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INTRODUCTION

The project presented is a two-story building located in Cambridge, Ontario. This building has two different parts tied together; one is a concrete mass embraced by the second and dominant part which is a box consisting of crossing arcades with brick finish. The building hosts refugees suffering from PTSD and house different functions related to story-telling as the most important treatment for PTSD. Three major spaces in the building are: story-telling hall, story-reading/writing hall (more or less a library) on the first floor and an amphitheater located on the second floor within the concrete mass. On the street facing sides (north and east) of the building there is a roofed **semi-open** arcade running around the building which protects pedestrians from sun or rain and works with interior spaces such as cafeteria through operable windows. In the central area of the project, there is a courtyard providing natural light, view and ventilation and is accessible from all the functions surrounding it for instance the library or the lobby.

The most critical challenge in the design process was to maintain a thick section for exterior walls to give them a natural brick masonry appearance while providing enclosure layers required to meet the requirements of the Canada design code and the LEED standards. As it will be explained in the envelope section, having thick walls resulted in a well-insulated enclosure assembly with minimum amount of thermal bridging. Moreover, a particularly designed detail was required to stop heat gain/loss by conduction through the externally extended continuous concrete slab at exterior colonnade roof. Another critical aspect of the design was the detail of the concrete wall which is **exposedly continues from exterior to interior space**.

Designing a building with both day and night time functions resulted in using both passive and mechanical strategies. Passive strategies taken mainly contribute sun and daylight and solar heat gain where there is a requirement for comprehensive sun study for the site, and mechanical systems are also combined with thermal energy to reduce the use of Fossil energy.

The following figures [1-5] show the main drawings for the design:

FIGURE 1
Exterior shot

FIGURE 2
First Floor Plan

1. Entrance
2. Lobby
3. Bike Rack
4. Cafe
5. Reception
6. Lost & Found Information
7. Writing/Reading Center
8. Storytelling Hall
9. Conference Room
10. Courtyard
11. Restroom
12. Fire Staircase
13. Elevator
14. Theatre
15. Makeup Room
16. Bathroom
17. Day Care
18. Pray Room
19. Mental Health Care (Consulting)
20. Class-room
21. Office
22. Mechanical room
22. Recycle bins

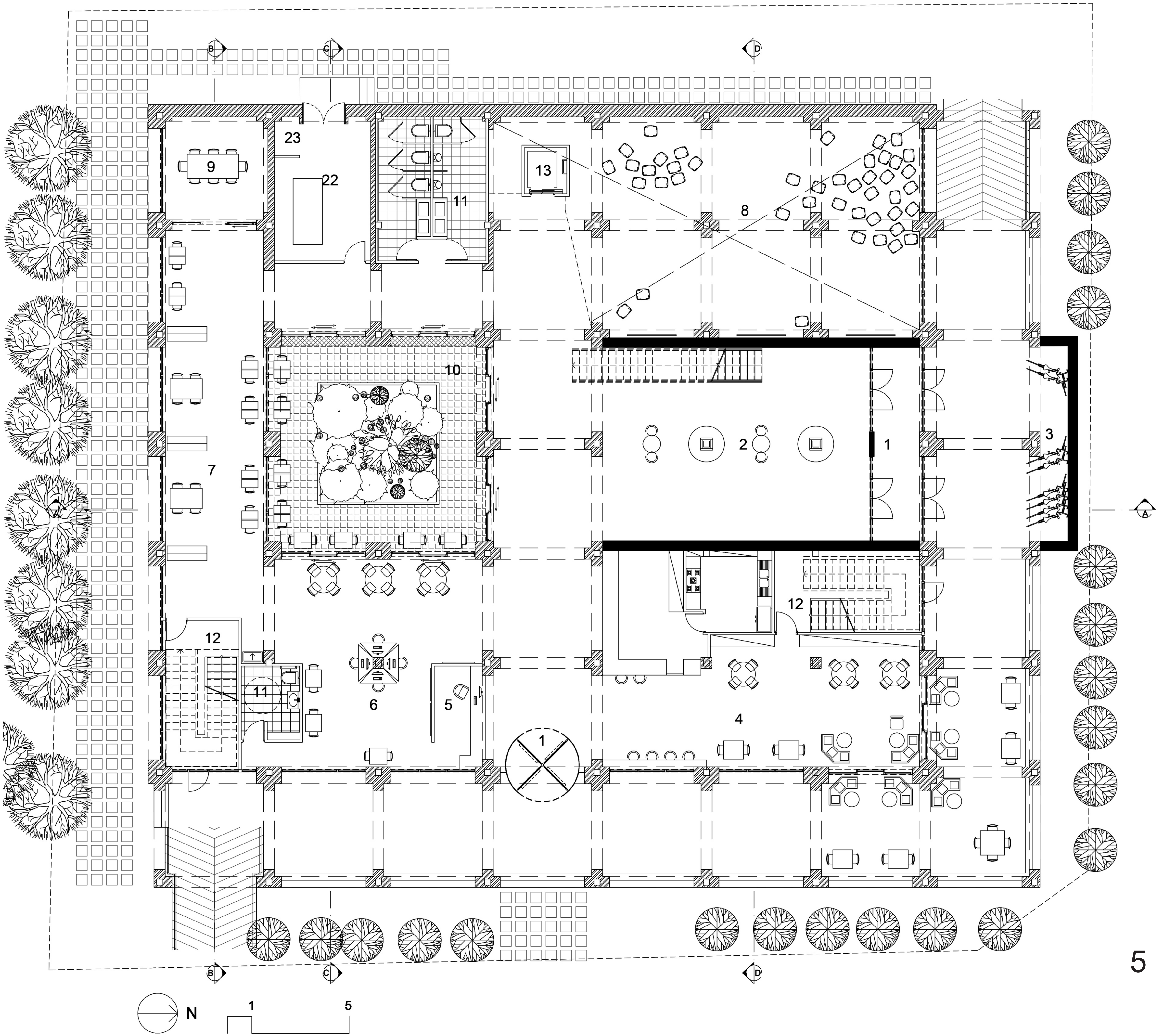

FIGURE 3
Second Floor Plan

1. Entrance
2. Lobby
3. Bike Rack
4. Cafe
5. Reception
6. Lost & Found Information
7. Writing/Reading Center
8. Storytelling Hall
9. Conference Room
10. Courtyard
11. Restroom
12. Fire Staircase
13. Elevator
14. Theatre
15. Makeup Room
16. Bathroom
17. Day Care
18. Pray Room
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20. Class-room
21. Office
22. Mechanical room
22. Recycle bins

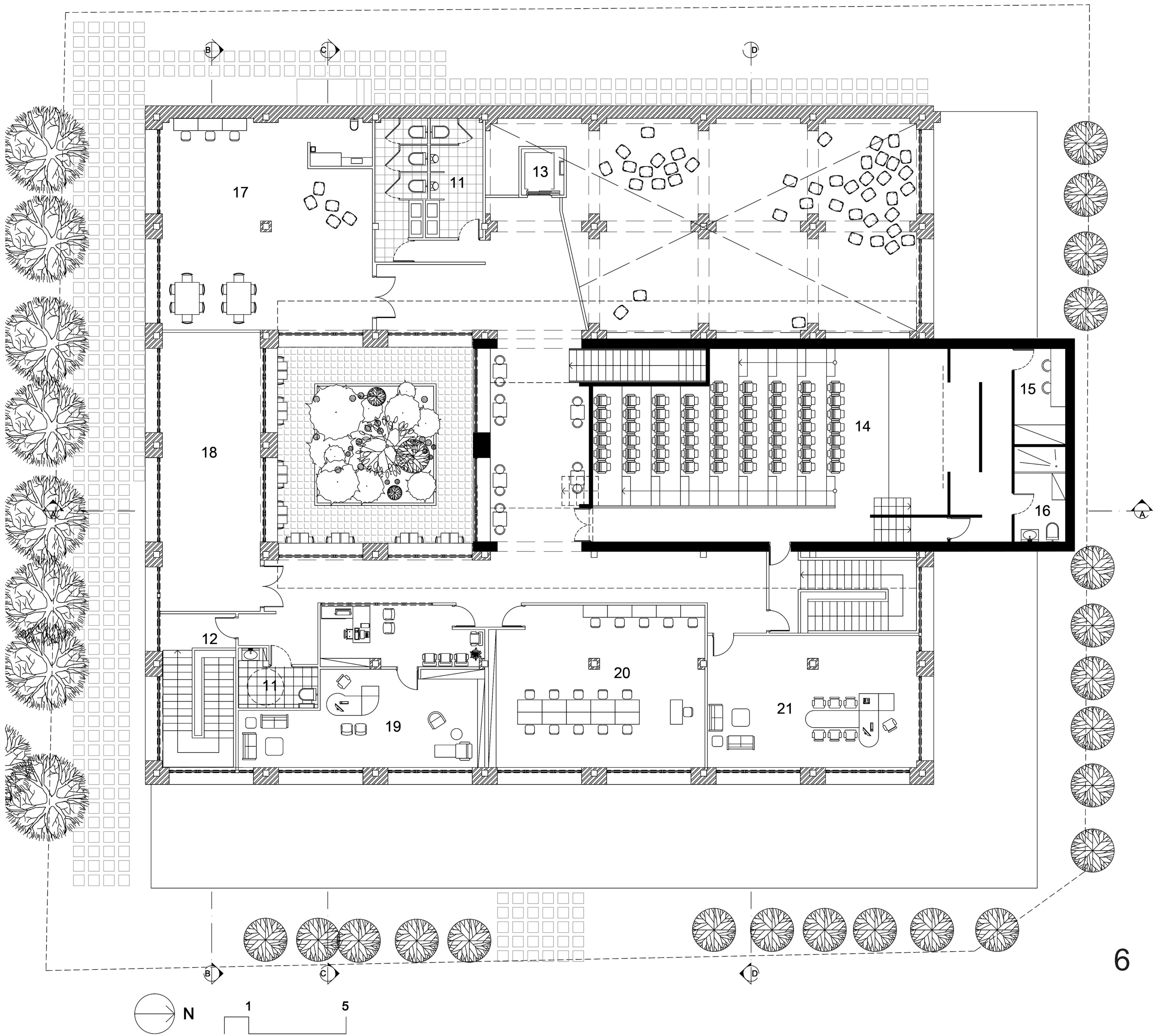
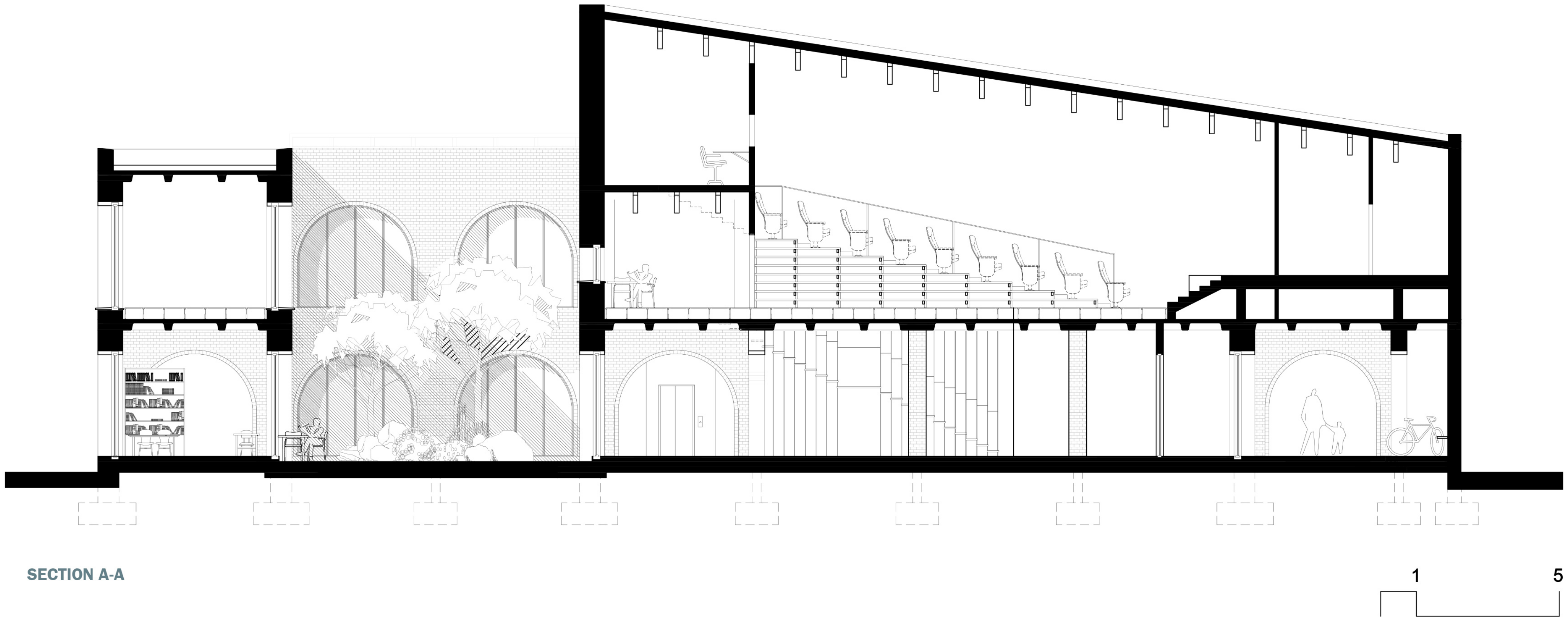
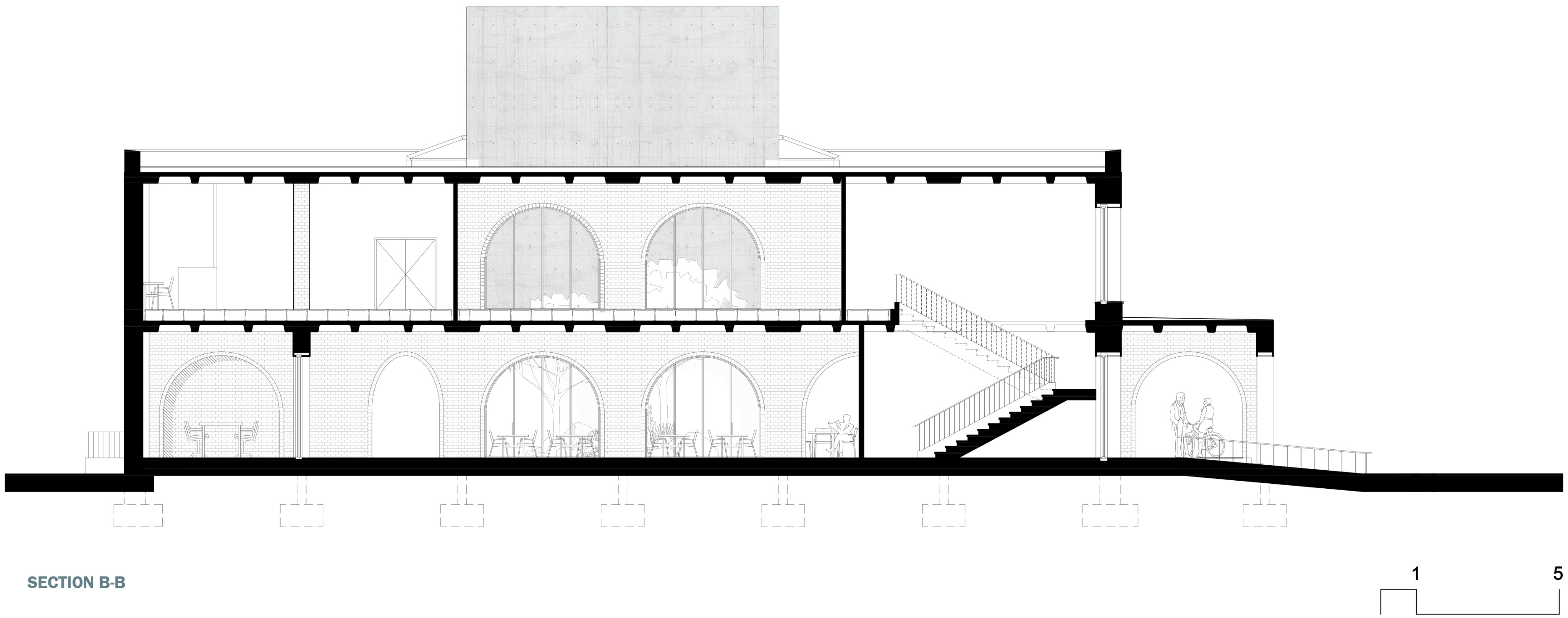


FIGURE 4
Sections A-A & B-B

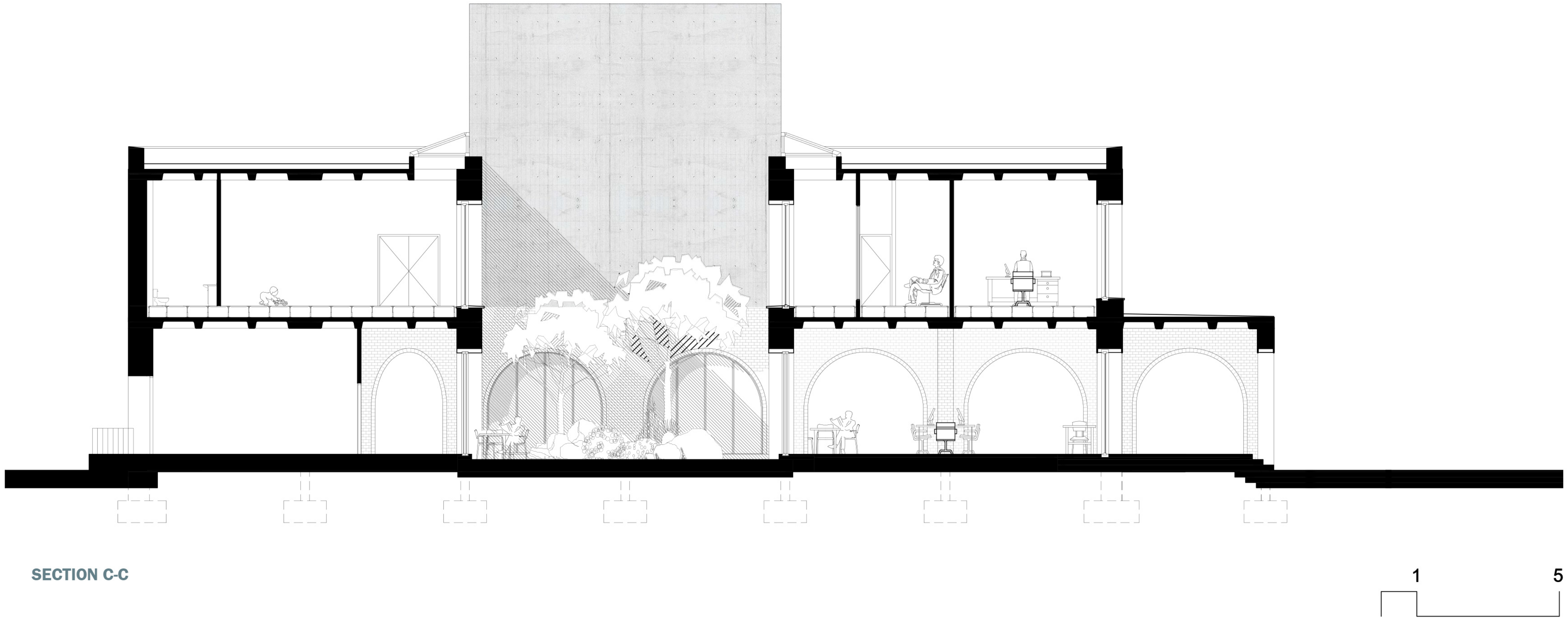


SECTION A-A

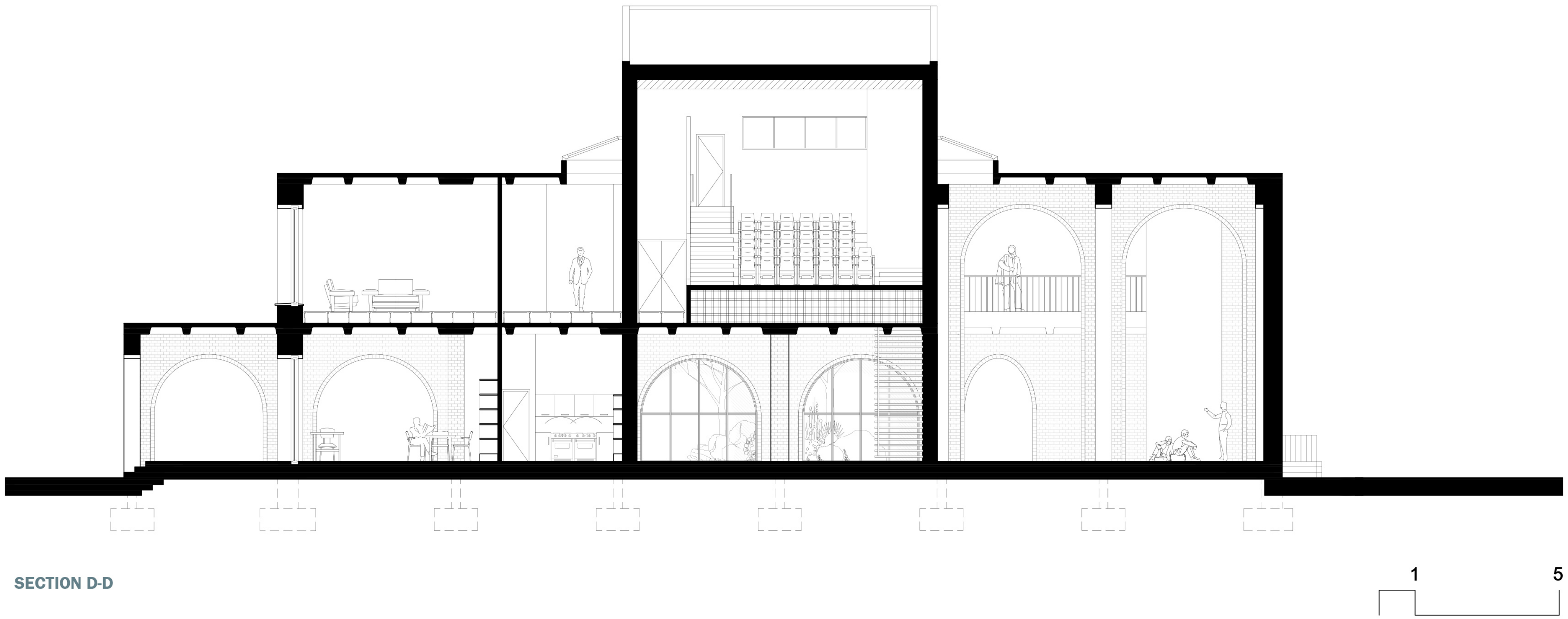


SECTION B-B

FIGURE 5
Sections C-C & B-B



SECTION C-C



SECTION D-D

STRUCTURE

The structural system of the dominant part of the project is based on a 4.5 by 4.5 (center to center) meter grid system of reinforced concrete columns [250mm * 250mm] supporting the roof system which is reinforced waffle concrete slab(figure 7). The concrete columns are covered with brick veneer. The brick veneer itself creates a form of an arch between two columns. A temporary wooden structure is used to support the arch during the construction and after completion of the form it can be removed due to the self-supportive characteristic of brick arches(figure 6). This peculiar characteristic of brick arches leads to omitting the lintel required in conventional openings constructions.

The structural system of the concrete mass in this project is cast in place concrete sandwich wall (reinforced concrete with a layer of thermal insulation in the middle) supporting glulam beams with metal deck on top, and a wooden framework system is used to support the tiered seating of the amphitheater(figure 7).

Reinforced concrete was used as the major structural material due to its high compressive strength, decent tensile strength, and high stiffness preventing deflections in the structural components, i.e. slabs. Also, the material is resistant to fire, it's very durable, and it performs well within many environmental conditions. Reinforced concrete is a readily available material and an economically reasonable structural solution. The materials used for the structure require very minimal maintenance and provide a long service life, allowing the building to last longer and to stay in a good shape.

Install an HVAC system within the raised floor and vertical movement of the mechanical components require having holes in the waffle slab which are molded into the roof during pouring the concrete of the waffle slab by inserting cylinder shaped molds in the center of the squares within the slab.(1)

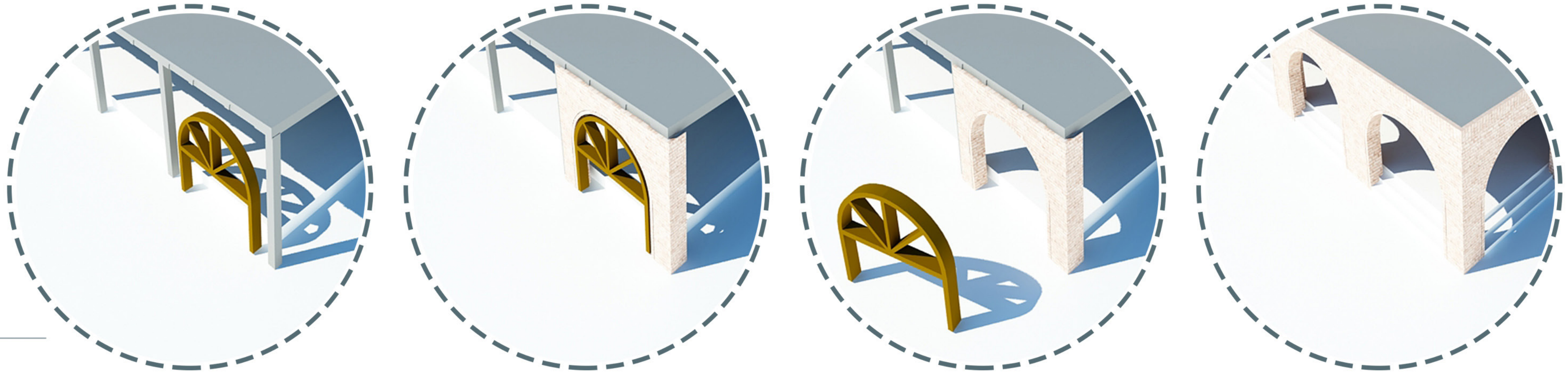


FIGURE 6

A temporary wooden structure is used to support the arch during the construction and after completion of the form it can be removed due to the self-supportive characteristic of brick arches.

FIGURE 7
Structural Axonometric

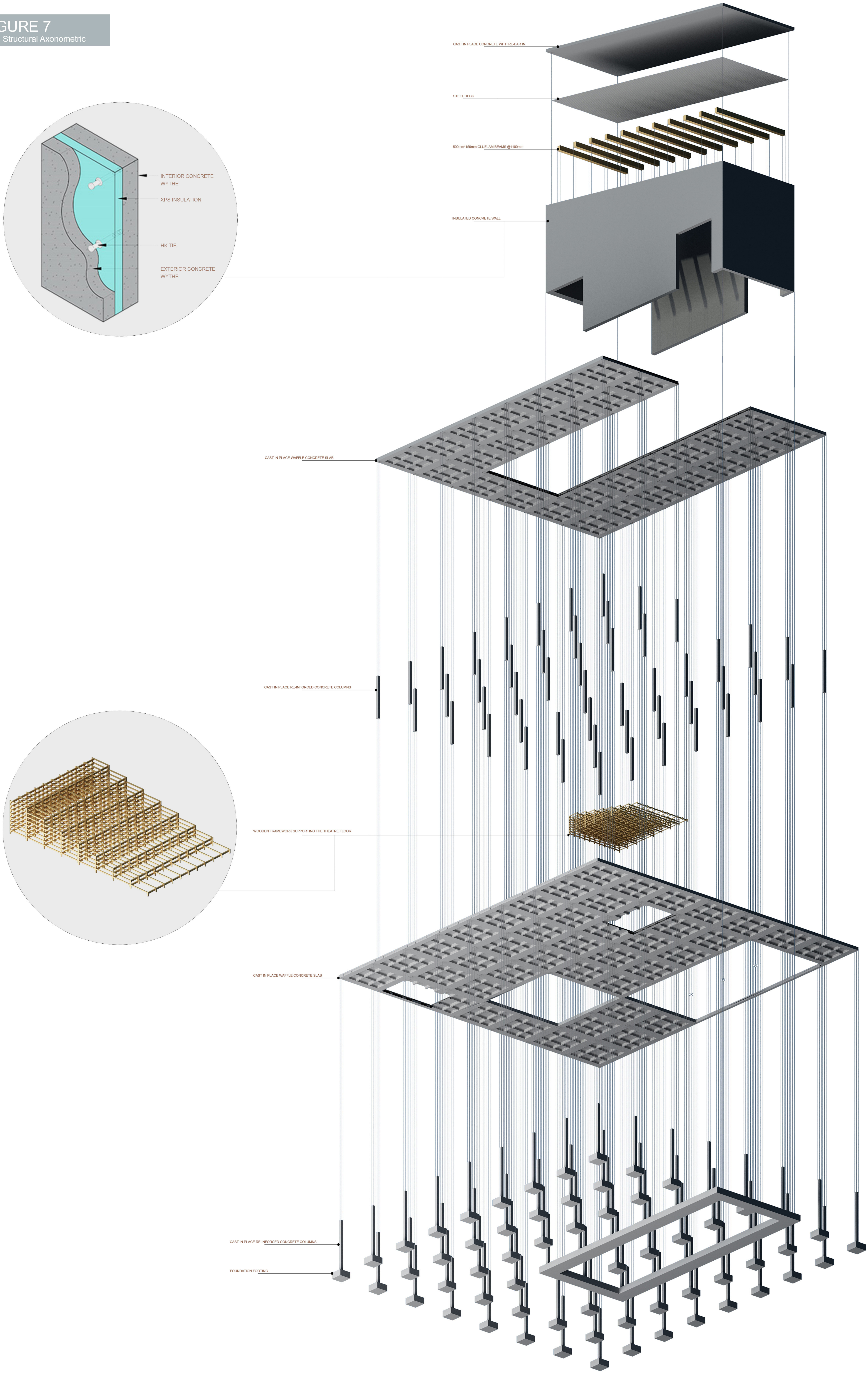
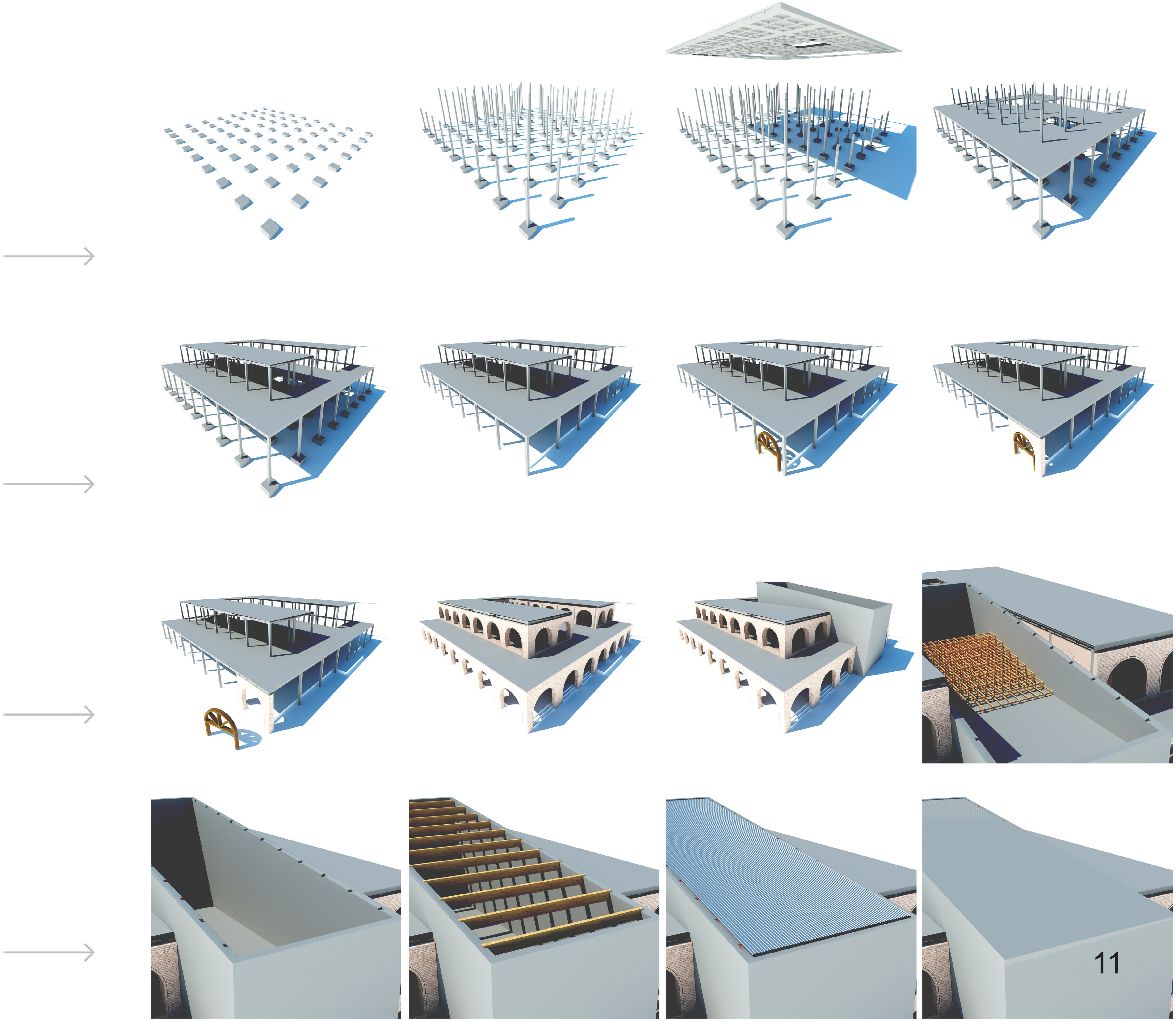


FIGURE 8
Stages of the construction



SKIN AND ENVELOPE DESIGN STRATEGIES (10)

The main enclosure assembly of the building is a brick finish covering the concrete structure and envelope layers from the inside and outside. To provide a thick masonry appearance, two layers of insulation are installed over the structure within the skin.

Support layer:
Steel stud framing system filled with Batt insulation is used as the support layer of the enclosure. Since at arch shaped windows bricks support each other from falling, No lintel is required to carry the downward physical load above the windows. Also to hold the brick cladding from lateral movement, thermally broken brick ties used on the exterior side of the wall while convictional metal ties used on the interior side.

Control layers:

Thermal: having two layers of insulation, one Batt insulation layer over the structure and a layer of rigid insulation over the steel stud framing system filled with Batt insulation, minimizes the amount of heat gain/loss through thermal bridging.

Air/Water: To ensure good indoor air quality and to reduce inward airflow and its attendant comfort problems, a continuous air barrier is provided within the enclosure and all over around the building in walls, roofs and windows. A continuous and air-impermeable layer, furthermore, results in heat gain/loss reduction and sound and odor transmission blockage.

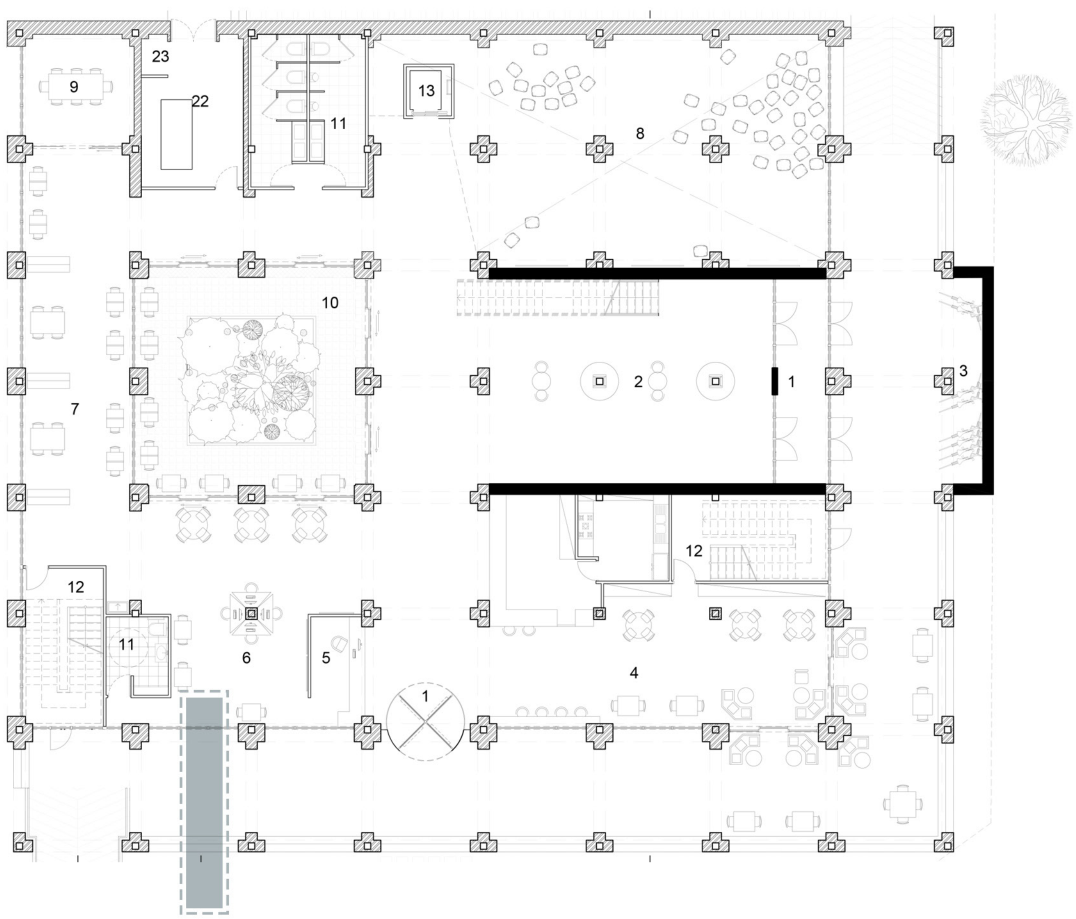
Vapor: There is a layer of vapor barrier installed on the interior (warmer) side of the insulation to avoid condensation within the enclosure. Condensation occasionally causes damaging amount of wetting, and leads to damaging the structure or mould growth and stain.

Glazing elements: The arch shaped glazing elements in the building are all double glazed, one Low-E coating, filled with Argon. These storefront products have an R-value around 3.8 K. m^2/W and a U-value of 1.47 W/m2 °C. Due to low angle sun radiation from west side, there is no glazing element on that side of the building to avoid gaining solar heat and low angle light with all of their intendant comfort problems. Moreover all the glazing components sit inside the thick exterior walls (closer to the interior edge of the wall). This results in not only emphasizing on the depth of the openings on the façade by making shadows on the windows but also regulating the solar radiation and heat in a passive way which is explained in the “Efficient Design Strategies section” of this report.

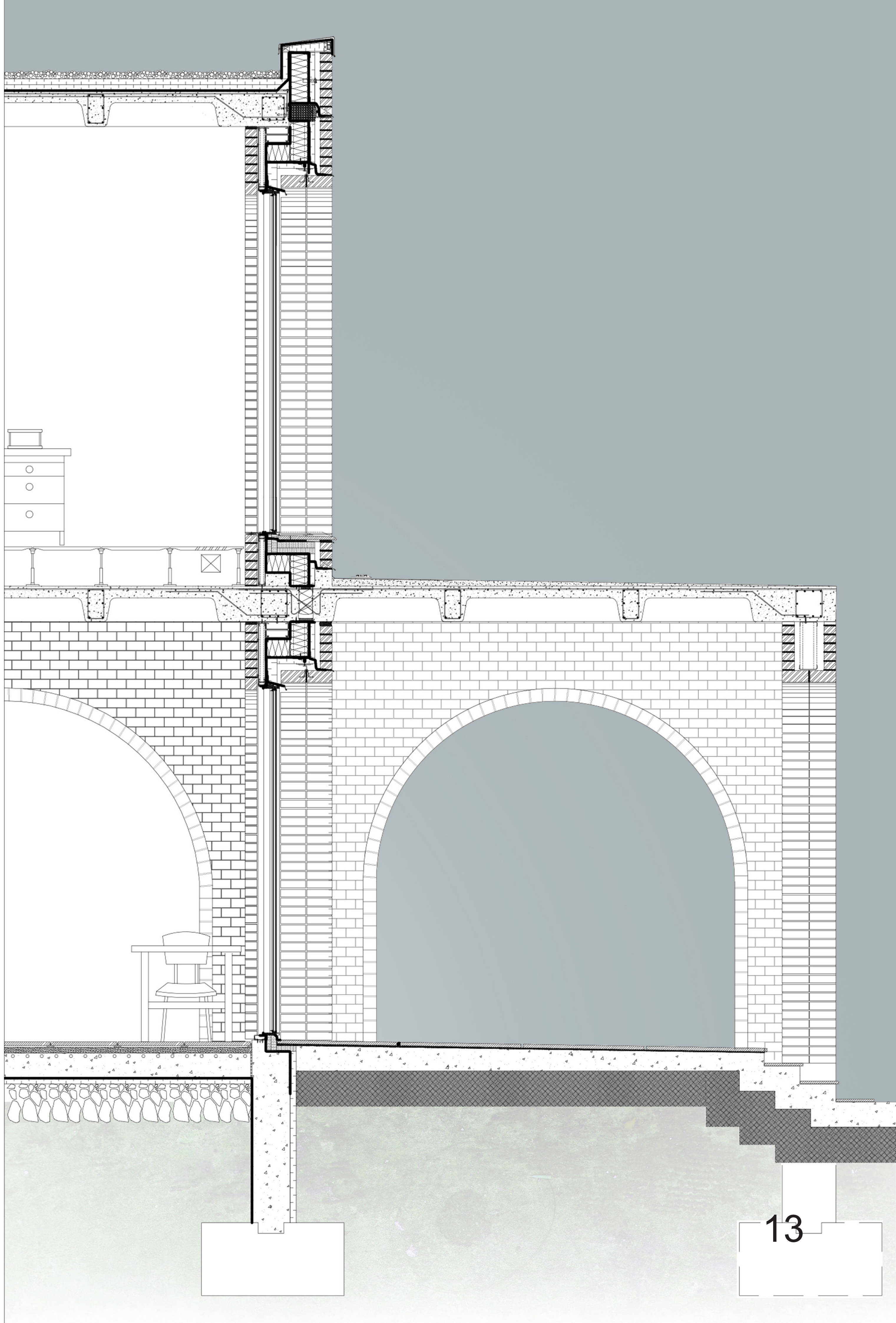
Finish: In addition to suiting the concept of the design, brick is a material used in many important buildings in the region where site is located and helps the building to coordinate with its surrounding. At the beginning the intention of the design was to have actual masonry brick walls, but for many reasons brick veneer is preferred, although the wall assembly designed to be thick to convey a more natural feeling of a brick building. Brick veneer is chosen for the following functional and stylistic qualities: 1.It is relatively easy to install, since there is only one layer of masonry. 2.It is generally more affordable. 3.It requires a relatively simple foundation and support system. Solid brick buildings, by contrast, are very heavy, and require substantial footing and foundation systems. 4.The air cavity between the brick and the other layers of building envelop helps to keep moisture out of the home and acts as an effective insulating space. Solid brick walls are poor insulators, and also may allow moisture to penetrate exterior walls and cause problems in the building. 5.Like solid brick, veneer is durable and fireproof, it looks fancy, and it requires little maintenance and no paint or stain.

The other enclosure assembly of the project, as it is shown in figure number 7, is a concrete wall with a layer of insulation in the middle.

FIGURE 9
Wall Section



Location of the Wall Section on Ground Floor Plan



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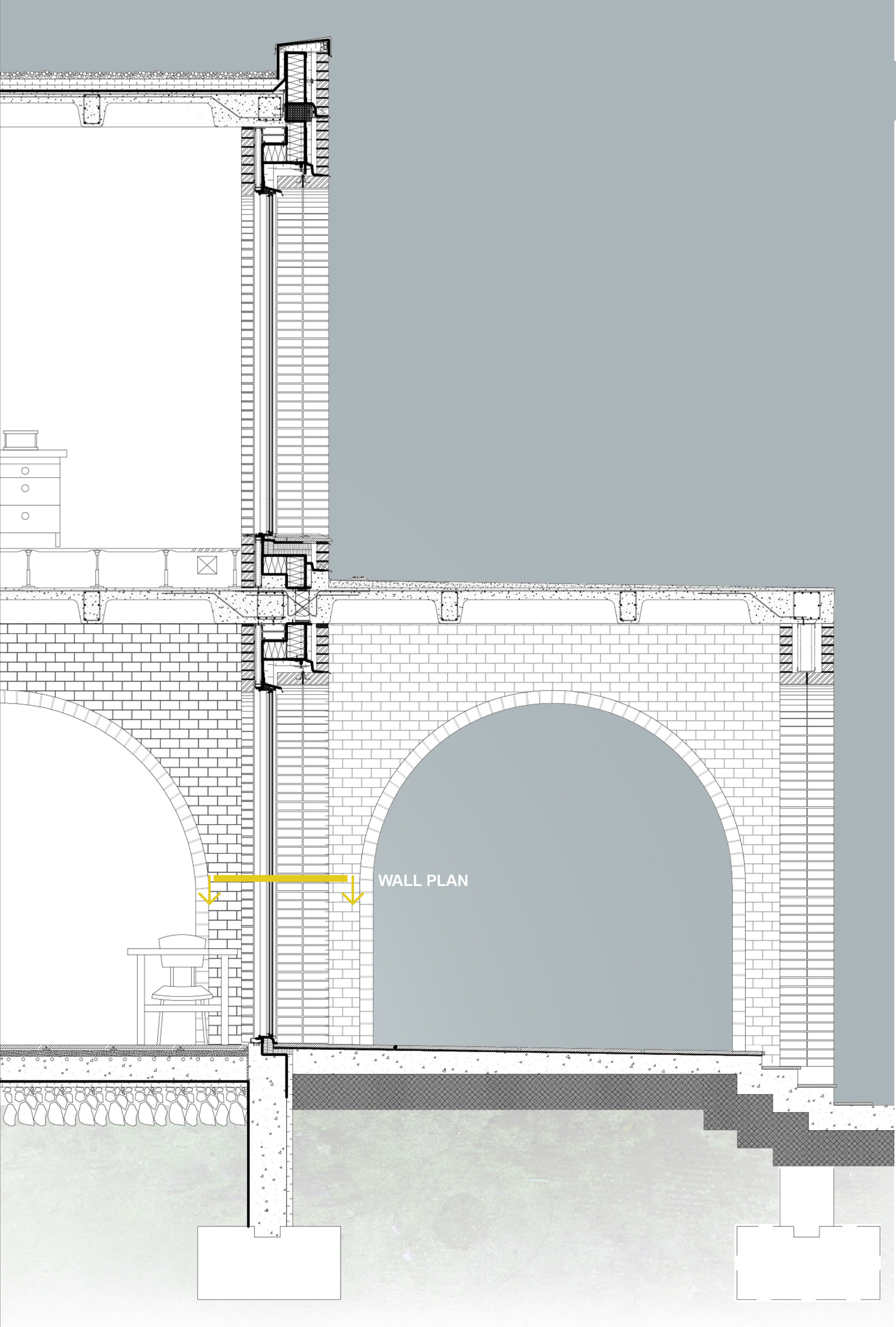


FIGURE 10
Detail 1.

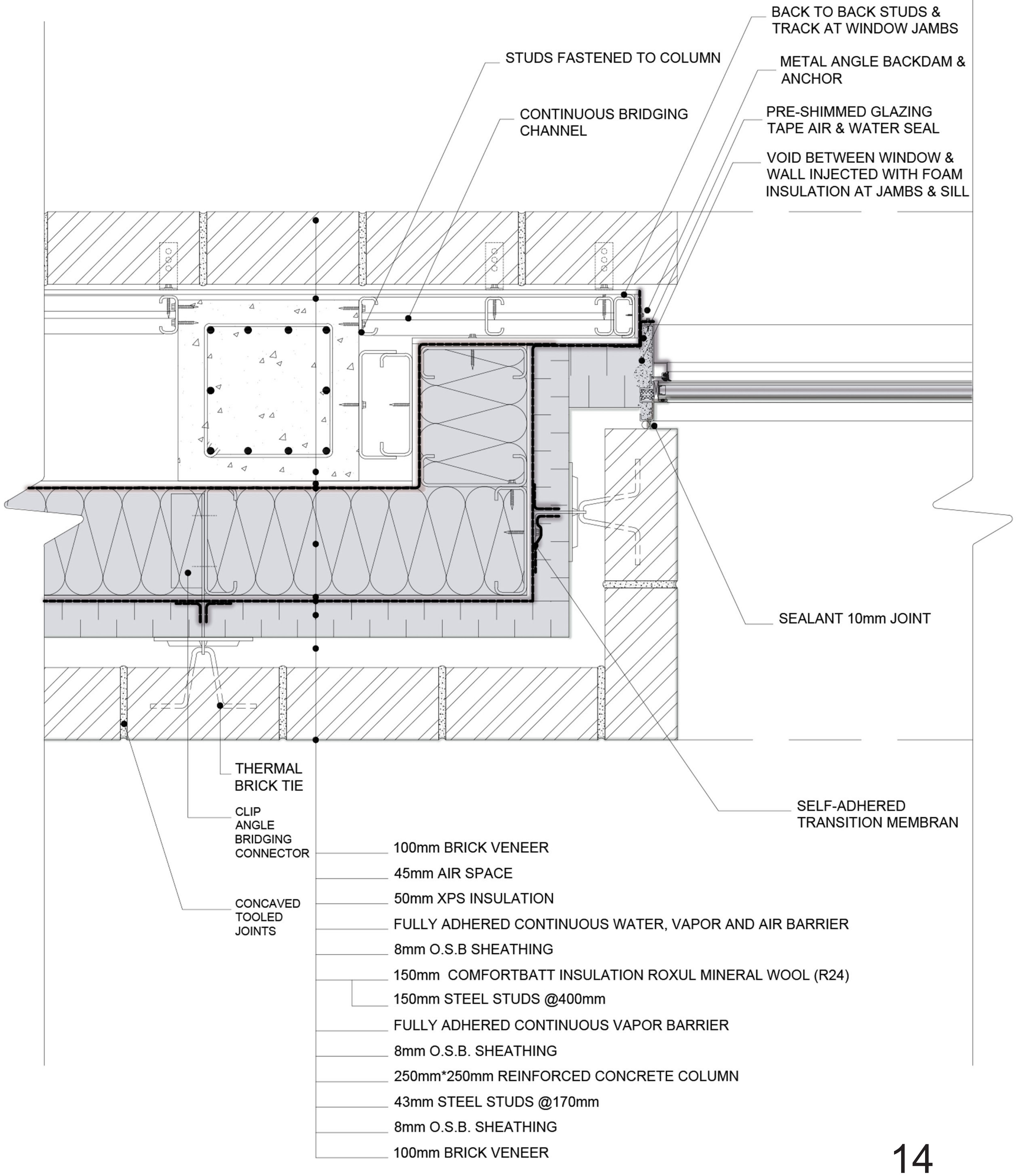
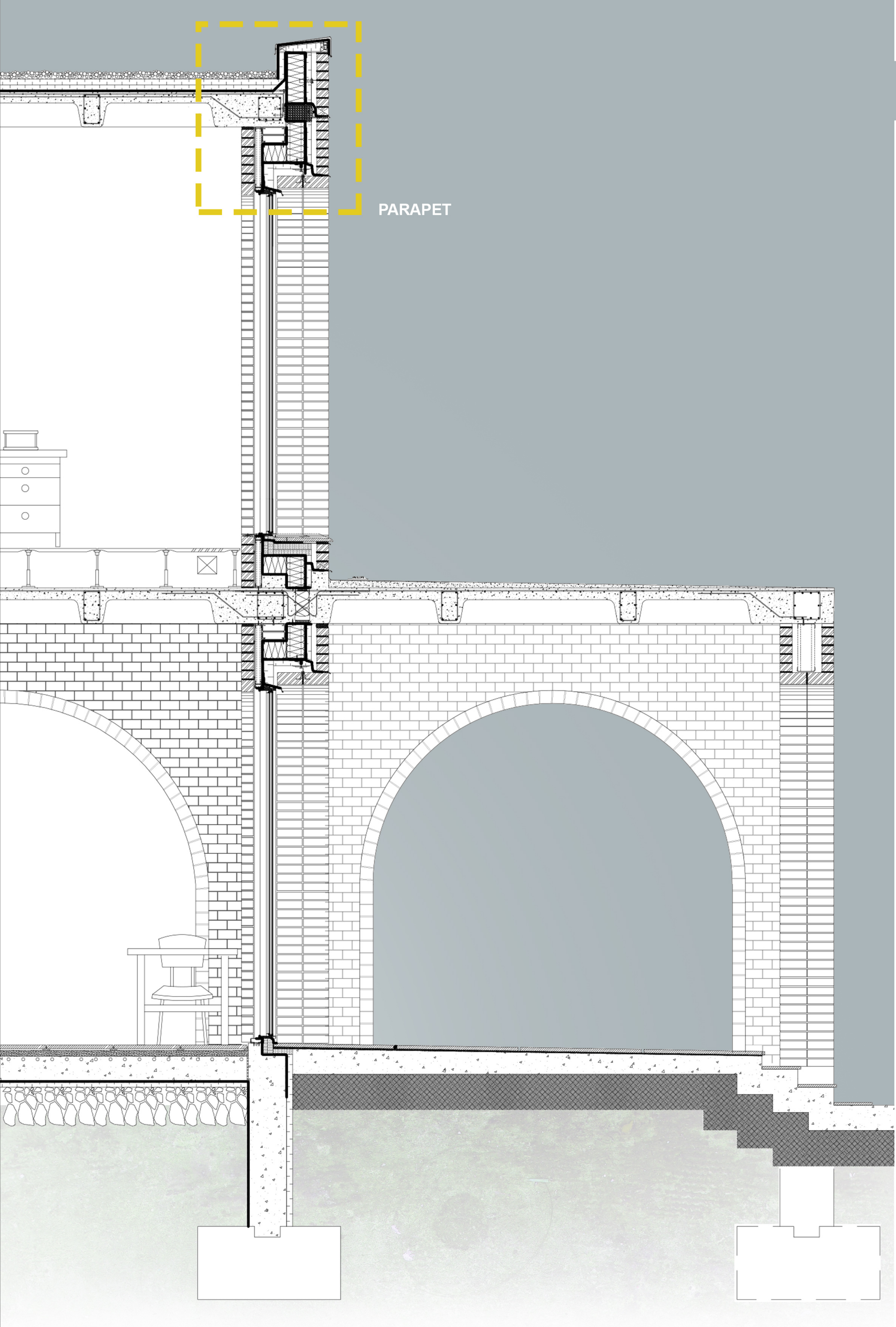
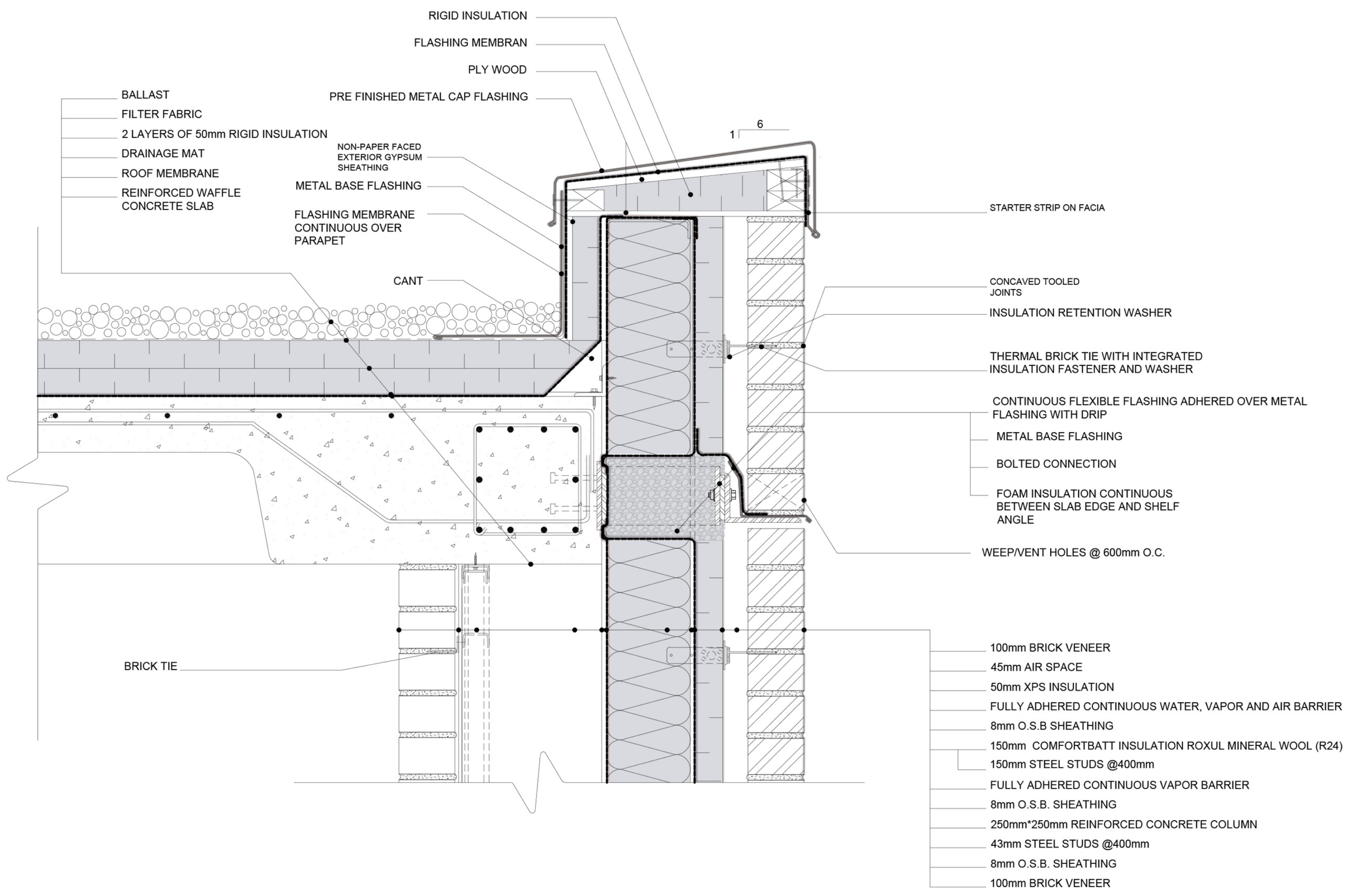


FIGURE 11
Detail 2.





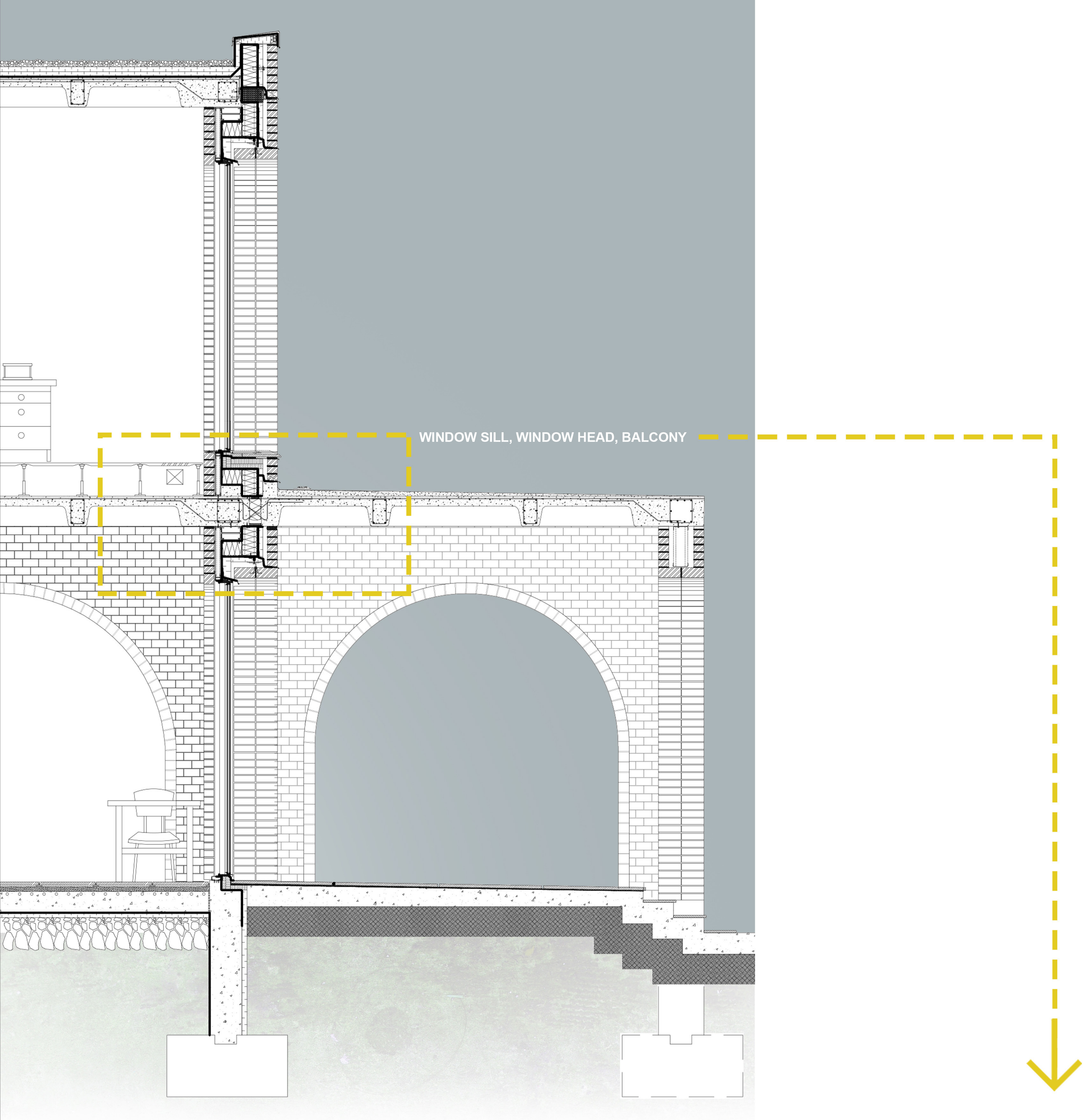
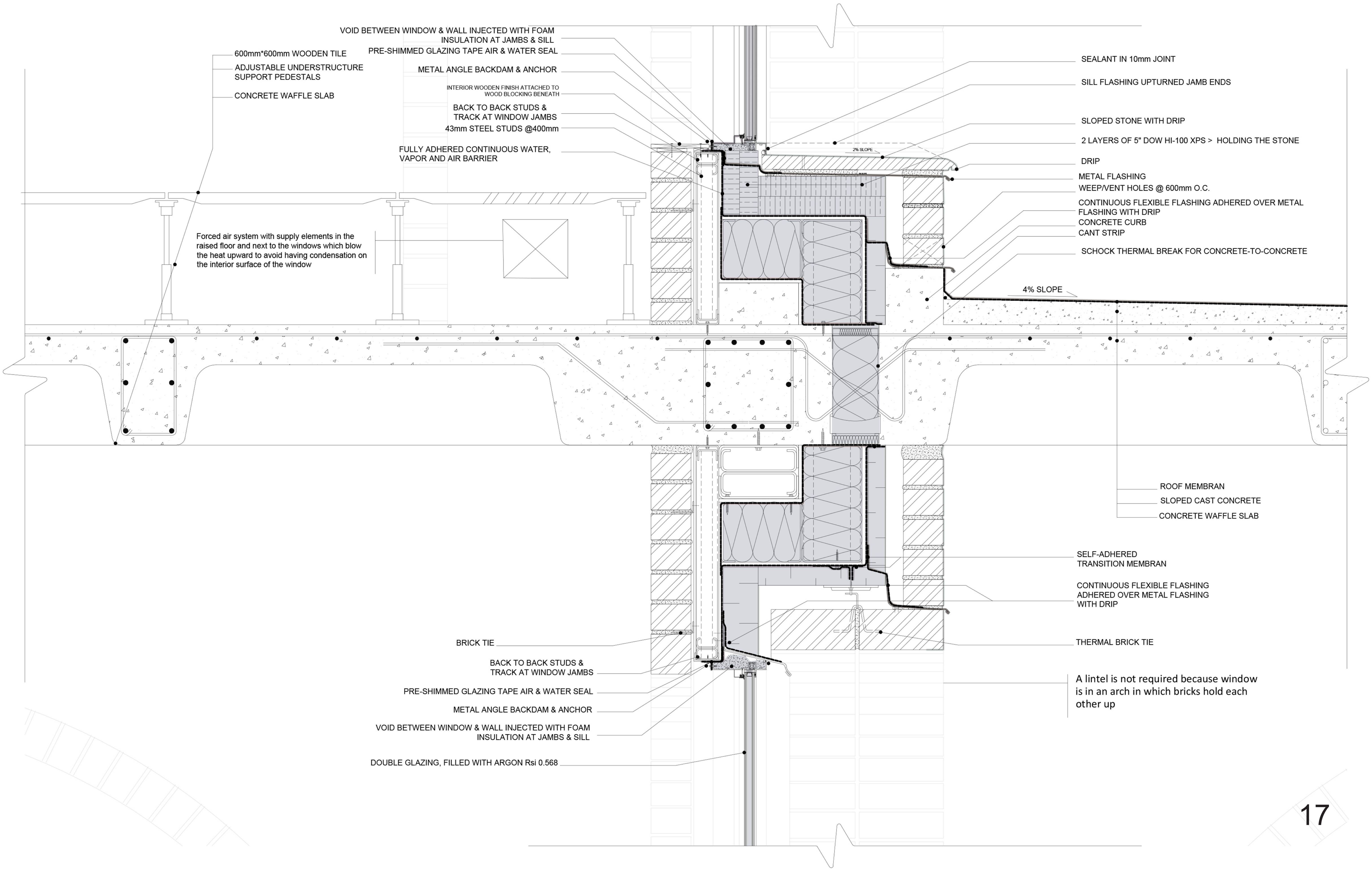

WINDOW SILL, WINDOW HEAD, BALCONY

FIGURE 12
Detail 3.



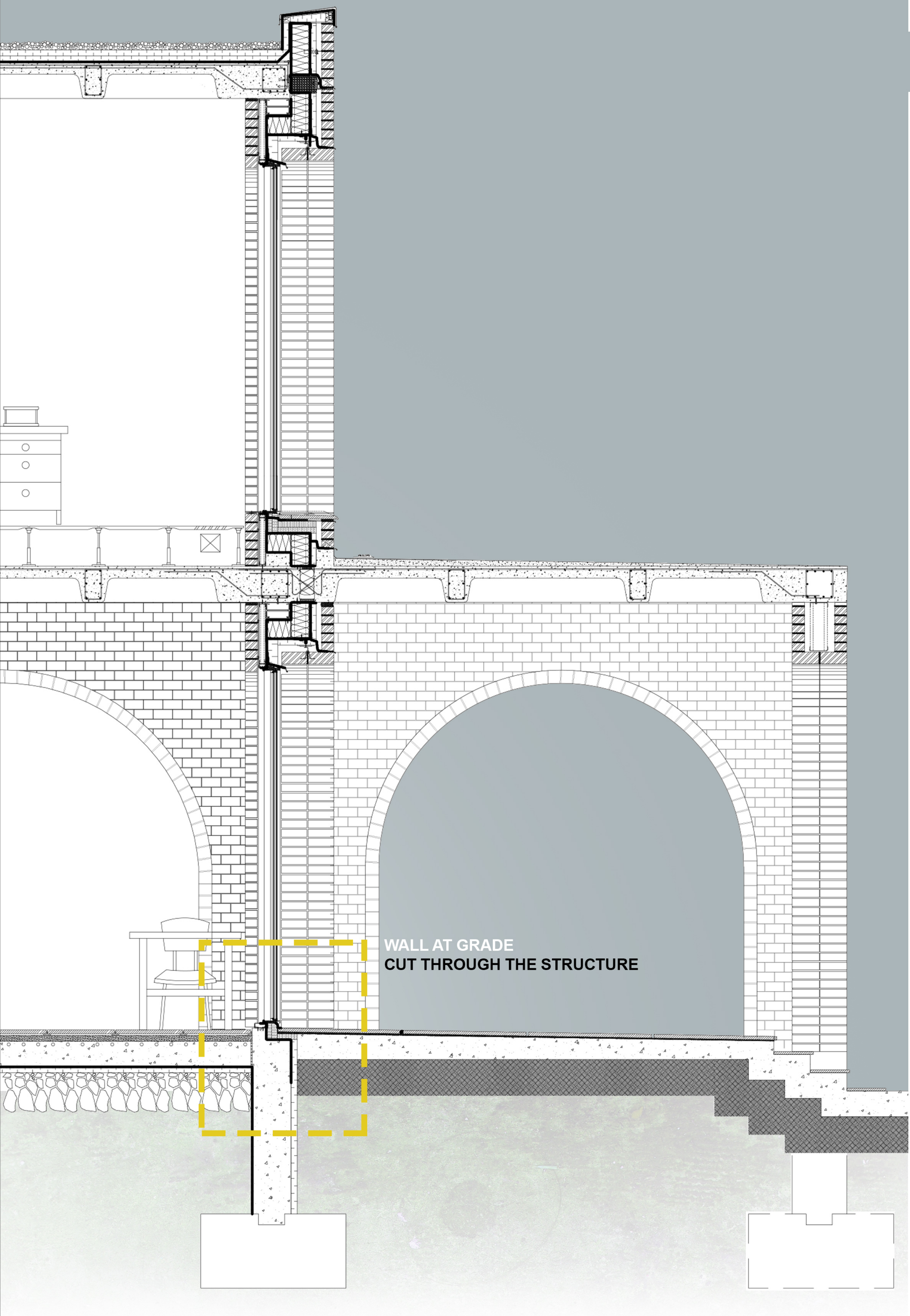


FIGURE 13
Detail 4.

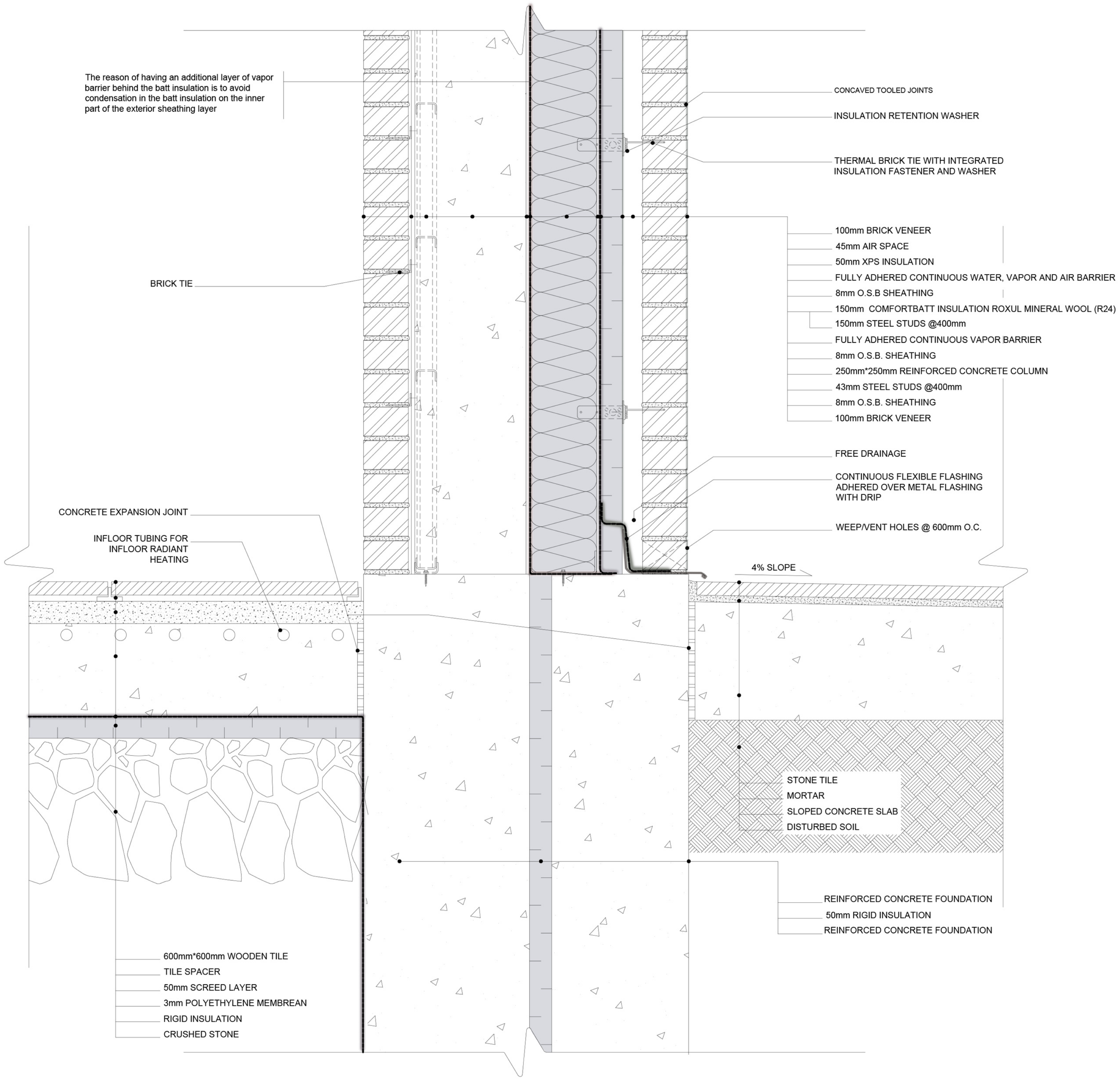
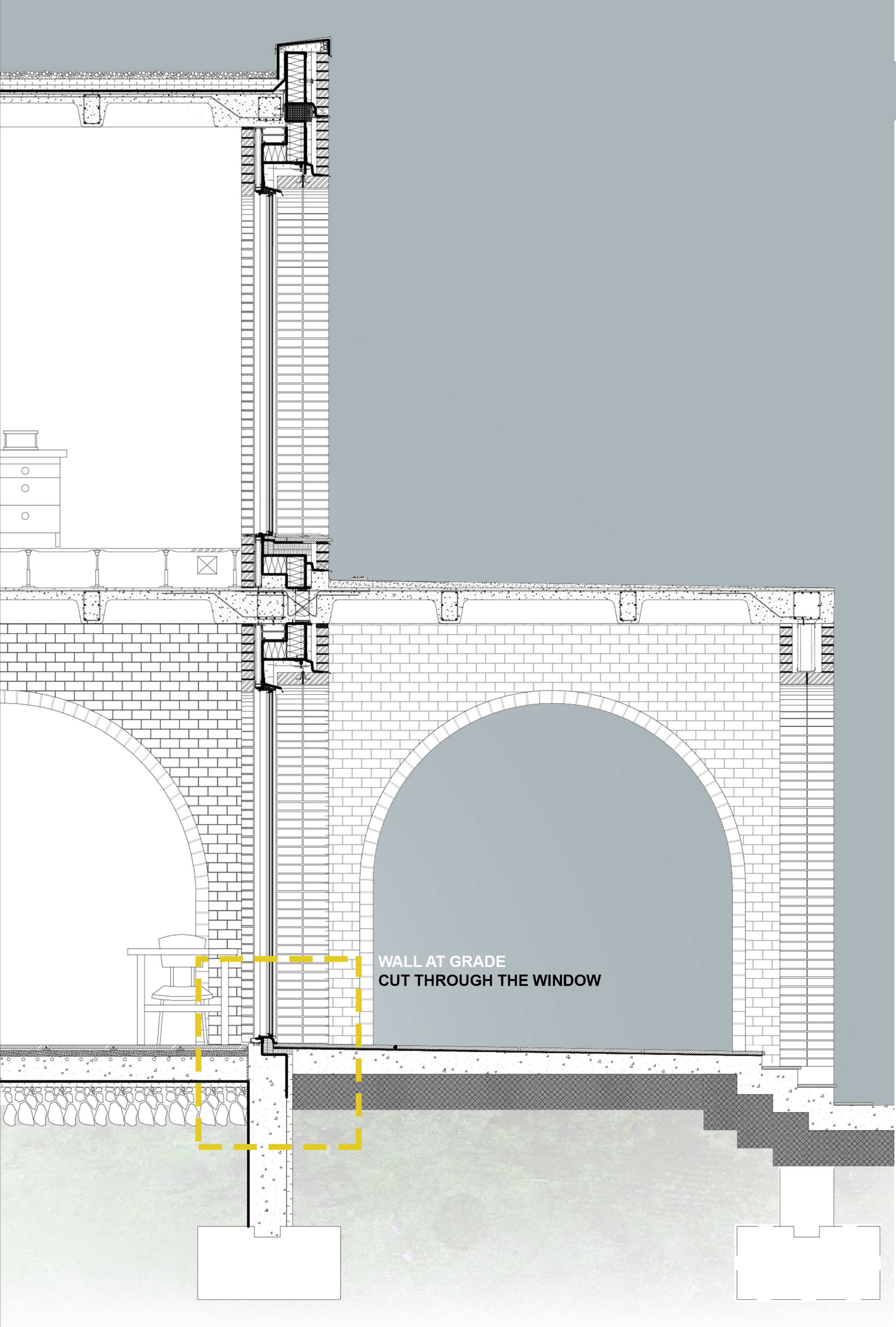


FIGURE 14
Detail 5.



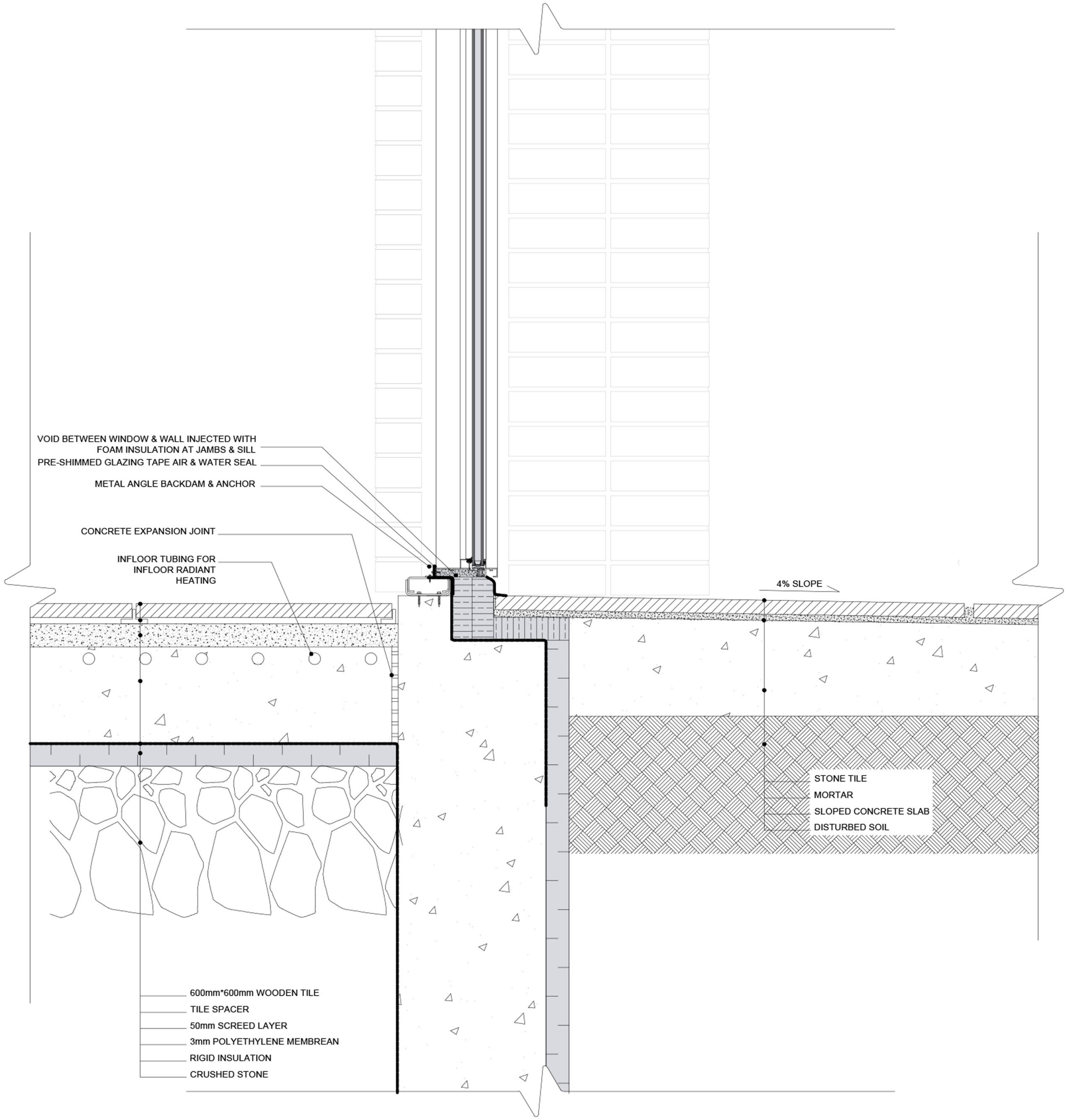


FIGURE 15
R-Value Calculation

Layer	Conductivity (k)	Thickness (l)	Conductance (C)	Resistance (RSI)
Interior film	N.A.	N.A.	8.300	0.120
Brick veneer	1.300	0.100	13.000	0.077
O.S.B. sheathing	0.100	0.008	12.500	0.080
Concrete	1.800	0.250	7.200	0.139
O.S.B. sheathing	0.100	0.008	12.500	0.080
Comfortbatt insulation Roxul mineral wool	0.380	0.150	2.533	0.395
O.S.B. sheathing	0.100	0.008	12.500	0.080
XPS insulation	0.024	0.050	0.480	2.083
Air space	N.A.	0.045	N.A.	0.170
Brick veneer	1.300	0.100	13.000	0.077
Exterior film	N.A.	N.A.	34.000	0.029
			RSI Total	**3.331**
		Overal Heat Transfer, U		**0.300**

R-Value of the exterior wall assembly is R19

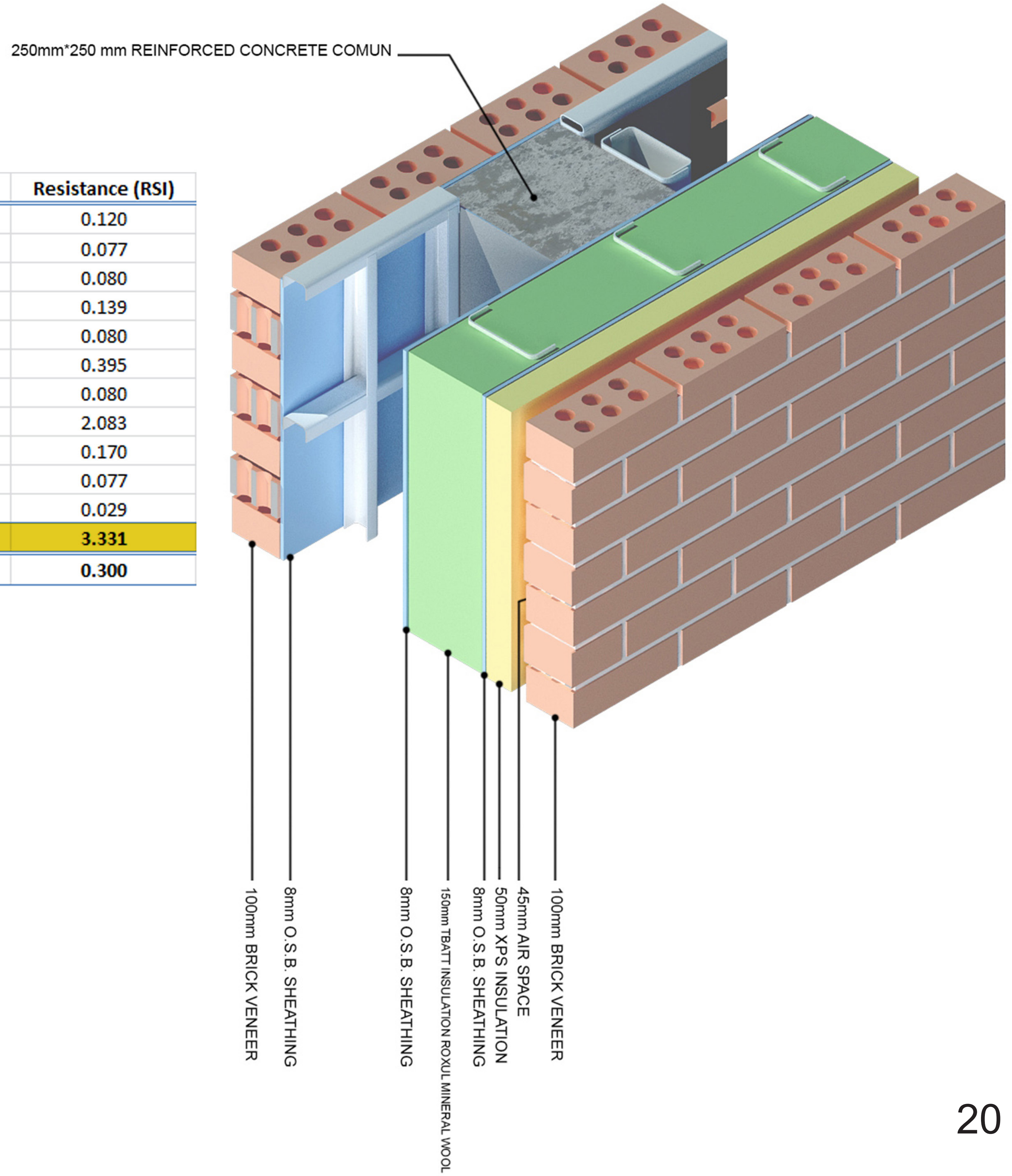
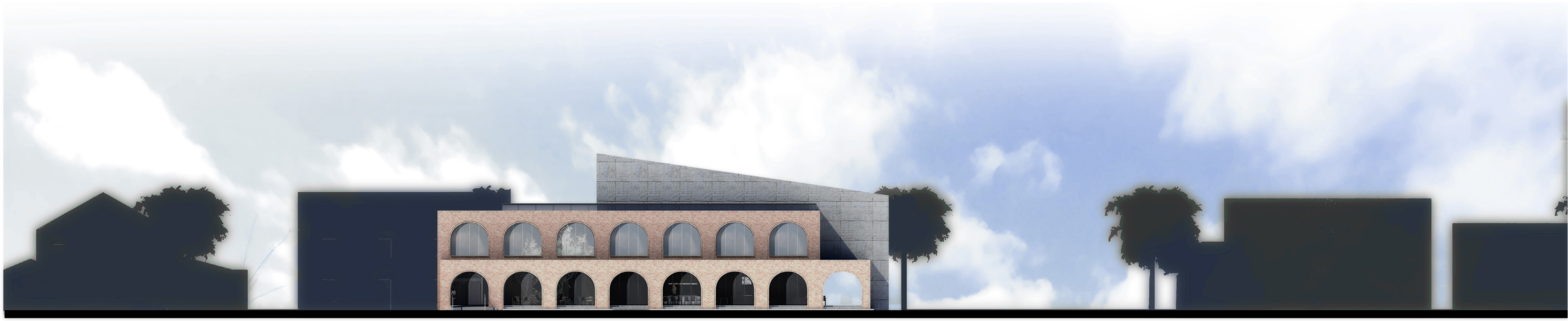


FIGURE 16
Elevations South & North

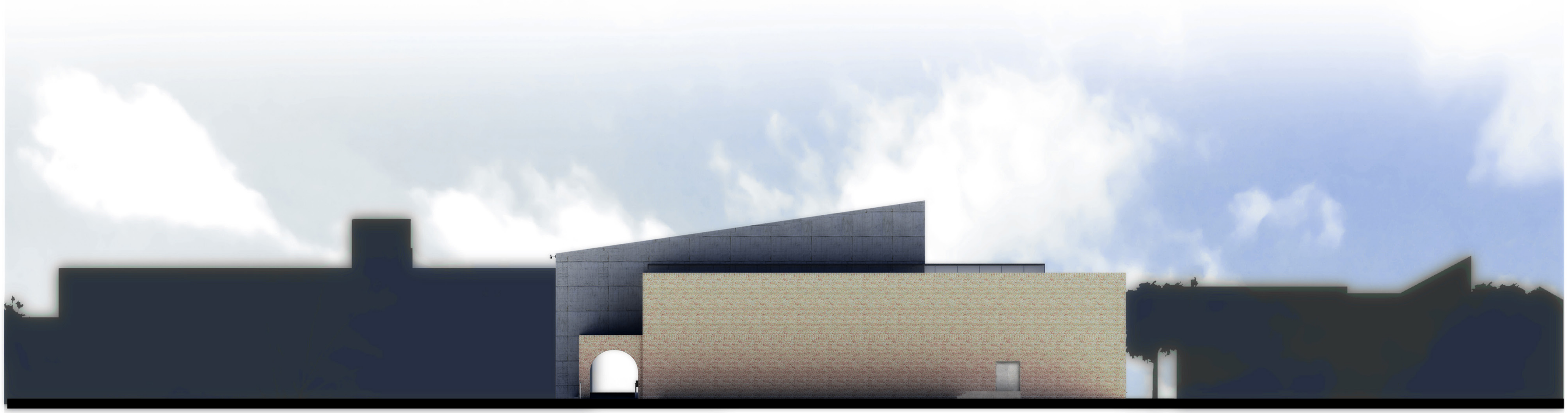
SOUTH ELEVATION

NORTH ELEVATION

FIGURE 17
Elevations East & West



EAST ELEVATION



WEST ELEVATION

EFFICIENT DESIGN STRATEGIES (3,5)

To reach a high level of environmental efficiency, some considerations are taken in design, enclosure, Services, and systems of the building and selecting the trees to be planted on the site.

The design and orientation of the building allows for natural ventilation throughout its spaces. In good weather days, operable windows in the building envelop and around the courtyard, allow for natural air to flow within the building by stack ventilation (figure 18). Even the function of some spaces such as library and cafeteria is extended to the exterior and allows the building consumers to access the open spaces in good weather days. To avoid opening big glazed doors or large operable windows when natural ventilation is required, smaller operable components are considered within the larger glazing elements.

The courtyard is designed in central part of the building to provide natural light and ventilation for spaces surrounding it. A sun-study is done on the site using the program 3D's Max and by giving the parameters relevant to the site location (figure 19). According to the result of the sun study, sun light from the west creates more comfort problems than benefits, and the fact that the majority of the spaces in the building benefit the natural light from at least 2 sides resulted in not having glazing on the west façade of the building. Moreover there is a sky light providing natural light for the activities on the second floor and the double height story telling hall (figure20, 21). Windows or other glazing products are designed to be installed on the interior edge of the thick arch shaped opening. This strategy results in thick brick arches acting as exterior shading to regulate the solar heat gain of the openings in a way that in winters, when sun is in low angle, more solar heat penetrates and in summers, when sun light comes from a large angle, less solar heat is gained (figure20).

Both deciduous and evergreen trees are used to improve the environmental quality of the exterior and also interior spaces of the building. In the courtyard and on the south side of the building deciduous trees are planted, such as red and white maples; they provide shade in the hot summer days and lose their leaves in the winter allowing for deeper penetration of light into the building. On the eastern and northern side of the building and along the semi open arcade, evergreen trees are planted to act as a dam against the wind to provide a more comfortable area within the arcades (figure 22). Only local plants are used in the project in order to reduce transportation costs and to allow for their natural growth within their environment.

Rain water is collected in water storage tanks after being directed to multiple roof drains. The stored water is then sent to a filter process to get ready to be used in toilets and showers and to water plants in the courtyard (figure23). Within the building, low-flow sensor faucets are used in washrooms and in the cafeteria kitchen in order to lessen the amount of water used. In landscape areas a drip irrigation system is used in order to use less water, thereby, making the building more efficient.

Ground source heat pump is used to provide heat. Use of geo thermal energy as a renewable energy source leads to reducing the amount of fossil energy is used to heat or cool the water (figure 25).

The roof of the building is a low-sloped roof with a bright colored, high reluctant material in order to reduce solar heat gain by the building in the summers. Open-grid pavement system around is used on the landscape around the building resulting in heat island reduction. Also, to insure that the building is air tight and protected from all climate conditions, thermal insulations and air barriers are made continuous around the entire building, and its windows. (Details 1-5)

FIGURE 18
Natural Ventilation

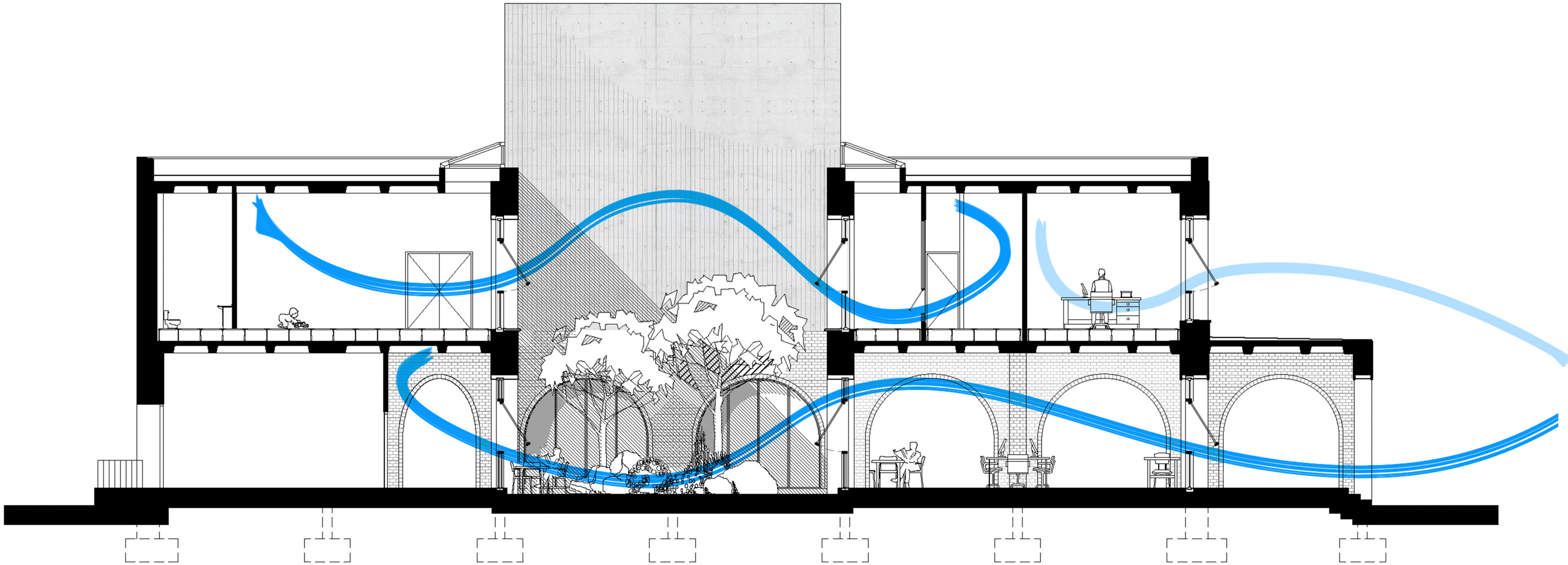
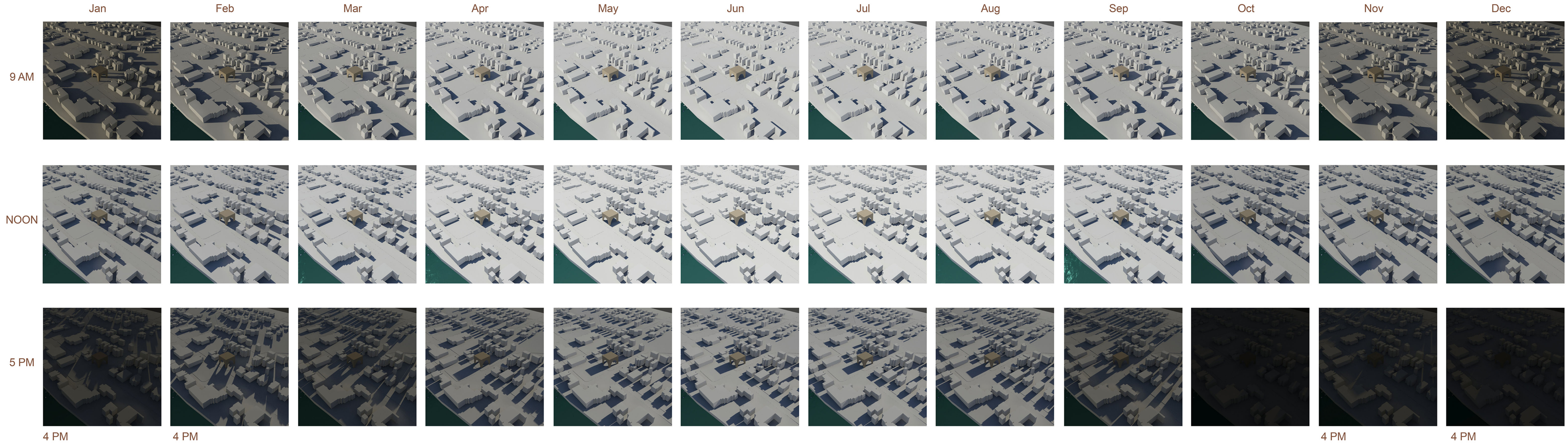


FIGURE 19
Site Sun Analysis



A sun-study is done on the site using the program 3D’s Max and by giving the parameters relevant to the site location. According to the result of the sun study, sun light from the west creates more comfort problems than benefits, and the fact that the majority of the spaces in the building benefit the natural light from at least 2 sides resulted in not having glazing on the west façade of the building. Moreover there is a sky light providing natural light for the activities on the second floor and the double height story telling hall

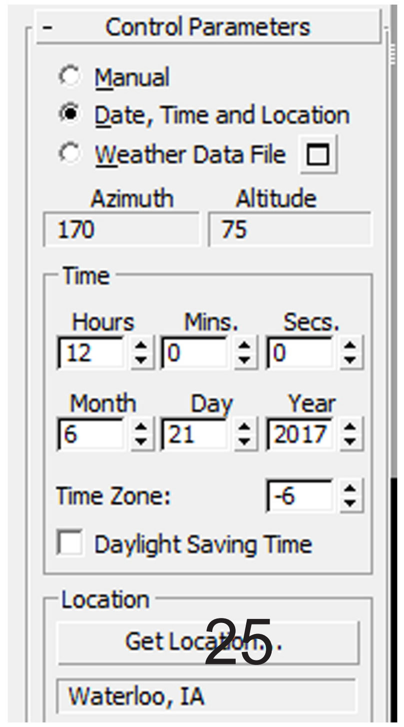
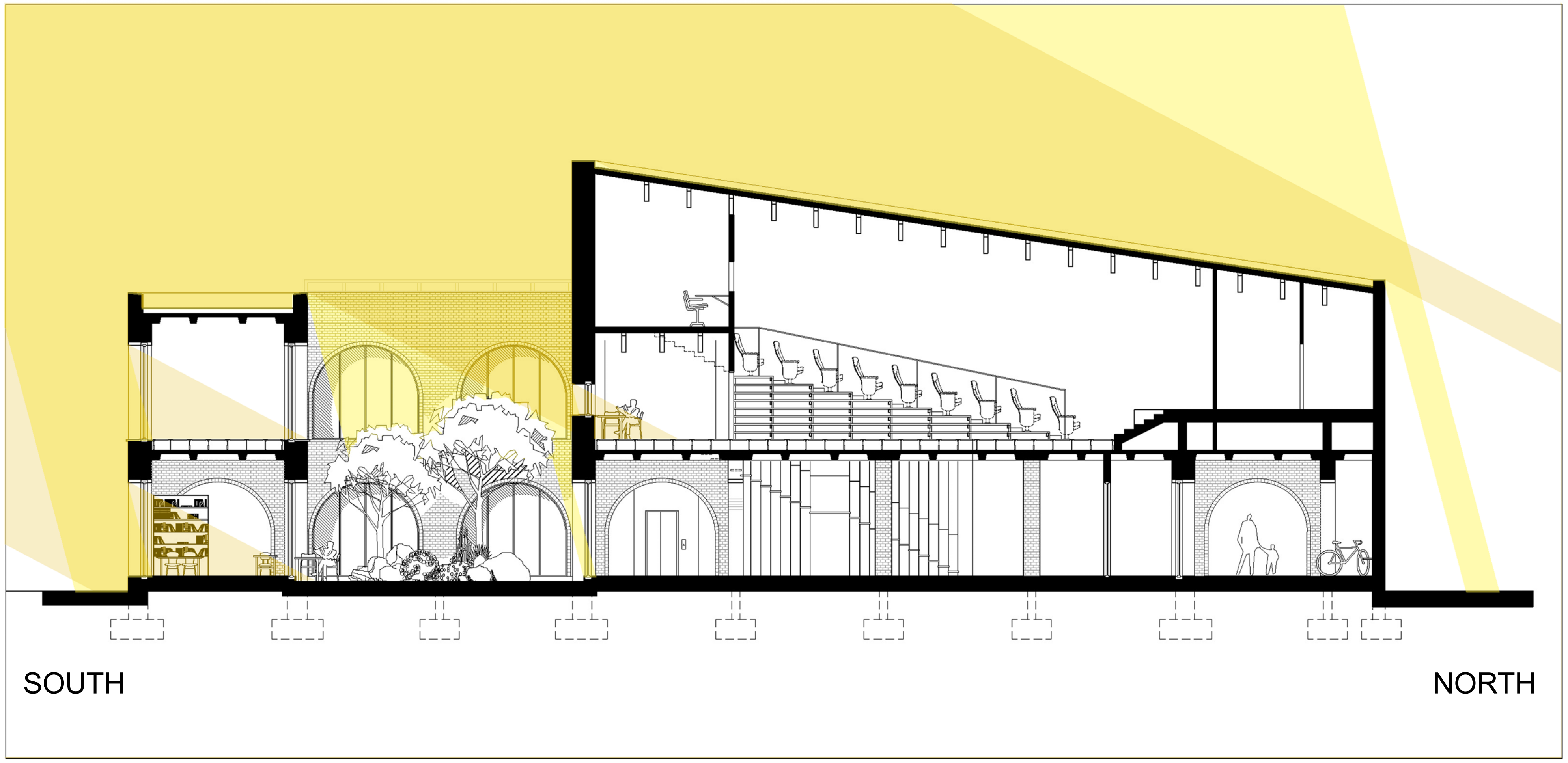
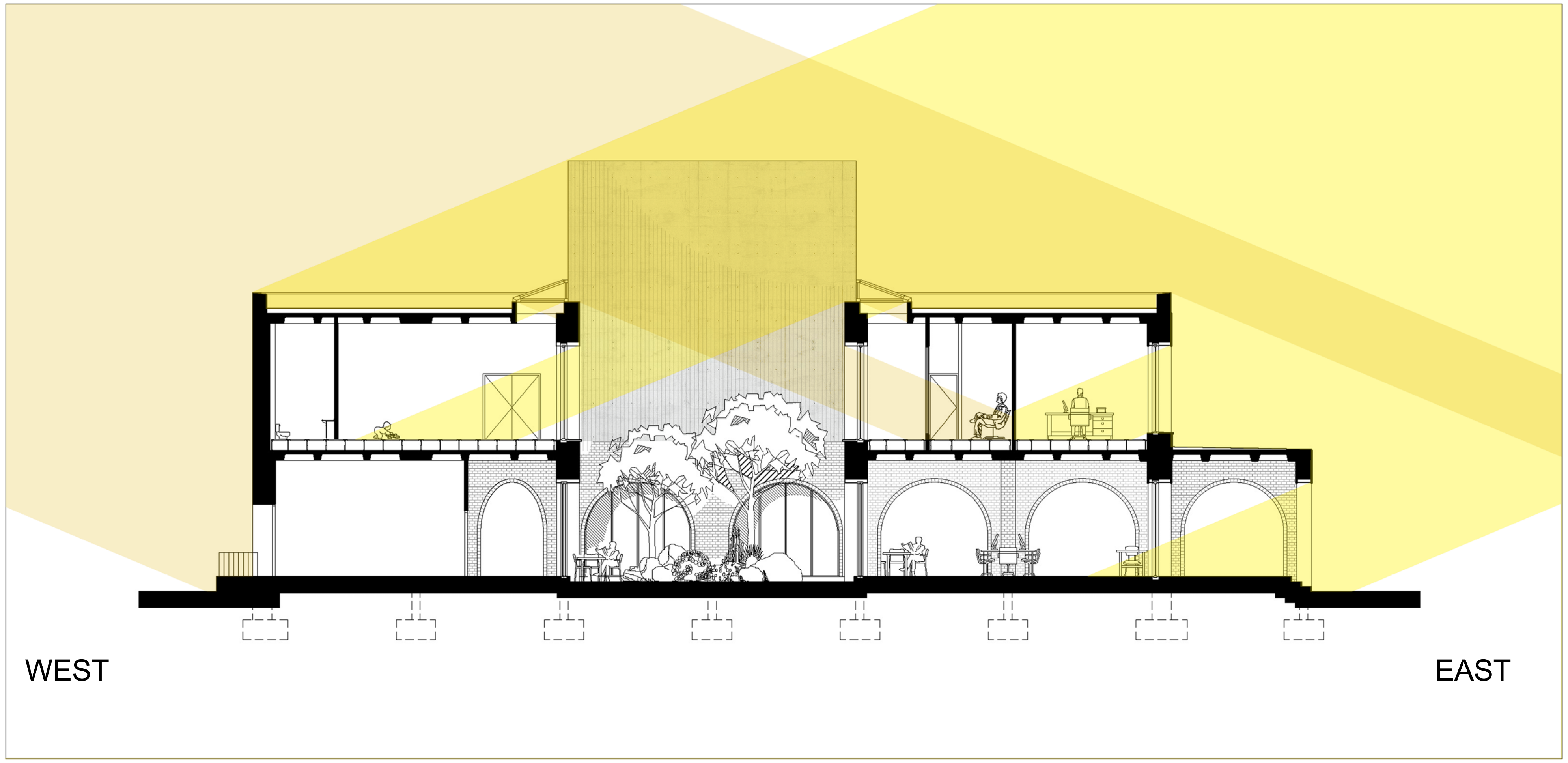
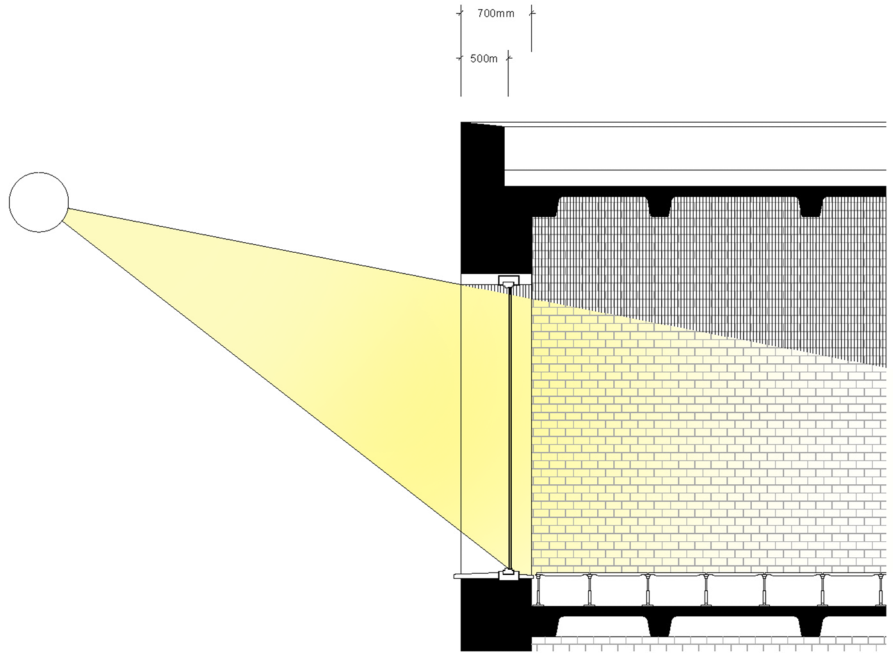


FIGURE 20
Day Lighting





Windows or other glazing products are designed to be installed on the interior edge of the thick arch shaped opening. This strategy results in thick brick arches acting as exterior shading to regulate the solar heat gain of the openings in a way that in winters, when sun is in low angle, more solar heat penetrates and in summers, when sun light comes from a large angle, less solar heat is being gained.(9)



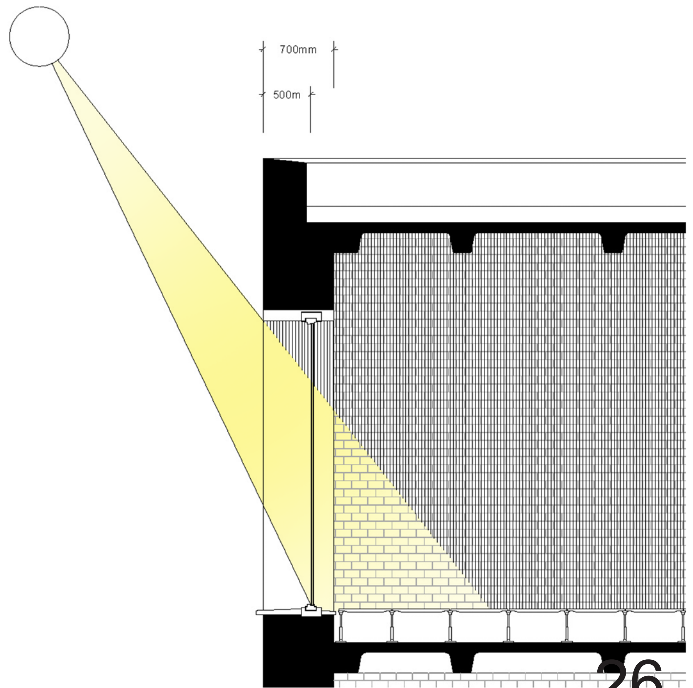


FIGURE 21
Interior Lighting Quality

the majority of the spaces in the building benefit the natural light from at least 2 sides. Moreover there is a sky light providing natural light for the activities on the second floor and the for the double-height story telling hall.


LIBRARY


LOST & FOUND INFORMATION (TECHNOLOGY CENTER)


CAFE

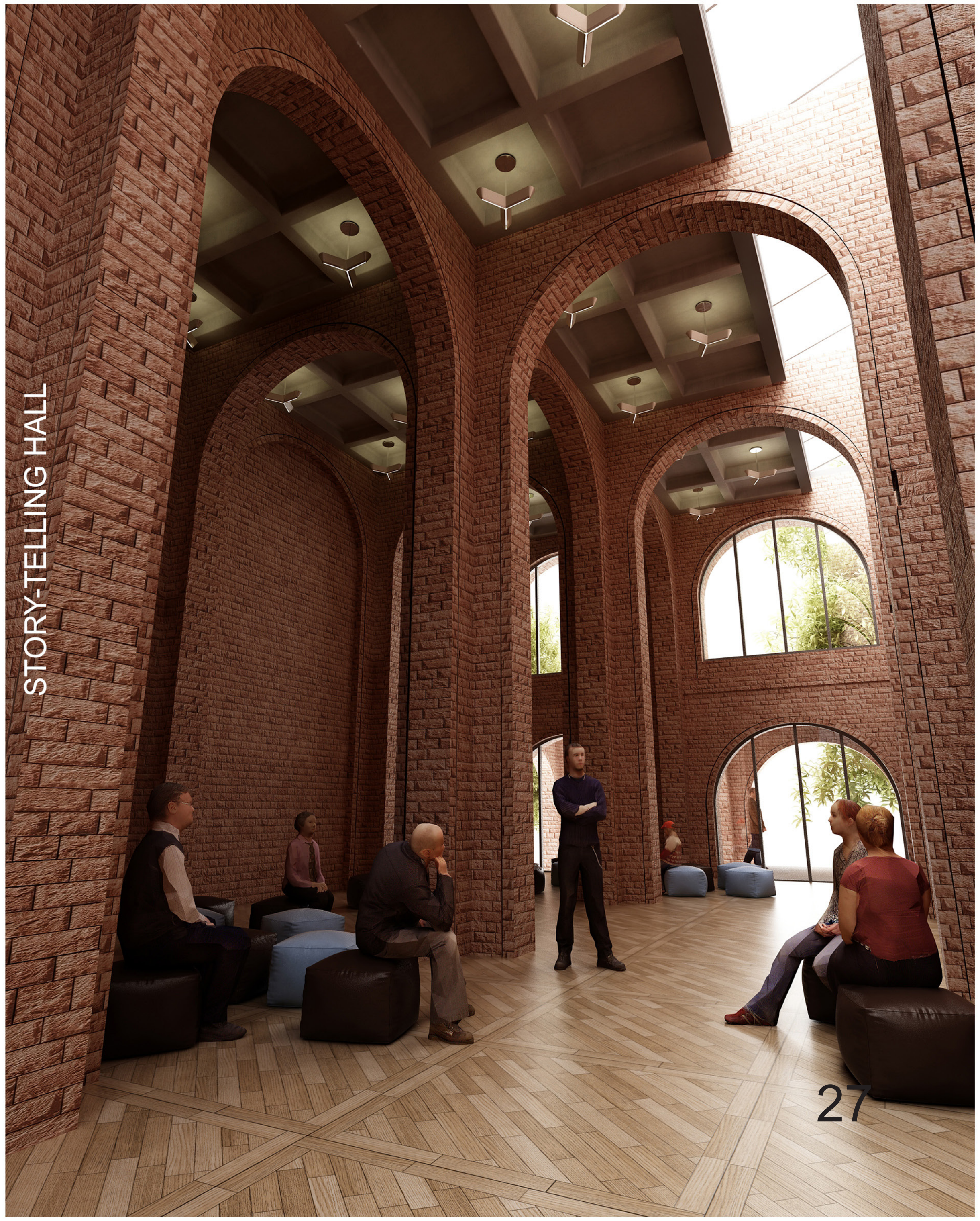

STORY-TELLING HALL

FIGURE 22
Landscape Design Strategies

Both deciduous and evergreen trees are used to improve the environmental quality of the exterior and also interior spaces of the building. In the courtyard and on the south side of the building deciduous trees are planted, such as red and white maples; they provide shade in the hot summer days and lose their leaves in the winter allowing for deeper penetration of light into the building. On the eastern and northern side of the building and along the semi open arcade, evergreen trees are planted to act as a dam against the wind to provide a more comfortable area within the arcades. Only local plants are used in the project in order to reduce transportation costs and to allow for their natural growth within their environment.(5)

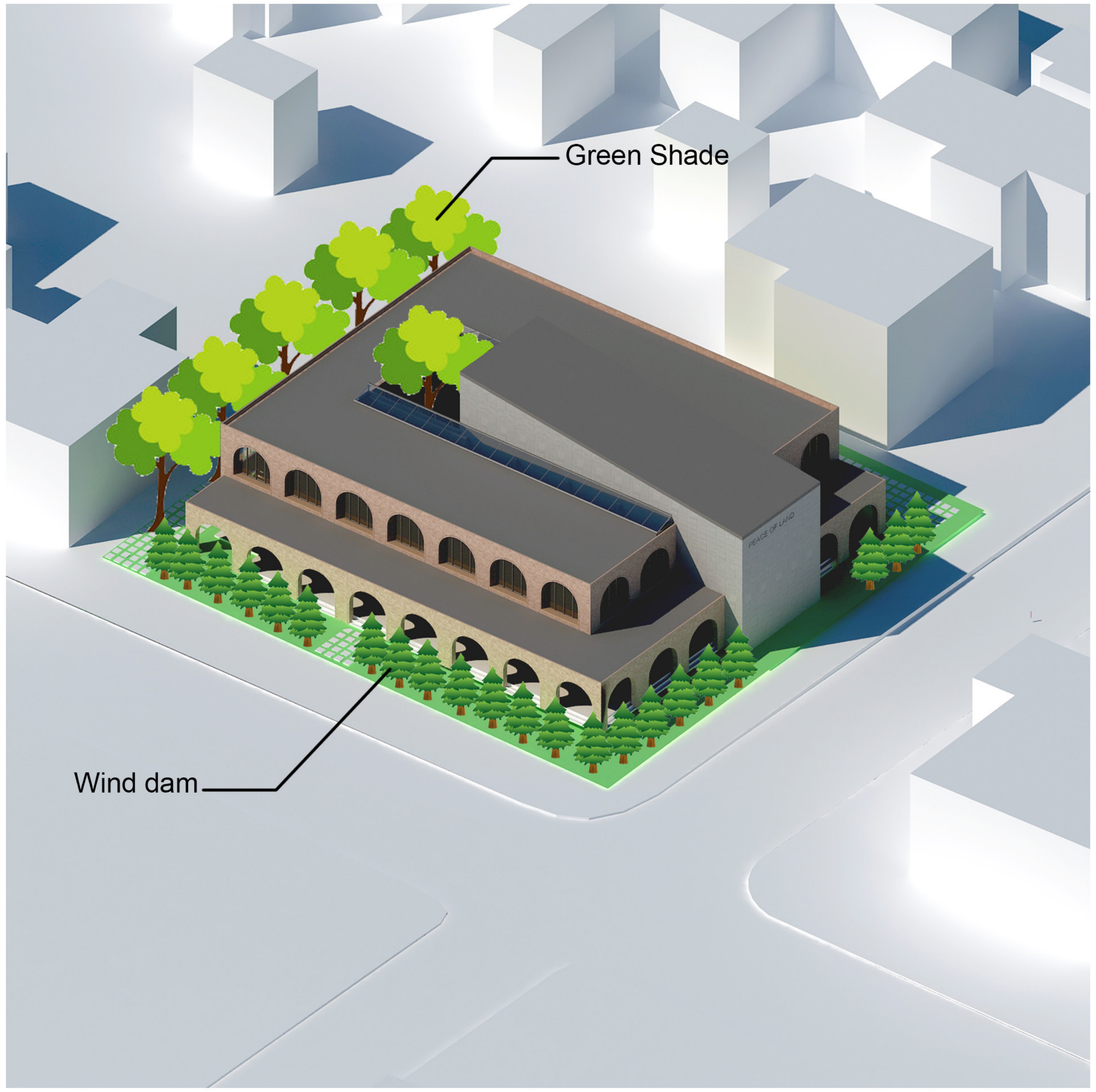
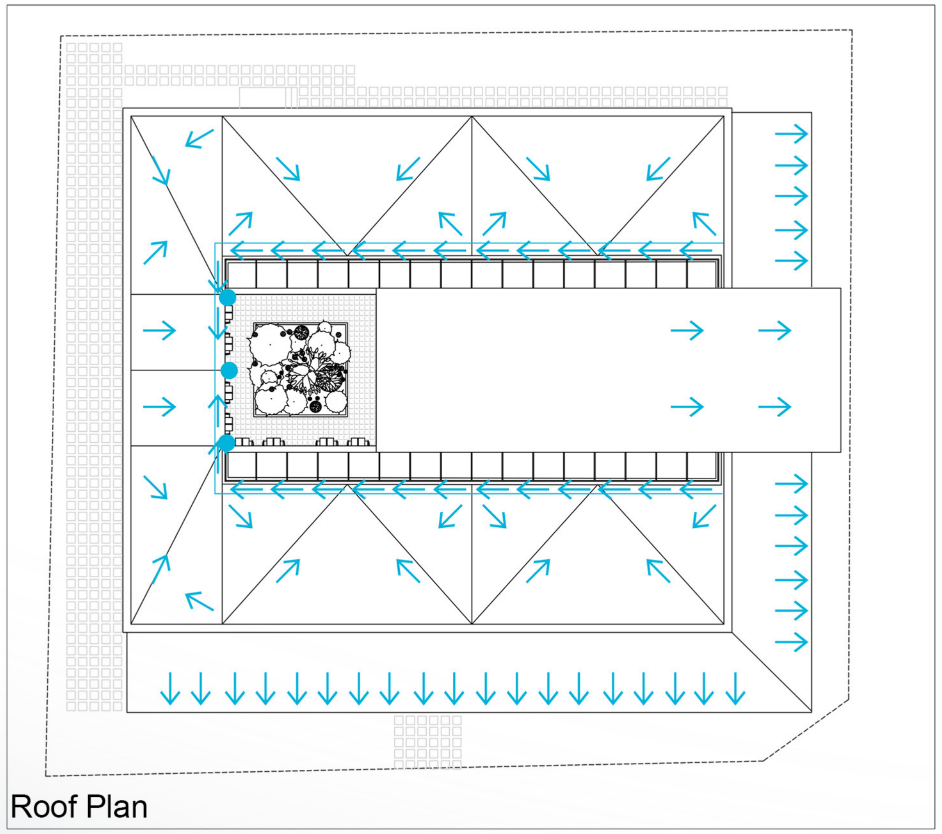
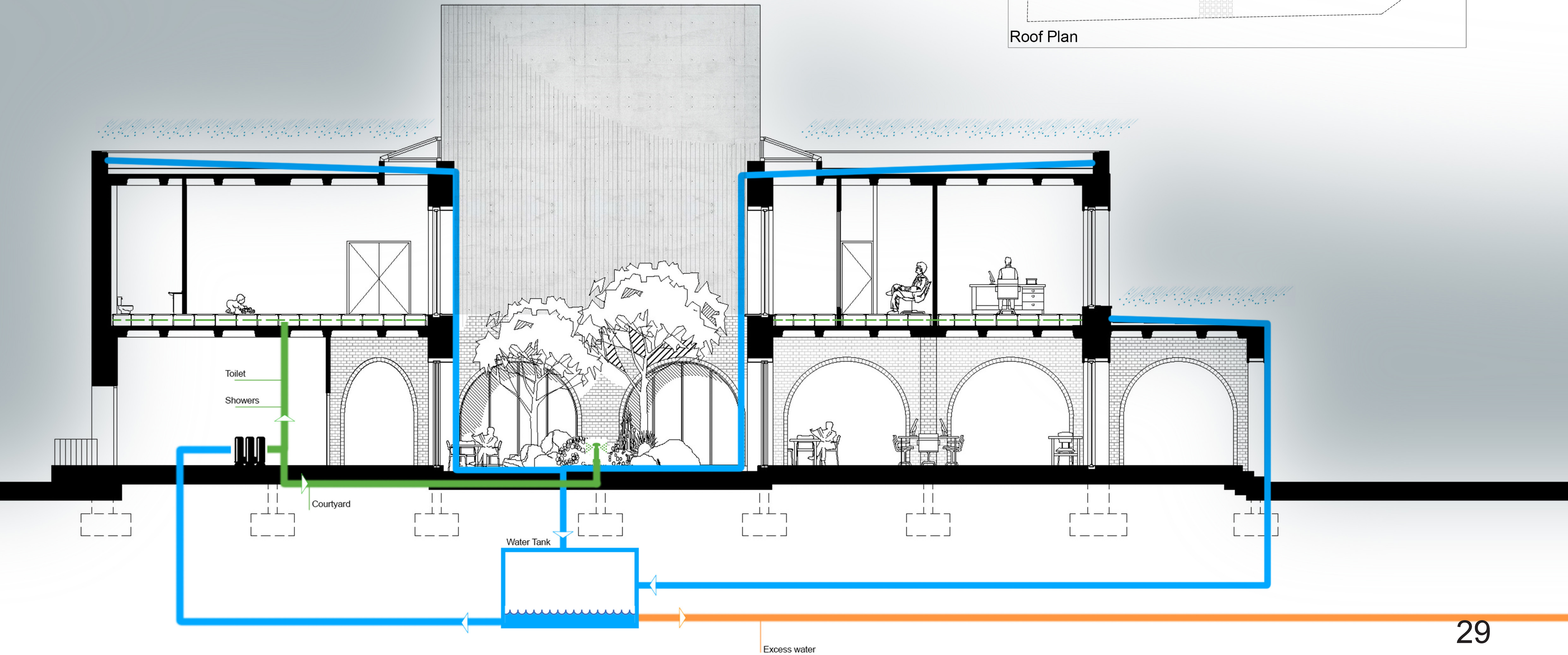


FIGURE 23
Rain Water Collection





ENVIRONMENTAL SYSTEMS and SERVICES (7, 4)

The HVAC system used in this Building is a combination of an in-floor radiant heating system and Forced Air Heating/cooling system. Ducts system within the raised-floor is used for distribution and air conditioning and ventilation. Depending on different zones and functions The HVAC system is arranged throughout the Building (figure 27-28).

Exposed waffle slab structure leads to a need for a raised floor system on the second floor for distributing the services. Also for providing the possibility of vertical movement of services, holes are molded in the central area of thinner parts of the slab.

Environmental systems used for the first floor :

1. Heating: In-floor radiant heating.
2. Cooling: Forced air system (from the ceiling, within the second floor raised floor system).
3. Return: Ceiling (ducts run through the second floor raised floor system).

Environmental systems used for the first floor :

1. Heating: In-floor forced air system.
2. Cooling: In-floor forced air system.
3. Return: In the raised-floor, while cooling and at a high level within the wall while heating (figure 24-26).

Because of the fact that cold air moves downwards and hot air moves upwards and to provide a complete air circulation, high and low return system is used in this building. This system works in a manner that returned air collects at a high point while the supply is heating the space and at a low point while it is cooling. (figure 24).

Due to the naturally different climatic conditions of spaces near the openings, supply elements are mainly located near the glazing systems. Also having heated air supply near the windows provides a good air circulation and prevents condensation.

All mechanical systems are located in the main mechanical room on the first-floor level. The mechanical room is a 4 by 5.7 room with a direct access to exterior space.

Two layers of brick veneer with other enclosure layers in middle protect the building from outside noises. The dominant finish material of interior walls is brick which has good acoustic qualities, and in combination with waffle slab absorbs some of the interior noises and maintains an acoustically excellent interior environment. The amphitheater, especially, should be acoustically controlled. In order to reach that goal, interior surfaces of amphitheater walls are covered with acoustic panels. Moreover exposed glulam beams system as the roof structure provides good acoustic properties in terms of absorbing noises and avoiding echo.

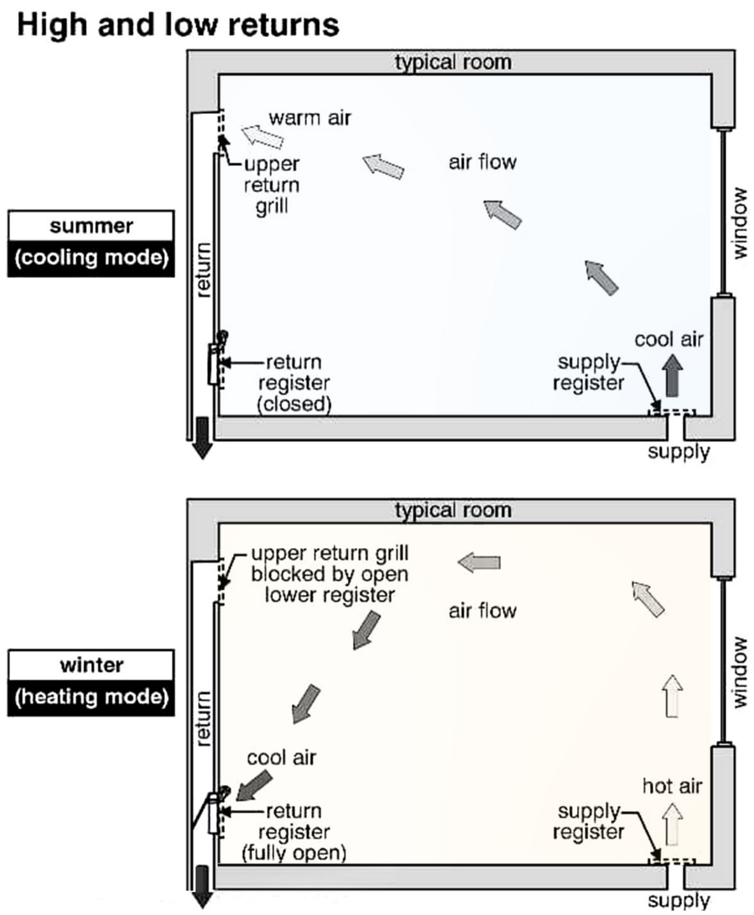
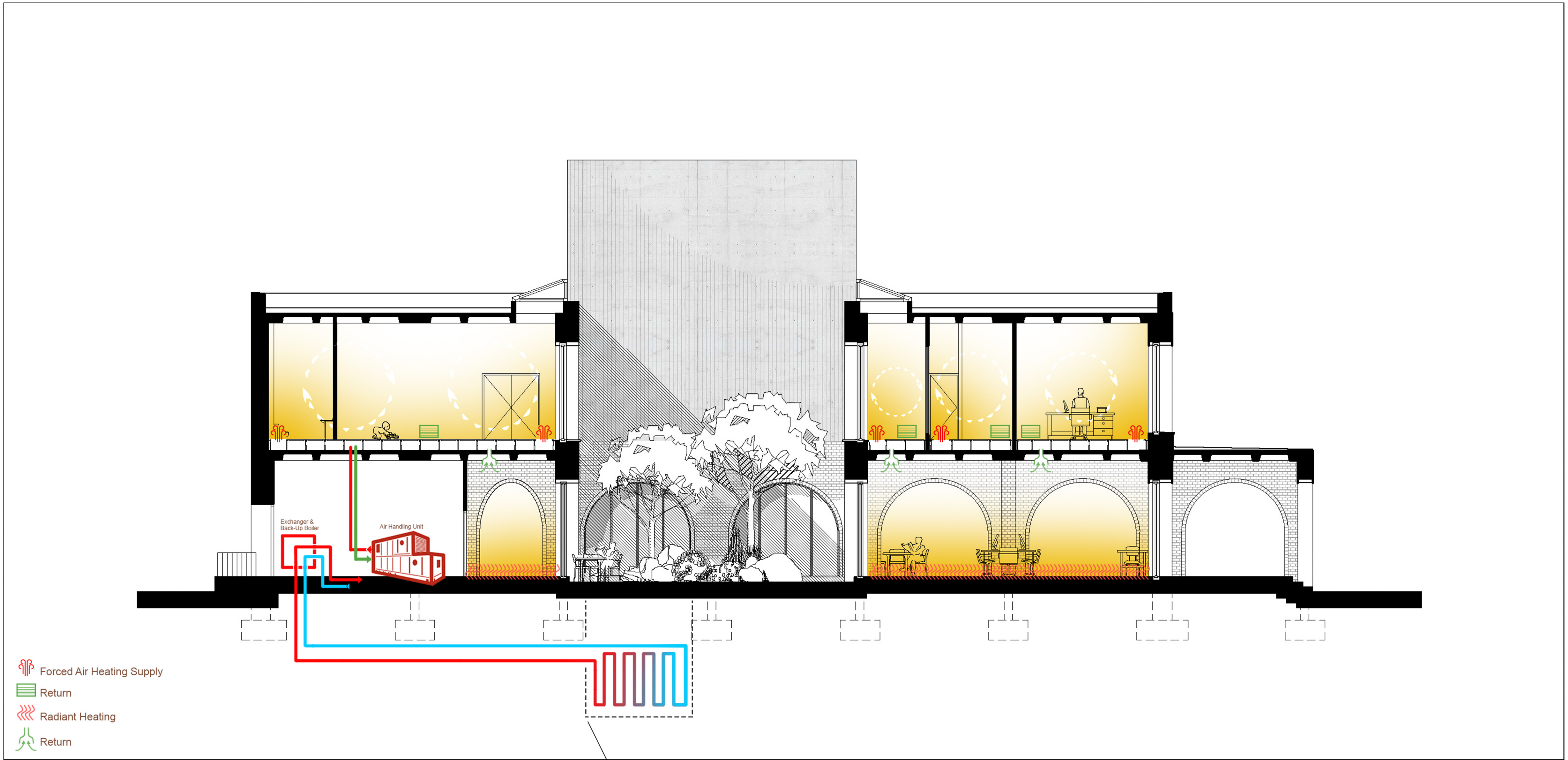


Figure 24.
Extracted from: https://inspectapedia.com/air-cond/Duct_Air_Flow.php

FIGURE 25
HVAC System; Heating



During the winter, a geothermal system collects the low-grade thermal energy from the earth and concentrates the pre heated liquid inside the process of in-floor radiant heating to provide space heating. If an increase is required in the temperature of water which is already heated, it will be sent to a backup boiler to reach the certain temperature before sending it to the space heating system.(3)

FIGURE 26
HVAC System; Cooling

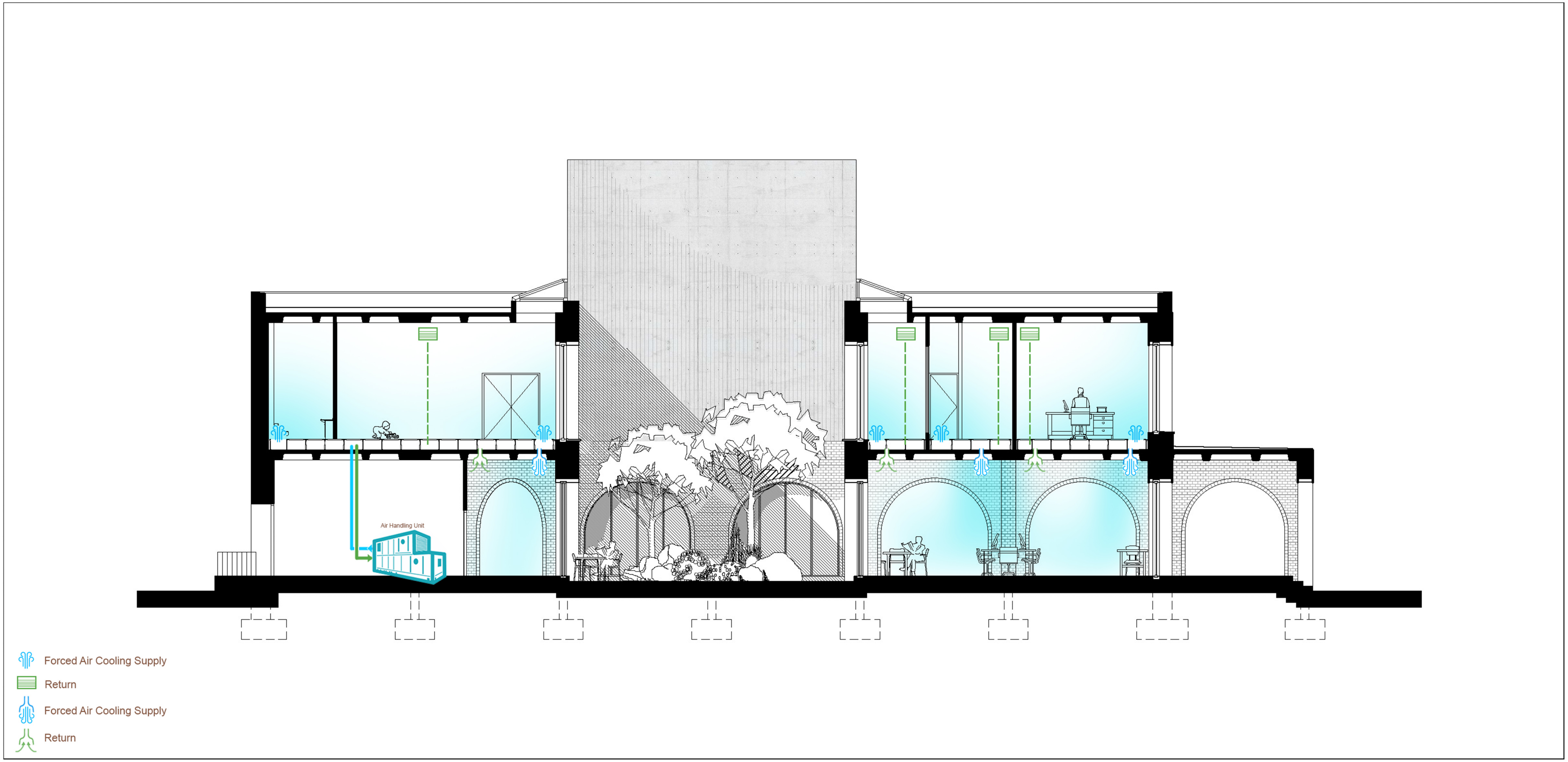
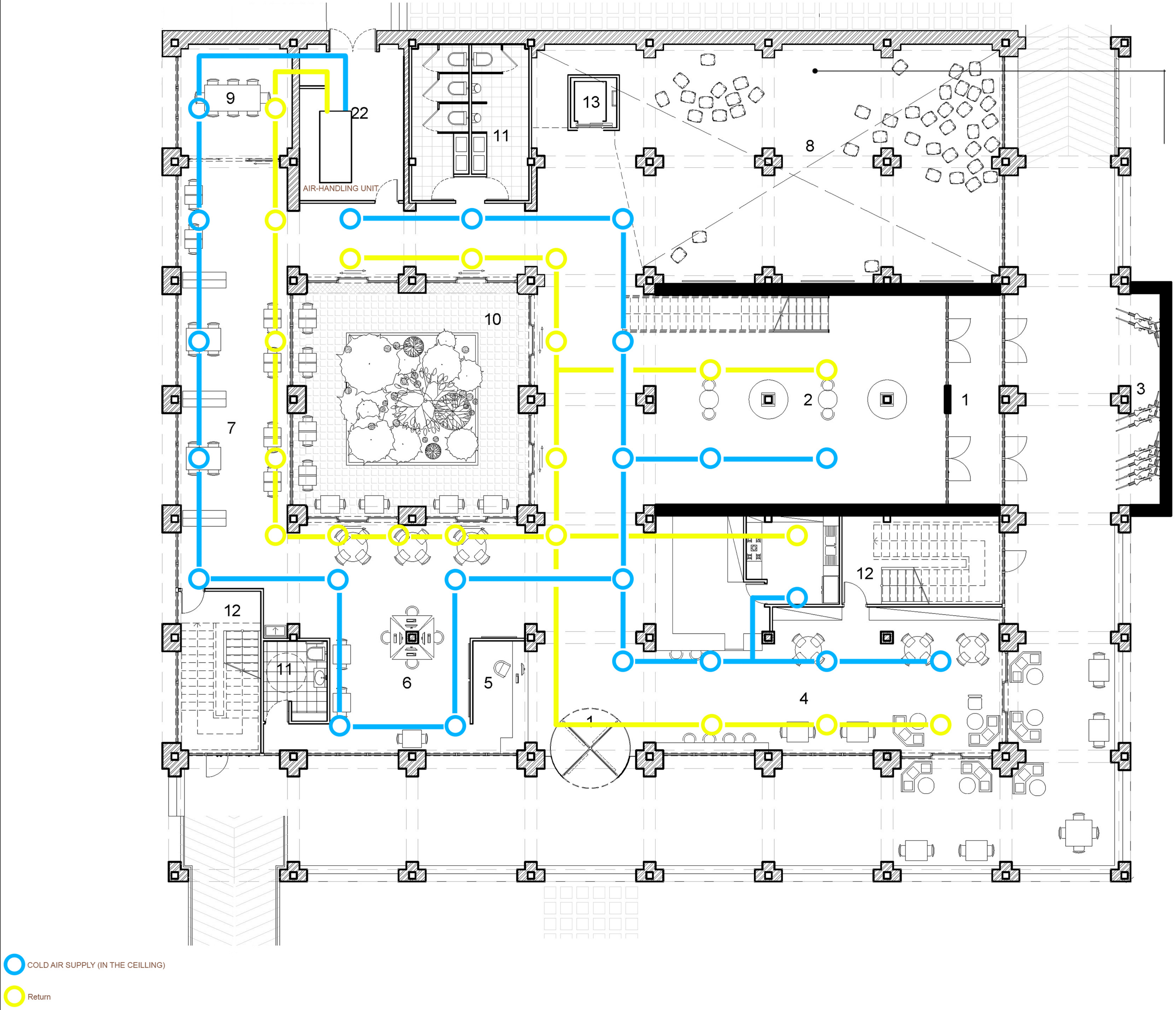
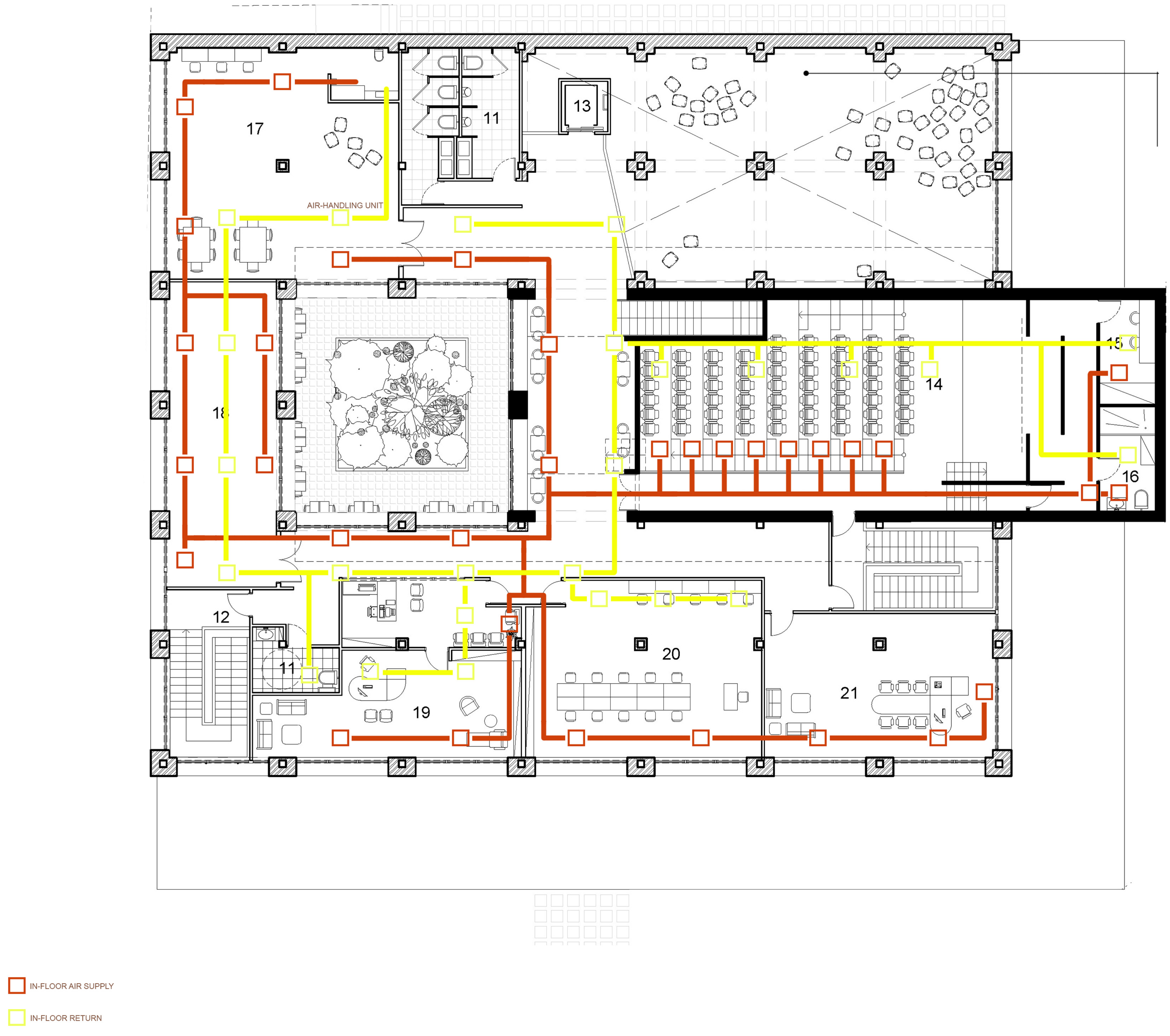


FIGURE 27
Distribution of HVAC; First Floor



The Story-telling hall is a double height space and is not cooled since cold air moves downward and the cold air flow coming from the upstairs is enough, but still it is heated by in-floor radiant heating system.

FIGURE 28
Distribution of HVAC; Second Floor



The Story-telling hall is a double height space and is not cooled since cold air moves downward and the cold air flow coming from the upstairs is enough, but still it is heated by in-floor radiant heating system.

Life Safety

Occupants' life safety is a very critical aspect in this building due to the fact that some portions of the building such as story-telling hall or amphitheater with functions hosting a number of people gathering to conduct a certain activity require strict safety considerations. All of the doors of the amphitheater open outwards and have a minimum width of one meter. Also amphitheater space is directly connected to an exit stair case. The story telling hall is located on the first floor with a direct horizontal connection to the outside.

All main exits of the building have doors with a minimum width of 1 meter; all of those exits open outwards and are equipped with panic bars making the exiting easier in case of an emergency. Two main fire exit stairs are placed on both ends of the building as shown in figure? Both stairs cases have a width of 2.4m [1.1m stair flight width]. The evacuation route is direct, clear, and the exit routes are indicated by signs throughout the building. Both fire staircases have exterior walls with glazing on them which can be used in case of emergency exit or entrance of firefighters. The whole building is equipped with a fire detection and alarm system with an automatic sprinkler system. The sprinklers are distributed on the surface of the exposed concrete slab on the two main floors. Those sprinklers are connected back to the main pipes which run through the raised floor.

Barrier Free Design

The project which is called Peace of Land is designed to be barrier free. This building is meant to be occupied by war refugees; so most likely, it would host people with physical or mental problems. Two Ramps are provided at the main exterior arcade entrances. The two floors are connected via a main elevator. One family, barrier free washroom is located on each floor, also a washroom with small sized toilets and faucets, specifically dedicated to children, is provided in the day care center. (figure ?)

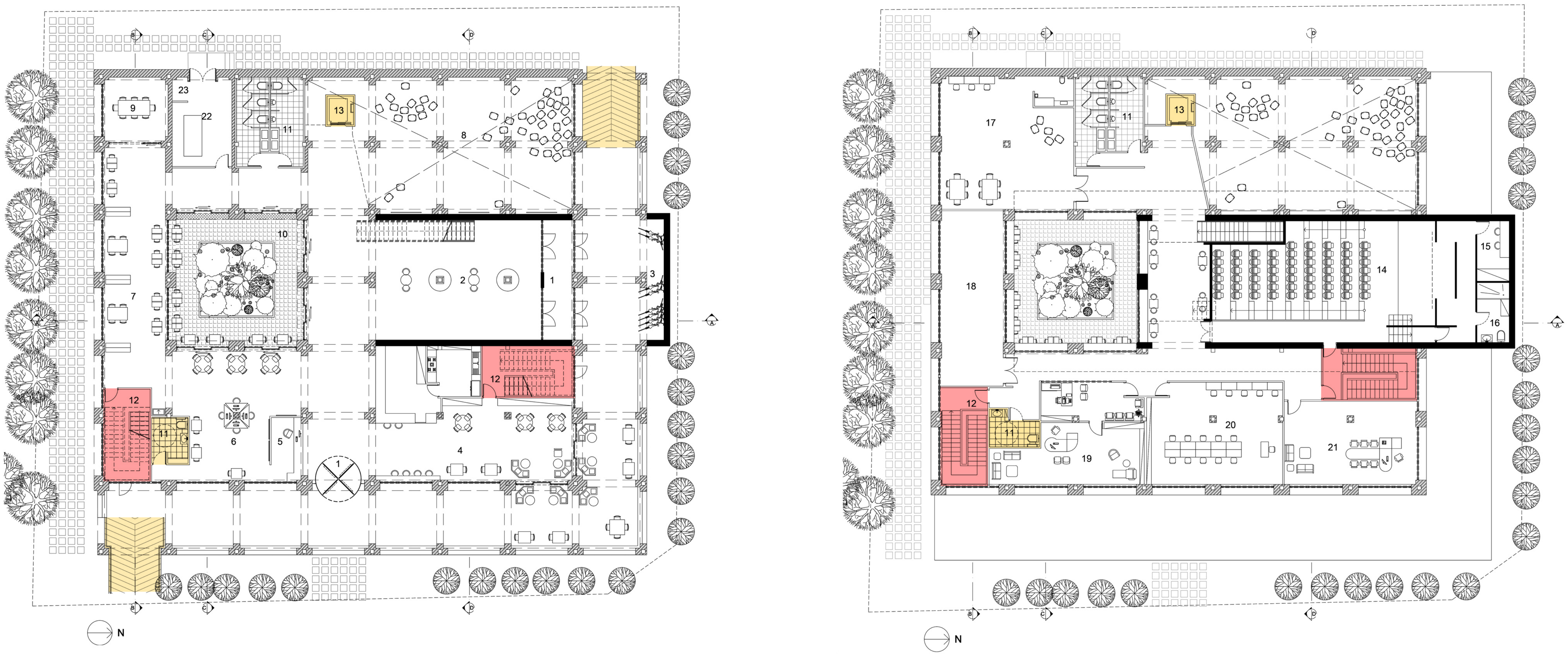


Figure 29.
Life safety / Barrier free Diagram

Barrier free

Life safety

Environmental Site Strategies

Since the building does not cover the site area completely, outdoor green spaces are provided. Trees are planted within the courtyard as well, bringing a natural touch to the interior. The design provides an area for bike parking within the concrete mass but outside the building as well as an outdoor seating area under a roofed exterior arcade in order to connect the public to the building and to invite the people to walk under the arcade and become closer to the site and the building itself. All plants used are local; they grow within their natural environment. Around the building, on the outside perimeter, natural grass is grown and partially is floored with open grid pavement. Roofs are sloped to roof drains in order to allow rain water to drain through pipes connected to storage tanks. Excess water runs to the road service pipe: the storm water pipe; refer back to figure 23. The roofs and floor of the exterior arcade around the building is sloped outwards, towards the streets, where all the water is drained and directed to catch basins. A specific space in the mechanical room with direct access to outside is dedicated to recycle bins. Recycling containers are also important aspects integrated in the design. Within the building, as well as outside of it, spaces are provided for recycling containers in order to encourage users to properly recycle used materials. (7)

CONCLUDING COMMENTS / ENVIRONMENTAL DESIGN: LEED Criteria

During the design process of this building, some considerations have been taken regarding structure, envelope design, environmental design, environmental systems, life safety, barrier free design and etc. to make it compatible with LEED requirements as much as possible. To me the most challenging part of the design was to design an envelope preserving the natural look of a brick masonry wall while providing a continuous layer of insulation and air barrier. Although the initiative concept of the building was not related to the environmental concerns, the simplicity and pureness of the forms used in the project allowed to keep adding and designing environmental solutions to the building, along the design was progressing.(8)
The comments on the LEED spreadsheet are based on the LEED requirements for New Construction. Based on the assessment of the project, a Gold LEED certification was achieved with 71 points. The design satisfies most of the LEED criteria which indicates a good, environmentally friendly, sustainable, and efficient project.

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

			PEACE OF LAND, A place for war refugees to relieve PTSD by telling their stories				**Comments**
			Date				
Y	?	N					
1			Credi 1	Integrative Process		1	The building was designed to be a high-performane and cost-effective project
			Location and Transportation		Possible Points:	16	
			Credit 1	LEED for Neighborhood Development Location		16	
1			Credit 2	Sensitive Land Protection		1	the site is not a farmland, nor is it a floodplain. It is not a habitat for any endangered species nor does it contain any water bodies or wetlands.
		2	Credit 3	High Priority Site		2	
3			Credit 4	Surrounding Density and Diverse Uses		5	The combined surrounding existing density of the site within 400m radius is 50505
		5	Credit 5	Access to Quality Transit		5	The bus transit trips do not meet the minimum requirement of 72 trips on weekdays and 40 on the weekends
1			Credit 6	Bicycle Facilities		1	Bike Parking is provided on site near the main entrance to the building
1			Credit 7	Reduced Parking Footprint		1	No parking is on the site
		1	Credit 8	Green Vehicles		1	
			Sustainable Sites		Possible Points:	10	
Y			Prereq 1	Construction Activity Pollution Prevention		Required	
1			Credit 1	Site Assessment		1	The site analysis was carried out and the results considerd during the design process of the building.
2			Credit 2	Site Development--Protect or Restore Habitat		2	Native and adapted vegetation are used on the site, restored and compacted soils meet the requirements.
1			Credit 3	Open Space		1	In the design, there is a courtyard in middle of the site where is accessible from most of the spaces on the first floor and it is planted with a diversity of vegetation types. Semi open outdoor areas are also provided as a form of an arcade around the building working with different parts of the building specially the cafe in order to encourage social interactions and also it is an inviting element to the building since in different occasions like a rainy day or a hot sunny day people prefer to walk under the arcade.
3			Credit 4	Rainwater Management		3	Graywater treatment for water is collected in an underground tank and sent for filteration before its used in toilets as well as courtyard
2			Credit 5	Heat Island Reduction		2	Use of open-grid pavement system around the building+ Plants are used to provide shade. Also shade is provided with architectural devices or structures (thick walls with windows sitting inside the wall -closer to the interior edge-.)
		1	Credit 6	Light Pollution Reduction		1	
			Water Efficiency		Possible Points:	11	
Y			Prereq 1	Outdoor Water Use Reduction		Required	
Y			Prereq 2	Indoor Water Use Reduction		Required	
Y			Prereq 3	Building-Level Water Metering		Required	
2			Credit 1	Outdoor Water Use Reduction		2	The use of a drip irrigation system which depends on collected rain water reduces outdoor water use to 100%
6			Credit 2	Indoor Water Use Reduction		6	Water reducing fixtures all water-sense labeled are used such as low-flow sensor faucets, urinals, and toilets. Collected rain water is used in toilets and showers after the filtration process.
		2	Credit 3	Cooling Tower Water Use		2	

1			Credit 4	Water Metering		1	water meters are installed for both the irrigated landscape area and indoor plumbing fixtures
			Energy and Atmosphere		Possible Points:	33	
Y			Prereq 1	Fundamental Commissioning and Verification		Required	
Y			Prereq 2	Minimum Energy Performance		Required	
Y			Prereq 3	Building-Level Energy Metering		Required	
Y			Prereq 4	Fundamental Refrigerant Management		Required	
6			Credit 1	Enhanced Commissioning		6	commissioning authority follows the mechanical, electrical, and plumbing activities, and the building's thermal envelop in accordance to ASHRAE Guideline.
15		3	Credit 2	Optimize Energy Performance		18	two layers of insulation -one batt layer and one rigid- over the structure to reduce the energy load and omit thermal bridges. Duble glazed high quality windows filled with Argon are used to reduce the energy waste. strategies are used to benefit sunlight and skylight for interior lighting.
1			Credit 3	Advanced Energy Metering		1	Advanced energy metering is incorporated into the design
			Credit 4	Demand Response		2	
1			Credit 5	Renewable Energy Production		3	Geo-thermal energy is used for pre-heating the water being used for in-floor radiant heating. (there is a back up boiler in case of need for higher temperature)
1			Credit 6	Enhanced Refrigerant Management		1	only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50 are used.
		2	Credit 7	Green Power and Carbon Offsets		2	
			Materials and Resources		Possible Points:	13	
Y			Prereq 1	Storage and Collection of Recyclables		Required	
Y			Prereq 2	Construction and Demolition Waste Management Planning		Required	
3		2	Credit 1	Building Life-Cycle Impact Reduction		5	A life cycle assesment of the project structure and enclosure demonstrates a reduction of greenhouse gases due to the use of natural light and ventilation and geo thermal in order to reduce the amount of fossil energy used
2			Credit 2	Building Product Disclosure and Optimization - Environmental Product Declarations		2	Environmental product decleration and review of lifecycle confirmed to ISO
2			Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials		2	Raw material source and extraction committed to reducing environmental harms
2			Credit 4	Building Product Disclosure and Optimization - Material Ingredients		2	Materials used have a Health Product Declaration, building products are sourced from product manufacturers that are in place to optimize health and safety
2			Credit 5	Construction and Demolition Waste Management		2	Waste during construction will be limited to 2.5 pounds per square foot or lessIndoor
			Indoor Environmental Quality		Possible Points:	16	
Y			Prereq 1	Minimum Indoor Air Quality Performance		Required	
Y			Prereq 2	Environmental Tobacco Smoke Control		Required	
2			Credit 1	Enhanced Indoor Air Quality Strategies		2	natural ventilation through operable windows + mechanical ventilation system (Air-Handling unit) + Co2 dedictors
3			Credit 2	Low-Emitting Materials		3	Low Emission Building Materials and Low Emission Finishing Materials (CONCRETE & BRICKS)
1			Credit 3	Construction Indoor Air Quality Management Plan		1	An indoor air quality (IAQ) management plan is Developed and implemented for the construction and preoccupancy phases of the building.
2			Credit 4	Indoor Air Quality Assessment		2	Baseline IAQ testing is conducted After construction ends and before occupancy, but under ventilation conditions typical for occupancy.
1			Credit 5	Thermal Comfort		1	The batt and rigid insulation layers are both on the structural elements + In-floor radiant heating + HVAC system + double glazed high quality windows filled with Argon

Y	?	N	Credit	Title	Points	Notes
2			Credit 6	Interior Lighting	2	Lights with dimmer switches + for individual occupant spaces, individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences are provided + lighting is controlled for presentations in amphitheater hall
3			Credit 7	Daylight	3	Unless amphitheater, all the regularly occupied spaces are naturally lit. Amphitheater hall is a closed space without windows due to its need for having perfectly controlled lighting.
1			Credit 8	Quality Views	1	Presence of windows looking onto the courtyard and/or the area around the building and the neighborhood in all the spaces but amphitheater hall due to its need to have controlled lighting.
1			Credit 9	Acoustic Performance	1	Acoustic wall panels provided in amphitheater + exposed repetitive glulam beams on the ceiling to reduce echo + having waffle concrete slab as the major roof system results in reduction in echo and enhancement in acoustic performance
			Innovation	Possible Points:	6	
			Credit 1	Innovation	5	
1			Credit 2	LEED Accredited Professional	1	Supervised by Terri BoakeRegional
			Regional Priority	Possible Points:	4	
1			Credit 1	Regional Priority: Specific Credit	1	Water use reduction in toilets, urinals, faucets
1			Credit 2	Regional Priority: Specific Credit	1	Construction waste mamagement provided
1			Credit 3	Regional Priority: Specific Credit	1	regional materials, concrete and brick / local plants
1			Credit 4	Regional Priority: Specific Credit	1	storm and gray water management plans
71			**Total**	Possible Points:	110	

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

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