



COMPLEX PROJECTS

# **SALAM EMERGENCY STATION**

Beirut Studio group 3

Rik Sijbrandij

24/06/2022

Introduction

# BEIRUT, LEBANON

04-08-2020



# BEIRUT, LEBANON

04-08-2020



≥ 218  
DEATHS



> 7000  
INJURIES

# CATASTROPHE



## DEALING WITH CATASTROPHE IN THE BUILT ENVIRONMENT

# EMERGENCY SERVICES



# DAMAGED EMERGENCY SYSTEM



# DAMAGED EMERGENCY SYSTEM



Healthcare



Police



Fire brigade

## 'EMS SYSTEM LEBANON: A SYSTEM CHALLENGED BY A TRIPLE CRISIS'

- Mazen El Sayed  
Director of EMS & Prehospital Care,  
American University of Beirut Medical Center

# CHALLENGING RECENT HISTORY



DAMAGED EMERGENCY SYSTEM



FINANCIAL CRISIS



POWER OUTAGES



MEDICINE CRISIS



INCREASING CRIME RATES



FUEL CRISIS



COVID-19 PANDEMIC



VIOLENT PROTESTS



TERRORISM & GANG VIOLENCE



# EMERGENCY SERVICES



Lebanese Red Cross

☎ 140



The Internal Security Forces

☎ 112



Lebanese civil defence

☎ 125

# EMERGENCY SERVICES

## INDEPENDENT



Lebanese Red Cross

☎ 140

## GOVERNMENT



The Internal Security Forces

☎ 112

## GOVERNMENT + VOLUNTEERS



Lebanese civil defence

☎ 125

# EMERGENCY SERVICES

INDEPENDENT

GOVERNMENT

GOVERNMENT +  
VOLUNTEERS



**LACK OF COORDINATION**

Lebanese Red Cross

The Internal Security Forces

Lebanese civil defence

☎ 140

☎ 112

☎ 125

# RESEARCH QUESTION


**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**

# URBAN REDEVELOPMENT



Introduction

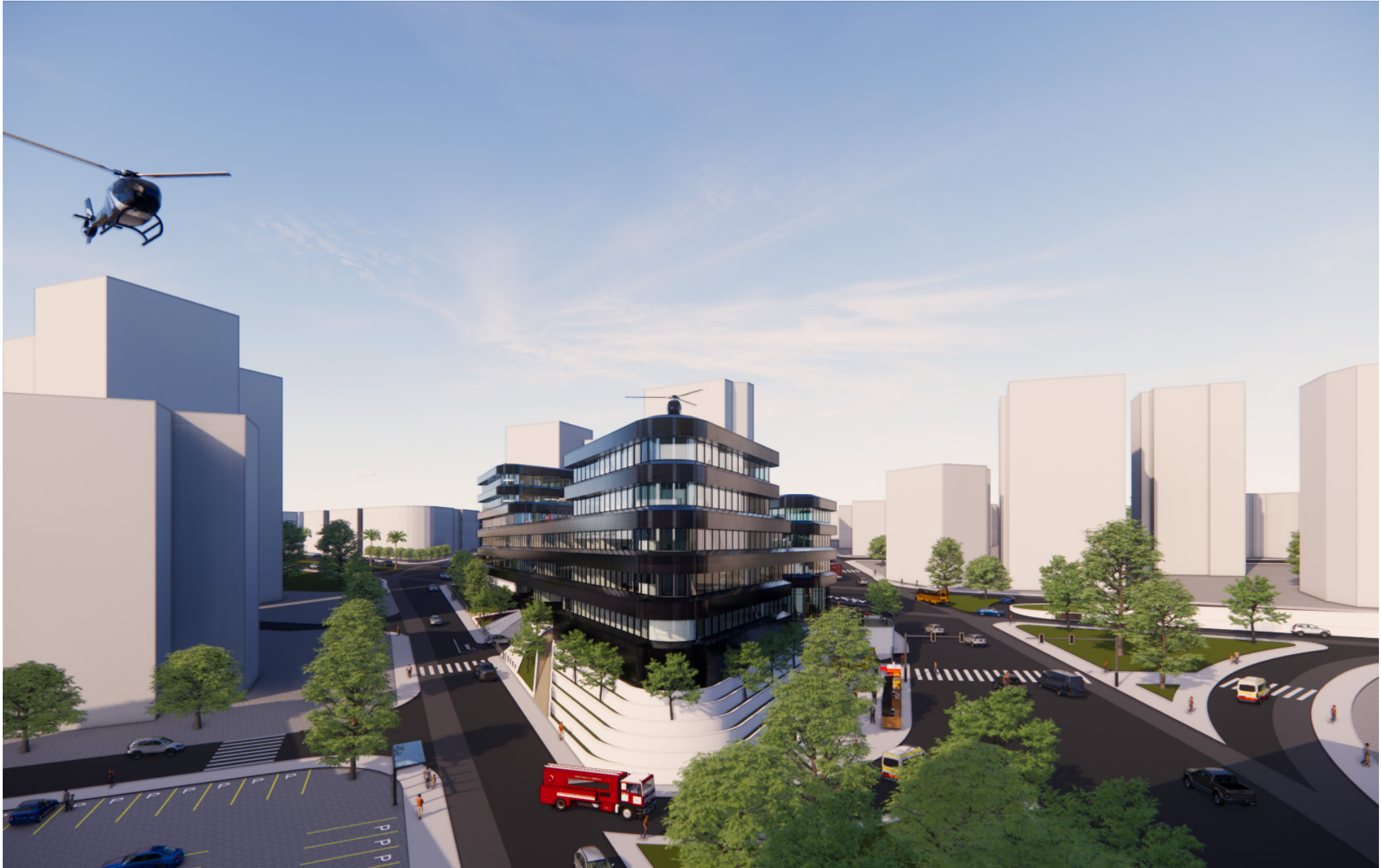
# EMERGENCY STATION

 112



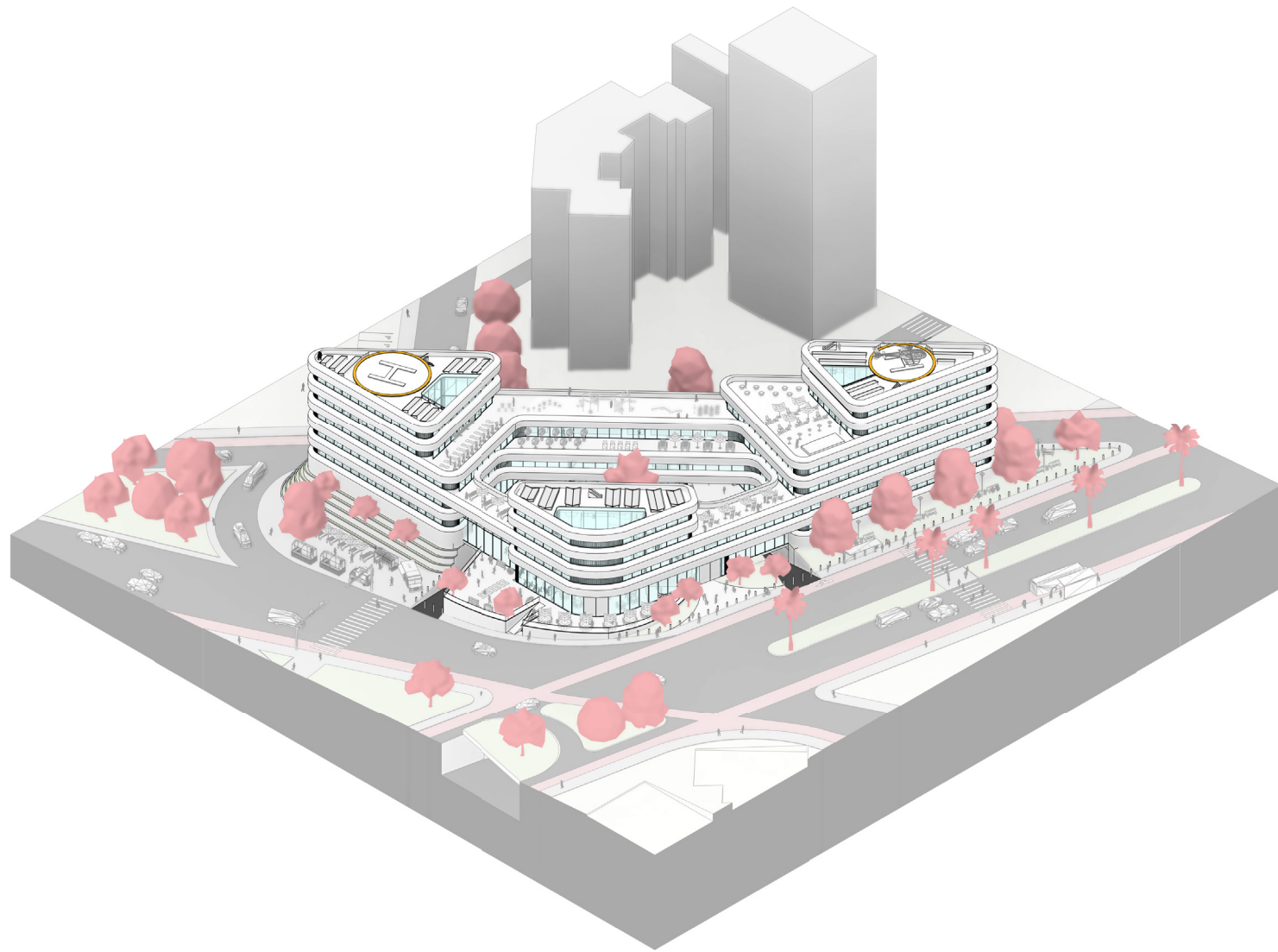
Introduction

# SALAM EMERGENCY STATION



Introduction

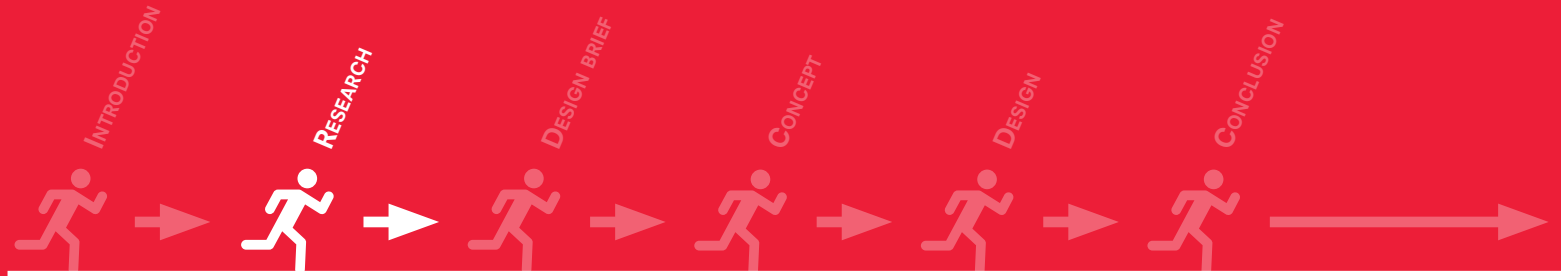
# SALAM EMERGENCY STATION





# SALAM EMERGENCY STATION

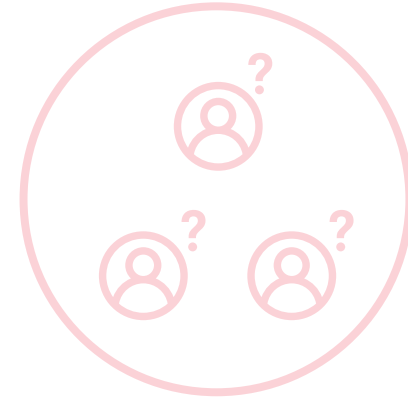




# RESEARCH

# PROBLEM STATEMENT

In Beirut, one of the most fundamental human needs is currently not being met, namely **safety**.



# PROBLEM CAUSES

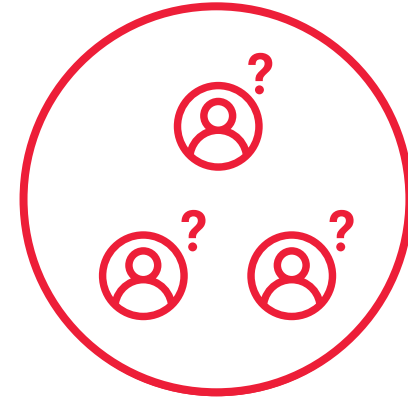
In Beirut, one of the most fundamental human needs is currently not being met, namely **safety**.



Slow response times  
of emergency services



Terrorist threat &  
public tensions



Lack of coordination  
between emergency  
services

# RESEARCH QUESTION

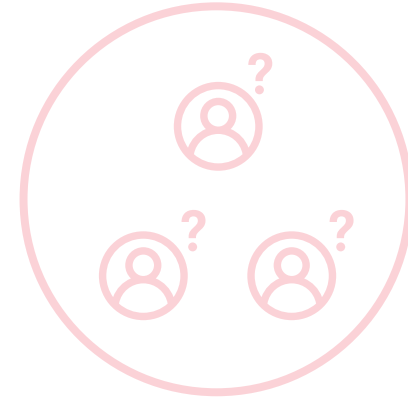
**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**



Slow response times  
of emergency services



Terrorist threat &  
public tensions



Lack of coordination  
between emergency  
services

Research  
**AMBITIONS**

**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**



Fast response  
times



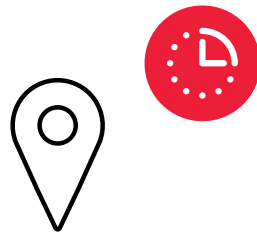
Resilient building  
design



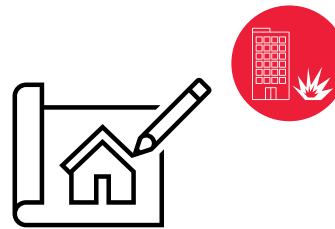
Coordinated  
emergency aid

# RESEARCH STRUCTURE

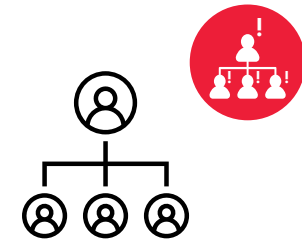
**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**



Location



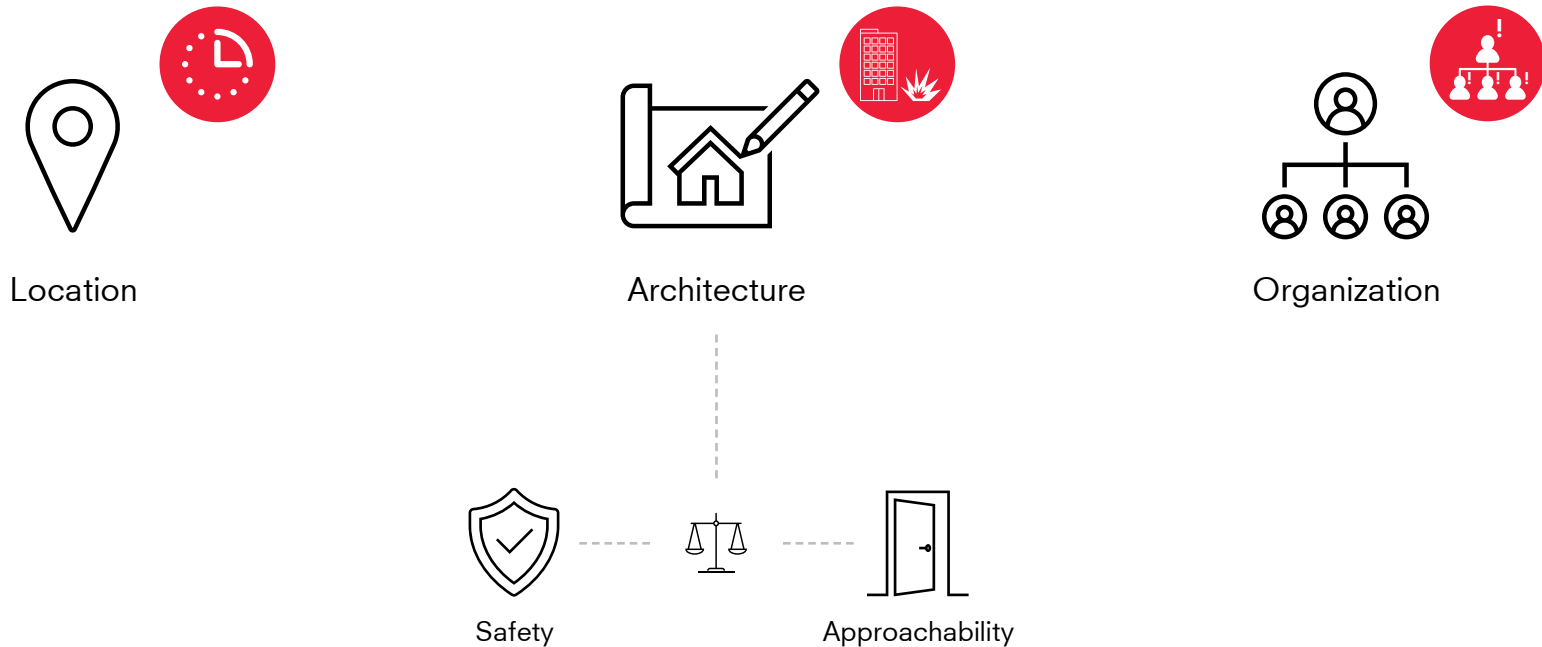
Architecture



Organization

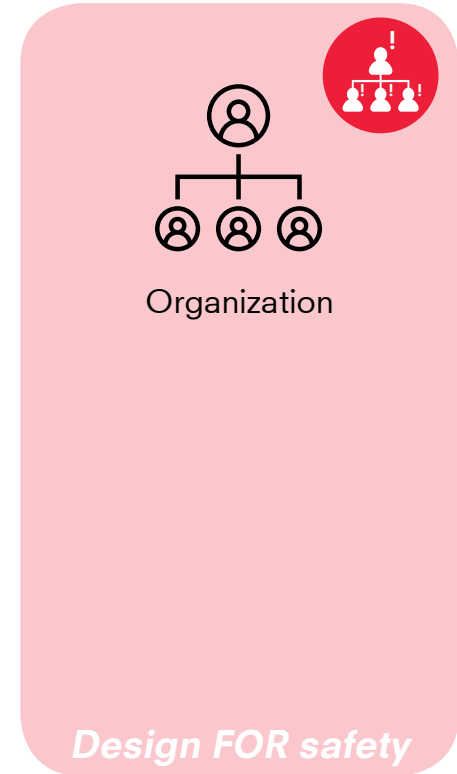
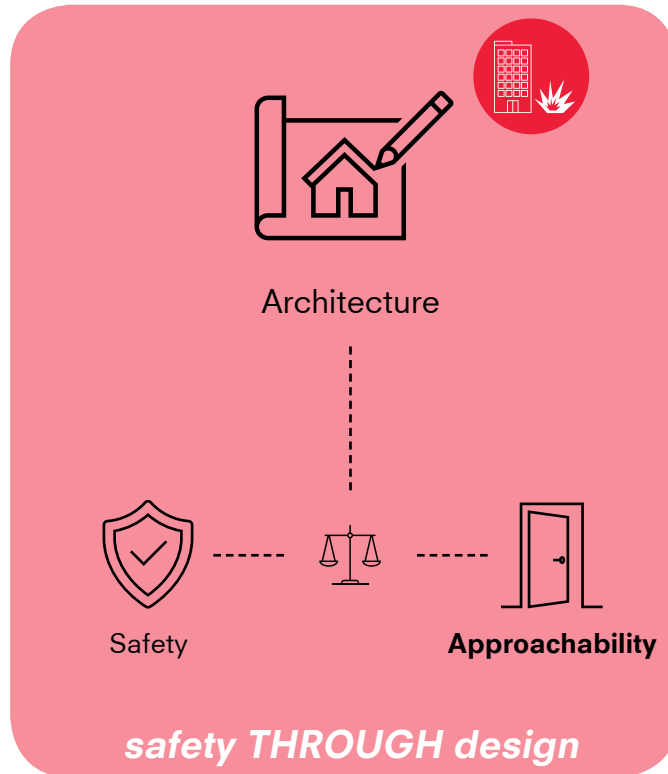
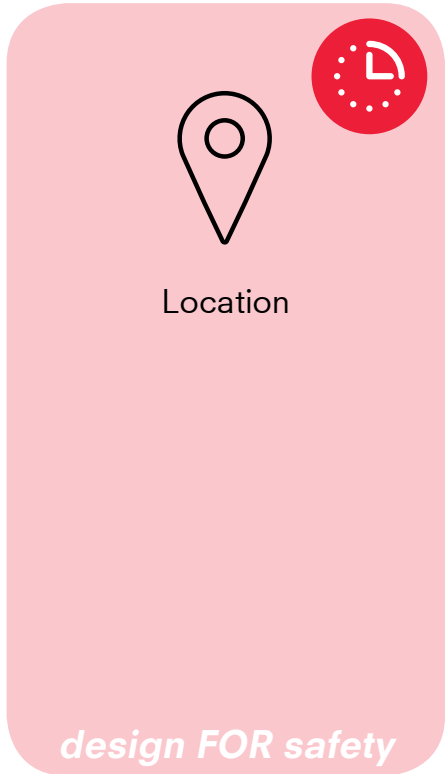
# RESEARCH STRUCTURE

**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**





**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**



# APPROACHABILITY



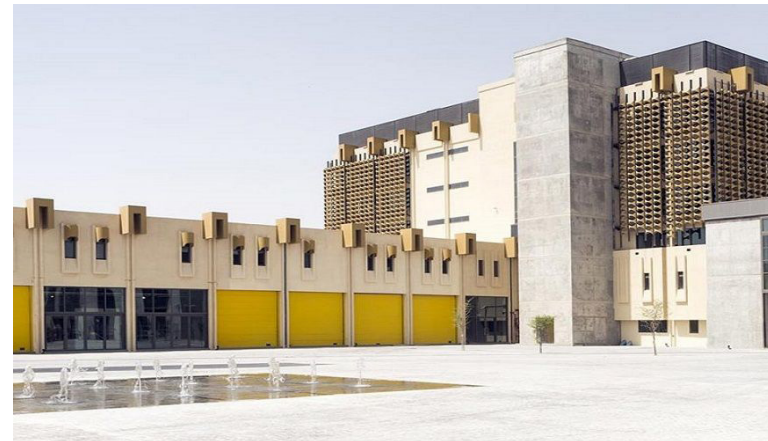
**POLICE STATION, LEBANON**



**POLICE STATION, OMAN**



**FIRE STATION, DUBAI**



**FIRE STATION, QATAR**

Research  
**RELEVANCE**



**NATURAL DISASTER**



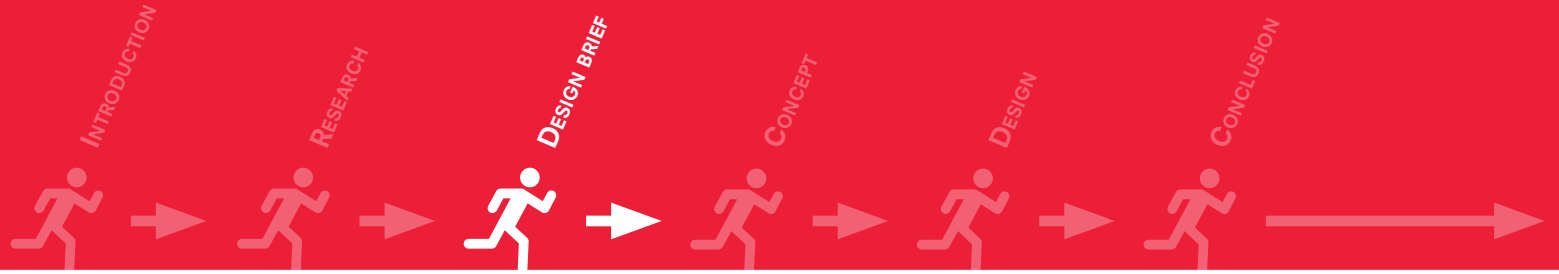
**WAR**



**TERRORISM**

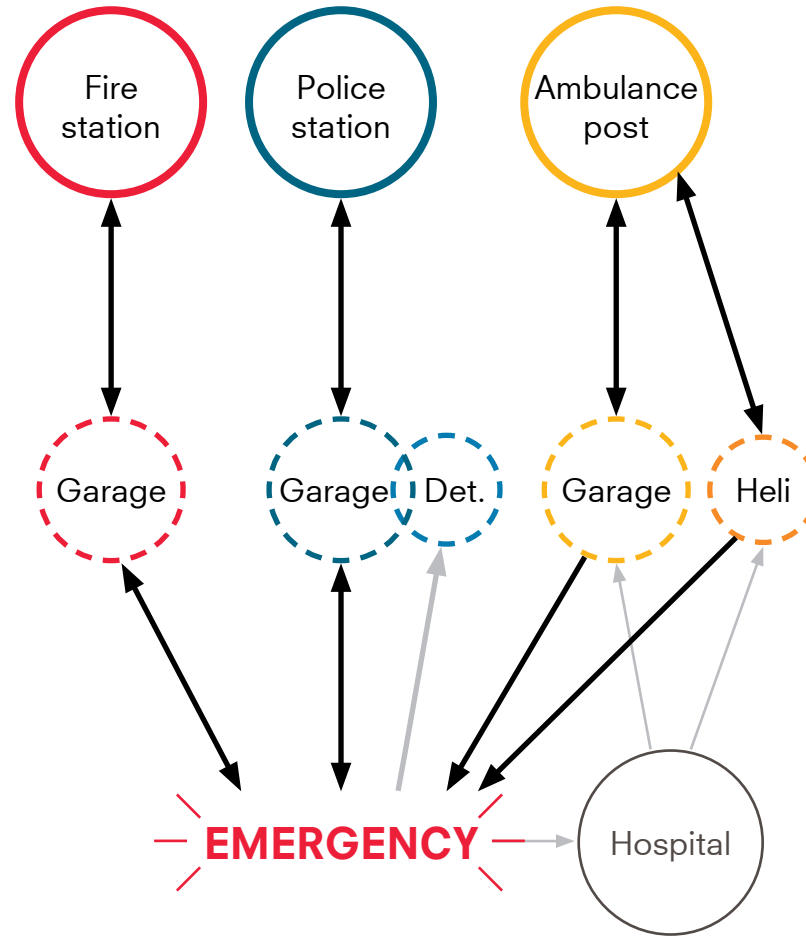


**PROTESTS**

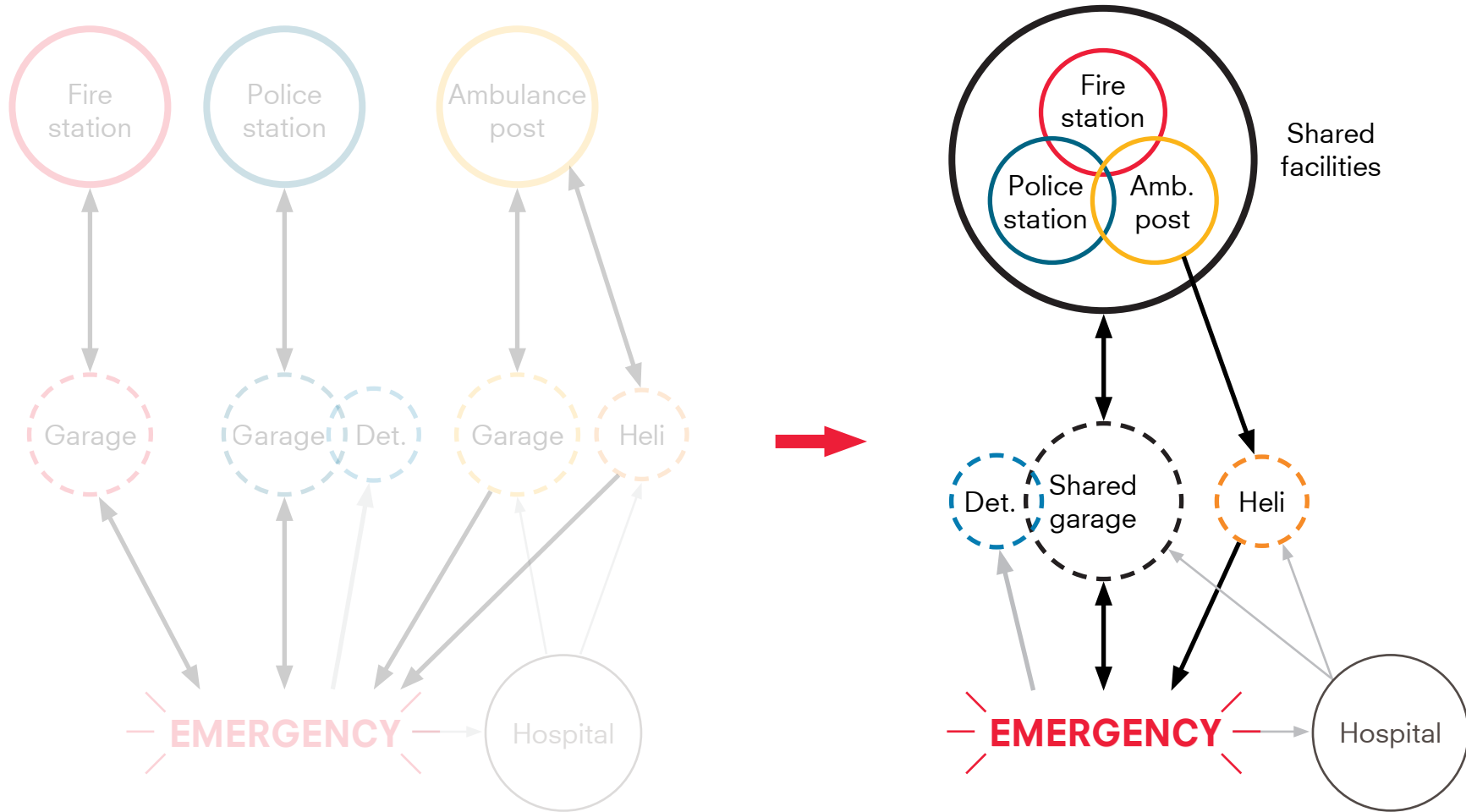


# DESIGN BRIEF

# CURRENT SITUATION



# PROPOSED SITUATION



# EMERGENCY SERVICES



Civil Defence



Lebanese Red Cross



Internal Security Forces



FIRE STATION



AMBULANCE POST



POLICE STATION

# EMERGENCY PROGRAM



Civil Defence



Lebanese Red Cross



Internal Security Forces



**FIRE STATION**



**AMBULANCE POST**



**POLICE STATION**



Design brief  
**SHARED PROGRAM**

**GOVERNING BODY**



Municipality of Beirut



**FIRE STATION**

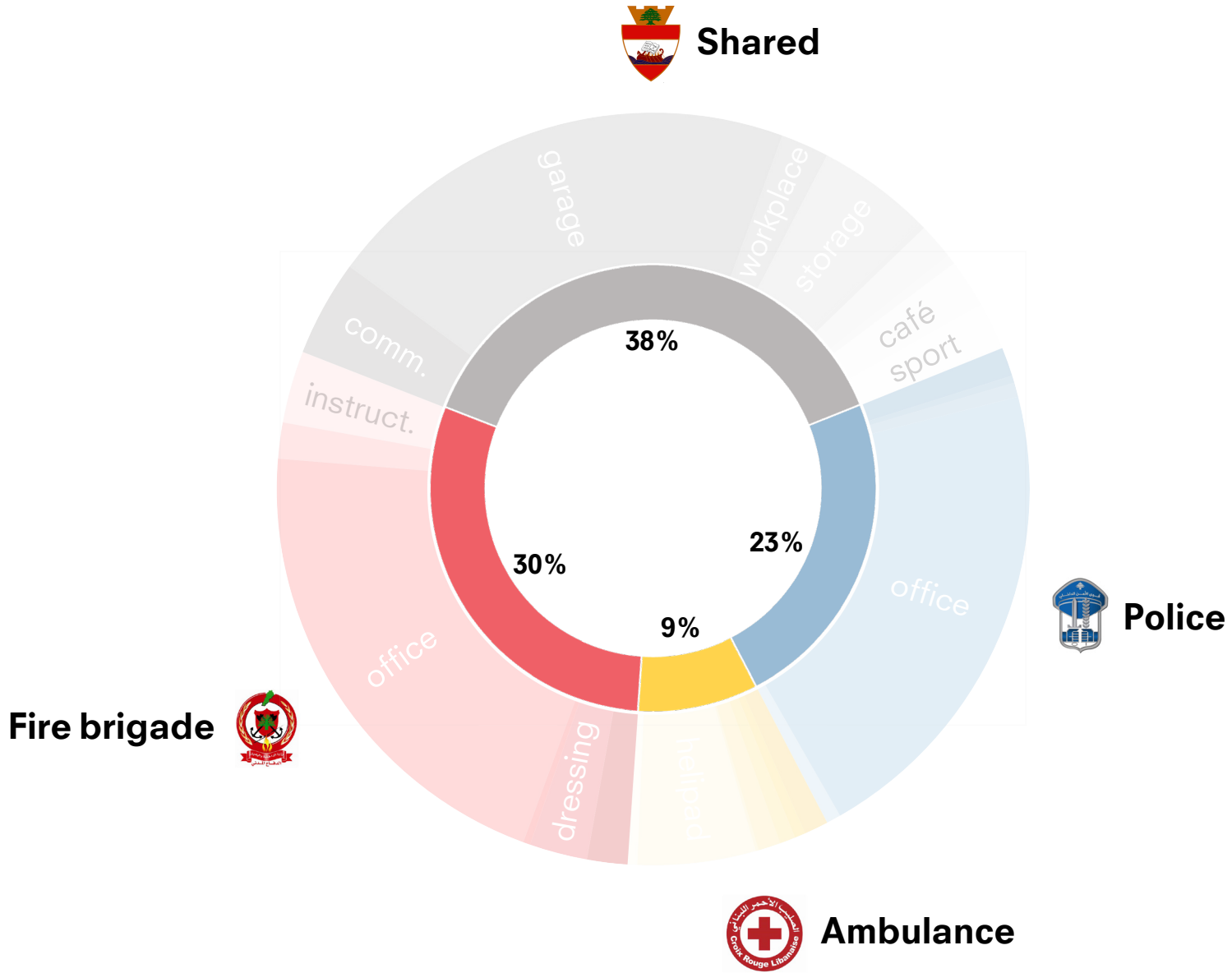


**AMBULANCE POST**

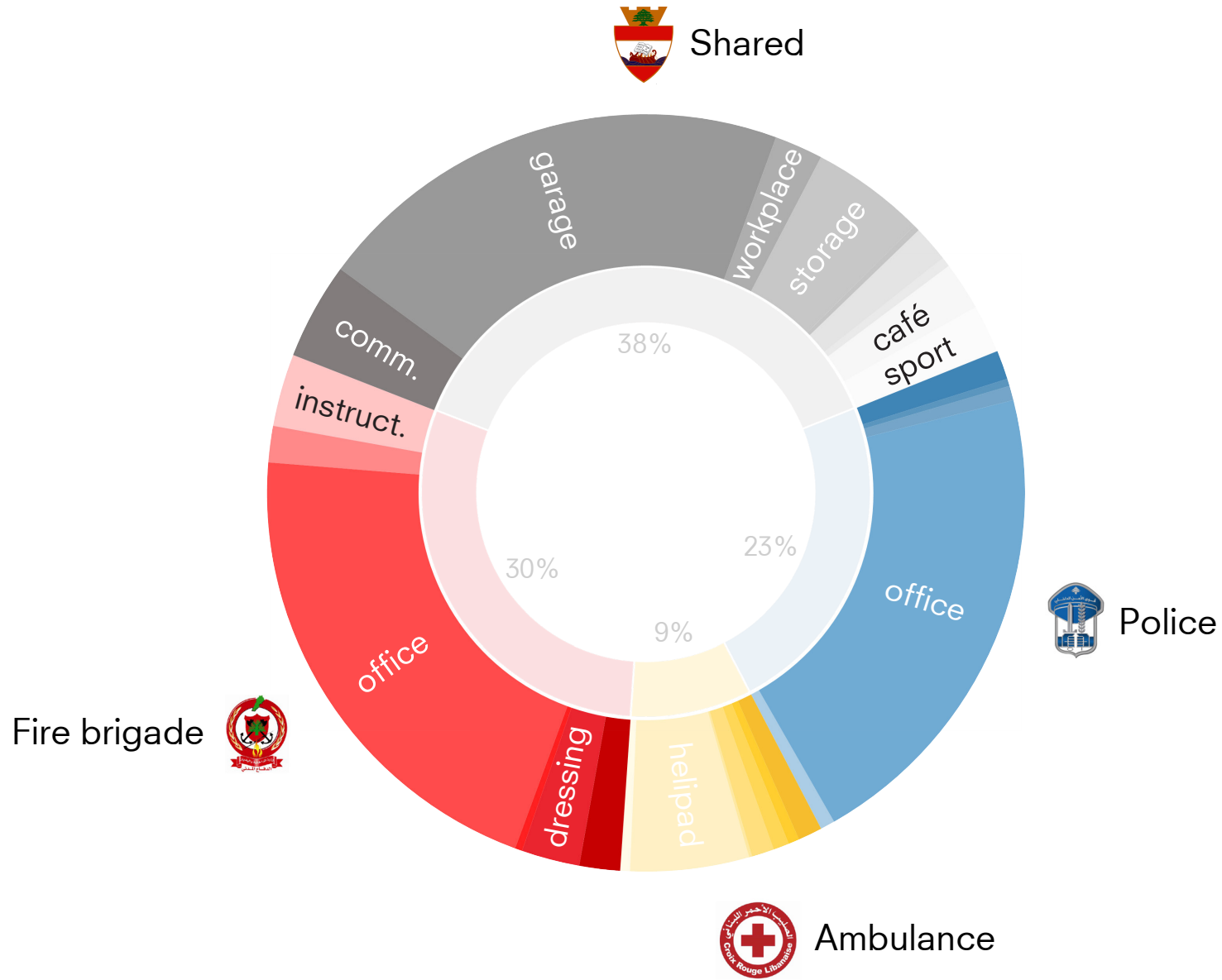


**POLICE STATION**

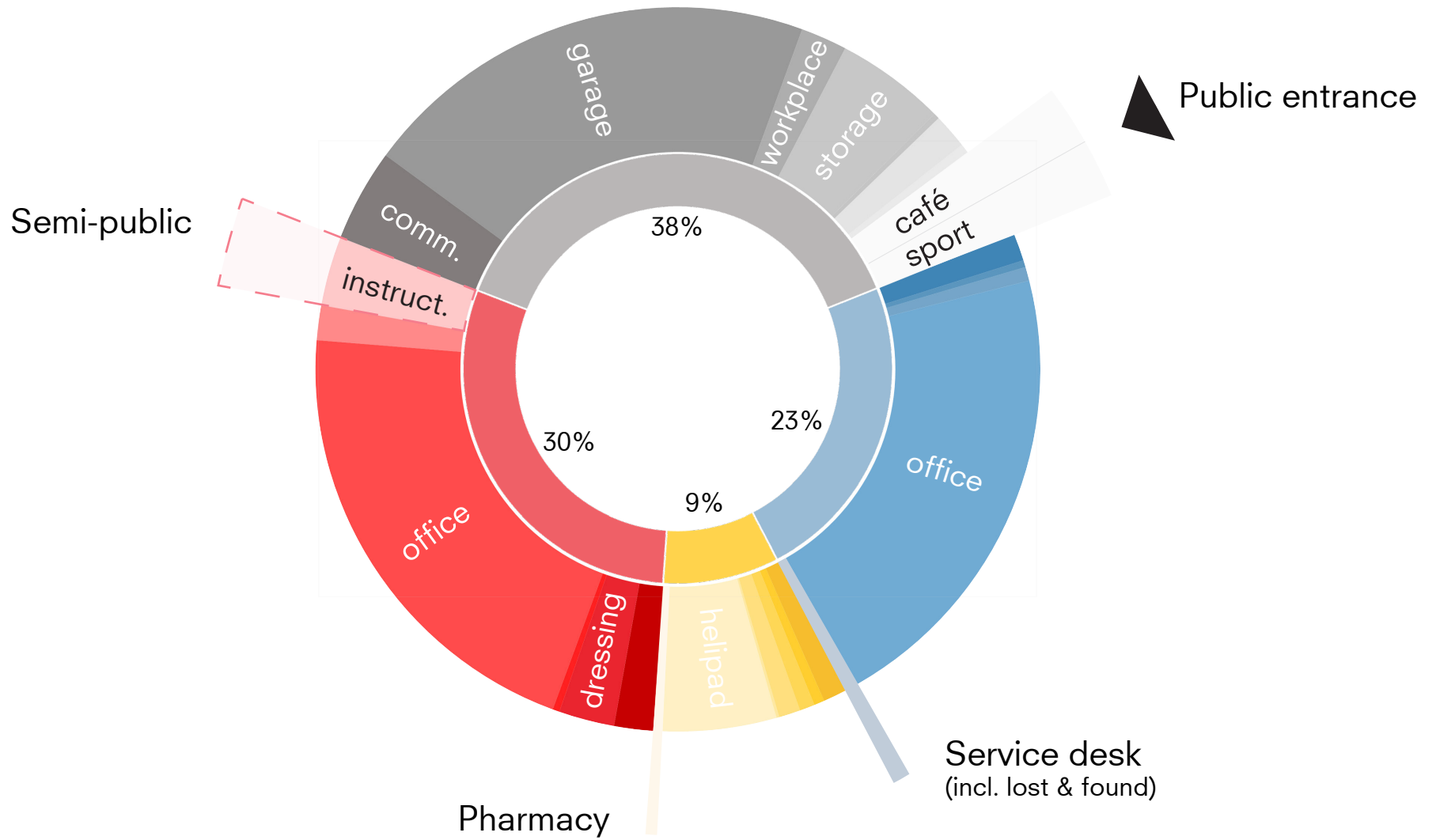
# TOTAL PROGRAM



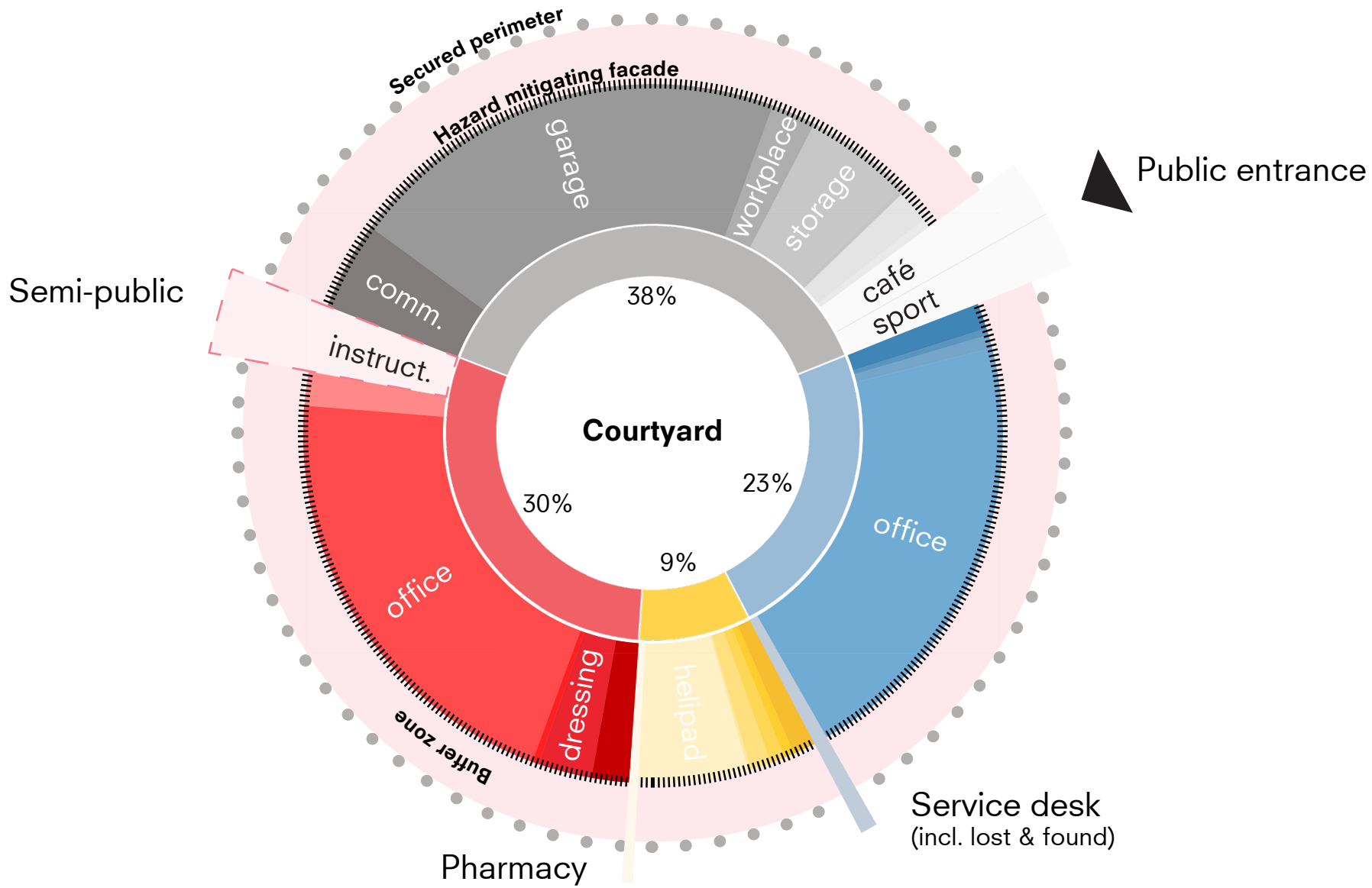
# TOTAL PROGRAM



Design brief  
**PUBLIC PROGRAM**

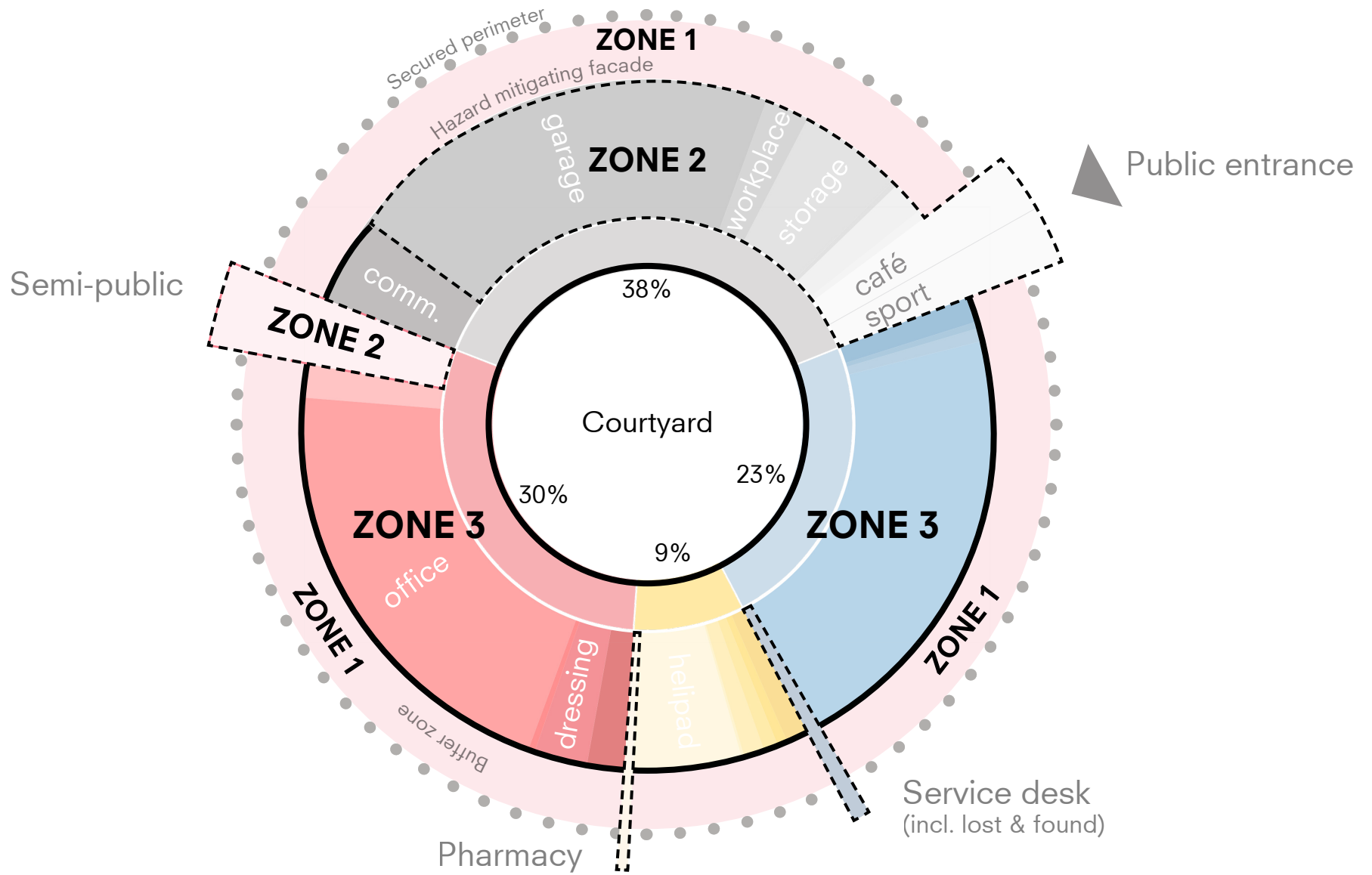


Design brief  
**SECURITY**

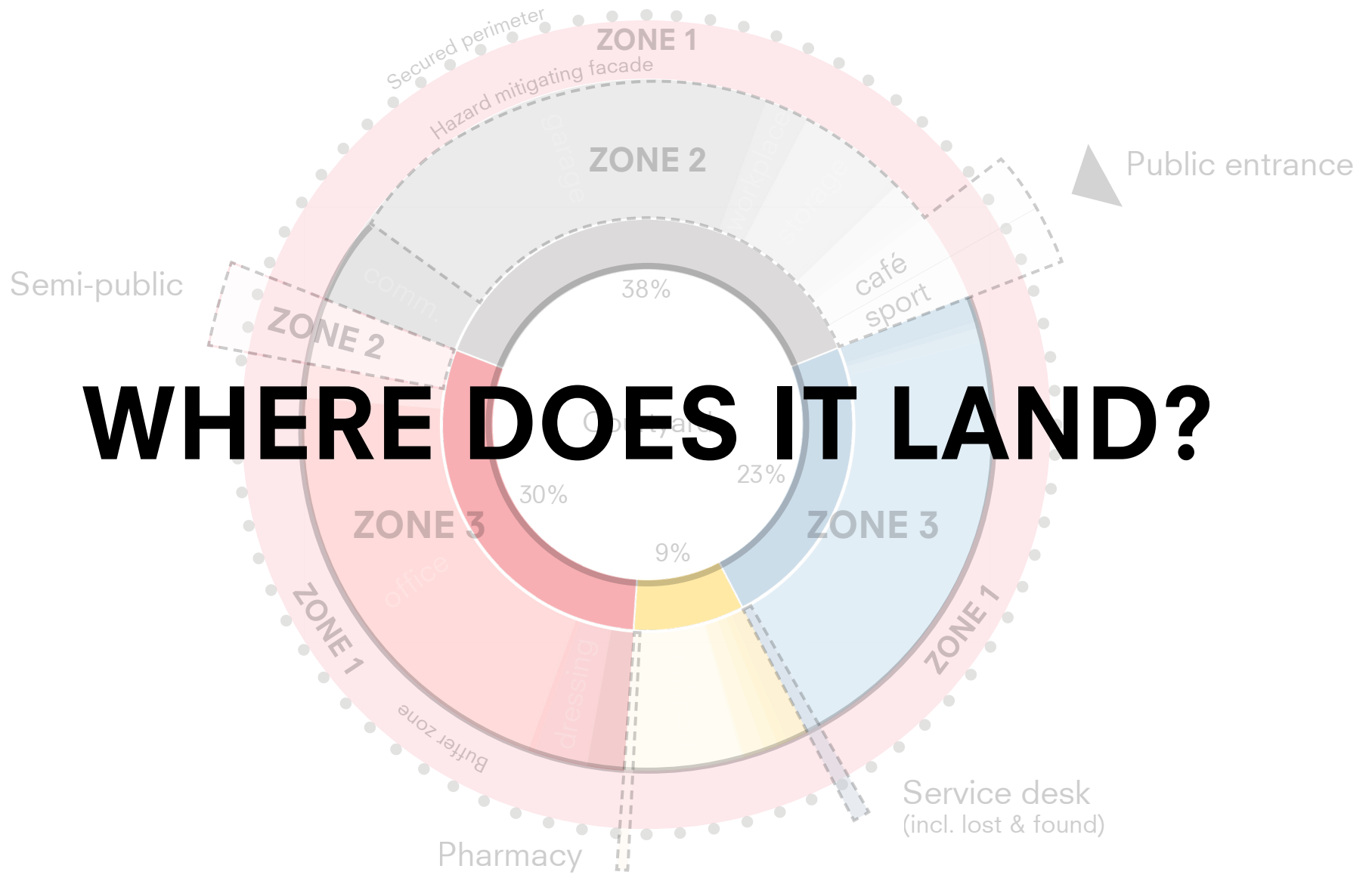


# Design brief

## ZONING



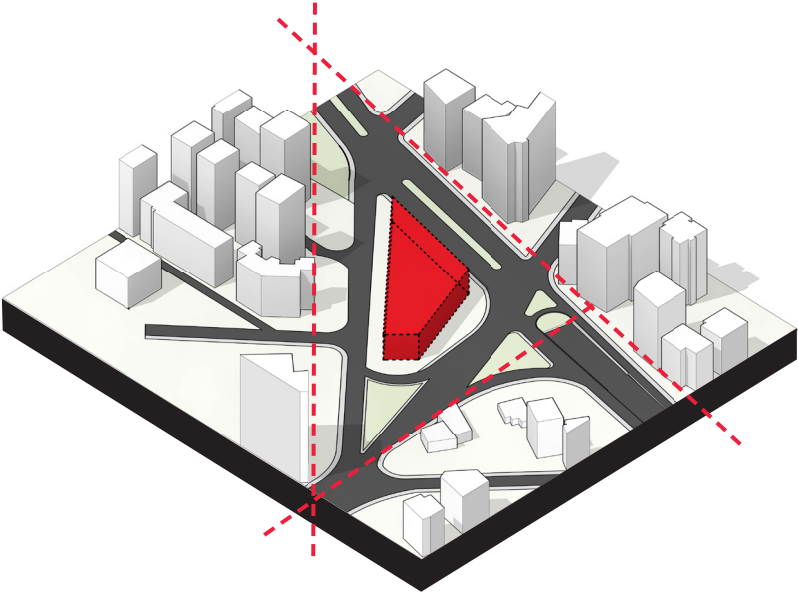
Design brief  
**ZONING**



Design brief

# URBAN AMBITION

A SAFE HAVEN TO SOLVE CONFLICTS



**RECOGNISABLE PUBLIC VOID**

*Safety through design*

FAST EMERGENCY RESPONSE

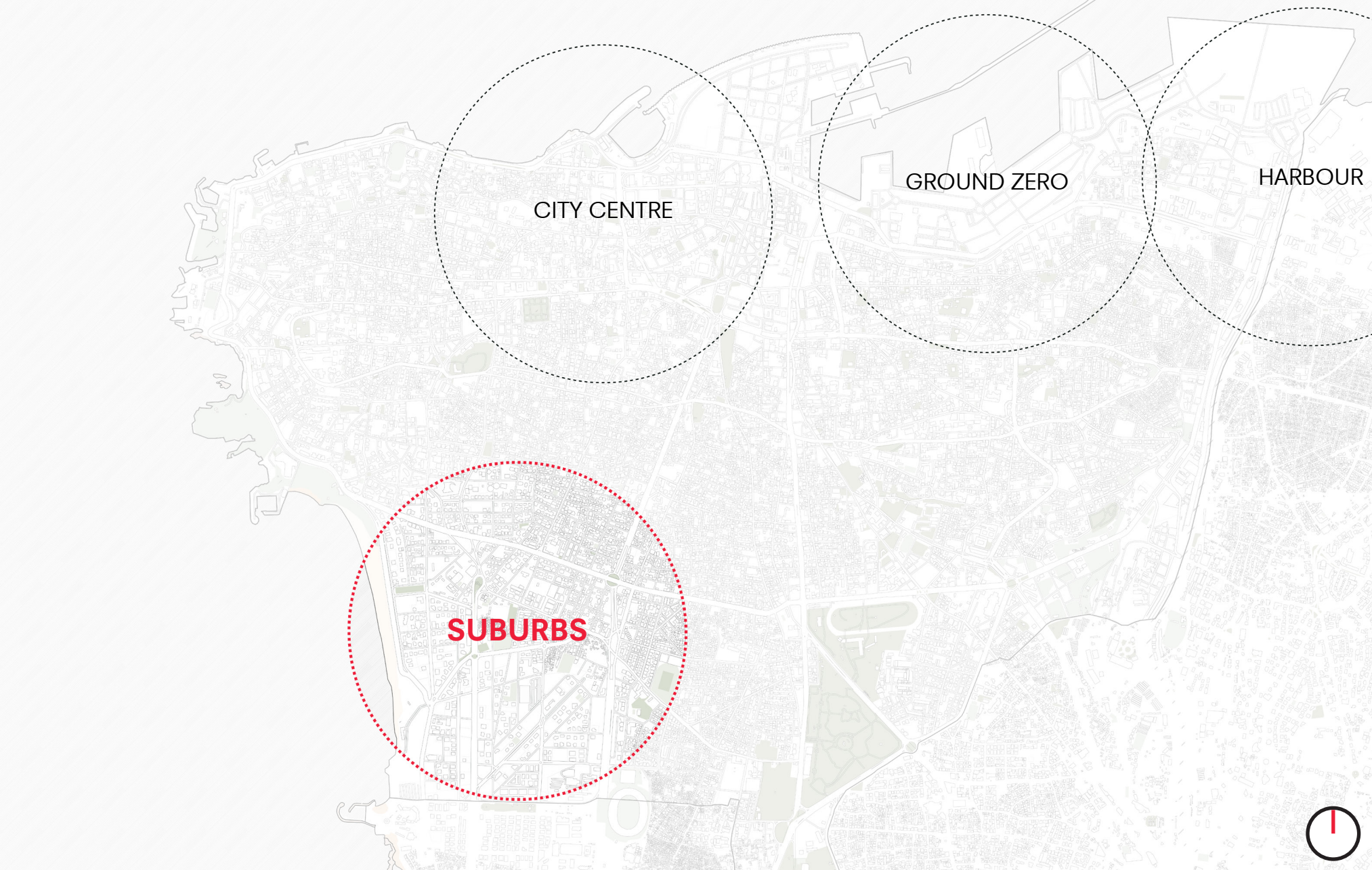


**LOCATION AT INFRASTRUCTURAL NODE**

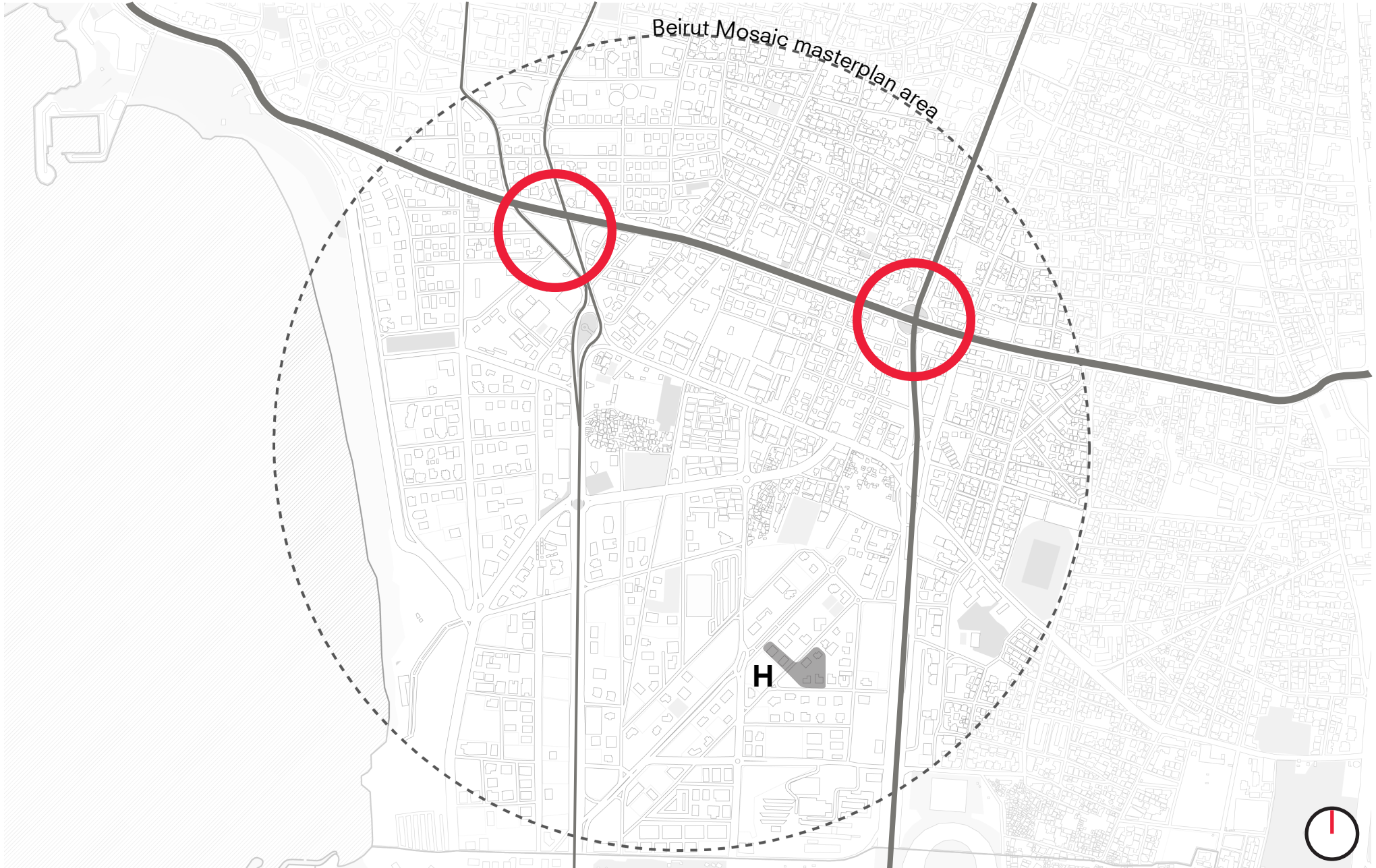
*Design for safety*



# BEIRUT



# PROJECT LOCATION



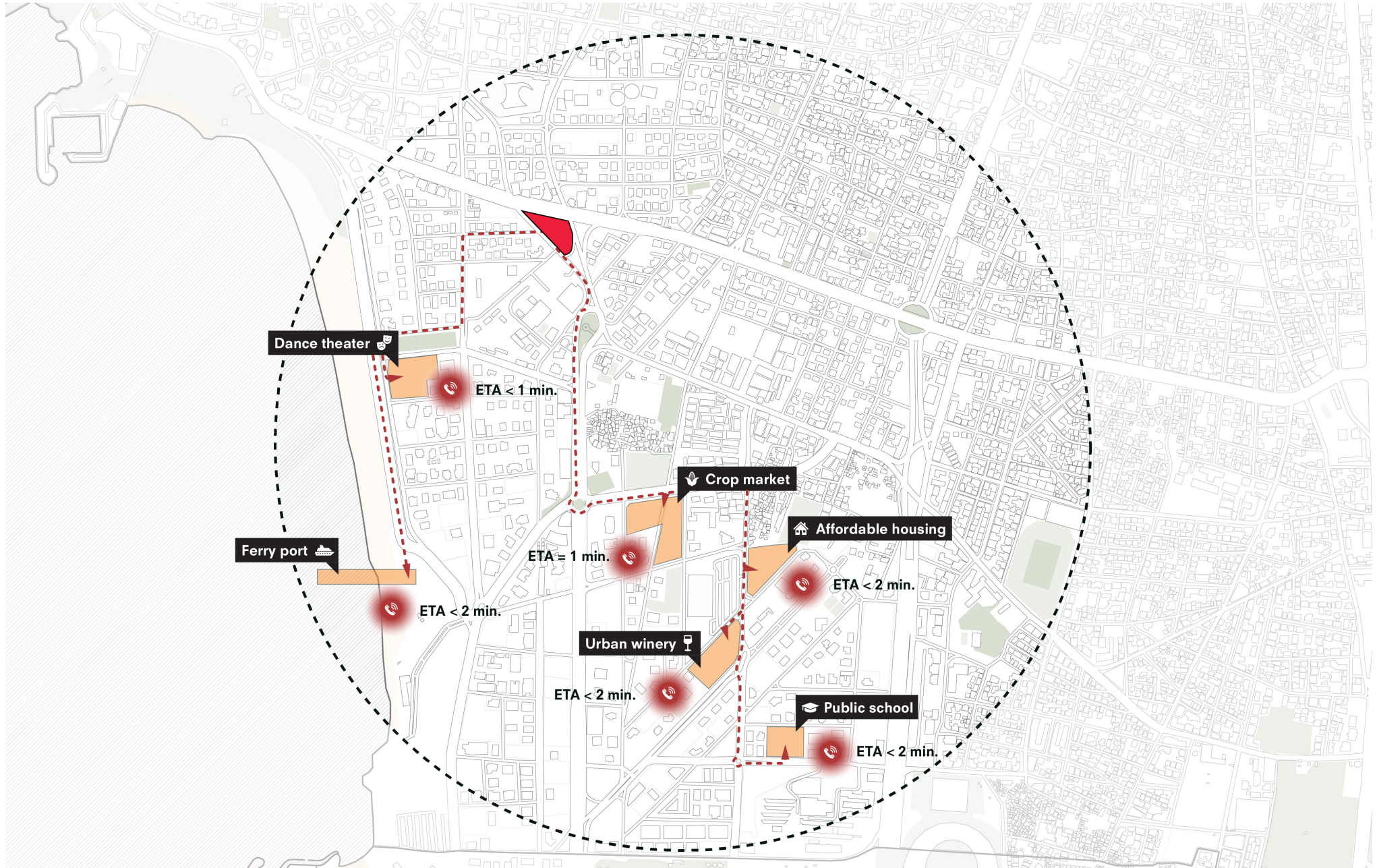
# PROJECT LOCATION



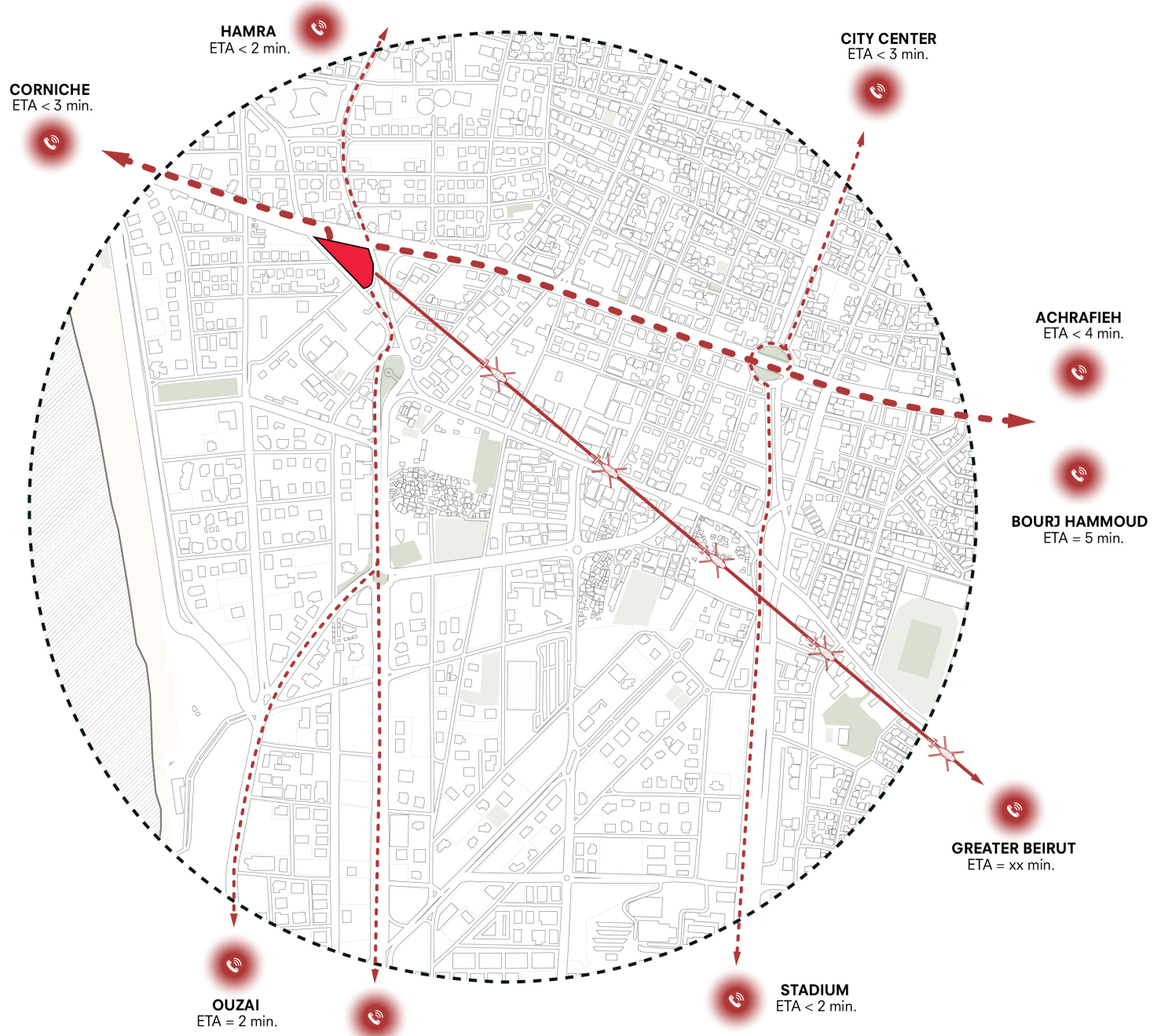
Design brief  
**MASTERPLAN**



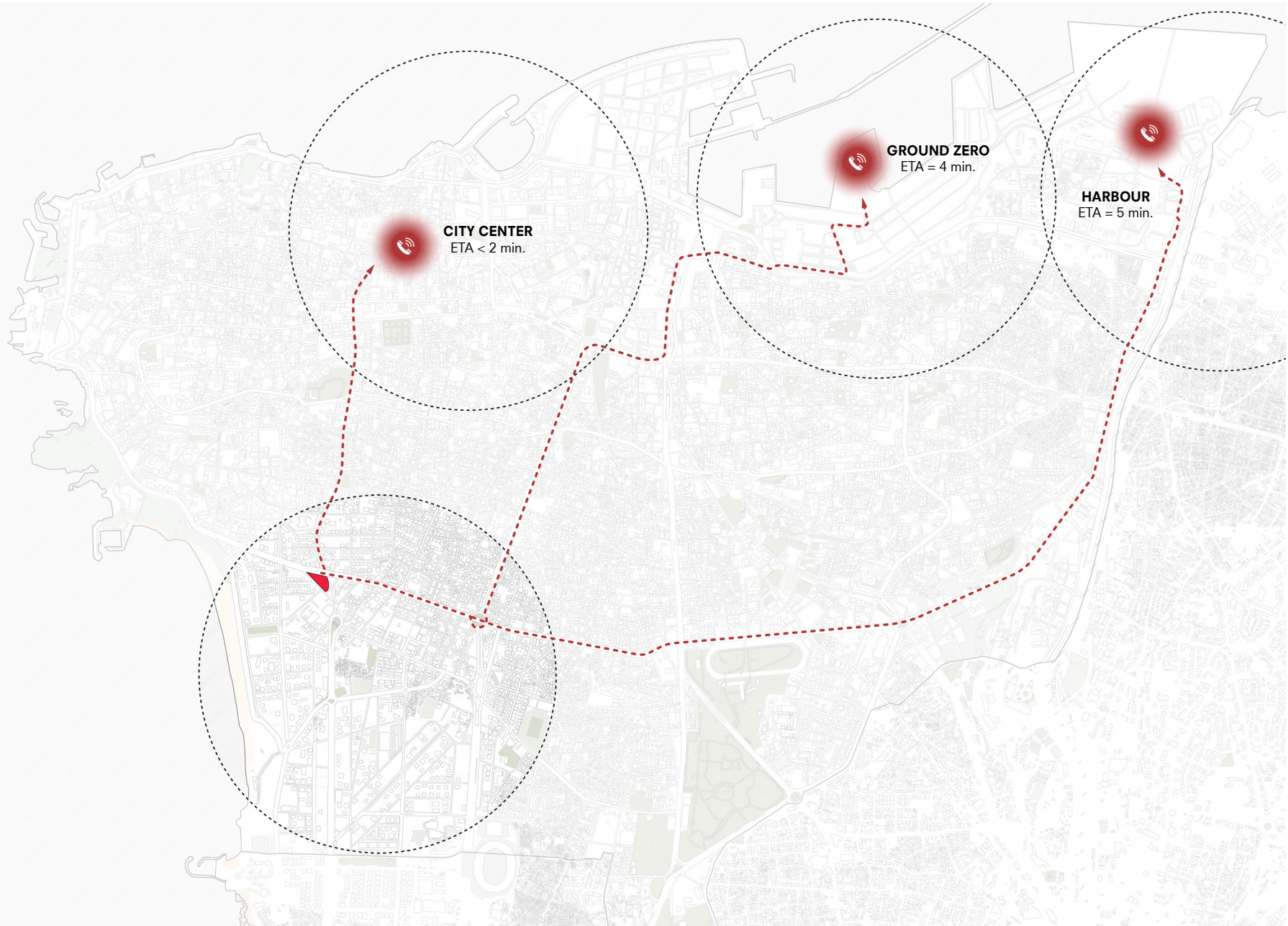
# RESPONSE TIMES



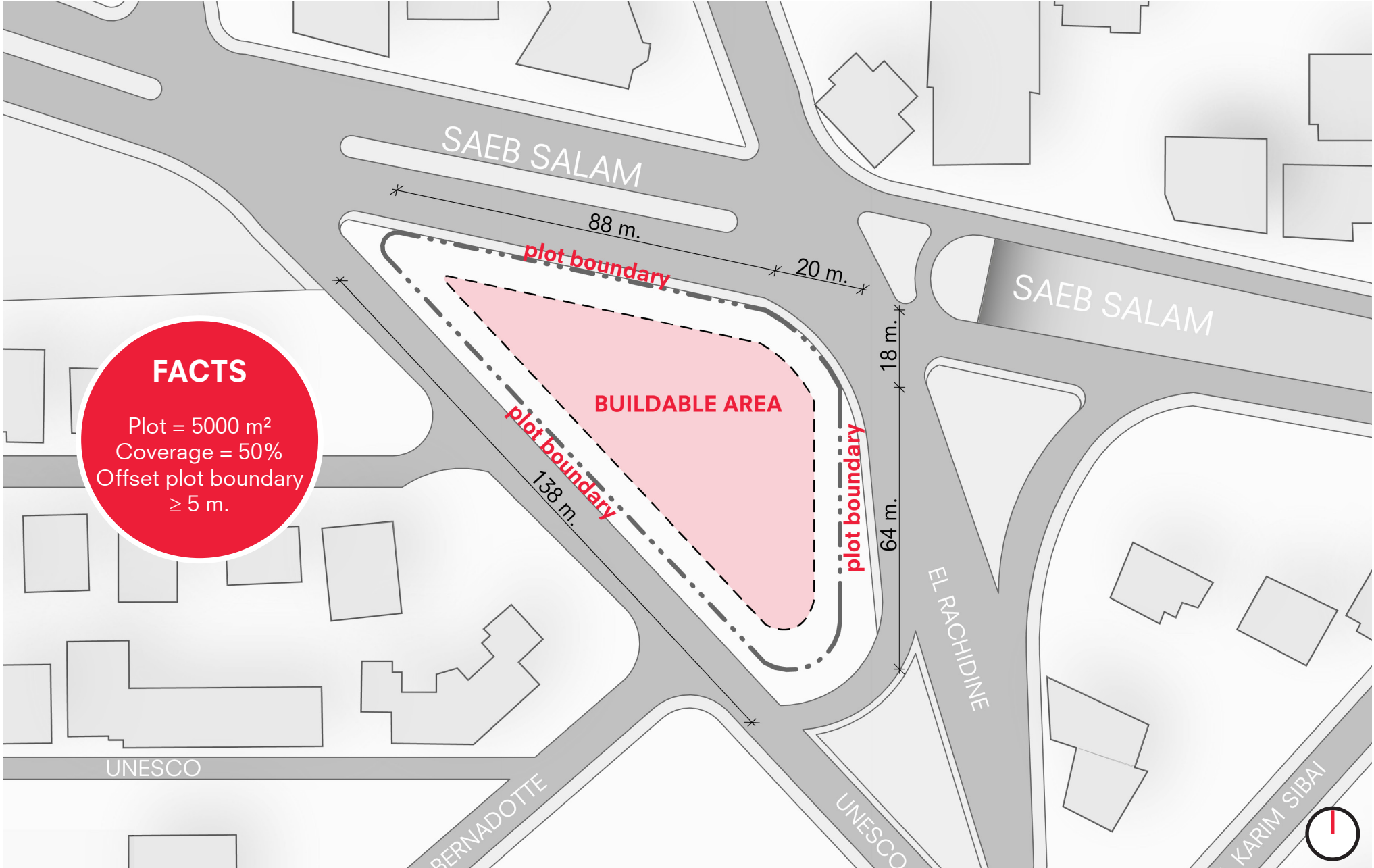
# RESPONSE TIMES



# RESPONSE TIMES



# SITE RESTRICTIONS

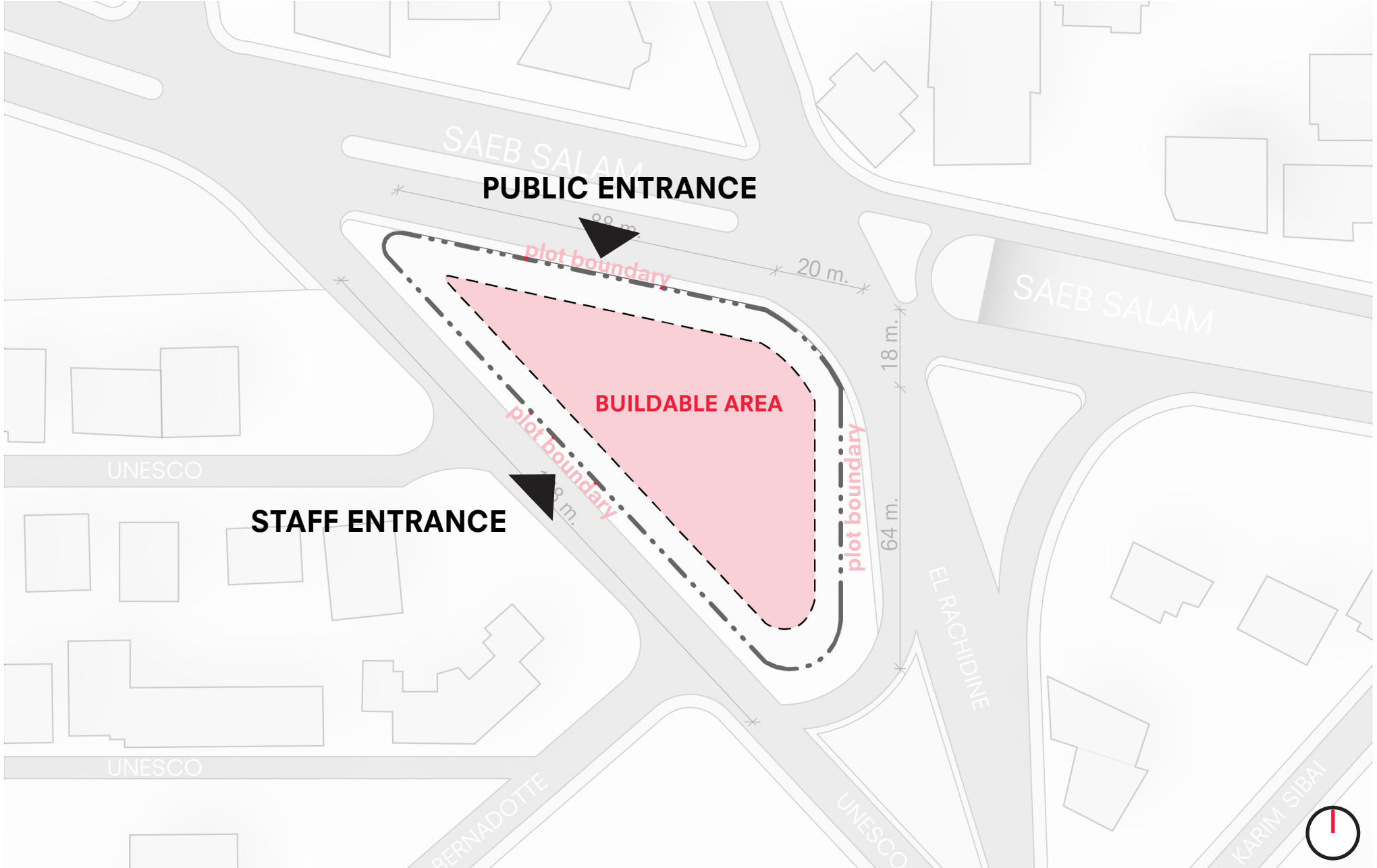


## FACTS

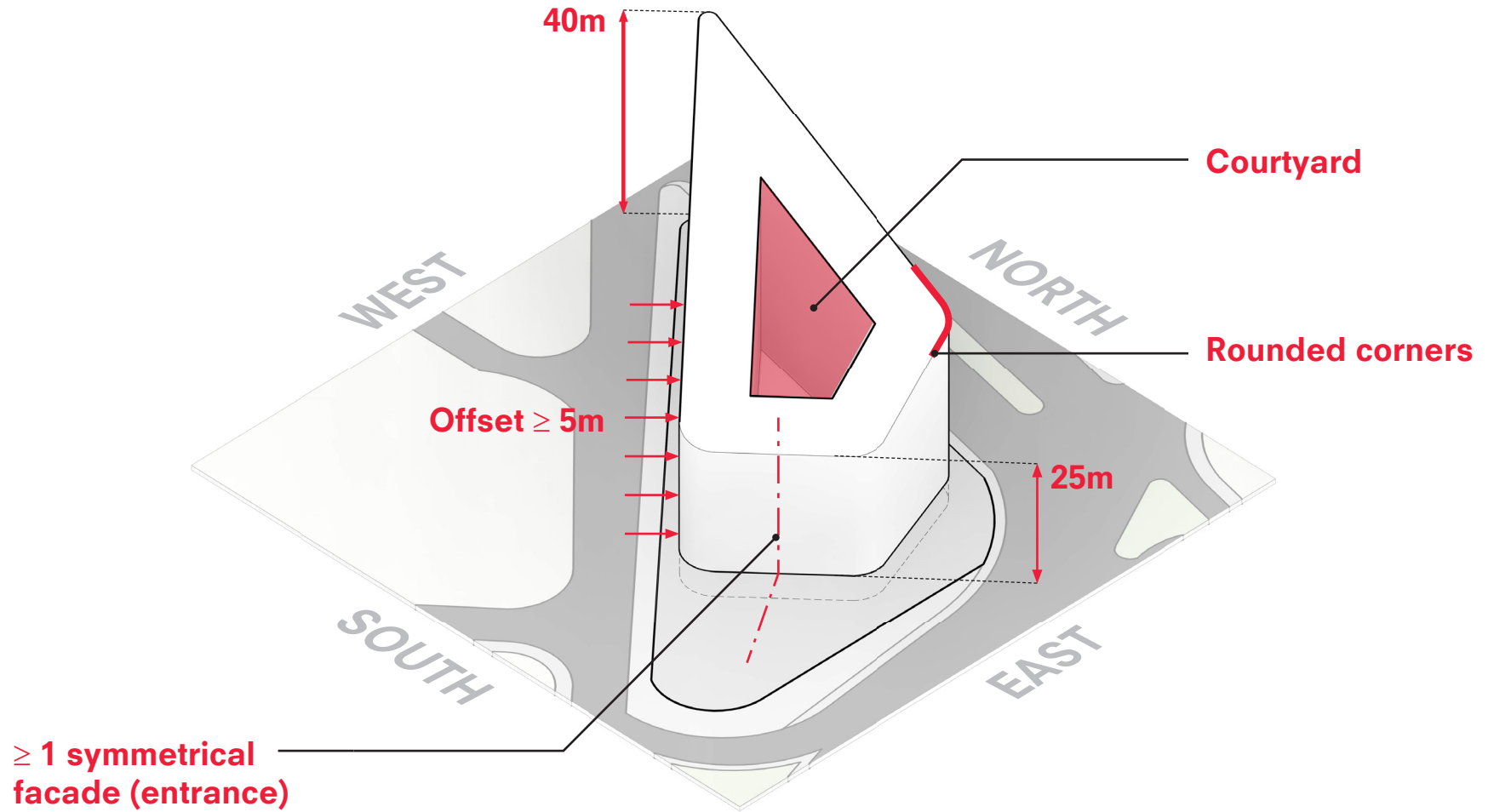
- Plot = 5000 m<sup>2</sup>
- Coverage = 50%
- Offset plot boundary ≥ 5 m.

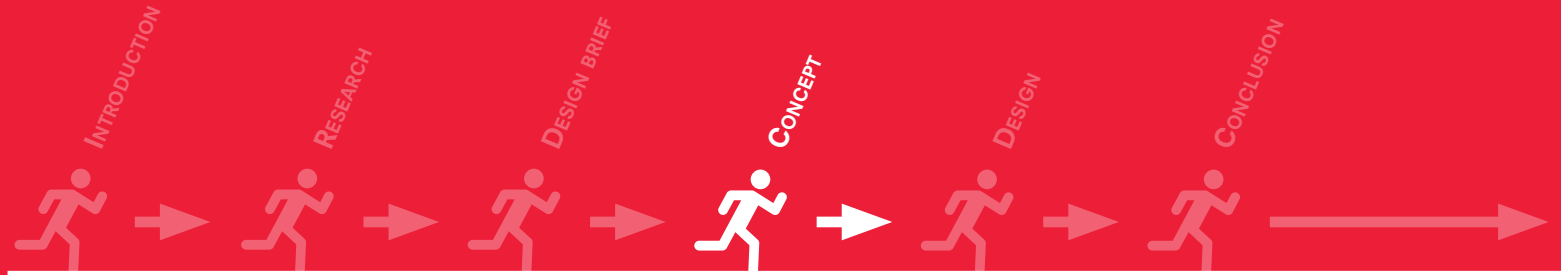


# SITE ENTRANCES



# MASSING RESTRICTIONS





# CONCEPT

# RESEARCH QUESTION

**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**



Fast response times



Resilient building design



Coordinated emergency aid

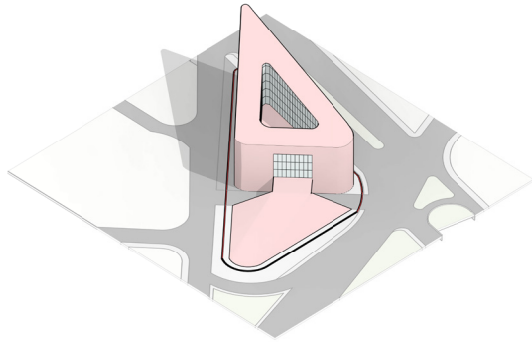
Concept

# FUTURISTIC FORTRESS

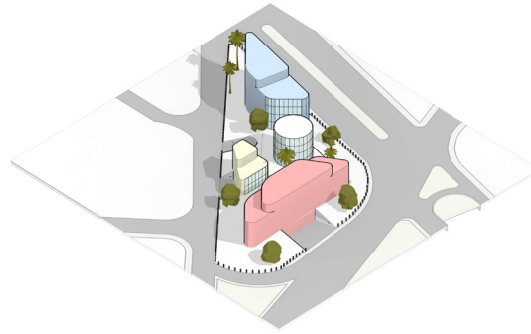
**A highly efficient, modern and secure building with a large reach to safeguard the people of Beirut**



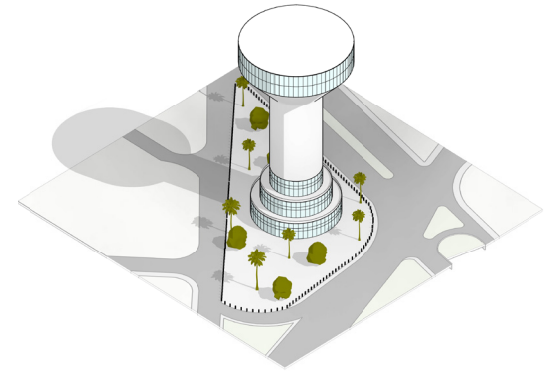
# Concept STUDIES



CRISIS CASTLE

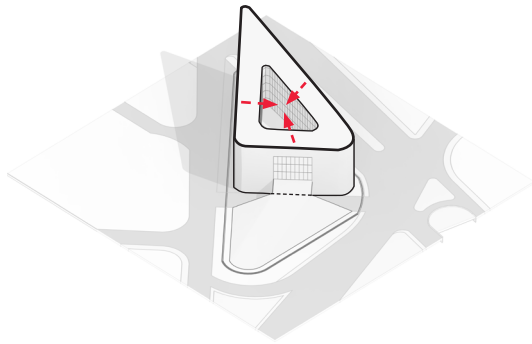


EMERGENCY SQUARE



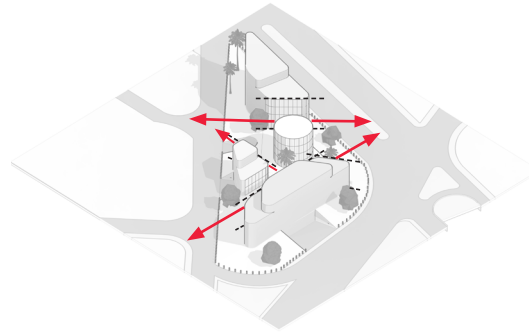
ACCIDENT LOOKOUT

Concept  
**KEY ELEMENTS**



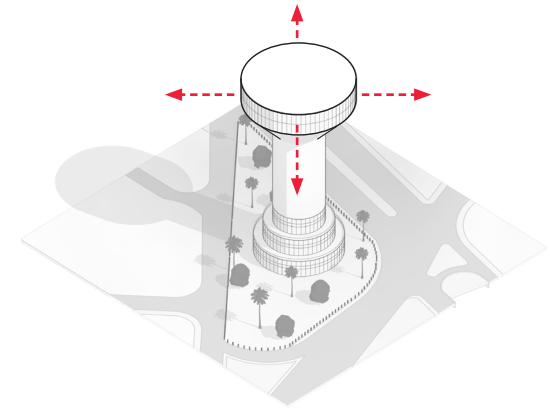
CRISIS CASTLE

*courtyard*



EMERGENCY SQUARE

*permeability*

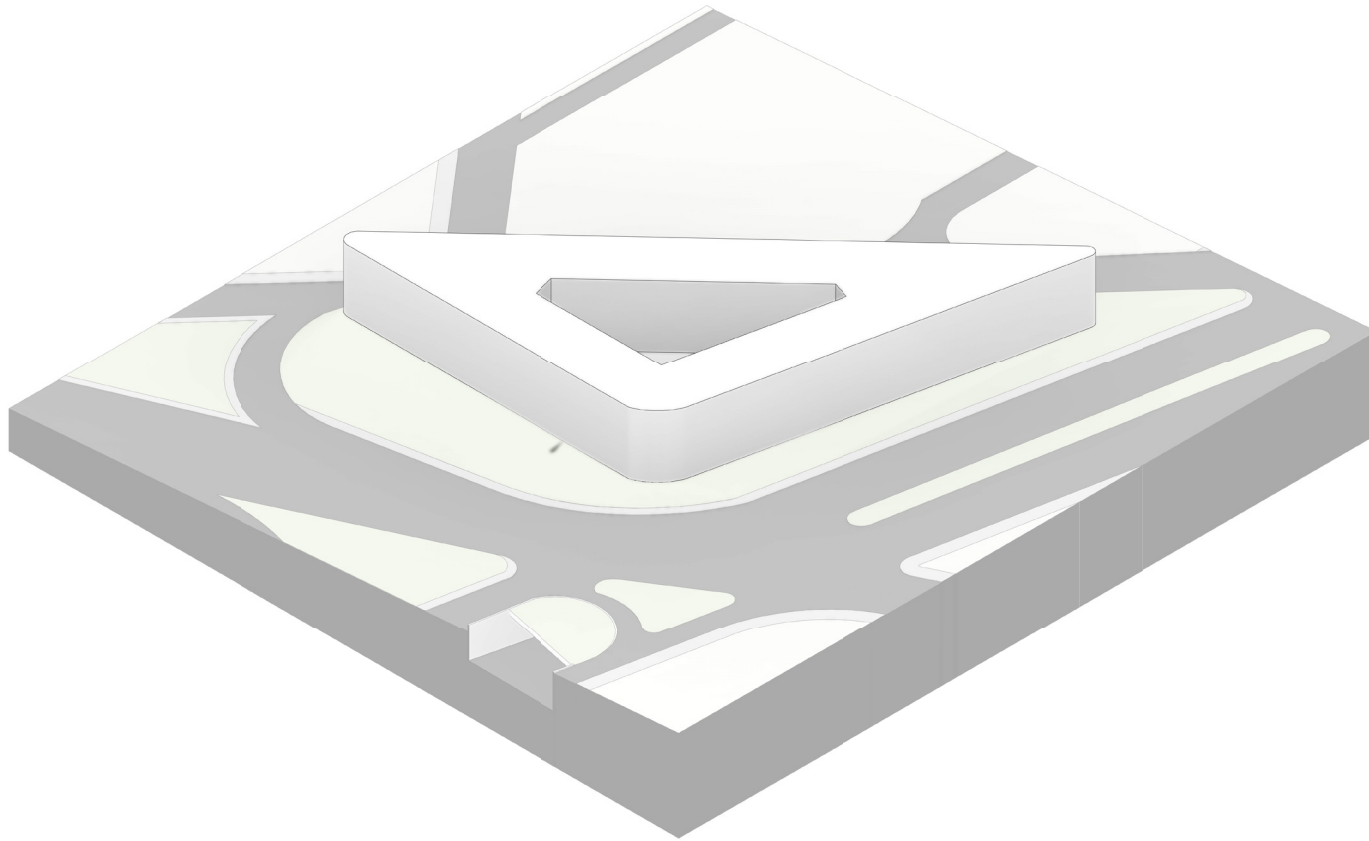


ACCIDENT LOOKOUT

*sightlines*

Concept  
**DEVELOPMENT**

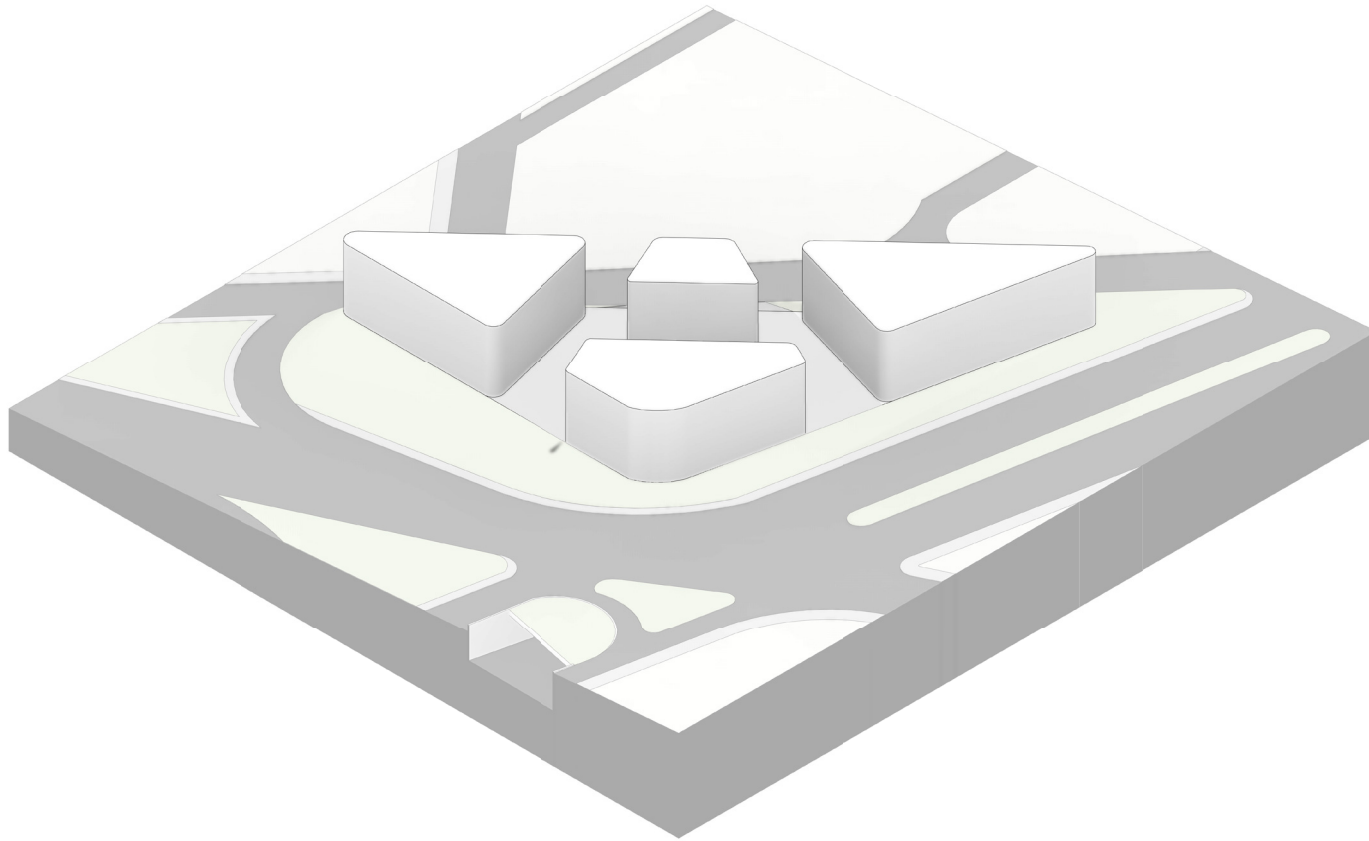
1. Courtyard typology





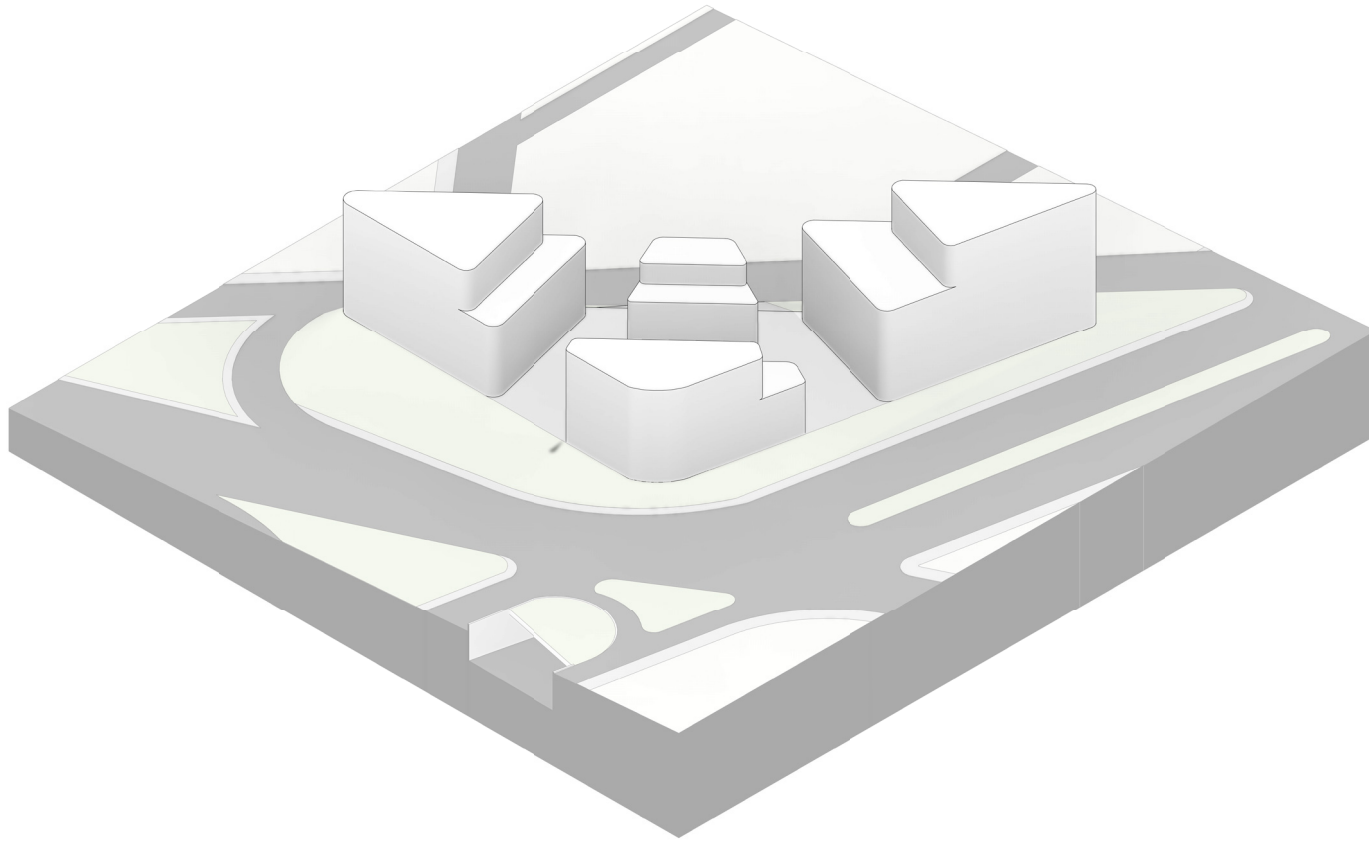
Concept  
**DEVELOPMENT**

2. Opening up the block



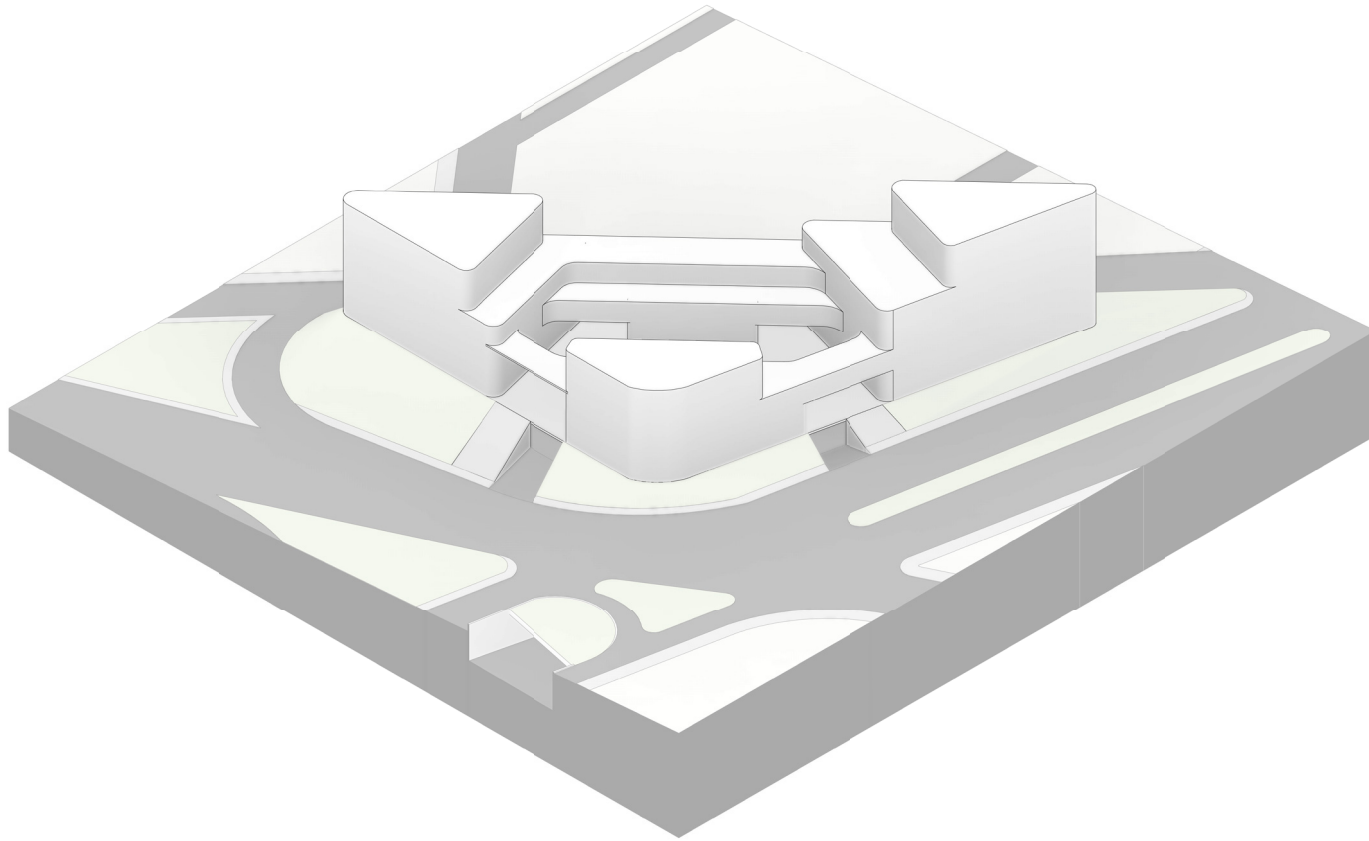
Concept  
**DEVELOPMENT**

3. Watchtowers on the volumes



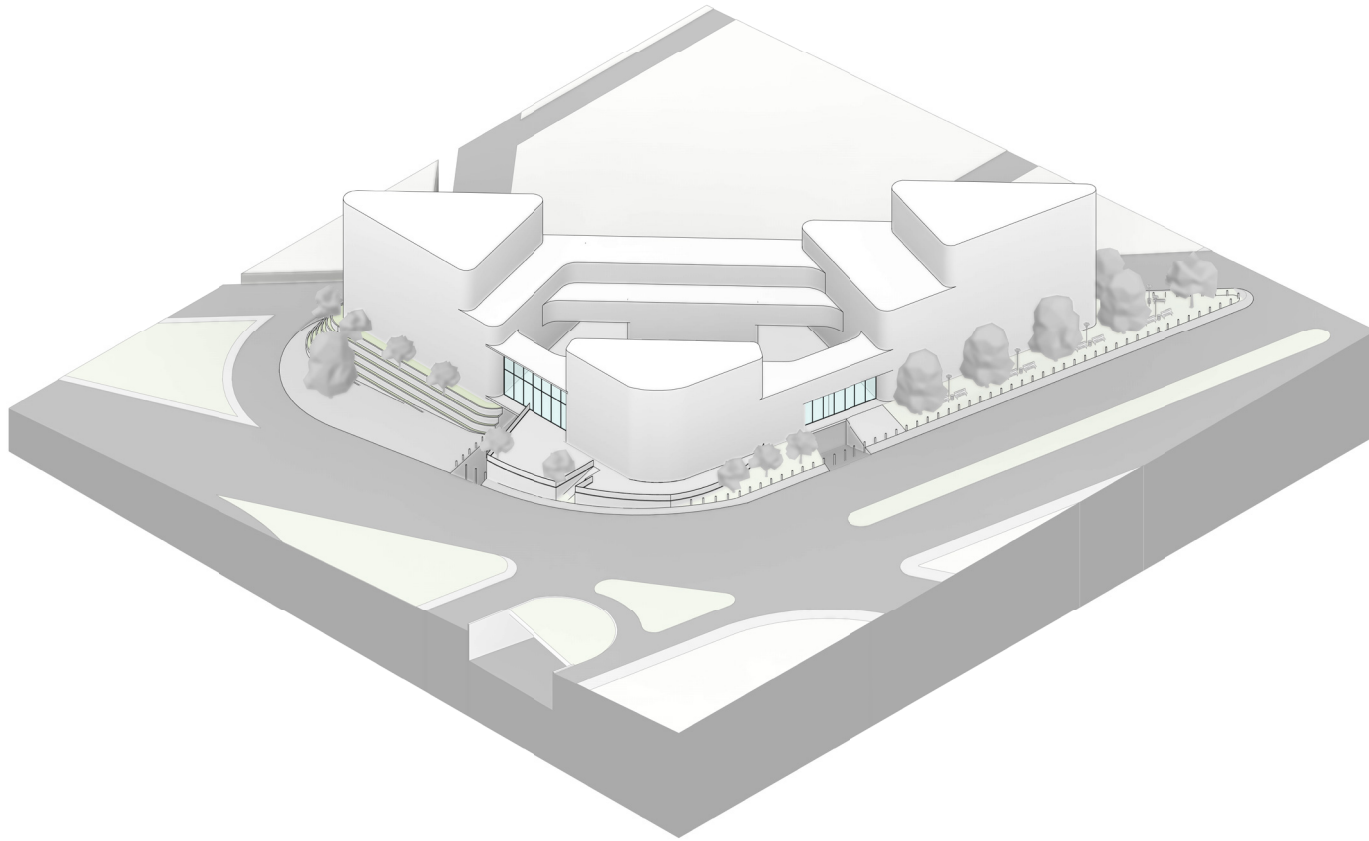
Concept  
**DEVELOPMENT**

4. Separating pedestrian from vehicle



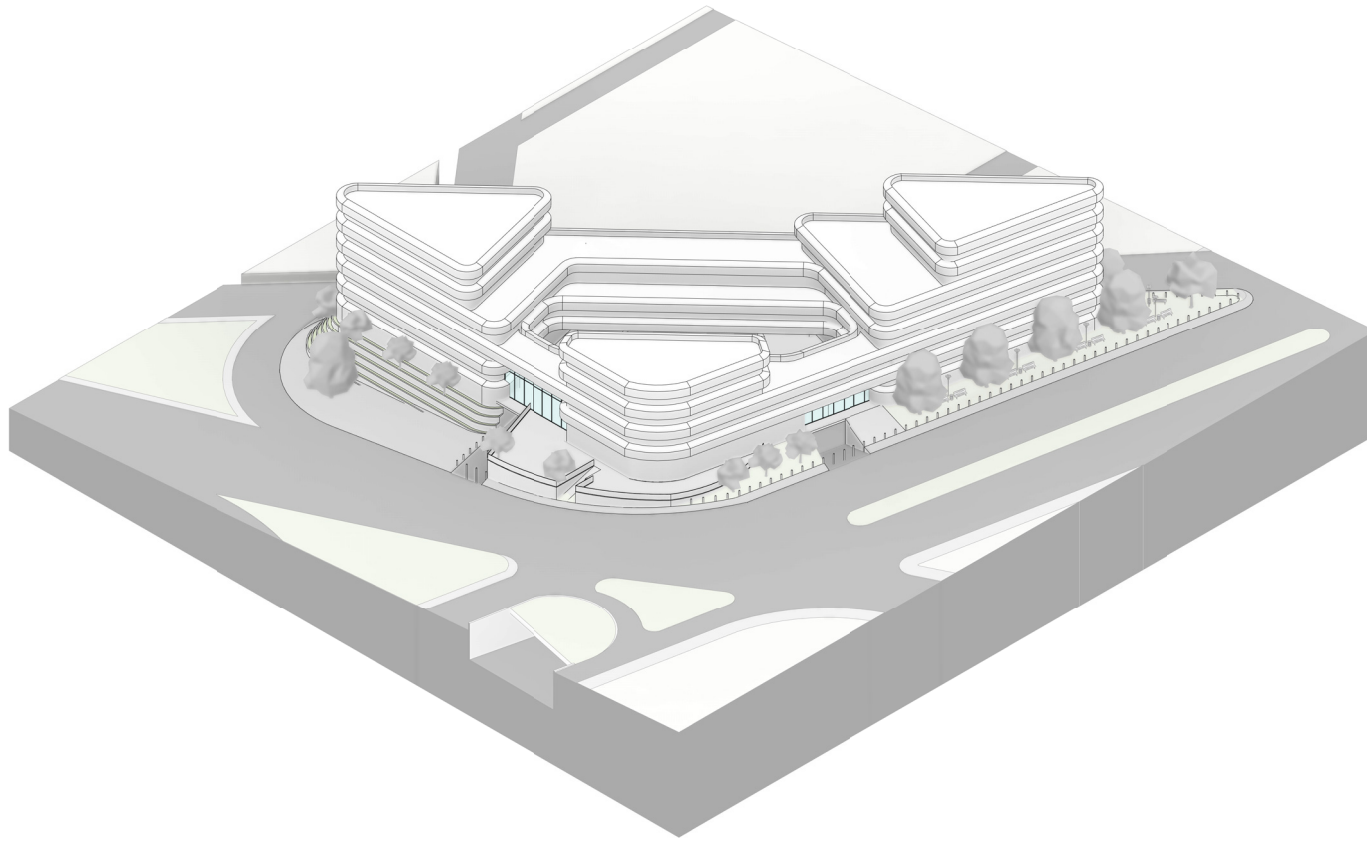
Concept  
**DEVELOPMENT**

5. Security layers

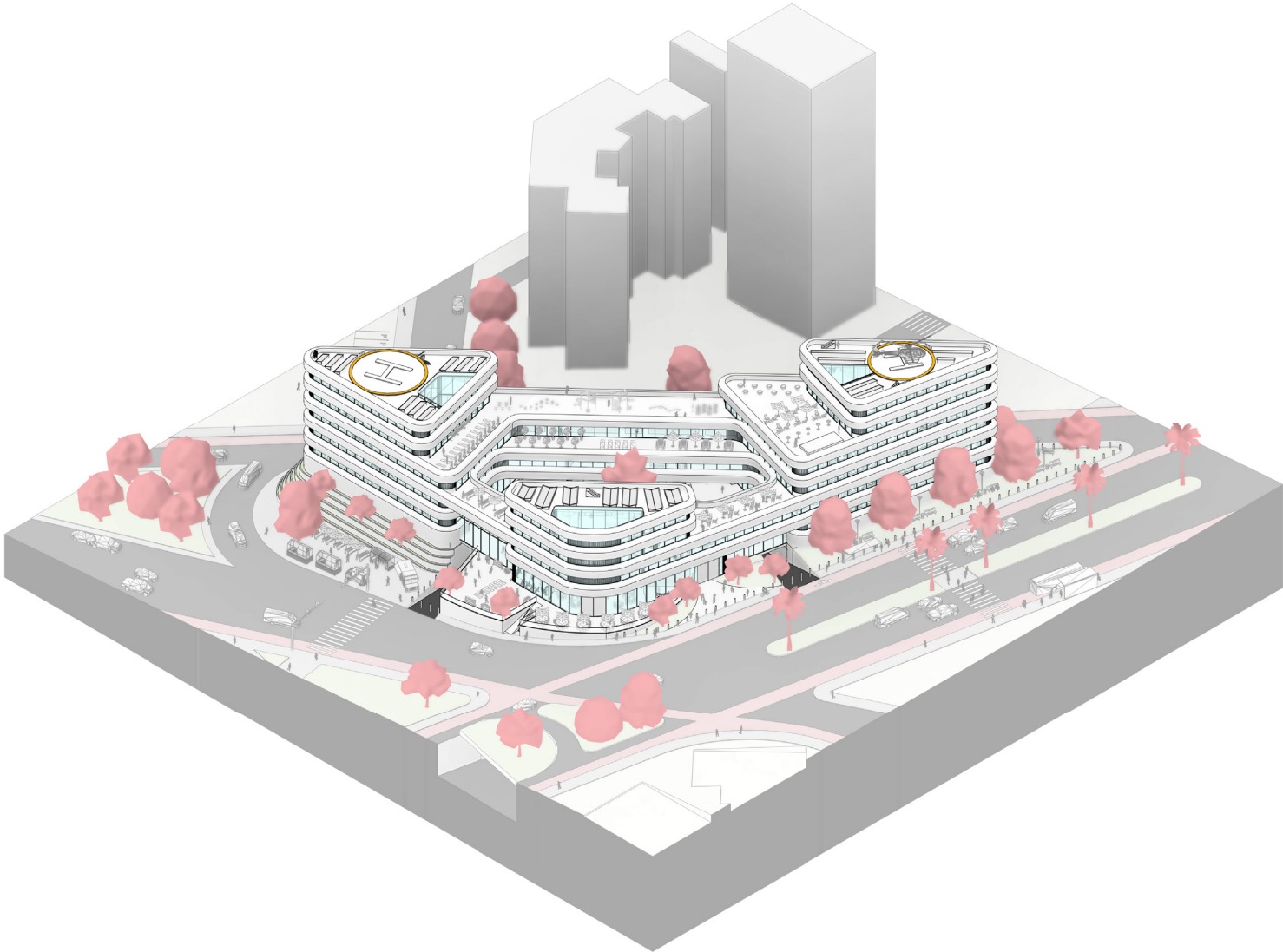


Concept  
**DEVELOPMENT**

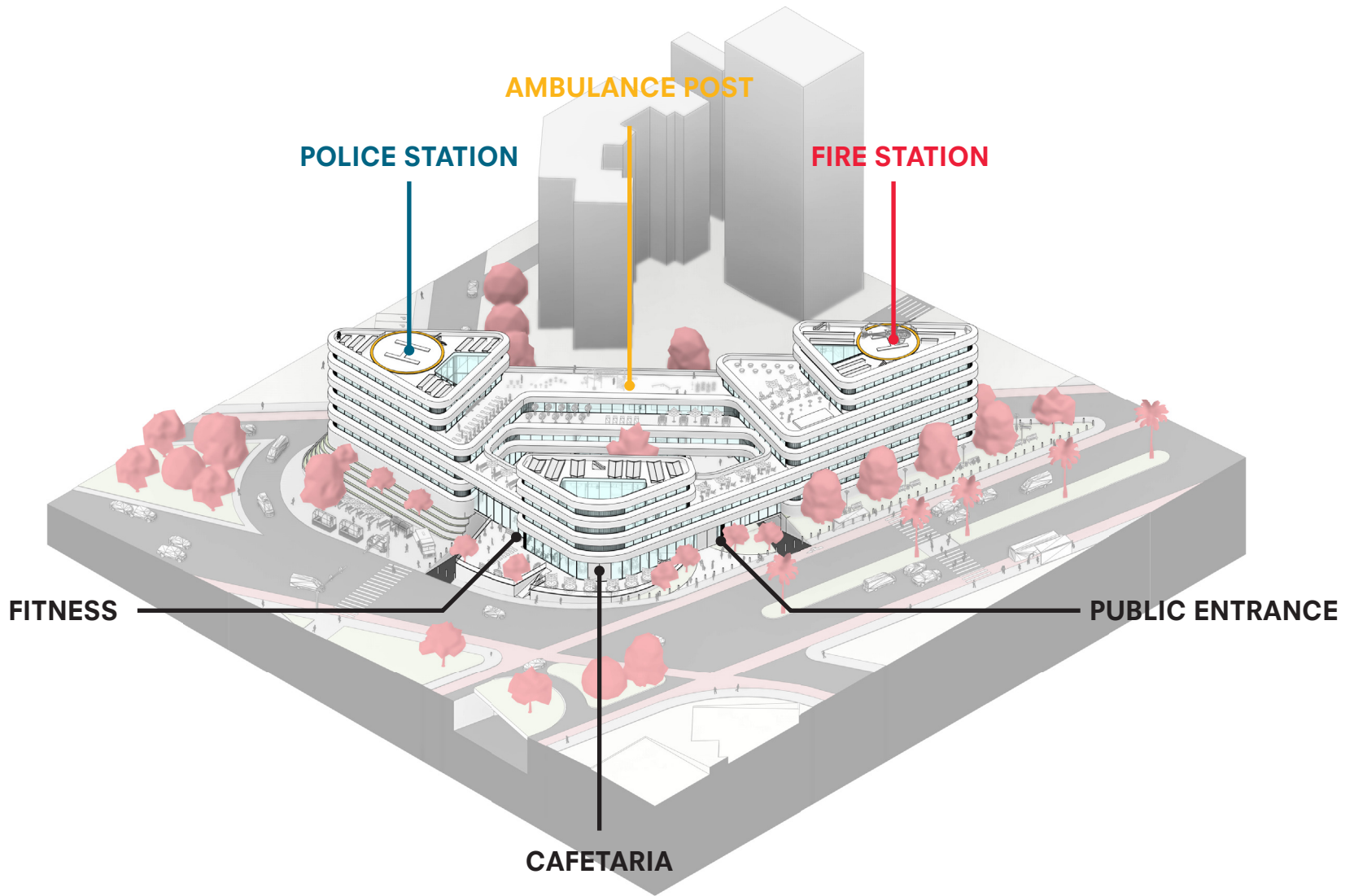
6. Uniformity through facade elements



Concept  
**FUTURISTIC FORTRESS**

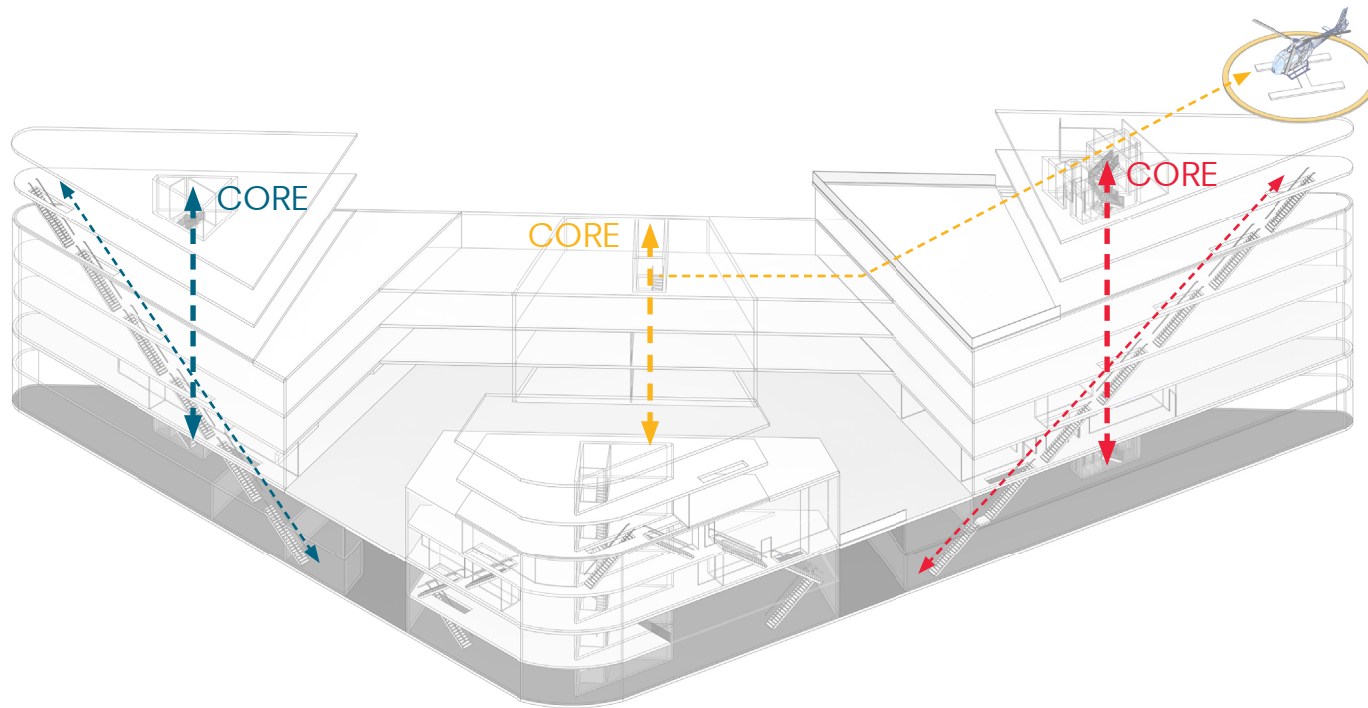


# Concept PROGRAM



Concept

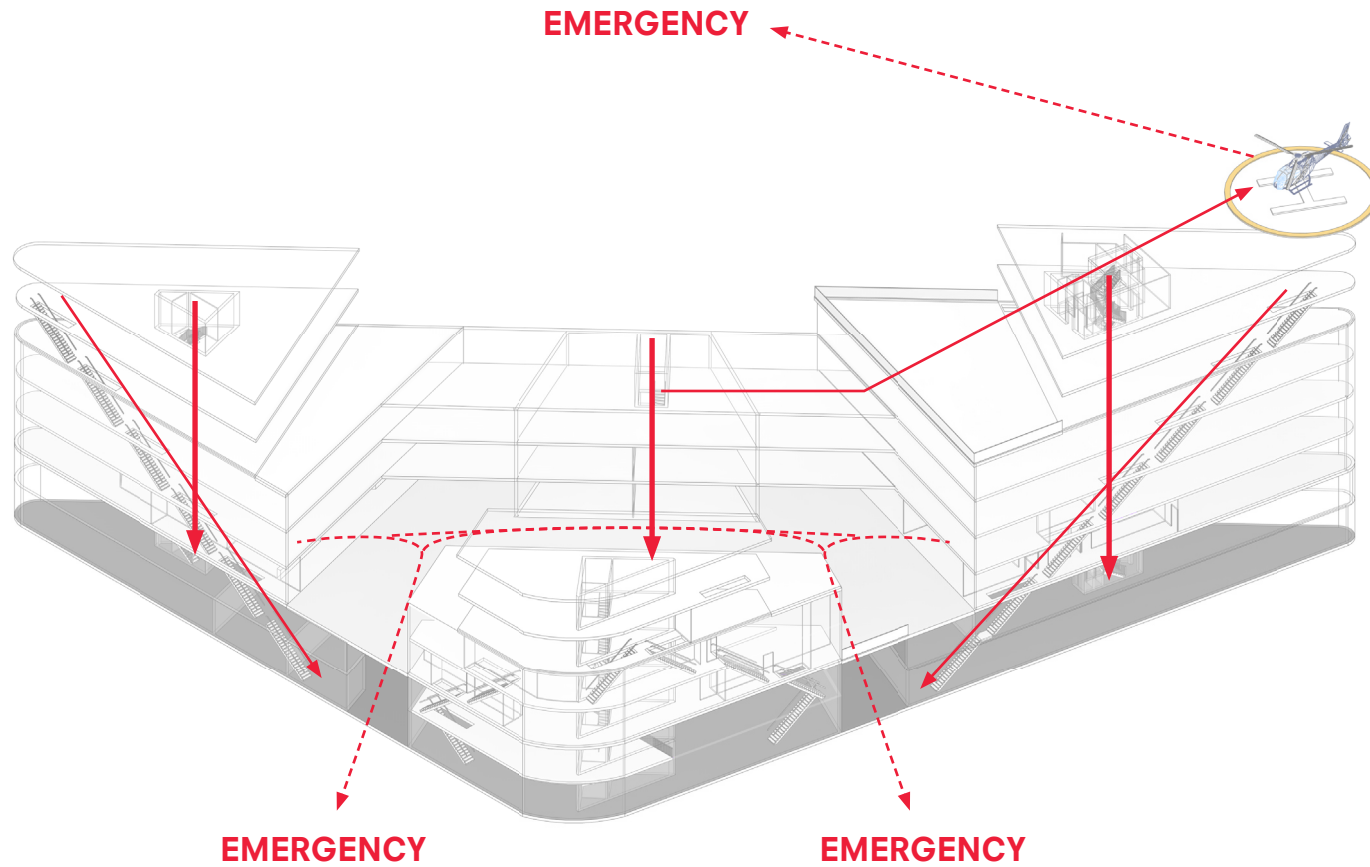
# PRINCIPLE OF FLOWS





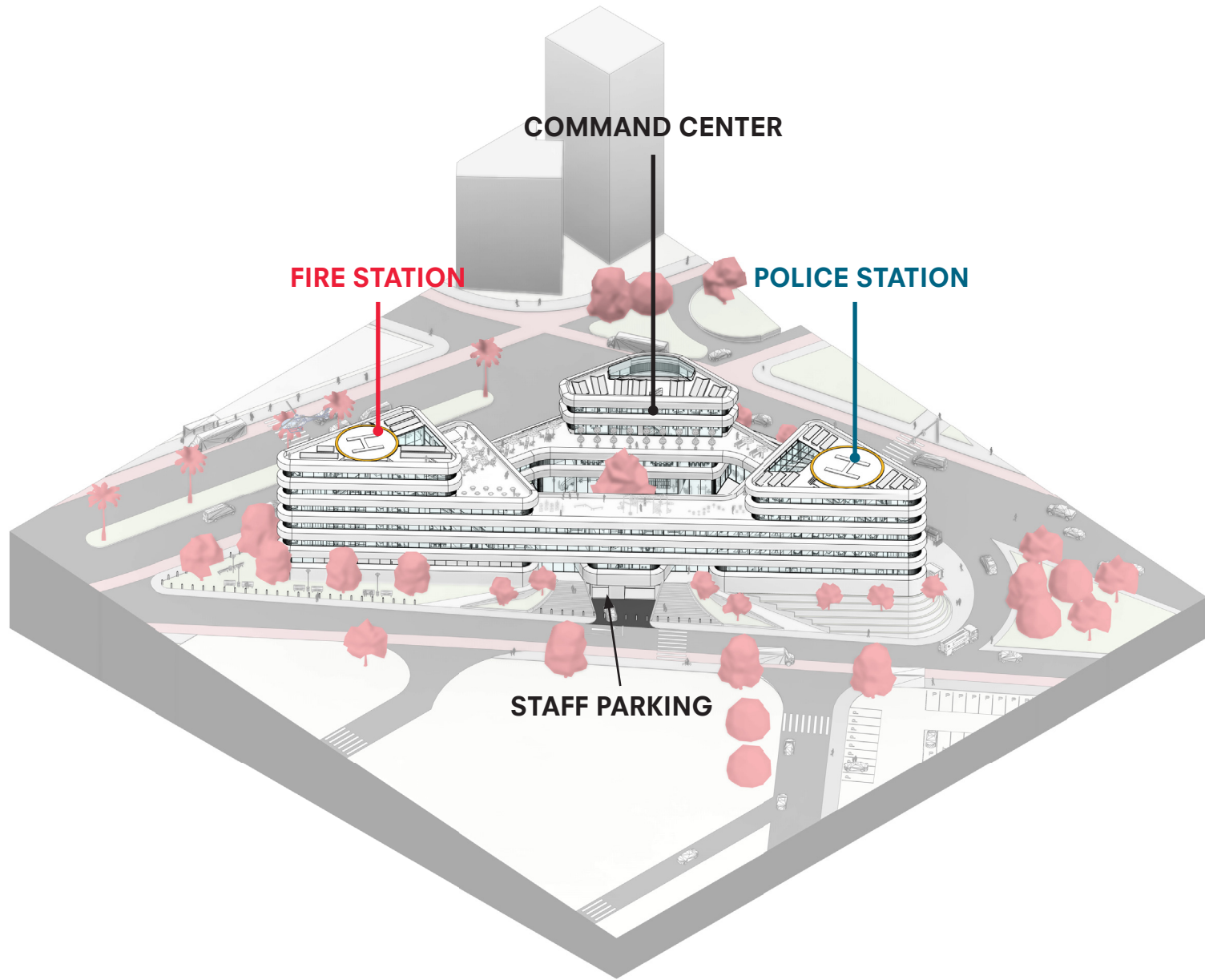
Concept

# PRINCIPLE OF FLOWS

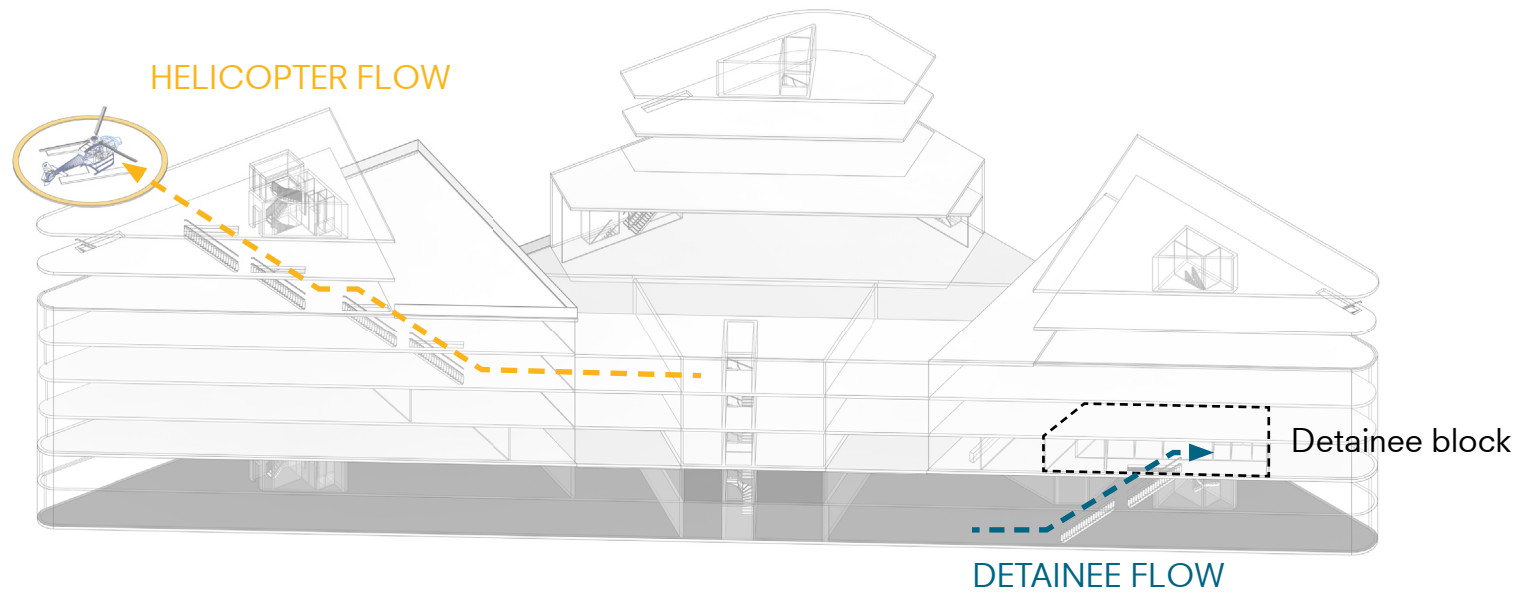


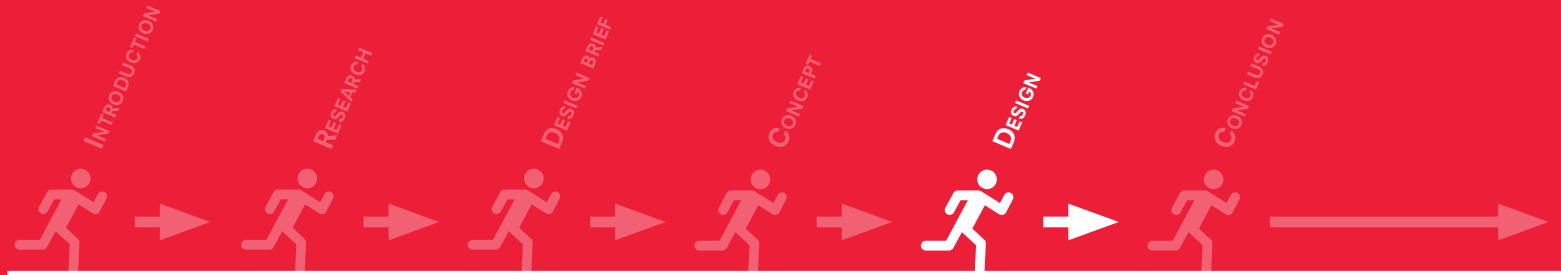
Concept

# FUTURISTIC FORTRESS



Concept  
**PRINCIPLE OF FLOWS**





# DESIGN

# GROUP SITE PLAN



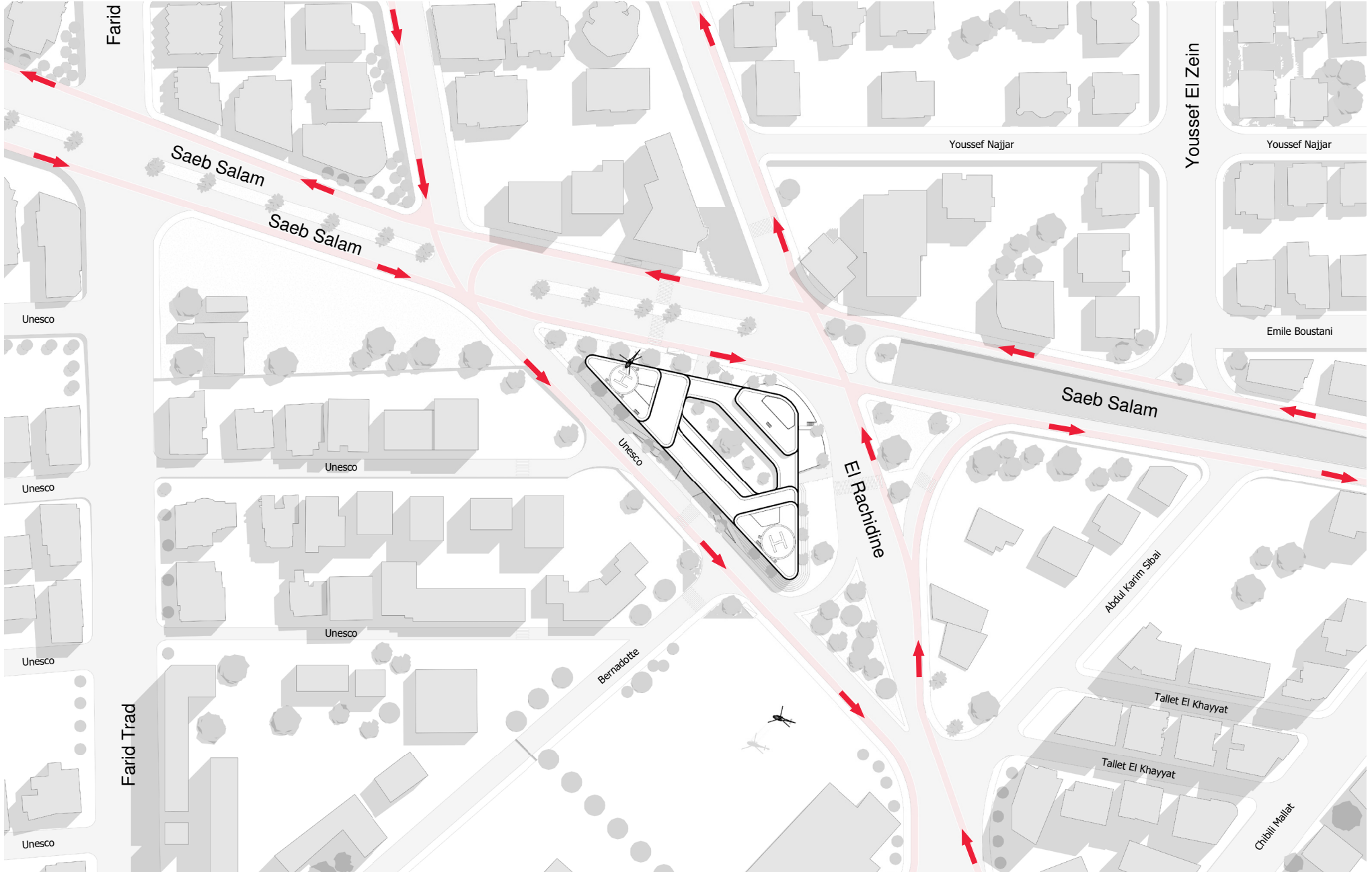
# SITE PLAN



# INFRASTRUCTURAL NODE

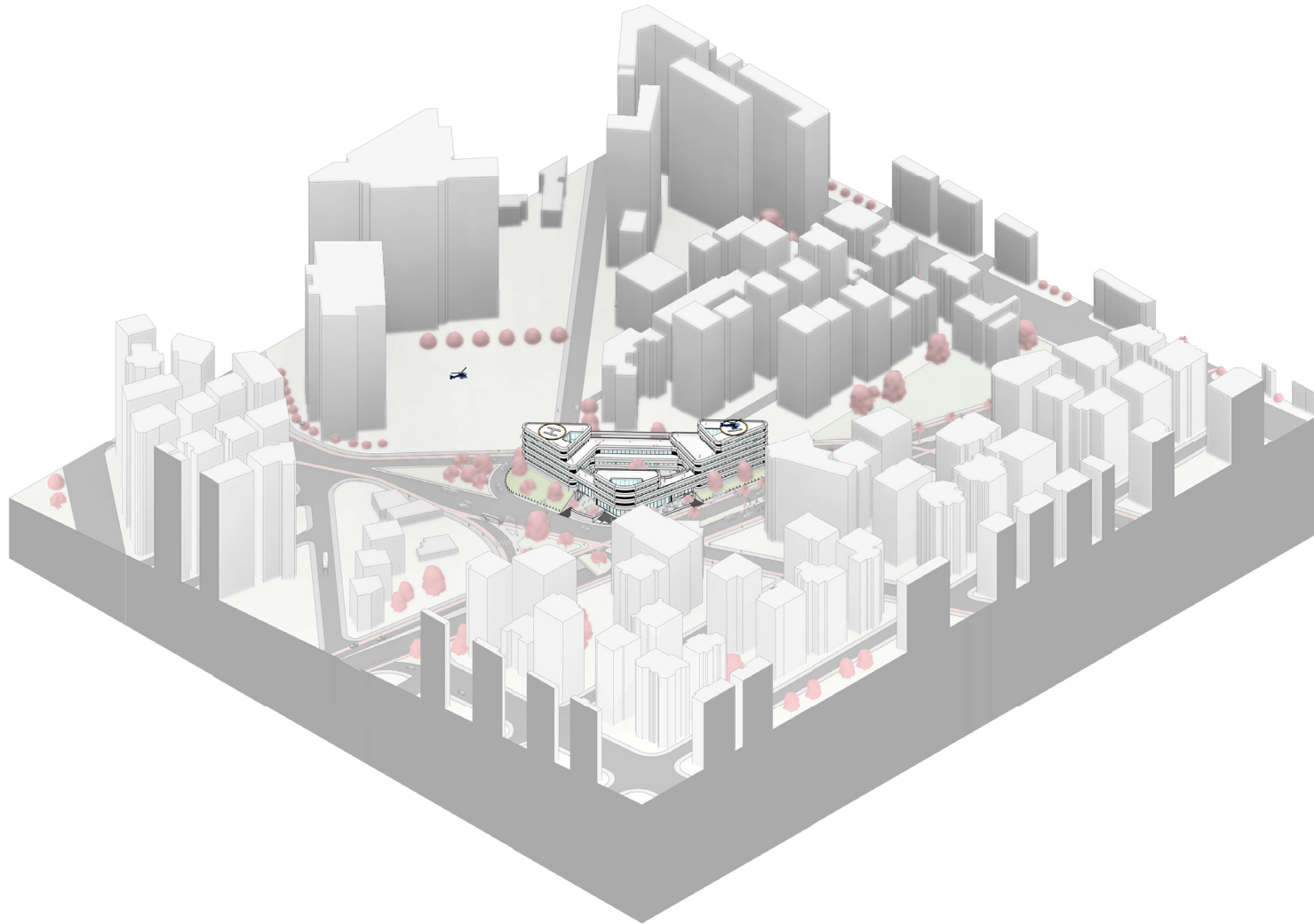


# PUBLIC TRANSPORT LANES

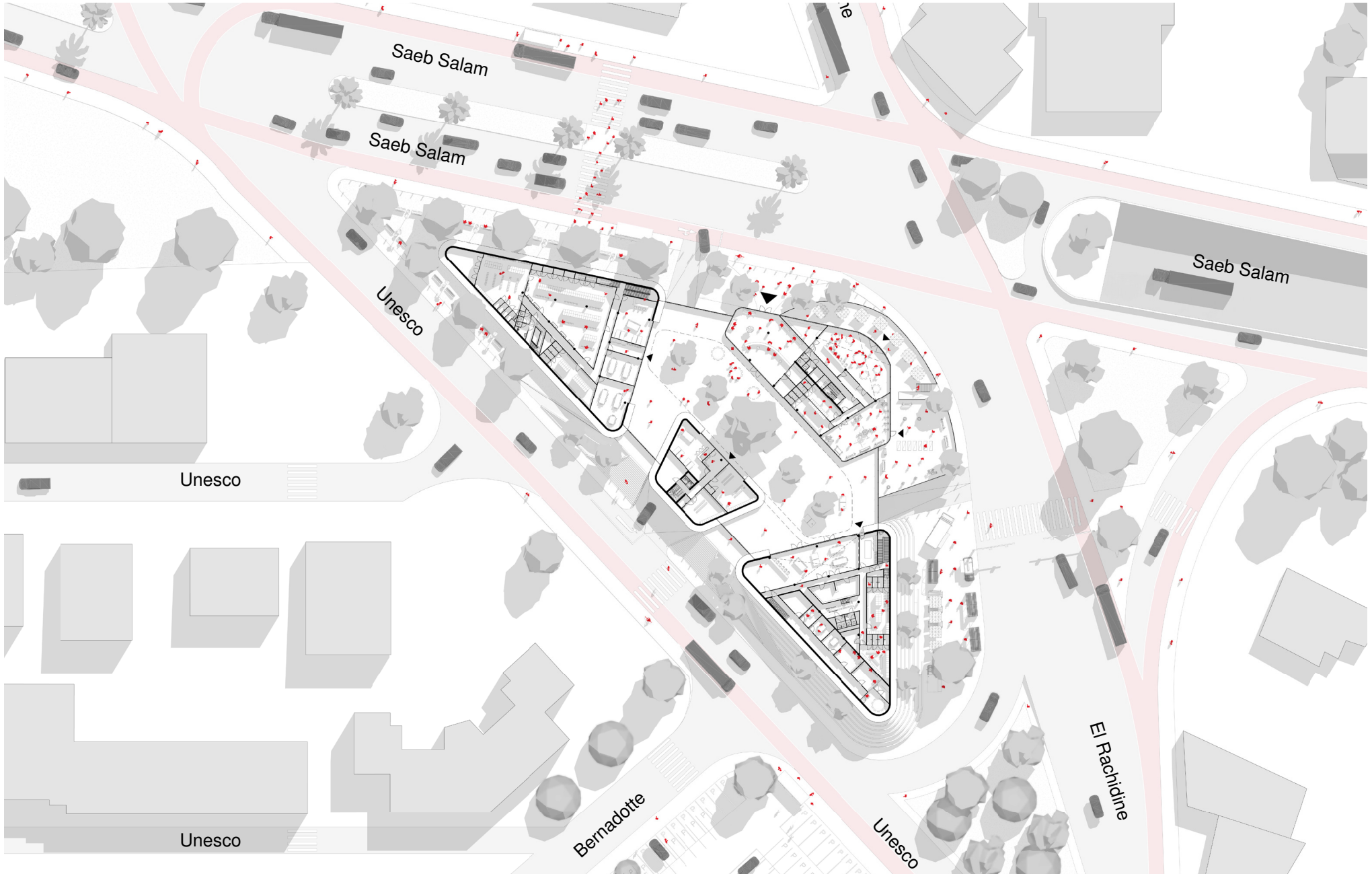




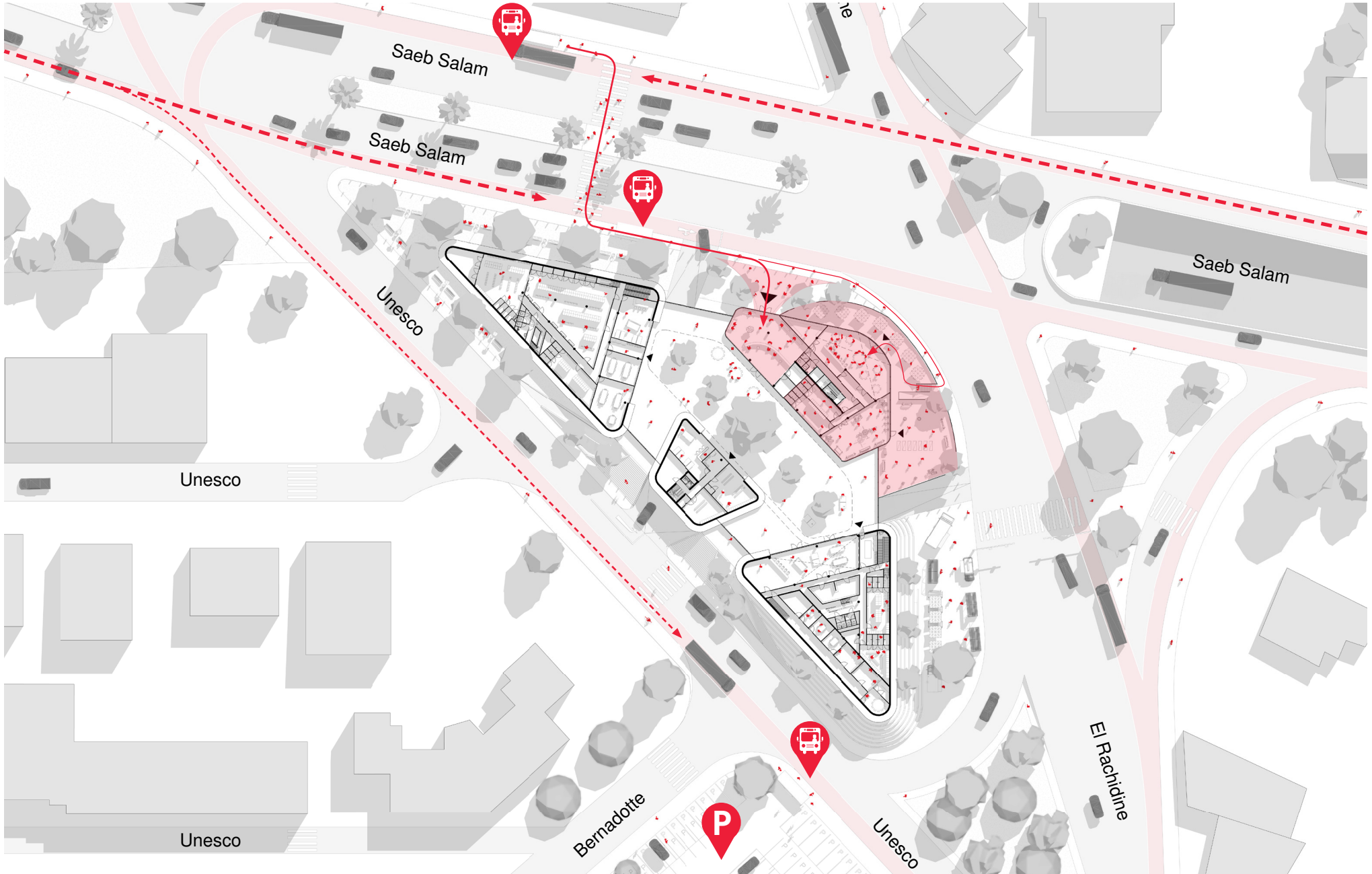
Design  
**PUBLIC VOID**



# URBAN IMPLEMENTATION



# PUBLIC APPROACH

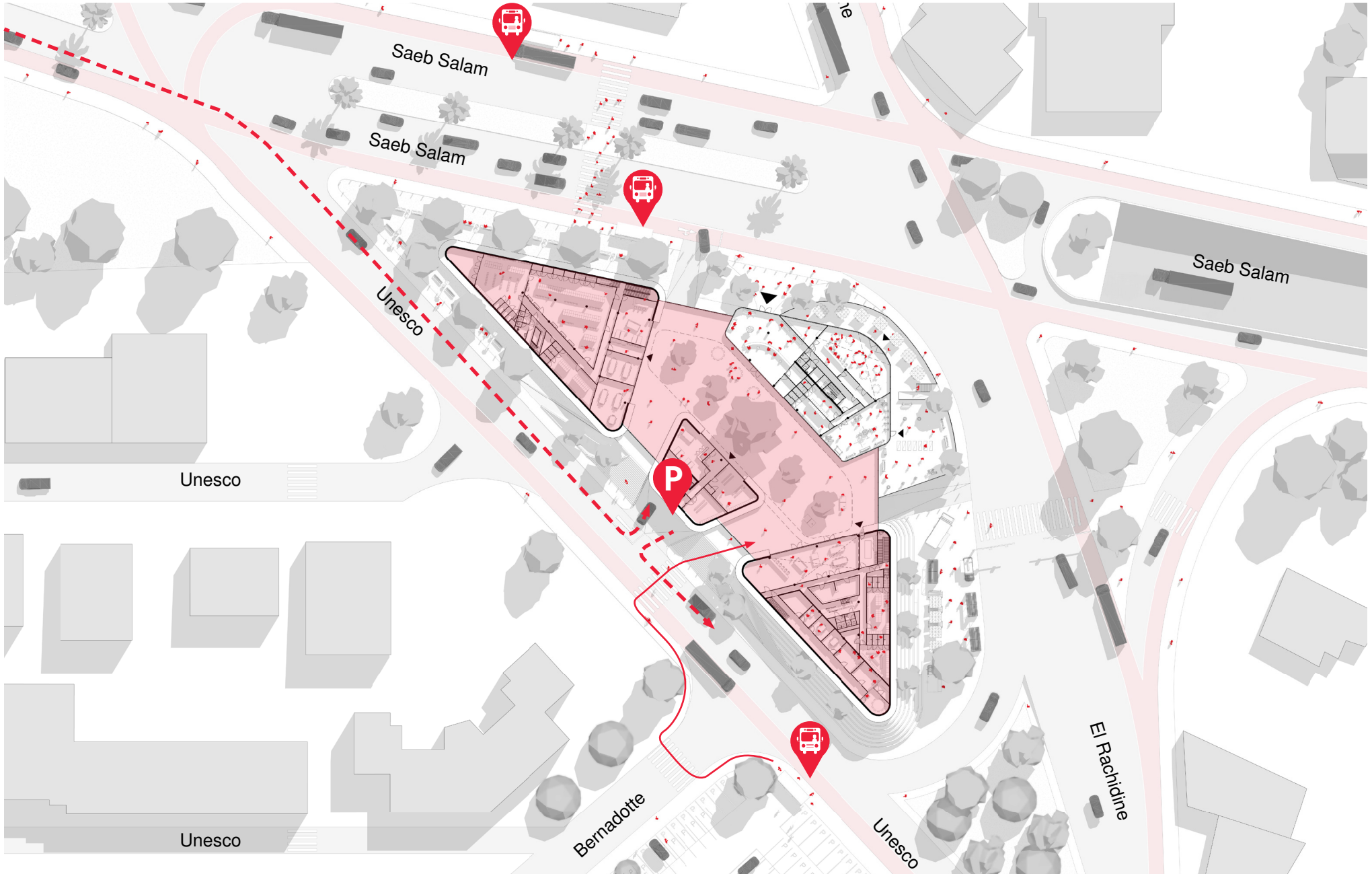


Design

# PUBLIC ENTRANCE



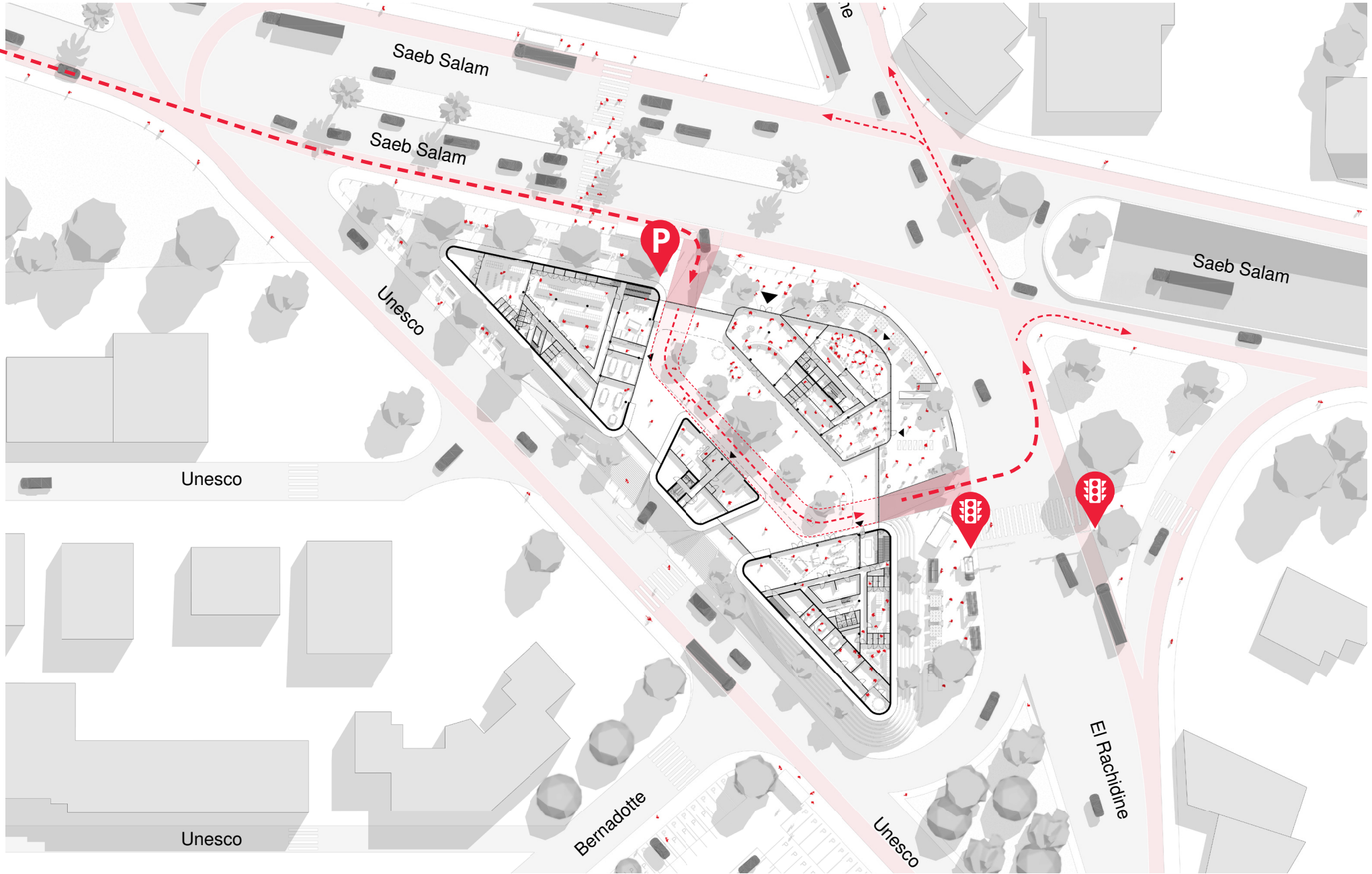
# STAFF APPROACH



Design  
**STAFF ENTRANCE**

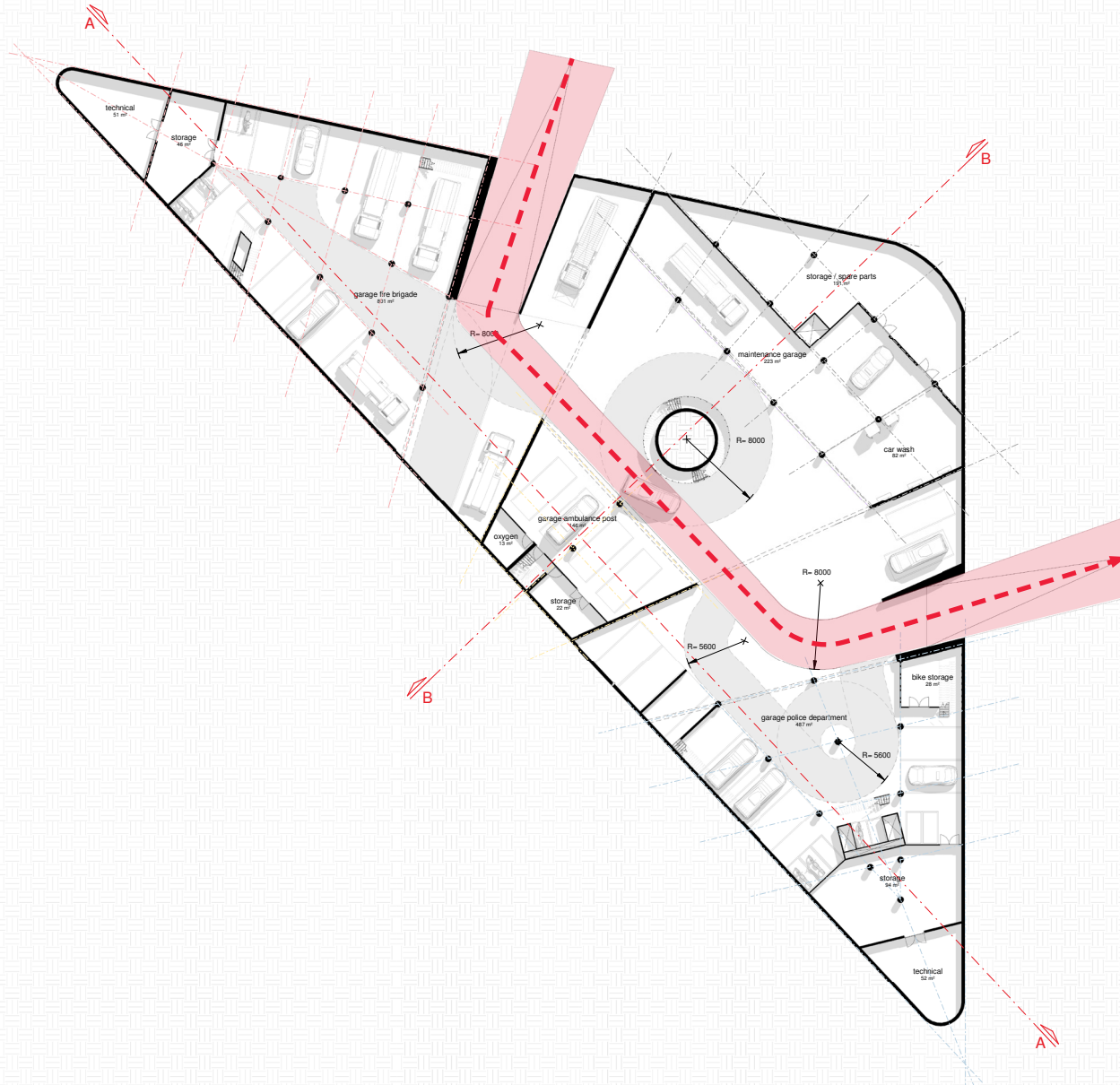


# EMERGENCY FLOW



# Design

## GARAGE FLOOR





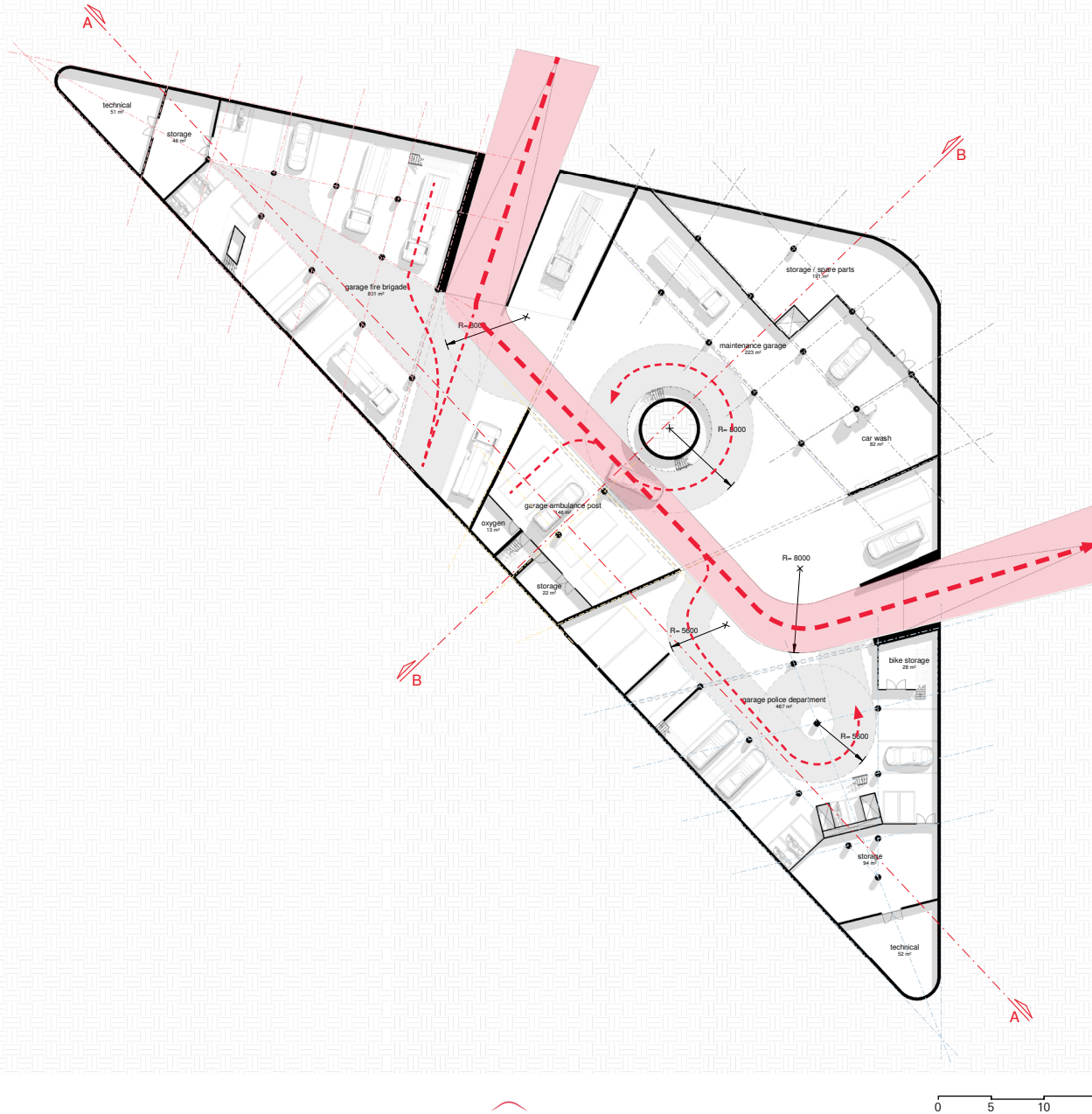
Design

# IMPRESSION GARAGE



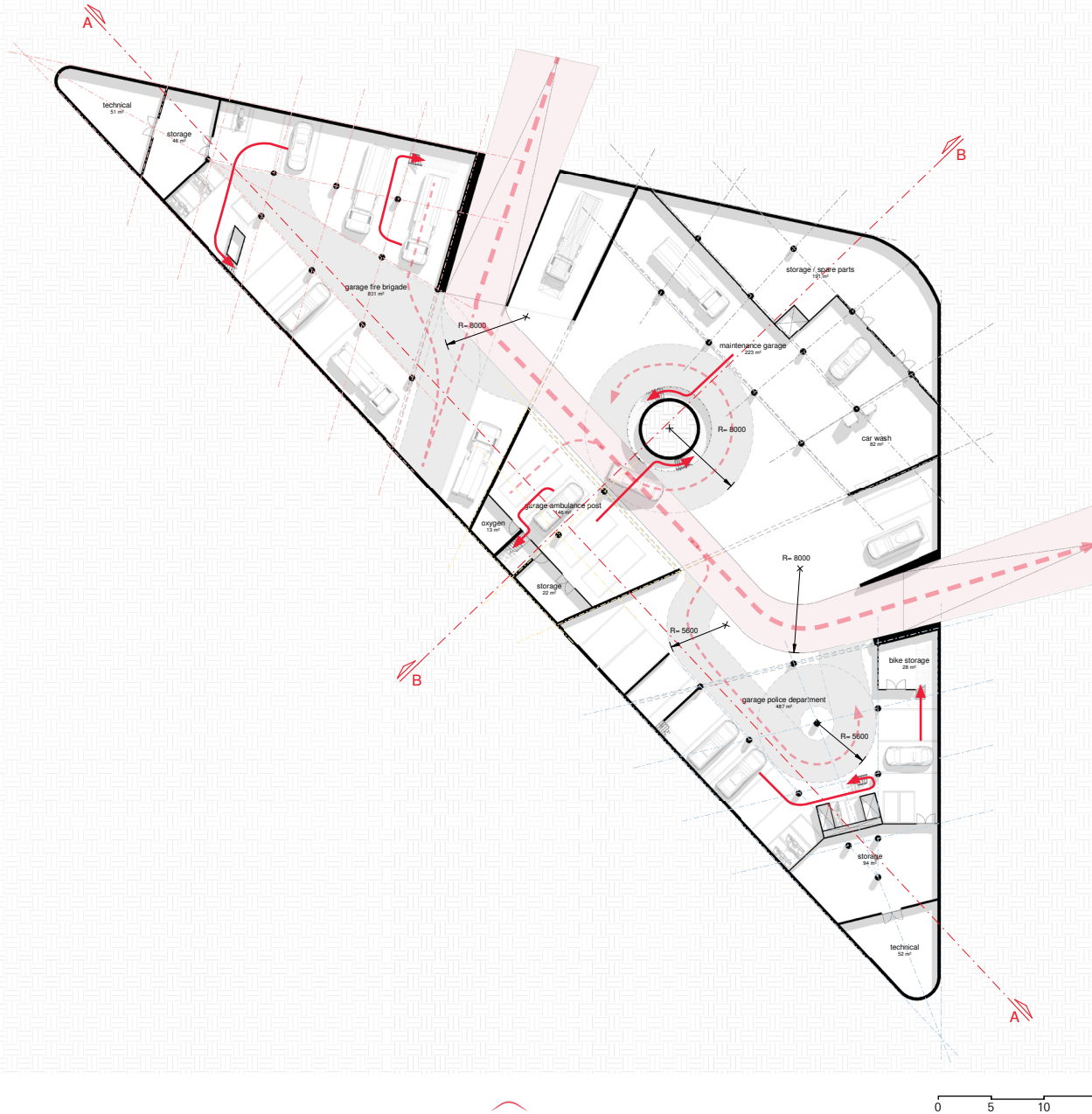
# Design

## SECONDARY ROUTING



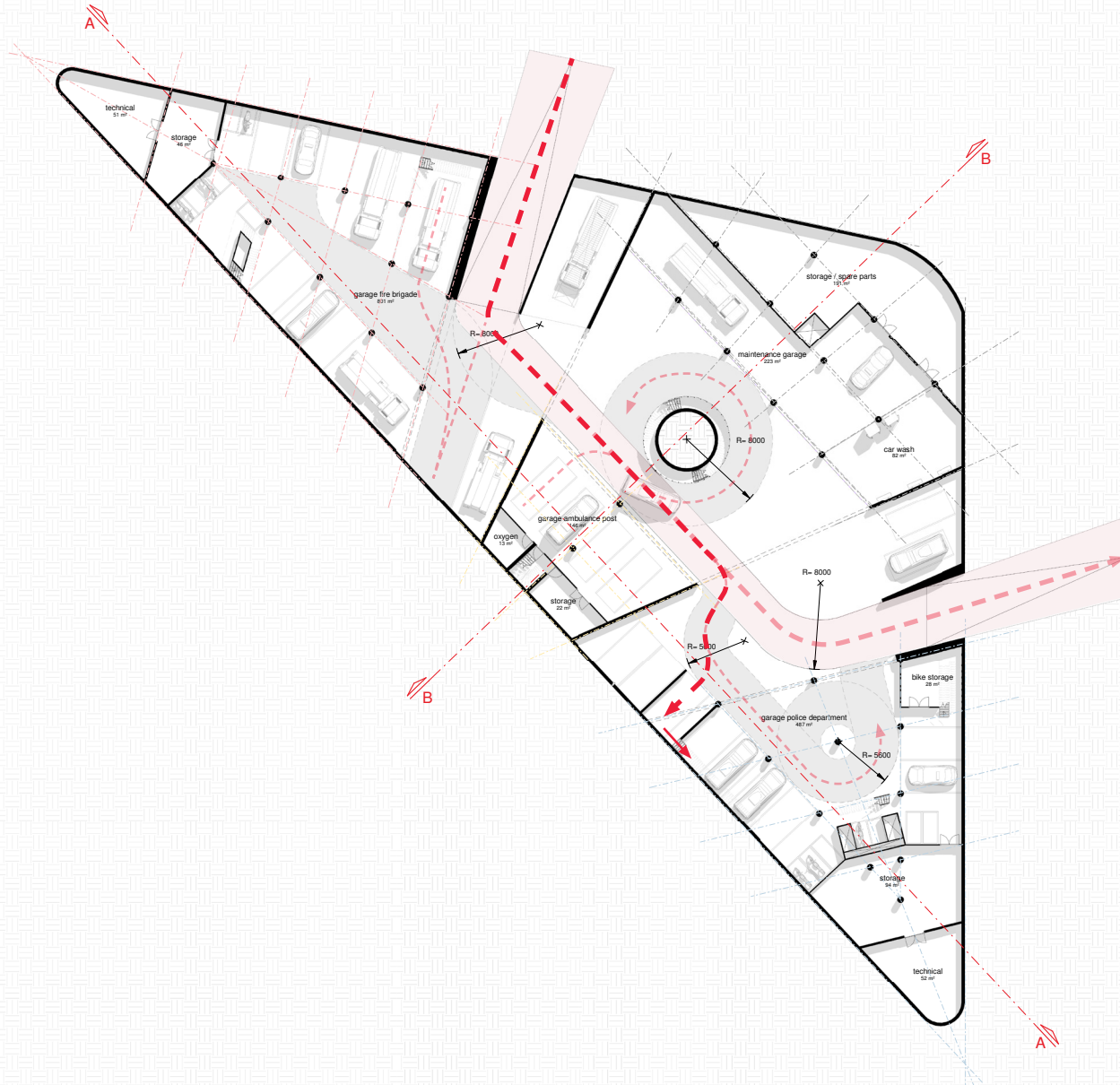
# Design

## VERTICAL ROUTING



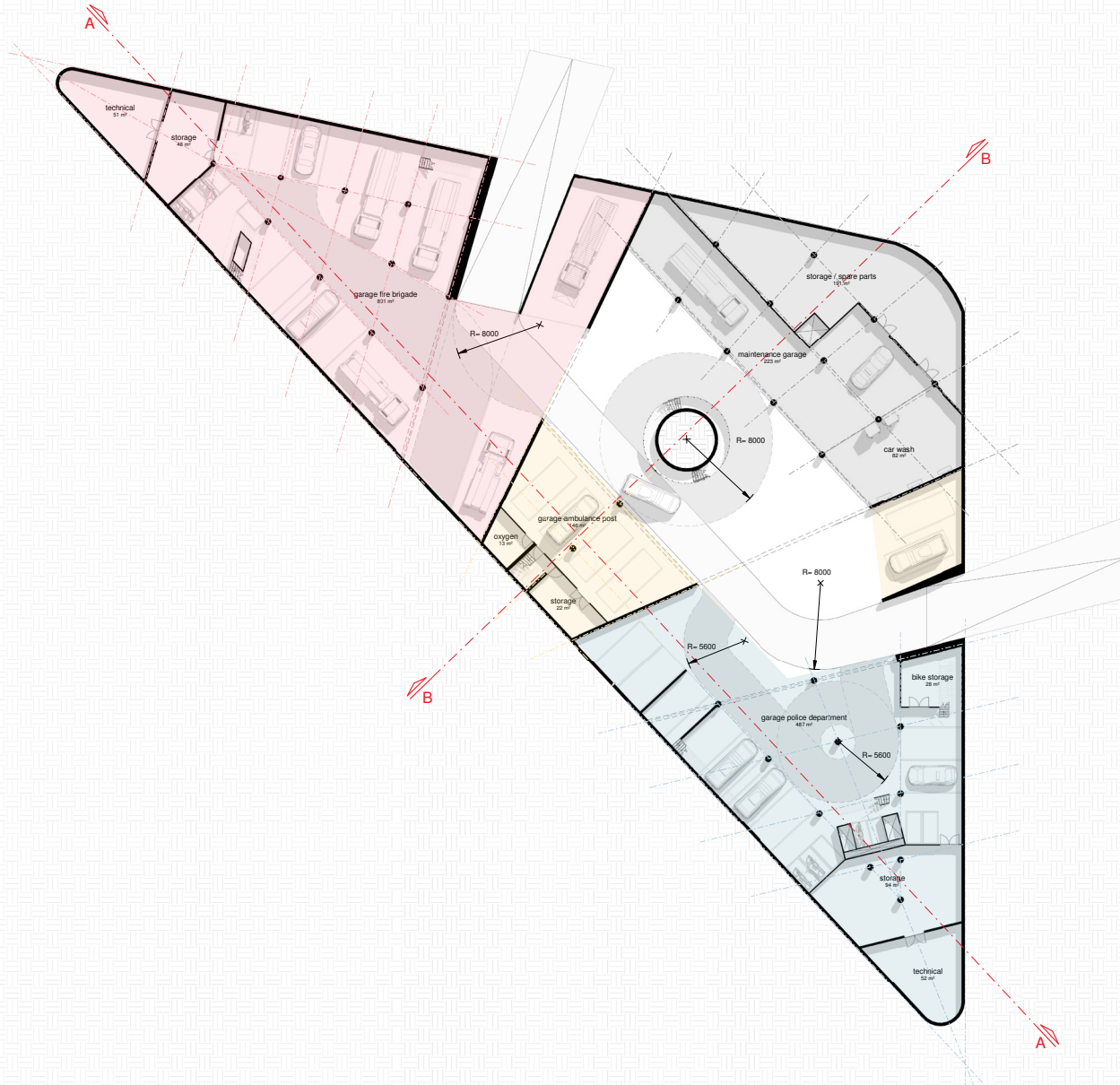
# Design

## DETAINEE FLOW



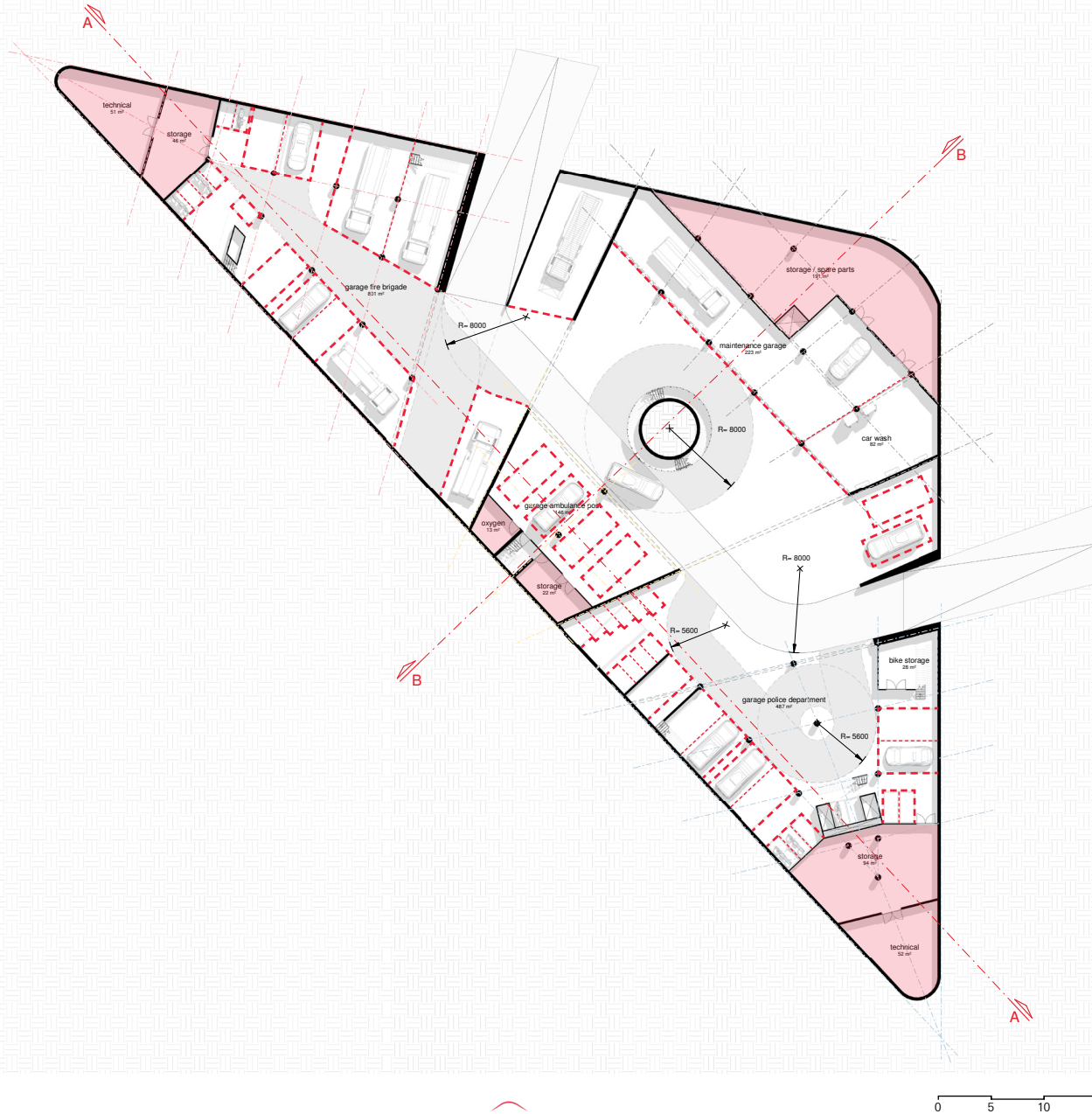
# Design

## DEPARTMENTS



# Design

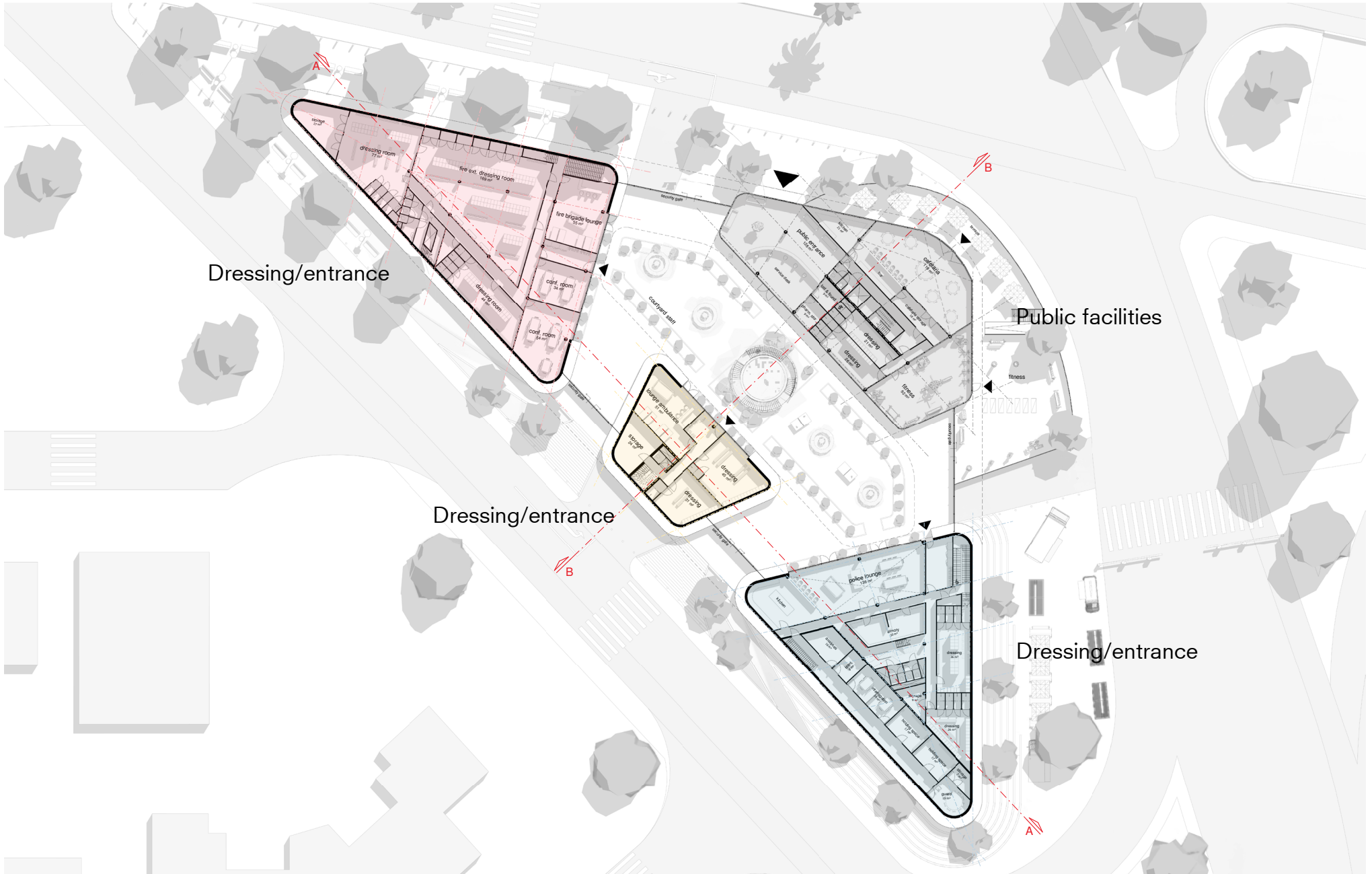
## PARKING & RESTOCKING



Design  
**GROUND FLOOR**

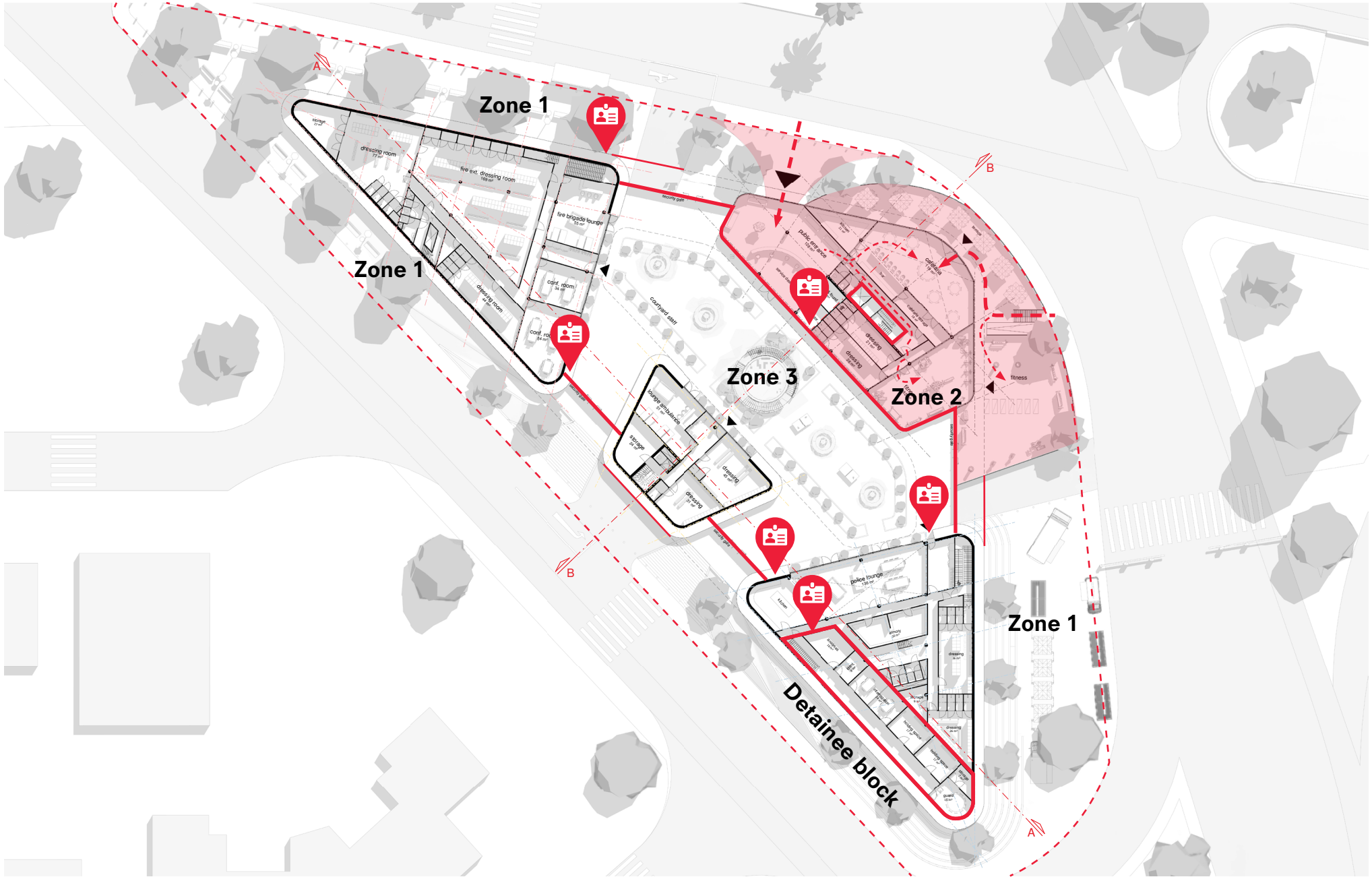


# Design DEPARTMENTS





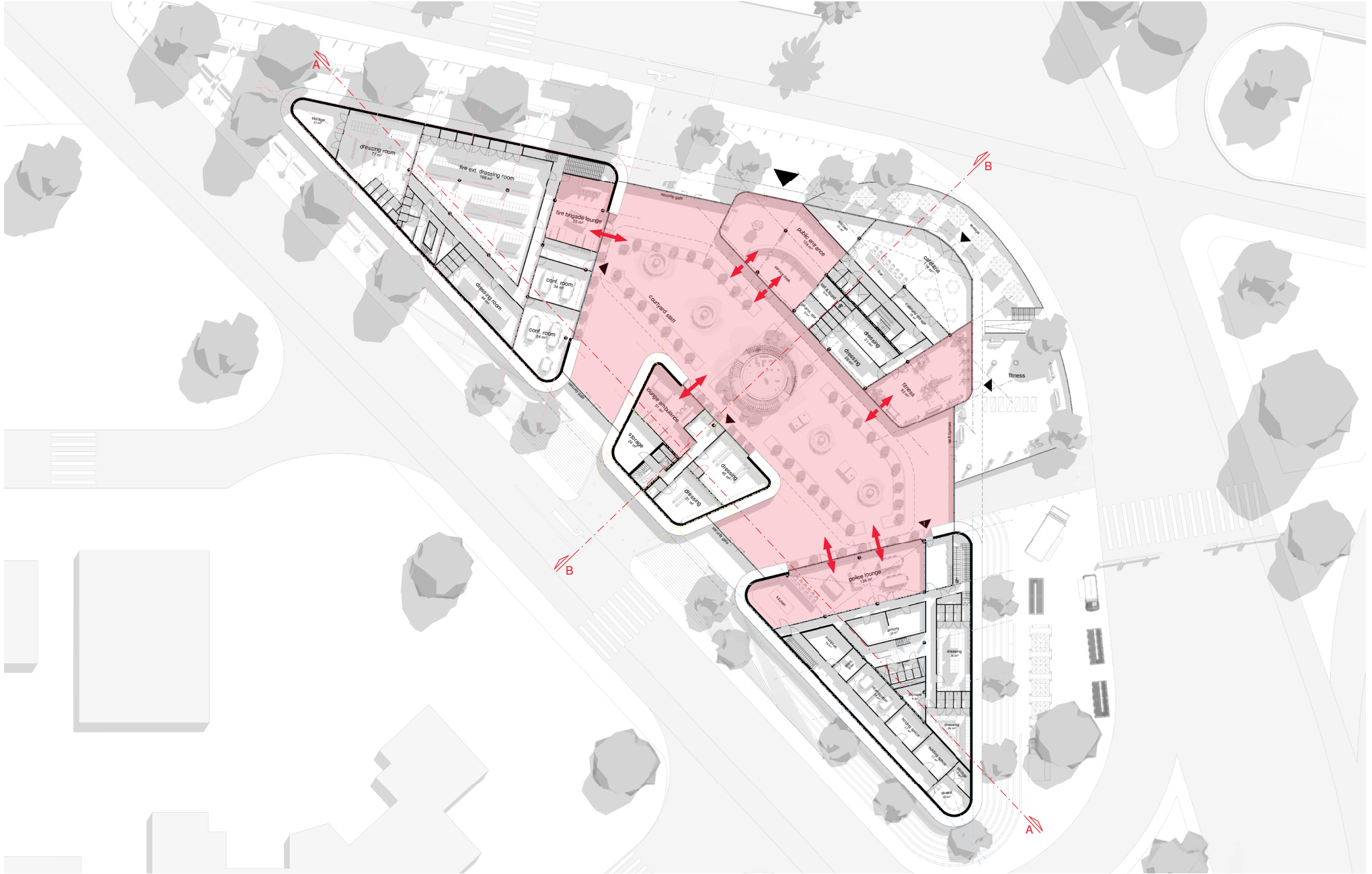
# PUBLIC V.S. SECURITY



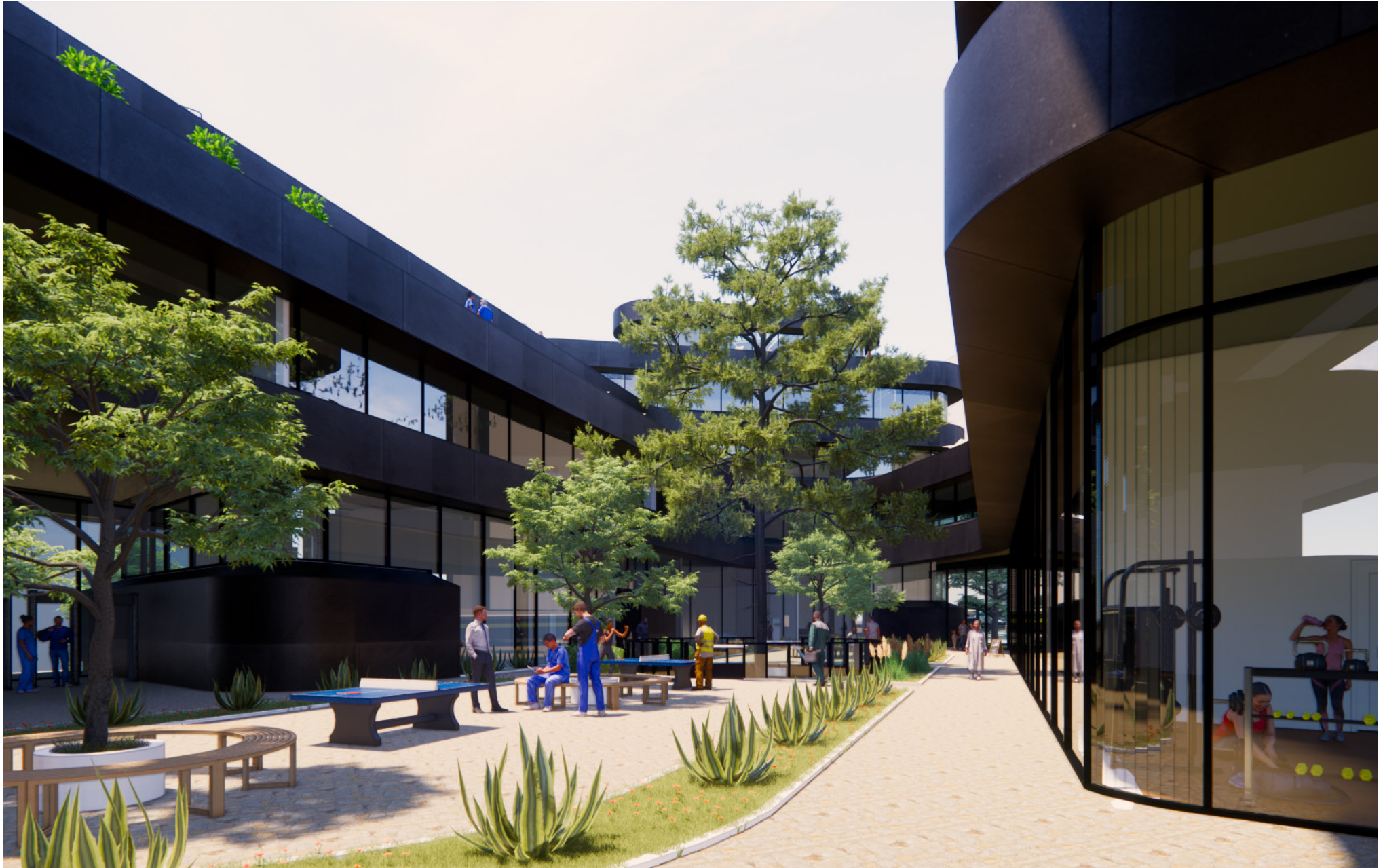
Design  
**COURTYARD**



# Design **LEISURE**



Design  
**COURTYARD**



# ENTERING DEPARTMENTS



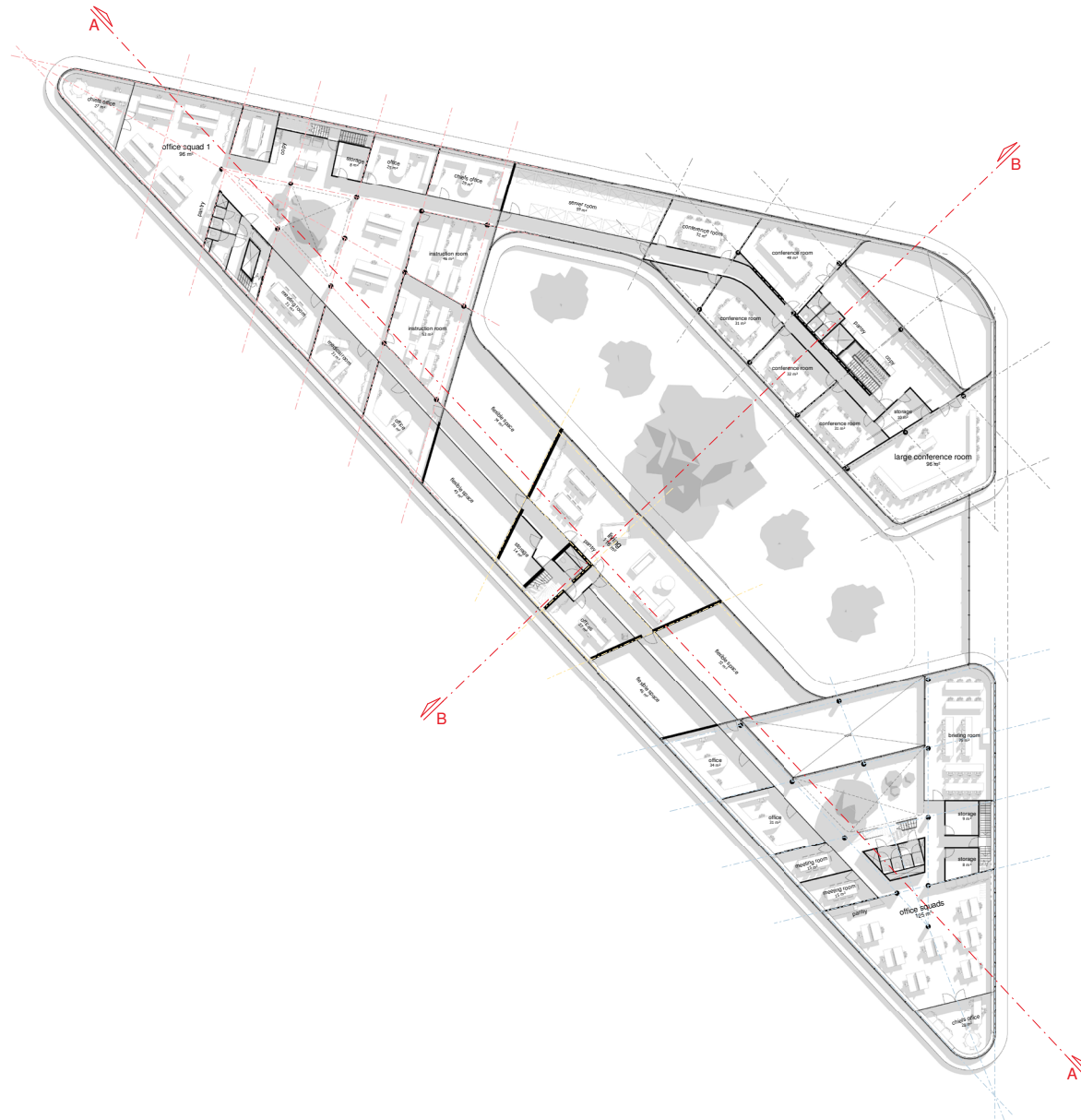
Design  
**EMERGENCY**



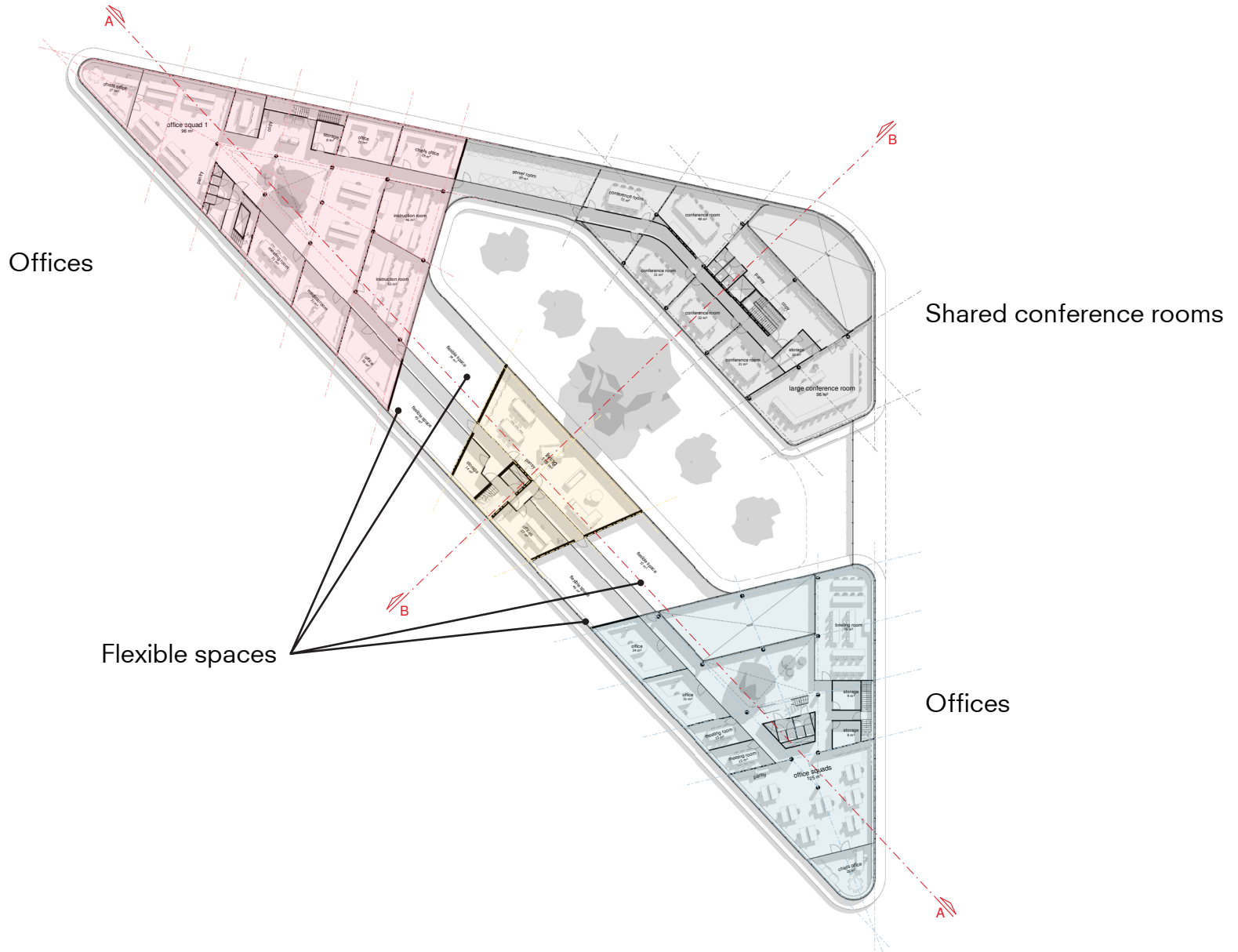
**STEPS**

- 1. Dressing room**
- 2. Armory / Fire ext. room**
- 3. Garage**

# Design FIRST FLOOR



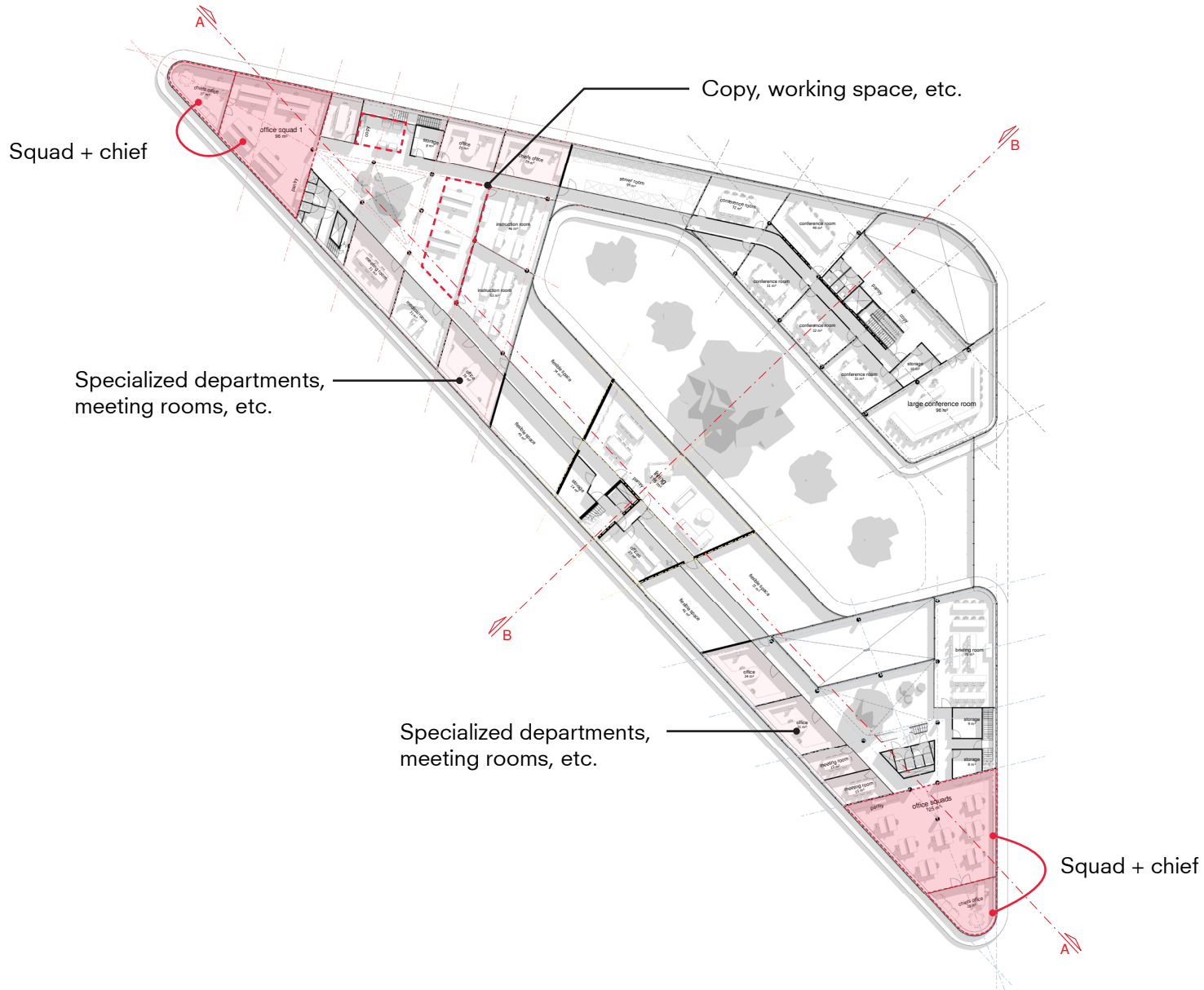
# Design DEPARTMENTS





# Design

## OFFICE HIERARCHY



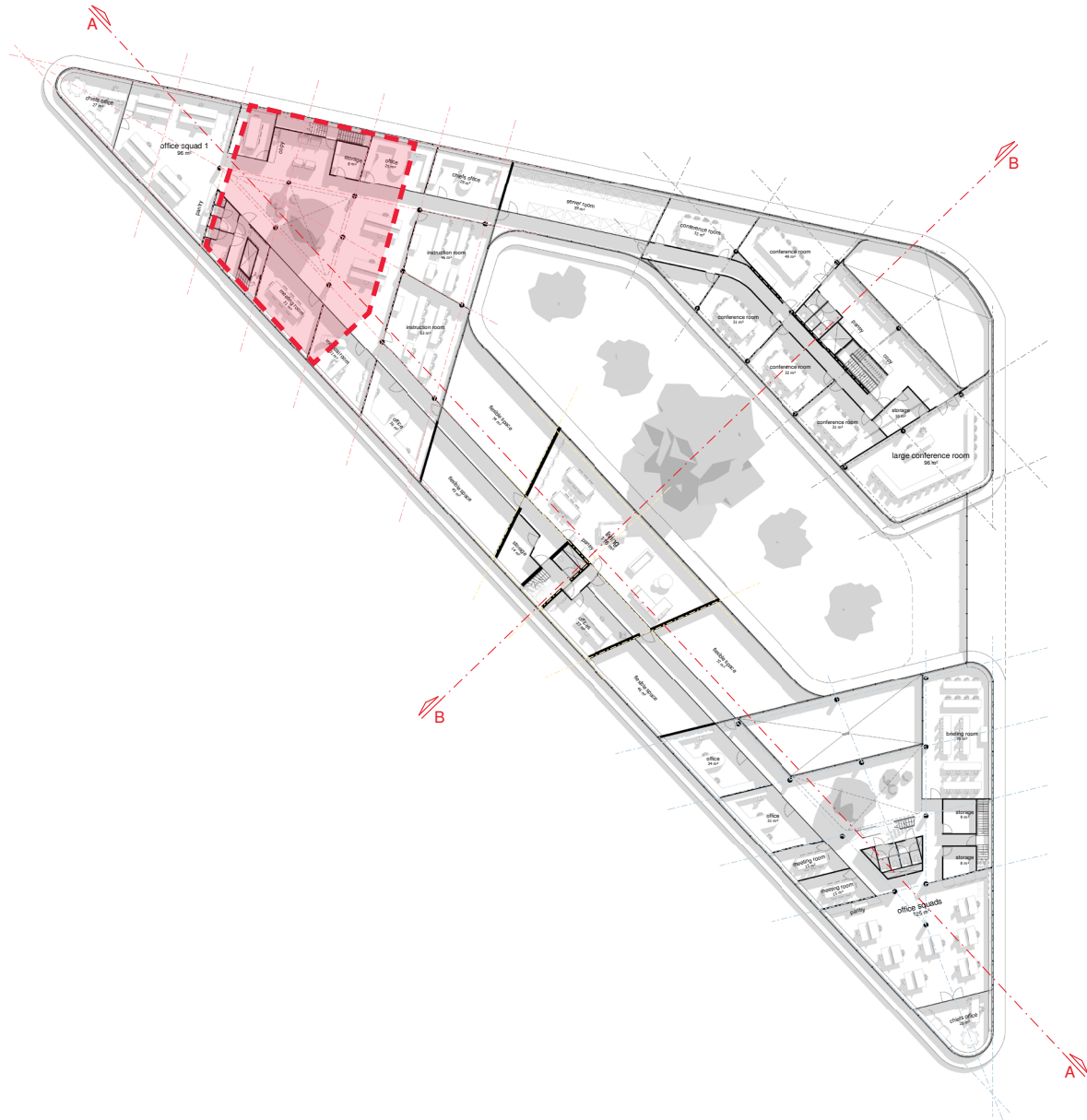
Design

# IMPRESSION OFFICE CORNER

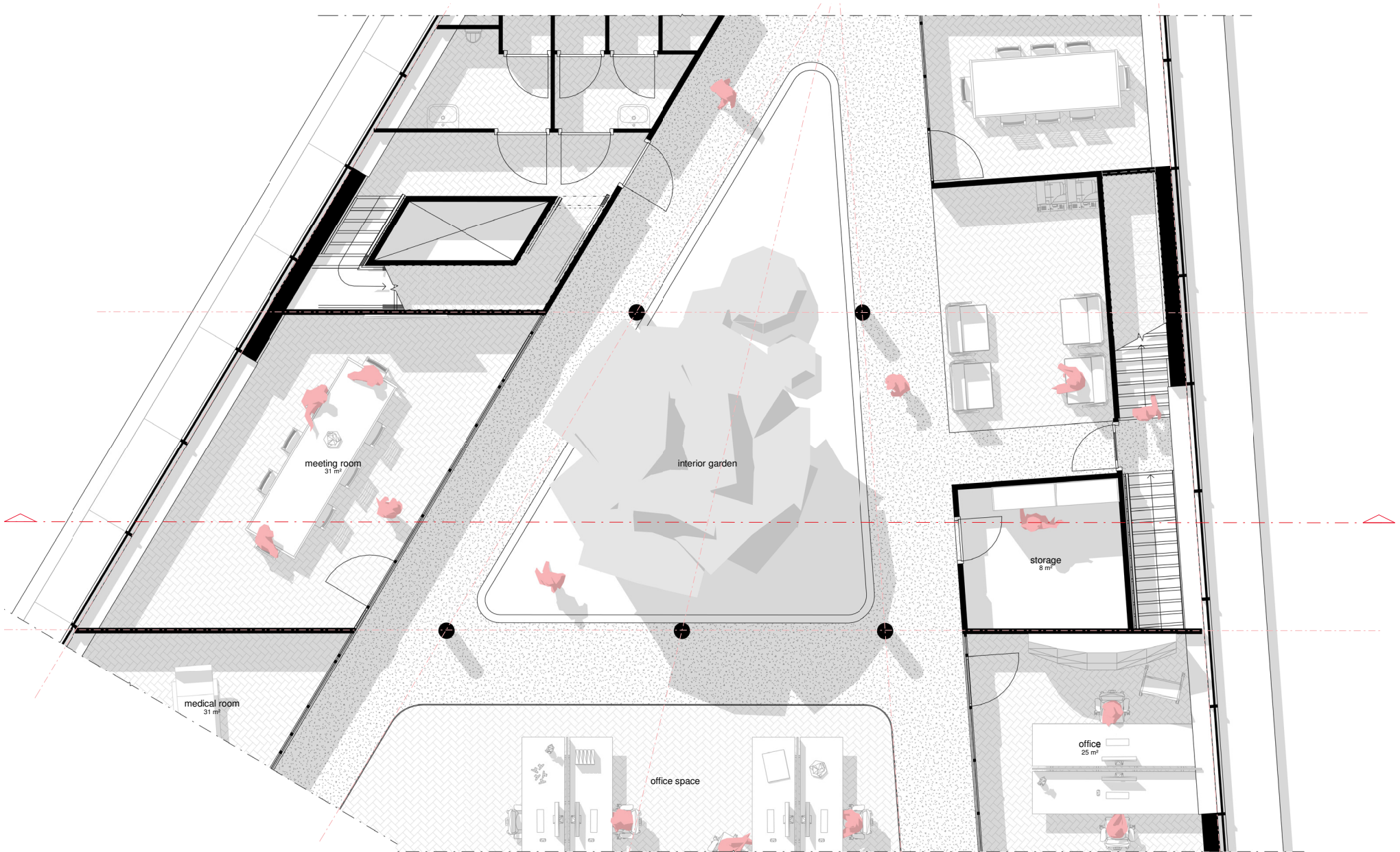




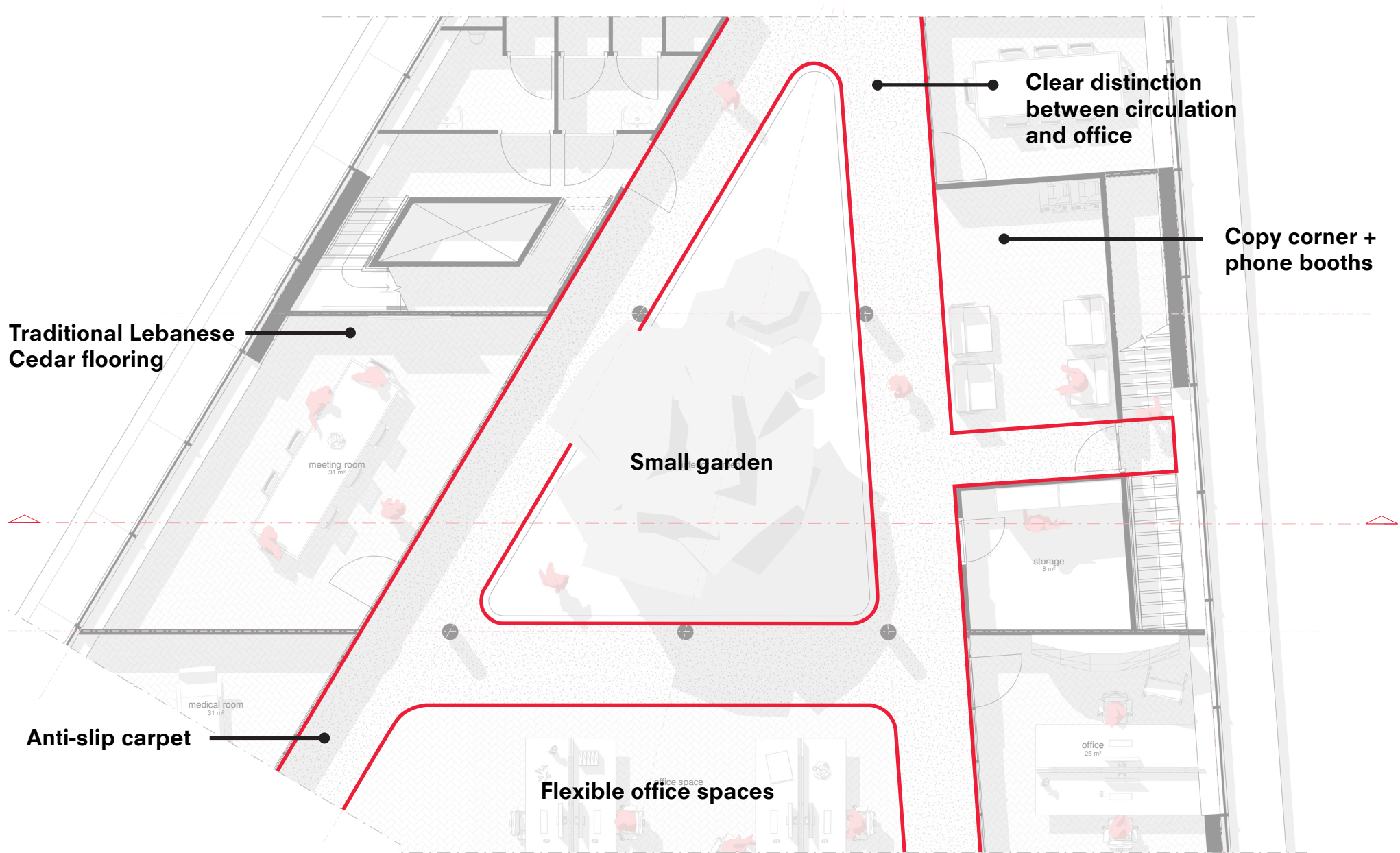
# Design **OFFICE HEART**



# INTERIOR FRAGMENT



# INTERIOR FRAGMENT



Traditional Lebanese Cedar flooring

Clear distinction between circulation and office

Copy corner + phone booths

Small garden

meeting room  
31 m²

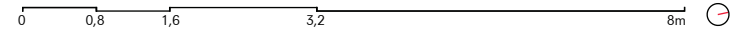
storage  
8 m²

medical room  
31 m²

Flexible office spaces

office  
25 m²

Anti-slip carpet



Design  
**OFFICES**

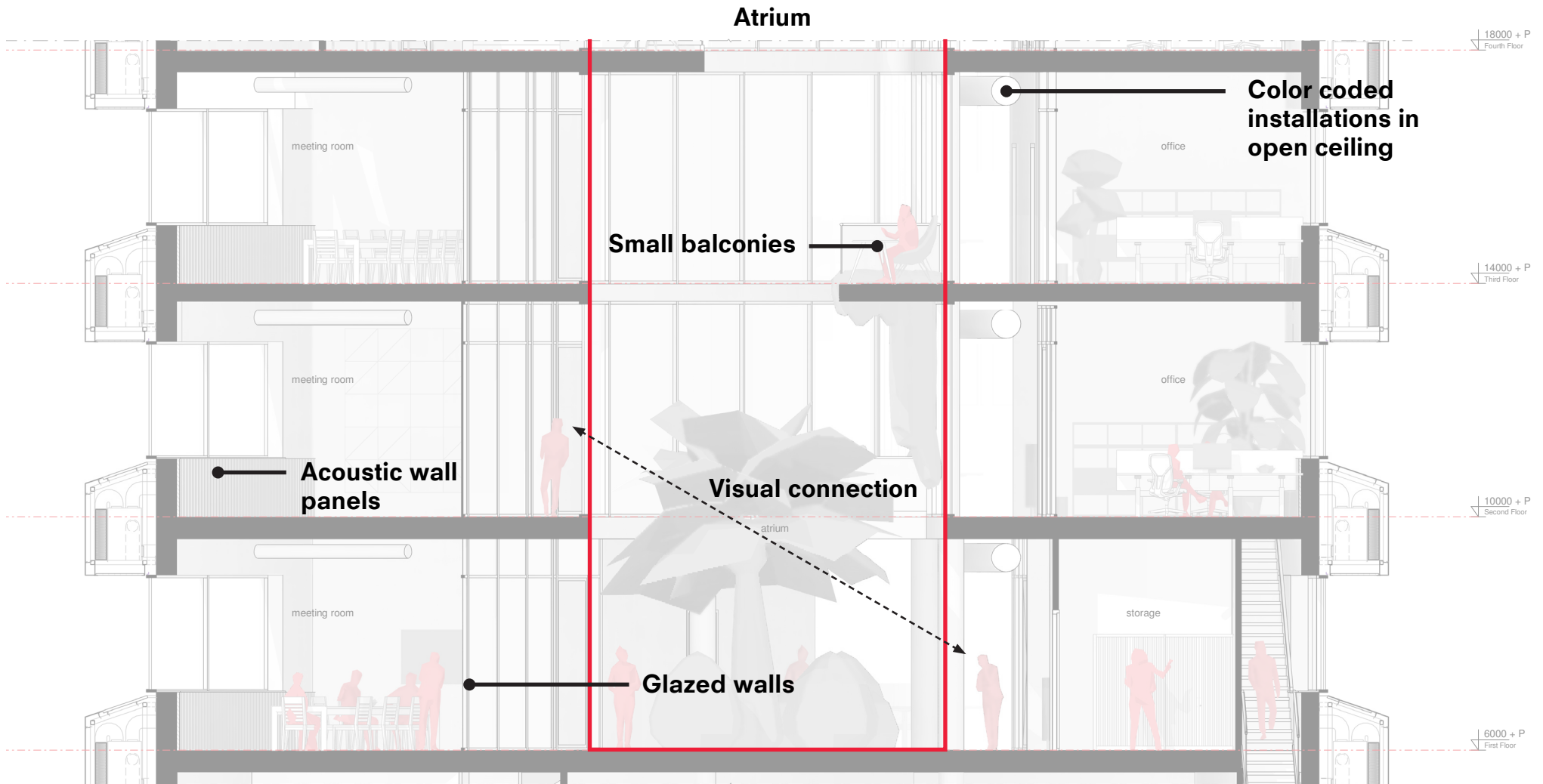


Design  
**INTERIOR FRAGMENT**

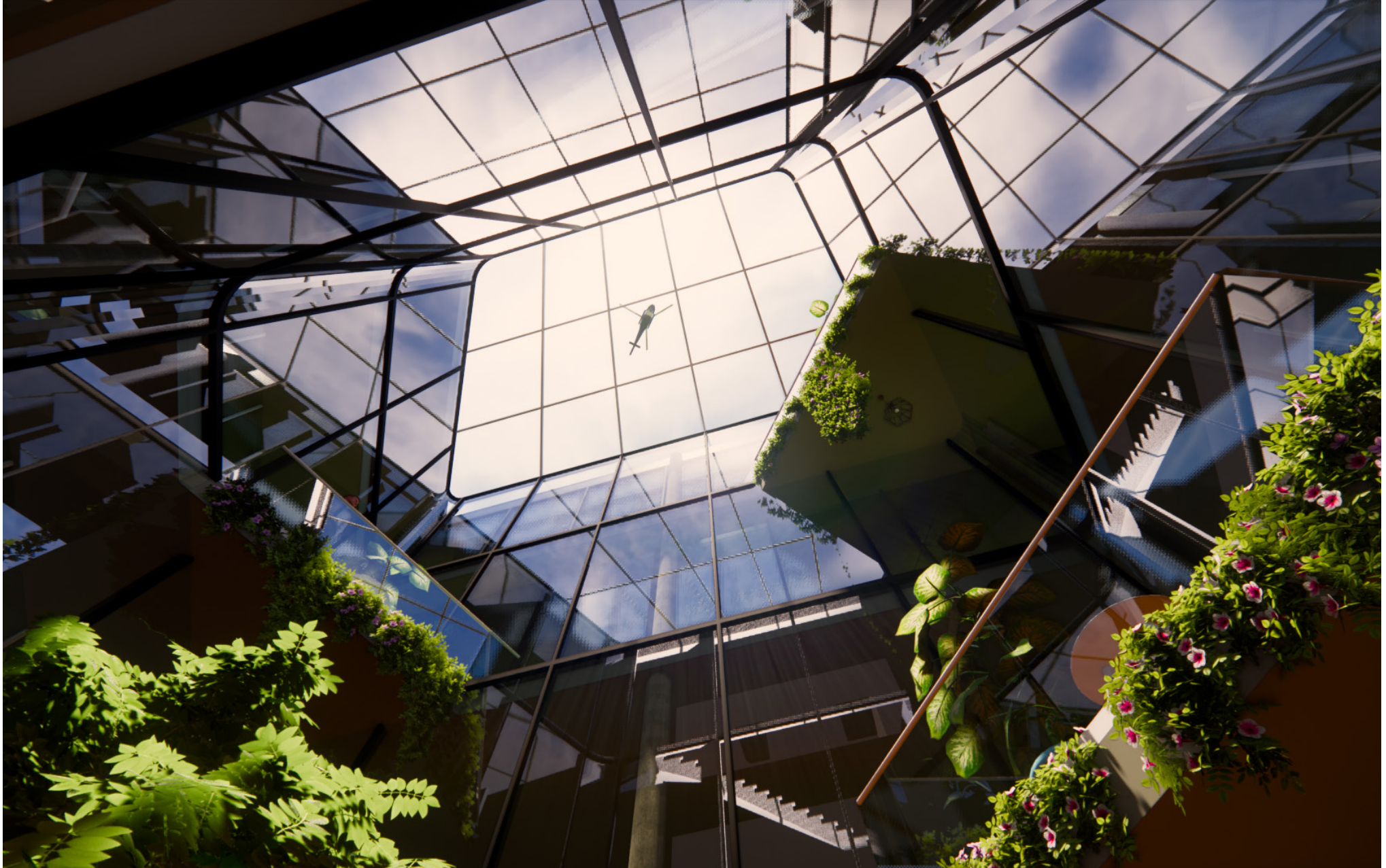




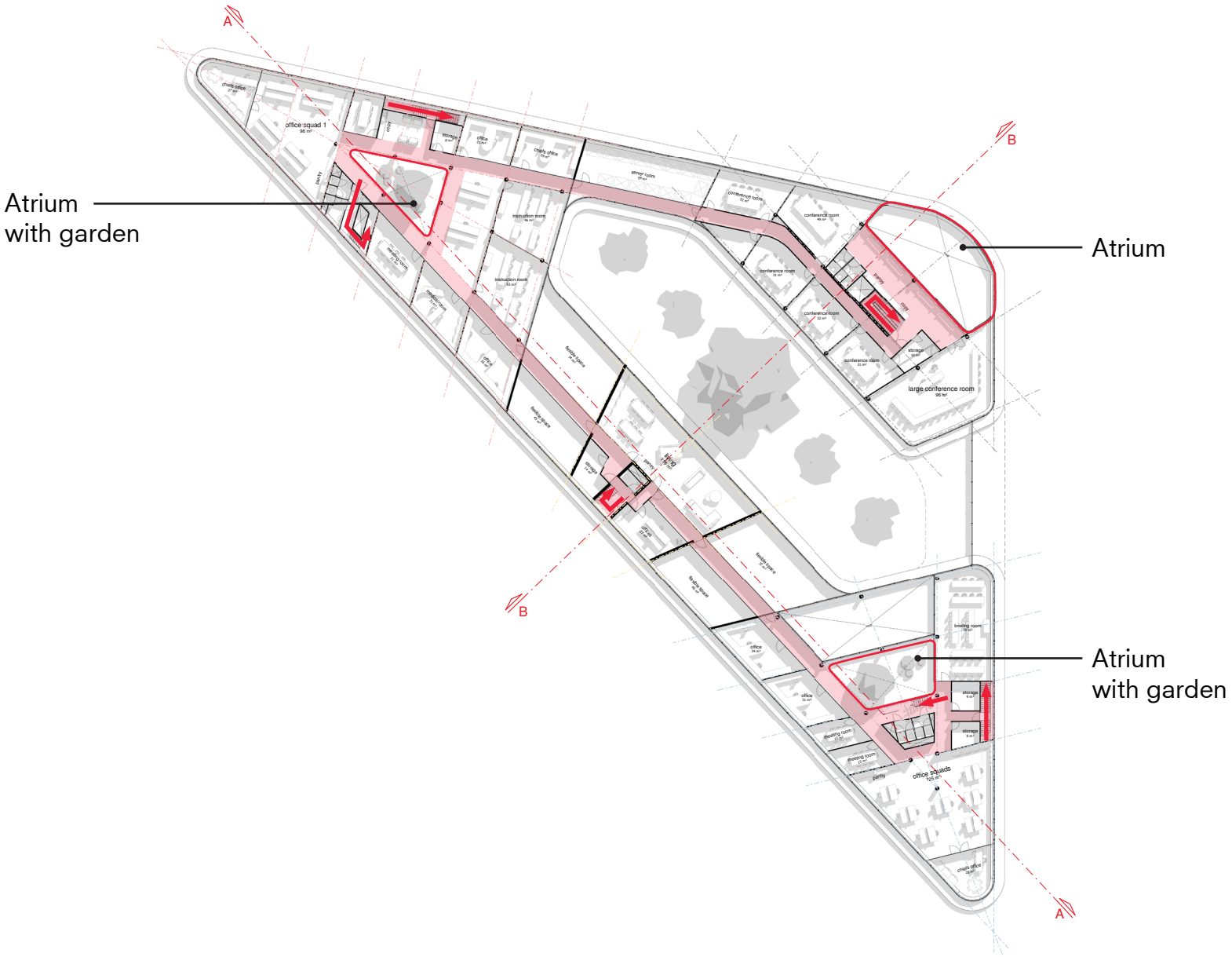
# INTERIOR FRAGMENT



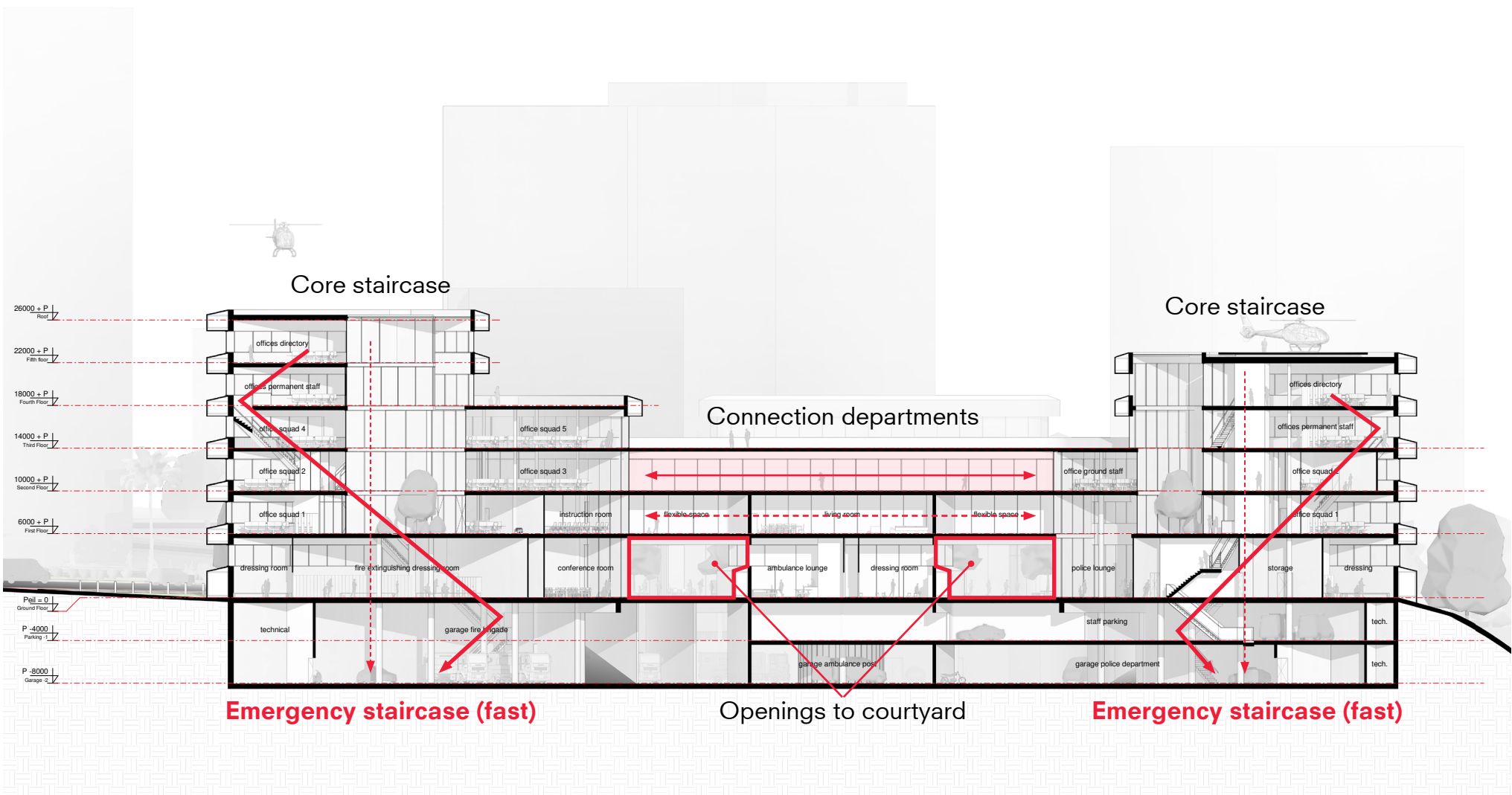
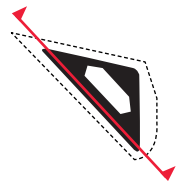
Design  
**ATRIUM**



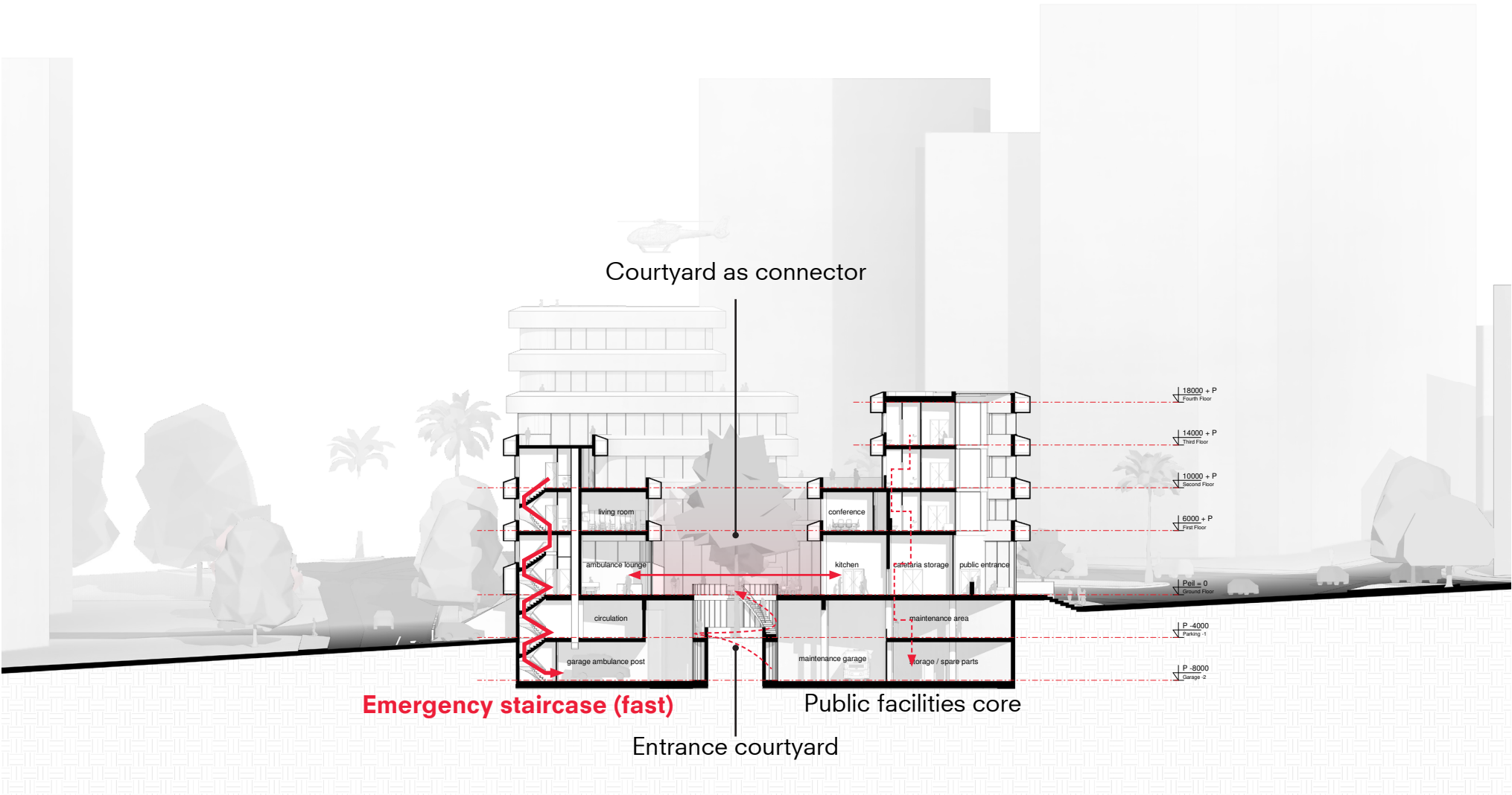
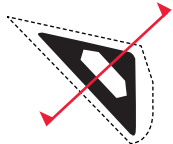
# Design **CIRCULATION**



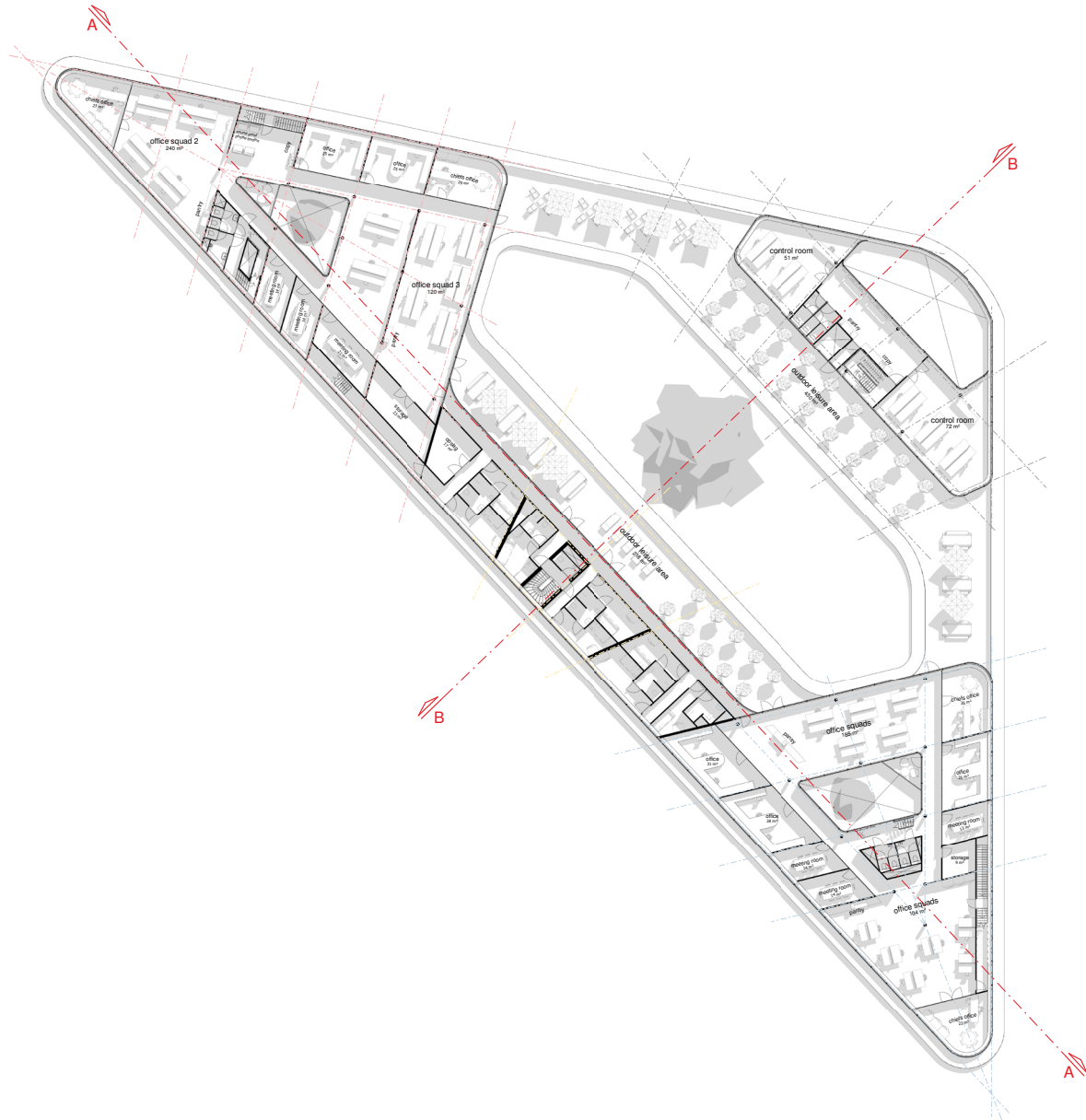
# Design CIRCULATION



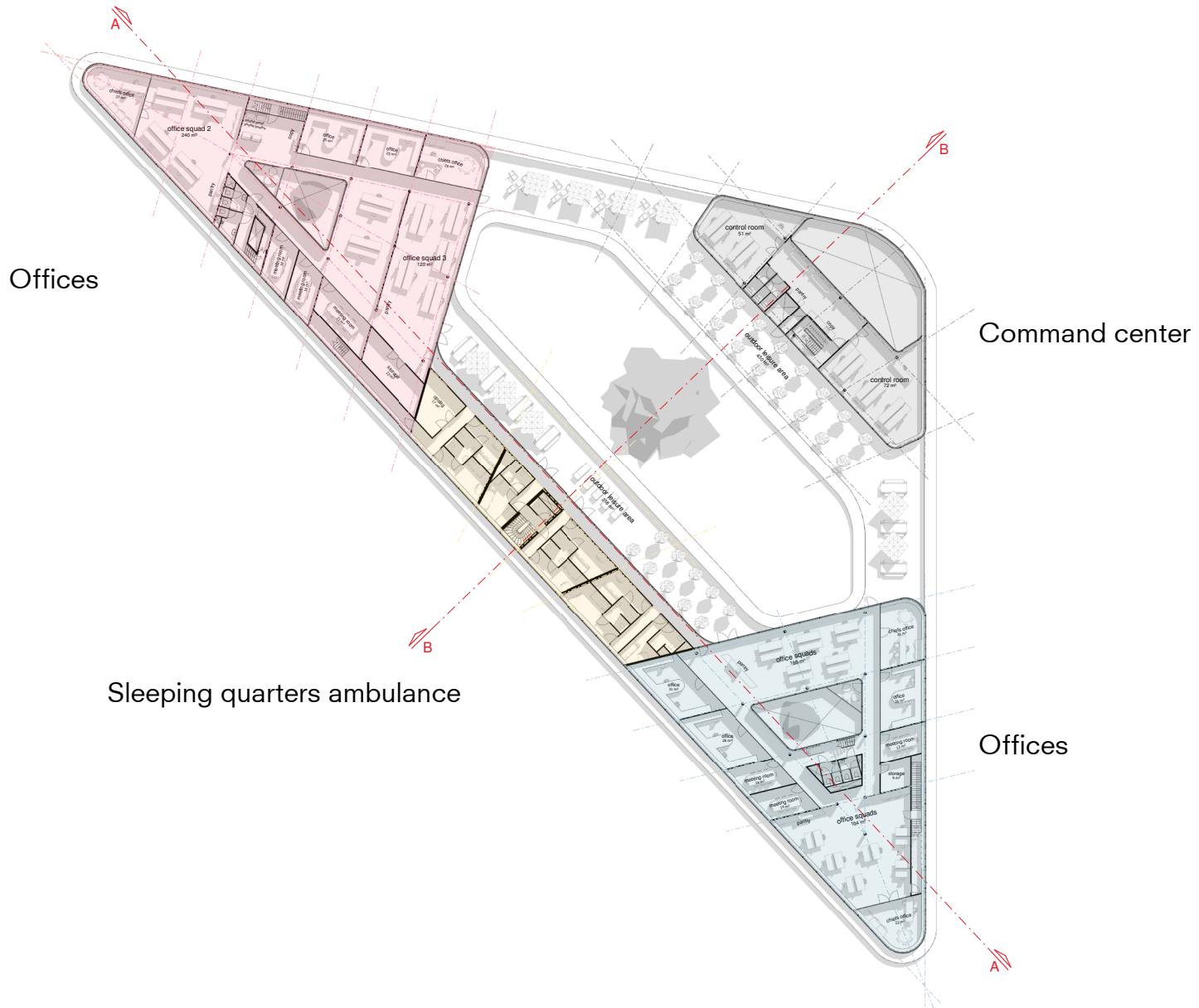
Design  
**CIRCULATION**



# Design SECOND FLOOR

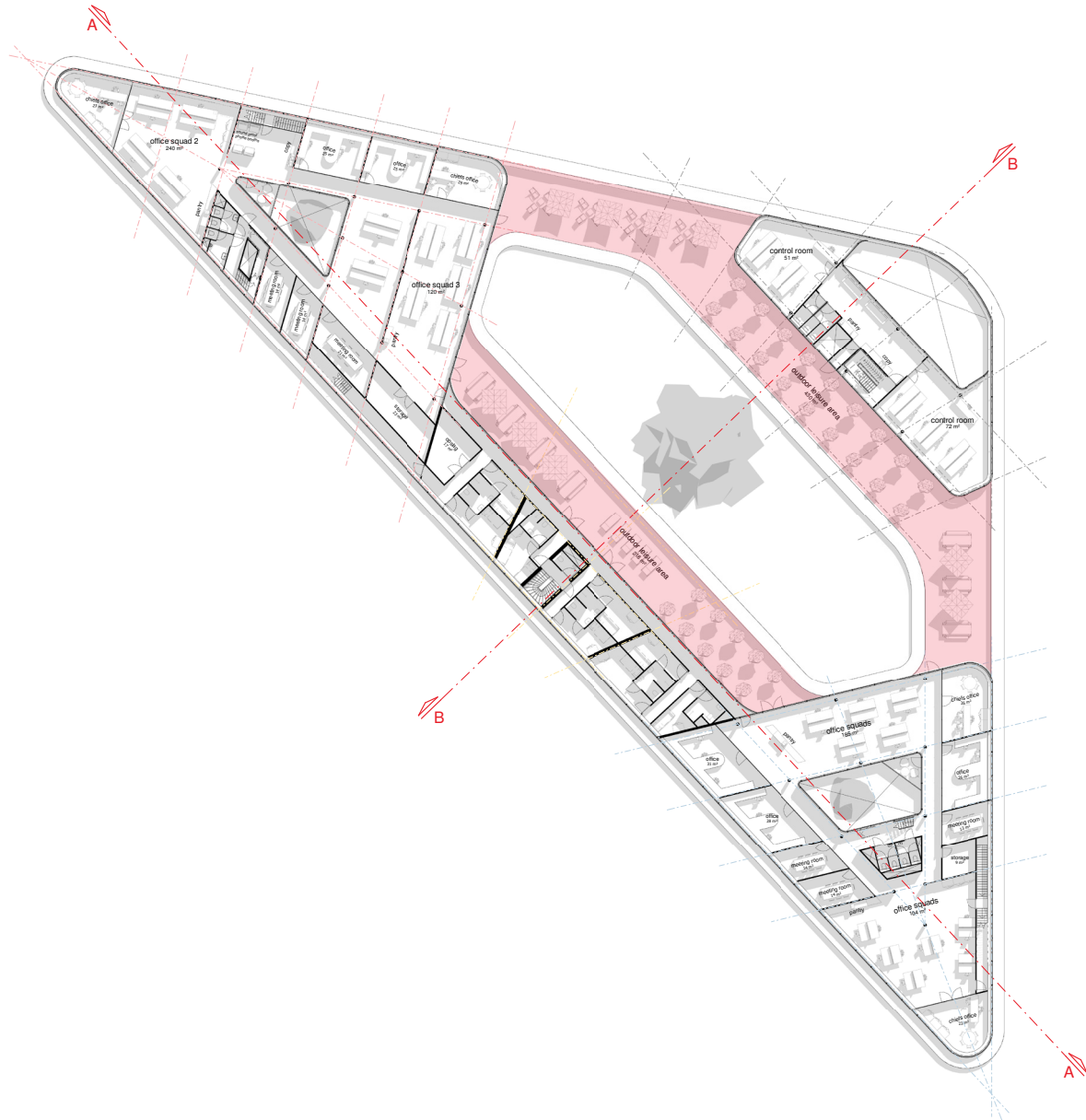


# Design DEPARTMENTS



# Design

## LEISURE ROOF



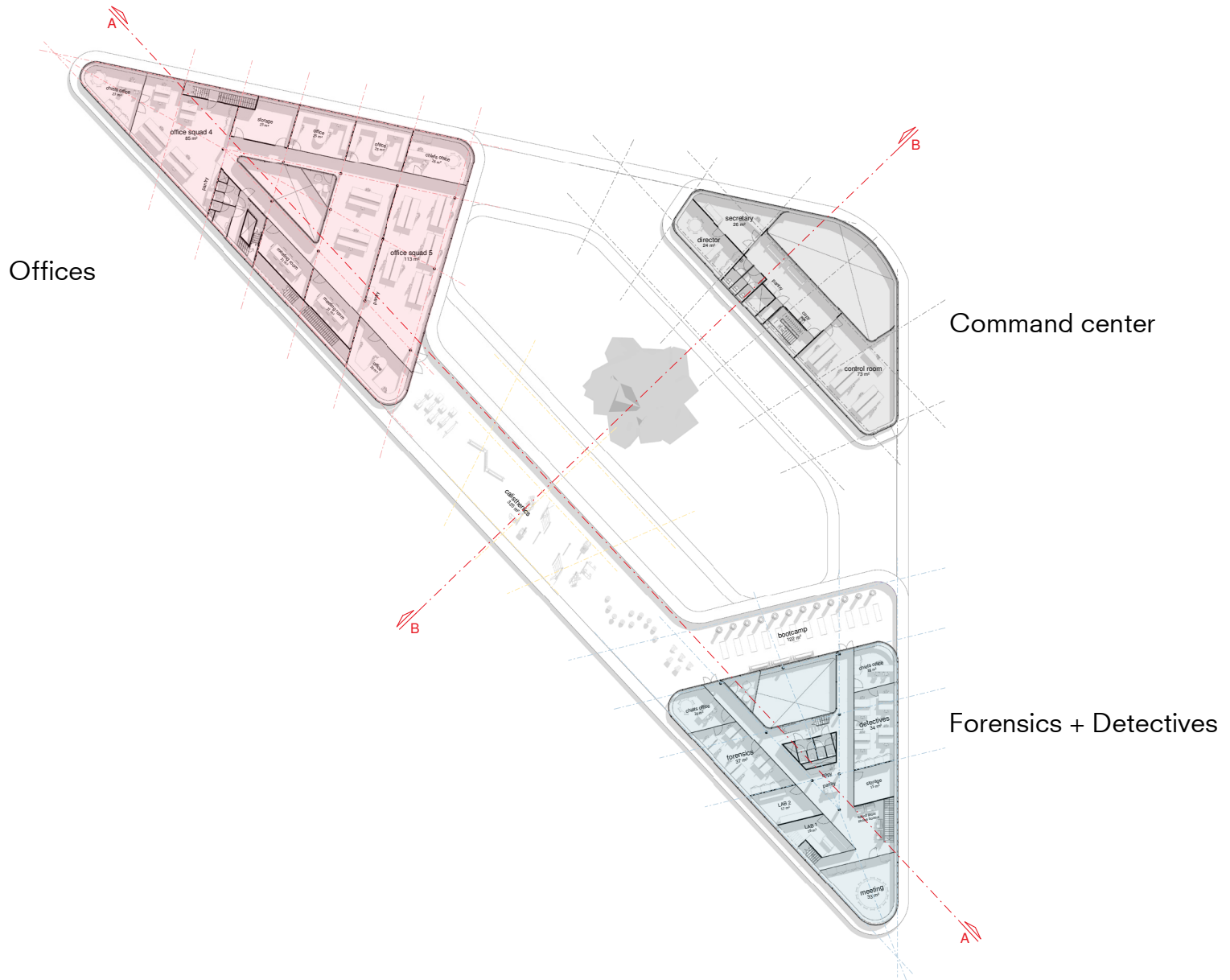


Design

# SECOND FLOOR VIEW

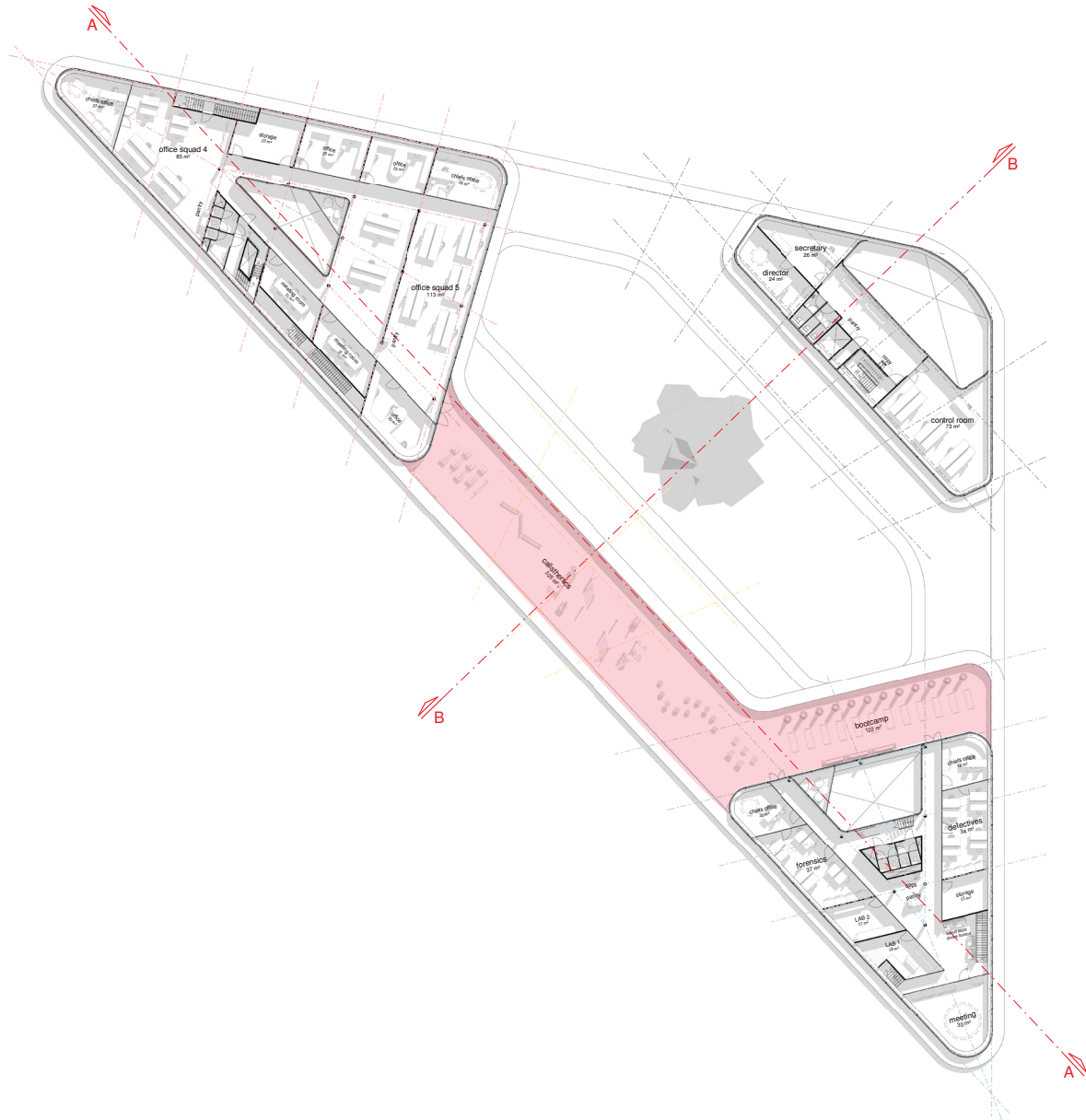


Design  
**THIRD FLOOR**

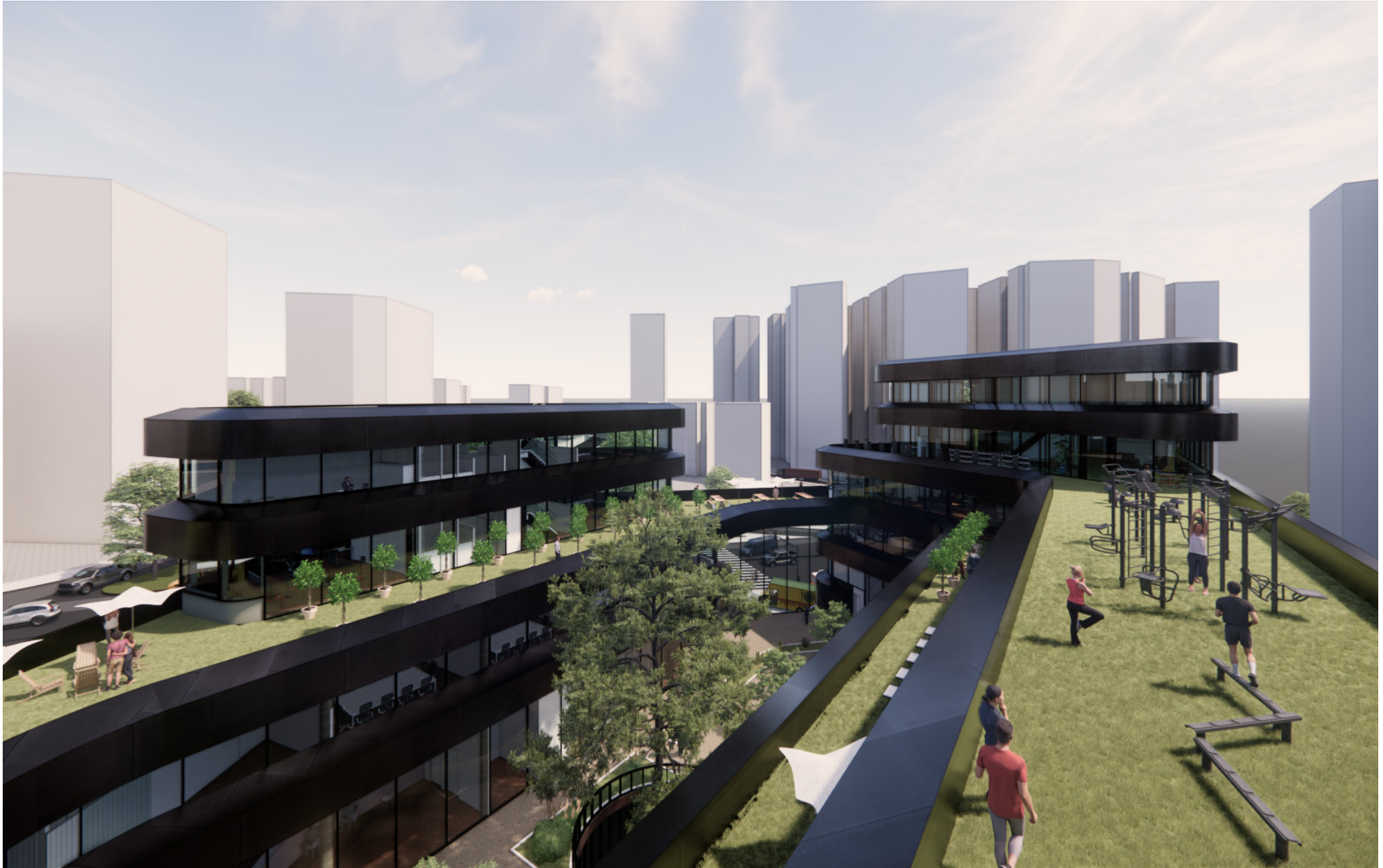


# Design

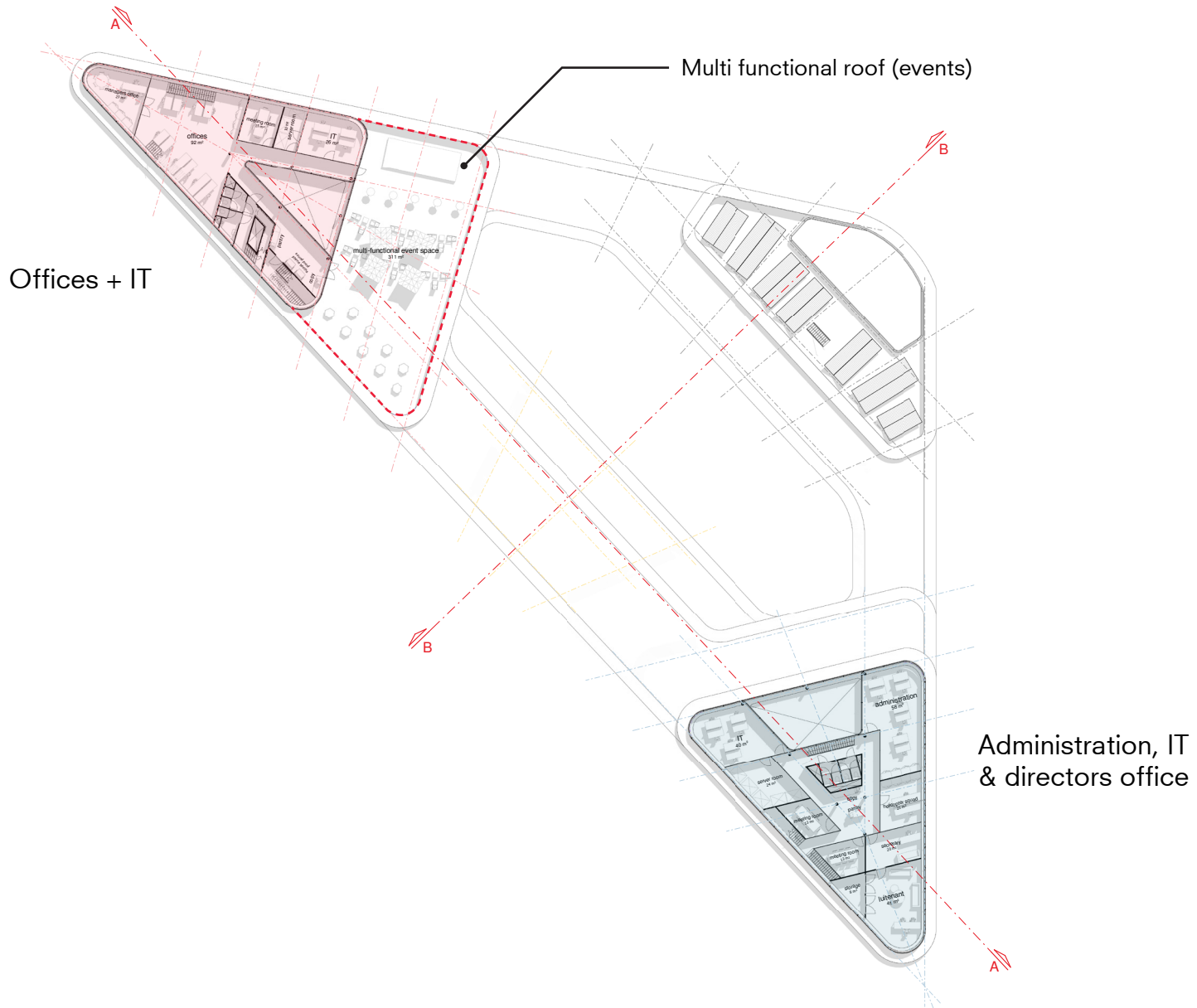
## ACTIVE ROOF



Design  
**ACTIVE ROOF**

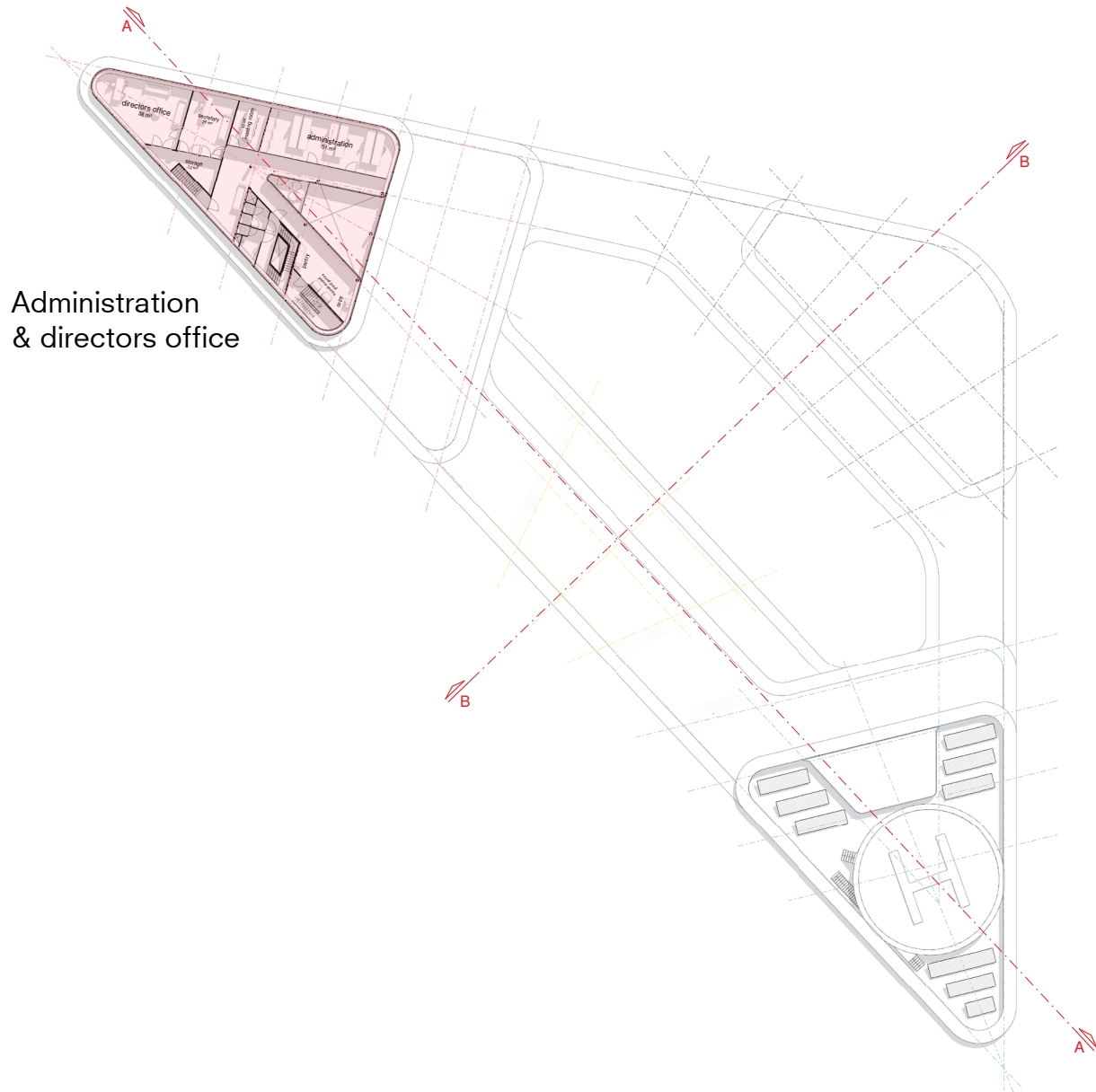


# Design FOURTH FLOOR



# Design

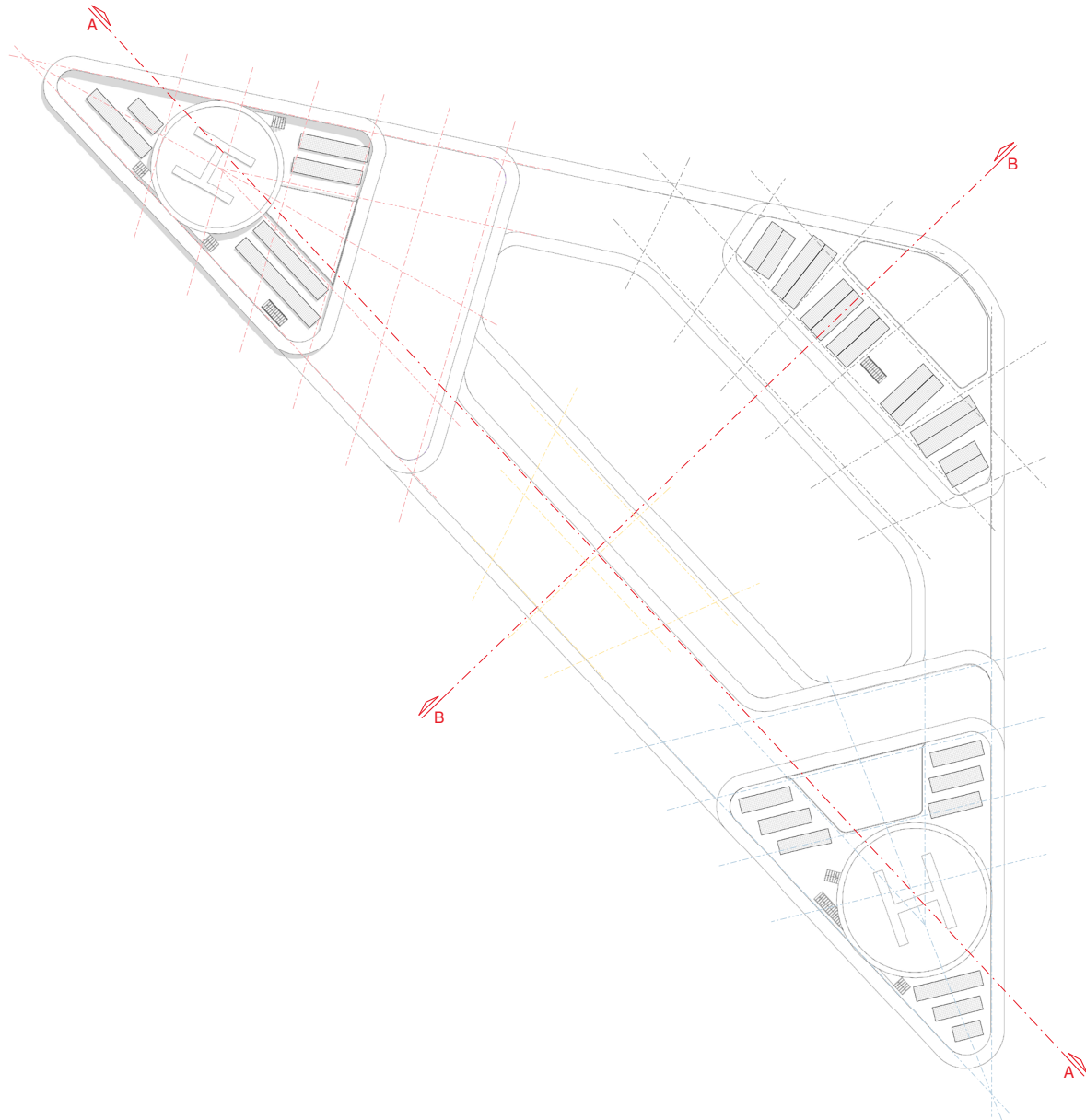
## FIFTH FLOOR



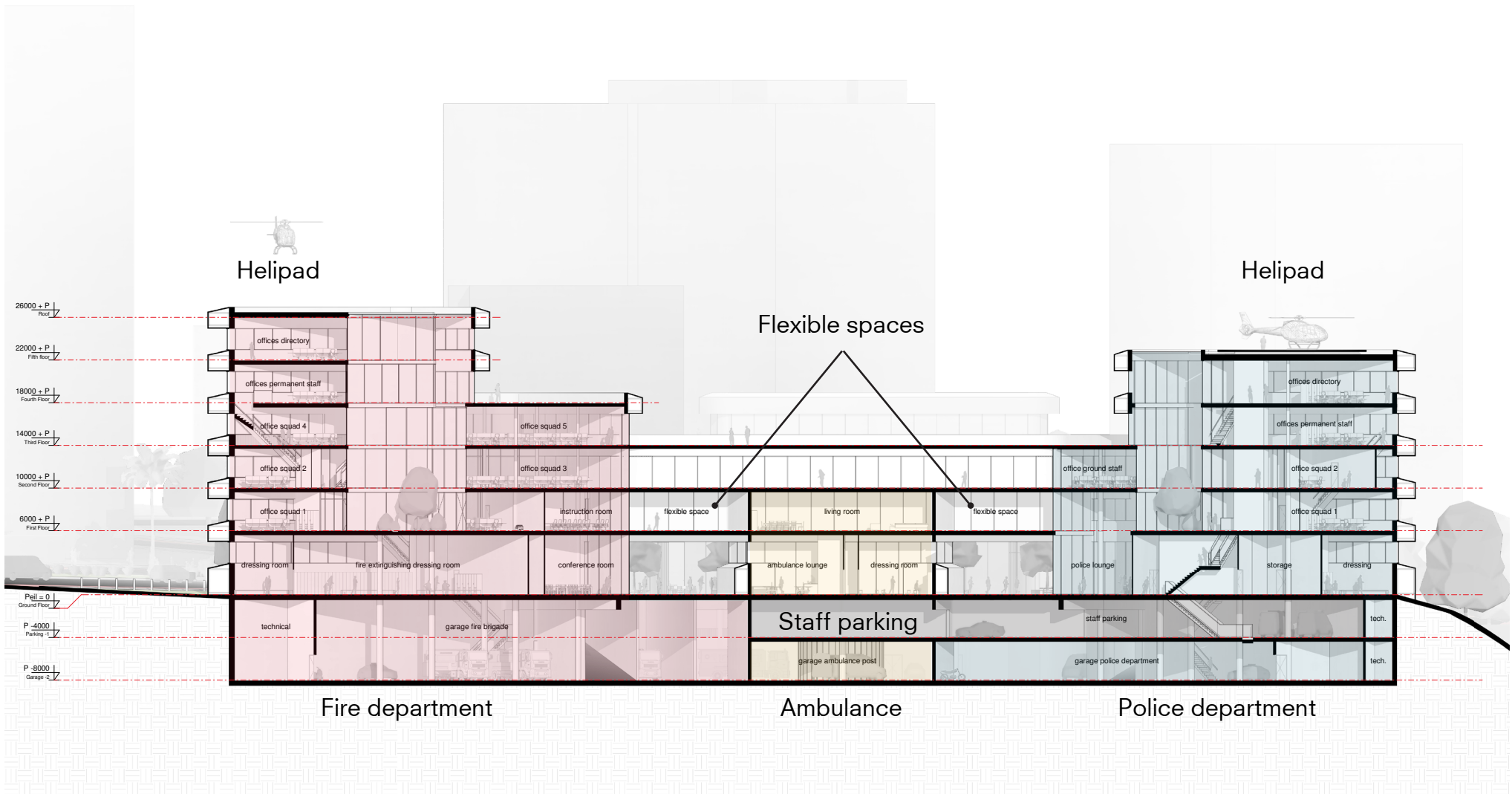
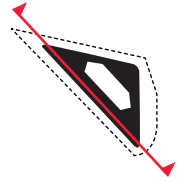
Administration  
& directors office

# Design

## ROOFTOPS

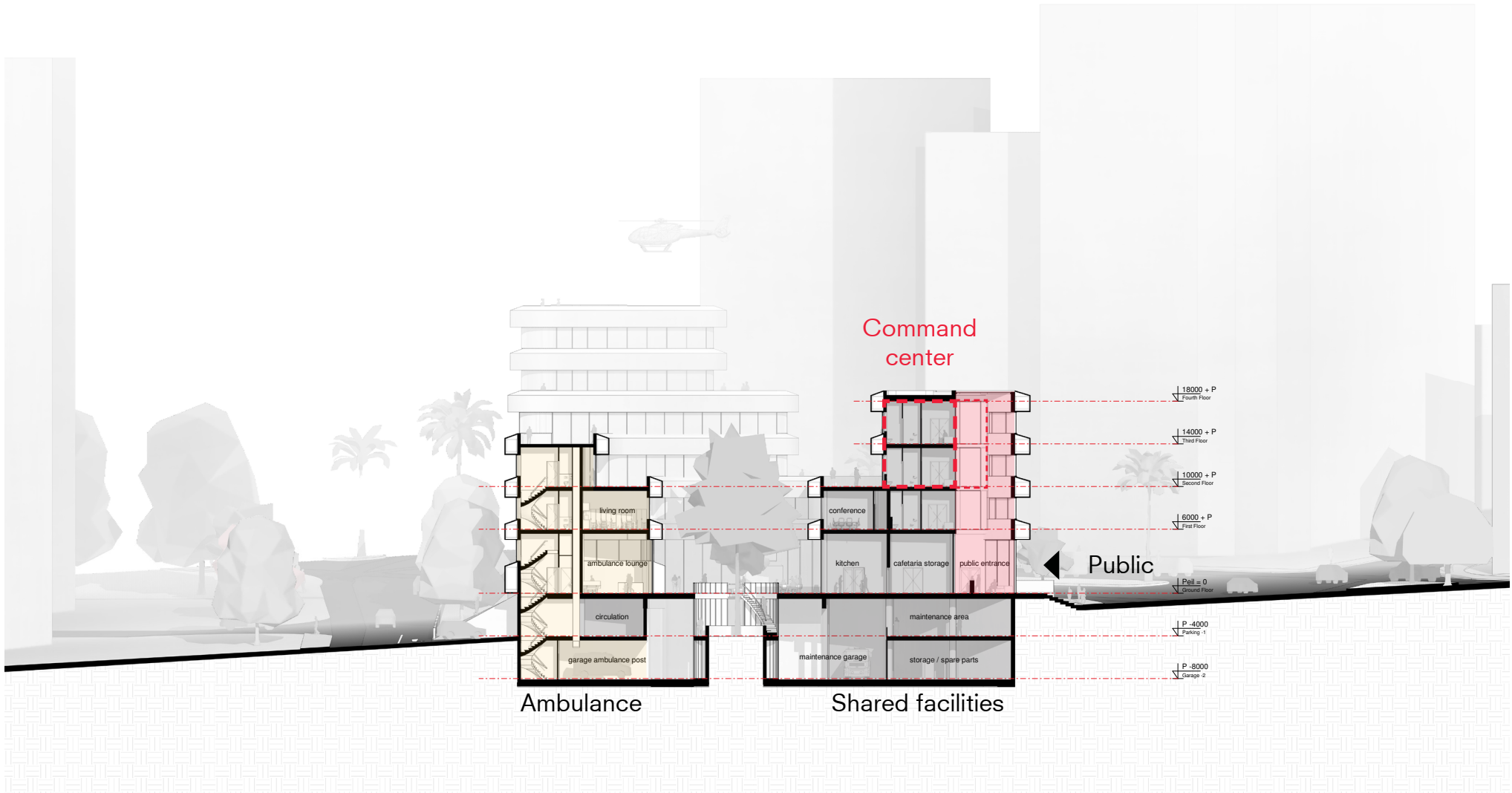
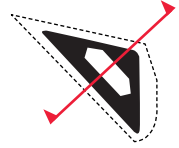


# Design DEPARTMENTS



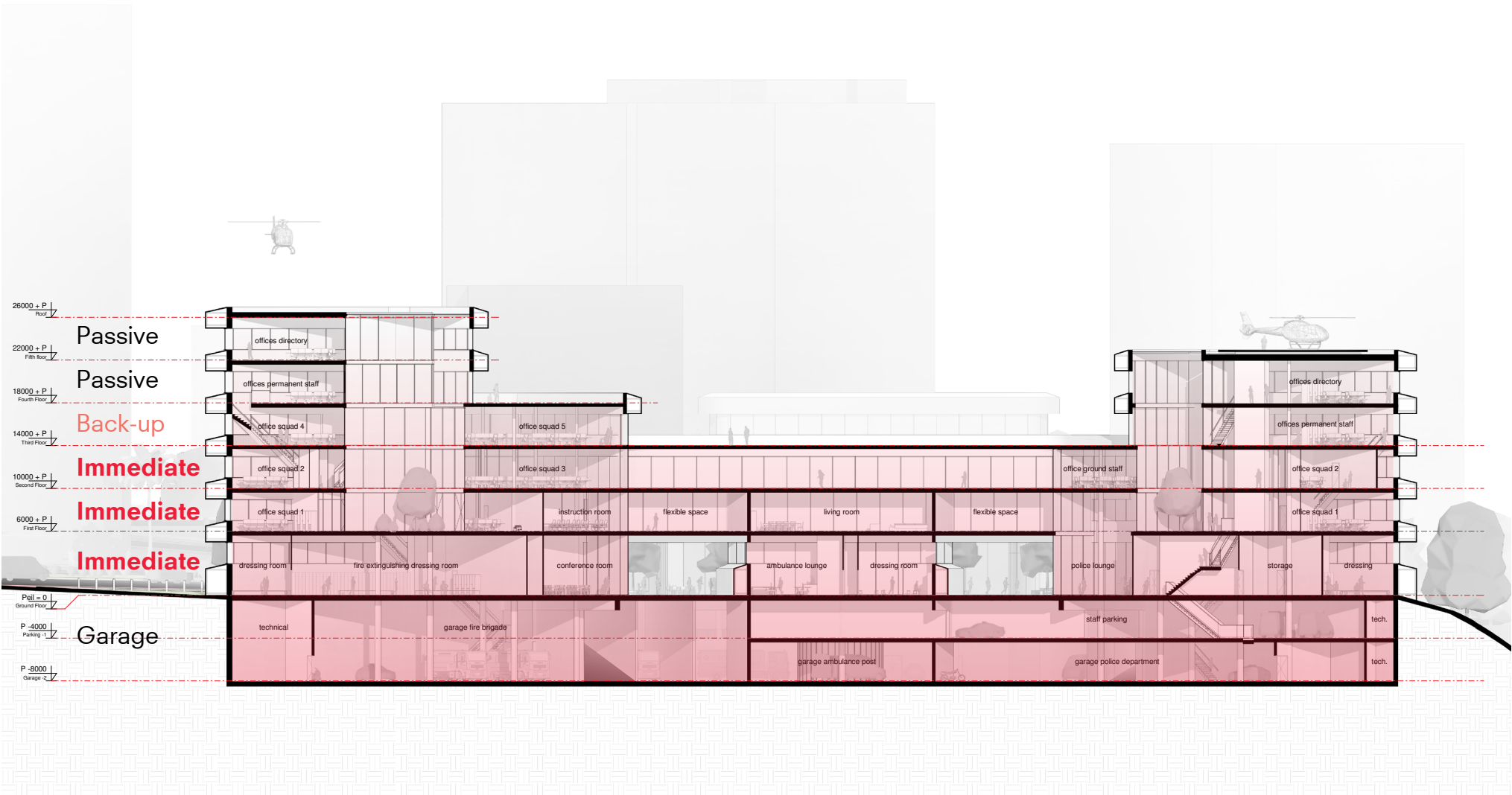
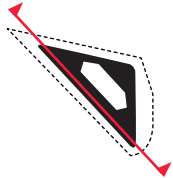


Design  
**DEPARTMENTS**

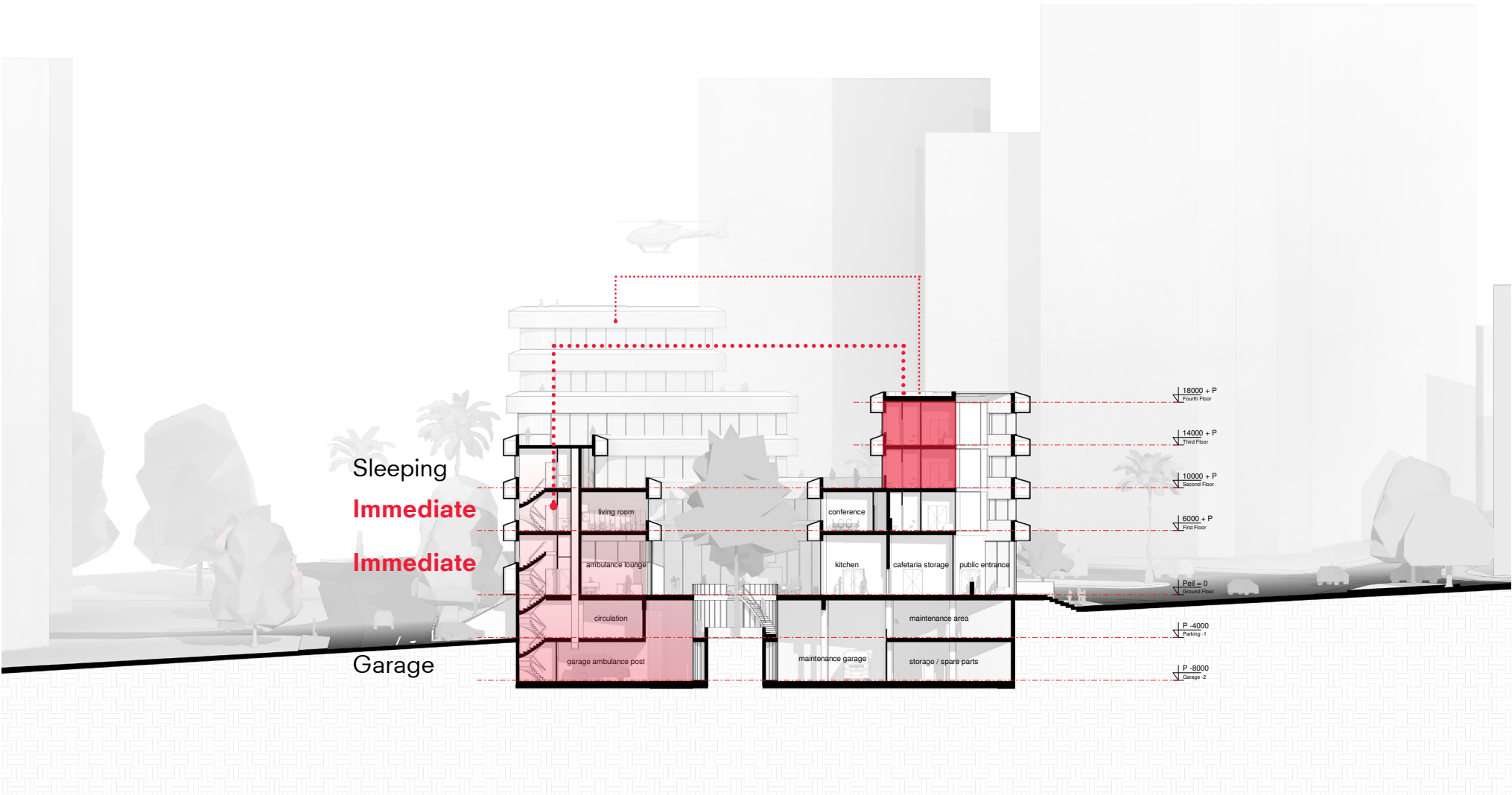
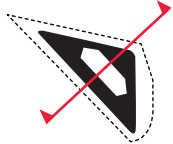


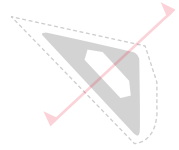
# Design

# RESPONSIVENESS

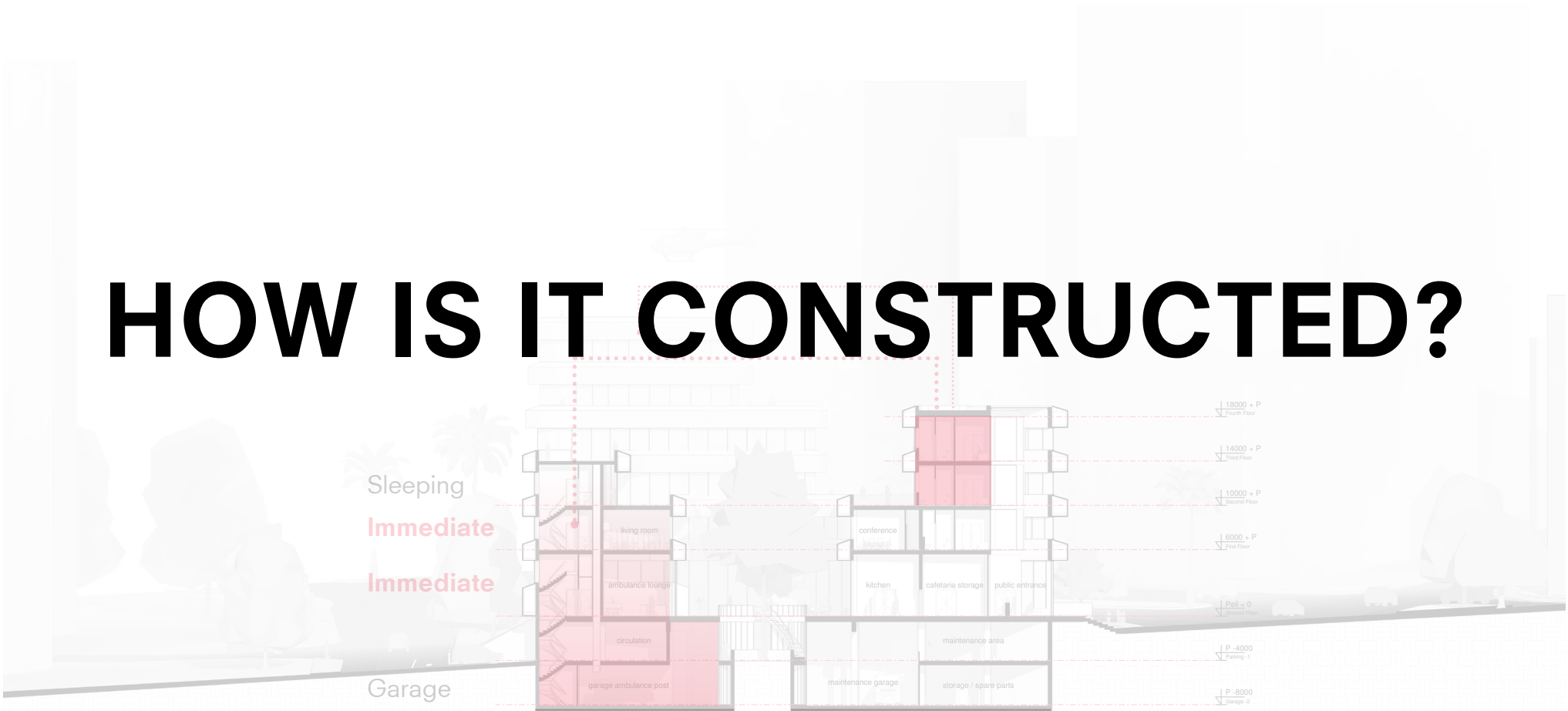


Design  
**RESPONSIVENESS**

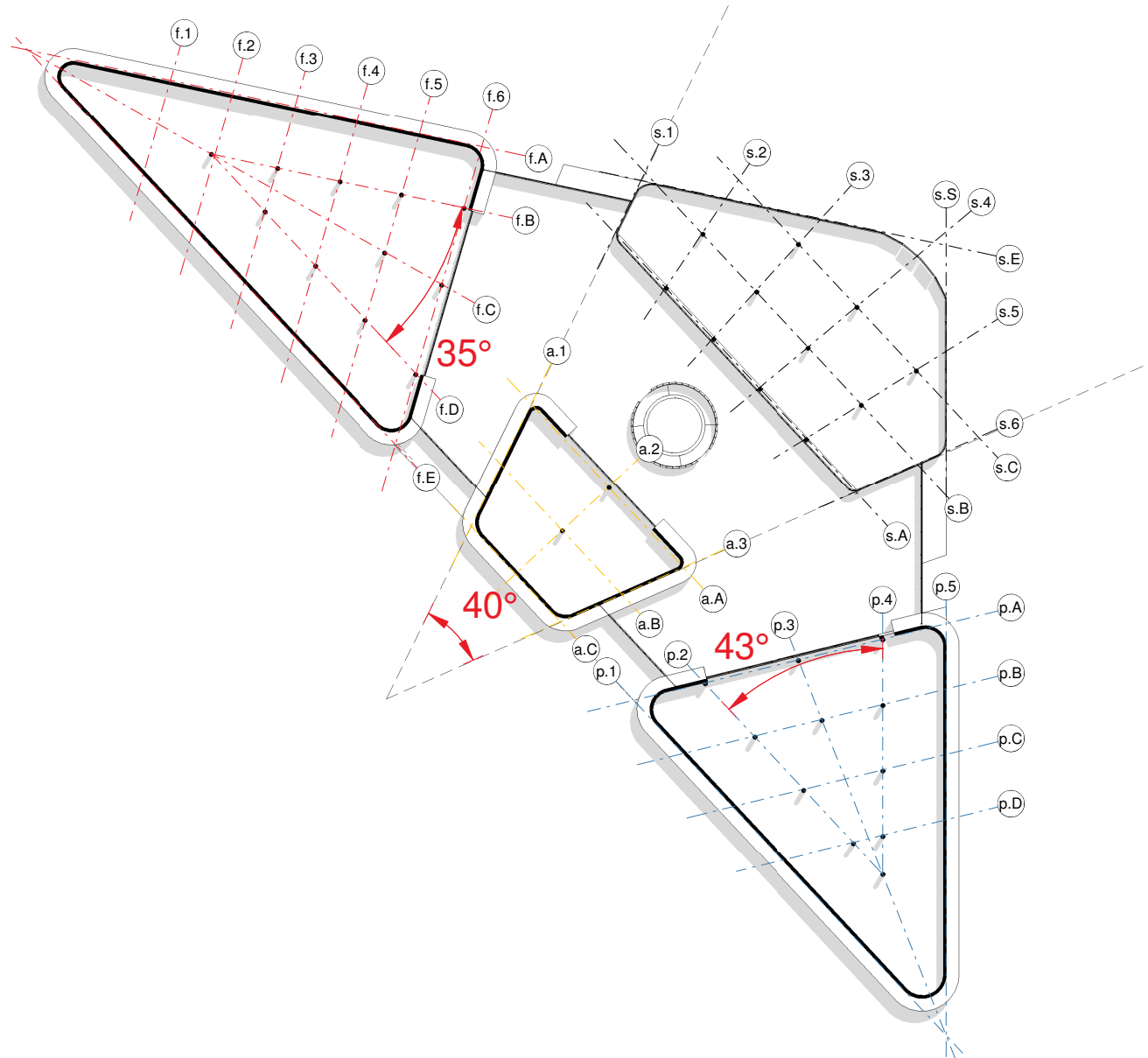




# HOW IS IT CONSTRUCTED?



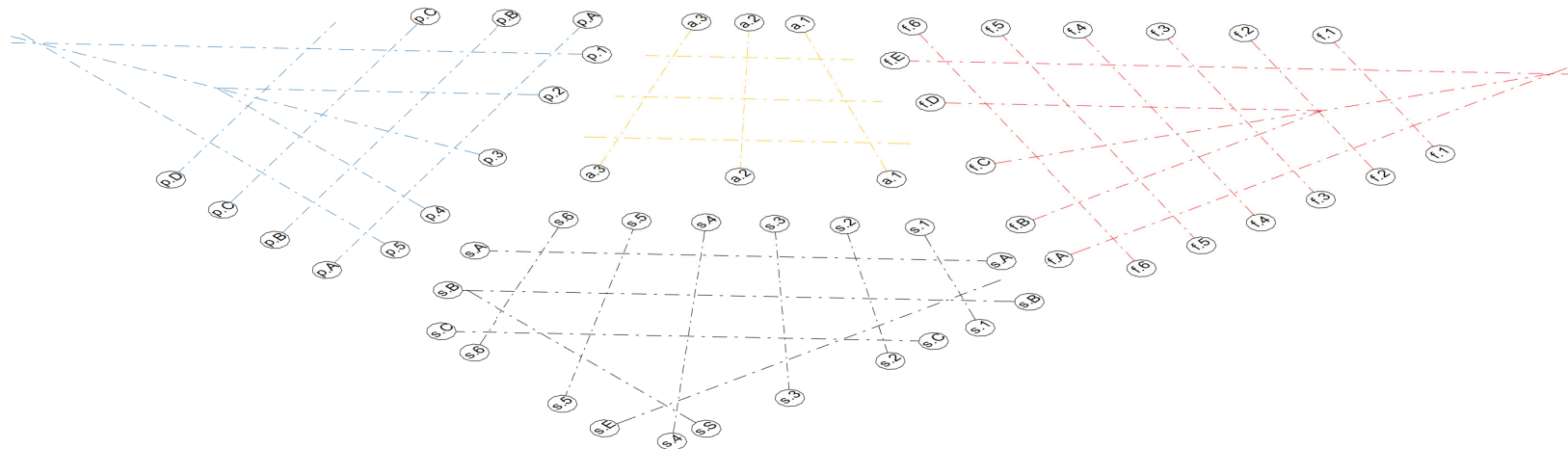
# Design CONSTRUCTION GRID



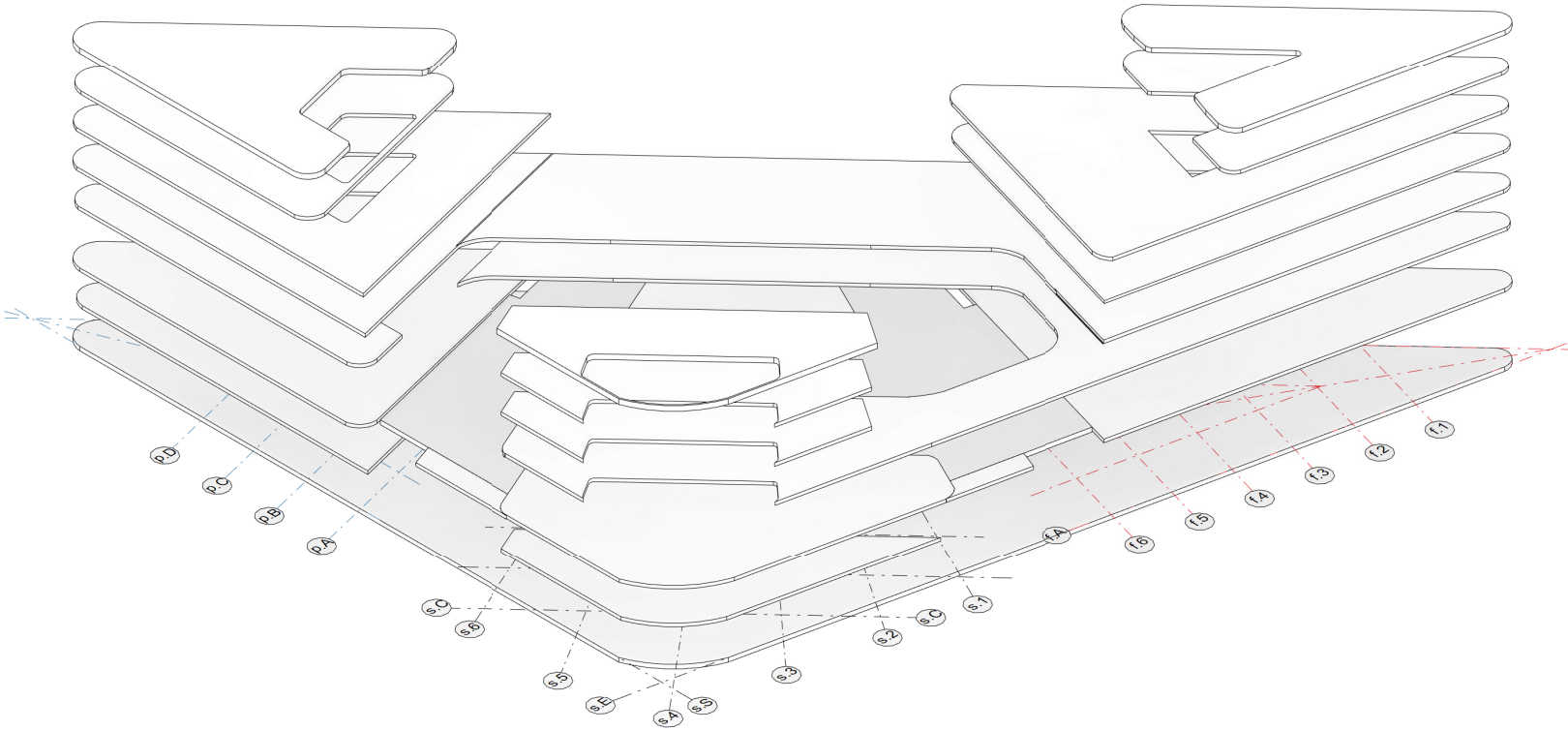
# Design

## CONSTRUCTION GRID

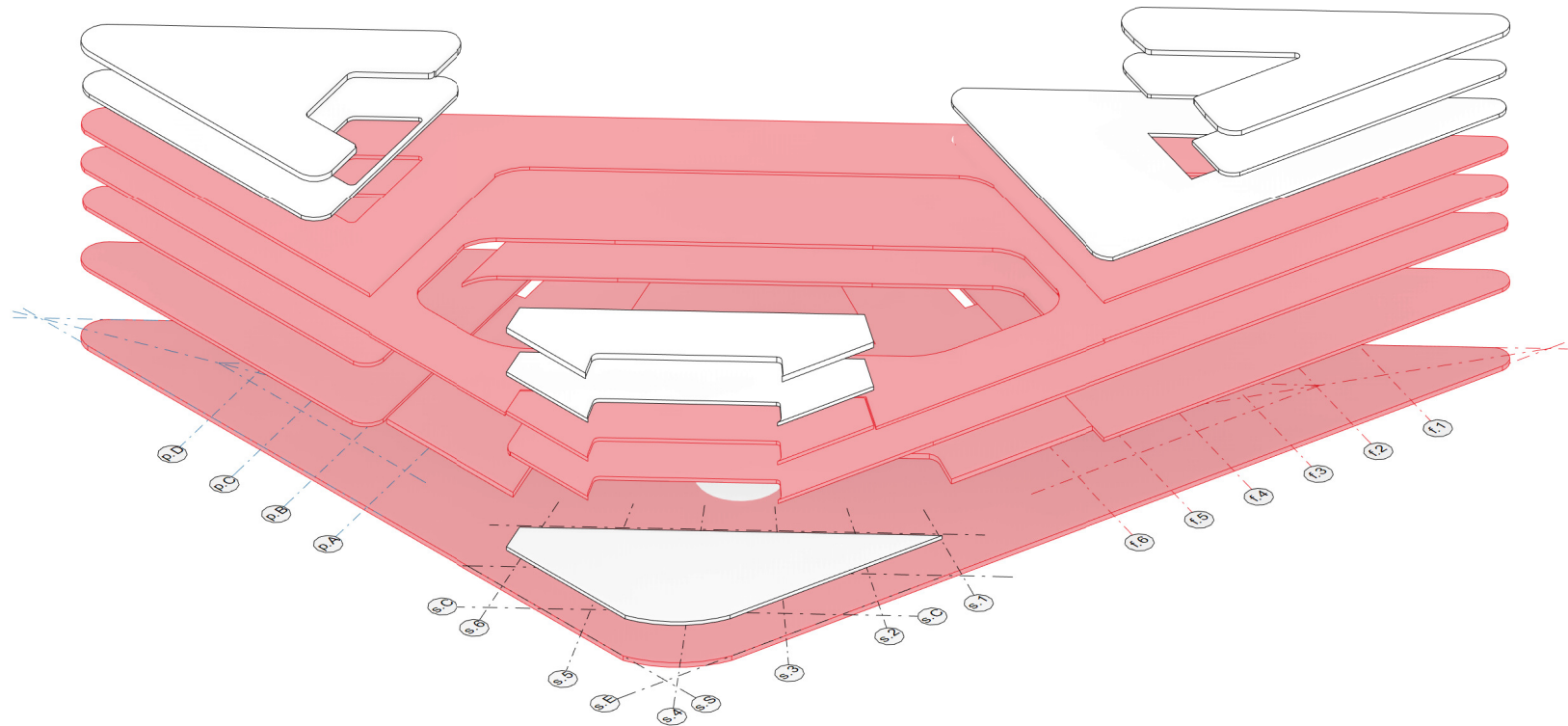
Grid based on 300a



Design  
**IN-SITU CONCRETE**



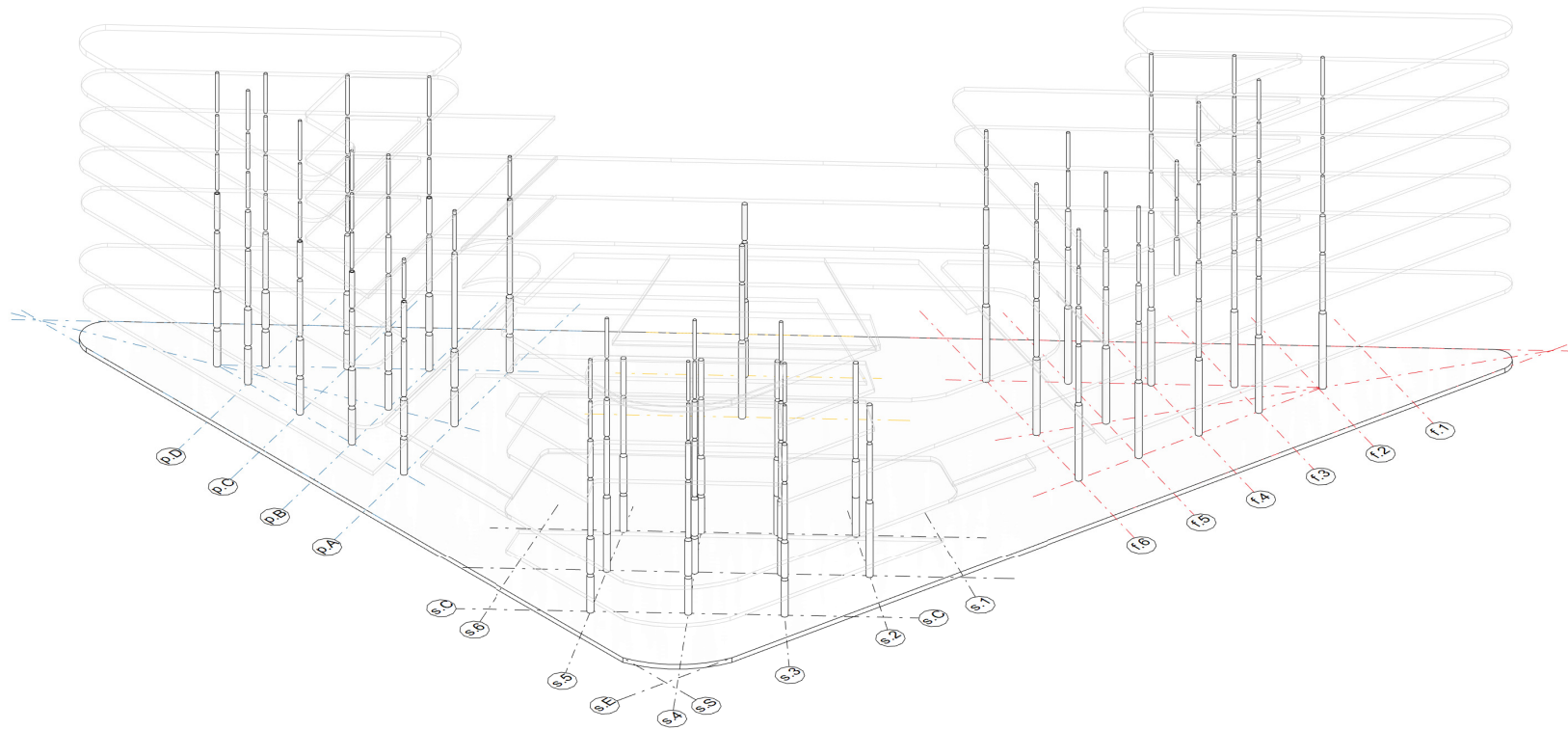
Design  
**BINDING FLOORS**





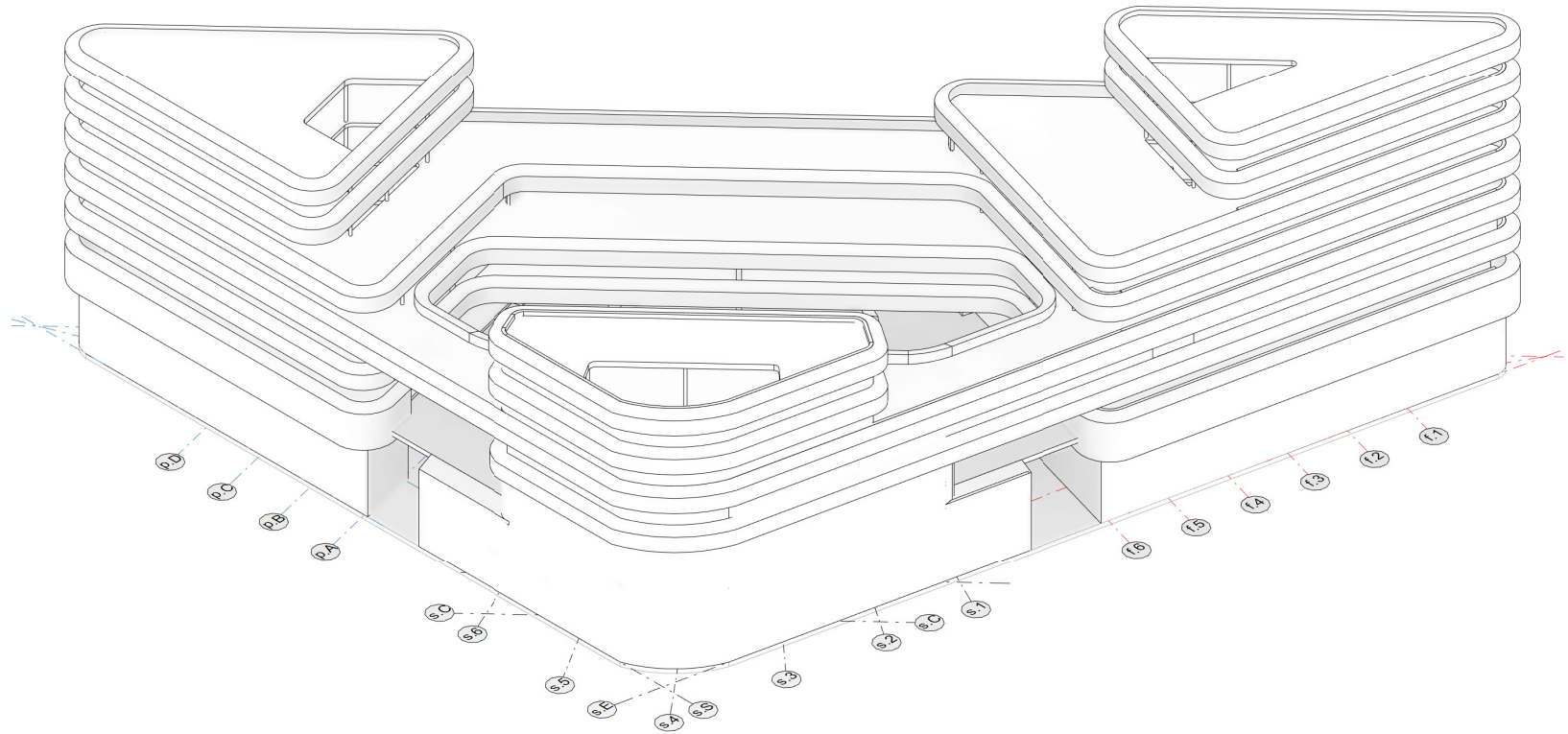
Design

# ROUND COLUMNS

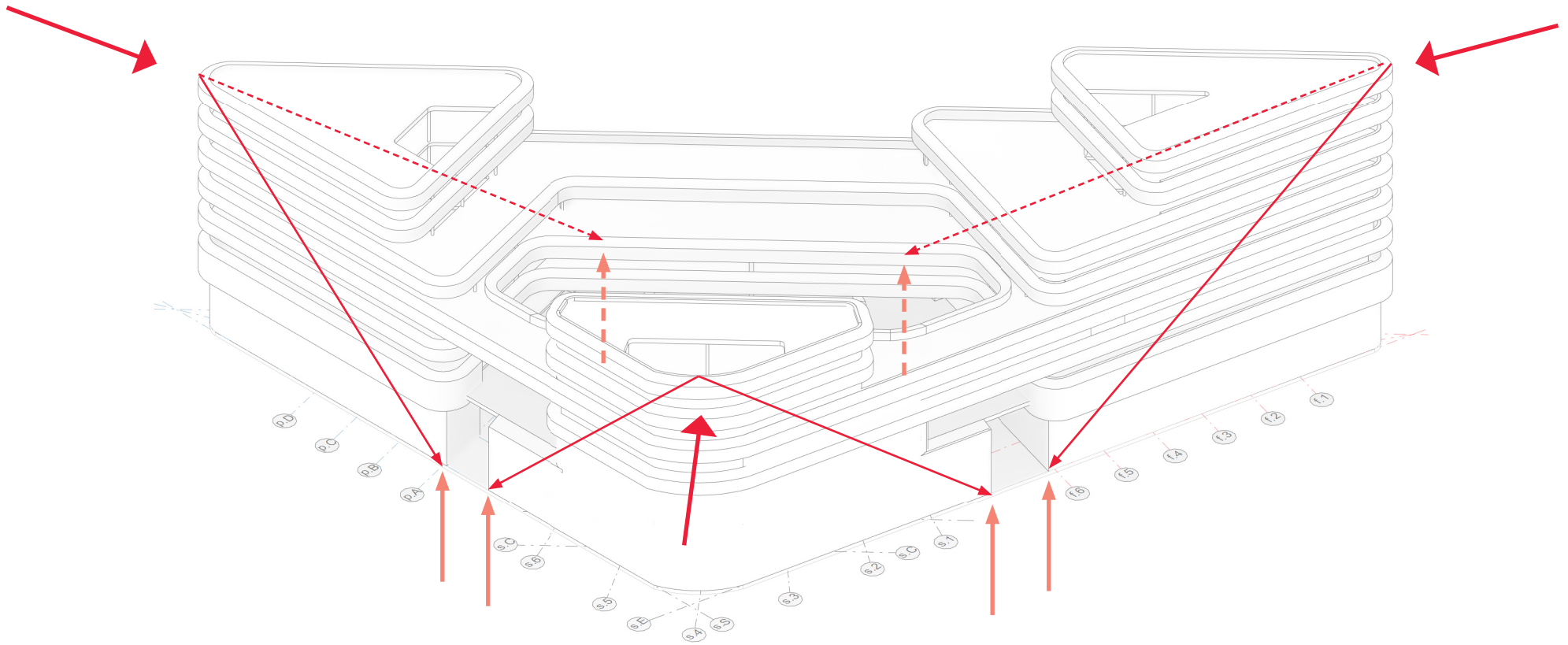


Design

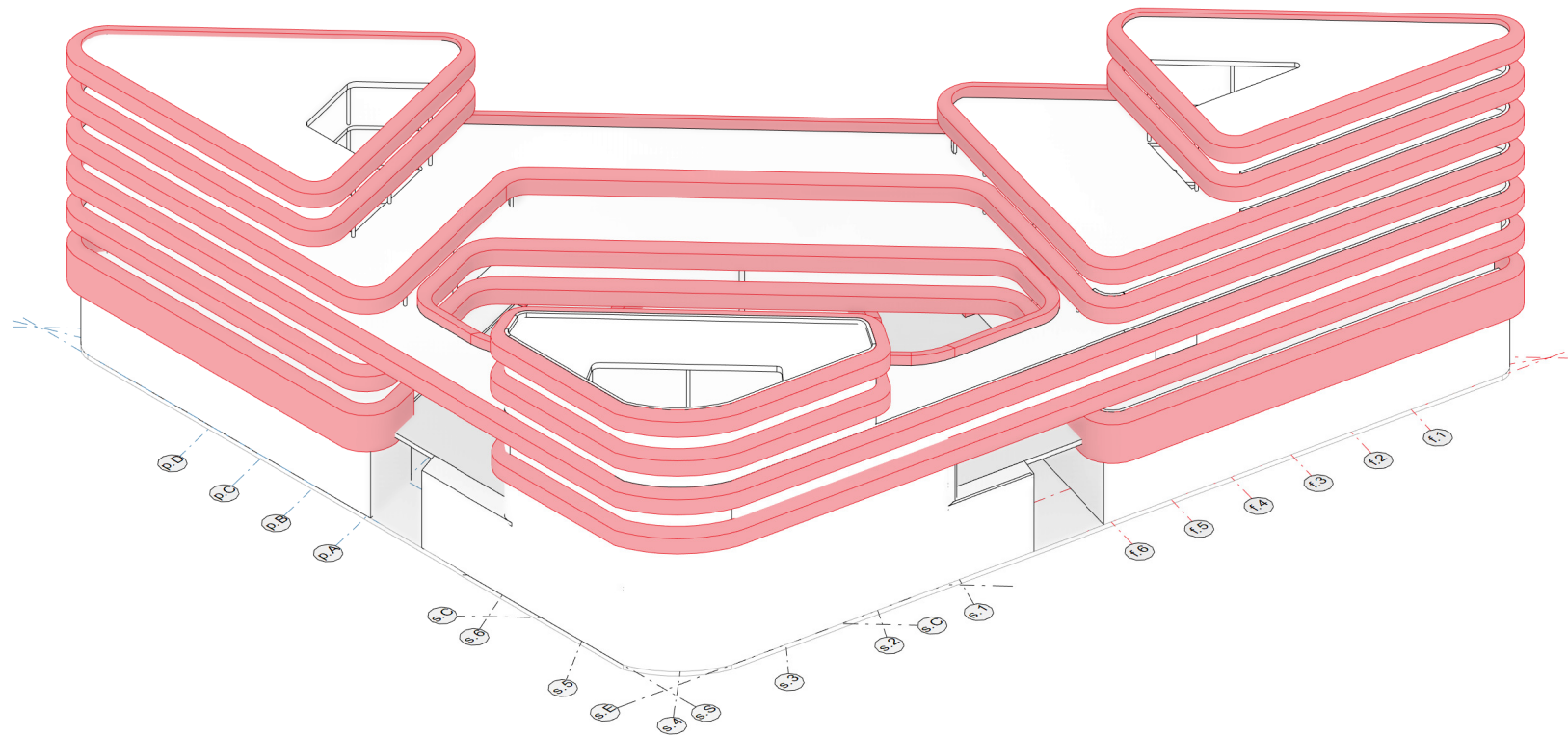
# LOAD-BEARING OUTER WALL



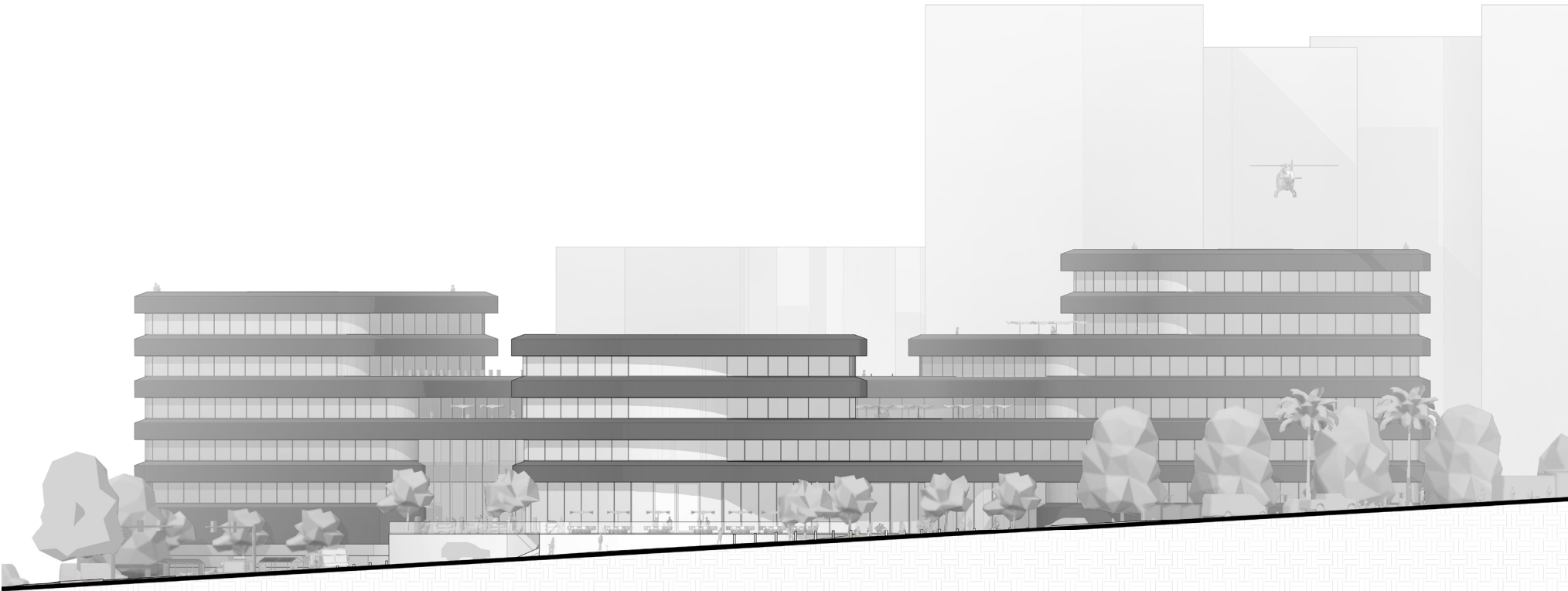
# Design **STABILITY**



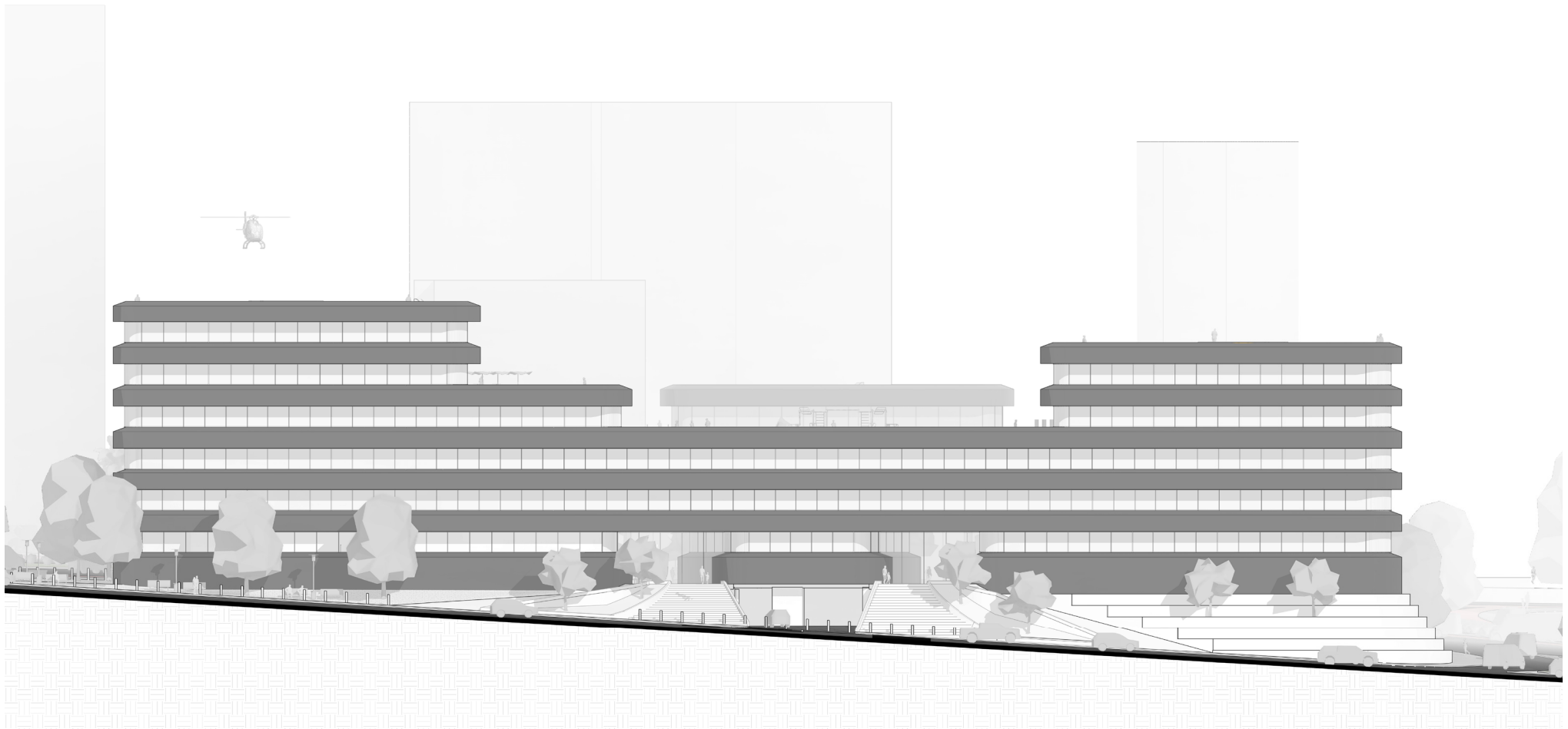
# SECONDARY FACADE STRUCTURE



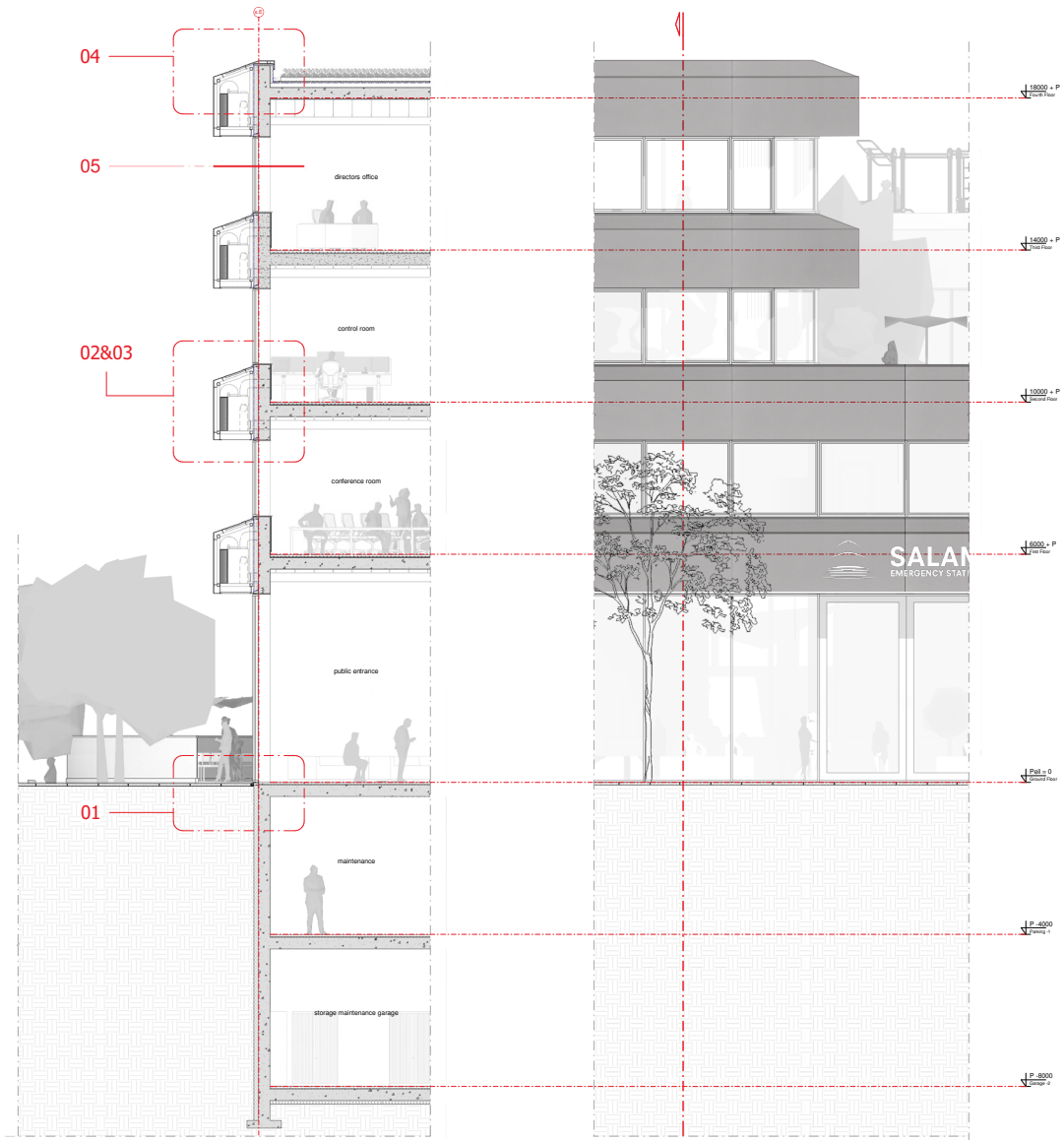
Design  
**NORTH-EAST FACADE**



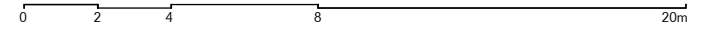
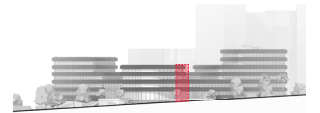
Design  
**SOUTH-WEST FACADE**



# ENVELOPE FRAGMENT

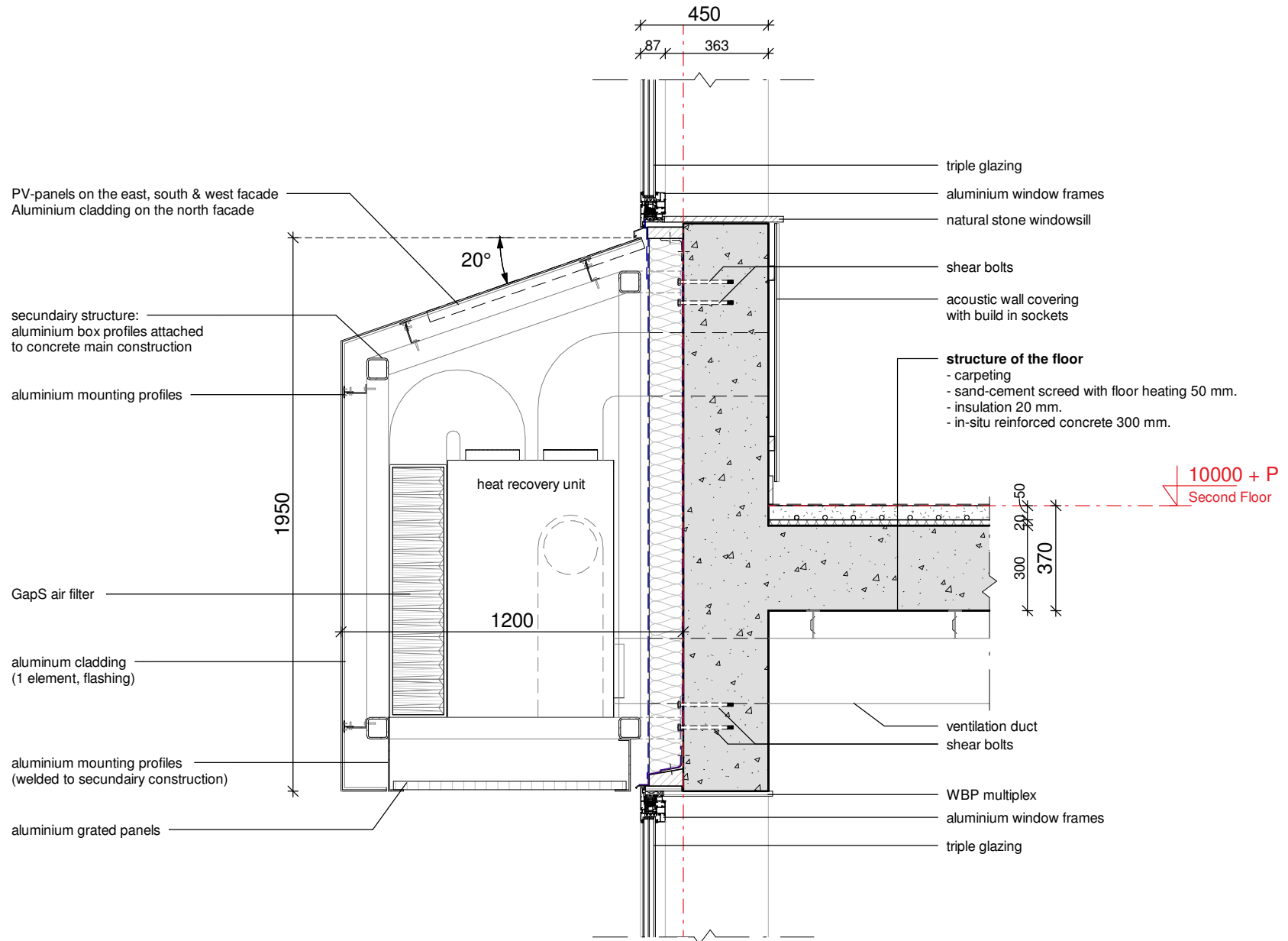


# ENVELOPE FRAGMENT

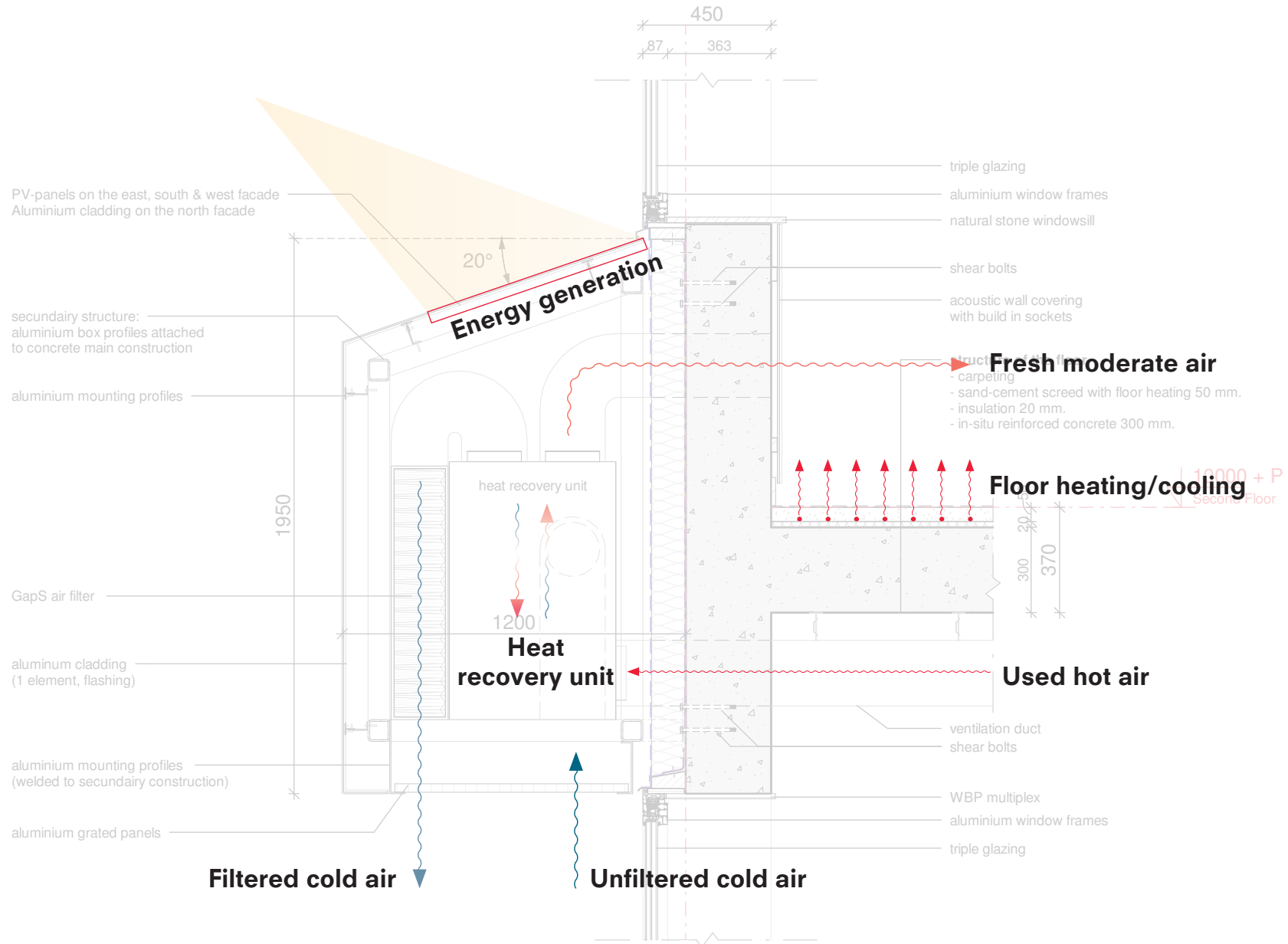




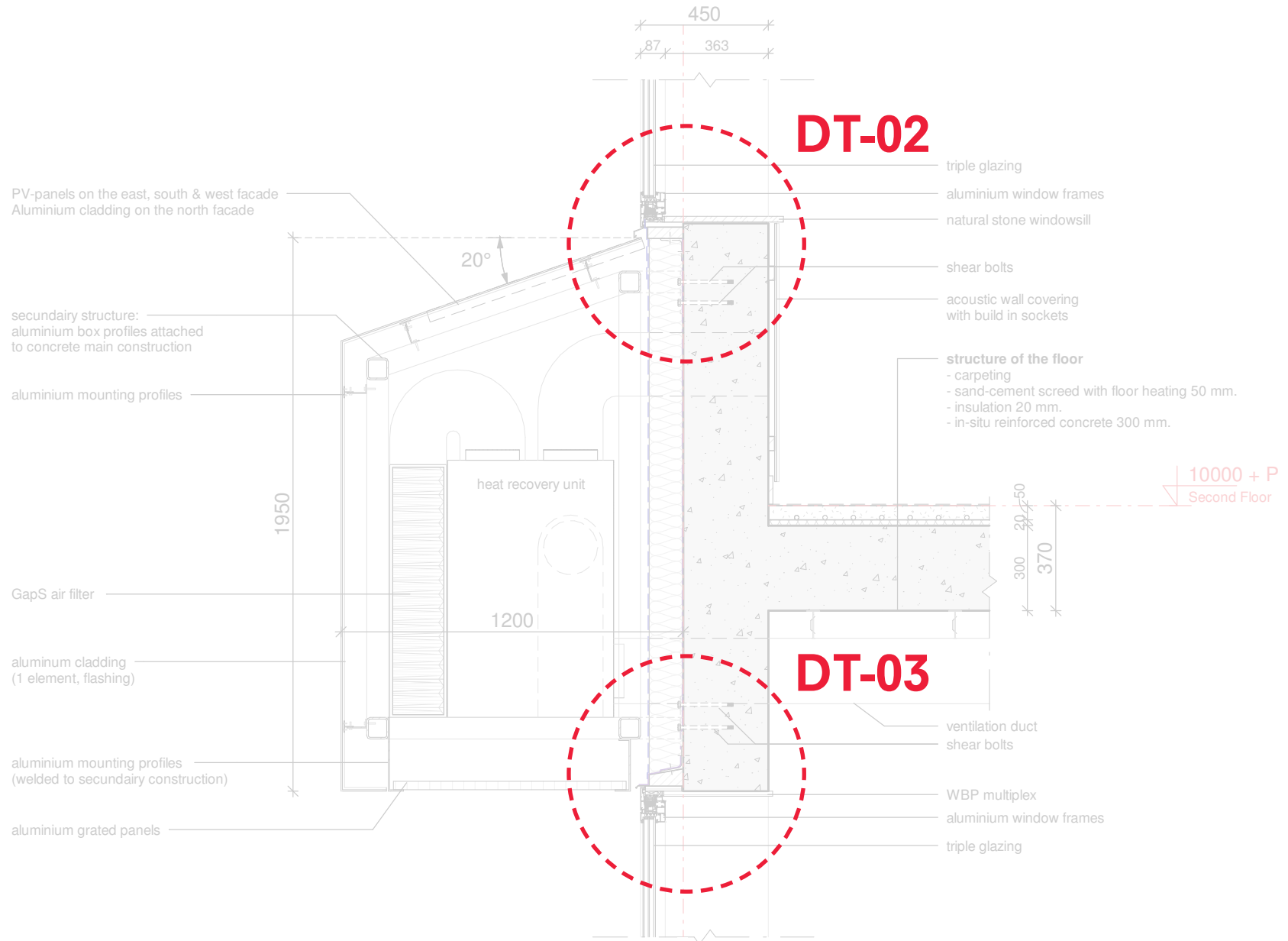
# FACADE DETAILING | DT-02 & 03



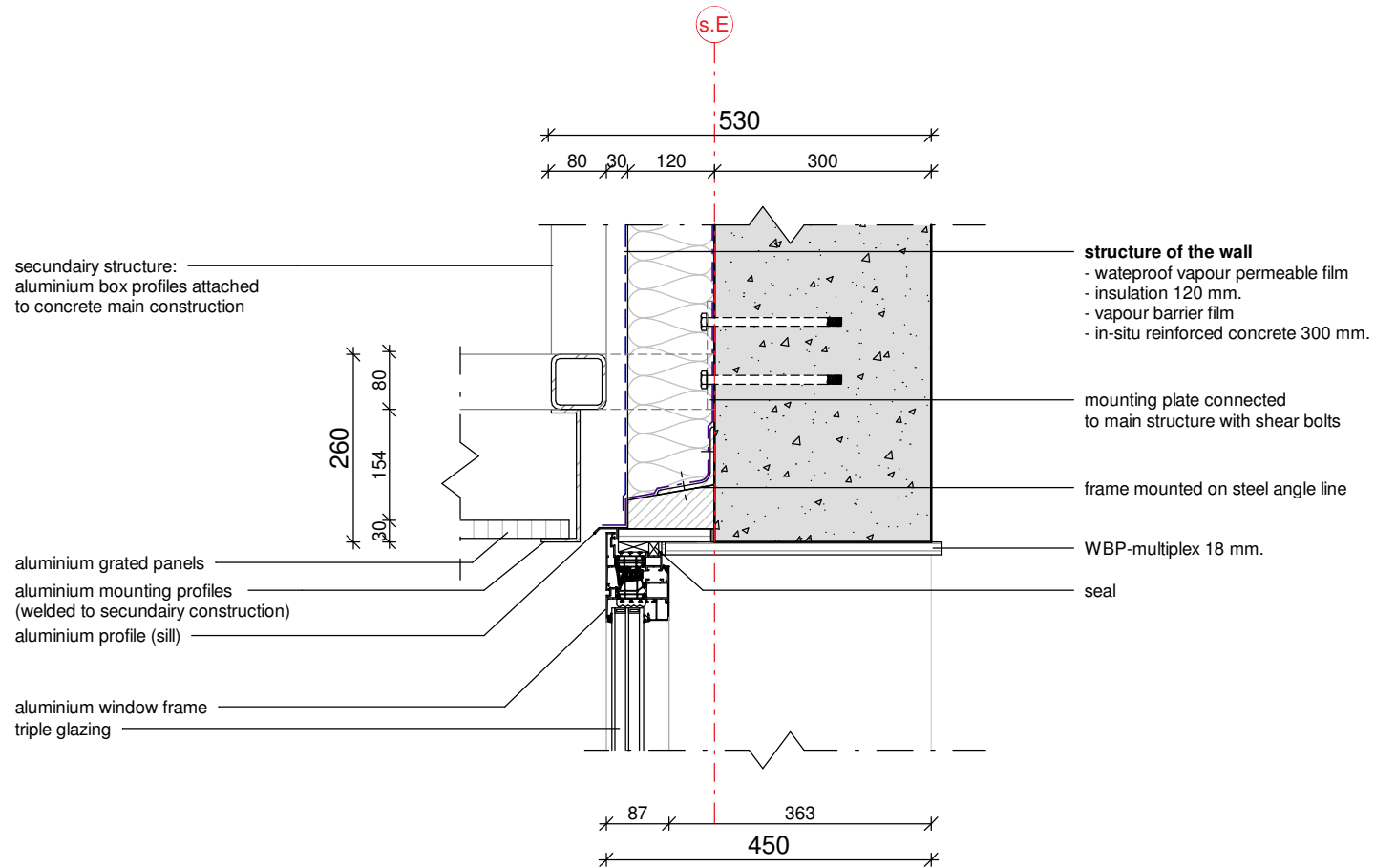
# FACADE DETAILING | DT-02 & 03



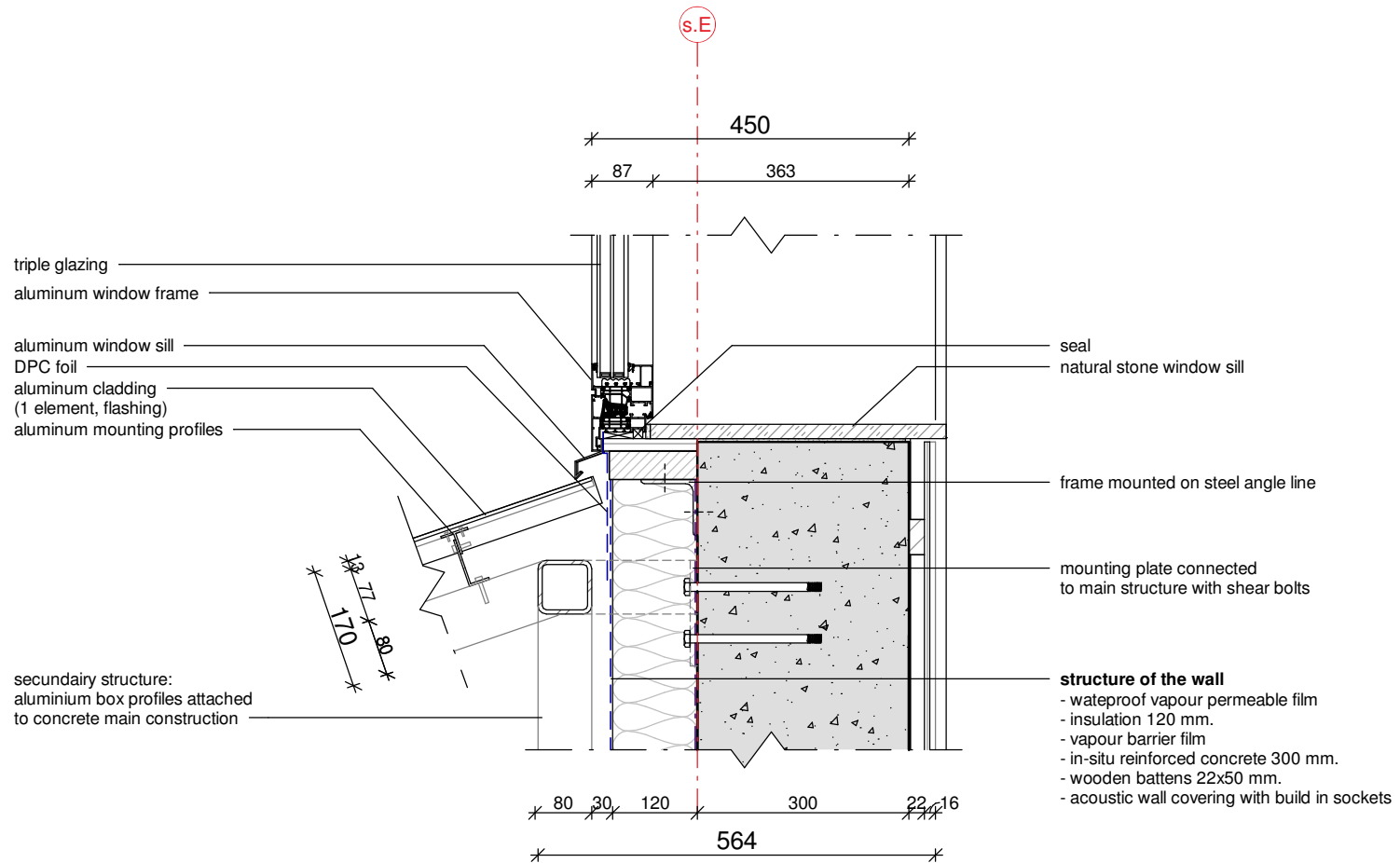
# FACADE DETAILING | DT-02 & 03



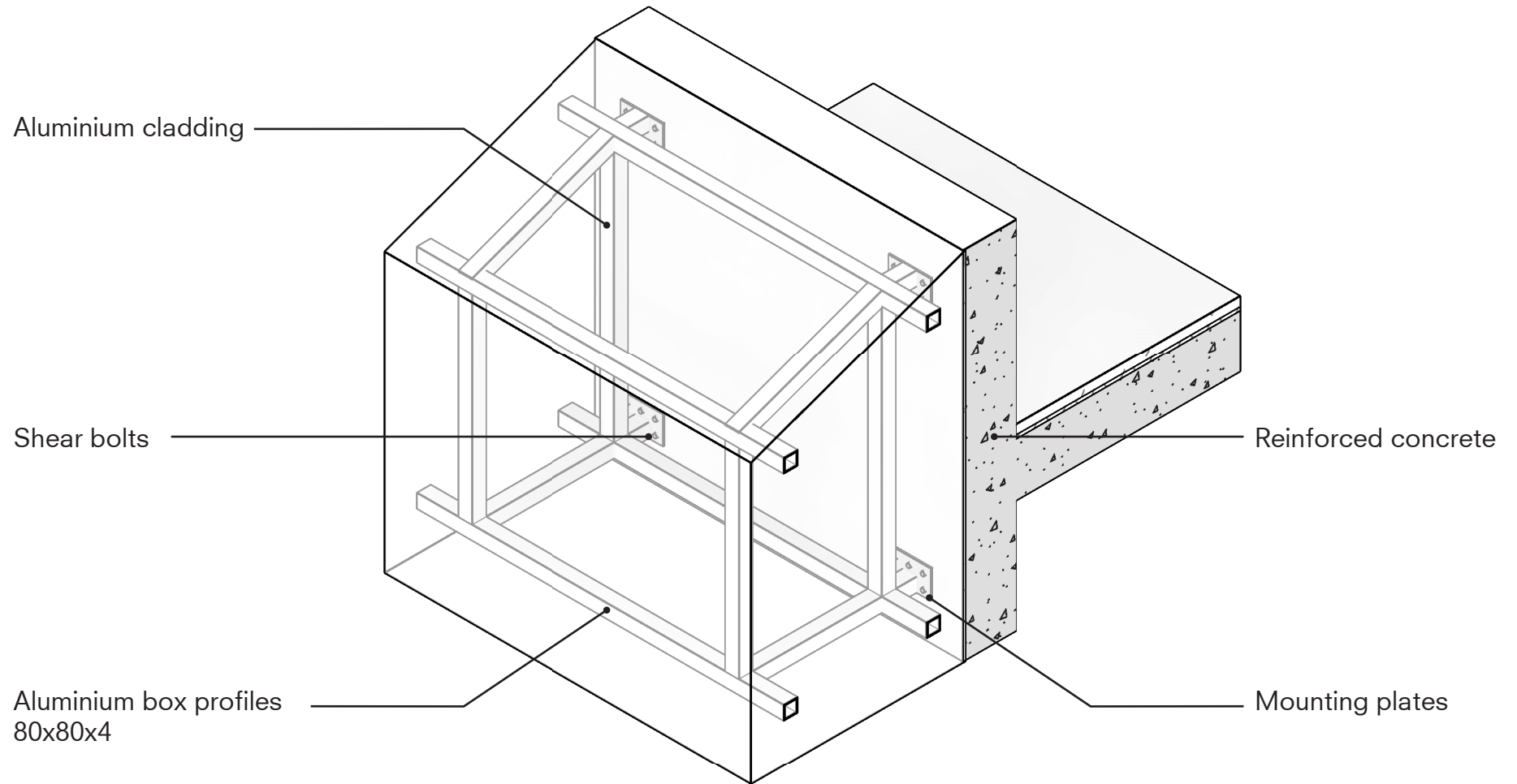
# DETAIL 02 - WINDOW (TOP)



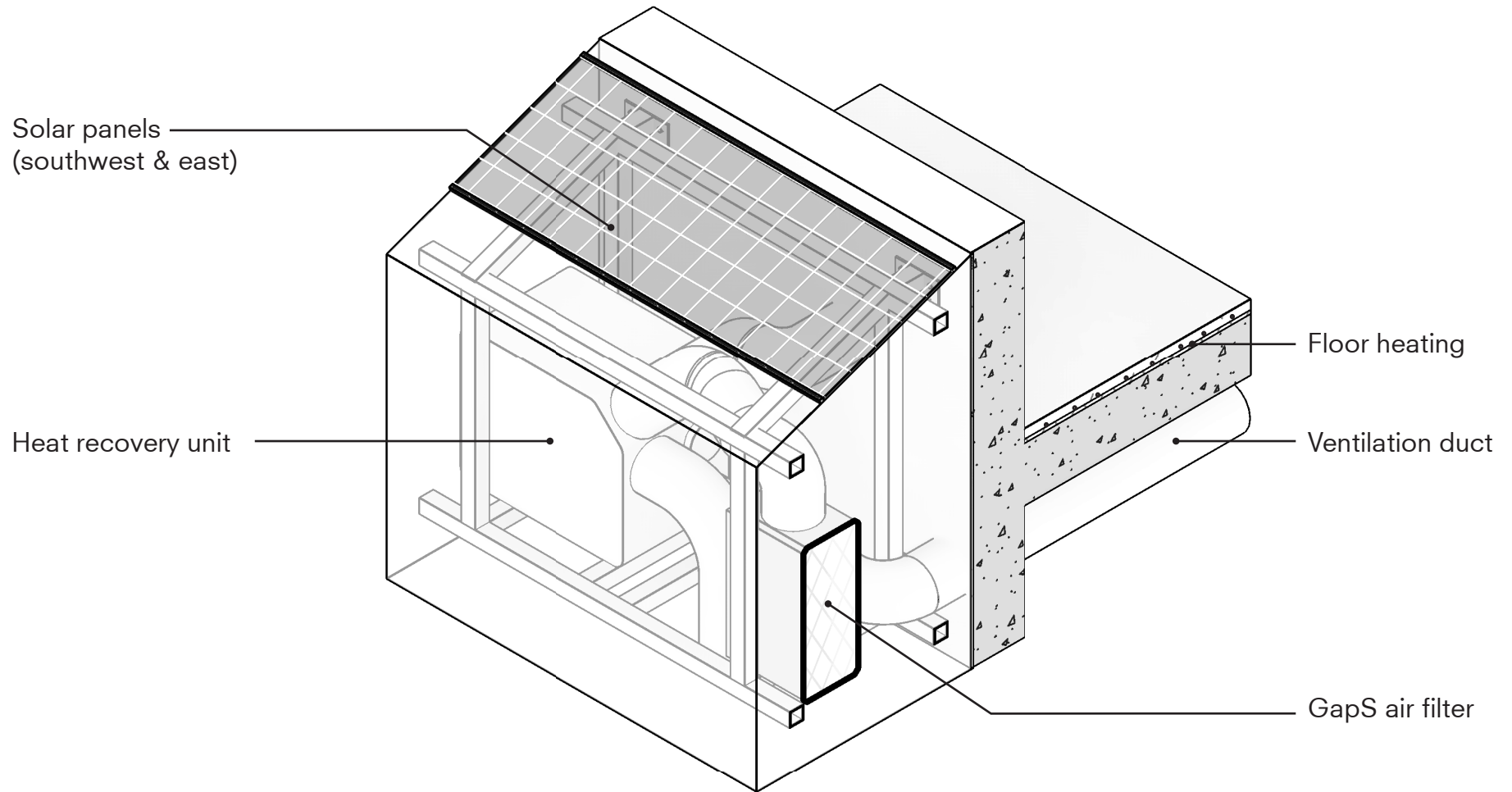
# DETAIL 03 - WINDOW (BOTTOM)



# ALUMINIUM FRAME

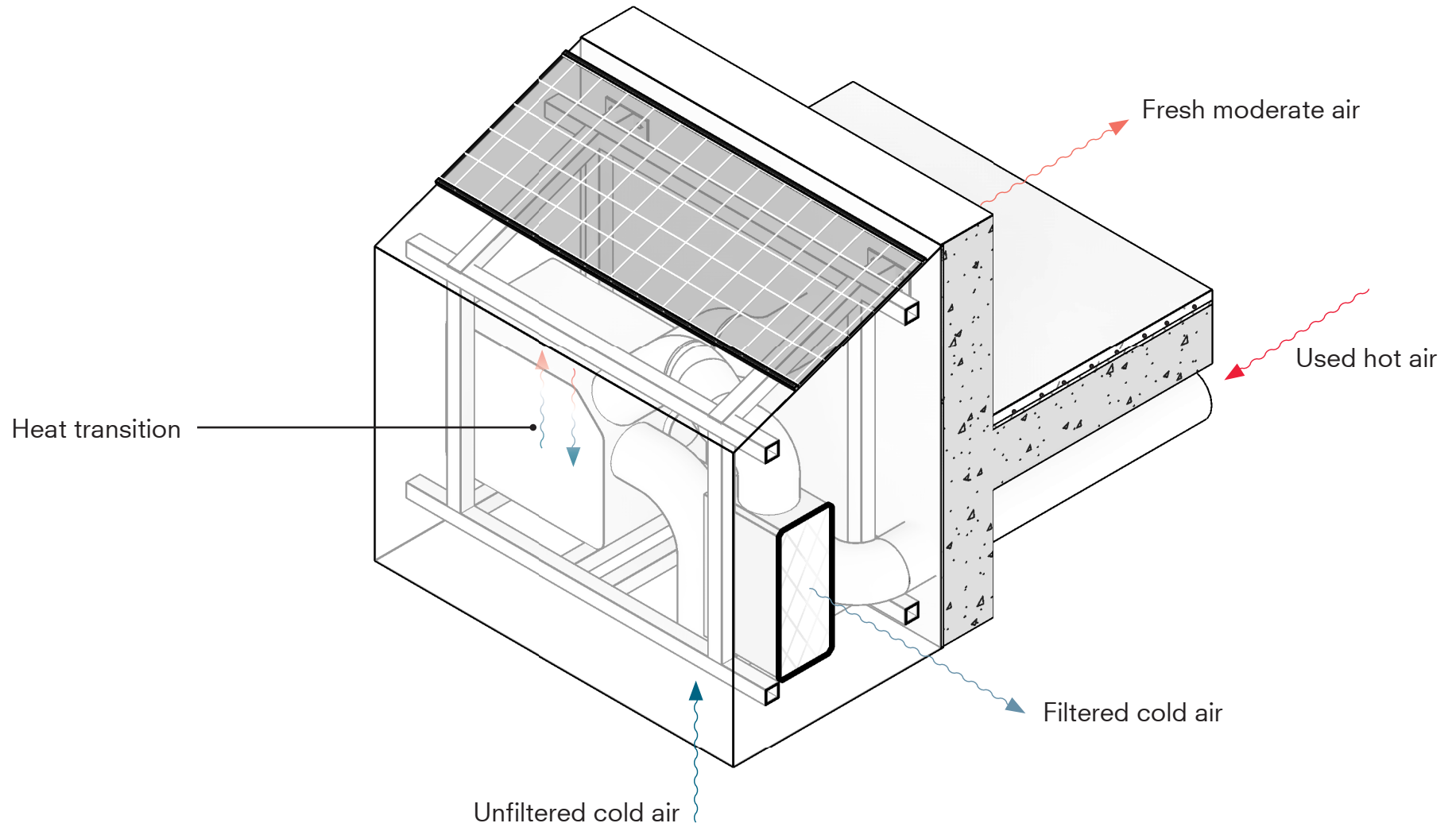


# INSTALLATIONS IN FACADE



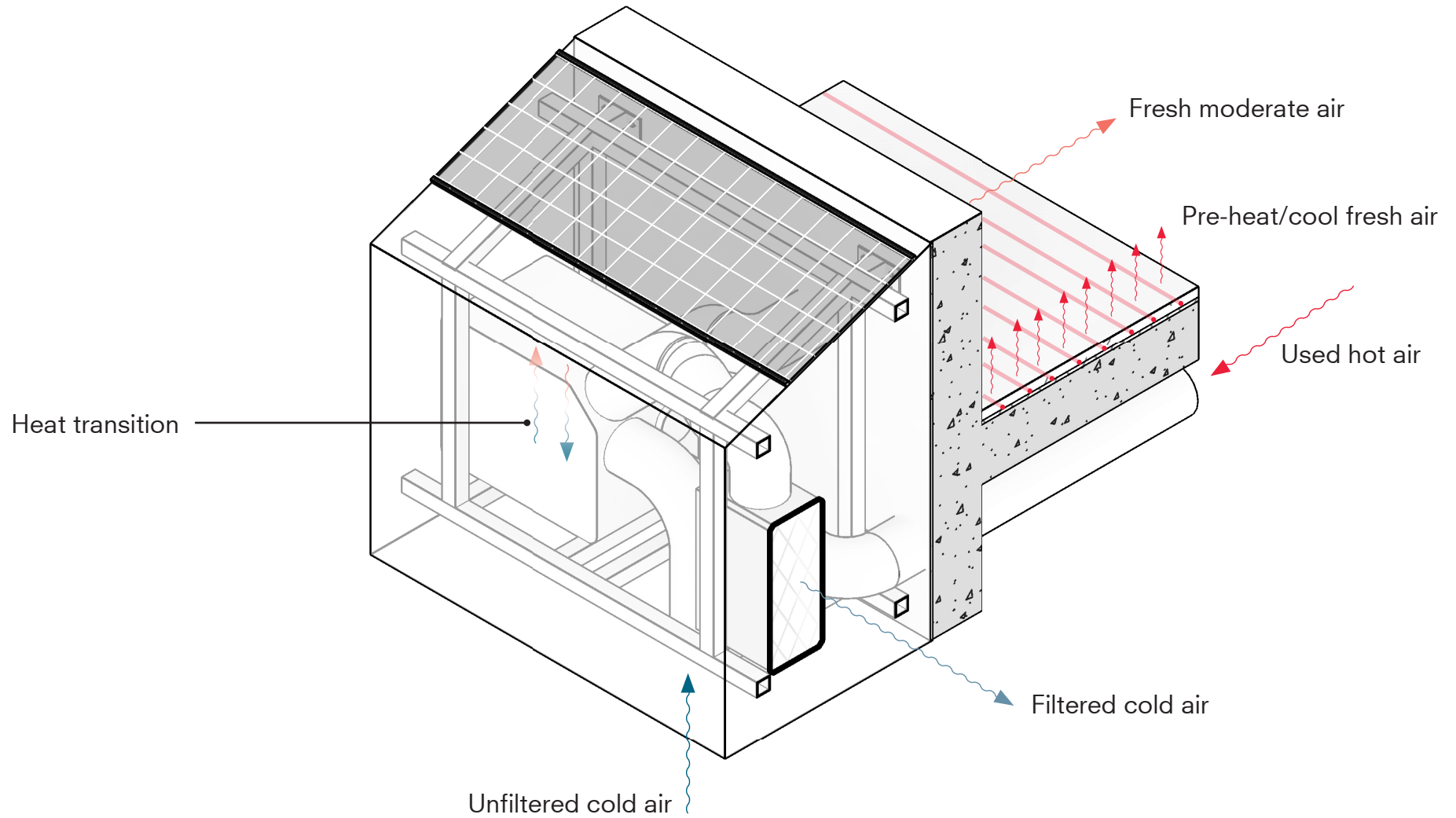
Design

# VENTILATION



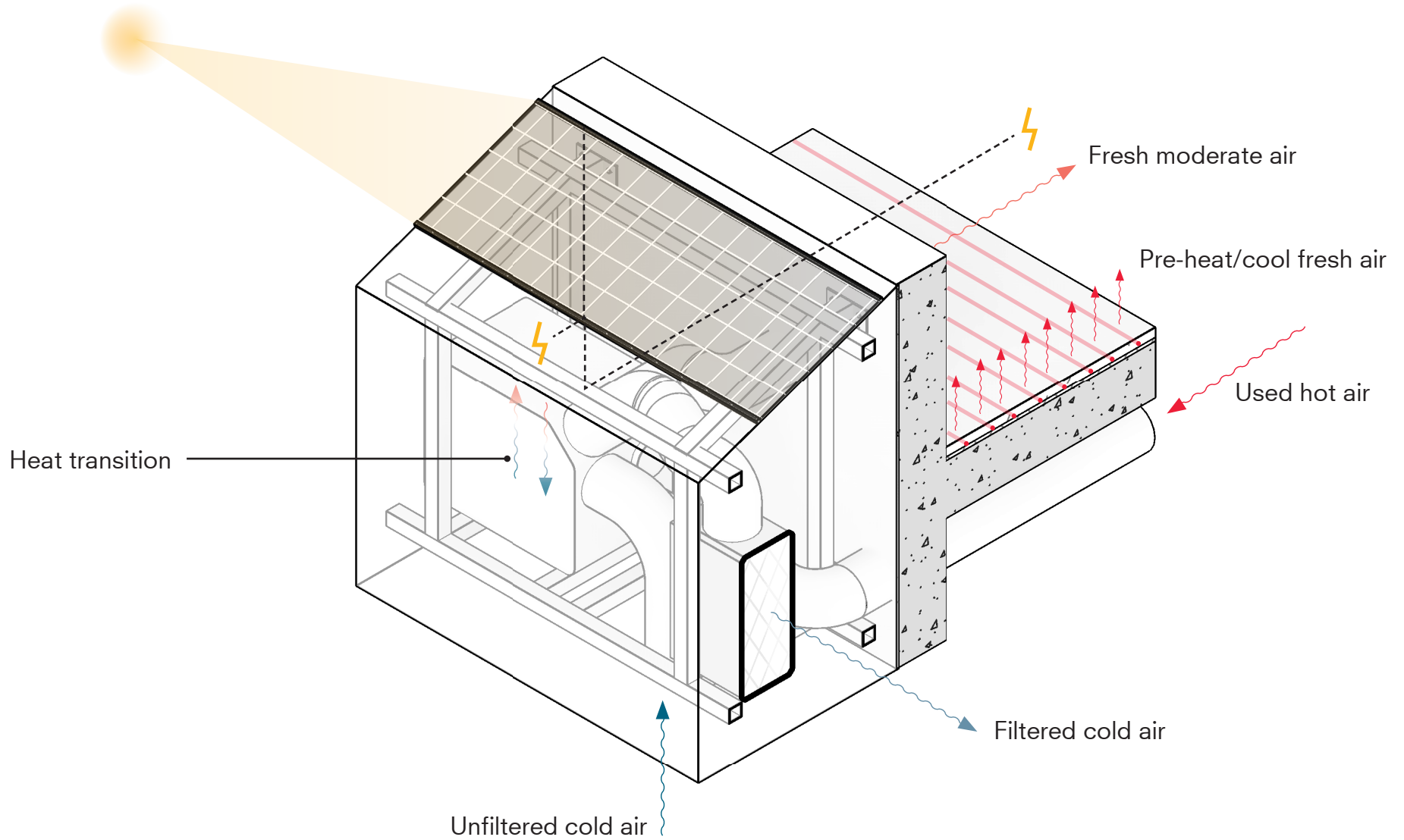


# HEATING/COOLING

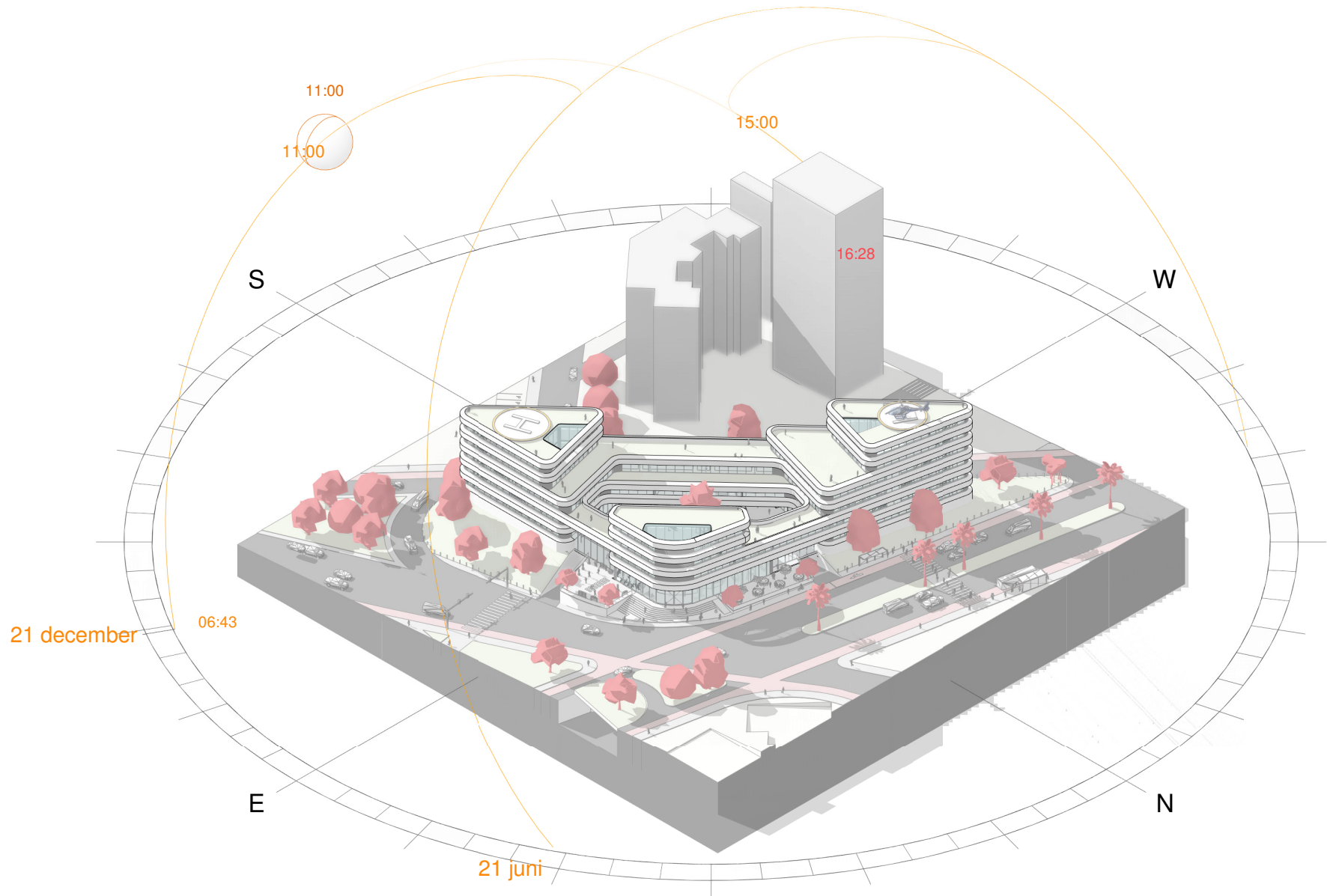


Design

# ELECTRICITY

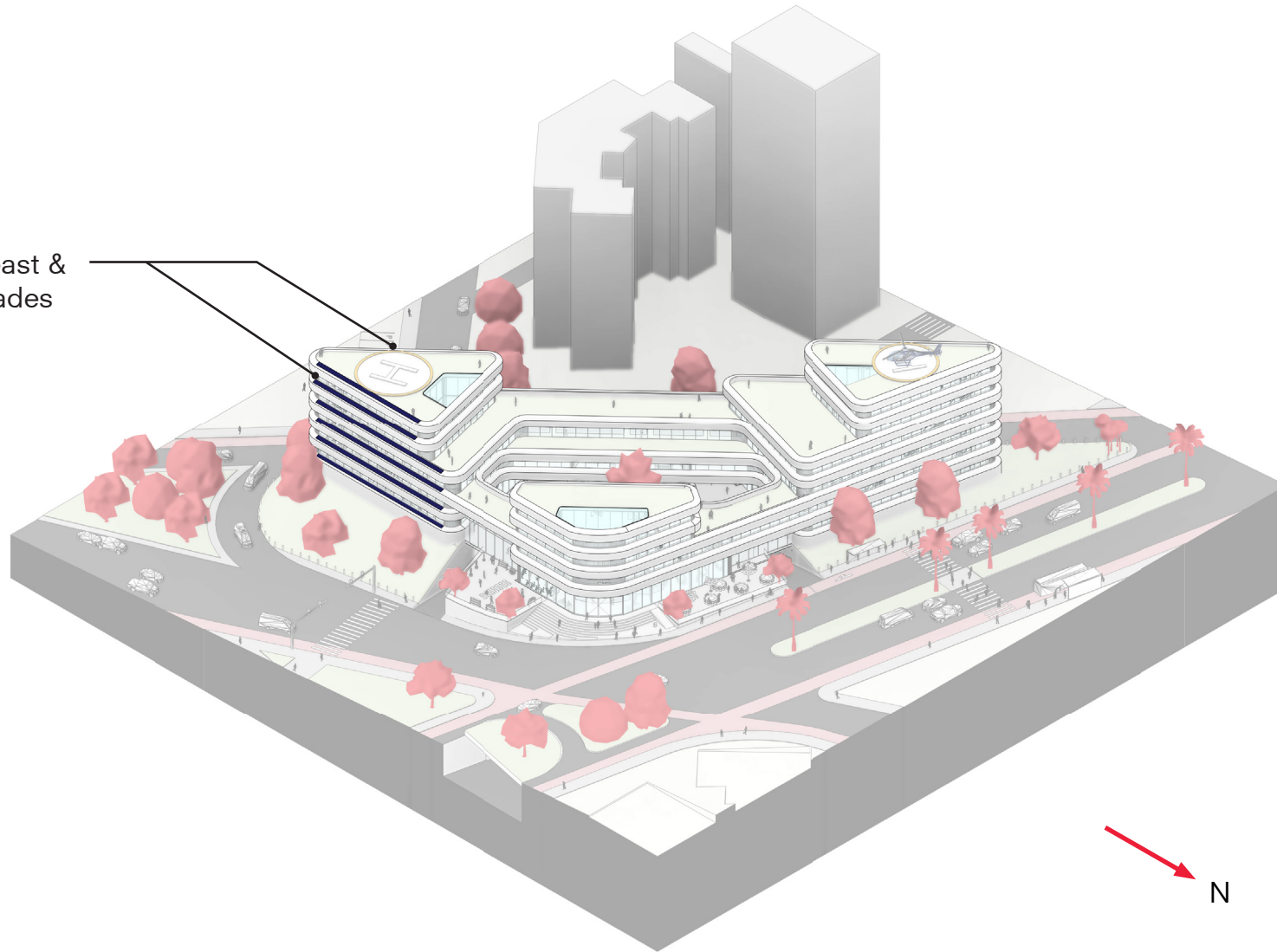


# Design CLIMATE



# ENERGY GENERATION

PV-panels on east & southwest facades

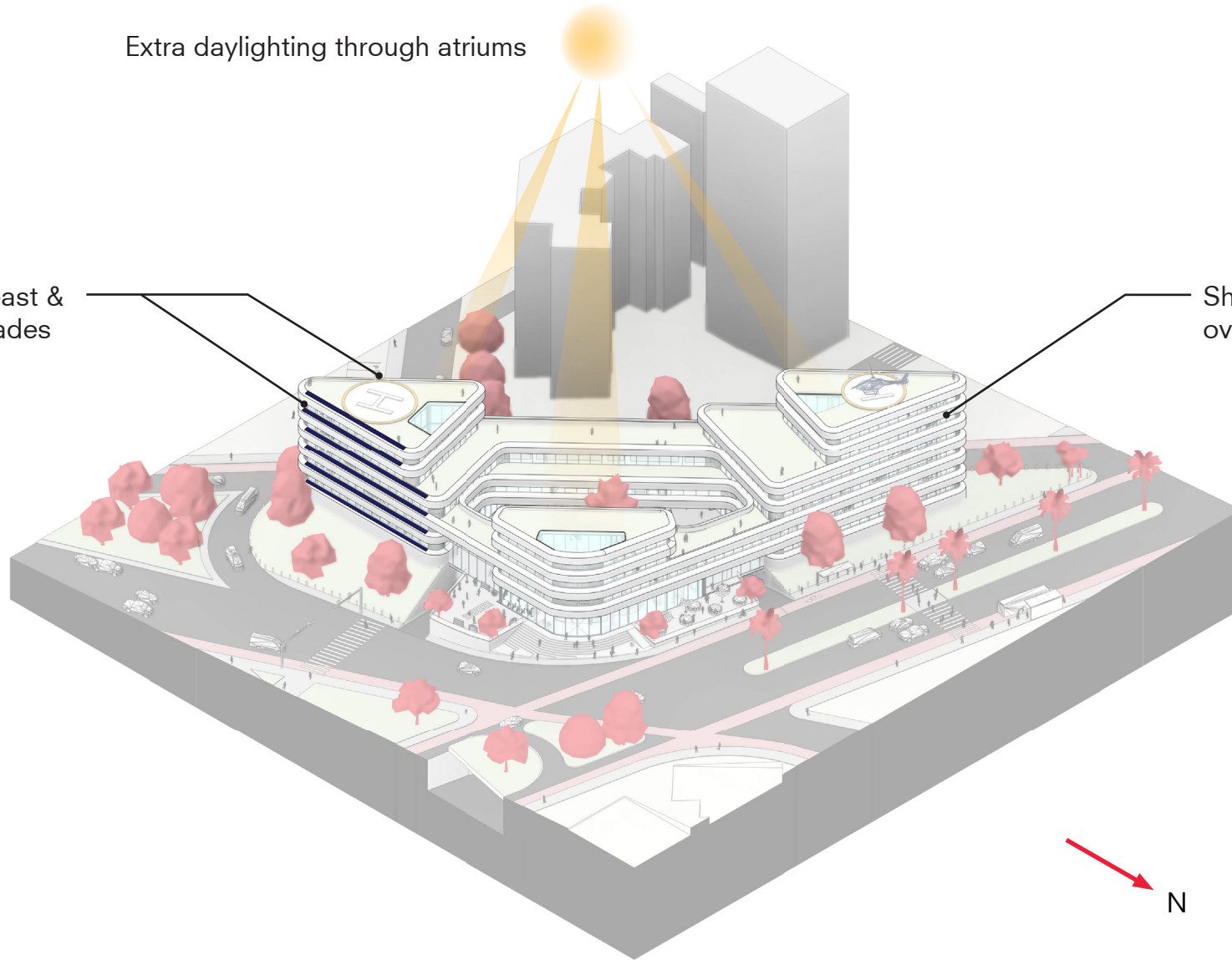


# SHADING/DAYLIGHTING

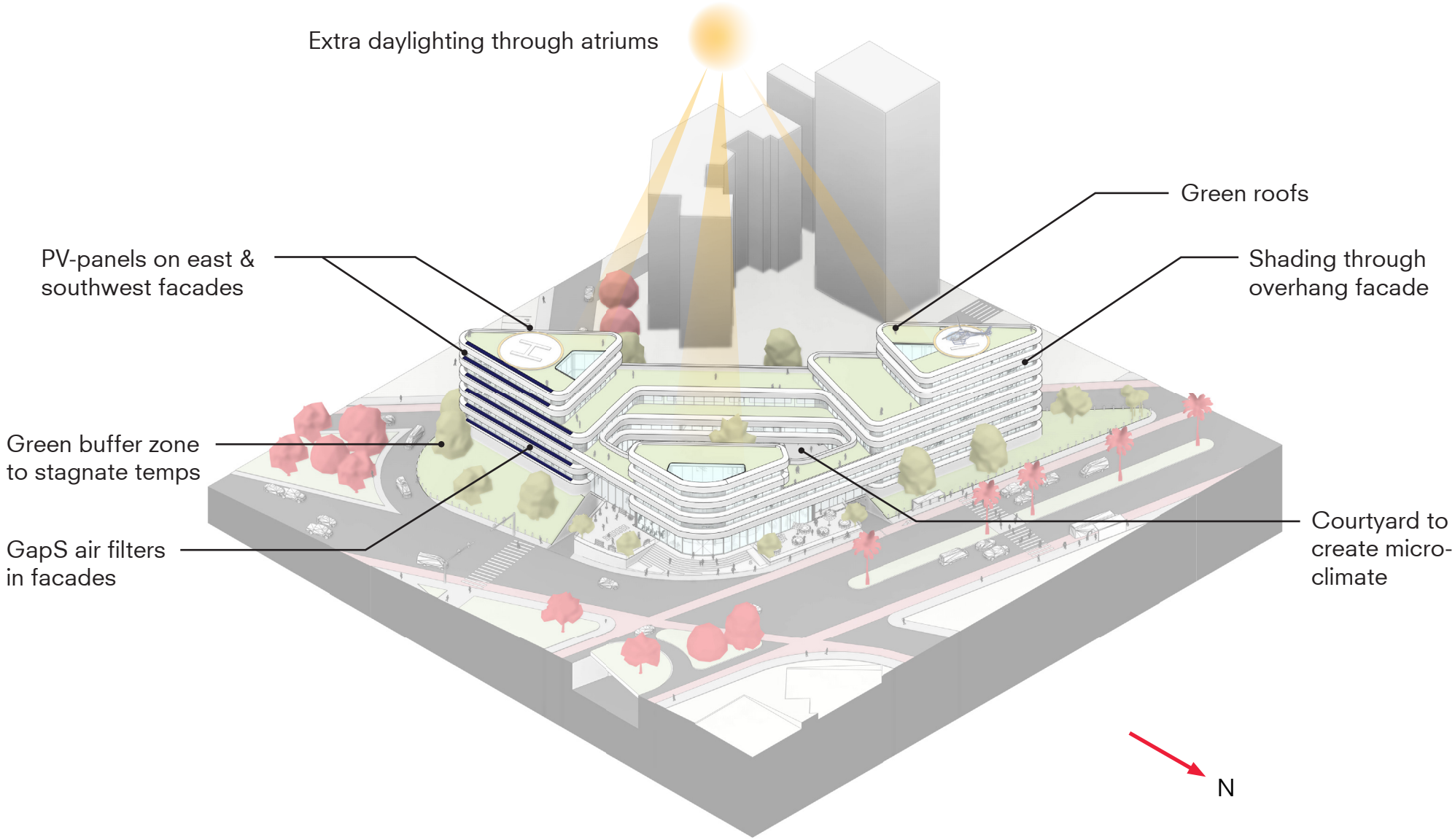
Extra daylighting through atriums

PV-panels on east & southwest facades

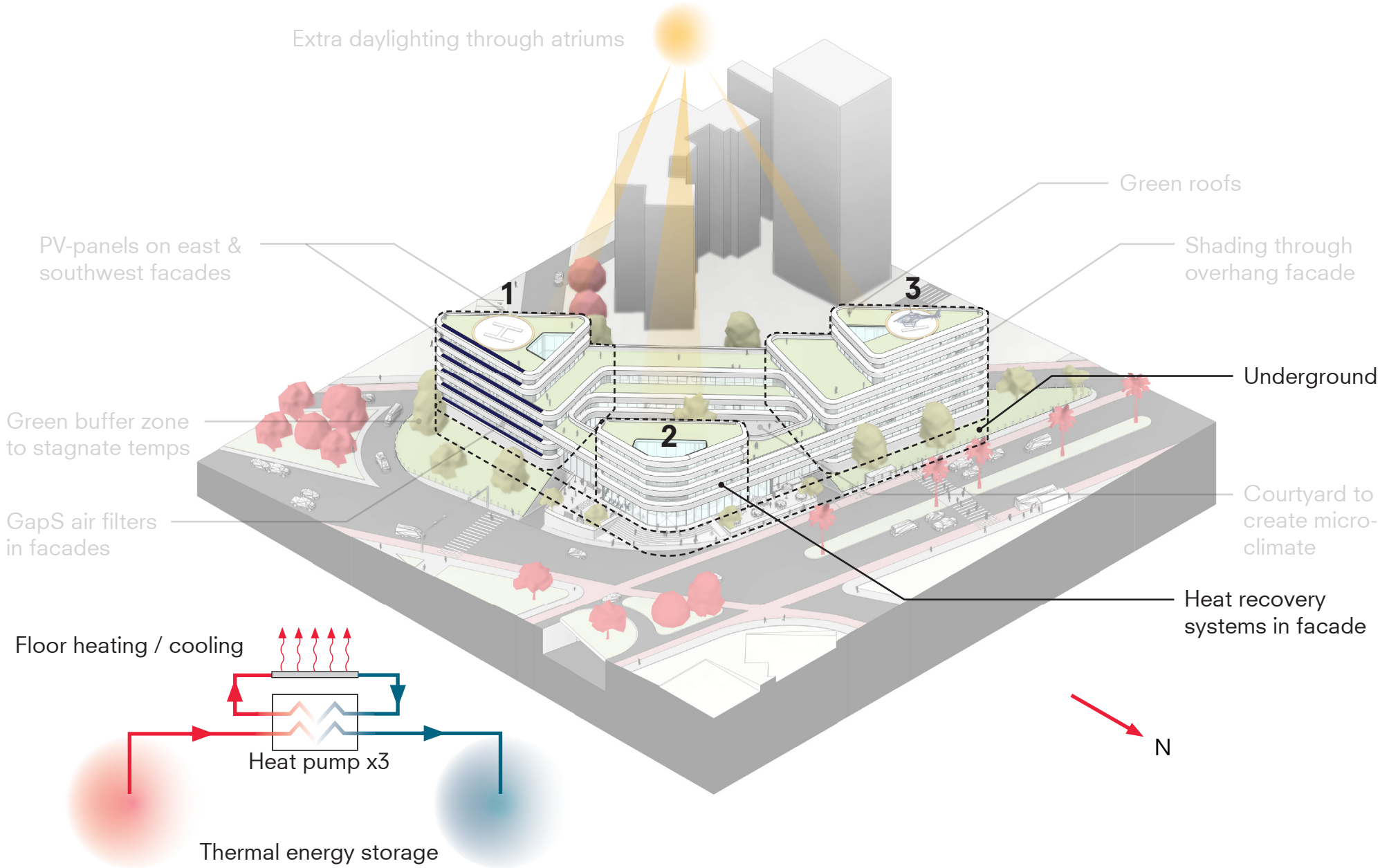
Shading through overhang facade



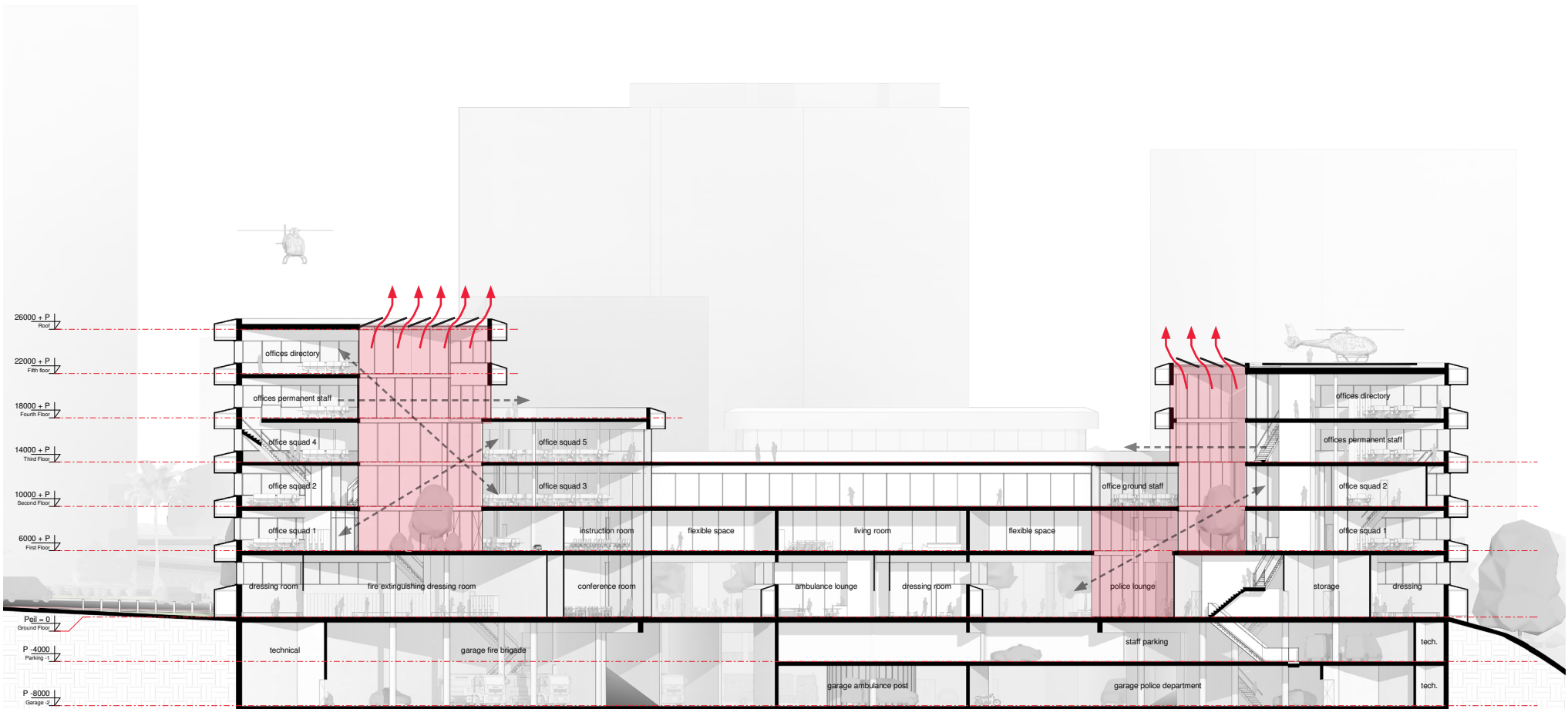
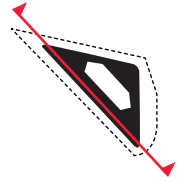
Design  
**MICRO-CLIMATE**



# Design HEATING & COOLING

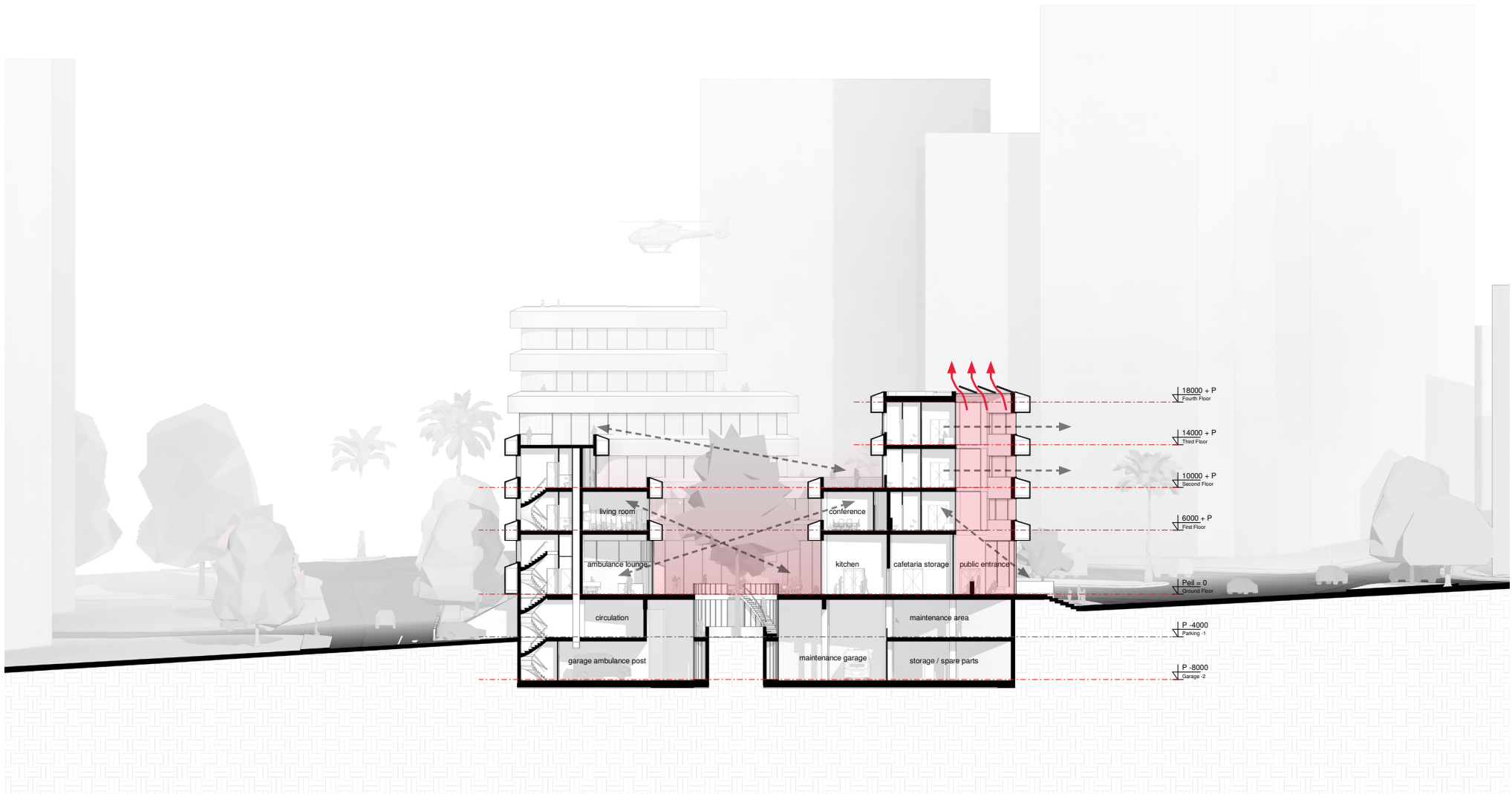
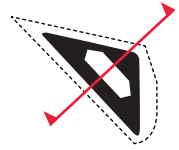


# Design ATRIUMS





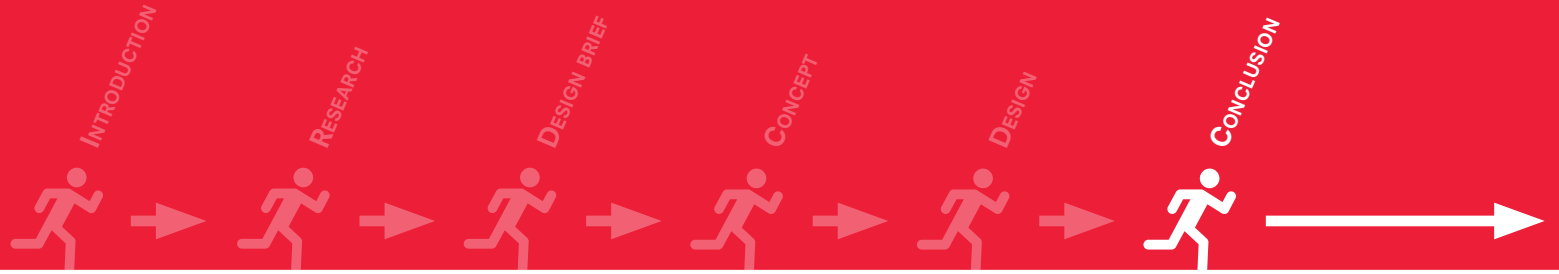
# Design ATRIUMS



Design

# SALAM EMERGENCY STATION





# CONCLUSION

## RESEARCH QUESTION

**How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?**

# SALAM EMERGENCY STATION

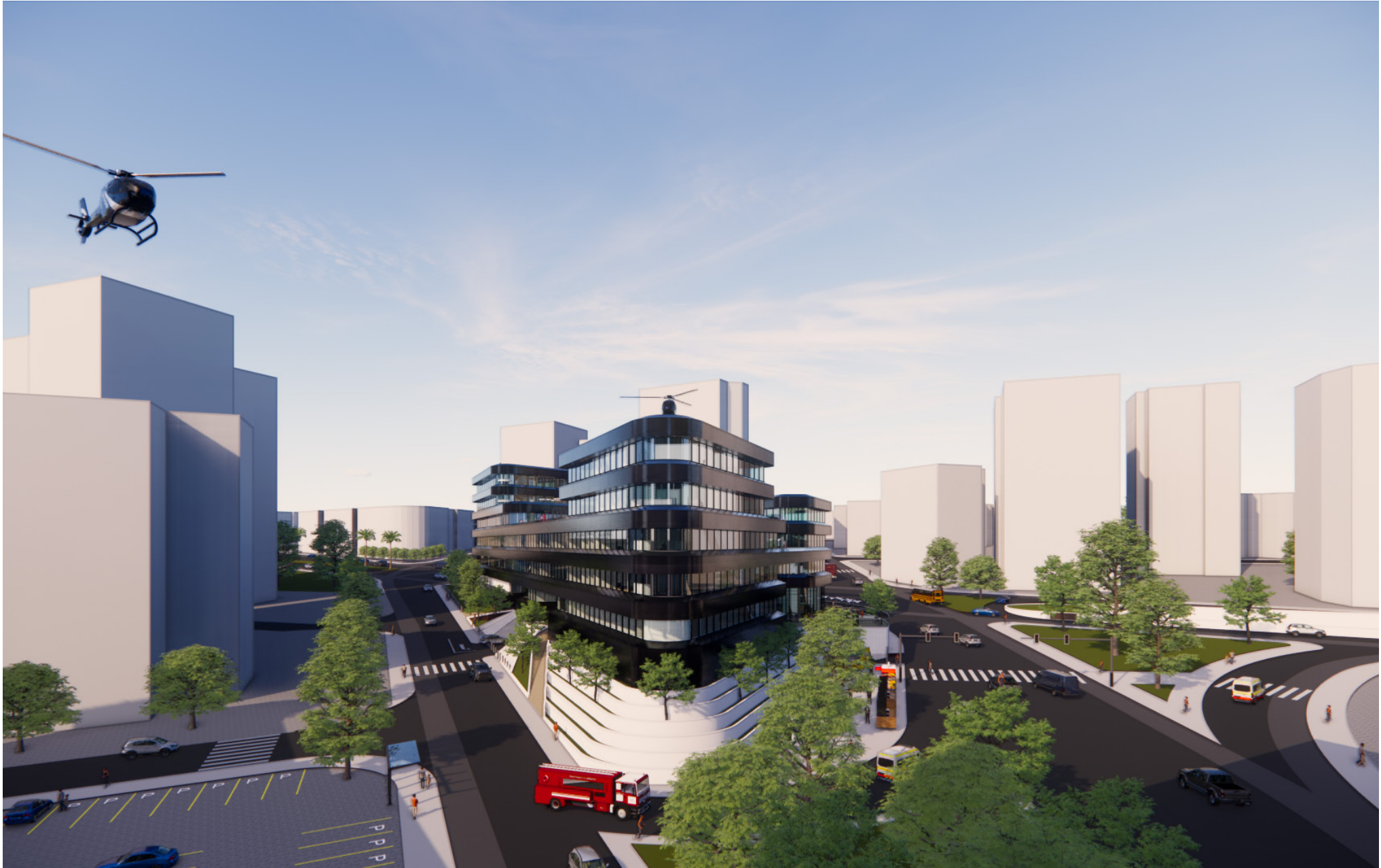
How can security concerns in crisis-stricken Beirut be generated architecturally in a building typology that unifies the emergency services and contributes to the safety of the city?



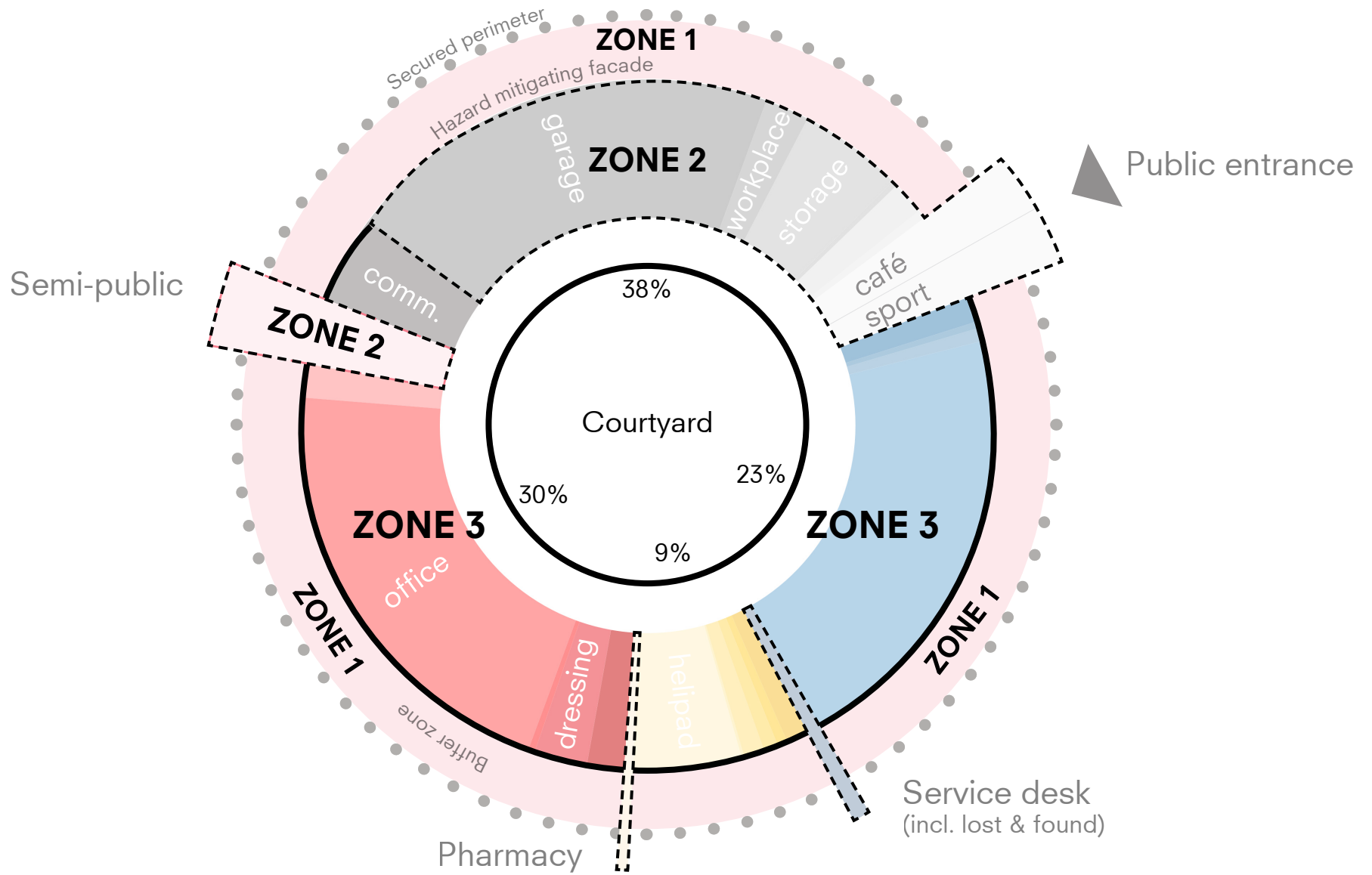
**A highly efficient, modern and secure building with a large reach to safeguard the people of Beirut**

Conclusion

# SALAM EMERGENCY STATION



Conclusion  
**REFLECTION**



# Conclusion REFLECTION





# RECOMMENDATION



## SALAM EMERGENCY STATION

Conclusion

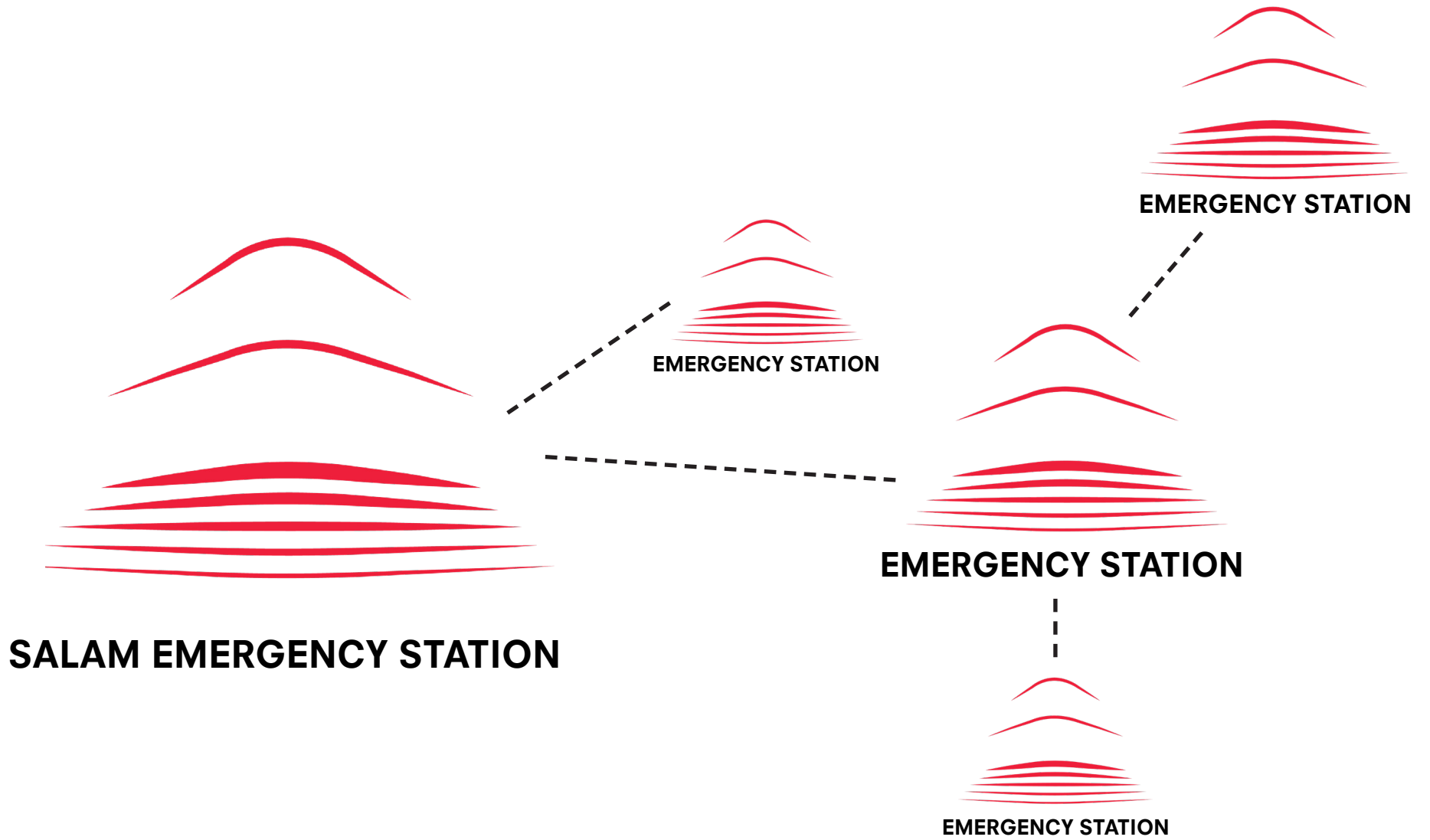
# RECOMMENDATION



SALAM EMERGENCY STATION

Conclusion

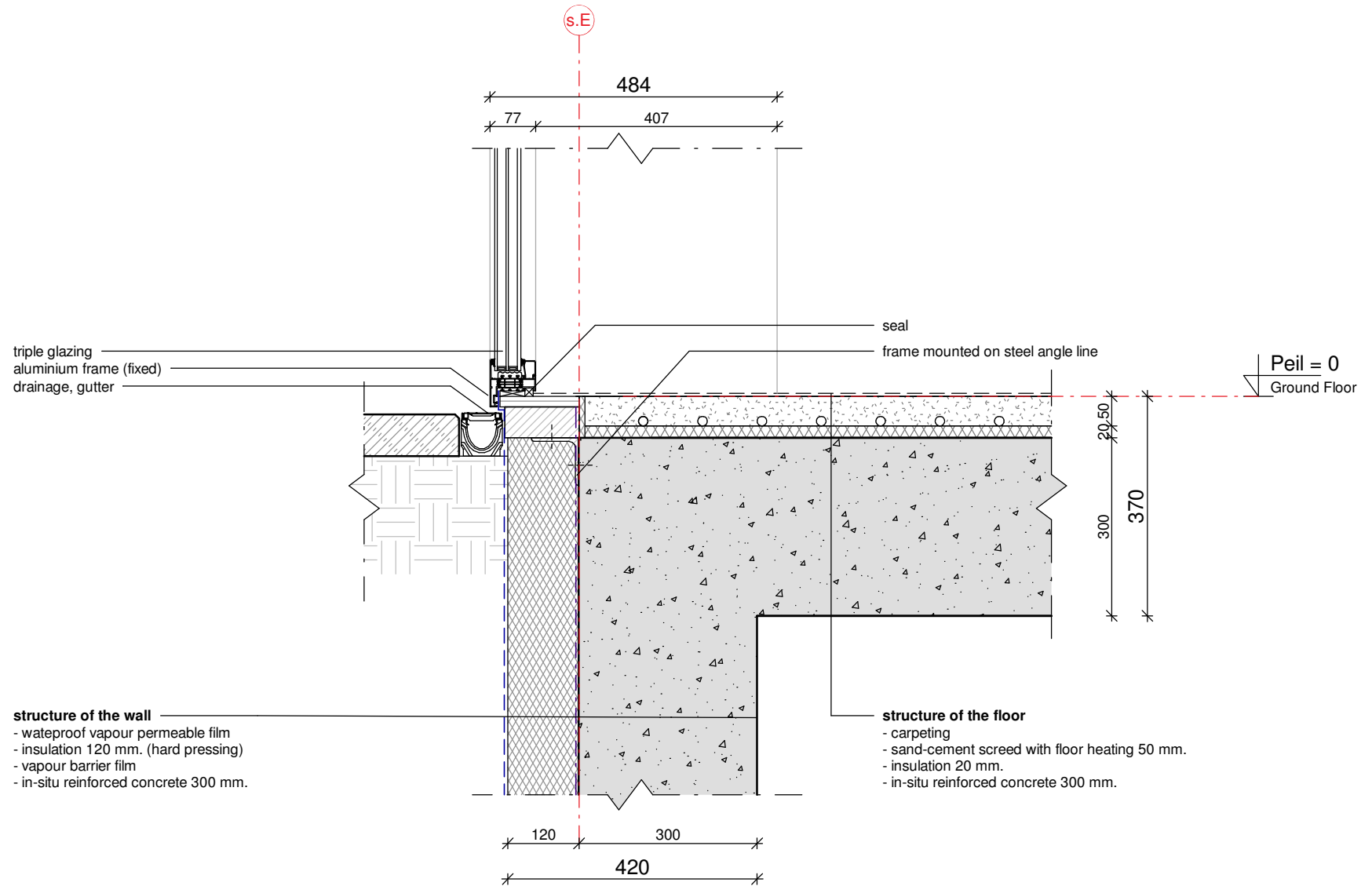
# RECOMMENDATION



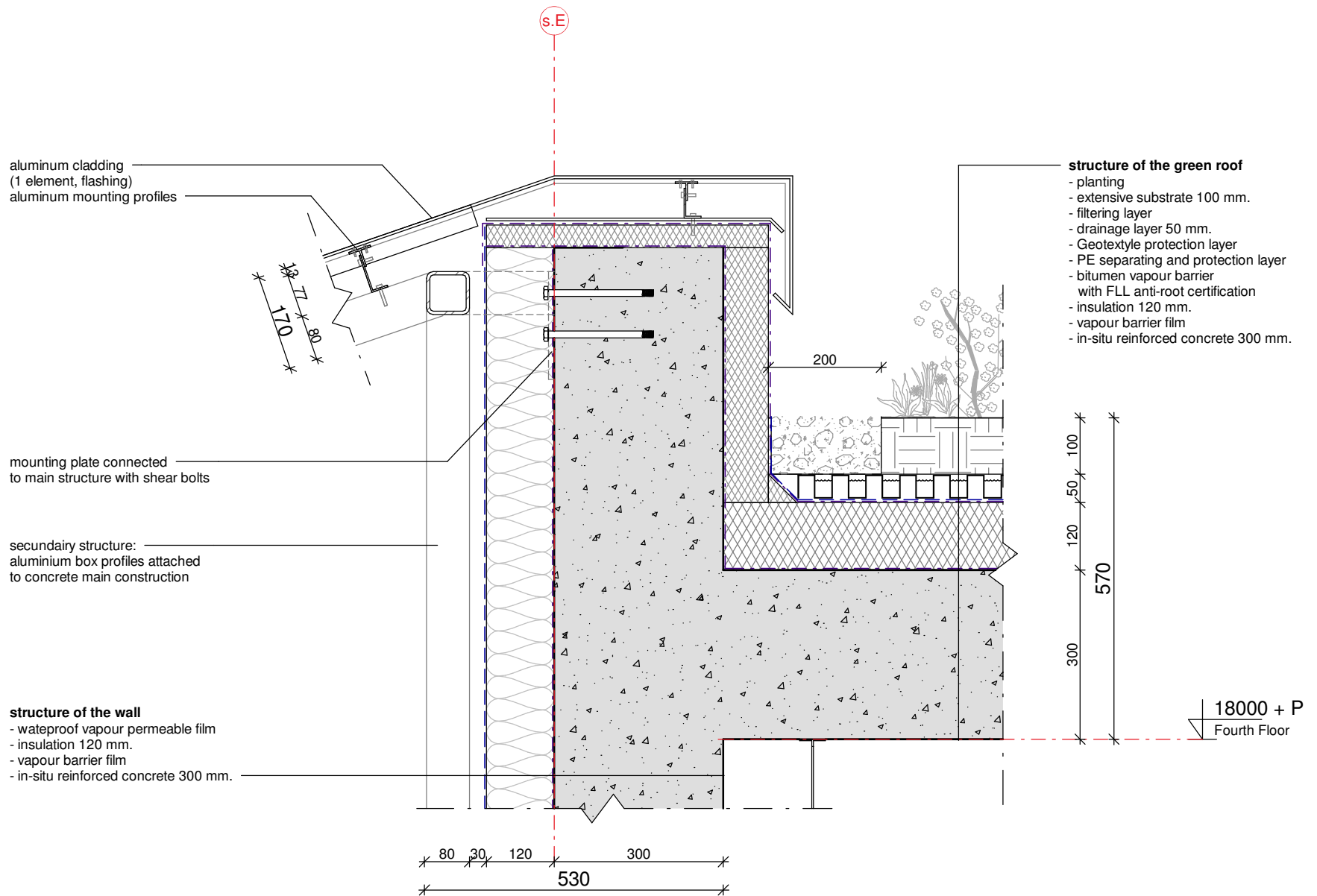


**SALAM**  
**Emergency Station**

# DETAIL 01 - GROUND LEVEL



# DETAIL 04 - EAVE



# DETAIL 05 - HORIZONTAL FRAME

