

Bangladesh Karmochary Kalyan Board Bhaban

By

Kazi Abrarul Haque
15108014

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

Department of Architecture
Brac University
May, 2020

© 2020. Brac University
All rights reserved.

Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

Student's Full Name & Signature:

Kazi Abrarul Haque
15108014

Approval

The thesis/project titled Bangladesh Karmochari Kalyan Board Bhaban” submitted by Kazi Abrarul Haque (15108014) Of Fall, 2020 has been accepted as satisfactory in partial fulfillment of the requirement for the Bachelor of Architecture degree on 31st of December, 2020.

Examining Committee:

Supervisor:
(Member)

Huraera Jabeen,
PhD Associate Professor,
Dept. of Architecture BRAC University

Supervisor:
(Member)

Mohammad Faruk, PhD
Associate Professor,
Department of Architecture

Departmental Chairperson:
(Chair)

Zainab Faruqui Ali,
PhD Professor & Chairperson,
Dept. of Architecture BRAC University

Abstract

Bangladesh Karmochary Kalyan Board also known as (BKKB) is an organization under the ministry of public administration aspiring to help eradicate and develop the socio-economic state of the country. Starting its journey in 2004, the board is actively working in eight districts including the Dhaka metropolitan area but it fails to have its own identity. Therefore, to enhance its administrative aspects and creating a permanent source of income which will directly be used in the welfare of the non-military public employees and its family, the board has decided to build its own administrative identity. This dissertation paper deals with my academic journey of the architectural design process of the “Bangladesh Karmochary Kalyan Board Bhaban” regarding how to make this project an efficient, climate friendly, iconic landmark building from the preliminary researches till the completed design product.

Keywords: BKKB, Commercial, Office, Efficient, Iconic, Landmark.

Acknowledgement

All the praise is due to Allah, the one who guides, the one who helps, the one who gives and the only one who is the divine Architect. All the praise is due to the Almighty creator who has bestowed upon me good health, family, friends, and teachers and granted me sound knowledge and peace of mind.

I am truly thankful and forever indebted to my mother Wahida Mahmood, and my father Kazi Amirul Haque, for their incomparable love, unimaginable support and consistent encouragement and teachings. I am also ever thankful for my sister Nafisa Anjum for the mental support and motivation which helped me to go on when things were getting rough.

I am forever grateful to my design instructors, Fuad H. Mallick, Iftexhar Ahmed, Abul Fazal Mahmudun Nobil, Khandaker Hasibul Kabir and Zillur Rahman and my seminar instructor Huraera Jabeen for their constant guidance, a means of support and extreme patience especially during the covid situation to help accomplish my design ideas, appreciating the goods and helping me to correct the mistakes into a better outcome of my project.

I am greatly obliged by my seniors, Reza Noor Muin, Arifur Rahman Shuvo, Nafis Nibraz for all the guidance throughout the process and beyond.

A special thanks to all my juniors especially, Yasir Rahman, Fayek al Rafi, Humayra Zareen, Nushin Ibshar, for helping me out and being my sword and shield.

Last but not the least a shout out to all of my friends Tanima Tasnim Uddin, Sadat Ajar Rahman, Sindis Hassan, Itminan Tasneha, Fateen Faiyaz, Zubair Arif Ahmed, Arik Islam, Mashiat Islam, Sajjad Hossen, Rakib Hossain, Kazi Mainuddin, and everyone whom I could not mention here for all that they have done for me from helping in design to giving me a word of encouragement in times of distress, I truly cannot thank you all enough.

Table of Contents

Declaration.....	2
Approval	3
Abstract.....	4
Acknowledgement	5
Table of Contents	6
List of Figures.....	8
Chapter 1: Introduction	11
1.1 Introduction to the Project	11
1.2 Aim and Objectives of the Project	12
1.3 Project Summary.....	12
Chapter 2: Literature Review.....	14
2.1 Effective and efficient office workspaces.....	14
2.2 Green building concept.....	15
2.3 Safety protocols	16
2.4 Social identity and Public Realm.....	17
2.5 Core and services	19
Chapter 3: Site Appraisal.....	20
3.1 Site surroundings	20
3.2 Historical Development of the Site.....	21
3.3 Geographical and Climatic Characteristics of the Site	22

3.4 Land-use Pattern of the Surroundings.....	24
3.5 Accessibility and Connectivity	28
3.6 Images of Existing Site Condition	30
Chapter 4: Case Study Appraisal.....	34
4.1 Gandom Office Building.....	34
4.2 Spire Edge office Building.....	42
Chapter 5: Program Appraisal.....	46
5.1 Administrative facilities.....	47
5.2 Training facilities.	49
5.3 Recreational and semipublic facilities.	50
5.4 Public amenities.	50
5.5 Security maintenance and parking facilities.	52
5.6 Rentable office spaces.....	53
Chapter 6: Design Considerations.....	54
6.1 Sustainable Building Design Approach.	54
6.2 Increasing the Marketability of the Building.	55
Chapter 7: Design Suggestions	56
7.1 Design concept and Form generation	56
7.2 Floor Plans	62
7.3 Sections and Elevations and Rendered Image	73

List of Figures

Figure 2. 1: Core details.....	19
Figure 3. 1: Site surroundings.....	21
Figure 3. 2:Temperature chart of Dhaka.....	22
Figure 3. 3: Precipitation chart of Dhaka.....	23
Figure 3. 4: UV index chart of Dhaka.....	23
Figure 3. 5:District mapping.....	25
Figure 3. 6:Edge, Node, Landmark mapping.....	26
Figure 3. 7: Building height mapping.....	27
Figure 3. 8:Connectivity mapping	29
Figure 3. 9: Zoomed in site	30
Figure 3. 10: Existing site image 1	31
Figure 3. 11: existing site image 2	32
Figure 3. 12: existing site image 3	33
Figure 4. 1:Gandom office building perspective view.....	35
Figure 4. 2: Average min and max temperature of Tehran.....	36
Figure 4. 3: Average precipitation (rain/snow) of Tehran	36
Figure 4. 4: Typology of spaces.....	38
Figure 4. 5: Horizontal and vertical circulation 1	39
Figure 4. 6: Horizontal and vertical circulation 2	40
Figure 4. 7: Site planning and landscaping.....	41

Figure 4. 8: Spire Edge commercial building perspective	42
Figure 4. 9: Micro-climate and concept	43
Figure 4. 10: User behavior and requirement	44
Figure 4. 11: Horizontal and vertical circulation	45
Figure 5. 1:Program division	47
Figure 5. 2:Administrative facilities	48
Figure 5. 3 :Office Grouping	48
Figure 5. 4: Supporting facilities for office	49
Figure 5. 5:Training facilities	49
Figure 5. 6: Recreational facilities	50
Figure 5. 7: Public facilities	52
Figure 5. 8:Security maintainance and parking	53
Figure 5. 9:Rentable office spaces	53
Figure 7. 1: Site analysis	56
Figure 7. 2: Concept and form generation 1	57
Figure 7. 3: Concept and form generation 2	58
Figure 7. 4: Concept and form generation 3	58
Figure 7. 5: Concept and form generation 4	59
Figure 7. 6: Concept and form generation 5	59
Figure 7. 7: Concept and form generation 6	60
Figure 7. 8: Concept and form generation 7	60
Figure 7. 9: Concept and form generation 8	61
Figure 7. 10: Concept and form generation 9	61

Figure 7. 11: Site plan.....	62
Figure 7. 12: Ground floor plan	63
Figure 7. 13: Basement plans.....	64
Figure 7. 14: Shopping floor plan	65
Figure 7. 15: Typical office 1	66
Figure 7. 16: Typical office 2	67
Figure 7. 17: Office floor plan 1	68
Figure 7. 18: Office floor plan 2	69
Figure 7. 19: Day care and Library plan	70
Figure 7. 20: Gym floor plan	71
Figure 7. 21: Fine dine floor plan	72
Figure 7. 22: Section AA	73
Figure 7. 23: Section BB.....	74
Figure 7. 24: East elevation	75
Figure 7. 25: North elevation.....	76
Figure 7. 26: Render Image	77

Chapter 1: Introduction

1.1 Introduction to the Project

Employment is one of the main sources of earning and creating livelihood for most of the people of our country while poverty is one of the main drawbacks to the nation's prosperity and growth. The economic development of any country indicates upsurge in financial investments both from government bodies as well as the private sector. Although the labor force of this country is 56.7 million, of which almost 70% is male and the rest is female, the rate of unemployment is 4.5% and the rate of under employment is 20.3% per year (Ahmed & Khan, 2015). The economy of Bangladesh 5.8% per year and the labor force was increased by 4.6% during the period from 2000 to 2010. A total of 15.1 million job opportunities were created but 20.1 million new labors entered the labor force and as a result, the unemployment rose to 2.6 million in 2010 whereas it was 1.3 million in 1995 (World bank Bangladesh development report. volume:2, 2012).

The government of Bangladesh took an initiative to help eradicate and develop the socio-economic state of the country by conjoining “Bangladesh Karmochari Kalyan Odhidoptor” and former “Board of Trusties” and forming “Bangladesh Karmochary Kalyan Board” under the ministry of Public Administration in 2004. The activities of the board include general and complicated treatment help, monthly benevolent grants, Educational scholarships, vocational female training alongside other facilities as well. (Bangladesh karmochari kalyan board, 2020)

The Board is actively running in eight districts though out the country including the Dhaka metropolitan area, however, it fails to have its own identity of having an administrative office building. Hence, the board has proposed a high-rise iconic building, in the dense commercial hub of Motijheel, at Dilkusha, housing their own administrative office alongside other mixed

use rentable commercial, communal and recreational spaces. Therefore, this will support the administrative aspects of the board and also create a permanent source of fund which will directly be used in the welfare of the non-military public employees and its family and also the country at large.

1.2 Aim and Objectives of the Project

1. The aim of the project is to create an iconic high-rise building for the “Bangladesh Karmochari Kalyan Board” to help facilitate its administrative purpose and to promote and enhance the social and financial image of the board.
2. Understanding the functional characteristics of government office programs and merging with new efficient office space design to create a healthy and effective work environment.
3. Designing an environment friendly and efficient building with proper fire safety, earthquake resistance protocols.
4. Understanding the site and its socio-economic context and communal activities and incorporating them to create an impact on the community.
5. Incorporating maximum green space into the building as it is one of the few building yet to be constructed in the dense commercial hub.

1.3 Project Summary

Name of the Project: Bangladesh Karmochari Kalyan Board Bhaban

Implementer of the Project: Ministry of Public Administration

Location: Dilkusha, Dhaka

Site area available for the Project Development: 1.4 acres (approx.).

Proposed built-up area of the Project:

Proposed Program of the Project: 2,22,000 sft (approx.)

The project includes broad programs such as Administrative facilities, training facilities, public amenities, recreational amenities and other security and maintenance facilities. The program analysis chapter will address these in a greater manner.

Chapter 2: Literature Review

2.1 Effective and efficient office workspaces

The literature review implies on portraying an overall outlook on the underlying aspects and the necessary studies which is essential to understand the challenges, complexities and opportunities of the project and also to ensure a successful completion of the project.

The designed office environment can in a general way raise or depress morale, and can play a pivotal role in having a major impact on how well the organization functions. (Elsbach & Bechky, 2007) On the contrary, a building without having a smart and efficient work environment effects not only the organization but the entire economy as well. International architectural firm, Gensler highlights the financial impact of poorly designed offices claiming that, poorly designed offices could be costing British business up to £135 billion every year (Wheeler & Almeida, 2006). Furthermore, a productive workspace uplifts interpersonal relation because such design helps forge social bonds that extend not only over space, but also over time (Mukherjee, 1994).

Studies show that a smart office configuration can portray status and group membership, improve collaboration and critical thinking to solve problems among gatherings, and influence individuals' attachment to their work environments (Elsbach & Bechky, 2007). Hence, flexibility in office workspaces are encouraged and highly promoted. Well-designed breakout spaces ensure socializing where co-workers can celebrate food and drinks without disturbing others. Similarly, these places also satisfy basic psychological needs and the design of the office also needs to address the affinity with nature and be planned on a human scale with intuitive wayfinding (Oseland, 2009). Although, the true innovation may arise at an interesting level of connectivity – but with too much connectivity, individuals may feel stressed and retreat to a

haven or quiet space (Davies, 2010). Thus, the key to the solution is to provide a choice of work-settings to support different tasks and environmental preferences for solitude, concentration and contemplation (Oseland, 2009).

2.2 Green building concept

In present times the absence of accord regarding the existence and particularities of environmental change is in sharp differentiation to the understanding that the global economic crisis is real and terrifying. During recent years clients over the world, working in both the private and public sectors, have made significant responsibilities towards sustainable design especially corporate headquarters, industrial factories and commercial buildings has proved to be a good testing ground for green building concept (Edwards & Naboni, 2013). By captivating the green building concept, the main three parties the client, the architect and the user reaps benefit. However, as our world is suffering from many ecological aspects the main goal sets to be making our homeland a better place to live in through various technical advancements. Basically, it is the prime ground where architecture can speculate the subtle relation between space, environment and creative working.

A green building may create a higher rental expenditures compared to other buildings, in reality this generates long lasting and higher returns which can be visible through energy consumption, water and waste reduction (Kats, 2003). As most the users are ought to work 5 days a week and 8 hours per day, this contributes substantial benefits for the users regarding health matters and work performance (WYON, 2004). Similarly, Daylighting analysis has risen as a critical factor in sustainable design. Definite daylighting investigation helps in a superior comprehension of the connection of the structure with its environment. It additionally uses sunlight as the essential light source through façade design and glazing choices in taking maximum solar radiation to limit energy consumption (Vaddadi, Patwa, & Sharan, 2013).

Moreover, any material which is employed into construction with the purpose of lowering energy consumption, operating and maintenance costs by a fair margin in comparison to conventional technology is referred to as Green Technology material which will serve the purpose of energy savings for high performance green buildings.

Another key aspect towards designing a green building is reducing water consumption and protecting water quality. Water is a resource which becomes scarcer each year and it is said to believe that buildings consume 20% of the world's available water (Roos, 2009). Similarly, the key factor which ought to be taken into consideration for making buildings ecofriendly and sustainable is Green roofing. With the increasing influx of pollutants and greenhouse gases into the atmosphere and as the site is located near a busy commercial hub in a densely populated area, already infamous for its air quality index, maximum usage of greenery will help raise awareness and act as an example for future buildings.

2.3 Safety protocols

As the mixed-use commercial building is proposed to be a high-rise building, the safety protocols must be ensured to prevent any sort of natural/manmade unwanted hazards. Bangladesh is one the most disaster-prone countries in the world. Various natural disasters like earthquake, flood, and hurricane might affect this country any moment. Although no major earthquakes have affected Bangladesh severely, the low incident of seismic hazard has made most of the policy makers be unaware about the risks of a fatal earthquake damaging many lives and properties (Sharifuddin, 2001). However, unlike the seismic hazard, Bangladesh has previously affected by the lack of fire safety protocols. The most recent incident that sheds light on this topic is the fire that broke out in the F.R tower in Banani, Dhaka which took 19 lives and 70 others injured. Fire incidents at the city's growing skyscrapers are nothing new. Cramped buildings, narrow alleyways, lack of fire security kits, inadequate fire exits and fire

safety protocols in the skyscrapers are often considered a recipe of such disasters (The Daily Star, 2019).

The key point of proper fire safety protocols needs to ensure the evacuation of the users and its occupants in due time while the structural components will remain intact for that period. The height of many modern tall buildings, combined with the limited number of vertical escape routes and fire stairs and fire lifts extend travel times such that the stairwells might act as the outside. In that case, it must be designated a safe zone which should guarantee the safety of occupants once reached and allow safe transit to a place of refuge, within or outside the building. In effect the tall building becomes a collection clusters of multi-storey buildings (Fire safety design for tall buildings , 2013).

Likewise, without adequate protection from smoke entering the stairwells, the width and number of vertical escapes and staircases will act meaningless. Hence, a common method to ensure smoke free stairwells is the provision of pressurization systems. Stair pressurization was developed in the 1960-70s through experimental work which is designed in a manner that the pressure difference between the stairwell and its surroundings remains within this range under both every day and operational conditions in order to maintain the smoke free requirement (Tamura, 1987). A more recent study shows that while ensuring traditional approach, reducing egress time, evacuation strategies with refuge floors and smoke and fire resistant vertical shaft and peripheral access road to ensure the firefighters can get things under control is highly promoted (Chow, 2015).

2.4 Social identity and Public Realm

Apart from the Bangladesh karmochari kalyan board office spaces, the mixed-use building proposes a diverse amount of public facilities such as rentable spaces and markets and the surrounding area is occupied with different hawkers. This creates a doorway for public

congregation and informal economic activity. The urban spaces between buildings and the plots on which they stand provide room for circulation, utilities, transportation, congregation, informal economic activity, landscaping, and so on. Such spaces are often thought of as public realm because they are jointly consumed by 'the public' and are contrasted with the private realm (Webster, 2002). On the contrary, very few urban spaces and facilities such undeviating benefits to the city. A city is an agglomeration of exercises that exist on account of its clients and must react to their necessities. The quintessence of a city lies in its capacity to oblige public life and make the interactions between the users and the public spaces advantageous. Local spaces like roads, markets and so forth are the spaces utilized by the residents routinely. To make the city a better place to live in, it is critical to concentrate on the subtleties of public spaces more than the planning of iconic structures (Raipat, 2016).

The board being under the ministry of public administration it is actively working on the welfare of not only the employees but different socio-economic environment as well. Therefore, the public has their own right to be benefitted and also benefit the building itself. Public spaces are where the city's way of life and conventions can be shown. The exercises occurring in an open space shift as per the time, day of the week or month of the year. Each open space assists with building up a feeling of a network in the city, with the assistance of its local identity and attachments. Neighborhood open goods in urban communities present numerous advantages, and disbenefits, to coordinate users and to surrounding land uses, land on which the rights to expend an advantage are unassigned is public domain land, as for that specific public good attribute, and it appears to be sensible to mark it as the public realm. This does not mean, however, that the public realm is simply land not in private ownership, or that it is the only land used by or accessible to the general public (Webster, 2002).

2.5 Core and services

A “tall building” is a multi-story structure in which most occupants depend on elevators [lifts] to reach their destinations (Challinger, 2008). The core and services become an integral part of such buildings. The Core is the central of arterial art of a multistory building that integrates functions and services. It is however supported by more functions such as toilets, elevator banks, utilities, mechanical facilities, fire stair and lifts etc. there are different types of core to serve the building according to its needs however with the quantity of lifts and other supportive functions, necessary calculations are to be made according to the requirement of occupants or users using each floor.

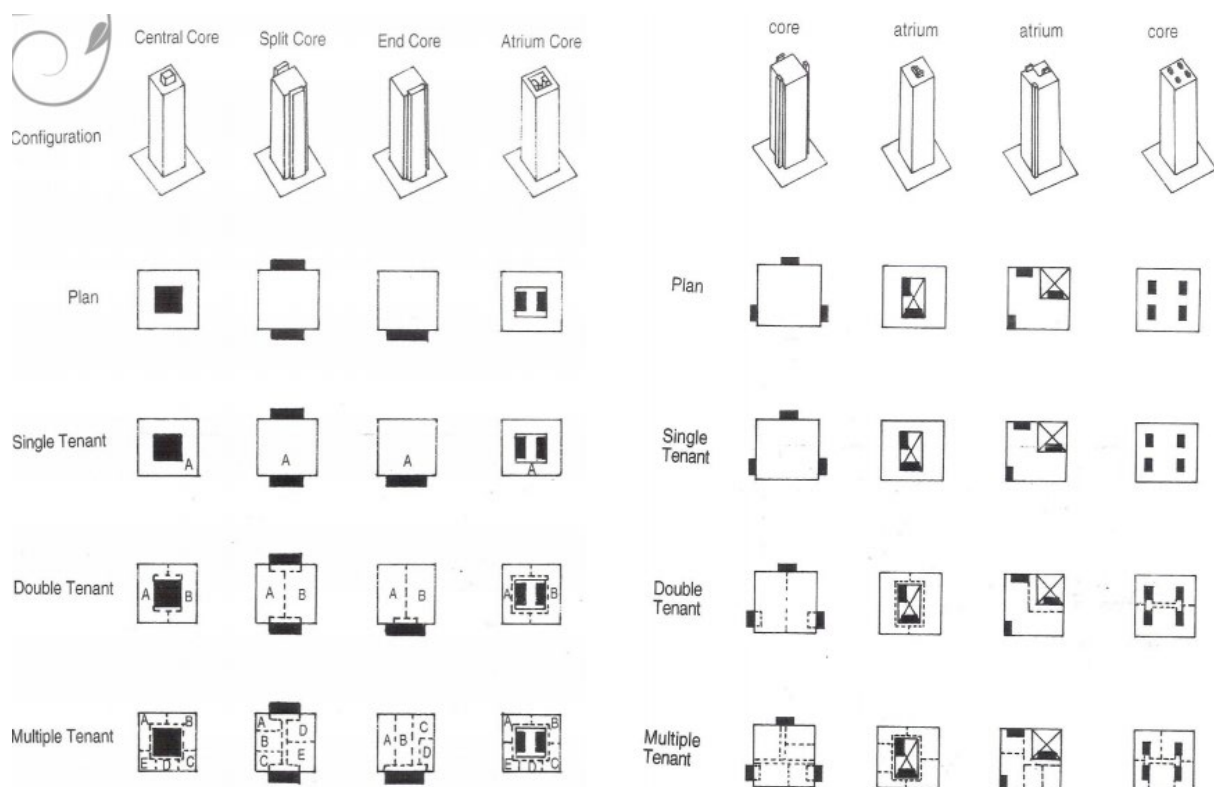


Figure 2. 1: Core details

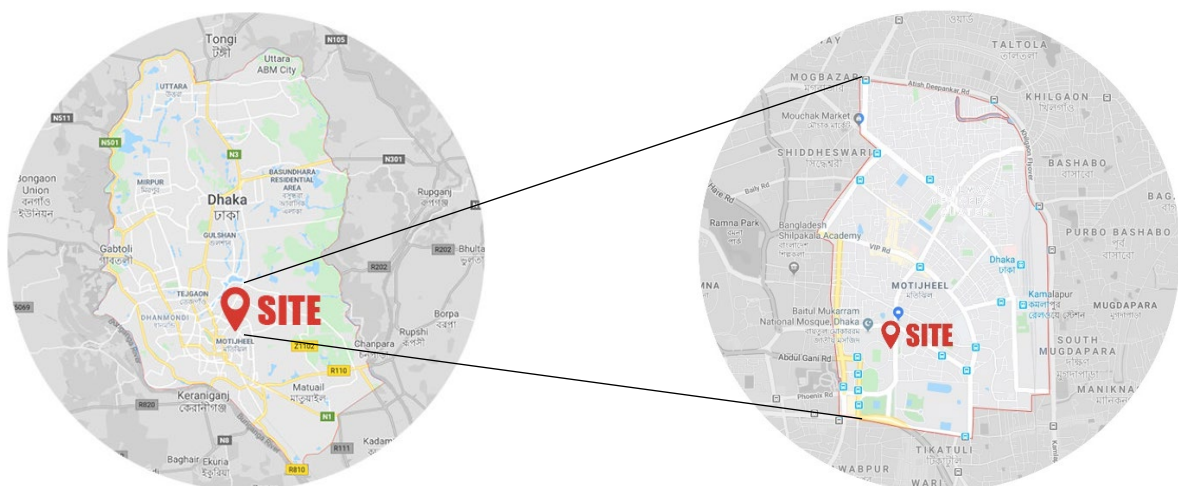
Source: <https://www.sefindia.org/rangarajan/CoreDesign>

Chapter 3: Site Appraisal

The allocated site of Bangladesh Karmochari kalyan board bhaban is situated at Dilkusha, Motijheel, having distinctive site forces which helps to guide and shape the holistic design process of this project. The ecology and climatic factors also play a pivotal role throughout the design.

3.1 Site surroundings

The site is at Dilkusha, which is the commercial center of Dhaka, which is the capital of the country. Motijheel is the major business and commercial hub of Dhaka city and has more offices and business institutions than any other part of the city (Ahmed & Islam, 2002). It is also home to the largest number of both government and private corporate headquarters and various significant skyscrapers in the megacity. The site can be significantly identified by its surroundings, mainly the national mosque of Bangladesh, Baitul Mukarram at a 400 feet distance to the west, Bangabandhu National Stadium to the adjacent west, BSC tower at north, Shilpa Bank on south and DIT Avenue on the eastern side of the site. The site surrounding mostly portrays a scenario of the oldest business company headquarters carrying a national value within the country.



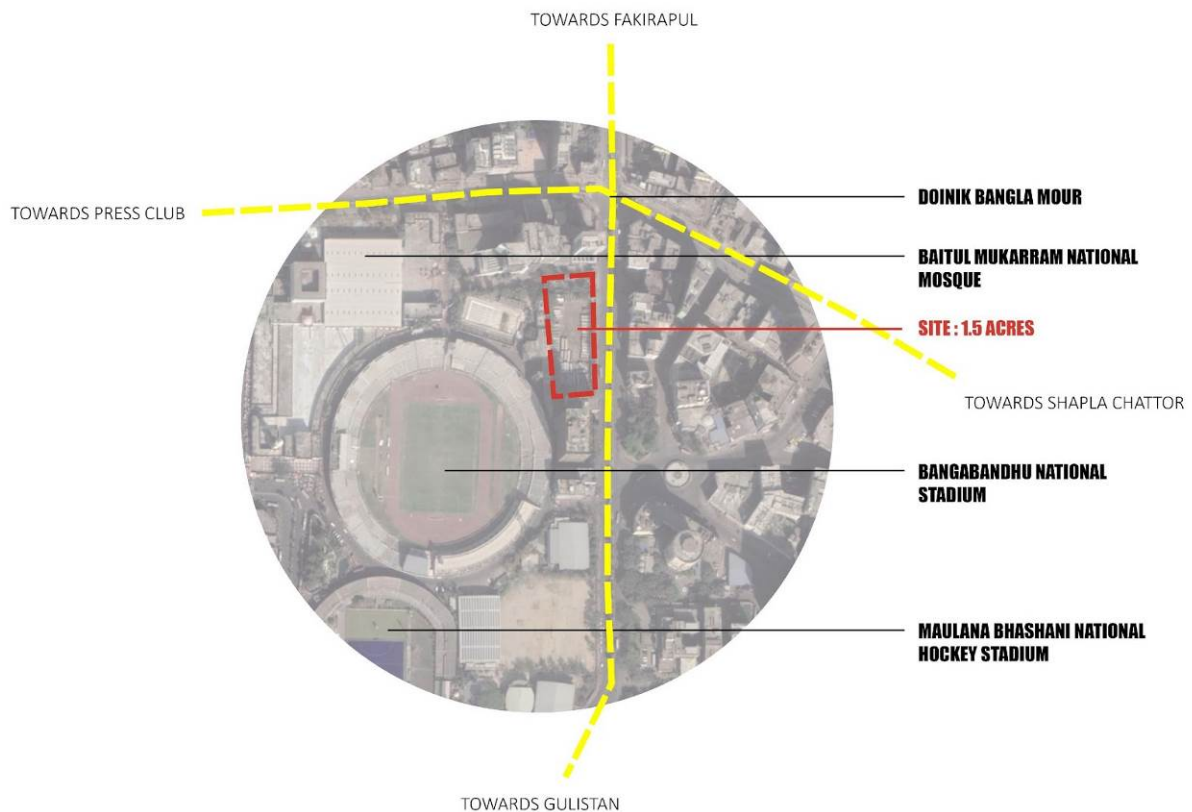


Figure 3. 1: Site surroundings

3.2 Historical Development of the Site

The site is located at a historically significant location Dilkhusa, Motijheel in the capital Dhaka. Motijheel itself is known as the city center where the offices and business centers had taken place since the development of Dhaka city right after independence. Dilkusha is an area adjacent to the present Bangabhaban in Dhaka. It is now a commercial place. The area was once adorned with a Rang Mahal built by Mirza Mohammad. A big canal, later on turned into a lake and known as Motijheel, used to run through it. With the passage of time, the whole area came to be known by that name. Mir Mukim, the Daroga of Mir Jumla's naval force, had his residence in the area to the west of the Bangabhaban. Whereas, the site itself shows no significant changes in the past 20 years of timeline.

However, Motijheel”- the most important commercial hub was developed on a swampy marshy land in a desolated fringe area in 1954. In the 1959 Master Plan of Dhaka City, Motijheel was demarcated as a commercial area but not a CBD. And to support this commercial hub, “Tikatuli”, located at the south, “Shantinagar” located at the north and “Kamalapur” located at the east of Motijheel were developed as residential settlements during 1950s (Ahsan, 2009).

3.3 Geographical and Climatic Characteristics of the Site

Dhaka, the administrative capital and commercial hub of Bangladesh is one of the megacities of the world and it has a population of 15 million (Bangladesh Bureau of Statistics , 2012). Among other dense commercial spaces, Motijheel area has the highest mean air temperature at 12pm in November and the recorded mean air temperature is 29°C. On the other hand, within a distance of 2 km 4% difference of air temperature has been identified in the research. (Rob, Kabir, & Rabby, 2015).

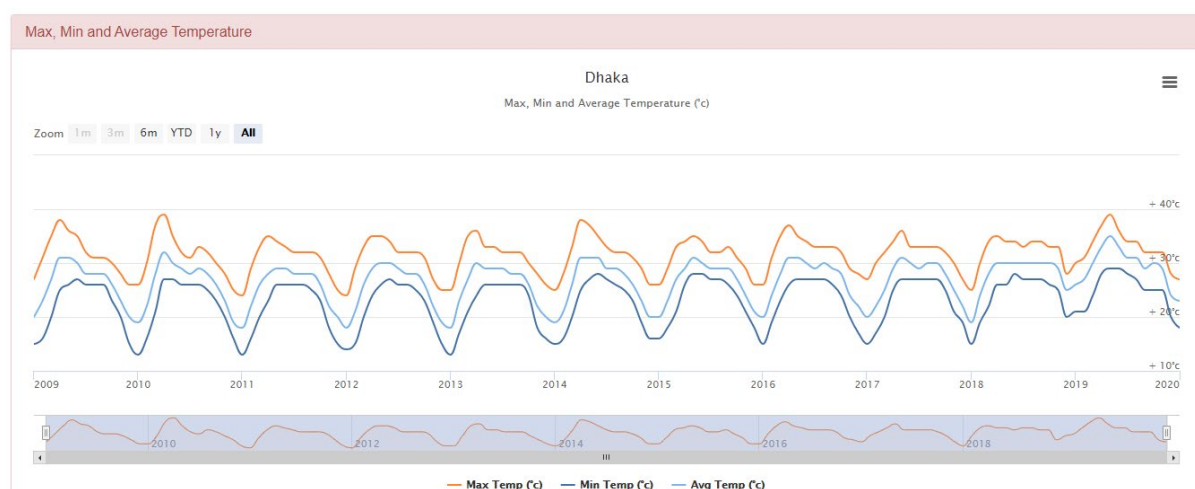


Figure 3. 2: Temperature chart of Dhaka

Source: Temperature chart of Dhaka city, World weather online

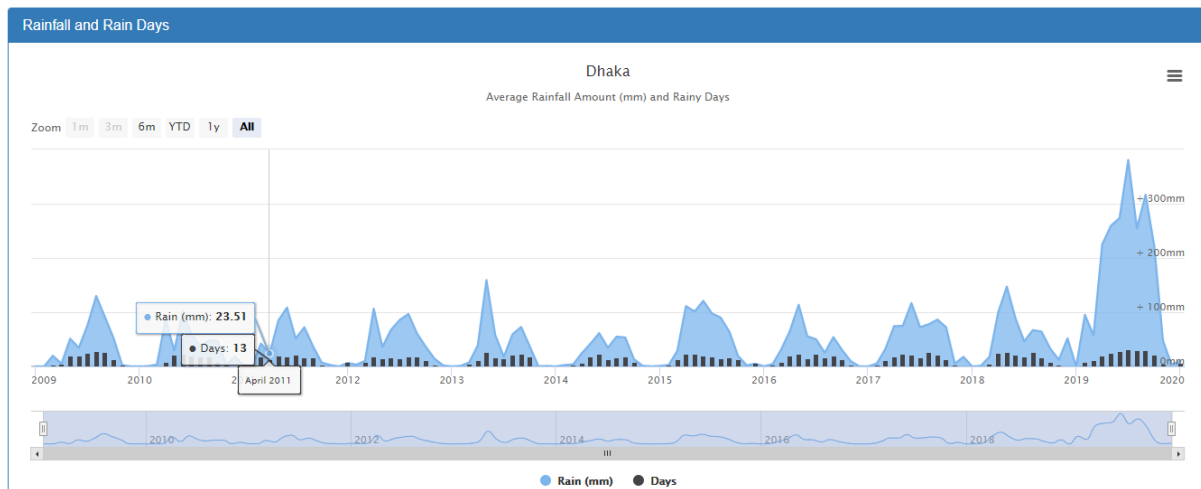


Figure 3. 3: Precipitation chart of Dhaka

Source: Annual precipitation of Dhaka city, World weather online

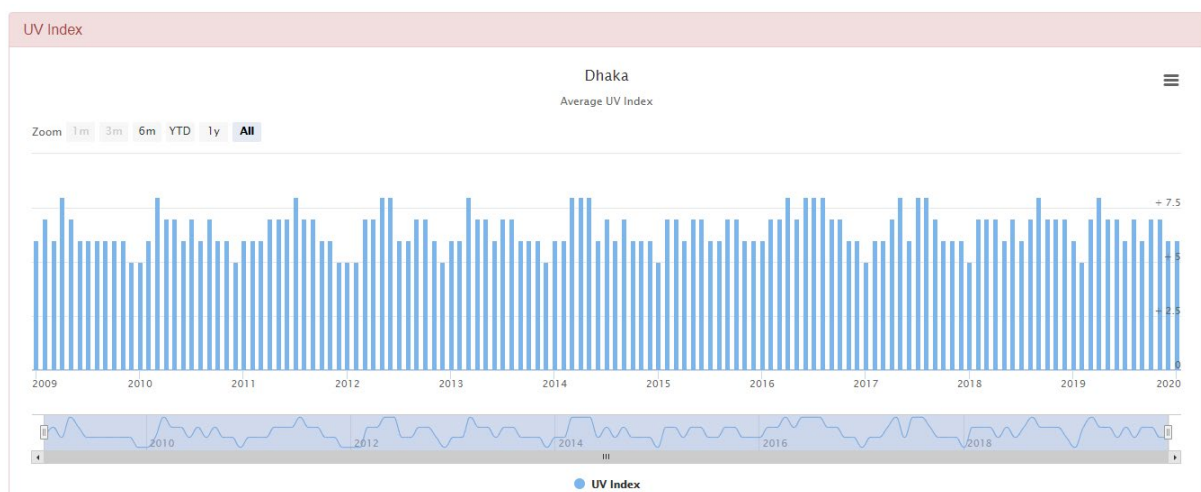


Figure 3. 4: UV index chart of Dhaka

Source: Annual UV index of Dhaka city, World weather online

3.4 Land-use Pattern of the Surroundings

Motijheel C/A is also one of the oldest parts of Dhaka city. The increased commercial and economic development of this CBD is naturally generating more activities and opportunities along with more infrastructure development which will eventually require the expansion of the physical boundary of CBD. Now the question is whether Motijheel area is also encountering this constriction problem being incapable of horizontal expansion and whether there is any scope for vertical expansion to accommodate its future commercial growth.

Motijheel area is encompassed with intense land uses from every side. According to RAJUK and DMDP (area: group C), about 58 percent of Paltan and Tikatuli area located on the western and southern side of Motijheel are developed as mixed land uses. About 70 percent of Shantinagar and Kamalapur area which are located in the northern and eastern side of Motijheel are concentrated with residential land uses. (Kar, et al., 2016).

Land use of surround areas.

Types of Land Use	Total Area (In sq meters)	Percentage (%)
Mixed use	246256	35.16
Commercial Activity	100036	14.28
Residential	192449	27.48
Open space	41902	5.98
Water Body	40943	5.85
Transport and Communication	29726	4.24
Education and Research	22090	3.15
Restricted Area	14002	2.00

Land use of Motijheel area.

Land Use	Total Area (In sq meters)	Percentage (%)
Commercial Activity	91584	64.00
Mixed use	19717	13.78
Vacant Land	11416	7.98
Water Body	9602	6.71
Transport and Communication	6571	4.59
Restricted Area	3418	2.39
Education and Research	792	0.55

Source: DAP, 2010

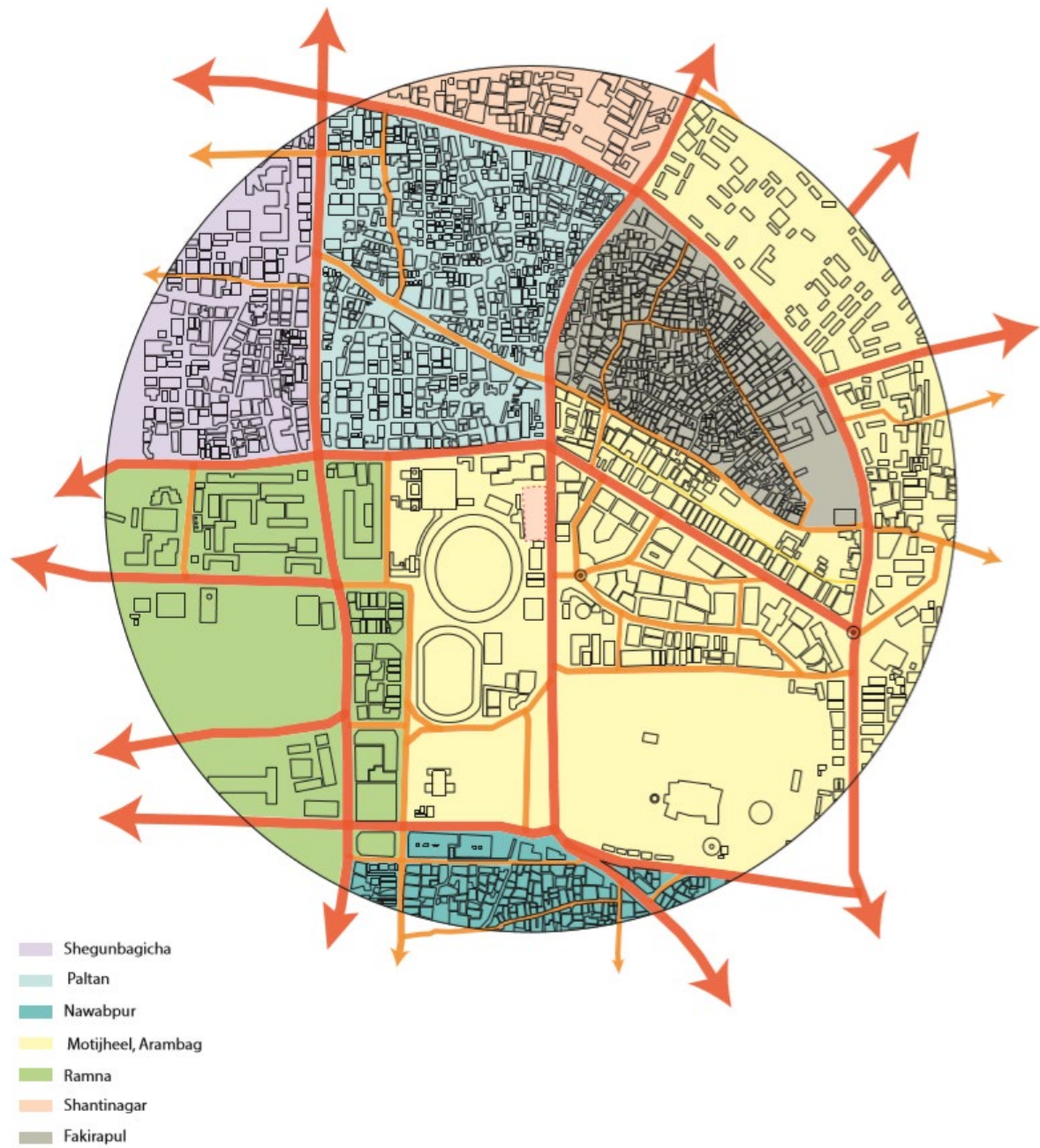


Figure 3. 5: District mapping

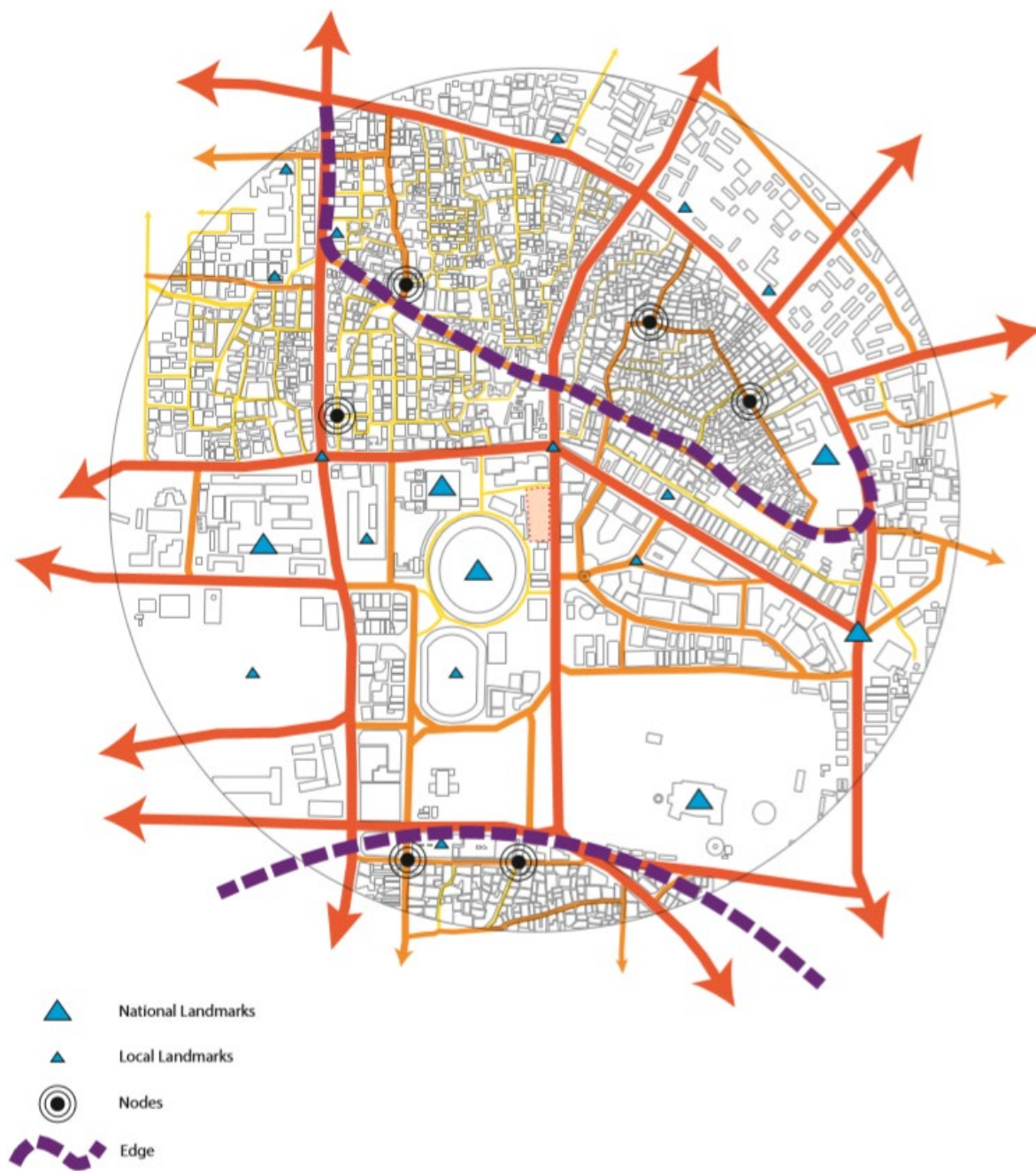


Figure 3. 6: Edge, Node, Landmark mapping

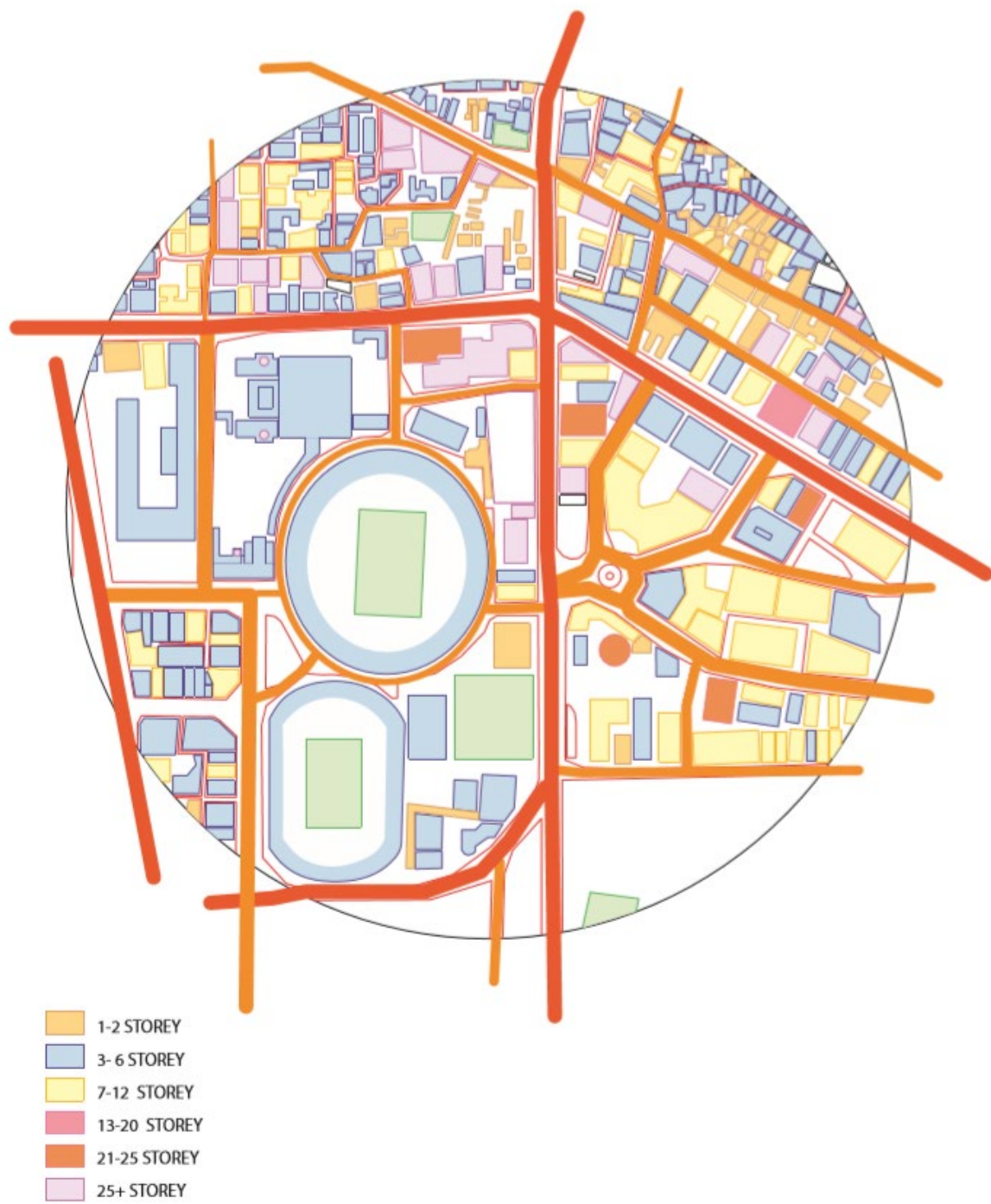


Figure 3. 7: Building height mapping

3.5 Accessibility and Connectivity

The site is surrounded by major roads of the city both from the north-south and also the east-west directions, mostly having a width of 90 feet to 60 feet. The D.I.T avenue road is the adjacent road to the site which connects the route from Fakirapul to Gulistan. The east-west connectivity is made through the Topkhana road which connects Paltan and Shapla chattar. Similarly, there are more roads which establishes the connection with kakrail, Highcourt and Bongobazar. These main roads provide separate pedestrian walkway along the vehicular routes. However, many organic roads are seen leading in various points of the area which are considered to be the minor roads having a width of at least 10 feet and in some cases till 30 feet too. Both pedestrian and vehicular movement is allowed in these minor roads.



Figure 3. 8: Connectivity mapping

3.6 Images of Existing Site Condition

The preliminary focus was to identify key points to effectively analyze the existing site condition. In regards to that, three key locations were identified from where the current condition of the site was clearly understandable.

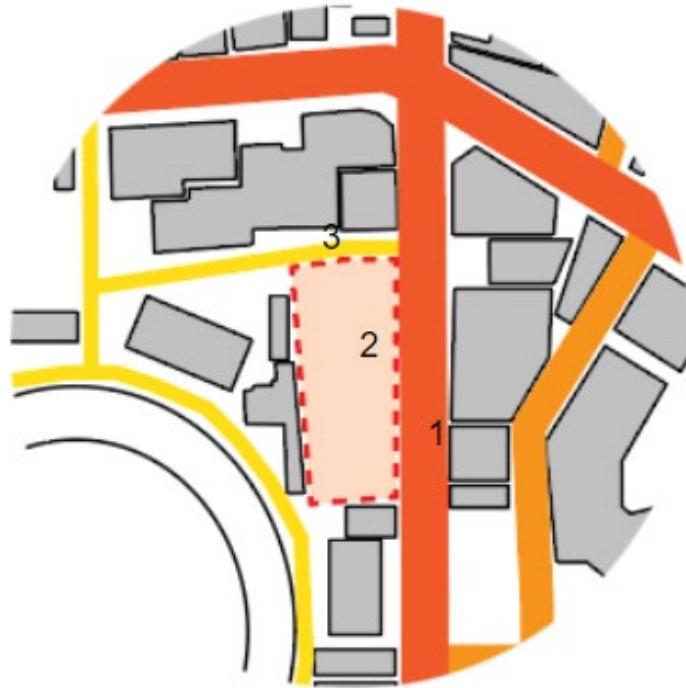


Figure 3. 9: Zoomed in site

Image 1: D.I.T avenue road, adjacent to the site; looking towards Doinik bangla node.

This image shows the existing state of the vehicular fabric in the adjacent road to the site which is also a primary road of more than 90 feet excluding the divider area where some plantation of trees can be seen. Different forms of vehicles both heavy and light have access to this road and an existing walkway connects the pedestrian connection all the way from north to south.



Figure 3. 10: Existing site image 1

Source: Physical site survey, February 2020

Image 2: Existing condition of the site area.

The existing condition in the site area itself shows how it's being used now. As the picture depicts, the site is being used as a parking spot for many vehicles of the Bangladesh Karmochary Kalyan Board. The picture also portrays the area to be a flat land having very less vegetation in it.



Figure 3. 11: existing site image 2

Source: Physical site survey, February 2020

Image 3: Presidential road towards Baitul Mukarram

Road allocated by the authority of the board is a tertiary road. The general purpose is to enhance permeability towards the eastern entrance of the Baitul Mukarram mosque for pedestrian which is currently absolutely unused and is a place of garbage disposal and roadside tongs.



Figure 3. 12: existing site image 3

Source: Physical site survey, February 2020

Chapter 4: Case Study Appraisal

The case study appraisal is an important segment as it becomes a criterion of how buildings have dealt with certain aspects such as climate, user behaviors, development of the form, typology of spaces and other planning and structural details.

4.1 Gandom Office Building

The Gandom office building has been selected to analyze and understand the form, functions and spatial arrangement of spaces within a compact site. Although the climate and context does not correspond with the existing climate and conditions of the “Bangladesh Karmochari Kalyan Board Bhaban, the Gandom office building establishes their own office headquarter also having a multi-functional cultural space so that the ground floor could be in a connection with the city.

Name of the Project: Gandom Office Building.

Architect: Olgooco Architects.

Location: Tehran, Iran.

Site area available for the Project Development: 1.94 acres. (Approx.)



Figure 4. 1: Gandom office building perspective view

Source: Archdaily

4.1.1 Environment and micro-climate

Tehran the capital of Iran has a diverse climatic condition mostly due to its geographical location. It has the Alborz Mountain to its north and the country's central desert to the south. It can be normally described as mild in spring and autumn, hot and dry in summer, and cold and wet in winter. Teheran experiences mild springs and autumns. Long, hot and dry summers and short but cold winters. Since there is some difference in altitude in the city you have different micro climates. The higher northern Tehran is cooler and has a more pleasant microclimate than the southern city parts which is very flat and warmer.

Summers are warm and hot with very little rainfall, a relative low humidity and with cool night temperatures. Light precipitation falls mainly between late autumn and mid spring, but none of

these months can be called wet. The average annual rainfall is not higher than 230 millimeters (9 inch). The average temperature in July is 30 degrees Celsius (86 ° Fahrenheit) in South Tehran and 25 ° Celsius (77 ° Fahrenheit) in the northern city parts, with some extremes of 40 ° Celsius (105°F).

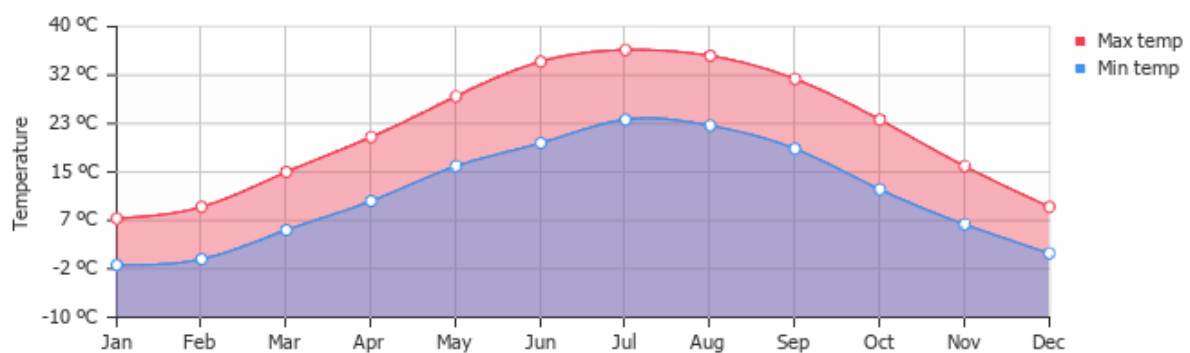


Figure 4. 2: Average min and max temperature of Tehran

Source: Weather and climate, 2019.

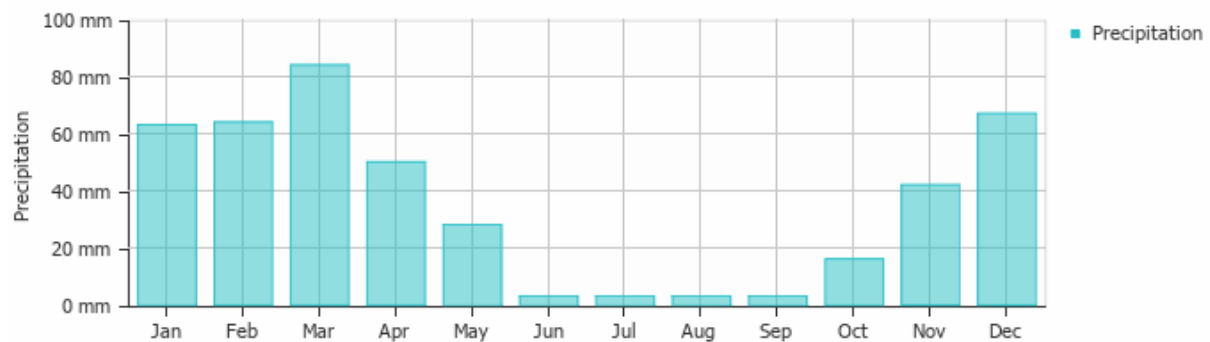


Figure 4. 3: Average precipitation (rain/snow) of Tehran

Source: Weather and climate, 2019.

4.1.2 User behavior and requirements

“Gandom”, is a pasta manufacturing company needed its own identity and an administrative office. Thus, the need established the purpose for the building emerged. The building was proposed to be exclusively for administrative purpose and the employees having a typical corporate work lifestyle. The planning of the new building consisted of some broad sections including management, offices of high-level managers, teamwork halls, and conference rooms which were placed on the floors from top to down. However, the ground floor has been dedicated to multi-purpose commercial use and a connection to the city.

4.1.3 Form and Function

Although the office building will address administrative employees, different from the employees directly working in the production factories the architect pursued a keen interest to understand the whole process going in the factories. It was a stupendous cycle of various activities driven by wheat. The movement of wheat in gigantic grain depots left a residue containing bran and wheat crumbs which were used as waste in the chipboard industry. Utilizing this remnant was heeded as a fundamental and symbolic bond between pasta manufacturing industry and the headquarter in the forming process of the project.

The site was linear in shape and small in size having less than 2 acres. The architect considered the sunlight to be a crucial factor for the office building as the satisfaction of the employees had to be prioritized above all.

4.1.4 Typology of spaces

There are a segregation of the public and private spaces in the building. This is crucial because of the fact that on the rush hours, the employees working on the building enters or evacuates the building in a very short period of time, thus the separation between the employees and the public becomes very important for a smooth circulation.

In order to create a sense of integrity among different users, the public space of each segment including the secretary, waiting, and the connecting corridor is linked to others. The private spaces were located around that open space. Therefore, the diagram of office spaces were transformed in a way that the sense of presence in a vast horizontal surface was merged with single management in a vertical order.

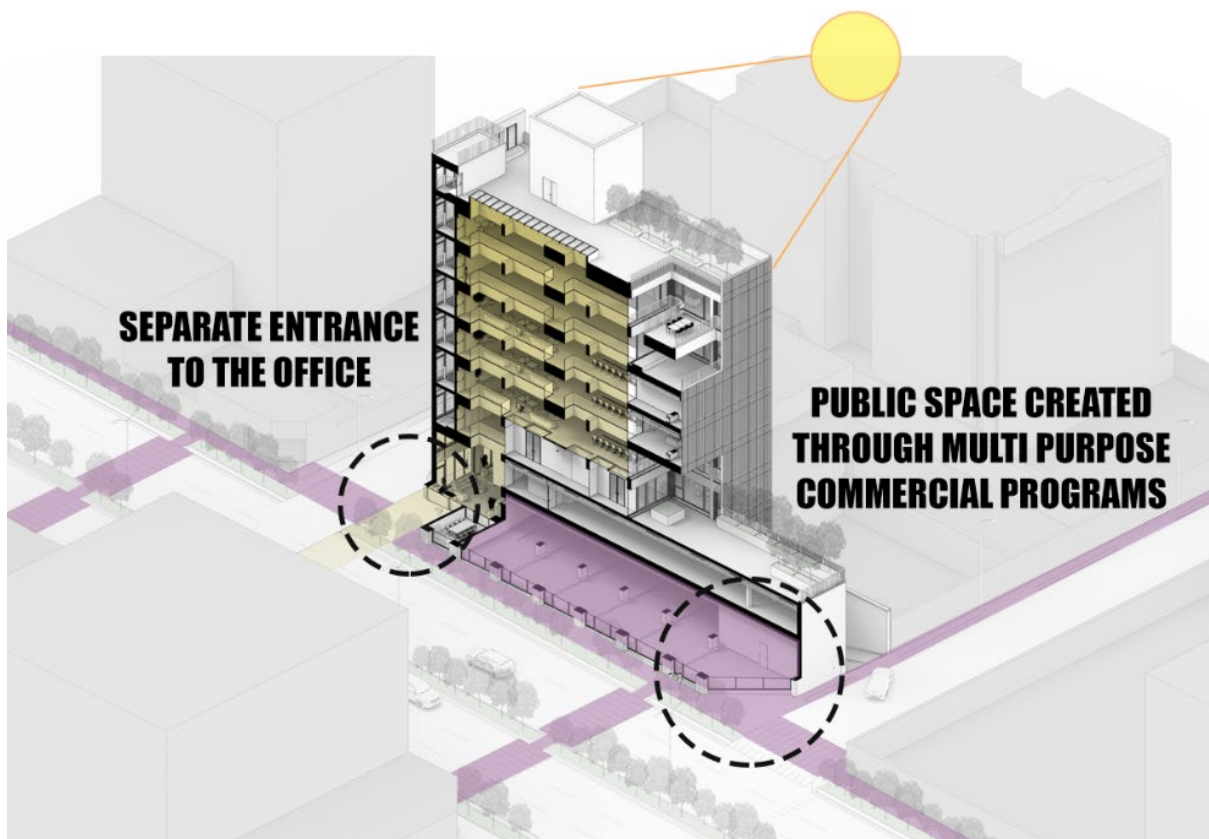


Figure 4. 4: Typology of spaces

4.1.5 Horizontal and vertical circulation

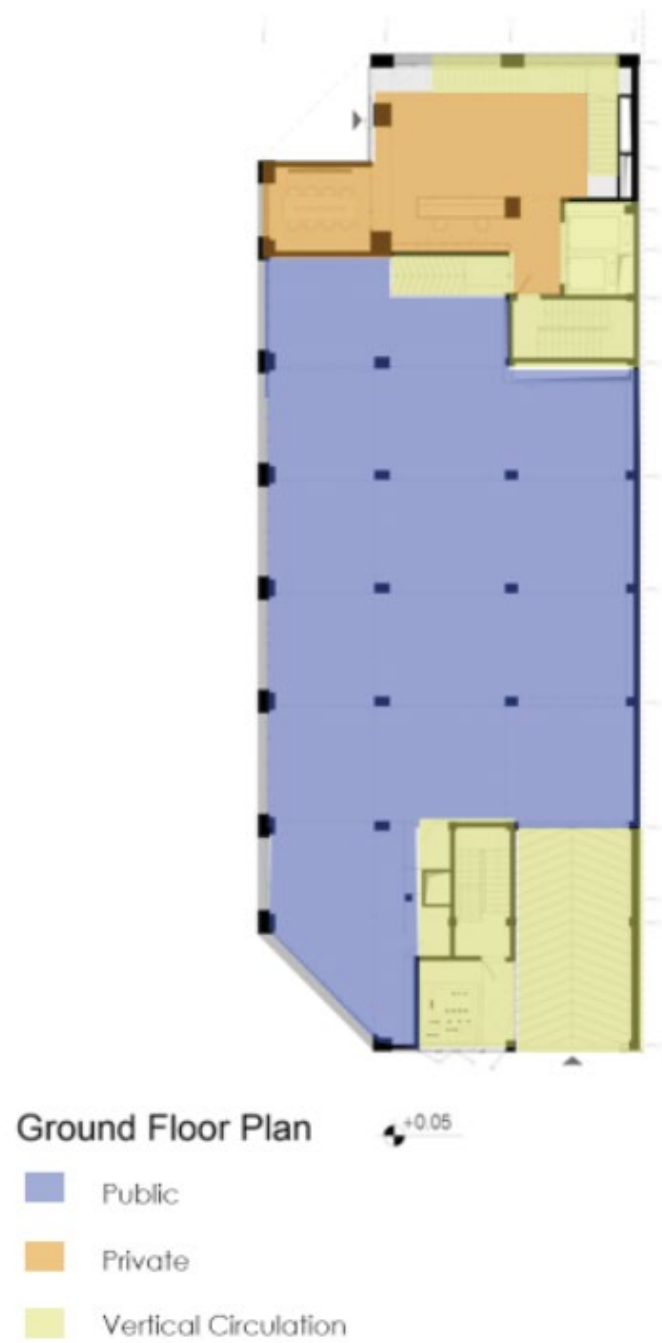


Figure 4. 5: Horizontal and vertical circulation 1



Figure 4. 6: Horizontal and vertical circulation 2

4.1.5 Site Planning and Landscape detailing

The landscaping has been thought in a way that it is coherent with the city as the ground floor is majorly a public space. Vertical green belts have been introduced as terrace spaces which creates a relief for the office users.



Figure 4. 7: Site planning and landscaping

4.1.6 Structural details

Based on new physical planning, the architect designed this building with steel structure was because of the internal longer spans needed to withstand its live and dead loads. Thus, it was also quick to install and complete the buildings. To control the sunlight in the southern and western faces of the building, a semitransparent shell was used on the main network in which there is a metaphor of wheat stalks on it in the form of ceramic printed glass.

4.2 Spire Edge office Building



Figure 4. 8: Spire Edge commercial building perspective

The 21 storey “Spire Edge” office tower, standing as an iconic landmark on a new IT park located in India, accommodates offices, auditorium, gallery and other facilities.

Name of the Project: Spire Edge commercial building.

Architect: T.R Hamzah & Yean Ssn Bhd.

Location: Manesar, India

Site area available for the Project Development: 1.8 acres. (Approx.)

4.2.1 Micro-climate and concept

The tower maintains a rich micro-climate as a result of its continuous green ecoinfrastructure covering the north façade, and running all throughout the commercial building through a series of ramps, terraces and gardens. The tower is also designed to work as a self-sufficient water reuse/recycling system. The rain water harvesting process along with water storage facilities at the basement ensures the building's sustainability over the use of water.

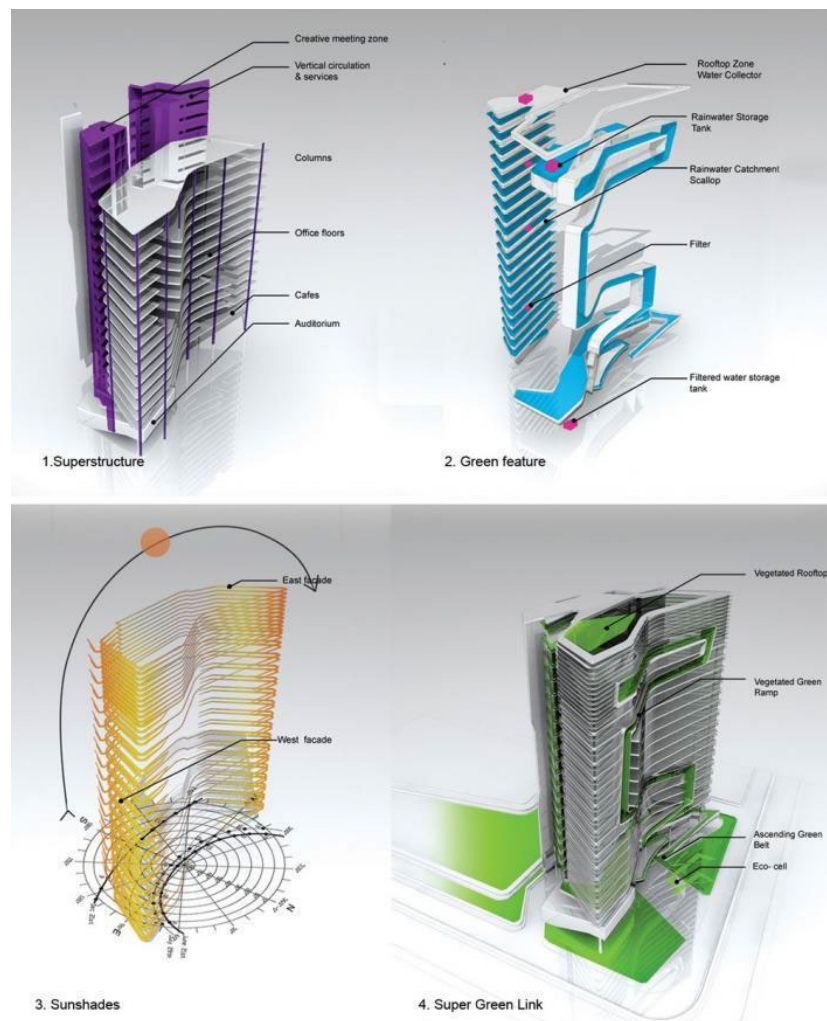


Figure 4. 9: Micro-climate and concept

4.2.2 User behavior and requirements

For the convenience of office user's creative and social interactions, the building is designed with multiple sky courts, ramps leading to creative meeting spaces and terraces, gardens supported by thermal buffer. These spaces allow the users to experience the views of the IT Park and enhance their work creativity.

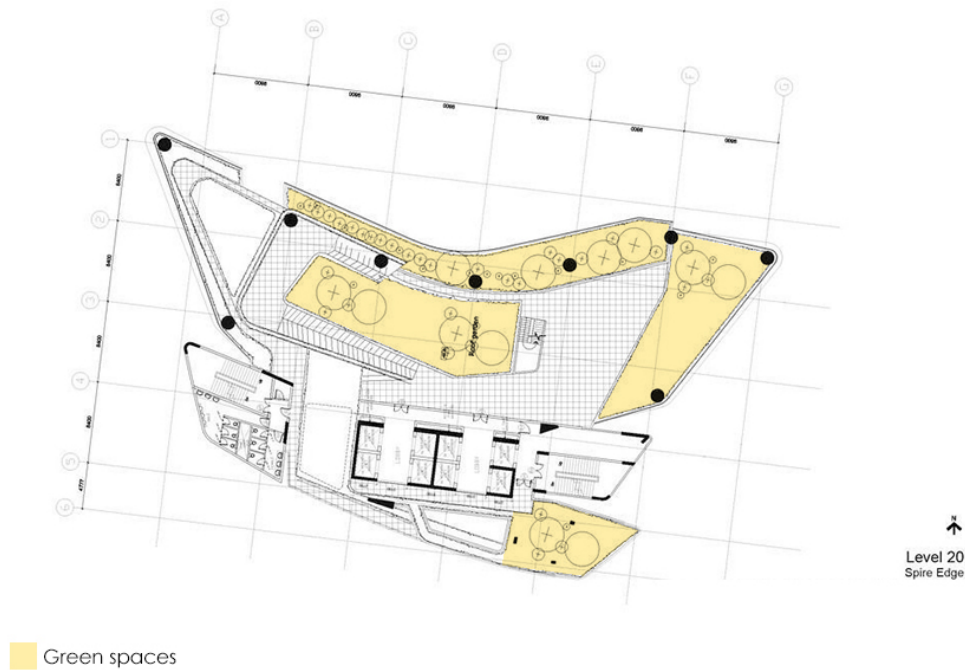


Figure 4. 10: User behavior and requirement

4.2.3 Form and Function

The project's climate-responsive façade design originated with the analysis of the local sun-path. Facade studies analyzing the solar-path determined the shape and depth of the sunshade louvers, which also double as light-shelves. The light shelves merge into single louvers at the north facade creating a slick look for the façade. In conjunction with the south spiral landscaped ramp, north green walls and ramps, and sky gardens, the sunshade louvers also assist in establishing comfortable micro-climates in habitable spaces along the building's exterior.

4.2.4 Horizontal and vertical circulation

The ramps making the south façade allows for a secondary vertical circulation while being an additional evacuation point.



Figure 4. 11: Horizontal and vertical circulation

4.2.5 Site Planning and Landscape detailing

The landscaping of the building is infused with its green facades. The vertical landscaping system consisting of green walls, green planter ramps and series of sky terraces begin from the ground level to the top roof garden.

4.2.6 Structural details

The internal typical office spaces have large span floor beams to eliminate any in-between columns. The floor configuration seeks to create a new form internal life for its users, with

occasional sky terraces linked to the eco-infrastructure, a rear ramp at the south face that has Creative Meeting Rooms.

4.2.7 Design details

The tower is designed as a self-sufficient water reuse/recycling system within the building. Both of the green ramps act as a water filter/collecting device to channel rainwater collected from the roof garden to the water tank located at the basement of the building, hence being recycled and reused by the users of the building.

Rainwater Harvesting/Recycling: The building's extensive landscaped areas are irrigated via a large-scale rainwater recycling system. Rainwater is collected from the perimeter landscaped ramps and roof garden. It is channeled and stored at the lowest basement level, beneath the Eco-cell, and reused as recycled water within the building.

Chapter 5: Program Appraisal

The “Bangladesh Karmochary Kalyan Board Bhaban” has proposed the initial list of programs. The programs have been cross checked through various standards and space requirements such as Time Saver Standards, Neufert Architects Data, Planning commission Building Standards under Ministry of Works, Bangladesh, and other and guidelines which led to a comprehensive analysis of these functional space allocations based on number of users or other units to benefit both the board and the community. The program list has been classified into four major categories which are described below. All the sft of the programs have been excluded from the circulation which will be added later on.

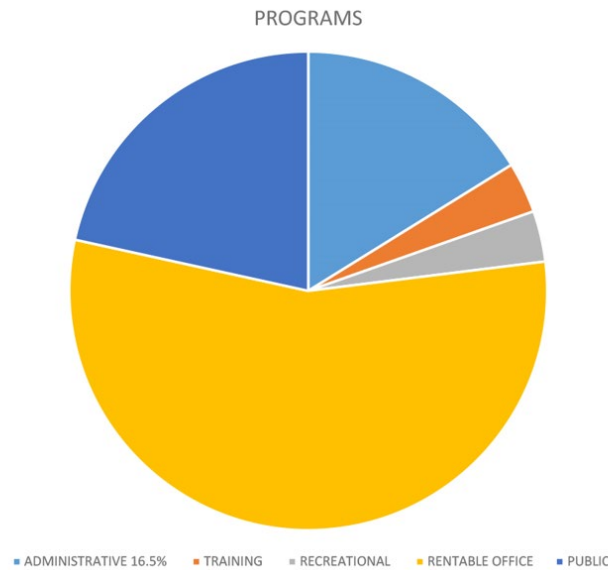


Figure 5. 1: Program division

- A. Administrative facilities.
- B. Training facilities.
- C. Public amenities
- D. Security and maintenance.
- E. Rentable office spaces.

5.1 Administrative facilities.

The administrative section has been formed by studying and analyzing the boards own organogram and the space standards are mostly derived from the Planning commission Building Standards under Ministry of Works Bangladesh, as it is a government office where government employees from different pay scale and circulars will be actively observing their duties as government officials. However, international guidelines and requirements and new workspace criteria's through different literatures and the ever-evolving efficient workspace design considerations have also been considered, which are referred in the literature review section.

Program for Bangladesh Karmochari Kalyan Board Bhaban								
	Functional space	Purpose	Users	Sub classification	Number of units	Number of users per unit	Area per person/unit (in sqft)	Total area (in sqft)
A1 Administrative facilities								
1	Reception and lobby	Main lobby and reception area for the employees.	All	N/A	1	300	8	2400
2	Single offices	Individual workspace for senior officials	Director General	Office room	1	1	325	325
				P.A room	1	1	100	100
			Directors	Waiting room	1	15	12	180
				Toilet	1	1	40	40
				Office rooms	3	1	160	480
				P.A room and waiting area	1	15	12	180
Toilet	3	1	30	90				
Subtotal of area =								3795
Circulation (30%) =								1139
Subtotal (nearest thousands) =								5,000
Possible floors =								0.6
3	General offices	Common work area for employees working in the similar division or group	Research and Development	Common office rooms	1	6	30	180
				Programmers office room	3	1	100	300
				Server room	1	N/A	400	400
			Administrative Division	Common office rooms	2	10	30	600
				Admin Officers room	4	1	100	400
			Curriculum Division	Common office rooms	2	10	30	600
				Division Head officer	1	1	100	100
			Welfare Division	Common office rooms	4	12	30	1440
				Welfare officers room	4	1	100	400
			Joint Insurance Division	Common office rooms	2	12	30	720
				Division Head officer	1	1	100	100
			Accounts (Board Fund Division)	Common office rooms	2	10	30	600
				Accounts officers room	2	1	100	200
			Accounts (Welfare Division)	Office rooms	2	10	30	600
				Storage area	1	N/A	100	100
			Accounts (Insurance Division)	Office rooms	2	10	30	600
				Office rooms	2	10	30	600
			Post and Distribution Division	Office rooms	2	10	30	600
				Storage area	1	N/A	100	100
			Women Development Board	Office rooms	2	10	30	600
				Common office rooms	1	8	30	240
			Maintenance Division	Maintenance officers room	4	1	100	400
				Office rooms	12	10	30	3600
Additional Divisions	Storage area	2	N/A	200	400			
	Subtotal of area =							
Circulation (30%) =								3984
Subtotal (nearest thousands) =								18,000
Possible floors =								2.3

Figure 5. 2:Administrative facilities

A necessary grouping between various Designations and their requirements regarding the lobby spaces have been grouped to ensure smooth flow of work and efficient space arrangement.

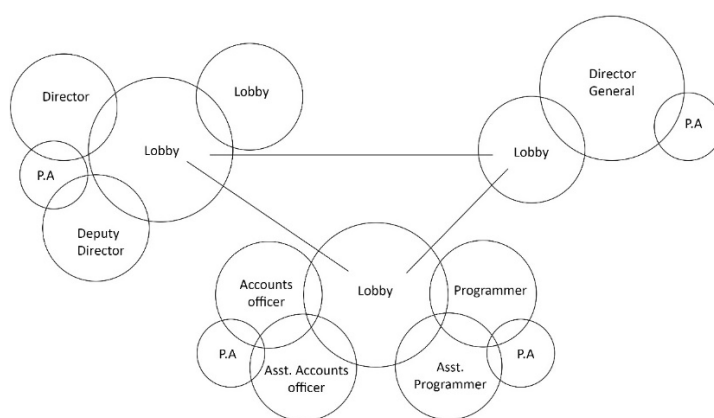


Figure 5. 3 : Office Grouping

A2 Supporting facilities for office								
1	Conference rooms	To arrange meetings and	N/A	N/A	4	35	30	4200
2	Archive room	Archiving documents, files and achievements for the last 20 years	N/A	N/A	1	N/A	1000	1000
3	Food corner/central lobby	Acting as a refreshing breakout space to get rid of monotony and a central lobby which will connect various supportive functions.	N/A	N/A	1	100	25	2500
4	Prayer rooms	To perform the daily prayers	Male	Praying area	1	60	16	960
				Ablution area	1	10	8	80
			Female	Praying area	1	40	16	640
				Ablution area	1	10	8	80
5	Toilets	N/A	Male	N/A	15	N/A	20	300
			Female	N/A	18	N/A	20	360
6	Staff Dining	To cater to the dining facilities for the staff working under the board.	N/A	Seating area	1	20	20	400
				Kitchen	1	5	40	200
7	Multipurpose Hall	To organize theatre, awareness and cultural programs	N/A	N/A	1	100	8	800
8	Storage	To store common documents and other necessities	N/A	N/A	2	N/A	200	400
Subtotal of area =								11520
Circulation (30%) =								3456
Subtotal (nearest thousands) =								15,000
Possible floors =								1.9

Figure 5. 4: Supporting facilities for office

5.2 Training facilities.

The training facility of this project occupies a very small portion of the total list. The Karmochary kalyan board not only works to facilitate and help the employees of the non-military employees but also the family members too. Thus, the board has previously started vocational training programs for women such as embroidery and cooking classes. The space requirement has been taken from the time saver standards along with other standards.

B. Training facilities								
1	Lobby/Reception	Main lobby for the training facility exclusively for women	N/A	N/A	1	30	8	240
2	Vocational training	Classrooms focused on practical training	Embroidery	Classrooms	2	20	20	800
				Storage	1	N/A	200	200
			Cooking/Baking	Classrooms	2	20	15	600
				Storage	1	N/A	200	200
			Handicraft	Classrooms	2	20	20	800
				Storage	1	N/A	200	200
3	General classrooms	Classrooms focused on conventional teaching method	General	Classrooms	4	25	8	800
			I.T Training	Classrooms	2	20	25	1000
4	Trainer's room	To facilitate the training employees	N/A	Trainer's lounge	1	10	30	300
				Pantry	1	N/A	100	100
				Meeting room	2	4	30	240
Subtotal of area =								5480
Circulation (30%) =								1644
Subtotal (nearest thousands) =								8,000
Possible floors =								0.8

Figure 5. 5: Training facilities

5.3 Recreational and semipublic facilities.

Some programs have been generated for the employees and the family members the employees of the building. These program addresses the recreational need of the users.

C. Recreational facilities for Employees								
1	Lobby	To cater the employees, exclusive to the recreational block	N/A	N/A	1	30	8	240
2	Library	Providing resources,information forpersonal development including recreation and leisure for the employees.	N/A	Study area	1	30	50	1500
				Librarins counter	2	1	100	200
				I.T and Browsing area	1	10	25	250
3	Indoor sports	Providing facilities for various indoor games for employees	N/A	Table tennis	1	N/A	750	750
				Carrom and Native games	1	N/A	750	750
				Lounge and info	1	N/A	250	250
				Storage	1	N/A	200	200
4	Gym	Providing health and fitness facility for employees	N/A	Fitness area	1	30	15	450
				Locker rooms	1	30	15	450
				Storage	1	N/A	200	200
				Lounge and info	1	10	12	120
Subtotal of area =								5360
Circulation (30%) =								1608
Subtotal (nearest thousands) =								8,000
Possible floors =								1.0

Figure 5. 6: Recreational facilities

5.4 Public amenities.

Although the board runs its activities in almost all over the country it fails to have its own its office building to run all the administrative works. As the population and economy is growing rapidly the board faces financial difficulties to support its activities solely on the fund. Thus, the office building is set to be built in such a way that it marks the identity of the board and creates revenue through various public facilities incorporated in the building to not only help the board and its economy, but it similarly aspires to enhance integration of the inhabitants of the community with the building as well. The programs of this section have been carefully prospected by analyzing case studies of similar buildings both local and international and more importantly the site and context, land use pattern and the economic characteristics of the surrounding community.

Since these programs and their approximate space allocations are proposed the study analysis and necessity had to be properly examined and well thought of. Hence, the following programs were generated through the careful study of context, site, demand and other necessary variables.

One general thing has to be understood before describing further into this section is the site area is 1.43 acres which is approximately 62380 sft. Since, the F.A.R is unrestricted and the M.G.C is 50%, the buildable area becomes approximately 31,190 sft. Another thing which is to be considered is the Bangladesh Karmochari Kalyan Board needs to sustain through the amount generated by this building by making it rentable and the board has also keenly ascribed this building to become an Iconic building, so to take these into consideration, new programs and their estimated space allocation has been carefully generated through context analysis and space study standards to reach its desired goal.

Although the site located at the heart of the CBD, on the northern side of Dilkusha is the Paltan where residential land-use character is seen. Basically, the context around the site shows a predominant number of departmental and retail shops and hawkers shopping area but lacks in super shop availability. Only two super shops are to be seen, one on the north at the Shegunbagicha and one on the south near Wari, which is not sufficient enough to cater for the inhabitants neighboring the site. Hence, a floor has been dedicated to facilitate the needs of the people.

D. Public Amenities								
1	Supershop Outlet	To sell essential products	N/A	N/A	1	N/A	20000	20000
2	Foodcourt and arcade	for food concession to cater both office employees and the public	Food court	Seating area	1	500	20	10000
			Arcade	N/A	1	N/A	2000	2000
			Stalls	N/A	20	200	N/A	4000
3	Rentable Auditorium	To rent the auditorium for various programs and events	Seating area	N/A	1	200	15	3000
			Break out space	N/A	1	N/A	1000	1000
			Reception Lobby	N/A	1	50	8	400
			Toilet	Male	1	N/A	300	300
				Female	1	N/A	300	300
5	Daycare center	To facilitate employees having children who needs to be taken care of during office period	N/A	N/A	1	50	30	1500
6	Fine dine rooftop restaurant	To stimulate as many senses as possible to create a unique, memorable experience in dining	Seating area	N/A	1	100	15	1500
			Kitchen	N/A	1	10	50	500
			Washroom	Male	7	1	20	140
				Female	5	1	20	100
			BBQ and Juice bar	N/A	1	30	10	300
			Infinity pool	N/A	1	N/A	1000	1000
			Changing room	Male	1	20	15	300
				Female	1	10	15	150
Subtotal of area =							42490	
Circulation (30%) =							12747	
Subtotal (nearest thousands) =							50,000	
Possible floors =							6.3	

Figure 5. 7: Public facilities

5.5 Security maintenance and parking facilities.

As the building is proposed to be an iconic commercial high-rise building, as a result the security and maintenance facility requires top notch priority. For the building to maintain its smooth workflow it has to be equipped with security and control rooms, each floor has one V.R.F room which eradicates the need for the chillers on the rooftop. There's also the electro mechanic facilities and other safety protocol rooms along with their supporting facilities. These rooms are the antibodies of the building from which the country would boosts its economy. The government has also highly emphasized on the importance of proper security and maintenance of such buildings especially after the horrific accidents in the recent past caused due to the lack of proper security and maintenance facilities. The space requirements have been carefully studied and analyzed through various standards, BNBC and other government codes.

E. Security and Maintenance								
1	Security and control	To achieve specific goals for building protection regarding security	Workstation room	N/A	1	N/A	500	500
			Changing room	male	2	1	30	60
				female	2	1	30	60
			Toilet	male	2	N/A	20	40
				female	2	N/A	20	40
			Storage	N/A	2	N/A	100	200
2	Electro mechanical service	To achieve specific goals for regarding electro mechanical aspects	Fire protection Equipment room	N/A	1	N/A	500	500
			Service and maintenance room	N/A	1	N/A	400	400
			Generator room	N/A	1	N/A	2000	2000
			Sub station power room	N/A	1	N/A	1500	1500
			Pump room	N/A	1	N/A	300	300
3	Parking facilities		Car/coversed van	N/A	200	N/A	100	20000
			Motorbike	N/A	100	N/A	24	2400
			Bycycle	N/A	50	N/A	20	1000
			Drivers lounge	N/A	1	N/A	500	500
			Toilet	Unisex	1	10	20	200
Subtotal of area =							29640	
Circulation (30%) =							8892	
Subtotal (nearest thousands) =							39,000	
Possible floors =							4.88	

Figure 5. 8: Security maintainance and parking

5.6 Rentable office spaces

One of the most important aspect of this building which has to be considered is the Bangladesh Karmochari Kalyan Board needs to sustain through the amount generated by this building by making it rentable. Therefore, a major segment of the buildings program is the rentable office spaces. As the flexibility plays a crucial role in order to make the building easy for renting and easy for the people who would possibly want to rent this spaces, it has to have the option of either renting the entire floor, combined floors or even just one wing of a floor.

E. Rentable space							
1	Offices	To cater the need and opportunity to rent office spaces	Office space	N/A	N/A	N/A	100000
Subtotal of area =							100000
Circulation (30%) =							30000
Subtotal (nearest thousands) =							130,000
Possible floors =							16

Figure 5. 9: Rentable office spaces

Chapter 6: Design Considerations

The design decision of the “Bangladesh Karmochary Kalyan Board Bhaban” has been taken from critically analyzing various key points from the “Literature review”, “Site appraisal “and Case study appraisal” chapters. It becomes a necessary tool to be taken as a guideline as what are the points that needs to be considered for designing this training academy. The broad points which were derived from the analysis of the above-mentioned chapters are depicted and described below.

6.1 Sustainable Building Design Approach.

The high-rise commercial building in the heart of the CBD aims to achieve a new platform by incorporating crucial aspects such as green building concept, climatic considerations, efficiency and effectiveness of the building. As the area is concentrated with flourishing commercial activities, only few sites still remain as unbuilt. This creates an opportunity to utilize this by designing an iconic green building and setting an example on how commercial buildings should be built.

The sustainability of the building basically implies not only to remove the negative environments of the place, but a smart design will establish the iconic feature and help create its own identity in the country. On the other hand, the city is facing its own environmental problems due to lack of green and excessive amount of air pollution. Hence, the opportunity to make this building a green building, climatic considerations having terrace and semi outdoor spaces with an adequate amount of greenery and vegetation will provide an excellent work and health environment for the users of the building.

6.2 Increasing the Marketability of the Building.

The “Bangladesh Karmochary Kalyan Board Bhaban” building consists of the boards own administrative body and the rest is ought to be rentable office space and other public amenities which will provide a permanent source of income for the board itself. Thus, enhancing public interaction with the building through different public amenities such as super shop, food court, rentable auditoriums, banks and other facilities have been generated through analyzing case study and context analysis. Similarly, there is also an adjacent road allocated exclusively for the pedestrians to enhance permeability to the famous “Baitul Mukarram” mosque which is currently unusable due to lack of public amenities and has become a garbage zone. The shops and other facilities will attract the public users and build up the reputation of the building and help eradicate this problem to use this as an opportunity to increase the marketability of the building.

Chapter 7: Design Suggestions

The chapter basically deals with the gradual development of the design process to the finished design outcome. The broad topics which will be discussed in this segment consists of the Design concept and form generation, Floor plans, section elevations and rendered images.

7.1 Design concept and Form generation

The design concept of the project has been developed from the analysis of the site and its context. By carefully analyzing the data gathered from the site appraisal segment, the analysis was done in order to logically establish key design criteria's and a broad picture of how the project is going to take shape.

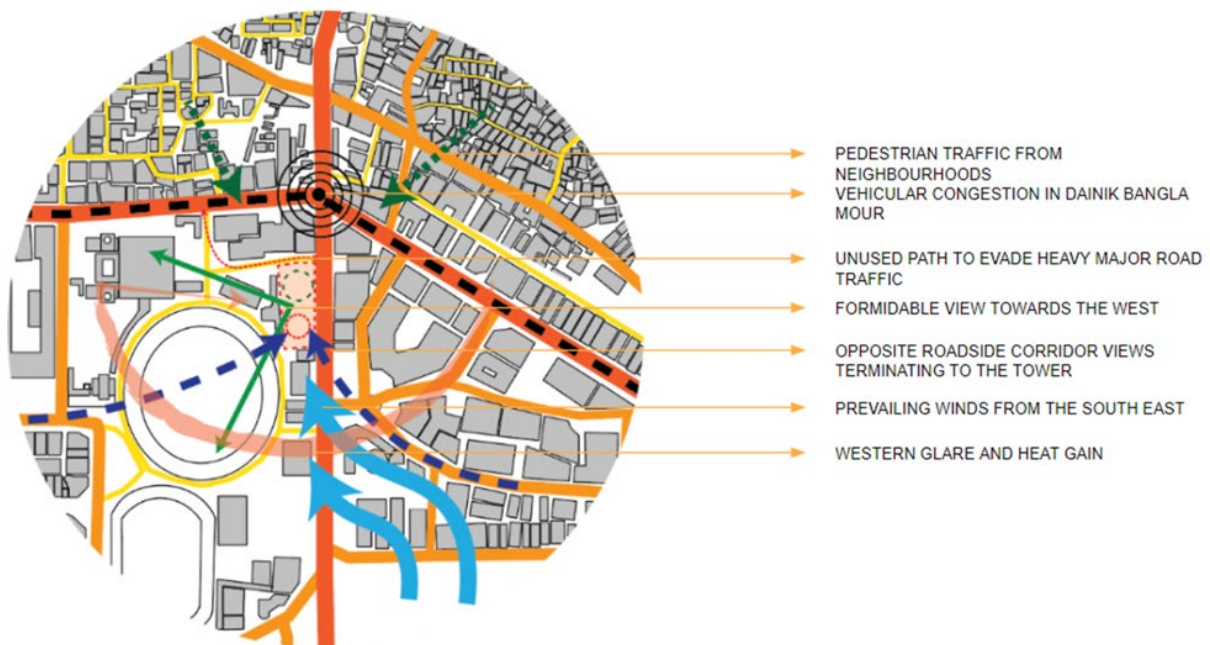


Figure 7. 1: Site analysis

As we carefully analyze the context of the site we can see that, a decent amount of pedestrian movement is visible. However the maximum amount of vehicular congestion and noise is also generated due to heavy traffic in the Dainik Bangla Node. The presidential road which is currently unusable is identified as an opportunity to bypass this traffic for enhancing ease of movement for the pedestrians. As the Baitul Mukarram and the Bangabandhu stadium is situate at the west, it offers formidable views and both the west and the east side has terminating roads which creates a visual termination of the building. Hence, the northern side of the site has been considered to be opened up creating a space for a public realm and the southern side for the tower. Following up with the site being north south elongated and views to the west, it became a challenge to make the building energy efficient by reducing the western heat gain whilst maintaining the views to the users. As a result a protective screen was introduced to reduce the heat gain and also ensuring proper indoor workable environments for the users of the building.

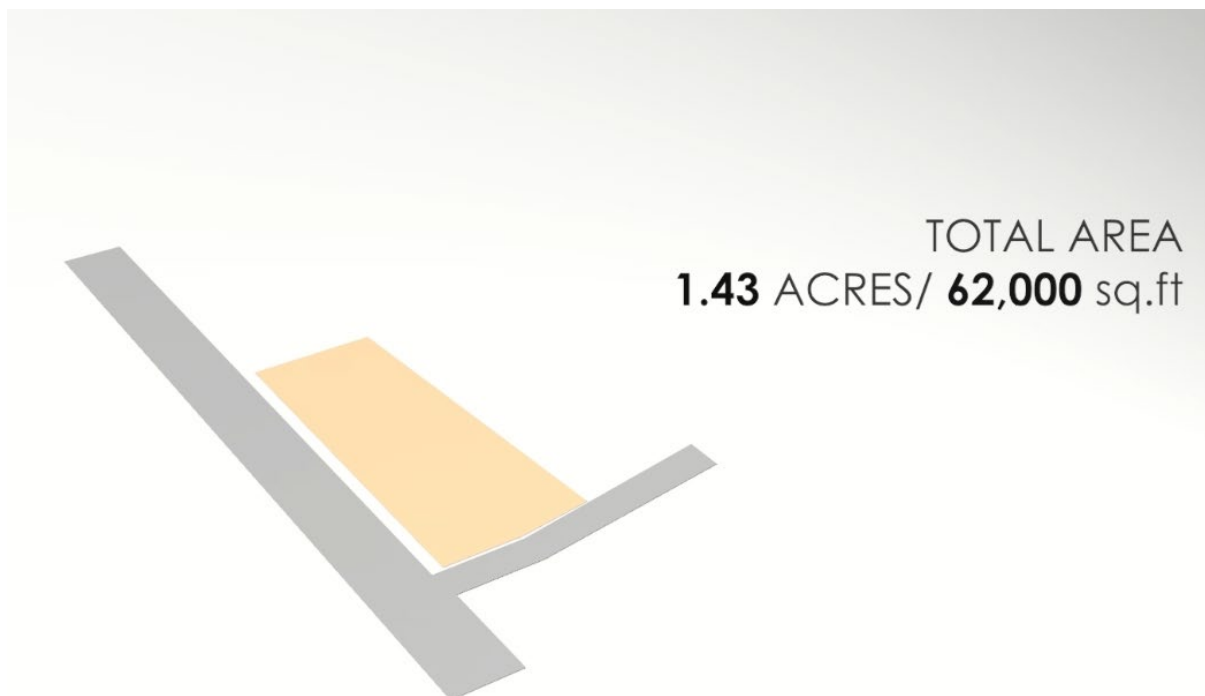


Figure 7. 2: Concept and form generation 1

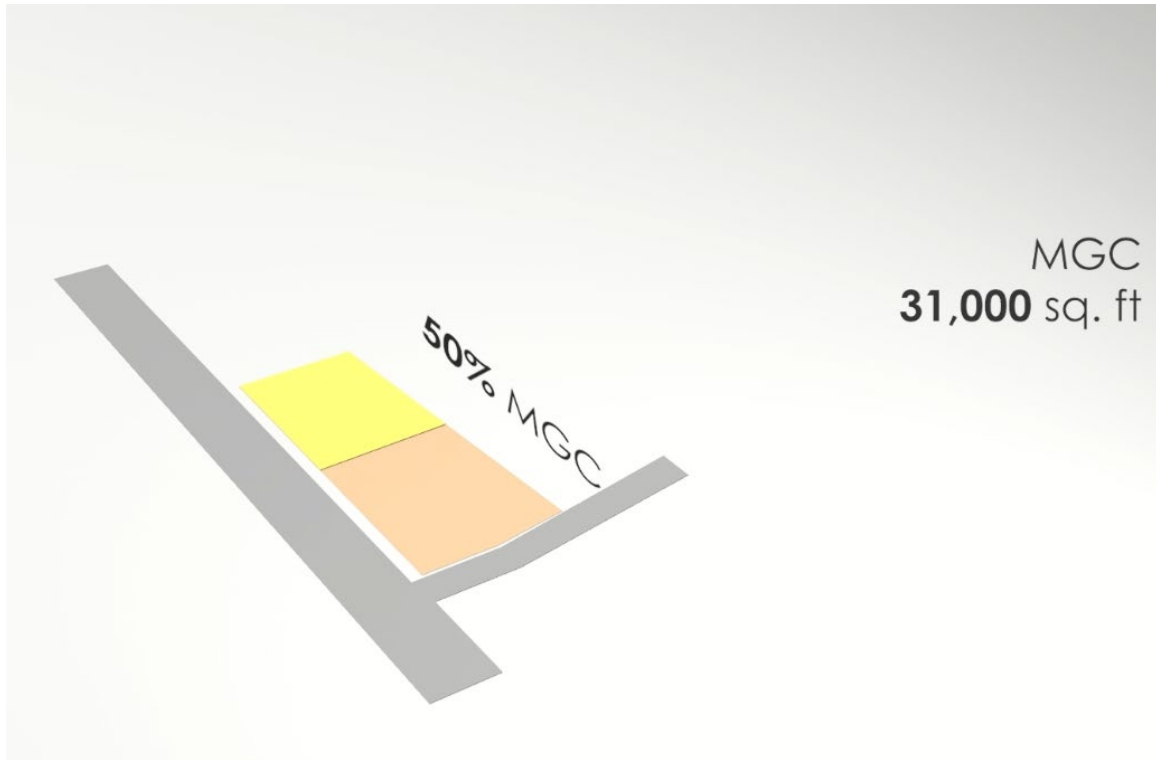


Figure 7. 3: Concept and form generation 2

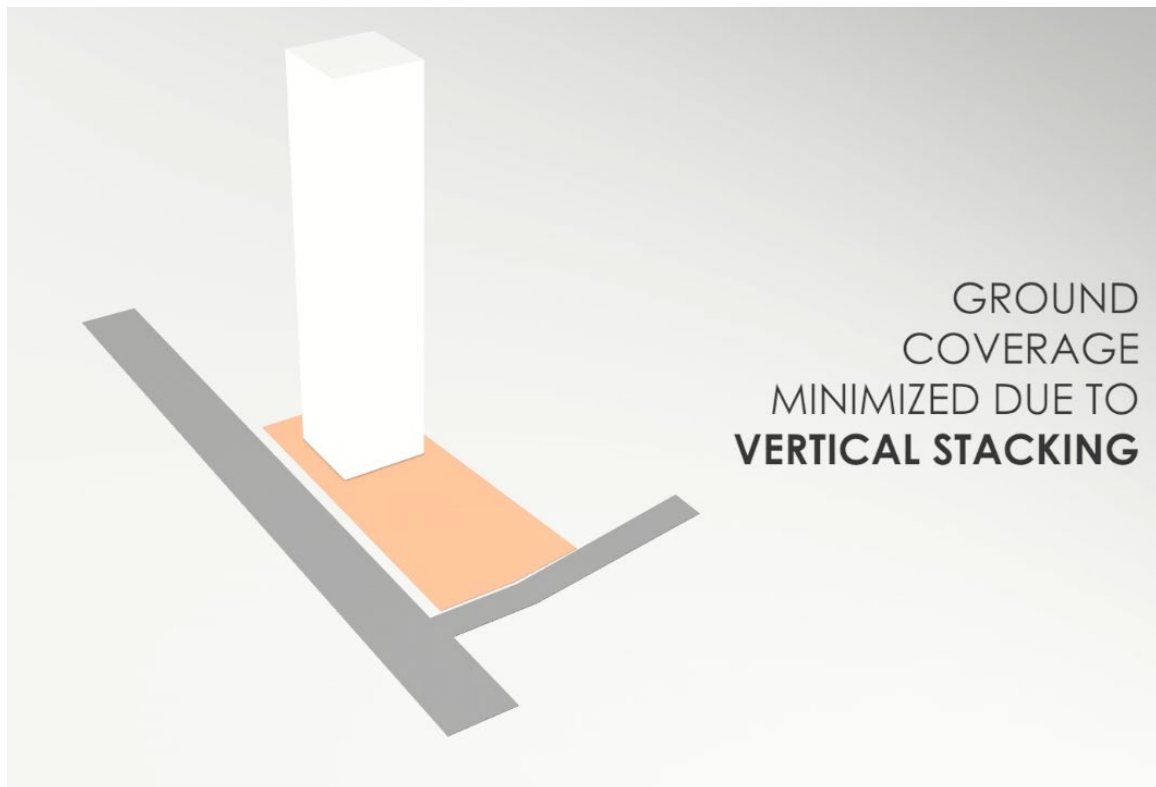


Figure 7. 4: Concept and form generation 3

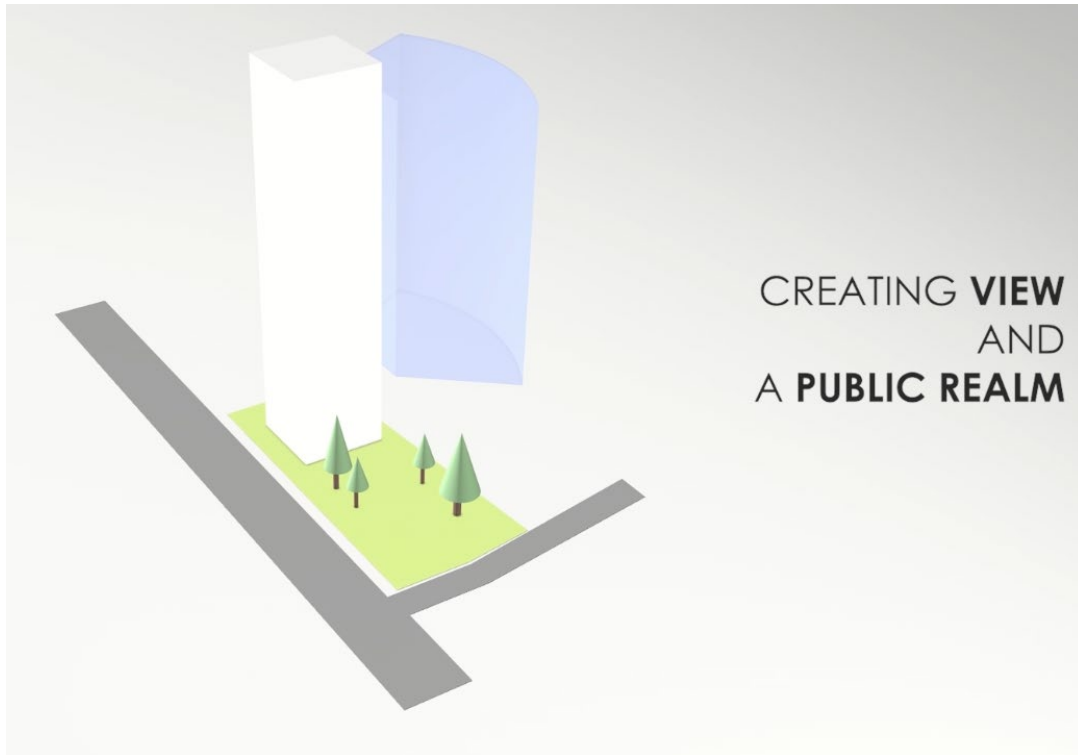


Figure 7. 5: Concept and form generation 4



Figure 7. 6: Concept and form generation 5

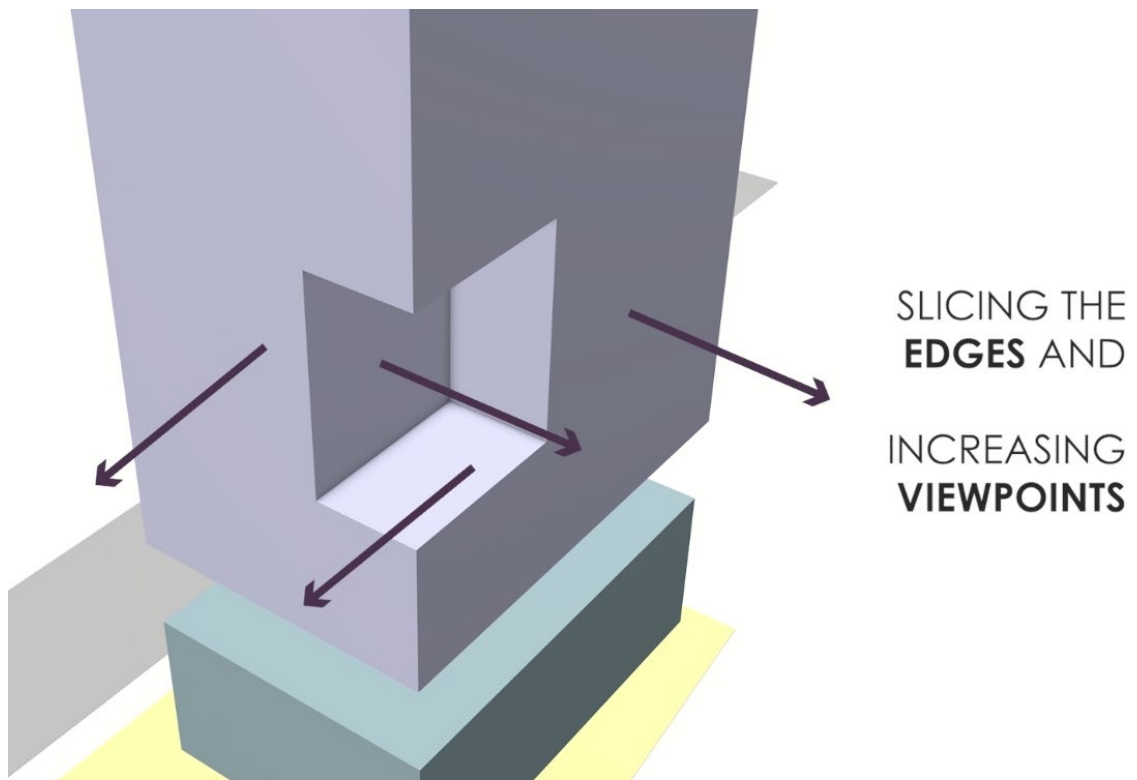


Figure 7. 7: Concept and form generation 6



Figure 7. 8: Concept and form generation 7



Figure 7. 9: Concept and form generation 8

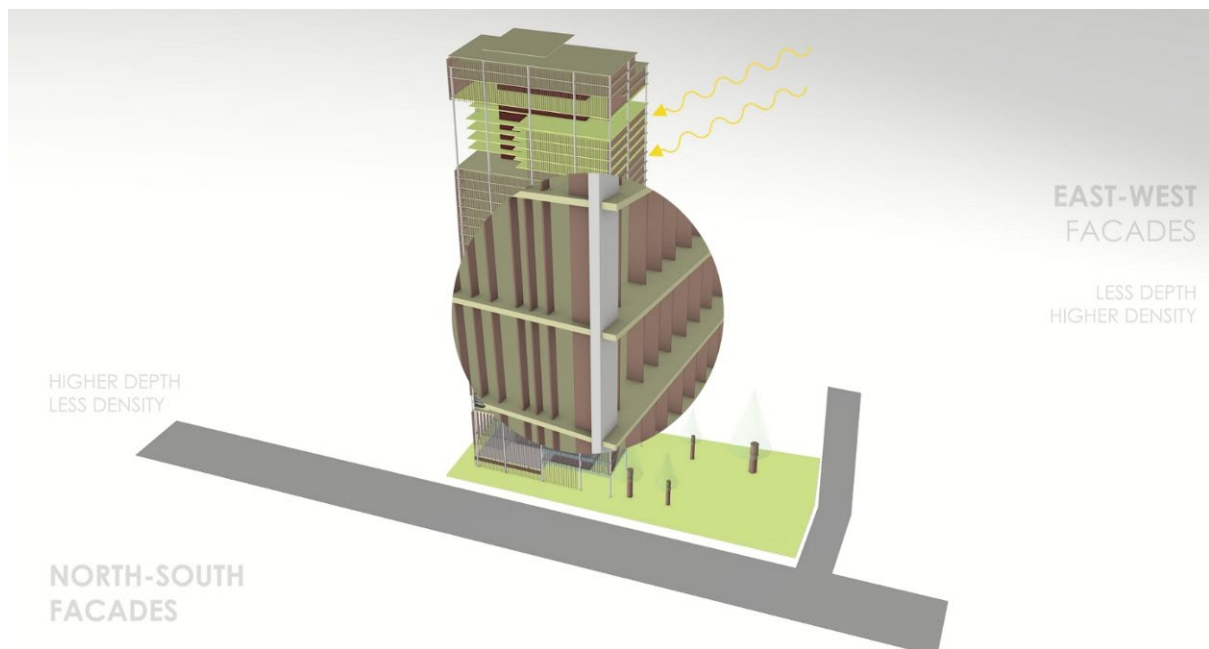


Figure 7. 10: Concept and form generation 9

7.2 Floor Plans

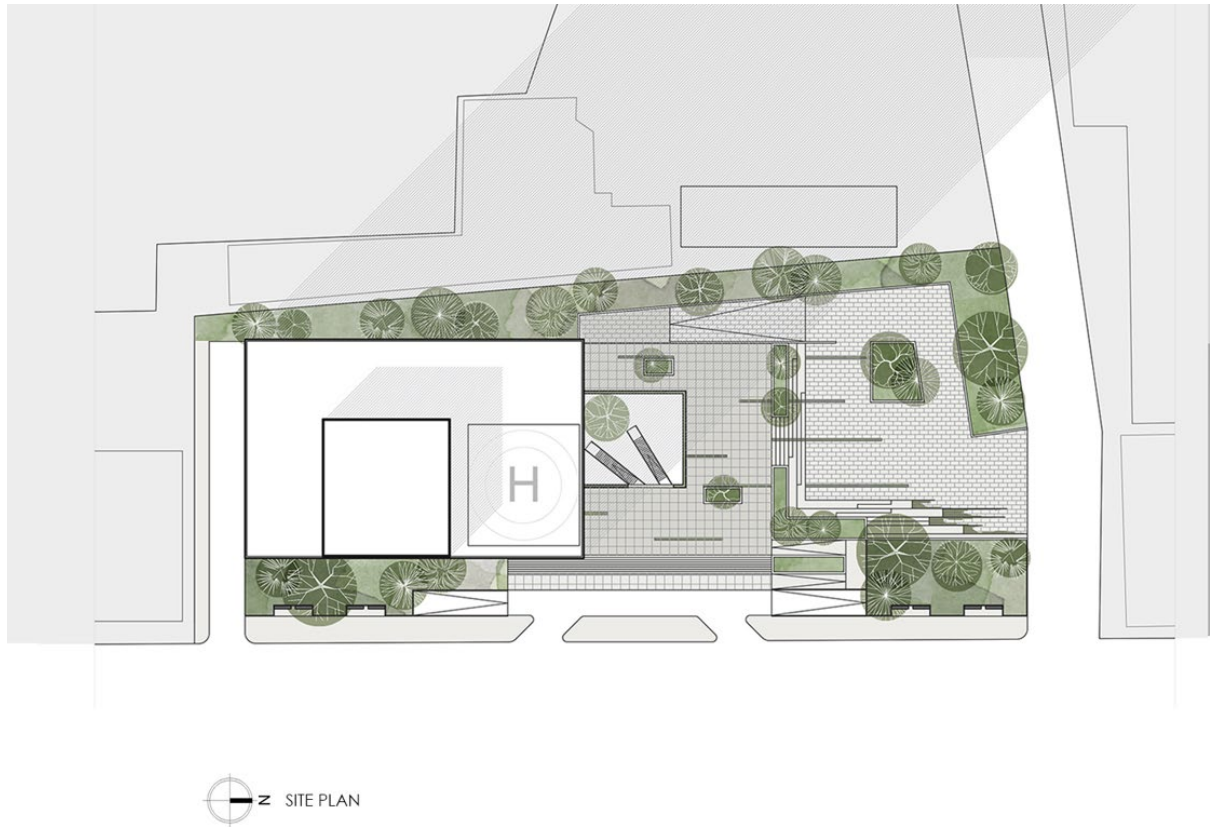


Figure 7. 11: Site plan

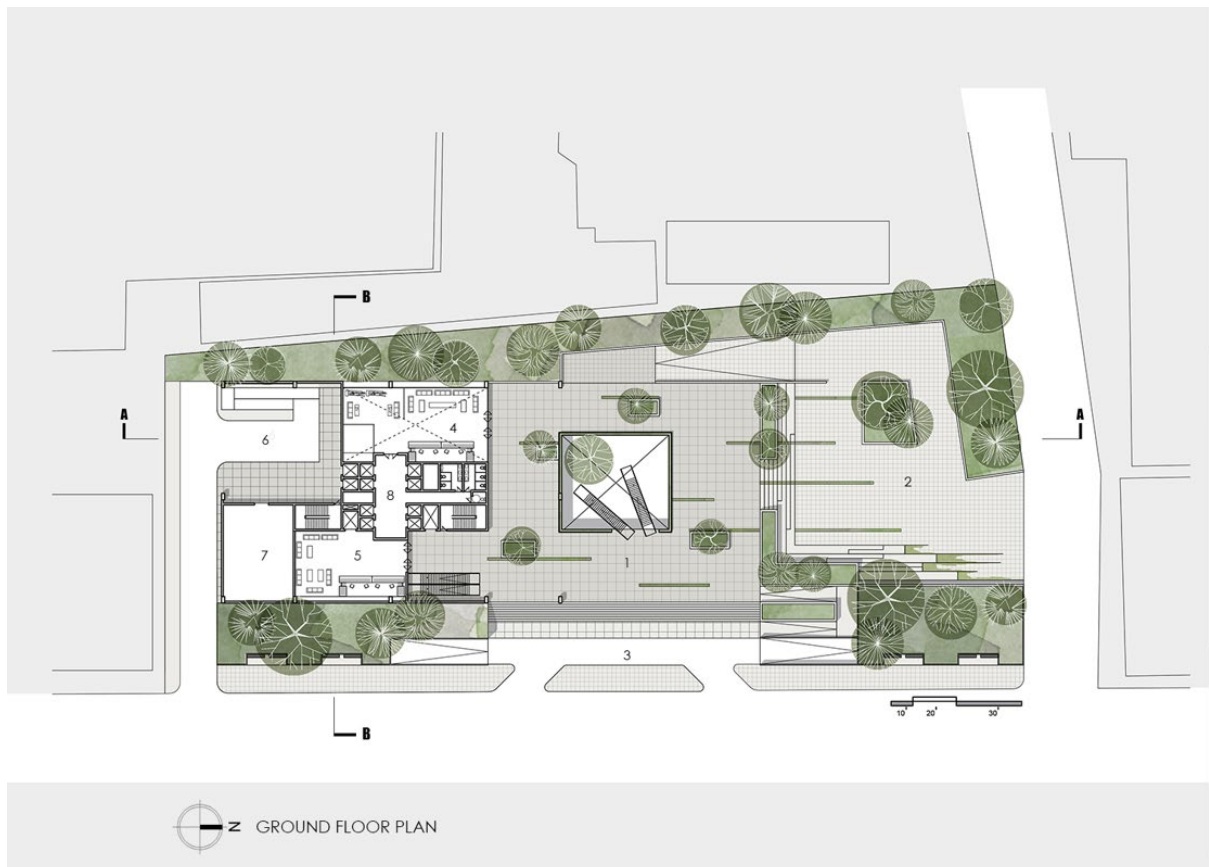


Figure 7. 12: Ground floor plan

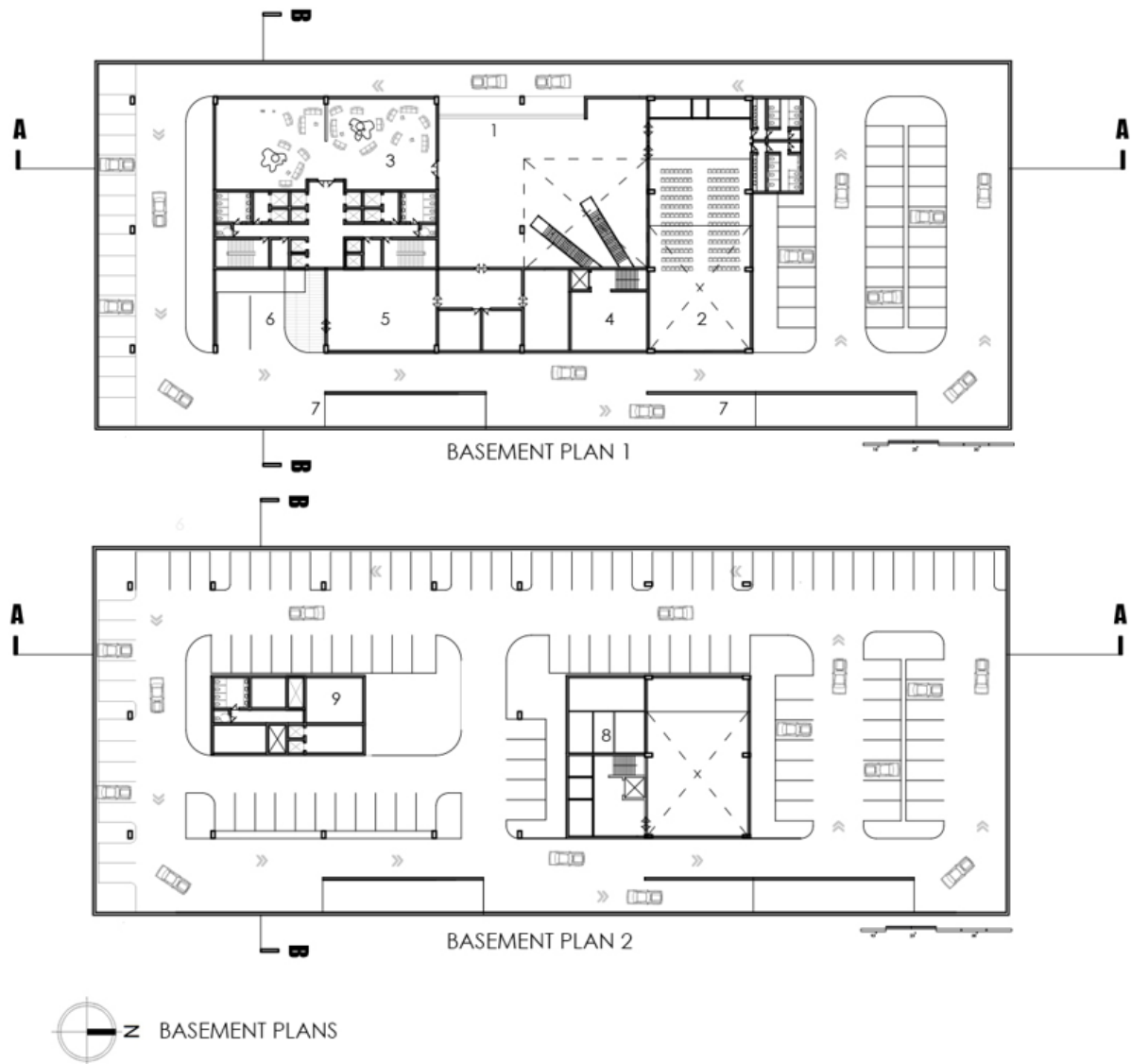
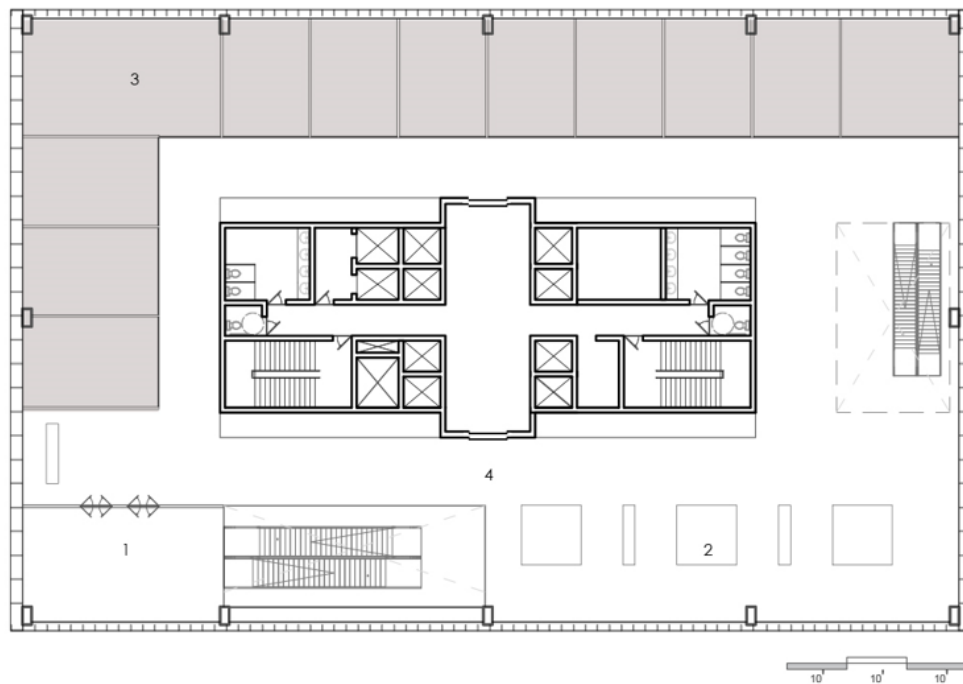


Figure 7. 13: Basement plans



 SHOPPING FLOOR PLAN

Figure 7. 14: Shopping floor plan

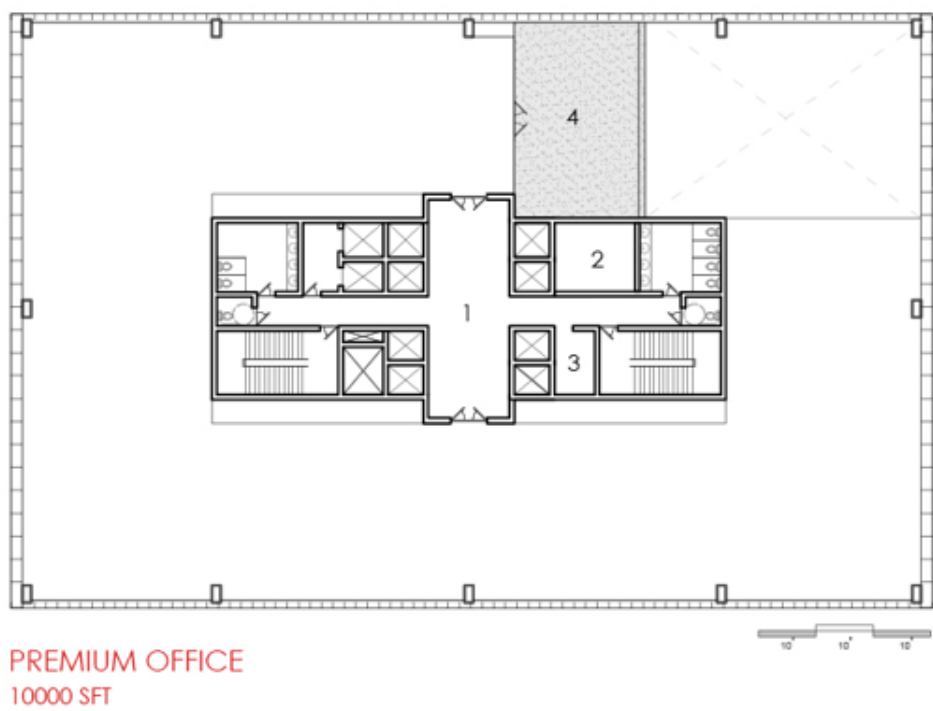
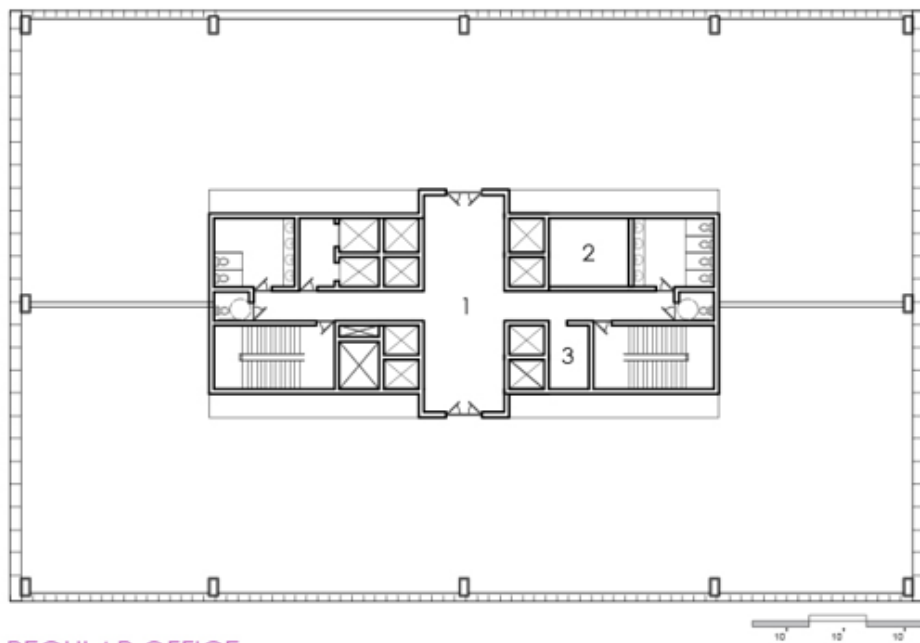
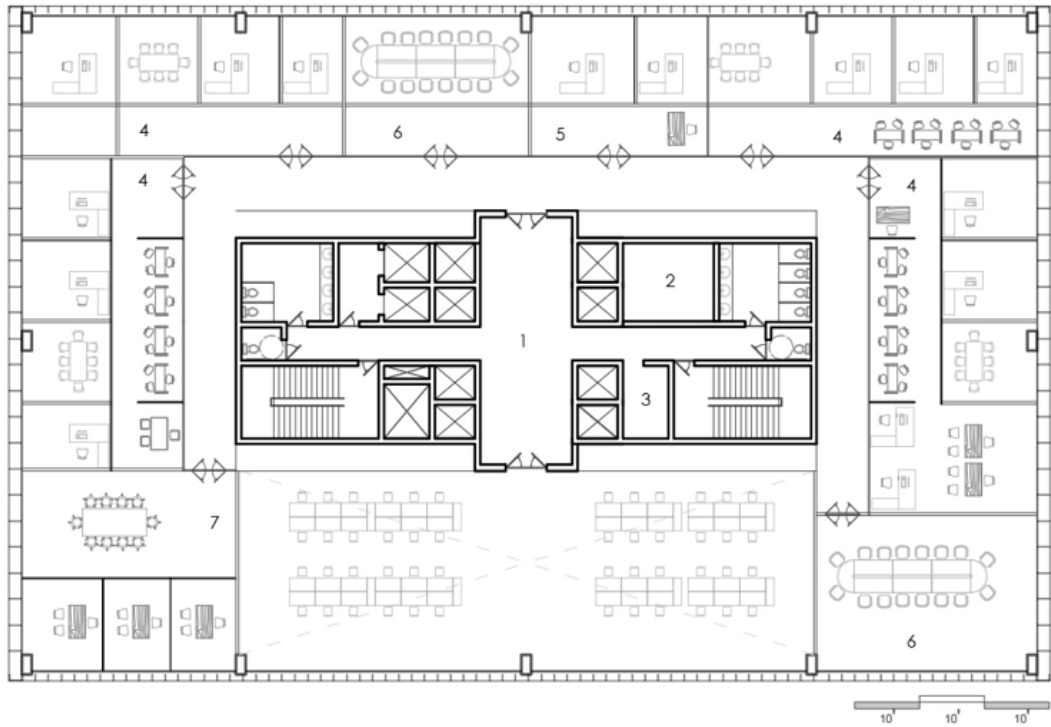


Figure 7. 15: Typical office 1



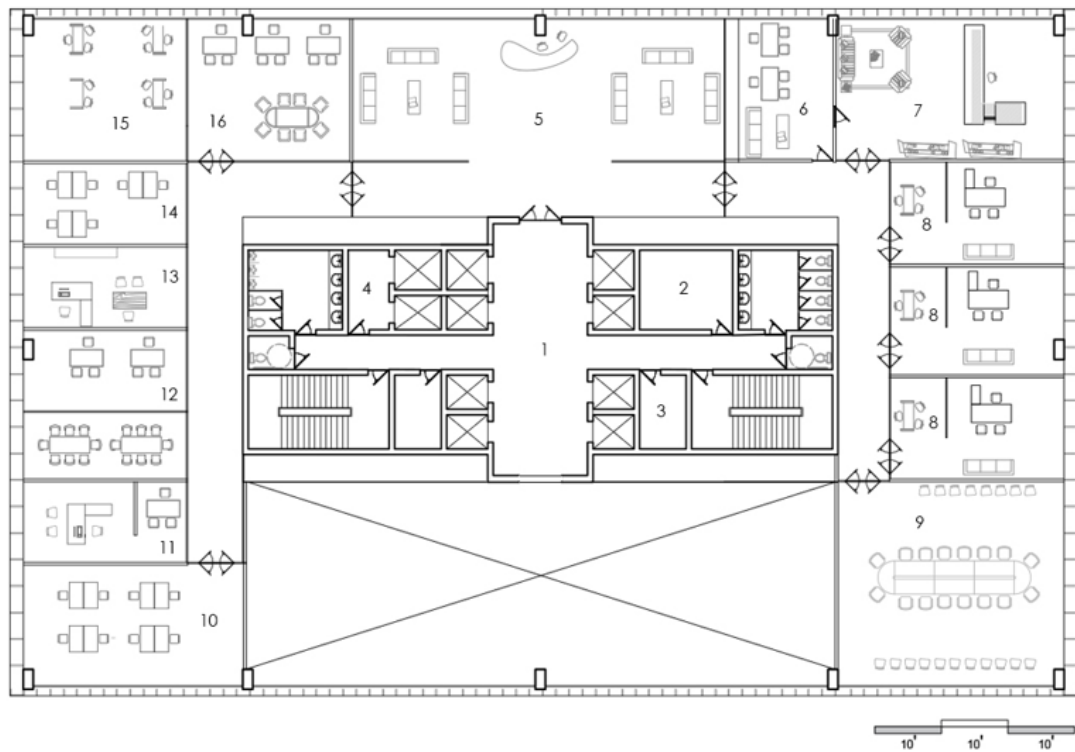
REGULAR OFFICE
13000 SFT
CAN BE DIVIDED INTO TWO WINGS (6500 SFT PER WIN)

Figure 7. 16: Typical office 2



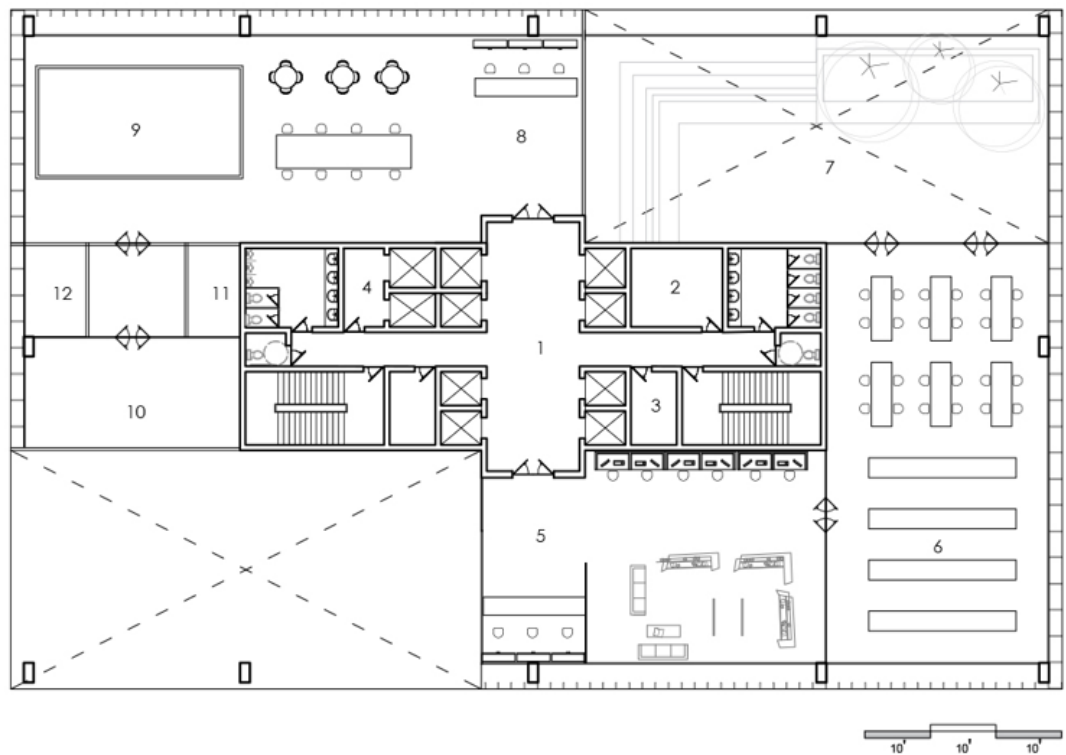
 **Z** OFFICE FLOOR PLAN

Figure 7. 17: Office floor plan 1



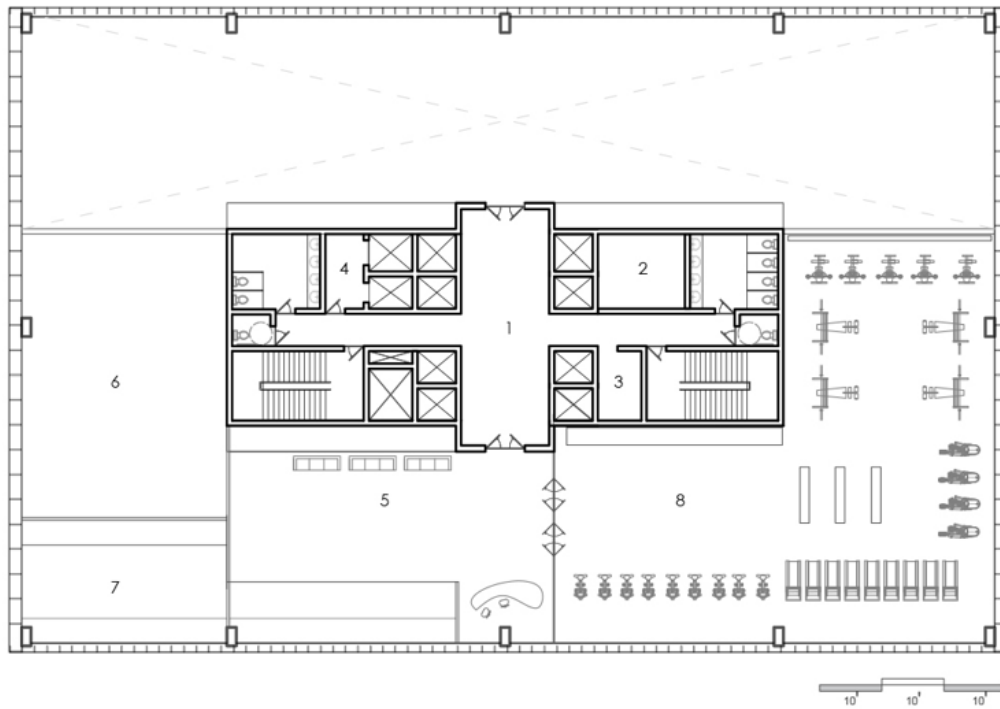

 OFFICE FLOOR PLAN

Figure 7. 18: Office floor plan 2



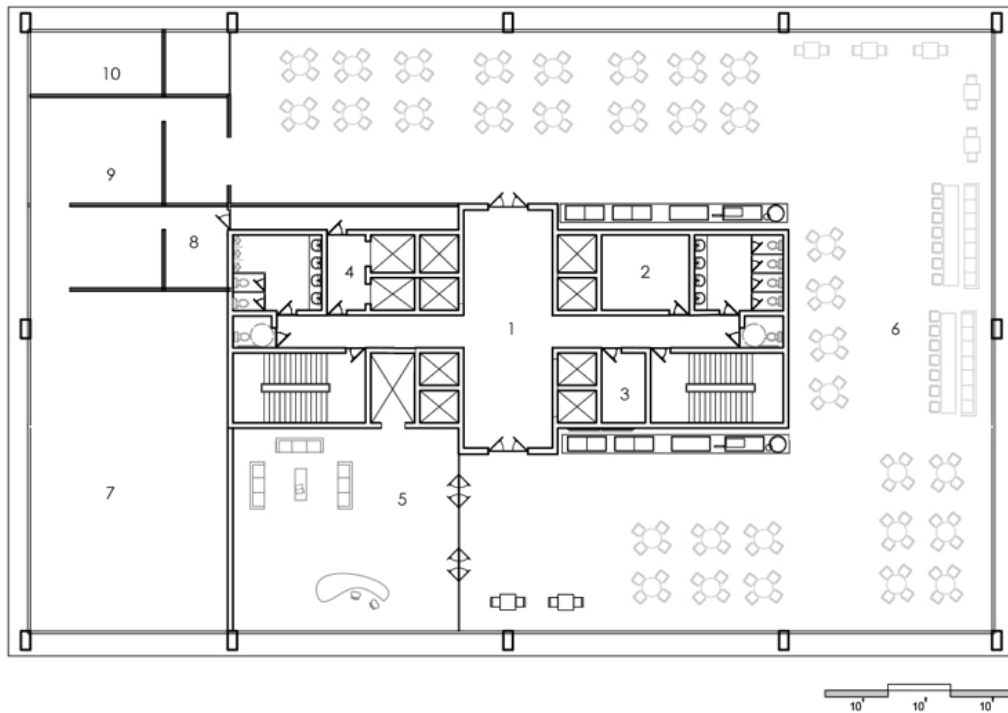
 DAY CARE AND LIBRARY PLAN

Figure 7. 19: Day care and Library plan



 **Z** GYM FLOOR PLAN

Figure 7. 20: Gym floor plan




 Z FINE DINE PLAN

Figure 7. 21: Fine dine floor plan

7.3 Sections and Elevations and Rendered Image

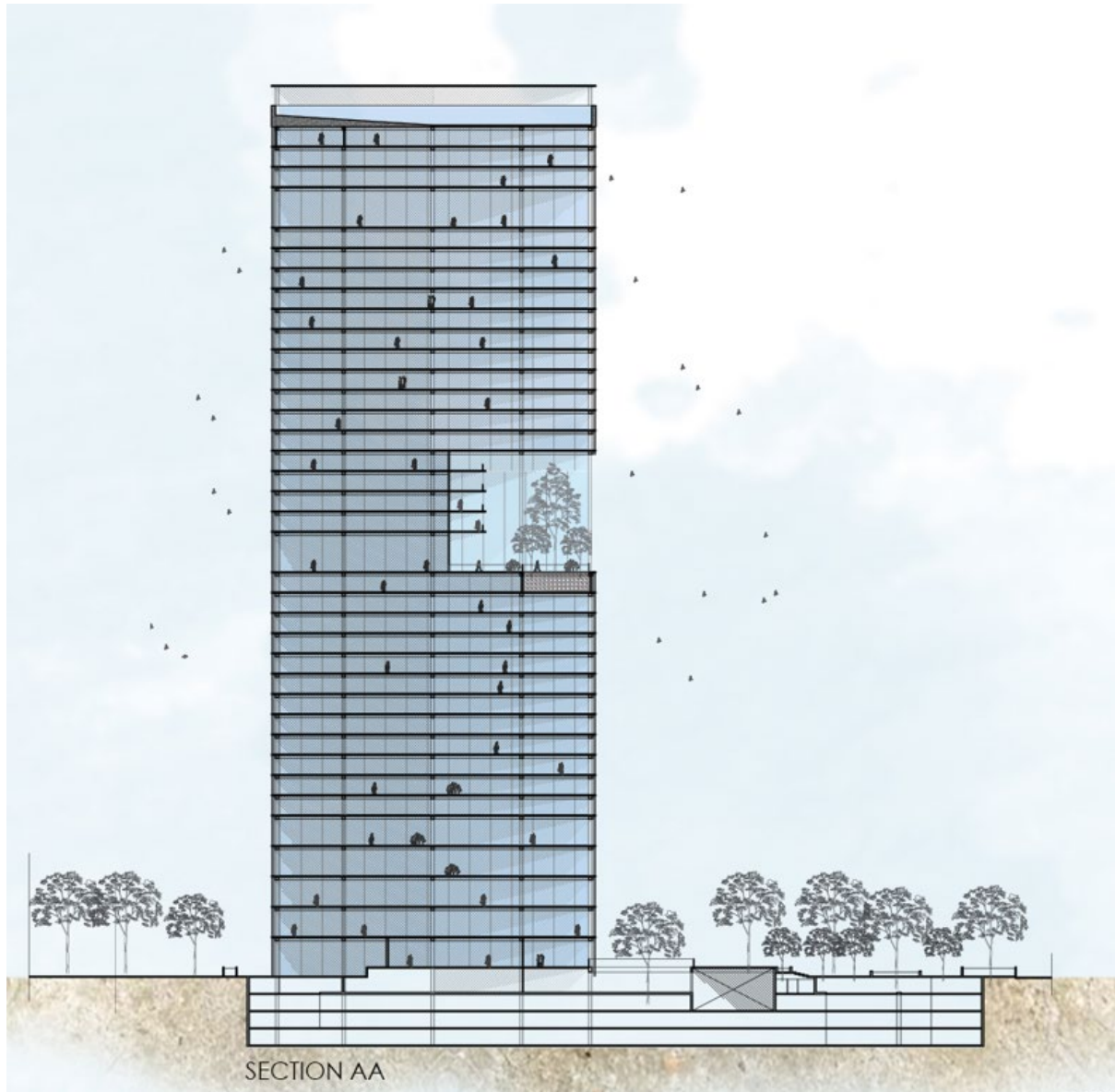


Figure 7. 22: Section AA



Figure 7. 23: Section BB

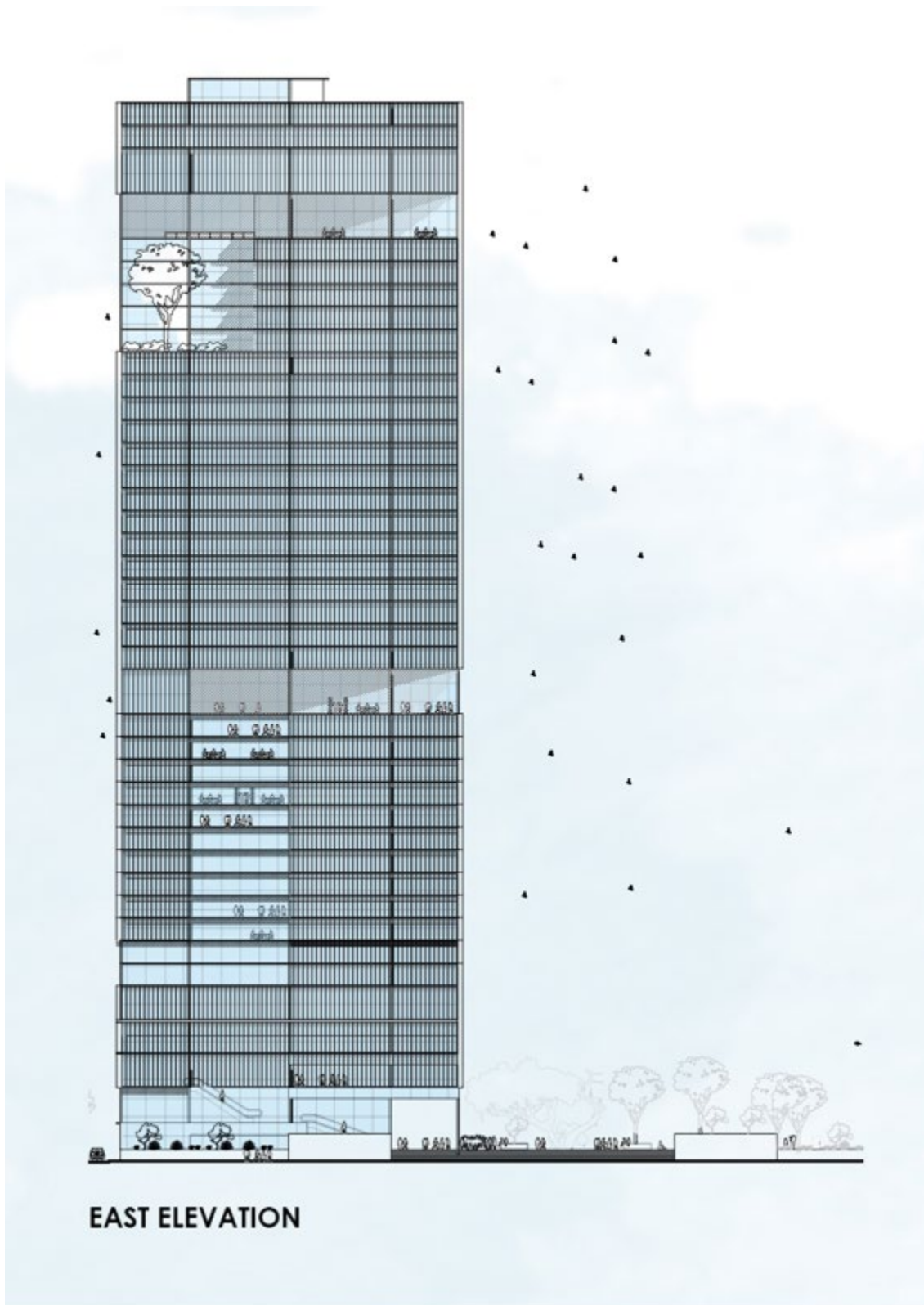


Figure 7. 24: East elevation

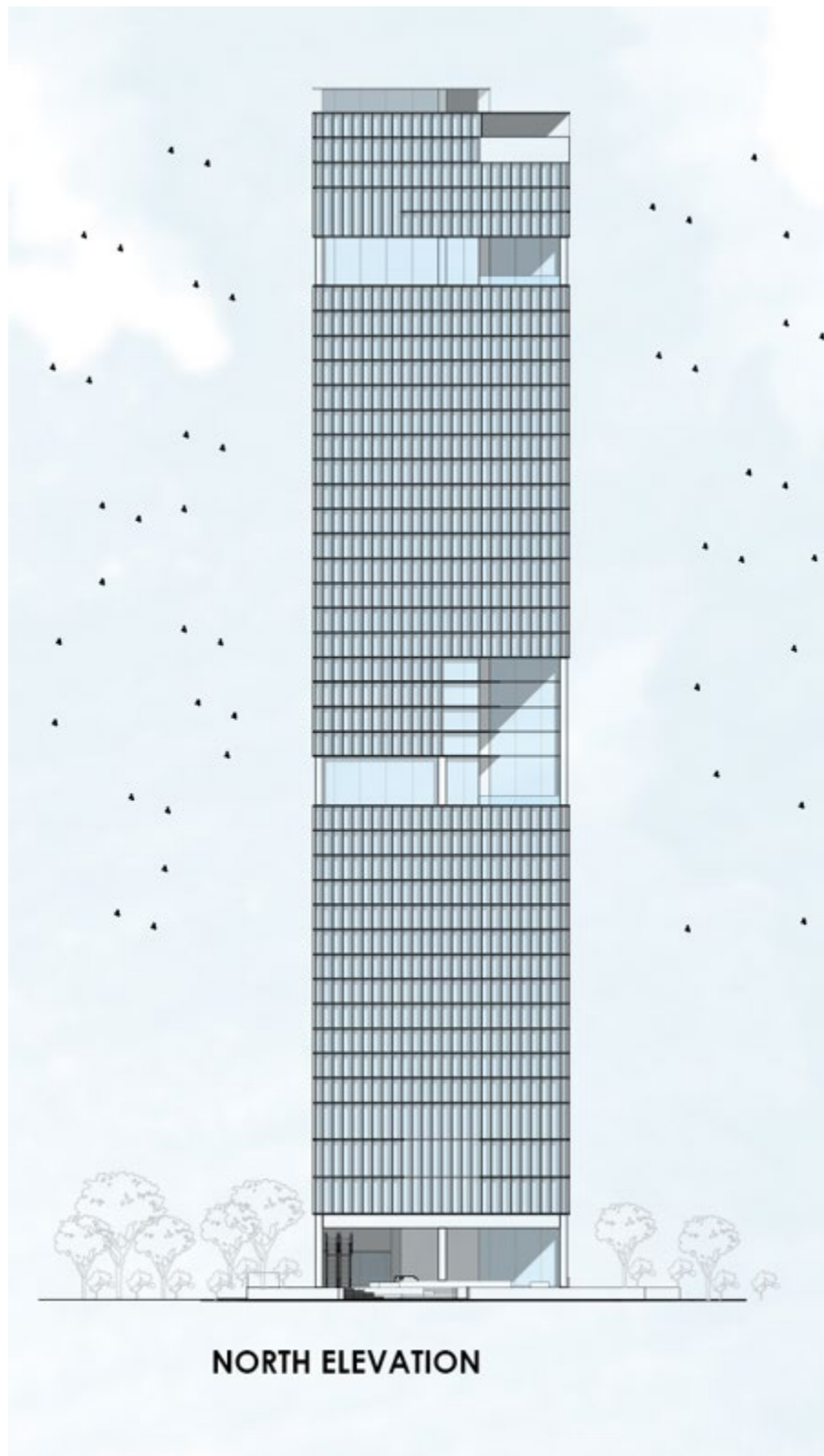


Figure 7. 25: North elevation

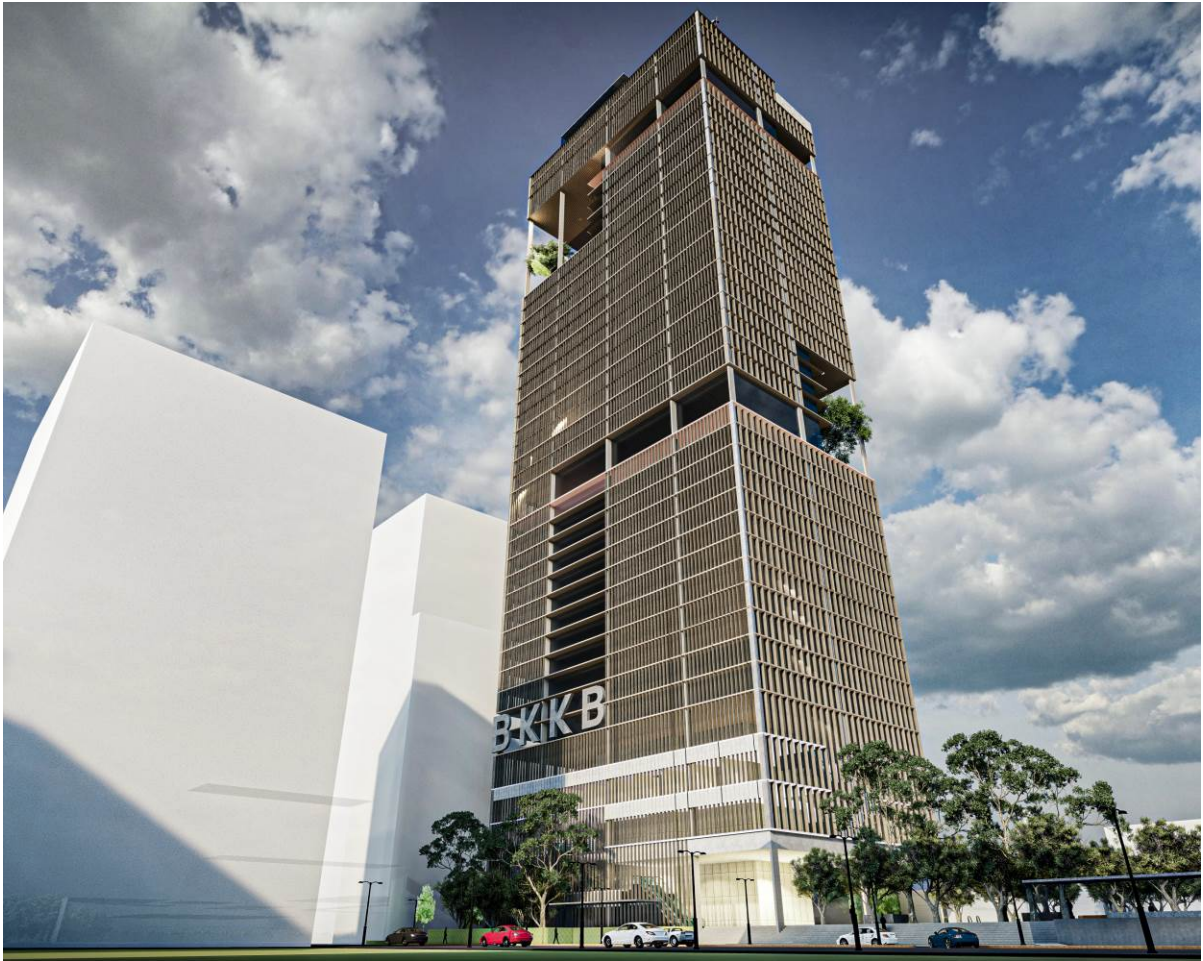


Figure 7. 26: Render Image

Bibliography

- (2012). *World bank Bangladesh development report. volume:2*. World bank.
- (2012). *Bangladesh Bureau of Statistics* . Dhaka, Bangladesh: Population Census 2011, Community Series.
- Ahmed, J., & Islam, S. (2002). *Banglapedia: National Encyclopedia of Bangladesh (Second ed.)*. Dhaka: Asiatic society of Bangladesh.
- Ahmed, S. S., & Khan, M. R. (2015). Employment and Unemployment situation in Bangladesh:A dismal picture of Development.
- Ahsan, R. M. (2009). Changing pattern of the commercial area of Dhaka city. In *'Dhaka Past Present Future* (pp. 396- 414). Dhaka: Asiatic Society of Bangladesh.
- Bangladesh karmochari kalyan board*. (2020, February). Retrieved from bangladesh national portal: <http://bkkb.gov.bd>
- Challinger, D. (2008). *From the Ground Up:Security for Tall Buildings*. Alexandria: ASIS foundation.
- Chow, W.-K. (2015). A Discussion on Tall Building Fire Safety in the Asia-Oceania Regions. In K. Harada, K. Matsuyama, K. Himoto, Y. Nakamura, & K. Wakatsuki, *Fire science and technology 2015* (pp. 61-72). Springer.
- Davies, D. H. (2010). THE PSYCHOLOGICAL AND PHYSICAL NEEDS OF WORKERS IMPACTING OFFICE DESIGN . *COBRA 2010 : Proceedings of the RICS Foundation Construction and Building Research Conference*.
- Edwards, B. W., & Naboni, E. (2013). *Green Buildings Pay Design, productivity and ecology* . New York: Routledge .

- Elsbach, K. D., & Bechky, B. A. (2007). It's More Than a Desk: Working Smarter through Leveraged Office Design. *California review Management* .
- Fire safety design for tall buildings . (2013). *Procedia Engineering* , 169-181.
- Kar, A., Mashraky, R., Khatun, F., Huq, M. E., Mahmud, S., Islam, I., & Akther, M. S. (2016). Prospects of Urban Regeneration in Motijheel Commercial Area of Dhaka City. *Imperial Journal of Interdisciplinary Research (IJIR)*.
- Kats, G. H. (2003). *Green Building Costs and Financial Benefits*. Massachusetts : Massachusetts Technology Collaborative.
- Mukherjee, C. (1994). "Toward a Sociology of Material Culture: Science Studies, Cultural Studies, and the Meanings of Things. In D. Craine, *The sociology of culture* (pp. 143-162). M.A blackwell.
- Oseland, N. (2009). The impact of psychological needs on office design . *Corporate Real Estate, Vol. 11*.
- Raipat, V. (2016). Re-imagining Public Spaces for Sustainability: Ranchi, India. *Cities People Places*.
- Rob, M. A., Kabir, M. H., & Rabby, Y. W. (2015). An Assessment of Microclimatic Variations A Study in Dhaka City, Bangladesh. *ICUC9 - 9th International Conference on Urban Climate* .
- Roos, G. (2009). Water Efficiency to Become Critical in Green Building Designs. *Environment+energy leader*. Environment+energy leader.
- Sharifuddin, M. (2001, April). EARTHQUAKE HAZARD ANALYSIS FOR BANGLADESH. Dhaka, Bangladesh: BUET.

- Tamura, G. (1987). Review of the DBR/NRC studies on control of smoke from a fire in high buildings. *U.S. Department of Energy*.
- The Daily Star. (2019). *Banani building fire death toll rises to 19*. Dhaka: The Daily Star.
- Vaddadi, R. V., Patwa, K., & Sharan, M. (2013). AN INTEGRATED DESIGN APPROACH OF HIGH-PERFORMANCE GREEN BUILDINGS. *International Journal of Students Research in Technology & Management*, 598-603.
- Webster, C. (2002). Property rights and the public realm: gates, green belts, and Gemeinschaft. *Environment and Planning B: Planning and Design 2002, volume 29*, 397-412.
- Wheeler, G., & Almeida, A. (2006). These four walls. In D. C. Croome, *Creating the productive workplace* (pp. 257-359). London: Taylor and Francis.
- WYON, D. (2004). The effects of indoor air quality on performance and productivity. *Europe PMC*.