

SEMINARY

A THESIS

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Architecture degree

By

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SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY) Accredited

With Grade “A” by NAAC

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MAY 2024



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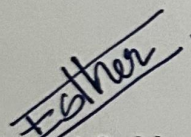
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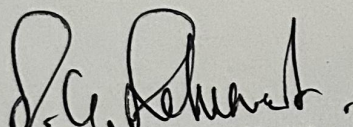
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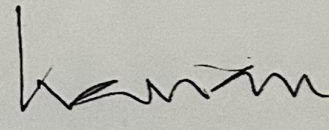
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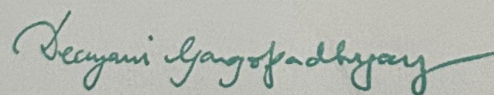
BONAFIDE CERTIFICATE

This is to certify that Thesis Report is the bonafide work of **Doreen Grace Santhosh (39210021)** who carried out the Thesis entitled "**Seminary**" under our supervision from November 2023 to May 2024.

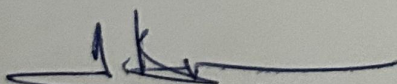

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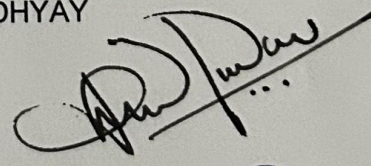
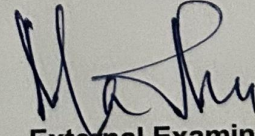

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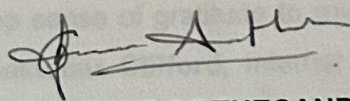


External Examiner

DECLARATION

I, **DOREEN GRACE SANTHOSH** hereby declare that the Thesis Report entitled "SEMINARY" done by me under the guidance of **Ar. Esther Kiruba Jebakumar Clifford** (Internal Guide), **Ar. Selvendiran** (Internal Review Member) and **Ar. Kurian George** (External Guide) Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Architecture Degree.

DATE: 15-05-2024

PLACE: Chennai


SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **Sathyabama Institute of Science and Technology** for their kind encouragement in doing this Thesis and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr.Devyani Gangopadhay**, Dean and Head of the Department, School of Building and Environment, Our Design Chair **Dr.Suresh Kuppuswamy**, Thesis Coordinator **Ar. Esther Kiruba Jebakumar Clifford** 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 my Thesis Internal guide **Ar. Ar. Esther Kiruba Jebakumar Clifford**, Internal Review member **Ar. Selvendiran** and External Guide **Ar. Kurian George** their guidance, suggestions and constant encouragement which paved the way for the successful completion of my Thesis work.

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

DOREEN GRACE SANTHOSH

THESIS SYNOPSIS

A seminary is a specialized institution for the education and training of individuals pursuing careers in religious ministry, particularly within Christian denominations. Seminaries vary in their denominational affiliations, curriculum, and focus but generally aim to provide comprehensive theological education and practical training for those entering religious vocations..

There are various denominations in Christianity. The Brethren denomination started as a movement against various practices that were wrong according to the Bible. The Brethren denomination is a part of the Protestant community

The idea of this thesis is to develop a space for those to are yearning to learn about God and graduated in a course of 10 years. There are very few seminaries for the Protestant community and even few are designed by architects.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This thesis is set at investigating various activities involved in theological seminaries and management institutes. It also identifies various problems associated with the physical structures of studied theological seminaries, particularly within our own environment. The text in the thesis finally gives guideline for the incorporation of management Education into theological seminary; and carries out an architectural design whereby provision is made for physical structures which would effectively and efficiently facilitate the learning of the theology and management education together under a single seminary; thus providing an overall environment which is conducive to Christian Religious training and fellowship.

The seminarmy is a christian institution which would perform three basic functions in the Following priorities. The first and major function is the training of the theologian. The secondary function is to provide the theologians with basic management education, thereby qualifying them as managers as well. The third function is the conduction of christinn congregational worship. Thoaleciens are mainly trained to propegate the Gospel of Jesus Christ primarily through the church, and then other forums as they are opportuned. Theologians are also refered to as Pastors.

This theological seminary would be provided with all the basic ammenities which would enable it to incorporate all these functions together effectively and efficiently.

1.2 NEED OF THE PROJECT

Education is the foundation of any society. It is responsible for the social, economical, and development of society. Religious training is even more important as it shapes, moulds and makes a person, training him/her to live a life set apart from others. An institute which provides

for the same should be designed with careful considerations to the beliefs and the system of education which is different from secular education.

1.3 AIM AND OBJECTIVE

The choice of subject was first due to the fascination with the architecture power to create places with identity and environments / atmospheres able to awake the senses and emotions, triggering experiences. Secondly, due to the conviction that the spiritual and metaphysical experience can be enhanced by the liturgical space experience. If the liturgical space aims to provide a religious experience, it is the architecture responsibility to answer that demand, establishing itself as a medium - rising space - to reach the divine. Religious architecture has the ability to express the 'unspeakable' and the transcendent. Therefore, it is a great challenge for the architect to design spaces that can provide the desired religious experience.

CHAPTER 2

LITERATURE CASE STUDIES

2.1 SAINTE MARIE DE LA TOURETTE

Location - Bangalore, India

Architects: Le Corbuisé

Year: 1960

Type: Convent Dominican community

Architectural style: Modernist, International

Country: France

Total Square Footage: 16,500 sq. ff.

Style: Modernist, International Style

Structure: Rough Reinforced Concrete

His idea was to create functional spaces to meet the social and personal needs of modern people. He developed the five principles for a new architecture:

1. A building lifted on pilotis stilts,
2. A self-supporting structure formed with columns and beams,
3. The façade should be free, mainly glazed,
4. Flexible open plan that can be modified as per the user's requirements,
5. The roof will act more like a garden.

2.1.1 Exterior:

The monastery consists of four perimeter heavy rectangular structures that create a closed interior space. The compact rectangle that rests on the edge of the hill houses the church and

the church sacrifice, while the other three wings are raised with pilotis of many different shapes, accommodating living spaces and all the rest functions of the monastery.



2.1.2 Interior:

The monastery was designed to have one hundred bedrooms for apprentices and teachers, study rooms, one workplace and one entertainment room, a dining room, a library and a church. At the lowest level are the dining room and the peristyle of the temple in the form of a cross, that functions as ramp and leads to the church. The study, work, entertainment and library halls are placed on the above level, while the friars' cells are at the highest level. The monastery's four wings create an enclosed central space.



2.1.3 Patio:

The open space between the four wings isn't a typical patio. It is divided into four parts by the two vertical corridors joining each other. Forms of different geometry are contained in each of

the four parts that are created: a cylinder in the inside is a helix staircase, a prismatic roof, a quadrangular pyramid and a series of polygonal apertures on the roof of a parallelepiped protrusion on church's wall.



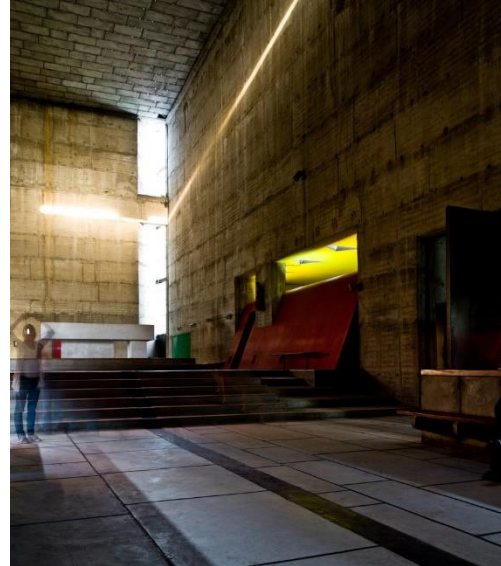
2.1.4 Materials:

The structural form of the building is reinforced concrete, with undulating glass surfaces located on three of the four exterior faces, which were designed by Iannis Xenakis.

2.1.5 The use of the light:

The gradual path from the natural landscape to the interior of the sanctuary, where there is no iconographic representation rather than the view of natural light, is at the same time a continuous removal of the visual phenomena from "out" to "in". The complexity of the landscape is reduced to simple geometric shapes and at the end to the ultimate light.

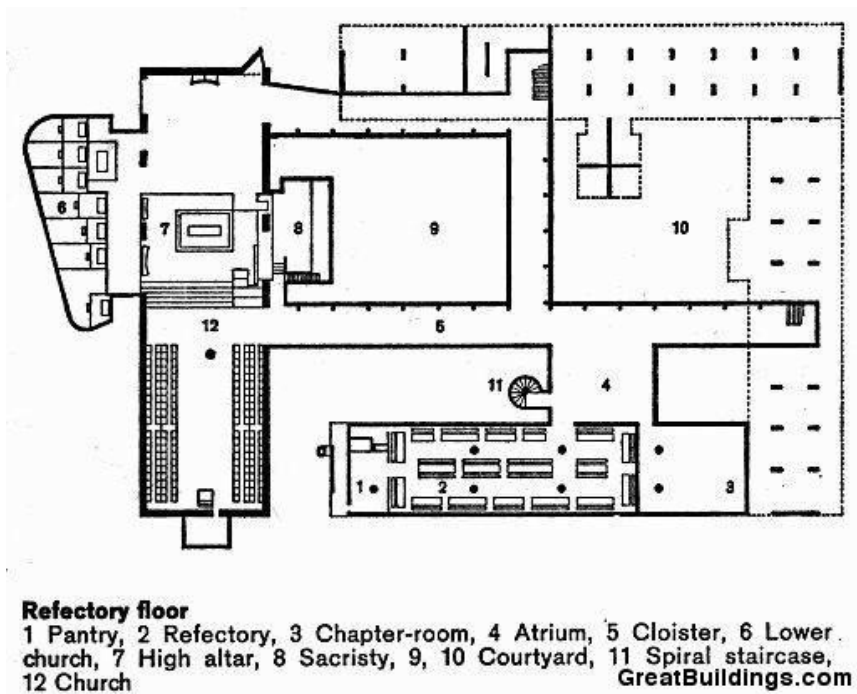
Light is a way of experiencing the space, as it moves freely within it luring the visitor to do the same. In order to control the amount of light that enters the large public spaces and the long corridors, vertical wavy glass sheets are used.

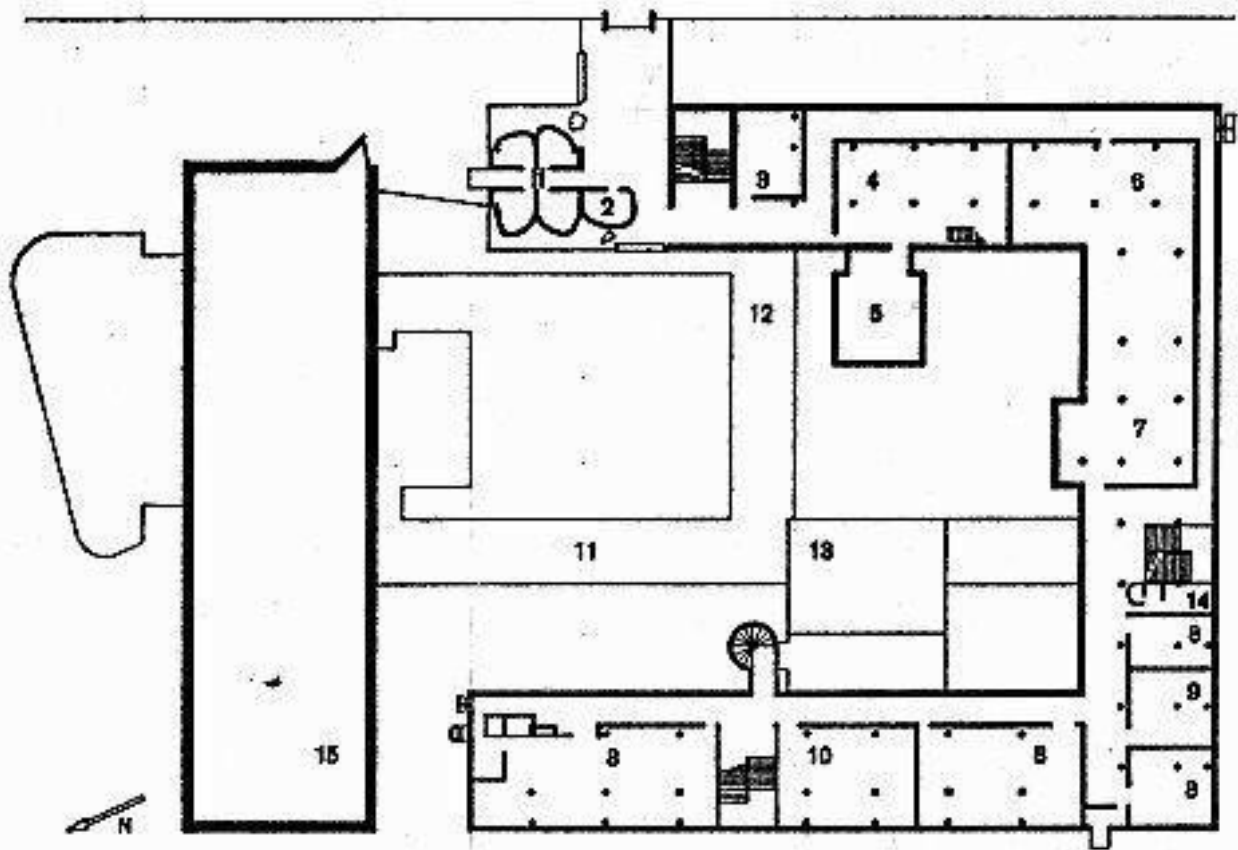


2.1.6 Now:

Though still functioning for a reduced population of friars, La Tourette has, like Ronchamp, become something of a pilgrimage site for students of architecture. The priory allows overnight stays in the unused cells. Fees for the room go to maintenance of the priory.

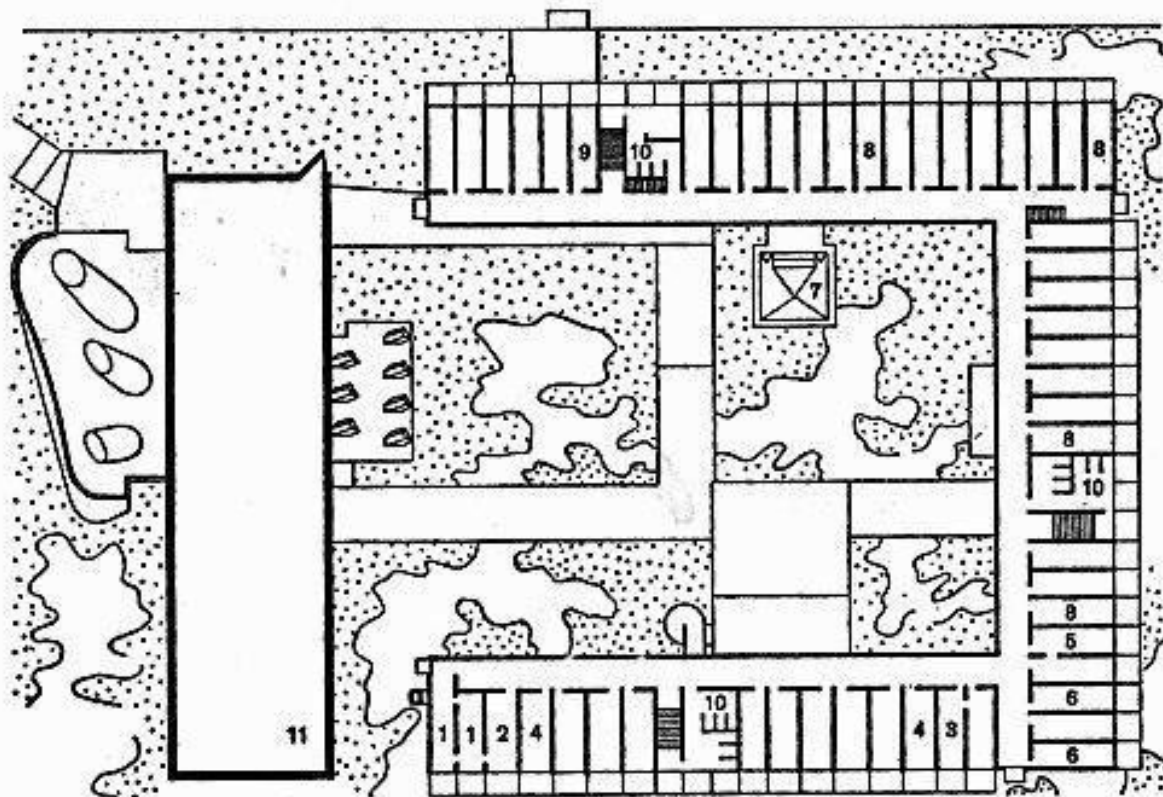
2.2. PLANS





Entrance floor

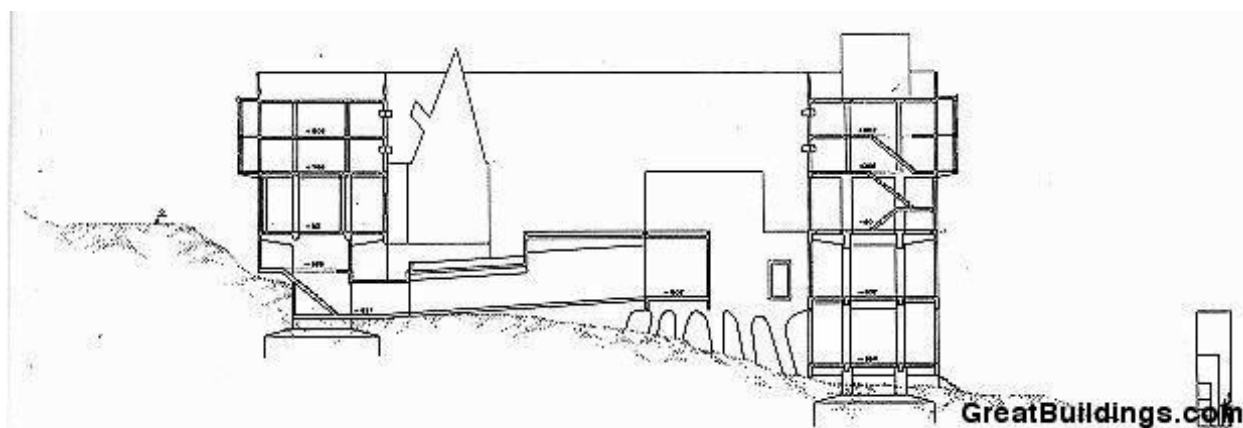
1 Conversation cells, 2 Porter, 3 Room for the lay-brothers, 4 Common-room for the student brothers, 5 Oratory, 6 Reading-room, 7 Library, 8 Lecture rooms, 9 Common-room for the student brothers, 10 Common-room for the fathers, 11, 12 Cloister, 13 Atrium, 14 WC, 15 Church



Cell floor

1 Cells for the sick, 2 Nurse's cell, 3 Cells for visitors, 4 Fathers' cells, 5 Cell for the monk in charge of the student brothers, 6 Student priests' cells, 7 Oratory, 8 Student brothers' cells, 9 Lay brothers' cells, 10 Sanitary offices, 11 Church

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2.2 ST. IGNATIUS CHAPEL

Location Architects: Steven Holl Architects

Year: 1997

Type: Church Jesuit Church

Country: Seattle, WA, United States

Total Square Footage: 6100 sq. ft

2.1.1 Concept

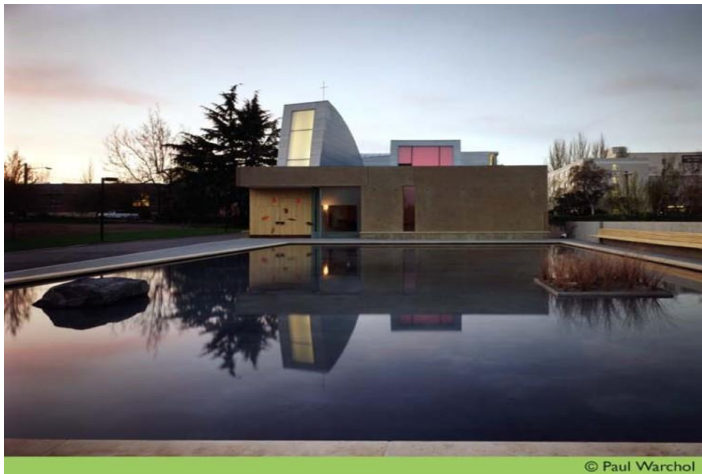
Seven bottles of light in a stone box; the metaphor of light is shaped in different volumes emerging from the roof whose irregularities aim at different qualities of light: East facing, South facing, West and North facing, all gathered together for one united ceremony. Each of the light volumes corresponds to a part of the program of Jesuit Catholic worship. The south-facing light corresponds to the procession, a fundamental part of the mass. The city-facing north light corresponds to the Chapel of the Blessed Sacrament and to the mission of outreach to the community. The main worship space has a volume of east and west light. At night, which is the particular time of gatherings for mass in this university chapel, the light volumes are like beacons shining in all directions out across the campus.

The Chapel of St. Ignatius, designed by Steven Holl Architects, is a Jesuit chapel for [Seattle](#) University. A series of light volume corresponds to a part of Jesuit Catholic worship service, such as the south facing light corresponds to the procession, a fundamental part of the mass.





The chapel is sited to form a new campus quadrangle green space to the north, the west, and in the future, to the east. The elongated rectangular plan is especially suited to defining campus space as well as the processional and gathering space within. Directly to the south of the chapel is a reflecting pond

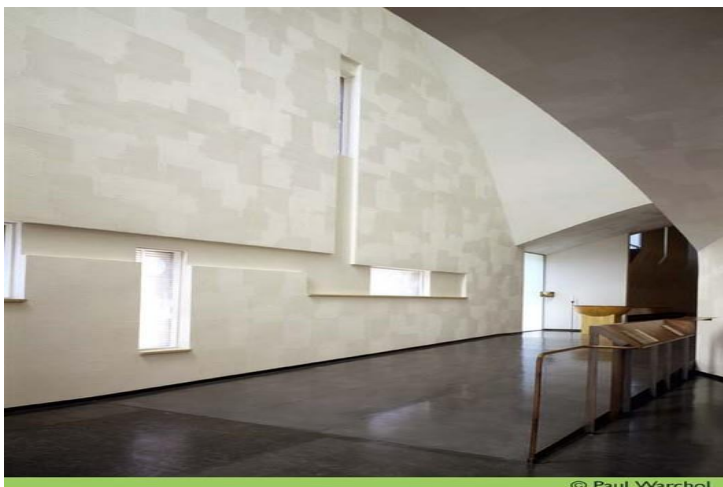


In the Jesuits "spiritual exercises", no single method is prescribed - "different methods helped different people...". Here a unity of differences is gathered into one. The light is sculpted by a number of different volumes emerging from the roof. Each of these irregularities aims at different qualities of light. East facing, South facing, West and North facing, all gather together for one united ceremony.



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The city facing north light corresponds to the Chapel of the Blessed Sacrament and to the mission of outreach to the community. The main worship space has a volume of east and west light. The concept of Different Lights is further developed in the dialectic combination of a pure colored lens and a field of reflected color within each light volume. A baffle is constructed opposite the large window of each “bottle of light.” Each of the baffles is back painted in a bright color; only the reflected color can be seen from within the chapel. This colored light pulses with life when a cloud passes over the sun. Each bottle combines the reflected color with a colored lens of the complementary color.

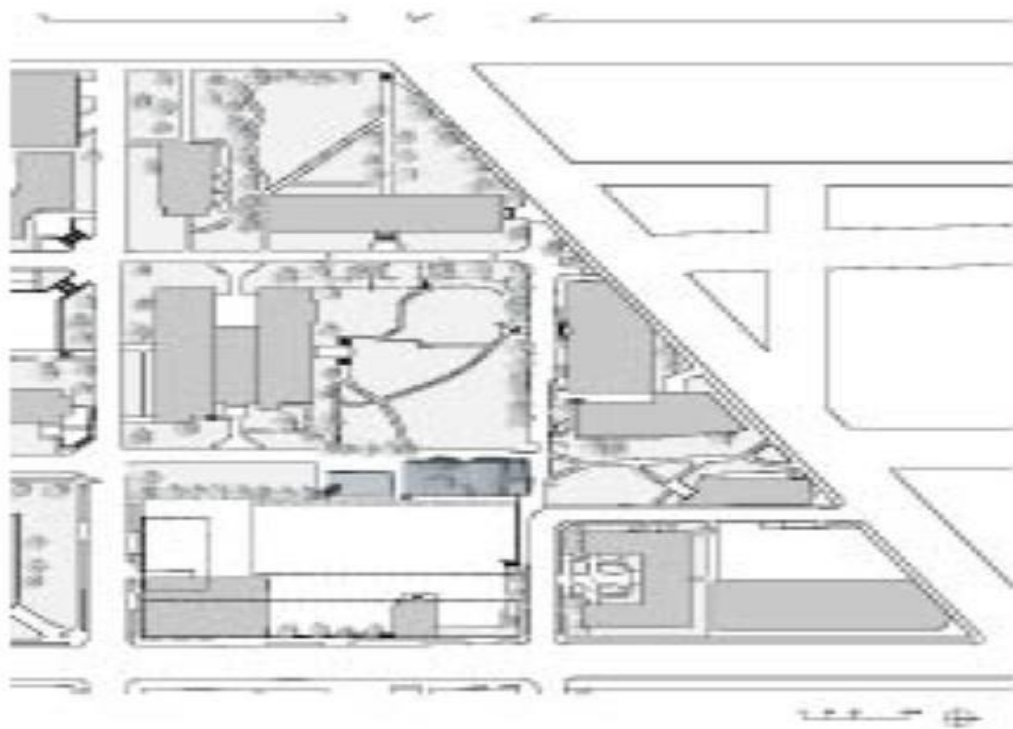


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At night, which is the time of gatherings for mass in this university chapel, the light volumes shine in all directions out across the campus like colored beacons. On occasion, for those in vigilant prayer, light will shine throughout the night. The visual phenomena of complementary colors can be experienced by staring at a blue rectangle and then a white surface. One will see a yellow rectangle; this complementarily contributes to the two-fold merging of concept and phenomena in the chapel



The concept of “Seven Bottles of Light in a Stone Box” is expressed through the tilt-up method of construction. The integral color tilt-up concrete slab provides a more direct and economical tectonic than stone veneer. The building’s outer envelope is divided into 21 interlocking concrete panels cast flat on the chapel’s floor slab and on the reflecting pond slab. Over the course of two days these panels were put in place by a hydraulic crane, which strained at the ponderous weights of up to 80,000 lbs. “Pick pockets,” or hooks inset into the panels were capped with bronze covers once the panels were upright. Windows were formed as a result of the interlocking of the tilt-up slabs, allowing the 5/8” open slab joint to be resolved in an interlocking detail.



Plan

2.3 CHURCH OF LIGHT

Architects: Tadao Ando Architect & Association

Year: 1999

Type: Church

Dominican community

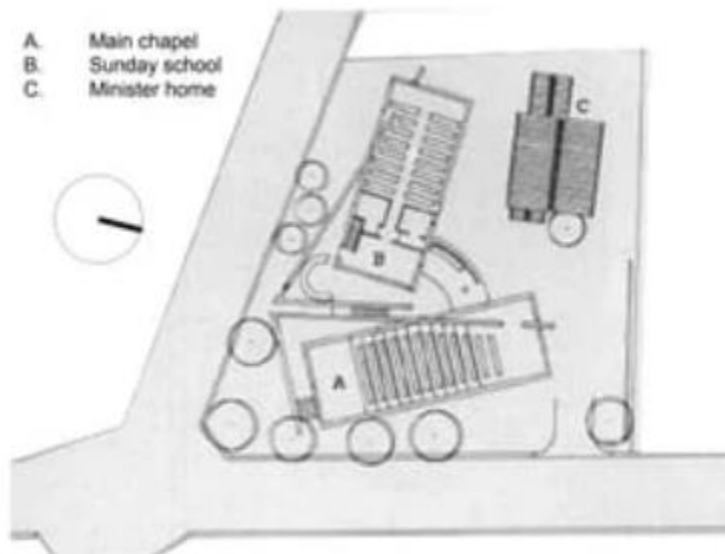
Country: Japan

Total Square Footage: 2820 sq. ft.

2.3.1 Concept

The set consists of two volumes (the church and a chapel secondary) prepared at an angle consistent with the urban environment. The whole arrival is indirect, as it requires to enter a side road through which you reach a small square from where the hits are distributed to the two buildings.

Both consist of rectangular blocks of concrete. The main Church of Light, is a box of 6 x 6 x 18 crossed by a wall at an angle of 15 °, which energizes the space because, being separate from the cover that allows light to filter inside creating the impression of a floating roof. The diagonal wall contains the glass entrance door, which slides horizontally.



2.3.2 Spaces

The interior can be seen the rough texture of the soil and the banks. Everything in the design is stripped naked to highlight a fund with a wall of vertical and horizontal opening forming a cross of light that fills the space. These holes were designed to enter not only light but also the air, but were subsequently closed due to inclement weather.



2.3.3 Materials

The building, constructed in particular, has left the entire surface of the ornament for giving spiritual light, becoming more intense as the sacrum.

Even the seats (which were made with parts of the Scaffold used for construction of the church and covered with black paint), say its austere and minimal.

2.3.4 Circulation

Upon entering the chapel the wall is immediately encountered and forces a left turn into the wall allowing a right turn into the main chapel space. The purpose of the manipulation of the circulation sequence is realized

as one passes through the wall. At this particular point one pivots around as they become totally aligned with the crucifix of light at the end of the chapel.

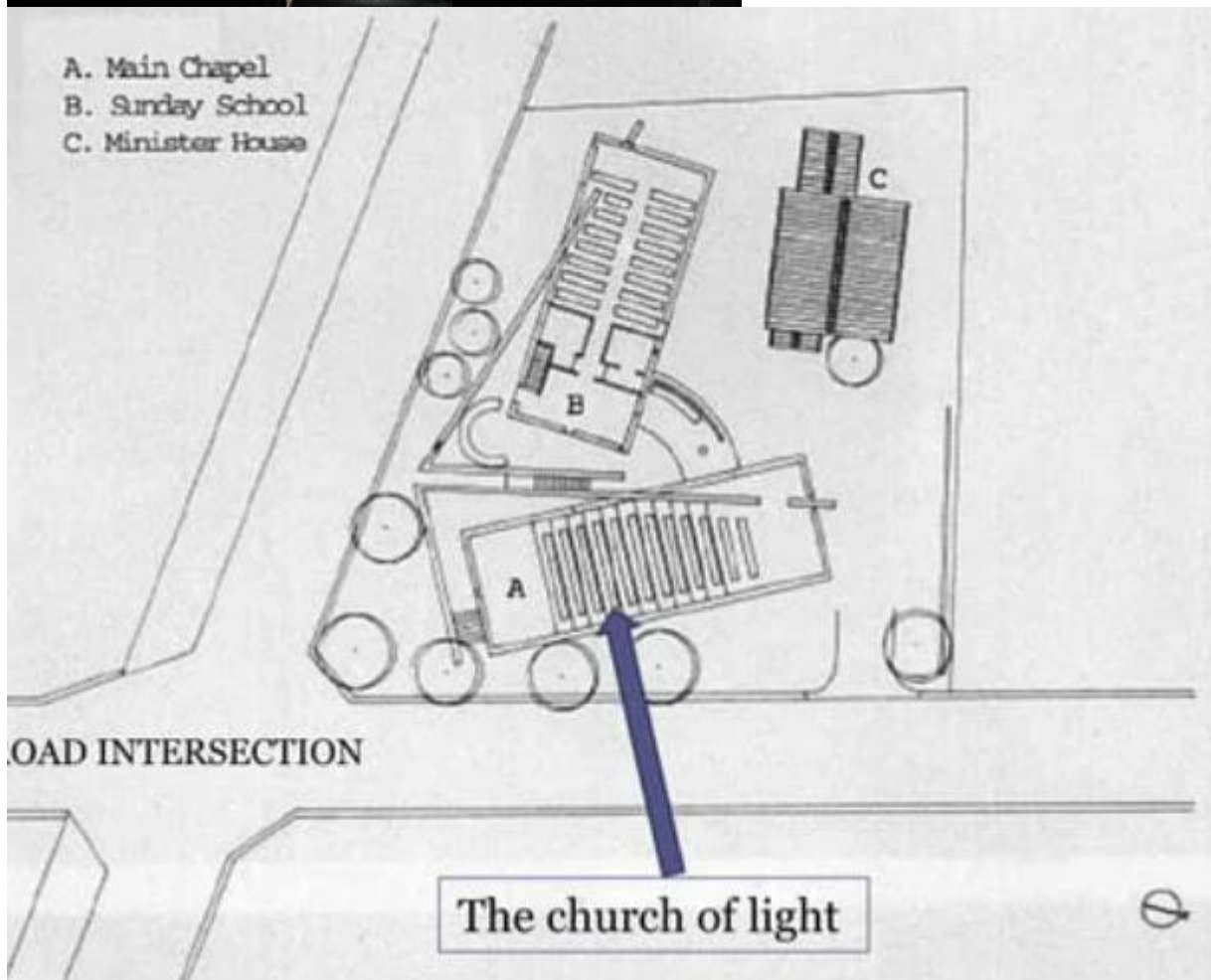
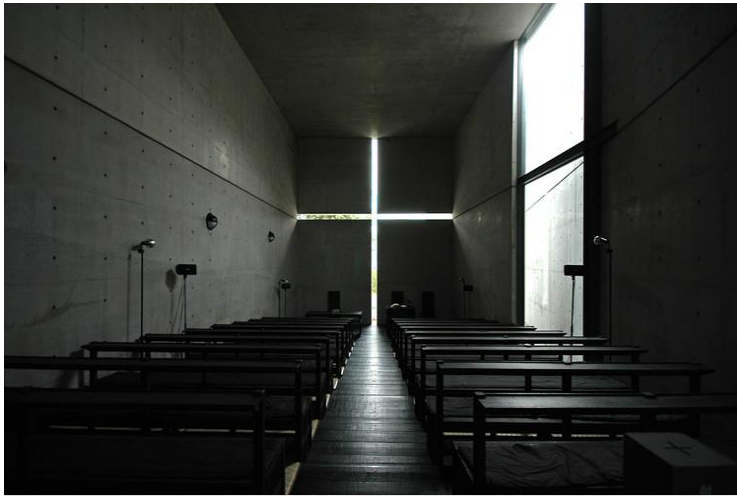
By keeping the amount of openings to a minimum, the power of the light penetrating from the crucifix is intensified



2.3.5 Light

Light is the most important elemental material Ando uses in his work. He had a quote stating. "In all my works, light is an important controlling factor, I create enclosed spaces mainly by means of thick concrete walls. The primary reason is to create a place for the individual, a zone for oneself within society. When the external factors of a city's environment require the wall to be without openings, the interior must be especially full and satisfying." It may seem almost impossible inspire such a large amount of emotion from a seemingly fairly empty space. It is because the space is so empty that all of the focus is placed on the sitional light as a design

feature. There is no other distractions within the space to detract from the reverence and significance the light gives.



2.4 ST. PETER'S SEMINARY

Architects: Isi Metzstein

Year: 1966

Type: Seminary

Roman Catholic community

Country: Cardross, UK

Total Square Footage: 5060 sq. m.

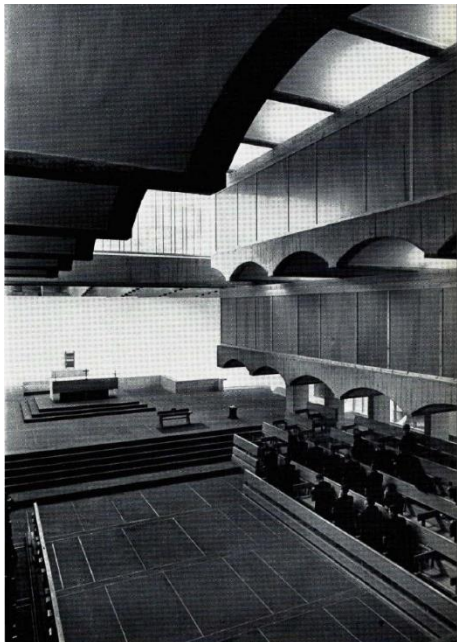
Described by the reviewer as 'virile' and 'rugged', displaying its debt to Le Corbusier openly, the seminary at Cardross was a masterclass of in-situ concrete, varying in textures and finishes both inside and out to such an extent that it's hard to take it all in at once. The group of buildings including classrooms, study rooms, refectory, chapel and convent, formed an embrace around the sombre 19th Century baronial Kilmahew House. Each of the three main elements have their own character but, nevertheless, form a cohesive whole. This owes much to the strength of character in the main building, housing the chapel, refectory and study rooms, rising in stepped ziggurat-like tiers. The vaulted ceilings, expressed both inside and out, owe much to Le Corbusier's Maison Jaoul in Paris (1954-56). The distinctive arched concrete forms resonate regularly in the Brutalist canon, particularly in the work of Sir Basil Spence.



The interior of the main block has access balconies overlooking the chapel and refectory, ensuring that the spiritual and material activities of the building remained interconnected. But the use of light and shadow, the arrangement of forms and the judicial softening influence of timber, combined to create spaces of purpose and of reflection. The impression you get from the images is one of intelligent and sensitive response to the brief, where there is a collective atmosphere, like a club, but one that allows for individual thought and quiet rumination.



The refectory overlooked by arched beams and timber parapets.

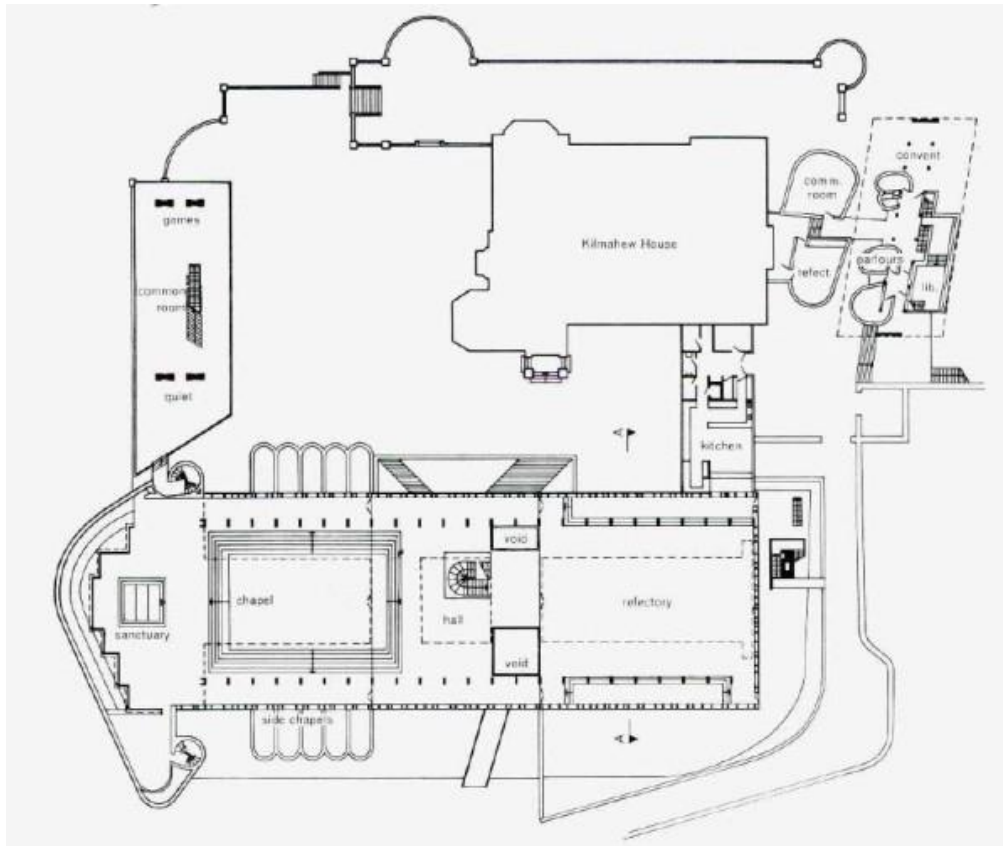


The chapel with cantilevered access balconies.

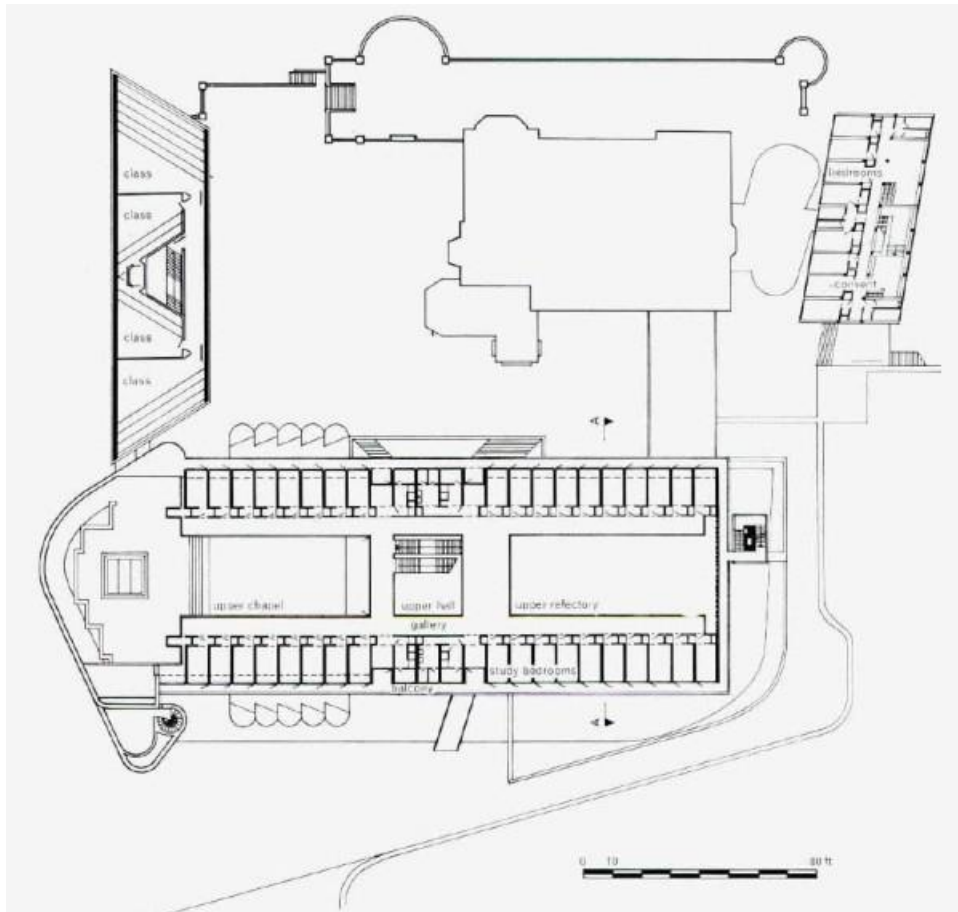
The classroom block also contained a common room and library and was a striking structure in its own right. Raised on four internal columns, the upper section cantilevers at both ends up to 40ft, quite dramatically over the sloping landscape, and is angled at each end so that the form in plan view is trapezoidal. This was further accentuated by the concrete shuttering being arranged in a herringbone pattern and the jewel-like triangular roof lights.



View towards the cantilevered classroom and library.



Ground floor plan.



First floor plan.

St Peters is a study in form and texture. The terraced main block and convent with its rugged, brown-tinted aggregate, the accentuated arched vaulting, the exposed concrete shuttering, the sculptural pod forms of the side chapels. If you were to cite a building that stretched and utilised the many characteristics of concrete, you would be hard pushed to find an example better than this. Small wonder, then, that it achieved a RIBA architecture award for Scotland. Which makes it all the more extraordinary that it fell into such comprehensive decay.



COMPARITIVE ANALYSIS

	ST. IGNATIUS CHAPEL	CHURCH OF LIGHT	ST. PETER'S SEMINARY	SAINTE MARIE DE LA TOURETTE	INFERENCE
AREA	8100 SQ.FT	2820 SQ.FT	54485 SQ>FT.	18,500 sq.ft.	7.15 acres
ARCHITECT	Steven Holl Architects	Tadao Ando Architect & Association	Andy MacMillan and Isi Metzstein	Le Corbusier	
LOCATION	Seattle, WA	Ibaraki, Japan	Cardross, UK	France, Europe	Injambakkam, Chennai
YEAR OF COMPLETION	1997	1999	1966	1960	
MATERIAL USED	concrete and glass	Reinforced concrete and wood	in-situ concrete, timber	Concrete, Glass	Concrete, wood, glass
LIGHTING	The architect bought light into the space through compressive forms coming together. The architect referred to this as "Gathering of different lights".	Daylighting is brought into the space through narrow slits on the wall forming a cross..	Lighing is provided through the position of each floor which is rising in stepped ziggurat-like tiers.	Floor to ceiling glazing, Light canons, Light guns, Strip windows	Colored light is used in worship spaces to give the emotion of prayer.
SPECIAL FEATURES	Used light to mark notable points	The smooth surface of the concrete along with the light gives a calming and rhythmic experience to the space.	comprised of traditional elements but rearranged over multiple levels in unexpected ways, alternately enclosing and opening up to its surroundings."	A building lifted on pilotis stilts. Entrance to the building lies in the first floor of the building.	Usage of light. Raising the building to not disturb green cover.
ARCHITECTURAL STYLE	The building captures Holl's signature style, characterized by his distinctive use of fragmented cubes, and the modulation of space and light.	Modern architecture	Modernist, Brutalist	Modernist, International Style	
CIRCULATION	Carried out by illuminating the notable points	Circulation into the area is controlled by the angular wall.		Circulation follows a unique concept of upside down city. The entry to the building lies in the first floor. The public spaces are located in the ground and first floors. The private spaces are allocated in the top floors	Circulation to start from common rooms and end in dormitories.

CHAPTER 3

DATA COLLECTION AND STANDARDS

3.1 VENTILATION

Lighting includes the use of both artificial light sources like lamps and light fixtures, as well as natural illumination by capturing daylight. Daylighting (using windows, skylights, or light shelves) is sometimes used as the main source of light during daytime in buildings.

Artificial lighting takes into account the amount of daylight received in an internal space by using Daylight factor calculation.

Daylighting is simply designing a space to use as much natural light as possible. This decreases energy consumption and costs, and requires less heating and cooling from the building.

TYPES OF VENTILATION

- (a) Natural ventilation
- (b) Wind driven natural ventilation
- (c) Buoyancy driven ventilation

MECHANICAL VENTILATION

- (a) Assist control ventilation
- (b) Pressure support ventilation
- (c) Pressure control ventilation

Table 4.5 Size of Ventilation Shaft

Height of Building in m.	Size of ventilation shaft in sq m.	Minimum size of shaft in m.
9.0	1.5	1.0
12.5	3.0	1.2
15 and above	4.0	1.5

^{**} For buildings above 15.0 m. height, mechanical ventilation system shall be installed besides the provision of minimum ventilation shaft.

3.2 ELECTRICITY

Power usage of different elements

<i>Element</i>	<i>Rating W</i>
Incandescent lamps	60
Ceiling fans	70
Table fans	
Ordinary socket outlet points	100
Fluorescent tubes:	
Length : 600 mm	25
1 200 mm	50
1 500 mm	90
Power socket-outlet	1 000
Air-conditioner	2 500
CFL	20
LED	10
Exhaust fan	50
Geyser (storage type)	2 000
Geyser (instant)	3 000
Computer point	150
Computer (laptop)	50
Printer (laser)	1 500
Printer (inkjet)	70
Kitchen outlet	1 500

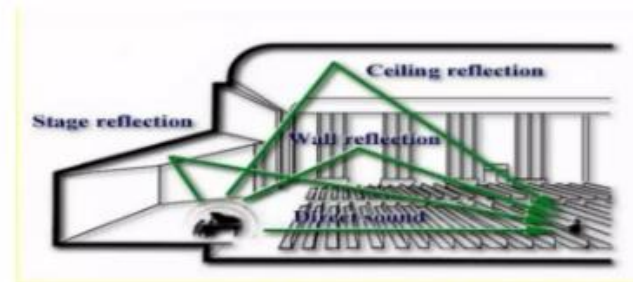
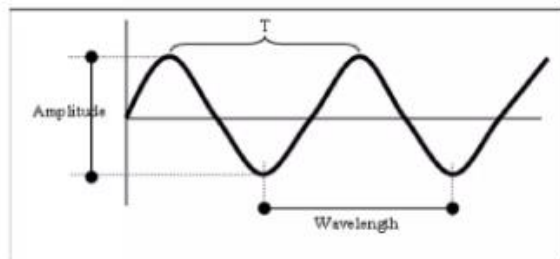
The distance in accordance with the current electricity rules and its amendments from time to time is to be provided between the building and overhead electric supply line.

	Vertically	Horizontally
a) Low and medium voltage lines and service lines	2.50 m.	1.20 m.
b) High voltage lines upto and including 11,000 volts	3.70 m.	1.20 m.
c) High voltage lines above 11,000 volts and upto and including 33,000 volts	3.70 m.	2.00 m.
d) Extra high voltage lines additional 33,000 volts	Plus 0.3 mt. for every additional 33,000 V or part thereof.	Plus 0.3 m. for every additional 33,000 V or part thereof.

3.3 ACOUSTICS SOUND INSULATION AND NOISE CONTROL

3.3.1 SOUND

Sound can be described as a disturbance or turbulence which passes through a physical medium in the form of longitudinal waves from a source to a receiver causing a sensation of hearing. This medium could be solid, fluid or gas.



3.3.2 OUTDOOR NOISE

There are two aspects of defence by planning:

- (a) The first is to plan so as to keep the noise at a distance. Under this aspect comes the separation of housing from traffic noise by interposing buffer zones, and the protection of schools and hospitals by green belts, public gardens, etc.
- (b) The second is the principle of shading or screening. This consists of deliberately interposing a less vulnerable building to screen a more vulnerable one or by providing a solid barrier, such as a wall, between the source and the location to be protected.

Table 3 Typical Noise Levels Due to Free-Flowing Road Traffic (Clause 3.2.3)		
Sl No.	Type of Traffic	L_{50} 30 m from Edge of Road dBA
(1)	(2)	(3)
i)	5 000 vehicles per 18 hour day (10 percent heavy vehicles), 50 km/h	65
ii)	10 000 vehicles per 18 hour day (20 percent heavy vehicles), 60 km/h	70
iii)	10 000 vehicles per 18 hour day (40 percent heavy vehicles), 80 km/h	75
iv)	20 000 vehicles per 18 hour day (40 percent heavy vehicles), 80 km/h	77
NOTE — The values are applicable to free flowing traffic without honking.		

3.3.3 INDOOR NOISE

(1) The noises created inside the school premises are produced by students while learning. Which include

- (a) Singing,
- (b) Instrumental reproduced music

(2) Which may take place in class rooms and in dining and assembly halls particularly in primary schools. In secondary schools, specialized music rooms are generally provided.

(3) Movement of chairs, desks and tables at the end of one period may disturb a class engaged in a lesson in a room.

For purposes of sound insulation, rooms in educational buildings may be classified as follows:

Class A	Noise producing	a) Workshops b) Kitchens c) Dining rooms d) Gymnasiums e) Indoor swimming pools
Class B	Noise producing but needing quiet at times	a) Assembly halls b) Lecture halls c) Music rooms d) Typing rooms
Class C	Average	a) General class-rooms b) Practical rooms c) Laboratories d) Offices
Class D	Rooms needing quiet	a) Libraries b) Studies
Class E	Rooms needing privacy	a) Medical rooms b) Staffrooms

3.4 STAIRCASE

Building with	Thickness of wall			
	On G. F.	On F. F.	On S. F.	On T. F.
(i) Ground + One floor	23 cm	23 cm		
(ii) Ground + Two floor	23 cm	23 cm	23 cm	
(iii) Ground + Three floor	35 cm	23 cm	23 cm	23 cm

Sr. No.	Type Of occupancy	Minimum width of staircase/ Stairway/Corridor (in meters)
(1)	(2)	(3)
1	Residential building (a) Low rise (b) Hotels and High rise	1.2 1.5
2	Educational building (a) Upto 24 m. high (b) Over 24 m. high	1.5 2.0
3	Institutional buildings (i.e. hospital) (a) Upto 10 beds (b) Over 10 beds	1.5 2.0
4	Assembly buildings	2.0
5	Mercantile, business, industrial storage, hazardous buildings (a) Low Rise (b) High Rise	1.5 2.0

Length of Corridor (in Mts.)	Width of Corridor	
	Residential	Non-Residential
Upto 6	1.0	1.2
Upto 9	1.2	1.5
Upto 15	1.2	2.0
Above 15	1.5	2.5

3.4.1. Minimum width provisions for stairways

The following minimum width provisions shall be made for each stairway

a)	i) Residential low rise building	0.9 m.
	ii) Other residential building e.g. flats, hostels, group housing, guest houses, etc	1.25 m.
b)	Assembly buildings like Auditorium, theatres and cinemas	2.0 m.
c)	All other buildings including hotels	1.5 m.
d)	Institutional building like hospitals	2.0 m.
e)	Educational building like School, Colleges.	1.5 m.

3.4.2. Minimum width provisions for passageways

The following minimum width provisions shall be made for each passage way/corridor.

a)	Residential buildings, dwelling unit type	1.0 m.
b)	Residential buildings, e.g., hostels, etc.	1.25 m.
c)	Assembly buildings like auditorium theatres and cinemas	2.0 m.
d)	All other buildings including hotels	1.5 m.
e)	Hospital, Nursing Homes, etc.	2.4 m.

3.5 FIRE SAFETY

Fire safety is the set of practices intended to reduce the destruction caused by fire. Fire safety measures include those that are intended to prevent ignition of an uncontrolled fire, and those that are used to limit the development and effects of a fire after it starts

**Table 19 Comparative Floor Area Ratio for
Occupancies Facing One Public Street
Atleast 9 m Wide**
(Clauses 2.6 and 3.4.5)

Occupancy Classification	Type of Construction			
	Type 1	Type 2	Type 3	Type 4
(1)	(2)	(3)	(4)	(5)
Residential	UL	2.0	1.4	1.0
Educational	UL	2.0	1.4	1.0
Institutional	UL	1.5	1.0	0.8
Assembly	UL	1.0	0.7	0.5
Business	UL	2.9	2.3	1.6
Mercantile	8.0	1.8	1.4	1.0
Industrial	7.5	1.9	1.6	1.3
Storage (see Note 3)	6.0	1.5	1.3	1.0
Hazardous (see Note 3)	2.8	1.1	0.9	NP

UL — Unlimited.

NP — Not permitted.

- a) Residential buildings (dwellings) 1.0 m
- b) Residential hotel buildings 1.5 m
- c) Assembly buildings like auditorium, theatres and cinemas 2.0 m
- d) Educational buildings up to 30 m in height 1.5 m
- e) Institutional buildings like hospitals 2.0 m
- f) All other buildings 1.5 m

**Table 22 Travel Distance for Occupancy and
Type of Construction**
(Clauses 4.4.1, 4.5.1 and 4.5.2)

Sl No.	Group of Occupancy	Maximum Travel Distance Construction	
		Types 1 & 2	Types 3 & 4
(1)	(2)	m	m
(3)	(4)		
i) Residential (A)		30.0	22.5
ii) Educational (B)		30.0	22.5
iii) Institutional (C)		30.0	22.5
iv) Assembly (D)		30.0	30.0
v) Business (E)		30.0	30.0
vi) Mercantile (F)		30.0	30.0
vii) Industrial (G)		45.0	"
viii) Storage (H)		30.0	"
ix) Hazardous (I)		22.5	"

Table 21 Occupants per Unit Exit Width
(*Clusters 4.4.2, 4.4.3 and C-1.6.2*)

Sl No.	Group of Occupancy	Number of Occupants		
		Stairways	Ramps	Doors
(1)	(2)	(3)	(4)	(5)
i)	Residential (A)	25	50	75
ii)	Educational (B)	25	50	75
iii)	Institutional (C)	25	50	75
iv)	Assembly (D)	40	50	60
v)	Business (E)	50	60	75
vi)	Mercantile (F)	50	60	75
vii)	Industrial (G)	50	60	75
viii)	Storage (H)	50	60	75
ix)	Hazardous (J)	25	30	40

CHAPTER 4

SITE STUDY AND ANALYSIS

4.1 SITE STUDY:

Location - Injambakkam

Distance from the beach - 475 m

Total area 10.7 ACRES

Nearest bus top - Sai Baba Temple Bus stop - 180 m

Bethel nagar bus stop 150 m

20 kms from Chennai central railway station

25 kms from Chennai Airport

Longitude 80°15'5.38"E

Latitude 12°55'34.60"N

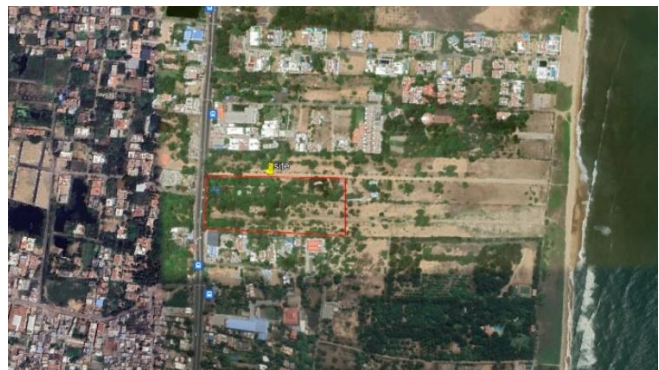
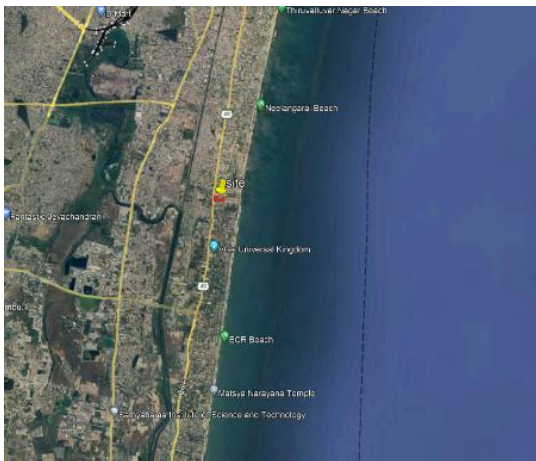
Type of soil: Sandy soil

View: Unobstructed view of the beach.

Access. Accessible from ECR and the adjacent road connected to the beach.

Wind Direction: South East to North West

Height restriction: 18m



4.2 SWOT ANALYSIS

(a) **STRENGTH:** The site offers an unobstructed view of the beach. The site is located along the ECR road, providing easy access.

(b) **WEAKNESS:** The various regulations have to be followed and the height of the building cannot exceed 18 m.

(c) **OPPORTUNITIES:** The mode of transport is easy. The location of the site is also ideal for a seminary.

(d) **THREATS:** There are possibilities of buildings coming up in front of the site in the future. Which must also be taken into account.

4.3 CRZ III (CATEGORY 3)

Areas that are relatively undisturbed and those which do not belong to either Category I or II. These will include coastal zone in the areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas which are not substantially built up.

Regulations:

a) The area up to 200m from the HTL is to be earmarked as 'No Development Zone'. No construction shall be permitted in this zone except for repairs of existing authorized structures not exceeding existing FSI, existing plinth area and existing density. However, the following uses may be permissible in this zone-agriculture, horticulture, gardens, pastures, parks, play fields, forestry and salt manufacture from sea water.

b) Development of vacant plots between 200 and 500m of High Tide Line in designated areas of CRZ-III with prior approval of Ministry of Environment and forests permitted for construction of hotels/beach resorts for temporary occupation of tourists/visitors.

c) Construction/ reconstruction of dwelling units between 200m and 500m of the High Tidal Line permitted so long as it is within the ambit of traditional rights and customary uses such as existing fishing villages and gothans. Building permission for such Construction/reconstruction will be

subject to the conditions that the total member of dwelling unit shall not be more than twice the number of existing units; total area covered on all floors shall not exceed 9 meters and construction shall not be more than 2 floors (ground floor plus one floor).

d) Reconstruction/alteration of an existing authorized building permitted subject to (1) to (3) above.

4.4 NEIGHBOURHOOD:

The site is bounded by 2 institutions (The Bay International School & Junior College, Montessori school) along with a residential area in the north The east side of the site is an open ground connecting to the Beach

A Christian retreat center and an Orthodox Syrian church are located to the south of the site. It also has a few residential buildings The chennai corporation water tank is found to the west of the site.

There is also a homeless shelter for orphans opposite to the site.

4.5 CLIMATE:

The climate of Chennai (or Madras) is tropical, with a rainy season from July to December and a dry season from January to May.

The wettest period is from mid-October to mid-December, due to the north-east monsoon or retreating monsoon.

The average temperature of the coldest month (January) is of 25.4 °C (77.7 °F), that of the warmest month (May) is of 33.0 °C (91.3 °F).

Here are the average temperatures.

Chennai - Sunshine hours		
Month	Average	Total
January	7.5	230
February	8.5	240
March	9.5	290
April	10	295
May	9.5	300
June	8	235
July	4.5	145
August	6	190
September	6.5	195
October	8.5	255
November	8.5	260
December	7	210
Year	7.8	2850

Chennai - Average temperatures (1991-2020)						
Month	Min (°C)	Max (°C)	Mean (°C)	Min (°F)	Max (°F)	Mean (°F)
January	20.7	30.1	25.4	69	86	77.7
February	21.6	31.8	26.7	71	89	80.1
March	23.6	34.2	28.9	74	93	84
April	26.1	36.1	31.1	79	97	88
May	27.5	38.4	33	81	101	91.3
June	27	37.7	32.3	81	100	90.2
July	26	36	31	79	97	87.8
August	25.4	35	30.2	78	95	86.4
September	25.1	34.6	29.9	77	94	85.7
October	24.4	32.8	28.6	76	91	83.4
November	23	30.6	26.8	73	87	80.3
December	20.3	29.6	25.6	71	85	78
Year	24.3	33.9	29.05	75.8	93.1	84.5

4.6 LANDUSE MAP:



CHAPTER 5

ARCHITECTURAL DESIGN

5.1 AREA STATEMENT

PROGRAM	NO. OF PEOPLE	NO. OF SPACES	AREA FOR EACH	TOTAL AREA REQUIRED IN SQ.M.
ADMINISTRATION				
Reception				25
Conference room				50
Waiting room				30
Principal's office				20
Registrar's office				20
Accademic dean office				20
Dean of student affairs office				20
Executive's office				20
Restrooms	10	2		44
Accountant's office				20
Sub total area				269
10% for circulation				26.9
Total area				295.9
EDUCATION				
Classrooms				
For Batchelors	25	4	60	240
For Masters				
In Theology	15	4	40	160
In Divnity	6	3	30	90
Library				120
Librarian's office				20
Stage		2	50	100
Computer lab	15	2	35	70
Toilet	5	4	25	100
Sub total area				900
10% for circulation				90
Total area				990
COMMON				
Kitchen			1	50
Mess			1	100
Sub total area				150
10% for circulation				15
Total area				165
ACCOMODATION				
Bedrooms				
Bachelors in theology				
student	4	25	20	500
Staff	1	10	15	150

Masters in theology				
Student	2	28	20	560
Staff	1	5	15	75
Masters in divnity				
Student	1	15	15	225
Staff	1	5	15	75
Toilet		88	15	1320
Sub total area				2905
10% for circulation				290.5
Total area				3195.5
CHAPEL				
Entrance hall				80
Chapel tower				20
Congregational seat	264			120
Stage				60
Music room				50
Preparation room				50
Sub total area				380
10% for circulation				38
Total area				418
Overall sq.m.				5,064
10% Circulation				506.44
Built up area				5,571

5.2 CONCEPT

5.2.1 STRATEGIES CAN BE FOLLOWED AT SITE LEVEL:

(a) Orientation -

The climate of Chennai is hot almost throughout the year so the orientation of the building must be in a manner lesser heat is gained into the building by surface absorption. The building is oriented in the North south direction to minimize heat gain. Another reason to orient the building in this direction is the location of the beach.

(b) Built form -

The building is kept rigid to show order and the seriousness of the course. Rigidity in the building brings law and order. Basic geometry is utilized to provide simplicity to the institute

(c) Vegetation -

Vegetation and landscaping can play a major role in changing the microclimate of a site and can lower the temperature vegetation can also be used to prevent and protect INS the undesirable winds and solar radiation.

Landscape makes a person calm down and admire nature which in turn brings the attention of the user to the creator of such marvelous works. So landscape can make the user feel the presence of God

(d) Wind channeling and buffer spaces -

Buffer spaces open gardens and courtyards can be provided to channel and bring in good Breeze and wind into the building

5.2.2 PASSIVE DESIGN STRATEGIES:

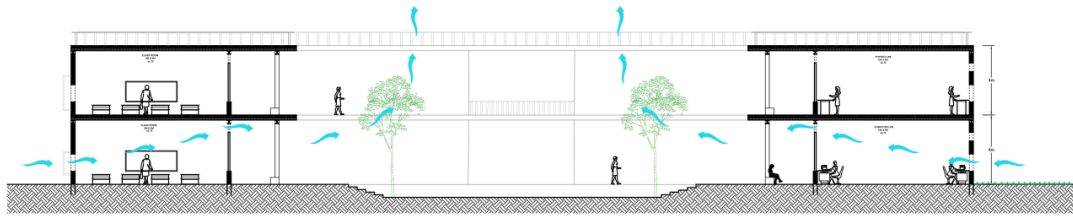
(a) Courtyard effect –

Courtyard can be microclimate modifier and controller it helps in evaporative cooling and increase of heat loss through ventilation. Usually open to the sky. The heat transfer that takes place within a courtyard is affected greatly by - the Airflow, thermal mass, solar radiation. Due to the incident solar radiation in the courtyard the air in it becomes warmer and rises up to replace it cool air from the ground level floors the rough the louvered openings of the room the producing the air flow

(b) Passive air conditioning system –

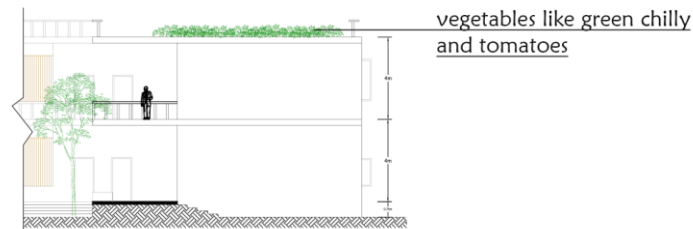
Allowing natural ventilation and day lighting through proper implementation can help in achieving passive air conditioning. Techniques stack ventilation can also be implemented to

avoid the use and consumption of mechanical air conditioning system



(c) Green roofing systems –

These are roofs covered with vegetation and soil and also functions by providing shading, insulation, evapotranspiration, and acts as thermal mass



5.2.3 ZONING AT SITE LEVEL:

The location of the site is near a major road, the EAST COAST ROAD. The noise from the traffic is a major issue that has to be addressed.

The site is zoned by keeping three things in mind

- (a) Noise from the traffic
- (b) View of the beach
- (c) Silent area for the church

To minimize the sound of traffic the public zone is provided to the front of the site. This also provides easy access to those who are coming to inquire about the college. The entire college can be viewed from the first floor of the building due to its height.

The beach can be viewed from the administration department itself due to the long walkway that stretches from the administrative department upto the waterbody at the rear end of the site.

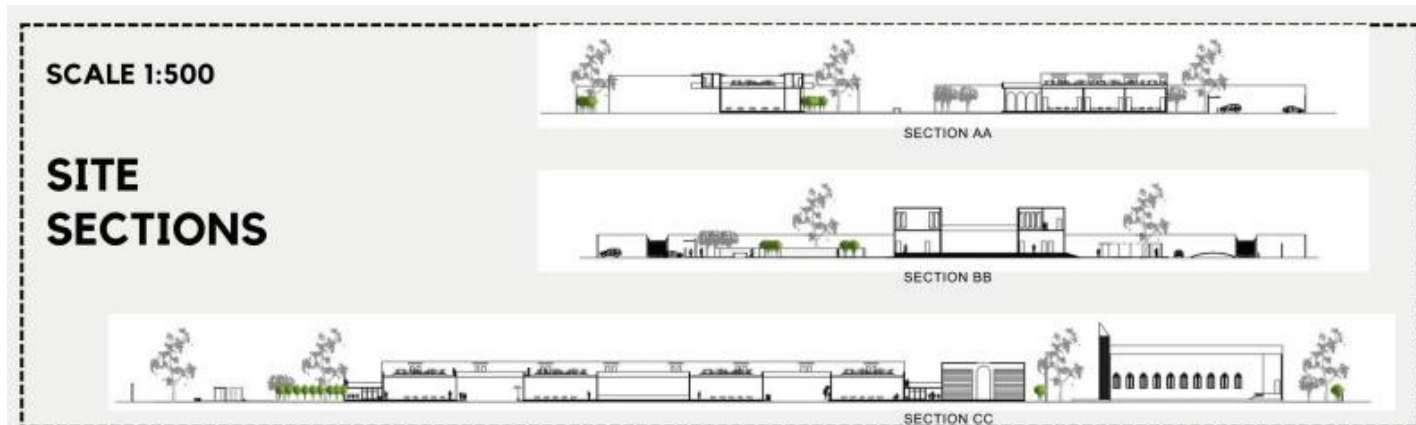
The church is given at the rear end of the site as that is the zone which is the most silent, The church is oriented in the East West direction so that when the user enter the space he will see the alter in all glory.

5.3 DETAILED DRAWINGS

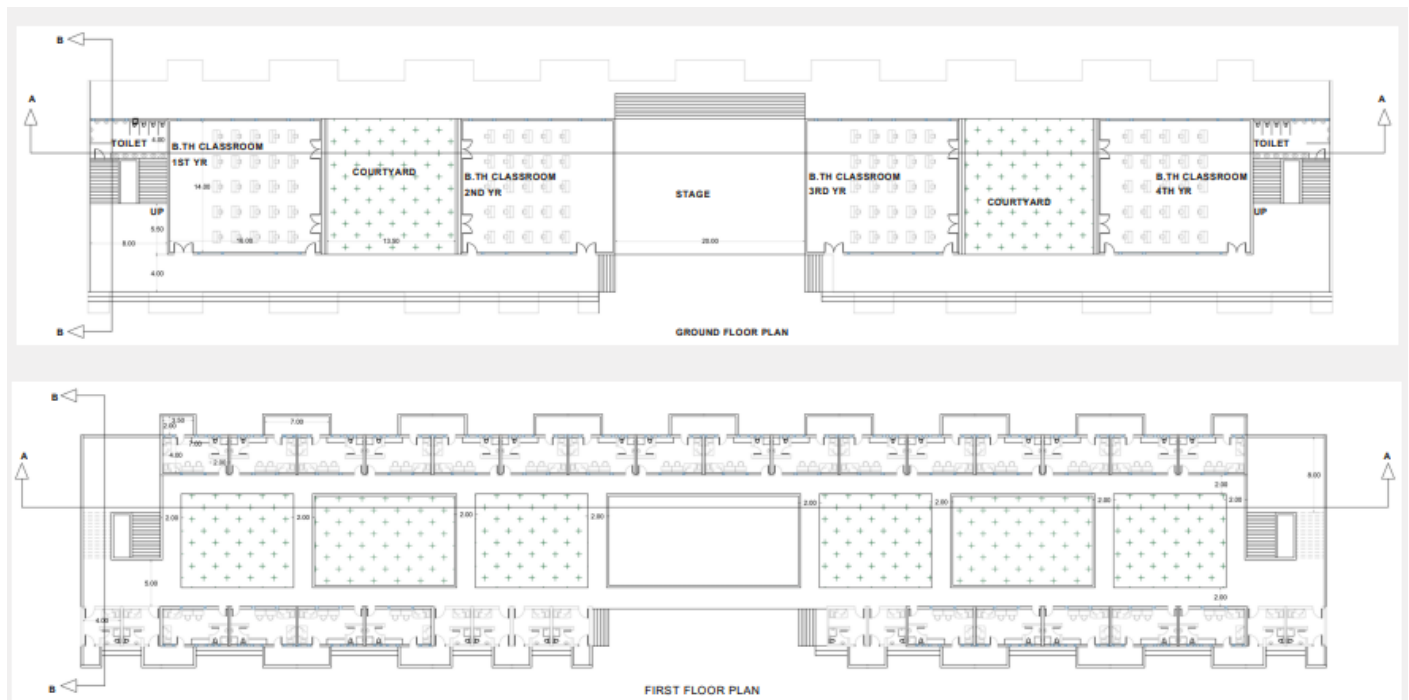
5.3.1 SITE PLAN:



5.3.2 SITE SECTION:



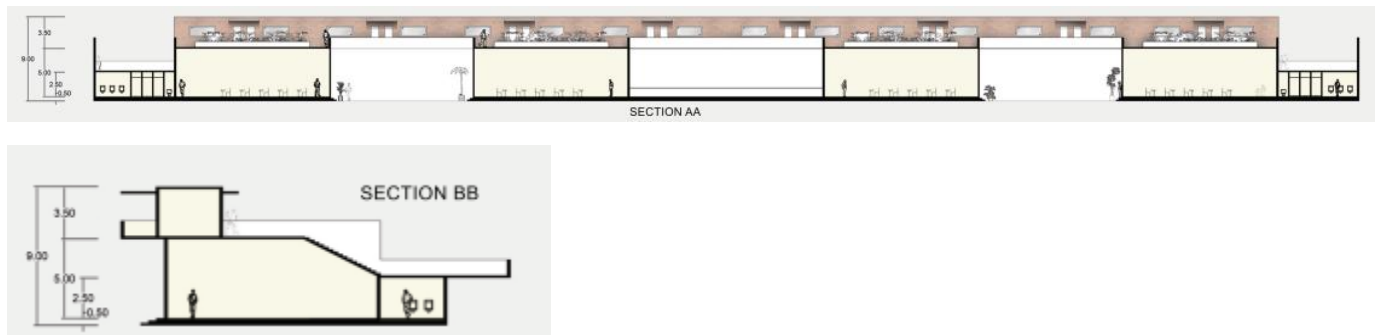
5.3.3 DEPARTMENT OF BACHELORS IN THEOLOGY FLOOR PLANS



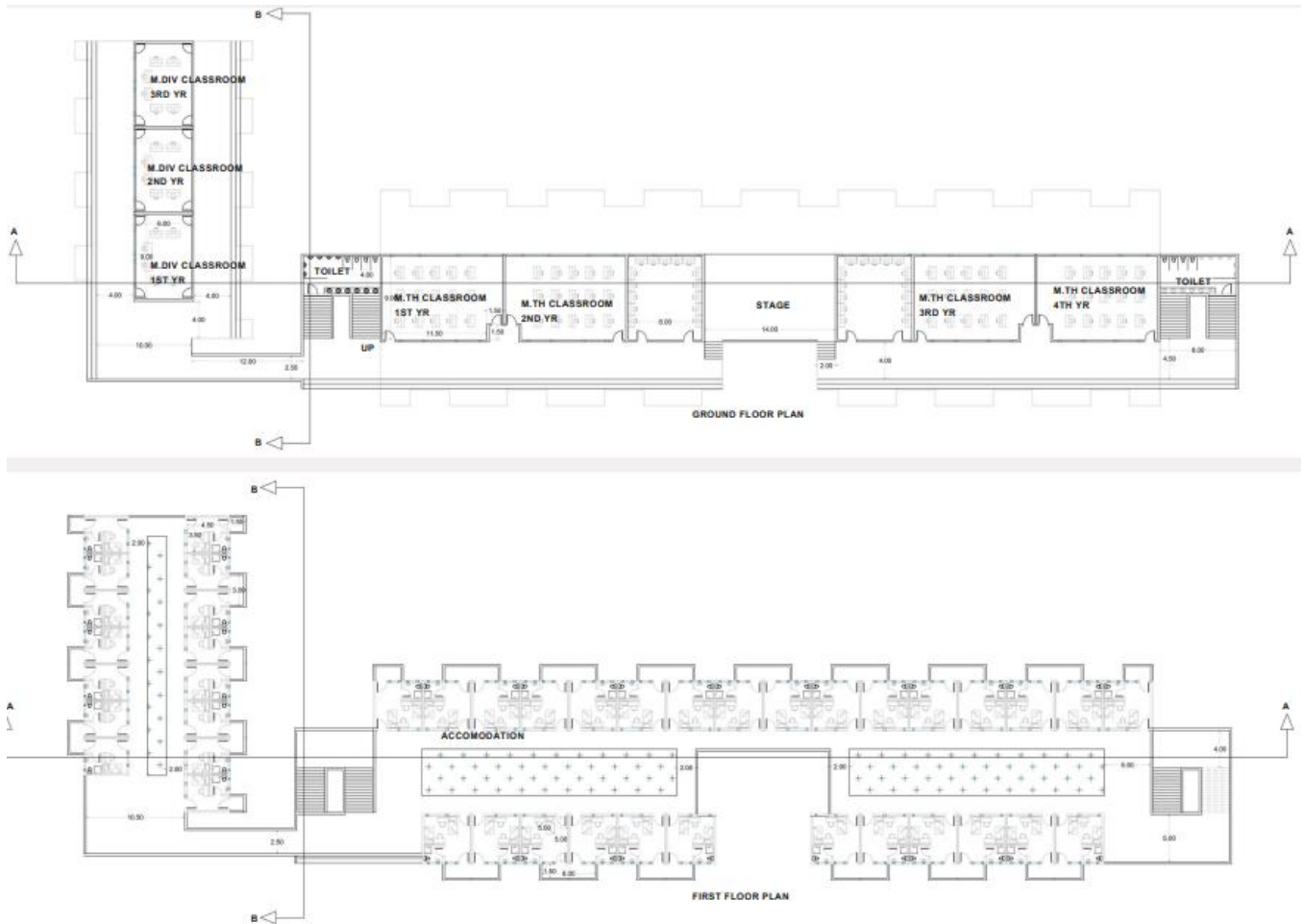
5.3.4 DEPARTMENT OF BACHELORS IN THEOLOGY ELEVATIONS



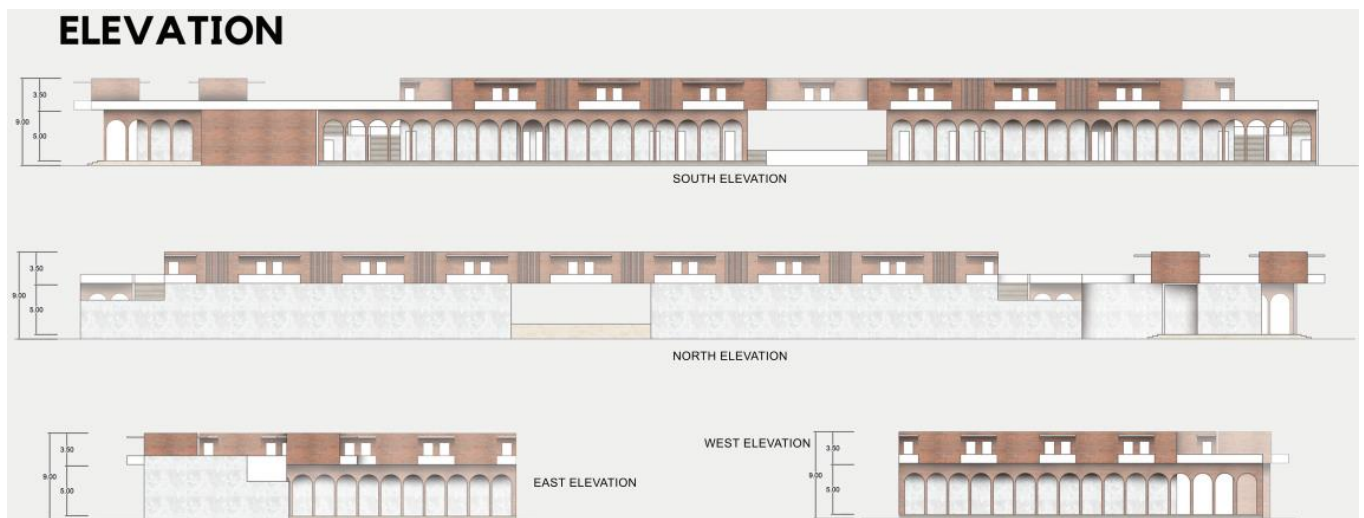
5.3.5 DEPARTMENT OF BACHELORS IN THEOLOGY SECTIONS:



5.3.6 DEPARTMENT OF MASTERS THEOLOGY FLOOR PLANS:



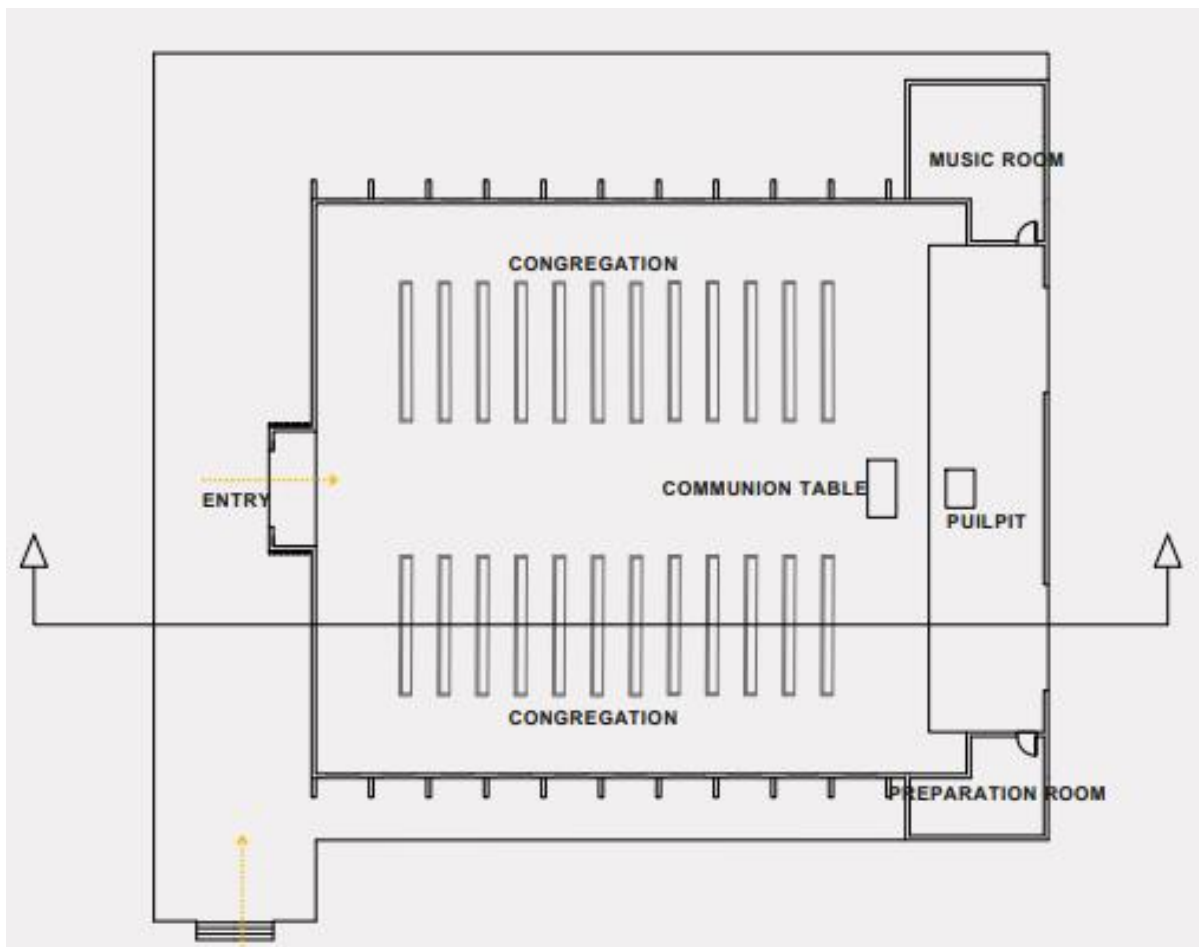
5.3.7 DEPARTMENT OF MASTERS THEOLOGY ELEVATIONS:



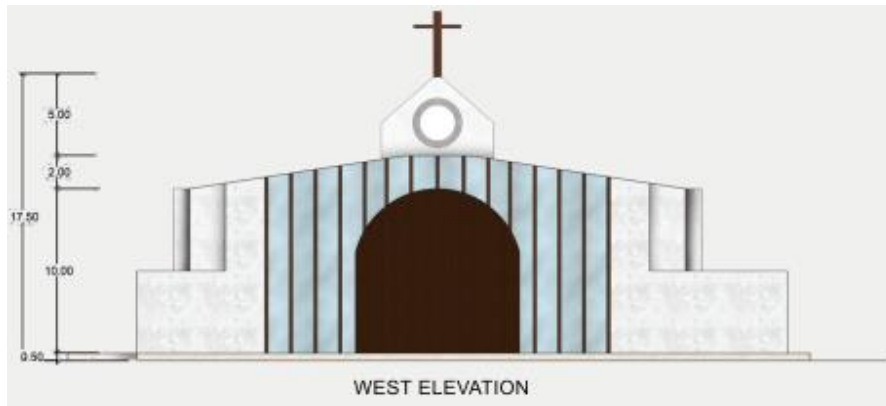
5.3.8 DEPARTMENT OF MASTERS THEOLOGY SECTIONS:



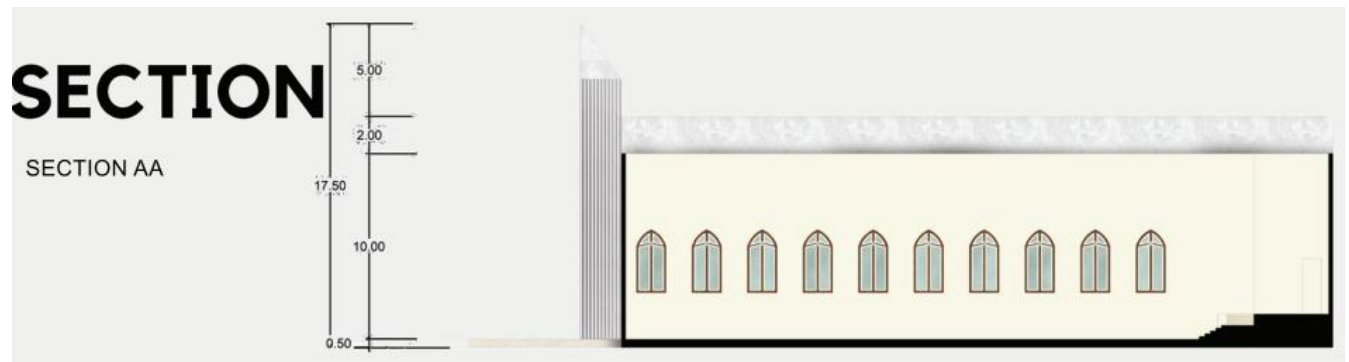
5.3.9 PLAN OF CHAPEL:



5.3.10 ELEVATION OF CHAPEL:



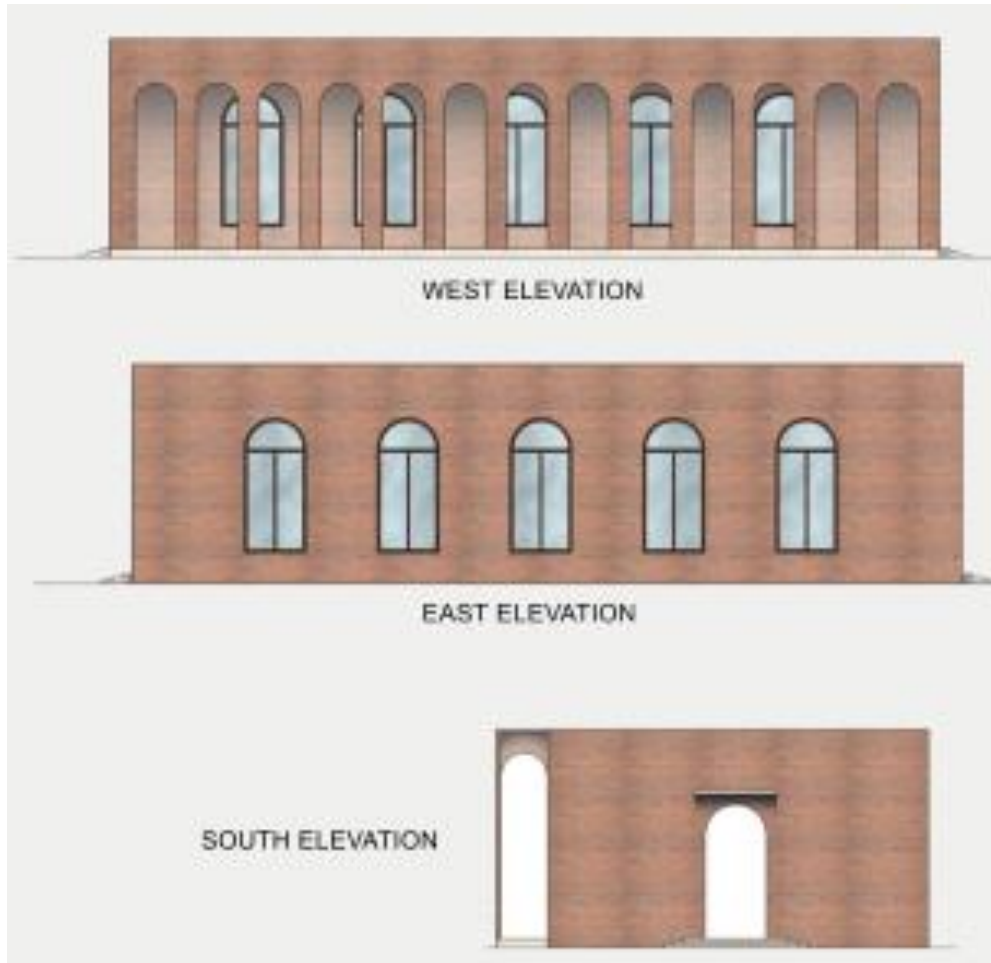
5.3.11 SECTION OF CHAPEL:



5.3.12 PLAN OF LIBRARY:

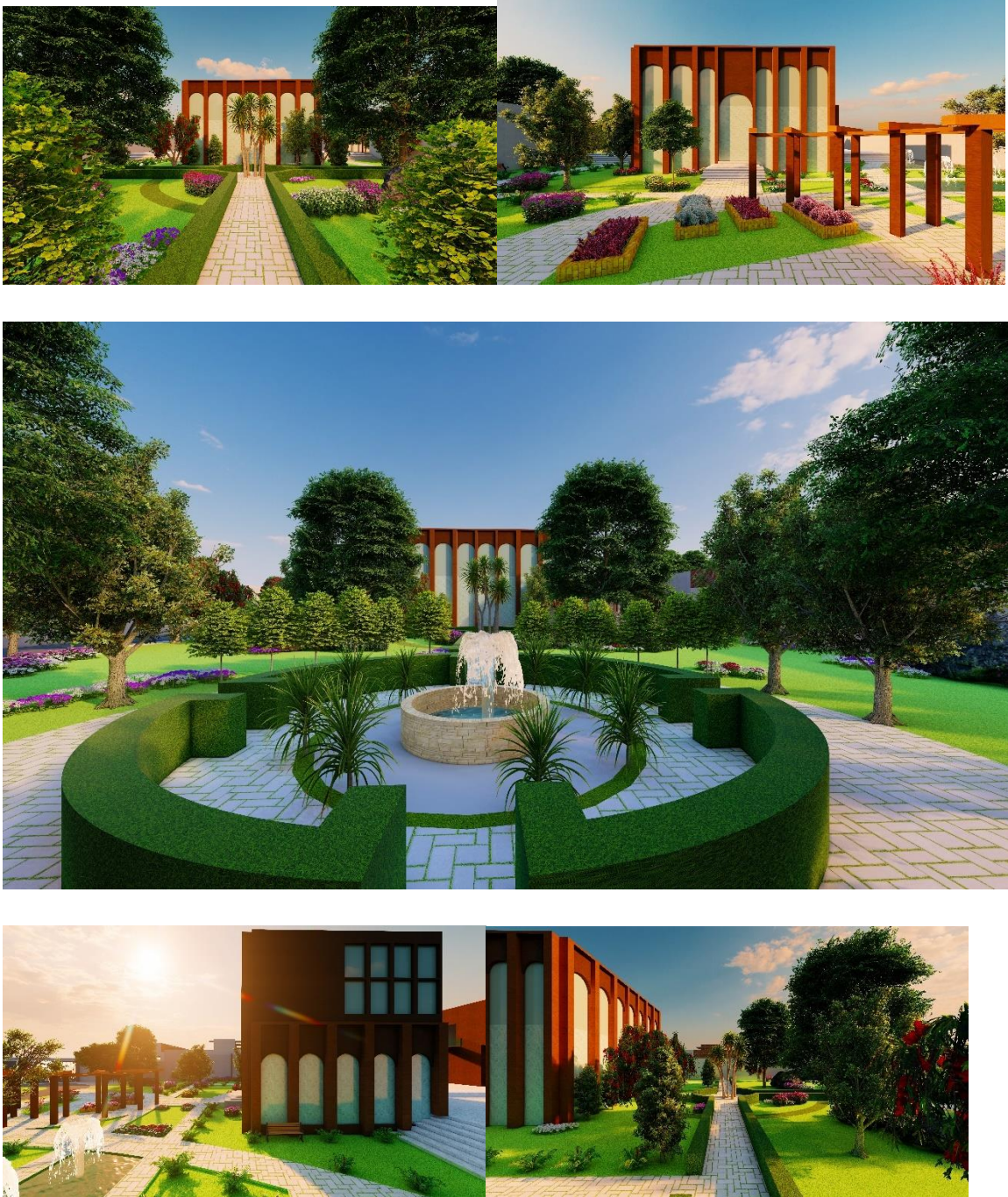


5.3.13 ELEVATION OF LIBRARY:

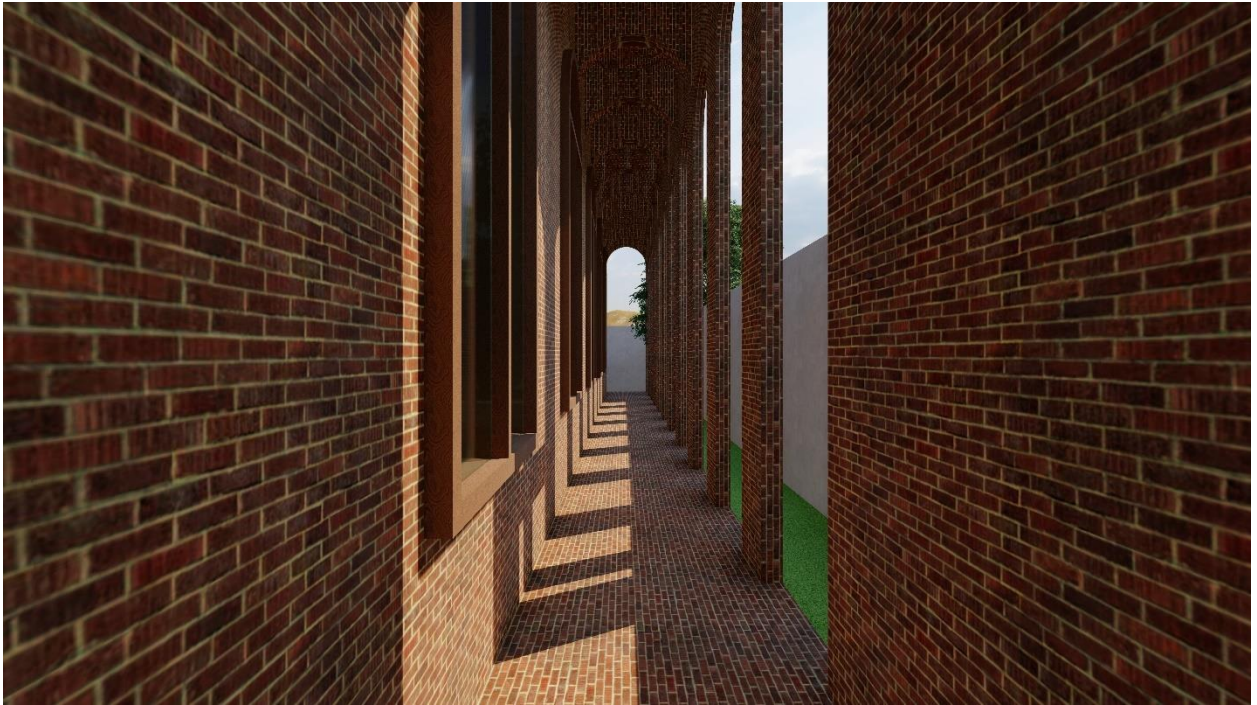


5.4 MODEL

5.4.1 ADMINISTRATION DEPARTMENT



5.4.2 LIBRARY



5.4.3 DEPARTMENT OF BACHELORS IN THEOLOGY





5.4.4 DEPARTMENT OF MASTERS



5.4.5 CHAPEL





5.4.6 GARDEN





