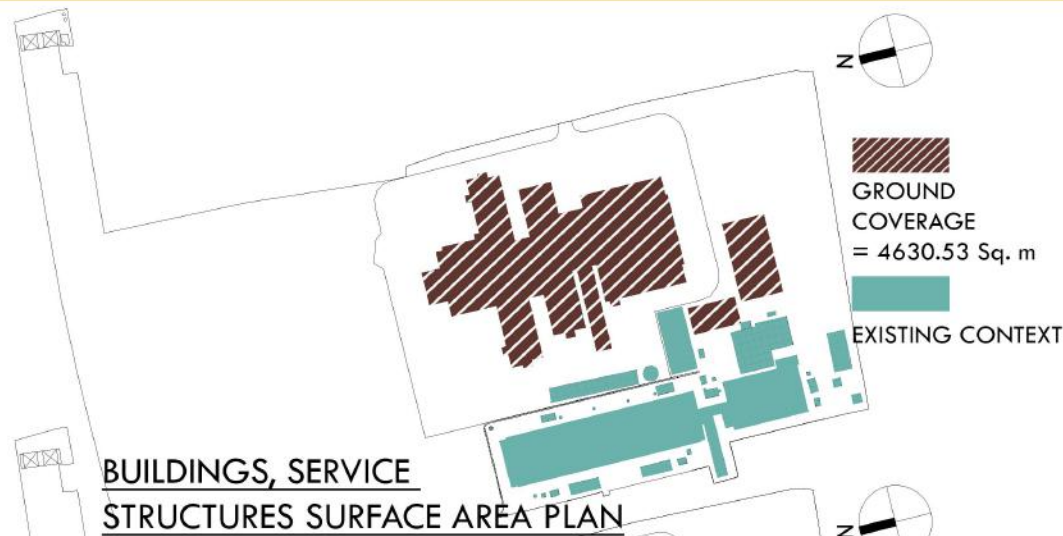


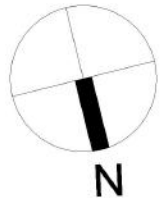
EXT. AIR FLOW @ 25.8 M LVL.





SITE LANDSCAPE SURFACE PLAN - SUPER-SPECIALITY HOSPITAL AT ALAPPUZHA, KERALA

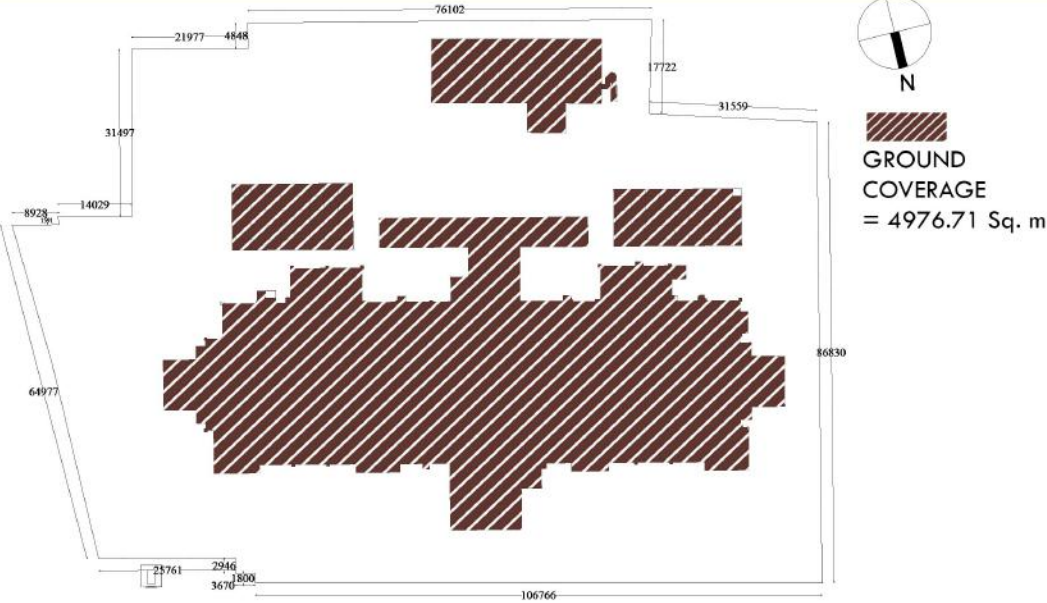


HOSPITAL
AT
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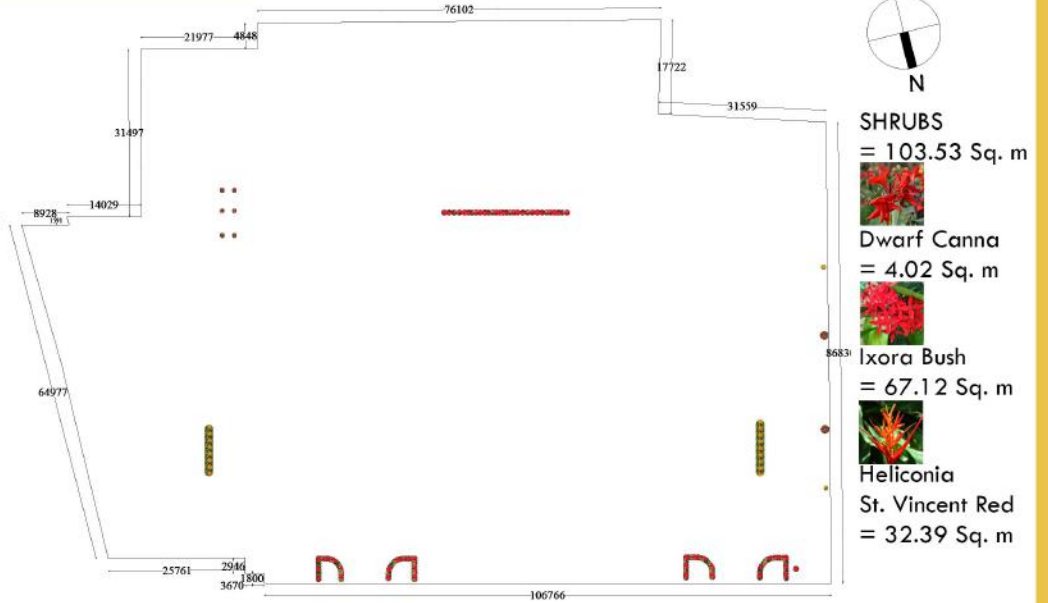
PROFESSIONAL TRAINING REPORT

41890013

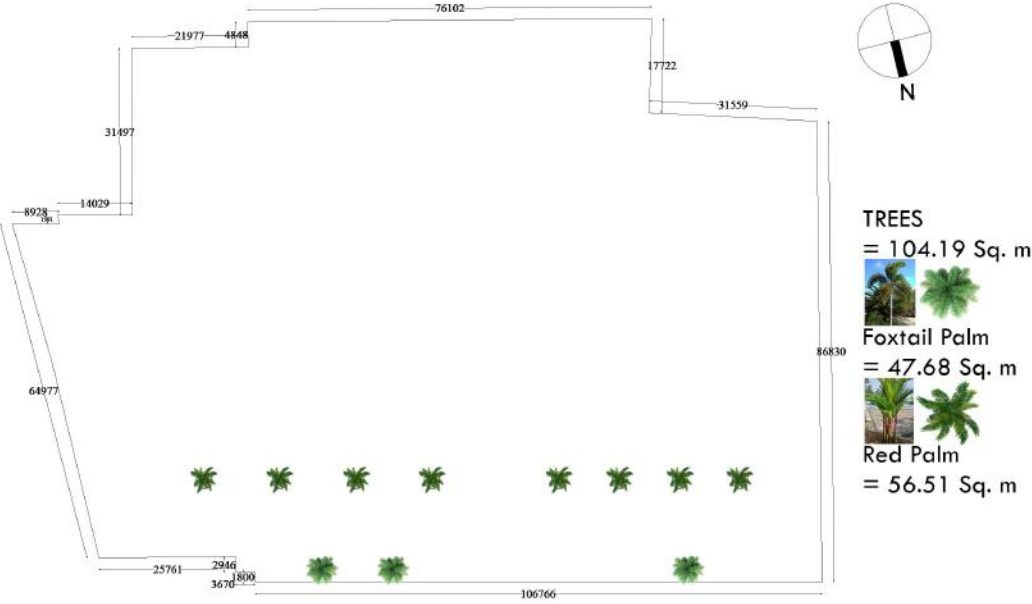
M. ARCH. SUSTAINABLE ARCHITECTURE



BUILDING & SERVICE STRUCTURES SURFACE AREA PLAN



ON-SITE SHRUBS SURFACE PLAN

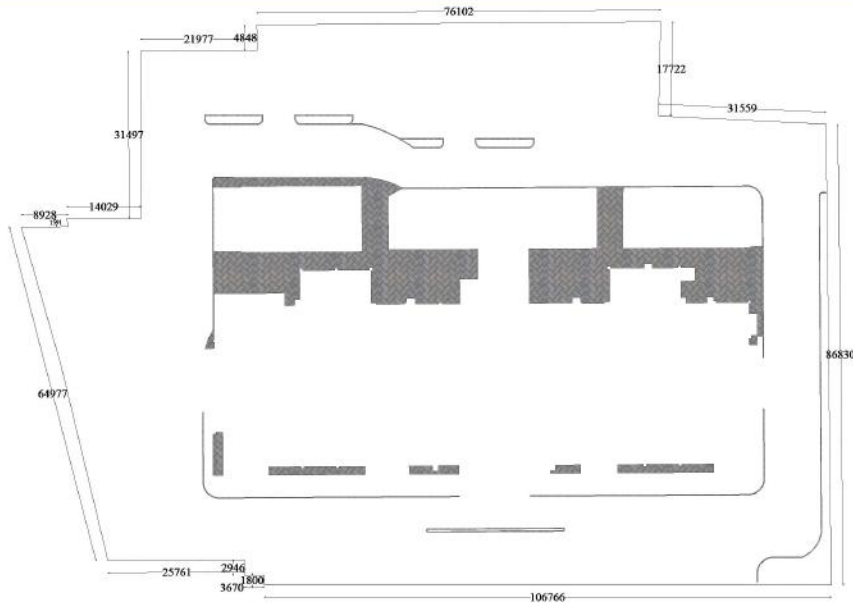


ON-SITE TREES SURFACE PLAN



LAWN SURFACE AREA PLAN

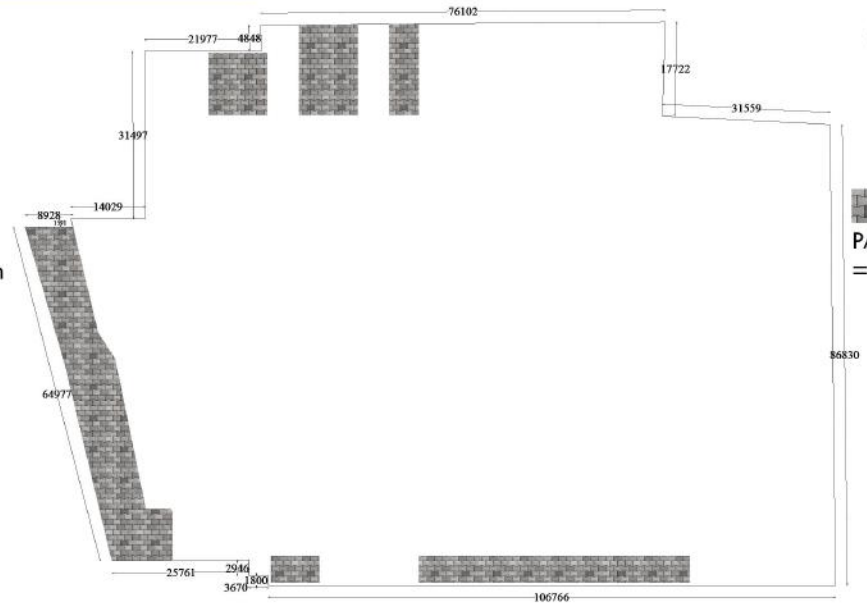
LANDSCAPE SURFACE FINISHES



PEDESTRIAN SURFACE AREA PLAN



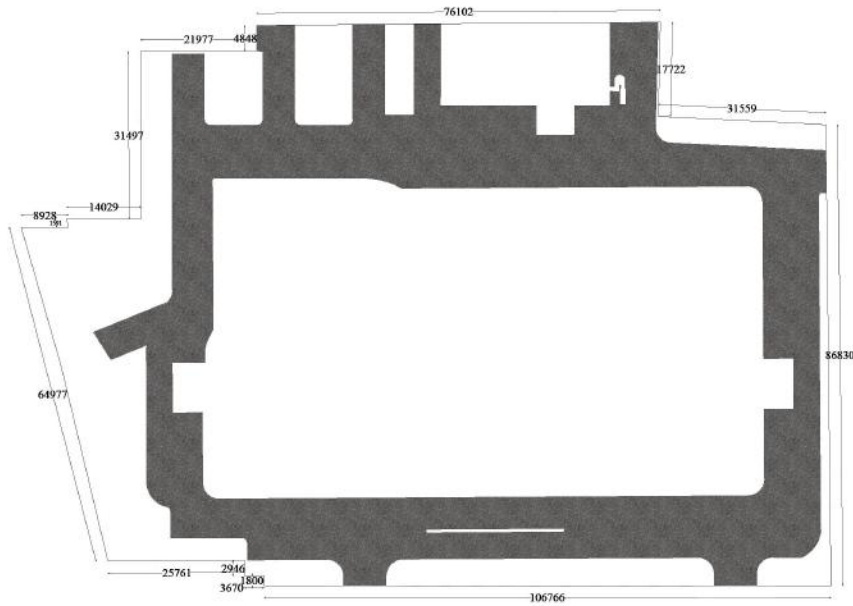
PEDESTRIAN
= 1063.26 Sq. m



PARKING
= 1301.28 Sq. m



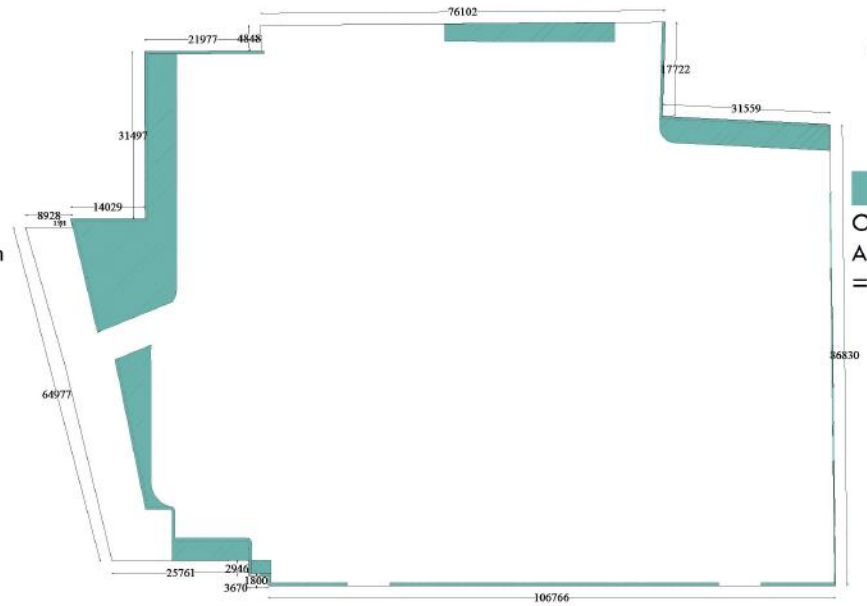
ON-SITE PARKING SURFACE AREA PLAN



DRIVEWAY SURFACE AREA PLAN



DRIVE-WAY
= 4454.03 Sq. m



OTHER SURFACE
AREAS
= 1051.43 Sq. m



OTHER SURFACE AREAS PLAN