



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 (S89APT)
JUL 2022 - AUG 2022**

Name of the Student : Balaji R

Semester : III

Reg No. : 41890005

Batch : 2021-2023



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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

VIVA-VOCE EXAMINATION

This is to certify that the Professional Training Report (S89APT) is the work of **Balaji R (Reg. no.: 41890005)** 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 **Balaji R (Reg. No.: 41890005)** hereby declare that this Professional Training Report **11th July 2022 to 18th August 2022** done by me under the guidance of **Ar. Sivashankar.T.S** 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. Samhita.M (Director)** and **Ar. Sivashankar.T.S (Managing partner)** for their 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 project.

I would not forget to remember **Ar. Visalakshi Chockalingam** for her encouragement with valuable inputs and suggestions, more over for timely support and guidance till the completion of my training.

I express my deep sense of gratitude to all staff members of the office for helping me to complete my project.

I have to thank my parents **Mr. R. Ramesh** and **Mrs. A. Sujatha** for their love and support throughout my life. Thank you both for giving me strength to reach for the stars and chase my dreams.

I would like to thank God Almighty for giving me the strength, knowledge, ability and opportunity to undertake this professional training and to persevere and complete it satisfactorily. Without his blessings, this would not have been possible.

CONFIRMATION LETTER

Date: 11th 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 confirm that **Mr. BALAJI.R (Reg. no.: 41890005)**, a student of 3rd semester (M.Arch-Sustainable architecture) from Sathyabama Institute of Science and technology, Chennai will be trained in our firm between July 2022 and August 2022 for a period of 30 working days.

Organization	Ela Green Buildings & Infrastructure Consultants Private Limited
Address	51, Officers Lane, Cantonment, Pallavaram-600043
Supervisor	Visalakshi, Sustainability Analyst
Intern Name	Balaji R

For Ela Green Buildings & Infrastructure Consultants Private Limited,



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

JOINING LETTER

Date: 11th 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. BALAJI.R (Reg. no.: 41890005)**, a student of 3rd semester (M.Arch-Sustainable architecture) from Sathyabama Institute of Science and technology, Chennai has joined our firm on July 11th 2022 as part of his professional training.

Organization	Ela Green Buildings & Infrastructure Consultants Private Limited
Address	51, Officers Lane, Cantonment, Pallavaram-600043
Supervisor	Visalakshi, Sustainability Analyst
Intern Name	Balaji R

For Ela Green Buildings & Infrastructure Consultants Private Limited,



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
2. Address & Contact Number	: No. 51, Officers Lane, Cantonment, Pallavaram, Chennai-43
3. Name of the student	: Balaji R
4. Duration	: From 11.07.2022 To 28.07.2022
5. Total No. of days	: 15 working days
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

: Always willing to learn something new and adhered to timeline

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



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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
2. Address & Contact Number	: No. 51, Officers Lane, Cantonment, Pallavaram, Chennai-43
3. Name of the student	: Balaji R
4. Duration	: From 29.07.2022 To 18.08.2022
5. Total No. of days	: 17 working days
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)



WORK DIARY

DAY	PROJECT NAME	WORK DONE	DAY	PROJECT NAME	WORK DONE
11.07.2022	Multispeciality hospital at Bellary	Ground watertable analysis, Plumbing fixtures flow rates, material calculations	30.07.2022	Multispeciality hospital at Kozhikode	Wind analysis-model making
12.07.2022	Multispeciality hospital at Bellary	Joineries area calculation	01.08.2022	Multispeciality hospital at Kozhikode	Wind analysis
13.07.2022	Multispeciality hospital at Bellary	Services zone marking	02.08.2022	Research study	STP-MBBR
14.07.2022	Multispeciality hospital at Allepey	Model for solar radiation	03.08.2022	Multispeciality hospital at Allepey	Exposed wall surface calculation
15.07.2022	Multispeciality hospital at Allepey	Signange layout	04.08.2022	Dining space at Nagpur	Daylighting analysis
16.07.2022	Multispeciality hospital at Bellary	Model for solar radiation	05.08.2022	Dining space at Nagpur	Daylighting analysis
18.07.2022	Multispeciality hospital at Allepey	Model for solar radiation	06.08.2022	Multispeciality hospital at Kalyani	Occupancy schedule
19.07.2022	Multispeciality hospital at Allepey	Solar insolation analysis	08.08.2022	VIMS	Surface finishes calculation
20.07.2022	Multispeciality hospital at Kozhikode	Model for solar radiation	09.08.2022	VIMS	Surface finishes calculation
21.07.2022	Multispeciality hospital at Kozhikode	Model for solar radiation	10.08.2022	VIMS	Surface finishes calculation
22.07.2022	Multispeciality hospital at Kozhikode	Model for solar radiation	11.08.2022	Multispeciality hospital at Bellary	Flow rates and materials calculation
25.07.2022	Multispeciality hospital at Kozhikode	Solar insolation analysis	12.08.2022	Multispeciality hospital at Bellary	Surface finishes calculation
26.07.2022	Multispeciality hospital at Nadia	Groundwater table report	13.08.2022	Multispeciality hospital at Bellary	Surface finishes calculation
27.07.2022	Multispeciality hospital at Kozhikode	Exposed wall surface calculation	16.08.2022	Multispeciality hospital at Kozhikode	Surface finishes calculation
28.07.2022	Multispeciality hospital at Kozhikode	Exposed wall surface calculation	17.08.2022	Multispeciality hospital at Kozhikode	Surface finishes calculation
29.07.2022	Multispeciality hospital at Kozhikode	Wind analysis-model making	18.08.2022	Multispeciality hospital at Kozhikode	Surface finishes calculation

Chief Architect Signature:

Office seal:



CONSOLIDATED CERTIFICATE

Date: 18th 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

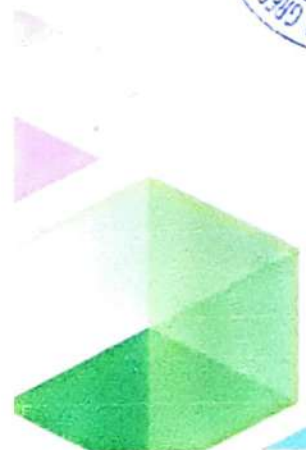
TO WHOMSOEVER IT MAY CONCERN

Sub.: Completion letter for Professional training

This is to certify that **Mr. Balaji.R (Reg. no.; 41890005)**, student of 3rd semester (M.Arch-Sustainable architecture) 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 Limited
Address	51, Officers Lane, Cantonment, Pallavaram-600043
Supervisor	Visalakshi, Sustainability Analyst
Intern Name	Balaji R

For Ela Green Buildings & Infrastructure Consultants Private Limited,



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

S.No	Contents	Project name	Page no.
1	About the firm		11
2	Flooring material area calculation	Bellary	12
3	False ceiling material area calculation	Bellary	13
4	Plumbing fixtures flow rates	Bellary	14
5	Joinery area details	Bellary	15
6	Ground floor signage boards	Bellary	16
7	First floor signage boards	Bellary	17
8	Second floor signage boards	Bellary	18
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10	Solar insolation anaysis	Allepey	20
11	Solar insolation anaysis	Allepey	21
12	Solar insolation anaysis	Kozhikode	22
13	Solar insolation anaysis	Kozhikode	23
14	Calculation of exposed wall surface area of utility spaces	Kozhikode	24
15	Calculation of exposed wall surface area of utility spaces	Kozhikode	25
16	Calculation of exposed wall surface area of utility spaces	Kozhikode	26
17	Calculation of exposed wall surface area of utility spaces	Kozhikode	27
18	Wind analysis	Kozhikode	28
19	Wind analysis	Kozhikode	29
20	STP MBBR Technology	Kozhikode	30
21	Calculation of exposed wall surface area of utility spaces	Bellary	31
22	Calculation of exposed wall surface area of utility spaces	Bellary	32
23	Daylighting analysis	Nagpur	33
24	Daylighting analysis	Nagpur	34
25	Daylighting analysis	Nagpur	35
26	Occupancy schedule	Kalyani	36
27	Site surface finishes	VIMS	37
28	Site surface finishes	Bellary	38
29	Flow rates	Bellary	39

ABOUT THE FIRM



‘Ela’ in Sanskrit refers to ‘the earth’. The firm take it up as their Core Philosophy to render unto and give back to the earth the abundance bestowed upon us by Mother Nature. They honour the earth we live on and are committed to effectuate change, one building at a time.

Ela Green Buildings & Infrastructure Consultants Pvt. Ltd. founded in 2009 by Ms. Samhita M, has grown to be one of India’s leading Green Building Consultancy firms, providing sustainability solutions to a wide range of projects across commercial, residential, industrial, retail, hospitality, and other sectors. The firm owe success and growth to the young & dynamic team, ideating green innovation with impeccable quality & dedication.

SERVICES



Feasibility study analysis

Analyzing project details in terms of green parameters and suggesting improvements required, financial implications along with a cost benefit analysis.



Facilitate green building certification for various building types

Ela provides green building consultancy services and undertake the entire process of registration, document collection, collation and submission to appropriate authority for certification.



Energy simulation for buildings

Ela believes in conducting business with the highest standards of honesty, integrity and professionalism.



Lighting simulation and day-lighting analysis

Lighting and daylighting analysis of the proposed building taking into consideration shading devices used and / or glazing characteristics using software tools.



Commissioning

Fundamental and enhanced building system commissioning as per project requirements and design report to meet the requirements of the rating system.



Municipal & Local body infrastructure on water & drainage

Planning, assessment, designing and project management of water, storm water and drainage systems.



Water efficiency analysis and fixture selection

Analysing the water consumption and suggesting measures to minimise usage through appropriate design strategies and appropriate use of fixtures.



Thermal comfort analysis

Analysing thermal design of buildings on the principles of human comfort.



Material selection

Appropriate selection of materials with focus on extending the life of reusable materials, using rapidly renewable materials and recycled content.



Water, sewage and waste management

Advisory services on setting up of suitable water treatment, water recycling and waste management plants.

VISION



PEOPLE

Increase productivity

- One-stop solution for all sustainability, green design, and energy-efficiency needs.
- Sensitive to client’s needs and balance technical solutions to practical constraints.
- Technical know-how and systemic thinking meets practical wisdom, allowing to achieve the perfect overlap between cost-benefit and sustainability.
- In sustainability, the whole is definitely greater than sum of its parts.
- The rigorous and stringent internal quality-check in firm assures credibility to the solutions offered and also the collaborative work strategy ensures timely delivery of our services.
- Approach to holistic sustainability – Integrated design approach.



PLANET

Makes greener



PROFIT

Save money

LEARNING EXPERIENCE

- Green building certification from design to documentantation
- Designing the dream space in a more sustainable manner balancing aesthetics and cost
- Offering design solution during design phase and post occupancy phase
- Buildings to comply with ECBC requirements and green standards

Ground floor

S.no.	Material	Area
1	600mmx600mm vitrified tiles	2,02,13,87,942
2	600mmx600mm vitrified tiles-Border	17,94,22,584
3	Granite flooring	76,54,84,549
4	Granite flooring-Border	210679119
5	Kota stone flooring	17,09,89,188
6	Epoxy flooring	37,11,51,785
7	Precast chequered concrete	27,60,45,639

First floor

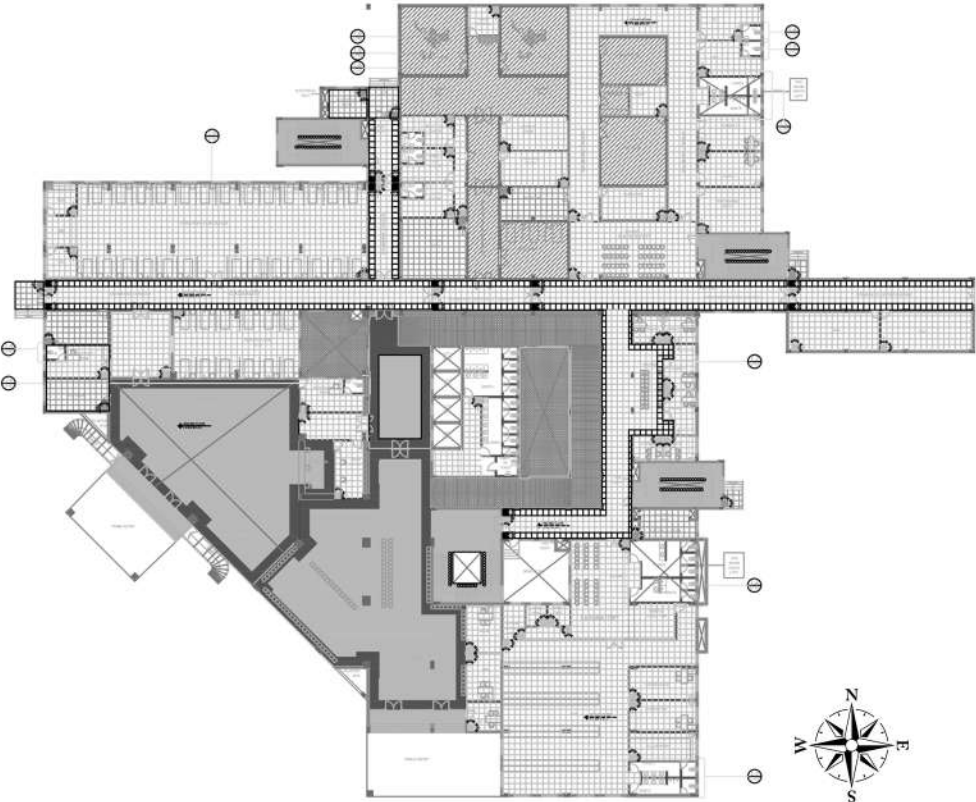
S.no.	Material	Area
1	600mmx600mm vitrified tiles	1,65,62,94,920
2	600mmx600mm vitrified tiles-Border	15,26,85,137
3	Granite flooring	25,85,98,870
4	Granite flooring-Border	6,01,55,155
5	Kota stone flooring	22,56,10,439
6	Epoxy flooring	371151785
7	Precast chequered concrete	16,02,02,719

Second floor

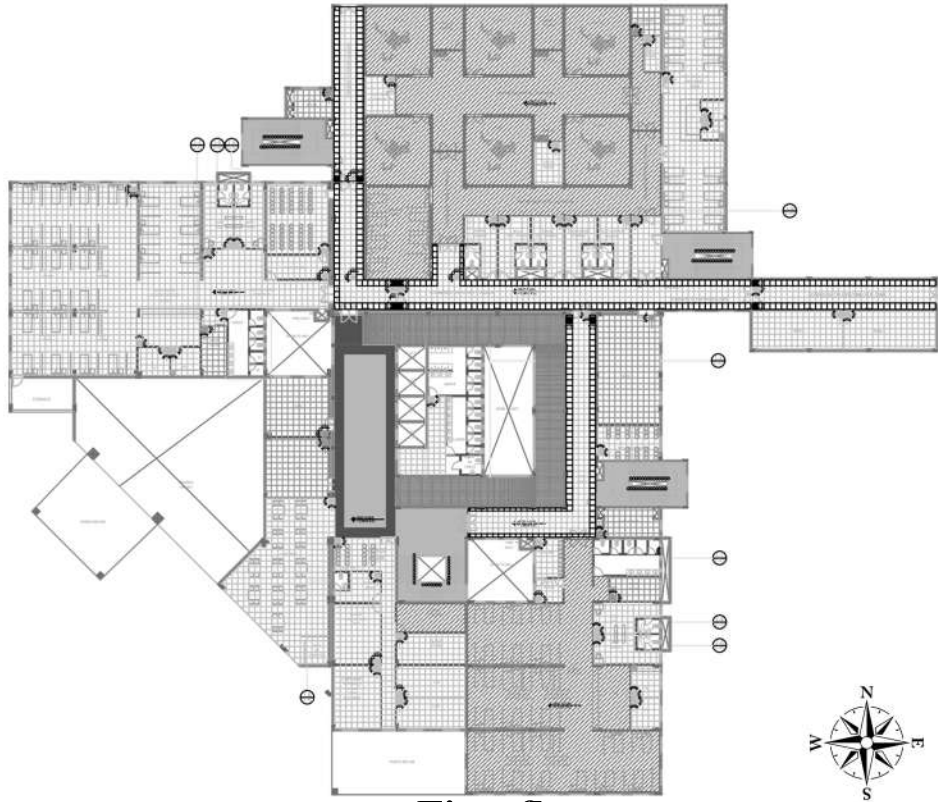
S.no.	Material	Area
1	600mmx600mm vitrified tiles	1,48,42,06,214
2	600mmx600mm vitrified tiles-Border	10,99,12,032
3	Granite flooring	27,50,33,238
4	Granite flooring-Border	5,75,86,840
5	Kota stone flooring	21,97,96,595
6	Epoxy flooring	Nil
7	Precast chequered concrete	14,96,33,337

Third floor

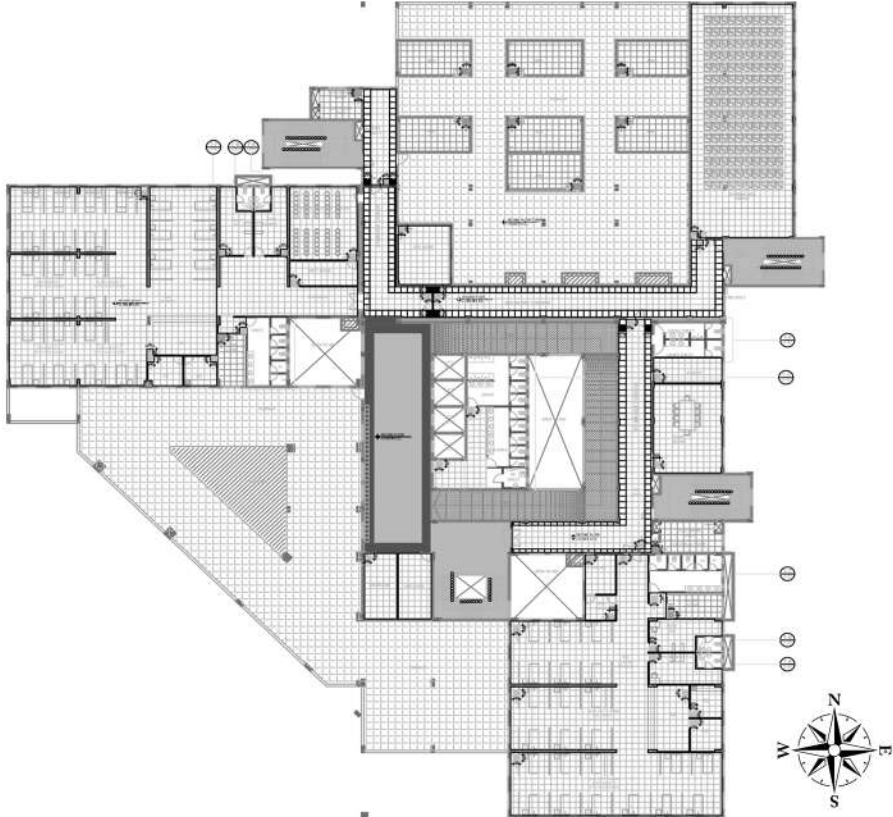
S.no.	Material	Area
1	600mmx600mm vitrified tiles	1,19,15,56,616
2	600mmx600mm vitrified tiles-Border	6,42,94,834
3	Granite flooring	24,76,89,069
4	Granite flooring-Border	5,75,86,840
5	Kota stone flooring	10,66,75,755
6	Epoxy flooring	10,98,088
7	Precast chequered concrete	14,96,33,337



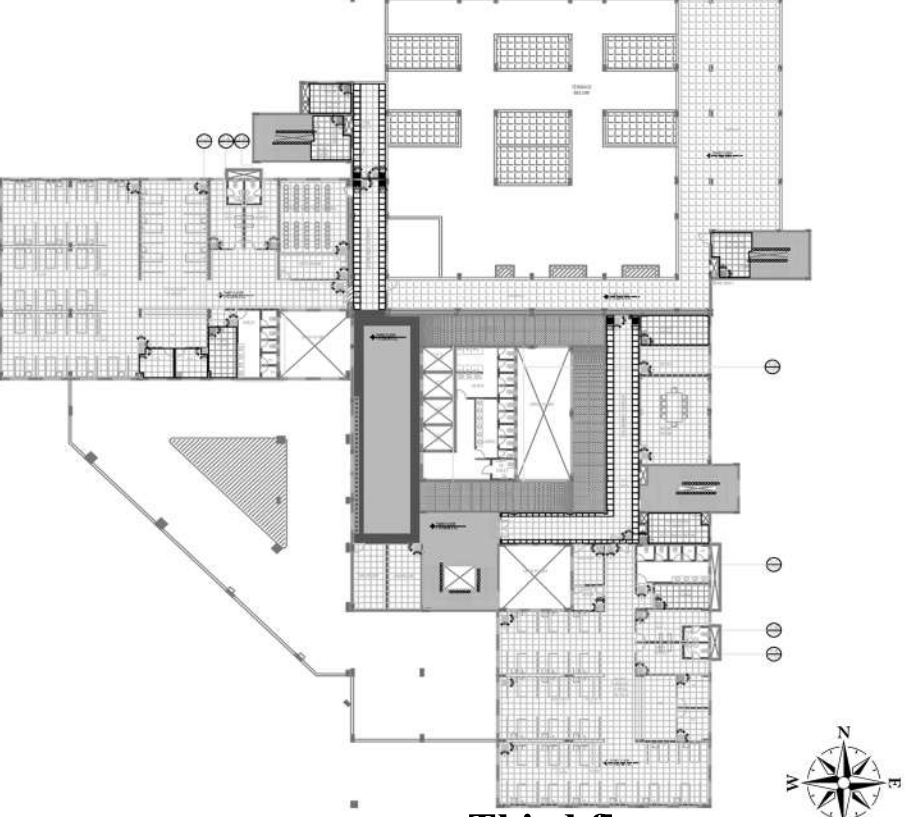
Ground floor



First floor



Second floor



Third floor

LEGEND

- 600X600 vitrified tiles
- 600X600 vitrified tiles border
- Granite flooring
- Granite flooring border
- Kota stone flooring
- Epoxy flooring
- Pre cast chequered concrete



Vitrified tiles



Granite



Kota stone



Epoxy flooring



Pre cast chequered concrete

Ground floor

S.no.	Material	Area (Sq.mm)
1	600x600mm 0.5mm thk GI metal ceiling	70,12,79,026
2	12.5mm thk P.O.P ceiling	2,34,28,71,801
3	Stainless steel ceiling	19,23,13,521
4	PVC false ceiling	16,49,92,026

First floor

S.no.	Material	Area (Sq.mm)
1	600x600mm 0.5mm thk GI metal ceiling	1,16,85,96,700
2	12.5mm thk P.O.P ceiling	1,78,74,35,944
3	Stainless steel ceiling	52,58,04,311
4	PVC false ceiling	14,75,48,232

Second floor

S.no.	Material	Area (Sq.mm)
1	600x600mm 0.5mm thk GI metal ceiling	79,45,57,722
2	12.5mm thk P.O.P ceiling	1,18,08,96,082
3	Stainless steel ceiling	Nil
4	PVC false ceiling	14,69,94,155

Third floor

S.no.	Material	Area (Sq.mm)
1	600x600mm 0.5mm thk GI metal ceiling	79,67,17,815
2	12.5mm thk P.O.P ceiling	88,84,98,448
3	Stainless steel ceiling	Nil
4	PVC false ceiling	12,65,72,242

LEGEND

- 600X600 0.5mm thk GI metal ceiling
- 12.5mm thk P.O.P ceiling
- Stainless steel ceiling
- PVC false ceiling



600X600 0.5mm thk GI metal ceiling



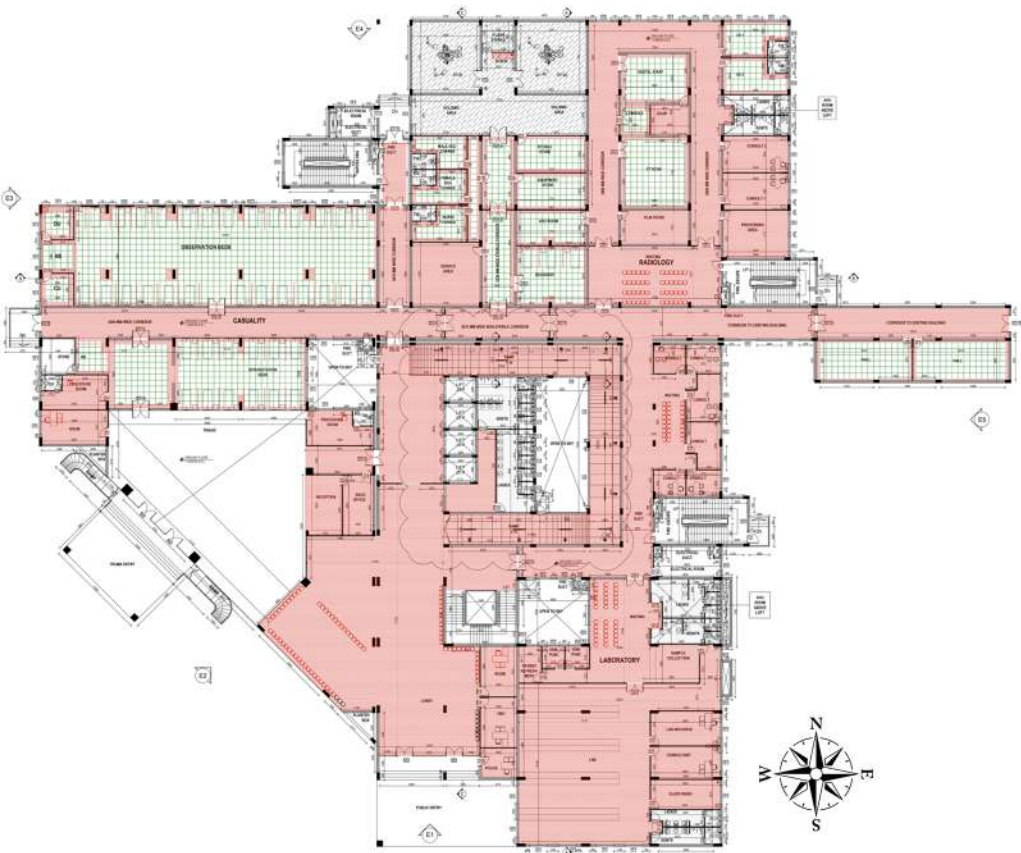
12.5mm thk P.O.P ceiling



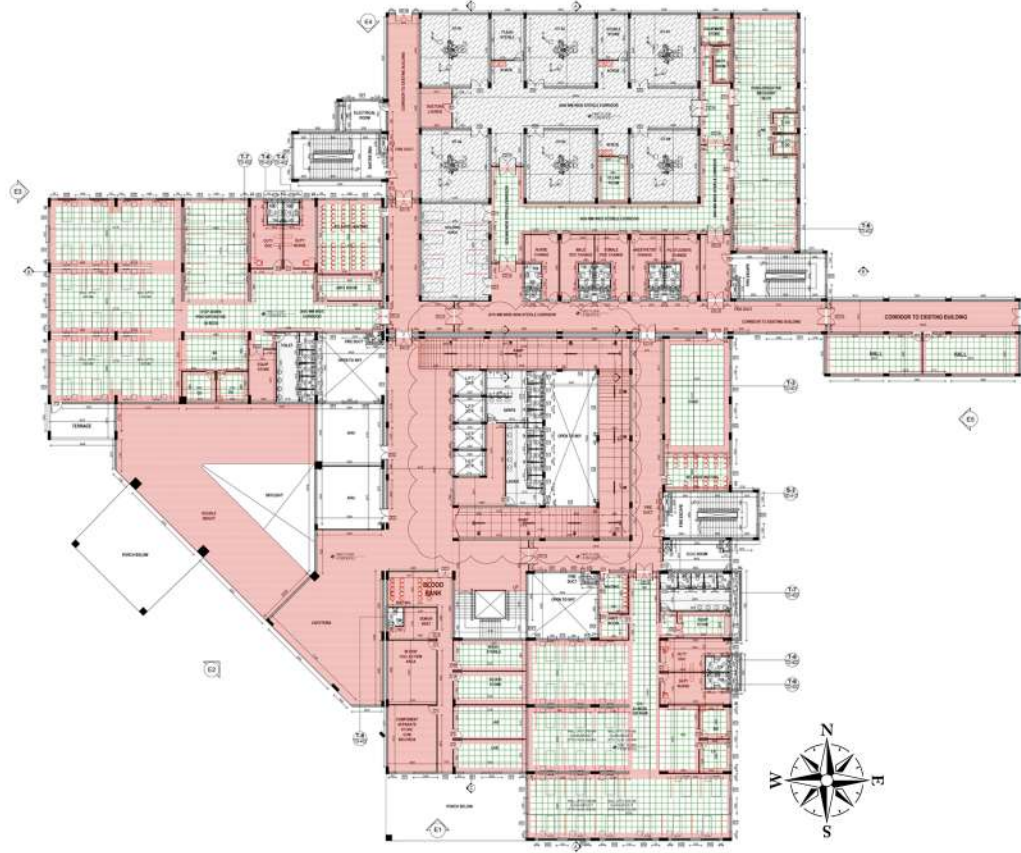
Stainless steel ceiling



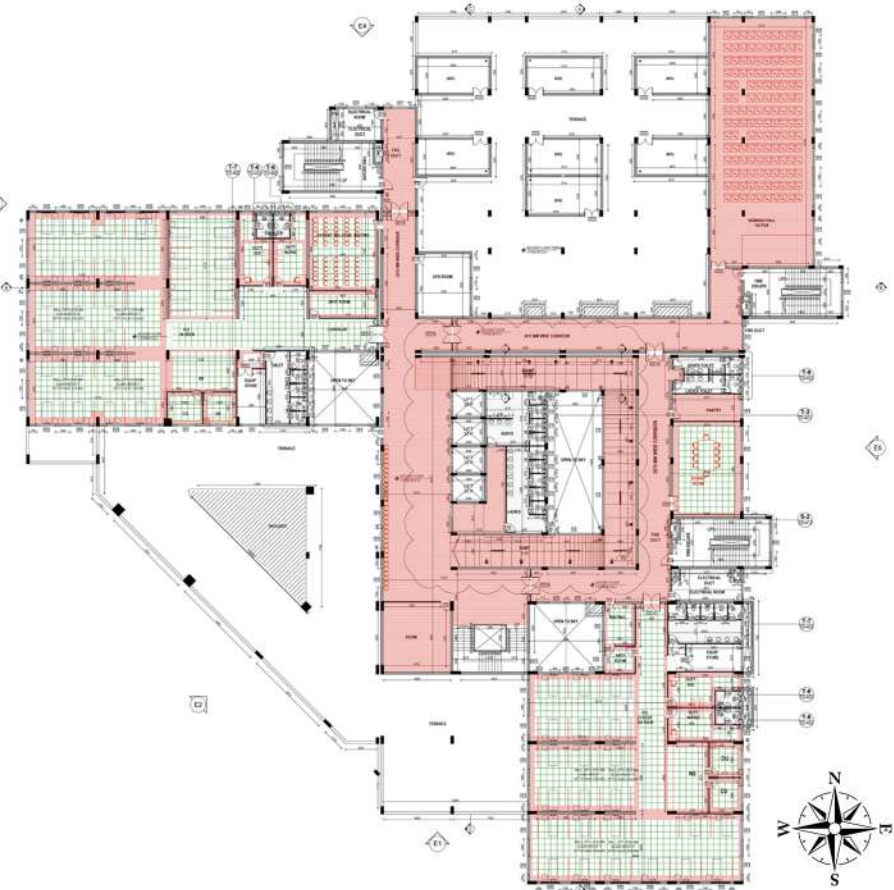
PVC false ceiling



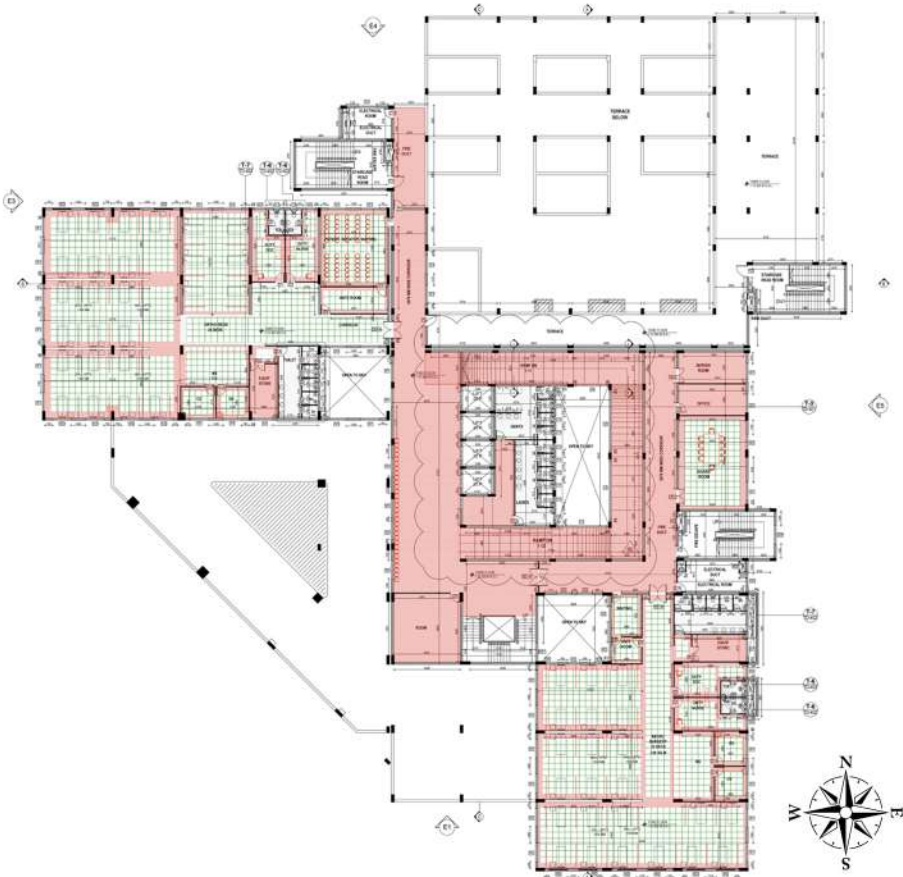
Ground floor



First floor



Second floor



Third floor

FLOW RATES								
Flow rates in LPM at								
S.no.	Product code	Product description	0.5 bar	1.0 bar	2.0 bar	3.0 bar	4.0 bar	5.0 bar
1	C0215 & C0769	Indust FM closet 110mm &Cis	Nil					
2	E8094	Solid soft closet	Nil					
3	C855481	Steel sink folded edge	Nil					
4	G1406A1	Coral long body bib cock	7.3	11	16	19.8	23.1	25.7
5	1813-C	Shower arm (PTMT) "Prayag make"	Nil					
6	T4414A1	Mixer taps	6	8.4	11.9	14.65	16.9	18.8
7	G0621A1	Sink taps	5.5	7.7	11.2	14	16.5	18.5



- Flow rate means the rate at which water flows through pipes, valves and emission devices, measured in litres per minute.
- The flow of water from your faucet is determined by water pressure.
- The more water that is being forced through a pipe, the more pressure there will naturally be.
- Through any pipe size, higher water pressure will cause greater water flow.



Indust FM closet



Solid seat closet



Steel sink folded edge



Coral long body bib cock



Shower arm



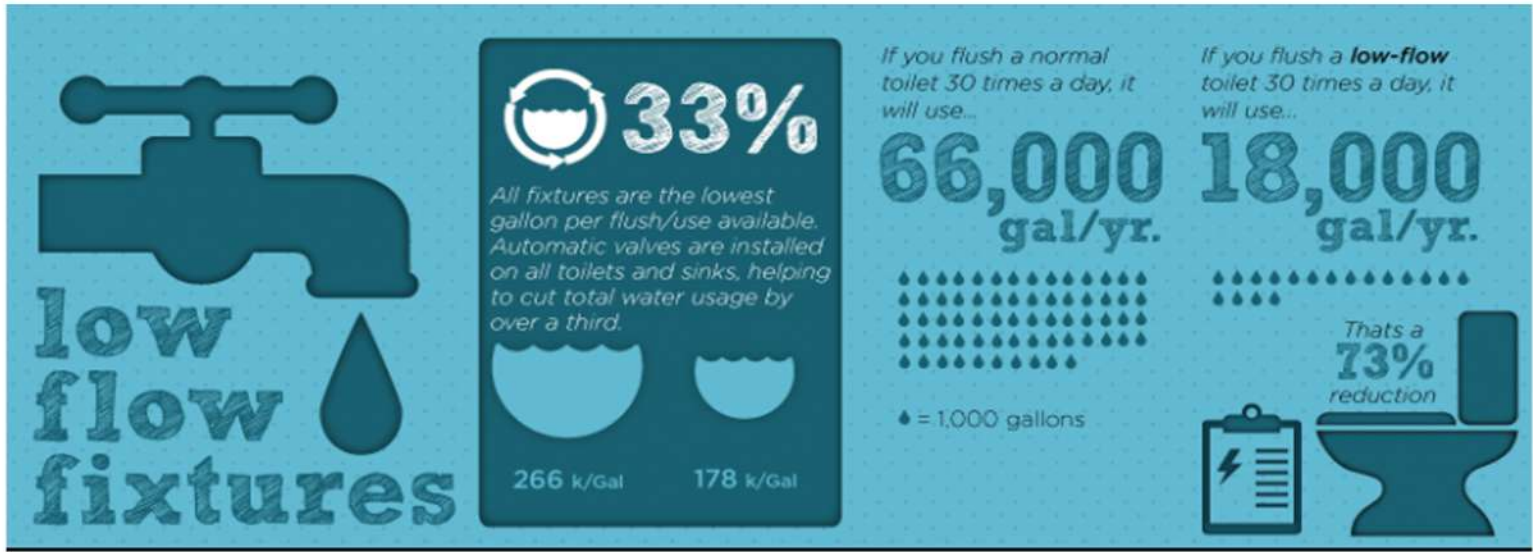
Mixer tap



Sink tap

Low flow fixtures

A low-flow fixture is a water saving plumbing fixture designed to achieve water savings by having a lower flow rate of water or a smaller quantity per flush. Some of these low-flow fixtures are faucets, showerheads, and toilets. Low-flow fixtures are designed to save water over conventional fixtures by having a lower flow rate while still maintaining satisfactory performance. The Environmental protection agency (EPA) WaterSense program has requirements for plumbing fixtures to achieve their definition for water saving low-flow.

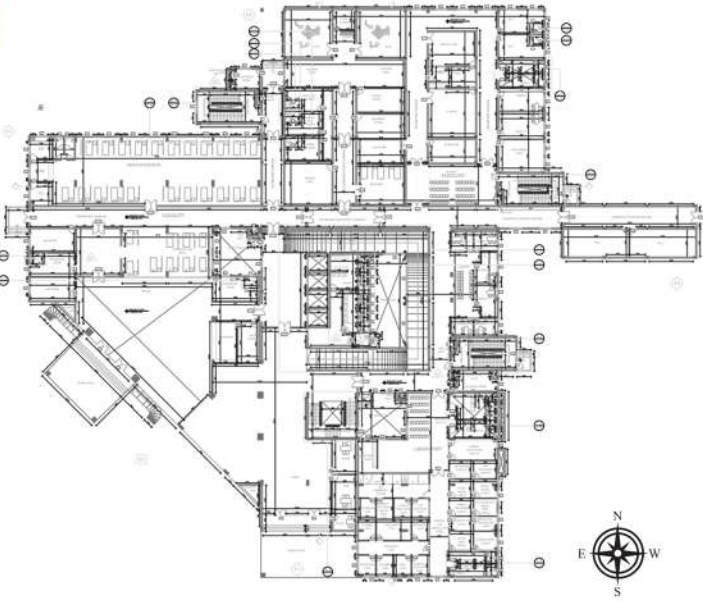


Ground floor					
S.No.	Window/door type	Total no.	Dimensions	Area (Sq.mm)	Total area
Doors					
1	MD	4	1800x2400	43,20,000	1,72,80,000
2	DD1	10	1800x2400	43,20,000	4,32,00,000
3	DD1A	13	1800x2400	43,20,000	5,61,60,000
4	DD1B	3	1800x2100	37,80,000	1,13,40,000
5	DD2	1	1500x2100	31,50,000	31,50,000
6	D1	48	1000x2100	21,00,000	10,08,00,000
7	D1A	26	1000x2100	21,00,000	5,46,00,000
8	D2	29	750x2100	15,75,000	4,56,75,000
9	HD	10	600x1200	7,20,000	72,00,000
10	FD	5	1200x2100	25,10,000	1,25,50,000
11	OD	2	1800x2400	43,20,000	86,40,000
Windows					
12	WD	6	1800x1200	21,60,000	1,29,60,000
13	WD1	2	1200x1200	14,40,000	28,80,000
14	W1	35	1800x1200	21,60,000	7,56,00,000
14	W2	7	1500x1200	18,00,000	1,26,00,000
16	W3	8	1200x1200	14,40,000	1,15,20,000
17	W4	1	1000x1200	12,00,000	12,00,000
18	SW	3	1800x1800	32,40,000	97,20,000
19	SW1	1	1800x1200	21,60,000	21,60,000
Ventilators					
20	V1	26	600x600	3,60,000	93,60,000
21	V2	2	5600x1200	67,20,000	1,34,40,000
22	V3	Nil	Nil	Nil	Nil
23	V4	1	3000x1200	36,00,000	36,00,000

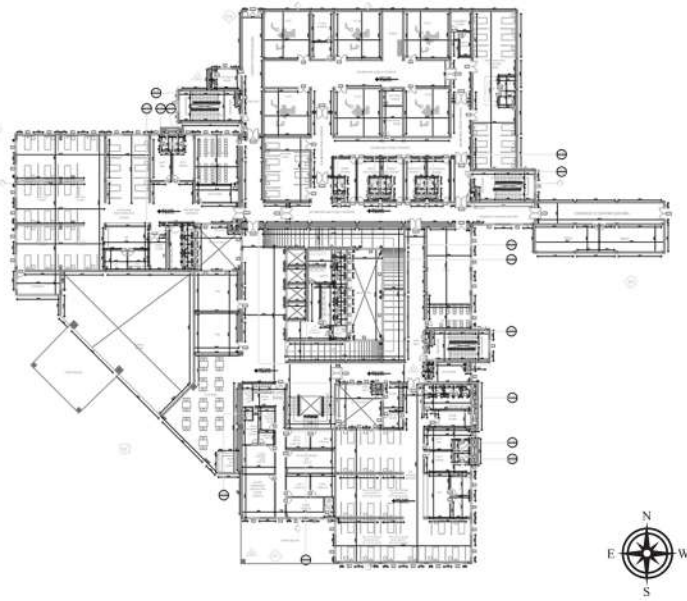
First floor					
S.No.	Window/door type	Total no.	Dimensions	Area (Sq.mm)	Total area
Doors					
1	MD	Nil	Nil	Nil	Nil
2	DD1	5	1800x2400	43,20,000	2,16,00,000
3	DD1A	18	1800x2400	43,20,000	7,77,60,000
4	DD1B	3	1800x2100	37,80,000	1,13,40,000
5	DD2	4	1500x2100	31,50,000	1,26,00,000
6	D1	26	1000x2100	21,00,000	5,46,00,000
7	D1A	27	1000x2100	21,00,000	5,67,00,000
8	D2	29	750x2100	15,75,000	4,56,75,000
9	HD	13	600x1200	7,20,000	93,60,000
10	FD	4	1200x2100	25,10,000	1,00,40,000
11	OD	6	1800x2400	43,20,000	2,59,20,000
Windows					
12	WD	10	1800x1200	21,60,000	2,16,00,000
13	WD1	Nil	Nil	Nil	Nil
14	W1	31	1800x1200	21,60,000	6,69,60,000
14	W2	7	1500x1200	18,00,000	1,26,00,000
16	W3	9	1200x1200	14,40,000	1,29,60,000
17	W4	Nil	Nil	Nil	Nil
18	SW	3	1800x1800	32,40,000	97,20,000
19	SW1	1	1800x1200	21,60,000	21,60,000
Ventilators					
20	V1	27	600x600	3,60,000	97,20,000
21	V2	2	5600x1200	67,20,000	1,34,40,000
22	V3	1	4600x1200	55,20,000	55,20,000
23	V4	1	3000x1200	36,00,000	36,00,000

Second floor					
S.No.	Window/door type	Total no.	Dimensions	Area (Sq.mm)	Total area
Doors					
1	MD	Nil	Nil	Nil	Nil
2	DD1	Nil	Nil	Nil	Nil
3	DD1A	5	1800x2400	43,20,000	2,16,00,000
4	DD1B	Nil	Nil	Nil	Nil
5	DD2	15	1500x2100	31,50,000	4,72,50,000
6	D1	12	1000x2100	21,00,000	2,52,00,000
7	D1A	14	1000x2100	21,00,000	2,94,00,000
8	D2	25	750x2100	15,75,000	3,93,75,000
9	HD	9	600x1200	7,20,000	64,80,000
10	FD	5	1200x2100	25,10,000	1,25,50,000
11	OD	Nil	Nil	Nil	Nil
Windows					
12	WD	14	1800x1200	21,60,000	3,02,40,000
13	WD1	Nil	Nil	Nil	Nil
14	W1	46	1800x1200	21,60,000	9,93,60,000
14	W2	9	1500x1200	18,00,000	1,62,00,000
16	W3	11	1200x1200	14,40,000	1,58,40,000
17	W4	Nil	Nil	Nil	Nil
18	SW	3	1800x1800	32,40,000	97,20,000
19	SW1	1	1800x1200	21,60,000	21,60,000
Ventilators					
20	V1	24	600x600	3,60,000	86,40,000
21	V2	2	5600x1200	67,20,000	1,34,40,000
22	V3	1	4600x1200	55,20,000	55,20,000
23	V4	1	3000x1200	36,00,000	36,00,000

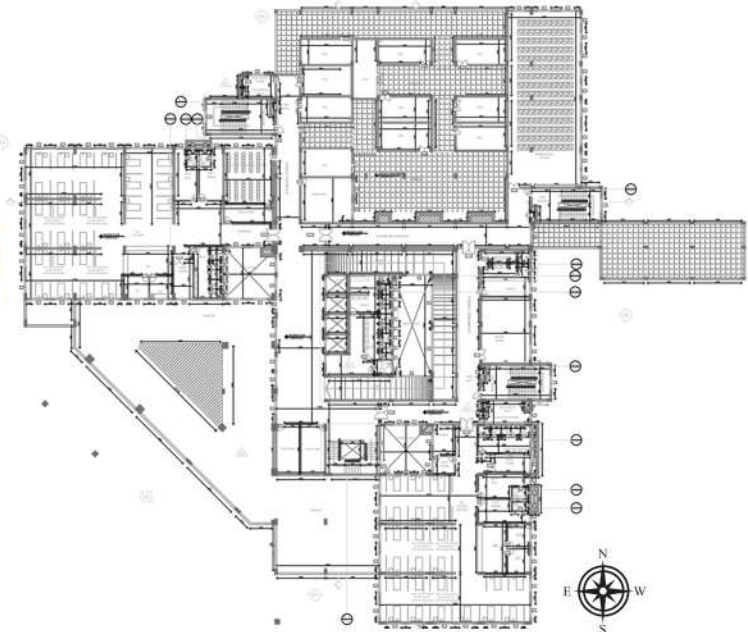
Third floor					
S.No.	Window/door type	Total no.	Dimensions	Area (Sq.mm)	Total area
Doors					
1	MD	Nil	Nil	Nil	Nil
2	DD1	Nil	Nil	Nil	Nil
3	DD1A	3	1800x2400	43,20,000	1,29,60,000
4	DD1B	Nil	Nil	Nil	Nil
5	DD2	5	1500x2100	31,50,000	1,57,50,000
6	D1	16	1000x2100	21,00,000	3,36,00,000
7	D1A	11	1000x2100	21,00,000	2,31,00,000
8	D2	23	750x2100	15,75,000	3,62,25,000
9	HD	8	600x1200	7,20,000	57,60,000
10	FD	3	1200x2100	25,10,000	75,30,000
11	OD	Nil	Nil	Nil	Nil
Windows					
12	WD	14	1800x1200	21,60,000	3,02,40,000
13	WD1	Nil	Nil	Nil	Nil
14	W1	38	1800x1200	21,60,000	8,20,80,000
14	W2	5	1500x1200	18,00,000	90,00,000
16	W3	8	1200x1200	14,40,000	1,15,20,000
17	W4	Nil	Nil	Nil	Nil
18	SW	2	1800x1800	32,40,000	64,80,000
19	SW1	1	1800x1200	21,60,000	21,60,000
Ventilators					
20	V1	22	600x600	3,60,000	79,20,000
21	V2	2	5600x1200	67,20,000	1,34,40,000
22	V3	1	4600x1200	55,20,000	55,20,000
23	V4	1	3000x1200	36,00,000	36,00,000



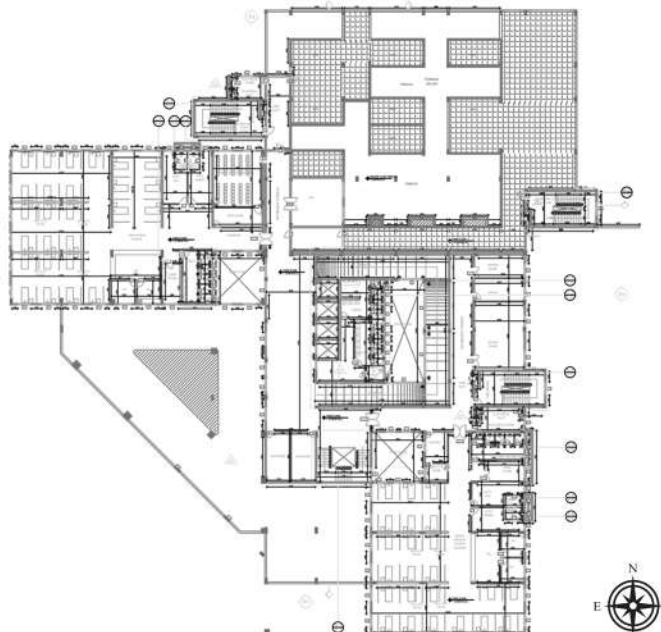
Ground floor



First floor



Second floor



Third floor

- The area of windows helps to calculate the window wall ratio which is very essential for calculation of the efficiency of natural ventilation and also the natural day lighting intensity.
- 40% is the minimum window wall ratio.
- It also helps to calculate the materials quantity required for construction and reduces material wastages.

GENERAL NOTES :-

- 1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
- 2. THIS DRAWING SHALL BE READ ALONG WITH RELEVANT STRUCTURAL AND OTHER SERVICES DRAWINGS
- 3. MEASUREMENTS NOT TO BE SCALED FROM THE DRAWING
- 4. ALL THE LEVELS INDICATED IN THIS DRAWING ARE SSI (STRUCTURAL FLOOR LEVEL) AND FINISH
- 5. ALL THE SILL LEVELS INDICATED IN THIS DRAWING ARE FROM SSI
- 6. ANY DISCREPANCY IN THE DRAWING SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE ARCHITECT
- 7. ALL THE LEVELS INDICATED IN THIS DRAWING ARE FROM FINISHED FLOOR LEVELS (F.F.L) UNLESS OTHERWISE SPECIFIED

SITE AREA 14.617 ACRES

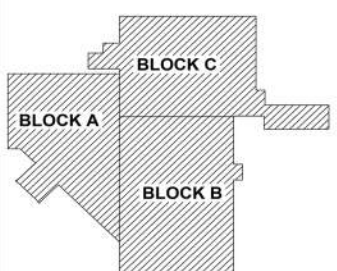
LOCATION PLAN :



LEGEND

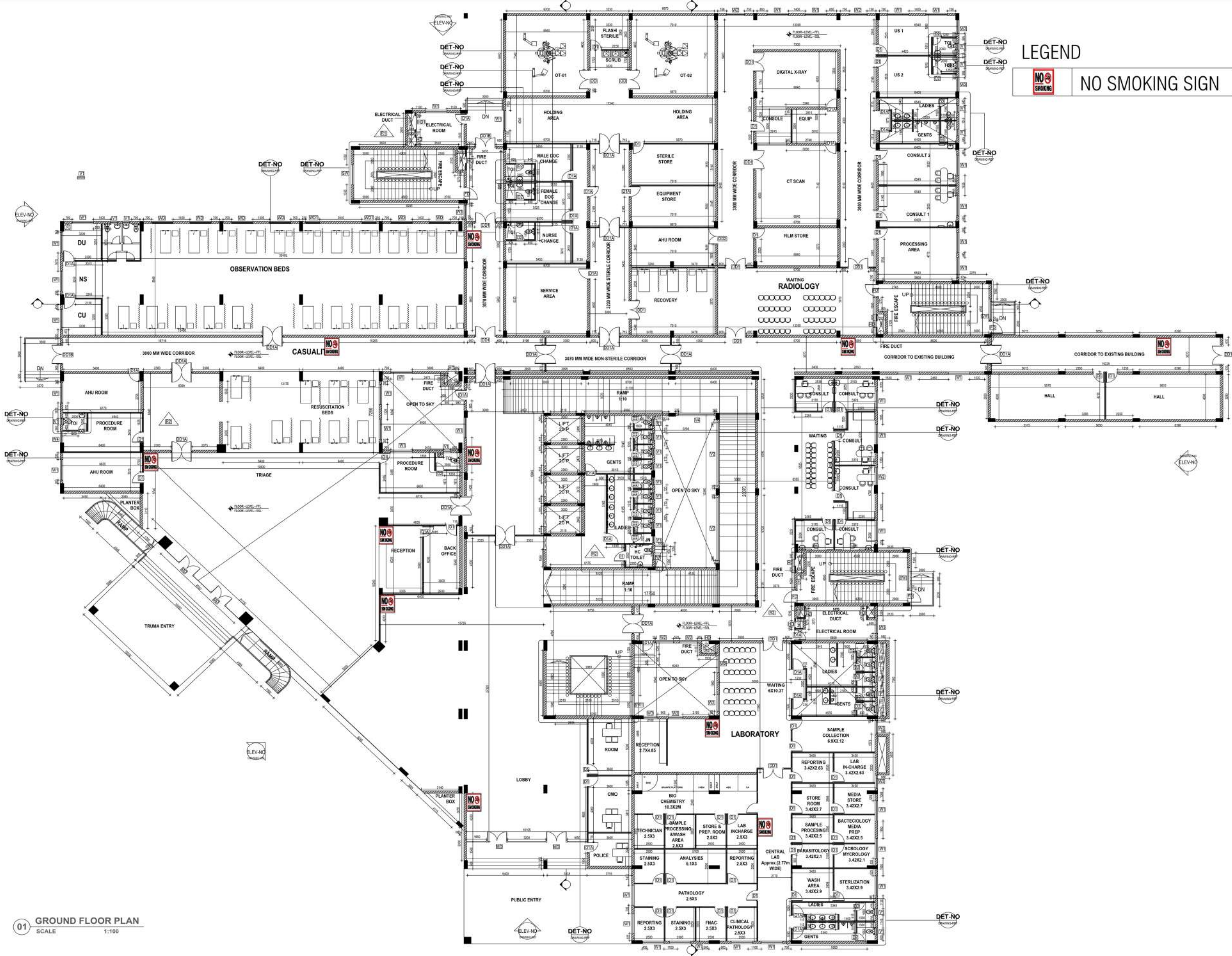
BOUNDARY LINE	---
SETBACK LINE	---
200 MM THICK WALL	---
100 MM THICK WALL	---

KEY PLAN :



JOINERY DETAIL:-

NO.	TYPE	SIZE IN MM	SPECIFICATIONS
A. DOORS			
1.	MD	1800 X 2400	AUTOMATIC SLIDING DOOR WITH FRAMELESS TOUGHENED GLASS 25
2.	DD1	1800 X 2400	POC-CAL PARTLY GLAZED DOOR WITH VIEW PANEL 25-90°
3.	DD1A	1800 X 2400	POC-CAL PARTLY GLAZED DOOR WITH VIEW PANEL 25-180°
4.	DD1B	1800 X 2400	POC-CAL PARTLY GLAZED DOOR WITH VIEW PANEL 25-90°
5.	DD2	1500 X 2100	POC-CAL PARTLY GLAZED DOOR 25
6.	D1	1000 X 2100	POC-CAL PARTLY GLAZED DOOR WITH VIEW PANEL 15
7.	D1A	1000 X 2100	POC-CAL PARTLY GLAZED DOOR WITH VIEW PANEL 15
8.	D2	0750 X 2100	UP P.V.C. FRAMED DOOR WITH U.P.V.C. SHUTTER 15
9.	HD	0800 X 1200	HATCH DOOR 15
10.	FD	1200 X 2100	1-HOUR FIRE RATED FIRE EXIT DOOR 25
11.	OD	1800 X 2400	OT DOOR AS PER STANDARDS 25
B. WINDOWS			
12.	WD	1800 X 1200	POC-CAL 3-TRACK GLAZED FIXED WINDOW
13.	WD1	1200 X 1200	POC-CAL 3-TRACK GLAZED FIXED WINDOW
14.	W1	1800 X 1200	POC-CAL 3-TRACK GLAZED SLIDING WINDOW
15.	W2	1500 X 1200	POC-CAL 3-TRACK GLAZED SLIDING WINDOW
16.	W3	1200 X 1200	POC-CAL 3-TRACK GLAZED SLIDING WINDOW
17.	W4	1000 X 1200	POC-CAL 3-TRACK GLAZED SLIDING WINDOW
18.	SW	1800 X 1800	POC-CAL FIXED WINDOW
19.	SW1	1800 X 1200	POC-CAL FIXED WINDOW
C. VENTILATORS			
20.	V1	600 X 600	POC-CAL LOUVERED FIXED VENTILATOR
21.	V2	500 X 1200	POC-CAL FIXED GLASS VENTILATOR
22.	V3	4800 X 1200	POC-CAL FIXED GLASS VENTILATOR
23.	V4	3000 X 1200	POC-CAL FIXED GLASS VENTILATOR



01 GROUND FLOOR PLAN
SCALE 1:100



LEGEND



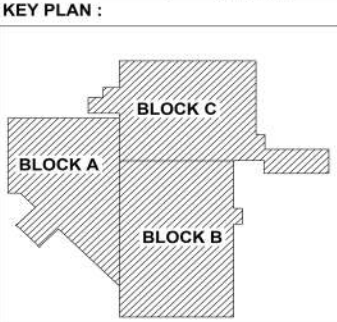
NO SMOKING SIGN

- GENERAL NOTES :-
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 - 2. THIS DRAWING SHALL BE READ ALONG WITH RELEVANT STRUCTURAL AND OTHER SERVICES DRAWINGS.
 - 3. MEASUREMENTS NOT TO BE SCALED FROM THE DRAWING.
 - 4. ALL THE LEVELS INDICATED IN THIS DRAWING ARE SLAB/STRUCTURAL SLAB LEVEL AND HEIGHTS TO BE CONSIDERED FROM FFL (FINISHED FLOOR LEVEL) AND OPENING
 - 5. ALL THE SILL LEVELS INDICATED IN THIS DRAWING ARE FROM SSL
 - 6. ANY DISCREPANCY IN THE DRAWING SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE ARCHITECT
 - 7. ALL THE LEVELS INDICATED IN THIS DRAWING ARE STRUCTURAL SLAB LEVELS (SSL) AND NOT FINISHED FLOOR LEVELS (FFL) EXCEPT DETAIL DRAWINGS WHERE ALL LEVELS ARE FROM FINISHED FLOOR LEVELS (FFL) UNLESS OTHERWISE SPECIFIED



LEGEND

BOUNDARY LINE	
SETBACK LINE	
200 MM THICK WALL	
100 MM THICK WALL	



JOINERY DETAIL:-

NO	TYPE	SIZE IN MM	SPECIFICATIONS
A. DOORS			
1	MD	1800 X 2400	AUTOMATIC SLIDING DOOR WITH FRAMELESS TOUGHENED GLASS-25
2	DD1	1800 X 2400	POCCAL PARTLY GLAZED DOOR WITH VIEW PANEL-25-90°
3	DD1A	1800 X 2400	POCCAL PARTLY GLAZED DOOR WITH VIEW PANEL-25-180°
4	DD1B	1800 X 2100	POCCAL FRAMED DOOR-25-90°
5	DD2	1500 X 2100	POCCAL FRAMED DOOR-25
6	D1	1000 X 2100	POCCAL PARTLY GLAZED DOOR WITH VIEW PANEL-15
7	D1A	1000 X 2100	POCCAL FRAMED DOOR-15
8	D2	0750 X 2100	UP V.C. FRAMED DOOR WITH U.P.V.C. SHUTTER-15
9	HD	0600 X 1200	HATCH DOOR-15
10	FD	1200 X 2100	4-HOUR FIRE RATED FIRE EXIT DOOR-25
11	OD	1800 X 2400	DOOR AS PER STANDARDS-25
B. WINDOWS			
12	WD	1800 X 1200	POCCAL 3-TRACK GLAZED FIXED WINDOW
13	WD1	1200 X 1200	POCCAL 3-TRACK GLAZED FIXED WINDOW
14	W1	1800 X 1200	POCCAL 3-TRACK GLAZED SLIDING WINDOW
15	W2	1500 X 1200	POCCAL 3-TRACK GLAZED SLIDING WINDOW
16	W3	1200 X 1200	POCCAL 3-TRACK GLAZED SLIDING WINDOW
17	W4	1000 X 1200	POCCAL 3-TRACK GLAZED SLIDING WINDOW
18	SW	1800 X 1600	POCCAL FIXED WINDOW
19	SW1	1800 X 1200	POCCAL FIXED WINDOW
C. VENTILATORS			
20	V1	600 X 600	POCCAL LOUVERED FIXED VENTILATOR
21	V2	5600 X 1200	POCCAL FIXED GLASS VENTILATOR
22	V3	4600 X 1200	POCCAL FIXED GLASS VENTILATOR
23	V4	3000 X 1200	POCCAL FIXED GLASS VENTILATOR

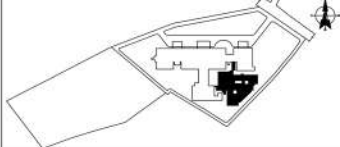
02 FIRST FLOOR PLAN
SCALE 1:100

GENERAL NOTES :-

- 1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
- 2. THIS DRAWING SHALL BE READ ALONG WITH RELEVANT STRUCTURAL AND OTHER SERVICES DRAWINGS.
- 3. MEASUREMENTS NOT TO BE SCALED FROM THE DRAWING.
- 4. ALL THE LEVELS INDICATED IN THIS DRAWING ARE SSI/STRUCTURAL FLOOR LEVEL AND OPENING
- 5. ALL THE SILL LEVELS INDICATED IN THIS DRAWING ARE FROM SSL
- 6. ANY DISCREPANCY IN THE DRAWING SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE ARCHITECT.
- 7. ALL THE LEVELS INDICATED IN THIS DRAWING ARE STRUCTURAL SLAB LEVELS (SSL) AND NOT FINISHED FLOOR LEVELS (FFL) EXCEPT DETAIL DRAWINGS WHERE ALL LEVELS ARE FROM FINISHED FLOOR LEVELS (FFL) UNLESS OTHERWISE SPECIFIED

SITE AREA 14.617 ACRES

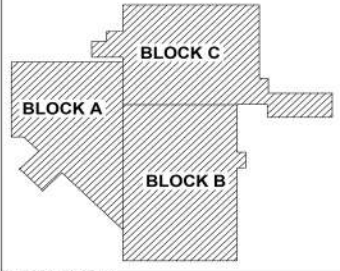
LOCATION PLAN :



LEGEND

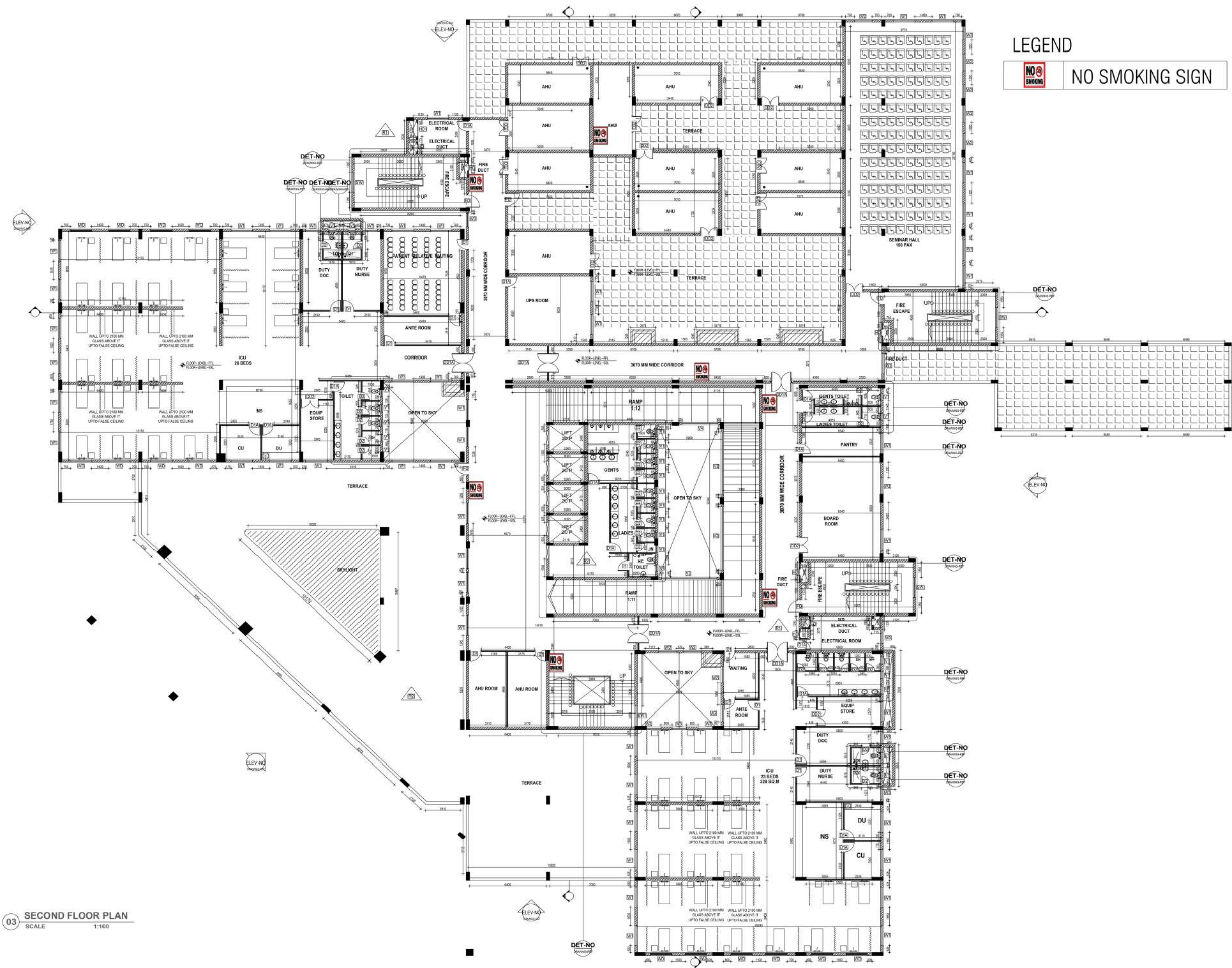
BOUNDARY LINE	---
SETBACK LINE	---
200 MM THICK WALL	---
100 MM THICK WALL	---

KEY PLAN :



JOINERY DETAIL:-

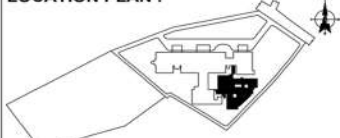
NO.	TYPE	SIZE IN MM	SPECIFICATIONS
A. DOORS			
1	MD	1800 X 2400	AUTOMATIC SLIDING DOOR WITH FRAMELESS TOUGHENED GLASS-25
2	DD1	1800 X 2400	PCCA AL PARTLY GLAZED DOOR WITH VIEW PANEL-25-90°
3	DD1A	1800 X 2400	PCCA AL PARTLY GLAZED DOOR WITH VIEW PANEL-25-180°
4	DD1B	1800 X 2100	PCCA AL PARTLY GLAZED DOOR WITH VIEW PANEL-25-90°
5	D2	1500 X 2100	PCCA AL PARTLY GLAZED DOOR WITH VIEW PANEL-15
6	D1	1000 X 2100	PCCA AL PARTLY GLAZED DOOR WITH VIEW PANEL-15
7	D1A	1000 X 2100	PCCA AL PARTLY GLAZED DOOR WITH VIEW PANEL-15
8	D2	0750 X 2100	UP V.C. FRAMED DOOR WITH U.P.V.C. SHUTTER-15
9	HD	1800 X 1200	HATCH DOOR-15
10	FD	1200 X 2100	2-HOUR FIRE RATED FIRE EXIT DOOR-25
11	OD	1800 X 2400	T. DOOR AS PER STANDARDS-25
B. WINDOWS			
12	WD	1800 X 1200	PCCA AL 3-TRACK GLAZED FIXED WINDOW
13	WD1	1200 X 1200	PCCA AL 3-TRACK GLAZED FIXED WINDOW
14	W1	1800 X 1200	PCCA AL 3-TRACK GLAZED SLIDING WINDOW
15	W2	1500 X 1200	PCCA AL 3-TRACK GLAZED SLIDING WINDOW
16	W3	1200 X 1200	PCCA AL 3-TRACK GLAZED SLIDING WINDOW
17	W4	1000 X 1200	PCCA AL 3-TRACK GLAZED SLIDING WINDOW
18	SW	1800 X 1800	PCCA AL FIXED WINDOW
19	SW1	1800 X 1200	PCCA AL FIXED WINDOW
C. VENTILATORS			
20	V1	600 X 600	PCCA AL LOUVERED FIXED VENTILATOR
21	V2	500 X 1200	PCCA AL FIXED GLASS VENTILATOR
22	V3	4000 X 1200	PCCA AL FIXED GLASS VENTILATOR
23	V4	3000 X 1200	PCCA AL FIXED GLASS VENTILATOR





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2. THIS DRAWING SHALL BE READ ALONG WITH RELEVANT STRUCTURAL AND OTHER SERVICES DRAWINGS.
3. MEASUREMENTS NOT TO BE SCALED FROM THE DRAWING.
4. ALL THE LEVELS INDICATED IN THIS DRAWING ARE FROM SL (STRUCTURAL SLAB LEVEL) AND NOT TO BE CONSIDERED FROM FFL (FINISHED FLOOR LEVEL) AND OPENING.
5. ALL THE SILL LEVELS INDICATED IN THIS DRAWING ARE FROM SSL.
6. ANY DISCREPANCY IN THE DRAWING SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE ARCHITECT.
7. ALL THE LEVELS INDICATED IN THIS DRAWING ARE FROM STRUCTURAL SLAB LEVELS (SSL) AND NOT FINISHED FLOOR LEVELS (FFL) EXCEPT DETAIL DRAWINGS WHERE ALL LEVELS ARE FROM FINISHED FLOOR LEVELS (FFL) UNLESS OTHERWISE SPECIFIED

LOCATION PLAN : N

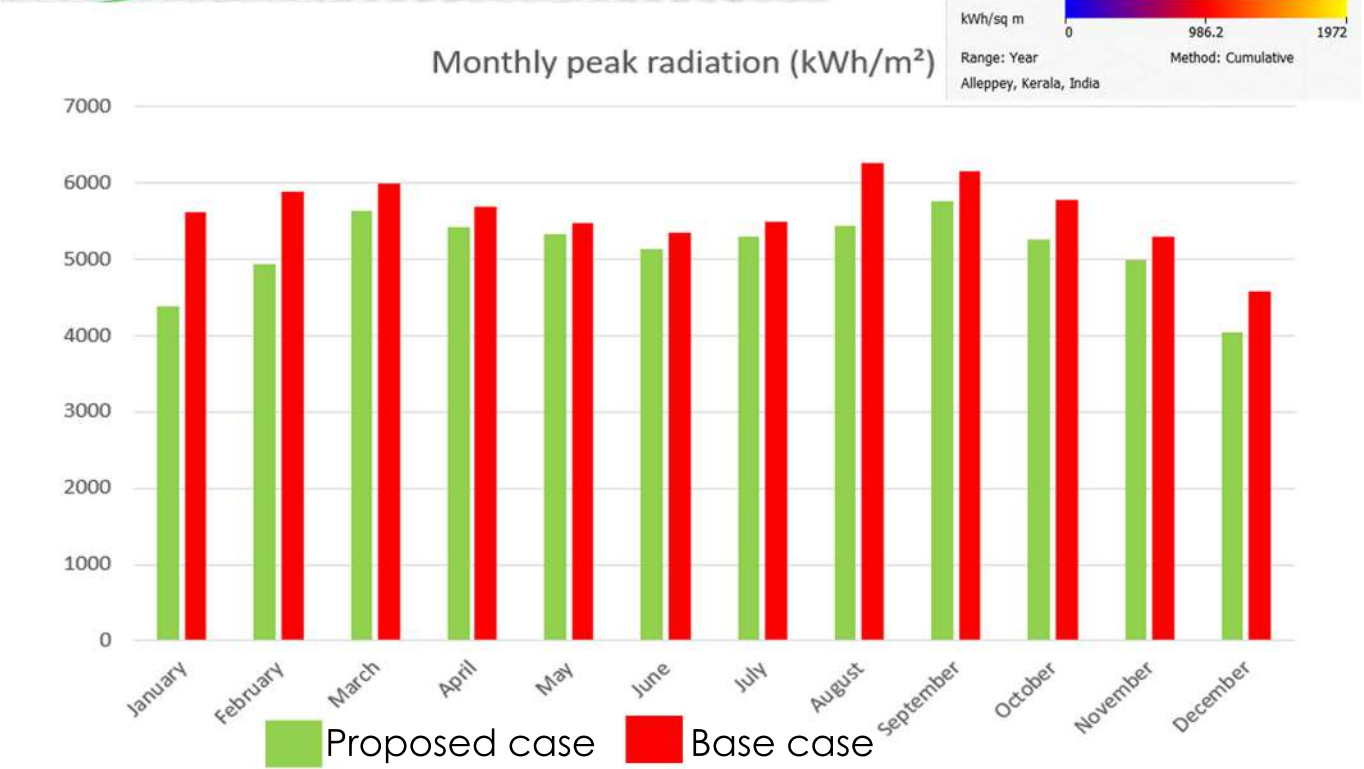
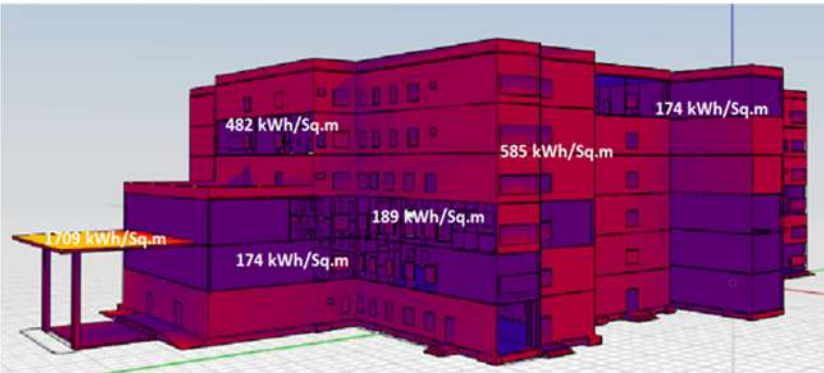
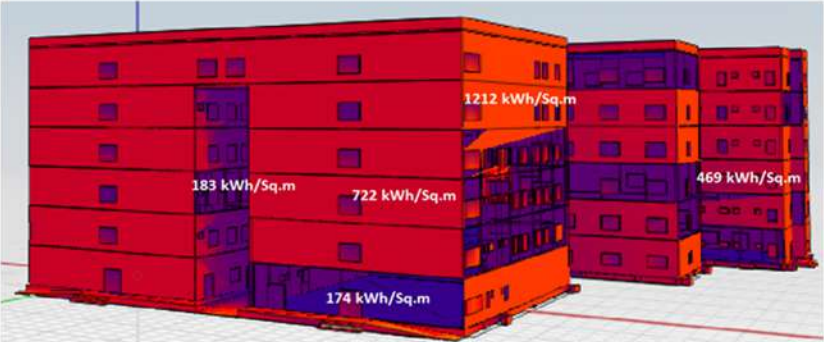
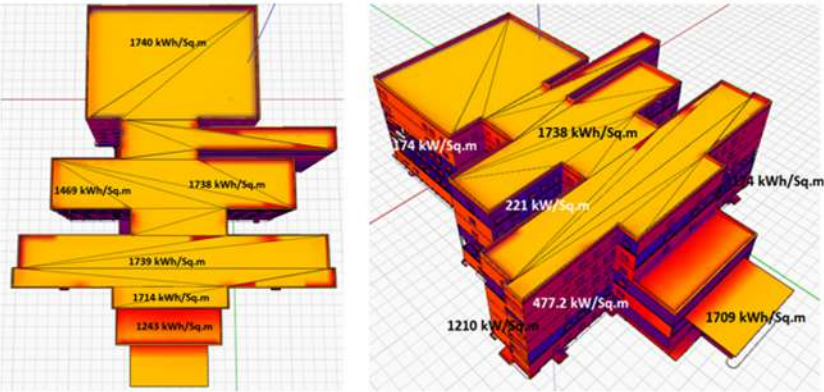


BOUNDARY LINE	
SETBACK LINE	
200 MM THICK WALL	
100 MM THICK WALL	

SPECIFICATIONS	
NO.	SIZE IN MM
1	1500 X 2400 / AUTOMATIC SLIDING DOOR WITH FRAMELESS TIGHTENED GLASS-25
D01	1500 X 2400 / PC-CAL PARTIALLY GLAZED DOOR WITH VIEW PANEL-25°
D01A	1500 X 2400 / PC-CAL PARTIALLY GLAZED DOOR WITH VIEW PANE-25°
D01B	1500 X 2400 / PC-CAL PARTIALLY GLAZED DOOR WITH VIEW PANE-25°
D02	1500 X 2100 / PC-CAL, FRAMED DOOR-25
D03	1500 X 2100 / PC-CAL, FRAMED DOOR WITH VIEW PANE-18
D1A	1500 X 2100 / PC-CAL, FRAMED DOOR-15
D2	0750 X 2100 / P.V.C, FRAMED DOOR WITH P.V.C, SHUTTER-15
D0	800 X 1200 / PARTIAL DOOR-15
D0	230 X 2110 / SHUTTER DOOR WITH FIRE EXIT DOOR-15
D0	1800 X 2000 / D DOOR AS PER STANDARDS-25
B WINDOWS	
W1	1500 X 1200 / PC-CAL-3 TRACK GLAZED FIXED WINDOW
W2	1200 X 1200 / PC-CAL-2 TRACK GLAZED FIXED WINDOW
W1	1500 X 1200 / PC-CAL-3 TRACK GLAZED SLIDING WINDOW
W2	1500 X 1200 / PC-CAL-3 TRACK GLAZED SLIDING WINDOW
W3	1500 X 1200 / PC-CAL-3 TRACK GLAZED SLIDING WINDOW
W4	1500 X 1200 / PC-CAL-3 TRACK GLAZED SLIDING WINDOW
SW	1800 X 800 / PC-CAL, FIXED WINDOW
SW	1500 X 1200 / PC-CAL, FIXED WINDOW
C VENTILATORS	
V1	600 X 600 / PC-CAL / LOUVERED FIXED VENTILATOR
V2	500 X 200 / PC-CAL / FIXED GLASS VENTILATOR
V3	650 X 100 / PC-CAL / FIXED GLASS VENTILATOR
V4	300 X 1200 / PC-CAL / FIXED GLASS VENTILATOR

04 THIRD FLOOR PLAN
SCALE 1:100

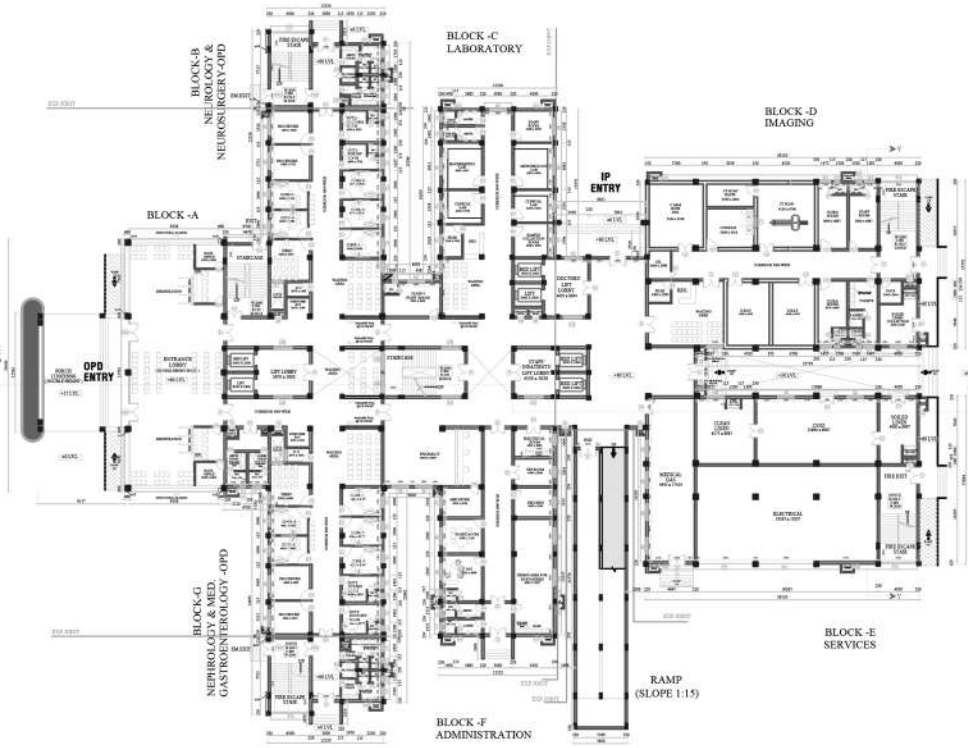
Month	Month peak radiation (kWh/m2)		Cumulative radiation (kWh/m2)	
	Proposed case	Base case (Griha cube)	Proposed case	Base case (Griha cube)
January	4381 kWh for 16050.7 m2 0.34 kWh/m2	5614 kWh for 19546m2 0.34 kWh/m2	82,42,866 kwh for 16050.7 m2 624 kWh/m2	94,86,757 kwh for 16050.7 m2 768 kWh/m2
February	4938 kWh for 16050.7 m2 0.36 kWh/m2	5886 kWh for 19546m2 0.36kWh/m2		
March	5633 kWh for 16050.7 m2 0.4 kWh/m2	5985 kWh for 19546m2 0.38kWh/m2		
April	5421 kWh for 16050.7 m2 0.39 kWh/m2	5674 kWh for 19546m2 0.4 kWh/m2		
May	5329 kWh for 16050.7 m2 0.35 kWh/m2	5468 kWh for 19546m2 0.36 kWh/m2		
June	5134 kWh for 16050.7 m2 0.31 kWh/m2	5346 kWh for 19546m2 0.33 kWh/m2		
July	5298 kWh for 16050.7 m2 0.33 kWh/m2	5489 kWh for 19546m2 0.32 kWh/m2		
August	5432 kWh for 16050.7 m2 0.32 kWh/m2	6251 kWh for 19546m2 0.31 kWh/m2		
September	5751 kWh for 16050.7 m2 0.42 kWh/m2	6143 kWh for 19546m2 0.42 kWh/m2		
October	5248 kWh for 16050.7 m2 0.35 kWh/m2	5769 kWh for 19546m2 0.37 kWh/m2		
November	4983 kWh for 16050.7 m2 0.29 kWh/m2	5294 kWh for 19546m2 0.32 Kwh/m2		
December	4031 kWh for 16050.7 m2 0.24 kWh/m2	4578 kWh for 19546m2 0.22 kWh/m2		



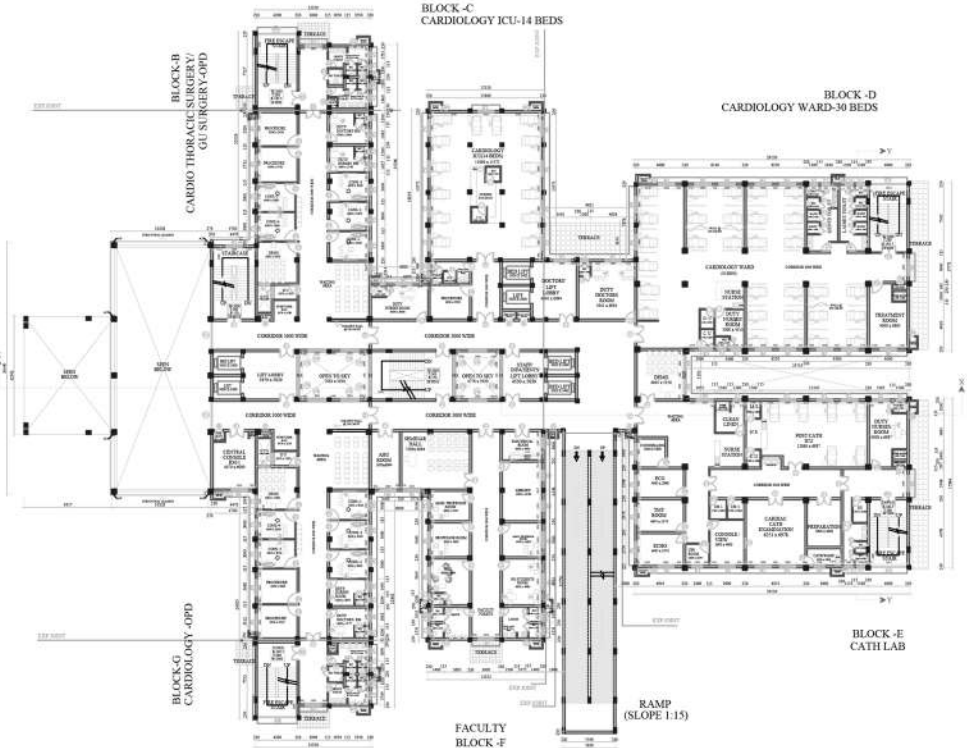
Inference:

- Solar insolation analysis was done for monthly peak radiation and cumulative radiation.
- The results (cumulative radiation) shows that the radiation value of base case (**624 kwh/m2**) is higher than the proposed case (**768 kwh/m2**), which shows that the building performing well in terms of solar insolation.
- In proposed case highest radiation falls in the month of **september** with **0.42 kwh/m2** and last in the month of **december** with **0.24 kwh/m2**
- In base case highest radiation falls in the month of **august** with **0.42 kwh/m2** and least in the month of **december** with **0.22 kwh/m2**

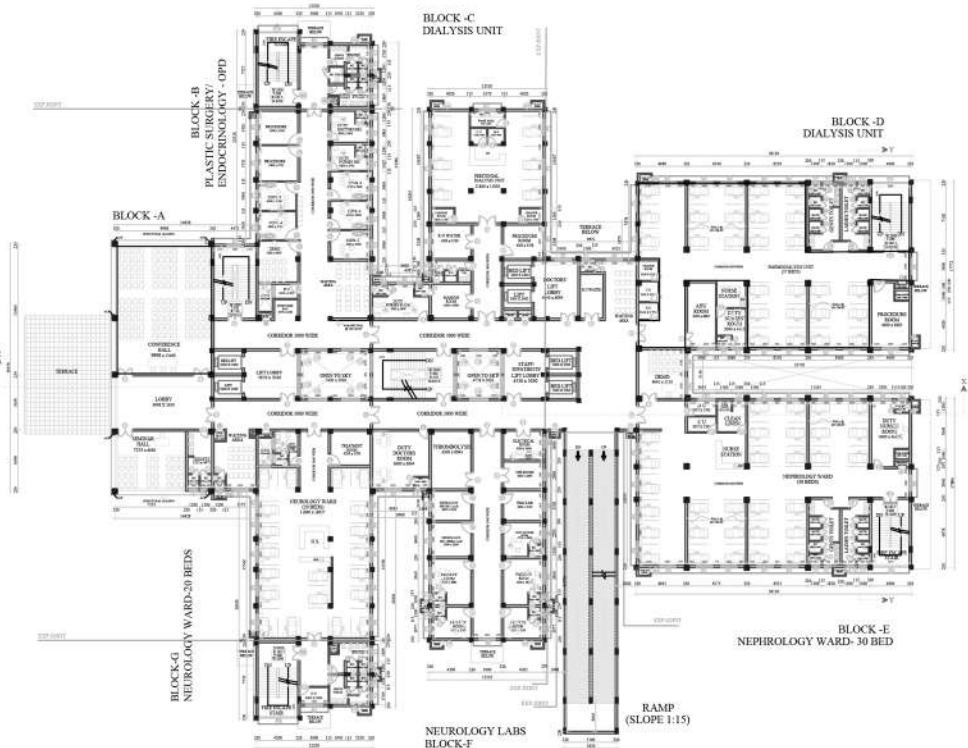
Key plan:



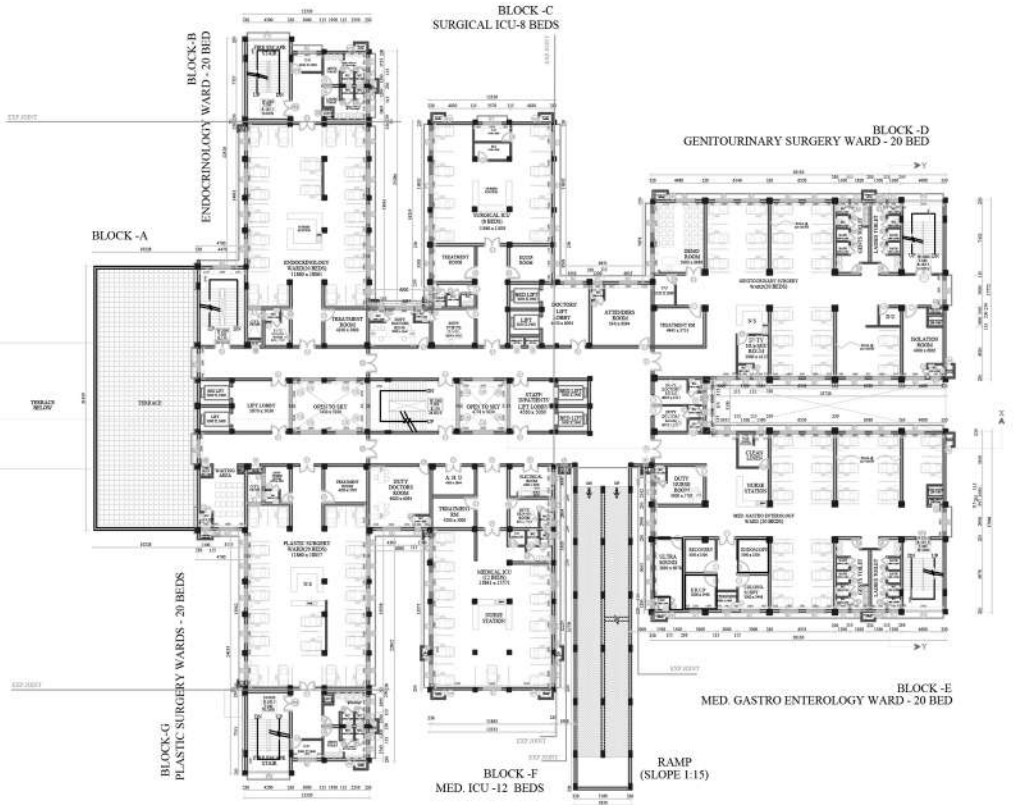
Ground floor plan



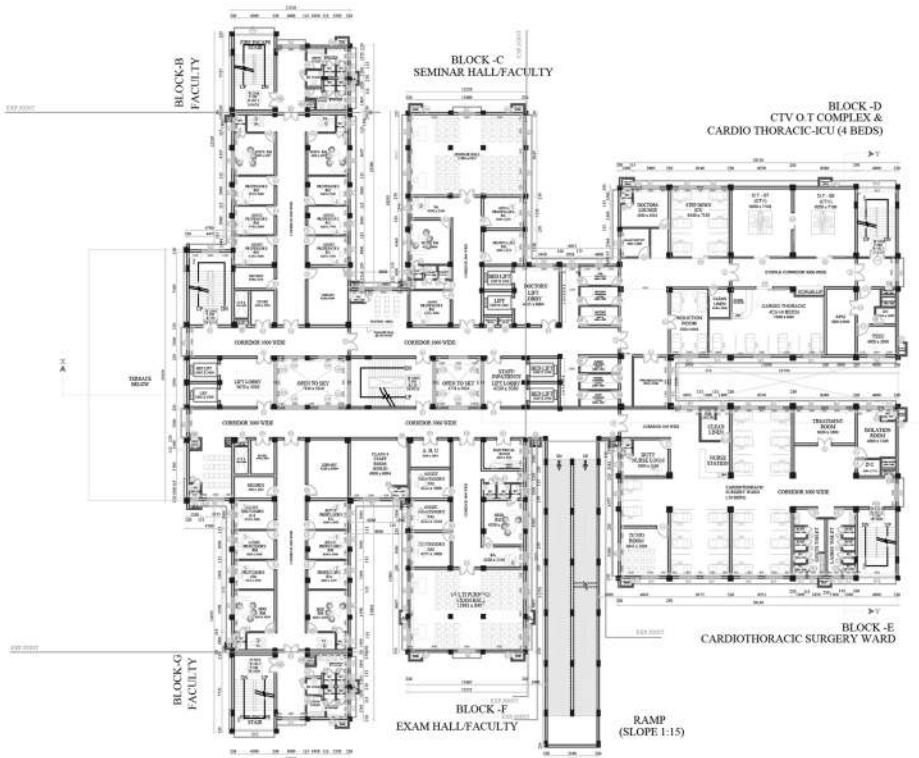
First floor plan



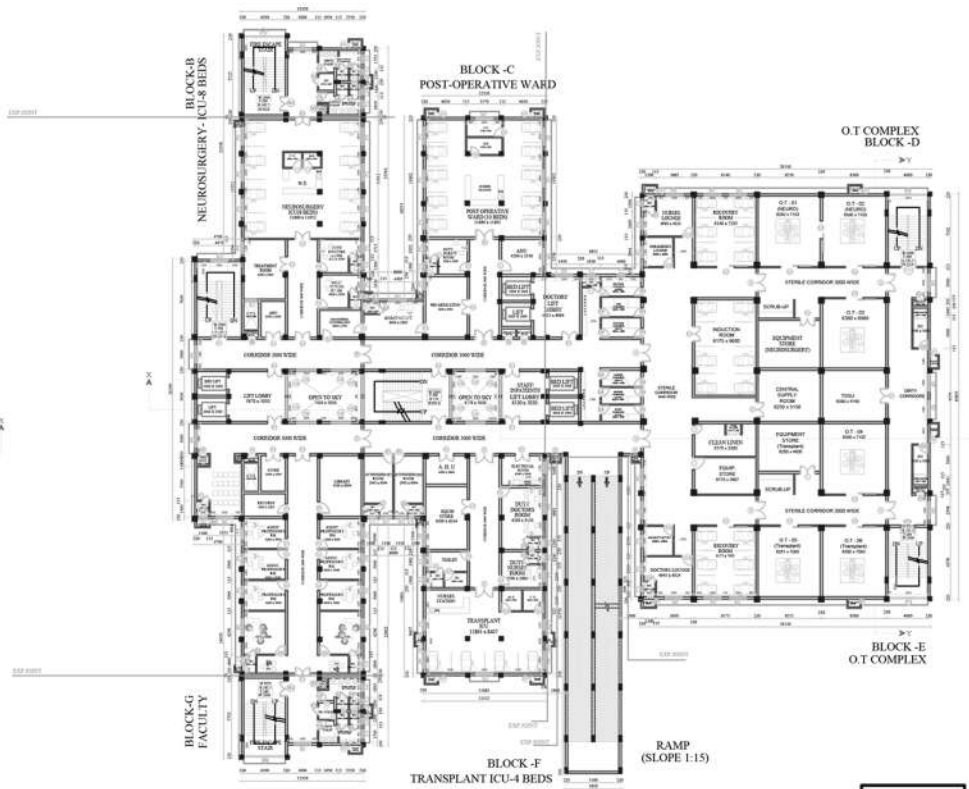
Second floor plan



Third floor plan

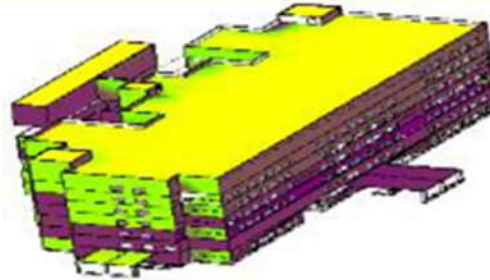
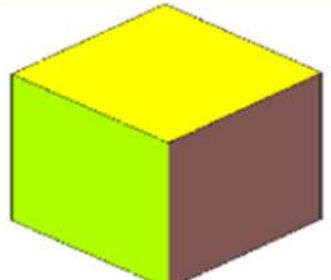
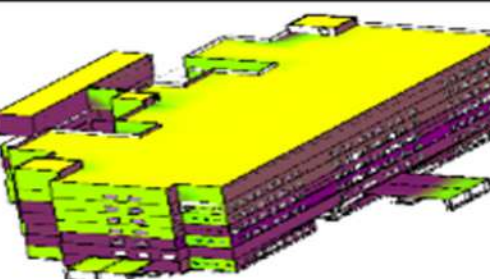
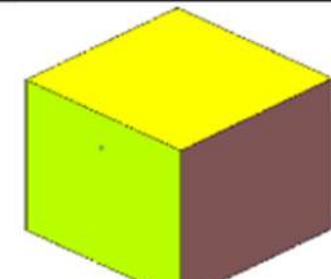
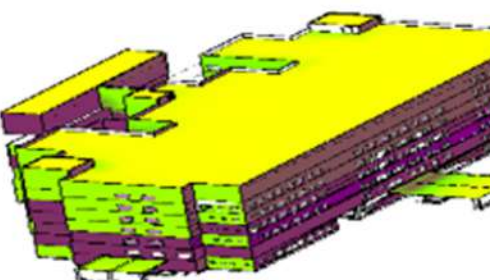
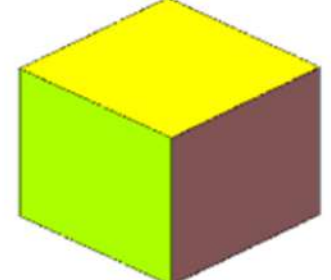
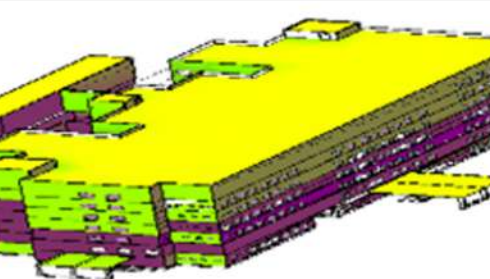
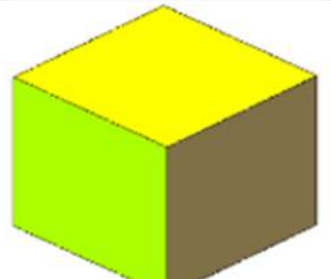
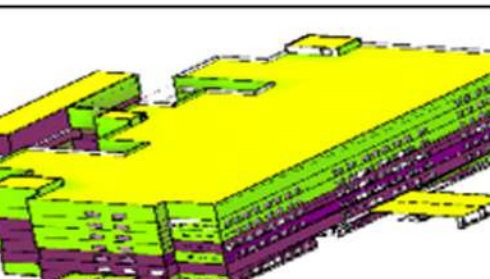
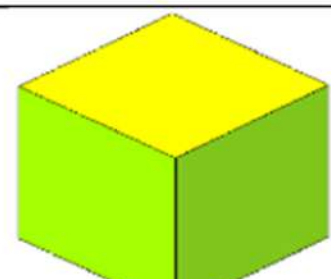
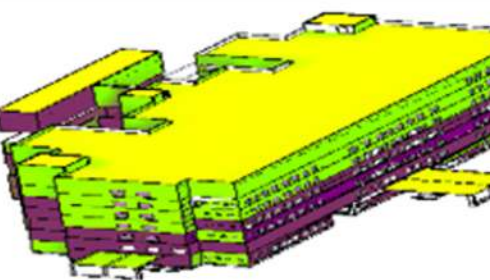
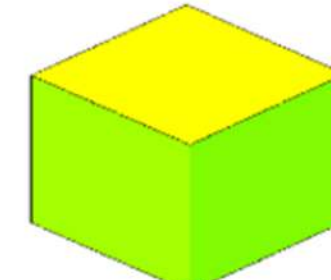


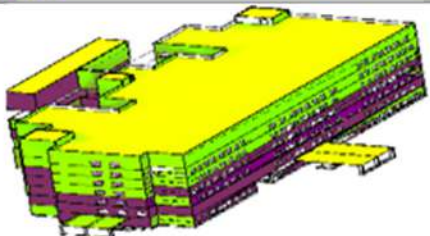
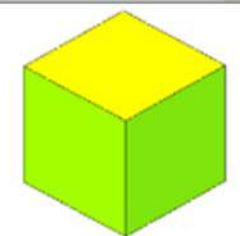
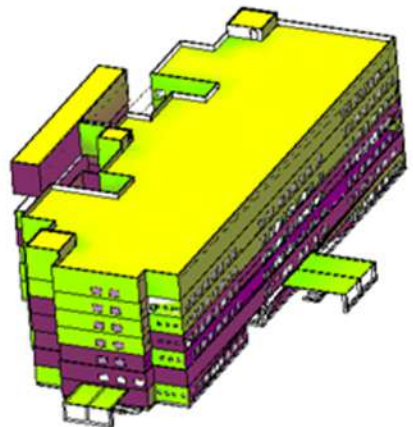
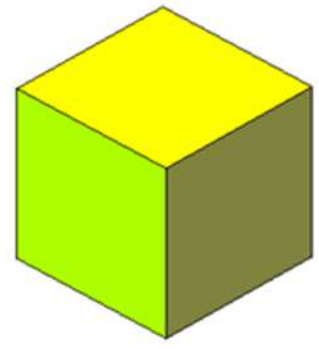
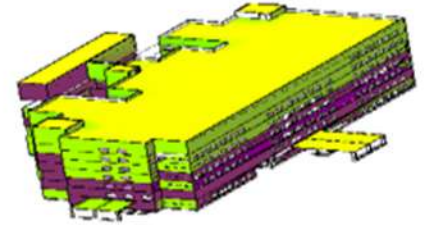
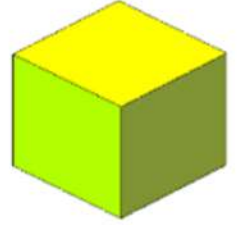
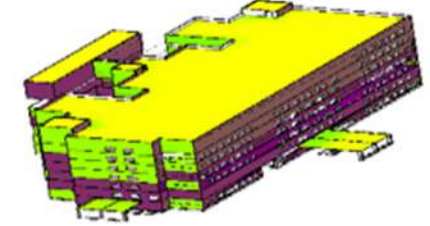
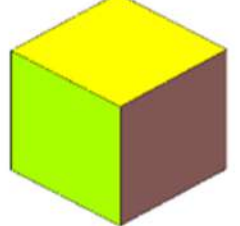
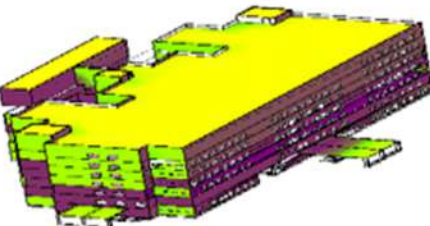
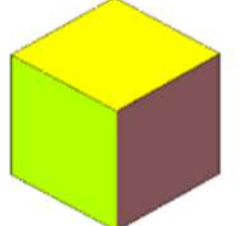
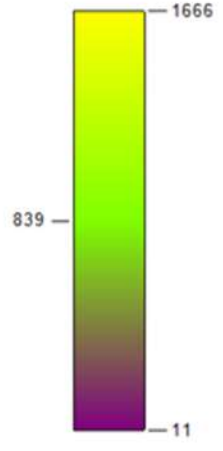
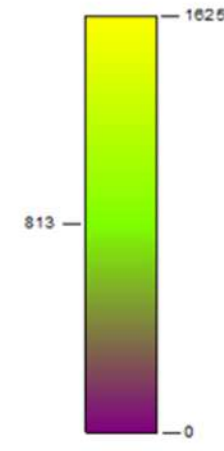
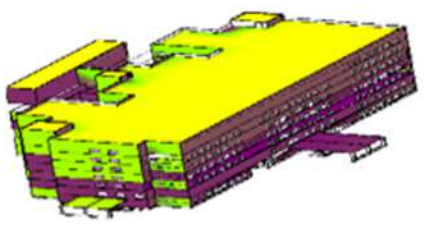
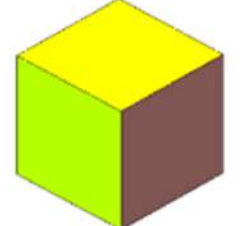
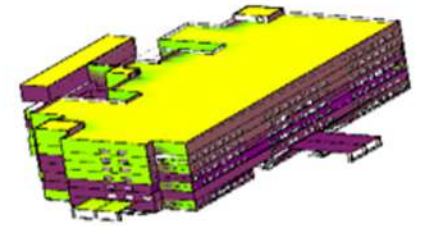
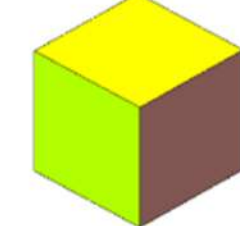
Fourth floor plan



Fifth floor plan

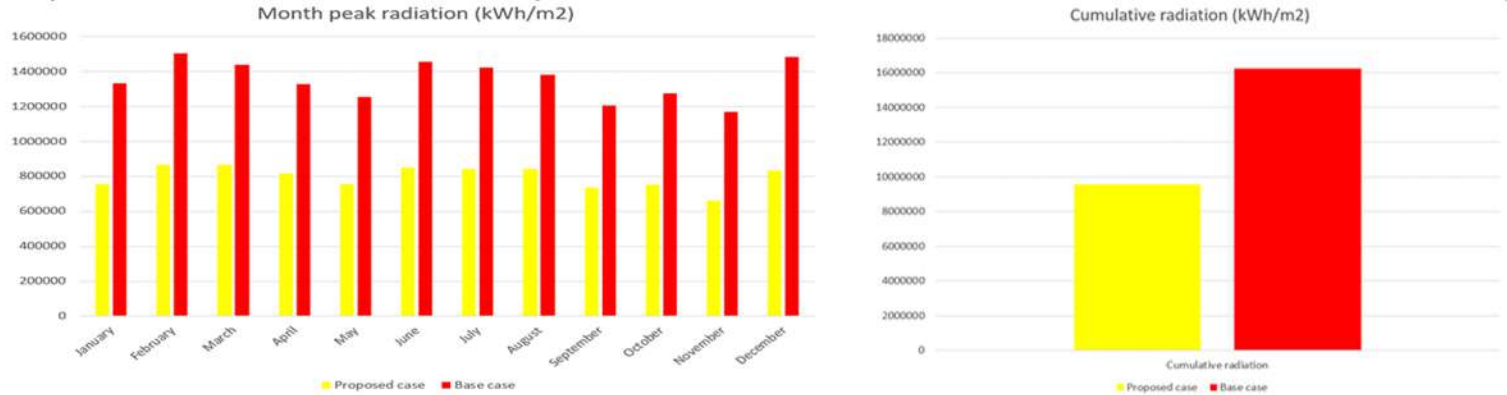


Month	Month peak radiation (kWh/m2)			
	Proposed case		Base case (Griha cube)	
January	Results Cumulative Insolation 7,54,726 kWh 44 kWh/m² Study Settings 17,331 m² selected 1-1 to 1-31 6am-6pm 		Results Cumulative Insolation 13,32,272 kWh 60 kWh/m² Study Settings 22,326 m² selected 1-1 to 1-31 6am-6pm 	
February	Results Cumulative Insolation 8,67,675 kWh 50 kWh/m² Study Settings 17,331 m² selected 2-1 to 2-28 6am-6pm 		Results Cumulative Insolation 15,03,578 kWh 67 kWh/m² Study Settings 22,326 m² selected 2-1 to 2-28 6am-6pm 	
March	Results Cumulative Insolation 8,65,135 kWh 50 kWh/m² Study Settings 17,331 m² selected 3-1 to 3-31 6am-6pm 		Results Cumulative Insolation 14,35,791 kWh 64 kWh/m² Study Settings 22,326 m² selected 3-1 to 3-31 6am-6pm 	
April	Results Cumulative Insolation 8,17,275 kWh 47 kWh/m² Study Settings 17,331 m² selected 4-1 to 4-30 6am-6pm 		Results Cumulative Insolation 13,26,706 kWh 59 kWh/m² Study Settings 22,326 m² selected 4-1 to 4-30 6am-6pm 	
May	Results Cumulative Insolation 7,54,158 kWh 44 kWh/m² Study Settings 17,331 m² selected 5-1 to 5-31 6am-6pm 		Results Cumulative Insolation 12,52,655 kWh 56 kWh/m² Study Settings 22,326 m² selected 5-1 to 5-31 6am-6pm 	
June	Results Cumulative Insolation 8,50,536 kWh 49 kWh/m² Study Settings 17,331 m² selected 6-1 to 6-30 6am-6pm 		Results Cumulative Insolation 14,52,086 kWh 65 kWh/m² Study Settings 22,326 m² selected 6-1 to 6-30 6am-6pm 	

Month	Month peak radiation (kWh/m2)				Cumulative radiation (kWh/m2)	
	Proposed case		Base case (Griha cube)		Proposed case	Base case (Griha cube)
July	Results Cumulative Insolation 8,41,399 kWh 49 kWh/m² Study Settings 17,331 m² selected 7-1 to 7-31 6am-6pm		Results Cumulative Insolation 14,21,629 kWh 64 kWh/m² Study Settings 22,326 m² selected 7-1 to 7-31 6am-6pm			
August	Results Cumulative Insolation 8,40,049 kWh 48 kWh/m² Study Settings 17,331 m² selected 8-1 to 8-31 6am-6pm		Results Cumulative Insolation 13,80,687 kWh 62 kWh/m² Study Settings 22,326 m² selected 8-1 to 8-31 6am-6pm			
September	Results Cumulative Insolation 7,37,145 kWh 43 kWh/m² Study Settings 17,331 m² selected 9-1 to 9-30 6am-6pm		Results Cumulative Insolation 12,06,014 kWh 54 kWh/m² Study Settings 22,326 m² selected 9-1 to 9-30 6am-6pm			
October	Results Cumulative Insolation 7,49,768 kWh 43 kWh/m² Study Settings 17,331 m² selected 10-1 to 10-31 6am-6pm		Results Cumulative Insolation 12,73,688 kWh 57 kWh/m² Study Settings 22,326 m² selected 10-1 to 10-31 6am-6pm		 Project location: KOZHICODE Sun study start date time: 01-01-2021 06:00:00 Sun study end date time: 31-12-2021 18:00:00 Cumulative Insolation	 Project location: Kozhikode Sun study start date time: 01-01-2011 06:00:00 Sun study end date time: 31-12-2011 18:00:00 Cumulative Insolation
November	Results Cumulative Insolation 6,63,173 kWh 38 kWh/m² Study Settings 17,331 m² selected 11-1 to 11-30 6am-6pm		Results Cumulative Insolation 11,66,544 kWh 52 kWh/m² Study Settings 22,326 m² selected 11-1 to 11-30 6am-6pm			
December	Results Cumulative Insolation 8,33,556 kWh 48 kWh/m² Study Settings 17,331 m² selected 12-1 to 12-31 6am-6pm		Results Cumulative Insolation 14,82,919 kWh 66 kWh/m² Study Settings 22,326 m² selected 12-1 to 12-31 6am-6pm			

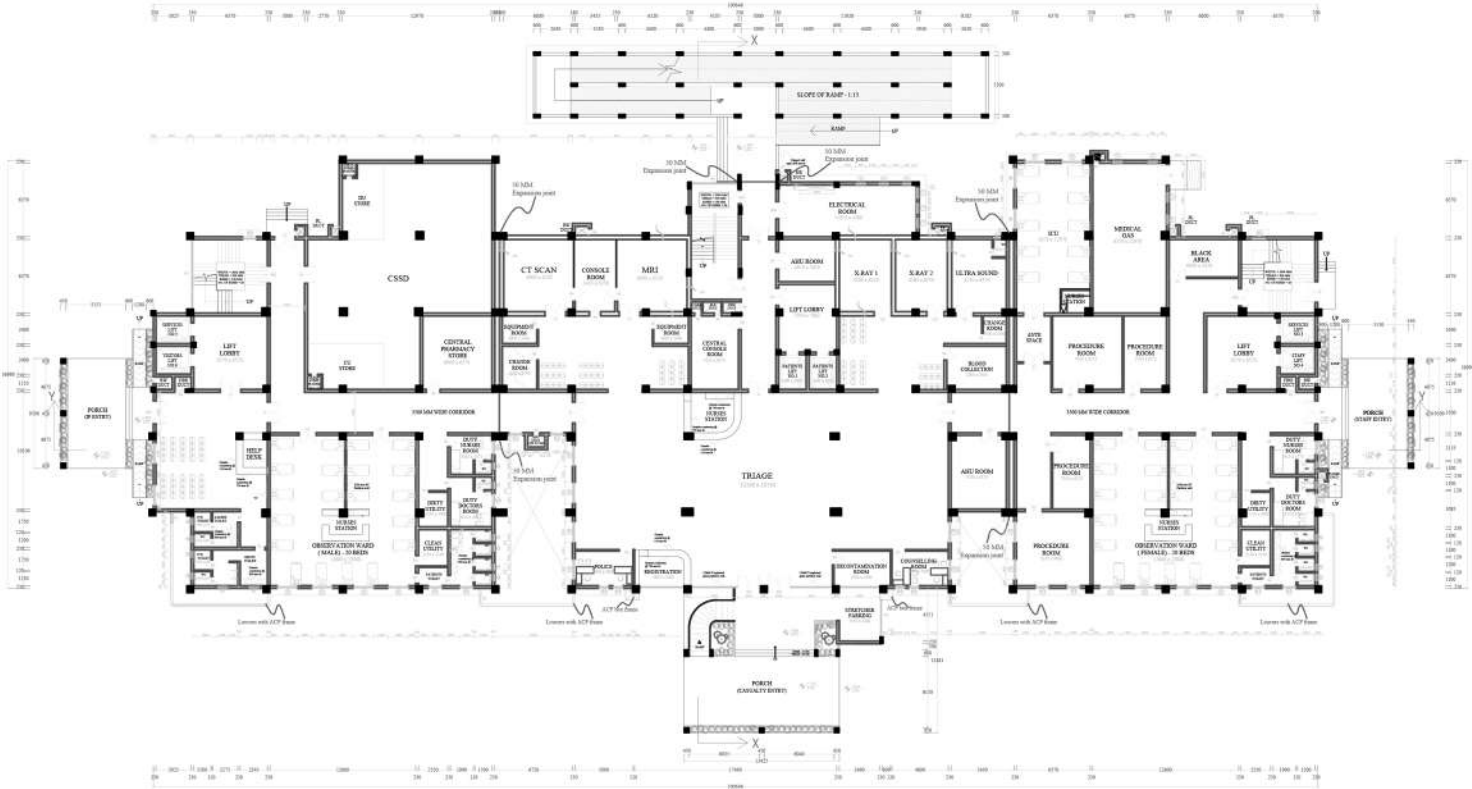
Inference:

The value of proposed case is lower than the base case in all the months. Solar insolation is high in the month of **february** with **8,67,675 kWh** in proposed case and with **15,03,578 kWh** in base case. Solar insolation is recorded least in the month of november with **6,63,173 kWh** in proposed case and with **11,66,544 kWh** in base case. The solar insolation value of proposed case (**95,74,591 kWh**) is lesser than the base case (**1,62,34,566 kWh**) in cumulative radiation

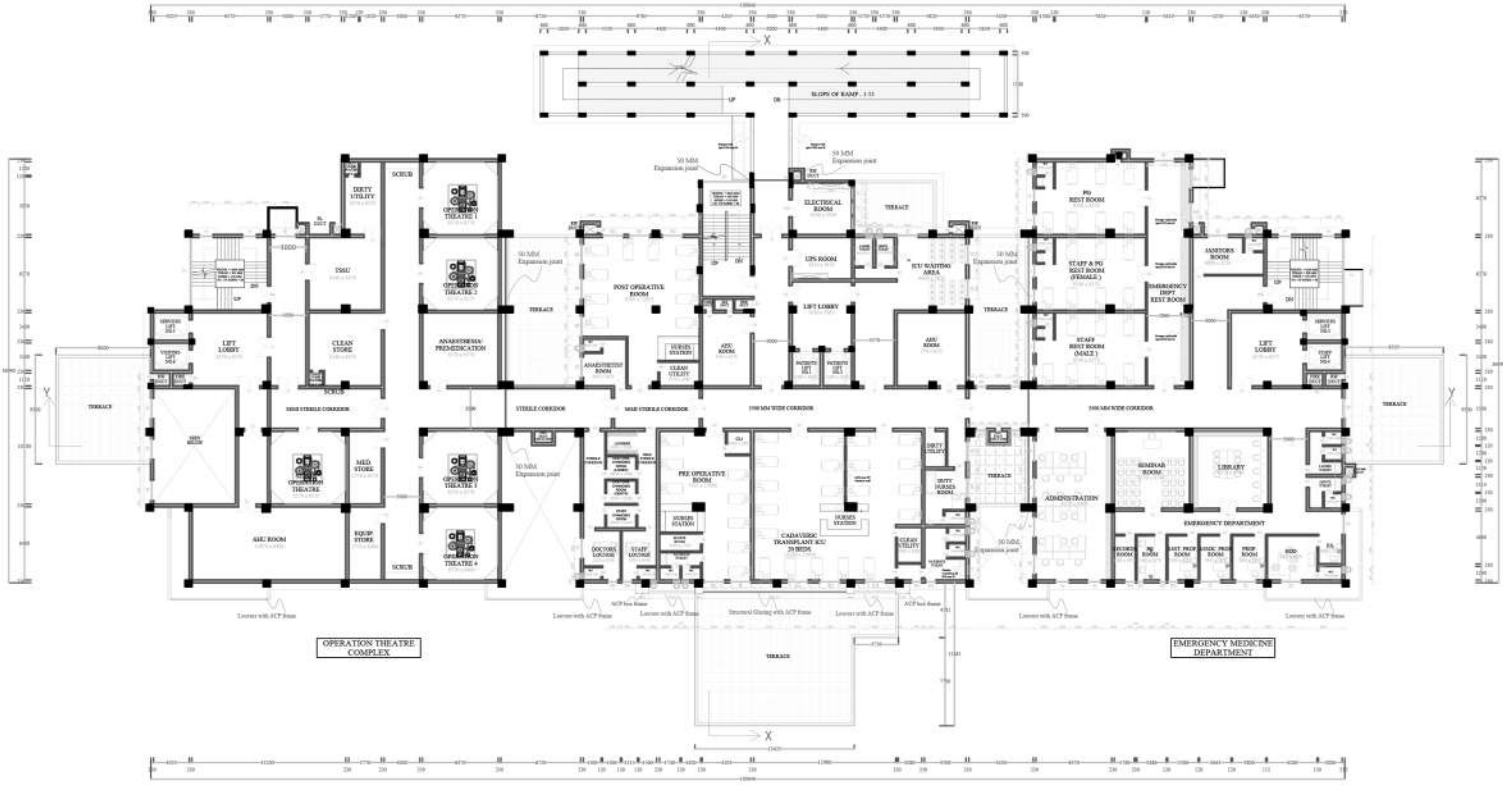


HOSPITAL PROJECT AT KOZHIKODE, KERALA																																			
PROPOSED SUPER SPECIALITY BLOCK FOR GOVERNMENT MEDICAL COLLEGE UNDER PMSSY PHASE-III, KOZHCODE, KERALA																																			
CALCULATION OF EXPOSED WALL SURFACE AREA OF UTILITY SPACES																																			
S.no.	Floor level	Length (M)	Floor height (M)	Total wall surface area (Sq.m)	North facade																							Total (m)	Floor height (m)	Total wall area					
					Break up of utility spaces																														
1	Ground floor	137	3.9	534.3	Toilet	Patient's toilet	Corridor	AHU duct	Corridor	AHU room	Procedure room	Patient's toilet	Duct	Ramp	Ramp	Stretcher parking											80.3	3.9	313.17						
					6.8	6.8	2.6	1.9	2.1	5.4	6.8	6.8	0.9	17.9	18.3	4																			
2	First floor	137	3.9	534.3	Ramp	Ramp	AHU room	Equip. store	Scrub	OT-4	Sterile corridor	AHU Duct	Sterile corridor	Toilet	Toilet	Toilet	Toilet	Pre operative	Patient's toilet	Corridor	AHU Duct	Corridor	Record's room	Toilet	Duct			96.3	3.9	375.57					
					17.9	18.3	13.4	3	3.2	6.6	2.1	1.9	2.3	1.7	1.6	2	1.7	4.3	6.1	1.5	1.9	1.5	2.1	2.3	0.9										
3	Second floor	137	3.9	534.3	Ramp	Ramp	Toilet	Patient's toilet	Med. And Equip. Store	Corridor	AHU Duct	Corridor	Toilet	Toilet	Corridor	AHU Duct	Corridor	Med. And Equip. Store	Patient's toilet	Duct								78.6	3.9	306.54					
					17.9	18.3	3.2	6.8	3.6	1.5	1.9	1.5	2.2	2.3	1.5	1.9	1.5	6.8	6.8	0.9															
4	Third floor	137	3.9	534.3	Ramp	Ramp	Toilet	Patient's toilet	Med. And Equip. Store	Corridor	AHU Duct	Corridor	Toilet	Toilet	Corridor	AHU Duct	Corridor	Med. And Equip. Store	Patient's toilet	Duct								78.6	3.9	306.54					
					17.9	18.3	3.2	6.8	3.6	1.5	1.9	1.5	2.2	2.3	1.5	1.9	1.5	6.8	6.8	0.9															
5	Fourth floor	137	3.9	534.3	Ramp	Ramp	Toilet	Patient's toilet	Med. And Equip.	Corridor	AHU Duct	Corridor	Toilet	Toilet	Corridor	AHU Duct	Corridor	AHU room	Patient's toilet	Duct								78.6	3.9	306.54					
					17.9	18.3	3.2	6.8	3.6	1.5	1.9	1.5	2.2	2.3	1.5	1.9	1.5	6.8	6.8	0.9															
6	Fifth floor	137	3.9	534.3	Ramp	Ramp	Toilet	Patient's toilet	AHU room	Corridor	AHU Duct	Corridor	Toilet	Toilet	Corridor	AHU Duct	Corridor	AHU room	Patient's toilet	Duct								78.6	3.9	306.54					
					17.9	18.3	3.2	6.8	3.6	1.5	1.9	1.5	2.2	2.3	1.5	1.9	1.5	6.8	6.8	0.9															
7	Sixth floor	137	3.9	534.3	Ramp	Ramp	Scrub	OT-14	OT-13	Clean linen	OT-12	OT-6	OT-4	Scrub	OT-3	Anaesthesia	Sterile corridor	Staff changing room	Toilet	Record's room	Toilet	Duct						112.1	3.9	437.19					
					17.9	18.3	3.4	6.8	6.6	6.2	6.6	6.7	6.6	3.2	6.6	6.5	3	6.6	1.8	2.1	2.3	0.9													
Total				3740.1																										2352.09					
% OF WALL AREA ABUTTING SERVICE ZONE=62.8%																																			
S.no.	Floor level	Length (M)	Floor height (M)	Total wall surface area (Sq.m)	South facade																							Total (m)	Floor height (m)	Total wall area (Sq.m)					
					Break up of utility spaces																														
1	Ground floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Corridor	CSSD	CT Scan	Console room	MRI scan	Staircase	Electrical room	X-ray-2	Ultra sound	Medical gas	Black area	Staircase	Duct	Ramp											129.2	3.9	503.88		
					3.2	6.8	3	16.4	6.5	3.4	6	4.5	12	2.4	5.7	6.3	6	6.8	0.9	39.3															
2	First floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Corridor	PL duct	TSSU	PL duct	Dirty utility	Scrub	OT-1	Sterile corridor	RW duct	Staircase	RW duct	Electrical room	Toilet	Toilet	RW duct	Toilet	Med. Gas duct	Duct	Janitor's room	Duct	Duct	Staircase	Ramp	109.8	3.9	428.22			
					3.2	6.8	3	1	1.8	0.9	3.6	3.2	6.6	6.5	1.6	4.6	1.2	4.2	1.8	2	1.6	1.8	1.5	0.9	4	1.2	0.9	6.6	39.3						
3	Second floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Toilet	Toilet	Duct	Duct	Toilet	Corridor	RW duct	Staircase	RW duct	Electrical room	RW duct	Corridor	Med. Gas duct	Toilet	Duct	Janitor's room	Staircase	Duct	Ramp								104.5	3.9	407.55
					3.2	6.8	1.5	0.6	1	0.9	6.8	6.5	1.6	4.6	1.2	4.2	1.6	5.2	1.5	5.3	1.2	4	6.6	0.9	39.3										
4	Third floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Toilet	Toilet	Duct	Duct	Toilet	Corridor	Duct	Staircase	Duct	Electrical room	RW duct	Corridor	Med. Gas duct	Toilet	Duct	Janitor's room	Staircase	Duct	Ramp								104.5	3.9	407.55
					3.2	6.8	1.5	0.6	1	0.9	6.8	6.5	1.6	4.6	1.2	4.2	1.6	5.2	1.5	5.3	1.2	4	6.6	0.9	39.3										
5	Fourth floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Toilet	Toilet	Duct	Duct	Toilet	Corridor	Duct	Staircase	Duct	Electrical room	RW duct	Corridor	Med. Gas duct	Toilet	Duct	Janitor's room	Staircase	Duct	Ramp								104.5	3.9	407.55
					3.2	6.8	1.5	0.6	1	0.9	6.8	6.5	1.6	4.6	1.2	4.2	1.6	5.2	1.5	5.3	1.2	4	6.6	0.9	39.3										
6	Fifth floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Toilet	Toilet	Duct	Duct	Toilet	Corridor	Duct	Staircase	Duct	Electrical room	RW duct	Corridor	Med. Gas duct	Toilet	Duct	Janitor's room	Staircase	Duct	Ramp								104.5	3.9	407.55
					3.2	6.8	1.5	0.6	1	0.9	6.8	6.5	1.6	4.6	1.2	4.2	1.6	5.2	1.5	5.3	1.2	4	6.6	0.9	39.3										
7	Sixth floor	135.1	3.9	526.89	Service's lift no.5	Staircase	Corridor	Duct	Corridor	Duct	Dirty utility	Scrub	OT-10	OT-7	RW duct	Toilet	Staircase	Duct	Electrical room	RW duct	Toilet	Anaesthesia room	Med. Gas duct	Toilet	Duct	Janitor's room	Staircase	Duct	Ramp	119.5	3.9	466.05			
					3.2	6.8	2.1	1	1.8	0.9	3.6	3.2	6.6	6.3	1.6	3.4	4.6	1	4.2	1.6	3.6	5.2	1.5	5.3	1.2	4	6.6	0.9	39.3						
Total				3688.23																										3028.35					
% OF WALL AREA ABUTTING SERVICE ZONE=82.1%																																			

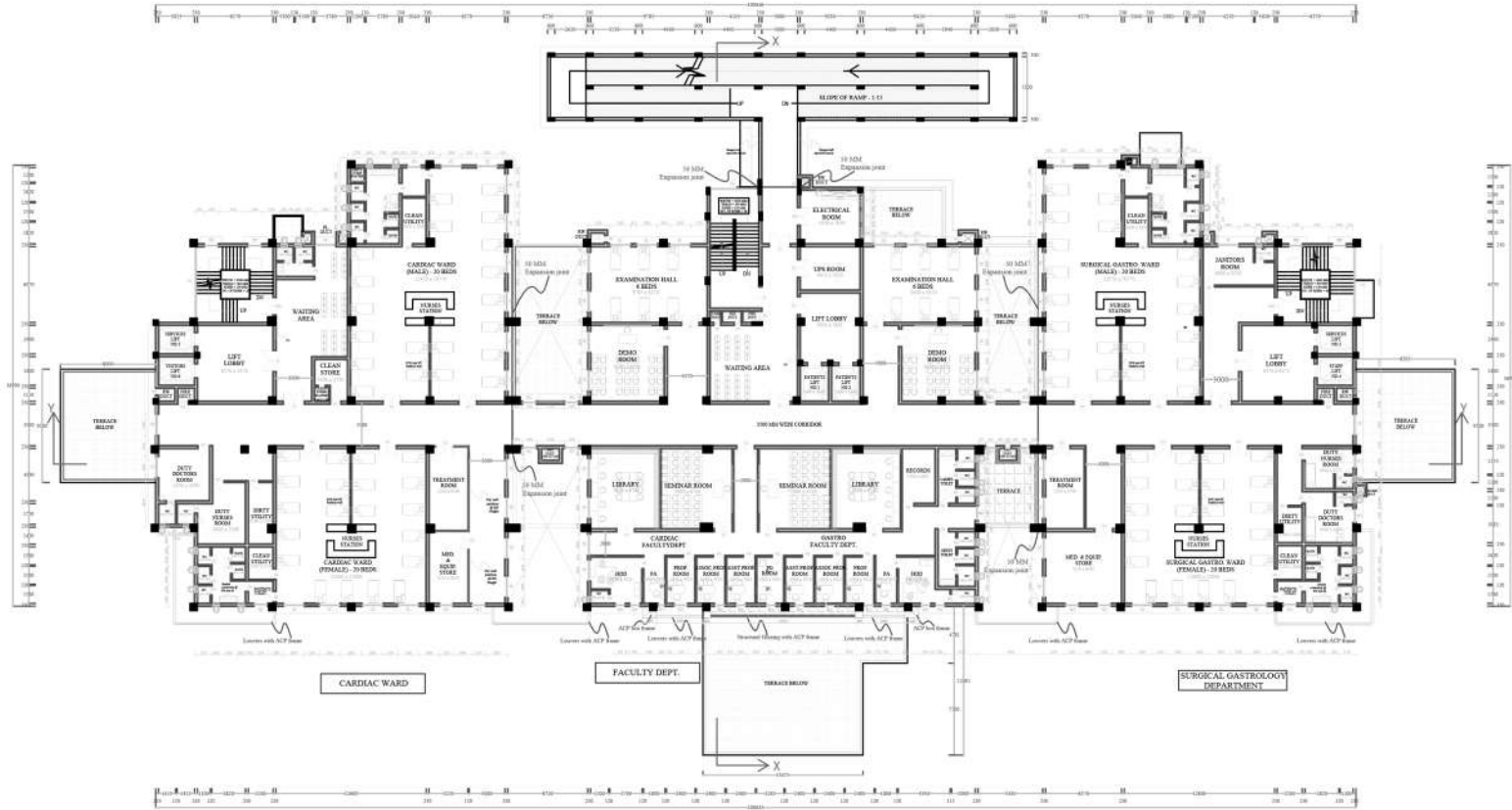
S.no.	Floor level	Length (M)	Floor height (M)	Total wall surface area (Sq.m)	West facade																				Total (m)	Floor height (m)	Total wall area (Sq.m)			
					Break up of utility spaces																									
1	Ground floor	73.1	3.9	285.09	Ramp	Staircase	DU store	Staricase	Service lift no.5	Visitor's lift no.6	RW duct	Toilet	RW duct	Duct	Stretcher parking															
					5.5	4.6	5.5	6.6	2.6	2.8	1.5	6.8	1	1	1.9															
2	First floor	73.1	3.9	285.09	Ramp	Staircase	RW duct	Dirty utility	PL duct	Stairase	Service lift no.3	Staff lift no.4	AHU room	Sterile corridor	Toilet	RW duct	Med. gas duct	Duct												
					5.5	4.6	1	5.5	1	6.6	2.6	2.8	6.8	8.6	1.4	1	0.8	1												
3	Second floor	73.1	3.9	285.09	Ramp	Staircase	RW duct	Toilet	PL duct	PL duct	Stairase	Service lift no.3	Staff lift no.4	Corridor	Toilet	Toilet	Corridor	Toilet	Med Equi. Store	Duct	RW duct	Med. gas duct								
					5.5	4.6	1	5.7	1.2	1.2	6.6	2.6	2.8	3.5	2.2	5.2	2.1	1.4	6.4	1	1	0.8								
4	Third floor	73.1	3.9	285.09	Ramp	Staircase	RW duct	Toilet	Duct	Stairase	Service lift no.3	Staff lift no.4	Corridor	Toilet	Toilet	AHU duct	Corridor	Toilet	Med Equi. Store	Duct	RW duct	Med. gas duct								
					5.5	4.6	1	5.5	1	6.6	2.6	2.8	3.7	2.2	5.2	1.2	2.3	1.4	6.4	1	1	0.8								
5	Fourth floor	73.1	3.9	285.09	Ramp	Staircase	RW duct	Toilet	Duct	Duct	Stairase	Service lift no.3	Staff lift no.4	Corridor	Toilet	Toilet	AHU duct	Corridor	Toilet	AHU room	Duct	RW duct	Med. gas duct							
					5.5	4.6	1	5.5	1	1	6.6	2.6	2.8	3.7	2.2	5.2	1.2	2.3	1.4	6.4	1	1	0.8							
6	Fifth floor	73.1	3.9	285.09	Ramp	Staircase	Central supply	Equip. store	Toilet	Duct	Stairase	Service lift no.3	Staff lift no.4	Corridor	Toilet	Toilet	AHU duct	Toilet	AHU duct	AHU room	Duct	RW duct	Med. gas duct							
					5.5	4.6	6.6	6.5	3.8	1	6.6	2.6	2.8	3.7	2.2	5.2	1.2	1.4	1.2	6.4	1	1	0.8							
7	Sixth floor	73.1	3.9	285.09	Ramp	Staircase	RW duct	Dirty utility	Duct	Duct	Stairase	Service lift no.3	Staff lift no.4	Duct	TSSU	Sterile corridor	OT-14	OT-4	Toilet	Toilet	Duct	RW duct	Med. gas duct							
					5.5	4.6	1	5.5	1	1	6.6	2.6	2.8	1.3	7.1	3.2	6.6	6.6	1.6	1.5	1	1	0.8							
Total				1995.63																										
%																								OF WALL AREA ABUTTING SERVICE ZONE=74.2%						



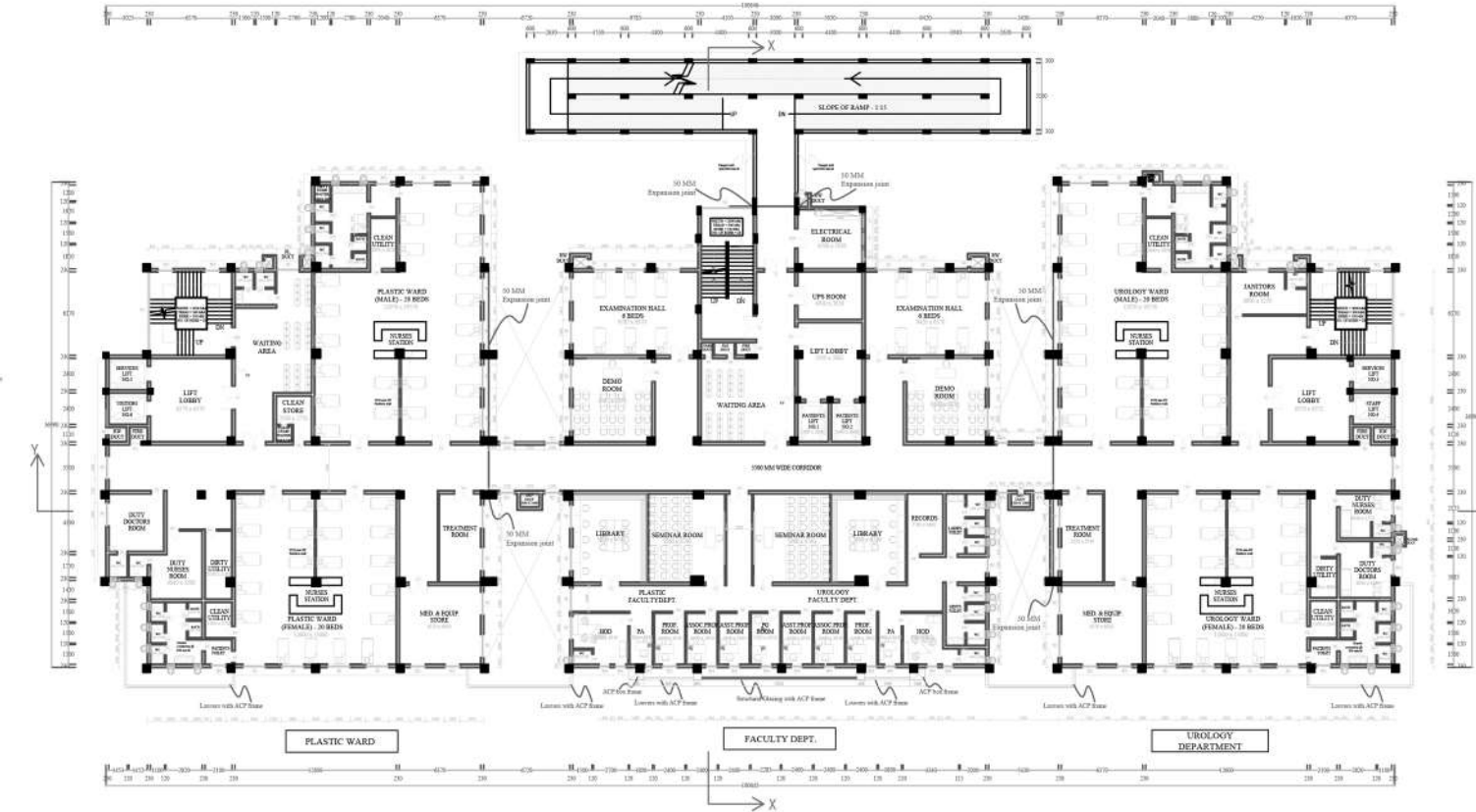
Ground floor plan



First floor plan

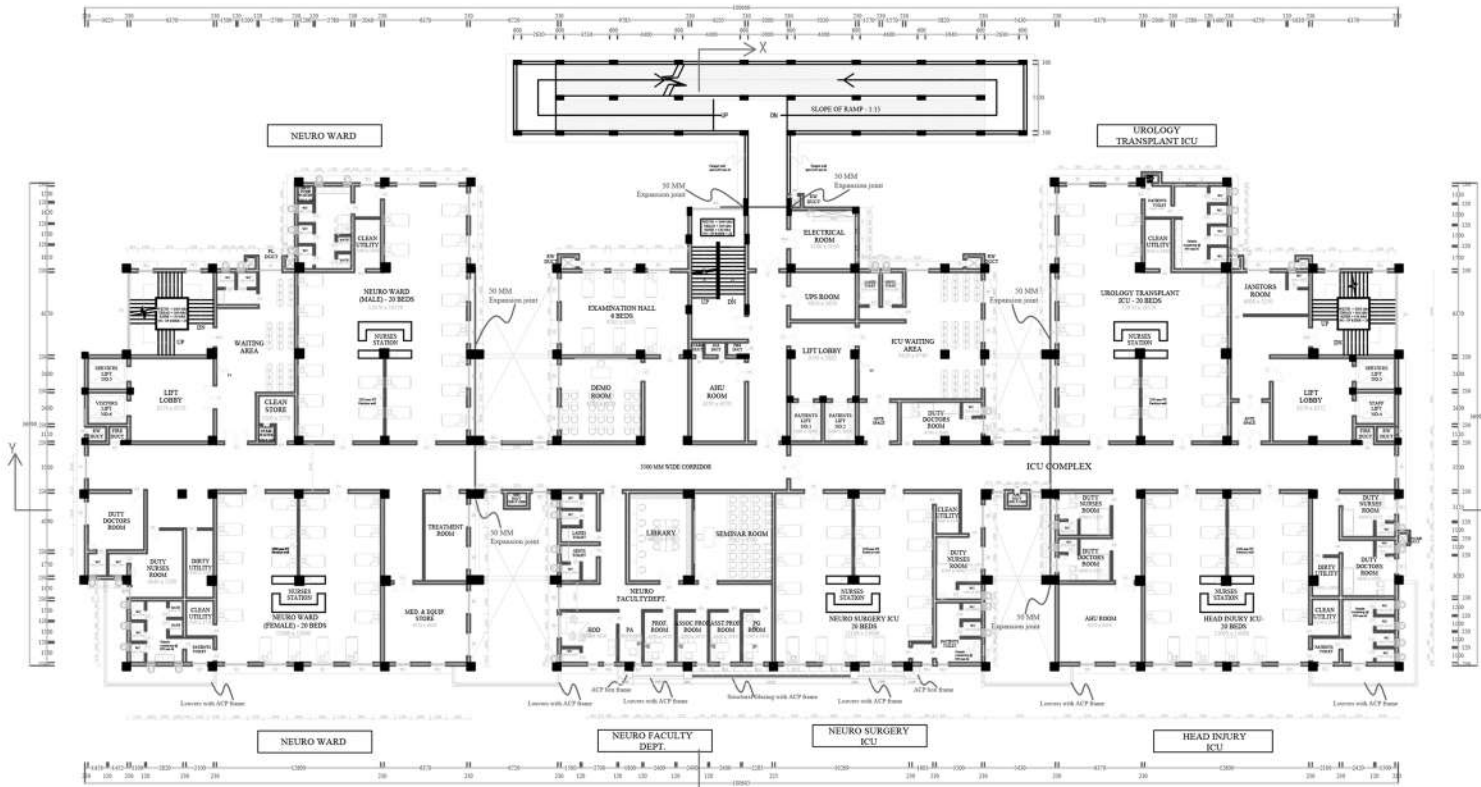


Second floor plan

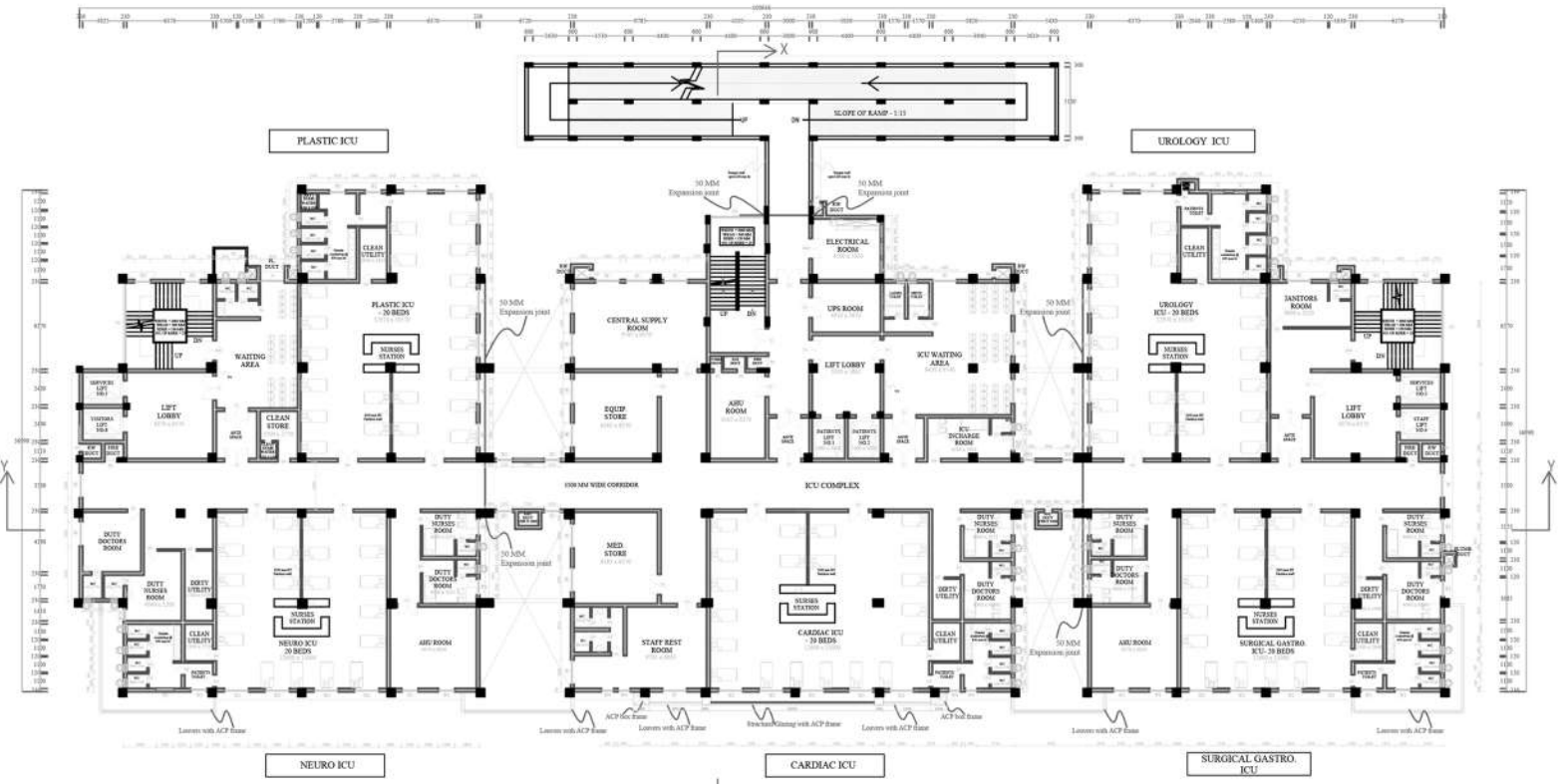


Third floor plan

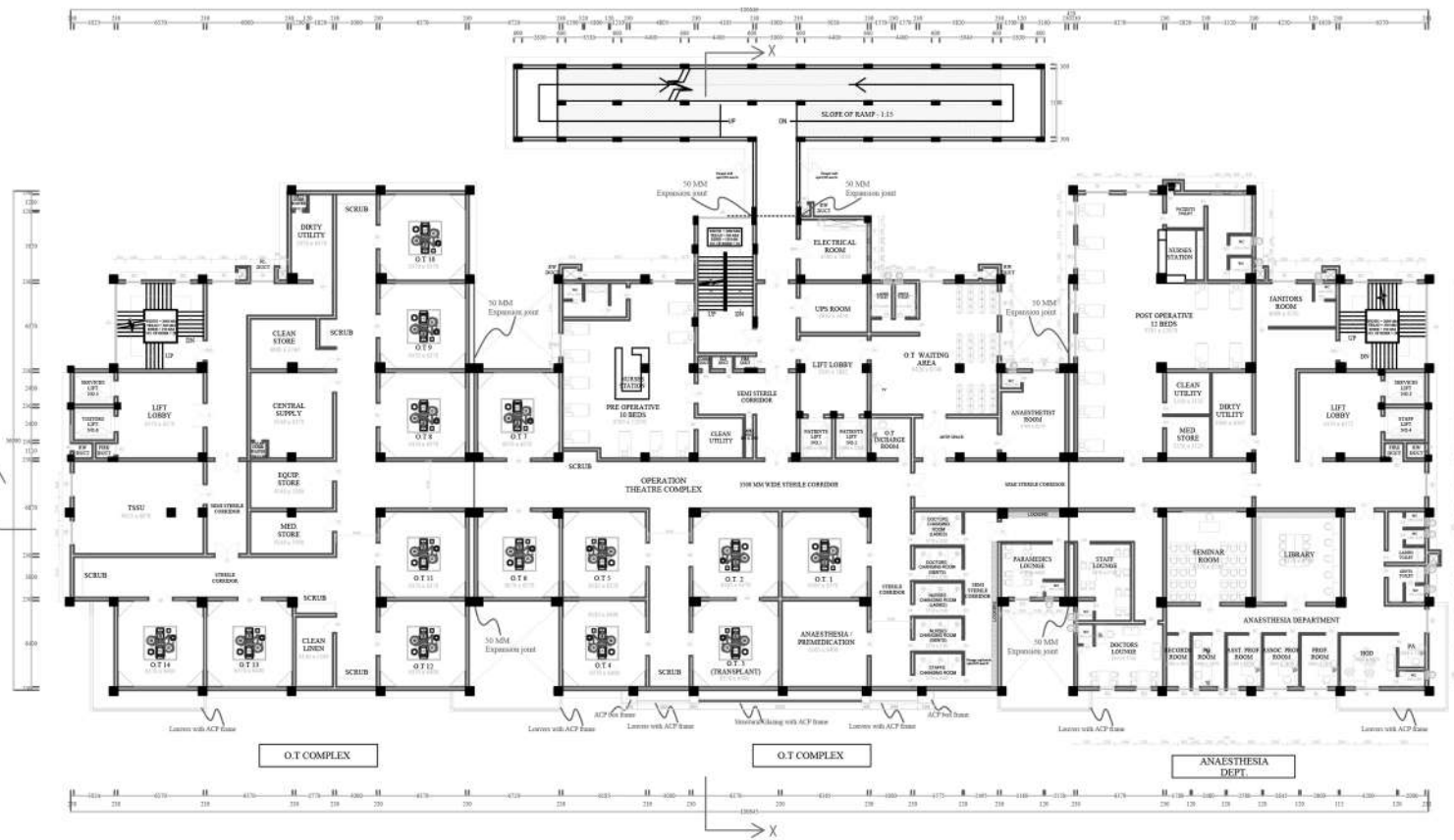




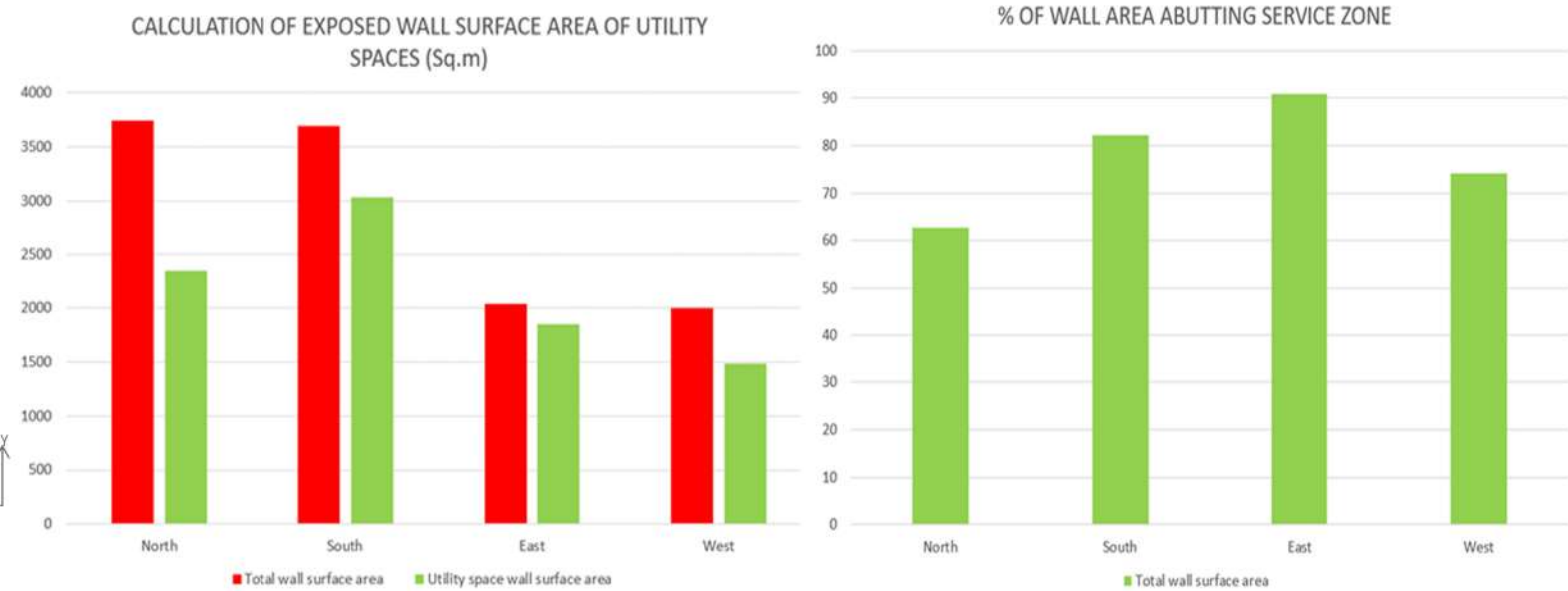
Fourth floor plan



Fifth floor plan

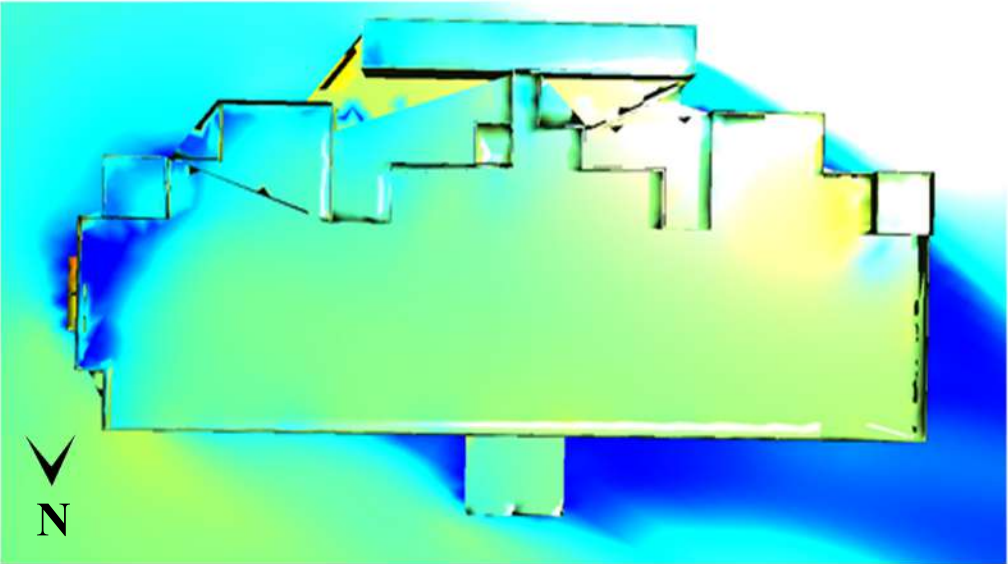


Sixth floor plan

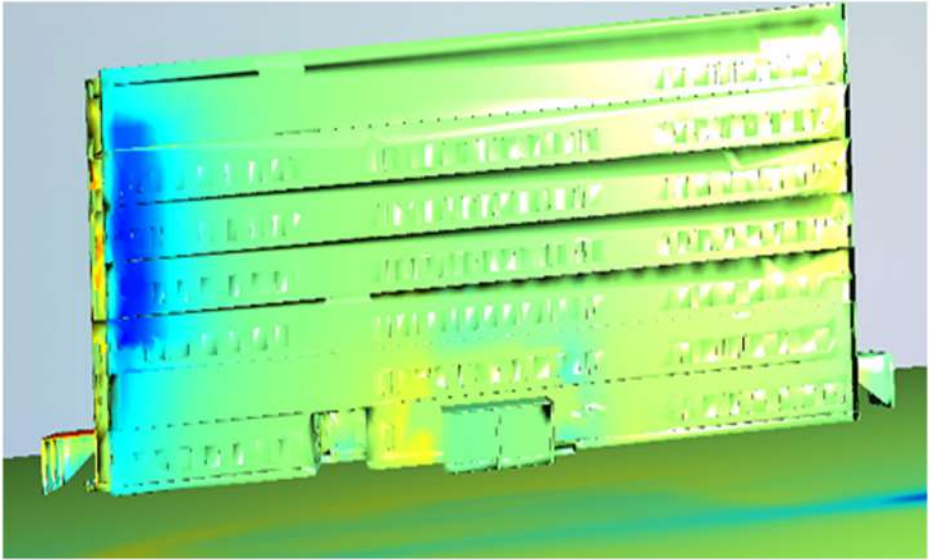


Inference:

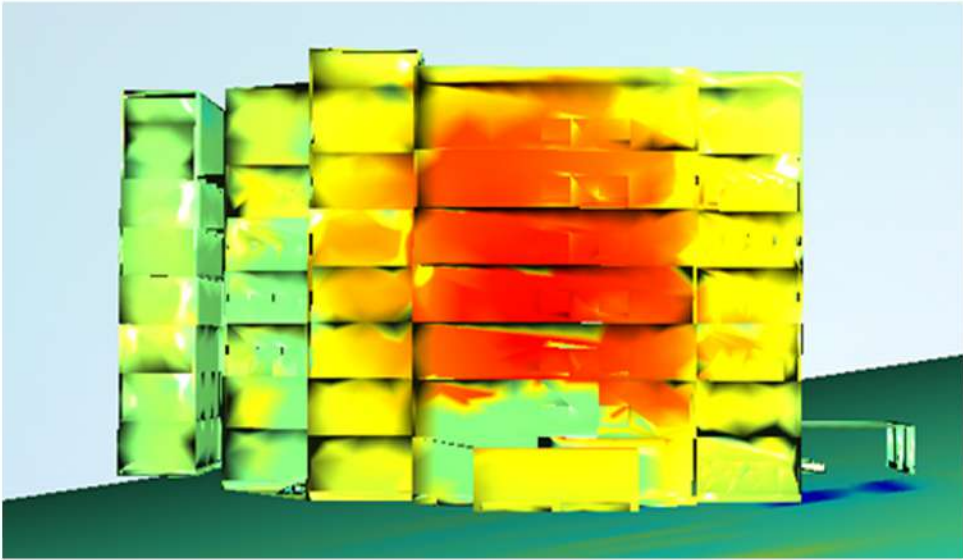
% of wall area abutting service zone in the eastern facade higher with **90.8%** and lesser in northern facade with **62.8%** and the total wall surface is higher on north facade with **3740.1 Sq.m** and lesser on the west facade with **1995.63%**



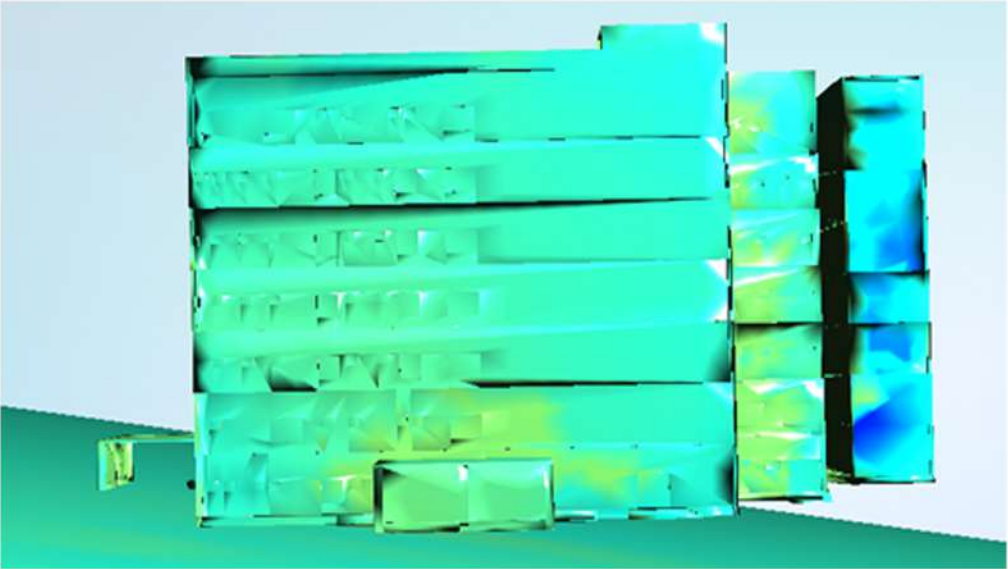
Top view of the building



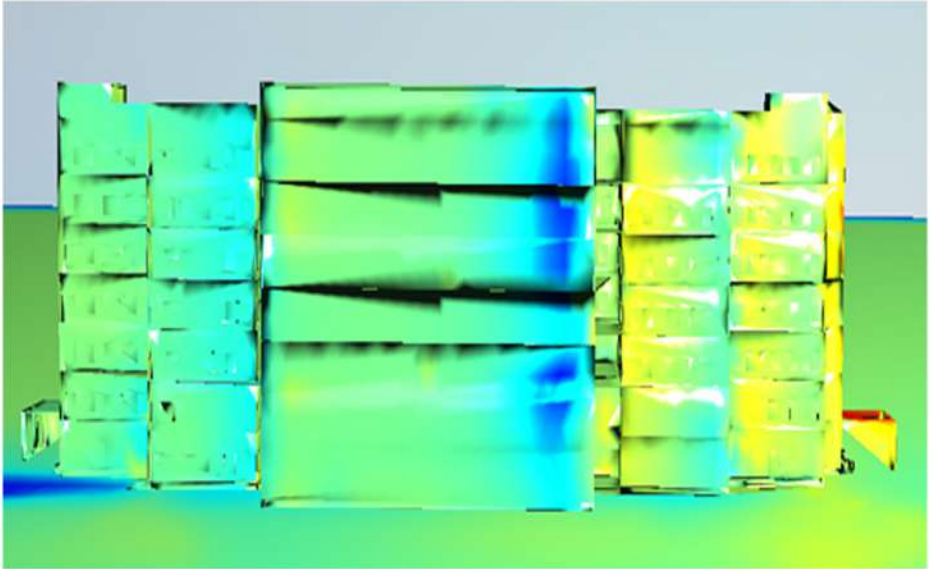
North facade



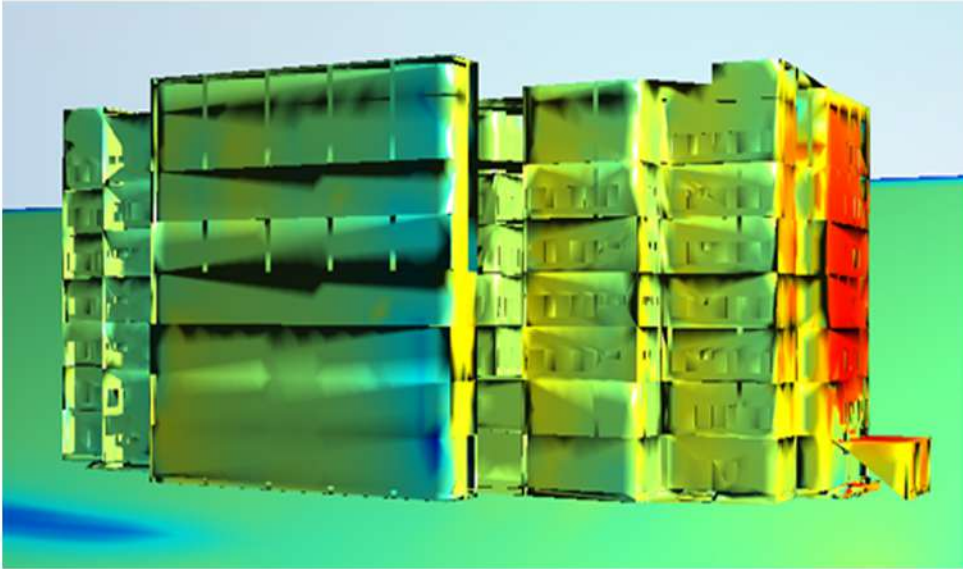
West facade



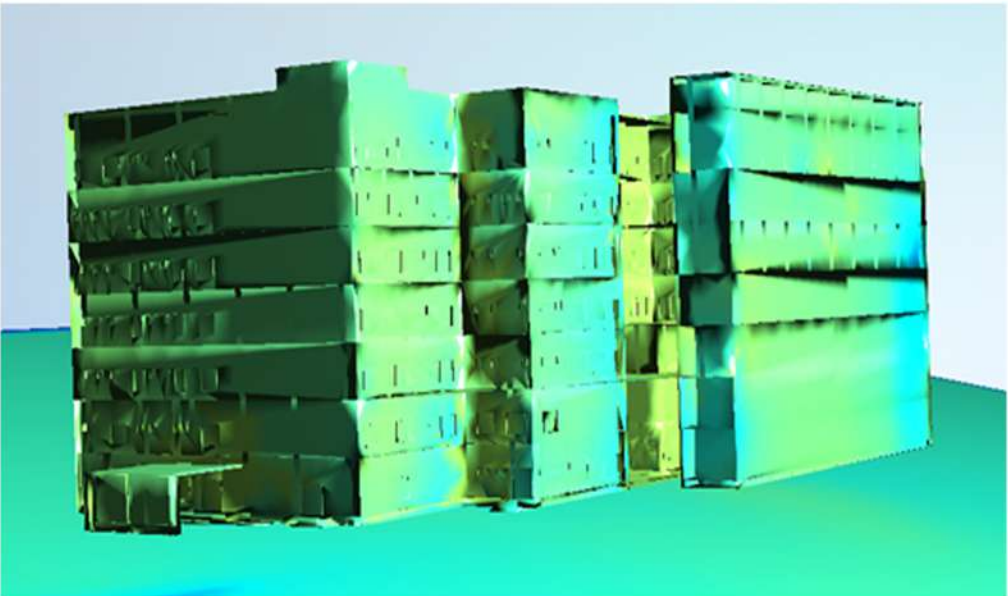
East facade



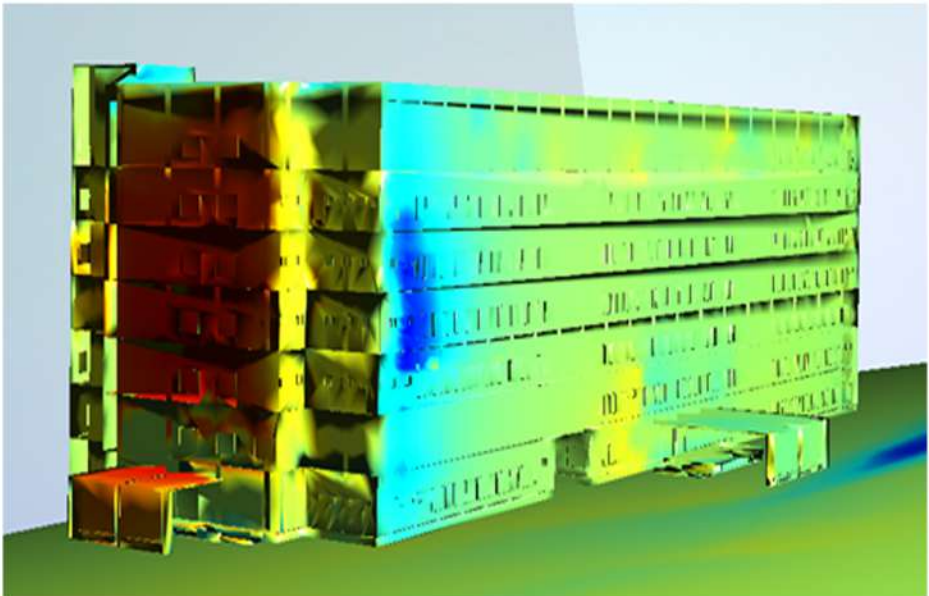
South facade



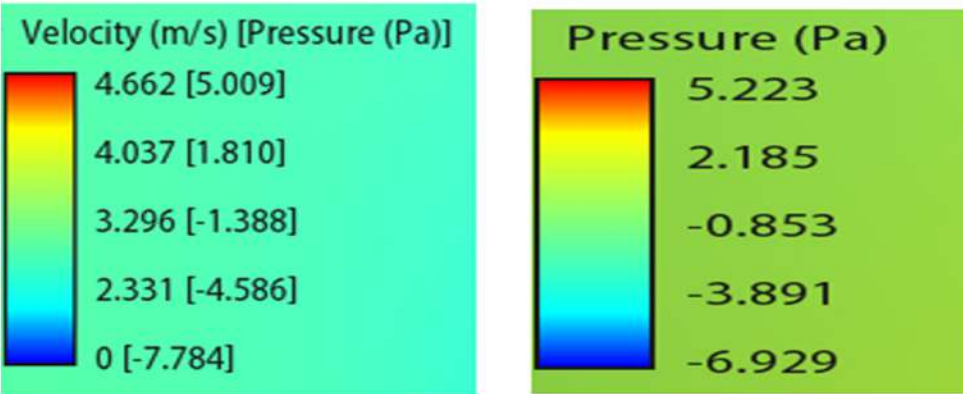
South west corner view



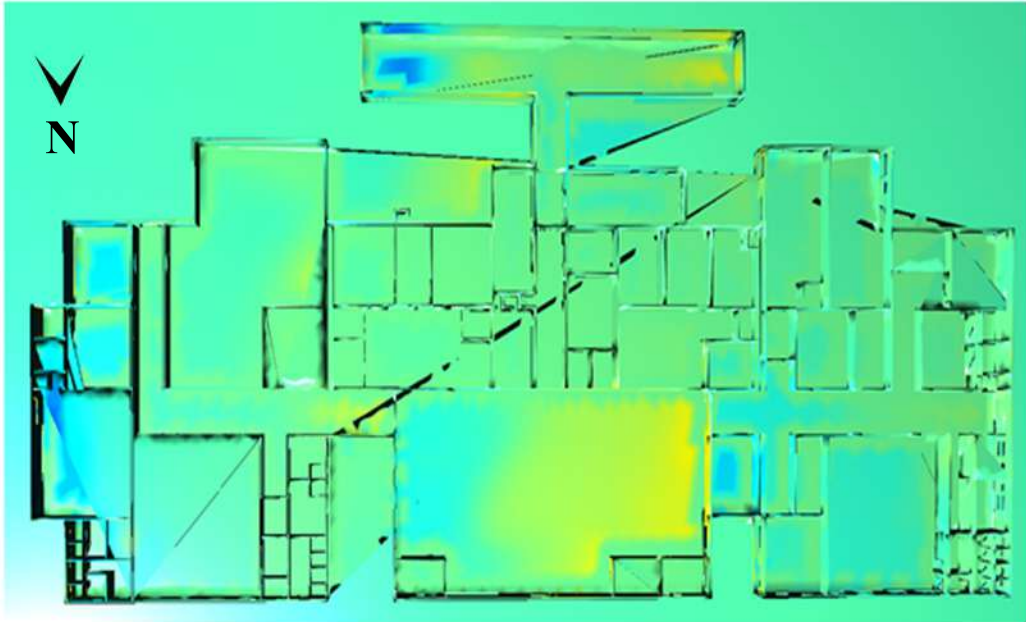
South east corner view



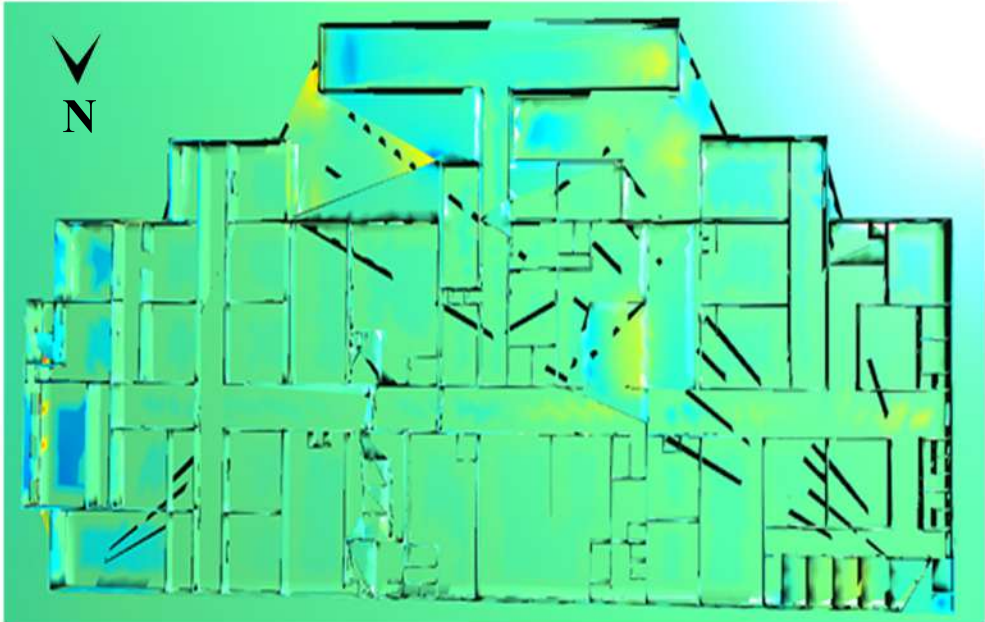
North west corner view



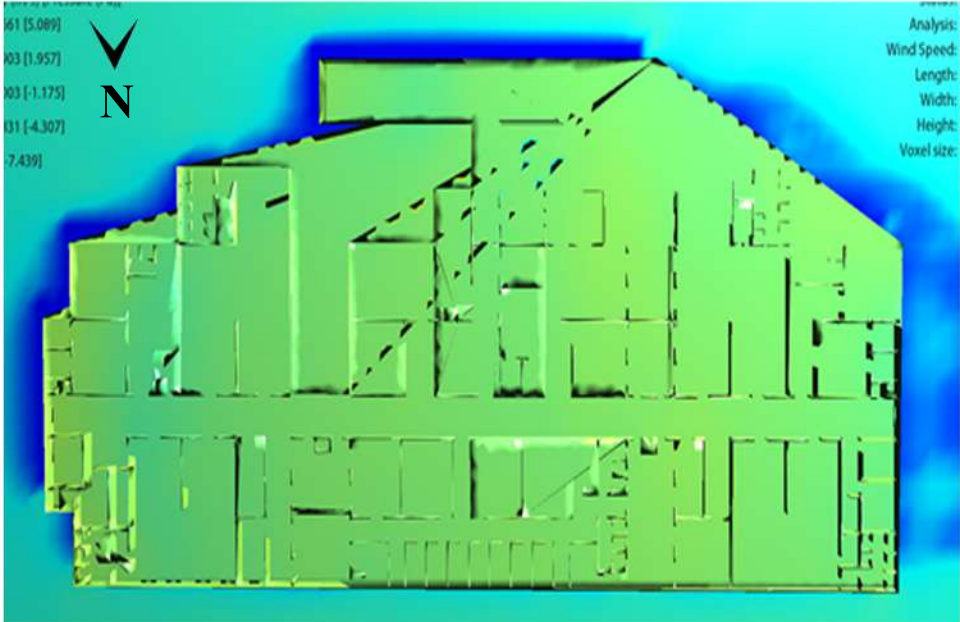
Inference:
The velocity of the wind is high in the west direction with **4.6m/s** and less velocity in the eastern direction with **2.3m/s**. North facade receives wind of about **3.2 m/s** and south facade receives wind of about **2.3m/s to 4m/s**.



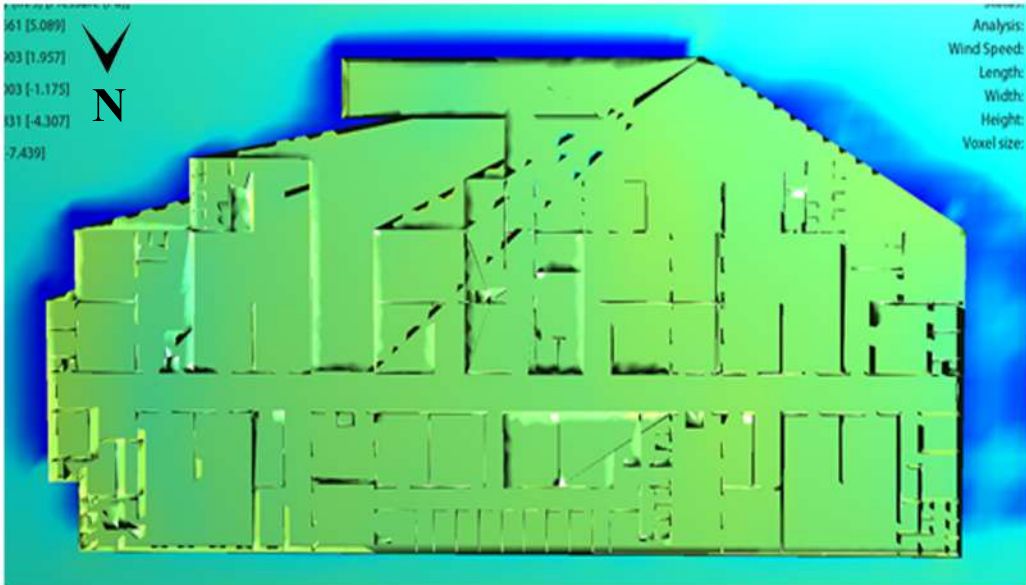
Ground floor



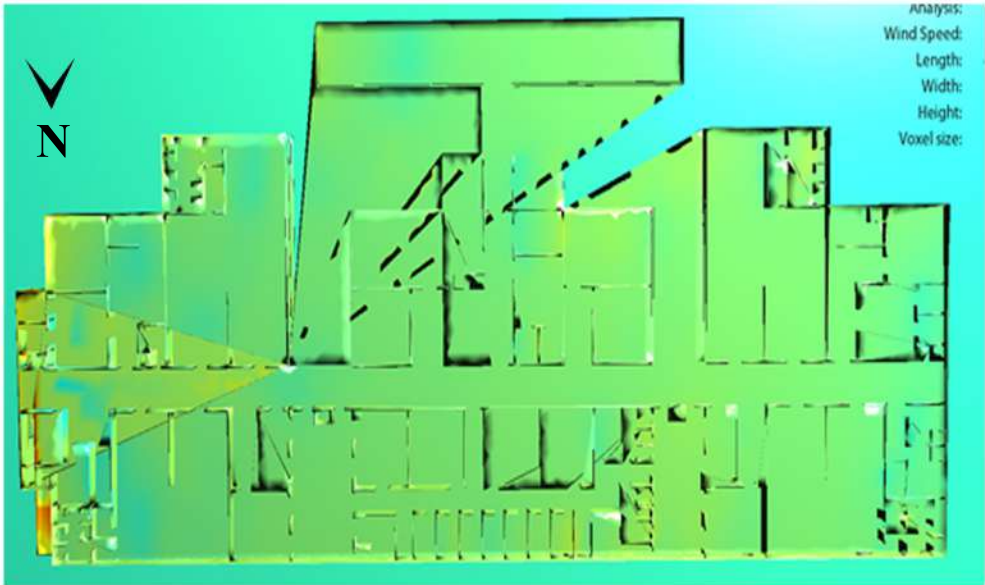
First floor



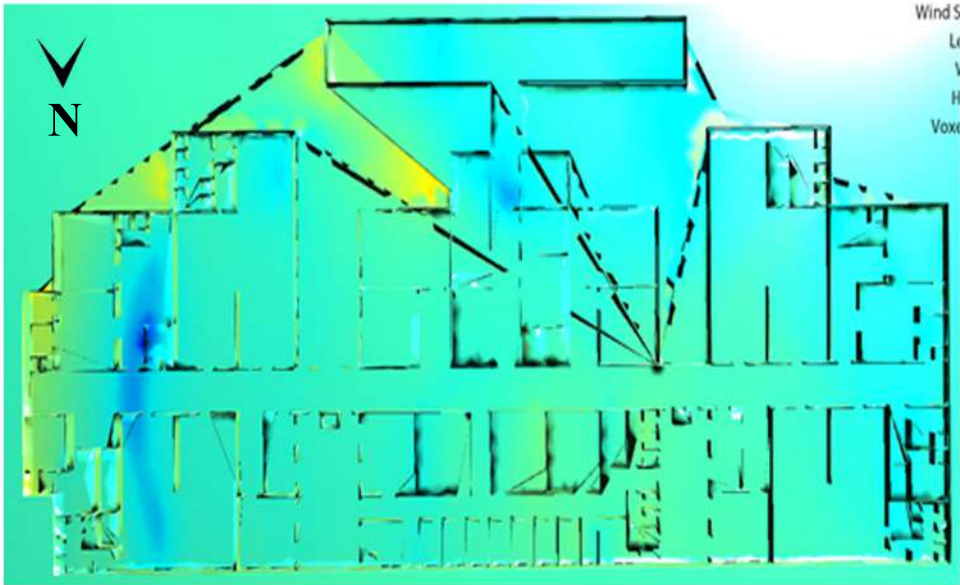
Second floor



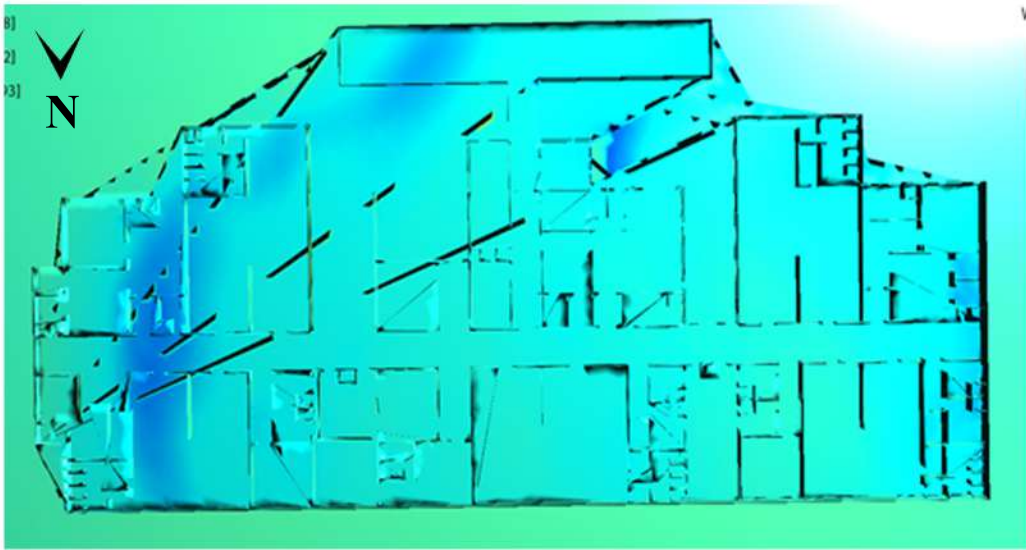
Third floor



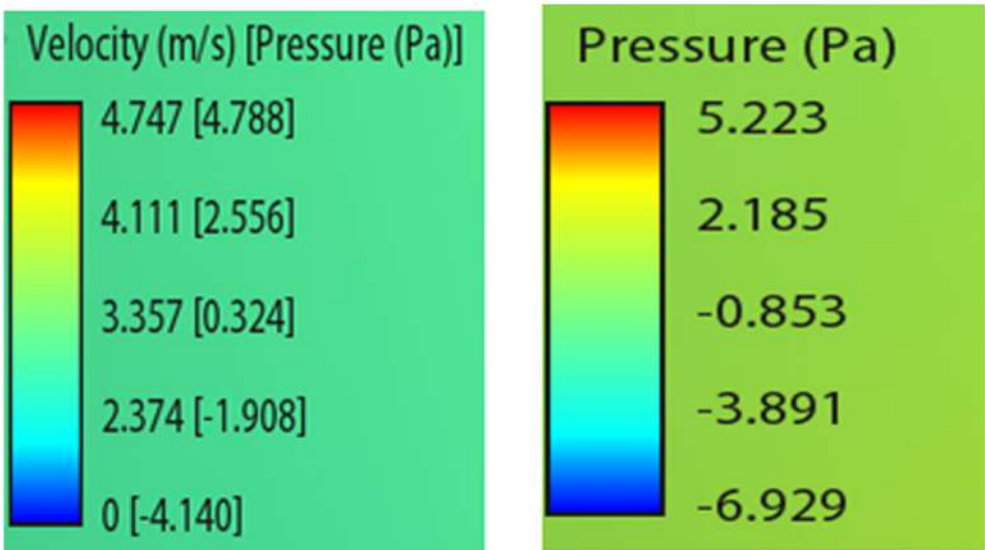
Fourth floor



Fifth floor



Sixth floor

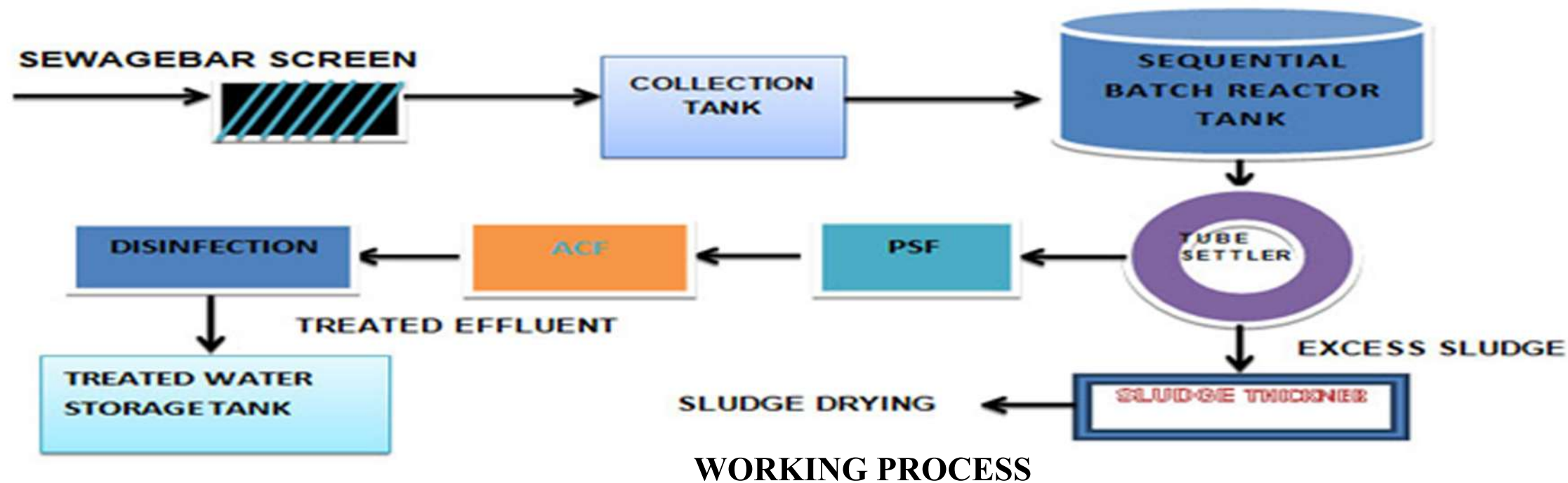


Legend

Inference:
The indoor air velocity of all the floors ranges from **2.3m/s to 3.3m/s**. The wind pressure ranges between **-6.9Pa to -3.8Pa** on the southern side. Negative wind pressure denotes the leeward wind direction. The predominant wind direction of this location is from the western direction and the leeward side seems to be southeast direction as per the simulation results.

STP MBBR TECHNOLOGY

- STP MBBR technology is the use of a moving bed biofilm reactor in sewage treatment plants.
- MBBR wastewater treatment system enables efficient results of the disposal using low energy.
- The technology is used to separate organic substances, nitrification and denitrification.
- The MBBR process utilizes floating High Capacity MicroOrganism BioChips media within the aeration and anoxic tanks.
- The microorganisms consume organic material. The media provides increased surface area for the biological microorganisms to attach a
- This method makes it possible to attain good efficiency results of disposal with low energy consumption.



How does MBBR Wastewater Treatment work?

- The MBBR system consists of an activated sludge aeration system where the sludge is collected on recycled plastic carriers. These carriers have an indoor large surface for optimal contact water, air and bacteria.
- The bacteria/activated sludge grow on the interior surface of the carriers. The bacteria break down the organic matter from the waste water. The aeration system keeps the carriers with activated sludge in motion. Only the additional amount of bacteria growth, the surplus sludge will come break away the carriers and can flow with the treated water towards the ultimate separator.
- The system can contains a 1 stage or more stage system (see underneath schedule), counting on the precise demands. The specific bacteria remain in their own duty tank due to the very fact that the carriers remain in just 1 tank, protected by screens.
- The MBBR process is often used for a spread of various applications to achieve the specified results, counting on the standard of the wastewater and therefore the discharge regulations.

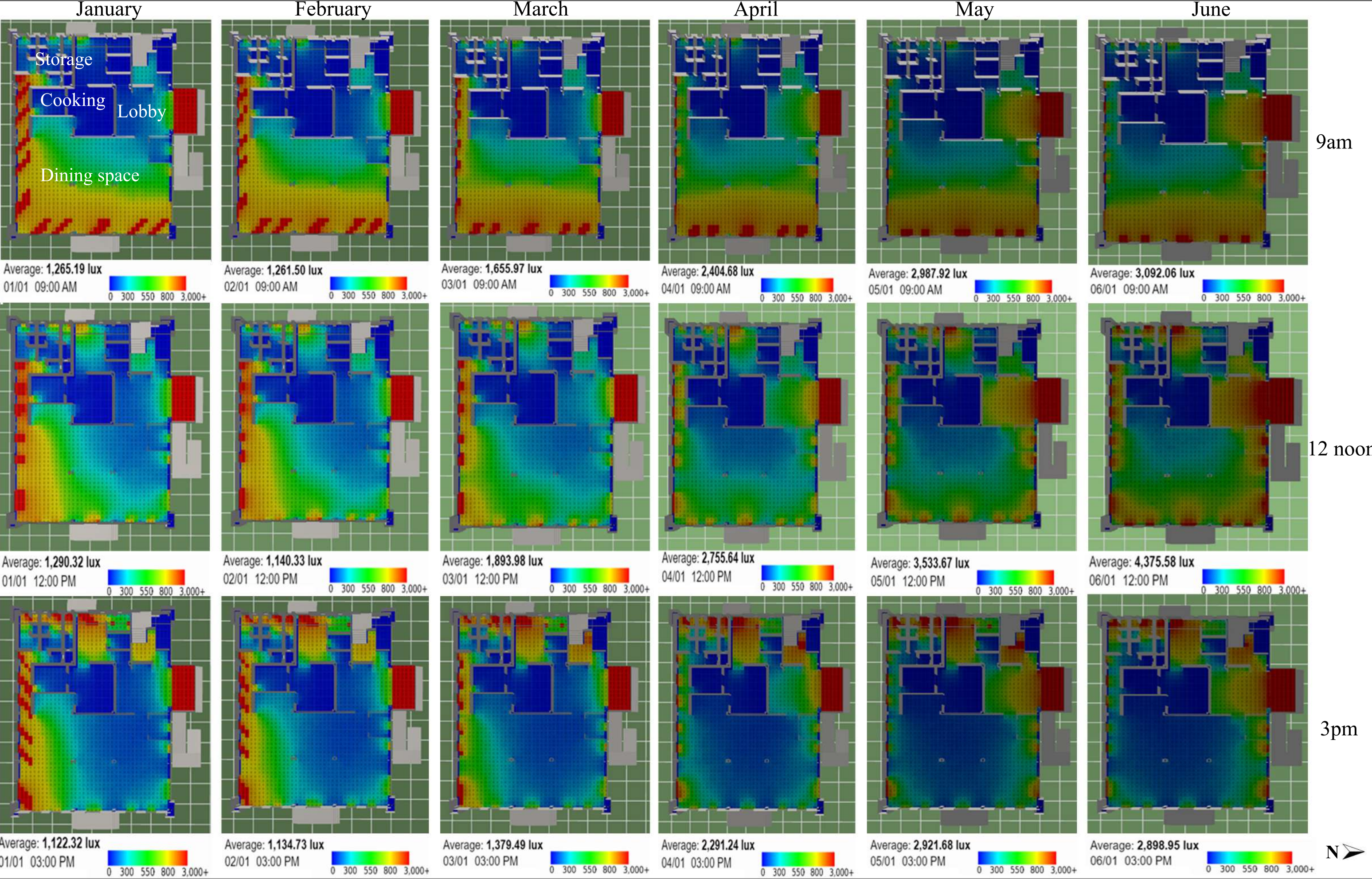
CALCULATION OF EXPOSED WALL SURFACE AREA OF UTILITY SPACES

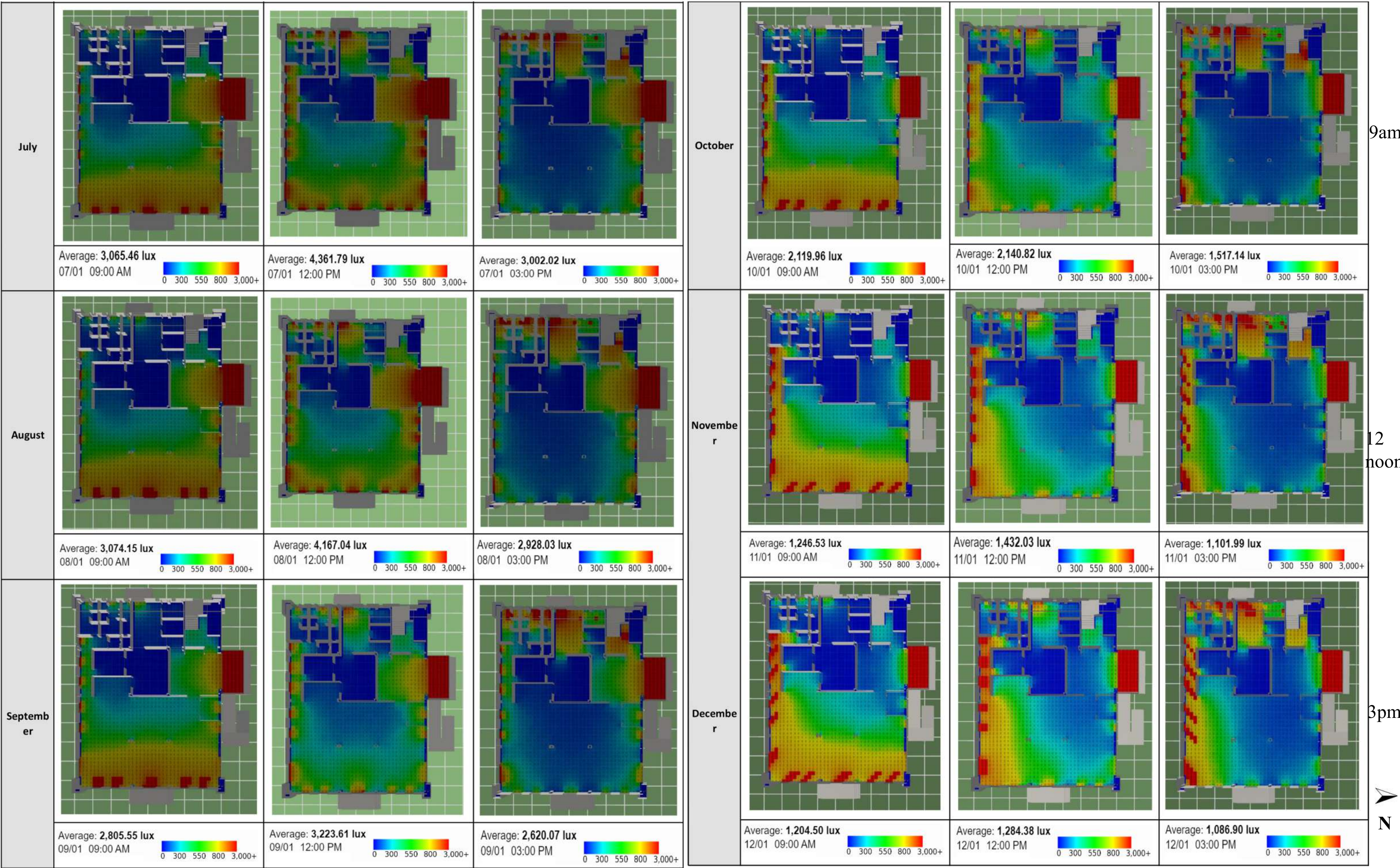
HOSPITAL PROJECT																			
CALCULATION OF EXPOSED WALL SURFACE AREA OF UTILITY SPACES																			
S.No.	Floor level	Lenth (m)	Height (m)	Area of the exposed wall	North facade									Total (m)	Floor height (m)	Total wall area (Sq.m)			
					Break up of utility spaces														
1	Ground floor	83.9	4.5	377.55	Staircase	Duct	Corridor	Electrical room	Ramp	FHC				50.95	4.5	229.275			
					9.9	2.1	12.1	10.5	14.9	2.4									
2	First floor	82.9	4.5	377.55	Women's locker	Staircase	Corridor	AHU	Ramp	Locker women's	AHU				69.05	4.5	310.725		
					5.2	9.9	26.7	5	14.9	6.5	1.3								
3	Second floor	77.7	4.05	314.685	Women's locker	Staircase	Corridor	AHU	Ramp	AHU	Locker women's	AHU				75.55	4.05	305.9775	
					5.2	9.9	26.7	5	14.9	6.5	6.5	1.3							
4	Third floor	77.7	4.05	314.685	Women's locker	Staircase	Corridor	AHU	Ramp	AHU	Locker women's	AHU				75.55	4.05	305.9775	
					5.2	9.9	26.7	5	14.9	6.5	6.5	1.3							
5	Fourth floor	77.7	4.05	314.685	Women's locker	Staircase	Corridor	AHU	Ramp	AHU	Locker women's					74.25	4.05	300.7125	
					5.2	9.9	26.7	5	14.9	6.5	6.5								
6	Fifth floor	72.5	4.05	293.625	Staircase	Hardscap e	AHU	Ramp	AHU						62.65	4.05	253.7325		
					9.9	26.8	5	14.9	6.5										
7	Terrace floor	57.6	3	172.8	Staircase	Duct	Duct	Machine room	Machine room	Duct	Staircase	Duct				57.6	3	172.8	
					9.9	1.6	6.2	11.9	8.2	6.2	9.5	4.4							
Total				2165.58													1879.2		
% OF WALL AREA ABUTTING SERVICE ZONE=86.7%																			

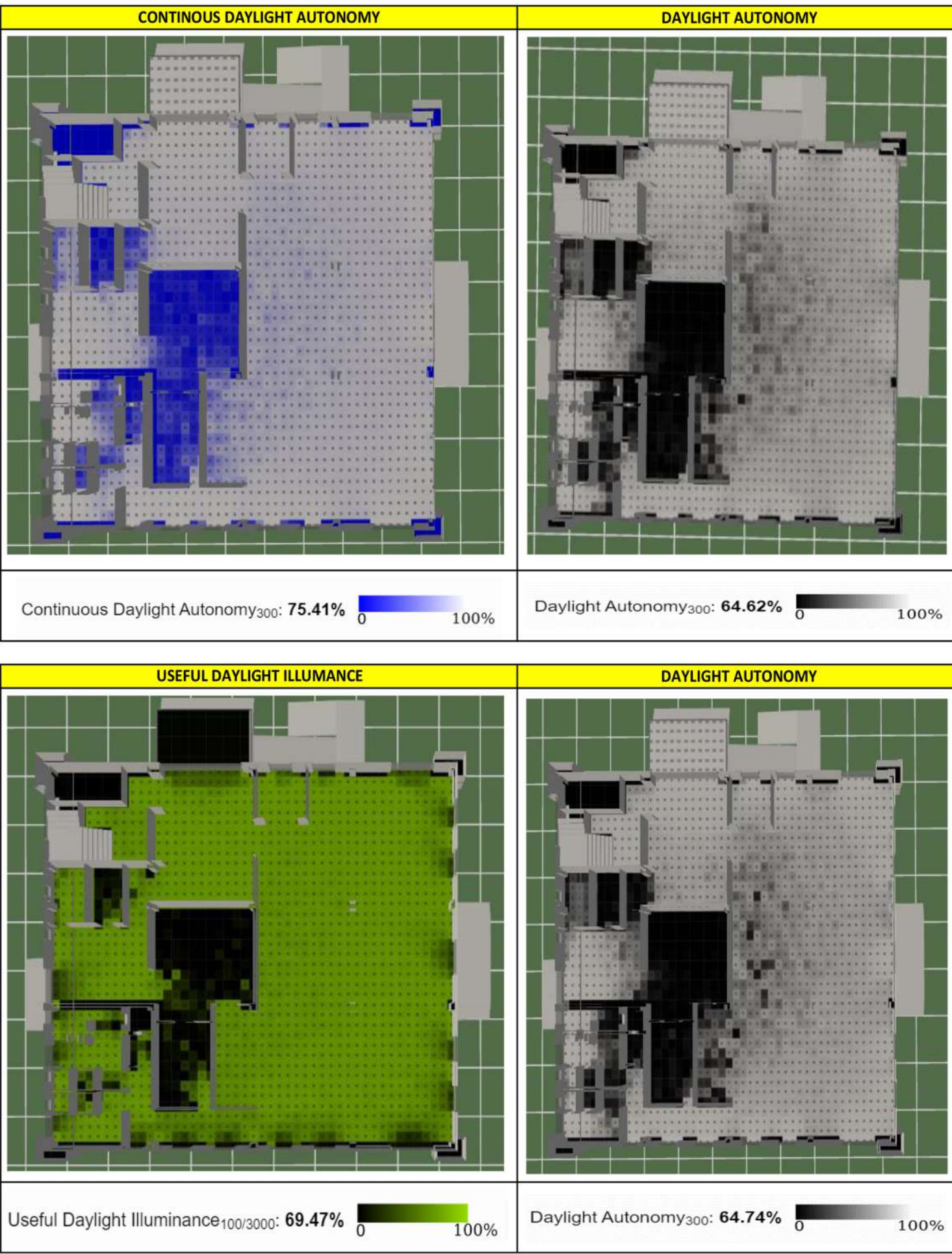
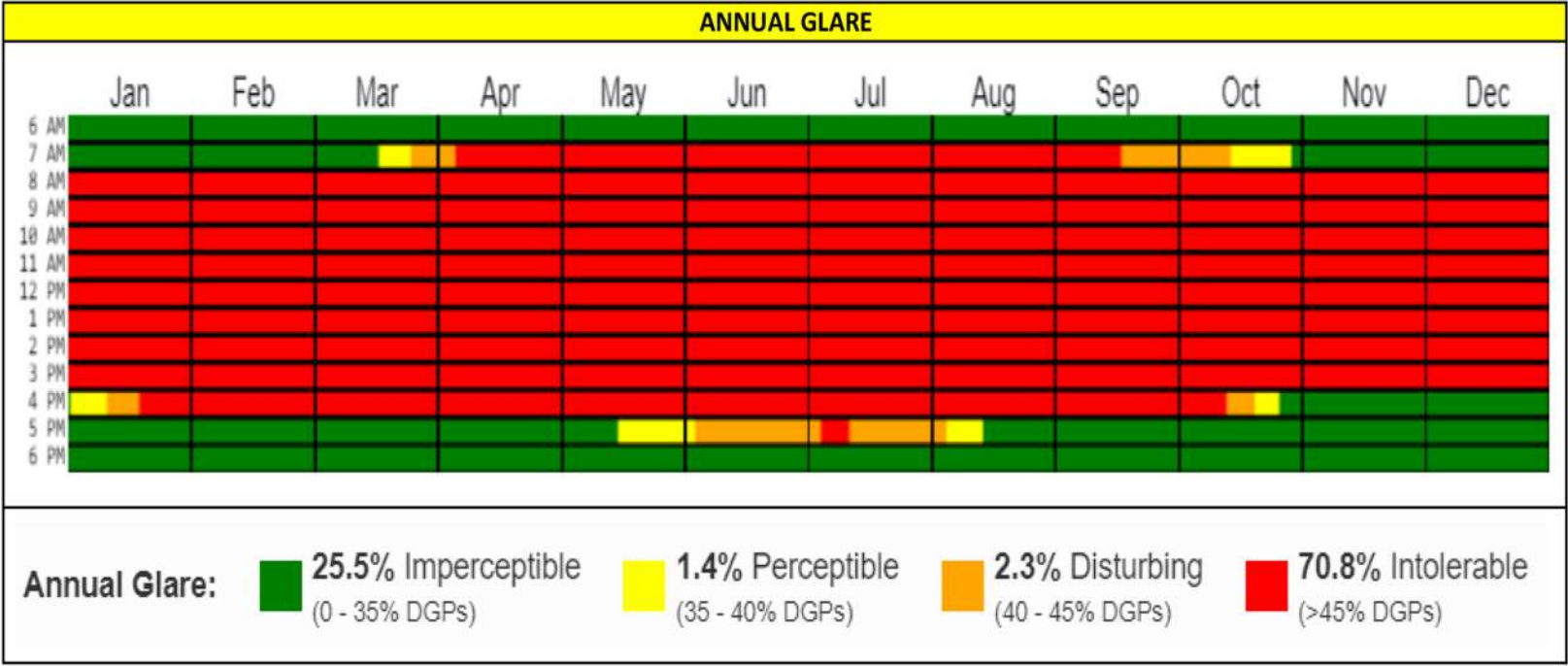
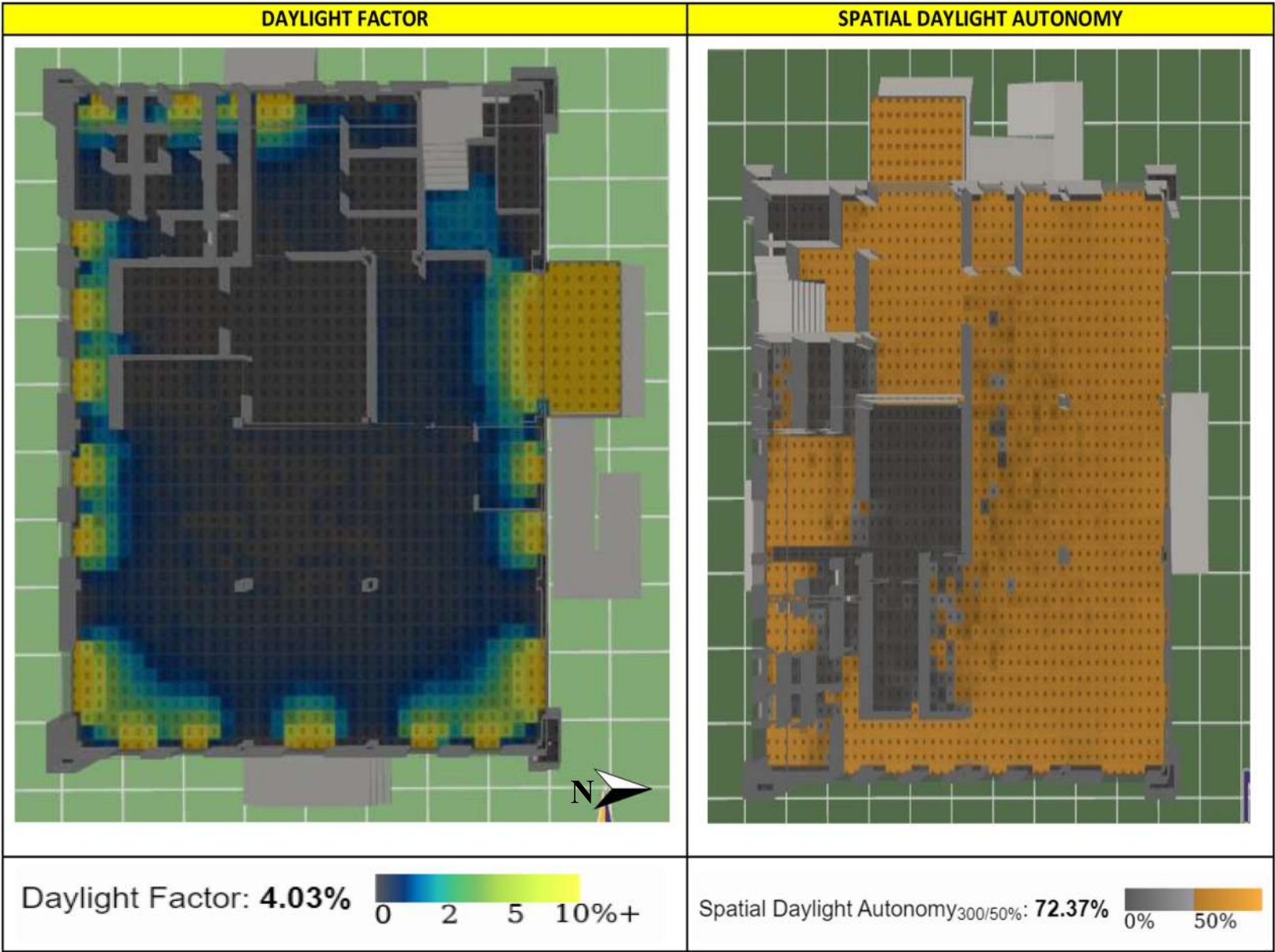
S.No.	Floor level	Lenth (m)	Height (m)	Area of the exposed wall	South facade												Total (m)	Floor height (m)	Total wall area (Sq.m)			
					Break up of utility spaces																	
1	Ground floor	84.2	4.5	378.9	Staircase	Hospital lift	Hospital lift	AHU	Service lobby	Service lift	Utilities	Corridor	Staircase	Ramp	AHU			60.1	4.5	270.45		
					6.7	3.2	3.2	6	4.5	3.5	3.7	2.5	6.7	14.9	5.2							
2	First floor	84.2	4.5	378.9	Staircase	Hospital lift	Hospital lift	AHU	Service lobby	Service lift	Utilities	Corridor	Staircase	Ramp	AHU			60.1	4.5	270.45		
					6.7	3.2	3.2	6	4.5	3.5	3.7	2.5	6.7	14.9	5.2							
3	Second floor	77.5	4.05	313.875	Staircase	Hospital lift	Hospital lift	AHU	Service lobby	Service lift	Utilities	Corridor	Staircase	Ramp	AHU	Men's toilet		65.3	4.05	264.465		
					6.7	3.2	3.2	6	4.5	3.5	3.7	2.5	6.7	14.9	5.2	5.2						
4	Third floor	77.5	4.05	313.875	Staircase	Hospital lift	Hospital lift	AHU	Service lobby	Service lift	Utilities	Corridor	Staircase	Ramp	AHU	Men's toilet		65.3	4.05	293.85		
					6.7	3.2	3.2	6	4.5	3.5	3.7	2.5	6.7	14.9	5.2	5.2						
5	Fourth floor	77.5	4.05	313.875	Staircase	Hospital lift	Hospital lift	AHU	Service lobby	Service lift	Utilities	Corridor	Staircase	Ramp	AHU	Men's toilet		65.3	4.05	293.85		
					6.7	3.2	3.2	6	4.5	3.5	3.7	2.5	6.7	14.9	5.2	5.2						
6	Fifth floor	72.4	4.05	293.22	Staircase	Hospital lift	Hospital lift	AHU	Service lobby	Service lift	Utilities	Corridor	Staircase	Ramp	Men's toilet			60.1	4.05	243.405		
					6.7	3.2	3.2	6	4.5	3.5	3.7	2.5	6.7	14.9	5.2							
7	Terrace floor	57.6	3	172.8	Staircase	Machine room	Machine room	Staircase	Duct	Staircase	Staircase	Duct					57.6	3	172.8			
					9.5	11.9	8.2	9.5	1.6	9.45	9.5	4.4										
Total				2165.445																1809.27		
% OF WALL AREA ABUTTING SERVICE ZONE=83.5%																						

S.No.	Floor level	Lenth (m)	Height (m)	Area of the exposed wall	East facade															Total (m)	Floor height (m)	Total wall area (Sq.m)		
					Break up of utility spaces																			
1	Ground floor	89.2	4.5	401.4	Staircase	AHU	Women's toilet	Men's toilet	Ultrasoun d	Toilet	Ultrasoun d	Corridor	CTRL	Corridor	Locker women's	Toilet	Men's locker	Duct	Staircase	79.8	4.5	359.1		
					6.7	6.3	8.7	7.9	3.5	3	3.5	2.1	5	2.9	4.8	4.2	9.7	1.6	9.9					
2	First floor	89.2	4.5	401.4	Staircase	AHU	Corridor	Men's toilet	Locker men's	Lounge staff	AHU	Women's toilet	Locker women's	Corridor	AHU	Staircase	Duct			83.6	4.5	376.2		
					9.9	5.1	1.6	5.6	4.6	7.8	8.5	5.1	5	15.4	6.7	6.7	1.6							
3	Second floor	89.2	4.05	361.26	Staircase	AHU	Men's toilet	Lounge staff	AHU	Women's toilet	Locker women's	Corridor	AHU	Staircase						75.8	4.05	306.99		
					9.9	5.1	5.6	7.8	8.5	5.1	5	15.4	6.7	6.7										
4	Third floor	89.2	4.05	361.26	Staircase	AHU	Men's toilet	Lounge staff	AHU	Women's toilet	Locker women's	Corridor	AHU	Staircase						75.8	4.05	341.1		
					9.9	5.1	5.6	7.8	8.5	5.1	5	15.4	6.7	6.7										
5	Fourth floor	89.2	4.05	361.26	Staircase	AHU	Corridor	Men's toilet	Lounge staff	AHU	Women's toilet	Locker women's	Corridor	AHU	Staircase					82.4	4.05	333.72		
					9.9	5.1	6.6	5.6	7.8	8.5	5.1	5	15.4	6.7	6.7									
6	Fifth floor	89.2	4.05	361.26	Staircase	AHU	Corridor	Men's toilet	Lounge staff	AHU	Women's toilet	Locker women's	Corridor	Staircase						82.8	4.05	335.34		
					9.9	5.1	6.6	5.6	7.8	8.5	5.1	5	22.5	6.7										
7	Terrace floor	60.4	3	181.2	Staircase	Duct	Machine room	Staircase	Staircase	Machine room	Staircase	Staircase							60.4	3	181.2			
					6.7	1.6	6.3	11	11	11.6	6.1	6.1												
Total				2429.04																		2233.65		
% OF WALL AREA ABUTTING SERVICE ZONE=91.9%																								

S.No.	Floor level	Lenth (m)	Height (m)	Area of the exposed wall	West facade										Total (m)	Floor height (m)	Total wall area (Sq.m)			
					Break up of utility spaces															
1	Ground floor	89.2	4.5	401.4	Ramp										49.2	4.5	221.4			
					49.2															
2	First floor	89.2	4.5	401.4	Ramp										49.2	4.5	221.4			
					49.2															
3	Second floor	89.2	4.05	361.26	Ramp	Staircase	FHC	AHU							72.7	4.05	294.435			
					49.2	6	11.5	6												
4	Third floor	89.2	4.05	361.26	Ramp	AHU	FHC	AHU							72.7	4.05	327.15			
					49.2	6	11.5	6												
5	Fourth floor	89.2	4.05	361.26	Ramp	Staircase	FHC	AHU							66.7	4.05	270.135			
					49.2	9.9	1.6	6												
6	Fifth floor	89.2	4.05	361.26	Ramp	Staircase	FHC	AHU							66.7	4.05	270.135			
					49.2	9.9	1.6	6												
7	Terrace floor	59.6	3	241.38	Staircase	Staircase	Machine room	Staircase	Staircase	Duct	Machine room	Staircase	Machine room			59.6	3	241.38		
					6.7	11	12.2	6.2	6.2	1.6	6.3	3.1	6.3							
Total				2489.22														1846.75		
% OF WALL AREA ABUTTING SERVICE ZONE=74.1%																				







Hospital project at Kalyani, West Bengal		
Occupancy schedule-Habitable spaces		
Ground floor		
S.no.	Name of the space	Occupants
1	Office	4
2	Office	4
3	Doctor's room	3
4	Doctor's room	3
5	Doctor's room	3
6	Doctor's room	3
7	Doctor's room	3
8	General radiology	3
9	Control room	2
10	Rad/Fluro control	2
11	Ultrasound	3
12	General radiology	3
13	Control room	2
14	Control room	2
15	Ultrasound	3
16	Work room	6
17	Office	4
18	Waiting area	509
Total		562

Fifth floor		
S.no.	Name of the space	Occupants
1	OFC-UM	2
2	OFC-CC	2
3	OFC-MD	2
4	OFC-TUM REG	2
5	Staff work	4
6	Consultation room	3
7	Consultation room	3
8	Clnc	3
9	Clnc	3
10	Clnc	3
11	Clnc	3
12	Clnc	3
13	Nurse station	3
14	Pharmacy	5
15	Port. Proc	4
16	Nurse station	4
17	Nurse station	4
18	Clean supplies	3
19	Pantry	3
20	Infusion pharmacy	4
21	Nurse station	4
22	Office unit manager	2
23	Therapy	47
24	Waiting area	149
25	Garden Therapy OTS	10
26	Conference	15
Total		290

Overall total occupants	3212
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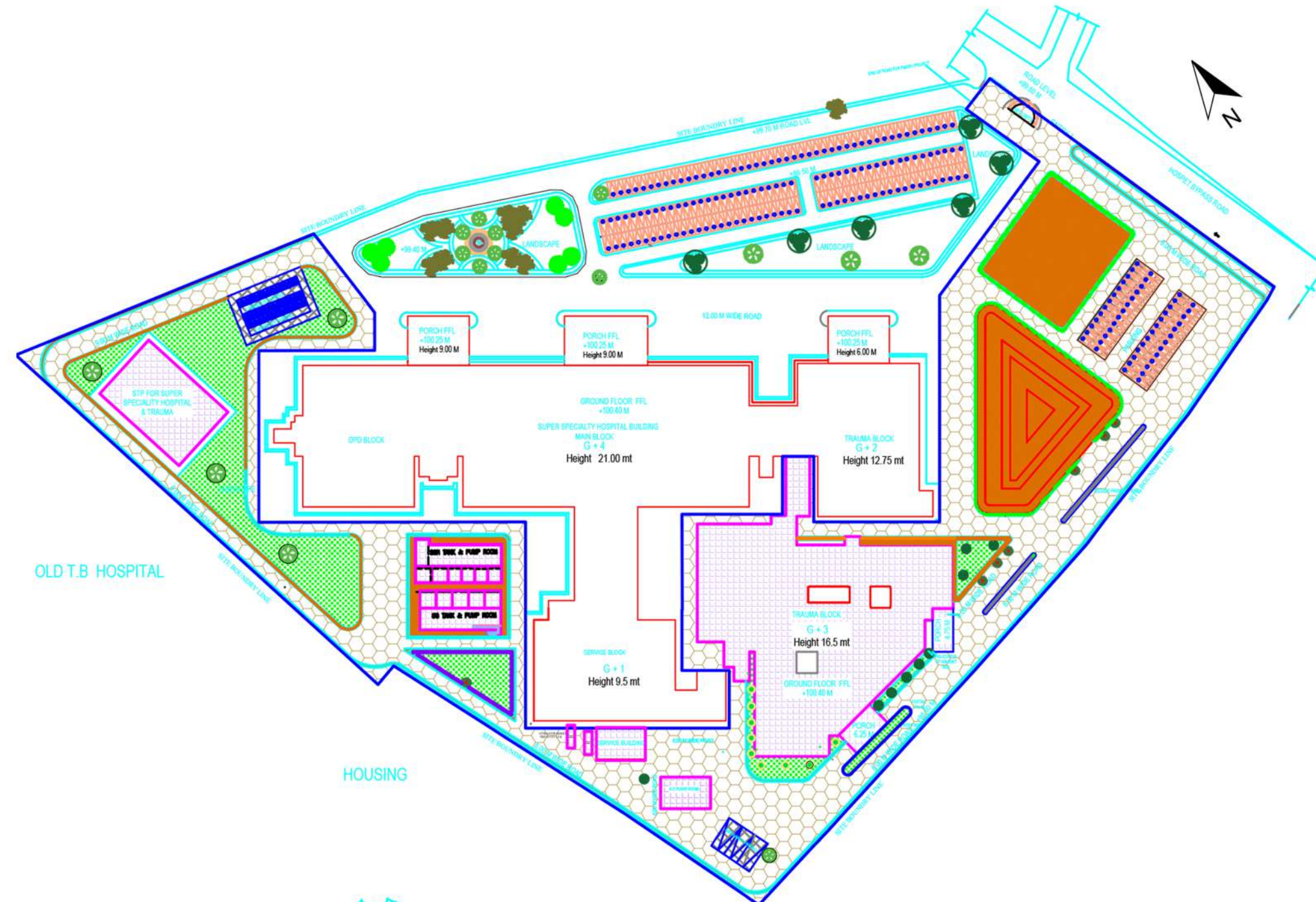
First floor		
S.no.	Name of the space	Occupants
1	Echo	3
2	Echo	3
3	Echo	3
4	Test stress	3
5	Test stress	3
6	Test stress	3
7	Echo	3
8	Station nurse	3
9	Manager office	2
10	Consultation room	3
11	Consultation room	3
12	Station nurse	3
13	ICD	3
14	EKG	3
15	EKG	3
16	EKG	3
17	EKG	3
18	EKG	3
19	Doppler vasc	3
20	Doppler vasc	3
21	Lab	10
22	Office	4
23	Office	4
24	Admin	8
25	Office	2
26	Office	2
27	Office	2
28	Office	2
29	Office	2
30	Easy street	3
31	Adl Apt	3
32	OT Space	5
33	Hydro therapy	3
34	Hydro therapy	3
35	Hydro therapy	3
36	Therapy	3
37	Therapy	3
38	Therapy	3
39	Therapy	3
40	Therapy	3
41	Therapy	3
42	Therapy work area	2
43	PT-Gym	10
44	Waiting area	314
Total		459

Second floor		
S.no.	Name of the space	Occupants
1	Examination room	3
2	Examination room	3
3	Examination room	3
4	Examination room	3
5	Minor procedure room	4
6	Hold bay	3
7	Examination room	3
8	Examination room	3
9	Examination room	3
10	Counter	4
11	Support	3
12	Vitals	3
13	Examination room	3
14	Examination room	3
15	Examination room	3
16	Vitals	3
17	Support	3
18	Support	3
19	Examination room	3
20	Examination room	3
21	Examination room	3
22	Examination room	3
23	Counter	4
24	Phlebotomy	3
25	Examination room	3
26	Examination room	3
27	Examination room	3
28	Examination room	3
29	Examination room	3
30	Examination room	3
31	Examination room	3
32	Support	3
33	Support	3
34	Phlebotomy	3
35	Vitals	3
36	Examination room	3
37	Examination room	3
38	Examination room	3
39	Examination room	3
40	Hold bay	3
41	Minor procedure room	4
42	Support	3
43	Vitals	3
44	Counter	4
45	Examination room	3
46	Examination room	3
47	Examination room	3
48	Examination room	3
49	Waiting area	520
Total		669

Third floor		
S.no.	Name of the space	Occupants
1	Examination room	3
2	Examination room	3
3	Examination room	3
4	Examination room	3
5	Minor procedure room	4
6	Hold bay	3
7	Examination room	3
8	Examination room	3
9	Examination room	3
10	Counter	4
11	Support	3
12	Vitals	3
13	Examination room	3
14	Examination room	3
15	Examination room	3
16	Vitals	3
17	Support	3
18	Support	3
19	Examination room	3
20	Examination room	3
21	Examination room	3
22	Examination room	3
23	Counter	4
24	Phlebotomy	3
25	Examination room	3
26	Examination room	3
27	Examination room	3
28	Examination room	3
29	Examination room	3
30	Examination room	3
31	Examination room	3
32	Support	3
33	Support	3
34	Phlebotomy	3
35	Vitals	3
36	Examination room	3
37	Examination room	3
38	Examination room	3
39	Examination room	3
40	Hold bay	3
41	Minor procedure room	4
42	Support	3
43	Vitals	3
44	Counter	4
45	Examination room	3
46	Examination room	3
47	Examination room	3
48	Examination room	3
49	Waiting area	520
Total		669

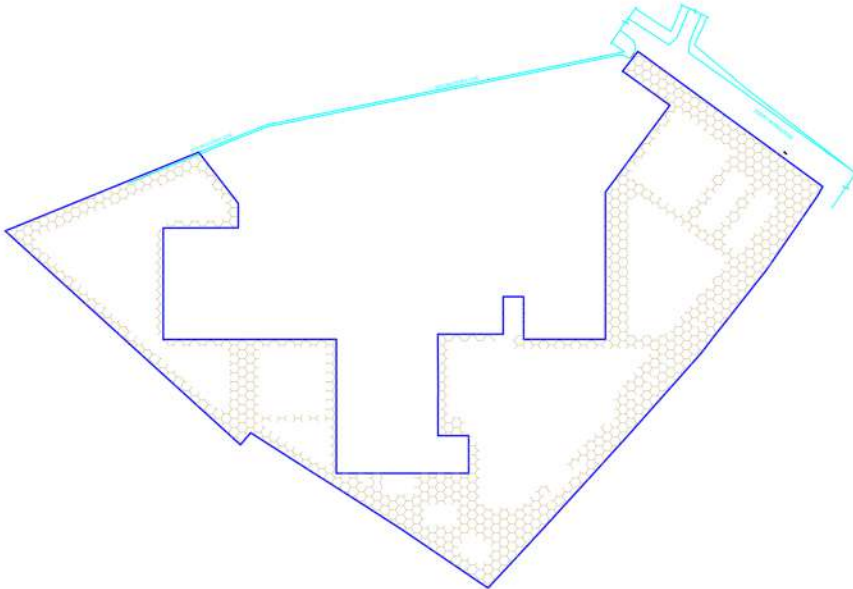
Fourth floor		
S.no.	Name of the space	Occupants
1	Office manager	2
2	PFT lab	3
3	Spirometry	3
4	Spirometry	3
5	Body box	3
6	Vitals	3
7	Clean/Med	3
8	Sleep lab	3
9	Sleep lab	3
10	Sleep lab	3
11	Sleep lab	3
12	Control room	2
13	Control room	2
14	Support	3
15	Counter	2
16	Examination room	3
17	Examination room	3
18	Examination room	3
19	Examination room	3
20	Support	3
21	Minor procedure room	4
22	Vitals	3
23	Counter	2
24	Hold bay	3
25	Examination room	3
26	Examination room	3
27	Examination room	3
28	Vitals	3
29	Examination room	3
30	Examination room	3
31	Examination room	3
32	Examination room	3
33	Support	3
34	Support	3
35	Counter	2
36	Phlebotomy	3
37	Examination room	3
38	Examination room	3
39	Examination room	3
40	Examination room	3
41	Dental examination OP	3
42	Dental examination OP	3
43	Dental examination OP	3
44	Dental examination OP	3
45	Dental examination OP	3
46	Dental examination OP	3
47	Counter	2
48	Hygenist work area	3
49	Counter	2
50	Pano/X-ray	3
51	Dental procedure	3
52	Autoclave	3
53	Dental check-in	3
54	Waiting area	412
Total		564



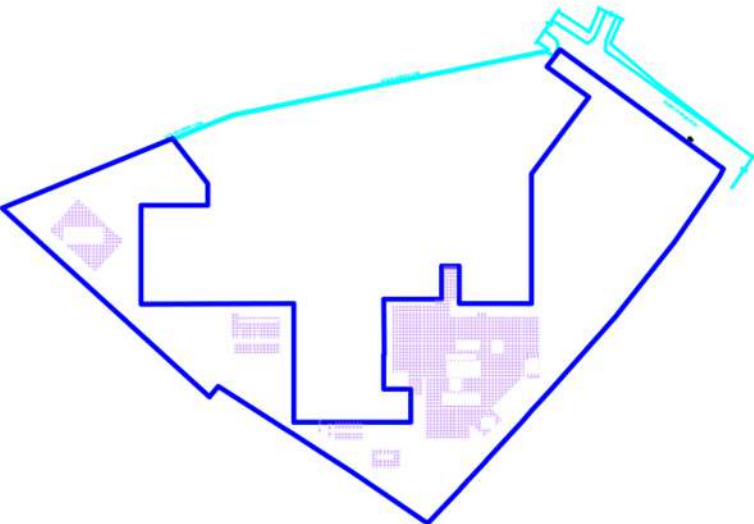


LEGEND:-

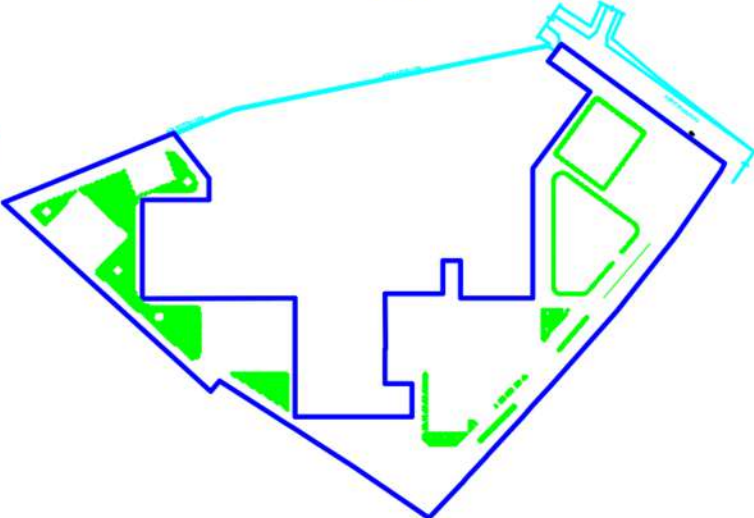
S.NO	TYPE	CATEGORY	AREA(Sq.m)	CATEGORY
1		GROUND COVERAGE BREAK-UP DETAILS: BUILDING FOOTPRINT - 4536.93 sq.m SERVICES - 1484.28 sq.m	6021.21	BUILDING STRUCTURE
2		LANDSCAPE BREAK-UP DETAILS: LAWN - 3308.45 sq.m SHRUBS - 92.64 sq.m TREES - 133.52 sq.m	3534.61	LAWN/SHRUBS/TREES
3		PEDESTRIAN	5331.24	PAVER BLOCKS
4		PARKING	1324.18	PAVER BLOCKS
5		ROAD NETWORK	13846.22	PAVER BLOCKS
TOTAL SITE AREA			30037.43 Sq.m	



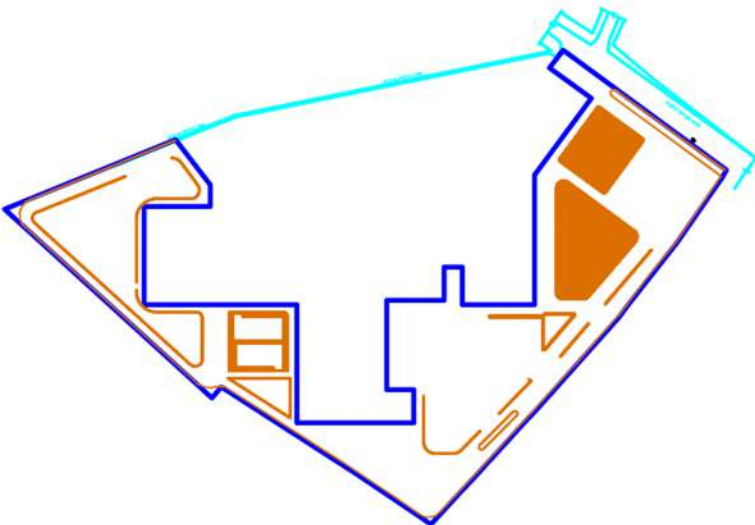
ROAD NETWORK 13846.22 Sq.m



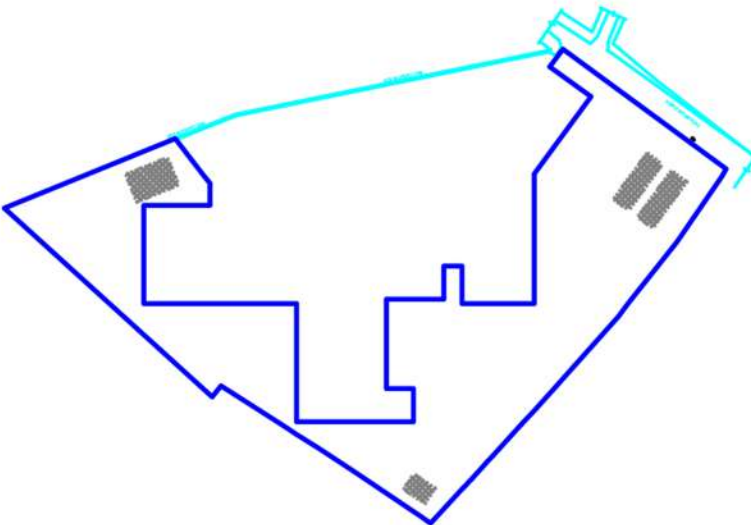
BUILDING FOOTPRINT 6021.21 Sq.m



LANDSCAPE 3534.61 Sq.m



PEDESTRIAN 5331.24 Sq.m



PARKING 1324.18 Sq.m

AMERICAN STANDARDS-FLOW RATES

S.no	Description of item	Product description	Model no.	Flow rate
1	Bib cock & long nose bib cock	Winston wall tap (lever handle)	FFAST602-000500BF0	10.9 L/min for spout outlet
2	Stop cock (concealed)	Winston concealed shower nono(lever)	FFAST605-709500BF0	10.5 L/min for shower outlet
3	Divertor type shower mixer	Neo modern L-bend mixer-chrome	FFAS0714-604500BA0	11 L/min for spout and 10L /min for handshower
4	Basin mixer pillar tap	WF-0707.151.50/Neo modern single hole la	FFAS0701-151500BA0	3L/min
5	Angle valve for basin mixer	Angle stop	FS4400-CHACT	1.5 to 20 L/min

