



POLITECNICO
DI MILANO

Rethinking urban and commercial space.



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We could say that this proposal is kind of an experiment to study the different possibilities for rethinking a design format or path that almost all the designers in this city, the city of Monterrey, follow to build a shopping center or better said, commercial center, in short words we could say that basically we are talking about a big parking space, even when this sites have also underground parking, retail area and sober colors. What would happened if instead of this we give to the visitor a totally different experience, car free areas, trees and vegetation, color in the environment and, why not, we could add the use of materials that have been used initially for a different purpose than making architecture.

Chapter 1 **Over view**

| | |
|---|---|
| <i>Chapter 1.0</i> Monterrey's Overview | 3 |
| Early history | 4 |
| Middle History | 4 |
| Recent History | 5 |
| Nuevo Leon Today | 5 |

Chapter 2 **Green Areas**

| | |
|---|----|
| <i>Chapter 2.0</i> <i>Green Areas Context</i> | 9 |
| General situation | 10 |
| Monterrey's situation | |

| | |
|-------------------------------|----|
| <i>Chapter 2.1</i> Vegetation | |
| Native Vegetation | 16 |
| Encino Memelito | 17 |
| Olmo | 18 |
| Palo Blanco | 19 |
| Chaparro Prieto | 20 |
| Cenizo | 21 |
| Dodonea | 24 |
| Lantana | 25 |
| Lupino | 26 |
| Native Grass | 27 |
| Veintiunilla | 28 |
| Lechuguilla | 29 |
| Maguey Cenizo | 30 |
| Nopal de Monte | 31 |

| | |
|--|----|
| <i>Chapter 2.2</i> Green Areas Context | |
| Important green areas for our projec | 35 |
| Macroplaza | 35 |
| Santa Lucia River Walk | 37 |
| Fundidora Park | 38 |
| Bikeway and park: Rio Santa Catarina | 39 |

Chapter 3 **City Urban Paths** 43

| | |
|---|----|
| <i>Chapter 3.0</i> Mobility | |
| Urban Structure Analysis | 44 |
| <i>Chapter 3.1</i> Public Transportation Analysis | 46 |
| <i>Chapter 3.2</i> Zooning analysis | |

Index

| | |
|---|-----------|
| General Zoning Analysis | 48 |
| Site Area zoning analysis | 49 |
| Chapter 4 Urban Proposal | 55 |
| <i>Chapter 4.0</i> Traffic lanes Analysis | |
| Lane situation | 56 |
| <i>Chapter 4.1</i> Exclusive Lanes for public Transport Corridors | 57 |
| <i>Chapter 4.2</i> Bicycle paths around the city | |
| Benefits to society | 60 |
| Chapter 5 Introduction to the concept | 63 |
| <i>Chapter 5.0</i> Introduction to the concept | |
| Existing commercial centers and their design paths | 64 |
| <i>Chapter 5.2</i> Paseo Tec | 66 |
| <i>Chapter 5.3</i> Color | 71 |
| Chapter 6 Architectural proposal | 85 |
| <i>Chapter 6.0</i> The project | 86 |
| <i>Chapter 6.1</i> Plans, Sections, Elevations, Details, Schemes | 91 |
| <i>Chapter 6.2</i> Energy strategies schemes | 114 |

1

CHAPTER

[OVERVIEW]

overview

CHAPTER [1]

[MONTERREY'S OVERVIEW]

Situated on the border between Mexico and the United States, Nuevo León is famous for its adventure sports - including rock climbing and rappelling - but most of the state's revenue comes from its ironwork, steelwork and smelting plants.



FACTS

- Capital: Monterrey
- Major Cities (population): Monterrey (1,133,814) Guadalupe (691,931) San Nicolás de los Garza (476,761) Apodaca (418,784) General Escobedo (299,364)
- Size/Area: 24,792 square miles
- Population: 4,199,292 (2005 Census)
- Year of Statehood: 1824

HISTORY

Early History

Anthropological and archaeological evidence suggests that early nomad hunters and gatherers arrived in the area now known as Nuevo Leon as early as 8900 B.C. The state's primary source of pre-Hispanic relics near Mina has yielded over 1,000 engraved stones dating from 1350 to 650 B.C. Evidence suggests that as many as 250 indigenous tribes may have dwelled near Monterrey, Cadereyta and Cerralvo, including the Amapoalas, Gualiches and Gualeguas. When the Spaniards

arrived in the early 16th century, Nuevo León was devoid of large settlements. Most of the natives were still nomadic and traversed the unfriendly Nuevo León terrain on their way to other regions.

Middle History

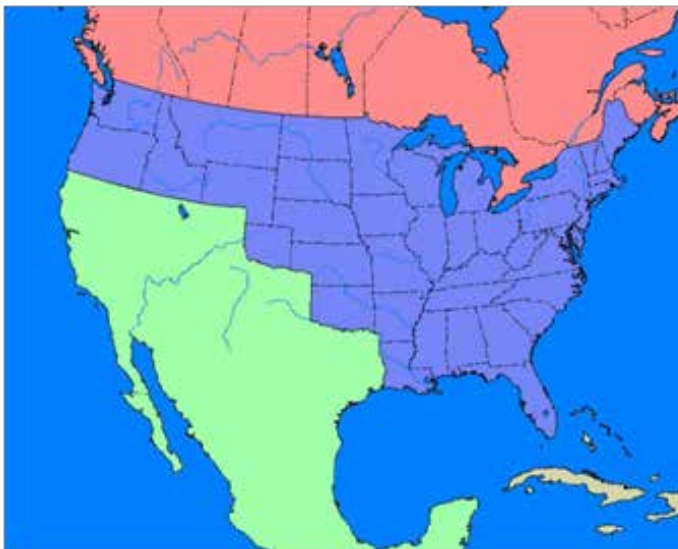
The first Spanish conquistadors to visit present-day Nuevo León were Alvaro Nuñez Cabeza de Vaca around 1535 and Andrés de Olmos a decade later. Alberto del Canto entered the area in 1575 and discovered a valley that he named Extremadura; the city of Monterrey was later built there. Further north, de Olmos also found mineral deposits at San Gregorio. In the early 1600s, Spanish Governor Diego de Montemayor led a new colonization effort in the area. He was joined by Franciscan priests who began converting the indigenous population to Catholicism. By the late 17th century, colonization efforts had been mostly abandoned.



Recent History

In 1811, the independence movement caught on briefly in Nuevo León. After the execution of the popular and powerful priest and revolutionary Miguel de Hidalgo y Costilla, rebellions in the area were brought to a halt. Forces loyal to Spain regained control of the entire region, and it wasn't until after the Plan of Iguala in 1821 that Nuevo León became a province of independent Mexico. In 1824, it became a federal state and a new constitution was adopted.

The rest of the 19th century was marred by political instability and fighting. Conflicts between centralist and federalists and a civil war between liberals and conservatives prevented economic development of the region. The continuous fighting caused social order to deteriorate in Monterrey and other towns. After Mexico ceded its northern territories, including Texas, to the United States, a liberal regime was established that helped bring about much-needed economic development. However, low population density remained a problem for Nuevo León. Towards the end of the 19th century, a new railroad between Mexico City and Monterrey helped promote industrialization.



Nuevo León was an early supporter of the Mexican Revolution. In 1910, revolutionist and presidential candidate Francisco Indalecio Madero were arrested in Monterrey after being accused of fraud by incumbent president Porfirio Díaz. The ensuing protests grew into a revolution later that year, and the revolutionaries eventually gained control of Nuevo León. The state participated in the writing and promulgation of the Mexican Constitution

of 1917. After the end of the revolution, Nuevo León became a cattle ranching state, and Monterrey solidified its position as the most important industrial and financial center in northern Mexico.

Nuevo Leon Today

Nuevo León ranks above all Latin American countries in the Human Development Index, a comparative measure of life expectancy, literacy, education and standard of living developed by the United Nations. The state is the third most industrialized in Mexico, and most residents enjoy a comfortable standard of living. One of its municipalities, San Pedro Garza García, has the second highest per capita income in Mexico.



The industrial structure of the state includes oil refining and heavy and light manufacturing. Nuevo León is one of Mexico's leading producers of iron, steel and chemicals, and Monterrey is home to many large manufacturing companies: Cemex (cement), Bimbo (bakery and pastry), Maseca (food and grains), Banorte (a Mexican-owned bank), Alestra (telecommunications), Vitro (glass), Hylsa (aluminum), FEMSA (Coca-Cola) and Cervecería Cuauhtémoc-Moctezuma (brewers of five beer brands). Nuevo León also has a rich agricultural core, the orange belt, which is made up of the municipalities of Allende, Montemorelos, Hualahuis, General Terán and Linares.

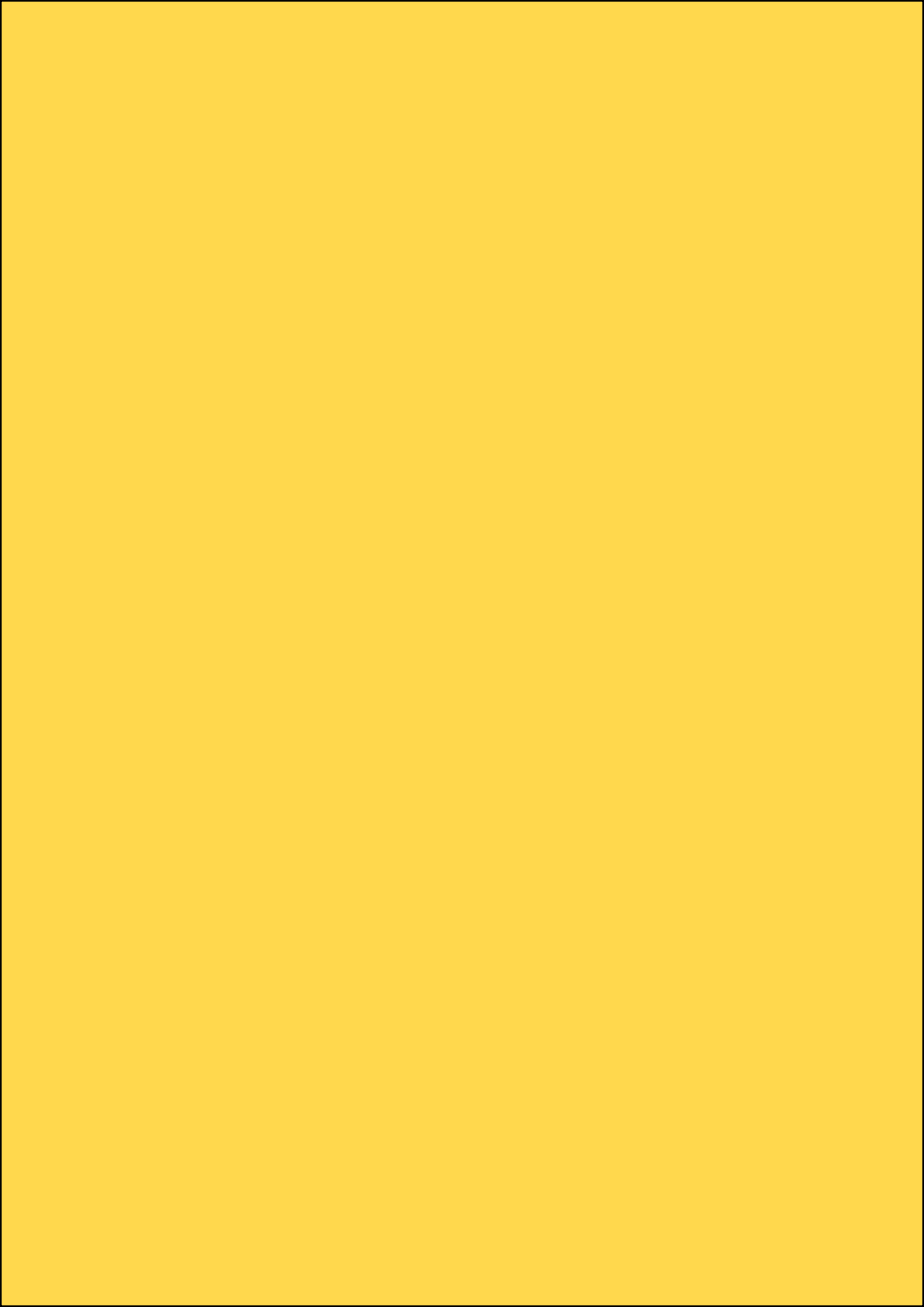
While industrial Nuevo León and the orange belt enjoy economic wealth, the southern part of the state (including the municipalities of Galeana, Arramberri, Zaragoza, Doctor Arroyo and Mier y Noriega) remains poor largely due to climatic and geographic conditions that make the area unsuitable for agriculture and livestock. Manufacturing represents the largest source of the state's economy at 27 percent. Service-based companies represent 22 percent of the economy, followed by trade at 19 percent, finance and insurance at 15 percent, transportation and communication at 11 percent, construction at 3 percent, agriculture and livestock at 2 percent and mining at 1 percent.

Nuevo León is not only an industrial leader, it also promotes culture and supports the arts. From September through December 2007, Monterrey hosted the United Nation's Universal Forum of Cultures. Among the state's museums are the Marco (contemporary art), the Mexican History Museum and the Glass Museum.

Every year, thousands of students from all over the country pour into the capital city to study at the Monterrey Institute of Technology and Higher Education, the University of Monterrey and the Autonomous University of Nuevo León.







2

CHAPTER

[GREEN AREAS]

[GENERAL SITUATION]

INTRODUCTION

Due to the importance of green areas in the quality of urban areas way of life, the world health organization (WHO) recommends that in each city exists, at least, a 9m2 of green area per habitant.

In general, we can observe a tendency between population growth and the reduction of green areas in the cities that are with a high population. The contact with biodiversity, can be consider as an indicator in the quality of life for the habitants of a determinant area, because of this maintaining adequate green space quality and quantity compared to the rapid growth of urban areas is a major challenge for urban planners. The importance of green areas in urban zones lies in the benefits that it brings to the resident population, effects that can manifest in various areas of social character, since the creation or development of ecological awareness to the feeling of safety and physical and mental health of the inhabitants.

MONTERREY'S SITUATION

Is important to clarify the fact that Monterrey is the largest city and capital of the state of Nuevo Leon, México, in 2010 brought together a total of 1,135,512 inhabitants, and it is also the head of the Monterrey metropolitan area, which includes a total of 4,150,000 inhabitants in 2010. The Different cities of Monterrey metropolitan area are very close to each other so it is very common to refer to all as "Monterrey city". However for this study has been taken into account only the official area (1'135,000).



According to the study realize by "Roccalli (2004), green areas in Monterrey occupy a surface of 528.168 hectares. This means that there are 4.8 square meters of green area per inhabitant (in the year of the study population was estimated at 1'100,350 inhabitants).

INEGI census study In 2010 gave as result that Monterrey had a population of 1'135,000 inhabitants. The study of green areas conducted by the Faculty of forestry science, UANL in 2013 says that there are 1,838.75 hectares cover by vegetation inside the area of Monterrey. On a first view if we analyze the satellite image of Monterrey we can note a large area cover by vegetation. However we need to recognize the difference between areas cover by vegetation and green areas.

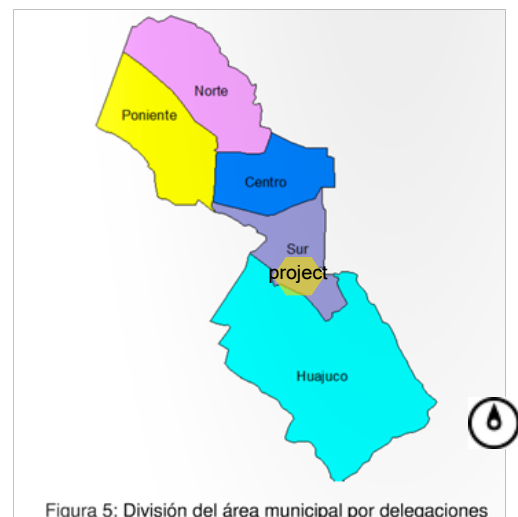
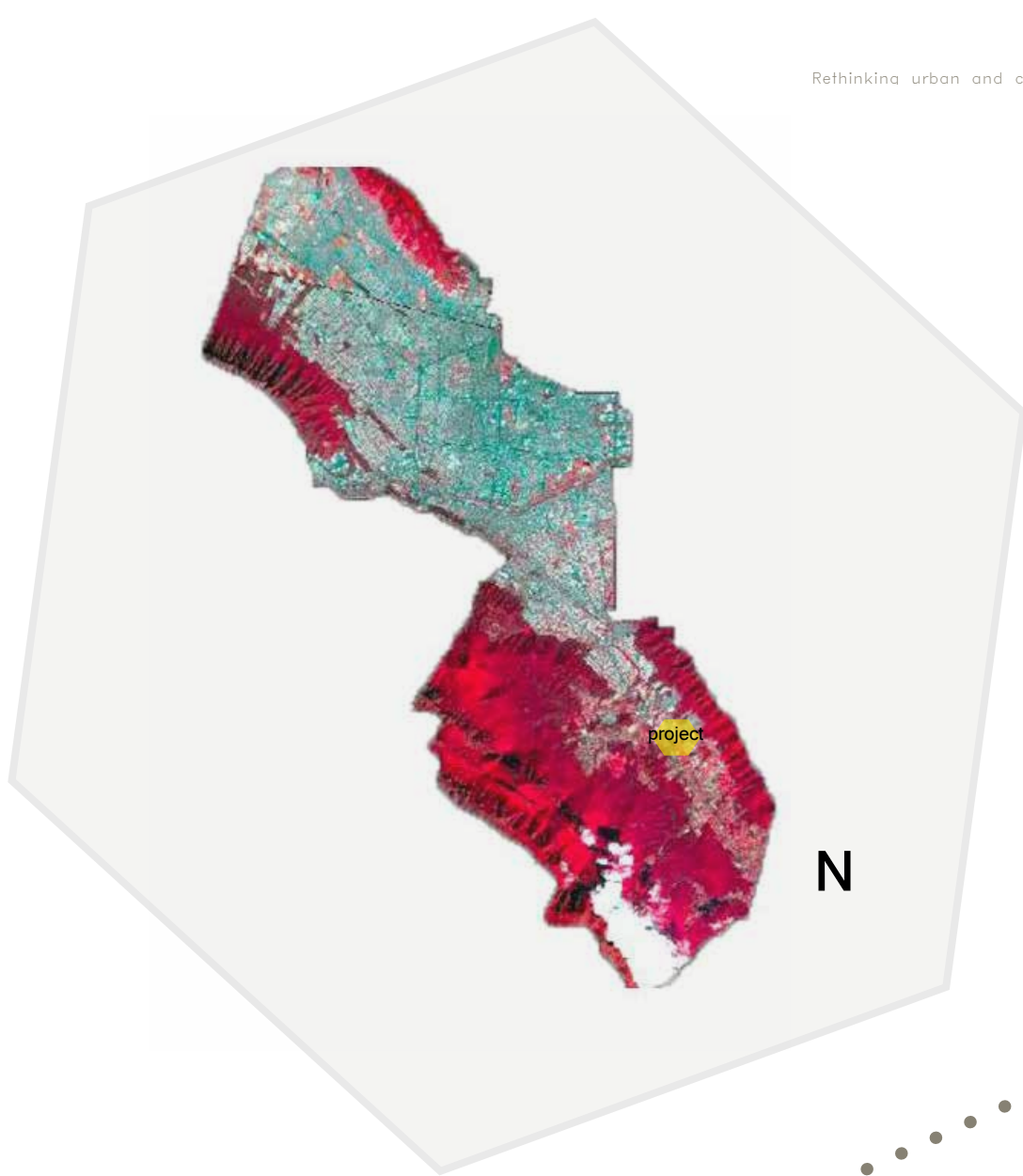


Figura 5: División del área municipal por delegaciones



[VEGETATION + GREEN AREAS]

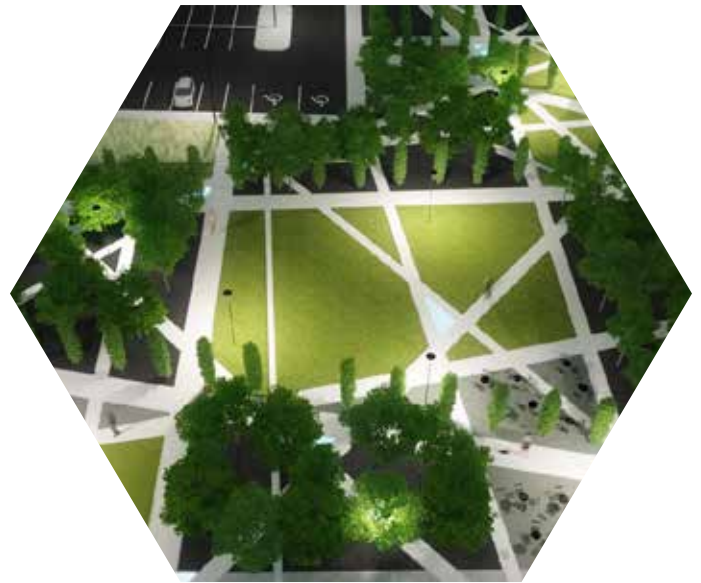


An area cover by vegetation maybe could not be accessible for the population, a “green area” must be a space in which predominates vegetation and at the same time it provides benefits to the population and the urban environment. In the most common benefits we can mention:

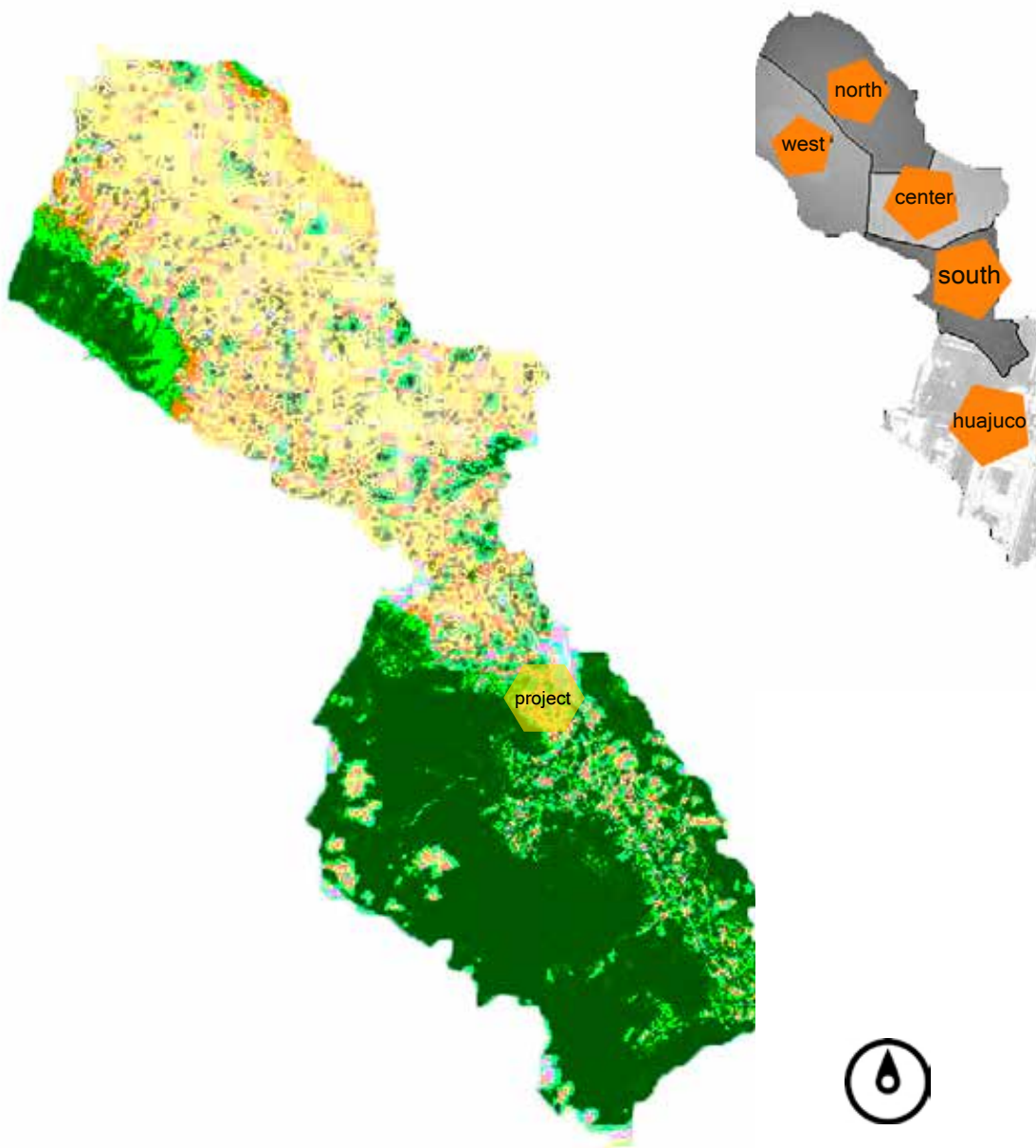
Encourage physical activity, social inclusion and a better quality of life for the population, should provide environmental services such as urban temperature control, carbon sequestration, improved air quality, protection of biodiversity, reduced erosion, flood control, energy saving and noise control. Considering these features only 704.24 of 1838.75 hectares detected initially meet this standard. The rest (1,134.50 He) can only be considered covered by vegetation and areas that are not available for the enjoyment of the population because are private property or has not infrastructure or roads that provide access to them.

Therefore the city of Monterrey has 6.2 m² of green area per inhabitant. This result cannot be interpreted as exceeding 4.8 m² reported by Roccatti (2004) because it must be noted that most of the green areas are concentrated in the south and west of Monterrey, which makes them practically inaccessible areas for the inhabitants of the center and north of the city. The south (including cannon Huajuco) contributes to increase the amount of green areas with a 40.63% of all green areas in the city. This area (south) includes: Col. Independencia, GARZA SADA, Lazaro Cardenas, Satellite and Huajuco and this are within the recommended standards by OMS because it has 9.97m² per inhabitant.

The same situation occurs in the west of the city (Cumbres, Cumbres Poniente, Cerro de las Mitras y San Jerónimo) which provides 32.49% of green areas and 12.78m² of green area per inhabitant. However, the northern region (Cd. Solidaridad, Cerro del Topo chico, Mitras Norte, San Bernabé y Valle Verde) has only 2.63m² per capita, which is well below the international standard. The same applies to the downtown area (Centro, Ind. Moderna, Mitras Centro y Obispo) that count only with 3.48m² per inhabitant.



| ZONE (ha) | AREA WITH VEGETATION (ha) | GREEN AREAS (ha) | INHABITANTS | GREEN AREA PER INHABITANT (M ²) |
|-----------|---------------------------|------------------|-------------|---|
| NORTH | 195.834 | 134.69 | 513,093 | 2.63 |
| WEST | 304.446 | 228.82 | 178,907 | 12.78 |
| CENTER | 186.941 | 54.57 | 156,458 | 3.48 |
| SOUTH | 447.28 | 286.15 | 286,892 | 9.97 |
| TOTAL | 1134.50 | 704.23 | 1,135,350 | 6.2 |



In recent decades the city of Monterrey has had a more orderly growth than in the past. However, its initial setup and the lack of an initial development plan make it virtually impossible to create new green areas within the city. For this reason,

It is proposed to concentrate efforts on increasing the quality of existing green areas in the city center.

Also, is important to control the growth of the city to the south and west as the creation of new housing complex and population growth will in

crease in the coming years, this could make this area to be located below the international standard.

The goals to be achieved in terms of green area (9m² per inhabitant), number of mature trees required to achieve 9m² of green area per inhabitant, deficit of green areas in the city of Monterrey are shown on Table 2.

We can observe that the priority zones where is needed the location of green areas are the north and center of the city, as shown in the table.

| Zone | Required area to achieve 9 m ² per inhabitant. | Deficit of green areas. | Number of mature trees required to achieve 9 m ² /inhabitant. |
|-------------------|---|-------------------------|--|
| NORTH | 461.78 | 327.09 | 204,431 |
| WEST | 161.01 | ----- | ----- |
| CENTER | 140.81 | 86.32 | 53,950 |
| SOUTH AND HUAJUCO | 258.20 | ----- | ----- |
| TOTAL | 1021.80 | 413.41 | 258,381 |

Table 2. Number of mature trees required to achieve 9m² of green area per inhabitant.



In a comparative way the results of green area per inhabitant in some cities are presented:

| CITY | AREA/INHABITANT (m ²) |
|------------------------|-----------------------------------|
| Curitiba, Brasil | 52 |
| Rotterdam, Netherlands | 28.3 |
| New York, USA | 23.1 |
| Madrid, España | 14 |
| Toronto, Canada | 12.6 |
| Paris, Francia | 11.5 |

Table 3. Cities with more green areas per inhabitant

| CITY | AREA/INHABITANT (M ²) |
|-------------------------|-----------------------------------|
| Buenos Aires, Argentina | 1.9 |
| Tokio, Japan | 3 |
| México City, México | 3.5 |
| Monterrey, México | 6.2 |

Table 4. Cities with less green areas per inhabitant

[TORONTO,CANADA]



[MEXICO CITY, MEXICO]



[MADRID, ESPAÑA]



[MONTERREY,MEXICO]



vegetation

CHAPTER [2.1]

[NATIVE VEGETATION]

In a city like Monterrey where the weather is so extreme, it is important to think about the type of vegetation that could be used in this area.

Throughout the decades, the trees have also had seasons in which certain species have become fashionable. So in the 70 large urban and rural plantations of eucalyptus (*Eucalyptus* spp.) were performed. Then followed urban plantations ash (*Fraxinus* spp), Laurel India (*Ficus microcarpa*), Ficus (*Ficus benjamina*), Thunder (*Ligustrum japonicum*), all these species are considered non-native, but by rapid growth were chosen without full knowledge of their biology, or the problems of their origin, would bring to the streets, sidewalks, buildings and green areas in general.

These trends in reforestation have brought catastrophic consequences when environmental contingencies were presented, as in the case of the

cold wave that hit the northern states of Mexico in February 2011, where in cities like Chihuahua were recorded at temperatures below -20°C , freezing temperatures that ended with all the trees in the city, mostly composed by Eucalyptus. This problem could have been avoided if they had selected native species adapted to the local weather.

Next is shown a special selection of native vegetation appropriate for our project. This selection has been made searching in this case for a low cost maintenance as well as a good shadow projections for the project, taking into account that in an open space located in Monterrey these aspects are specially important due to the weather as we mentioned before.



1

ENCINO MEMELITO

QUERCUS LACEYI SAMLI

It is a tree of minimal maintenance and high resistance.

From August to October this Encino presents green acorns.

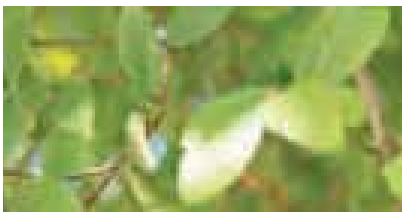
| | |
|-----------------------------|------|
| 2 | OLMO |
| <i>QUERCUS LACEYI SAMLI</i> | |



Elm meets ideal to be planted in a parking characteristics, for there to sweep the leaves, the fruit does not stain, gives ample shade and requires little maintenance. However, needs its lower branches are pruned, because they can grow down, hampering the use of space under the canopy.

3

PALO BLANCO

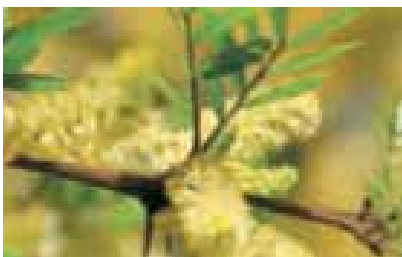
CELTIS LAEVIGATA WILD

The white stick gives a wooded aspect to a landscape without expected decades. In situations where the effect of foliage height required promptly, this species may be good option.

4

CHAPARRO PRIETO

ACACIA VIGIDULA BENTH



Their general appearance is arid nature, but his exuberance Spring gives a more tropical character. His landscape potential maximum is obtained if allowed its natural, branched and with several trunks, growth performing pruning only to cause a bloom more intense, rocky landscapes or semi desert

5

CENIZO

LEUCOPHYLLUM FRUTESCENS BERL.

His sensitivity to rain and their ability to cope with its absence allows the ash to be used as a kind of low maintenance, while the aesthetic benefits are obtained in a garden high watch out.

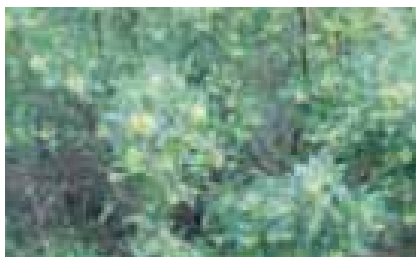
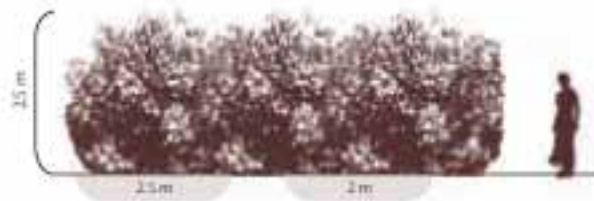




6

DODONEA

DODONAEA VISCOSA JACQ.



The main feature of this species is its unusual resistance to drought. This is because the resin layer of the sheets which prevents loss of water. As a result the Dodonea is an excellent shrub with great potential in the landscape urban. Its foliage is evergreen and tone of their leaves shown young, bright

7

LANTANA

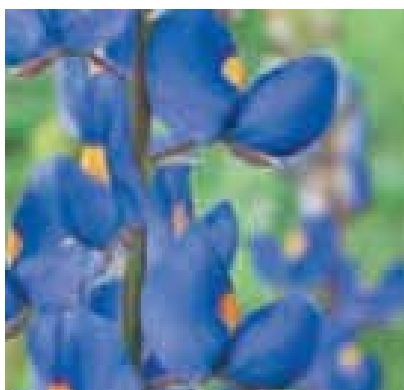
LANTANA CAMARA L.

Lantana has a high potential landscape. Their resistance high temperature and relatively low maintenance requiring much appreciated-even when watering constantly make it ideal for large areas of the mood landscaping, creating chromatic turn carpet. They are always full of life. You can also establish more specific details, although the individual is very irregular and unattractive in winter.

8

LUPINO

LUPINUS TEXENSIS HOOK.



At first glance lupine plant is always Green whose height does not exceed fifty centimeters. You can quickly cover the ground giving it life adverse weather conditions, since the requirements of Lupine water are minimal. It is recommended in areas of intense sun and if planted in a soil for the first time is beneficial because it injects nitrogen to land, allowing better rooting lupine.

9

NATIVE GRASS

BOUTELOUA CURTIPENDULA, GRACILIS, DACTYLOIDES



At first glance lupine plant is always Green whose height does not exceed fifty centimeters. You can quickly cover the ground giving it life adverse weather conditions, since the requirements of Lupine water are minimal. It is recommended in areas of intense sun and if planted in a soil for the first time is beneficial because it injects nitrogen to land, allowing better rooting lupine.

9

VEINTIUNILLA

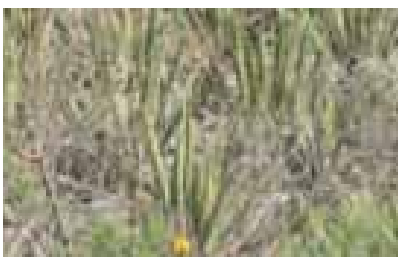
ASCLEPIAS CURASSAVICA L.



The veintiunilla has flowers almost all year round and most abundant form in autumn. usually attract many fans to be home and food of the monarch butterfly. However, should limit its use since it requires moist soil and regular watering.

10

LECHUGUILLA

AGAVE LECHEGUILLA TORR.

This species is found in the ideal vegetable repertoire for green roofs, urban spaces usually are affected by similar conditions to the desert, such permanent sunshine, strong winds and soil loss.

11

MAGUEY CENIZO

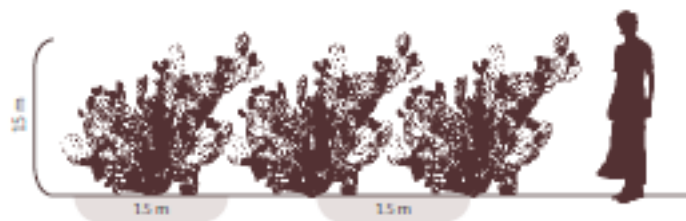
AGAVE AMERICANA L.



Like all desert species, maguey survives to drought and requires no maintenance, is only necessary to equip it with the space required for develop fully. A lone maguey may represent a visual detail in residential gardens and in some cases, commercial.

12

NOPAL DE MONTE

OPUNTIA ENGELMANNII SALM-DYCK

Because of their numerous spines pads is recommended that this species be planted in areas well defined outside the pedestrian circulation. In turn, public green areas can serve broader physical and visual barrier, since at maturity can measure up to eight feet tall.



Native vegetation is ideal for green roofs due to its low maintenance requirements.



Monterrey has a great potential to locate species of trees, shrubs and creeping plants which can increase the density of green areas in the city like: existing spaces, medians of avenues, sidewalks, parks, plazas and new areas that have opportunity to be planned / designed with features that become green areas according to international standards.

There are very successful examples where even in small areas such as medians or important avenues have been conducted tree planting projects, such as Calzada and Calzada del Valle San Pedro, in the municipality of San Pedro Garza Garcia, NL (Monterrey metropolitan area) in which the long-lived but even healthy trees, encourages endless recreational activities and outdoor recreation that attracts residents from nearby areas such as Monterrey.



[IMPORTANT GREEN AREAS FOR OUR PROYECT]

like the Metropolitan Cathedral of Monterrey.

Macroplaza is currently under remodeling, the image below shows the current project and in the next page we can see the new proposal already UNDERCONSTRUCTION.

INTRODUCTION

Now we will describe a series of green areas close to the project. These areas will be connected by bike paths proposed in the urban redefinition of our project. For this reason it is important to describe each one. This green areas are very popular between Monterrey's society, this places are an important key in the lives of the inhabitants of this city.

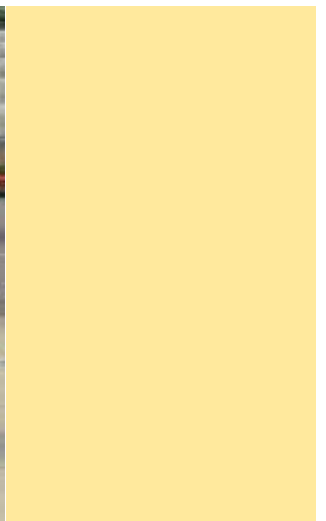
1) MACROPLAZA

The "Gran Plaza" was built in the 1980's. It is 40 hectares in length and it is considered as one of the biggest plazas in the world. It starts at the "Explanada de los Heroes" where the neo-classical style of the State Government Palace building stands out.

Around the Macroplaza we can find several museums such as the MARCO (Contemporary Art Museum), the Government Palace Museum, the Metropolitan Museum of Monterrey, the Mexican History Museum, and many beautiful old facades inside the Barrio Antiguo (Old Quarter). There are also many beautiful Churches

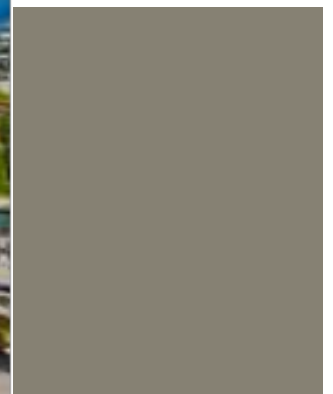


New Macroplaza project under construction:



2) SANTA LUCIA RIVER WALK

THE SANTA LUCIA RIVER WALK IS ONE OF THE MOST POPULAR PLACES FOR VISITORS THAT HAVE COME TO THE CITY FOR A VACATION, TO DO BUSINESS, OR TO PARTICIPATE IN THE GREAT NUMBER OF CONGRESSES AND CONVENTIONS CELEBRATED DURING THE YEAR. ITS PROMENADE STARTS AT THE "OJOS DE AGUA DE SANTA LUCIA" WHERE THE CITY OF MONTERREY WAS FOUNDED. THROUGH ITS LENGTHY PASSAGEWAY OF 2.5 KILOMETERS, IT CONNECTS THE MACRO PLAZA AT THE MEXICAN HISTORY MUSEUM ALL THE WAY TO THE PARQUE FUNDIDORA. IT HAS A DEPTH OF 1.20 METERS, WITH A CAPACITY OF 44 THOUSAND CUBIC METERS OF WATER. IN THE PROMENADE YOU WILL FIND 10 BEAUTIFUL PEDESTRIAN BRIDGES BETWEEN THE CORRIDORS, AND YOU CAN ENJOY THE BEAUTY AND TRANQUILITY OF THE 22 FOUNTAINS LOCATED ACROSS THE CANAL. THE MOST FAMOUS FOUNTAIN IS THE ONE LOCATED ON THE MAIN LAKE; IT IS CALLED THE WAVES FOUNTAIN (FUENTE DE LAS OLAS).



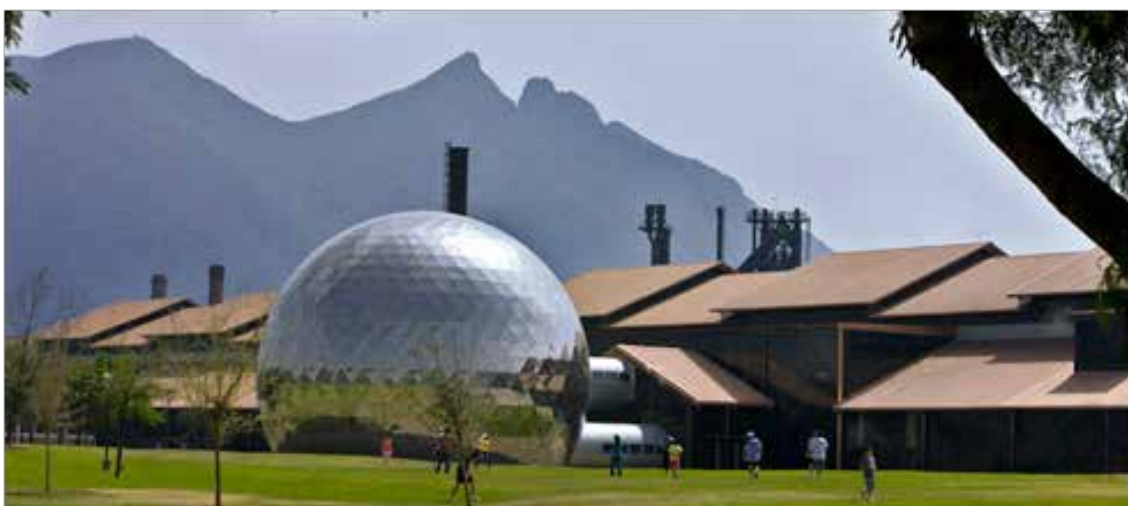
3) FUNDIDORA PARK

The company "Fundidora de Fierro y Acero de Monterrey S.A." (Steel and Iron Smelting Co) was created on May 5, 1900. The Governor Bernardo Reyes authorized the operations of this company, which was established in a large field close to the downtown area where sport facilities, housing, and educational institutions were built and provided as facilities for the workers.

This company has a significant historic value to the city, due to its influence during the transformation process of Monterrey where it became an industrial leader. Since 1988 it has been a very important public park and industrial museum with an abundance of recreational and cultural activities. Inside the park you can find CINTERMEX (a world renowned convention and exhibition center), the "Auditorio Fundidora", with a 20,000 people capacity, and the "Arena Monterrey". As well as many other facilities that have been host to great events, such as the Universal Forum of Cultures Monterrey 2007.

In addition, it is a recreational park where you can find an ice skating center, an aviary, a baseball field, kid's play areas, "Plaza Sésamo" theme park, lakes, and an international speedway facility which is used daily for runners, bikers, and people of all ages.

Cultural places located in this park are very diverse. Here you can enjoy national and international events. As well as: art museums, the Arts Center Theater (an alternative movies theater), and the recently inaugurated "Museo del Acero" (Steel Museum), which shows the origin and history of the steel industry in Monterrey.



4) BIKEWAY AND PARK: RÍO SANTA CATARINA

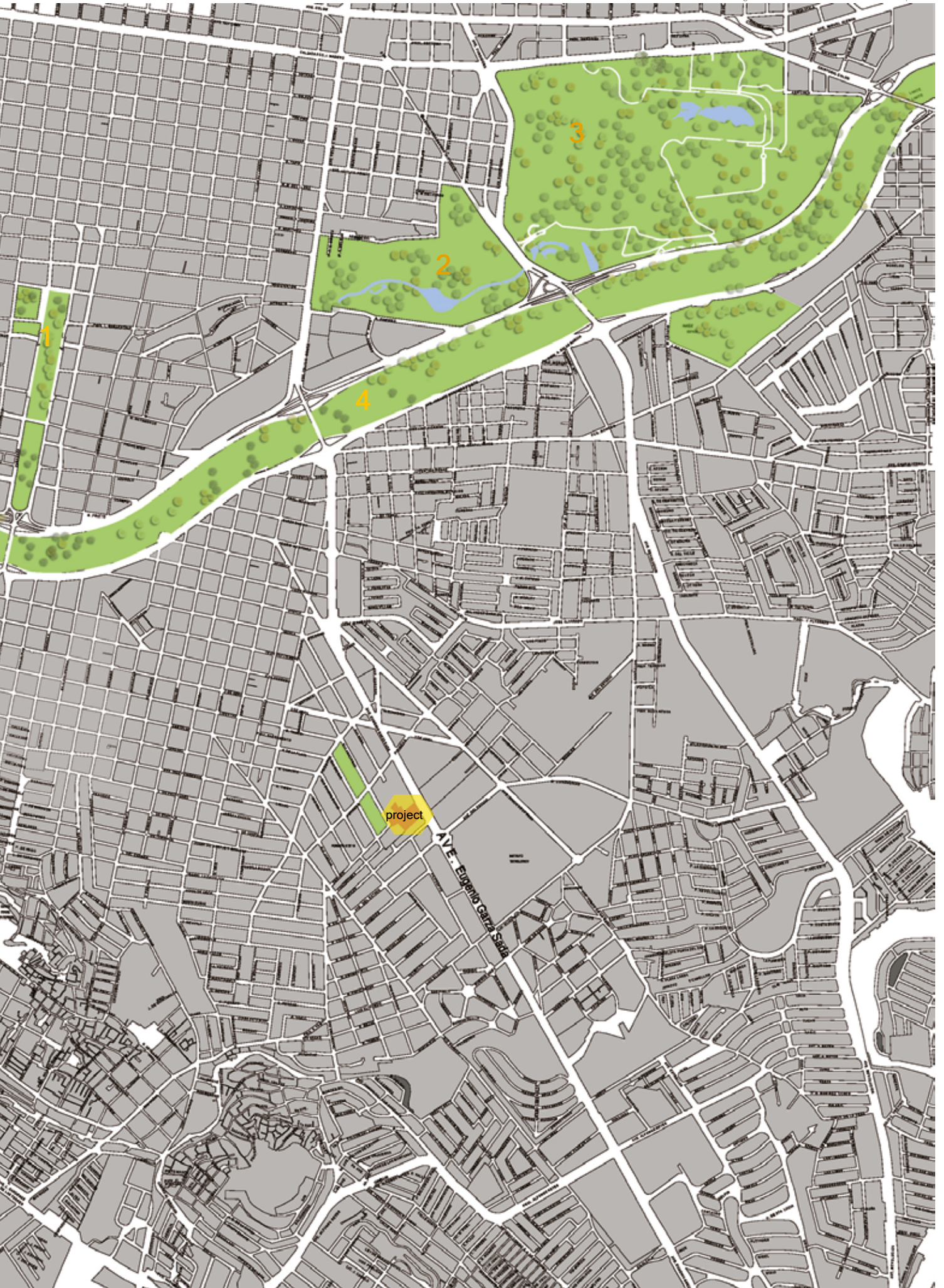
This is a 11.99 km Bike Ride in Monterrey, Mexico. The Bike Ride has a total ascent of 3.0 m and has a maximum elevation of 601.0 m. This route was created by hyperlacteo on 09/22/2009. Along the bike path, we can find many places to practice sports, from athletics, football, golf, etc.





IMPORTANT GREEN AREAS FOR OUR PROYECT

- 1) MACROPLAZA
- 2) SANTA LUCIA RIVER WALK
- 3) FUNDIDORA PARK
- 4) BIKEWAY AND PARK: RÍO SANTA CATARINA



3

CHAPTER

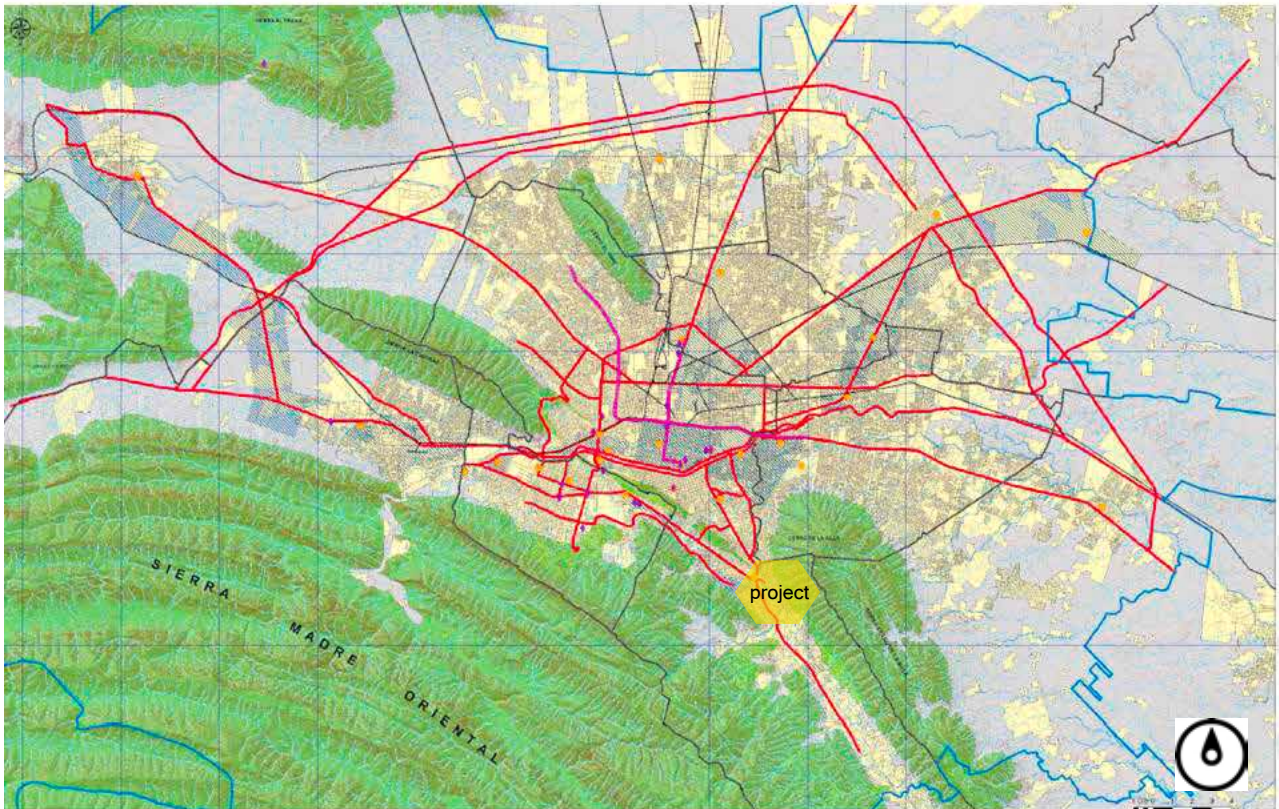
[CITY URBAN PATHS]

mobility

CHAPTER [3.0]

URBAN STRUCTURE ANALYSIS

The composition of the metropolitan area of Monterrey, speaking about its form, is explained by the mountains, valleys, streams and rivers that conform it, they have conditioned the distribution of its road infrastructure. In its most elementary or basic concept, the urban structure of the metropolitan area consists of master or principal roads and urbanized areas that are developed based on these roads.



TRAIN

METRO

PRINCIPAL AVENUES



As natural borders, the topography and hydrology of the Conurbation has historically characterized the image of Monterrey, with its imposing and majestic mountains, rivers and streams, and structures that frame the valleys that make up the urban area.

The existing railways in the metropolitan area of Monterrey, become almost physical barriers of mobility and urban life, considering result as artificial edges. For the location of large and medium industrial enterprises in the center of the metropolis (previously in the periphery), the inputs required and sending products abroad, cause the railroad access them, having to cross urban high density arteries and roads causing traffic disruptions conflicts. Also, the high structures of lines 1 and 2 of METRO, and currently the expansion of the last one, are considered artificial borders or edges, with high presence in the metropolitan landscape. The Avenues Colón, Simon Bolivar and Universidad are substantially transform by these structures, altering the urban scale and somehow segregating local activities.



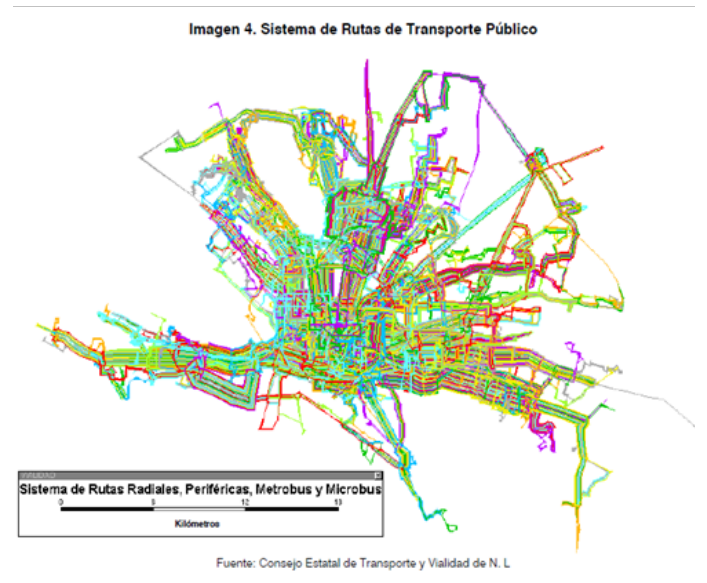
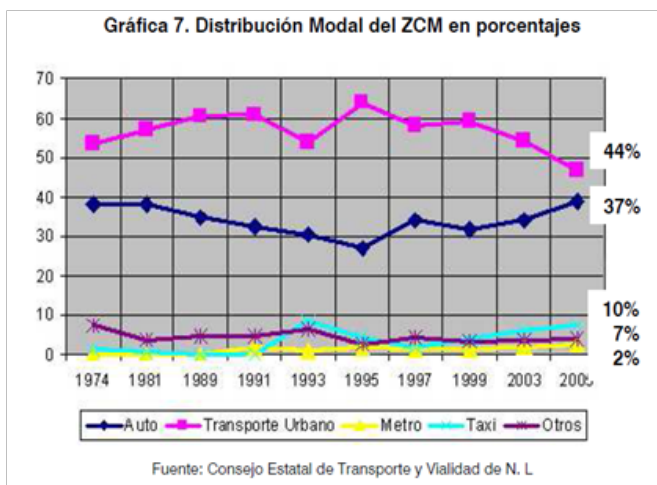
public TRANSPORTATION

CHAPTER [3.1]

[ANALYSIS]

Because most of the Nuevo Leon state's population is located in the metropolitan area, it is vital to take into account the current structure of the metropolis, accordingly to restructure the Transportation System, especially in the modality of public transport buses and Metro.

As shown in the following image, the itinerary of many routes converge in the center of Monterrey, which causes overcrowding of roads. The presence of a high number of units of public transport also causes serious problems in the management of traffic in major sections of the road network of the first frame of the city.



As seen in the chart above, there is a decrease in the preference of public transport and a constant increase in population that moves in private vehicles, this and the strong cultural presence of the idea about using automobile as an element of social status, generate much of the inefficiency of public transport.

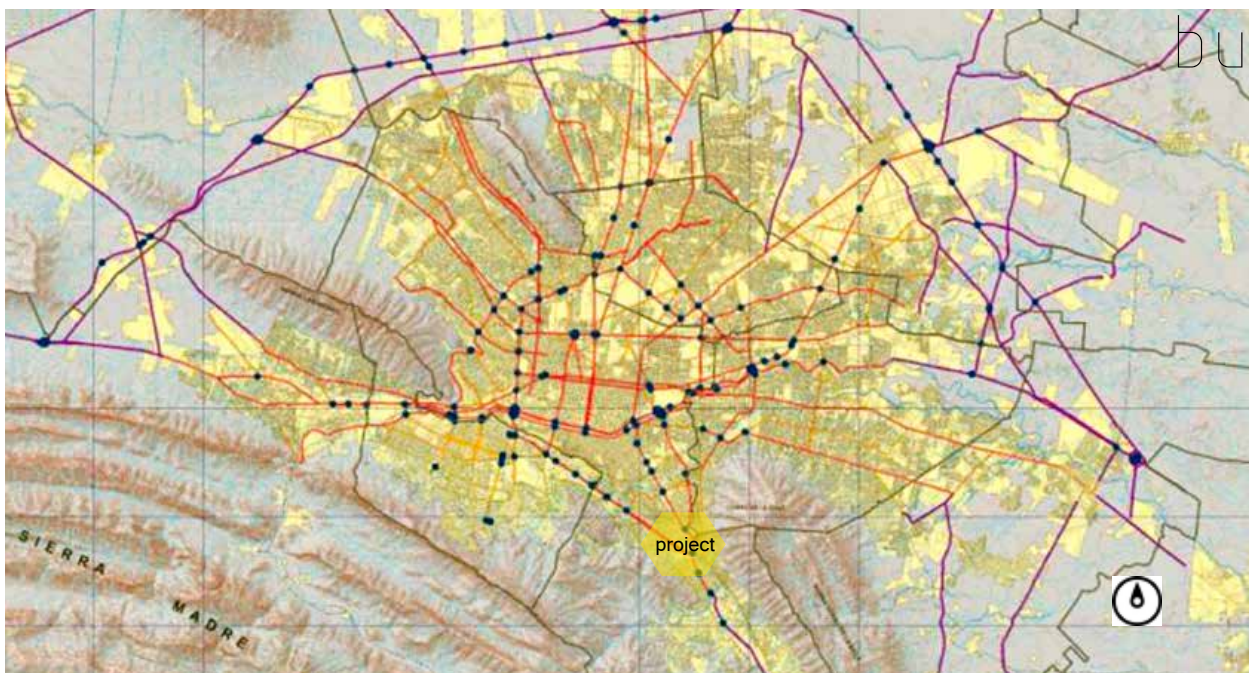
Another important factor is that the road where that transport can transit, have few or no options, since precisely because the urban structure bound by mountains, is the primary radial roads, concentrating in most cases all flow in a single avenue.

| Year | Private | Public | Total |
|------|---------|--------|-------|
| 1997 | 34.3% | 65.7% | 100% |
| 1999 | 36.0% | 64.0% | 100% |
| 2003 | 42.0% | 58.0% | 100% |
| 2003 | 42.6% | 57.4% | 100% |
| 2005 | 43.2% | 56.8% | 100% |

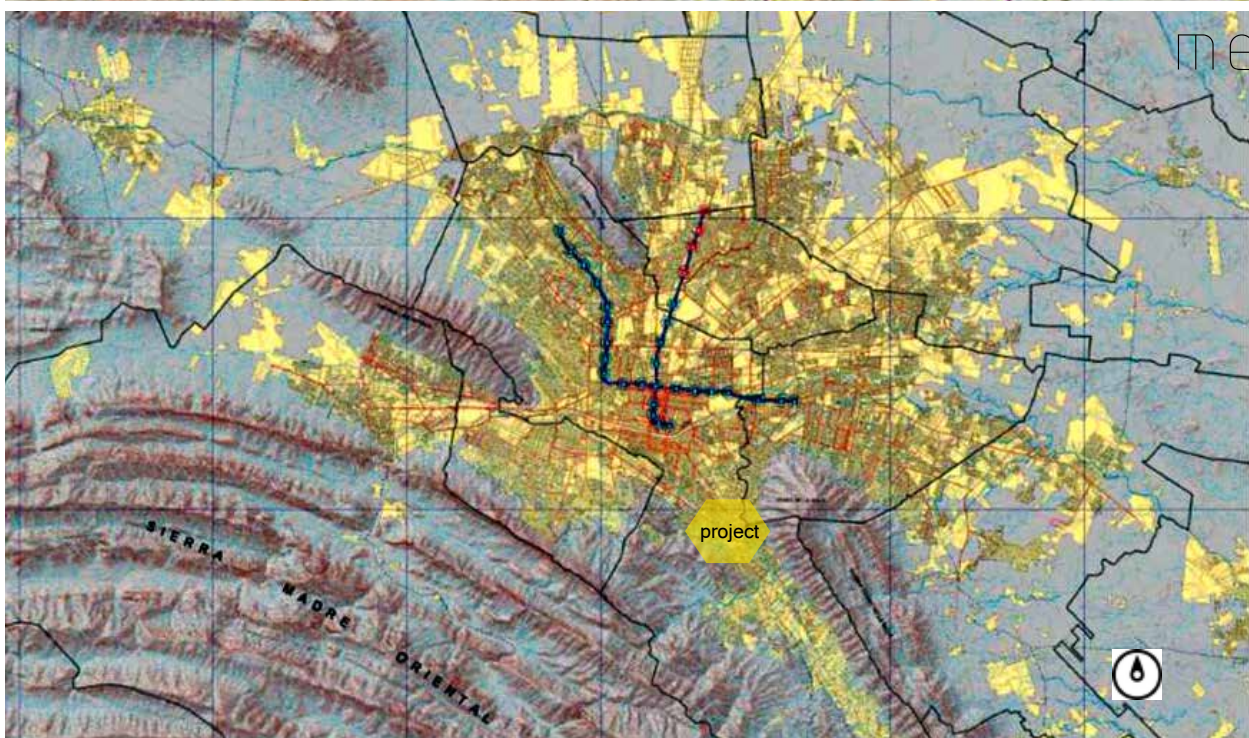
The efficiency of public transport than private transport is done by car, if you take into account the traveler occupied as the car takes between 10.00 and 12.50 m and 21.50 m area bus, but the bus can travel up to 70 people a car and a maximum of 7 people, what can be deduced that for purposes of the efficient use of the roads, it would be preferably to use public transport or other means of transport as well as METRO cilovías increase in the city for bicycle use.

A city like Monterrey with just over 4 million people require to have an efficient collective system Metropolitan (Metro) with a minimum of 5 lines in operation today. The reality is that only have 2 lines that are insufficient for the population of this city that only uses the subway if your destination is the center of it mainly. Both subway lines run through just a few points of an increasingly extensive and chaotic urban sprawl. 5 lines of transport it would barely just enough to encourage people to leave their cars and some use public transport.

PUBLIC TRANSPORTATION RED



bus



metro

zoning

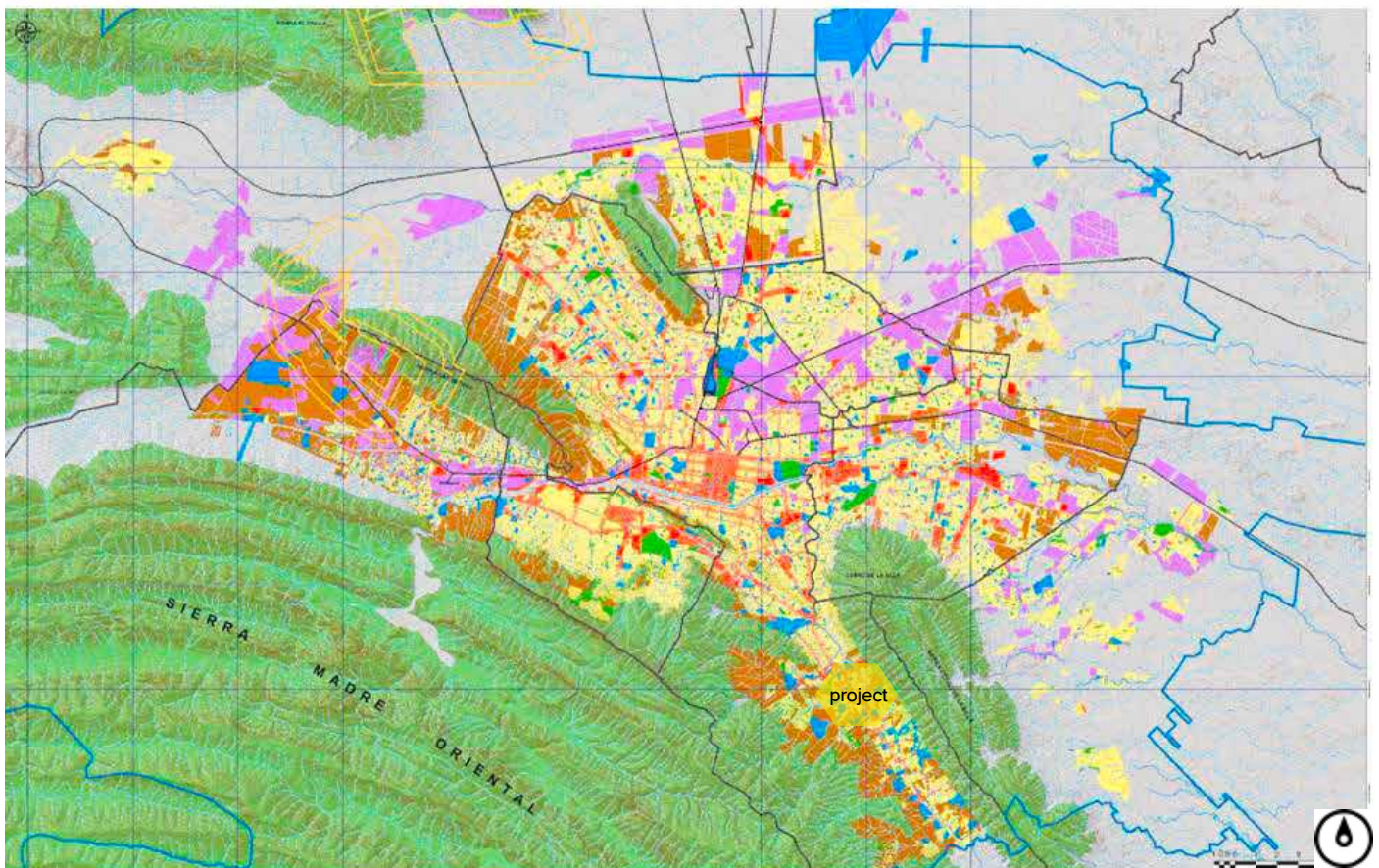
ANALYSIS

CHAPTER [3.2]

[GENERAL ZONING ANALYSIS]

Monterrey is an industrial city so even in the center of the city we can find industrial areas, this derives people who is working on those industry giving as a result big housing areas all around the metropolitan area. As we can see one of the biggest problems of the city, especially in the center is the lack of green areas, as we mentioned on chapter 2.

-  HOUSING
-  COMERCIAL
-  SERVICES
-  INDUSTRY
-  GREEN AREAS
-  WASTELAND



[SITE AREA ZONING ANALYSIS]

PROJECT LOCATION

Av. Eugenio Garza Sada, Monterrey, N.L., México



SURROUNDING STREETS AROUND THE PROJECT:

AV. EUGENIO GARZA SADA

DESCRIPTION:

Principal Avenue in the southern part of the city, is connected with the principal highway of the area. In this avenue is located the university “Tecnológico de Monterrey” as well as important offices buildings for the city due to this there are a very high number of visitors and passers through this area every day.



PICTURES



IMPORTANT BUILDINGS IN THE AVENUE



PASEO TEC COMMERCIAL CENTER

DESCRIPTION

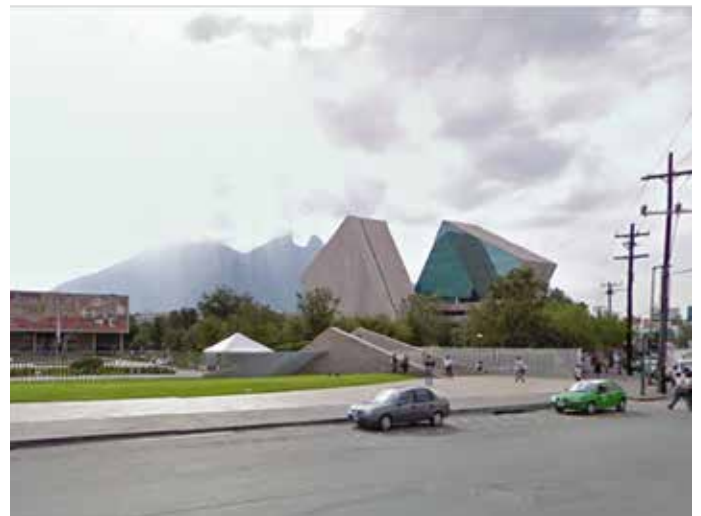
Is the first part of our project, in other words the commercial center we are proposing is the extension of this building. Counts with a Hotel, retail space and convention center.



UNIVERSIDAD TECNOLÓGICO DE MONTERREY

DESCRIPTION

This University is one of the most important and Universities in Latinoamerica.





GARZA SADA SHOPPING CENTER AND CINEPOLIS

DESCRIPTION

The Site area is in a commercial zone, however we can say that there are two commercial centers that can be classified as a competence for our project.

The first one is “Plaza Garza Sada 1892”, and this complex counts with retail area, apartments and offices. The second one “Plaza Cinema” counts with retail area and a cinema.

RÍO AMAZONAS STREET



DESCRIPTION

Located behind the site; this street is important to our project due to the park that is situated here. This park will be accessible from our project.



PIRINEOS STREET



DESCRIPTION

Is a short street next to the site, conformed practically by residential area.

FÍSICOS STREET

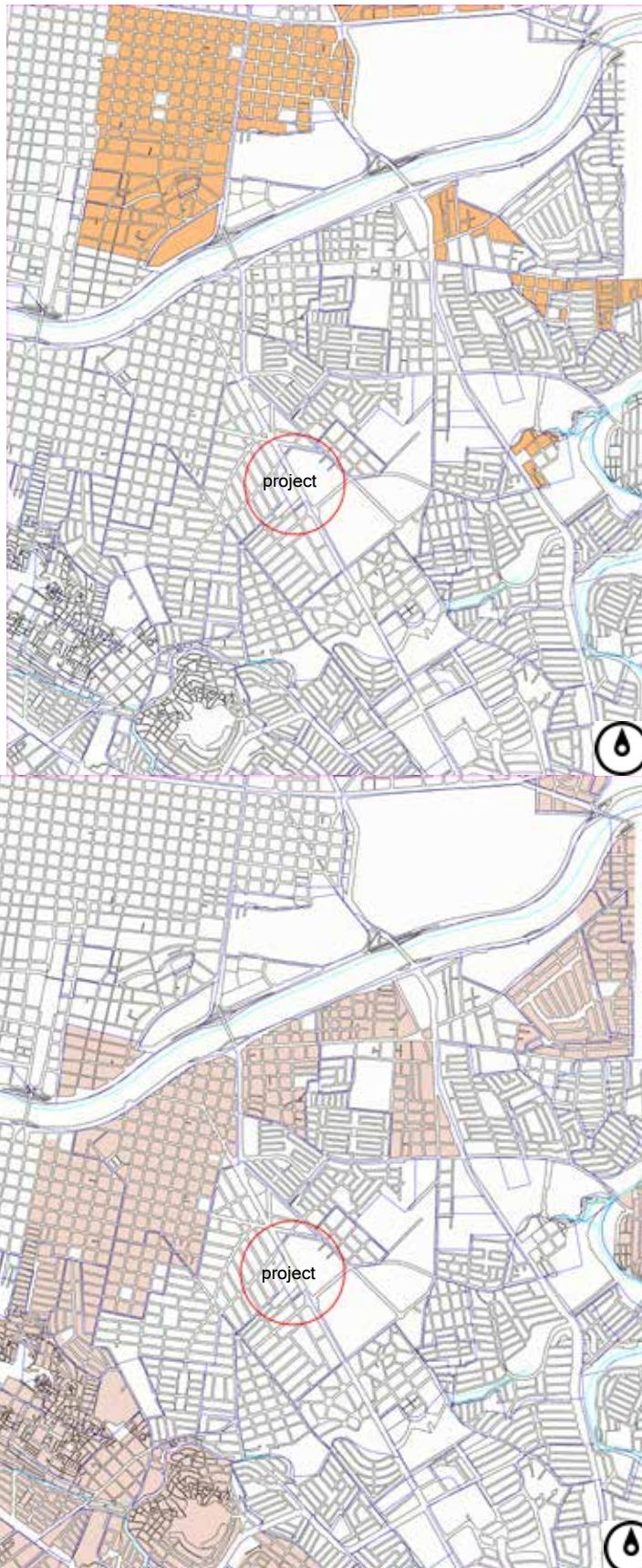


DESCRIPTION

This street is mix-uses we can find residential area for students as well as small commercial areas.

[SITE AREA ZONING ANALYSIS]

An analysis of the different typology of areas around the project is shown next. Is important to understand the positive impact of the urban proposal of our project around this area due of all the residential, university and commercial zones that we can find around it



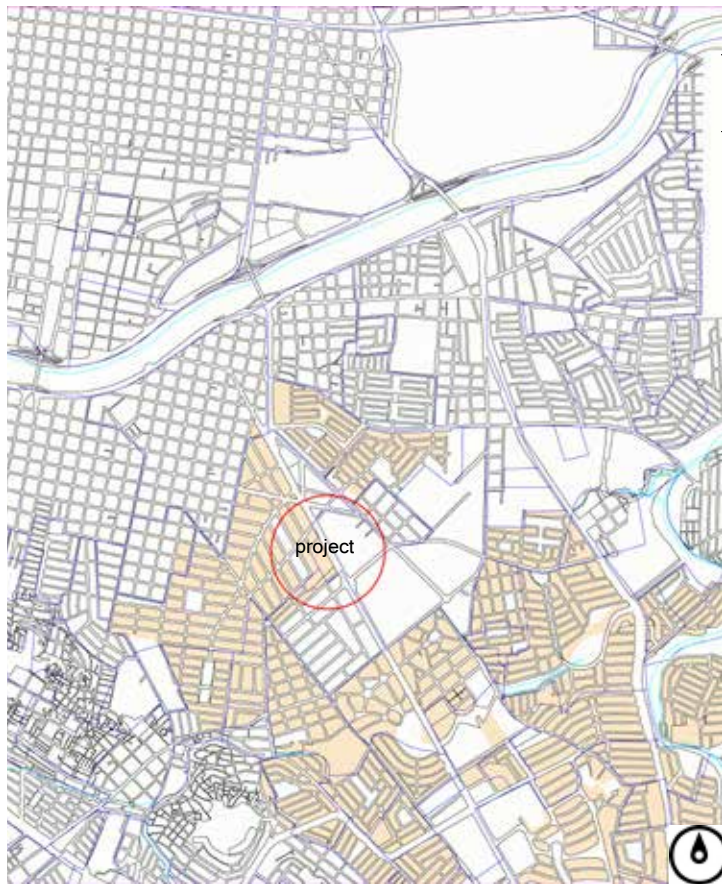
RESIDENTIAL
AND MIX USE
(INTENSE)



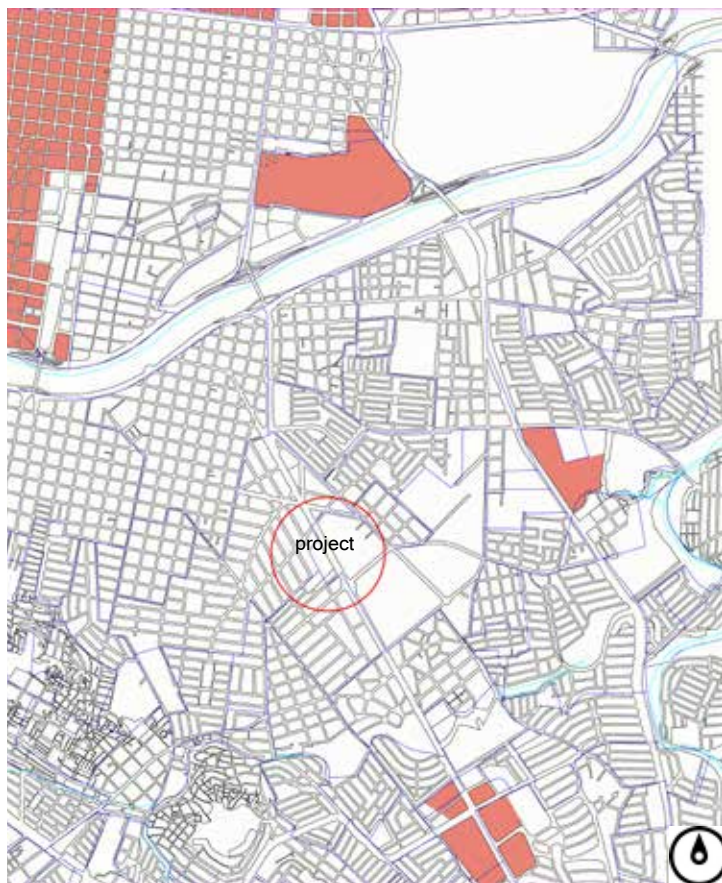
RESIDENTIAL
AND MIX USE
(LIGHT)



SITE AREA ZONING ANALYSIS

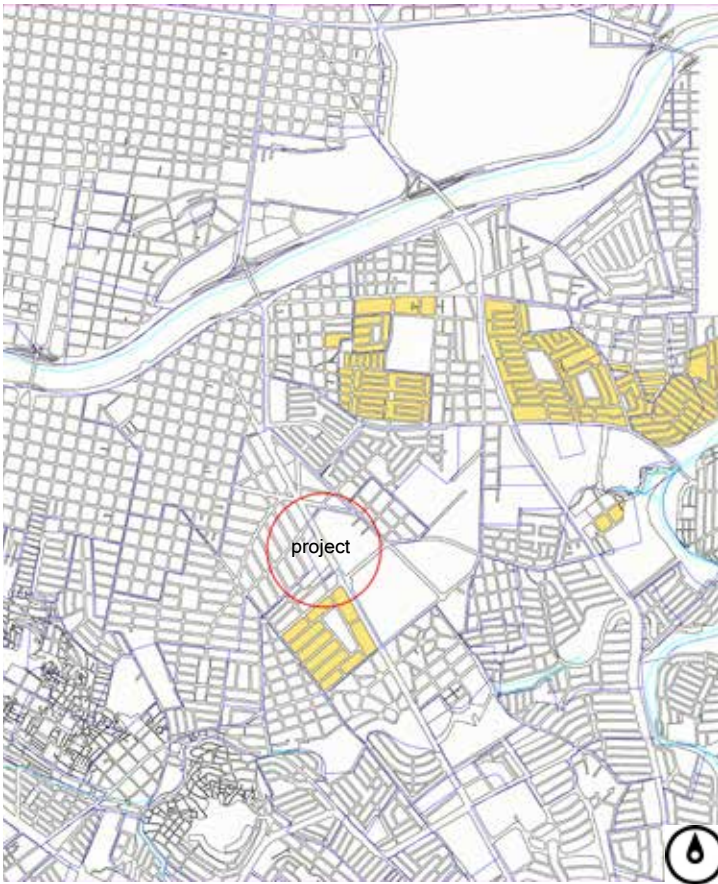


RESIDENTIAL
USE

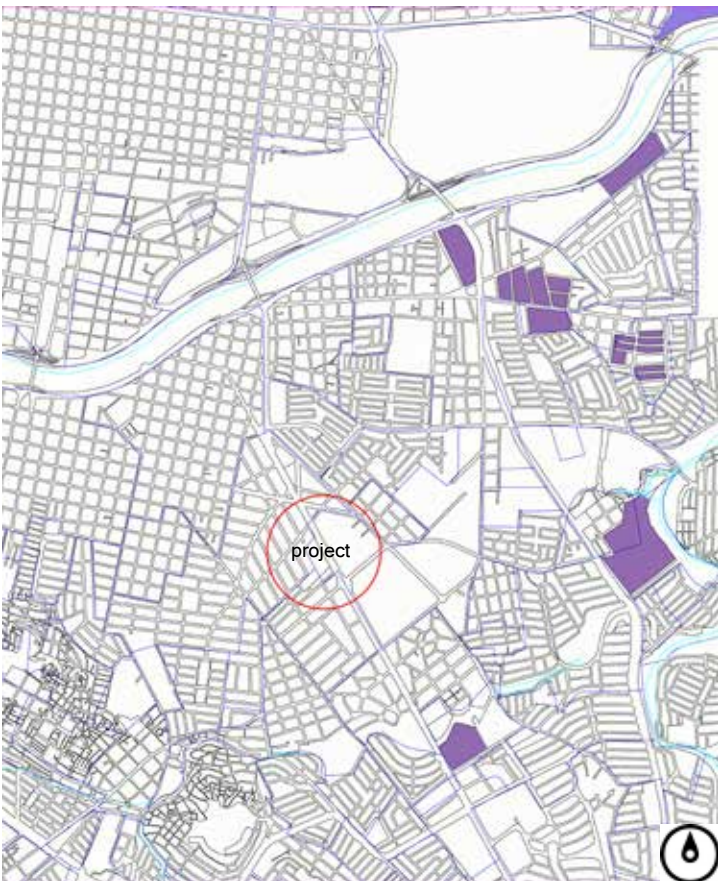


RESIDENTIAL
WITH
COMMERCIAL
IN 1ST AND 2ND
FLOOR.

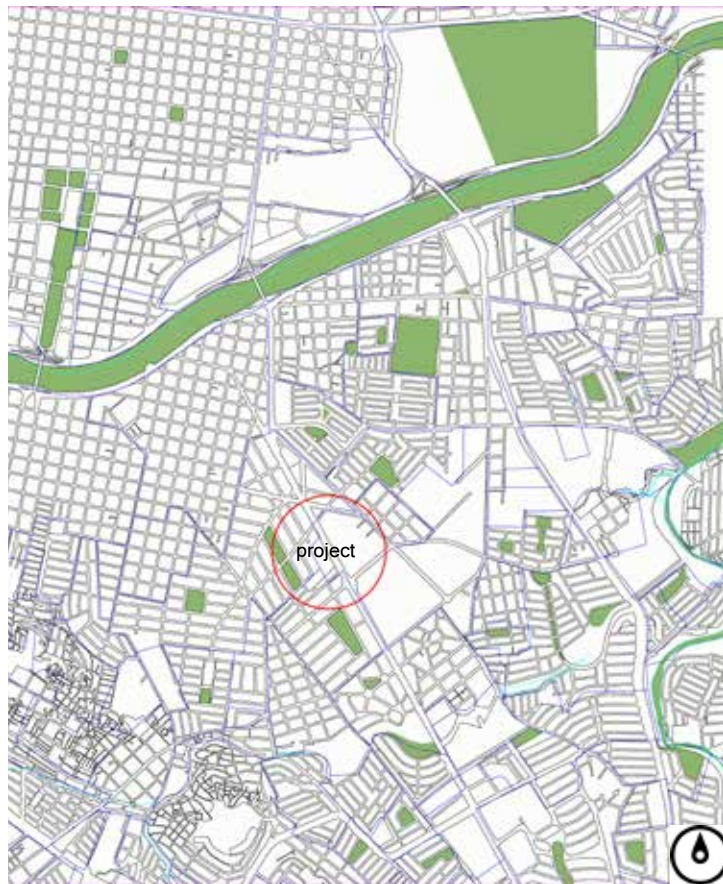
MULTIFAMILY RESIDENTIAL



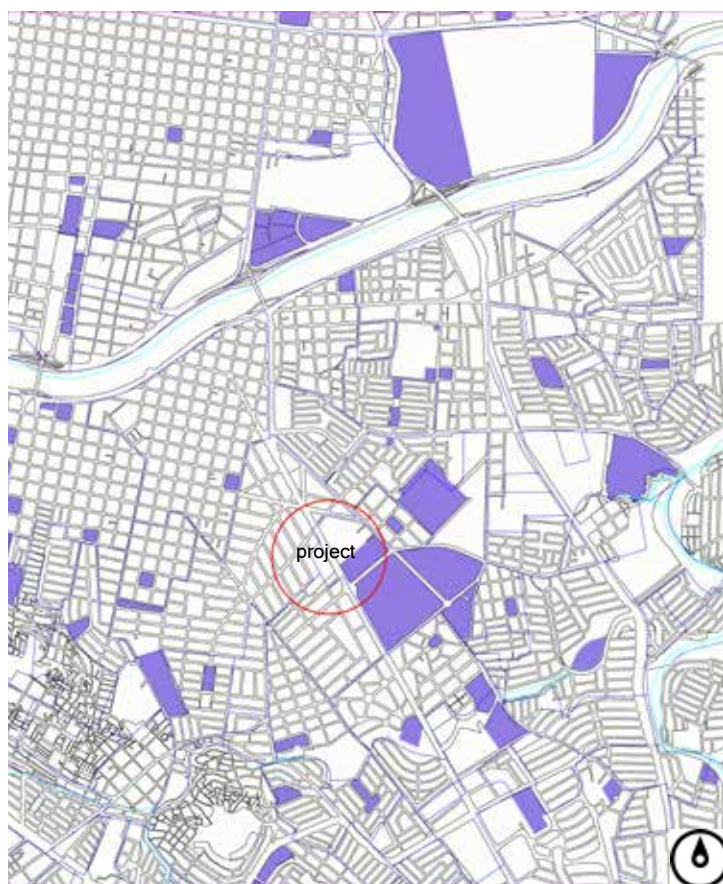
INDUSTRIAL



[SITE AREA ZONING ANALYSIS]



GREEN
AREAS



AREAS FOR
SPORTS
ACTIVITIES

4

CHAPTER

[URBAN PROPOSAL]

traffic lanes

ANALYSIS

CHAPTER [4.0]

[LANES SITUATION]

INTRODUCTION

The city of Monterrey in the northern state of Nuevo Leon, is the second most populous and the third largest city in the country. Traffic and transport efficiency is always a topic to discuss given to road deficiencies and a combination of different factors that gives as a result a very hard time trying to drive around Monterrey's avenues in peak hours. Like other major cities such as Guadalajara or Mexico City, Monterrey's metropolitan faces every day and every year the problem that new cars are added to traffic lanes while creation of new avenues, or optimization of these, not keep pace and are readily exceeded in operational capacity. This results in the heaviest traffic hours some arteries become almost public parking and drivers employ more and more minutes on their transfers.

Monterrey requires a restructuring of urban paths. The design of exclusive lanes for public transportation (bus), bicycle paths and the respect from car drivers for not to invade that space would be helpful. Urban paths should serve as an alternative and complement to public transport system it should be a helpful element to metro systems.

ACTUAL SITUATION

This pictures is a sample of Monterrey's traffic situation on peak hours:



urban proposal

TRAFFIC LANES

CHAPTER [4.1]

[EXCLUSIVE LANES FOR PUBLIC TRANSPORT CORRIDORS]

In the metropolitan area, growth has virtually exhausted its possibilities in some areas, so it is necessary to give a qualitative change, reorientation and promote transformation and beautification. The city is a vicious cycle of urban development based on feasibility negative for the development of Nuevo Leon, affecting the environment, your finances, your mood and your health. This requires restructuring urban planning to re-densify the city, in order to reduce time and transportation costs and improve the environment. To solve this problem, we propose the restructuring of public transport routes and the implementation of exclusive lanes for public transport corridors located in the principal Avenues of The Metropolitan Area of Monterrey, in order to allow them the free movement between avenues.

The benefit gained by the implementation of the lanes is the decrease in travel time for public transport users as well as the decrease in operating costs of public transport units.

WHERE TO START?

The idea is to implement this exclusive lanes for public transport corridors in the principal Avenues of the Metropolitan Area of Monterrey (as seen in Figure1). However we propose to start with two of the principal Avenues and Public Transportation Corridors that crosses the entire metropolitan area of monterrey. (Figure 2)

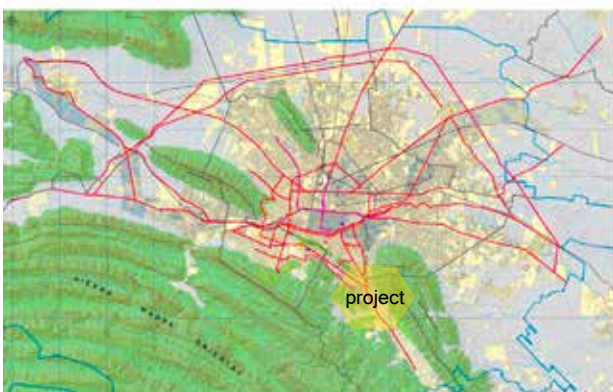


Figure 1

The main avenues Av. Cortines and Av. Eugenio Garza Sada:

- Av. Cortines is located in different proportions in three municipalities belonging to the metropolitan area of Monterrey (AMM), which according to the percentage of use of urban space are listed as follows; Monterrey (71.69%), Guadalupe (24.59%) and San Nicolás de los Garza (3.72%).
- Av. Eugenio Garza Sada is located in the south part of the city and to most of the residential and comercial areas in the zone.

WHY AV. CORTINES?

Of the 1,133,814 inhabitants of the Municipality of Monterrey, 224.415 are settled along the corridor, which represent 20% of the population Municipal (according to the Environmental Impact Statement)

WHY AV. GARZA SADA?

Is connected with the principal highways in the metropolitan area. In this Avenue we can find two of the most biggest and important Universities of the country wich means that the traffic in that area is overloaded. Is Also a very important area for commerce.

SOME BENNEFITS

- Reduced travel time and travel costs for users.
- Influence in 3 municipalities to some extent.
- Connectivity with the Metro red.
- Future implementation of facilities for pedestrians and bicycle.
- Reduction in the emission of pollutants.
- Reduction of accidents involved public transport along the transit corridor.
- Reducing congestion in principal avenues, consequently, increased speed average in mixed traffic and commercial vehicles speed public transport

urban proposal

TRAFFIC LANES

AV. EUGENIO GARZA SADA + AV. CORTINES PROPOSAL

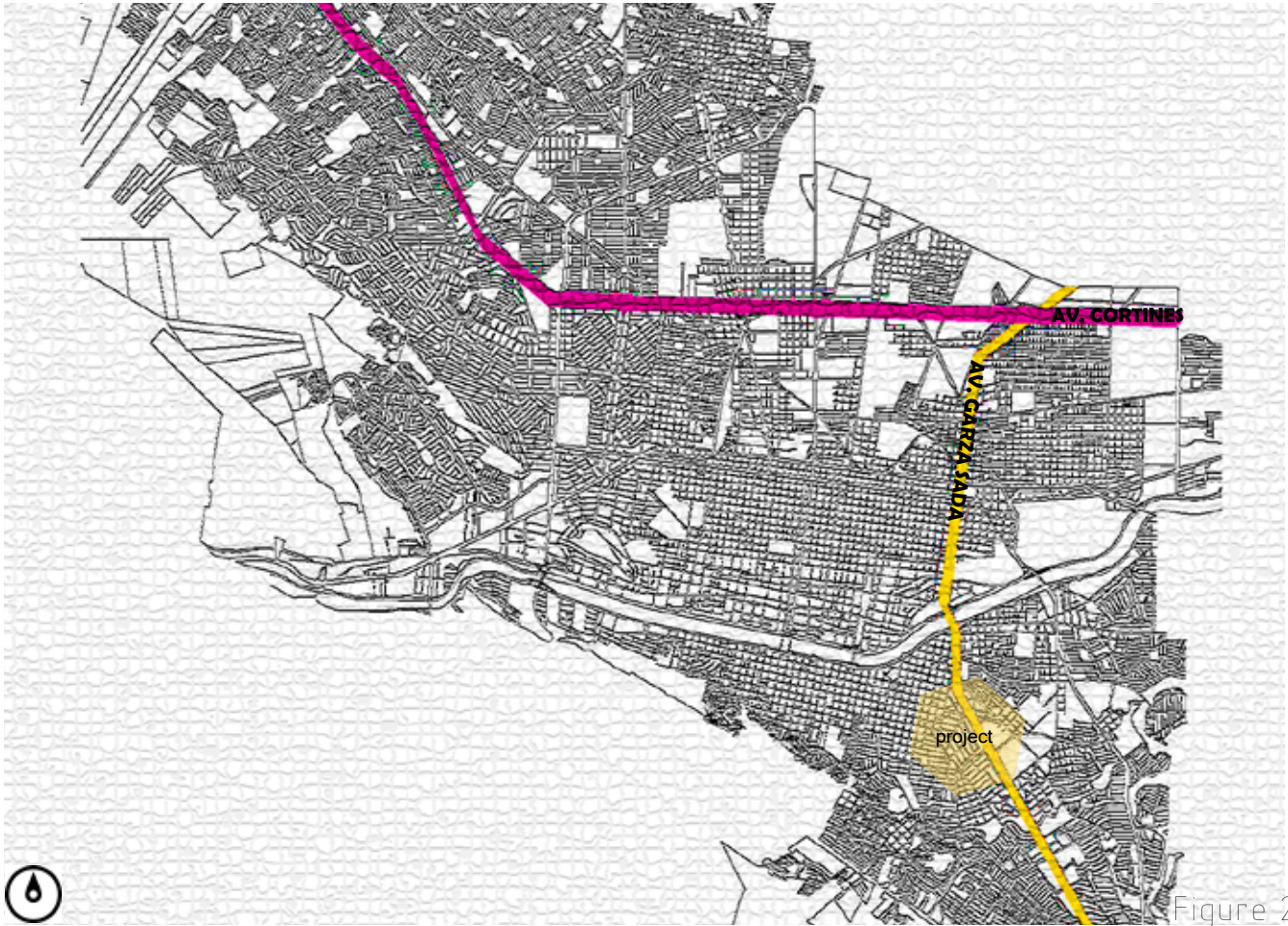
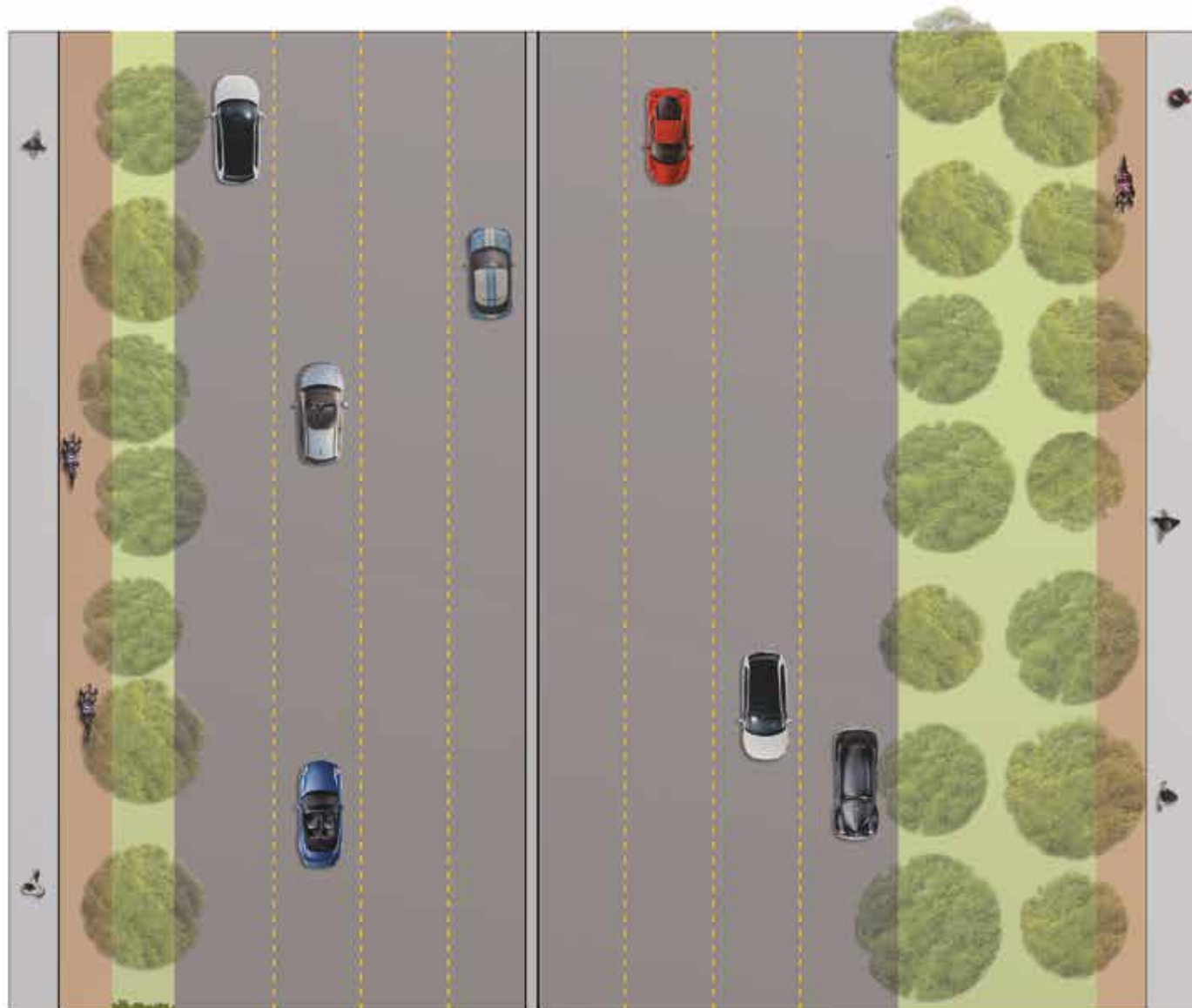
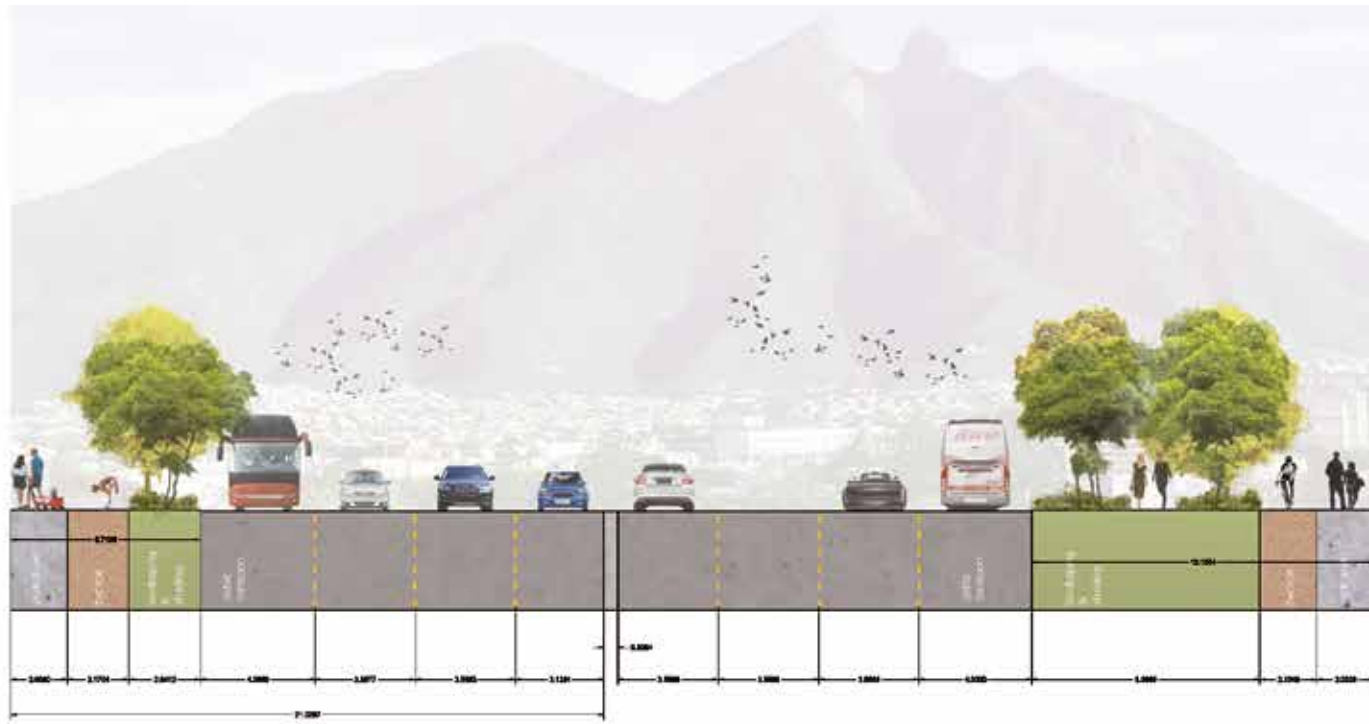


Figure 2

location

GENERAL CONCEPT

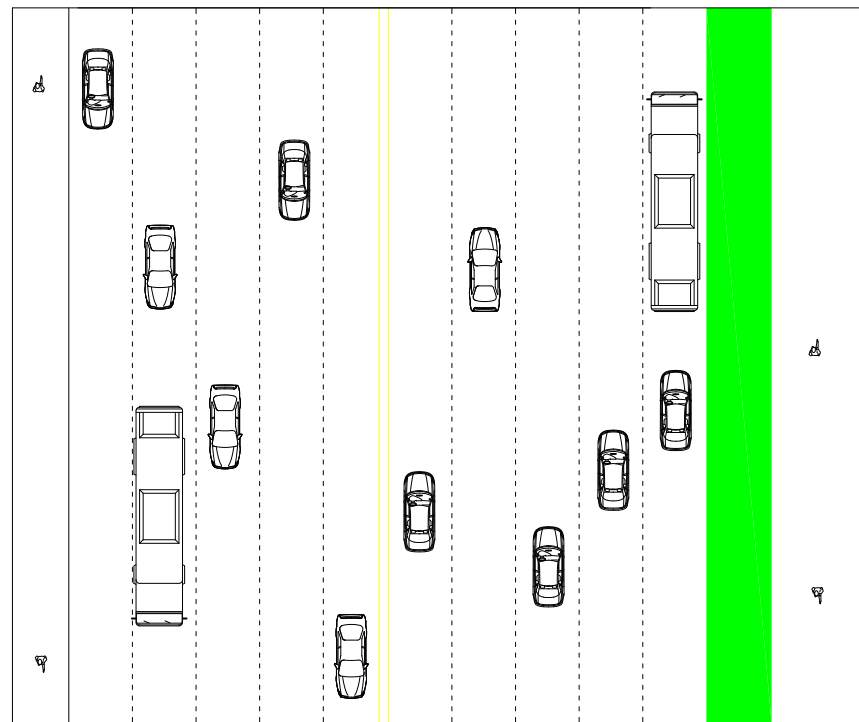
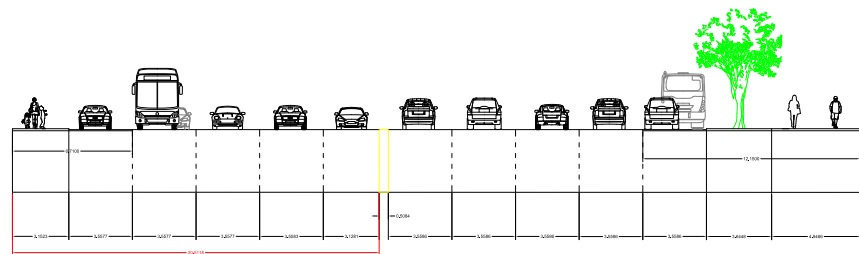


proposal

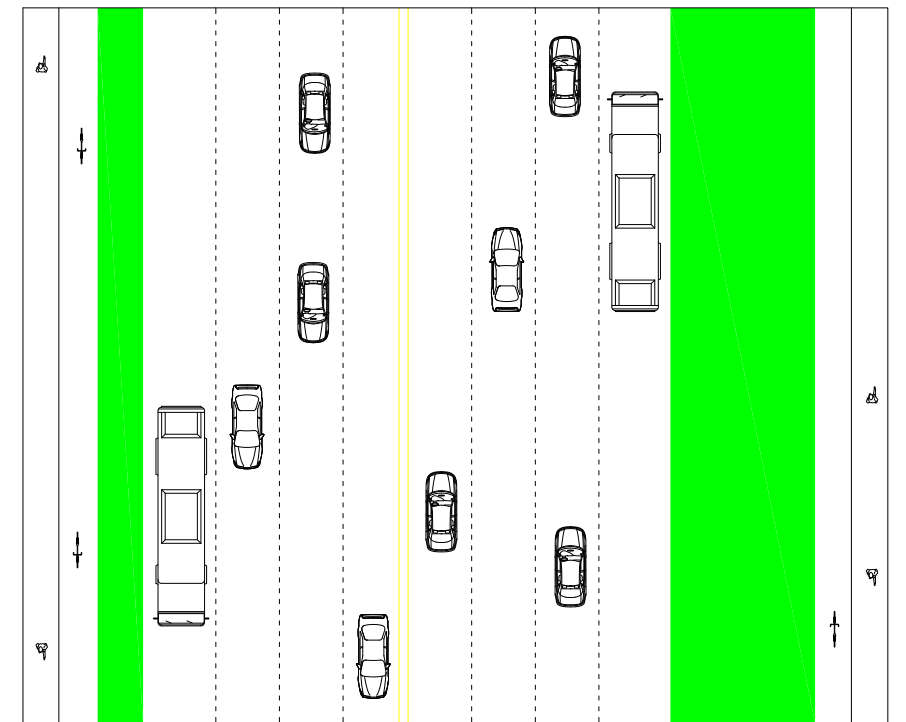
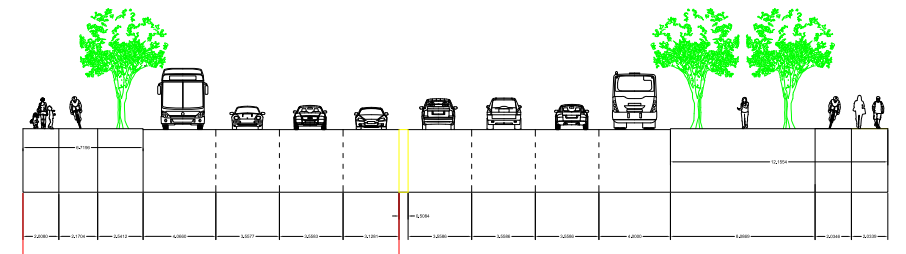


concept

[AV. EUGENIO GARZA SADA]



existing conditions



proposal

urban proposal

BICYCLE NETWORK

CHAPTER [4.2]

[BICYCLE PATHS AROUND THE CITY]

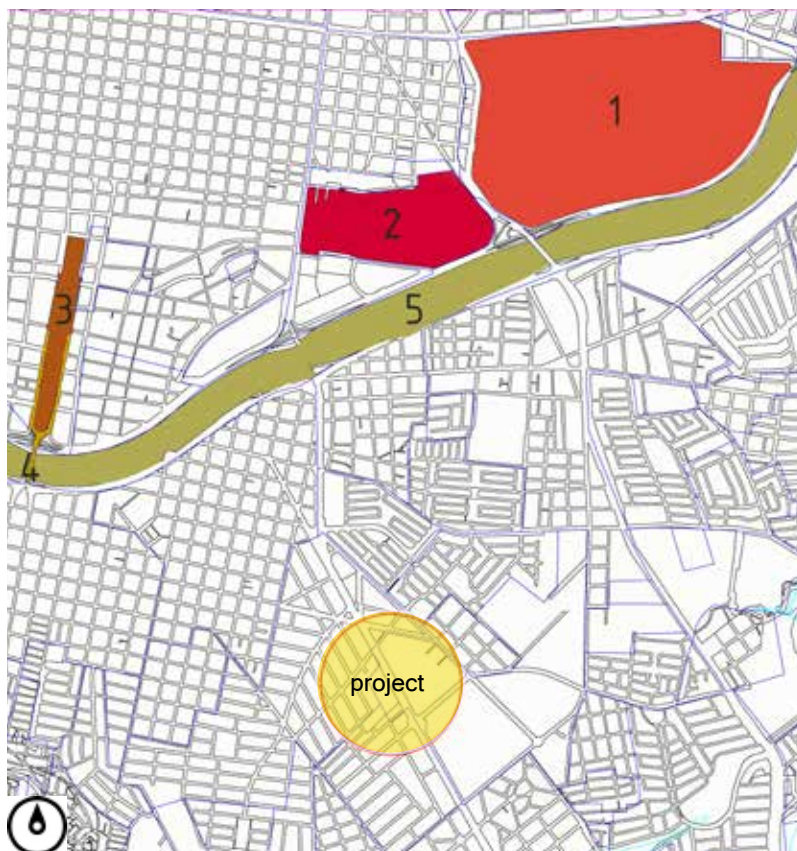
BENEFITS TO SOCIETY

The community benefits when more people ride bikes. The more people ride for transport the more time is saved, the lower the costs of transport infrastructure and the less congestion on our roads and in public transport. These benefits are matched by a reduction in transport related pollution including greenhouse gases.

Bike riding for pleasure creates jobs in tourism and recreation. Bike riding for transport improves productivity and reduces time off work for illness.

Above all the community benefits from a reduction in disease and pain as well as the financial costs of poor health.

The idea is to propose a bycle network that connects the existing recreative bicycle paths localizate in “Parque Fundidora”(1),”Paseo Santa Lucá (2)”, Ró Santa Catarina” (5)and the new two projects under construction “Macroplaza”(3) and “Puente Zaragoza” (4). The new bicycle network proposal would be connected also with “San Pedro Gran Vá” (6), this is a bicycle circuit located in the southern part of the metropolitan area of the city called San Pedro Garza Garcá.





3



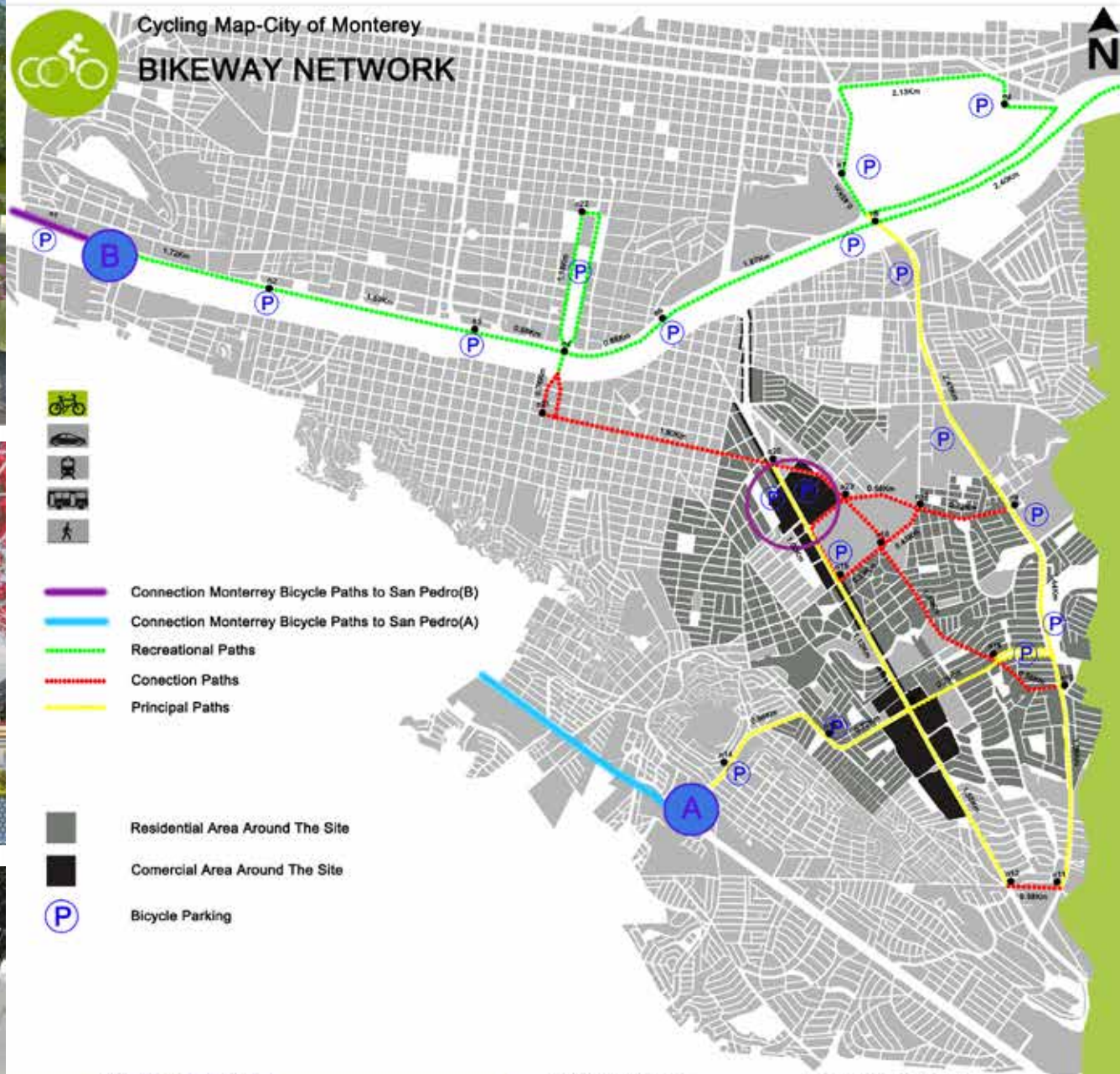
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4



5



Recreational Paths 19.41 Km

- Recreational routes.
- Exclusive for bicycle and pedestrian use.
- Bidirectional bicycle ways.
- Connection with principal routes.
- Connection between existent bicycle routes and parks.
- Apart from traffic circulation.
- Dimensions : between 2.60 and 4.00 m for bidirectional ways.



Principal Paths 12.86 Km

- Principal avenues and downtown.
- Connection with metro station and bus stops.
- Connection with recreational routes.
- Connection with universities
- Physically separated from cars lane.
- Same direction of traffic flow.
- One way lane in each traffic side.
- Located on the right side of the street.

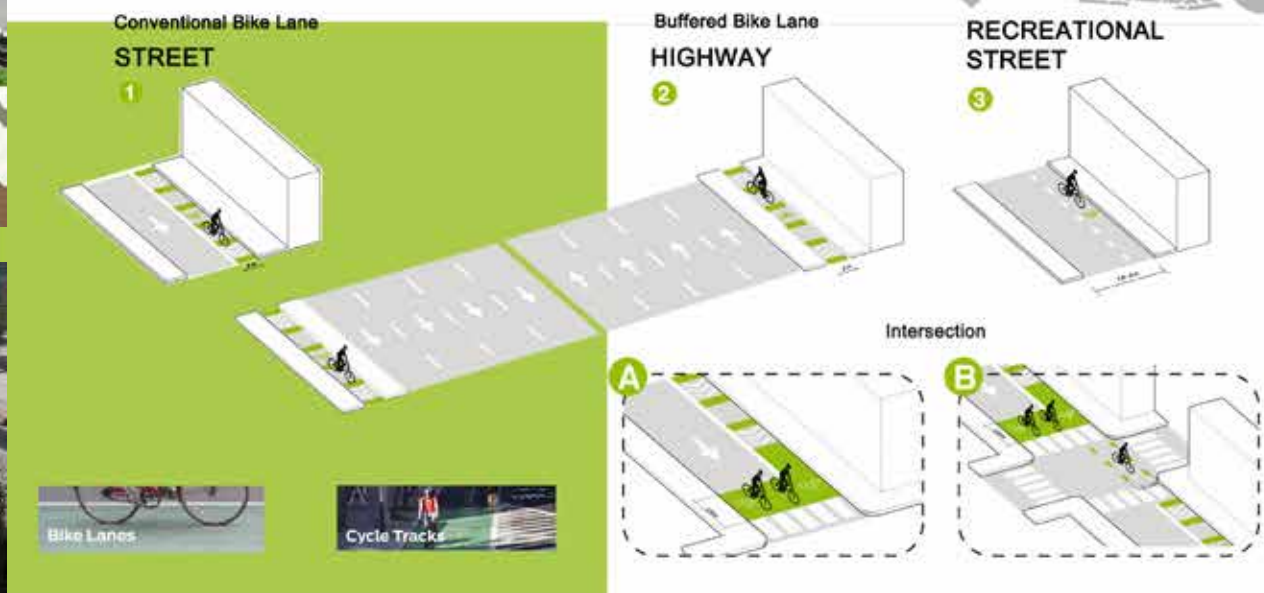


Connection Paths 8.67 Km

- Share space with road traffic.
- Space is bounded only by a double line on the ground.
- One way lane. (same than traffic)
- Connections for principal and recreational routes.
- Located on the right side of the street.
- Only for collector roads.
- Dimensions : between 1.50 and 2.00 m.



6



5

CHAPTER

[INTRODUCTION]
TO THE CONCEPT

Introduction

TO THE CONCEPT

CHAPTER [5.0]

EXISTING COMMERCIAL CENTERS AND THEIR DESIGN PATHS

In this chapter we will discuss the typical path or style that architects use to design their projects talking specific about commercial centers that can be classify in the same type as our project and compare it with the our project proposal. What do we mean with “same type”, well this projects are categorize as commercial centers, usually they are at open air, people use this places as a social reunion point as well as business point because usually this type of project counts with spaces for commercial retail and offices sometimes even apartment, in the case of our project this would be just commercial retail and offices, we will detail this description later.

So what is one of the biggest problems or deficiencies of these spaces?, Well normally they have a parking spaces all over the place, so the first thing that you see when you arrive there is a big concrete space but they also have underground parking so is kind of unnecessary to have that big concrete plaque facing the project. Where are the green areas, the walking spaces or circulations that a place like this need to make comfortable the visitors walks,. The thing is that it seems that architects around here (Monterrey) are more worry about the visitors cars than the design of a good quality space that can offers you as well as a social reunion point a place where you can go, shop, see green areas and walking space free of cars. A place where you can say let’s go for a walk?, saying this now we can show some examples of this commercial centers that we are talking about, of course they are located in Monterrey and some of them very close to our project.



The idea of our commercial center proposal is to change those typical paths that architects follow in this type of constructions, let's start to talk about the location of the project. Is located in Av. Eugenio Garza Sada, as we talked before in the urban proposal chapter, this avenue is very important point because we have there one of the most important University in Mexico and Latinoamérica is also important because it's connection with one of the most used highways in Monterrey.

Our project is located very close to this university and also is a second part of a commercial center that is in front of our project, they would be connected by a bridge which is already and of course this project follows also the typical path with parking facing the projects, and zero green areas, of course it also has underground parking.

The idea is to compare this design of a previous project and the new version of the same, of course when I say the "new version" we are talking about our project, it doesn't mean that is a new proposal for that exactly same previous project but as our project is an extension of this one we can see it as the "new version" of it.

First let's take a look of this so mentioned previous project called "Paseo Tec" and the important characteristic about it:



Introduction

TO THE CONCEPT

CHAPTER [5.2]

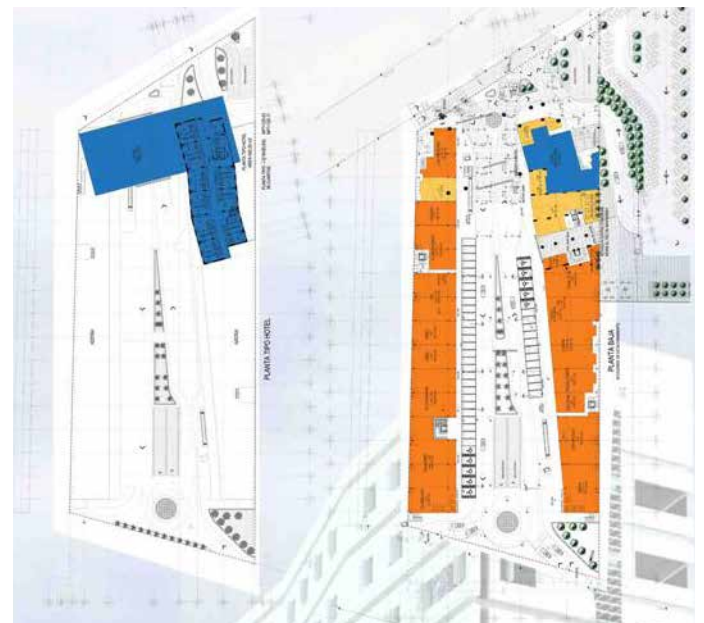
[PASEO TEC]

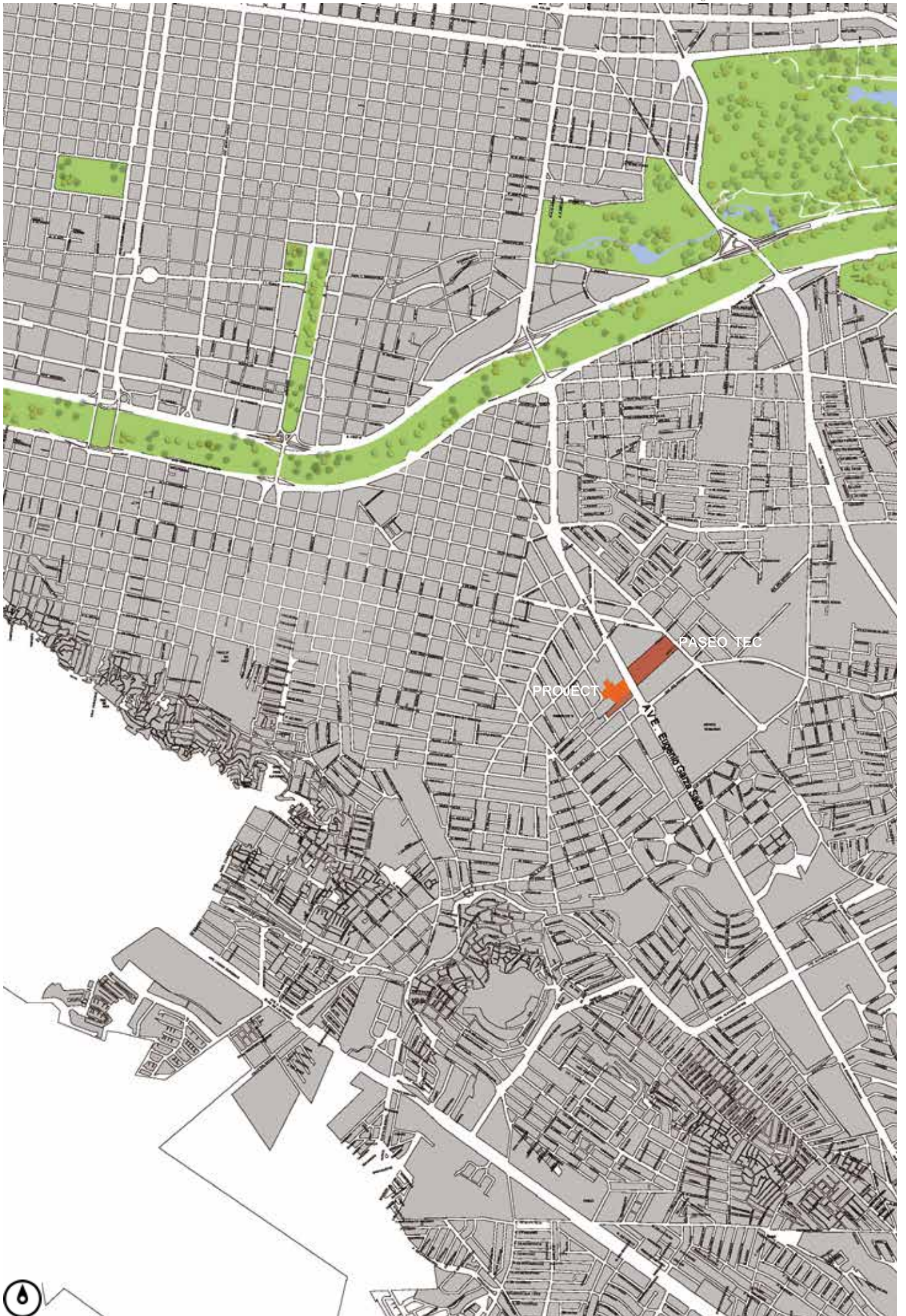
Located in av. Eugenio Garza Sada, Paseo Tec counts with over 40 commercial spaces, one Hotel and one convention center. Is placed in front of our project and it will be connected to it with a bridge that has two purposes:

- 1) It can be used as a normal bridge for pedestrians to cross the avenue.
- 2) It would be a connection to our project.

In the front view of “Paseo Tec” can be seen at first instance the parking which is located in the center of the project and acts as a central axis distribution for the retail area. What if instead of using this space as a parking we use it for retail area plus green area, we would have a double benefit from this:

- 1) More retail area which for the investors would mean more incomes.
- 2) More green and pedestrian circulation areas having then a complete car free space where visitors could walk freely. It would attract more people to the place and hence this also can be seen as more incomes.





Let's see some examples of how would be if we changed the parking of this commercial center into a more friendly space for the visitor:







- + GREEN AREAS
- PARKING



Introduction

TO THE CONCEPT

CHAPTER [5.3]

[COLOR]

One important matter about shopping center/commercial centers design is the materials and colors used for architects in these projects; unfortunately we are almost always surrounded by the sad and gloomy gray concrete, white color and aluminum material. It seems that if they don't use the same materials in every different project, then the place is not going to succeed.

Asking to some people around the metropolitan area of Monterrey about what they think of the actual concept of this projects, specifically in this case about colors. Most of this people answered that they would like more live colors to make the building warmer in sight, like when you go to "Oaxaca" or "San Miguel" (mexican typical cities) one person answered: "I don't really get why this places that suppose to be something that gets your attention instead of that makes you think twice about coming here" and finally one peculiar answer caught my interest, someone said: "this shopping centers with a lot of white color, concrete and aluminum everywhere makes me think about a hospital or an office, I think my mood goes down when I think of it".

The use of this colors in contemporary Mexican architecture, especially in the north of México, is due that we are copying the American architecture style forgetting about our own culture, about the colorful architecture that we been doing since the beginning of the times in typical Mexican architecture. Cities come alive and charm when its buildings add a colorful touch to the environment.

So why not retake these roots that we have, well some architects like Ricardo Legorreta and Lu s Barragan actually used colorful designs inspired by Mexican traditional architecture. Specially Luis Barragan was not afraid of color. In fact he liked color in huge expanses and interesting patterns, all juxtaposed with shifting angles and light.

With this I'm not saying that we should use just colorful finishing in every building but in a project like this I definitely think is necessary.

So let's take a look of some examples of typical mexican architecture that we have been talking about and from which we took our inspiration as part of the design concept for our project which we will discuss later.



PUERTO VALLARTA, M XICO



ZACATECAS, M XICO



AJIAC, MÉXICO



GUANAJUATO, MÉXICO



SAN LUIS POTOSÍ, MÉXICO



GUANAJUATO, MÉXICO



CHIGNAHUAPAN, MÉXICO



GUANAJUATO, MÉXICO



LUIS BARRAGAN



LUIS BARRAGAN

6

CHAPTER

[architectural]
proposal

[THE PROJECT]

The proposed project is a commercial center with retail area for multiple uses (770 m2 ground floor and 770 m2 1st level), anchor store (10005 m2), retail area for bars and restaurants (736m2 ground floor and 330m2 1st level), kiosk (192m2 and 27m2 for the smallest ones) Offices building (1,065 m2 ground floor, 1st and 2nd level) and underground parking (7,493m2 basement 1 and 3,659.67 basement 2).

The site is located in Av. Eugenio Garza Sada, one of the most important Avenues in Monterrey due to the location of one of the most prestigious Universities in México and Latin America hence this Avenue is a very concu

red street full of young people and activities all around, there is also a residential area for students and families very close to our site.

It's been given in previous chapters an introduction for the concept of the commercial center, we talked about changing the typical paths of design for this type of projects, adding more green areas and spaces free of cars; the project will be connected to a park (Figure 3) that is behind the site so it can be seen as an extension of it, also green roof, cables with vegetation from building to building and planters in the top of the buildings are proposed (Figure 2).



Figure 1

- University
- Paseo tec
- Project

- Park

We also talked about why we want to use different materials and colors for our design; in this case we are using live colors combined with images depending on the type



Figure 2



Figure 3

of the store we are referring to. In addition of this we are proposing the use of lightweight and recycled materials such as shipping containers and tensions membrane elements. (Figure3).

Building with shipping containers presents myriad advantages for both the environment and the building owner.

Construction consumes a huge amount of natural energy resources, while also producing an inordinate amount of waste, in an industrial city like Monterrey using industrial objects and systems not originally intended for architecture would be

helpful to the environment as this type of “waste” occupies a large percentage of discarded materials, the ‘upcycling’ of shipping containers as a construction technology is a highly sustainable practice, given the vast amount of containers that lie in our ports unused. We can find this material very easily and accessible in the port of Tampico Tamaulipas, México (6 hrs from Monterrey) with a cost of approximately 300 USD placed in Monterrey.

Is important to mention that we are proposing the mixing of two construction techniques,

containers shipping plus normal techniques as concrete block are used in offices and anchor store due to the proportion of this spaces, in thi sway we can modulate in a better way this spaces.

The areas where we are proposing the use of containers are filled with yellow, basically the anchore store and part of the offices are the only areas where normal construction techniques would be used (gray areas). (figure 5,6 and 7).

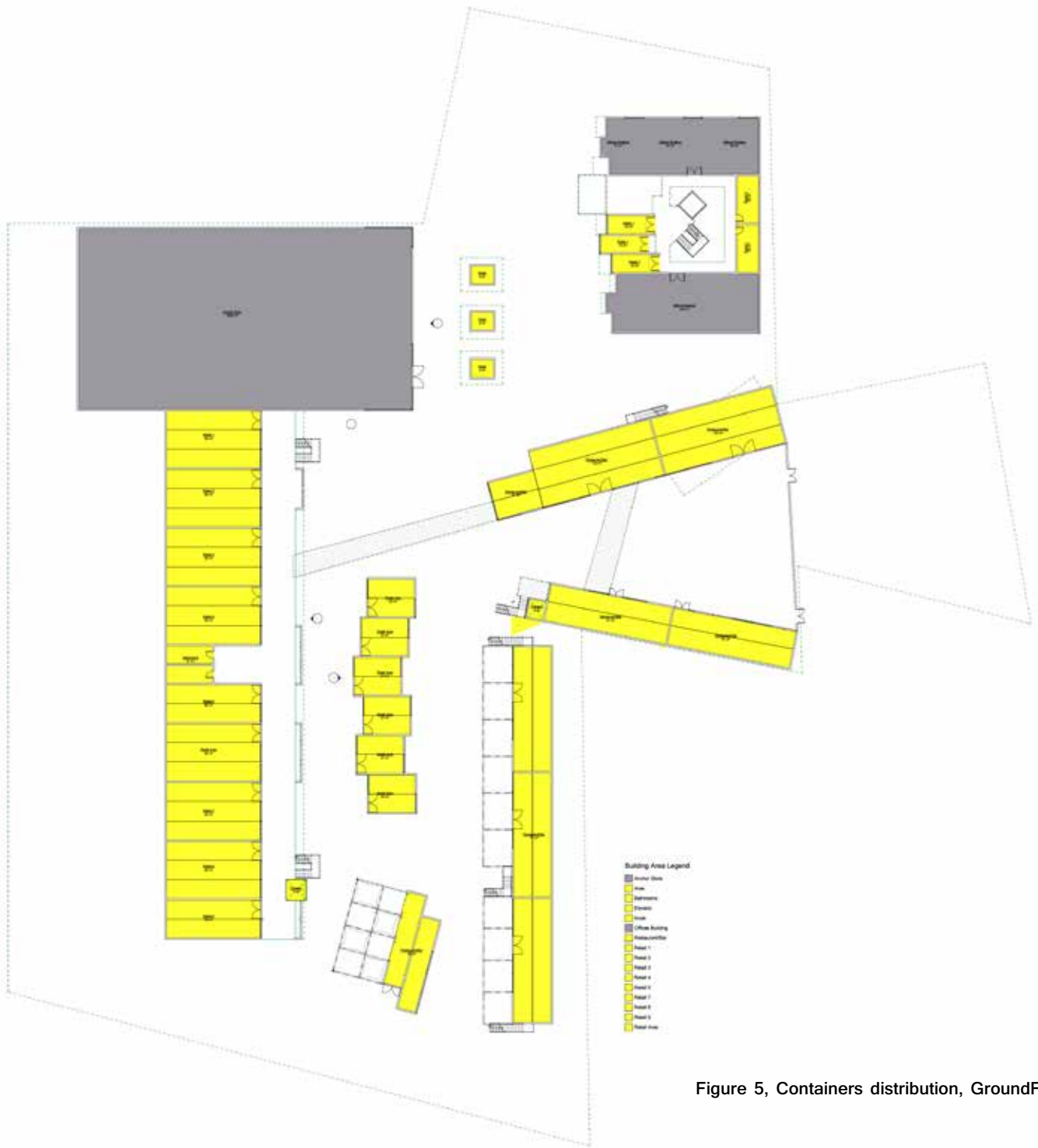


Figure 5, Containers distribution, GroundFloor

CONTAINERS DISTRIBUTION

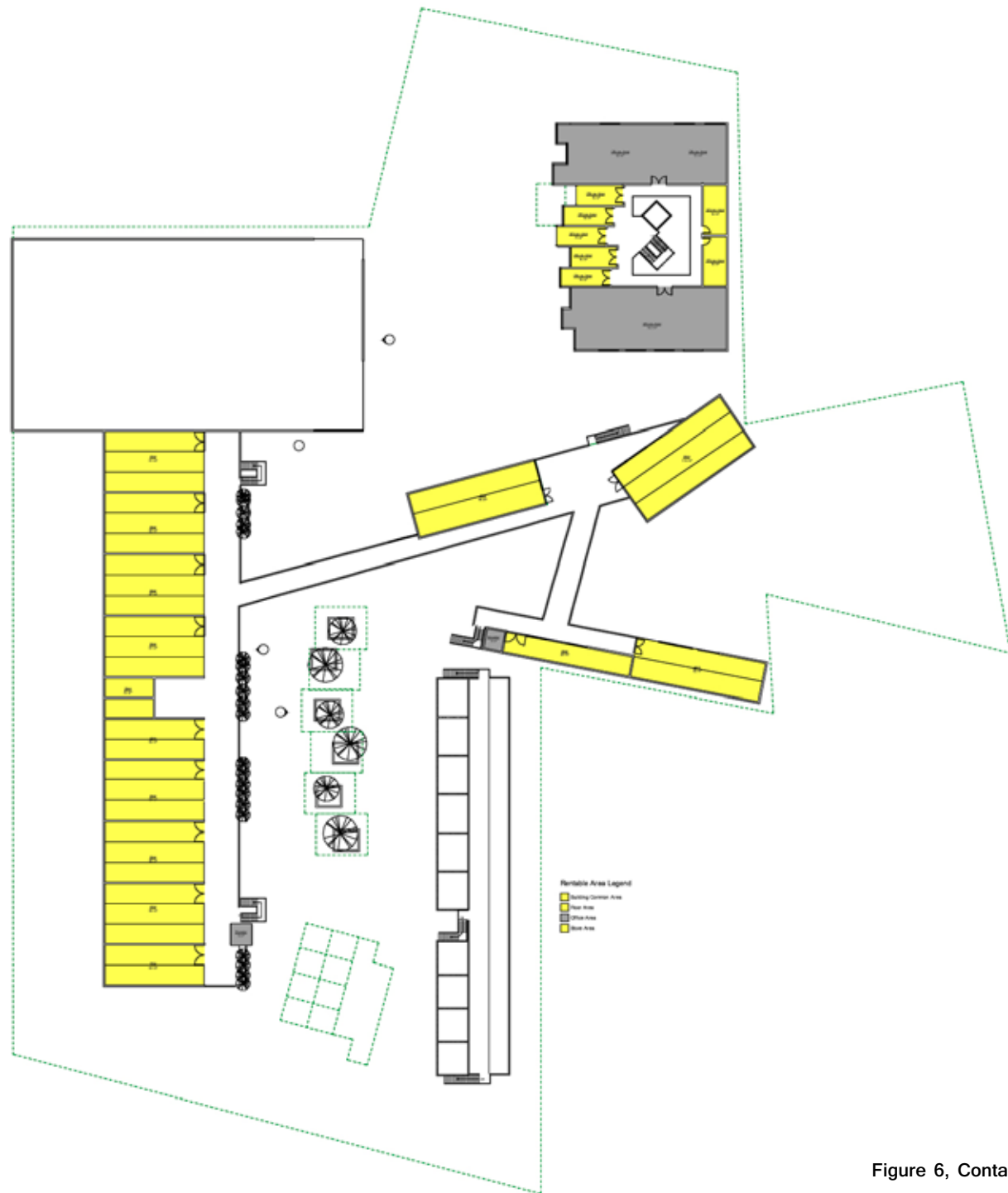


Figure 6, Containers distribution, level 1

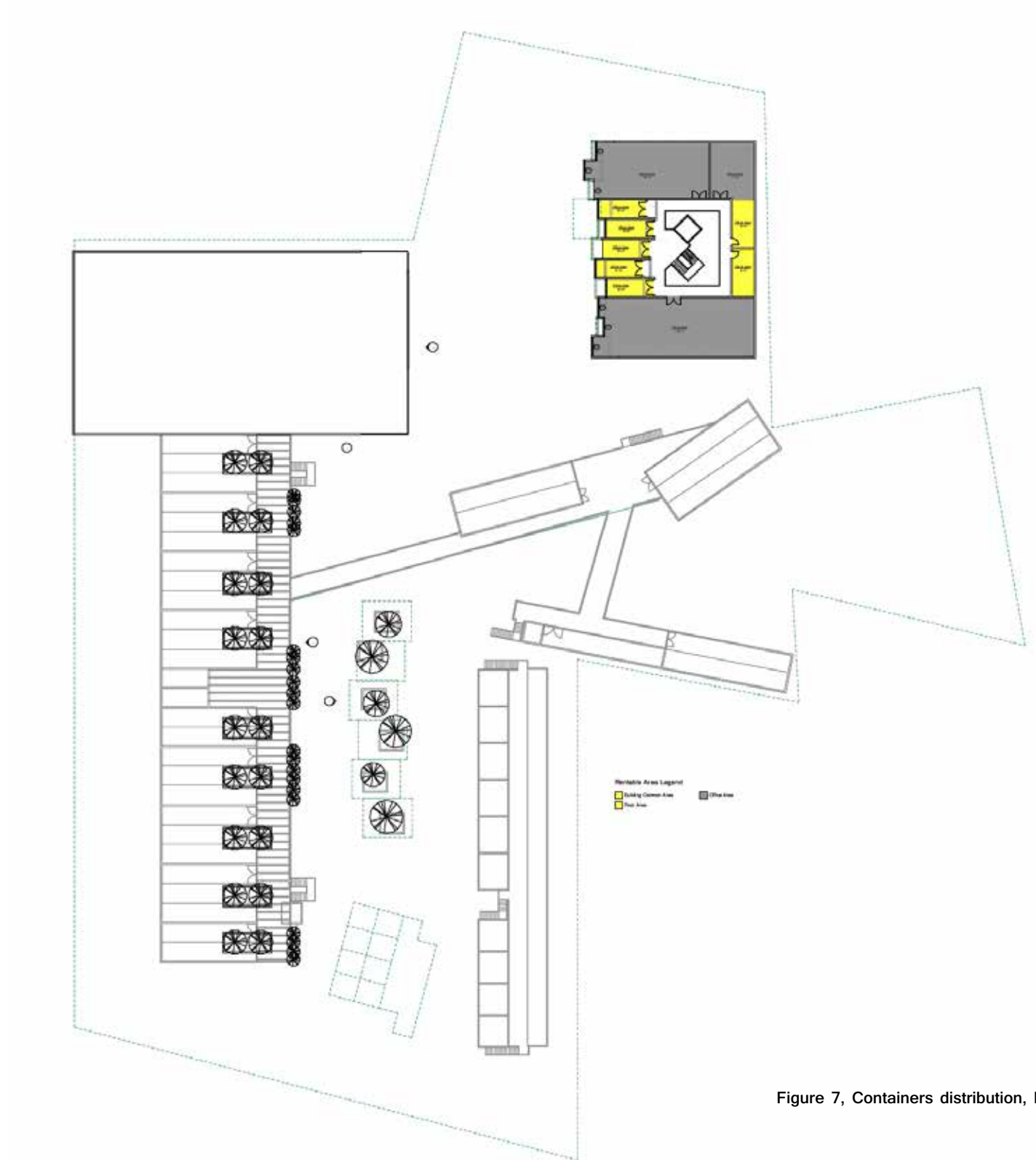


Figure 7, Containers distribution, level 2

CONTAINERS DISTRIBUTION

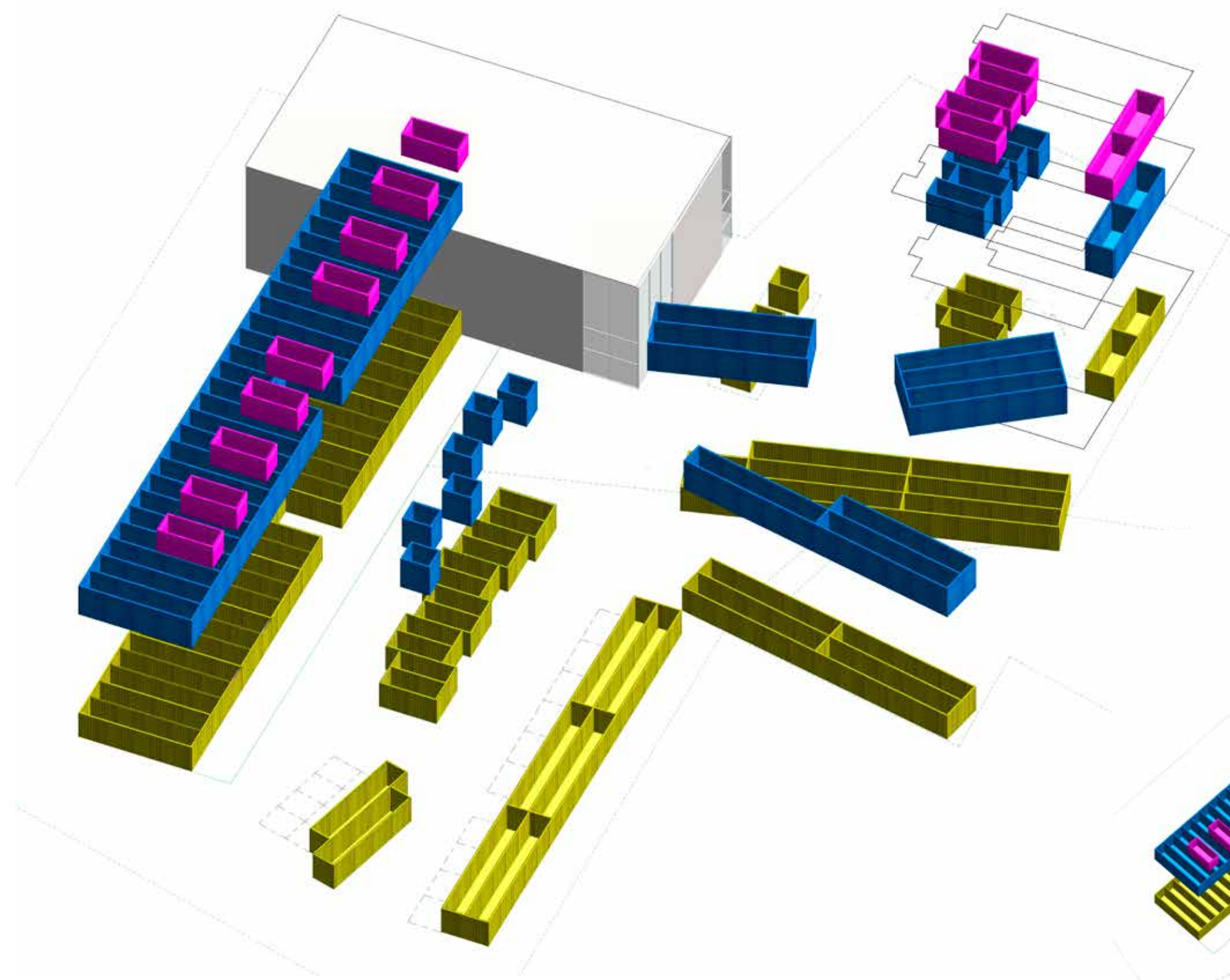


Figure 8, Containers distribution volumetry.

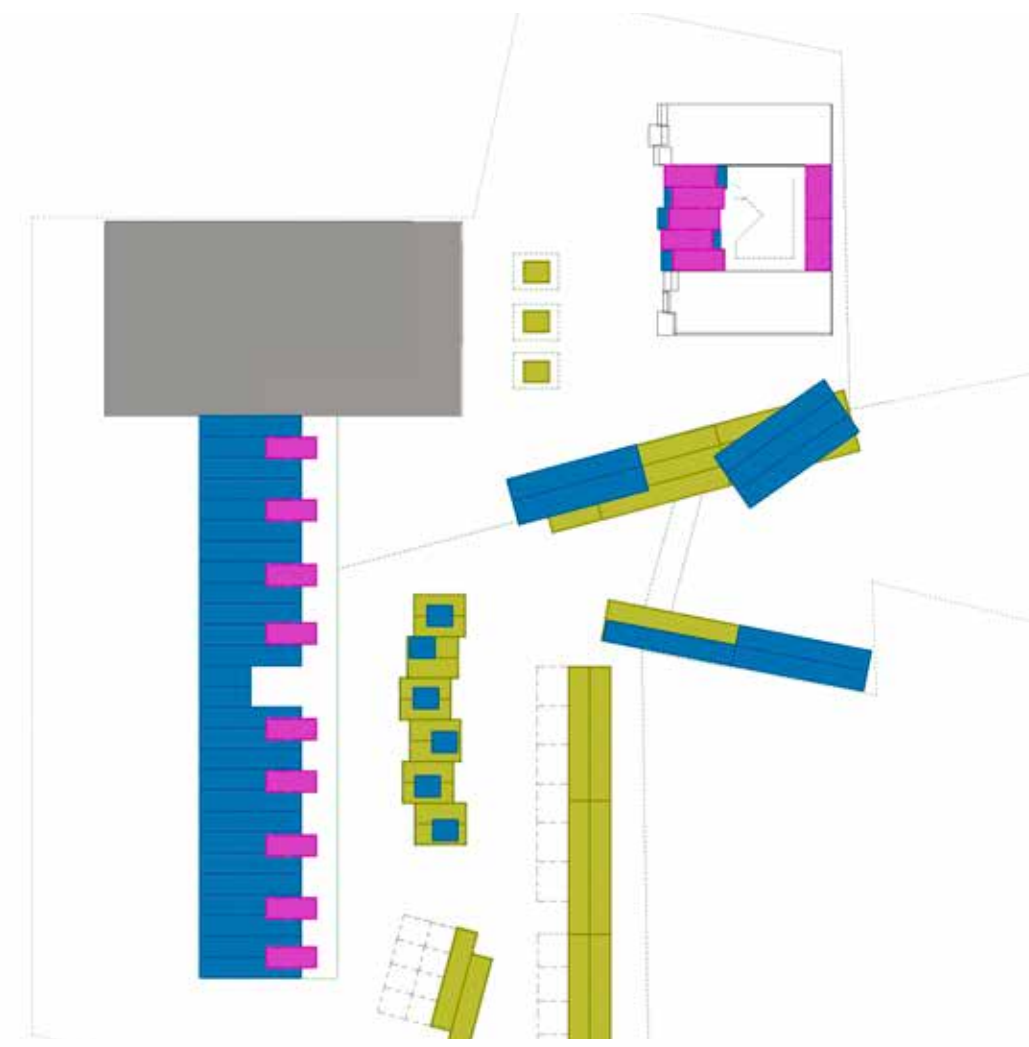
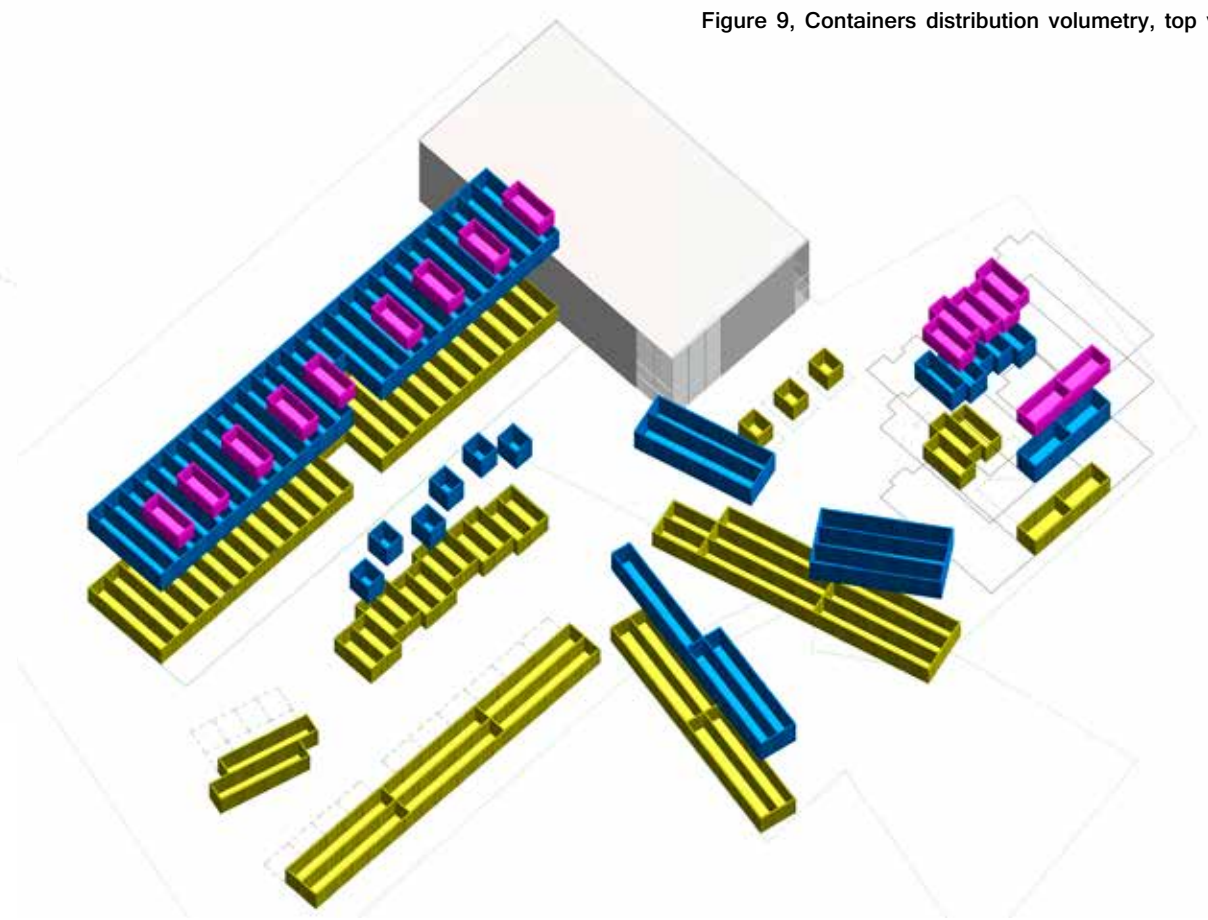
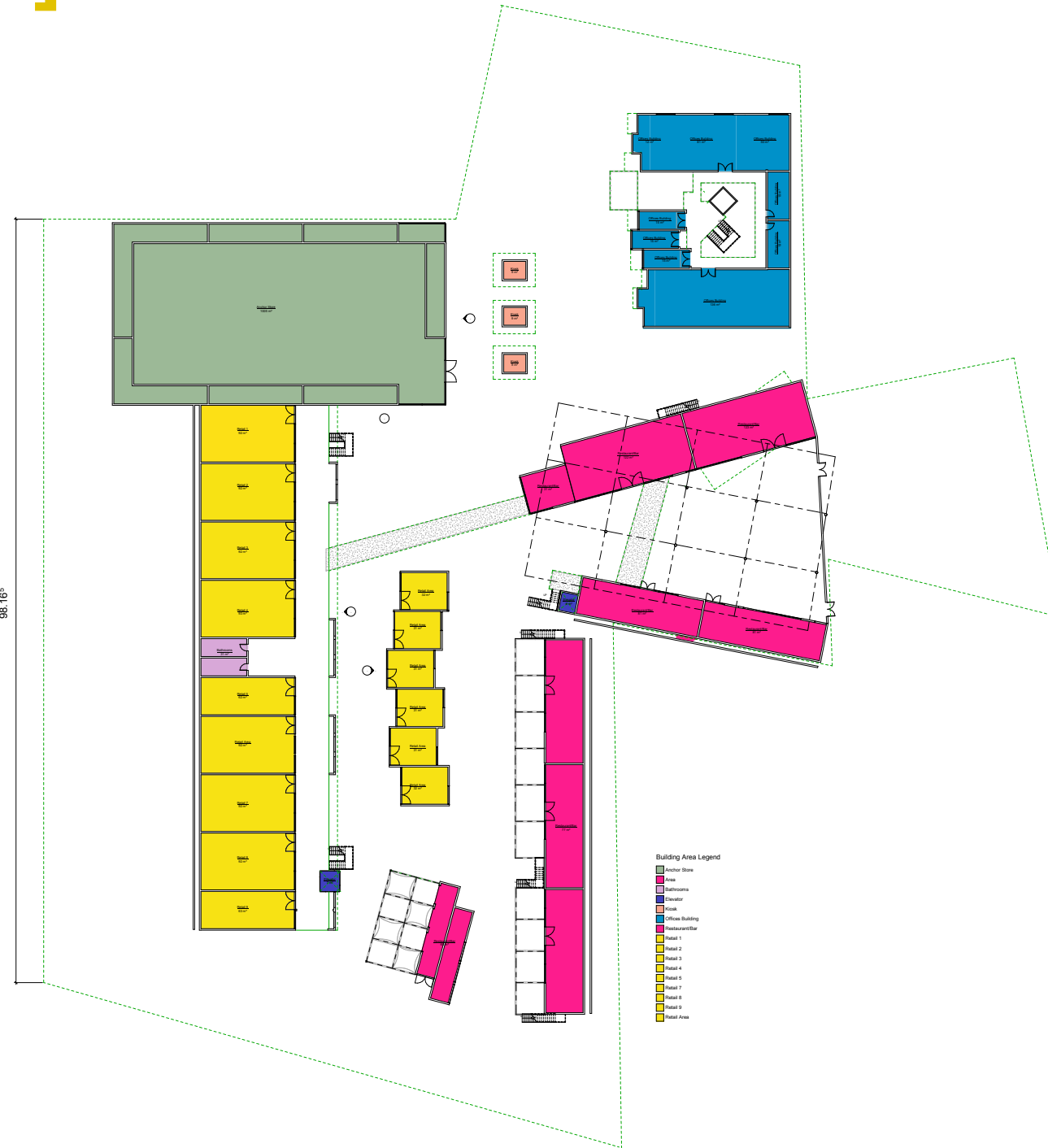


Figure 9, Containers distribution volumetry, top view.



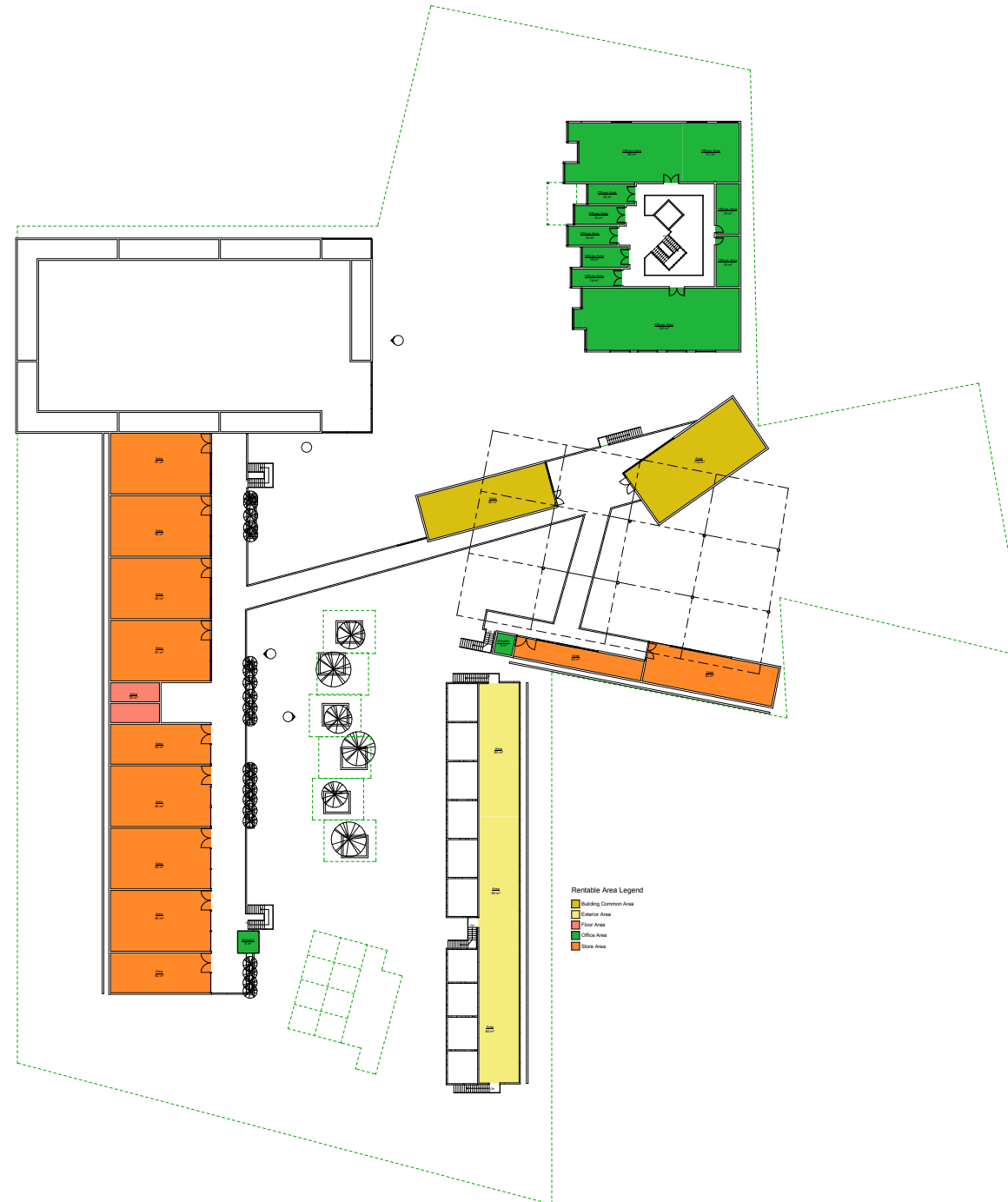
GENERAL PLANS DISTRIBUTION



GROUND FLOOR

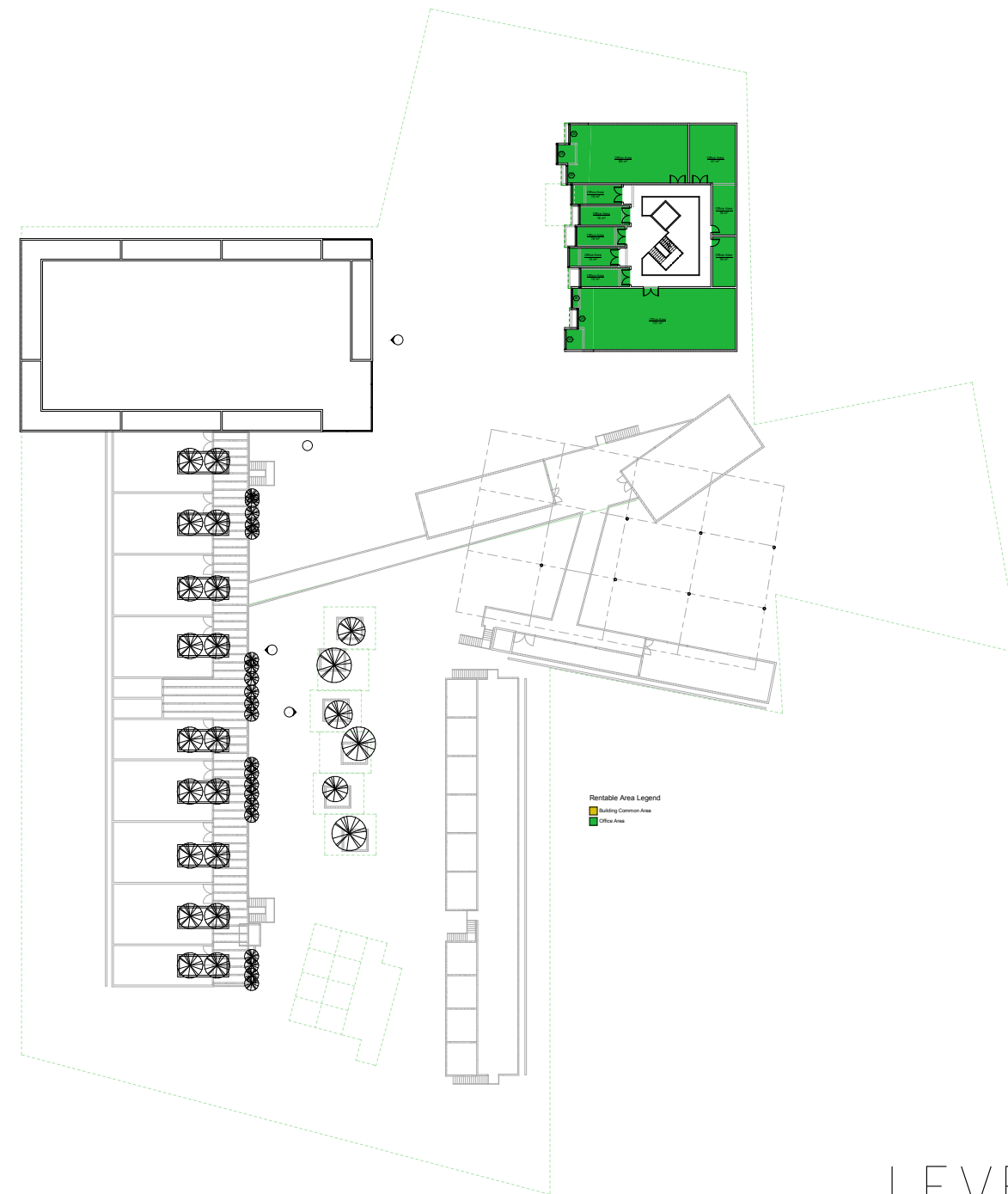


[GENERAL PLANS DISTRIBUTION]



LEVEL ONE

[GENERAL PLANS DISTRIBUTION]

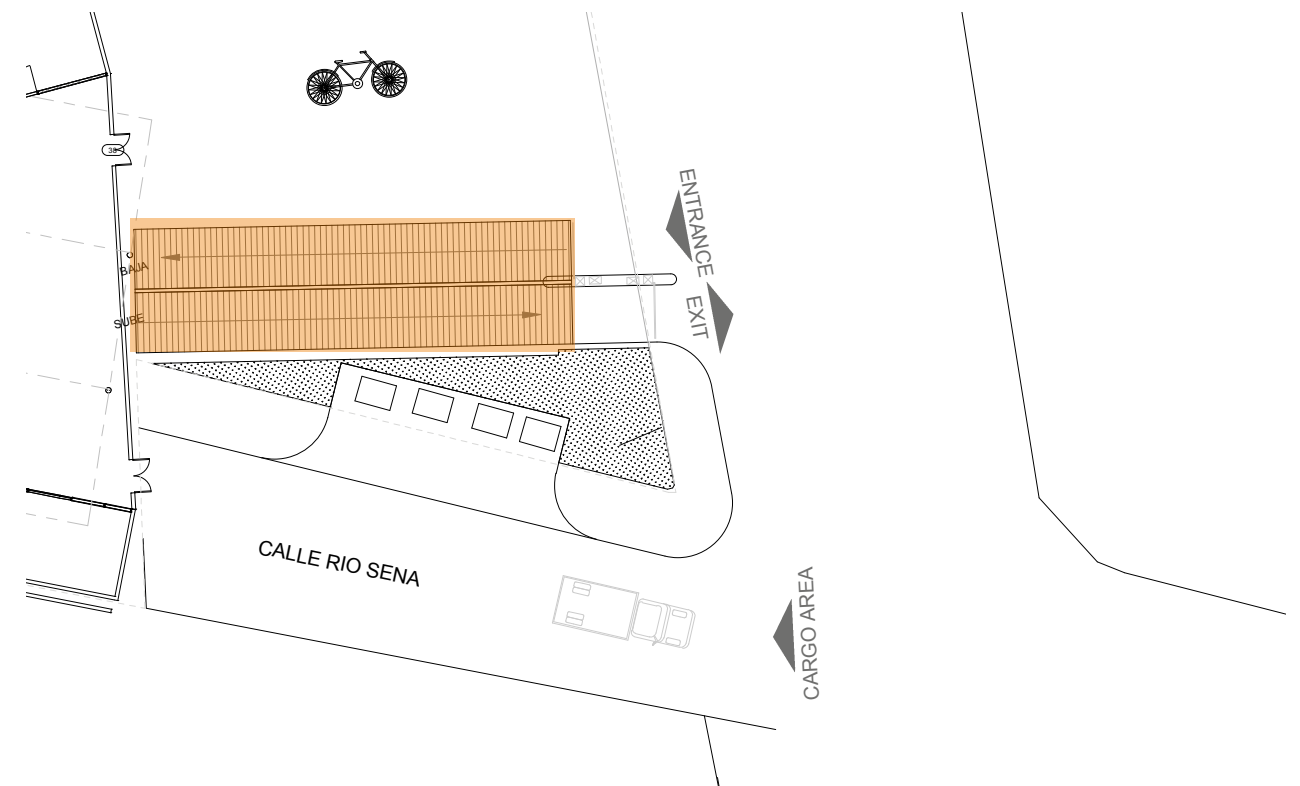
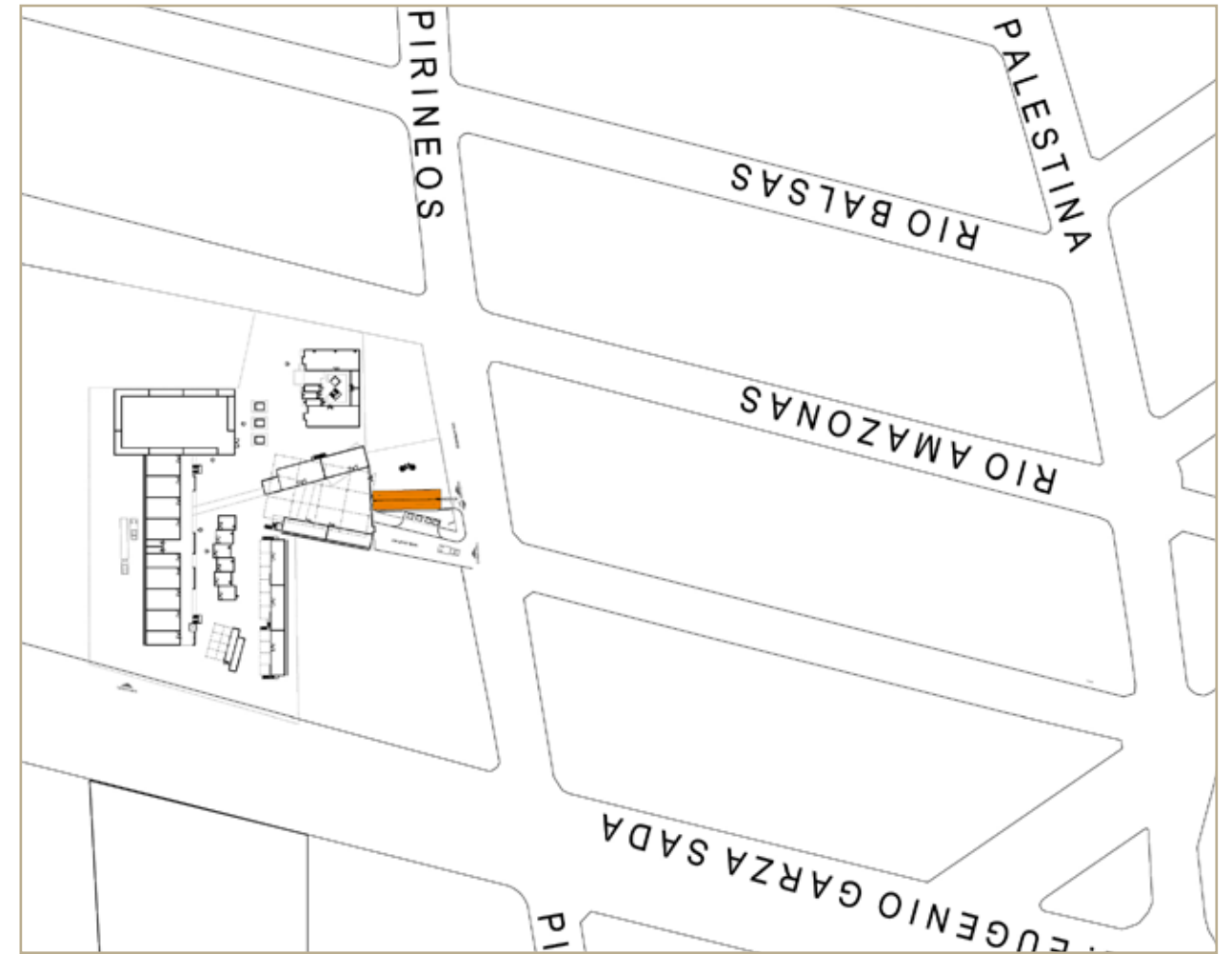
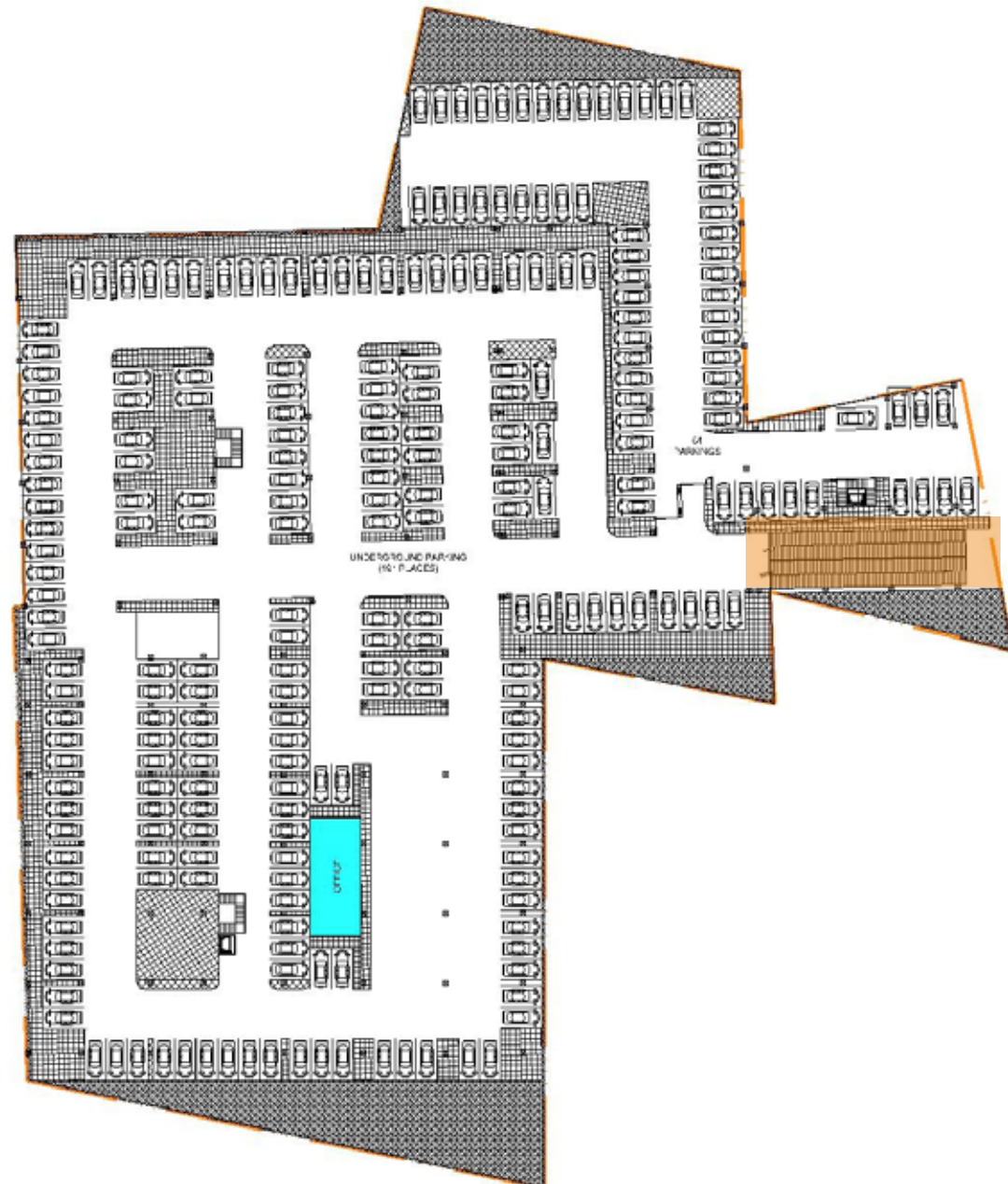


LEVEL TWO

architectural PROPOSAL

CHAPTER [6.1]

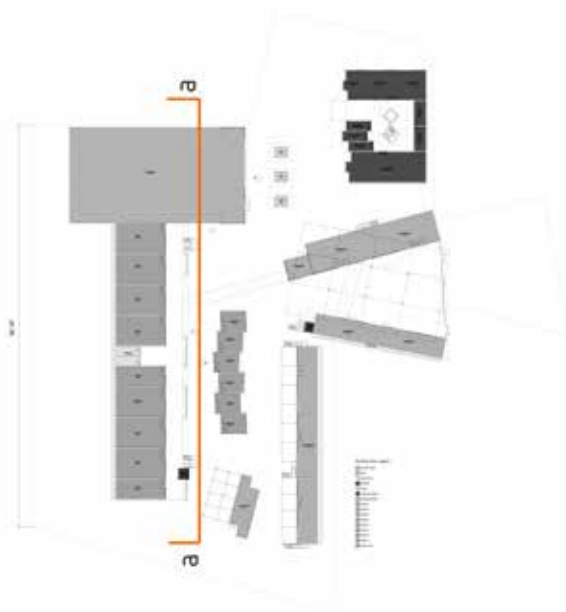
GENERAL PLANS DISTRIBUTION



UNDERGROUND LEVEL



[ELEVATIONS]

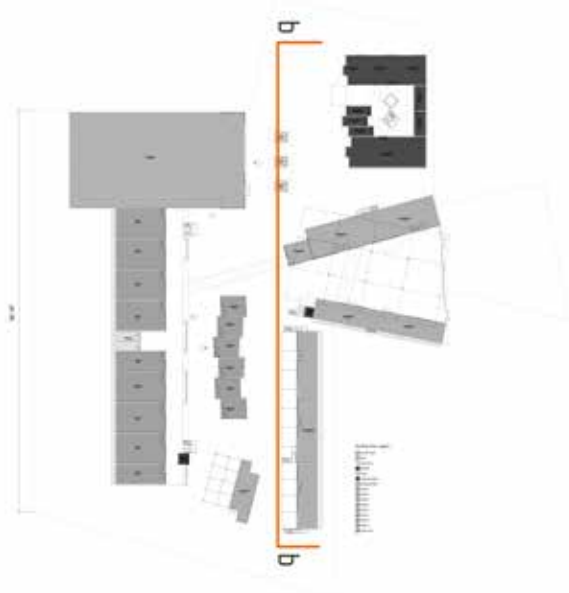


ELEVATION A-A

architectural PROPOSAL

CHAPTER [6.1]

[ELEVATIONS]



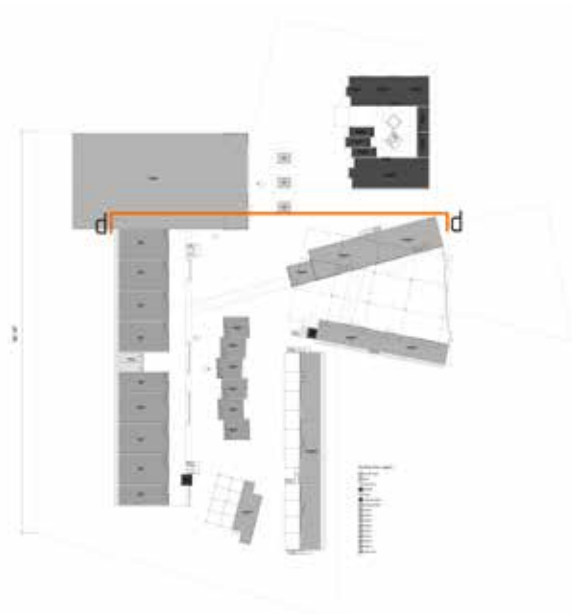
ELEVATION B-B

[ELEVATIONS]



ELEVATION C-C

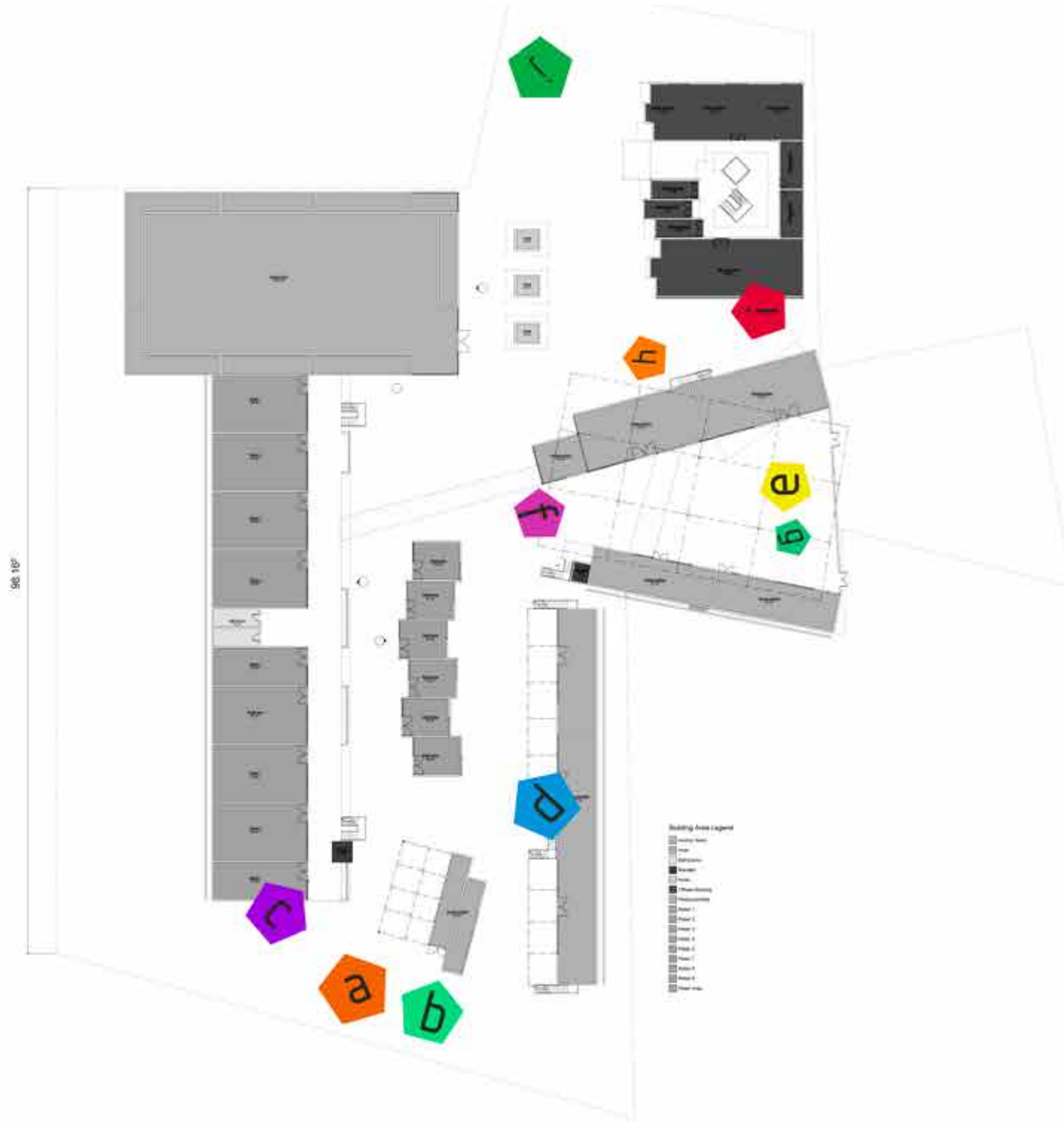
[ELEVATIONS]



ELEVATION D-D

CHAPTER [6.1]

[PERSPECTIVES]



PERSPECTIVES

location i

PERSPECTIVES



PERSPECTIVE a

PERSPECTIVES



PERSPECTIVE B

PERSPECTIVES



PERSPECTIVE c

PERSPECTIVES



PERSPECTIVE d

PERSPECTIVES



PERSPECTIVE e

PERSPECTIVES



PERSPECTIVE f

PERSPECTIVES



PERSPECTIVE g

PERSPECTIVES



PERSPECTIVE h

PERSPECTIVES



PERSPECTIVE i

[PERSPECTIVES]



PERSPECTIVE j

INTERIOR OFFICE BUILDING



TOP VIEW



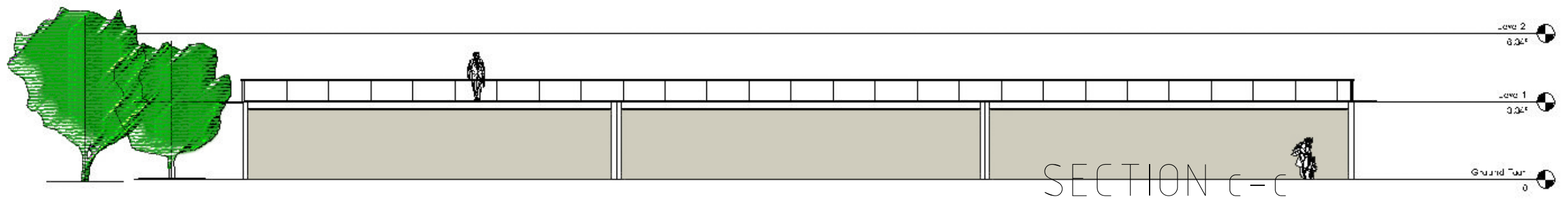
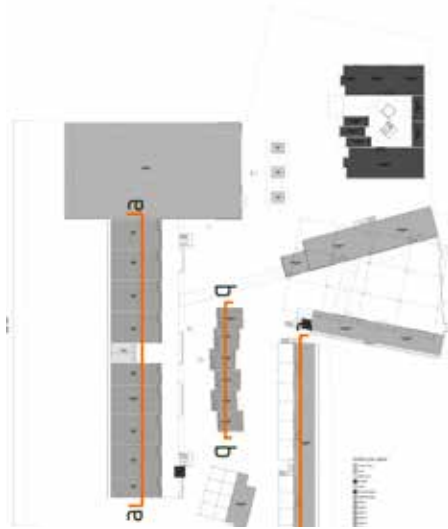
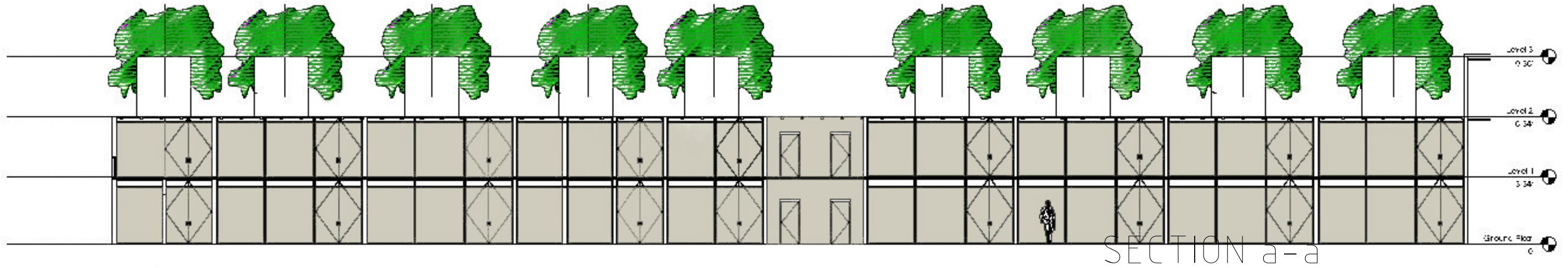
The park will be accessible from the mall



architectural PROPOSAL

CHAPTER [6.1]

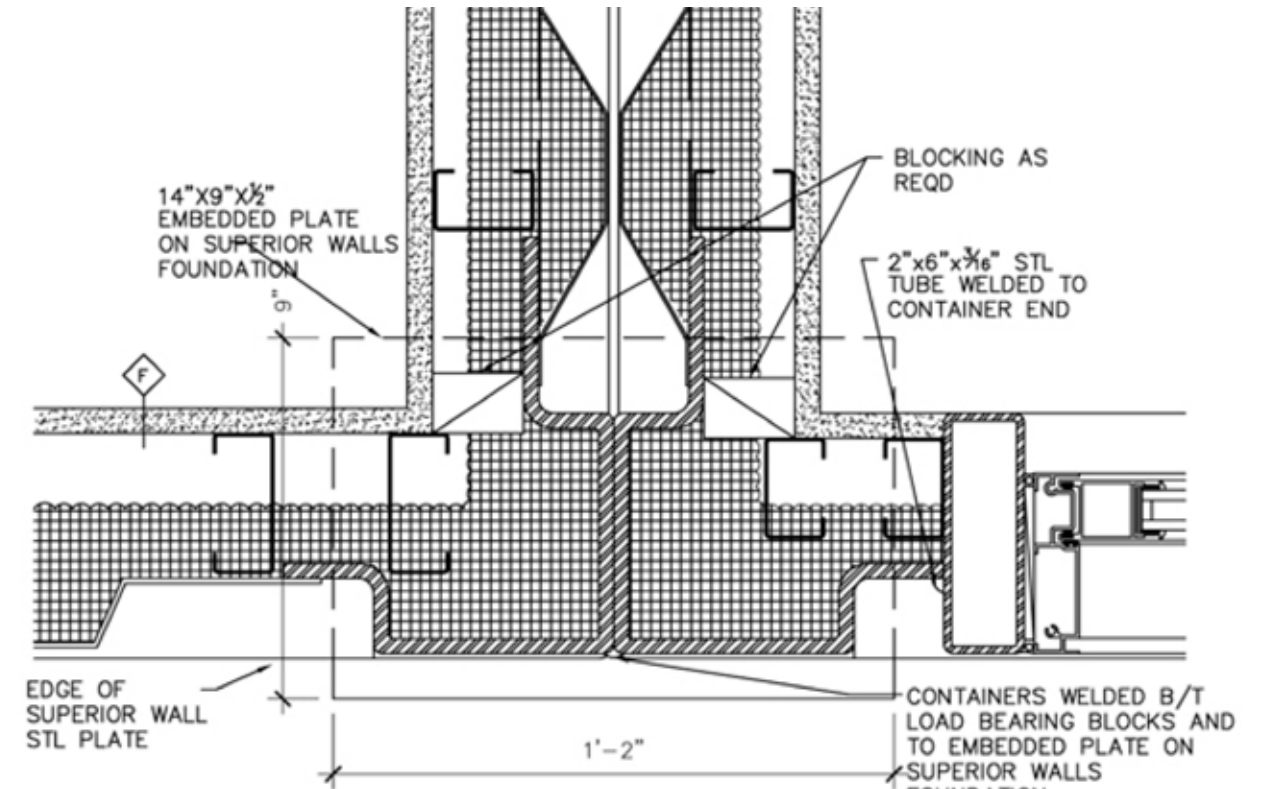
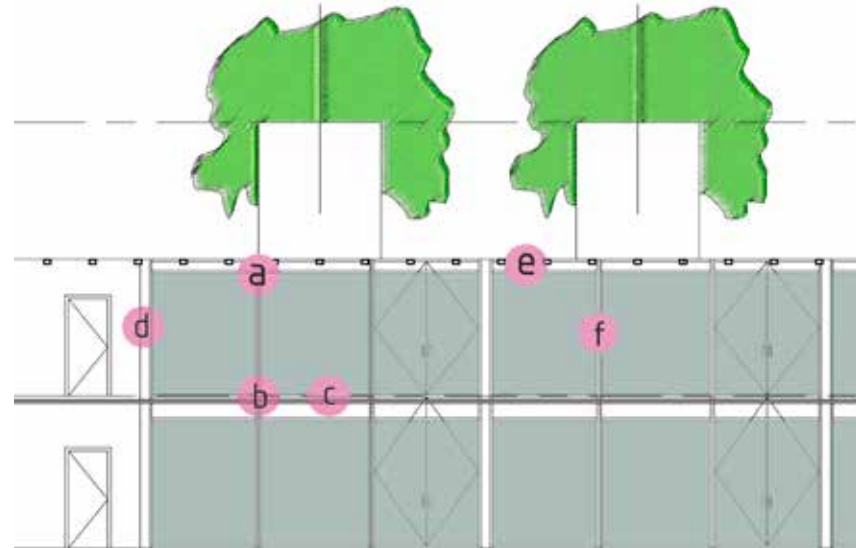
[SECTIONS]



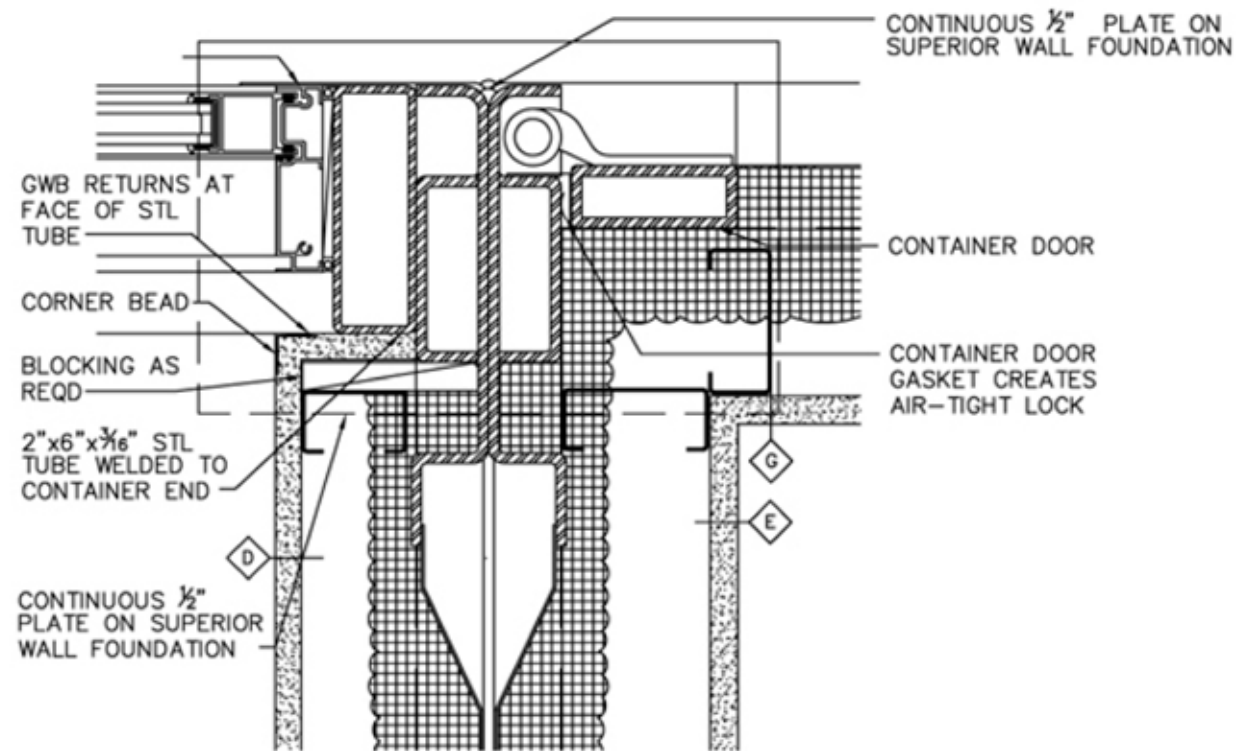
architectural PROPOSAL

CHAPTER [6.1]

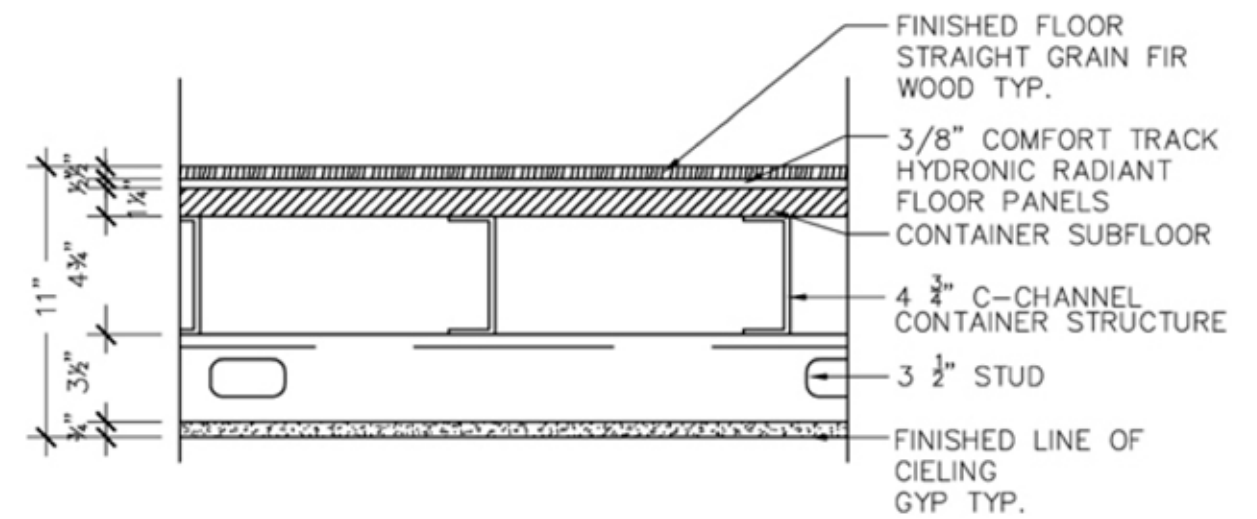
[DETAILS]



SECTION b-b CONTAINER CONNECTION AT END-WALL PLAN DETAIL



SECTION a-a CONTAINER CONNECTION PLAN DETAIL

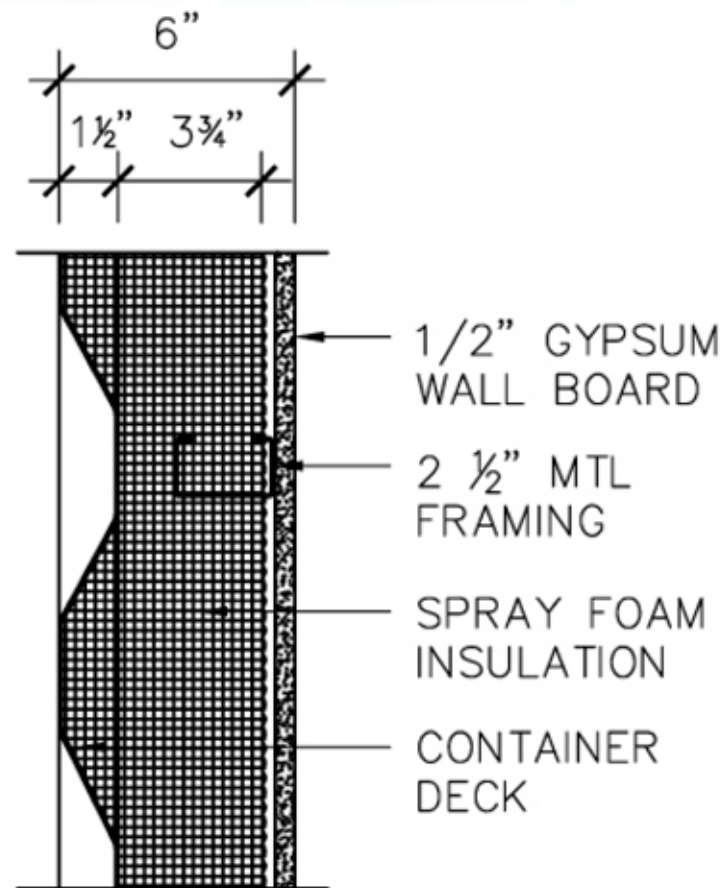
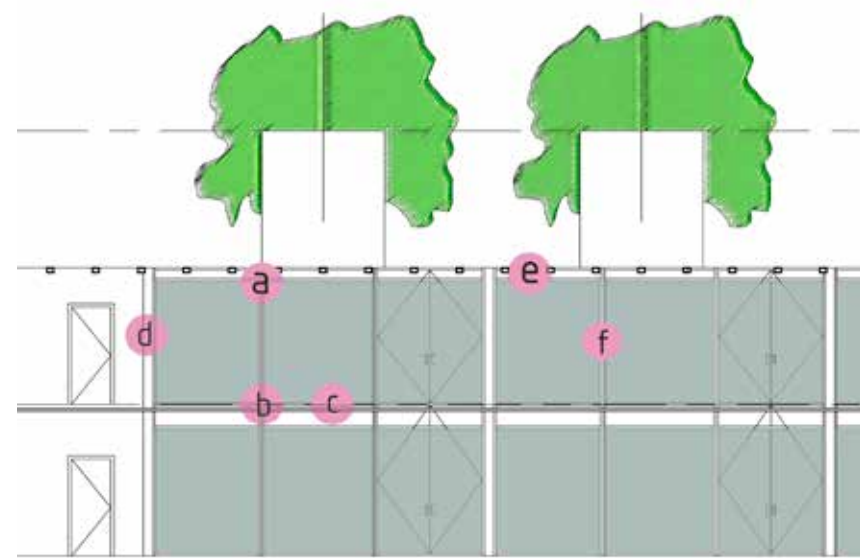


SECTION c-c CONTAINER FLOOR SECTION DETAIL

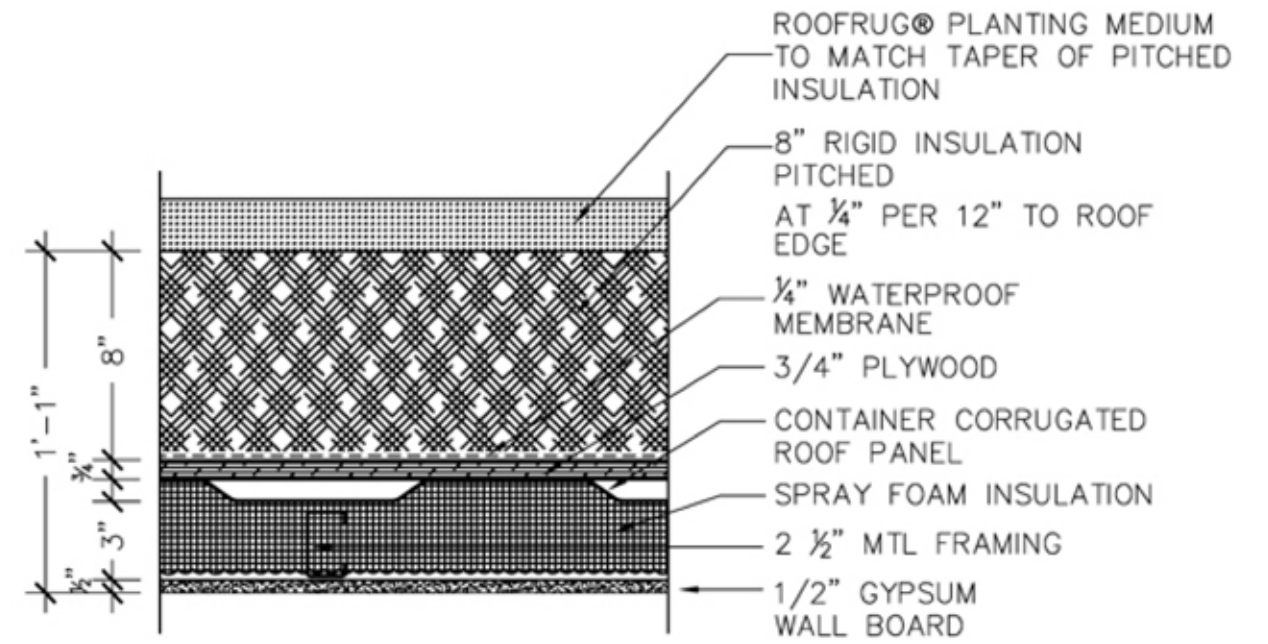
architectural PROPOSAL

CHAPTER [6.1]

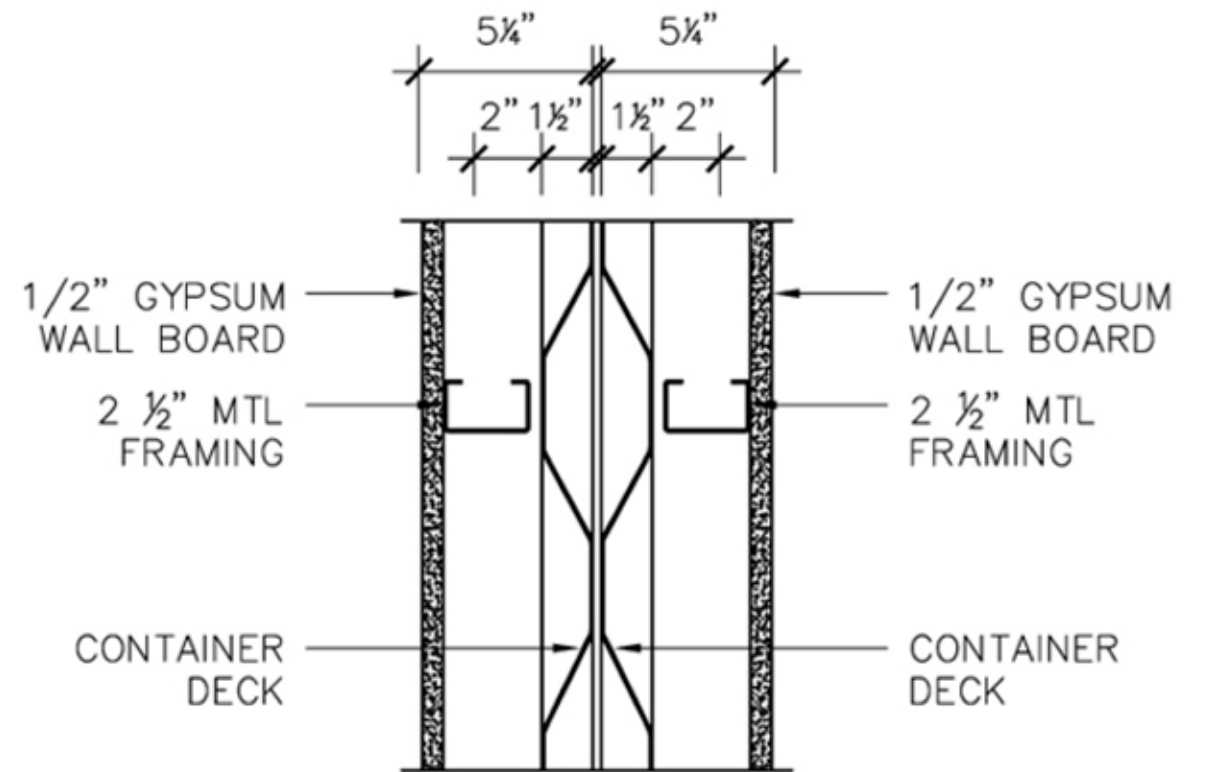
[DETAILS]



SECTION d-d EXTERIOR CONTAINER WALL



SECTION e-e ROOF SECTION DETAIL



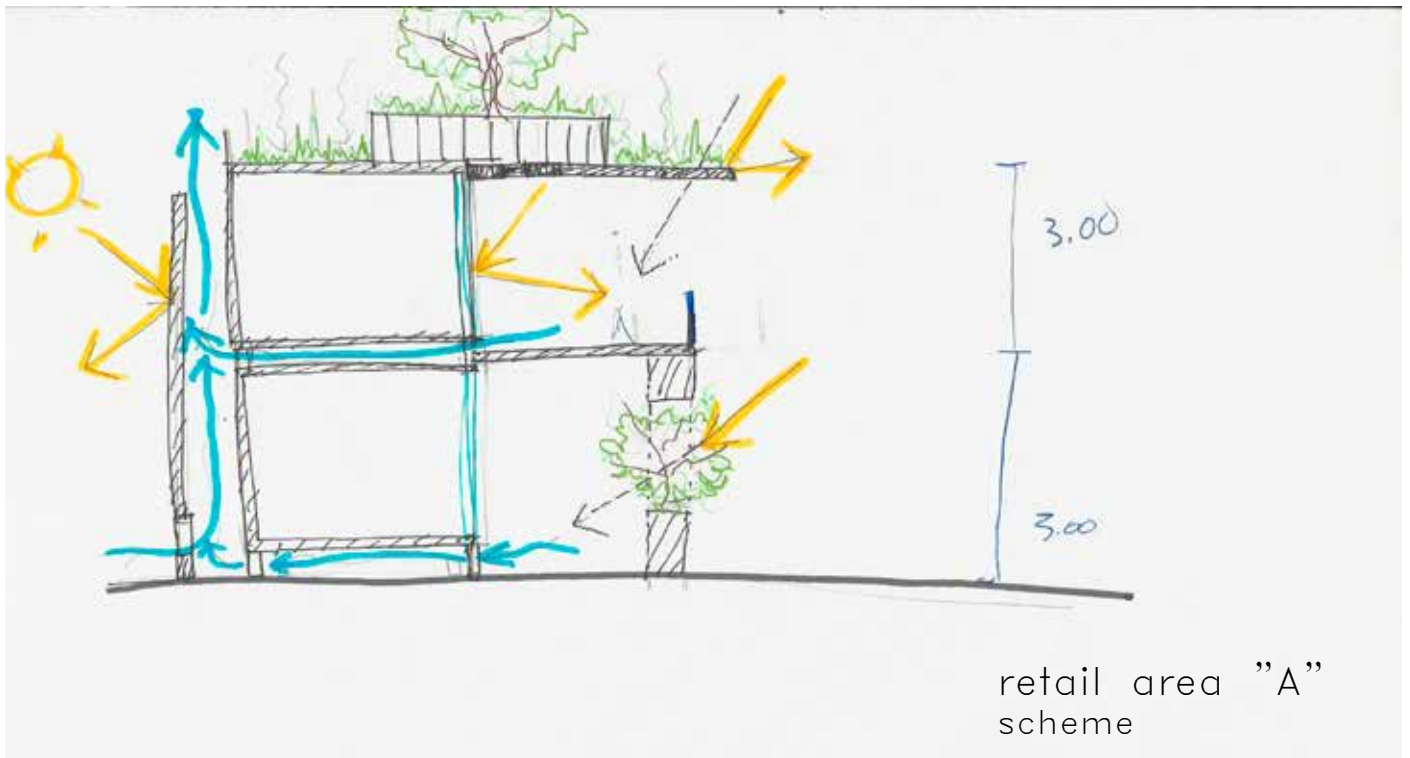
SECTION f-f INTERIOR CONTAINER WALL

Introduction

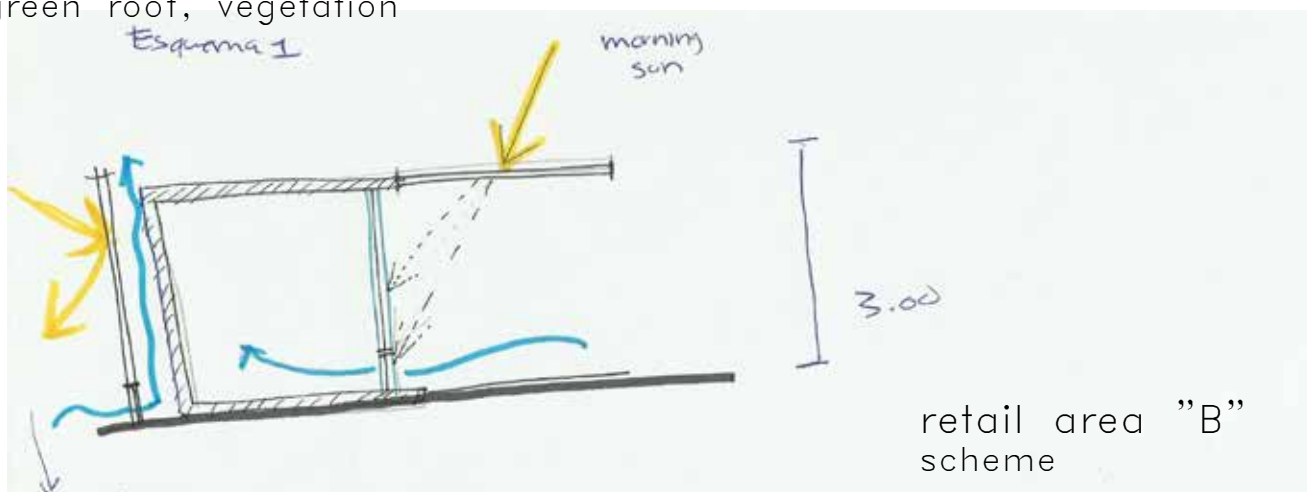
TO THE CONCEPT

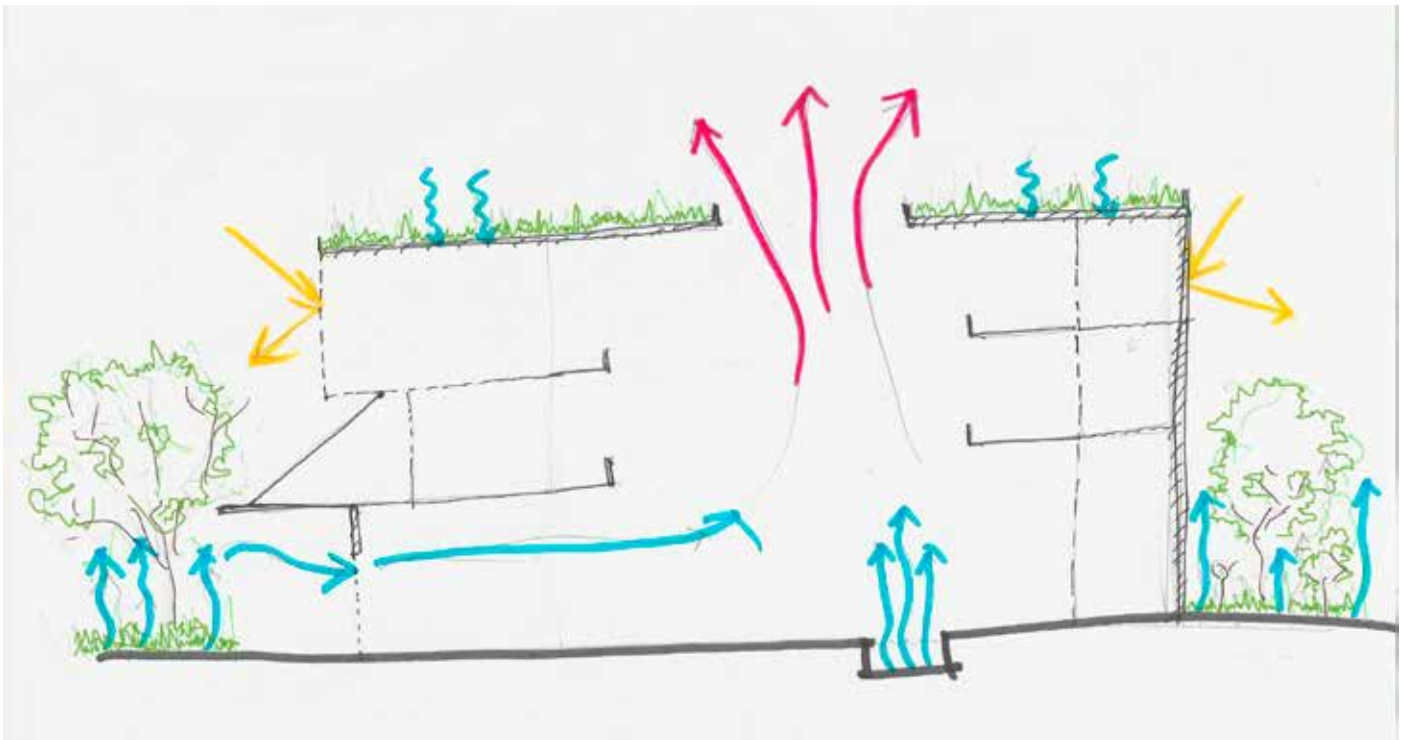
CHAPTER [6.2]

[ENERGY STRATEGIES SCHEMES]

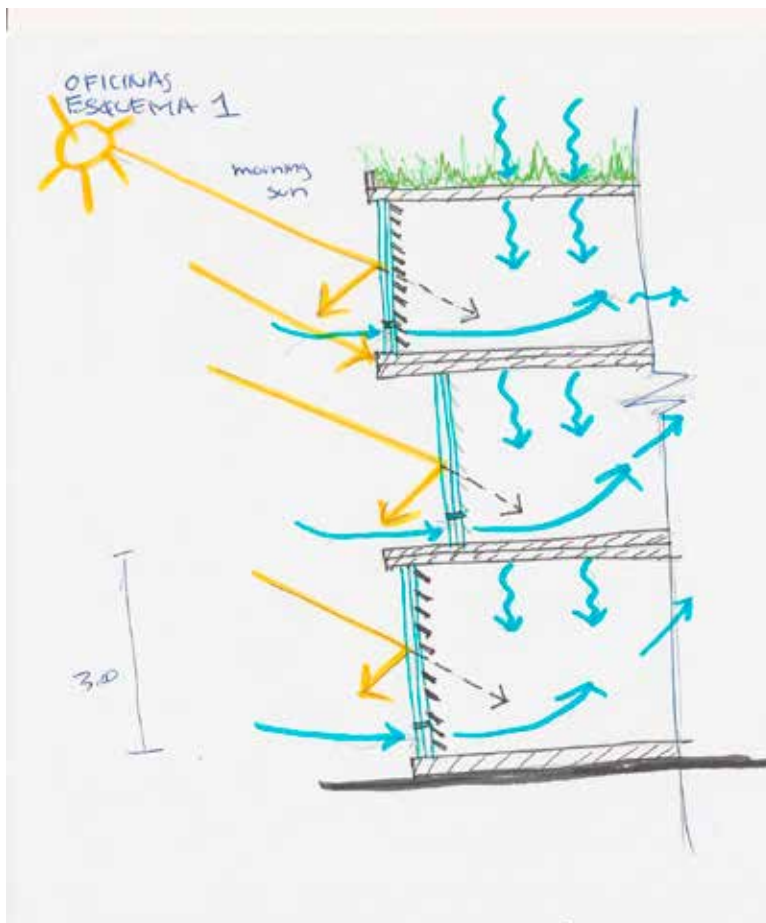


- a) Heat from afternoon sun is deflected
- b) interior of the containers is insulated to reduce heat
- c) roof eave shades morning sun
- d) air flow through spaces between containers
- e) air flow between containers and protective wall
- f) green roof, vegetation





Cool air generated in summer by the presence of vegetation around the building and a reflecting pool, which acts as a heat-cool mass transfer.



Office Building scheme

Even with the cons that cargo architecture has; difficulties to install basic services such as electricity and water, amount of energy required to make the box habitable, the temperature inside containers can easily go too low in cold season (controlling temperature inside the steel container house is a major concern), etc cargoarchitecture also has many advantages in the bold and innovative thought of container architecture.

First of all, building with shipping containers save costs, secondly reusing transport receptacles actually lessens the impact of the use of conventional construction materials like brick, cement, and wood and also saves considerable energy which is otherwise needed to meld down metal containers when scrapping, thirdly, importing countries like USA, which import more than export, are now having some hundreds of thousands of containers abandoned in ports, fourthly, container structure is designed to be exposed to heavy loads, harsh climatic conditions, and regular rough handling.

Therefore we could choose going out of the comfort zone, with this I mean doing an effort to include this kind of materials in our projects and dealing with the benefits after had passed the difficulties of using this type of technology.



Monterrey, N.L., México