

NATIONAL SPORTS COMPLEX FOR THE DIFFERENTLY ABLED

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

Department of Architecture

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Declaration

It is hereby declared that

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Approval

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Abstract

The topic of disability and proper facilities for the differently abled community has become a major socio-economic issue in Bangladesh. As a result the Ministry of Social Welfare under the Public Works Department (PWD) of Bangladesh has deemed it necessary to establish a first of its kind, National Sports Complex specifically tailored for the differently abled community near the urban capital of Dhaka. The project aims to promote the development of differently abled youths through sports facilities, education, medical support, vocational training, accommodation and act as a hub for the promotion of paralympic sports around the country. This dissertation explores the academic architectural design of the National Sports Complex for the Differently Abled from the design process, to best integrate the project into the public realm fulfilling all the specialized needs of the differently abled youths and the various paralympic sports, to the finished design product.

Keywords: Sports Complex, Differently Abled, Disability, Paralympic Sports, Sports, Accessible Design, Accessibility

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Chapter 1: Introduction

1.1 Project Brief

Project Name: Jatiyo Protibondhi Krira Complex (National Sports Complex for the Differently Abled)

Client: Government of Bangladesh, Ministry of Social Welfare

Site size: 12 acres (618772 sqft)

Site Location: Savar, West Bank Town, Southernmost part of Savar Union next to Karnatali River

1.2 Introduction

Disability is a major socio-economic issue in Bangladesh. According to Surveys by ActionAid Bangladesh about 14% of the population of Bangladesh suffer from some form of disability, which is 22.6 million people. It is high time we realize that without the contribution and participation of a large portion of our population, we cannot prosper as a Nation. Moreover, the Government has only recently recognized the issues and has enacted Rights and Protection act for people with disabilities in 2013. As a result the support systems and facilities for this large group of people are by and large absent in Bangladesh. Consequently, it is seen that they are deprived of quality education, employment, medical and social support and sports-recreational facilities.

The description of disabilities have changed over the years from being an individual's medical condition to the inabilities of society and its systems to create fair opportunities and equity for the differently abled. To address these issues the Ministry of Welfare of the Government of Bangladesh has issued A National Sports Complex for the Differently Abled to be built under the Public Works Department.

This facility hopes to raise awareness and develop more interaction between the general public and the differently abled youth. Sports can be a universal platform to transcend

linguistic, cultural and social barriers for a more inclusive upbringing. Through sports and supporting facilities youths with disabilities can acquire vital social skills, a sense of belonging and empowerment as well as individual autonomy to function confidently in society. Furthermore, there are no facilities for sports for the differently abled community as well as no scope in participation of paralympic sports in Bangladesh. So in order to build a more inclusive society such a sports complex is necessary. This project has the potential to bring the opportunity to produce more facilities to the differently abled community and help them nurture mentally and physically to work as a functional member of society.

1.3 Project Rationale

There is a severe lack of awareness and equally lack of proper facilities and platforms for the differently abled community in Bangladesh. As mentioned Previously 14% of the population of Bangladesh are differently abled. This is a substantial portion of the population who do not have equal and just opportunities as a member of society. This stems from the inability of our system to properly accommodate and integrate these groups into society from early childhood. As a result, in order for differently abled youths to be integrated into society, they need a proper support system in place and a nurturing environment for their physical and mental development.

As a result, the National Sports Complex for the Differently Abled has been proposed to address such issues and shortcomings in our society. Sports is universal, can transcend socio-cultural boundaries and can be a powerful driving factor in the physical, mental and social development of youths. Through cooperation and teamwork in sports differently abled children can learn crucial social skills and gain confidence in oneself to act individually and a sense of belonging. It can provide a healthy release of stress through stimulation and reinforce constructive habits for self development. Furthermore, this project can act as a platform for promoting Paralympic sports in the country which is largely absent. Therefore, this institution aims to provide a nurturing environment best suited to the needs of the various differently abled children. This environment will not only cater to their academic and medical needs, but also any social support for their families and growing the platform and awareness for the differently abled communities.

1.4 Methodology

Firstly, we are required to study the context of the site by collecting necessary data related to the project and analyze data. Upon analysis of the context we will be able to take preliminary design decisions as well as be able to predict future scenarios. This analysis will help us better understand various issues such as physical, socio-economic, cultural, environmental issues which will become guiding principles for our design. Secondly, this proper knowledge of the various kinds of disabilities and universally accessible design methods must be studied through literature reviews and case studies of designs. This also includes consulting with people from the differently abled community as well as experts in healthcare. Furthermore, the various kinds of para-sports, their facilities, court sizes and rules are to be studied in order to design for them. Thirdly, case studies of similar projects are to be done in order to broaden the perspective on designing the project. Fourthly, designing according to the compliance requirements provided in the proposal by the government but not being limited to the scope given. Through creativity and proper research the scope of the project may be widened to design a more comprehensive project which addresses more issues. Finally, through the design process of drawing plans, making models and experimentation I will propose a final design which will be the culmination of all my learnings throughout my 5 years as a student.

1.5 Program Provided by the Client

This project aims to provide a nurturing environment for the complete physical and mental growth of youths with different disabilities with an emphasis on sports and social activities. The program is designed to provide a safe and stimulating environment for the differently abled youths, in order for them to build the necessary skills to become a functioning member of society. The given program is as follows:

- 1) 10 Storied Administrative & Academic Building with the following functions:
 - a. Administrative Unit
 - b. Academic Unit
 - c. Medical Center (20 bedded with physiotherapy and rehabilitation facilities)
 - d. Auditorium/Multipurpose Hall (600 people capacity)
 - e. Seminar Rooms
 - f. Meeting Rooms

- g. Universally accessible toilets
 - h. Reception & Lift Lobby
 - i. Cafeteria
 - j. Basements Parking (100 cars)
- 2) Sports Facilities with the following functions:
- a. Athletic Track + Football Field for Main events (400m)
 - b. Cricket Field
 - c. Universally Accessible Swimming Pool
 - d. Shaded Galleries
 - e. Para Sport Court + Gymnasium
 - F. Locker rooms
- 3) Accommodation Facilities with the following functions:
- a. 6 Storied Staff Quarter
 - b. 6 Storied Youth Dormitories
 - c. Mosque and Religious Space

1.6 Aims and Objectives of the Project

The main objective of the project is to facilitate the development of differently abled youths through universally accessible facilities, and enable them to integrate into society and enjoy all spheres of life. The objectives of the project are:

- Ensuring the rights and needs of the differently abled youths through the development of Academic, Recreational and Medical facilities in the National Sports Complex for the Differently Abled.
- To raise awareness among the general population and society at large about the Differently Abled Communities and providing them a platform.

- Providing a nurturing environment for the differently abled youths for their development into contributing members of society.
- Tending to the specialized needs of the differently abled youths through state of the art technologies and Universally Accessible design.
- Creating an interconnected and inclusive network with related facilities and bodies for the betterment of the conditions of the Differently Abled Community in Bangladesh.
- To promote, facilitate and create opportunities for Paralympic sports in the country.

Chapter 2: Background on Disabilities and Paralympic Sports

2.1 Understanding disability

Disability is a physical or mental impairment of a human being that limits his/her normal functioning of life. Socially, a disability is defined as a condition or function which puts an individual at a significant disadvantage relative to the normal functioning standard of an individual or group. The term is used generally to describe conditions that create barriers to individual functioning such as sensory impairment, physical impairment, cognitive impairment, intellectual impairment, mental illness, autism and various types of chronic diseases. According to The World Health Organization (WHO), Disability is complex, dynamic, multidimensional and contested. Over recent decades, the disabled people's movement, together with numerous researchers from the social and health sciences have identified the social and physical barriers in disability. The transition from an individual, medical perspective to a structural, social perspective has been described as the shift from a medical model to a social model in which people are viewed as being disabled by society rather than their bodies...A balanced approach is needed, giving appropriate weight to

different aspects of disability (World Report on Disability, 2011). So we understand that the term disability is not just used to describe a medical term. Rather it is a dynamic relation of the person with impairments and, the social and environmental factors that dictate their effective participation in society on a fair and equal basis.

2.2 Disability in the context of Bangladesh

Disability in Bangladesh is a huge socio-economic issue that has yet to be properly addressed. Due to the prevailing rates of overpopulation, poverty, illiteracy, lack of public awareness, lack of medical care and lack of universal services, the number of people with disabilities in Bangladesh is high. Action-Aid Bangladesh and Social Assistance and Rehabilitation for the physically vulnerable states that the Differently abled population at 14.04% of the population. This is an alarmingly high number of people who do not get proper services and opportunities to participate in different spheres of society. Furthermore, the country has only recently started acting to address such issues as early as 2013 when they implemented “Persons with Disability’s Rights and Protection Act 2013”. Although there is a net general sense of compassion and positive attitude towards the differently abled, there are many people in Bangladesh who view them as a curse and a cause of embarrassment to the family. This is especially true in the case of women who are relatively more vulnerable to social discrimination and neglect.

These issues are so prevalent because there is a distinct lack of awareness and proper planning at the governmental level. Universal accessibility and the welfare of the differently abled groups is hardly ever considered during the planning of infrastructure and development. This issue not only is physical but also extends to other parts of the system such as no proper safety net for differently abled groups. Differently Abled people are often systematically

barred from getting proper healthcare services, employment opportunities, education and participation in society as a whole. Even when these people get opportunities according to law they are faced with unfair competition , social stigma and in compromising situations.

Although the response to the issue of Disability has been slow in Bangladesh, several government and non-government organizations have taken up the task of addressing various aspects of disability in the country. According to Japan International Cooperation Agency (JICA) some prominent organizations in the country are as follows; Centre for Disability in Development (CDD), Handicap International (HI), the National Forum of Organizations Working with the Disabled (NFOWD), Action on Disability and Development (ADD) Bangladesh, The Centre for the Rehabilitation of the Paralyzed (CRP), Rehabilitation Institute and Hospital for the Disabled (RIHD), Government Blind and Deaf and Dumb School, Training and Rehabilitation Centre for the Physically Disabled, Action Aid Bangladesh (AAB), Assistance for Blind Children (ABC), Bangladesh Blind Mission (BBM), Bangladesh Drishtihin Foundation (BDF), Bangladesh Organization for Disabled Advancement (BODA) and many more. These organizations are constantly working with the differently abled groups in the country to ensure them their basic human rights in creating environments for equal and fair participation in society.

2.3.1 The Diversity of Disability

The modern definition of disability has been conceptualized to be multidimensional. The International Classification of Functioning Disability and Health (ICF) , is a WHO recognized framework of classification of health components of functioning and disability, which takes into account the roles of physical, social and environmental factors affecting the

differently abled. This process was developed through a long process involving academics, clinicians and most importantly persons with disabilities. The ICF categorizes the problems with human functioning in three interconnected areas:

- Impairments: Problems in body structure or body functions.
- Activity Limitations: Difficulties in executing activities
- Participation restrictions: Problems with involvement in any area of life

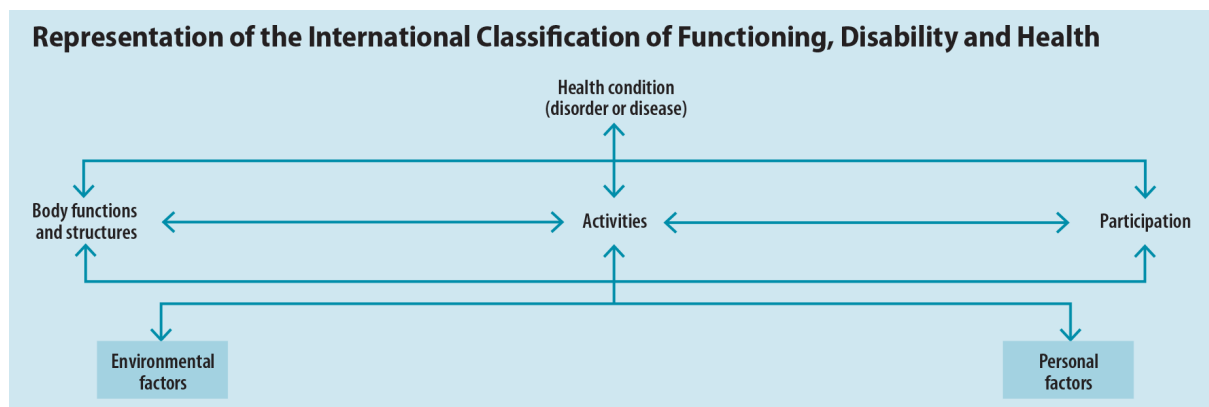


Fig 1: International Classification of Functioning Disability and Health Diagram (ICF)
Source: World Report on Disability, 2011

The ICF does not distinguish between the type and cause of the disability and adopts neutral terminology such as Health conditions to avoid any type of segregation. It also factors in environmental factors describing the circumstances different people live through. It also recognizes personal factors such as motivation and self-esteem and individual differences that affect how they participate in society. As a result this covers all aspects of human functions and treats disability as a continuum rather than categorizing people with disabilities and creating segregation. This is why this framework of categorization is more universal.

2.3.2 Classification of Disabilities

According to the ICF framework the types of disabilities include various types of physical and mental impairments can affect a person in functioning normally in their daily activities.

These disabilities can be classified into a number of subcategories which are as follows:

- i) Mobility/Physical disabilities
- ii) Spinal Cord Injury (SCI)
- iii) Head/Brain Injuries (TBI & ABI)
- iv) Visual Impairments
- v) Hearing disabilities
- vi) Cognitive/Learning disabilities
- vii) Psychological disabilities
- viii) Invisible disabilities

2.3.2.1 Physical disabilities

Mobility Impairments vary widely between people with different physical disabilities. According to NANDA, physical and mobility impairment as a limitation in independent, purposeful physical movement of the body or of one or more extremities (Disabled World ,2019). This type of disability may be caused by accidents, disease, amputations, malnutrition, with old age and congenital. Mobility impairments can severely hamper day to day activities in many different ways. It is frequently seen that this type of disability creates multiple barriers to access to different areas of life such as access to buildings and transport, employment in certain physical fields, unassisted work and independent movement etc. The types of Mobility disabilities may involve a variety of physical conditions and diseases, some common types of Physical disabilities are:

Cerebral Palsy

Muscular Dystrophy

Spina Bifida

Heart Defects

Polio

Amputation/Absent Limb / Reduced Limb function

2.3.2.2 Spinal Cord Injuries (SCI)

Spinal Cord injuries consist of any injury temporary or permanent to the spinal cord that lead to reduced or loss of motor, sensory or automatic function. According to the WHO people who suffer a spinal cord injury are 2 to 5 times more likely to die prematurely. Spinal cord injuries most commonly occur due to trauma to the spine. WHO states that 90% of SCI occurs due to traffic accidents, falls and violence (WHO, International Perspectives on Spinal Cord Injury, 2013). The affected may lose voluntary control of the body below the affected spine. The affected people suffer more because the condition is crippling, comparatively expensive, mandatory dependence and lower rates of participation in spheres of life. This type of disability consists of the following conditions:

Paraplegia

Quadriplegia

Hemiplegia

Complete SCI/ Incomplete SCI

Anterior Cord Syndrome

Central Cord Syndrome

Spinal Constitutions

2.3.2.3 Brain Injuries (TBI & ABI)

Brain injuries are a serious disability which typically results in loss of sense of balance and disorientation. The two main types of brain injuries are Traumatic Brain Injury and Acquired

Brain Injury. The TBI usually occurs due to trauma to the head from external factors, while ABI occurs due to the rapid degeneration of the brain after birth. This type of injury usually leads to loss of sense of balance and often causes vertigo and unsteady gait. This type of disorientation can seriously affect daily activities and focusing on tasks, which often leads to reduced opportunities in participation in different aspects of life. According to CDC, it is estimated that at least 1.4 million people in the United States are affected by traumatic brain injuries every year. (CDC,2017)

2.3.2.4 Vision Impairments

Visual Impairments are a partial or complete loss of vision by the human eye. There are multiple varying causes of visual impairments such as congenital defects, disease and accidents. Globally the number of people of all ages visually impaired is estimated to be 285 million of whom 39 million are blind (WHO,Global data on Visual impairments, 2010). Vision is considered to be the most important of the 5 primary senses and having visual impairments can drastically affect an individual's potential to participate in different spheres of life. Common visual impairments are:

Blindness

Ocular Trauma

Cornea injury

Sclera injury

Corneal graft

Dry eye

2.3.2.5 Hearing Disability

Hearing disability is an impairment which partially or completely prevents an individual from receiving and perceiving sound from the environment. Hearing impairment can be both congenital and acquired over time. It can affect one ear which is called unilateral hearing disability, or can affect both ears which is called bi lateral hearing disability. This impairment can also be an inability to hear certain thresholds of sounds to the point of being completely deaf. Over 5% of the world's population – or 466 million people – has disabling hearing loss (432 million adults and 34 million children) (WHO,2020). Communication becomes a huge barrier to participation to persons with hearing impairments as it is one of the five main human senses.

2.3.3.6 Cognitive or Learning Disabilities

Cognitive disabilities are defined as a variety of medical conditions that affect the cognitive ability of an individual. This type of disability causes lapses in the processing of information in the brain and hampers certain perceptive abilities of human beings. This can affect some of the most basic aspects of life such as memory, learning new skills, calculation, reading, linguistics, concentration, decision making, problem solving and so on. This can show mild to severe conditions depending on the circumstances. As a result learning disabilities can widely affect an individual in different aspects of life and can become a huge barrier to equal participation to complex forms of work. The causes of cognitive and learning disabilities are often congenital but can also be acquired by trauma, age, disease and other external factors. This form of disability encompasses a broad range of intellectual and cognitive conditions, some common types of cognitive disabilities is as follows:

Autism

Dyslexia

Attention Deficit Hyperactivity Disorder

Dementia

Down syndrome

Dyscalculia

Dysgraphia

Auditory Processing Disorder

Language Processing Disorder

Non-Verbal Learning Disabilities

Visual Motor Deficit

2.3.3.7 Psychological Disorders

There are many different mental disorders, with different presentations. They are generally characterized by a combination of abnormal thoughts, perceptions, emotions, behaviour and relationships with others. (WHO,2019). Mental health impairments can occur to any human being at any point in their life and can cause long lasting effects. This is an often ignored disorder in most parts of the world, and can severely affect proper participation in different spheres of life. Mental health disorders are complex and may take many forms, some common forms of mental health disorders are:

Depression

Bipolar Disorder

Schizophrenia and forms of psychoses

Dementia

Autism and other developmental disorders

Personality and Behavioural disorders

Different Phobia

Attention Deficit Disorder

2.3.3.8 Invisible Disabilities

Invisible Disability is an umbrella term that is used to define a spectrum of hidden disabilities which are neurological in nature. These forms of disabilities are typically not apparent and are difficult to diagnose hence they are called Hidden disabilities. They are chronic and neurological in nature and it is difficult to distinguish between persons with hidden disabilities. Common forms of Invisible disabilities include:

Chronic Pain

Fibromyalgia

Chronic Fatigue

Mental Illness

Chronic Dizziness

Renal Failure

Sleep Disorders

2.4.1 Paralympic Sports

The word Paralympic comes from the Greek word “Para” (alongside) & “Olympics” i.e. Parallel Olympics, that is to put emphasis on the equality and equity of differently abled people. The Paralympic movement was conceived as a means to showcase to the world the abilities of differently abled persons while also being a platform for awareness of disability

rights through ensuring equity and equality of opportunities, social integration and universally accessible environments. Moreover, the sports aspect of the movement empowers people with disabilities, brings media attention to raise awareness and restructures social norms to benefit the differently abled persons.

2.4.2 History of Paralympic Sports

Para-sports came about as a form of recreation and rehabilitation for persons with disabilities. After the atrocity of World War II the surge of large numbers of people with disabilities led to the introduction of para-sports for physical and mental recreation for the affected people. Gradually these sports grew from being recreational to competitive. “In 1944, at the request of the British Government, Dr. Ludwig Guttmann opened a spinal injuries centre at the Stoke Mandeville Hospital in Great Britain, and in time, rehabilitation sport evolved to recreational sport and then to competitive sport.” (paralympic.org). Overtime, with the participation of different countries and organizations these games evolved to become the modern Paralympic Games.

2.4.3 Types of Paralympic Sports

There are different types of Paralympic Sports that are accessible to a wide range of persons with different disabilities. There are various classifications in each sport for more inclusivity and participation of people with different disabilities in the same sport. Participants and athletes are classified through a variety of processes that evaluate their disability group for their particular sport for competitive fairness. Each sport is different and has its own specific systems of classification. For example wheelchair basketball allows 5 athletes with 5 different categories of physical disability based on the range of body movement. The rules also enforce participation and accessibility by assigning points to the level of range of body movement and having a limit on points on each team. As a result the team cannot have 5

members with the least disability, rather the team must be composed of different categories of physical disability. Similarly, other sports are categorized for maximum participation. The major sports are given below:



Fig 2: Different Paralympic Sports. Source: tokyo2020.org

All disabilities are not suited for sports, as a consequence there is a variety of sports that are catered for different disabilities. The paralympic organization has classified different sports classes for different sports:

- 1.Impaired Muscle Power
- 2.Impaired Passive Range of movement
- 3.Limb Deficiency
- 4.Leg Strength Difference
- 5.Short Stature
- 6.Hypertonia
- 7.Ataxia
- 8.Athetosis
- 9.Vision Impairment
- 10.Intellectual Impairment

Chapter 3: Contextual Analysis

3.1 Site Appraisal

The site is situated in the southernmost part of Savar City on Government Ground acquired by the Public Works Department.

3.2 Site Location

The site is located on the southernmost part of Savar Union in the residential area of West Bank Town next to the Karnatali River. The site is adjacent to the Karnatali river branching from the Dhaleshwari river with its bank along the site. One section of the site is directly adjacent to the Savar Aricha Highway with the bridge over the river visible from the site. Right next to the residential areas of East and West Bank town towards the north and south of the site along the highway are various industries.

Area: 12.01 Acres (618772 sft)

Location: West Bank Town, Savar, Bangladesh

Coordinates: 23°49'9.81"N, 90°15'20.59"E

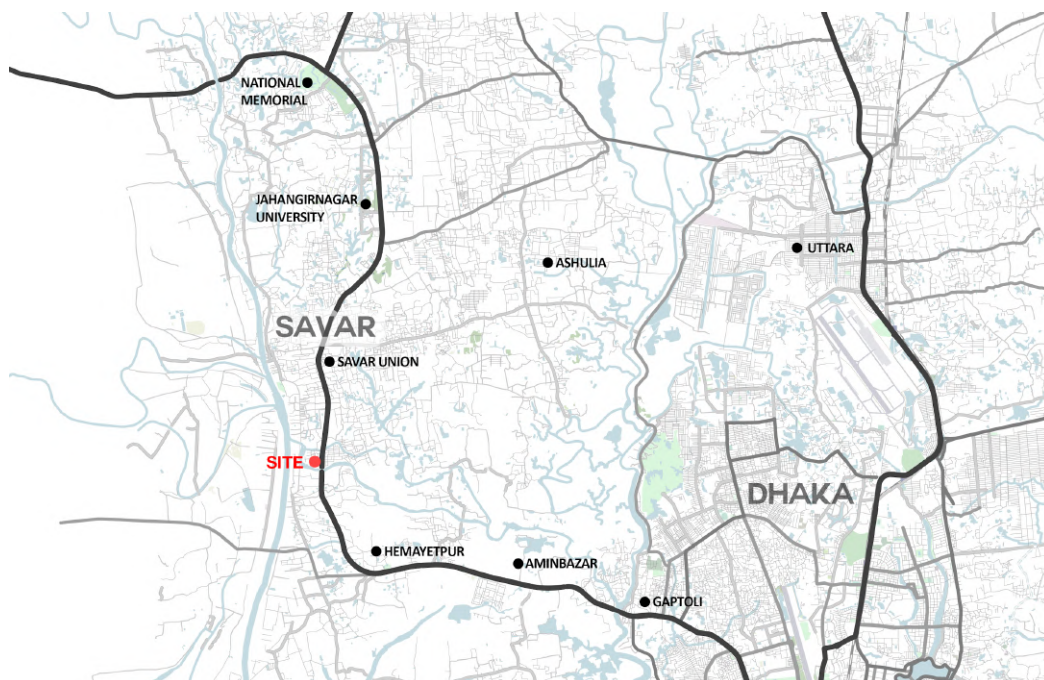


Fig 3: Site location Source: Author



Fig 4: Site satellite image Source (Google Earth)

3.3 Planning Context

Savar grew as one of the satellites to Dhaka initially used as vast Agricultural land. With the development of the Export Processing Zone various industries started being erected in Savar and it gradually became a large industrial zone and a satellite city to Dhaka.

3.4.1 Surrounding Land Use

Savar has grown exponentially over the years due to the growth of different industries in the areas. The agricultural zones of savar were rapidly being transformed into residential areas and the zones near the main highways were being transformed into industrial zones. The site marked in the diagram falls within a residential area and is flanked on the east and west by other residential zones. While to the north and south of the site there is a mix of industrial and residential zones.

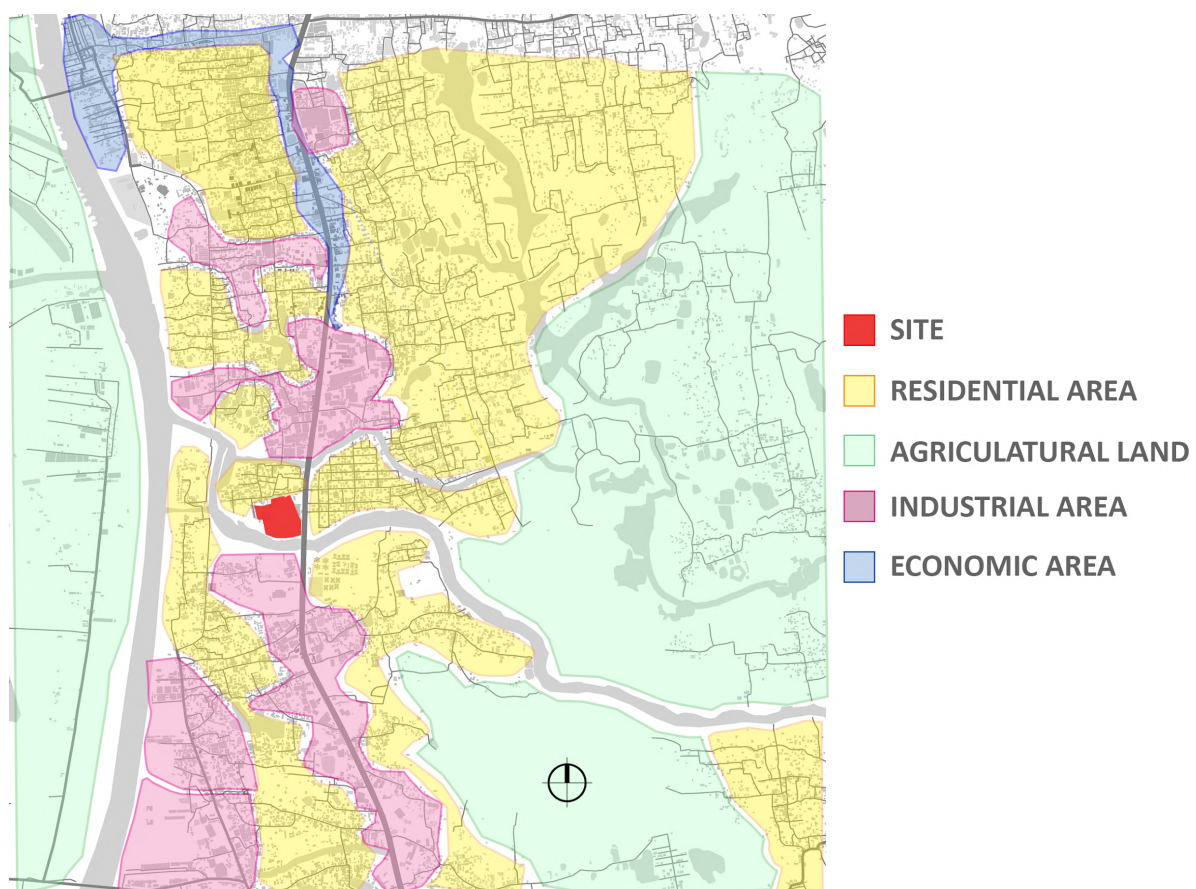


Fig 5: Current Zoning of Savar (Source: Author)

Due to the site being surrounded by residential zones there may be an issue of privacy with its function being a Sports Complex. There are no harmful industries upstream as a result the water flowing from the north along the southern side of the site is safe. The economic zone is 10 min drive away from the site. The rural edge of the area is used as agricultural lands.

3.4.2 Neighbourhood Land Use

The area the site lies in is primarily a residential area for working class and middle income families. The site is also flanked on the east and west by upper class residential areas and lower middle class residential areas respectively. Towards the north and south of the site are industries mainly garments manufacturing and textiles.



Fig 6: Neighbourhood Land use mapping (Source Author)

Since the site is surrounded by a diverse group of residential areas with multiple income groups, a public space through the site can serve these areas. Aside from serving these areas it can also act as exposure to the general public to the differently abled community.

3.5 Neighbourhood Structure

3.5.1 Neighbourhood Form

The site is within a working class residential area of West Bank Town. There is a mix of single storied corrugated iron housings, three storied buildings and seven storied apartment

buildings. The neighbourhood is connected by narrow pedestrian roads and small shops occupy the ground floor of most buildings for convenience. There is a center for human resource development to the north of the site in the neighbourhood. On the opposite side of the highway is the East Bank Town with its five to seven storied residential buildings for the middle and upper middle class. The roads in these parts are wider, grid like and more designed for vehicles.

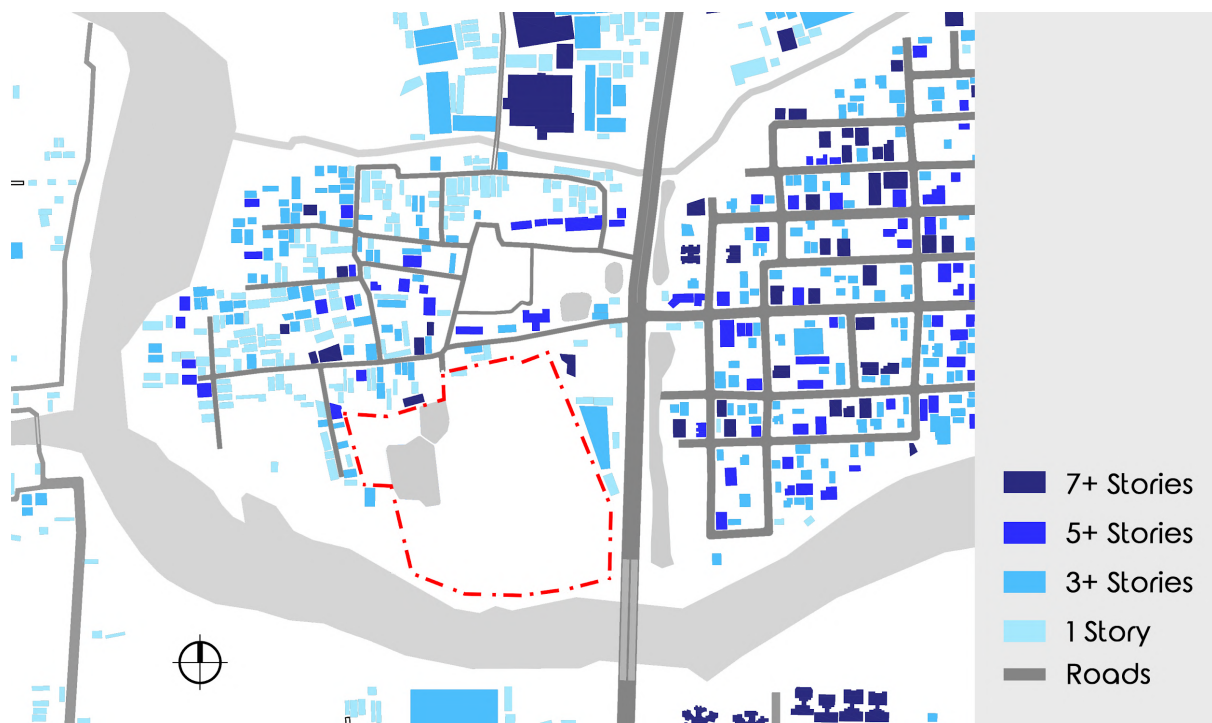


Fig 7: Neighbourhood Building Height Map (Source: Author)

Regarding the function of the Sports complex for the differently abled youths it is quintessential for us to have medical facilities nearby within 2.5km. The medical facilities near the site are quickly accessible through the Savar Aricha Highway. The time taken from the site to the hospitals are timed for cars.

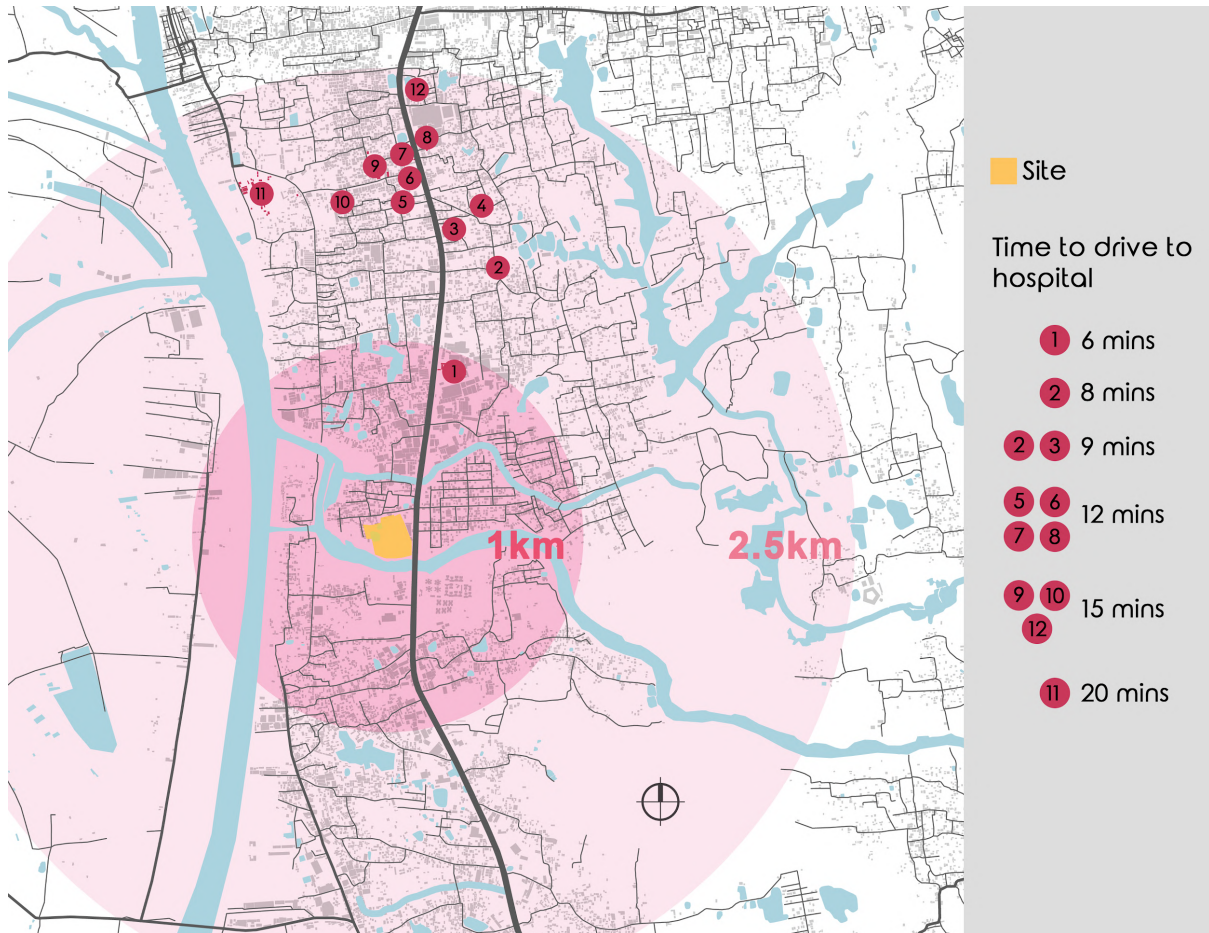


Fig 8: Time taken to drive from the site to nearby hospitals (Source: Author)

3.5.2 Demographic Study

Upon studying the disabled demographic of Dhaka and Savar the percentage of types of the differently abled community were found out. Then the data from Dhaka and Savar were compared and their aggregate percentage was taken for the Sports Complex accommodation. Then the future population growth was also taken into account and the accommodation of the differently abled youths were increased from 100 to 140. Then among these 140 they were divided among the percentage of disabled demographic aggregate data. In this way we get 50 youths with Physical impairments, 25 youths with speech impairments, 22 with visual impairments, 11 with hearing impairment and 10 with neurological disorders. In this way the disabled demand is found out and accommodation will be divided accordingly.

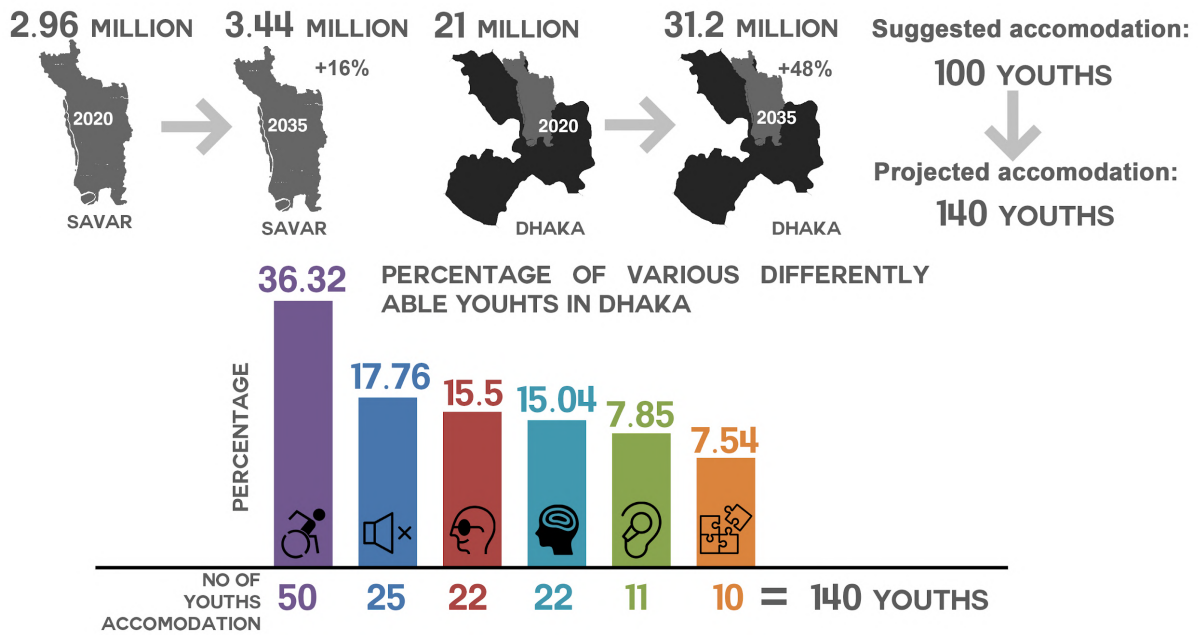


Fig 9: Accommodation from Demographic Study of Differently Abled community (Source: Author)

3.6 Landscape

3.6.1 Topography

Savar is mostly a flatland with very low elevation difference of 1m to 11m. There is no leaning slope towards any particular direction. However, having rivers going along the periphery has caused certain areas to become floodplains due to overflow of rivers during the monsoon season. The site for the Sports Center is located in the Upper Madhupur Terrace zone where the land is higher and has more stable ground. Surrounding the site is the Terrace slope zone which is higher than the flood plains. So the chances of water coming into the site is low. However, the Karnatali river being adjacent to the site during monsoon season has a chance to cause some waterlogging in the site.

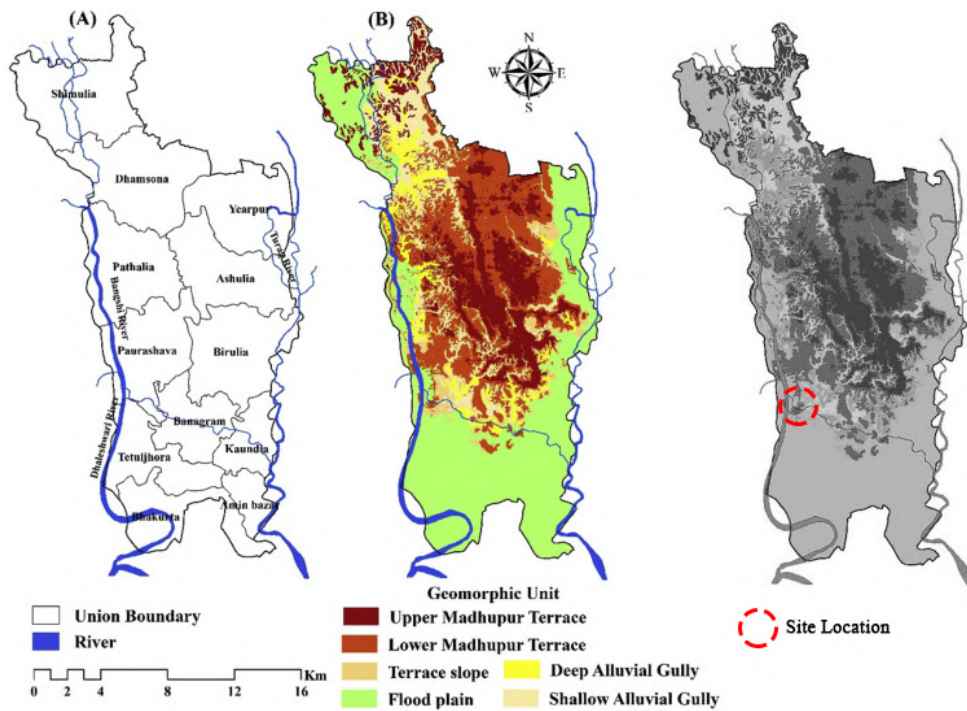


Fig 10: Geomorphic Mapping [Source: Groundwater vulnerability assessment in Savar upazila of Dhaka district, Bangladesh — A GIS-based DRASTIC modeling (slightly edited by author to locate site)]

3.6.2 River Overflow and Flooding

During the monsoon season the rivers overflow and flood the lower flood plains where there is generally agricultural land or river banks. The south part of the site is slightly affected by seasonal flooding as illustrated in the diagram below.

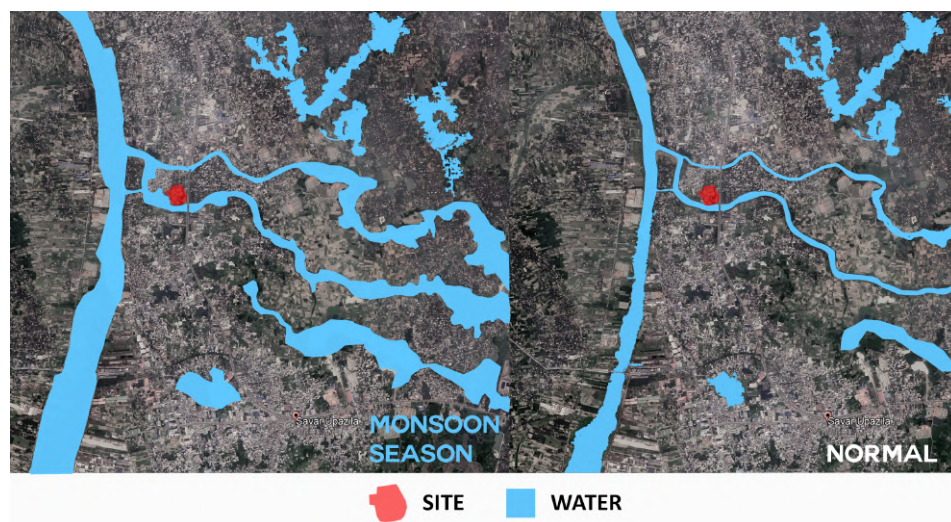


Fig 11: Seasonal Flooding Comparison (Source:Google Earth & Author Edited)



Fig 12: The parts of the site affected by flooding (Source: Author)

3.6.3 Ground Conditions

Currently the entire site is entirely used as agricultural land with two ponds for fish culture. The land is suitable for construction because it has clay loam type of soil. The higher land of the site is marked by trees while the lower portion is towards the south adjacent to the river.



Fig 13: Site Ground Conditions (Source: Author)

3.6.4 Climate conditions and Microclimate

The Savar lies 13m above sea level Savar's climate is classified as tropical. In winter, there is much less rainfall than in summer. The climate here is classified as Aw by the Köppen-Geiger system. The average temperature in Savar is 25.8 °C. Precipitation here is about 1990 mm per year. (climate-data.org)

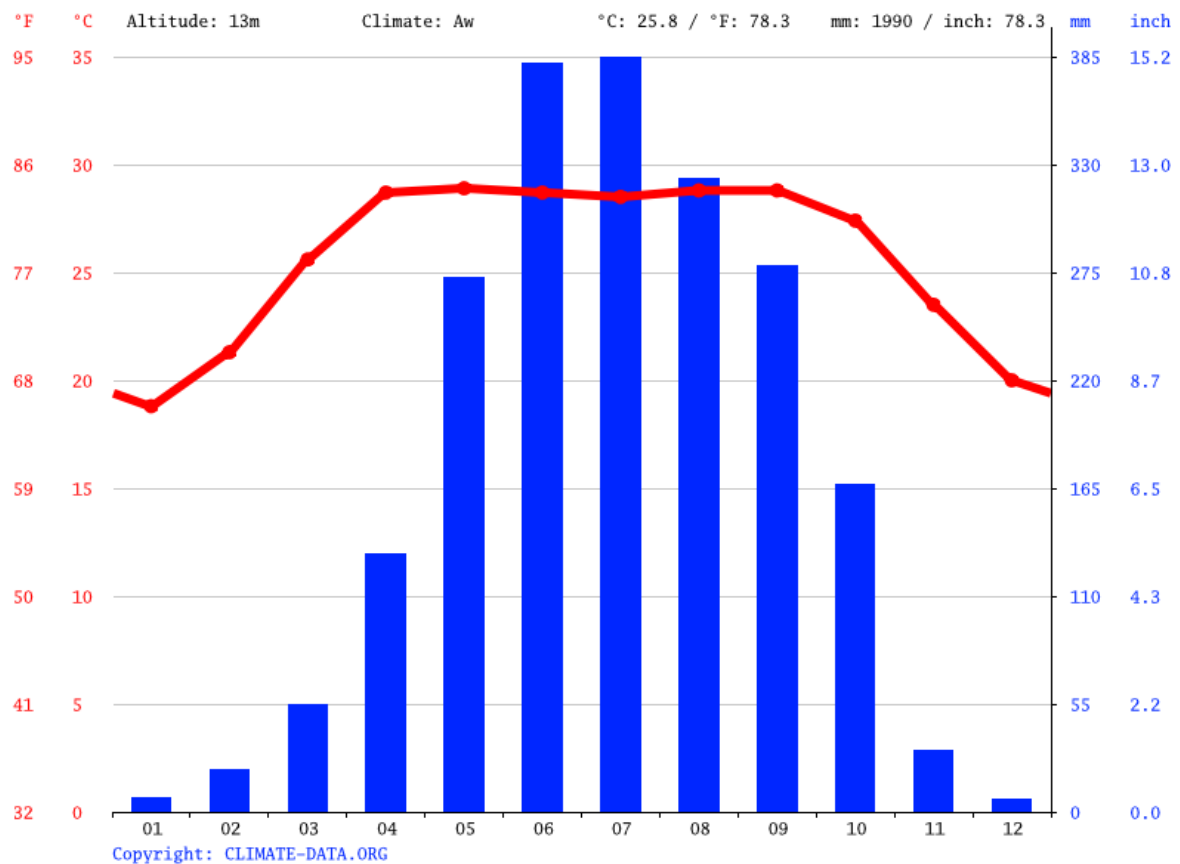


Fig 14: Climate graph (Source: climate-data.org)

Precipitation is the lowest in December, with an average of 6 mm. Most precipitation falls in July, with an average of 372 mm. At an average temperature of 28.9 °C, May is the hottest month of the year. In January, the average temperature is 18.8 °C. It is the lowest average temperature of the whole year. (climate-data.org)

3.7 Movement Infrastructure

3.7.1 Road hierarchy & access

As mentioned previously the site is directly adjacent to the Savar Aricha highway which is the primary mode of transportation in Savar. It is the only major road going through the heart of Savar from north to south connecting it to other districts. Other secondary roads connections from Ashulia and Uttara running from east to west from Dhaka connect to the aforementioned highway.

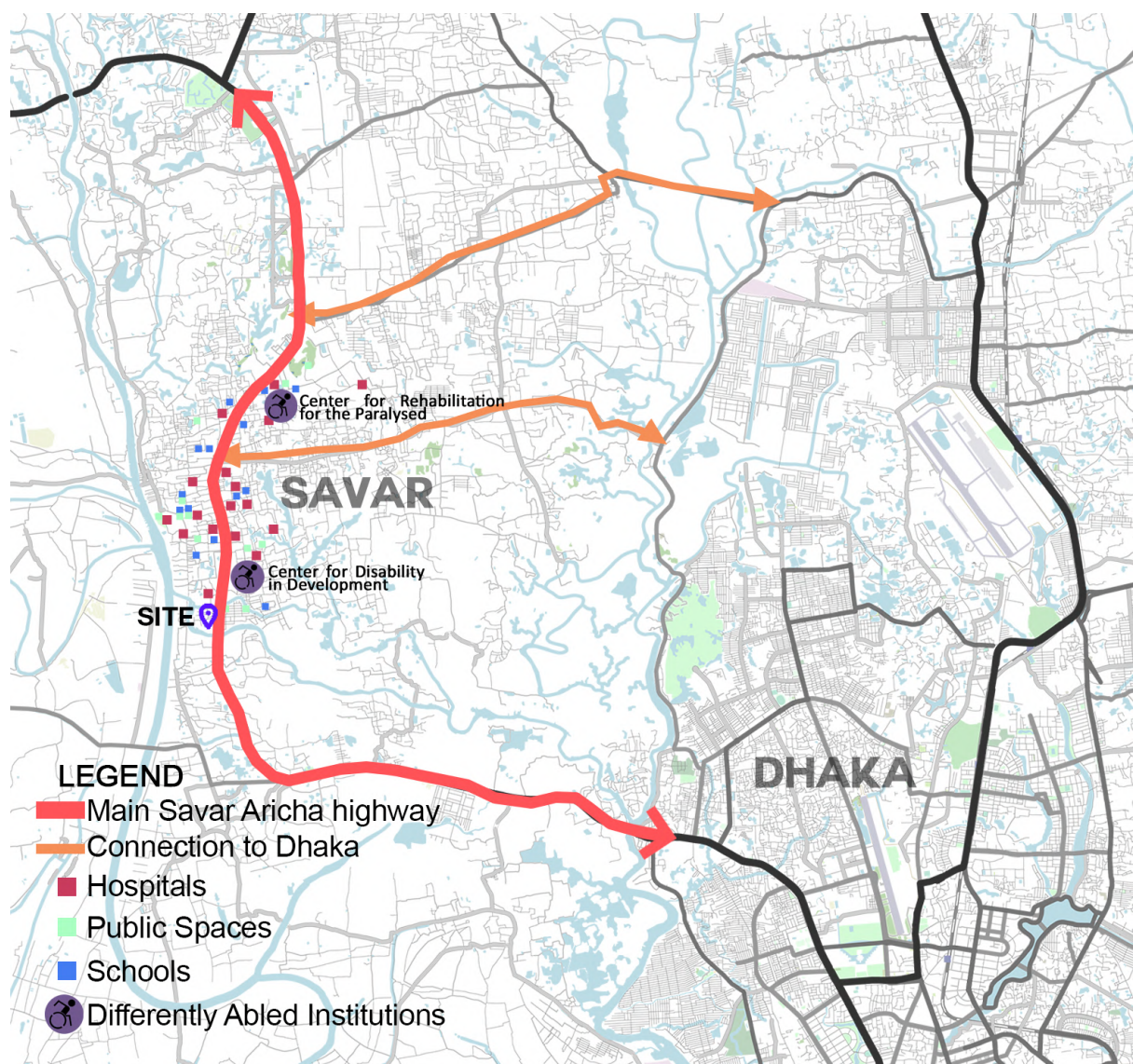


Fig 15: Regional Connection from Dhaka to Savar (Source: Author)

3.7.2 Pedestrian and Vehicular Flow

We can see that the infrastructure is heavily dependent on the highway and as Savar grows the load on the highway will increase as there are no other north to south connections. Currently the traffic is low to moderate however it is expected to increase manyfold, especially with the construction of the Metrorail. So special consideration has to be taken for the connection to the site from the Highway.

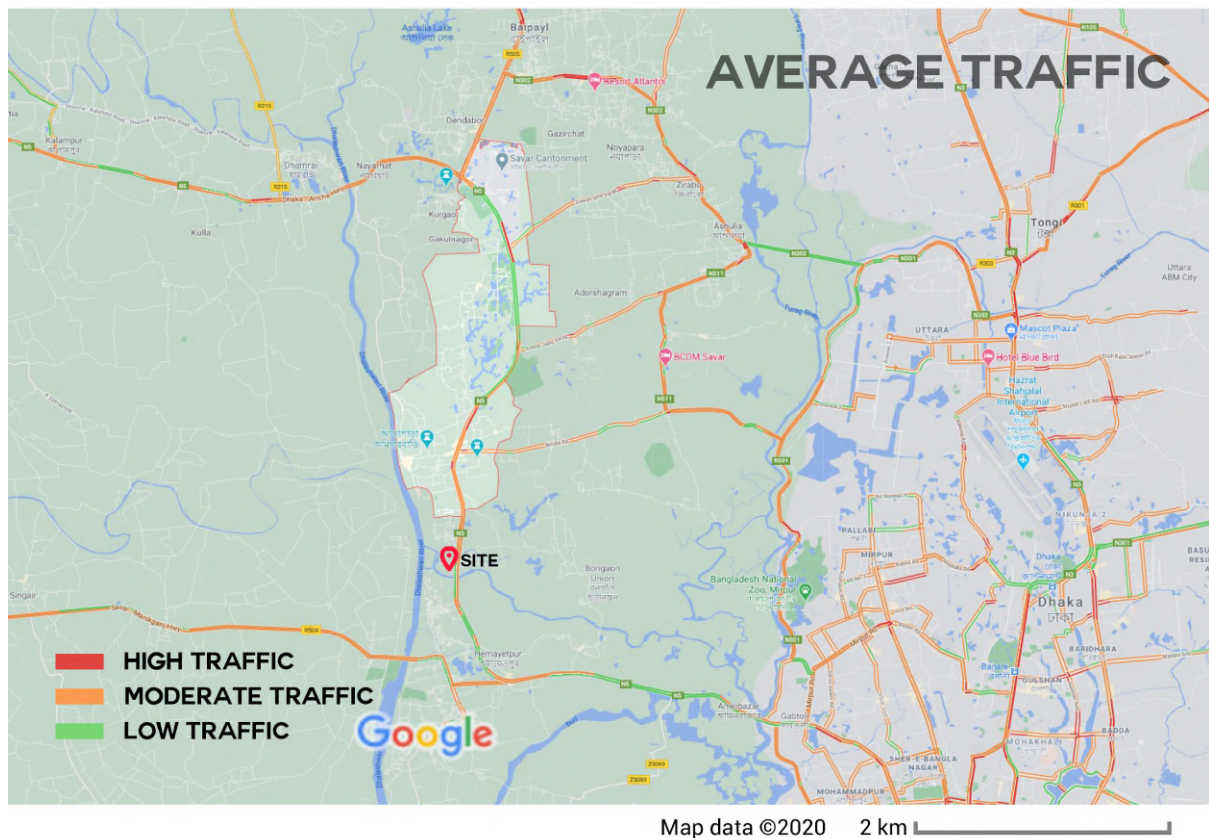


Fig 16: Average Traffic (Source: Google Maps)

The average vehicular traffic analysis shows that the traffic going through the Savar Aricha Highway is low to moderate. This means that connectivity to surrounding infrastructure throughout Savar is relatively smooth. It is quite easy to get around Savar once on the highway.

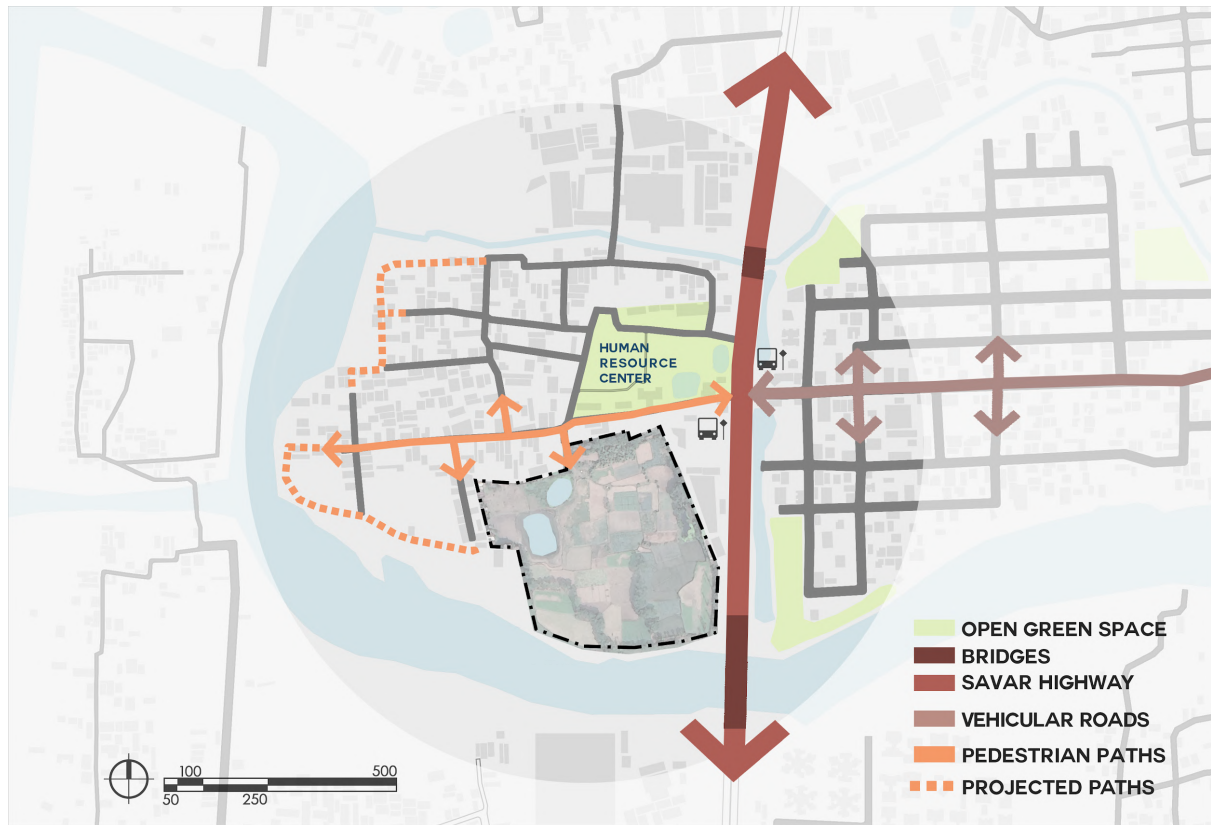


Fig 17: Neighbourhood Level Vehicular and Pedestrian Flow (Source: Author)

On a neighbourhood level it is seen that the main connections to the highway from both Bank towns have a bus stop which dictates pedestrian flow. The West Bank Town roads are 12-15 ft wide and vehicles rarely enter the narrow roads. So the orange mapped road connecting the site and the highway are almost exclusively for pedestrian use. On the other hand on the West Bank town side the roads are 30-35 ft in width and are vehicular connecting the multistoried residences. Between the two towns to the south the Bridge connects to Hemayetpur. The slope of the bridge extends quite a bit and makes it impossible to enter the site from the South East corner. One unique characteristic of the site is that the entire site can be viewed from the Bridge. So there is potential for a viewing corridor from the bridge to the site to increase awareness of the Differently Abled Sports Center.

3.7.3 Design Decisions from Movement Infrastructure

Upon Analysis of the site we see that vehicular entry from the South East of the site is impossible due to the slope of the bridge. Also the narrow path leading to the site cannot accommodate the flow of vehicular traffic. As a result a direct connection from the highway into the site is necessary. The narrow path from the highway into the site can be a pedestrian entry into the site. Furthermore, towards the north of the site there are potential connections that can be made throughout the Human Resource Center to the site to sonnet walkways with the surrounding neighbourhoods.

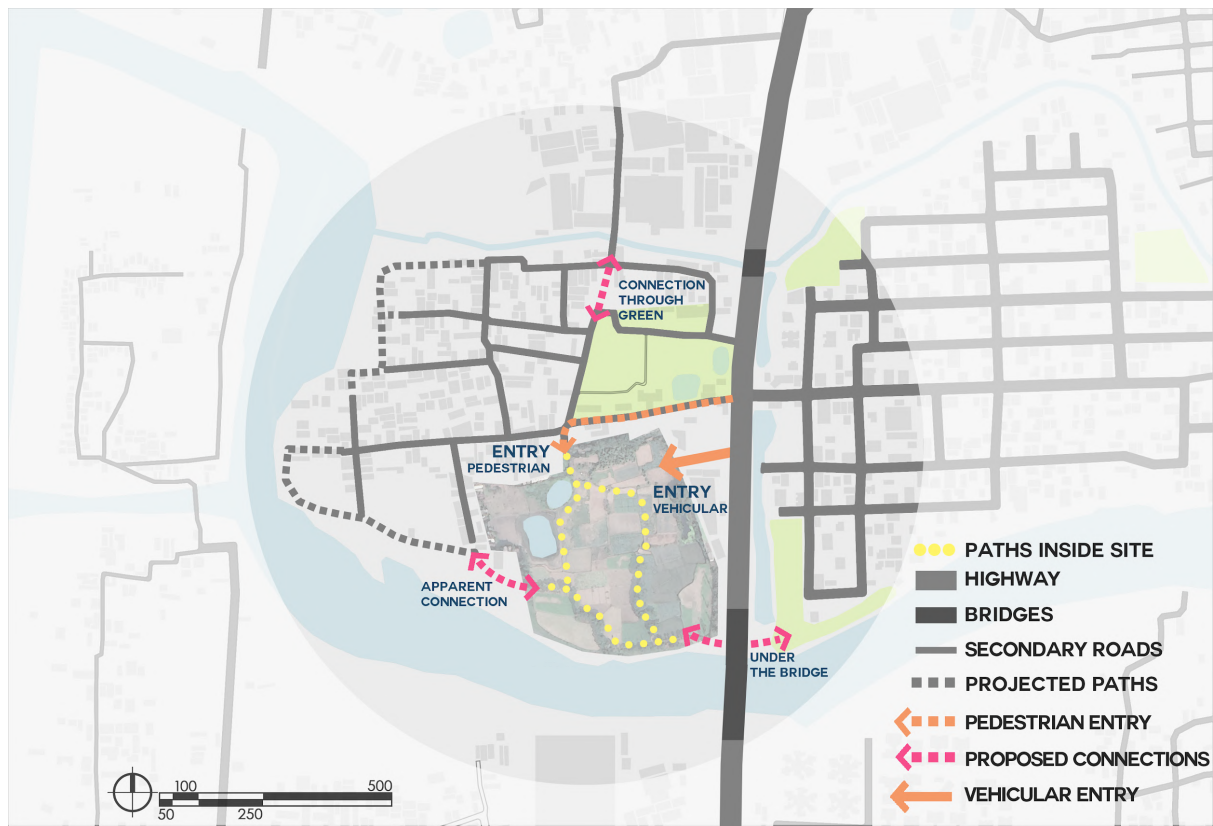


Fig 18: Decisions Regarding Movement Infrastructure (Source: Author)

Similarly, we see an apparent connection to the site along the bank of the Karnatali river towards the west. Towards the south-east of the site we see a potential underpass under the bridge connecting the public spaces of East Bank town and West Bank town. This path under the bridge can be safe and pedestrians can move across without having to cross the highway.

The elevation changes and pre-existing paths inside the site can be a guideline to the entry points on the site and functional placement.

3.8 Built form

3.8.1 Urban form

If we see the built form mapping we can infer that the majority of the urban density is around the Savar Aricha Highway. The further we move away from the highway the more rural agricultural lands are seen. From previous analysis we know that gradually the agricultural land is being transformed into residential, industrial or commercial lands. So the built form is expected to grow more towards the void open areas.

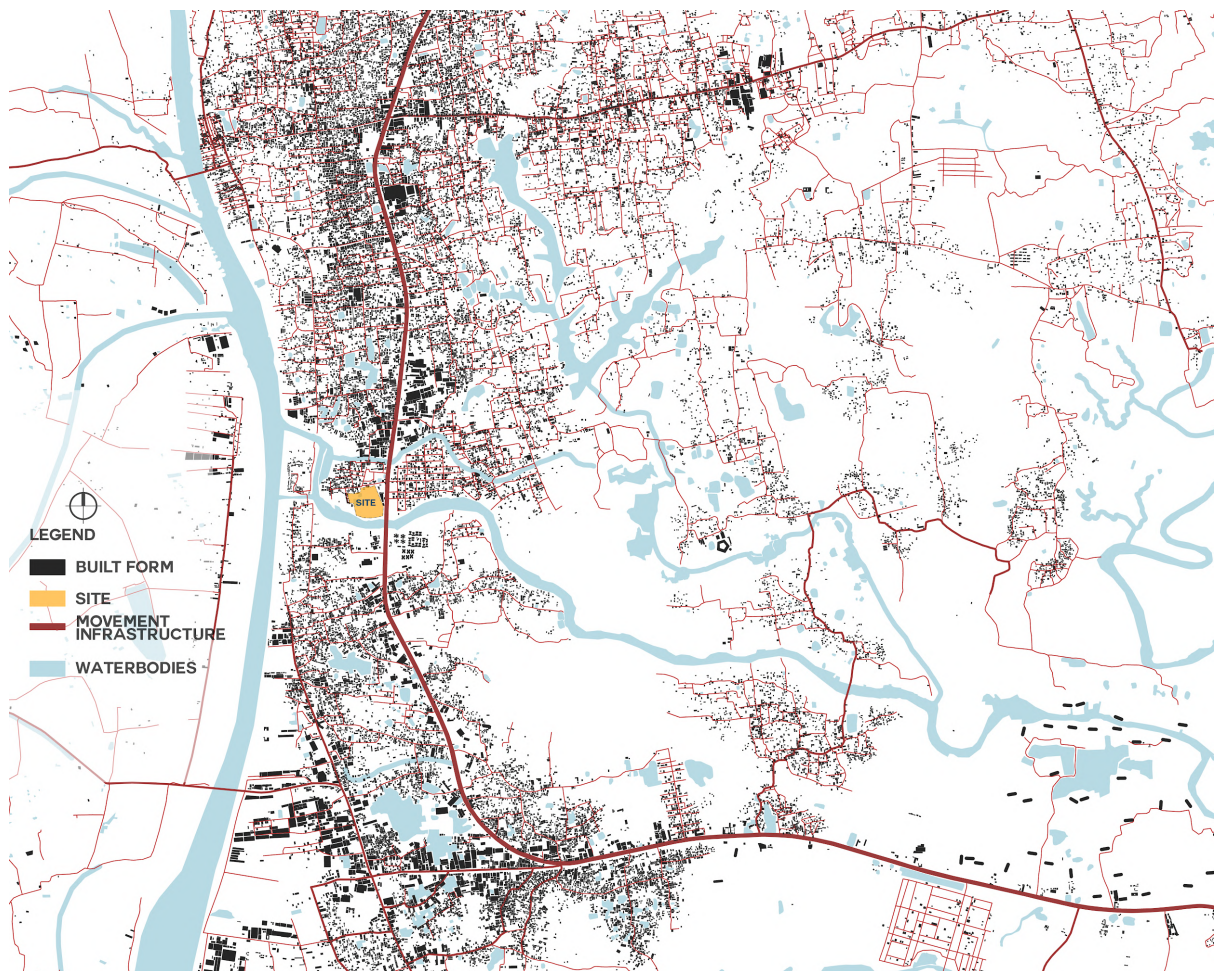


Fig 19: Built Form Mapping (Source: Author)

In the following diagram we see the projected growth of Savar towards the East along the major connections to Dhaka. From previous growth data it is predicted that Savar will grow

in such a manner and will become more urbanized. Because these areas are yet to be built and the Sports Center for Differently Abled is nearby, it can have an impact on development of these areas with Universal access in mind, unlike the unplanned sprawlings growth that typically occurs. This has the potential to build a more inclusive society overall and set a standard for opportunities for Differently Abled Community.

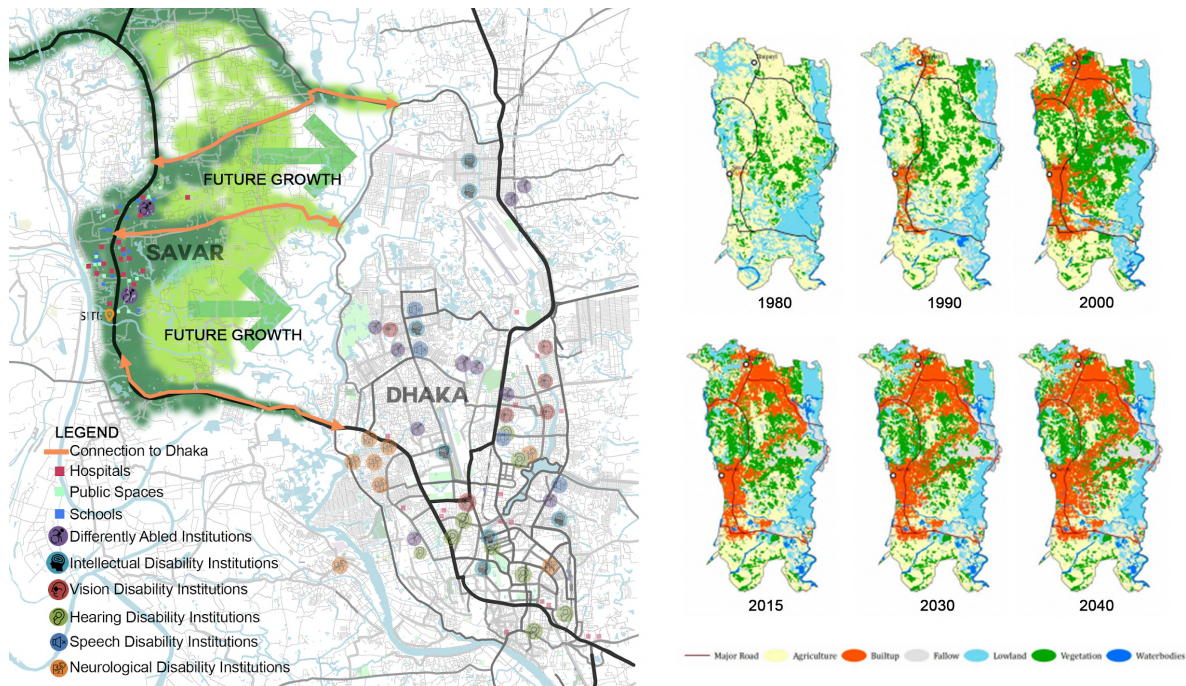


Fig 20: Built Form Mapping (Source: Author)

Fig: Land Cover Map (Source: Analyzing Land Cover Change and Urban Growth Trajectories of the Mega-Urban Region of Dhaka Using RemotelySensed Data and Ensemble Classifier)

3.8.2 Building Height

If we analyse the building heights in the area we see that a major portion of savar is still low height pucca and kaccha buildings made of bricks or corrugated iron. However, there are large industrial buildings several stories high that are newly developed.

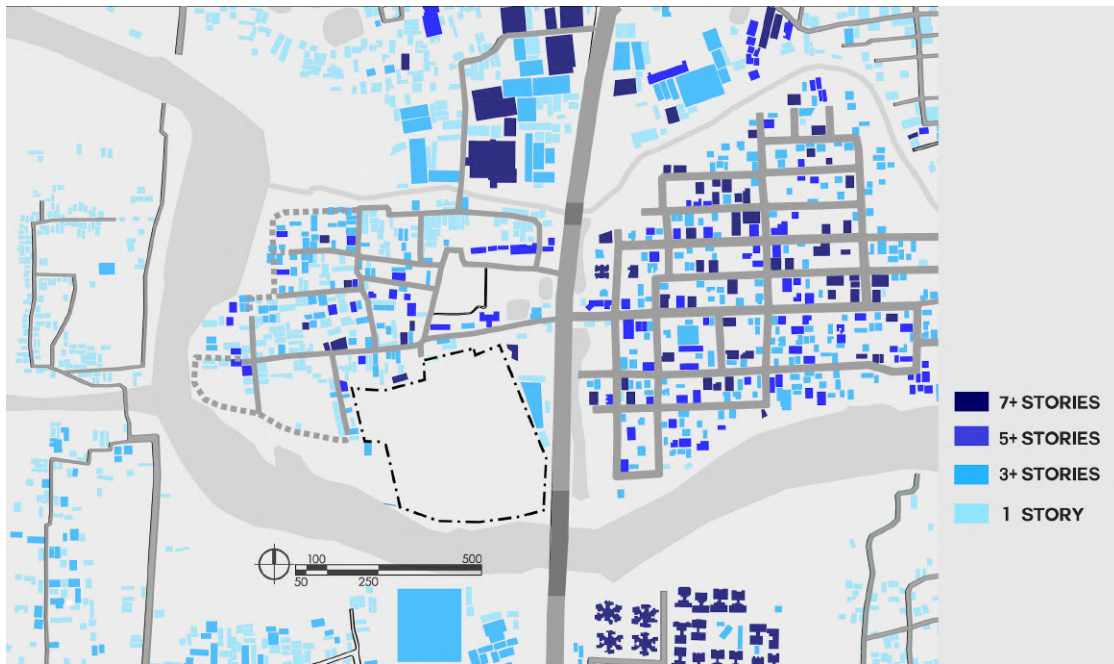


Fig 21: Current Building Height (Source Author)

Currently in West bank town where the site is located most buildings are 1-3 stories with a few newer buildings reaching 5-7 stories. This zone is more for the working class and middle class residents. On the other hand in East Bank town we see that there is a much higher number of 5-7 story buildings and a significantly low number of single storied buildings. Furthermore, all the buildings here are concrete and brick built for upper middle and higher residents.

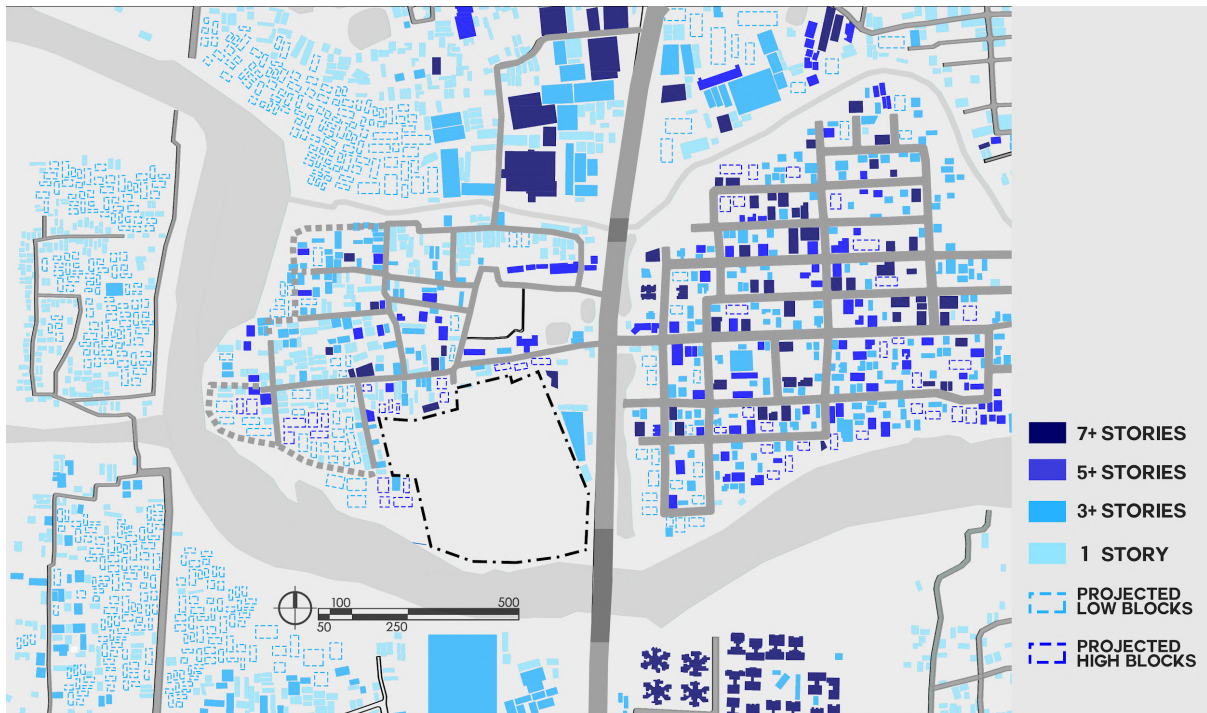


Fig 22: Projected Building Height (Source Author)

From the growth trends seen in previous chapters we can predict that more 5-7 storied buildings will gradually be built in east Bank town which is the neighbourhood of the site. In the given map we see a projection of future building heights which will help us understand the urban density around the site.

3.8.3 Privacy decifrom Building Height

From the building height maps we see that the site will be surrounded by 5-7 storied buildings if the current rate of urban development proceeds. Then there will be a breach of privacy from around the site especially where the private functions of the site will be. So as a design decision the areas of privacy breach can be buffered by tall trees. Furthermore, trees such as Sal have been proven to grow especially well on this soil.

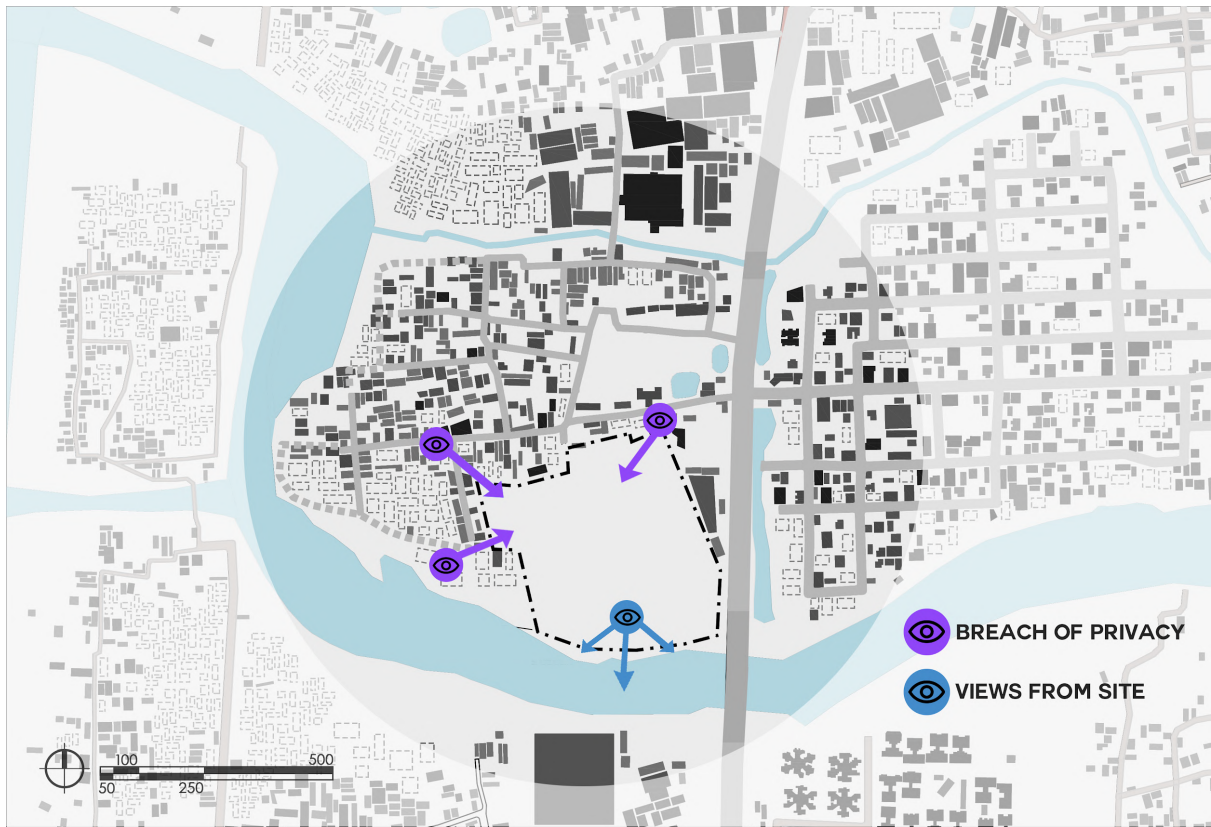


Fig 23: Privacy issues on site from nearby buildings (Source Author)

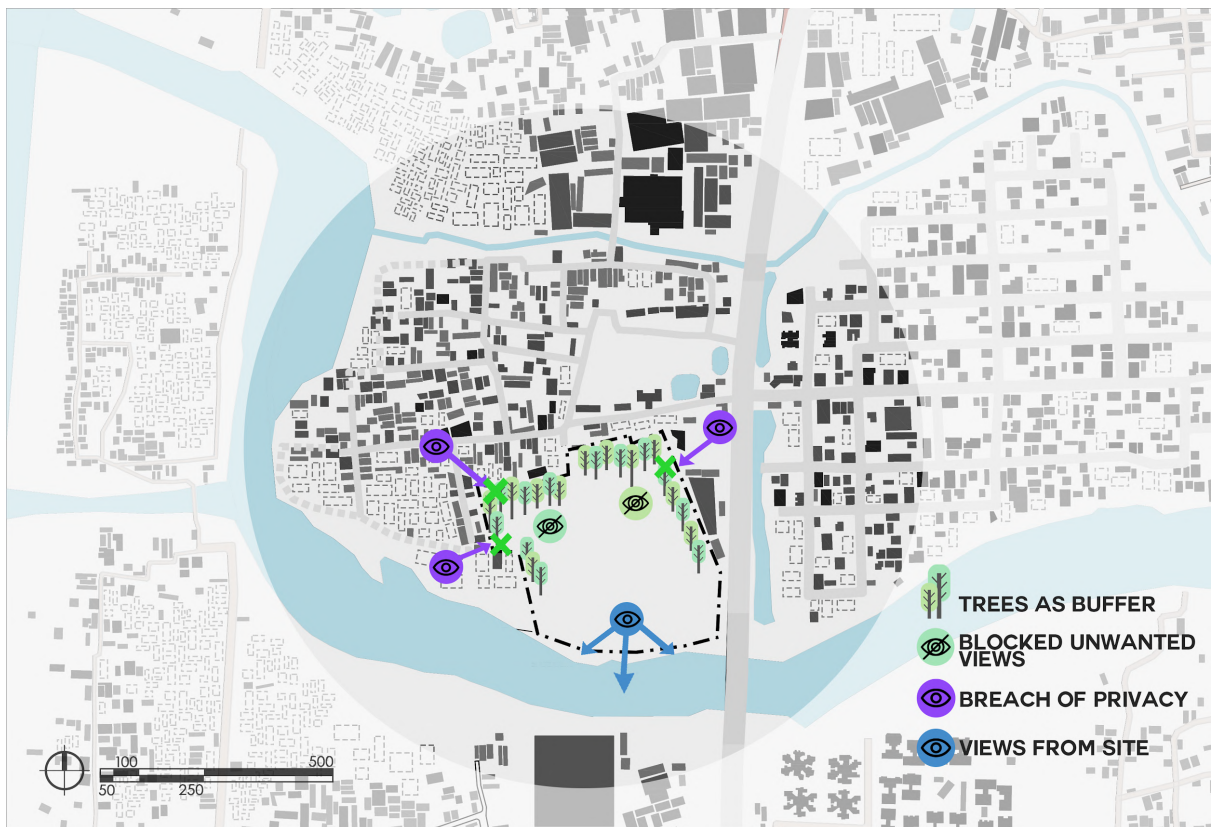


Fig 24: Privacy issues on site from nearby buildings (Source Author)

Chapter 4: Case Study

4.1 Case study 1

Project: Cultural Sports Complex for Disabled, Experimental Branch of Architecture, Iran

Location: Tehran, Iran

Area: 18000 square meters

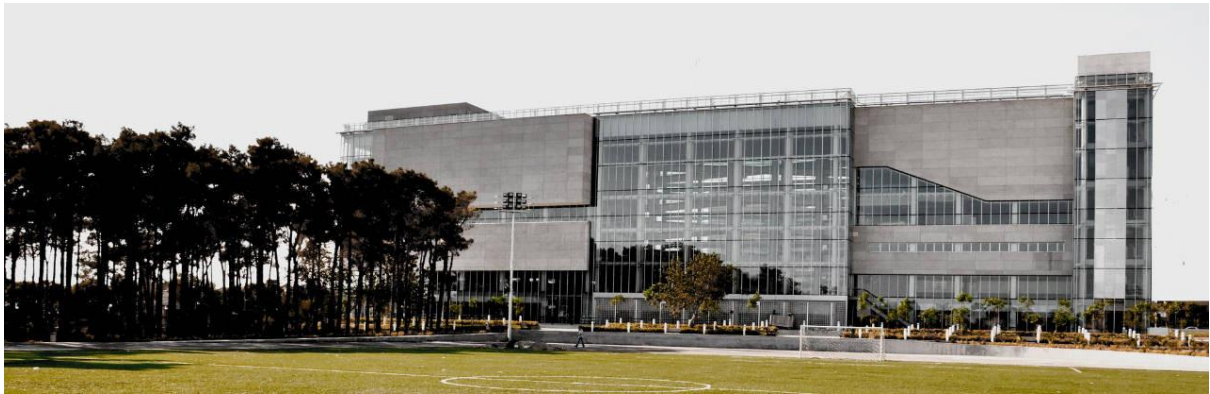


Fig 25: Cultural Sports Complex for the Disabled (Source: Archdaily)

Due to the limit of space in the urban setting, large functions and building restrictions the sports center took a more vertical approach than a typical sports complex which is low height and spread over a large distance. Designing the complex vertically has allowed the surrounding space to have a large field open for sports and other events. The open field also acts as a public space during the evening where people come for recreation. The monolithic building was oriented from east to west lengthwise due to the solar radiation of the desert climate from those directions in Iran. furthermore a large portion of the north and south portion of the building are completely made of glass with a large courtyard inside. This allows for vistas across the field and public spaces on either side and also a huge proponent of natural light into the building. The structural form and facade is minimal and made of RCC and tempered glass to emphasize the solid void relationship of the interior to the exterior.



Fig 26: Site Plan (Source: Archdaily)

If we observe the following sectional diagram it is clear that there is a large void connecting the different functions of the building from east to west. The central void or court not only acts as a source of light, views and main hub but also a connector to every part of the building. Access Ramps line the inner walls of the building all the way up to the top floor. There is also a wheelchair athletic track designed on the roof.

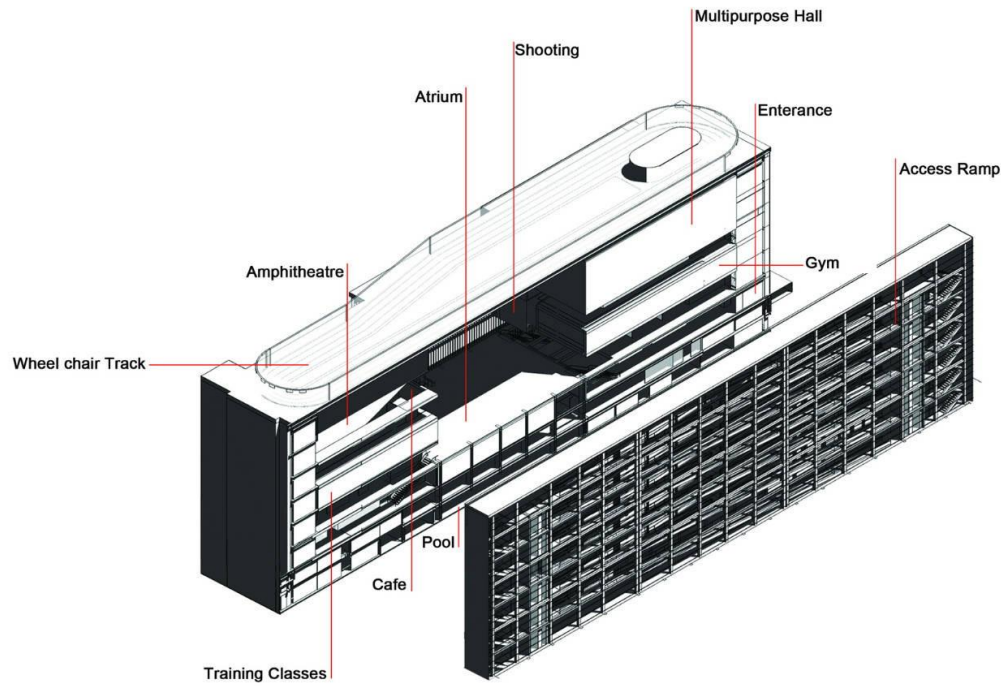


Fig 27: Sectional Diagram (Source: Archdaily)

If we observe the Access Ramp it is seen that all floors from ground level are connected through it and easily accessible for any persons with disabilities. There are also various resting spots along the ramp and stunning views for stopping and seeing at the ramp.



Fig 28: Ramps and Spaces (Source: Archdaily)

As mentioned previously, the court acts a primary hub for connecting the different functions together. Towards the east there are the larger functions such as multipurpose hall, indoor

sport, the gymnasium. While on the west functions such as academic classrooms, cafeteria, medical rooms are designed.

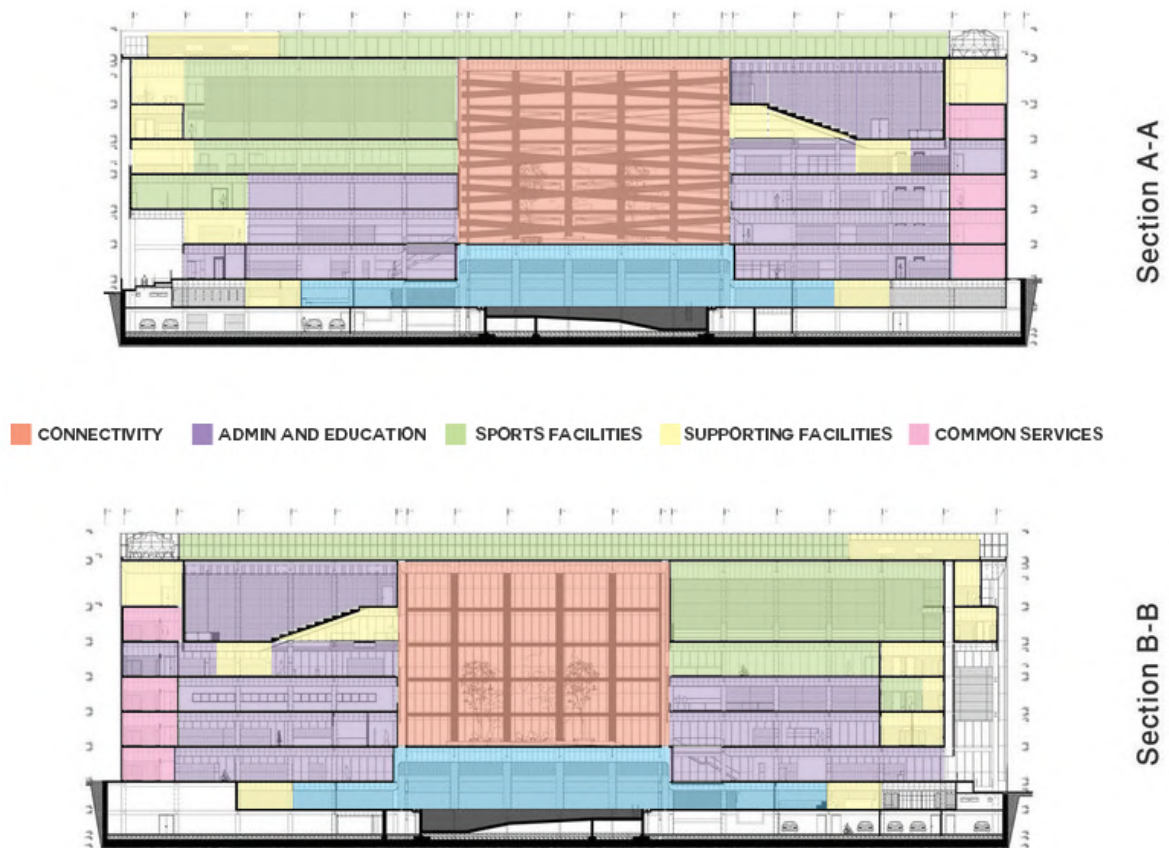


Fig 29: Sectional Diagram of functions (Source: Archdaily Edited by author)

By analysing the spaces and color coding them we see that the ramps and main void at the middle of the building connects all the functions together and acts as a common hub for traversing through the different areas of the building.



Fig 30: Void Lobby Space(Source: Archdaily Edited by author)

Plan



Fig 31: Floor Plans (Source: Archdaily)

Upon analysis of the plan the vertical circulation is encouraged to be taken through the ramps allowing for freedom of movement. For those opting or requiring elevators they are easily accessible to the far east and west of the buildings. Under the central court in the basement level the space in the middle is used for the swimming pool. The large block of the east accommodates sporting functions such as the indoor games, gymnasium, WC basketball and Multipurpose Hall.

Plan



Fig 32: Floor Plans (Source: Archdaily)



Fig 33: Sports Facilities (Source: Archdaily Edited by Author)

A varied range of facilities are available to the differently abled users . Special athletic wheelchairs are used for maximising faster turns in movement in sports such as WC basketball and WC ping pong. Different types of accessible gym equipment such as accessible treadmills, accessible stationary bikes, ergonomic bench press equipment, vaulting surfaces for rehabilitation etc.



Fig 34: Sports Facilities (Source: Archdaily)

The entire roof is used as an athletic track and shaded galleries are right next door to it for resting and viewing from a comfortable place, away from the hot desert climates. The roof also houses the main chillers for the HVAC system on the building in a discrete location.

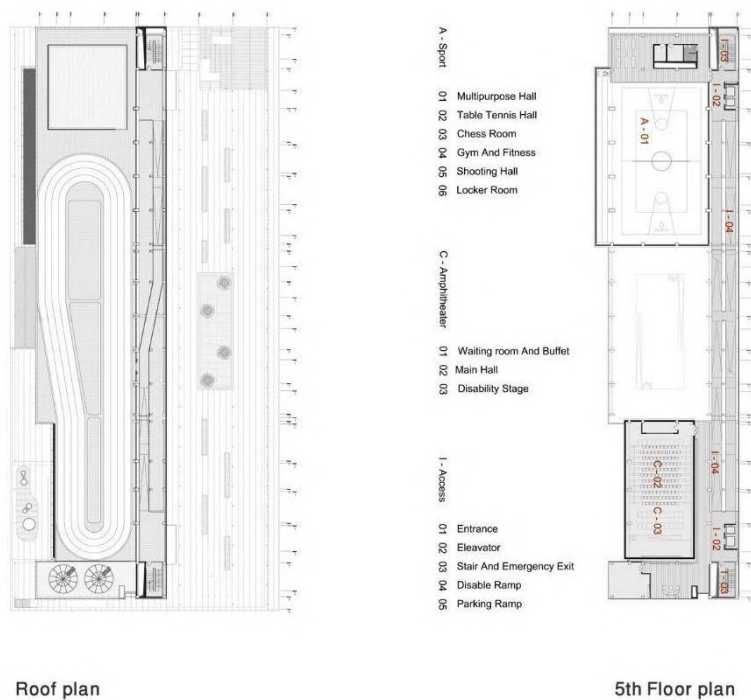


Fig 35: Floor Plans (Source: Archdaily)

Opposite to the sporting functions towards the west there are academic functions such as class rooms, special training classes, workshops, counseling rooms and locker rooms. Furthermore, the 4th & 5th floor are fused together on the west to form a stepped auditorium which is universally accessible.

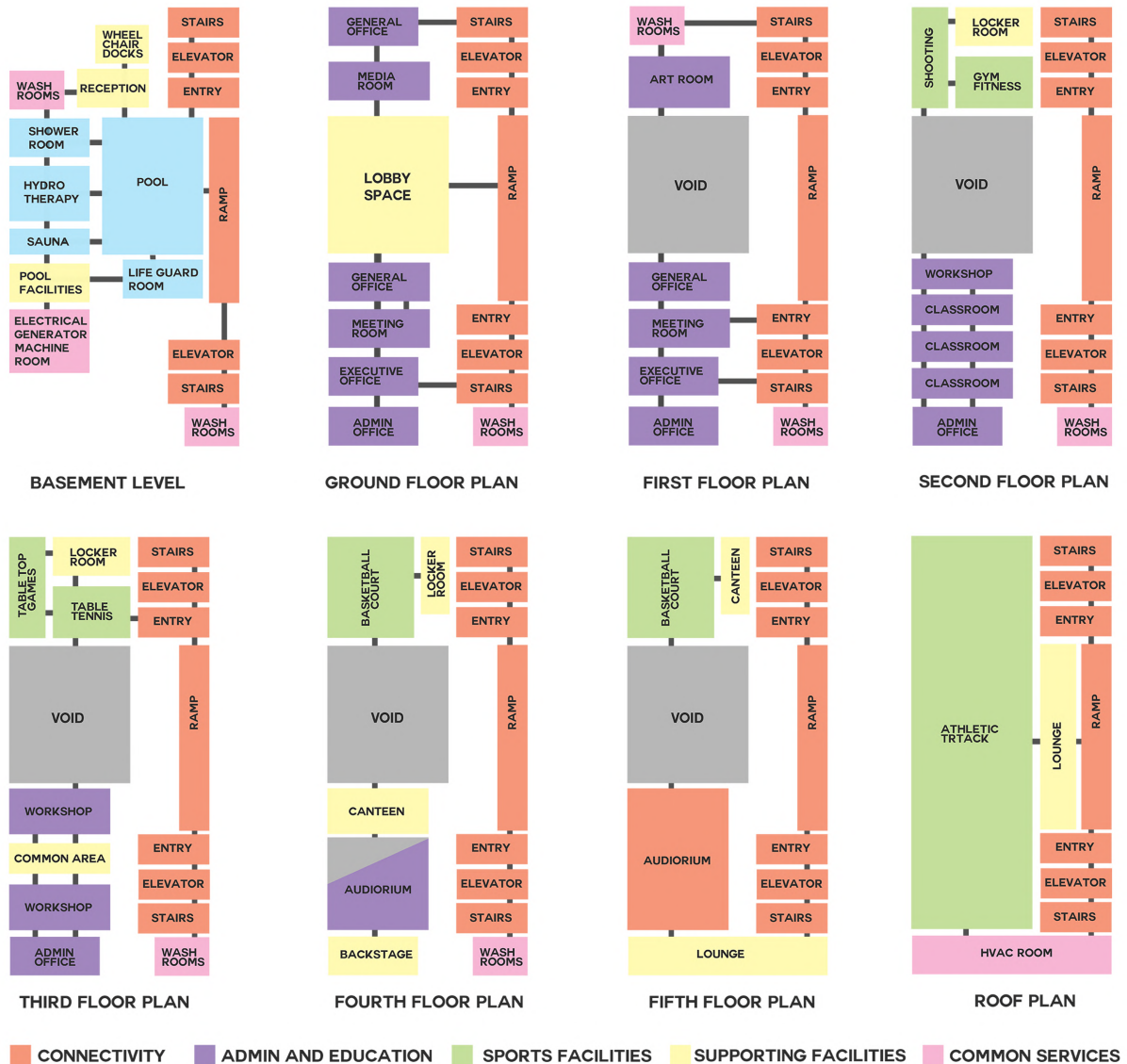


Fig 36: Functional Analysis Diagram (Source Author)

The functional analysis reveals an interesting character of the building where the higher up we go in the building, the play spaces and sports facilities become progressively larger. Whereas the lower floors have administrative and educational facilities.



Fig 37: Floor Plans (Source: Archdaily)

The public spaces towards the south are lined with flower beds and wide accessible roads for recreation outdoors. Overall the project uses a unique approach to a sports center by using its limitations as an advantage to create a new vertical experience for the differently abled.

4.2 Case Study 2

Project: Sports and Fitness Center for Disabled People

Designer: Baldinger Architectural Studio

Location: Phoenix, Arizona, USA

Area: 45000 sft

The Sports and Fitness center incorporates industrial design elements into a relatively small site and integrates multiple facilities for the development of people with disabilities. The competitive sports functions aside the structure also becomes an event space for the community and increases interaction between people with disabilities and the general public, thus increasing awareness of such issues. In this way the project has become a valuable resource for not only the people with disabilities but also the surrounding communities.



Fig 38: Northside Entry (Source: Archdaily)

The form of the building is L shaped and the circulation inside is very linear with very little branching paths such that the movement is simple, easy and accessible. The major functions arranged around the circulations are visible from the entry of the site.



Fig 39: Northside Entry (Source: Archdaily)

Upon analysis of the functions through a functional diagram we see that the three major functions of Basketball courts, Accessible Pools and Fitness Gym are organized along a simple connecting corridor for the easiest access to these functions.

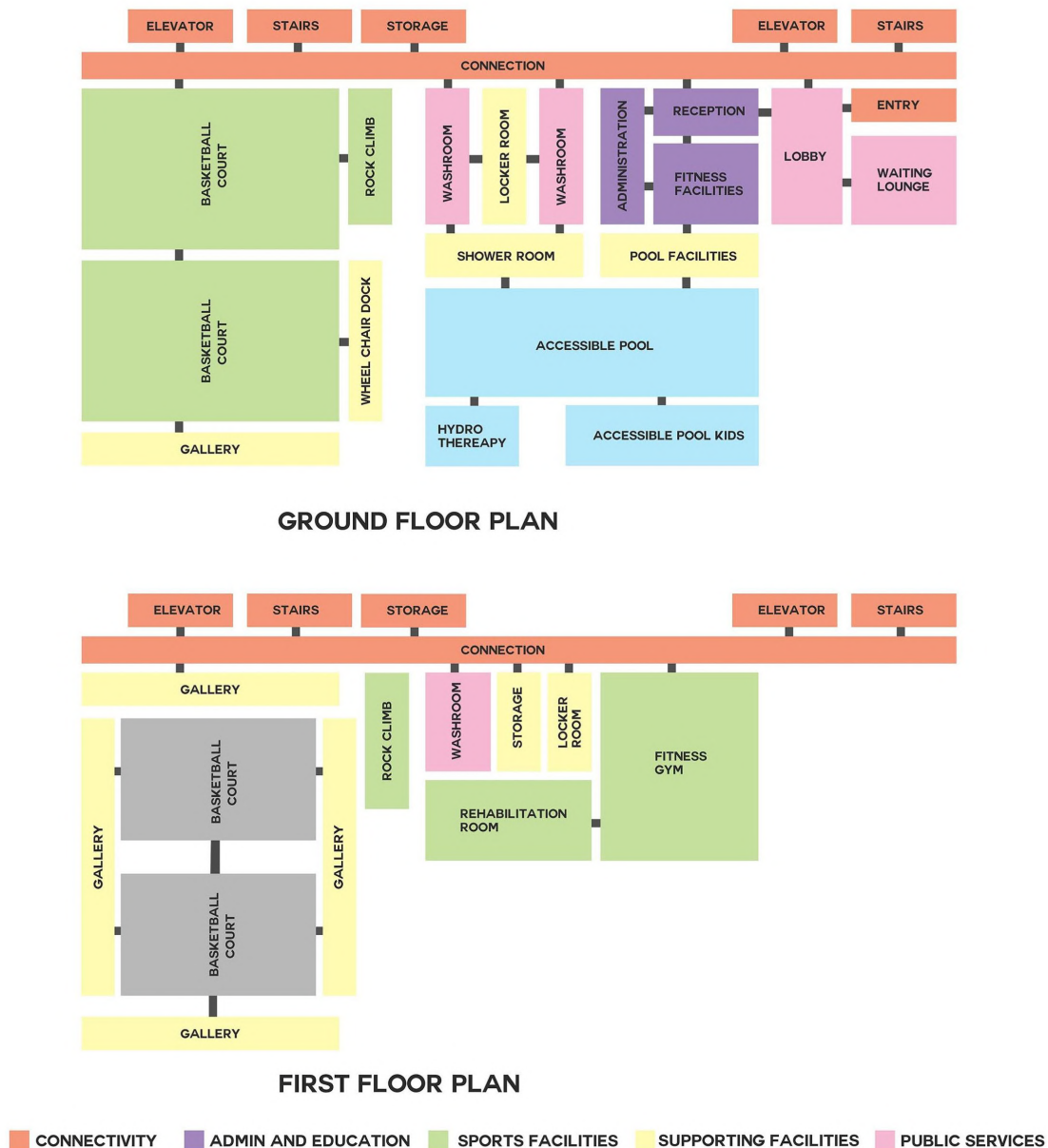


Fig 40: Function Analysis Diagram (Source: Author)

The Fitness gym is on the first floor of the building overlooking the Swimming pool and can be easily accessed by the elevator in 2 locations along the connecting corridor. The corridor branches out and extends and wraps around the basketball court to create an athletic track and gallery.



Fig 41: Basketball court & Athletic track (Source: Archdaily)

Around the upper track in the different negative spaces there are sports functions cleverly built in to maximize the use of the space. Such as the rock climbing wall between the basketball court and the access ramp, the static bicycles zone near the basketball court next to the stands. These spaces not only add a variety of new experiences to the facility but also use otherwise leftover spaces efficiently.

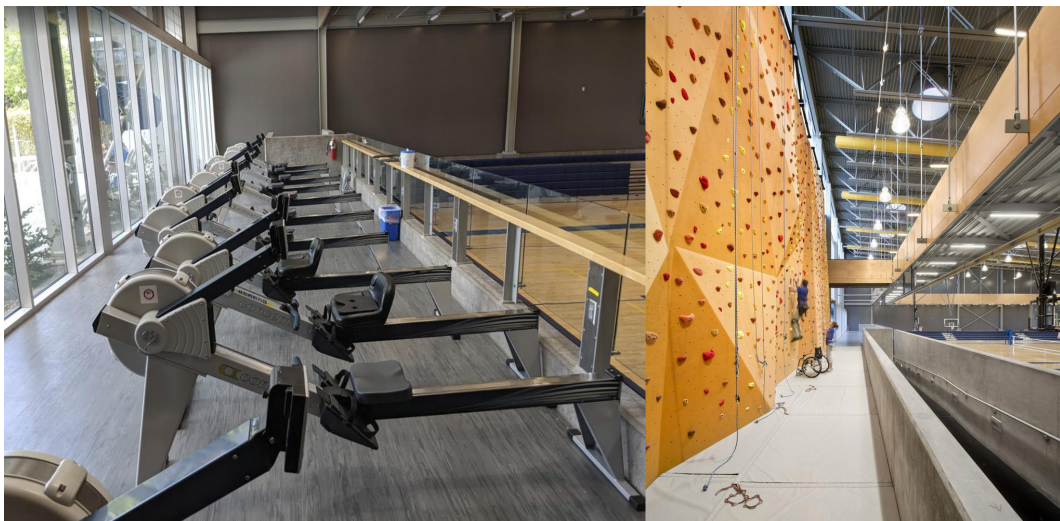


Fig 42: Basketball court & Athletic track (Source: Archdaily)

The structure of the building is composite in nature where half of the building is made of concrete and brick while the other half is constructed from prefabricated steel space frames. The basketball court, suspended athletic track, rock climbing wall and static bike zone are all in a continuous space created from steel space frames which allow coverage of a larger span. The space frame also allows more openings and glass facades to allow the entire north facade of the building to be glazed to maximize diffused natural light into the largest space.

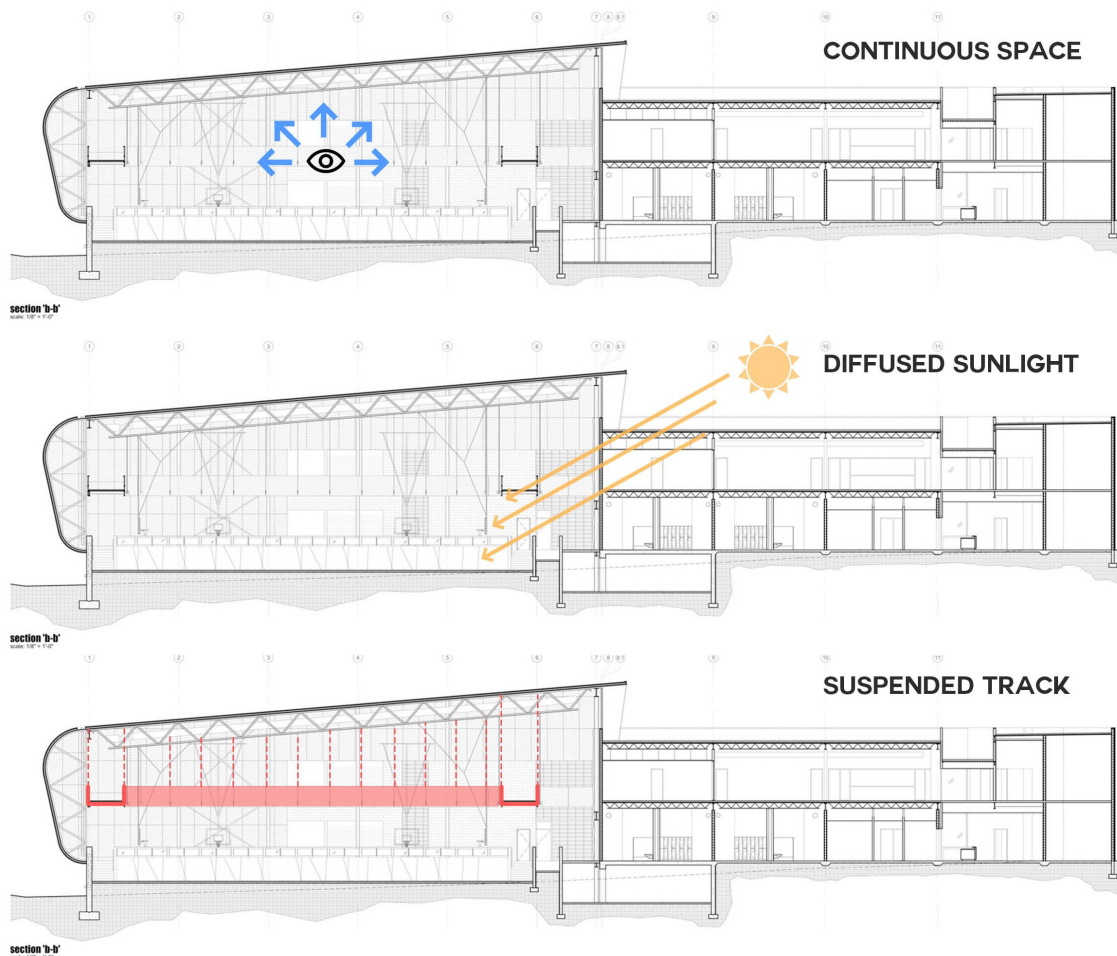


Fig 43: Sectional Analysis of Basketball Court (Source: Archdaily Edited by Author)

The other half of the building is made of concrete and brick. The structural rigidity of RCC and brick is necessary for the other half because of heavy gym equipment and the live load of activity in the fitness gym. Furthermore, the thicker walls of the building and outer tile cladding helps alleviate the hot phoenix climate.



Fig 44: Exterior Cladding (Source: Archdaily)

Similarly, the South facade of the building housing the basketball court is closed to limit the amount of harsh sunlight entering the event space. While the major source of sunlight in the basketball court comes from the north. As the basketball court is housed in a space frame the outer shell is made of iron sheets. This is because the winters of Phoenix is very cold and steel conducts radiation from sunlight well.

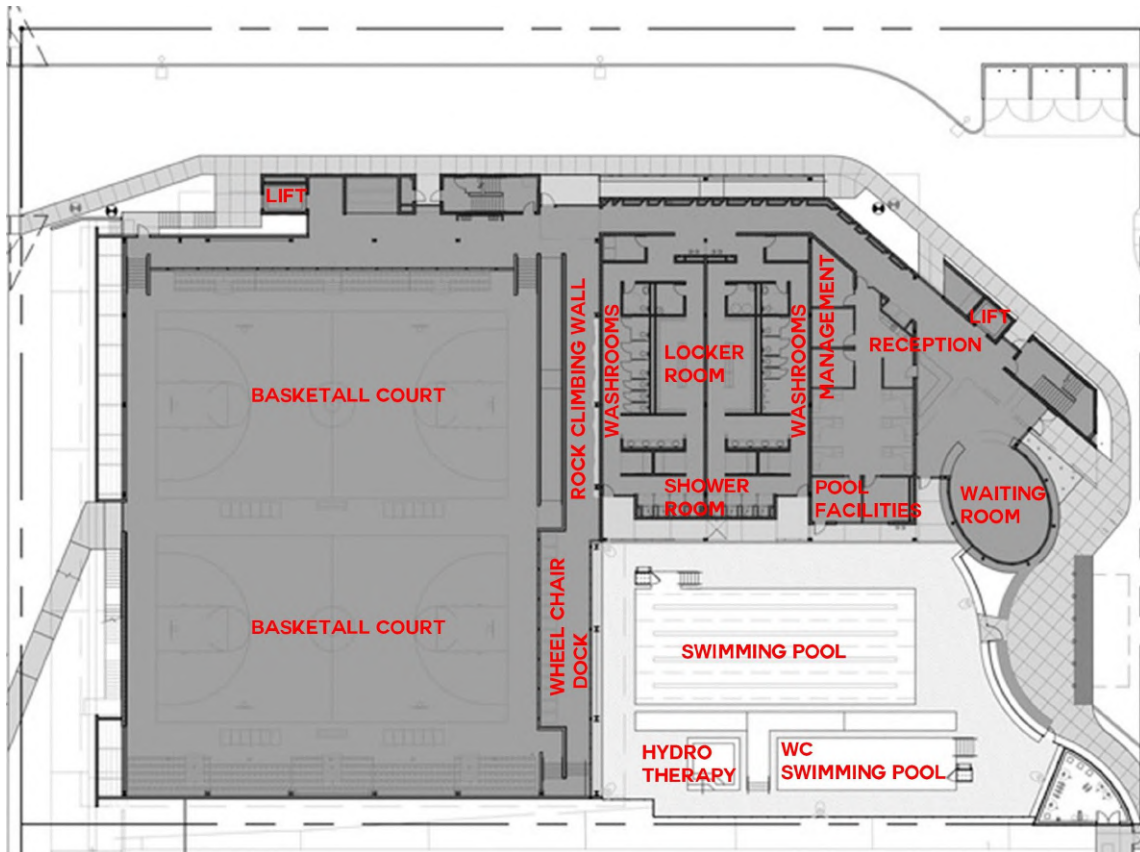


Fig 45: Ground Floor Plan (Source: Archdaily)

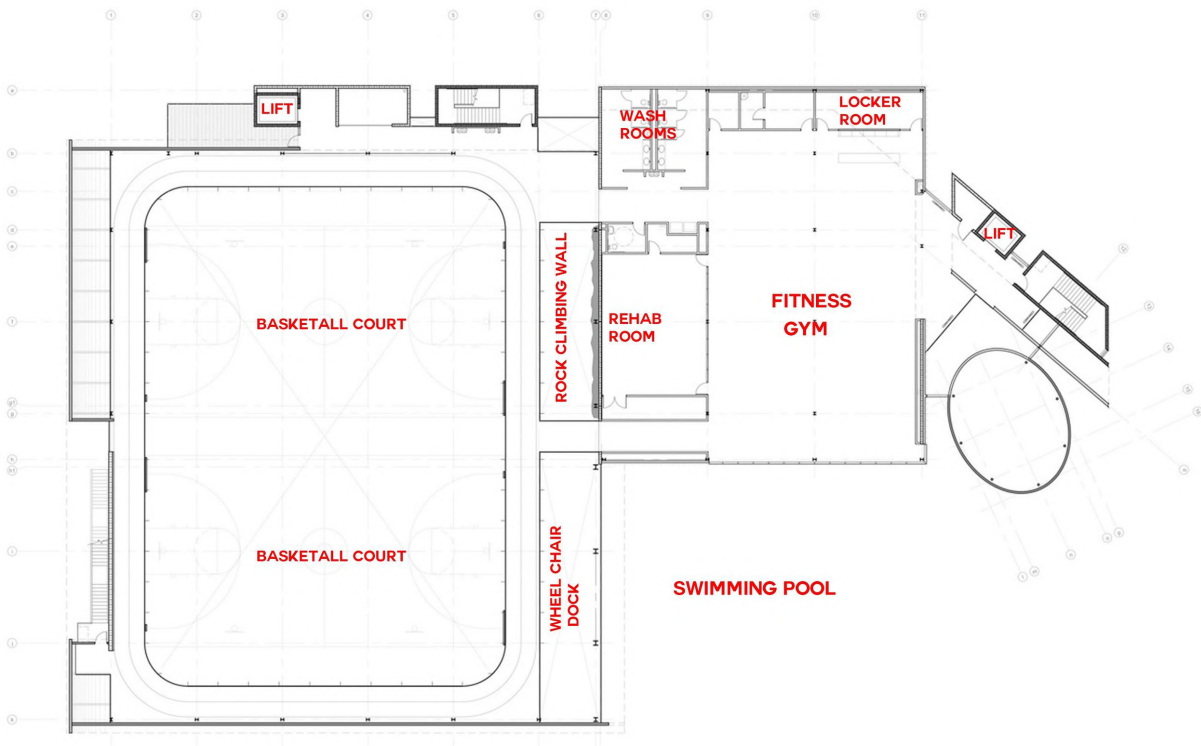


Fig 46: First Floor Plan (Source: Archdaily)

From the plan we see that all the major functions, services and vertical circulation are arranged around the linear connecting path. Furthermore, there is clear visual connectivity between all three major functions. This kind of simple yet effective approach works seamlessly for people with disabilities. Rather than overcomplicating matters with trying to achieve universal accessibility, a straightforward and logical approach is seen to be the best way to achieve it.



Fig 47: First Floor Plan (Source: Archdaily)

The swimming pool is divided into three categories for accessibility of different people with different disabilities as well as varying age groups. The rails to all the different pools are designed to be universally accessible. There is even a mechanized seat that can be lowered down into the hydrotherapy pool so that people with very limited mobility can enjoy the pool. The pool's edges are flanked by ramps for easy access for people in wheelchairs.

Chapter 5: Program Development

5.1 Program Provided by the Client

This project aims to provide a nurturing environment for the complete physical and mental growth of youths with different disabilities with an emphasis on sports and social activities. The program is designed to provide a safe and stimulating environment for the differently abled youths, in order for them to build the necessary skills to become a functioning member of society. The given program is as follows:

- 1) 10 Storied Administrative & Academic Building with the following functions:
 - a. Administrative Unit
 - b. Academic Unit
 - c. Medical Center (20 bedded with physiotherapy and rehabilitation facilities)
 - d. Auditorium/Multipurpose Hall (600 people capacity)
 - e. Seminar Rooms
 - f. Meeting Rooms
 - g. Universally accessible toilets
 - h. Reception & Lift Lobby
 - i. Cafeteria
 - j. Basements Parking (100 cars)
- 2) Sports Facilities with the following functions:
 - a. Athletic Track + Football Field for Main events (400m)
 - b. Cricket Field
 - c. Universally Accessible Swimming Pool
 - d. Shaded Galleries
 - e. Para Sport Court + Gymnasium
 - f. Locker rooms

3) Accommodation Facilities with the following functions:

- a. 6 Storied Staff Quarter
- b. 6 Storied Youth Dormitories
- c. Mosque and Religious Space

5.2 Program Analysis

The common and specialized functions serving the users of the Sports Complex must be connected through a Universal Accessibility Framework for maximising ease of access and movement.

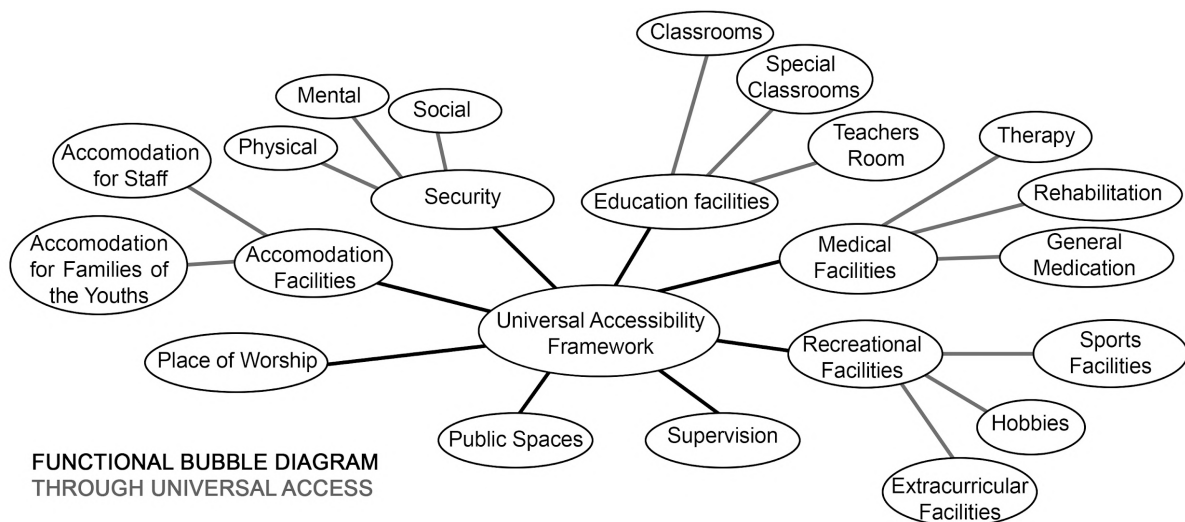


Fig 48: Functional Bubble Diagram through Universal Access. Source: Author

5.4 Tentative Functional Requirement of Program

The program provided gives a detailed list of the programs required for the project. The different programs were analyzed and to suit their size and space requirements along with other necessary programs or spaces to serve the basic programs. The size of the spaces are in sq ft from credible sources such as Time Saver Standard, Neufert and other case studies.

Functional Space			No. of Users	Area per Unit (sft)	No. of Units	Total Area (sft)
A	Administrative Facilities					11390 sft
No.	Function	Activities				
1	Admin Office	Interviews, Meetings		200 sft	1	200 sft
2	Executive Office	Management		200 sft	1	200 sft
3	General Office	Paperwork		500 sft	1	500 sft
4	Conference Room	Meetings		400 sft	1	400 sft
5	Auditorium	Events		9000 sft	1	9000 sft
6	Reception	Gathering		300sft	1	300sft
7	Human Resource Office	Management		200 sft	1	200 sft
8	Security Room	Security		150 sft	1	150 sft
9	Washrooms	Toiletries		40 sft	6	240 sft
10	Storage Room	Storage		100 sft	2	200 sft
Subtotal						11390 sft

Functional Space			No. of Users	Area per Unit (sft)	No. of Units	Total Area (sft)
B	Educational Facilities					7740 sft
No.	Function	Activities				
1	Classrooms	Education		400sft	8	3200 sft
2	Specialized Classrooms	Training		400 sft	3	1200 sft
3	Teachers Room	Education		500 sft	1	500 sft
4	Conference Rooms	Meetings		400 sft	1	400 sft
5	Staff Rooms			200 sft	1	200 sft
6	Library			2000sft	1	2000sft
7	Washrooms			40 sft	6	240 sft
Subtotal						7740 sft

Functional Space			No. of Users	Area per Unit (sft)	No. of Units	Total Area (sft)
E	Residential Facilities					68350 sft
No.	Function	Activities				
1	Accommodation Bedrooms	Accommodation	140	400 sft		56000 sft
2	Staff Accommodation	Accommodation	10	700 sft	10	7000 sft
3	Officer's Accommodation	Accommodation	5	800 sft	5	4000 sft
4	Accessible Reception			1000 sft		1000 sft
5	Warden's Office	Management	1	150 sft	1	150 sft
6	General Office	Paperwork		200 sft	1	200 sft
Subtotal						68350 sft

Functional Space			No. of Users	Area per Unit (sft)	No. of Units	Total Area (sft)
F	Service Facilities					
No.	Function	Activities				
1	Cafeteria	Food Service	150	3000 sft	1	3000 sft
2	Kitchen	Food Service	15	1000 sft	1	1000 sft
3	Laundry Service	Dry Cleaning	5	300 sft	1	300 sft
4	Electrical Substation Room					
5	Water Service Room					
6	On Site Ponds					
7						
8						
9						
10						
Subtotal						sft

Chapter 6: Design Development and Considerations

From the aforementioned chapters Background Study and Contextual Analysis it is clear that designing a self isolated sports complex would do little to impact the current issue of disability in our country. As it stands there is hardly any public awareness about paralympic sports and disabled communities in general. So to bring more awareness and to grow an audience for such sports we need to bring the surrounding community into the process. Through community participation we can create a more inclusive environment and a society of empathy and equity.



Fig 49: Concept Diagram: Connecting through Universal Access. Source: Author

In order to bring the community together, firstly something of value to the community had to be created. In this case a large public space connecting the various functions as well as the surrounding neighbourhood had to be created in the site. In this way by allowing for public access, the people of the neighbourhood can be acquainted with the various paralympic sports and issues regarding disability through direct exposure. This synchronizes with the ideals of accessible design as it is meant to benefit all groups, and not just the differently abled.

Furthermore, if we allow for the children of the community to play alongside the differently abled youths in paralympic sports they will be more aware and willing to engage with paralympics in the future.

Moreover, there are no riverside public spaces that are accessible in the neighbourhood , so providing that in the site will bring value to the community and give them a reason to visit the site.

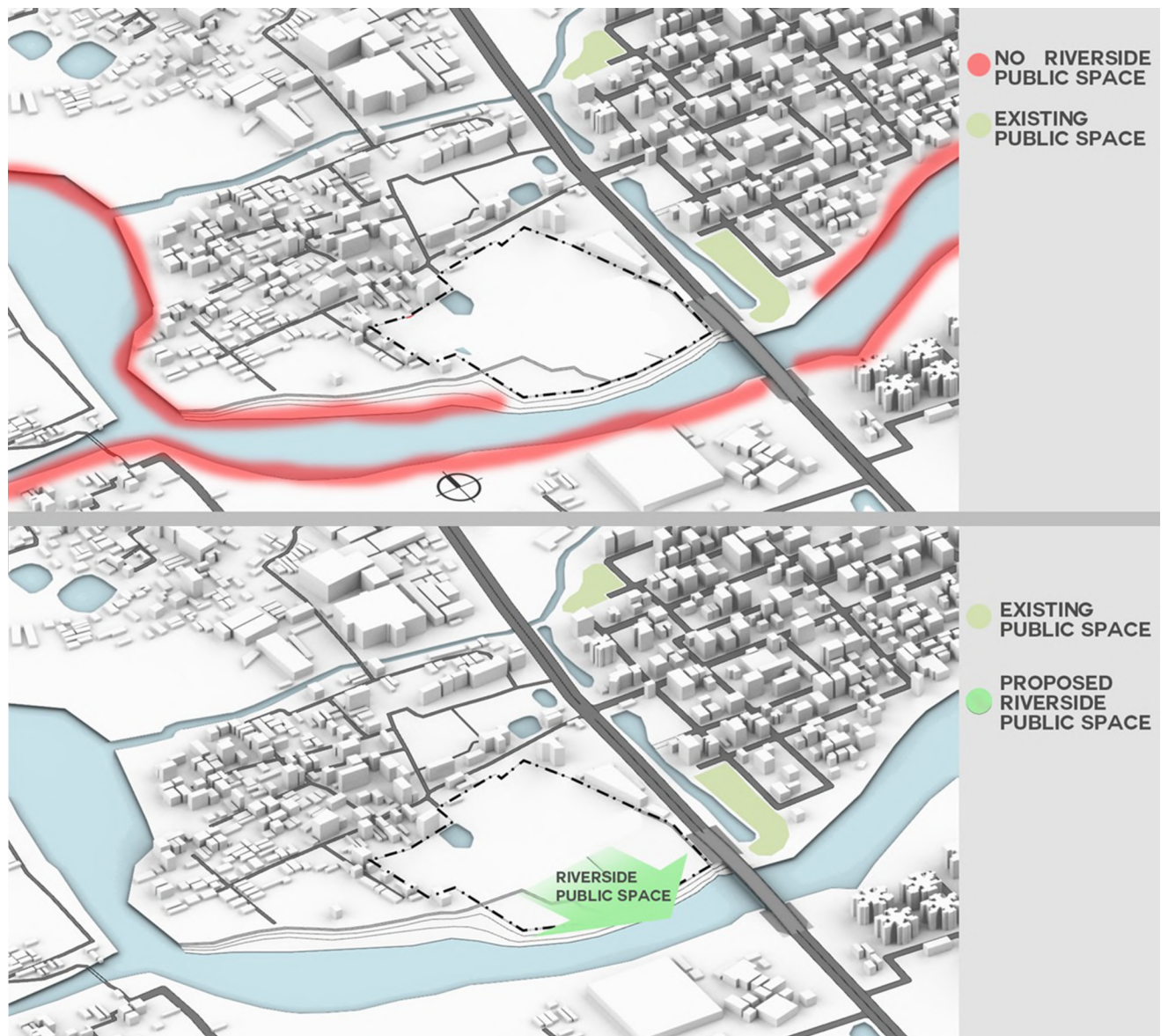


Fig 50: Concept Diagram: Riverside Public Space. Source: Author

To further iterate on connecting the neighbourhood upon pedestrian and vehicular traffic analysis, walkable and vehicle free connections to the site was made. These connections join with other public spaces and people do not have to cross the busy highway to access the site.

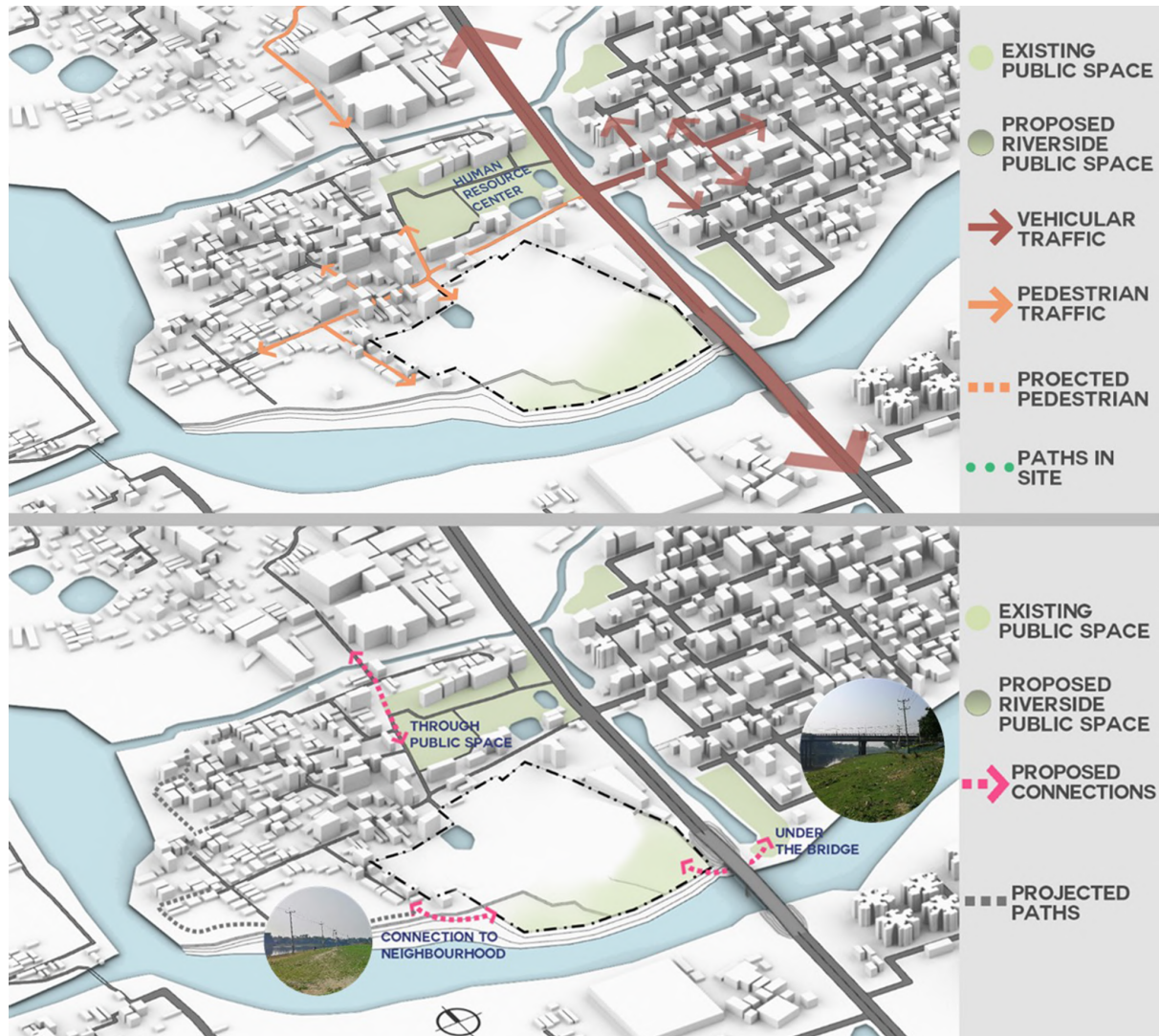


Fig 51: Concept Diagram: Connecting through Universal Access Ways. Source: Author

Upon creating the connections, pedestrian flow through the site was simulated. According to the pedestrian flows through the site the zoning was split into Public, Semi Public and Private zones. The two major fields which are the Athletic Field and the Cricket Field are placed around these paths for maximum exposure to the public. The cricket field in particular is placed in the natural depressed land already present in the site to maintain the natural contours of the river edge.

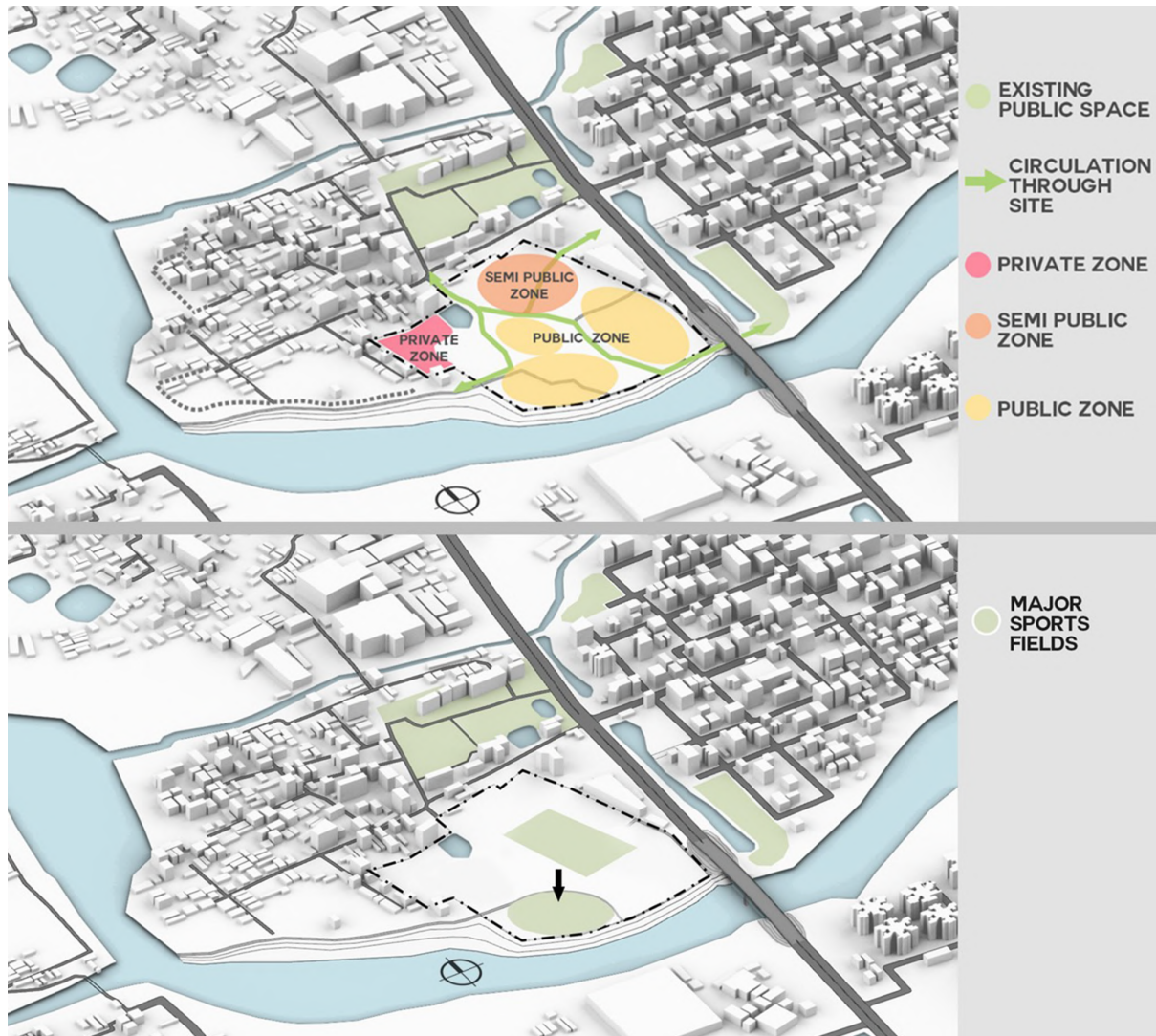


Fig 52: Concept Diagram: Zoning and Field Placement. Source: Author

According to the position of the fields and the pedestrian fields the main functions are placed in their respective zones based on privacy. The residential zone in the private zone, the the sporting facilities in the public zones and the school facilities in the public zones. In order to break up the monotony of the large blocks, green play spaces are introduced in between the functions.



Fig 53: Concept Diagram: Zoning and Offset Green Spaces. Source: Author

The patches of green spaces breaking up the long monotony of the forms are then turned into small courtyards and the forms wrap around them. Courtyards are a mainstay in our climate and acts as spaces which allow for gatherings as well as spaces for cross ventilation and sunlight to enter. The spaces are joined around the play spaces by an accessible pathway joining all functions.

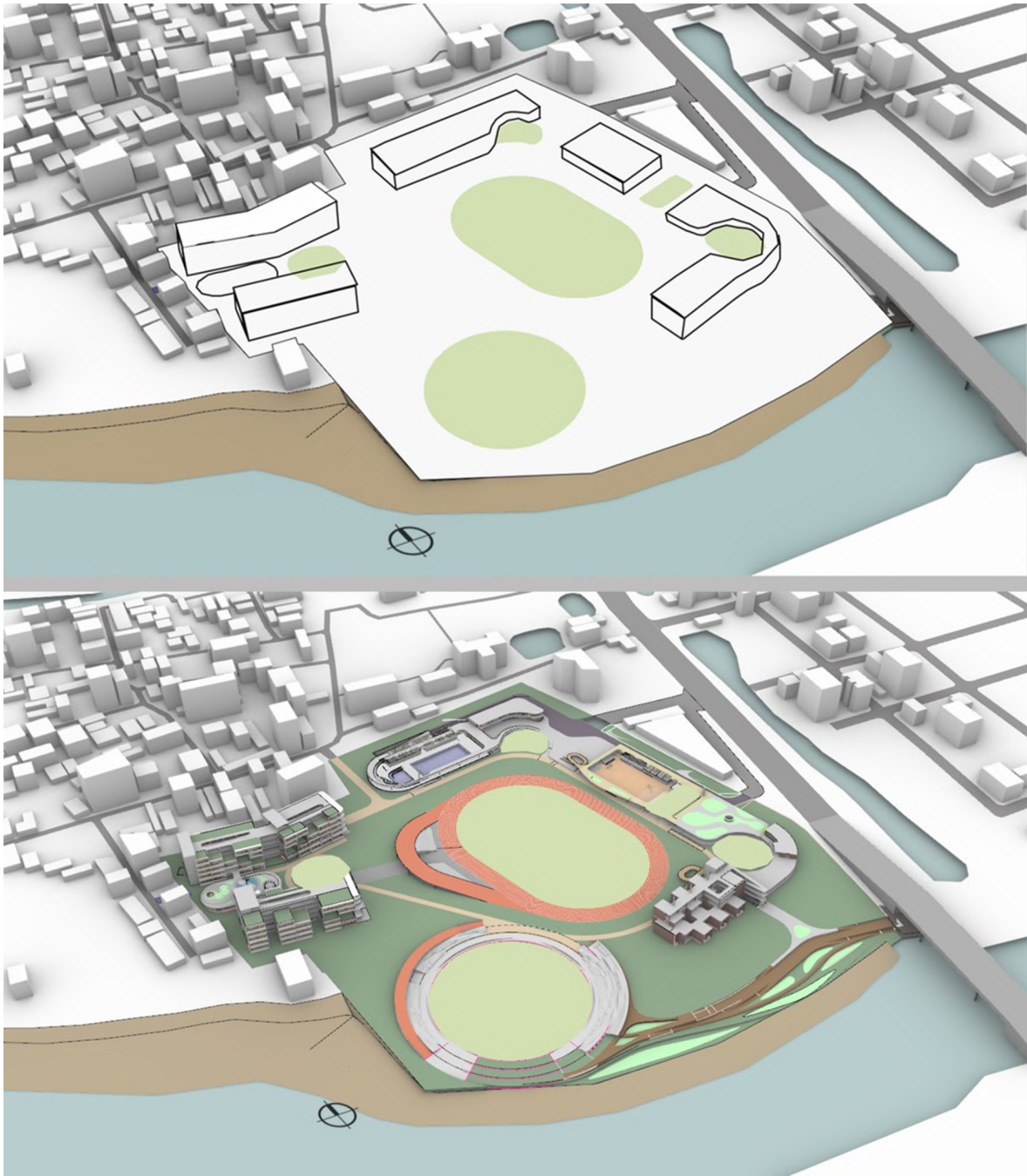


Fig 54: Concept Diagram: Connecting through Universal Access. Source: Author

The various connectivity around the site is ensured through hard paves which are accessibility compliant and level changes in the functions are all connected by ramps or elevators.

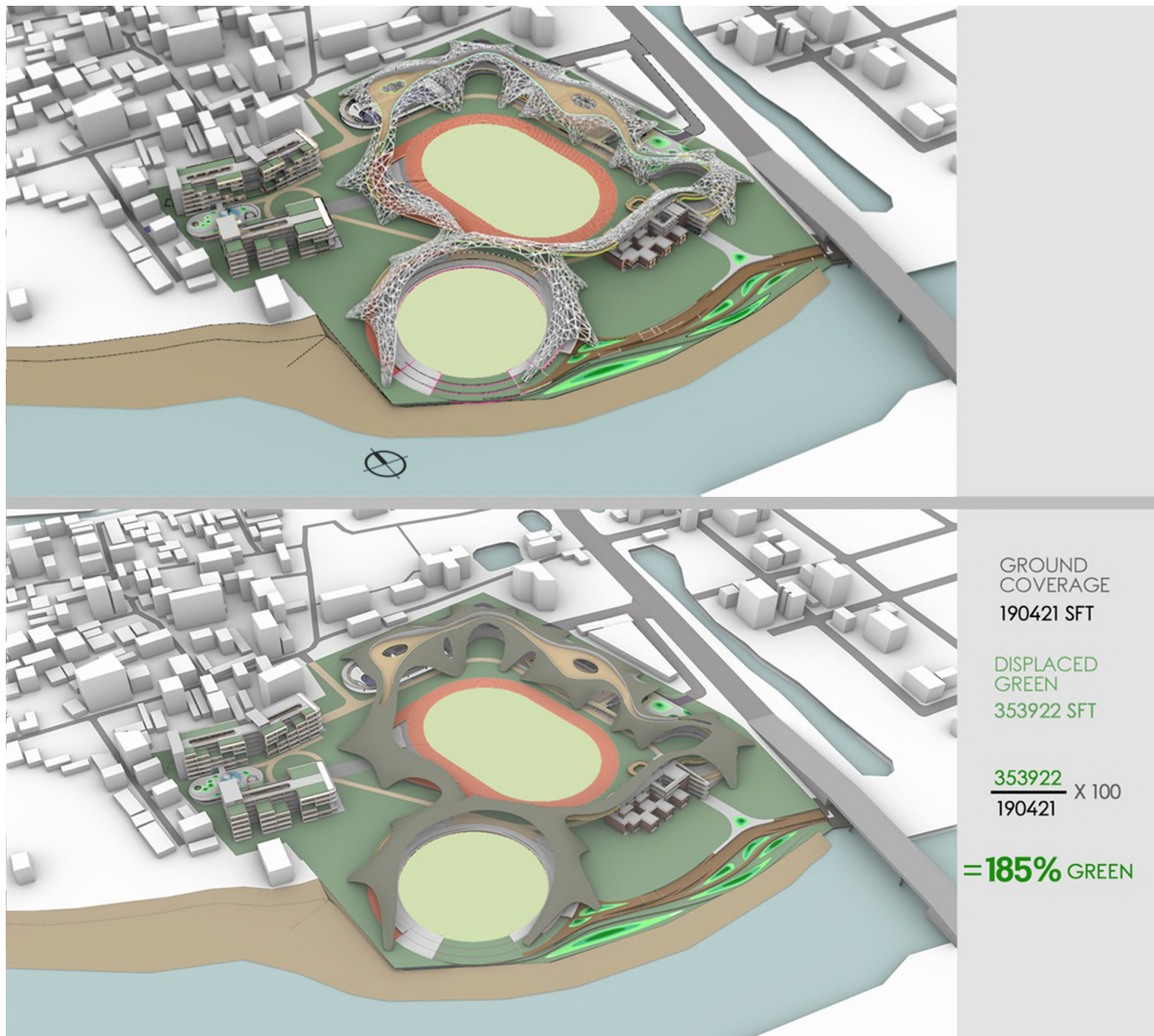


Fig 55: Concept Diagram: Funicular Green Roof. Source: Author

As the different forms and functions are specialized and are of varying shapes covering large spans, a funicular form was generated to cover the functions from the elements of climate. The entire structure is then converted into a green roof to replace the displaced green from the ground level. The green roof goes above and beyond and increases the green soakable surface of the site to 185% of the ground displaced. There are also green playspaces and viewing points along the green roof such that sports functions in the site can be viewed from a higher vantage point.

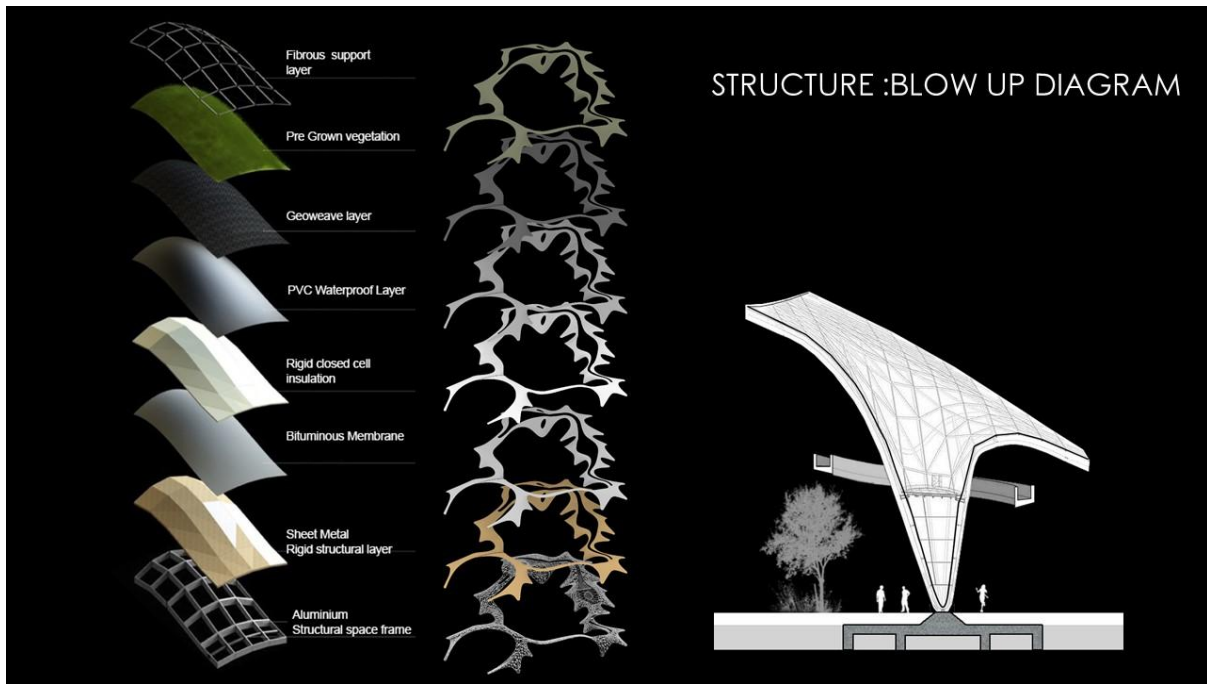


Fig 54: Concept Diagram: Connecting through Universal Access. Source: Author

The structure is such that the green grass can grow along the entire surface with the assistance of geo weave technology. The inner layers are there as damp protection and fire protection and structural rigidity to the form.

Chapter 7: Design Suggestions

7.1 Plans and Supporting Drawings

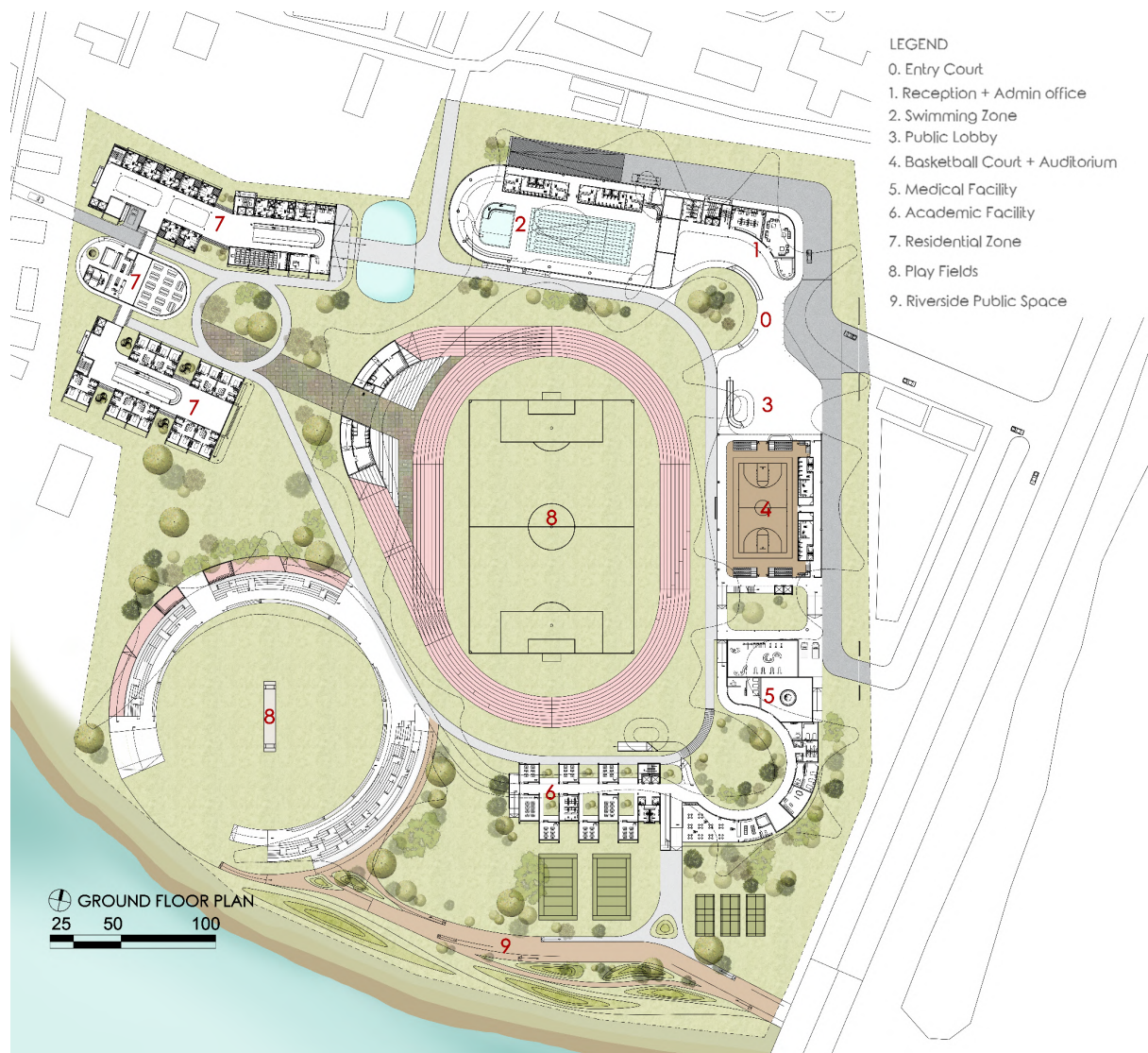


Fig 56: Ground Floor Plan. Source: Author

The plan focuses on freedom of movement and accessibility which will help its primary users, the differently abled youths gain a sense of empowerment through being able to go anywhere in the site. This is done through use of accessible ramps, elevators, simple pathways, minimum level changes, tactile paving, brailed handrails and other accessible standards. The forms and the pathways are linearly arranged around the large fields and courtyards and corners are filleted to maximise visibility and ease of turning.

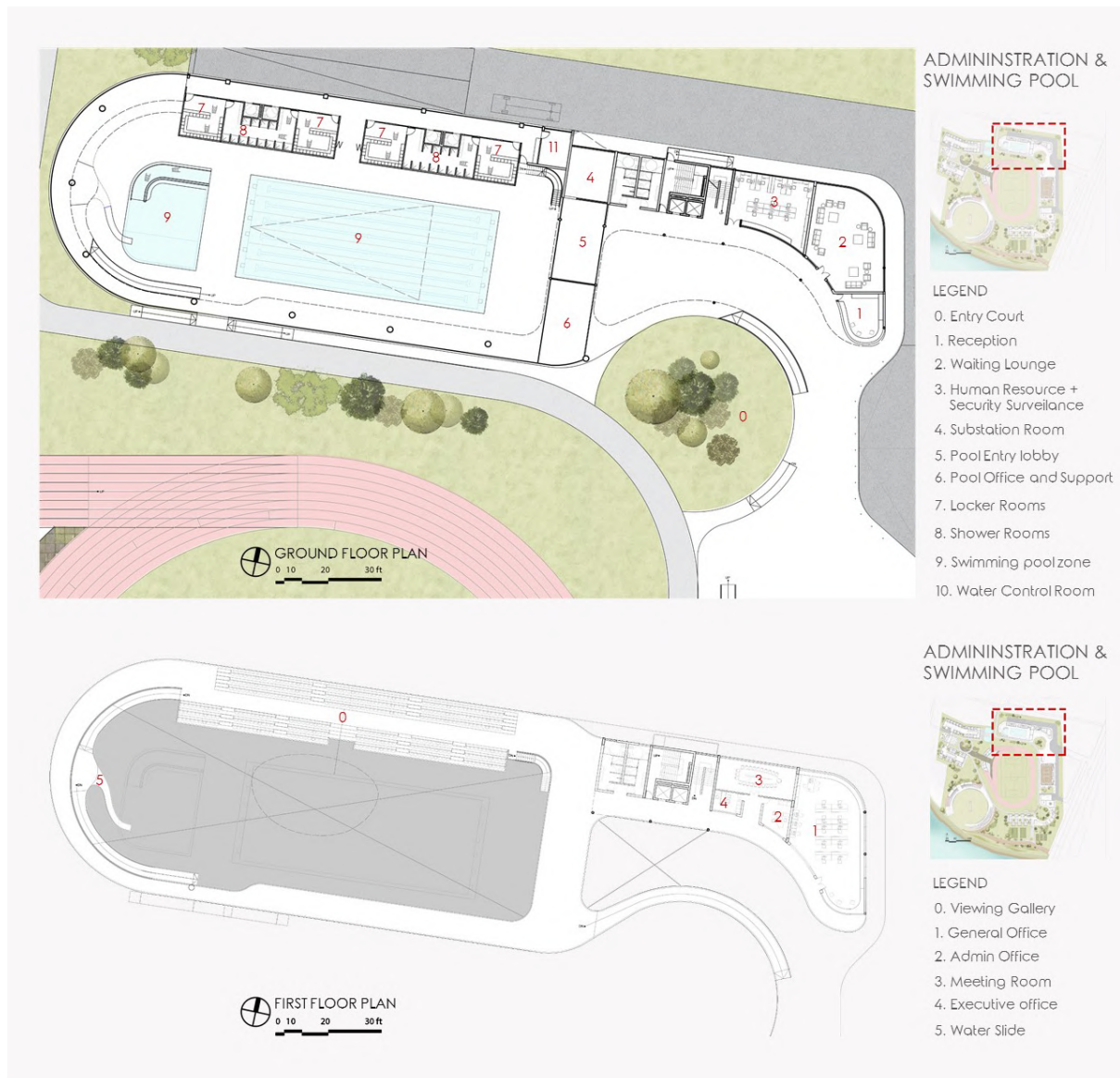


Fig 57: Entry lobby, Administration and Swimming Pool Zone. Source: Author

Upon entry the courtyard opens outwards towards the vast field giving a view of the large athletic field gradually revealing itself. Towards the north the administration block and further north west is the swimming pool block hosting a competitive pool and a recreational pool with an accessible viewing gallery.

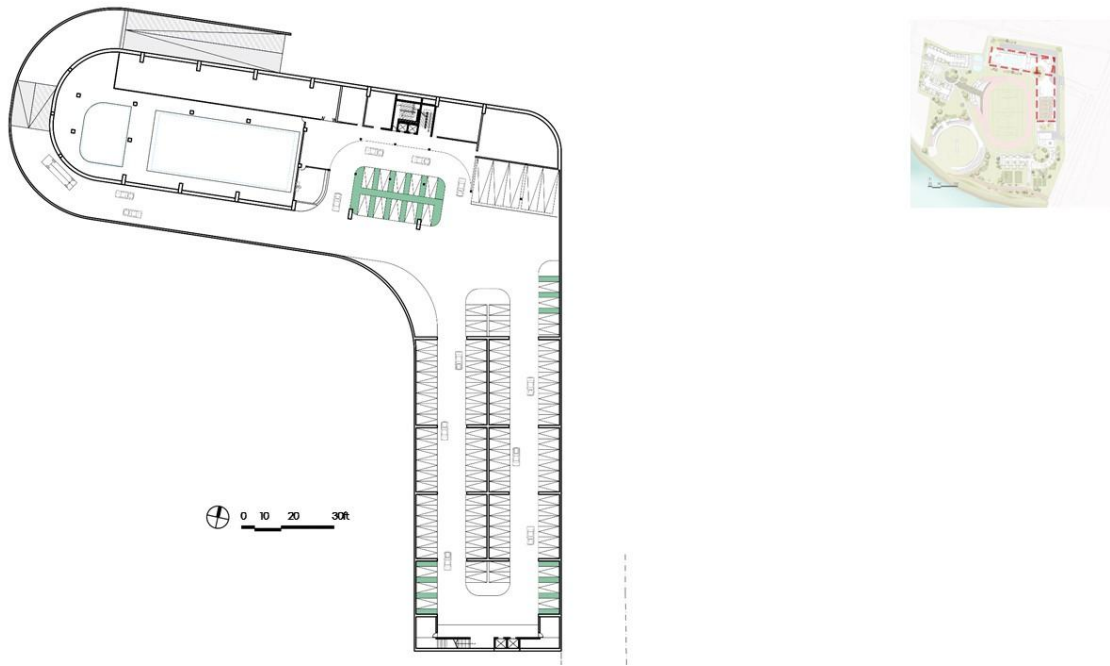


Fig 58: Parking. Source: Author

Accessible parking spots are reserved near the elevators and safe zones are created such that people can easily move about without having to step onto the vehicular path. The basement level also contains the generators and the water management system for the green superstructure and the swimming pool zone.



Fig 59: Entry lobby and Swimming Pool Zone Renders. Source: Author

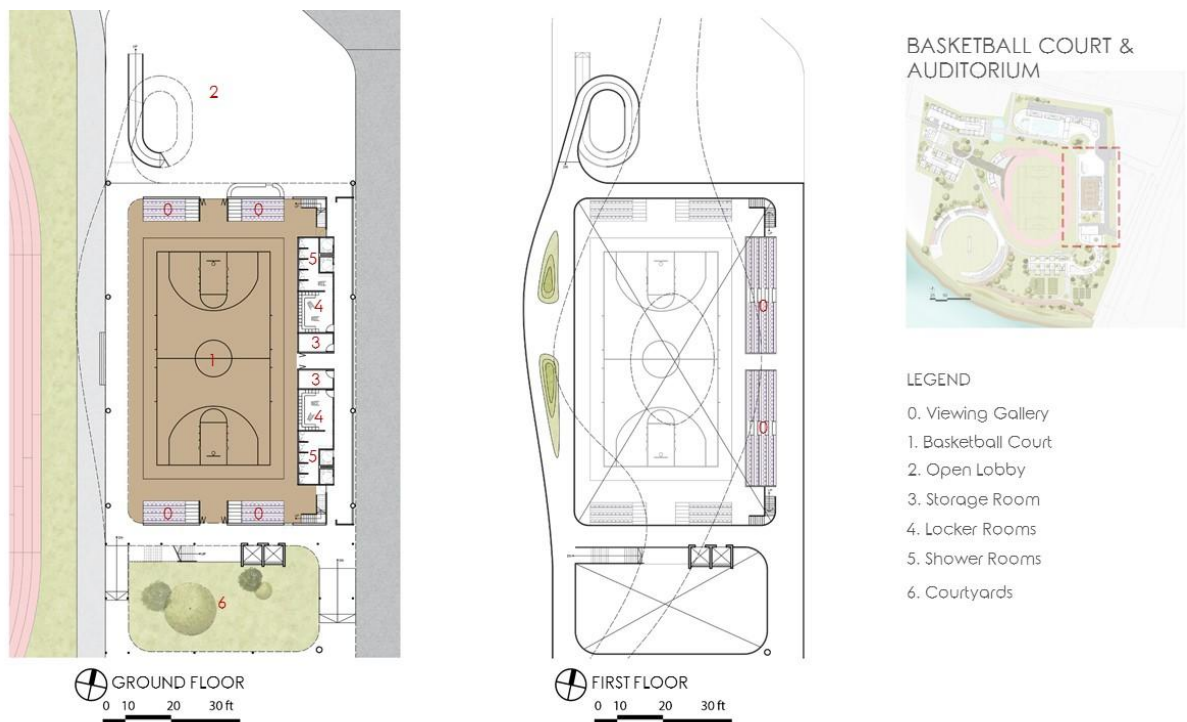


Fig 60: Entry lobby and Basketball Court/Auditorium. Source: Author

The basketball court has a raised walkways with accessible ramps such that differently abled individuals can view the sports from a higher vantage point without having to use the gallery and also give them autonomy of movement and empowerment.



Fig 61: Basketball Court/Auditorium Renders. Source: Author

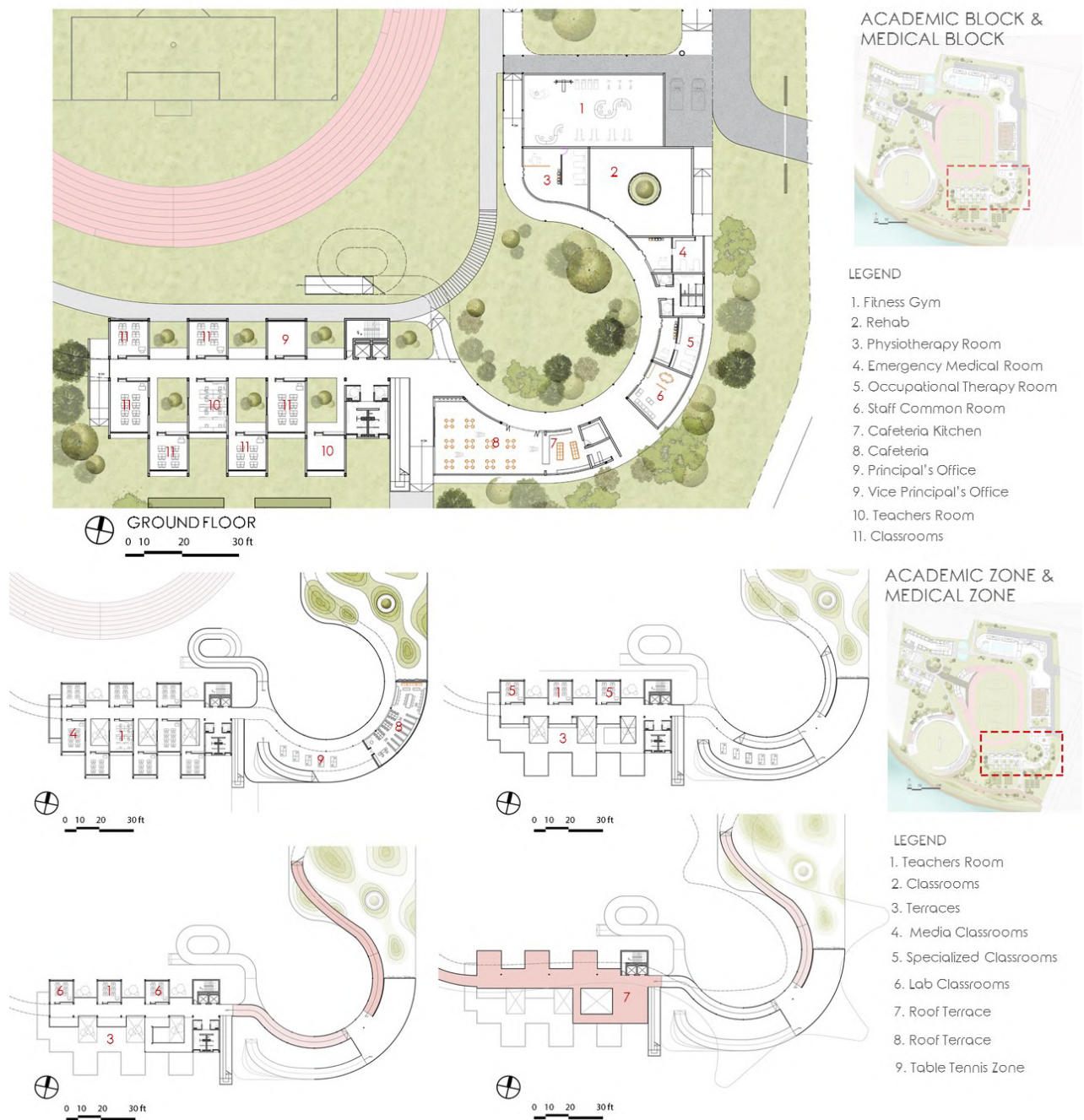


Fig 62: Medical Facility and Academic Facility. Source: Author

The Medical facility and the Academic facility are both offset by a circular courtyard. The courtyard can act as a place for younger children to play and also medical tenants and rehab patients to enjoy. On the roof of the medical facility there are play spaces with green mounds for younger children to play freely. The academic zone also has small interior playspaces as well as staggered terraces for different kinds of activities and play.

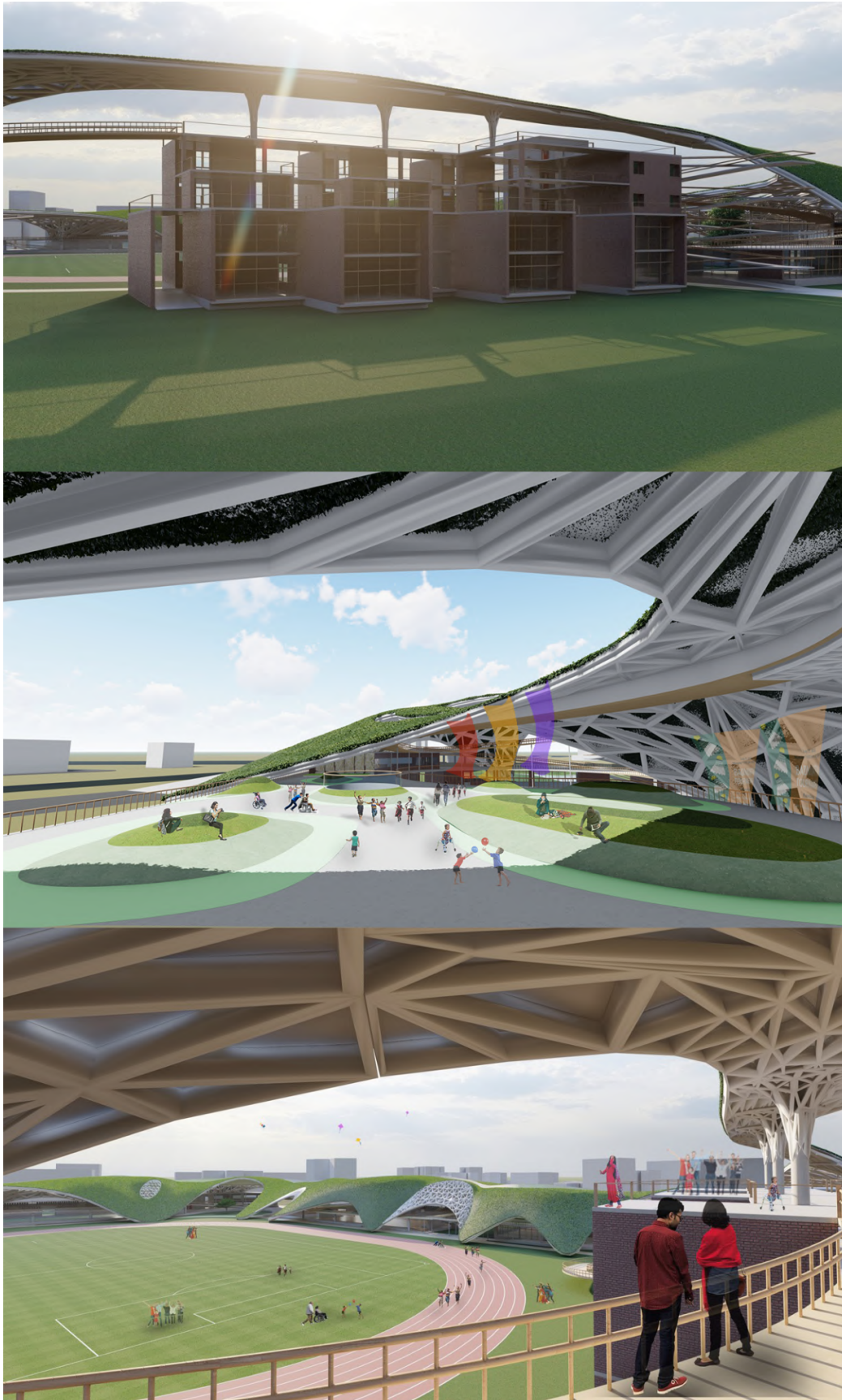


Fig 63: Rooftop Play space and Academic Facility renders Source: Author

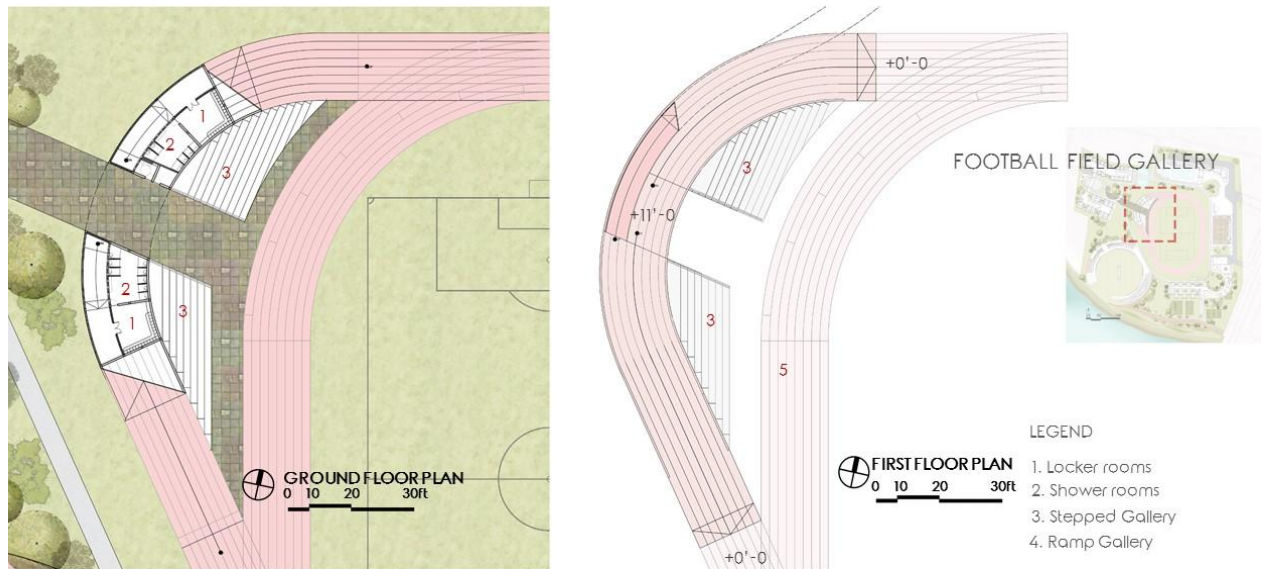


Fig 64: Athletic Field Ramped Gallery Source: Author



Fig 65: Athletic Field Ramped Gallery redners Source: Author

Since typical galleries besides the football field are inaccessible for persons with disabilities a ramped gallery was proposed. The gallery merges with the running track and also extends to the roof of the parametric roof. This allows for differently abled persons to have a ramped playspace and gallery fro which they can view the events of the athletic field.

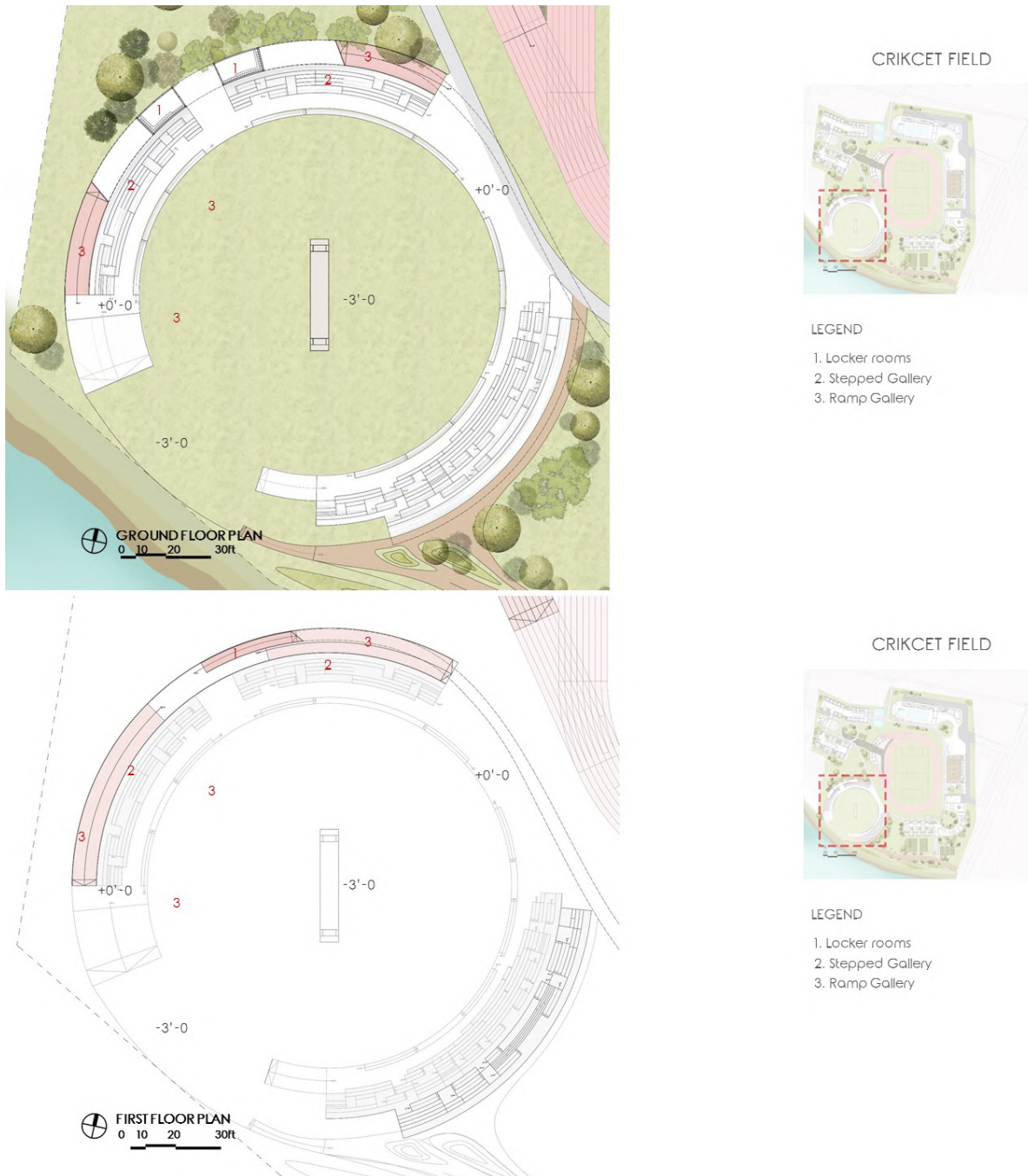


Fig 66: Cricket Field Ramped Gallery Source: Author

Similar to the previous athletic field ramped gallery, a similar gallery was imagined for the cricket field with steps and ramps fusing together for accessibility. This creates a unique play space around the cricket field with ramps.

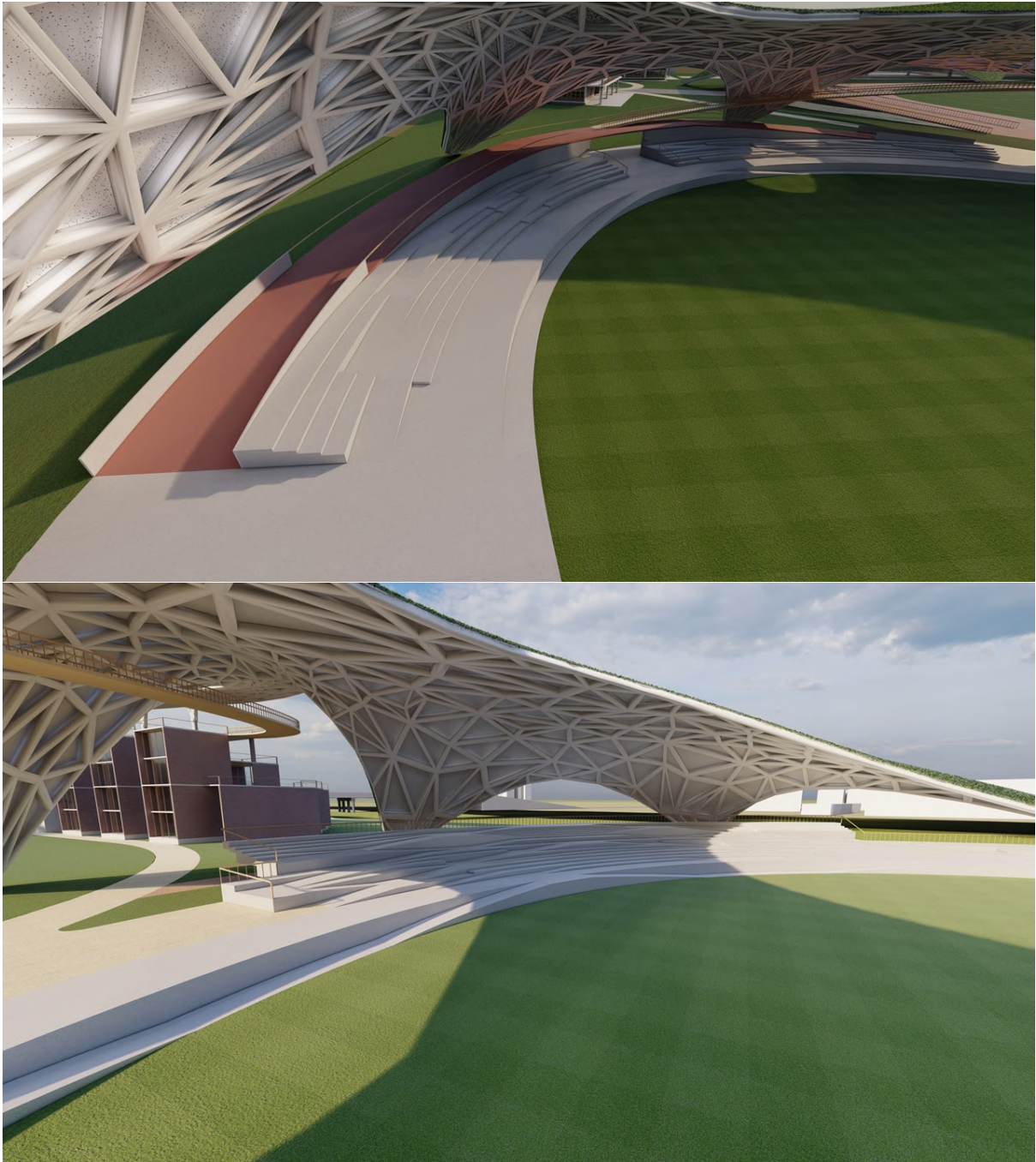


Fig 67: Cricket Field Ramped Gallery renders Source: Author

Based on the data from Demographic study the accommodation of the residences were determined. Then the dorms of male and female were arranged east to west in order to limit solar gains and maximise southern winds. The dorms were staggered and courts were opened in order for winds to pass through and allow for cross ventilation on both buildings.

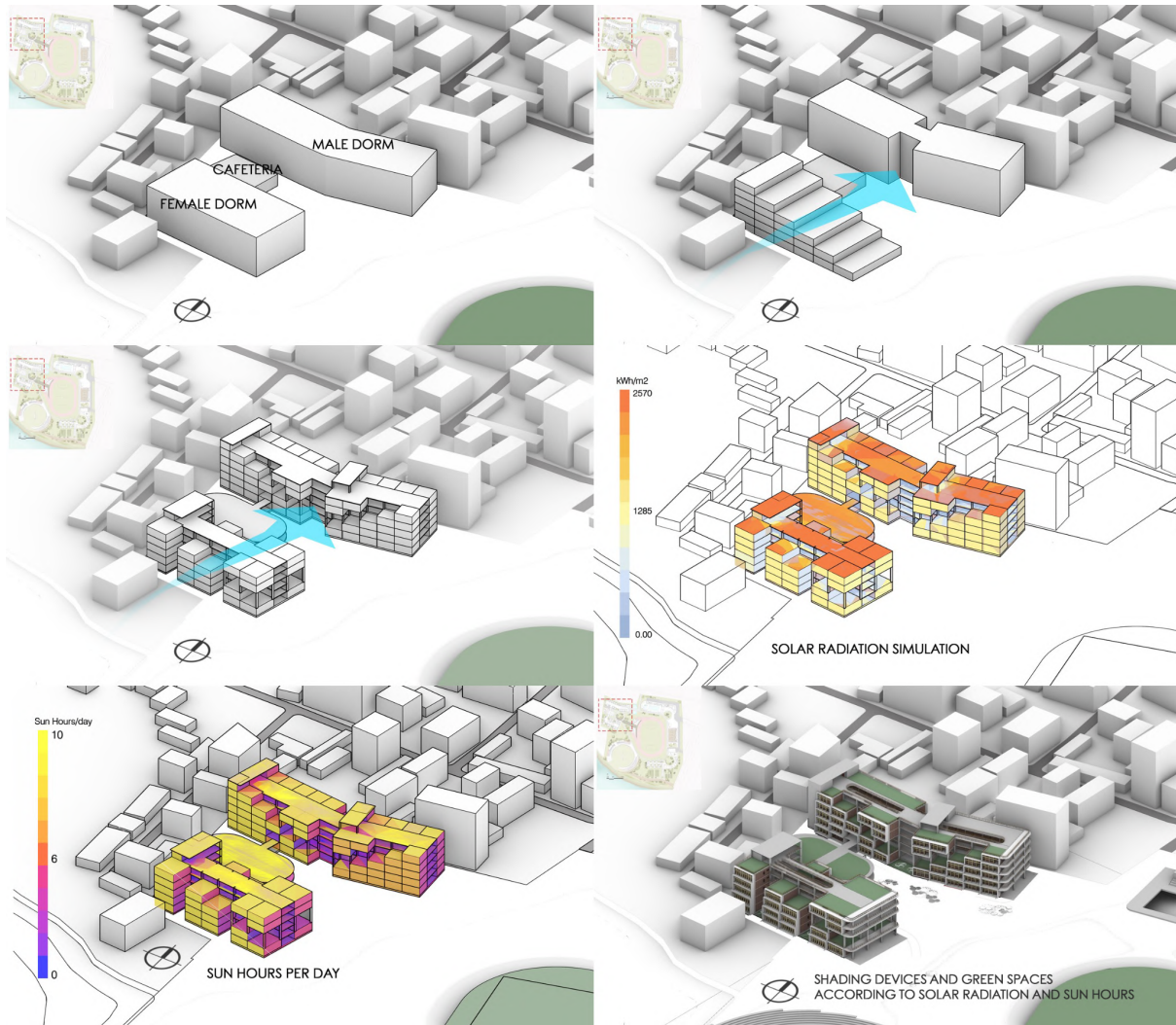


Fig 68: Residential Dorm Development Diagram Source: Author

Through the analysis of Solar radiation simulation of the two Equinoxes the shading devices were designed. Similarly, through daily sun hours simulations the areas where green terraces would be most effective were found out and designed accordingly. The green terraces are such that each floor has at least 2 large terraces. The two dorms are connected by the cafeteria and the cafeteria rooftop has a small rooftop playground on it.



Fig 69: Residential Dorm Plans Source: Author



Fig 70: Residential Dorm Unit Types. Source: Author

The residential dorms have accessibility compliant rooms of two types. The rooms are kept flexible so that it can meet the needs of different disabilities. The smaller dorm room type 1 is for two roommates to live together. While the larger dorm type 2 can be used as a room for 2 roommates or one bedroom remains open for visiting parents.

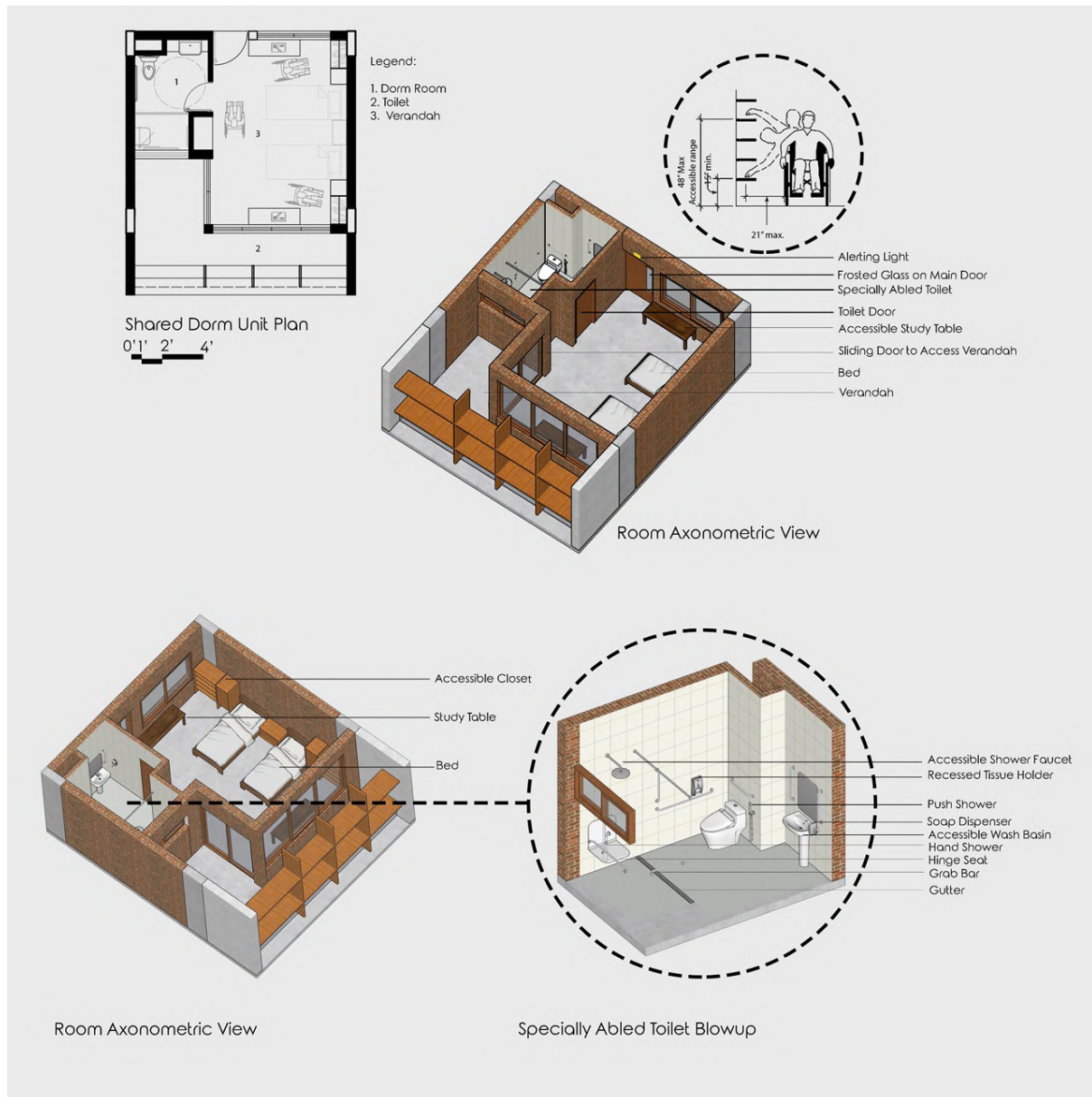


Fig 71: Residential Dorm Unit Type 1 Blow Up Diagram. Source: Author

The universal accessibility of the rooms are illustrated in the diagrams given above. The washrooms are accessibility compliant with grab bars on all three fixtures, recessed toilet paper and soap dispensers in the walls and shower seats. The rooms have built in accessible furniture and the doors have light indicators and glass indents for the hearing impaired. The rooms are shaded with a wooden shading device to break up the south sunlight and bounce diffused light into the interior space.

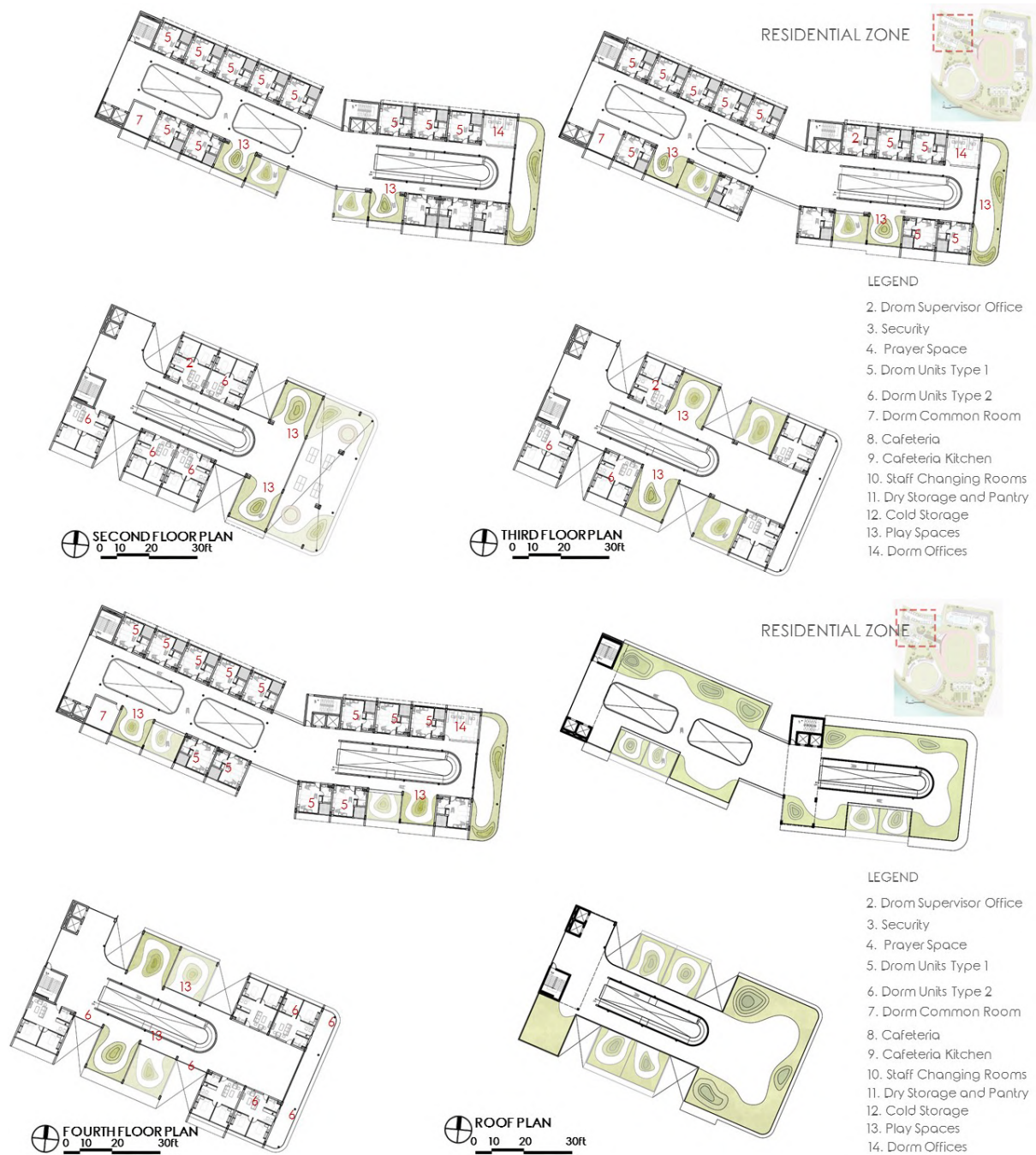


Fig 72: Residential Dorm floor plans. Source: Author

Similarly on the upper floors the green terraces on the staggered form ensures that there are at least 3 green terraces on each floor. The greenery continues to the roof of both the residential buildings.



Fig 73: Residential Dorm redners. Source: Author

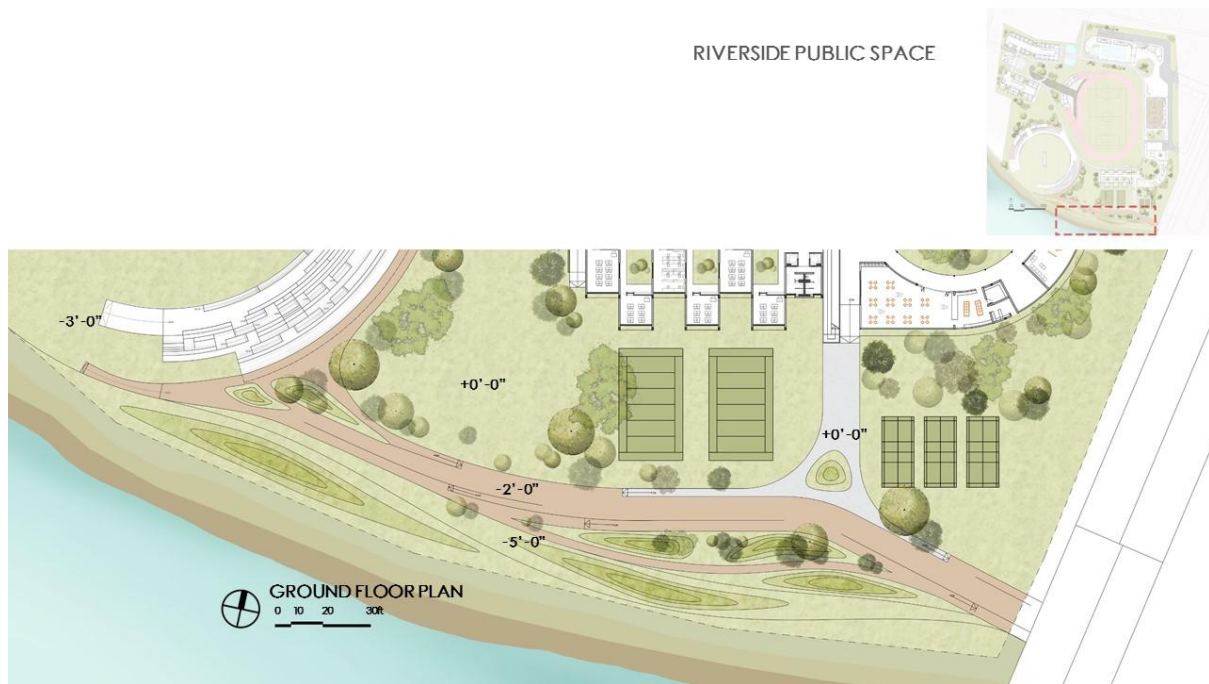


Fig 74: Riverside Public Space. Source: Author

As mentioned in the Design development (Chapter 7) the riverside public space connects the neighbourhood with the site. The Public space was designed along the natural contours of the site and the slope down is done gently with ramps so that it is universally accessible. Playscapes along the river edge stretch along the southern part of the site leading into the site beside the cricketfield. Through this public space people are to come into the site from surrounding neighbourhoods of east and west bank town and gain exposure to the world of paralympics and the differently abled community.

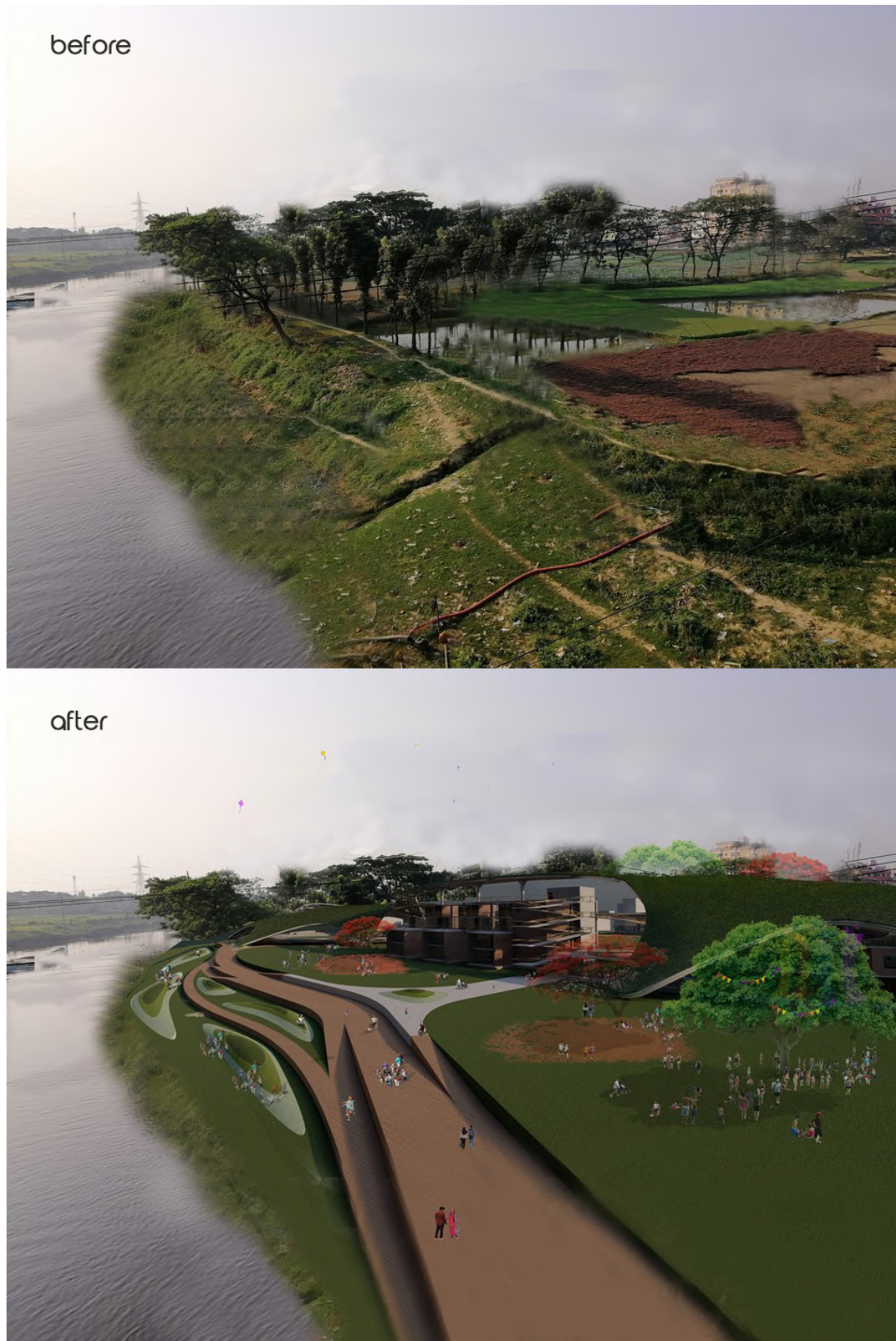


Fig 75: Riverside Public Space collage render. Source: Author

7.2 Sections and Elevations

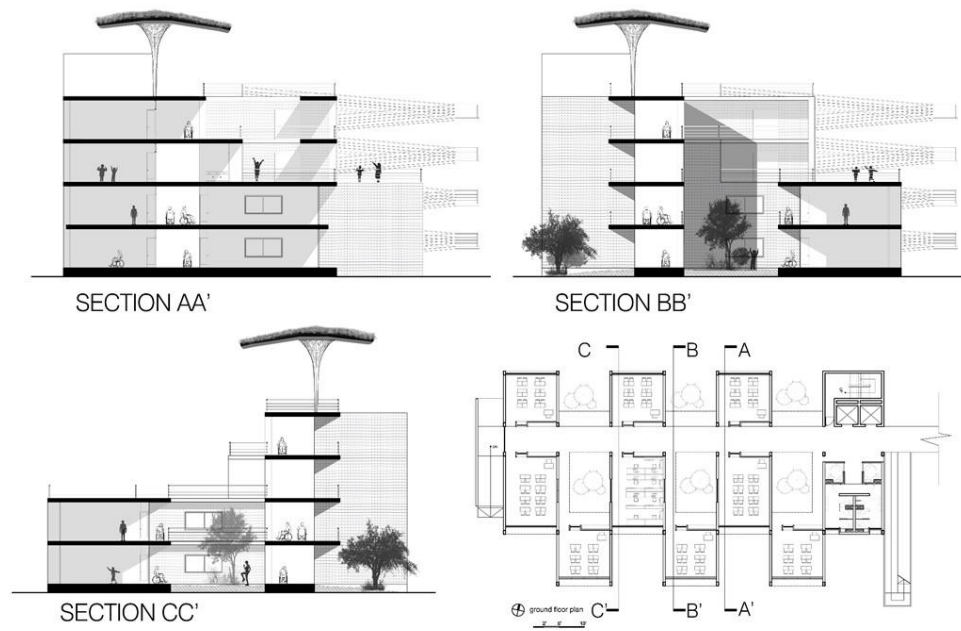


Fig 76: Academic block sections. Source: Author

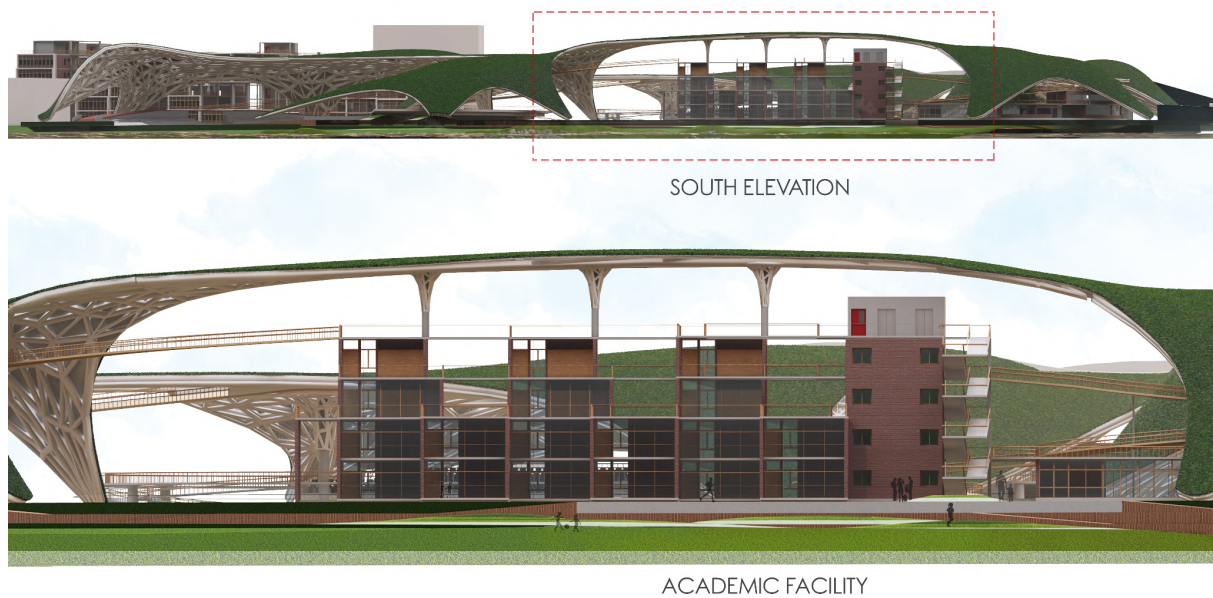
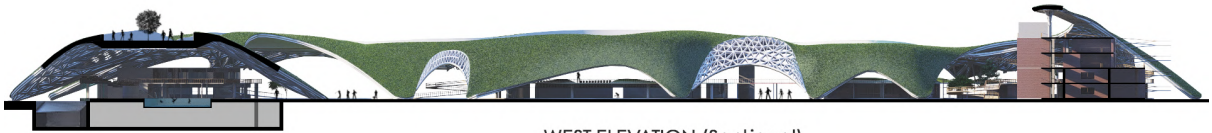


Fig 77: Elevations. Source: Author



EAST ELEVATION



WEST ELEVATION (Sectional)

Fig 78: Elevations. Source: Author

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