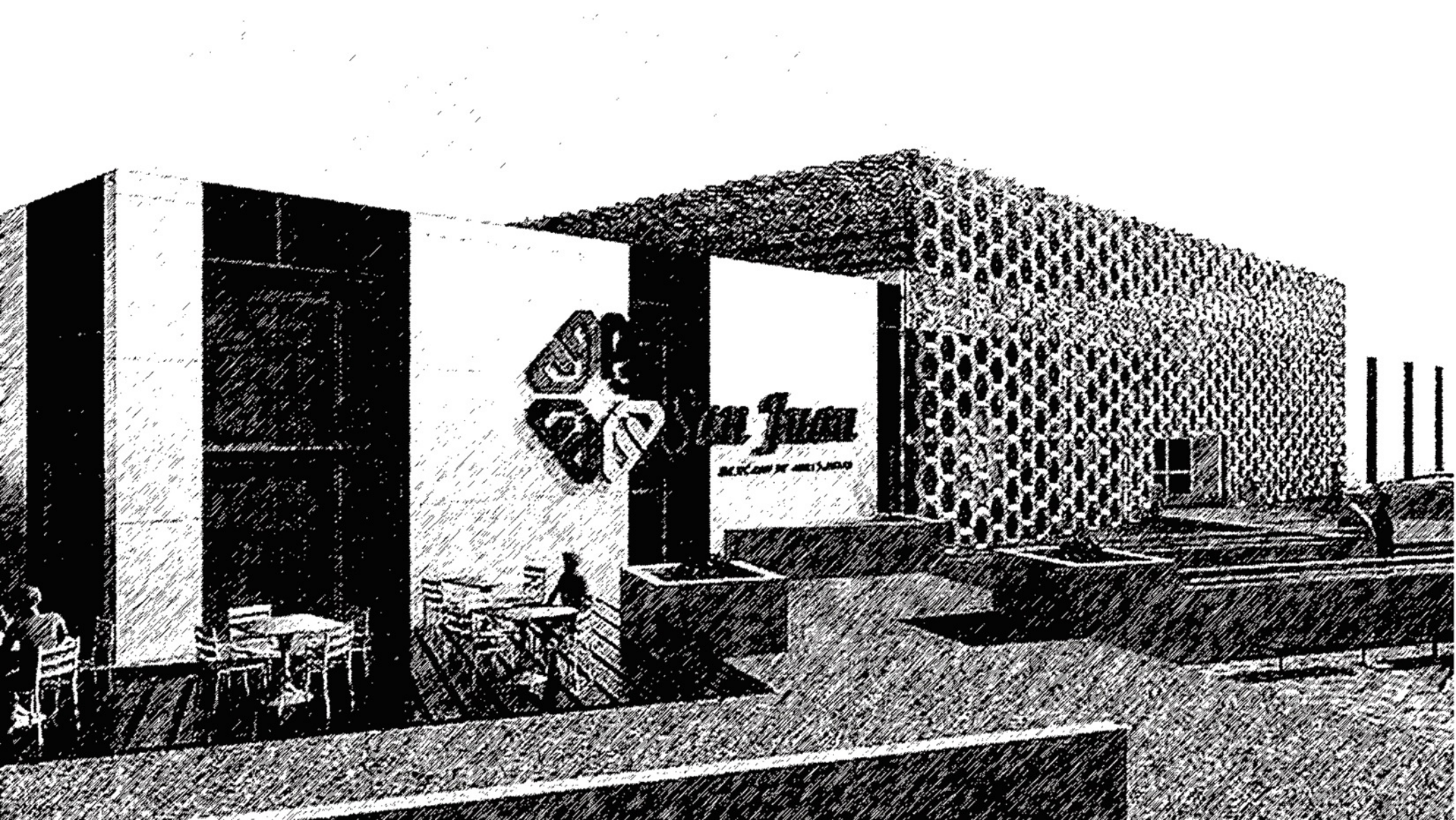


# CITY

## CULTURE AND TRADITION

Renovation of the Handcraft Market of Mexico City, and its connection with the historic center



**POLITECNICO DI MILANO**

VI FACULTY OF ENGINEERING  
POLO TERRITORIALE DI LECCO



MASTER OF SCIENCE IN ARCHITECTURAL ENGINEERING  
COURSE OF BUILDING ENGINEERING

MASTER THESIS  
CITY, CULTURE AND TRADITION: RENOVATION OF THE HANDCRAFT MARKET OF  
MEXICO CITY, AND  
ITS CONNECTION WITH THE HISTORIC CENTER.

RELATORE  
PROF. MASERA GABRIELLE

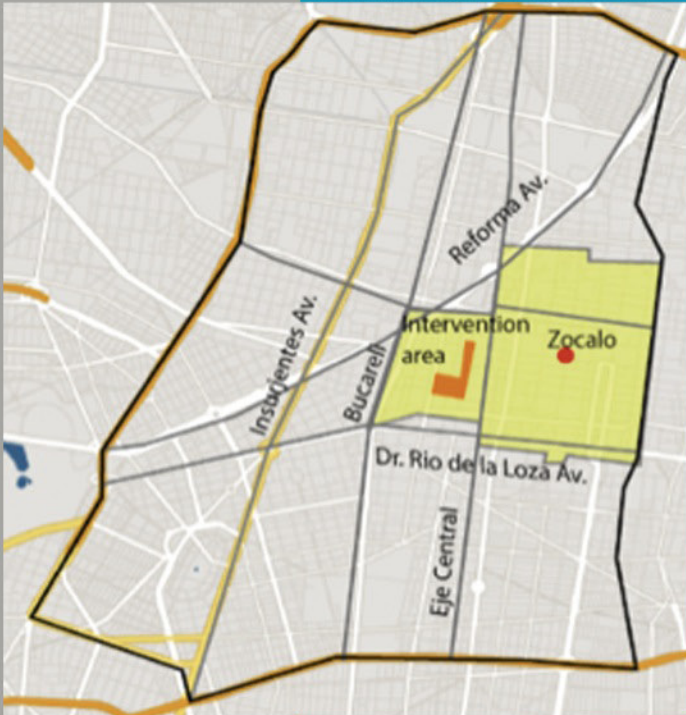
CORRELATORE  
PROF. MARTINELLI PAOLO

PRESENTED BY  
GIRALDO NARANJO MARIANA                   797385  
DEL CARMEN CORTEZ OMAR ULISES       796839

APRIL 2015



LOCATION OF MEXICO CITY



SITE LOCATION

Site	Mexico City
Latitude	19° N
Longitude	99.1° W
Climate	Humid Subtropical Climate (Cwa)
Classification	
Temperature	Min 8°C      Av 15-20°C Max 29°C
Precipitation	762 mm
Wind	West winds.
Psychometrics	Need of solar radiation in winter Natural ventilation for summer Many days in comfort zone
Air quality	High pollution



Duomo Milano

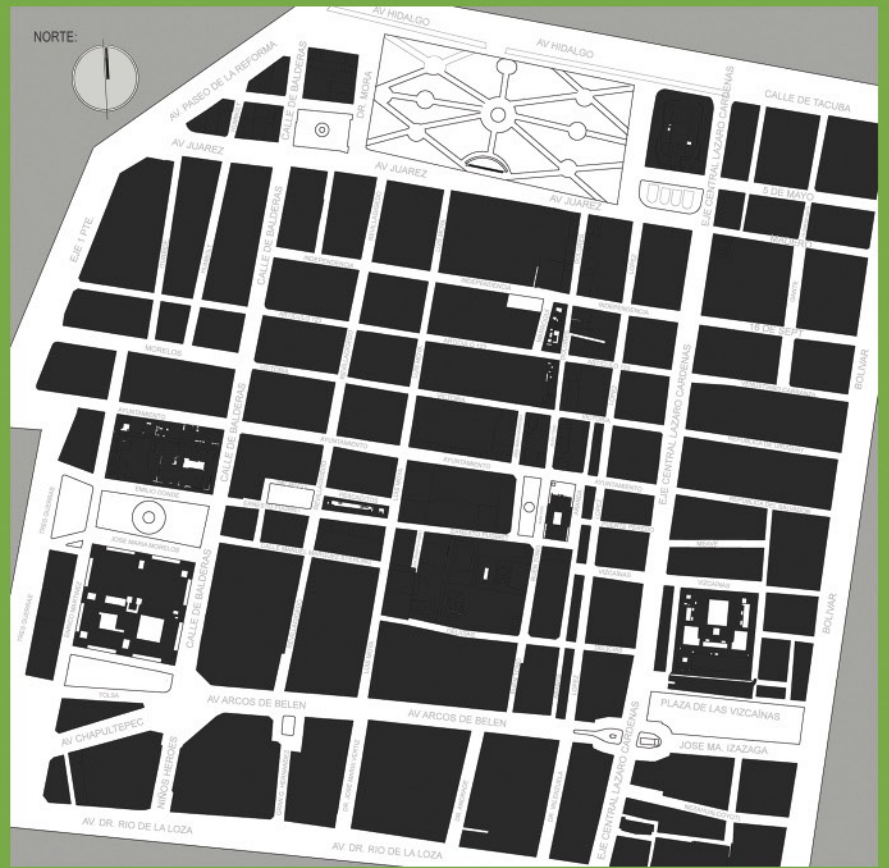
SCALE COMPARISSON



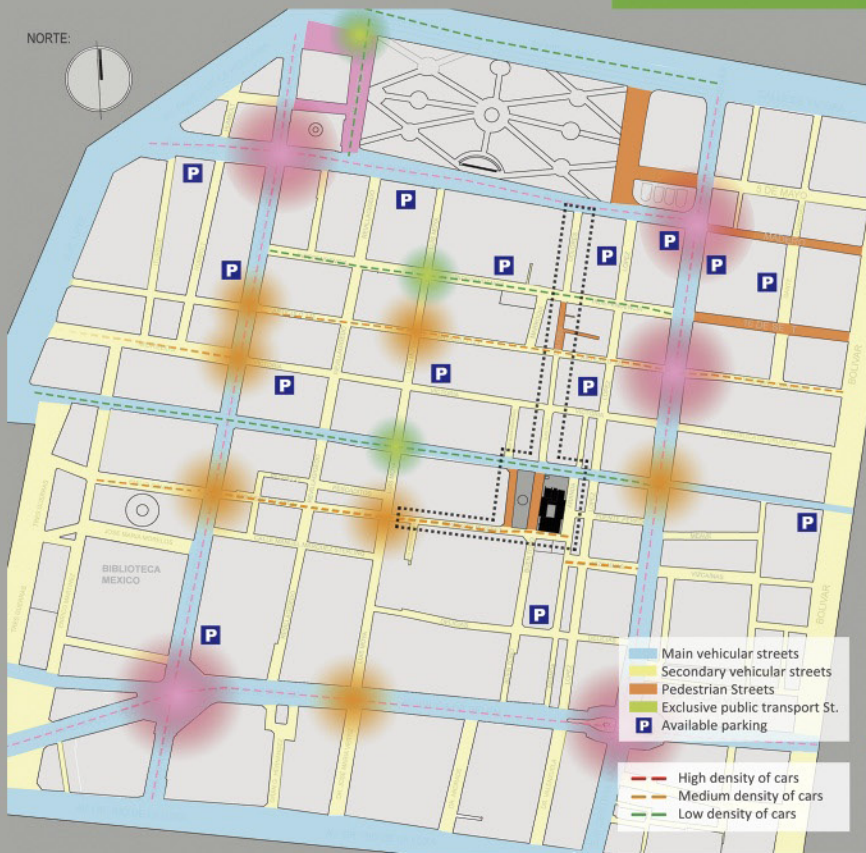
SKYLINE



**LANDUSE**



NO SCALE



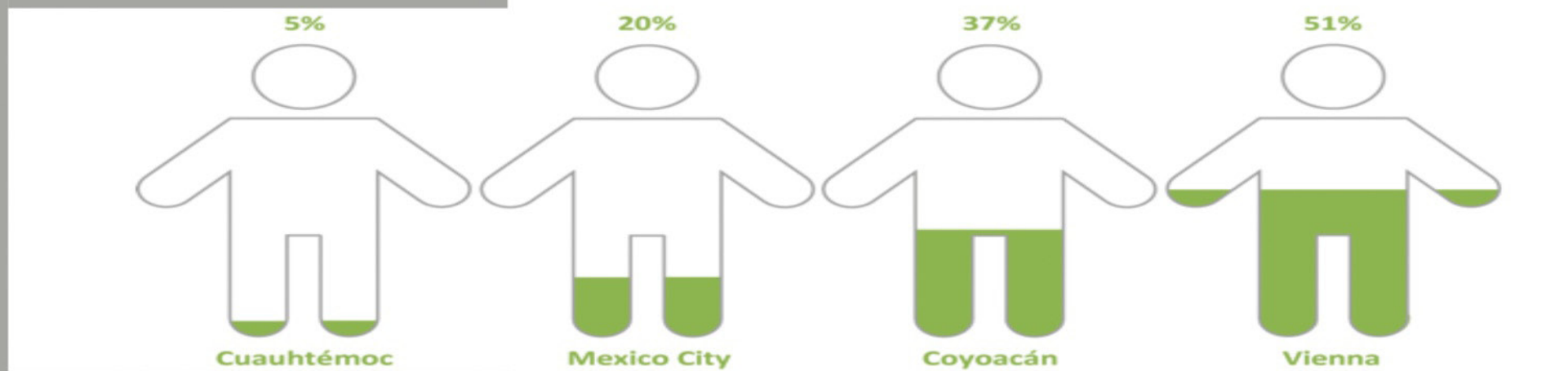
**MOBILITY**



**PUBLIC TRANSPORT**



**GREEN AREAS**



**GREEN AREAS COMPARISSON**

## Strength

- Historical Heritage.
- Concentration of services, commercial, cultural and political activities in the surrounding area.
- Urban corridors / Tourism / Commercial.
- Located in one of the most important boroughs in the city.
- 1.5 million visitors a day.
- 24/7 commercial services.
- Important influence of the neighborhood in the city activities.
- Cultural - social diversity

Strengths



## Opportunities

- Growth of the population.
- Big economical resources addressed to the restoration and recuperation of public spaces.
- Concentration of economical activities.
- Recuperation of land uses.
- Re-habilitation of the streets: different projects held by the city government.
- Conservation programs for buildings.
- Re-habilitation of the urban layout and landscape

Opportunities



## Weakness

- High concentration of population.
- Oldest neighborhood in the city.
- Segregation of social sectors.
- Functional misused of buildings.
- Big concentration of cars traffic.
- High level of delinquency.
- Bad image of streets and corridors.
- Bad organization of streets.
- Lack of parking lots.
- Pedestrian accidents.

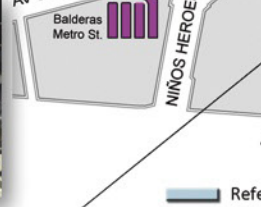
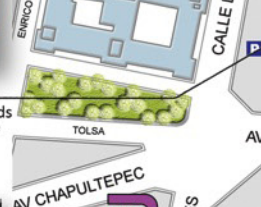
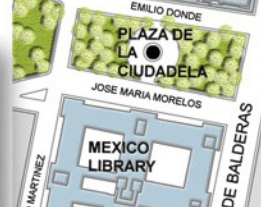
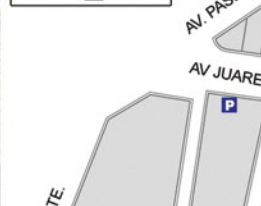
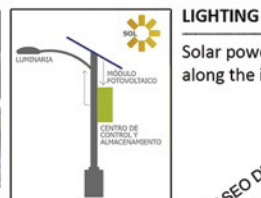
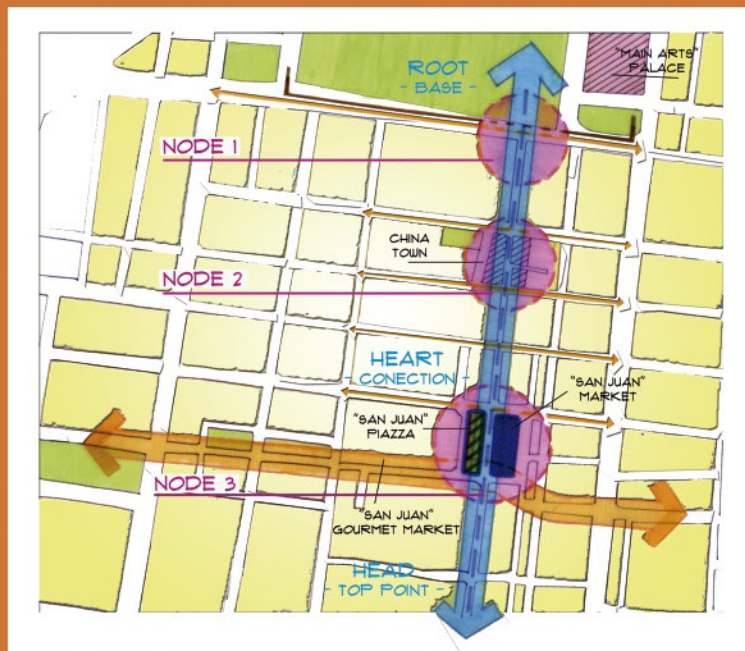
Weaknesses



Threats

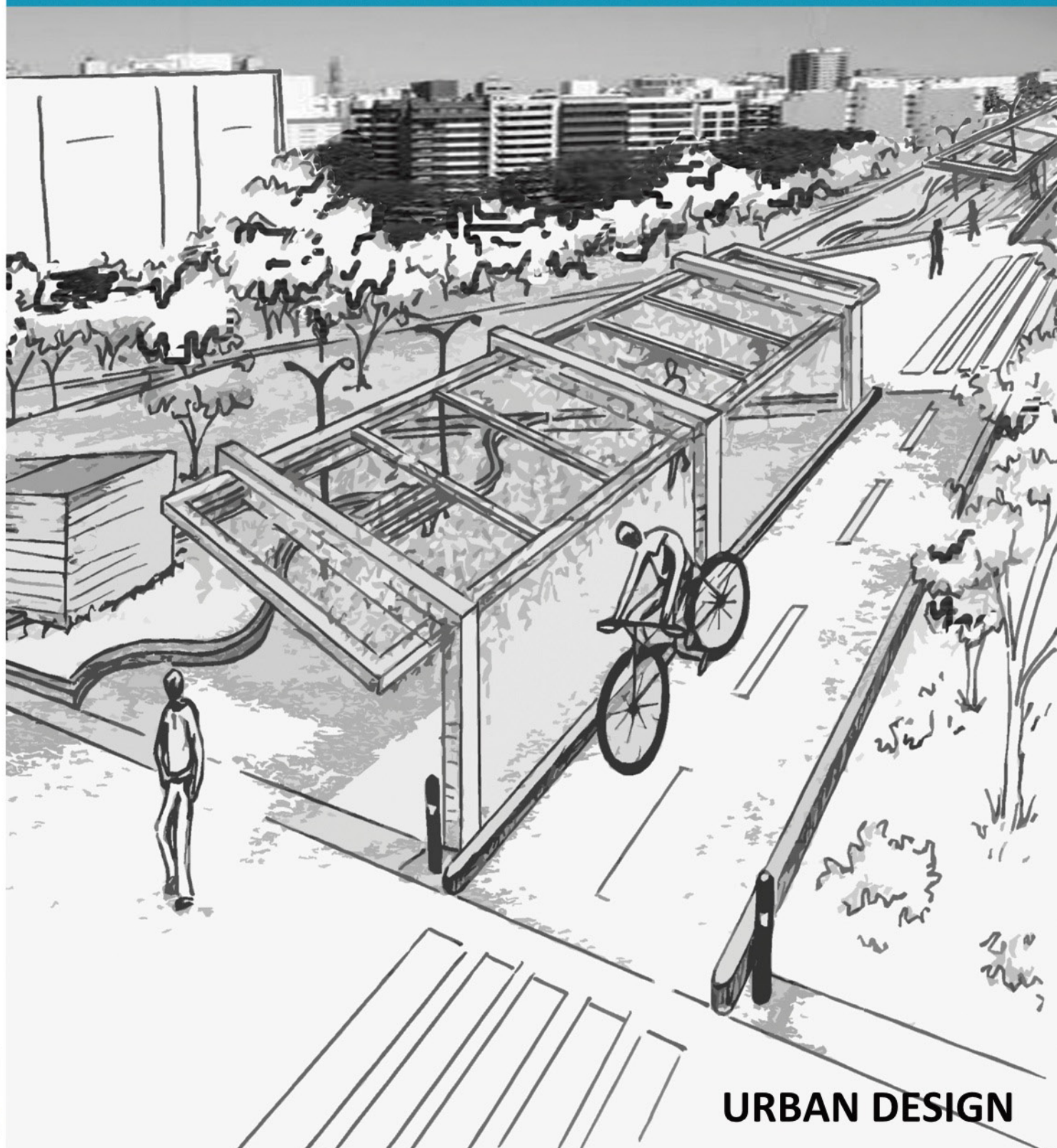
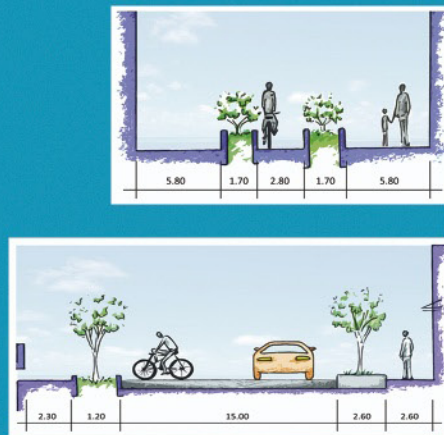
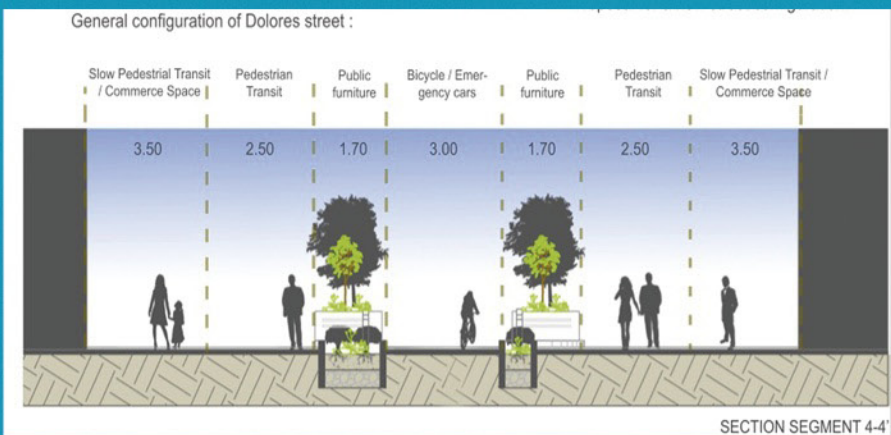
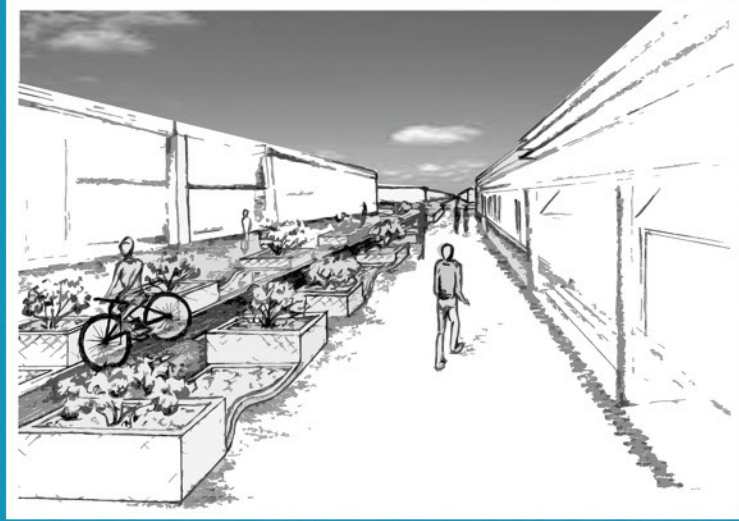
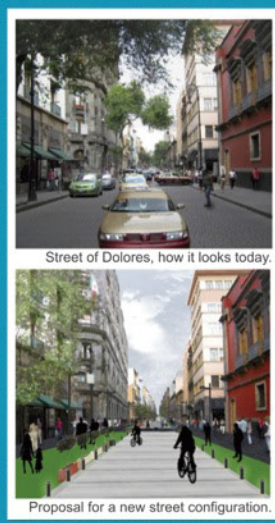
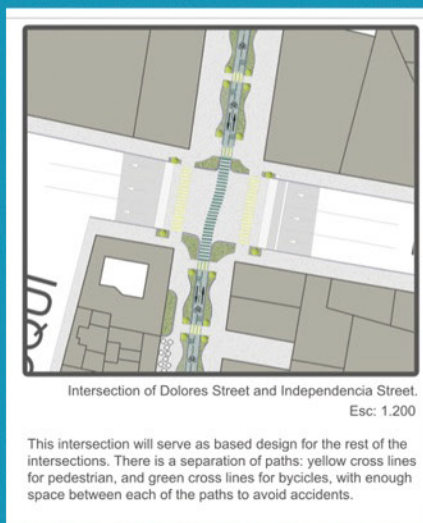
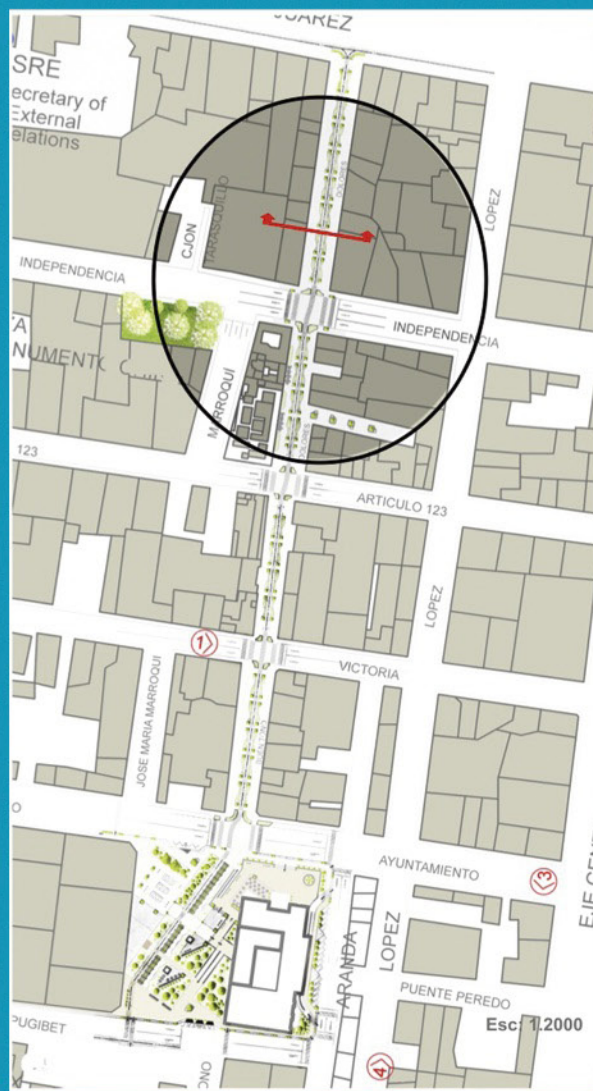
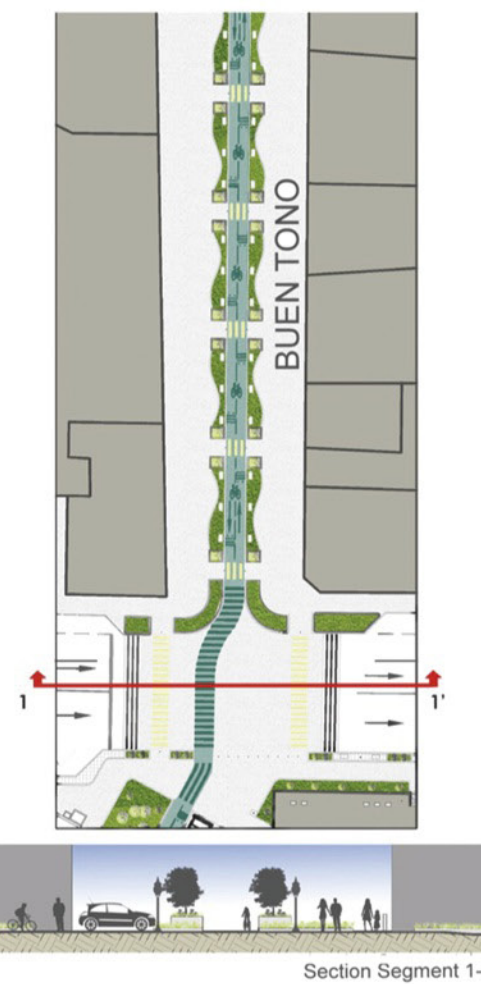
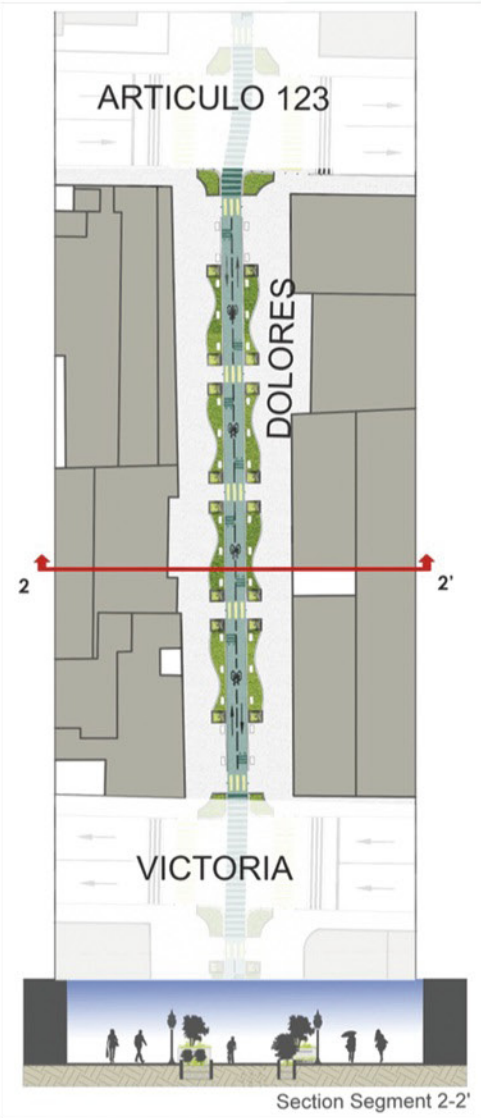
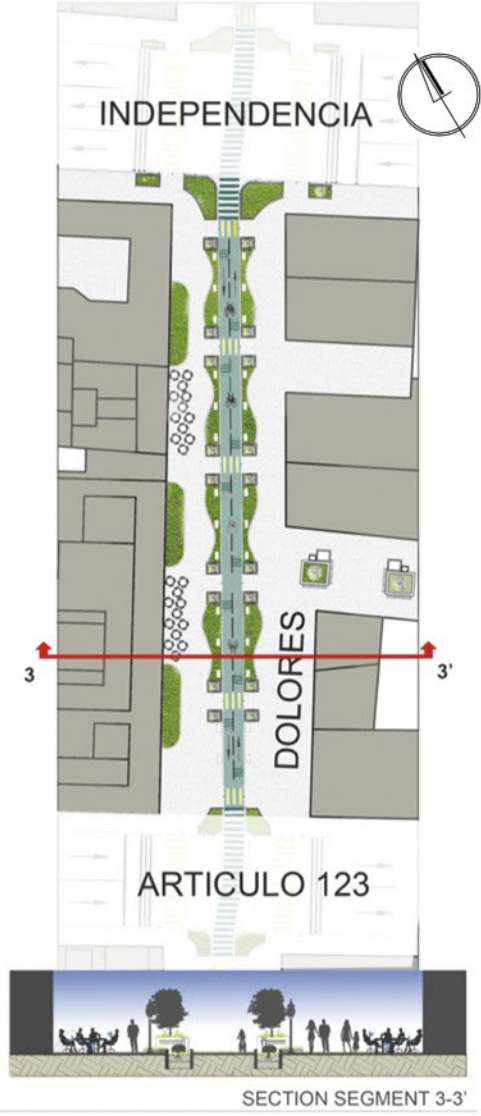
## Threats

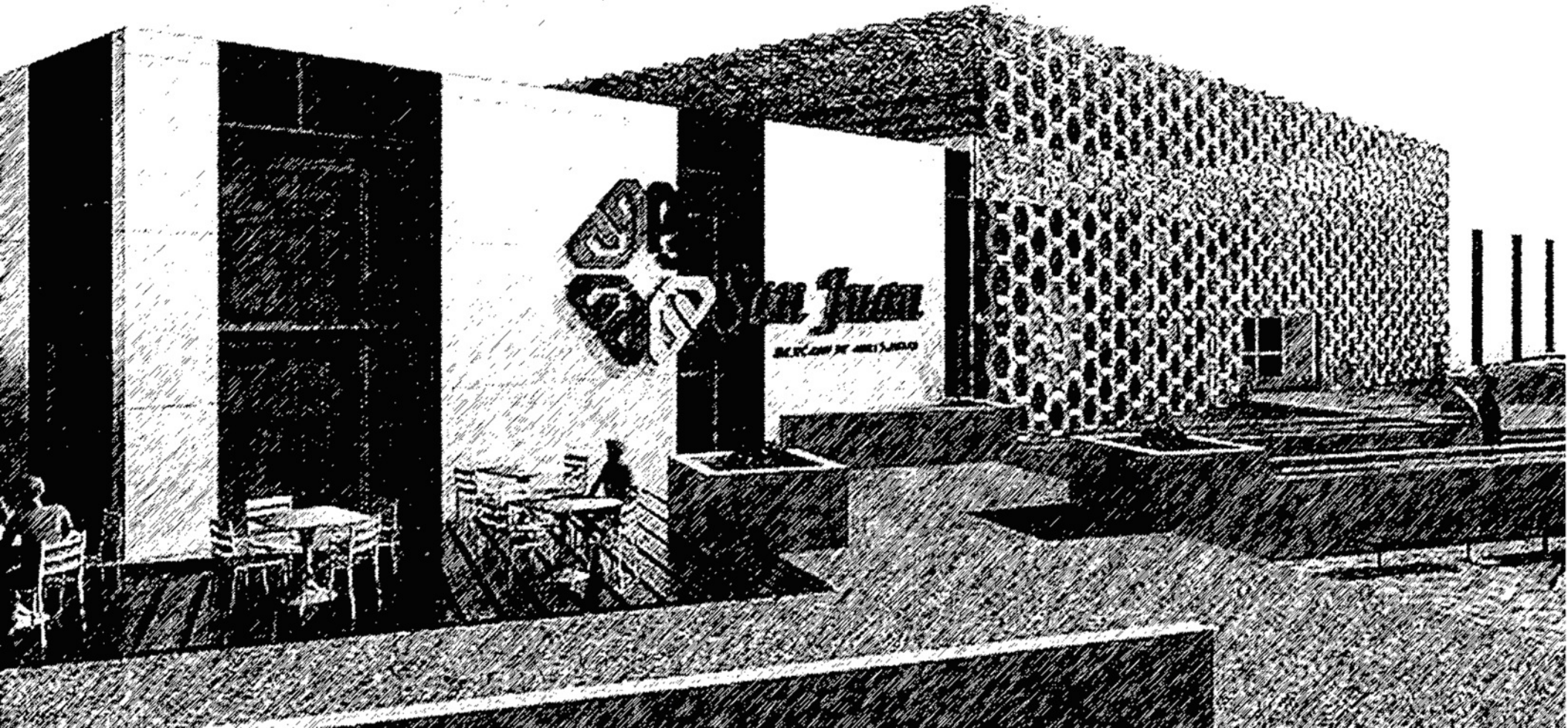
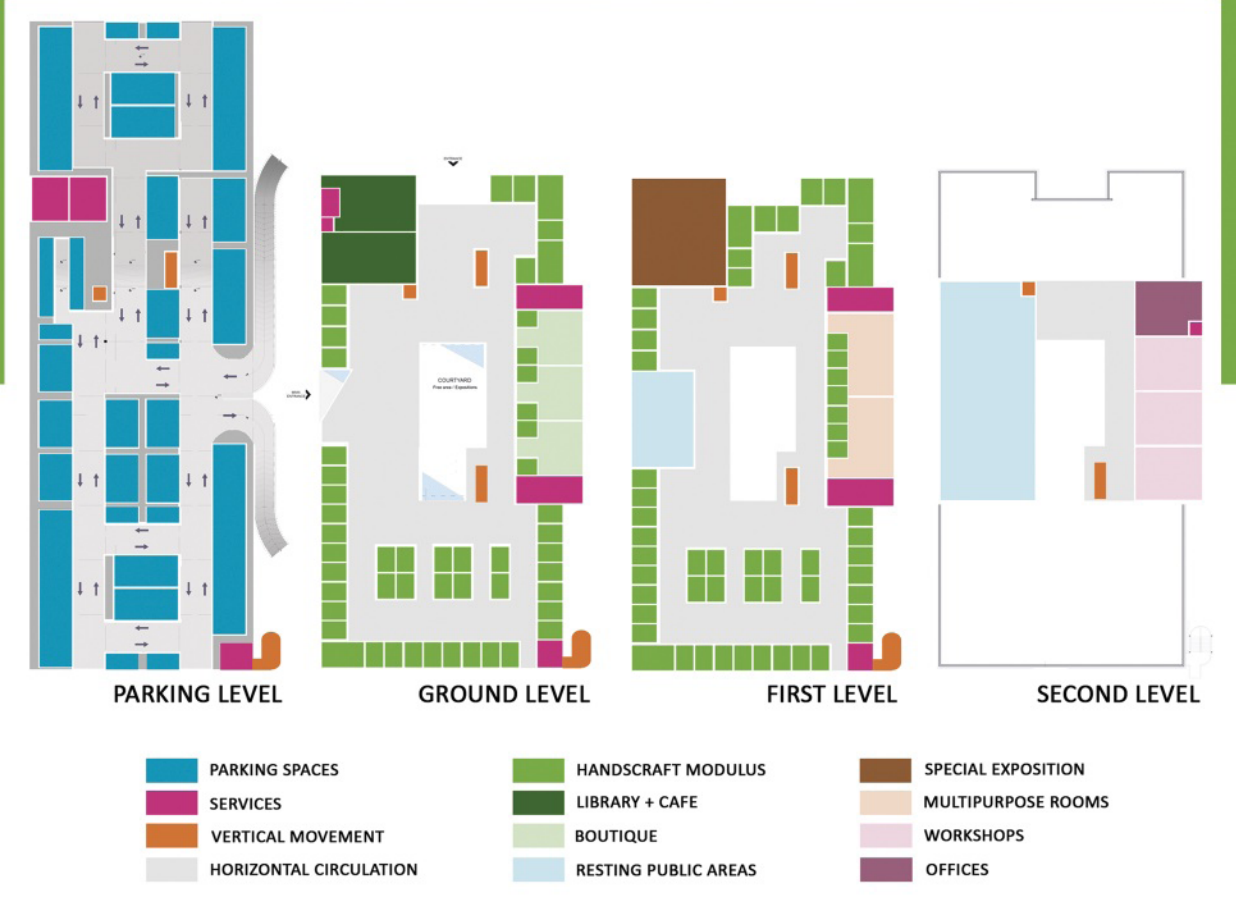
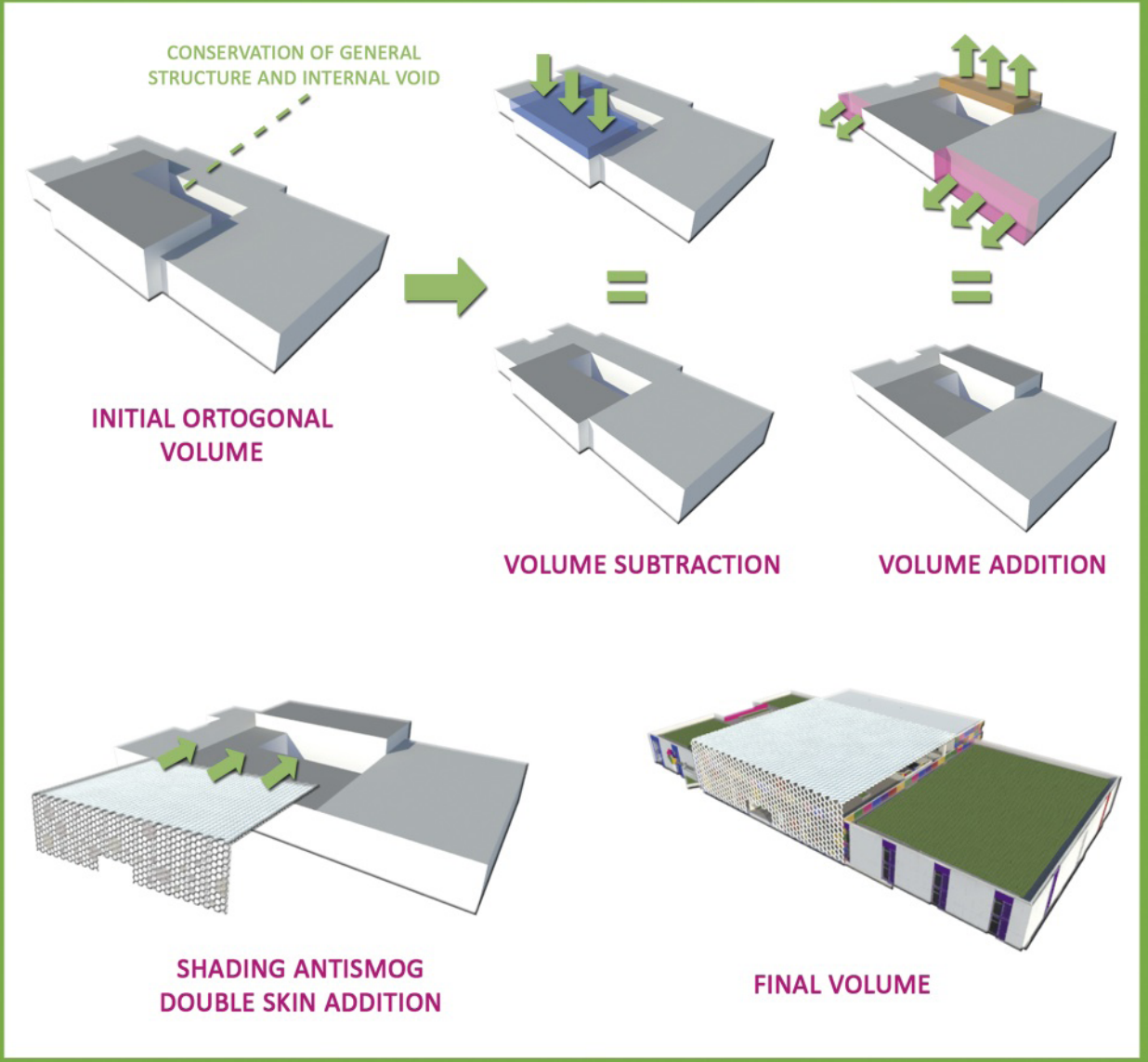
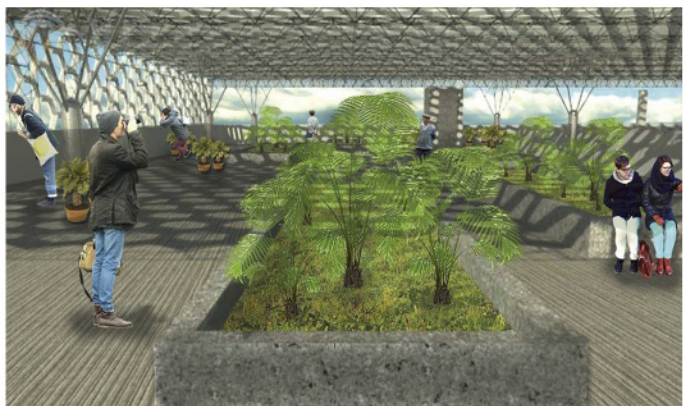
- Segregation of some sectors of the population.
- Elimination of residential use.
- Lack of quality life for the inhabitants due to the degradation of the urban spaces.
- Destruction of the historical buildings and squares.
- Wastage of the infrastructure already built.
- Increase of the unnecessary movement along the city.

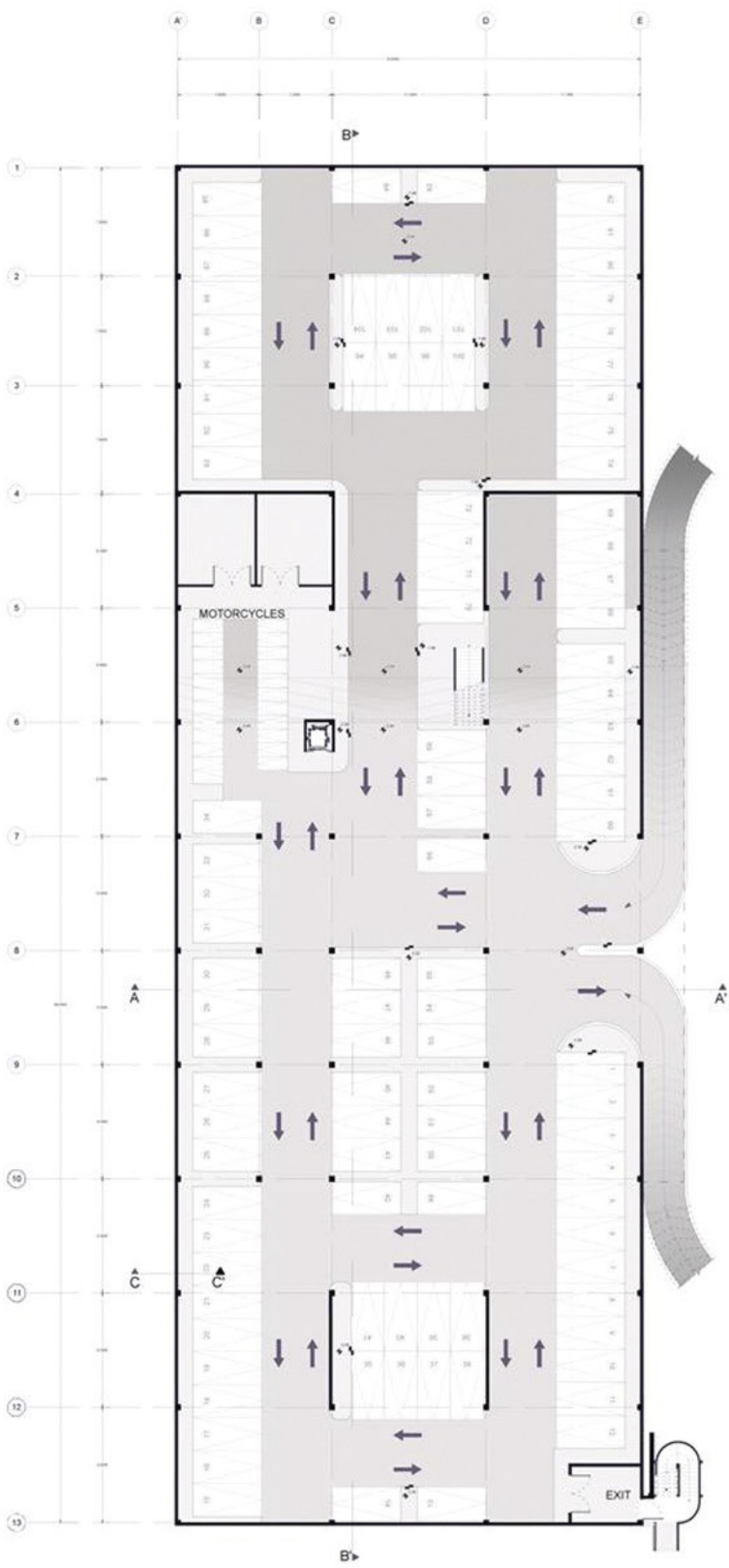


ECOBICI & TAXI CHARGE  
Hot spot for locating an new ecobike point as well as a station to recharge electric taxis

Implementation of a white anti smog ceramic (Prosolve 370e) to constitute mobiliary elements that help with the environment







PARKING LEVEL



GROUND LEVEL



SC. 1:500

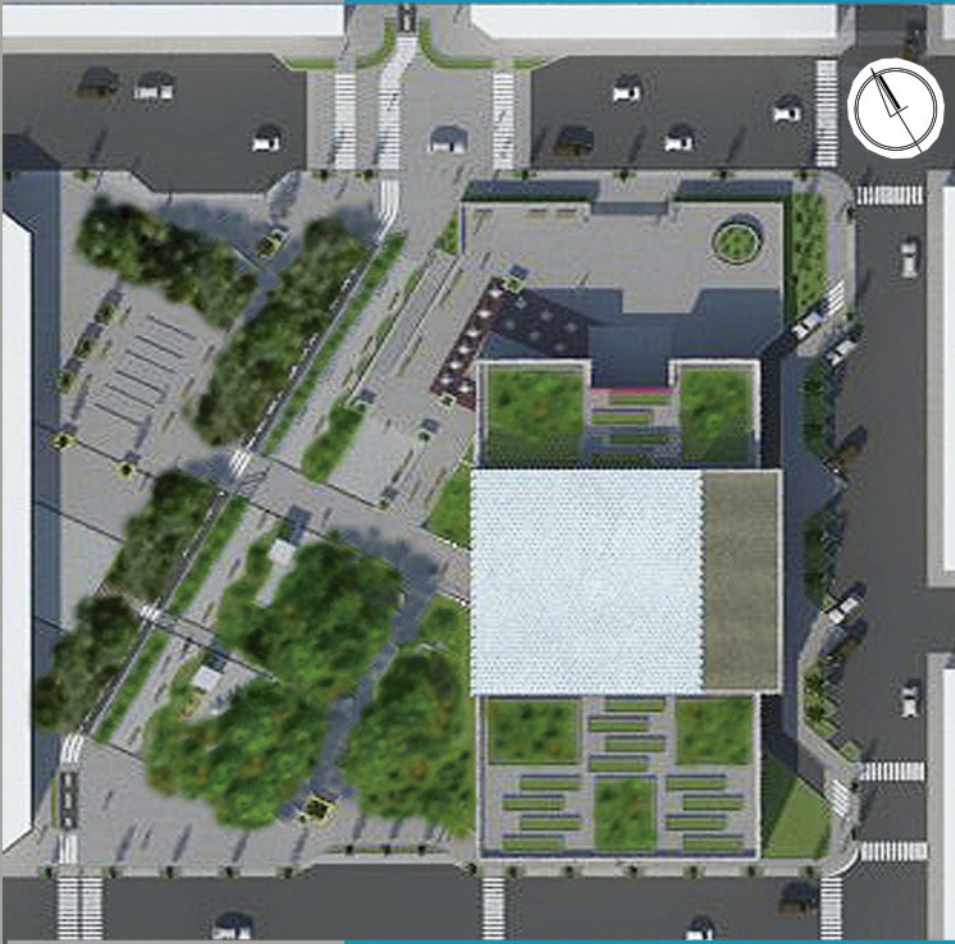


FIRST LEVEL



SECOND LEVEL

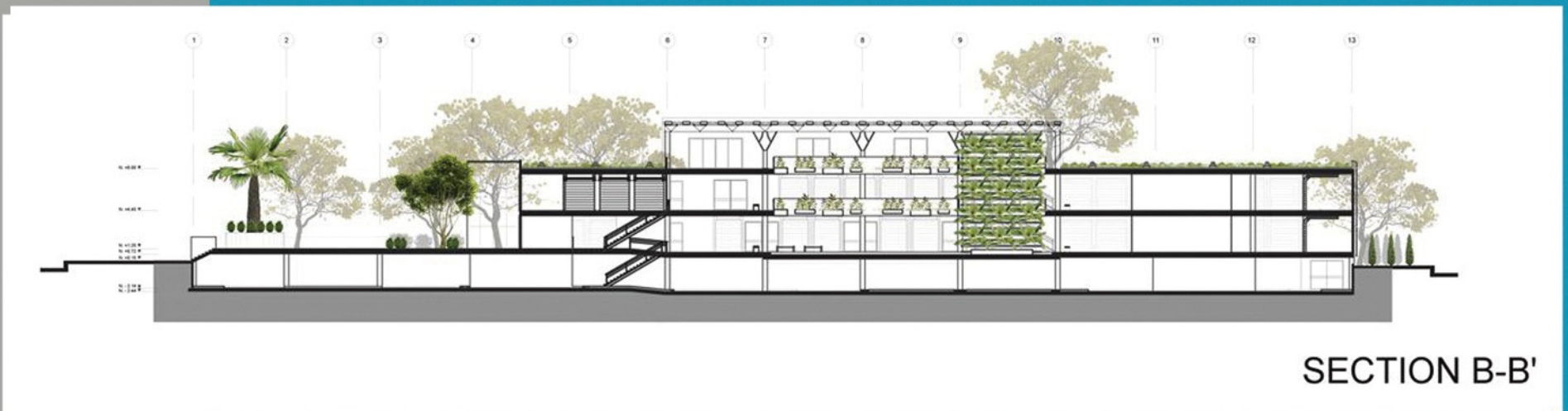




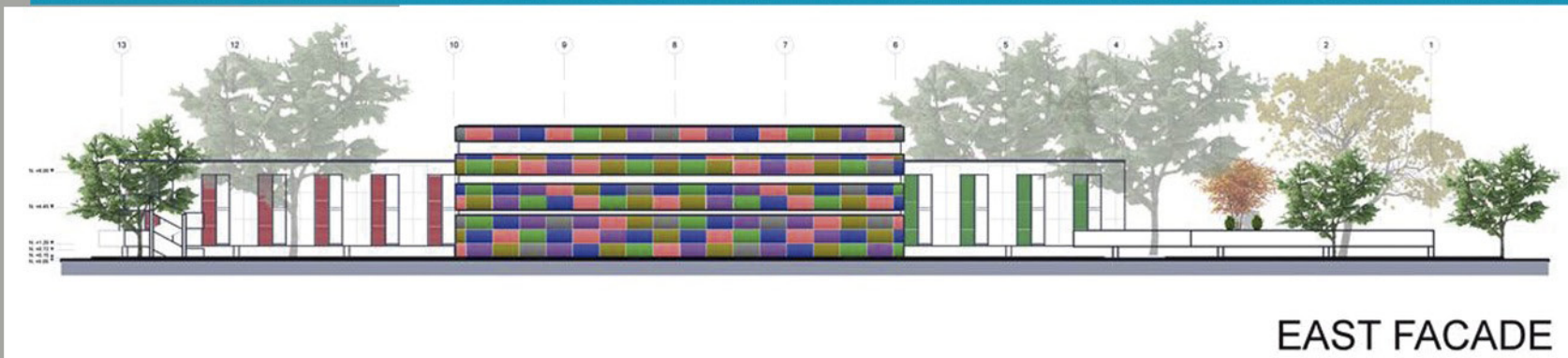
SC. 1:500



SECTION A-A'



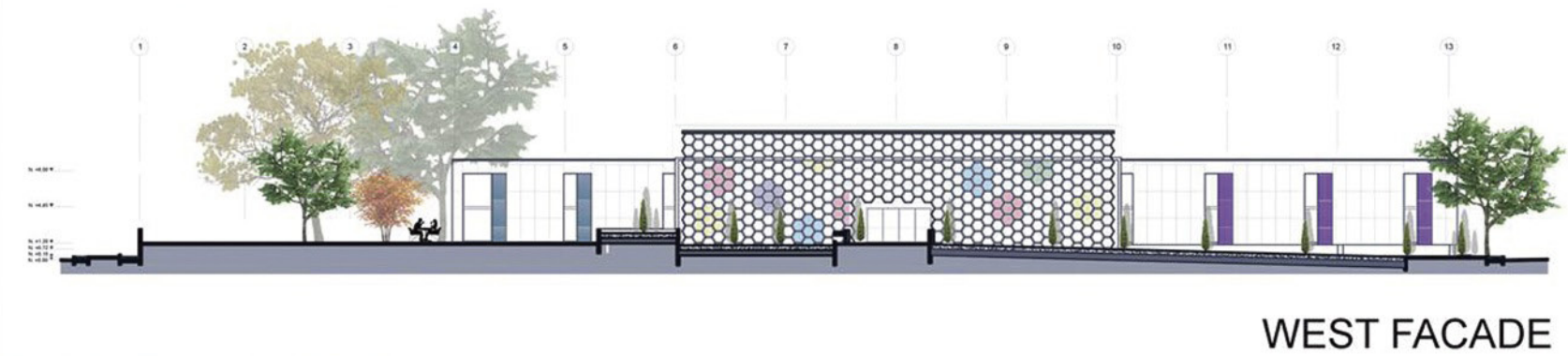
SECTION B-B'



EAST FACADE



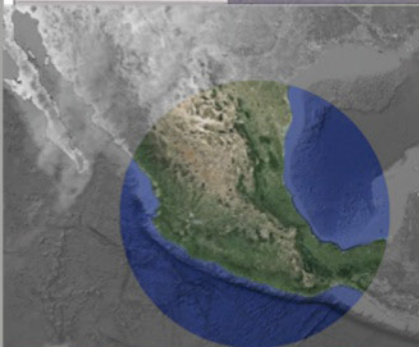
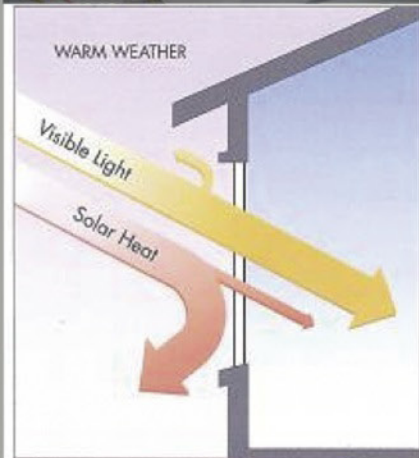
SOUTH FACADE



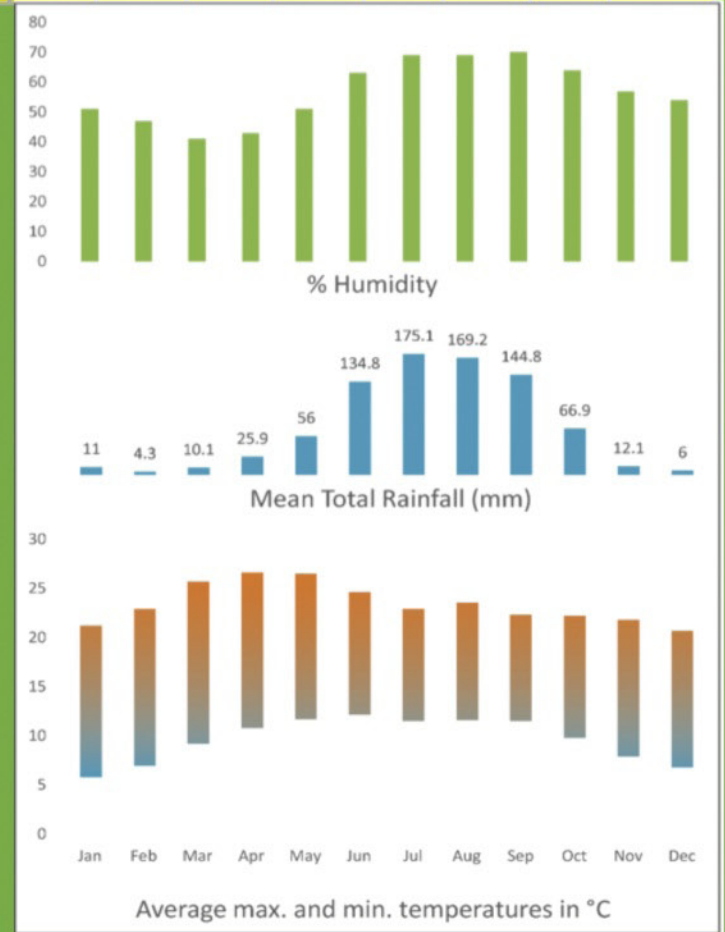
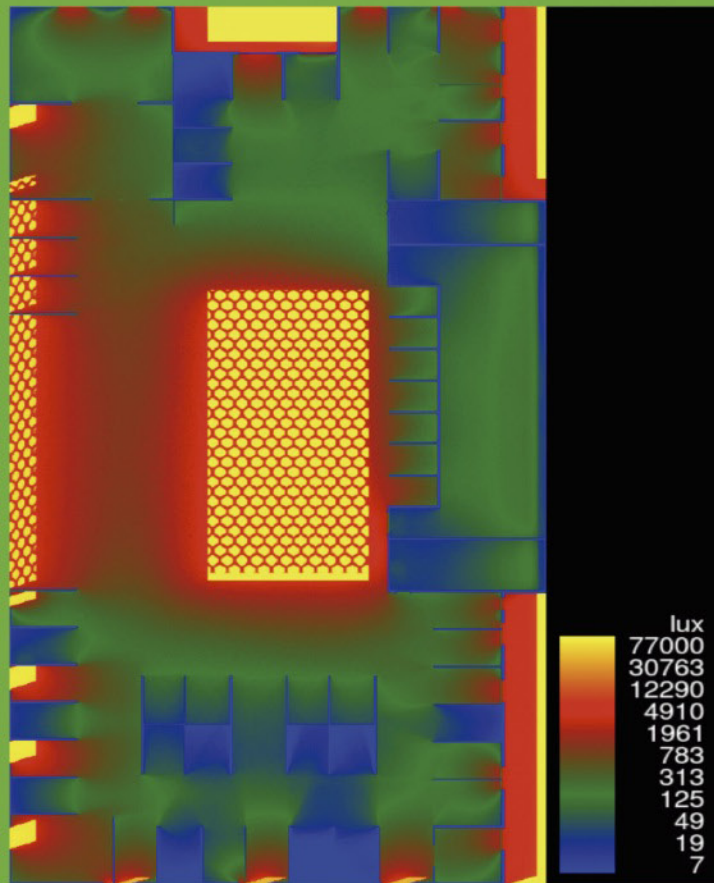
WEST FACADE



NORTH FACADE

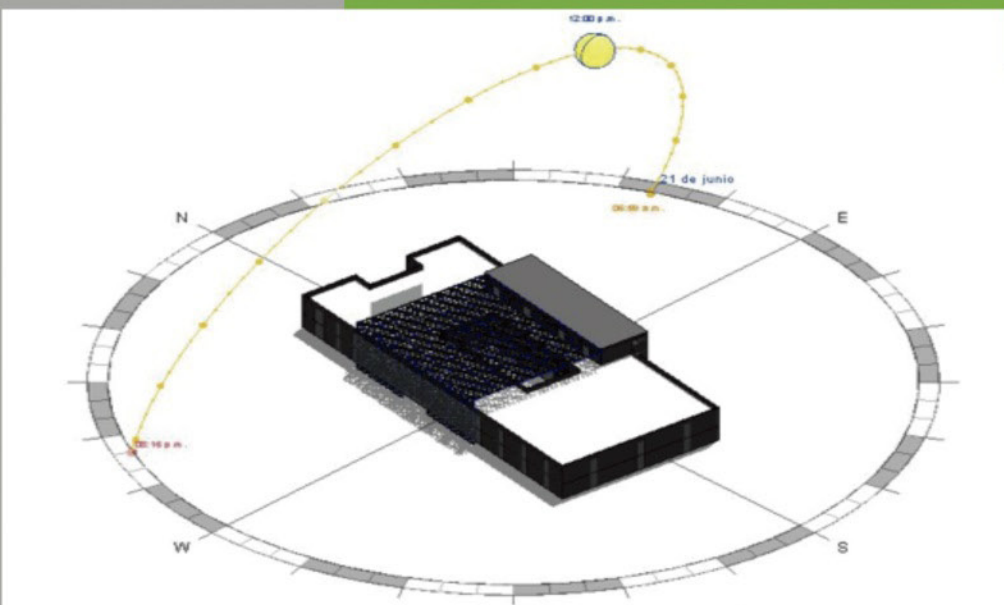


Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C	28	29	33.3	33	33.9	33.5	30	28.4	28.5	29	29.3	28	33.9
Average high °C	22	23	25.7	27	26.8	25.3	23.8	23.9	23.3	23	22.9	22	24
Daily mean °C	15	16	18.1	20	20	19.4	18.2	18.3	18	17	16.3	15	17.5
Average low °C	7.4	8.5	10.4	12	13.2	13.5	12.5	12.7	12.7	11	9.7	8.1	11
Record low °C	-4.1	-4.4	-4	-0.6	3.7	4.5	5.3	6	1.6	0	-3	-3	-4.4
Precipitation mm	11	4.3	10.1	26	56	135	175	169	145	67	12.1	6	816
Avg. precipitation days (≥ 0.1 mm)	2.2	2.5	4.1	6.8	12.9	18.7	23.2	20.9	18.2	9.6	3.8	2	125
% humidity	51	47	41	43	51	63	69	69	70	64	57	54	56
Mean monthly sunshine hours	240	234	268	232	225	183	176	176	157	194	232	236	2,555

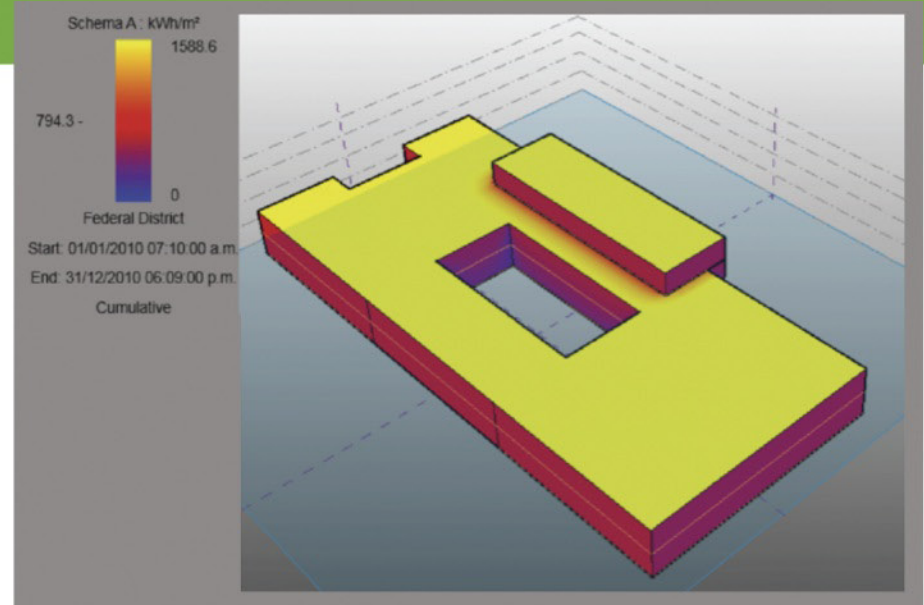


LIGHTING ANALYSIS

WEATHER ANALYSIS



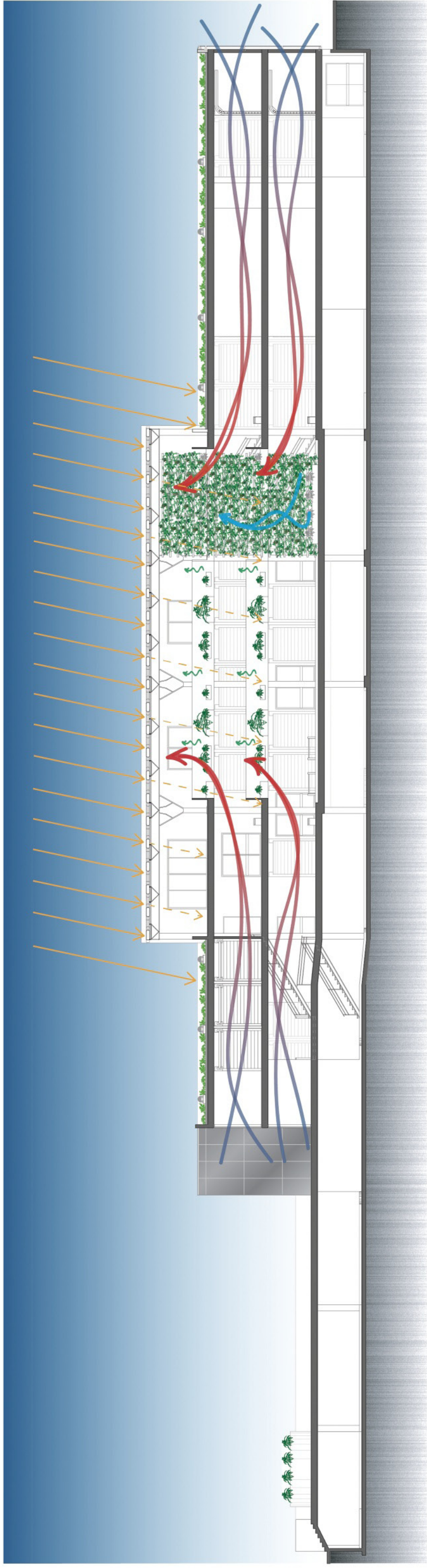
SHADOW ANALYSIS



SOLAR RADIATION



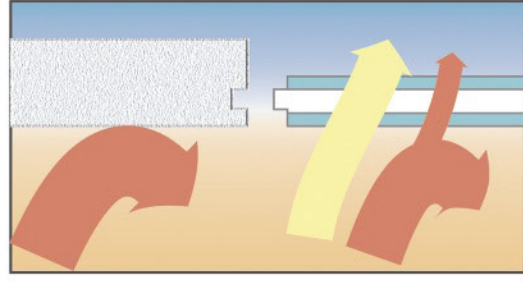
GREEN STRATEGIES



This scheme shows the effect of the shading system made of hexagonal panels in addition to an expanded metal layer below, the sunlight is diffused and it reaches the ground less intense. In order to refresh the whole building we take advantage of the natural ventilation from the north-east, the big interior openings let the air flow easily through the market.

To refresh the air, the courtyard collects the warm air and this raises the top of the building, sucking up the interior streams, including vegetation and a water body in the courtyard helps by the evaporation effect. Ventilation in the parking is possible due to the fact that the floor over it is above the street level around 1m and is open to the exterior.

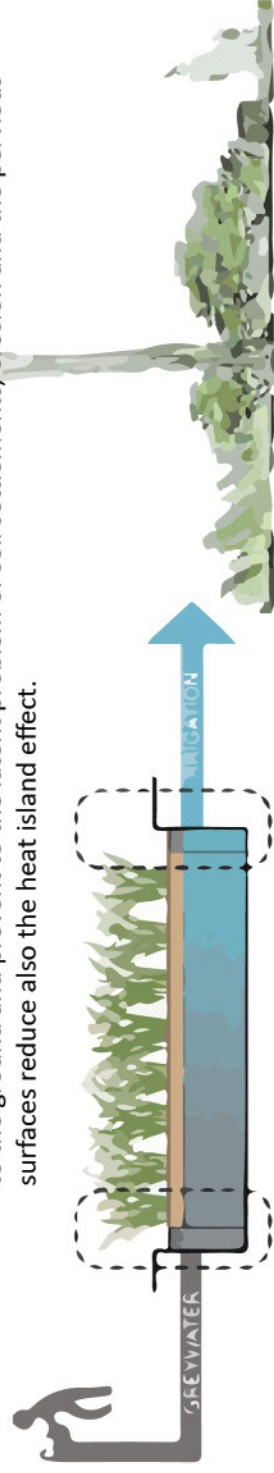
In order to reduce the energy necessities we have described and located along the project, in the diagram we can see how the light enters into the building, the daylight analysis shows the lack of internal lighting, to solve this issue we provide a system that captures and directs the rays of the sun. The process starts with a receiver on the outside, cables (optic fiber) that transport the light through the property and reach the luminaries that spreads the light inside. The lamps have a support system made of LEDs. The upper level is illuminated by solar tunnels in the roof.



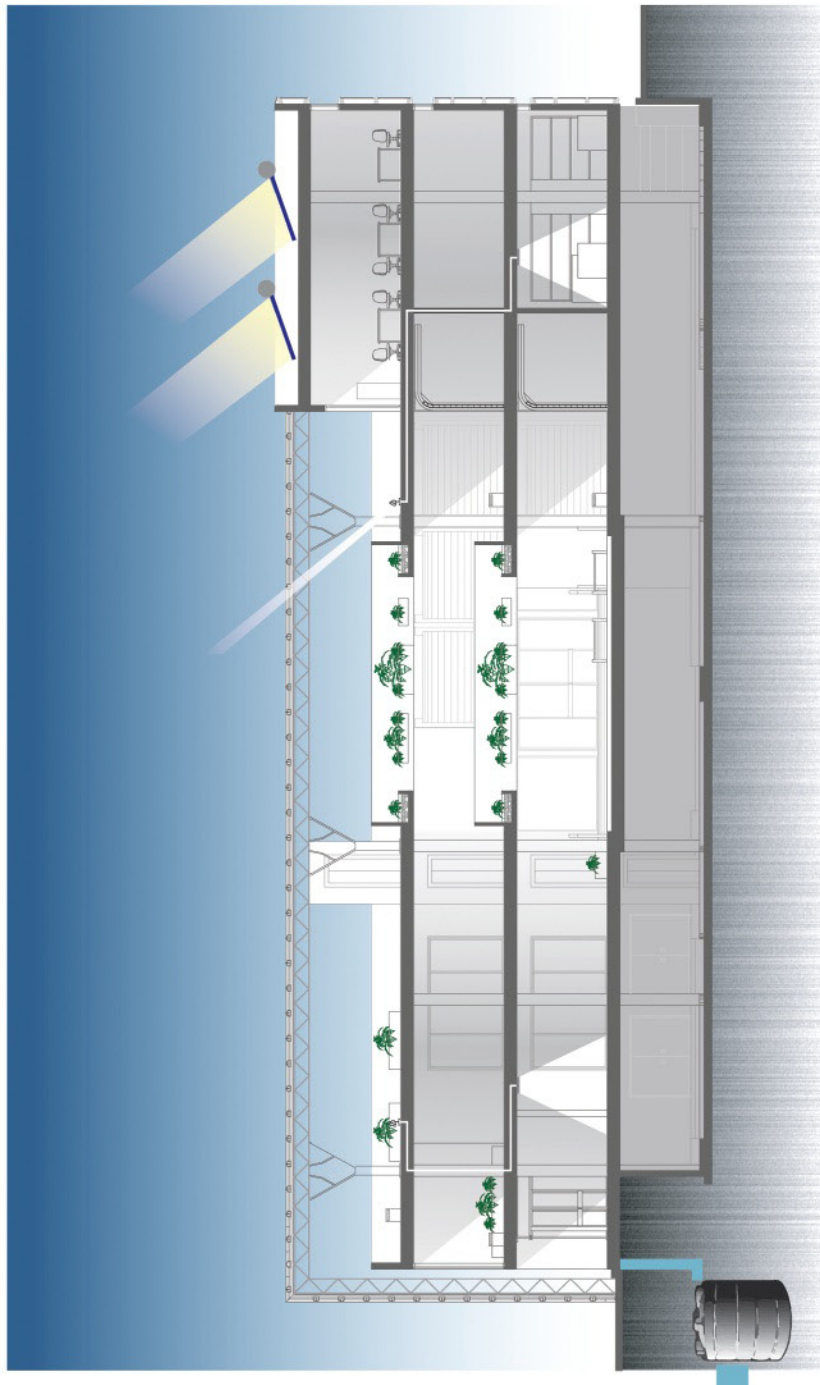
The façade facing the park is a curtain wall, where the glass is coated by a E-low coating, this prevent the overheating letting the light pass, to reduce the bright the second façade works as a shading system.

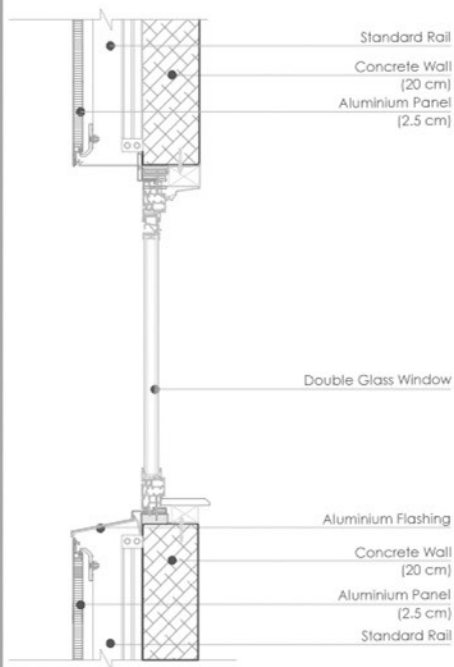
The other element that prevents the heat entering the market is self-insulated walls, made of autoclaved aerated concrete, this material is protected to the exterior elements by an aluminum panel cladding that in part reflects the heat from the sun.

The water efficiency is increased collecting the stormwater and using it to irrigate the vegetated areas, to complement the system and in order to clean the waste water used in the market, we install a reedbed system, the water obtained by both sources will help to increase the infiltration to the ground and prevent to the latent problem of soil settlements, erosion and the pervious surfaces reduce also the heat island effect.

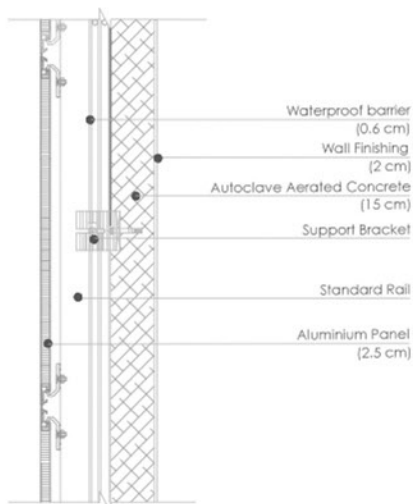


Solar thermal collectors (Evacuated tubes) are installed over the offices level, the diurnal function of the market reduces the need of extra lighting at nights, the water supplied by the thermal collectors is used in toilets and cafeteria. Some extra PV panels are used for the hybrid lighting system in corridors.

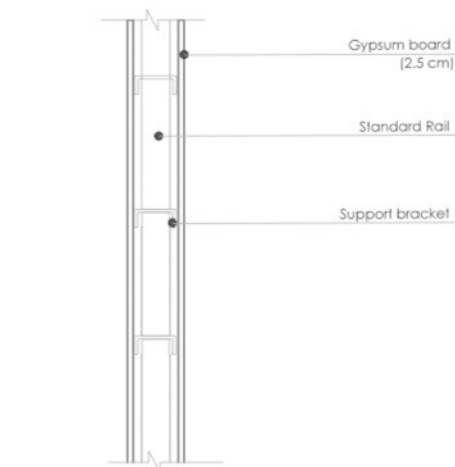




FACADE / WINDOW  
(CONNECTION)  
Width = 30 cm  
**D - 5**

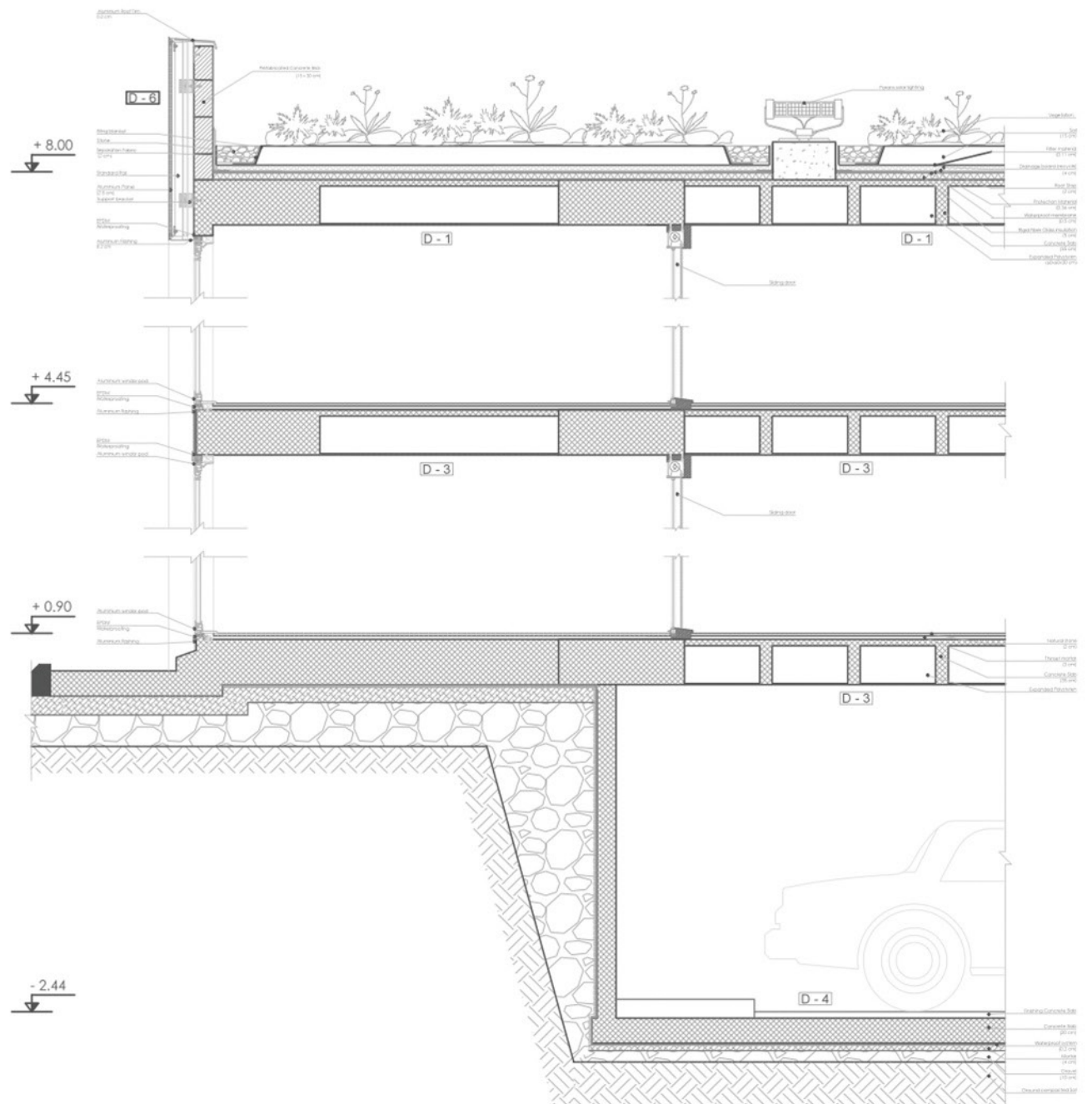


FACADE / WALL  
Width = 30 cm  
**D - 6**



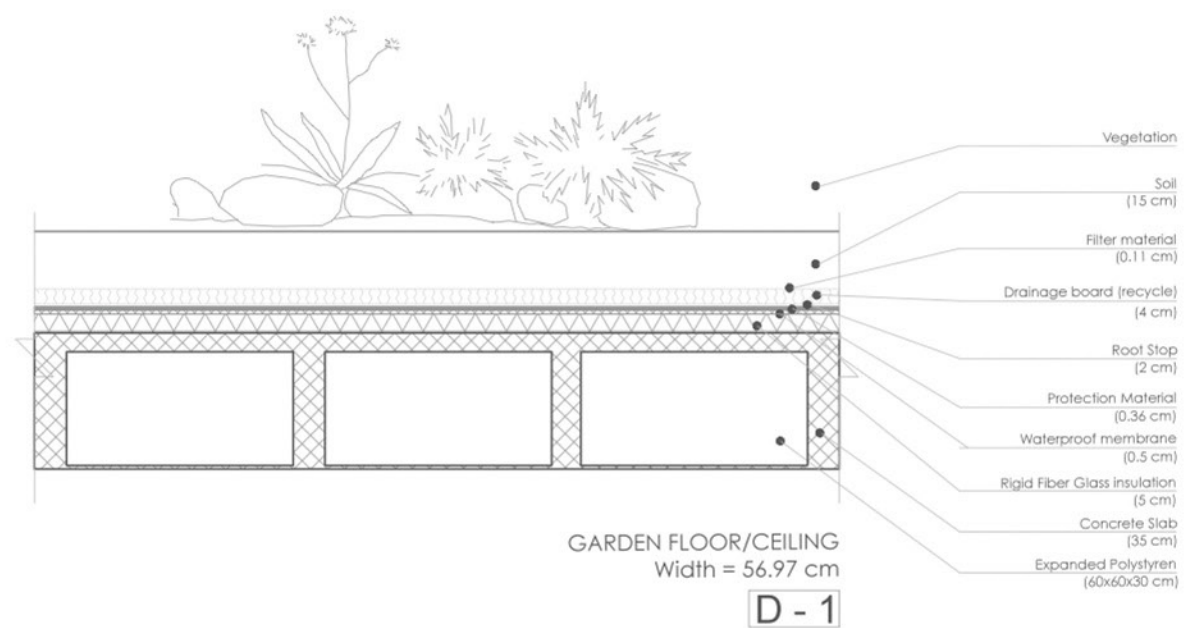
INTERNAL PARTITION  
Width = 15 cm  
**D - 7**

**SC. 1:20**

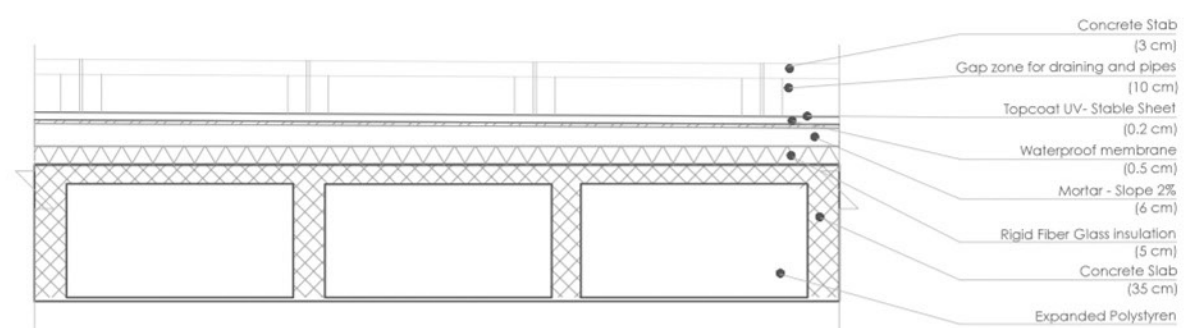


**SC. 1:50**

**SECTION C - C'**

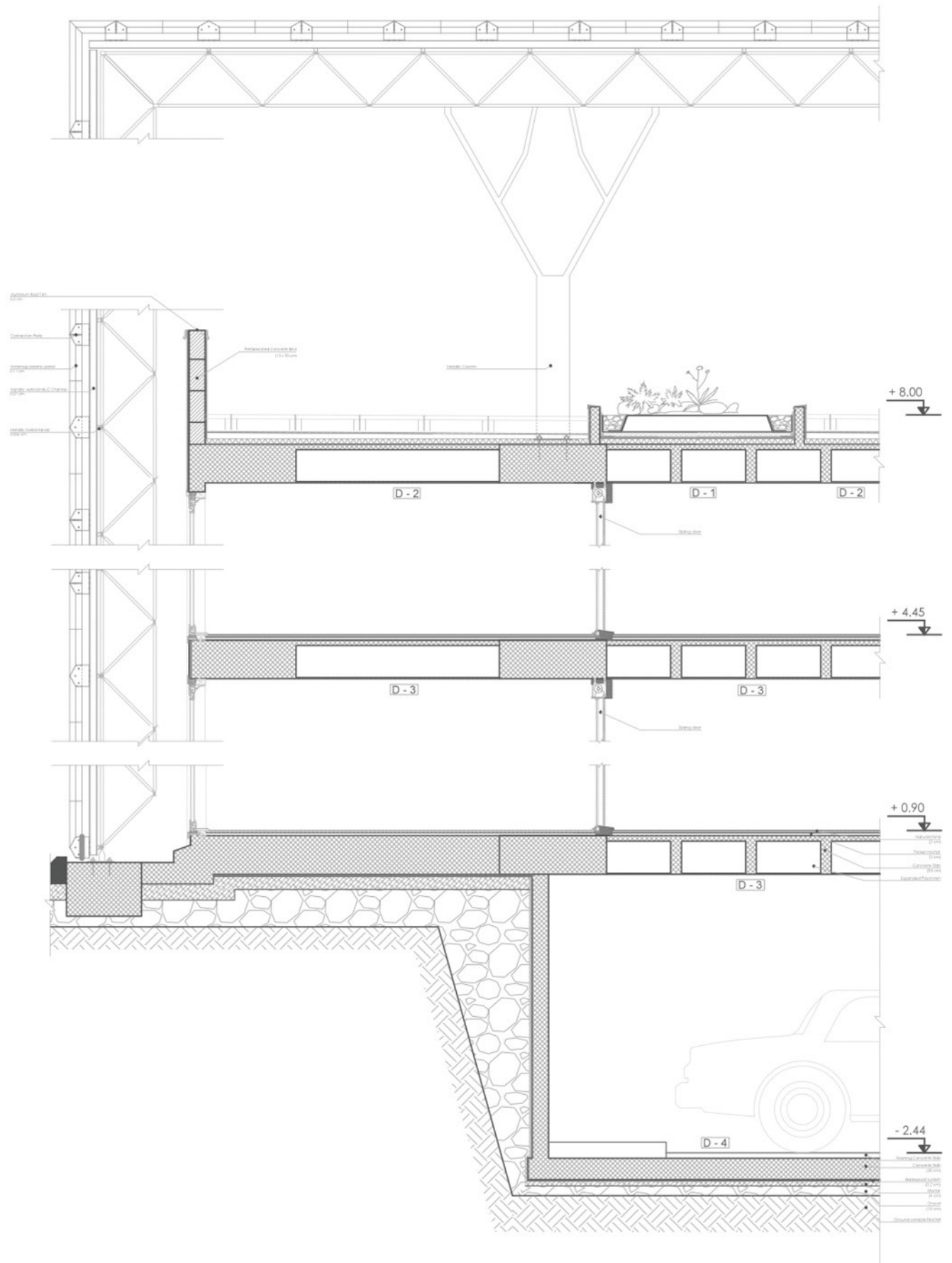


GARDEN FLOOR/CEILING  
Width = 56.97 cm  
**D - 1**

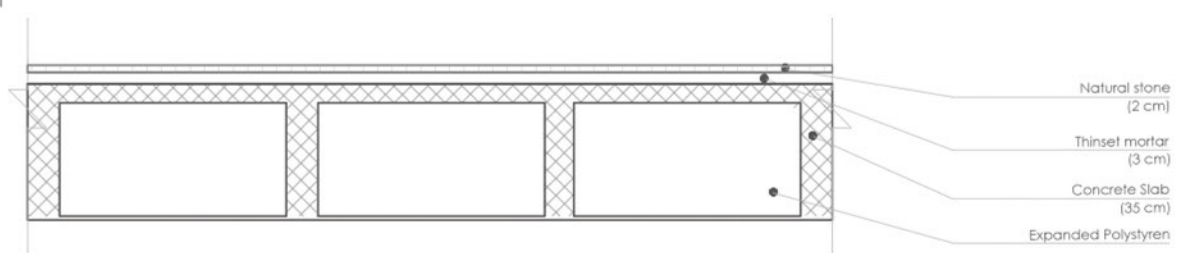


ROOF (WALKING AREA)  
Width = 54.7 cm  
**D - 2**

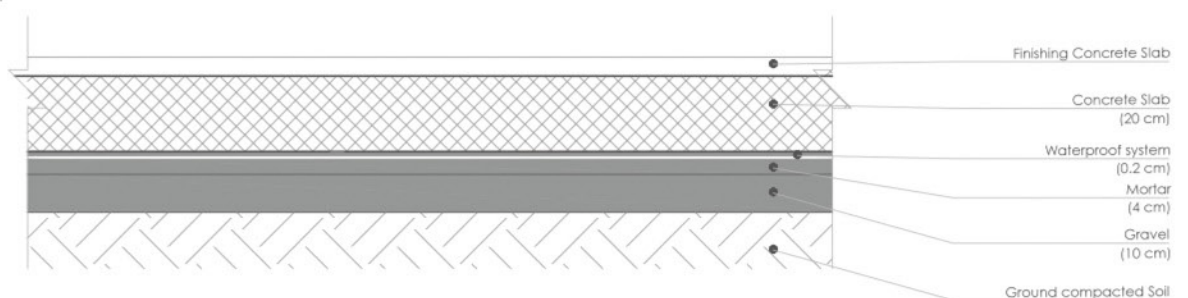
**SC. 1:20**



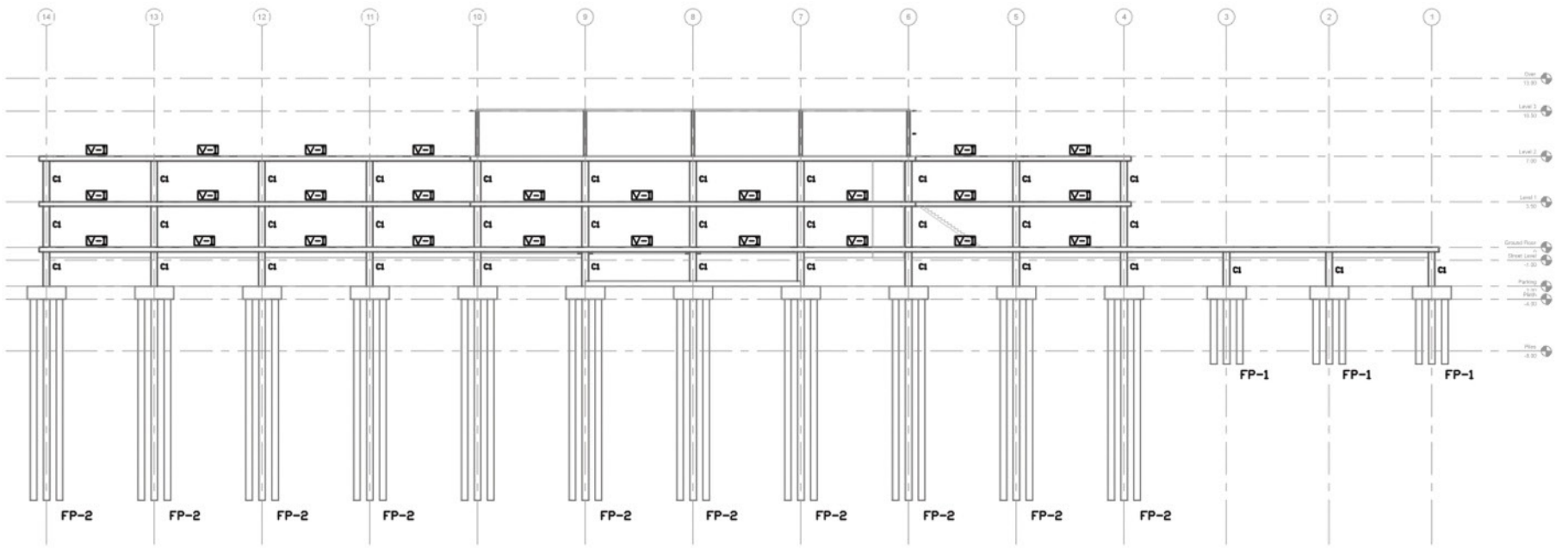
SECTION D - D'



FLOOR / CEILINGS  
Width = 40 cm  
**D - 3**

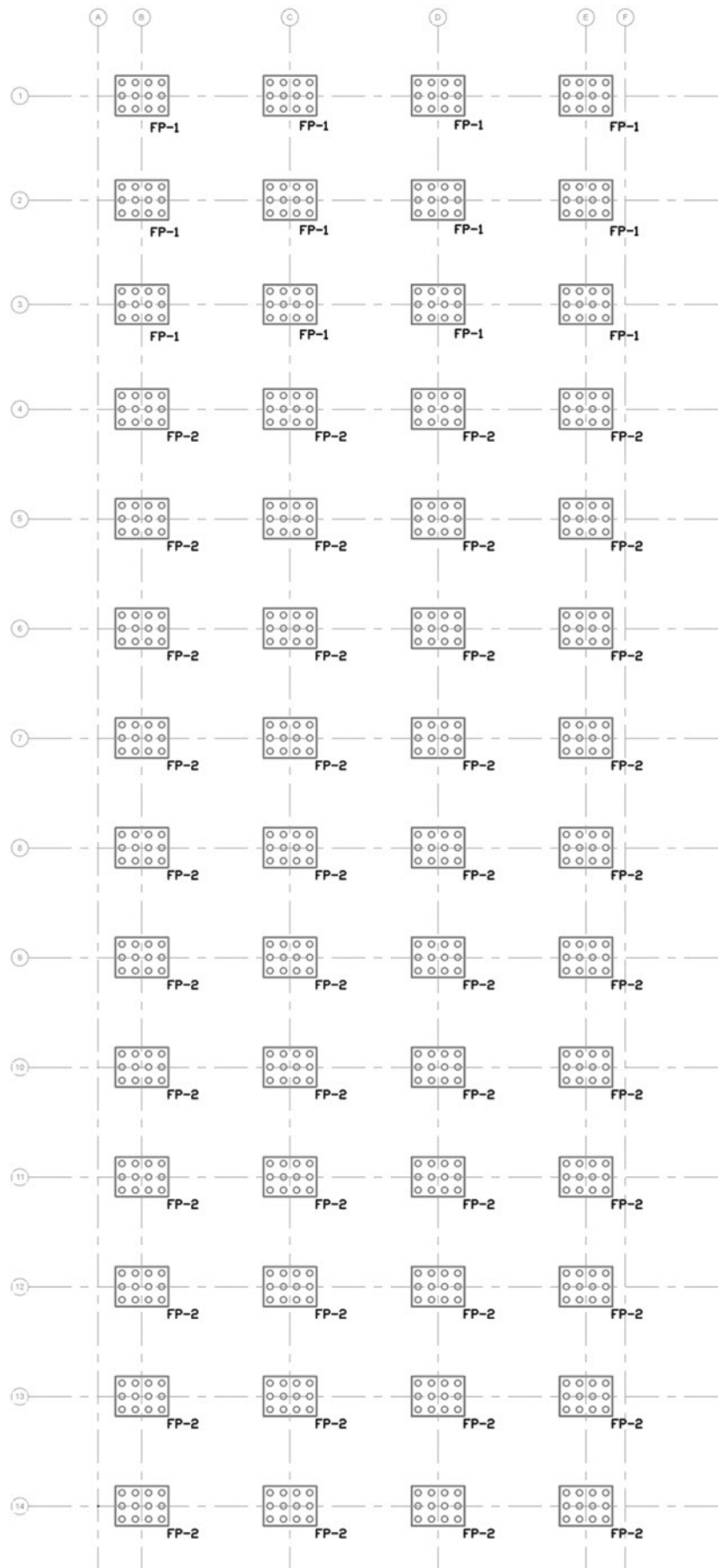


GROUND SLAB  
Width = 40 cm  
**D - 4**



### Structural Plan East Elevation

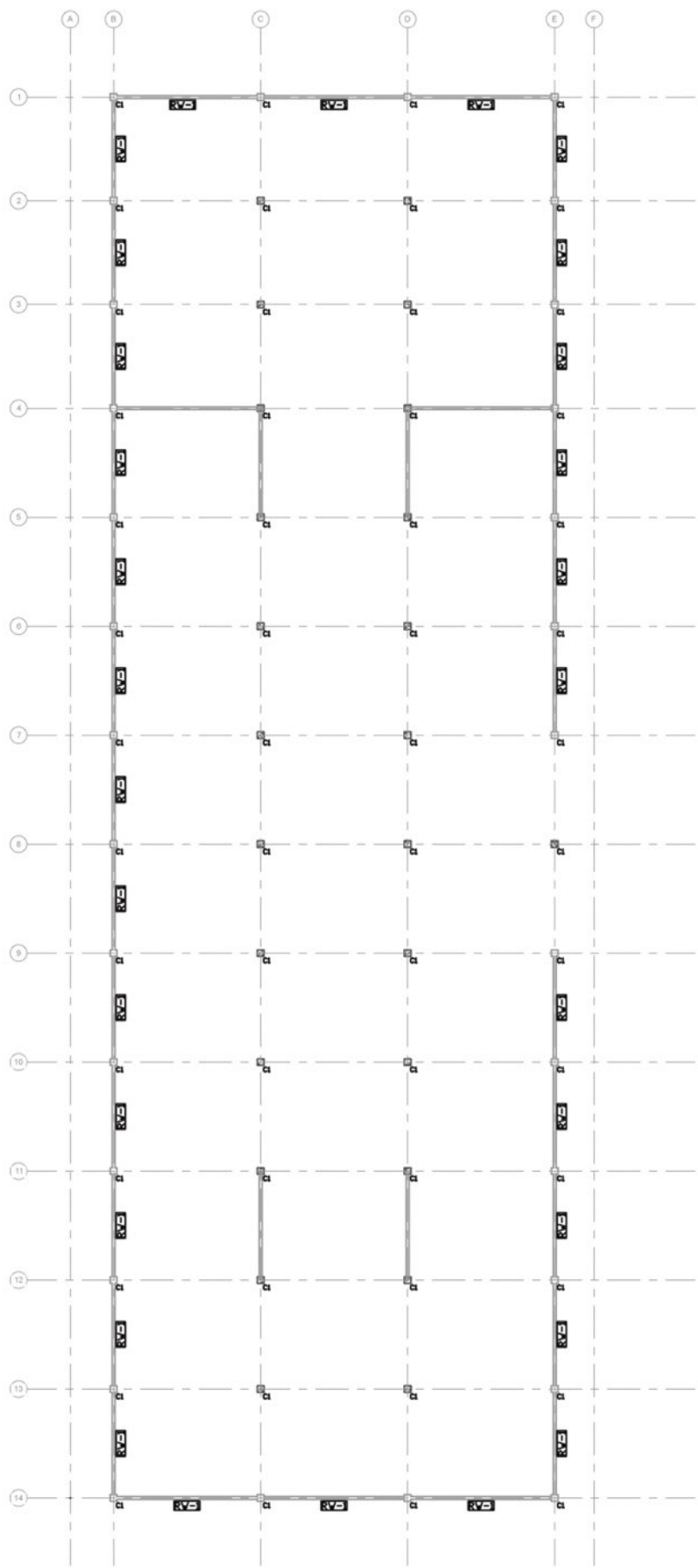
Column C1 50x50  
 Interior Beam V-I 100x35  
 Edge Beam V-B 40x35  
 Shear Walls R-W1 Thickness 20cm



SC. 1:500

### Foundation

Plinth 400x300x100  
 Pile Group FP-1 Ø 50cm 5m Depth  
 Pile Group FP-2 Ø 50cm 15m Depth

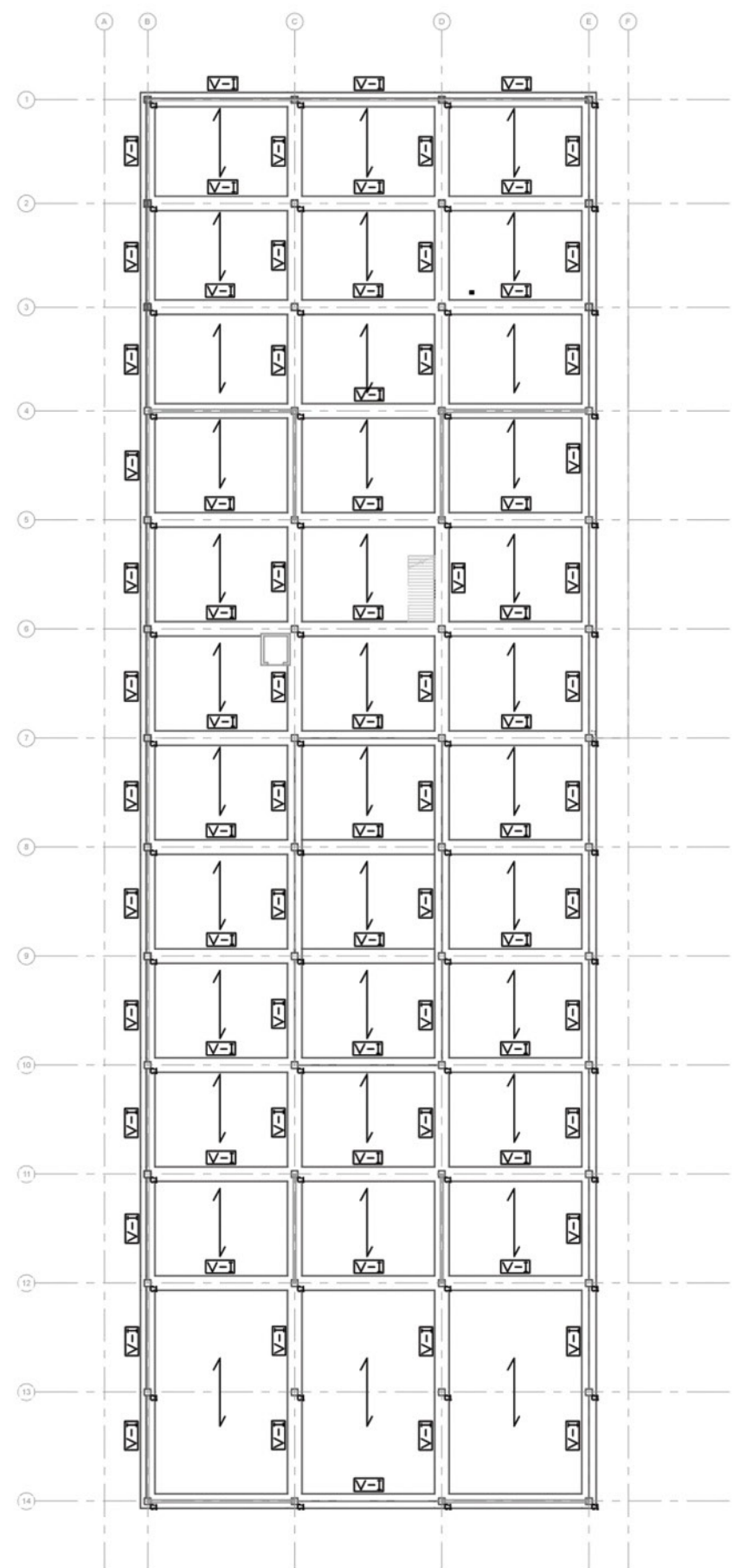


### Structural Plan Parking

Column C1 50x50  
 Foundation slab 40cm Thickness  
 Shear Walls R-W1 Thickness 20cm

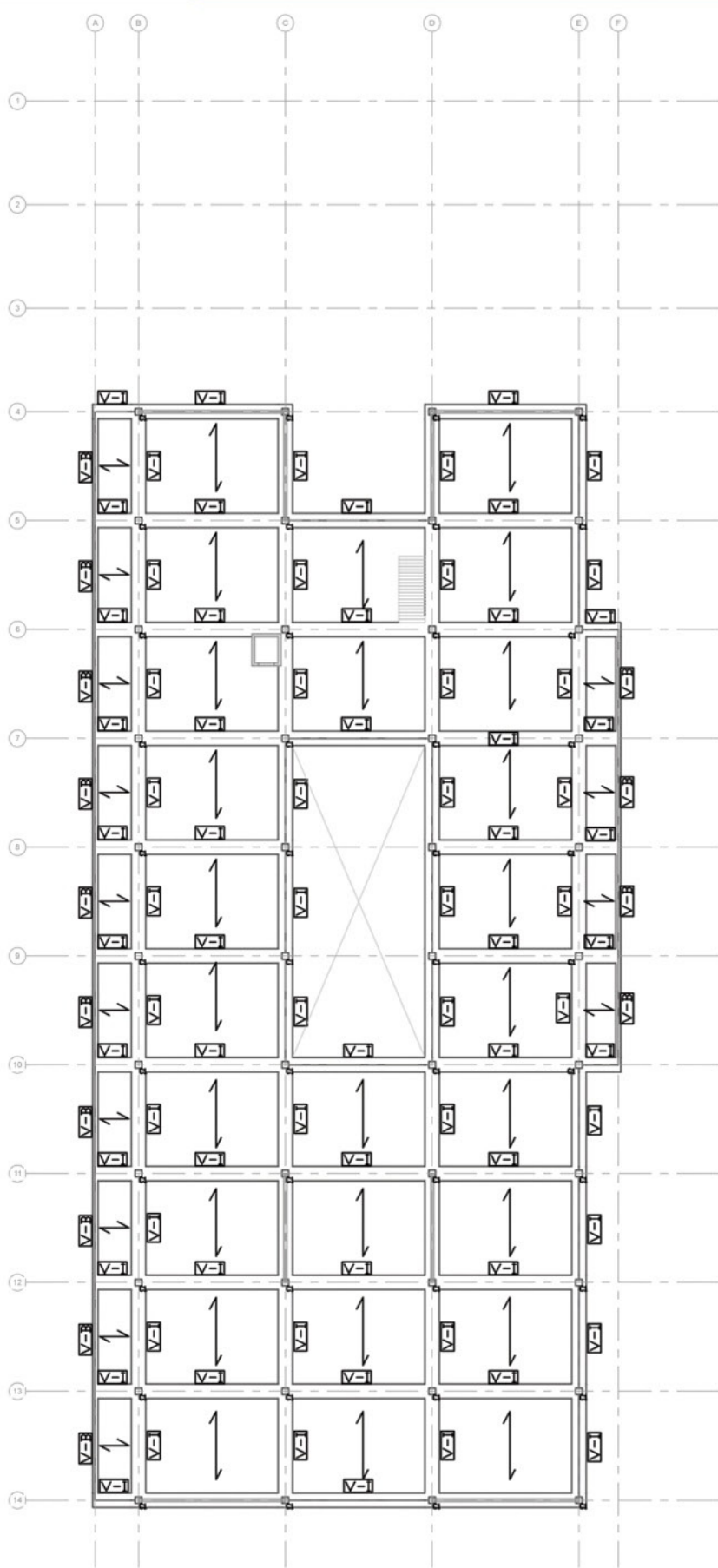


SC. 1:500



### Structural Plan Ground Floor

Foundation slab 40cm Thickness  
 Interior Beam V-I 100x35  
 Shear Walls R-W1 Thickness 20cm

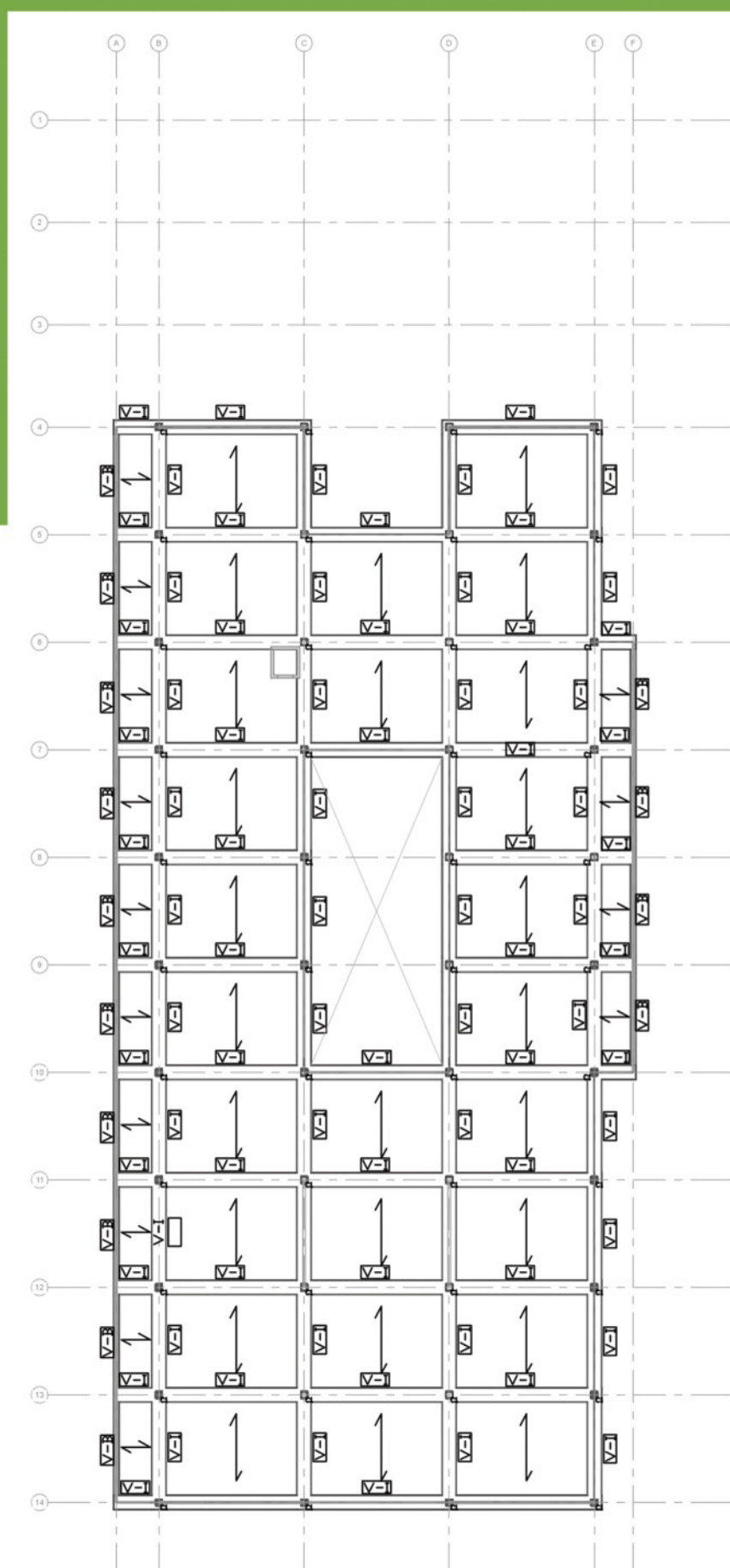


Structural Plan First Floor

Column C1 50x50  
 Interior Beam V-I 100x35  
 Edge Beam V-B 40x35  
 Shear Walls R-W1 Thickness 20cm



SC. 1:500



Structural Plan Second Floor

Column C1 50x50  
 Interior Beam V-I 100x35  
 Edge Beam V-B 40x35  
 Shear Walls R-W1 Thickness 20cm

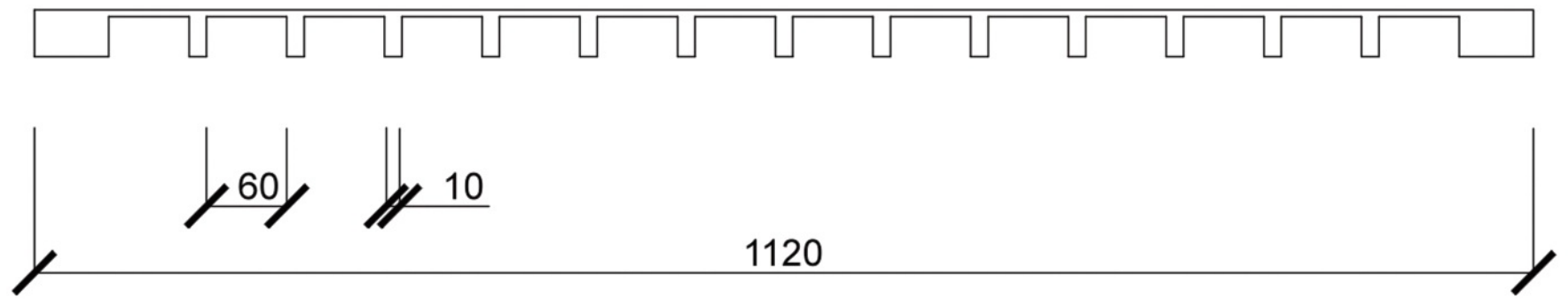
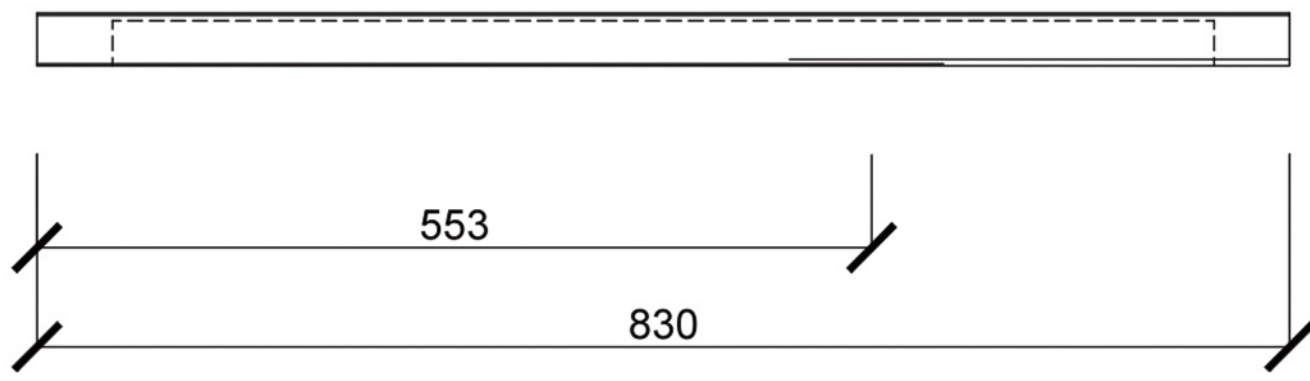


Section A

Section S

Section B'

Section B

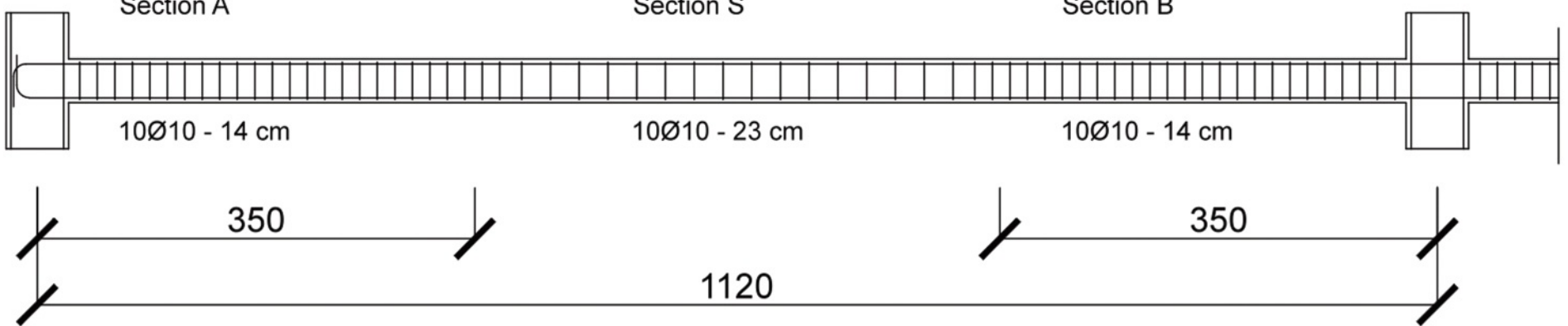


SC. 1:50

Section A

Section S

Section B

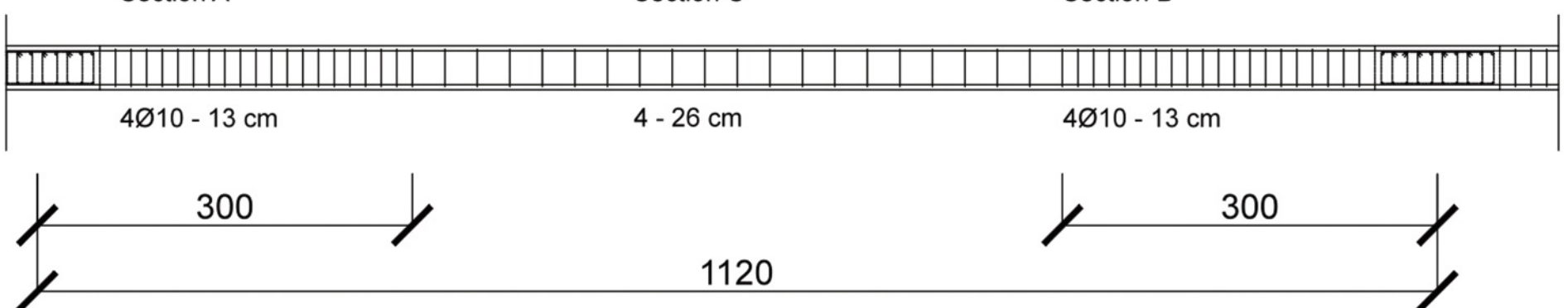


Edge Beam  
V-B 40x35

Section A

Section S

Section B



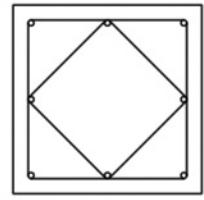
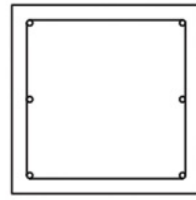
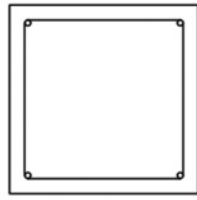
Int. Beam  
V-I 100x35

Interior

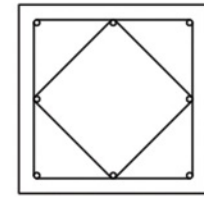
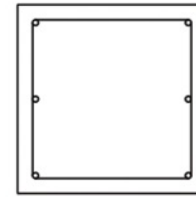
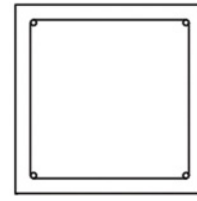
Edge

Corner

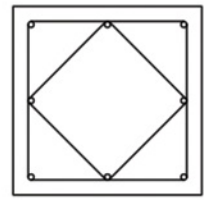
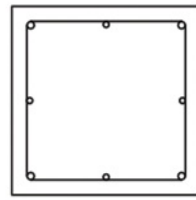
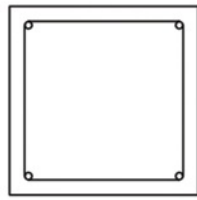
1st Floor



Ground Floor

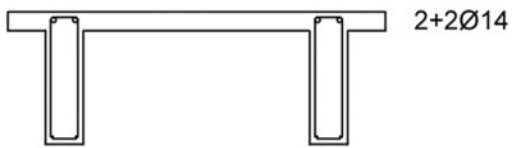


Basement

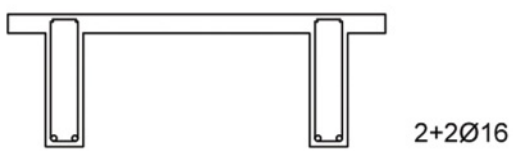


### Columns C1 50x50

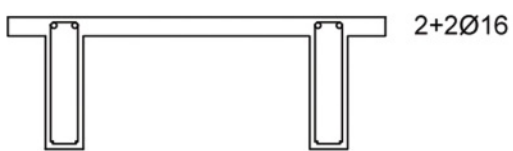
SC. 1:20



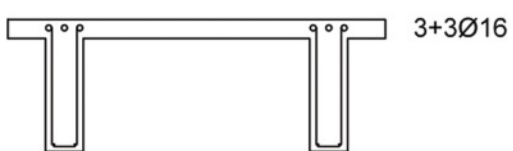
Section A



Section S

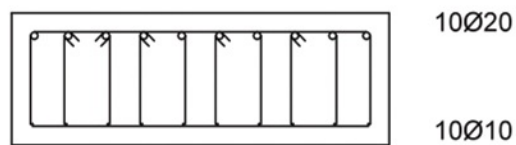


Section B'

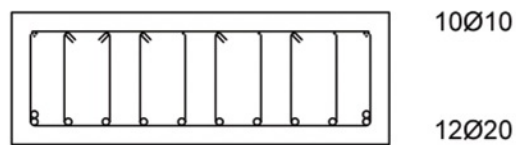


Section B

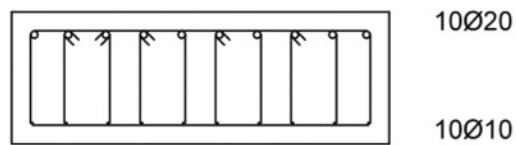
### Slab Sections



Section A

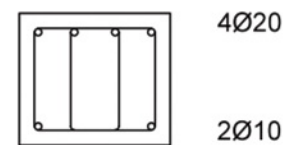


Section S

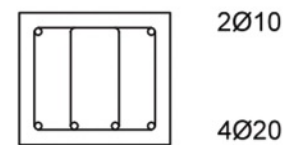


Section B

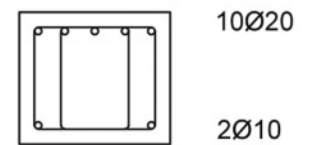
### Int. Beam V-I 100x35



Section A



Section S



Section B

### Edge Beam V-B 40x35