



DIAMOND STADIUM

SOLAR ENVELOPE AS AN ARCHITECTURAL TOOL

P5 PRESENTATION
NAWAZ DABBAGH
1523996



Tu Delft
Faculty of Architecture
Graduation Studio: Architectural Engineering +
Technology, Friday June 30st 2015



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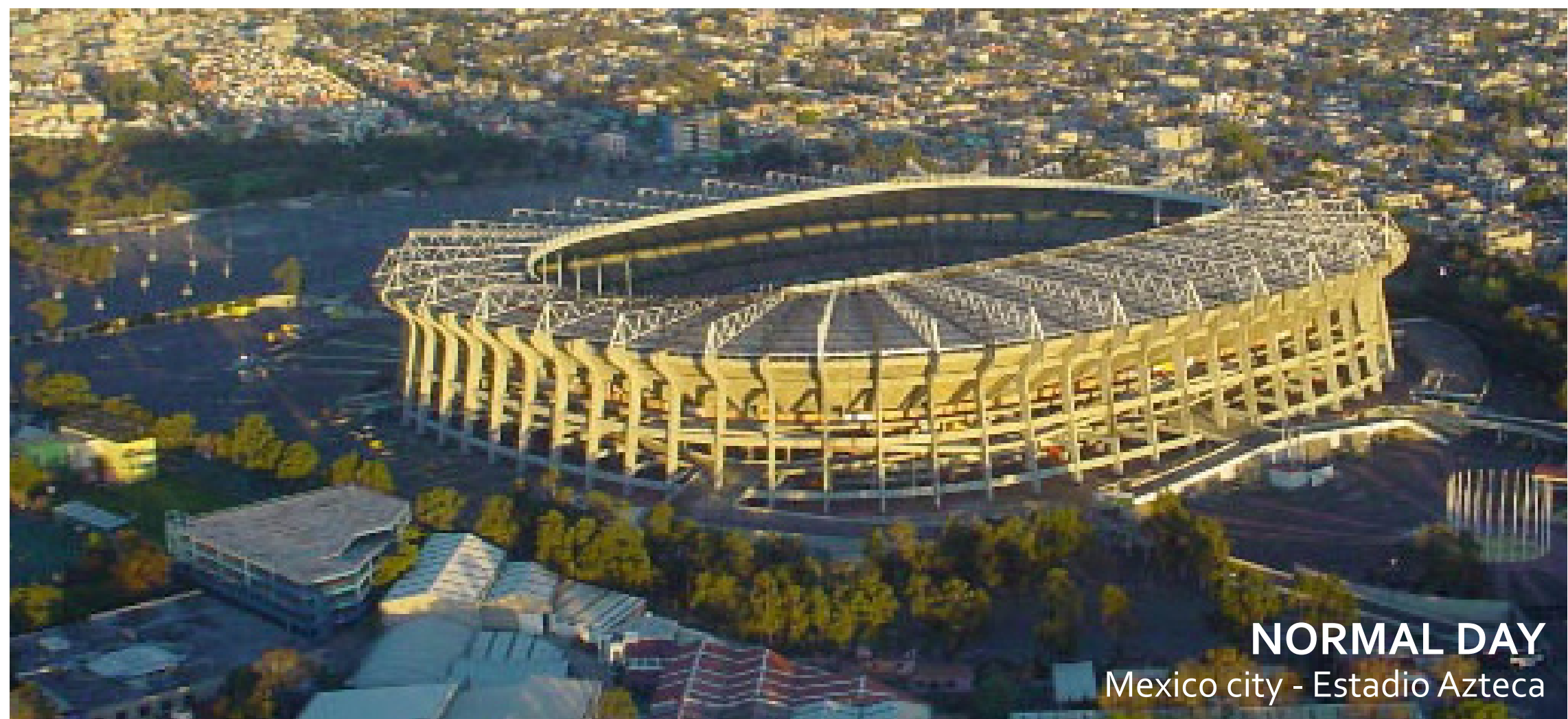
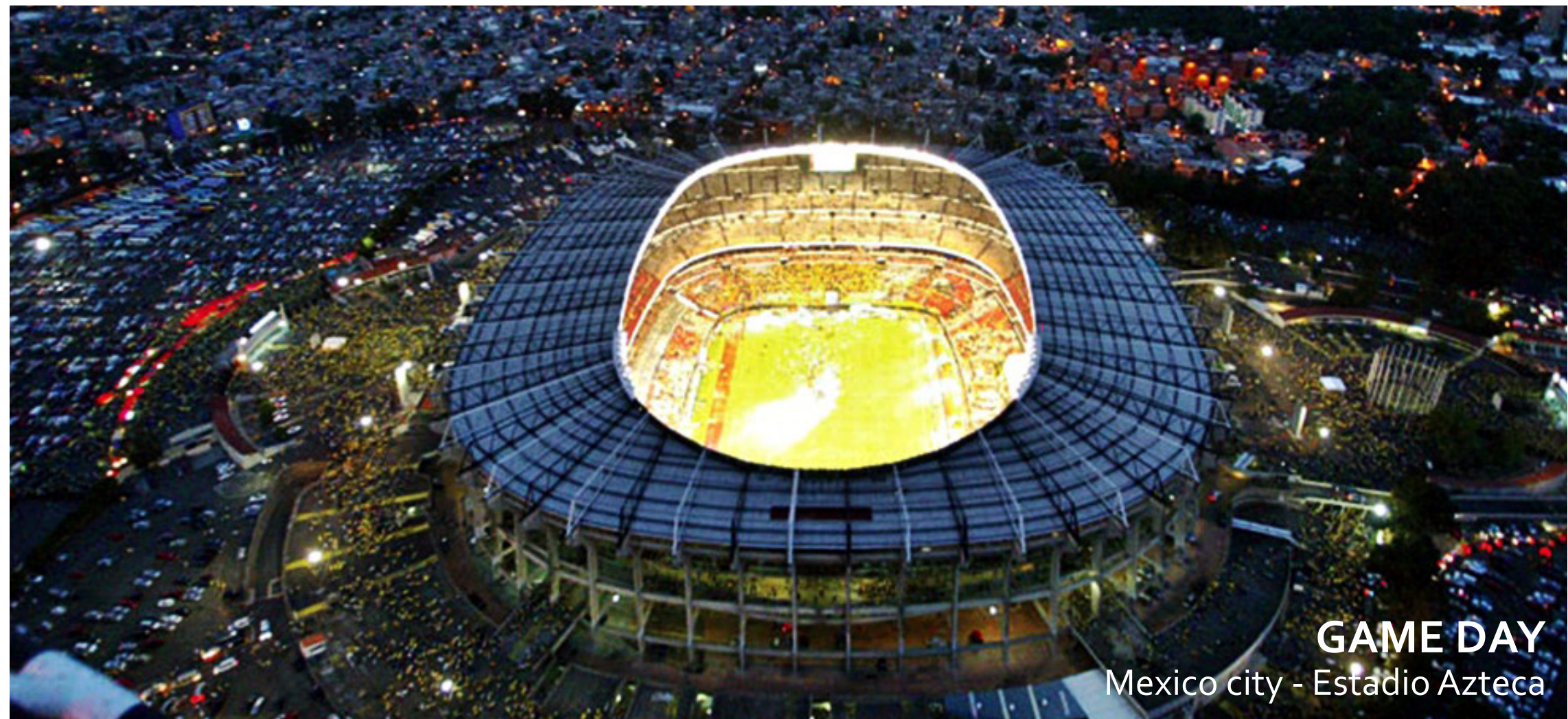
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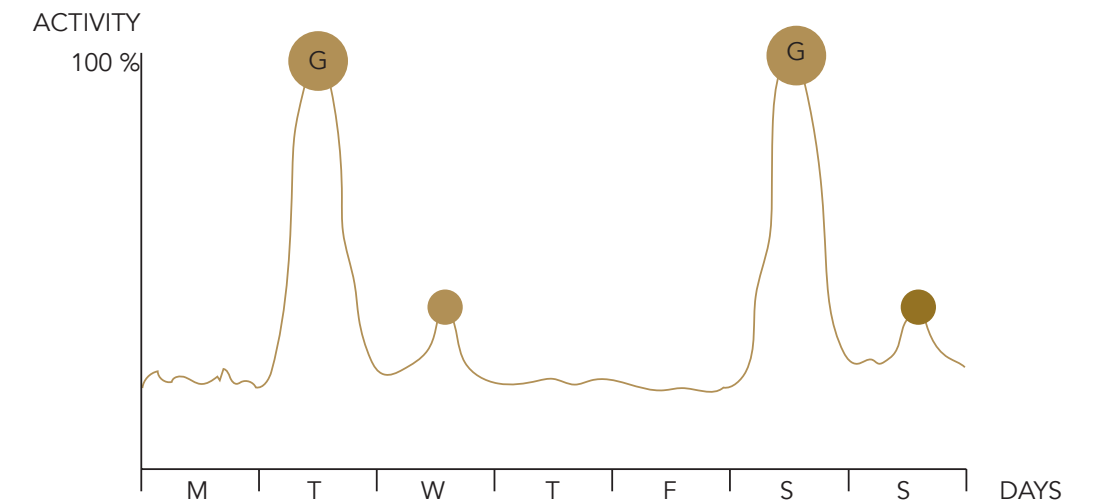
NO RELATIONSHIP WITH PUBLIC SPACES



NOT A SUSTAINABLE BUILDING



NO ADDED SPATIAL AND ARCHITECTURAL QUALITY



2 DAYS **LIVELY** 5 DAYS **VACANT**



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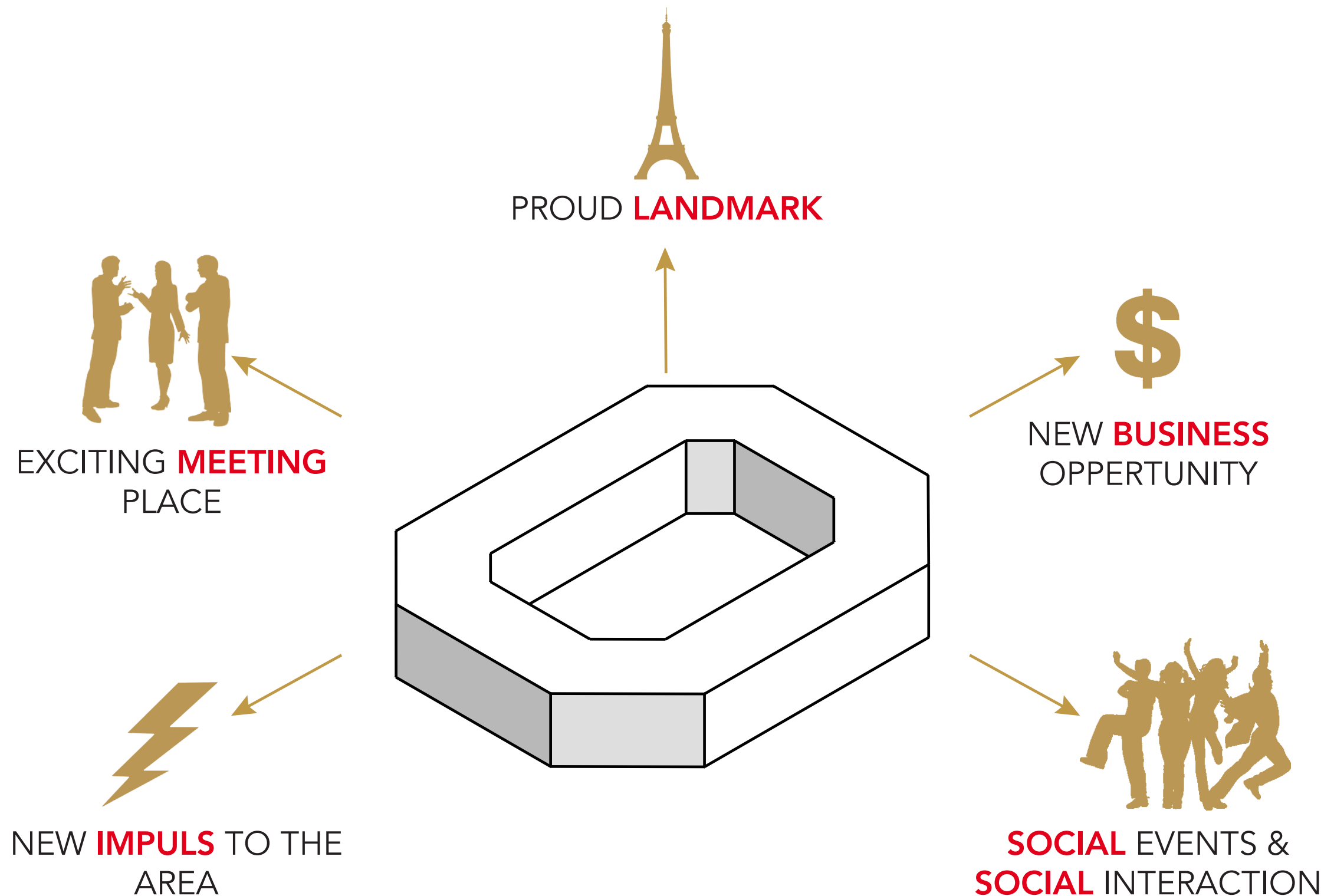
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PHILIPS STADIUM

MENTIONED **PROBLEMS & RELEVANCE** APPLICABLE



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PSV WANTS TO EXPAND



NUSPORT.NL

"AMSTERDAM - PSV wil het Philips Stadion uitbreiden naar 45.000 stoeltjes. Uit een onderzoek (dat nog altijd gaande is) blijkt, dat het achterland groot genoeg is voor deze capaciteit. De Noord-, Oost- en Westtribune zouden in de plannen worden voorzien van een extra laag. Dit meldt het AD dinsdag"

OMROEP BRABANT

"GRAN CANARIA - PSV wil graag een stadion waar plaats is voor 50.000 toeschouwers. Dat heeft de club zojuist bekendgemaakt op een bijeenkomst in Gran Canaria, waar de selectie op trainingskamp is. Of dat kan door uitbreiding van het huidige stadion of een nieuw stadion moet onderzoek uitwijzen."

NOS

"PSV wil een stadion waar plaats is voor 50.000 bezoekers. Dat kan via een verbouwing van het huidige Philips-stadion of door het bouwen van een geheel nieuwe voetbaltempel. Algemeen directeur Tiny Sanders zei voor de microfoon van Omroep Brabant nog niet te weten hoe het moet gebeuren en ook niet wanneer."



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EINDHOVEN

2045 ENERGY NEUTRAL





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OVERALL **DESIGN** QUESTION

HOW TO **TRANSFORM** THE EXISTING **PHILIPS STADIUM** INTO A **SOLAR POWERED** STADIUM WITH A CAPACITY OF 45 000 SEATS AND **INTEGRATING** THE STADIUM WITH THE **CITY** ?



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THEMATIC RESEARCH QUESTION

HOW TO DESIGN A **NEW** BUILDING **ENVELOPE** THAT CAN **OPTIMIZE** THE **SOLAR ENERGY** PRODUCTION AND AT THE SAME TIME **ENHANCES** THE DESIRED **SPATIAL AND ARCHITECTURAL QUALITY** ?

CONTEXT



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CONTEXT

---- CITY EINDHOVEN ----

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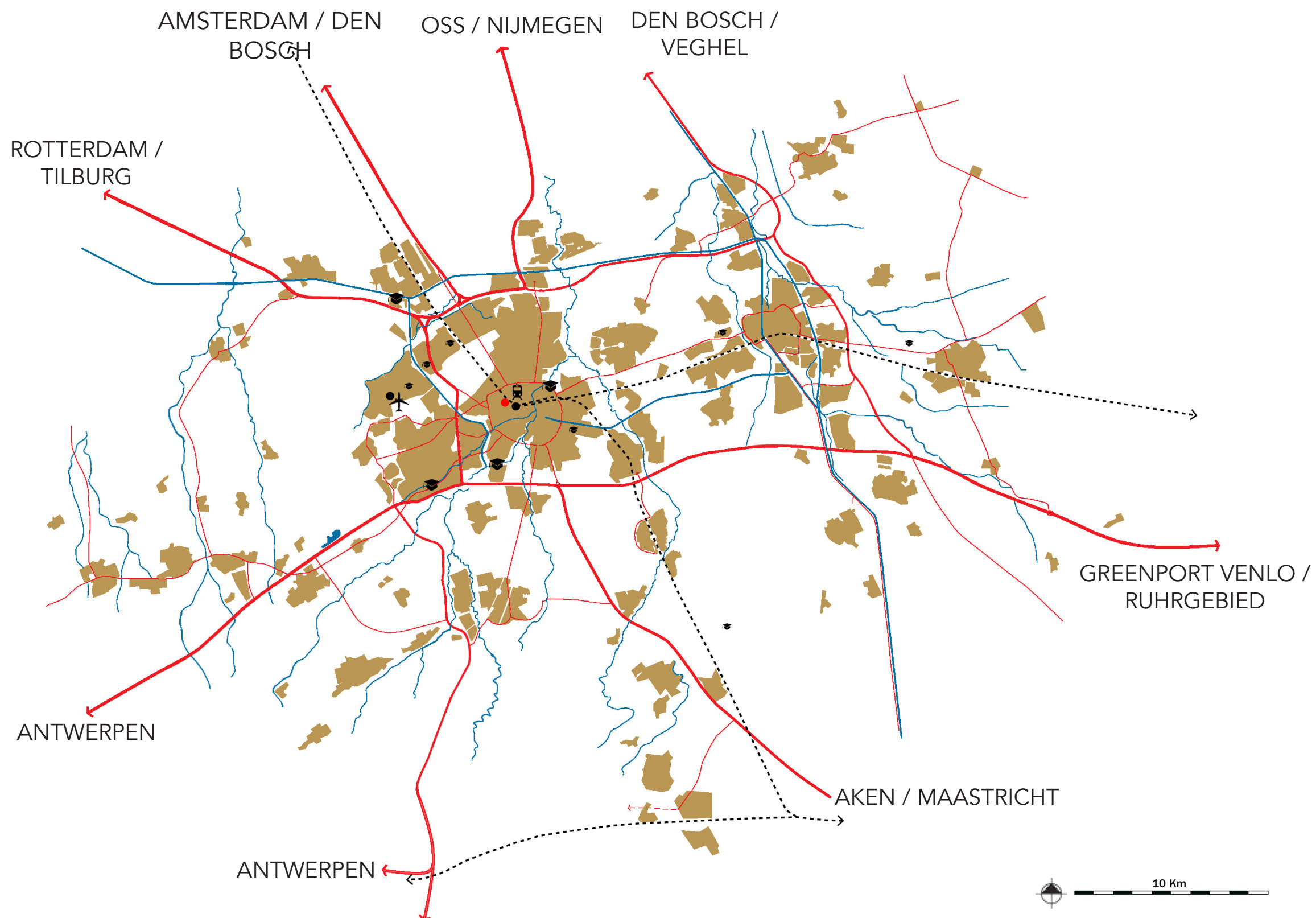
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EINDHOVEN HIGHLY ACCESSIBLE





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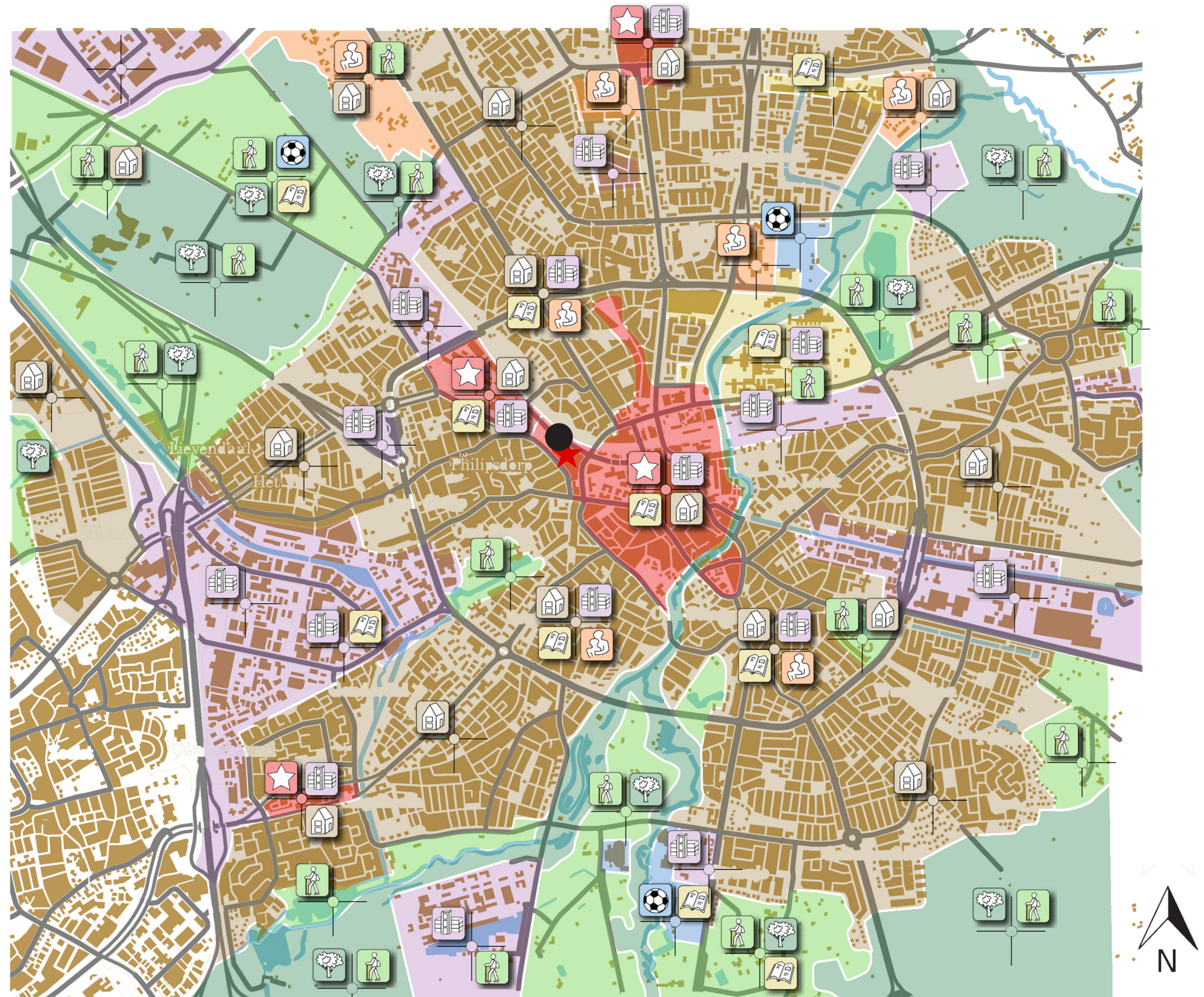
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NATURE



RECREATIONAL GREEN



CARE AND SUPPORT



LIVING



EDUCATION



WORKING



SPORT



CITY CENTER



PHILIPS STADIUM



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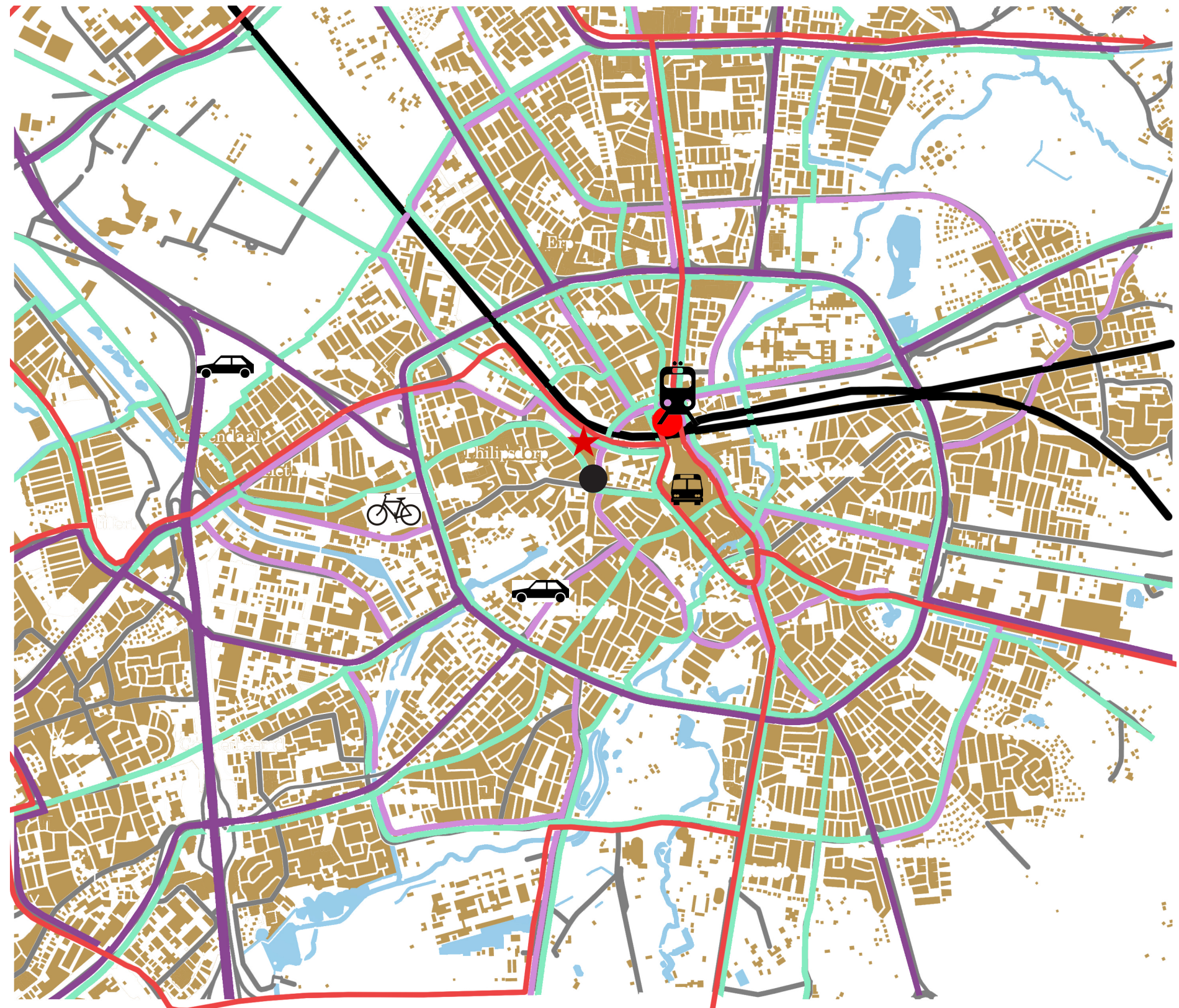
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INFRASTRUCTURE



PRIMARY CAR ROAD

SECONDARY CAR ROAD

BICYCLE ROAD

PUBLIC TRANSPORTATION
(HOOGWAARDIGE OV)

RAILROAD

PHILIPS STADIUM

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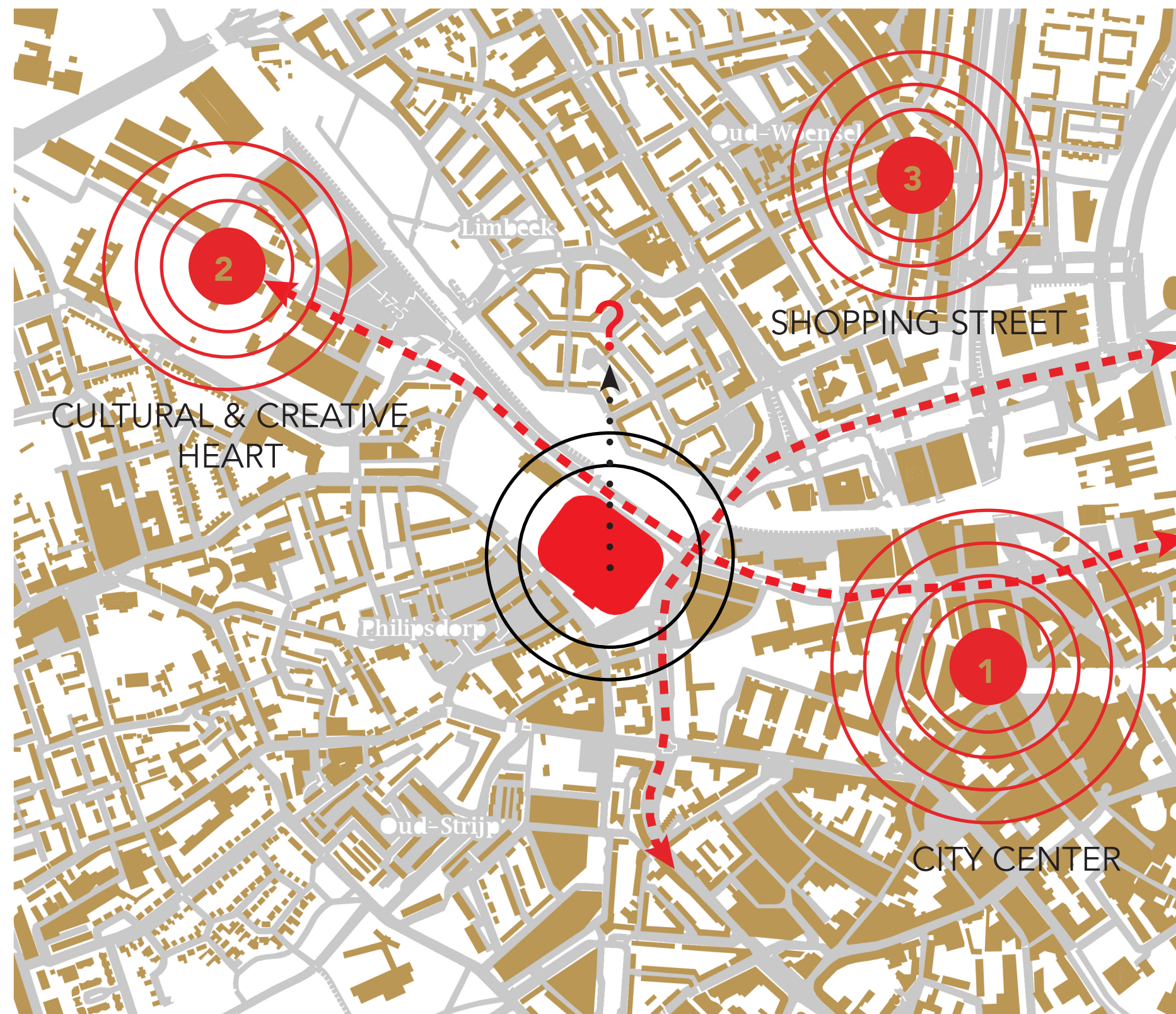
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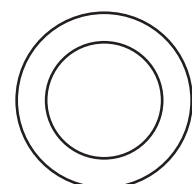
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ACTIVTY ZONES



MISSING ACTIVITY



IMPORTANT AXE





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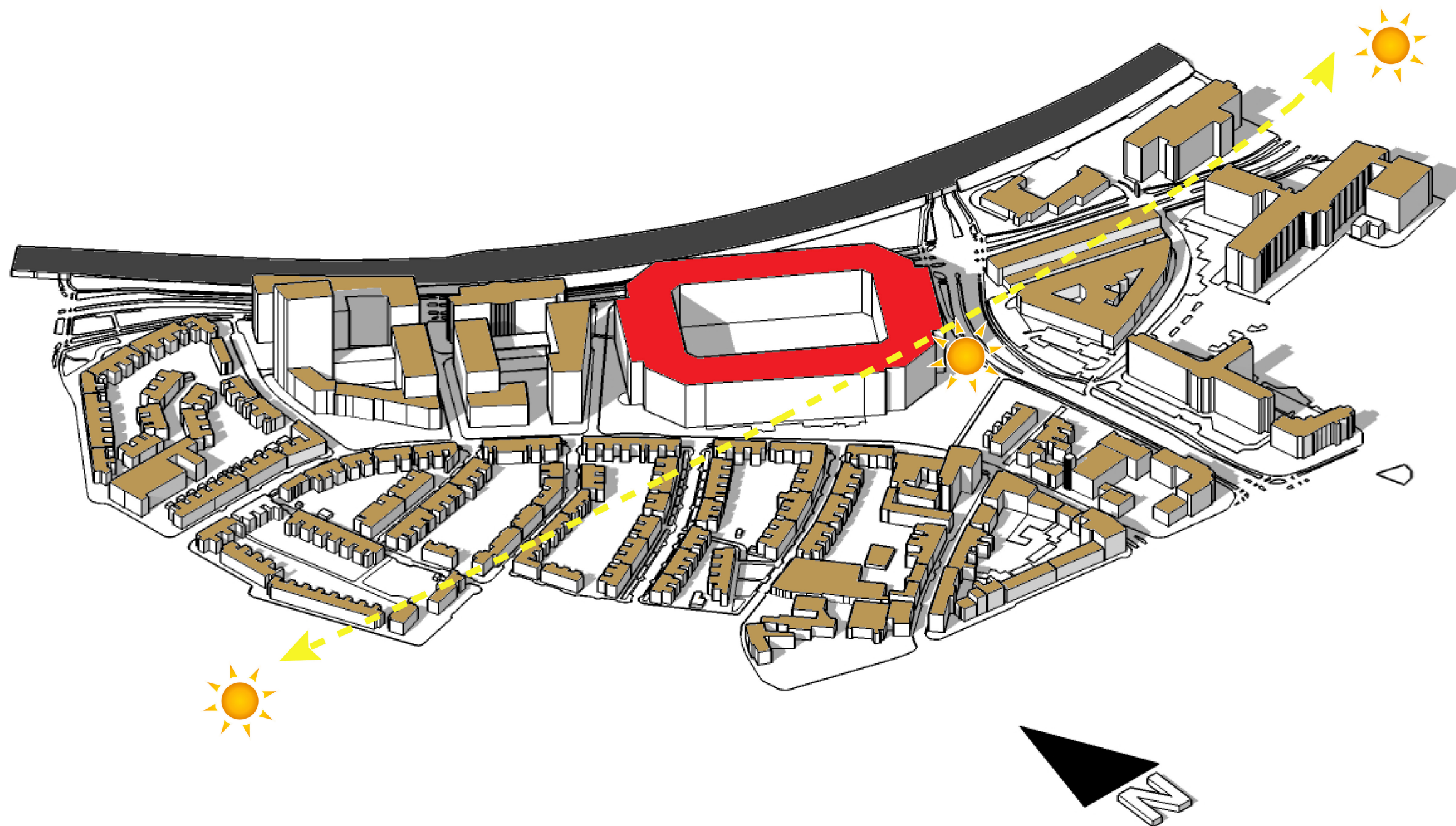
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SOLAR PATH & SCALE



SHADOW FALLS ON THE **WEST** SIDE

BIG DIFFERENCE IN **SCALE** OF THE **BUILDINGS**



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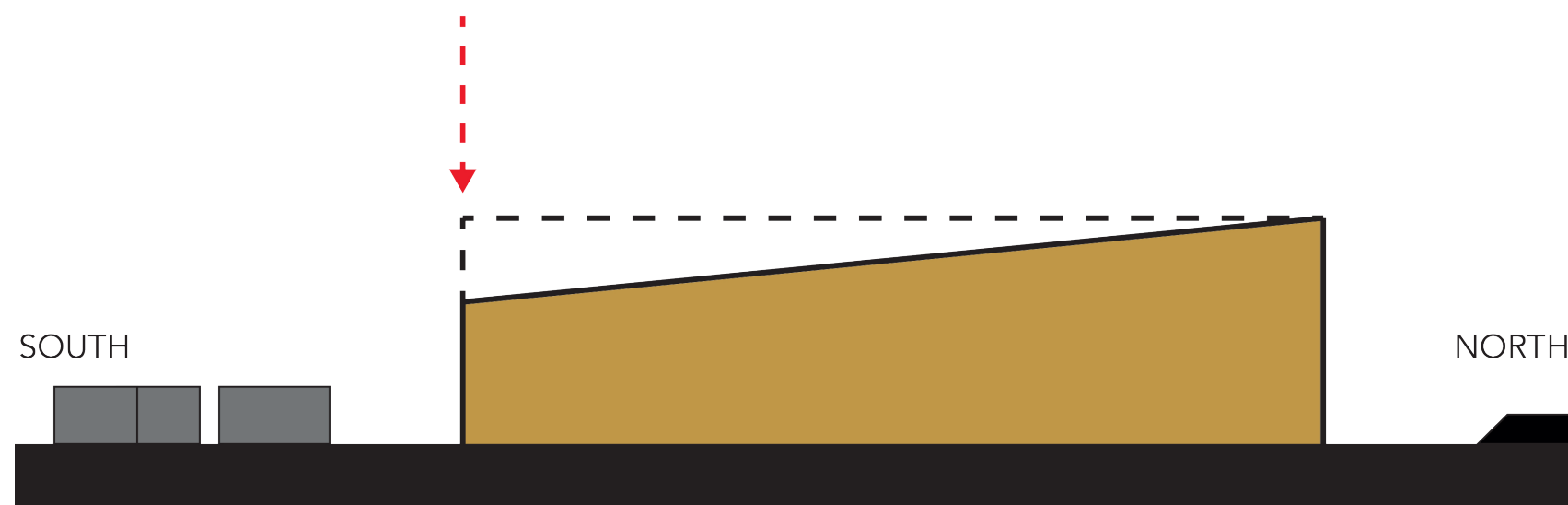
---- CONCLUSION ----

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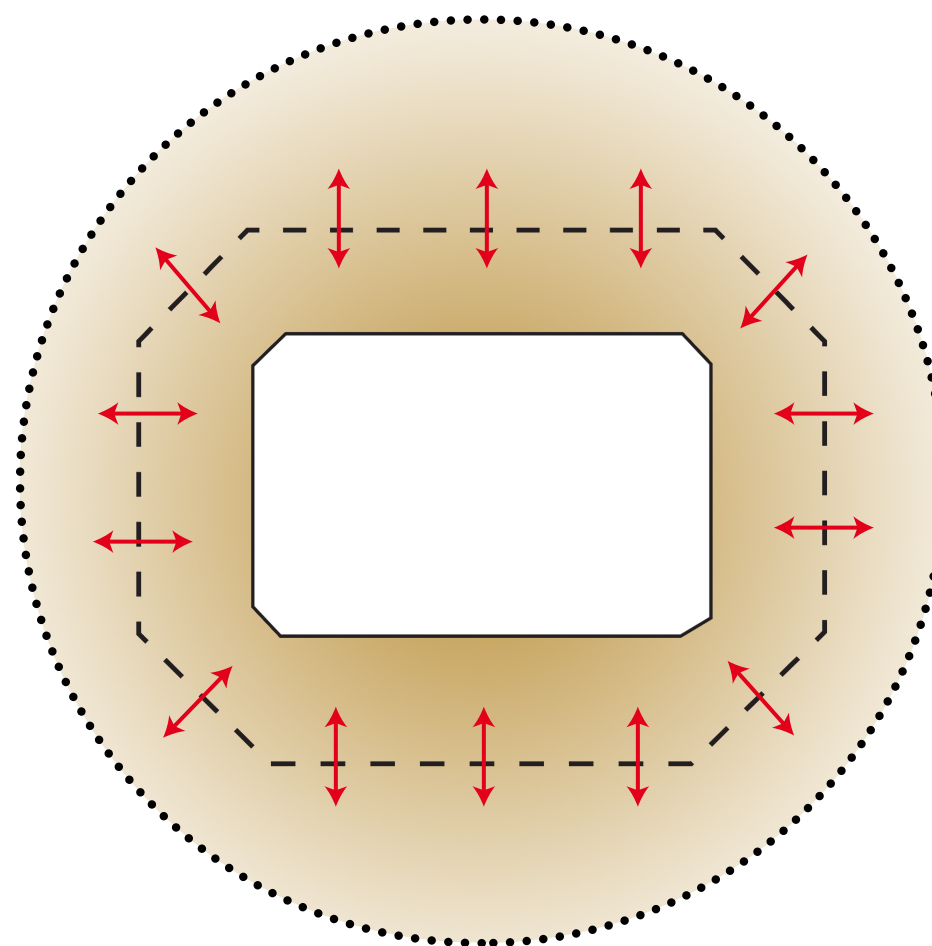
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REDUCING **SCALE** OF THE BUILDING

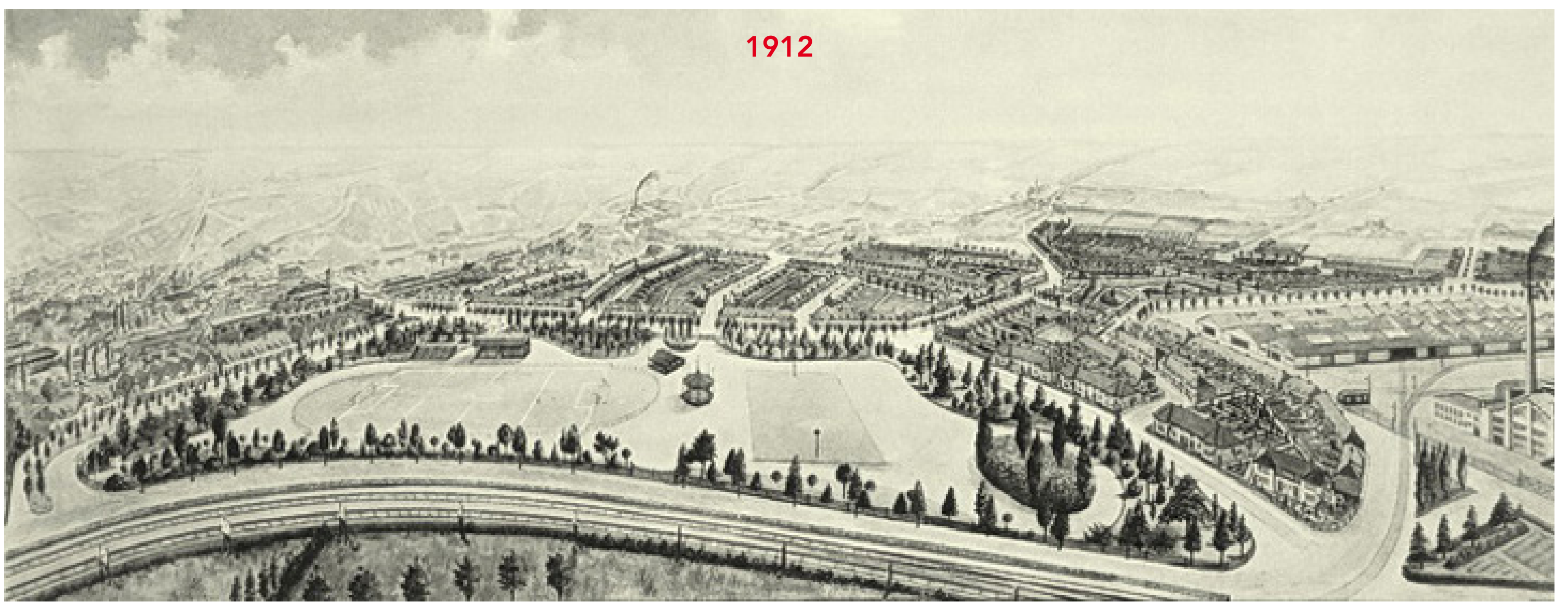


CONNECTING TO THE **PUBLIC REALM**
OUTSIDE

PROGRAM



1912



1941

1935-1945



Een lied met ons allen
Want eendracht maakt

1966







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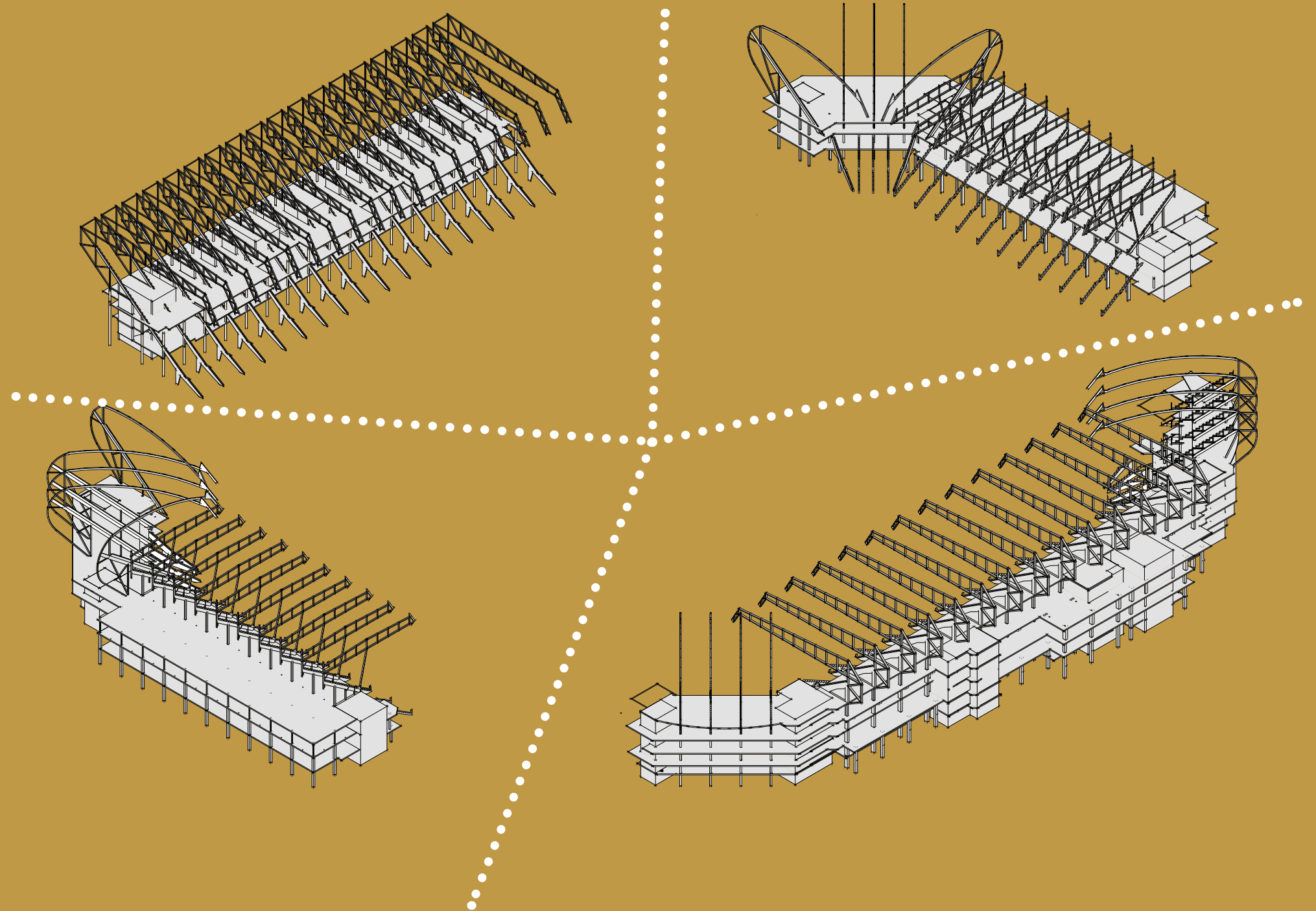
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SEPARATE LOAD-BEARING STRUCTURE

DIFFERENT FLOOR HEIGHTS





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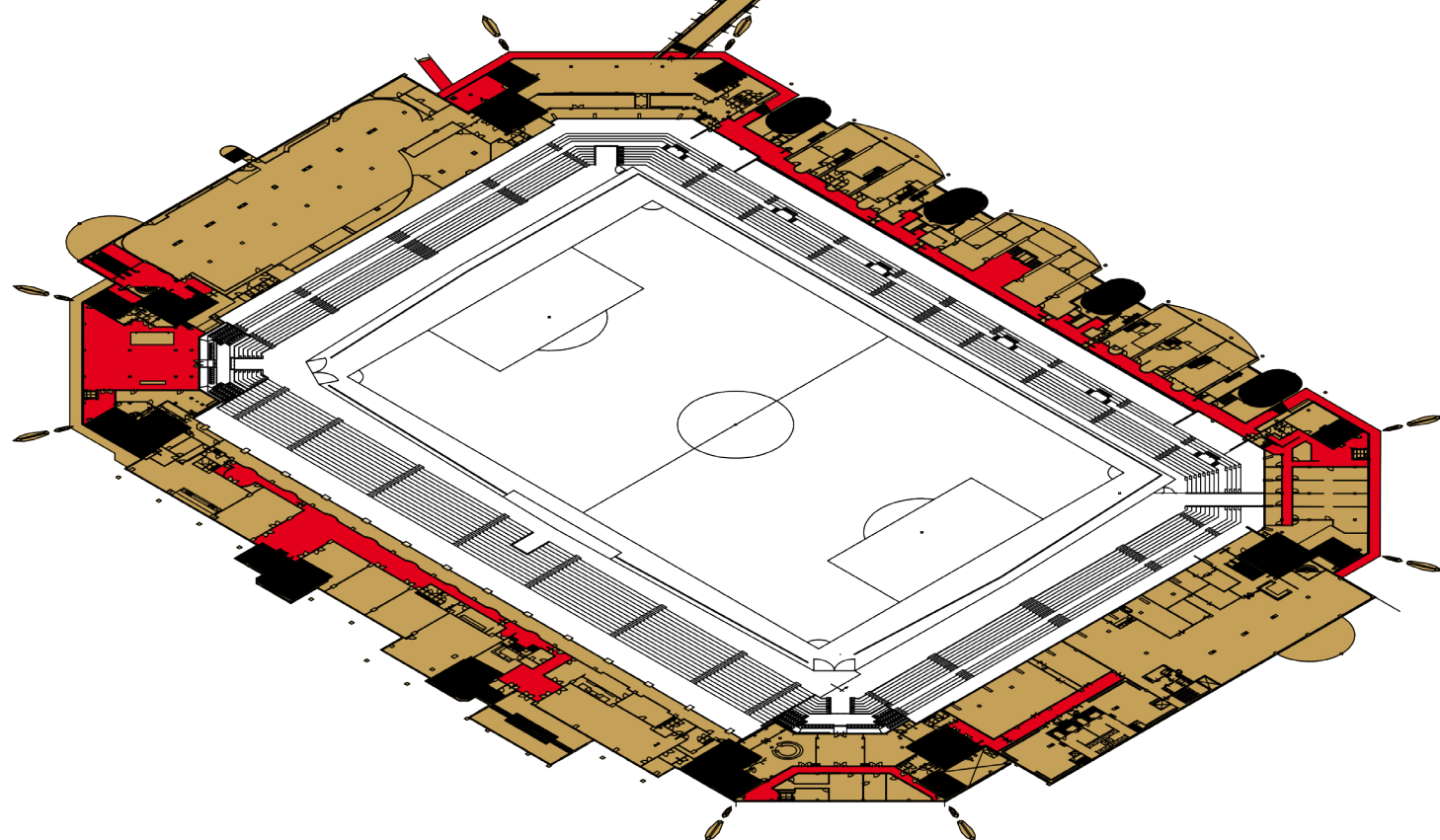
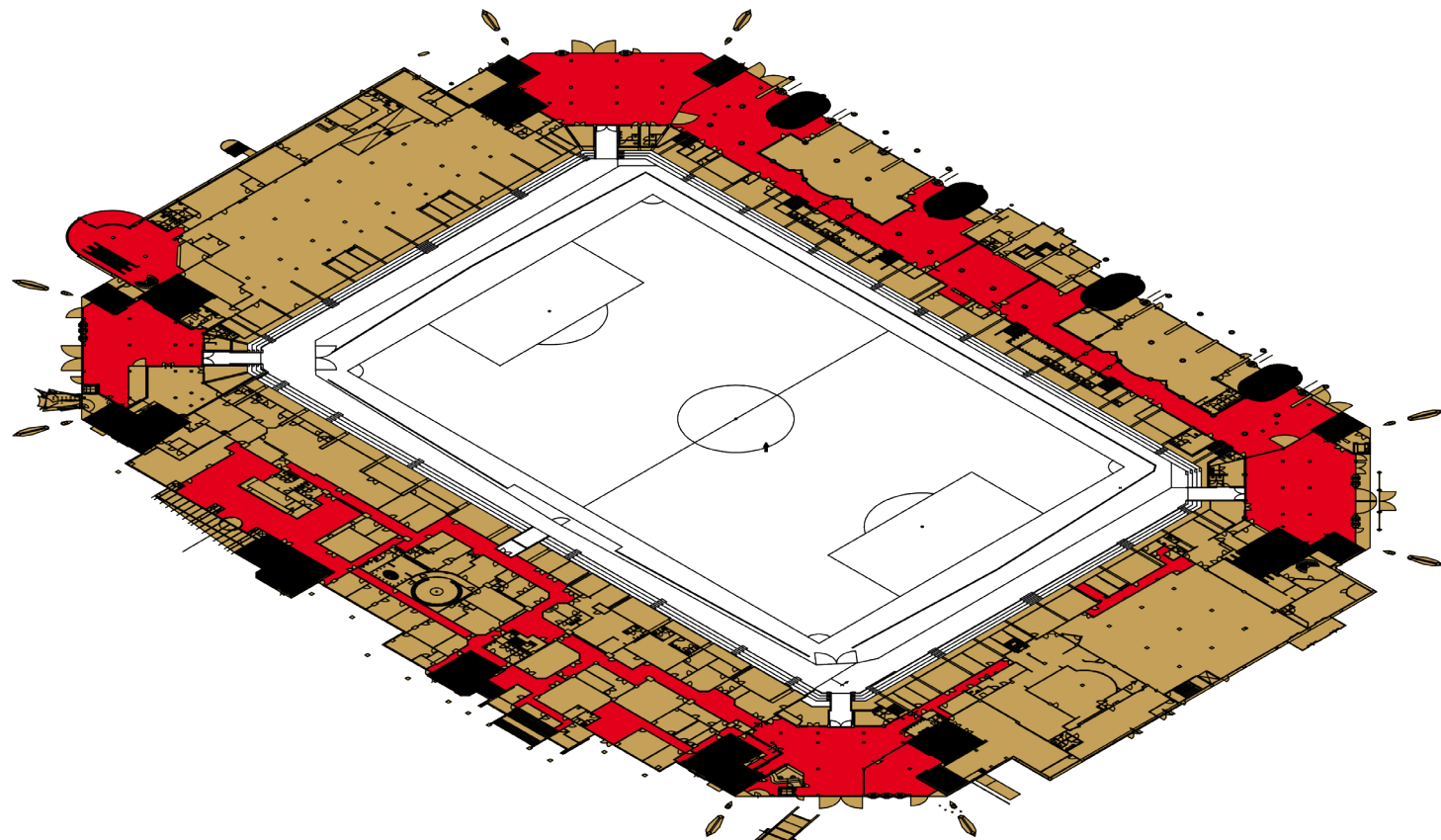
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GROUND FLOOR



FIRST FLOOR

FRAGMENTED
NO INTERNAL & EXTERNAL RELATION
SINGLE PURPOSE/PRIVATE BUILDING



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BUSINESS

CONGRES/SEMINAR, MEETINGS,
PRESENTATIONS, TRAINING



FESTIVE

PARTIES, 'BORREL', RECEPTION

ACTIVITY



ADVENTUROUS

GOLF, ABSEILEN, DIFFERENT
SPORTS



EAT & DRINK

RESTAURANTS & CAFE'S



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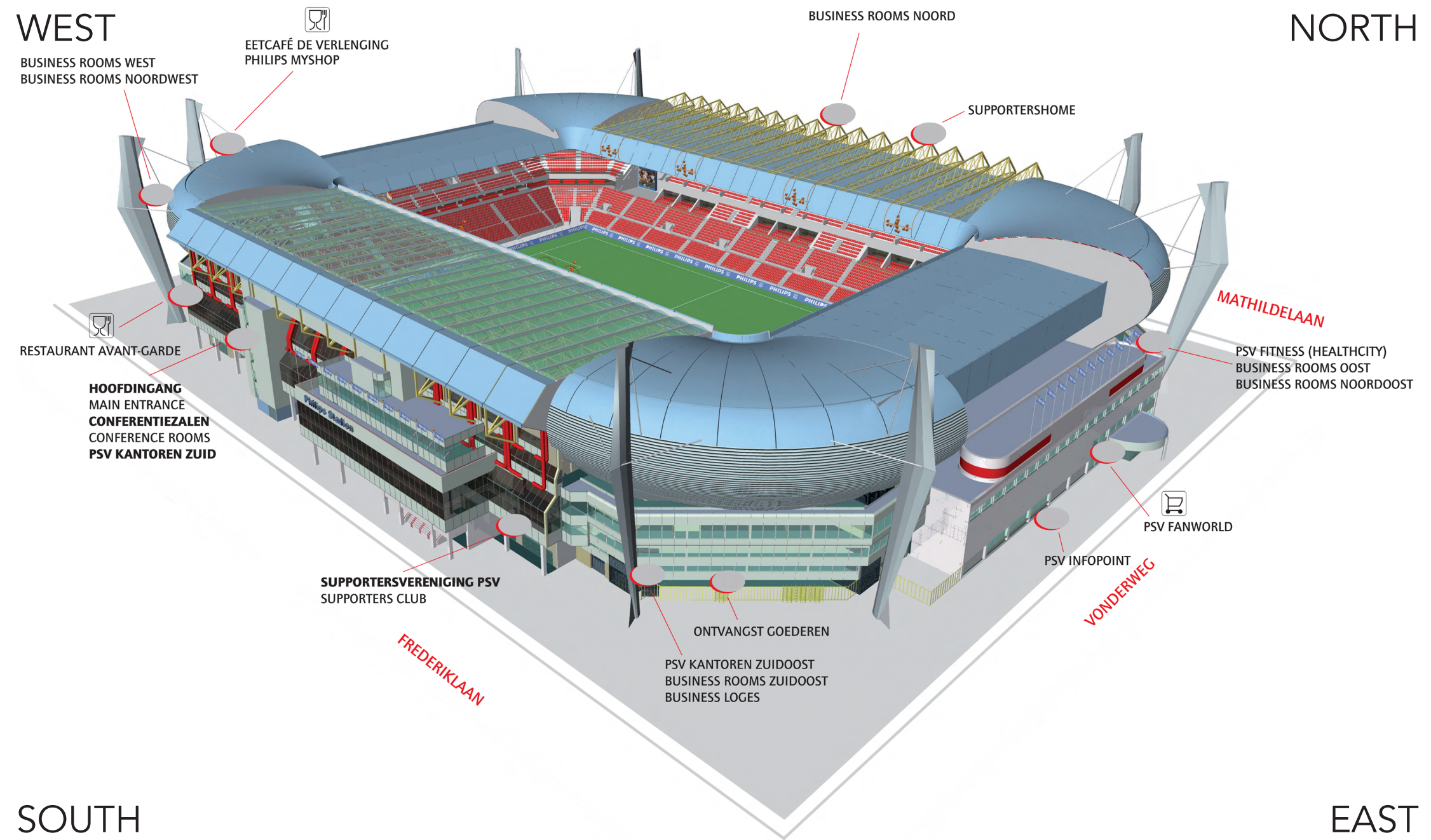
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EXTERNAL APPEARANCE



FUNCTIONS **NOT CLEAR**



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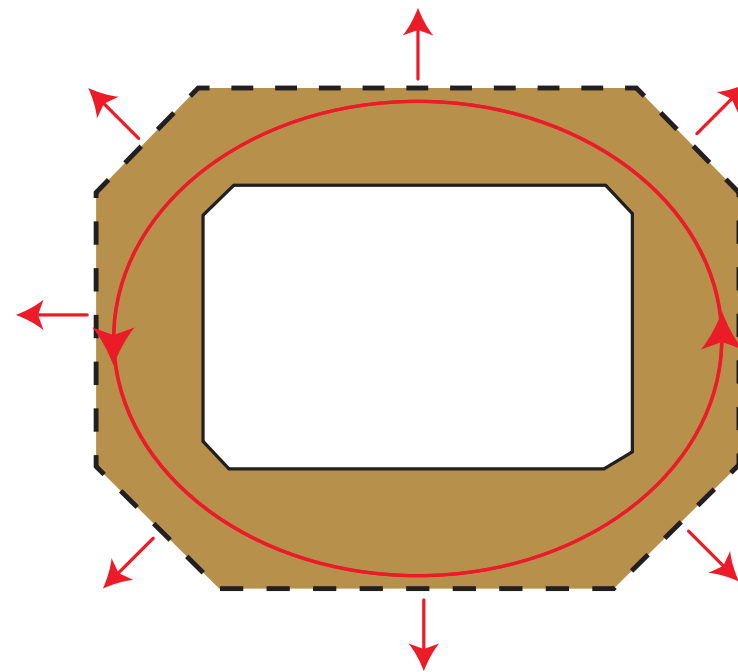
BUILDING ANALYSIS

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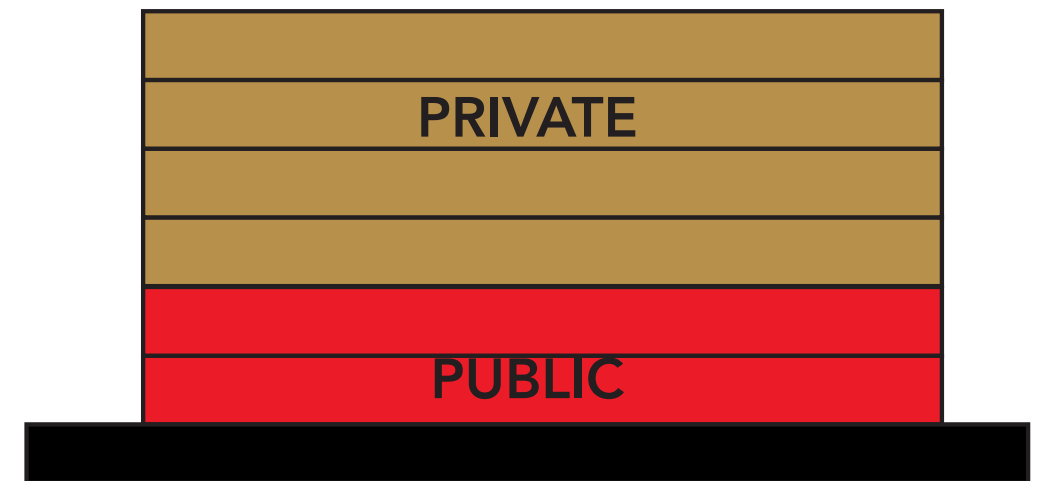
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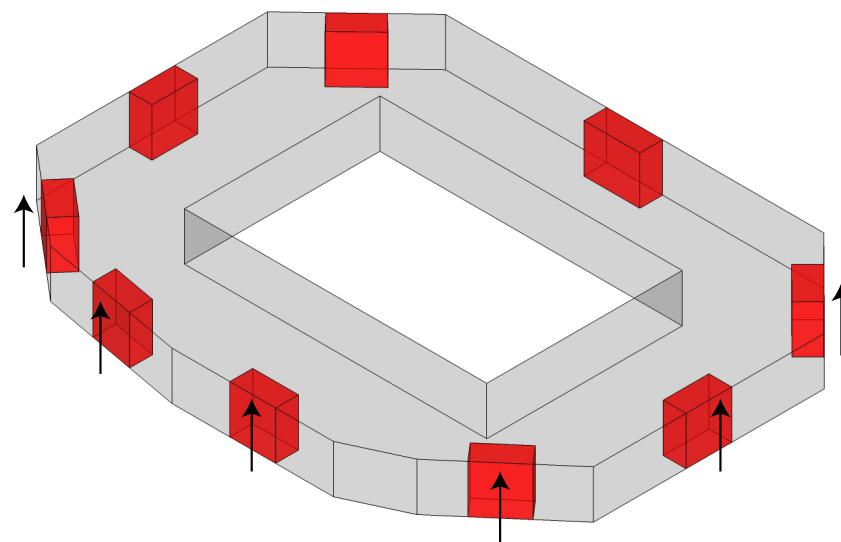
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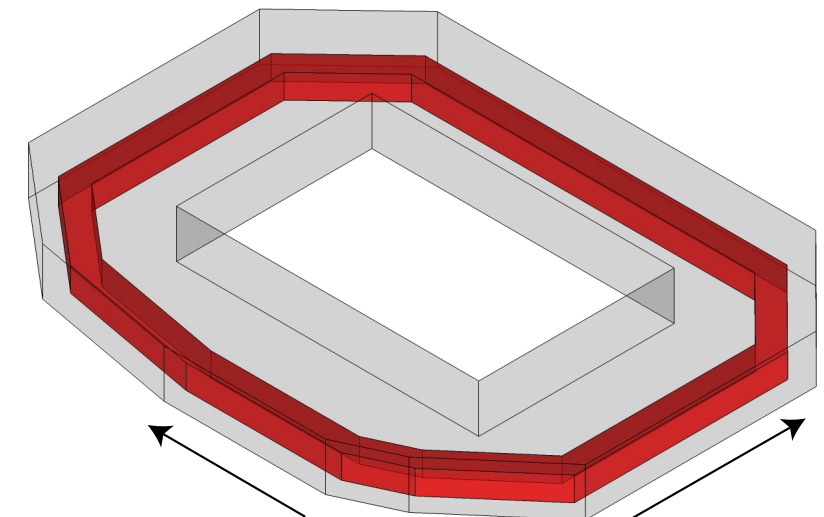
INTERNAL & EXTERNAL RELATION



MULTI-PURPOSE BUILDING



VERTICAL EXPERIENCE

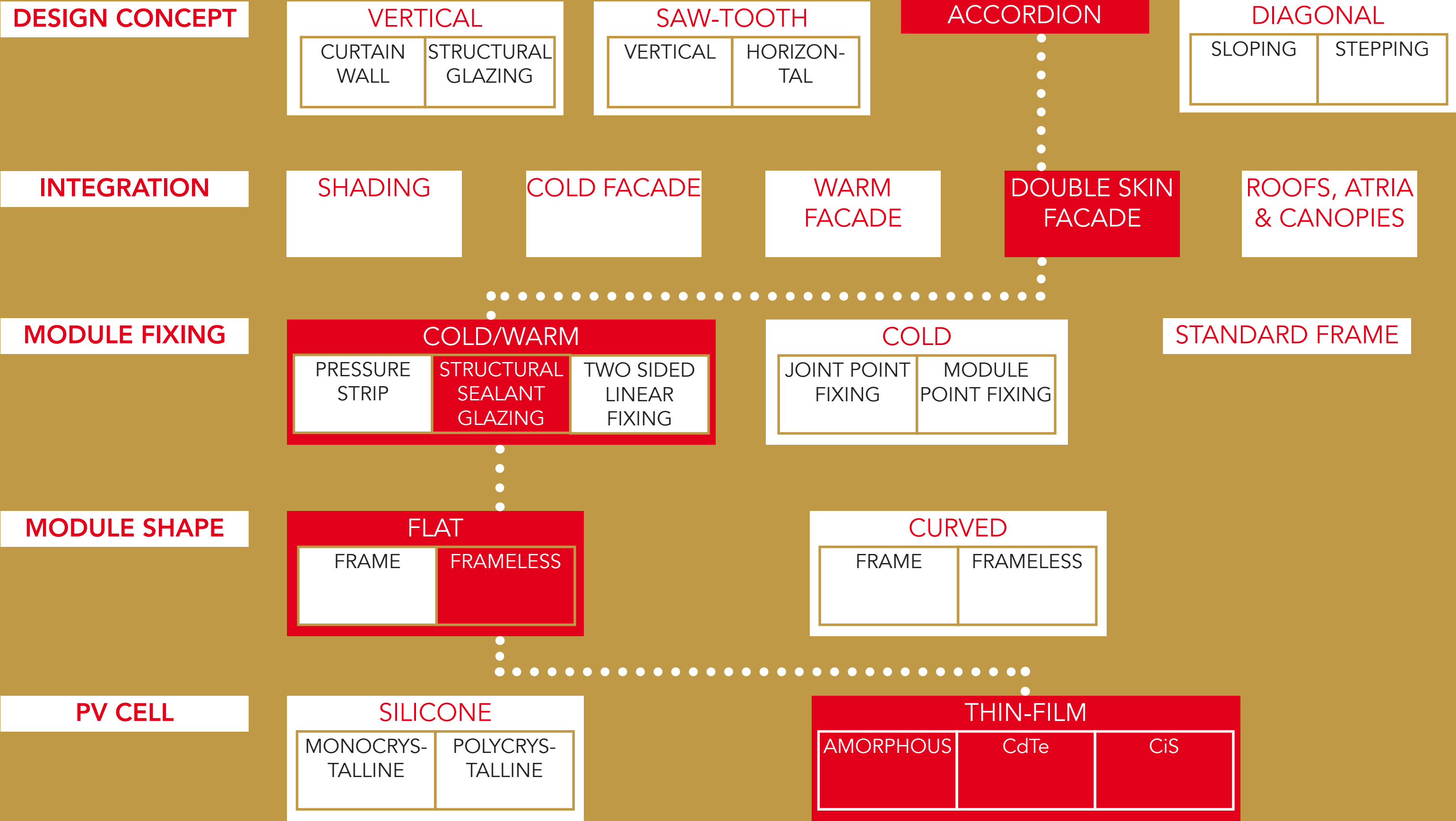


HORIZONTAL EXPERIENCE

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MATRIX





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DESIGN CONCEPT & INTEGRATION



VERTICAL FACADE



VER. SAW-TOOTH



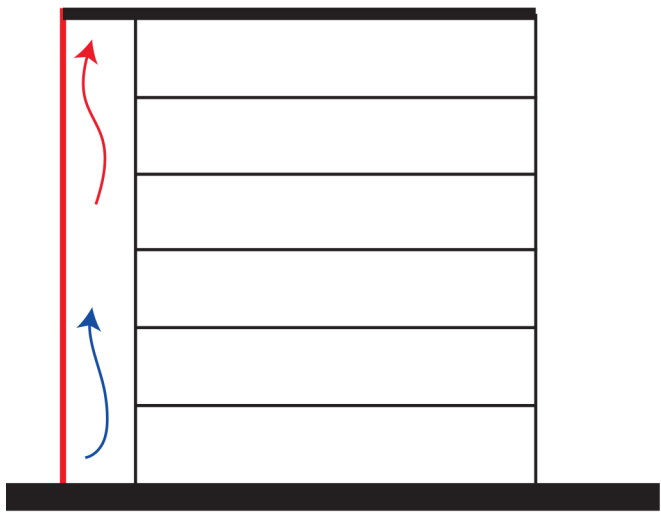
HOR. SAW-TOOTH



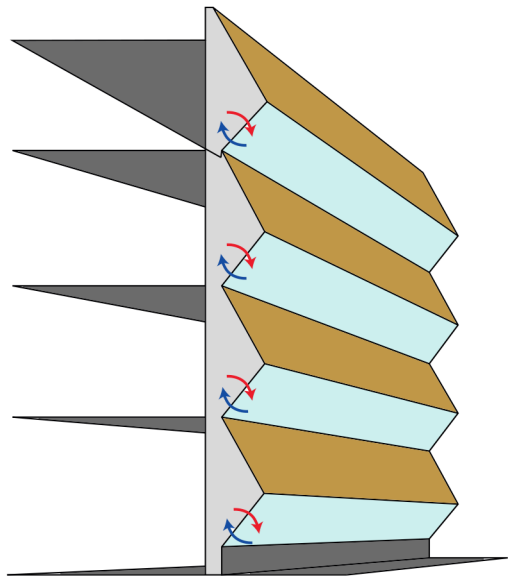
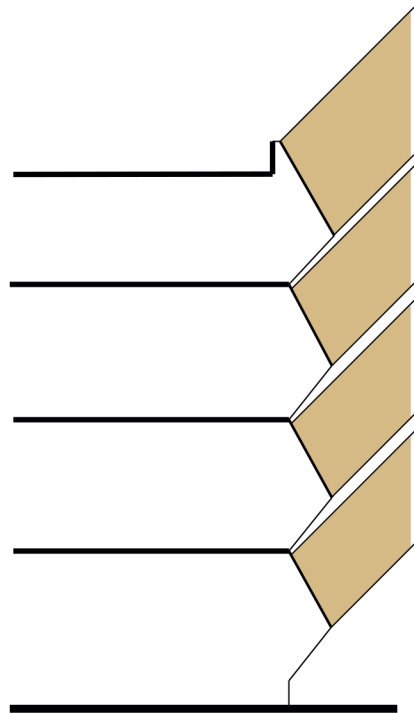
ACCORDION FACADE



SLOPING FACADE



DOUBLE SKIN FACADE



ACCORDION FACADE



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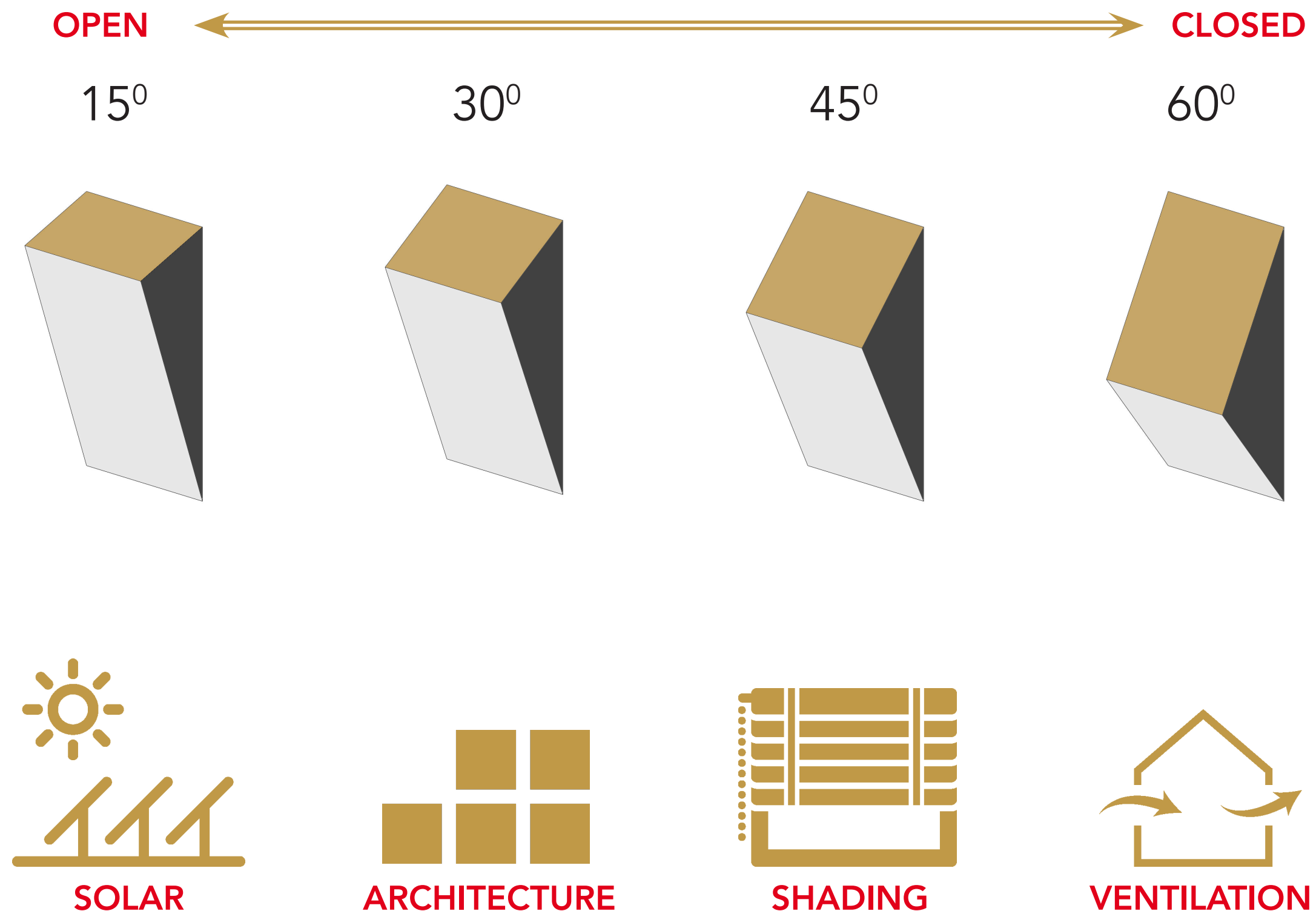
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MULTI-PURPOSE FACADE



THE DESIGN



DESIGN AIM

INCREASING **CAPACITY**

SOLAR ENVELOPE AS AN **ARCHITECTURAL** TOOL

INTEGRATING WITH THE CITY

CAPACITY

NEW CAPACITY 45 418



EAST STAND

EXISTING CAPACITY: 36 500

WEST STAND



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CAPACITY

----- **FORM FINDING** -----

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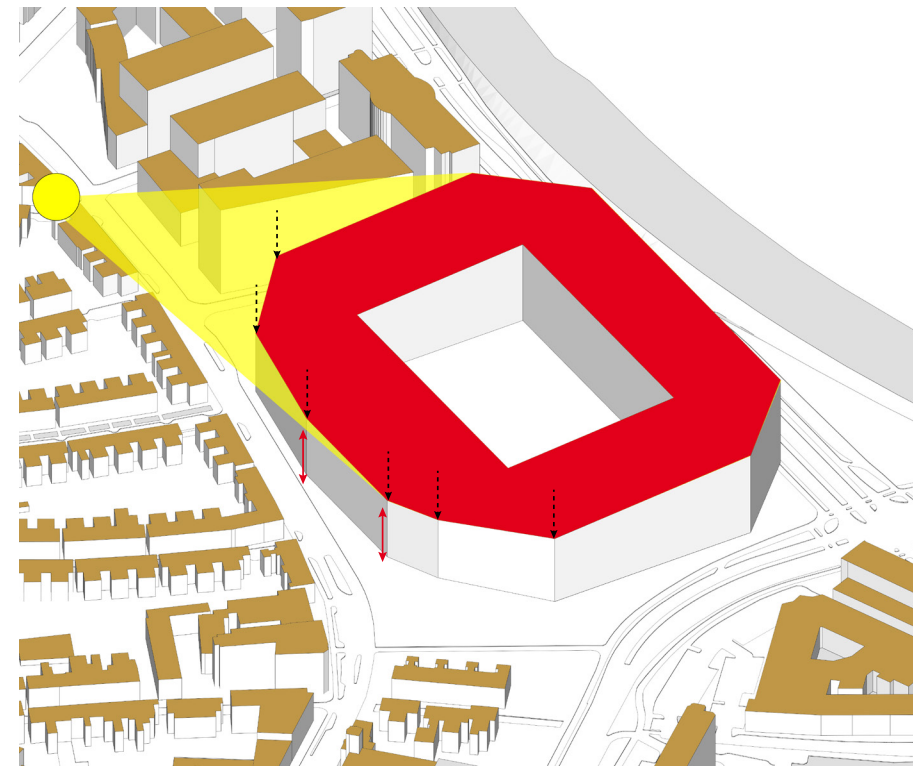
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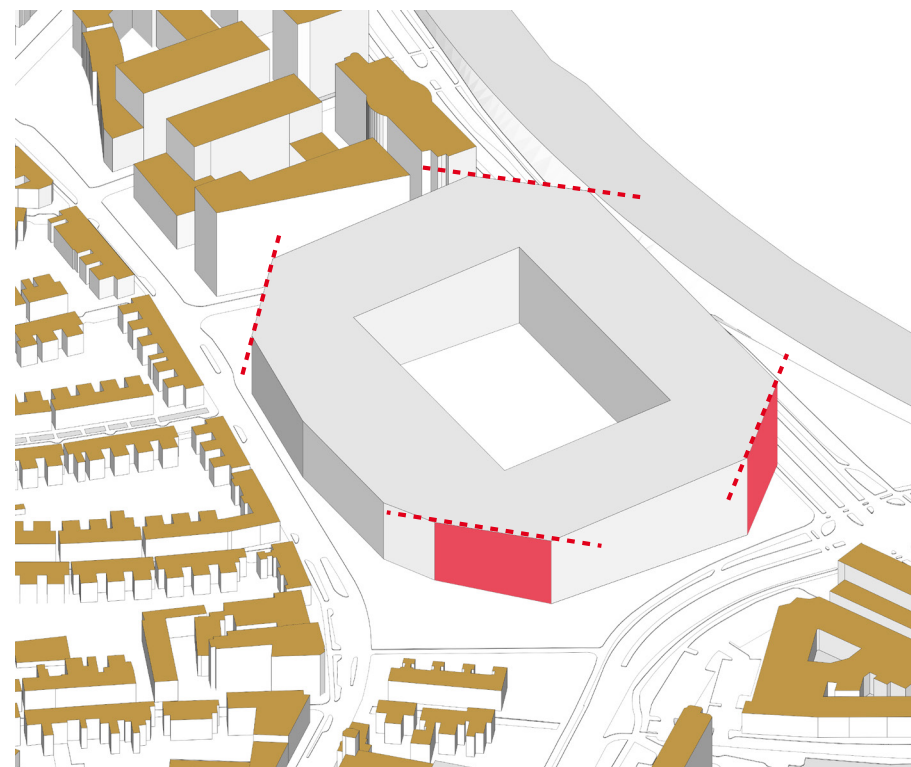
BUILDING TECHNOLOGY

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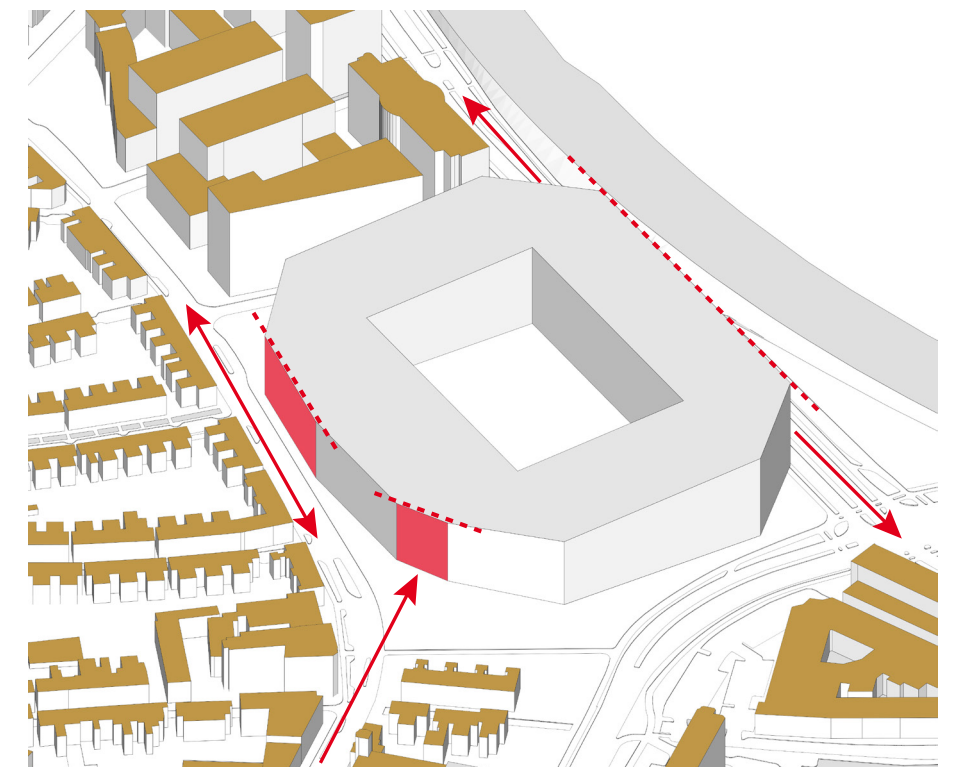
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SLOPED ROOF



CORNERS ENTRANCE



RELATING TO SURROUNDING



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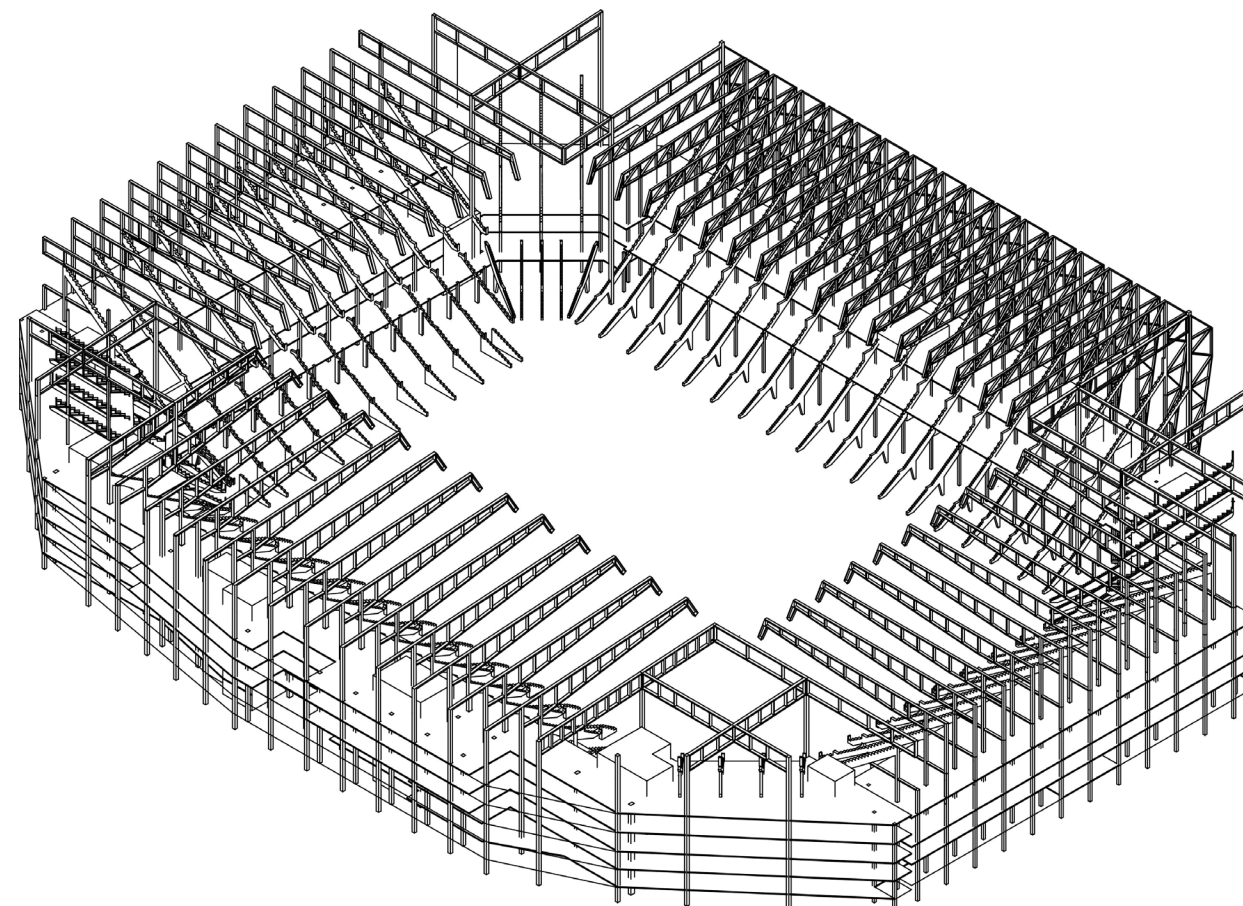
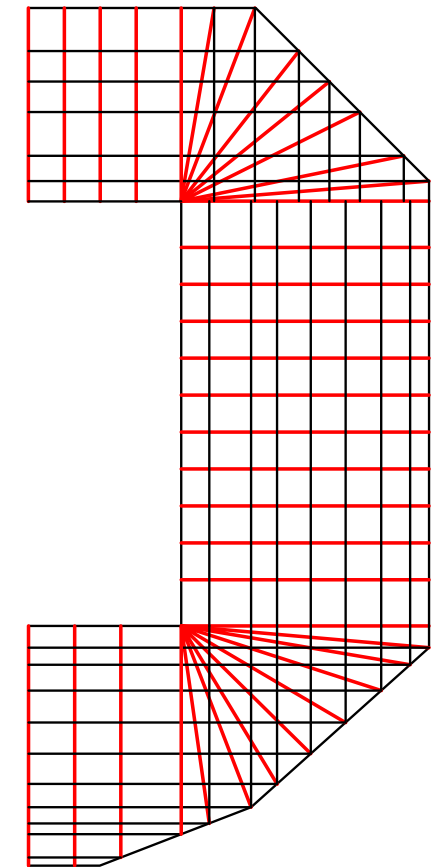
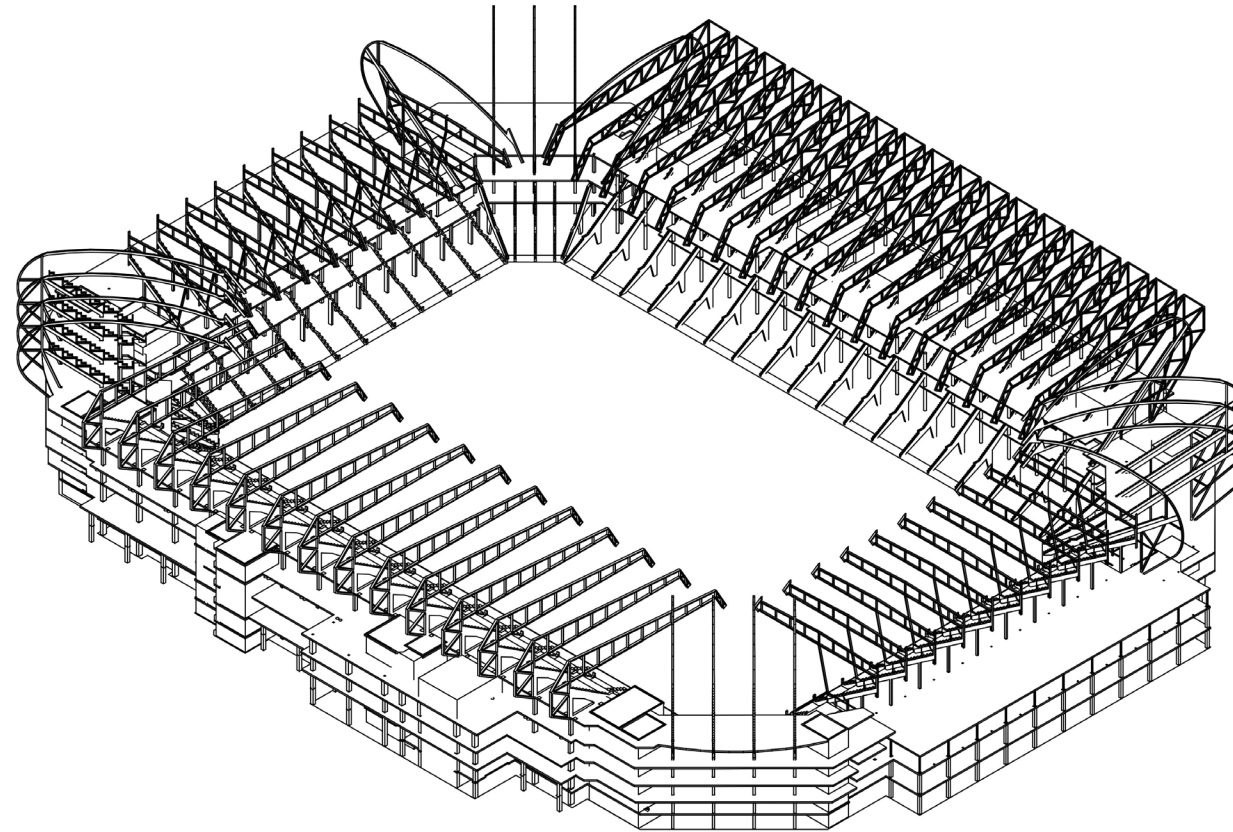
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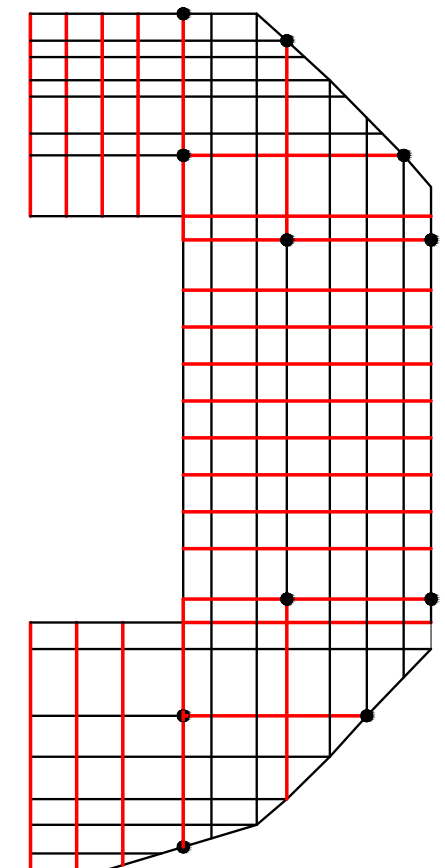
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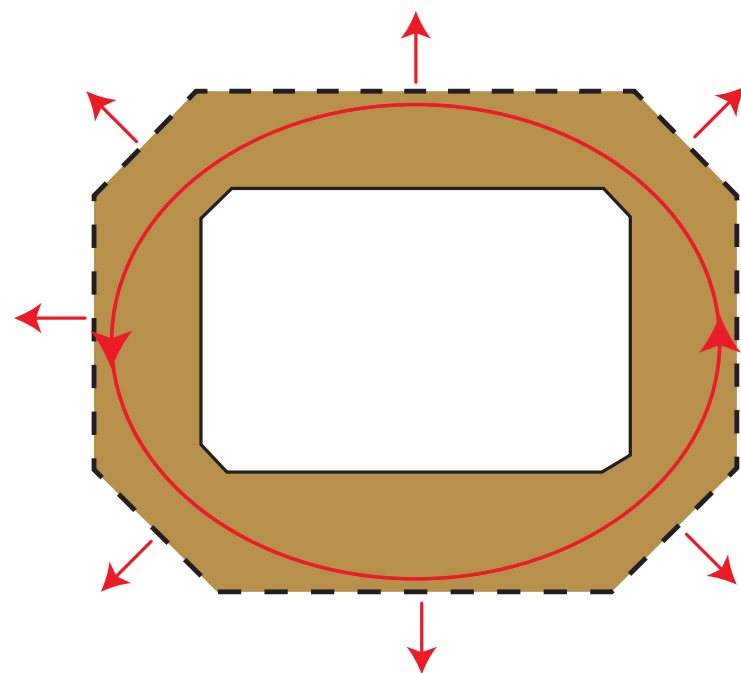
FACADE

BUILDING TECHNOLOGY

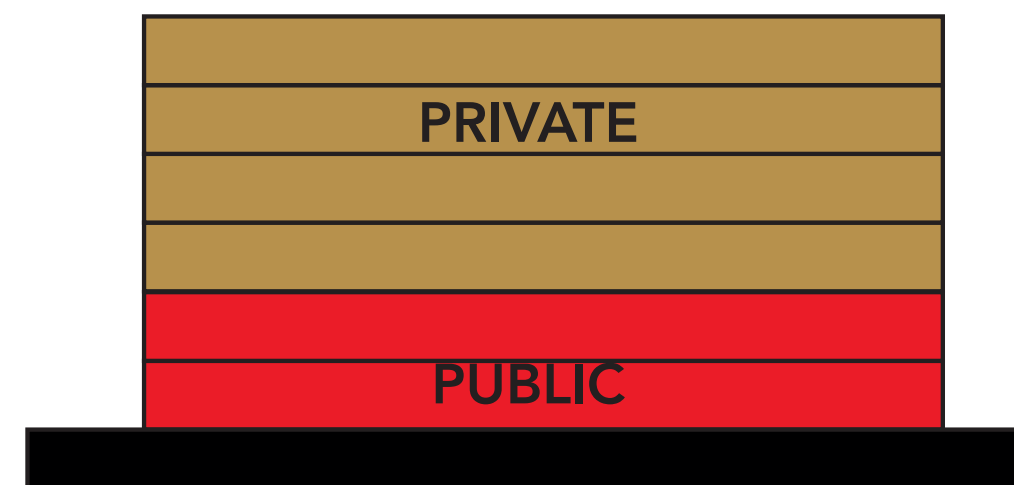
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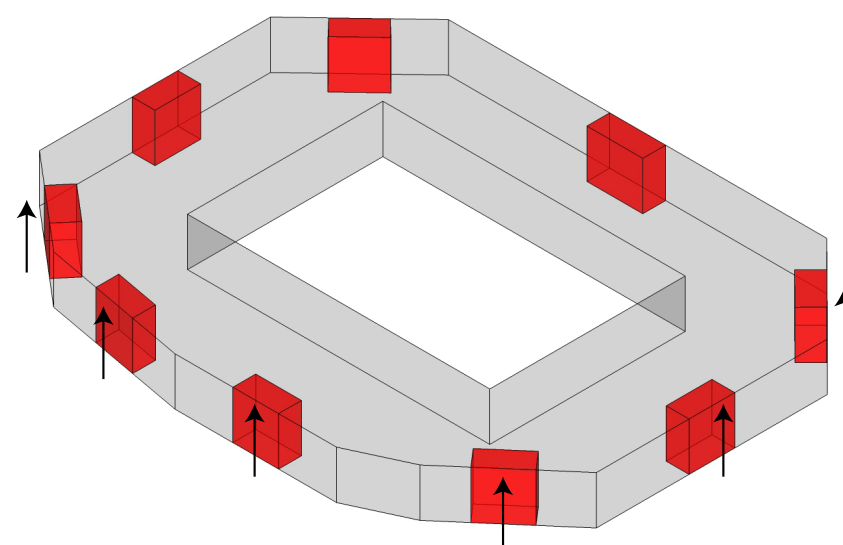
DESIGN GUIDELINES



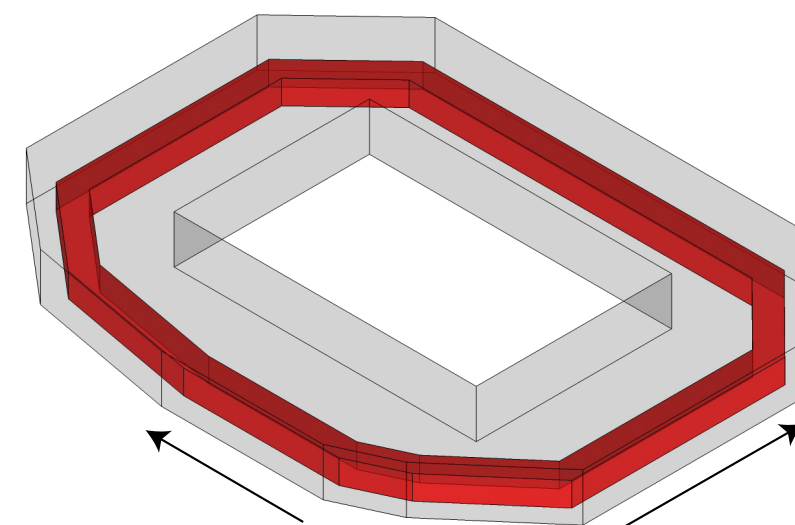
INTERNAL & EXTERNAL RELATION



MULTI-PURPOSE BUILDING



VERTICAL EXPERIENCE



HORIZONTAL EXPERIENCE



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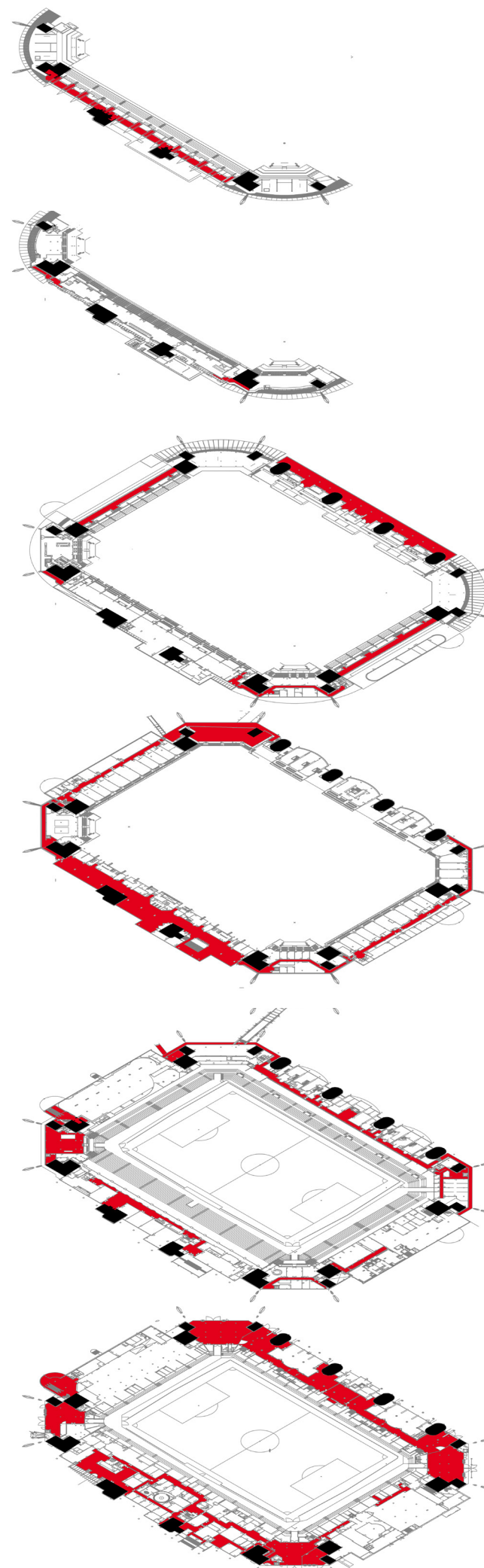
SECTION

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ROUTING

FIFTH FLOOR

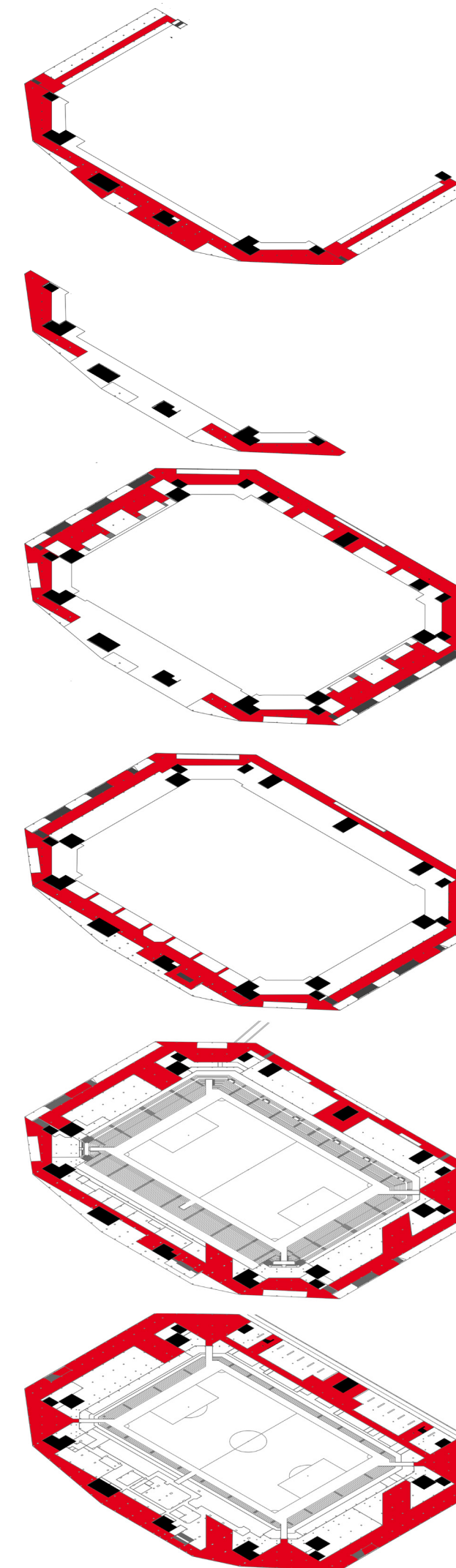
FOURTH FLOOR

THIRD FLOOR

SECOND FLOOR

FIRST FLOOR

GROUND FLOOR



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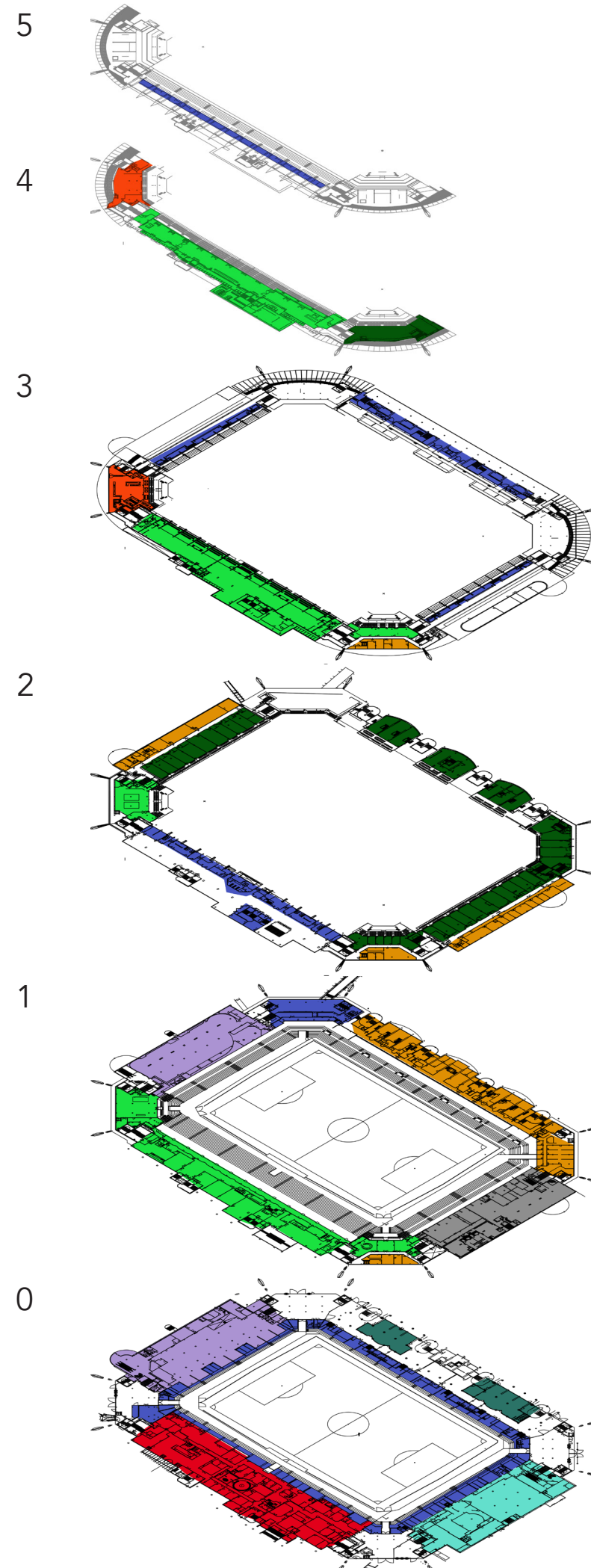
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FACADE

BUILDING TECHNOLOGY

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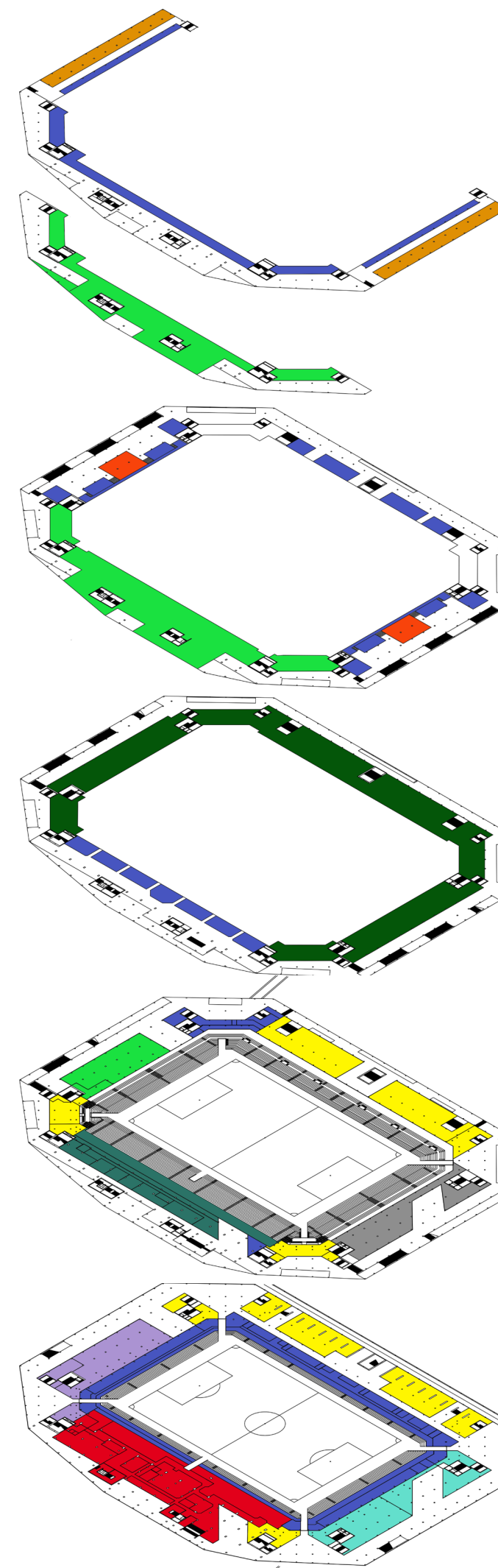
BEFORE



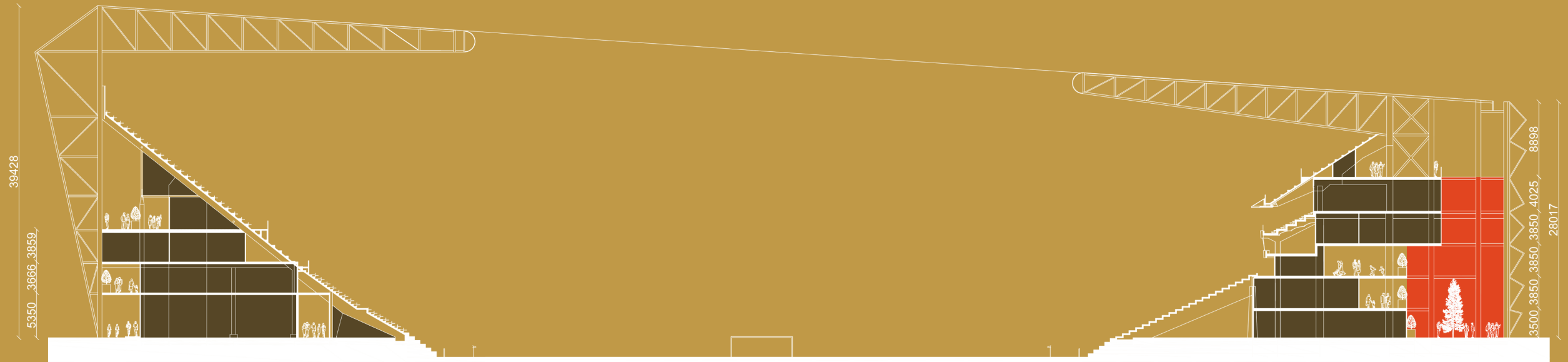
PROGRAM

- PSV CLUB
- MUSEA & PSV STORE
- PHILIPS STORE
- FACILITIES
- OFFICES
- PARTY HALLS
- FITNESS
- RENTABLE SPACE
- COMMUNITY OFFICES
- BUSINESS BOX
- RESTAURANT

AFTER



SECTION



NORTH

SOUTH



STAND

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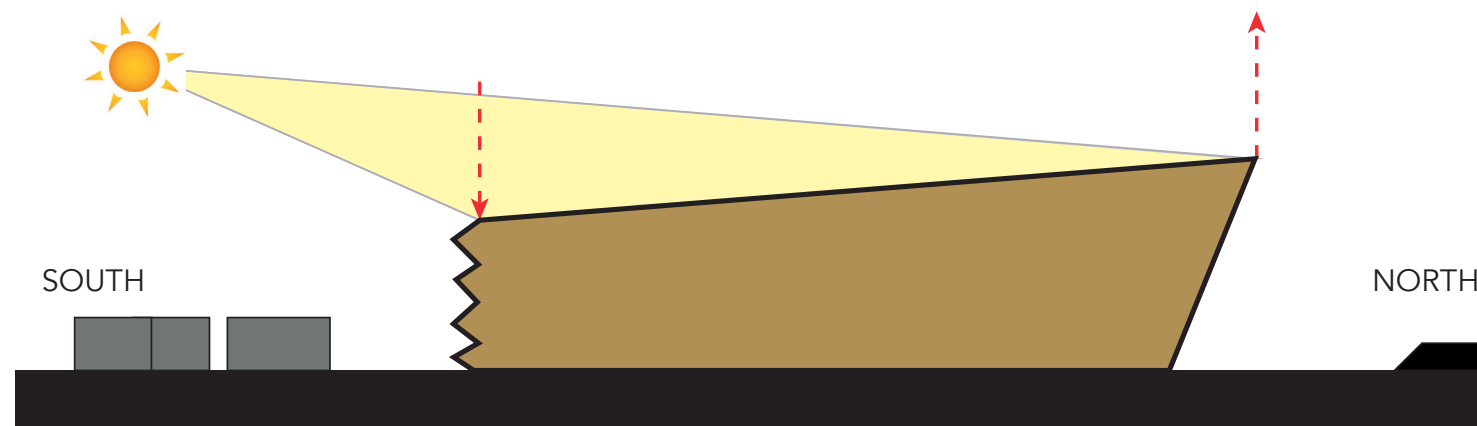
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---- FACADE ----

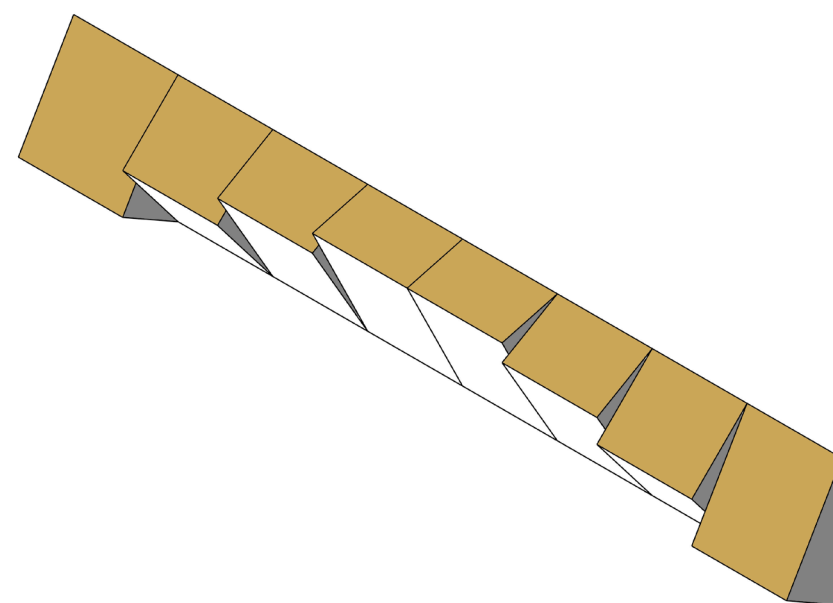
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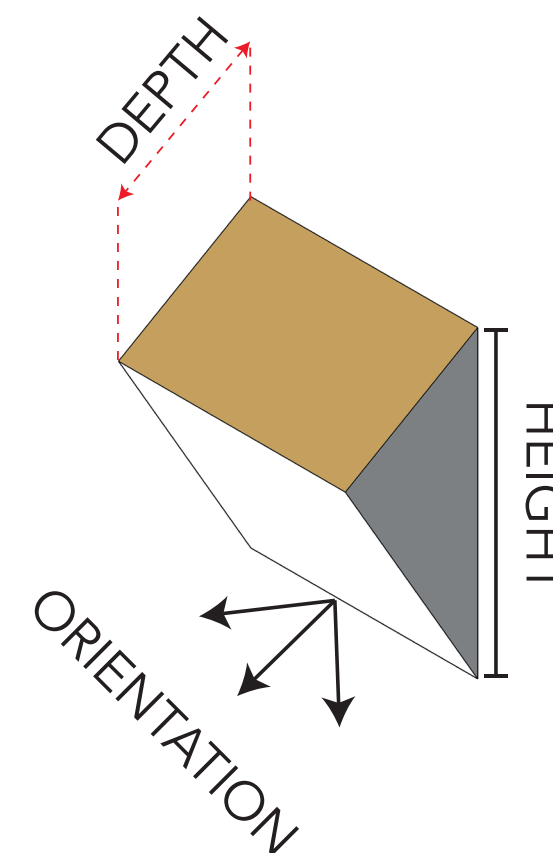
DESIGN GUIDELINES



FROM **SMALL** FACADE ELEMENTS TO **LARGE** FACADE ELEMENTS



STEPWISE TRANSITION



GEOMETRY OF THE ELEMENTS



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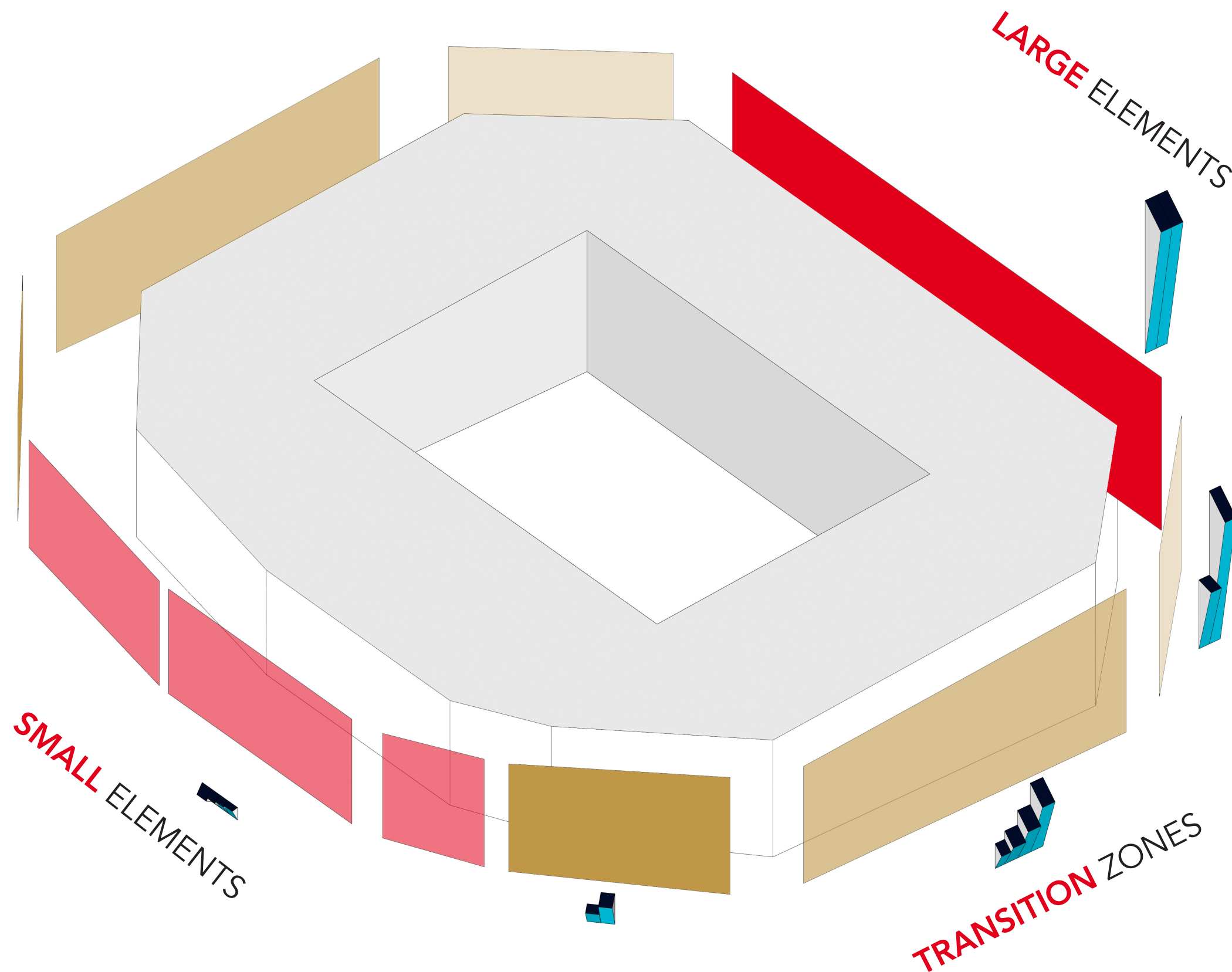
SECTION

---- **FACADE** ----

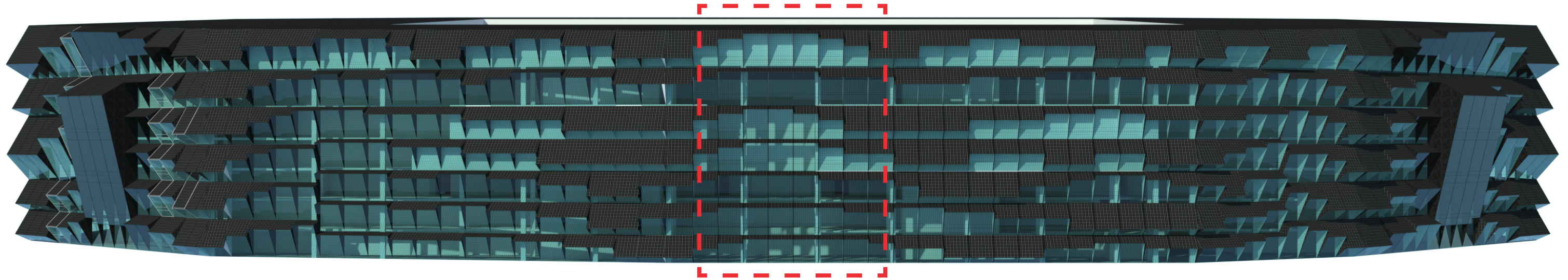
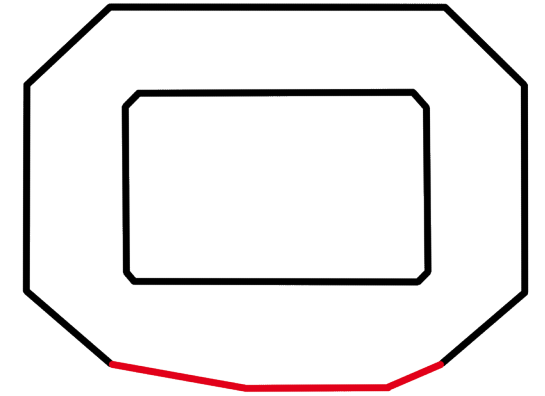
BUILDING TECHNOLOGY

IMPRESSIONS

COMPOSITION

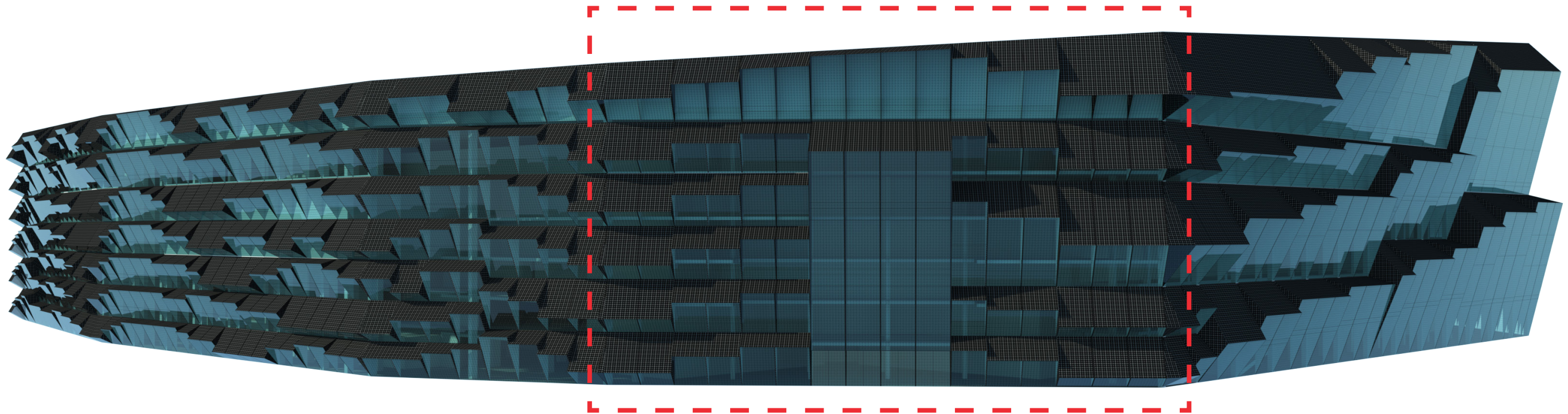
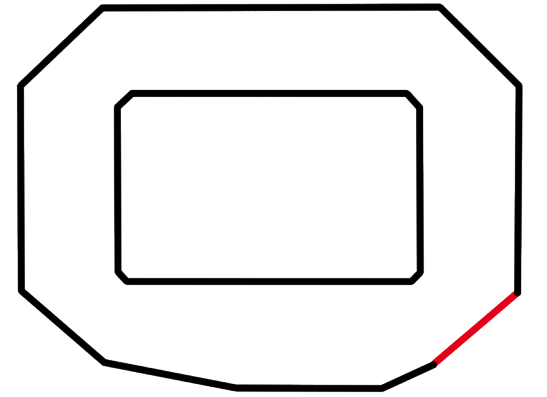


SOUTH ELEVATION



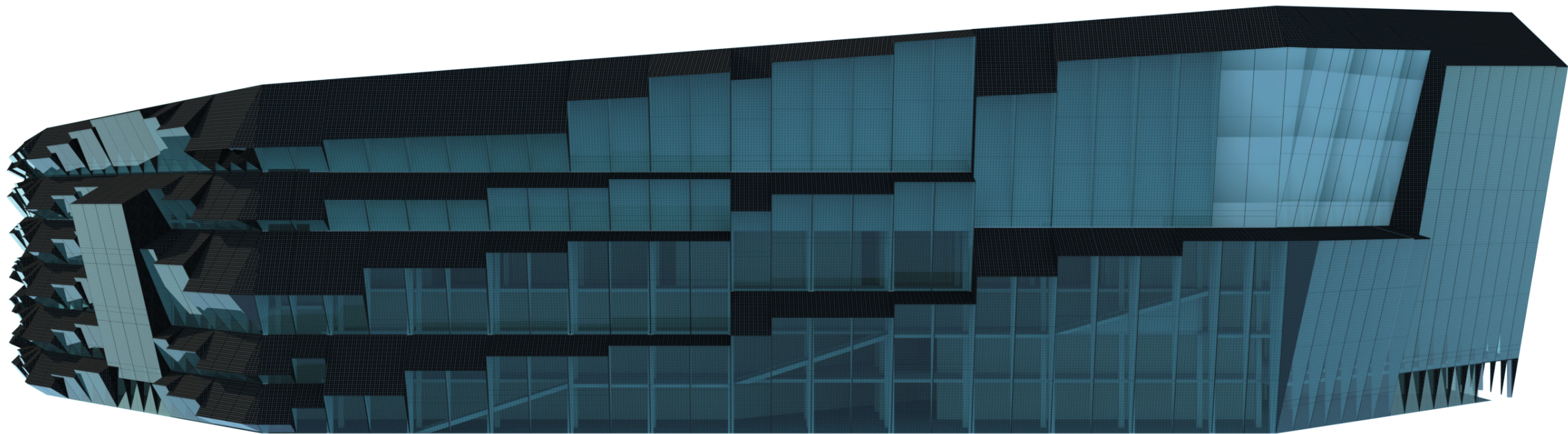
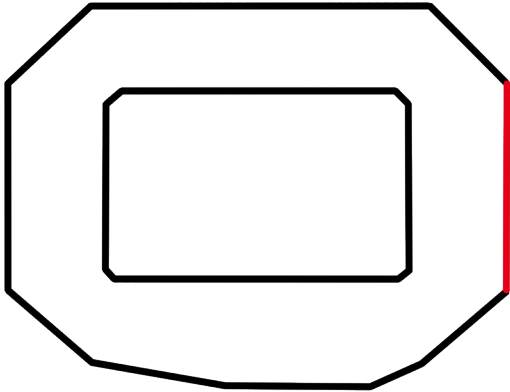
SMALL FACADE ELEMENTS

SOUTH CORNER ELEVATION



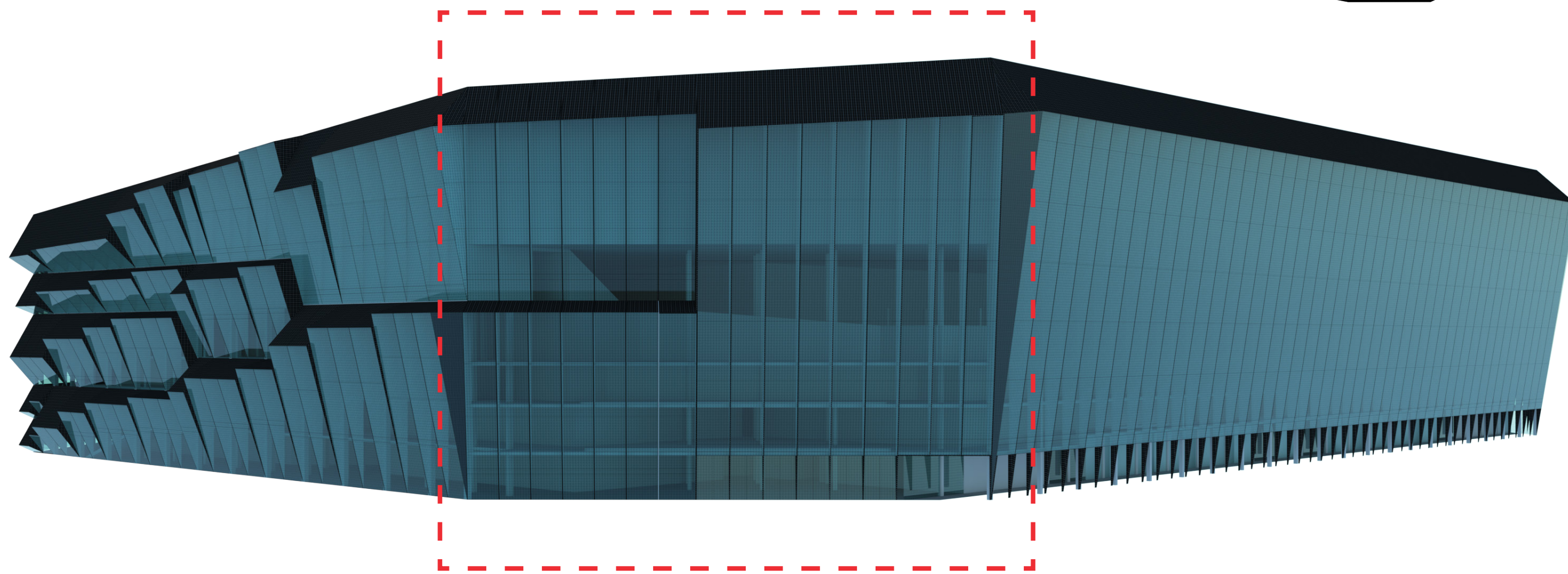
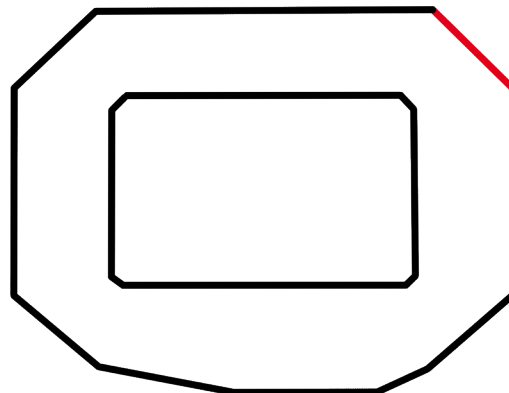
TRANSITION & ENTRANCE ZONE

EAST & WEST ELEVATION



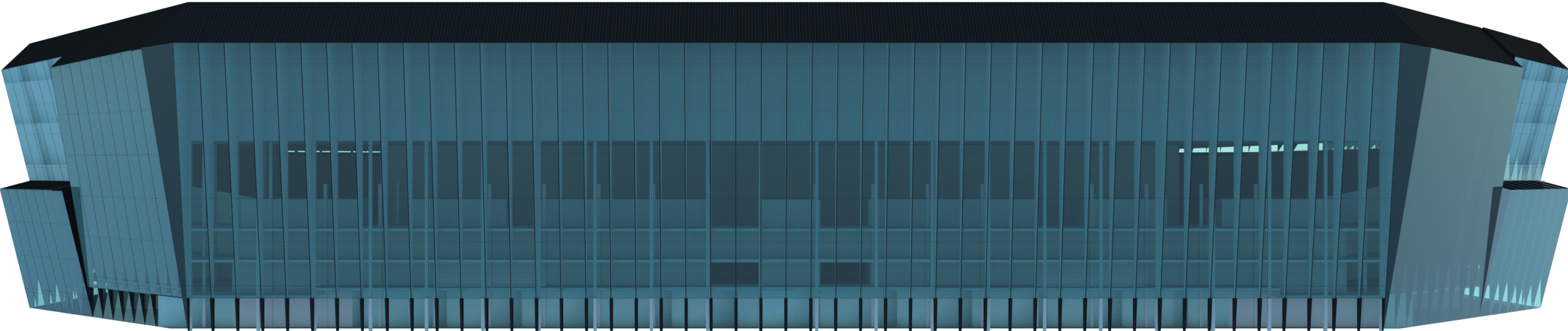
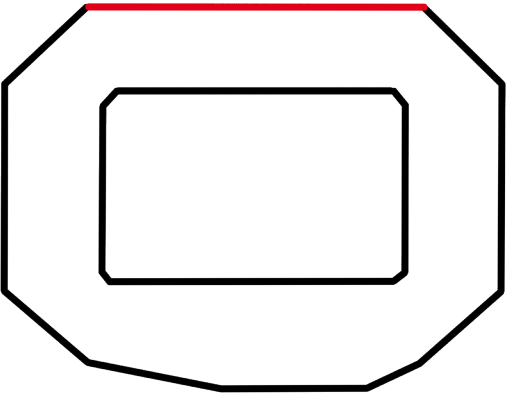
TRANSITION ZONE

NORTH CORNERS ELEVATION



TRANSITION & ENTRANCE ZONE

NORTH ELEVATION



LARGE FACADE ELEMENTS



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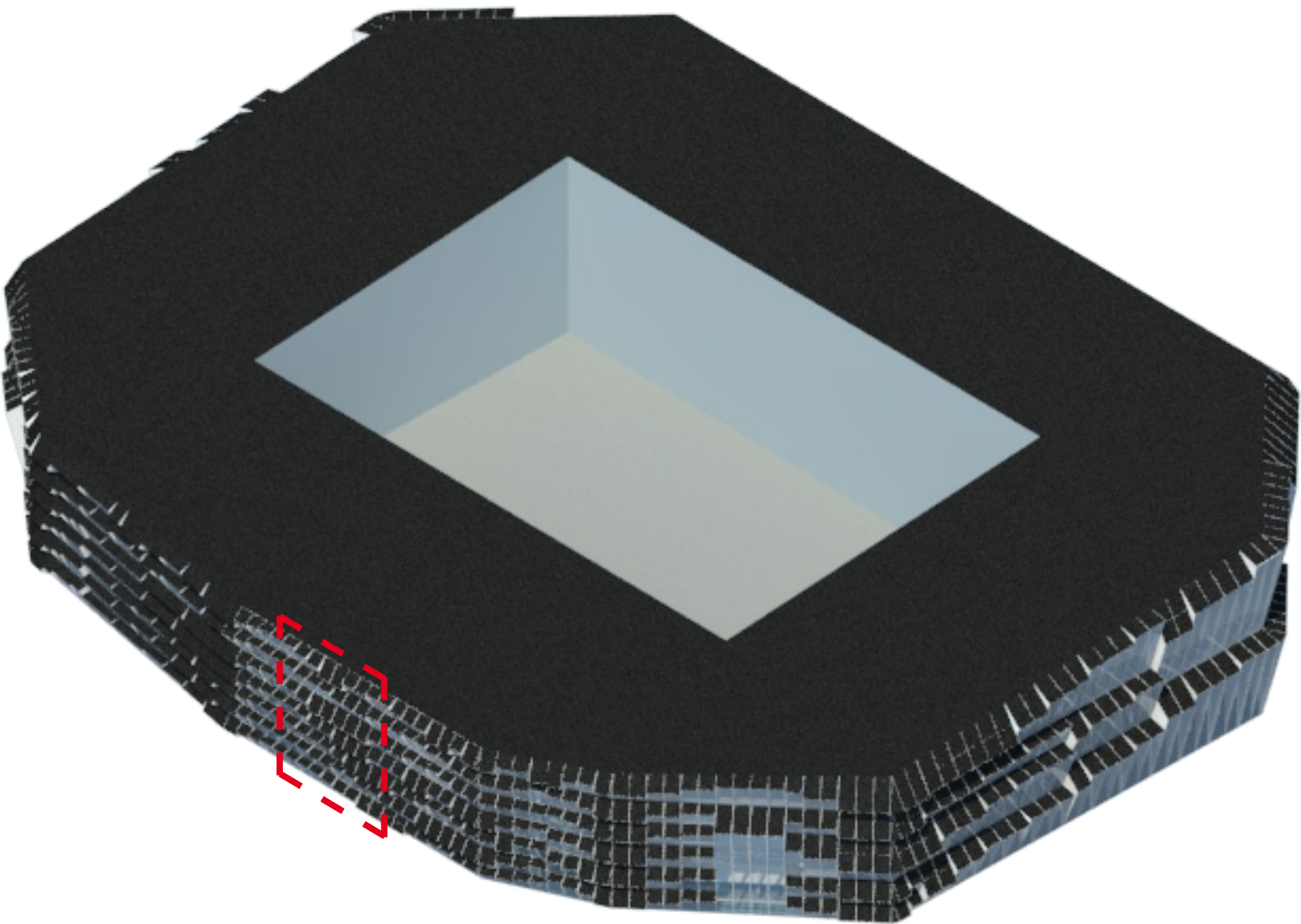
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CHOSEN FACADE FRAGMENT



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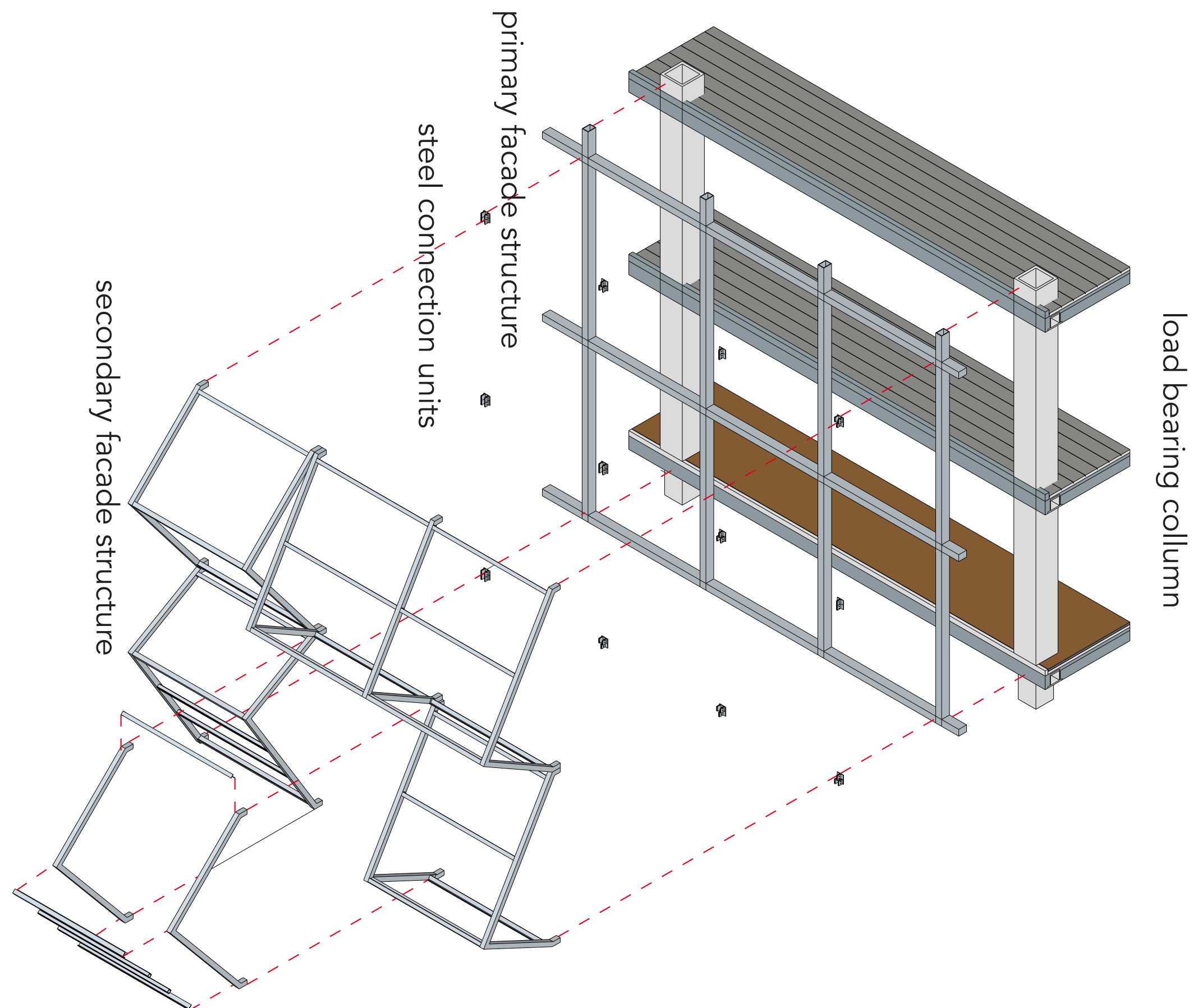
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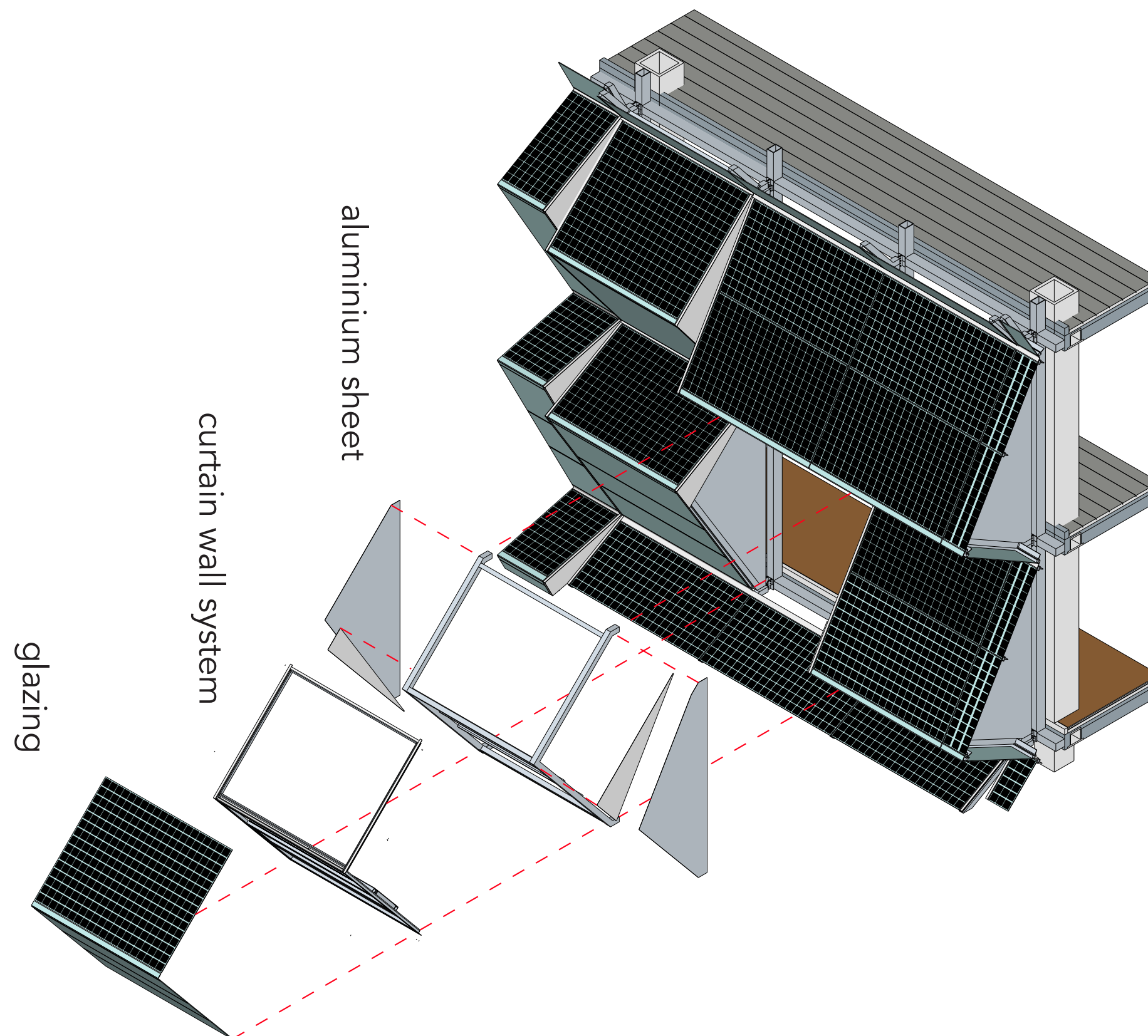
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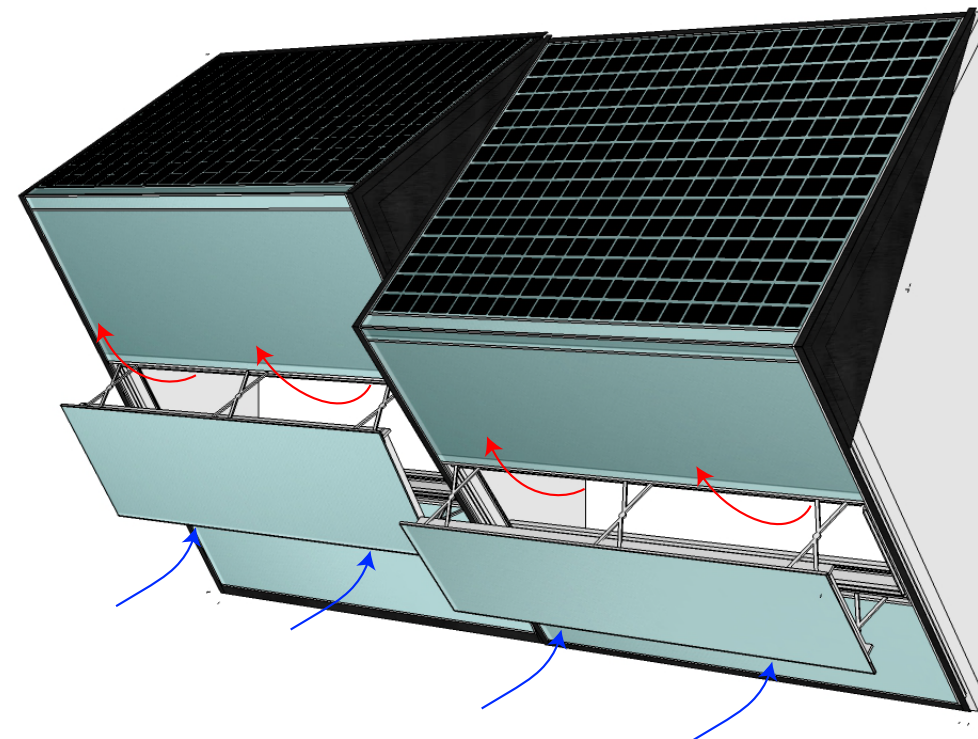
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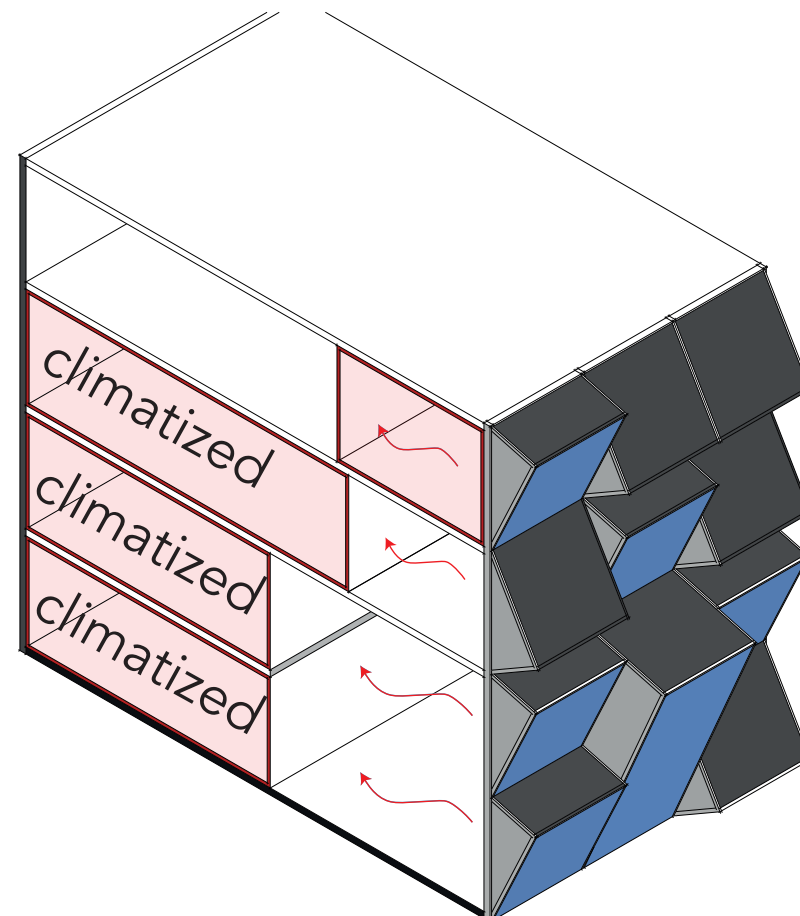
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CLIMATE SCHEME



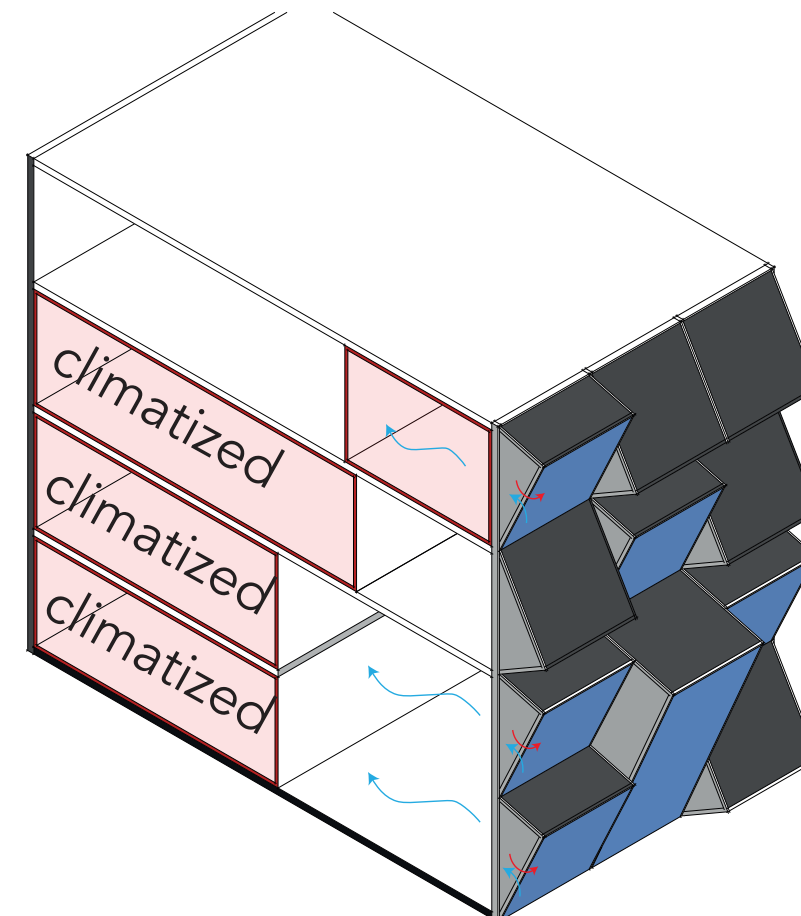
PARALLEL OUTWARD WINDOW

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GREEN HOUSE EFFECT

SUMMER



VENTILATED FACADE



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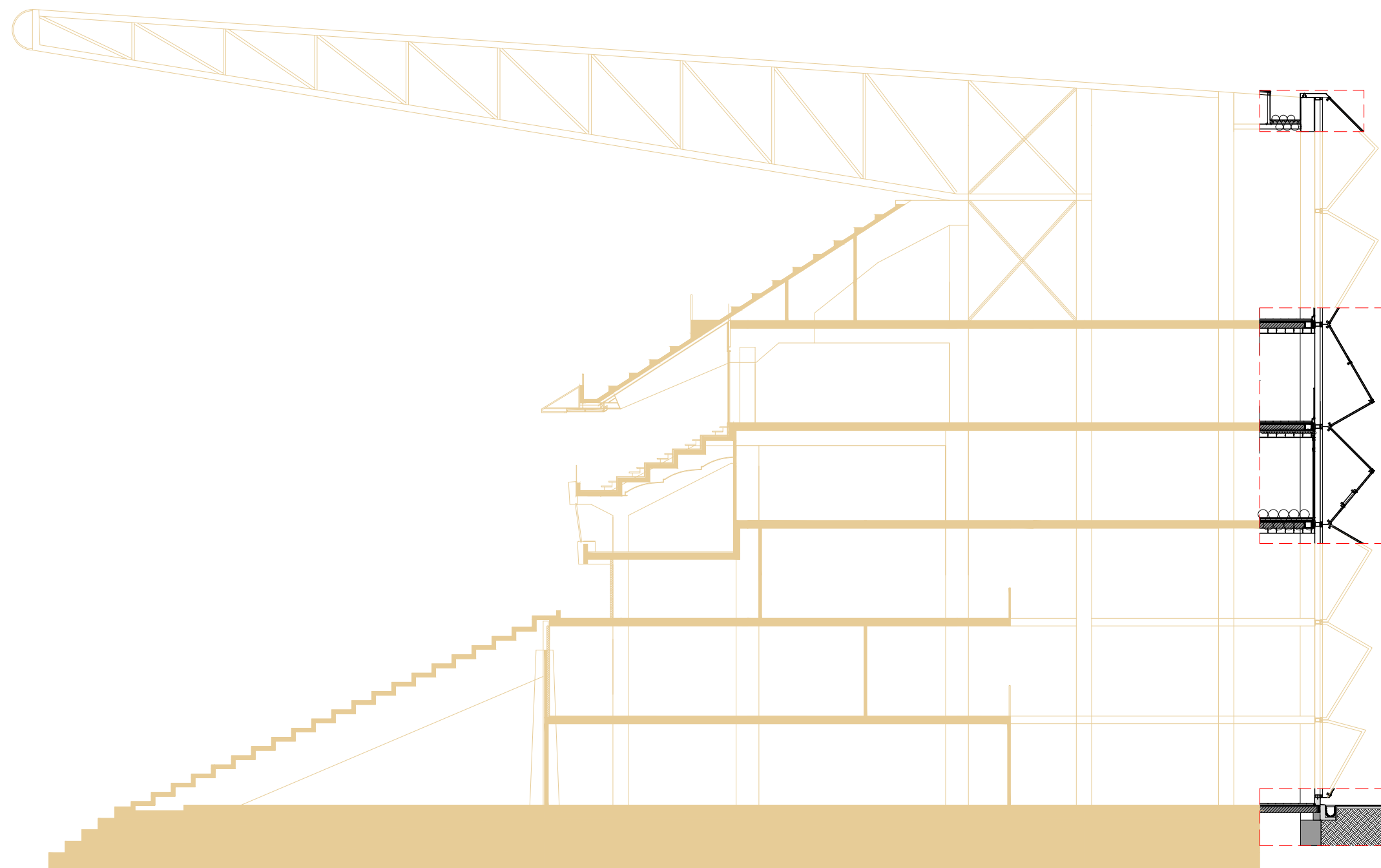
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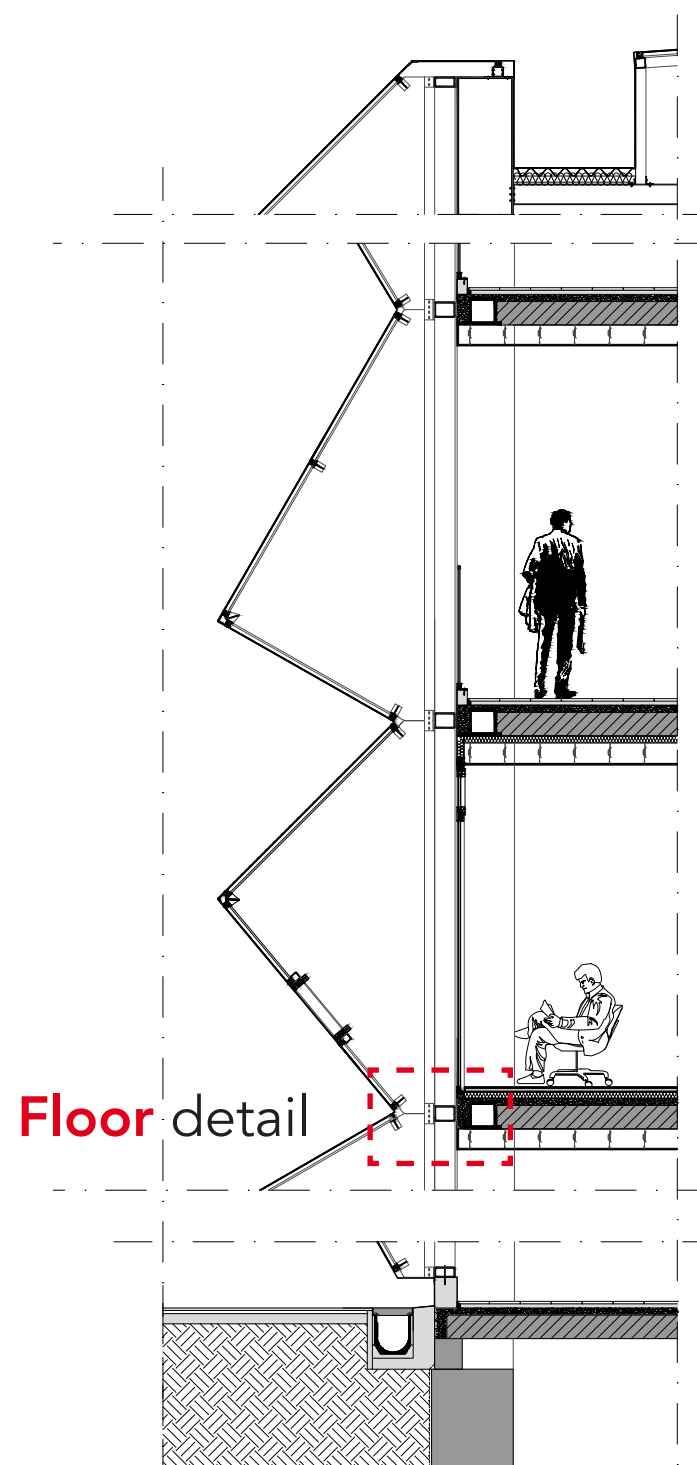
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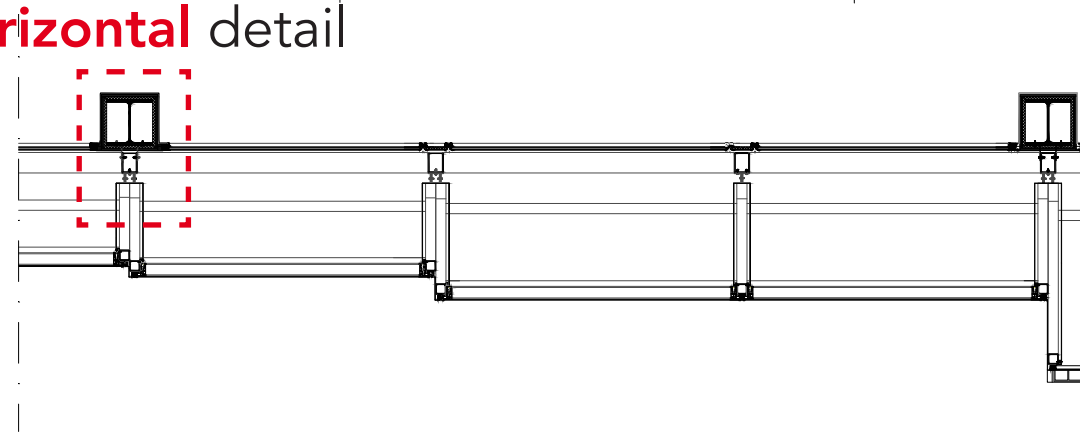
FACADE FRAGMENT

CROSS
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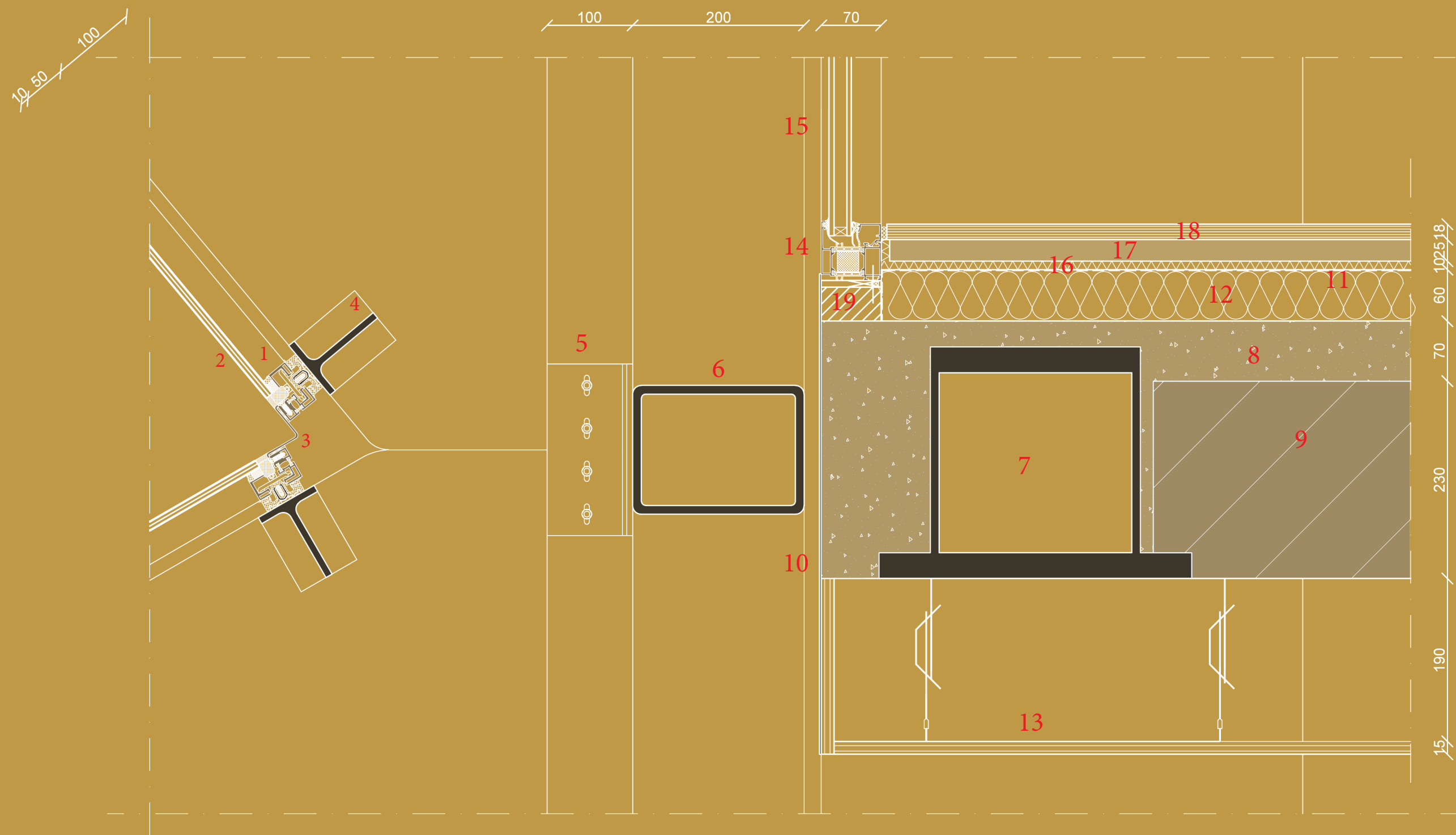
Floor detail

Horizontal detail



HORIZONTAL
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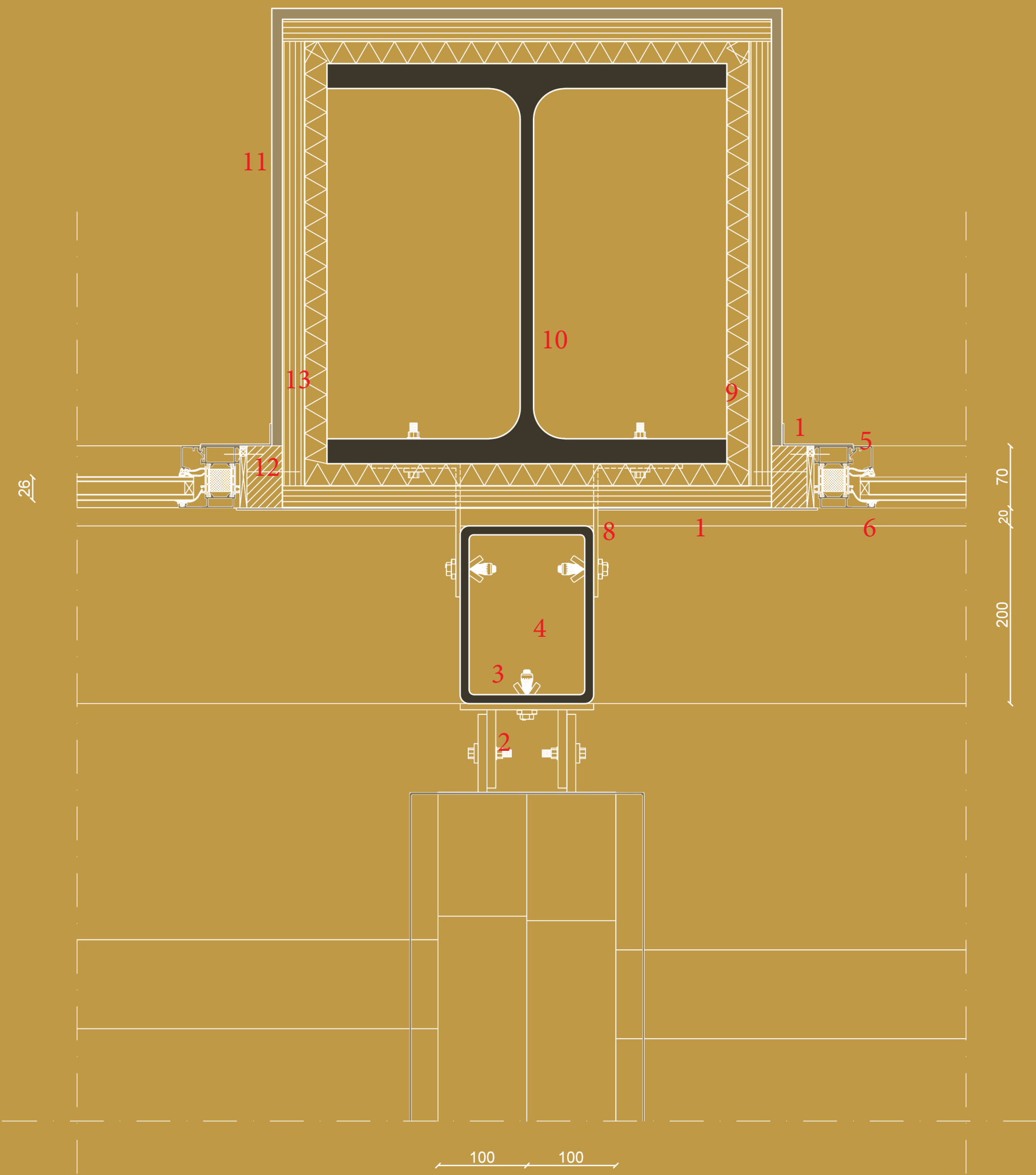
FLOOR DETAIL



1. RAICO THERM S-I CURTAIN WALL SYSTEM
2. SINGLE LAYER FLOATGLASS
3. ALUMINIUM SHEET
4. T-PROFILE STEEL BEAM
5. STEEL FACADE FRAME CONNECTION UNIT
6. PRIMARY FACADE STRUCTURE (HOLLOW STEEL PROFILE 150 X 200)
7. STEEL 'HOED' BEAM
8. CONCRETE PRESSURE FLOOR
9. HOLLOW CORE SLAB FLOOR

10. ALUMINIUM SHEET
11. VAPOUR BARRIER
12. RIGID THERMAL INSULATION
13. SUSPEND CEILING SYSTEM HANGER
14. ALUMINIUM PROFILE (GLASPU)
15. INSULATED GLASS
16. GYPSUM FIBREBOARD
17. CEMENT BED
18. TIMBER FLOOR
19. WOODED GUIDE FRAME

HORIZONTAL DETAIL



- 1. ALUMINIUM SHEET
- 2. STEEL FACADE FRAME CONNECTION UNIT
- 3. BOX BOLT
- 4. PRIMARY FACADE STRUCTURE (HOLLOW STEEL PROFILE 150 X 200)
- 5. ALUMINIUM WINDOW PROFILE (GLASPUI)
- 6. INSULATED GLASS
- 8. STEEL L-PROFILE CONNECTION UNIT
- 9. INSULATION
- 10. STEEL I-PROFILE LOAD BEARING COLLUMN
- 11. PLASTERBOARD
- 12. WOODED GUIDE FRAME
- 13. PLYWOOD PANEL



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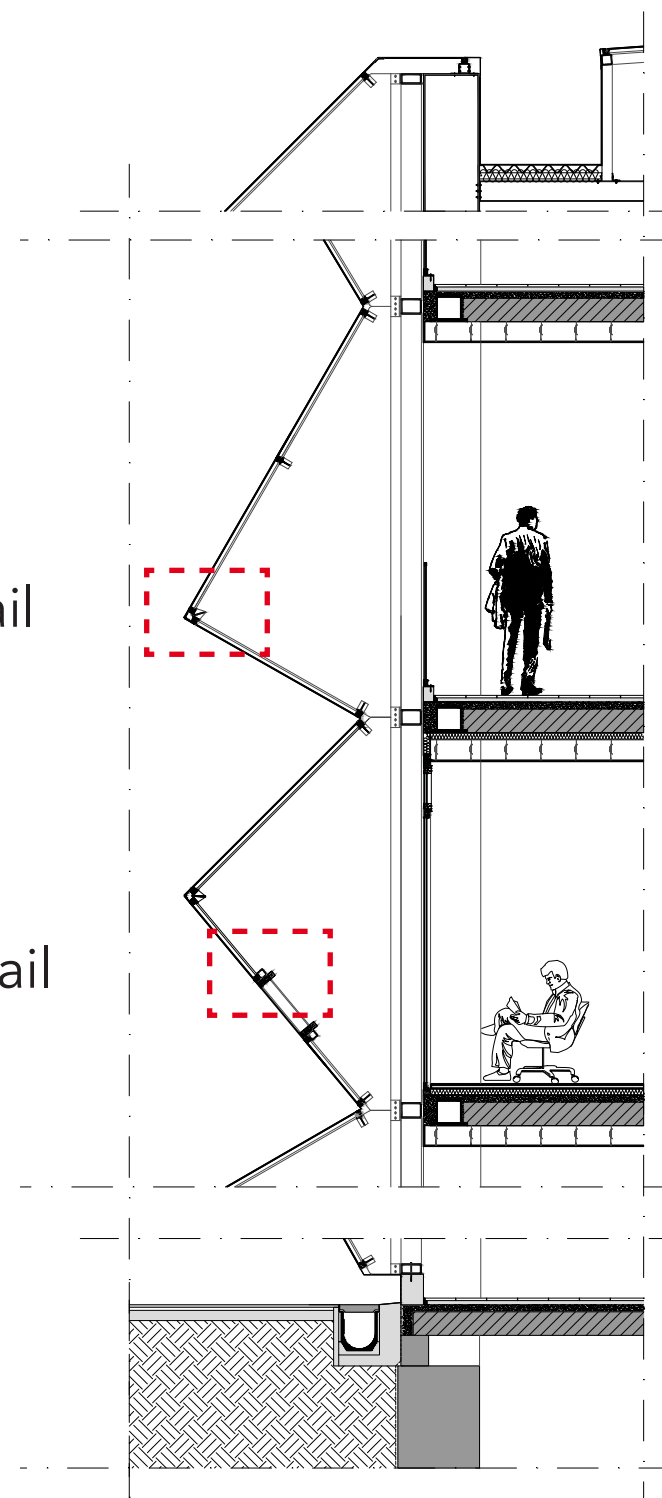
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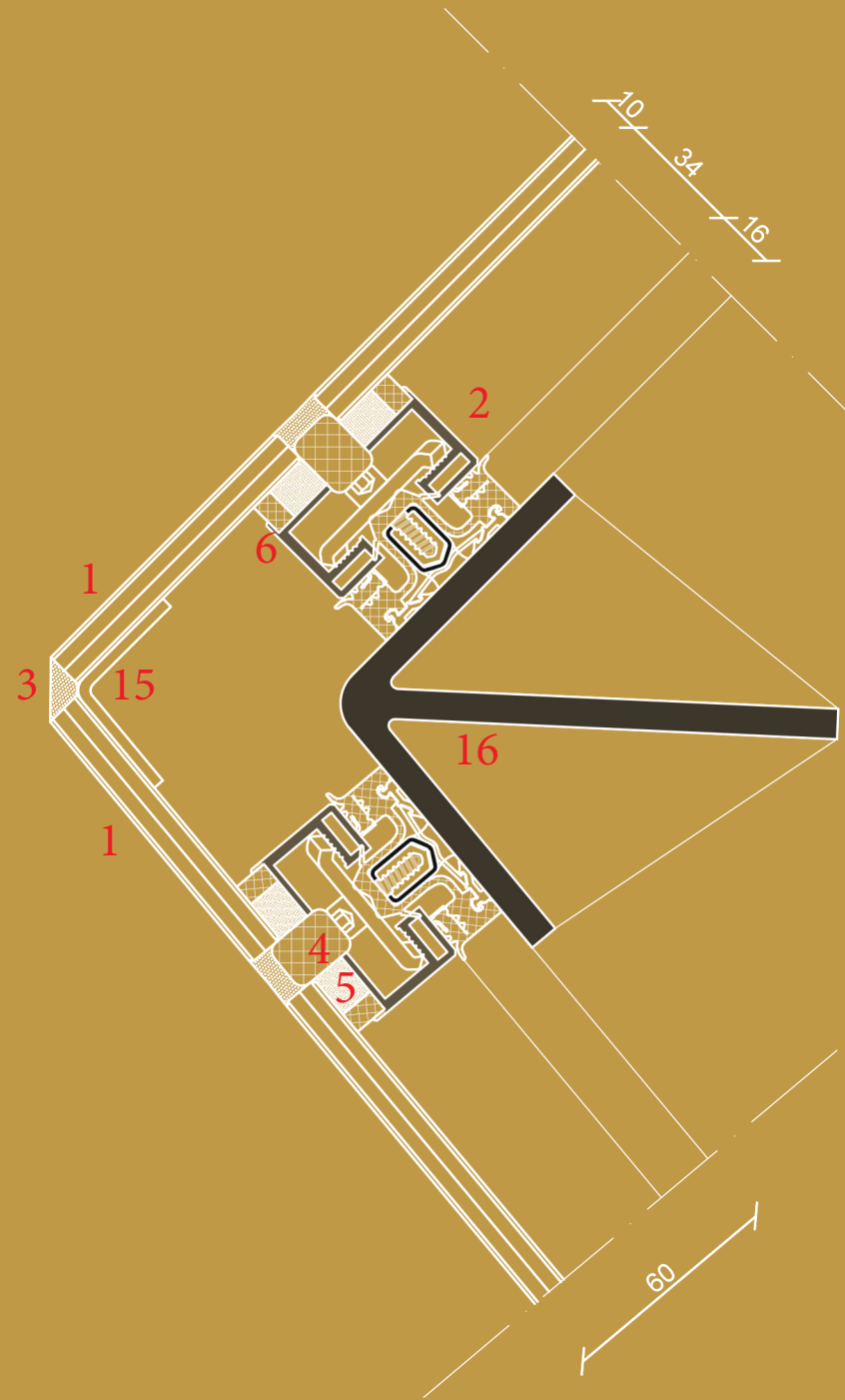
CROSS
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Corner detail

Window detail

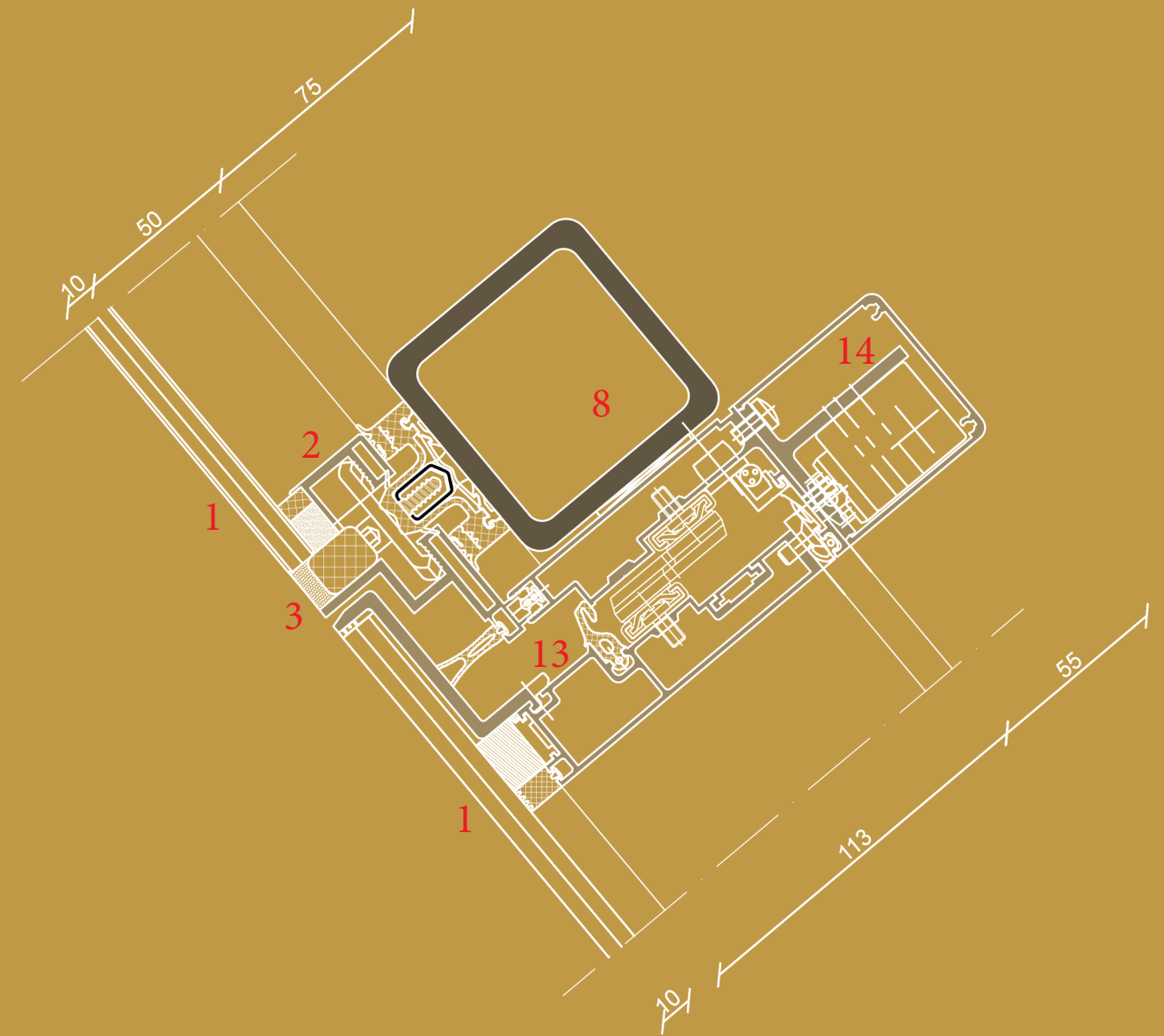


CORNERS & WINDOW DETAIL



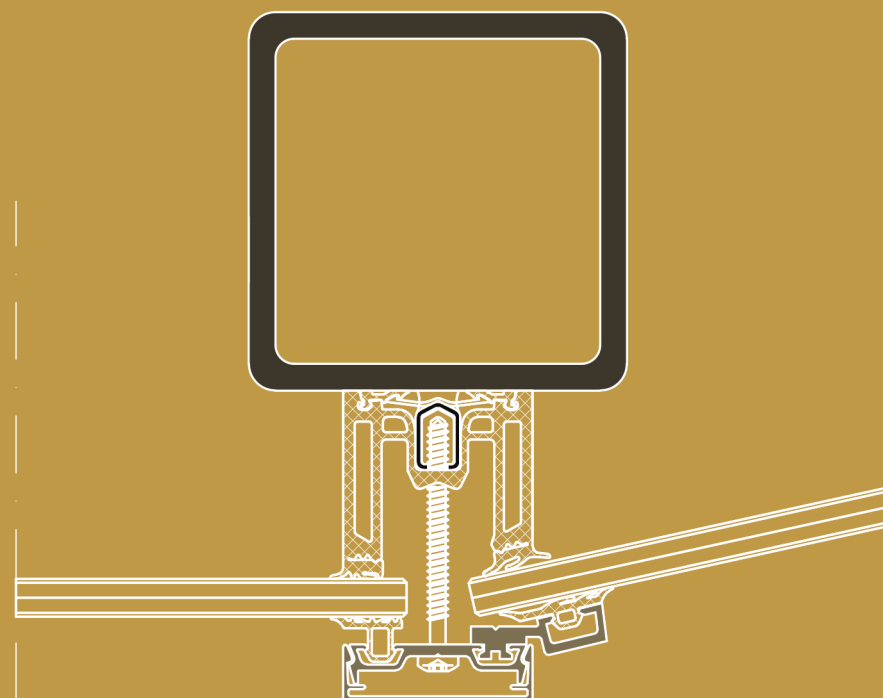
CORNER DETAIL 1

- 1. SINGE LAYER FLOATGLASS
- 2. RAICO THERM S-I CURTAIN WALL SYSTEM
- 3. SILICONE WEATHER SEAL
- 4. BACKER ROD
- 5. SILICONE STRUCTURAL SEAL
- 6. SILICONE RUBBER SPACE BLOCK



WINDOW DETAIL

- 13. PARALLEL OUTWARD WINDOW
- 14. MOTOR DRIVING MECHANISM
- 15. ALLUMINIUM PROFIEL
- 16. CUSTOM MADE STEEL PROFILE BEAM



CORNER DETAIL 2

IMPRESSIONS













INCREASING **CAPACITY**



SOLAR ENVELOPE AS AN **ARCHITECTURAL** TOOL



SOLAR

ARCHITECTUREAL

SHADING

VENTILATION

INTEGRATING WITH THE CITY



THANK YOU FOR LISTENING !
ARE THERE ANY QUESTIONS ?