ARC 512

বাতায়ন

BREATHING SPACE WITHIN EXTREME URBAN DENSITY

Submitted in partial fulfillment of the requirements
For the degree of Bachelor of Architecture
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ABSTRACT

Mogbazar intersection is one of the busiest nodes in Dhaka. Amid extreme urban density and a multitude of socio-economic issues, the introduction of fly-overs without much consideration of the area itself introduced further problems and created a claustrophobic environment. Among these issues, a new mixed use building is proposed on a site adjacent to the intersection. In our country it's common for new buildings to be developed without much linkage to the context of site and community and instead focus on serving its own function. The purpose of this thesis project is to design a context sensitive building which both meets the requirements of the client and addresses the issues of the community, while giving the user a place to breath. First this project will determine the current condition of the area then compare it with how things were before the overpasses were built in order to determine the problems and issues caused by the fly-over to its surrounding area. The study will also analyze the overall community context and condition. Finally it will propose design solutions that address the problems and utilize the opportunities. Surveys, mapping and interviews will be used to gather information. Through these methods this project aims to fulfil its aim to designing a context sensitive mixed use building.

KEY WORDS: Mogbazar Intersection, Node, Issues, Opportunities, Community, Context sensitive, Breathing space.

CHAPTER 1: BACKGROUND OF PROJECT

1.1 Introduction

Mogbazar is one of the densest areas in Dhaka city. The intersection at Mogbazar is an extremely dense, busy node that connects two important routes together. As a result, it's also afflicted by severe traffic jam all throughout the day. In order to reduce traffic congestion, an 8.7km three part overpass was proposed connecting Saatrasta intersection, Mogbazar, Mouchak, Rajarbagh and Shantinagar together. One of its three parts, the portion stretching 2km and connecting Saatrasta to Mogbazar (near Shaheed captain Mansur Ali avenue) was completed on September 2016, another portion connecting Mogbazar (near Janakantha building) to Mouchak (near Arong) and stretching 1 km was completed and opened on June 2016. These portions go crisscrossing right over Mogbazar intersection and as a result puts the area in shadow.

The implementation of the Saatrasta-Mogbazar -Mouchak overpasses focusing only on dealing with traffic and utter disregard to surrounding context has led to a situation too common with our city's unplanned development. While the overpasses serve their purpose of ensuring fluid, agile unobstructed flow of traffic, they also brings up new problems for the surrounding area. The underpass is devoid of direct daylight for the most part. This has allowed growth of pockets of depravity: dark spaces used for unlawful activities. Many poor and homeless are also clamoring to the underside of the overpasses as a means to shelter, and their increasing numbers is hampering the urban qualities of the area at large. Furthermore, the overpasses are causing privacy concerns for adjacent buildings by providing unobstructed view lines in unwanted areas. As the area grows unpleasant for pedestrians, the commercial buildings are suffering economically. The value of land properties is decreasing and the existing socio-economic structure of the area is changing for the worst. Finally there is also increased noise pollution as the number of vehicles active at a time has increased. Overall the flyovers are causing the entire Mogbazar intersection zone to decay in terms of urban quality.

Amongst these conditions, a new mixed use building is proposed on a site adjacent to the Mogbazar intersection. The site's owner, Hosaf group wants a high rise with rentable commercial and office spaces.

This project aims to study in detail, the context of Mogbazar intersection under flyover, and use the accumulated data to identify issues that a new commercial mixed use building will face, then design with the proper considerations to ensure the building functions with maximum efficiency, provides breathing space for the users and instead of causing further issues gives something back to the community.

1.2 Project brief

Project name: বাতায়ন, Breathing space within extreme urban density
Project type: Mixed use building (Commercial + Office)
Site: Mogbazar, Dhaka, Bangladesh
Site Area: 1.5 Acre
Client: Hosaf group

1.3 Problem statement

The flyovers at Mogbazar provide both new opportunities and creates new issues. Understanding how the urban context is affected by them, analyzing the newly created spaces and defining appropriate functions for them, it will be possible to generate urban pockets. By incorporating them with existing site parameters while preserving the urban characteristics of Mogbazar, it will be possible to regenerate Mogbazar intersection as a successful focal node.

1.4 Methodology

Surveys, interviews and Mapping will be the primary tools for site appraisal. Other relevant information will be collected from RAJUK and department of architecture. However focus will be on getting information from locals and observing the site itself in order to understand the local context properly. Programs will be developed based on the requirements of the client. Information regarding the client's requirements will be collected from Hosaf's engineer through interview.

1.5 Scope of the project

The projects scope will be limited to evaluating the urban characteristics of Mogbazar intersection and surrounding area to identify the issues and parameters that will affect the site. It will work within a specific framework for ease of organizing. First, the existing issues around the site will be identified. Next both the current condition of the site and area as a whole as well as their condition prior to the flyovers' construction will be analyzed and compared. By doing so the changes in context, the issues and opportunities will be determined. In addition, case studies will be done to get relevant information on mixed used development amidst extreme density, especially on how such issues and opportunities were dealt with. Finally through critically evaluating all collected data, design proposals will be made to construct a building that will successfully achieve the objectives of the project. There are unfortunately some limiting factors to the project's scope. Time constraint, the complexity of critically analyzing the urban characteristics of a densely busy city node, dealing with conflicting parameters, etc. limit the scope of the thesis.

1.6 Objectives

i. Designing a Place to breath
ii. While meeting Client's requirements.
iii. While addressing demands of the surrounding community.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter aims to familiarize the reader with the development of the Mogbazar - Mouchak overpass and the impact of overpass on urban environment. Then it discusses urban design and the different ways to approach urban design. Next placemaking and designing for pedestrians is discussed. Mixed use development is studied and the aspects of it relevant to the project are elaborated on. Finally methods to designing a modern result oriented office space and vertical greenery to complement such spaces is discussed. This chapter aims to setting up a conceptual framework connecting the different aspects of the project. The purpose of the conceptual framework is to organize and connect the different aspects of the study, outline possible courses of action and make it easier to analyze all collected data. (Jeffels, 2013)

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2.2 Overview of Mogbazar-Mouchak overpass development

Dhaka, our capital city is one of the most densely populated cities in the world. It's estimated to have a population of 22.04 million by 2020 (source: city mayor's statistics, 2012). The population density is 44,100 person per square kilometers (Wendell Cox, 2016). This high population combined with poorly planned infrastructure has turned Dhaka into one of the most traffic congested cities in the world. In order to reduce traffic congestion, proposals were made for multiple flyovers connecting different nodes of the city. The Mogbazar -Mouchak flyover was proposed in 2011 and construction began in 2012. It was to be completed in three phases. So far two of those portions have been completed. The portion connecting Saatrasta (Shaheed Tajudding Ahmed Sarani) to Mogbazar (near Shaheed captain Mansur Ali Avenue) was completed on September 2016. The portion connecting Mogbazar (near Janakantha building) to Mouchak (near Arong) was completed on June 2016. The last portion finished construction in November 2017.

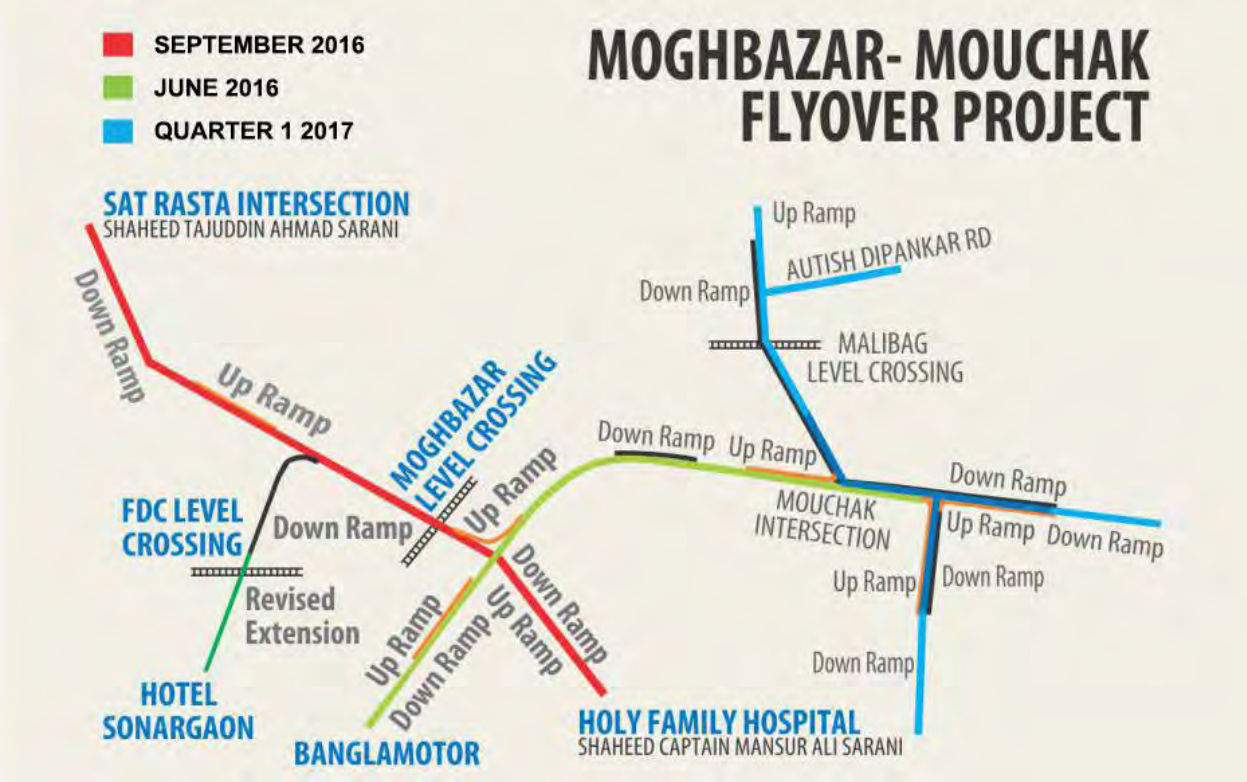


Figure 02: The three phases of Mogbazar -Mouchak Flyover. Source: The Daily Star

2.3 Impact of overpass to surrounding areas

There are certain impacts of overpasses to the surrounding area as classified by the US Department of transportation and federal highway administration:

- *Physical impact:* Overpass creates barrier and shadowing effect.
- *Traffic impact:* Reduces congestion of traffic and improves flow.
- *Social and Psychological impact:* This includes redistribution of population, changing social values, perceived changes in quality of life and segregation of certain class of people.
- *Displacements:* Can cause residences, businesses or institutes to be displaced.
- *Visual impact:* Changes the aesthetic quality of an area.
- *Land use impact:* Causes change in value and density of land use. May cause loss of land due to development of overpass.
- *Economic impact:* Can encourage establishment of new business. But also effects existing ones. Can impact visibility of commercial area. May cause relocation of existing business. Causes change in property value.
- *Environmental impact:* Air and Noise pollution levels increase due to overpass.
- *Safety:* Can impact safety both positively by improving emergency response and negatively by creating negative spaces.
- *Privacy:* Causes privacy issues for residences by allowing new sightlines.

2.4 Urban design approaches

Urban design is the art of making places in an urban context which involves designing groups of buildings and the spaces and landscapes between them and further the creation of frameworks for successful development. (Urban Design Group, 2011).

Urban design initially started as a means to city beautification. But it has evolved into a fundamental tool for city development. It is the union of architecture, landscape architecture and city planning. It is a collaborative discipline which works with other disciplines in order to create three dimensional forms and space for people which function effectively. Its aim is to enhance the quality of life of city dwellers in socio-economic and environmental terms. (Wall & Waterman, 2010).

Sustainability has become an integral part of urban design. The aim now is to design an urban community which is economically, socially and environmentally sustainable. The EGAN wheel (Egan, 2004.) shows an exemplary framework for creating a sustainable community through urban design.

There are mainly two approaches towards urban design. The traditional top down

process and the newer bottom up process.

Top down process: This method of urban planning first a general hypothesis is formed about the situation. Then the problem is analyzed to test validity of the hypothesis. Then using the collected data the hypothesis is confronted and adjusted. Thus design solutions are found. Finally they are communicated to the client and implemented. (Nuwan et al. 2014). This method has certain advantages:

- It gives planners and designers more control and efficiency.
- Development proposals are already prepared so they can be easily communicated to the community.
- Less time consuming as the entire process is preplanned, organized and carried out by professionals.
- More effective use of resources.

- Easier to manage funding as the top down process allows budgets to be maintained easily, promoting confidence.

However the top down process has multiple weaknesses which makes it unfit for modern urban development:

- Often designs considering the target a ‘blank slate’ while in truth the existing local culture, tradition, history, socio-economic structure all need to be considered.
- Alienates local community members. Limited participation option for local stakeholders.
- May fail to capture local context and issues.
- The high level planning may not match the requirements of the ground level micro issues.
- Solutions are often rigid and don’t respect or consider local initiative, environmental changes, tradition etc.
- General blanket policy used in top down urban design isn’t viable when the community varies greatly in context.
- Having an already created hypothesis can cause manipulation of local opinion leading to the real data getting lost.
- Solution found by top down process may not be accepted by local stakeholders as it doesn’t match their insight.
- Planning is done with efficiency and cost effectiveness in mind and as such may skip over many details and provide inappropriate solution.
- Often uses quantitive data sampling and numerical estimations which lead to imperfect or incomplete data collection. (Nuwan et al. 2014).

Bottom up process: Due to the shortcomings of top-down process, a new paradigm of urban design was needed. In this process data is collected by directly communicating with the locals, engaging them in the design process and finding the context through them. In this process some of the solutions might come from the locals themselves. This

approach has been referred to as regenerative design because it seeks to restore the physical, social and environmental systems to “good health”. (Reed, 2006). Bottom up process has many advantages:

- Starts with consideration of existing conditions rather than a ‘blank slate’ making this process immediately more accurate than most top down processes.
- The local community is actively engaged so the unique issues, factors and parameters are properly understood, so data is more accurate.
- Data is qualitative in nature and with minimal estimation.
- Due to having the accurate data it’s possible to get better understanding of local context.
- This method fills the gap between planners and actual micro level problems that exists in top down process.
- The generated solutions are realistic and context sensitive and are much more likely to address the issue than blanket solutions.
- The local community gains better understanding of the issue themselves and can manage them better in the future.
- Due to being context sensitive and dealing with micro issues, the design is more sustainable.
- Promotes confidence in local stakeholders, might even be community funded.

However bottom up process has its own set of weakness. Gathering data is much more expensive and time consuming. Organizing and analyzing the data also poses difficulty. The local community might also have biased opinions, personal agendas or be manipulated by local leaders with selfish reasons or politics. This makes gather factual data difficult at times. Also the solutions the locals think to be appropriate might not actually be correct as the locals aren’t experts in the field. (Nuwan et al. 2014).

Regardless of these issues bottom up process in undoubtable a very versatile and more appropriate process for doing urban design.

In this thesis, a mix of both top-down and bottom-up process will be used in order to collect data, analyze the information and designing solutions. By doing so the aim is to complement the shortcomings of both processes and come up with solutions that are both accurate and efficient.

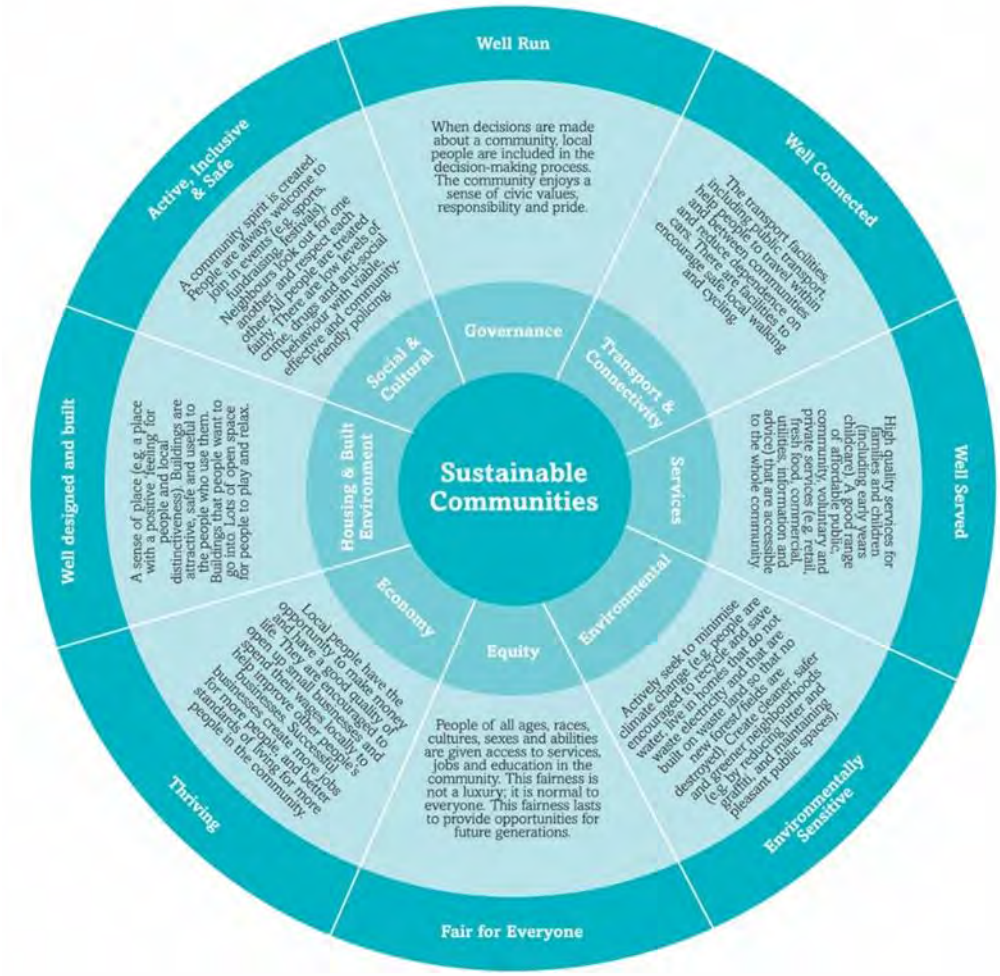


Figure 03: The EGAN wheel

2.5 Placemaking

Placemaking is a bottom up approaches to urban design. It is a method where public spaces are designed utilizing the assets, inspirations and input of the local community. Its main aim is to create public spaces that promote happiness, good health and well-being. It's a collaborative effort to maximize the shared value of public realm. (PPS, 2009)

- The main principles of placemaking dictates that the community is the expert when it comes to urban design.
- The goal should be create a 'place' not a design.
- Placemaking starts at the smallest scale, on the street level.
- It starts with a vision of generating 'place' and then acquires the necessary information to implement that vision.
- The locals are the main source of information.
- Information is also acquired by observing the site itself.
- The diverse opinions and information is analyzed and integrated into a cohesive whole which supports the initial vision. 'Triangulation' is used to link the different aspects.
- Then solutions are found and compared based on their cost, efficiency and synergy with site context.
- The most suitable solution is implemented through planning and design.

The final goal of placemaking is to create a space that has a certain set of qualities. The qualities are shown in the diagram below:

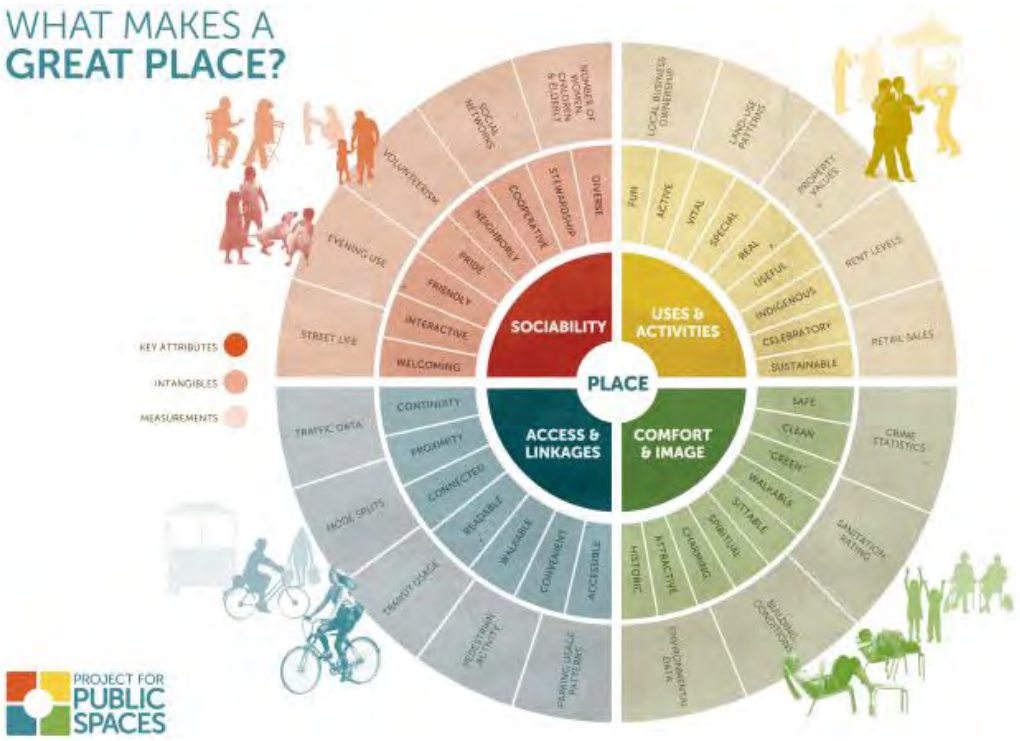
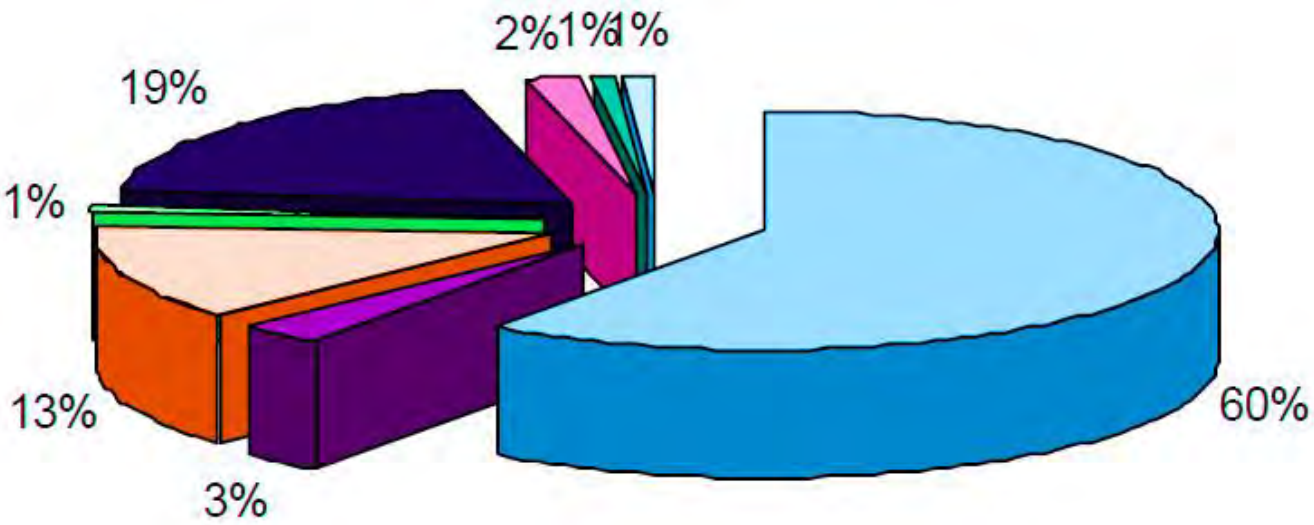


Diagram: qualities of a great space. Source: https://i1.wp.com/www.pps.org/

2.6 Pedestrian and planning for pedestrians

Pedestrian can be defined as human traffic that walks as a part of his movement and uses facilities such as foot over bridge, zebra crossing, underpass, footpath etc at any stage of their travel in order to accomplish their activities. All people on the road are pedestrians at some stage of their journey and some are pedestrians for the whole time (Waresh Md. A, 2001). Pedestrian movement in linked with the land use characteristics of a site. People move in order to reach their place of activity. So an area with more and various activities has denser pedestrian flow. It is also effected by accessibility of an area and varies with time of day. Pedestrians also tend to keep their travel distance as low as possible while walking so long stretches of pedestrian paths don't necessarily mean long pedestrian flow. The economic condition of an area also effects pedestrian density as people's tendency to walk certain distances is related to their financial condition. Finally pedestrian flow depends on how accessible an area is to pedestrians. An area without proper pedestrian paths will see less pedestrian flow regardless of its functions.Dhaka is a densely populated city with huge variety of activities. As such pedestrians are the dominant mode of transport. Around 60% of Dhaka's traffic is pedestrian. (Rahman, 2003)



When doing urban design for pedestrians, certain principles have to be followed and certain things should be given priority (Donald et al, 2003). These principles are:

Pedestrian convenience: Adequately wide pedestrian path is the first requirement for convenience. Amenities like seating area, bus shelter, and pedestrian crossing, subsurface or overhead bridges all improve convenience. Meanwhile obstructions like vendors, parking, and garbage dumps ruin convenience.

Pedestrian continuity: Continuity has to be maintained for smooth pedestrian flow. The designed pedestrian path has to be perceived by the pedestrian as the “least effort”. Both functionally and visually the pedestrian circulation has to be a coherent system in order to preserve continuity.

Pedestrian attractiveness: An area needs to be attractive for pedestrians through its functions and its aesthetics. An architect may use landscaping, fountains, plazas, designed vistas etc to make a site aesthetically attractive for pedestrians. Civic spaces, urban parks, public places, food courts, play area etc are some of the functions that might make an area attractive to pedestrians.

Pedestrian safety and security: Pedestrian safety and security has to be insured for proper flow. Stopping vehicle-pedestrian conflict by designing safe crossing, vertical separation (underpass / overpass) goes a long way. Street lighting can provide security at night. Long sight lines also make pedestrians feel safer. Avoiding narrow pedestrian paths further improves safety.

2.7 Mixed use development

Mixed use development means combining different land use types such as industrial, commercial, institutional, residential or office together. Mixed use development allows for a 24 hour vibrant lifestyle instead of being limited to one time of day like an office building. Their variety of function serve different people making them better suited for extremely dense areas. They complement the urban fabric by catering to the needs of the local community and can have amenities and leisure activities for a single location. Mixed use development also makes a building more economically viable through the blend of functions. For example foodstalls and kiosks on ground floor may be a better investment than office space.

2.8 Tall buildings in urban context of Dhaka city

The number of tall buildings has grown exponentially in Dhaka, especially in the last few decades. However the infrastructure has not improved along with the new development. As a result, the buildings often have insufficient services and cause issues in a city already overburdened by various problems.

A tall building is defined as having 9 or more stories. In Dhaka majority of tall buildings are mixed use office commercial.

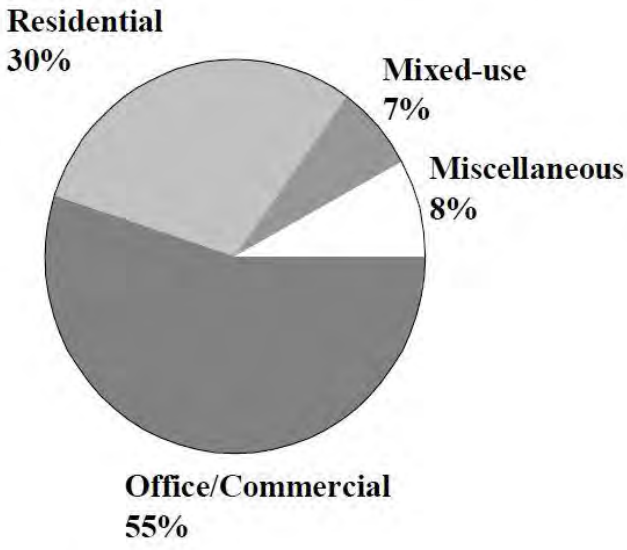


Fig. 1, Types of Tall Buildings in Dhaka City

The extreme density of tall buildings comes with serious requirements of public amenities. This includes water supply, sewerage, power, gas and telecommunication. They also create social issues by segregating the ground level space and blocking light and airflow for lower height buildings. Also unless properly designed tall buildings lack any social interaction space for the community. (Iqbal, 2005)

2.9 The result oriented office design

While strict all work no play policies are the norm in office space, it has started to change recently. The modern office is not only a place for work but also a place for socializing and collaborating. As a result it's important for modern workplace to incorporate design elements that allow for breakout places. With laptops being common people aren't tethered to a place anymore but rather can work anywhere. So its important to provide spaces for socializing. These areas might be built around food and water or inspired by residential interiors. However they are not only for socializing but also double as work areas. Furthermore they allow for sharing of ideas and networking, making them into informal meeting places. Some modern office designs go as far as having a fully stocked Kitchen. Office with long hours might even have sleeping space. Space designed to take employees out of their typical state of mind makes them work more efficiently. Thus, having relaxation spaces with smoothing environment can break monotony and give better results. Overall these solutions to result-oriented design can greatly improve the work efficiency of office space. (M.Dombrowski, 2012)

2.10 Vertical greenery

Vegetation in buildings come with a host of benefits including heat mitigation, protection from weather and most importantly, they can improve the environment of a workspace and make it more vibrant. Large trees aren't necessarily needed for this purpose as grass, shrubs and small plants are sufficient for both functional and aesthetic purpose. Vegetation on walls is usually on a mesh and green walls can be both indoor and on outdoor facade. Vegetation on roof or floor need multiple layers to be separated from the concrete slab. This includes the vegetation layer, a growing medium, a filter fabric, water draining layer, root barrier and waterproofing membrane. Planter boxes and sky terraces are also options for vegetation in buildings. (K.lim, 2015)

CHAPTER 3: SITE APPRAISAL

3.1 Introduction

This chapter aims to familiarize the reader with the site. The existing site conditions are presented through mapping. Through these maps the existing conditions are analyzed and connections are found.

3.2 General information

Area Name: Mogbazar Intersection

Location: Mogbazar, Ramna Thana, Dhaka, Bangladesh. Located between Escaton on the west, Ramna to the south, Tejgaon on the north and Malibagh-Siddheswari on the east.

Area of study: 71325 sq. ft. ~ 1.6 acre

Land use type: Mixed (Commercial and Office)

Population Density of surrounding area: 1159 /km² (Bangladesh Bureau of Statistics, 2011).

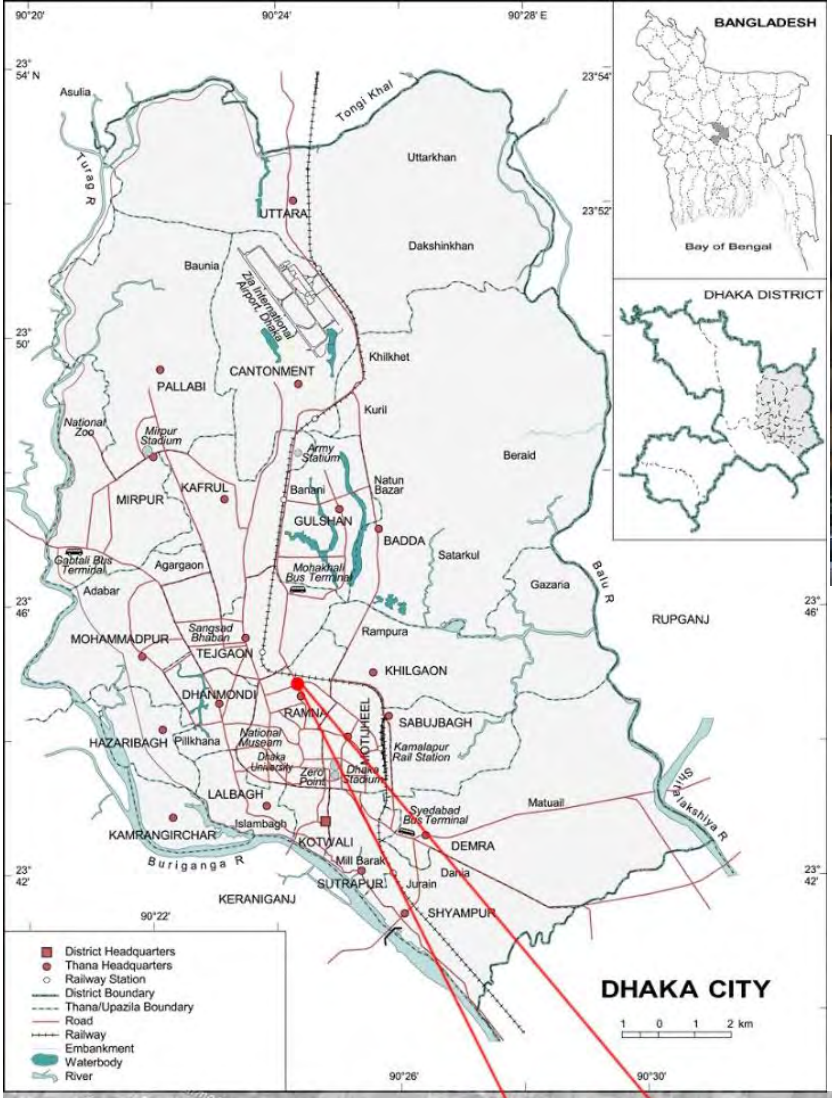
Literacy rate of surrounding: 78.1% (Bangladesh Bureau of Statistics, 2011).

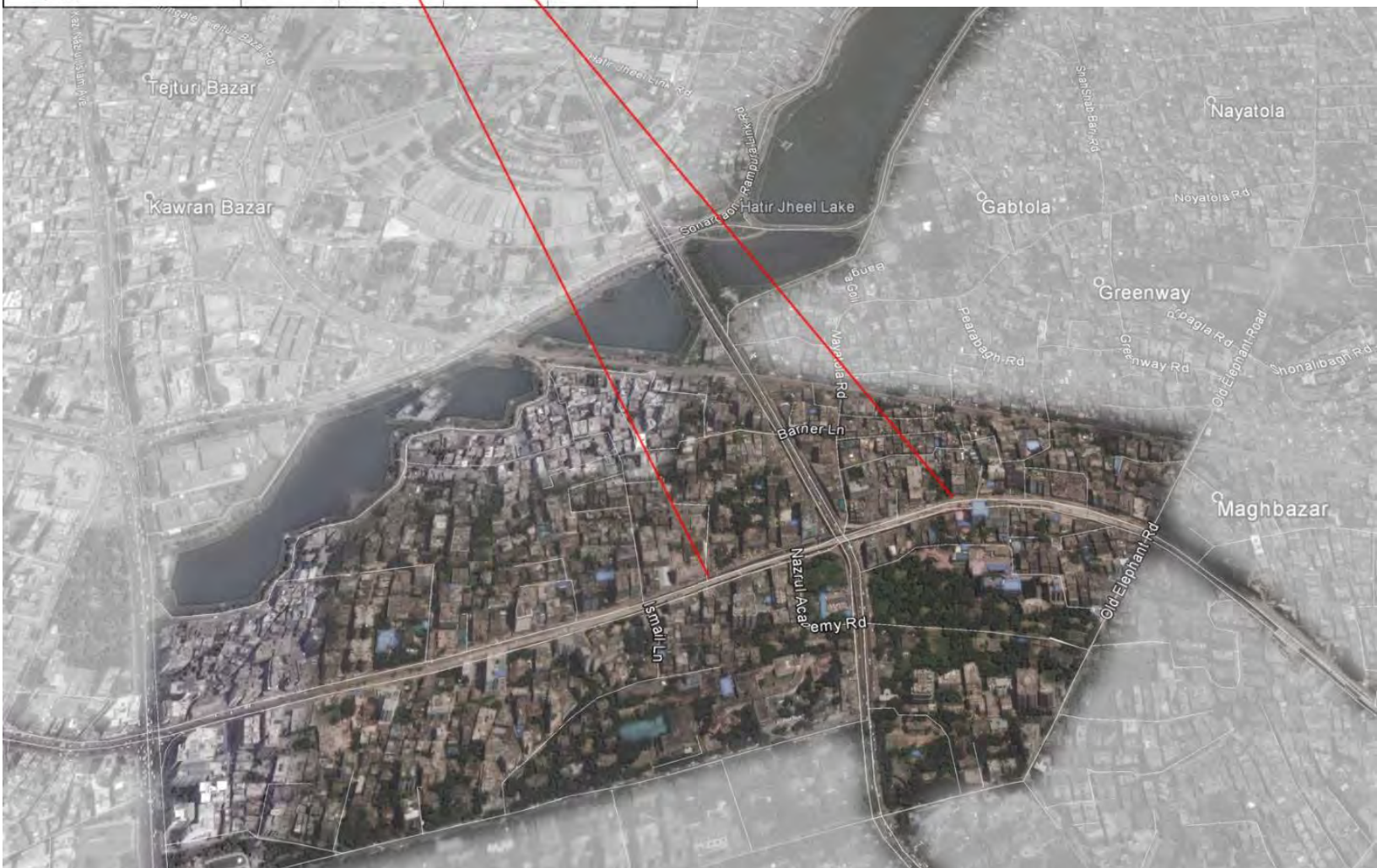
Brief History: The origin of Mogbazar date back to Mughal period. It is named after Moghs or Maghs of Arakan who ruled ancient Bengal before the Mughal period. The Mughal subedar Islam Khan defeated the moghs in their capital in Chittagong. The moghs surrendered and accepted Islam. They were allowed to stay in the area which is now known as Maghbazar or Mogbazar. (Fazilatun Nessa, 2012).

Underneath the Mogbazar flyover

CURRENT CONDITION OF SURROUNDING


ভাড়া দেওয়া হইবে
ব্যাংকের বুথ/দোকান ও ৩য় তলায়
রেডী অফিস ভাড়া হবে।
যোগাযোগঃ ০১৯৫৬-১৭০৪৪১


BANGLADESH
Bay of Bengal
DHAKA DISTRICT
DHAKA CITY
District Headquarters
Thana Headquarters
Railway Station
District Boundary
Thana/Upazila Boundary
Road
Railway
Embankment
Waterbody
River
Asulia
Uttarkhan
Dakshinkhan
Baunia
UTTARA
Zia International Airport Dhaka
CANTONMENT
PALLABI
Khilkhet
Kuril
Beraid
National Zoo
Mirpur Stadium
Army Stadium
KAFRUL
MIRPUR
Baridhara
Natun Bazar
GULSHAN
BADDA
Satarkul
Gabtali Bus Terminal
Agargaon
Mohakhali Bus Terminal
Adabar
Gazaria
Balu R
RUPGANJ
MOHAMMADPUR
Sangsad Bhaban
TEJGAON
Rampura
KHILGAON
DHANMONDI
RAMNA
SABUJBAGH
HAZARIBAGH
Pilkhana
National Museum
Dhaka University
Zero Point
Dhaka Stadium
Kamalapur Rail Station
LALBAGH
Islambagh
Syedabad Bus Terminal
Matuail
KAMRANGIRCHAR
KOTWALI
DEMRA
Mill Barak
Jurain
Dania
SUTRAPUR
KERANIGANJ
SHYAMPUR
Buriganga R
Shitalakshiya R
90°20'
90°24'
90°28' E
90°22'
90°26'
90°30'
23° 54' N
23°54'
23°52'
23° 50'
23° 46'
23° 42'
1 0 1 2 km


Tejturi Bazar
Kawran Bazar
Hatir Jheel Lake
Gabtola
Nayatola
Greenway
Maghbazar
Baner Ln
Nazrul Academy Rd
Ismail Ln
Old Elephant Rd
Pearabagh Rd
Noyatola Rd
Shonalibagh Rd

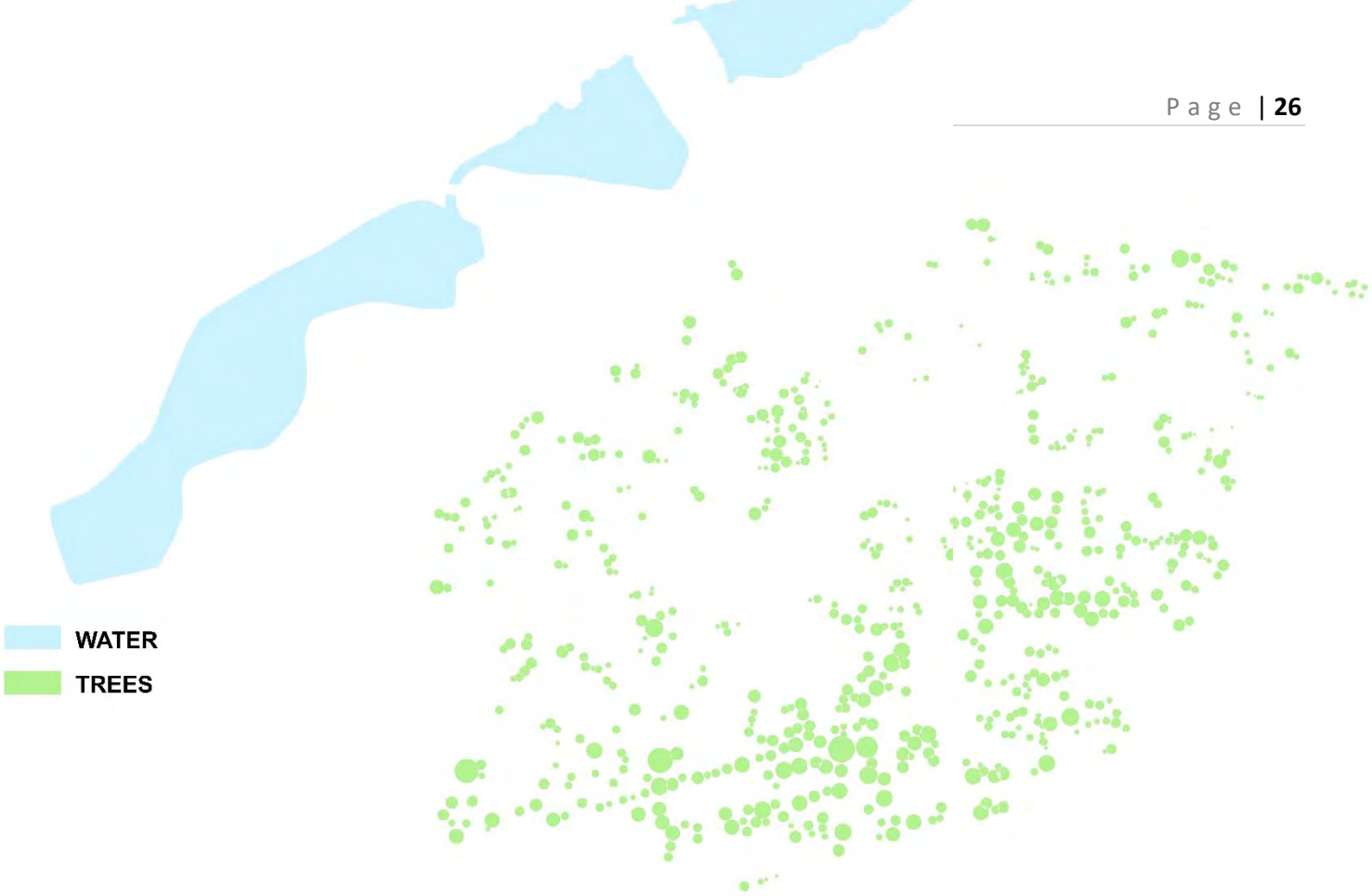
SOLID-VOID RELATIONSHIP

ONE
TWO
THREE
FOUR
FIVE
SIX - SEVEN
EIGHT+
SITE AREA

HEIGHT

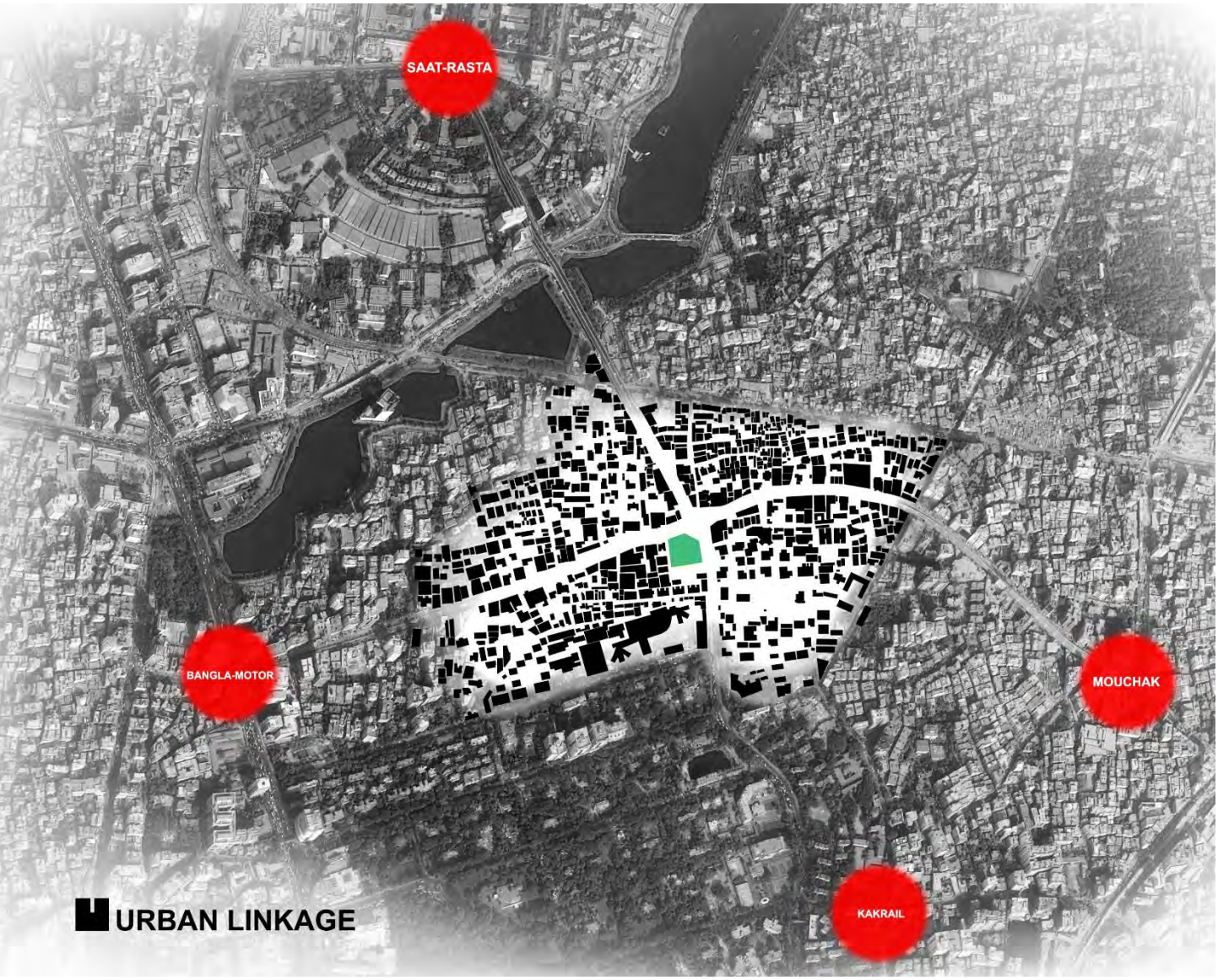
RESIDENTIAL
COMMERCIAL
MIXED
EDUCATIONAL
GOVERNMENT
MEDICAL
RELIGIOUS
SITE AREA

LAND USE

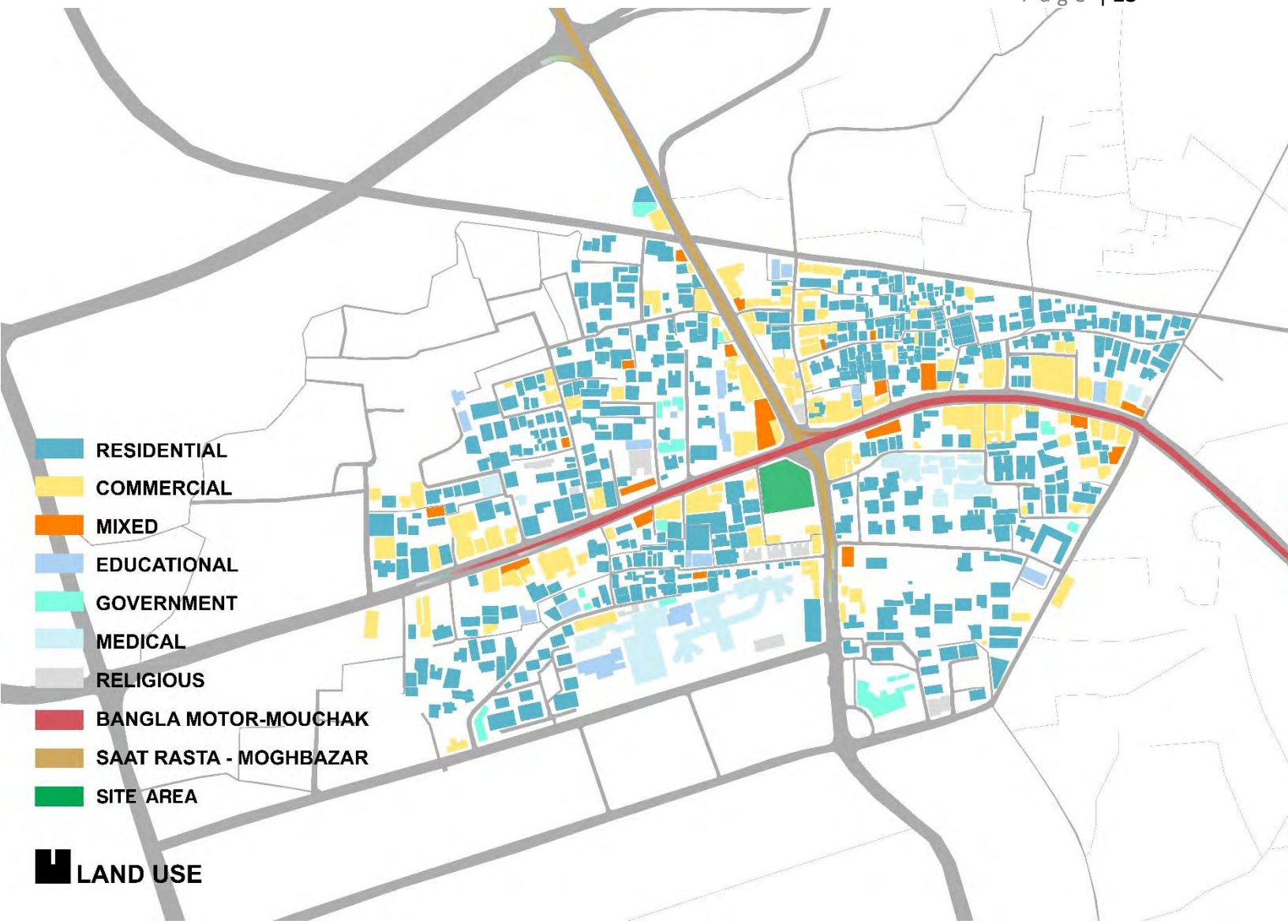


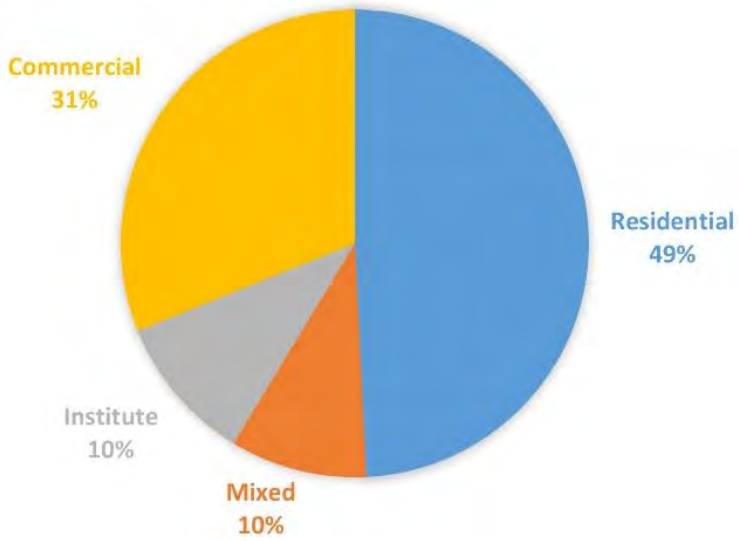
NATURE

3.3 Site analysis (macro)



Mogbazar intersection is well connected with the rest of Dhaka through the two main roads that cross each other to form the intersection. To the north it is connected with Saat rasta and to the south with Kakrail. On east there is Mouchak and on west there is Bangla motor. Through them Mogbazar intersection is linked to Mohakhali, Tejgaon, Karwan Bazar, Farmgate, Shahbag, Eskatan, Kathalbagan, Shantinagar, Fokirapul, Paltan, Shegunbagicha, Malibagh, Razarbag, Shantibag, Shiddeswari etc.





The overall land-use pattern of the site surrounding is mixed between residential and commercial. However, most of the buildings alongside the main roads are commercial, showing very noticeable concentration around the Mogbazar intersection area.

There is almost no vegetation near the main roads of Mogbazar intersection. The area underneath the fly-over is also devoid of trees. However the density of vegetation increases the further one goes from the main roads. The vegetation density is 6.25% of the area shown.

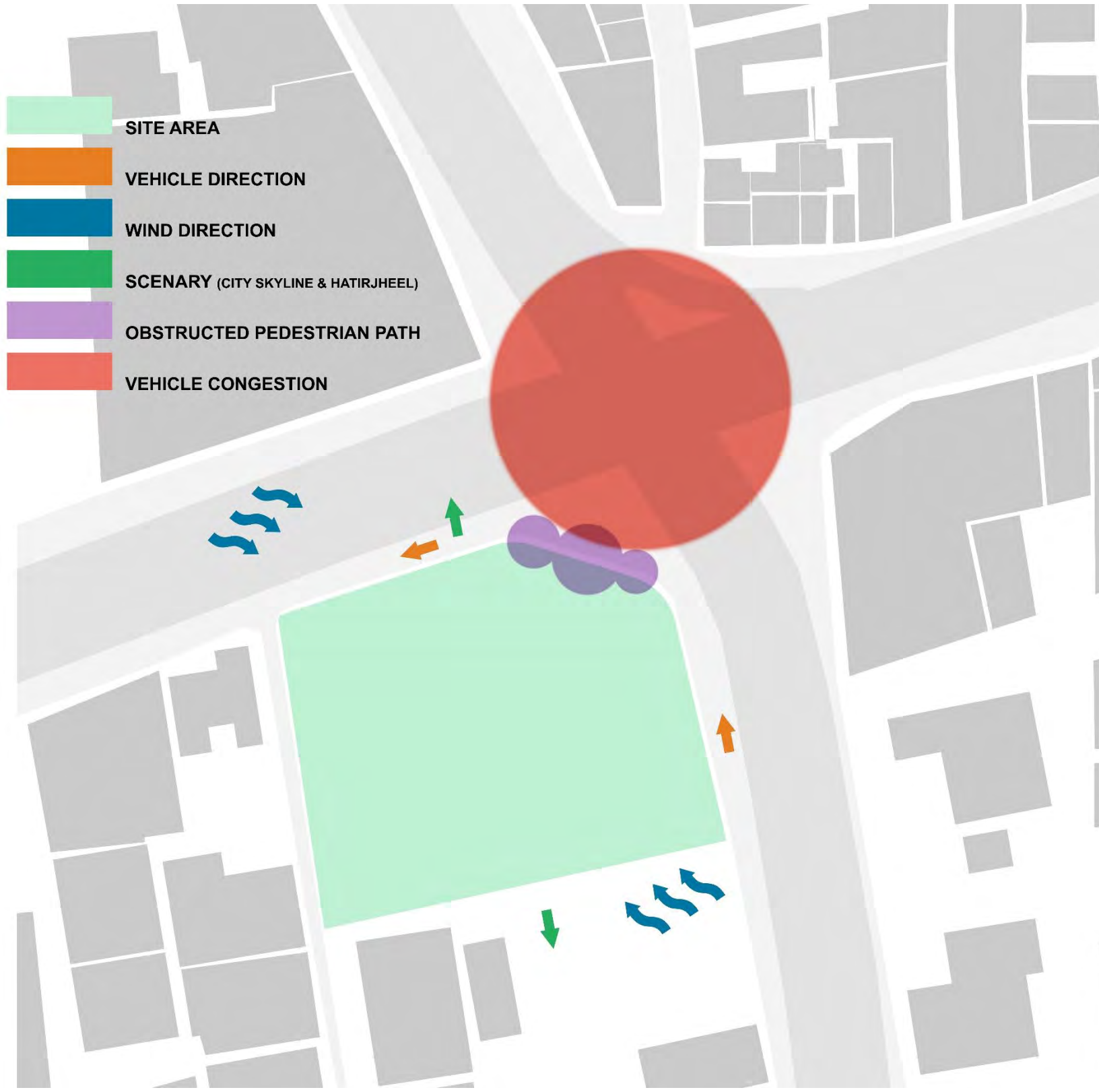
The fly-overs have greatly reduced traffic congestion however congestion still occurs in the intersection underneath the flyovers as well as the end point of saat-rasta to Mogbazar flyover as well as the rail crossing on the other side. There is a bus stop nearby in the road from bangla motor and rickshaw and cng stands right at the intersection. All these contribute to increasing congestion.

While the fly-overs reduced traffic, they increased noise pollution greatly. Heavy traffic is 80-90db and even moderate traffic causes 50db noise up to 100 feet away. Noise greater than 85db causes hearing loss and more than 45db is enough to make one unable to sleep (Columbia Electronic Encyclopedia, 2012). The flyovers thus have increased noise pollution of an already busy road intersection and moreover helped to disperse it at a greater area and height. Duration of exposure is another factor in noise pollution (Columbia Electronic Encyclopedia, 2012). Before the flyovers, noise was mainly limited to the busy rush hours. But now trucks pass by the flyovers deep at night and overall exposure to duration has gone up.

Pedestrian path around Mogbazar intersection is through footpaths, secondary and tertiary roads. The roads that make the intersection all have footpath. However the width of footpath varies wildly. In some places it's as wide as 9 feet while in others it's barely 2 feet. This wild variety of width hampers pedestrian flow. Moreover there are a lot of issues obstructing pedestrians. Vendors and street shops and tea stalls take over space from footpath. Pedestrian flow is further obstructed by illegal parking. Furthermore there is no safe way to cross the roads. All these together make Mogbazar very unwelcoming for pedestrians.

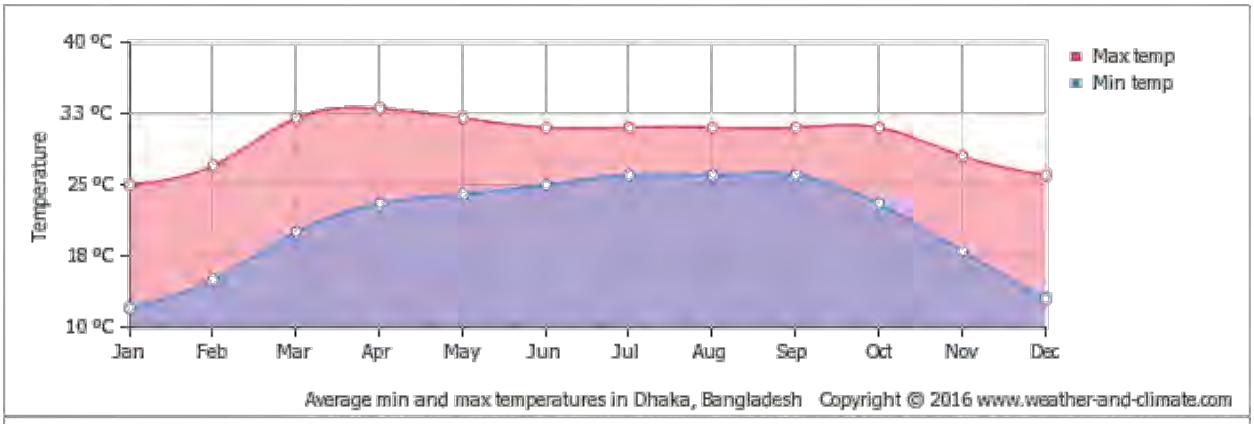

PEDESTRIAN PATH (footpath & streets)
PEDESTRIAN PATH (unbuilt)
RICKSHAW
CNG
BUS STOP
PARKING
VENDORS
BANGLA MOTOR-MOUCHAK
SAAT RASTA - MOGHBAZAR
PEDESTRIAN EXPERIENCE

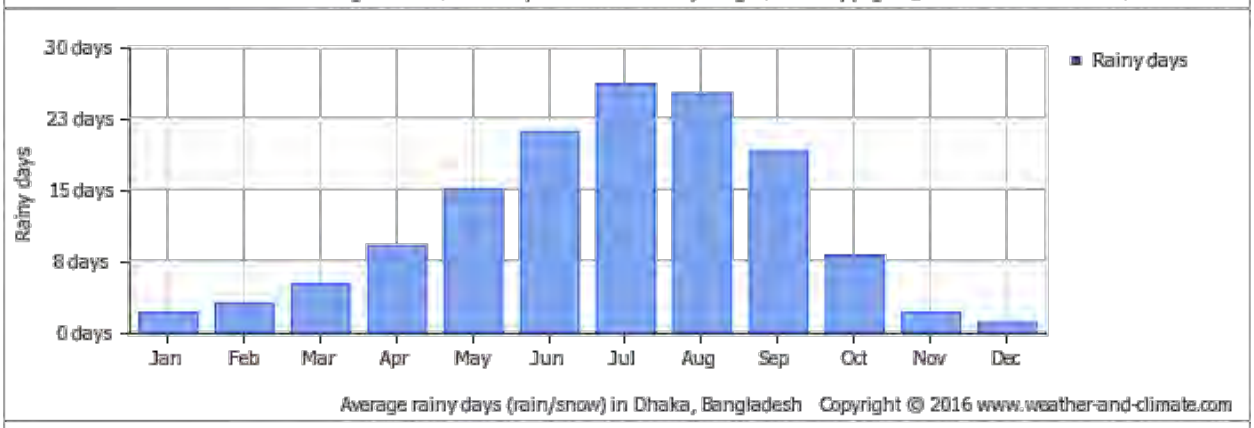
3.4 Site analysis (micro)

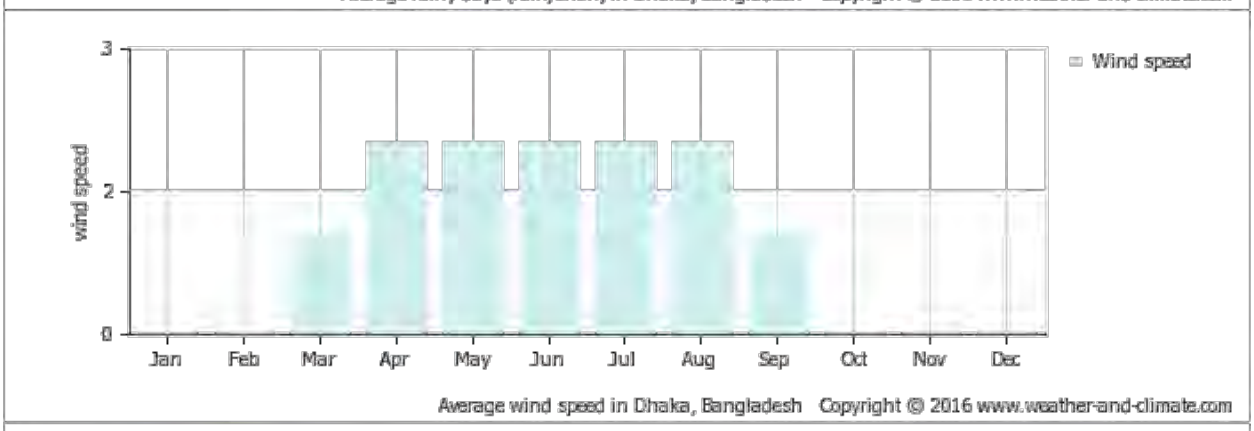


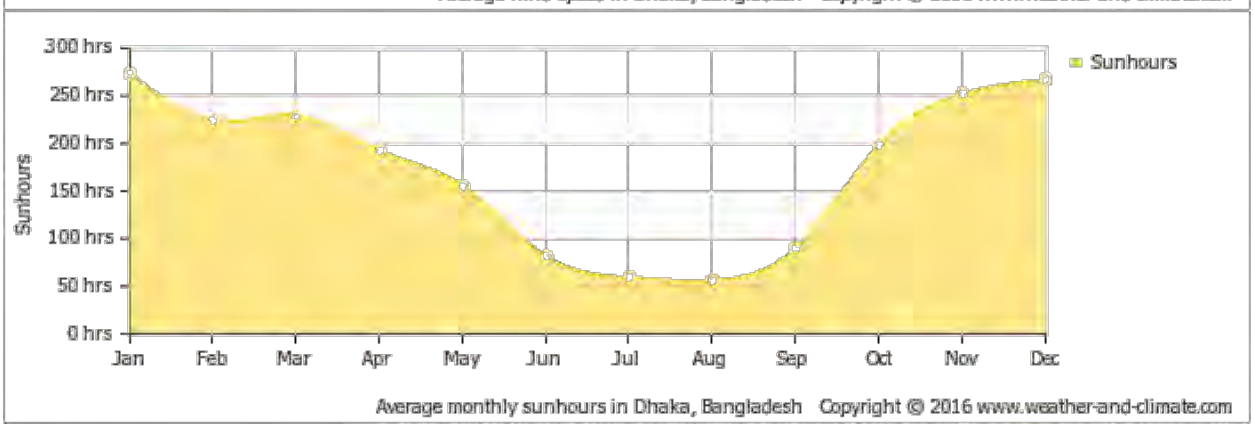
3.5 Environmental considerations

Some general environment statistics are given below (weather and climate information, 2017):



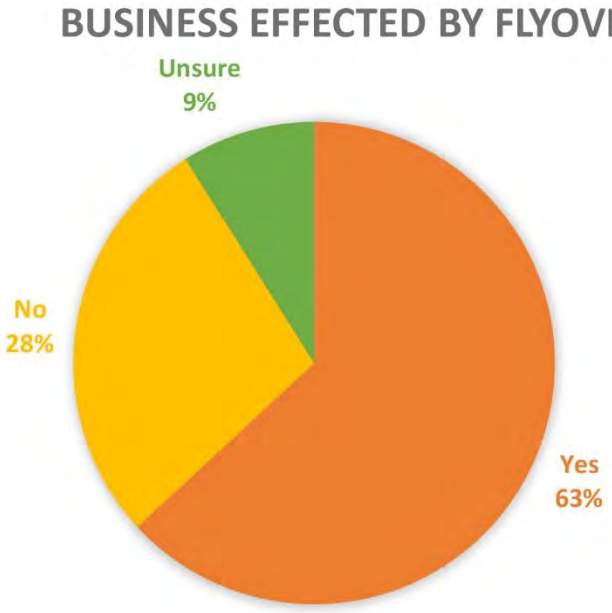


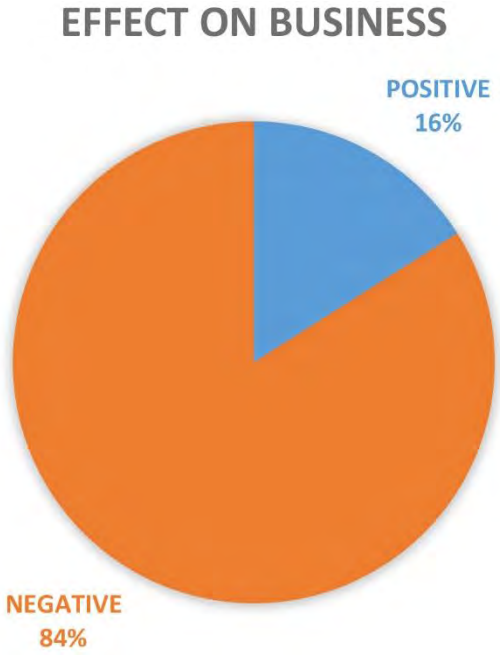




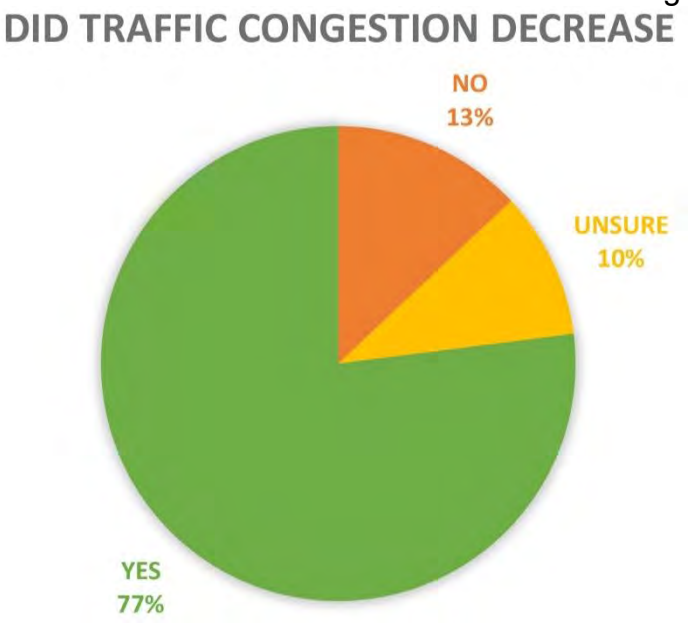
3.6 Survey, data collection and analysis

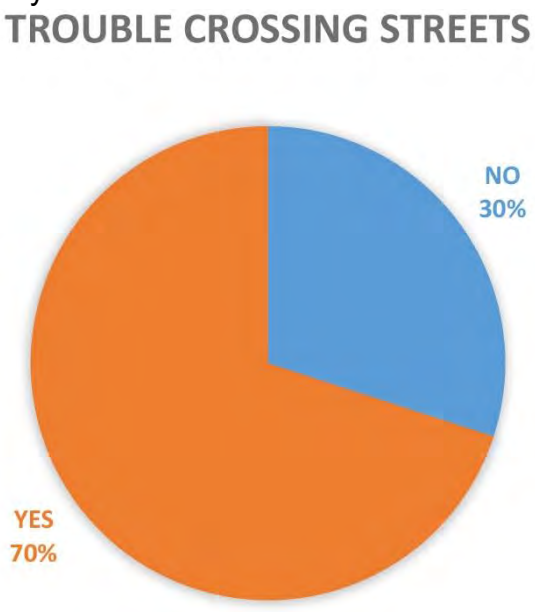
Questionnaires were used to interview the local businessmen, Residents, Pedestrians and Landowners. A radius of 100 feet around the intersection was taken as the survey area. 30 was the target number for each survey demographic. This was met in all cases except land owners in which case only 8 person was found for interview. The surveys aimed at finding the issues flyovers caused to businessmen, residents and land owners. They also aimed at evaluating pedestrian experience.



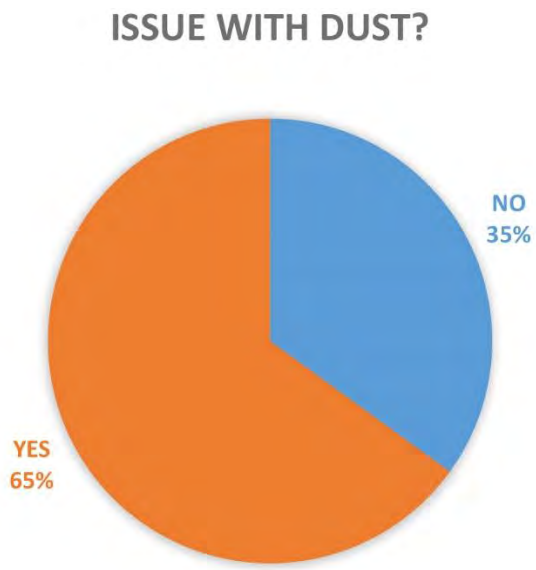


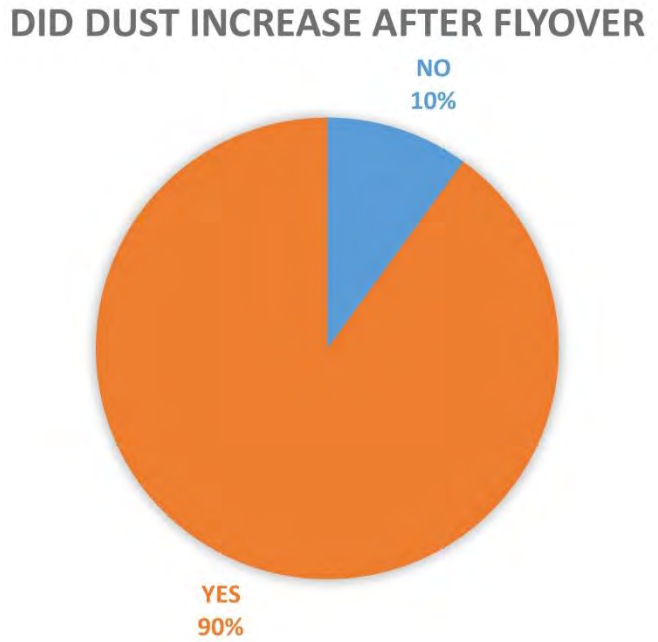
From these two surveys it can be seen that fly-overs are effecting businesses negatively.



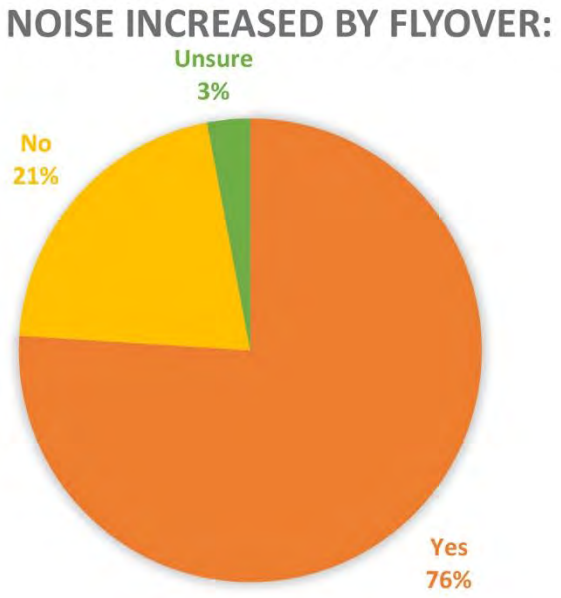


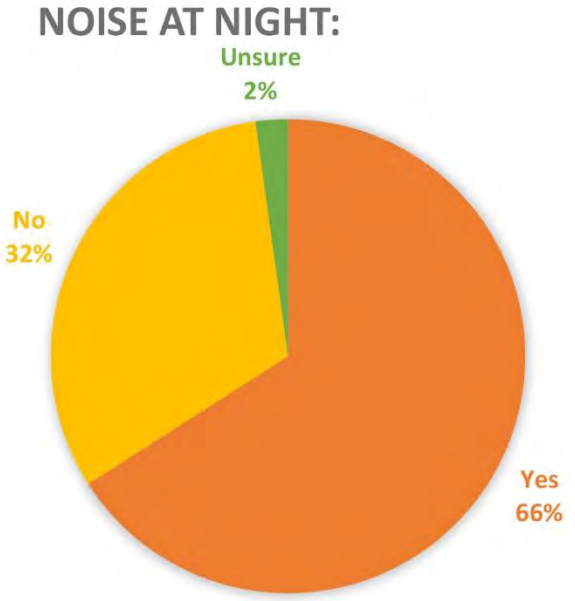
From the third it's visible that the fly-overs did in fact serve their purpose of reducing congestion and improving traffic flow in the intersection. However while vehicle flow is smoother, the fourth survey shows that pedestrian flow is still poor.



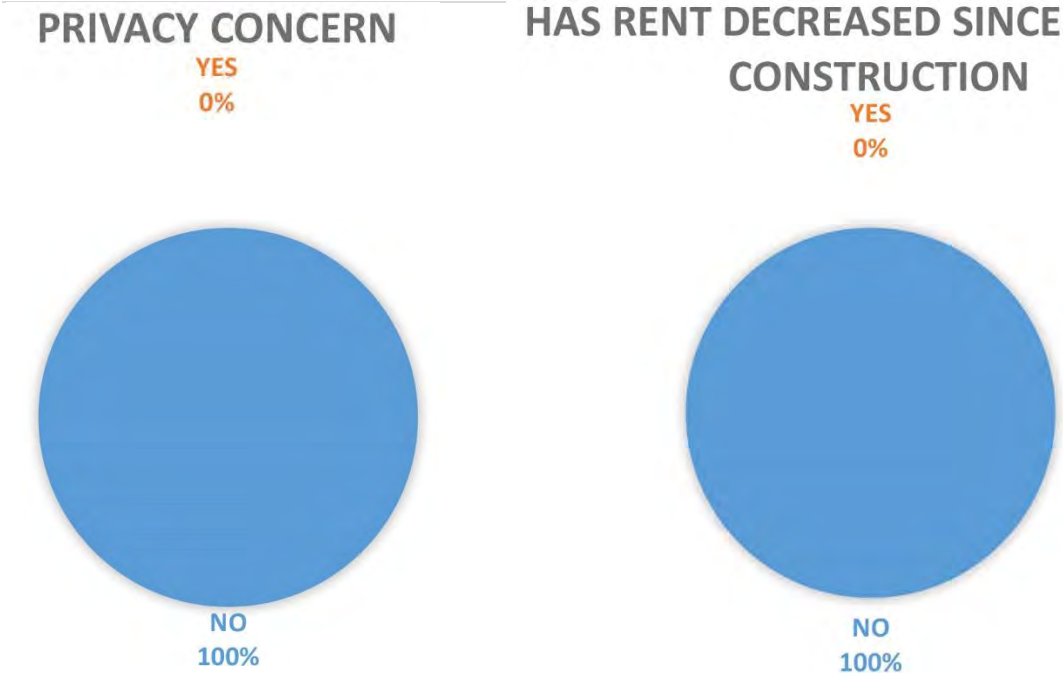


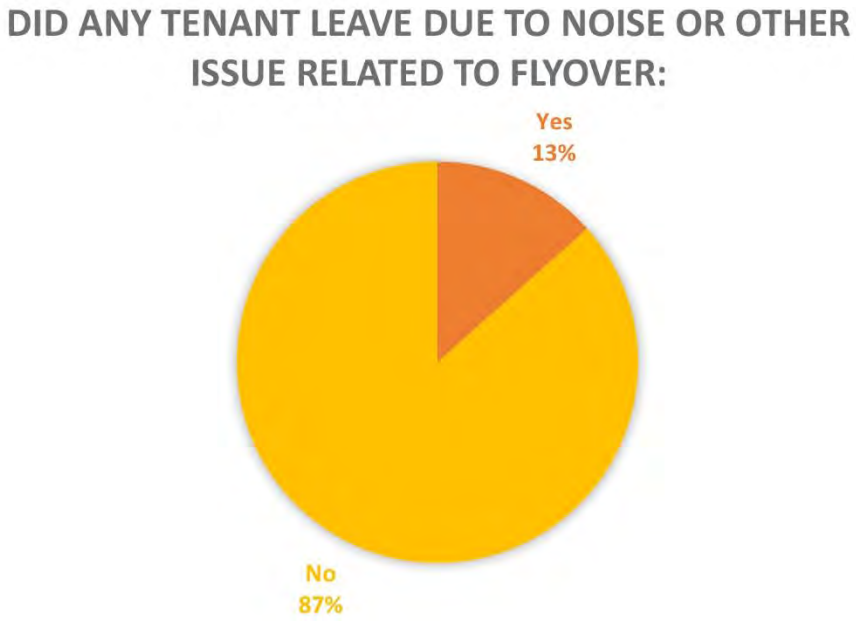
From the fifth and sixth survey we learn that dust is an issue in site. From questioning regarding this as well as observation it's found that the lack of green and construction material left after the flyovers were built are the causes of dust.





Flyovers increased noise in the site and made the situation especially worse at night. Residents of buildings adjacent to flyovers complained that the noise from trucks hampers their sleep.





Through the surveys above a few things are determined. Residents don't have any privacy concern even though some residential buildings have open sight line from fly-overs. More importantly, despite noise very few residents have actually moved away.

Overall from these surveys we find that Fly-overs are most majorly affecting the commercial sector. The residential sector is relatively unaffected (in terms of economy). It's also clear that pedestrian flow is hampered in the site.

CHAPTER 4: PROGRAMME DEVELOPMENT AND ANALYSIS

4.1 Introduction

In this chapter the overall concept of the project will be firmly established. Then the appropriate programs will be analyzed by determining solutions for issues found during site appraisal.

4.2 Concept

MAXIMISED SPACE USAGE
APPROPRIATE FLOORWISE ZONING

VEHICULAR ENTRY FOR COMMERCIAL ZONE
PEDESTRIAN ENTRY FOR COMMERCIAL ZONE
VEHICULAR ENTRY FOR OFFICE ZONE
PEDESTRIAN ENTRY FOR OFFICEZONE
PROPER CIRCULATION
LIGHT
WIND FLOW
BREATHING SPACE
(WITH GREEN AND VIEW OF CITY SKYLINE)

UNOBSTRUCTING PEDESTRIAN PATH
APPROPRIATE COMMERCIAL FUNCTION
BREATHING SPACE
(WITH FOODCOURTS AND SITTING)
VEHICULAR ENTRIES TO SITE SHOULDNT CONTRIBUTE TO CONGESTION

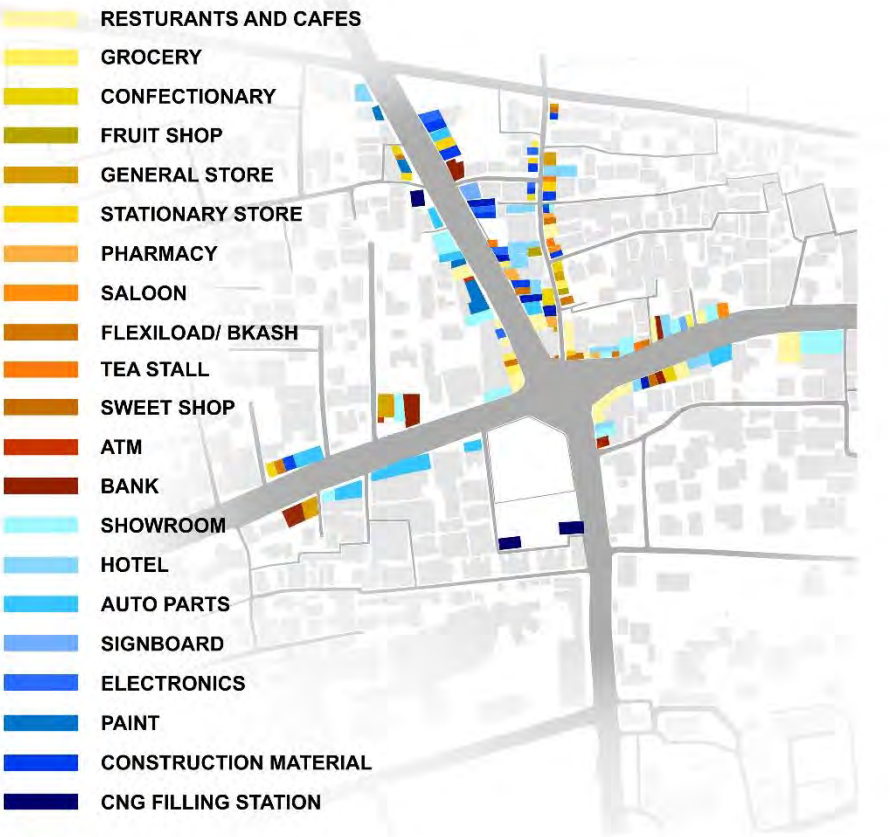
The main concept is to design a building that meets the client's requirements, while creating a place to breath for the users and at the same time giving something back to the surrounding community.

Client's requirement:

Maximum space usage

First 5 floors should be commercial space

Rest of the floors should be office.



COMMERCIAL FUNCTIONS IN SITE

MOST SUCCESSFUL BUSINESSES:

LARGE SHOWROOMS

RESTURANTS AND CAFES

FAST FOOD SHOPS

GENERAL STORES

4.3 Program Analysis

Commercial space:

- Super Shops
- Showrooms
- General stores
- Normal shops
- Restaurants
- Cafes
- Foodstalls
- Kiosks
- Service

Office space:

- Rentable office space
- Conference room
- Seminar room
- Prayer room
- Cafeteria
- Breakout space

CHAPTER 5: CASE STUDY

5.1 Microsoft offices inside herzog & de meuron's Feltrinelli building

Location: Feltrinelli building. Milan, Italy

Program: Office.

Client: Mircosoft

Area: 7,500 sqm

Description:

Microsoft's office in Feltrinelli building, Milan designed by herzog & de meuron spans six floors and works as the headquarters to

Microsoft Italia. The interior, designed by DEGW focuses on mixing Italian interior design taste with innovative spaces that promote flexibility and teamwork in a dynamic, welcoming environment. The office features a open smooth flowing layout. Everyone is encouraged to move around instead of being rooted in stationary work stations. Different work environments have been created for different employees. The spaces feature vibrant colors and accentuated hues which create a warmer atmosphere.

5.2 Commerzbank Headquarters by Foster and partners

Location: Frankfurt, Germany.

Program: Office.

Built area: 120,736m²

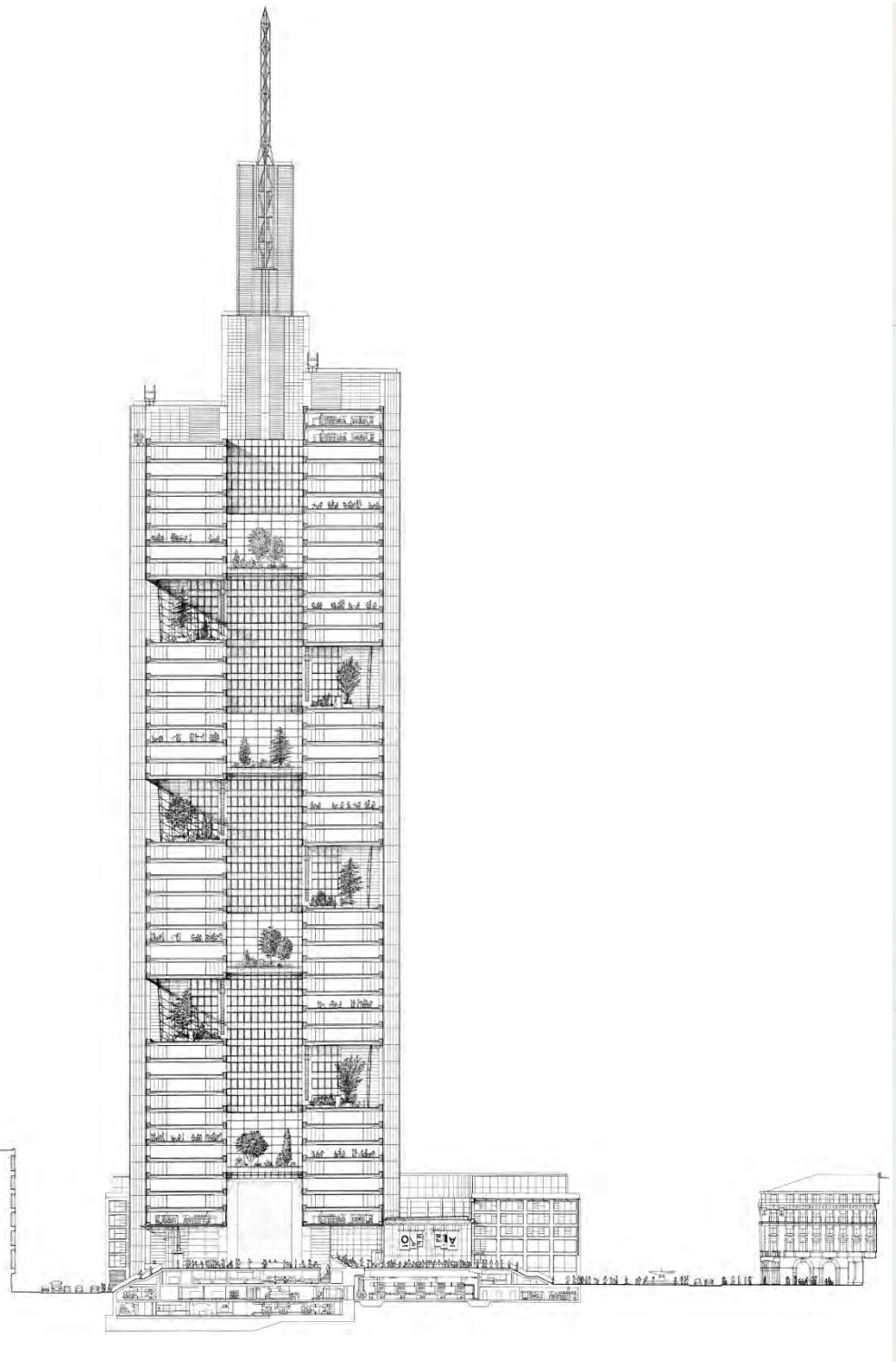
Height: 298m (53 storey)

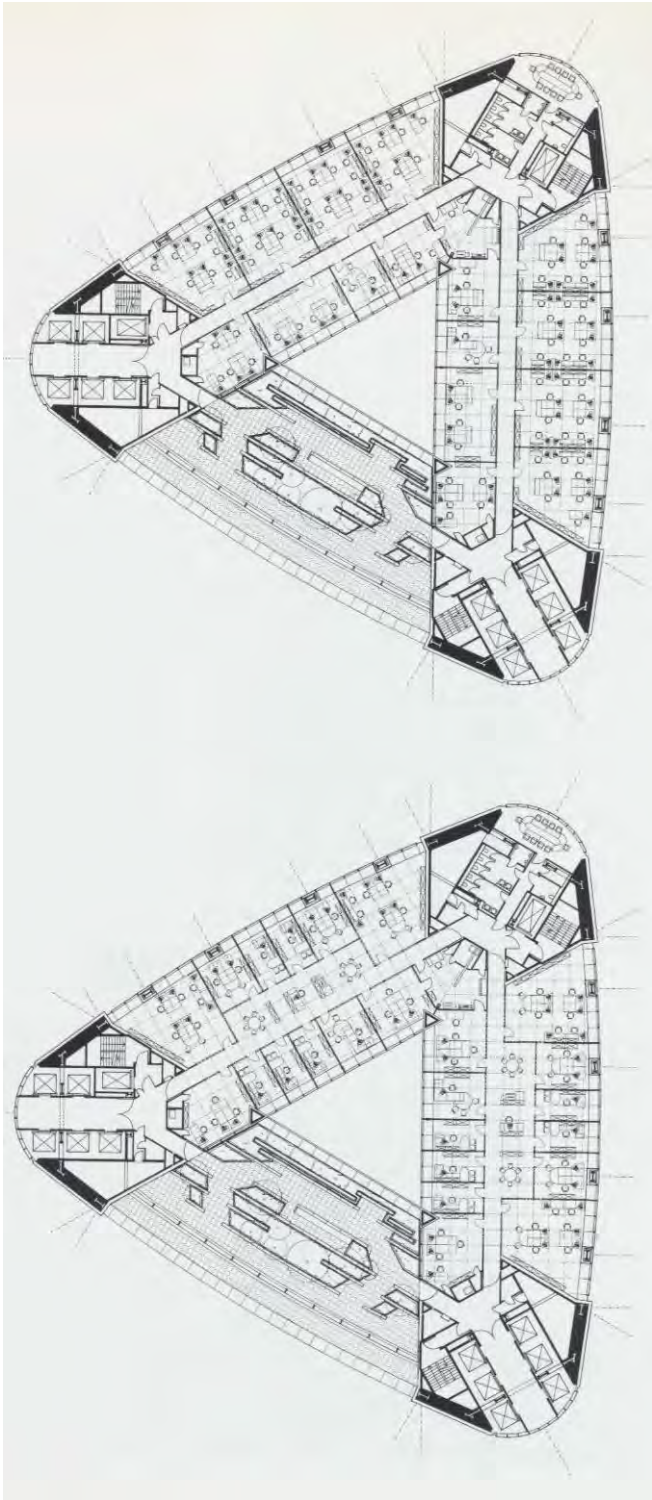
Client: Commerzbank AG

Description: At fifty-three storeys, the Commerzbank is the world's first ecological office tower and on completion it was the tallest building in Europe. The project explores the nature of the office environment, developing new ideas for its ecology and working patterns. Central to this concept is a reliance on natural systems of lighting and ventilation. Every office is day lit and has operable windows, allowing the occupants to control their own environment. The result is energy consumption levels equivalent to

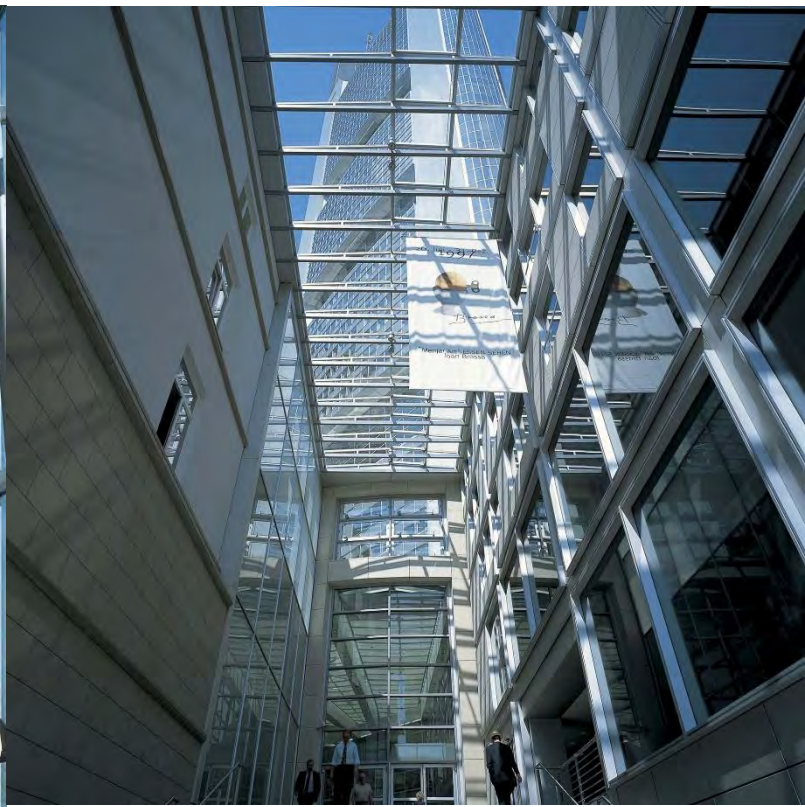
half those of conventional office towers - the offices are now naturally ventilated for 85% of the year.

The building is triangular in plan, comprising three 'petals' for the office floors and a 'stem' formed by a full-height central atrium.Winter gardens spiral up around the atrium to become the visual and social focus for four-storey office clusters.From the outside these gardens in the sky give the building a sense of transparency and lightness.They form focal points for village-like clusters of offices, providing places to meet colleagues or relax during breaks.





Environmentally, they bring light and fresh air into the central atrium, which acts as a natural ventilation chimney for the inward-facing offices.Depending on each garden's orientation, planting is from one of three regions: North America, Asia or the Mediterranean.The tower has a distinctive presence on the Frankfurt skyline but is also anchored into the lower-scale city fabric, through the restoration and sensitive rebuilding of the perimeter structures to reinforce the original scale of the block.These buildings provide shops, car parking, apartments and a banking hall, and help to forge links between the Commerzbank and the broader community.With its restaurants, cafés and spaces for social and cultural events, it has become a popular pedestrian thoroughfare.Interestingly, on the day the Commerzbank opened, the Financial Times adopted it as the symbol of Frankfurt, just as it features the Houses of Parliament and the Eiffel Tower as symbols of London and Paris.



5.3 Proposition 2065- Urban Porosity by Billard Leece Partnership

Location: Sydney, Australia.

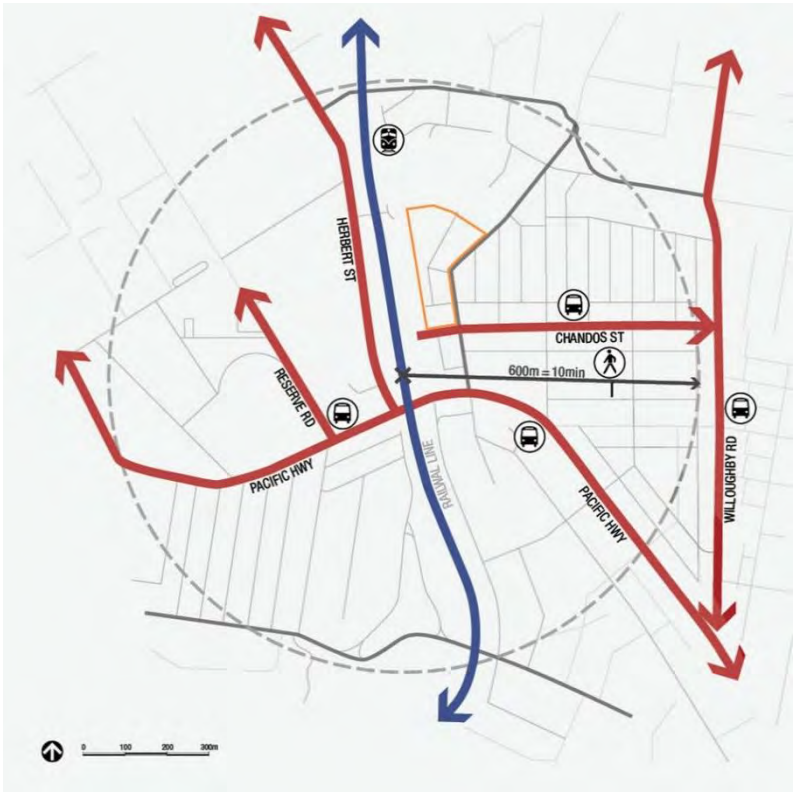
Program:

Mixed use: Office, Shopping, Residential units.

Public: Civic space, Pedestrian paths.

Built area: 29,000 sqm

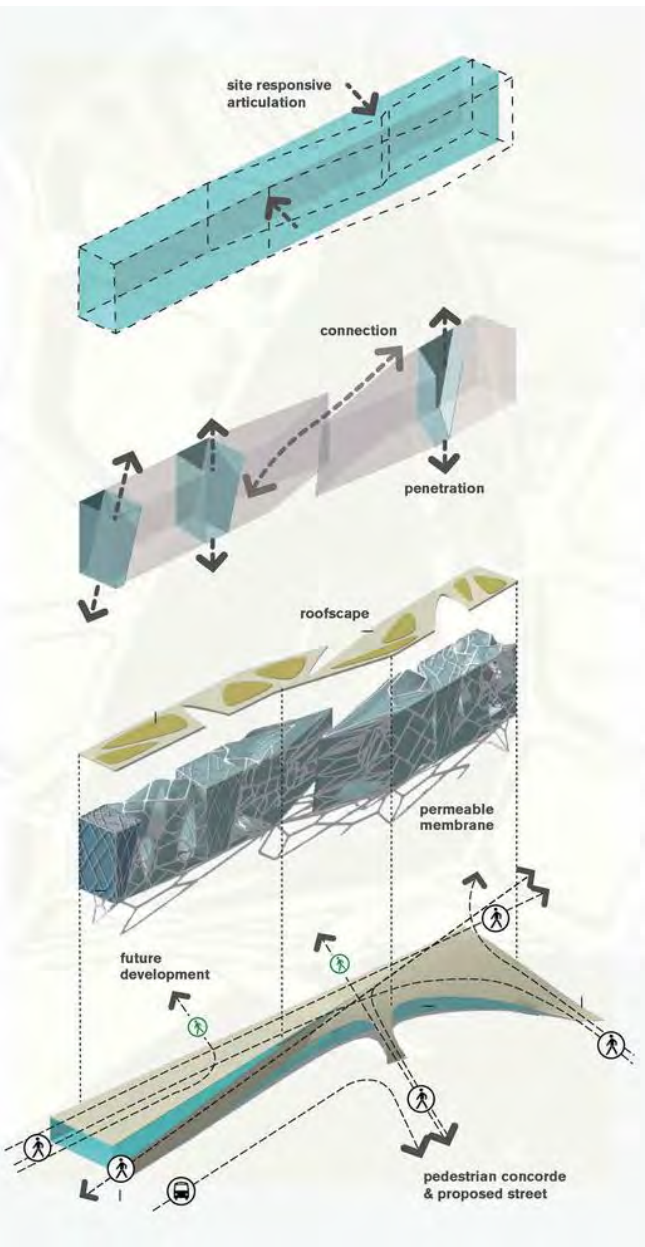
Client: Willoughby City Council, Altomonte Holdings



Description: The concept of this project was to provide pedestrian connections among four streets on the site while also creating new public and commercial space to keep up with the city's central business district's growing requirements.

It also proposes a mixed use building which contains office, residential and commercial spaces. The building is articulated based on site parameters and is wrapped by an exoskeleton which imitates the porosity of the site while allowing for open floor plates. The building is suspended over the site on top of a pedestrian concord. (BLP, 2010)

Significance of the project: This project is important because it shows how a site located in the middle of dense urban development may be used to form new pedestrian connections as well as providing both civic space and new mixed use functions.



CHAPTER 6: DESIGN DEVELOPMENT

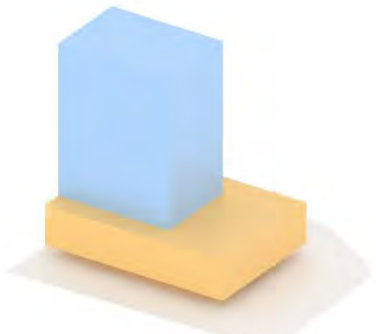
5. 1 Introduction

In this chapter, the design development is explained. Starting from initial form development, to final design drawings and perspectives.

5. 2 Form development

The form was developed by starting with putting commercial and office mass sqft blocks on site, the changing slenderness ration and emptying ground level for community functions, then running wind simulations to shape the building to refine the form with the aim being creating breakout spaces around wind tunnels.

SQFT MASS PUT ON SITE ACCORDING TO CLIENT'S REQUIREMENT



GROUND FLOOR MADE SMALLER TO ACCOMODATE BREATHING SPACE

SLENDERNESS RATIO CHANGED

WIND TUNNELS CREATED BASED ON INITIAL SIMULATION

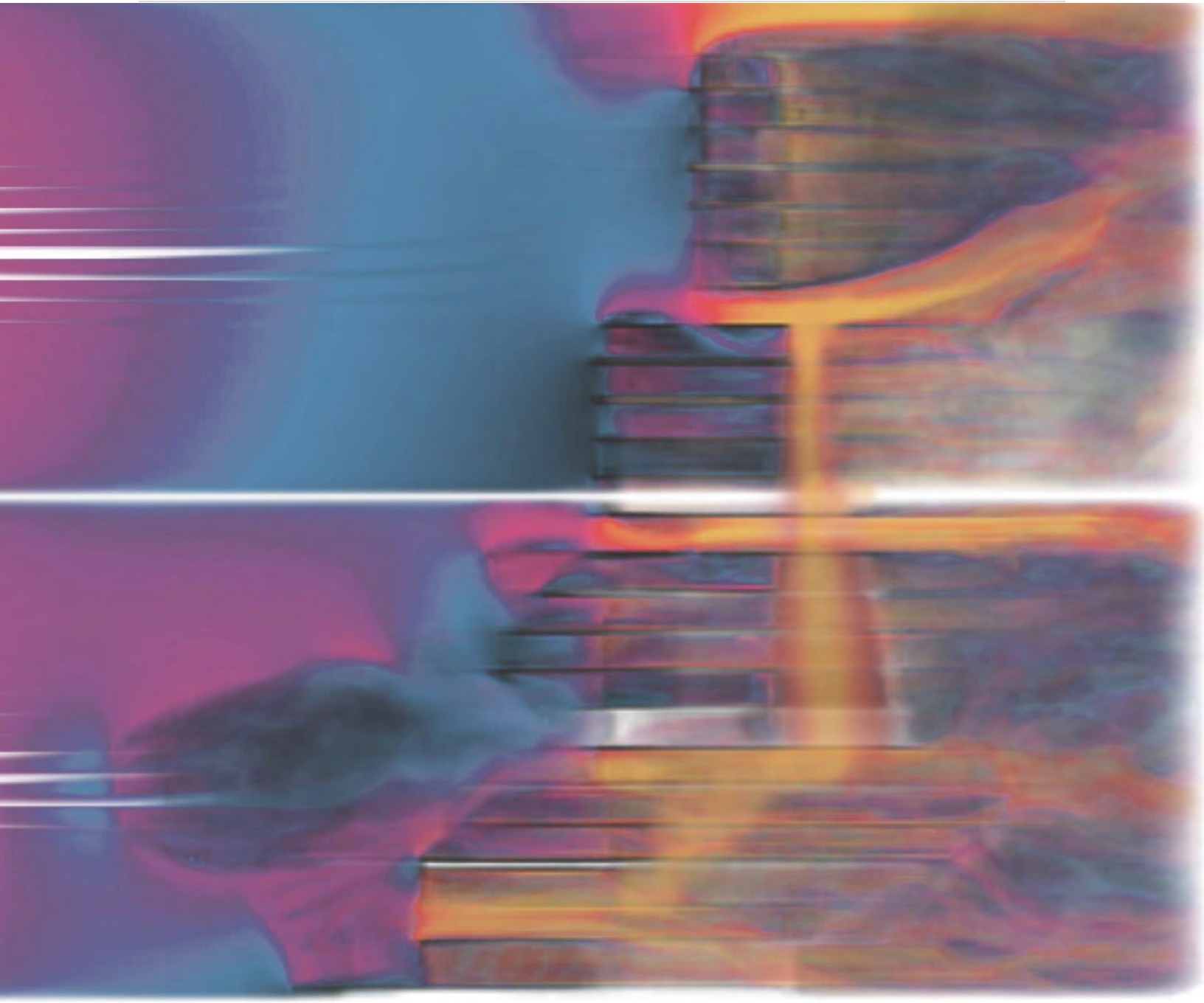
OPTIMISING FORM THROUGH WIND SIMULATION PHASE 2

OPTIMISING FORM THROUGH WIND SIMULATION PHASE 3

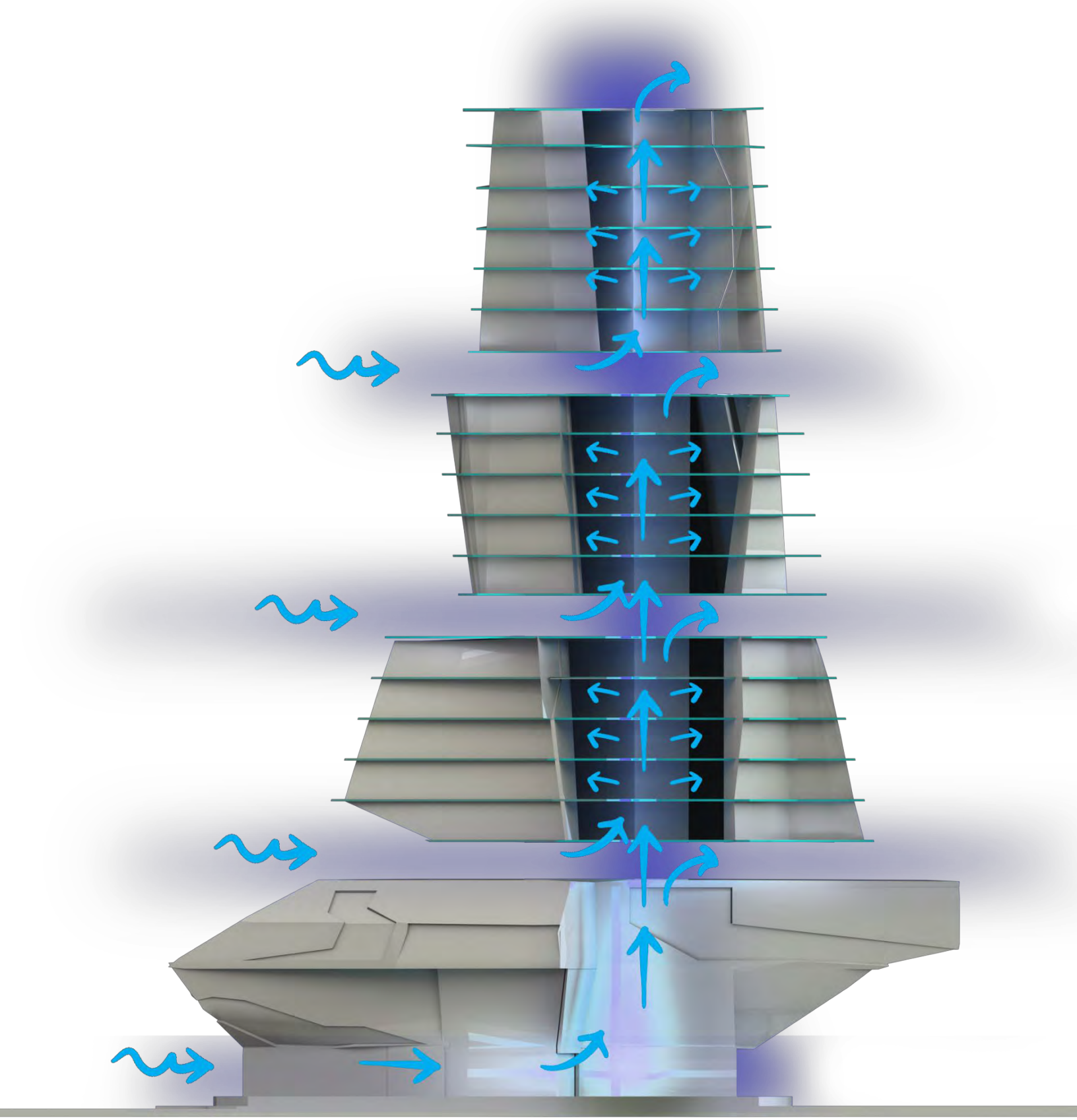
BREATHING SPACE ADDED AROUND PRIMARY WIND FLOW

DETAILED SKIN AND SLABS THROUGH FINAL WIND SIMULATION

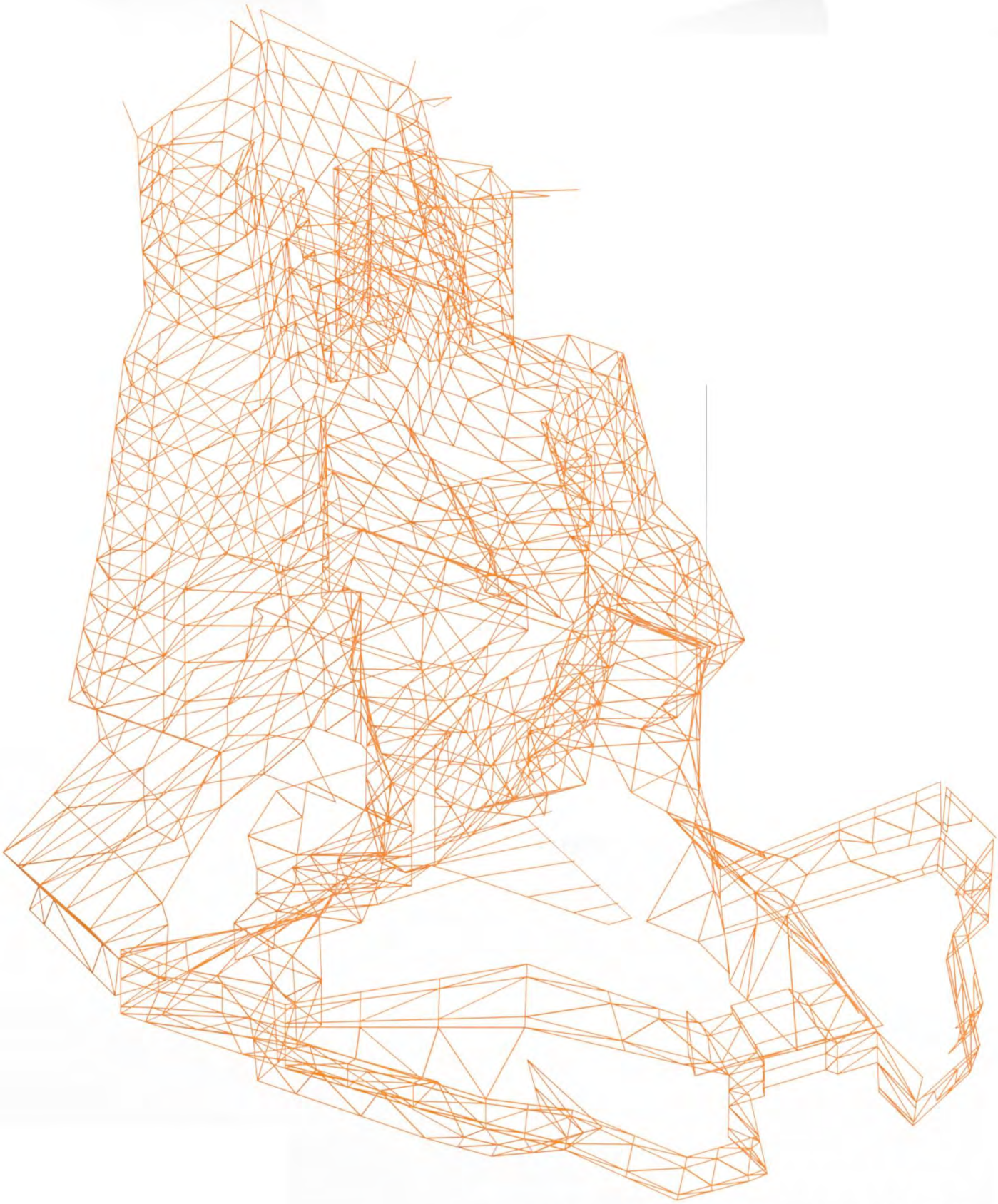
AXOSKELETON IMPLEMENTED AS STRUCTURE



WIND SIMULATION (WIND SPEED)



WIND SIMULATION: WIND FLOW



EXOSKELETON

FINAL MASS

5. 3 Final design

The Ground floor contains plaza with food stalls and kiosks that serve the community.

The commercial portion mainly contains large showrooms and super-shop, with multiple

entrances to serve different commercial pedestrian traffic. While the office section contains lift lobby and lounge surrounded by a glass box.

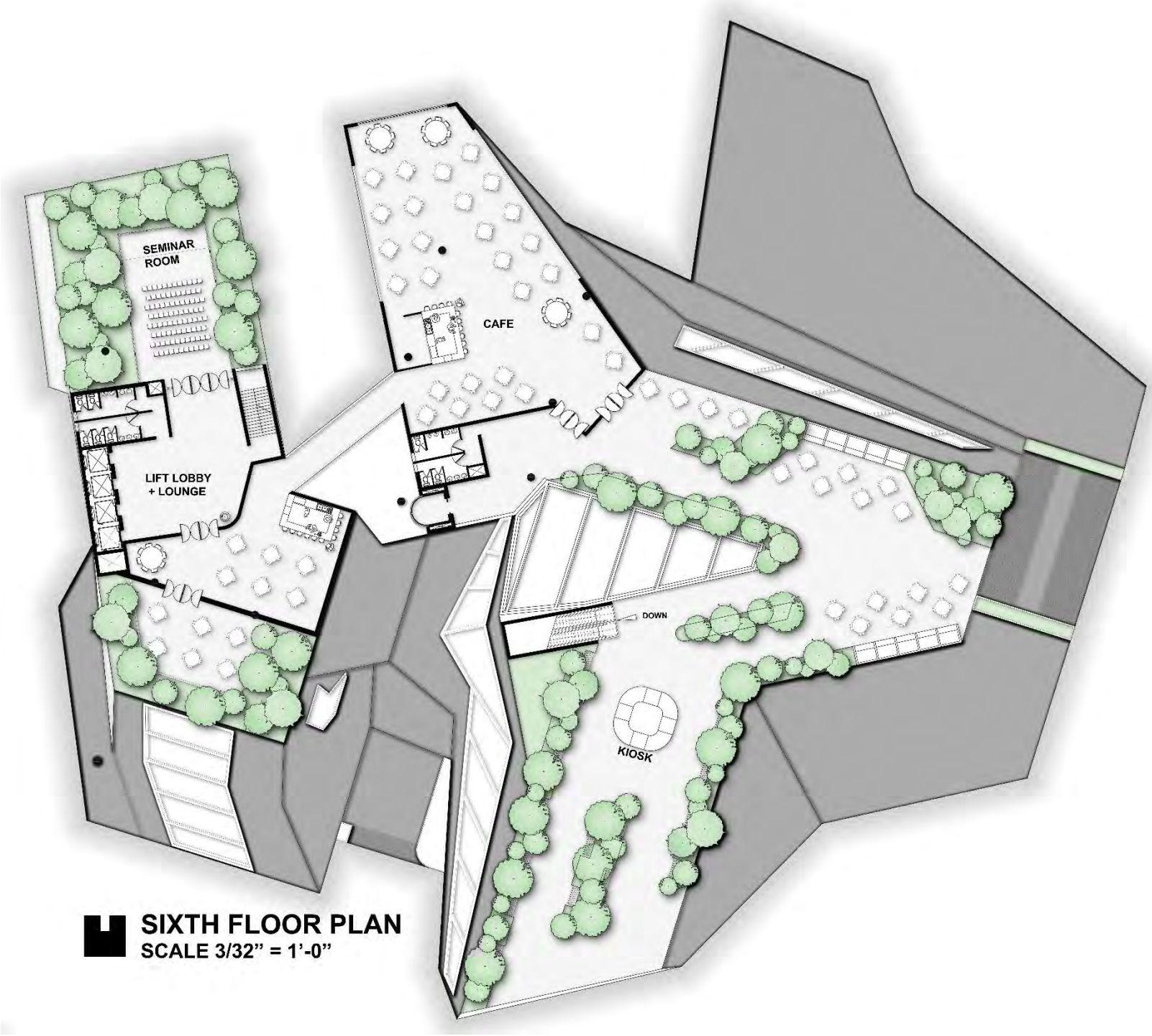
FIRST FLOOR PLAN

SCALE 3/32" = 1'-0"

The first floor contains the main pedestrian access for the office part leading to a double height lift lobby which is connected to the ground floor by another stair. On the commercial area this floor mainly contains showrooms.

SECOND FLOOR PLAN
SCALE 3/32" = 1'-0"

The second floor commercial area sees the start of normal rentable shop spaces. But instead of them being in the periphery they are central to allow for wind tunnels at the edges.



SIXTH FLOOR PLAN
SCALE 3/32" = 1'-0"

The sixth floor contains seminar room and staff cafeteria in the office side and restaurant, kiosks and sitting areas on the commercial site on the roof of commercial mass.

TYPICAL OFFICE PLAN A

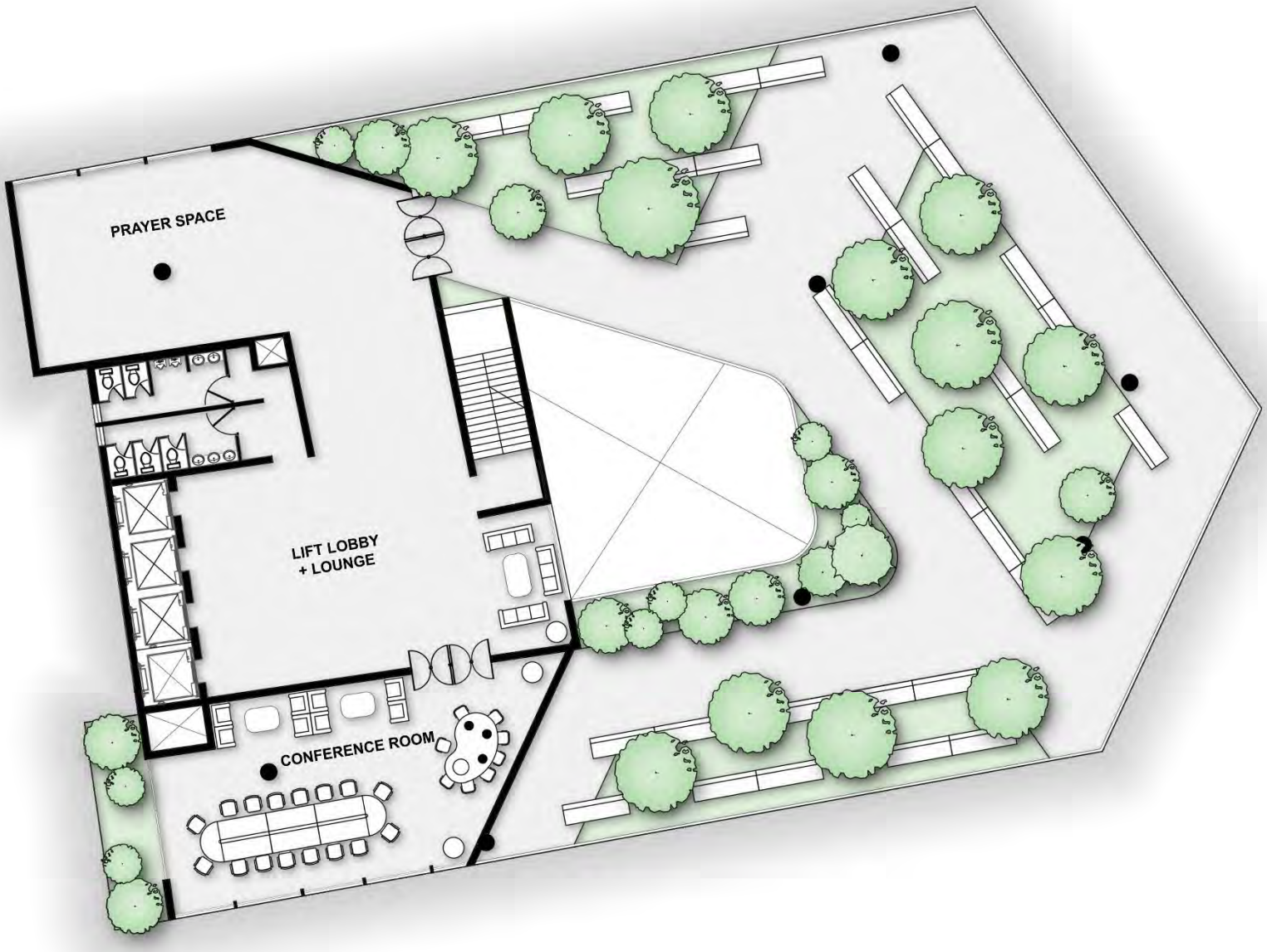
SCALE 3/32” = 1’-0”

TYPICAL OFFICE PLAN B

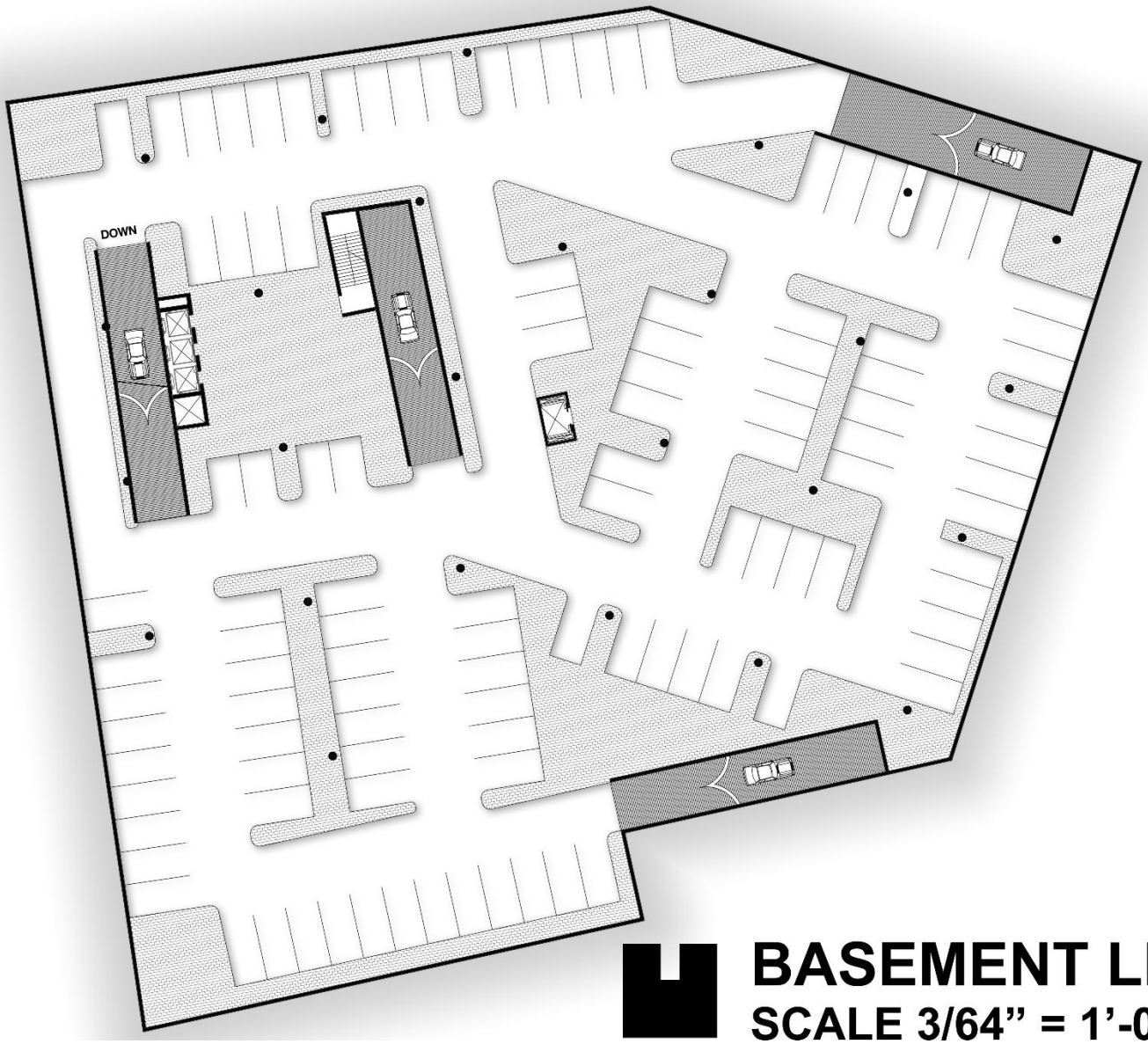
SCALE 3/32” = 1’-0”

TYPICAL OFFICE PLAN C

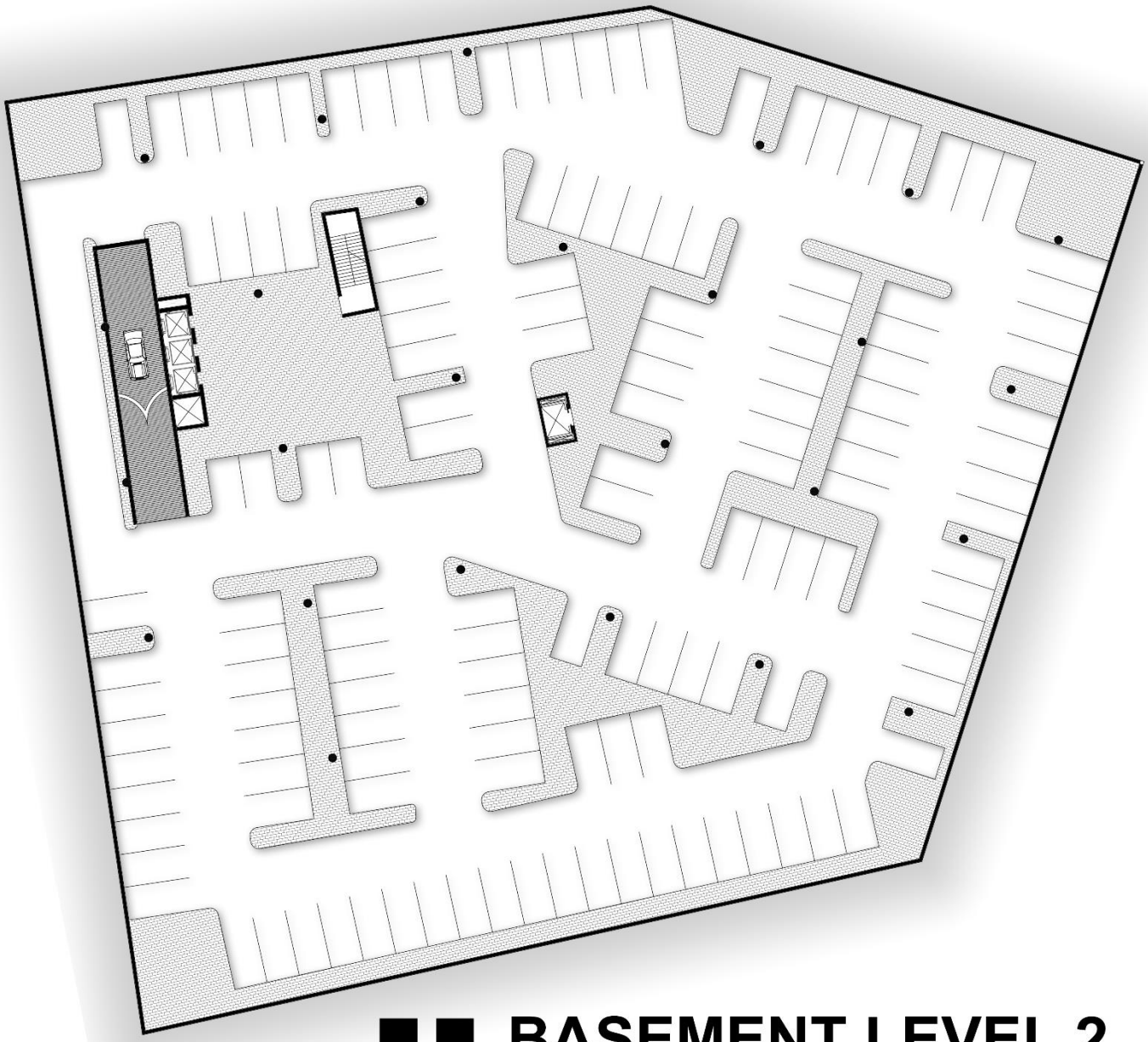
SCALE 3/32” = 1’-0”



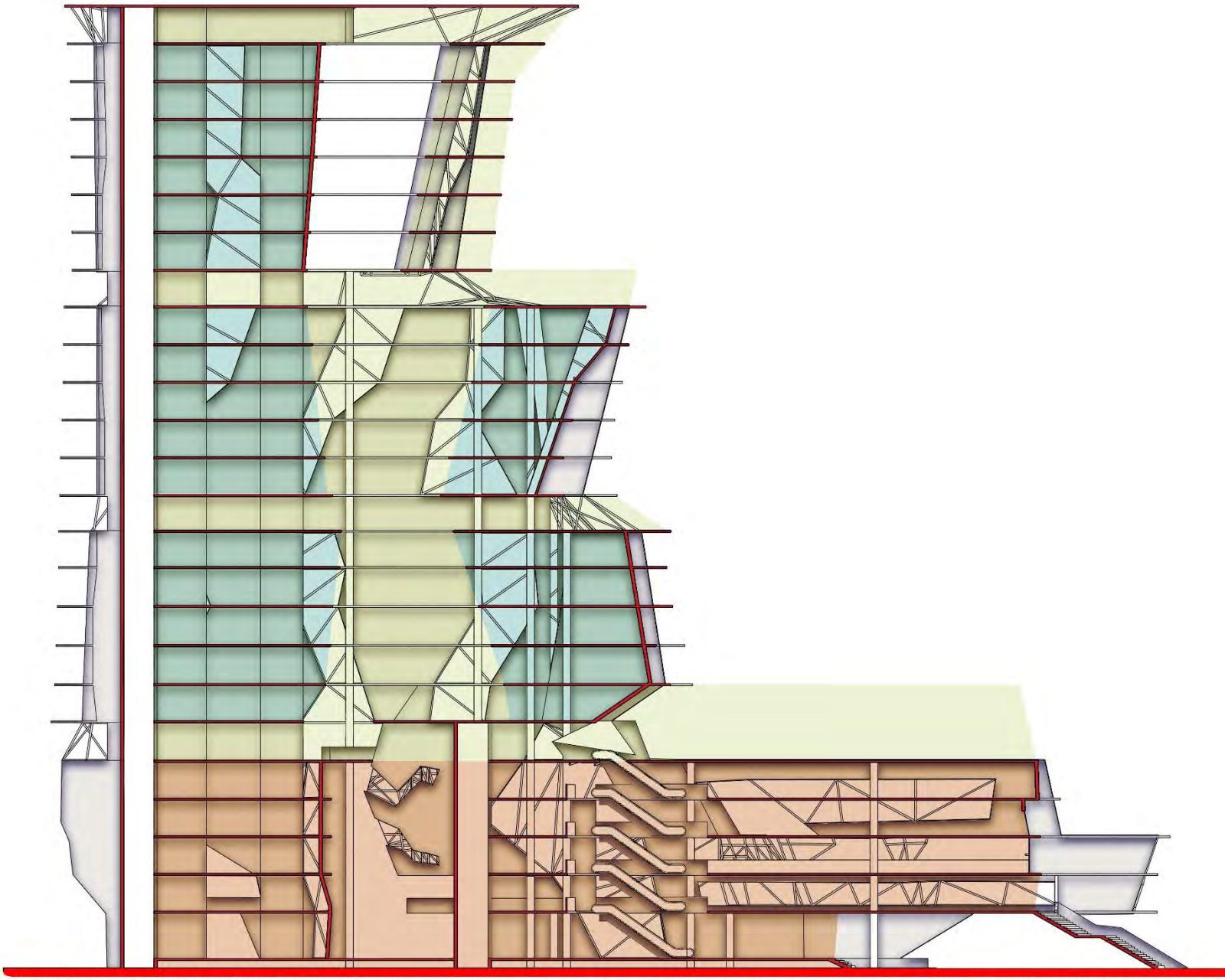
BREATHING SPACE
SCALE 3/32” = 1’-0”



BASEMENT LEVEL 1
SCALE 3/64” = 1’-0”

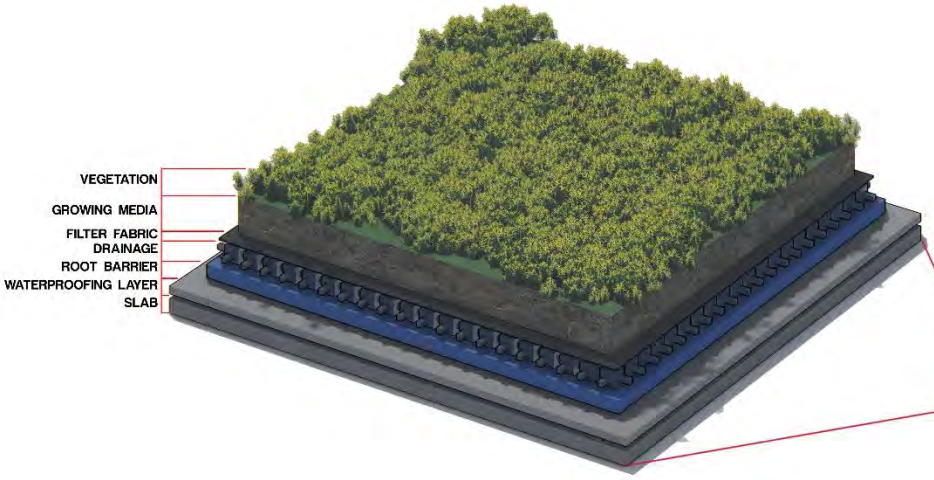


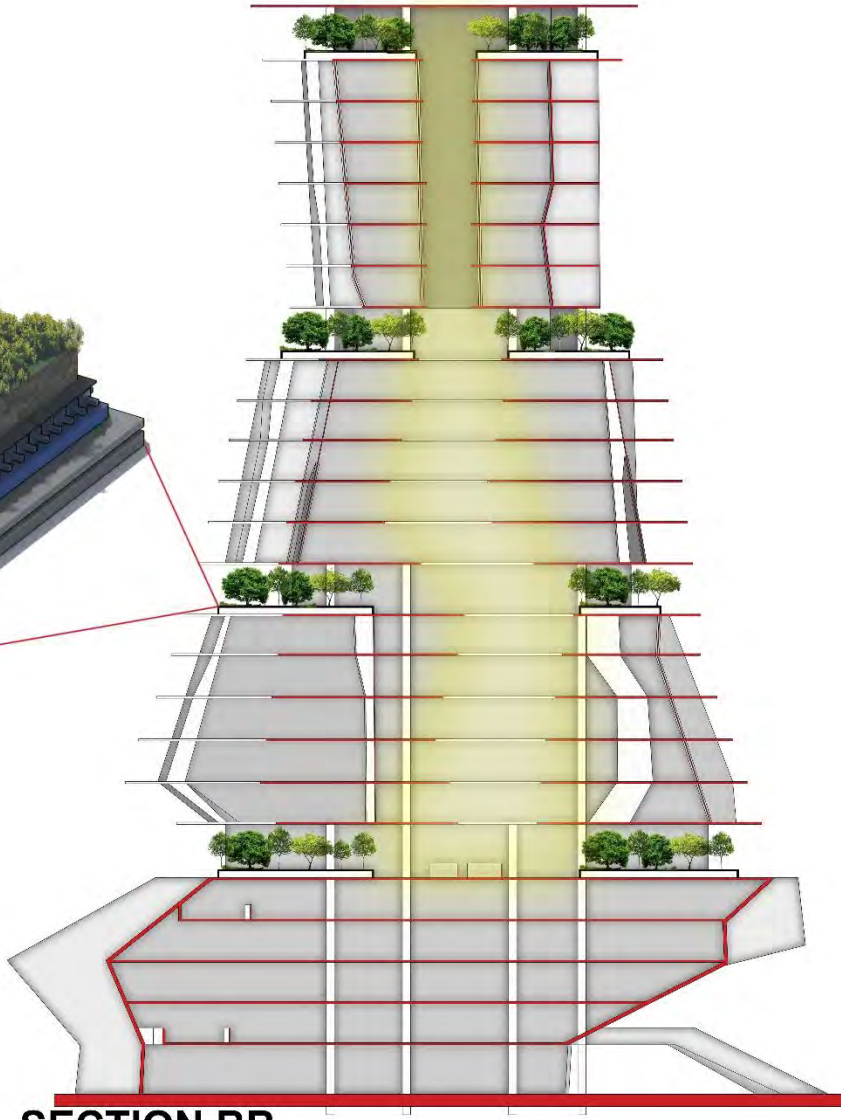
BASEMENT LEVEL 2
SCALE 3/64” = 1’-0”



SECTION AA +Zoning
SCALE 1/16” = 1’-0”

COMMERCIAL SPACE
OFFICE SPACE
BREATHING SPACE





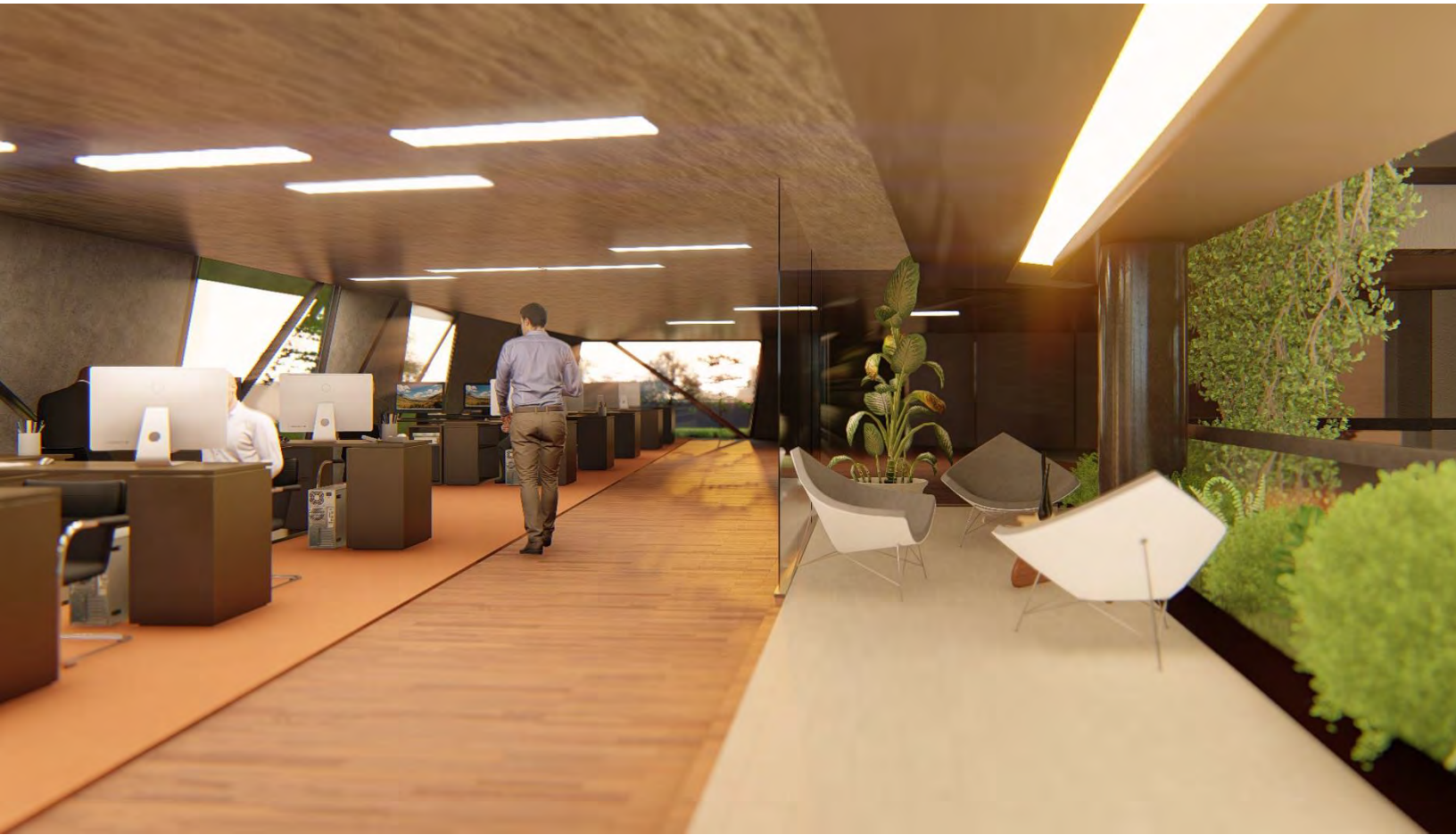
SECTION BB
SCALE 1/16” = 1’-0”

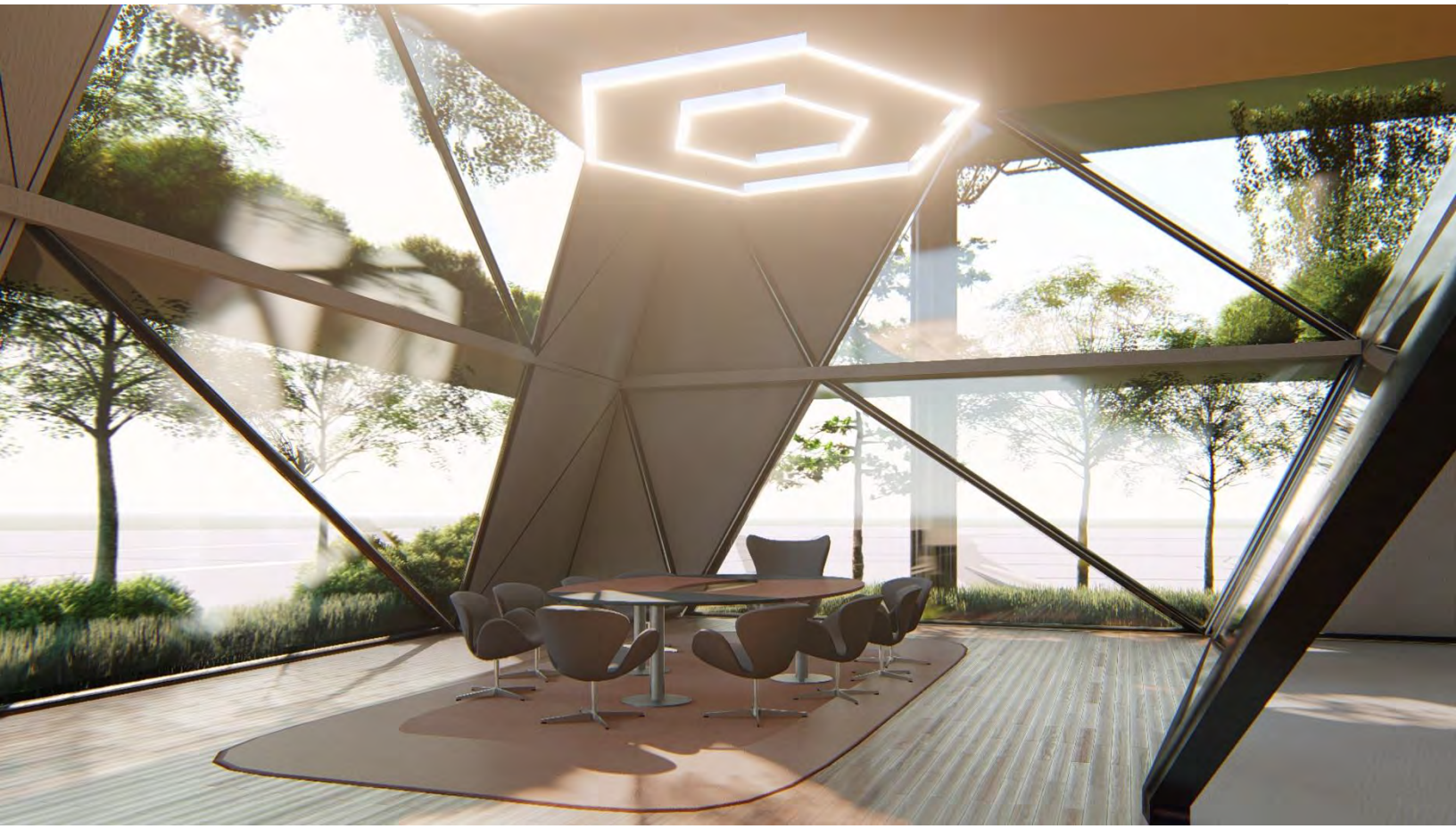
STREET ELEVATION

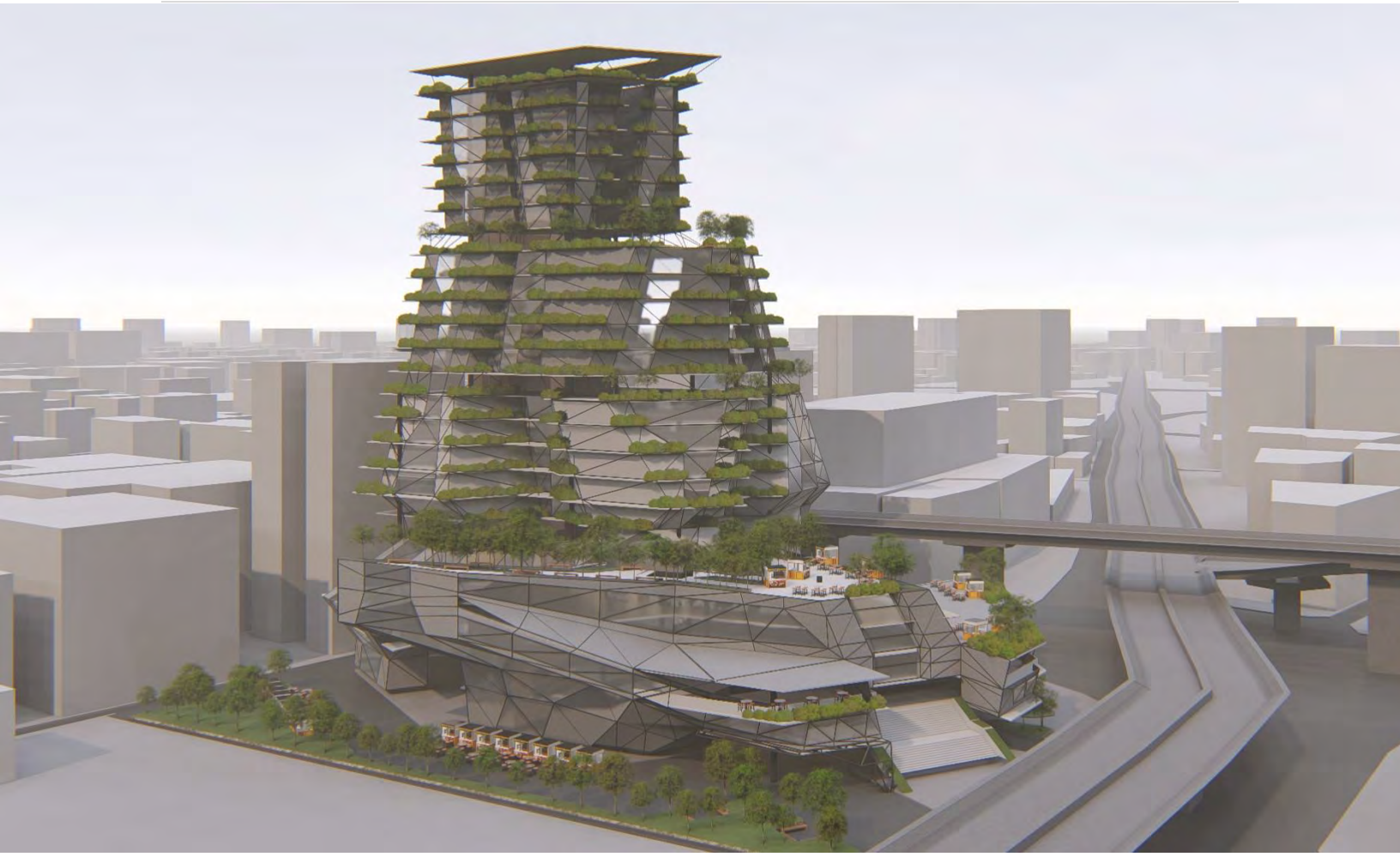

THAI FOOD


Khaleb Shawarma


BAGGY BAGS
LOREN
IPSUM
MATERIA
LINDA
DAVENS







CHAPTER 7: Conclusion

The purpose of this project was to design a context sensitive breathing space among extreme urban density. It will act as a benchmark for designing buildings in similar conditions.

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