PUBLIC INTERIOR

CHURCH AS A CONNECTOR

AR3AH115
Revitalizing Heritage - Zero Waste Church

Mark Jorrit Ritsema
5189063


Evenementen
2022
meppel
diep geluk

GROTE- OF MARIAKERK, MEPPEL

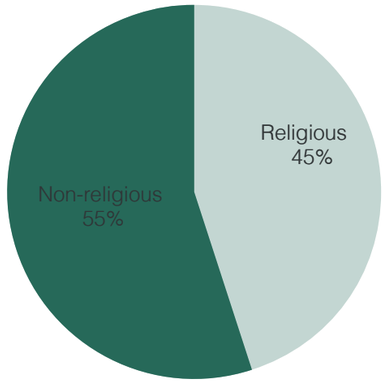
Grote of Mariakerk in Meppel sluit de deuren. Gebrek aan vrijwilligers én de hoge energieprijzen zorgen ervoor dat het College van Kerkrentmeesters dit besluit naar eigen zeggen móet nemen

Eelco Kuiken • 10 oktober 2022, 16:22 • Meppel

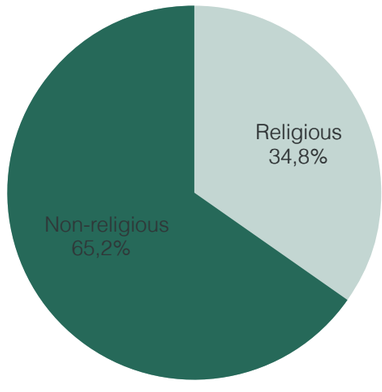
Deel dit artikel

De Grote of Mariakerk in het hart van Meppel. Het oudste deel stamt uit 1432. Foto: Wilbert Bijzitter

Amount of religious in the Netherlands



Amount of religious in Meppel



IMPORTANCE FOR THE COMMUNITY OF MEPPEL

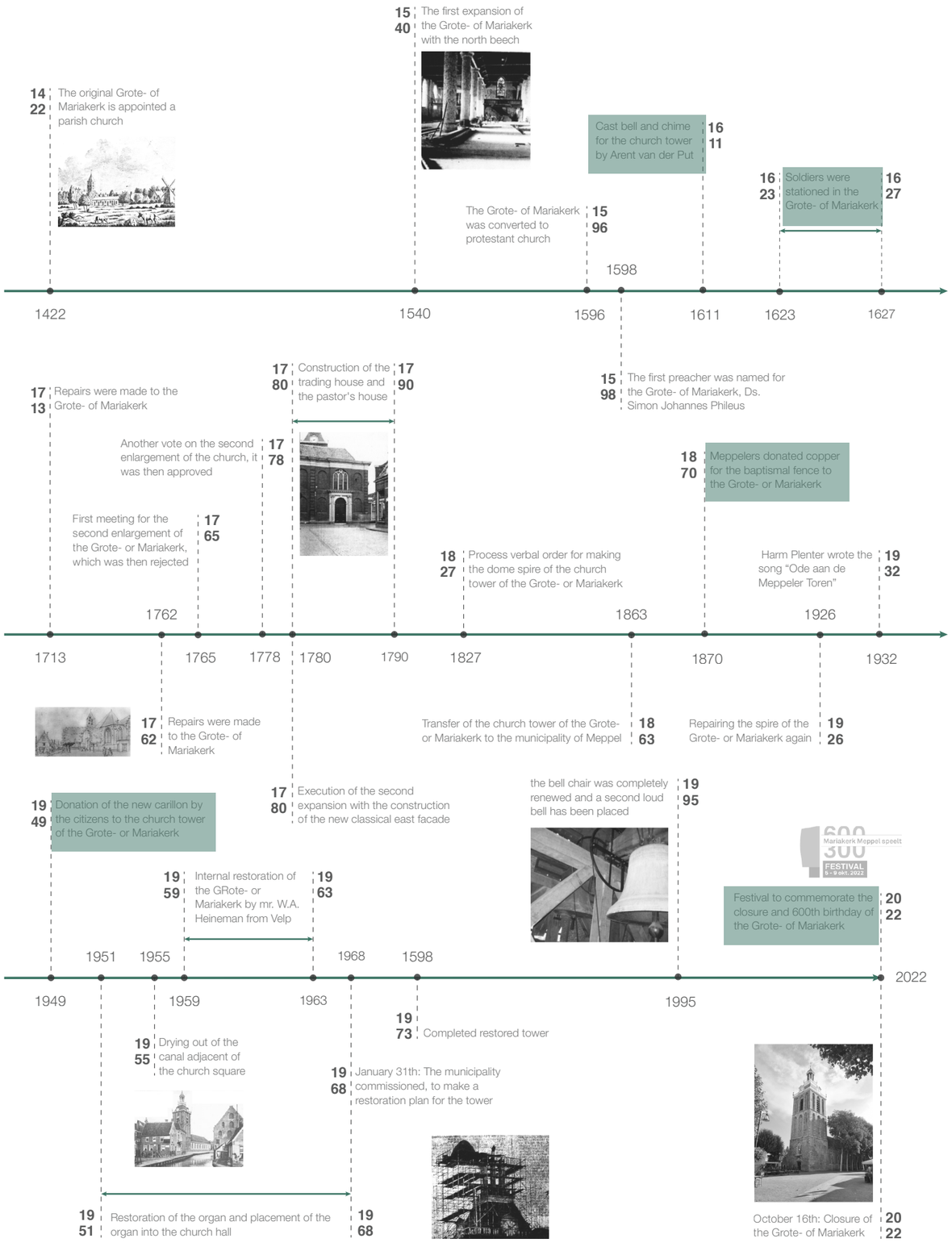
▲ Stadsomroeper Jan Vos gehuld in zijn stijlvolle tenue in het centrum van Meppel. © Foto Freddy Schinkel

Stadsomroeper Jan Vos: 'Sluiting van de Mariakerk is amputatie voor Meppel'

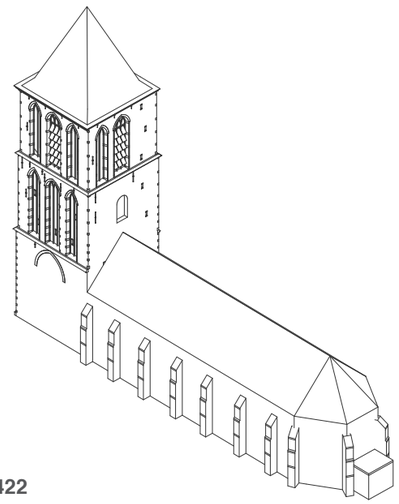
▲ De organisatie met vanaf links Mannes Hofsink, Fenna van der Weide en Jan Dijkstra. © Hilbert Heitmeijer

Vierdaags 'groots festival' in jarige Meppelse Mariakerk

HISTORIC RELEVANCE



HISTORIC GROWTH OF THE CHURCH



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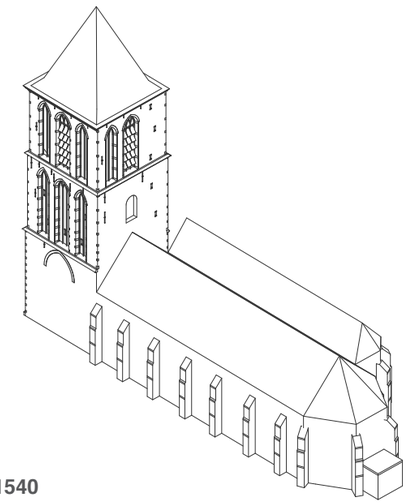

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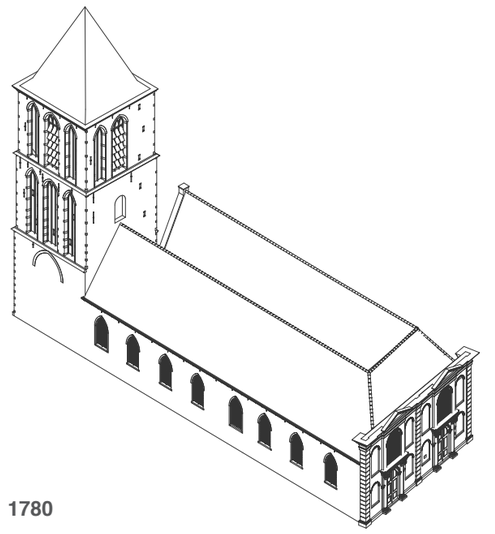
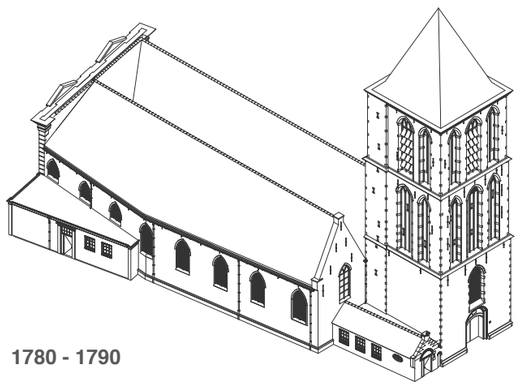
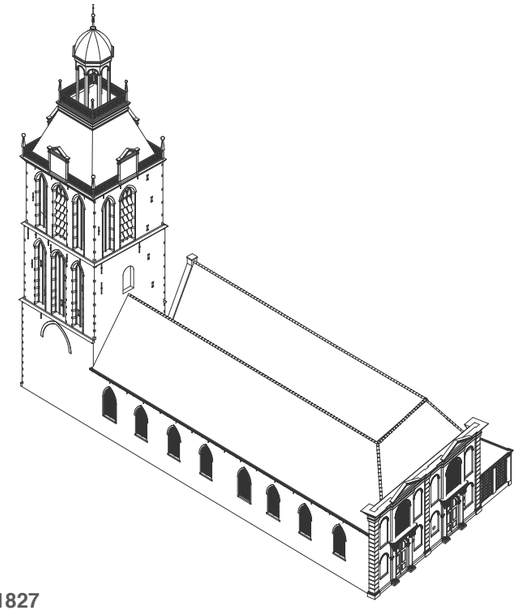


1780



1780 - 1790



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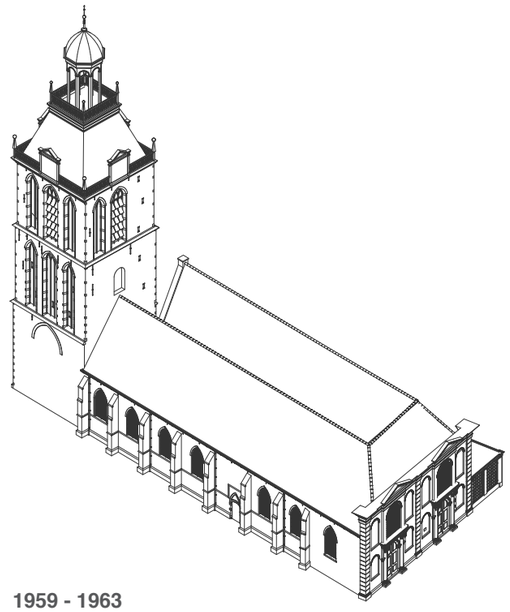
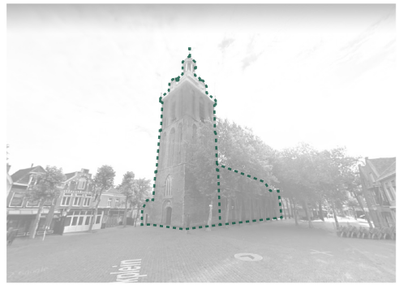


1959 - 1963

INFLUENCE ON SURROUNDINGS



Sightline 1 - from Kerkplein (50,0 m)

Sightline 2 - from Prinsenplein (260,0 m)

Sightline 3 - from Galmanspand (270,0 m)

Sightline 4 - from Gemeente Meppel (300,0 m)

Sightline 5 - from Sluisgracht (500,0 m)

Sightline 6 - from Pelikaanstraat (850,0 m)

Sightline 7 - from Soembastraat (700,0m)

Sightline 8 - from Parallelweg (750,0 m)

Sightlines - **Meppel city center**

0M 20M 40M 60M 80M

Grote - of Mariakerk

Direct view (area)

Buildings in sight

Sightlines

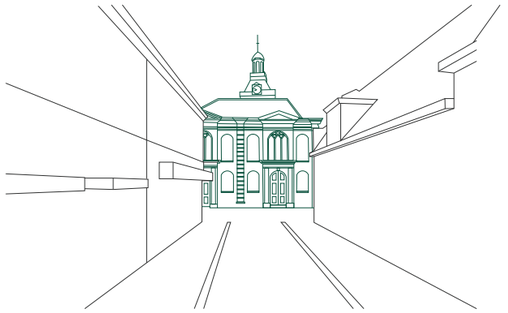
INFLUENCE ON SURROUNDINGS

Sightline 1

Approaching the Grote- of Mariakerk from the Hoogetin onto the Kerkplein

Sightline 2

Approaching the Grote- of Mariakerk from the Kleine Akkerstraat onto the Kerkplein

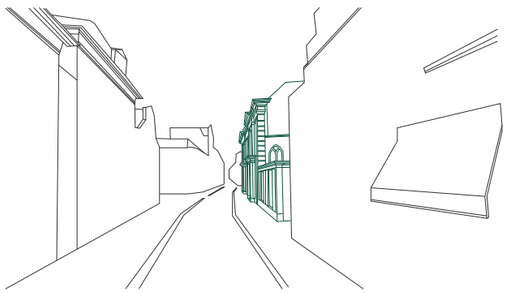


Sightline 3

Approaching the Grote- of Mariakerk from the Grote Kerkstraat

Sightline 4

Approaching the Grote- of Mariakerk from the Grote Akkerstraat



Sightline 5

Approaching the Grote- of Mariakerk from the north of the Hoofdstraat

Sightline 6

Approaching the Grote- of Mariakerk from the south of the Hoofdstraat

INFLUENCE ON SURROUNDINGS

Program Longitudinal section

0M 15M 30M

Program Cross section

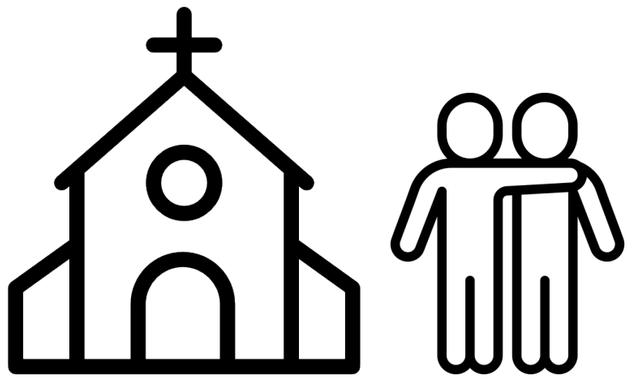
0M 15M 30M

TRANSFORM THE CHURCH INTO A PUBLIC INTERIOR

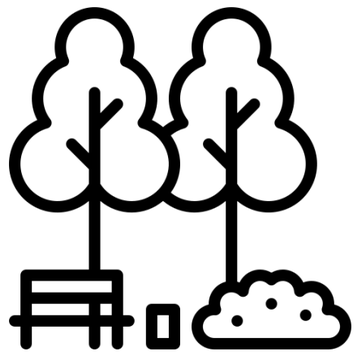
Public Interior

“Buildings in which the city’s public space is, in a certain sense, continued. These buildings’ interiors are intented to be temporary, comfortable, covered alternatives to one’s own home.”

Kloos (1993)



Contemporary twist on the original church idea as a place of gathering where people from different backgrounds in society came together under one roof.



Improve social and physical quality of environment

PUBLIC INTERIOR

“Public Interiors are places that are used as public spaces although they might belong to a private owner.”

- M. de Solà-Morales (1992)

“The best used and best-liked public interiors have strong visual tie with the outside”

- American urbanist and socologist William Whyte (M. Harteveld, 2014)

“A good public interior should have attractive designed entrances so that you walk inside in a natural manner”

- Kloos (1993)

PUBLIC SPACE

“The way people use public spaces tells a lot about the quality of the public space”
(Gehl, 2011, p.150)

“If the edge works, so does the space”
(Gehl, 2011, p.150)

TRANSITION ZONE

“The social and functional diversity of urban buildings is reflected in their facades.”

- B. Jürgenhake (2014)

“The façade doesn’t belong completely to the interior, or the exterior, but is part of the relationship between these two worlds.”

- Martinelli, P. M. (2019,)

“The area surrounding the façade, its interior and its exterior, is the ‘transition zone’”

- Gehl (2011)

“Transition zones should be clearly defined, yet accessible and easy to traverse.”

- Gehl (2011)

"What role can the transition zone play in the transformation towards a public interior, whilst maintaining its heritage values, when redesigning the Grote- of Mariakerk in Meppel?"

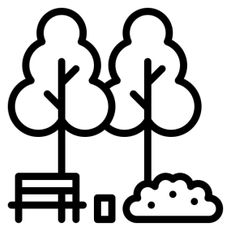
Literature study
- Public space
- Public interior
- Transition zone

Case-studies
- Contribution of transition zone
- Heritage transformation- & Non-heritage projects

Field-research
- Existing transition zones of the Grote- of Mariakerk
- Experience of user

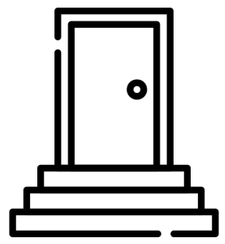
Opportunities & challenges
- Resulted in Design Approaches to transform Grote- of Mariakerk

LITERATURE STUDY
CRITERIA FOR CASE STUDIES



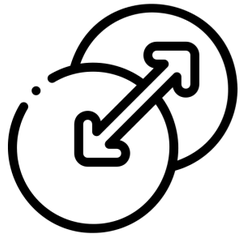
QUALITY OF THE LOCATION

- LIES ON URBAN ROUTE
- FAVOURABLE EXTERIOR FEATURES



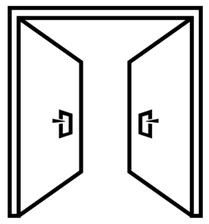
ACCESSIBILITY

- EASILY ACCESSIBLE
- ACCESSIBLE TO EVERYONE



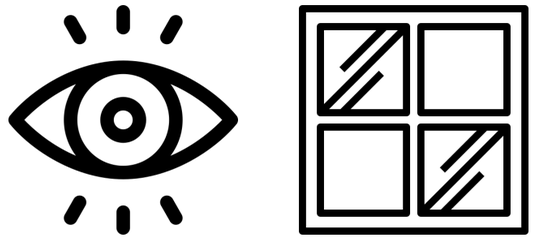
GENTLE TRANSITIONS

- GENTLE TRANSITIONS BETWEEN PUBLIC AND PRIVATE



ATTRACTIVE / INVITING ENTRANCES

- VISIBLE ENTRANCE
- MAIN ENTRANCE CAN BE DISTINGUISHED
- ENTRANCE SHOULD BE INVITING
- VISUALLY ENHANCED ENTRANCE



VISUAL TIE WITH THE OUTSIDE

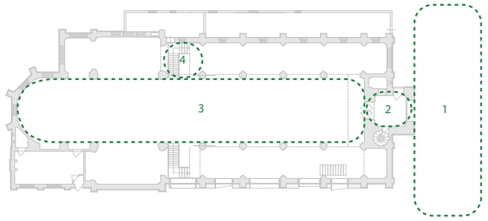
- PEOPLE CAN LOOK OUTSIDE/INSIDE
- ACTIVITIES ARE VISIBLE FROM THE OUTSIDE

CASE STUDIES
METHOD + RESULTS

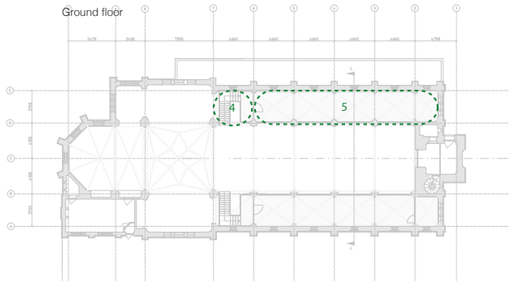
CASE STUDY
CUYPERSKERK, SAS VAN GENT

Site

Urban route · Private area · Cuyperskerk
Favourable exterior features · Direction of approach

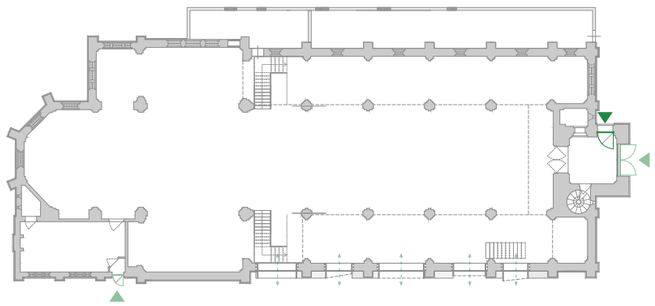


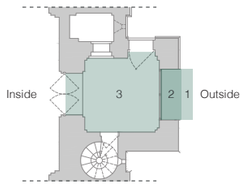
Ground floor



First floor

1. Public square 2. Entrance 3. Church nave / market 4. Central corridor 5. Office space



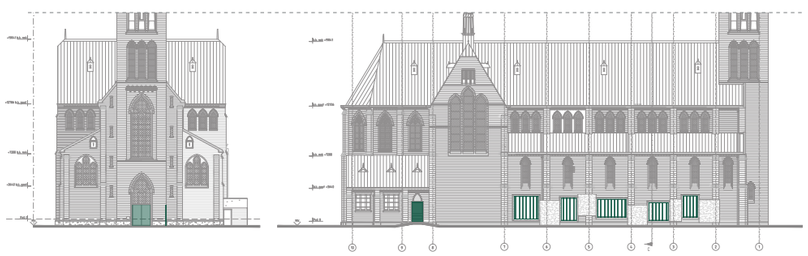


Main entrance

1. Outward steps
2. Recessed entrance
3. Draught lobby

Ground floor

Private door / Emergency exit · Wheelchair friendly entrance
Entrance with obstacles · Visual connection inside-outside



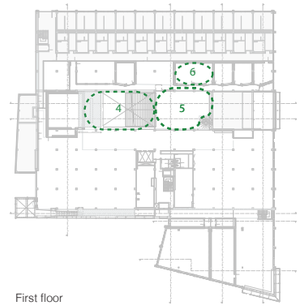
Private door / Emergency exit · Wheelchair friendly entrance · Entrance with obstacles · Active transparant surfaces · Inactive transparant surfaces

CASE STUDY
DOK CENTRUM, DELFT

Site

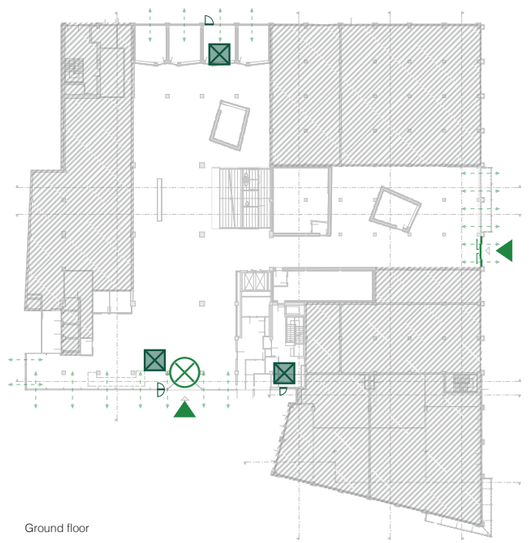
Urban route · Private area · DOK Centrum
Favourable exterior features · Direction of approach

Ground floor

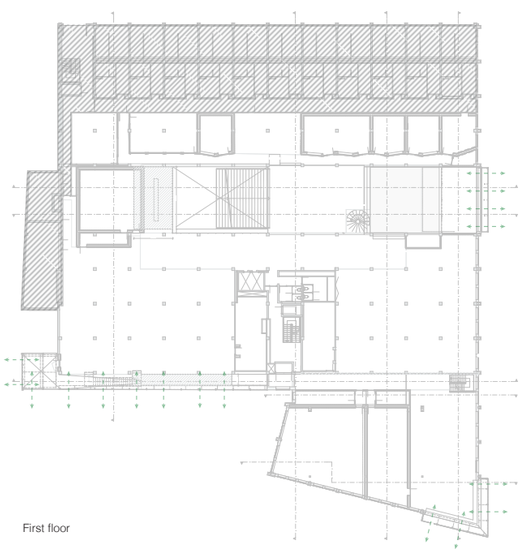


First floor

1. Public square 2. Entrance 3. Entrance foyer 4. Grandstand / atrium 5. Circulation space 6. Music studio

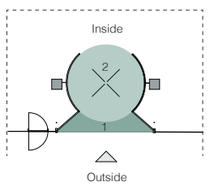


Ground floor



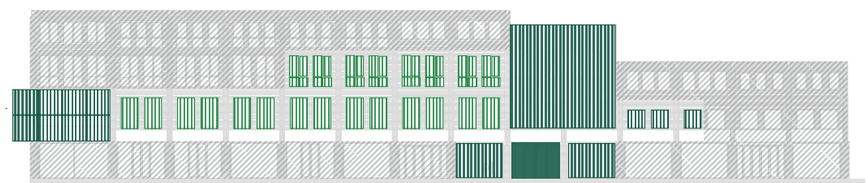
First floor

Private door / Emergency exit · Wheelchair friendly entrance
Entrance with obstacles · Visual connection inside-outside

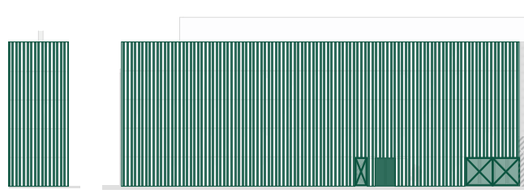


Main entrance

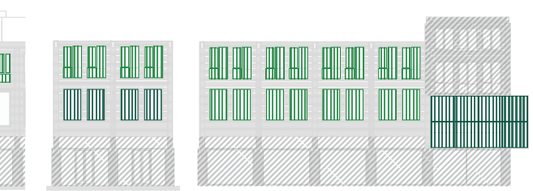
1. Recessed entrance 2. Tourniquet



North-east facade



South-west facade part 1 · South-east facade part 2



South-west facade part 1 · South-east facade part 2

Adjacent buildings · Emergency exit · Wheelchair friendly entrance · Entrance with obstacles · Active transparant surfaces · Inactive transparant surfaces

CASE STUDIES
RESULTS

		DOK Centrum Delft	Book Mountain	Cuyperskerk	Pastoor van Arskerk	St. Clemenskerk
Quality of the location	Centrally located in town or neighbourhood	✕	✕	✕	✕	✕
	The site invites people to sit, eat play and so on.	✕	✕			✕
Accessibility of the building	Single-sided access		✕	✕	✕	✕
	Multi-sided access	✕				
	Amount of public entrances relative to building surface	1 per 215 m2	1 per 1600 m2	1 per 267 m2	1 per 500 m2	1 per 1600 m2
	Percentage of wheelchair friendly public entrances	100%	100%	33%	67%	100%
Gentle transitions	Amount of transitions between public street and nearest private function in building	5	6	4	4	4
	Amount of transitions at main entrance	2	1	3	3	4
Effect of transitions	Creates inviting gesture	✕	✕	✕	✕	✕
	Transition in height	✕	✕	✕	✕	✕
	Making the user more aware of entering	✕	✕	✕	✕	✕
	Forms obstacle				✕	

- Contribution of the transition zone is higher in non-heritage projects than in heritage transformation projects.

- According to VG Architecten fewer sensitivities are involved in non-heritage projects than in heritage.

			DOK Centrum Delft	Book Mountain	Cuyperskerk	Pastoor van Arskerk	St. Clemenskerk
Attractive / inviting entrances	The entrance stands out in shape		✕	✕	✕	✕	✕
	The entrance stands out in size				✕	✕	
	The entrance stands out in material						✕
	The main entrance is clearly distinguished		✕	✕	✕	✕	✕
	Type of entrance	Flushed entrance					
		Projected entrance	✕	✕			✕
		Recessed entrance		✕	✕	✕	
	Visually enhanced entrance	Lower	✕	✕			✕
		Wider					
		Narrower			✕	✕	
		Deeper			✕	✕	
Visual tie with the outside	Ground floor	Percentage of transparant surfaces	85,7%	81,7%	5,6%	21,7%	3,8%
		Percentage of active transparant surfaces	100%	100%	100%	42,4%	100%
	First floor	Percentage of transparant surfaces	62,6%	50,4%	5,5%	6,0%	22,9%
		Percentage of active transparant surfaces	78,0%	89,4%	0%	0%	0%
	Second floor	Percentage of transparant surfaces	73,6%	100%	0%	0%	0%
		Percentage of active transparant surfaces	51,7%	100%	0%	0%	0%

RESEARCH WAS EXTENDED

CHANGE OF METHOD

LIMITS OF CASE STUDIES

Results of case studies were only focussed on functional definition of transition zone:

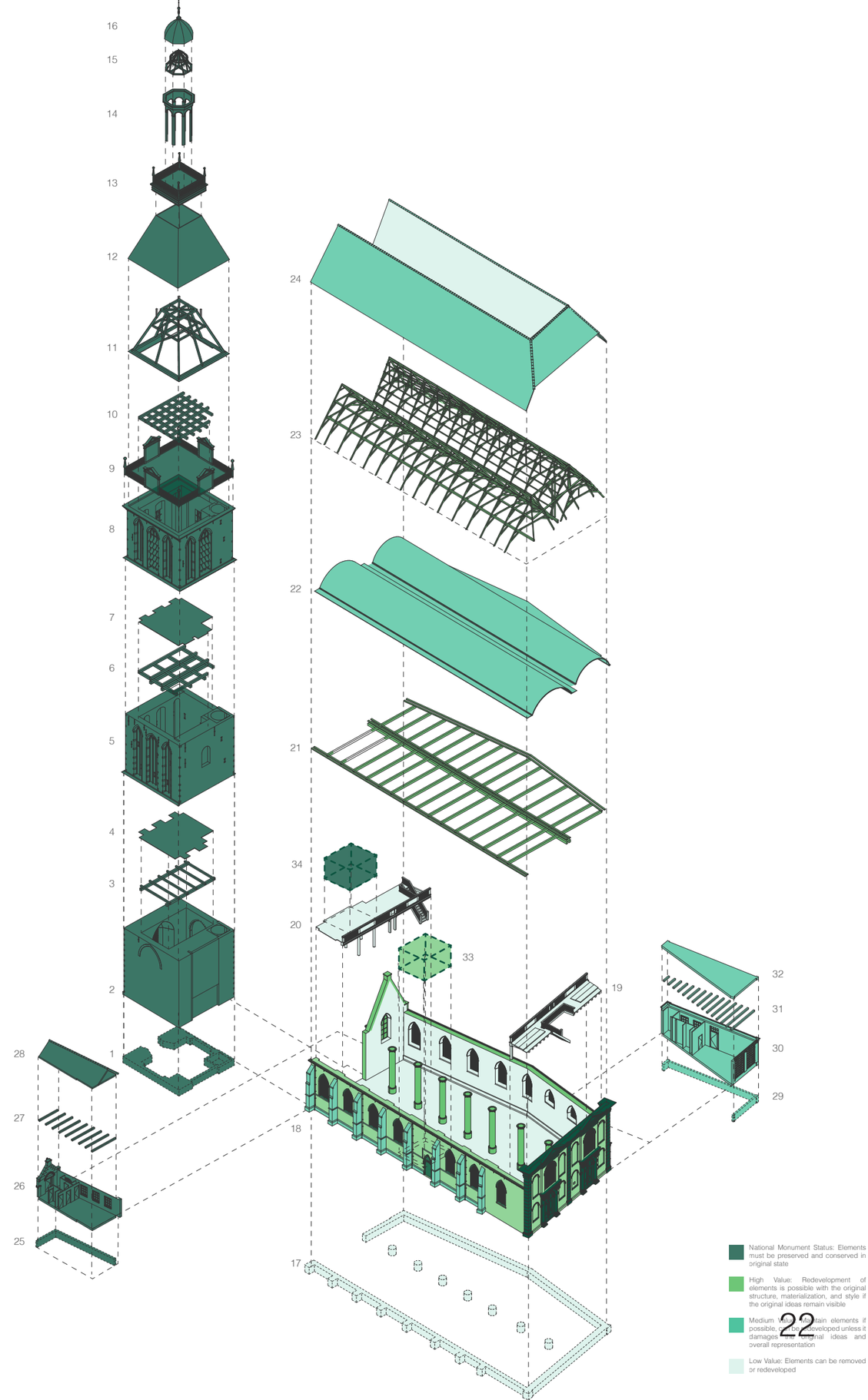
- *Accessibility*
- *Visibility*
- *Usability*

VALUE ASSESSMENT

- *Based on notions in different types of texts, linked to attributes*
- *Needed more focussed on the transition zone*

FIELD RESEARCH

- *Additional research, to involve the experience of the user*



ANALYSIS FIELD RESEARCH

Analysis of the current transition zones of the Grote- of Mariakerk:

- *situational*
- *architectural*
- *heritage*

METHOD

- Site analysis
- Serial vision inspired on George Cullen's method to map the user's experience

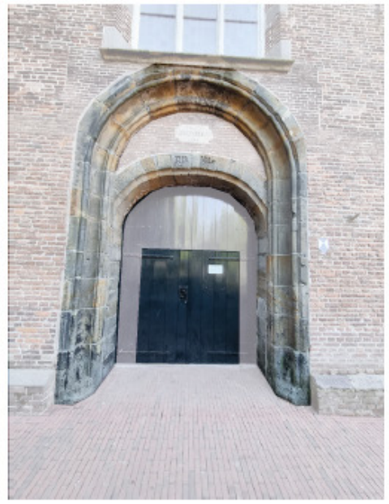


Figure 10. West entrance (Ritsema, 2023)

Figure 11. East entrances (Ritsema, 2023)

Figure 12. South Facade (Ritsema, 2023)

FIELD RESEARCH
RESULTS SITE

OPPORTUNITIES

- Many social activities present at the church square
- Many third-party visitors who cross the church square
- A free water point is available at the church square

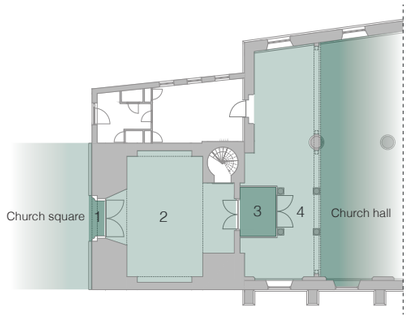
CHALLENGES

- No places to sit / eat /play without having to pay for it
- Usability of the square as a market / event square should stay intact

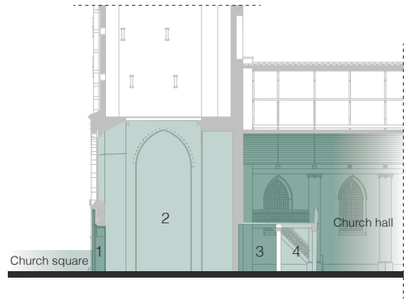

Marktgezicht om de toren ± 1900

FIELD RESEARCH
RESULTS TRANSITION ZONES

EXISTING TRANSITION ZONES:
- Protective and closed-off character from the outside
- Creating a soft inside atmosphere where equality and a sense of community are present through the lack of hierarchy.



1. Recessed entrance
2. Tower base
3. Draught lobby
4. Space underneath gallery



1. Recessed entrance
2. Tower base
3. Draught lobby
4. Space underneath gallery

ART OF COMPRESSION:
- Makes the transition more dramatic, by the size differences of the subsequent spaces
- Raises the focus upwards towards the ceiling, towards the heaven
- Transforms the user, bringing the use in a different state

LACK OF HIERARCHY:
- This makes the users feel equal in the space, as if they are part of a greater whole
- It makes the user feel like they are part of the community of Meppel

FIELD RESEARCH
RESULTS TRANSITION ZONES

WEST ENTRANCE
- Very stately/formal, however changing its appearance is not desirable since its such a monumental entrance
- Wheelchair friendly
- Not clearly visible and accessible

Figure 10. West entrance (Ritsema, 2023)

EAST ENTRANCE
- Very stately/formal, however changing its appearance is not desirable since its such a monumental entrance
- Clearly visible already
- Not yet wheelchair friendly, but can be by small ramp

Figure 11. East entrances (Ritsema, 2023)

SOUTH FACADE
- Protective/closed character
- Row of trees forms extra border
- Many social activities on church square already
- Not sufficiently linked yet
- Improving this link can also result in visible activities along the south facade
- Historic feature of Deadman's gate as entrance for everyone can be restored in a contemporary way

Figure 12. South Facade (Ritsema, 2023)

FIELD RESEARCH

CHALLENGES / OPPORTUNITIES -> DESIGN STRATEGIES

DESIGN STRATEGIES

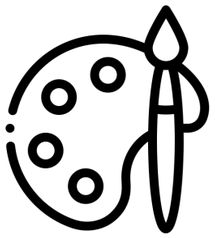
- Based on the challenges and opportunities, design approaches were formulated

- This part of the research has been very useful for the in the design phase

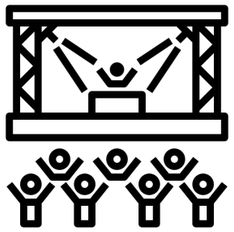
	OPPORTUNITIES	CHALLENGES	DESIGN APPROACH
SITE ANALYSIS	There are many social activities present at the church square.	Currently the square is used as market square and square for events.	The current usability of the square as a market square and square for events must be taken into account in the redesign.
	There are many third-party visitors who cross the church square.	The church and the square are not sufficiently linked currently.	The new design could create opportunities for more people to enter and more spontaneous interactions could possibly arise.
	A free water point is available at the church square. There is space to play.	There are no places to sit and eat without having to pay for it available at the church square.	The entire church square should be redesigned to also create spaces for social activity to arise without people having to pay for it.
WEST ENTRANCE	The monumental entrance has a very stately appearance.	The apprearance is protective and closed and therefore not inviting.	Changing its appearance is not desirable since it is such a monumental entrance.
	The entrance and its subsequent transitions are already wheelchair friendly.		The entrance needs no severe changes for the redesign.
		The visibility and accessibility is limited, due to the terrace in front of it.	The public space in front of the west entrance should be redesigned to make the west entrance more visible and accessible.
	The existing transition of using compression when entering and releasing this compression after, is making the transition more dramatic.		This is an important part of how people experience entering the church, and it is crucial to keep this transition intact.
EAST ENTRANCES	The monumental entrances have a very stately appearance.	Their apprearance is protective and closed and therefore not inviting.	Changing their appearance is not desirable since it is such a monumental entrance.
		The entrance and its subsequent spaces are not wheelchair friendly.	This can be resolved by removing the cut stone step and replacing it by a small ramp in the redesign.
	The entrances are clearly visible from adjacent streets.		The entrance needs no severe changes for the redesign.
	The existing transition of using compression when entering and releasing this compression after, is making the transition more dramatic.		This is an important part of how people experience entering the church, and it is crucial to keep this transition intact.
SOUTH FACADE	Currently all social activities surrounding the church take place on the church square.	The church does not seem to be sufficiently linked with the church square spatially.	Improving the link between the two would benefit the accessibility of the public interior and could create opportunities for more people to enter and more spontaneous interactions could possibly arise.
	The church square has always been related to the church, as a cemetary and market square. The deadman's gate has always been an entrance for the 'common folk'.		By creating a new entrance in the south façade, this historic feature of the Grote- of Mariakerk can be restored in a contemporary way: by creating an inviting entrance which does not have a stately/formal appear like the existing entrances.
	Improving the link between the south façade and the church square can result in visible activities along this facade, which is currently not present and which is beneficial to a public interior.	The protective character is an important feature of the south facade. By opening up the façade, this feature might be negatively affected.	If a new link towards the church square is to be made, the new wall openings should be kept to a minimum, preferably in line with the current glazing to keep the verticality intact. By doing this, people still experience entering the thick walls and the existing transition zones won't be negatively affected by the redesign.
		The row of trees along the south facade forms a border between the church square and the church and currently hides the Grote- of Mariakerk from the church square.	By integrating the row of trees in the redesign, it could be an additional transition zone instead of a border.
	The existing transition of using compression when entering and releasing this compression after, is making the transition more dramatic.		This is an important part of how people experienced entering the deadman's gate, and if a new link towards the church square is to be made, this transition should use the art of compression and releasing this compression again.

CHOICE OF FUNCTIONS

LOCAL TRENDS IN MEPPEL

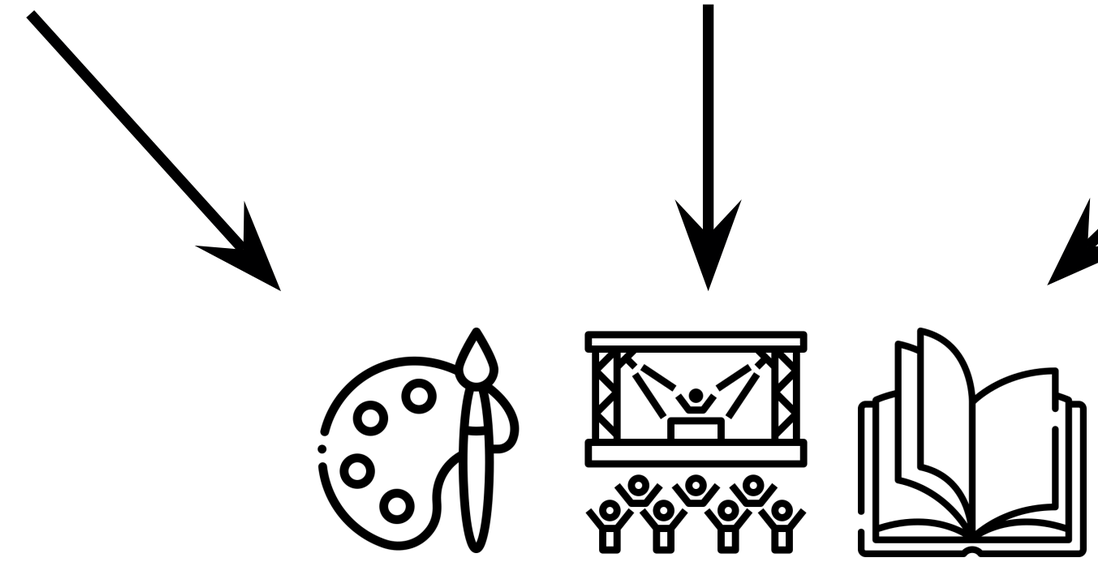


ART CENTRE SCALA IS DECLARED BANKRUPT



THEATRE OGTEROP WANTS TO ADD A POP PODIUM

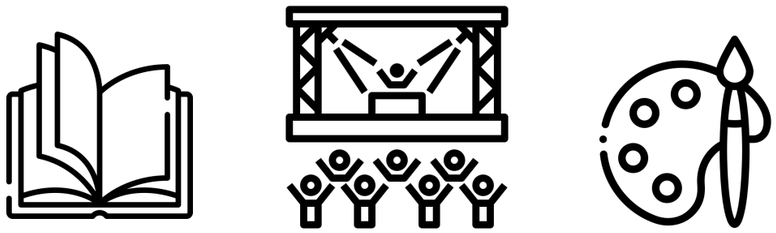
MEPPEL LIBRARY NEEDS A LARGER BUILDING



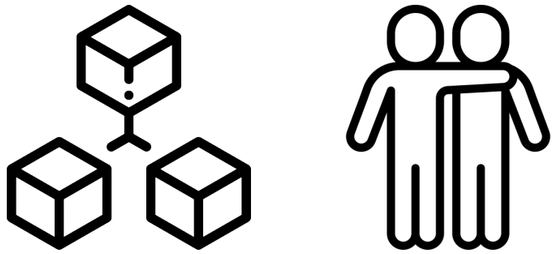
MULTIFUNCTIONAL CULTURAL PROGRAM

CONCEPT
FOCUS POINTS

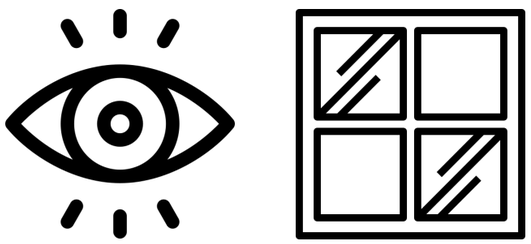
PUBLIC INTERIOR AS
AN URBAN LIVING ROOM



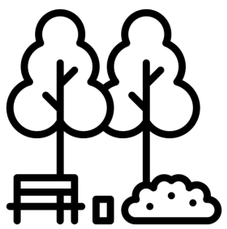
MULTIFUNCTIONAL CULTURAL
PROGRAM



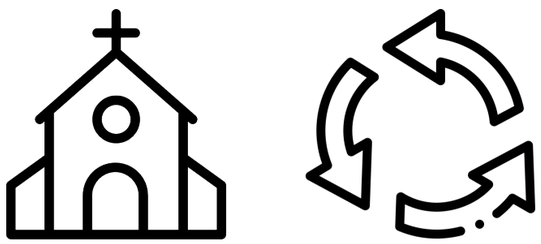
PROGRAM HAS OVERLAP OF
ACTIVITIES TO CREATE A LIVELY
BUILDING WITH SPONTANEOUS
ENCOUNTERS



ACTIVITIES ARE
MADE VISIBLE



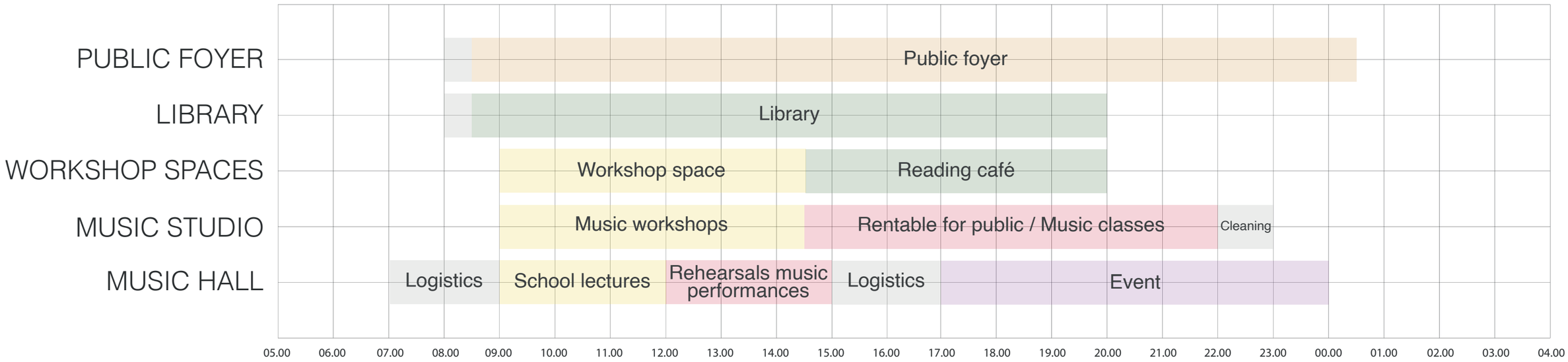
CREATE MORE CONNECTION
WITH SURROUNDING SITE
AND IMPROVE SITE QUALITY



RESPECTING THE HERITAGE
AND RE-USE IF POSSIBLE

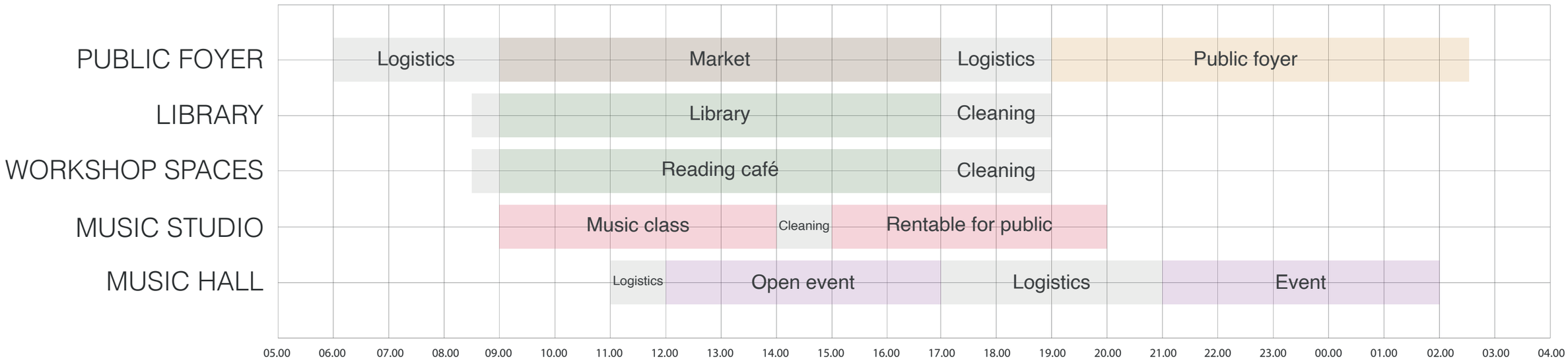
MONDAY-FRIDAY

OPENING HOURS



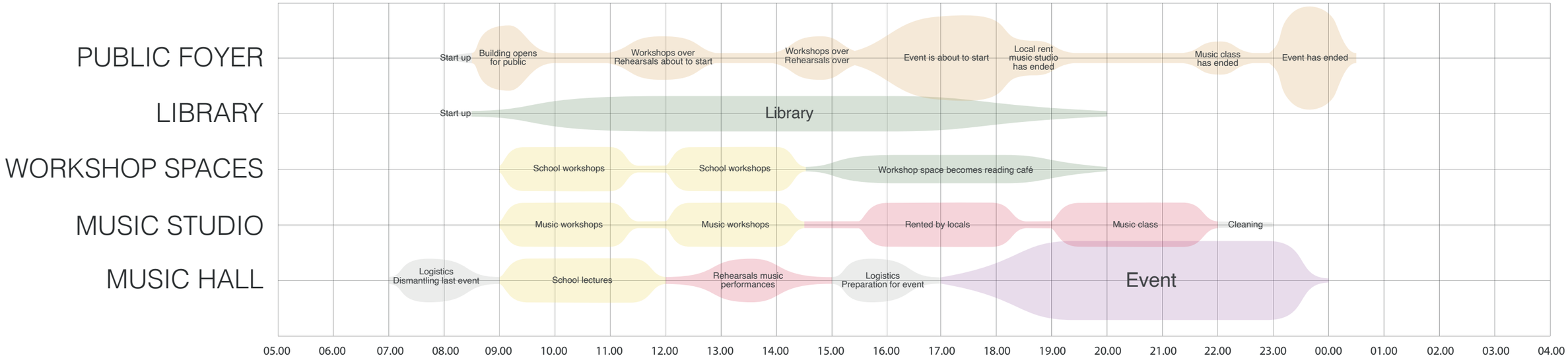
SATURDAY

OPENING HOURS



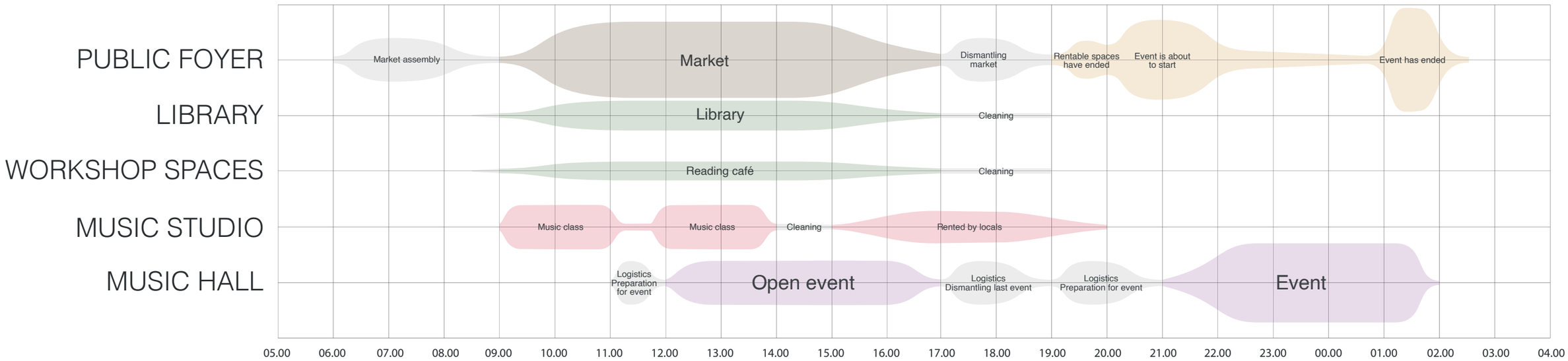
MONDAY-FRIDAY

ACTIVITY SCHEME

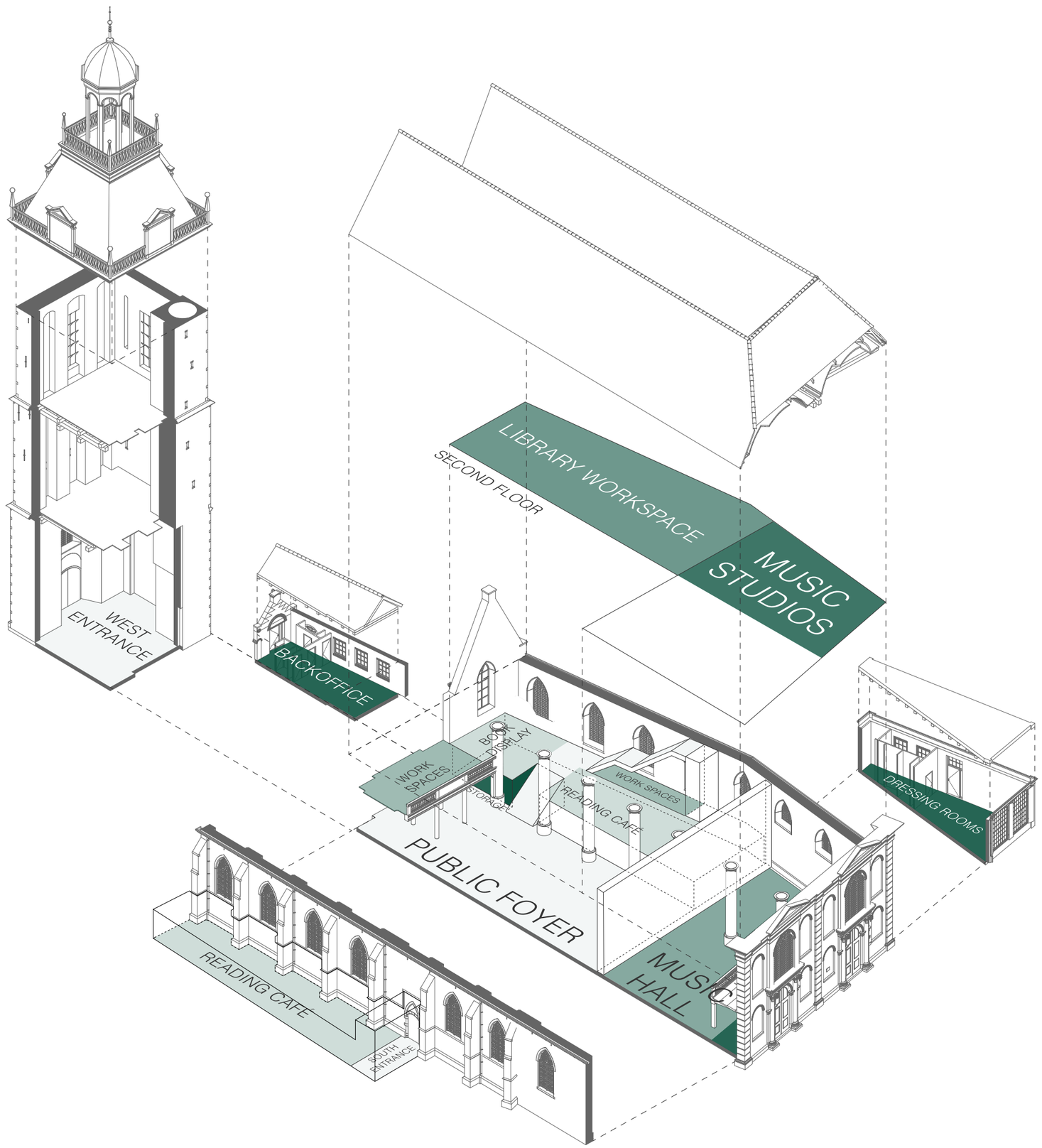


SATURDAY

ACTIVITY SCHEME

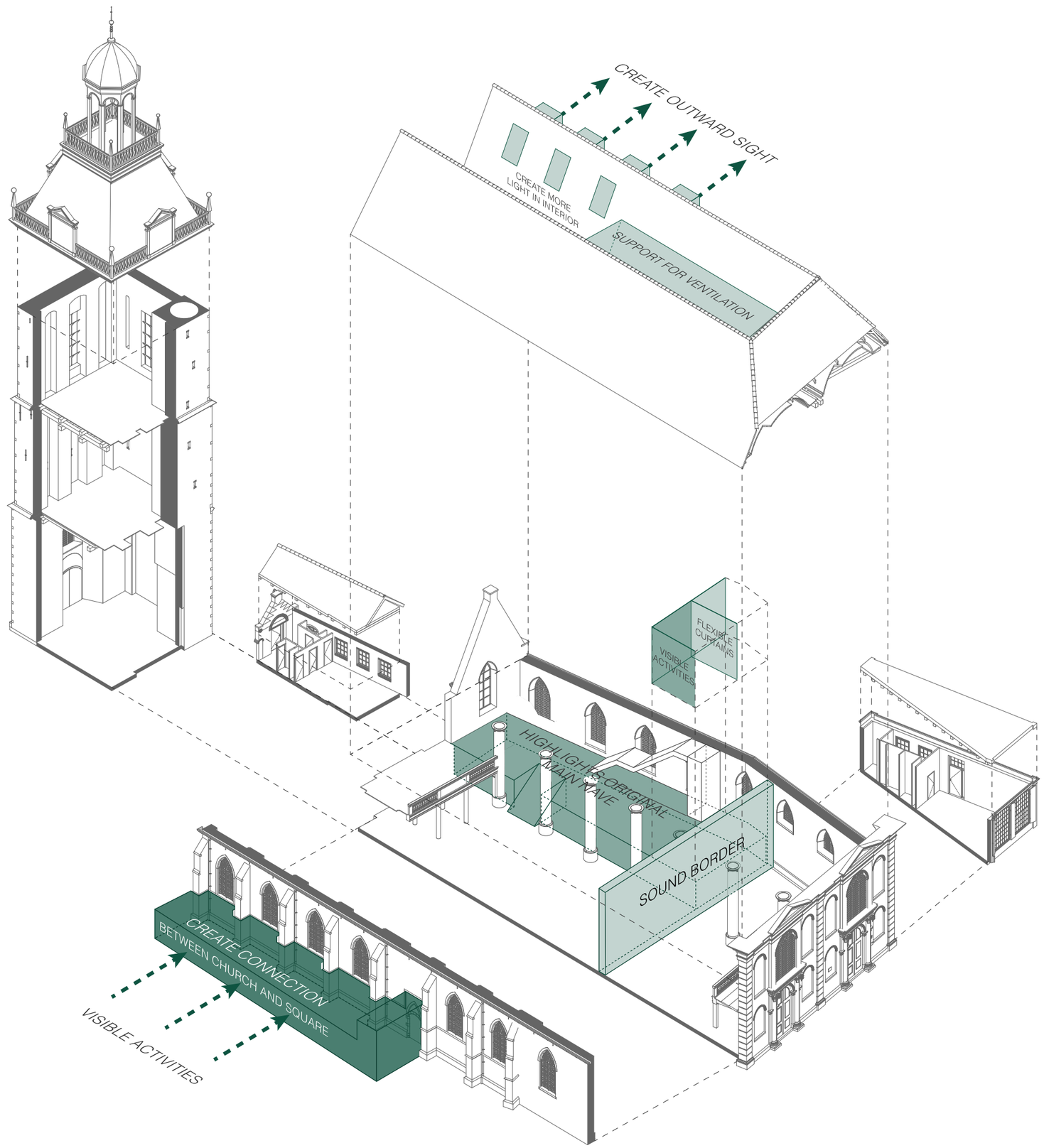


CONCEPT
PRIVACY



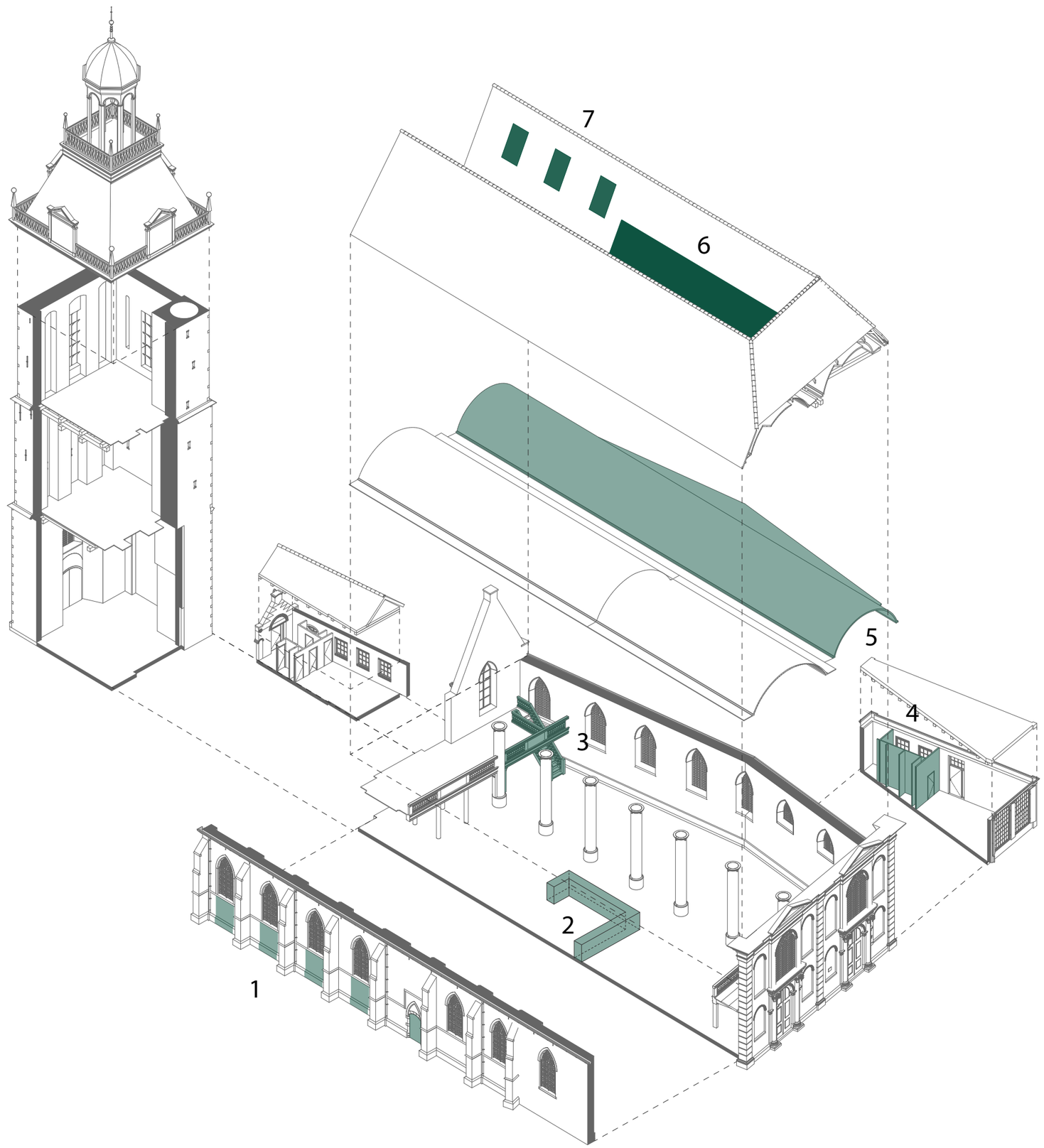
PUBLIC PRIVATE

CONCEPT
INTERVENTIONS



CONCEPT

RE-USE



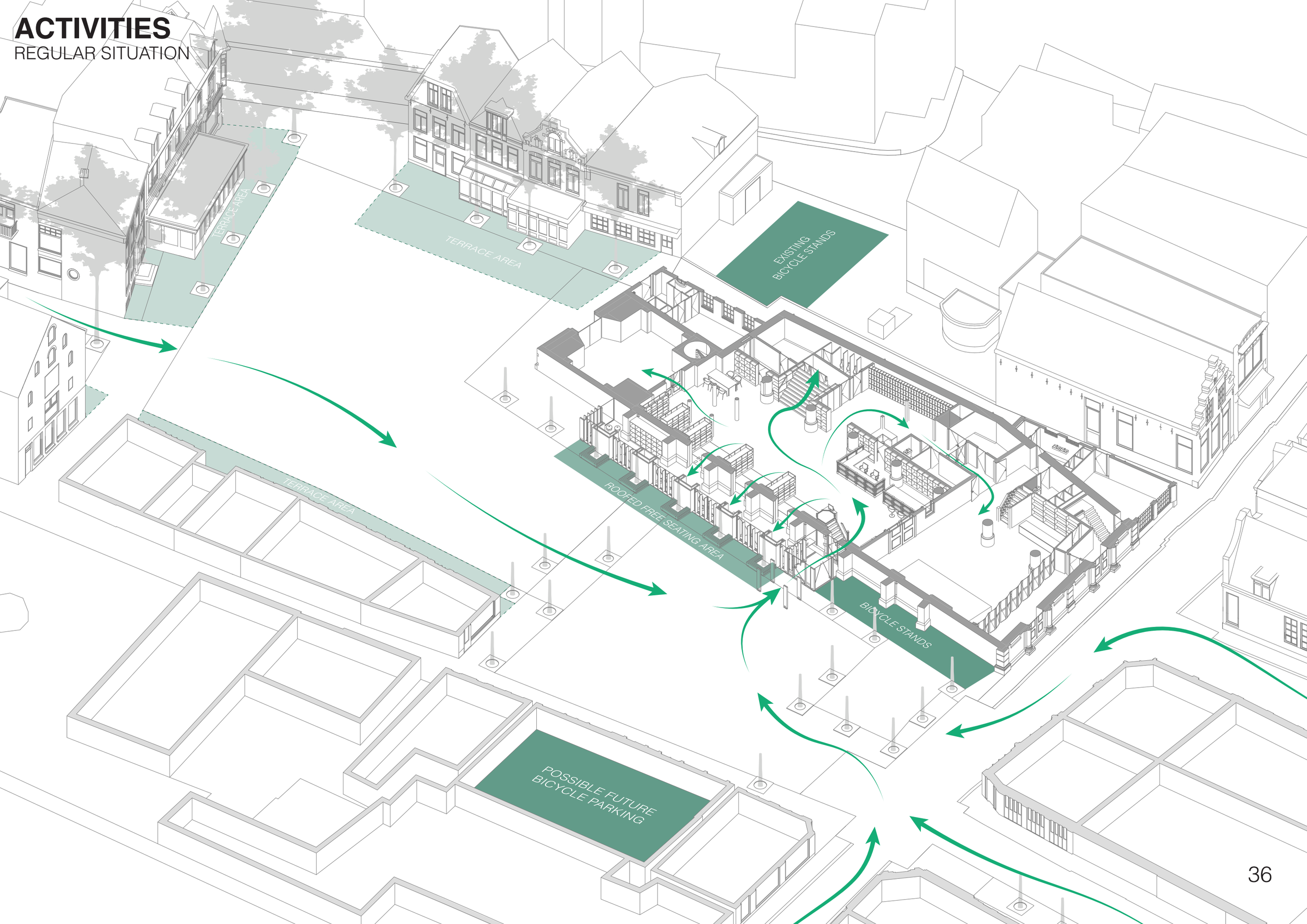
REMOVED / REPLACED

REUSED IN THE BUILDING

CIRCULATION

REGULAR SITUATION

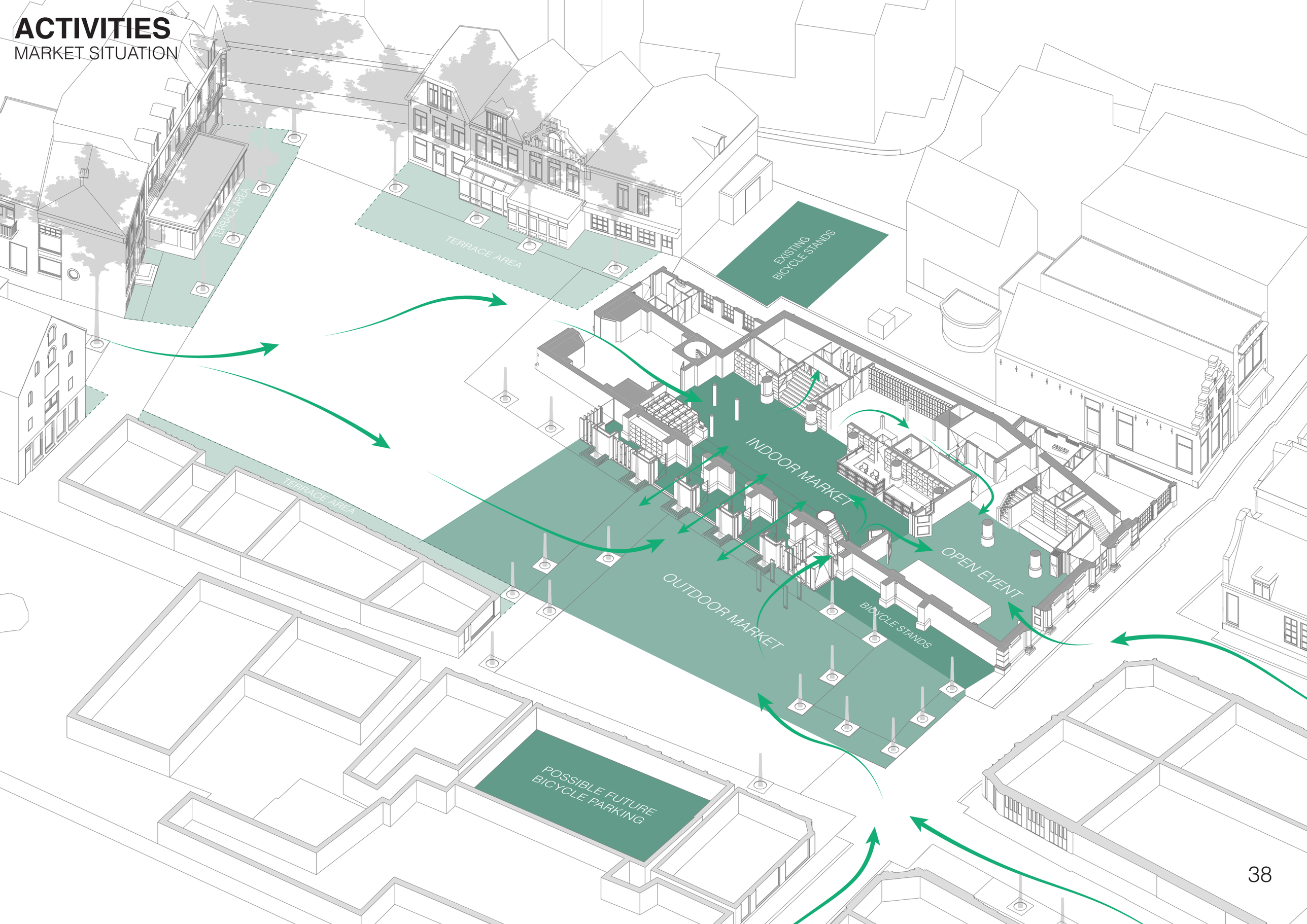
ACTIVITIES
REGULAR SITUATION



CIRCULATION

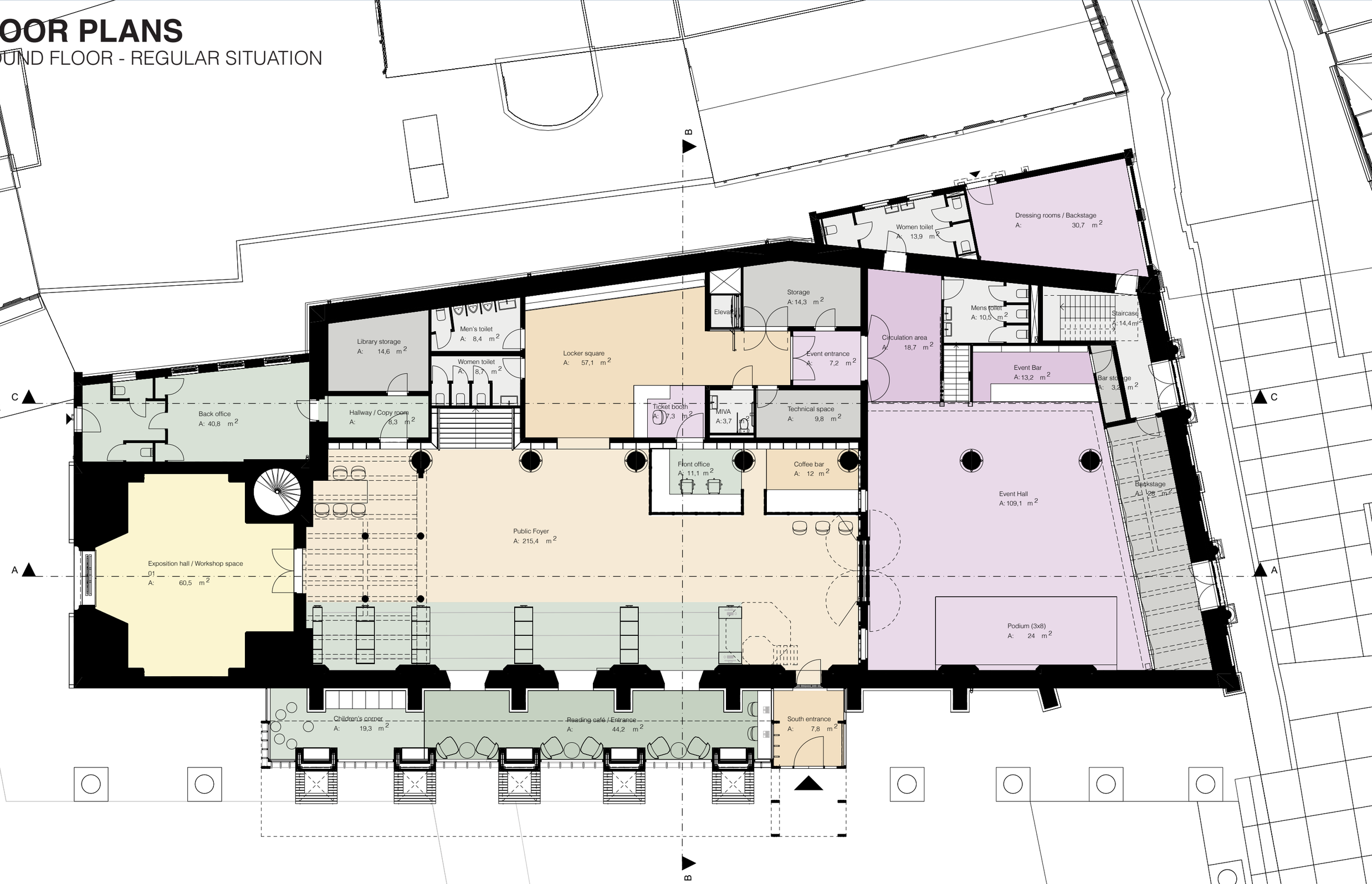
MARKET SITUATION

ACTIVITIES
MARKET SITUATION



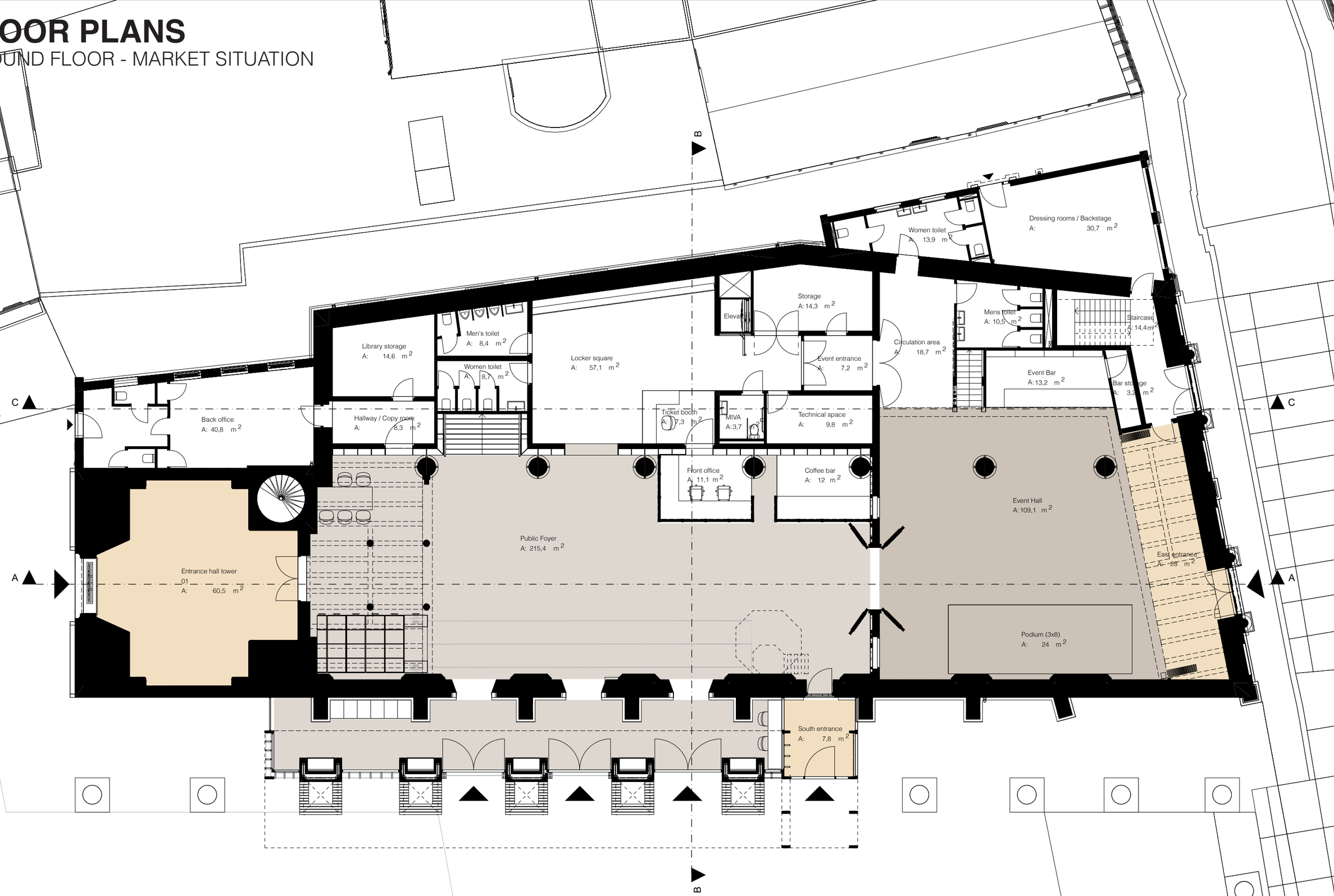
FLOOR PLANS

GROUND FLOOR - REGULAR SITUATION

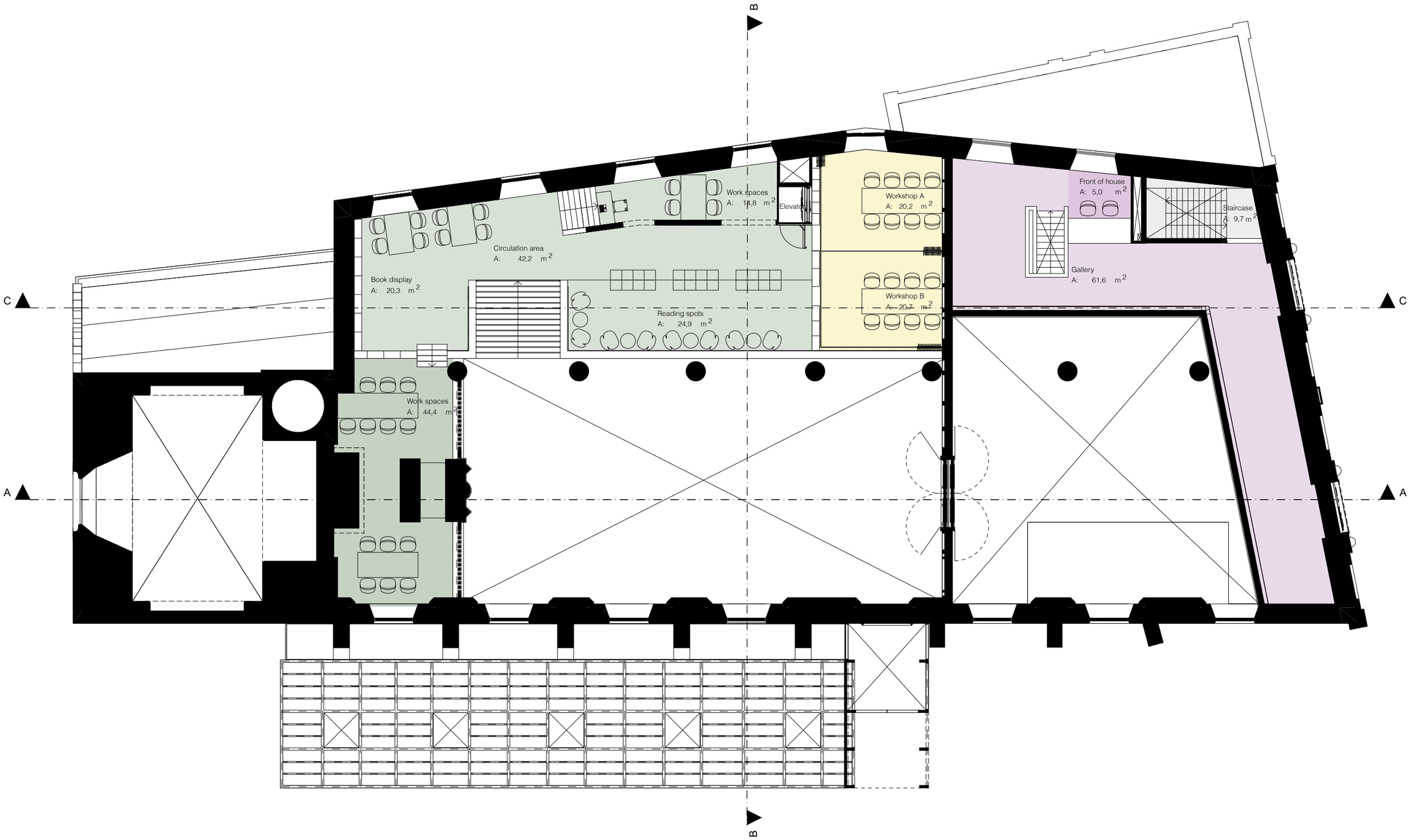


FLOOR PLANS

GROUND FLOOR - MARKET SITUATION

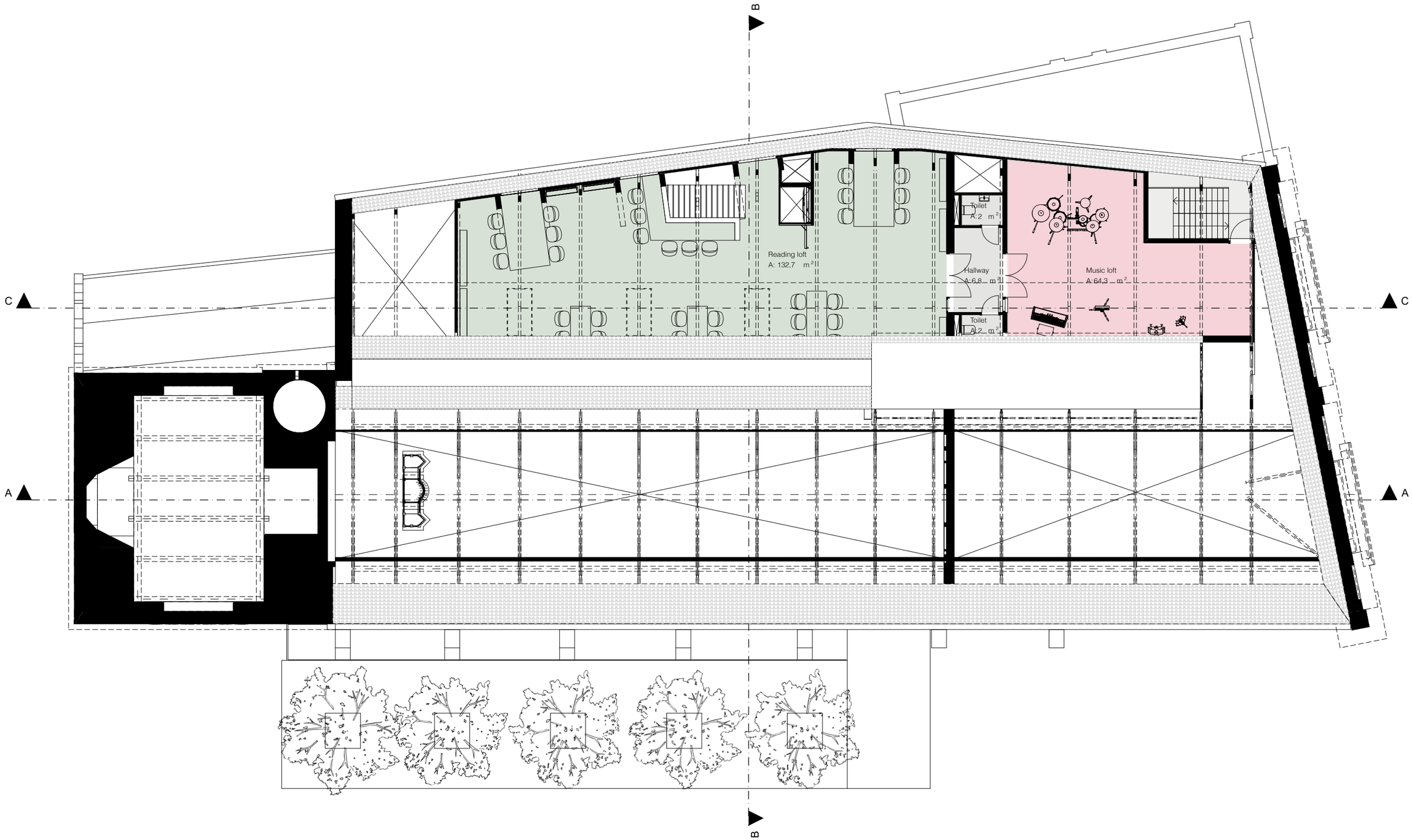


FLOOR PLANS
FIRST FLOOR



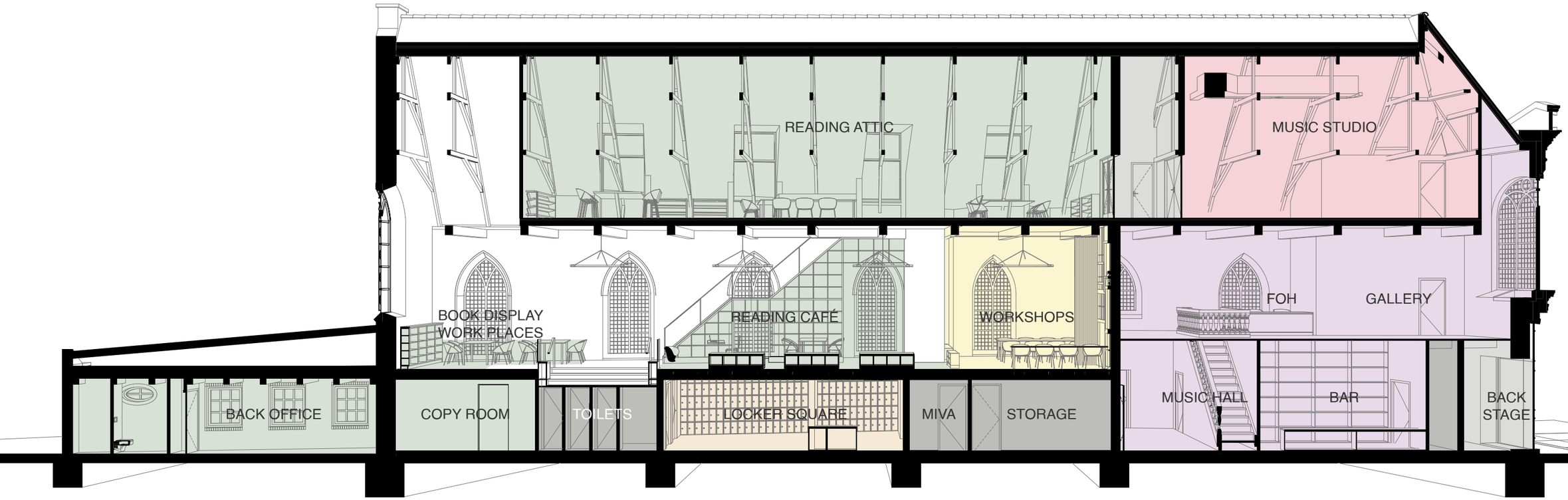
FLOOR PLANS

SECOND FLOOR



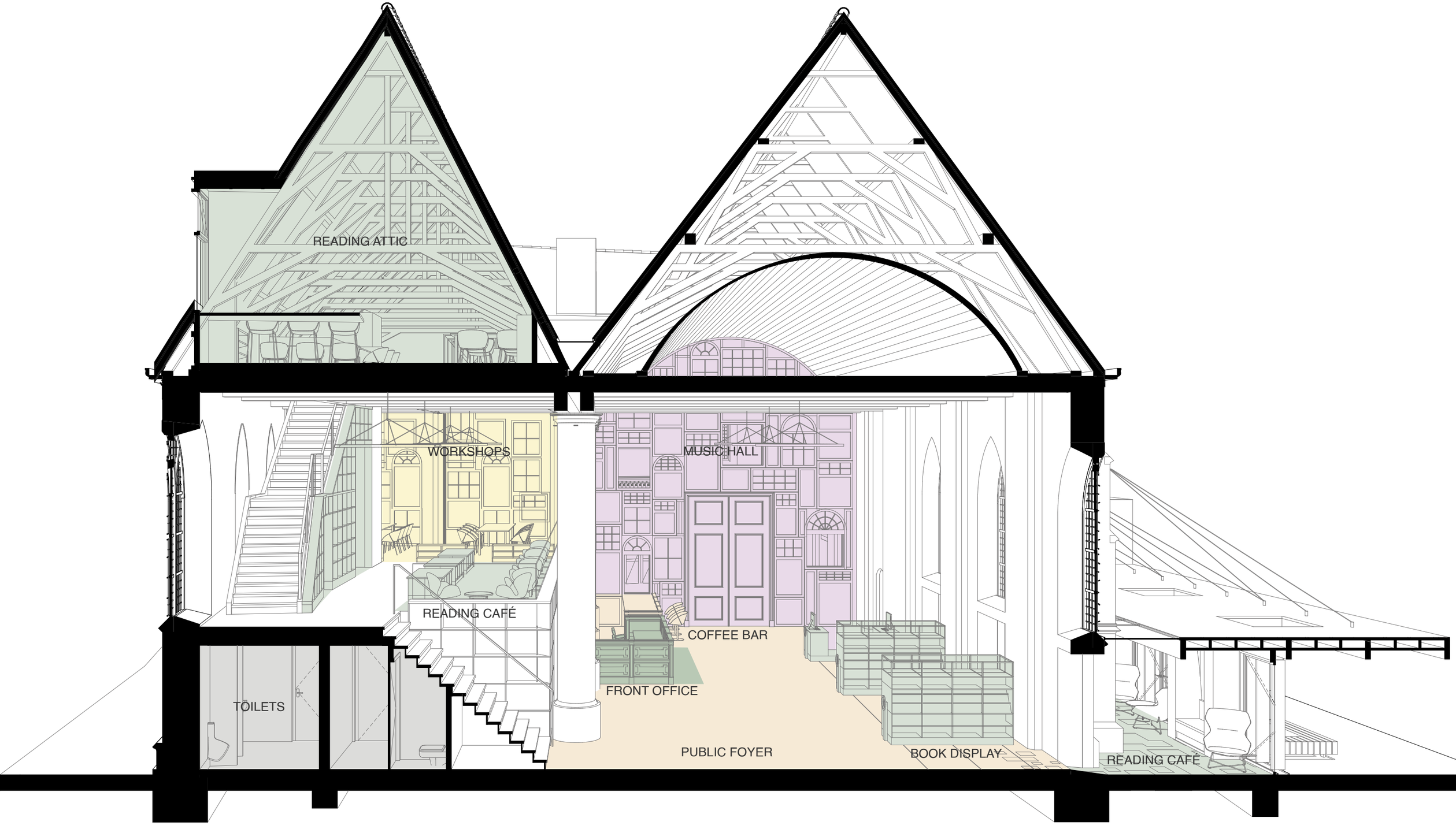
SECTIONS

LONGITUDINAL SECTION CC



SECTIONS

CROSS SECTION BB



MATERIALS
SOUTH EXTENSION

DESIGN APPROACH

NEW ENTRANCE RESTORES HISTORIC
FEATURE IN CONTEMPORARY WAY

DESIGN APPROACH

INTEGRATED TREELINE NO LONGER FORMS BORDER

DESIGN APPROACH

ACTIVATING THE EDGE OF PUBLIC SPACE

MATERIALS
SOUTH EXTENSION

DESIGN APPROACH

VERTICAL COMPRESSION BY LOWERED ROOF

DESIGN APPROACH

TRANSPARANT SURFACES & VISIBLE ACTIVITIES INTERIOR

DESIGN APPROACH

SKYLIGHT FOR OPTIMAL EXPERIENCE OF TRANSITION

DESIGN APPROACH

MINIMAL OPENINGS IN FACADE FOR VERTICALITY

MATERIALS
CHURCH HALL

MATERIALS
CHURCH HALL

MARKET SITUATION

CHURCH HALL

DESIGN APPROACH

VOLUME BEHIND COLUMNS TO ENHANCE VERTICALITY

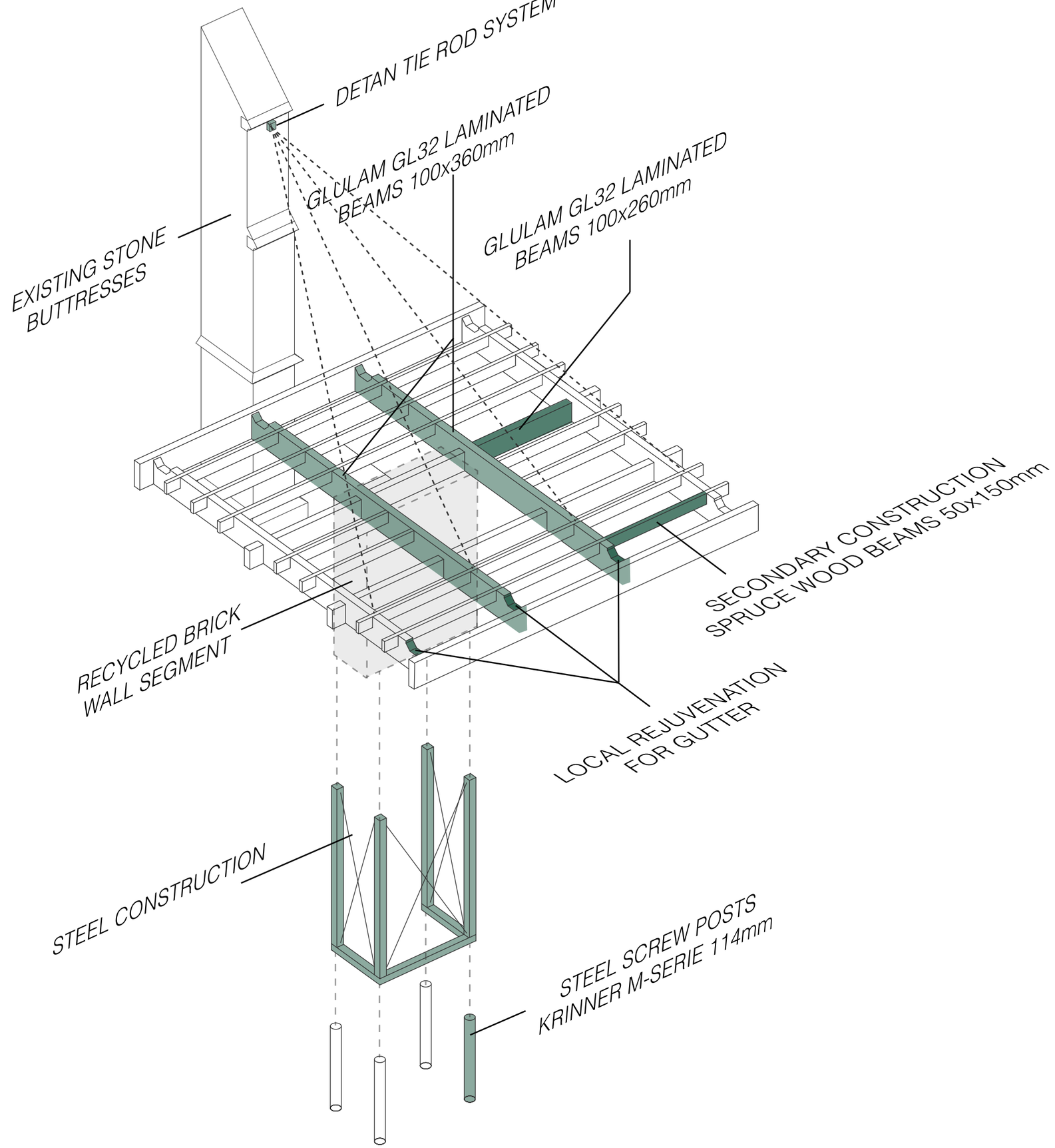
DESIGN APPROACH

PAINTED WOODEN BEAMS TO ENHANCE HORIZONTALITY

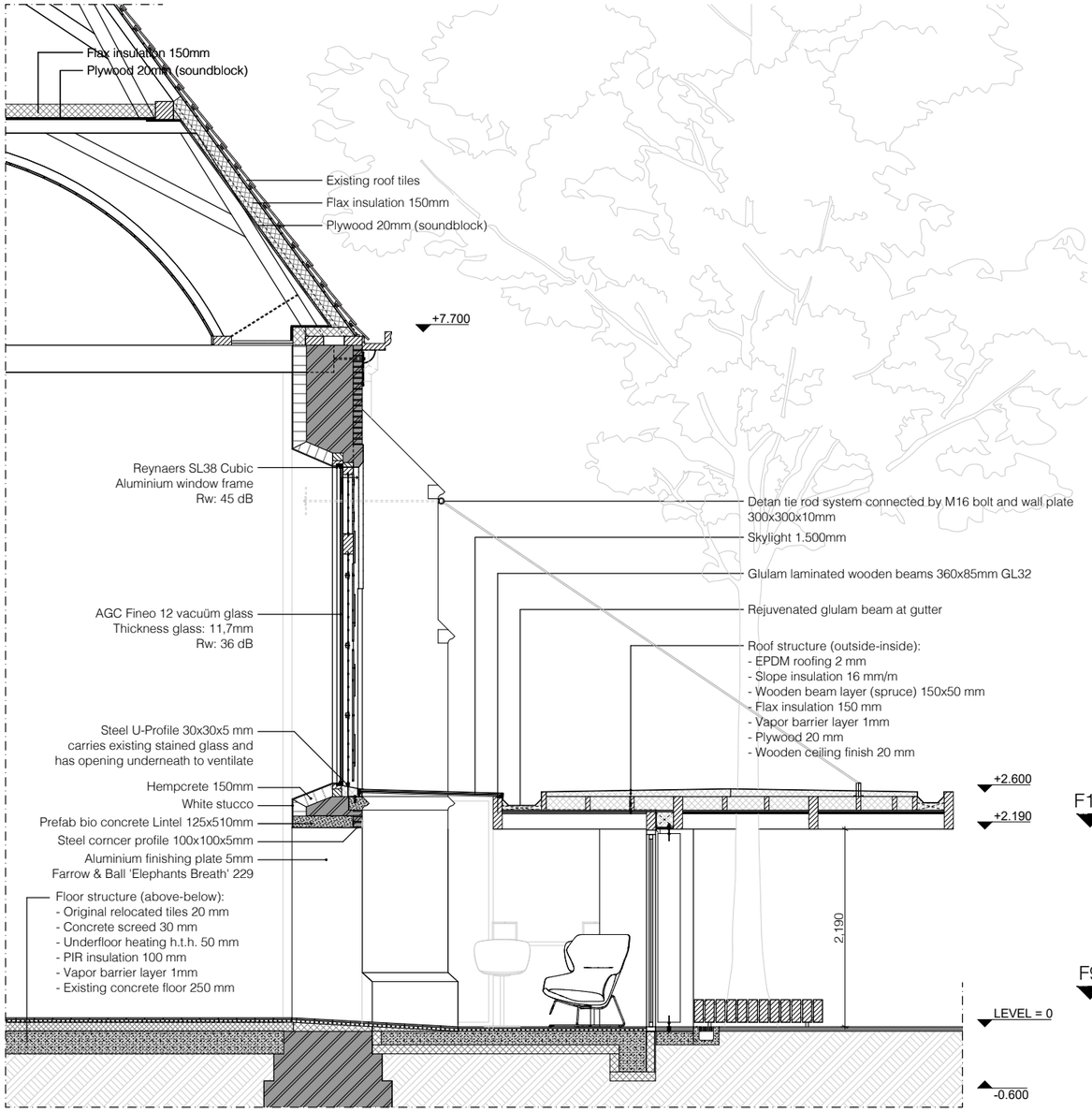
FACADE

SOUTH FACADE 1:200

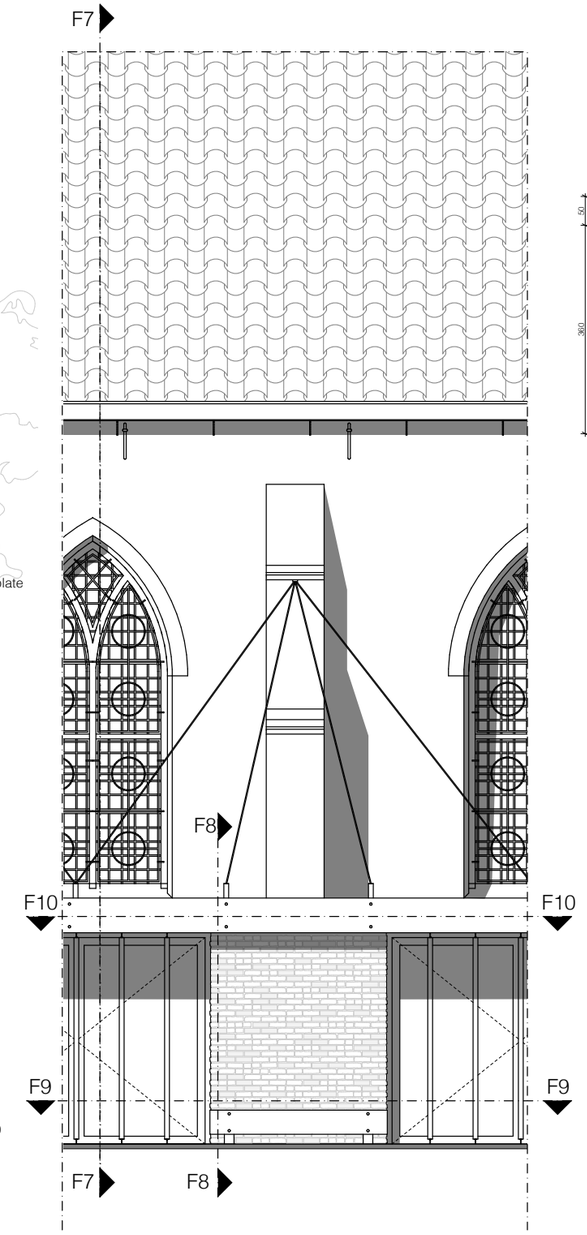
FRAGMENT
SOUTH EXTENSION



FRAGMENT
SOUTH EXTENSION

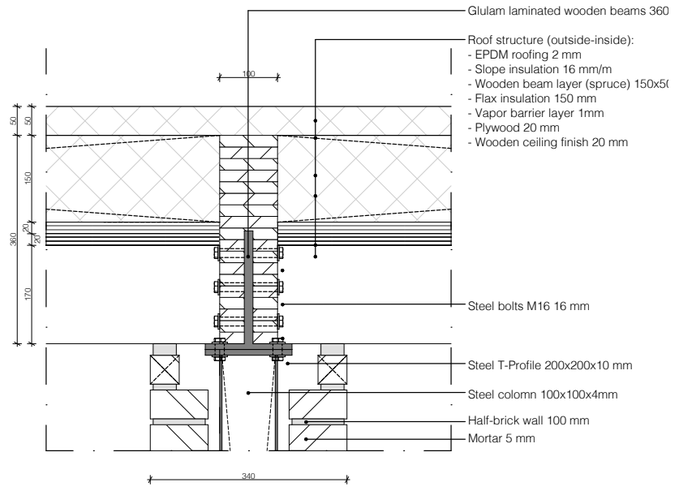


Vertical section F5 1:30

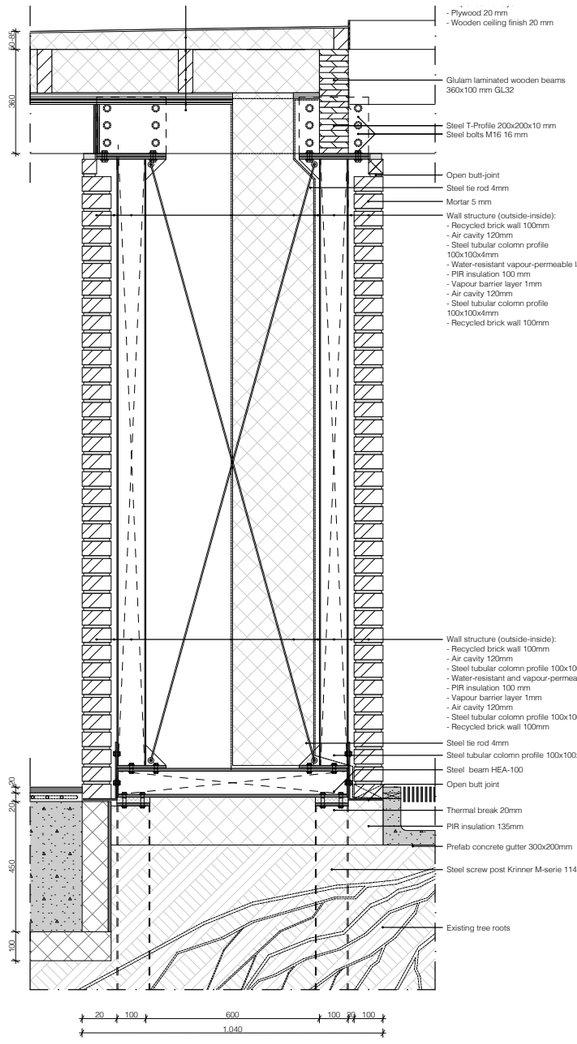


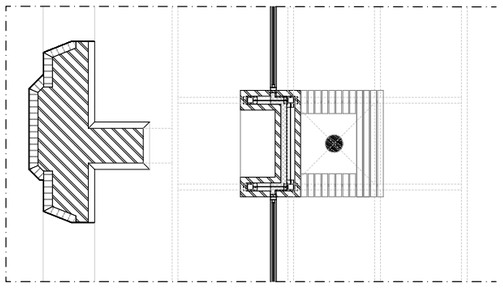
Front view 1:30

Detail V05 1:10

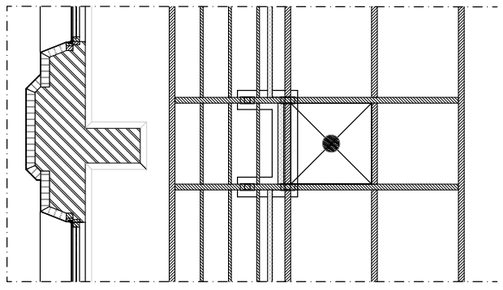


Vertical section F8 1:20





Horizontal section F6 1:30



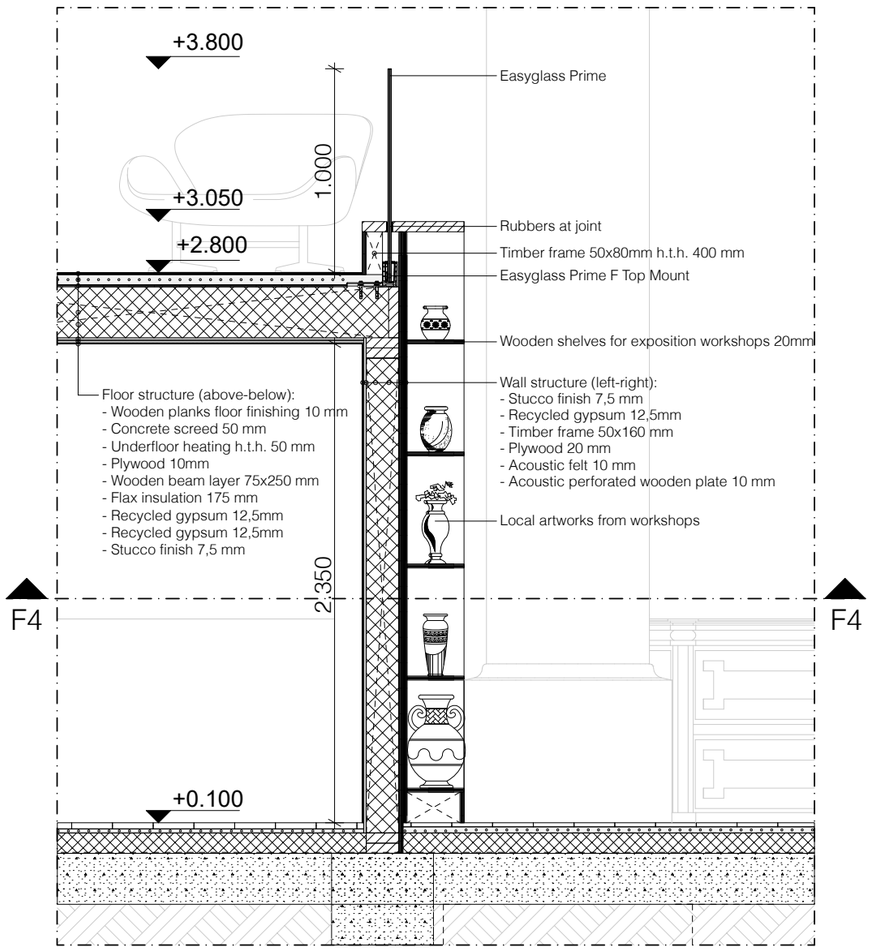
Horizontal section F6 1:30

INVOLVING THE COMMUNITY

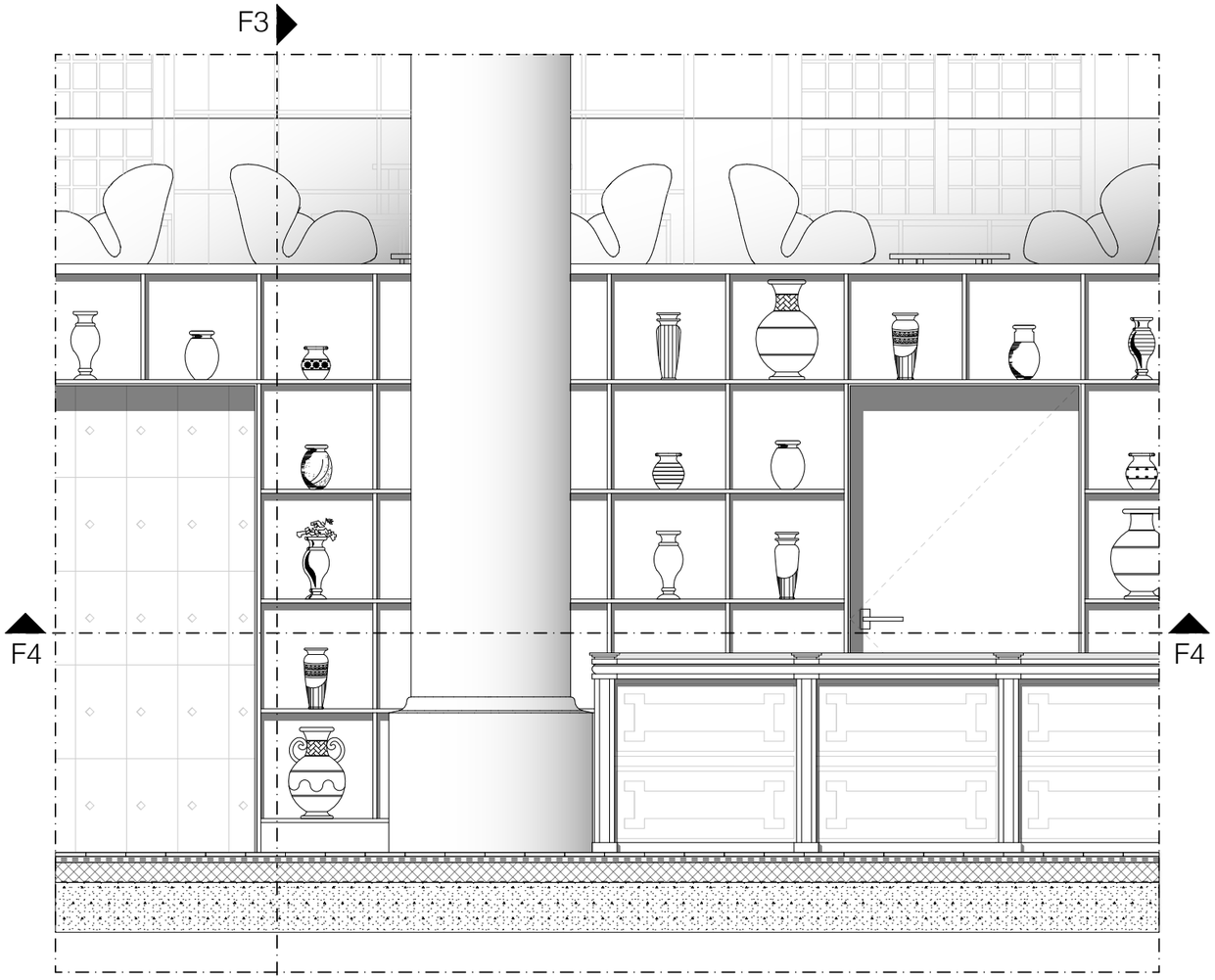
WORKSHOP EXHIBITION WALL

FRAGMENT

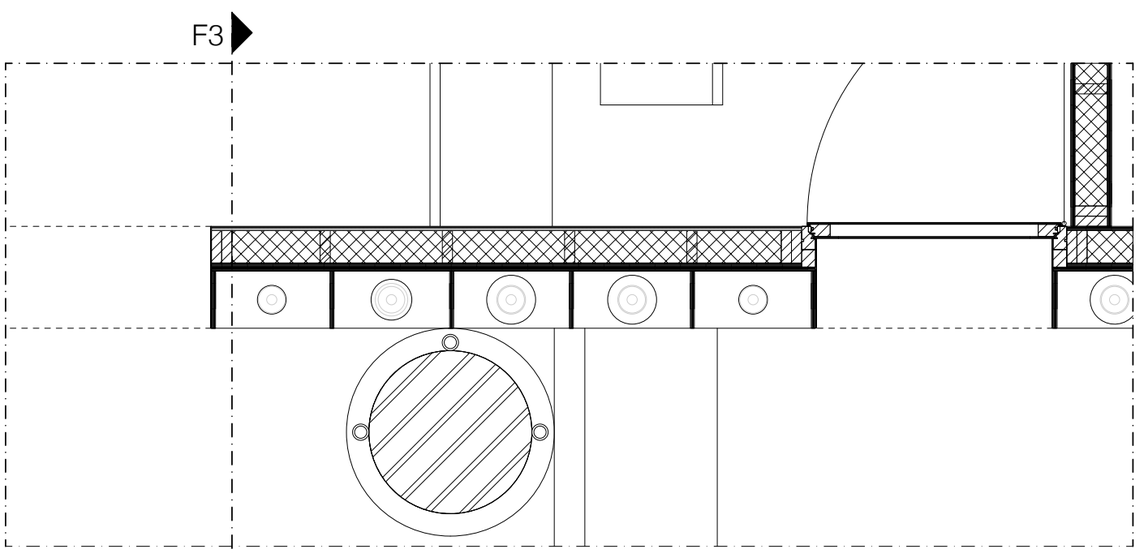
WORKSHOP EXHIBITION WALL



Vertical section F3 1:20



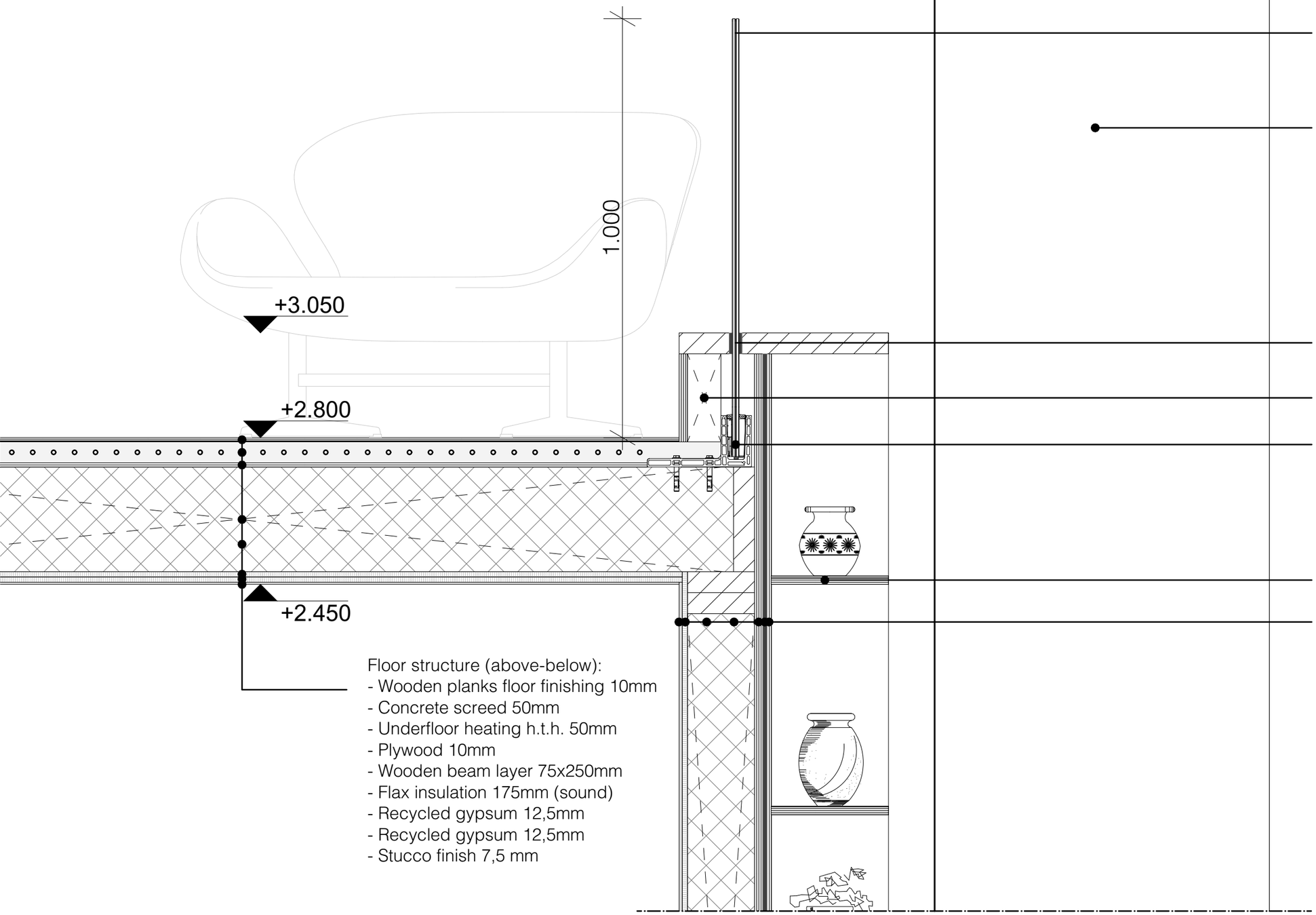
Front view 1:20



Horizontal section F4 1:20

DETAILS

DETAIL V07

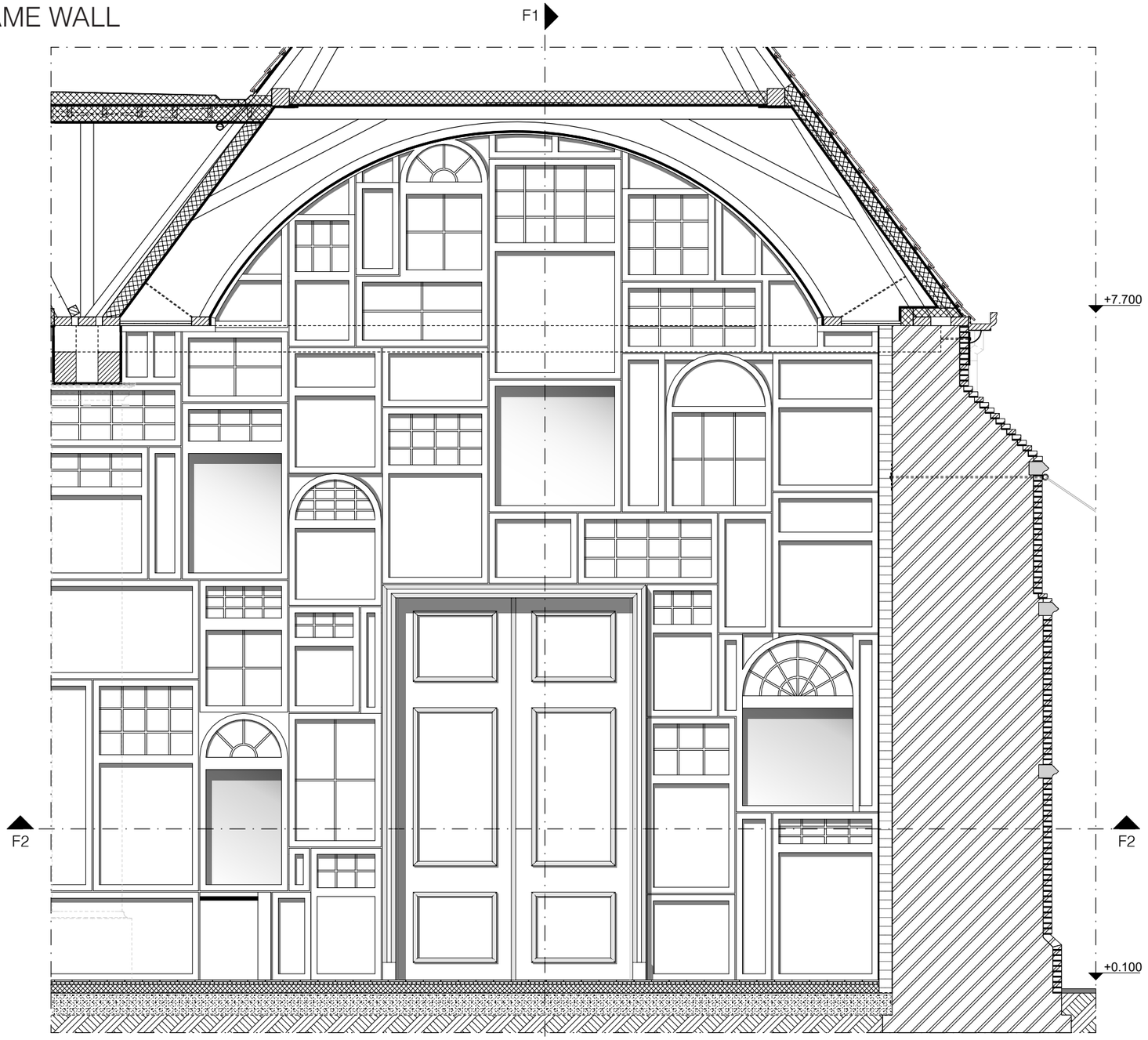


INVOLVING THE COMMUNITY

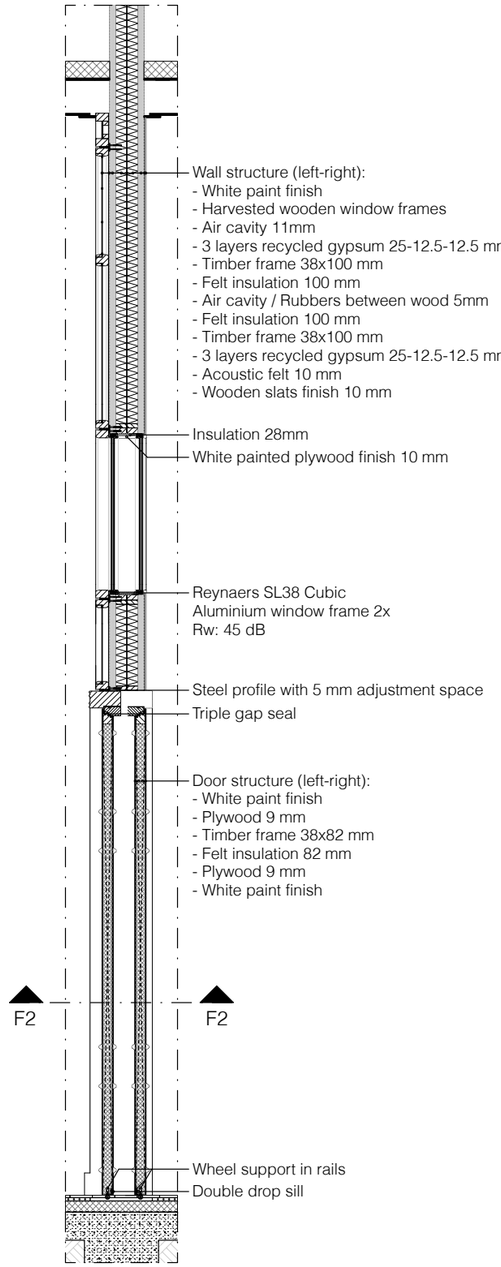
WINDOW FRAME WALL

FRAGMENT

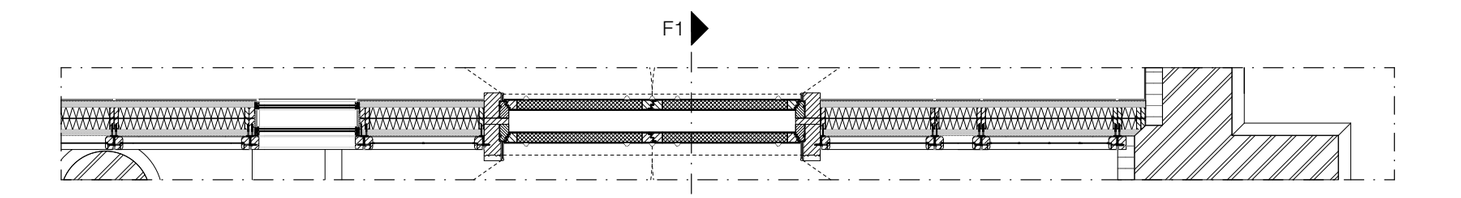
WINDOW FRAME WALL



Front view 1:20



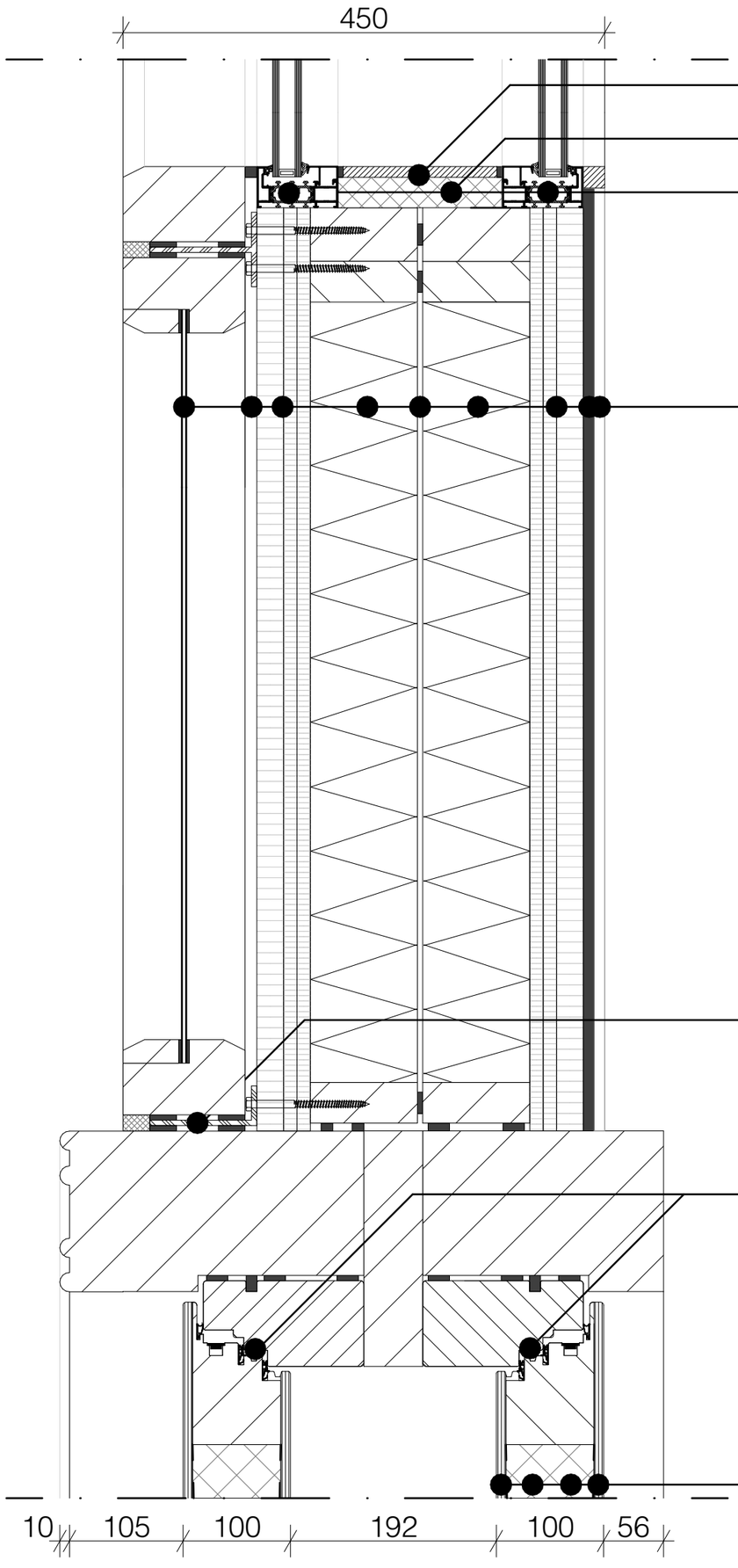
Vertical section F1 1:20



Horizontal section F2 1:20

DETAILS

DETAIL V09



White painted plywood finish 10 mm

Insulation 28mm

Reynaers SL38 Cubic
Aluminium window frame 2x
Rw: 45 dB

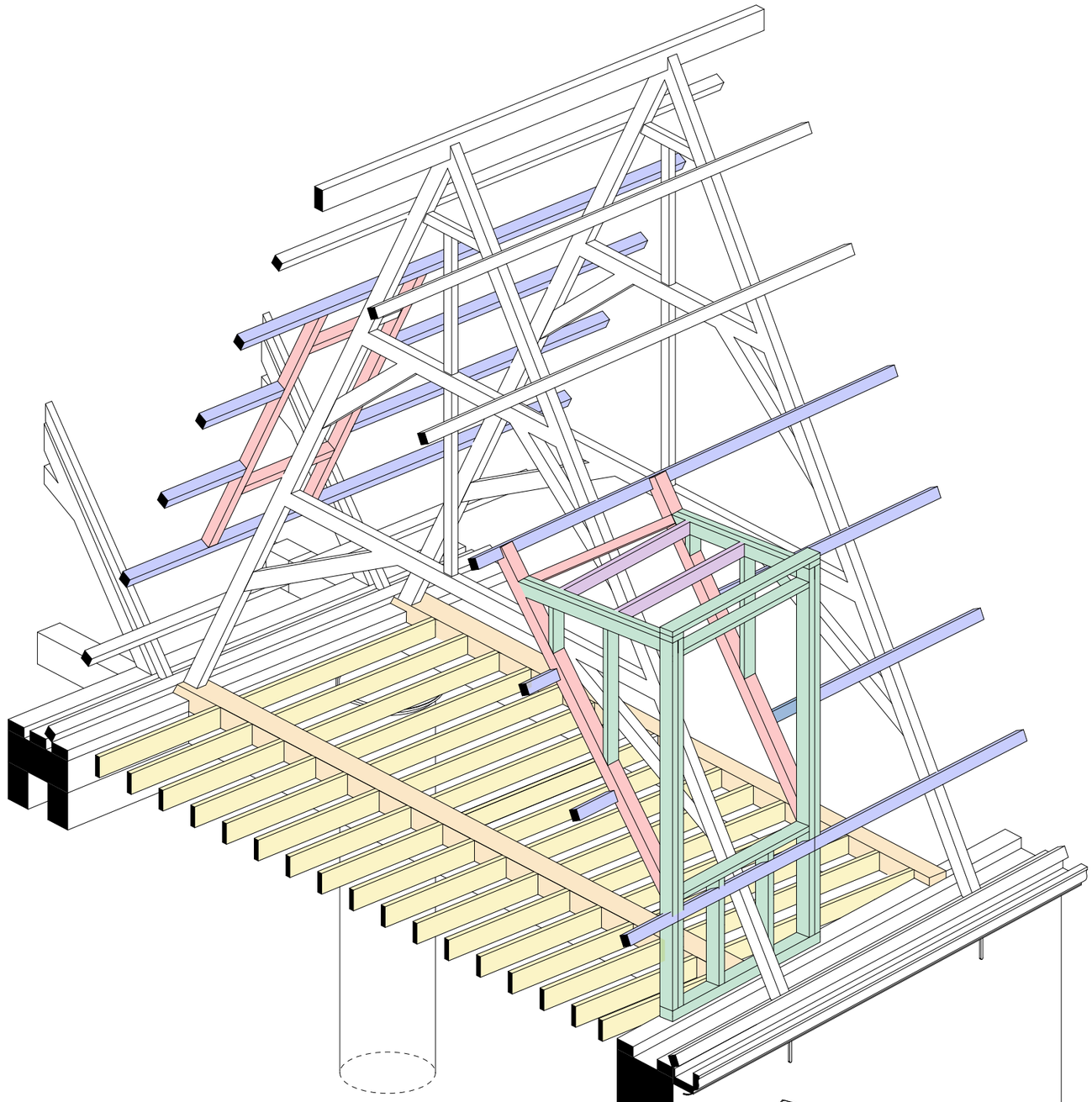
Wall structure (left-right):
- White paint finish
- Harvested wooden window frames
- Air cavity 11mm
- 3 layers recycled gypsum 25-12.5-12.5 mm
- Timber frame 38x100 mm
- Felt insulation 100 mm
- Air cavity / Rubbers between wood 5mm
- Felt insulation 100 mm
- Timber frame 38x100 mm
- 3 layers recycled gypsum 25-12.5-12.5 mm
- Acoustic felt 10 mm
- Wooden slats finish 10 mm

Steel profile with 5 mm
adjustment space

Triple gap seal

Door structure (left-right):
- White paint finish
- Plywood 9 mm
- Timber frame 38x82 mm
- Felt insulation 82 mm
- Plywood 9 mm
- White paint finish

CONSTRUCTION
READING ATTIC

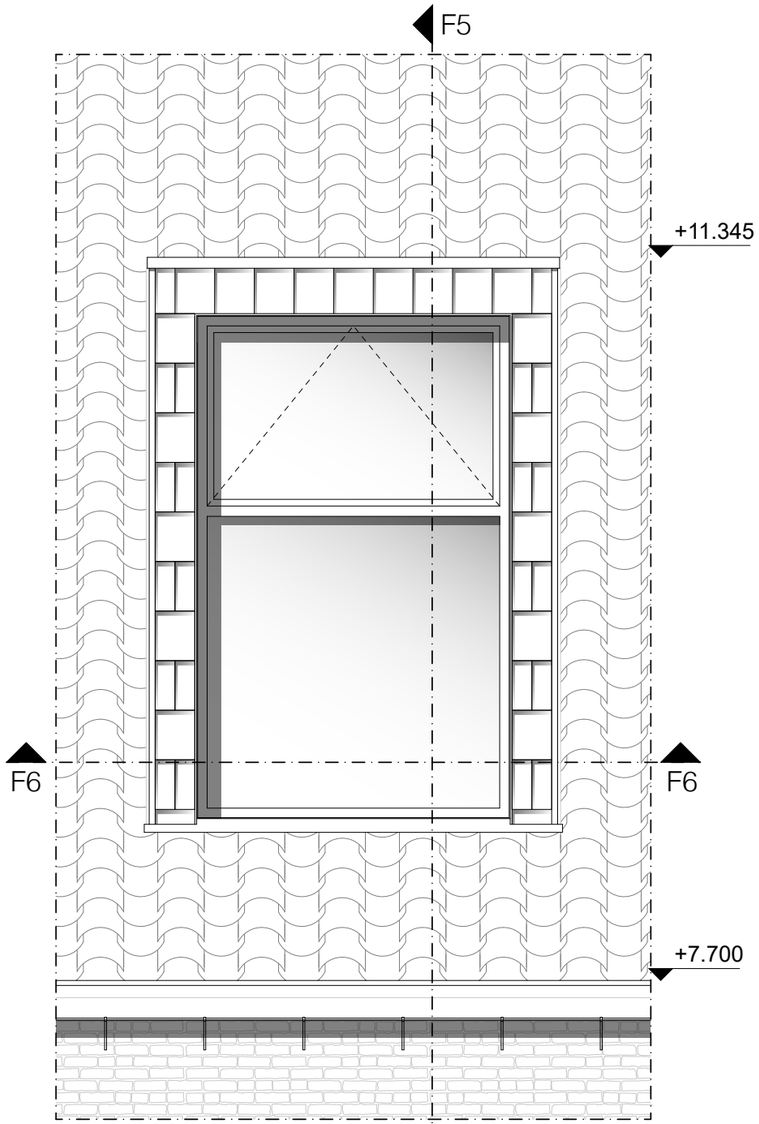


- Reinforcement wooden beam 250 x 195 mm
- Wooden beam layer 50 x 195 mm h.t.h. 400 mm
- Wooden beam 100 x 100 mm
- Trimming bar 100 x 100 mm
- Wooden timber frame 50 x 140 mm
- Wooden beam layer 50 x 120 mm h.t.h. 600 mm

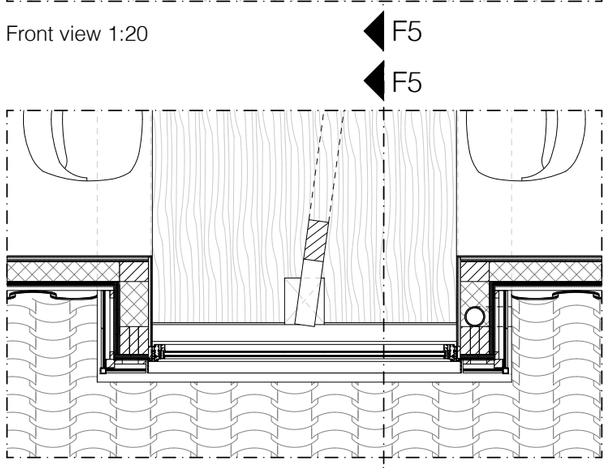
MATERIALS
READING ATTIC

FRAGMENT

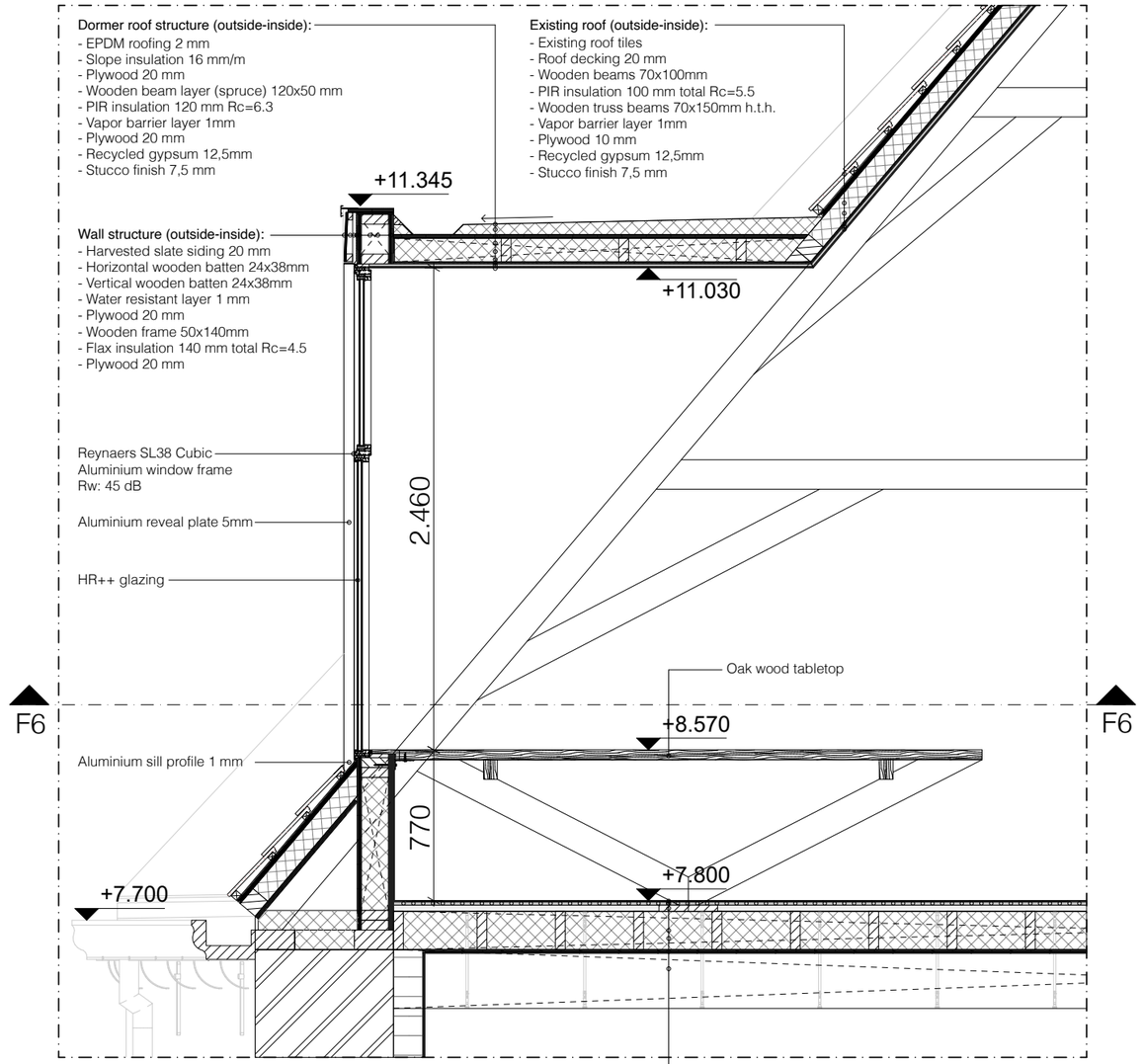
DORMER WINDOW



Front view 1:20



Horizontal
section F6 1:20



Vertical section F5 1:20

Aluminium reveal plate 5mm

HR++ glazing

Reynaers SL38 Cubic
Aluminium window frame
Rw: 45 dB

Aluminium sill profile 1 mm

Existing roof (outside-inside):
- Existing roof tiles
- Roof decking 20 mm
- Wooden beams 70x100mm
- PIR insulation 100 mm
  total Rc=5.1
- Wooden truss beams
  70x150mm h.t.h.
- Vapor barrier layer 1mm
- Plywood 10 mm

+8.570

Oak wood tabletop

Floor structure (above-below):
- Wooden planks floor finishing 5mm
- Studded plate 18mm with
  underfloor heating h.t.h. 50mm
- GIFAfloor Presto 32mm bearing layer
- Wooden beam layer 50x150mm
- Flax insulation 175mm (sound)
- Existing wooden beam layer
  250x300mm
- Remanufactured wooden
  planks ceiling 20mm

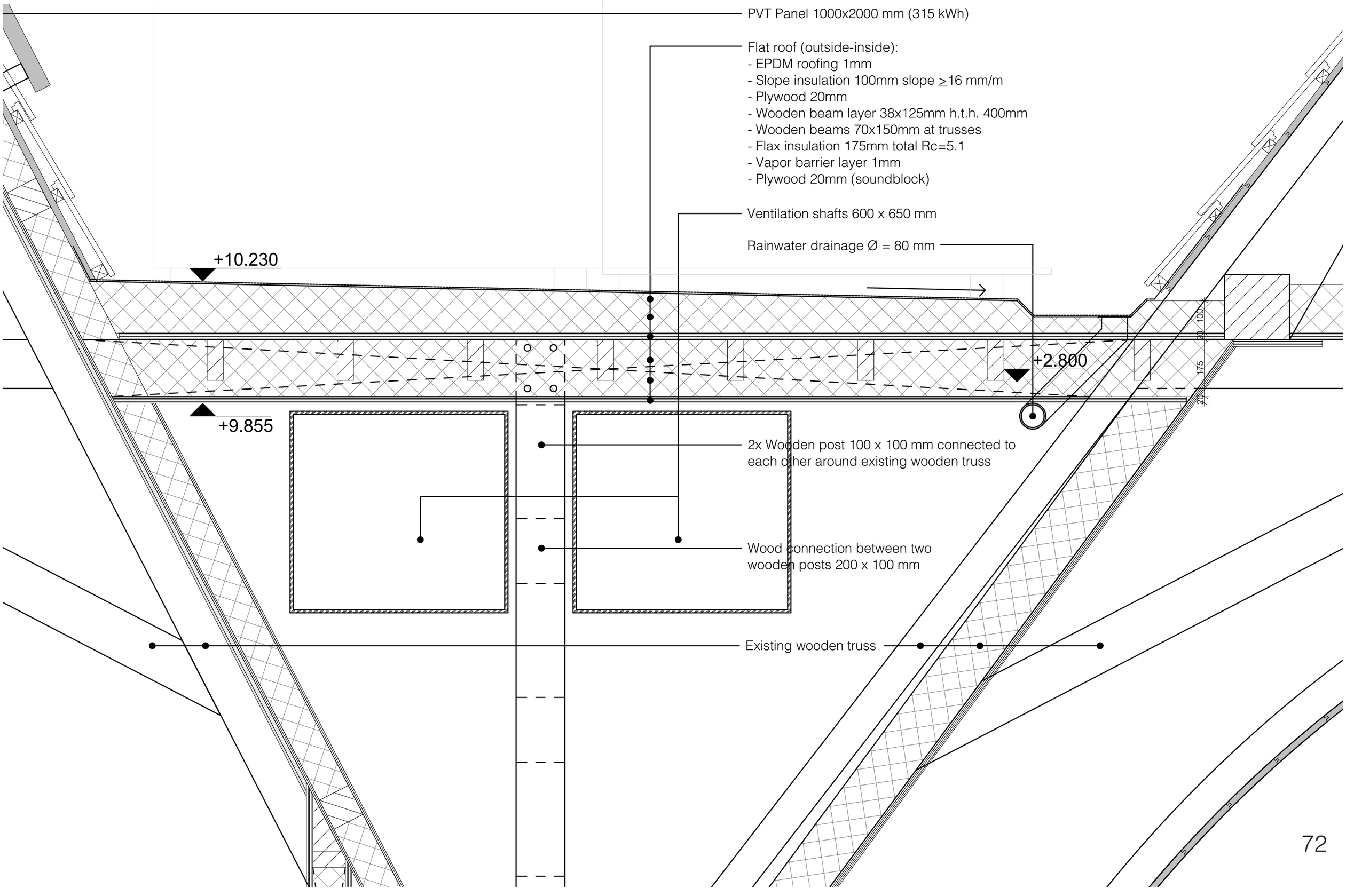
770

+7.800

+7.700

DETAILS

DETAIL V12



CLIMATE

HEATING / COOLING / INSULATION

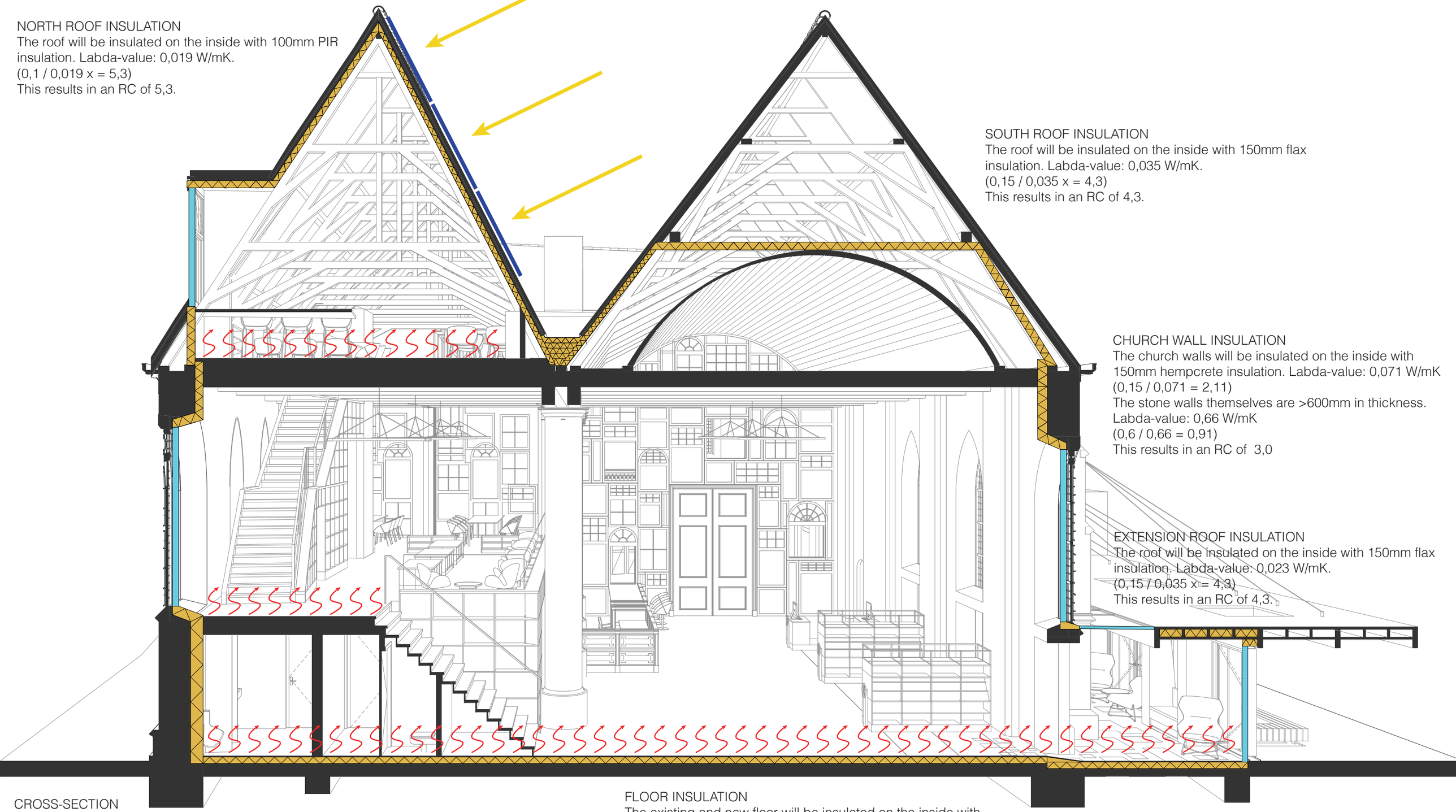
PVT PANELS ON ROOF
The roof of the church will be covered with 87 PVT panels.
The average yearly revenue is 315 kWh per solar panel.
87 x 315 = 27.405 kWh yearly revenue in total

NORTH ROOF INSULATION
The roof will be insulated on the inside with 100mm PIR insulation. Labda-value: 0,019 W/mK.
(0,1 / 0,019 x = 5,3)
This results in an RC of 5,3.

SOUTH ROOF INSULATION
The roof will be insulated on the inside with 150mm flax insulation. Labda-value: 0,035 W/mK.
(0,15 / 0,035 x = 4,3)
This results in an RC of 4,3.

CHURCH WALL INSULATION
The church walls will be insulated on the inside with 150mm hempcrete insulation. Labda-value: 0,071 W/mK
(0,15 / 0,071 = 2,11)
The stone walls themselves are >600mm in thickness.
Labda-value: 0,66 W/mK
(0,6 / 0,66 = 0,91)
This results in an RC of 3,0

EXTENSION ROOF INSULATION
The roof will be insulated on the inside with 150mm flax insulation. Labda-value: 0,023 W/mK.
(0,15 / 0,035 x = 4,3)
This results in an RC of 4,3.



CROSS-SECTION

- INSULATION
- SOUND INSULATION
- HR++ GLAZING (Rw: 50 dB)
- SOLAR PANELS
- FLOOR HEATING
- WARM / COLD WATER

FLOOR INSULATION
The existing and new floor will be insulated on the inside with 100mm PIR insulation. Labda-value: 0,019 W/mK.
(0,1 / 0,019 x = 5,3)
This results in an RC of 5,3.

CLIMATE
HEATING / COOLING / INSULATION

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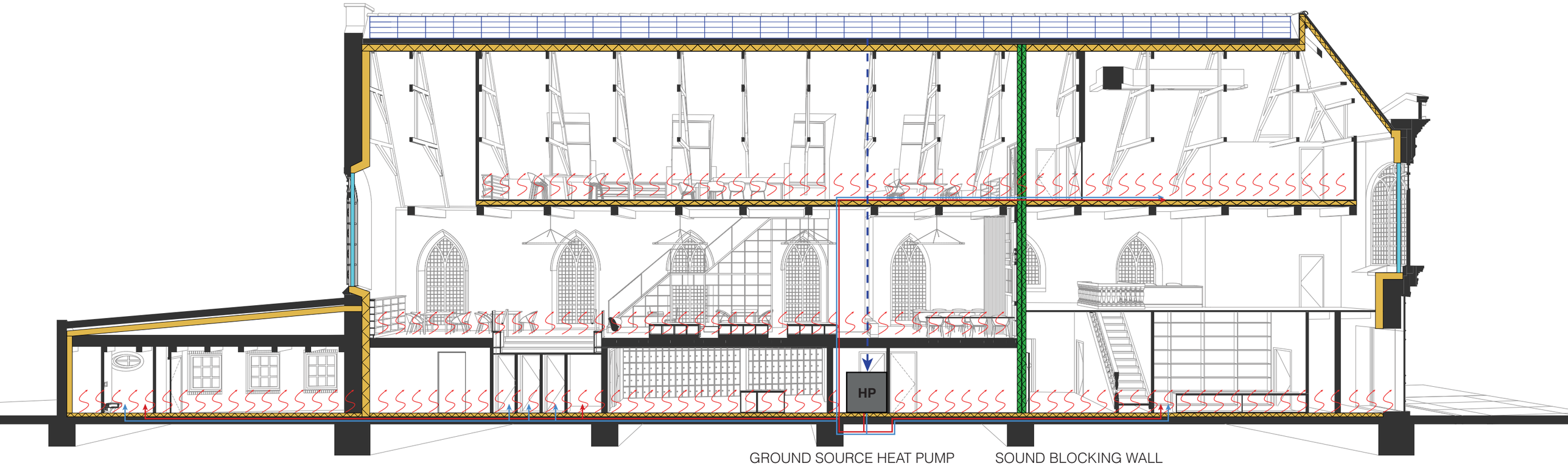
(0,1 / 0,019 x = 5,3)
This results in an RC of 5,3.



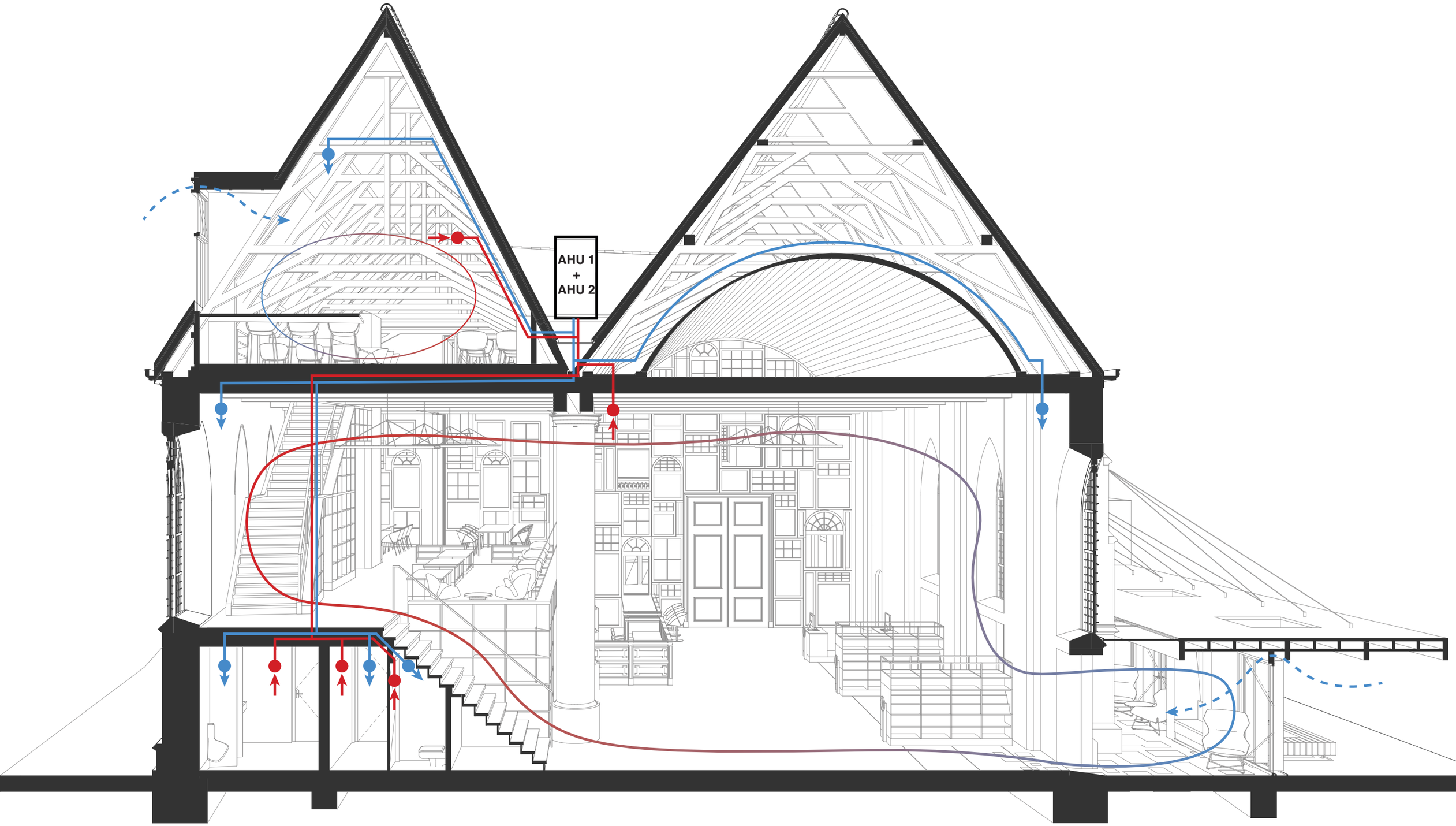
GROUND SOURCE HEAT PUMP
All vertical pipes are located in the shaft between the elevator

SOUND BLOCKING WALL
The wall extends from the ground floor untill the roof. Structure: double wooden frame with 2x recycled gipsum and air cavity in between.
Rw: 78 dB

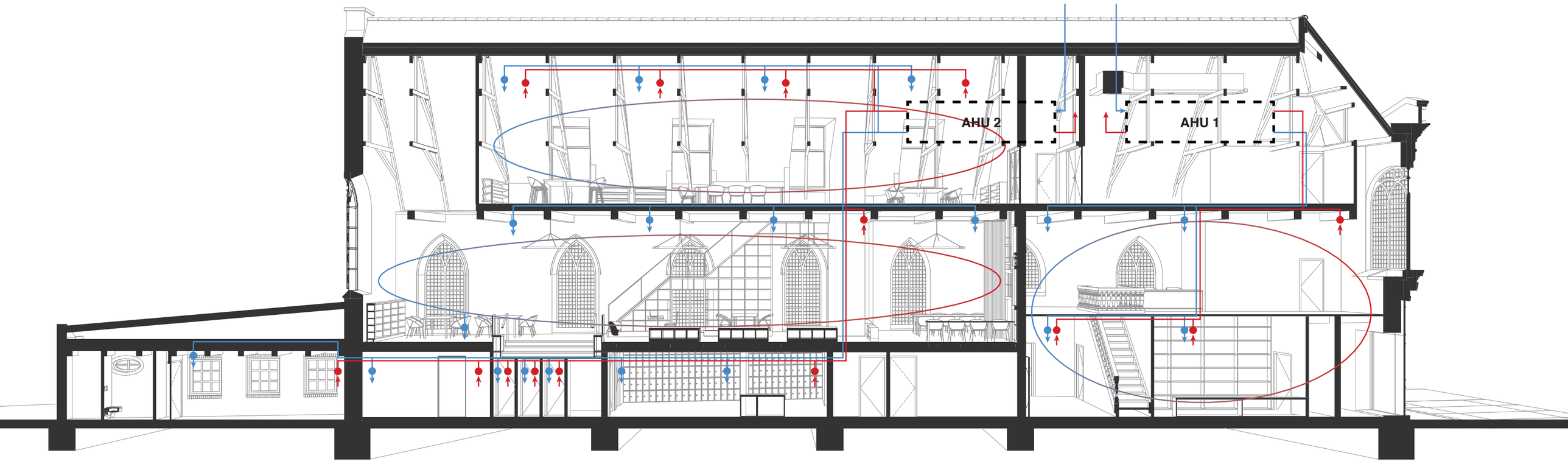
LONGITUDINAL SECTION

- INSULATION
- SOUND INSULATION
- HR++ GLAZING (Rw: 50 dB)
- SOLAR PANELS
- FLOOR HEATING
- WARM / COLD WATER

CLIMATE
VENTILATION



CLIMATE
VENTILATION



FRESH AIR SUPPLY

DIRTY AIR EXTRACTION

NATURAL VENTILATION

AIR CIRCULATION

CHURCH MODEL

INTERVENTIONS & RE-USE

CHURCH MODEL

INTERVENTIONS & RE-USE

CHURCH MODEL

INTERVENTIONS & RE-USE

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