DE CENTRALE

P5 presentation

25-06-2024

By

Hidde Schunselaar

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CONTENT

- Research
- From Research to Design
- Design
- Conclusion

PROBLEM

- Changes within the built environment
- Heritage – significance
- Vacancy => demolition
- How to redevelop?
- What is the most sustainable solution?
- Essential to consider the energy implications

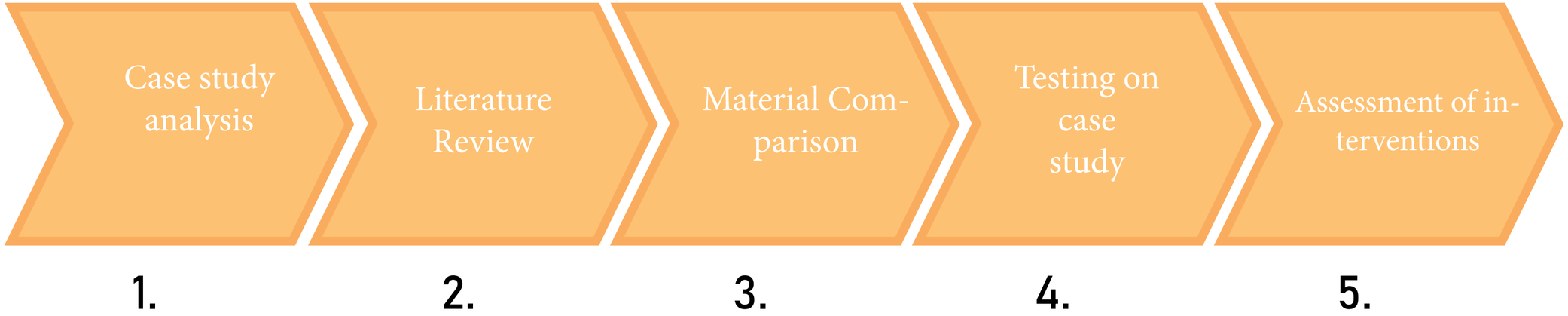
- **Embodied Energy**

The energy from manufacturing, transporation, and installation of building materials

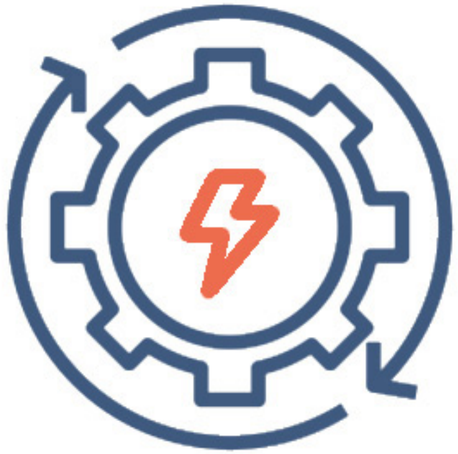
- **Operational Energy**

Energy consumption of the building

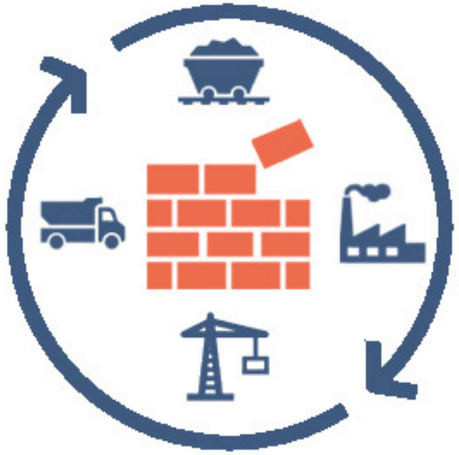
METHOD


Case study analysis
Literature Review
Material Com-parison
Testing on case study
Assessment of in-terventions
1.
2.
3.
4.
5.

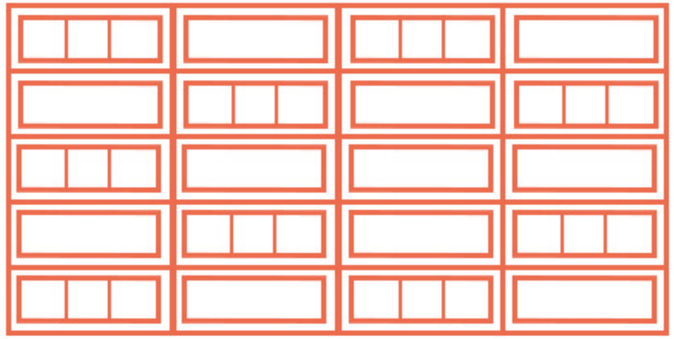
FIELD OF RESEARCH



EMBODIED ENERGY



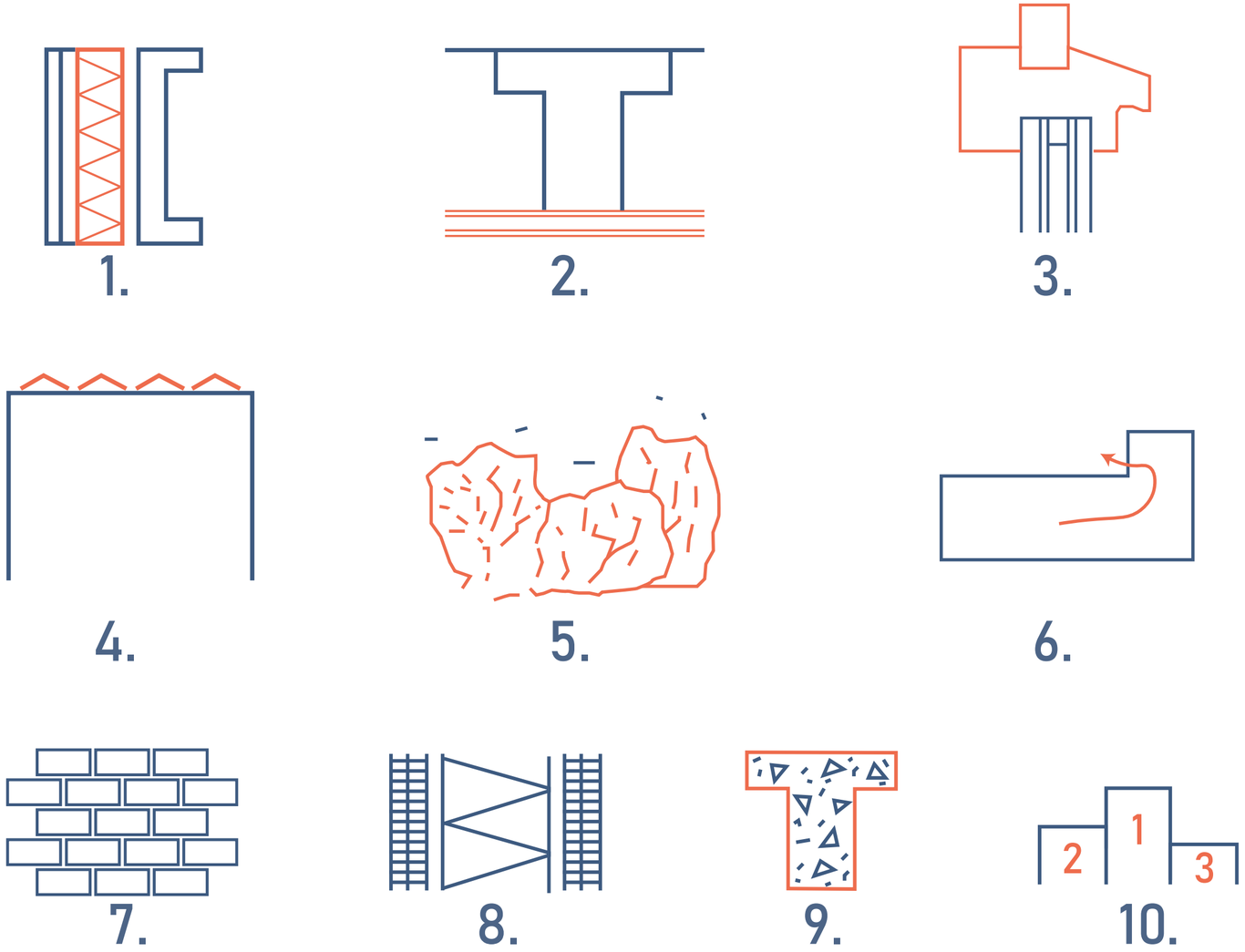
OPERATIONAL ENERGY



HERITAGE

FROM RESEARCH TO DESIGN

1. Adding internal insulation
2. Applying smart services
3. Window replacement
4. Add PV panels
5. Apply natural elements
6. Natural ventilation
7. Reuse of materials
8. Apply flexible floor plan
9. Preserve materials with high E.E amount
10. Apply materials with low E.E amount

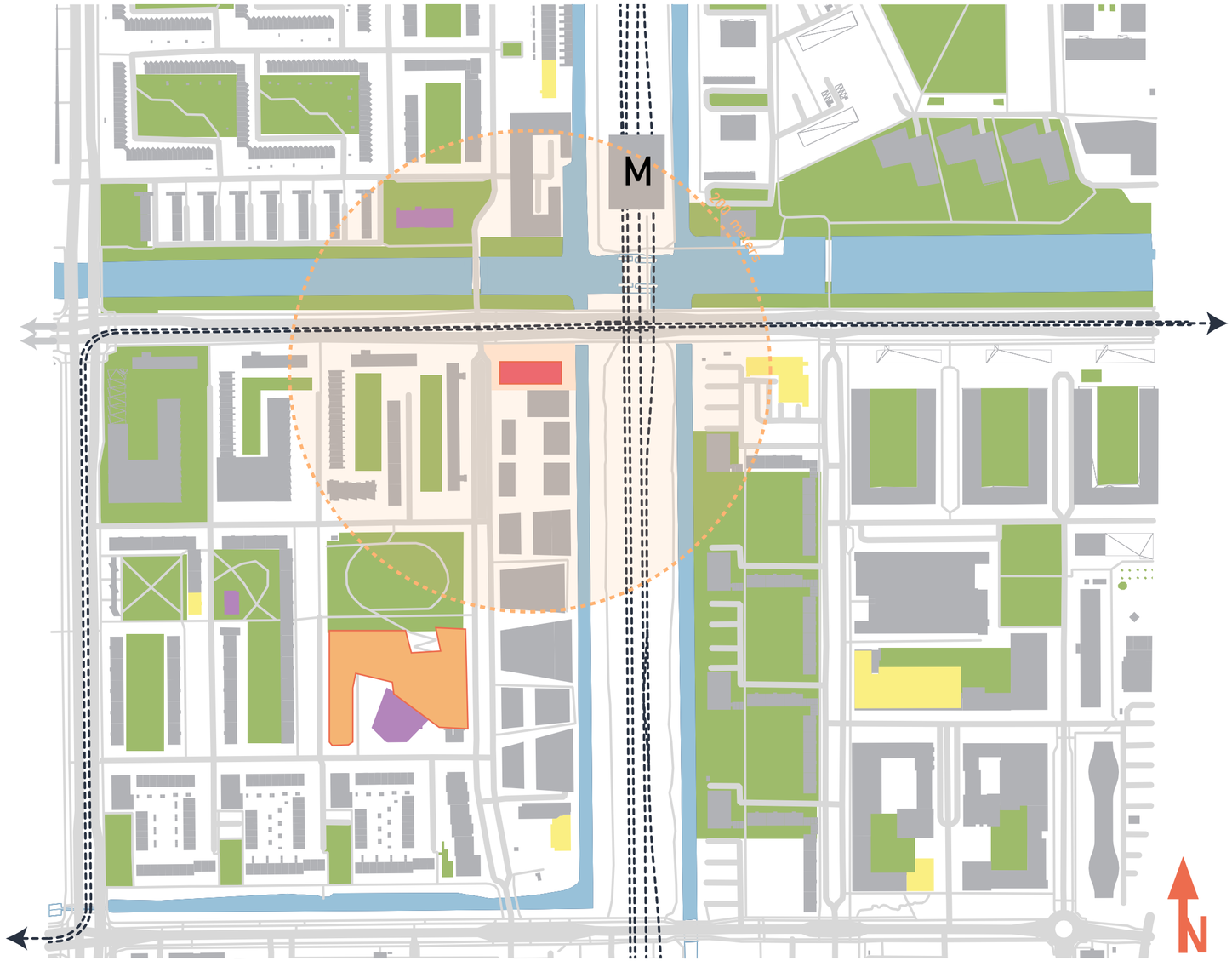


SITE ANALYSIS

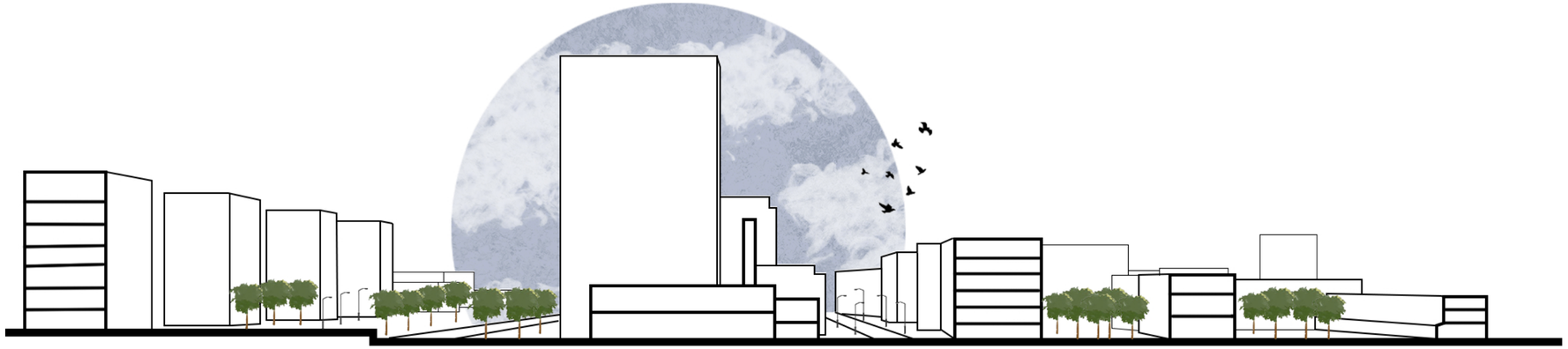
SITE ANALYSIS

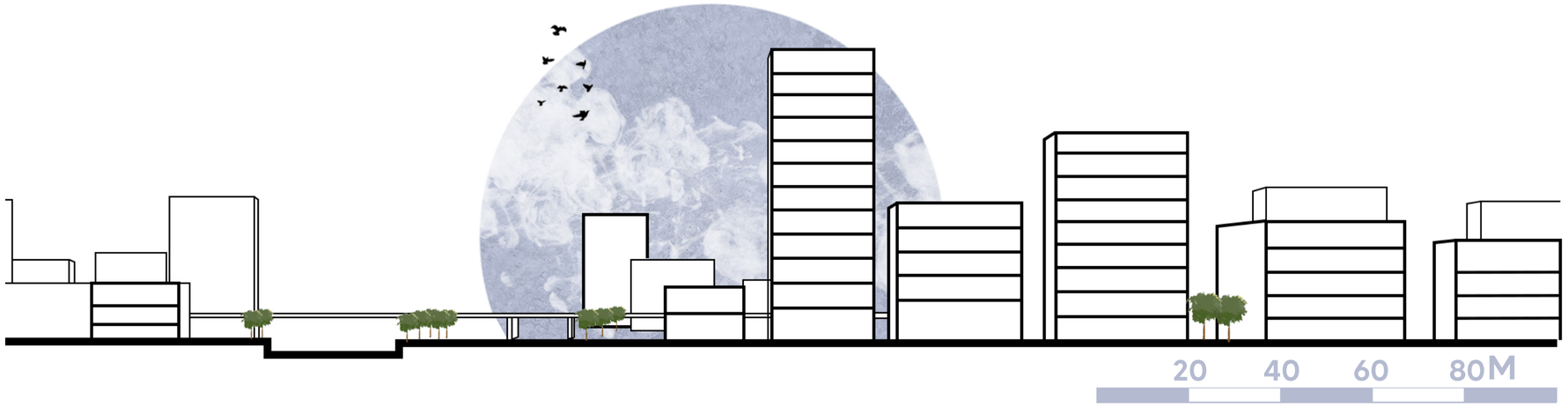
LEGEND

- Design Case
- Dwelling
- Water
- Greenery
- School
- Religious building
- Restaurant
- M Metro
- 200m from case



SITE ANALYSIS

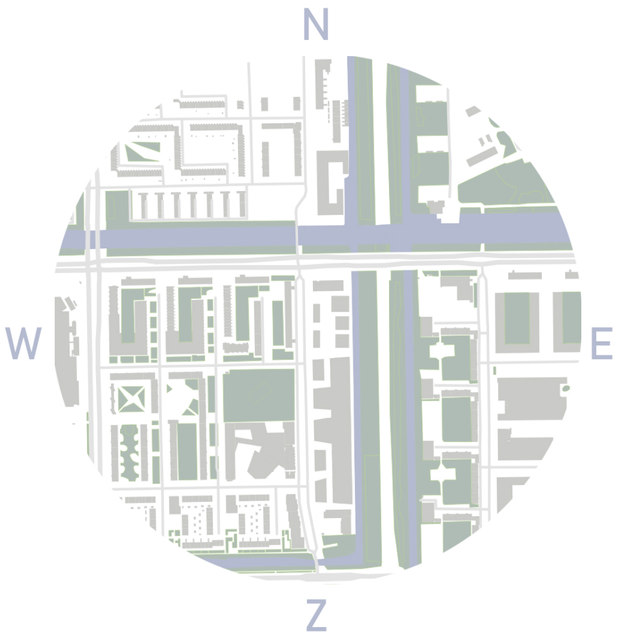




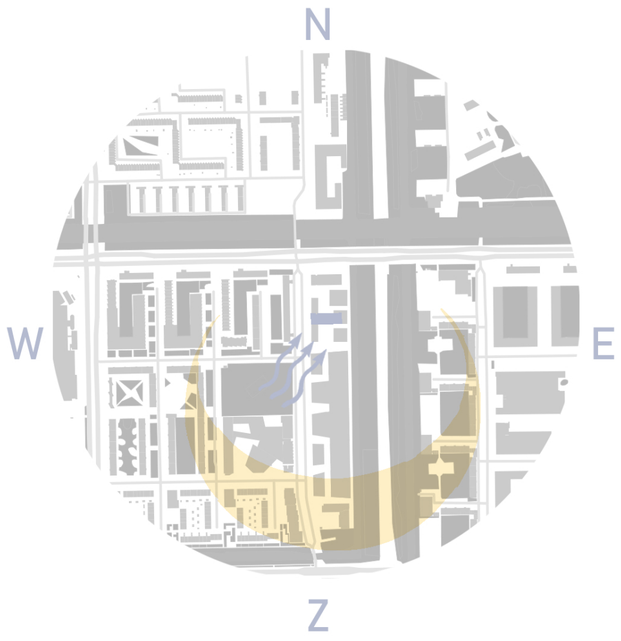
URBAN CONTEXT (FLOW REAL ESTATE, 2023)

SITE ANALYSIS

CONSTRUCTION YEAR



GREENERY



SUN PATH

BUILDING ANALYSIS


THE CALL CENTER IN 1960 (AMSTERDAMOPDEKAART, 2017)

1960

CALL CENTER

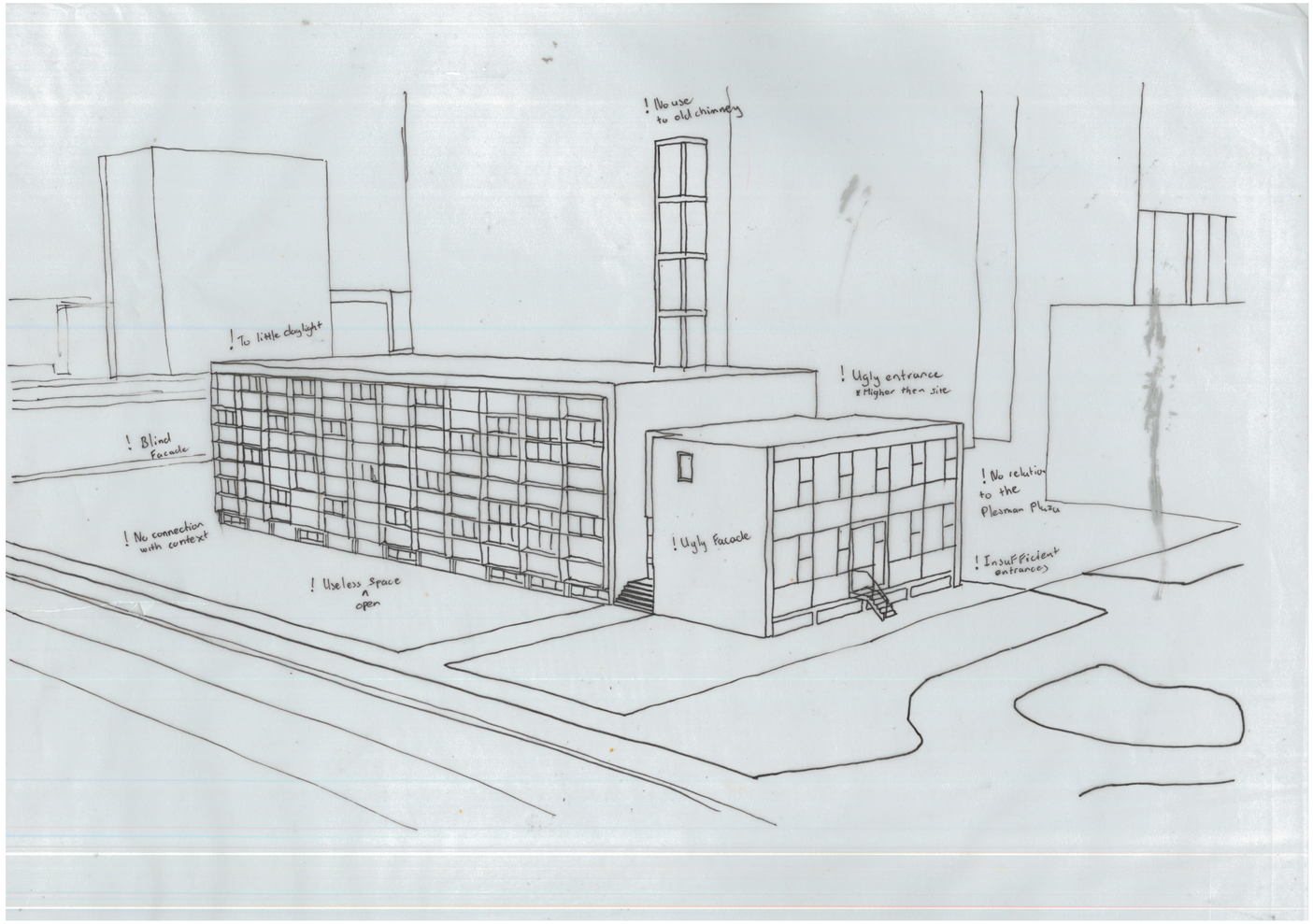
2023

LARGELY VACANT

BUILDING ANALYSIS

Points to adress

- no relation to context
- insufficient entrances
- useless spaces
- blind facade



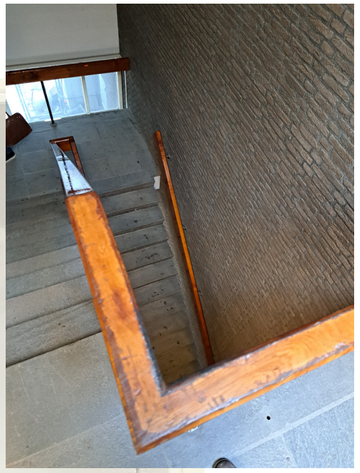
BUILDING ANALYSIS

Tangible values

- North + South facade
- The old chimney
- Staircase
- Collum/Beam structure

Intangible values

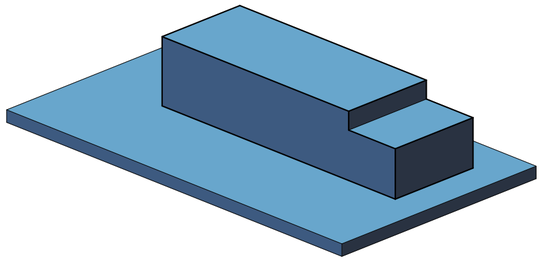
- Boxing school
- Social value
- Historical value



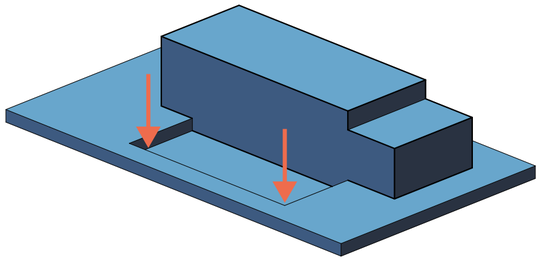
MP PRO BOXING CENTER

THE NOBLE ART OF SELF DEFENCE

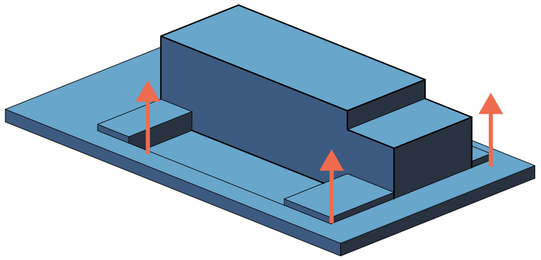
DESIGN STEPS



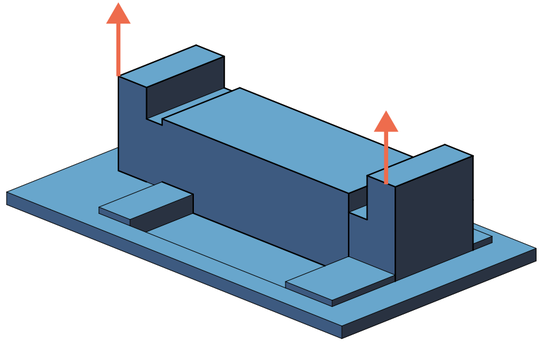
1. CURRENT BUILDING



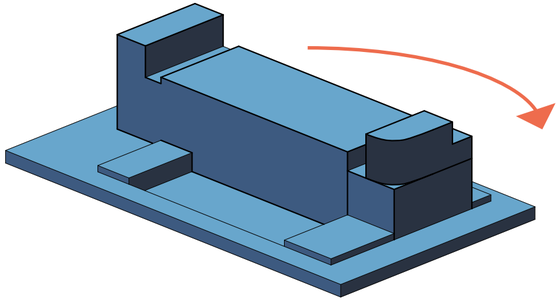
2. EXCAVATE NORTH SIDE
OPENS THE FACADE



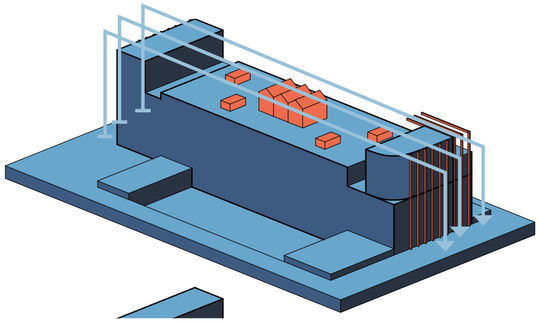
3. ELEVATED ENTRANCES



4. ADD NEW VOLUMES



5. DECREASE NORTH FACADE
CREATE SOUTH TERRACE



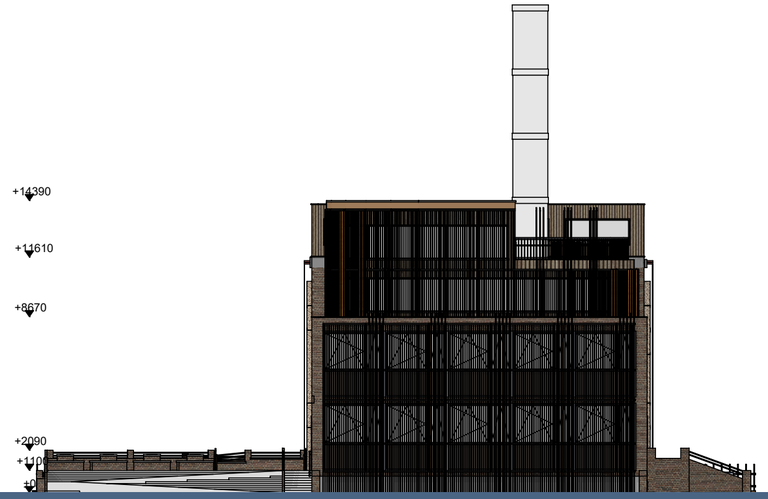
6. EMBRACE GREENERY
THROUGHOUT BUILDING

SITE ANALYSIS

North

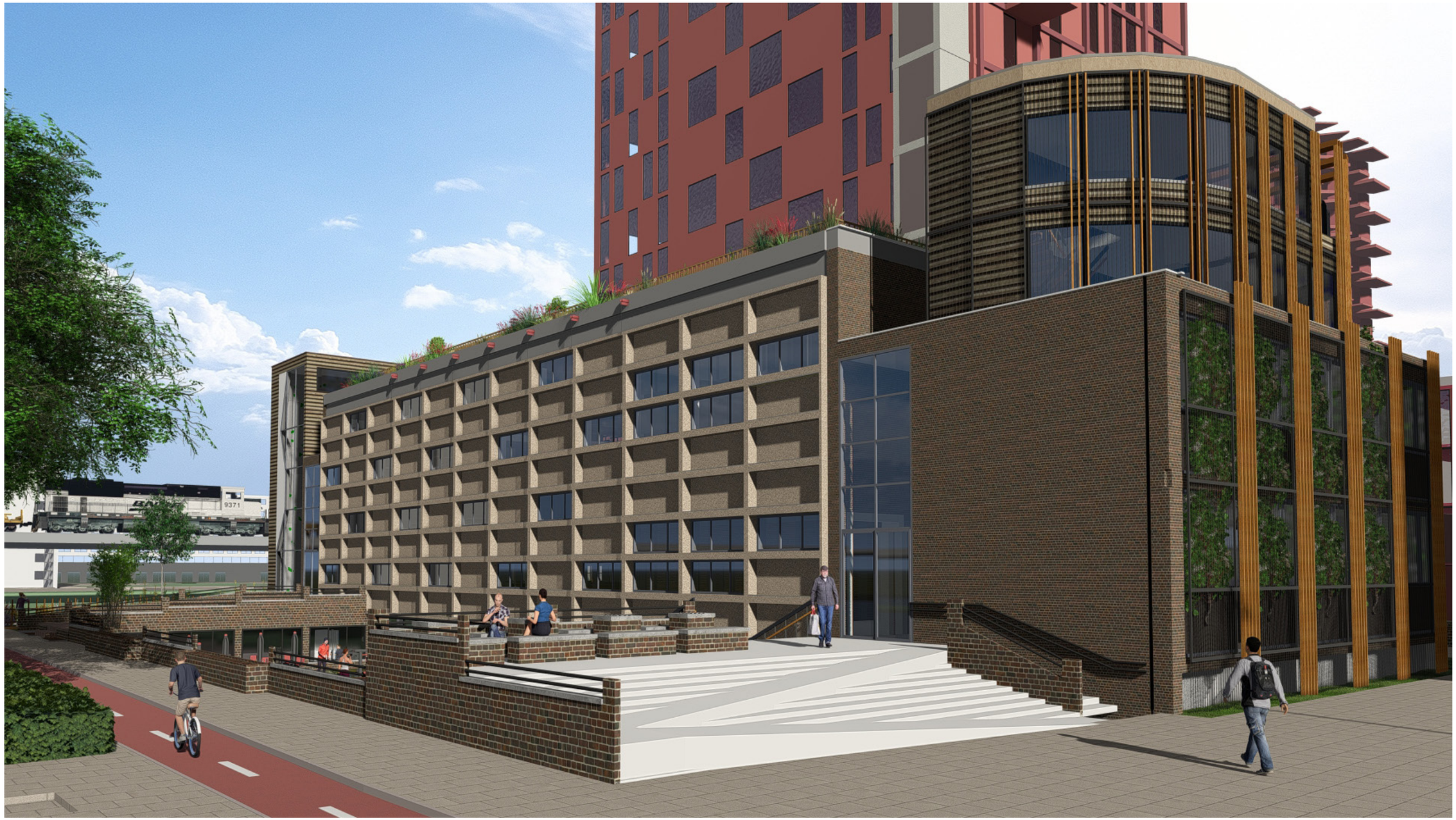
East

South

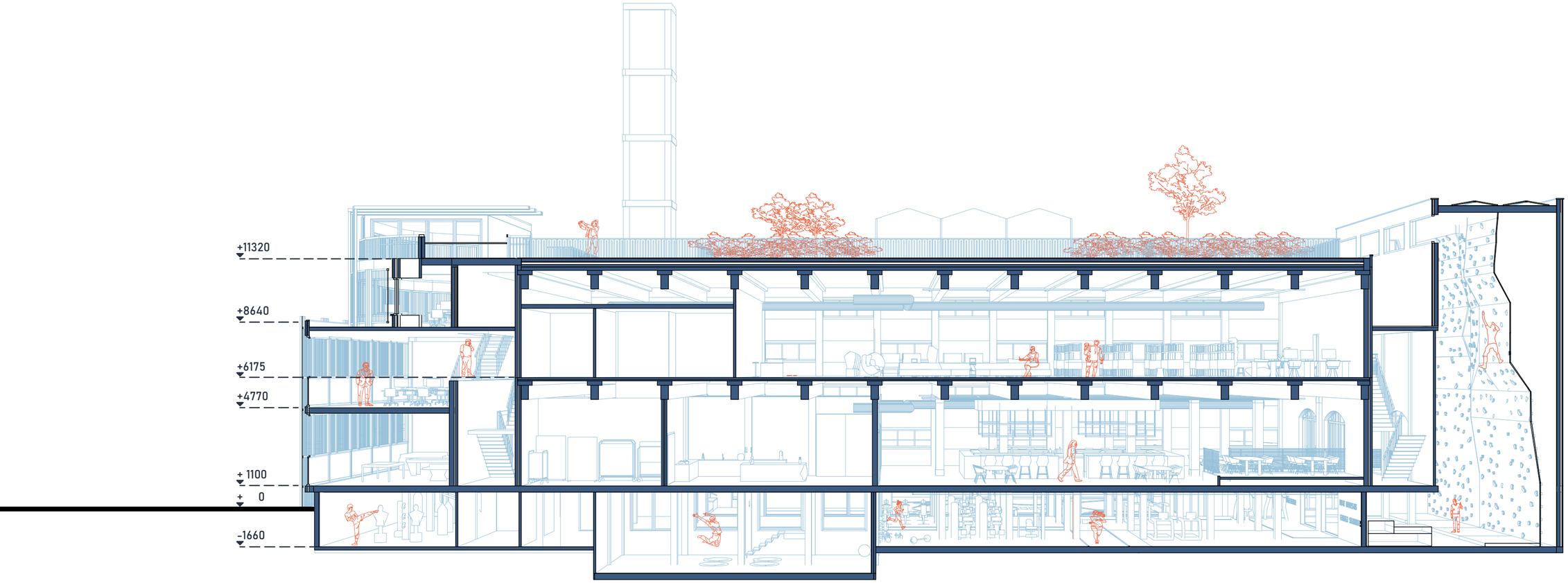


West

MASTERPLAN


9371

SECTION ANALYSIS

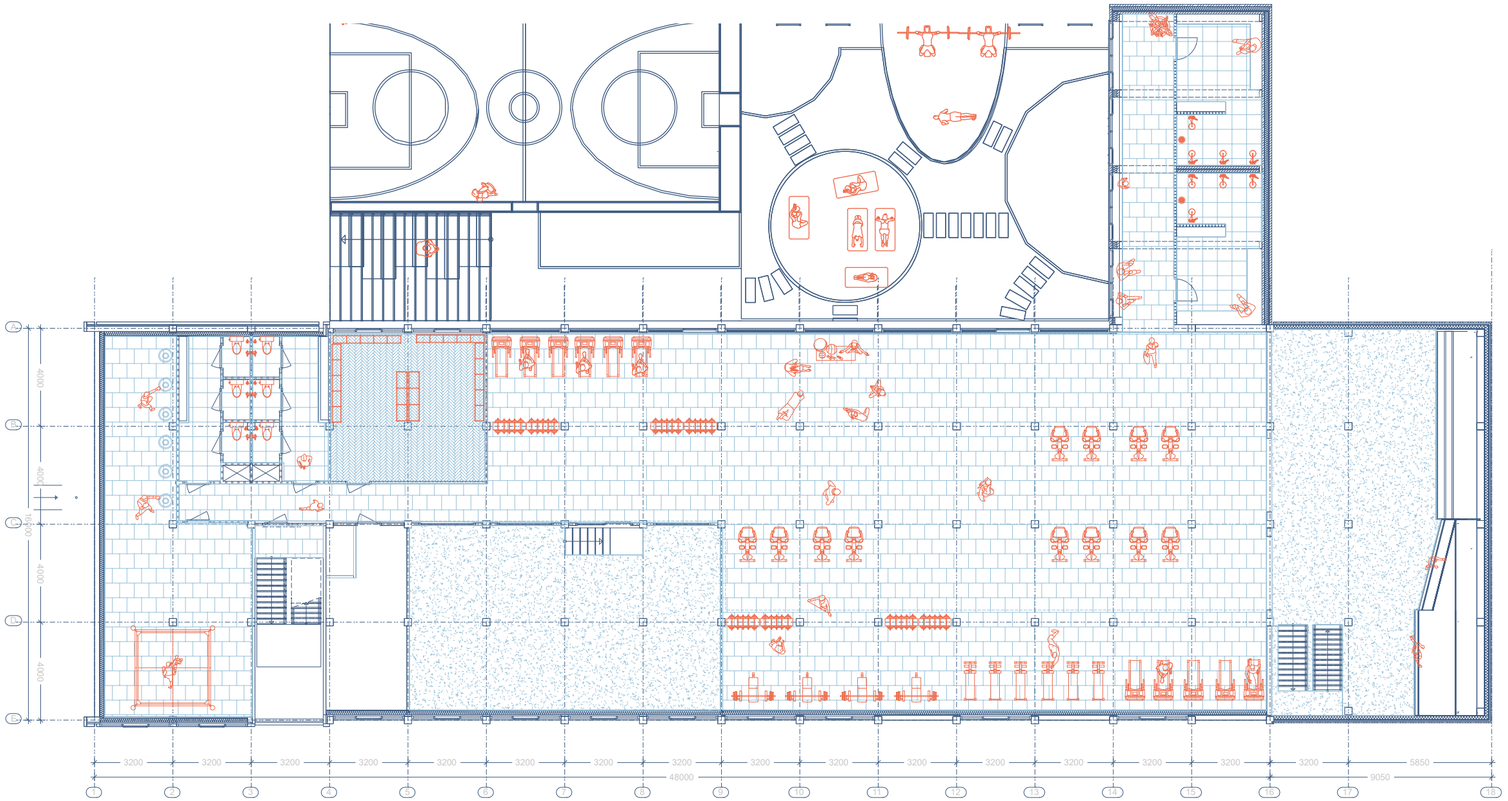


PROGRAM

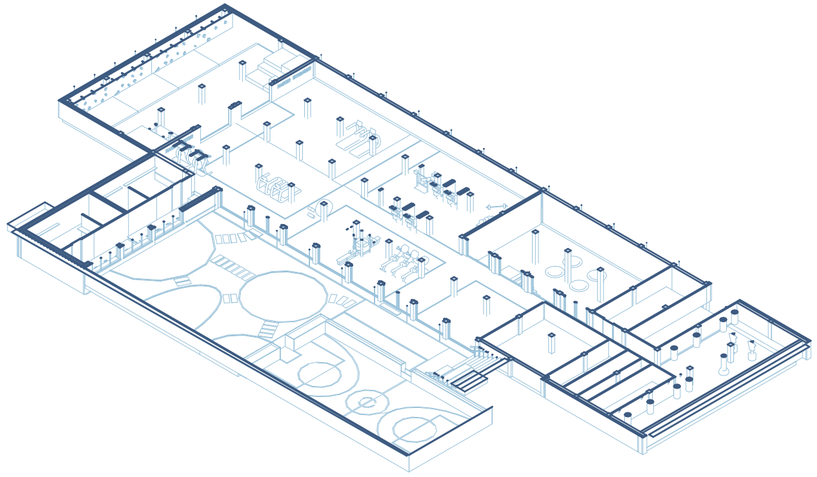

PV PANELS
GREEN ROOF
PV PANELS
OFFICE
OFFICE
TECHNIAL
LIBRARY
FLEX
STAIR
STAIR
WALL
CLIMBING
LOUNGE
KITCHEN
RESTAURANT
BOXING
DANCE
SPORTSCHOOL

SPORT SPHERE

SPORT SPHERE



Floor plan



Isometric view of basement

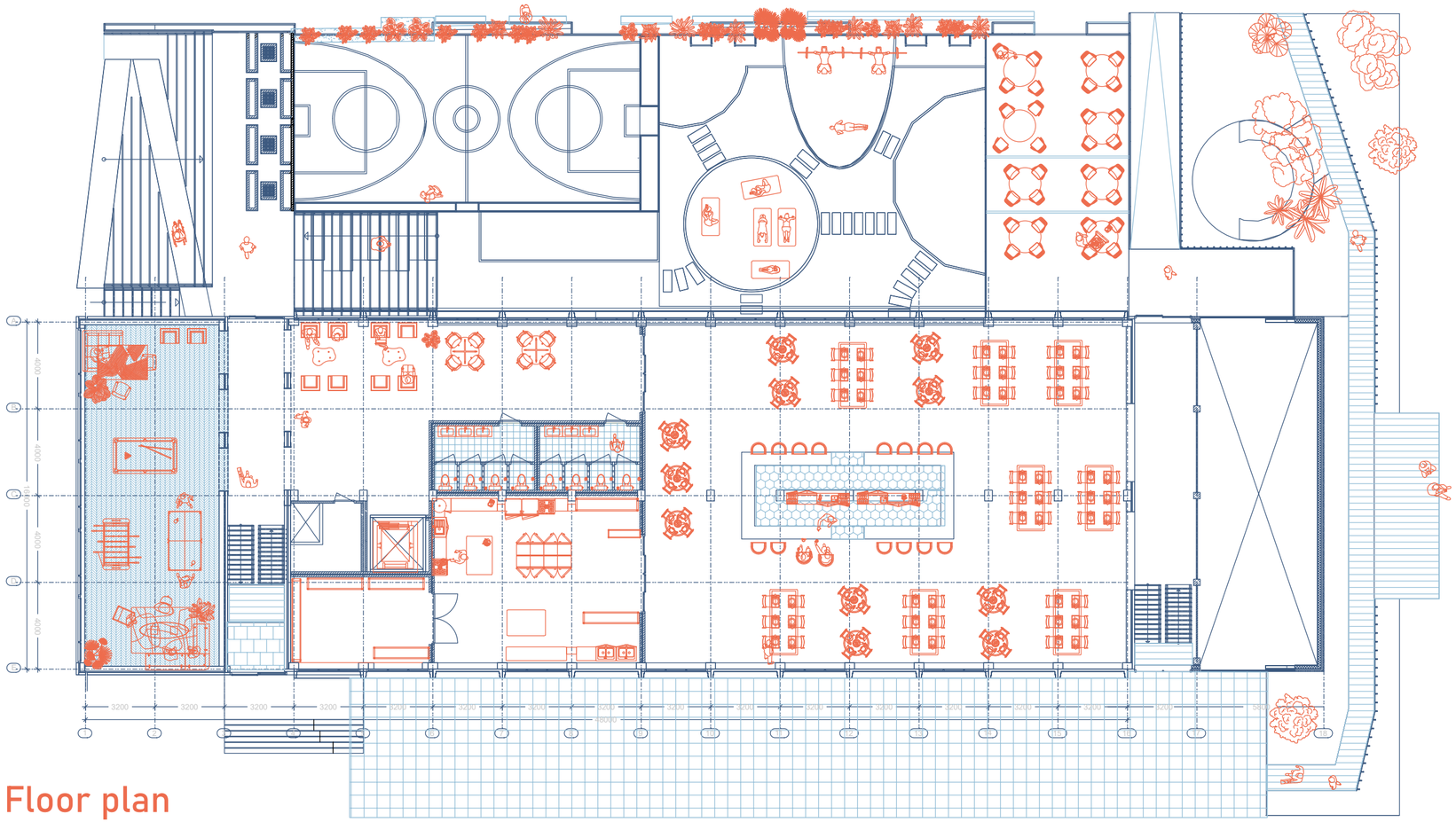
Program


ORK IT MAKE IT
HARDER BETTE

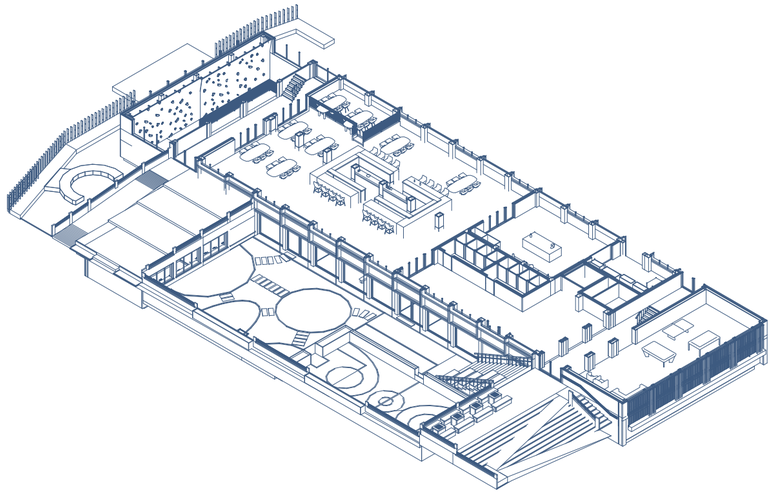
CENTRAL HUB


PV PANELS
GREEN ROOF
PV PANELS
OFFICE
OFFICE
TECHNIAL
LIBRARY
CLIMBING
WALL
FLEX
STAIR
STAIR
LOUNGE
KITCHEN RESTAURANT
BOXING
DANCE
SPORTSCHOOL

CENTRAL HUB



Floor plan



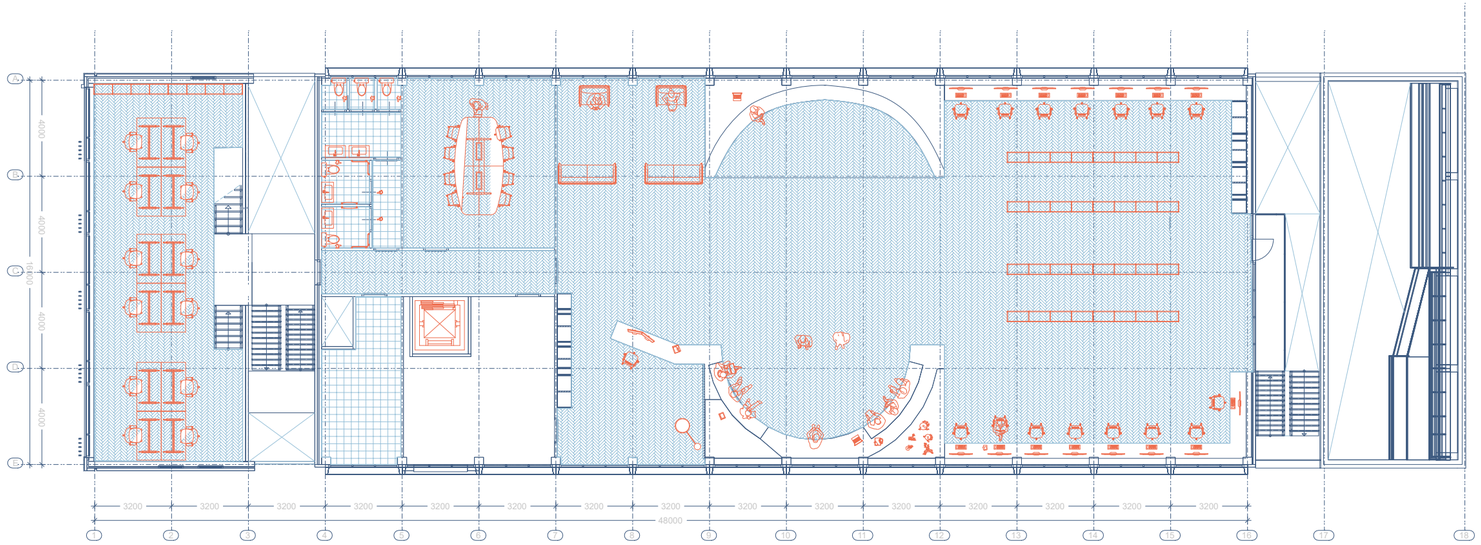
Isometric view of ground floor

Program

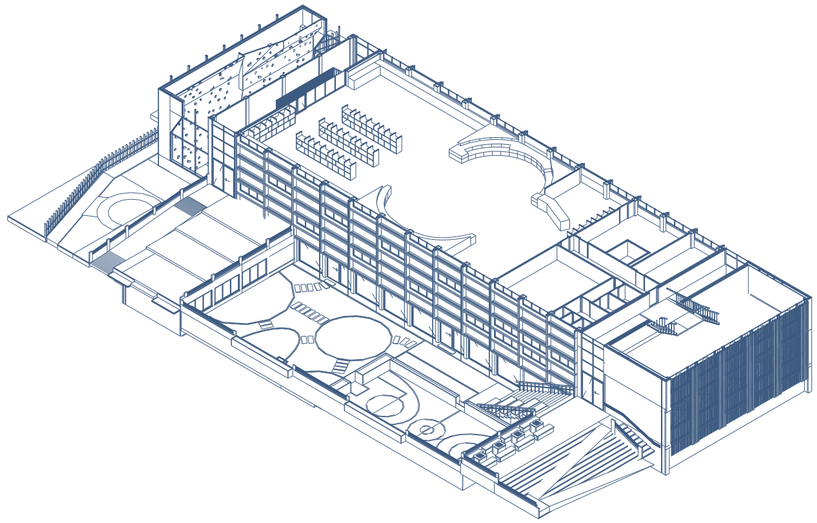
STUDY HALL


PV PANELS
GREEN ROOF
PV PANELS
OFFICE
OFFICE
TECHNIAL
LIBRARY
FLEX
STAIR
STAIR
WALL
CLIMBING
LOUNGE
KITCHEN
RESTAURANT
BOXING
DANCE
SPORTSCHOOL

STUDY HALL



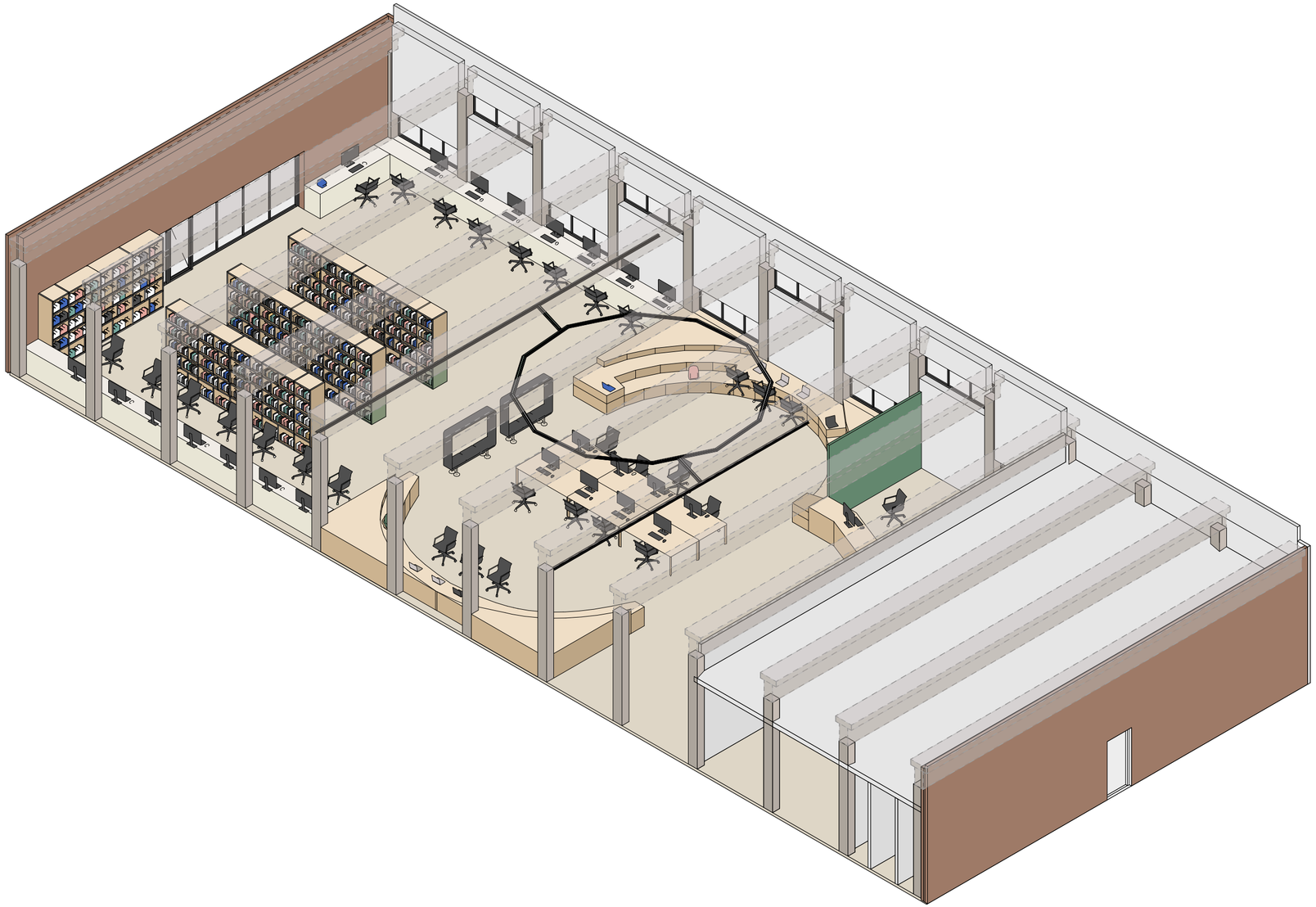
Floor plan



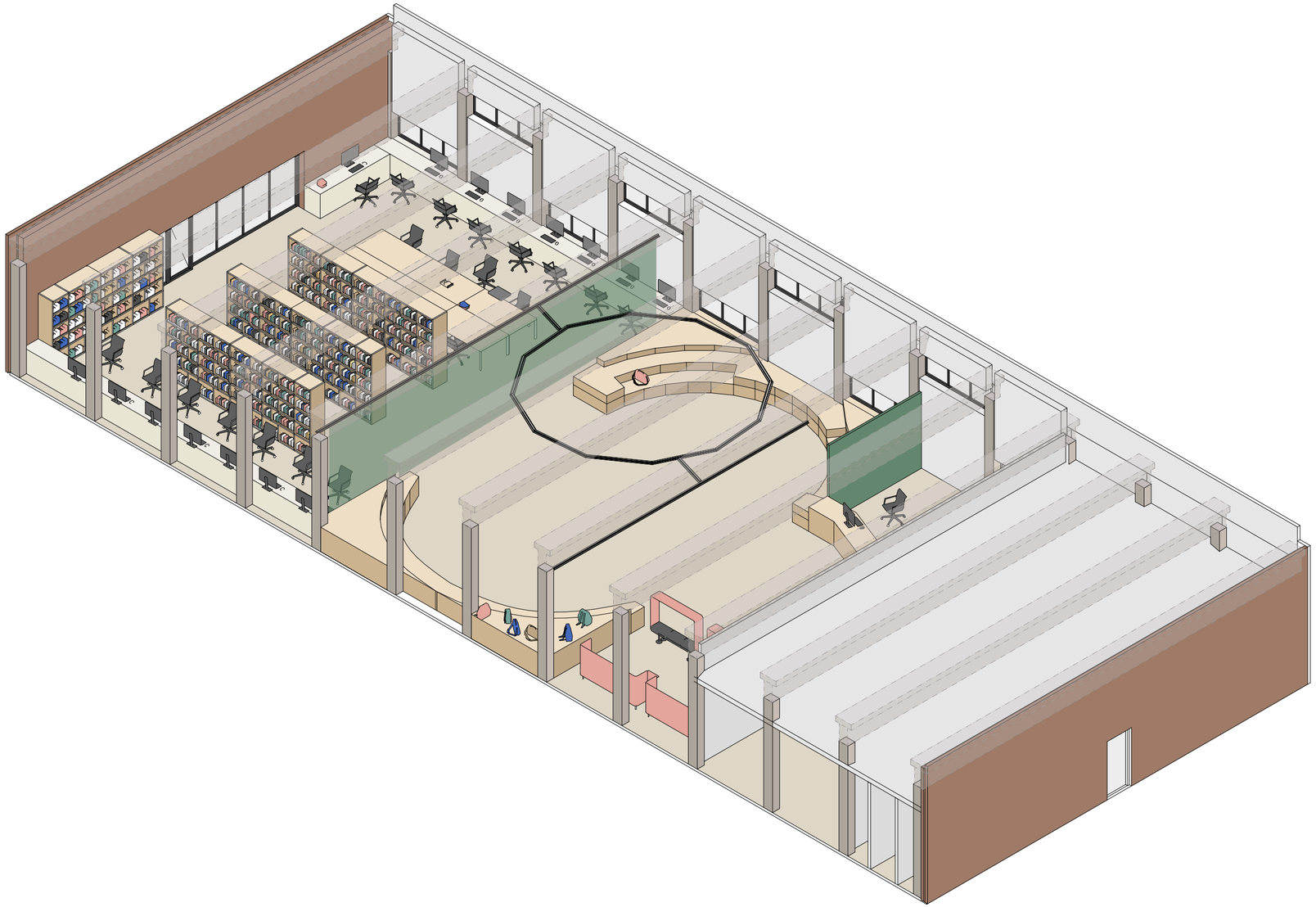
Isometric view of first floor

Program

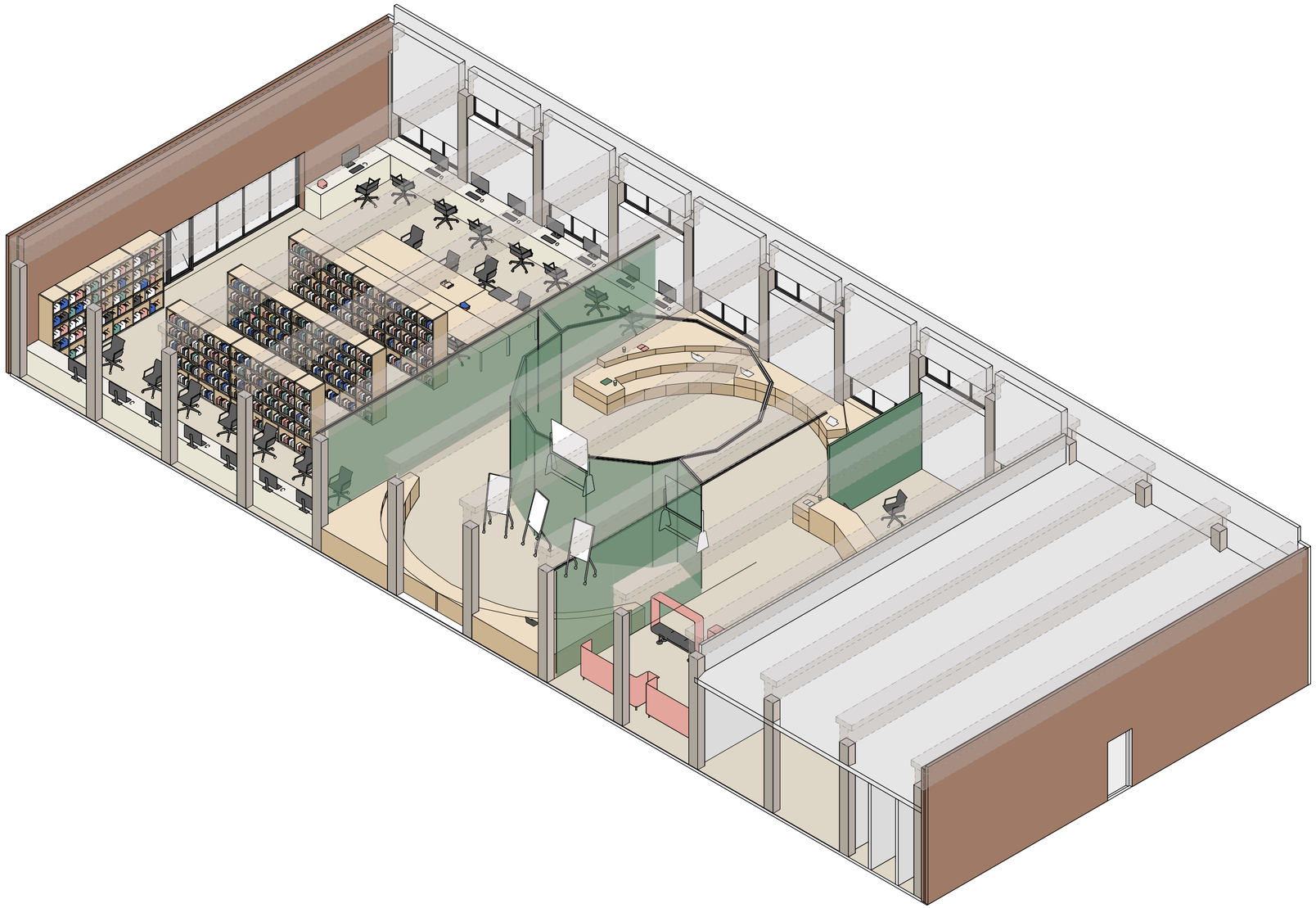
FLEXIBLE LIBRARY



FLEXIBLE LIBRARY



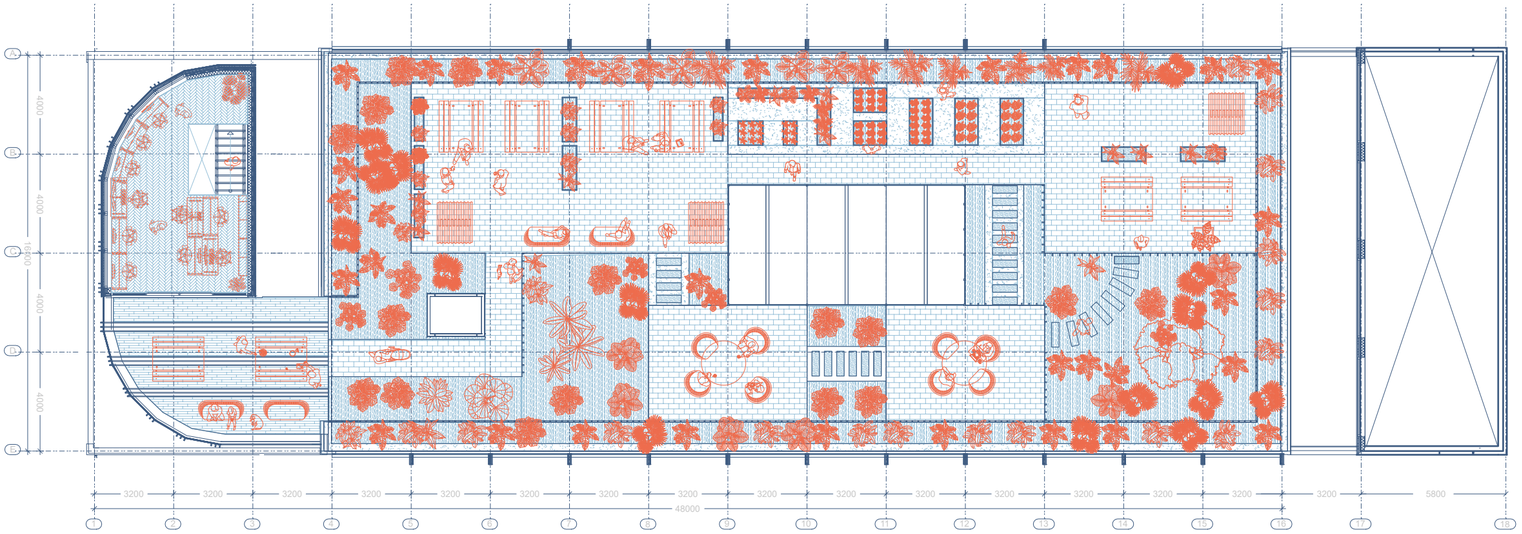
FLEXIBLE LIBRARY



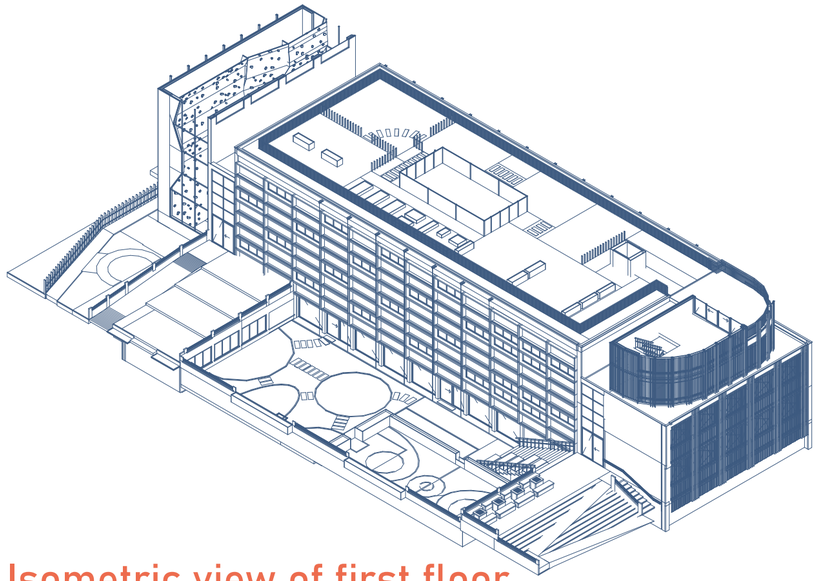
SKY PARK


PV PANELS
GREEN ROOF
PV PANELS
OFFICE
OFFICE
TECHNIAL
LIBRARY
CLIMBING
WALL
FLEX
STAIR
STAIR
LOUNGE
KITCHEN
RESTAURANT
BOXING
DANCE
SPORTSCHOOL

SKY PARK



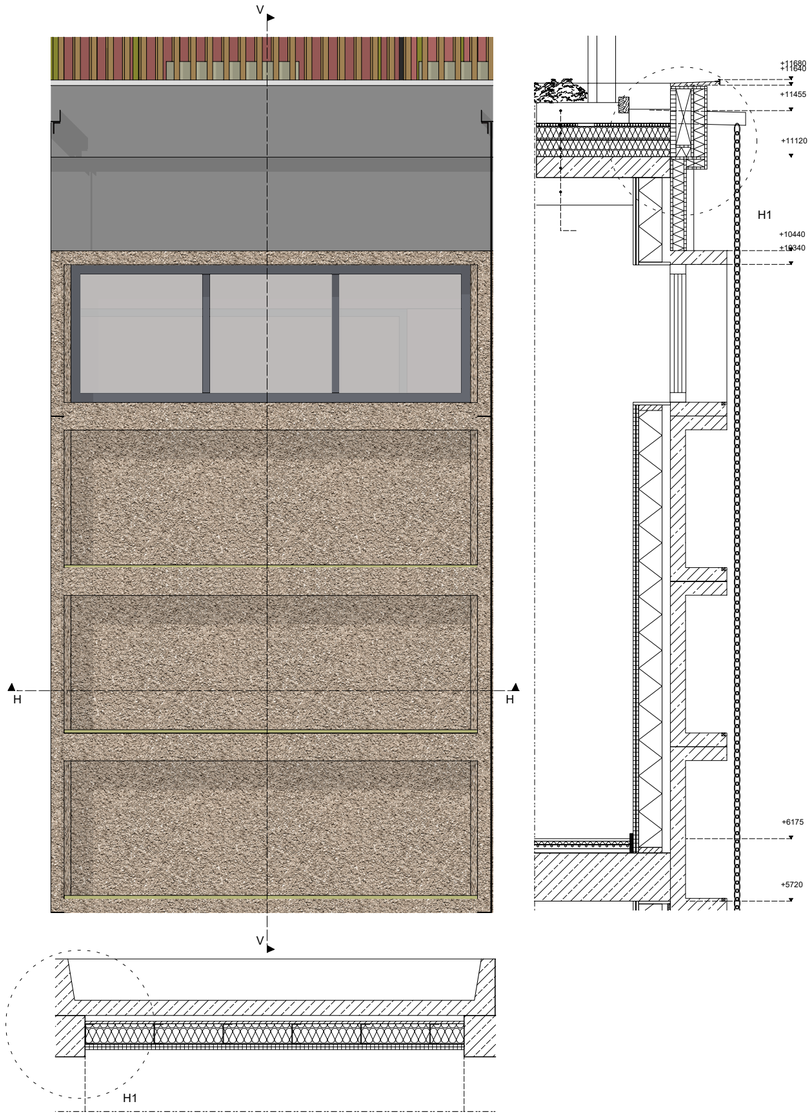
Floor plan



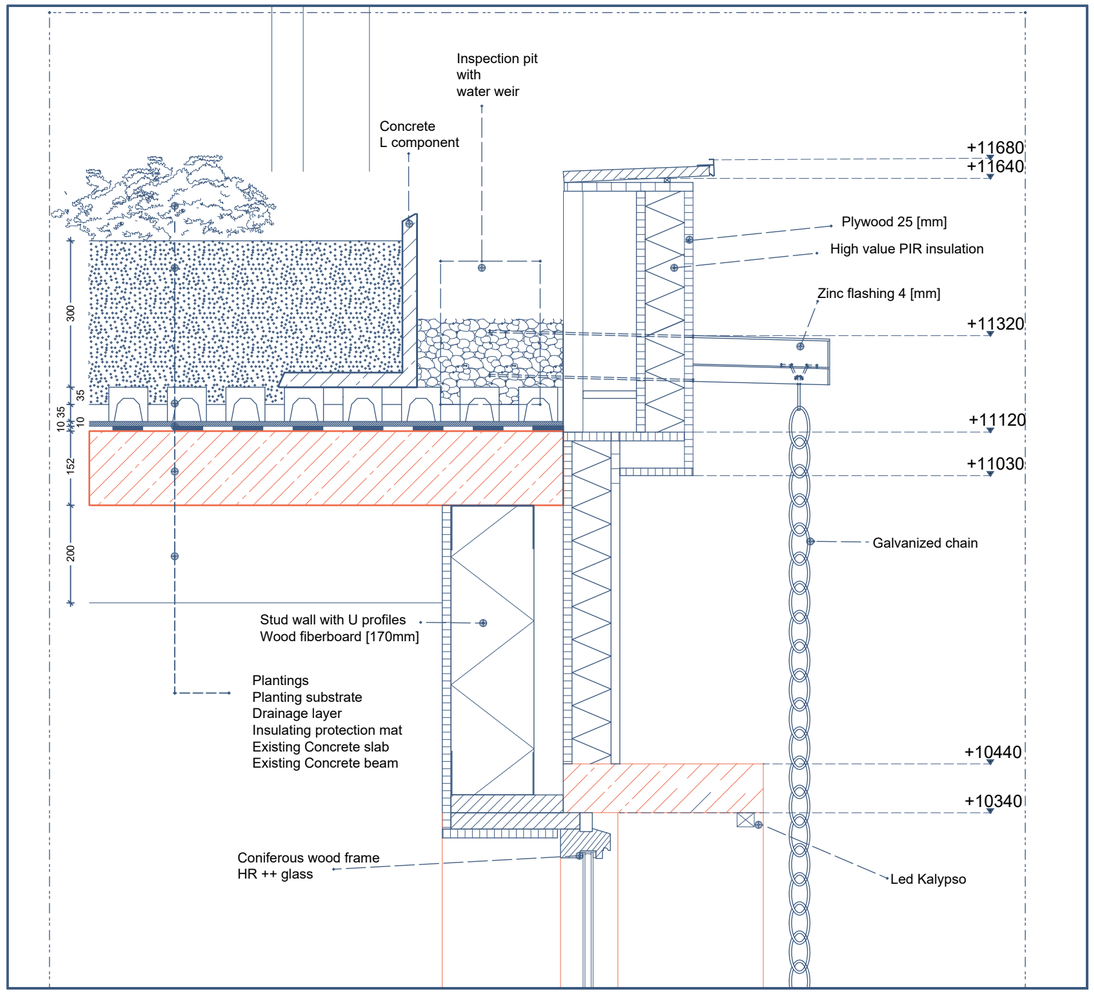
Isometric view of first floor

Program

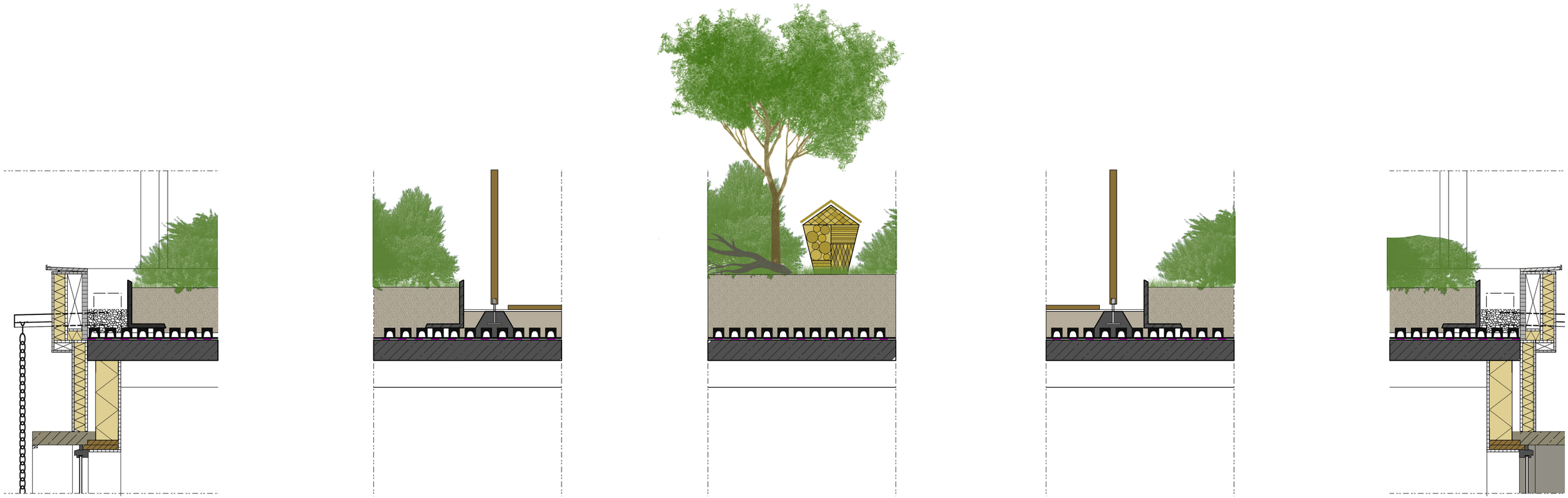
1:20 FRAGMENT



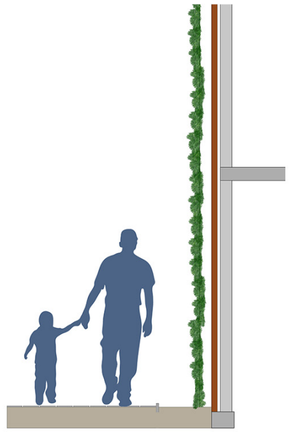
1:5 DETAIL V2

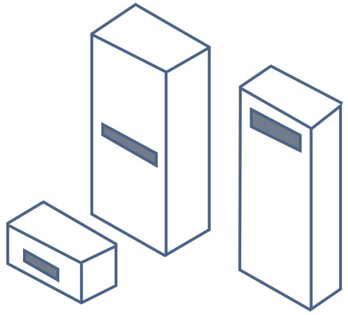


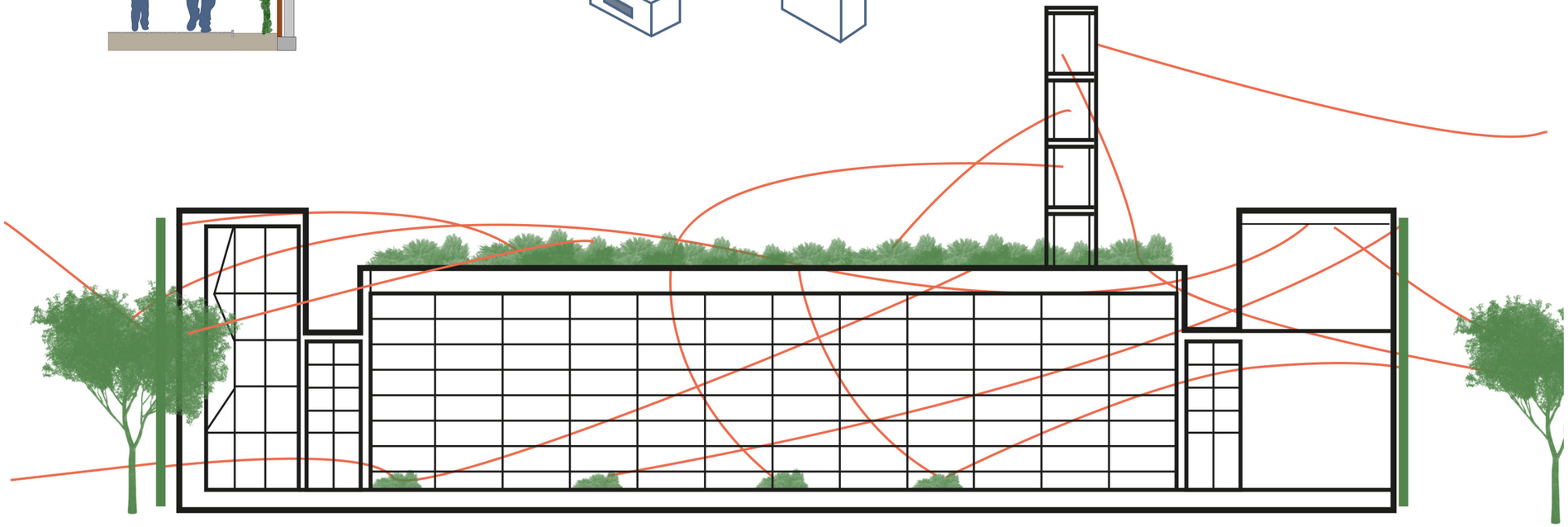
ROOF STRUCTURE



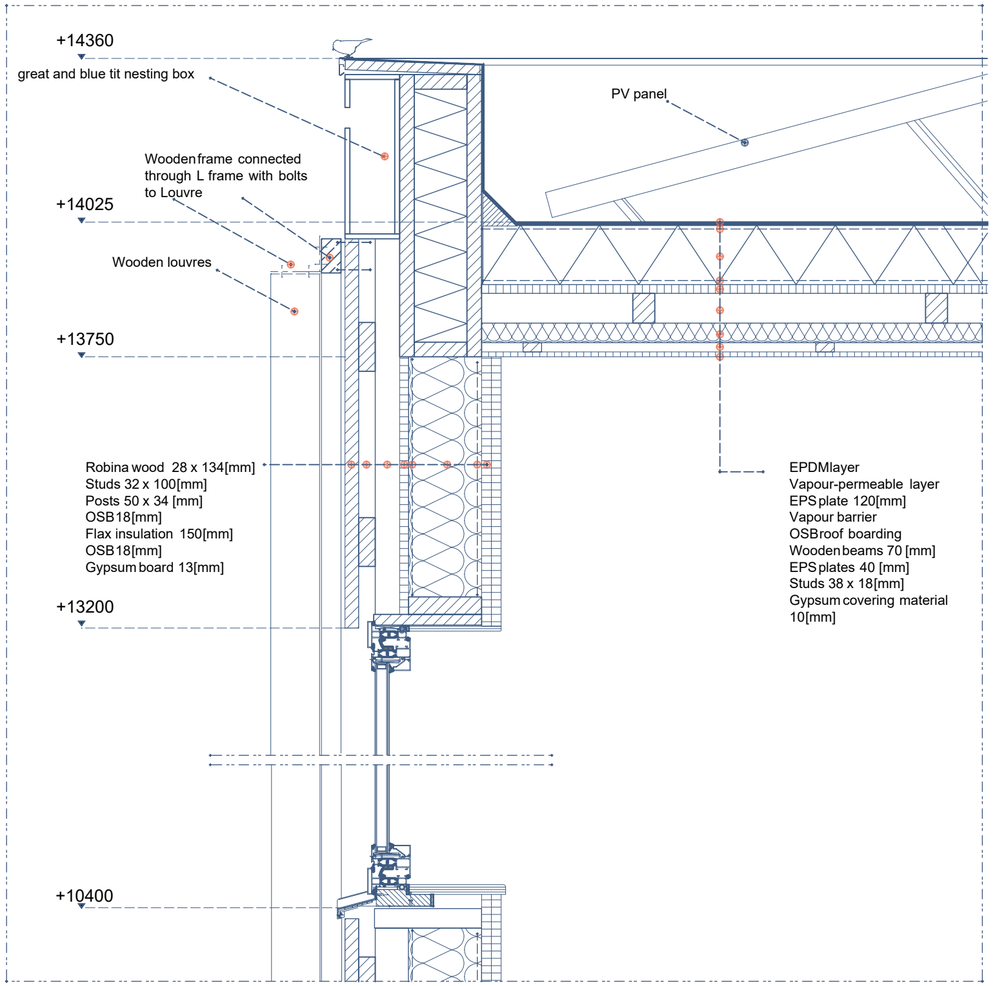
BIODIVERSITY

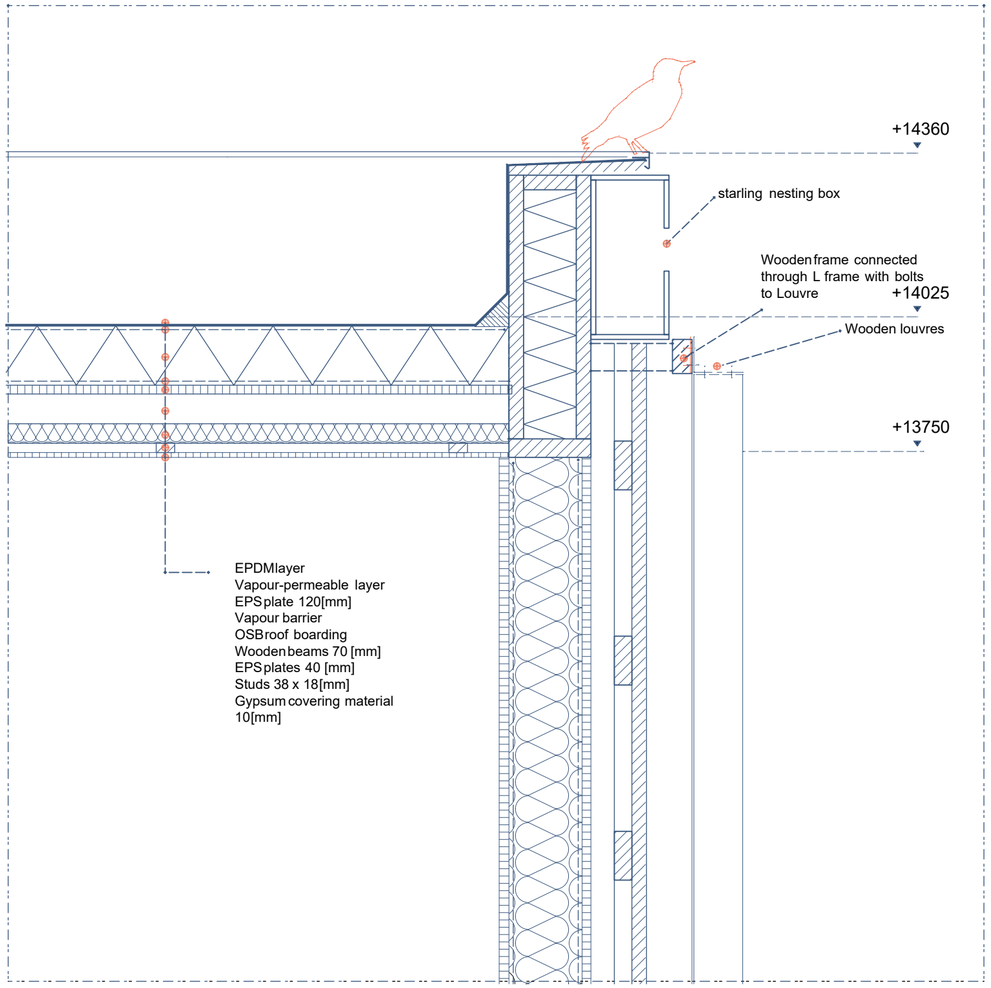






1:5 DETAILS


+14360
great and blue tit nesting box
PV panel
Wooden frame connected through L frame with bolts to Louvre
+14025
Wooden louvres
+13750
Robina wood 28 x 134[mm]
Studs 32 x 100[mm]
Posts 50 x 34 [mm]
OSB18[mm]
Flax insulation 150[mm]
OSB18[mm]
Gypsum board 13[mm]
EPDMlayer
Vapour-permeable layer
EPS plate 120[mm]
Vapour barrier
OSBroof boarding
Wooden beams 70 [mm]
EPS plates 40 [mm]
Studs 38 x 18[mm]
Gypsum covering material
10[mm]
+13200
+10400


+14360
starling nesting box
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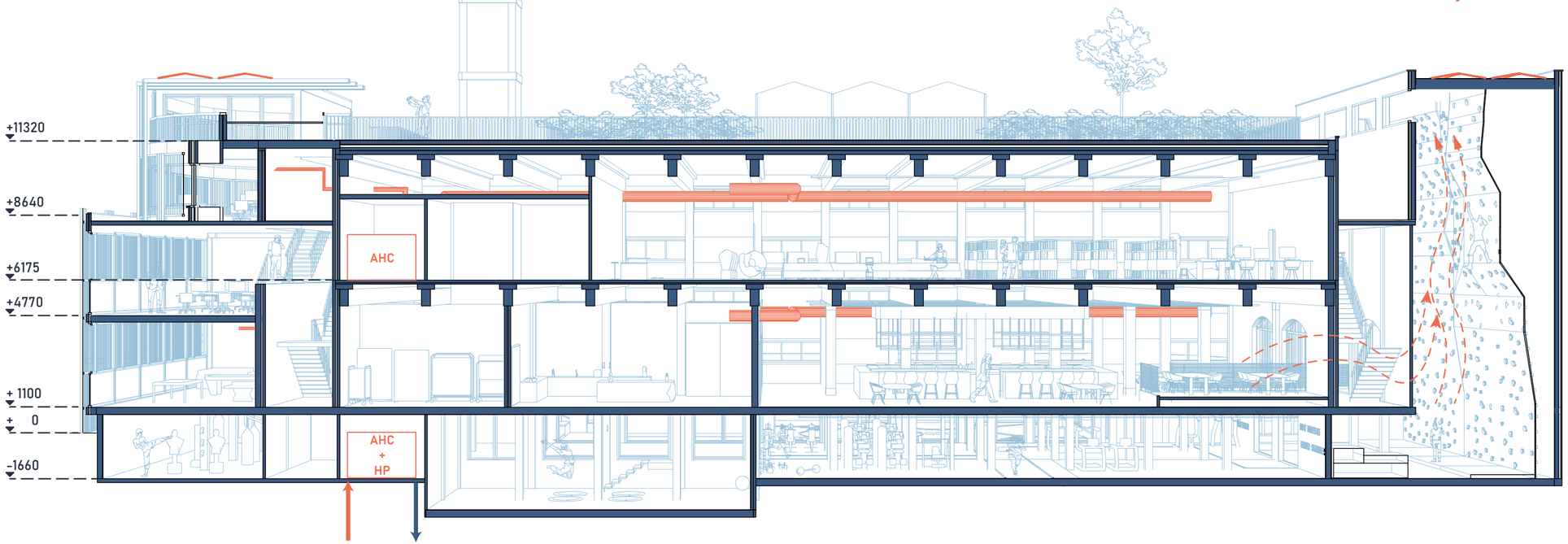
EPDMlayer
Vapour-permeable layer
EPS plate 120[mm]
Vapour barrier
OSBroof boarding
Wooden beams 70 [mm]
EPS plates 40 [mm]
Studs 38 x 18[mm]
Gypsum covering material
10[mm]

CLIMTATIC DESIGN

VENTILATION WORKPLACES
Expected amount of people (max) = 25
A= V/(3600*3)
A= 0.12 [m²]
d = 0.38 [m]

VENTILATION GYM/RESTAURANT/LIBRARY
Expected amount of people (max) = 100
A= V/(3600*3)
A= 0.46 [m²]
d = 0.76 [m]

SOLAR PANELS
Oriented towards East and West
Total amount of 49 solar panels
Area = 83.2 m²
Total = 37485 kwh/year

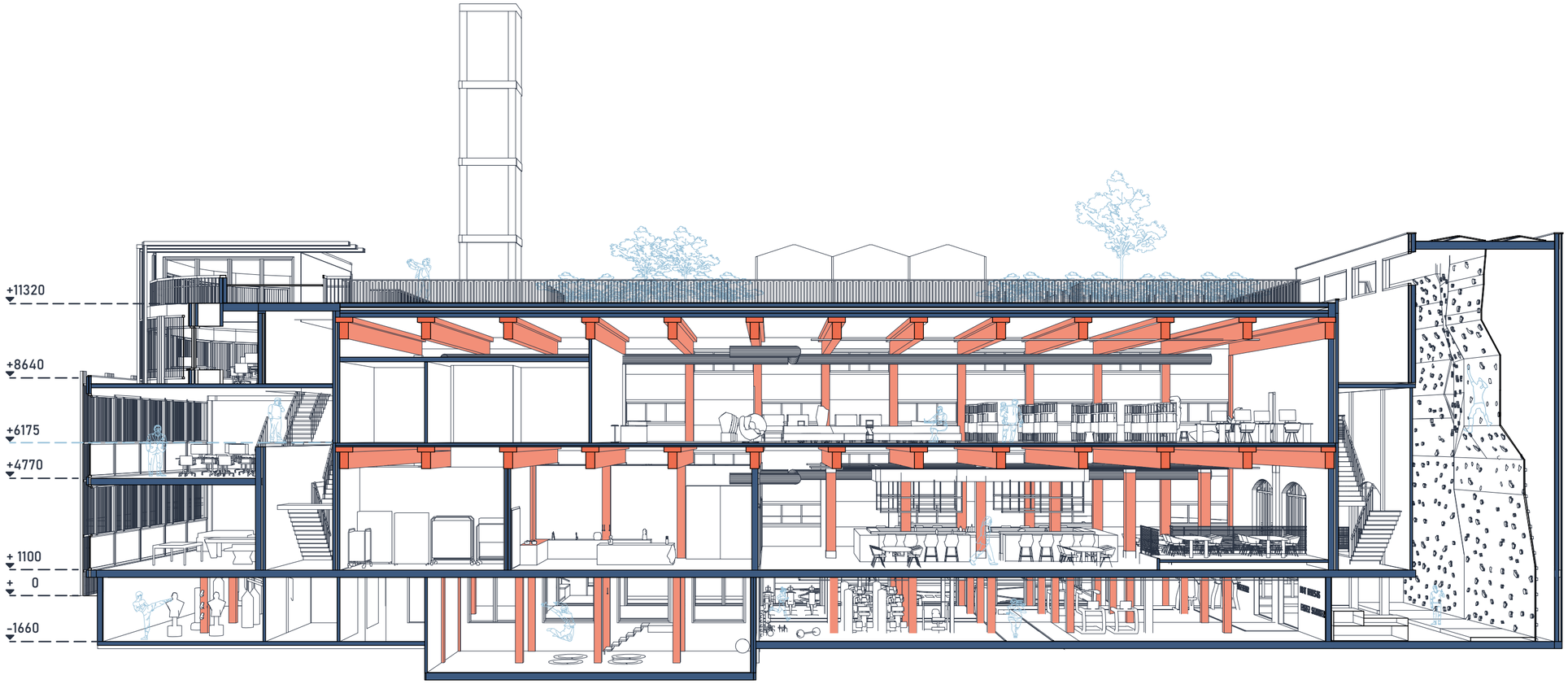


AIRHANDELING CABINET
Two airhandeling cabinets are installed within the building

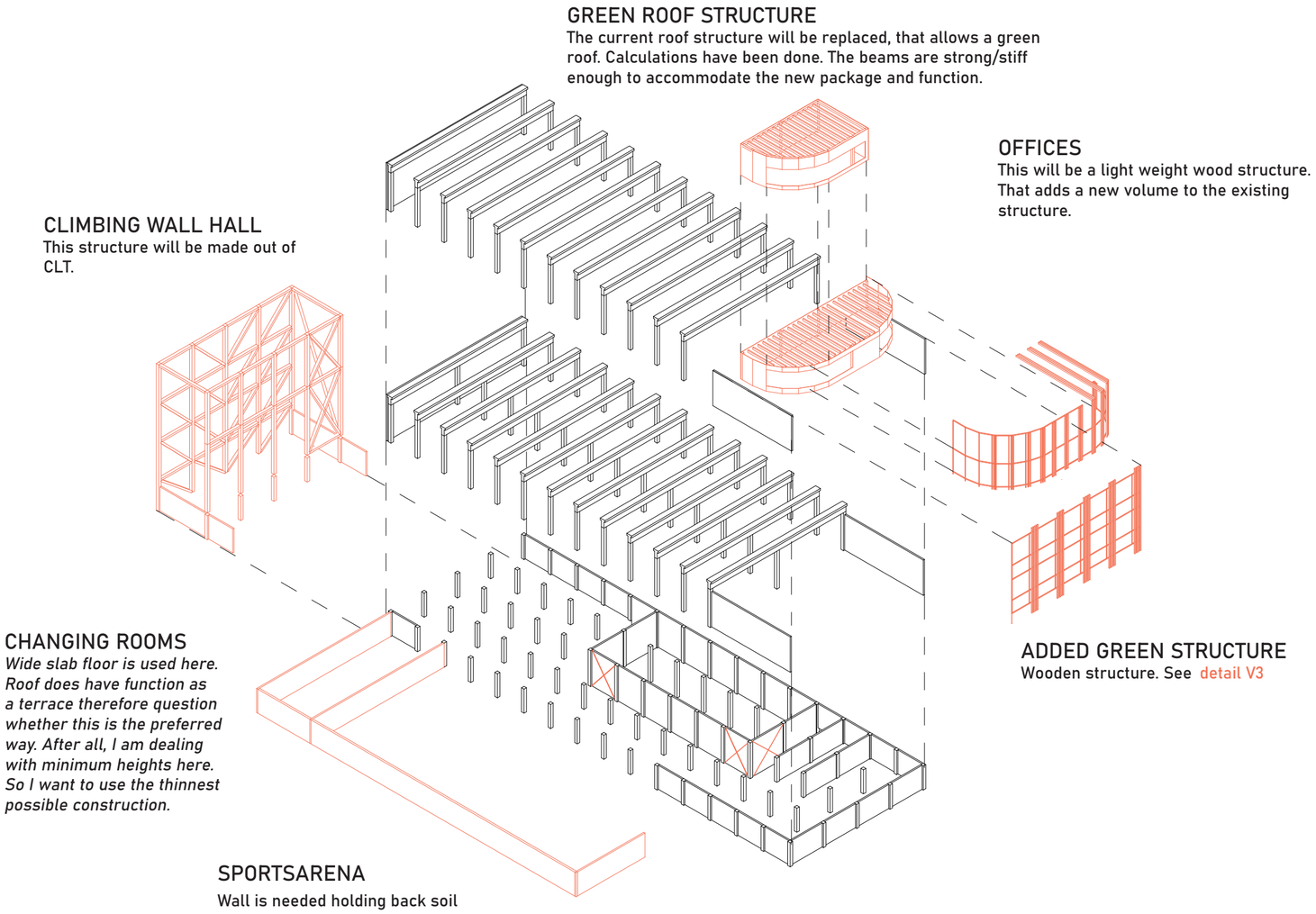
HEAT PUMP
Within the technical rooms ther is a heat pump.
Connected on a heat cold storage

FLOOR HEATING
Inside the building underfloor heating is installed on the existing floor

STRUCTURAL DESIGN

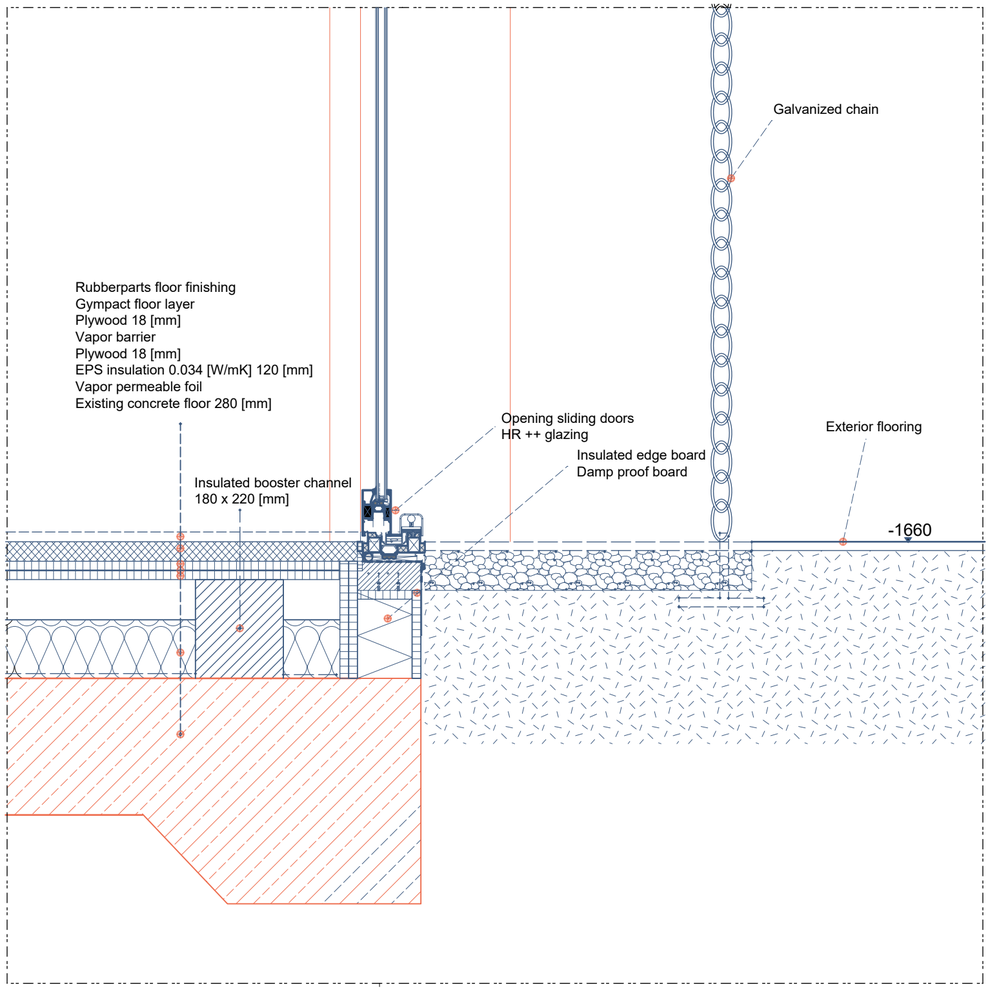


STRUCTURAL DESIGN

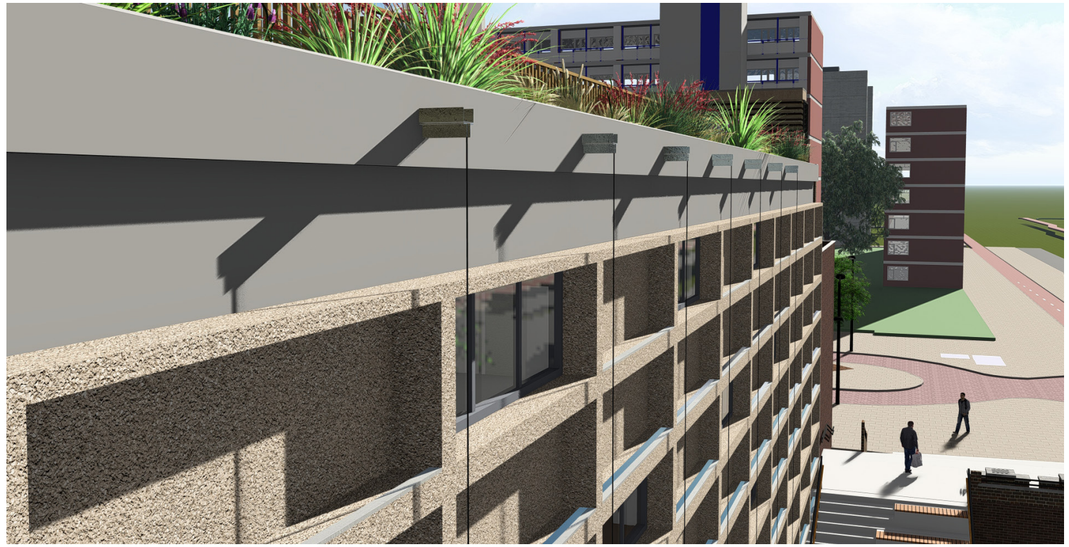


1:50 FRAGMENT

1:5 DETAIL V1



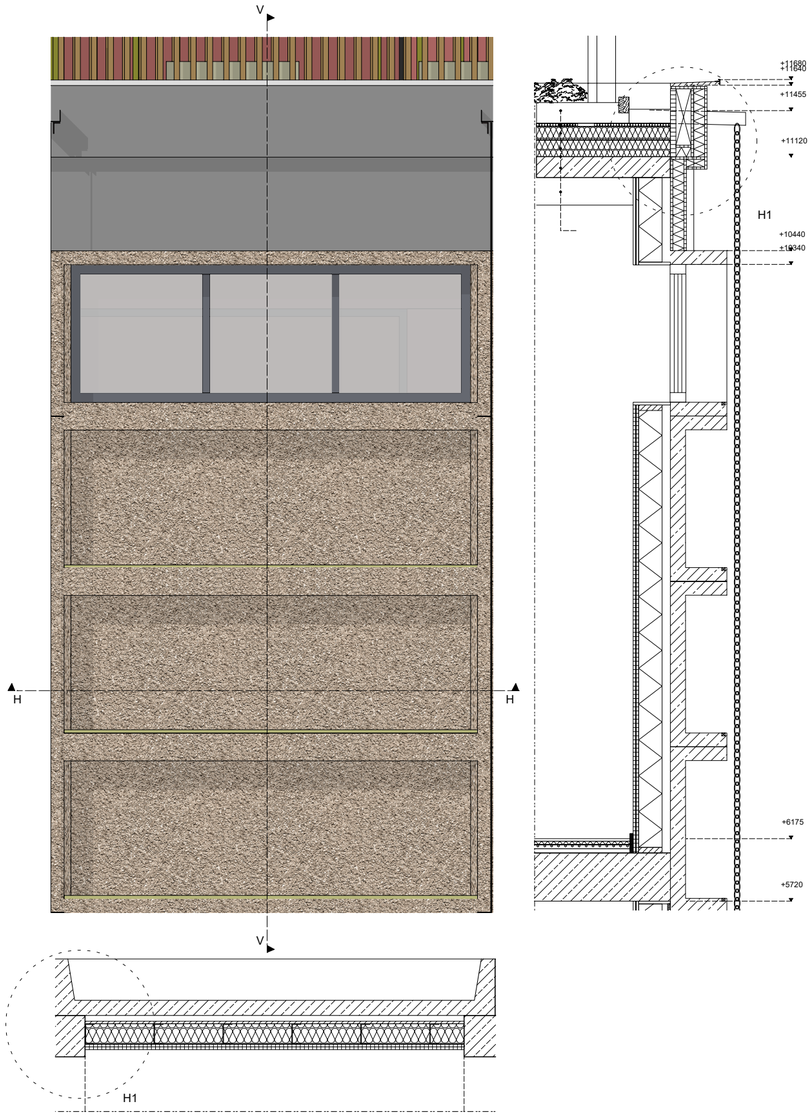
WATER TREATMENT



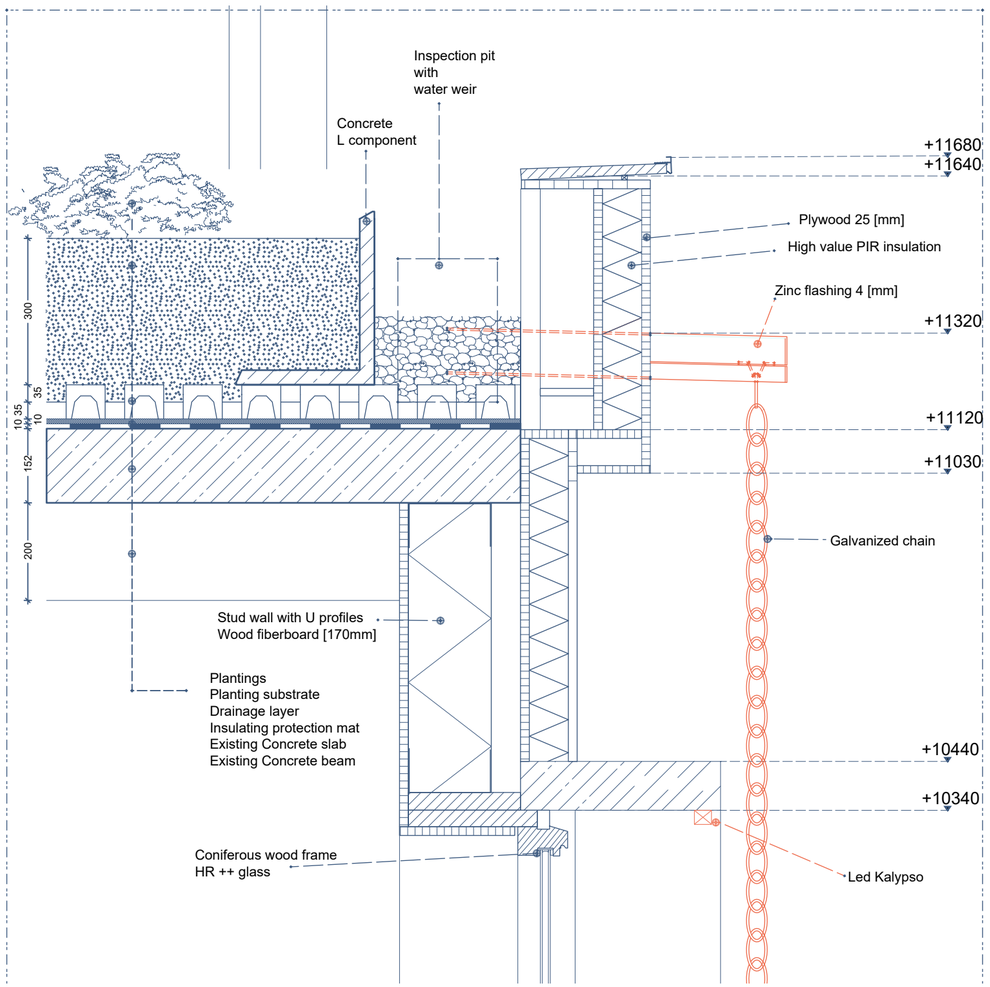
4 x 5.000 L

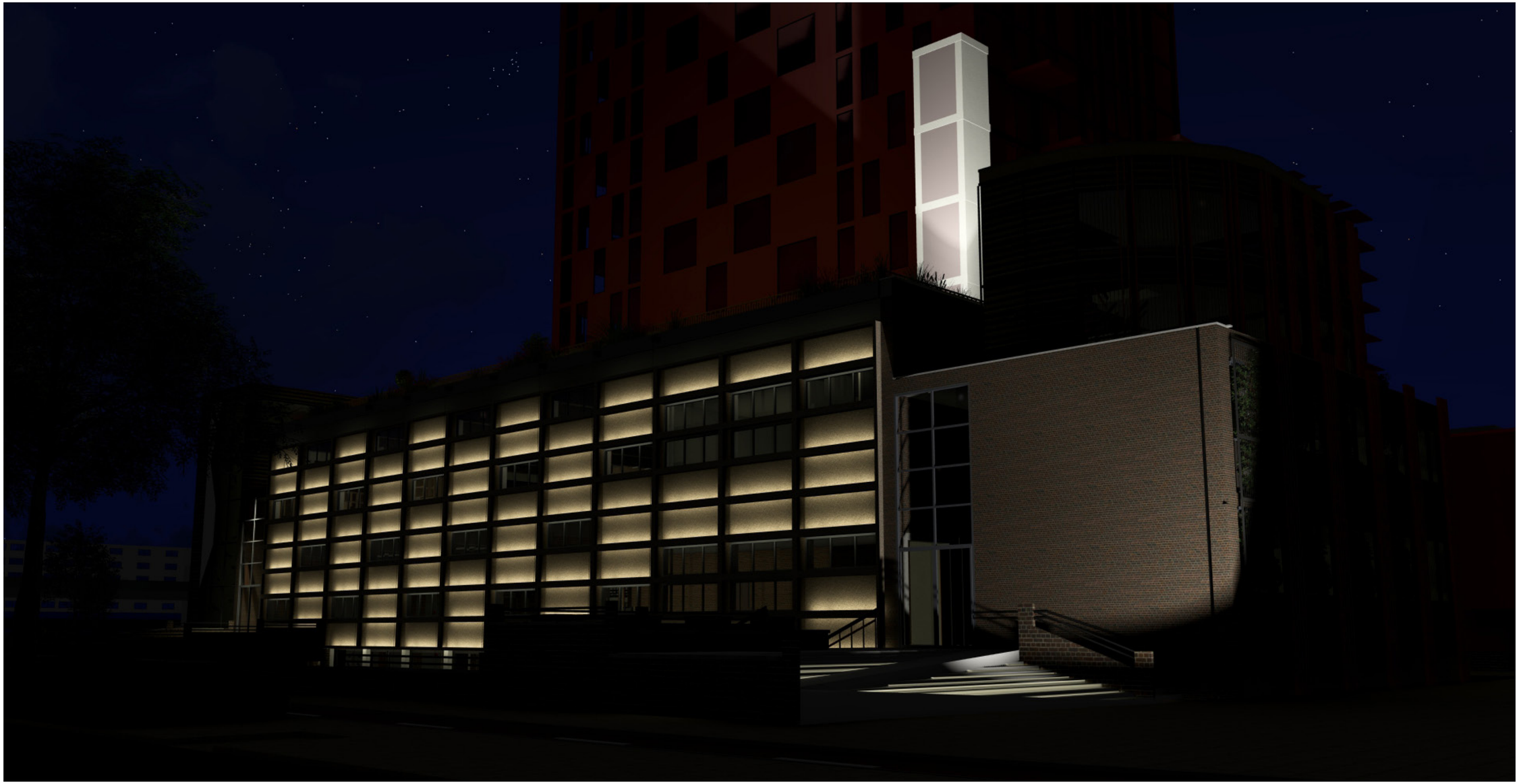
60% full at
extreme scenario
12280 L in total

1:20 FRAGMENT



1:5 DETAIL V2





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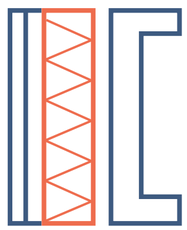
9. Preserve materials with high E.E amount
10. Apply materials with low E.E amount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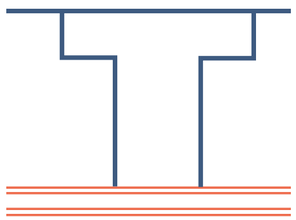
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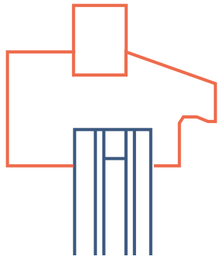
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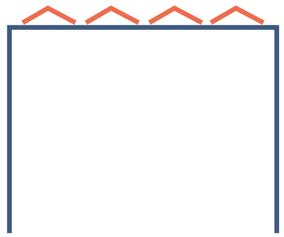
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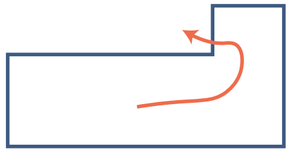
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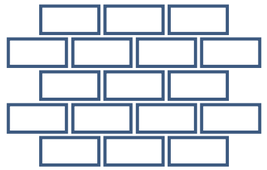
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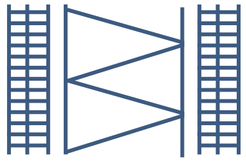
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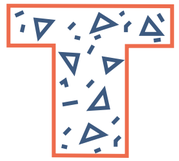
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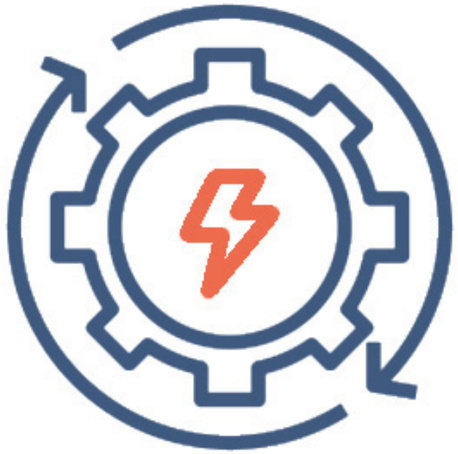
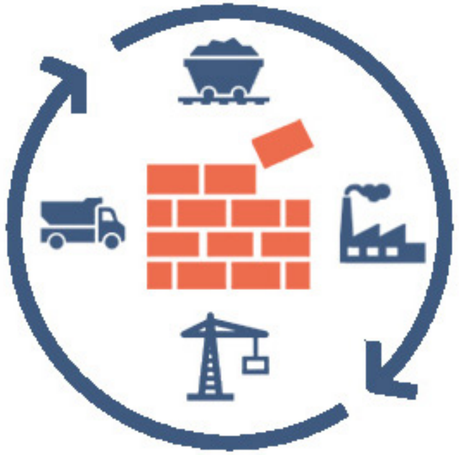
10.

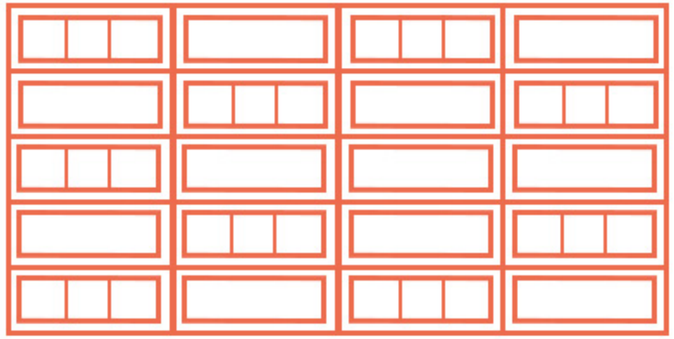
CONCLUSIONS



EMBODIED ENERGY

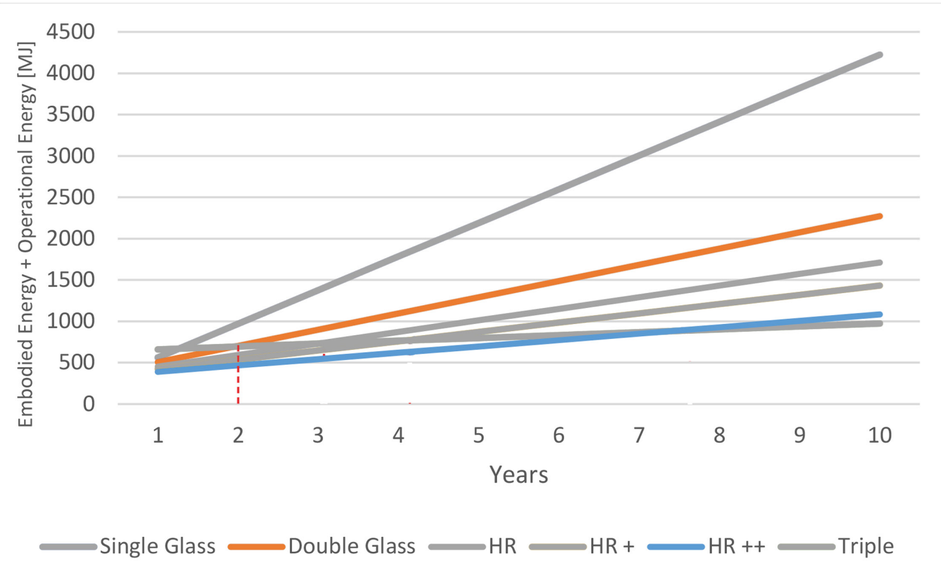


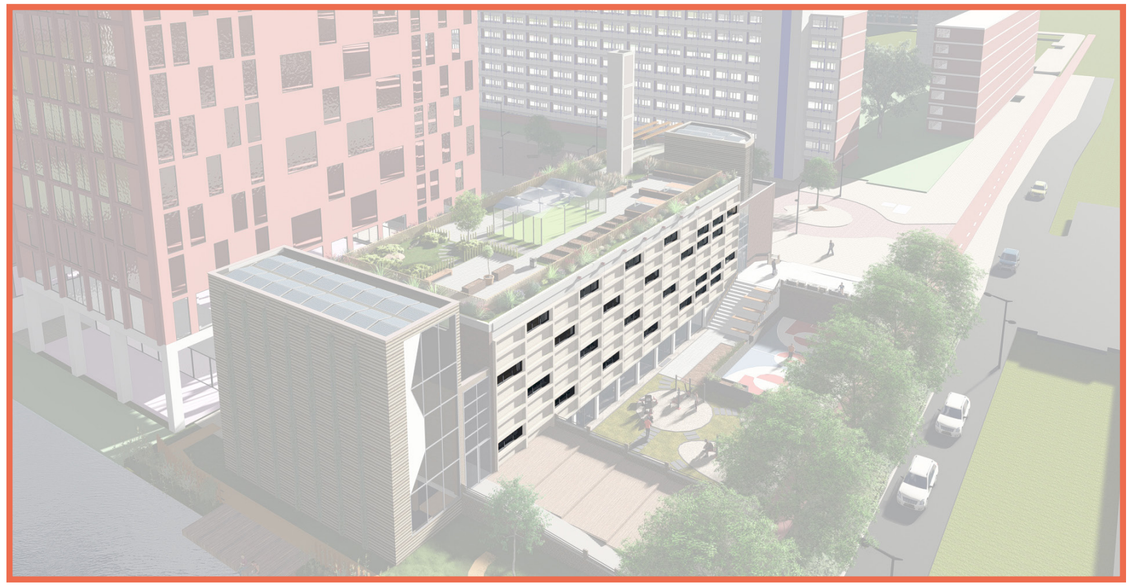
OPERATIONAL ENERGY

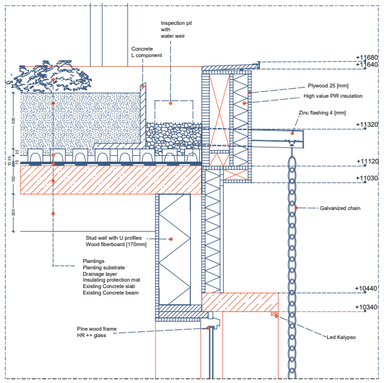


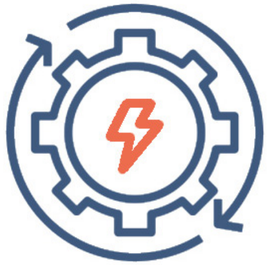
HERITAGE

WINDOW REPLACEMENT









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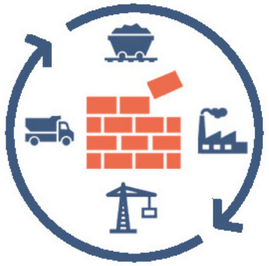

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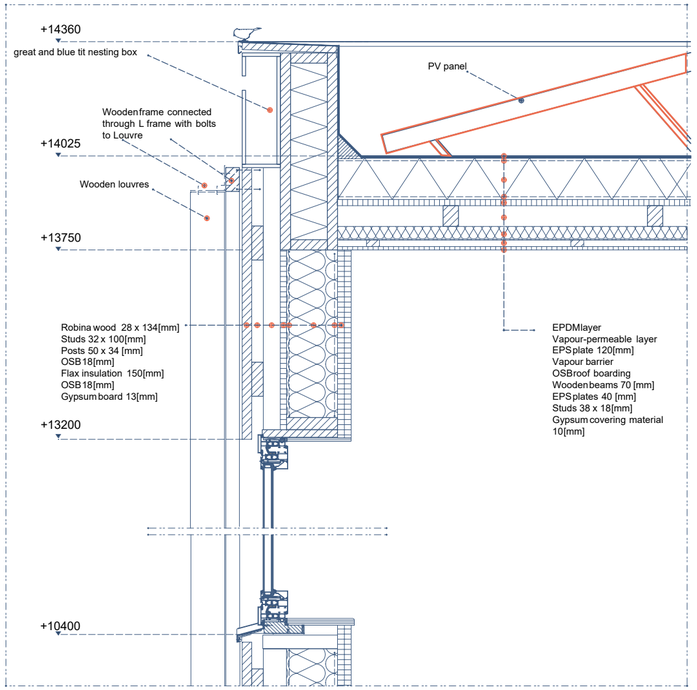
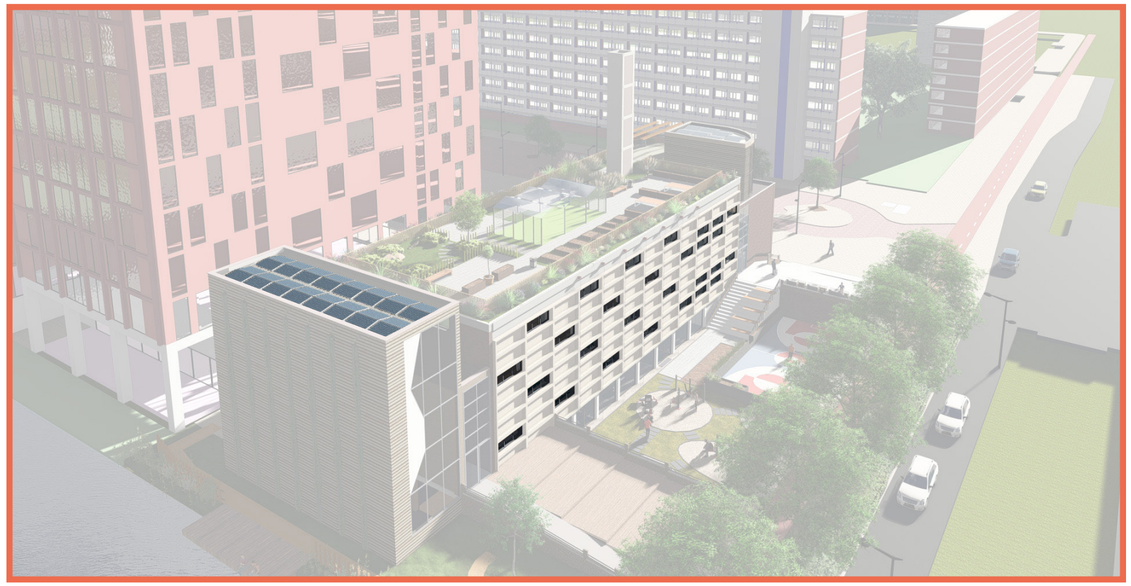
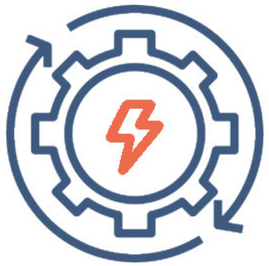
RENEWABLE ENERGY





Total of 49 PV panels
Area = 83.3 m²

Total = 37.4585 kwh/Year



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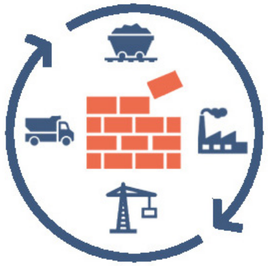

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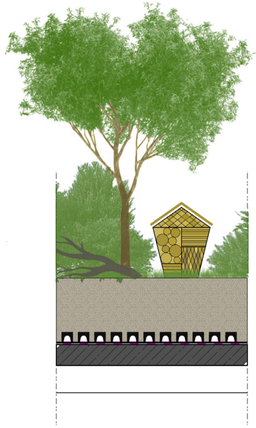
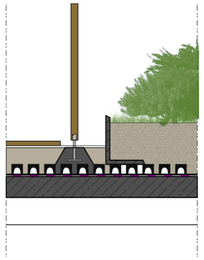
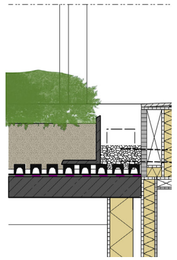
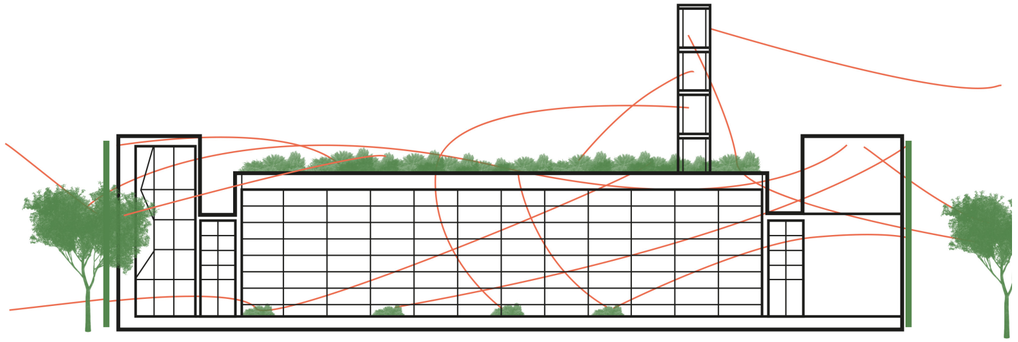
+/-

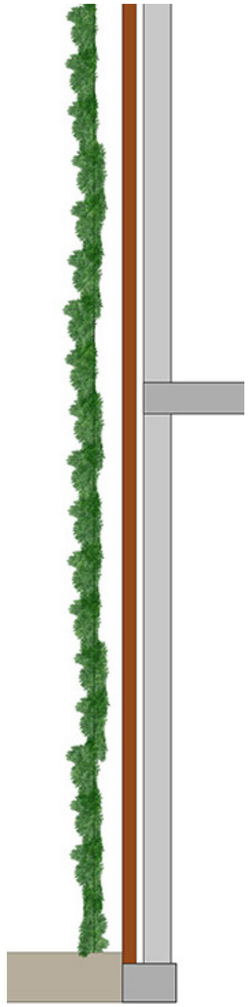
PASSIVE COOLING

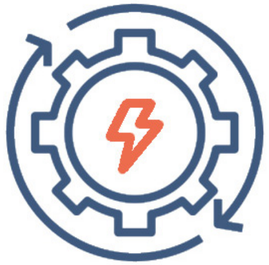












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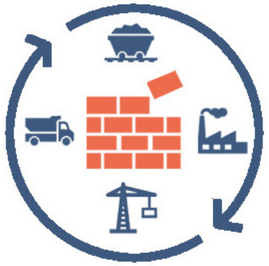

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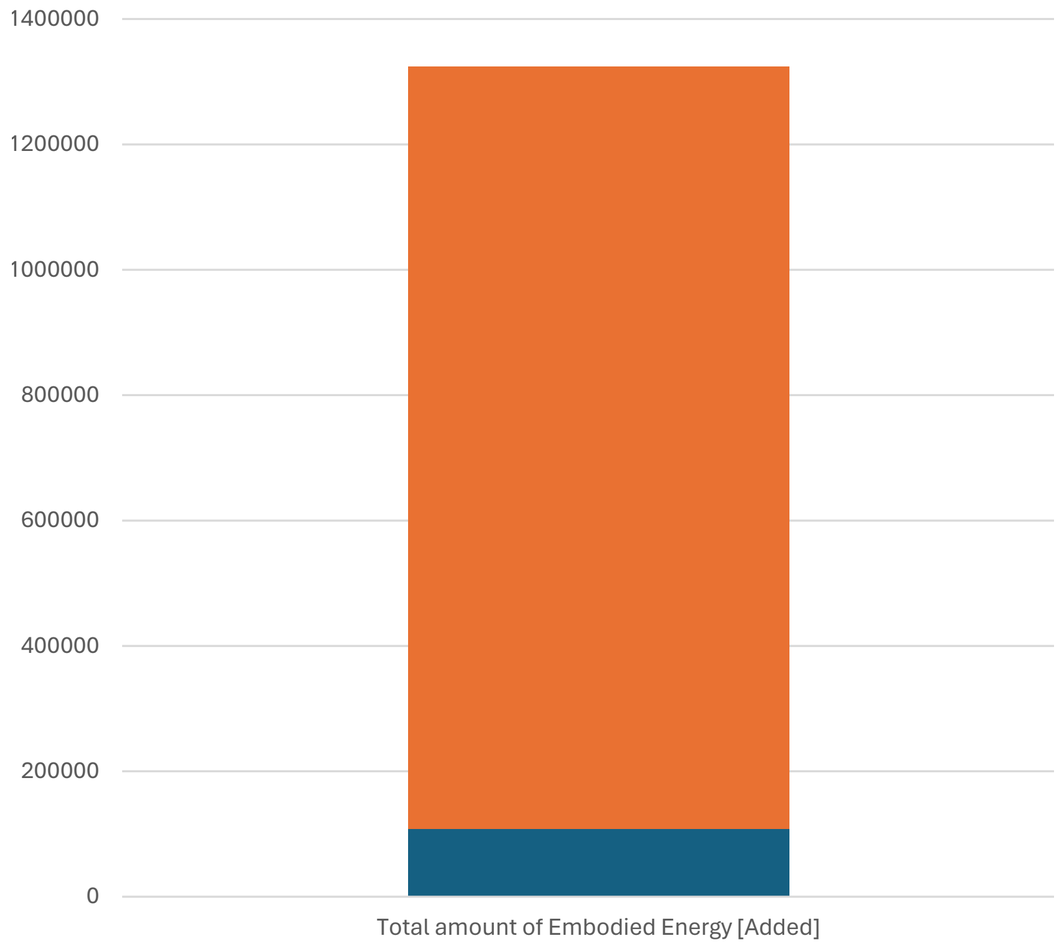
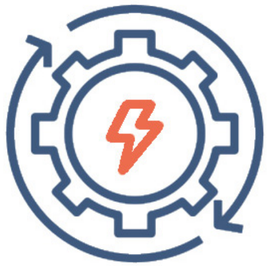
ADD SUSTAINABLE MATERIALS





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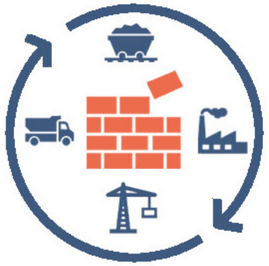

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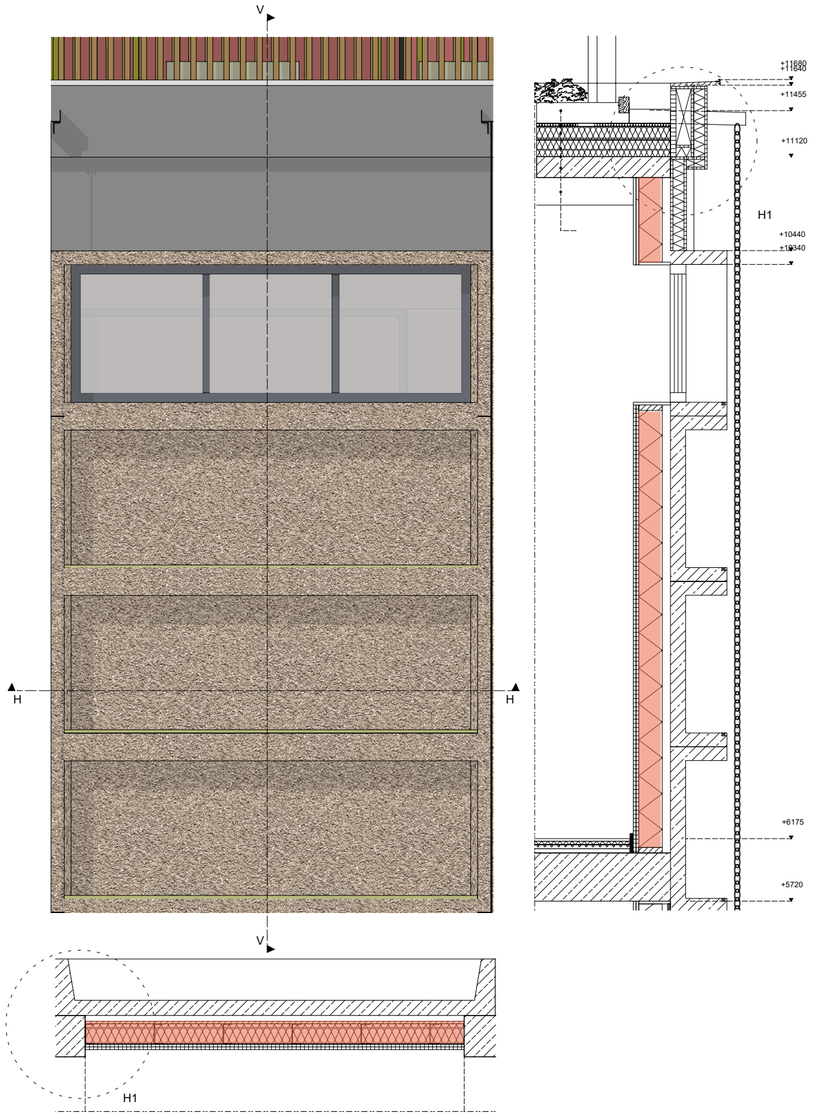
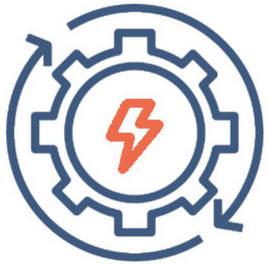
+/-

INTERNAL INSULATION





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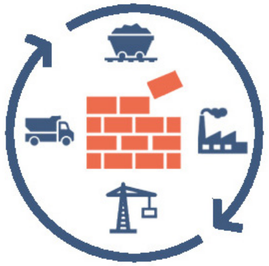


+/-

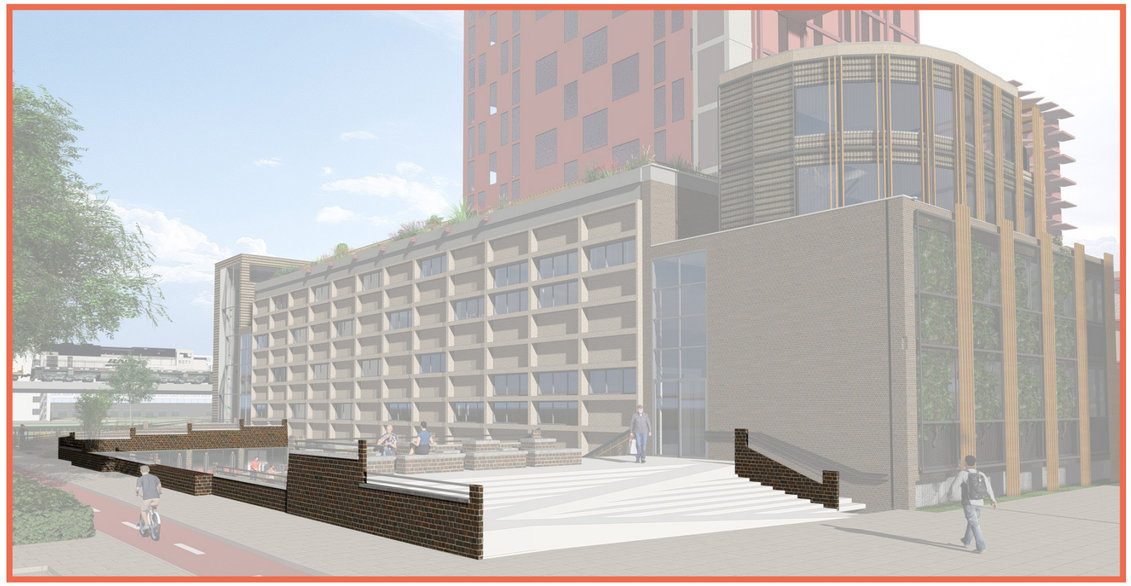
+

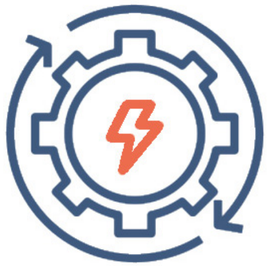
REUSE OF BRICKS

Total amount of ‘reusable brick = 36 [m^3]

Within the direct context I am able to reuse 64% for a new purpose

23 [m^3] will be used as boarding alongside the Sportsarena and entrances of
‘De Centrale’





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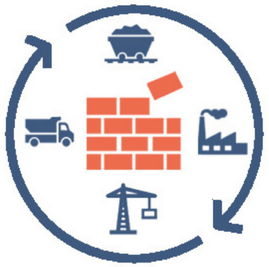

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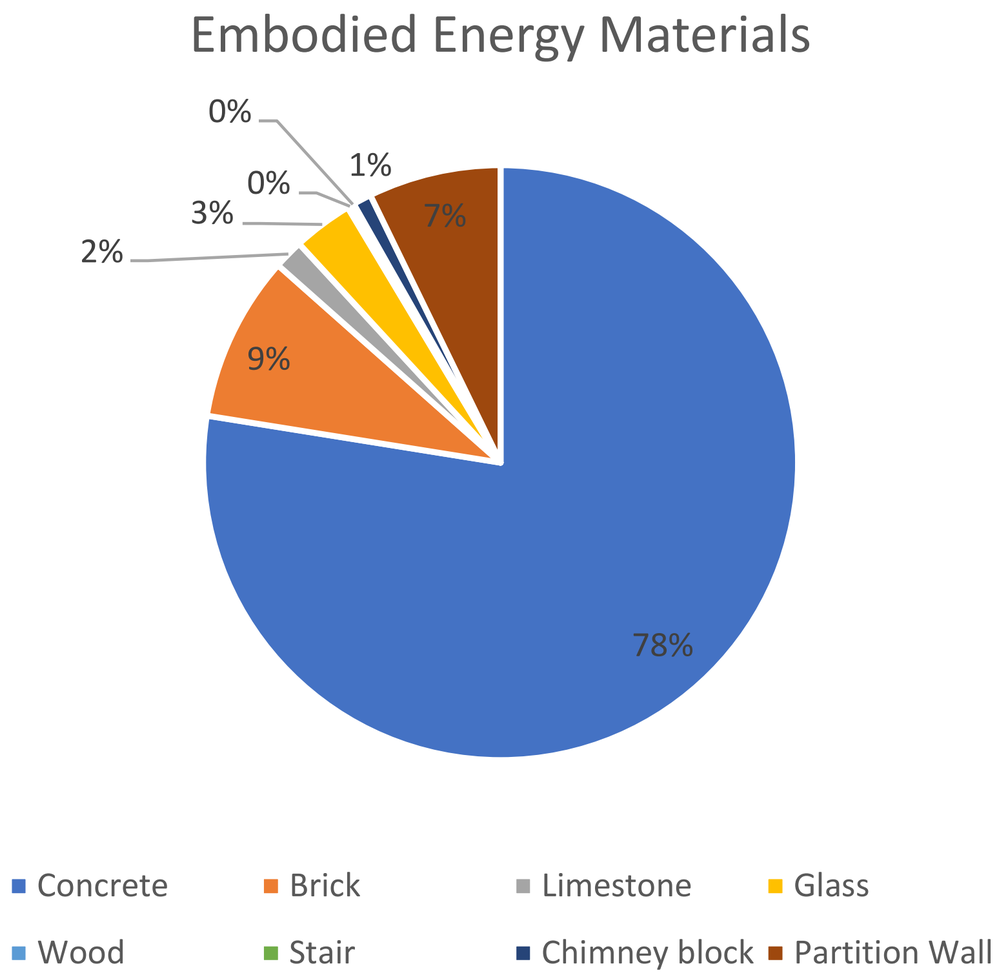
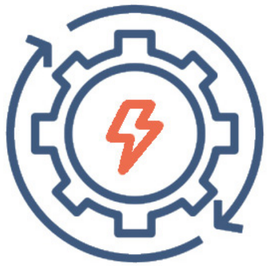
PRESERVE HIGH E.E MATERIALS





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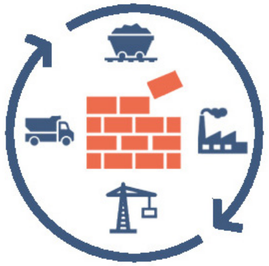

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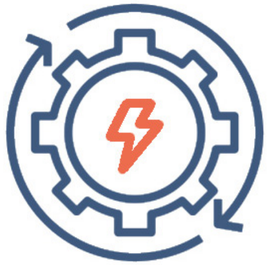
SMART SERVICE INSTALLATION



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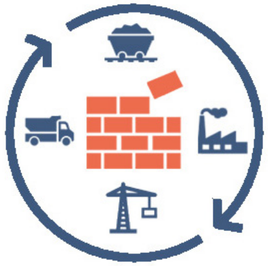

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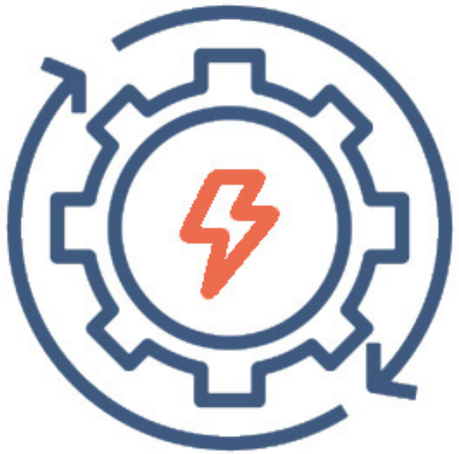
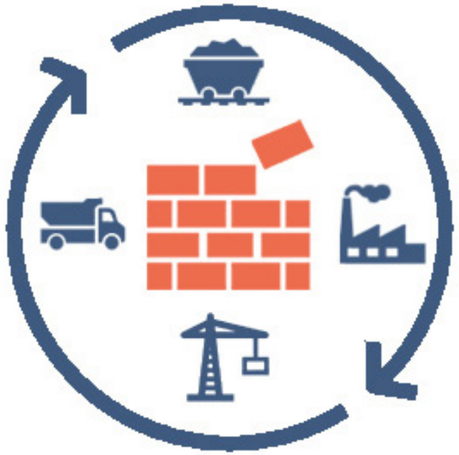
CONCLUSIONS



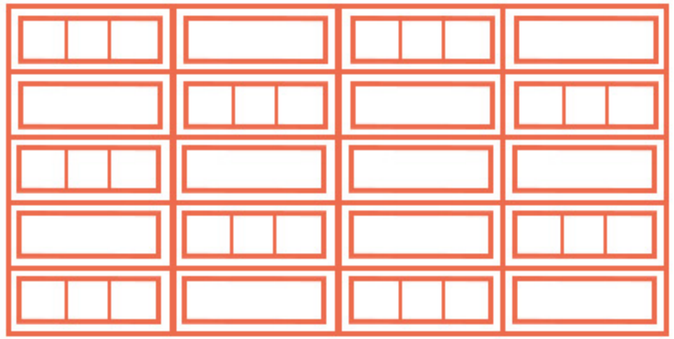
EMBODIED ENERGY

INCREASE OF 9.8%



OPERATIONAL ENERGY

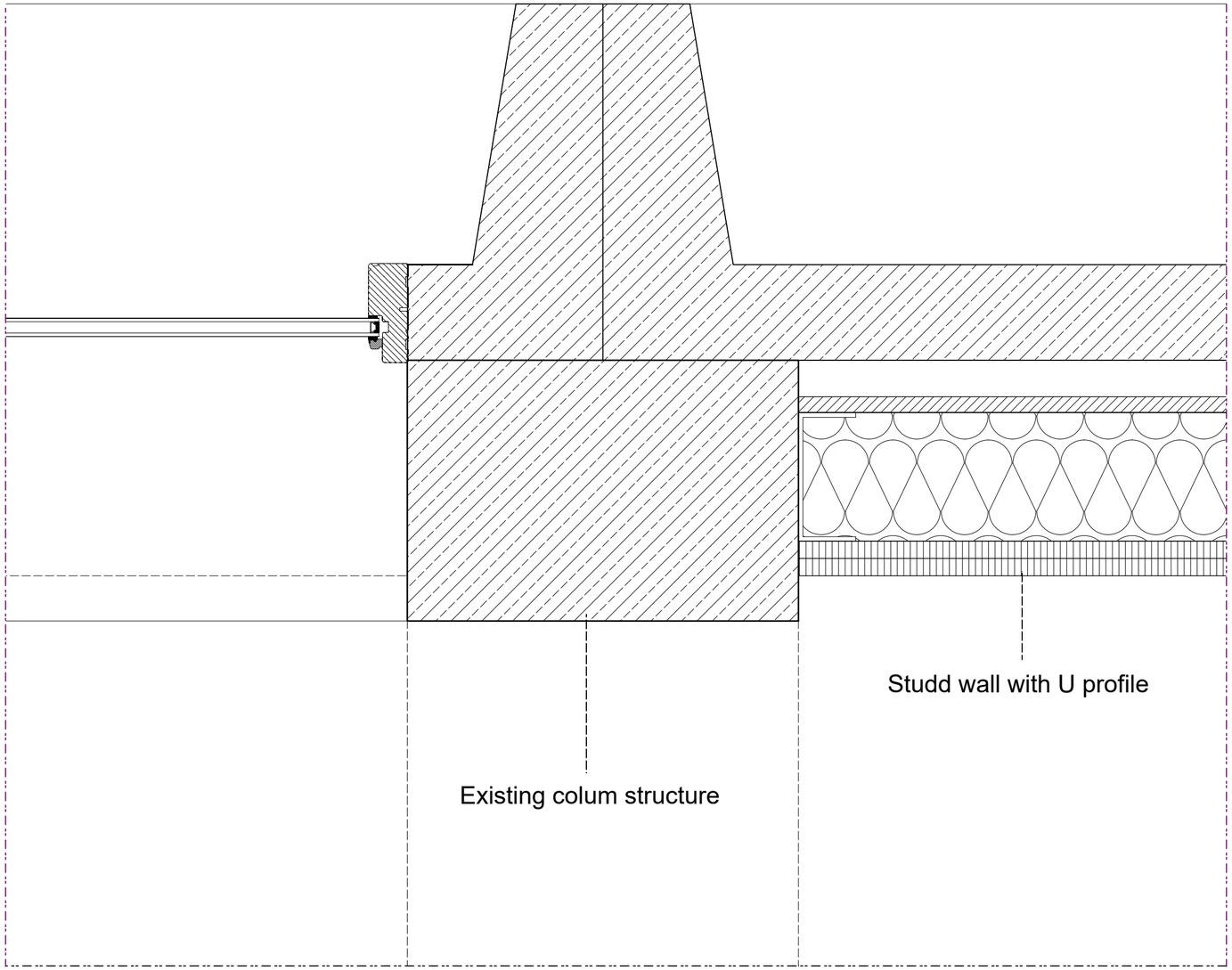
DECREASES TO 21%



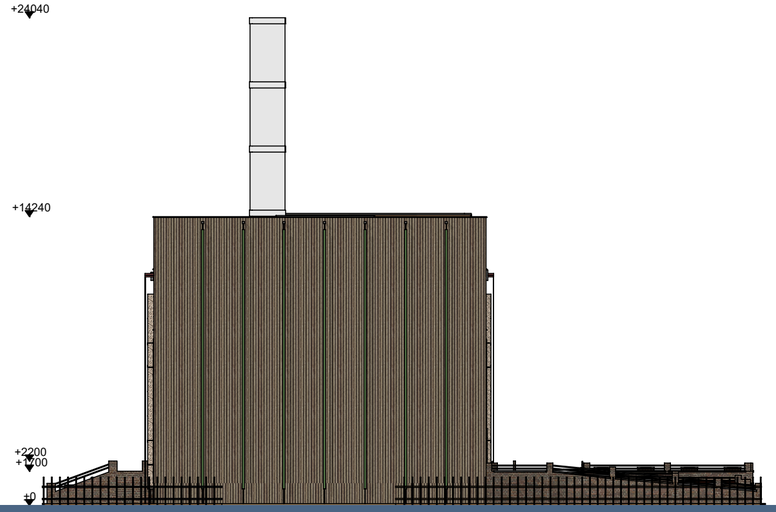
HERITAGE

POSITIVE IMPACT
PRESERVATION OF VALUES

EXTRA

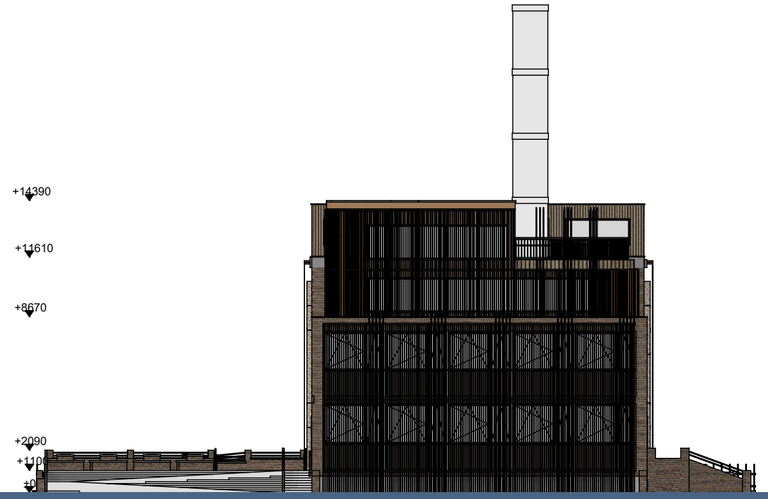


North

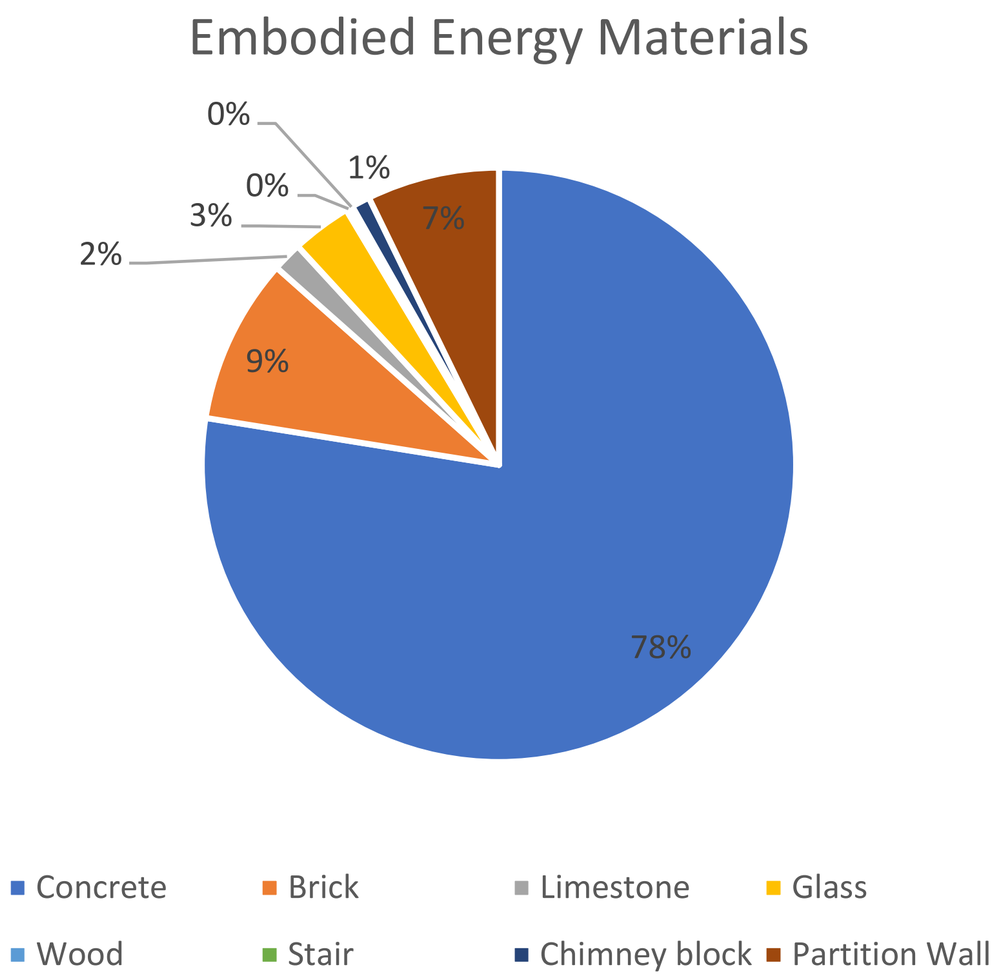


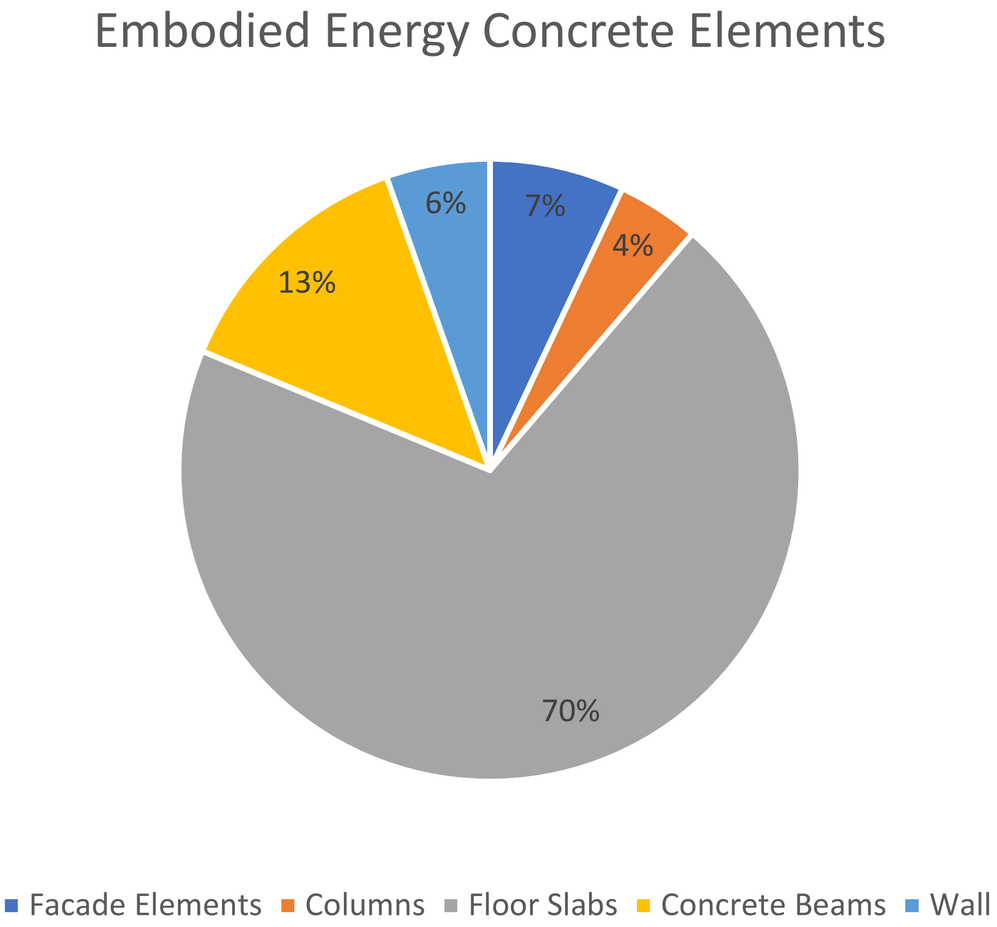
East

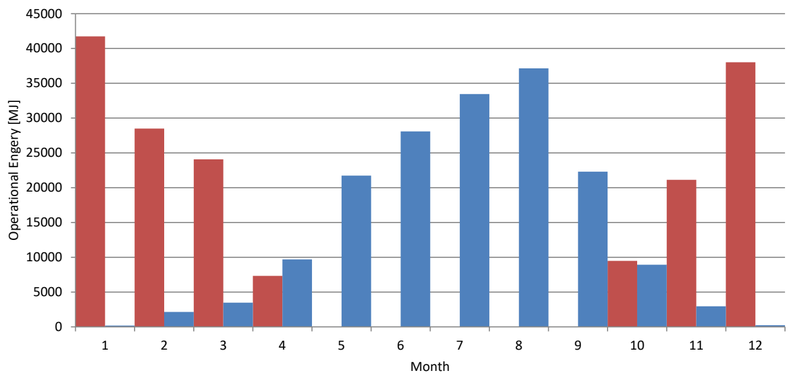
South

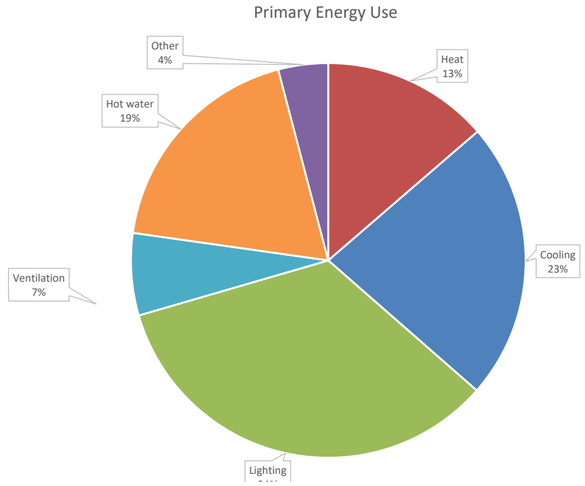


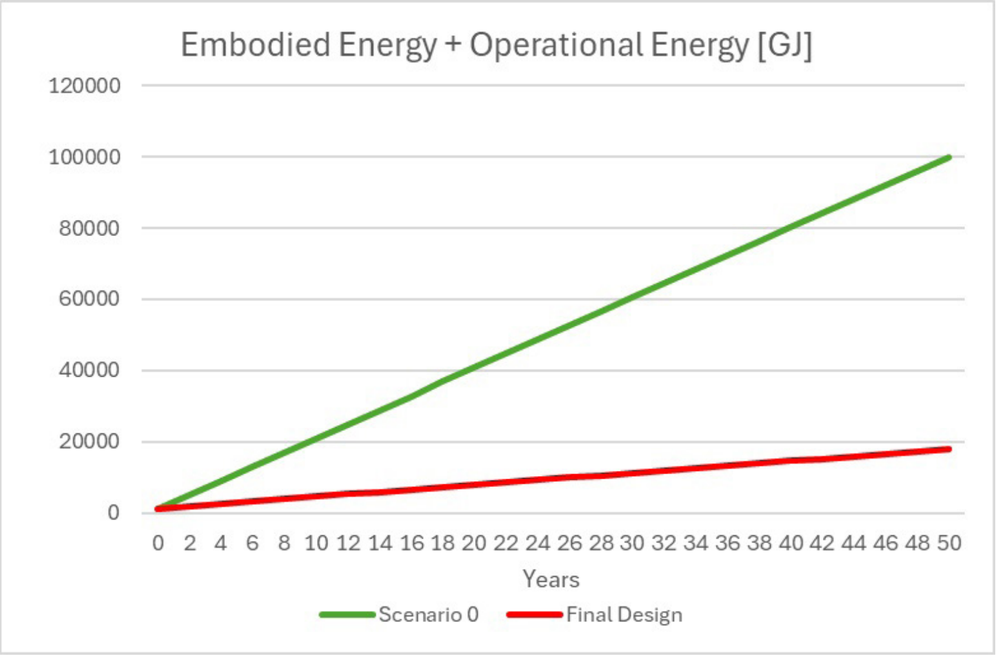
West

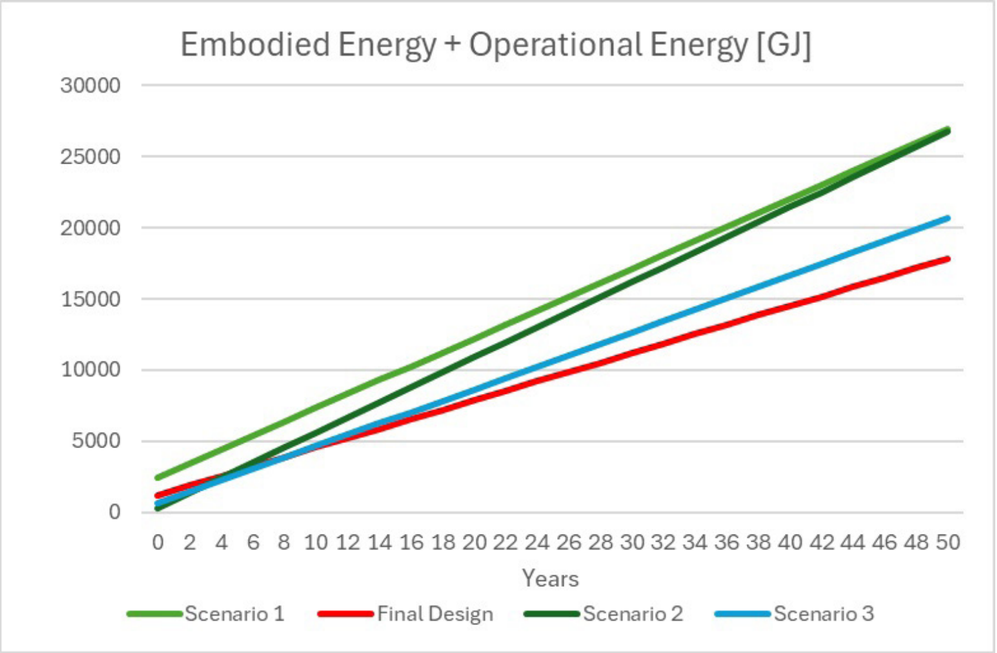

Embodied Energy Materials
0%
0%
1%
3%
7%
2%
9%
78%
Concrete
Brick
Limestone
Glass
Wood
Stair
Chimney block
Partition Wall

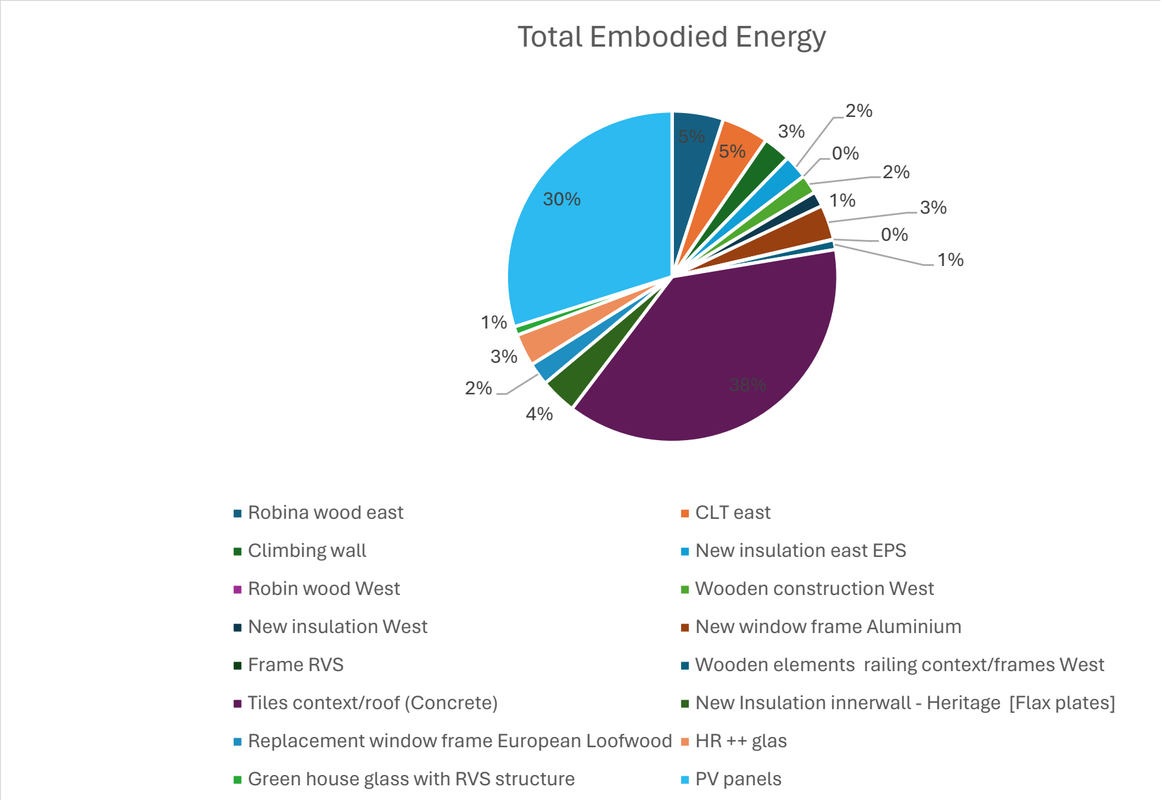

Embodied Energy Concrete Elements
6%
7%
4%
13%
70%
Facade Elements
Columns
Floor Slabs
Concrete Beams
Wall

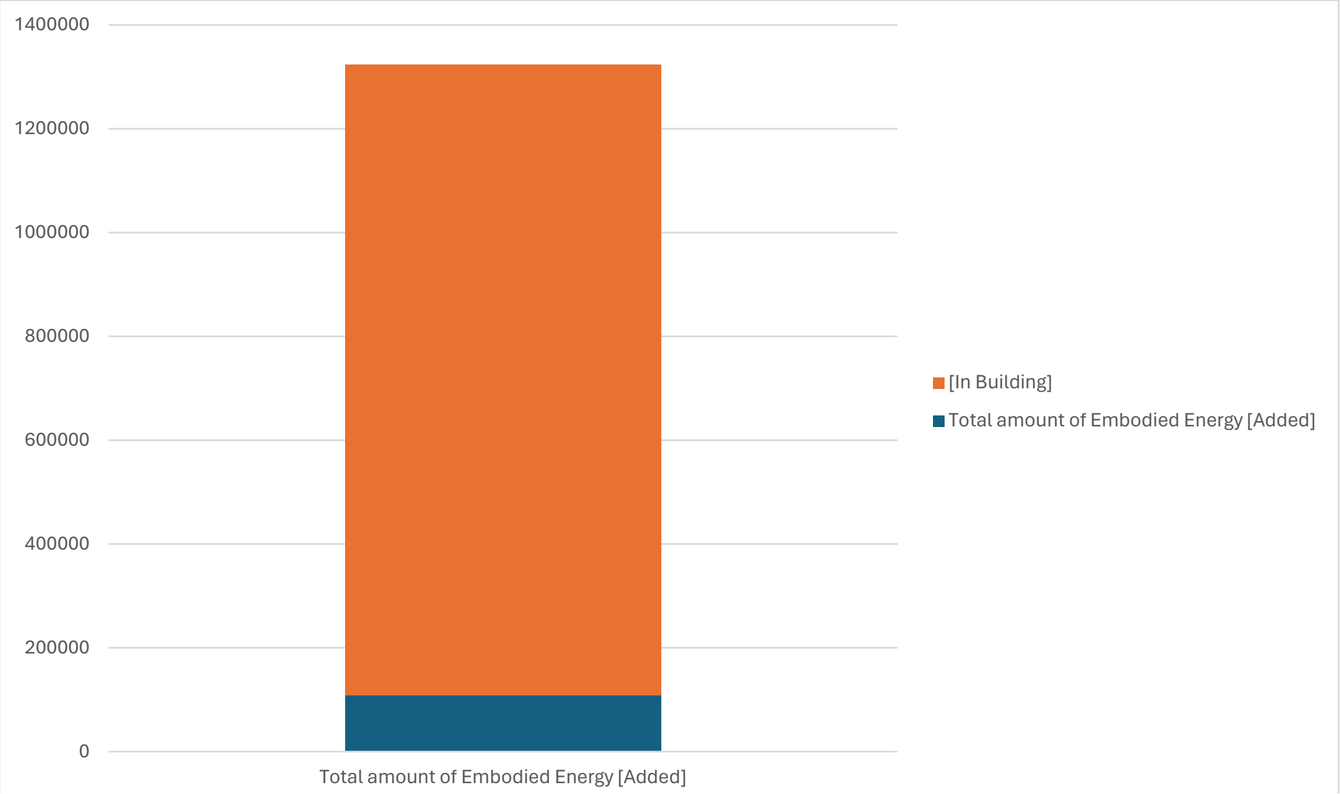

Operational Engery [MJ]
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1 2 3 4 5 6 7 8 9 10 11 12
Month


Primary Energy Use
Other 4%
Heat 13%
Hot water 19%
Cooling 23%
Ventilation 7%
Lighting

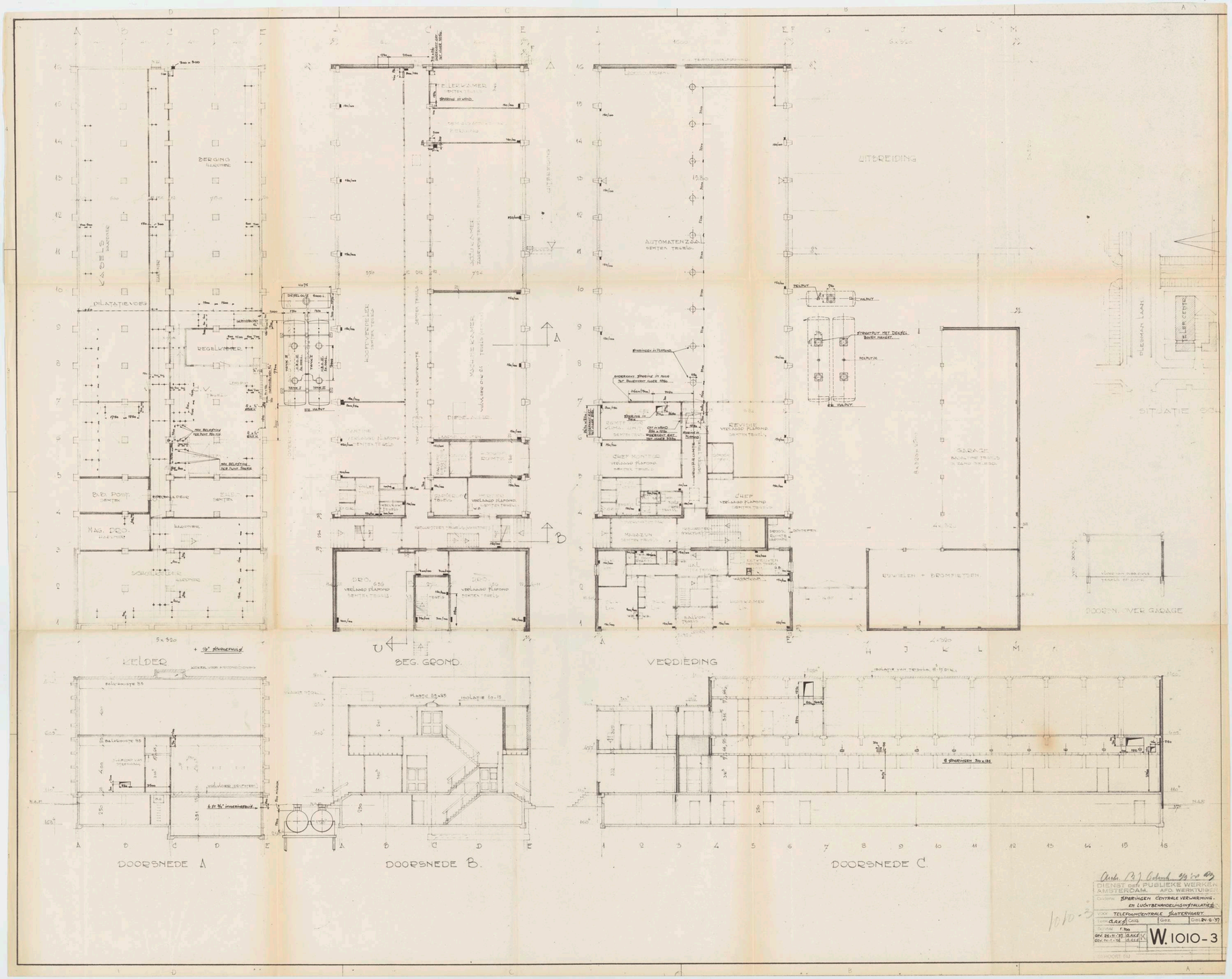

Embodied Energy + Operational Energy [GJ]
120000
100000
80000
60000
40000
20000
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
Years
Scenario 0
Final Design


Embodied Energy + Operational Energy [GJ]
30000
25000
20000
15000
10000
5000
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
Years
Scenario 1
Final Design
Scenario 2
Scenario 3





	ADDED	EXISTING	FINAL
MJ	108.621	1.107.111	1.215.732
[%]	9.8%	100%	109.8%



Arch. B.J. Gebruik 19/10-49

DIENST der PUBLIEKE WERKEN
AMSTERDAM. AFD. WERKTUIGEN.

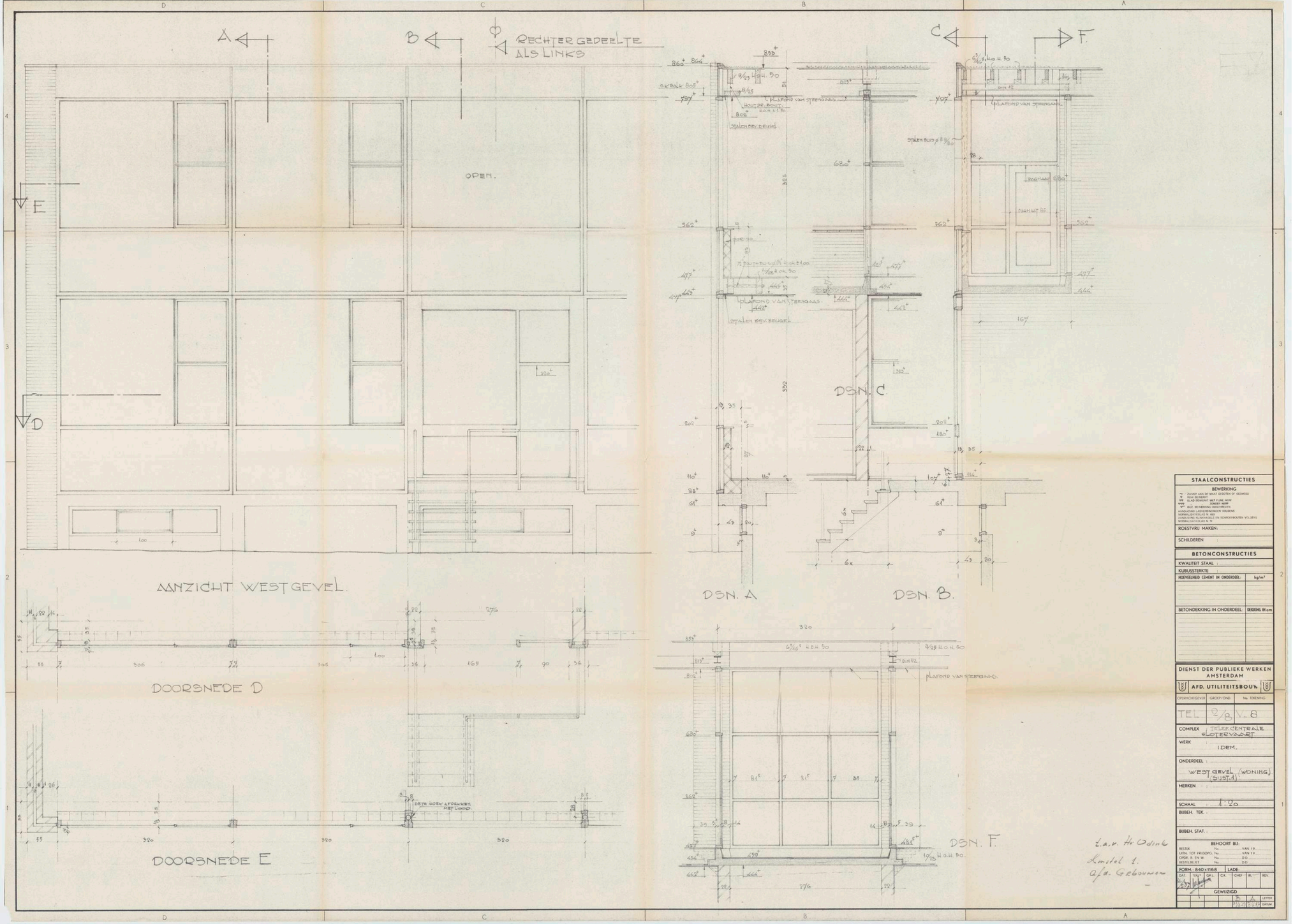
Gebouw: SPARINGEN CENTRALE VERWARMING EN LUCHTBEVOCHTIGINGSINSTALLATIE

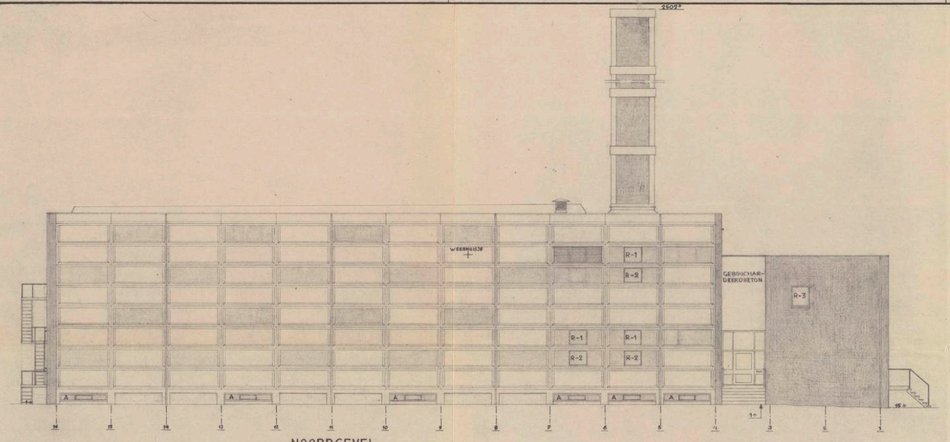
voor: TELEFOONCENTRALE SLOTERVIART.

Teekend: G.A.K.	Geg.	Gez.	Dat. 24-4-57
Schal: 1:100			
Gew. 26-11-57 G.A.K.			
Gew. 11-12 G.A.K.			

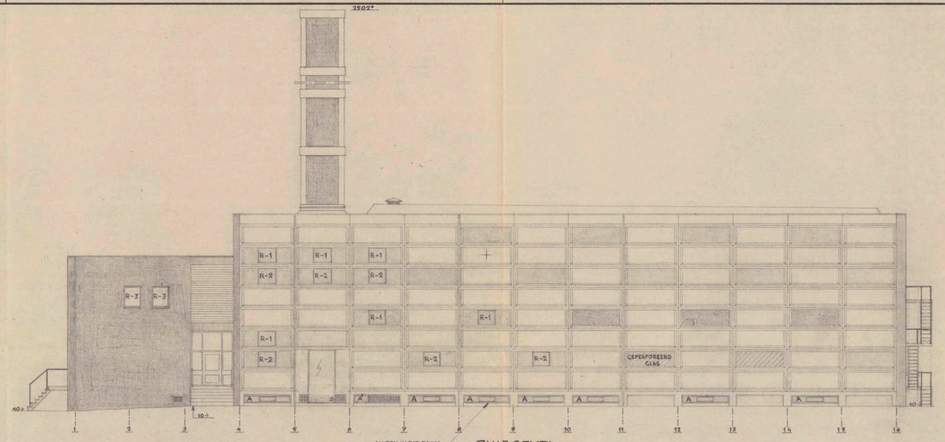
W. 1010-3

1010-3

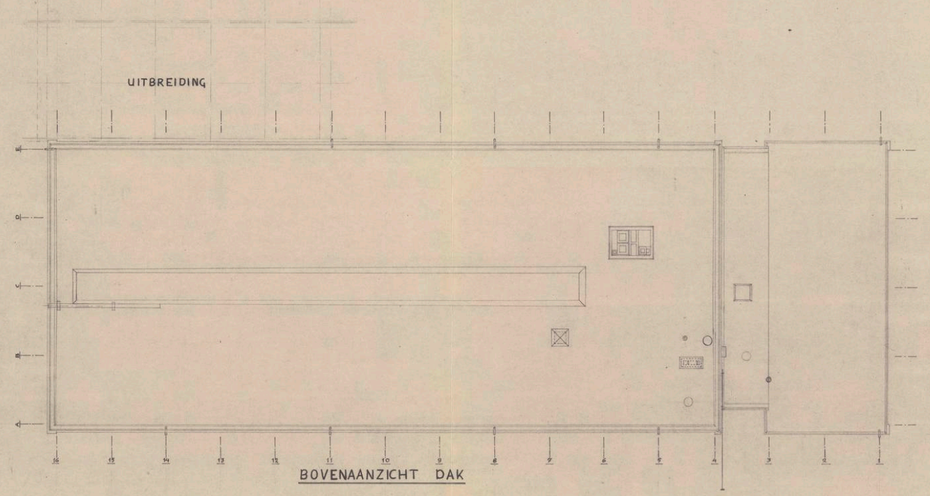

RECHTER GEDEELTE ALS LINKS
OPEN.
AANZICHT WESTGEVEL.
DOORSNEDE D
DOORSNEDE E
DEZE HOEK AFGEWERKT MET LOOD
DSN. A
DSN. B
DSN. C
DSN. F
PLAFOND VAN STEENGAAS
HOUTPR. BOUT
STALEN BEK BEUGEL
STALEN RUD
DIN 42
DEKMAT B5
STAAL CONSTRUCTIES
BEWERKING
ROESTVRIJ MAKEN:
SCHILDEREN
BETONCONSTRUCTIES
KWALITEIT STAAL
KUBUSSTERKTE
HOEVEELHEID CEMENT IN ONDERDEEL
kg/m³
BETONDEKKING IN ONDERDEEL
DEKKING IN cm
DIENST DER PUBLIEKE WERKEN AMSTERDAM
AFD. UTILITEITSBOUW
OPDRACHTGEVER
GROEP/ONDERDEEL
No. TEKENING
TEL
8/8
V-8
COMPLEX
TELEF. CENTRALE SLOTERVAART
WERK
IDEM.
ONDERDEEL
WEST GEVEL (WONING) (SUST. 1)
MERKEN
SCHAAL
1:20
BUBEH. TEK.
BUBEH. STAT.
BEHOORT BIJ:
BESTEK
LITN. TOT FRISOPG.
OPDR. B. EN W.
BESTELBL. B7
FORM. 840×1168
LADE:
DAT.
TEK.
GEL.
C.K.
CHEF
R.
REV.
GEWIJZIGD
LETTER
DATUM
t.a.v. Hr. Odink
Amstel 1.
afd. Gebouwen



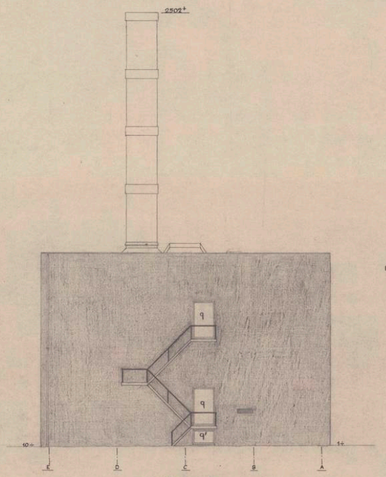
NOORDGEVEL



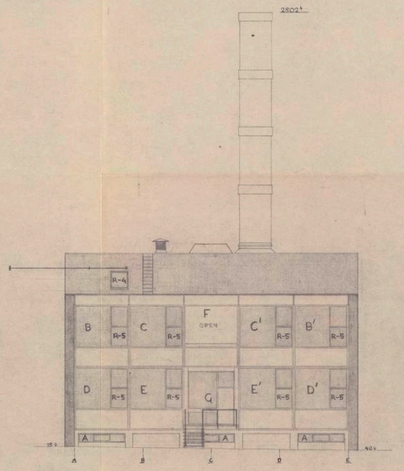
ZUIDGEVEL



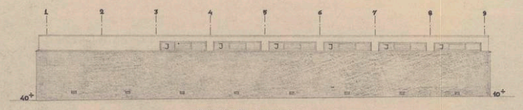
BOVENAANZICHT DAK



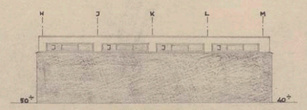
OOSTGEVEL



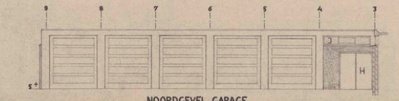
WESTGEVEL



ZUIDGEVEL GARAGE

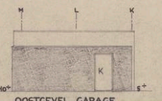


WESTGEVEL GARAGE

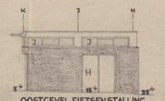


NOORDGEVEL GARAGE

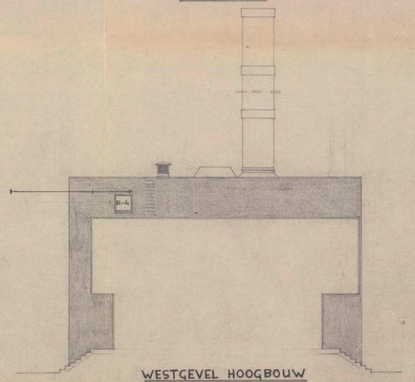
NOORDGEVEL FIETSENSTALLING



OOSTGEVEL GARAGE



OOSTGEVEL FIETSENSTALLING



WESTGEVEL HOOGBOUW

IN ALLE MERKEN A EN 2 EEN DRAAIBAAR ALUMINIUM GEDEELTE R-6

VOOR MERKEN BETONELEMENTEN ZIE TEK. -52

OP ALLE RAAMELEMENTEN VAN DE ZUIDGEVEL ZONWERING, BEHALVE DE RAAMELEMENTEN VAN ACCU-RUIMTE EN ZUIVERRUIMTE

VOOR DE ALUMINIUM RAMEN GEMERKT:
R-3 EN R-4 ZIE TEK. -96
R-5, R-6 EN R-7 ZIE TEK. -99
R-1, R-2 ZIE TEK. -98

STAALCONSTRUCTIES

BEWERKING

~ ZUIVER AAN DE WAAT GEMERKT OF GESMEERD
F RUW BEWERKT
FF GLAD BEWERKT MET FLINE NERF
FFF GLAD BEWERKT MAGER NERF
BB BLIJ BEWERKING VOLGENS
AANBIJDING I ADVOSTRONDNEN VOLGENS NORMALISATIEBLAD N. 1801
AANBIJDING KLINKNAGELS EN SCHROEFBOUTEN VOLGENS NORMALISATIEBLAD N. 11

ROESTVRIJ MAKEN:

SCHILDEREN :

BETONCONSTRUCTIES

KWALITEIT STAAL :

KUBUSSTERKTE :

HOEVEELHEID CEMENT IN ONDERDEEL: kg/m³

BETONDEKKING IN ONDERDEEL: DEKKING IN cm

DIENST DER PUBLIEKE WERKEN AMSTERDAM

AFD. UTILITEITSBOUW

OPDRACHTGEVER	GROEPFOND	No. TEKENING
TEL	2/8	I-3

COMPLEX : TELEFOONCENTRALE SLOTER VAART

WERK : TELEFOONCENTRALE SLOTERVAART.

ONDERDEEL : BESTEKTEKENING GEVELS EN BOVENAANZICHT DAK TELEFOONCENTRALE EN GEVELS GARAGE

MERKEN :

SCHAAL : 1:100

BUBEH. TEK. :

BUBEH. STAT. :

BEHOORT BIJ:
BESTEK No. VAN 19
UITN. TOT INVSCHR. No. LB-5-01 VAN 19 58
OPDR. B. EN W. No. D.D.
RESTELBLATT No. D.D.

FORM: 840 x 1168 | LADE.

DATUM	TEK.	GEL.	C.A.	CHEF	R.	REV.
14/5/58						

GEWIJZIGD

		C	B	A		LETTER
						DATUM

BIJ TEK. No. I-3 DATUM 14/5/58