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ROME MOTORINO CHECK POINT

Clemens Pöchacker - ROME MOTORINO CHECK POINT

DIPLOMARBEIT

ROME
MOTORINO
CHECK
POINT

ausgeführt zum Zwecke der Erlangung des
akademischen Grades eines Diplom-Ingenieurs

unter der Leitung von
Manfred Berthold Prof. Arch. DI. Dr.
E253 Institut für Architektur und Entwerfen

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Fakultät für Architektur und Raumplanung

von
Clemens Pöchacker
Matr.nr.: 0326430
Wurmbrandgasse 15, A-1220 Wien

Wien, am 25-09-2015

TECHNISCHE
UNIVERSITÄT
WIEN

ROME
MOTORINO
CHECK
POINT

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ABSTRACT

Meine Diplomarbeit mit dem Titel "Rome Motorino Check Point", beschäftigt sich mit einem neuen Netzwerk umweltfreundlicher Transportmöglichkeiten in Rom. Im Detail, geht es um ein Motor-Scooter "park&ride" Netzwerk, dessen Hauptgebäude und seine externen Stationen eine Verschmelzung von öffentlichem & individual Verkehr (bzw. bestehendem & neuem) ermöglichen sollen. Genauso wie das Hauptgebäude, werden die externen Stationen an öffentlichen Transportknotenpunkten errichtet, um den schnellen und attraktiven wechsel der Transportmedien zu ermöglichen. In weiterer Folge soll dadurch der Auto Verkehr in der Stadt entlastet, und deren benötigter Parkplatzbedarf reduziert werden. Die architektonische Neugestaltung des umgebenden Platzes des Hauptgebäudes und dessen Eingliederung in die umgebende Landschaft, ist ein weiterer Teil des Projektes. Der erste Schritt, der Veränderung des Transportverhaltens und das Hauptthema dieses Projektes, ist die Planung des Rome Motorino Check Points Hauptgebäudes des Netzwerkes neben der Termini Station. Direkt neben dem Hauptbahnhof Rom's (Stazione Termini) und in unmittelbarer Nähe von Bus- U-Bahn- und Straßenbahn- Stationen gelegen, ist dieser erste ideale Standort repräsentativ für das gesamte, in Planung befindliche, Netzwerk.

Die Gestaltung der einzelnen Gebäudeebenen in Form aktueller Formel 1 Rennstrecken und die Möglichkeit, diese auch unter Rennbedingungen zu erkunden, ist ein weiterer Bonus. Das Raumkonzept beinhaltet Scooter Shops, Scooter Werkstätten, Unterrichtsräume, Bars und Restaurants, Lagerräume und neben einem kleinen Capsel- Hotel alles andere was das Scooter Herz begehrt.

Die Optimale Balance zwischen dem Design eines neuen aufregendem Gebäudes inkl. einzigartigem Raumkonzept die Schaffung eines "Landmark"Gebäudes und der Eingliederung in die Umgebenden Gebäude und Landschaft (Piazza dei Cinquecento) war eine weitere Herausforderung dieses Projektes.

Rome Motorino Check Point:
"Die neue Art der Fortbewegung in Rom"

This Masterthesis with the titel "Rome Motorino Checkpoint", deals with a new environment friendly network of transport possibilitys in Rome. In detail the motor-scooter "park&ride" network its headquater and its extern stations should enable the melting of public and individual transport (existing & new one). The Headquater as well as the extern stations will be established at transportation-knots, to enable a fast and atractive exchange between different transportation media. As a result of this improvement car traffic and its need of parking space should be reduced. The architectural re-design of the landscape and the inclusion of the Rome Motorino Check Point in the surroundings is another part of this project. The first step in changing the transportation habbits and the main theme of this project is the planning of the Rome Motorino Checkpoint headquater of the network at the Termini Station. Located directly next to Roms main railway station (Stazione Termini) and in immediate proximity to bus- tube- and tramway-stations this first building site is the ideal location and representative for the currently planned network.

The design of the buildings levels, shaped as up to date formula 1 tracks and the possibility to thest these under racing conditions is just an additional bonus. The spatial concept includes scooter-shops, scooter-repair-shops, classrooms, bars and restaurantes, storage facilities and even a litle capsule-motel summarizing, everything the scooter drivers heart desires.

Finding the perfect balance between designing a new exciting building including a unique spatial concept – creating a "landmark" – and the integration refering to the surrounding buildings and landscape (Piazza dei Cinquecento) was another challenge of this project.

Rome Motorino Check Point –
"The new way of movement in Rome"

12 fig.001

COMPETITION

„**RMCP** = Rome Motorino Check Point the competitions
MAIN BUILDING next to
TERMINI CENTRAL STATION“

One of a network of „**PARK AND RIDE**“ type stations,
for **MOTORIZED SCOOTERS** and bicycles, wich are
connecting points with public transportation,
creating a synergy between transportation media.

ROMA TERMINI

= the most important **TRAIN STATION**
in Rome and one of the main stations of Europe.

It harbors two **METRO LINES**,
TRAINS and a great number of **BUSES**,
thus becoming an important connection point between
the city and the exterior.

COMPETITION GUIDELINES

PARKING for **1.000** motorized **SCOOTERS** /
250 bicycles
The building **HEIGHT** is **FREE**.
It is possible to **BURRY** part of the **BUILDING**.
The total **SIZE** cannot exceed approximately **5.000 M²**.

as listed:
Reception and administration 100 m^2
Public restrooms 2x25 m^2
3 workshop classrooms 3x50 m^2
Repair shop 100 m^2
Washing service 50 m^2

SPATIAL PROGRAMM

MAIN SERVICES	**SCOOTER PARKING**	Parking for 1000 motorized scooters
	bicycle PARKING	Parking for 250 bicycles
SUPPLEMENTARY SERVICES	**ADMINISTRATION, RECEPTION**	Administration and Reception 100 m^2
	repair shop	Repair Shop 100 m^2
	washing service	Washing Service 50 m^2
	workshop classrooms	Workshop Classrooms 3 x 50 m^2 The workshop classrooms will be used to hold citizen awareness conferences and road safety classes
	public restrooms	Public restrooms 2 x 25 m^2 The restrooms are for public use therefore they will have to service the building and the Cinquecento plaza

SITE ANALYSIS

fig.003

ITALY

Population: 60.782.668 Mio
Area: 301.338 km^2

3,5% of the Italian population uses scooters / motorbikes to get to work or study = **2.127.393 MIO**

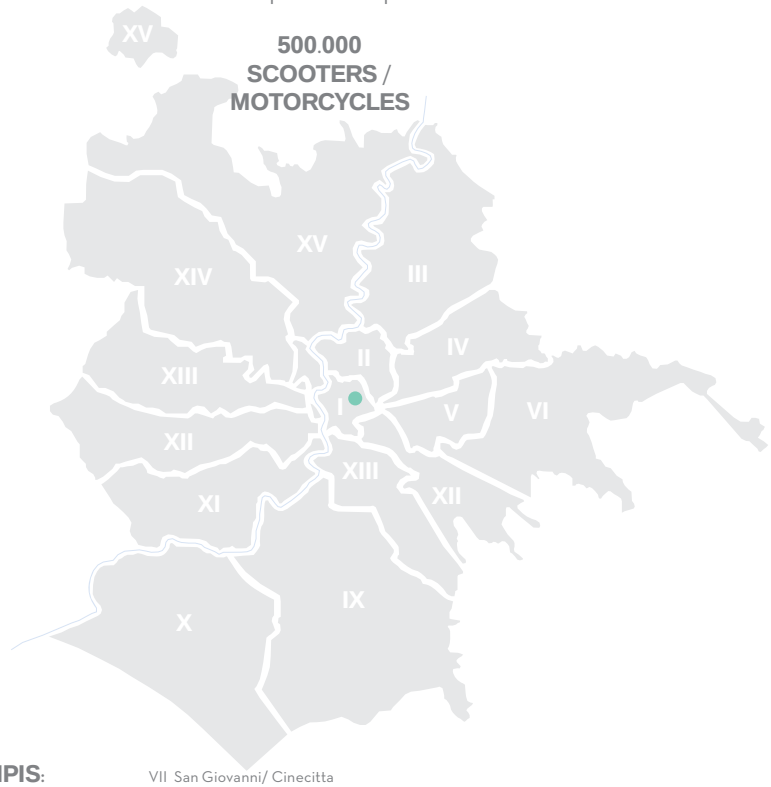
fig.004

ROME

Population: 2.863.322 Mio
Area: 1.285,31 km^2

60% private transport
40% public transport

500.000 SCOOTERS / MOTORCYCLES

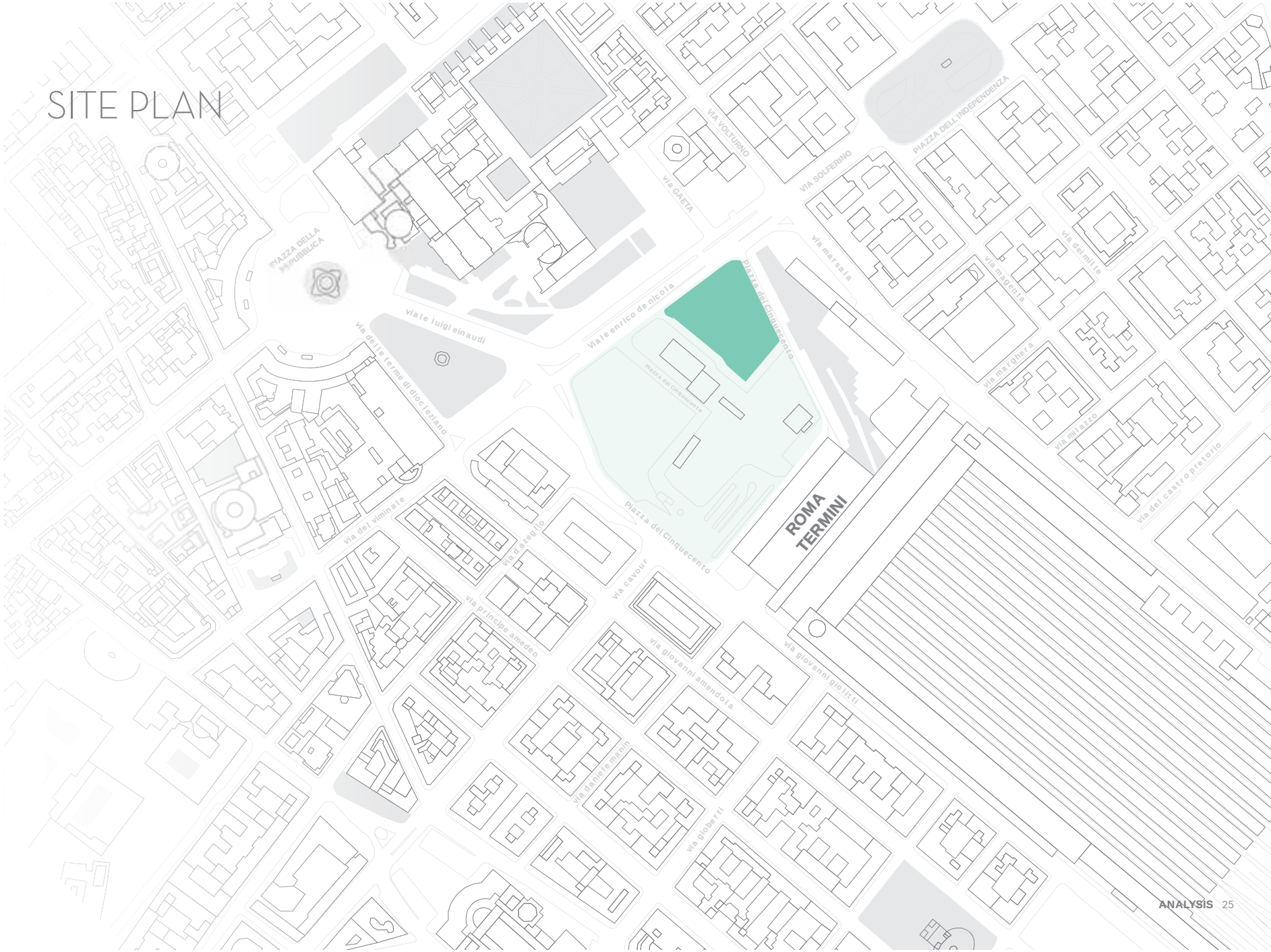


15 MUNICIPIS:

I Historical Centre - Prati
II Parioli/Nomentano - San Lorenzo
III Monte Sacro
IV Tiburtina
V Prenestino/ Centocelle
VI Roma Delle Torri
VII San Giovanni/ Cinecitta
VIII Appia Antica
IX EUR
X Ostia
XI Arvalia Portuense
XII Monte Verde
XIII Aurelia
XIV Monte Mario

fig.005

SITE PLAN



PIAZZA DELLA REPUBBLICA
via le luigi einaudi
via delle terme di diocleziano
via del viminale
via d'azeglio
via principe amedeo
via cavour
via giovanni amendola
via giovanni giolitti
via daniele manin
via gioberti
via enrico de nicola
Piazza dei Cinquecento
ROMA TERMINI
via GAETA
VIA VOLTURNO
VIA SOLFERINO
PIAZZA DELL'INDEPENDENZA
via marsala
via magenta
via dei mille
via marghera
via milazzo
via del castro pretorio
0 10 50 100

THE SITE

I TIBER
-TEVERE-
= the third longest river in Italy.
length: 406 km

II COLOSSEUM
-ANFITEATRO FLAVIO-
= largest amphitheatre in the world
construction: 70 - 80 AD
capacity: 50.000 - 80.000

III ALTARE DELLA PATRIA
-MONUMENTO NAZIONALE A VITTORIO EMANUELE II-
= built in honour of Victor Emmanuel, the first king of a unified Italy.
completed: 1925 AD
width: 135 m
height: 70 m

IV PIAZZA DELLA REPUBBLICA

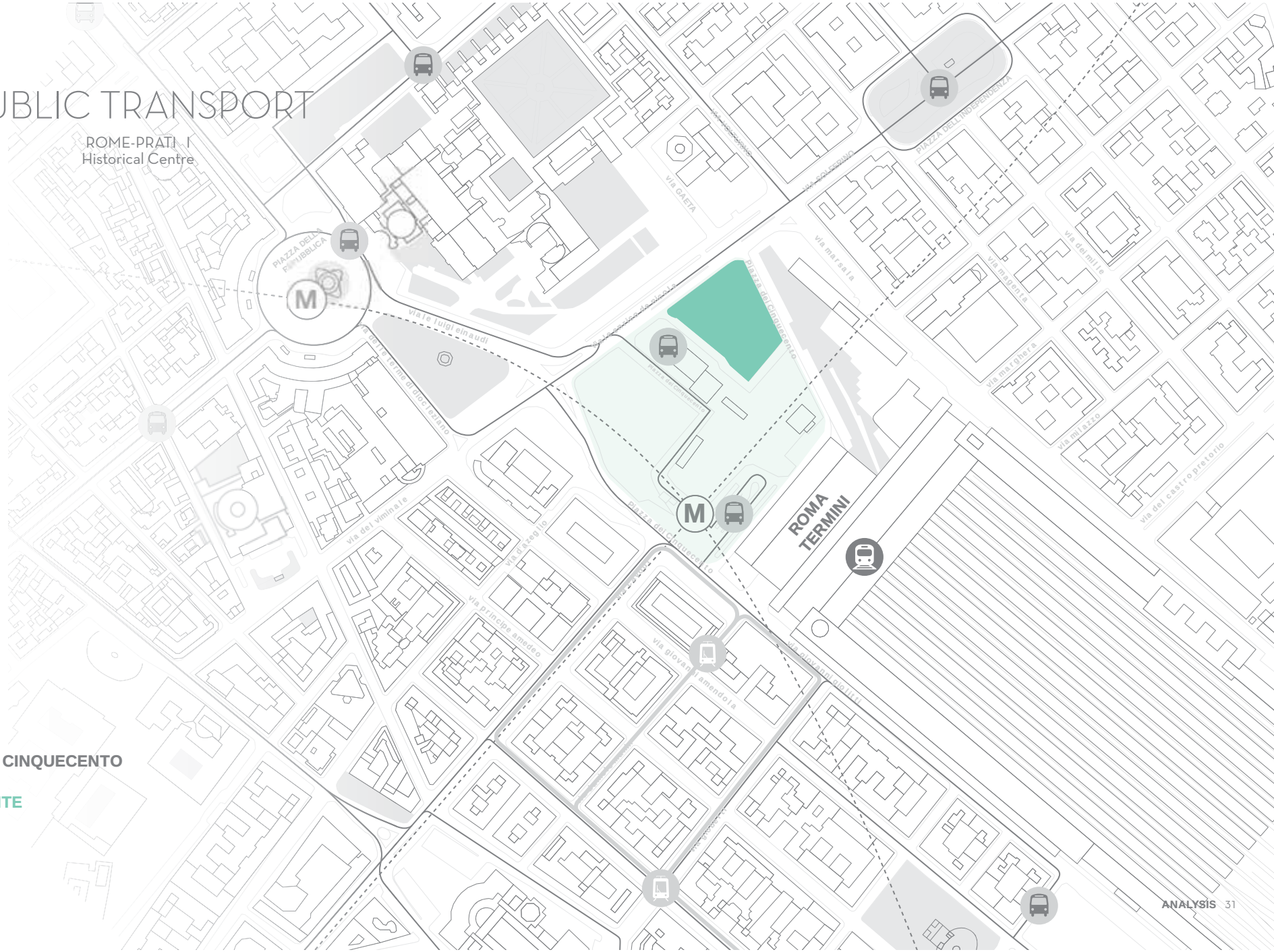
V STAZIONE TERMINI
-ROMA TERMINI-
= main railway station of Rome.
capacity: 150 Mio. /year

VI THERMAE DIOCLETIANI
-BATHS OF DIOCLETIAN-
= largest and most sumptuous of the imperial baths.
completed: 298 - 306 AD
size: 120.000 m^2
capacity: 3.000

STAZIONE TERMINI

PUBLIC TRANSPORT

ROME-PRATI I
Historical Centre



M METRO

BUS

TRAM

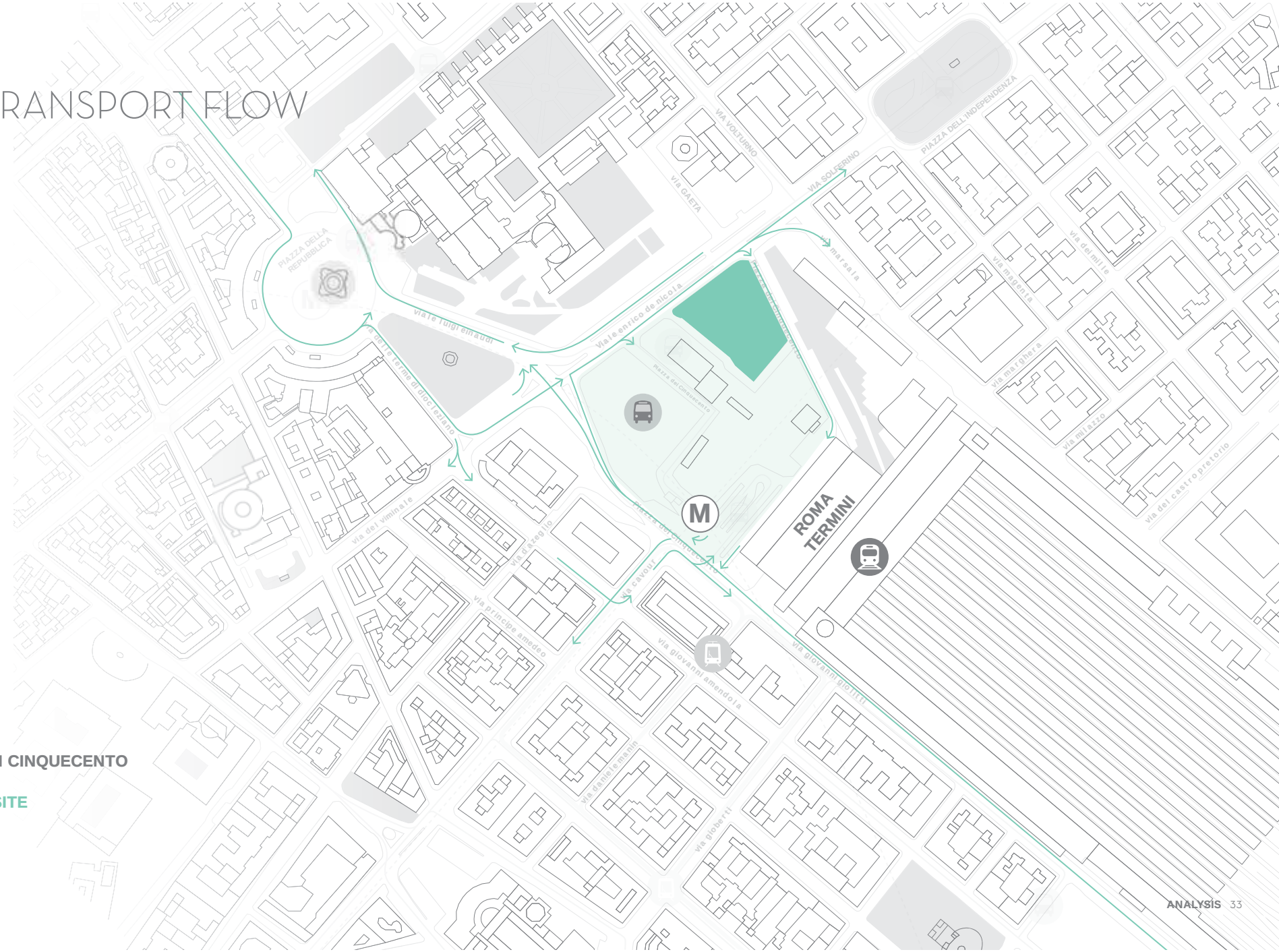
TRAIN

PIAZZA DEI CINQUECENTO

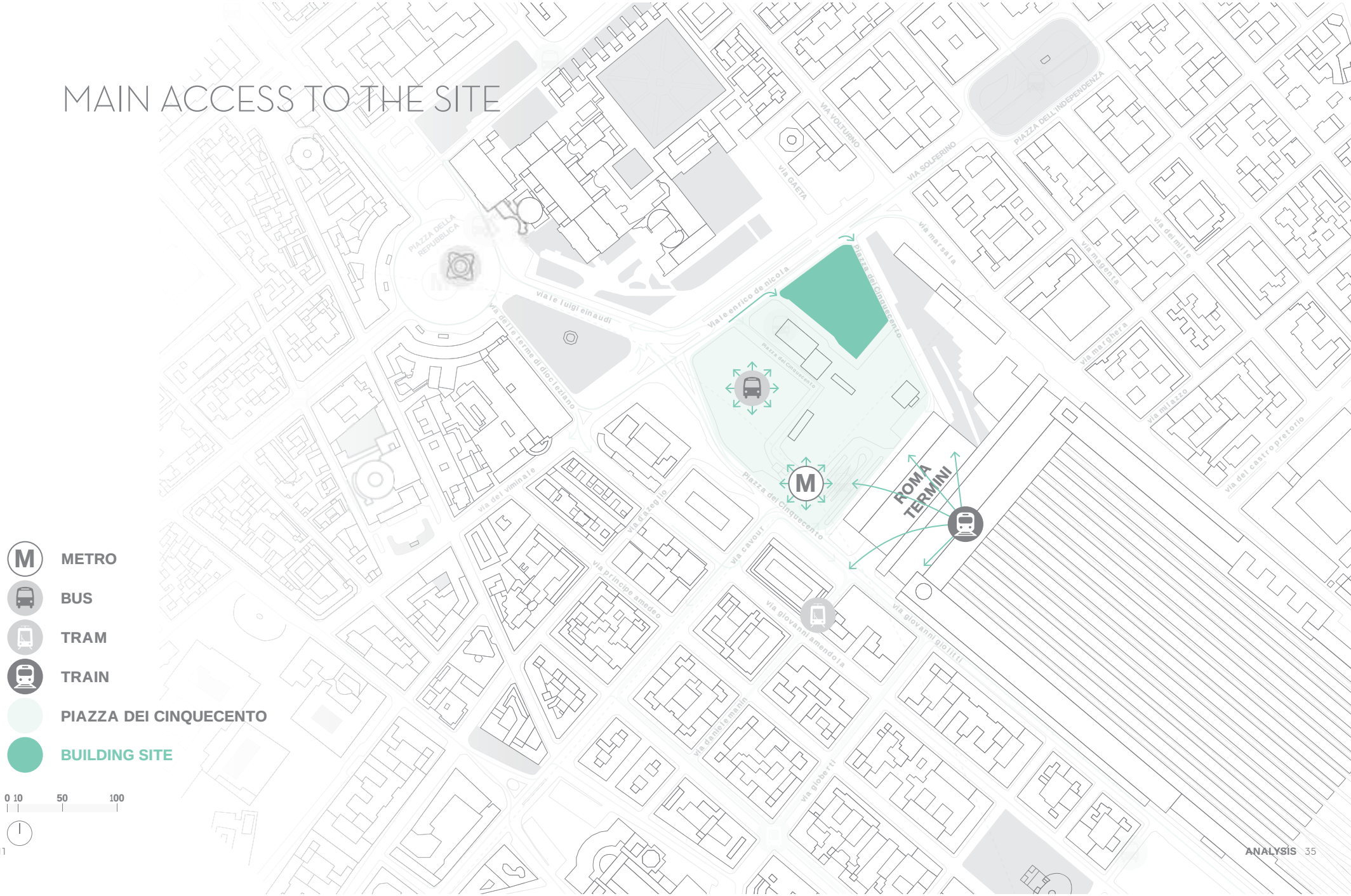
BUILDING SITE

0 10 50 100

TRANSPORT FLOW

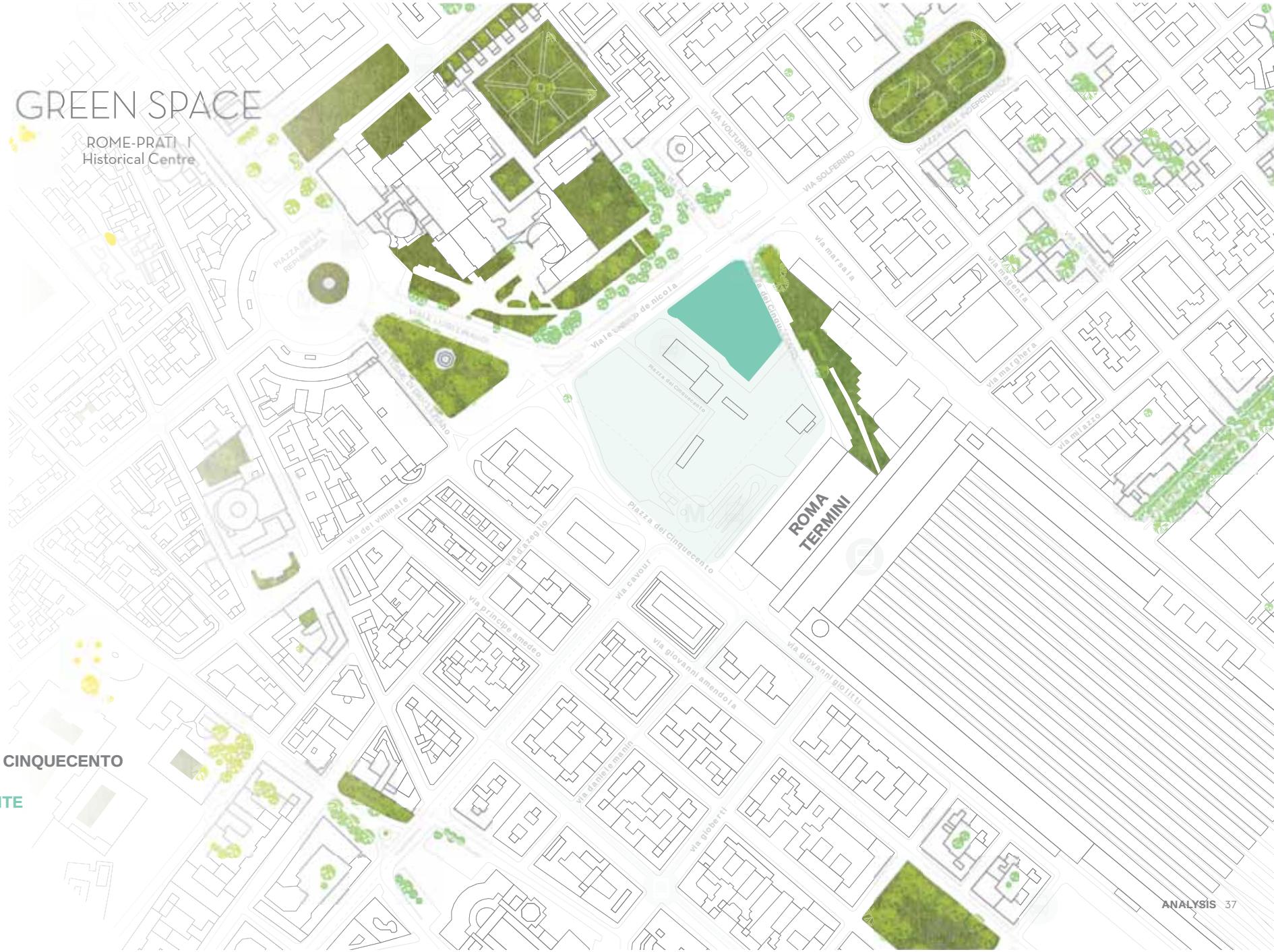


MAIN ACCESS TO THE SITE



GREEN SPACE

ROME-PRATI I
Historical Centre



M METRO

BUS

TRAM

TRAIN

PIAZZA DEI CINQUECENTO

BUILDING SITE

0 10 50 100

PARKING SPACE

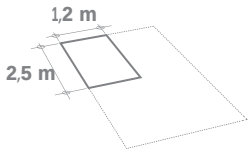
B

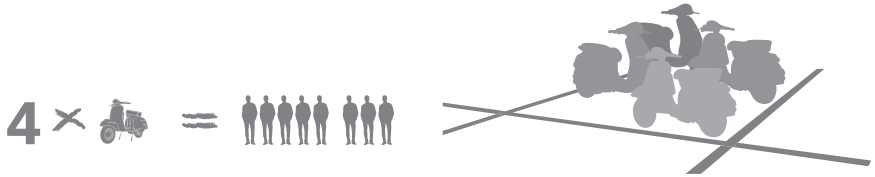
PARKING SPACE EVALUATION

STANDARD CAR PARKING

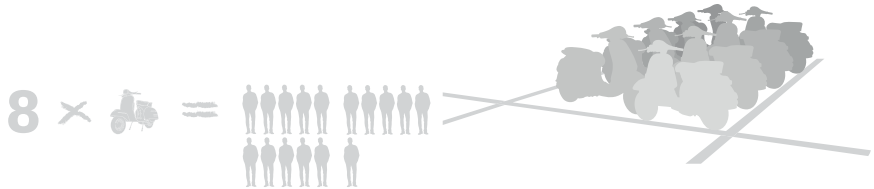
Comparing the standard parking space for a car with the needed space for a scooter an ideal size of 1,2 m × 2,5 m is chosen to leave enough room for higher density parking in different usage scenarios.

STANDARD SCOOTER PARKING

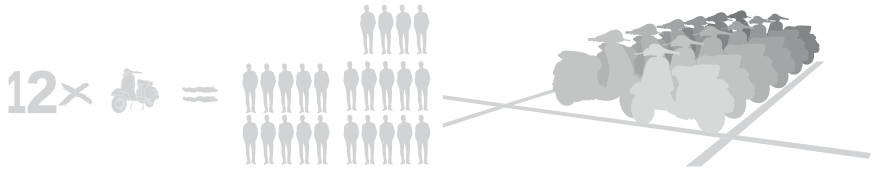




HIGH DENSITY SCOOTER PARKING



MAXIMUM SCOOTER PARKING



PARKING SPACE EVALUATION

LENGTH NEEDED

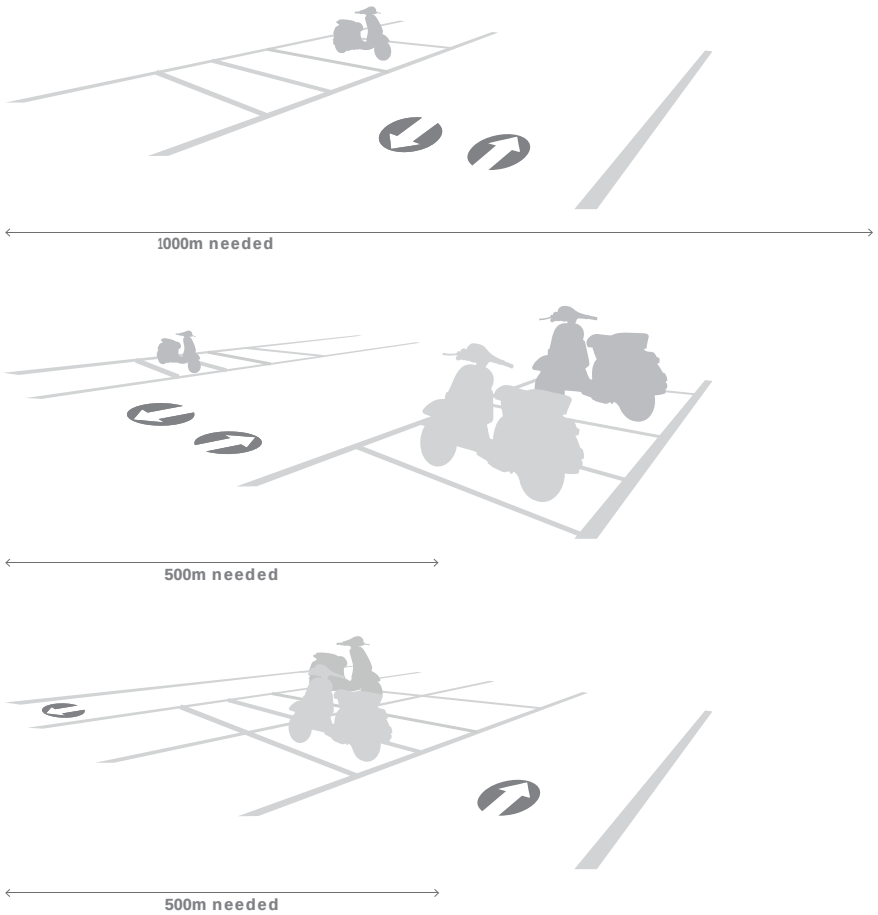


fig.014

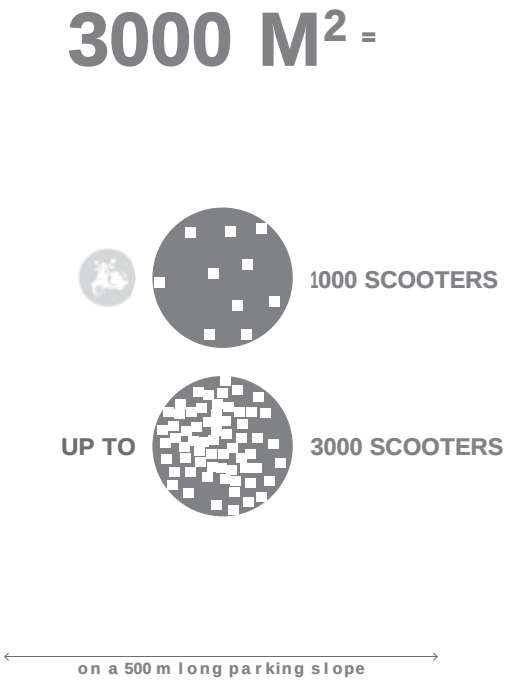
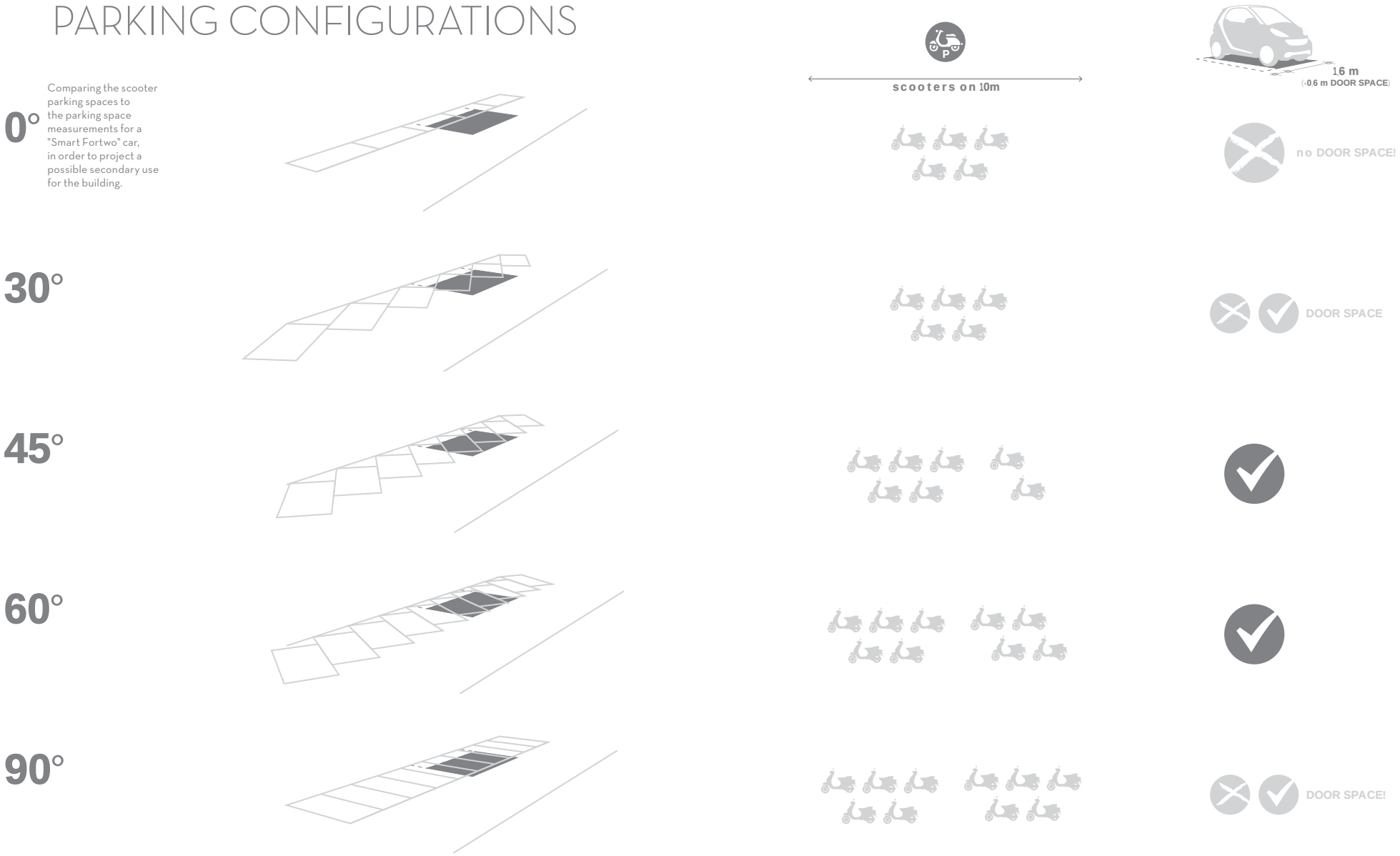


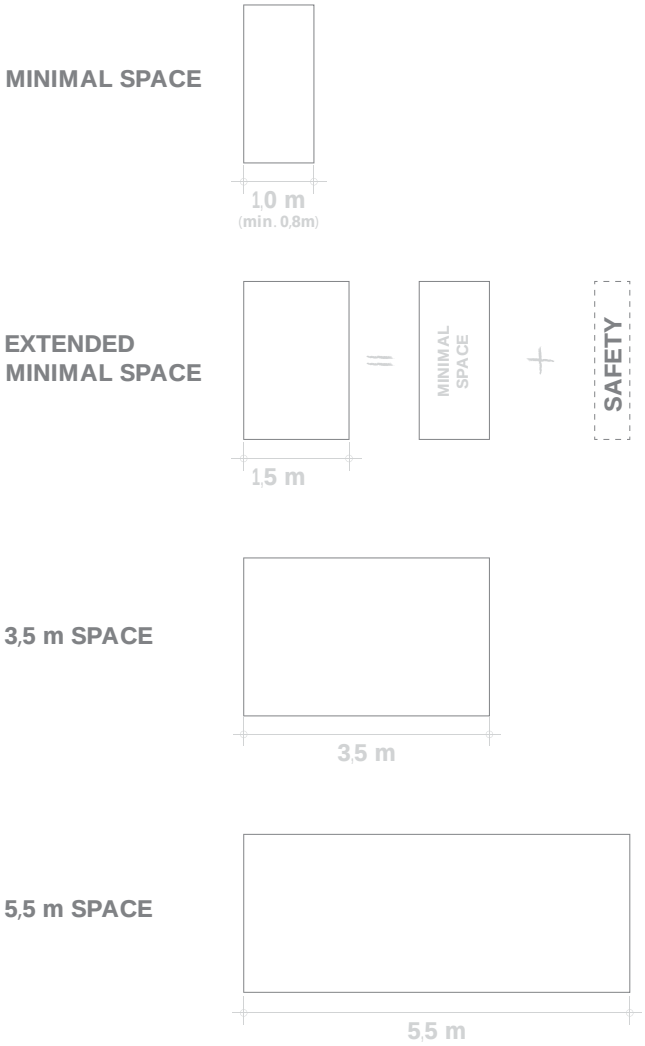
fig.015

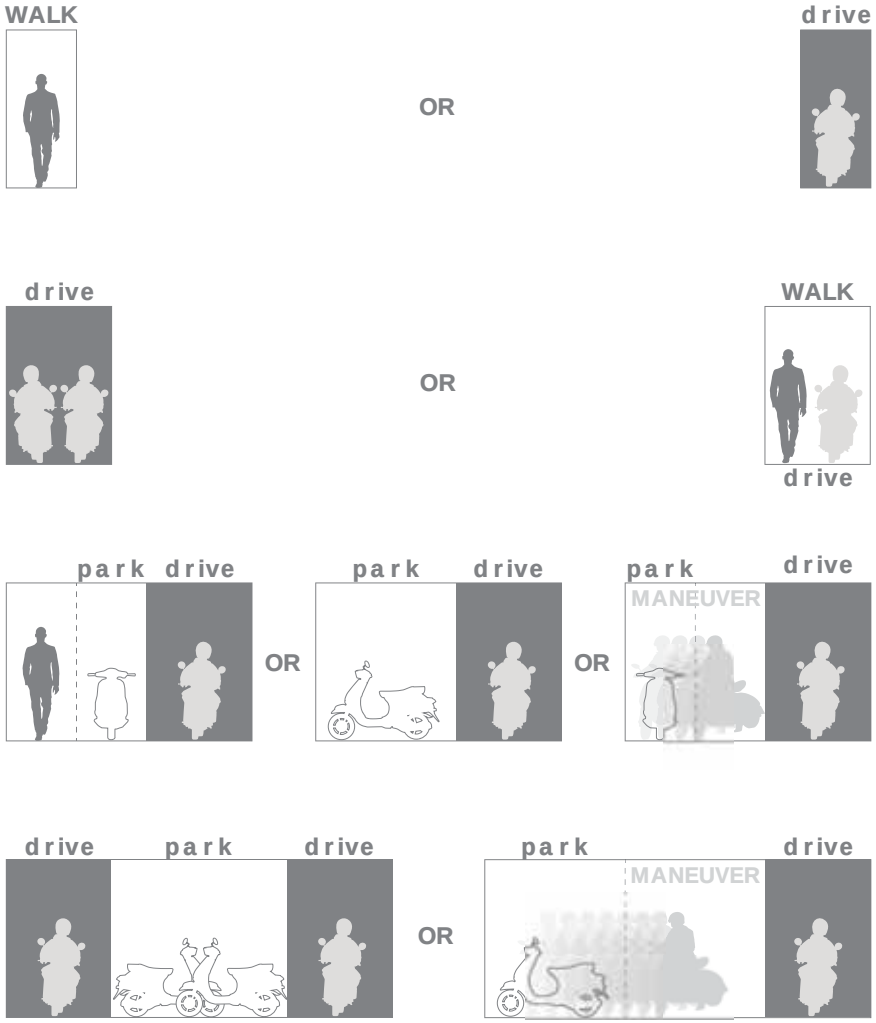
PARKING CONFIGURATIONS

Comparing the scooter parking spaces to the parking space measurements for a "Smart Fortwo" car, in order to project a possible secondary use for the building.

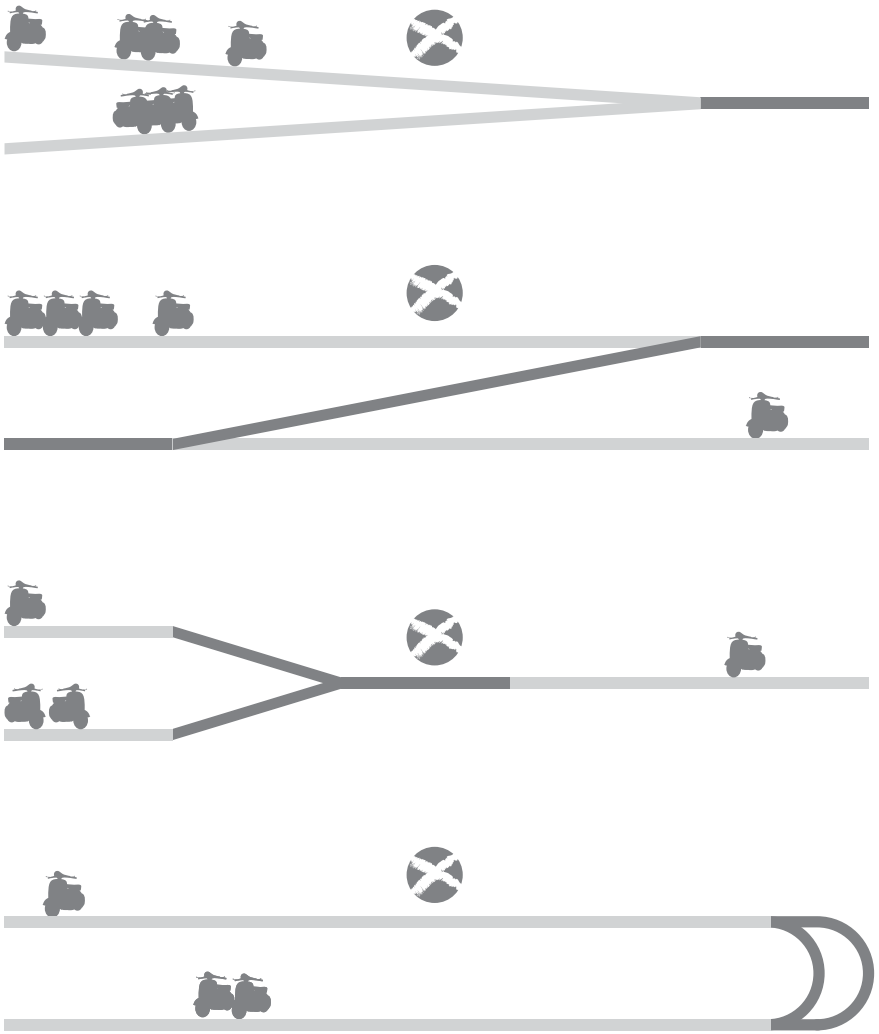


DRIVING LANE WIDTH





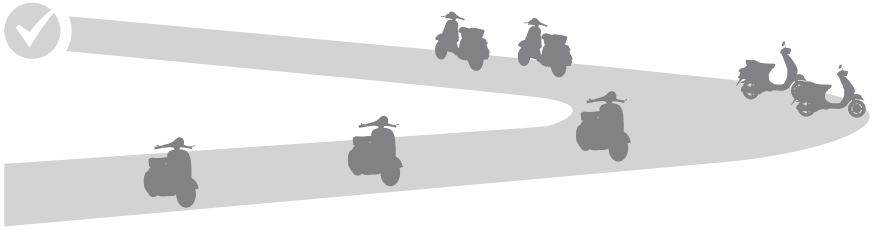
ACCESS SCHEMES



parking

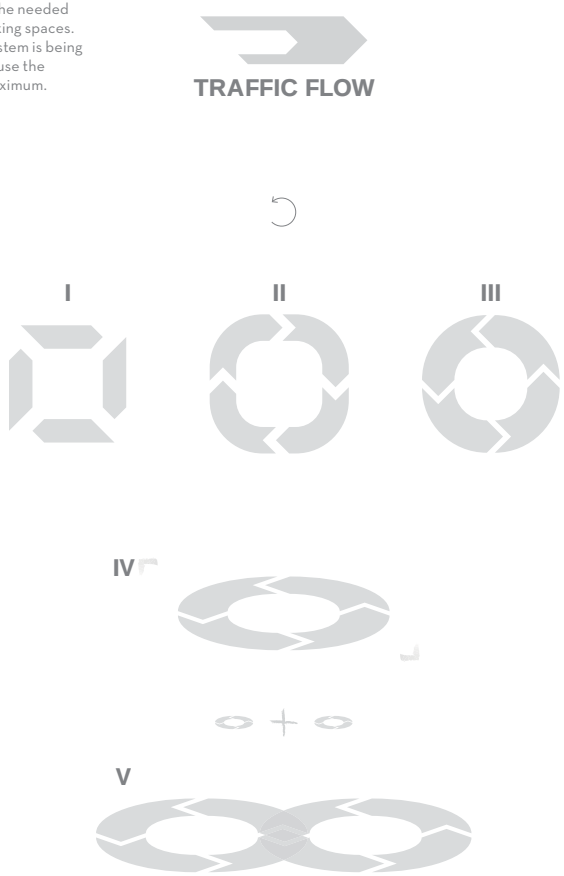
no parking
transition area
ramps

Comparing common methods to use ramps in parking garages the ideal case is chosen.
Parking on the ramps eliminates unused access areas and maximizes the parking area.



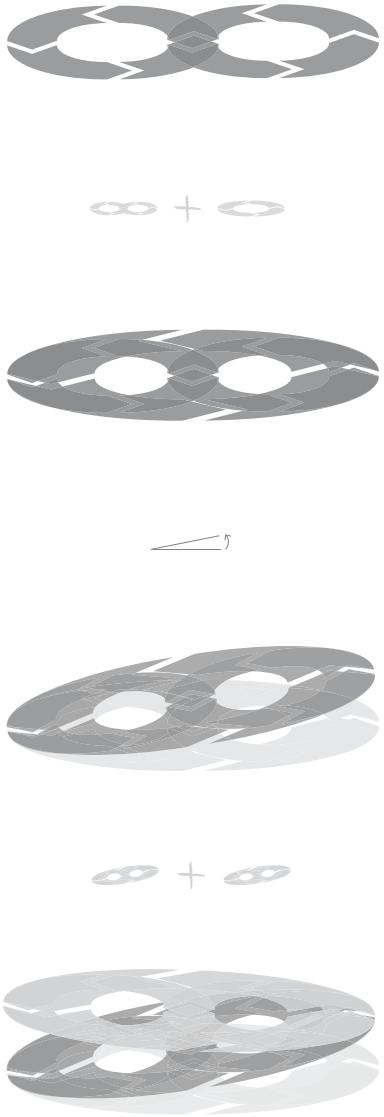
ACCESS SCHEMES

Determining how to fold and arrange the needed 500 m of parking spaces. A one-way system is being circulated to use the space to a maximum.



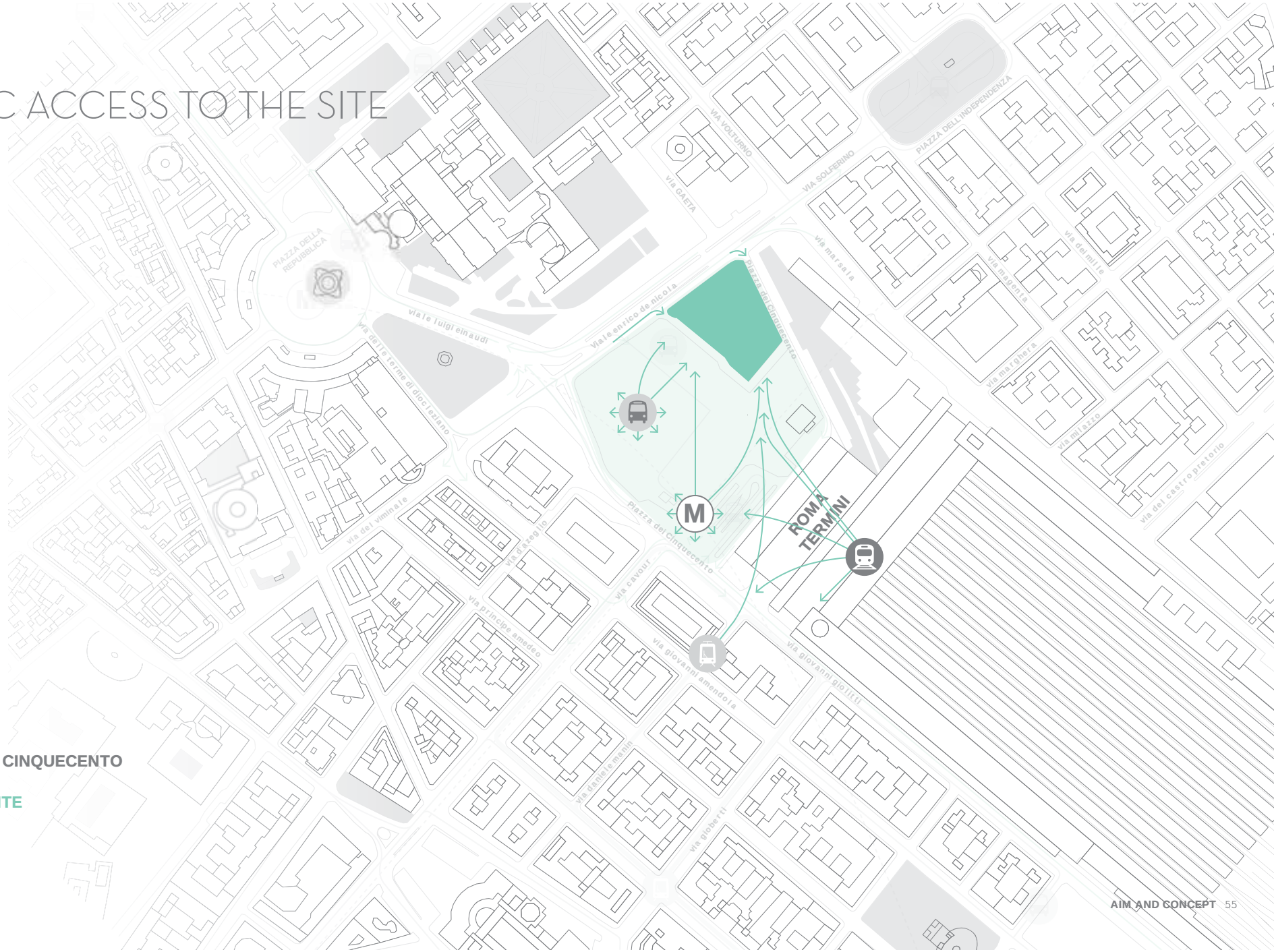
variation 1

variation 2



PUBLIC ACCESS TO THE SITE

The proposed building will serve as a landmark building, reaching out to the users of the neigbouring public transport stations and representing the Rome Motorino Check Point network as headquater.



M METRO

BUS

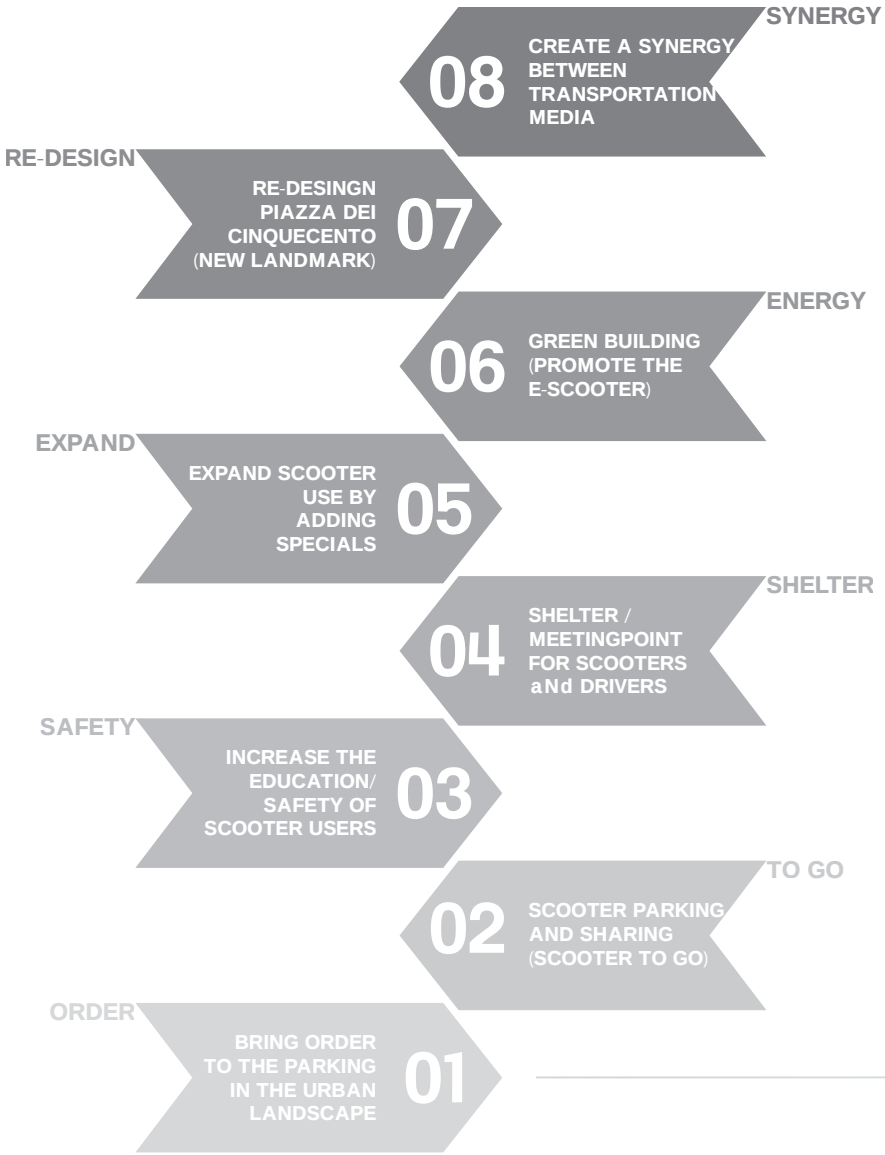
TRAM

TRAIN

PIAZZA DEI CINQUECENTO

BUILDING SITE

0 10 50 100

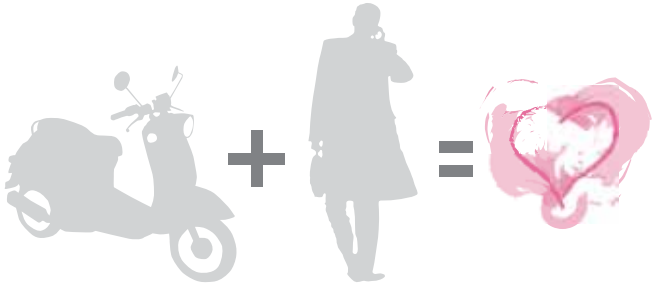


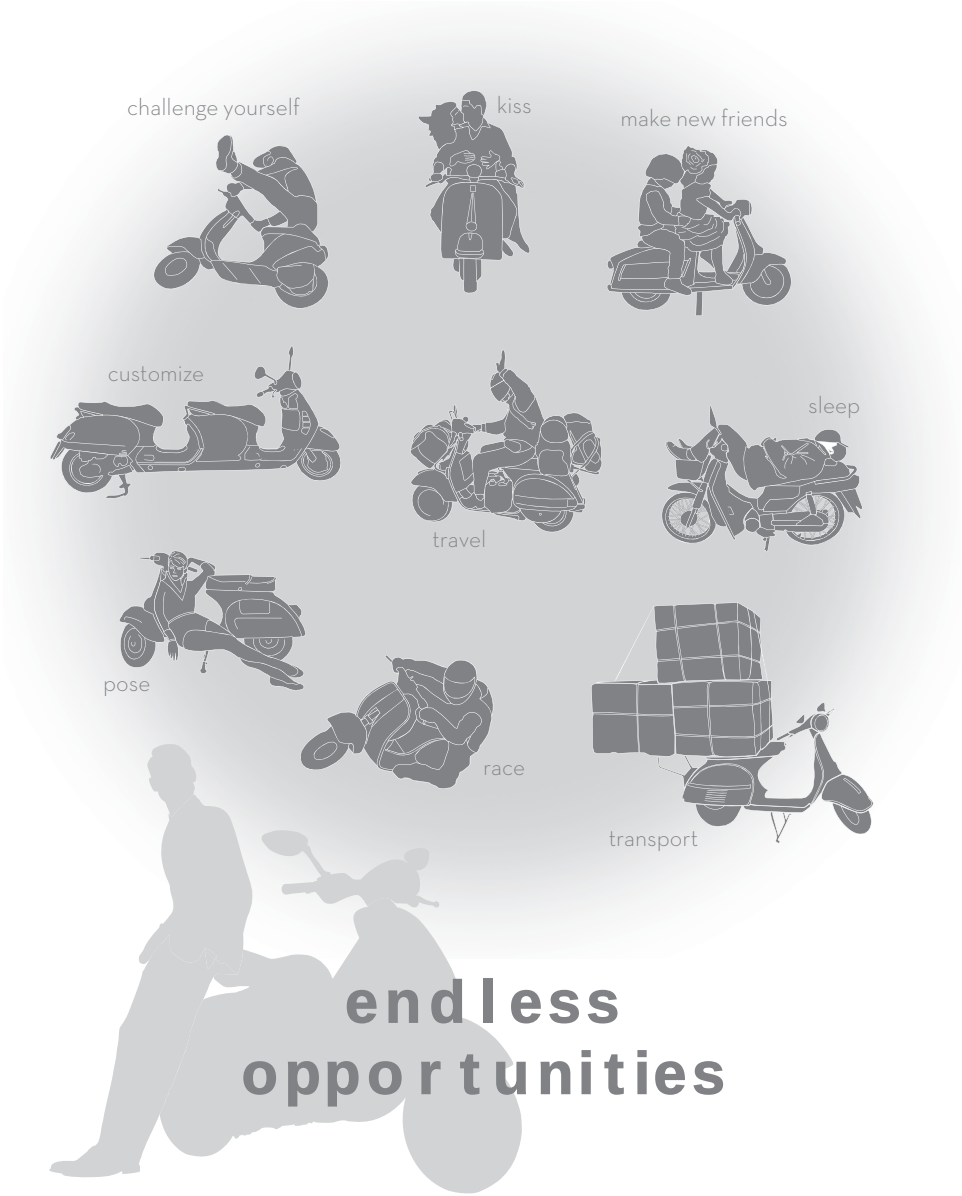
PROJECT AIM

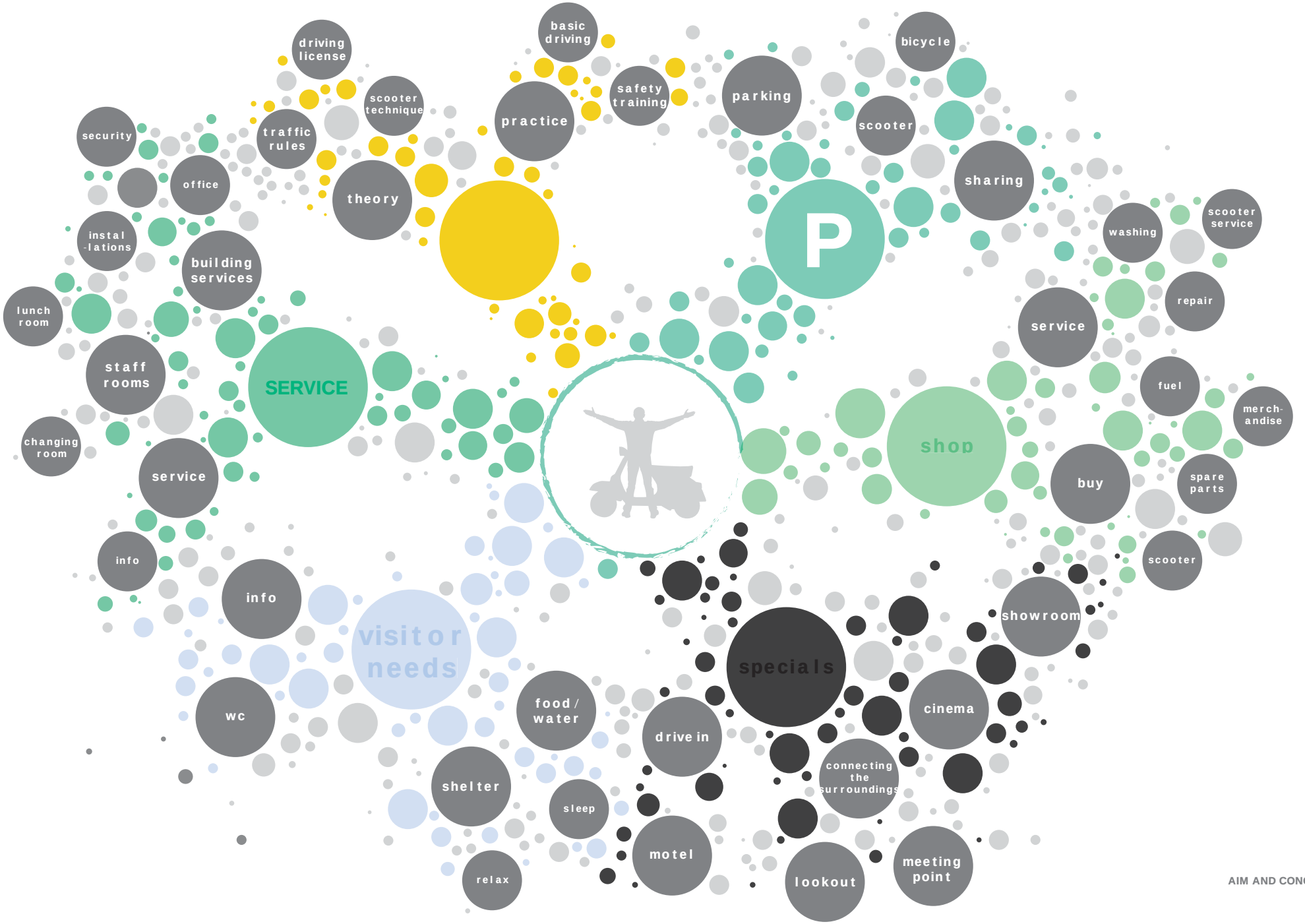
Combining these eight elements the project aim will be to create a scooter playground.

SCOOTER PLAYGROUND

The driver and the scooter a love story that opens the door to endless opportunities.






basic driving
driving license
scooter technique
practice
safety training
parking
bicycle
scooter
sharing
P
security
traffic rules
office
theory
instal -lations
building services
washing
scooter service
repair
lunch room
service
staff rooms
SERVICE
fuel
merch-andise
changing room
shop
service
buy
spare parts
info
scooter
info
showroom
visitor needs
specials
wc
food / water
cinema
drive in
connecting the surroundings
shelter
sleep
motel
lookout
meeting point
relax

FUNCTIONS

PARKING
- SCOOTER PARKING
- SCOOTER SHARING
- BICYCLE PARKING
- BICYCLE SHARING

SERVICE
- INFO
- OFFICE
- SECURITY
- STAFF ROOMS
- BUILDING SERVICES

SHOP
- BUY
- FUEL
- SPARE-PARTS
- SERVICE
- MERCHANDISE
- REPAIR
- WASHING

EDUCATION
- THEORIE
  - SCOOTER LICENSE
  - TRAFFIC RULES
  - SCOOTER TECH
- PRACTICE
  - BASIC DRIVING
  - SAFETY TRAINING

VISITOR NEEDS
- INFO
- DRINK
- WC
- FOOD

SPECIAL
- SNACKS
- LOCKERS
- DRIVE IN
- RELAX
- CINEMA
- SLEEP
- GREEN

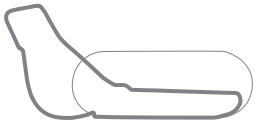
fig.026

ITALY'S FORMULA1 RACE TRACKS

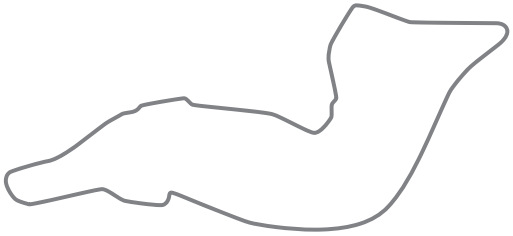
Italy had three Formula1 tracks in its history, Pescara, Monza and Imola.

PESCARA
Coppa Acerbo / Circuito di Pescara

Length: 25,579 km
Width: av. 5m
Formula 1: in 1957
Today: unused



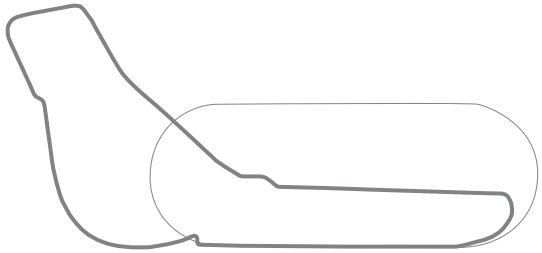
MONZA
Autodromo Nazionale Monza



IMOLA
Autodromo Internazionale Enzo e Dino Ferrari

Length: 4,933 km
Width: 10-15m
Curves: 17
Formula1: from 1980-2006
Today: used

European le Mans Series
Superbike WM



MONZA

Autodromo Nazionale Monza

Length: 5,793 km
Width: 10-12m
Curves: 10
Formula1: from 1950-2015
Today: used

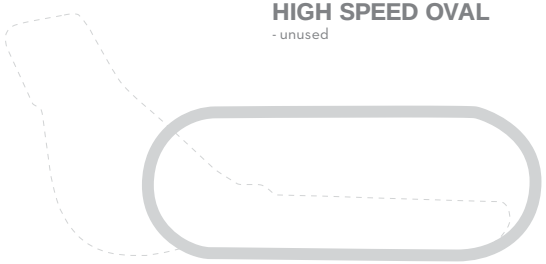
Formula1
Superbike WM
Supersport WM

The Monza Track consists of two differnedt tracks, the regular "High Speed Track" and the "High Speed Oval". While the oval is curently unused it is interesting as a racing track.

HIGH SPEED TRACK

HIGH SPEED OVAL

- unused



Imola

Monza

Monza
Oval

TRACK USAGE

TRACK 1
IMOLA

park or race

Choosing the currently used race tracks, Imola and Monza, as an inspiration for a the scooter playground.

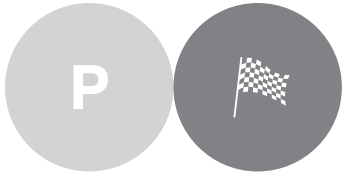
The second, now unused oval track of Monza adds a multi-functional track to the building.

TRACK 2
MONZA
high speed track

park or race

TRACK 3
MONZA
high speed oval

park and race



Imola

Monza

Monza
Oval

CASE 1

333 scooters

STANDARD DENSITY parking

333 scooters

STANDARD DENSITY parking

334 scooters

STANDARD DENSITY parking

CASE 2

0 scooters

500 scooters

high DENSITY parking

500 scooters

high DENSITY parking

CASE 3

500 scooters

high DENSITY parking

0 scooters

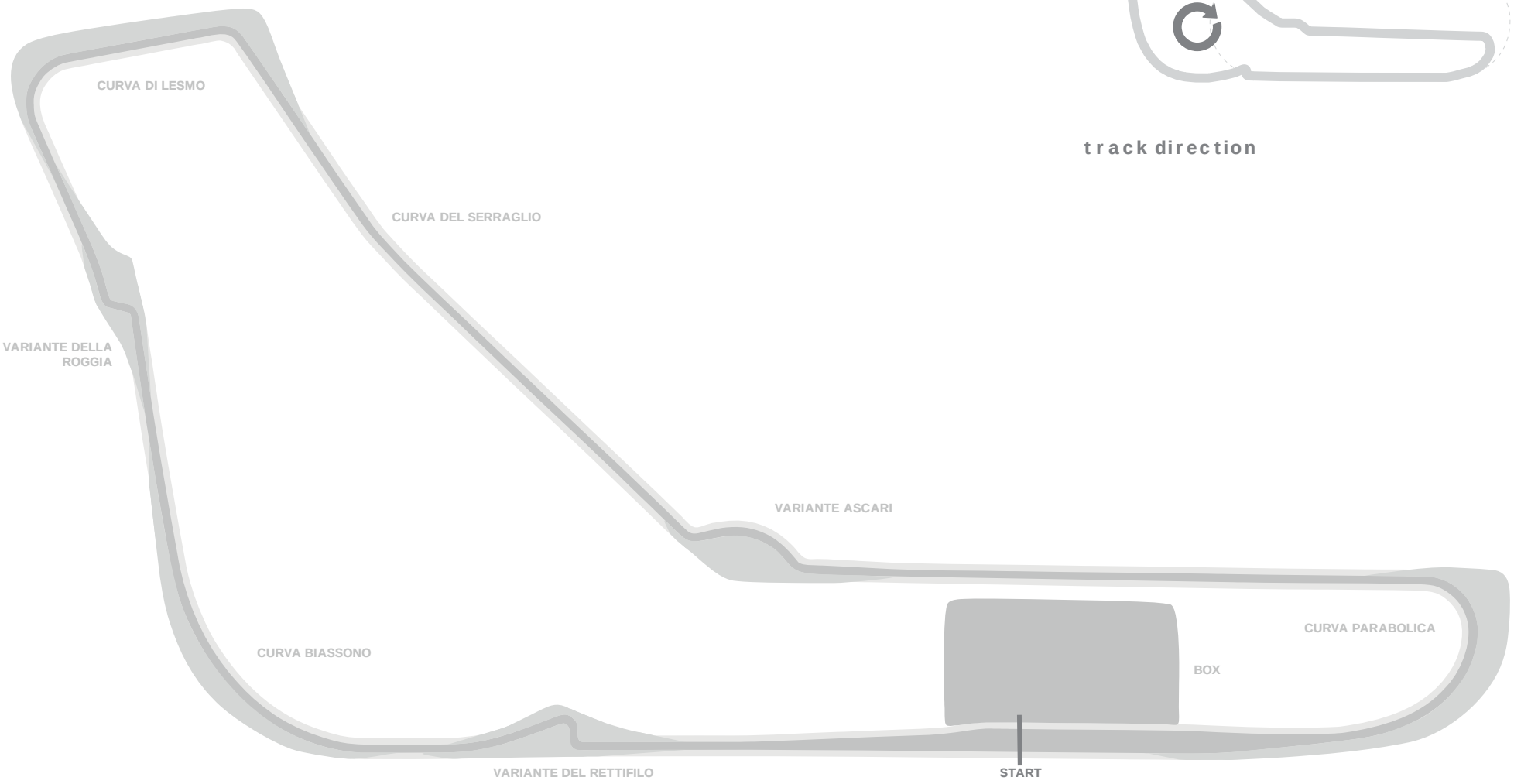
500 scooters

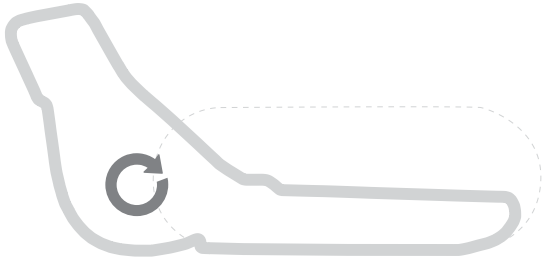
high DENSITY parking

Testing three scenarios for racing and parking the ideal use of every track is determined.

Case 1 is chosen as the standard scenario while case 2 & 3 remain optional for special

MONZA
TRACK



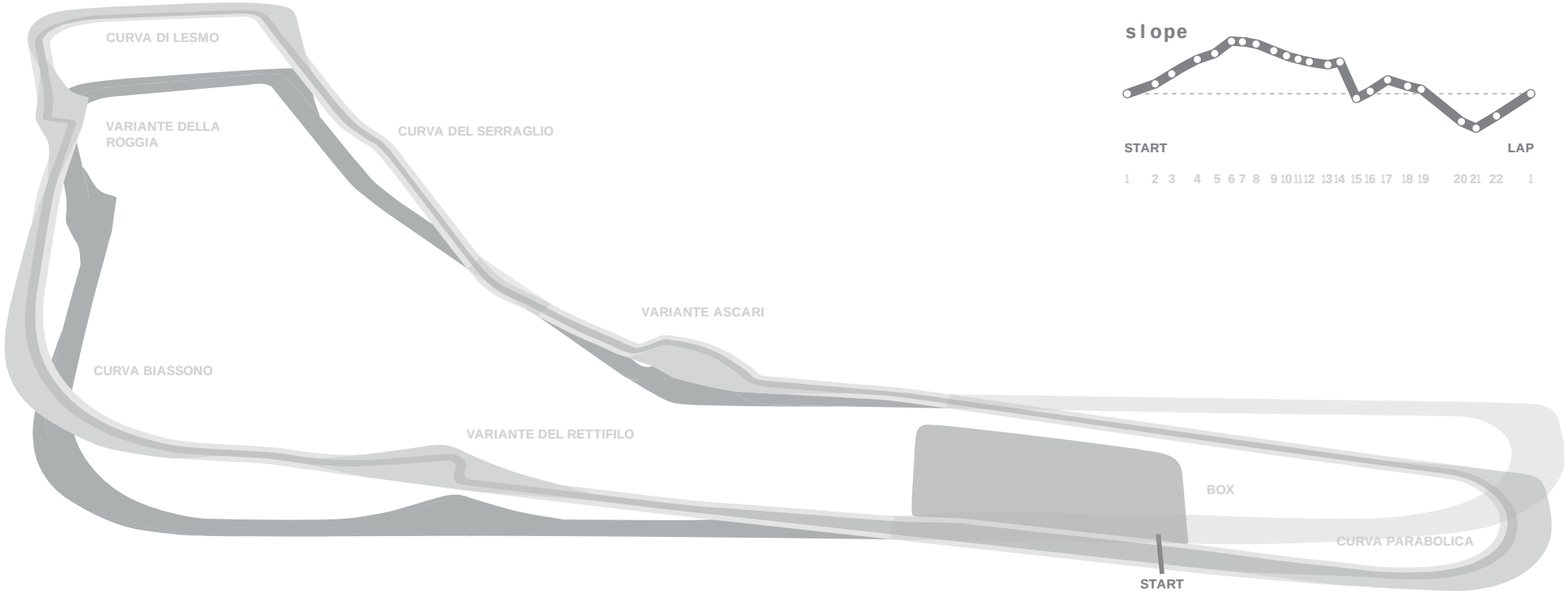


track direction

MONZA
SLOPE

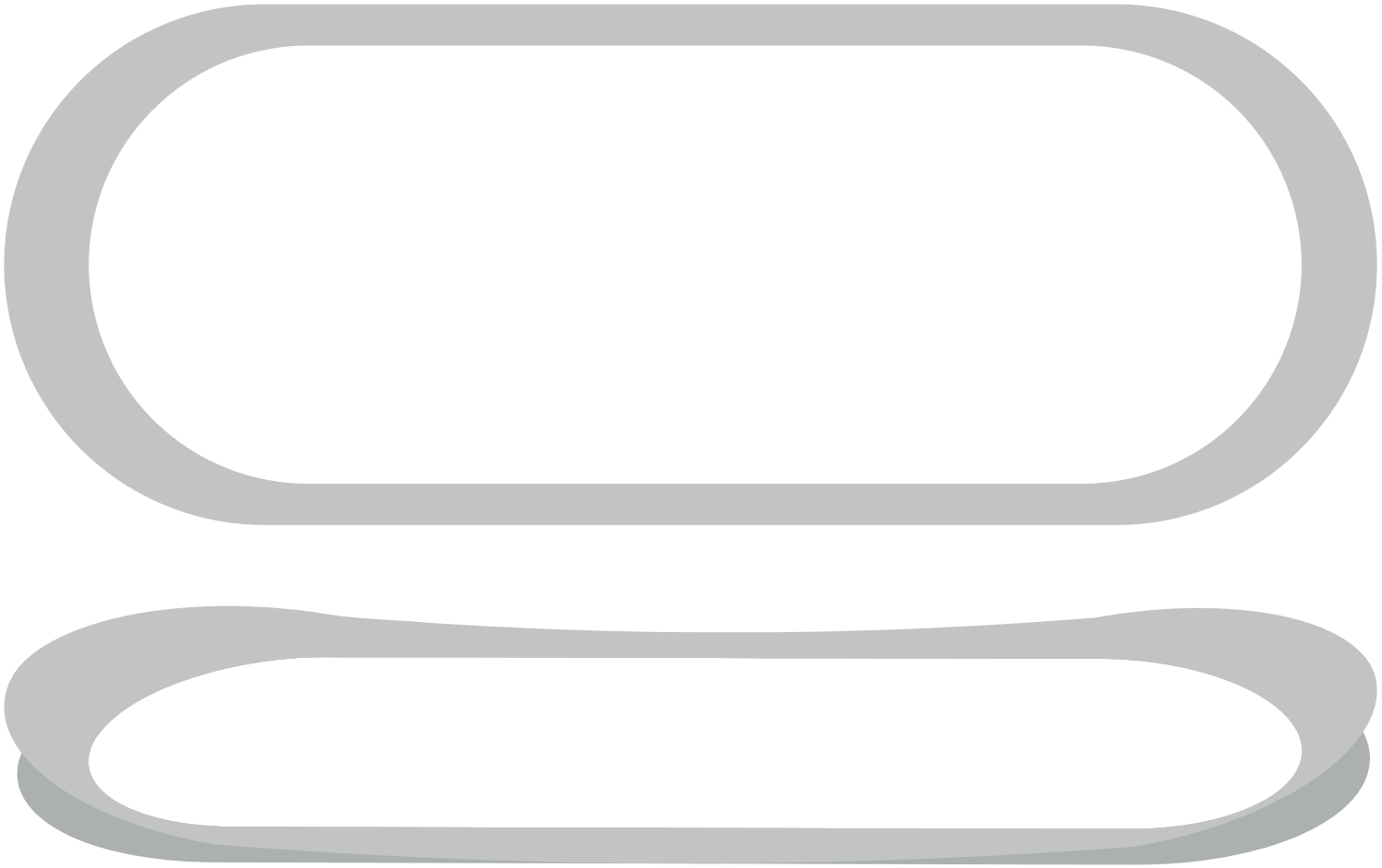
track direction

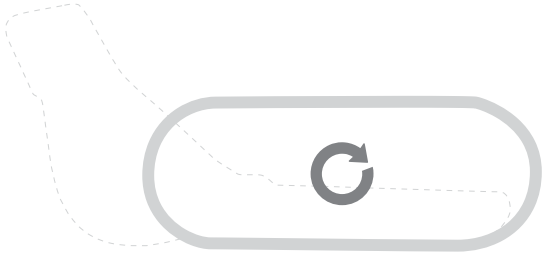
slope



MONZA

HIGH SPEED OVAL TRACK AND SLOPE



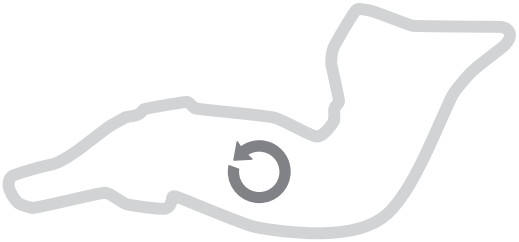


track direction

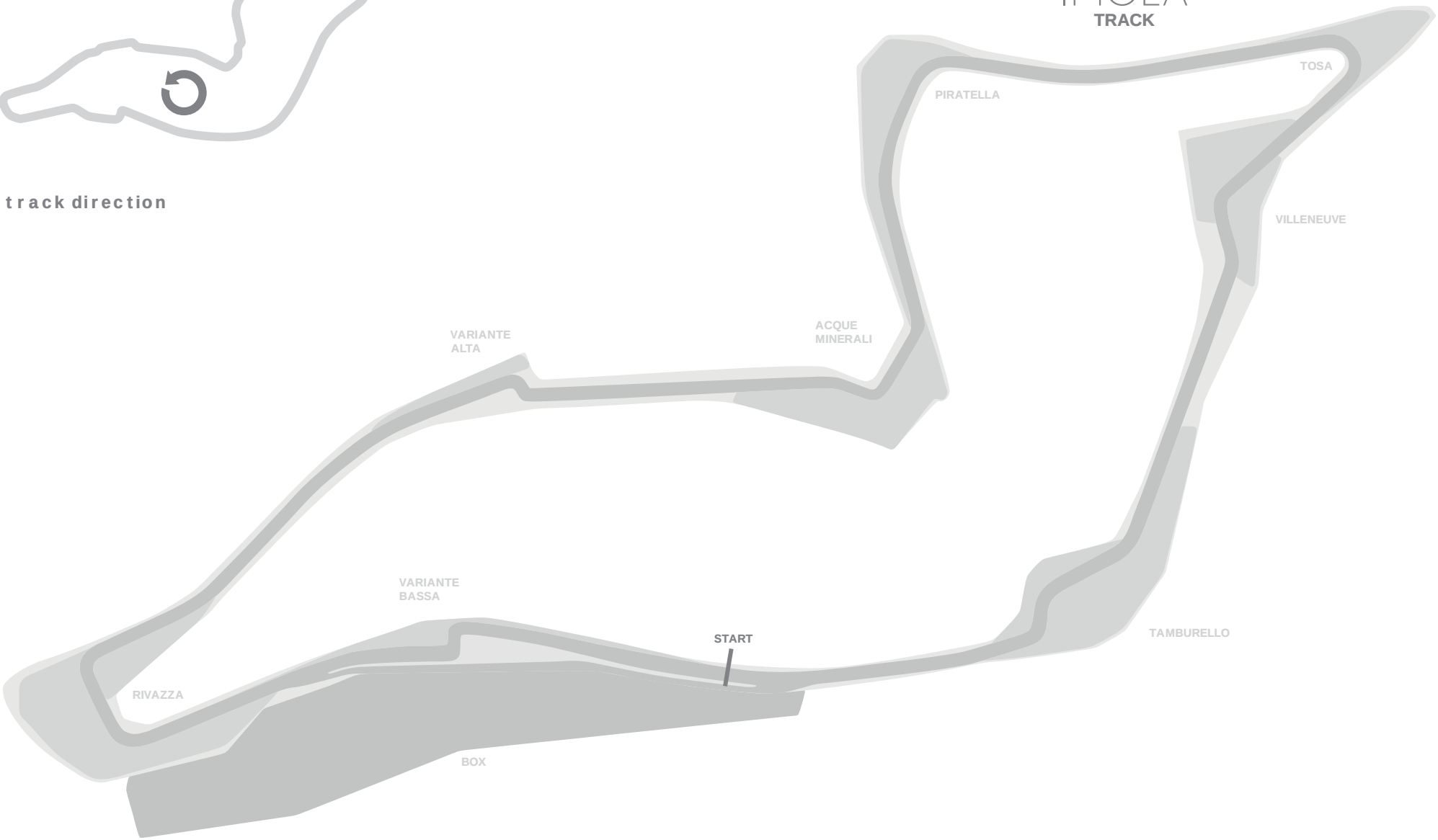
slope

The ovals curves are tilted up the rest of the track is flat and does not have hight changes.

IMOLA
TRACK



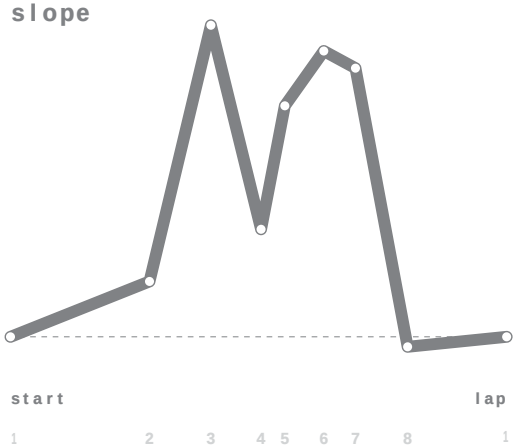
track direction

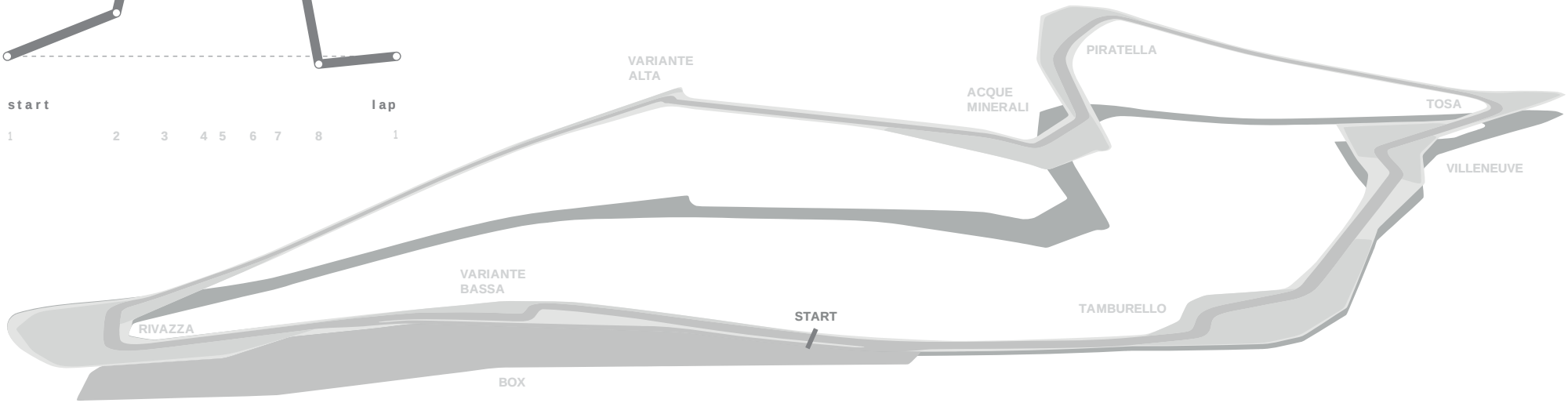


IMOLA
SLOPE

track direction

slope





SCALING FACTOR

SPEED

The race tracks as form-giving elements are at a length of up to 6 km to long for scooter use. Speed, acceleration and deceleration of the scooter provide a figures to scale down the tracks.

The 100% value derives from the maximum speed a Fomula1 car can reach. In several steps an appropriate scaling factor for the size of the plot can be determined.

45 km/h

130 km/h

170 KM/H

218,87 km/h

369,9 km/h (TOP SPEED MONZA)

413 km/h (TOP SPEED F1 CAR)

SCALING FACTOR

ACCELERATION AND DECELERATION

0-100		14-40 sec
100-0 (45km/h)	~	20,25 meters
100-0 (80km/h)	~	64 meters
100-0 (100km/h)	~	100 meters
100-0 (130km/h)	~	169 meters

$$\sim \left(\frac{\text{SPEED (km/h)}}{10}\right)^2$$

0-100	2,4 - 7,6 sec
100-0	36 Meters

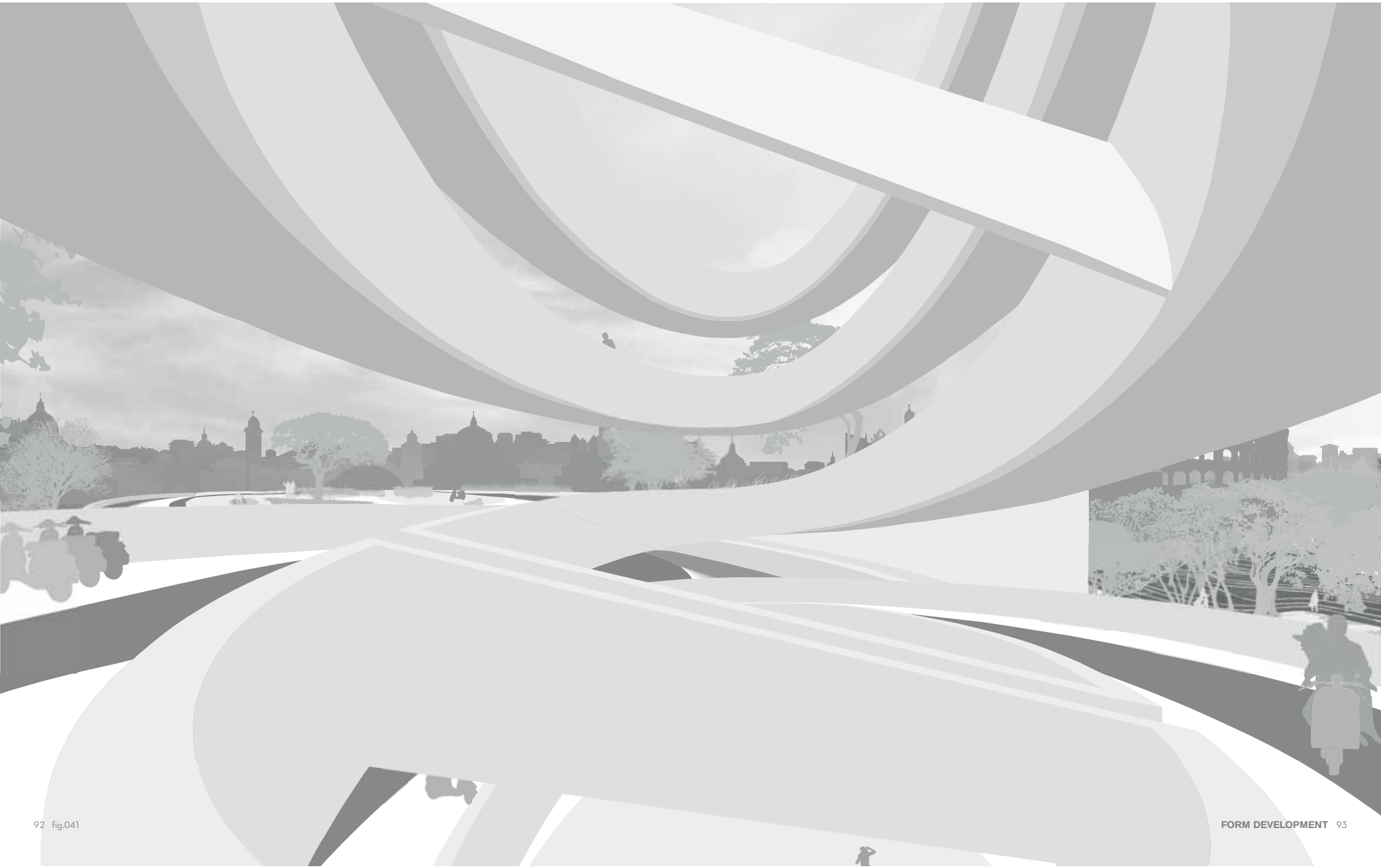
0-100	1.7 sec
100-0	17 Meters

SAFETY FIRST

The deceleration is being taken in account for the scaling. Reality first the acceleration adds as a factor for the scaling of the tracks to achieve a realistic scale for the training tracks for the

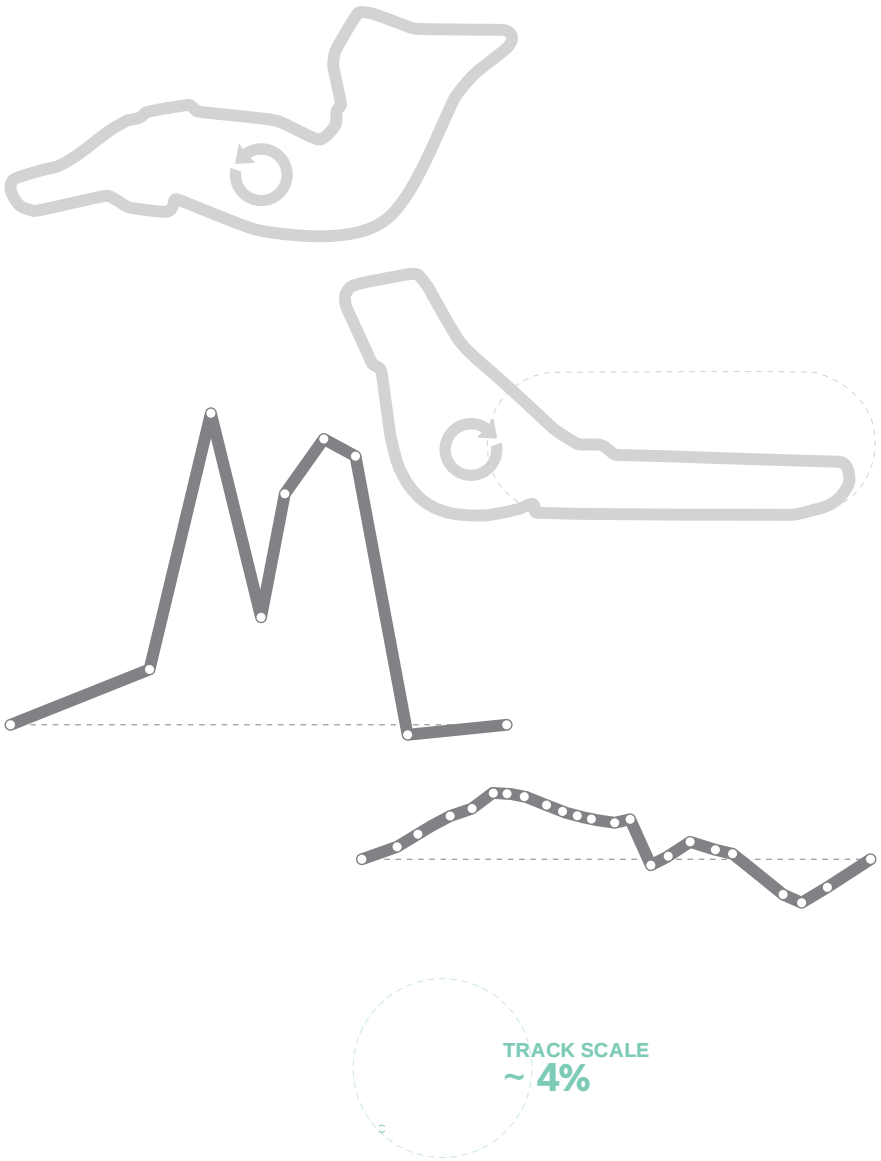
Deriving from the acceleration 4% is chosen as the final scaling factor to determine the size of the future scooter race tracks.

IV



92 fig.041

ROOM
1
ROOM
2

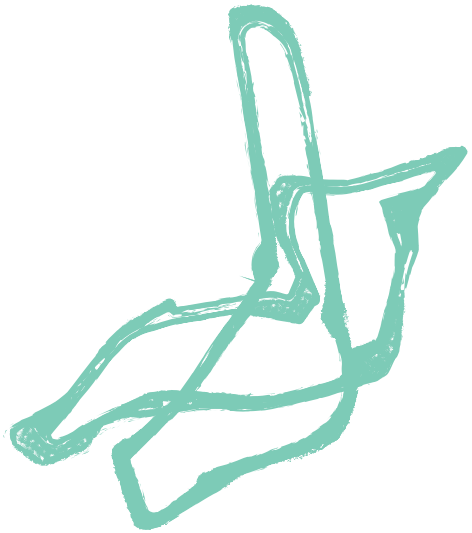


FORM FACTORS

The selected Formula1 tracks are being intersected to create connected "Race Tracks" for the scooter playground.

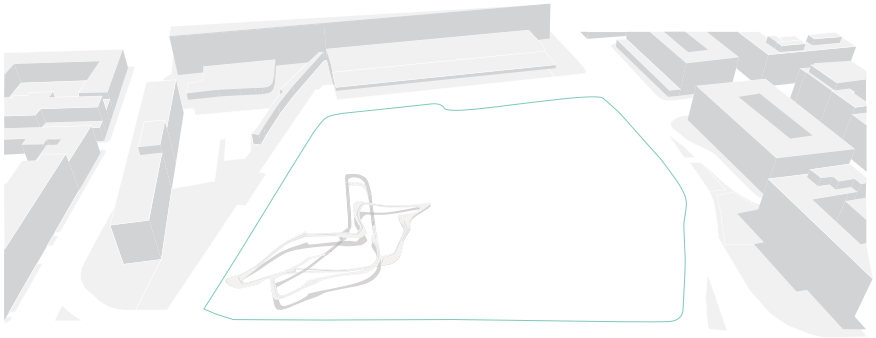
fig.044

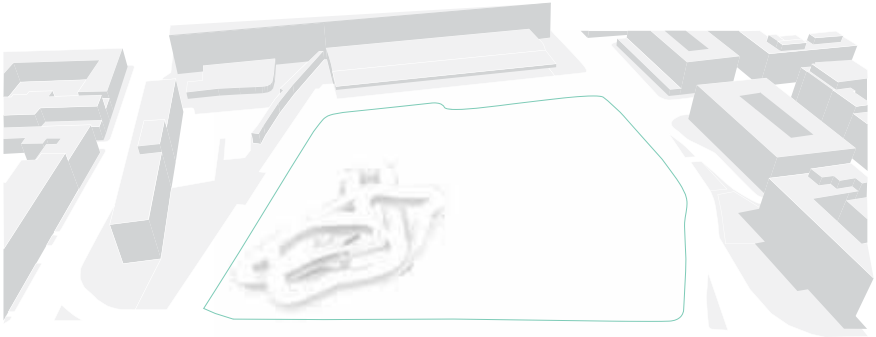
ADAPTION TO THE SITE



STEP I

The intersections of the selected Italian Formula1 tracks are being scaled to 4% of their original size and then adjusted to the building site.



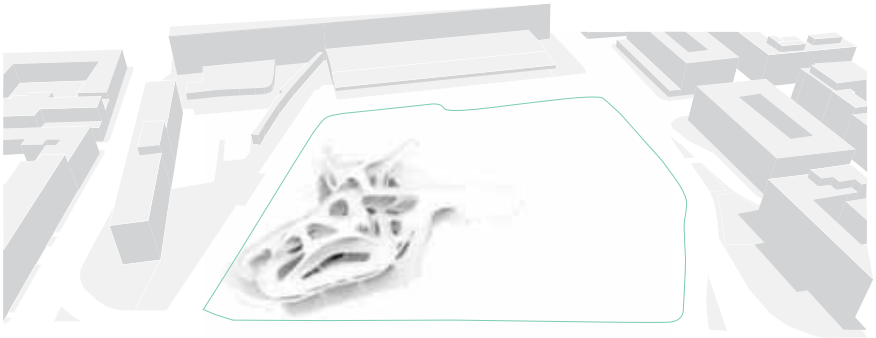


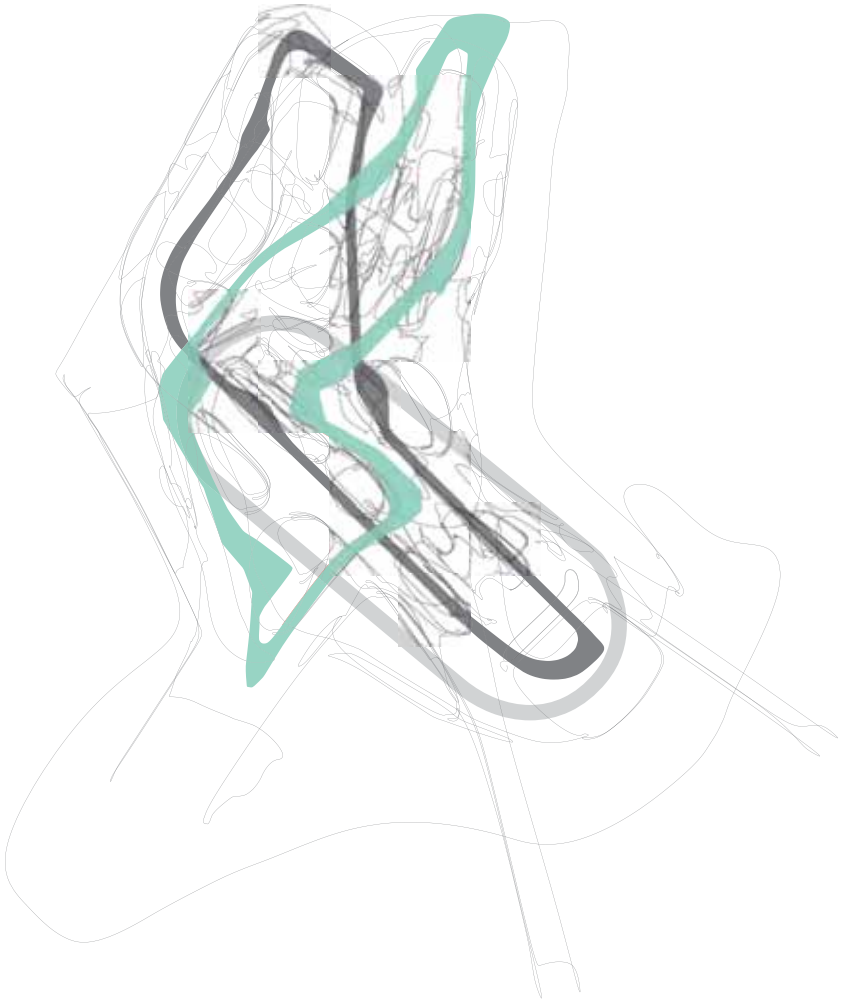
STEP II

Extending and linking the „Race Tracks" provides the required parking space for the project.

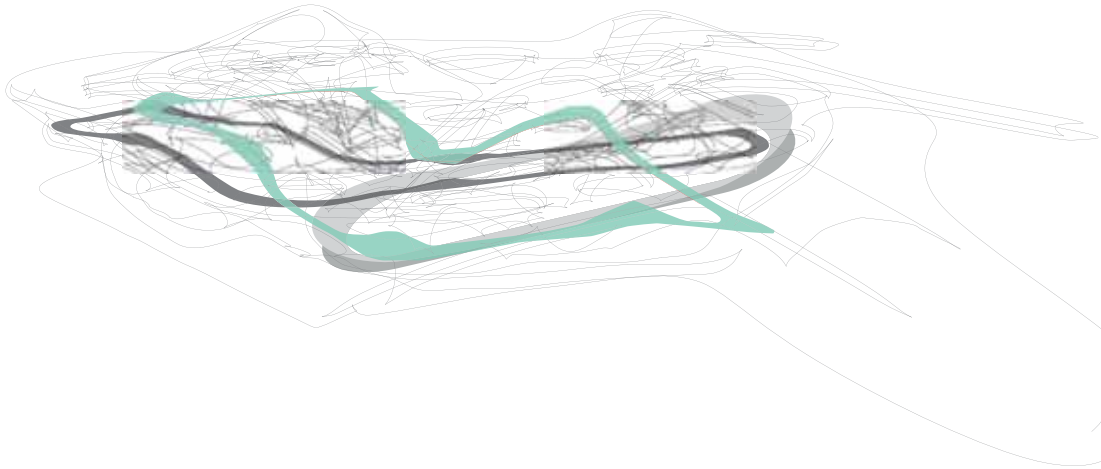
STEP III

Adding and extending spaces according to the spatial program and merging RMCP with the surrounding Piazza.





The developed building revolves around the intersected three race tracks creating the headquarter building of theRome Motorino Check Points.



MOTORINO CHECK POINT NETWORK
MUNICIPIO XV
NOMENTANO - SAN LORENZO
CONCA D'ORO
CASALOTTI
MUNICIPIO II
MUNICIPIO IV
FLAMINIO
TIBURTINA
BATTISTINI
MUNICIPIO XIII
VALLE AURELIA
VATIKAN
ROMA TERMINI
MAGLIANELLA DI SOPRA II
PRENESTINO
PIAZZALE OSTIENSE
MUNICIPIO XII
METRO
train
car
traffic jam
Rome MOTORINO CHECK POINTS
0
1
5

fig.047

V

SITE PLAN

PIAZZA DELLA REPUBBLICA
via delle terme di diocleziano
viale luigi einaudi
viale enrico de nicola
Piazza dei Cinquecento
via gaeta
via volturno
via solferino
piazza dell'indipendenza
via marsala
via magenta
via del mille
via margherita
via milazzo
via del castro pretorio
ROMA TERMINI
via del viminale
via d'azeglio
via principe amedeo
via cavour
via giovanni amendola
via giovanni giolitti
via daniele manin
via gioberti
0 10 50 100
+ 21 metri sul livello del mare / Elevation

GROUND FLOOR

RT
2ND
1ST
GF
UG

GF

I	**ENTRANCE** INFOPOINT TICKETS SECURITY GUARD ADMINISTRATION OFFICE	40m²
IIA	**SCOOTER SHOP A** BUY A SCOOTER	110m²
IIB	**SCOOTER SHOP B / CAFE** CAFE SPARE PARTS MERCHANDISE FUEL	110m²
III	**PUBLIC RESTROOMS**	30m²
iv	**EDUCATION I** THEORIE	70m²
V	**relax waiting space**	50m²
VI	**EDUCATION II** THEORIE	50m²
vii	**PUBLIC RESTROOMS**	30m²
VIII	**EDUCATION III** SCOOTER TECH	50m²
ix	**SCOOTER WORKSHOP** REPAIR SERVICE FUEL WASHING	100m²
X	**ELEVATOR I/II/III**	15m² (each)
xi	**staircases I** relax/waiting space	60m²
xii	**staircases II** relax/waiting space	60m²
Xiii	**staircases Iii** relax/waiting space	150m²
XV	**CITY BIKE STATION S**	
	GROUND FLOOR TOTAL	955m²

0 10 50

1ST FLOOR

RT
2ND
1ST
GF
UG

1ST

I	CAPSULE MOTEL "DELLA ROGGIA" SPACE for 6-12 PEOPLE	40m²
II	public restrooms relax/waiting space	50m²
III	CAFE "PARABOLICA" terrace	60m² 80m²
X	ELEVATOR I/II/III	15m² (each)
XI	STAircases I RELax/waiting space	50m²
XII	STAircases II RELax/waiting space	90m²
XIII	STAircases III relax/waiting space	70m²
	1ST FLOOR TOTAL	405m²

2ND FLOOR

RT
2ND
1ST
GF
UG

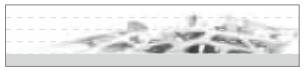
2ND

I	BAR/RESTAURANT	120m²
	"FORMULA ONE" terrace	120m²
X	ELEVATOR I/II/III	15m² (each)
XI	staircases I relax/waiting space	90m²
XII	staircases II RELax/waiting space	120m²
XIII	STAircases III RELax/waiting space	70m²
	2ND FLOOR TOTAL	445m²

ROOFTOP

UNDERGROUND

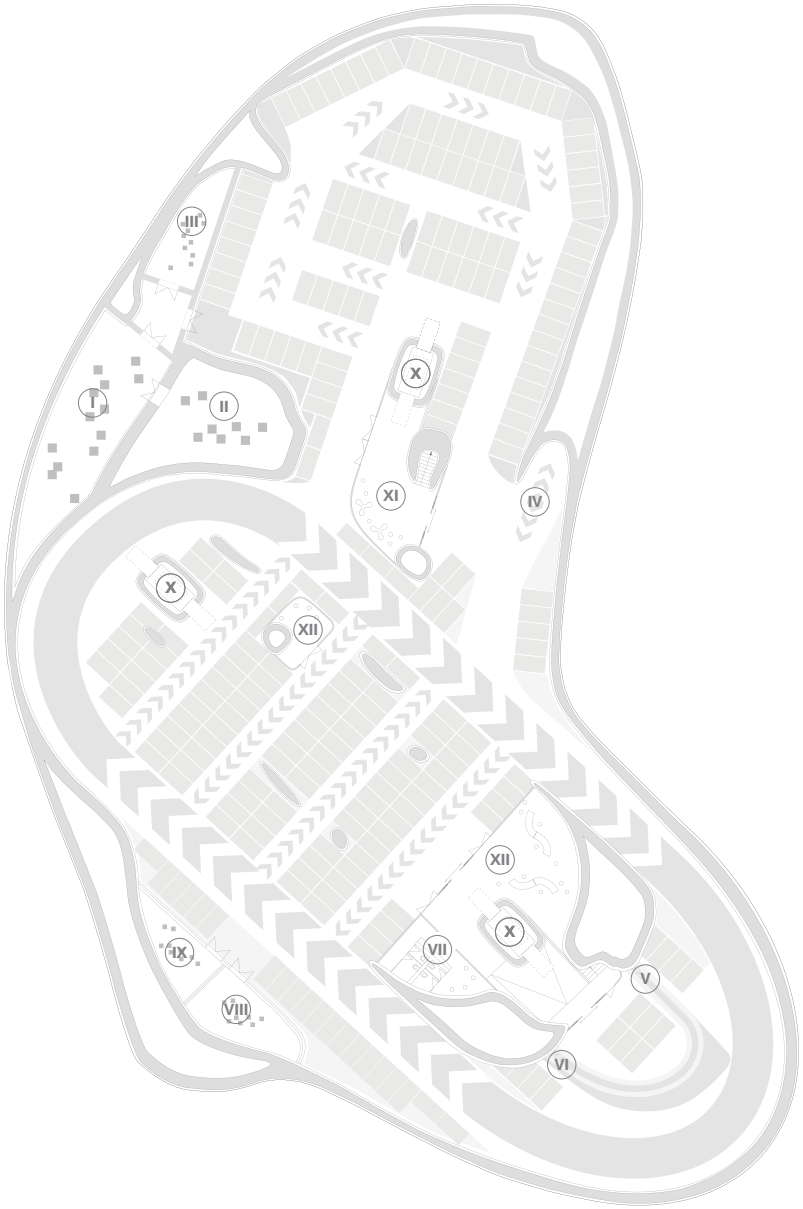
RT
2ND
1ST
GF
UG



UG

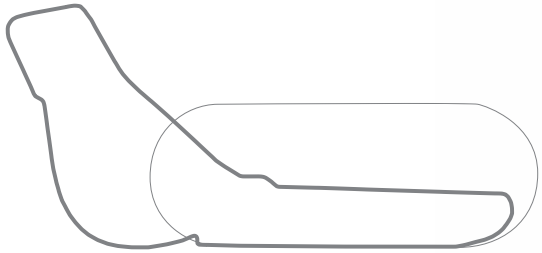
I	**STORAGE SPACE** SPARE PARTS MERCHANDISE	180m²
II	**BUILDING SERVICES**	100m²
III	**STORAGE SPACE** CAFE RESTAURANT	70m²
IV	**CONNECTION RAMP** EXIT	
V	**CONNECTION RAMP** INCOMMING MONZA	
VI	**CONNECTION RAMP** OUTGOING MONZA	
VII	**PUBLIC RESTROOMS**	30m²
VIII	**STAFF I** OFFICE LOCKERS BREAKROOM	70m²
IX	**STAFF II** STAFF RESTROOMS SHOWER	50m²
X	**ELEVATOR I/II/III**	15m² (each)
XI	**staircases I** relax/waiting space	70m²
XII	**staircases II** relax/waiting space	20m²
XIII	**staircases III** relax/waiting space	130m²
	UNDERGROUND FLOOR TOTAL	765m²
	UNDERGROUND FLOOR **PARKING DENSITY I** PARKING DENSITY II PARKING DENSITY III	**250P** 500P 750P

0 10 50



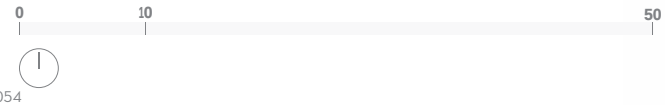
MONZA TRACK

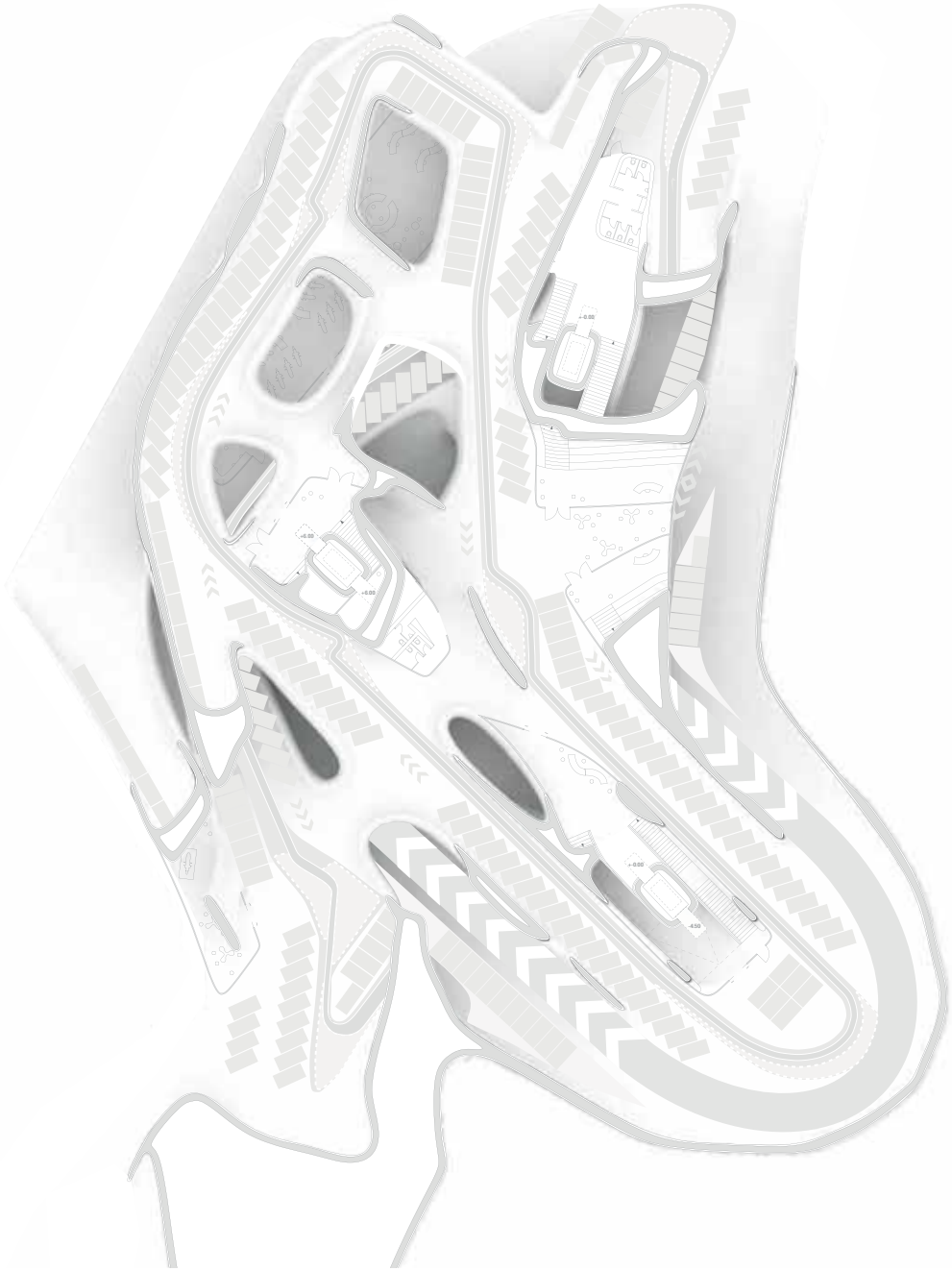
RT
2ND
1ST
GF
UG



MONZA
Autodromo Nazionale Monza

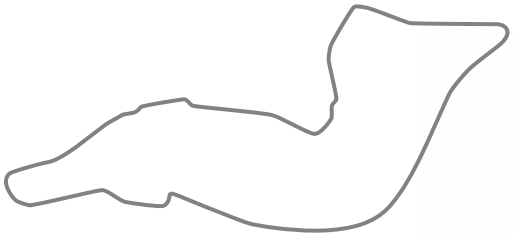
Scaling factor: 4%
Resulting length: 231m





IMOLA TRACK

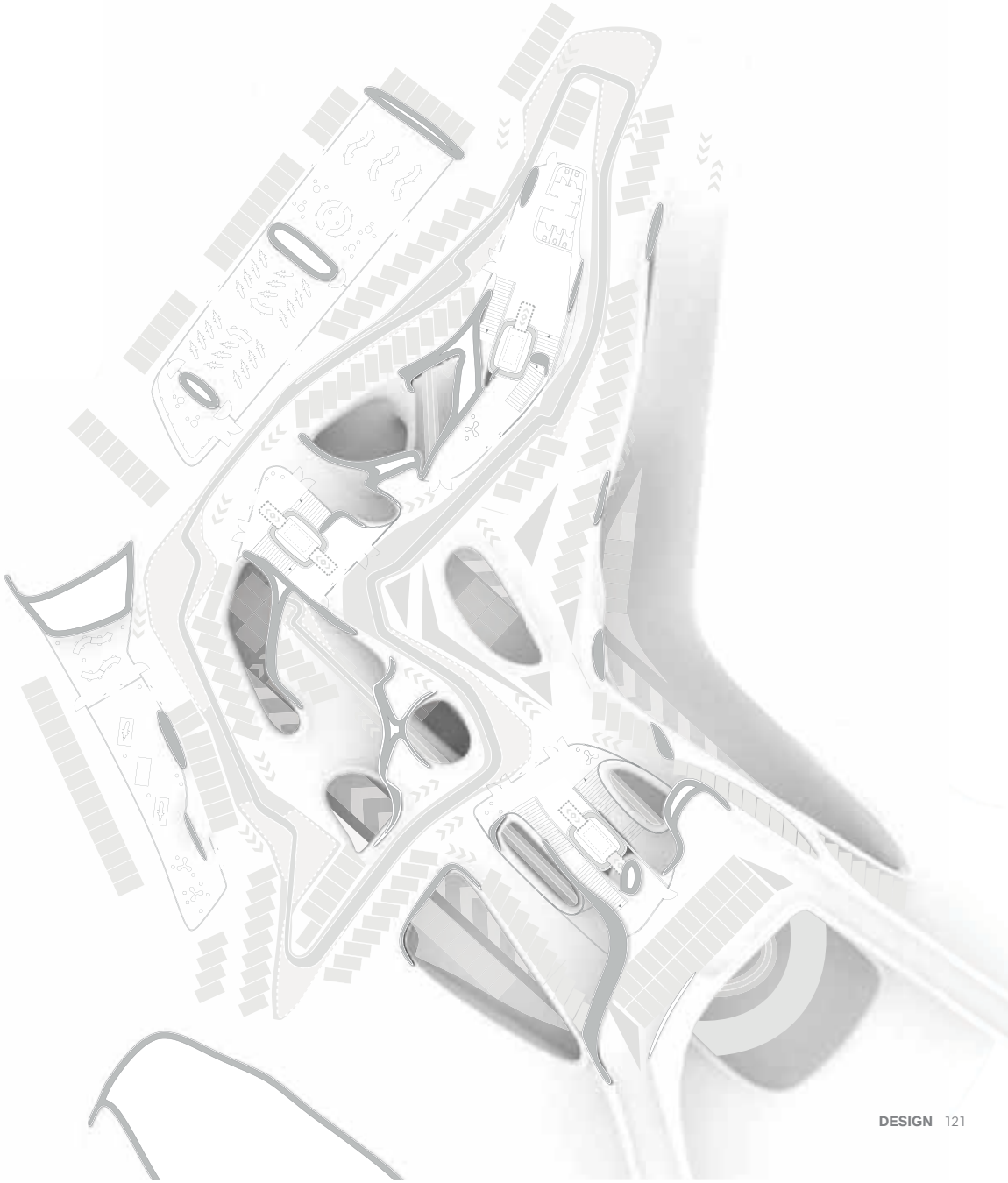
RT
2ND
1ST
GF
UG



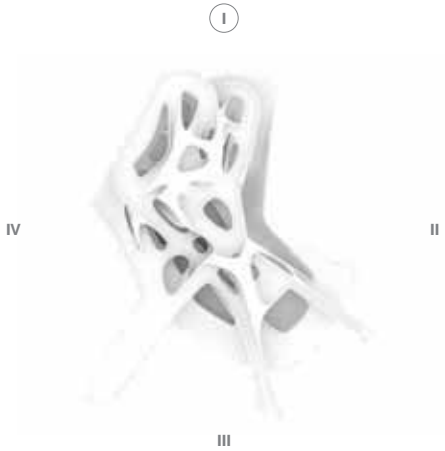
IMOLA
Autodromo Internazionale Enzo e Dino Ferrari

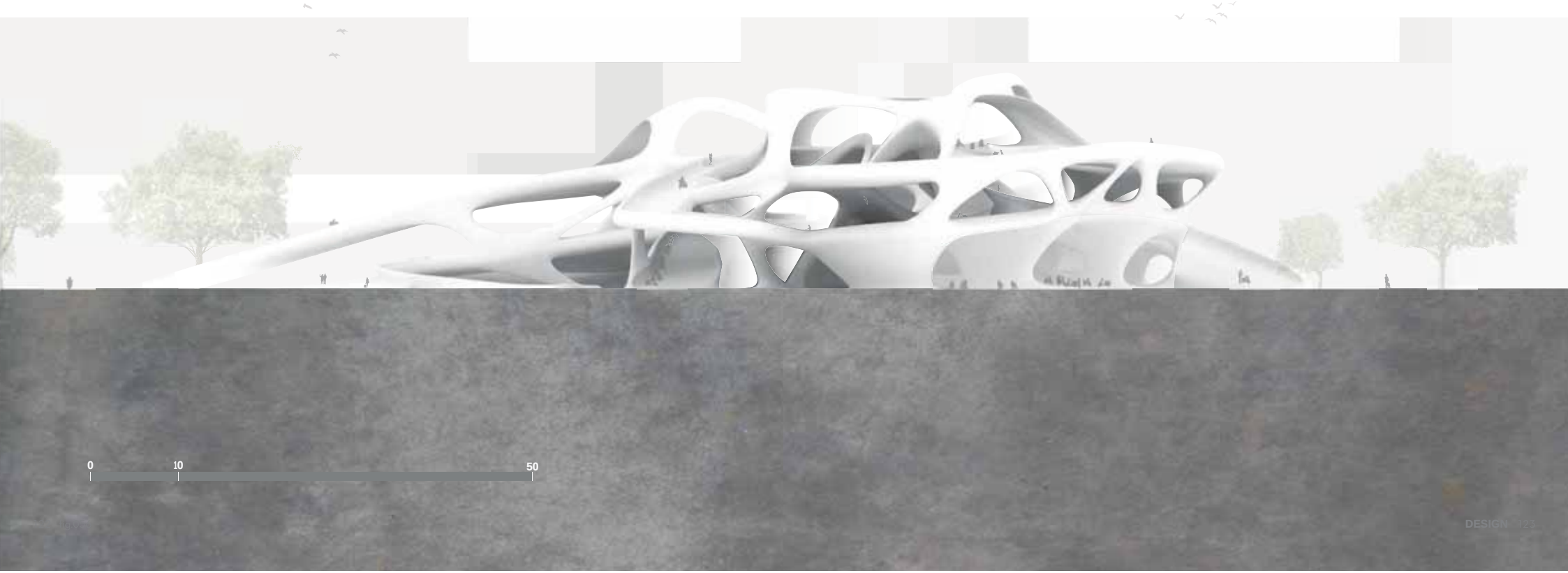
Scaling factor: 4%
Resulting length: 197m

0 10 50

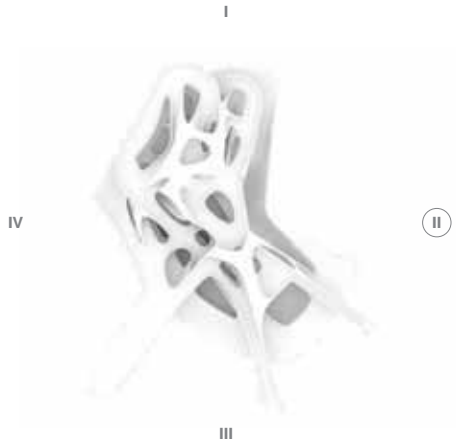


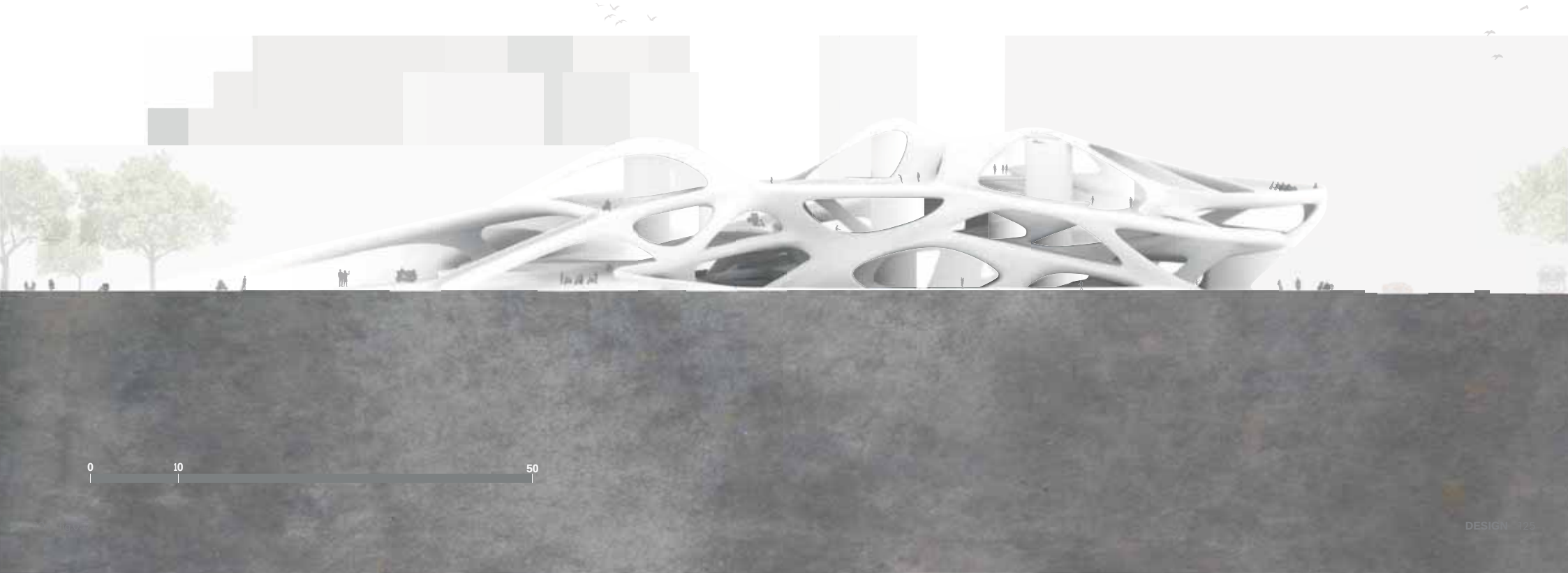
ELEVATION I
NORTH



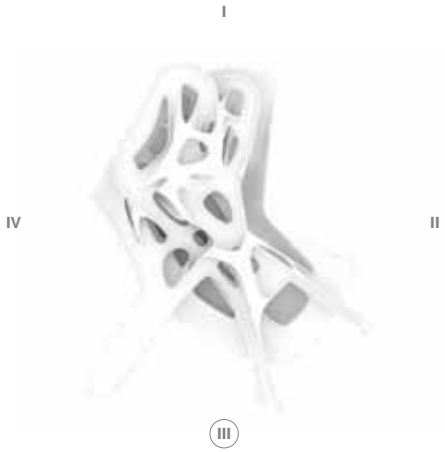


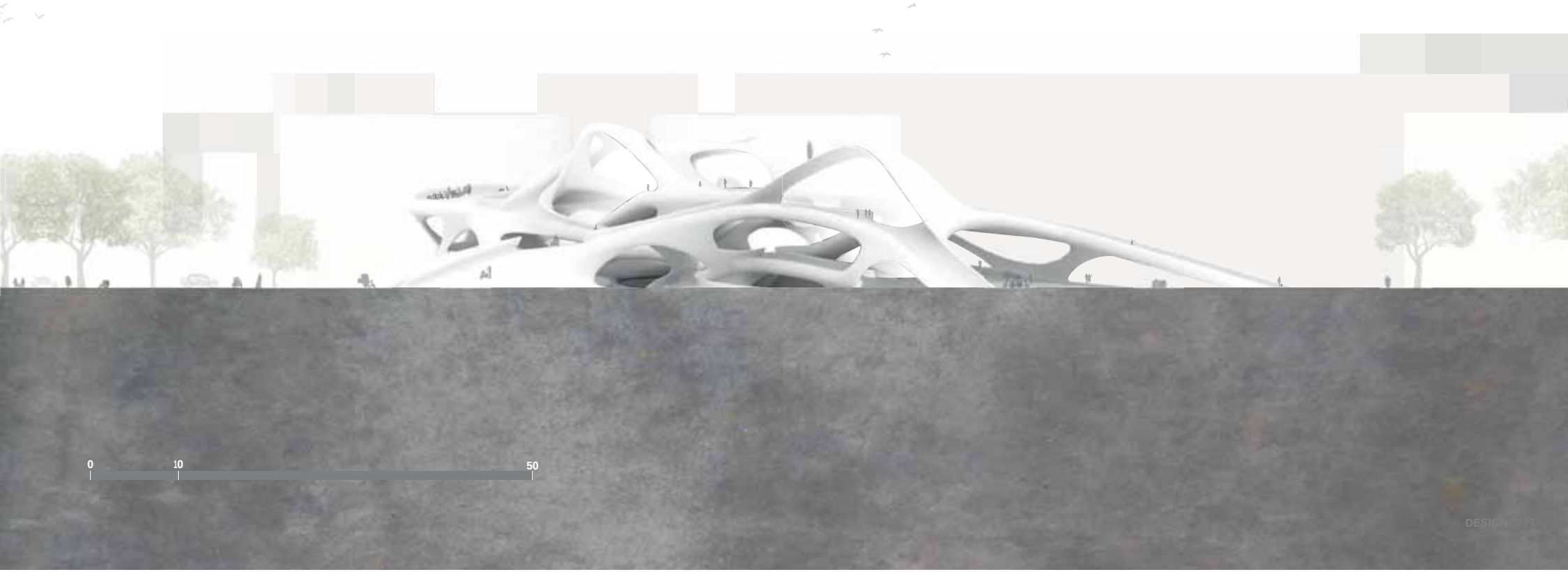
ELEVATION II
WEST



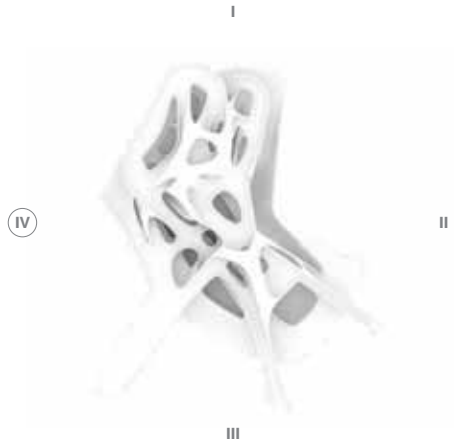


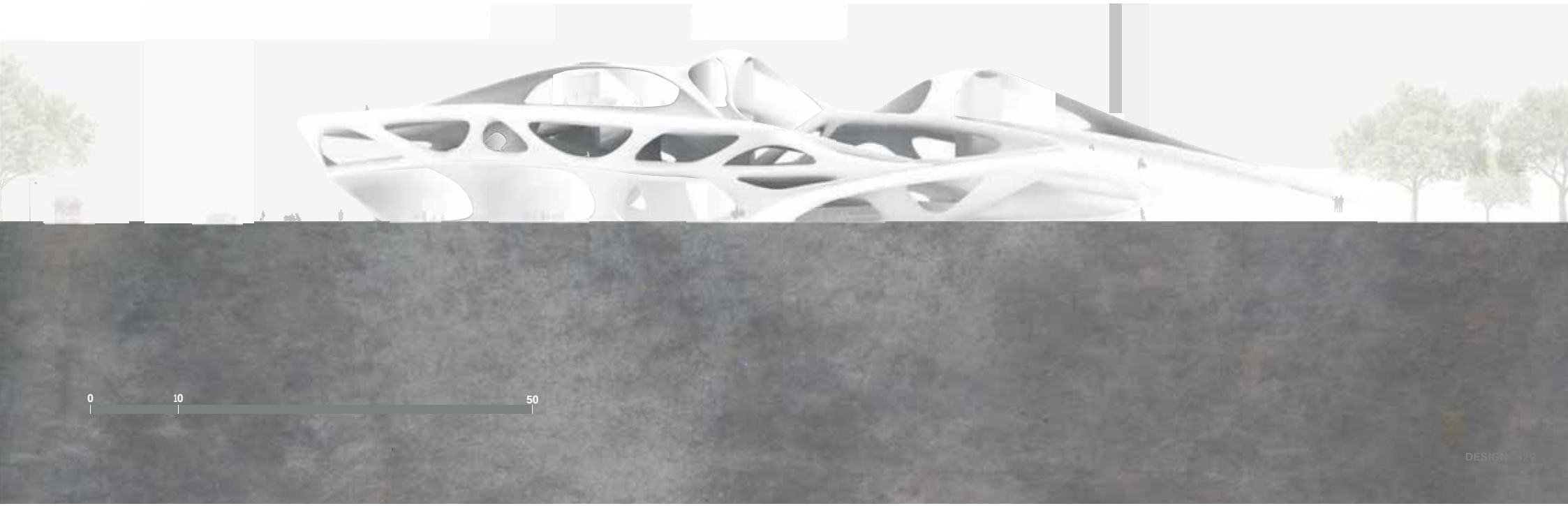
ELEVATION III
SOUTH



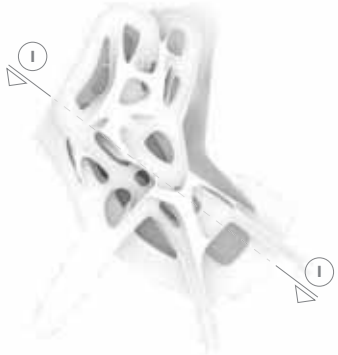


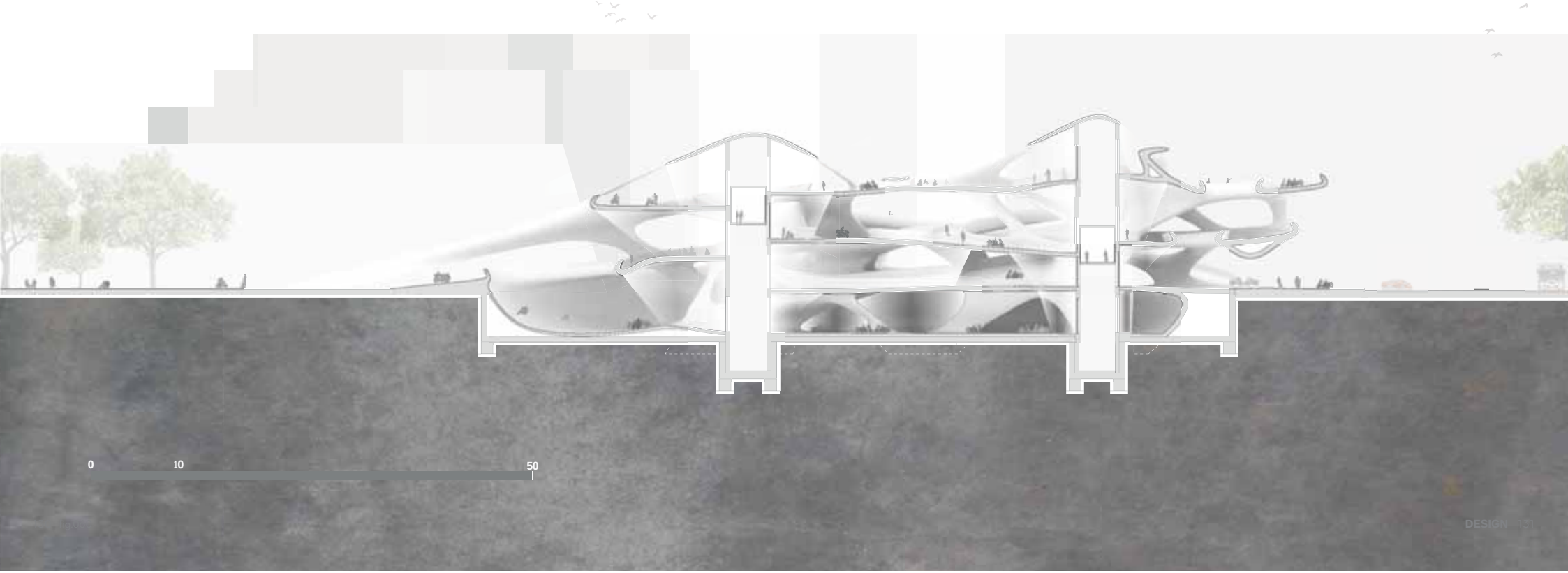
ELEVATION IV
EAST





CROSS SECTION I-I





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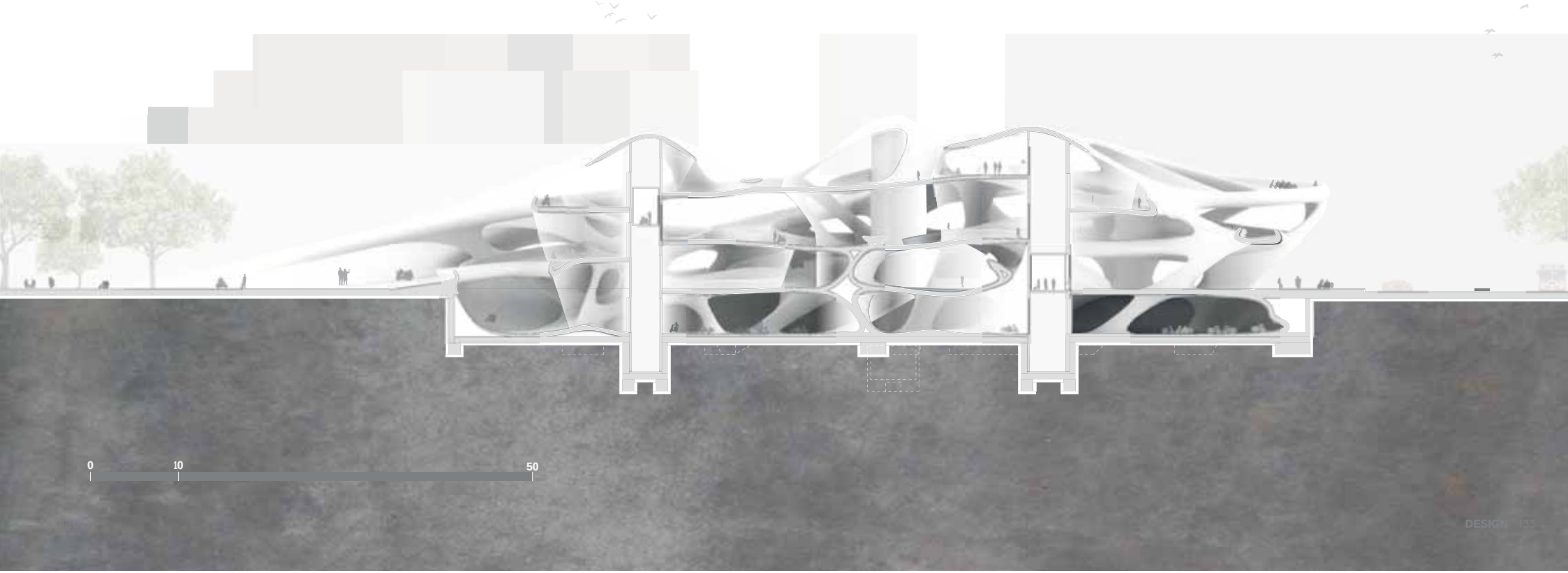

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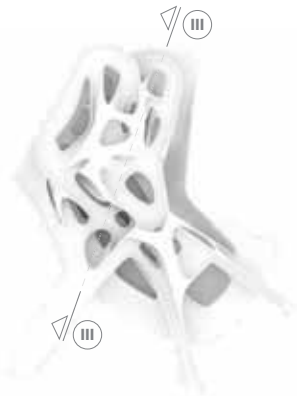
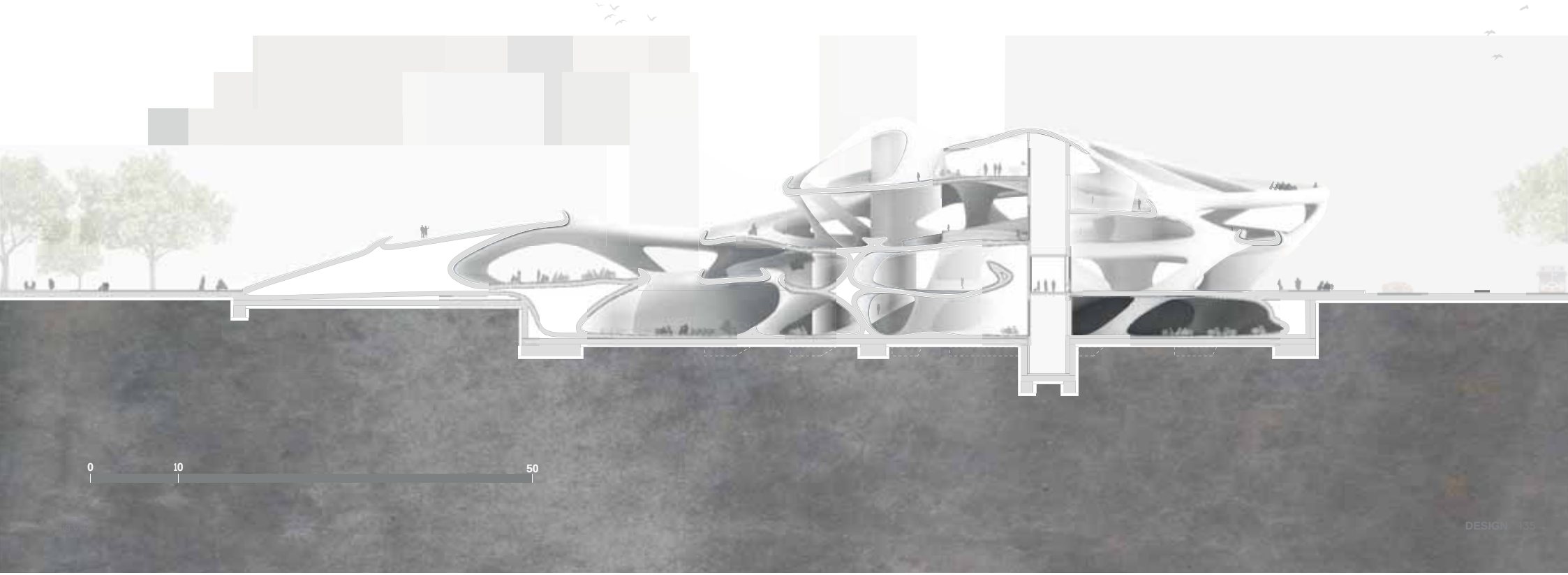




VI

GREENPLAN

138 fig.063

GREENPLAN PIAZZA DEI CINQUECENTO

0 10 50 100

i
Arbutus unedo
strawberry tree
westlicher erdbeerbaum

ii
CERATONIA SILIQUA
CAROB TREE
JOHANNISBROTbaum

iii
CITRUS
CITRUS
ZITRUSPFLANZEN

iv
ERICA ARBOREA
TREE HEATH
BAUMHEIDE

v
JUNIPERUS COMMUNIS
COMMON JUNIPER
GEMEINER WACHOLDER

vi
LAURUS NOBILIS
bay LAUREL : SWEET BAY / BAY TREE
ECHTE LORBEER

vii
Myrtus communis
Myrtus
MYRTE

viii
Olea europaea
olive
Olivenbaum

ix
Pinus pinaster
maritime pine or cluster pine
SEE-KIEFER

x
Quercus ilex
evergreen- HOLM- HOLLY-oak
Stein-eiche

xi
Quercus suber
cork oak
korkeiche

xii
Salvia
salvia
salbei

GREENPLAN ROOFTOP

(i)
Trifolium michelianum
extinction risk: lower
Frequency: extremely rare
Habitat: wetlands

(ii)
Eryngium barrelieri
extinction risk: vulnerable
Frequency: very rare
Habitat: wetlands

(iii)
Cardamine parviflora
extinction risk: vulnerable
Frequency: very rare
Habitat: wetlands

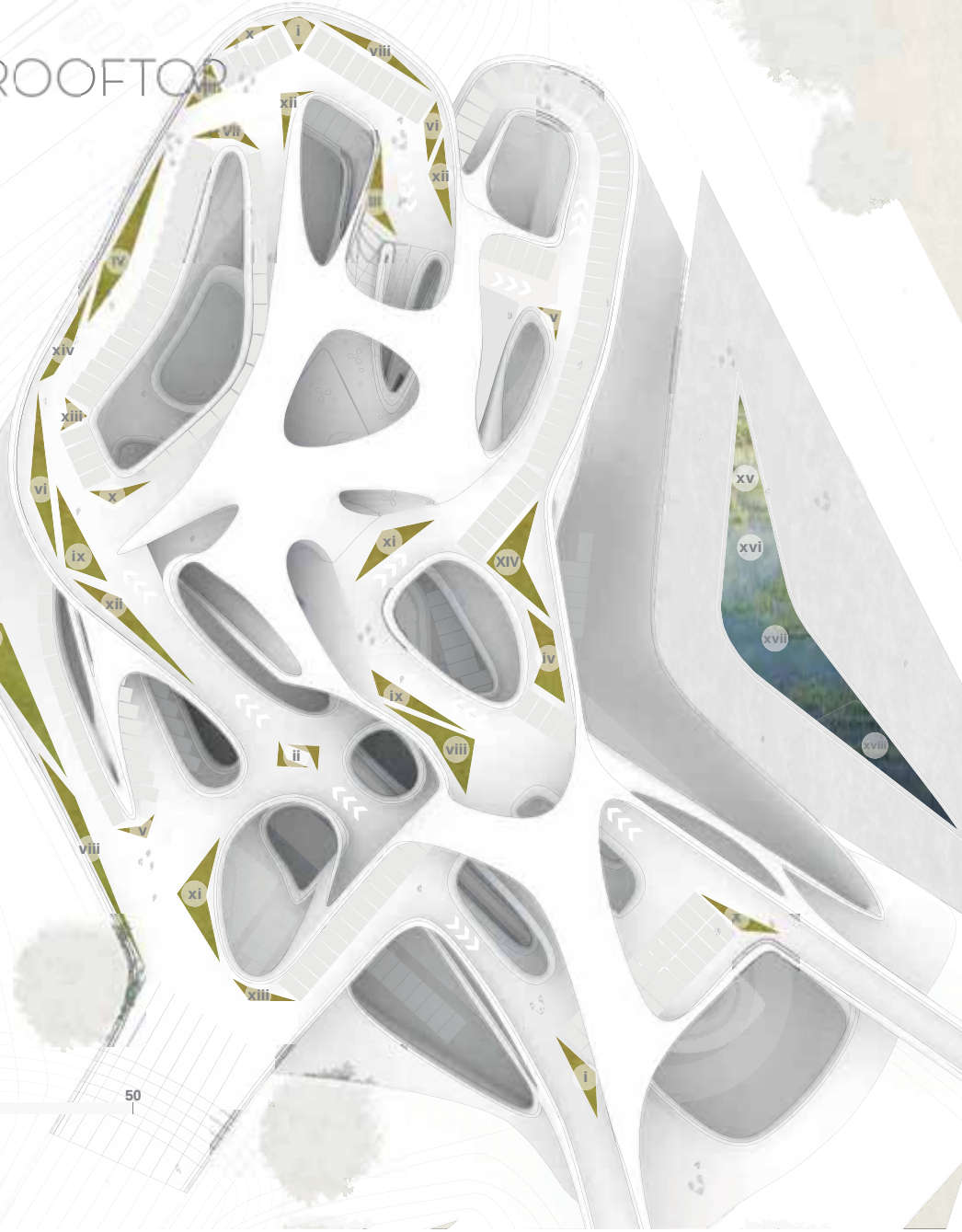
(iv)
Simethis mattiazzi
extinction risk: Endangered
Frequency: very Rare
Habitat: Mediterranean maquis

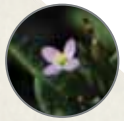
(v)
Asparagus aphyllus
extinction risk: UNKNOWN
Frequency: extremely rare
Habitat: Mediterranean maquis

(vi)
CORONILLA JUNCEA
EXTINCTION RISK: VULNERABLE
FREQUENCY: EXTREMELY RARE
HABITAT: MEDITERRANEAN MAQUIS

(vii)
EUPHORBIA CORALLIOIDES
EXTINCTION RISK: UNKNOWN
FREQUENCY: uncommon
HABITAT: MEDITERRANEAN MAQUIS

(viii)
LINIUM MARITIMUM
EXTINCTION RISK: LOWER RISK
FREQUENCY: VERY RARE
HABITAT: SAND DUNES AND BACKDUNES





(ix)
Exaculum pusillum
extinction risk: vulnerable
Frequency: very rare
Habitat: wetlands

(x)
Micromeria microphylla
extinction risk: vulnerable
Frequency: extremely rare
Habitat: walls and mosaics

(xi)
Romulea rollii
extinction risk: endangered
Frequency: rare
Habitat: sand dunes and backdunes

(xii)
Daphne sericea
extinction risk: unknown
Frequency: rare
Habitat: Mediterranean maquis

(xiii)
Tamarix dalmatica
extinction risk: unknown
Frequency: very rare
Habitat: wetlands

(xiv)
Antinoria insularis
extinction risk: unknown
Frequency: extremely rare
Habitat: wetlands

(xv)
Myriophyllum alternifolium
extinction risk: lower risk
Frequency: extremely rare
Habitat: wetlands

(xvi)
Damasonium alisma
extinction risk: lower risk
Frequency: rare
Habitat: wetlands

(xvii)
Apium INUNDATUM
extinction risk: UNKNOWN
Frequency: VERY RARE
Habitat: wetlands

(xviii)
Potamogeton polygonifolius
extinction risk: lower risk
Frequency: very rare
Habitat: wetlands

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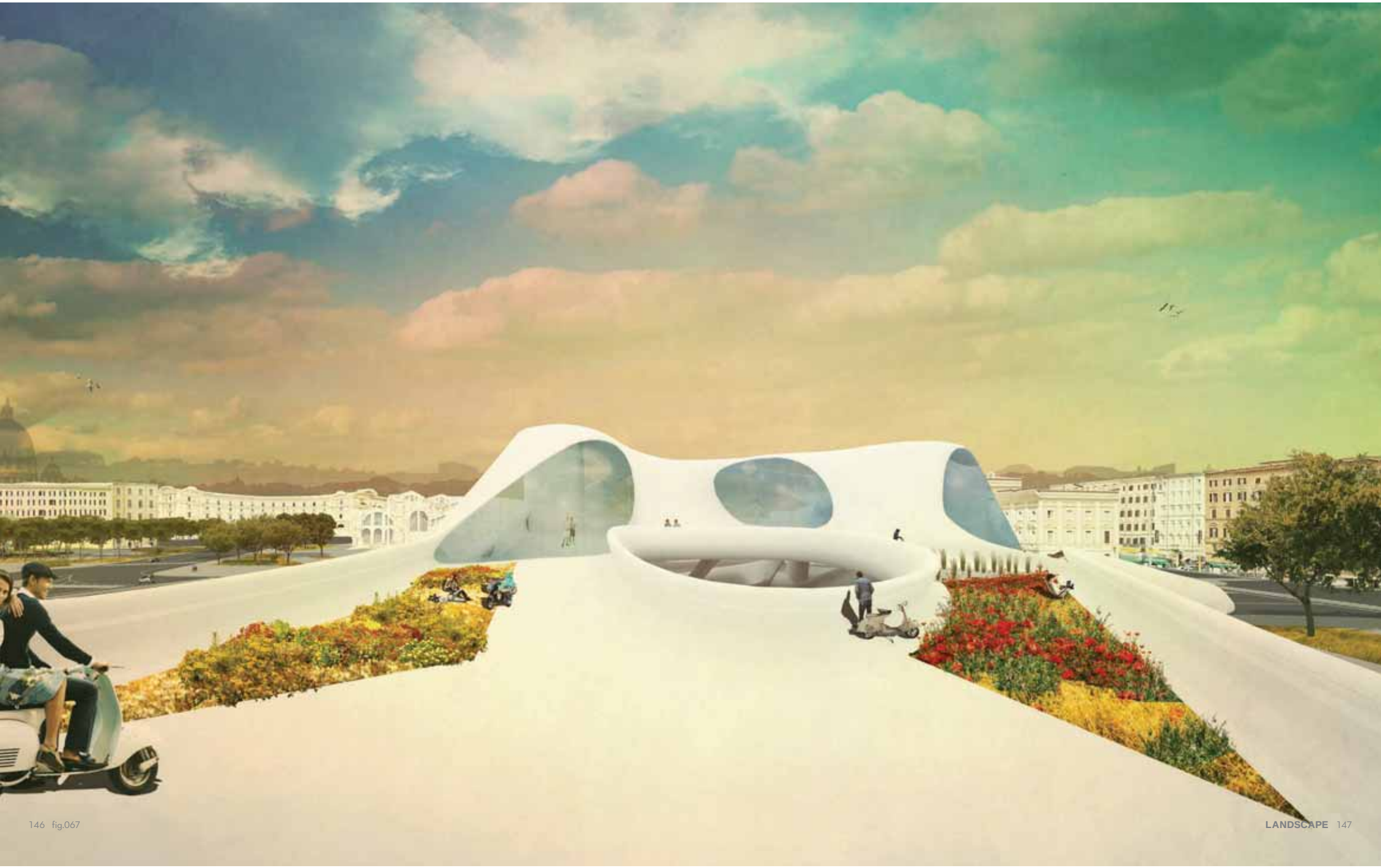

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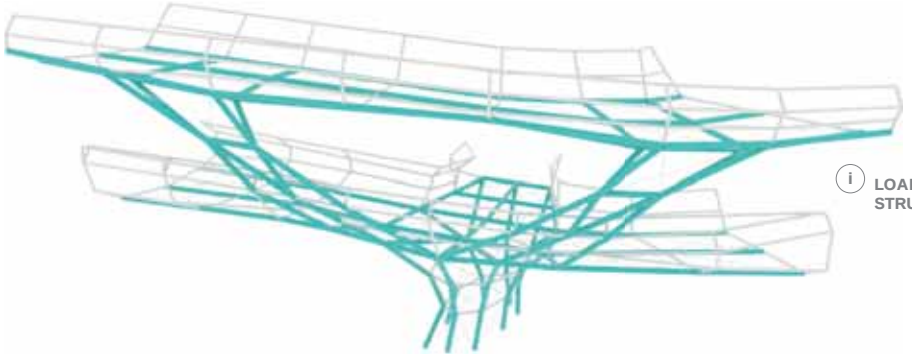
STRUCTURE MODEL

(i) FAÇADE

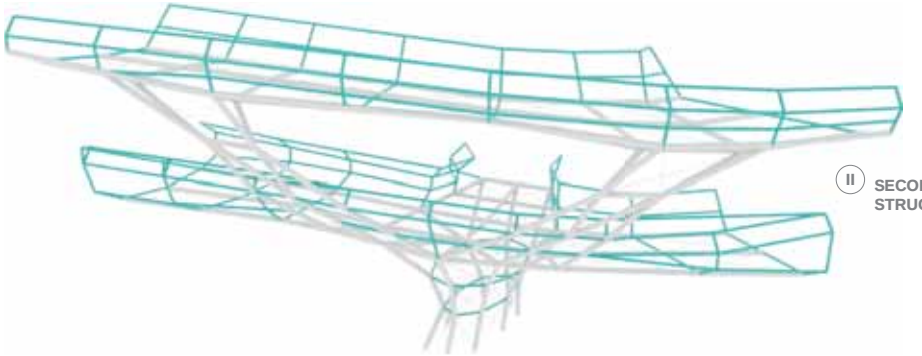
(II) LOAD-BEARING STRUCTURE

(iii) UNDERGROUND STRUCTURE

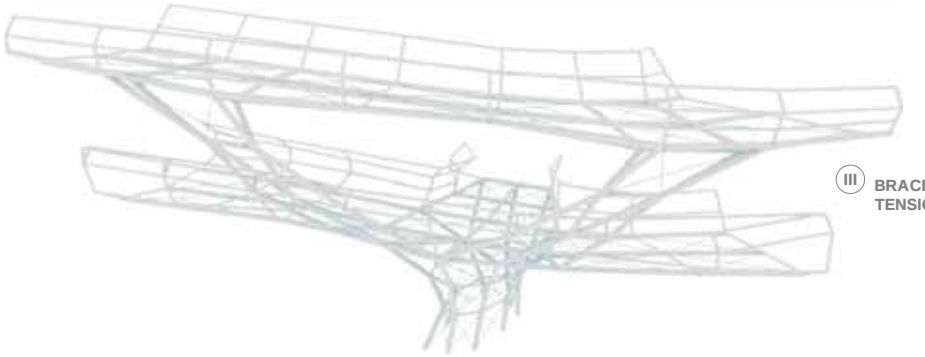
STRUCTURAL SYSTEM



i LOAD-BEARING STRUCTURE



II SECONARY STRUCTURE



III BRACING & TENSION ROPES

fig.070
fig.071
fig.072

STRUCTURAL DETAILS

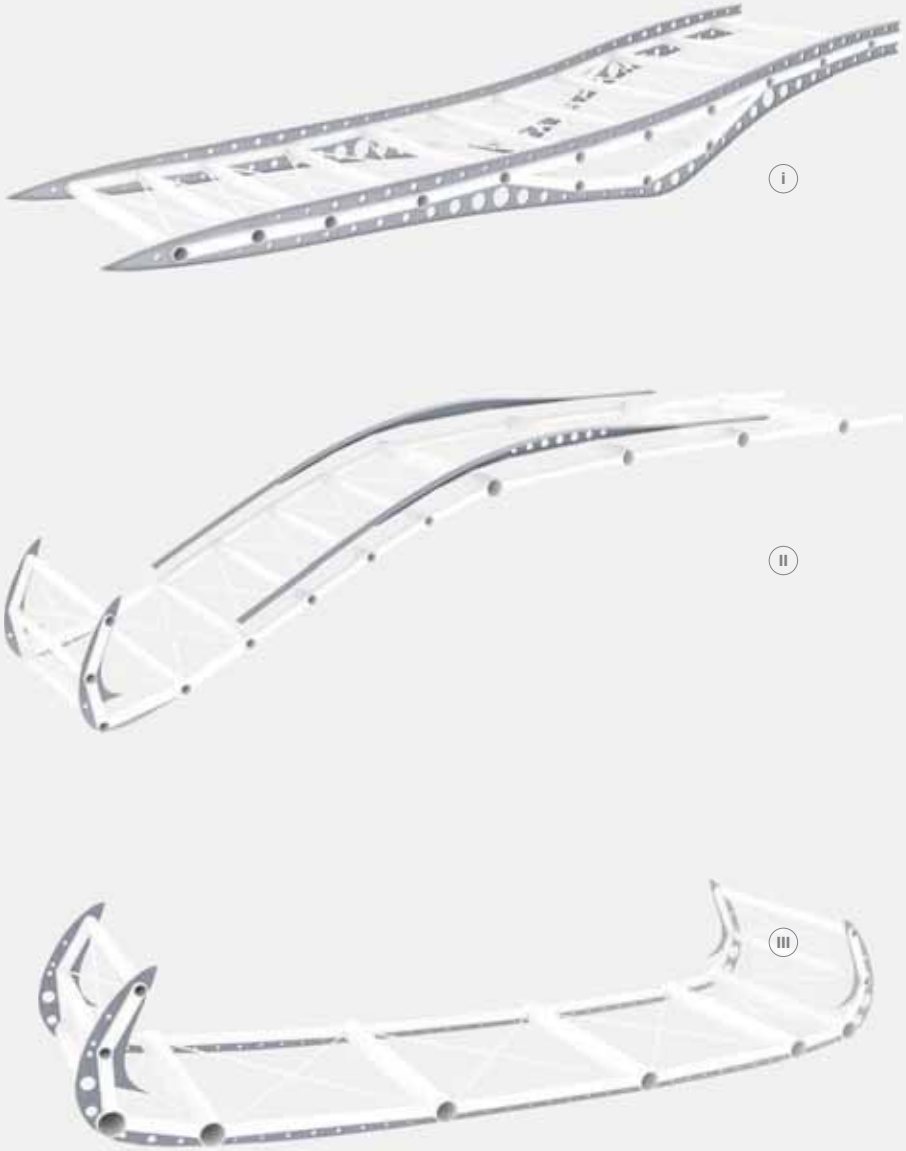


fig.074
fig.075
fig.076

VIII

DETAILS I TO VI

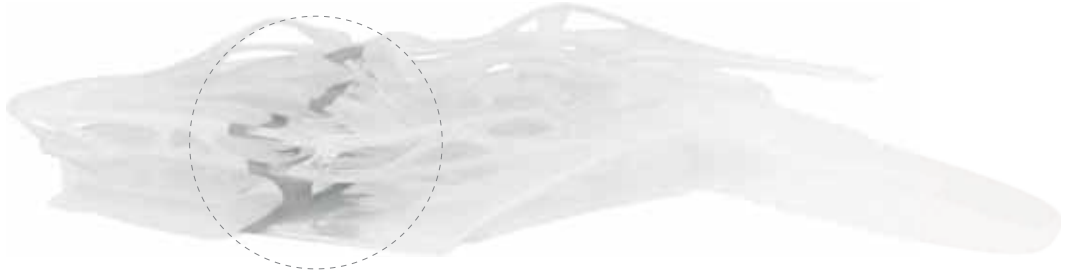


fig.077

fig.078

DETAIL I & II

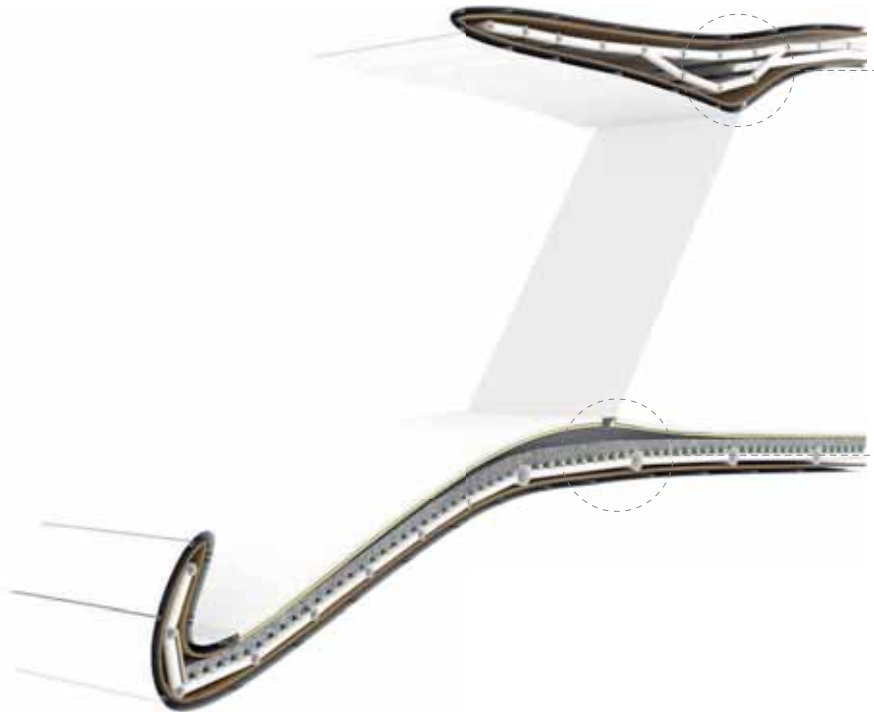


fig.081

fig.080

i	facade panel	ix	metal sheet
ii	subconstruction (ventilated)	x	insulation
iii	waterproofing	xi	reinforced concrete
iv	oriented strand board	xii	screed
v	supporting frame (insulated if needed)	xiii	mastic asphalt screed
vi	extruded aluminium glazing bar	xiv	aluminium gutter
vii	double glazed unit	xv	cover panel (water permeable)
viii	pressure plate and capping		

DETAIL III & IV

i	facade panel	viii	reinforced concrete
ii	subconstruction (ventilated)	ix	l-metal sheet
iii	waterproofing	x	screed
iv	oriented strand board	xi	mastic asphalt screed
v	load bearing steel hollow profile (insulated if needed)	xiii	aluminium gutter
vi	composite panel (with insulation)	xii	cover panel (water permeable)
vii	insulation (subconstruction if needed)	XIII	LED-STRIP (with subconstruction)

fig.083

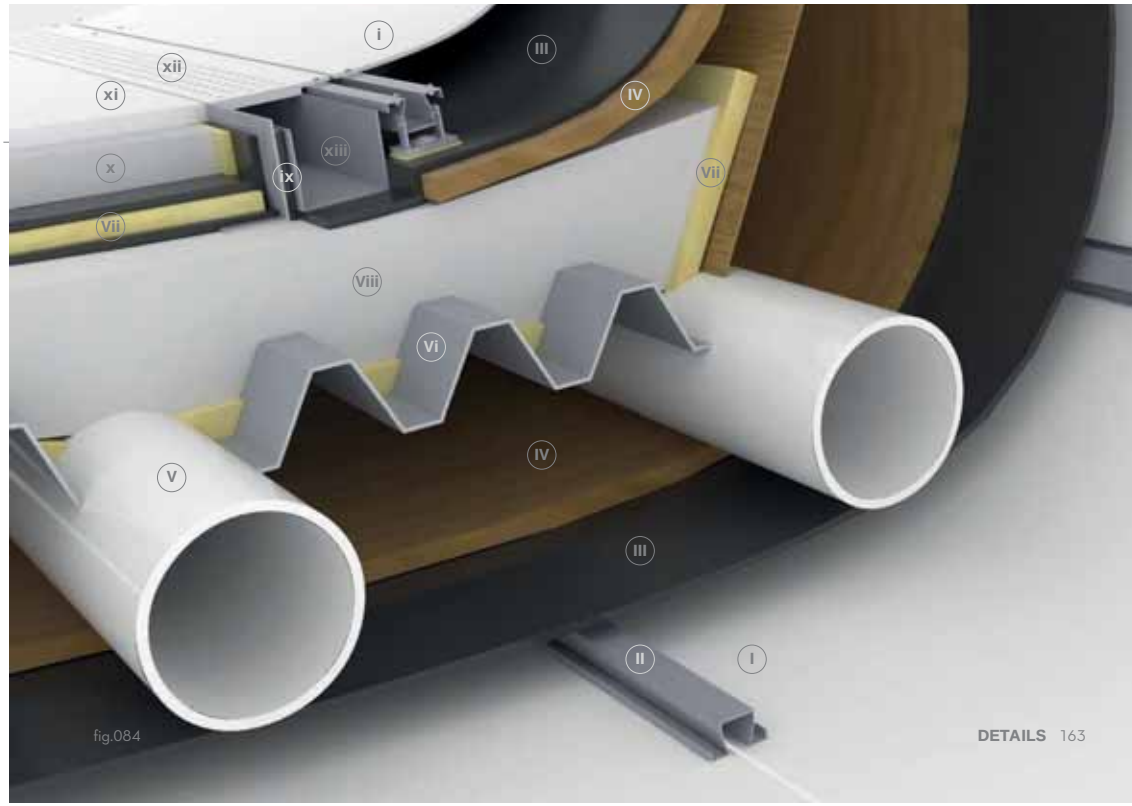


fig.084

DETAIL V & VI

i	facade panel	viii	reinforced concrete
ii	subconstruction (ventilated)	ix	l-metal sheet
iii	waterproofing	x	screed
iv	oriented strand board	xi	mastic asphalt screed
v	load bearing steel hollow profile (insulated if needed)	xii	SUPPORTING FRAME
vi	SEALING STRIP		
vii	insulation (subconstruction if needed)		

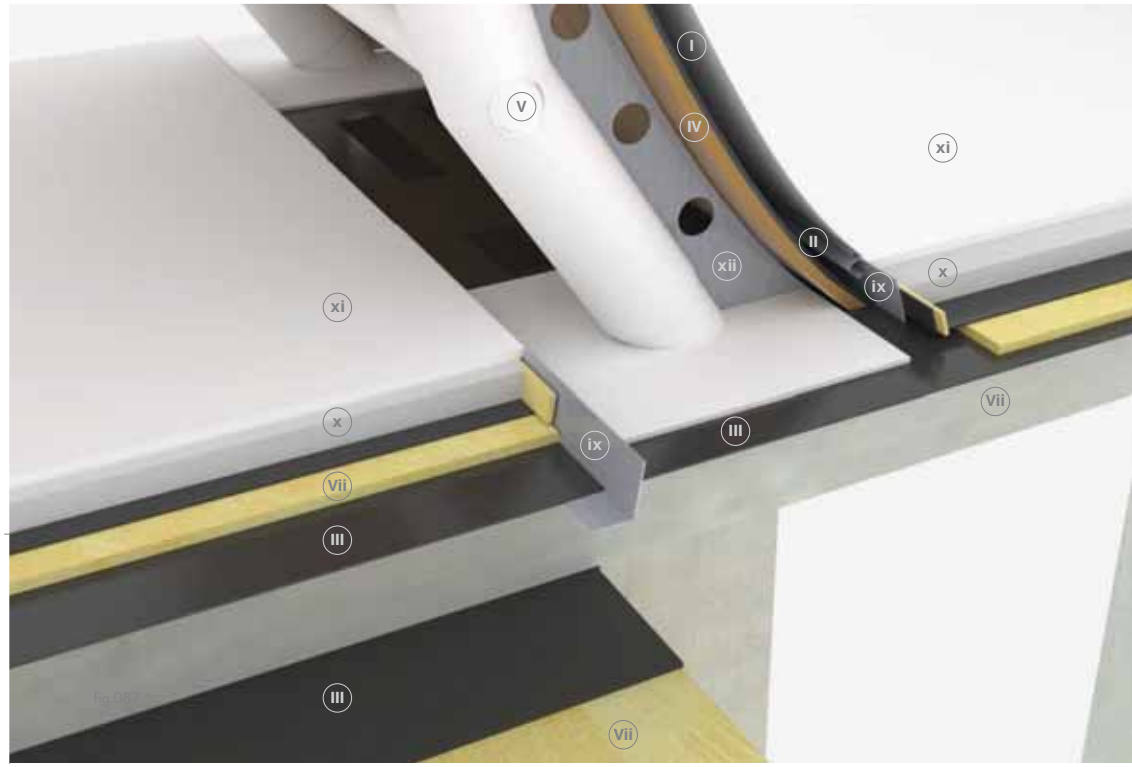


fig.087

fig.086

IX

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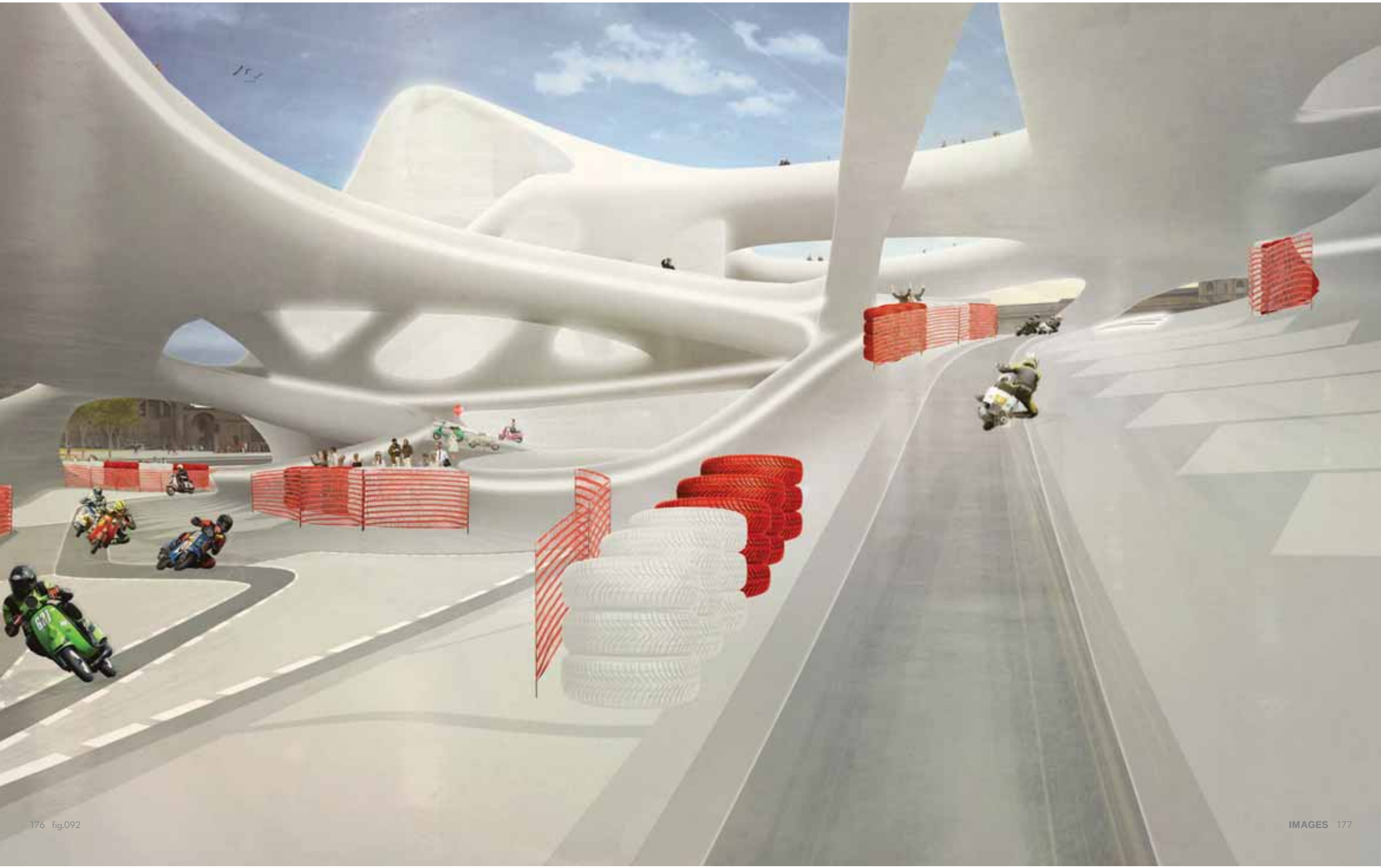

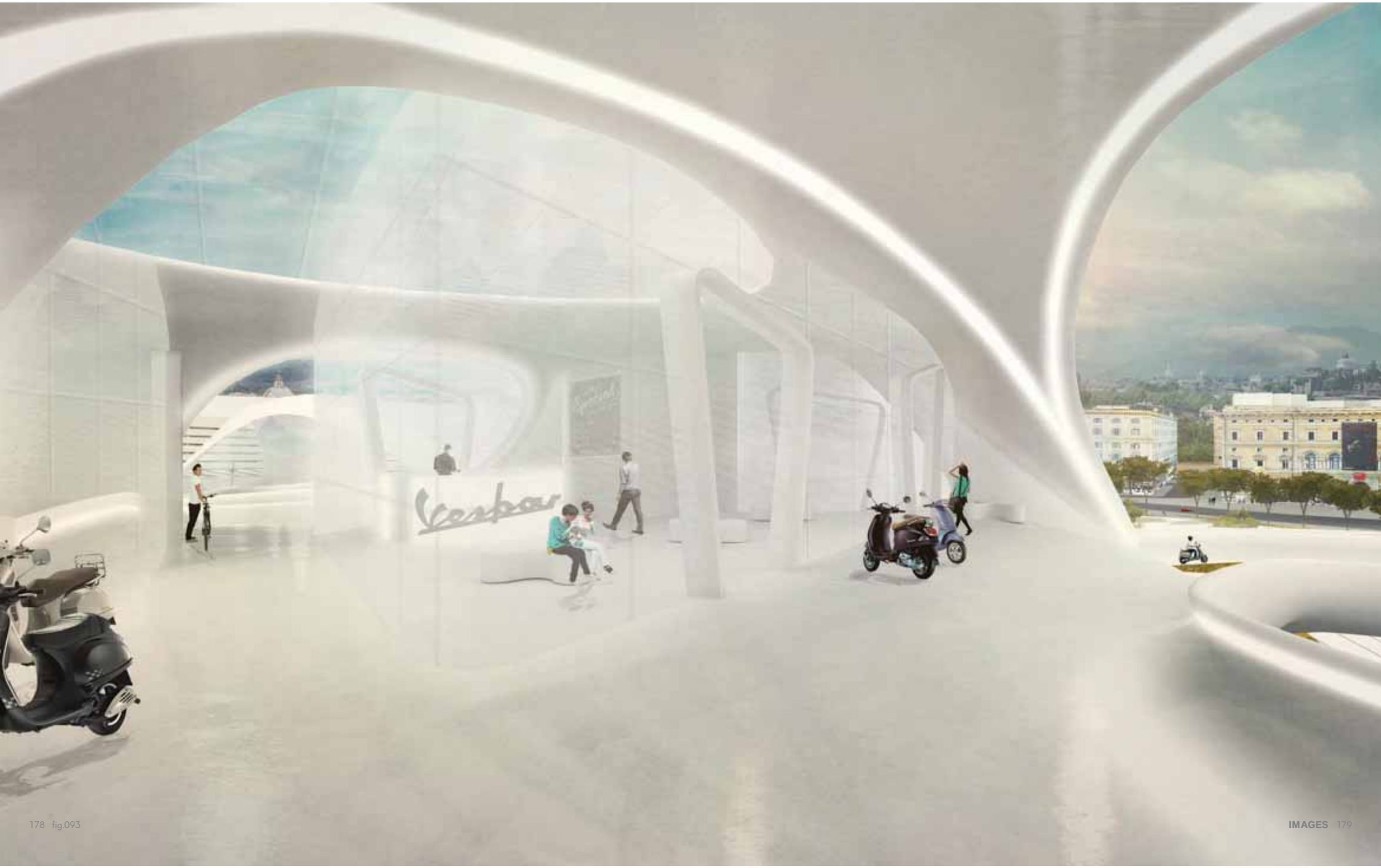
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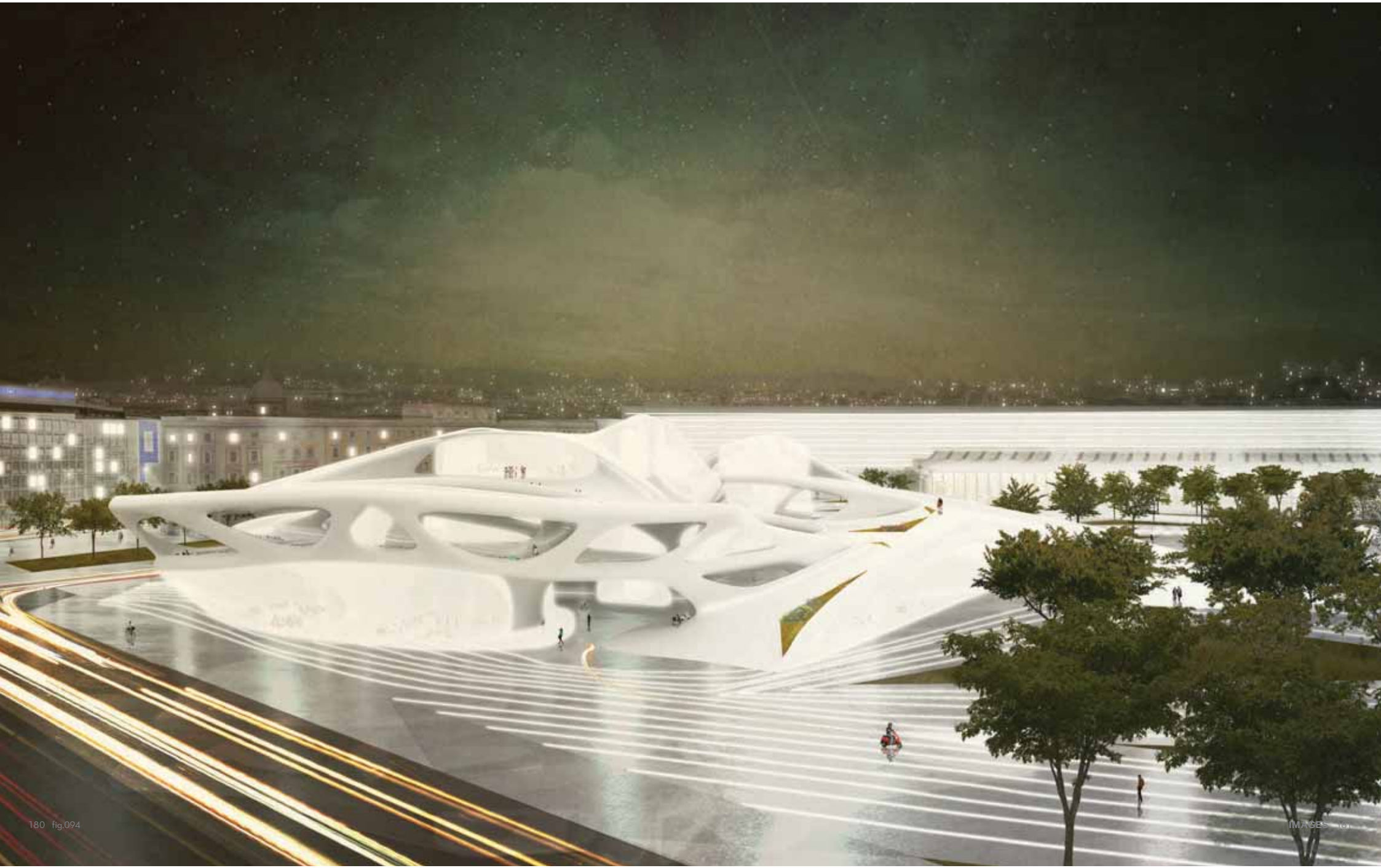

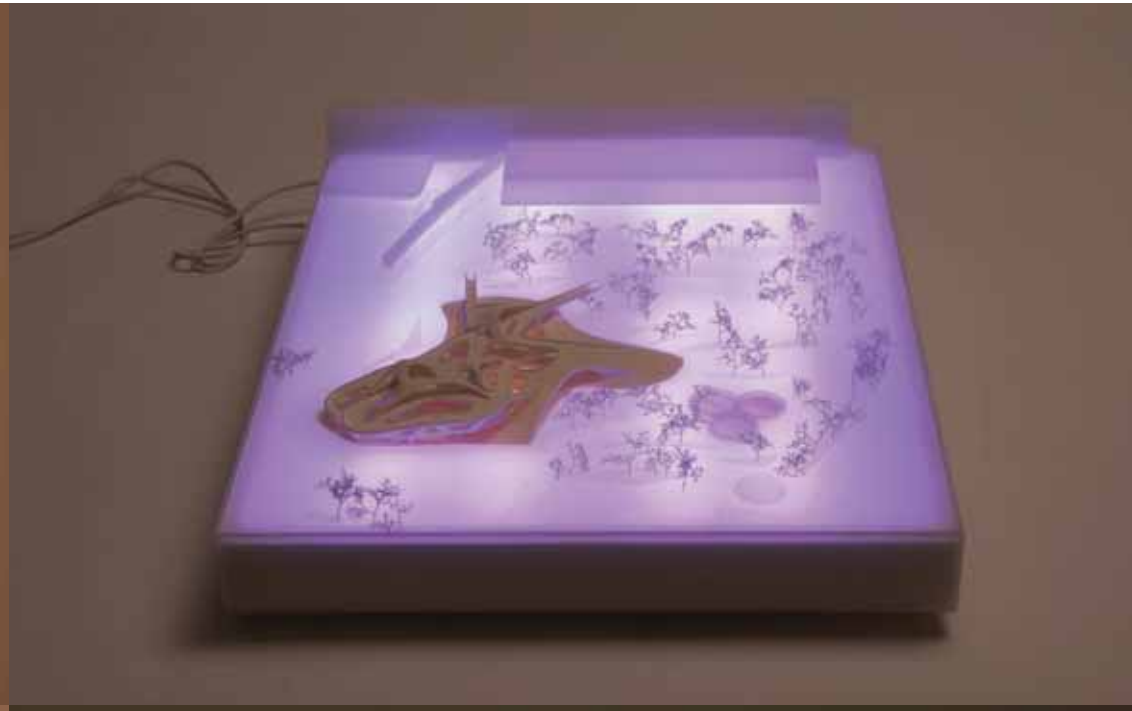

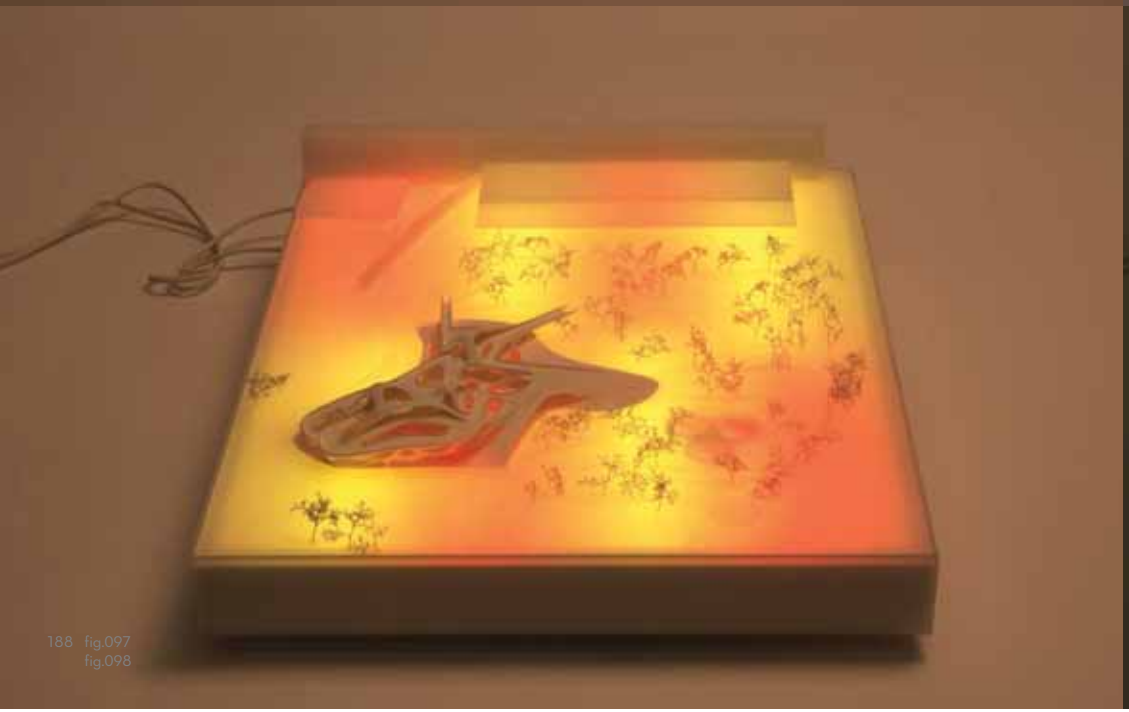

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fig.098

fig.099
fig.100

fig.102

fig.103

XI

thank you to:

Ao.Univ.Prof. Arch. Dipl.-Ing. Dr.techn. Manfred Berthold

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CV

Clemens Pöchacker
+43 680 20 04 907
clemens.studio@gmx.at
Wurmbrandgasse 15/2
1220 Wien

2002	Higher school certificate CAMILLO SITTE LEHRANSTALT Höhere Technische Bundeslehr- und Versuchsanstalt Wien III
2002	Basic military service
2003	Vienna University of Technology: architecture
	Among other things: - architecture- model object- photography and video - basic principles of plastic forming - digital model - graphic design - materials and technologies as formal conditions - process simulation - phenomena in settlements - techniques of plastic forming - unplanned urban development
Since 2004	Assistance and cooperating in various architecture offices including: - krischanitz - bolldorf 2 architekten - endmayer
2015	Master degree in architecture
Languages:	German, English;
Programs:	-Creating 2d and 3d plans and models in various cad programs (ArchiCad/AutoCad) -Parametric design in rhinoceros and grasshopper -Digital image processing, editing and layouting (pictures and movies) (Adobe applications)
	Drivers license: class b
	Other interests than architecture, art and design: Music and sports.