

Khulna Divisional Government Public Library

Boyra, Khulna

By

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**A thesis submitted to the Department of Architecture in partial fulfillment of the
requirements for the degree of
Bachelor of Architecture**

Department of Architecture

Brac University

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It is hereby declared that

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3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
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APPROVAL

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ABSTRACT

Khulna Divisional Government Public Library will be a platform for the citizens of Khulna to social interact and live, to share and gain knowledge. the purpose of this library is not only be a **knowledge hub**, but also a **place for social-interaction** because this is a divisional library and it will connect people from different districts. every year, a book fair is held in this library throughout February month. social-interaction is already present there but it needed to be enhanced throughout the year. to create a **knowledge-hub** it is needed to place activities to-gain knowledge, create knowledge and disseminate to form a **place for social-interaction**. it will be an iconic civic hub not only through the conventional ways but also in the ways which people have enlightened through ages. this library will play a vibrant role in the development of our culture that promotes reading, motivated readers and learners for life.

Keywords: knowledge hub, place for social-interaction, general library, digital library.

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Chapter 1

Background of the project

1.1 Project brief

1.2 Project rationale

1.3 Introduction

1.4 Aims and objective of the project

1.5 Description of the proposed facilities

1.1 PROJECT BRIEF

Title of the project: Divisional public library Khulna

Statement: Pursuit of knowledge

Client: Government

Site location: Boyra, Khulna, Bangladesh

Site area: 2.64 acre or 115366.20 sft.

Communication service: Beside Khulna-Jessore highway road

1.2 PROJECT RATIONALE

Any library is a temple of knowledge. To nourish a thirsty mind with knowledge is the best way to develop any civilization. A library does that job in its own way. In every division we have one divisional public library that serves that division's people. Khulna have its divisional library on this proposed site but the library was too old and it needs reconstruction and boost. Therefore, government thought to build a new divisional public library for Khulna on the same existing site, demolishing the old one. This library is also act as a public gathering space. Book fair (akushe boi mela) is one of the popular fair for citizens of Khulna. Every year this fair is held in this public library. The location of this project is surround mostly with educational institutes that makes the place more suitable for build a public library. Though this library will attract people of all ages but Most of the users of this library will be students. Even boyra residential area is near to this library and people who is preparing themselves for BCS and IELTS are also attracted and regular users of this library. To give maximum facility to the wide range of readers, existing library is not sufficient enough. Therefore, this site demands a better and more user capable library. Library is not only about the building block, it's the interaction of people that gives them a platform to share their knowledge, it's an environment that influence people to pursuit the light of knowledge.

1.3 INTRODUCTION:

Library is known as a collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection can include books, newspapers, periodicals, maps, prints, documents, manuscripts, microform, CDs, Cassettes, DVDs, Blu-ray Discs, films, videotapes, e-books, databases and other formats. Libraries range in size can differ from a few shelves of books to several millions of items.

A library is organized for use and maintained by a public body, an institution, a corporation, or a private individual. Public and institutional collections and services may be intended for use by people who choose not to—or cannot afford to—purchase an extensive collection themselves, who need material no individual can reasonably be expected to have, or who require professional assistance with their research. In addition to providing materials, libraries

also provide the services of librarians who are experts at finding and organizing information and at interpreting information needs. Libraries often provide quiet areas for studying, and they also often offer common areas to facilitate group study and collaboration. Libraries often provide public facilities for access to their electronic resources and the Internet. Modern libraries are increasingly being redefined as places to get unrestricted access to information in many formats and from many sources.

Khulna division

The needs and functions of library buildings have certainly changed over the last decade, but the necessity for planning intelligently and thoroughly hasn't. In fact, tighter budgets and the complex demands of both library users and staff call for careful preparation now more than ever. Whether you're building from the ground up or simply remodeling, the success of your project hinges on planning, coordination, and communication.

1.4 AIMS AND OBJECTIVE OF THE PROJECT

There are three main objectives of this project

- The project aims to be a platform for social interaction that combine people from various fields, ages and income group. People will share their ideas, their findings for the betterment of society. It should be always kept on mind that knowledge has no boundaries and there is always something new to learn and each individual has something to teach others because everyone's perspective is different from each other.
- the project should be able to blend into the lifestyle of the people and it should attract people.
- Lastly the project should add a new dimension in the context of the city. The project should act as a guideline or path that drives the society forward.

1.5 DESCRIPTION OF THE PROPOSED FACILITIES

- Car parking: 50 cars
- Electric sub-station: electric power station (500kv)
- Seminar and meeting room: 150 sittings for seminar and 30 sittings for meeting room
- Book exhibition center
- Computer lab: 20 sittings
- Cyber cafe: 20 sittings
- Library and reading rooms:
 - I. normal reading room for 150 people with one librarian room
 - II. science textbook reading room for 100 people with one librarian room
 - III. reference textbooks reading room for 50 people with one librarian room
 - IV. children's reading room for 50 people
 - V. reading room for 50 disable people
 - VI. women's reading room for 50 people
 - VII. reading room for 30 old people

VIII. open reading room for 100 people with one librarian room

- Others: administration block
- Garden space
- Cafeteria: for 50 people
- Dormitory: for 20-25 trainers
- Residential facilities: Director-01 (grade-4), Sub-Director (grade-5), Residential Librarian, Security Officer, Deputy Assistant Engineer, Caretaker, Electrician, Security Guards
- Auditorium: 500 sittings
- Security and Generator

Chapter 2

LITERATURE REVIEW

2.1 Introduction

2.2 Theoretical background

2.3 Influence of technology and libraries over societies

2.4 Library as a second home

2.5 Types of library

2.6 Design consideration

2.1 INTRODUCTION

Main purpose of any library is to light up people with knowledge. Now what is knowledge? It is an awareness, discussion, or understanding of someone or something. for example, such as information, changes, statements, facts, or proficiency, which people achieve by experience or education by perceiving, discovering, or learning. Information is a form of knowledge that enciphered in physical and biological structures. Structures in the world, follows the natural laws, including physical and biological laws. it is also a theoretical or practical understanding of any subject and can be more or less systematic.

Bertrand Russell noted "knowledge by acquaintance" as immediate or direct awareness of any particular thing. He contradicts this type of basic knowledge with knowledge of concepts, ideas or "universals," which can be used to recite so many particular things. He named this "knowledge by description." He also added the intuition data of "right, here, now" in prompt knowledge, knowledge we less likely to doubt and that serves as a logical foundation. Therefore, it can be said that, our environment, surroundings and physical or biological matter cultivates information and learn things that we process and store in our minds through which we live our lives in a better and easy way.

2.2 THEORETICAL BACKGROUND

Library is a cultured institution or place where information is kept in various fprm such as book, newspapers, CDs, DVDs, audios, videos and so on, to be used by readers and researchers. Origin of the word library is liber, a Latin word which means Books. Another derivative of the word liber is Libraium which means 'place to keep books'. In Anglo-French the word Librarie means 'collection of books'.

Concept of library was not like that before the invention of printing machine. Before that people use to write on leaf or bark, on animal skins, stone and clay pots and those were collected and also preserved in a place. From that concept of libraries generated. The tradition of preserving information or manuscript of puthi prevailed in our country too. These were written on palm leaf, bark or on parchment vellum. These manuscripts were reserved in religious places of Bihars.

The first royal library in the medieval age was established on Hossain Shahi dynasty. In 1780, to preserve printed books and manuscripts a library was established by missionaries of Srirampur and after that this trend was followed in several places in Bengal. This trend went throughout the undivided Bengal until World War II. For British bureaucrat these libraries played a major role as learning place and social gathering place as well as a place for leisure time.

In every district of Bangladesh, libraries were established during the 19th century. NATIONAL BOOK CENTRE (NBC) shows that there are 1600 libraries throughout the country. Yet, most of them are not developed. 31 public and 51 private universities have their own libraries. Library clubs were set up in villages of our country in early 20th century. These libraries were mostly religion and literature oriented. Libraries begin its act as a specialized organization from 2nd decade of 20th century and as a specific discipline in the universities, Library Science emerged.

2.3 INFLUENCE OF TECHNOLOGY AND LIBRARIES OVER SOCIETIES

Now a day, we are surrounded by technology and we can't imagine our daily life without it. So it's so obvious that technology has strong influence over our society. Libraries are also having a strong influence over our society. This two factor cab be explained by these theories below,

2.3.1 The ripple effect

A ripple effect is a situation such as ripples expanding across the water when an object is dropped into it, an effect from an initial state can be followed outwards incrementally.



Fig 1: the ripple effect

Source: Water Archives - *The Change of Our Lives*. (2018). *The Change of Our Lives*. Retrieved 25 March 2018, from <http://thechangeofourlives.com/tag/water/>

Technology and libraries are like that object that dropped into and water have an effect from an initial state and followed outwards incrementally. Societies are effected like that. One simple change can derive society easily. Library is made to enlighten people with knowledge and wisdom for their betterment as well as technology does that too. Technology and knowledge can make better changes to an individual and this followed outwards in community and society as well. Library play a role to make a person good and wise so his or her knowledge can help them and the society further in future. The effect is shown by a diagram below,

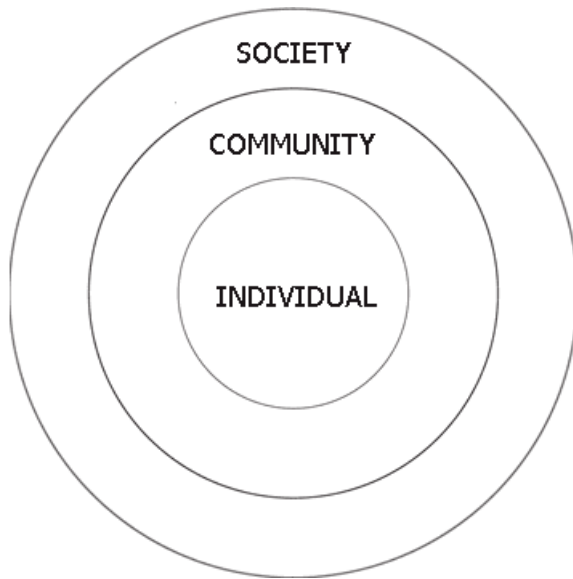


Fig 2: ripple effect on society for technology and library

Source: author

2.3.2 The domino effect

The domino effect is a situation in which, for one change causes a series of related changes, one following another. It is a chain reaction best known as a “**Mechanical Effect**”. For example, if today any change happens in our daily life than it would be have several changes in our life. Libraries are such a thing that changed people’s future from very beginning of its establishment. Imagine if there are no libraries or no documentation of anything that what will happen next? From the establishment of libraries so many rapid changes have been occurring in mankind.

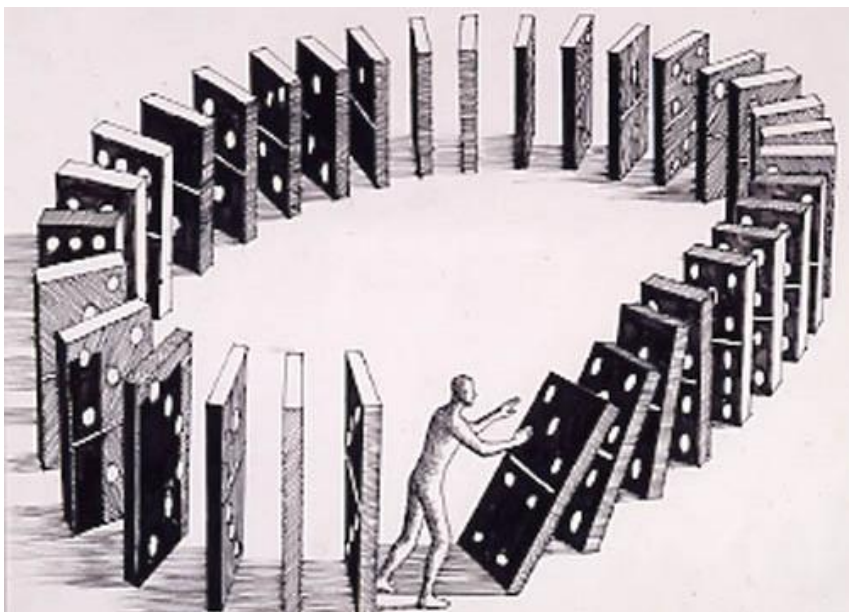


Fig 3: domino effect

Source: (2018). *Speakzeasy.files.wordpress.com*. Retrieved 25 March 2018, from <https://speakzeasy.files.wordpress.com/2014/05/domino-theory.jpg>

2.4 LIBRARY AS A SECOND HOME

At present, the concept of relation between home and library is changing. The facilities of library catalogues go online, reserve or renew library stock, enabling people to order and even electronic newsgroups for particular educational or cultural interest groups are being very popular. As a result, library is not only institutional any more, it has gone beyond the borderline. It is becoming a social gathering place and people are having more interest in it day by day. It has become a cultural and social hub.

The relationship between the library and the home is changing, as more library catalogues go online, enabling people to order, reserve or renew library stock, and even belong to electronic newsgroups established by libraries for particular educational or cultural interest groups. As a result, the library is being de-institutionalized, and becoming more like a club or leisure center. As has already been noted, in Sweden they talk of the public library as being ‘the living room in the city’ or even ‘the town salon’. Interior design and furnishing can help create a more domestic, club-like sense of membership and belonging: a home from home. For example, Seattle central library has broken the traditional norms of library buildings and introduced new program in the library **‘the living rooms of the city’**. Flexibility of different functions has been given great value in here which each function has its own form.

2.5 TYPES OF LIBRARY

There are four major types of libraries:

1. Academic libraries serve colleges and Universities.
2. Public libraries serve cities and towns of all types.
3. School libraries serve students from Kindergarten to grade 12.
4. Special libraries are in specialized environments, such as hospitals, corporations, museums, the military, private business, and the government.

2.6 DESIGN CONSIDERATION

Libraries are not only the place to read books and journals, it's a platform or opportunity to generate and share new ideas, socialize and gather knowledge. Although, our surroundings play a vital role in how we gather information and what information we gather. Libraries also houses advanced electronic resources, including the Internet, digital library collections, remote access to a wide range of technology and instruction.

There was an article published by American Library Association that says, “most library positions focus on one of the following:

- user services (connecting people to the information they need)
- technical services (ordering, cataloging, and preparing materials)
- computer services (maintain library databases, software programming, web page design)
- administrative services (manage the library and services, negotiate contracts with vendors, supervise library employees, prepare budgets)”

Chapter 3

SITE ANALYSIS

3.1 Background of the site

3.2 Site location

3.3 Site analysis

3.4 SWOT analysis

3.1 BACKGROUND OF THE SITE

In 1842 Khulna was a part of Jessore, than in 1881 Khulna was an individual district. Khulna is located beside Rupsha river. Before the division of India, Pakistan and Bangladesh, Khulna was a small city. Due to lack of communication system between Kolkata and Khulna, industries were started to build here. In 1940, the first school for women was build in Khulna though jessore was the prominent district and had no institutions at that time. Khulna was growing so fast at that time. The administrative area of Khulna was Boyra and still it is an administrative zone of Khulna.

3.1.1 Site map

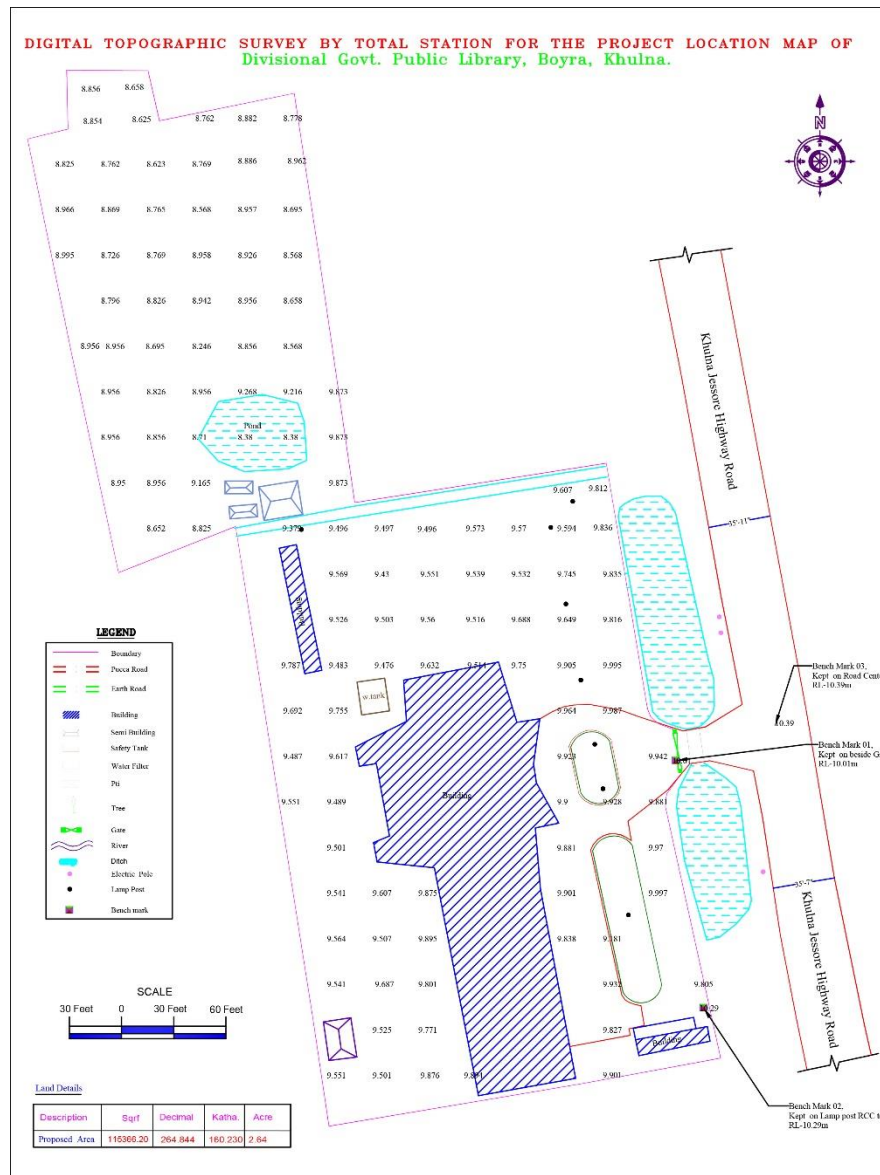


Fig 4: site map

Source: PWD

3.2 SITE LOCATION

Boyra, Khulna, Bangladesh. This place is situated in a key point of Boyra which is connected by Jessore-Khulna-Dhaka highway road. The place is surrounded by administrative zone, educational zone and residential zone of the city.

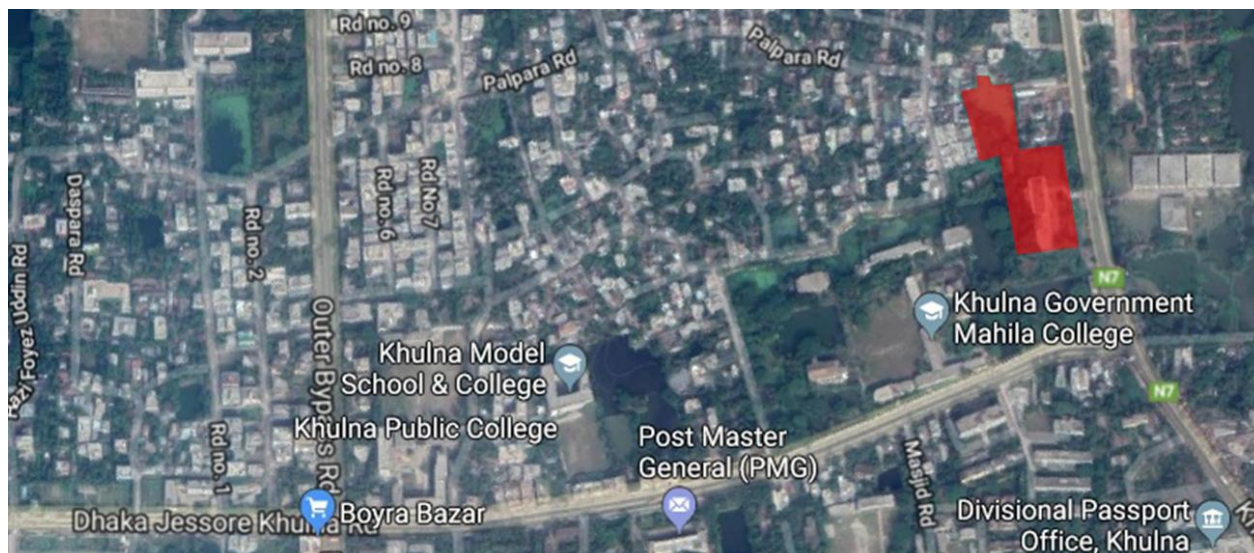


Fig 5: details site location in Boyra, Khulna.

Source: *Boyra Bazar*. (2018). *Boyra Bazar*. Retrieved 4 March 2018, from <https://www.google.com.bd/maps/place/Boyra+Bazar/@22.8374718,89.5342518,17z/data=!4m5!3m4!1s0x39ff9a95747715b9:0xb5b1d3b4d7a90d50!8m2!3d22.8354448!4d89.5319451?hl=en>

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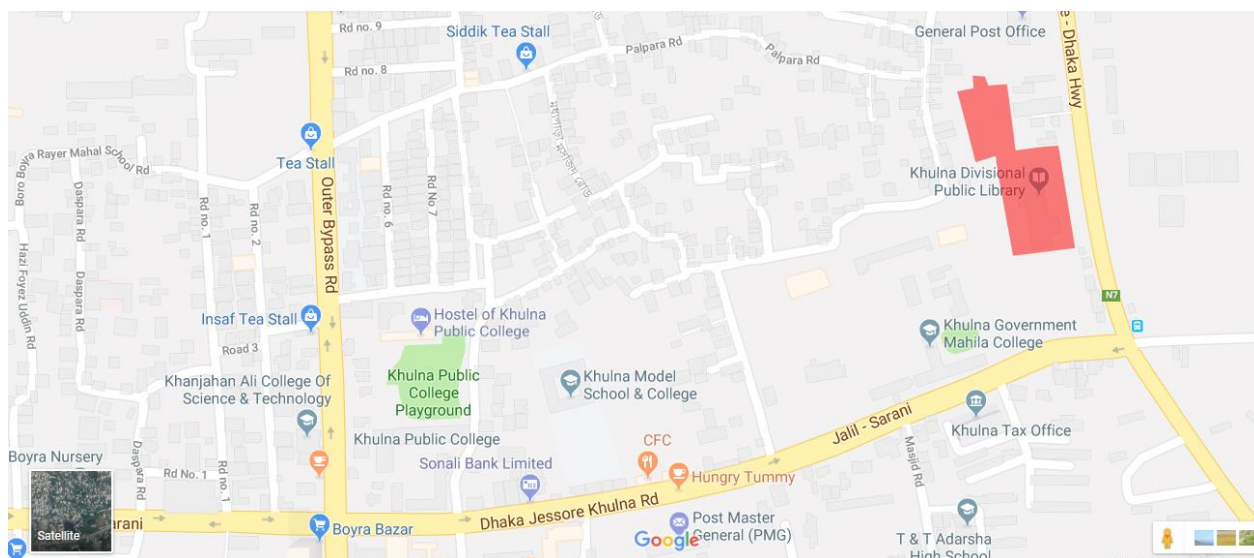


Fig 6: site location with surroundings in Boyra, Khulna (site is marked with red color)

Source: *Boyra Bazar*. (2018). *Boyra Bazar*. Retrieved 4 March 2018, from <https://www.google.com.bd/maps/place/Boyra+Bazar/@22.8374718,89.5342518,17z/data=!4m5!3m4!1s0x39ff9a95747715b9:0xb5b1d3b4d7a90d50!8m2!3d22.8354448!4d89.5319451?hl=en>

Edited by: Author

3.3 SITE ANALYSIS

Road networks of site and surroundings shown on the figure below. Major roads are Jessore-Khulna-Dhaka highway, Dhaka-Jessore-Khulna road, outer bypass road. Boyra is a very neat and clean city. There is not traffic jam as Dhaka city.



Fig 7: road networks (major roads are marked with red color)

Source: author

Boyra city is developing so fast and now planned ways developing is seen here. Due to more solid block void spaces are reducing so fast also.

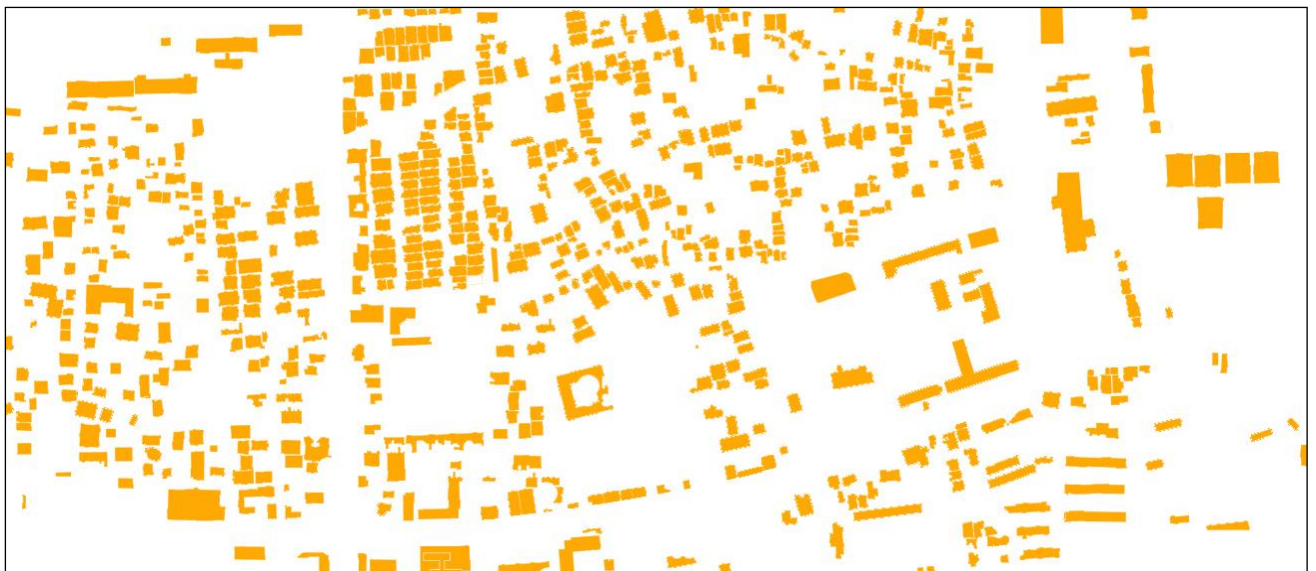


Fig 8: solid and void

Source: Author

Urban green is shown on the diagram below.



Fig 9: urban green

Source: Author

Though there is enough urban green presents but waterbodies are disappearing here if we go through the geographical history of this city.

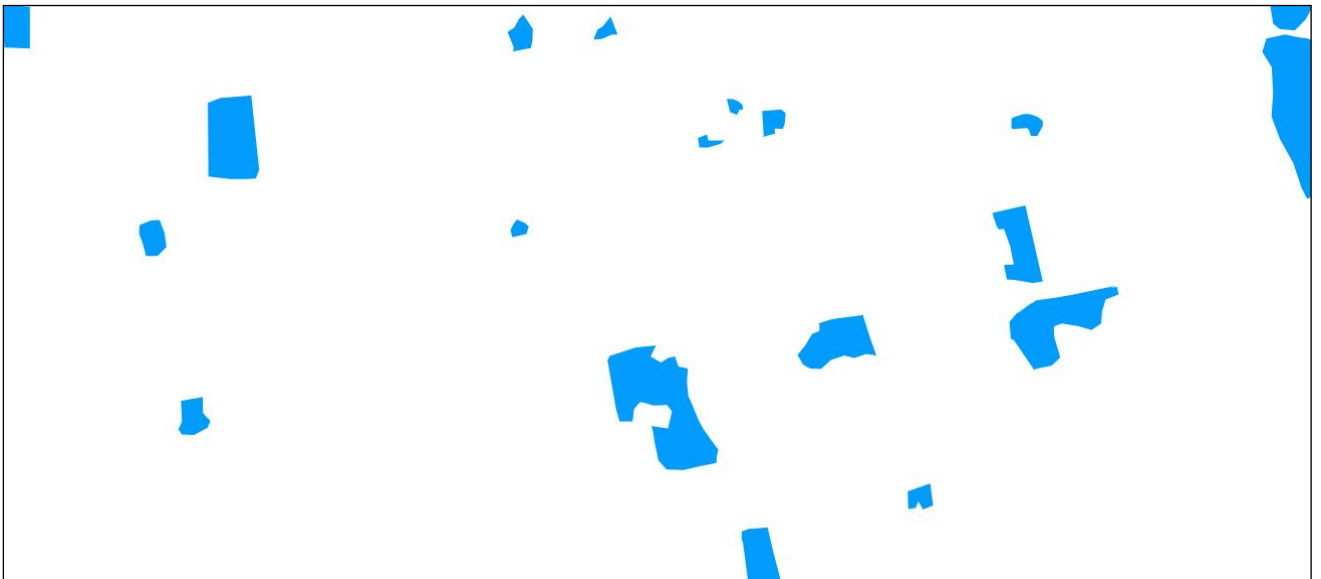


Fig 10: existing waterbody

Source: Author

Trying to identifying the educational institutions because a huge amount of library users are students. Though every aged people and people of every sector is a user of this existing library. This educational institutes have very important historical background behind the development of this city. Site forces are shown in below figure.



Fig 11: site force (institutions are marked with purple color)

Source: Author

3.3.1 Geographical change through time

To understand better how the city is evolving, the city maps of different times can be helpful. As shown on below figures, solid masses are increasing fast and causing lack of waterbodies and greens.

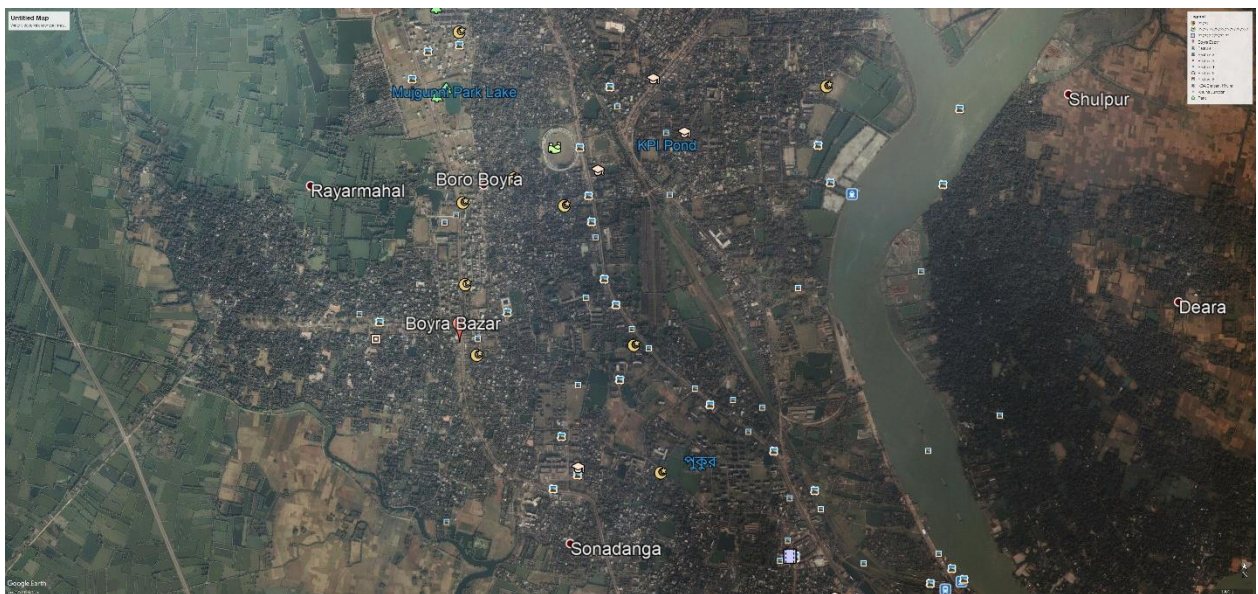


Fig 12: view of the city in 2007.

Source: Google Earth – Google Earth. (2018). Google Earth. Retrieved 25 February 2018, from <https://www.google.com/earth/>

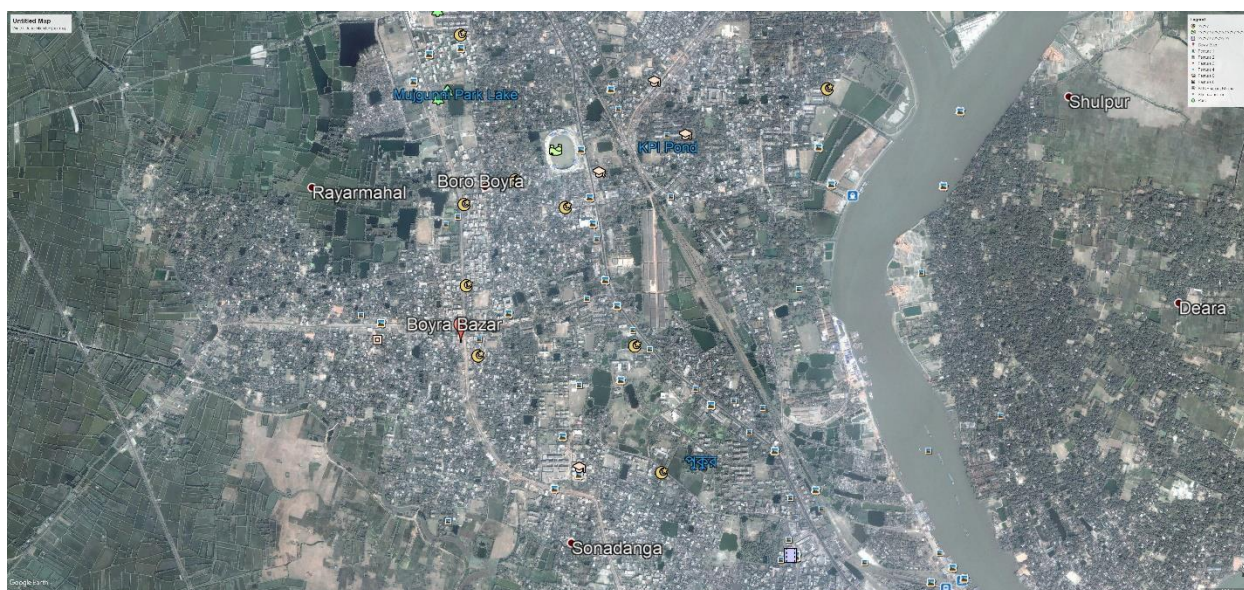


Fig 13: view of the city in 2013.

Source: Google Earth – Google Earth. (2018). Google Earth. Retrieved 25 February 2018, from <https://www.google.com/earth/>

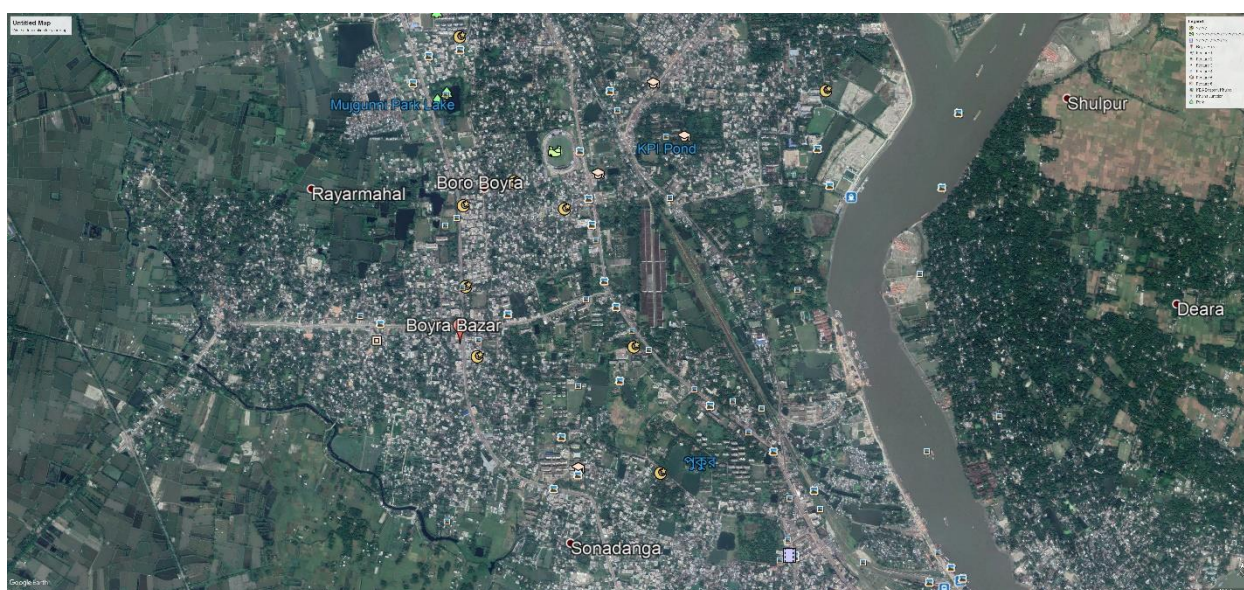


Fig 14: view of the city in 2017.

Source: Google Earth – Google Earth. (2018). Google Earth. Retrieved 25 February 2018, from <https://www.google.com/earth/>

3.3.2 Site pictures



Fig 16: connecting roadside of the site

Source: Author

Some pictures of existing library and site of this library are given below.



Fig 17: existing divisional public library of Khulna (inside of the library building)

Source: Author



Fig 18: existing library (site)

Source: Author



Fig 19: existing waterbody and green of the site.

Source: Author

3.4 SWOT ANALYSIS

Strength:

- Waterbody nearby
- Low rise surroundings give away the vistas from 1st floor
- Schools, colleges, universities are nearby
- Central point of Boyra
- The site is exposed to the wind on the south-east side
- User number of the library is high so it has the potential to become a successful library.

Weakness:

- Half of the site is already using as library block and other half is covered with water and unplanned greens.

Opportunities:

- This site has the opportunity of being the heart and social hub of the city because of its location and site forces.

Threat:

- The site is surrounded by boundary walls of other spaces.

Chapter 4

PROGRAM DEVELOPMENT

4.1 Introduction

4.2 Main sectors

4.3 Events and activities

4.4 Programs

4.1 INTRODUCTION:

The space imagining as it will be very busy and lively space. And thus events and activities have to run all throughout the year to create social interaction. This project will have three main spaces and they are,

- **Public space**
This place will welcome people to enjoy this place and use library as well. Cultural functions, more people gathering, book fair will be held in here. For example: library space, reading spaces, exhibition spaces, parking, landscape etc.
- **Semi-public space**
This place is not fully public or fully private space. This will be a threshold point or space for both public and private spaces. For example: workshop spaces, conference spaces etc.
- **Private space**
This place will be a private zone and not anyone can be there without permissions. For example: administration block, residential zone etc.

4.2 MAIN SECTORS

For any library there are some common sector that should consider in designing and create relation between functions so that the library can act properly. Based on case studies and similar projects and papers I have figured out some key components that would make any library to work successfully. They are,

- Supervision or monitoring
- Civic areas
- Educational areas
- Space for Innovation and sharing ideas
- Entertainment areas
- others

If these components can be organized in such a way so that there will be no privacy problem, and services can be given without any pause than the functions can be operated successfully. This is a sample functional diagram that I have found interesting because it's a simple diagram but with an easiest solution of privacy and services.

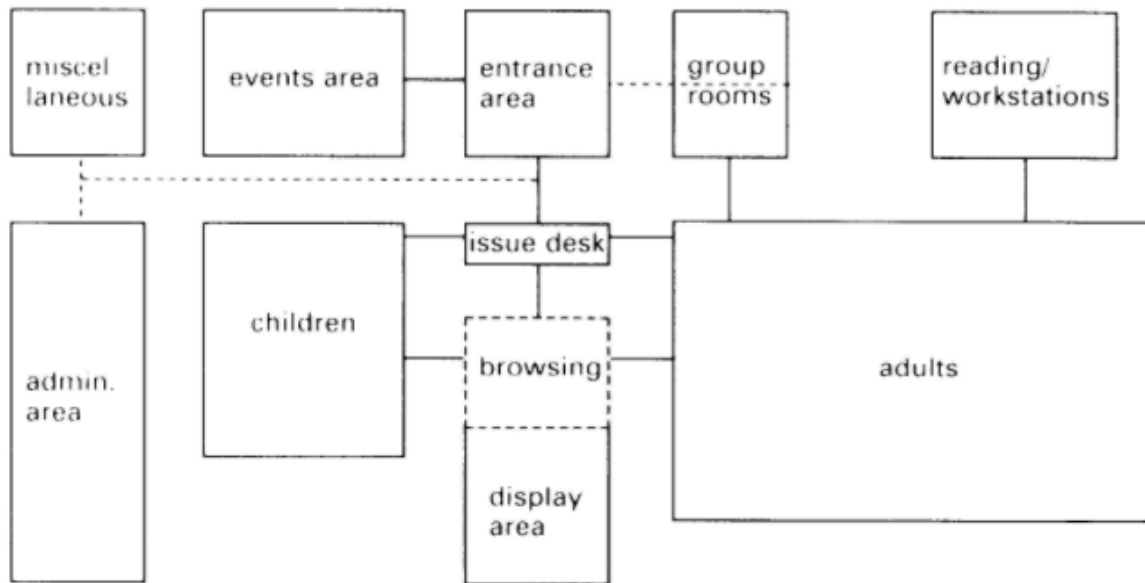


Fig 20: functional diagram of a library.

Source: Baiche, B., Neufert, E., Neufert, P., & Walliman, N. (2011). *Architects' data* (3rd ed., pp. 330). New York, NY: Wiley-Blackwell.

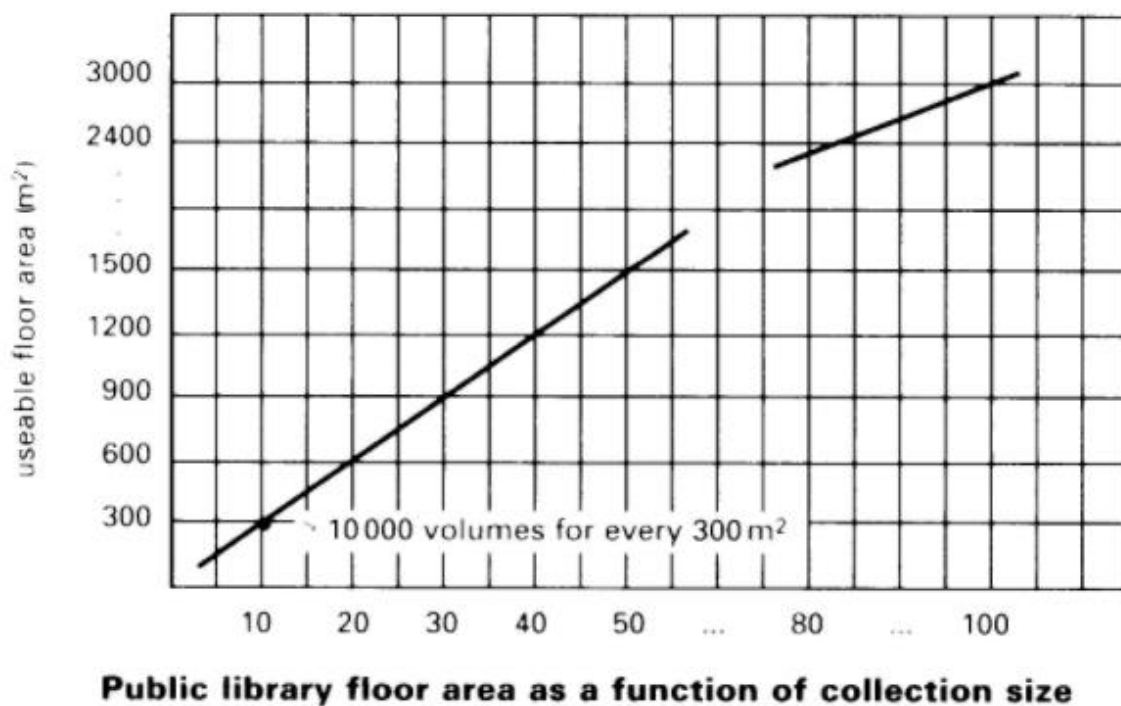


Fig 21: floor area as a function of collection size

Source: Baiche, B., Neufert, E., Neufert, P., & Walliman, N. (2011). *Architects' data* (3rd ed., pp. 330). New York, NY: Wiley-Blackwell.

The space design should invite people of every age and encourage them to enjoy the places separately with open-plan spaces where activities will take place. Based on size of collections, the floor areas are calculated. For every 10,000 media collection there should be 300m² (3229.17ft²) of usable floor area.

4.3 EVENTS AND ACTIVITIES

Based on events and activity, there will be two type of spaces and functions. They are,

Regular activities:

- Exhibition
- Workshop and conference
- Reading
- Cyber café
- Drama
- Documentary and Films
- Cafeteria
- Residential facilities
- Parking

Periodical activities:

- Book fare
- Science Fair
- Debate
- Art competition
- Design competition
- Book Reading competition
- Seasonal cultural Events

4.4 PROGRAM

The functional extents and area requirements of the programs were derived from various local and international case studies, Time Saves Standards, Architects' Data, The Architect's handbook. As per standards and the context of site,

ADMINISTRATIVE BLOCK

SL. NO.	SPACE	USER	UNITS	AREA in (sq.ft.)
1.	director	1	1	200
2.	asst. director	1	1	150
3.	general office	5	1	550
4.	storage	1	1	200
5.	lobby	1	1	400
6.	meeting room	1	1	400
7.	toilet			100
	I. total			2,000

Table 1: Administrative space requirements

Source : (Time Savers and author)

READING SPACES

SL. NO.	SPACE	USER	UNITS	STANDARD	AREA in (sq.ft.)
1.	normal reading room with one librarian	150			4,600
2.	science textbook reading room with one librarian	100			3,100
3.	reference textbooks reading room with one librarian	50			1,600
4.	children's reading room	1			
	reading room for disable people	50		30 sq.ft per person required in readers space (Time-saver standards for building types,1990)	2,000
5.	women's reading room	50			2,000
6.	reading room for old people	50			1,500
7.	open reading room with one librarian	30			900
		100			3,100
8.		1			
	Total				18,800

Table 2: Reading space requirements

Source : (Time Savers and author)

RESIDENTIAL FACILITIES

SL. NO.	SPACE	USER	AREA in (sq.ft.)
1.	director	1	2,200
2.	asst. director	1	1,600
3.	residential librarian	1	1,200
4.	security officer	1	1,200
5.	deputy assistant engineer	1	1,200
6.	caretaker	1	
7.	electrician	1	2,200
8.	security guards, night guard, cleaner	5	
9.	Dormitori	20-25	15,000
	Total		24,600

Table 3: Residential space requirements

Source : (Time Savers and author)

TOTAL BUILD SPACES

SL. NO.	SPACE	USERS	UNITS	STANDARD	AREA in (sq.ft.)
1	Parking (including cars, microbus and bikes)	50 cars		Lot width 2 rows + 1 driveway, per car is 310sq.ft. (Time-saver standards for building types,1990)	27,730
2	Electric Power-station (500 Kv)		1		5,000
3	Archives		1		20,000
4	Seminar Halls	150 sittings	1		4,000
5	Meeting rooms	30 sittings	1		1,800
6	Book exhibition center				5,000
7	Administrative block				2,000
8	Auditorium	500 sittings	1		6,850
9	Security and generator		1		3,000
10	Reception & Lounge				300
11	lobby				1,000
12	Display area				2,000
13	General library				20,000
14	Reading rooms,			30 sq.ft per person required in readers space (Time-saver standards for building types,1990)	18,800
15	Computer lab	20 sittings	1		1,000
16	Cyber cafe	20 sittings	1		1,000
17	Service & Storage				5,000
18	Digital library (Audio & Visuals)				10,000
19	Multimedia zone		1		4,000
20	Cafeteria	50	1		5,000
22	Residential facilities		2		24,600
Total					1,68,080
Circulation (30%)					50,424
Total build space required (approximate)					2,18,504

Table 4: Total build space requirements

Source : (Time Savers and author)

Chapter 5

CASE STUDY

5.1 Introduction

5.2 Cases

5.1 INTRODUCTION

This chapter is very important to understand practically how a library works, what is the actual strength and weakness of such a project like this.

5.2 CASES

5.2.1 Philip Exeter Library (1965-1972)

Architects: Louis Kahn

Location: Exeter, New Hampshire, United State.

Structural Engineer: Keast and Hood Company

Mechanical/Electrical Engineers: Dubin-Mindell-Bloome Associates

General Contractor: H.P. Cummings Construction Company

Structural System: Concrete, Brick and wood

Area: 12321.0 m²

Project Year: 1965-1972



Fig 22: interior spaces with natural daylight and exterior of Philip Exeter library.

Source: *Best 25+ Exeter library ideas on Pinterest | Exeter new hampshire, Louis kahn and Kahn university.* (2018). *Pinterest*. Retrieved 11 March 2018, from <https://www.pinterest.co.uk/explore/exeter-library/?lp=true>

In Architects own word,

"The quality of a library, by inspiring a superior faculty and attracting superior students, determines the effectiveness of a school. No longer a mere depository of books and magazines, the modern library becomes a laboratory for research and experimentation, a quiet retreat for study, reading and reflection, the intellectual center of the community....

Fulfilling needs of a school expected eventually to number one thousand students, unpretentious, though in a handsome, inviting contemporary style, such a library would affirm the regard at the Academy for the work of the mind and the hands of man."

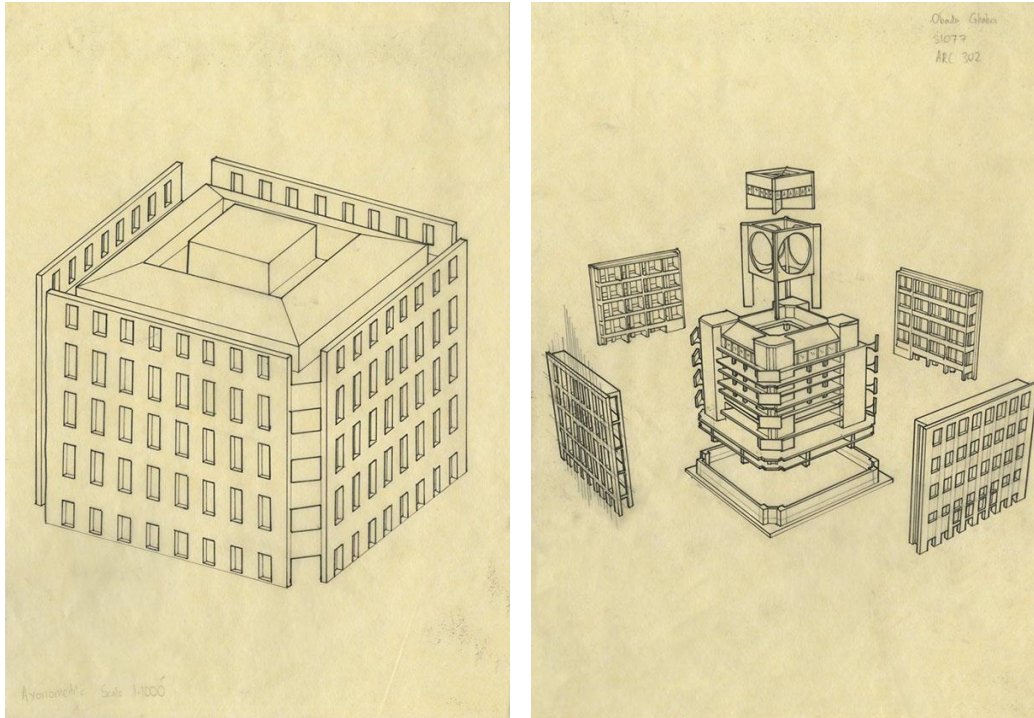


Fig 23: Philip Exeter library as a cube formed by four brick walls.

Source: Behance. (2018). Behance.net. Retrieved 11 March 2018, from <https://www.behance.net/gallery/6784061/Case-Study-Philips-Exeter>

From outside this building is looks like a huge cube box made of brick walls, but in inside there is a play of spaces and forms with different shapes made of concrete and woods. The beauty of this architecture, is the first floor. This main floor reaches 70 feet in height and soaks in natural light from a clerestory at the top of this space and from large expanses of glass on the north and west sides. The last step onto the first floor one can immediately perceive the relationship of reference area, circulation desk, and book stacks. Kahn found this aspect to be important so that visitors can easily understand the plan of the building upon their entrance.

With the circulation desk on the first floor instead of the ground floor it is evident that service took priority over security. The Academy accepted this at ease since it allowed librarians to be closer to the book stacks and the readers, therefore making the most sense when considering the function of a circulation desk in a library.

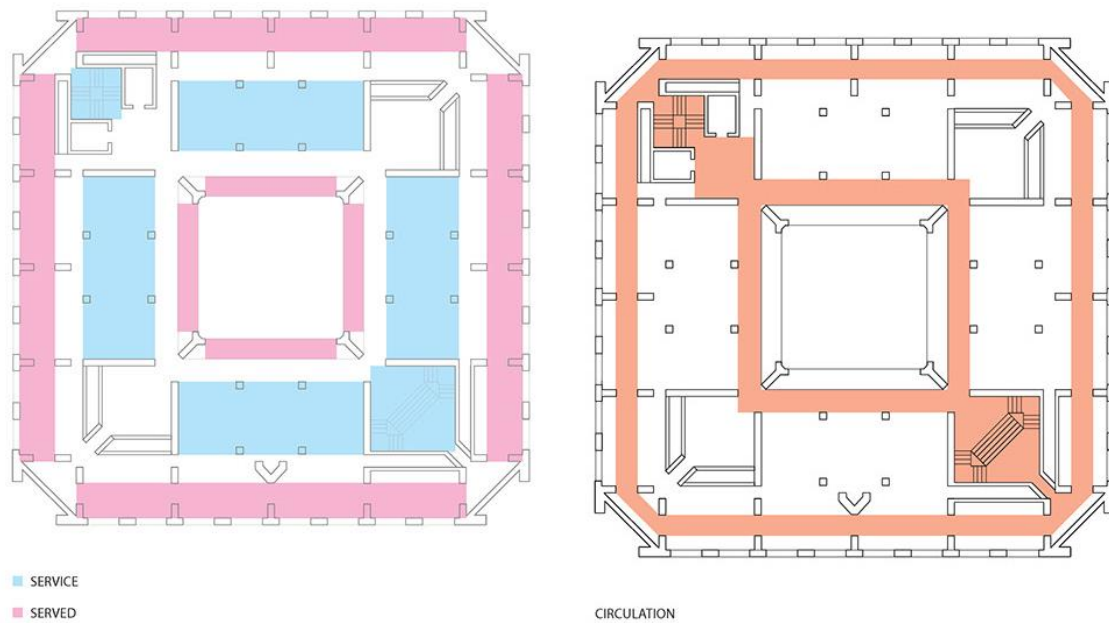


Fig 24: service and served areas, circulation areas.

Source: Behance. (2018). Behance.net. Retrieved 11 March 2018, from <https://www.behance.net/gallery/6784061/Case-Study-Philips-Exeter>

Placement of different functions in vertically and horizontally have mentioned in below diagram.

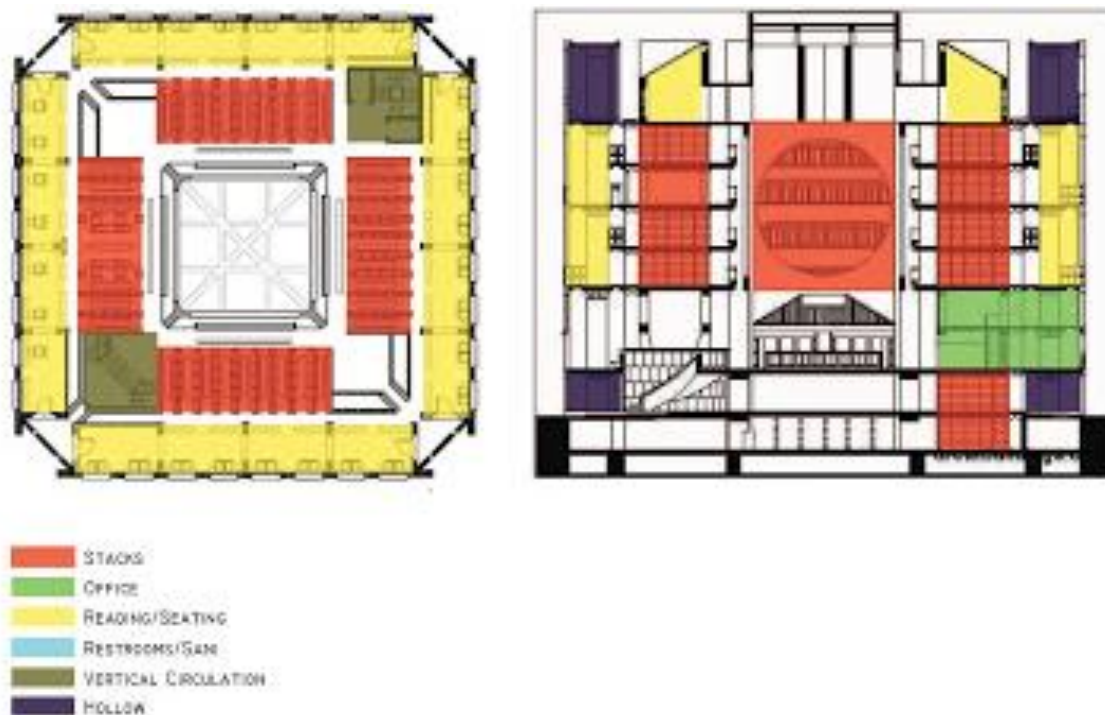


Fig 25: book stacks, office, reading spaces, vertical circulation and hollow spaces.

Source: Behance. (2018). Behance.net. Retrieved 11 March 2018, from <https://www.behance.net/gallery/6784061/Case-Study-Philips-Exeter>

The atrium is at the center with the book stacks surrounding it, and surrounding the book stacks are the reading areas towards the exterior and with the circulation on the corners. Natural light comes through the central atrium and natural air ventilation is also designed in this project.

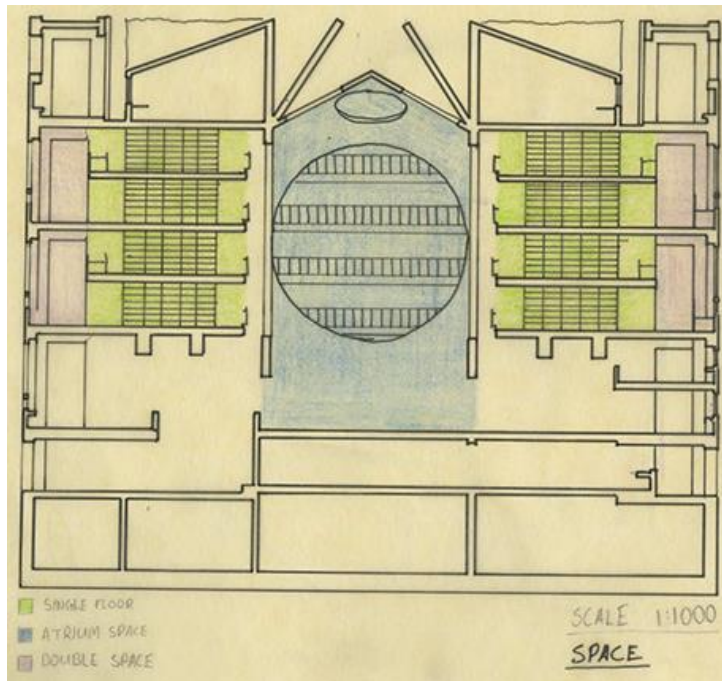


Fig 26: spaces inside the library.

Source: Behance. (2018). Behance.net. Retrieved 11 March 2018, from <https://www.behance.net/gallery/6784061/Case-Study-Philips-Exeter>

Kahn's designs are always so simple but majestic at the same time, he knows very well how to combine the shapes and materials in their pure form to create great spaces that are suitable for every single person that goes into his buildings.

As a library, it is very important to use natural illumination, which you can also see in the Library. Readers desk always have natural daylight. Architect uses light source very cleverly, he designed and placed the reader desk in such a manner that there will be always direct sunlight or defused sunlight, but that place will be lighten up throughout the whole day time.

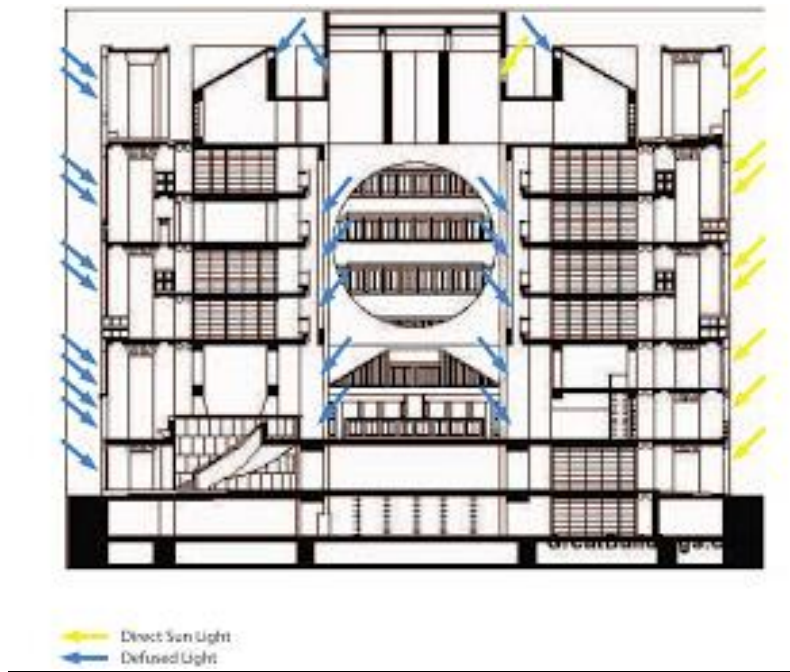


Fig 27: direct sun light and defused light diagram.

Source: Behance. (2018). Behance.net. Retrieved 11 March 2018, from <https://www.behance.net/gallery/6784061/Case-Study-Philips-Exeter>

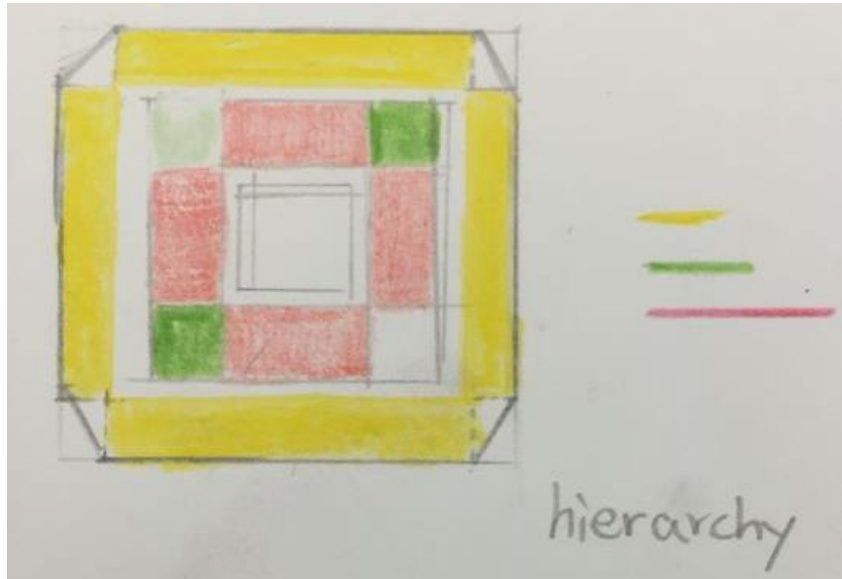


Fig 28: hierarchy of the places

Source: author

The concept of this library was light up from a dark space. Therefore, books shelves are situated in a low light area and reading areas are more lightened. It seems like, people are lightening up by reading books and earning the knowledge.

5.2.2 Seattle Central Library (1999-2004)

Architects: OMA + LMN

Location: Seattle, WA, United States

Area: 38300.0 sqm

Project Year: 2004

Client: Seattle Public Library

Structural system: Concrete base, steel members and Steel and Glass skin

Program: Central library for Seattle's 28-branch library system, including 33,700 sqm of hq, reading room, book spiral, mixing chamber, meeting platform, living room, staff floor, children's collection, and auditorium, and 4,600 sqm of parking.

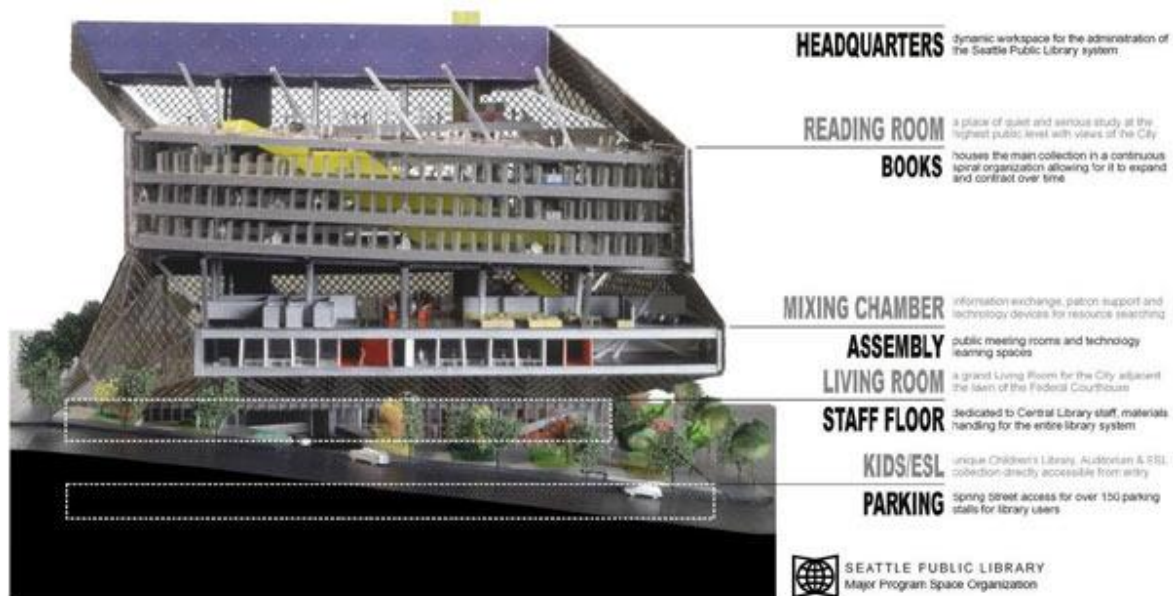


Fig 29: a cross section of the library showing the 'mixing chamber' customer help area and several purpose built reading rooms.

Source: *Seattle Central Library in the USA, Designed by Rem Koolhaas - Verdict Designbuild*. (2018). Verdict Designbuild.

Retrieved 11 March 2018, from <https://www.designbuild-network.com/projects/seattle-library/>

The first official building to house Seattle's public library was built in 1891 on Pioneer Square, eventually moving to a block bounded by Fourth and Fifth Avenues and Madison and Spring Streets. In 1998, Seattle voters embraced a \$196.4m makeover of the library, dubbed 'Libraries for All'.

Flexibility in contemporary libraries is conceived as the creation of generic floors on which almost any activity can occur. Programs are not separated, rooms or individual spaces not

given unique characters. In practice, this means that bookcases define generous (though nondescript) reading areas on opening day, but, through the collection's relentless expansion, inevitably come to encroach on the public space. Ultimately, in this form of flexibility, the library strangles the very attractions that differentiate it from other information resources. Each platform is a programmatic cluster that is architecturally defined and equipped for maximum, dedicated performance. Because each platform is designed for a unique purpose, their size, flexibility, circulation, palette, structure, and MEP vary. The spaces in between the platforms function as trading floors where librarians inform and stimulate, where the interface between the different platforms is organized—spaces for work, interaction, and play.

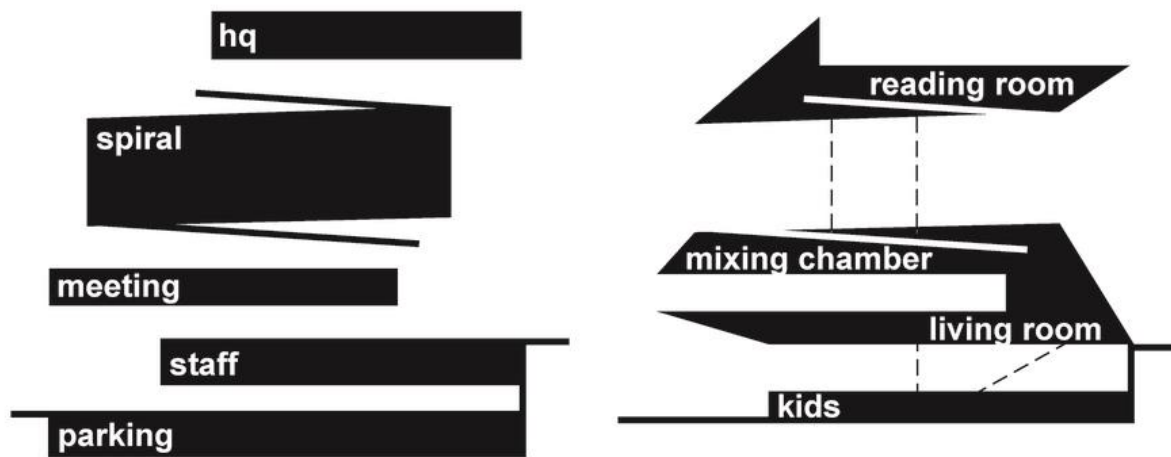


Fig 30: vertical zoning of the library building (five stable platforms and four unstable platforms).

Source: Architect Joshua Prince-Ramus the first American to claim the \$100,000 Marcus Prize. (2018). Archpaper.com.

Retrieved 11 March 2018, from <https://archpaper.com/2015/09/architect-joshua-prince-ramus-claims-100000-marcus-prize/>

Although the library is an unusual shape from the outside, the architects' philosophy was to let the building's required functions dictate what it should look like, rather than imposing a structure and making the functions conform to that.

Seattle central library has broken the traditional norms of library buildings and introduced new program in the library '**the living rooms of the city**'. Flexibility of different functions has been given great value in here which each function has its own form. The goal of this library was to give the illusion of floating offset boxes while minimizing columns and transfer grids.

5.2.3 TU Delft Library

Architects: Mecanoo

Location: Delft, The Netherlands

Type: Intensive

System: Single Source Provider

Size: 16146 sq.ft.

Slope: 15%

Access: Accessible, Open to Public

Delft University is the largest and oldest public Dutch technical university. Constructed in the 1960s, the large, brutalist concrete Aula or General Assembly Hall from Van den Broek & Bakema overshadowed the site for the new library and the university needed a campus atmosphere which included lawns with flowers and trees where students and professors could meet informally on broad stairs. The original 1997 intensive greenroof over the library was replaced in 2009. The 15,000 m² library contains extensive underground book archives, reading rooms, the university publisher, offices, Trésor for historical books and exhibitions, study spaces, and a book binder and book shop.



Fig 31: vertical zoning of the library building (five stable platforms and four unstable platforms).

Source: *TU Delft Archives - Greenroofs.com: Sky Gardens Blog*. (2018). *Greenroofs.com: Sky Gardens Blog*. Retrieved 11 March 2018, from <http://www.greenroofs.com/blog/tag/tu-delft/>

Architects vision was to develop a light-filled landmark that would serve as ‘**a gateway to the digital highway**’. This library has green roof as a public gathering space and the central cone invites day light into the library.



Fig 32: The main hall of the library is defined by its spaciousness. It has a cathedral-like effect: imposing and inviting.

Source: *Library Delft University of Technology*. (2018). *Mecanoo.nl*. Retrieved 11 March 2018, from <http://www.mecanoo.nl/Projects/project/27/Library-Delft-University-of-Technology?t=0>



Fig 33: Silent study area in the cone.

Source: *Library Delft University of Technology*. (2018). *Mecanoo.nl*. Retrieved 11 March 2018, from <http://www.mecanoo.nl/Projects/project/27/Library-Delft-University-of-Technology?t=0>

Chapter 6

DESIGN DEVELOPMENT

6.1 Introduction

6.2 Concept and design consideration

6.3 Form

6.4 final design

6.5 model photos

6.6 Render photos

6.7 Conclusion

6.1 INTRODUCTION

The purpose of this library is not only be a **knowledge hub**, but also a **place for social-interaction** because this is a divisional library and it will connect people from different districts. Every year, a book fair is held in this library throughout February month. Social-interaction is already present there but it needed to be enhanced throughout the year. To create a **knowledge hub** it is needed to place activities to- Gain knowledge, create knowledge and disseminate to form a **place for social-interaction**. However, to Generate-Social activities, Cultural events and Sharing information, major functions of this library have been created.

6.2 CONCEPT AND DESIGN CONSIDERATIONS

The design concept and form of this library mainly driven by its contextual aesthetics and functional demands. Initial zoning was made by analyzing the context. Main zoning was -

- (i) Main library block,
- (ii) Social-interaction zone as fair space,
- (iii) Residential blocks.

There were some key design considerations,

- To connect roads that needs
- To preserve existing trees
- To create a better and large space for fairs
- To continue design with the essence of existing library
- To give pedestrian entry more important than vehicle entry
- To have more natural views



Site with existing nature



connecting road



entries and pedestrian connections



views from site & existing fair place



residential zone



library zone and replace of fair place

Fig 34: design considerations and zoning

Source: Author

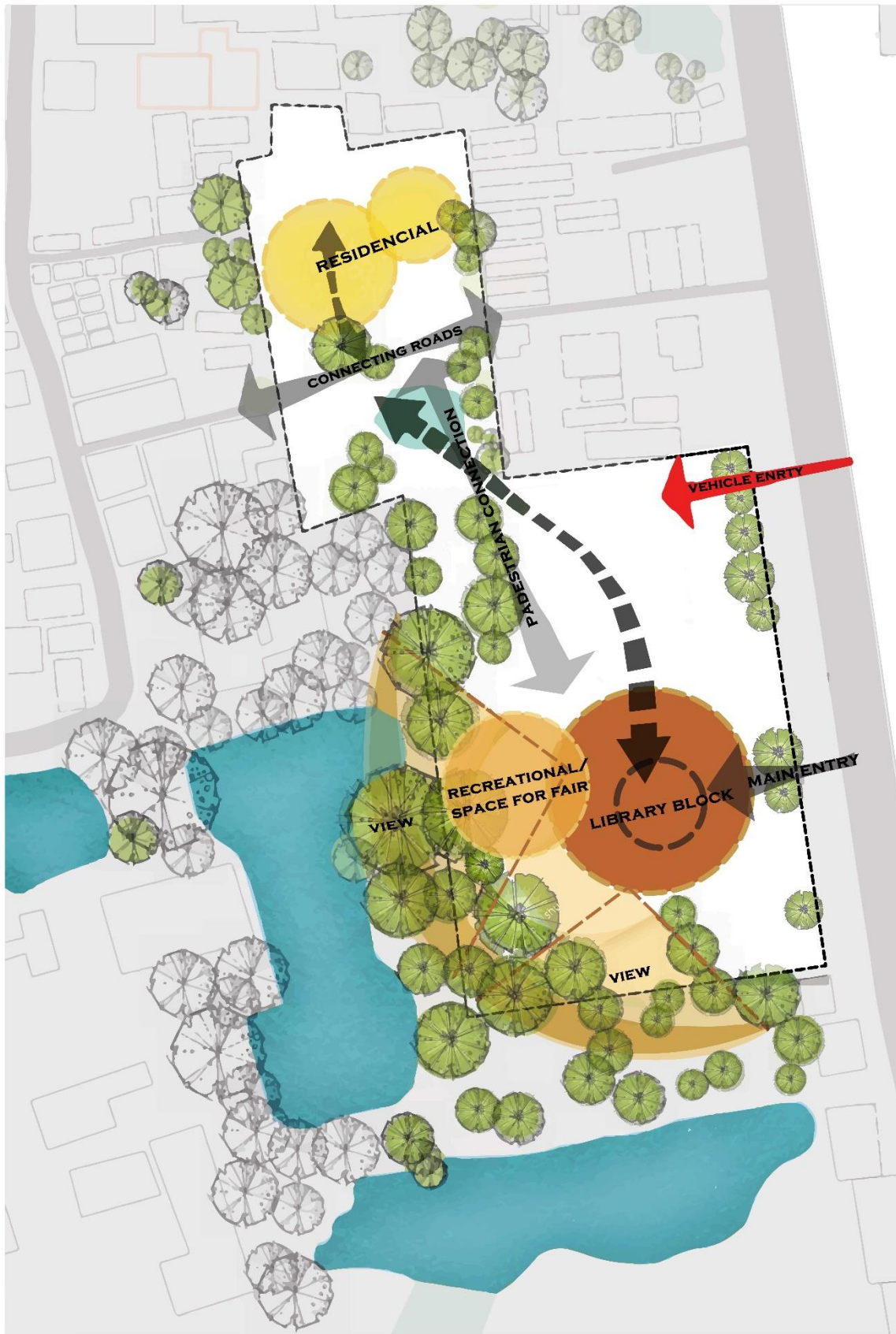


Fig 35: design considerations and zoning

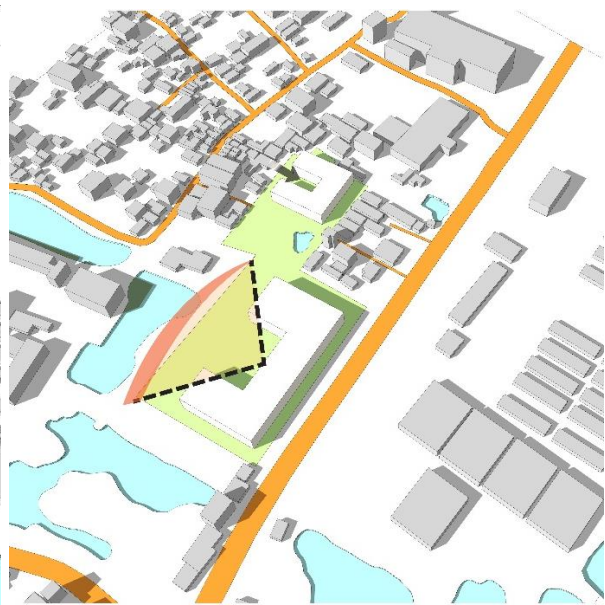
Source: Author

6.3 FORM

form was derived directly from the context analysis and design considerations.



road connections n entries



change in form for natural views & visual connections



Growing Vertically in need of spaces & frees ground



expands spaces as needed to incorporate all functions

Fig 36: form development

Source: Author

6.4 FINAL DESIGN

6.4.1 Plans

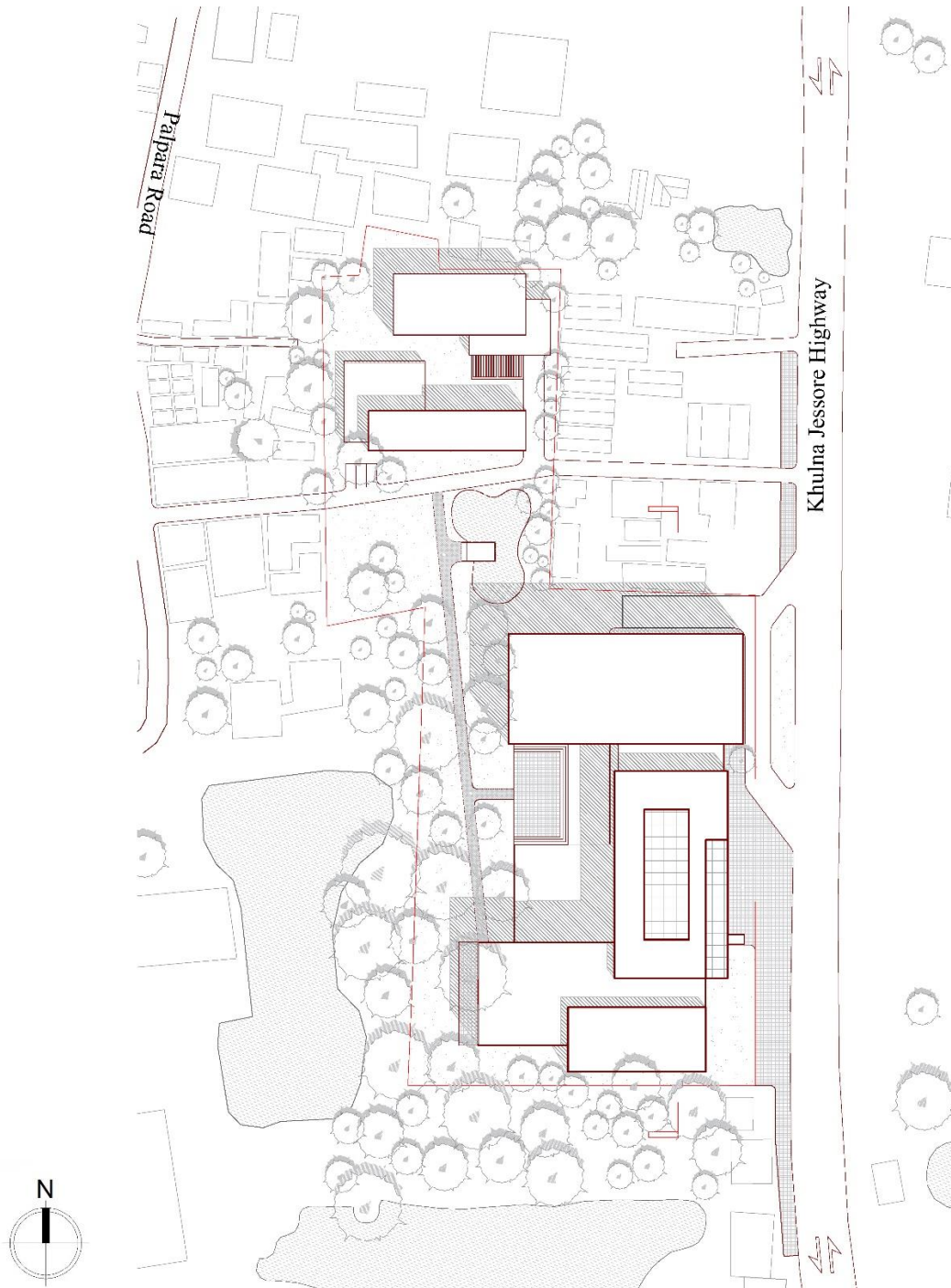


Fig 37: Roof plan

Source: Author



Fig 38: Ground floor plan

Source: Author

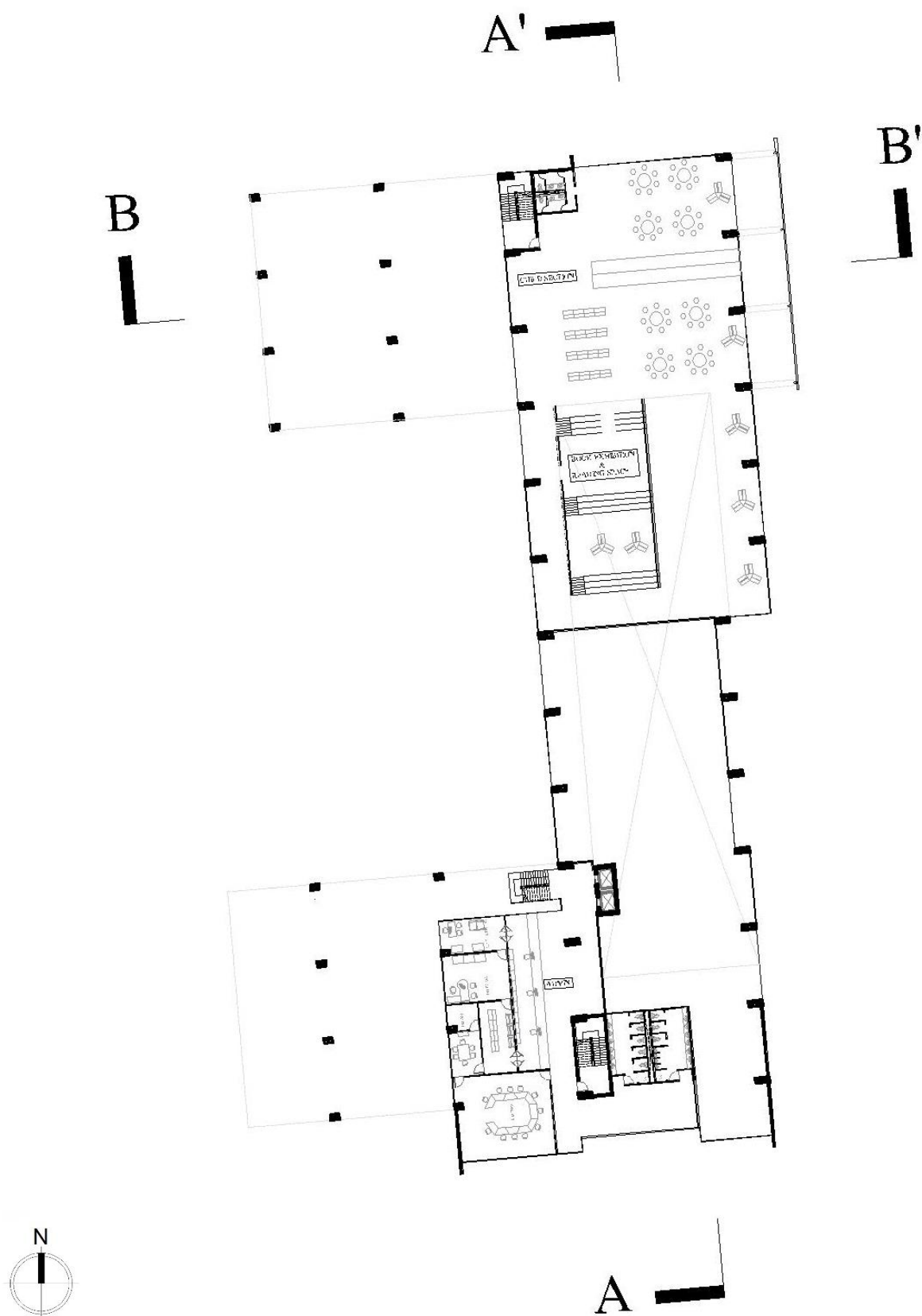


Fig 39: First floor plan

Source: Author

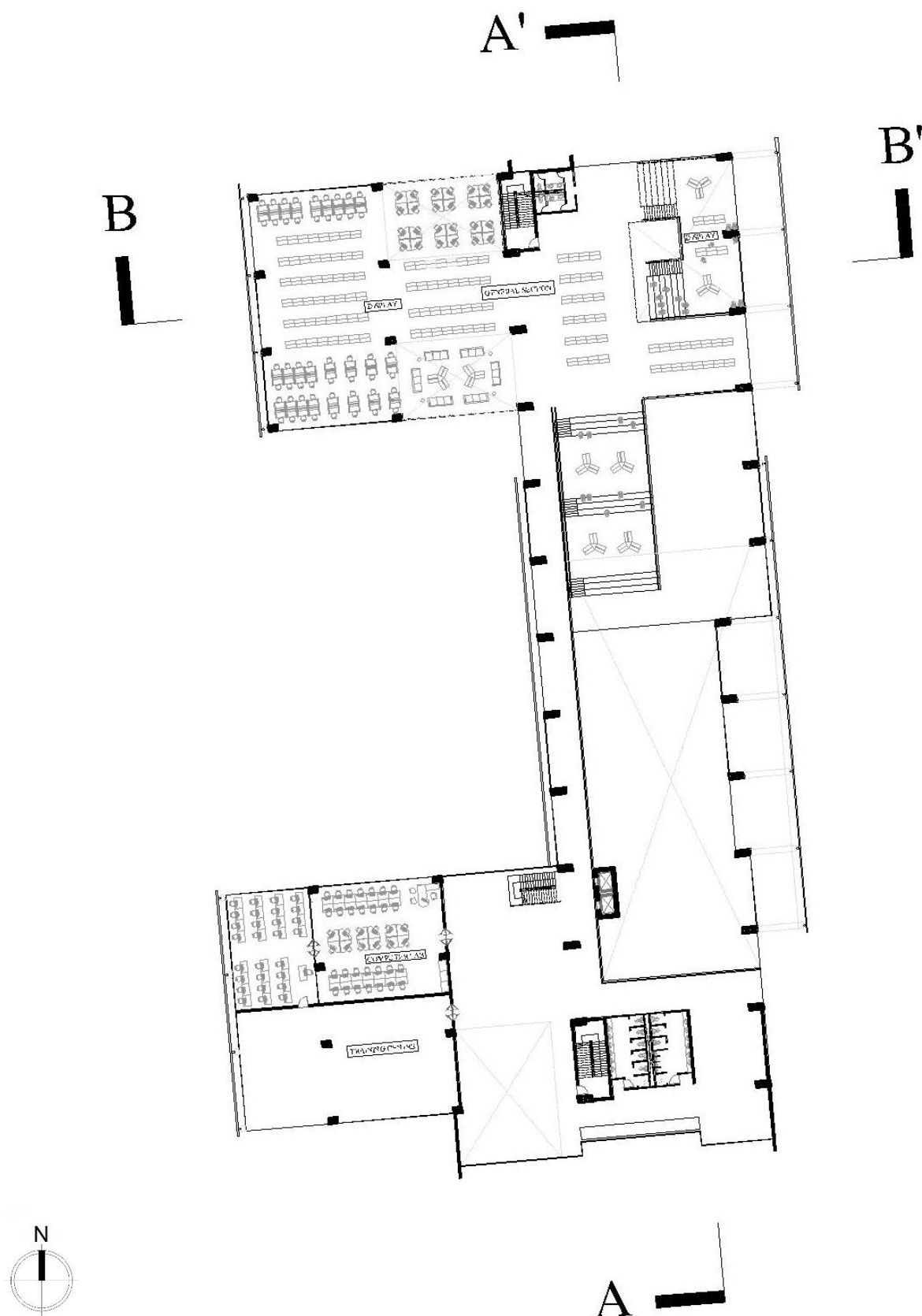


Fig 40: Second floor plan

Source: Author

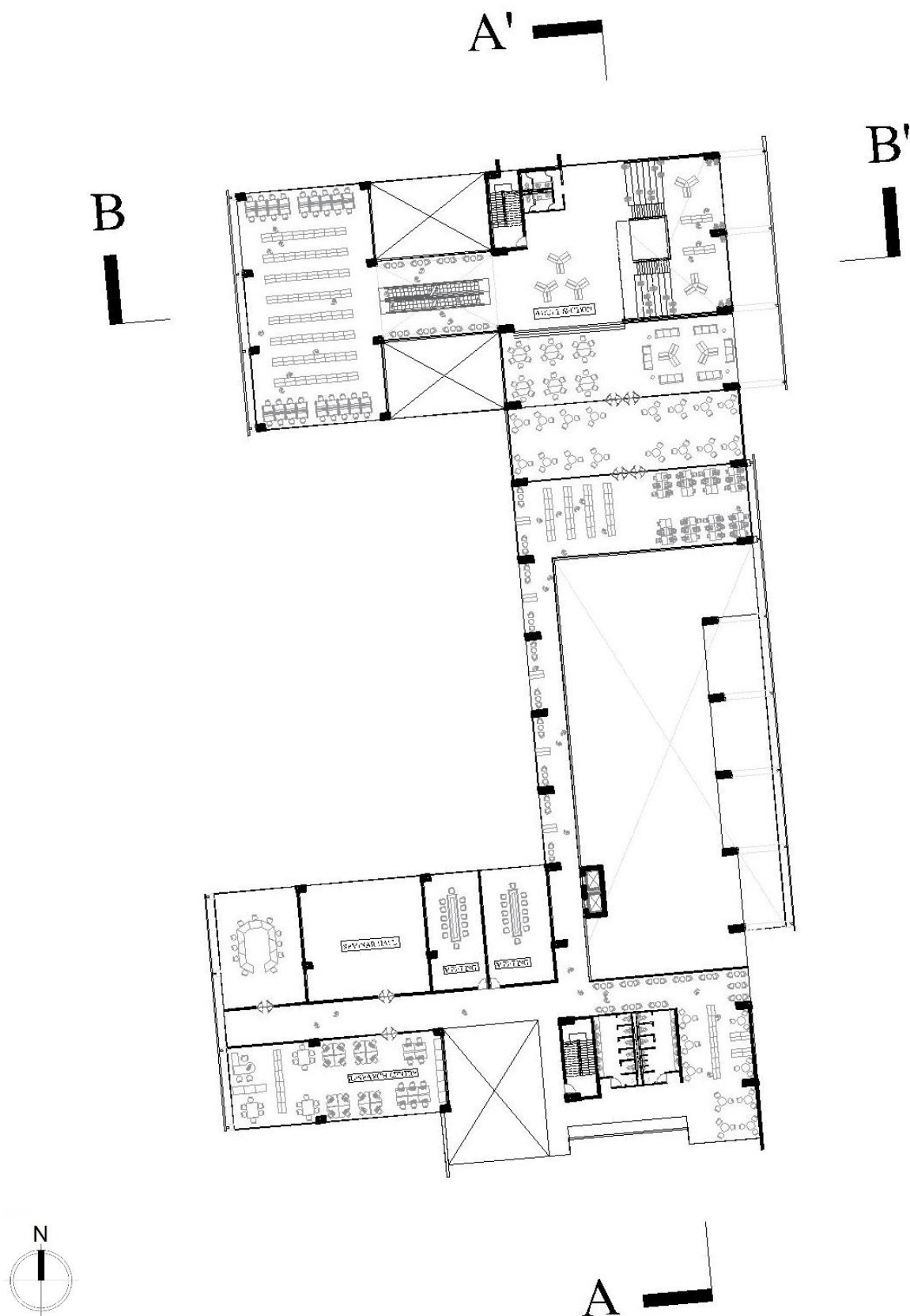


Fig 41: Third floor plan

Source: Author

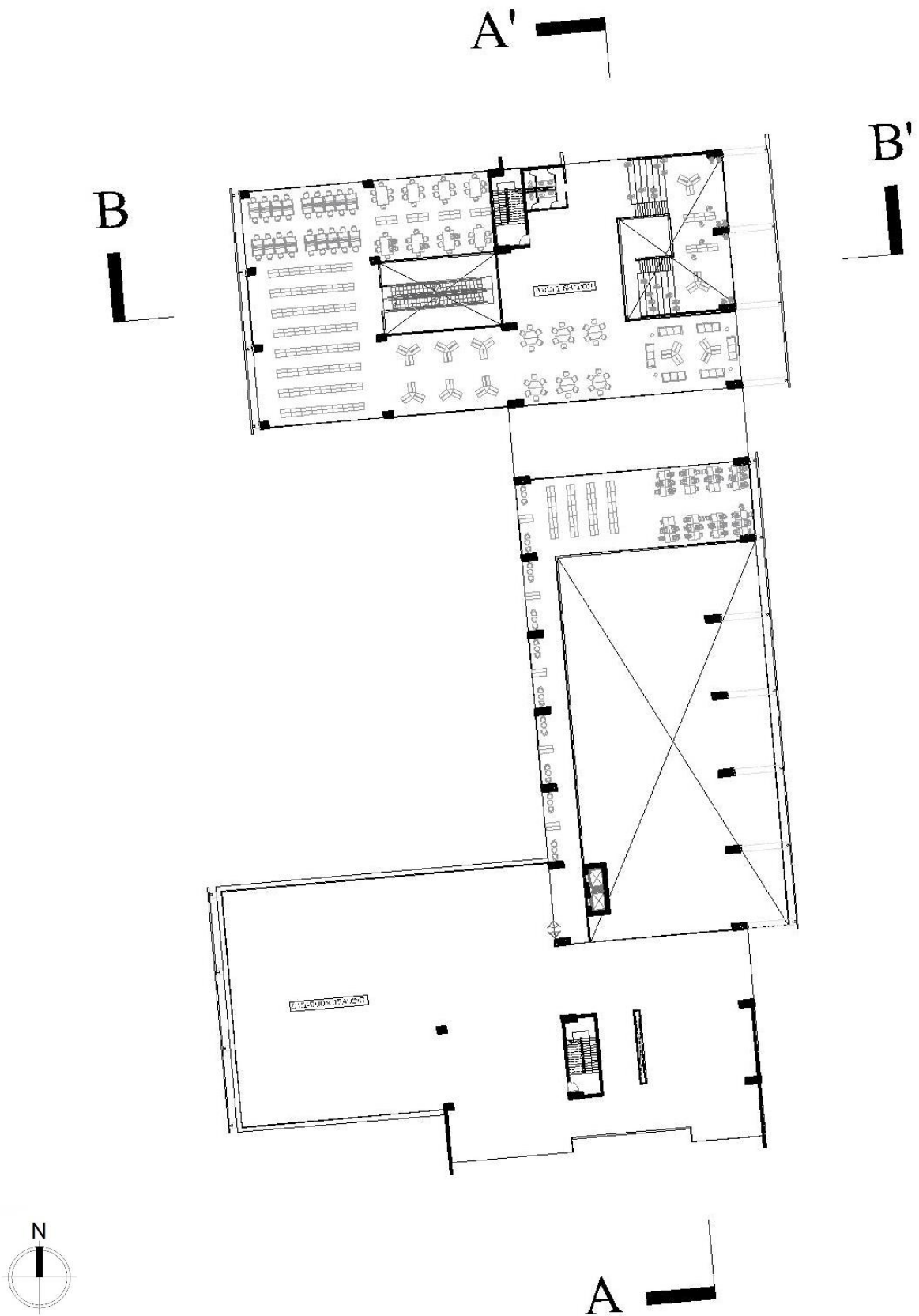


Fig 42: Forth floor plan

Source: Author

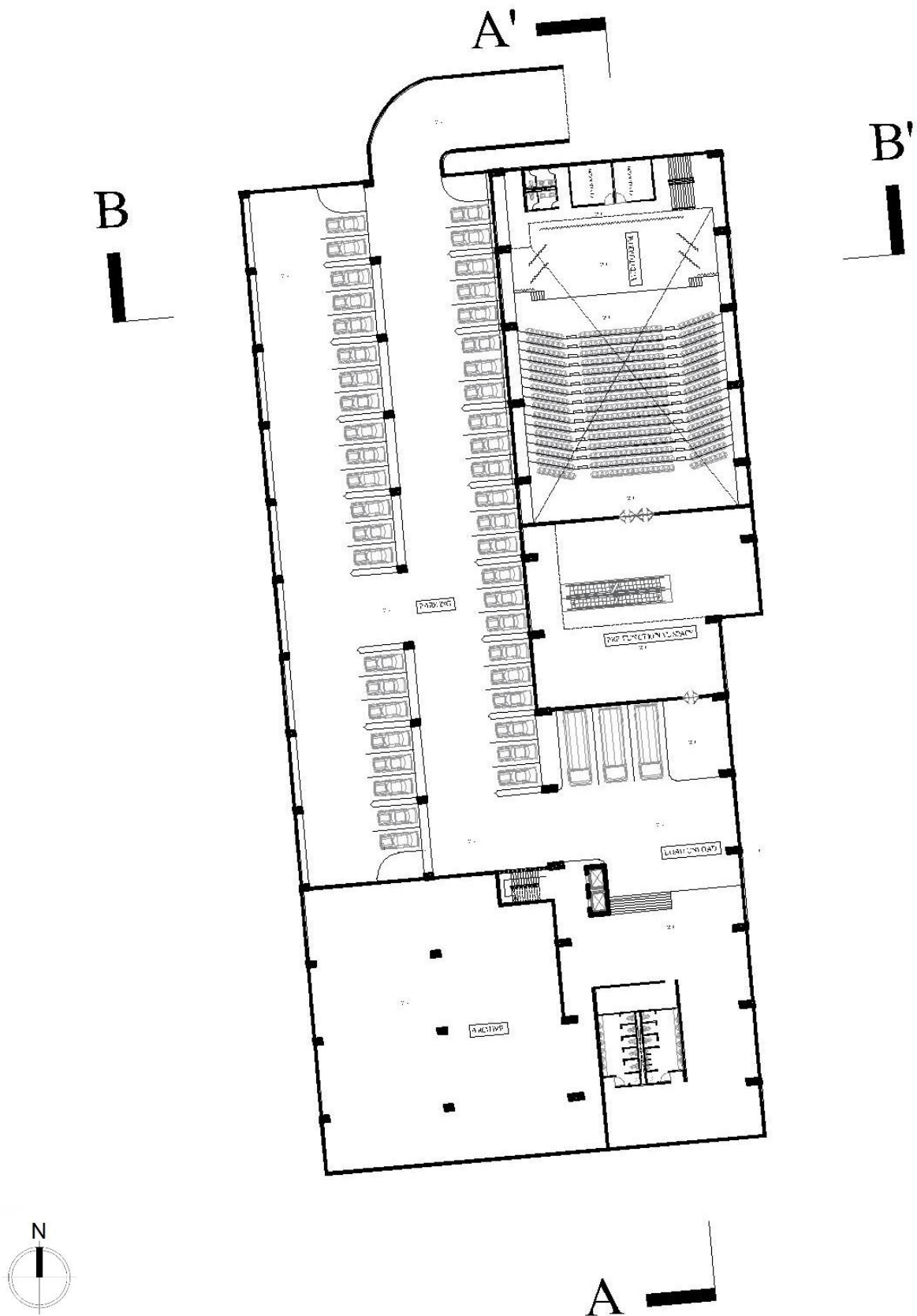


Fig 43: Basement plan

Source: Author

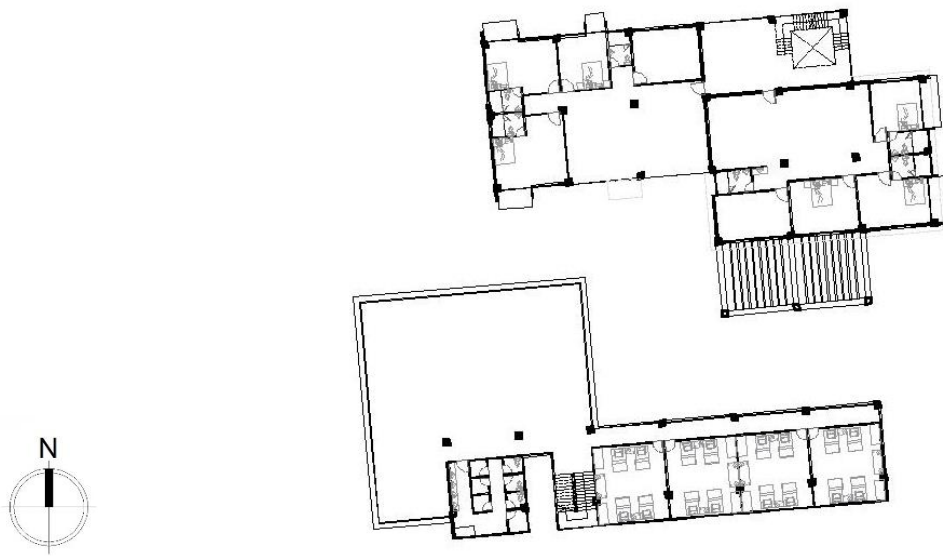


Fig 44: First floor plan (residential)

Source: Author

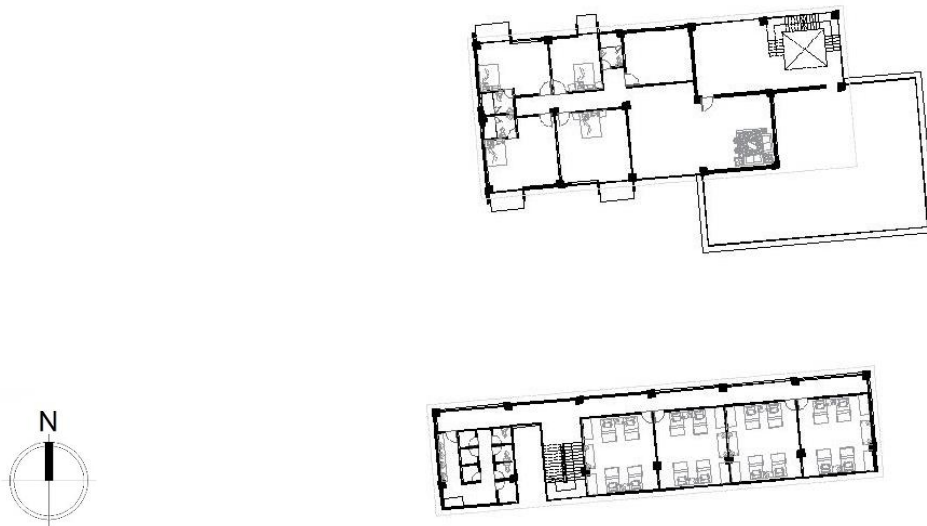


Fig 45: Second floor plan (residential)

Source: Author

6.4.2 Elevations



Fig 46: East elevation

Source: Author

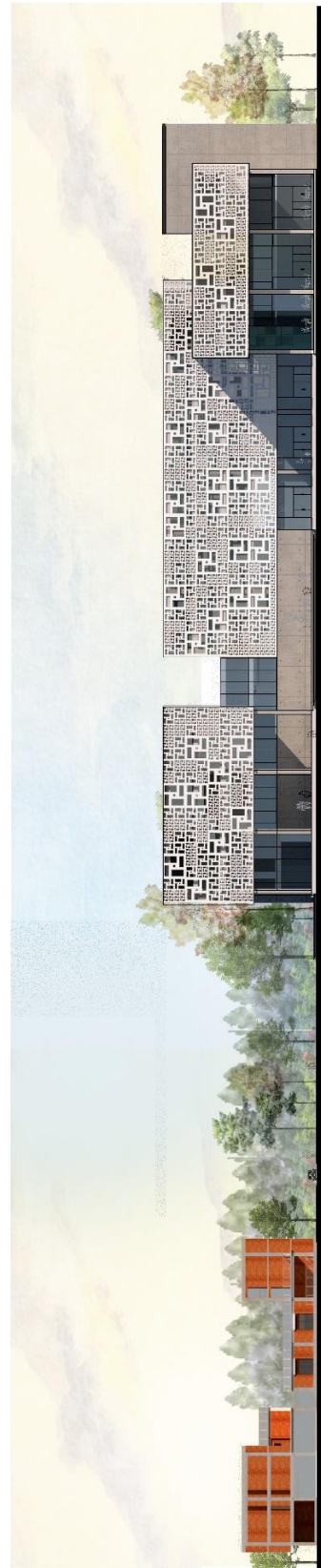


Fig 47: west elevation

Source: Author

6.4.3 Sections



Fig 48: Section AA'

Source: Author

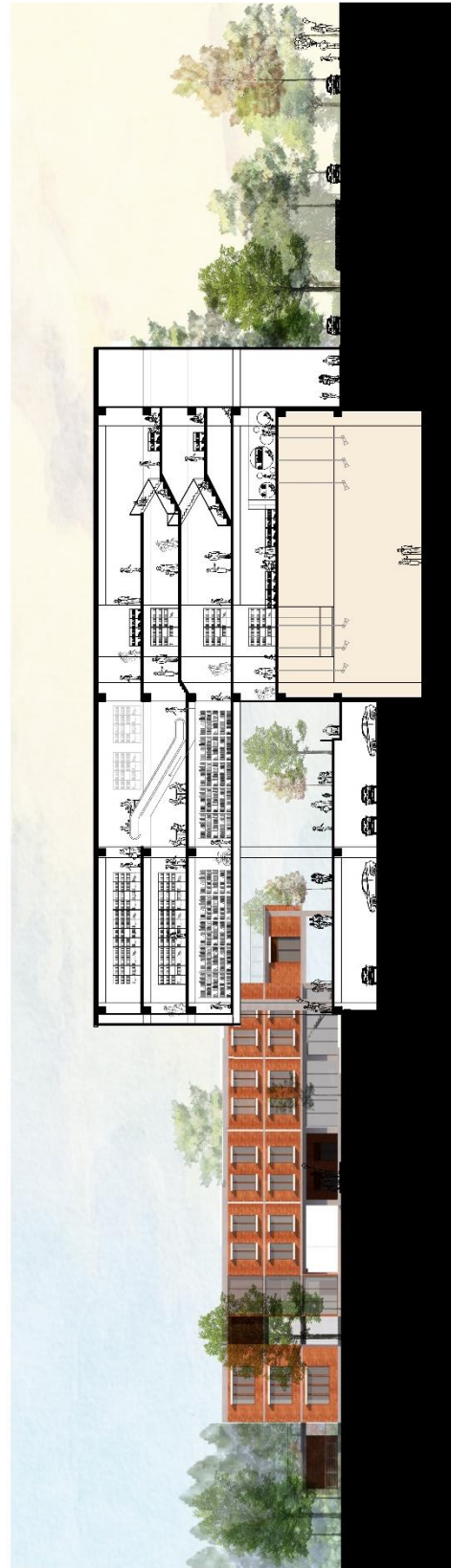


Fig 49: Section BB'

Source: Author

6.5 MODEL PHOTOS

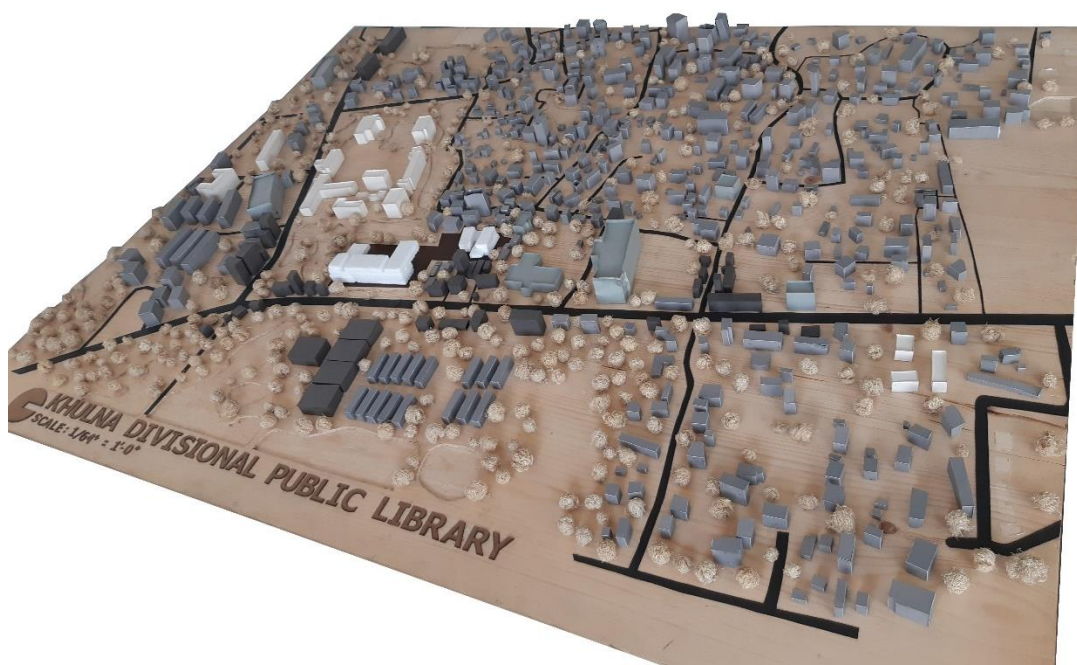


Fig 50: Site model

Source: Author



Fig 51: Main model

Source: Author



Fig 52: Main model

Source: Author

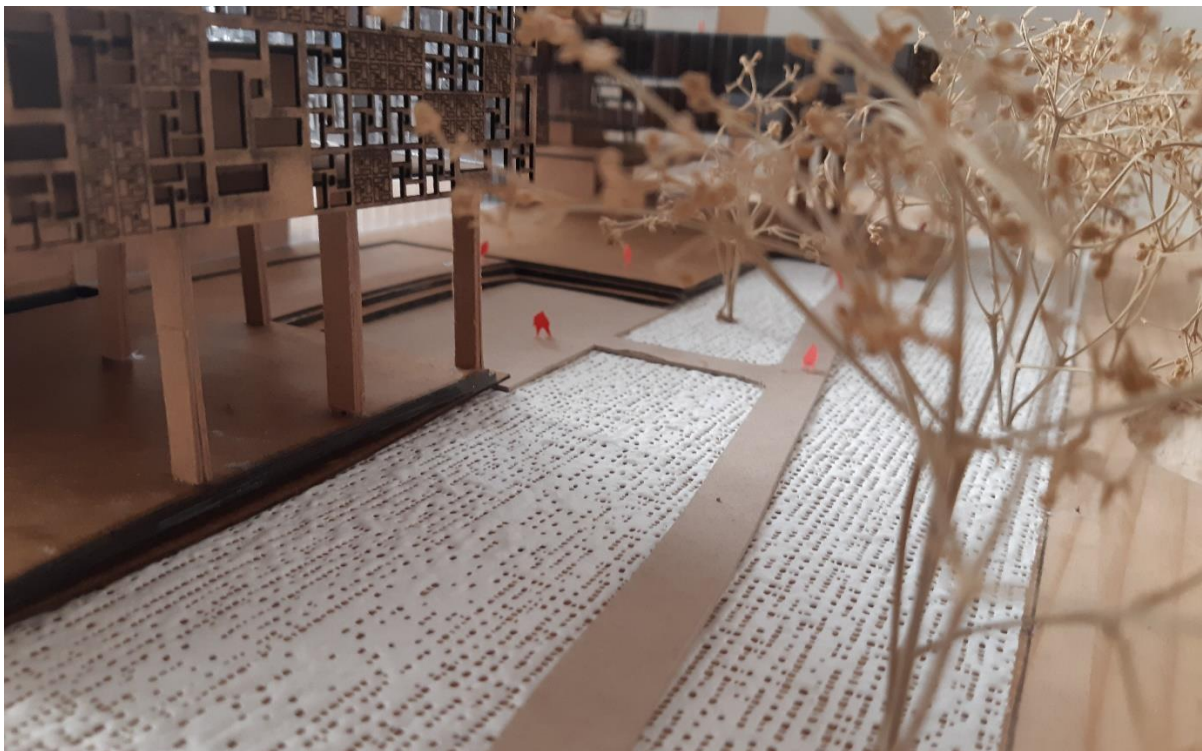


Fig 53: Main model

Source: Author



Fig 54: Main model

Source: Author



Fig 55: Main model

Source: Author



Fig 56: Main model

Source: Author

6.6 RENDER PHOTOS



Fig 57: main entrance of the library

Source: Author



Fig 58: west side of the library

Source: Author



Fig 59: residential (dormitory)

Source: Author

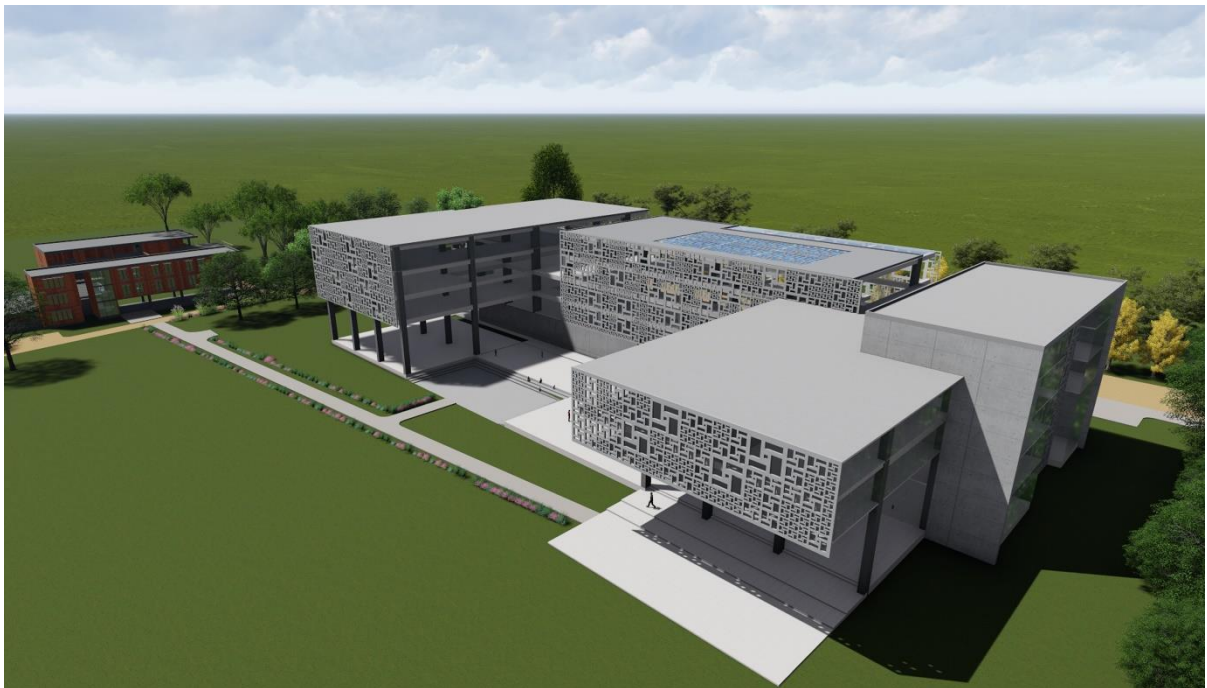


Fig 60: south-west vies of the library block, view of dormitory and residential building.

Source: Author

6.7 CONCLUSION

Khulna divisional government public library will become a space for people to commute and share their ideas and knowledge and they will also come to get enlightened from the information and data in the stored books and archives. It will become a major knowledge hub where people will come to take a break from their everyday lives in the natural green spaces created here and read books that they like and have a time that they can give themselves to be psychologically and physiologically balanced. Moreover, it will be a major social interaction place for Khulna where they can also get enlighten by the light of knowledge.

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