Kanaän, or the suburb of the polycentric metropolis

Graduation project of Wouter Kamphuis

Drawing booklet

PERSPECTIVE VIEW

AVANTIS CABLE CAR STATION

PERSPECTIVE VIEW

POST IBA REMAINS REUSABLE FOR FUTURE TRANSPORT

PERSPECTIVE VIEW

POSSIBLE LIGHT RAIL (SHOWN) OR HYPOLOOP TRANSPORT MODE STATION

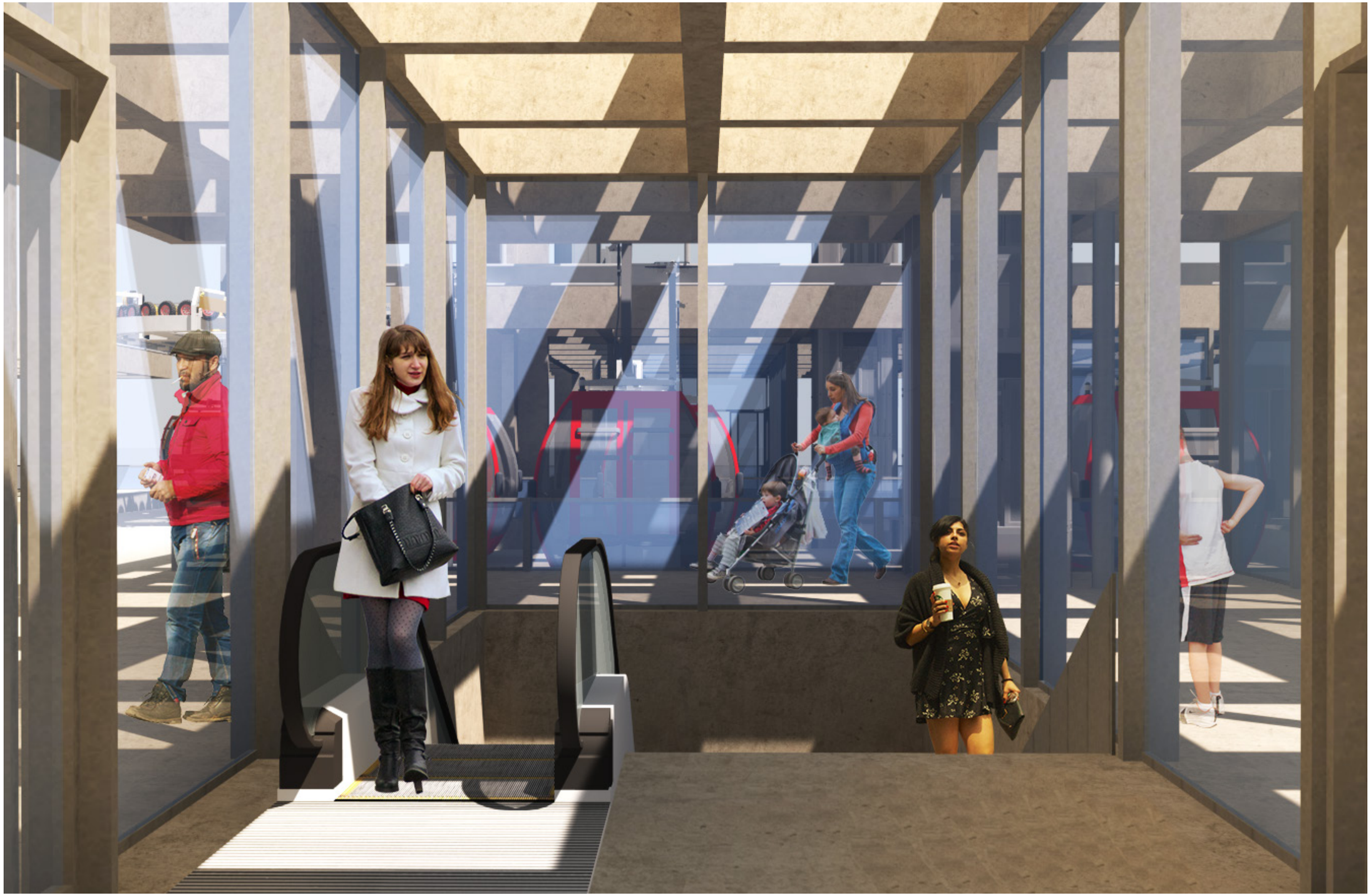
PERSPECTIVE VIEW

ARRIVING IN A CABLE CAR ALLOWS UNIQUE 360° VIEW

PERSPECTIVE VIEW

ARRIVAL AT THE PLATFORM

PERSPECTIVE VIEW



STAIRCASE FROM THE PLATFORM TO THE CENTER HALLWAY

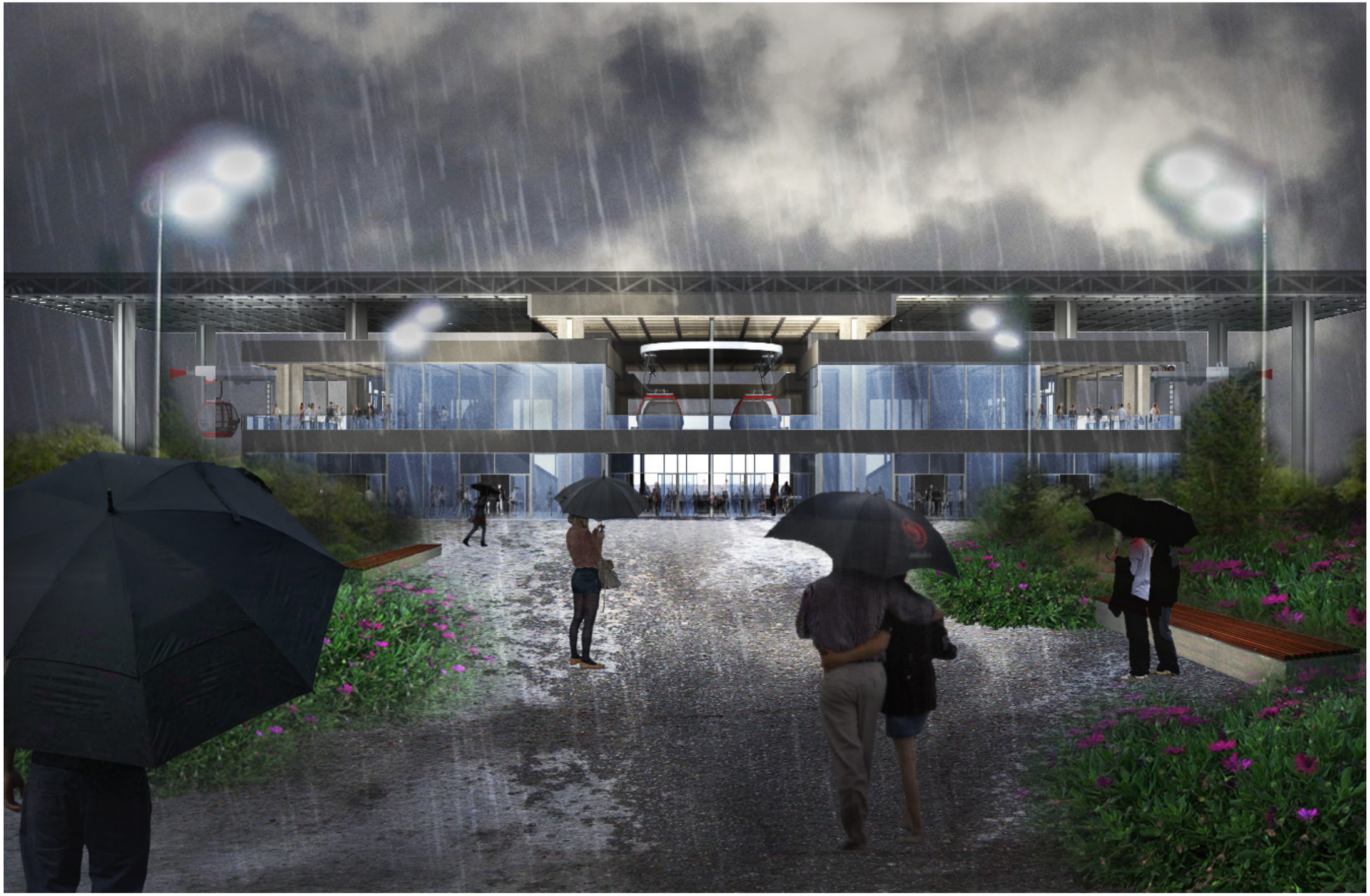
PERSPECTIVE VIEW

CENTER HALLWAY

PERSPECTIVE VIEW

CENTER HALLWAY VIEW OF MARKETPLACE AND STAIRCASE

PERSPECTIVE VIEW



SIDEVIEW IN RAINY WEATHER

PERSPECTIVE VIEW

SIDEVIEW IN THE SUNSHINE

PERSPECTIVE VIEW

ENTRANCE CLOSEUP

PERSPECTIVE VIEW

FACADE CLOSEUP

PERSPECTIVE VIEW

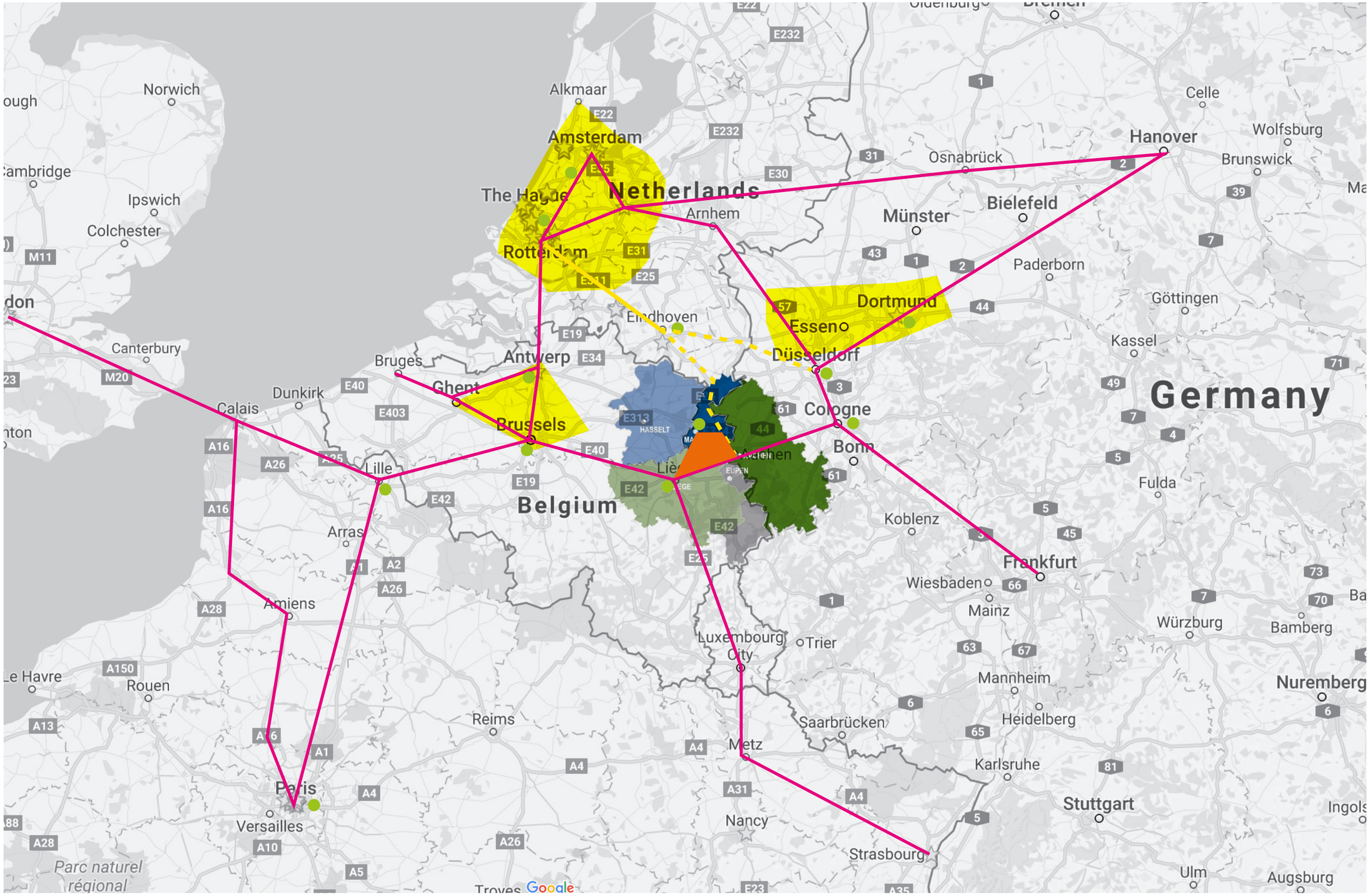
MOVING FROM STAIRCASE TO PLATFORM

PERSPECTIVE VIEW

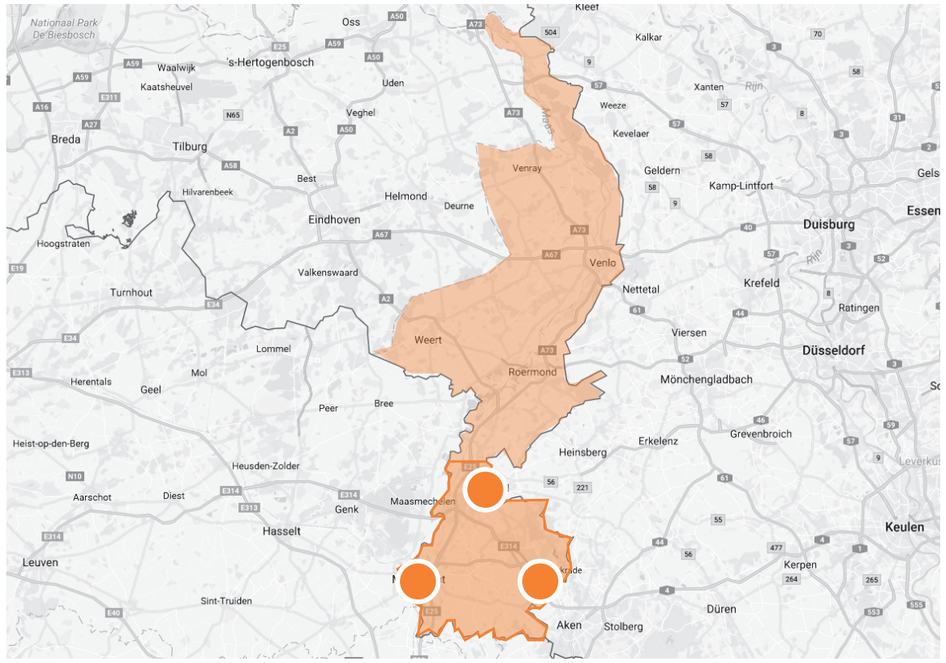
VIEW ON THE PLATFORM

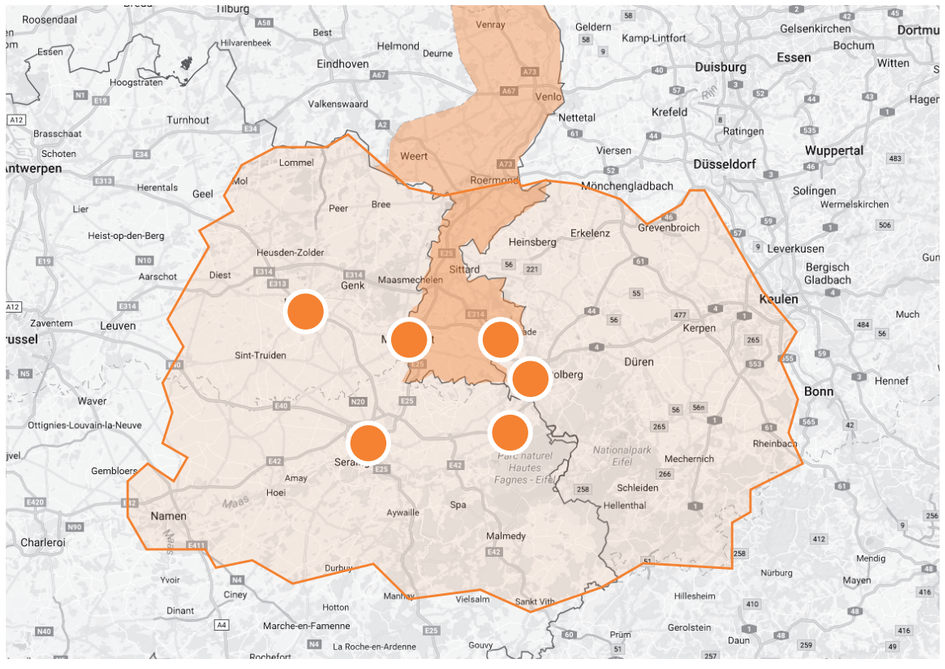
PERSPECTIVE VIEW

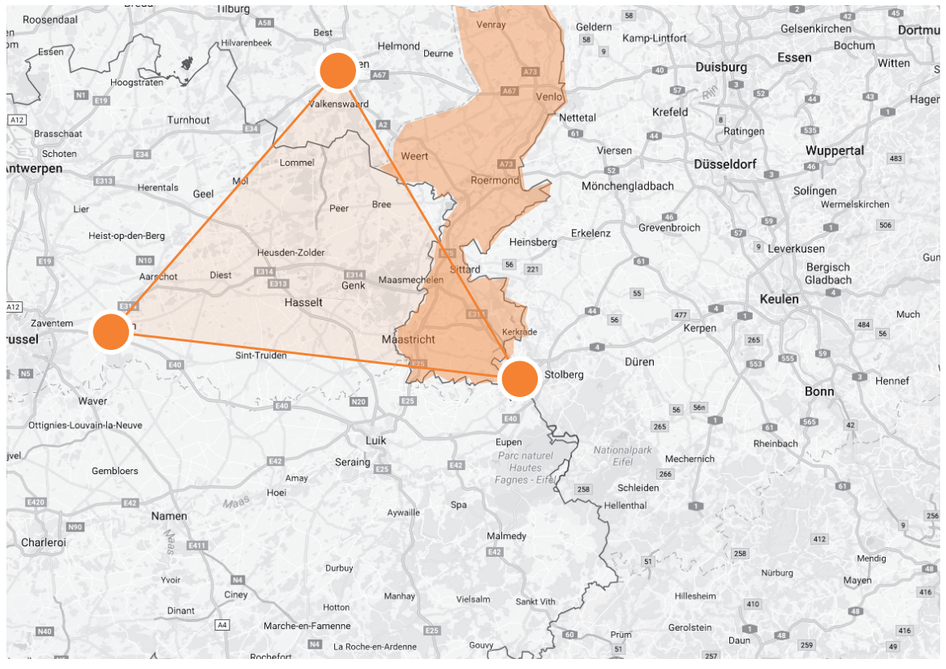
VIEW ON THE SURROUNDING BALCONY



SUBJECT TO RELATE TO HIGH SPEED RAIL AND LOCAL TRANSPORT RESOURCES

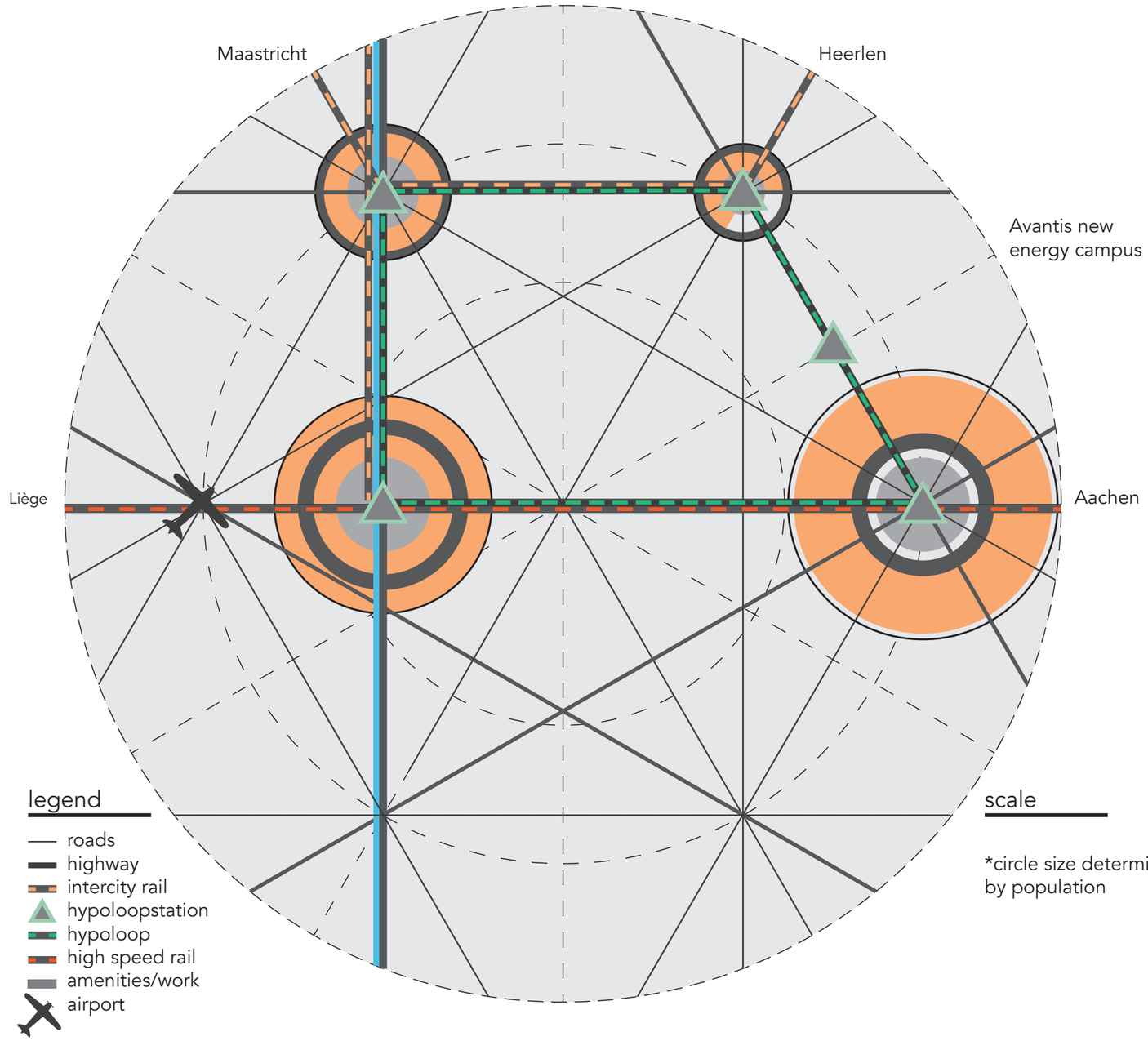






OF BORDER CROSSING IMPORTANCE CONNECTING KNOWLEDGE AND ECONOMY ON MULTIPLE SCALES

Meuse-Rhine Euroregion - 2040 - Hypoloop



CONNECTING THE FOUR MAJOR CITIES OF THE MEUSE-RHINE EUROREGION WITH A TO BE DEVELOPED MODE OF TRANSPORT

PLAN VIEW HEERLEN - AACHEN: CURRENT, PLANNED AVANTISLINE AND PROPOSED HYPOLOOP CONNECTIONS

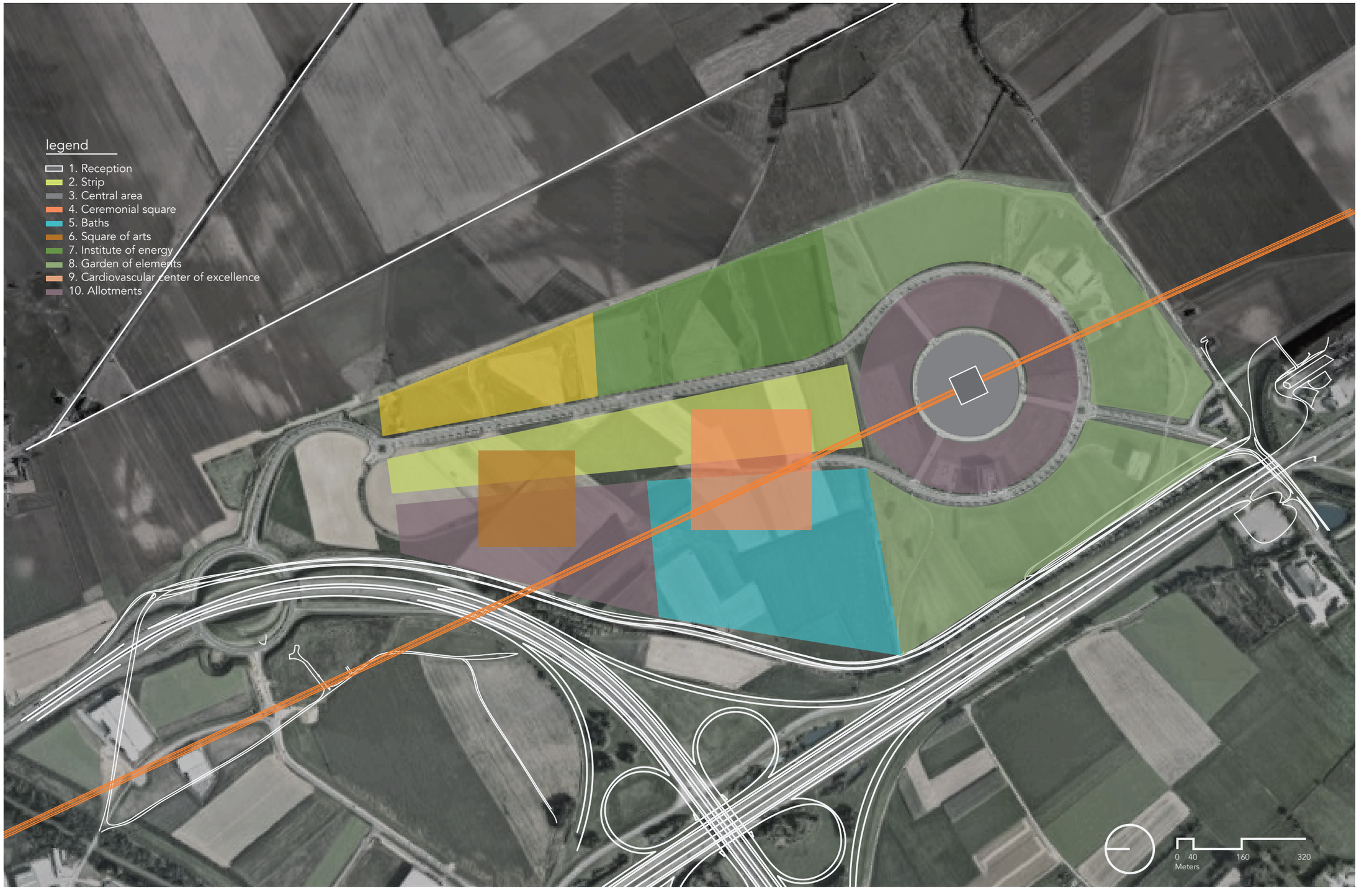
SCHEMATIC SECTION OF HEERLEN TO AACHEN AS IT RELATES TO PLAN VIEW

CENTER OF CONNECTION BETWEEN HEERLEN AND AACHEN

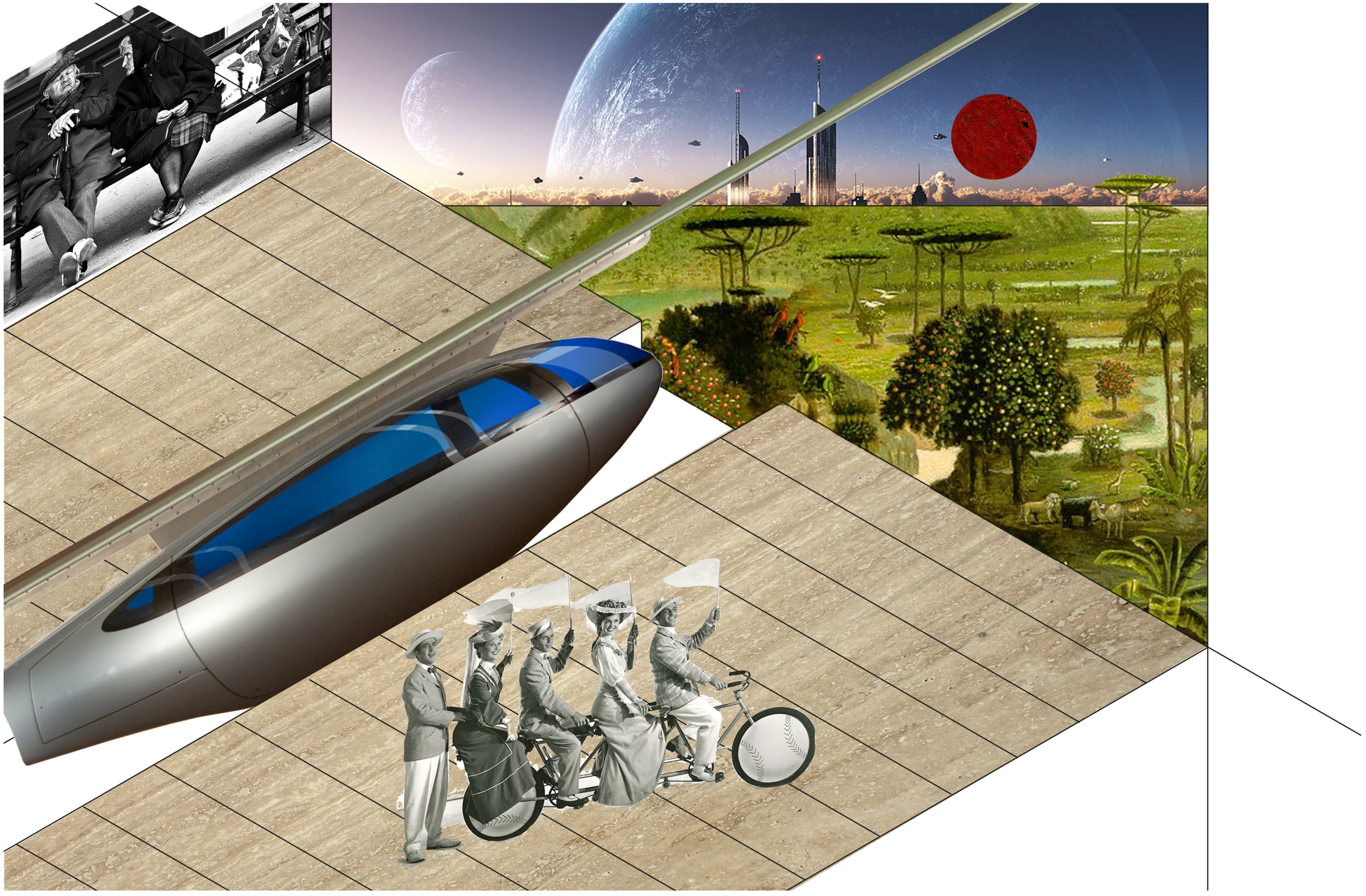
AVANTIS EUROPEAN SCIENCE AND BUSINESSPARK AT THE CENTER OF CONNECTION BETWEEN HEERLEN AND AACHEN

IMPRESSION OF THE AVANTIS PARK DURING THE IBA 2020

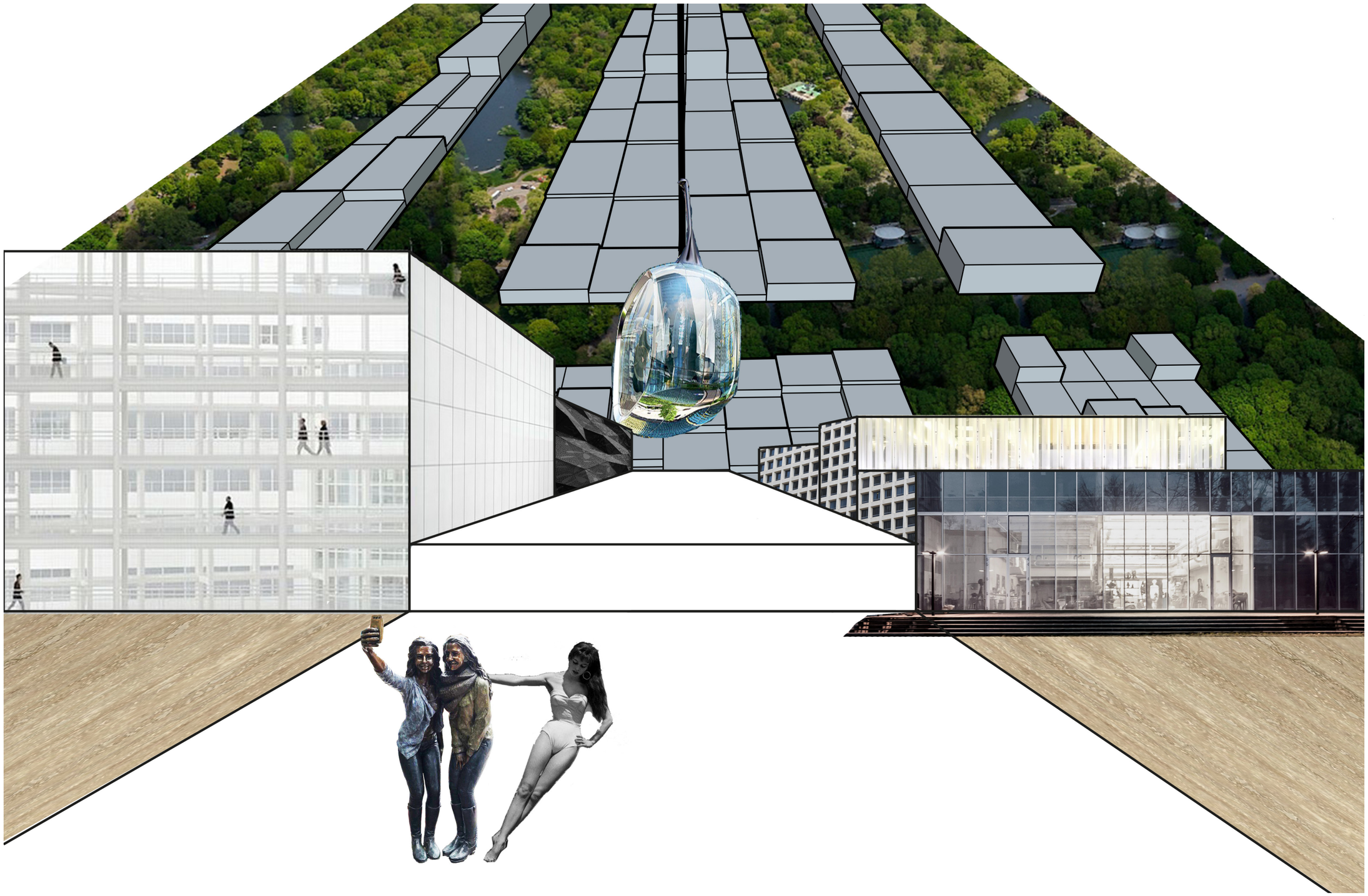
IMPRESSION OF THE AVANTIS PARK AND IT'S POTENTIAL GROWTH FOLLOWING THE IBA



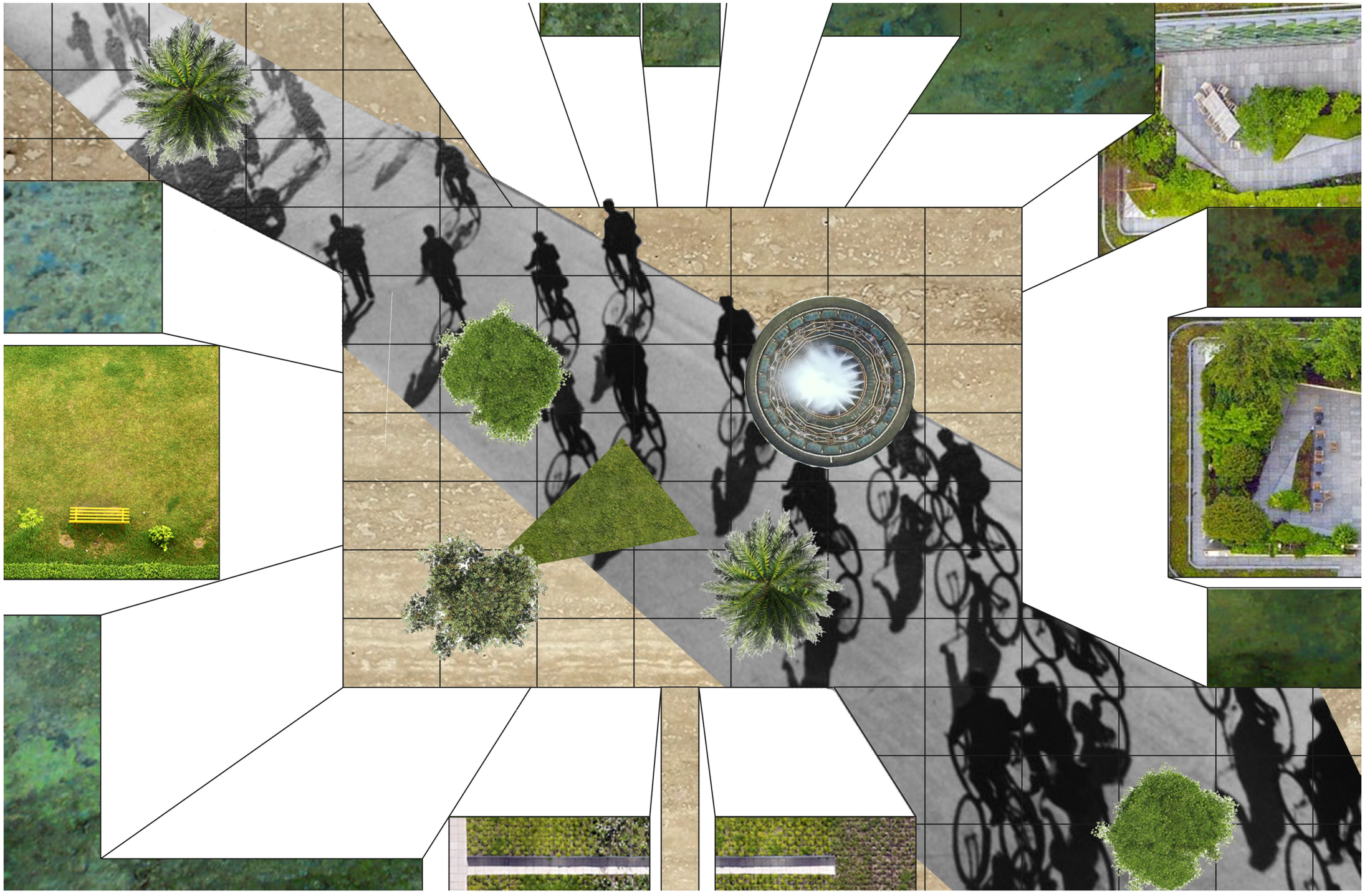
MASTERPLAN FOLLOWING 10 SELFCONSTRUCTED THEME'S FOR THE AVANTIS NEW ENERGY CAMPUS



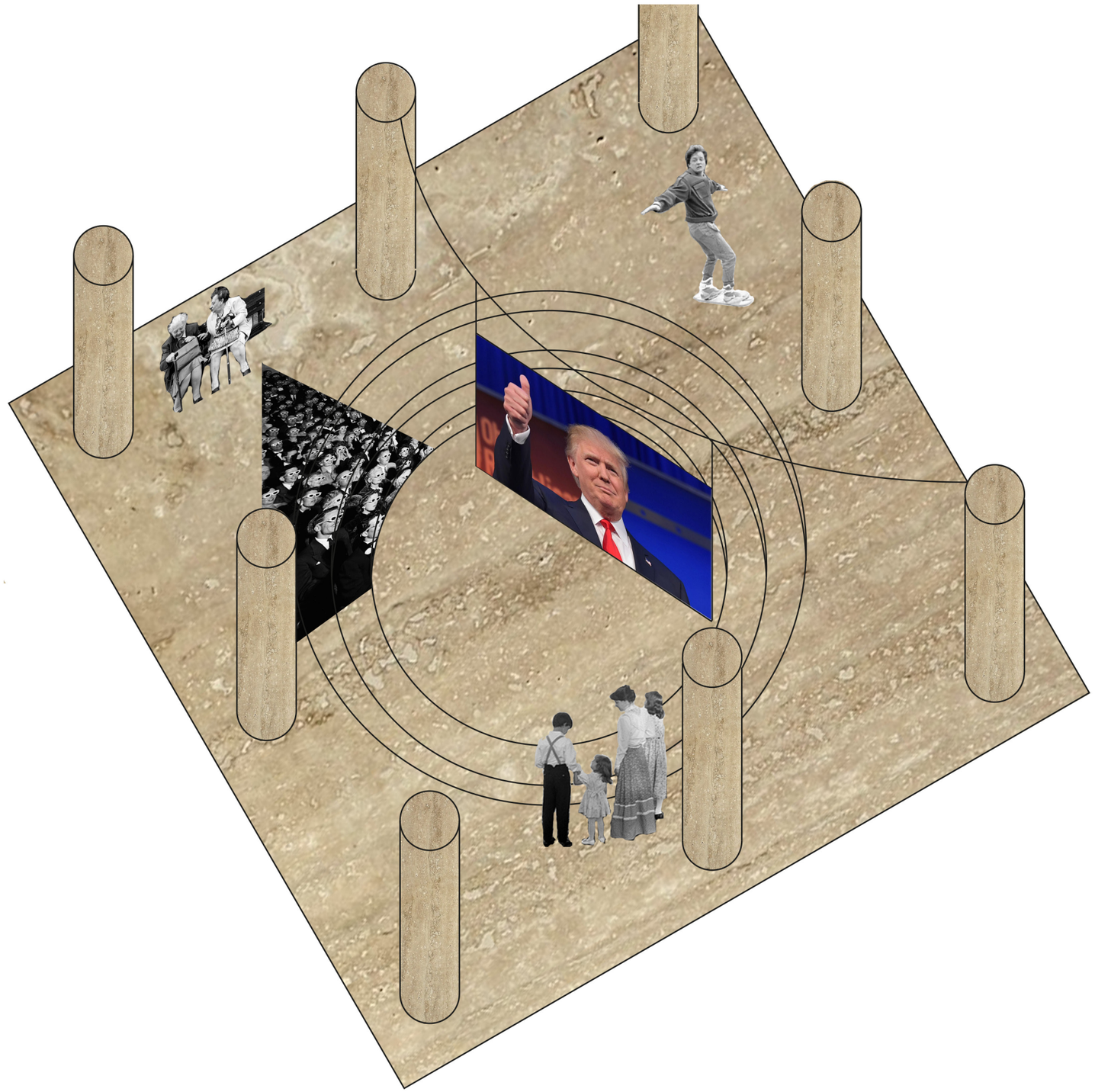
RECEPTION



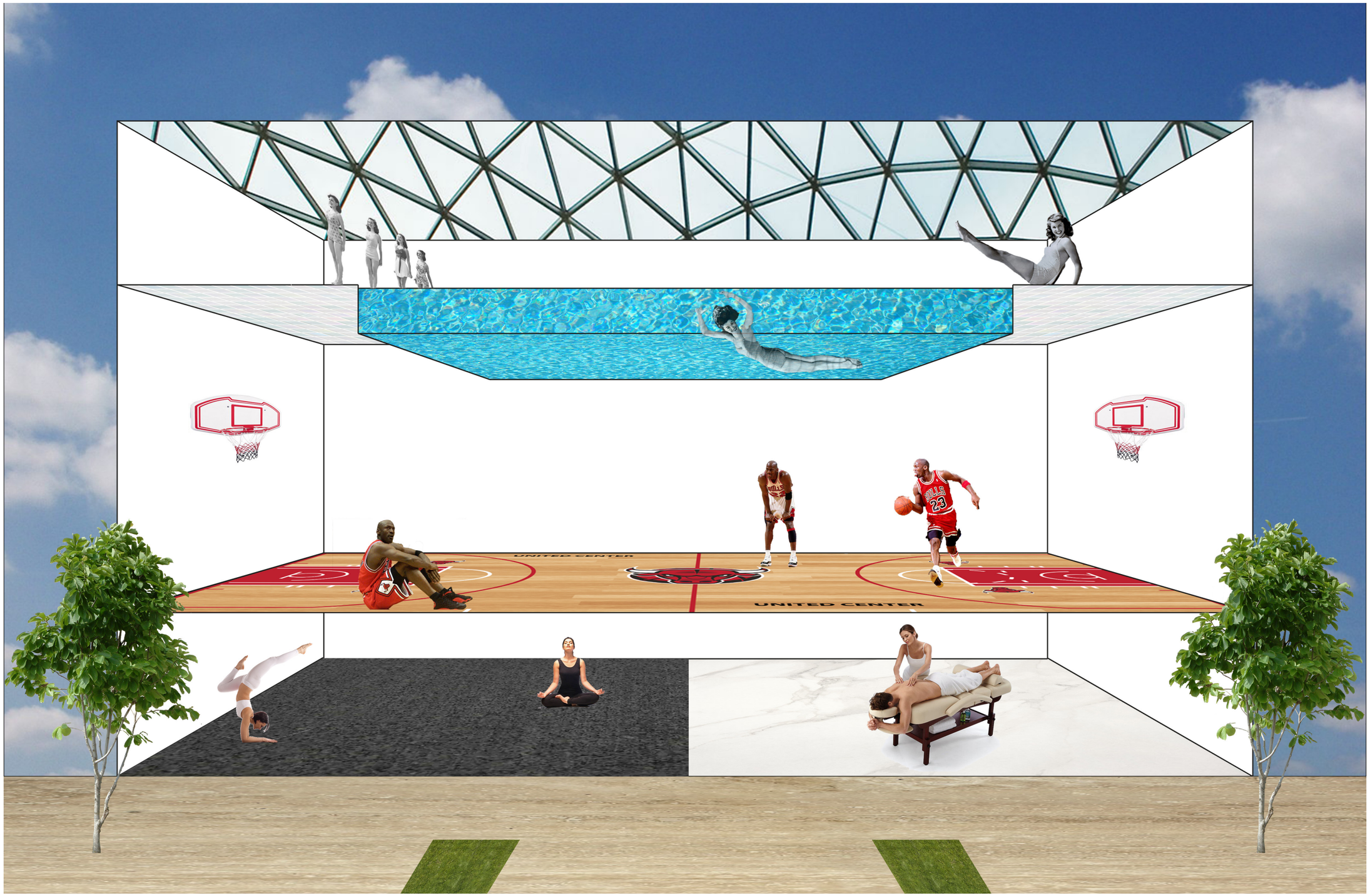
STRIP



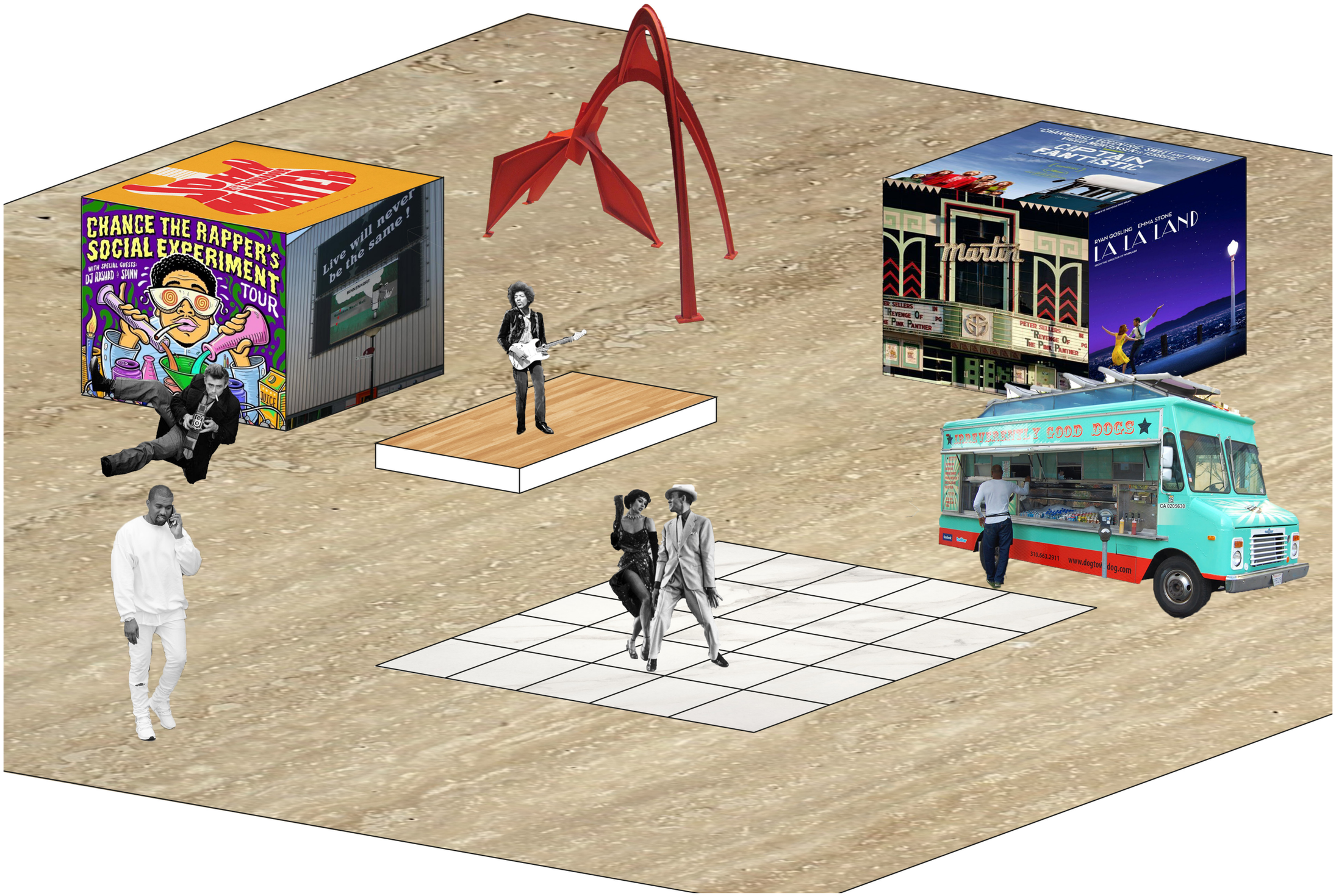
CENTRAL AREA



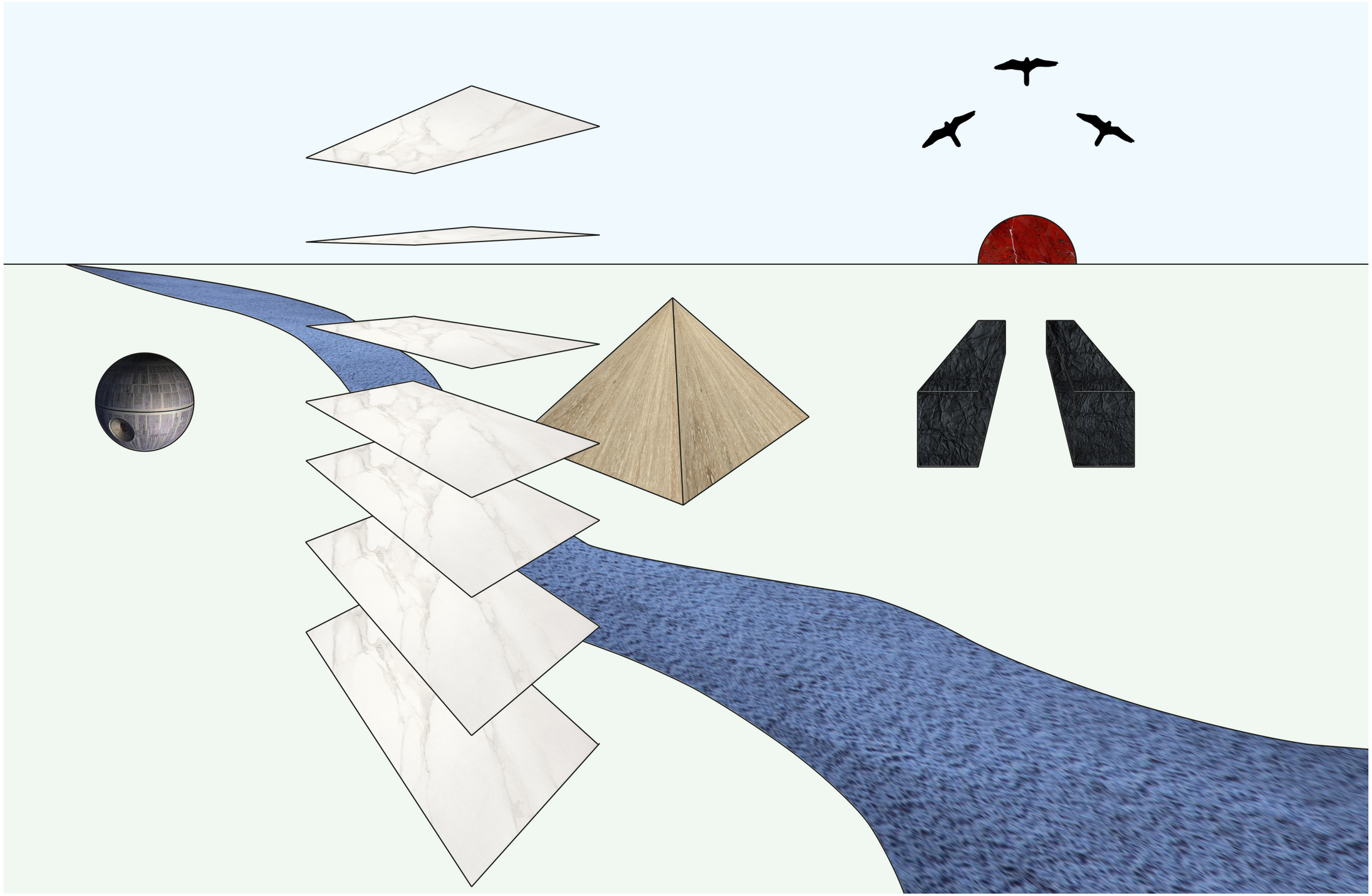
CEREMONIAL SQUARE



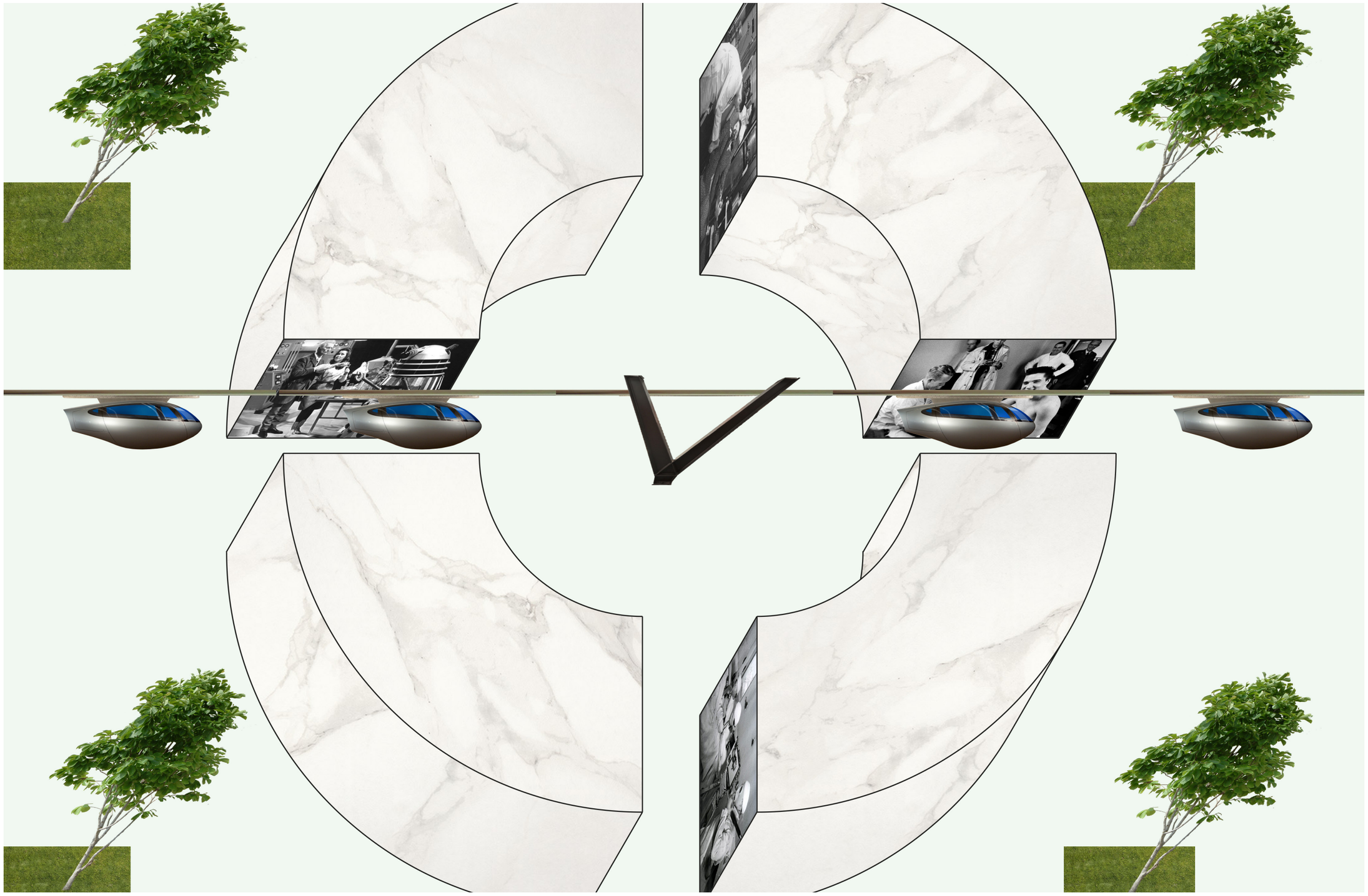
BATHS

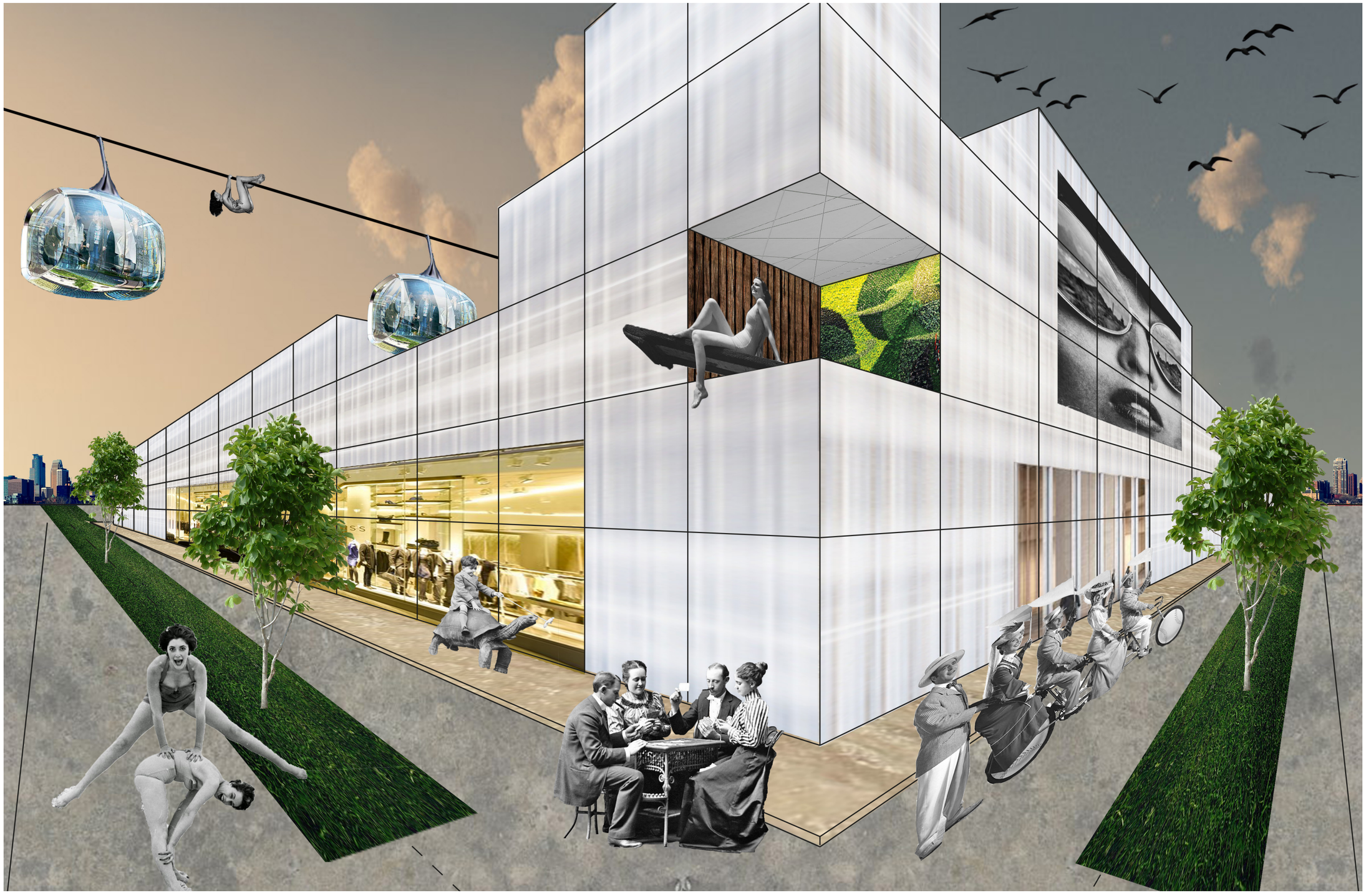

CHANCE THE RAPPER'S
SOCIAL EXPERIMENT
WITH SPECIAL GUESTS:
DJ RASHAD & SPINN
TOUR
Live will never be the same !
Martin
RYAN GOSLING EMMA STONE
LA LA LAND
CAPTAIN FANTASTIC
DOGTOWN GOOD DOGS
310.663.2911

INSTITUTE OF ENERGY



GARDEN OF ELEMENTS

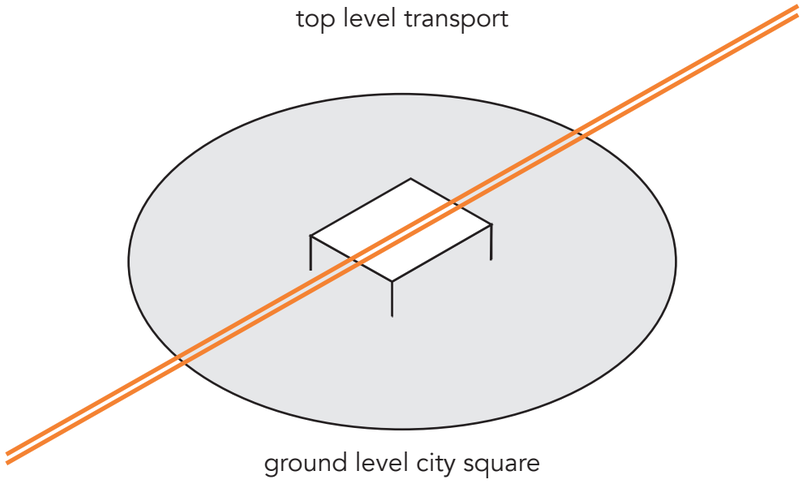




ALLOTMENTS

1. INTERWOVEN PROGRAM

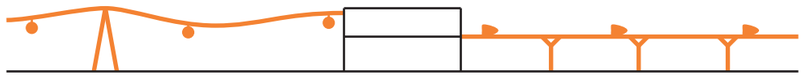
top level transport



ground level city square

2. SPECIFIC

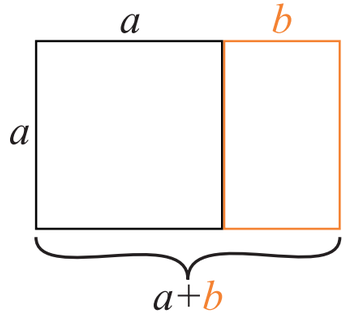
applicable for the Internationale Bauaustellung in 2020



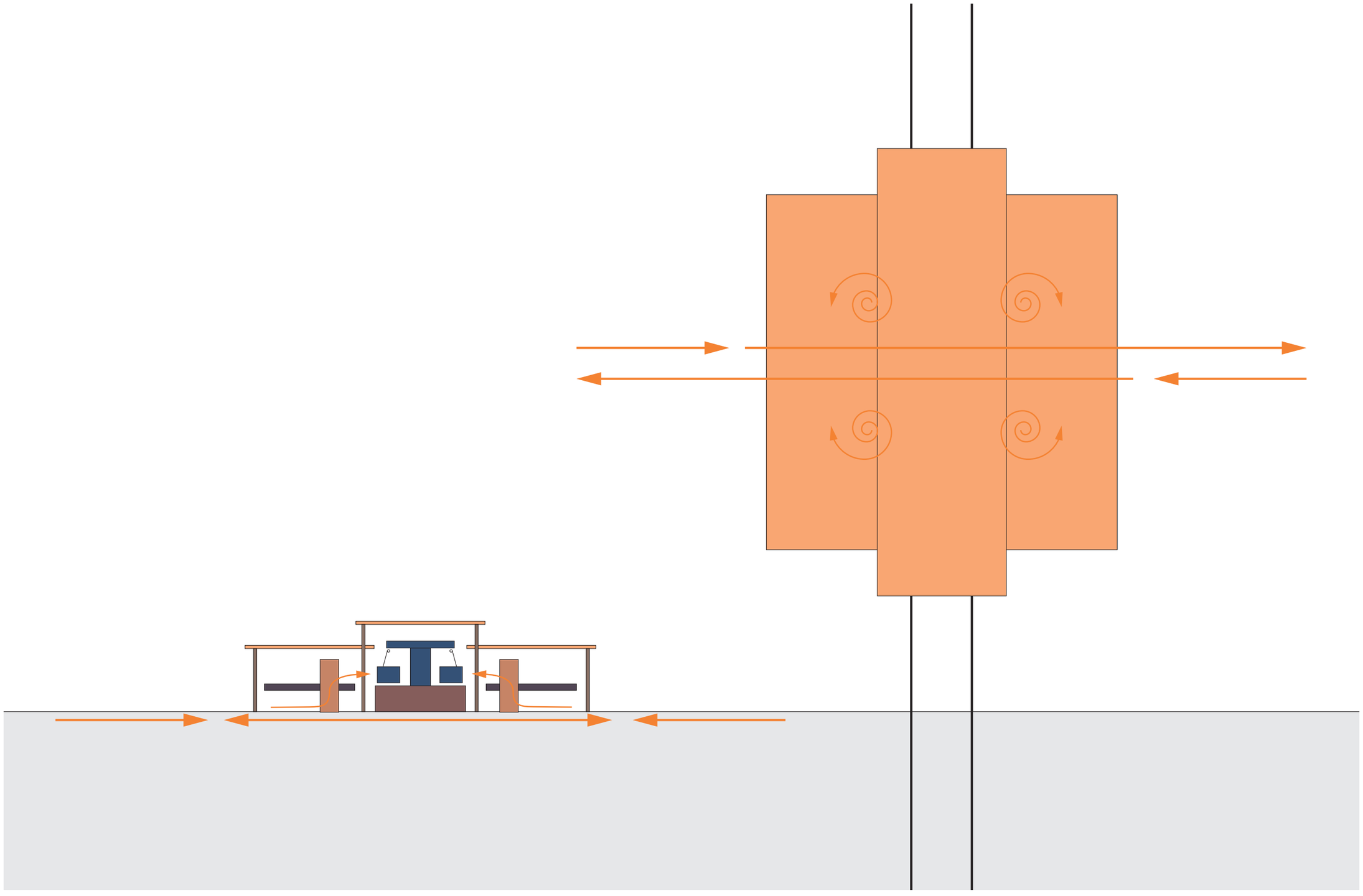
housing a contemporary mode of transport
such as a cable car or monorail

3. GENERIC

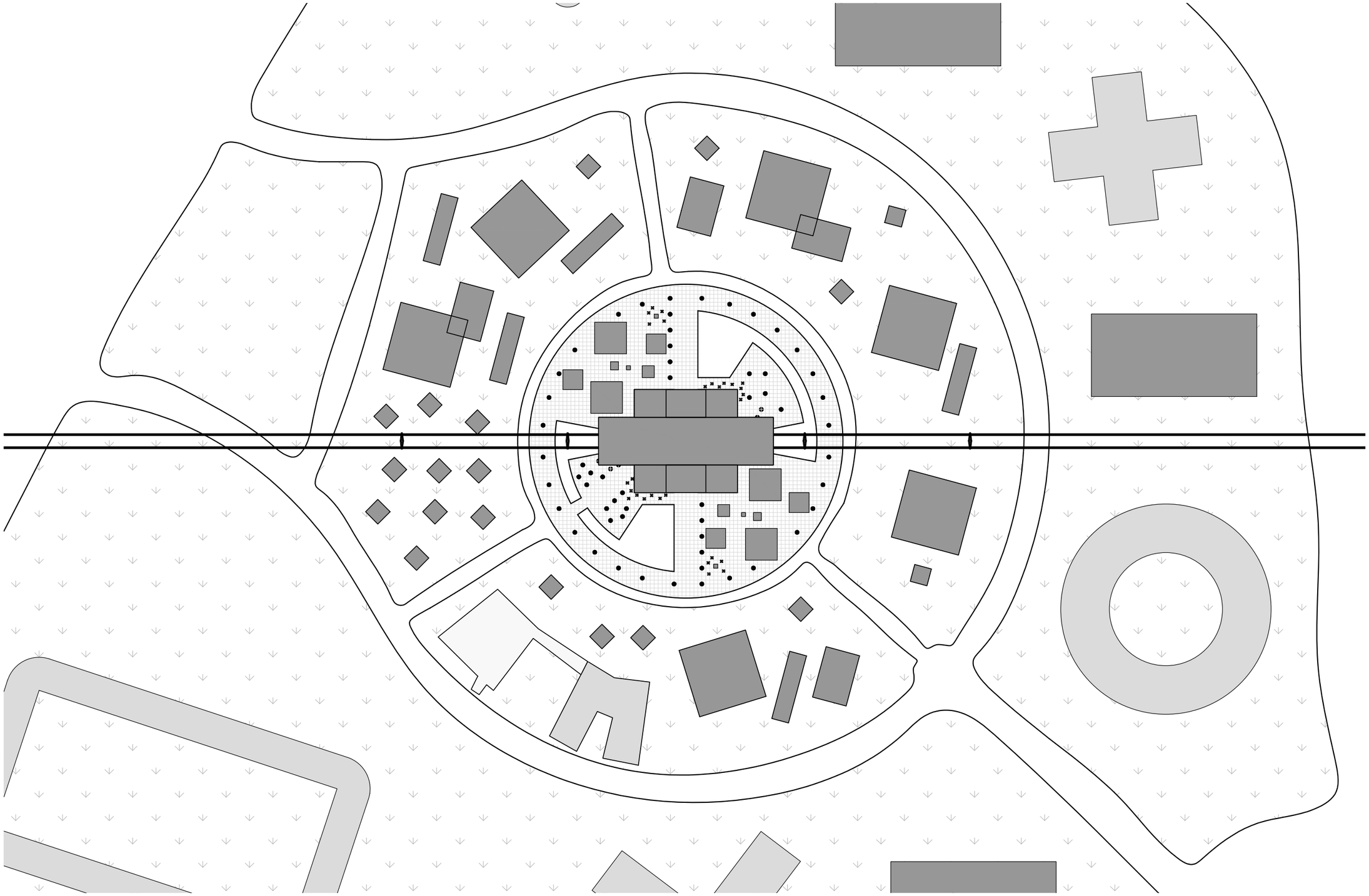
an object in and of itself in 2040
towards either shrink or growth



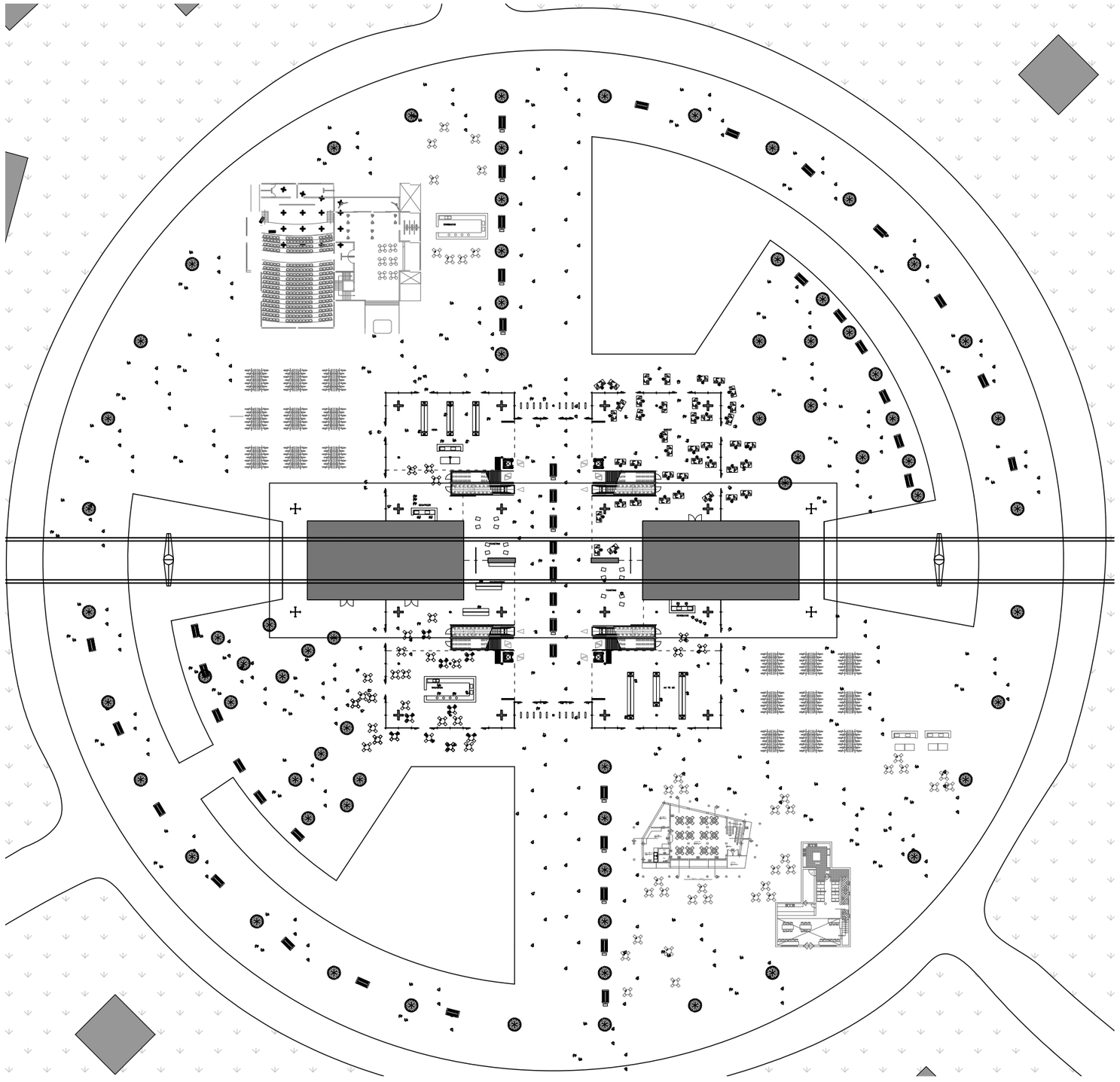
anticipating Avantis as the new energy campus
and key link in the connection of four Meuse-Rhine cities



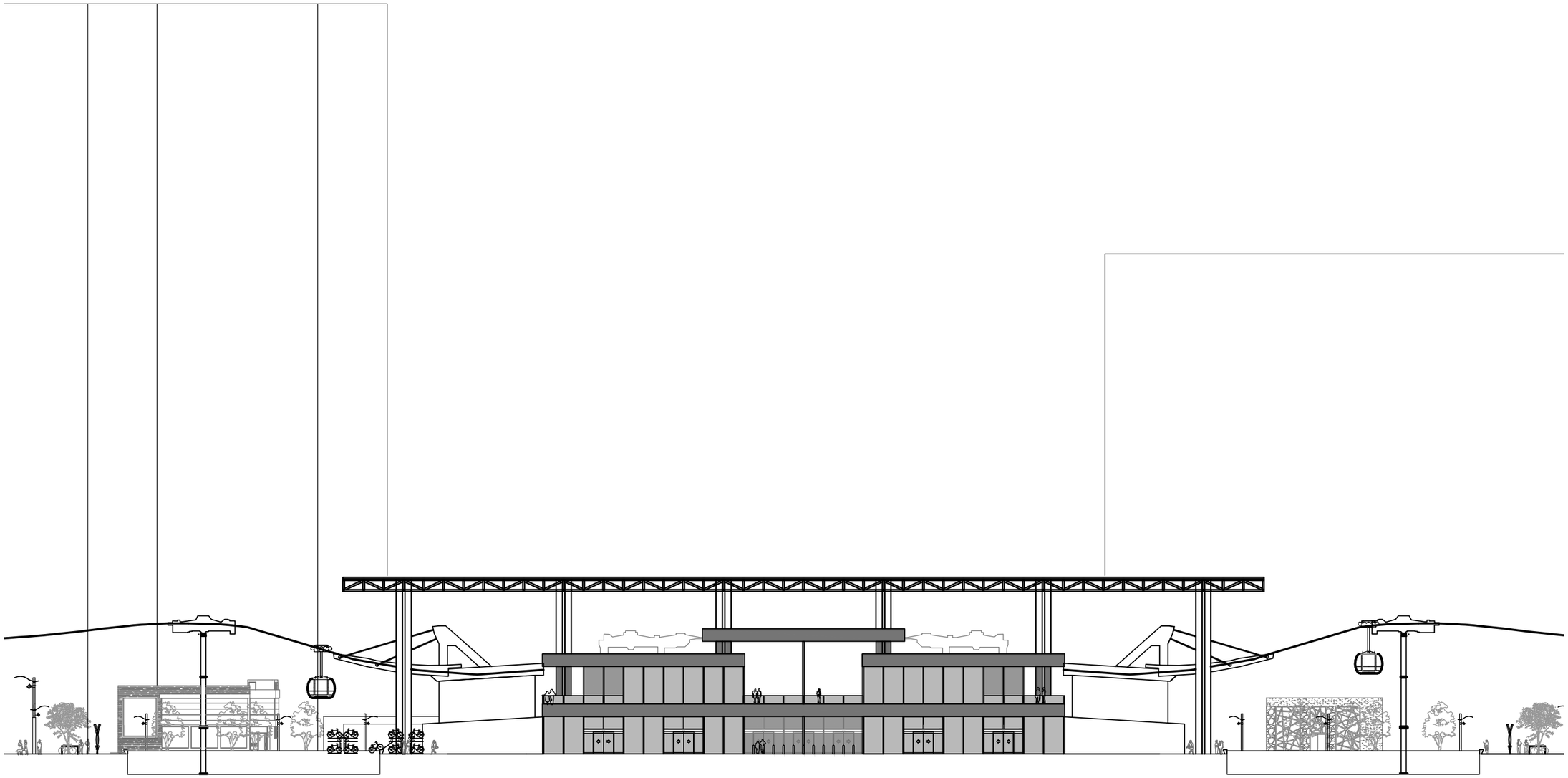
ACCORDING TO ROUTING AND PROGRAM



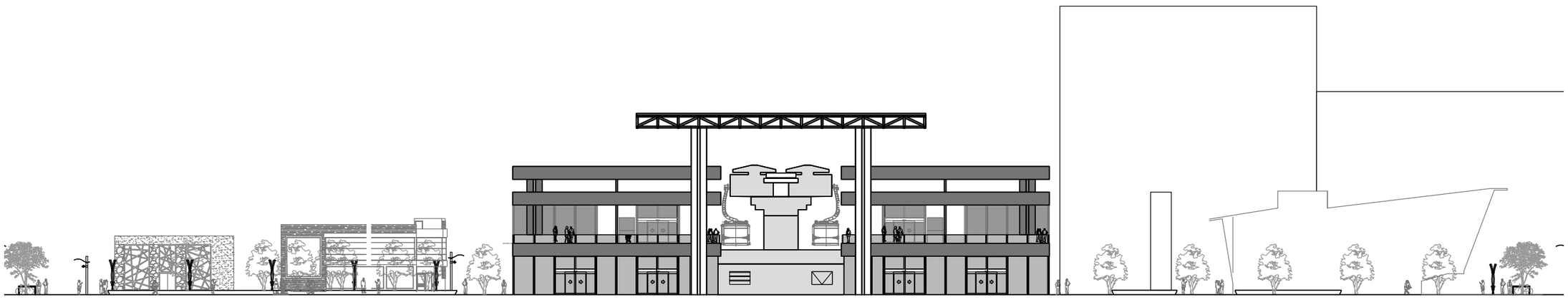
SITEPLAN INCLUDING GARDEN OF ELEMENTS, ALLOTMENTS, CENTRAL AREA AND RECEPTION



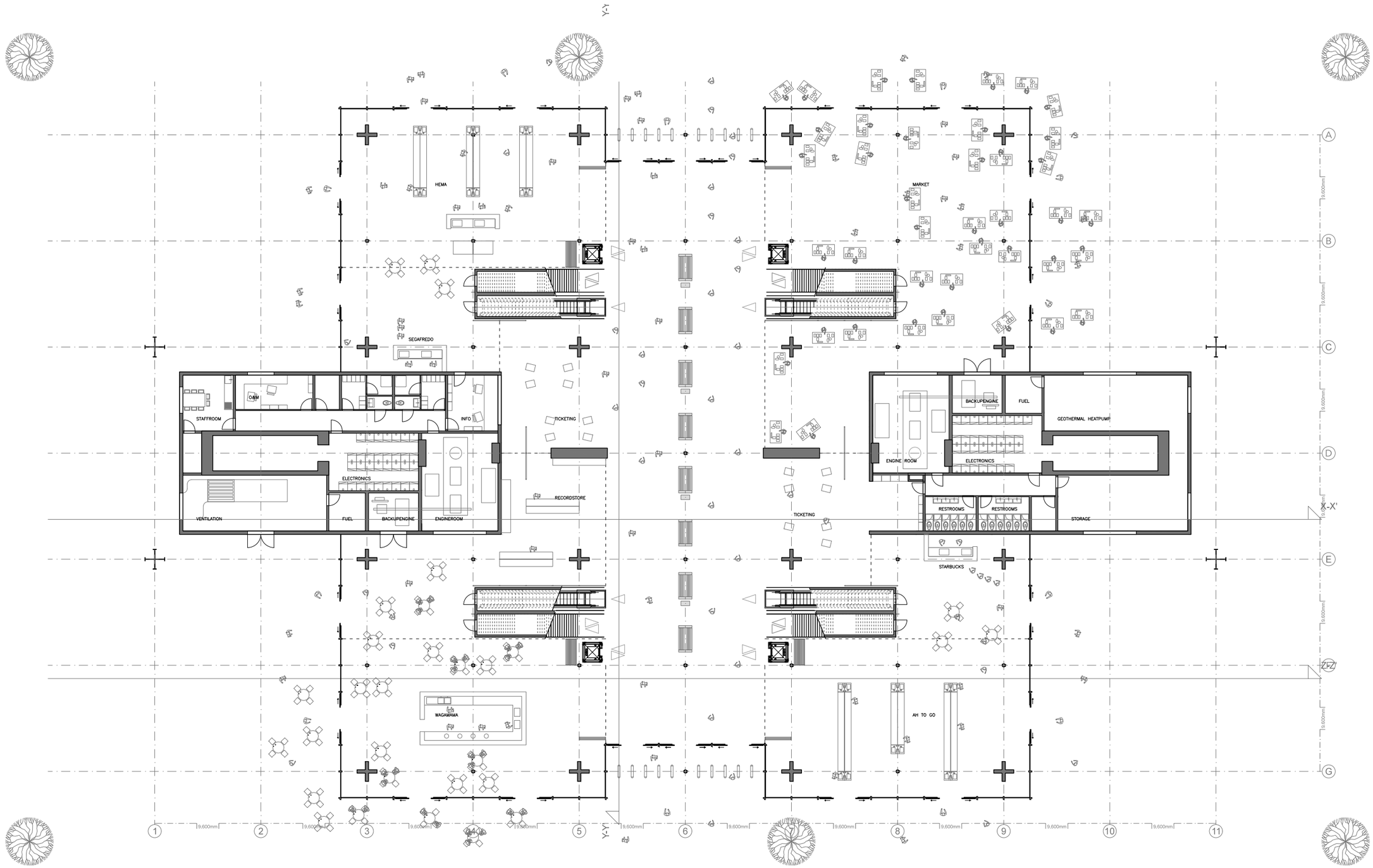
SITEPLAN INCLUDING CENTRAL AREA AND RECEPTION



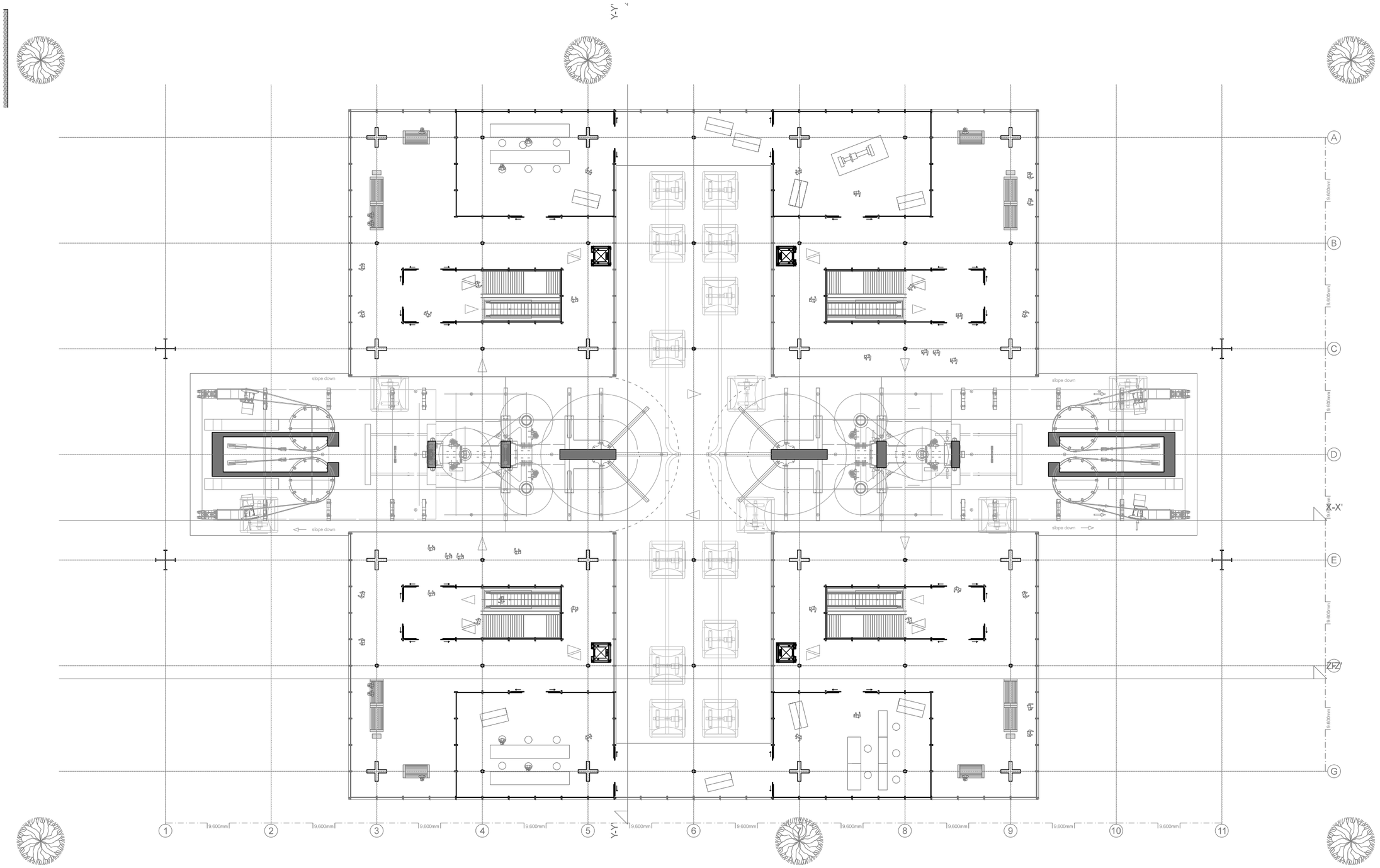
SOUTH FACADE VIEW INCLUDING CENTRAL AREA AND RECEPTION



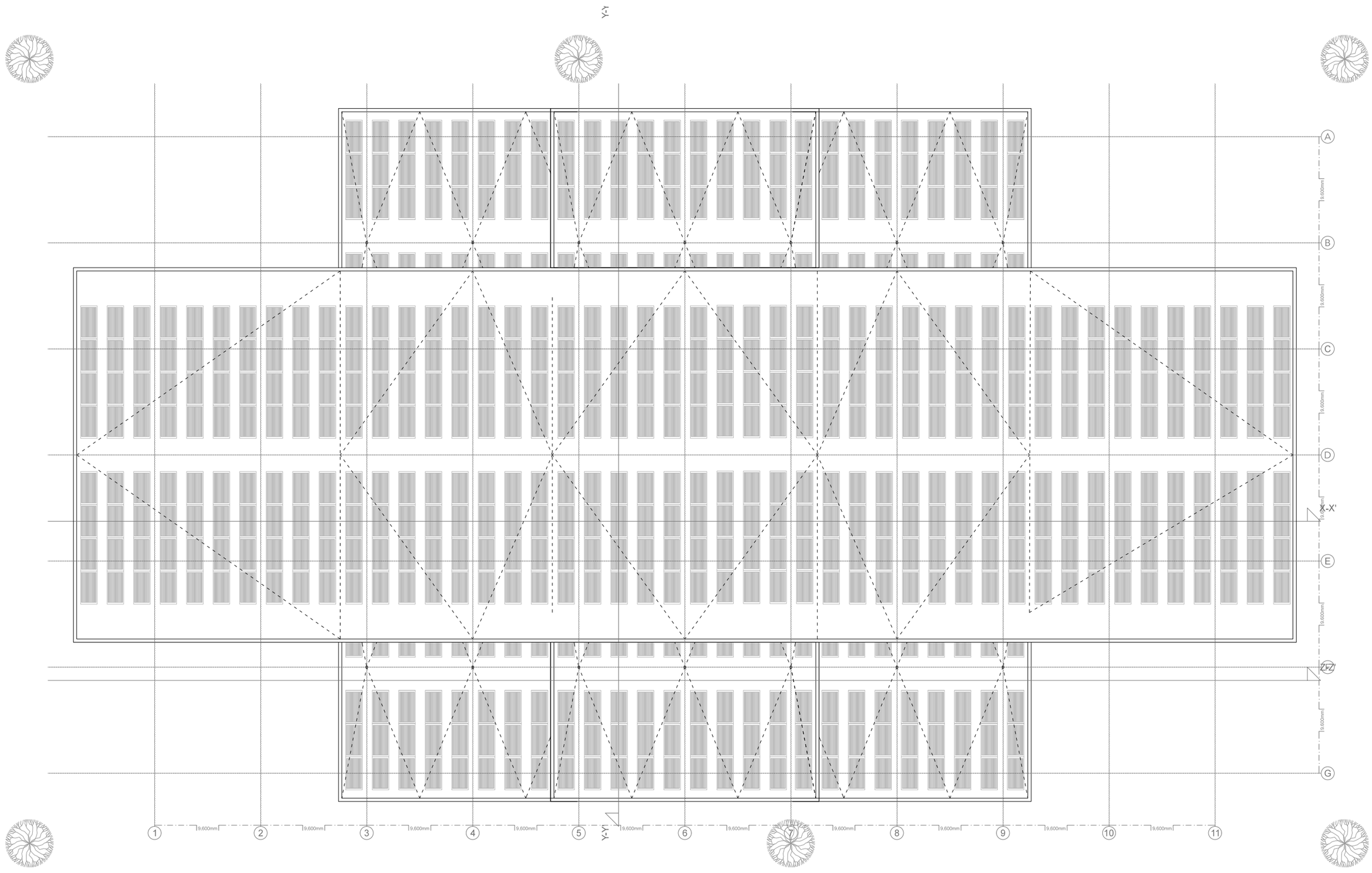
EAST FACADE VIEW INCLUDING CENTRAL AREA AND RECEPTION



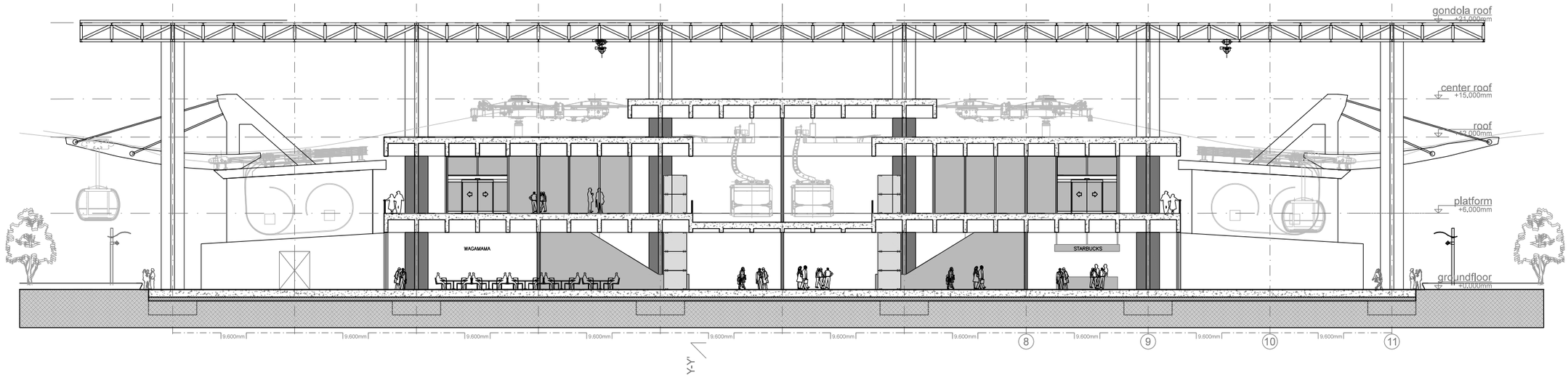
FLOORPLAN LEVEL 0



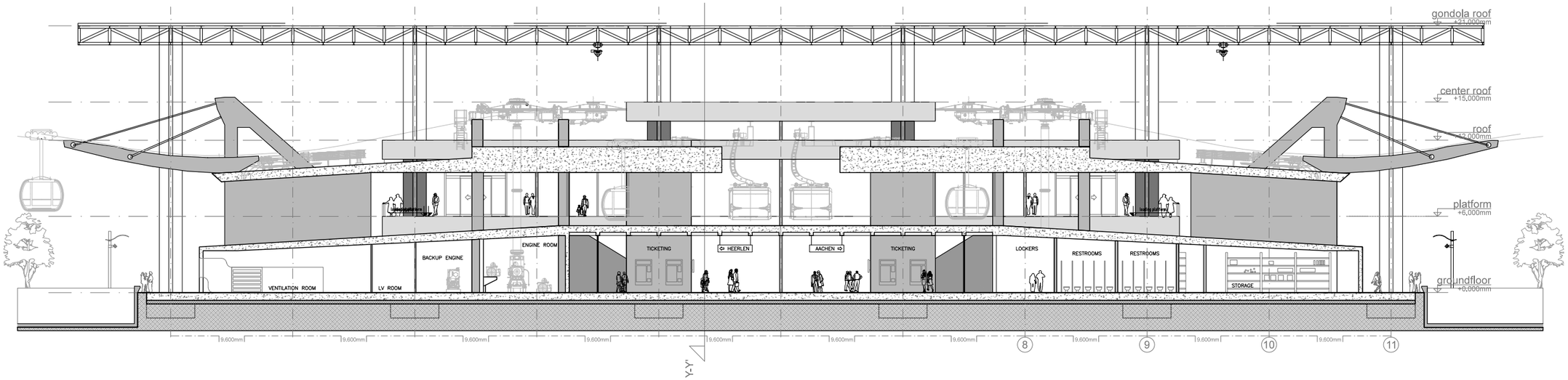
FLOORPLAN LEVEL 1



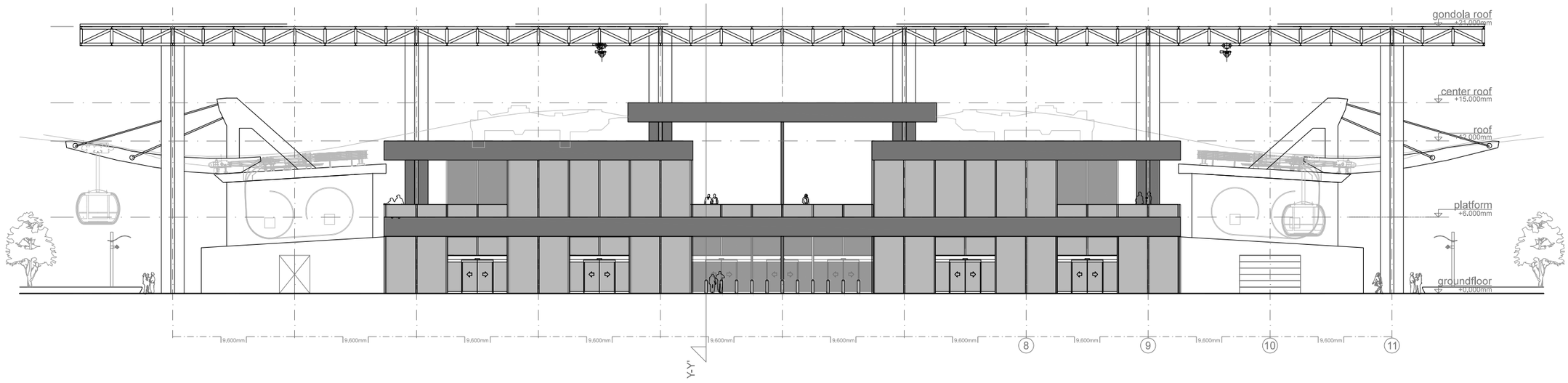
FLOORPLAN LEVEL 2 (ROOF)


gondola roof
+21,000mm
center roof
+15,000mm
roof
platform
+6,000mm
groundfloor
±0,000mm
WAGAMAMA
STARBUCKS
9.600mm
8
9
10
11
Y-Y'

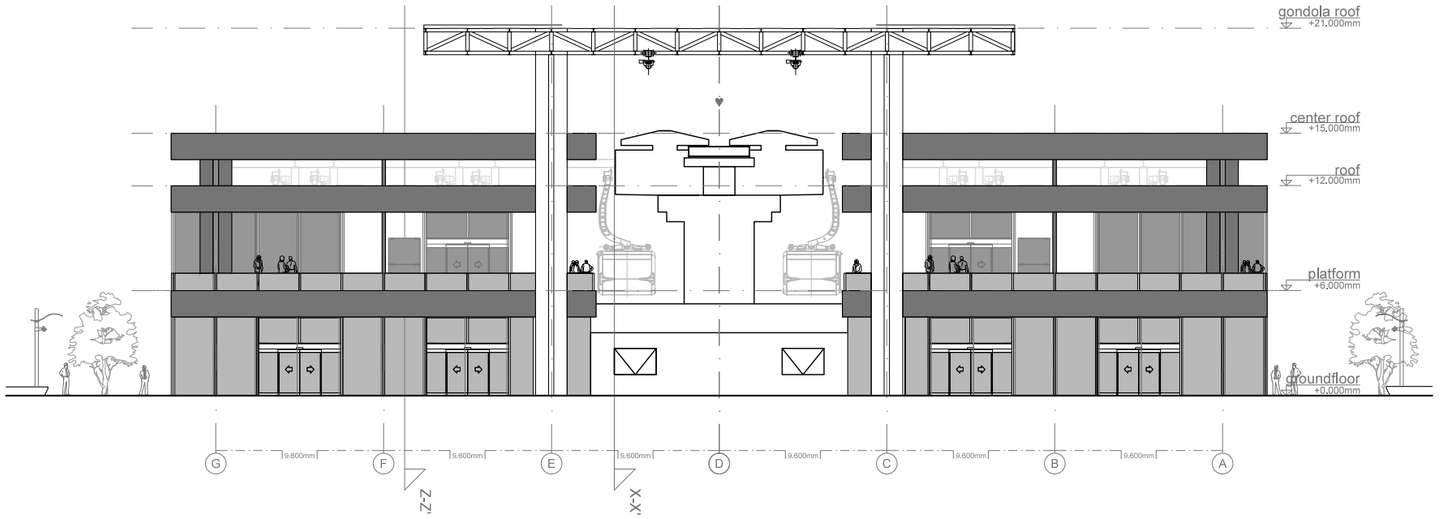
SECTION Z-Z'


gondola roof
+21,000mm
center roof
+15,000mm
roof
+12,000mm
platform
+6,000mm
groundfloor
+0,000mm
VENTILATION ROOM
LV ROOM
BACKUP ENGINE
ENGINE ROOM
TICKETING
HEERLEN
AACHEN
TICKETING
LOCKERS
RESTROOMS
RESTROOMS
STORAGE
9,600mm
9,600mm
9,600mm
9,600mm
9,600mm
9,600mm
9,600mm
9,600mm
9,600mm
9,600mm
8
9
10
11
Y-Y'

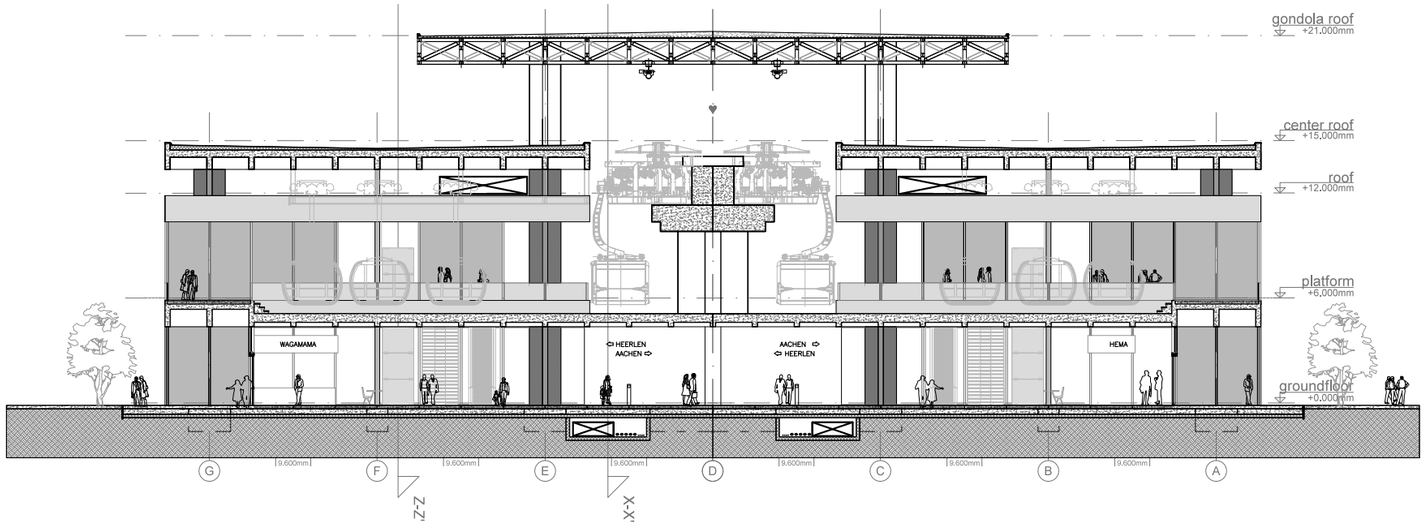
SECTION X-X'



SOUTH FACADE


gondola roof
+21.000mm
center roof
+15.000mm
roof
+12.000mm
platform
+6.000mm
groundfloor
±0.000mm
9.600mm
9.600mm
9.600mm
9.600mm
9.600mm
9.600mm
9.600mm
G
F
E
D
C
B
A
Z-Z'
X-X'

EAST FACADE


gondola roof
+21,000mm
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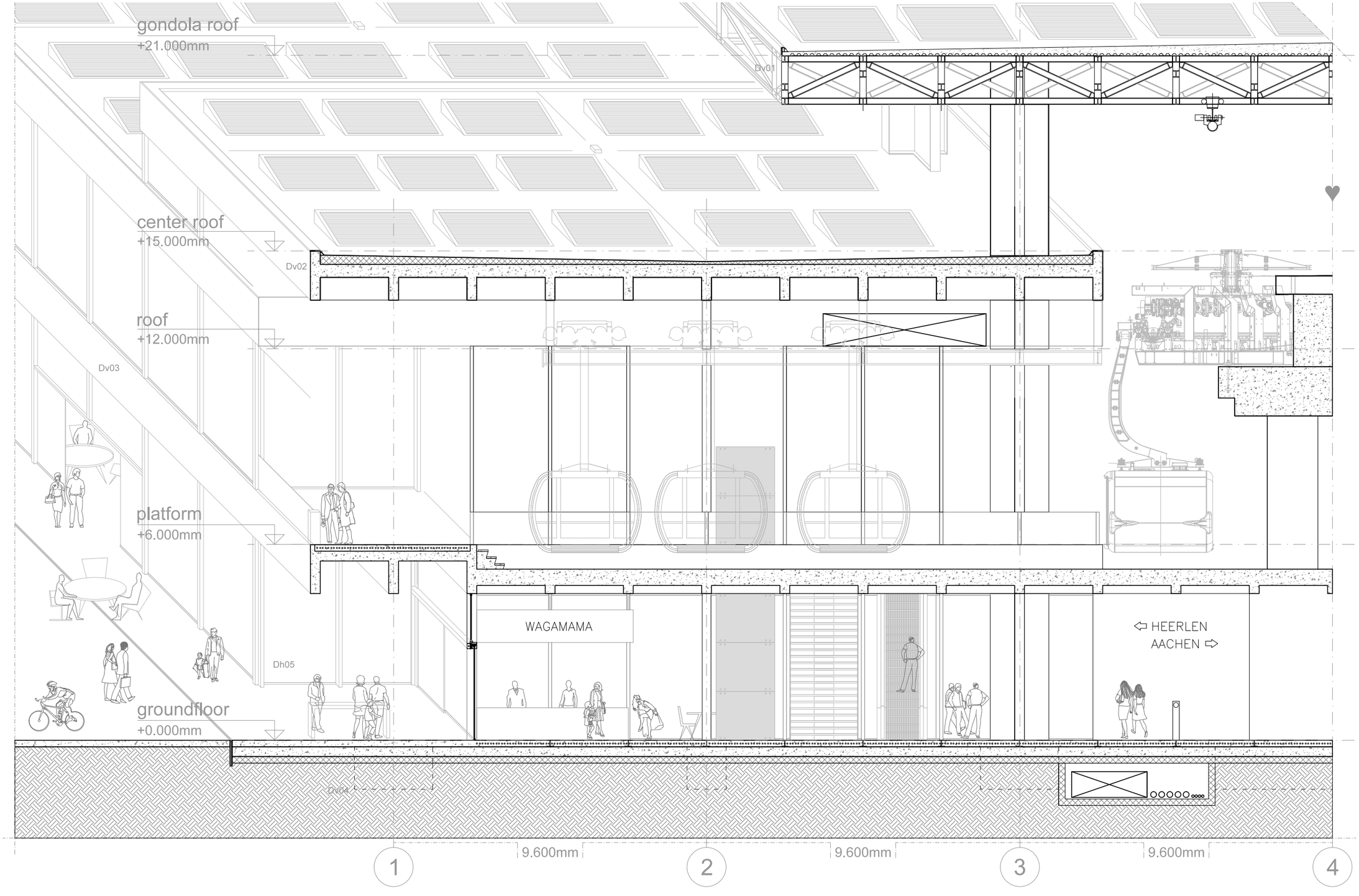
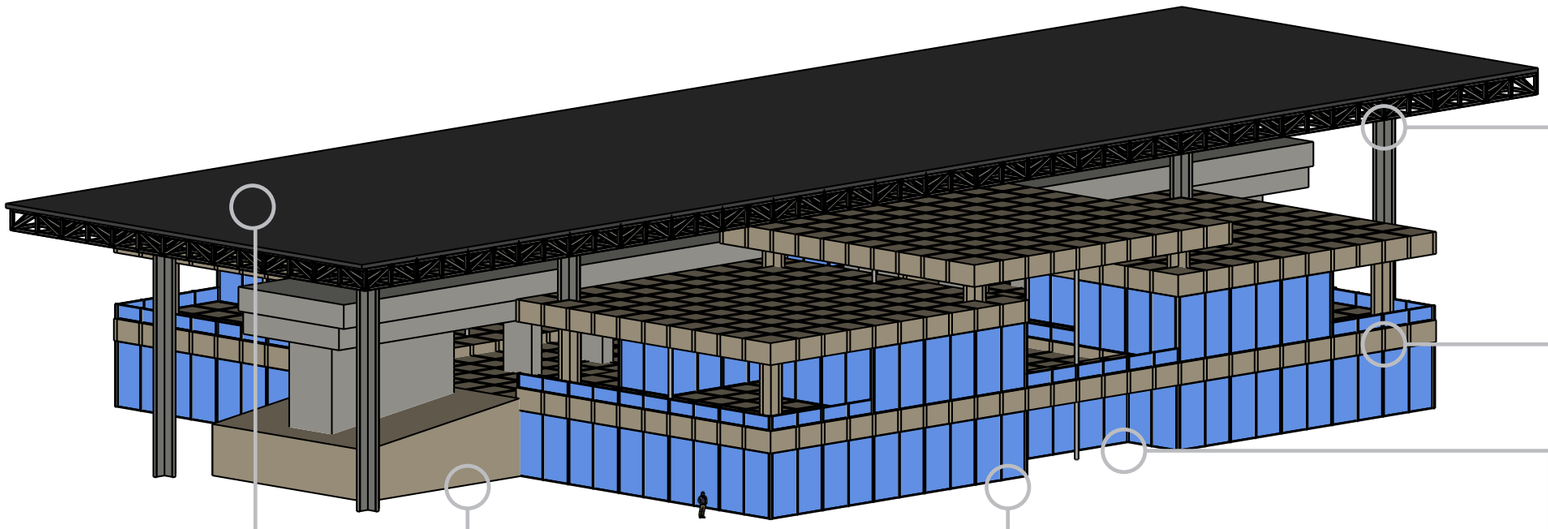
roof
+12,000mm
platform
+6,000mm
groundfloor
+0,000mm
WAGAMAMA
HEERLEN
AACHEN
AACHEN
HEERLEN
HEMA
9.600mm
G
F
E
D
C
B
A
Z-Z'
X-X'

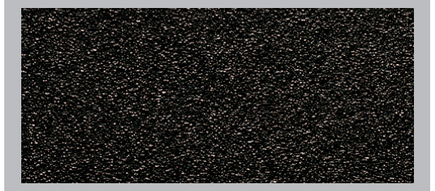
SECTION Y-Y'



SECTION HALFWAY CENTER SPLIT

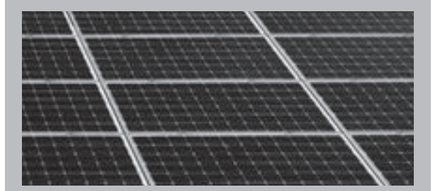
Materialisation



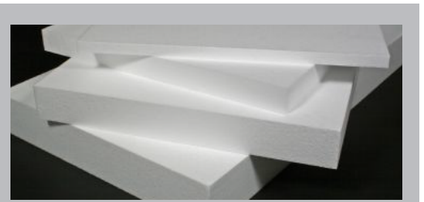


Steel
One of two major structural components is steel. all steel used is S275 strength, has been galvanized and is then powder coated. Graphite black (RAL9011)

Concrete
The second major structural component used is concrete. High strength, fibre reinforced, concrete is used due to the portal construction method and 300mm body width. Poured on site in 2,4x1,5m size. Mix Beige (RAL1001) / Silk Grey (RAL7044)



PV-panel
The roof is covered with PV panels providing 120kWh per m2 per year. The structure totals 0.5 million kWh annualy.

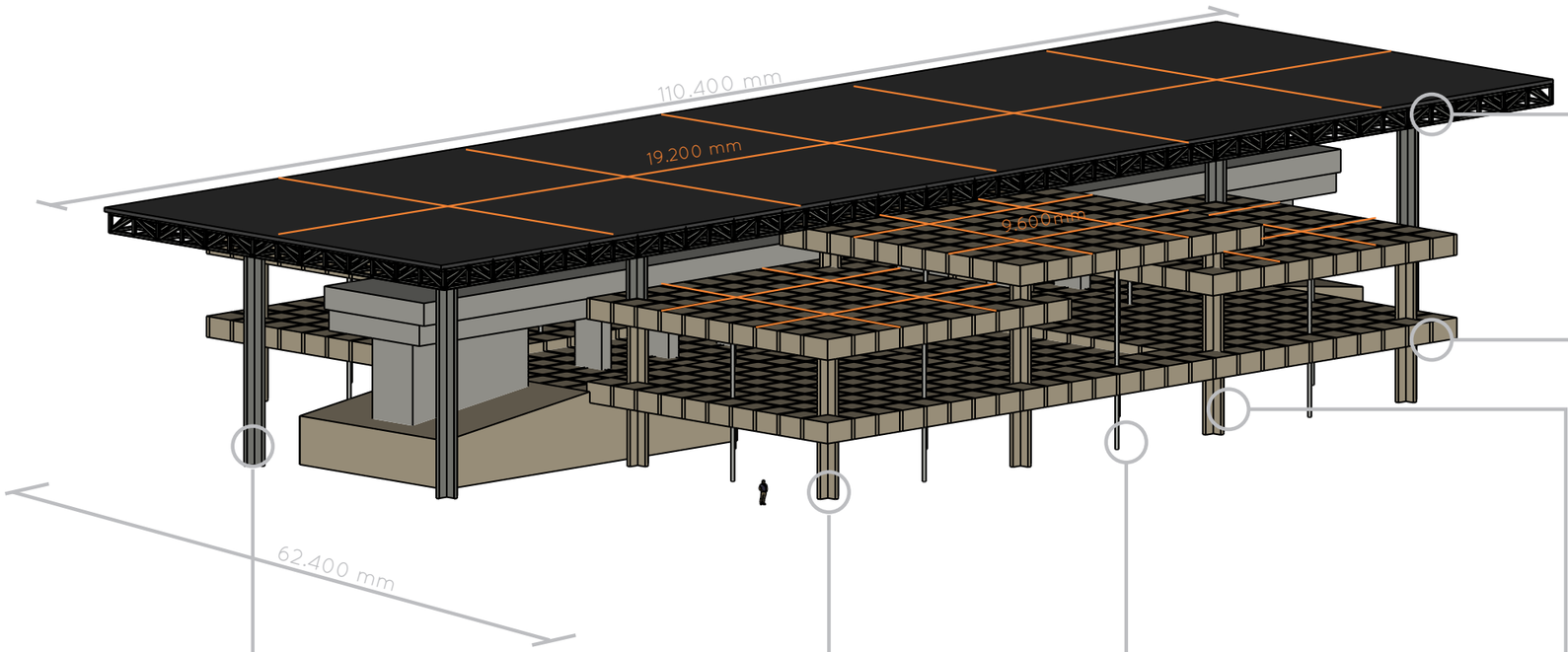


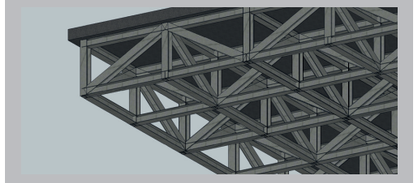
Foundation
After the column bases have been poured on site, the floor area is covered with EPS floorinsulation. The Limburg area is suited for a ‘funderen op staal’ method. Ventilation shafts are included in the floor.

Facade
The open segments of the facade are covered in double glass (HR++) panels of 2,4x4,5m in aluminium window frames of the same aesthetics as the construction.

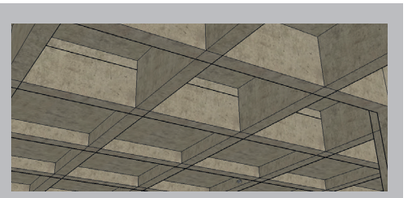
Doorways
The structure can be entered through automatic sliding doors. These doors are 4,8m total width and 3m tall. All metal and glass compents have the same properties as the facade.

Construction

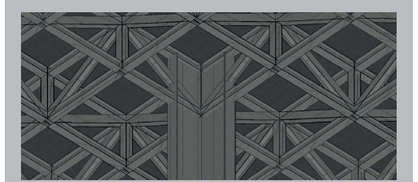




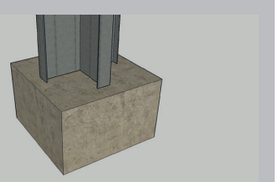
Steel truss roof
A trussed steel roof is required to span 19200mm, with overhang on all sides measuring 7200mm. All beams are HEB260 to carry roof weight and pulley system. The column runs through for portal construction.



Concrete cassette roof
The concrete structure has cassette roofing of a 2400x2400mm grid, beam body width 300mm, floor height 500mm and total height 1500mm. total height is reduced to 800mm in center parts due to gondola runway.

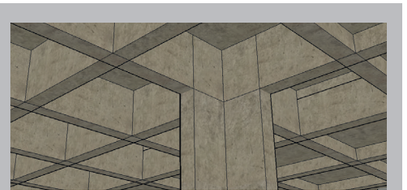


Steel primary column
The center roof is supported with steel cross section columns. Total width 1800mm, flange width 300mm and body thickness 20mm. Tallest column 21000mm, others are placed on top of concrete structure.



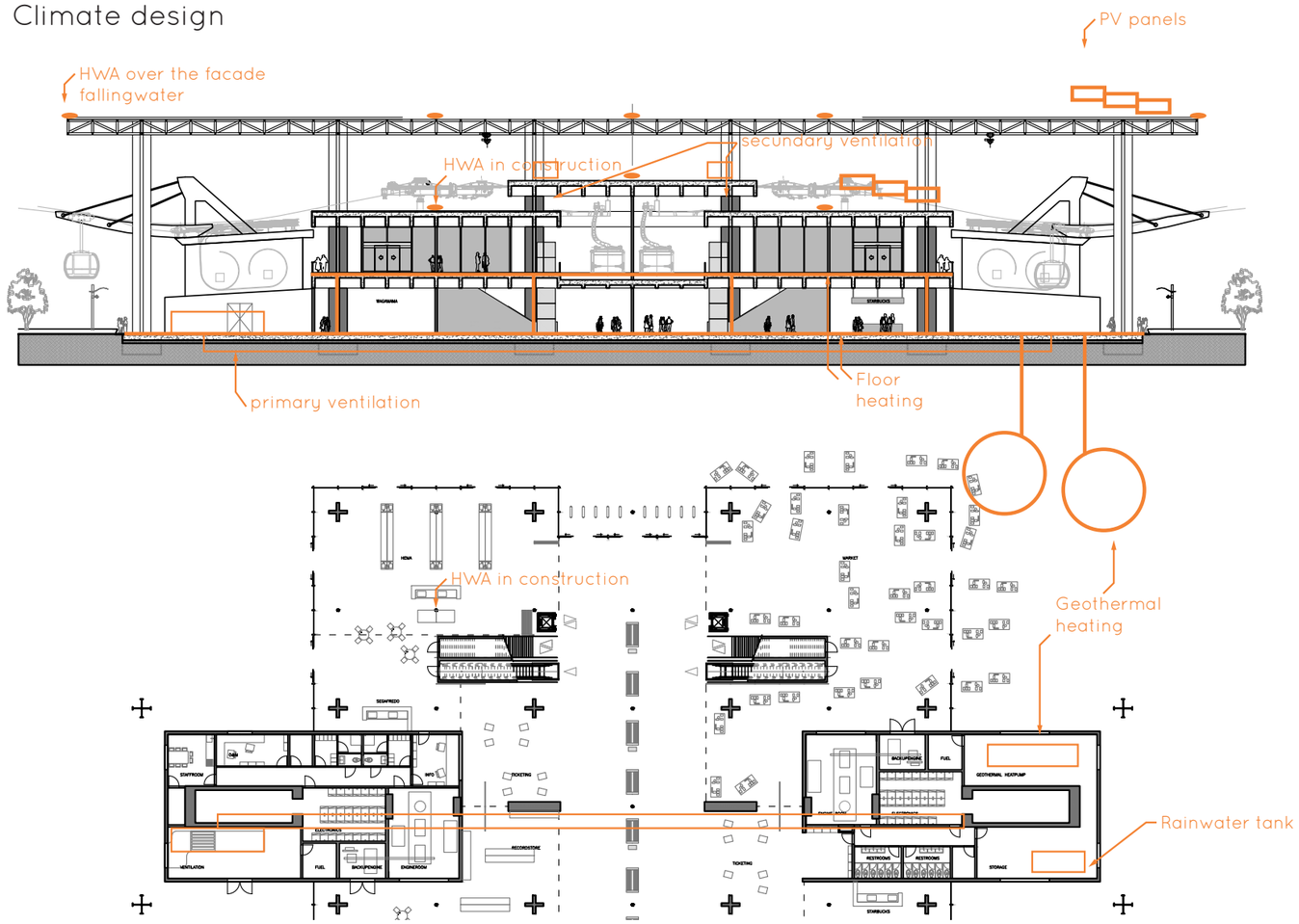
Concrete Foundation
All columns have a concrete base of 2400x2400x1500mm.

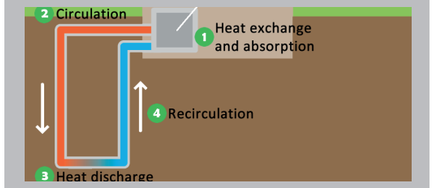
Steel secundary column
Round steel columns (273x16mm), height 4500mm, are placed in between the concrete columns to reduce span length to 9600mm. max floor size to carry 4800x7200mm.



Concrete column
Similar size to the Steel primary, 1800mm total width, 300m body width, height 4500mm. Cast on site with the cassette floor and extra steel reinforced due to the portal construction method.

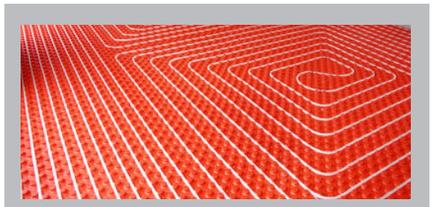
Climate design





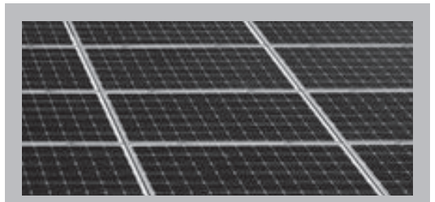
Geothermal heat pump

Using a closed-loop pump allows for the use of ground water providing a constant inside temperature of about 16 degrees celsius all year round.



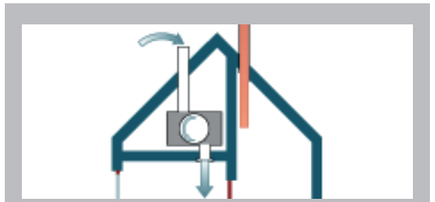
Floor heating

Seeing it is a heavy structure, floor heating can be placed as the ‘veins’ to the mass exchanging excess heat or cold from the body to the heatpump aquivers allowing for constant temperatures.



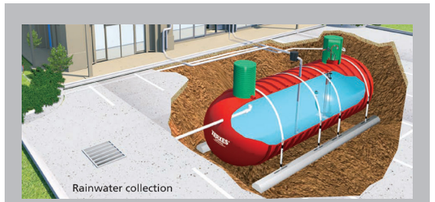
PV-panel

The roof is covered with PV panels providing 120kWh per m2 per year. The structure totals 0.5 million kWh annualy.



Ventilation

The ventilation of the bottom floor is drawn in from the side of the building, taken through the floor and and blown into the center at ceiling height. The top ventilation blows in through the roof cassette.



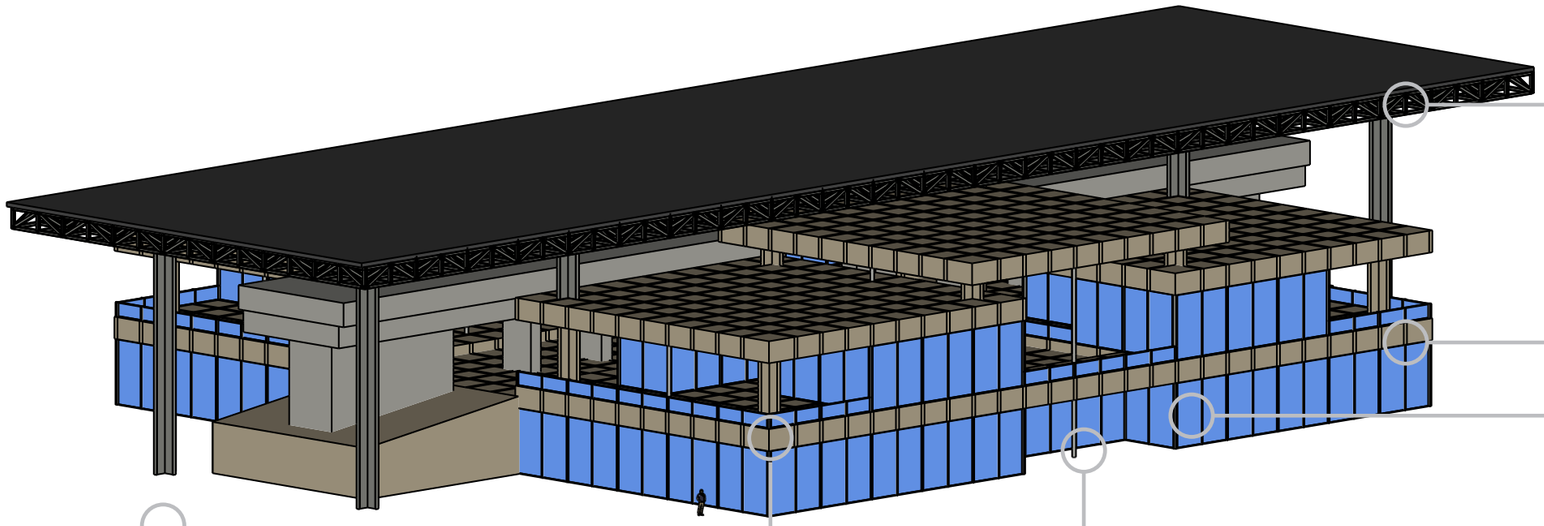
Rainwater collection

The large roofsurfaces allow for a great deal of grey water collection that can be used for the restrooms and cooling water in the engine rooms.

Concrete

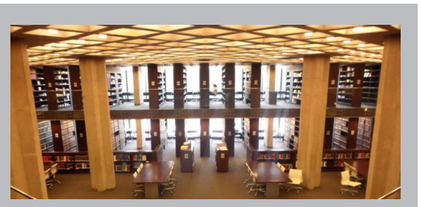
The use of Ultra high strength concrete allows for slim structures, filling the cassettes with lightweight concrete or bubbledeck systems further reduces the amount of concrete needed.

References



Military museum

Soesterberg, Claus & Kaan (2014). A finely detailed steel truss roof complete in matt black colour spanning over the entire interior of the structure including great overhangs.



D'angelo law library

Chicago, Eero Saarinen (1959). A high cassette roofing with cross cut concrete columns to create a robust and prestegieuse feeling.

Station Rotterdam

Rotterdam, Benthem Crouwel & West 8 (2014). Great interest is the relation of public space towards the station, measurements of wide and tall structures relating to infrastructure and routing.

Zuidasdok

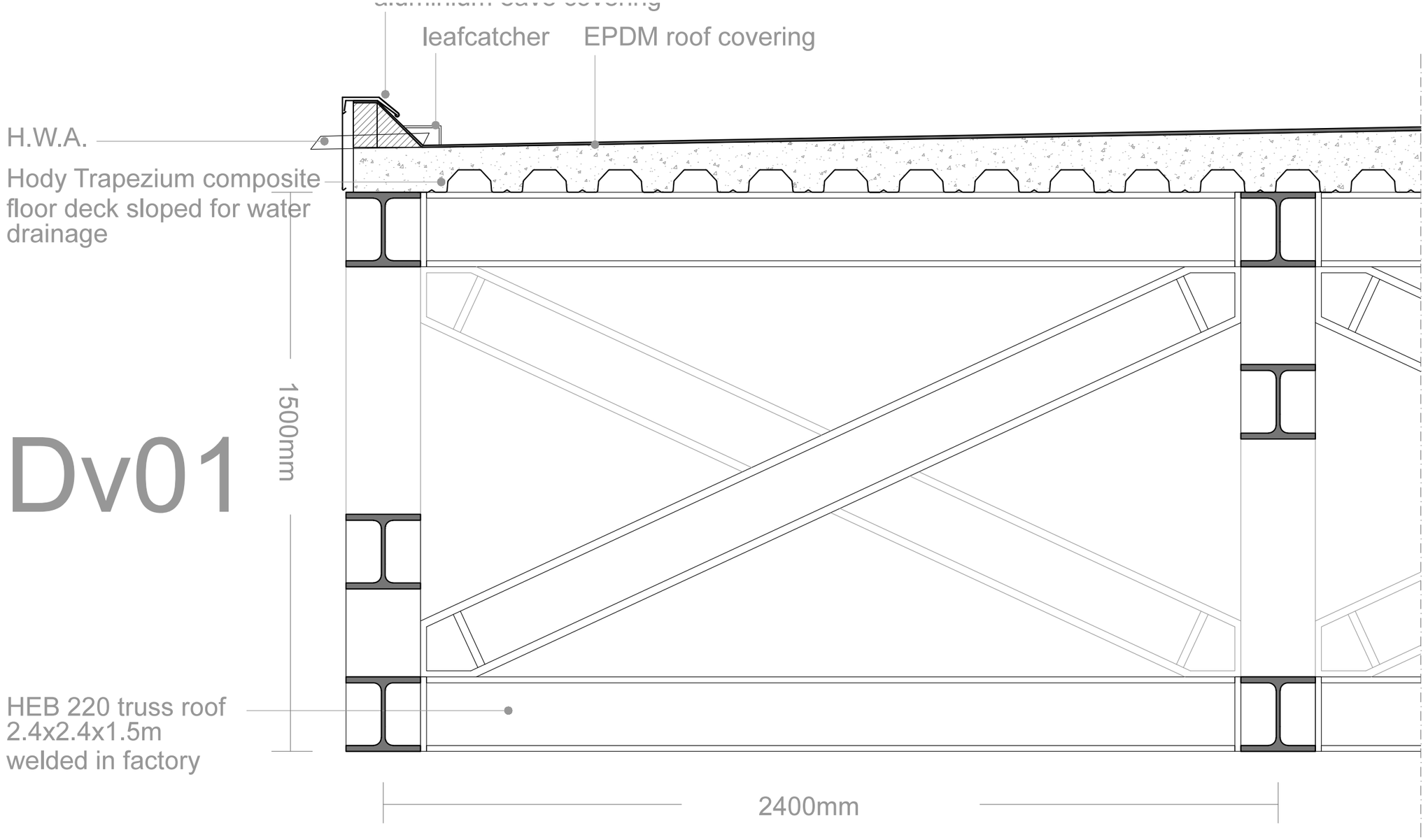
Amsterdam, Team V (planning). Impression of a terrassed, layer like build up of structure with high bars presenting level heights.

S.R. Crown Hall

Chicago, Mies van der Rohe (1956). A Slick construction showing great spans. finished with minimal windowframes and open plan structure.

Langen Foundation

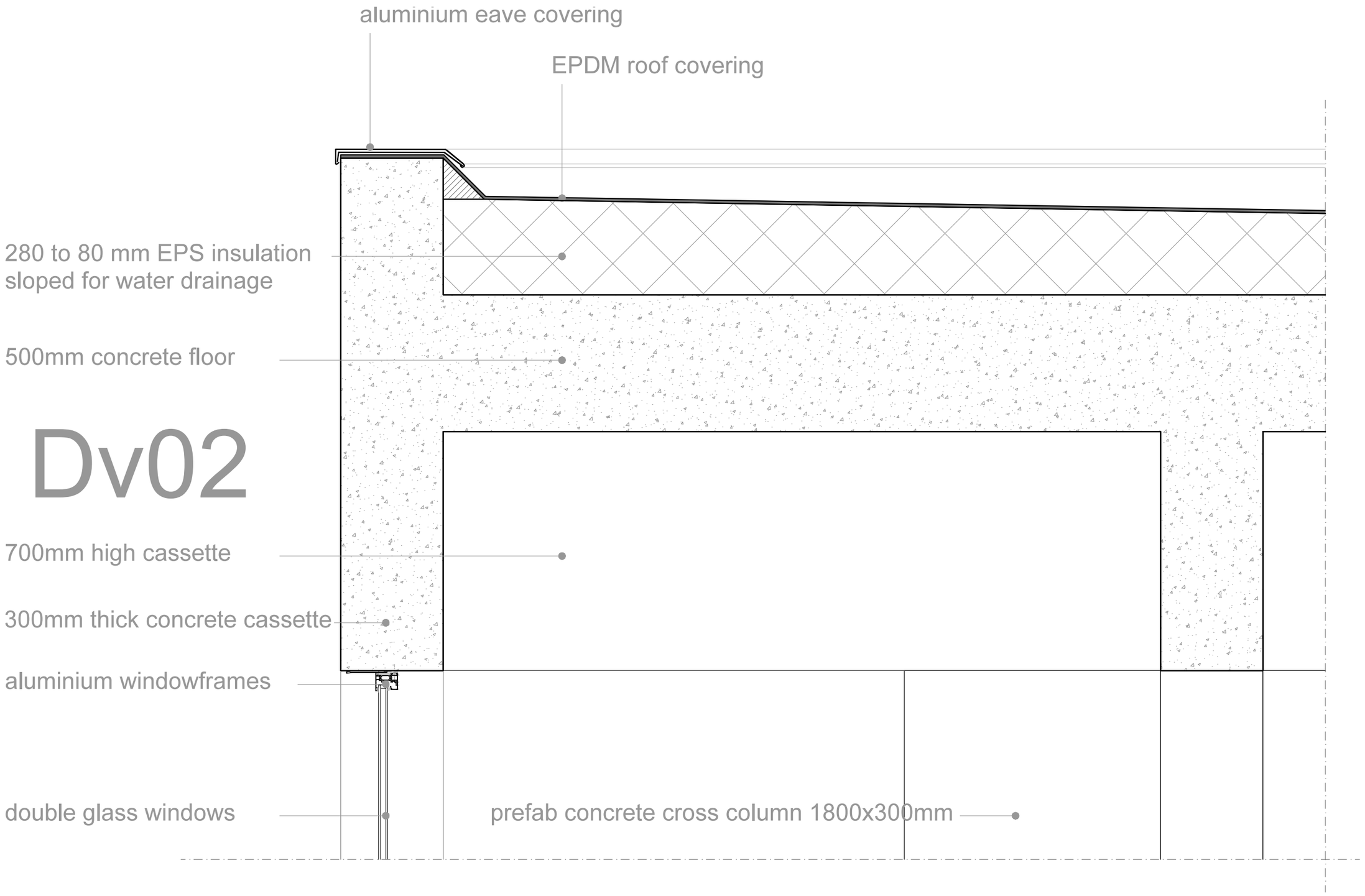
Neuss, Tadao Ando (2004). The connections of fine concrete with steel and glass frameworks.



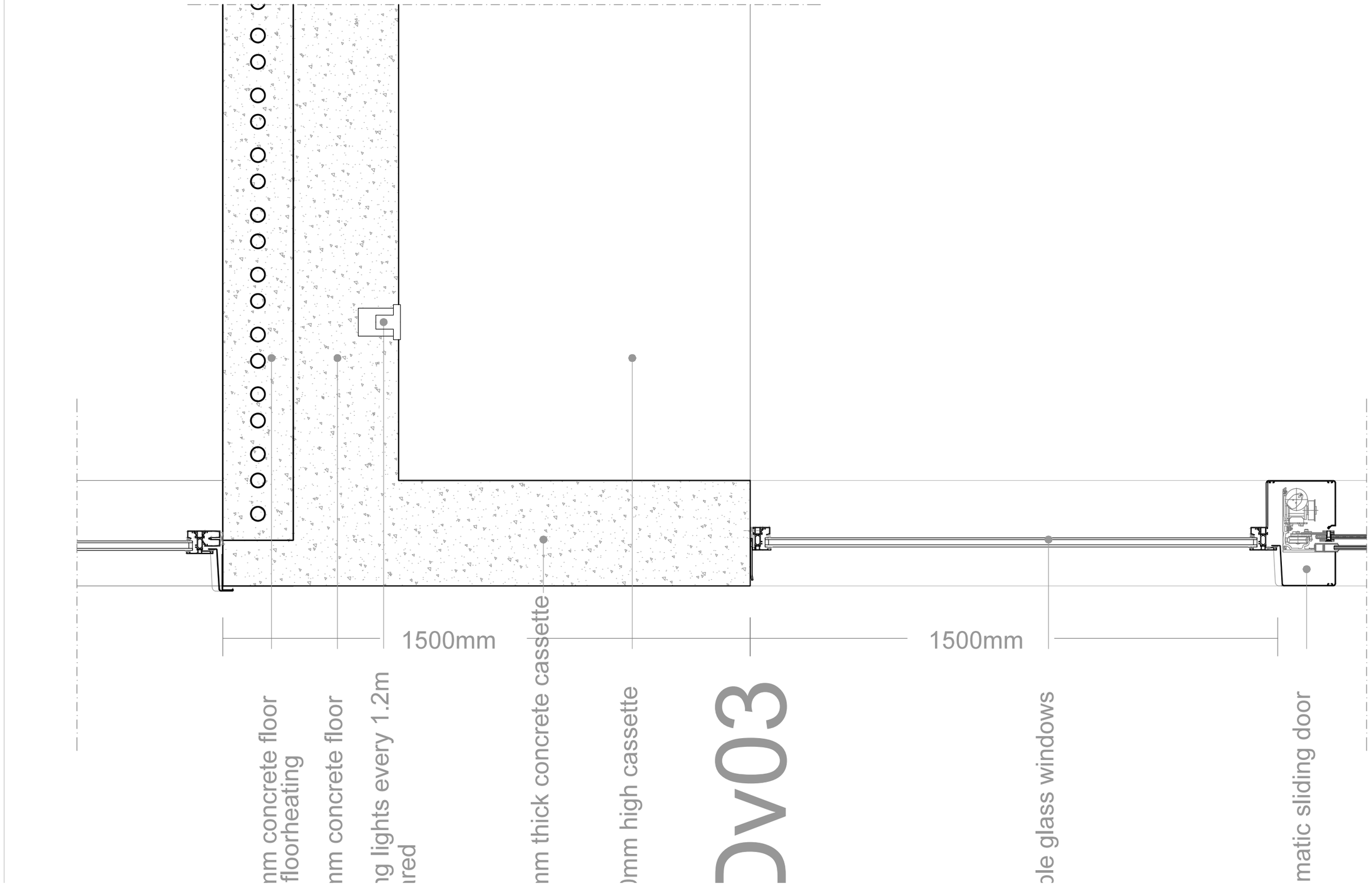
Dv01

DETAIL VERTICAL 01: STEEL TRUSS ROOFING

Dv02

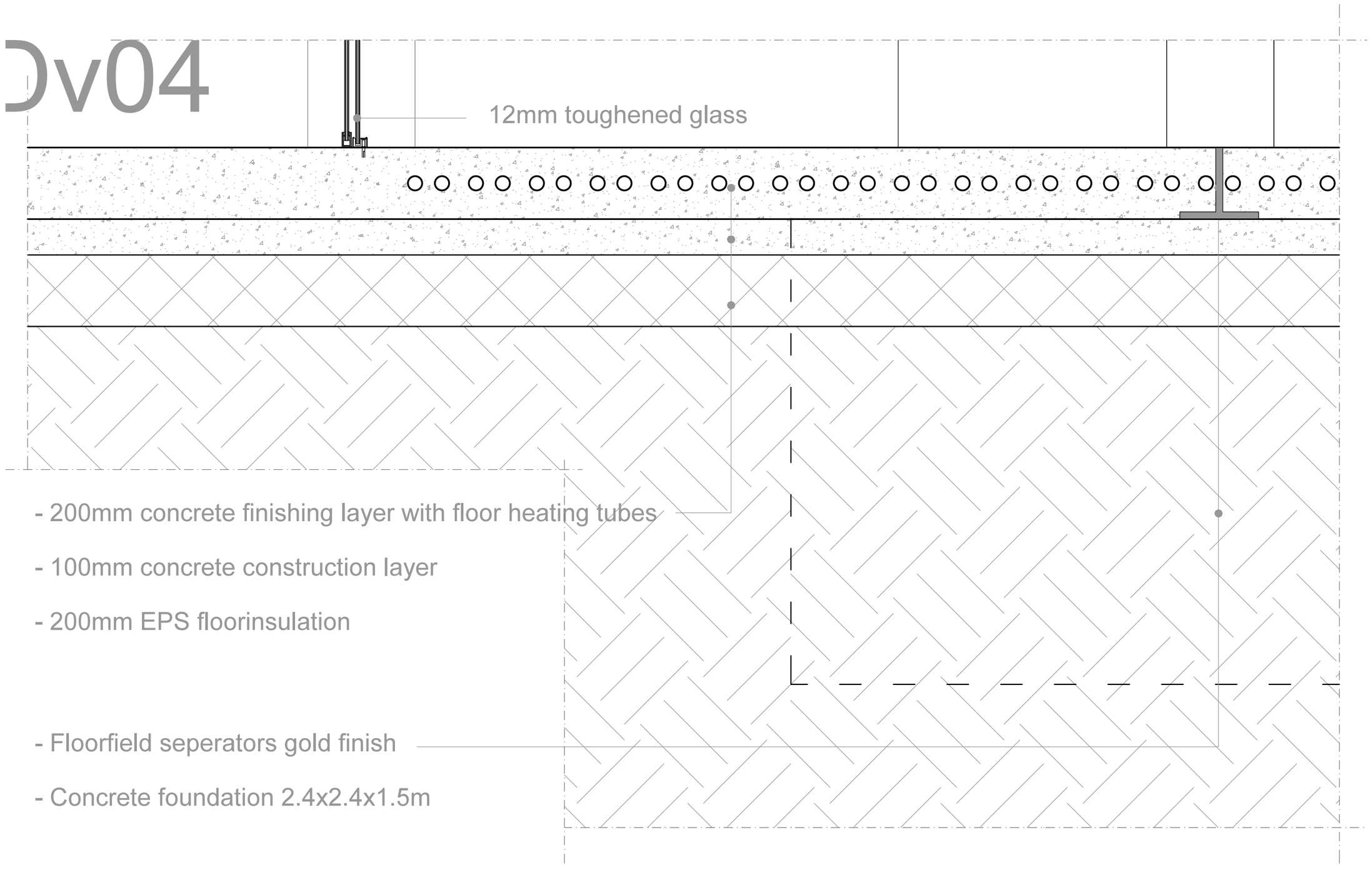


DETAIL VERTICAL 02: FACADE ROOF CORNER

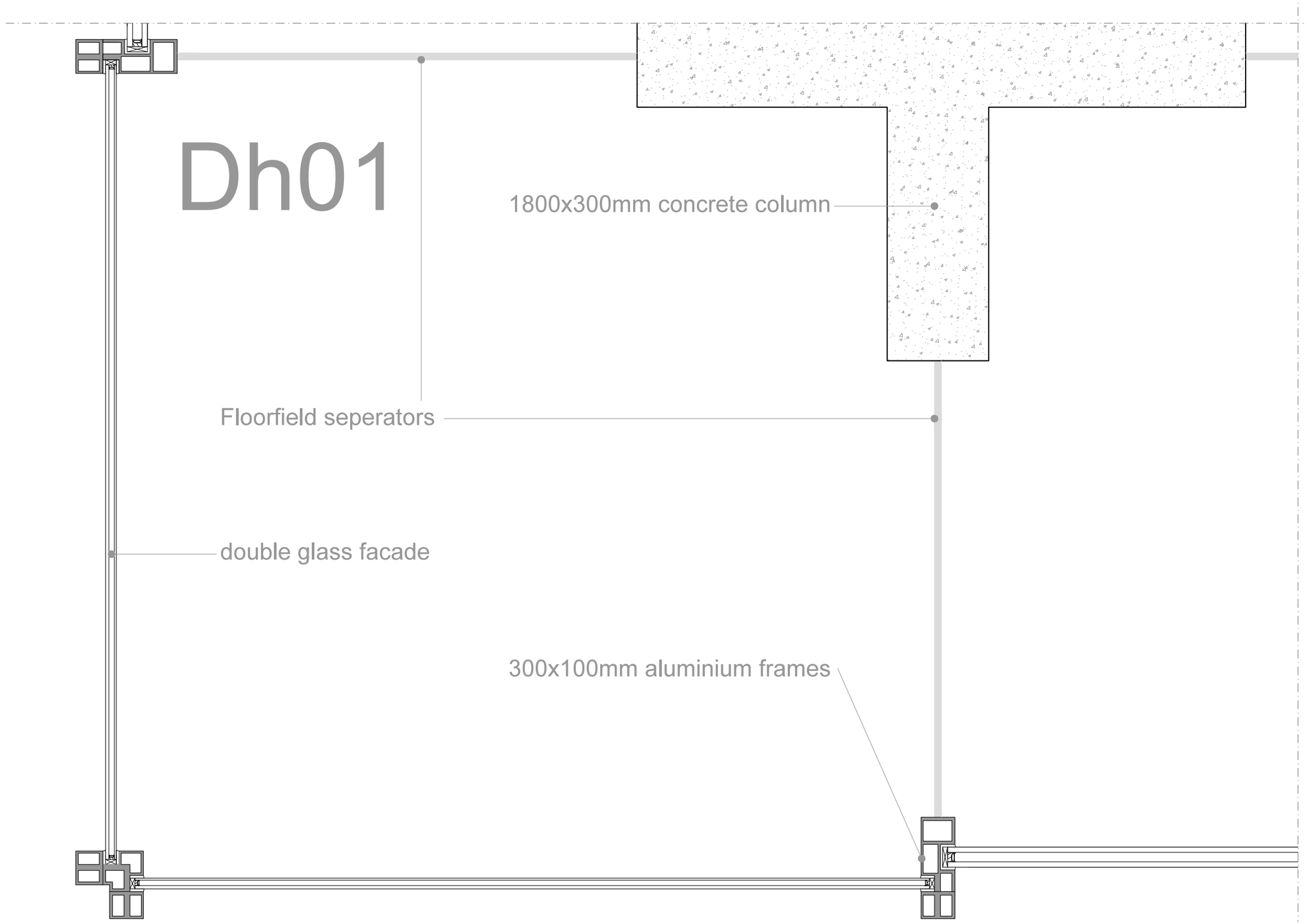


DETAIL VERTICAL 03: CONNECTING UPPER AND LOWER FLOOR

Dv04



DETAIL VERTICAL 04: FOUNDATION



DETAIL HORIZONTAL 01: FACADE CORNER

- 300mm concrete wall
- 40mm cavity
- water reflecting layer
- 200mm rockwool insulation
- vapour barrier
- 15mm plasterboard

Dh02

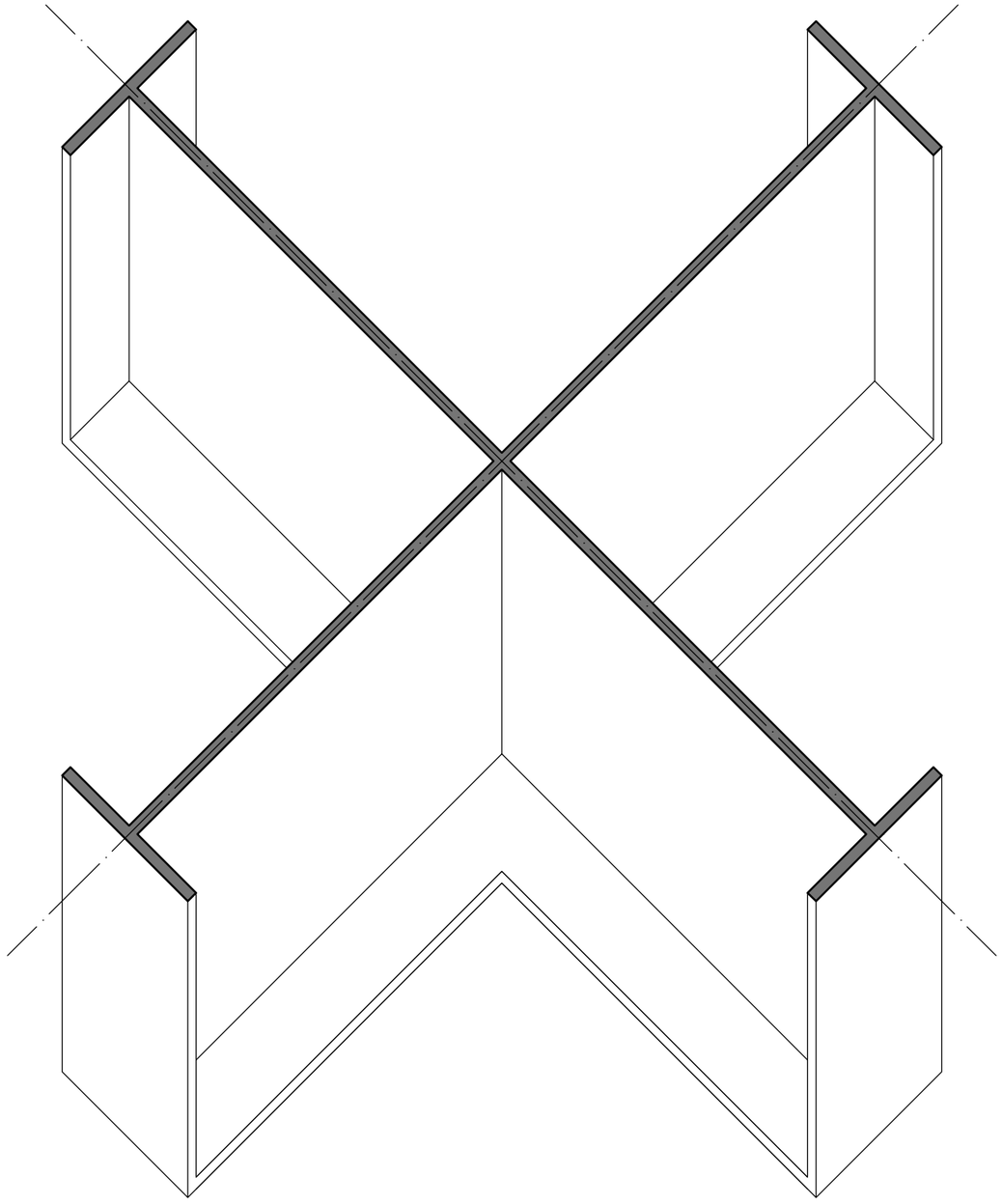
DETAIL HORIZONTAL 02: CONCRETE FACADE WITH WINDOW

- 300mm concrete wall
- 40mm cavity
- water reflecting layer
- 200mm rockwool insulation
- vapour barrier
- 15mm plasterboard

Dv05

Da01

1800x300x2mm steel column



DETAIL AXONOMETRY 01: CUSTOM STEEL CROSS COLUMN