

HOUSING COMPLEX FOR GOVERNMENT EMPLOYEES

MIRPUR-6, DHAKA

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ARC 512 SEMINAR II

Submitted in partial fulfillment of the requirements

For the degree of Bachelor of Architecture

Department of Architecture

BRAC University

ABSTRACT

Government of Bangladesh provides housing to the people who work for the government. Rental housing facilities are given to all the public servants from higher officials to employees and they can avail these facilities until they reach retirement. For densely populated country like Bangladesh, housing is a crucial problem. Government Housing projects were built throughout Bangladesh to accommodate increasing number of employee. The demand for housing is still high which needs to be fulfilled. Government officers need to hire private house or flats with higher rate or hire sub standard homes. As a result, officers face financial and social problems. This problem often leads to inefficiency and health problems of the Government officers. Considering all these problems, Ministry of Housing and Public Works took the initiative of a housing project for the PWD officers, in Mirpur-6, Dhaka. The idea of this project was to introduce communal spaces inside the housing complex, to promote social interaction. Social interaction helps to build strong bond among people, hence build stronger community. This project aims to diminish the barrier between government housing and the surrounding neighborhood and merge them together forming a community.

ACKNOWLEDGEMENTS

Firstly I would like to thank **Almighty Allah** for everything that I have successfully achieved till now. God has already given me all the things that I had wished for and blessed me with wonderful family and friends. Without his blessing I wouldn't have achieved a single thing in life. Unconditional support of my family also helped and encouraged me during the hard times of my life. Next, I would like to thank my brother **Bayezid Baten** for all the support. Without the help of my family I would not be able to do anything in life.

I would also like to thank my university teachers for all the support throughout five years of academic curriculum. First and Foremost, I would like to thank Ar.**Sheikh Rubaiya Sultana**, who has always inspired and motivated me during my student life. Next set of appreciation goes to my course instructors, Ar. **Mohammed Habib Reza**, Ar. **Shams Monsoor Ghani**, Ar. **Iftexhar Ahmed**, Ar. **Huraira Zabin**, Ar. **Naim Ahmed Kibria**, Ar. **Sajid Bin Douza**, for all the support and guidance to complete the project.

This project would not have been possible without all my classmates and seniors and juniors. I would like to thank especially **Anika Tabassum**, **Tasnima Zahan**, **Ayesha Khalil**, **Nazia Rahman** for all the help and support.

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Chapter 1: Introduction

1.1 Background of the Project

1.2 Project Brief

1.3 Programs

1.4 Project Introduction

1.5 Aim and Objective

1.0 INTRODUCTION

1.1 Background of the Project

Dhaka has already started feeling the heat of an overcrowded populace. Like most of developing cities around the globe, Dhaka is a disorganized city. With time, urban living condition of Dhaka city is deteriorating. As Dhaka is the Capital and largest metropolitan cities of Bangladesh, every year lots of people from rural areas migrate to Dhaka city, in order to get proper house, employment facilities and other opportunities. In 1957 population of Dhaka city was about 0.5 million, whereas, the current population is about 16 million people. The abnormal increment of urban population is consequence of migration. It is assumed that, if the rate of migration remains like this, then Dhaka city will need around 120,000 dwelling units each year to accommodate the growing population.

Accommodation of Government officials is a crucial problem for densely populated cities like Dhaka. Development of housing and other related infrastructures is failing to match the pace of rapid growth of population. As a result, Government officers are compelled to hire flats or house at a higher rate. In most cases, it becomes difficult for them to afford, so they hire a substandard house. This results in tremendous financial and social problem for the officials. Government officers become frustrated and this in turn reduces the working efficiency of the officers. Proper house is also one of the basic human rights of a person. The quality of house and its environment has huge impact on human psychology. Housing not only refers to the physical structures such as, buildings and neighborhood buildings but also the surrounding setting.

Government has initiated many housing projects for the government servants, to meet the increasing demand of housing. All the Government employee can stay in these rental housing apartments until they reach retire (58 yrs of age). As Government job opportunities is increasing day by day, large number of people are moving to cities for better employments. Government employees and officers deserve better house to live. Dhaka city has scarcity of land and it is a crucial problem to accommodate these large numbers of people. Only Government has the ability to allocate lands for the employee and to start as well as maintain this huge budget project. In addition to that, it is also mentioned in the National Constitution of Bangladesh that, every Government servant must receive better housing proper housing and it the basic need of people. Government officers and employees often find it difficult do to afford better apartments with their limited amount of salary. Government housing is essential to provide them with better housing condition as well as this would bring solvency in their lives.

1.2 Project Brief

Proposed Programs

Name: of the Project: Housing Complex for Government Employees

Client: Ministry of Housing and Public Works

Site Location: PWD Wood Workshop Campus, Mirpur-6, Dhaka.

Site area: 10 acre

Cost of the project: BDT 779,000,0000

1.3 Programs

- 350 (1250sft) Residential flats
- 350 (1500sft) Residential flats
- School
- Community Centre
- Mosque
- Utility Building
- Security Guard's room

1.4 Project Introduction

In the National Constitution of Bangladesh it is stated that, Housing is the basic need of human and it the primary responsibility of the Government to ensure proper housing for people. Proper Housing does not mean only refer to the physical infrastructure, rather it also includes the social settings and surrounding environment. People respond quickly to their home environment and it affects their mental process and growth. The demand for housing is failing to cope with the increasing growth of population in Dhaka. Government has undertaken many housing projects for the employees. At present, Ministry of Housing and Public Works has total 11,678 dwelling units under its authority, for about one hundred fifteen thousand Government officers and employees in Dhaka city. One of the Housing projects is proposed in PWD wood workshop campus, Mirpur-6, Dhaka under the supervision of Public Works Department. The housing complex is for the PWD officers and employees, which will have total 1064 dwelling units. The

intention of the project is to create a housing complex which will provide a healthy environment and enhance social bonding between people.

1.5 Aims and Objectives of the Project

Most of the Government Housing Complexes lack open spaces and any other community facilities. Monotonous looking apartment buildings do not allow proper ventilation and deprive the residents of proper breathing space. Social interaction between people is very important for healthy growth of human mind. Often it is seen that, housing project does not allow any provision for communal and recreational activities. Architecture has the ability to turn the world like our dreams, by creating beautiful spaces. The foremost objective of this project is to provide good quality residential accommodation for the Government employee. Most often it is found that Government lands are kept unused. As a result, this project also aims to increase the government income revenue by making proper utilization of the unused land. Better housing is essential for proper mental and physical growth of a human being. Finally, this project also intends to allow suitable and healthy accommodation for the employee. This will help to achieve improved service from the Government employees.

Chapter 02: Literature Review

2.1 Understanding Housing

2.1.1 Understanding and Definition

2.1.2 Housing and Home

2.2 History of Government Housing

2.3 Significance of Government housing

2.3.1 Understanding the importance of Government Housing

2.3.2 Need for Shelter

2.3.3 Housing as the basic human right for citizen

2.4 Standard Rules of Government Housing in Bangladesh

2.4.1 Distribution system of Public Housing

2.4.2 Public Housing space standards

2.5 Current trend of Housing Complex

2.5.1 Current trend of housing around the world

2.5.2 Present Condition of housing in Bangladesh

2.6 Consequences of Poor Housing on health

2.7 Features of Housing

2.7.1 Communal Spaces in Housing complexes

2.7.2 Ventilation and Housing

2.7.3 Lighting and Housing

2.0 LITERATURE REVIEW

2.1 Understanding 'Housing'

2.1.1 Understanding and Definition

Housing refers to any type of physical structure or enclosure that protects or shelters any person or animal that resides inside it. Housing complexes are the collective arrangement of houses and apartments, where groups of people live together forming a community. This certain group of people share similar facilities and form a strong social bonding among them. Adequate housing should have the security of tenure, sense of security and protection from the natural elements, all the necessary utility services such as, drinking water, sanitation and other services, along with these, it needs to be affordable and accessible. According to the National Housing Policy of Bangladesh 1993, Housing is one of the three basic rights of people. Housing gives security, shelter and also a sense of ownership.

2.1.2. Housing and Home

"A house is a Home, when it shelters the body and comforts the soul."- Phillip Moffitt

A house is a place or building where people stay. House could be anything, a hotel room, where people stay for a short period of time. It is not permanent; it's something people build for just a time being. House is simply a structure which is used as a residence or where people can take shelter, whereas, home is something completely different. Home is a place where people get emotionally attached and makes many

memories. It is a place which people create for themselves. Home creates the sense of comfort, security and happiness.

People might leave the place but their soul always resides inside home. It creates a notion of belongingness. It is said that, a house in which nobody lives is nobody's home. Once people start to live inside a house, special environment is created inside which turns the house into a home. (Shaw, 2003) stated that a home also brings ontological security, i.e. the notion of being secure and in control. Ontological security can be gained if the following conditions can be fulfilled.

- Home must be a place which is permanent. Material must be strong enough as well the social environment. People must feel secure and does not have any fear of losing it.
- Ontological Security can also be felt when a person who resides inside the home, can perform his/her daily activities. People must feel comfortable while doing all the daily chores.
- Home must be a place, where people have control of their own lives. People must feel free from any surveillance and does not need to ask for permission to anyone for performing any task.
- Home must have a secure base. There must not be any fear of eviction or legal issues.

The environment inside home affects the mental health and human psychology of a people who resides inside it. Comfortable environment inside a home is necessary as it helps to shape human behavior. Quality of housing and the social environment outside

is also an important factor to consider for building a peaceful environment inside a home. A peaceful home can give people the experience of heaven on earth.

2.2 History of Government Housing

Government of Bangladesh provides housing to the government employees and officers. These housings are given to them as rent and they can stay in these houses until they reach the age of retirement. The concept of rental residential complexes started before the partition of India and Bangladesh, in the colonial past of India. In 1911, the importance of housing all the employees was felt immensely, when the capital shifted from Calcutta to Delhi. British wanted all their industries to be operated by their people and under their supervision (Saqib, 2000). Under British era, there used to be bungalows for higher officials and barracks were allocated for employees. In 1947, many from people from India started to migrate after partition. Scarcity of housing was felt as the sudden increase in population was significantly higher in comparison to the development of housing. As a result, the Pakistan Public Works Department (PWD) built the Motijheel colony in Dhaka and the Agrabad colony in Chittagong, for the Government employees of the central Government. Later, the local Country Government established the Azimpur Colony and Eskaton Garden Governmental Housing in Dhaka city. In current time, Ministry of Housing and Public Works has total 11,678 residential units under its jurisdiction. These dwelling units have the capacity to accommodate around one hundred and fifteen thousand government officials and employees in Dhaka city (Afroza, 2000). In Dhaka city, although lots of Residential complexes already exist for the Government officials and employees, still it is not

sufficient enough to accommodate the increasing number of population. This abrupt increment in population is the consequence of migration from other cities to Dhaka city.

2.3 Significance of Government housing

2.3.1 Understanding the importance of Government Housing

Dhaka is the largest metropolitan cities of Bangladesh. Dhaka has seen drastic increase in population over years. Rapid urbanization in Dhaka is a critical problem in recent years. Most of the Dhaka city became dense packed with less open space for breathing. Housing became a huge problem for the rapid urbanization of Dhaka city. The development of housing was unable to meet the rate of rapid increment in population. It was estimated in 1991 that, about 40% of the total urban population lives in Dhaka city. In 1957, the population of Dhaka was only 0.5 million to nearly about 7.0 million in 1991. It was estimated that within 2000, Dhaka would have to accommodate around 10-16 million people. According to UNFPA's world population report, Dhaka was told to be one of the world's 20 megacities having a population over 10 million. It was estimated by some authorities that, the housing requirement of Dhaka city was about 45,000-83,000, whereas with a year, all private and public sector can only produce 25000 housing altogether.

Urban centre	1980 Population (Millions)	1980 Household (000's)	2000 Population (Millions)	2000 Household (000's)	1980-2000 New Housing req (000's)
Dhaka	3.5	515	9.3	1691	1176
Chittagong	1.43	220	4.0	727	507
Khulna	0.70	108	2.4	418	310

Table 2.3.1: Population growth of urban areas and new housing requirements (1980-2000).
Source: (Mamun Rashid)

The table shows, how the housing requirements in different metropolitan cities varied during 1980-2000. Rapid urbanization in Dhaka demands higher housing requirement in comparison to other cities.

2.3.2 Need for Shelter

The rapid increase in urban population is the result of migration. People shifts from the periphery to the centre, with many aspirations and dreams. Among all the South and South-East Asian countries, Bangladesh has the most rapid growth rate of urban population. In late 1960's the annual growth rate of urban population in Bangladesh was around 6%, whereas, it was 4% for India and 4.8% for Thailand.

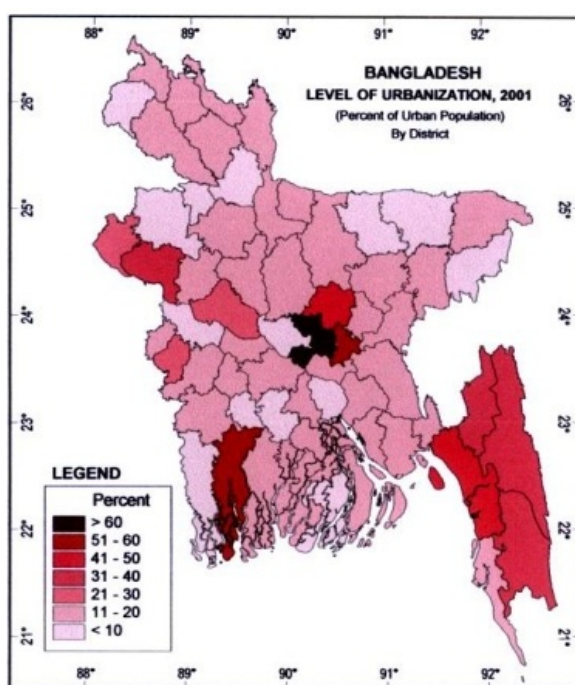


Figure 2.3.1: Level of urbanization of different cities in Bangladesh, 2001.
Source (Nazrul Islam)

Although migration to urban areas started in the post British period, drastic change in the rate was felt after independence in 1971. According to the figure, Dhaka is the most populated and urbanized city among all the cities. In addition to that, other cities like,

Narayanganj, Chittagong and Khulna are the most urbanized cities (Islam, 2015). Migrants are attracted mostly towards the bigger cities. In 1961-74, total number of migration was around 2,400,000. The migration rate was 6 times less in 1951-61.

People shifts from rural areas to urban areas with hopes of getting better lifestyle. Migration to urban cities depends on factors such as distance, cost and ease of travel and also depends on the economic condition of the city. There might be many reasons for migration to the urban cities:

- Most of the migrants move to the cities in for better employment opportunities. Employment in bigger cities also provides higher social status in comparison to rural areas. In rural areas, most of the people are involved in agricultural activities. Most often, due to lack of ownership of the land people need to stop the agricultural activities. Now a day, people in rural areas started to shift from agricultural activity to other ways of employment such as trading, commercial activities, services, etc. Bigger cities offer varieties of other professions and better salary in comparison to rural areas.
- Natural calamities and disasters (floods, cyclones, etc) forces people in rural areas to move to urban areas. Most people loses their house, land, livelihood, etc. these people move to cities for better facilities and to escape from poverty. People from coastal areas of Bangladesh are prone to natural disasters and migrate to urban areas. In most cases, people who used to work in rural areas become the new migrants.
- In most cases people migrate to urban areas for better facilities. Bigger cities provide better educational, socio-cultural, health and other facilities. People from

rural migrate in order to avail these services. Educated middle class people shifts to bigger cities for better lifestyle. People can get better education, health care facilities, services, etc.

Migration to urban areas has many impacts. In most cases, size of the city also determines the proportion of growth of population because of migration. One of the most important impacts is the rapid growth rate of urbanization in metropolitan cities of Bangladesh. Moreover, it also affects the economic and social fabric of the cities. Change in economic fabric can be easily traced by evaluating different economic indicators before and after migration (Isalm, 2015). In most cases, the indicators are the level of employment, industrial growth, capital accumulation and savings. Migration to urban cities also alters the social fabric of the city, as, people from different cities and origin settles in a different city with different origin and culture. In the whole, migration to the urban areas disrupts the balance between rural and urban areas, as a result, linkage between them changes.

2.3.3 Housing as the basic human right for citizen

Housing is one of the most important basic human rights of a person. Every single person need an adequate housing to live in order to get shelter and protection from natural calamities. Housing does not mean only a roof or shading to take shelter inside, rather it means a standard place of living. The place must have all the facilities and minimum comfort, needed for a standard way of living. Housing right is also considered as an important fundament right according to many international and national human right instruments.

- **Article 25 [1] of the Universal Declaration of Human Rights:**
Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control. (Rahman, 2010)

- **Global Strategy for Shelter for the year 2000:**
The General Assembly Resolution 43/181 of 20 December, 1998 on Global Strategy for Shelter for the year 2000 stated, all citizens of all states, poor as they may be, have a right to expect their Government to be concerned about their shelter needs, and to accept a fundamental obligation to protect and improve houses and their neighborhoods, rather than damage or destroy them. (Rahman, 2010)

Housing is also considered as an important issue in national constitution of Bangladesh. The Constitution of the People's Republic of Bangladesh states in Article 15 [a] that, it is the fundamental duty of the government to ensure the basic necessities of life, clothing, food, education, medical care and shelter of the citizen. (Rahman, 2010)

In article 11 it is mentioned that, "the republic shall be a democracy in which fundamental human rights and freedoms and respect for the dignity and worth of the human person shall be guaranteed..."(Rahman, 2010)

According to the National Housing Policy of Bangladesh 1993, housing is considered as one of the basic needs of people along with food and clothing. Housing gives shelter, safety and sense of ownership.

Paragraph 5.7.1 of the Policy which states: "The government would take steps to avoid forcible relocations or displacement of slum Dwellers as far as possible.....encourage in situ upgrading, slum renovation and progressive housing developments with conferment of occupancy rights, wherever possible and to undertake relocation with community involvement for clearance of priority sites in public interest." (Rahman, 2010)

2.4 Standard Rules of Government Housing in Bangladesh

2.4.1 Distribution system of Public Housing

Public housing means any dwelling or residential buildings, owned by the government and given as a rent to the government servants. In the past 40 years more than 10% of all the housing developments in urban areas were carried out by the public sector (Afroza, 2000). In public sector, Government is working since the colonial period to provide housing for the government officers and employees.

Most of the Government housing activities are carried out by Ministry of Housing and Public Works, different departments such as, Department of Architecture, Public Works Department (PWD), Housing and Settlement Directorate (HSD) and City Development Authority such as, Rajdhani Unnayn Kartripakkhya (RajUK), Urban Development Directorate (UDD) etc.

Government has allocated land in different areas of Bangladesh and different types of housing projects are carried out in that plots. These Government apartment complexes

are usually kept separated from rest of the city by a boundary. In these Complexes there are separate schools, medical centre, mosque, utility services and any other facilities need for a proper housing. Government servants form a small community of their own inside that small portion of land, separate from the city. Officers and employees are provided with the readymade dwelling units, independent houses or even duplex housing units. Different types of housing are categorized according to the salary and power of the officials and employees.

In return of the dwelling units, employees need to pay 7.5% of their salary every month. The supply of housing and land is less in comparison to the number of government servants. As a result, those who does not get housing unit, receives about 30-35% of their salary every month as housing costs. These housing units are only available to the government servant only during their working period. Officers and employees have to empty the dwelling units after the age of retirement, which is 58 years.

2.4.2 Public Housing space standards

Depending on the salary and designations, government servants are provided with different types of apartment flats and flat size also varies. Most often there is segregation between class of officers and employees, i.e. separate buildings are allocated for officers and separate apartments for employees. In 1969, WPI Ministry published a guide on residential and office space standards for Government officers and employees (Afroza, 2000).

Category of officers and employees	Allot able floor area in square feet	Types Categories of flat
Secretary	4000 3000	Bungalow Bungalow
Class I	1750 1500 1300	'F' Type 'E' Type 'D' Type
Class II	840	'C' Type
Class III	612	'B' Type
Class IV	519	'C' Type

Table 2.4.1: Residential Space Standard for Government Officers and Employees, 1969.
Source (Selina Afroza)

In 1971, after independence, new industries started to build up and Government activities became more active. As a result, immediate need was felt to accommodate huge number of Government servants. In 1982, Residential space standards were revised again. Space standards were formulated in 6 different residential units for 21 National Pay Scale. Further modifications were done later. In 1992, Ministry of works published housing entitlements in the form of a gazette notification.

Category of officers and employees	Pay Scale (Taka)	Allot able floor area in square feet	Entitlement
Class I	8000 and above	1800 + 200 for garage	Superior Type
	7100-7999	1500	'F' Type
	5500-7099	1250	'E' Type
	2850-5499	1000	'D' Type
Class II & III	1225-2849	800	'C' Type
	1125-1725	600	'D' Type
Class IV	1050-1915	500	'A' Type

Table 2.4.2: Residential Space Standard for Government Officers and Employees, 1992.
Source (Selina Afroza)

Table 2 shows that how the allotted floor area changed with the change in entitlement. As there is shortage of land, Government reduced the flat size to accommodate more

government servants. In table 1, 3000-4000sft (Bungalow) is reduced to 1800sft flat size. Later, Department of Architecture Bangladesh has proposed new residential space standard for different categories of Government servants. These space standards are followed where ever new construction were done.



Figure 2.4.1: "E" Type Old Building in Region D at Azimpur Governmental Housing Area.
Source (Selina Afroza)

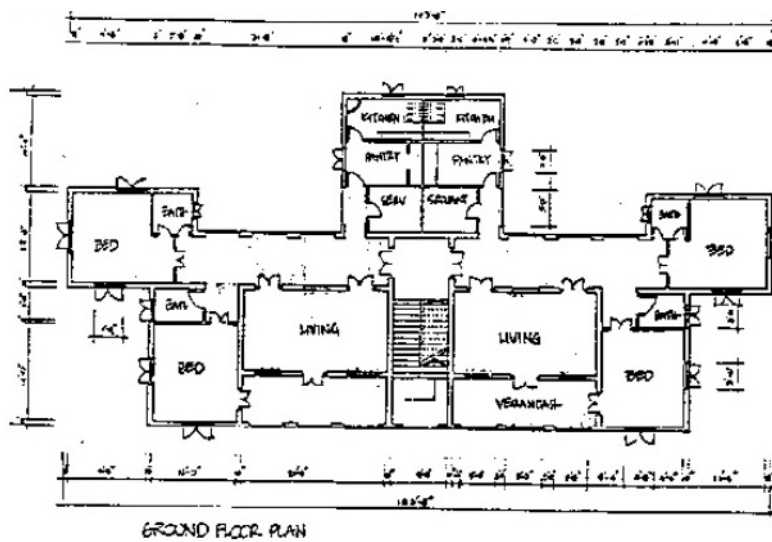


Figure 2.4.2: 1531 sq ft / Unit 'E' Type Flats in the Old Building at Azimpur Governmental Housing.
Source (Selina Afroza)

2.5 Current trend of Housing Complex

2.5.1 Current trend of housing around the world

Housing complex is the collective arrangement of all the essential amenities and residential apartments. A housing complex must have all the facilities that would make a place feel like home. Proper housing complex must have proper breathing space, enough parking facilities, recreational facilities, safety and security facility, open spaces and playground. According to the Hongkong Planning Standard and Guideline (2006), a housing complex must have a Community Hall, Shopping Mall, Ambulance Facility, Child Day Care Facility, School, Library, Elderly Community, Water Sprinkles and other essential amenities (Hongkong Planning Standard and Guideline, 2006). One of the most essential aspects of Housing complex is to provide provision for emergency vehicles such as fire trucks and ambulances. Along with that buildings must have all the safe precautions and fire detection facilities.

The complexes must be convenient for all types of people, as people from various age group, culture, social and economic status are going to live in the community. Community spaces and Residential buildings must be accessible to all types of people from kids to old people, as well as the physically handicapped people. These places must be close enough and alterative provision must be provided such as specially designed elevators and ramps. Spaces should be spacious enough to allow easier movement for the physically handicapped people. Community spaces are needed for elderly people, as they are going to spend most of the time in the complex. In addition to that, Daycare facility is essential to take good care of kids. Community spaces or multipurpose hall should be provided for meeting or any other functions.

Open space inside a complex is one the essential factors to consider. Open space is needed for better air flow. Residential buildings should have open terraces and balconies to allow spaces for breathing. Complexes must have enough trees and playground to allow playing spaces for kids. Recreational facilities are needed for proper mental and psychological growth of human. Considering the needs of teenage age group, communal spaces such as, swimming pool, gym, etc can be provided.

Housing Complexes around the world are more concerned about sustainable and eco friendly construction. Any type of construction must not pose any type off threat to the environment and residents. Sustainable environment can be created by placing solar panels. This would help to reduce electricity consumption and save energy. In addition to that, eco friendly building materials must be chosen. Rain water harvesting can be done to reduce energy consumption as well. This saved water can be used for daily activities, sprinklers, swimming pools, etc. Along with that, vertical gardens can be created as well. This would help to reduce heat, which in turn reduce energy consumption.



Figure 2.5.1: Vertical Garden in a Residential Building (Source: <http://www.ecofriendlyhouses.net/skyscaper-forest.html>)

Efficient use to space is also necessary. Some of the amenities can be grouped together to avoid wastage of space. Spaces must have optimum space standard for easy movement. Moreover, Recycling of material can even promote the concept of sustainability inside a complex.

2.5.2 Present Condition of housing in Bangladesh

Housing is one of the critical issues for rapidly growing city like Dhaka. Population of Dhaka is growing at a higher rate and accommodates about 600,000 people per year. 65% population of Dhaka is due to migration. According to RAJUK, population of Dhaka is estimated to grow from 15 million to 26 million by 2035. Since 2006, around 95% of the new structures built were of single storey and about 3% structures were of two storeys and above (RAJUK, 2006). In consideration of scarcity of available land, construction had to grow vertically. Most of the areas in Dhaka city are used for residential purposes. To accommodate huge number of population apartment buildings are being built recklessly. Buildings are being constructed without any consideration of environment and health condition of residents. Not enough separation gaps are provided in between two or more apartment buildings. In most cases, constructions are done illegally, without following any rules from the government and RAJUK. The consequence is that, densely packed environment are created with no breathing space. In private sector, Developers and Real estate companies design apartment flats, without any consideration of quality of space, health factors, and psychology of residents.



Figure 5.1.2: Existing Scenario of Housing in Dhaka city. Source (Source: Flickr/Sandeep Menon)

Residential buildings have taken over most of the open spaces in Dhaka city. Green spaces are rare to find even. However, people can find few trees peeking behind the concrete structure, in some areas of Dhaka city. If someone views Dhaka from top, he/she will find composition of concrete squares with few green trees adjacent to them. The proportion of open space and trees are less in comparison to buildings.



Figure 2.5.3: NAM Village, Housing Complex for Government Officers.
Source (<http://www.panoramio.com/photo/20230989>)

The housing conditions in Public housing complexes are not any different. Government allocates small area of land for the officers and employees. As, the number of government servant is comparatively high in comparison to the availability of land, public housing also goes for compact design. In most cases, a design prototype is created and it is clone stamped around the complex, without any consideration of site and context. Visually these projects are densely packed clusters of concrete structures.

In most cases, these groups of concrete structures, lack adequate amount of open space, recreational spaces and green. As a result, most apartment flats lack proper ventilation and the residents are deprived from breathing spaces. Monotonously looking apartment buildings also lacks space quality inside the dwelling units. Residential flats do not have provision for adequate light and ventilation. Good healthy environment is necessary for maintaining a. Good housing is one of the most important factors to make Dhaka an affordable, sustainable, livable and equitable city.

2.6 Consequences of Poor Housing on health

People spend most of the time in their home during a day. Condition of a house directly affects the health and psychology of people. Most important factor that is to be considered is the temperature and humidity inside the house. In a poor housing, the absence of adequate ventilation can alter the temperature and humidity of a house, which in turn can cause dampness and can lower the temperature. In both cases, it can give rise to hydrothermal conditions. Insufficient ventilation can cause dampness, which in turn can give rise to growth of fungi, mold and other micro-organisms. Symptoms

such as wheezing, aches, pain, diarrhea, headache, fever, etc were found to occur because of dampness. In case of small children, dampness can even result to pneumonia. In a study it was found that, people staying in damp housing are the sufferer from asthma (Shaw, 2003).



Figure 2.6.1: Dampness in wall. Source (<http://www.risingdamp.co.uk>)

2.7 Features of Housing

2.7.1 Communal Spaces in Housing complexes

Architecture has the power to inflect social bonds, promote new social bonds and helps to create stronger community. Social activities are the soul and Architecture is the body that contains the soul inside. Society, culture and architecture are closely linked together. These 3 factors are the important part for a housing complex (Mahdavinejad, Mahdavinejad, Ghaedi, 2012). A residential complex consists of many apartment buildings and other functional buildings. People living in a housing complex form a community and becomes emotionally attached among them. A person cannot live isolate and away from others. A person interacts with their neighbors and family members and becomes mutually independent on each other. Communal spaces

facilitate strong linkage between people, by creating a place where people as they can gather and spend time together.

In present time, most residential complexes lack proper gathering spaces. The consequence is that, people stay indoors to pass their leisure time. Most common way of passing leisure time is to watch television or play video games. For lack of open space children cannot even play. With the consideration of safety issues, parents do not allow their kids to play in grounds. Physical activity and fresh air is required for proper mental health and psychology. In most cases, it was found that lack of physical activity causes many health diseases such as cardiovascular disease, obesity, breathing problem and this also reduces stamina. Most alarming consequence of nation's sedentary lifestyle is that, it might lead to destruction of social linkage among neighbors. In recent time it is seen that, people in a dwelling unit does not even know about who their neighbors. People from different culture lives inside a residential complex. Interacting with others help to learn about other culture, creates strong bond between them, which in turn help to build a stronger community.

Communal spaces refer to any space that is shared by the people of the same community. Communal spaces should be designed in such a way that they must be accessible to everyone in the community. In addition to that, it must not compromise the safety factor of the residents. It often becomes the medium for learning new things and support. In a housing complex, Communal spaces can be of many types.

- Communal space in the form of open space. This open space can be used as recreational space or other facilities for the enjoyment of community people.

Open spaces are even necessary for the proper ventilation and sunlight. Enough amount of open spaces in between apartment buildings allow sufficient amount of air to enter into the flats. In addition to that, open space also allows provision for sufficient amount of daylight to enter inside the dwelling units. Not necessarily open spaces needs to be on the ground. It can be either in between residential flats or on the podium. Community people can gather and enjoy among them. Open spaces can also be used to conserve the natural environment and for visual purposes. Plantation of lots of trees would help to create a healthy environment, which in turn would help to create a healthy community.

- Recreational spaces are another form of communal spaces. Recreational spaces can be either in outdoor spaces or inside the building complexes. Recreational spaces are purposely built spaces inside the building which contains all the facilities for recreational purpose. In case of outdoor space, all the recreational facilities are provided outdoors.
- Communal spaces can also be in the form of passive open spaces. Spaces which have parks, gardens, sitting-out areas, waterfront promenades, playground for children, spaces for jogging and fitness, etc, and people can enjoy in these spaces in their leisure time. Any types of other facilities are not installed in these spaces. People in the community can gather in these spaces and interact with each other.

Communal spaces should be located in a right and convenient place inside a residential complex. It should be at a suitable distance so that every individual can reach the space easily. Safety issues need to consider while designing these spaces (Mashayekhi,

Mahdavinejad, Shishavan, 2012). In case of recreational spaces, noise must be controlled. Children's play area should be confined for supervision by parents. In case of disable and elderly people, special treatments must be provided. Facilities such as emergency phones, handicapped facilities, visual free walking area, ramps with handrails along with steps, adequate lighting, etc needs to provided for convenience of physically challenged people. Architecture has the ability to turn our dreams into reality. Regardless of the economic and social condition of people everyone has a house or a shelter, where they can stay. A comfortable environment and social context is what needed for a home. A communal space has the ability to create healthy environment which can turn a house into a home.



Figure 2.7.1: Communal space inside a residential complex (source: <http://www.asiaone.com/static/travel/Punggol-HDB.jpg>)

2.7.2 Ventilation and Housing

Ventilation of building helps to improve the air quality inside a building and thus maintains a comfortable environment indoor. Natural ventilation removes the used air inside and replaces them with fresh air from outdoors. Ventilation affects the comfort

level of users, i.e. the thermal comfort level. Thermal comfort is defined as the condition of mind which expresses satisfaction with the thermal environment and is assessed by subjective evaluation. Due to higher population density in Dhaka, buildings are being built at a greater rate. Most of the buildings in Dhaka city do not have sufficient open spaces for proper ventilation. This gave result to densely packed environment which is not healthy and creates discomfort to users. This densely packed environment is the consequence of improper building arrangement.

Residential buildings must have enough open space in between them, so that sufficient amount of air can pass through.(Islam, 2013) found out that residential buildings that allow maximum open space and maximum height have ample amount of ventilation in top floors as well as in bottom floors. In apartment flats, sufficient amount of opening is also an important factor. In addition to that, the openings orient in proper direction in order to get ample amount of ventilation. Lack of open space inside a housing complex reduces the access of natural air inside. This might result in breathing problems and other health problems of the residents. Moreover, insufficient ventilation also causes dampness, condensation and other problems inside the apartment. Apart from health problems, these might even causes psychological and mental health problems such as, anxiety, depression, etc.

Ventilation is one of the most important factors for a housing complex. There are different types of rules and regulations were made by the government and these sets of rules need to be followed while constructing any housing. Rajdhani Unnayn

Kartripakkhya (RAJUK) makes sure that every apartment complexes follows the rule set by Building Construction Act.

- Building Construction Act 1998, there was no mention of FAR (floor height ratio). Set back guided layout was mentioned. Different plot sizes were allocated different setback rules. For residential buildings with sites greater than 5 katha, the rear setback was 3m and side setback was 1.25m. Grid Iron pattern is created which creates dense environment with less open space. As a result of setbacks, narrow strips of land are often created. This unused space affects the ventilation inside the buildings by creating funneling effect.
- The key feature of Construction Act, 2013 was the introduction of FAR (floor area ratio). The FAR value is different for different types of plot size. According to this new change in Construction Act, height of the building can be increased following the ratio but certain amount of plot should be kept open in the ground floor. For areas near airport, the height must be limited according to the requirements of Civil Aviation Authority or City or area development authority or any other agencies of Government. For residential buildings minimum 30% land must be kept open. In case of larger plot size over 268 meter square having detached apartment buildings and height of 33m or 10 storey, minimum separation distance from the plot for frontage is 4m, for rear it is 6m and for side it is 4m.

Ventilation is essential for exchange of air inside, to create a thermal comfort inside the house. Proper ventilation can reduce breathing problems and other health problems.

Proper ventilation would create comfortable environment inside. Comfortable environment can make a house into a home.

2.7.3 Lighting and Housing

Natural light is one of the most important factors of housing. Day light affects the body and mind of human being. Sunlight can also ensure thermal comfort for the residents in winter, as well as sunlight can also heat the apartment. The amount of sunlight which enters the building can be controlled easily by altering the opening size and the material of the opening. Orientation of the opening is one of the factors to consider for allowing controlled amount of light to enter. Amount of sunlight can be optimized by maximizing the ceiling height of the apartment and minimizing the apartment depth. In addition to that, separation gap between buildings is also important factor to consider. In case of Housing complex, the adjacent buildings must be placed far enough to allow sufficient amount of light to enter. In most cases, North facing residential units receives more sunlight, rather than the south facing units.

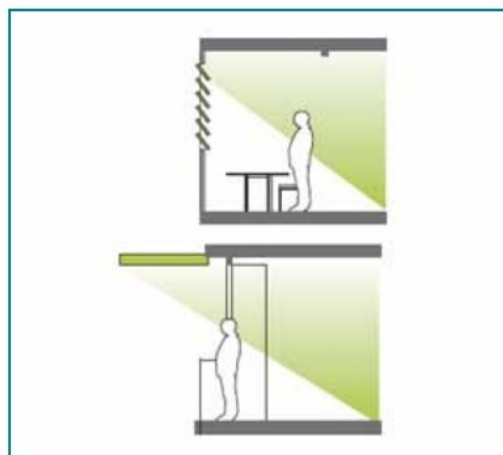


Figure 2.7.2: North facing opening (Source: Richard Wynne)

In Residential Apartments, all the rooms must be oriented properly to allow sufficient amount of daylight. As the sun rises in the east and sets in the west, rooms which need early morning light, such as, bedrooms, kitchen, should be located in east direction. On the other hand, rooms that are mostly used during evening such as living rooms can be placed towards south or west direction (Phillips, 2004). Sunlight might cause glare and this can be reduced by using the technique of glazing, which cut down the transmission of sunlight.

Opening does not only refer to window, rather it also includes, atrium and skylight. Skylight means which allows light to enter from top and protects the interior from nature. Skylight can be used in a Community space or living space inside an apartment. Atrium also allows daylight to enter and restricts wind and rain. Atrium can be used for large communal space.



Figure 2.7.3: Skylight (Source: <http://newcastlehometimberhardware.com.au>)

Chapter 03: SITE APPRAISAL

3.1 Background of the Site

3.1.1 Geographical

3.1.2 Socio-Cultural

3.1.3 Climatic

3.1.4 Historical

3.2 Site at a glance

3.2.1 Location of the Site

3.2.2 Site Analysis

3.3 Site Images

3.4 SWOT Analysis

3.0 SITE APPRAISAL

3.1 Background of the Site

3.1.1 Geographical

Mirpur is located at the North-East side of Dhaka city. It is situated between 23°46' and 23°48' north latitudes and in between 90°20' and 90°22' east longitudes. Mirpur consists of one union parishod, eight wards, 17 mouzas and 20 villages. Mirpur covers a total area of 58.66 square kilometers (22.65 sq mi). Mirpur thana is surrounded by many other thanas like Pallabi and Kafrul thana on the east side, Sher-e-Bangla and Darus Salam thana on the south, Shah Ali and Darus Salam thana on the west and in the north side there is Shah Ali and Pallabi thana. The thana has a flat land which is close to the sea level. In addition to that, the soil is moist and allows tropical vegetation. Mirpur thana is prone to flood in monsoon season, owing to cyclone and rainfall.

3.1.2 Socio-Cultural

Mirpur thana has a total population of 274530 people, which includes 148723 male and 125807 female. Among the total population there are 265803 Muslims, 5084 Hindus, 3309 Buddhist, 292 Christian and 42 people of other religion. The literacy rate is 68.90%. The thana population is composed of people from various districts of Bangladesh.. The national language, Bengali is mostly used among the people. Certain regional languages like Chittagonian and Sylheti are also commonly used among in certain areas of Mirpur.

Mirpur is famous for many historical places and recreational spaces. Dhaka Zoo, National Botanical Garden, Sher-e-Bangla National Cricket Stadium are one of the main attractions of the Mirpur thana, and these are also at close proximity to the site. In addition to that, many important cultural organization, commercial offices, educational institutes are located in this area.

Dhaka city is full of vibrant cultures. One of the famous celebrations is Pohela Boishak. People around the City gathers at important public locations like Ramna park, Dhaka University Campus, etc, wearing traditional clothes and celebrate. Other annual celebrations like Independence Day, Victory Day and Language Martyr's Day are also celebrated prominently across the city. Hindu religious festivals like Durga Puja, most important festivals for Hindu religion, are celebrated hugely in the city. In addition to that, Eid-ul-Fitr and Eid-ul-Adha, important Muslim festivals are celebrated here nicely.

3.1.3 Climatic

Dhaka has a hot, wet and humid tropical climate. Annual average temperature stays at 27°C (81°F), which varies monthly between 19.5°C (67°F) in January and 32°C (90°F) in May.

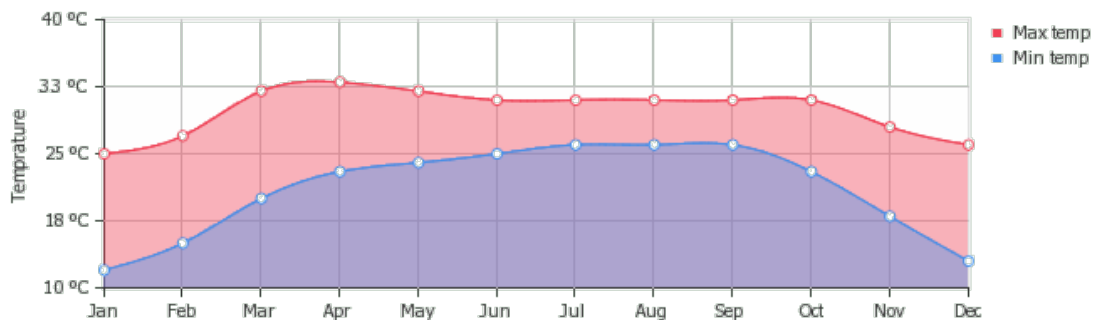


Figure 3.1.1: Average Min and Max temperature in Dhaka city. Source: (<https://weather-and-climate.com>)

January is the coldest month, whereas May is the warmest month of the year.

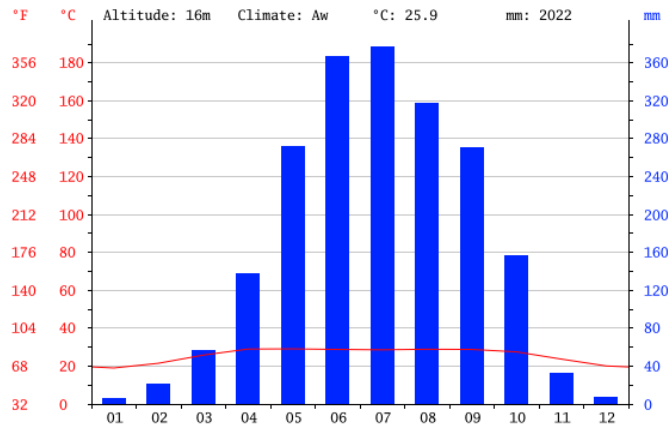


Figure 3.1.2: Climate graph. Source (<http://en.climate-data.org>)

January is the driest month of the year. About 6mm precipitation occurs in this month. Most precipitation occurs in July, averaging 377mm.

month	1	2	3	4	5	6	7	8	9	10	11	12
mm	6	21	57	138	272	367	377	317	271	157	32	7
°C	19.0	21.5	25.8	29.0	29.1	28.8	28.6	28.9	28.8	27.5	23.7	20.1
°C (min)	12.2	14.7	19.3	23.5	24.8	25.9	26.1	26.2	25.9	23.8	18.4	13.7
°C (max)	25.8	28.4	32.3	34.5	33.4	31.8	31.2	31.6	31.7	31.3	29.1	26.5
°F	66.2	70.7	78.4	84.2	84.4	83.8	83.5	84.0	83.8	81.5	74.7	68.2
°F (min)	54.0	58.5	66.7	74.3	76.6	78.6	79.0	79.2	78.6	74.8	65.1	56.7
°F (max)	78.4	83.1	90.1	94.1	92.1	89.2	88.2	88.9	89.1	88.3	84.4	79.7

Figure 3.1.3: Climate graph. Source (<http://en.climate-data.org>)

Throughout the year, between the driest and the wettest month precipitation varies by 371mm, whereas, temperature varies by 10.1 °C.

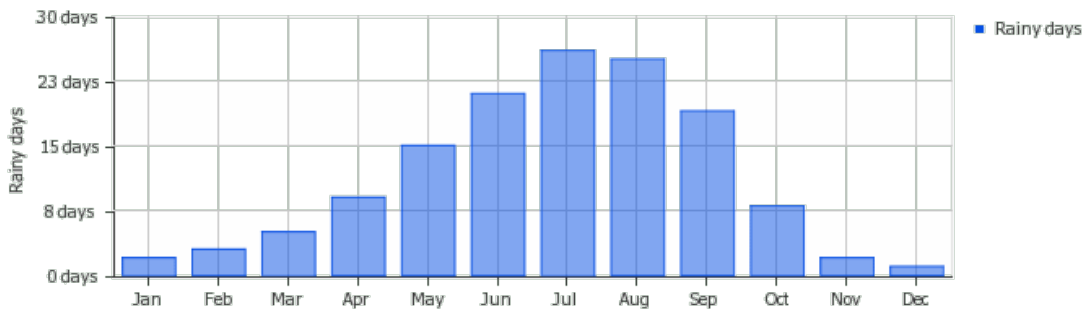


Figure 3.1.4: Average Rainy days (Rain/Snow) in Dhaka city. Source: (<https://weather-and-climate.com>)

Annual average rainfall 2,123 millimeters (83.5 in) occurs between May and October.

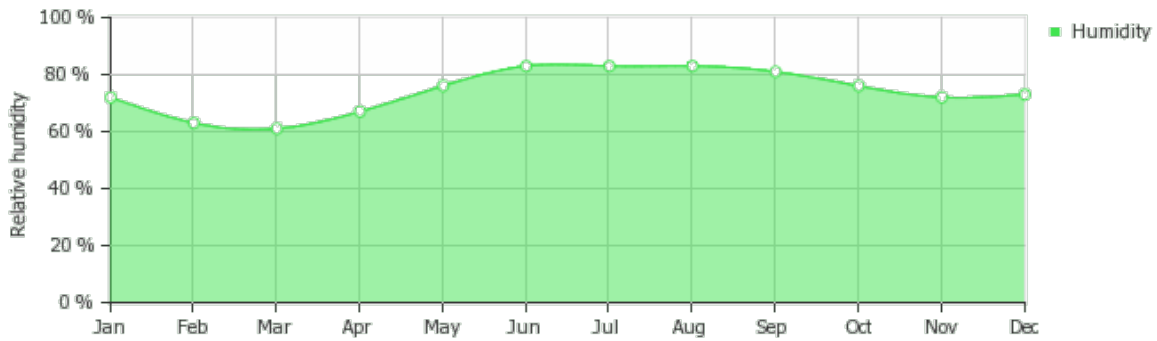


Figure 3.1.5: Average Relative Humidity in Dhaka city. Source: (<https://weather-and-climate.com>)

Throughout the year, June to August is the most humid month, with 80% relative humidity.

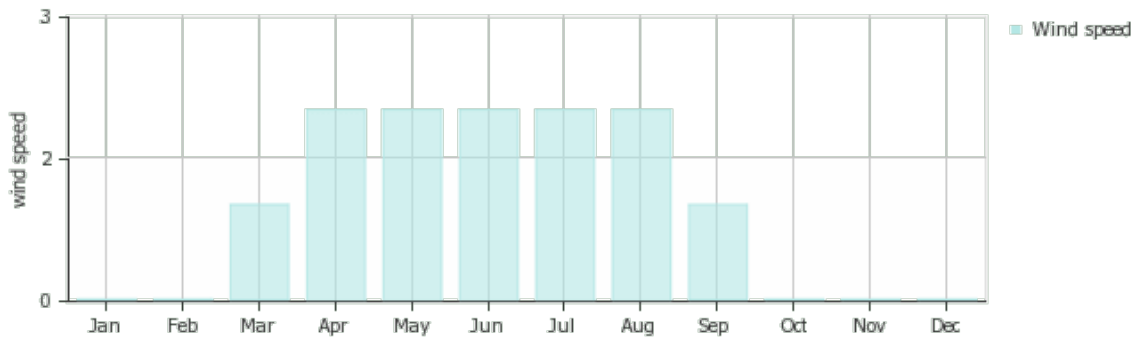


Figure 3.1.6: Average wind speed in Dhaka city. Source: (<https://weather-and-climate.com>)

Average wind speed in Dhaka city is more during the month April to August. Wind flows from the south to north direction. The wind speed can reach up to 40-60mph during Cyclone. Usually the storm and strong stormy wind hits the area from north-west side.

3.1.4 Historical

Urban settlement in this area started in the 1st century during the rule of Hindu Sena Dynasty. Dhaka was the part of Bikrampur area at that time. Under the Islamic rule, Dhaka was the part of Sonargoan, which was the administrative hub for Delhi and Bengal Sultanates. During the 16th century, Mughal emperor started to rule Bengal. Dhaka was considered as the Capital in 1608. In this time period, the Old Dhaka city grew along the bank of Buriganga River. Mughals built many beautiful gardens, mosques, temples, churches, bazaar, monuments and caravansaries. Bara Katara located in Old Dhaka city was the largest Caravansaries. Dhaka was known as the city of Mosques at that time period. This area was well-known as the centre for worldwide muslin trade. Dhaka started to develop during the 19th century, under the rule of British.

In 1962, Mirpur thana was first established. During British period (1757 to 1947) Mirpur thana was a part of Keraniganj thana. Later Mirpur was the part of Tejgaon thana during the Pakistan period (1947-1971). Mirpur became independent in 31st January in 1972, after the liberation war. Since independence till to the recent times, Mirpur is developing to become a self-sufficient thana to live in.

3.2 SITE AT A GLANCE

3.2.1 Location of the Site

The site is located in Mirpur-6, Dhaka. It is most commonly known as the PWD Wood Workshop Campus. The site exists beside the primary road, known as Milk Vita road. One of the main attractions around the site is the Sher-e-Bangla National Cricket Stadium and Indoors Stadium. These are few kilometers away from the site. Apart from these landmarks, the site is itself a Landmark, most prominently known as the PWD Wood Workshop.



Figure 3.2.1: Important Areas surrounding the site. (Source: Google Earth)



Figure 3.2.2: Site And its Surrounding Area. (Source: Author)

The Site is surrounded by clusters of residential buildings. Most of the area is used for residential purposes. Towards the South there is an empty plot of BFIDC, with lots of trees. The overall topography of the area is slightly inclined. There is a height difference of 10 feet between the west and east side.



Figure 3.2.3: Map of the site and Surrounding Existing (Source: Author)



Figure 3.2.4: Site view from the road, North East side. (Source: Author)



Figure 3.2.5: Site Communication Way (Source: Google Earth)

The way of communication and transport is through the Milk Vita Road. This road directly connects Mirpur 2 and Mirpur 7. Rajanigandha Road connects Mirpur-1 to the site. Bus stoppages near the site, at Shiyal Bari Mor, Proshika Mor and Chalantika Mor made accessibility even more easier.

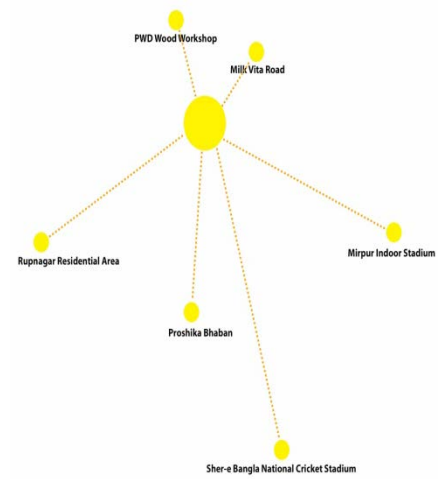


Figure 3.2.6: Site Connectivity, Landmarks (Source: Author)



SITE IS SURROUNDED BY REIDENTIAL BUILDINGS FROM ALL THE SIDE. ONLY SITE FORCE IS THE OPEN SPACE TOWARDS SOUTH.

Figure 3.2.7: Site Forces (Source: Author)

3.2.2 Site Analysis

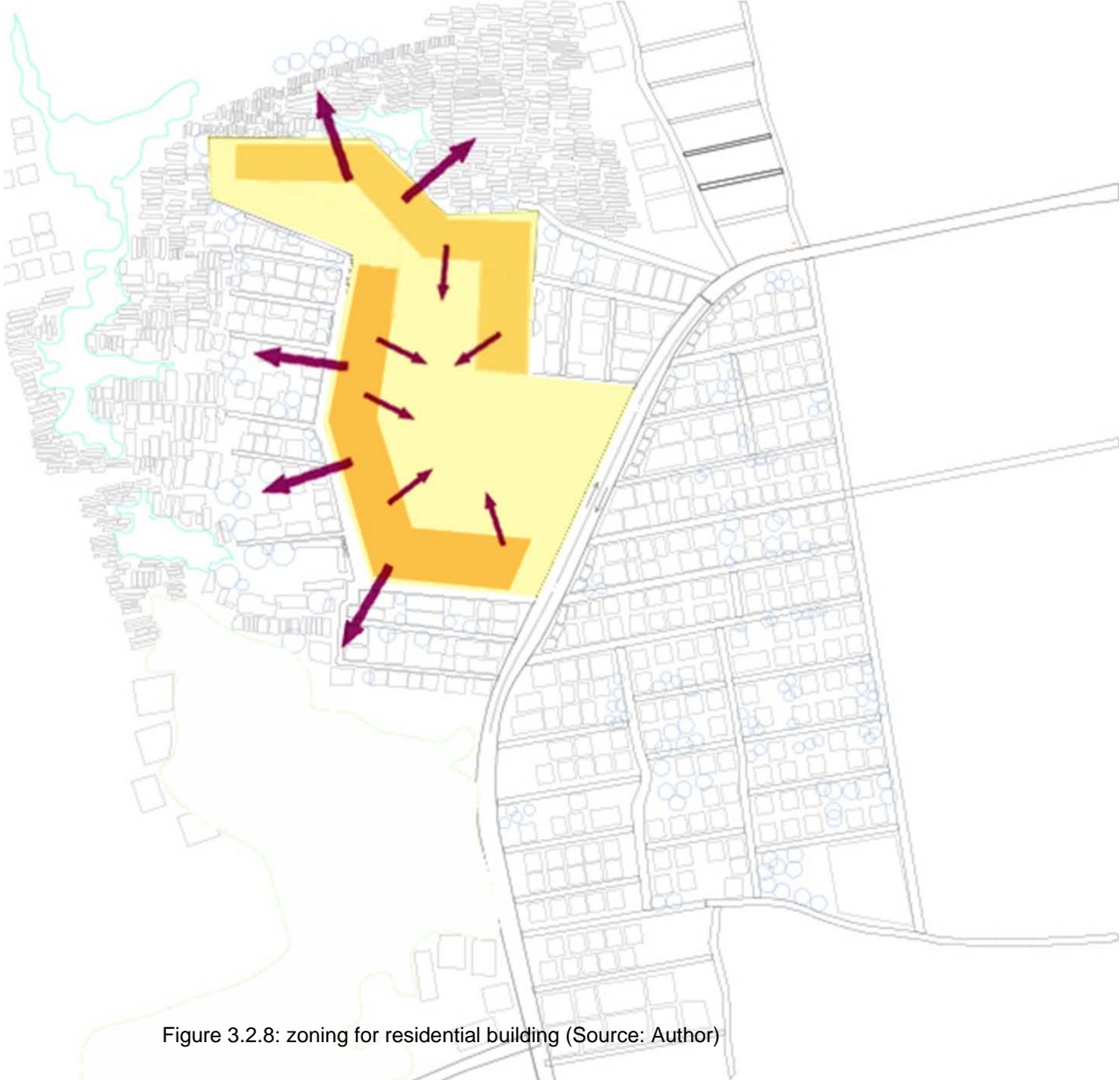


Figure 3.2.8: zoning for residential building (Source: Author)

The Proposed location for residential Buildings provides maximum exposure to green and maximum air flow. Residential buildings must be located at this proposed location to keep the sense of privacy.

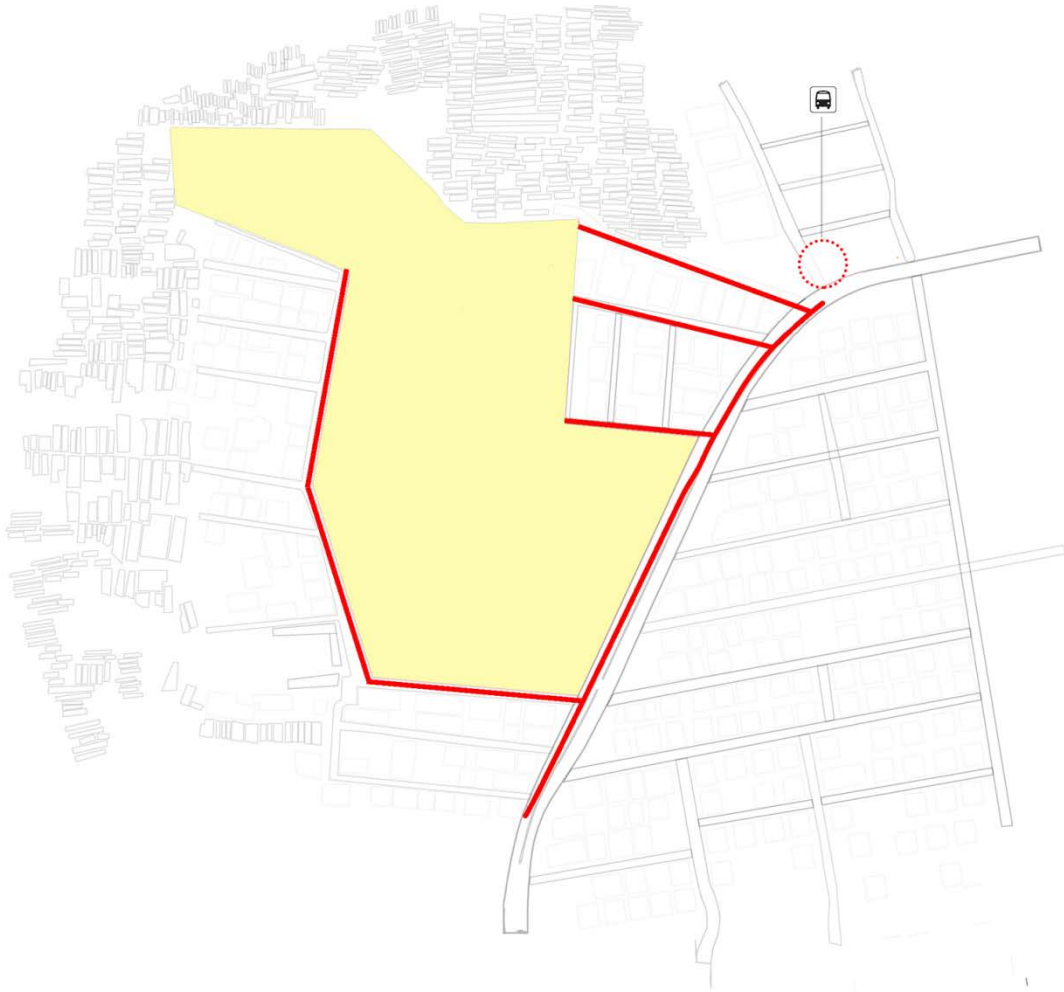


Figure 3.2.9: Roads surrounding the site. (Source: Author)

Site is accessible from all the side. A bus stop is located near the site, which makes the site even more accessible. Site entry can be done from any side of the site.

3.3 Site Images



Figure 3.3.1: North side of the site, PWD wood workshop (Source: Author)



Figure 3.3.2: North West side of the site (Source: Author)



Figure 3.3.3: West side of the site (Source: Author)



Figure 3.3.4: East side of the site (Source: Author)

3.4 SWOT Analysis

Strength

- Good transportation system, easily accessible.
- Site is located at the nodal point of a primary road.
- Many Educational Institutions
- Many Departmental stores.

Weakness

- Lack of open Space
- No place for recreation
- Site is surrounded by residential building.
- The area is overcrowded
- No medical centre/ Hospital near the site

Opportunities

- The Site is easily accessible. So it has the potential of becoming a good Housing Complex.

Threats

- In this entire area, the site is the only open area with lots of trees. As a result, any construction might affect the environment, if the site is not handled carefully.

Chapter 04: Case Study

4.1 Local Case Study

4.1.1 SPL Digonto

4.2 International Case Study

4.2.1 Linked Hybrid

4.2.2 The Interlace

4.2.3 Zakir Hussain Co-operative housing

4.1 Local Case study

4.1.1 SPL Digonto

Architects: DOMUS Architects

Location: 3A and 3 Paribag, Dhaka, Bangladesh

Client: Shanta Properties Limited

Year of Completion: 2012

Program: 300 apartments, climate-controlled swimming pools, rooftop terraces, fully-furnished libraries, gymnasium, walkways, sauna facilities, Grand community and party hall, 255 car parking facility.



Figure 4.1.1: SPL Digonto. (Source:<http://shantaholdings.com/#/>.)

SPL Digonto is one of the first Condominiums in Dhaka city. It has all the luxury and essential amenities inside the building. Along with the amenities, it has communal spaces for people to spend time. First floor offers all the communal functions such as indoor game, swimming pool, community hall, club, lounge, etc.



Figure 4.1.2: First floor. (Source: <http://www.skyscrapercity.com/showthread.php?t=896058&page=39>)



Figure 4.1.3: Spaces in between units. (Source: <http://www.skyscrapercity.com/showthread.php?t=896058&page=39>)

All the units are arranged such that, they receive sufficient amount of light and air. As people spend most of the time in home, rooms need to be well ventilated and lighted. House affects emotional as well as physical health of a person. One of the fascinating things about this building is that, there are terraces and void spaces in intermediate floors. Green spaces are very essential. Every human being wants to feel close to nature. Green terraces in between floors will allow people to spend time together as well as kids can play there under parent's supervision.



Figure 4.1.4: Types of Flats. (Source: <http://www.skyscrapercity.com/showthread.php?t=896058&page=39>)



Figure 4.1.5: Spaces inside the building.

(Source:<http://shantaholdings.com/mobile/projects/Completed/Residential/digonto>)

Project Analysis

SPL Digonto offers all the luxurious and essential amenities needed to live a happy life. Along with the amenities there are open and green spaces in intermediate floors, for people to spend time together. Communal spaces are very important to enhance social interaction. Social interaction helps to create a stronger community. All the residential units are properly ventilated and lighted. Ground floor offers gardens and lawns, where kids can play. This openness is very hard to find in most apartments nowadays. Altogether, this building tried to integrate nature into living space, making the building livable.

4.2 International Case Study

4.2.1 Linked Hybrid

Architects: Steven Holl Architects

Location: Beijing, China

Client: Modern Green Development Co., Ltd. Beijing

Area: 220000.0 sqm

Project Completion Year: 2009

Program: 750 apartments, public green space, commercial zones, hotel, cinemateque, kindergarten, Montessori school, underground parking.



Figure 4.2.1: Linked Hybrid Complex. (Source: <http://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

Linked Hybrid tended to create a porous urban space, which would be inviting and accessible by public from all around the site. The project introduced many open passages that make it “an open city within the city”. Linked hybrid enhances interactive relation among people by introducing public spaces such as commercial, residential, educational and recreational spaces. The Ground floor offers many public spaces such as small scale shops, open passage way for the residents and visitors to walk through. In addition to that, there is a large pond at the centre and sitting spaces surrounding the pond makes the environment even more interactive and soothing. Ground floor has all the public functions such as Montessori school, Kindergarten and cinema. On the intermediate levels, there are open terraces and roof garden to promote strong bondage among the people of the community. All the functions are arranged in a way so that they integrate with the green and open spaces in the site.



Figure 4.2.2: Site plan of Linked Hybrid Complex. (Source: <http://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

At the centre, there is a geothermal well which heats the project during winter and cools it down in summer. In winter, the pond freezes to be a water skating rink. The water in the pond is recycled and filtered. The cinematheque was one of the important gathering spaces, which floats on the shallow water and attracts everyone. All the interactive spaces in ground floor and intermediate floors act as a social condenser.

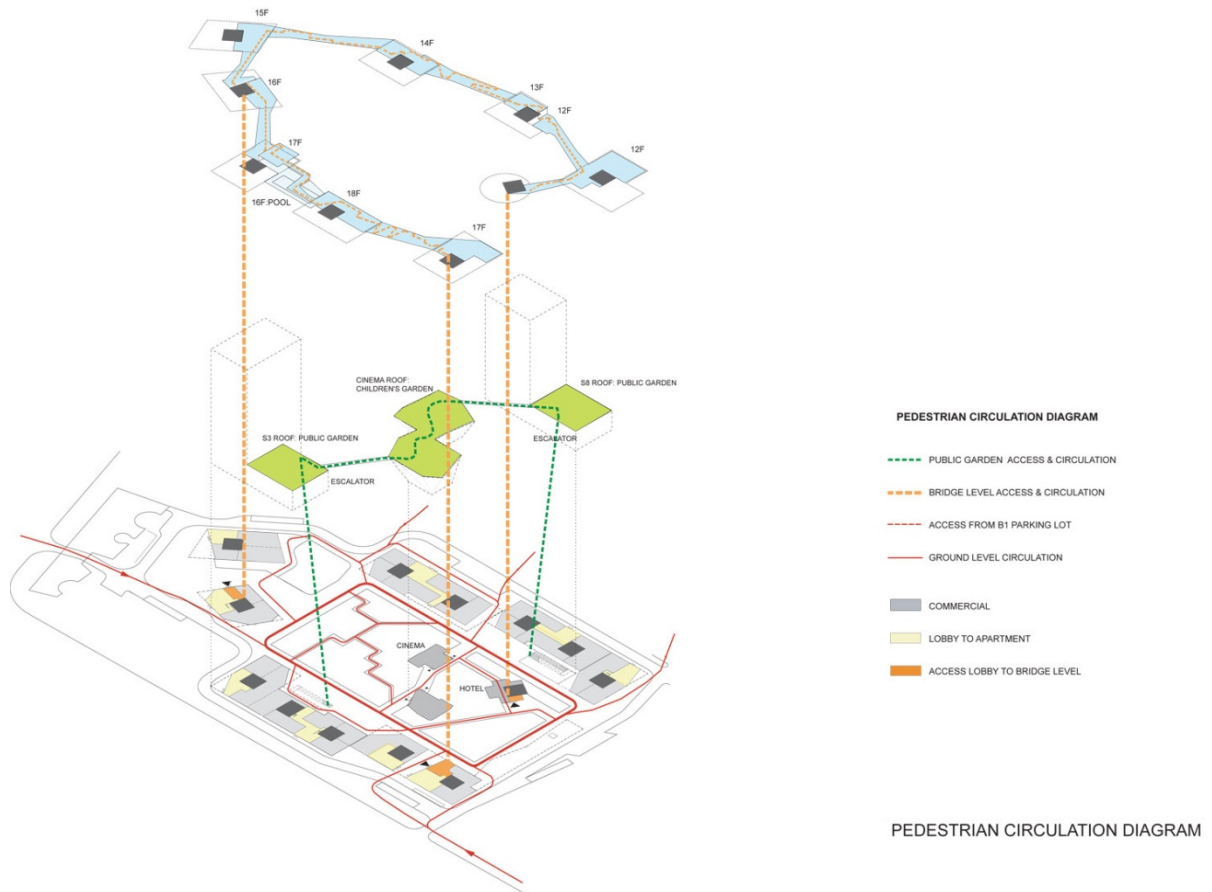


Figure 4.2.3: Pedestrian flow diagram. (Source: <http://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

The project offers different types of activity for different age group of people. There is basketball court, roller blade and skate board area in the 'Mould of Adolescence'. For Middle Age group there are Coffee and Tea house, tennis court and a Tai Chi platform in the 'Mould of Middle Age'. For Old age people there are wine tasting zone while, 'Mould of Infinity' has meditation space.

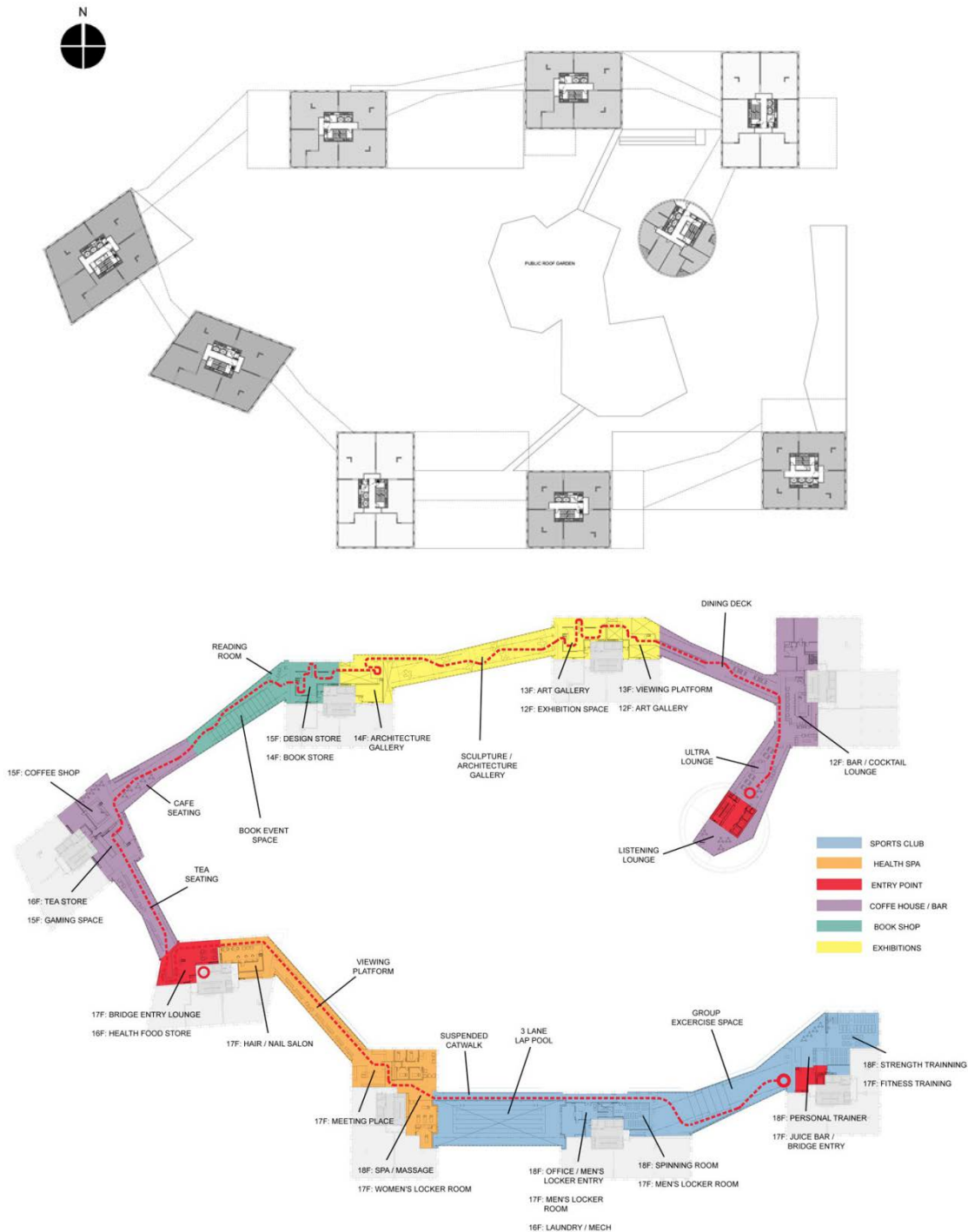


Figure 4.2.4: Floor plan of Linked Hybrid Complex. (Source: <http://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

Linked Hybrid Consist of eight towers connected together from the 12th to 18th floor, forming a loop, instead of isolated towers. These linked bridges consist of all the public functions such as cafe, swimming pool, auditorium, gym etc, making this bridge much more interactive. Each apartment has exposure from two sides with no interior hallway.

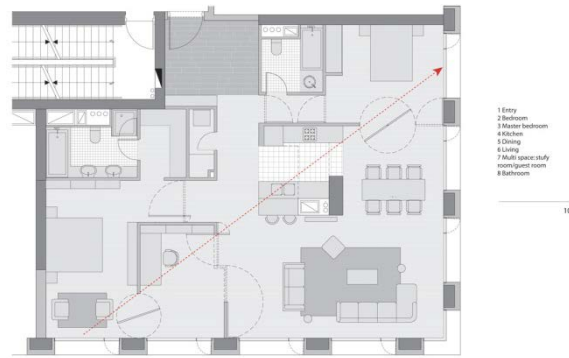


Figure 4.2.5: Single unit plan. (Source: <http://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

Linked Hybrid is a sustainable project that encourages the use of shared resources. It also acts as an urban oasis that allows lots of open and green spaces inside the complex. Around 220000 liters of water from all the residential flats are recycled and used for watering the landscape, toilet flushing, roof garden irrigation and etc.

The project uses a technique called displacement ventilation, which displaces the air inside and helps to maintain a comfortable environment inside, as well as reduces cost.

Linked hybrid used high performance building system such as exterior has louvers and low-e-coated glass to prevent heat gain.



Figure 4.2.6: Spaces inside Linked Hybrid. (Source: <http://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

Project Analysis:

Linked hybrid is a sustainable and energy efficient project, which encouraged the efficient use of spaces as well as materials. This also makes the project environmental friendly. In addition to that, this project also offers many communal spaces in the intermediate floors by placing public functions such as cafe, gym, etc. The presence of these communal spaces makes the project lively and enhances strong bond among the community people. Communal spaces are very essential in a housing project and in our context, this is applicable too. Linked Hybrid refers itself as an 'open city within a city' but this is not applicable in our context for security reasons. Our culture is completely different from the culture of China; our culture prefers every function to be much more private. One interesting thing about the project is that, it provides different type of functions for almost all age group of people. People of all age group need spaces for their leisure and for recreation. Finally, this project used extensive use of nature by integrating nature with the private function. This is necessary for creating a healthy and comfortable environment inside the housing complex.

4.2.2 The Interlace

Architects: OMA, Ole Scheeren

Location: Singapore

Area: 169600.0 sqm

Site Area: 81000sqm

Project Completion Year: 2013

“There was much interest in the project’s success at forming structures for high-density living deployed horizontally, and the resulting benefit of outdoor urban environments.”

- Jeanne Gang, Jury Chair, Studio Gang Architects



Figure 4.2.7: The Interlace (Source: <http://www.archdaily.com/627887/the-interlace-oma-2>)

The interlace shifted away from the typical standardized logic of isolated housing towers and tried to create a dramatically different approach to living. The approach was to integrate both the living and communal spaces with the natural environment by interlocking blocks, creating a vertical village. The Project covers a gross area of 170,000m², which provides total 1040 apartment units of varying size, including landscapes and open spaces. Altogether thirty-one blocks, which are identical in length and six-stories tall, are arranged in a hexagonal pattern. These stacked blocks eventually created eight large courtyards in between them.



Figure 4.2.8: Site plan of The Interlace (Source: <http://www.archdaily.com/627887/the-interlace-oma-2>)

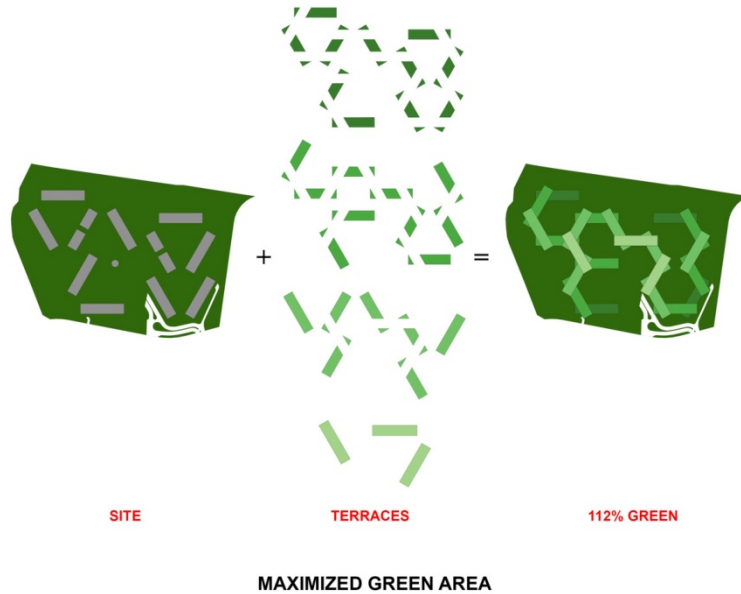
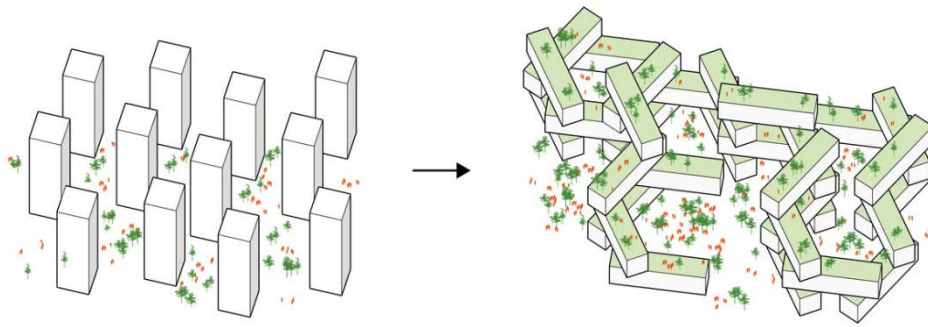


Figure 4.2.9: The Stacked Arrangement. (Source: <http://www.archdaily.com/627887/the-interlace-oma-2>)

“The design addresses concerns of shared space and social needs in a contemporary society and simultaneously responds to issues of shared living and individuality by offering a multiplicity of indoor/outdoor spaces specific to the tropical context.” -Ole Scheeren.

The project intermingled nature with private functions introduced many roof garden, landscaped sky terraces and balconies to maximize nature inside the complex.

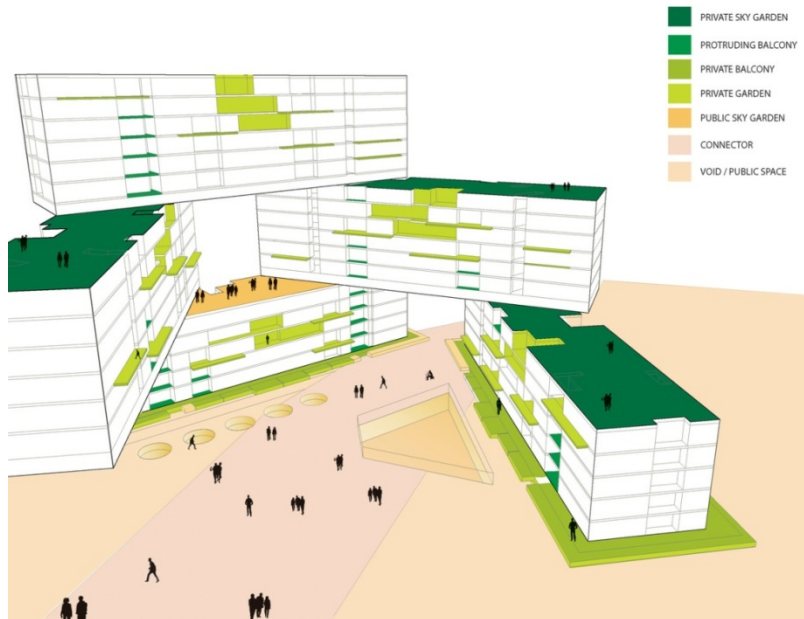


Figure 4.2.10: Open spaces inside the complex. (Source: <http://www.archdaily.com/627887/the-interlace-oma-2>)

The unique arrangement of the blocks and openings among them allow maximum air flow and sufficient amount of daylight inside the apartments. In addition to that, this arrangement also allows self-shading for all the communal spaces that helps to create comfortable outdoor spaces for all the communal spaces. The overlapping spaces of the blocks allow three core types of the 6, 18 and 24 stories respectively. Each core can serve three to four flats per floor. Compact arrangement of cores offers efficient circulation and they are naturally lit and well ventilated. All of these factors make the project sustainable and efficient in the context of Singapore. The presence of water body inside the complex allows evaporative cooling, which creates micro-climate zones and cools the entire premise.



Figure 4.2.11: Typical Floor plan of Blocks. (Source: <http://www.archdaily.com/627887/the-interlace-oma-2>)



Figure 4.2.12: Spaces inside the Complex. (Source: <http://www.archdaily.com/627887/the-interlace-oma-2>)

Project Analysis:

This specific project shows a unique arrangement of residential units, which is different from the typical standardized concept of isolated towers. One of the interesting aspects of this particular project is the integration of communal spaces with the private functions. Communal spaces such as roof garden, terraces, large balconies, etc are essential in our context. These spaces in the intermediate floors would make people feel close to the ground. Communal spaces also enhance stronger bonds among the people of the community. Introduction of nature in between the apartment acts as a shading device and helps to cut the heat gain. This is essential for our context, which will also make the project sustainable and cut down the cost. This project shows an open plan layout, which allows accessible pedestrian roads inside the complex. In our context, this open plan is not appreciable, as security is an important factor to consider. Our culture and

lifestyle is completely different from the culture of Singapore, as result Open arrangement of the complex is not suitable in our context. Moreover, this project shows an interlocking arrangement of the project is aesthetically beautiful and works well in the context of Singapore. But Bangladesh is much more prone to earthquake, which makes this arrangement less suitable for our country.

4.2.3 Zakir Hussain Co-operative Housing

Architects: Raj Rewal

Client: Zakir Hussain Cooperative Society

Location: New Delhi, India

Project Completion Year: 1984

The Housing complex contains total 204 residential units. The complex has units of various size depending on the needs and demands of the officers of Zakir Hussain Cooperative Society.

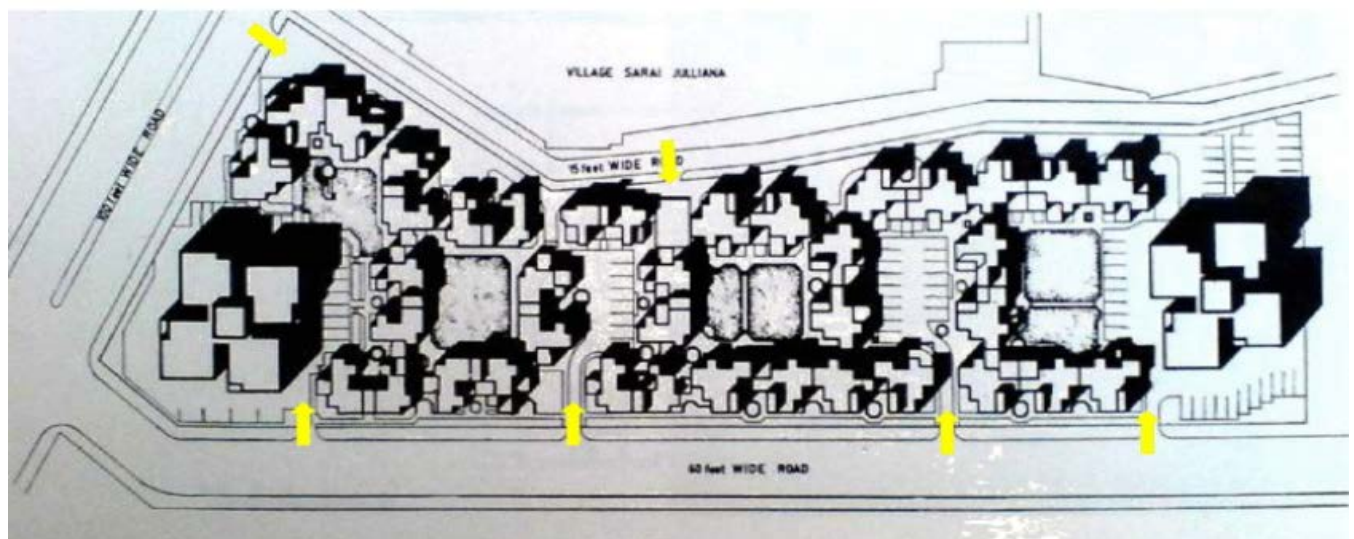


Figure 4.2.13: Master plan showing pedestrian and Vehicular access. (Source: <http://docslide.us/documents/zakir-hussain-cooperative-housing-final-1.html>)

The complex contains total 24 blocks. Two 8 storey towers at the extreme corners of the site consist of larger units of 130-160 square meters. Each tower consists of eight different types of flats. Other 4 storey towers consist of clusters of four smaller units approximately of 50-100 square meters. There are total 16 variations of unit types in the smaller towers. There are total six entries to the site. The South has total 4 vehicular

entries. Pedestrian Entry is from the north-west corner of the site and service entry from the north.

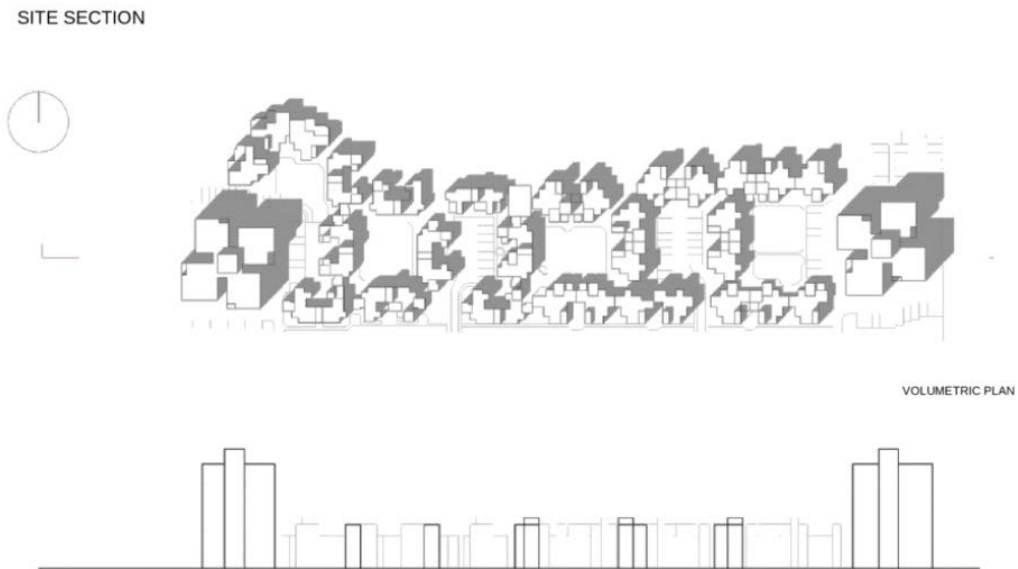


Figure 4.2.14: Site Plan and Site Section. (Source: <http://docslide.us/documents/zakir-hussain-cooperative-housing-final-1.html>)

The project has some unique features such as Courtyard, Terraces, and covered passageways. There is a essence of traditional urban touch.

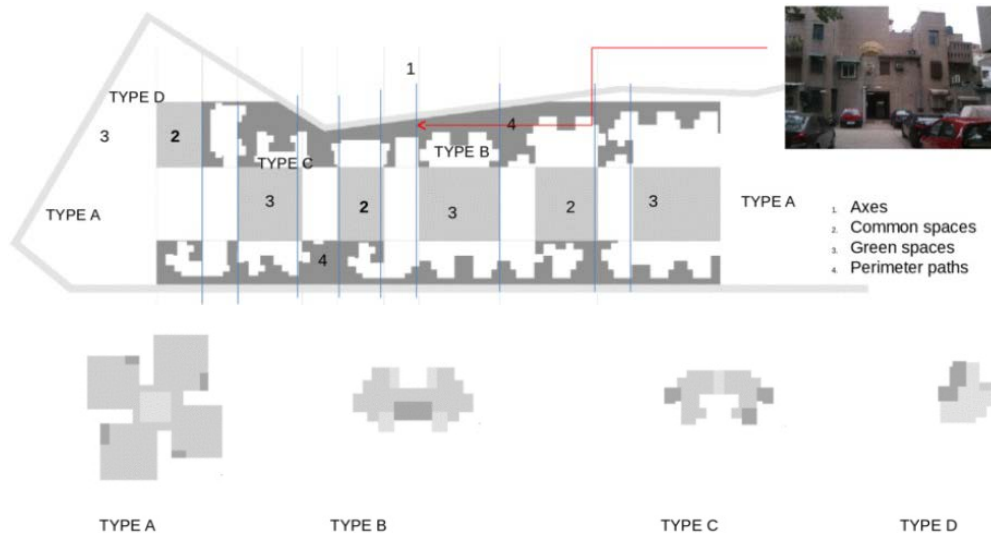


Figure 4.2.15: Types of Flat inside the Complex. (Source: <http://docslide.us/documents/zakir-hussain-cooperative-housing-final-1.html>)

BLOCK

- Two 8 storey towers were included as a means of providing large units of 130-160 sq. metre.
- There are 8 types flats in the towers.
- The two towers form poles at either end of the long site.

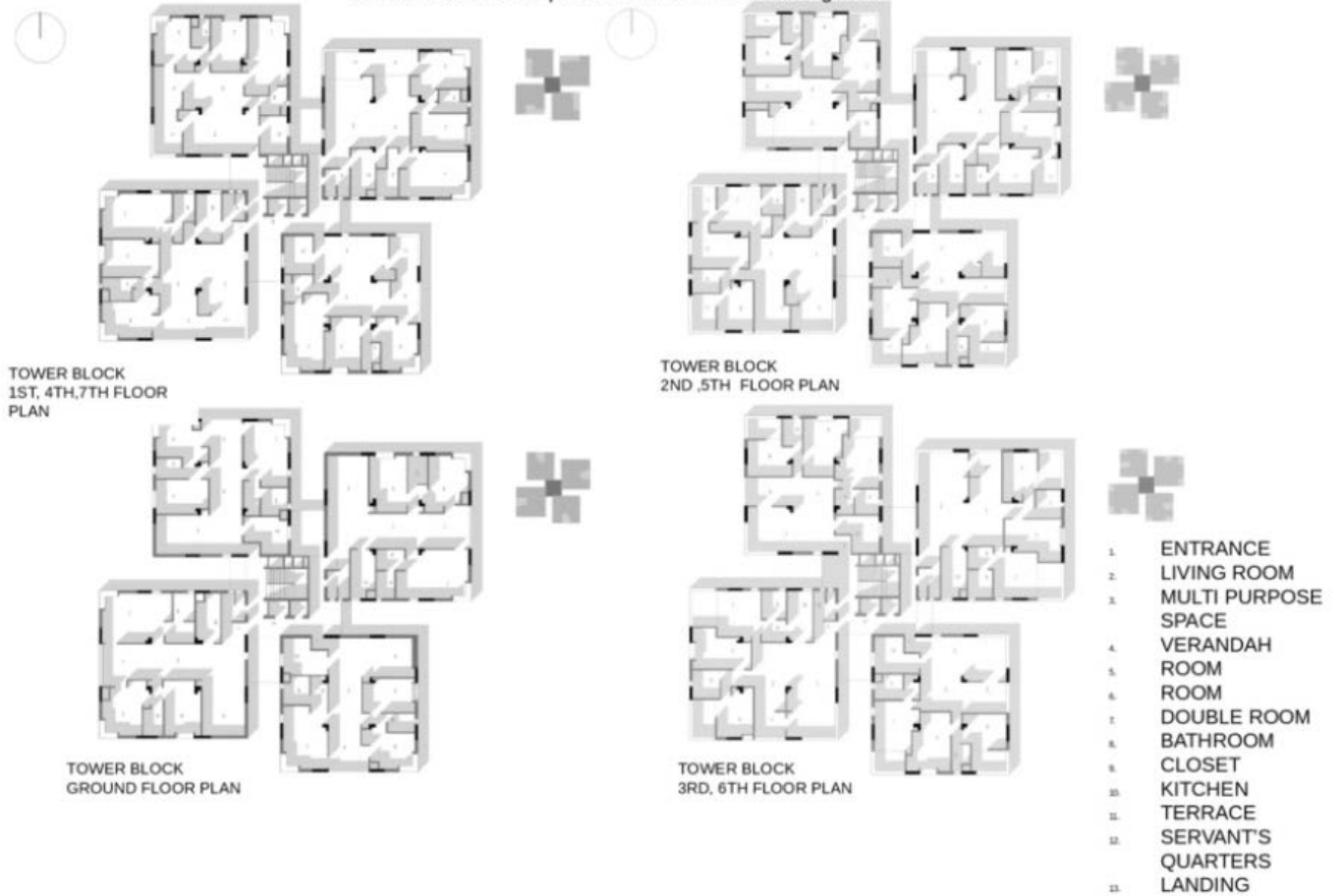
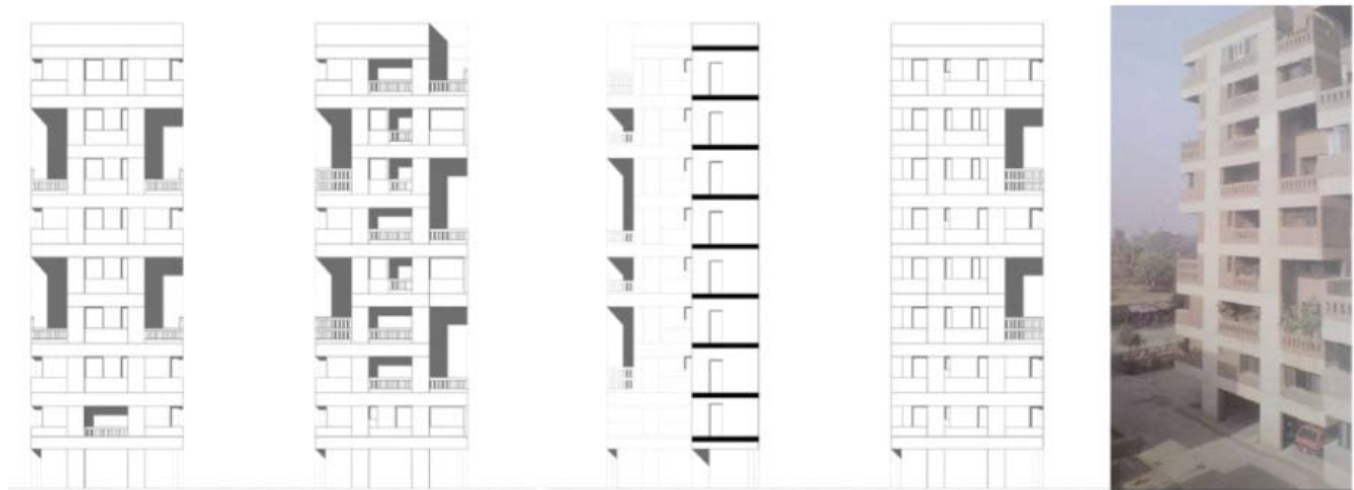


Figure 4.2.16: Typical Floor Plan of Type A towers. (Source: <http://docslide.us/documents/zakir-hussain-cooperative-housing-final-11.html>)

There are mainly four types of variation inside the towers. The flats are arranged orthogonally around the central core. The ground floor is used for parking and kept open. All the floors have cluster of 4 flats and each flat has opening from all the side that maximizes the exposure to daylight and natural air. All the flats have individual terraces.



SOUTH ELEVATION

EAST ELEVATION

NORTH ELEVATION

WEST ELEVATION

Figure 4.2.17: Elevation of Type A flats (Source: <http://docslide.us/documents/zakir-hussain-cooperative-housing-final-1.html>)

The towers have simple concrete beam and column structure. For the exterior wall, plaster is used in rough finish. For highlighting the structural system, white colors are used in the front, while darker colors are used for cladding.

Project Analysis:

The blocks inside the project are arranged beautifully, which allows maximum open space inside the complex. Each of the function inside the complex was designed thinking about the social and climatic aspect of the context. The material used for the buildings are suitable for the context of India. In addition to that, the units were solved very nicely to maximize the exposure of daylight and natural ventilation. A single core serves four flats, with less circulation space. This makes the project efficient. Moreover, the introduction of communal spaces inside the blocks is also recommendable. Communal spaces like private terraces, courtyard, and these spaces are an essential element for the culture of country like India.

Chapter 05: Program Development

5.1 Proposed program from Client

5.2 Rationale of the Program

5.3 Developed Program

5.3.1 Space Requirement Standard for Programs

5.3.2 Final Program Development

5.4 Maximum Ground Coverage

5.5 Functional Flow of the Programs

5.0 PROGRAM DEVELOPMENT

5.1 Proposed Programs from Client

- 350 (1500sft) residential flats
- 350 (1250sft) residential flats
- Mosque
- School
- Community Hall
- Utility Building
- Guard Room

5.2 Rationale of the programs

The housing complex consists of essential programs that will enhance comfort and ensure better environment for the users. Ministry of Housing and Public Works, proposed a list of programs that includes residential apartments, school, mosque, community hall, utility building and a security guard room, considering the security issues. Based on the need of the users and considering the context of the site, few changes were made to the program list.

Altogether, 700 Residential flats were proposed by the client. Residential flats are divided into two types, 1500sft and 1250sft flats. As the project is for PWD officers and employees, 1500sft flats are designated for the officers of higher pay scale. In Dhaka

city, accommodation of Government officers is an acute problem. As a result, officers need to rent private flats with higher rate. This reduces their efficiency and causes financial problems. These flats will help to accommodate large number of officers and their families. In addition to that, officers will be able to live a standard environment with better accommodation facilities, which will ultimately lead them to live a better life.

The complex will accommodate large number of people. School is an essential program for the complex. Students would not have to travel far from home for school. This school will provide education facility for 500 students at a time. There are few more schools and universities surrounding the site. As a result, primary school is enough for this particular site. Students between the age range of 11 to 19 years and further are mature enough and can easily travel far from home.

Majority of the citizen of Bangladesh are Muslim. Muslims pray five times a day and Jumma is one of the most important prayers for Muslims. Mosque is one of the most essential functions which need to be present in the housing. Although, there are two mosques already present nearby the site, one additional mosque is needed inside the housing to accommodate the huge number of people in the housing complex. Residents would not have to travel far for praying.

Large number of people would be living inside the housing complex forming a community. To facilitate strong bond between the community people, a community hall is needed. People can celebrate different types of occasion together inside the community together. As a result, they won't need to travel far from the complex and this will also be efficient economically.

5.3 Developed Program

5.3.1 Space Requirement Standard for Programs

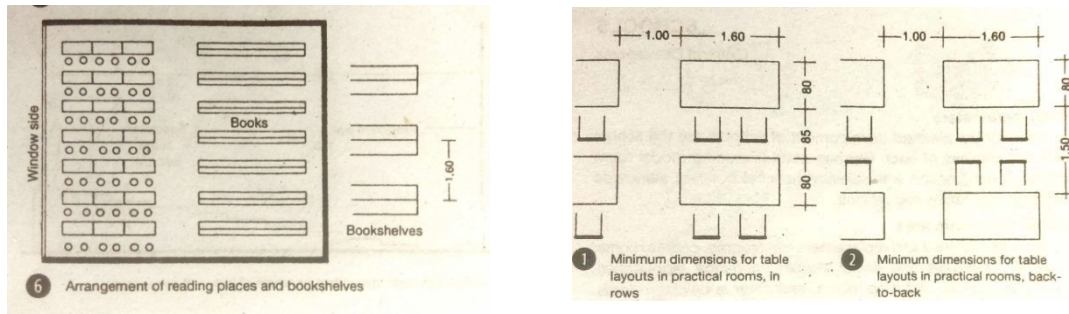


Figure 5.3.1: Furniture Layout and Minimum Space Requirement of School Classrooms. Source (Neufart Architect's Data)

Standard space measurements were followed while setting the space requirements for certain programs. For school classrooms, necessary spaces were kept while setting the furniture layout for 30 students per class. This will allow better and efficient use of space inside the classroom.

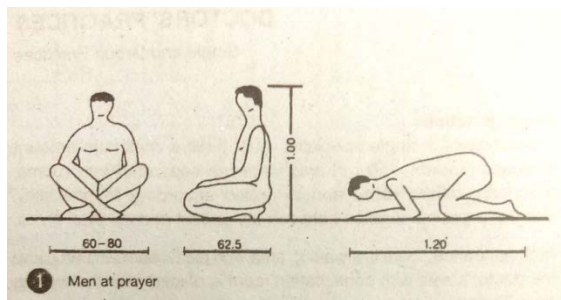


Figure 5.3.2: Minimum Space Requirement for praying in a Mosque. Source (Neufart Architect's Data)

Minimum 0.85 square meter space is needed for a person for praying in a mosque. The mosque has the capacity to accommodate 800 men and 50 women at a time. Multiplying the total number of people and minimum space requirement gives the size of prayer hall of the mosque.

5.3.2 Final Program Development

FUNCTION	FUNCTIONAL ACTIVITY	No. of Element	No. of User	Area in Sft
350 (1500sft) Residential flats	Foyer	1	-	50
	M.Bed	1	-	170
	Bed	2	-	150
	Store	1	-	50
	Living Room	1	-	210
	Dining Room	1	-	170
	Family Living	1	-	165
	Kitchen	1	-	90
	Ver (Kitchen)	1	-	50
	Ver(M.Bed)	1	-	35
	Ver(Bed)	1	-	55
	Toilet(M.Bed)	1	-	46
	Toilet(Bed)	1	-	40
	Toilet(S.Bed)	1	-	30
	Toilet	1	-	40
	Total sft of 1flat			1500
	Total sft of 350 flats			1500X350=525000
	30% circulation space			157500
	TOTAL sft of 350 (1500sft) flats			682500

350 (1250sft) Residential flats	M.Bed	1	-	150
	Bed	2	-	140
	Living Room	1	-	180
	Dining Room	1	-	240
	Family Living	1	-	100
	Kitchen	1	-	65
	Ver(M.Bed)	1	-	50
	Ver(Bed)	1	-	30
	Toilet(M.Bed)	1	-	40
	Toilet(Bed)	1	-	35
	Toilet(S.Bed)	1	-	25
	Toilet	1	-	35
	Total			1250
	Total sft of 350 flats			1250X350=437500
	30% circulation space			131250
	TOTAL sft per floor of 1 building			568750
SCHOOL	Classroom(kg-5)	2 Section= 12	12X25=300	1000X12=12000
	Classroom(play and nursery)	1 Section= 2	2X30=60	2X1200=2400
	Computer Lab	1	25	1000
	Art and Crafts Room	1	25	800
	Science Lab	1	25	400
	Music Room	1	25	200
	Library	1	40	1500
	Indoor Games Room	1	40	2000

	Teacher' Room	1	20	300
	Principal's Room	1	1	200
	Meeting Room	1	-	500
	Admin Room	1	2	220
	Accountant Room	1	1	100
	Parent's Waiting Room	1	30	450
	Multipurpose Hall Change Room	1	500	6500+150=6650
	Staff Room (M/F)	2	-	120X2=240
	Store Room	1	-	200
	Toilet (Faculty. M/F)	M-(2WC, 1 WB, 2U) F-(2WC, 1WB)	20	120+88=208
	Toilet (student M/F)	M-(4WC, 4 WB, 6U) F-(8WC, 4WB) Disabled-1M and 1F	-	340+300=640
	Toilet (Staff M/F)	M-(2WC, 1 WB, 2U) F-(2WC, 1WB)	-	180
	Medical Room	1	1	250
	Kitchen	1		300
	Janitor's Room	1	-	25
	Electric Room	1	-	80
	Canteen	1	40	800
	total			31600
	30% circulation space	-		9480
	TOTAL			41080

Community Hall	Multipurpose Hall	1	1000	12000
	Change Room	1	–	200
	Kitchen	1	–	800
	Store	1	–	150
	Toilet + Hand wash Area (M/F)	F(8WC, 10WB) M(4WC, 6U, 8WB)	–	350+ 500=850
	Staff Lounge	1	–	150
	Office	1	–	200
	Staff Toilet	M-(2WC, 1 WB, 2U) F-(2WC, 1WB)	-	180
	Total	–	–	14530
	30% circulation space			4350
	TOTAL			18880
Mosque	Prayer Hall (male)	1	500	4500
	Prayer Hall (female)	1	50	457
	Ablution Space (Male)	1	–	300
	Ablution Space (Female)	1	–	130
	Toilet (M/F)	M-(4WC, 4 WB) F-(8WC, 4WB)	–	300+300=600
	Room (Imam and Muezzin)	1	–	150
	Store Room	1	–	80
	Office	1	–	120
	Total			6337
	30% circulation space			1900
	TOTAL			8230

Guard Room	Bedroom	1	–	120
	Toilet	1	–	30
	TOTAL			150
Utility Building	Substation Room	1	–	2000
	Equipments Room	1	–	200
	Office	1	–	100
	Total			2300
	30% Circulation Space			690
	Total			2990
Parking	700residential flats + 300 community hall	1000cars	–	1000X 12=12000
	Grand Total			2,147,822

5.4 Maximum Ground Coverage

Site Area, A = 10acre = 435600sft

Minimum Width of road inside the site = 6m= 19.69ft

FAR for residential area = 4.25

MGC = 57.50% of A = 250,470

Total Build Area, TBA = FAR X Site Area = 4.25 X 435,600 = 1,851,300

With 30% Circulation = 1,851,300 + (1,851,300 X 30/100) = 2,406,690

Setback for the site:

Front: 1.50m = 5.0ft

Back: 3m = 10ft

Side: 3m = 10ft

5.5 Program Layout

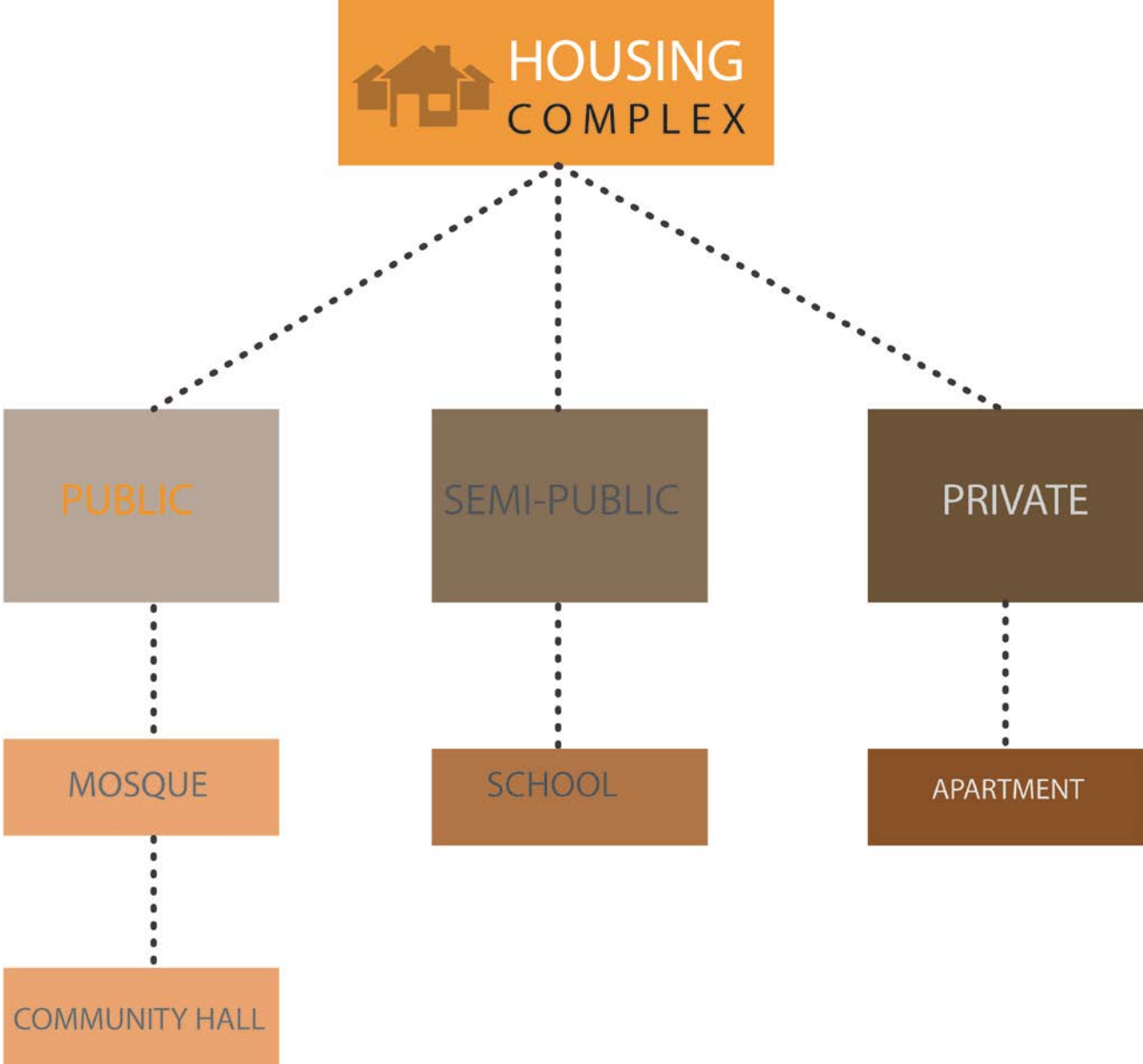


Figure 5.5.1: Program Layout Diagram.(Source: Author)

5.5.1 Functional Flow of the Programs

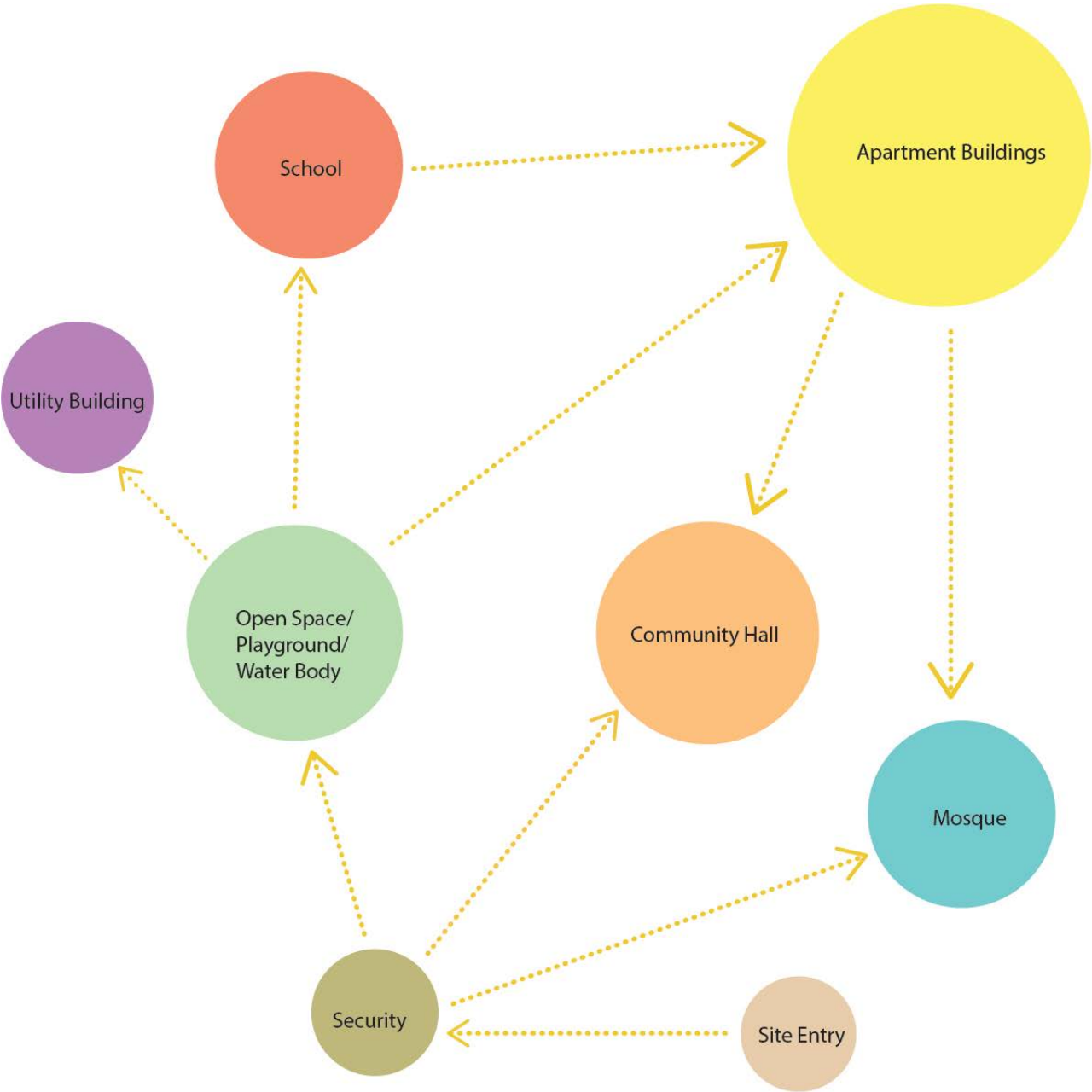


Figure 5.5.2: Functional flow of different programs inside the site. (Source: Author)

Chapter 06: Conceptual Stage and Design Development

6.1 Introduction

6.2 Analysis of the Programs

6.3 Concept Development

6.4 Form Development

6.5 Zoning

6.6 Architectural Drawings

6.7 Rendered Images

6.8 Model Images

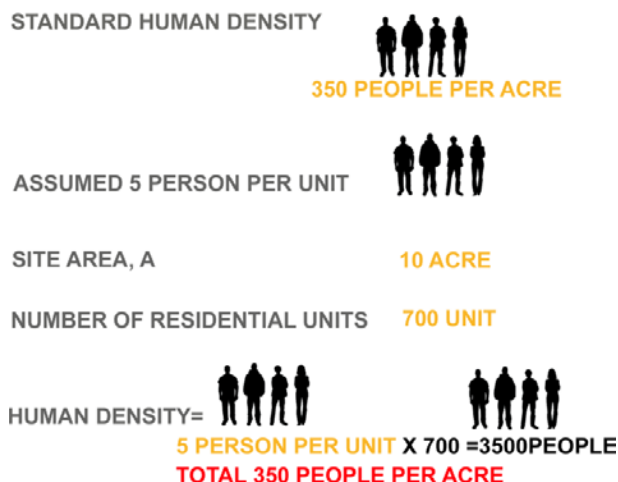
6.1 Introduction

Every government employee gets rental housing units and can avail these flats until retirement. They spend almost their entire life inside the housing complex. Housing is one of the basic human rights. It affects people emotionally as well as physically. Every human being dreams of a house that is safe and secure. From the past, people are living in a community. The aim of this project is to introduce communal spaces inside the housing complex, so that people can interact with each other. Social interaction is a vital issue inside a good housing. Maintain intention of this project was to diminish the difference between government employee and civilians. Government officers are not different from people in the neighborhood. Why this boundary? Everyone will stay together in a community. A stronger community is needed to build up a stronger neighborhood.

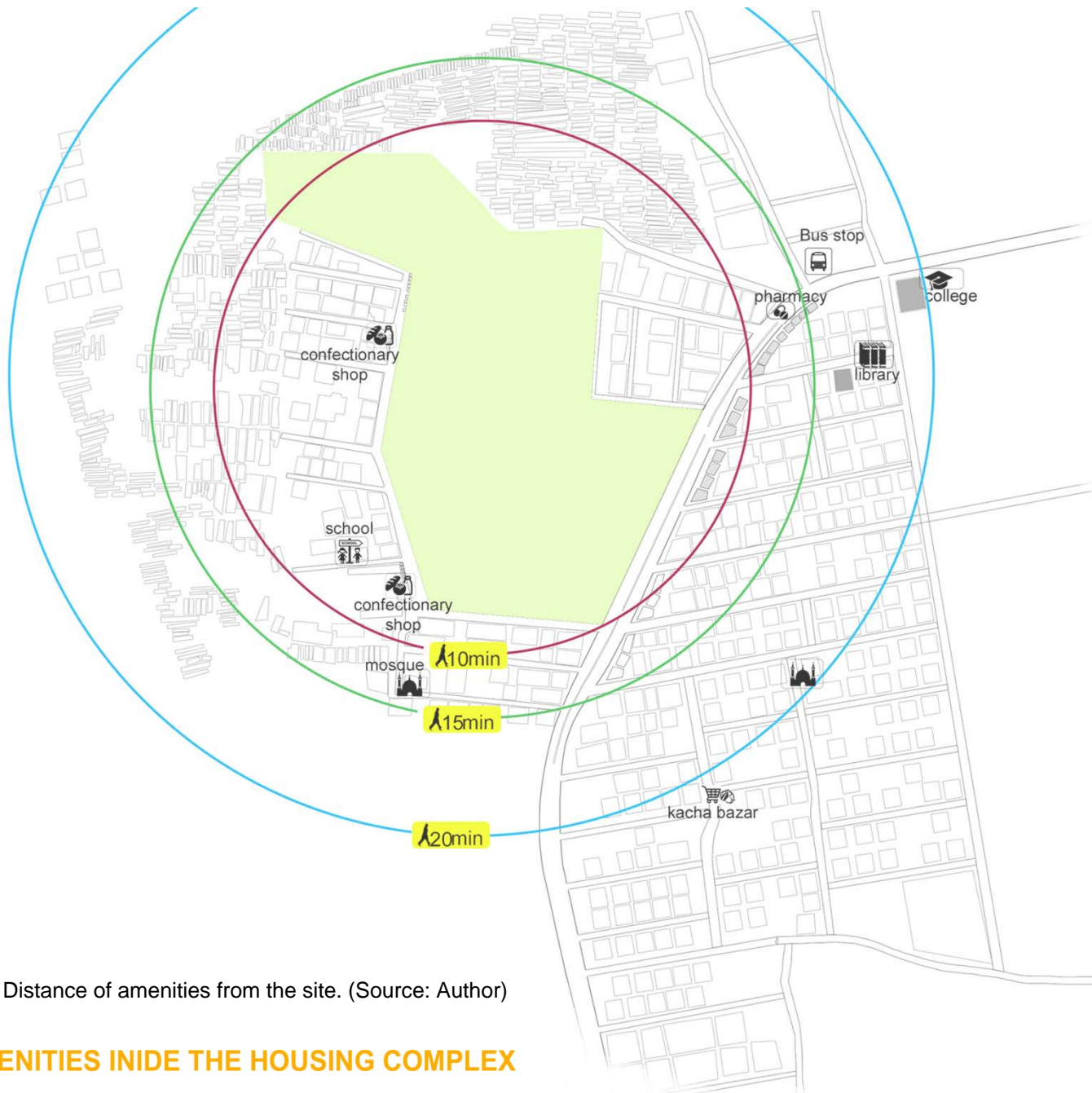
6.2 Analysis of Programs

6.2.1 Analysis of Human Density

For Housing Complex, Human density per acre is 350 people. For this project, human density is 3500 people in 10 acre. This density is not more than the standard density and it is within the limit.



6.2.2 Analysis of the amenities



6. 2.1: Distance of amenities from the site. (Source: Author)

AMMENITIES INIDE THE HOUSING COMPLEX

700 residential Units
 Primary School
 Mosque
 Gymmesium
 Supershop
 Clinic
 Saloon
 Library

Jogging Track
 Football Field
 Basketball Court
 Tennis Court
 Fishing Deck
 Apparatus Park
 Boating Ghat
 Park

6.3 Concept Development

The main concept of this project was to promote social interaction among people. Human being cannot live alone. They always live in a community. Social interaction is most important for building a stronger community. A stronger community helps to build a stronger neighborhood, which in turn help to build a stronger nation. Unfortunately, the current scenario of our country is such that, most of the people know nothing about their neighbors. The only reason behind this problem is that, most of the residential apartments lack proper communal spaces. Residents cannot interact with each other because of absence of communal spaces.

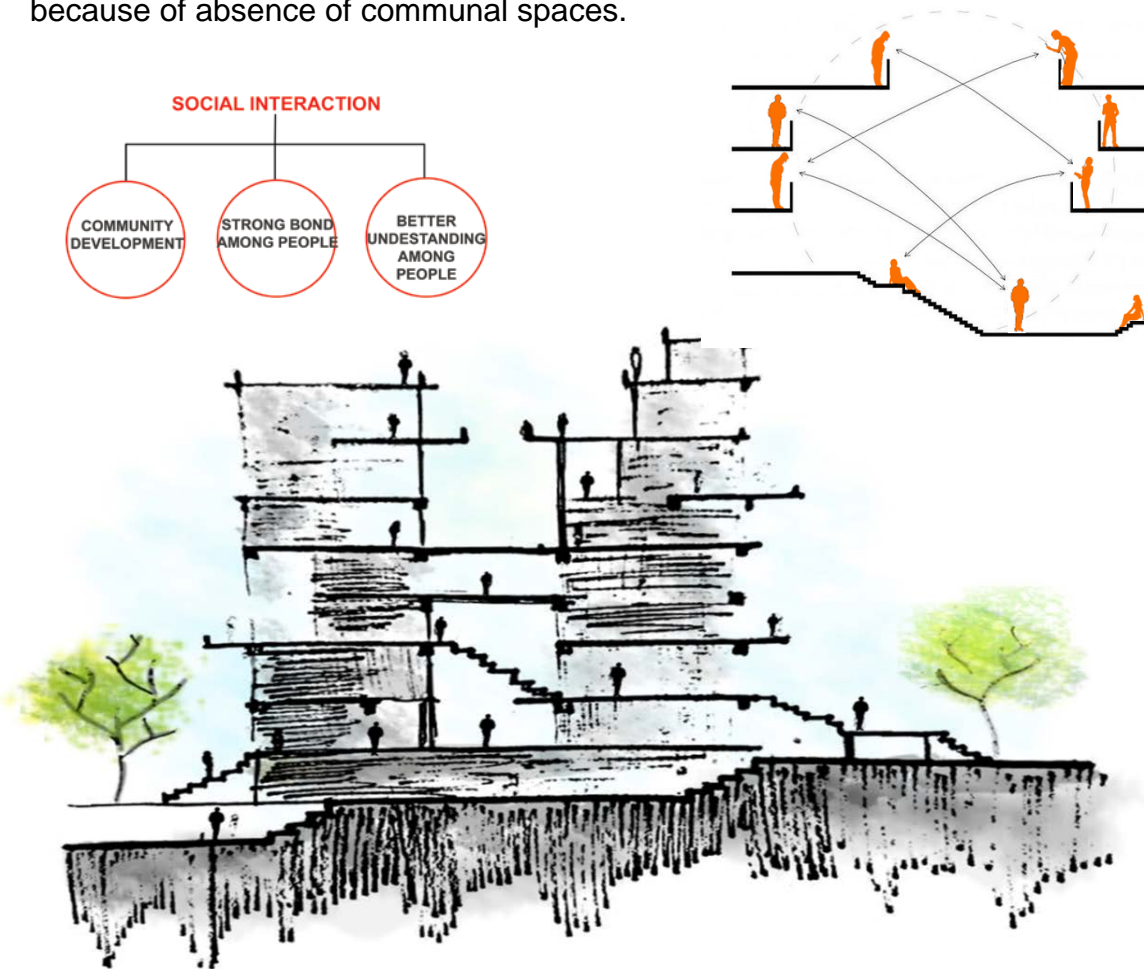


Figure 6.3.1: Communal spaces and social interaction (Source: Author)

The idea was to break the boundary between Government housing complex and neighborhood. Government employees are not different from the people in the surrounding. Local people will also enter the housing complex and interact with them, forming a community.

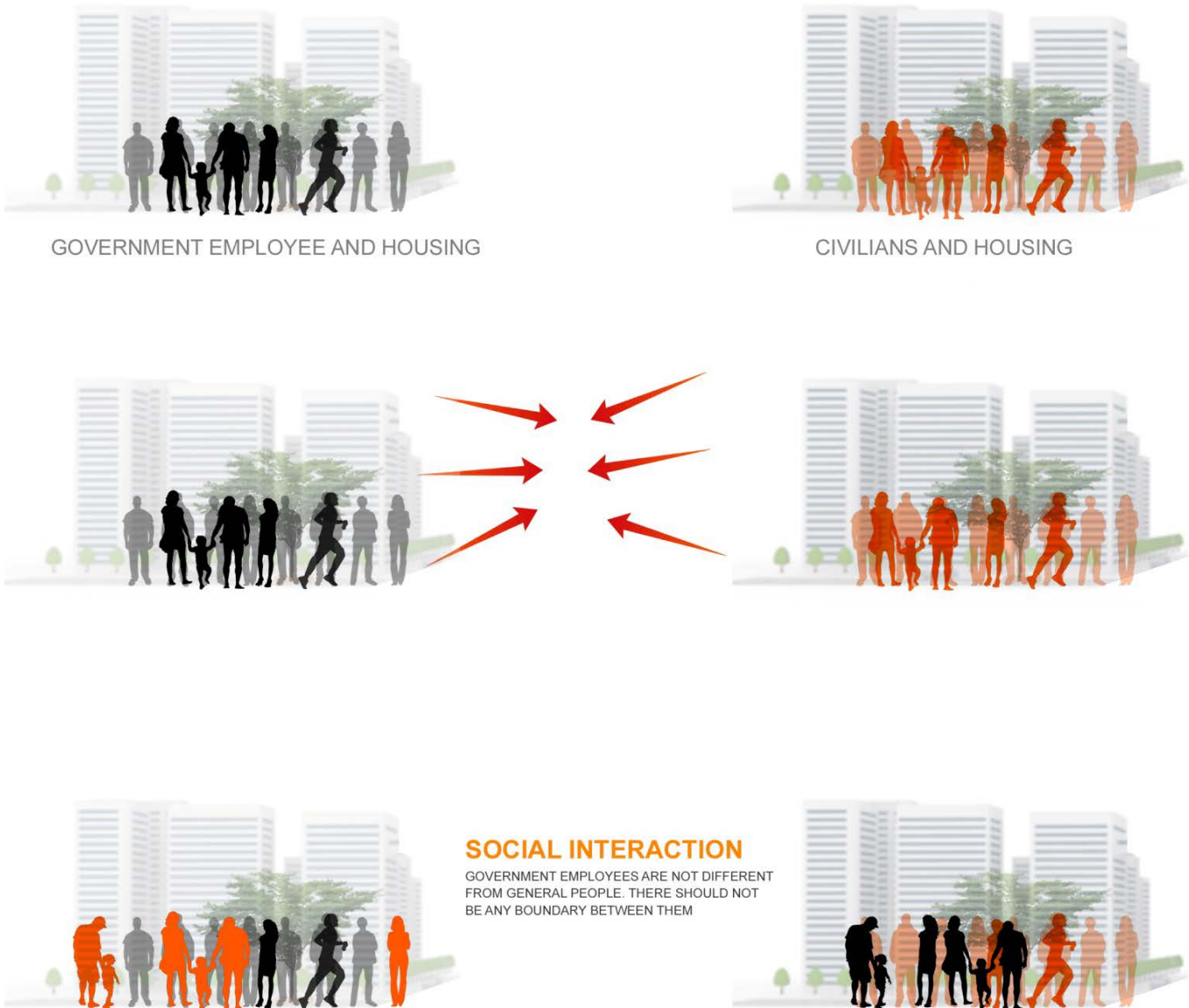


Figure 6.3.2: Conceptual idea. (Source: Author)

COMMUNAL SPACES

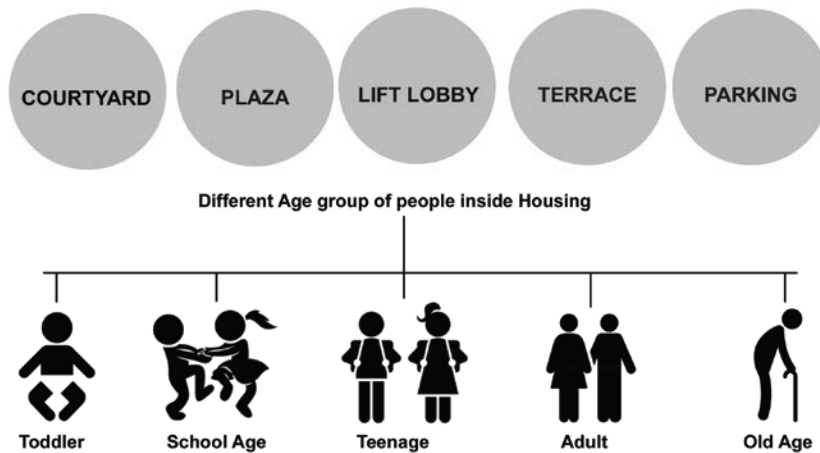


Figure 6.3.3: Types of people and spaces inside housing complex.(Source: Author)

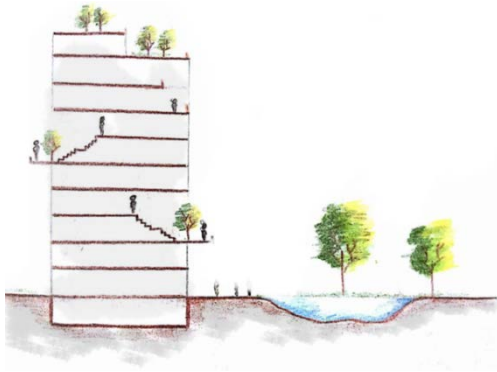
Housing is designing the lifestyle of people living inside the community. People of different age group and various profession lives together inside a housing complex. The idea of this project was to design a housing complex, which would incorporate places for all age group of people. Communal spaces such as terrace, courtyard, plaza, etc are prime places for social interaction. The idea was to design communal space in each floor, inside a building so that residents can gather and spend time together.



Figure 6.3.4: Conceptual ideas of communal spaces inside a building (Source: Author)



THE CONCEPT IS TO MAKE A CLUSTER OF BUILDINGS AND EACH CLUSTER WILL HAVE THEIR OWN COURTYARD. COURTYARD IS AN IMPORTANT COMMUNAL SPACE, WHERE PEOPLE CAN GATHER AND INTERACT WITH EACH OTHER.



EVERY CLUSTER HAS INTER-PERSONAL SPACE FOR SMALL KIDS TO PLAY. KIDS CANT GO FAR FOR PLAYING.WHEN KIDS GROW UP THEN THEY MOVE FAR FROM THE COURTYARD TO THE PLAYGROUND.



FOR ELDERLY PEOPLE WATERBODY IS TO BE DESIGNED. ALL THE CLUSTERS ARE ARRANGED SURROUNDING THE CENTRAL WATER BODY

Figure 6.3.5: Conceptual sketches of the spaces inside the complex (Source: Author)

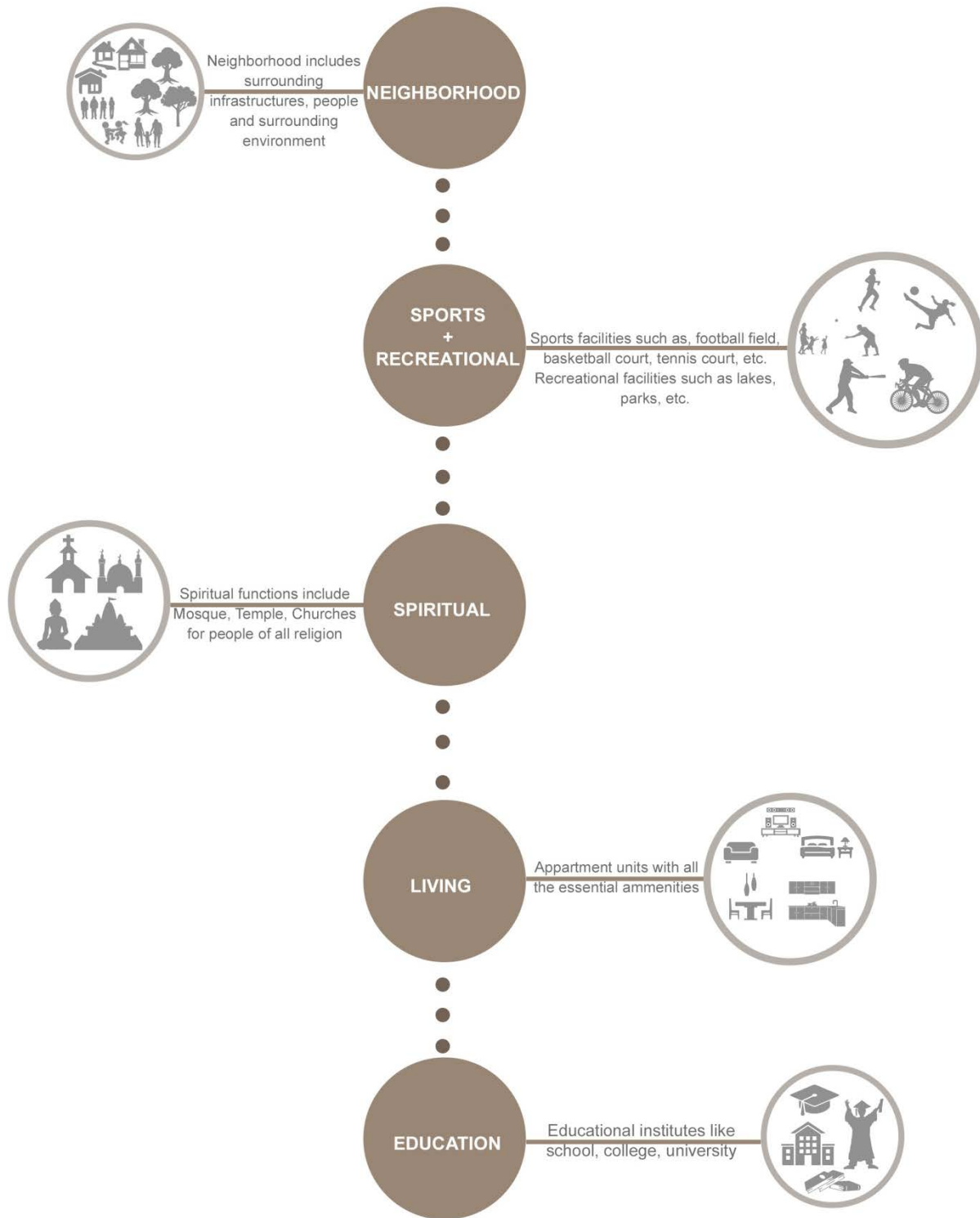
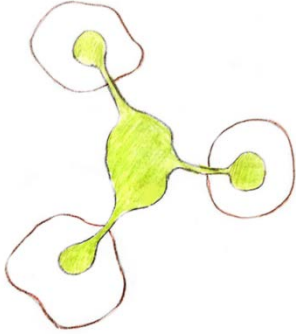


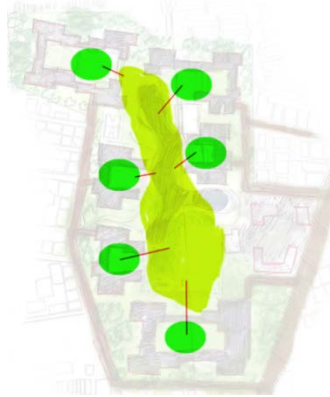
Figure 6.3.6: Different types of spaces inside housing Complex. (Source: Author)

6.4 Form Development

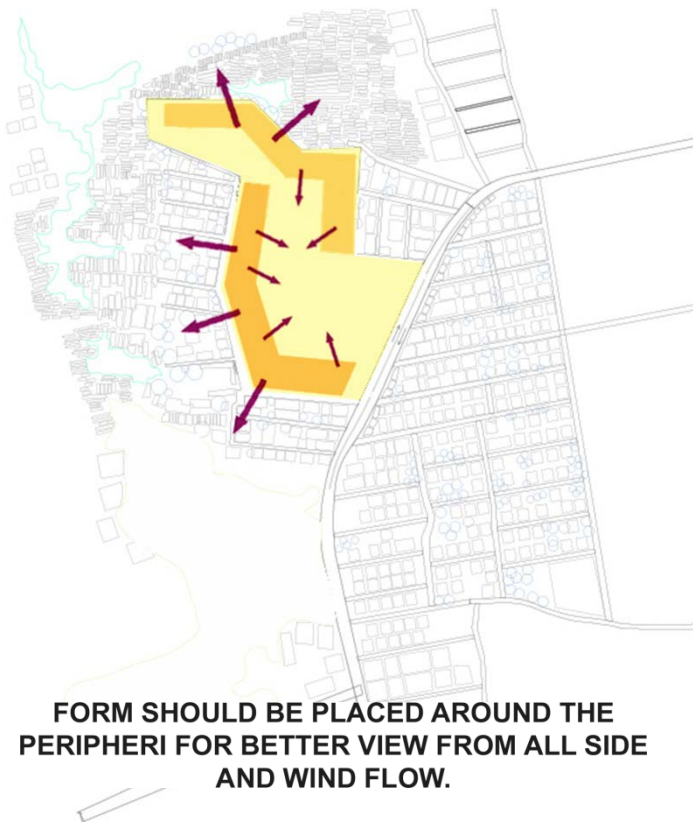
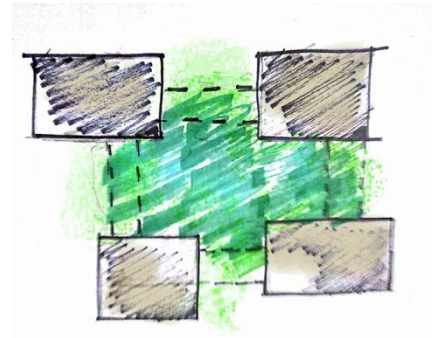
6.4.1 Arrangement of forms inside the complex



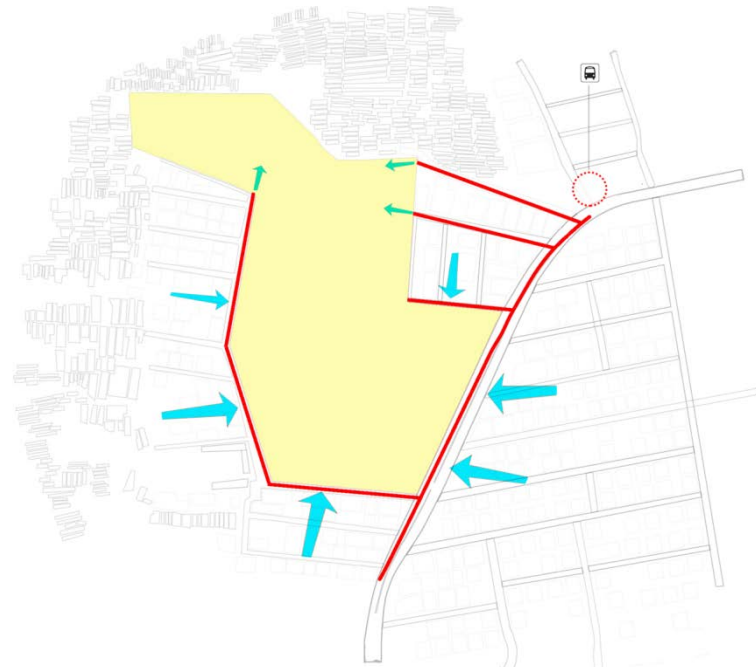
RECREATION AND COMMUNITY CENTRE,
PLAY FIELDS, PLAYGROUND, SITTING
AREA, PICNIC AREAS, PARK, LAKE, POOL.



ALL THE CLUSTERS ARE ARRANGED AROUND A
COURTYARD. THESE CLUSTERS ARE AGAIN ARRANGED
AROUND THE CENTRAL RECREATIONAL SPACE.



FORM SHOULD BE PLACED AROUND THE
PERIPHERY FOR BETTER VIEW FROM ALL SIDE
AND WIND FLOW.



SITE IS ACCESSIBLE FROM ALL SIDE
AND A BUS STOP
LOCATED NEAR THE SITE MAKES
IT EVEN MORE ACCESSIBLE.

Figure 6.4.1: Form placement Diagram. (Source: Author)

6.4.2 Form Derivation of the cluster

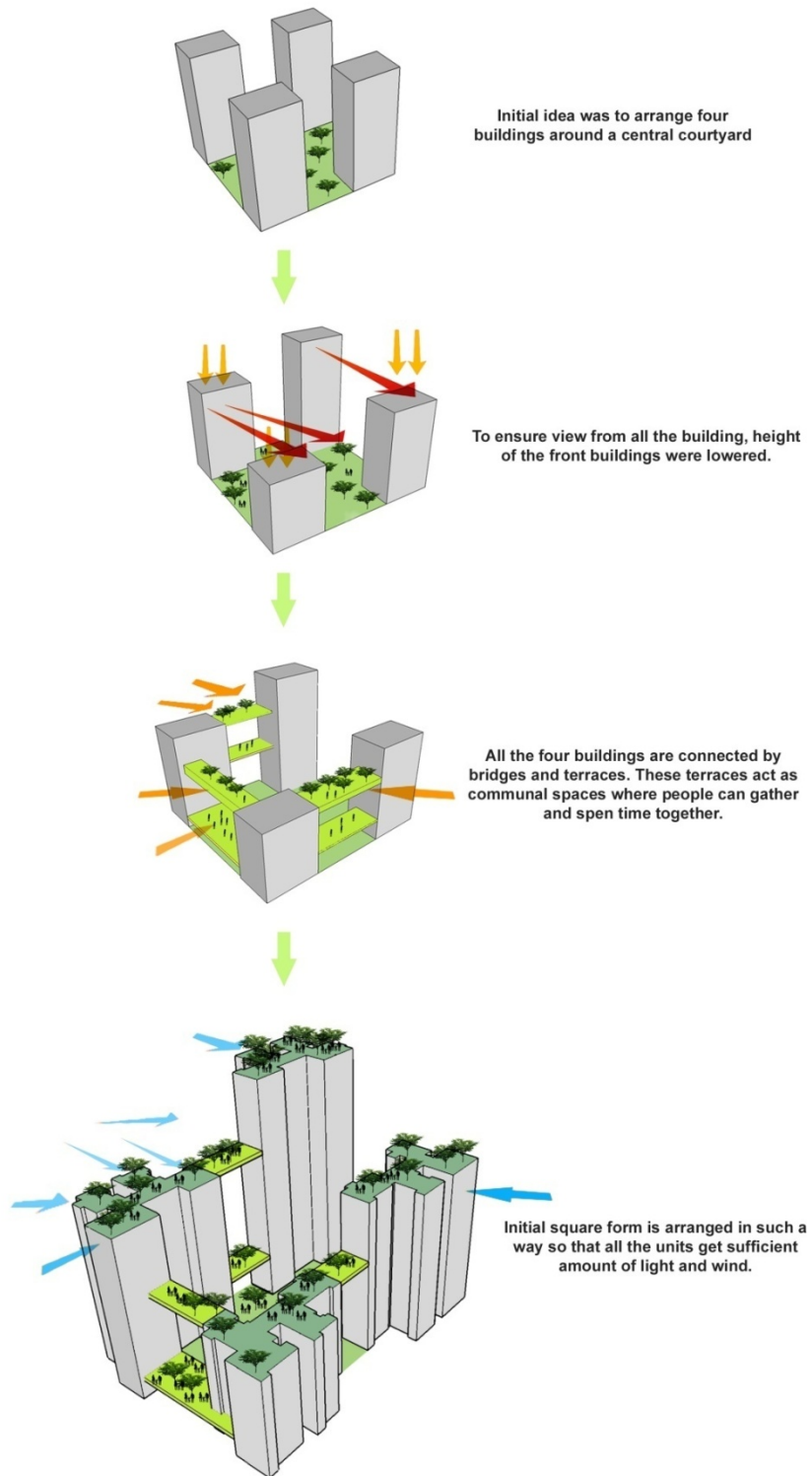


Figure 6.4.2: Form Derivation Diagram. (Source: Author)

6.5 Zoning

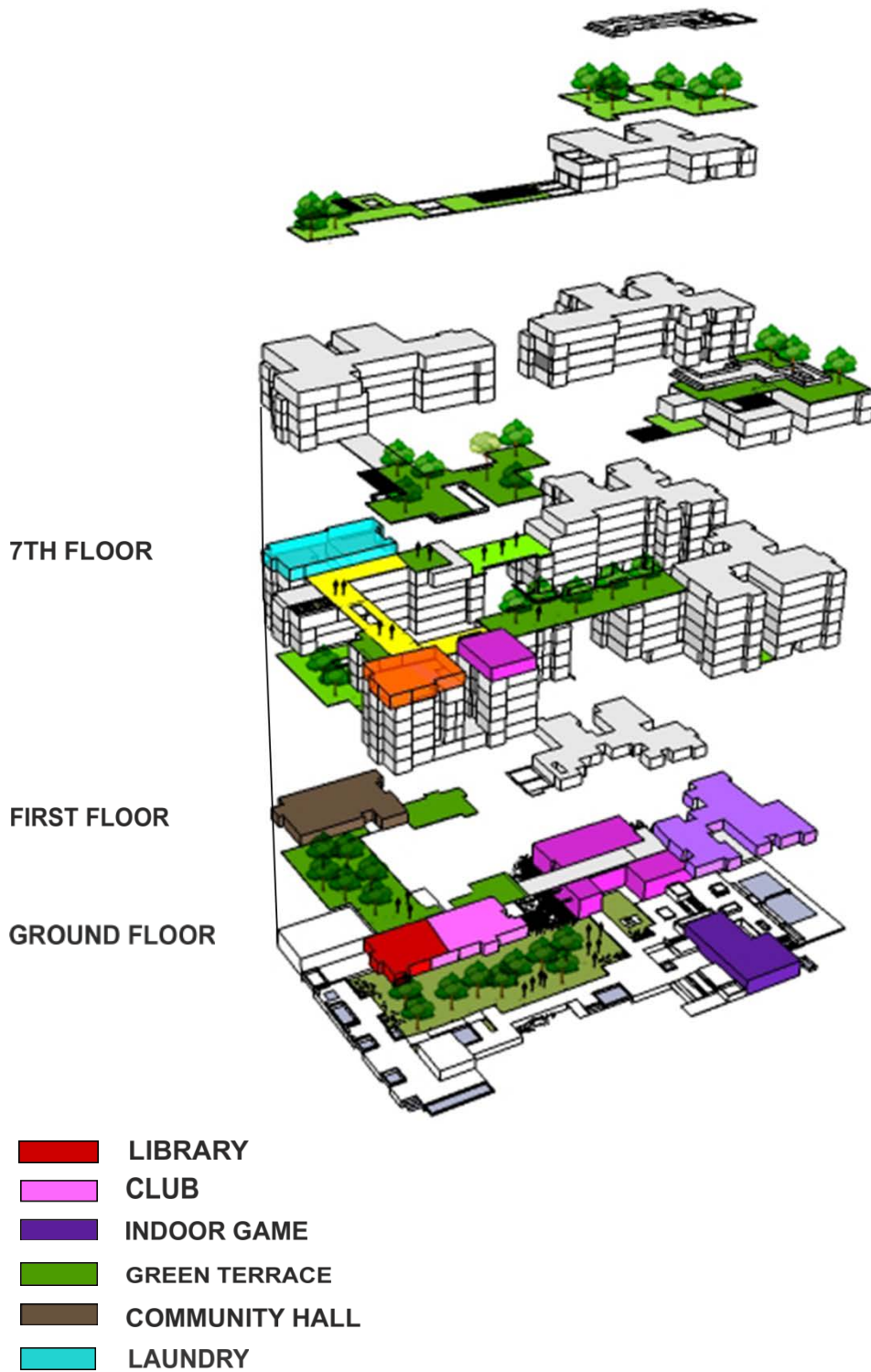


Figure 6.5.1: Functional Zoning Diagram in the cluster. (Source: Author)

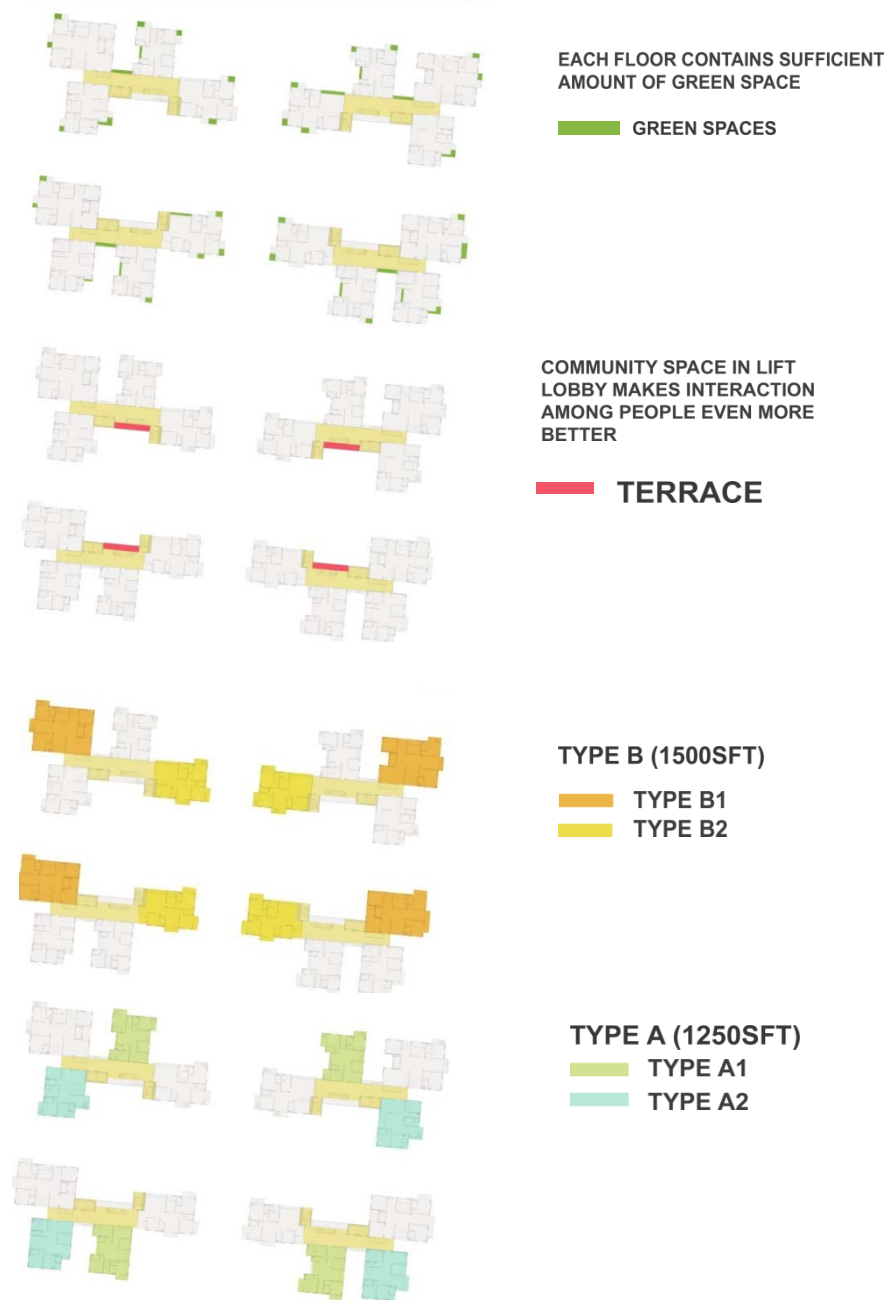


Figure 6.5.2: Spaces in typical floors. (Source: Author)

6.6 Architectural Drawings

6.6.1 Master plan

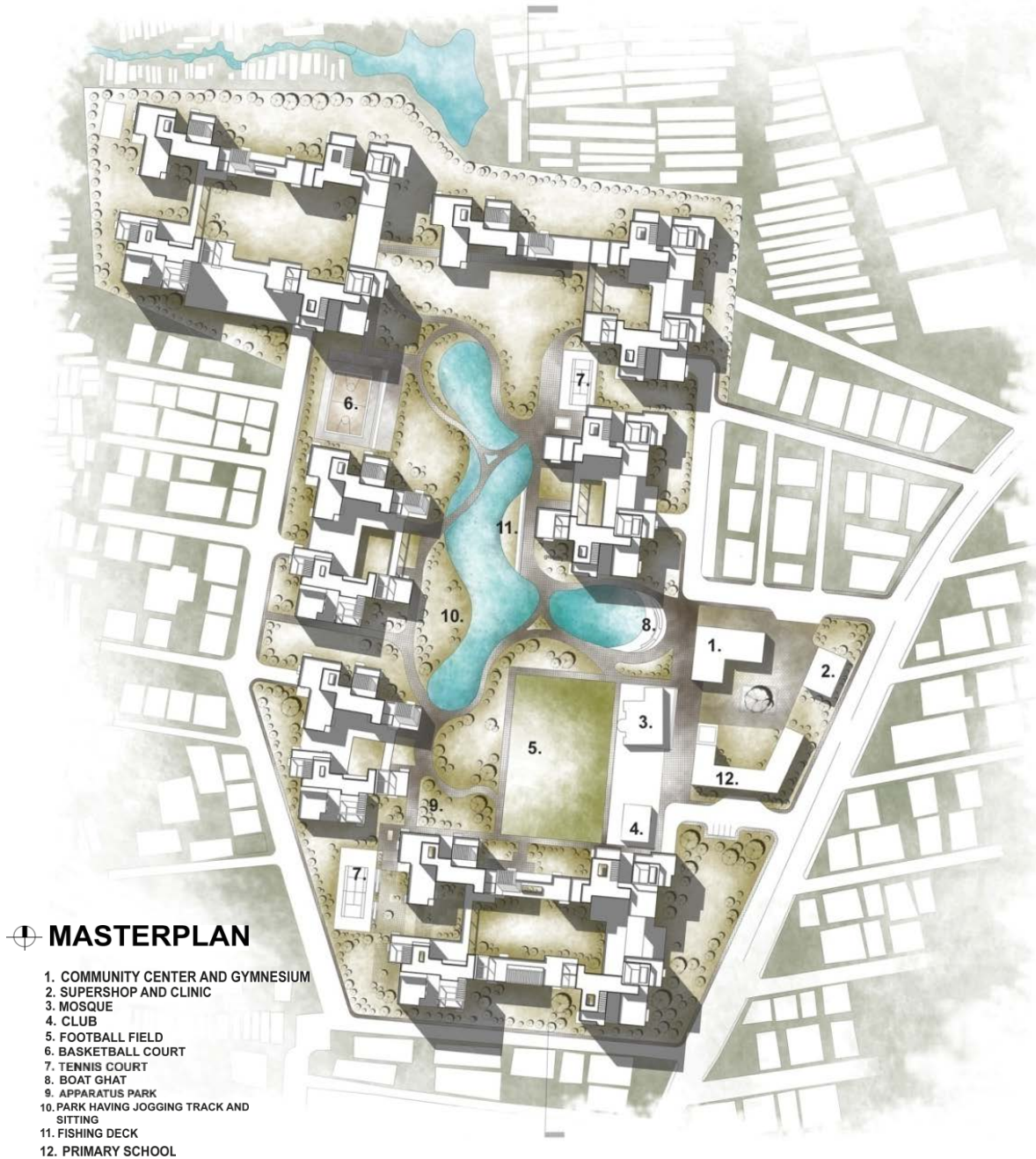


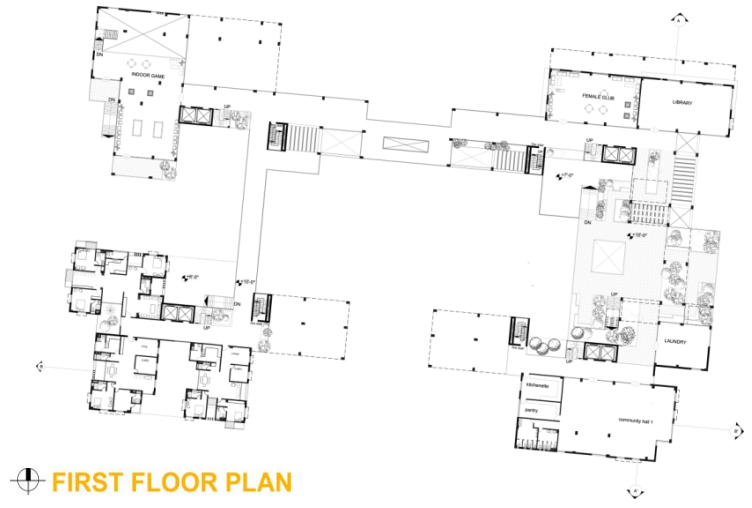
Figure 6. 6.1: Source: Author

6.6.2 Plan of Cluster



GROUND FLOOR PLAN

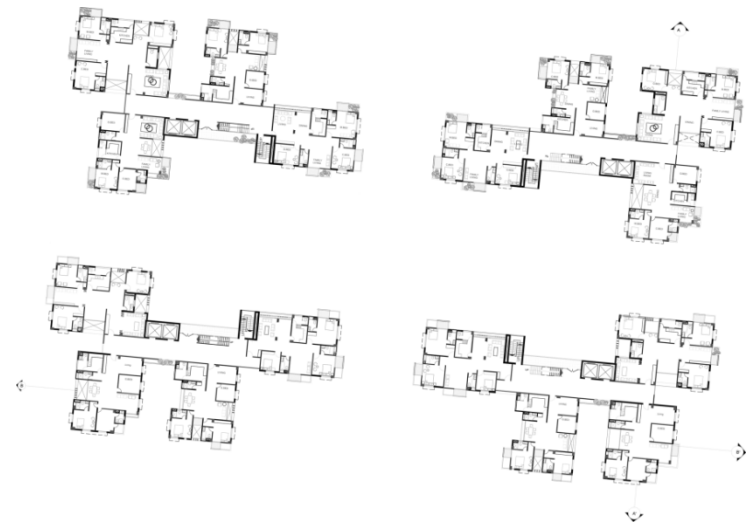
Figure 6.6.2: Ground Floor Plan (Source: Author)



FIRST FLOOR PLAN



SECOND FLOOR PLAN



TYPICAL FLOOR PLAN

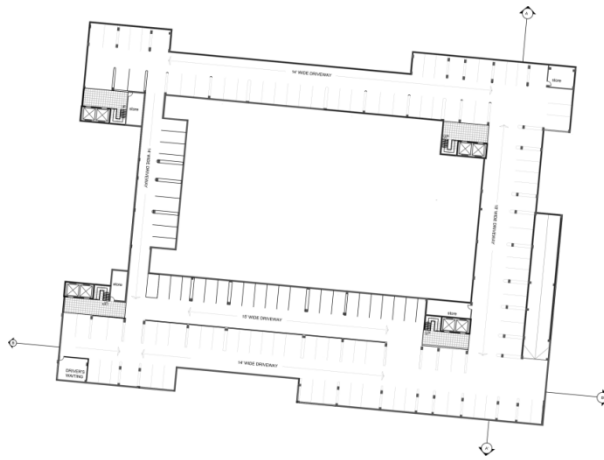
Figure 6.6.3: Source: Author



7TH FLOOR PLAN



8TH FLOOR PLAN



BASEMENT PLAN

Figure 6.6.4: Source: Author

6.6.3 Site Section

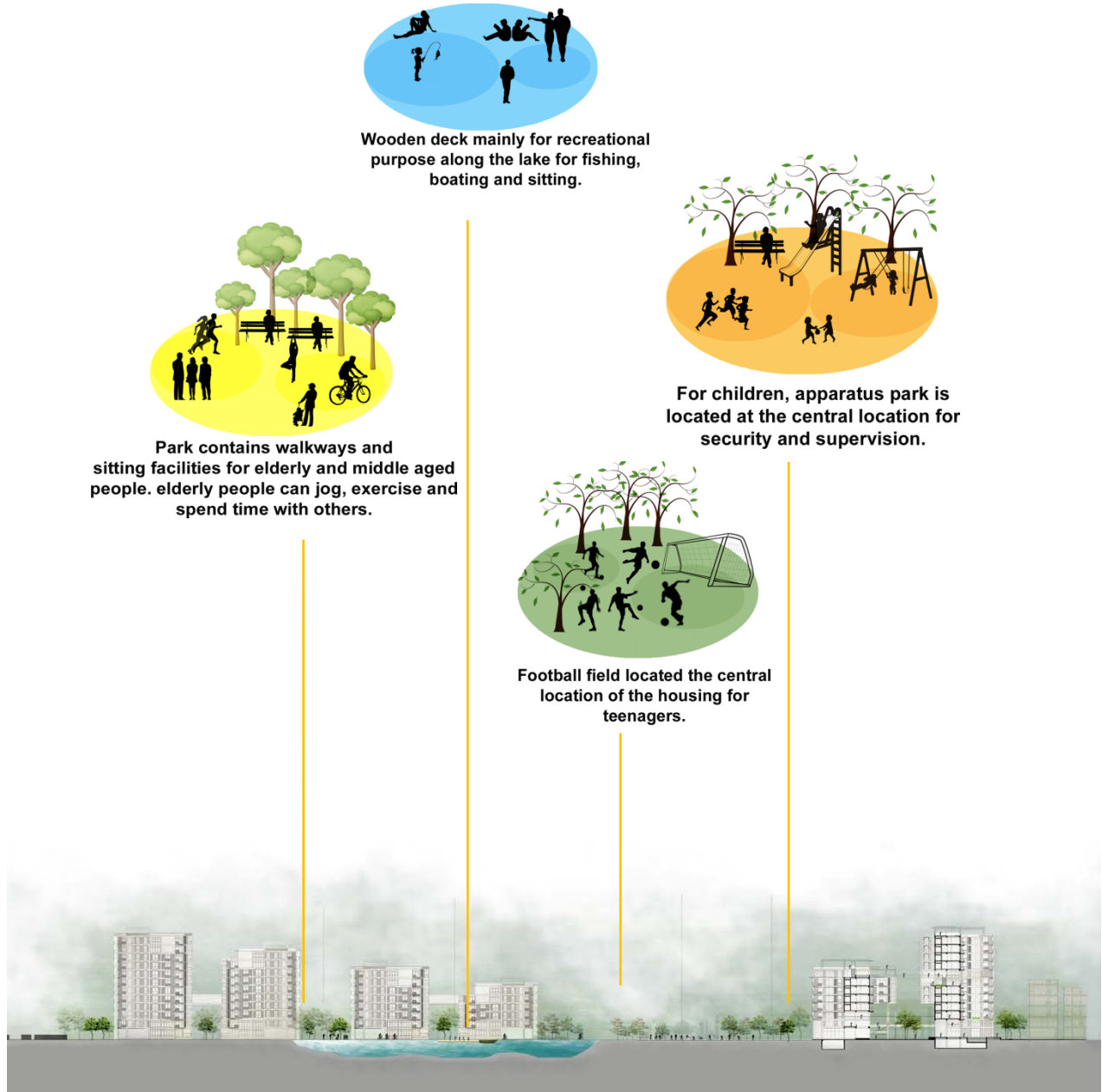


Figure 6.6.5: Source: Author

6.6.4 Section of Cluster



SECTION AA'

Figure: 6.6.6: Source: Author



SECTION BB'

Figure: 6.6.7: Source: Author

6.6.5 Elevations



EAST ELEVATION

Figure: 6.6.8: Source: Author



NORTH ELEVATION

Figure: 6.6.9: Source: Author

6.7 Rendered Images



Figure 6.7.1: Source: Author



Figure 6.7.2: Source: Author



Figure 6.7.3: Source: Author



Figure 6.7.4: Source: Author



Figure 6.7.5: Source: Author

6.8 Model Images



Figure 6.8.1: Source: Author

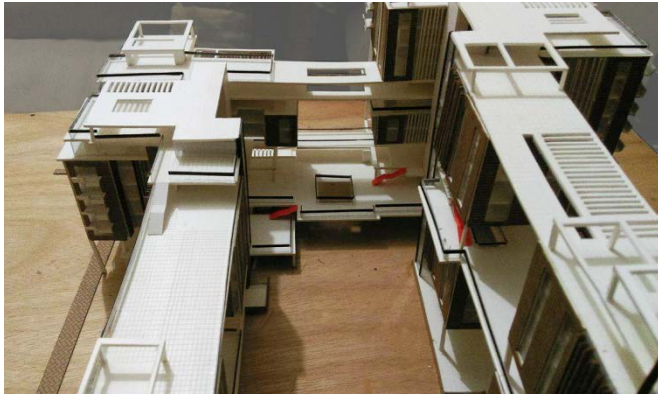


Figure 6.8.2: Source: Author

Chapter 07: Conclusion

Chapter 07: Conclusion

Government provides housing facilities to all the officers until they reach retirement. Housing is the most important part to life and well-being. It is not just about apartment buildings; housing also includes people, neighborhood, community, as well as nature. A person spends entire his life inside a housing complex, from infant stage till death. Throughout the lifespan of a person, they develop lots of memories. Housing is all about the lifestyle of people. Housing also affects the psychological as well as physical health of a person. Housing consists of people of various age group, various profession as well as people from different background. The aim of this project was to design interactive and communal spaces inside the housing complex, where people can spend time together. The idea was to introduce open and green spaces and make people feel close to nature. Government officers are not different from people in the neighborhood. Main idea of this project was to diminish the barrier between government housing and neighborhood. Interaction with the neighborhood would help to build a stronger community. Hence a stronger community would build a stronger nation.

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