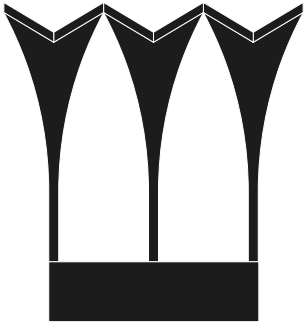


COMPLEX PROJECTS

MAR ELIAS CROP MARKET

P5 graduation

Tycho van Gelder

24/06/2022

O, LEBANON...

O, LEBANON...

MOUNTAINS

VALLEYS

FORESTS

PLAINS

DRY

WET

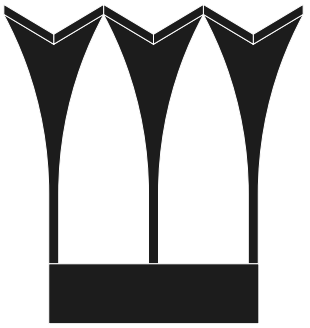
CAPACITY

MARKET

MARKET

FRESH AND SHARING

CELEBRATING AND JOYOUS



BEIRUT PRODUCTION

PRODUCTION SECTORS

metal fabricating

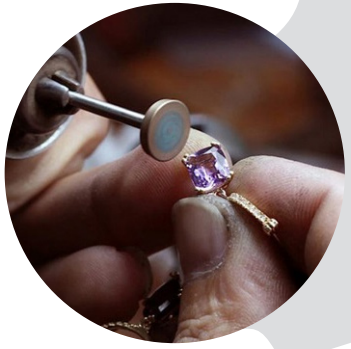
oil refining

wood industry

chemical production

agriculture industry

textile production



jewellery crafting

cement industry

wine production

PRODUCTION SECTORS

AGRICULTURE SECTORS

vegetables

fruits

nuts

livestock

tobacco industry

cereals

coffee, tea, mate

spices

CHANGE IN ECONOMY

SERVICE

PRODUCTION

1990

2020

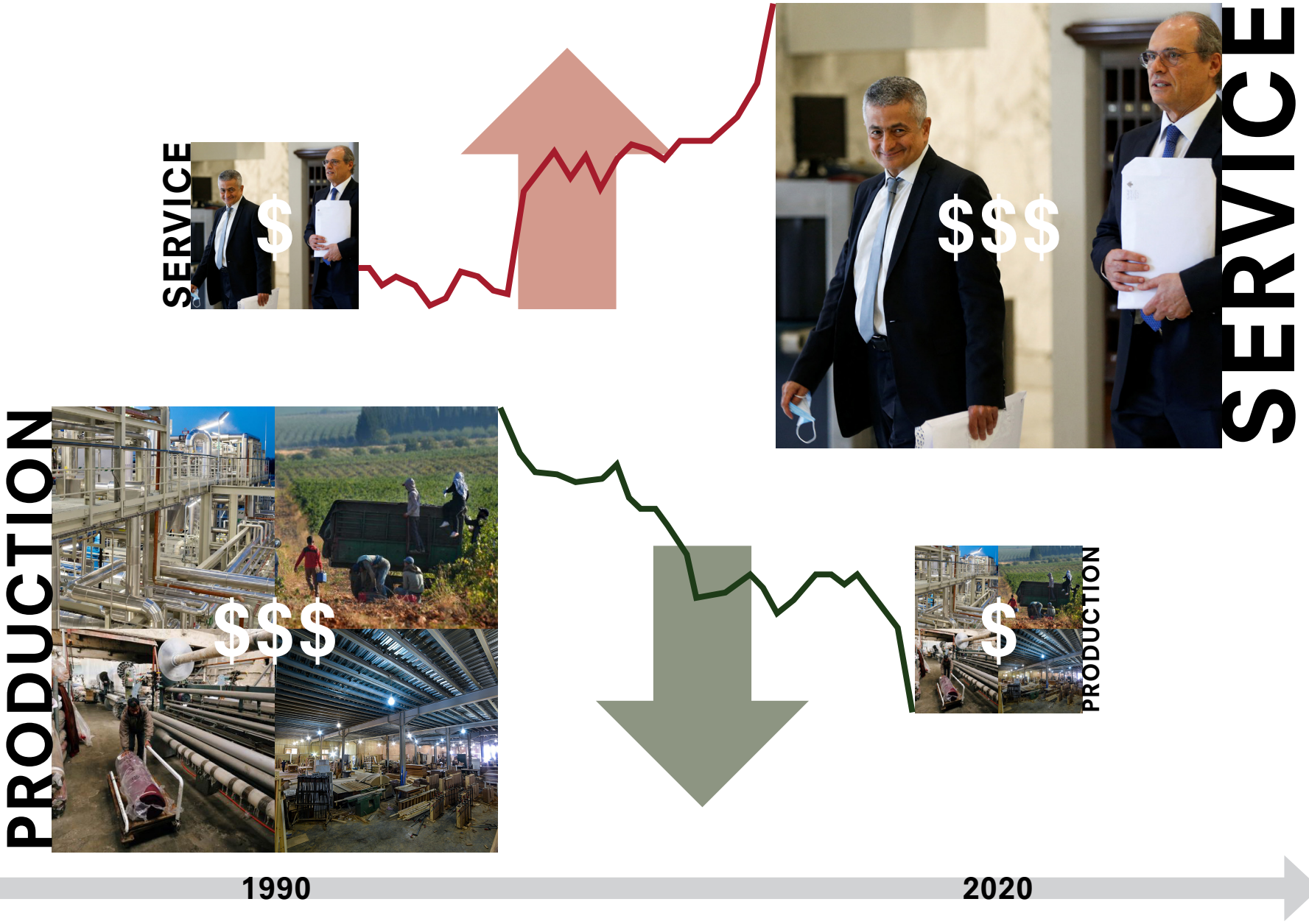
SERVICE

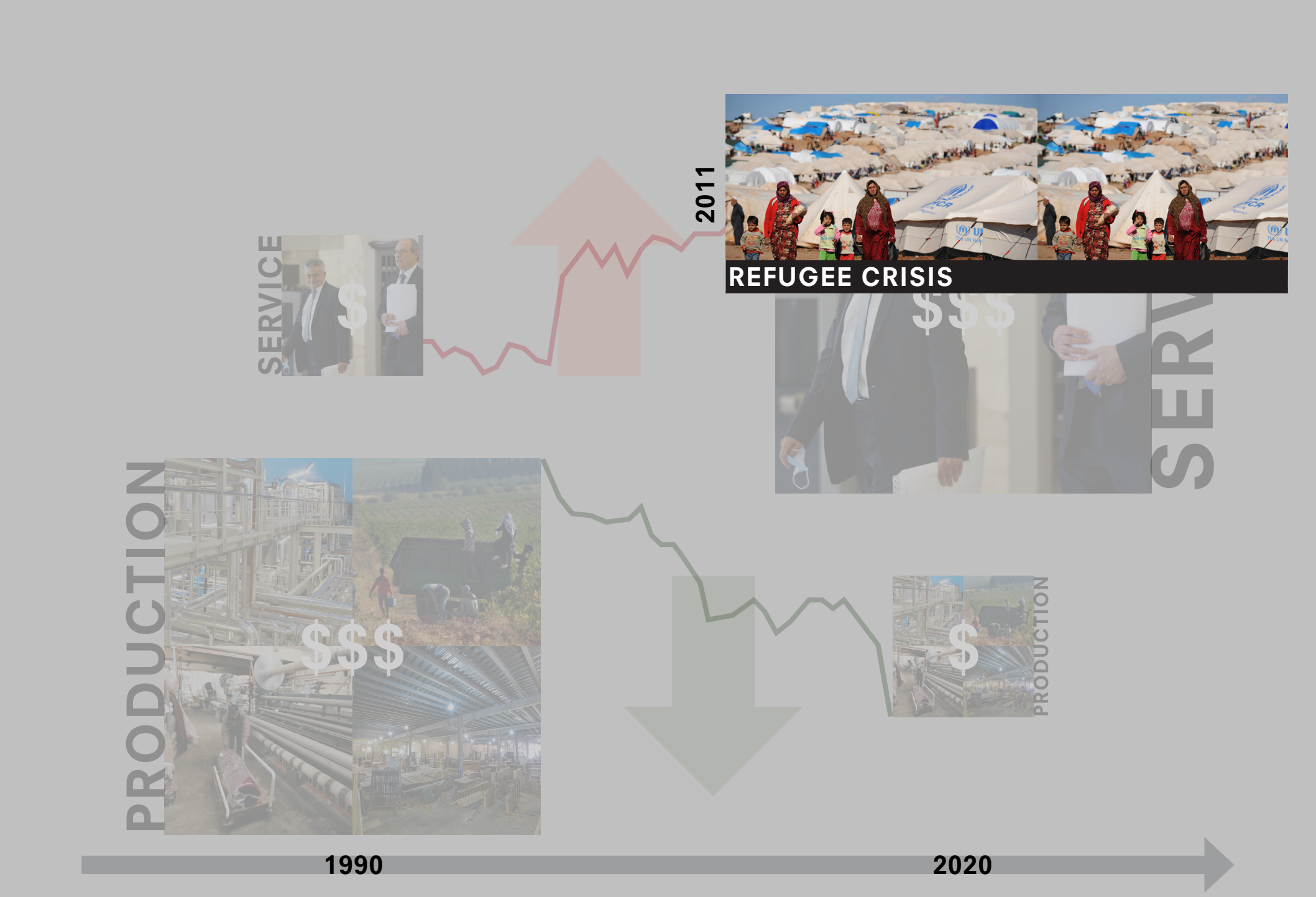
SERVICE

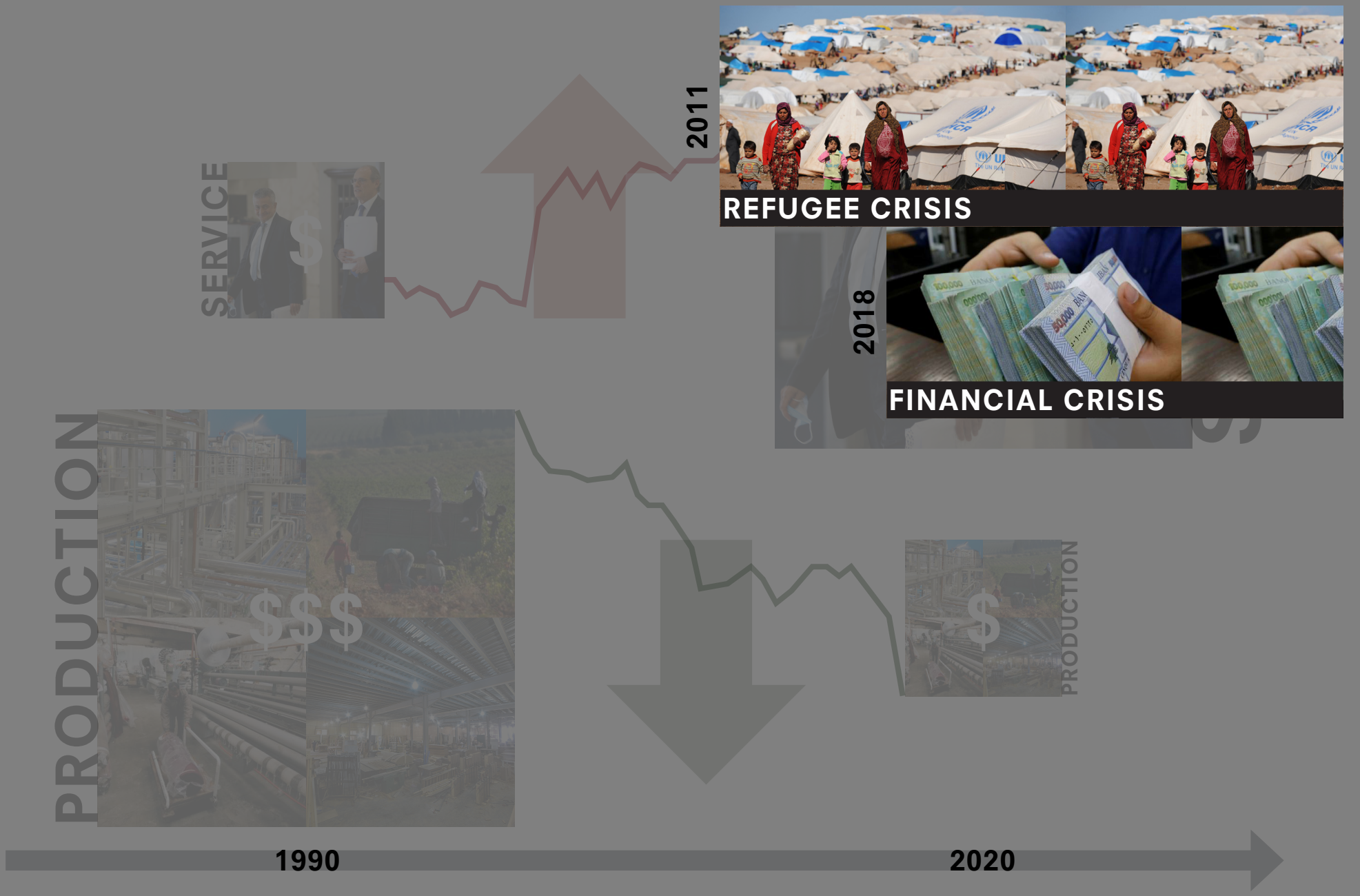
PRODUCTION

1990

2020


SERVICE
$
$$$
SERVICE
PRODUCTION
$$$
$
PRODUCTION
1990
2020


SERVICE
$
2011
REFUGEE CRISIS
$$$
SERV
PRODUCTION
$$$
$
PRODUCTION
1990
2020


SERVICE
2011
REFUGEE CRISIS
2018
FINANCIAL CRISIS
PRODUCTION
PRODUCTION
1990
2020

2011

REFUGEE CRISIS

2018

FINANCIAL CRISIS

2019

CIVIL PROTEST

1990

2020


SERVICE
PRODUCTION
1990
2020
2011
REFUGEE CRISIS
2018
FINANCIAL CRISIS
2019
CIVIL PROTEST
2020
PANDEMIC

4 AUGUST 2020

BEIRUT PORT

CATASTROPHE

CATASTROPHE

FOOD INSECURITY

Lebanon: land of plenty?

Lebanon's agriculture sector weighed down by challenges

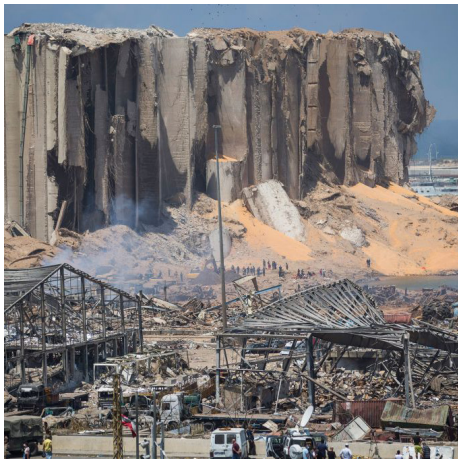
Since the massive explosion on Tuesday, August 4th, families' smoldering hunger has turned into a full-blown crisis.

Beirut blast worsens Lebanon's already concerning food crisis

Revolutionising Lebanon's agriculture sector as food runs out

Lebanon's farming industry has gone underfunded and underdeveloped for many years, hindered by a lack of modern equipment and inefficient production techniques.

CHALLENGES

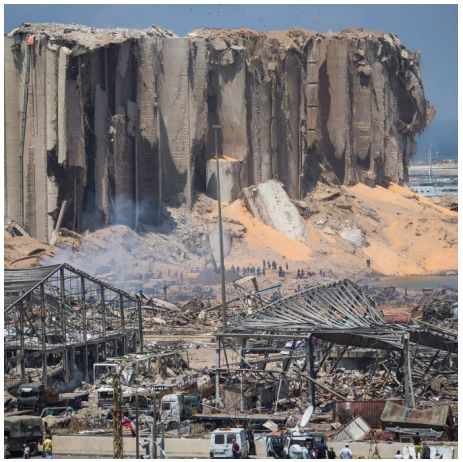


PORT BLAST

PROTESTS

NO PUBLIC SPACE

CHALLENGES



PORT BLAST

PROTESTS

NO PUBLIC SPACE

FOOD WASTE

EMPTY MARKETS

PANDEMIC

CHALLENGES

PORT BLAST

PROTESTS

NO PUBLIC SPACE

FOOD WASTE

EMPTY MARKETS

PANDEMIC

RESEARCH

How can a food logistics facility and wholesale crop market be integrated in a high density urban fabric in Beirut?

PROPOSAL

**FOOD STORAGE &
DISTRIBUTION FACILITY**

&

CROP MARKET

RELEVANCE

FOOD WASTE

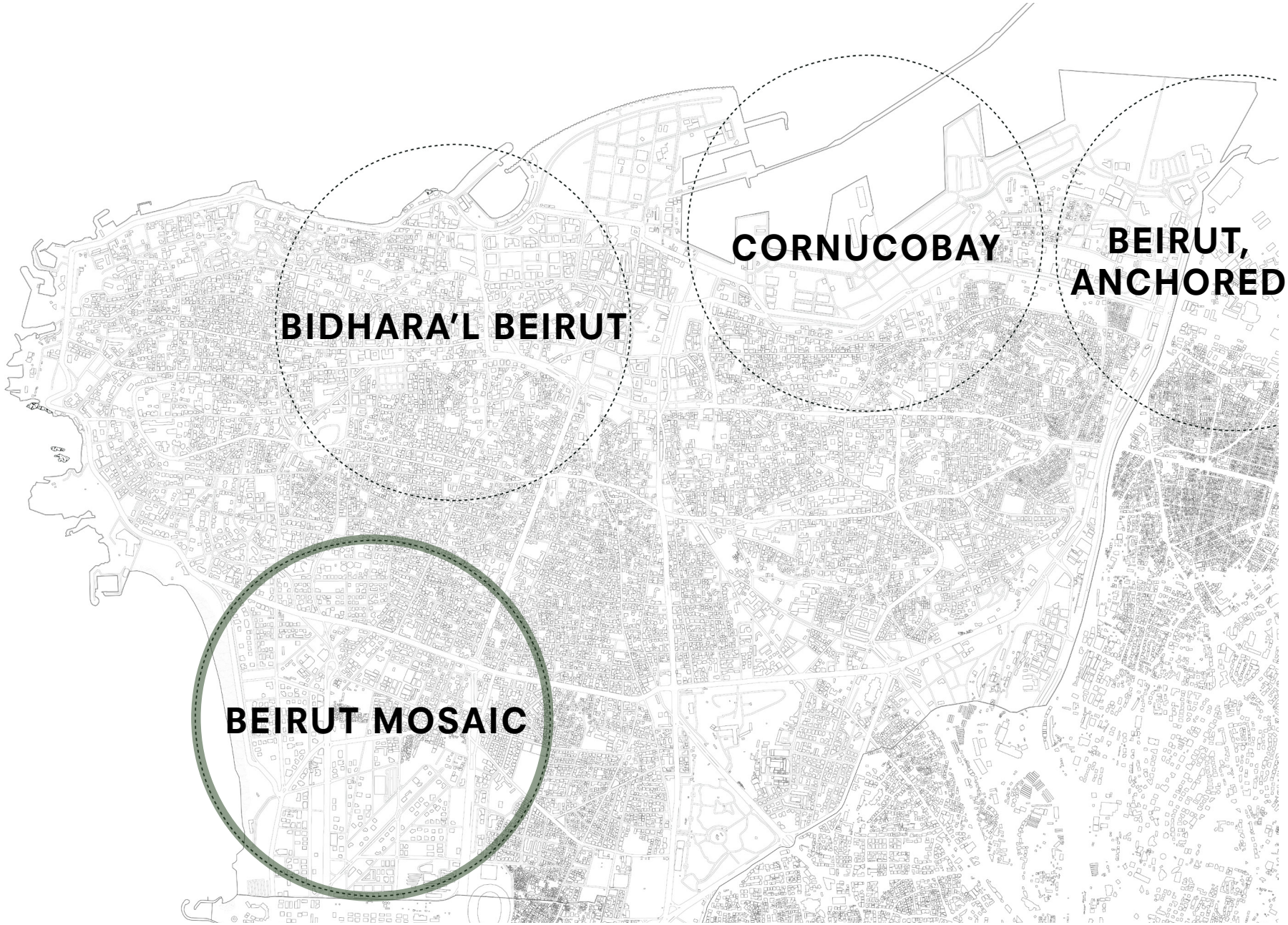
URBANISATION

FOOD INSECURITY

COMPLEX PROJECTS

INVESTIGATING BEIRUT

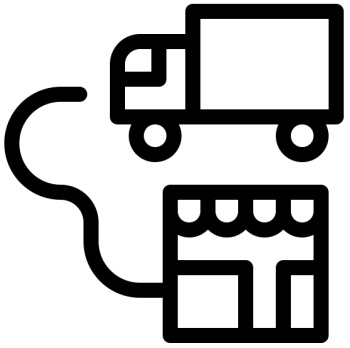
BEIRUT STRATEGY



BEIRUT MOSAIC

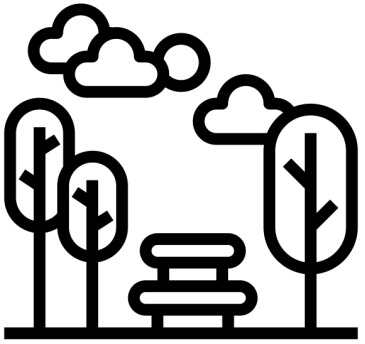
complex projects

CHALLENGES



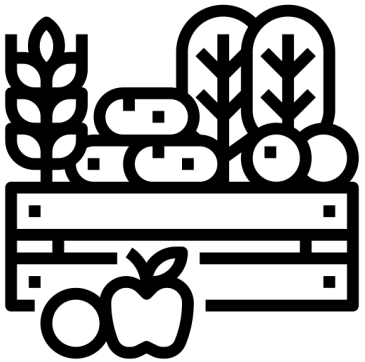
food waste

food insecurity

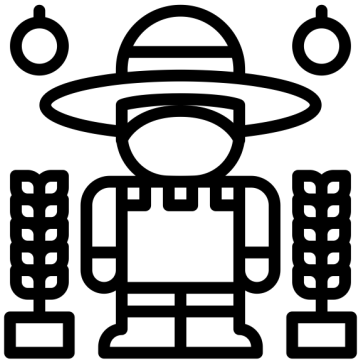


disconnection

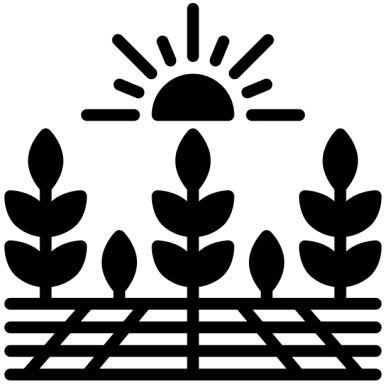
AMBITIONS



improving post-harvest handling



sparking youth interest in agriculture

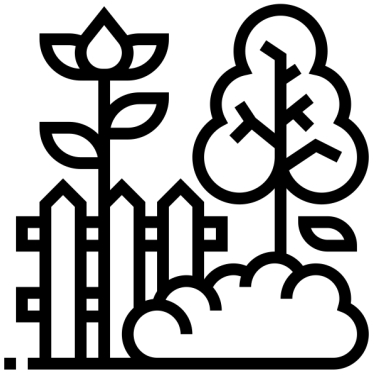


adding public space

PROJECT TRANSLATION

food logistics center

crop packaging, transportation, and storage



crop garden

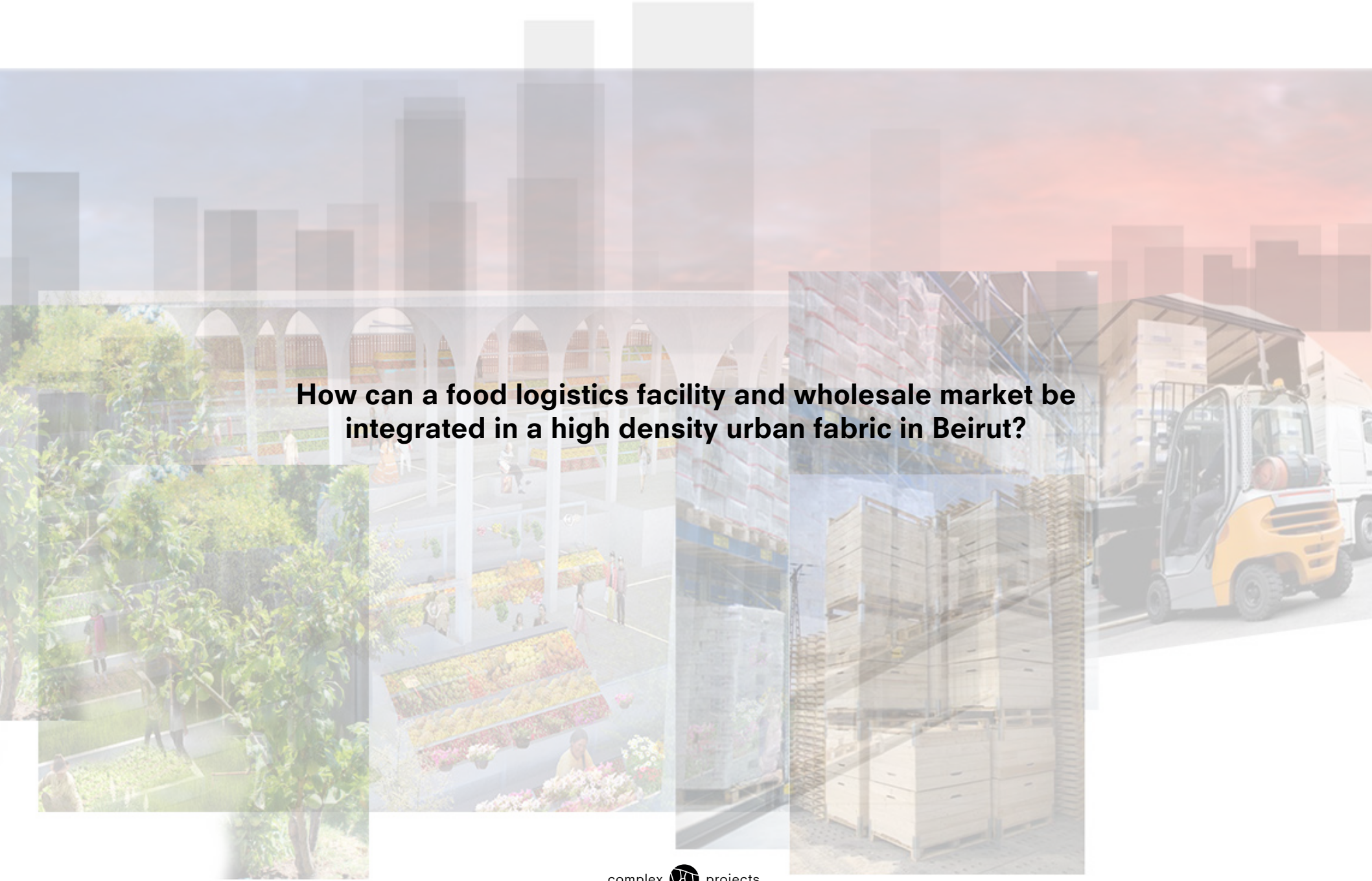
engages youth in agriculture and farming

(wholesale) crop market

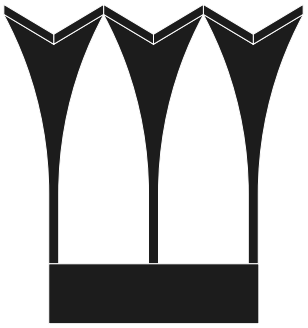
agriculture potential on display

VISION

RESEARCH QUESTION

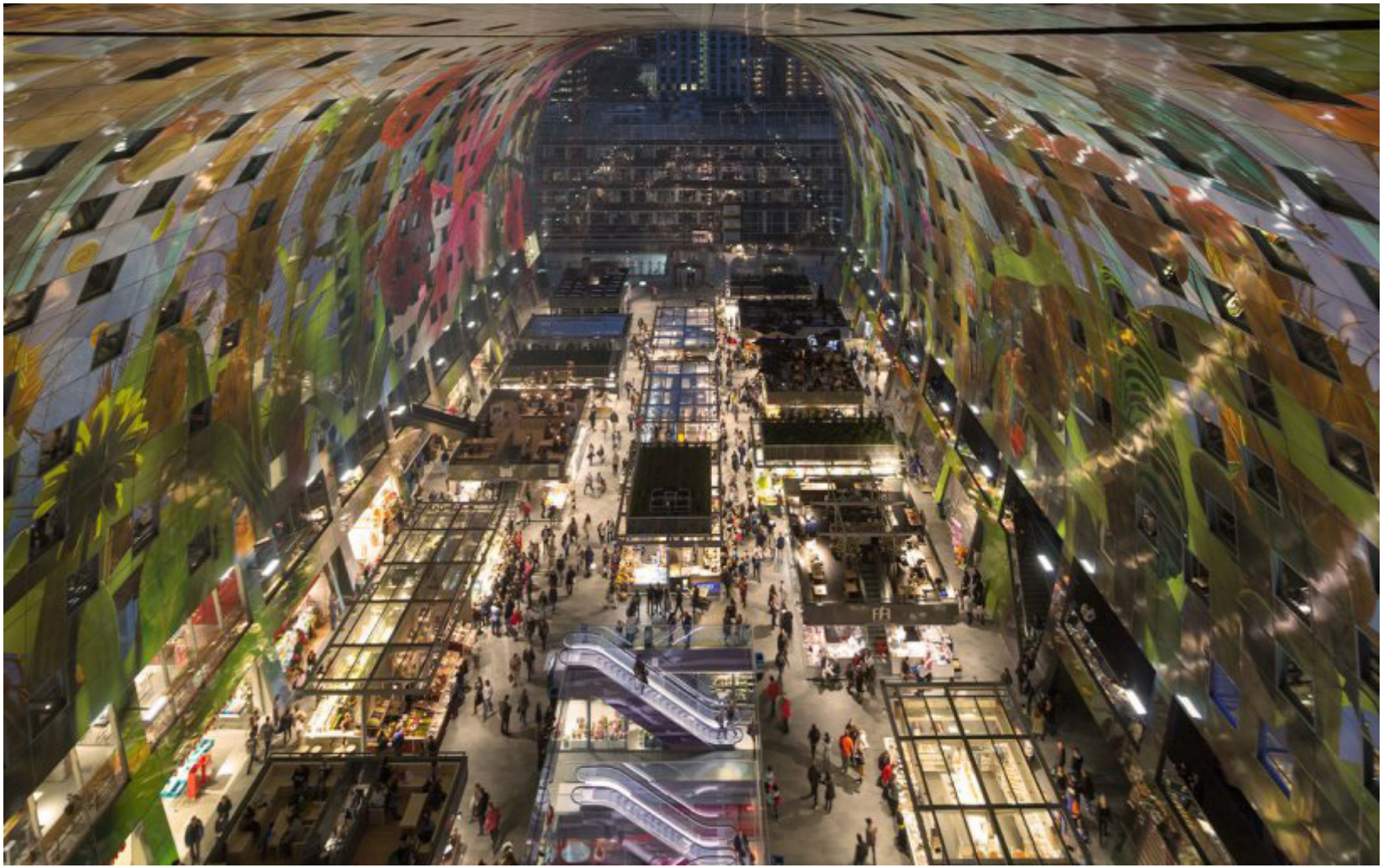


How can a food logistics facility and wholesale market be integrated in a high density urban fabric in Beirut?



RESEARCH

MARKET HALLS



RESEARCH QUESTIONS

What characterizes the architecture of the project?

What is the logistic/public program division?

How is the public and logistic program in the project organised?

How is parking organised in the project?

How are the entrance flows organised in the project?

REFERENCE PROJECTS

WMA – 2008
Mercabarna Flor Market

15 000 m²
flower market

SB – 2011
Mohali Fruit and Vegetable Market

18 720 m²
fruit & vegetable market

HPCA & P – 2012
International Flower Trade Center

29 700 m²
7 300 m²
flower market

OMA – 2015
West Louisville Food Port

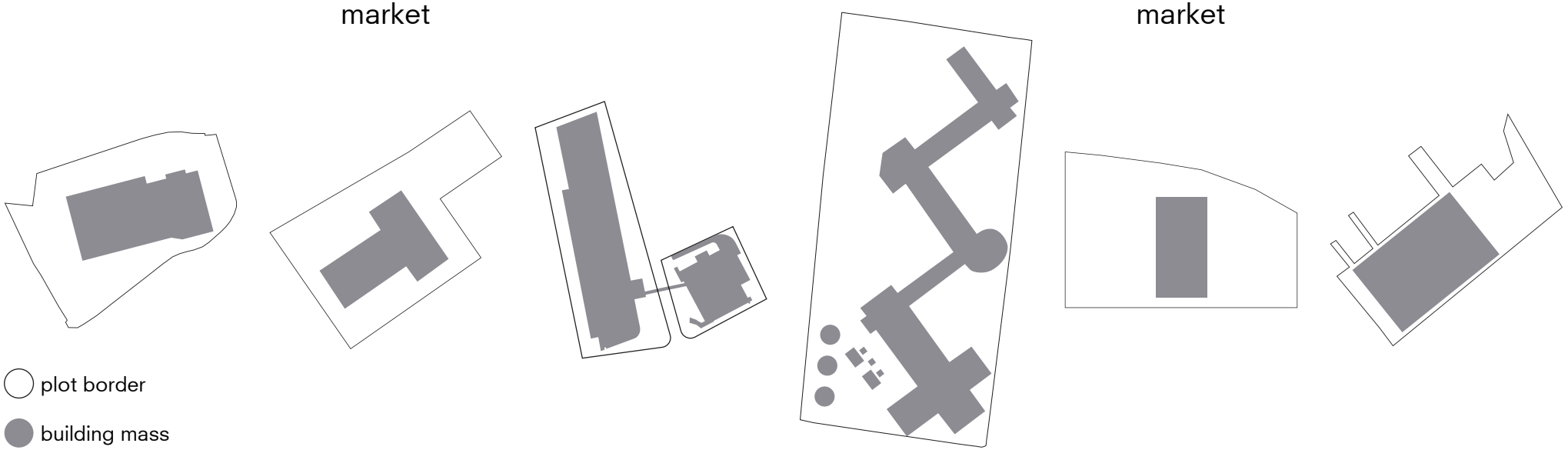
95 625 m²
food market

MVRDV – 2019
Tainan Wholesale Fruit and Vegetable Market

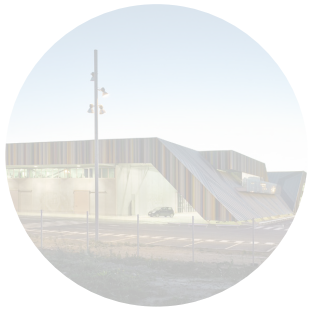
11 150 m²
fruit & vegetable market

3xn – 2019
Sydney Fish Market

80 000 m²
food market

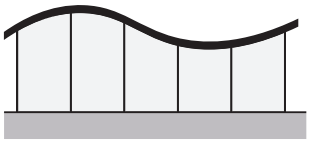


CHARACTER & FORM



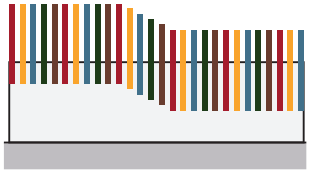



What characterizes the architecture of the project?



roof

slab footprint



facade

hook footprint

+ big (walkable) roof that envelops various/all program elements

+ recognisable (colourful) facade

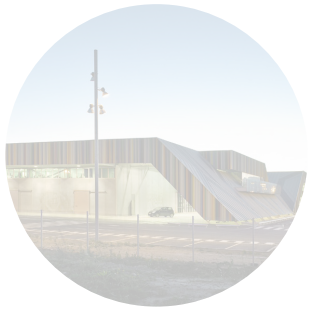
+semi open building

+ building size around 20 000 m2

+ typology: hook / slab

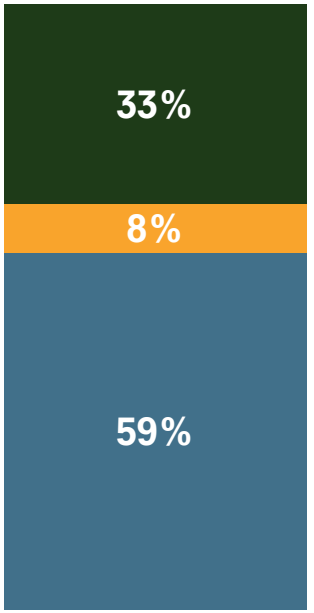
+ low/medium rise massing

PROGRAM DIVISION






What is the logistic/public program division?



+ most markets are public oriented

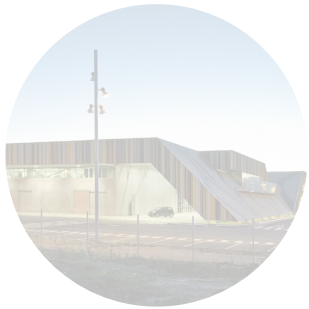
+ adminstrative acts as offices and support in program

logistic

administrative

public

PROGRAM RELATION






How is the public and logistic program in the project organised?

+ separation between LOGISTICS and PUBLIC program elements

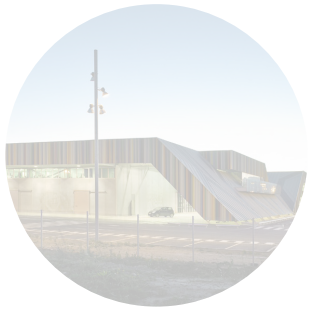
+ administrative acts as buffer between LOGISTICS and PUBLIC

logistic

administrative

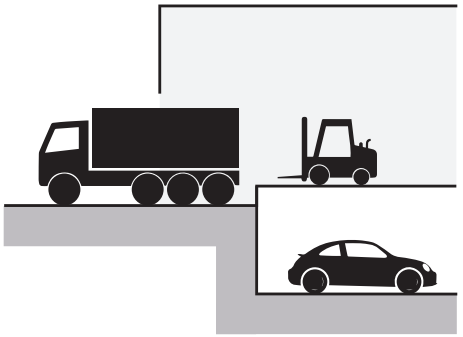
public

PARKING FLOWS






How is parking organised in the project?

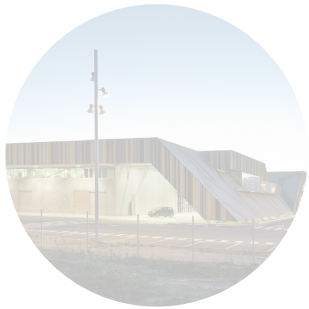


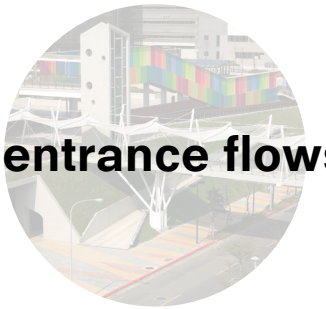
+ integrated logistic parking in building

+ separated logistic and public parking

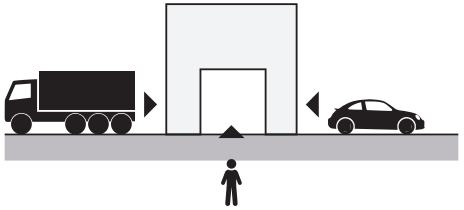
+ no big parking lot around building

ENTRANCE FLOWS






How are the entrance flows organised in the project?



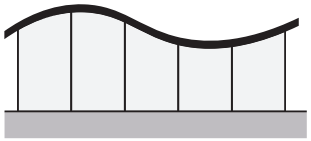
+ separate plot entrance for LOGISTIC and PUBLIC flows

+ separate building entrance entrance for trucs (LOGISTIC) and pedestrians, car (PUBLIC)

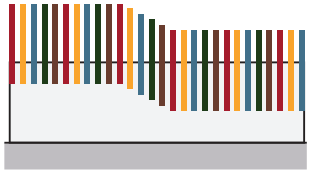
RESEARCH CONCLUSION

How can a food logistics facility and wholesale market be integrated in a high density urban fabric in Beirut?

CHARACTER



roof



facade

+ big (walkable) roof that envelops various/all program elements

+ recognisable (colourful) facade

MASSING/ TYPOLOGY

slab footprint

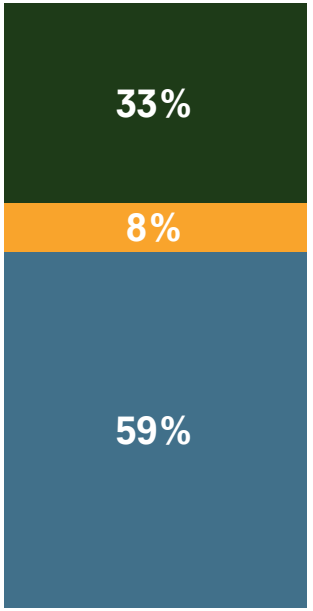
hook footprint

+ building size around 20 000 m2

+ typology: hook / slab

+ low/medium rise massing

PROGRAM DIVISION



+ most reference projects are public oriented

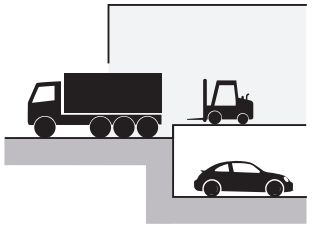
+ adminstrative act as offices and support in program

PROGRAM RELATION

+ separation between LOGISTICS and PUBLIC program elements

+ administrative is accessible from LOGISTICS and PUBLIC program

PARKING

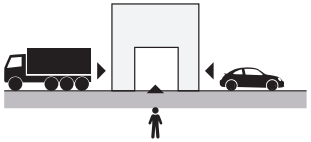


+ integrated logistic parking in building

+ separated logistic and public parking

+ no big parking lot around building

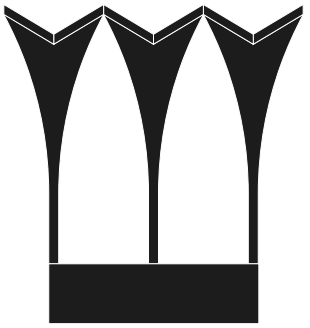
ENTRANCE FLOWS



+ separate plot entrance for LOGISTIC and PUBLIC flows

+ separate building entrance entrance for trucks (LOGISTIC) and pedestrians, car (PUBLIC)

logistic administrative public



DESIGN BRIEF

RESEARCH QUESTIONS

Who is the client of Mar Elias Crop Market?

What is the program size and program division of Mar Elias Crop Market?

How is Mar Elias Crop Market used?

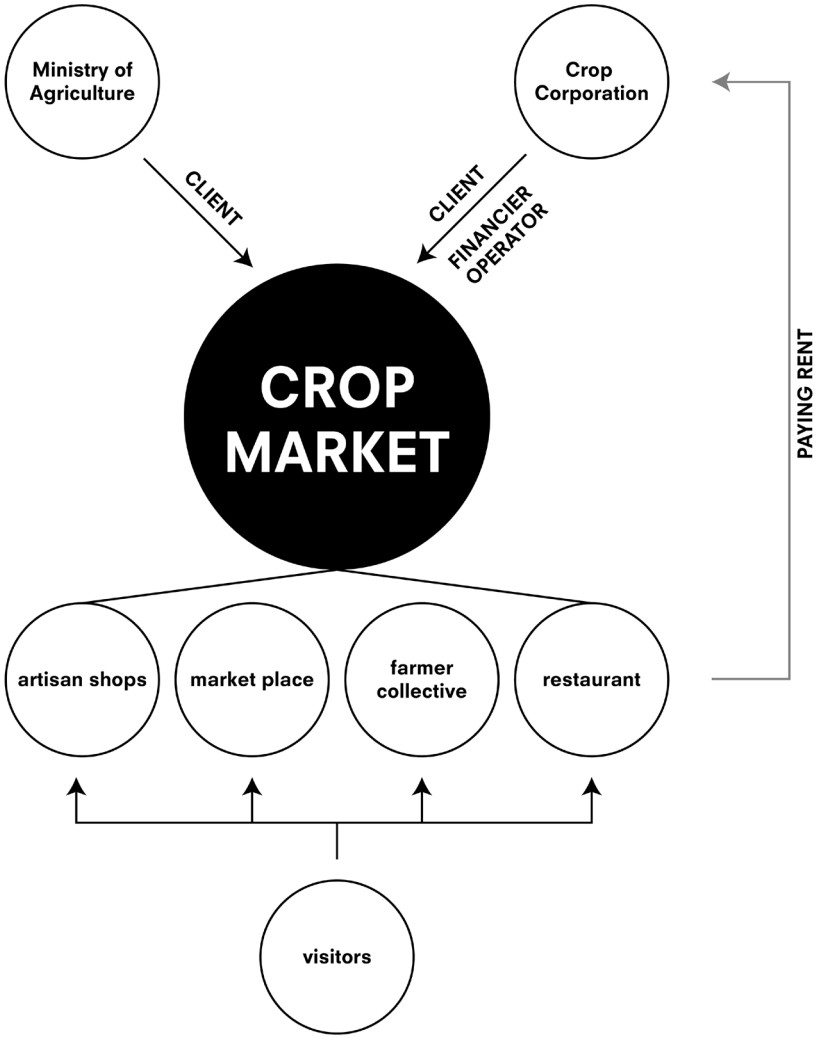
What is the relation between the program elements?

What spatial principles are developed?

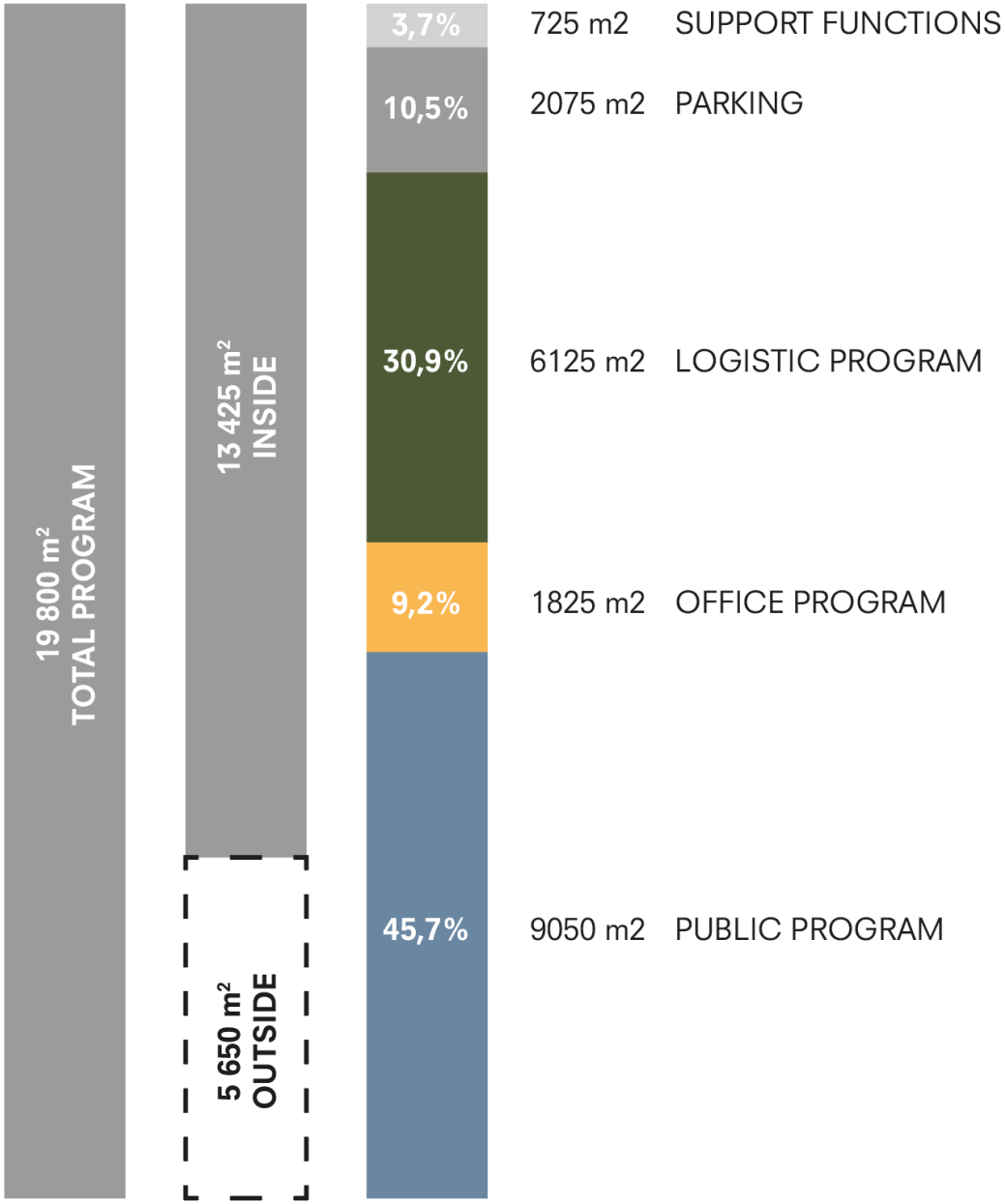
What is the location of Mar Elias Crop Market?

What are the massing criteria on site?

CLIENT


Ministry of Agriculture
Crop Corporation
CLIENT
CLIENT
FINANCIER
OPERATOR
CROP MARKET
PAYING RENT
artisan shops
market place
farmer collective
restaurant
visitors

PROGRAM SIZE



USERS

CROPS

PACAKAGING MATERIAL

SHOP OWNER

MARKET STAND OWNER

DISTRIBUTION

EMPLOYEE

CAR EMPLOYEE

INTERNAL TRANSPORT

PEDESTRIAN VISITOR

CAR VISITOR

DISTRIBUTION CLIENT

FARMER VISITOR

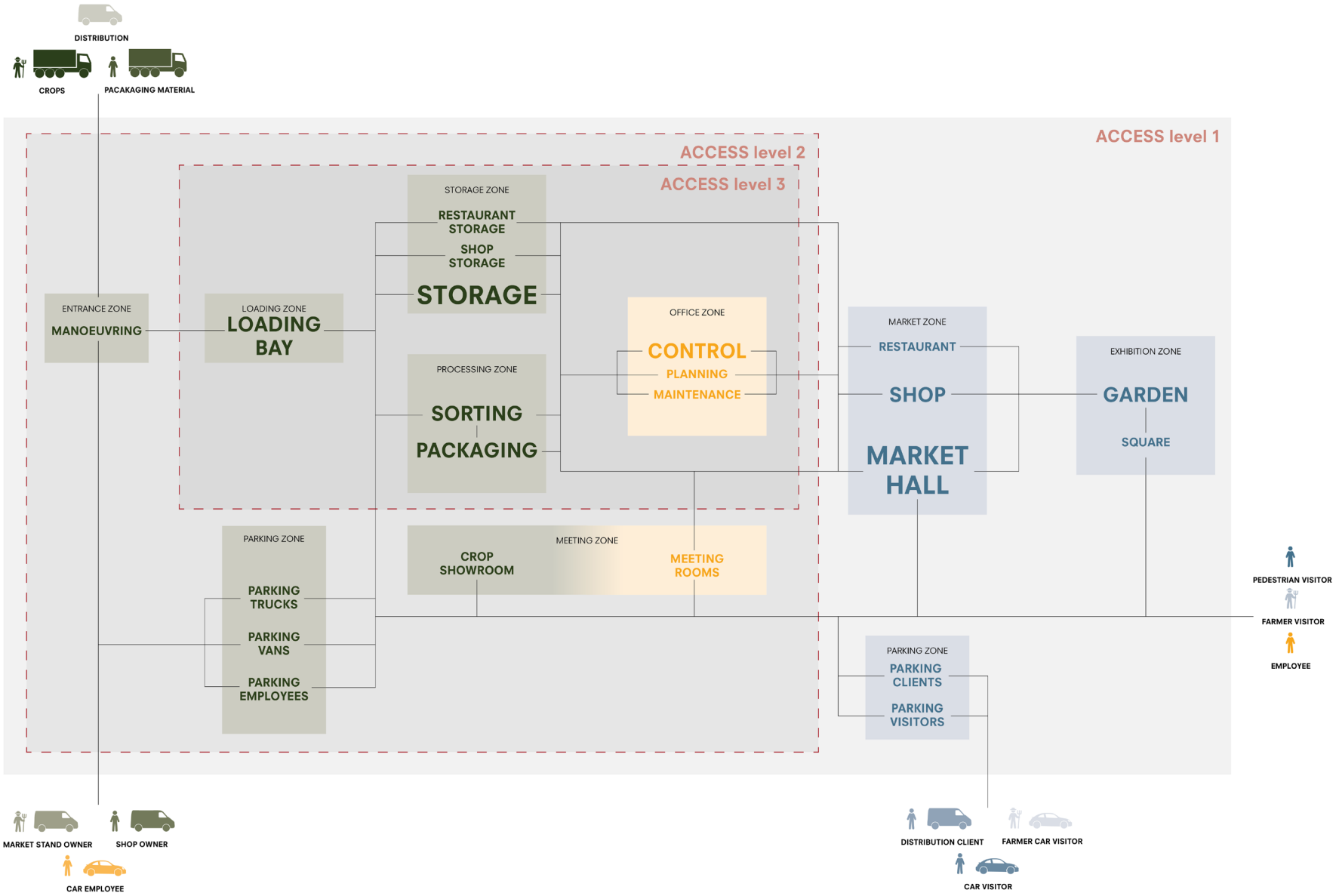
FARMER CAR VISITOR

logistic users

employees

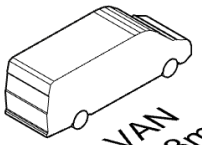
public users

RELATION DIAGRAM

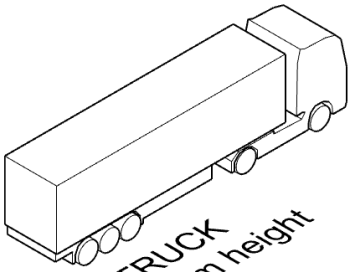


USERS

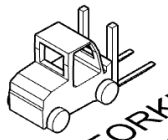
HUMAN
1.8m height



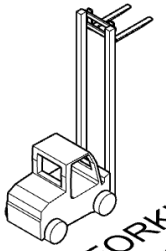
VAN
2.8m height



TRUCK
4.2m height

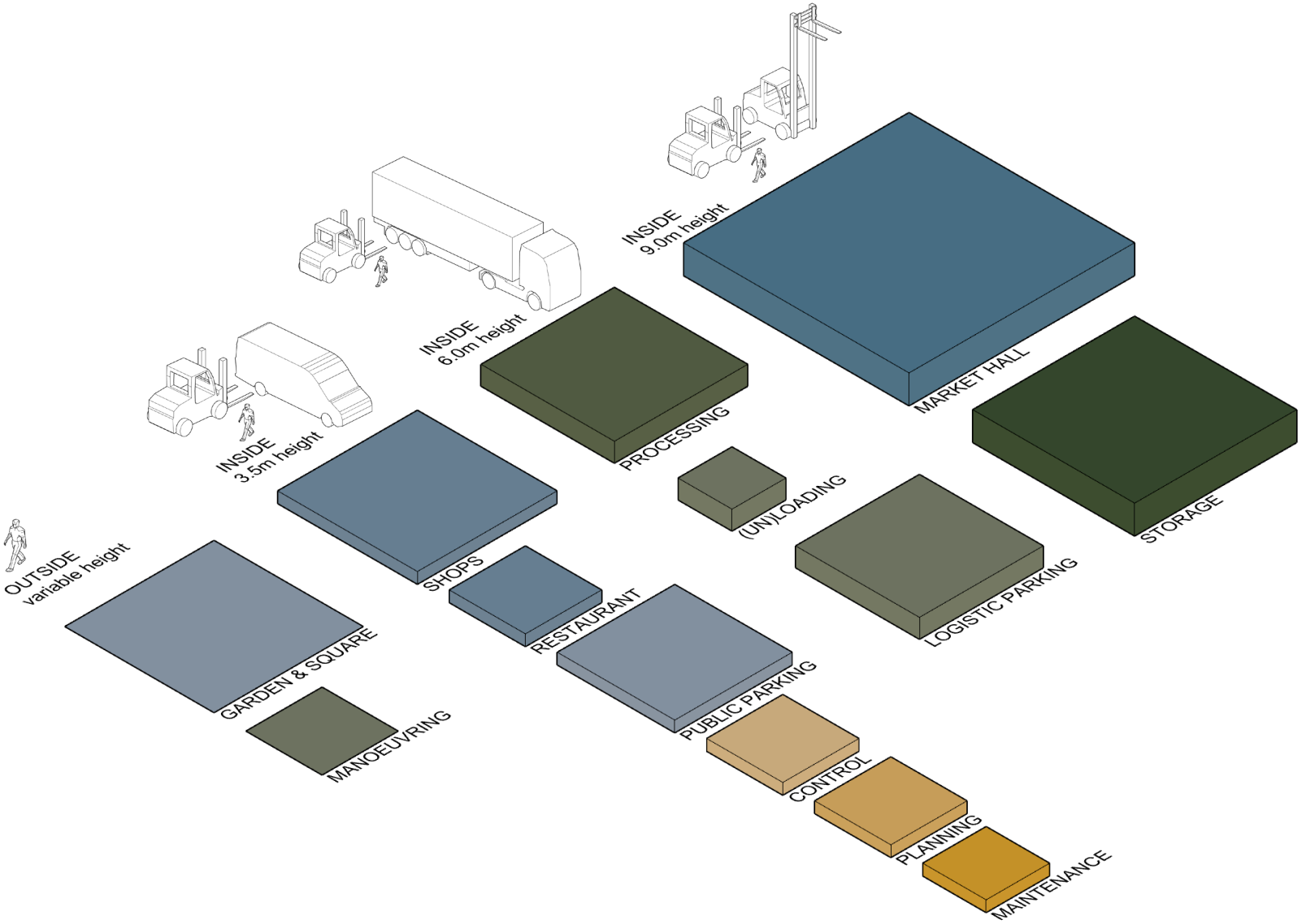


FORKLIFT (normal)
2.8m height



FORKLIFT (extended)
7.0m height

SPATIAL PRINCIPLES



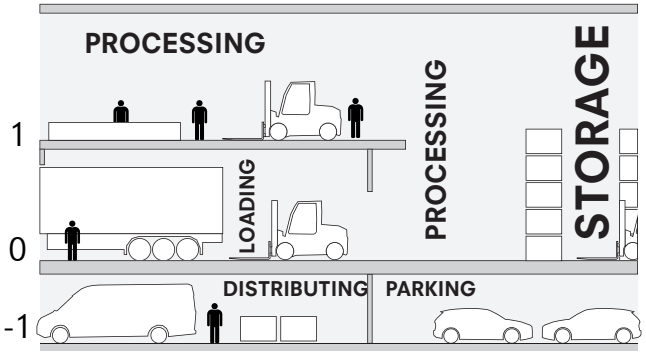
disclaimer: users are as illustration and are not the same scale as program elements

TYPICAL SECTIONS

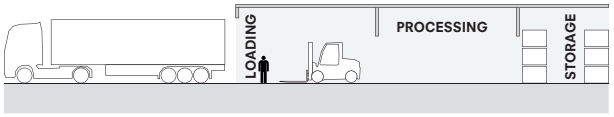
NEW

TRADITIONAL

TYPICAL SECTIONS



NEW

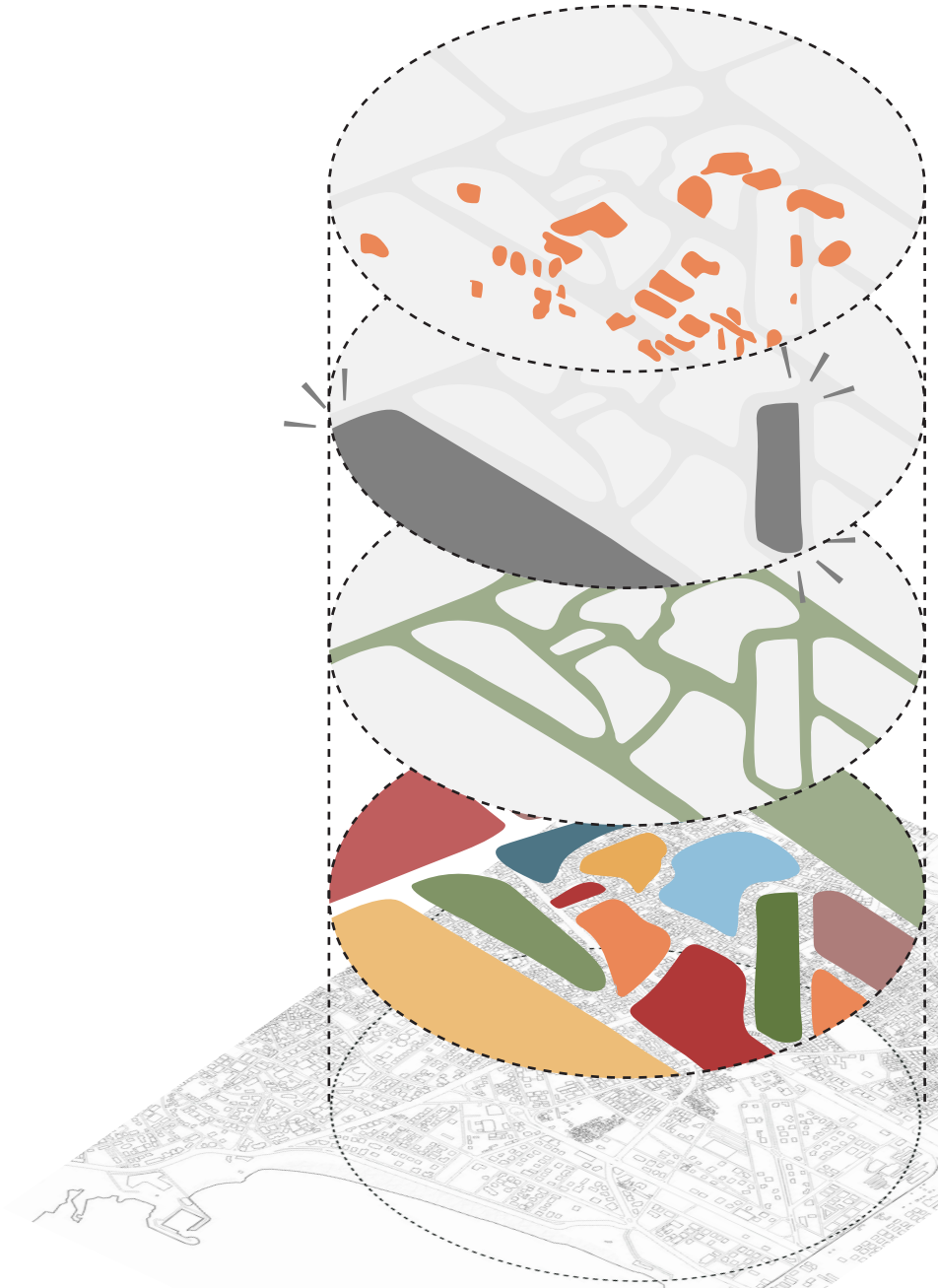


TRADITIONAL

BEIRUT MOSAIC

complex projects

GROUP STRATEGY



Affordable housing and education

2 key public spaces: beach and park

Pedestrian friendly connections

Enhance mosaic character

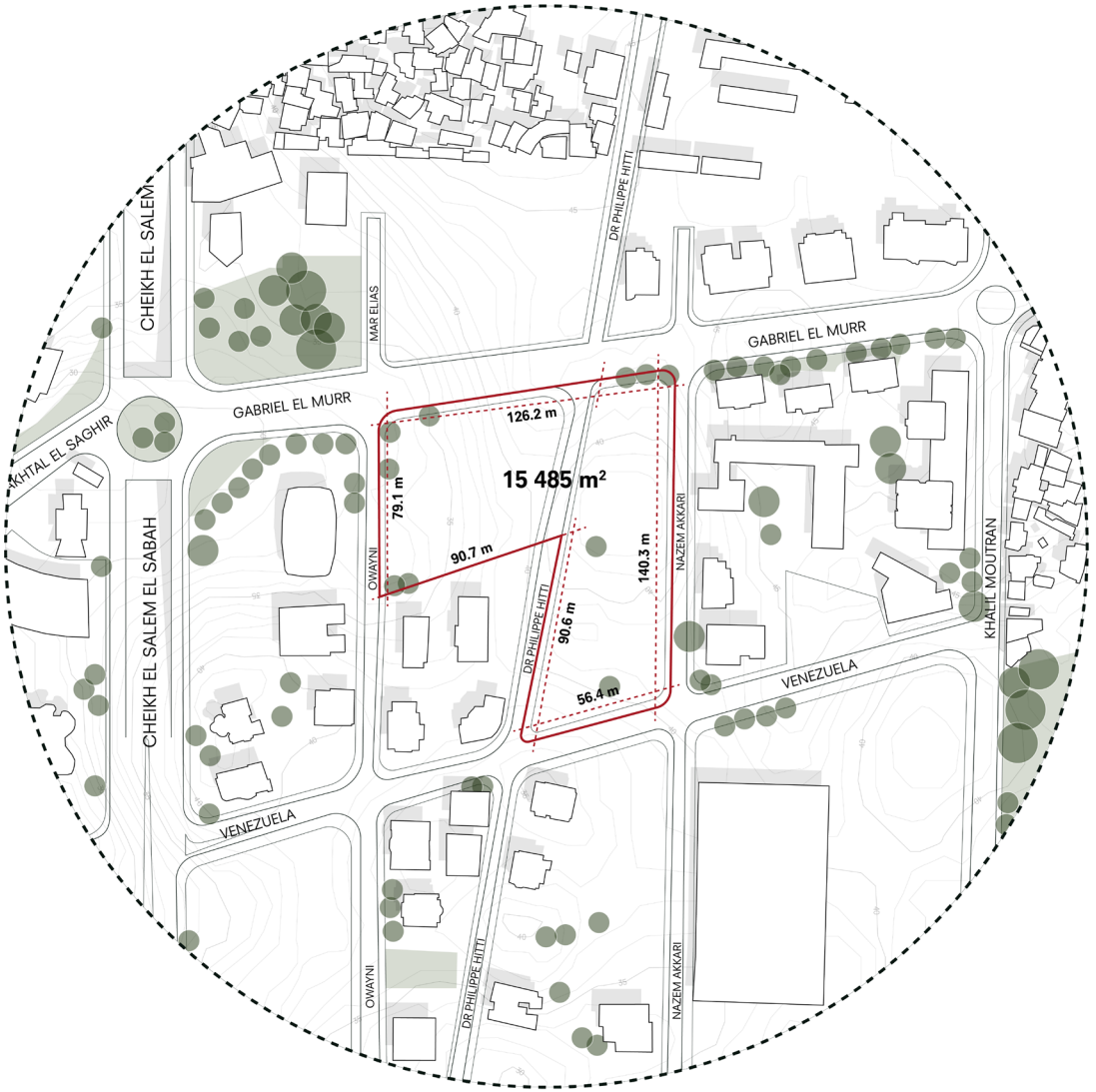
Beirut Mosaic

complex projects

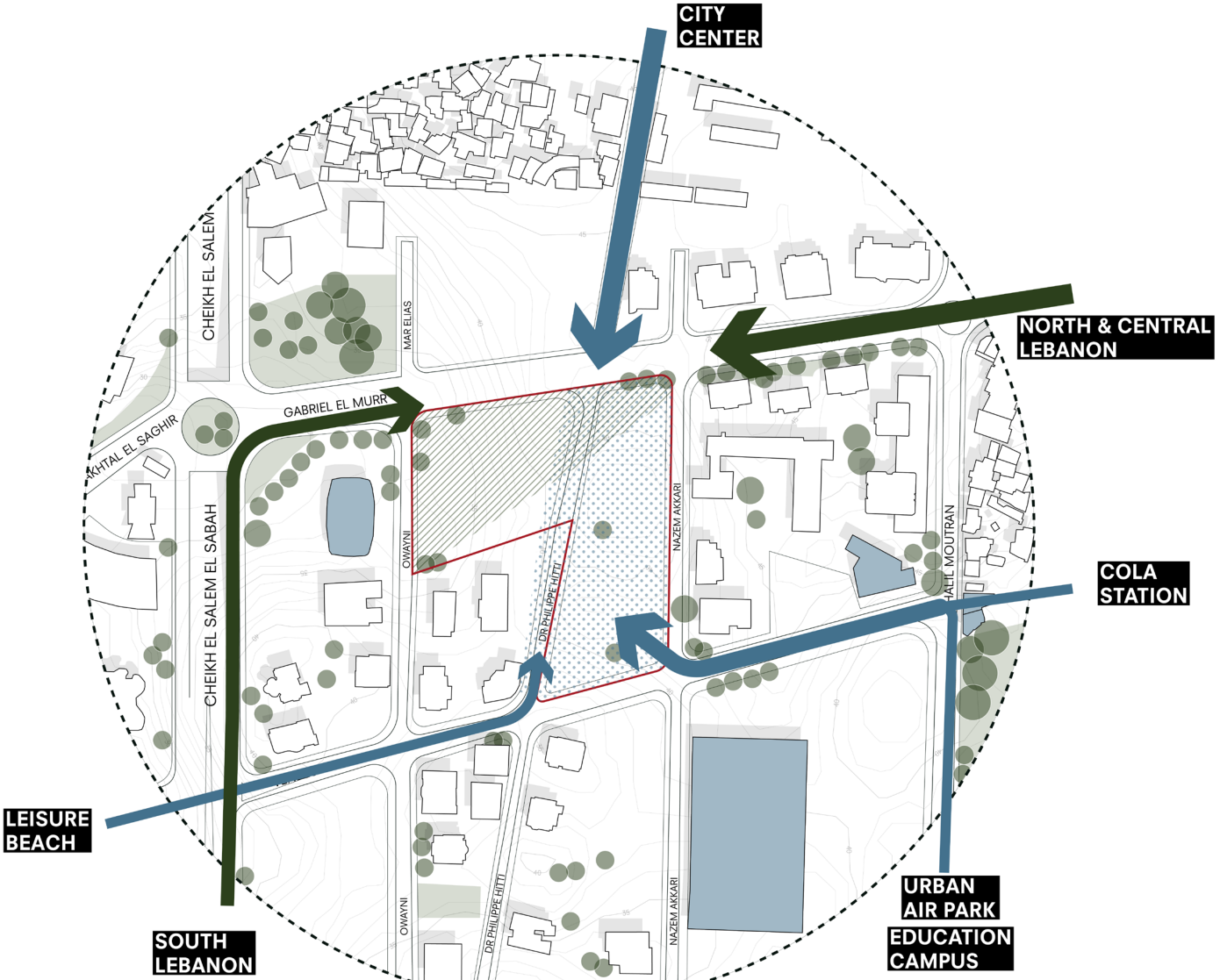
BEIRUT MOSAIC

complex projects

SITE

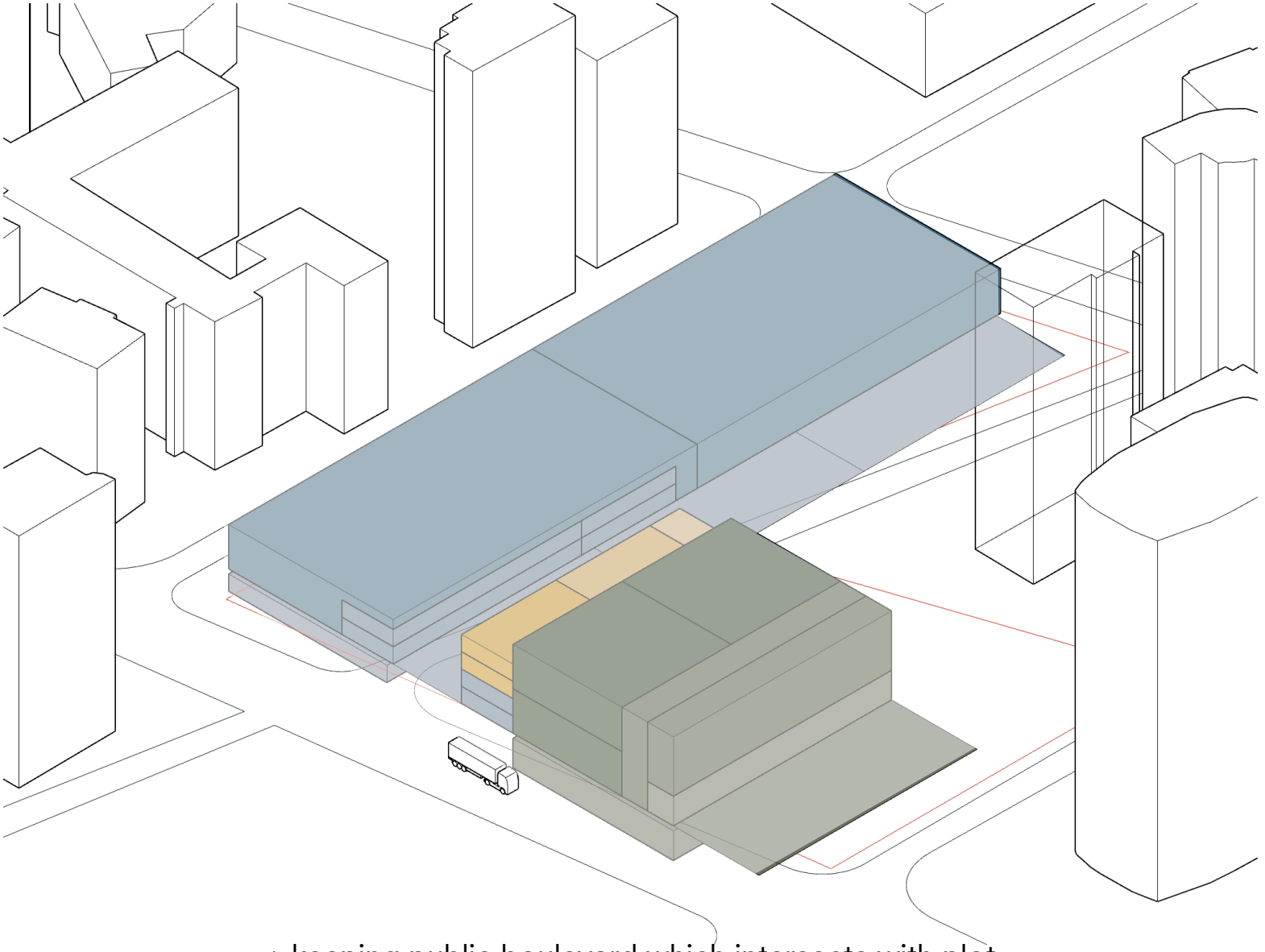

CHEIKH EL SALEM
MAR ELIAS
DR PHILIPPE HITTI
GABRIEL EL MURR
GABRIEL EL MURR
KHTAL EL SAGHIR
CHEIKH EL SALEM EL SABAH
126.2 m
15 485 m²
79.1 m
90.7 m
OWAYNI
DR PHILIPPE HITTI
90.6 m
140.3 m
NAZEM AKKARI
56.4 m
VENEZUELA
KHALIL MOUTRAN
VENEZUELA
OWAYNI
DR PHILIPPE HITTI
NAZEM AKKARI

SITE



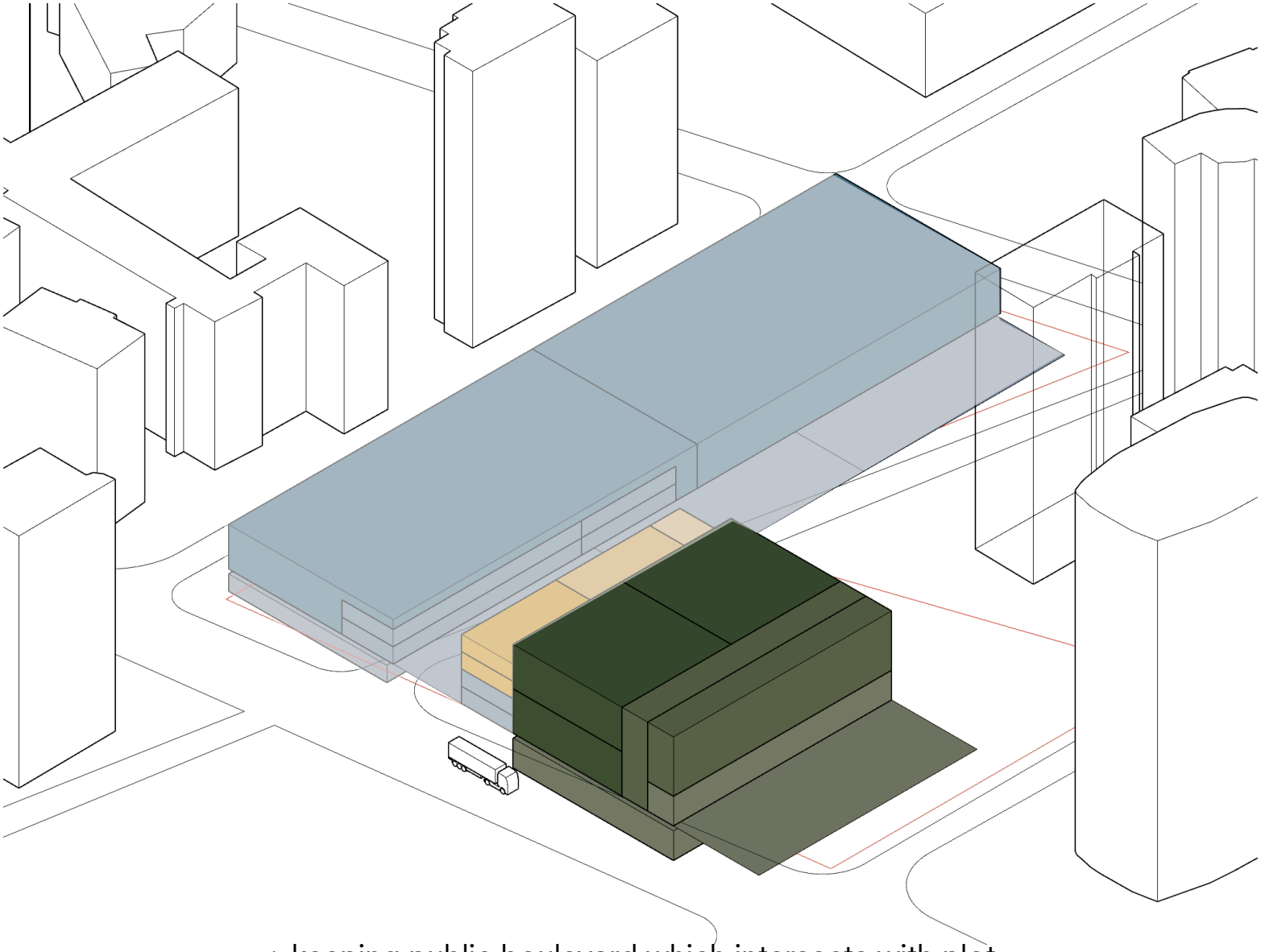
+ approach from all sides
+ program division resulting from flows and context
+ the boulevard as public heart

MASSING



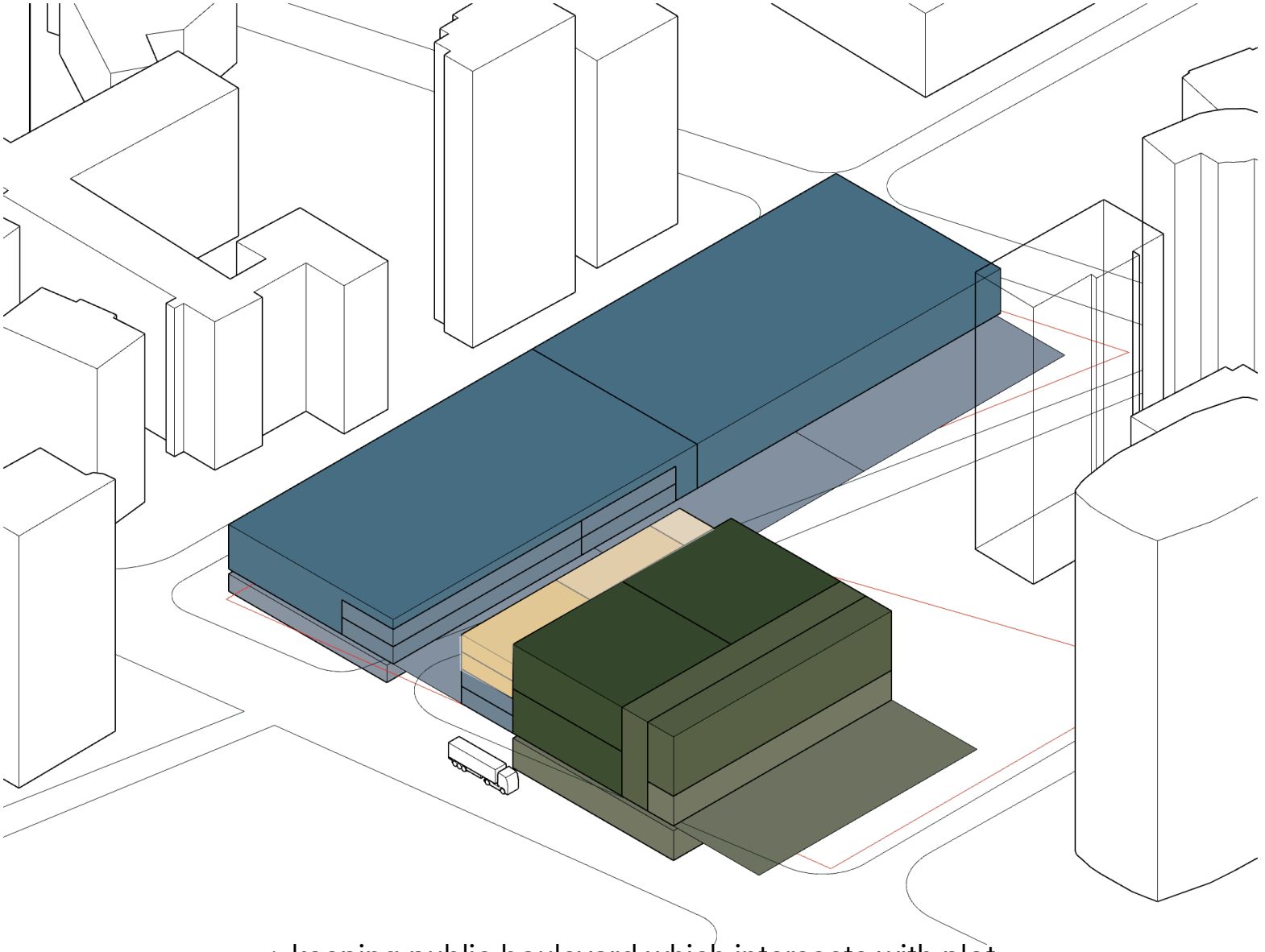
+ keeping public boulevard which intersects with plot
+ massing as compact as possible: integrating functions in eachother
+ connecting the offices to both programs

MASSING



+ keeping public boulevard which intersects with plot
+ massing as compact as possible: integrating functions in eachother
+ connecting the offices to both programs

MASSING



+ keeping public boulevard which intersects with plot
+ massing as compact as possible: integrating functions in eachother
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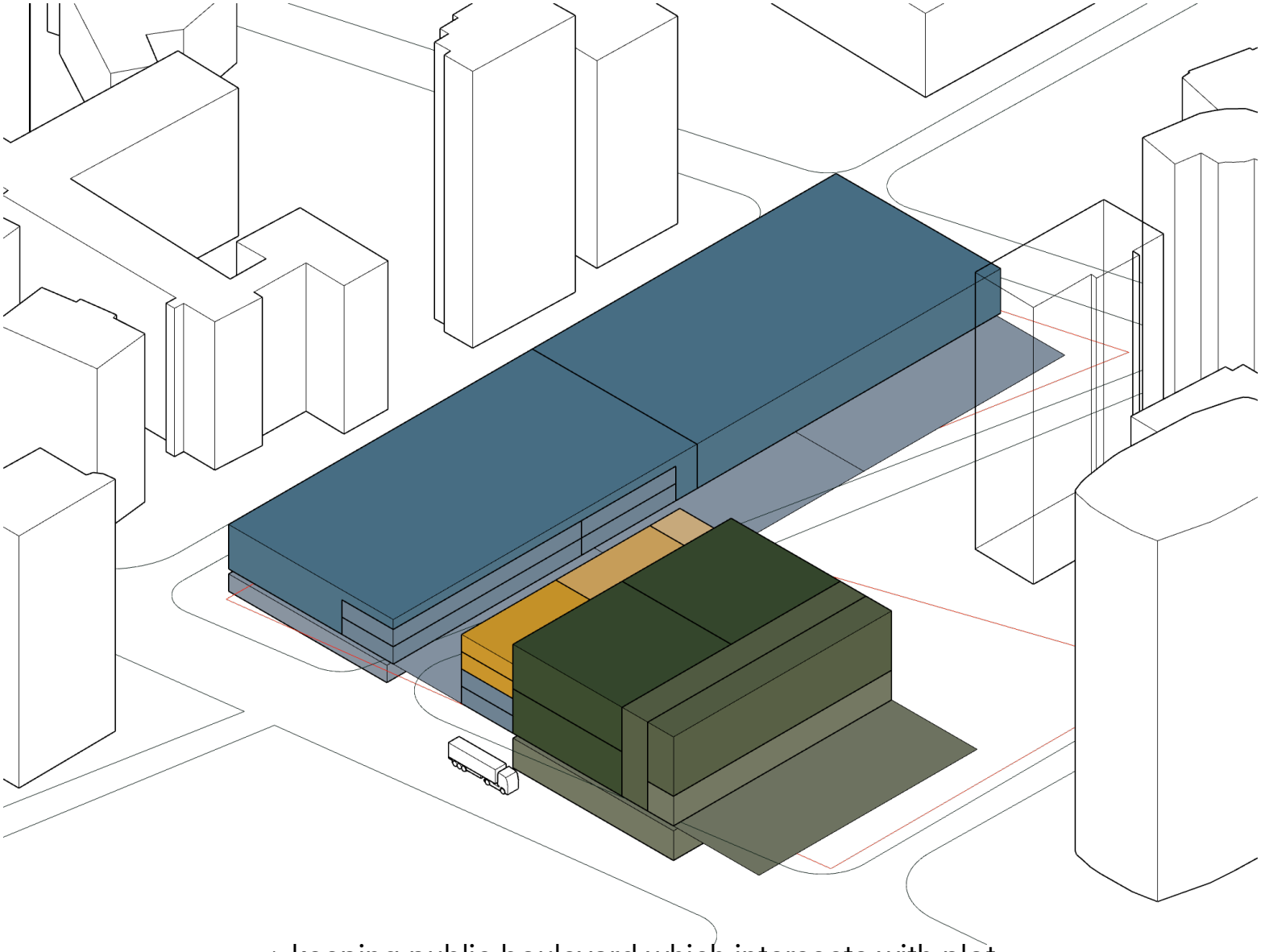
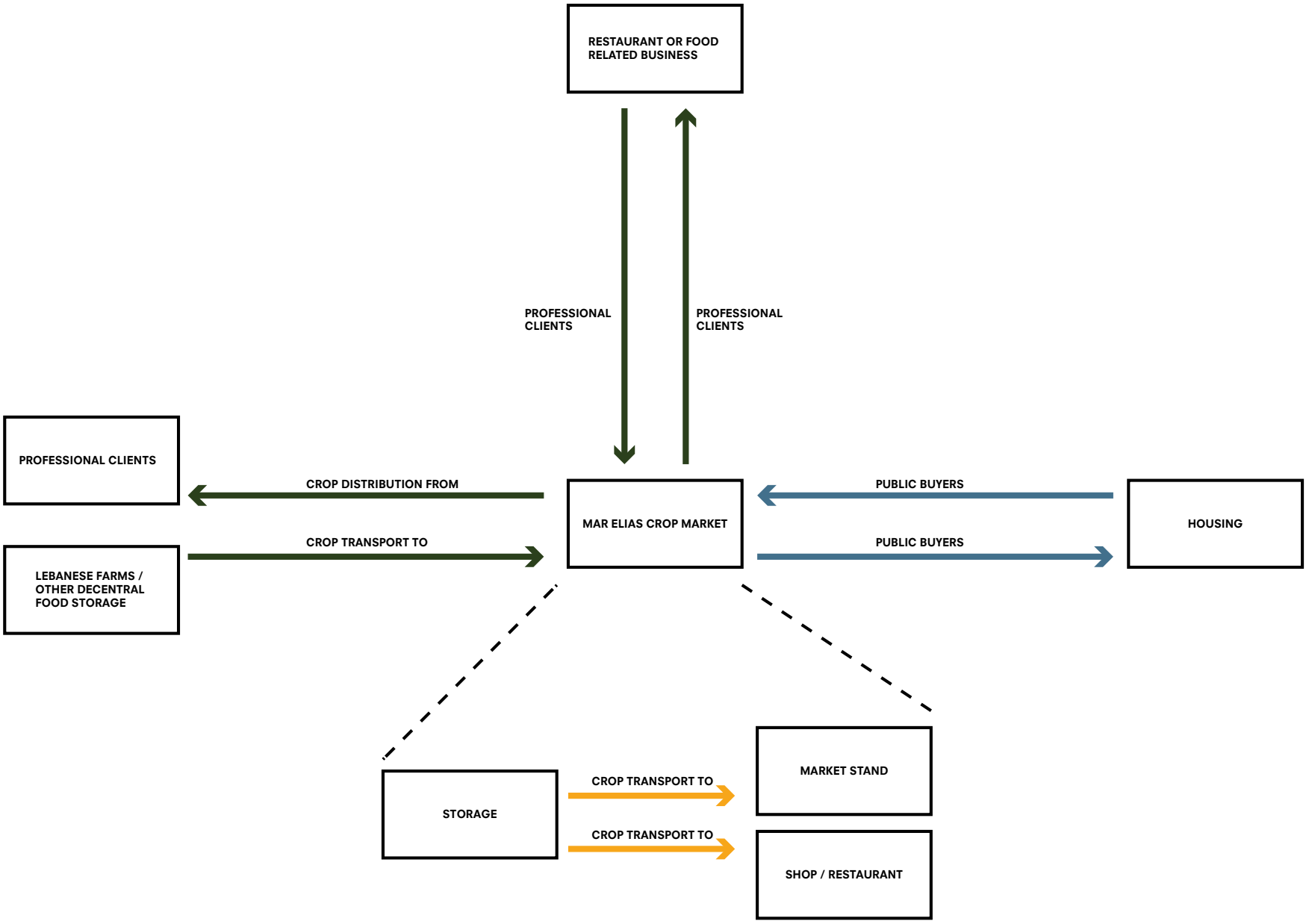
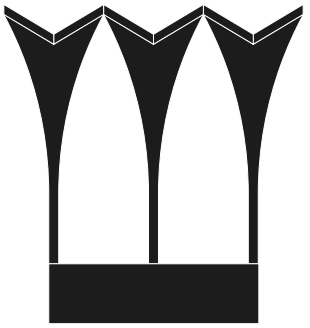
MASSING



+ keeping public boulevard which intersects with plot
+ massing as compact as possible: integrating functions in eachother
+ connecting the offices to both programs

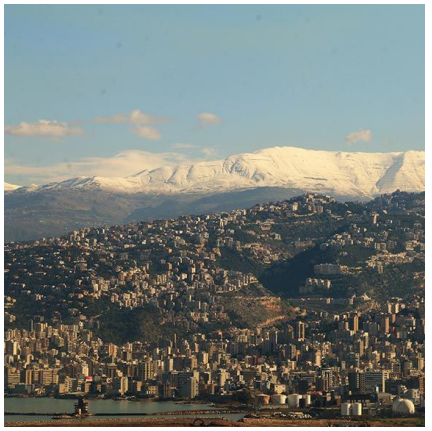
PROGRAM CONCEPT

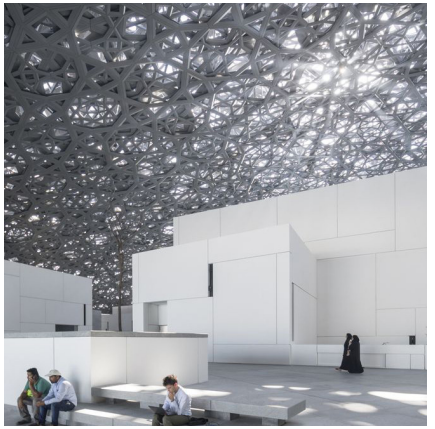




CONCEPT DRIVERS

CONCEPT DRIVERS





TERRAIN

terrain

using terrain
ranging from +32
to +42 meters

complex projects

CONTEXT

context

responding to the
built environment
context

complex projects

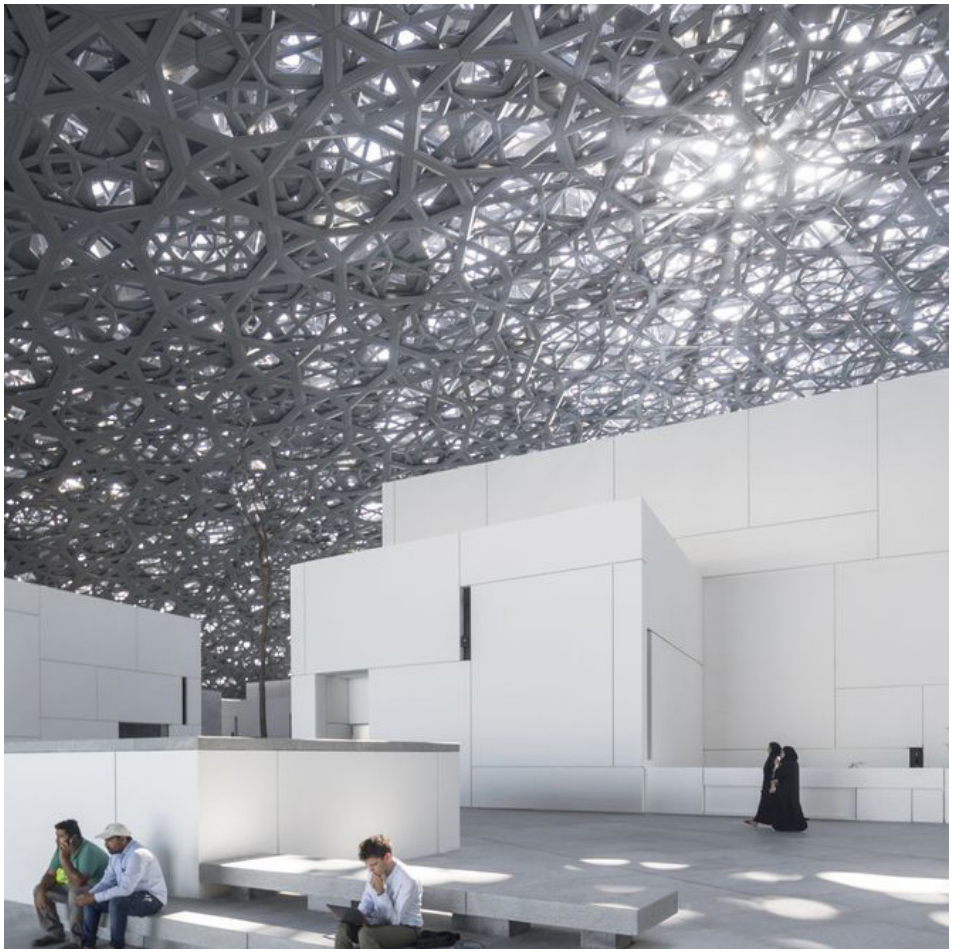
FLOWS

flows

separating various
public and logistic
flows

complex projects

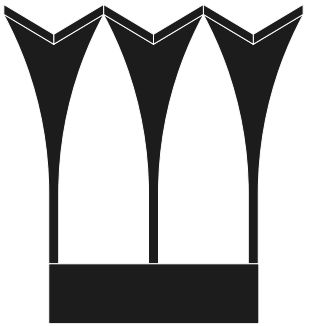
LIGHT



light

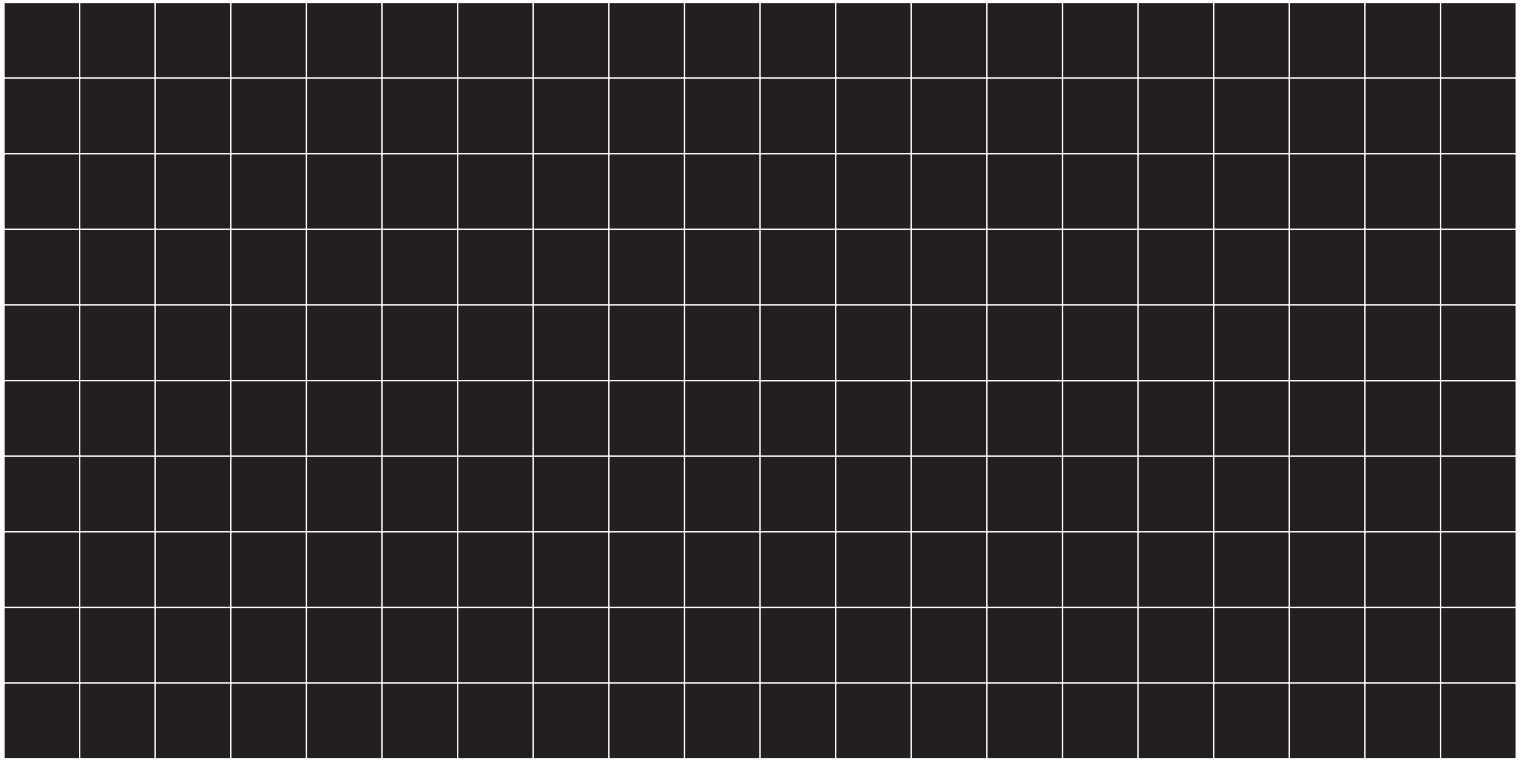
using light and
shade to create
atmosphere

complex projects



GRID

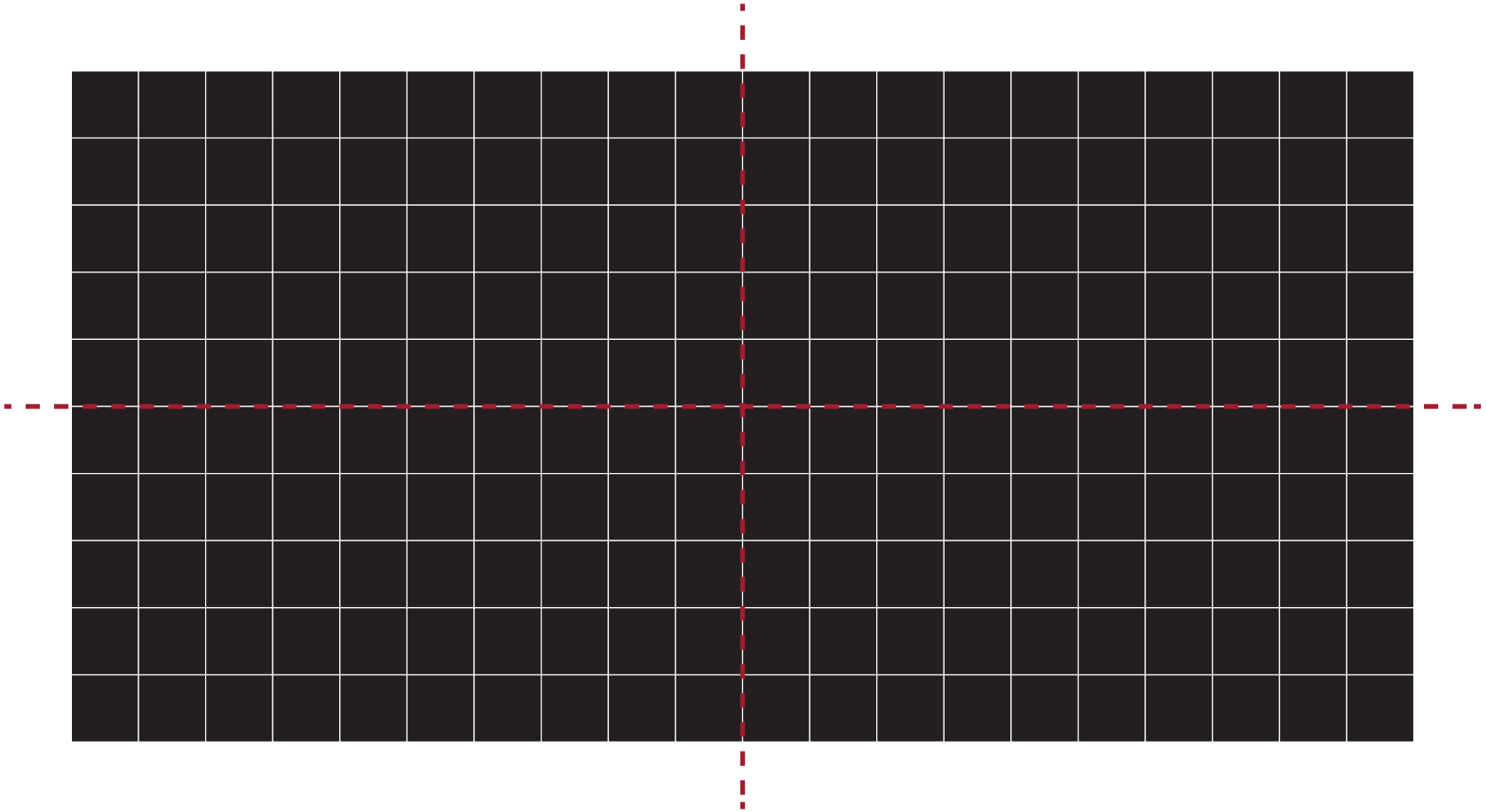
PROGRAM



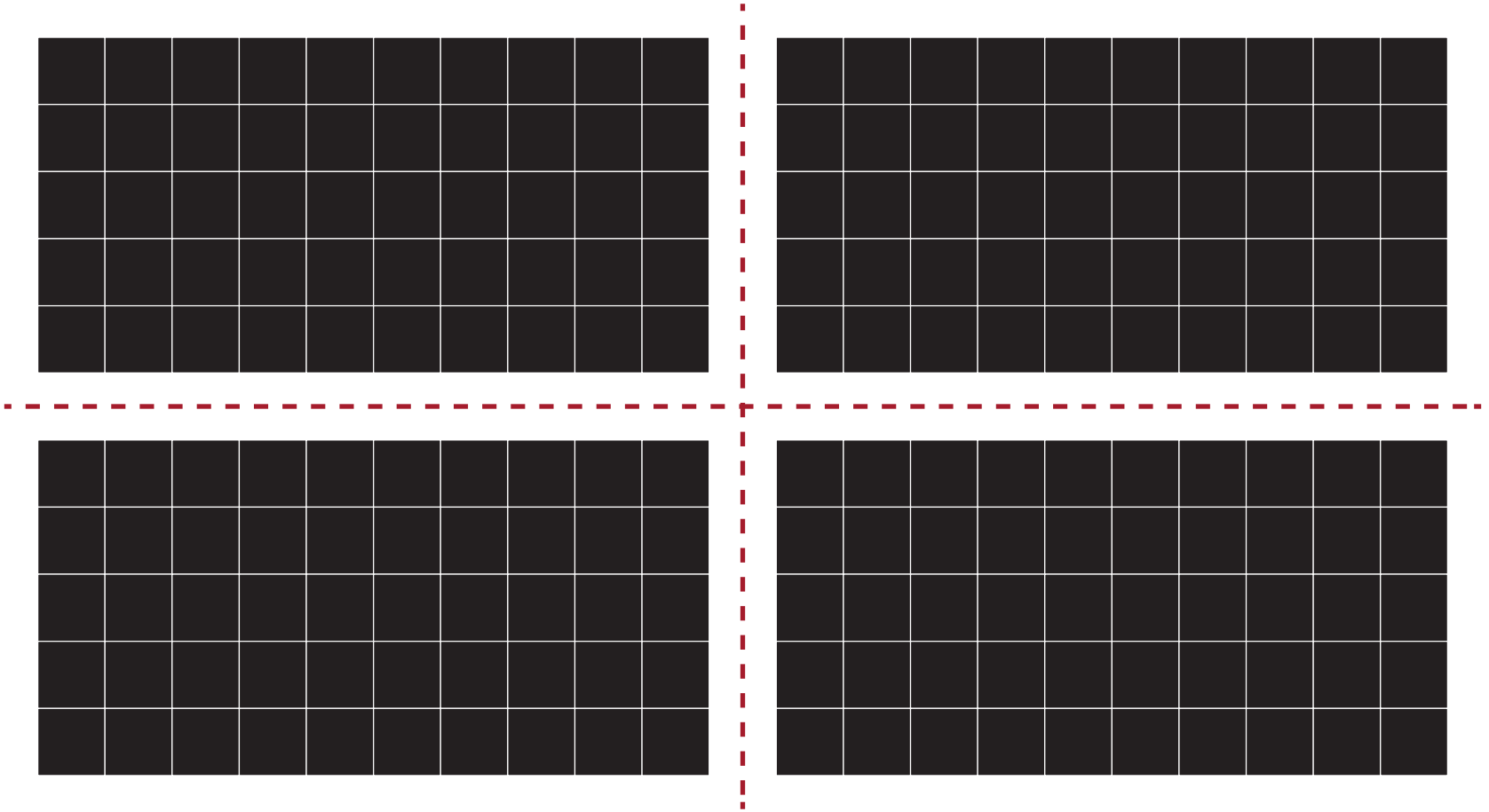
20 000 square
meters

complex projects

CUT



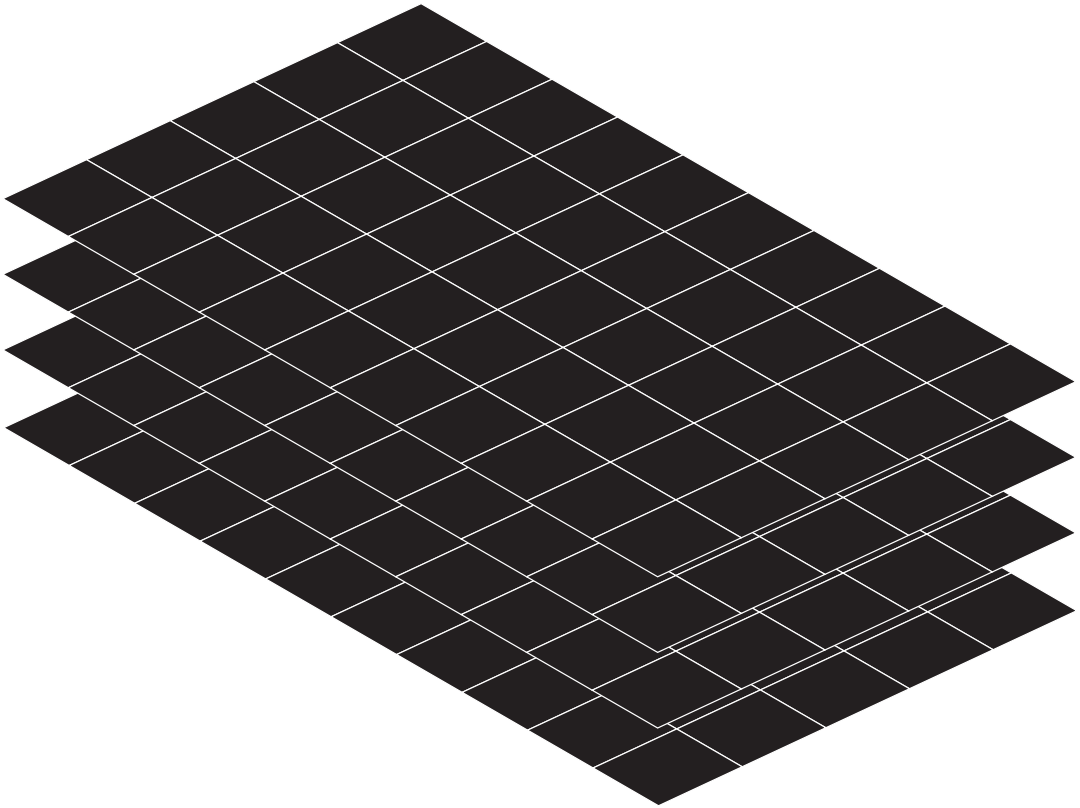
PARTS



20 000 square
meters

complex projects

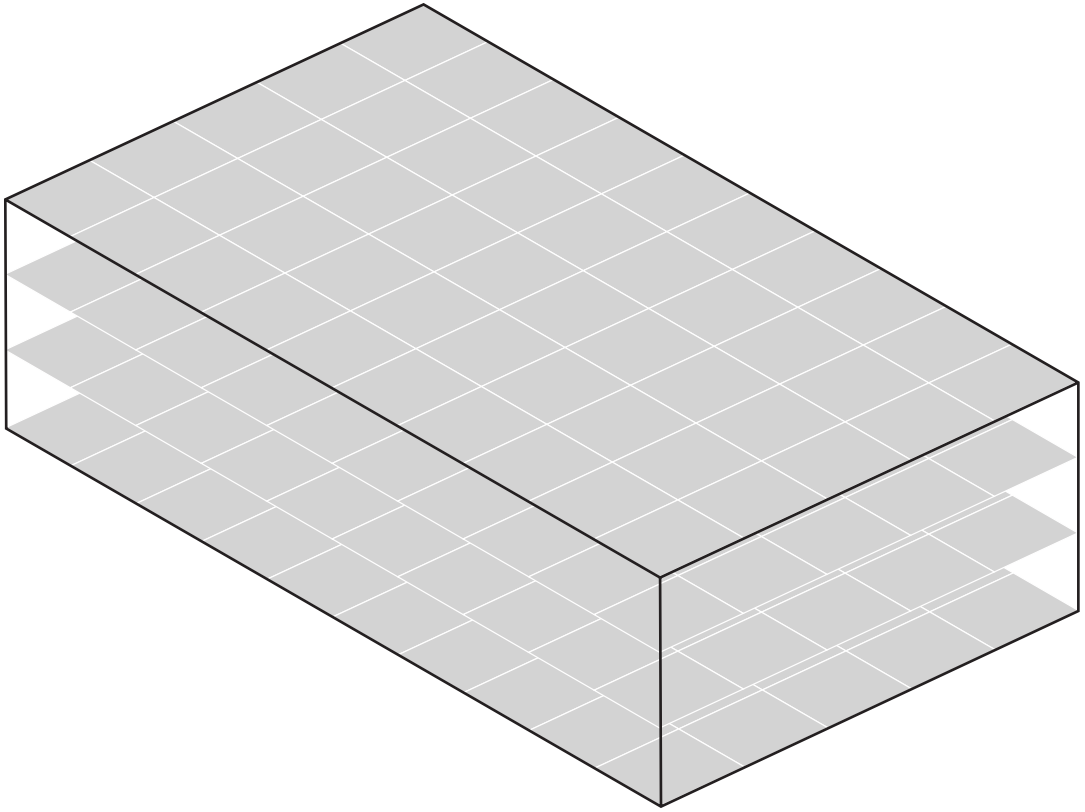
STACK



20 000 square
meters

complex projects

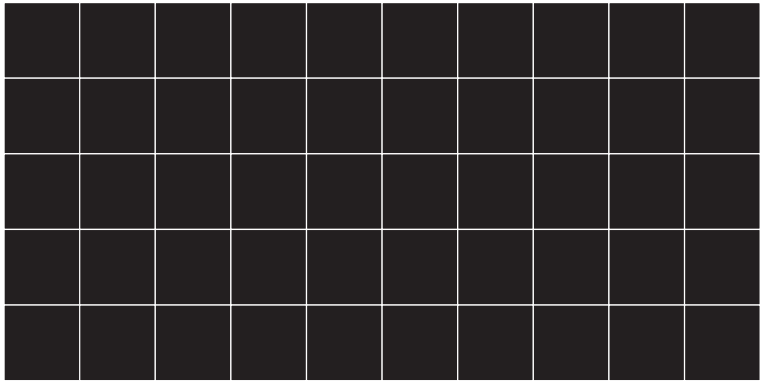
MASS



20 000 square
meters

complex projects

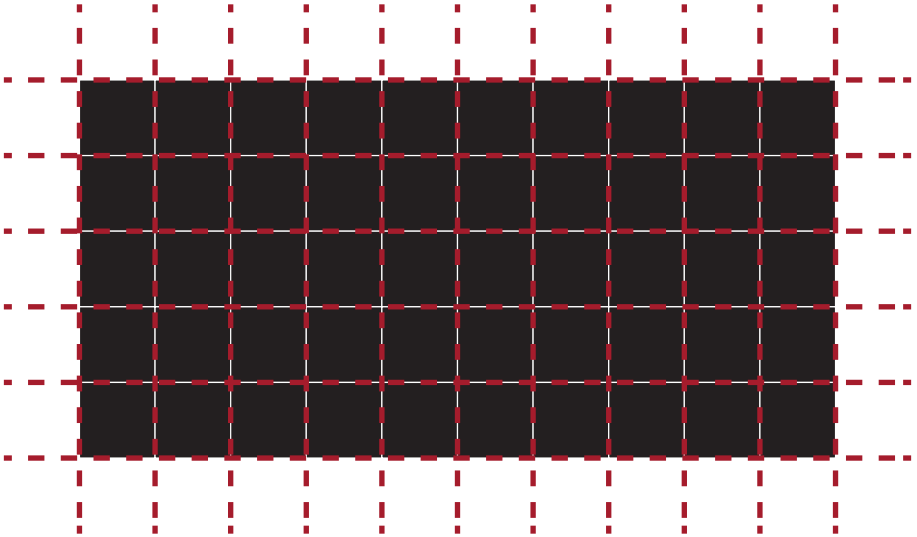
PLAN



5 000 square
meters

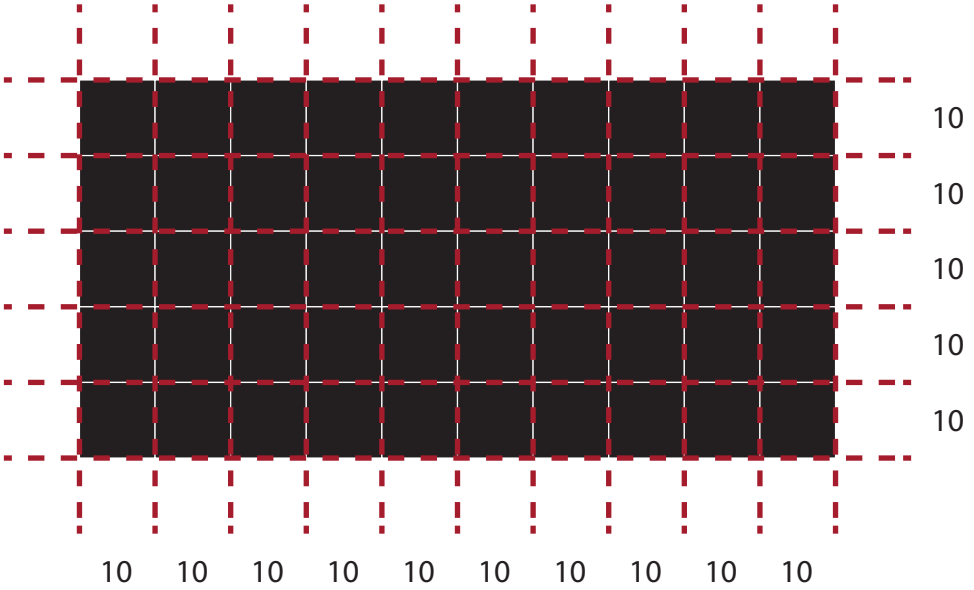
complex projects

GRID



5 000 square
meters

DIMENSION



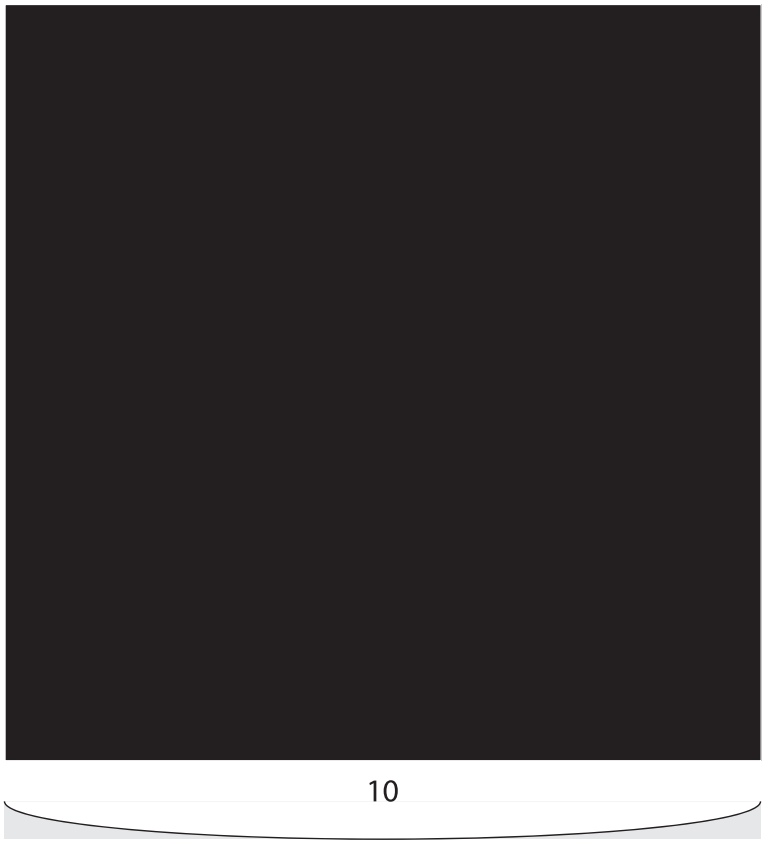
5 000 square
meters

UNIT

100 square
meters

complex projects

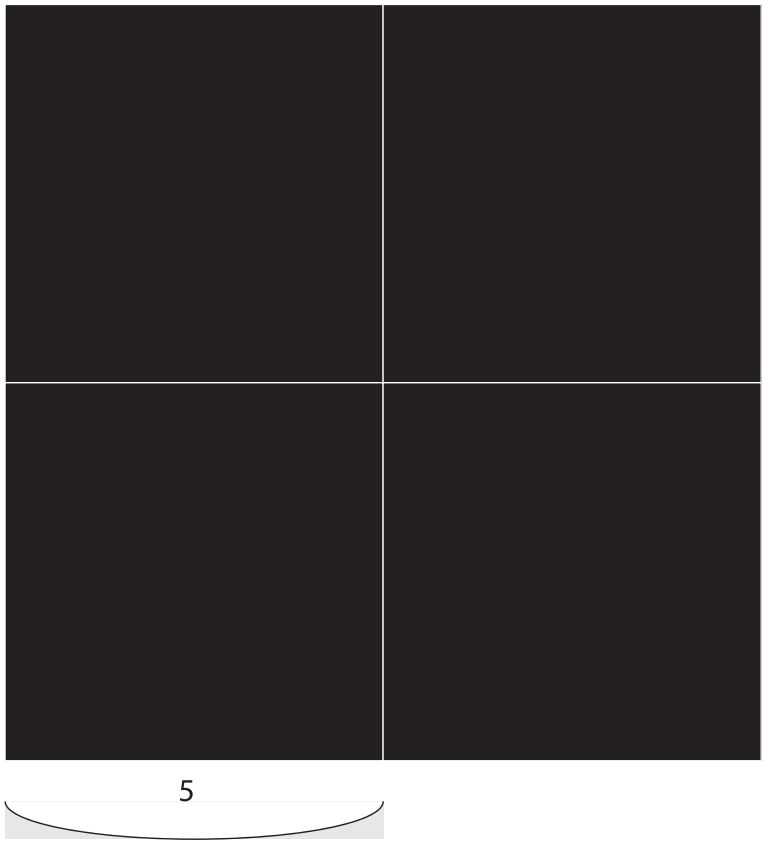
UNIT



100 square
meters

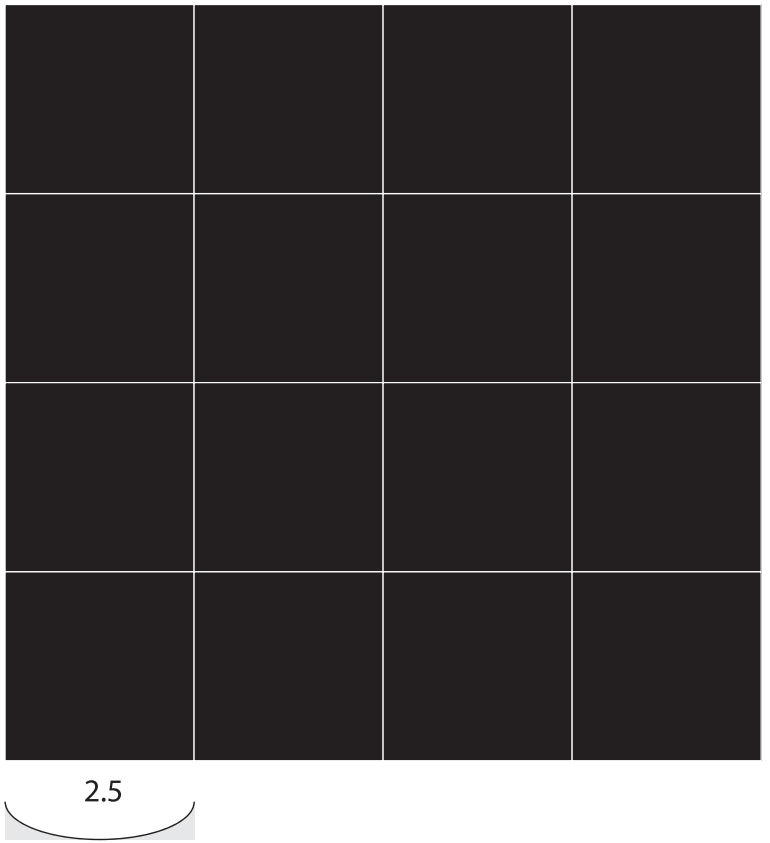
complex projects

DIVISION / 2



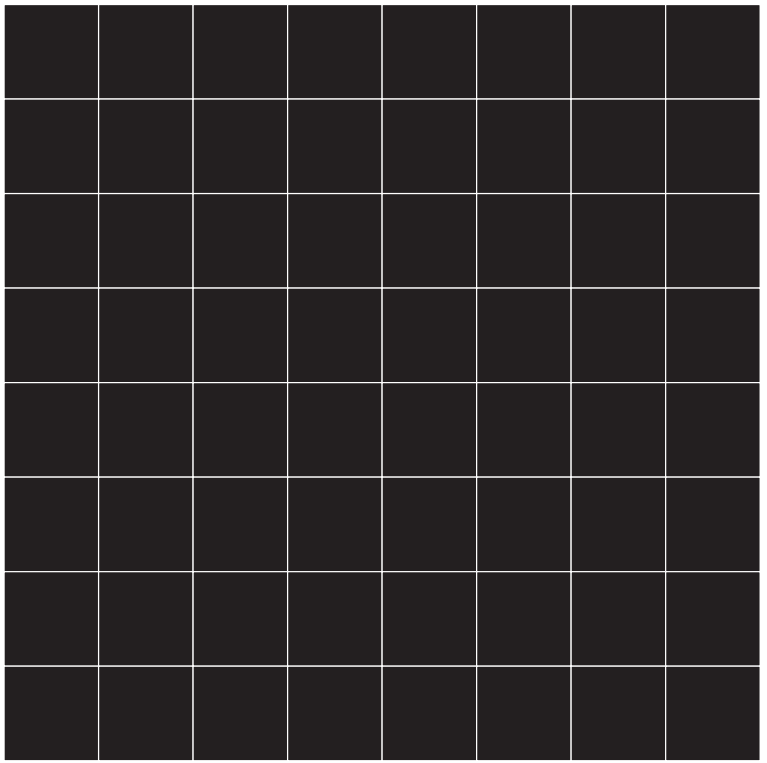
100 square
meters

DIVISION / 2



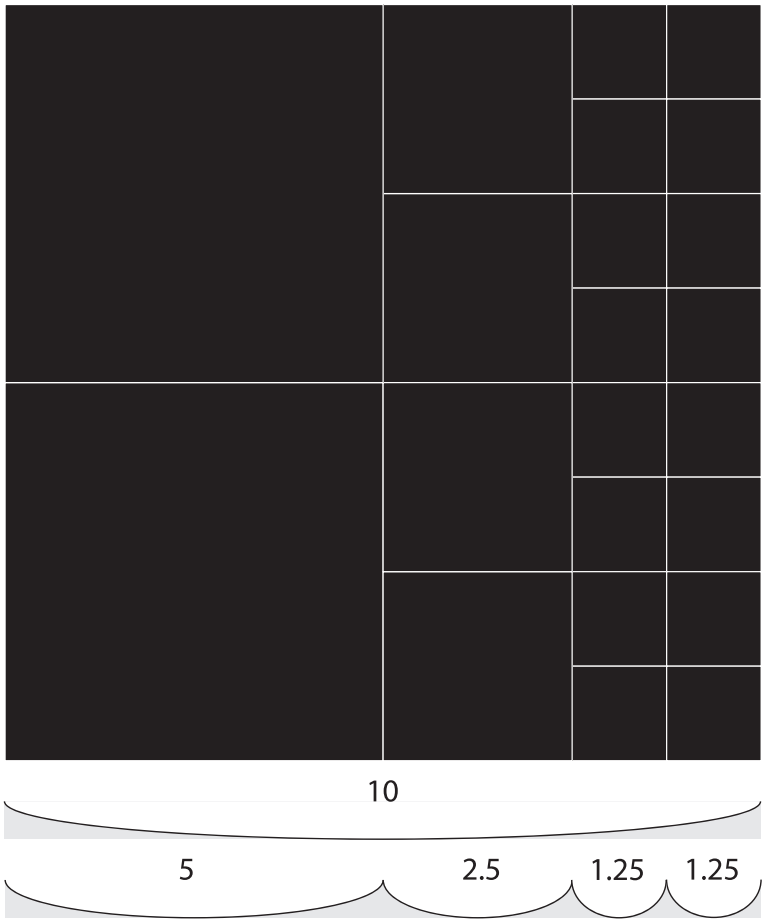
100 square
meters

DIVISION / 2



100 square
meters

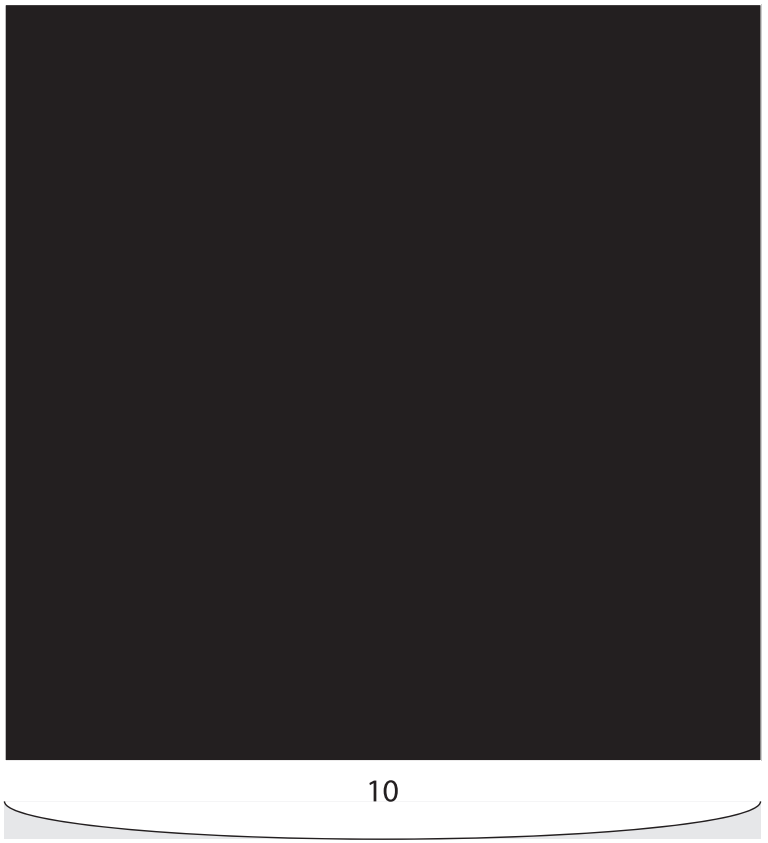
SYSTEM 1



100 square
meters

complex projects

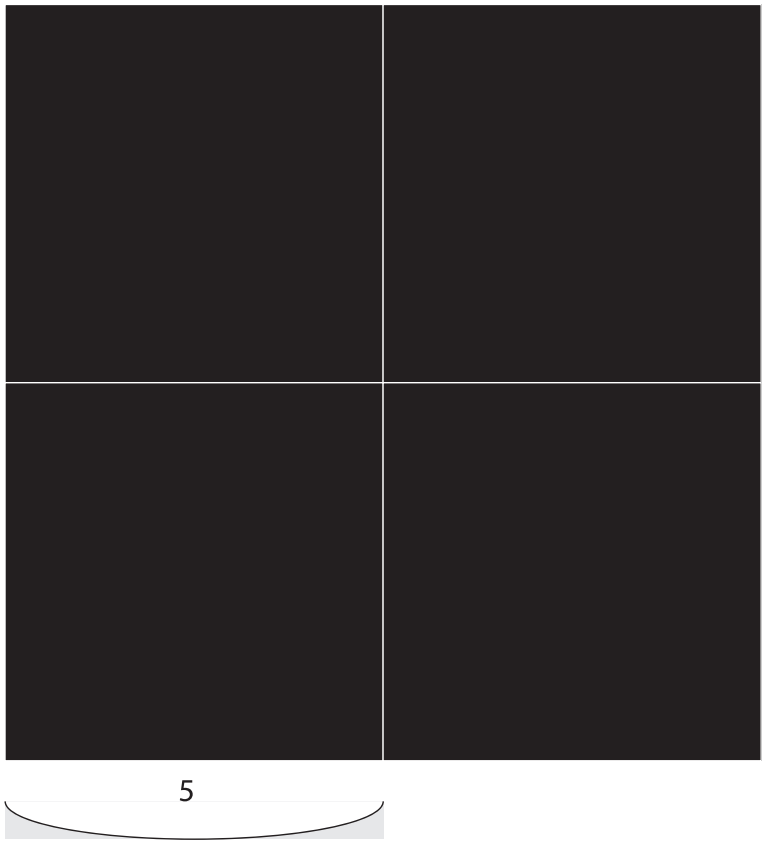
UNIT



100 square
meters

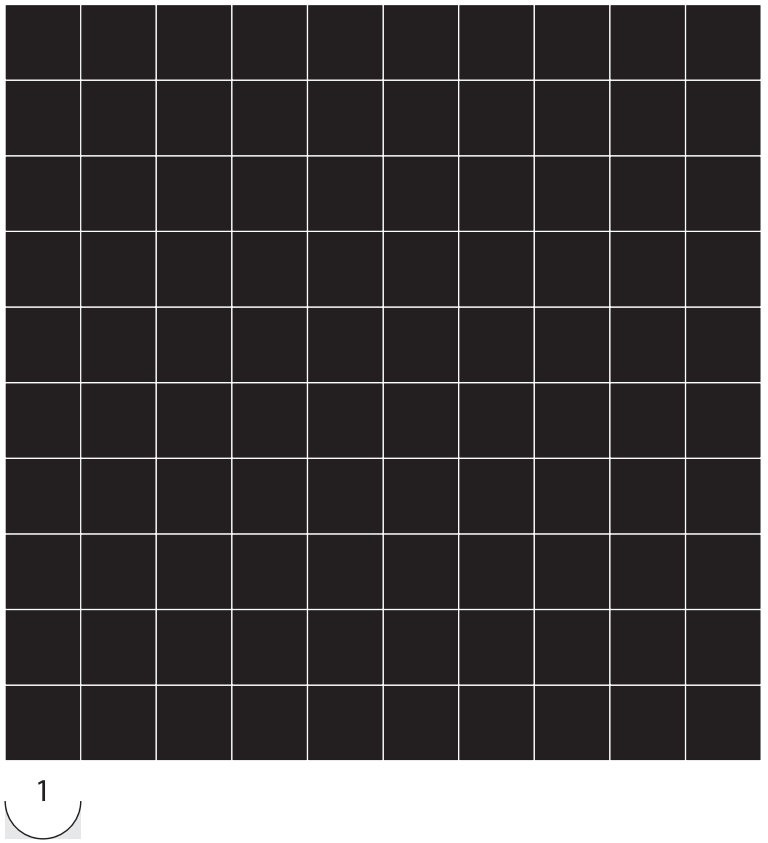
complex projects

DIVISION / 2



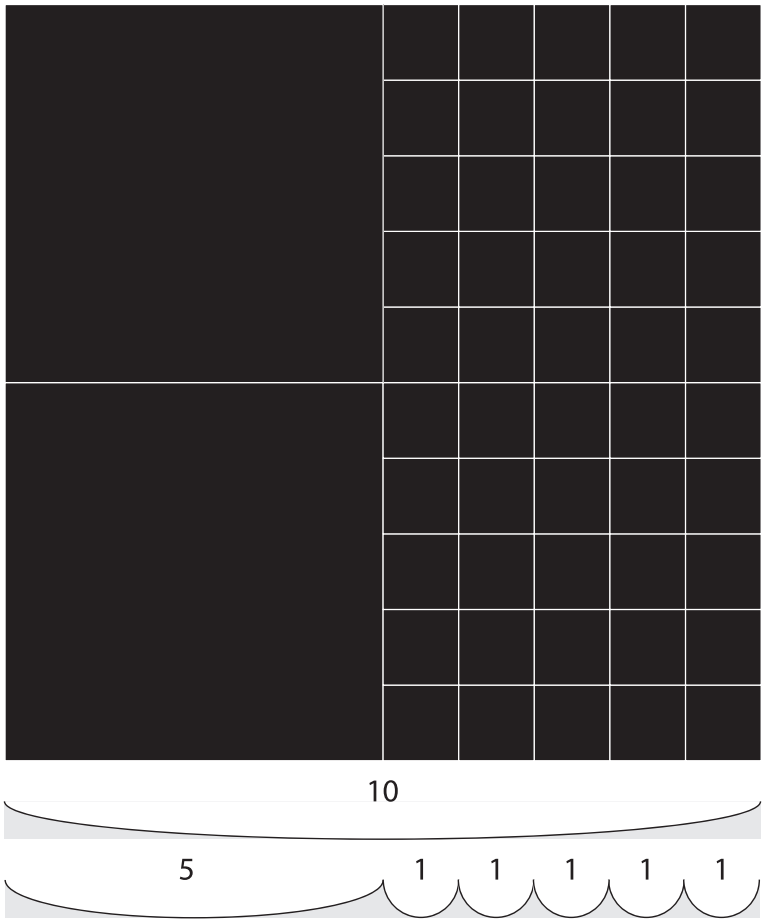
100 square
meters

DIVISION / 5



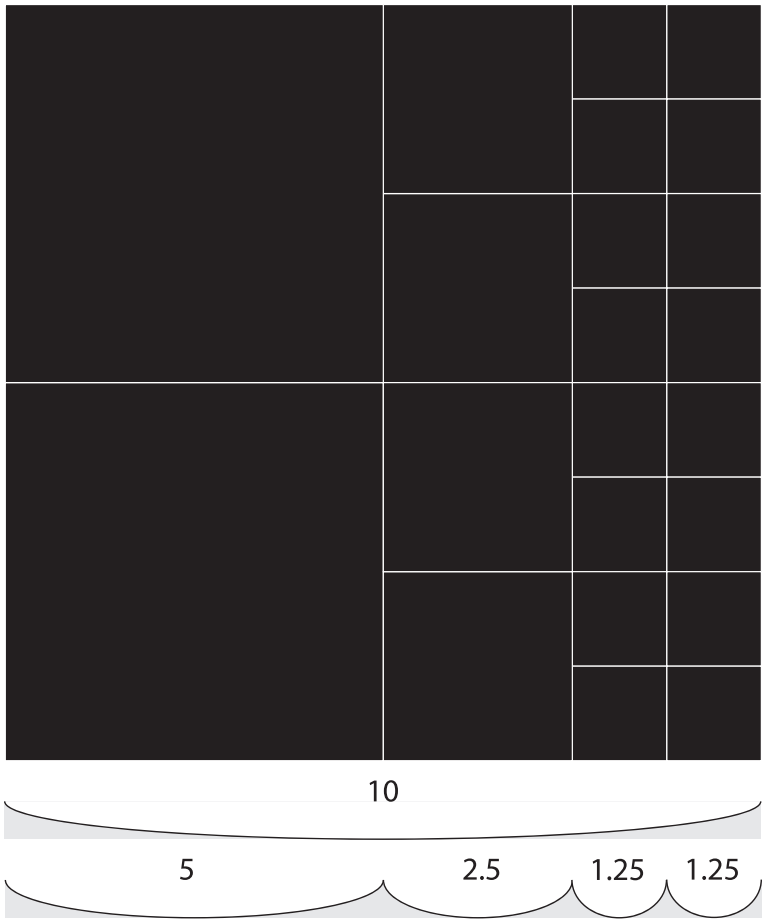
100 square
meters

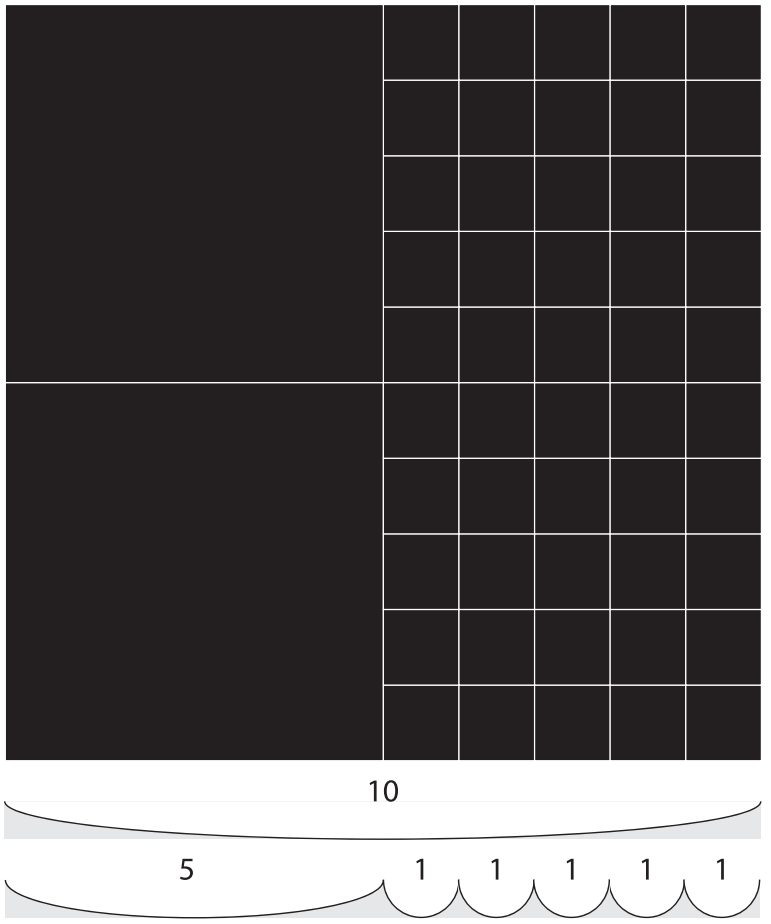
SYSTEM 2



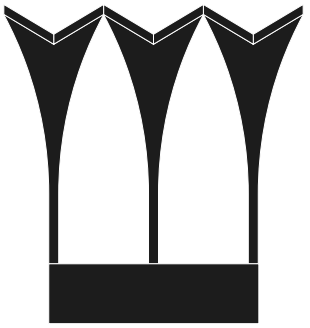
100 square
meters

SYSTEMS



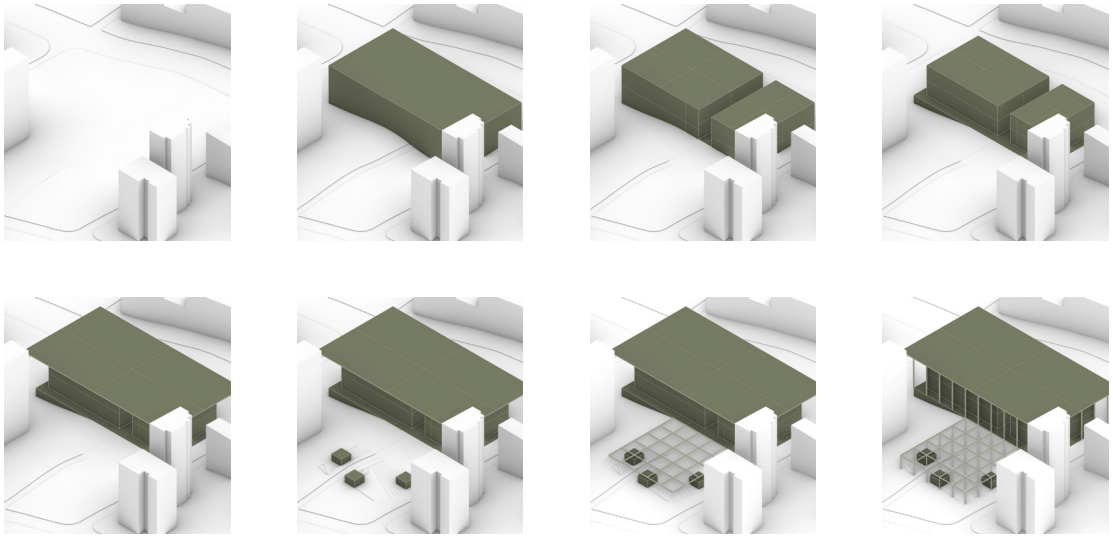


200 square meters

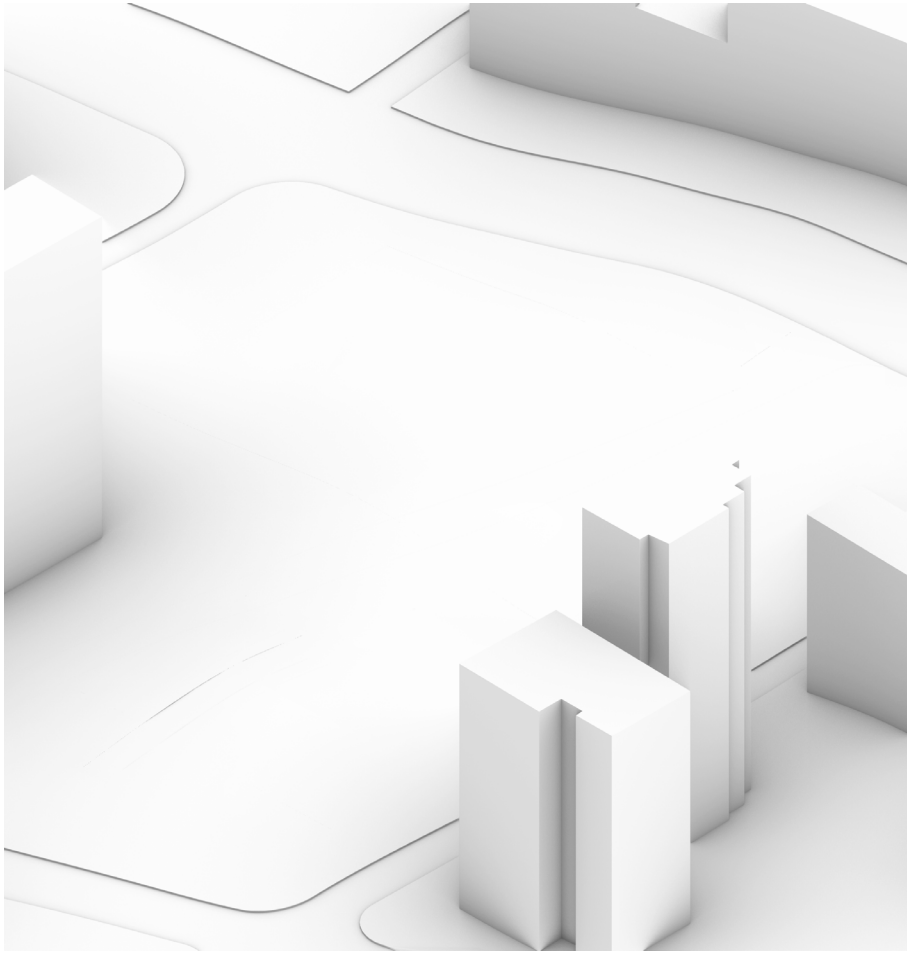


DESIGN CONCEPT

DESIGN CONCEPT



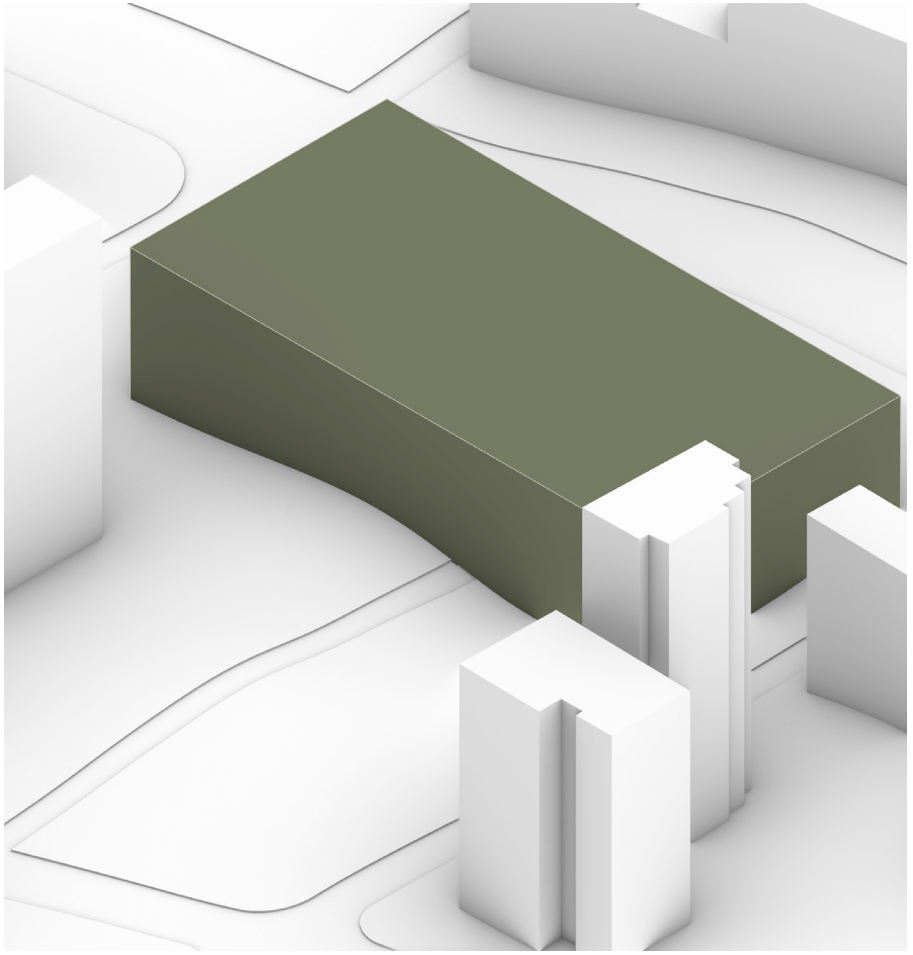
DESIGN CONCEPT



site

terrain ranging from +32 to +42 m

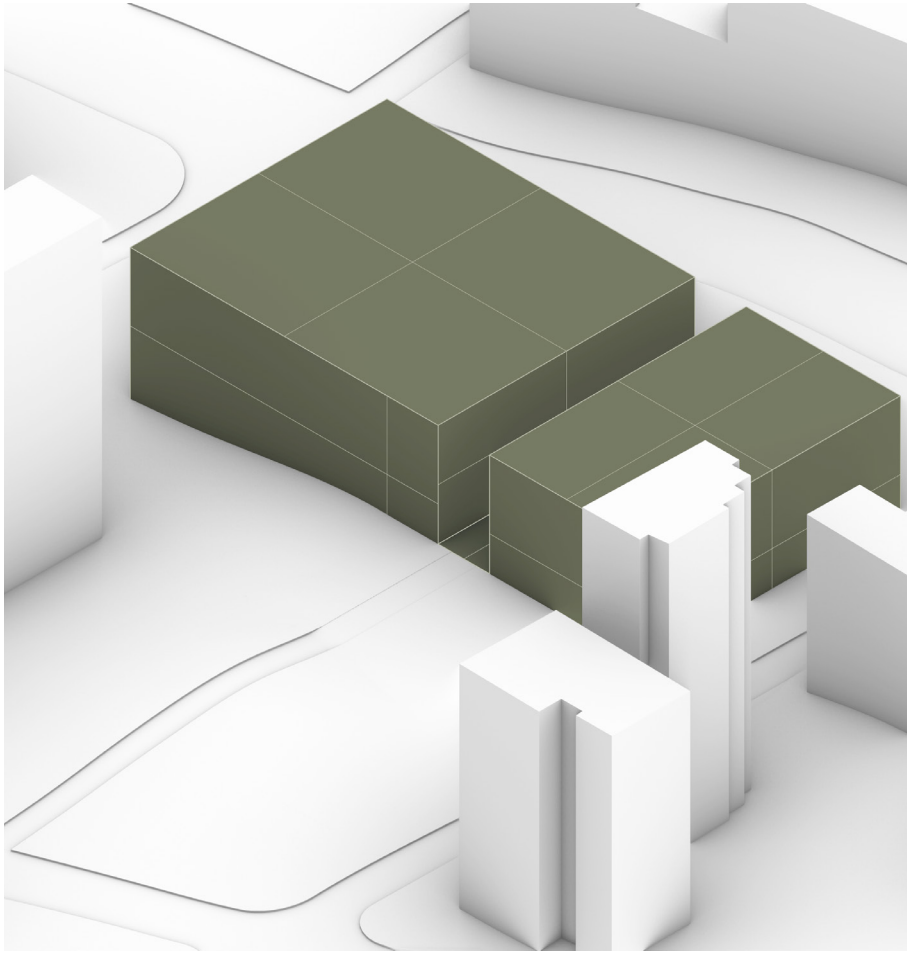
DESIGN CONCEPT



mass

mass emerging from terrain on north side of plot

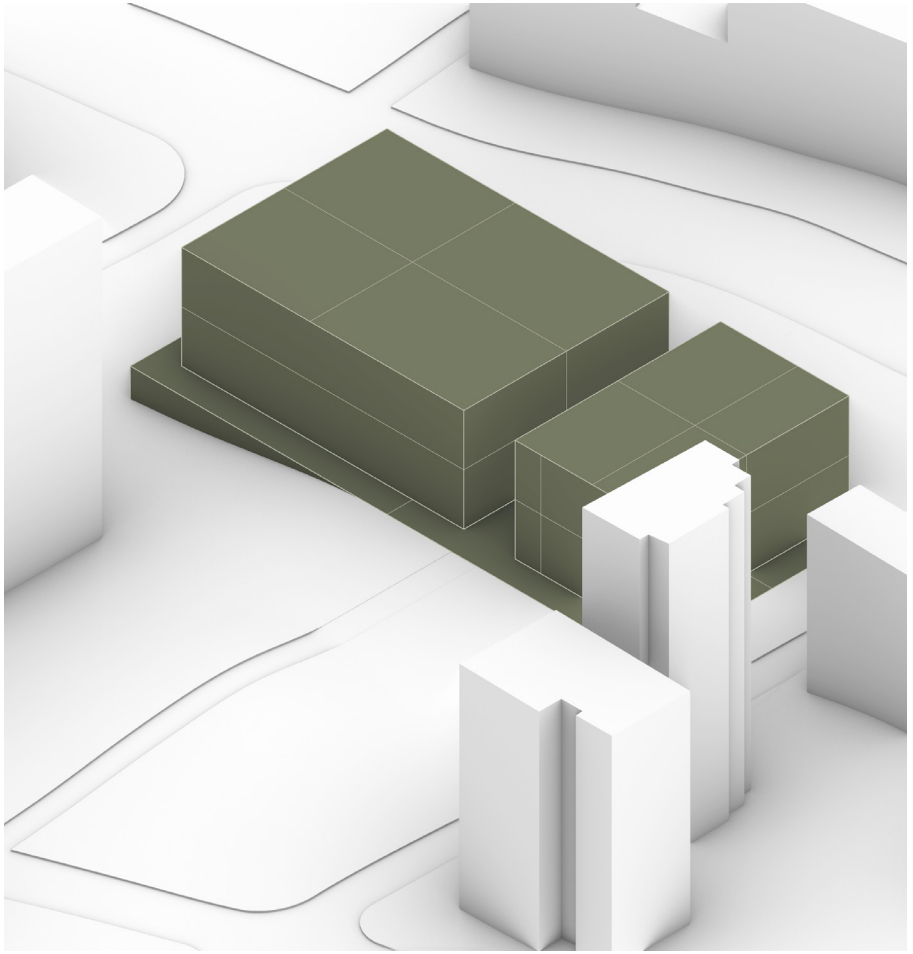
DESIGN CONCEPT



street

street intersects the mass, creating a passage

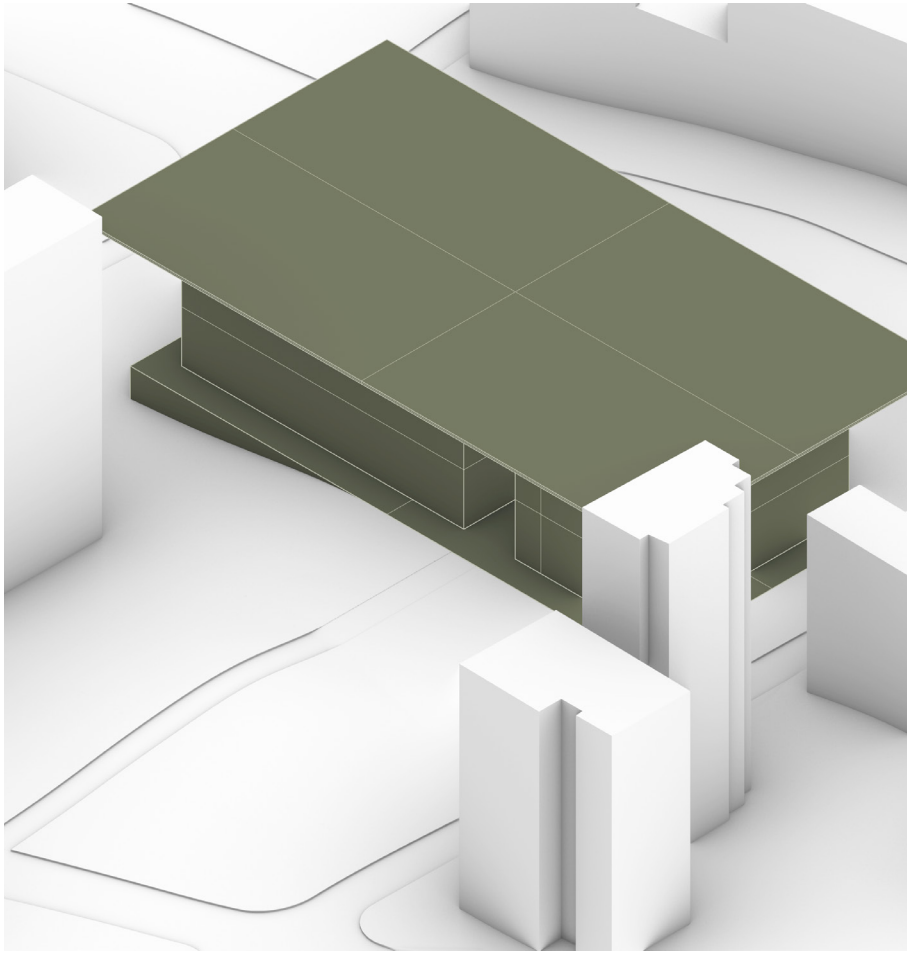
DESIGN CONCEPT



mass setback

setback creates transition space and a base

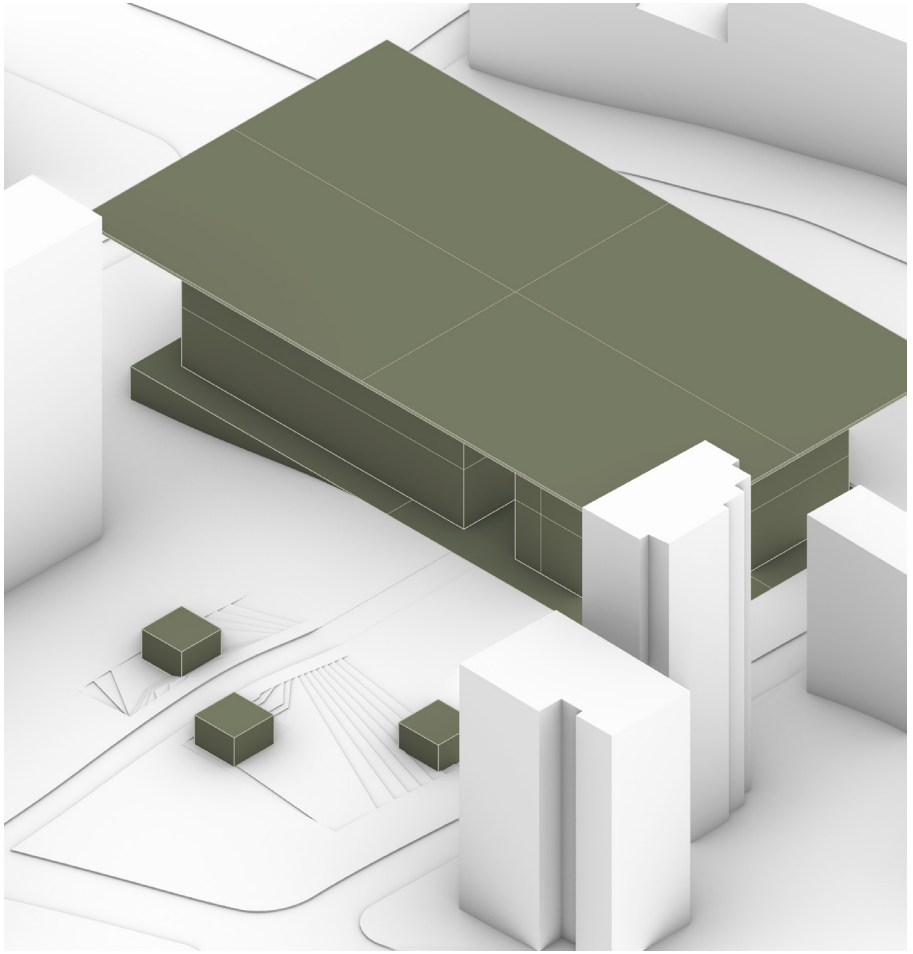
DESIGN CONCEPT



canopy

canopy shelters the mass from sun

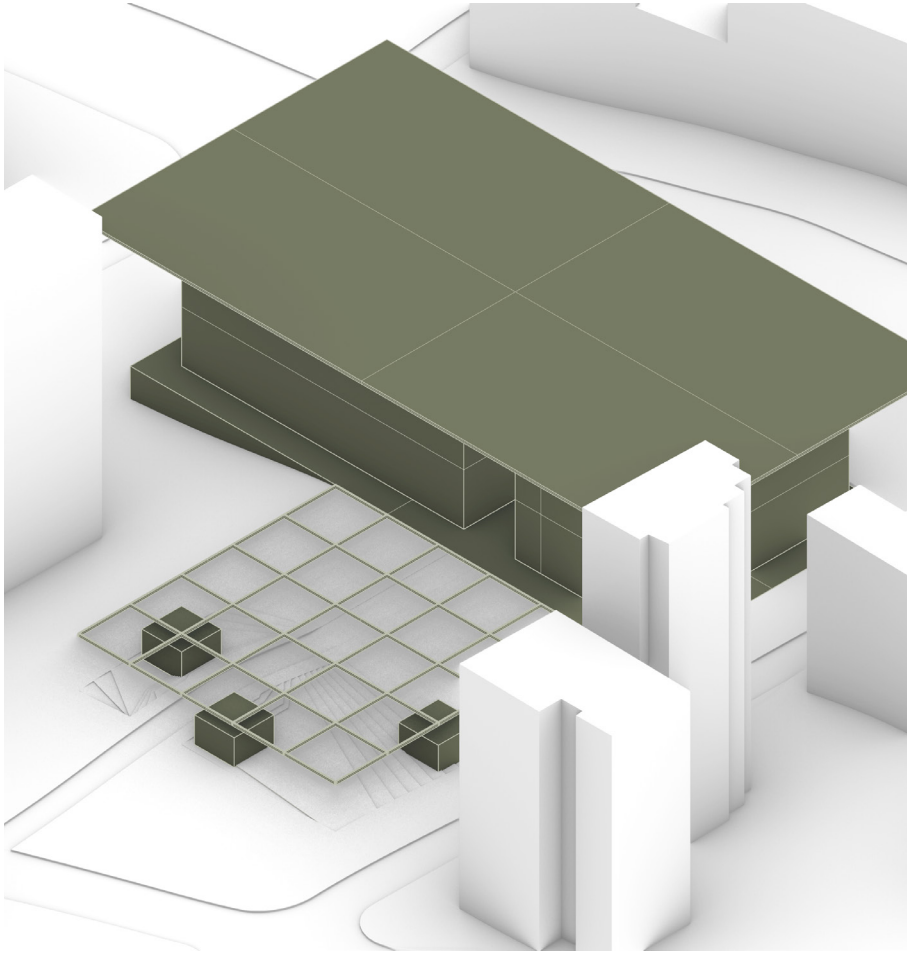
DESIGN CONCEPT



mass

emphasizing the contrast between the formal mass
and informal open space with pavillions

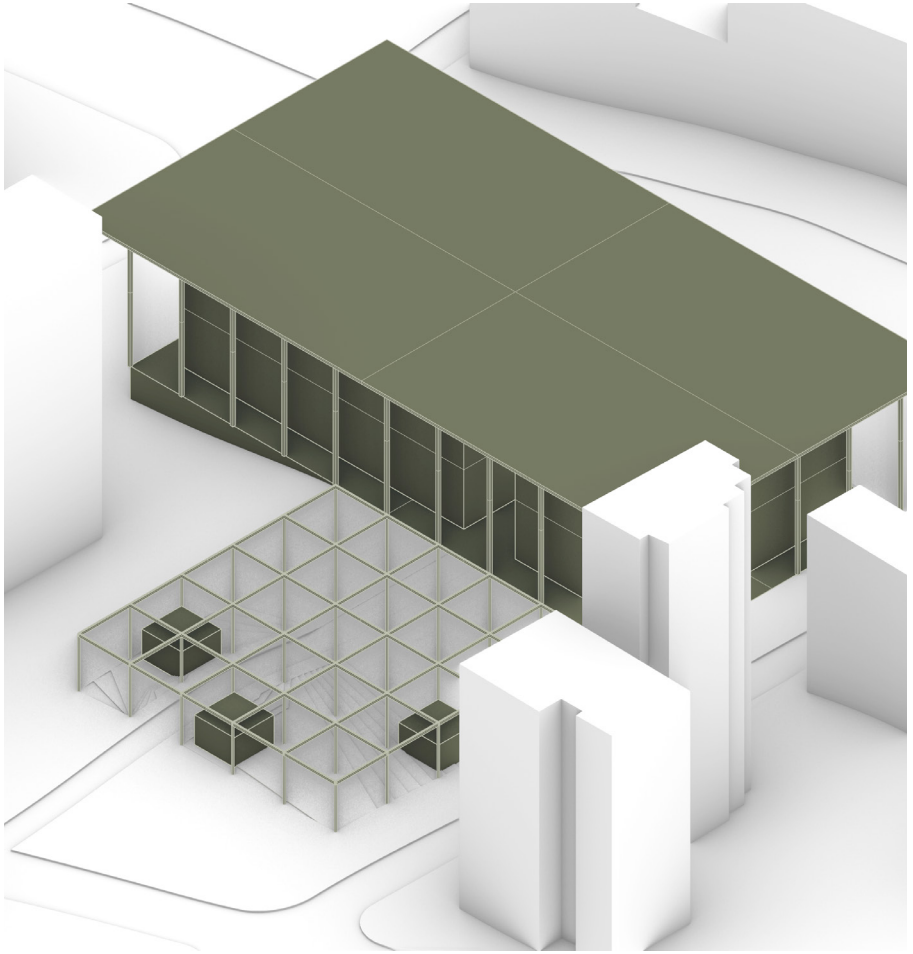
DESIGN CONCEPT



canopy

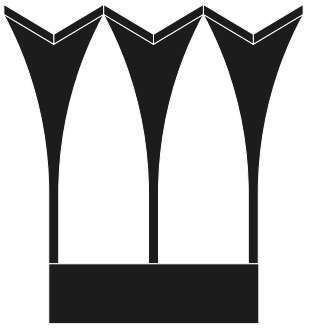
(semi) open canopy interiorizes outdoor

DESIGN CONCEPT



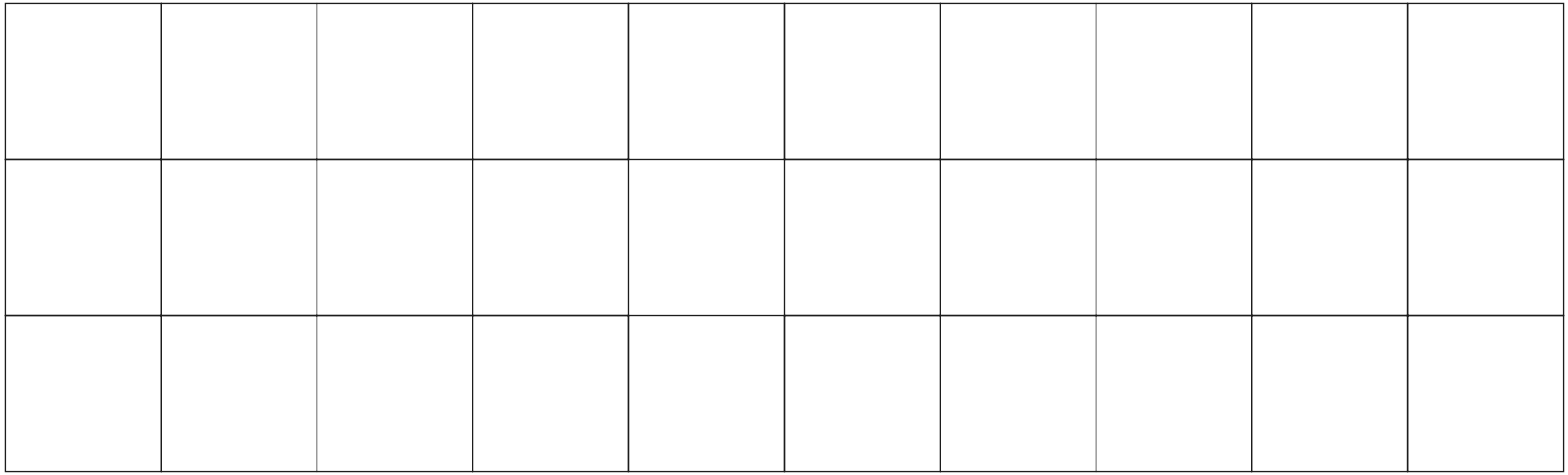
column

columns on grid support the canopy and connect
the formal mass and informal space

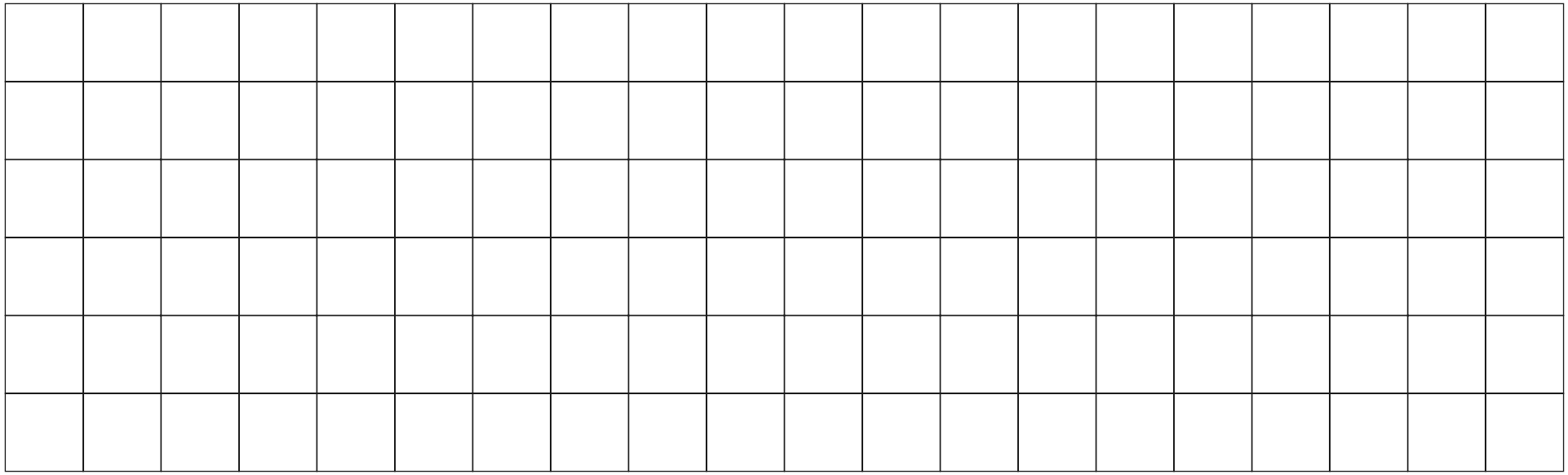


GEOMETRY

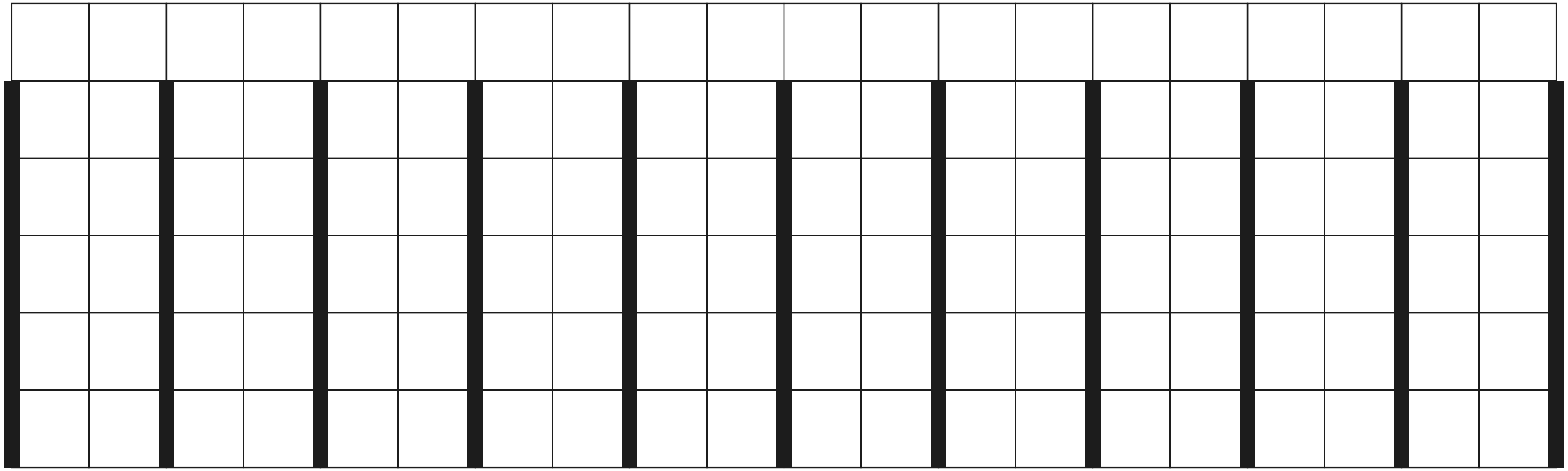
GEOMETRY



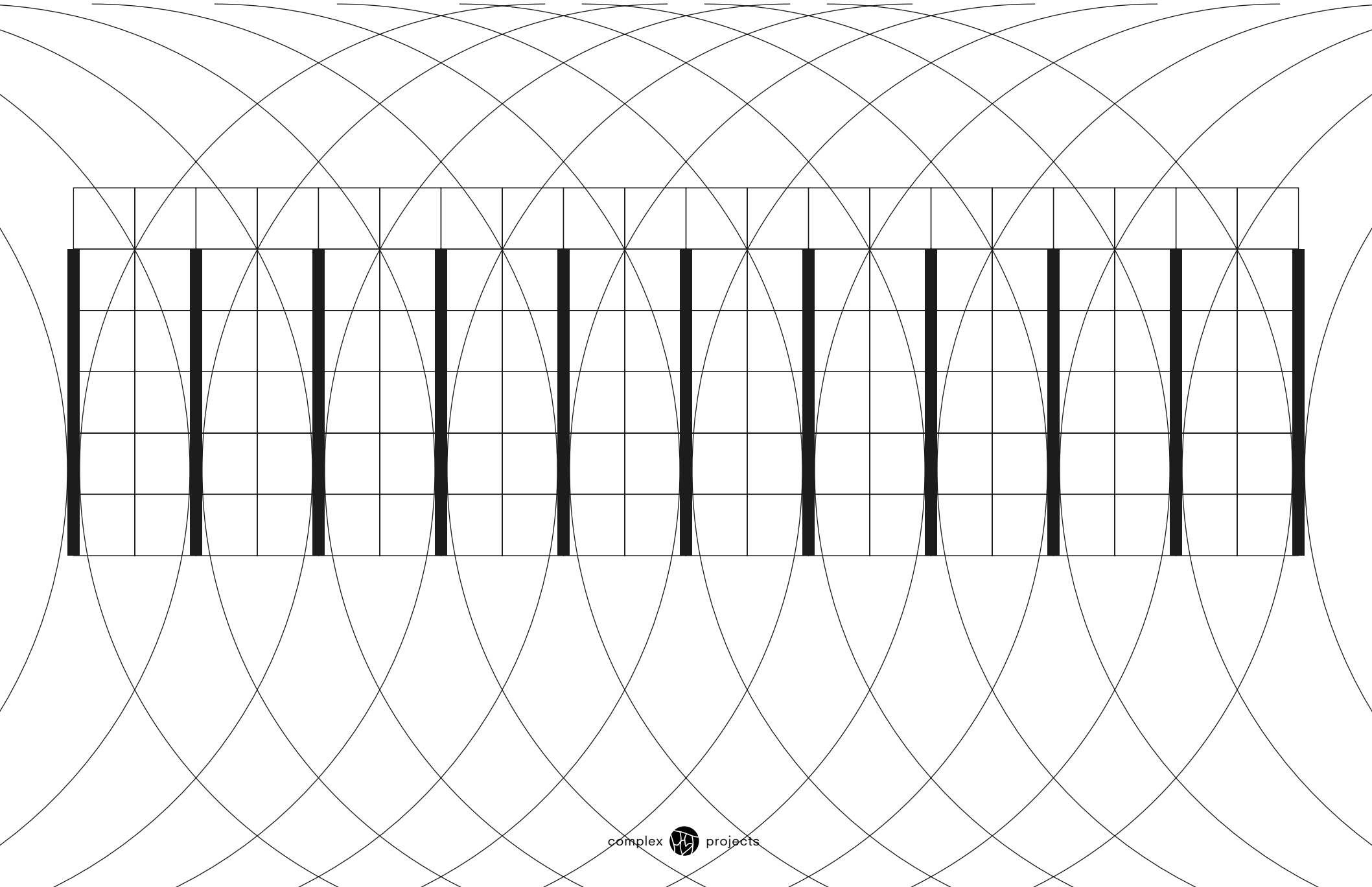
GEOMETRY



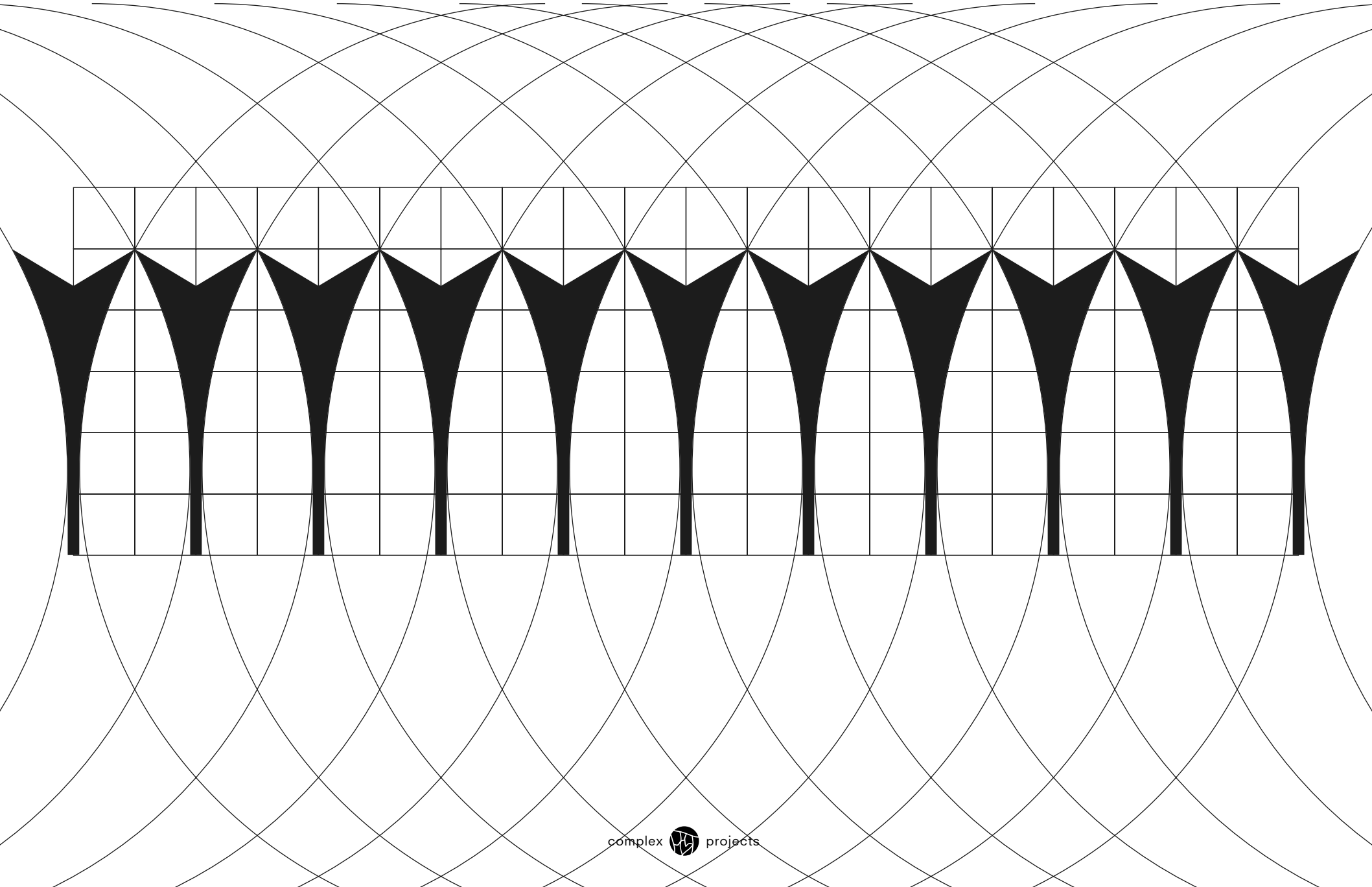
GEOMETRY



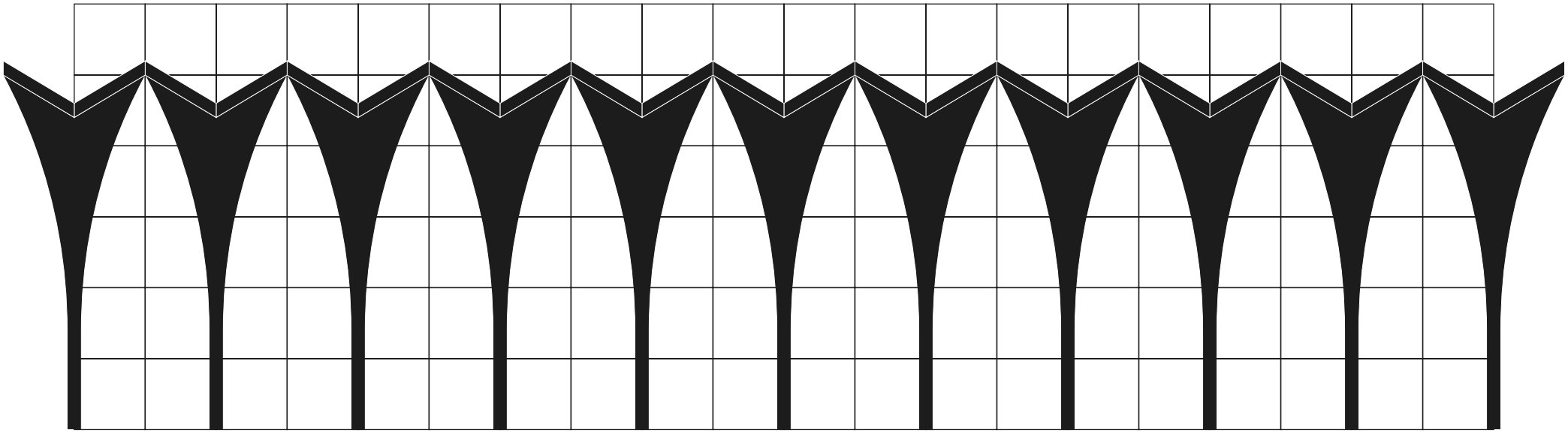
REACHING OUT



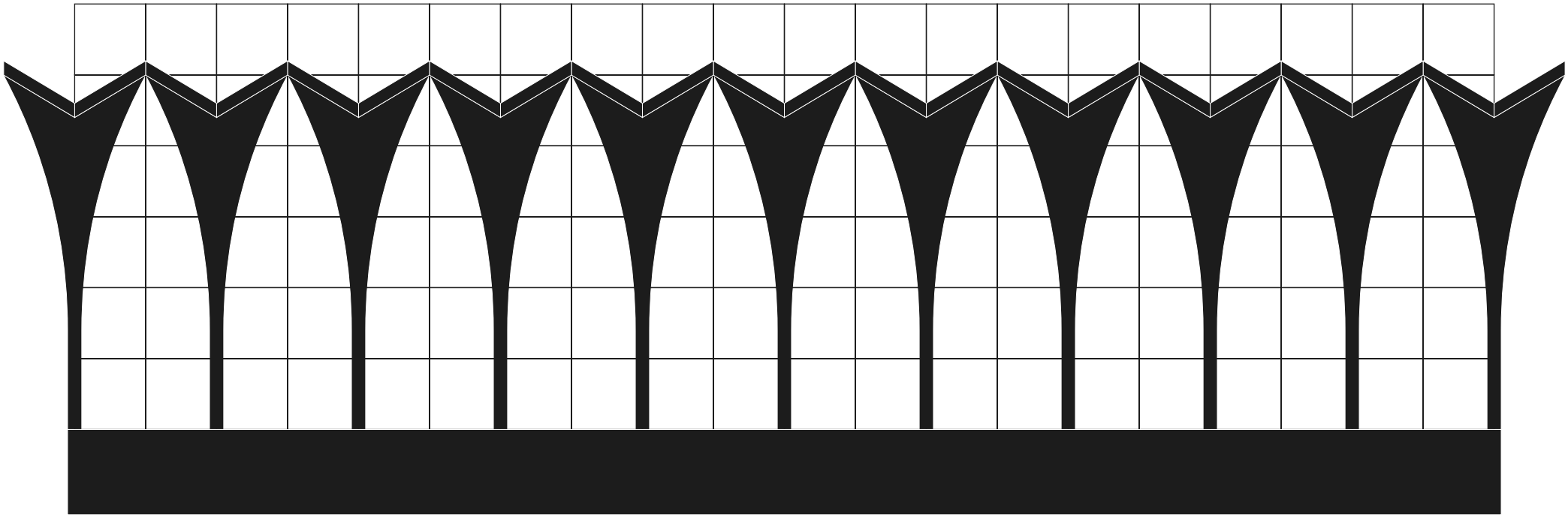
COLUMN



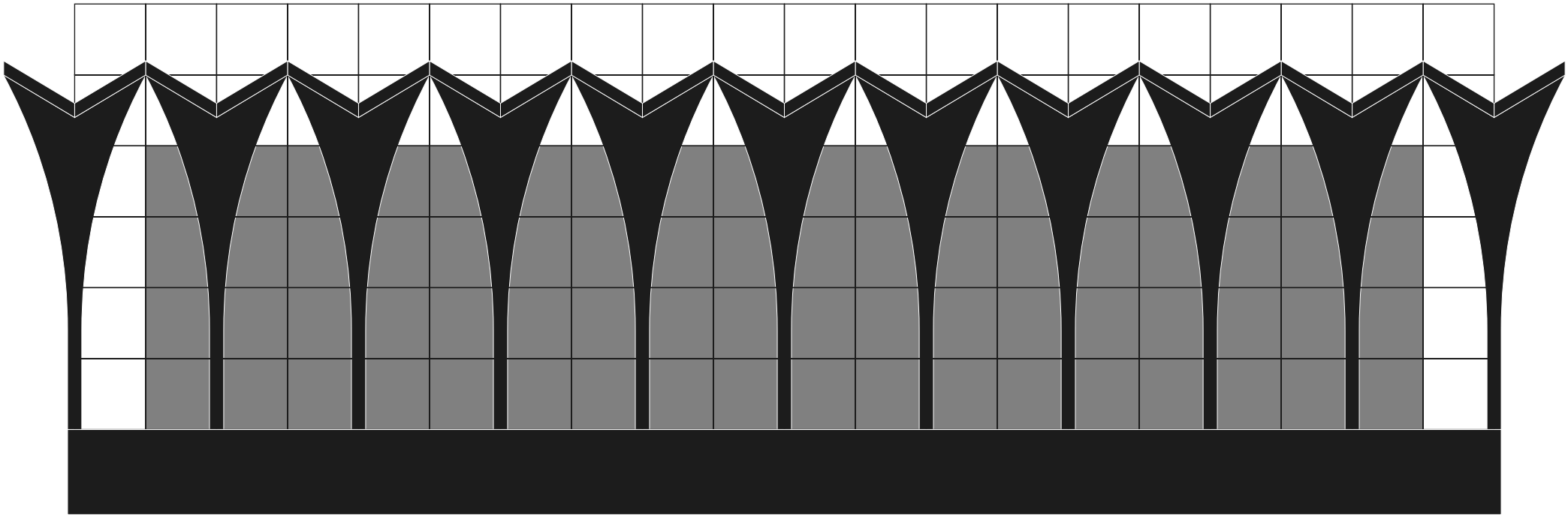
COLUMN AND CANOPY

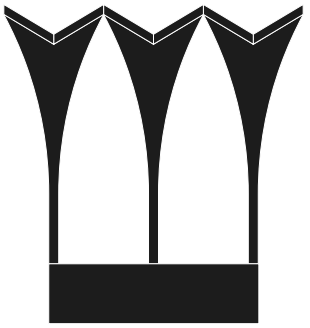


ON A BASE



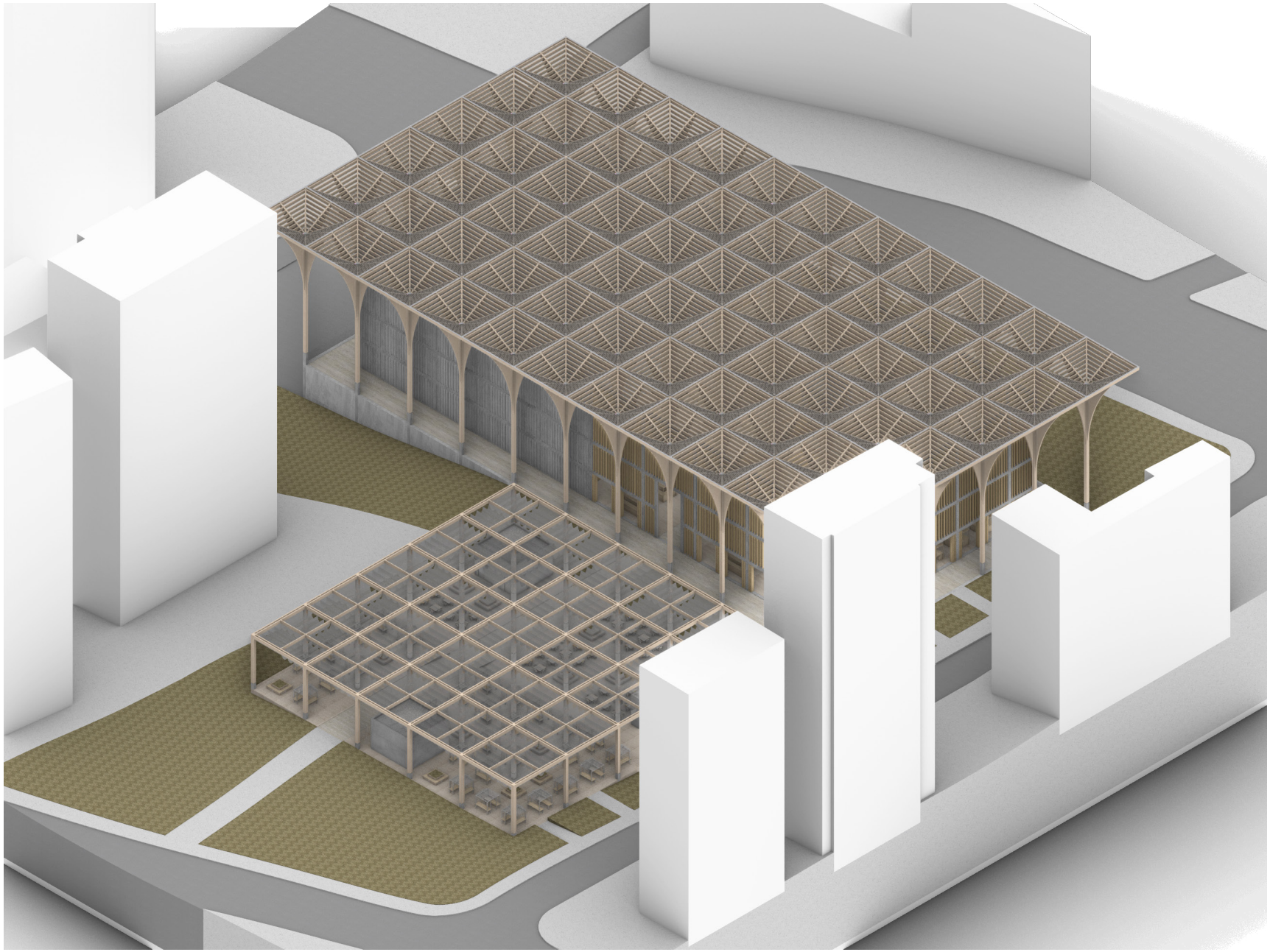
ENVELOPING THE MASS



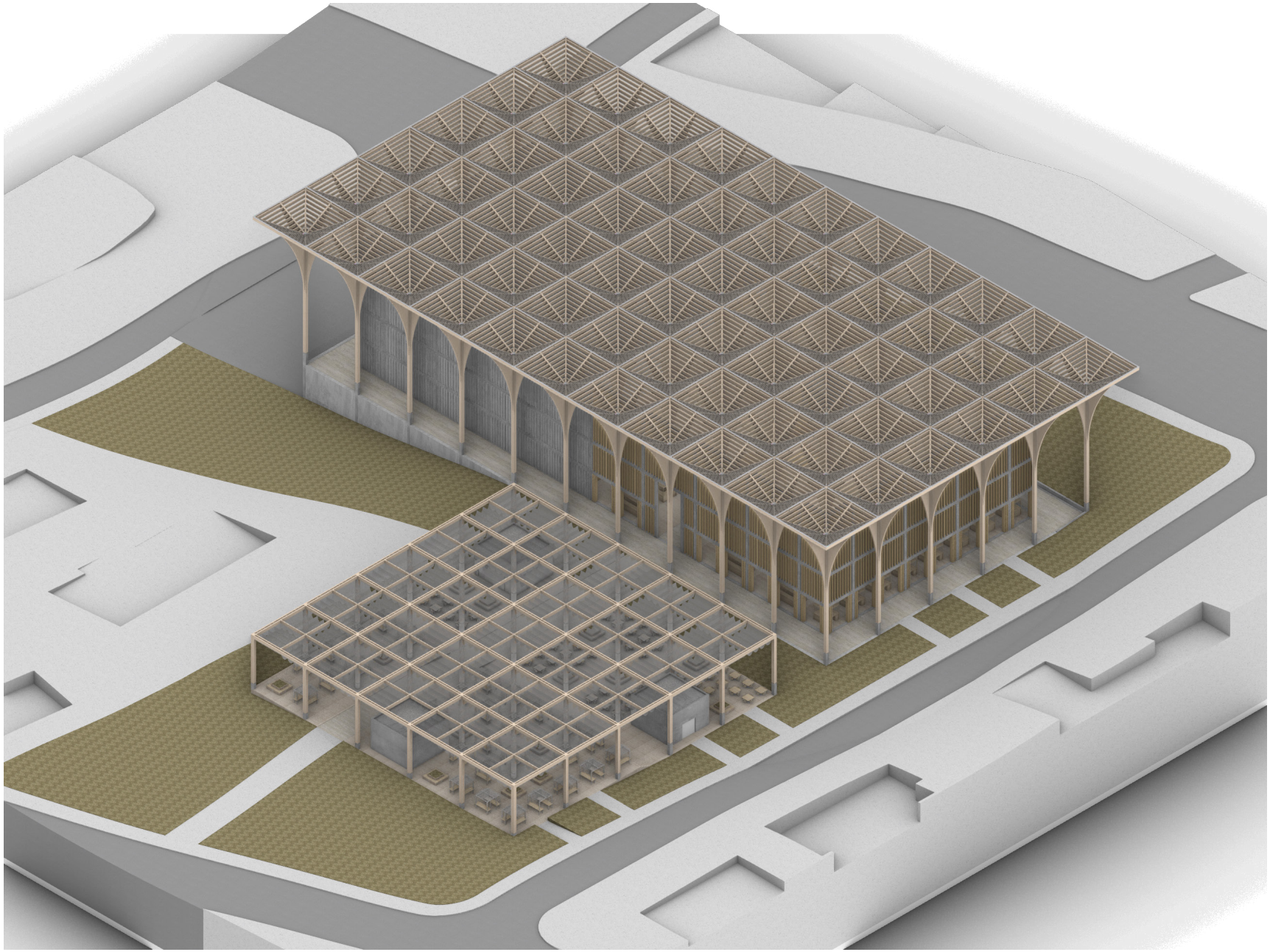


DESIGN

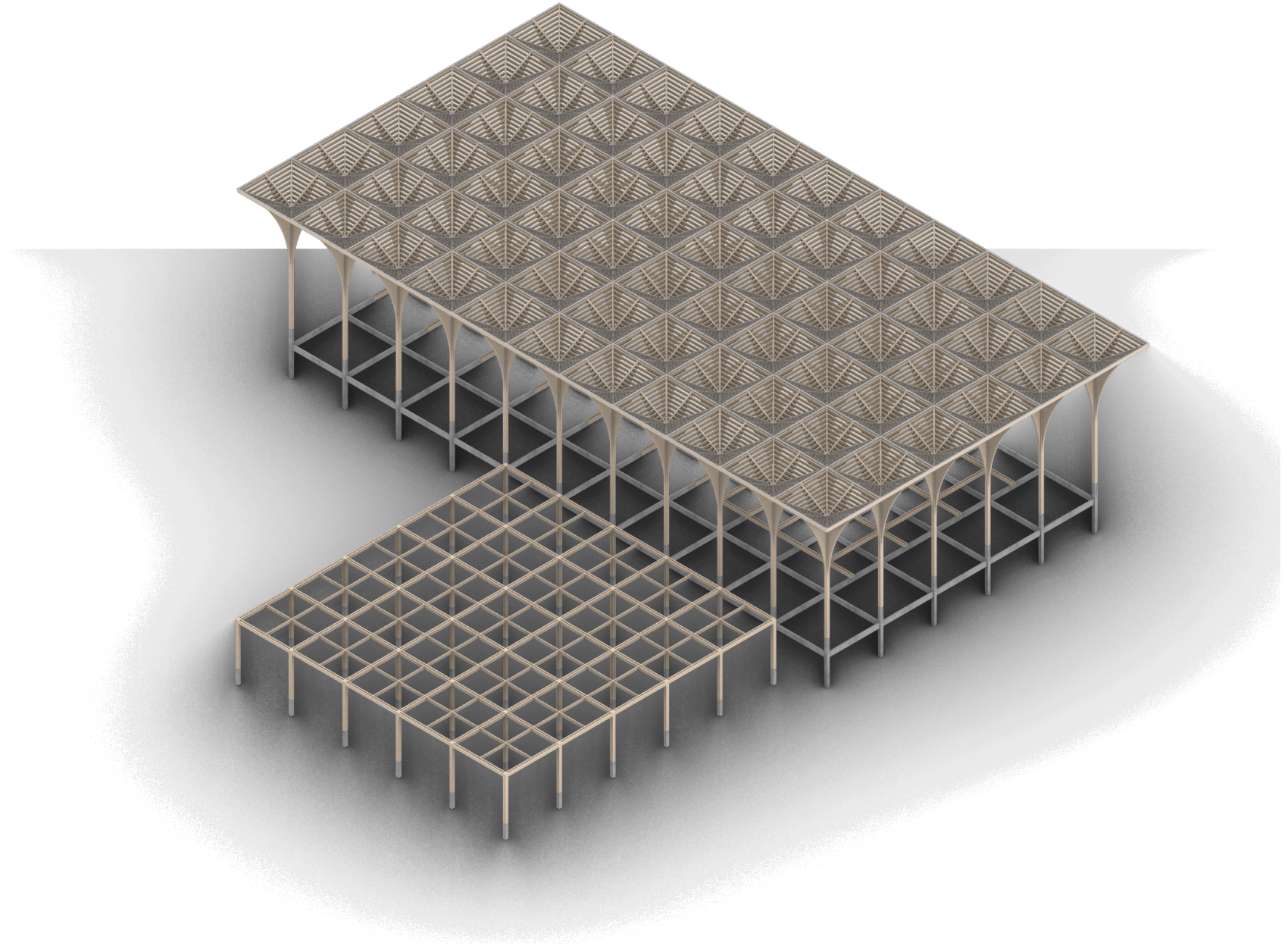
DESIGN



DESIGN



CONSTRUCTION



FORMAL VS. INFORMAL

building mass

- 100 x 50 meter plan surface
  with 10 x 10 meter grid

- columns placed on 66 grid intersections

- columns support 6600 m² canopy
  enveloping the program functions

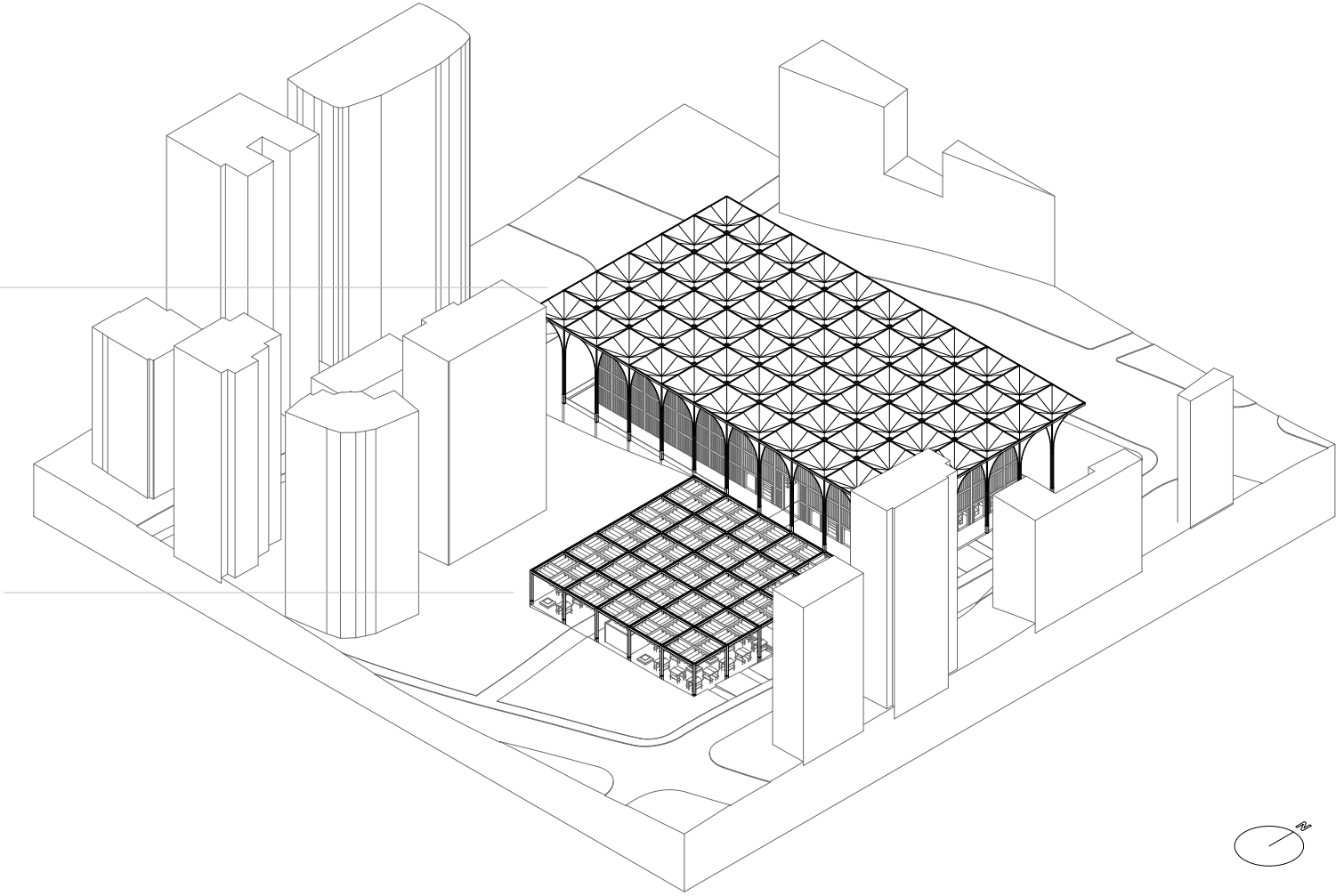
outdoor square

- 50 x 50 meter plan surface
  with 10 x 10 meter grid

- columns placed on 36 grid intersections

- informal 2500 m² pergola structure
  with textile canopy
  enveloping the program functions

- pergola main structure
  500 x 500 LVL hollow column
  steel connector element
  on 500 x 500 concrete base
  with 150 x 500 LVL beams



DESIGN
axonometry

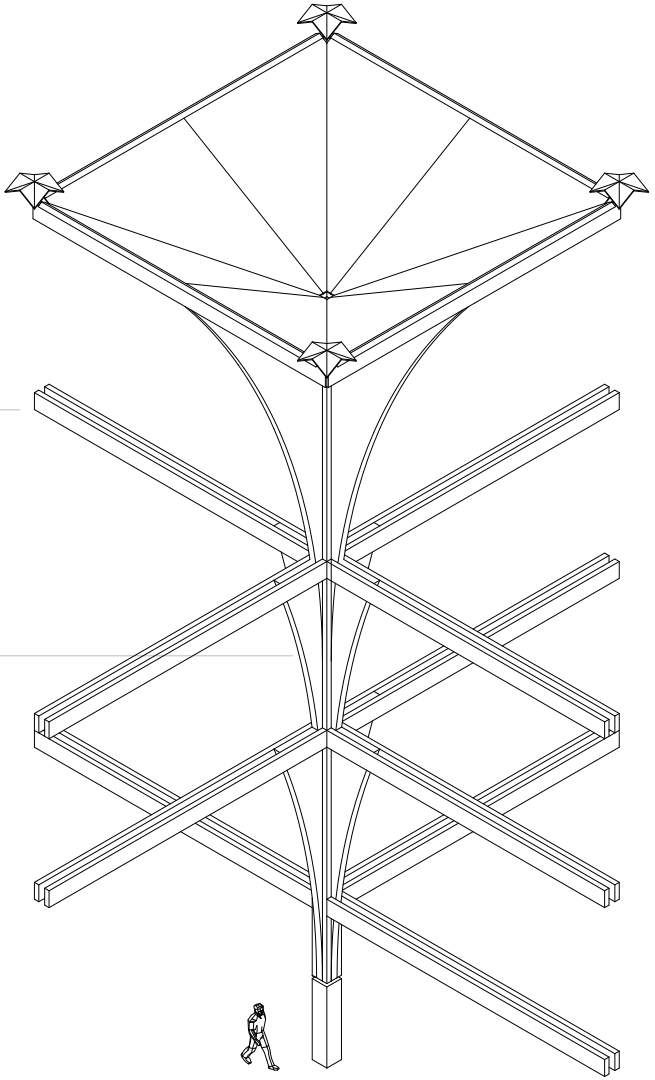
COLUMN

beams

- branching out from the column
- main load bearing structure bolted to flanges
- light elements in between beams creating atmosphere

flanges

- mimicking branching of a tree
- inserted in column milling seam, shortening the span of the beams



CONSTRUCTION

chalice canopy 10 x 10 m

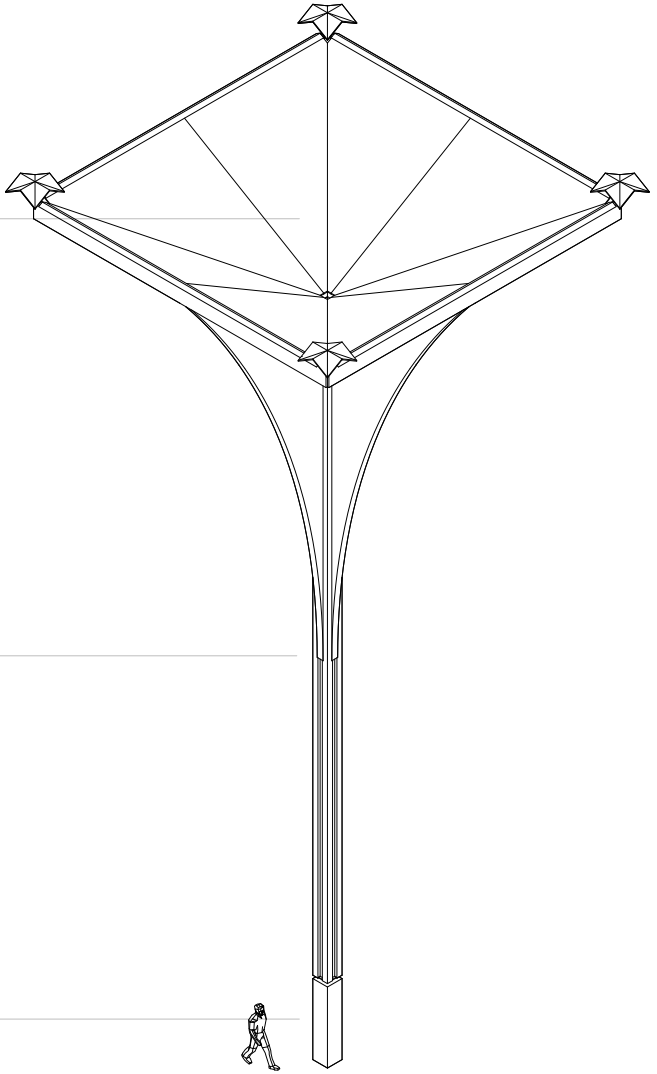
- collecting rainwater
  730 mm/year
- collecting solar energy
  300 sunny days per year
  8-9 hours of sun a day
- ventilation chimneys
  natural ventilation in market hall

column 500 x 500 mm

- laminated veneer lumber (LVL)
  pre-fabricated elements
- hollow core containing
  water drain pipe
  electricity cables
- column flanges connect to
  other columns forming a
  rigid portal

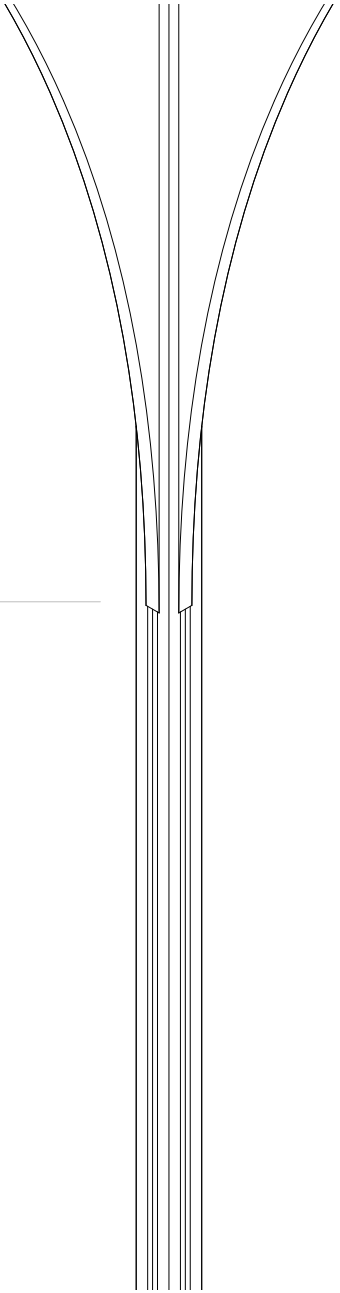
base 500 x 500 mm

- pre-cast concrete element
  with hollow core for water
  drain pipe
- adding human scale to the
  structure

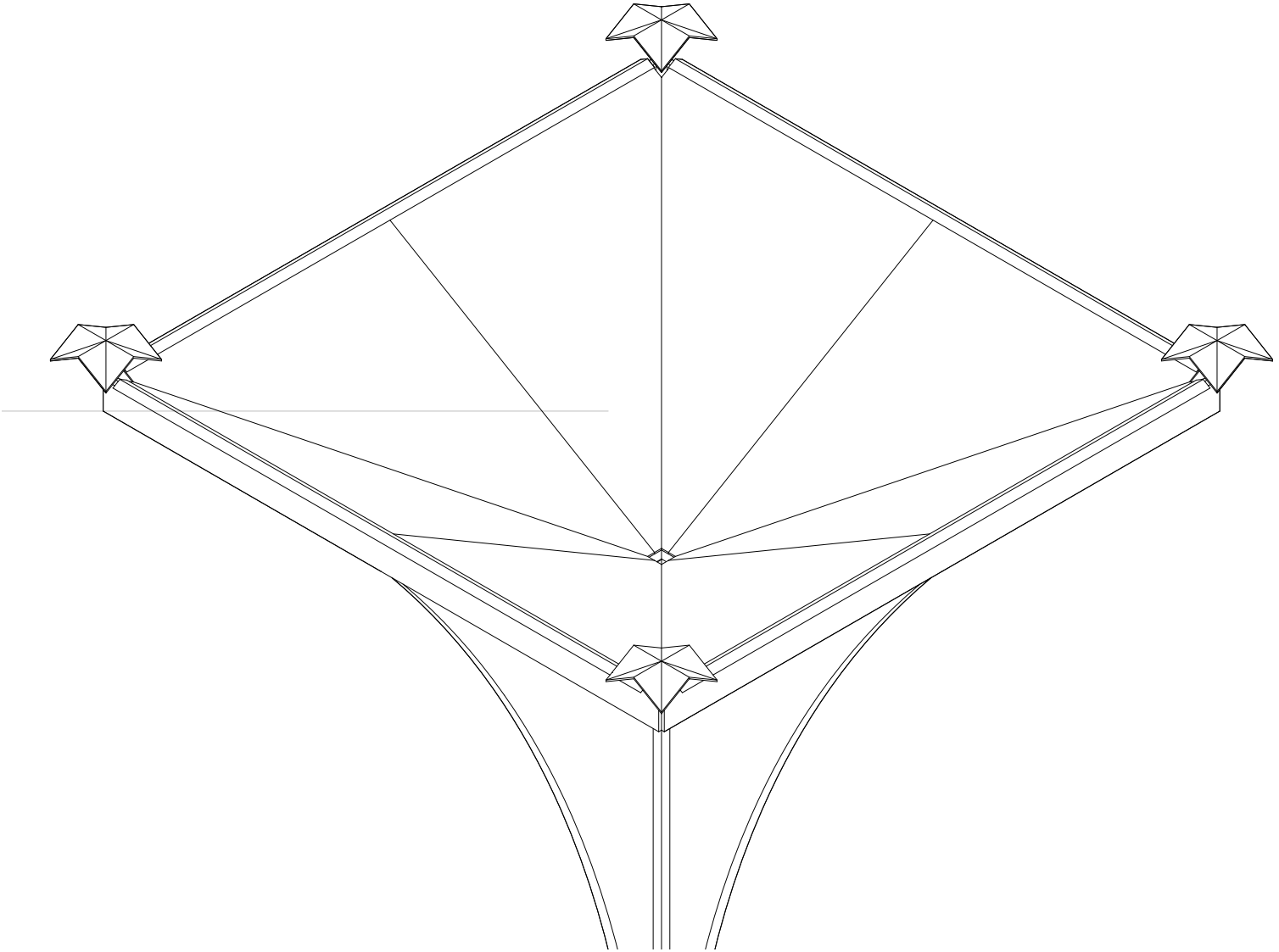


BASE

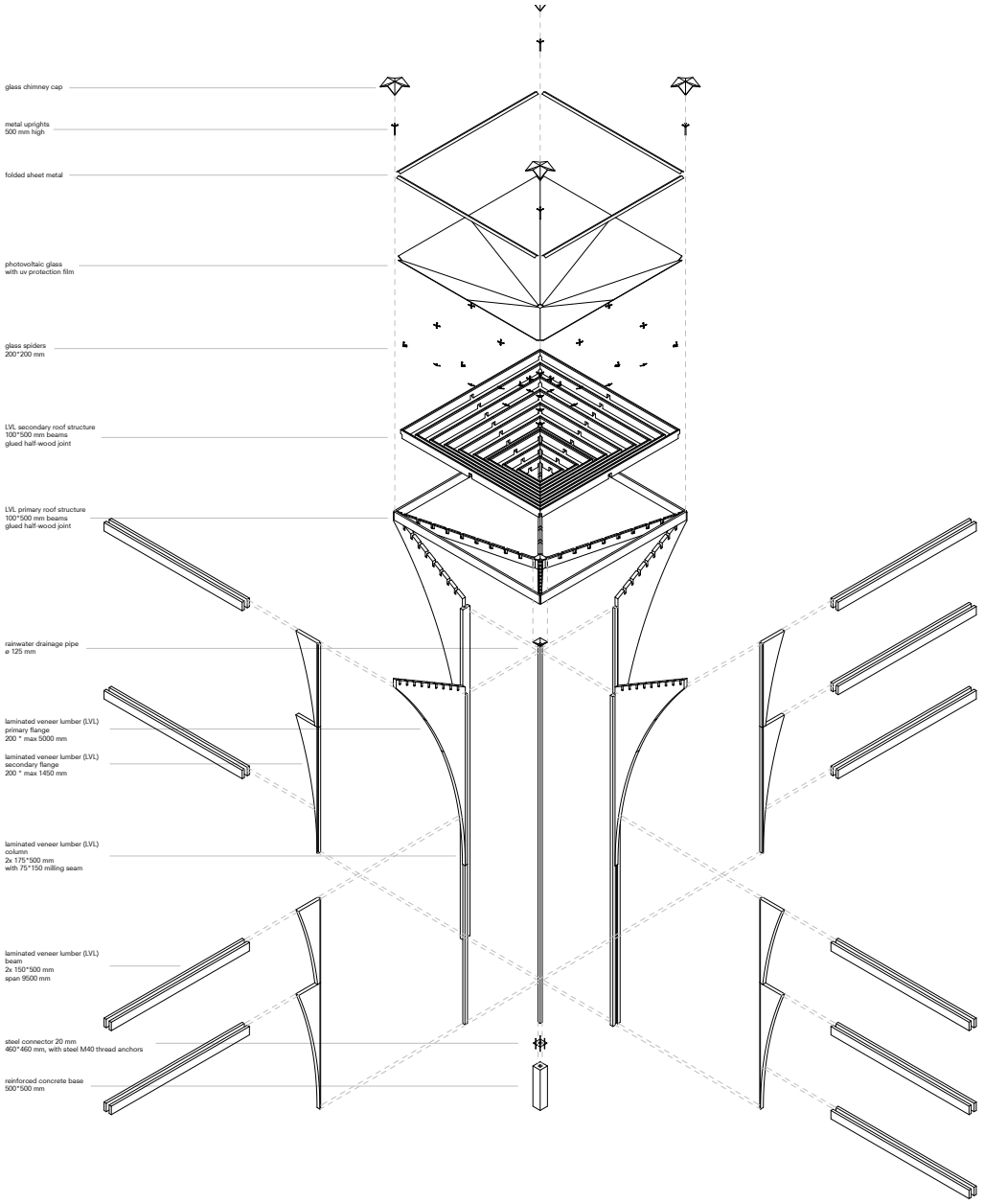
COLUMN



CHALICE



EXPLODED



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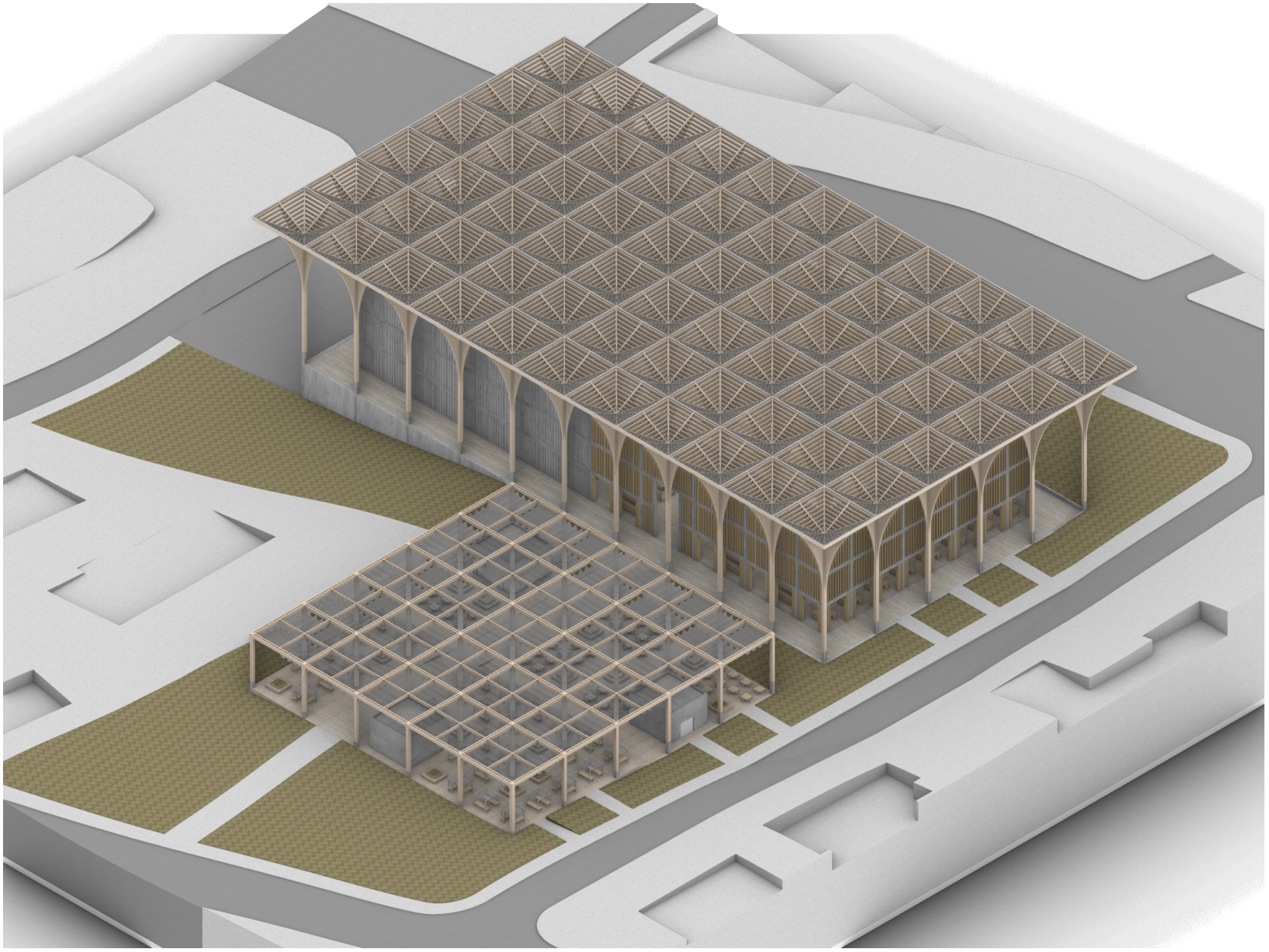
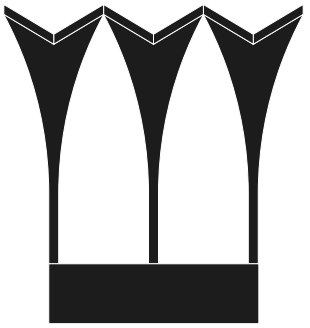
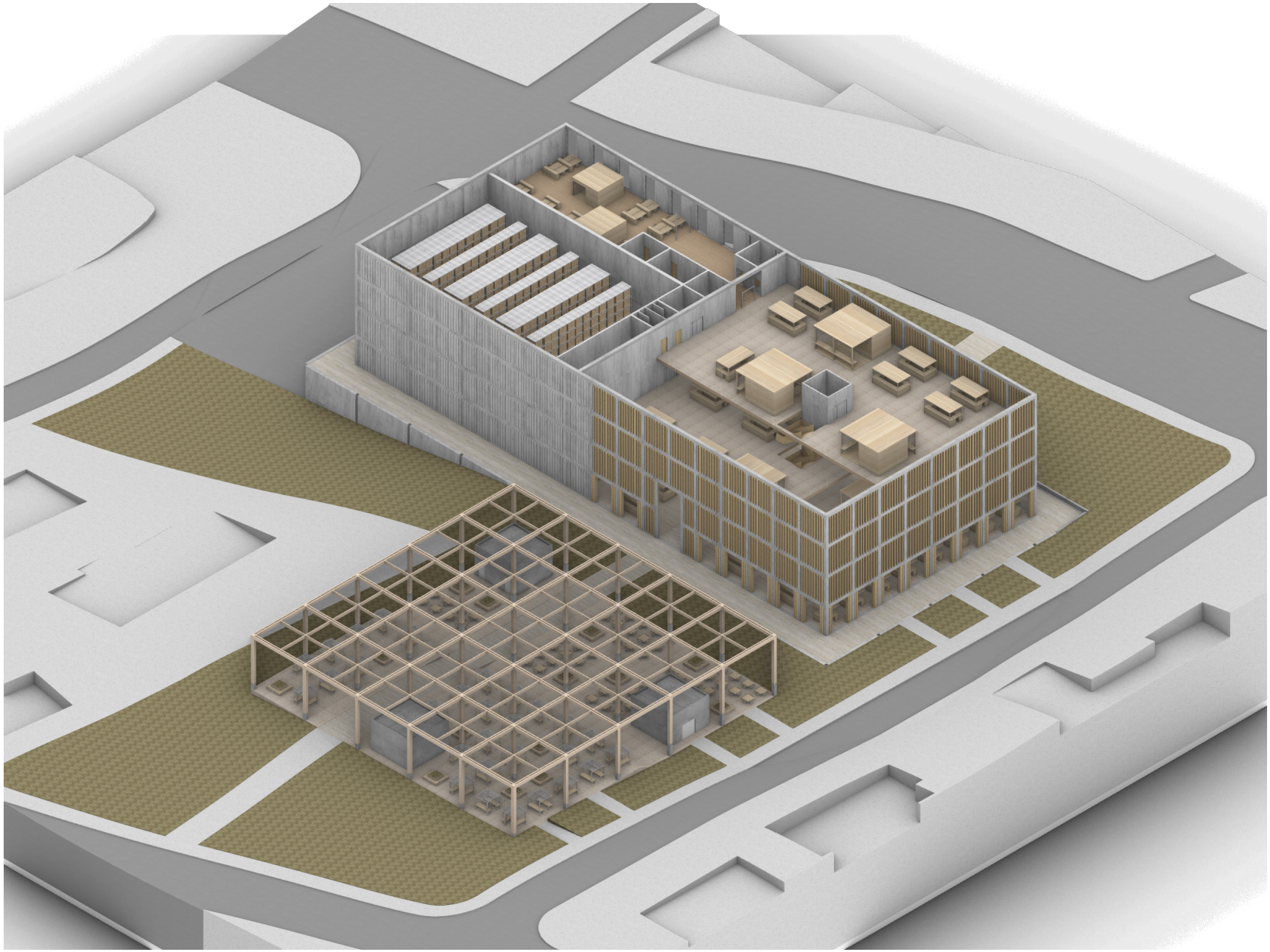
66 COLUMNS = 1 CANOPY





PROGRAM

PROGRAM



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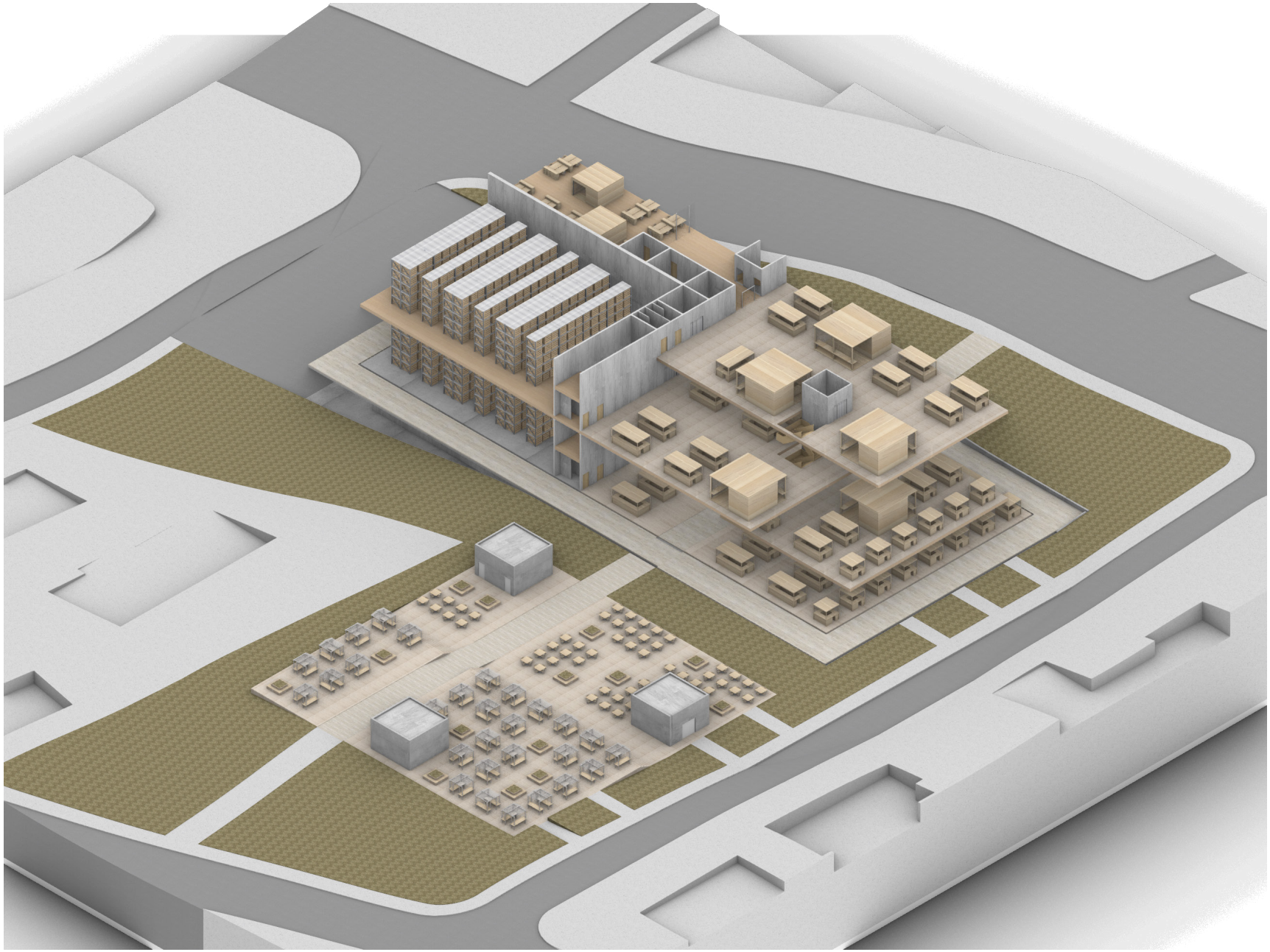

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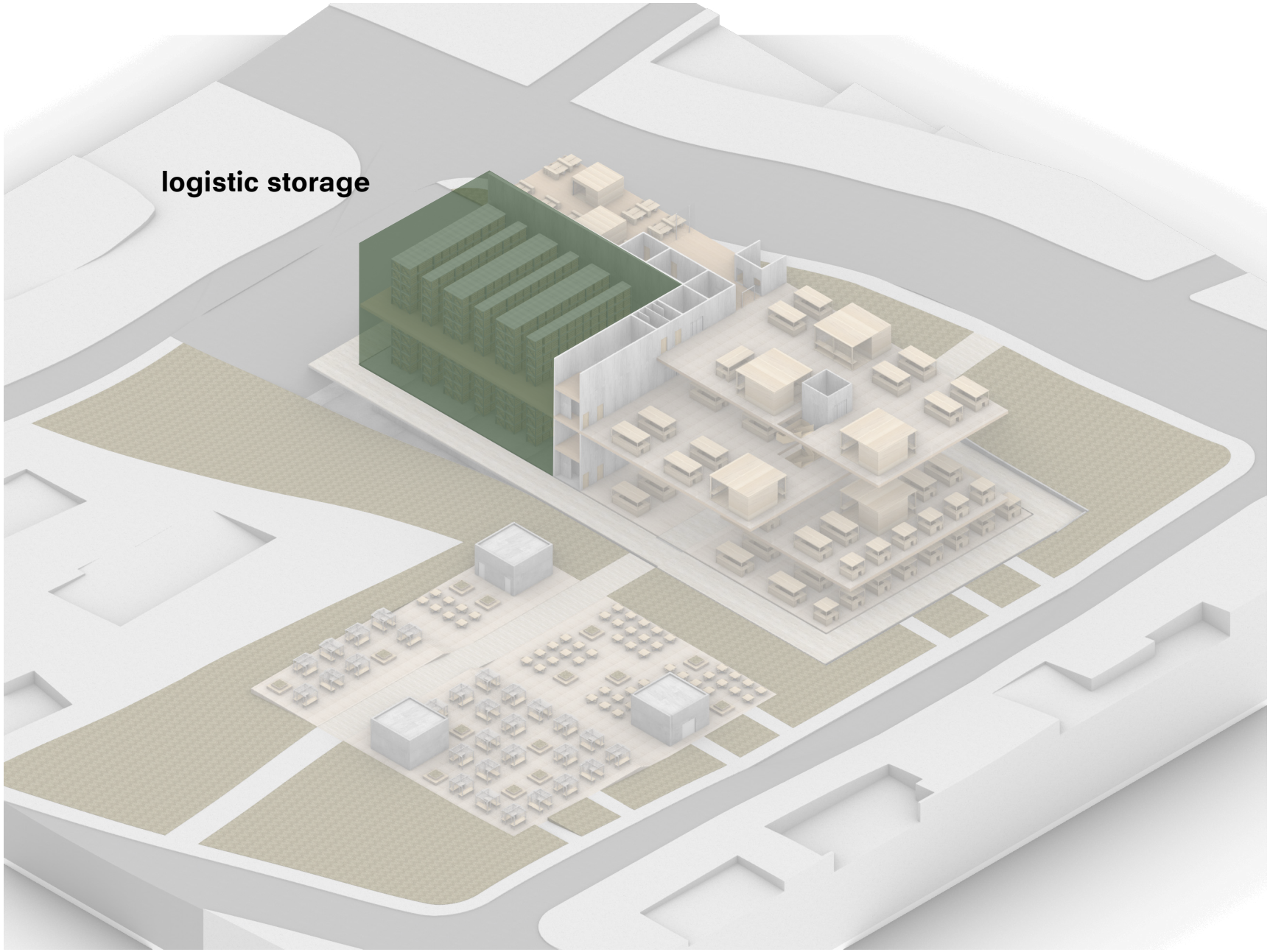

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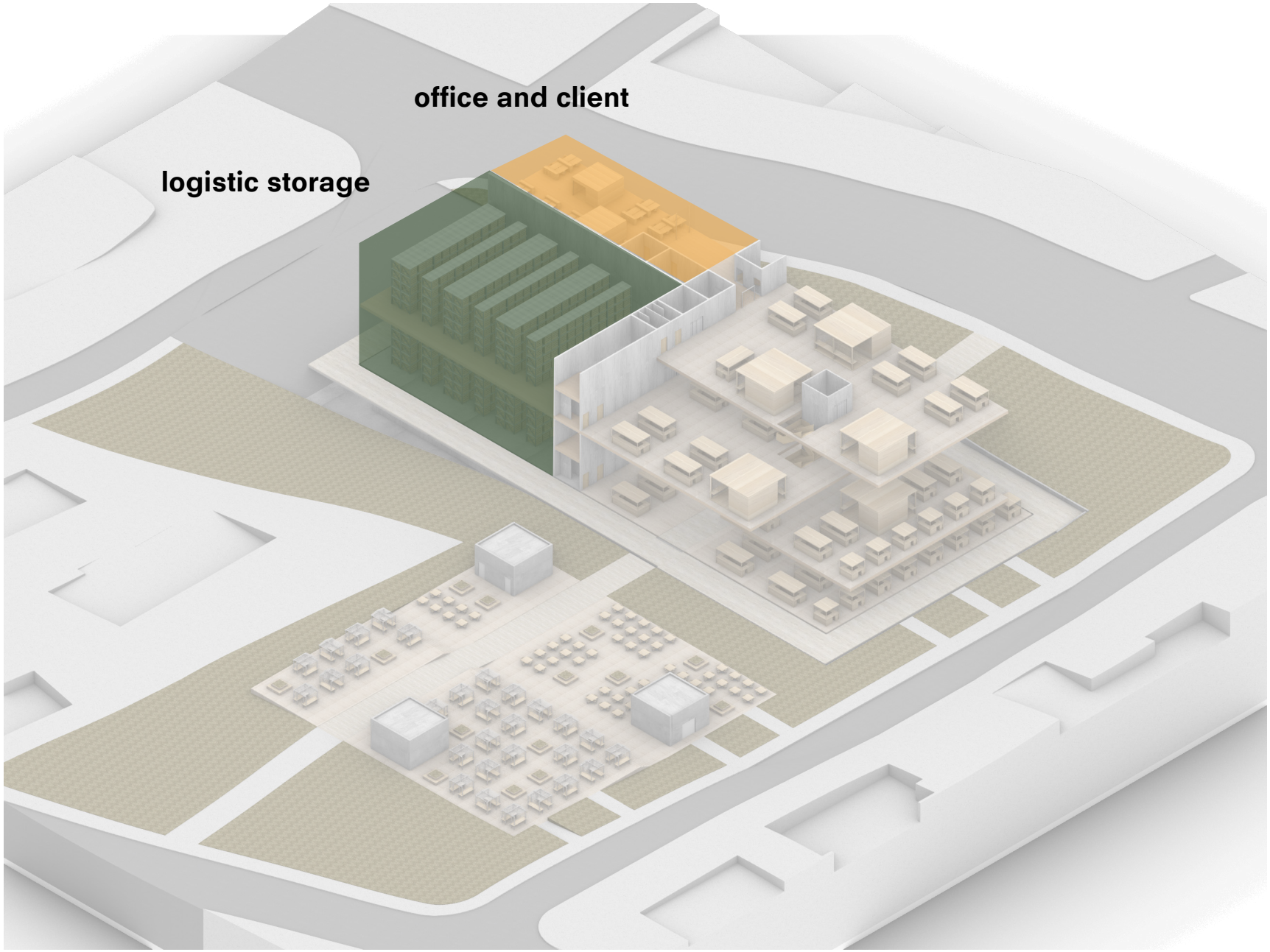

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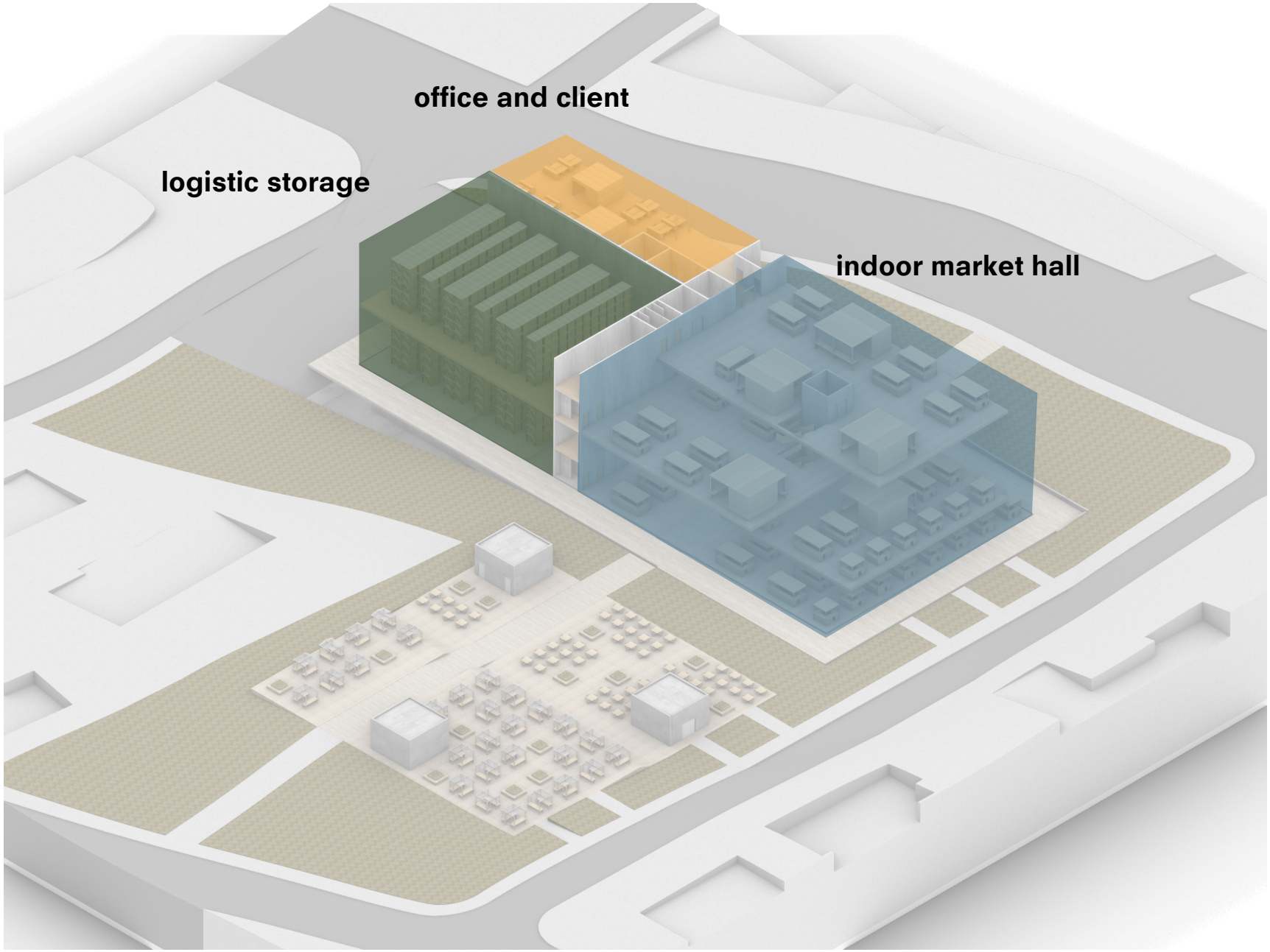

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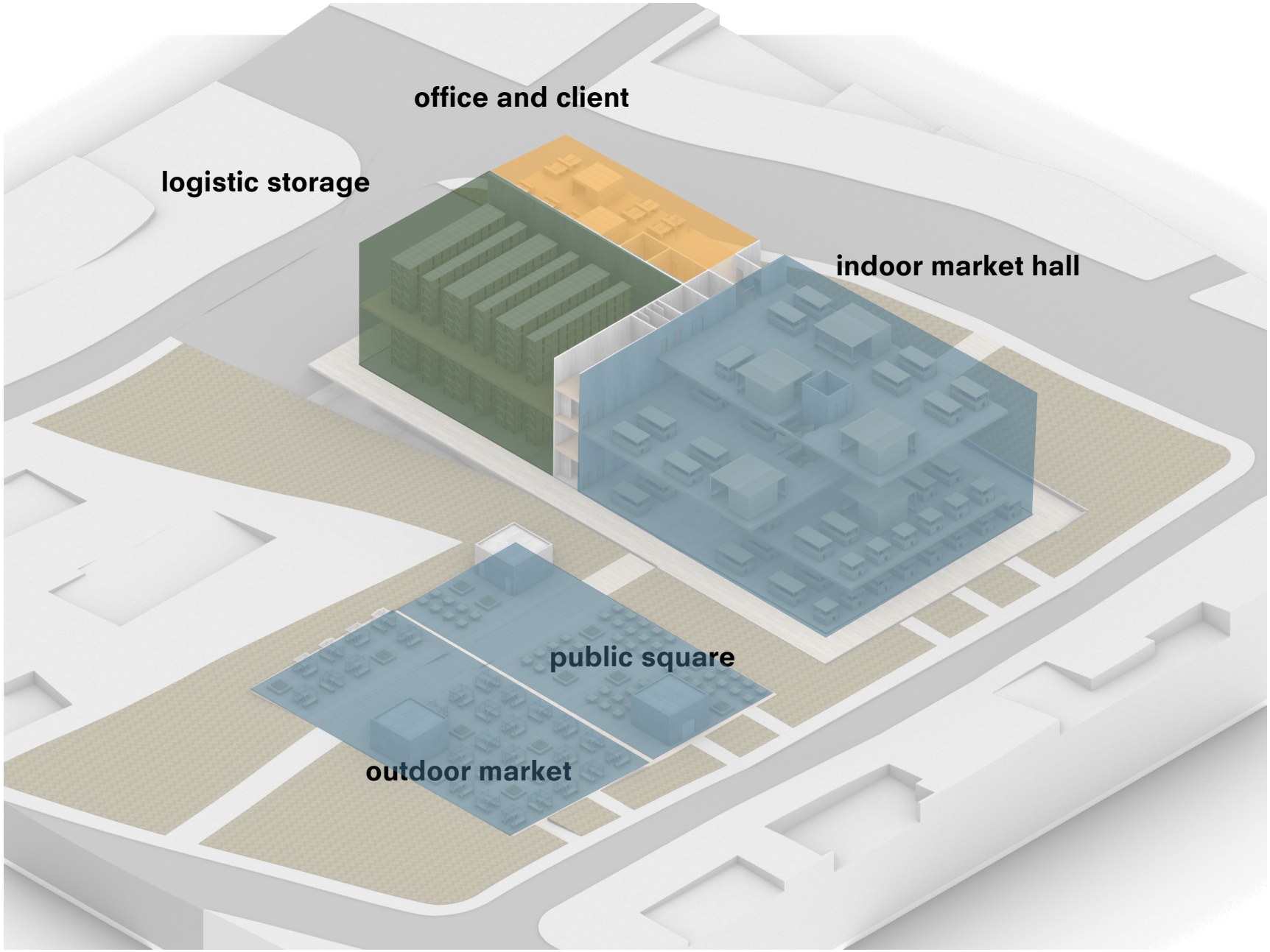
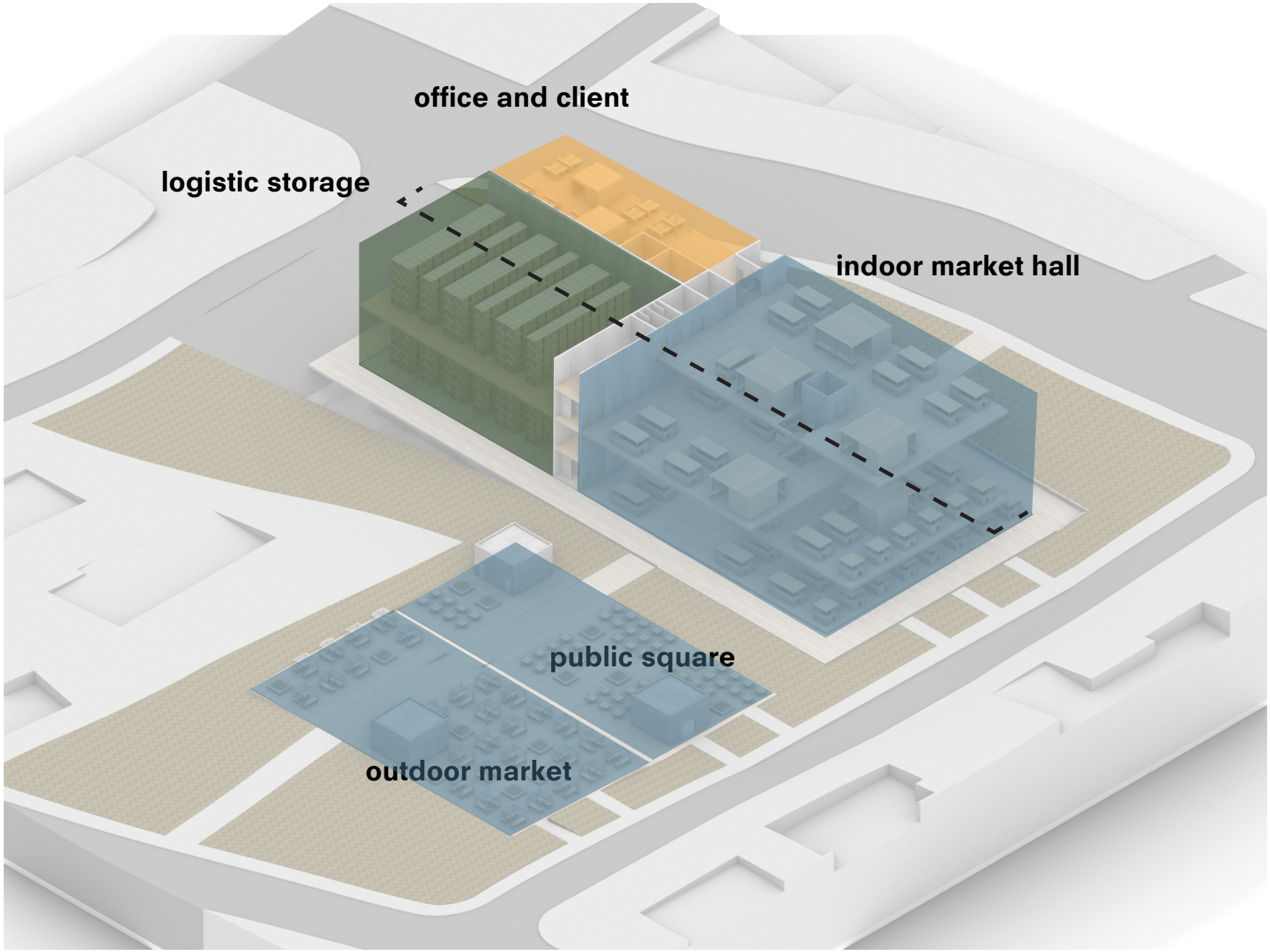
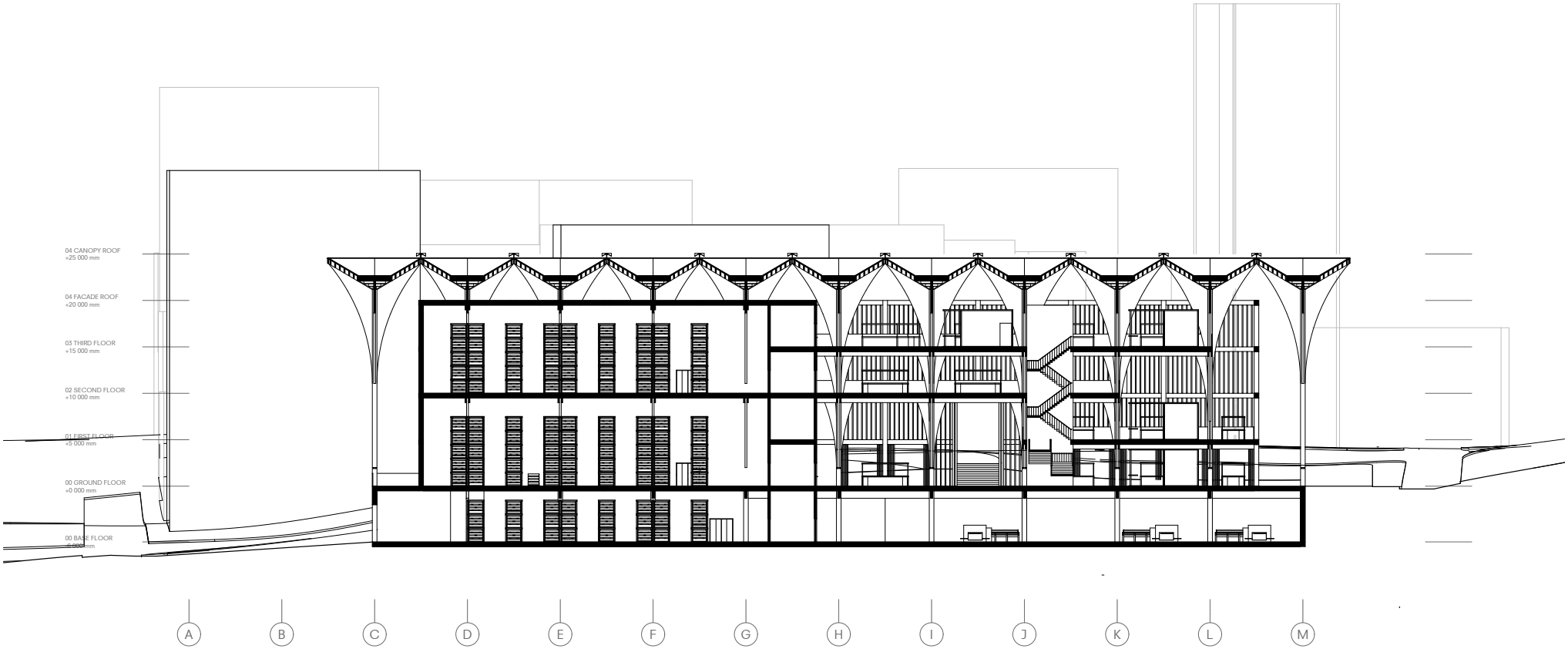

office and client
logistic storage
indoor market hall
public square
outdoor market

SECTION


office and client
logistic storage
indoor market hall
public square
outdoor market

SECTION STORAGE - MARKET



SECTION B – B'

0 10 20 m

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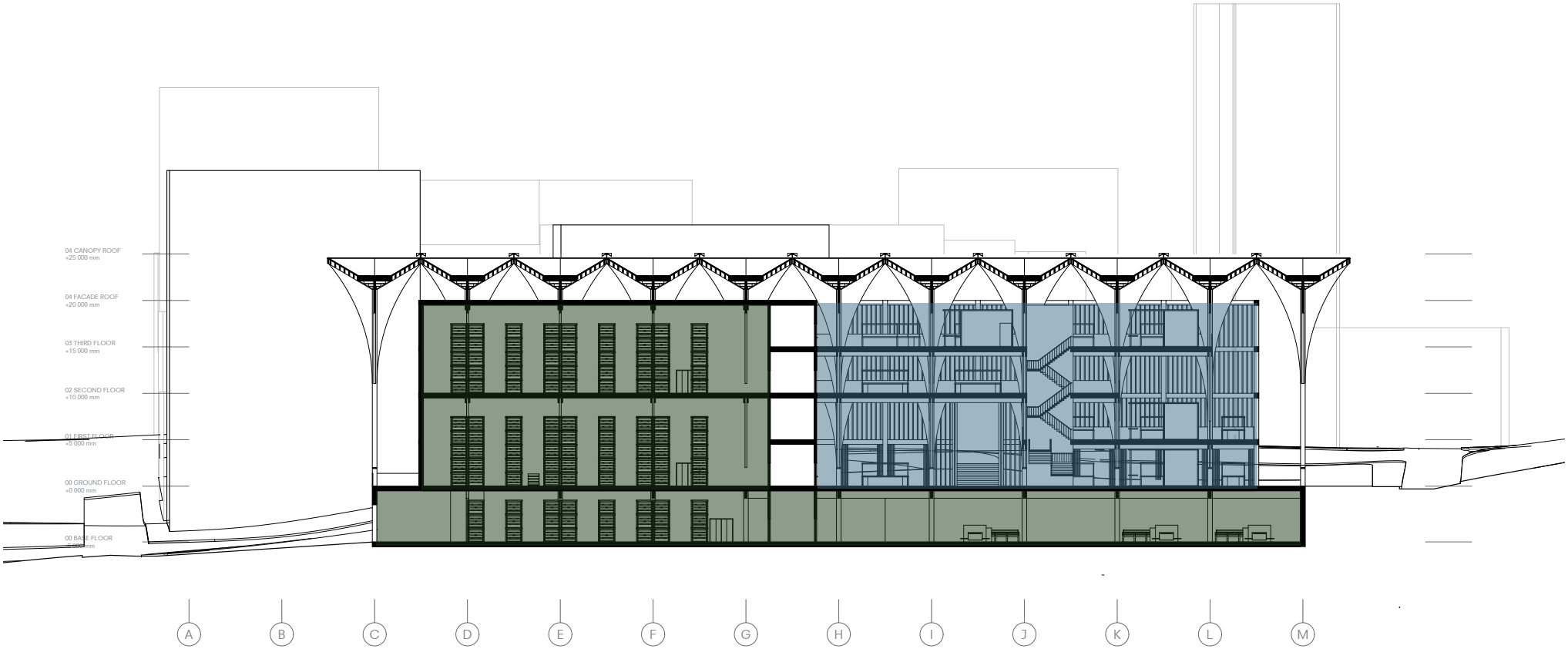
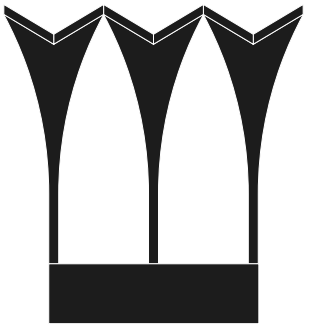
SECTION STORAGE - MARKET



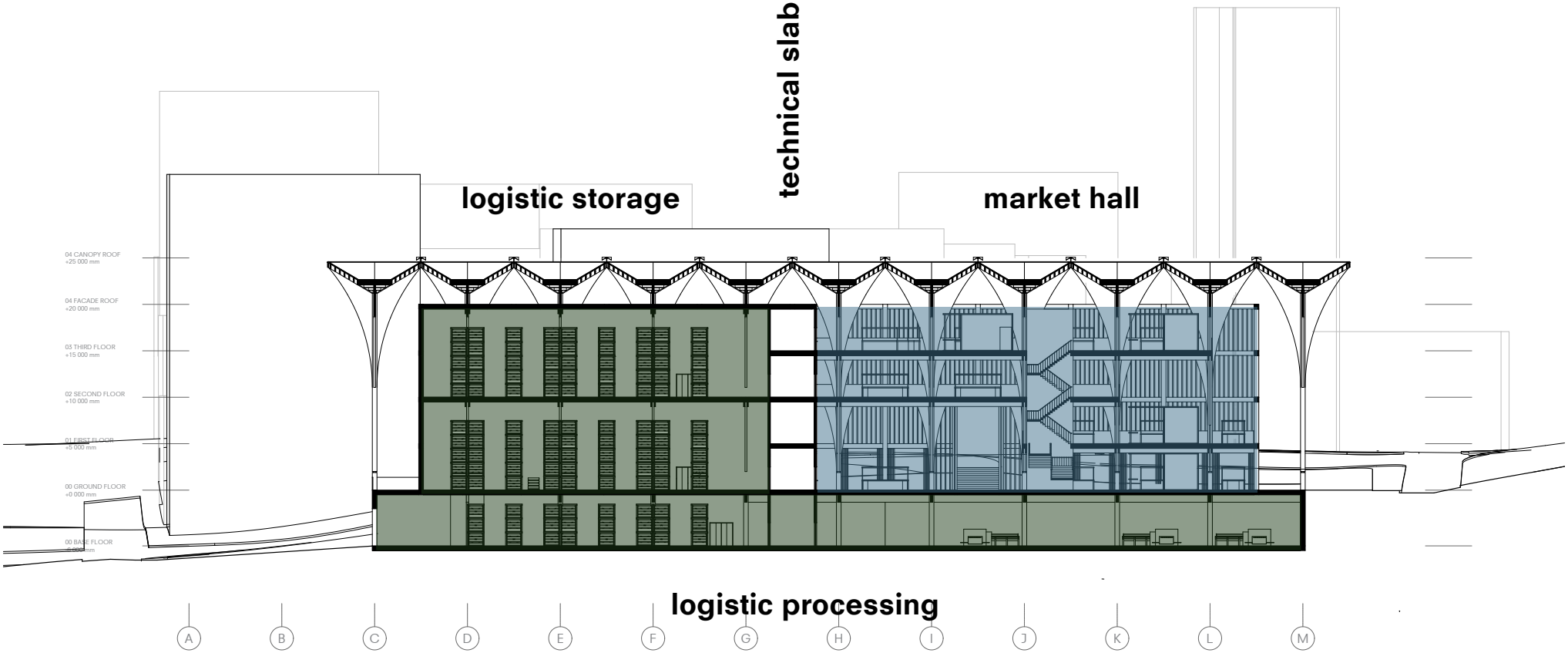
SECTION B – B'

0 10 20 m



CLIMATE PRINCIPLE

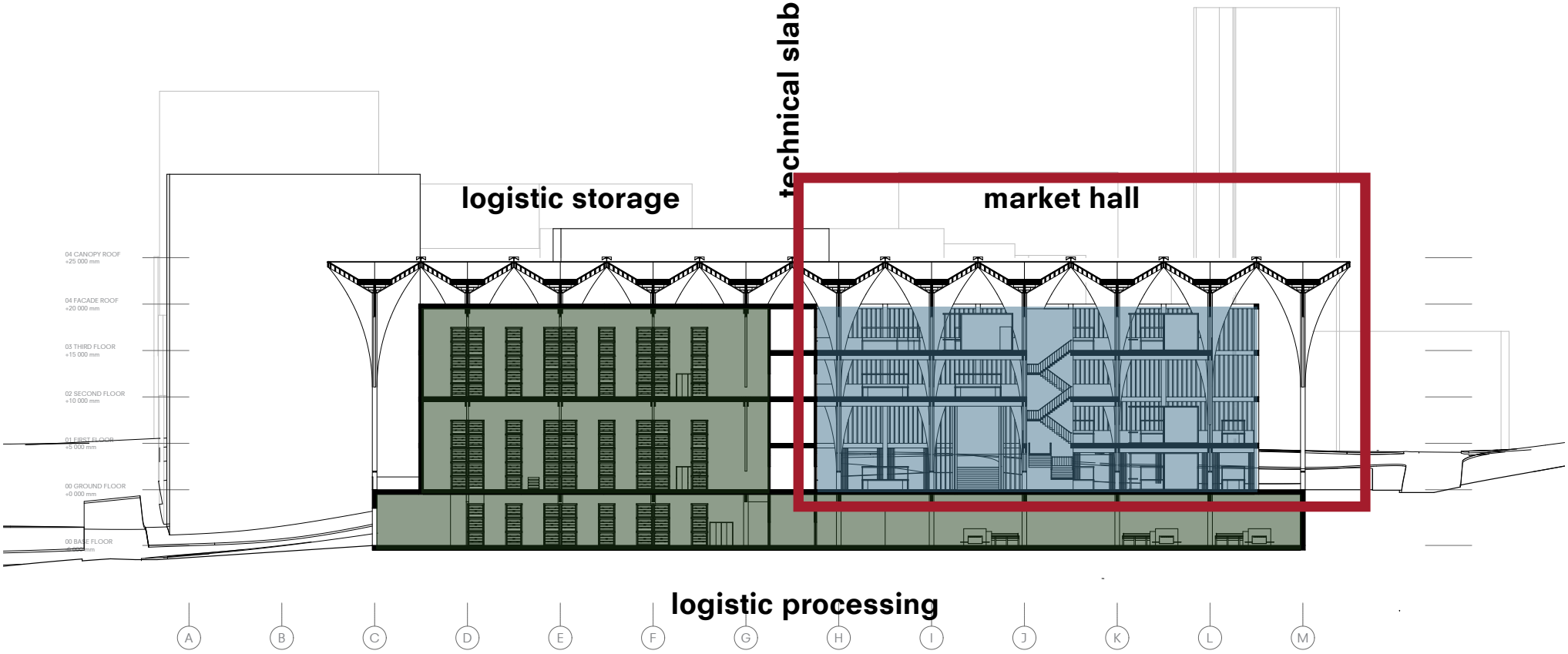
PROGRAM - SECTION



SECTION B – B'

0 10 20 m

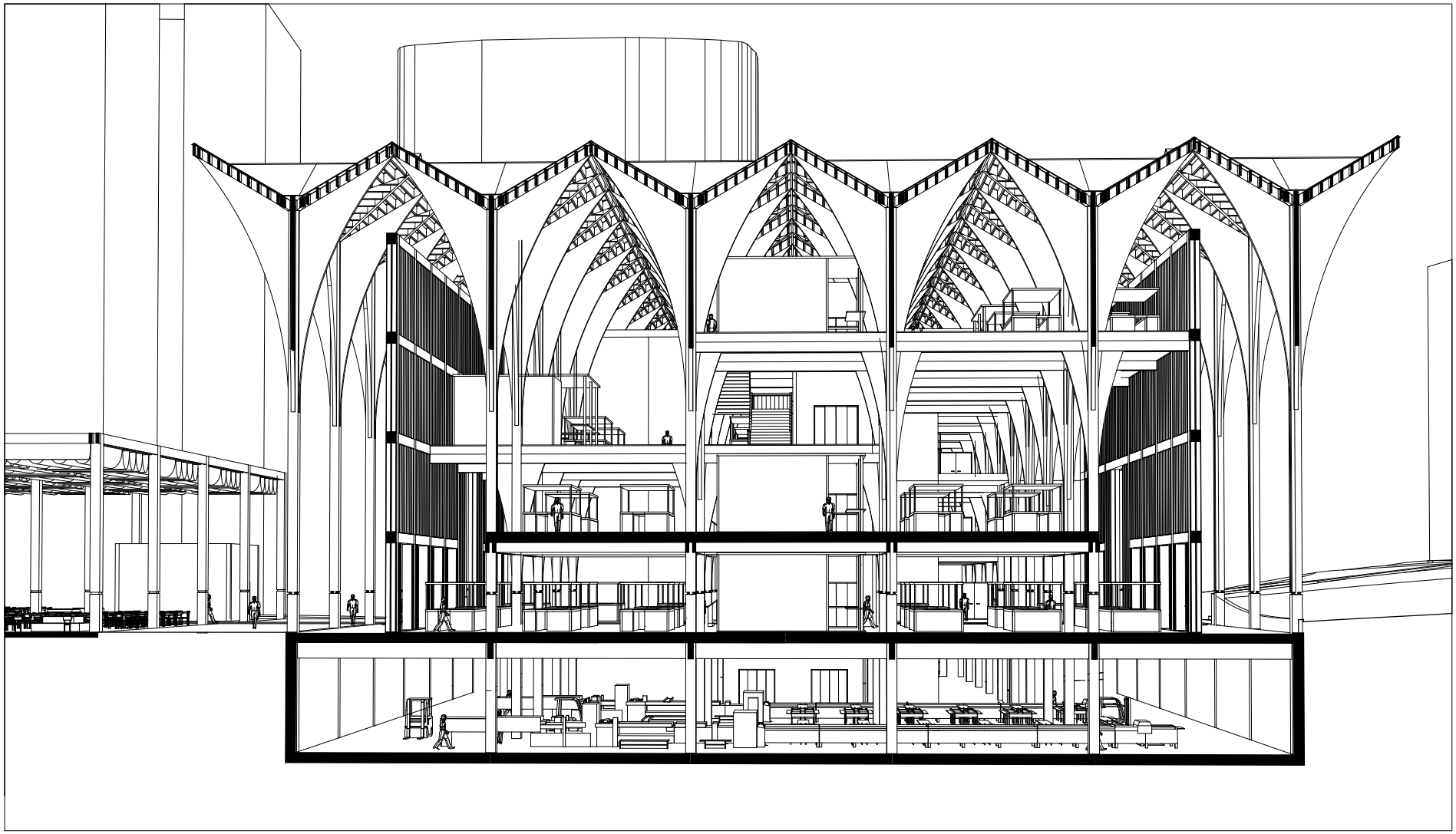
PROGRAM - SECTION



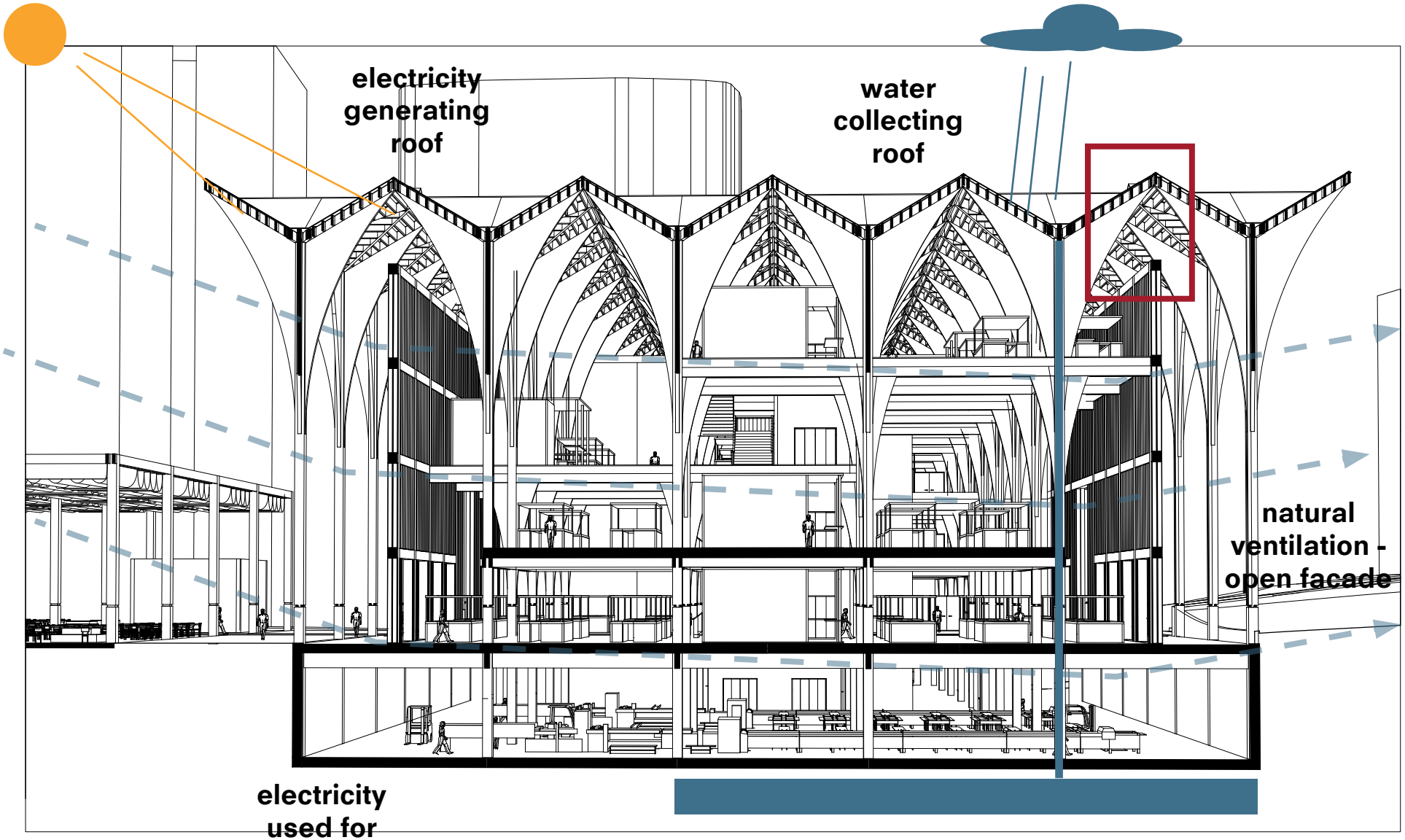
SECTION B – B'

0 10 20 m

MARKET HALL PRINCIPLE



MARKET HALL PRINCIPLE



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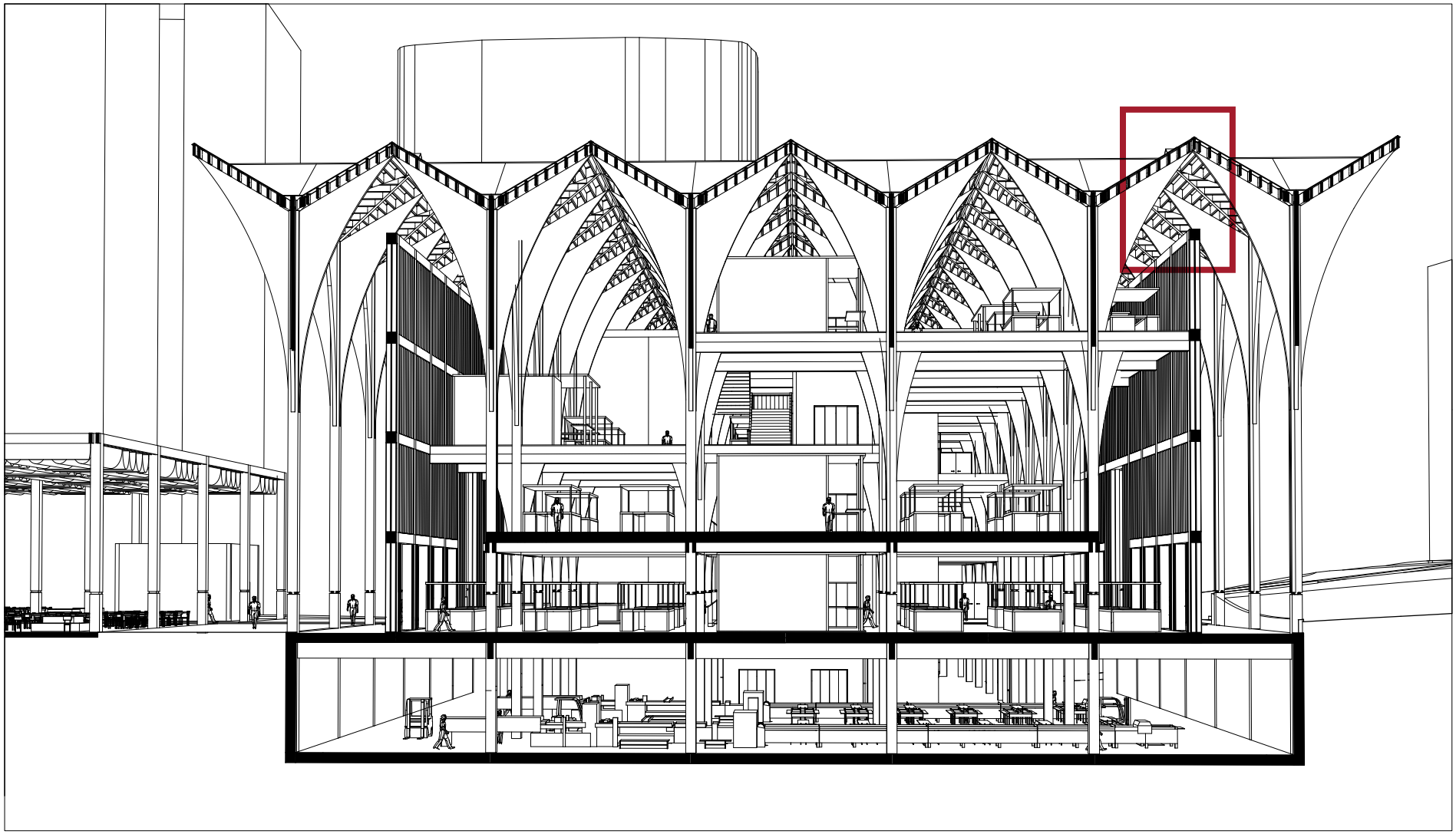

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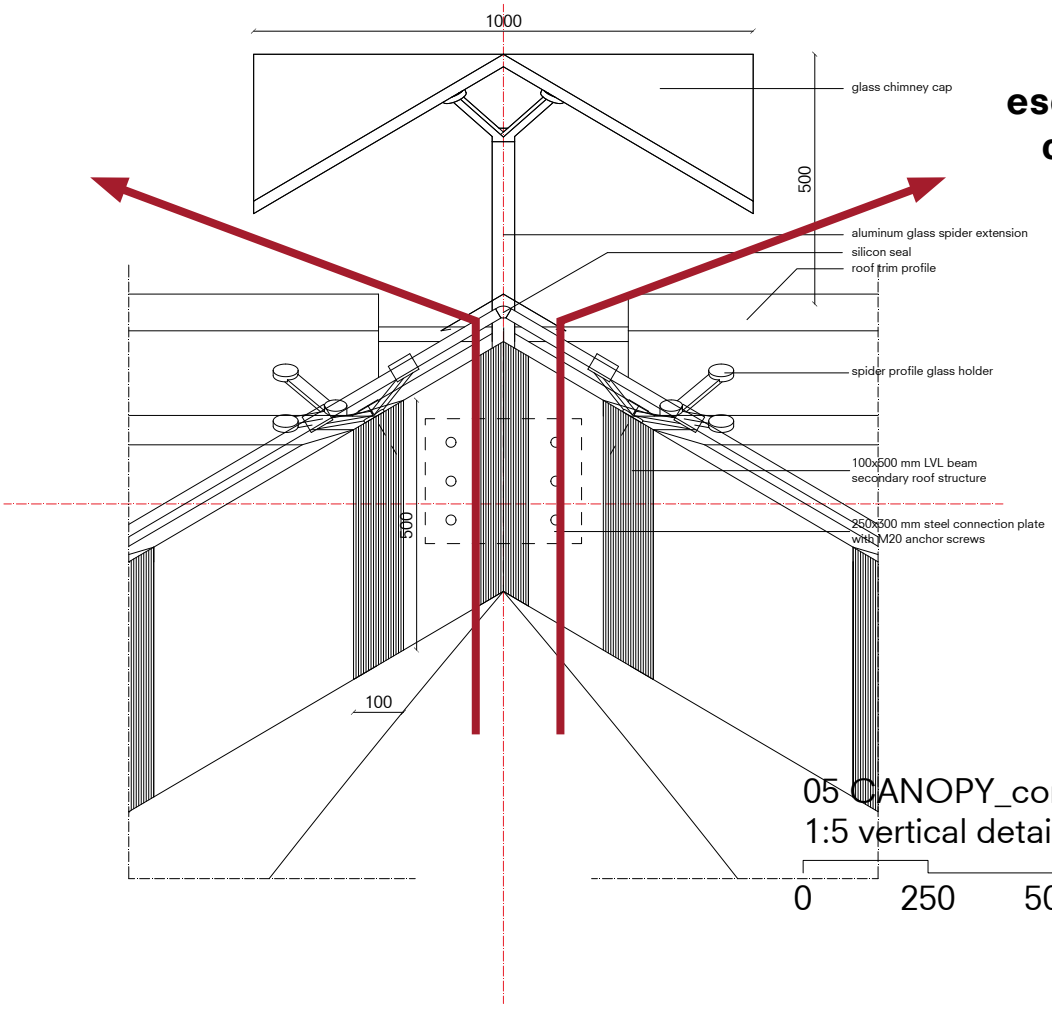

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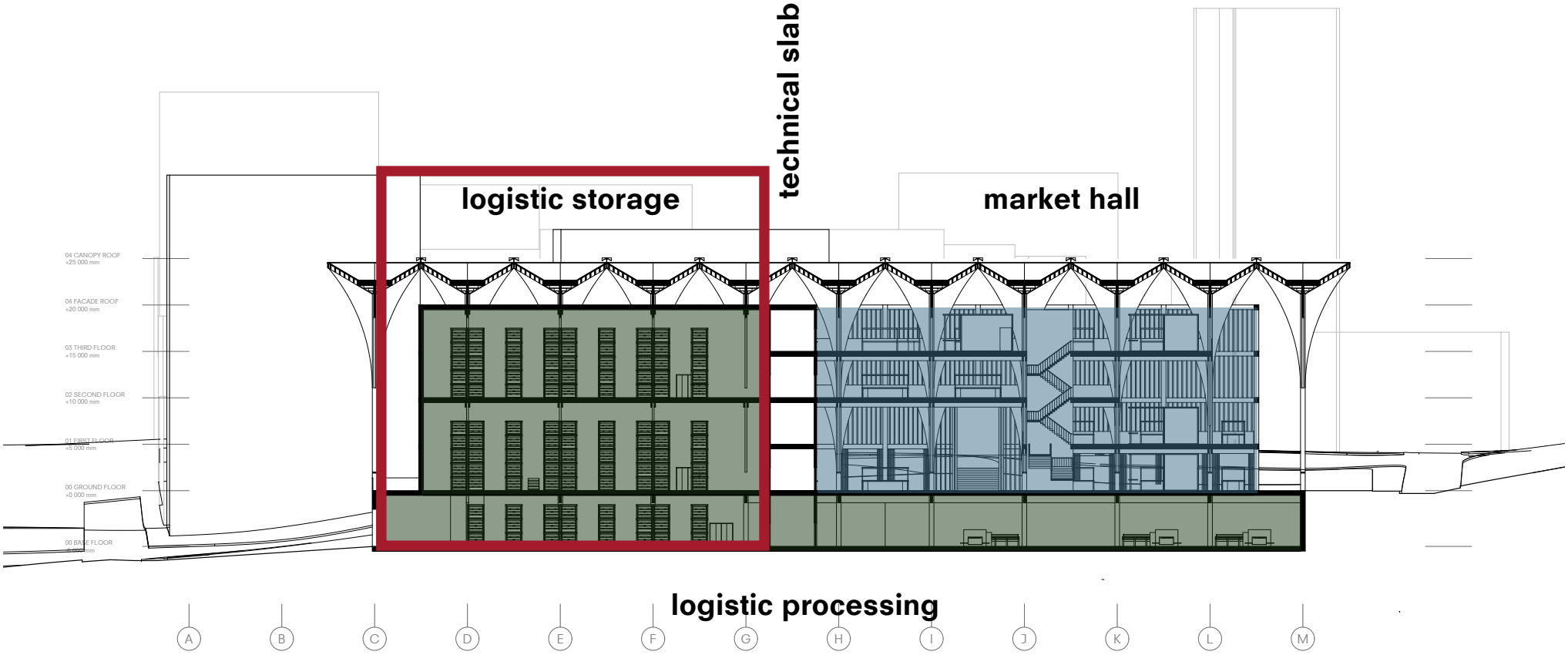
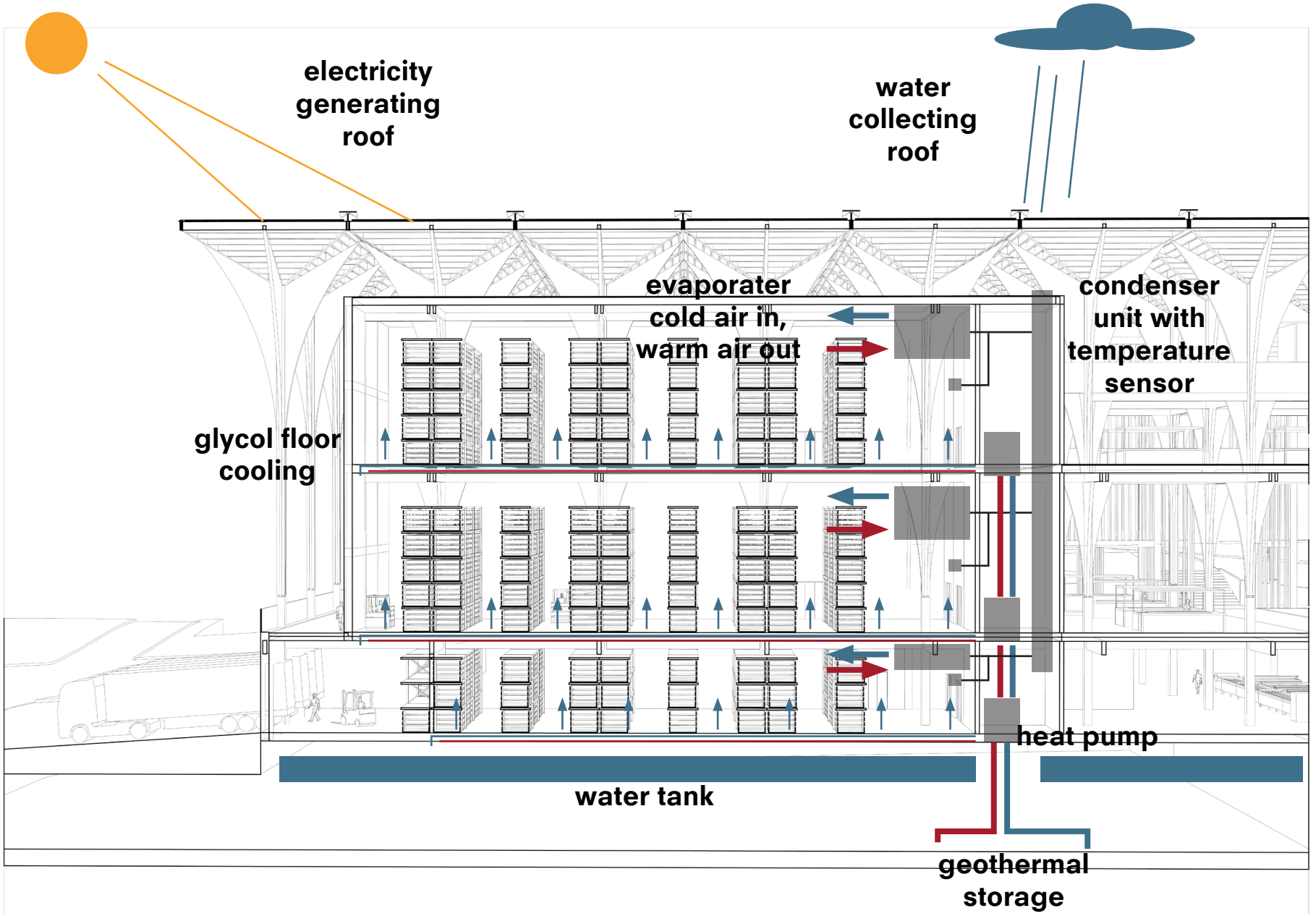


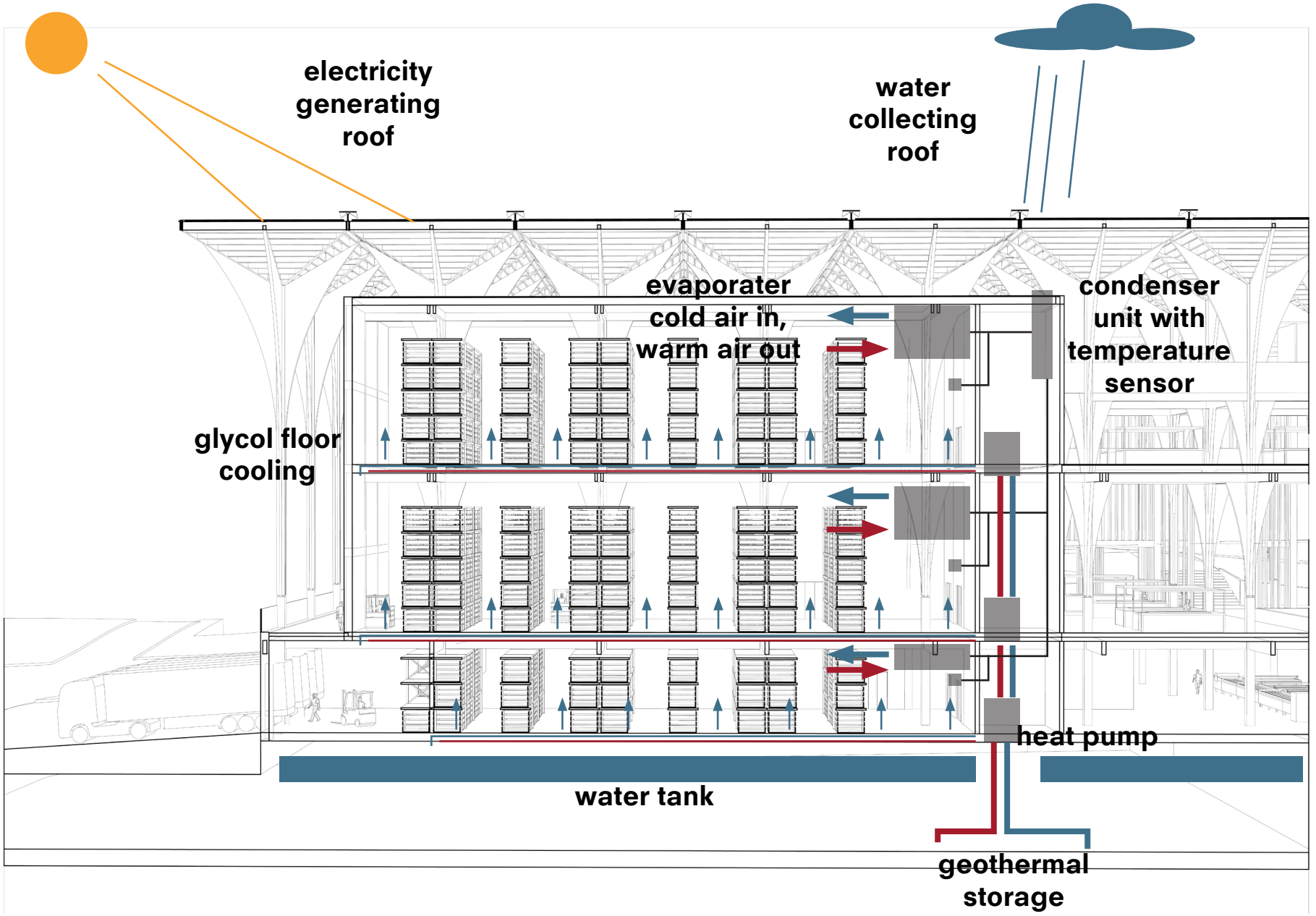
SECTION B – B'

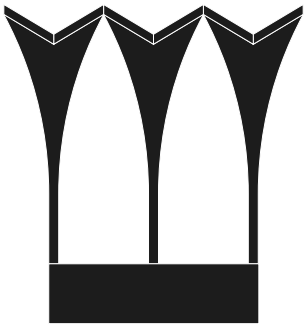
0 10 20 m

STORAGE HALL PRINCIPLE



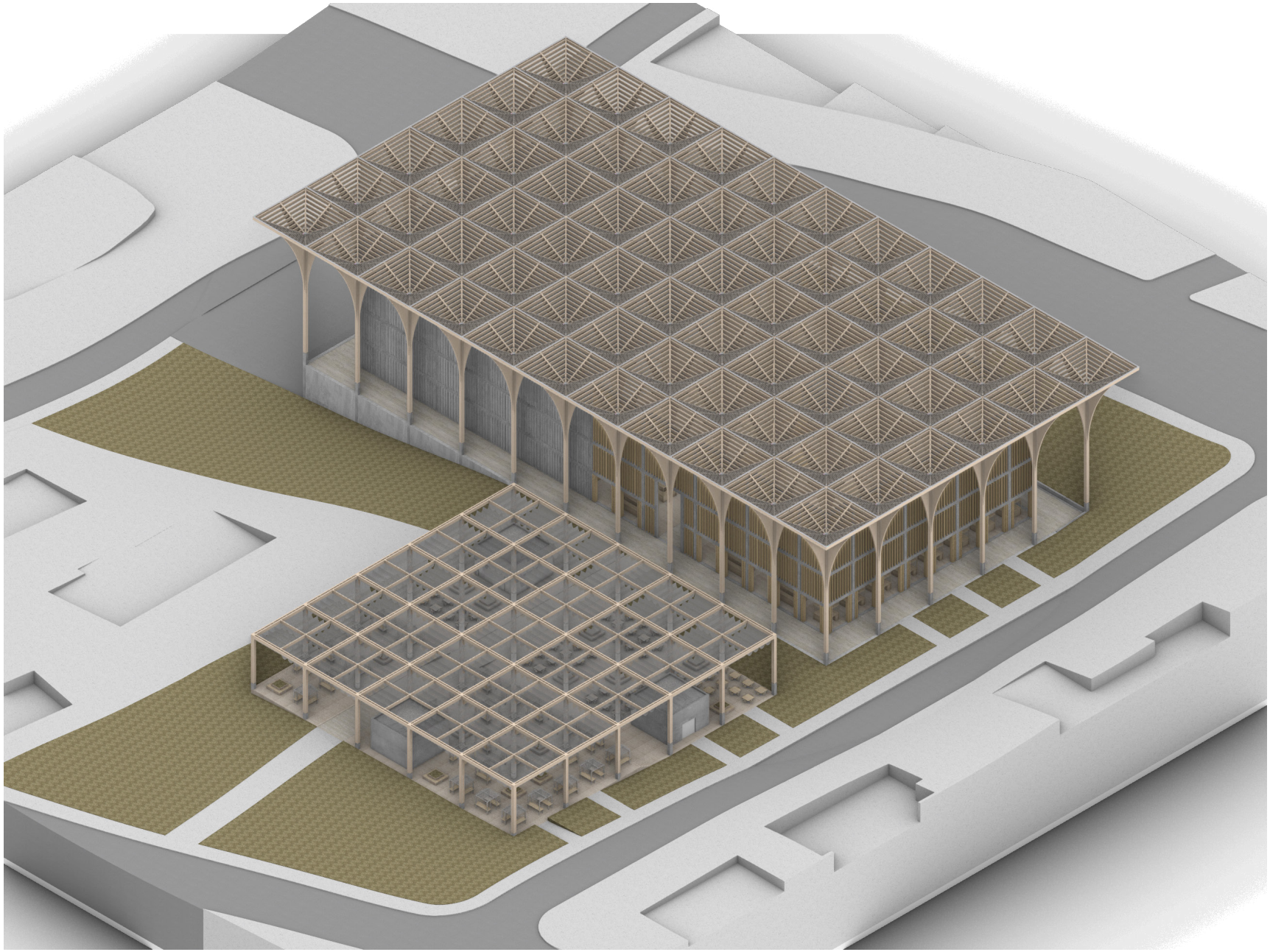
STORAGE HALL PRINCIPLE



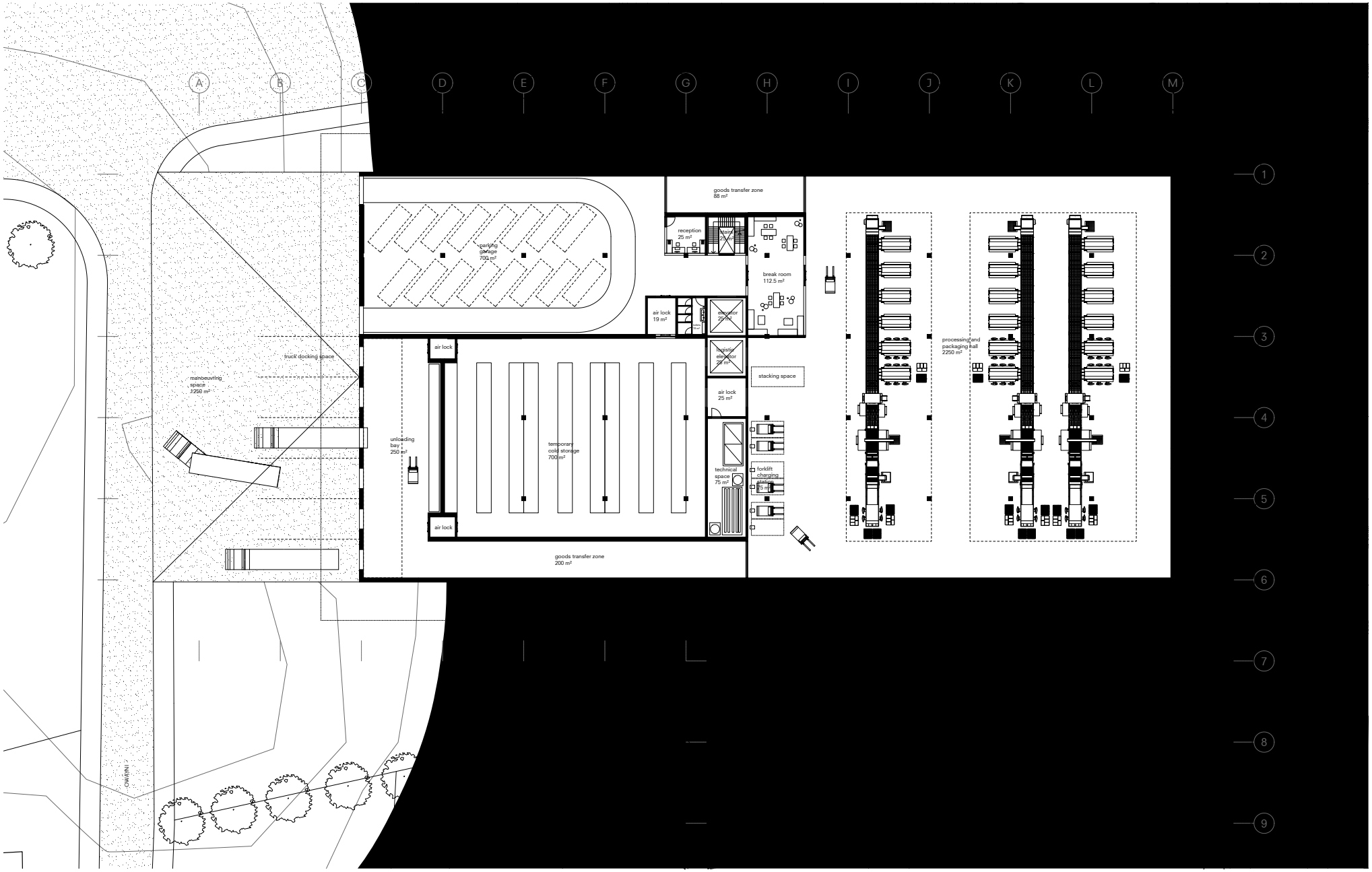


THE APPLE

HOW THE APPLE FLOWS



00 BASE FLOOR



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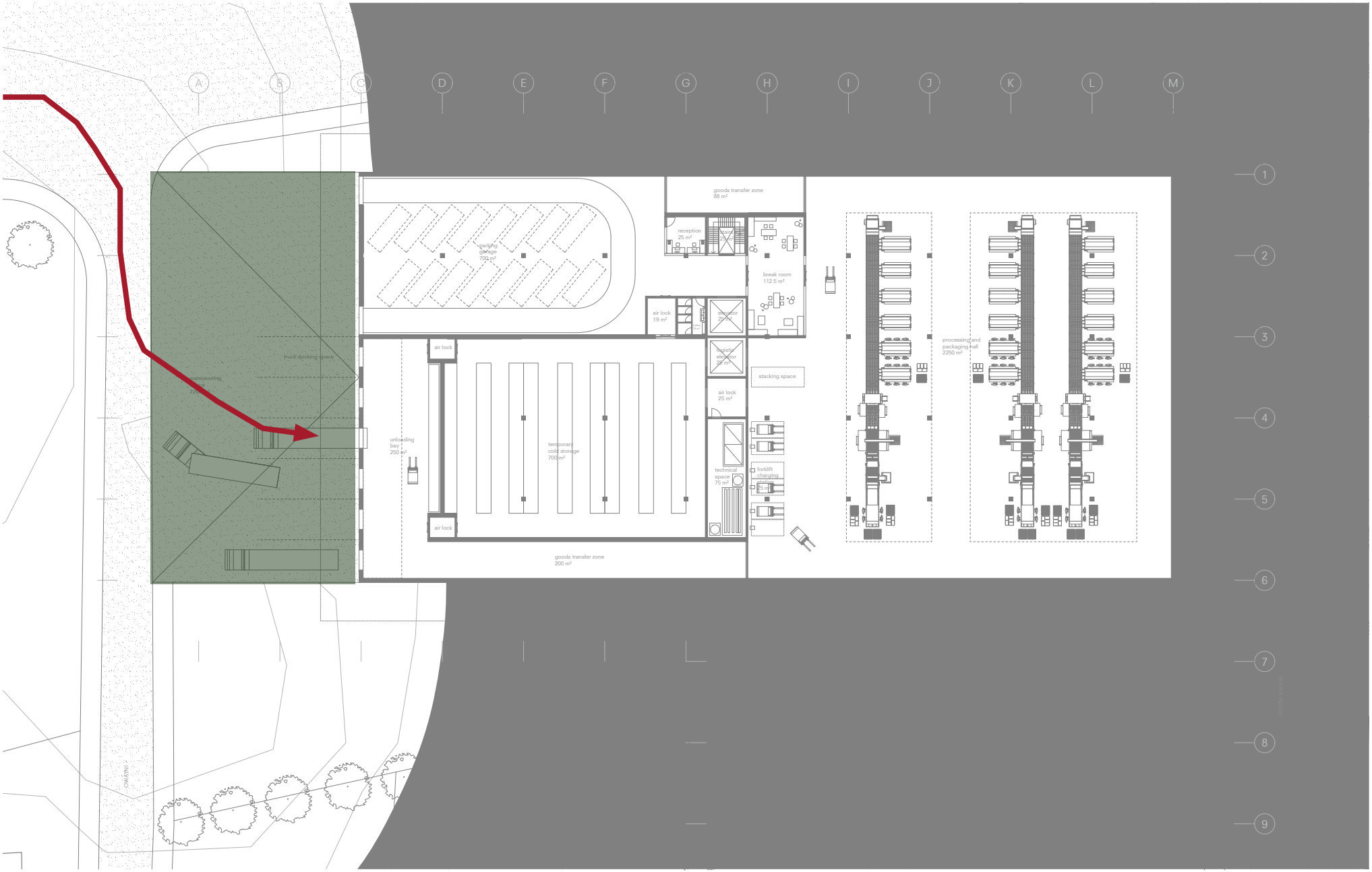
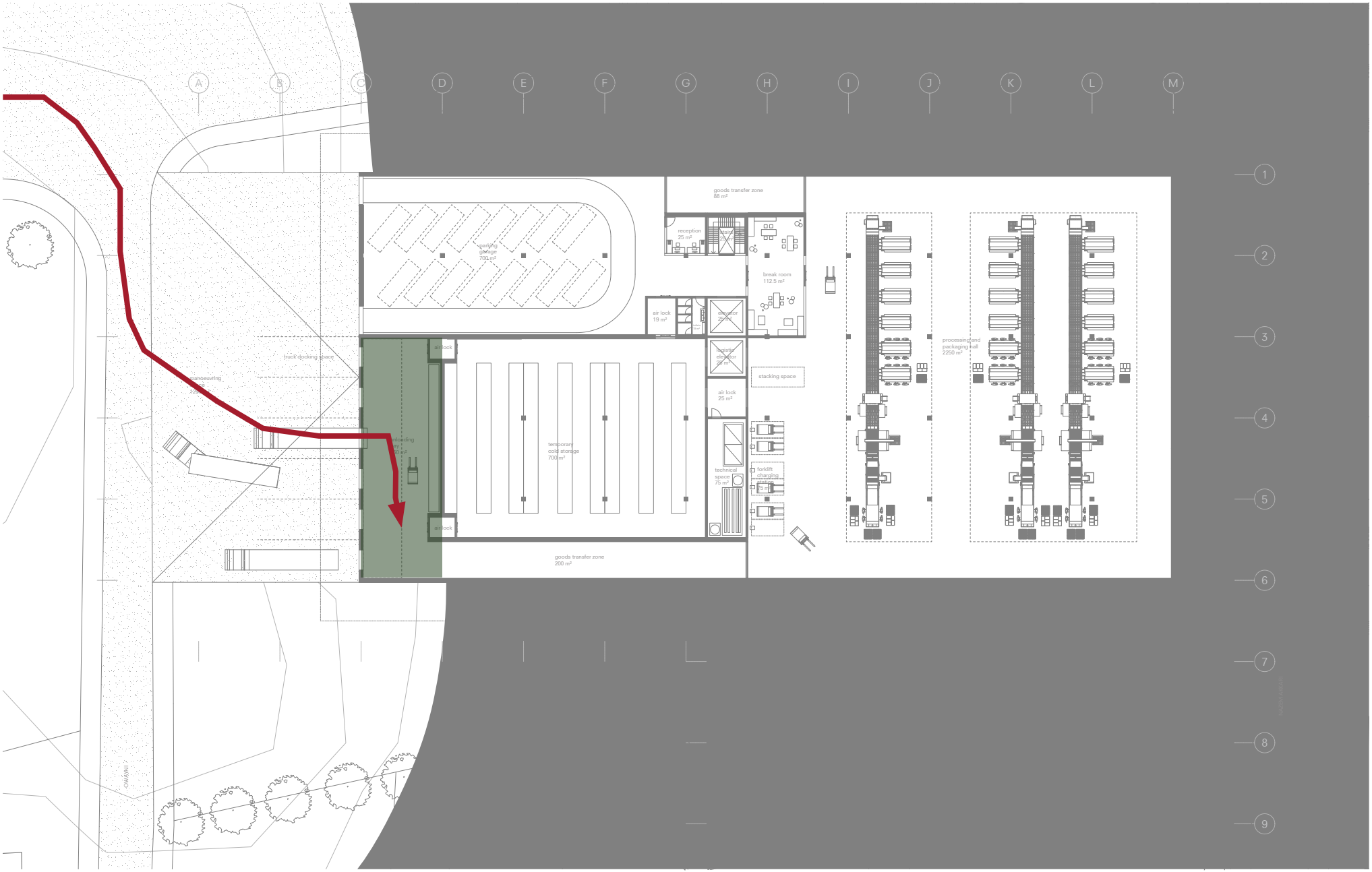
MANOEUVRING



complex projects

MANOEUVRING

UNLOADING



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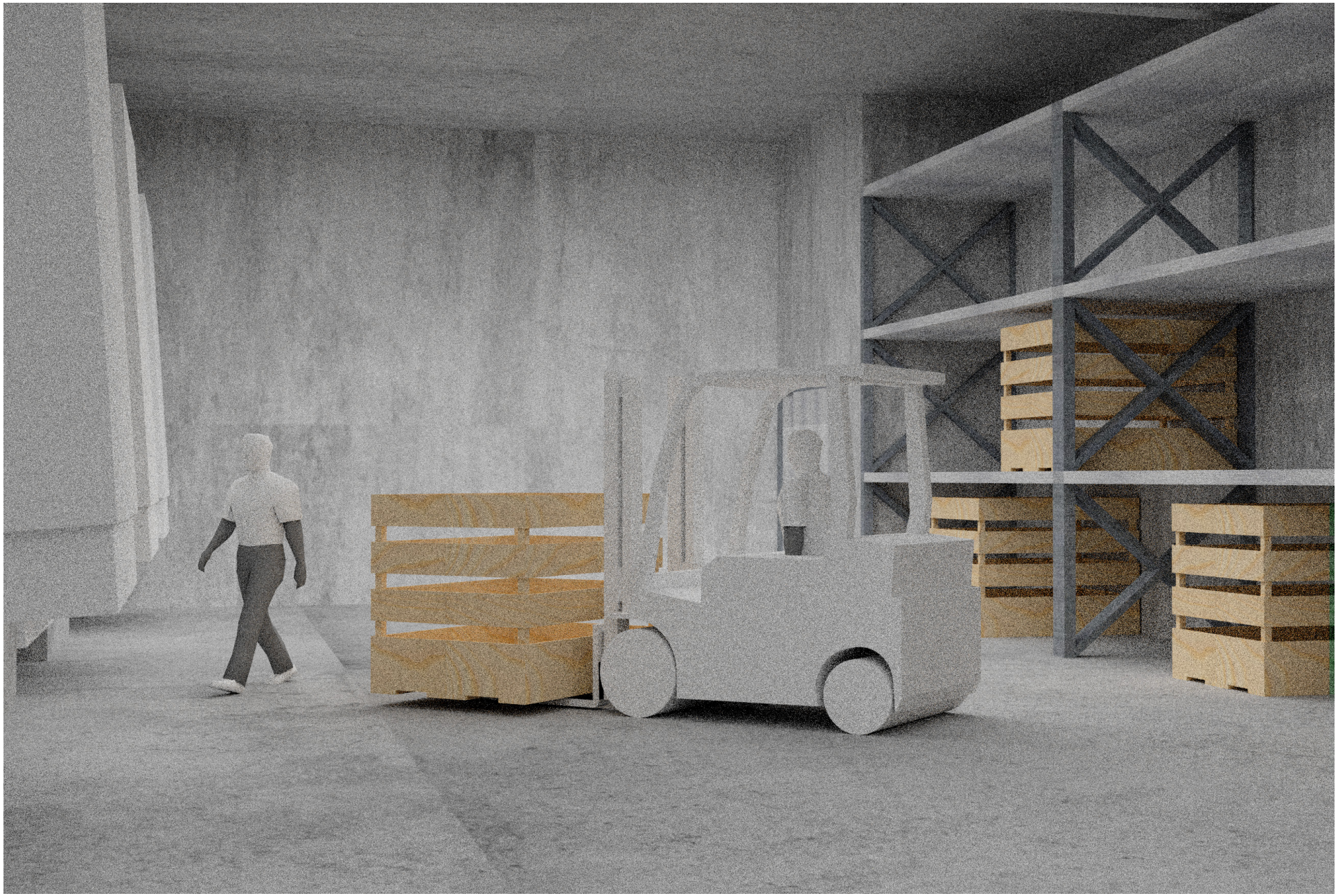
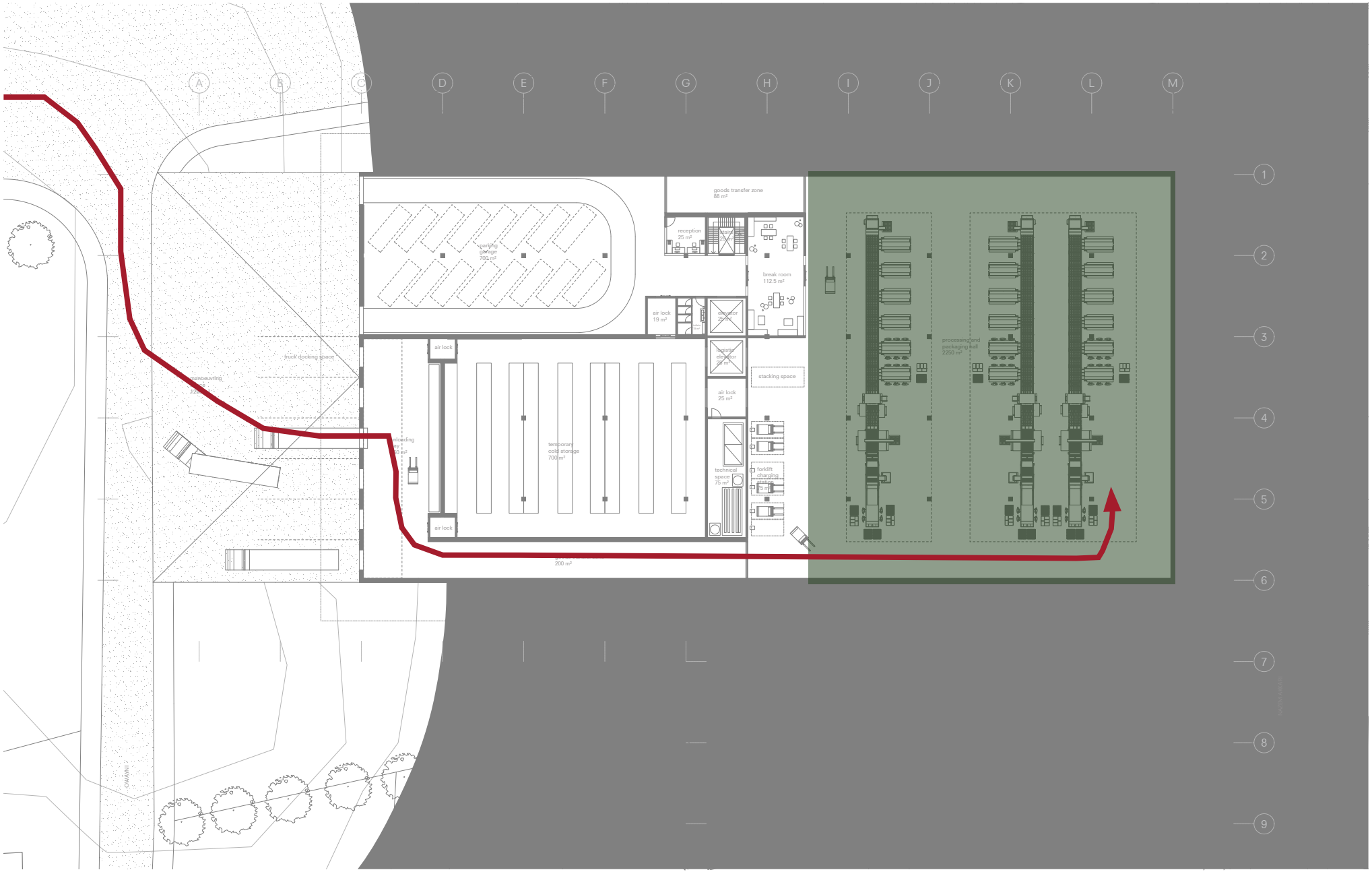
UNLOADING



PROCESSING HALL



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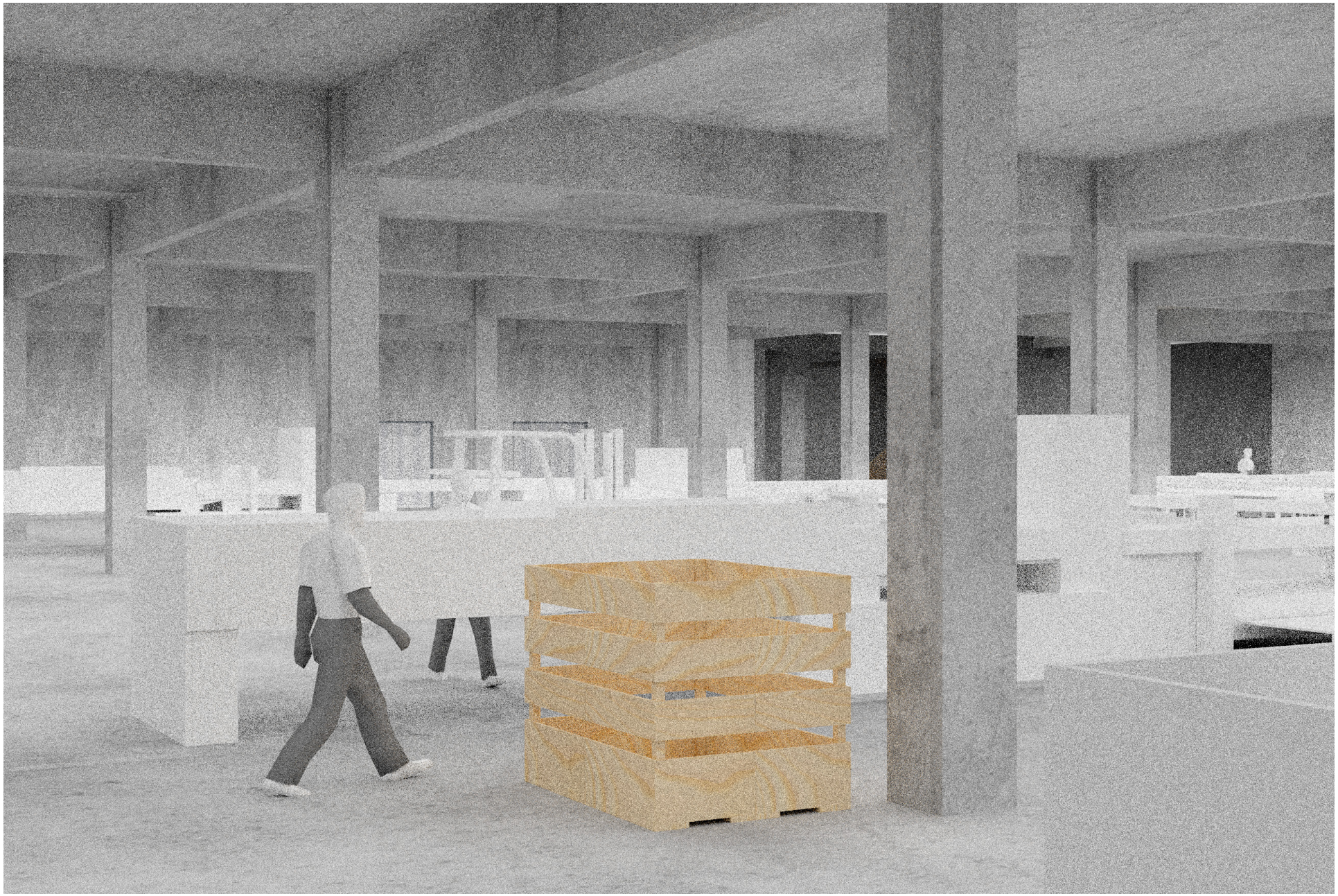
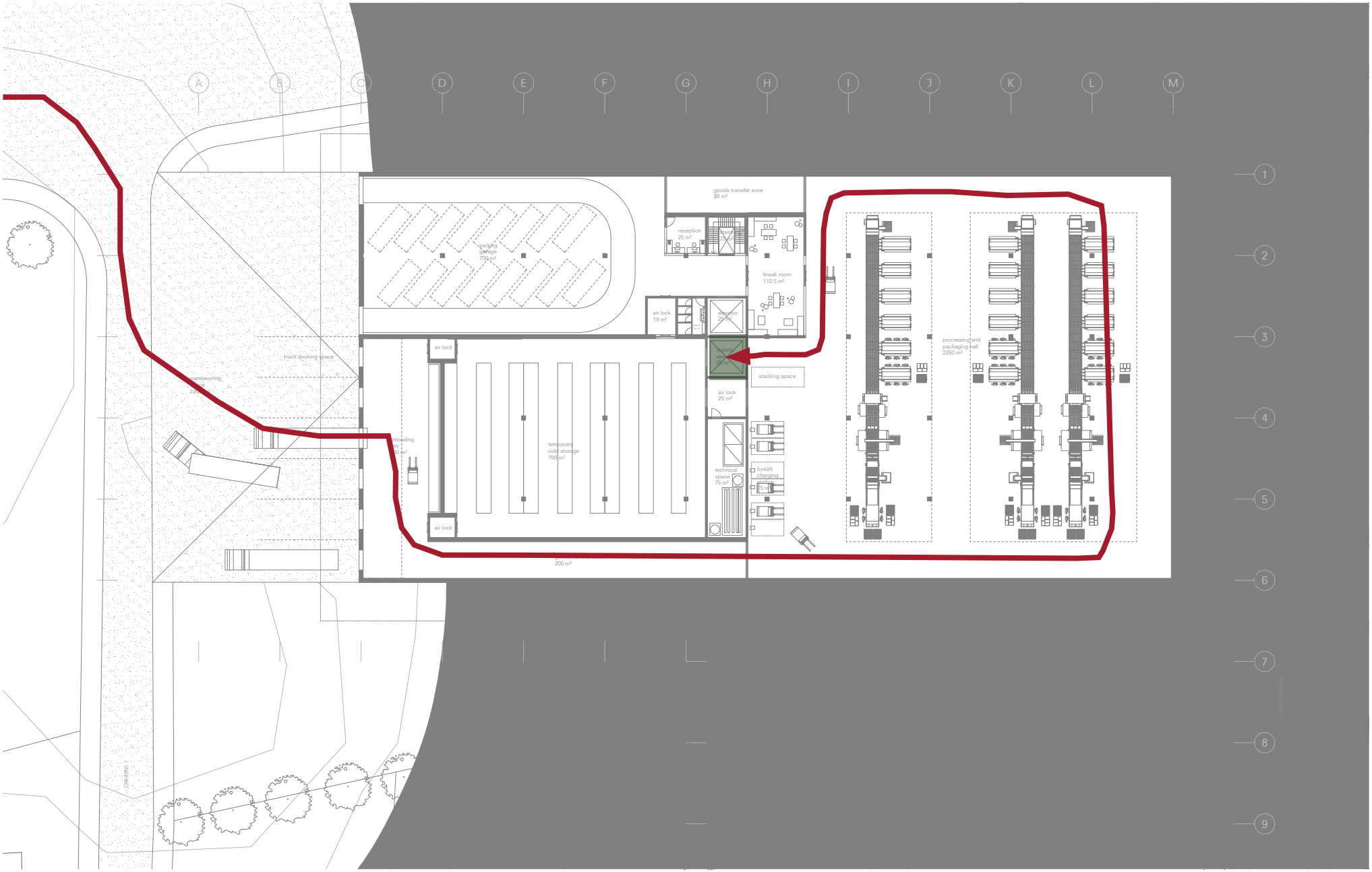
PROCESSING HALL



TRANSPORT



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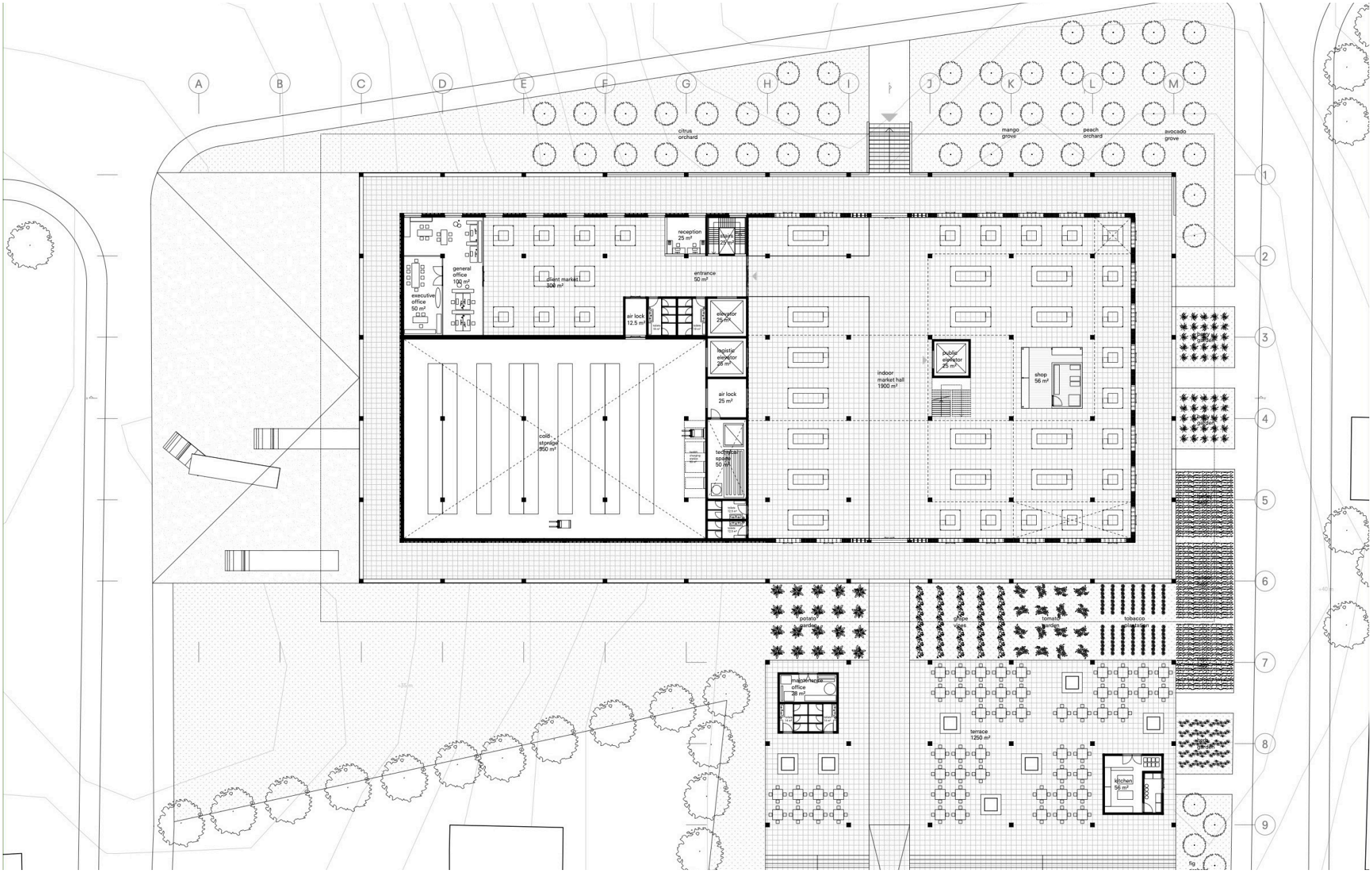
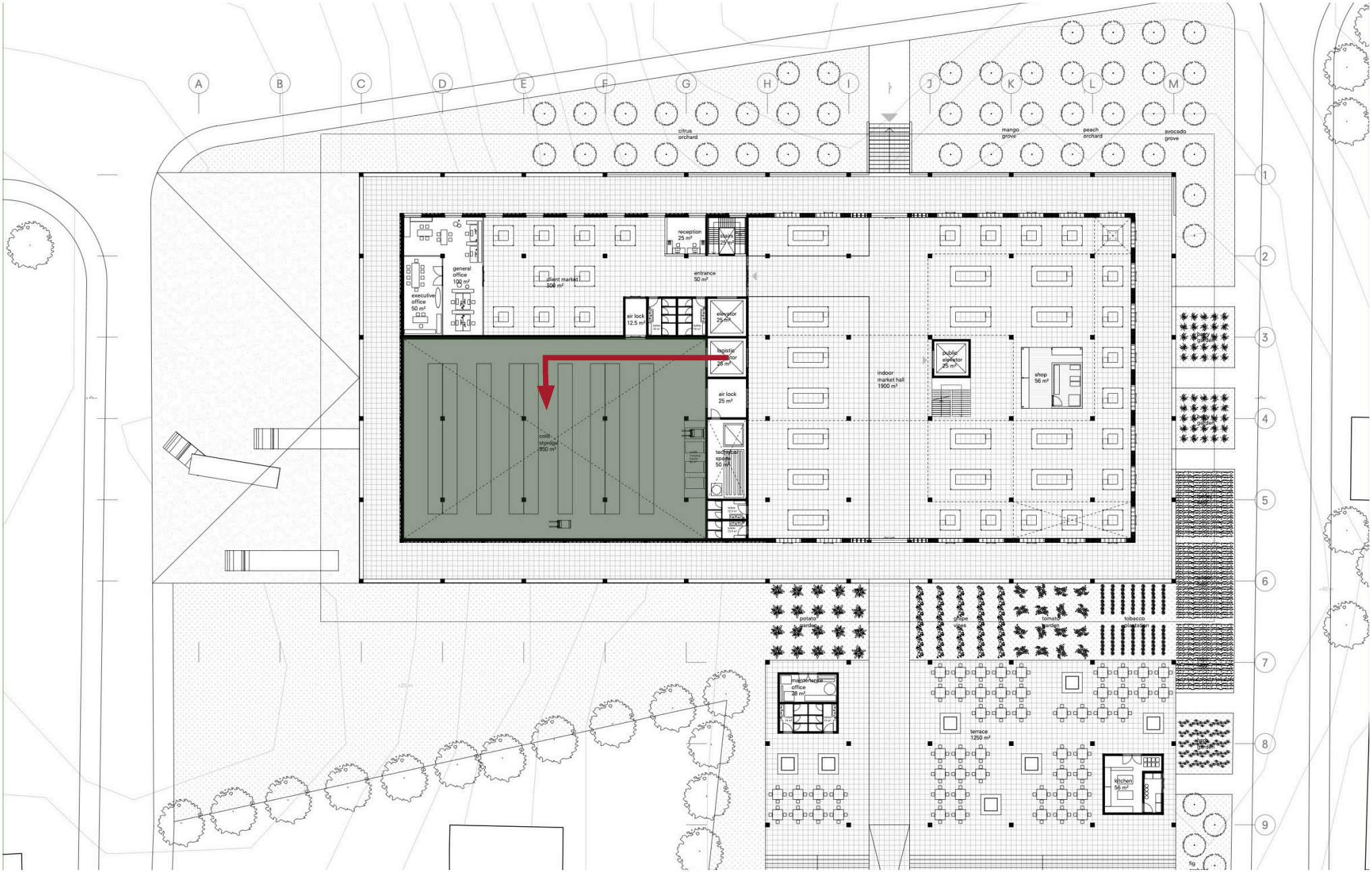
00 GROUND FLOOR



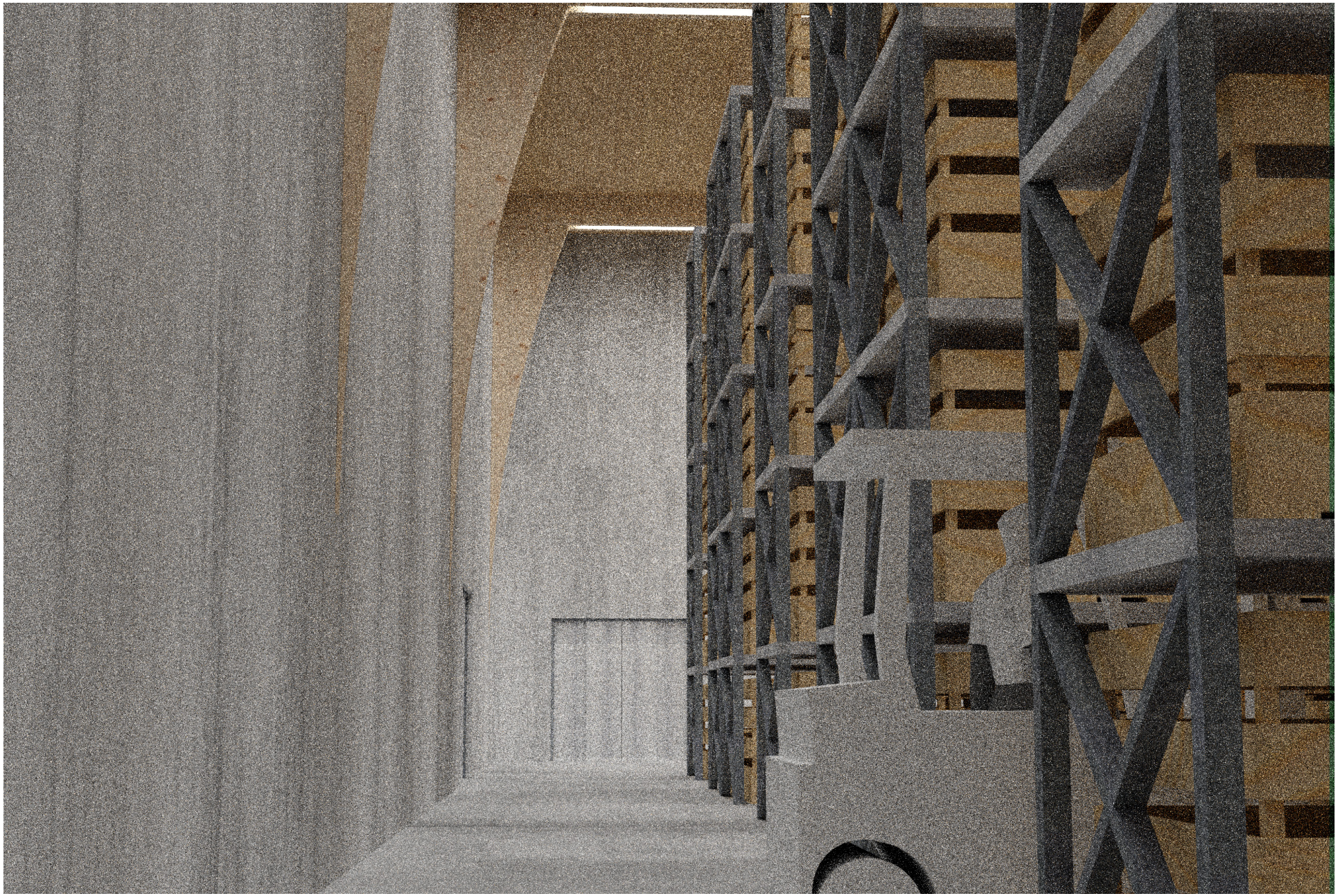
complex projects

TO THE STORAGE

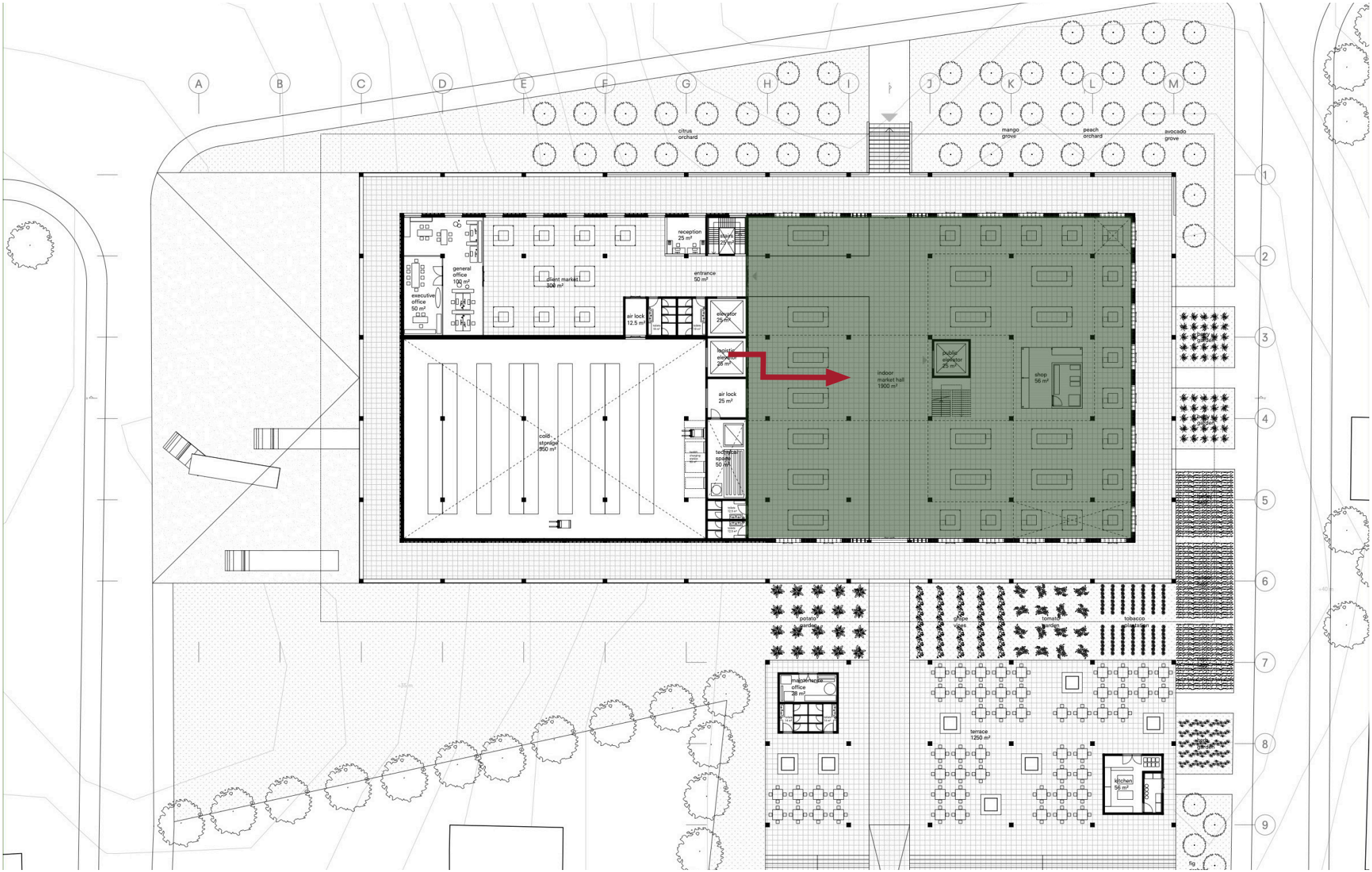


complex projects

IN THE STORAGE HALL



TO THE MARKET HALL



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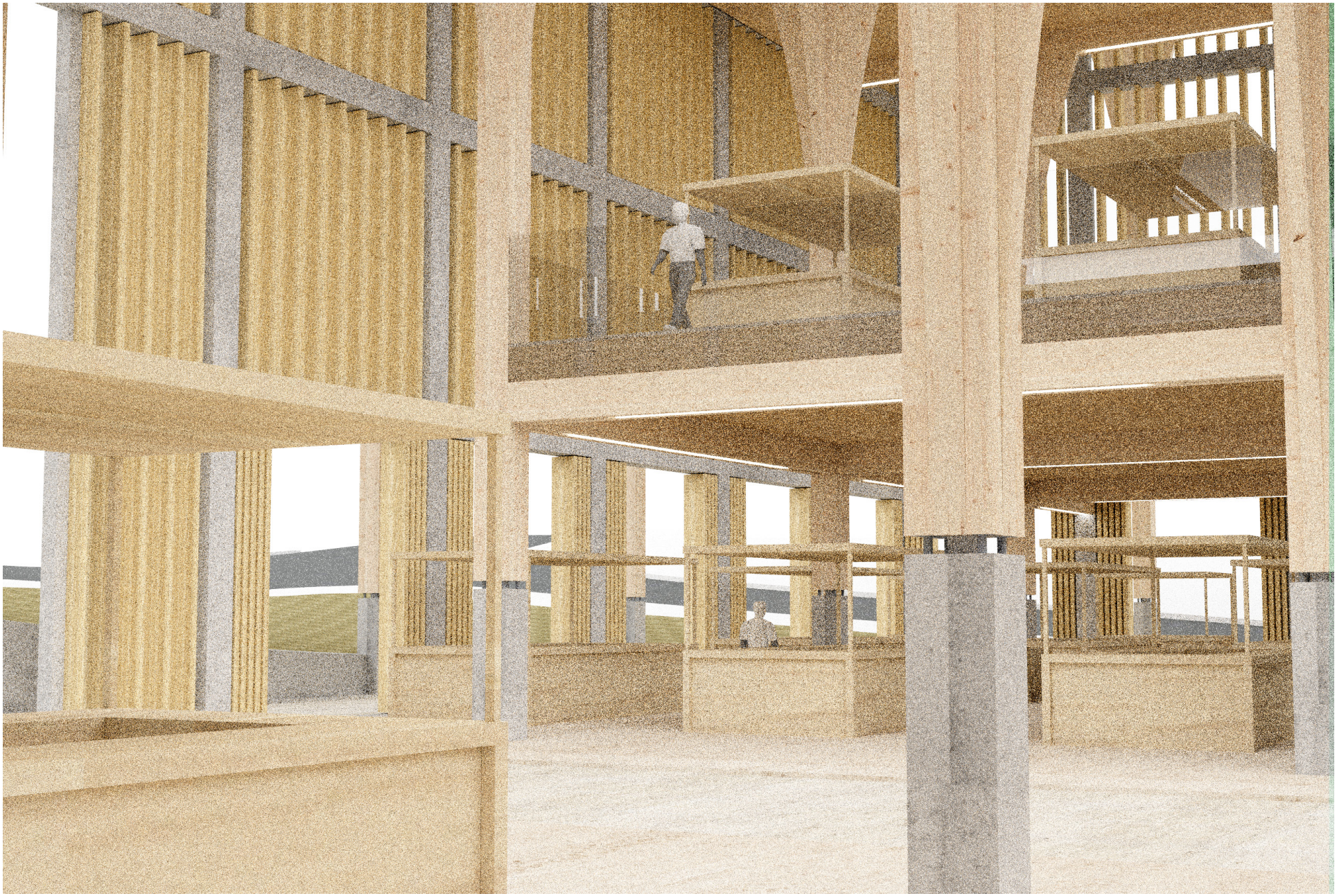
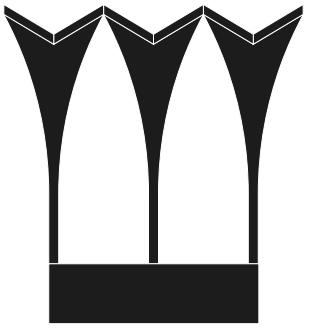
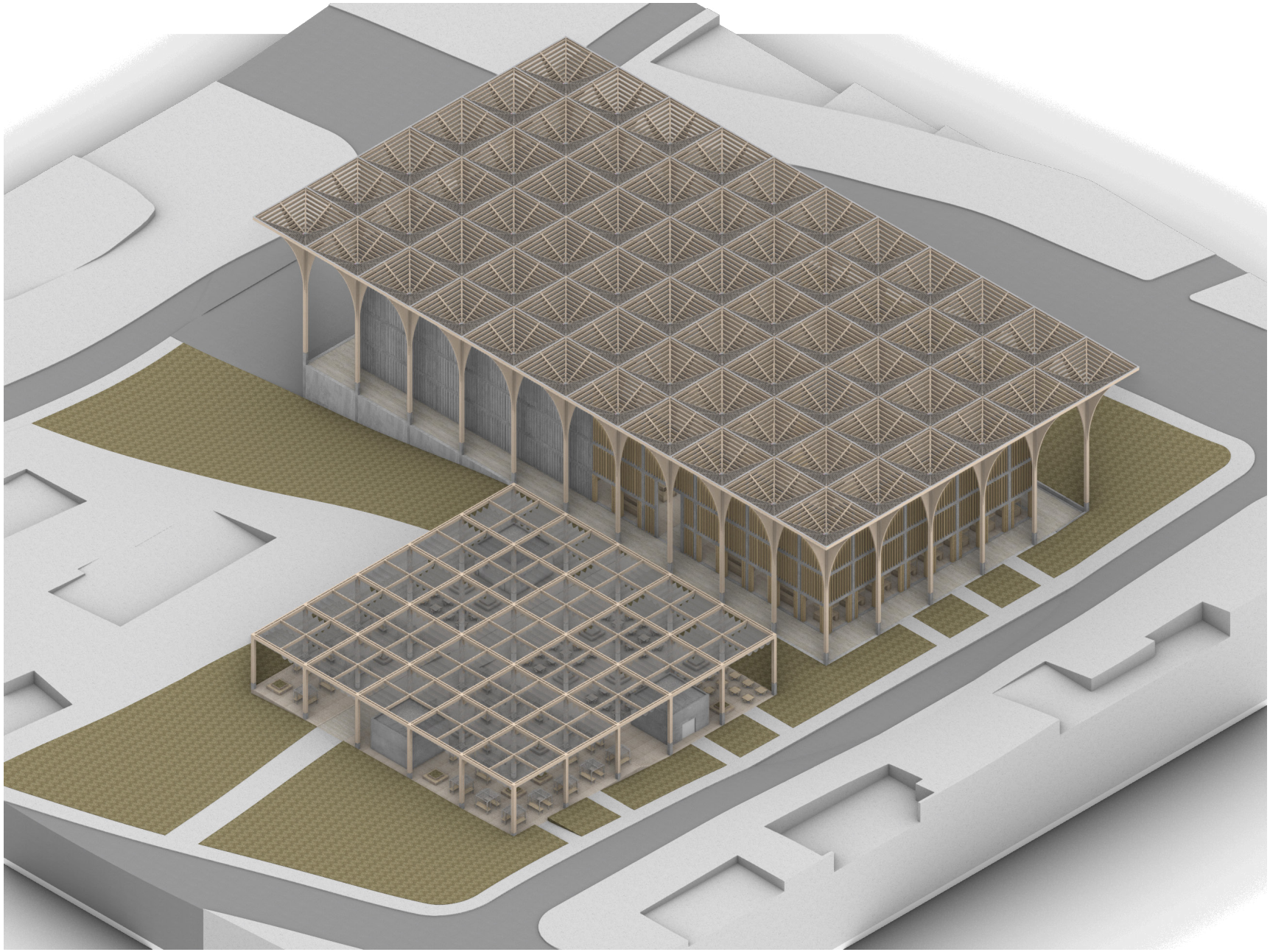
TO THE MARKET HALL



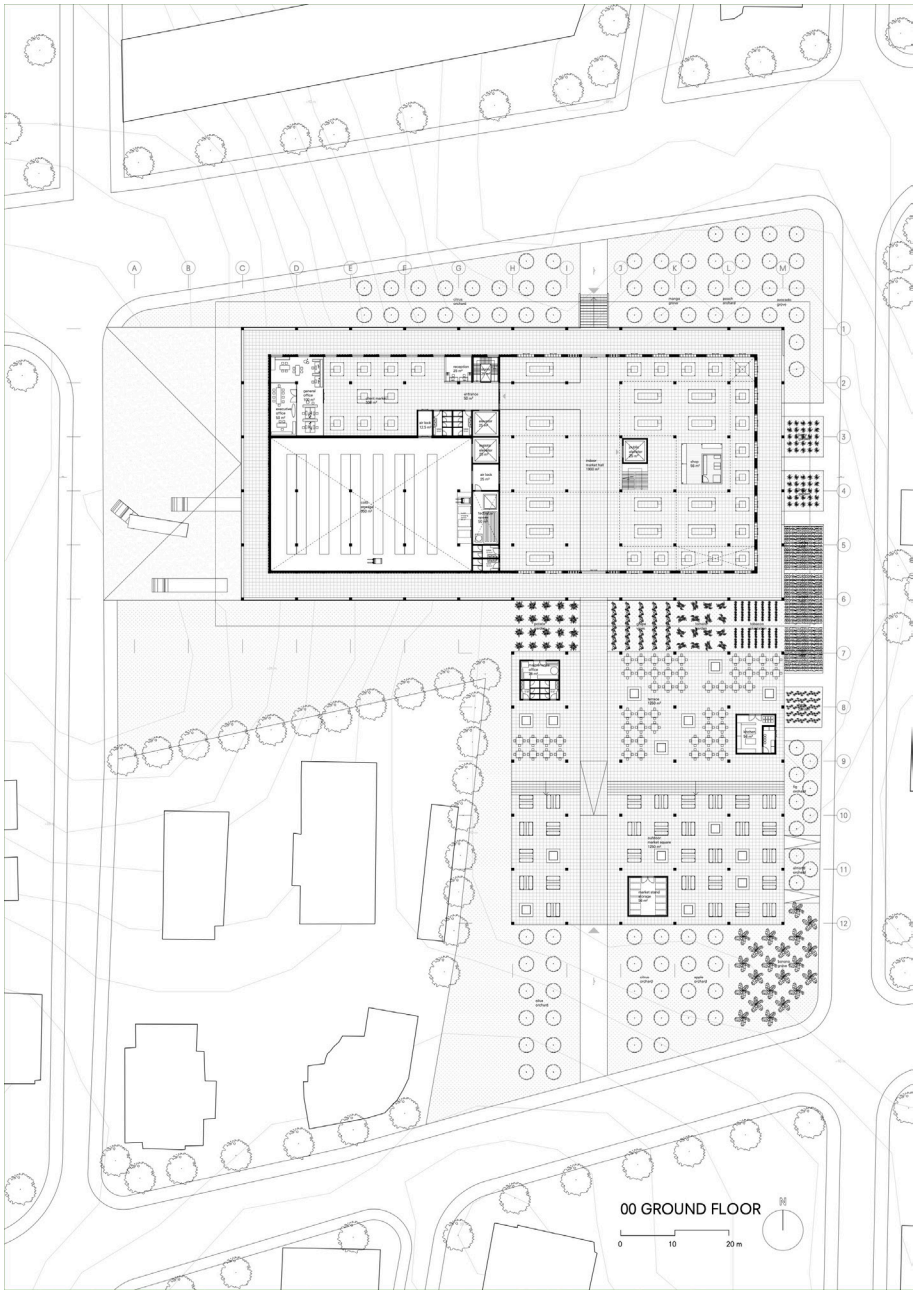


THE HUMAN

SLIDE TITLE



GROUND FLOOR



SLIDE TITLE


kitchen
56 m²
outdoor
market square
1250 m²
market stand
storage
56 m²
fig
orchard
almond
orchard
banana
grove
citrus
orchard
apple
orchard
olive
orchard
9
10
11
12
00 GROUND FLOOR
N
0
10
20 m

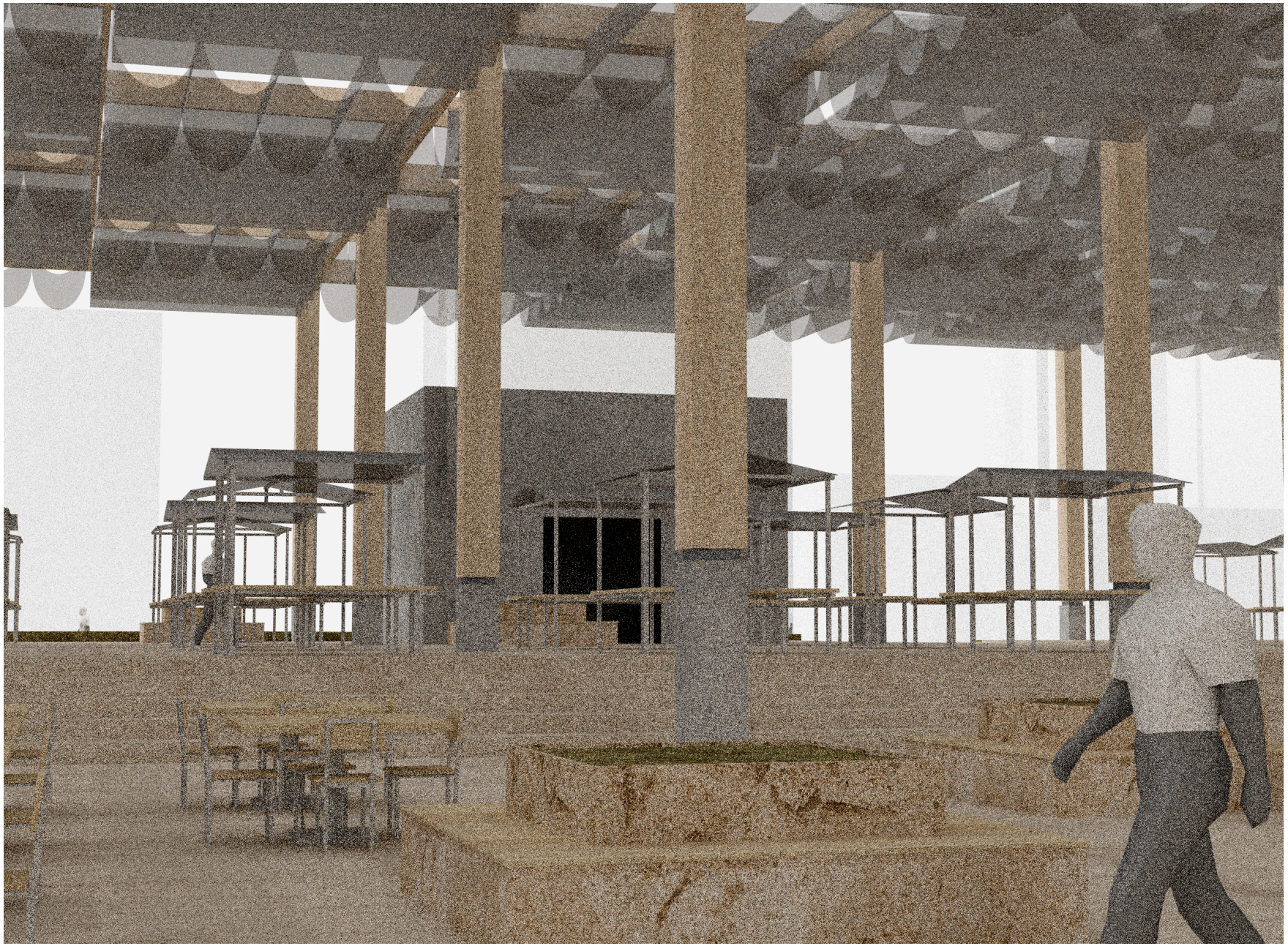
APPROACH SOUTH

APPROACHING THE STREET

STREET

OUTDOOR MARKET

THE OUTDOOR MARKET

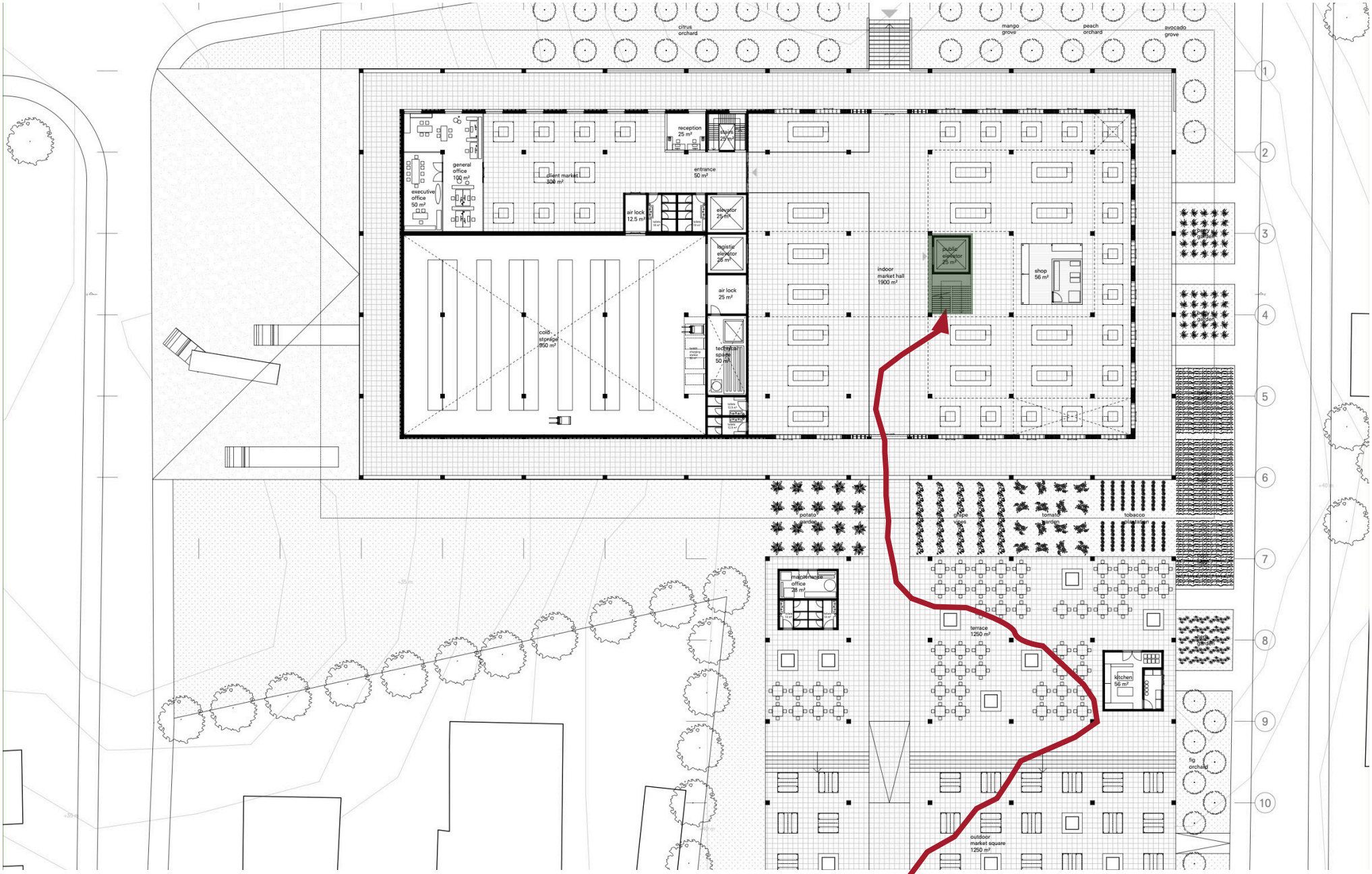


OUTDOOR IS INDOOR

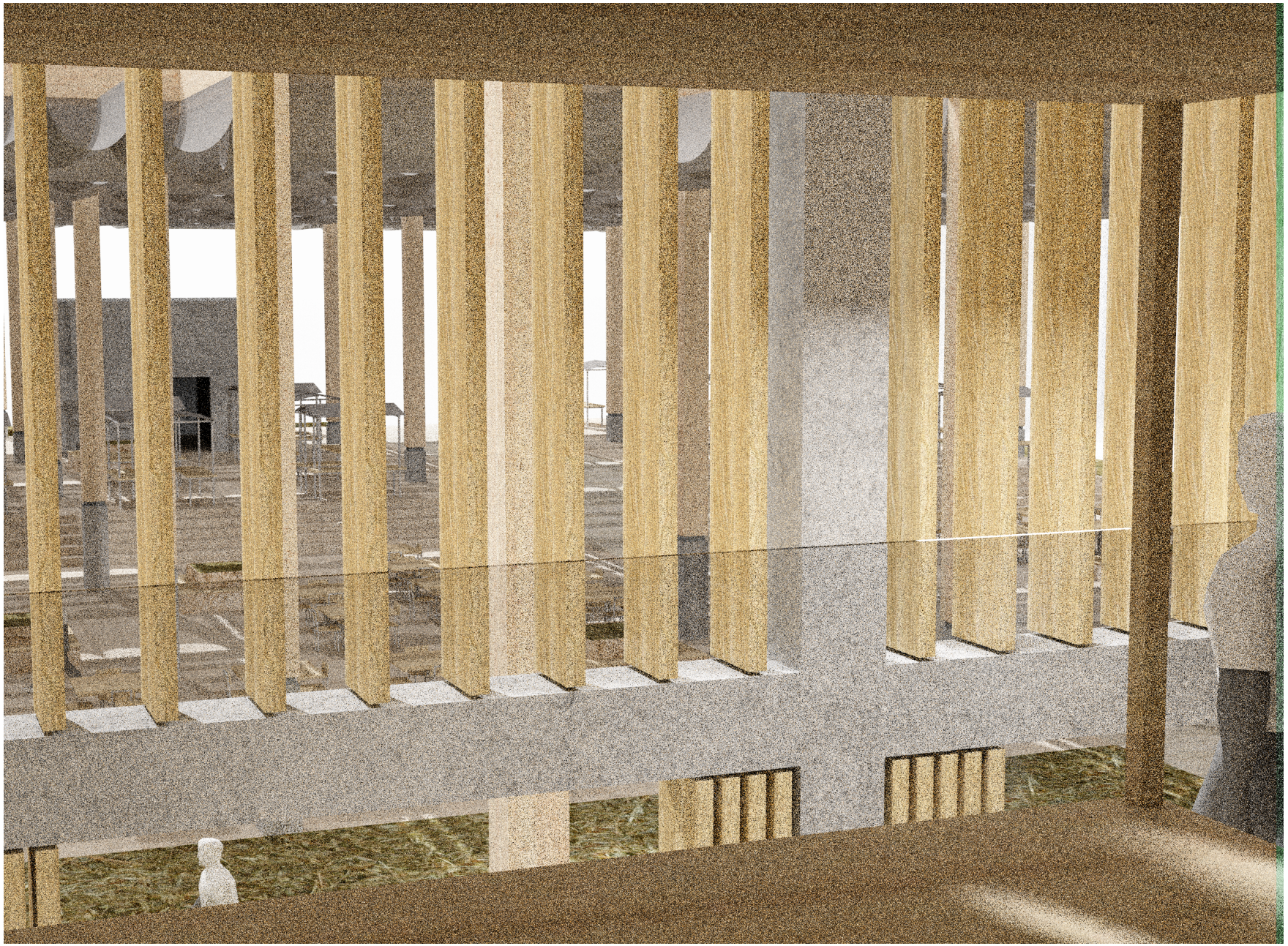
ENTRANCE FROM THE SOUTH

APPROACH

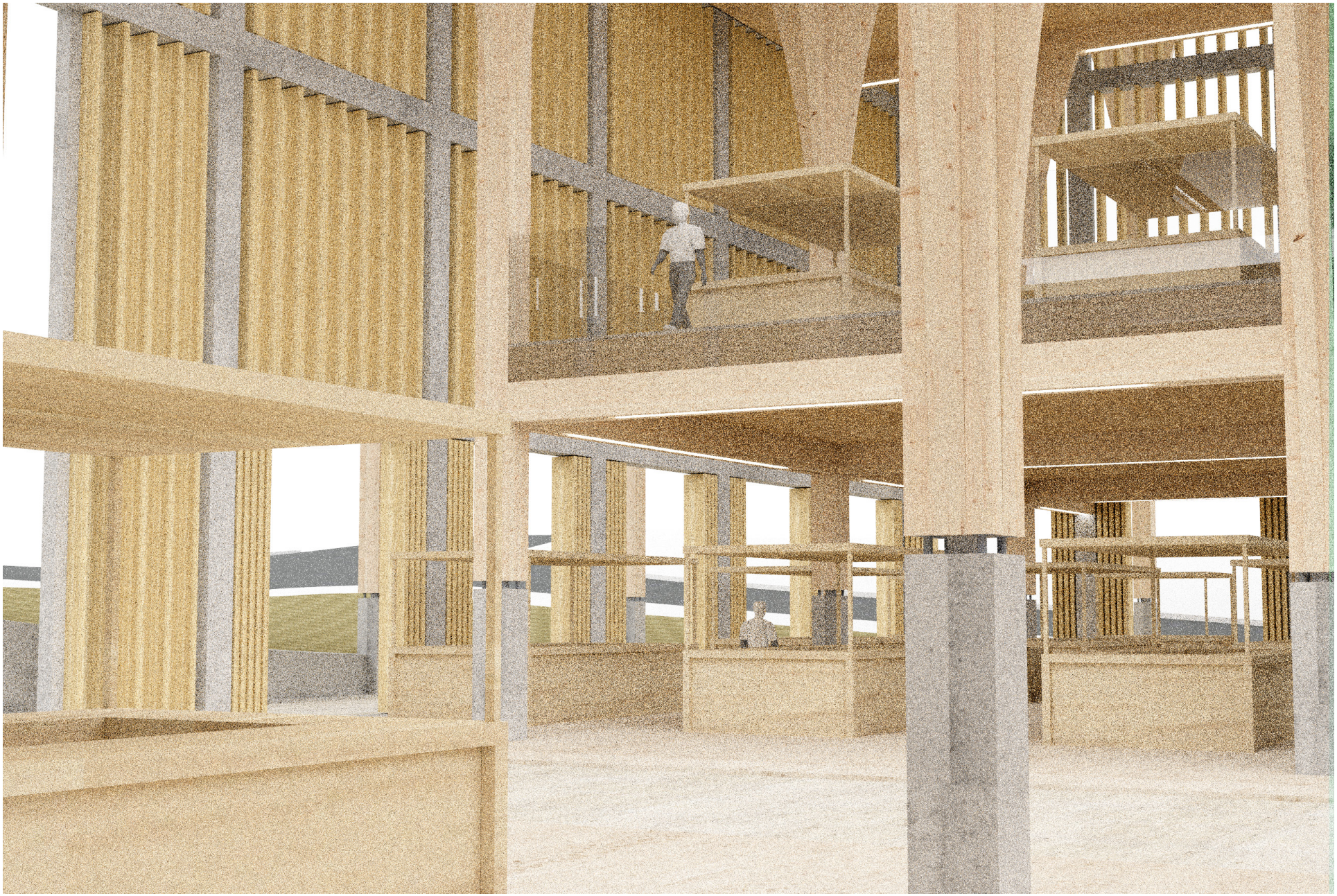
EXPLORING THE LEVELS



EXPLORING THE LEVELS

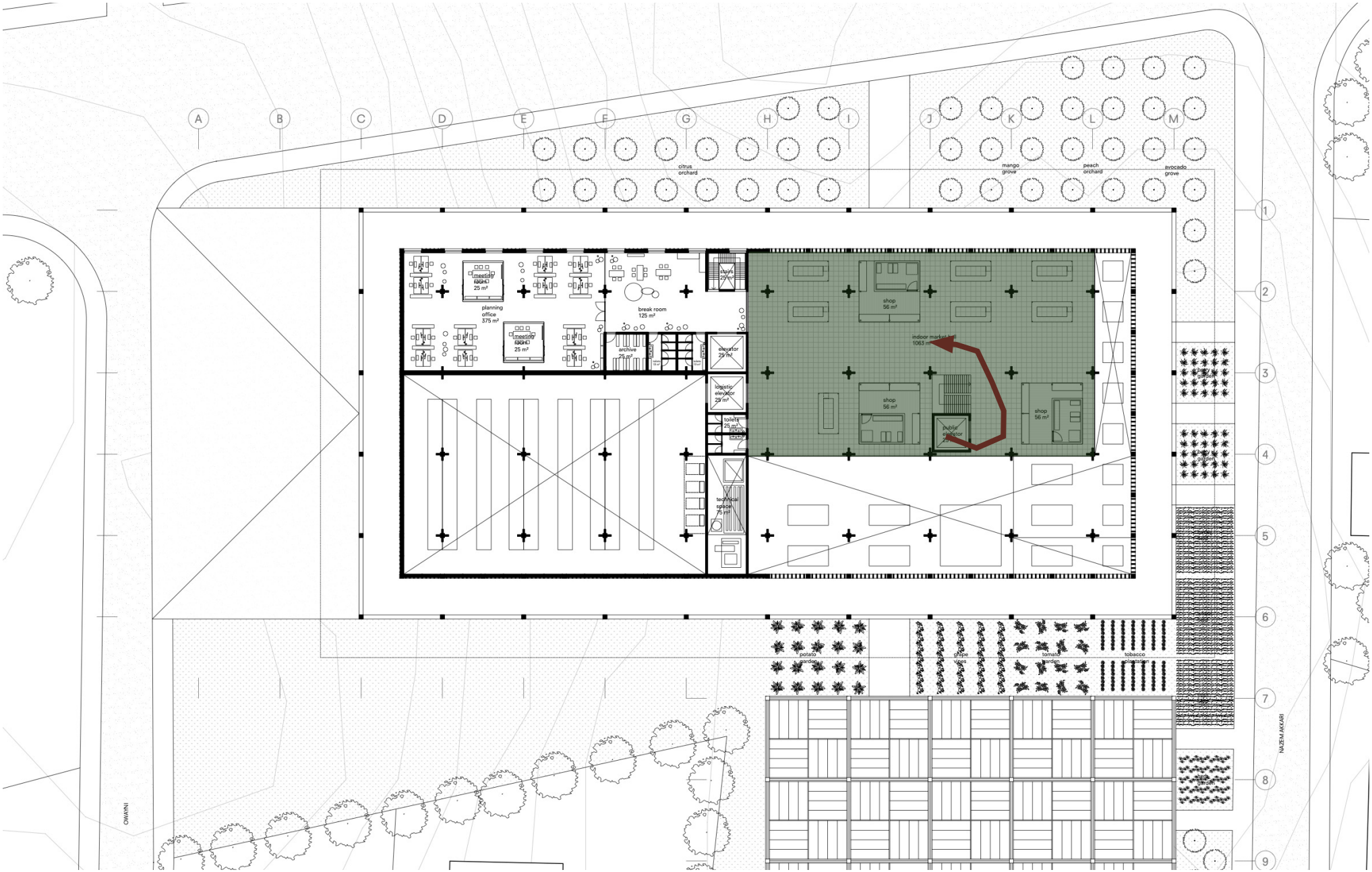


EXPLORING THE LEVELS



EXPLORING THE LEVELS

EXPERIENCE THE CANOPY



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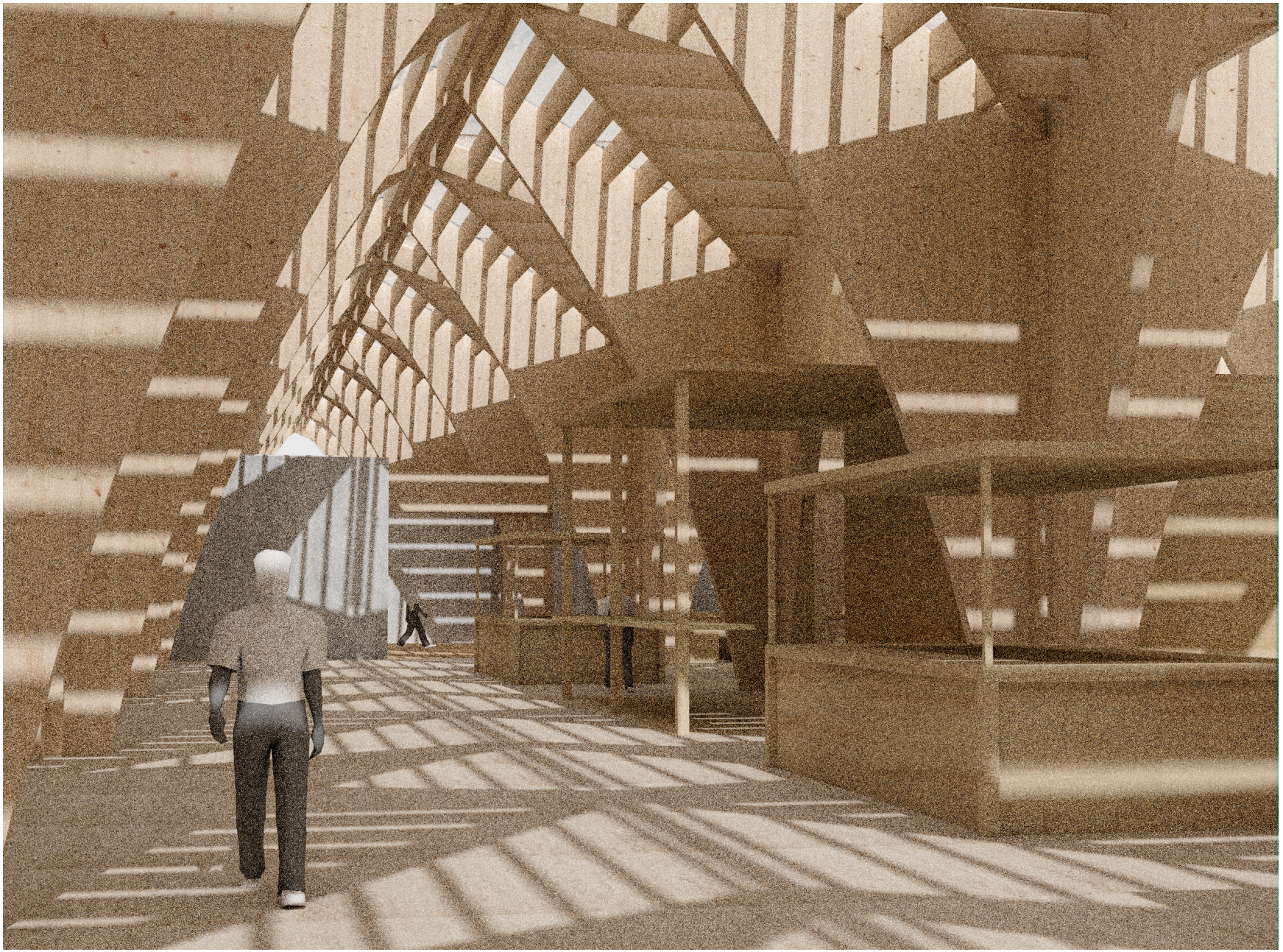
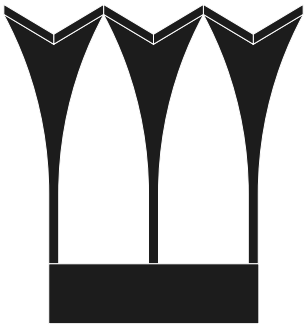
EXPERIENCE THE CANOPY



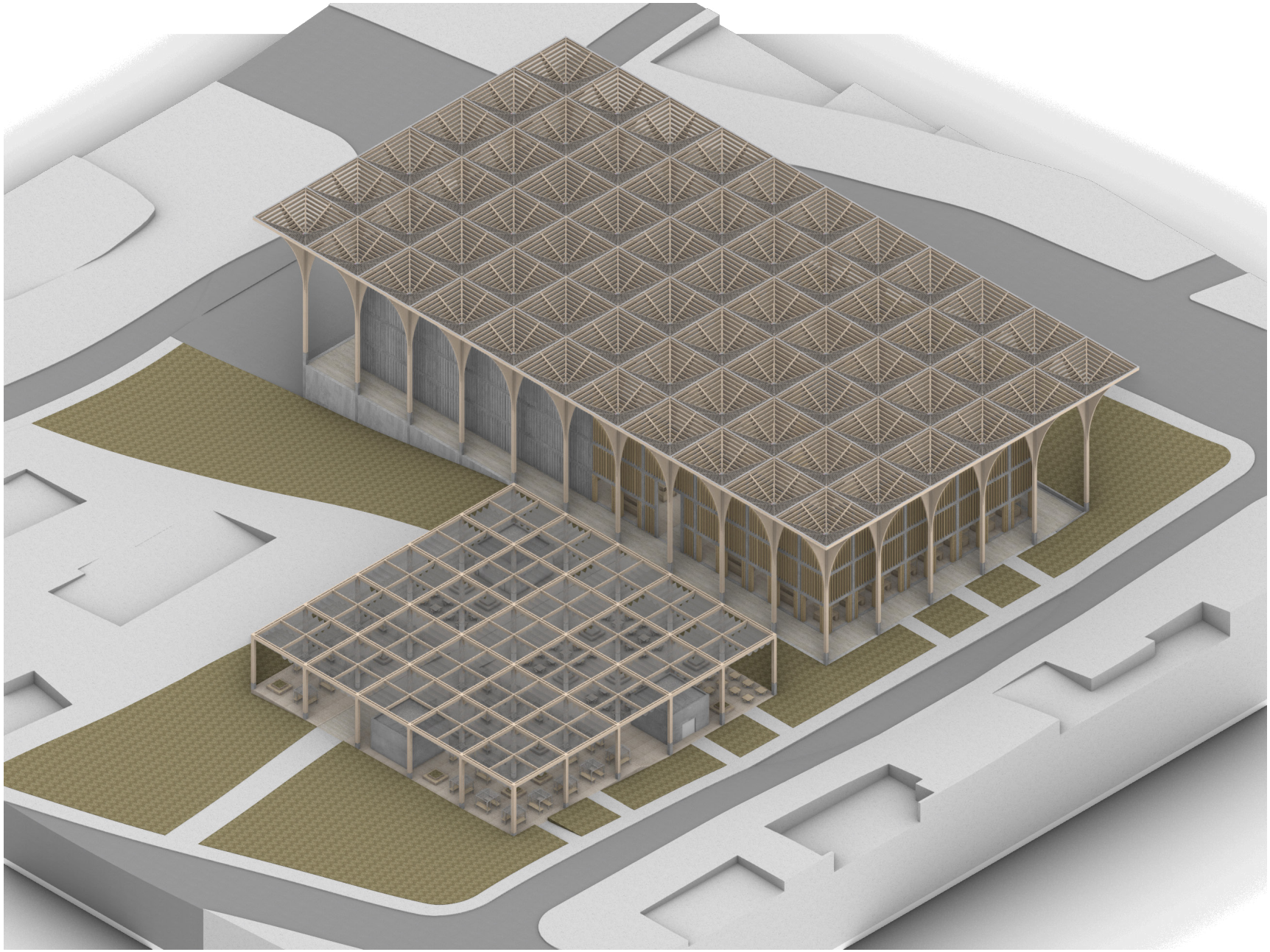


REFLECTION

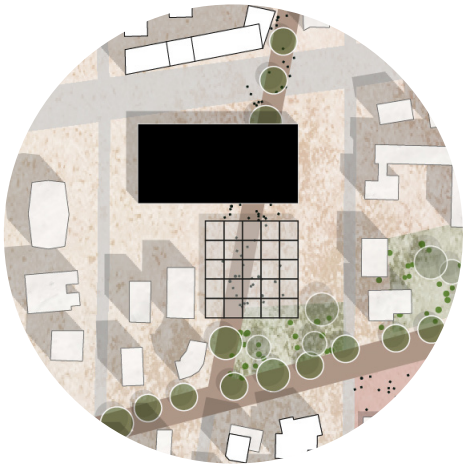
THE QUESTION

How can a food logistics facility and wholesale market be integrated in a high density urban fabric in Beirut?

THE ANSWER

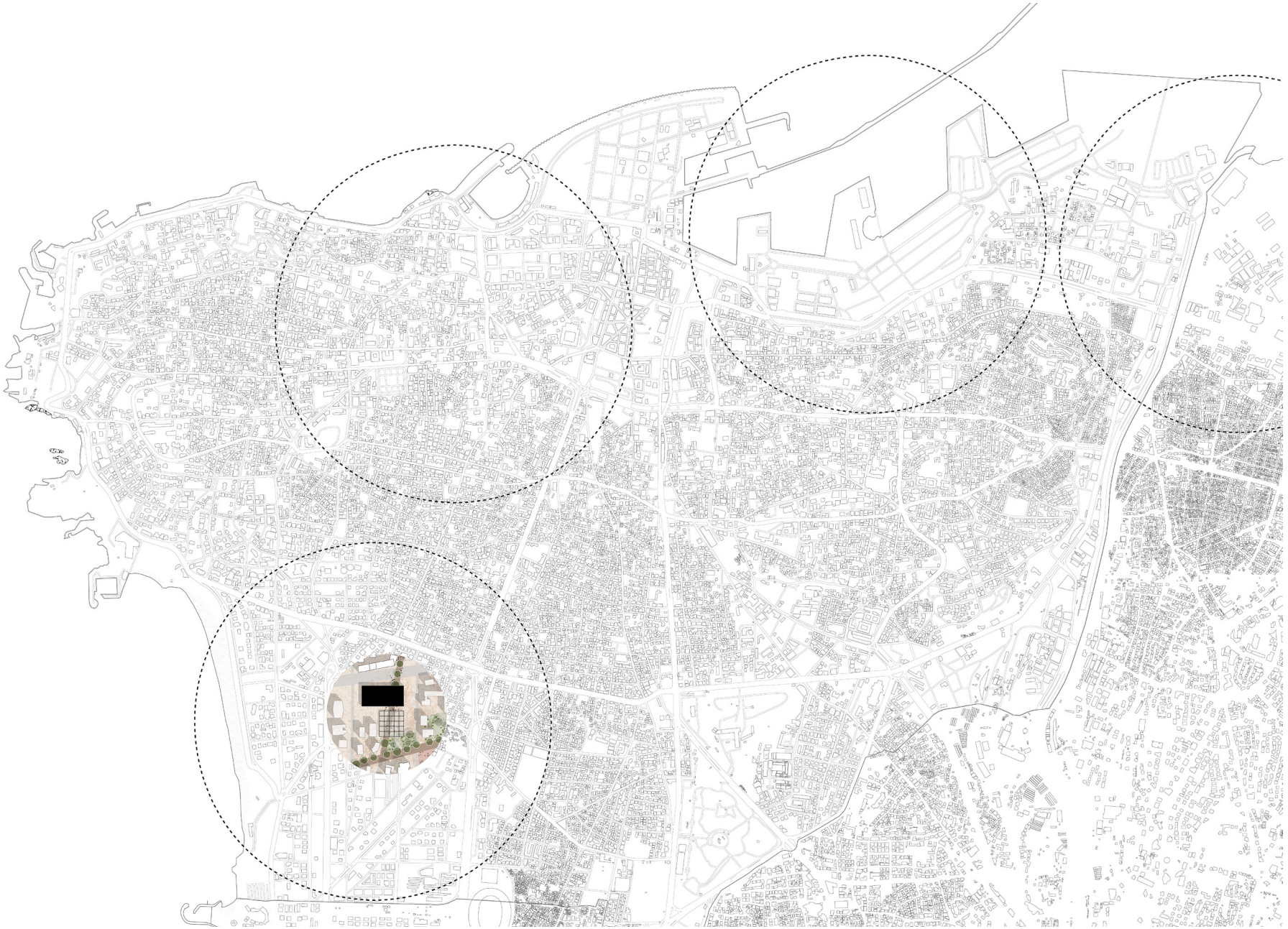


MAR ELIAS CROP MARKET



*“The **Mar Elias Crop Market** connects Beirutis with the Lebanese food chain through a varying and diverse program under a public canopy”*

NODE IN A NETWERK



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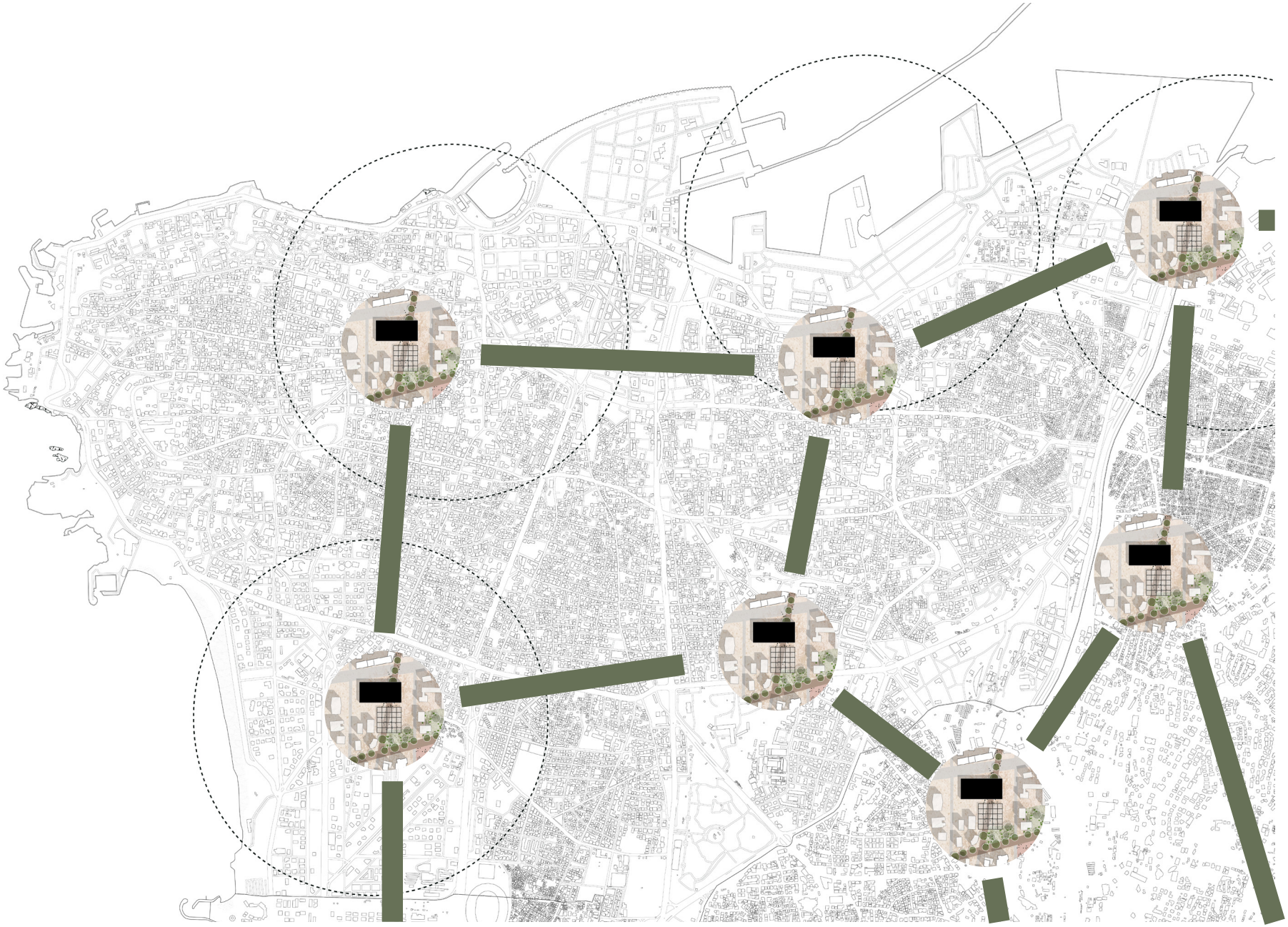
NODE IN A NETWERK



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REVIVE BEIRUT'S MARKET CULTURE

THANK YOU

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