P5 BOOKLET

RELIGHT V&D HAARLEM: DAYLIGHTING IN A FORMER DEPARTMENT STORE

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AR3AH105 Graduation Studio Adapting 20th Century Heritage: Vacant Heritage
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Research mentor: Hielkje Zijlstra
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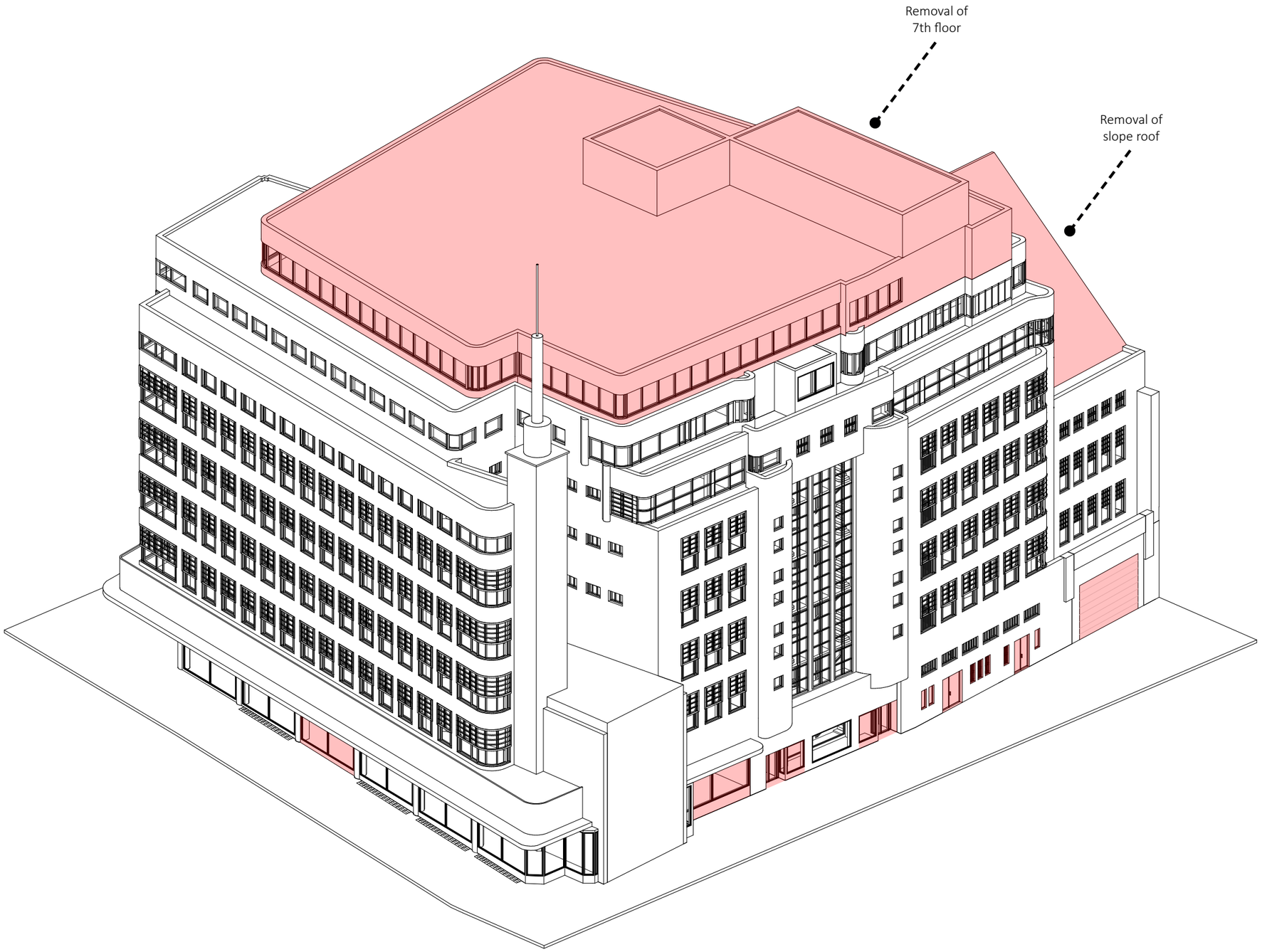
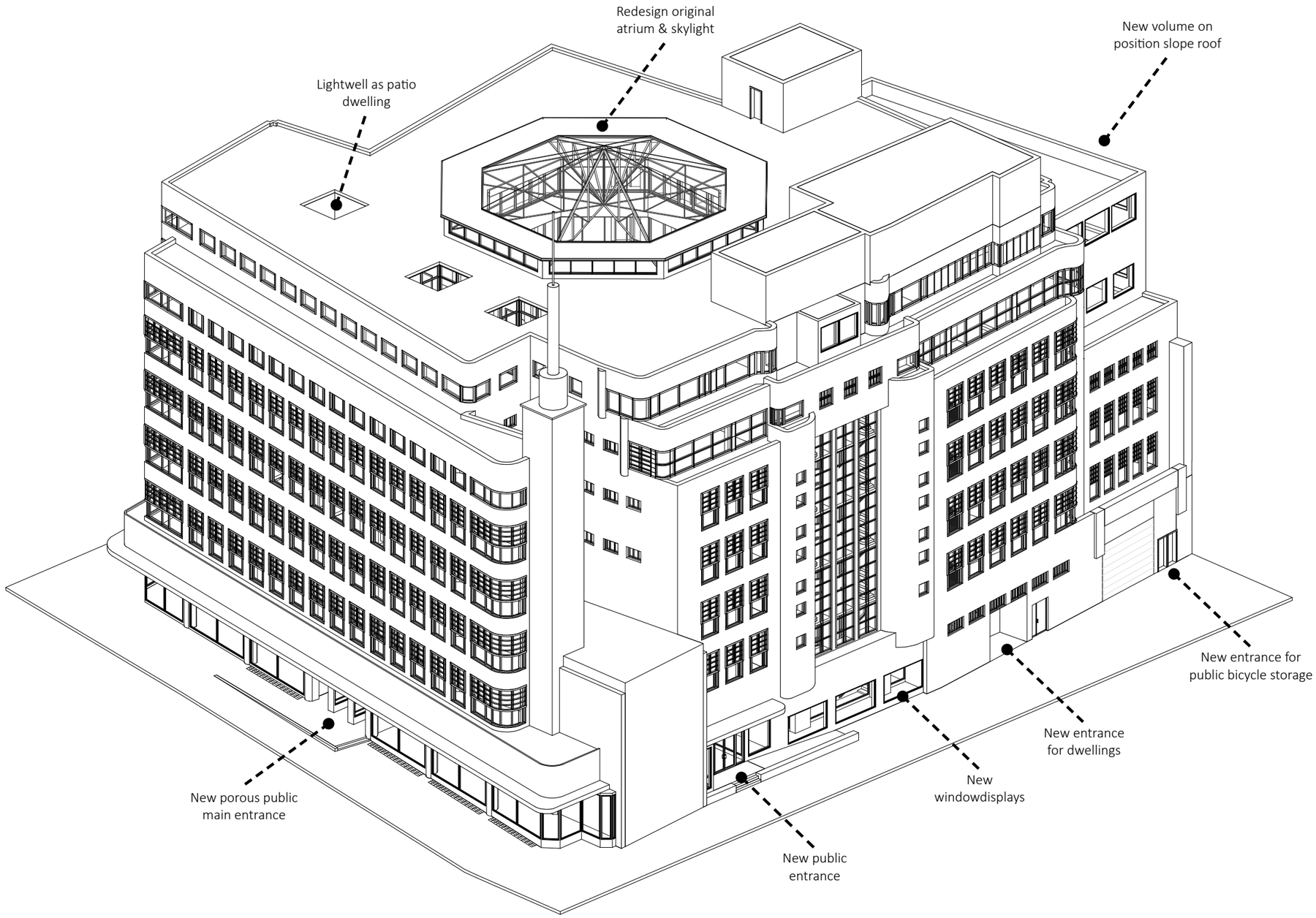
Transformation framework



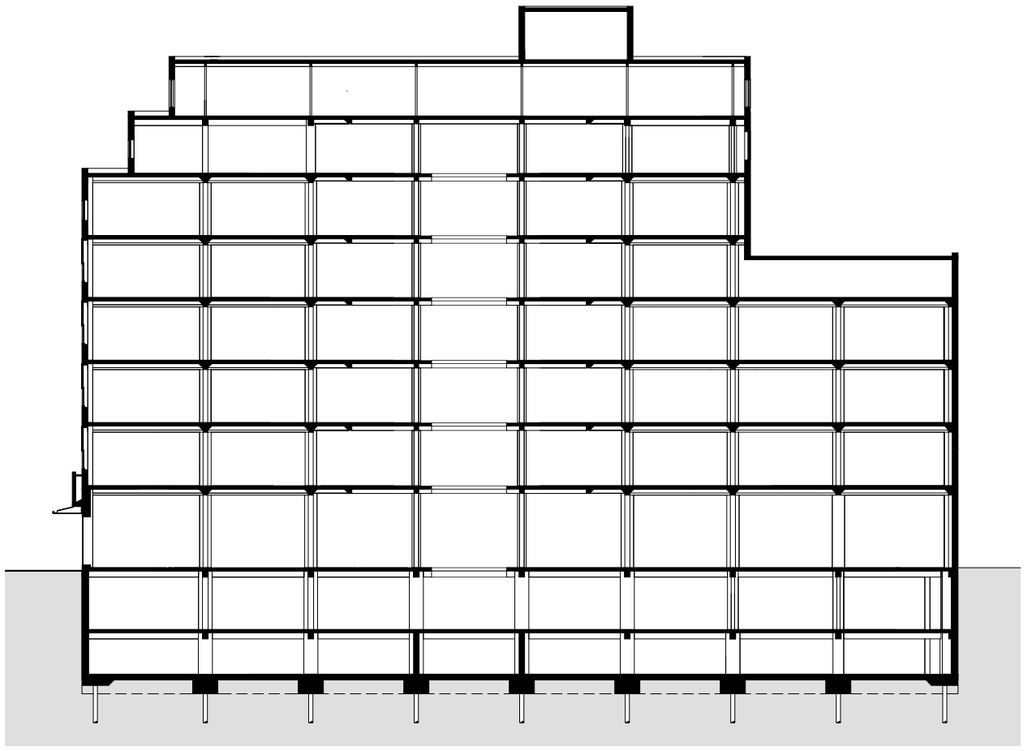
Existing situation with demolition

Transformation framework

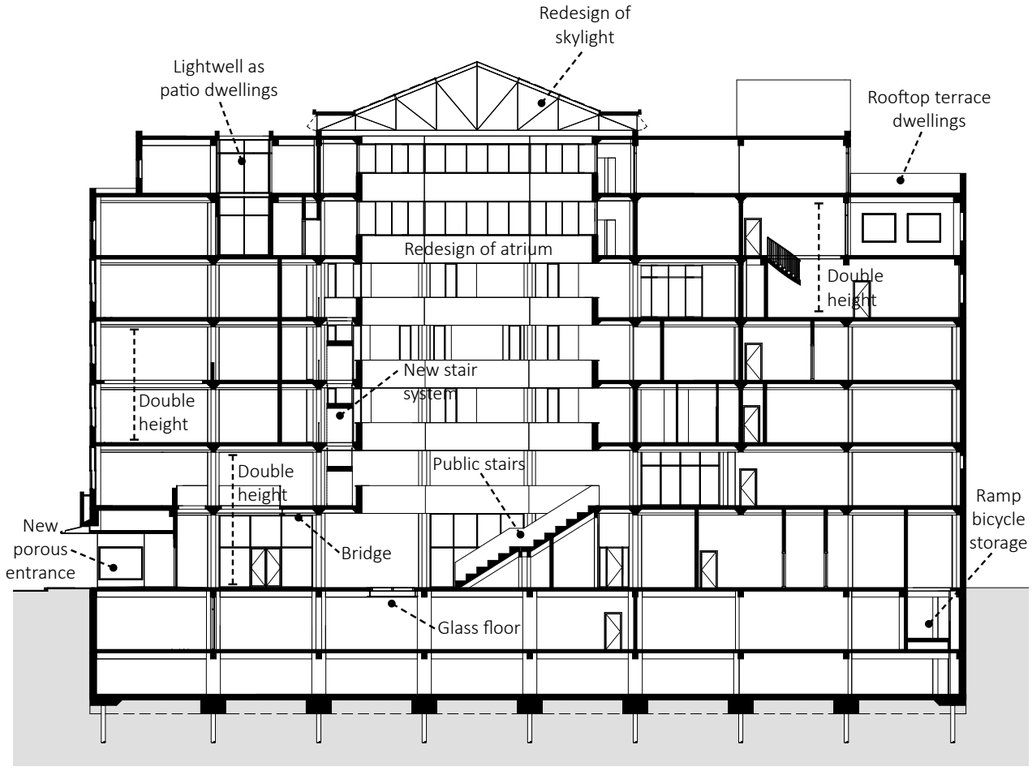


New situation with interventions

Transformation framework



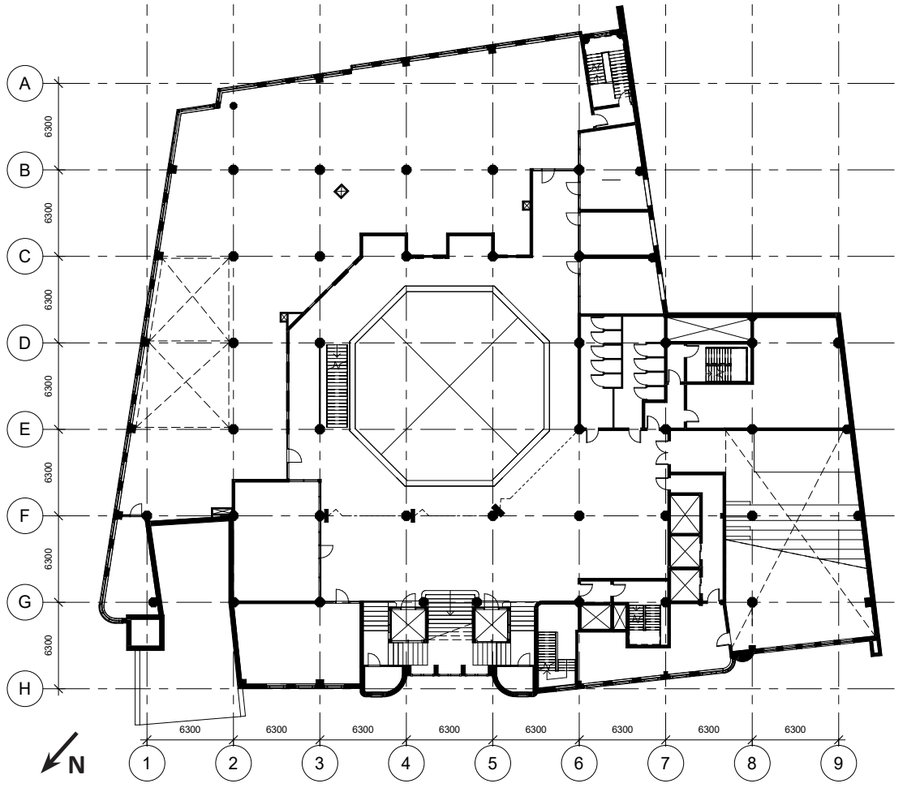
Existing situation with demolition



New situation with interventions

Demolition & redesign

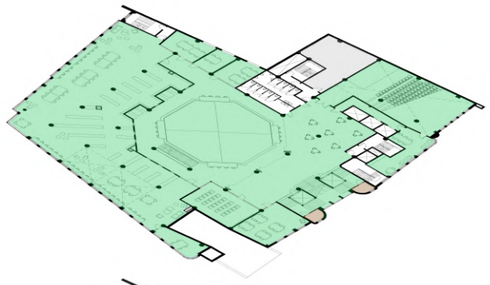
Demolition drawing of typical floor



Redesign of typical floor

Organisation program

2F



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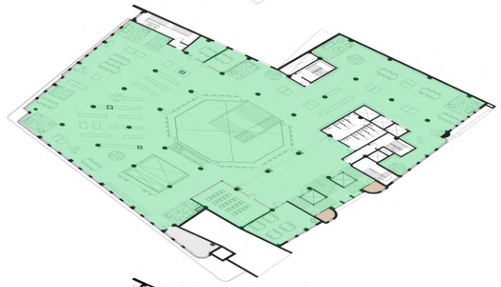

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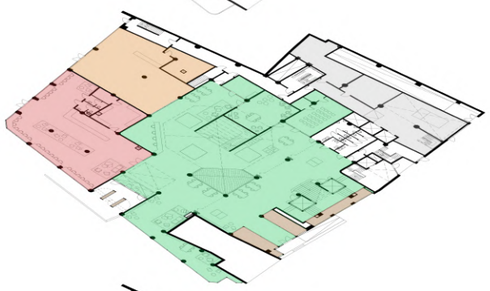
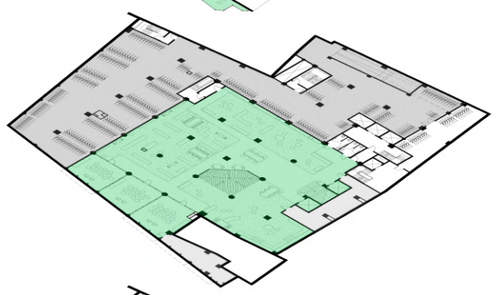


B1



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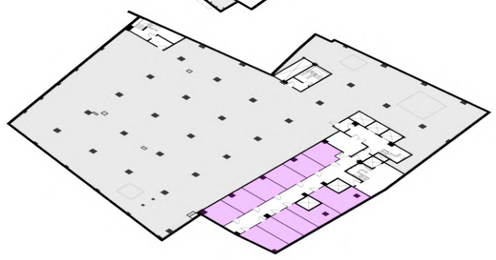

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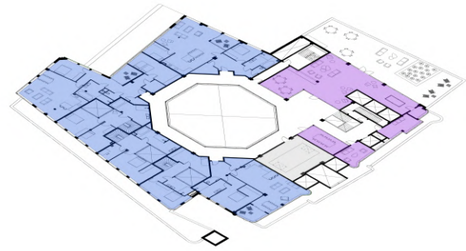

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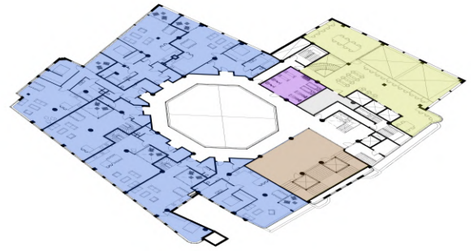

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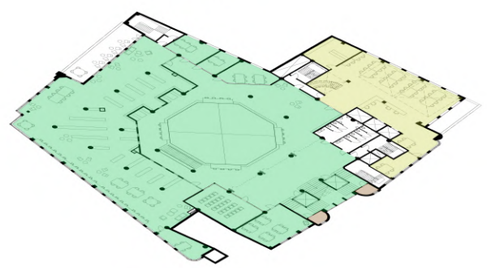

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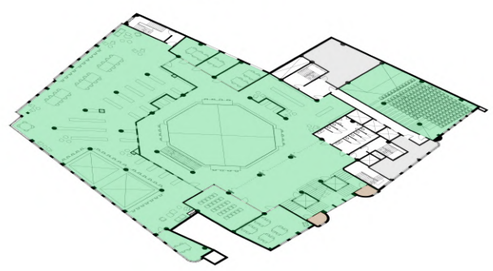


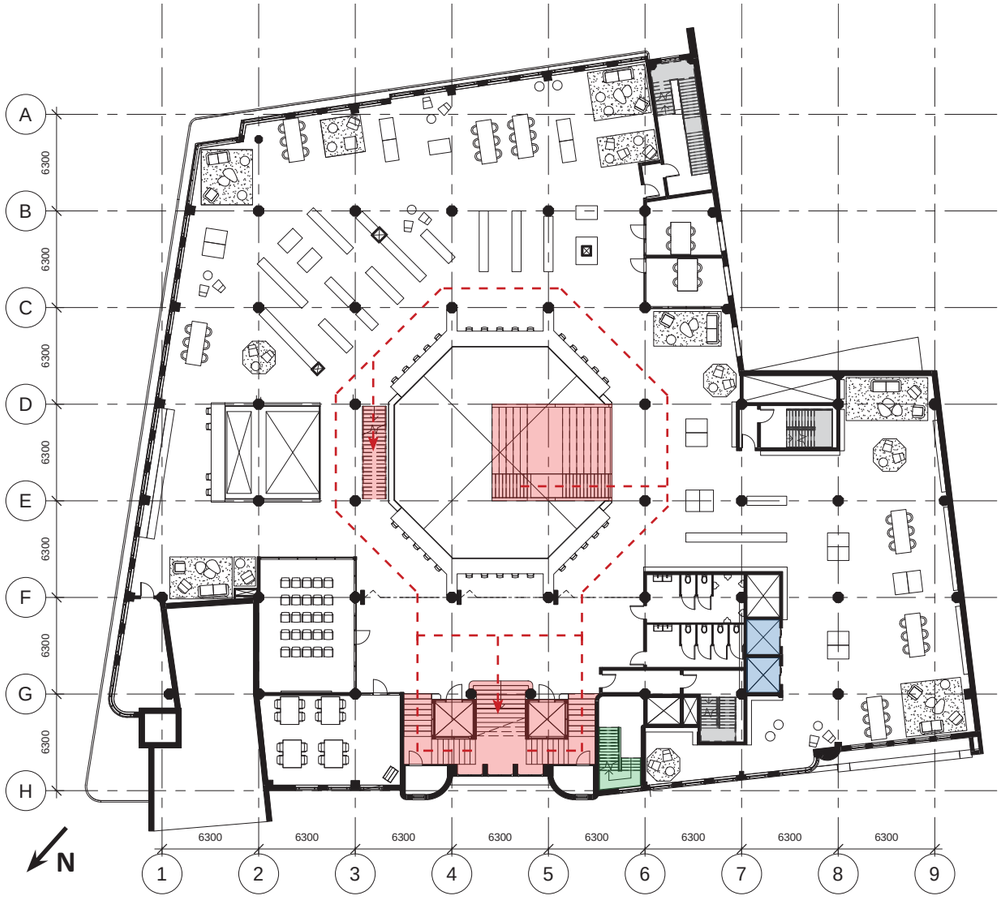
Library = 6800 m²
Archive reading room = 430 m²
Dwellings (10) + collec areas = 1400 m²
Café = 270 m²
Retail = 220 m²
Bicycle storage = 750 m² (500 places)

- Café
- Retail
- Library
- Archive reading room
- Exposition spaces
- Storage, technique & expedition
- Dwellings
- Dwellings, collective spaces
- Dwellings, external storage
- Public bicycle storage

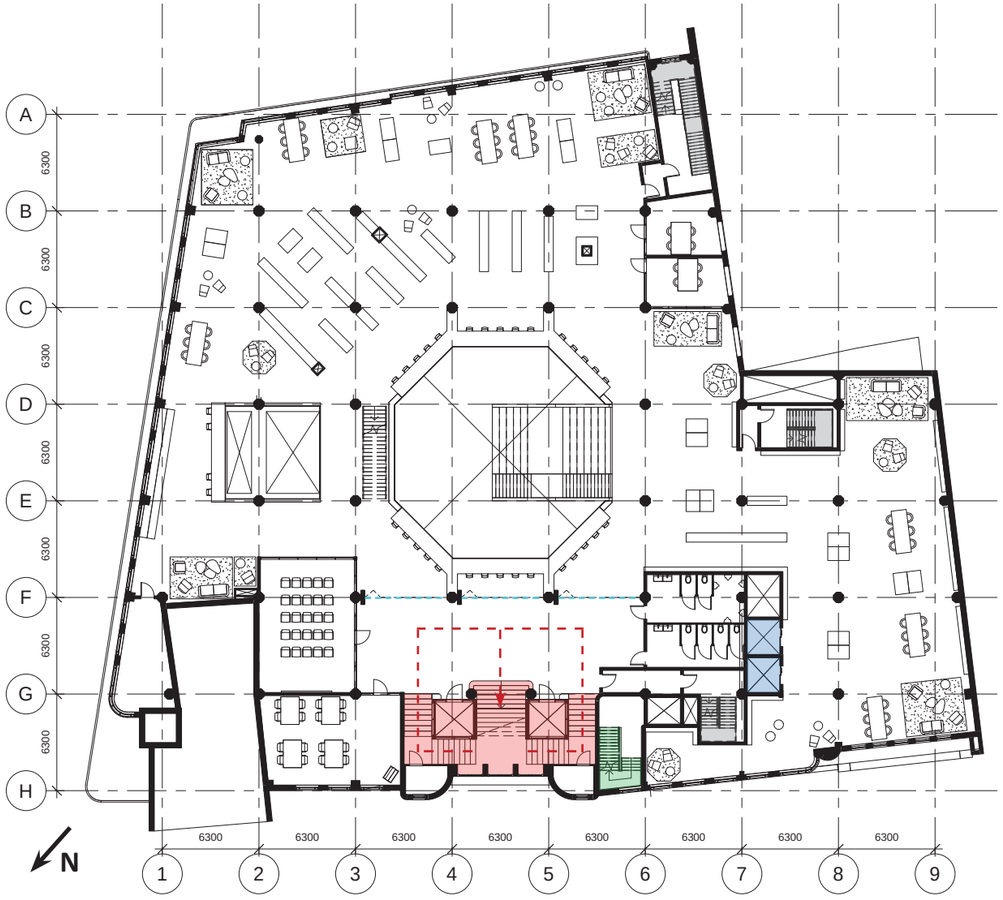
Accessibility & use (day)

Accessibility & use (evening)

Circulation & accessibility



Day circulation



Evening circulation

Public circulation library

Circulation to dwellingfloors

Logistics library

Emergency staircases

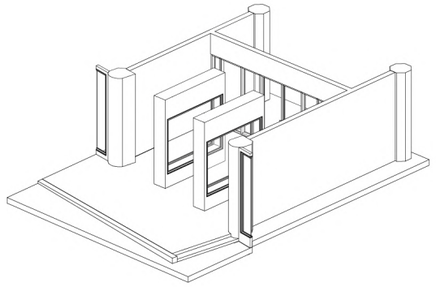
Transparant pivot doors

The new context

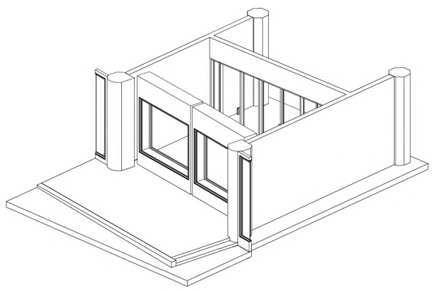
- Pedestrian friendly zone
- Bicycle path
- Bicycle and car as guest road
- Car road + bus (50km/h)
- **B** Bus stop
- **P** Parking spots for bicycles + scooters
- **H** Area for terrace horeca
- Public entrances
- Entrance cafe
- Entrance retail
- Entrance bicycle storage
- Dwellings' main entrance
- Entrance expedition

New context and entrances

Main public entrance Verwulft

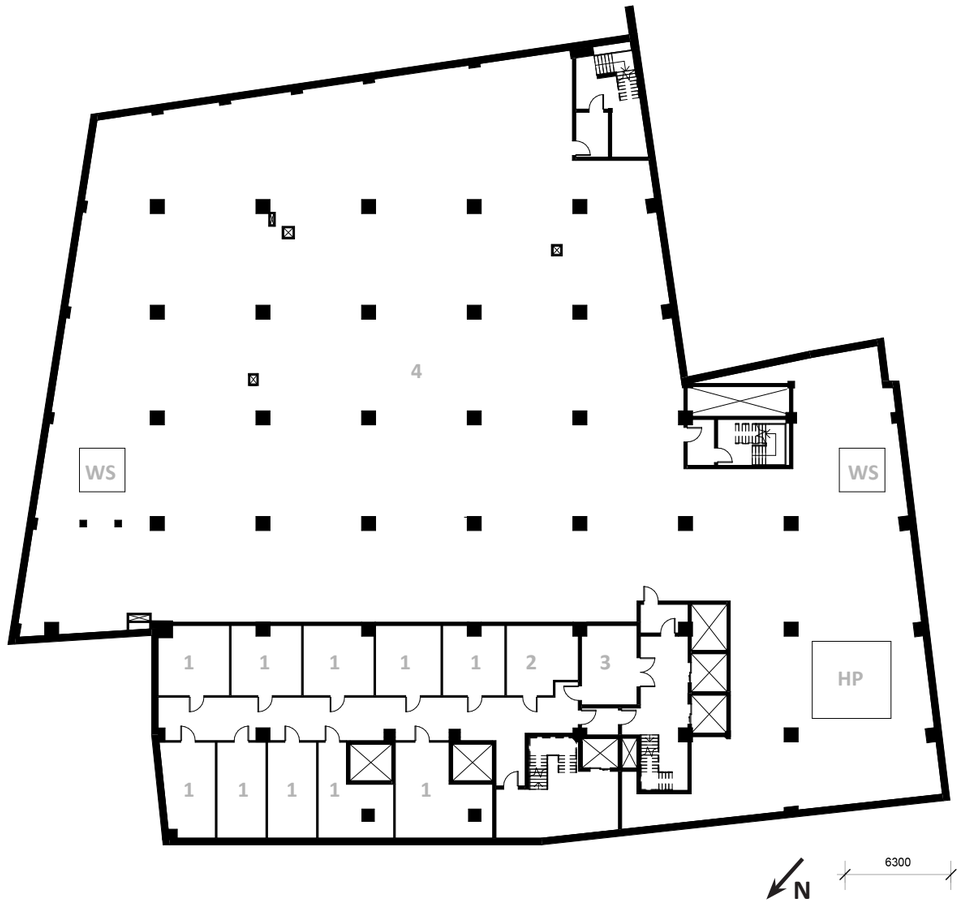


Day



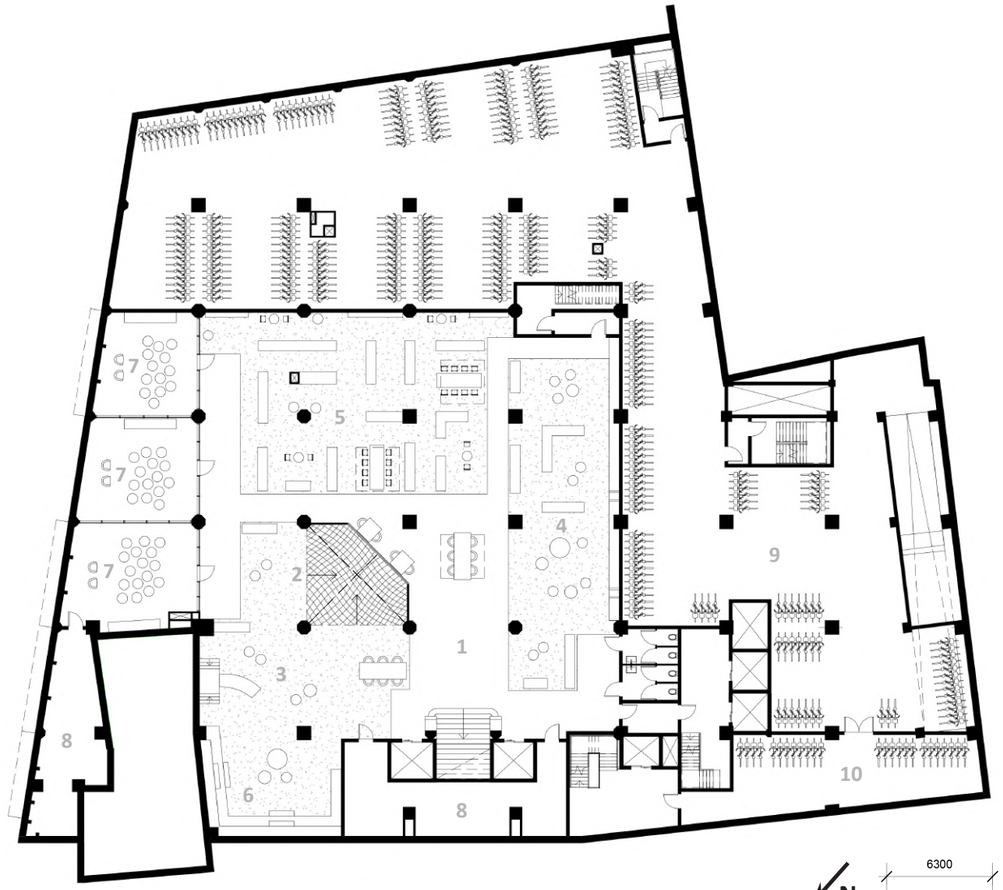
Evening

Lower & Upper basement floor



Basement B2

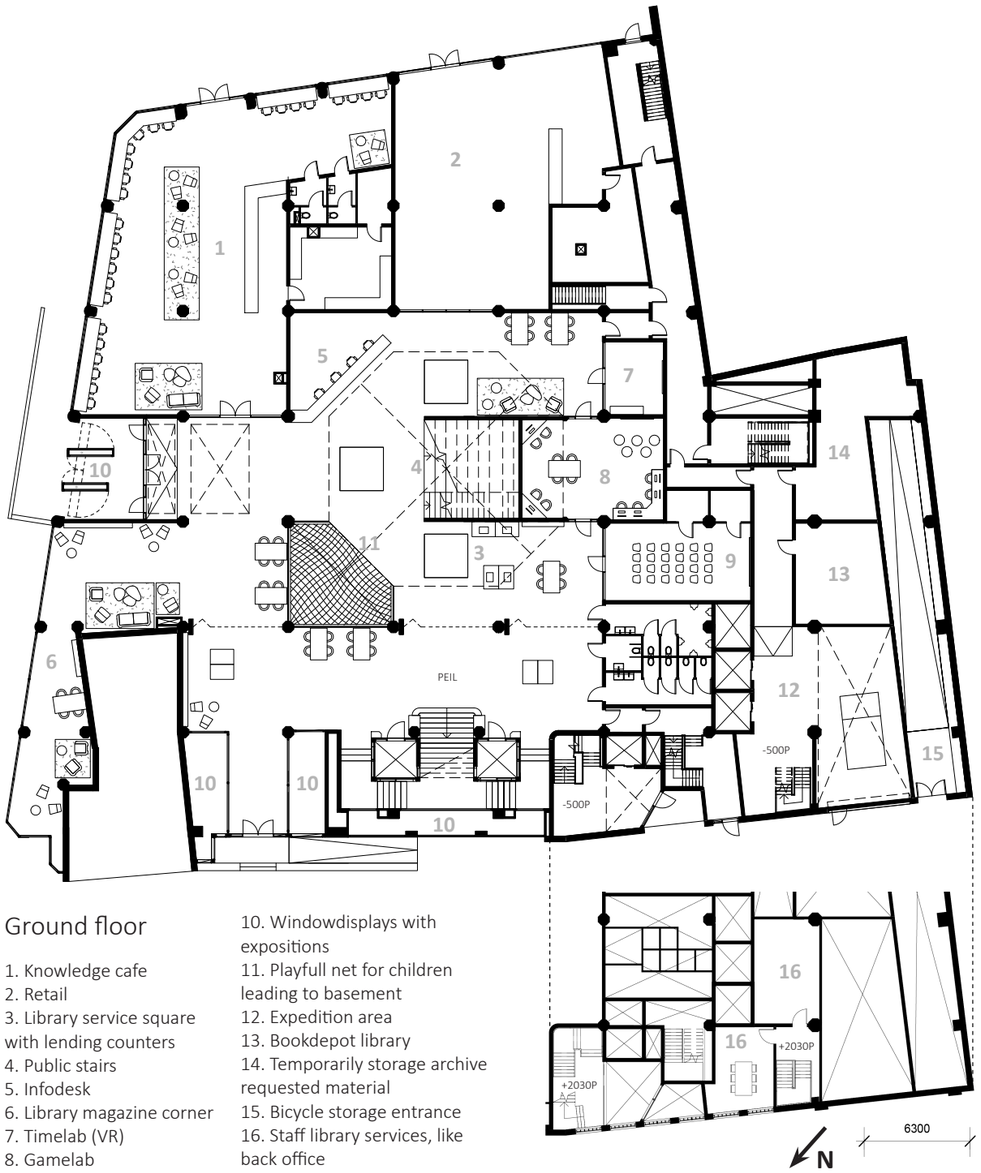
1. Dwellings' external storages
2. Dwellings' collective storage
3. Trashcans for dwellings
4. Installations space



Basement B1

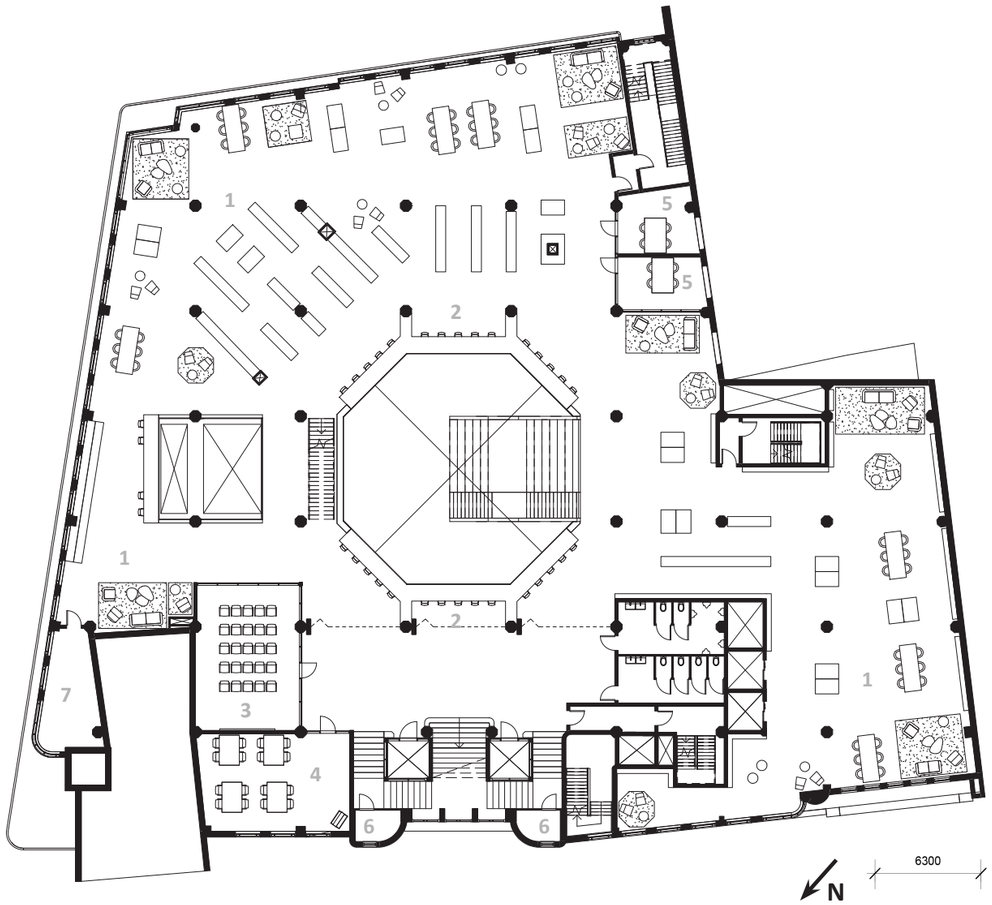
1. Children Library
2. Playfull net for children to enter basement
3. Part focussed on playing
4. Part focussed on reading
5. Part focussed on picking books
6. Flexible reading/event space
7. Rooms for readingsessions and workshops
8. Storage
9. Public bicycle storage
10. Bicycle storage for dwellings

Ground & First floor



Ground floor

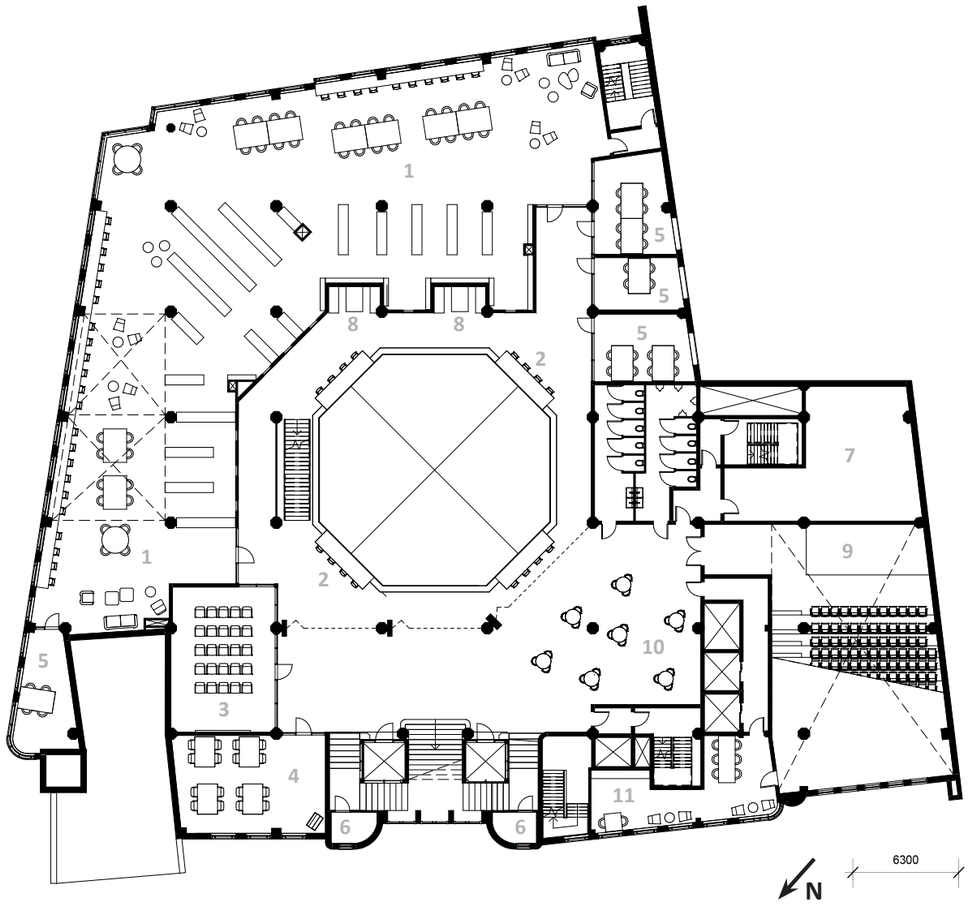
1. Knowledge cafe
2. Retail
3. Library service square with lending counters
4. Public stairs
5. Infodesk
6. Library magazine corner
7. Timelab (VR)
8. Gamelab
9. Futurelab
10. Windowdisplays with expositions
11. Playfull net for children leading to basement
12. Expedition area
13. Bookdepot library
14. Temporarily storage archive requested material
15. Bicycle storage entrance
16. Staff library services, like back office



First floor

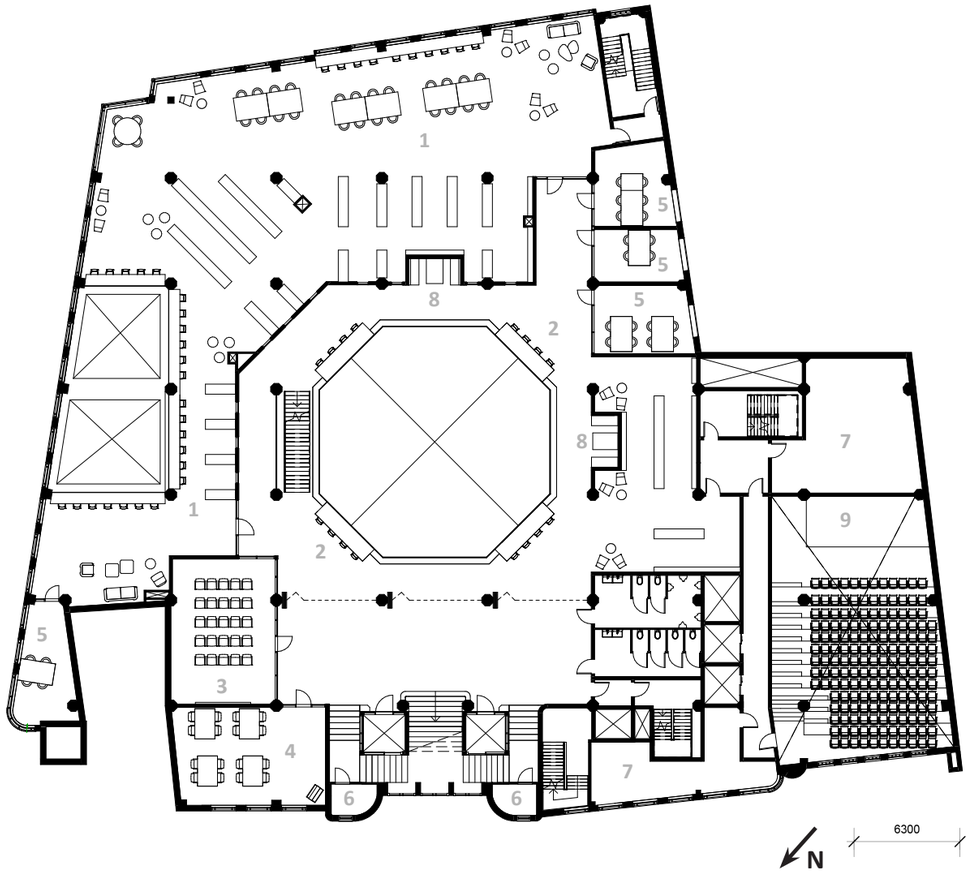
1. Mix of bookstacks and seats (focussed on adult and teen books)
2. Seats around atrium
3. Lecture space
4. Workshop space
5. (rentable) Meeting rooms
6. Exposition V&D
7. Storage

Second & Third floor



Second floor

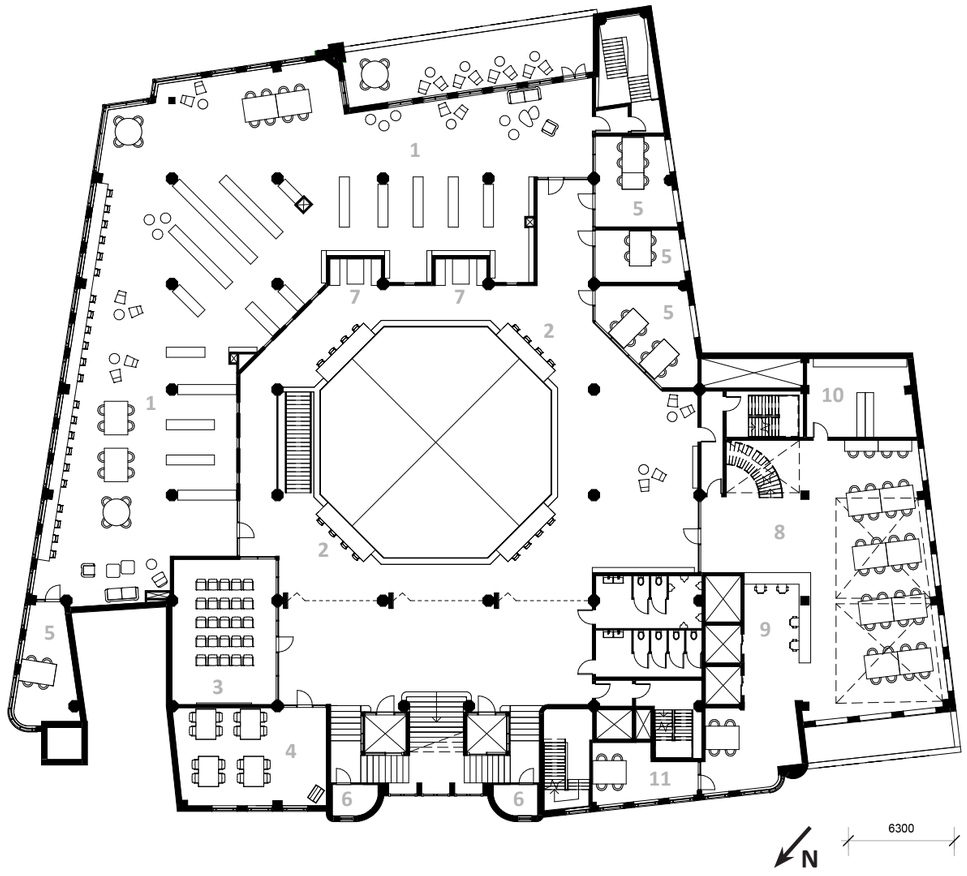
1. Mix of bookstacks and seats (focussed on studying)
2. Seats around atrium
3. Lecture space
4. Workshop space
5. (rentable) Meeting rooms
6. Exposition V&D
7. Storage
8. Pockets around atrium
9. Auditorium
10. Foyer auditorium
11. Cantine personnel



Third floor

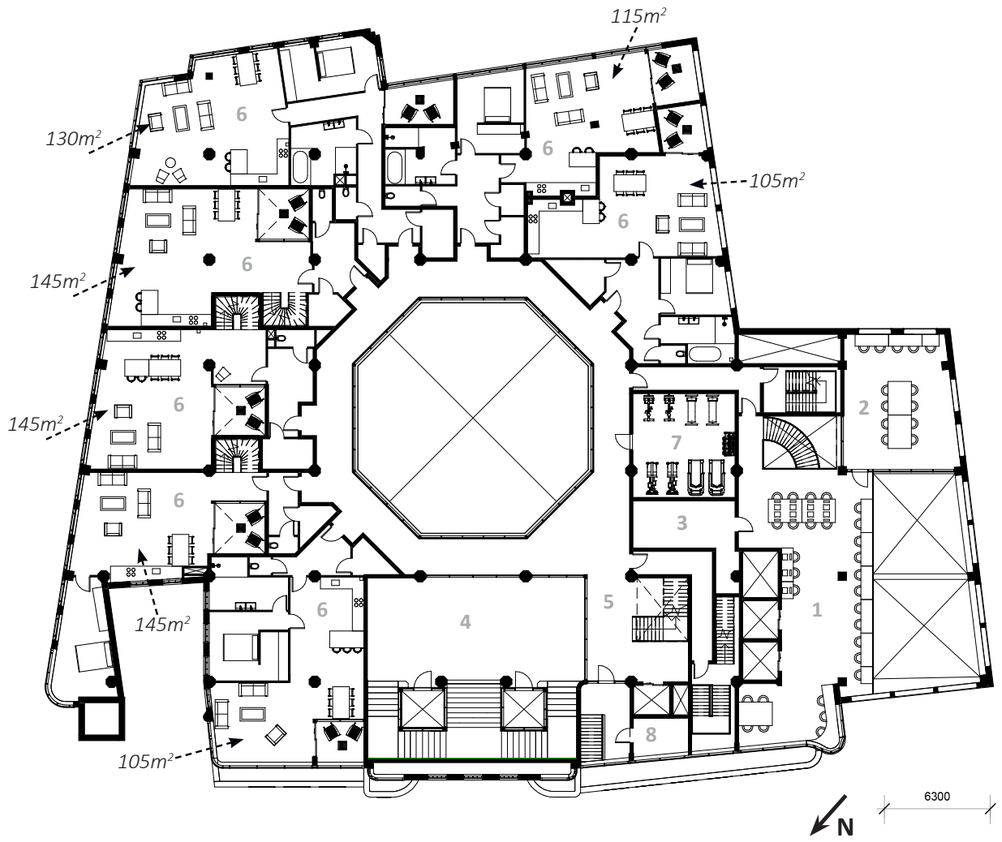
1. Mix of bookstacks and seats (focussed on studying)
2. Seats around atrium
3. Lecture space
4. Workshop space
5. (rentable) Meeting rooms
6. Exposition V&D
7. Storage
8. Pockets around atrium
9. Auditorium

Fourth & Fifth floor



Fourth floor

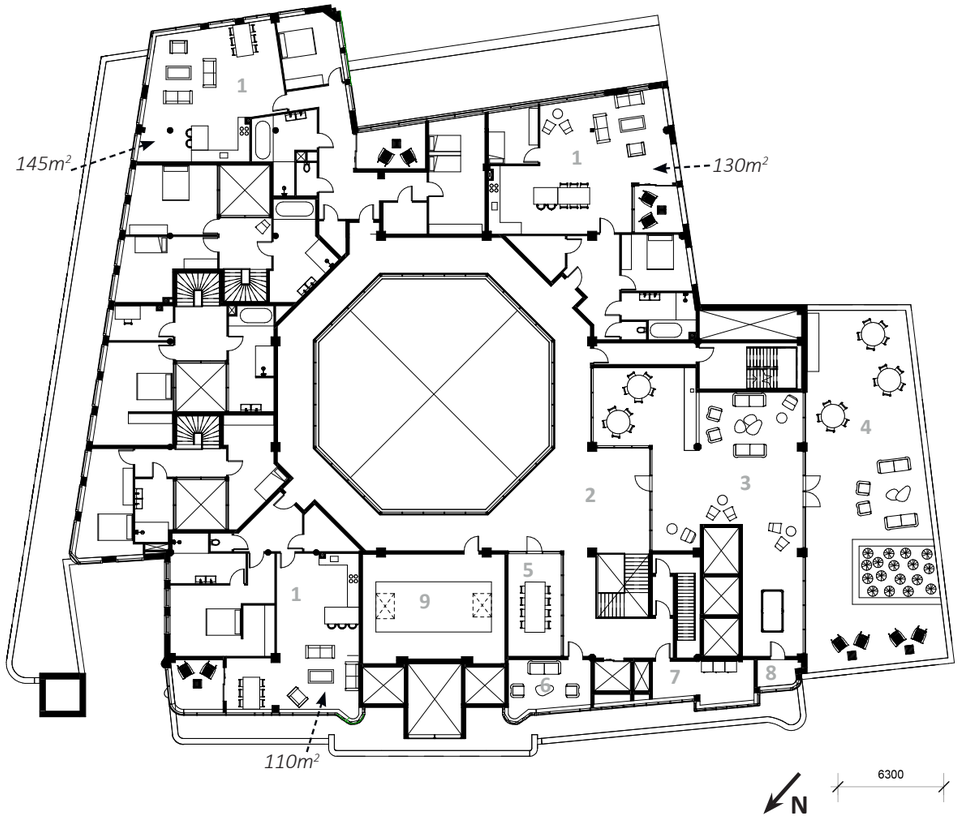
1. Mix of bookstacks and seats (focussed on studying)
2. Seats around atrium
3. Lecture space
4. Workshop space
5. (rentable) Meeting rooms
6. Exposition V&D
7. Pockets around atrium
8. Archive reading room
9. Info desk to request archive material
10. Lockers
11. Private study room



Fifth floor

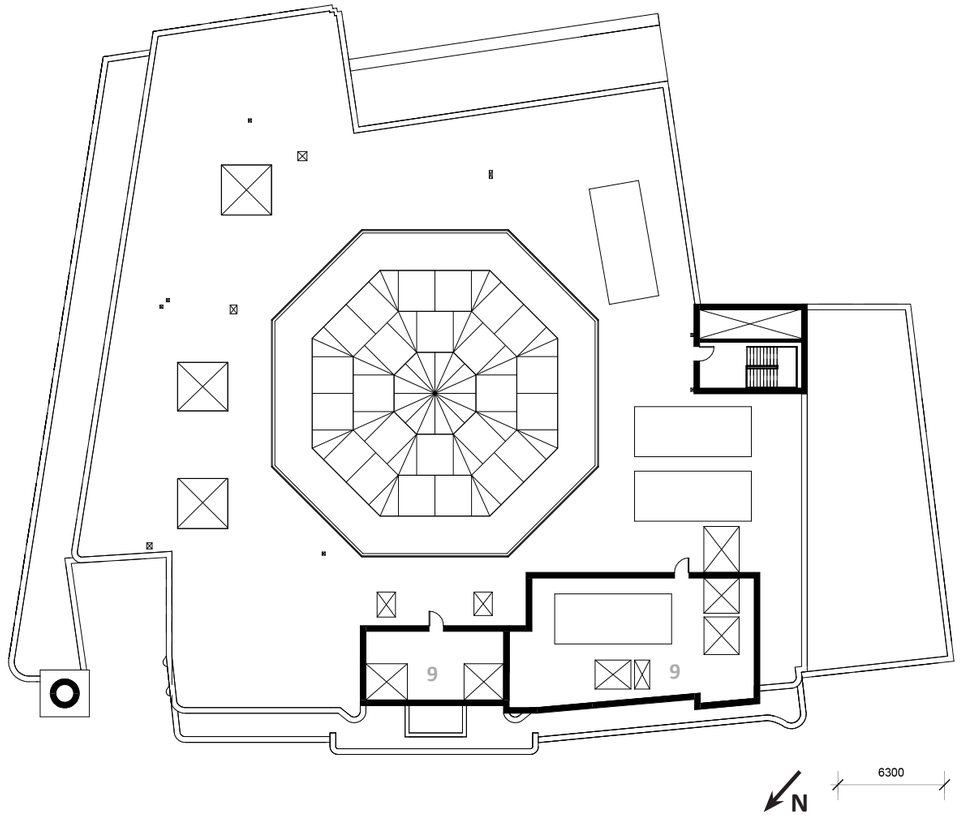
1. Archive reading room
2. Private study room
3. Storage archive
4. Exposition V&D
5. Entrance area dwellingfloor
6. Dwellings
7. Collective fitness space
8. Storage

Sixth floor & Roof



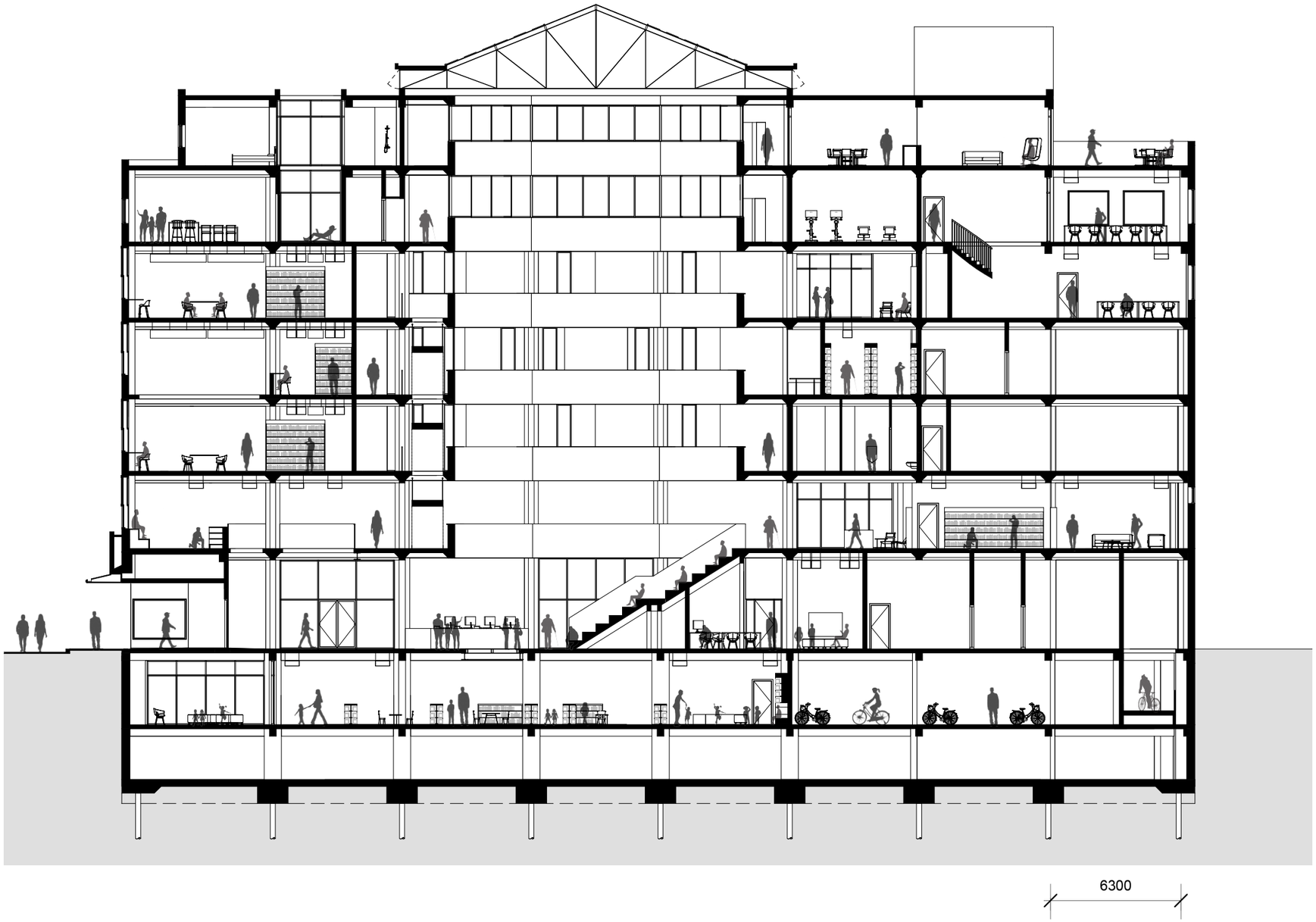
Sixth floor

1. Dwellings
2. Entrance area collective spaces dwelling floor
3. Collective living room
4. Collective rooftop terrace
5. VVE meeting room
6. Collective multi use room
7. Collective laundry space
8. Storage
9. Installations space

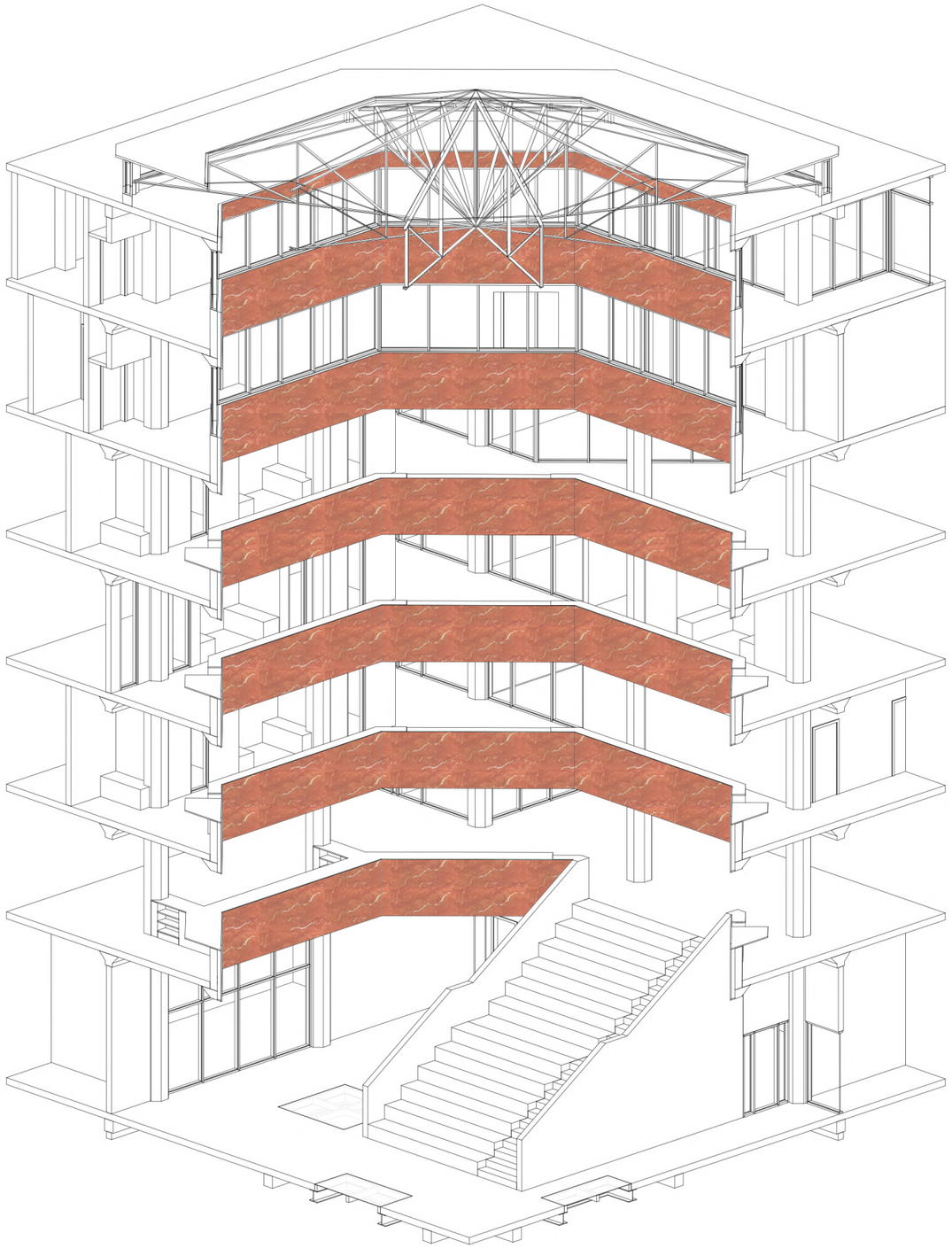


Roof

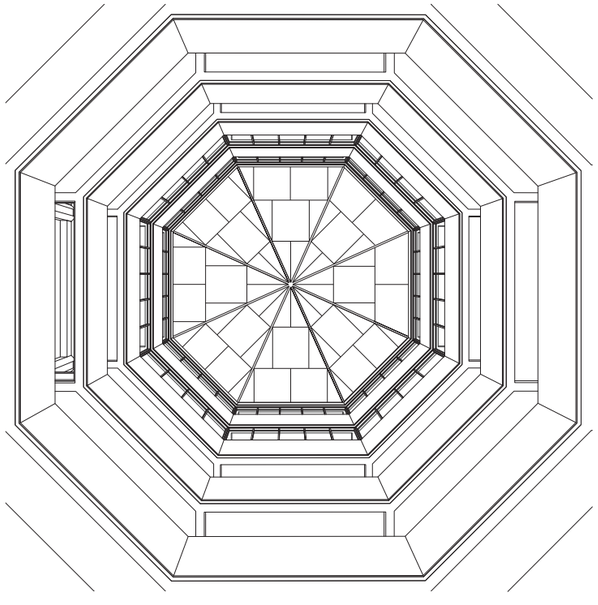
Section

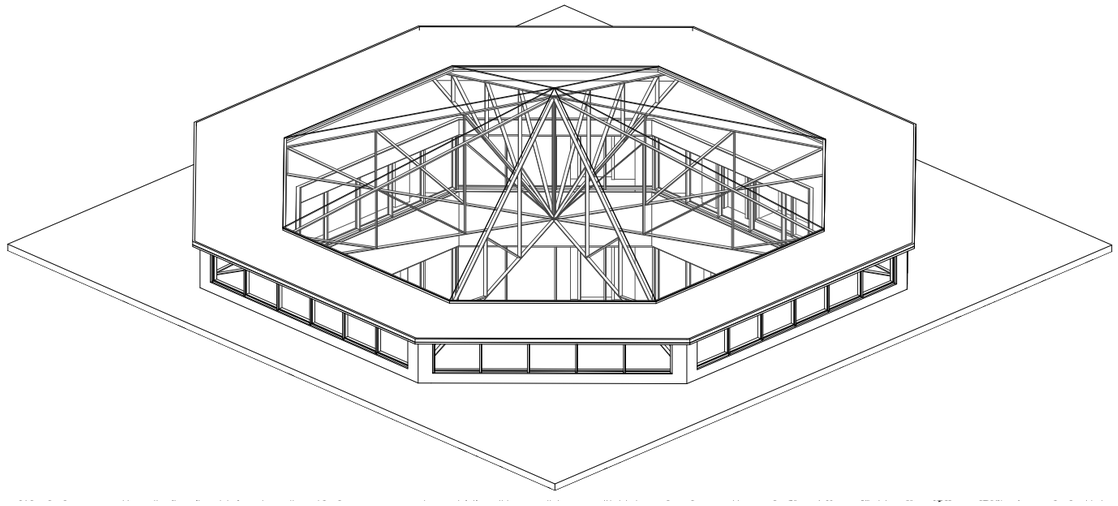


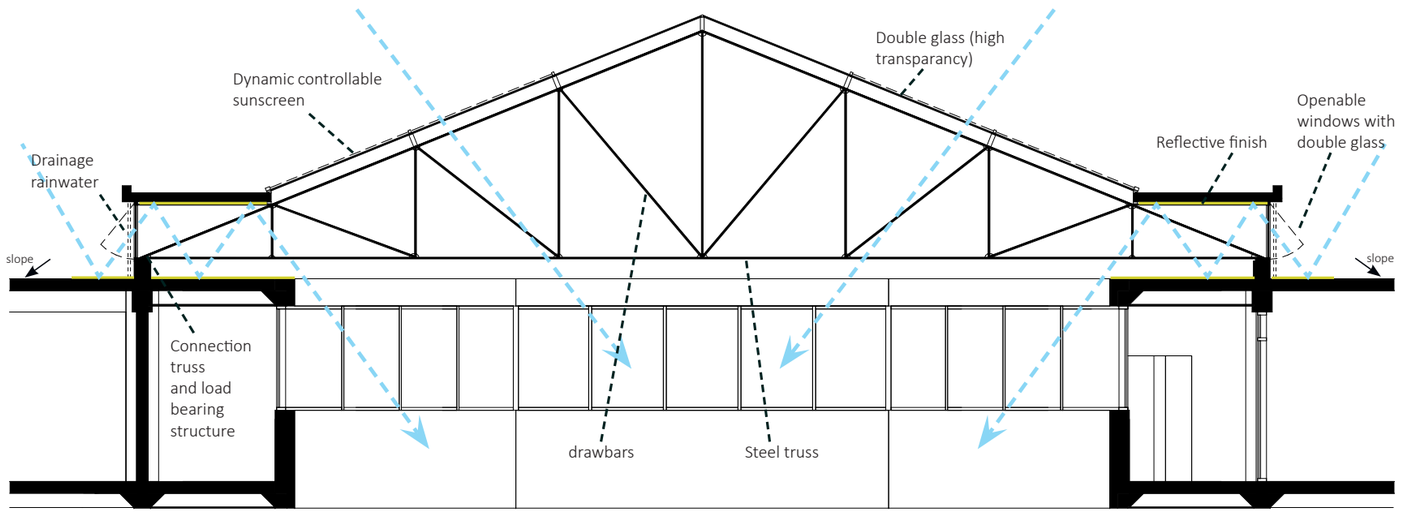
The new atrium



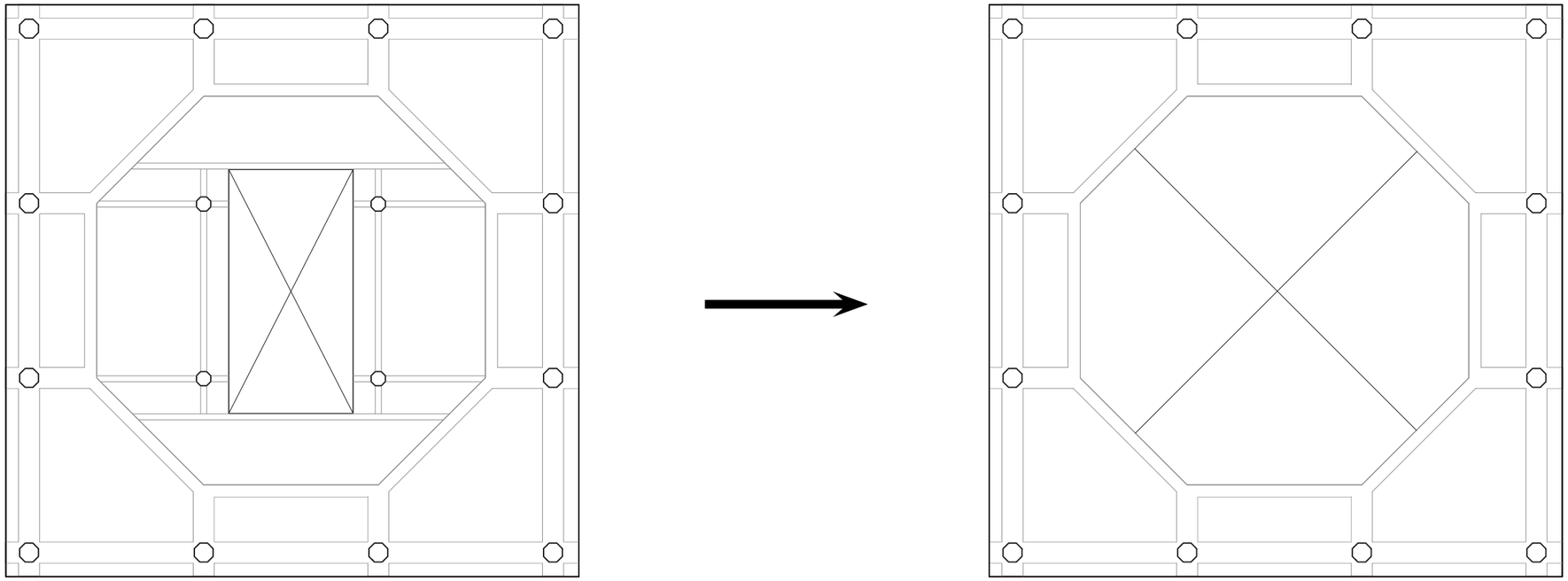
The new skylight







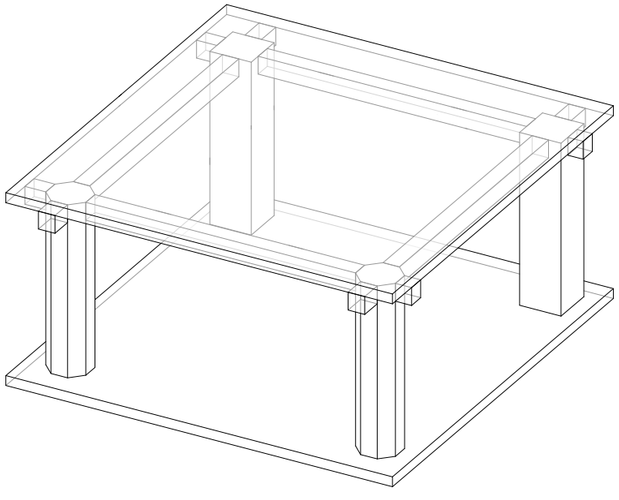
Structure atrium

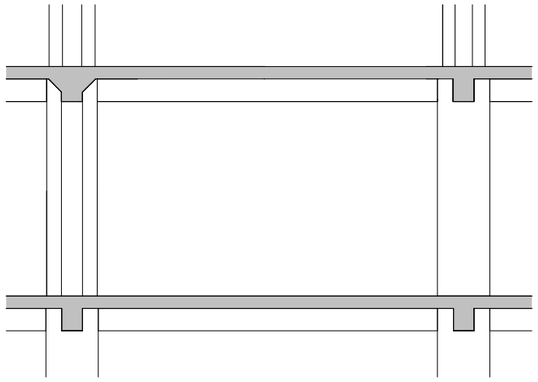


Structure existing

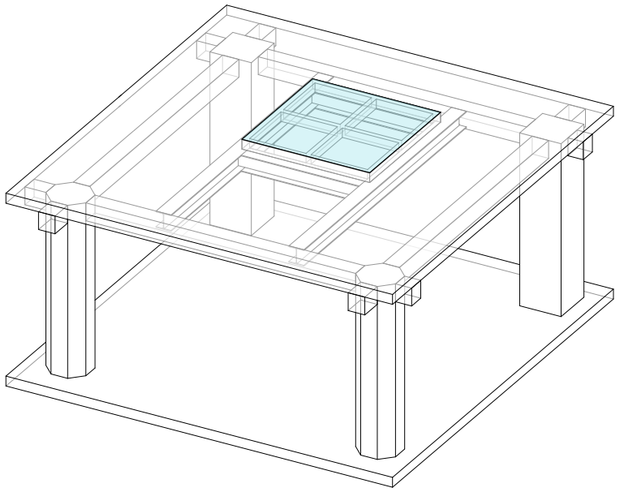
Structure new

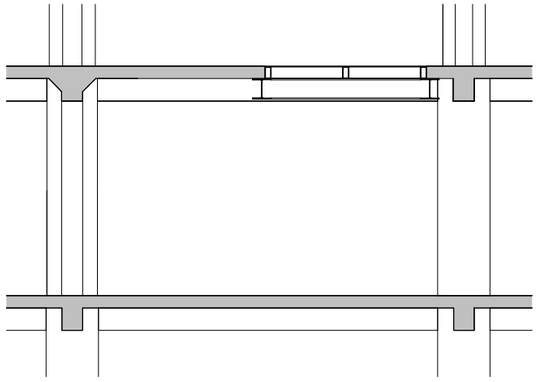
Structure glass floors





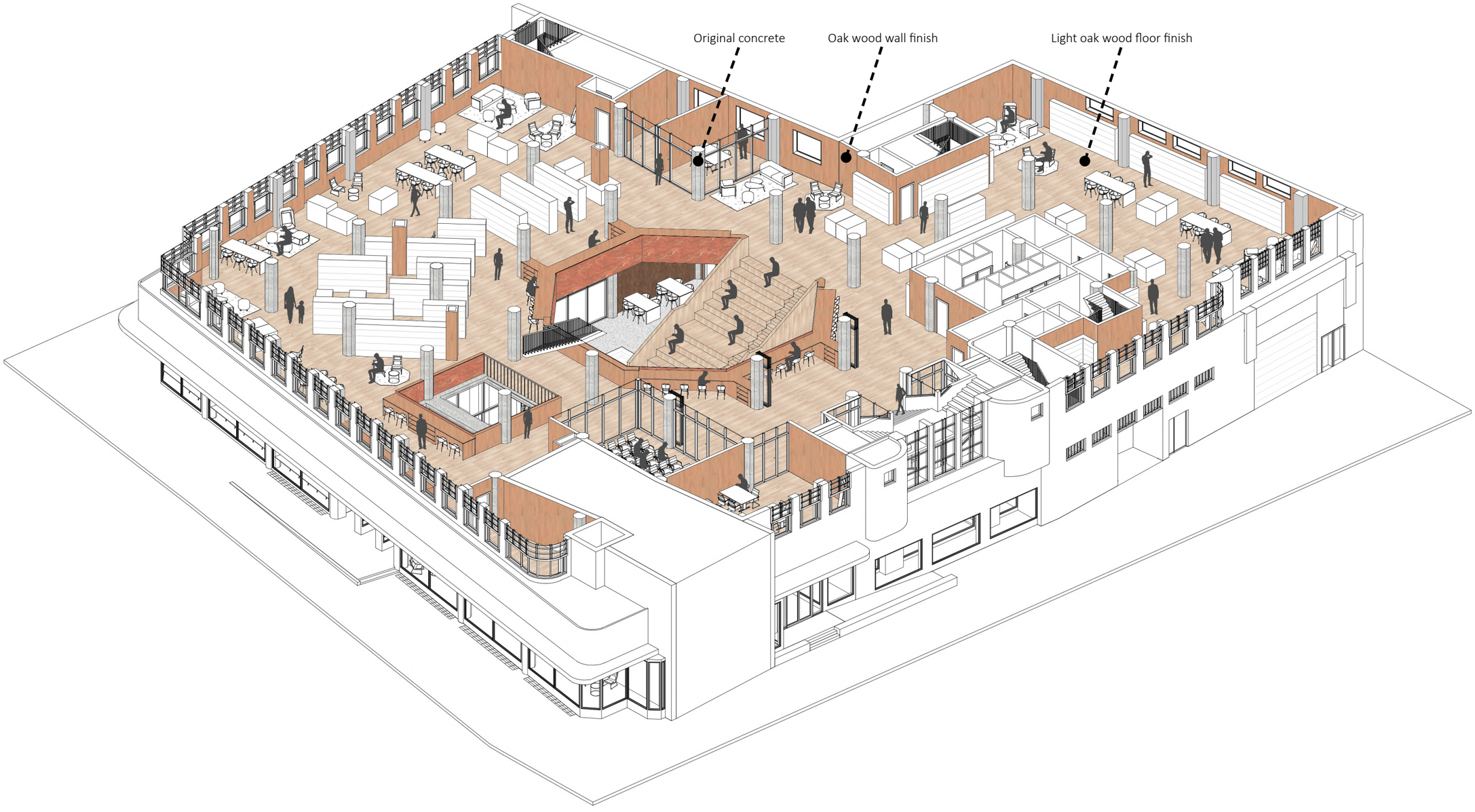
Structure existing



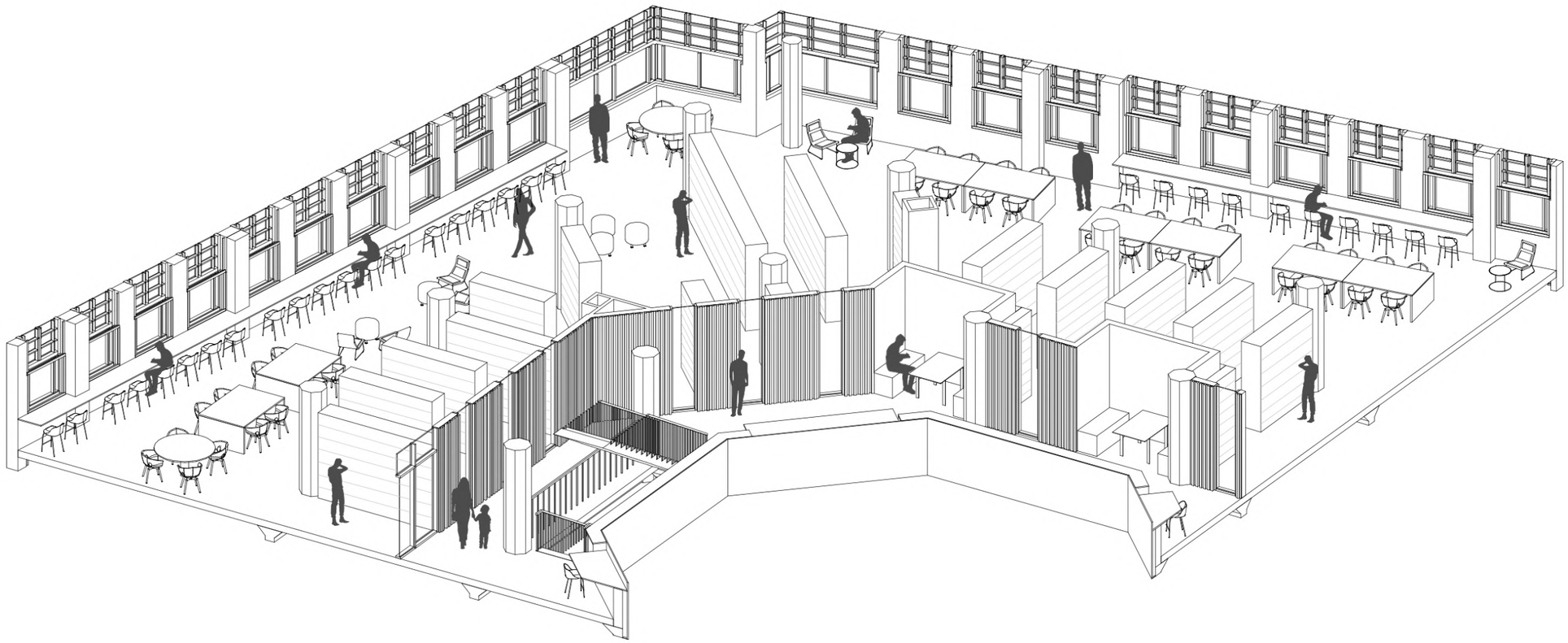


Structure with intervention glass floor

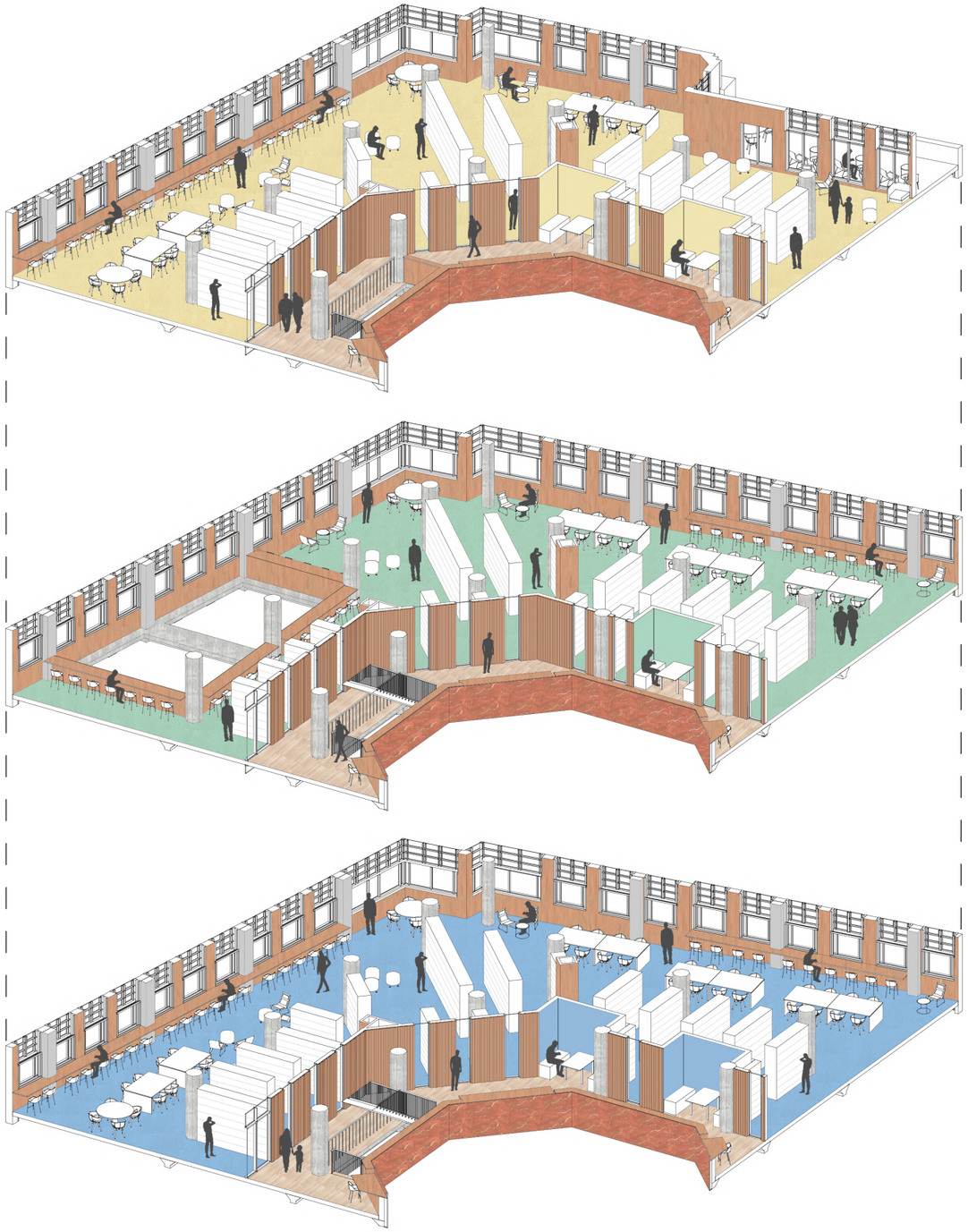
Materiality library



Spatial idea upper floors



Materiality upper floors



4F

3F

2F

Spatial sequence main entrance

The atrium

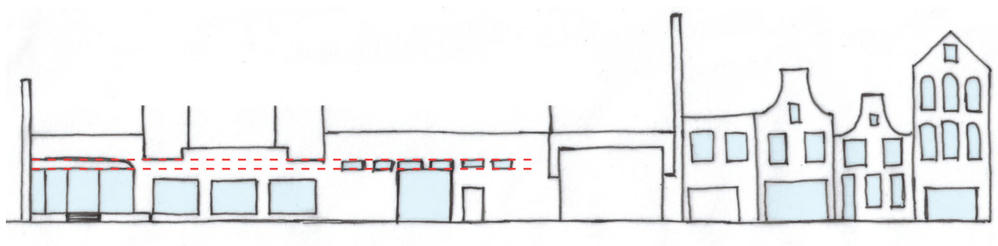
Impression basement

Impression space at atrium & facade (1F)

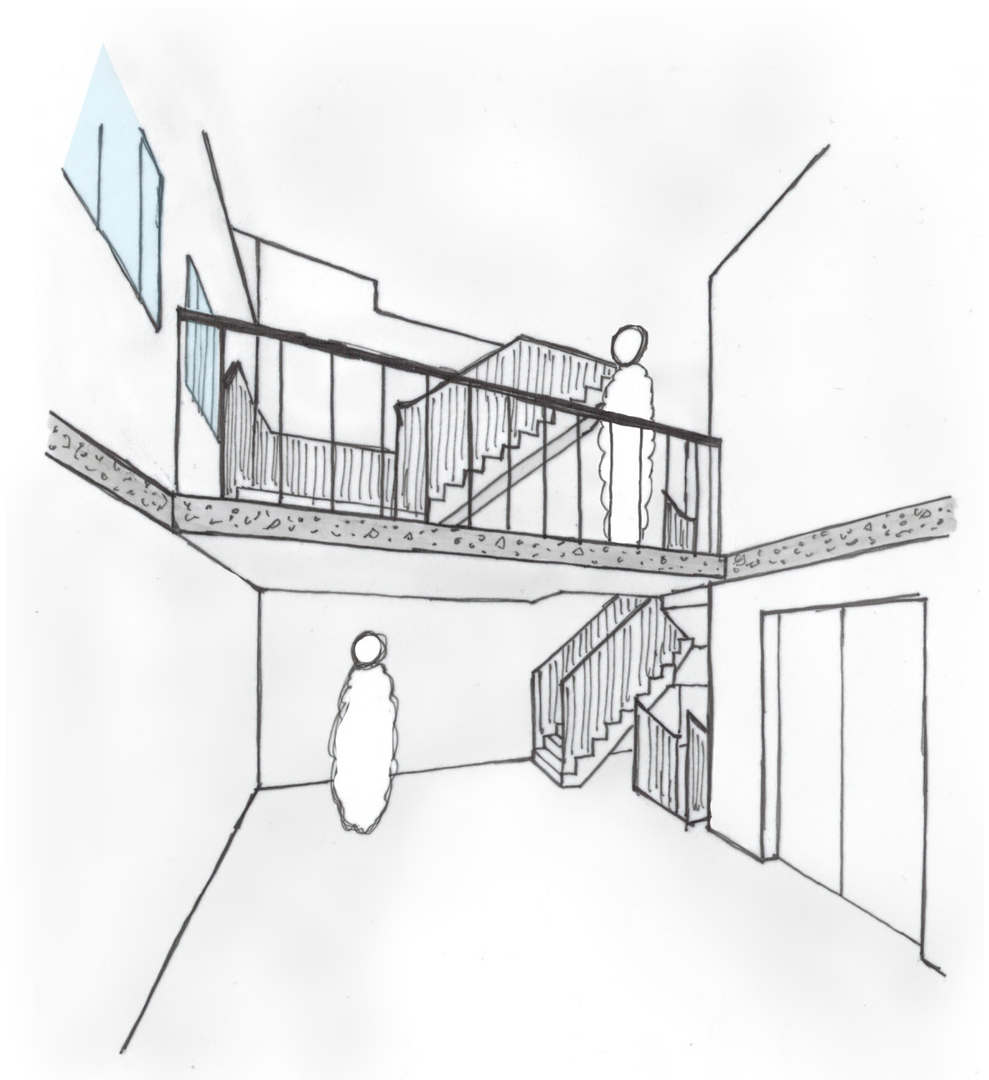
Impression space at atrium & facade (2F)

Dwellings' entrance Gierstraat

New entrance dwellings in Gierstraat



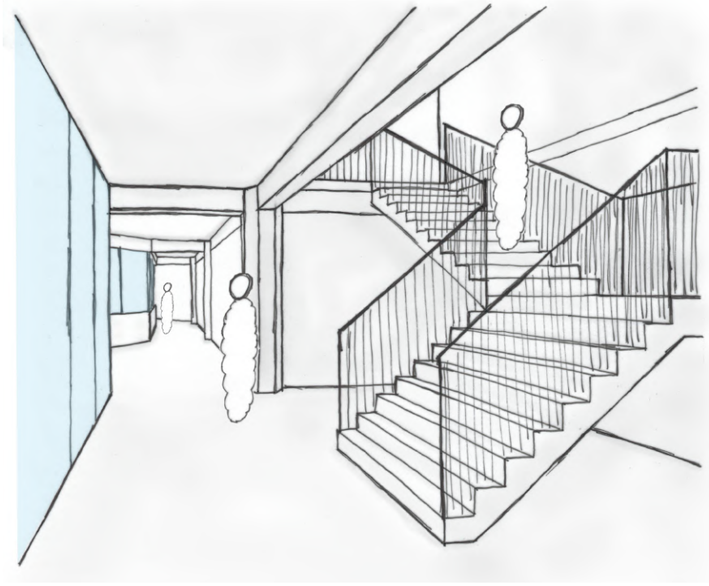
Schematic elevation facade Gierstraat with intervention new entrance dwellings



View on new double heigh space for entrance dwellings (ground floor)

Spatial sequence of routing towards dwellings

1. View on circulation in existing staircase leading to dwellingfloors

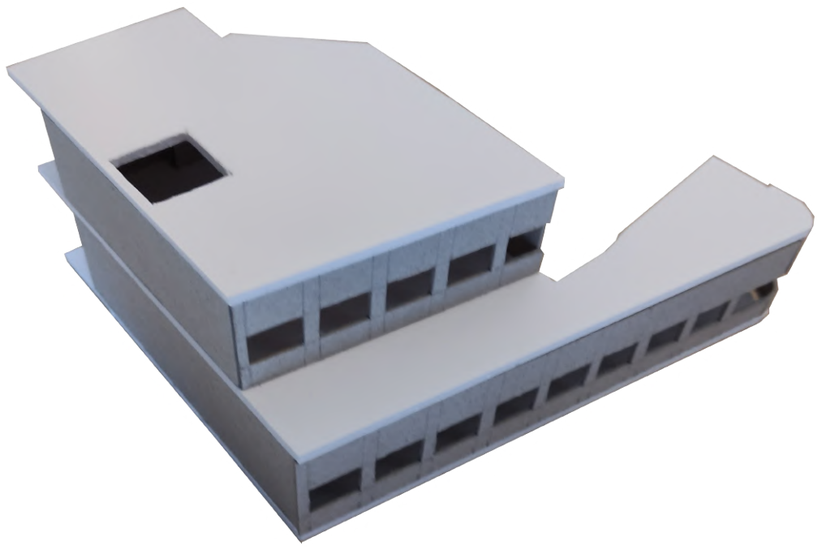


2. View on entrancearea 5th floor with a broad staircase leading towards the collective spaces and connecting the two dwellingfloors

3. View on entrancearea 6th floor with main collective living room and circulation to the dwellings around atrium

4. View on circulation around atrium with recessed entrances of dwellings

Daylightmodel of lightwell



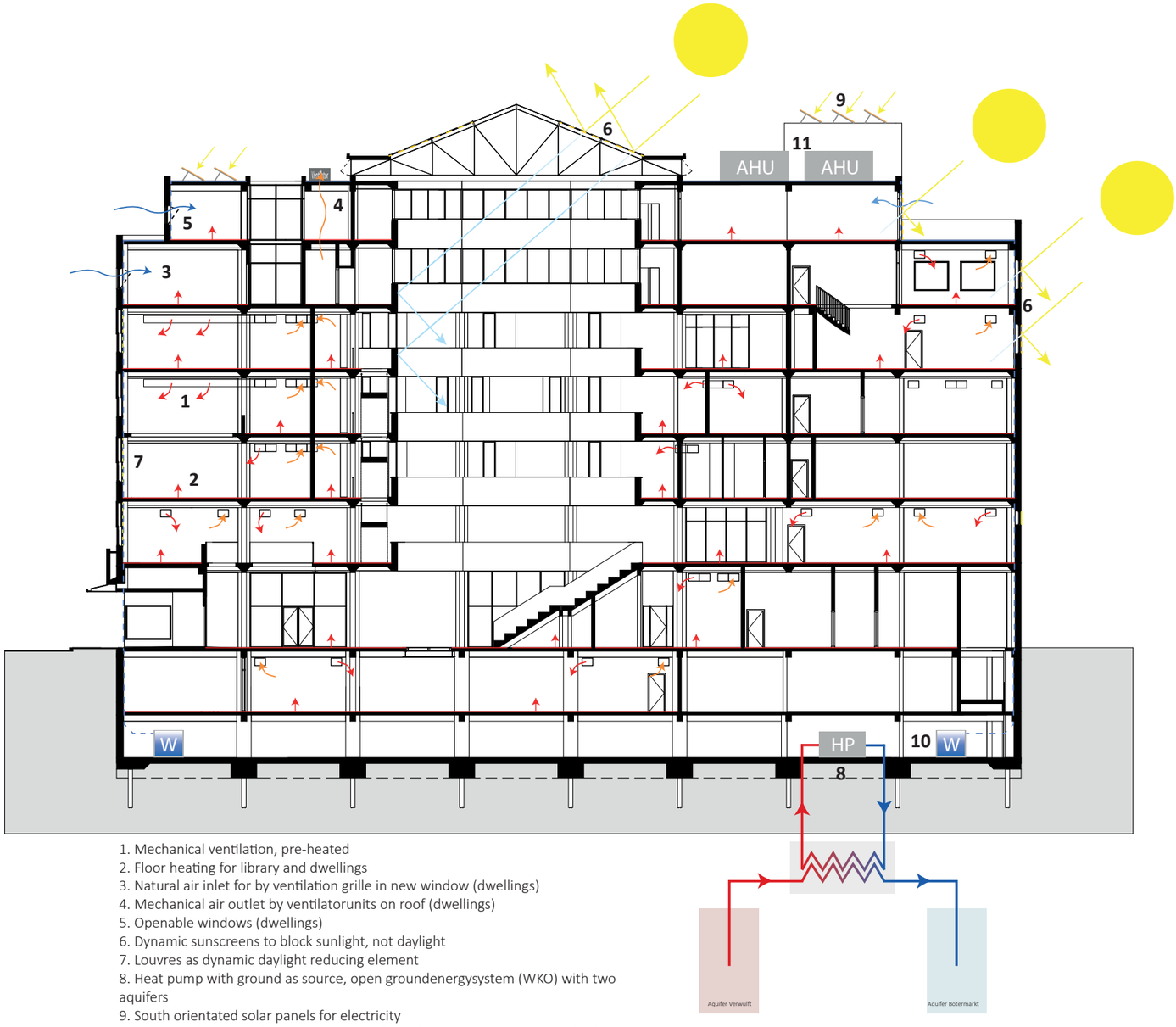
Daylight orientation 1: dwelling 5th floor view

Daylight orientation 2: dwelling 5th floor view

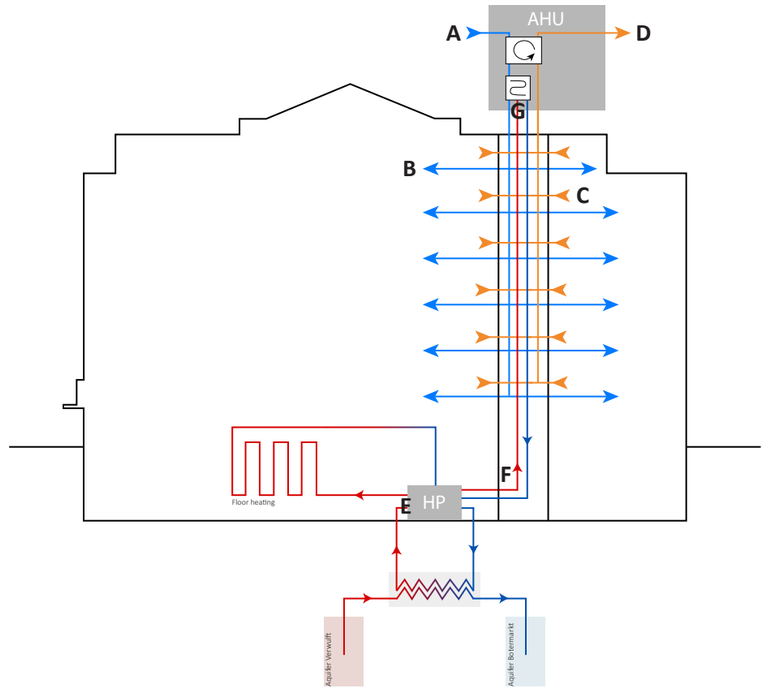
Daylight orientation 1: dwelling 6th floor view

Daylight orientation 2: dwelling 6th floor view

Climate: winter situation



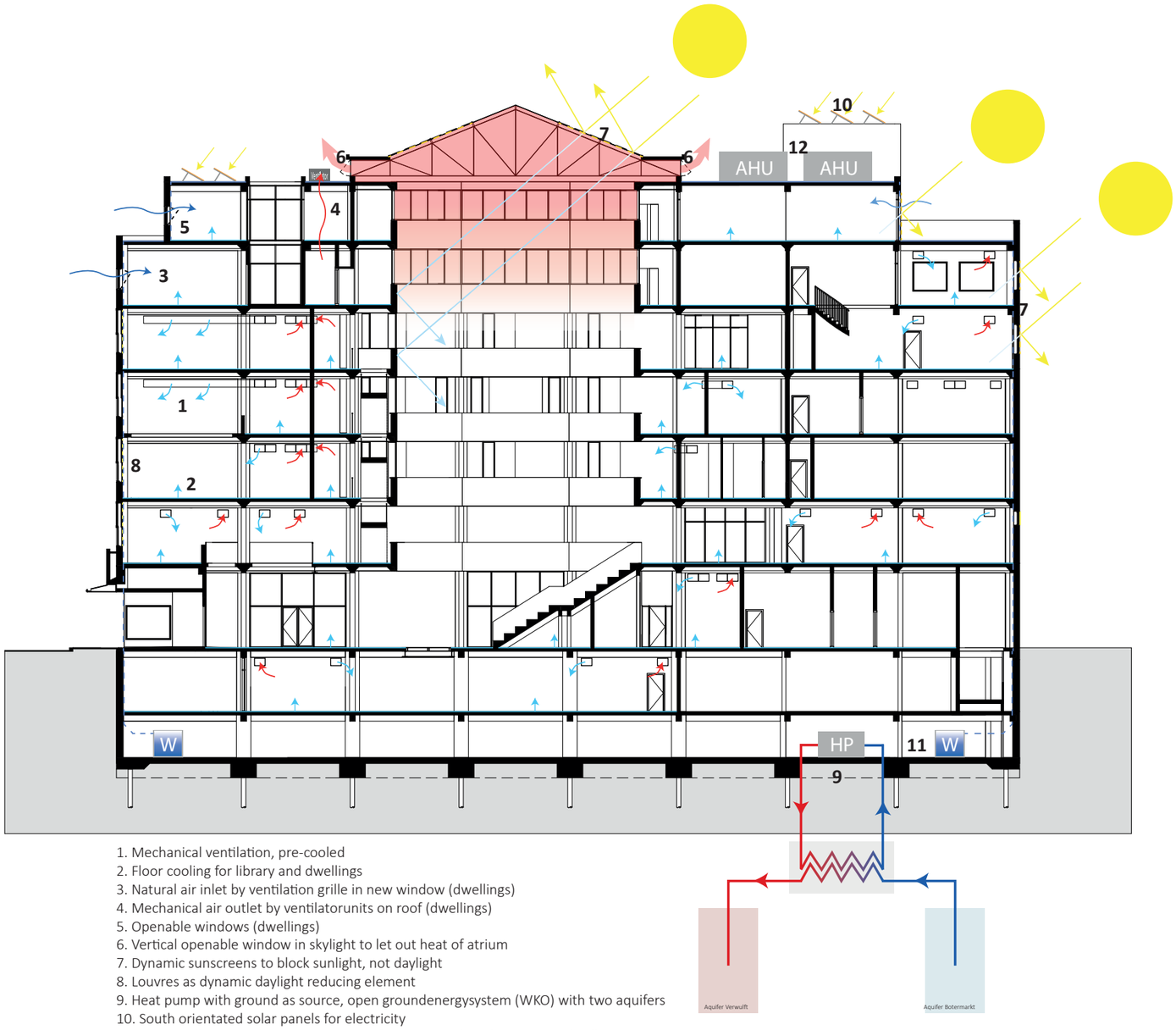
1. Mechanical ventilation, pre-heated
2. Floor heating for library and dwellings
3. Natural air inlet for by ventilation grille in new window (dwellings)
4. Mechanical air outlet by ventilatorunits on roof (dwellings)
5. Openable windows (dwellings)
6. Dynamic sunscreens to block sunlight, not daylight
7. Louvres as dynamic daylight reducing element
8. Heat pump with ground as source, open groundenergysystem (WKO) with two aquifers
9. South orientated solar panels for electricity
10. Water collection in basement to reuse for toilets and rooftop terrace dwellings
11. Air handling units placed on roof, provided with WTW by thermal wheel (n= 60-90%).



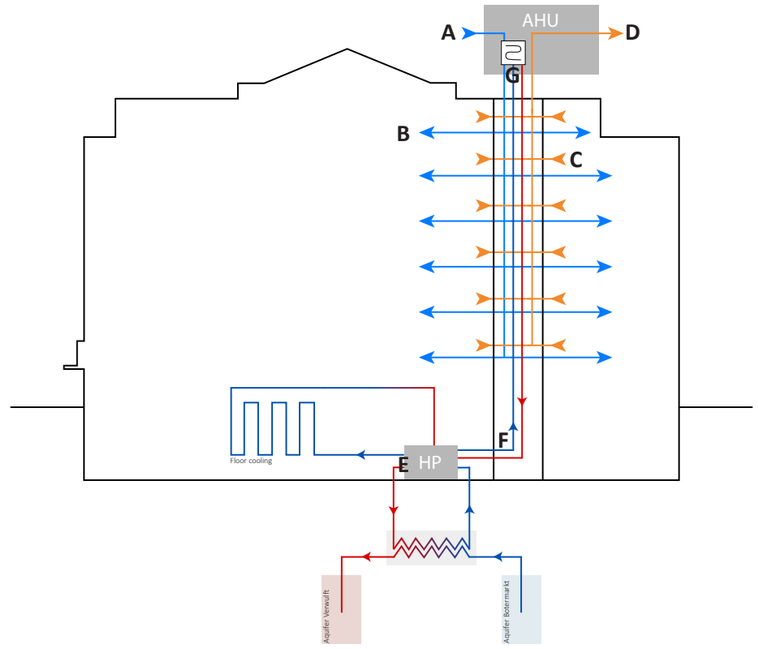
Principle heating in winter irt heatpump

A. Fresh inlet air
B. Fresh air comes into spaces
C. Exhaust air is sucked out of spaces
D. Expelled air out of building
E. Heat pump gets warm water from ground and flows to floor heating system in building
F. The warm water from the ground in the HP heats the pipe with water going up to the air handling unit
G. The warm water of the pipe is used in the heat exchanger of the AHU (fresh air/fluid medium) to heat up the fresh inlet air in combination with the residual heat from the exhaust air

Climate: summer situation



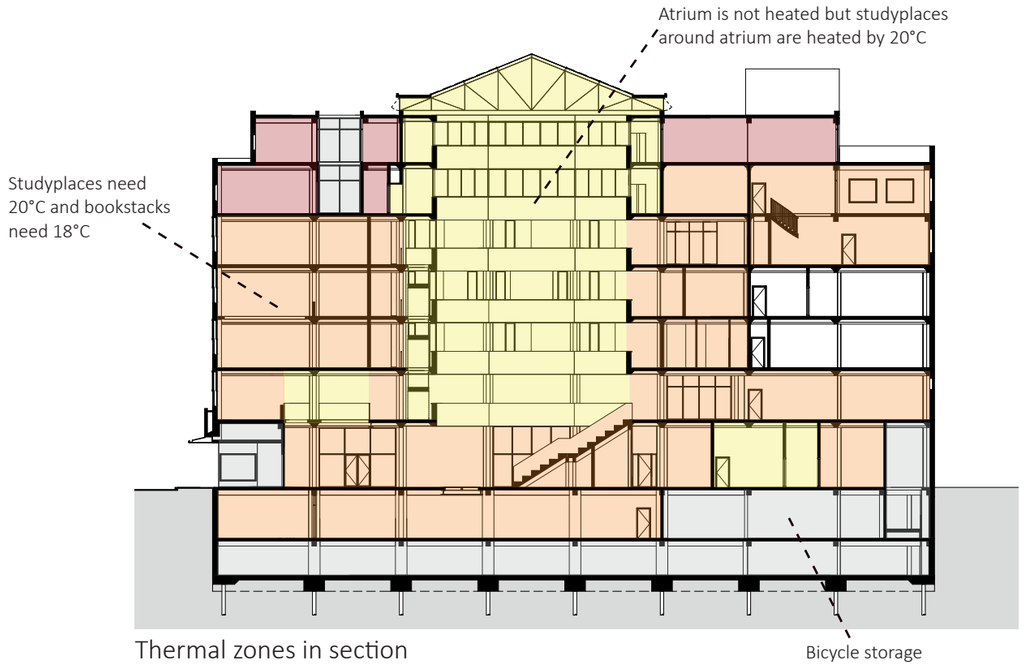
1. Mechanical ventilation, pre-cooled
2. Floor cooling for library and dwellings
3. Natural air inlet by ventilation grille in new window (dwellings)
4. Mechanical air outlet by ventilatorunits on roof (dwellings)
5. Openable windows (dwellings)
6. Vertical openable window in skylight to let out heat of atrium
7. Dynamic sunscreens to block sunlight, not daylight
8. Louvres as dynamic daylight reducing element
9. Heat pump with ground as source, open groundenergysystem (WKO) with two aquifers
10. South orientated solar panels for electricity
11. Water collection in basement to reuse for toilets and rooftop terrace dwellings
12. Air handling units placed on roof, provided with WTW by thermal wheel (n= 60-90%).



Principle cooling in summer irt heatpump

A. Fresh inlet air
B. Fresh air comes into spaces
C. Exhaust air is sucked out of spaces
D. Expelled air out of building
E. Heat pump gets cool water from ground and flows to floor cooling system in building
F. The cool water from the ground in the HP cools the pipe with water going up to the air handling unit
G. The cool water of the pipe is used in the heat exchanger of the AHU (fresh air/fluid medium) to cool down the fresh inlet air

Climate: thermal zones winter



Thermal zones in section

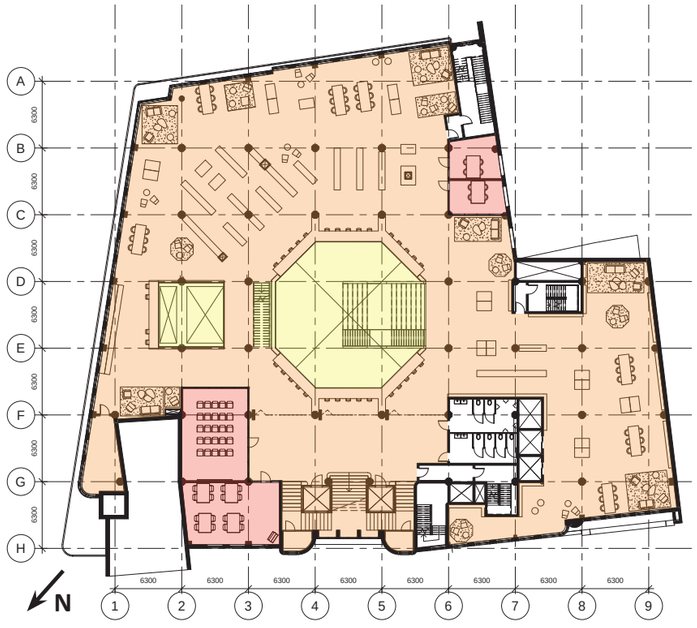
21 °C - these spaces are heated alltime due to constantly used during the day (floor heating)

20 °C - these spaces are seperately heated due to partly used during the day (heating by air + floor heating)

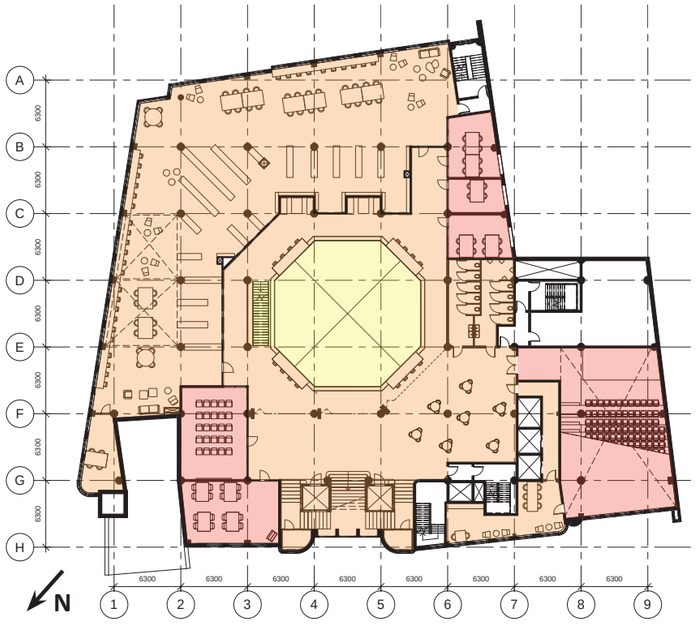
18 to 20°C - these spaces are heated alltime due to constantly used during the day within openinghours (heating by air + floor heating)

16 °C - no heating necessary due to function as atrium/void or circulation space, this space will be heated by residual heat from adjacent spaces

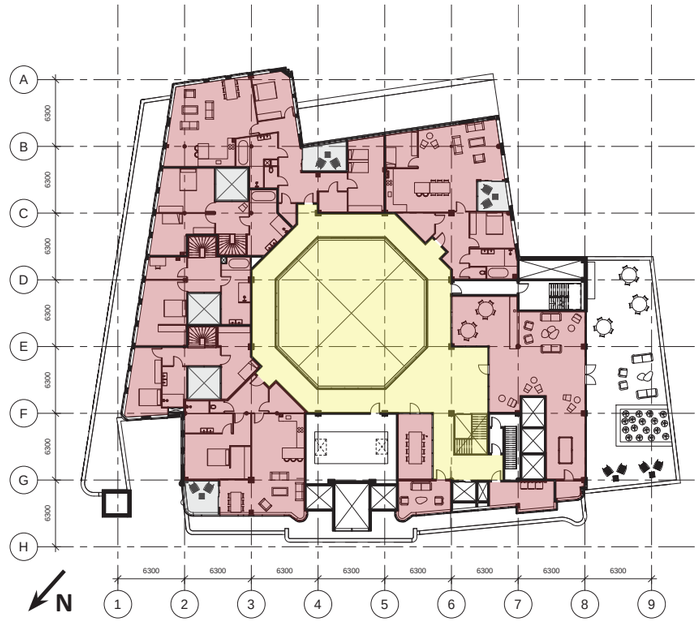
Exterior climate (instalation spaces have to be heated to be above 0 °C)



First floor

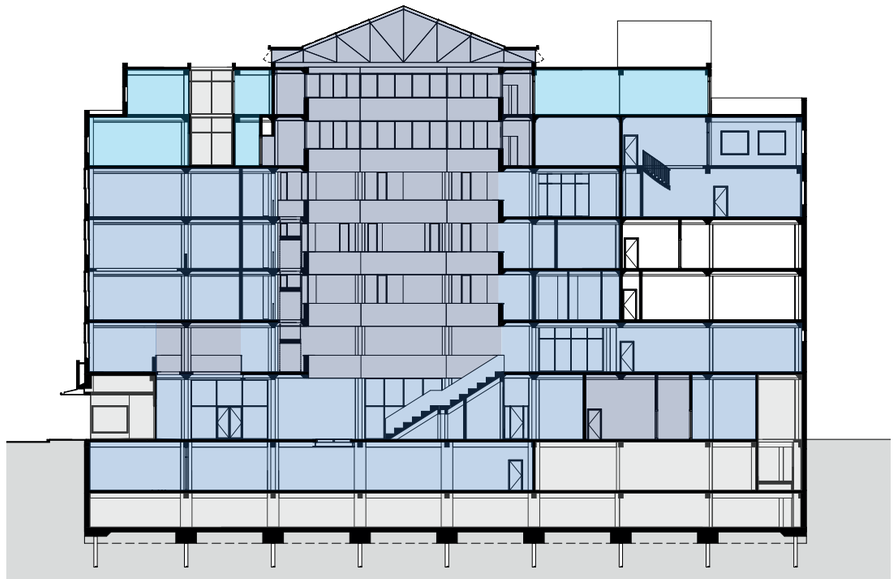


Second floor



Sixth floor

Climate: thermal zones summer



Thermal zones in section

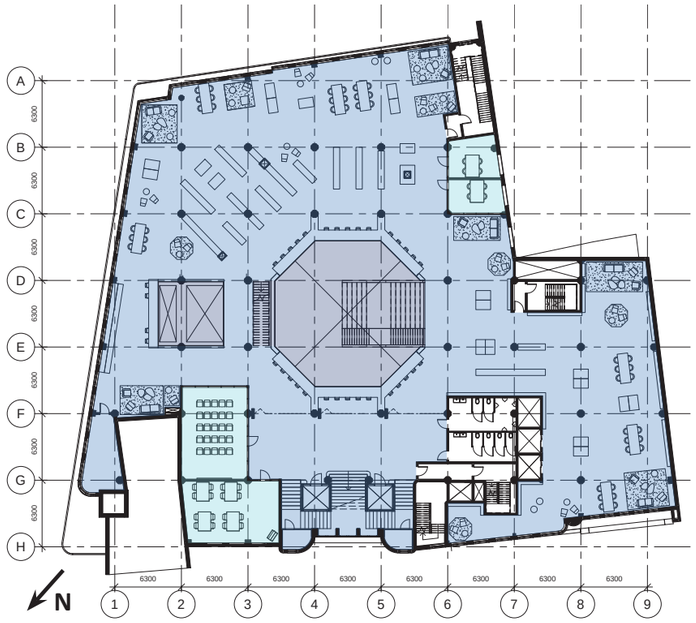
20 to max 23 °C - these spaces are seperately cooled (when necessary) due to partly used during the day (cooling by air + floor cooling) (high occupancy, light activity)

21 to max 25 °C - these spaces are cooled alltime (when necessary) due to constantly used during the day (floor cooling)

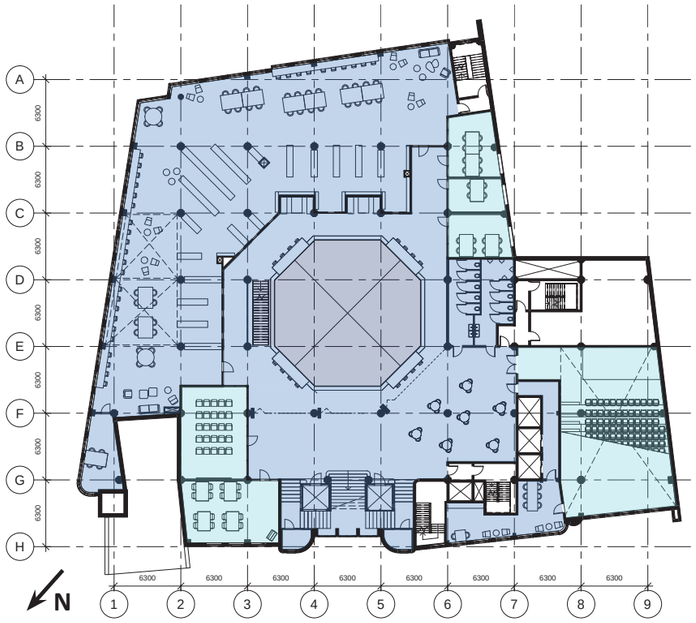
22 to max 25°C - these spaces are cooled alltime (when necessary) due to constantly used during the day within openinghours (cooling by air + floor cooling) (medium to low occupancy, light activity)

22 to max 28 °C - cooling is necessary if atrium/void or circulation space gets too warm (cooling by air + floor cooling)

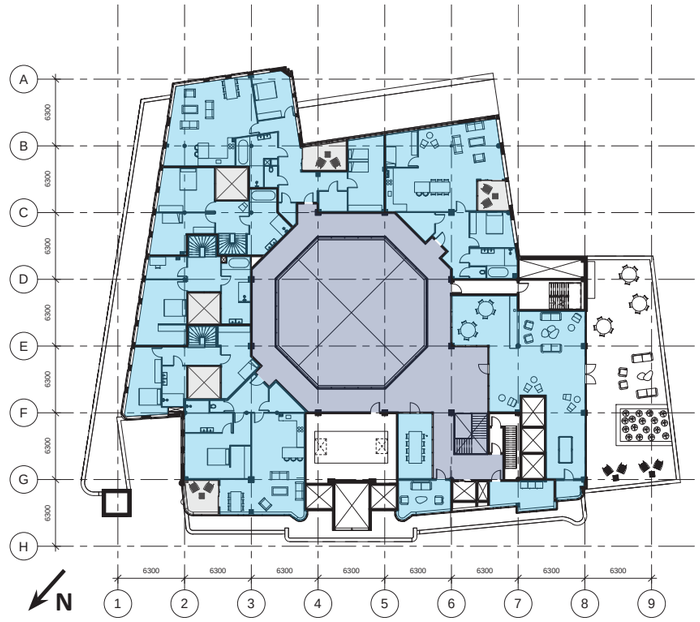
Exterior climate



First floor

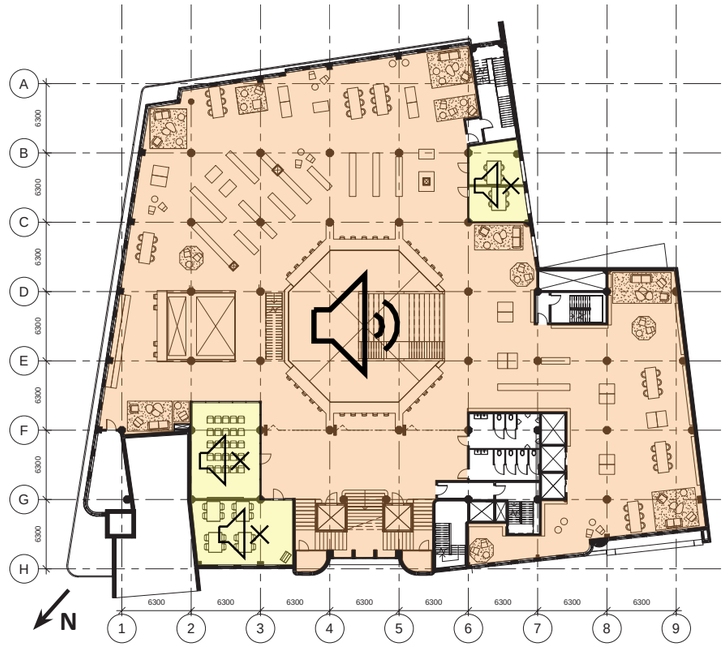


Second floor

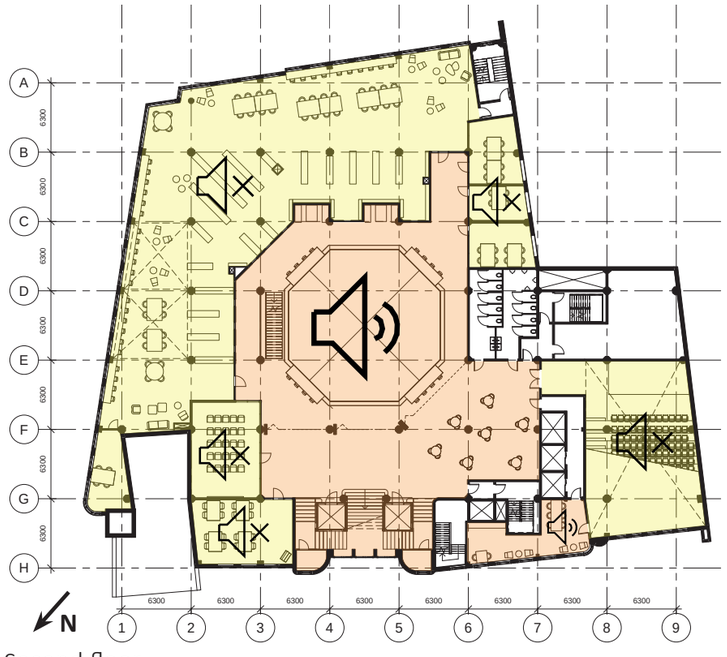


Sixth floor

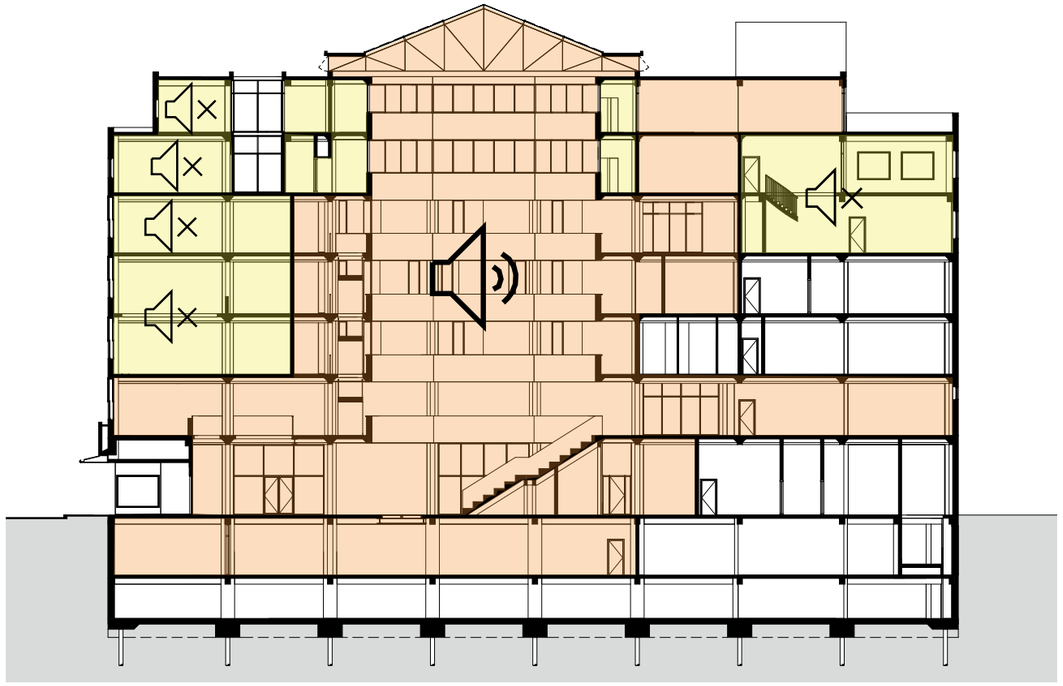
Climate: acoustic zones



First floor



Second floor

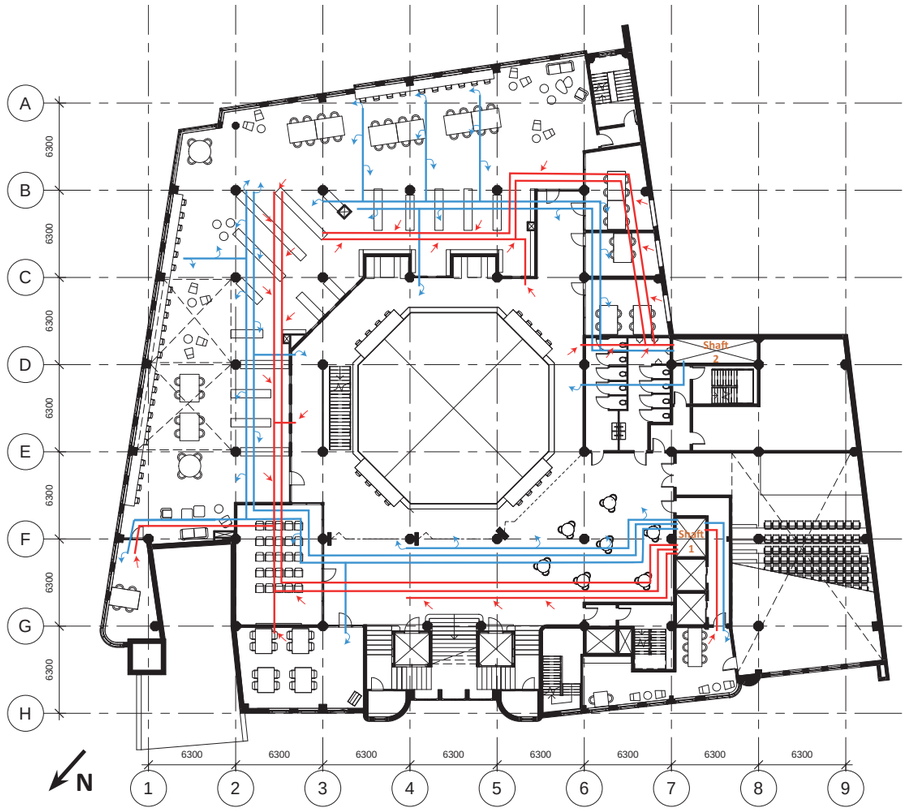


Acoustic zones in section

should be silent, no sound penetrating from adjacent spaces in different acoustic zone and vice versa

could be more noisy

Ventilation distribution principle



Second floor plan

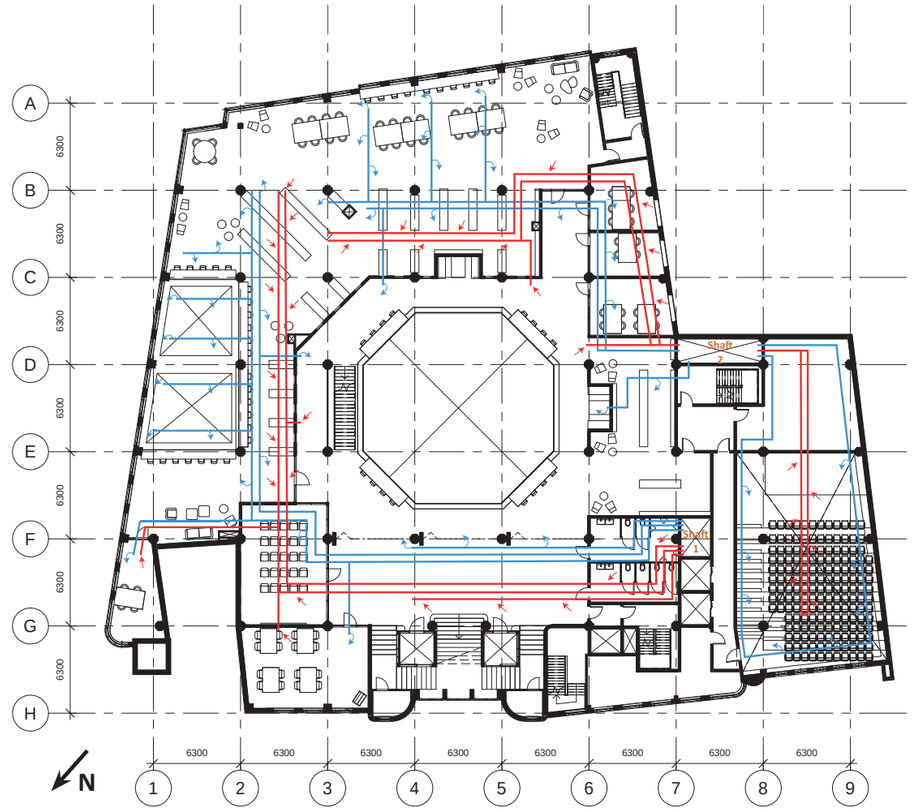
Ventilation calculation from shaft 1 to library spaces
Beginning of ventilation ducts:
677m2 * 3,5 m = 2370 m3
2370 * 5/h = 11848 m3/h = 3,29097 m3/s
3,29097 / 5m/s = 0,658 m2 = 6582 cm2
-> 3 ventilation ducts of 55x40cm (rectangular)

Ventilation ducts in study area:
348m2 * 3,5m = 1218 m3
1218 * 5/h = 6090 m3/h = 1,6917 m3/s
1,6917 / 5m/s = 0,3383 m2 = 3383 cm2
-> 2 ventilation ducts of 45x40cm (rectangular)

Ventilation calculation from shaft 2 to library spaces
Beginning of ventilation ducts:
481m2 * 3,5 m = 1684 m3
1684 * 5/h = 8418 m3/h = 2,3382 m3/s
2,3382 / 5m/s = 0,4676 m2 = 4676 cm2
-> 2 ventilation ducts of 60x40cm (rectangular)

Ventilation ducts in study area:
*354m2 * 3,5m = 1239 m3*
*1239 * 5/h = 6195 m3/h = 1,7208m3/s*
1,7208 / 5m/s = 0,3442 m2 = 3442 cm2
-> 2 ventilation ducts of 45x40cm (rectangular)

Ventilation calculation from shaft 2 to atrium
160m2 * 3,5 m = 560 m3
560 * 15/h = 8400 m3/h = 2,3333 m3/s
2,3333 / 5m/s = 0,4667 m2 = 4667 cm2
-> 1 ventilation duct of 120x40cm (rectangular)



Third floor plan

Ventilation calculation from shaft 1 to library spaces
Beginning of ventilation ducts:
677m2 * 3,5 m = 2370 m3
2370 * 5/h = 11848 m3/h = 3,29097 m3/s
3,29097 / 5m/s = 0,658 m2 = 6582 cm2
-> 3 ventilation ducts of 55x40cm (rectangular)

Ventilation ducts in study area:
348m2 * 3,5m = 1218 m3
1218 * 5/h = 6090 m3/h = 1,6917 m3/s
1,6917 / 5m/s = 0,3383 m2 = 3383 cm2
-> 2 ventilation ducts of 45x40cm (rectangular)

Ventilation calculation from shaft 2 to library spaces
Beginning of ventilation ducts:
476m2 * 3,5 m = 1666 m3
1666 * 5/h = 8330 m3/h = 2,3129 m3/s
2,3139 / 5m/s = 0,4628 m2 = 4628 cm2
-> 2 ventilation ducts of 60x40cm (rectangular)

Ventilation ducts in study area:
*354m2 * 3,5m = 1239 m3*
*1239 * 5/h = 6195 m3/h = 1,7208m3/s*
1,7208 / 5m/s = 0,3442 m2 = 3442 cm2
-> 2 ventilation ducts of 45x40cm (rectangular)

Ventilation calculation from shaft 2 to atrium
160m2 * 3,5 m = 560 m3
560 * 15/h = 8400 m3/h = 2,3333 m3/s
2,3333 / 5m/s = 0,4667 m2 = 4667 cm2
-> 1 ventilation duct of 120x40cm (rectangular)

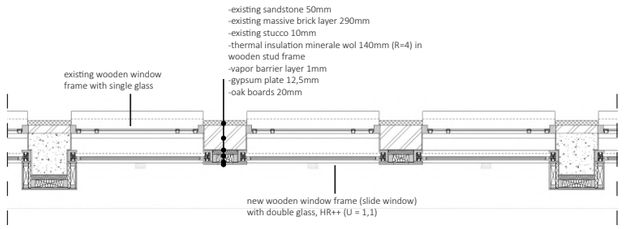
Ventilation calculation from shaft 2 to auditorium
156m2 * 7,2m = 1123 m3
1123 * 7/h = 7861 m3/h = 2,184 m3/s
2,184 / 5m/s = 0,4368 m2 = 4368 cm2
-> 2 ventilation ducts of 55x40cm (rectangular)

Ventilation calculation size shaft 1:
6[1] * 2370 m3 * 5/h = 71100 m3/h = 19,75 m3/s
19,75 / 10 m/s = 1,974 m2 = 19750 cm2
-> vertical ventilation duct in shaft of 210x95cm (rectangular) (one for inlet and one for outlet)
-> So 2 AHU's of around 36000 m3/h needed

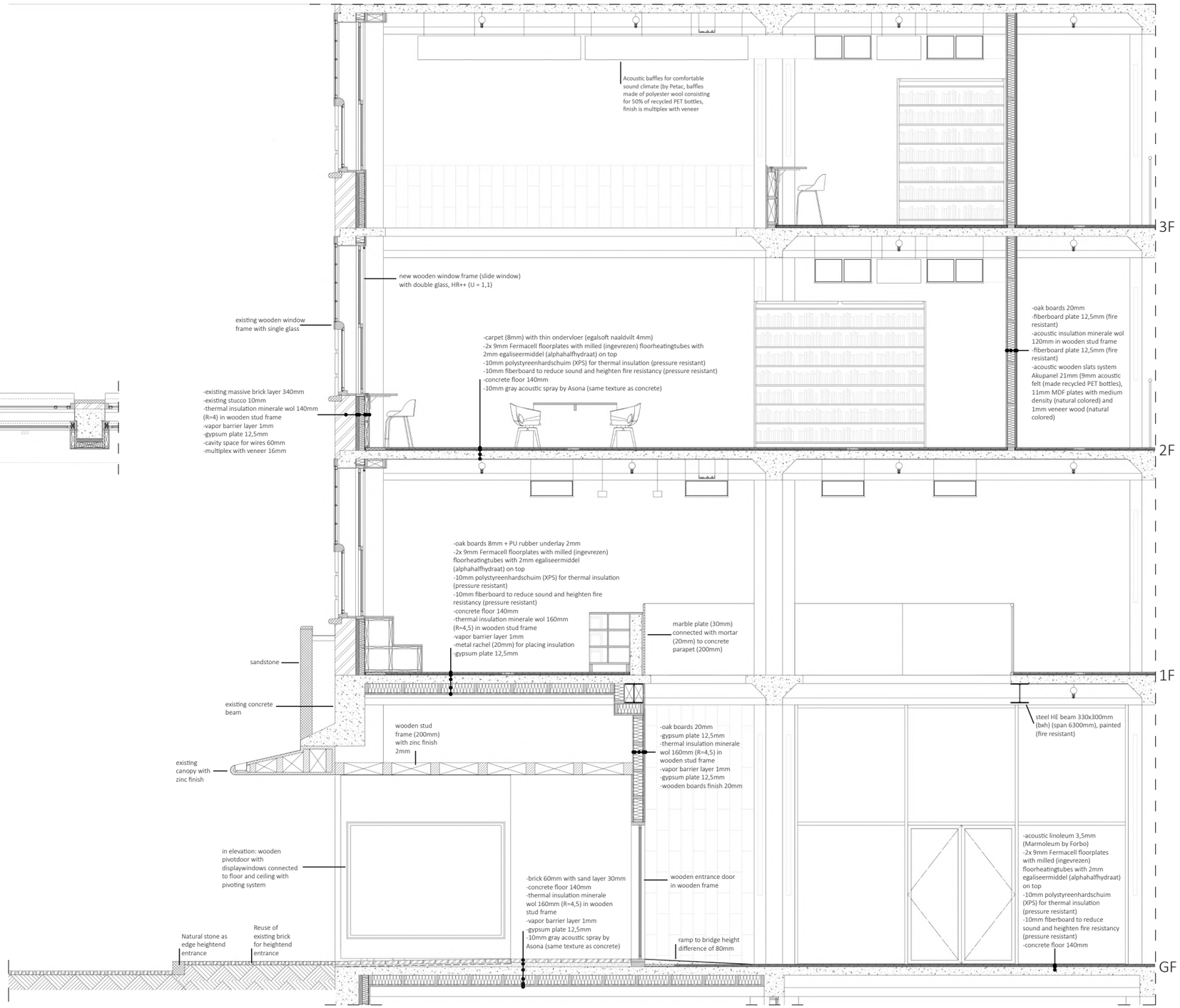
Ventilation calculation size shaft 2:
6[1] * 1684 m3 * 5/h + 7[2] * 560 m3 * 15/h + 1123 m3 * 7/h = 117181 m3/h = 32,550 m3/s
32,55 / 10 m/s = 3,255 m2 = 32550 cm2
-> vertical ventilation duct in shaft of 260x130cm (rectangular) (one for inlet and one for outlet)
-> So 3 AHU's of around 40000 m3/h needed

[1] amount of floors connected to this shaft for ventilation, volume of floor is estimated by taking one floor for example
[2] amount of floors where atrium is at (so ground floor till 6th floor)

Facade 1:20 detail

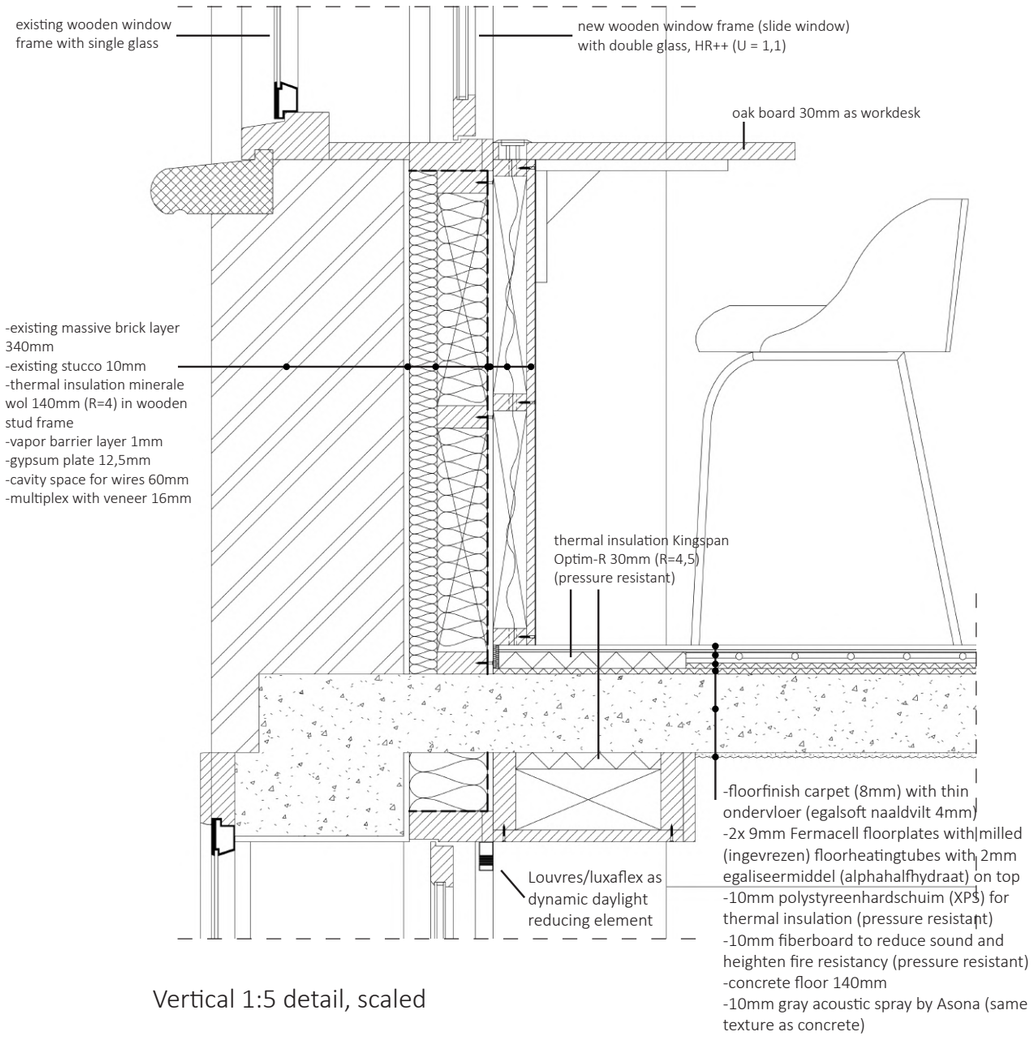


Horizontal 1:20 detail, scaled

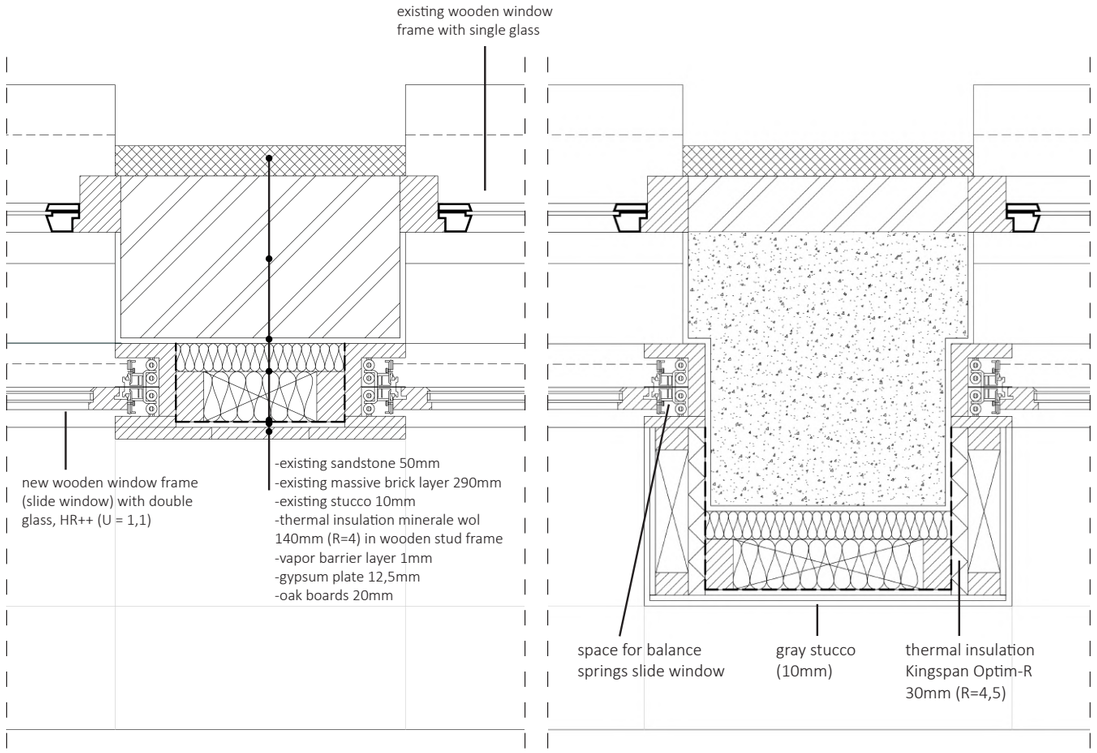


Vertical 1:20 detail, scaled

Facade 1:5 details

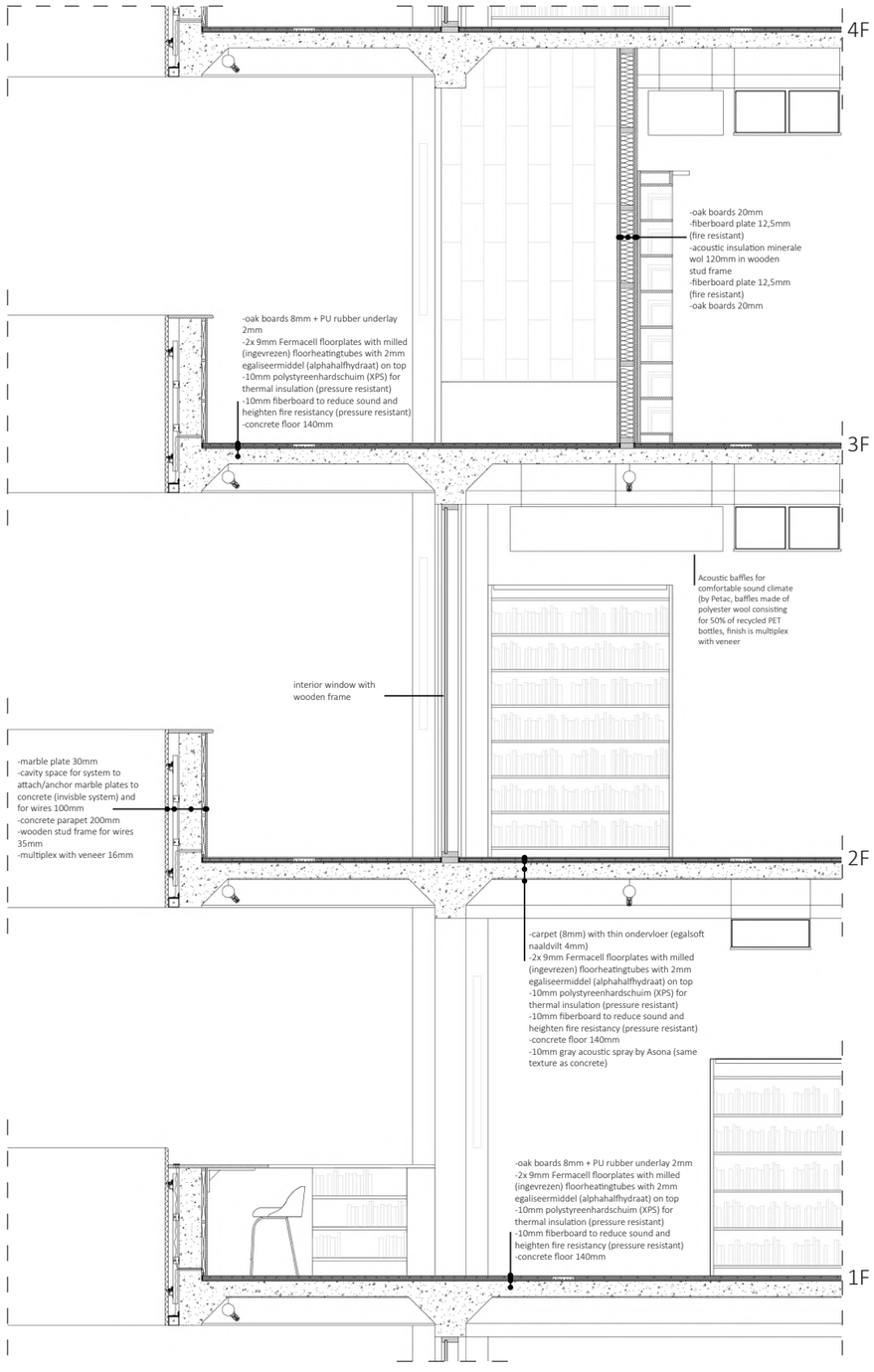


Vertical 1:5 detail, scaled



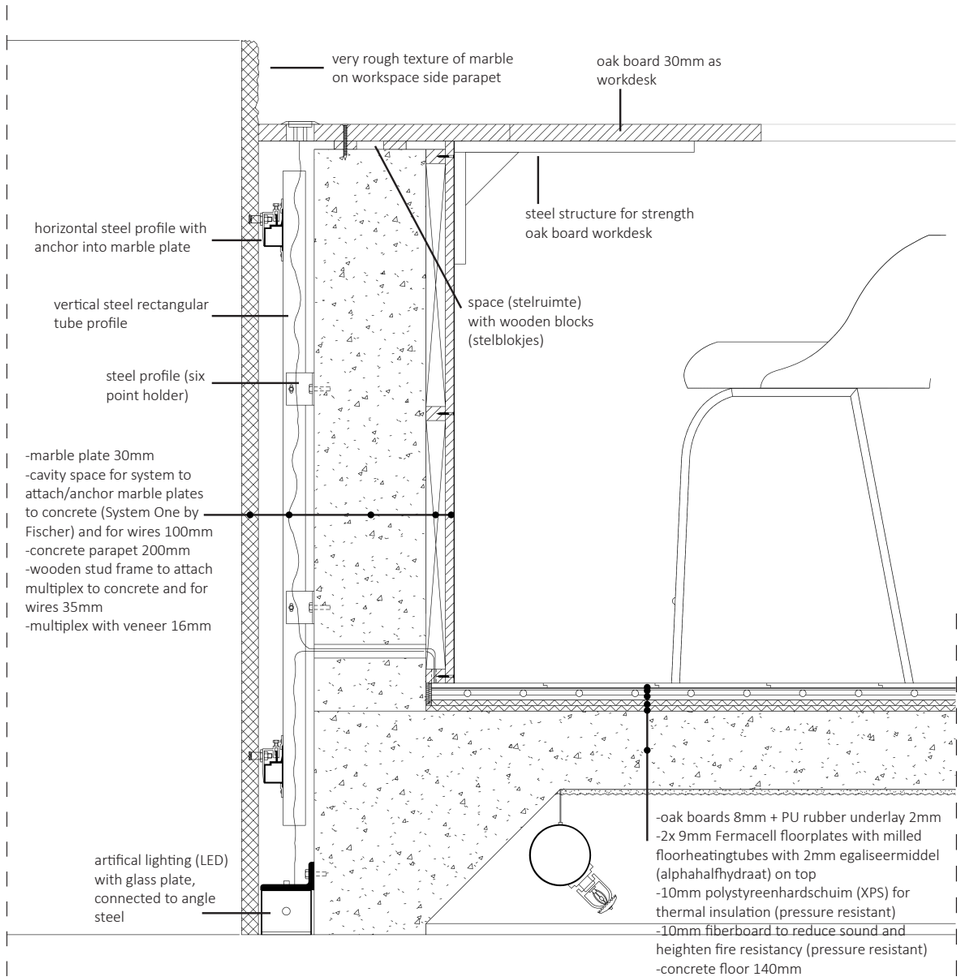
Horizontal 1:5 detail, scaled

Atrium 1:20 detail

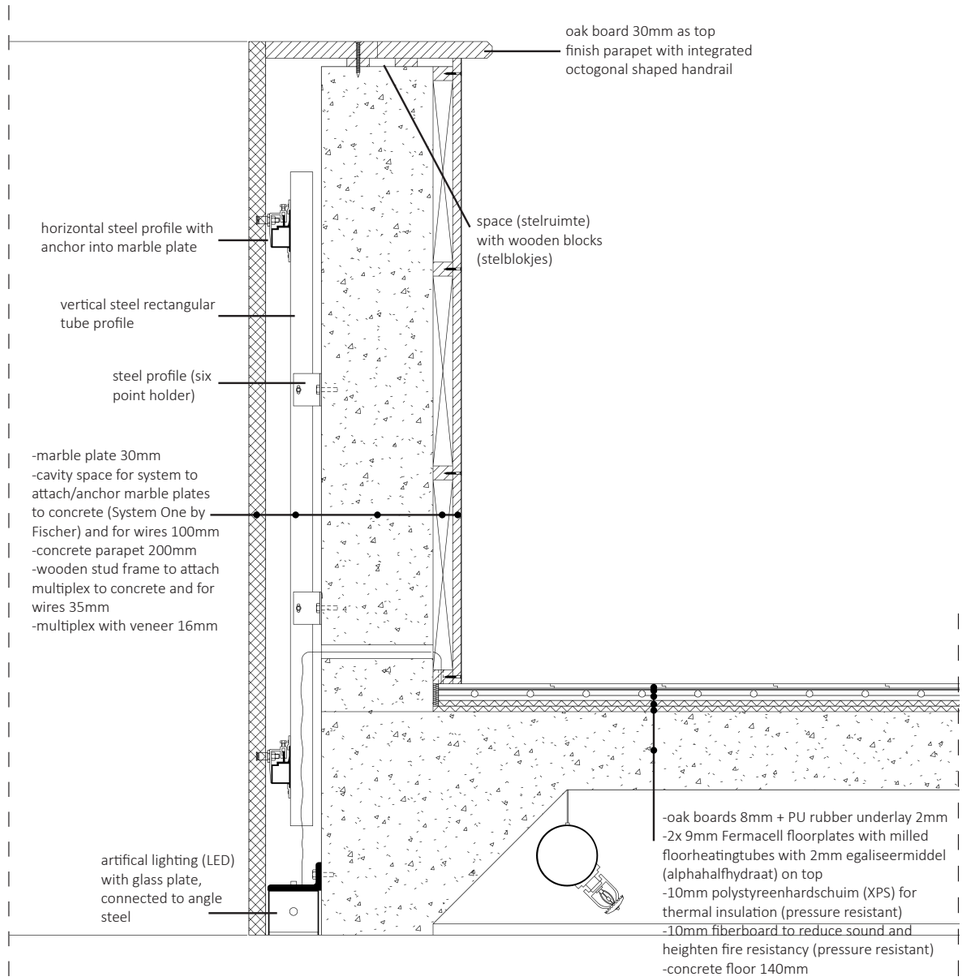


Vertical 1:20 detail, scaled

Atrium 1:5 details



Vertical 1:5 detail, scaled



Vertical 1:5 detail, scaled