Flying Theatre

Graduation report

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AR4AI130 Interiors Buildings Cities- Palace- City Stage
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Contents

Abstract

Europe has a long and rich history of theatre development, closely linked to the growth of cities and urban conditions. The shape of the theatre and the behaviour of the audience changed over time. Still, the interaction between the city and the stage in most theatres has remained virtually unchanged since the 19th century. The theatre serves only as a place for performance, catering to a specific audience. This often means the theatre building remains closed to the public for most of the day, opening only a few hours before the performance. Today, there is a desire to make theatre more accessible and an important part of the city's daily public life.

The site for the new theatre in Delft is in a complex, layered environment. Urban redevelopment of large apartment blocks began in the 1970s but never fully filled the demolished granular urban tissue of the old city. The new theatre bridges the difference in scale between new construction in the west and traditional, undemolished houses in the east by cascading and reducing its height from west to east. By aligning the stage tower to the axis of the existing street, the building creates a new and recognisable landmark for the city. By lifting the main auditorium to the first floor, a big public area is created on the ground floor. This space can be used throughout the day as a public meeting place, for leisure activities, independently from the theatre.

The result is a big urban gesture solving existing urban problems while also creating valuable indoor public space that can accommodate different events and activities.

1 View fromthe Kruisstraat onto the site

Introduction

Europe has a long and rich history of theatre development, which is closely related to the development of the cities and the urban condition. The shape of the theatre and the behaviour of the audience changed over time, but it is safe to say that the interaction between the city and the stage in most theatres has remained virtually unchanged since the 19th century. Inside the auditorium, performers and the audience are insulated from the outside world, which enables the creation of new worlds on stage and forces the audience to focus only on the performance. There were attempts to reform the theatre and the relation between stage and the city as well as the relation between performers and the audience throughout the 20th century, but most commercial theatres today are still proscenium theatres, meaning that there is a clear separation between the stage and auditorium in the form of a proscenium arch, which is also completely isolated from the outside world. Furthermore, there is a growing trend of combining several different public functions inside the same building. For example, the train station in Delft is not only a station but also the municipal office. An even clearer example is the Forum in Groningen, which houses a library, cinema, and museum. Such clustering of functions creates a space for interaction between different participants, who would not have met otherwise. Furthermore, it enables the local government to get two public institutions for the price of one building. Combining different functions also enables the building to be active and full of people for longer, which creates a more welcoming and safer environment in general. Given that most theatres are closed to the public during the day and open only in the evening before the performance, combining them with other public facilities, such as a library, coworking spaces, cafés or workshops, would increase the activity in the building.

The Dutch city of Delft has outgrown its current theatre building and needs a new, bigger venue. Theater de Veste is a receiving theatre situated in the southern part of Delft's historic city centre. It contains one stage and an auditorium for five hundred spectators. The current building is 30 years old and faces several challenges aside from the size of the auditorium. The small depth of the stage, only eight meters, means that many theatre productions cannot be staged in the theatre because their stage designs are meant for larger stages. The building does not have a sufficient air conditioning system, which makes it unusable in the late spring and summer months because of the heat. Accessibility is another key problem, given that there are no elevators, which leaves a big part of the building completely inaccessible to plenty of older people and people with disabilities. Lastly, the supporting areas of the theatre, both public and private, including storage and offices, but most importantly the foyer and the café, are limited in size, which makes them really crowded after the performance.

The project for the new theatre contributes to the discourse regarding the future of public buildings in general, whether clustering different institutions together intensifies the exchange of ideas and facilitates encounters between different kinds of users. It also presents a vision for the future of cities and how buildings can adapt to the changing circumstances around them. It also contributes to the future development of theatre as a typology and what makes a contemporary theatre, as well as the theatre of the future. Additionally, it serves as a catalyst for change for the people in charge, to get them interested in building a new theatre, as well as to raise awareness in other important participants who are otherwise unaware of these problems.

Theater de Veste wants its new building not to be just a theatre of the future, in the sense that it engages a wider array of users, but also to be a new contemporary architectural landmark for the city of Delft, which, despite its excellent architecture university, remains quite conservative and conventional in terms of its built environment, especially in the historic city centre. The design brief asks for a design of a receiving theatre with two venues: one 800-person proscenium stage and a smaller, more experimental 200-person black box theatre hall. In addition to these, all the supporting spaces are needed to make it a functional receiving house. The theatre also wants to

2 Parking deck in the middle of the site

3 The gloomy atmosphere under the parking deck

4 The clashing scales on site

5 New apartment blocks

6 Playground and back facades

7 Back-of-house character of the Yperstraat side of the site

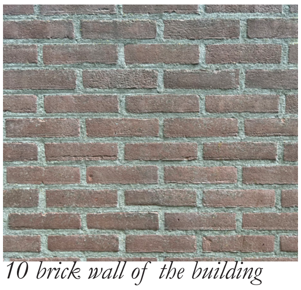
engage a wider audience, which is not necessarily interested in theatre, by transforming it from a monofunctional building into a social condenser, bringing together an unlikely encounter between different people.

A series of questions arise, such as what is the relationship between the city and contemporary theatre, is it still a backdrop for social spectacle and amusement, or has it become educational, a place where we search for the meaning of life through performances? Furthermore, is theatre a monofunctional space or does it serve a variety of functions at various times of the day, as a social condenser bringing people from different walks of life together through different programs, including traditional theatre performances? Another important question is whether one intervention into the urban tissue can shape the future appearance of the whole part of the city.

The site for the new theatre is situated in the southeastern part of Delft's historic city centre, not far from the existing theatre. During the 1970s, the whole southern part of the historic city was destined for urban renewal, and most of the old urban tissue was demolished in the process. The easternmost part of the neighbourhood still contains the old granular urban structure, while the rest was replaced with newer, bigger apartment blocks with commercial space on the ground floor. Unfortunately, the urban renewal was never fully completed, and some of the demolished city blocks are still not filled in. One of those scars in the urban fabric is the new site for the theatre. It is bordered by Kruisstraat on the southwestern side, Doorniksteeg on the northeastern side, and Yperstraat on the northwestern side. The southeastern side borders the back gardens of terrace houses on Gasthuislaan, built in the 1970s. Looking from above, one could be mistaken in thinking that the site is occupied by a nice urban square, but instead it houses a gloomy parking deck. Two industrial halls are situated on the Yperstraat side and are currently occupied by a car repair shop and a car rental. The whole area feels a bit hostile and uninviting. Doorniksteeg side borders a children's playground. All three sides are characterised by a relatively low building height of one or two storeys and the unassuming back-of-house and back-garden character. In contrast, the Kruisstraat side houses newer, higher apartment blocks whose main façades are oriented towards the site, giving it a certain grandeur. This part of the site invites the new theatre to open to it and engage with the public life of the city, while the other sides withdraw to themselves and do not engage with the city. Orienting the building towards Kruisstraat and putting the main entrance there has an added benefit of making that façade the first thing visitors see approaching from the train station situated a few blocks to the west. To increase the building area of the site, the industrial halls are also counted as part of it. The industrial halls from the 1950s, which used to be a warehouse for the Brouwer printing company, are characterised by a curved saw-tooth roof and an elongated triangular skylight. Their relatively small interior height, around 4.00 meters, and complex roof geometry make it difficult to adapt the existing structures for a new theatre function. The parking deck is made of steel columns and beams, which support precast concrete TT slabs spanning around 16.50 meters. Given the way in which the deck was constructed, it can be easily disassembled and reused in another location, or its components can be used in the construction of the new theatre building. Despite the diverse and clashing building scales and interactions with the street, the materiality of the buildings surrounding the site brings them all together. Regardless of scale, function or age, all the buildings are faced in different shades of brick. The road and the sidewalk are also finished in clinker bricks, which is typical for Dutch roads.


8 paving brick used on sdewalk on site

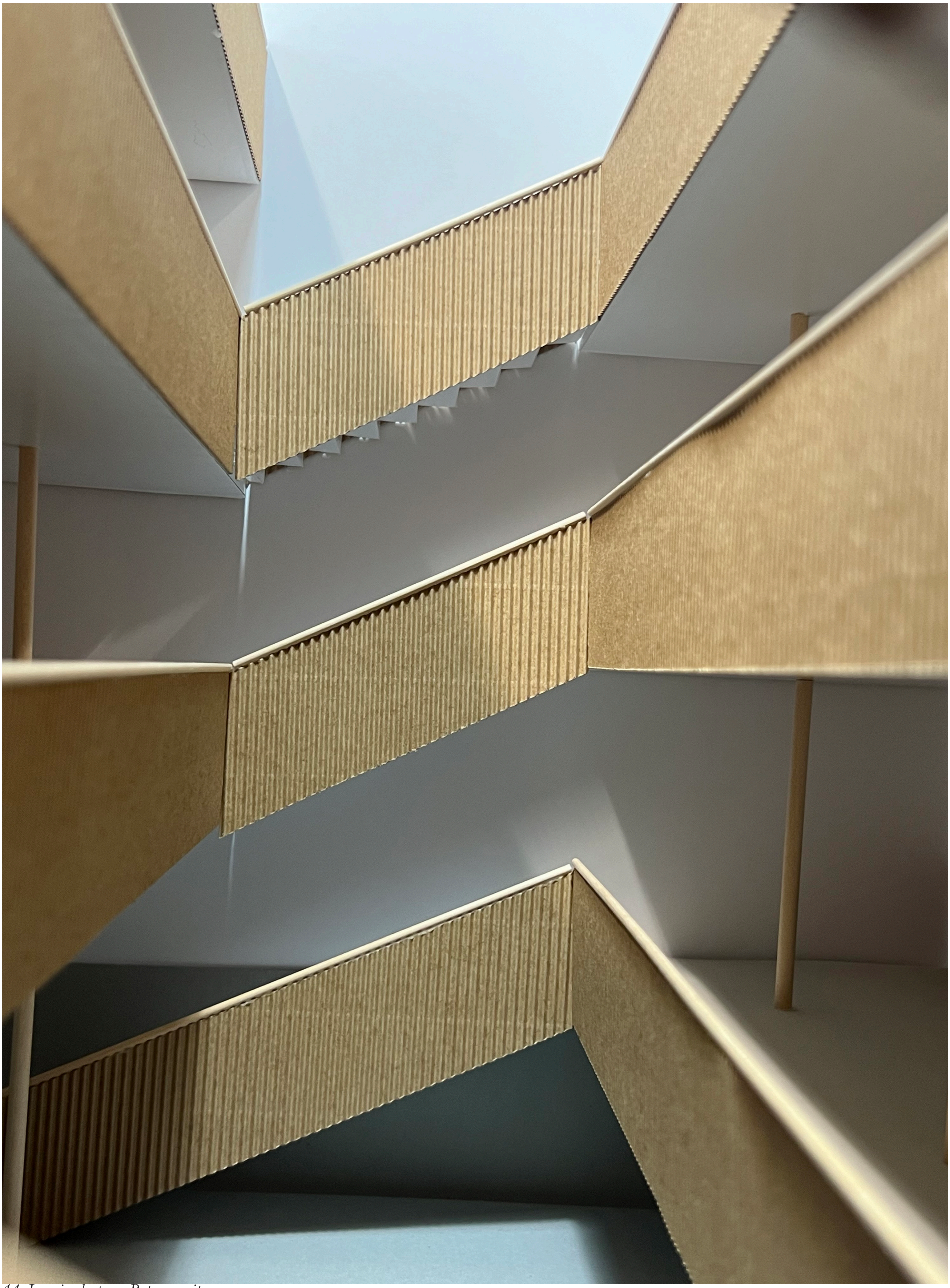

9 paving brick used on road on site


10 brick wall of the building on site


11 brick wall of the building on site


12 brick wall of the building on site


13 brick wall of the building on site



14 Imagined space Between city and stage 1:25 model

Approach

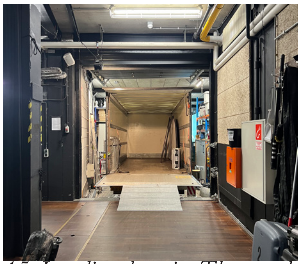
To better understand the full operation of a theatre and the daily challenges that arise from it, several field research visits to different theatres across the Netherlands were organized. The theatres include the *University of Amsterdam Theatre Studies, Theater Bellevue, International Theatre Amsterdam*, and the *National Opera & Ballet* in Amsterdam, *Kunstwerf, Theater Machinefabriek, Grand Theater*, and *Forum* in Groningen and *Theater de Veste* in Delft. It provides valuable insights into the functioning of different theatres and the preparation to put up a play. The differences in the size of the supporting spaces depending on the type of theatre provided valuable insight for the design. For example, the current *Theater de Veste*, a receiving theatre with a new show each night,has a relatively modest backstage environment aimed at hosting the receiving actors and theatre troupes. *Theater Machinefabriek*, a producing theatre, has several different workshops and storage spaces dedicated to producing and storing costumes and pieces of scenery. In contrast, the *National Opera & Ballet* in Amsterdam has a backstage area three times the size of the actual stage, which enables them to rotate between different shows without taking apart any scenery, just by moving it from the stage to the back. Feedback from the employees on what they like about working in their buildings and what the things that should be improved are, as well as the lived experience of visiting the backstage and back-of-house facilities, sheds additional light on how to better organise the spaces for the people who are working daily in the theatre. Oftentimes, the supporting areas, such as workshops and offices, are tucked away in a convenient corner regardless of their position in the building, which often leaves these spaces without or with very little natural light. Natural light was also one of the main wishes of the stage crews, who set up the scenery and lighting before the show, because the stage is often completely separated from the outside world.

To further familiarise with the theatre and to experience the theatre as a member of the audience, several additional theatre performances were attended. These provided some useful insights early in the design process as well as some innovative design solutions. The main takeaway from the visit to the *Kerempuh* theatre in Zagreb was the importance of sightliness because from the seats in the balcony one could not see the edge of the stage, which was frustrating because oftentimes actors could not be fully seen without assuming uncomfortable positions to get a better view.

Additionally, group models were made to better understand the broader surrounding area of southern Delft (1:500) and the site itself (1:200). They help with the understanding of the position of the theatre within the city and its relationship with surrounding buildings. The smaller-scale 1:500 model helps explore the position of the theatre in the city and how it fits into the existing urban fabric. The larger scale model 1:200 looks at the immediate surroundings of the new theatre and helps explore the relationship between it and the existing buildings it touches and interacts with. A series of different ideas can be quickly tested with the models, which will shape and better inform the design.

To better inform the future design of the theatre building, a design exercise exploring the relationship between the city and the stage was conducted. It imagines a space on the boundary between the public realm of the street and the public, but often self-contained world of the theatre performance. The lack of space in the city makes it impossible to organise all the functions on the same level, which would be ideal, forcing a vertical stacking of the programme. With that, the main challenge becomes how to design the ascent to these elevated spaces that does not include only elevators, escalators and monotonous flights of stairs, but makes the ascent a pleasant and varied experience where the ascent itself becomes a part of the performance.

Group research into ten iconic theatre buildings designed by European architects from different epochs gives valuable insight into different approaches each architect had when designing a theatre, how they solved specific problems, and how theatres absorbed additional social functions depend-


15 Loading bay in Theater de Veste


16 Costume workshop at the Theater Machinefabriek

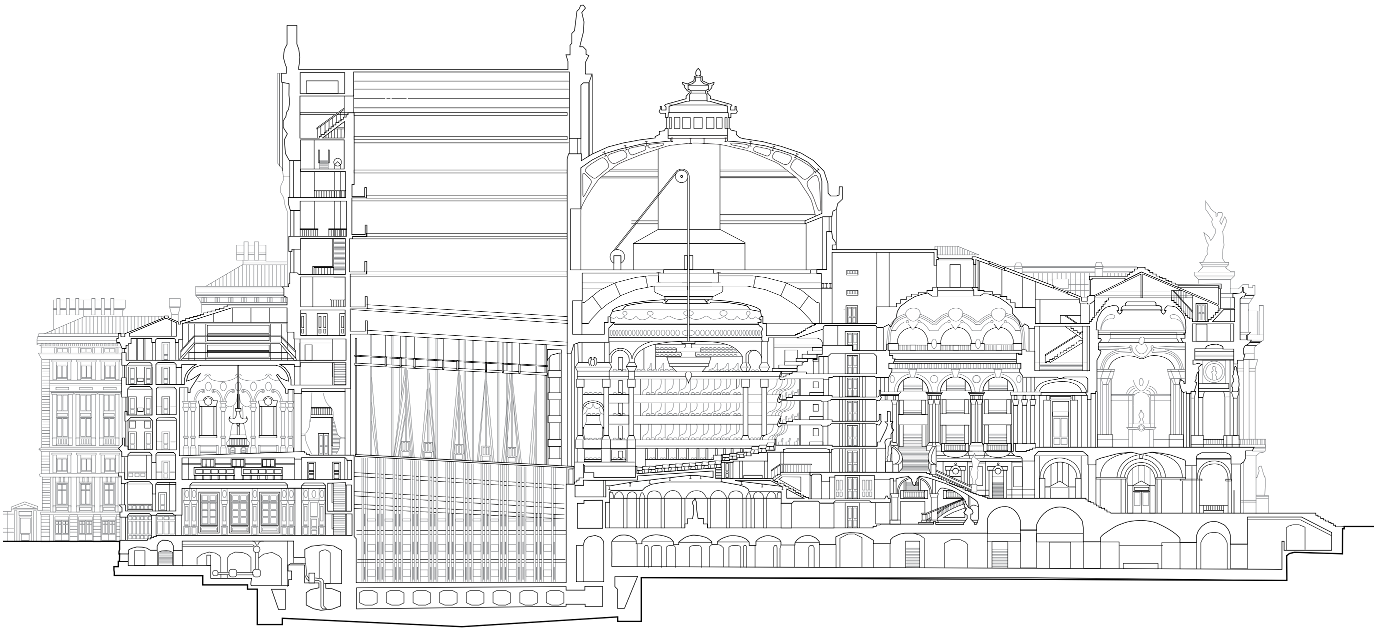

17 Backstage of the National Opera & Ballet in Amsterdam


18 View from the balcony of the Kerempuh theatre


19 Stage tower of Theater de Veste glowing in the dark

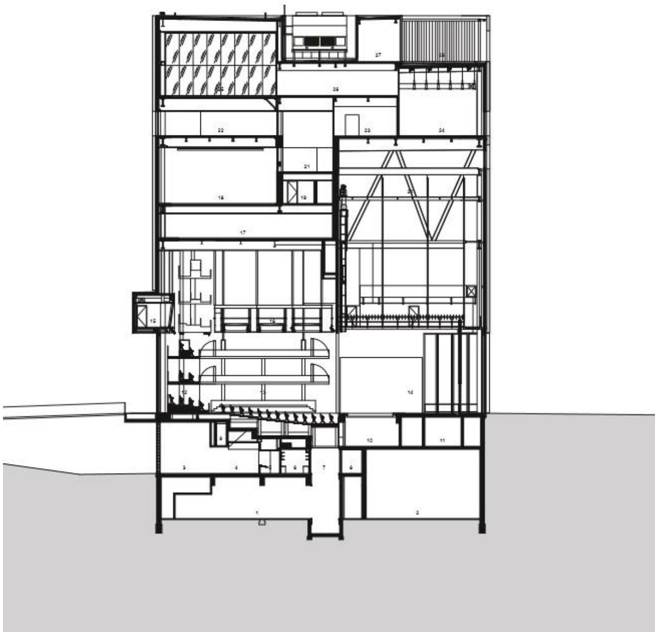
ing on the time at which it was built. The research included redrawing of the original plans and sections in the same scale, an isometric drawing of the relationship between stage and audience, a site plan with original context and an atmospheric drawing. The uniform scale, style and type of drawing facilitate comparison between the buildings and allow for their easier understanding. In the end, all the drawings and accompanying texts were compiled into a book for easier understanding and access to the materials. Opéra Garnier in Paris, France, designed by Charles Garnier in 1861, is an important historical precedent whose raised stage and auditorium, together with a vestibule under it, represent an early example of vertically stacking the programme. Furthermore, the highly theatrical ascent on the main staircase and being part of the social spectacle in which one comes to the theatre to see and be seen by other people instead of coming to see the play itself makes the ascent a lot easier and more eventful.

In addition to the research on historical theatres, close attention was paid to the plans and sections of contemporary theatres to get acquainted with different approaches in designing a contemporary theatre, focusing on the relationship between performer and audience as well as the relationship between city and stage. Dee and Charles Wyly Theater in Dallas, Texas, designed by OMA from 2001 to 2009, has all its supporting spaces, which are, in most cases, wrapped around the stage, stacked either on top of or below the stage. This frees the stage and enables it to have direct connection with the city centre. This is further emphasised by wrapping it and the auditorium in glass, meaning that the city of Dallas can serve as a backdrop for the play, but of course the windows can be covered, detaching the stage from the city. The auditorium is designed in a flexible way which enables it to change from a classic proscenium theatre, into a thrust or flat floor theatre in a few hours.

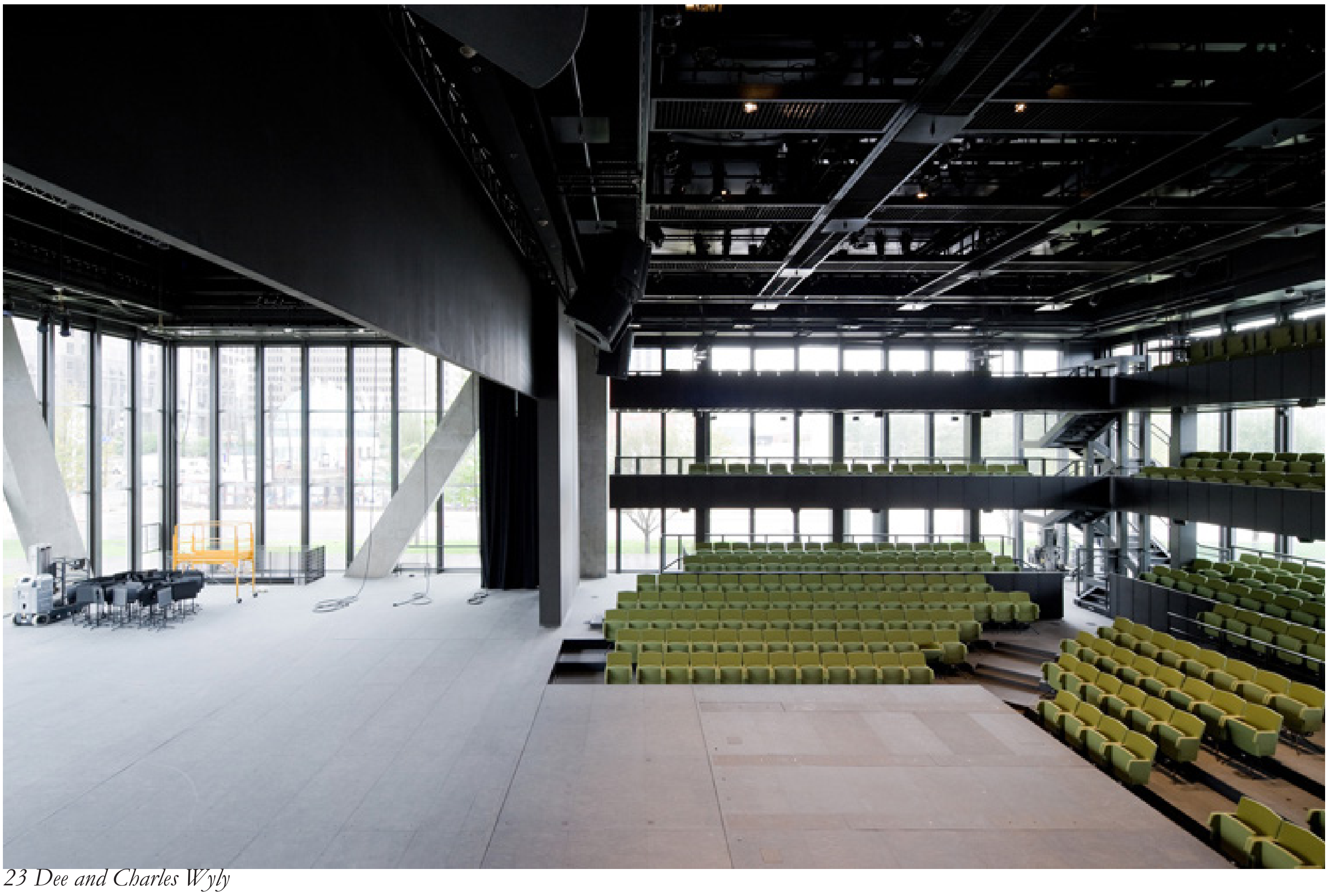


20 Opera Garnier, Paris, France, 1861, Section

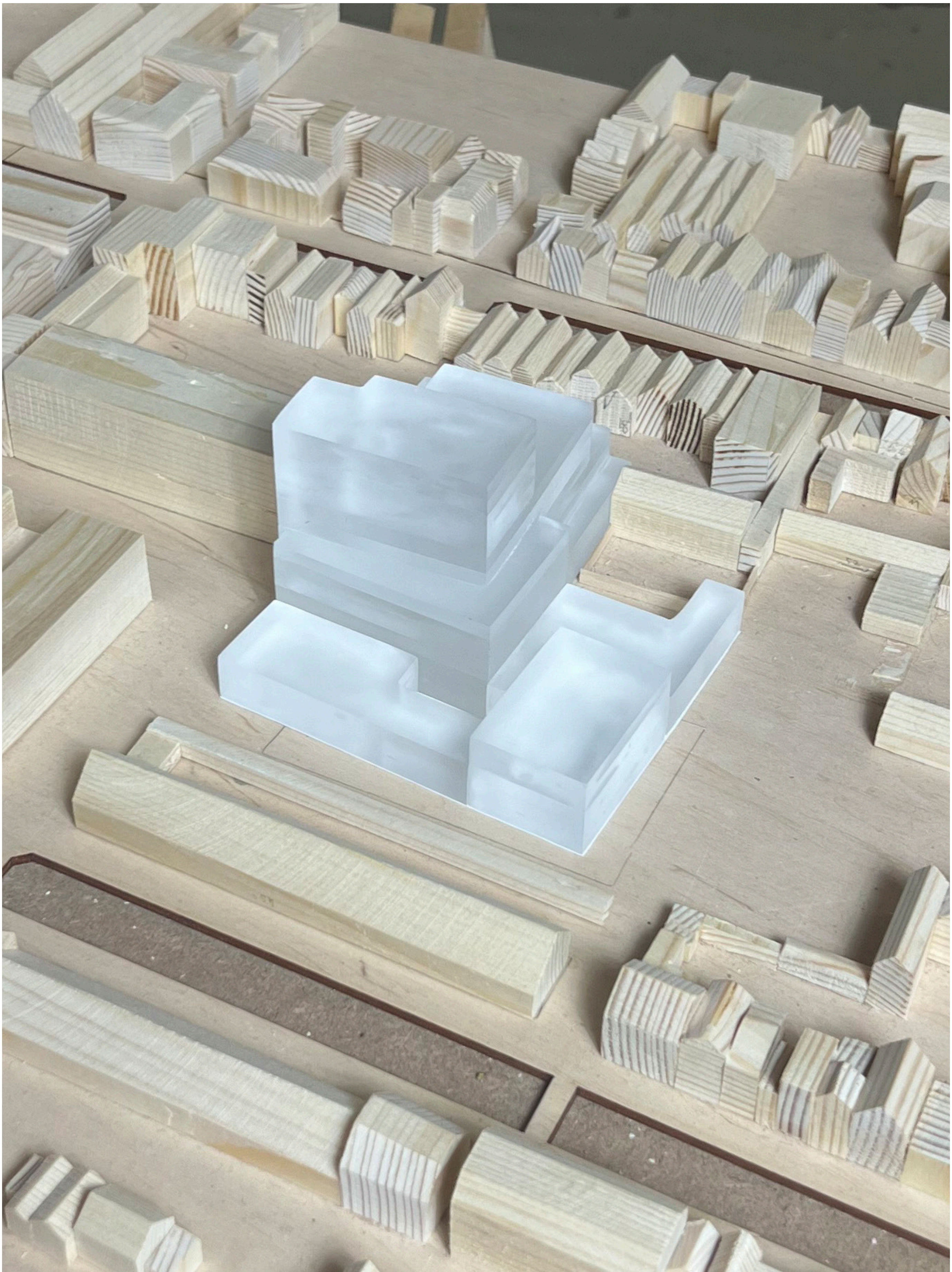
21 Stage tower of Theater de Veste glowing in the dark



22 OMA, Dee and Charles Wyly Theater, Dallas, Texas, section



23 Dee and Charles Wyly Theater, view of the stage



24 Final 1:500 model of the theatre

Results

In the quite complex conditions of the site, where different building scales clash, where the demolition left an unresolved space devoid of character, and where no programme is provided to attract people to go to and stay, the new theatre building tries to change that. By raising the main stage and the 800-person auditorium from the ground to the first floor, more public space is freed on the ground floor, and the first floor is entirely left to the realm of theatre, with actors' dressing rooms and employees' offices. This also improves the flow of people through the building while also enabling a more generous size of the side and backstage area.

Firstly, to mitigate the varying height of the buildings surrounding the site, with big apartment blocks, higher than 15.00 meters to the west, and smaller residential rowhouses, lower than 10.00 meters in height to the east, the building meets the height of existing blocks in the west and cascades to the east to meet the lower height of the houses there. A particular challenge to this approach is presented by the required height of the stage tower, which is considerably higher than any other building in the surrounding area, so there is no way to connect it to the surrounding buildings while respecting the neighbouring heights. Because of this, the stage tower is treated as a landmark that is not governed by the established rule to respect the height of neighbouring buildings, and it is positioned as centrally as possible in the plan, not to overshadow the surroundings. The stage tower is aligned to the central axis of the Kruisstraat, creating a monumental finish to the street, which is the main access point to the new theatre. To further solidify the presence of the new theatre in the street, the full height of the fly tower is extended over the western side stage, accentuating the verticality and height of the building. The main entrance to the theatre is positioned at the base of the tower, at the eastern bend of the Kruisstraat.

Secondly, given the tight conditions in the northern part of the site, where existing houses currently have no back gardens, a new public garden or a small square is created to give space to the existing buildings and to improve their conditions. It can be accessed either through the theatre building or an existing narrow alley on its eastern side. Similarly, a residential house to the northeast of the site has a garden oriented to the south, which would be completely overshadowed by the new theatre, which is why another smaller courtyard is created as an extension of the existing garden. Another atrium is created in the southeastern part of the building to bring light and air into the middle of the building and improve the overall conditions inside. To try and heal the demolished urban fabric, the new theatre building follows the lines established by the existing buildings. For example, the southeastern façade of the new theatre is aligned with the existing 1970s residential houses, recreating the contour of a city block.

The building is clad in glass blocks, further solidifying its landmark status by not trying to fit into its brick surroundings, neither with material nor colour. Still, the glass blocks were chosen to respect the traditional principles of using a modular small-format material. The slight translucency of the glass blocks reserves a degree of privacy for the people inside the building while signalling openness with the interplay of shadows and silhouettes on the outside. Their high mass also helps with the outside sound insulation. To satisfy the thermal requirements, the walls are built as a double-skin glass façade with a ventilated cavity in the middle, double-pane windows on the inside and the glass blocks on the outside. During the summer, the cavity can be ventilated through the openings at the top and the bottom, while in winter it creates a greenhouse effect, keeping the interior warm. The façade consists of prefabricated steel rectangular hollow section panels which hold the 78 glass blocks in each panel. These are hung on strong horizontal steel profiles at every floor level. The system enables quicker installation compared to traditional connections with mortar and steel reinforcement bars, while leaving no visible joints between individual panels. To unify the complex shape of the building and reinforce the oneness of the building, the treatment of the façade is the same across all façades.

The load-bearing structure of the auditoria and stage consists of concrete walls on its perimeter, ensuring the acoustic insulation of the venues, and standard steel HEB profile, primary and secondary beams, supporting the roof. The floor of the main 800-person auditorium is made from the prefabricated concrete TT plate reused from the parking deck. The rest of the building is done in a concrete skeleton system with concrete floor slabs on a 7.80 by 7.80-meter grid. A single material is again used to reinforce the oneness of the building. The foyer is spanned with a concrete Vierendeel truss to keep it as unobstructed as possible.

The main foyer on the ground floor is positioned under the sloped floor of the auditorium, forming a double-height space at one end which can be used for different exhibitions, film screenings, banquets, lectures, or livestream viewings of the events from the main hall. The foyer is separated from the newly created public garden by a double-height glass wall which can be lifted, connecting the two spaces.

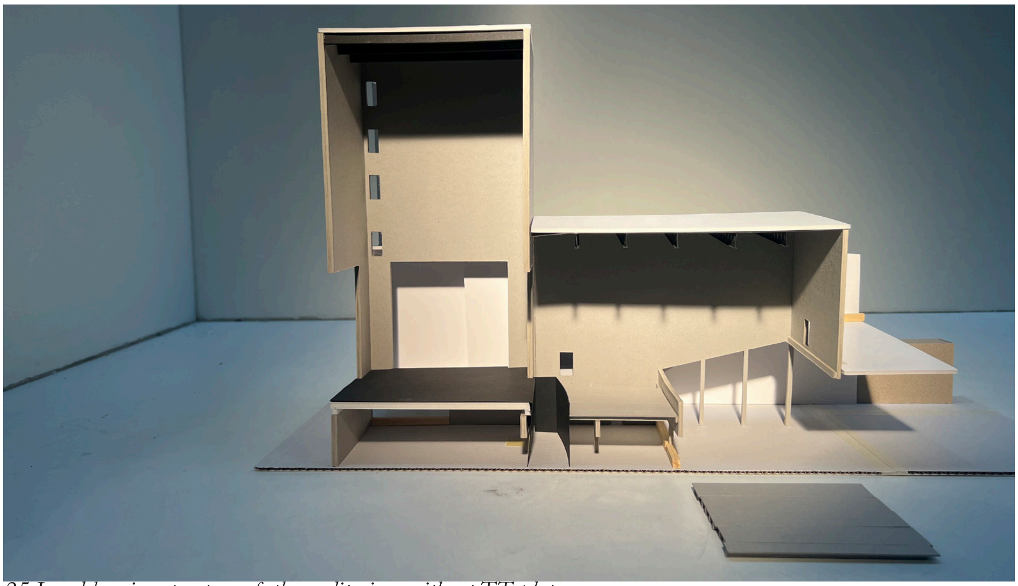
Similarly, the smaller 200-person auditorium, positioned on the ground floor, has an openable glass wall toward the street and the existing playground, allowing for the performance to come out onto it. The flexible black box theatre is fitted with removable seating. The floor and walls are made of non-precious materials, allowing them to be drilled, screwed, nailed into and painted, allowing it to host a wide array of performances.

The main fan-shaped auditorium with a proscenium stage is accessible from the smaller foyer on the second floor, which has sweeping views of Delft's historic centre and its churches through the glass wall spanning the whole length of the room. To acoustically separate the possibly noisy foyer from the quiet auditorium, two sound and light lobbies, with double doors, and a string of control rooms are positioned between them, which also enables a good overview of the event for the technicians. From the lobbies at the back of the auditorium, the audience members go either down to take their seats in the parterre or up onto the balcony. Another access point to the auditorium is at the side at the first-floor level, primarily for people with reduced mobility, to the flat section in the front. The auditorium is finished in red stained wood because red is the first colour to disappear when the lights are turned off, as well as the traditional colour of theatre interiors.

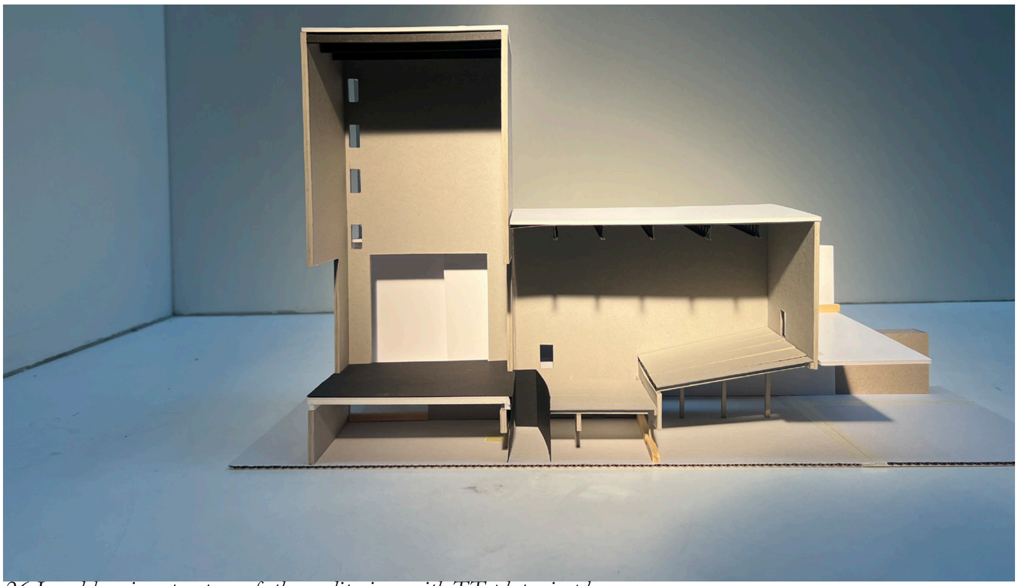
The flexibility of the proscenium and stage is an important consideration, given that it is a receiving theatre hosting many different performances. The maximum width of the new proscenium is 16 meters, which can accommodate a wide range of performances from dance to opera. The soft proscenium enables the change of proscenium width to better suit different performances while still preserving excellent visibility from all seats in the auditorium. The orchestra pit can also be raised, creating a small thrust stage, or aligned to the floor and fitted with additional seats at the front.

The configuration of the load-bearing concrete walls enclosing a space of almost 24.00 by 24.00 meters for the auditorium and 16.00 by 24.00 meters for the stage tower allows for future changes to the spaces. The interior fittings of the auditorium, including the rake, could be removed, leaving just the concrete shell in which a new auditorium configuration could be constructed if the need for a new auditorium configuration arises in the future and pushes out the classical proscenium theatre. The public spaces on the ground floor have the same clinker brick flooring as the streets outside to better express the openness and public character of the institution, as well as to pull people inside by identifying with the material character of the streets.

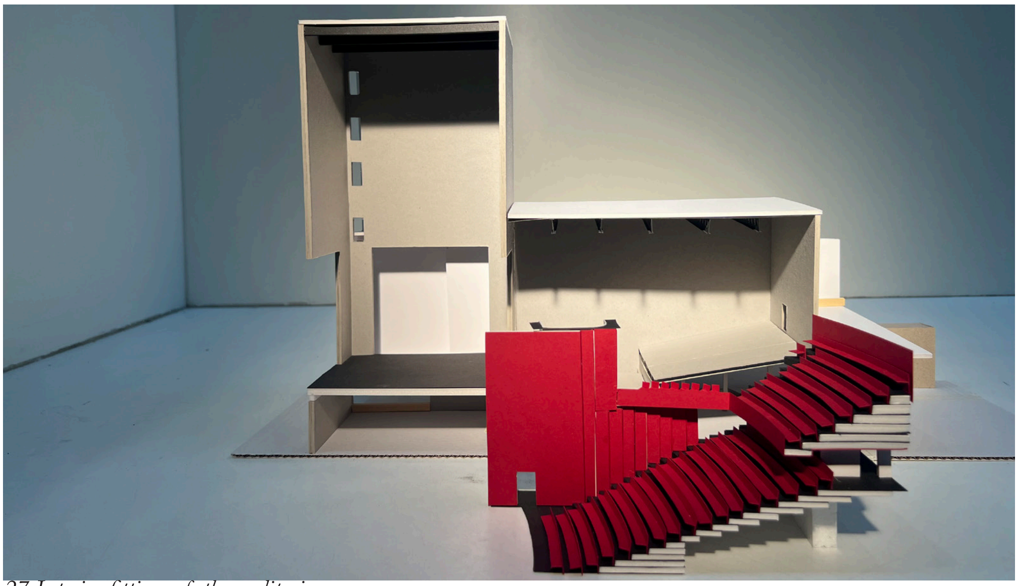
Although most of the public programme is confined to the ground floor, the space created by pushing the full height of the stage tower over the left side stage area is used as a bar offering views over the city. A separate staircase to reach these areas is positioned right behind the main façade of the stage tower. The bar is also serviced by an elevator which can be used to bring different pieces of equipment onto the stage tower galleries which are connected to the lighting galleries in the auditorium. The fire escape stairs on both sides of the auditorium also serve as the access point for the lighting galleries at the top of the auditorium.



25 Load-bearing structure of the auditorium without TT plates



26 Load-bearing structure of the auditorium with TT plates in place



27 Interior fittings of the auditorium

28 view from the stage to the auditorium

Conclusion and discussion

In conclusion, the new theatre building successfully bridges the difference in building scale around the site, cascading from five-storey height in the west to just two-storey height in the east. The great volumes of the stage tower and auditorium are carefully positioned and manipulated to fit nicely into the existing urban fabric. The stage tower's position in the axis of Kruisstraat, the main street approaching the new theatre, creates a visible landmark in the image of the city as well as the vista of the street. To better fit with the existing apartment block to the west of the stage tower, a section of it is removed to give some breathing space to it and not to completely overshadow it leaving the apartements on the lower floors in constat shade.

The building follows the directions established by the existing buildings, resulting in a slight rotation of around 4 degrees between the higher and lower sections of the building. The circulation area on the ground floor and the side stage and backstage areas accommodate the shift in direction. The crystalline form of the building is accentuated using glass blocks to clad the whole building. Glass blocks allow for sunlight to enter the whole interior while retaining a degree of privacy not offered by a regular window. Glass blocks also make it stand out in the predominantly brick environment of the site and Delft in general. The new city landmark was created in two ways, both by carefully manipulating the volume of the building and through the materiality.

The main auditorium is quite conventional and does not allow for a quick and drastic change in the layout of the auditorium, but the rational and simple disposition of the load-bearing structure, creating a big square box around the auditorium, allows for future adaptations and changes, even allowing the change from the fan shape to a different configuration. By incorporating additional hospitality functions, such as bars and restaurants, the new theatre can remain active during the whole day and not just in the evening as is the current case. The additional revenue from renting those spaces enables the theatre to organise different public events in its foyers and gardens, engaging a wider and more diverse audience.

The building shows a successful approach in dealing with complex and layered urban sites with varying building heights. It proves that a relatively small change to the volume can have dramatic improvements in a building's interaction with its neighbours, as was the case with removing a small section of the stage tower extension, which really relieved the adjacent building of its overbearing presence. The building is constructed using conventional and rational methods while still achieving an impressive appearance in the urban landscape of Delft. The use of glass block also illustrates an approach to how modern and non-traditional materials in a highly traditional context can be handled with care by choosing to employ the same principles used with traditional materials. Concretely, the use of a relatively small building element to construct an enormous structure.

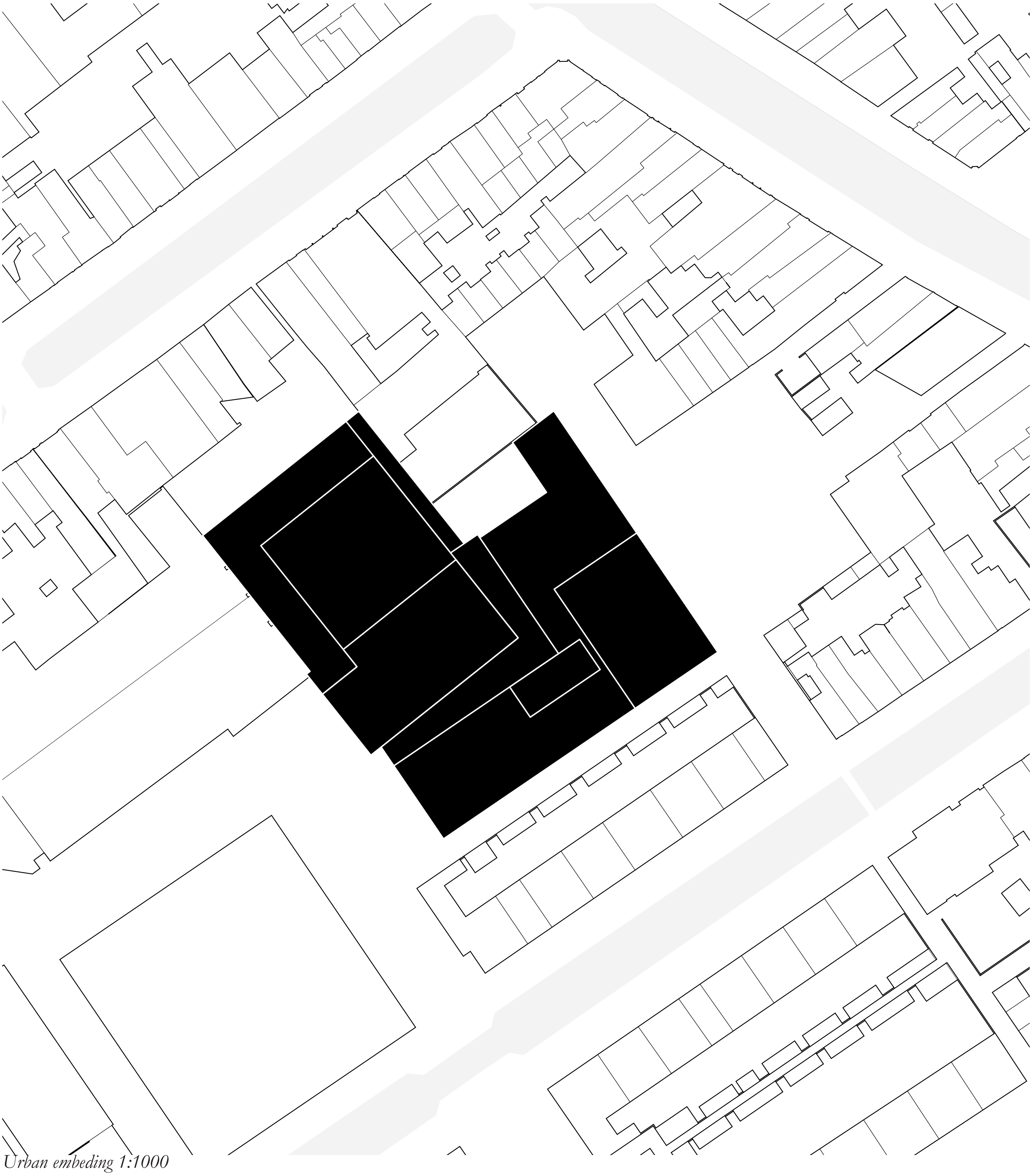
Fieldwork, both going to see the performances and the behind-the-curtain workings of the theatre world, was very valuable, giving a new understanding and a fresh perspective into its complex workings. The first-person experience of some theatre aspects showed which things special attention should be paid to. Most notably, the realisation that theatres are not always accessible, especially the backstage environment for the employees.

Similarly, the research into both contemporary and historical theatre precedents yielded a better understanding of the systems that govern the complex world of theatres. The focus of contemporary theatre research was in understanding the different technologies that enable the smooth and unobstructed functioning of the performance. Also, to realize that there are different solutions possible for achieving a highly adaptable experience, and that even though commercial interests often play a central role in theatres, a great variety of different configurations are possible. The historical research mostly served to better understand the evolution of European theatre since the times of the ancient Greeks all the way to the 20th century. It also showed that the most unusual and revolutionary theatres developed from a close collaboration between the architect and inspired theatre directors and artists who were oftentimes the driving force behind the spatial reorganization of the theatre.

Physical model making in different scales was very useful throughout the design process, helping in testing different ideas and oftentimes facilitating the explanation of certain ideas. The process of building the site models themselves also demanded getting better acquainted with the site rather quickly, which certainly influenced some design decisions.

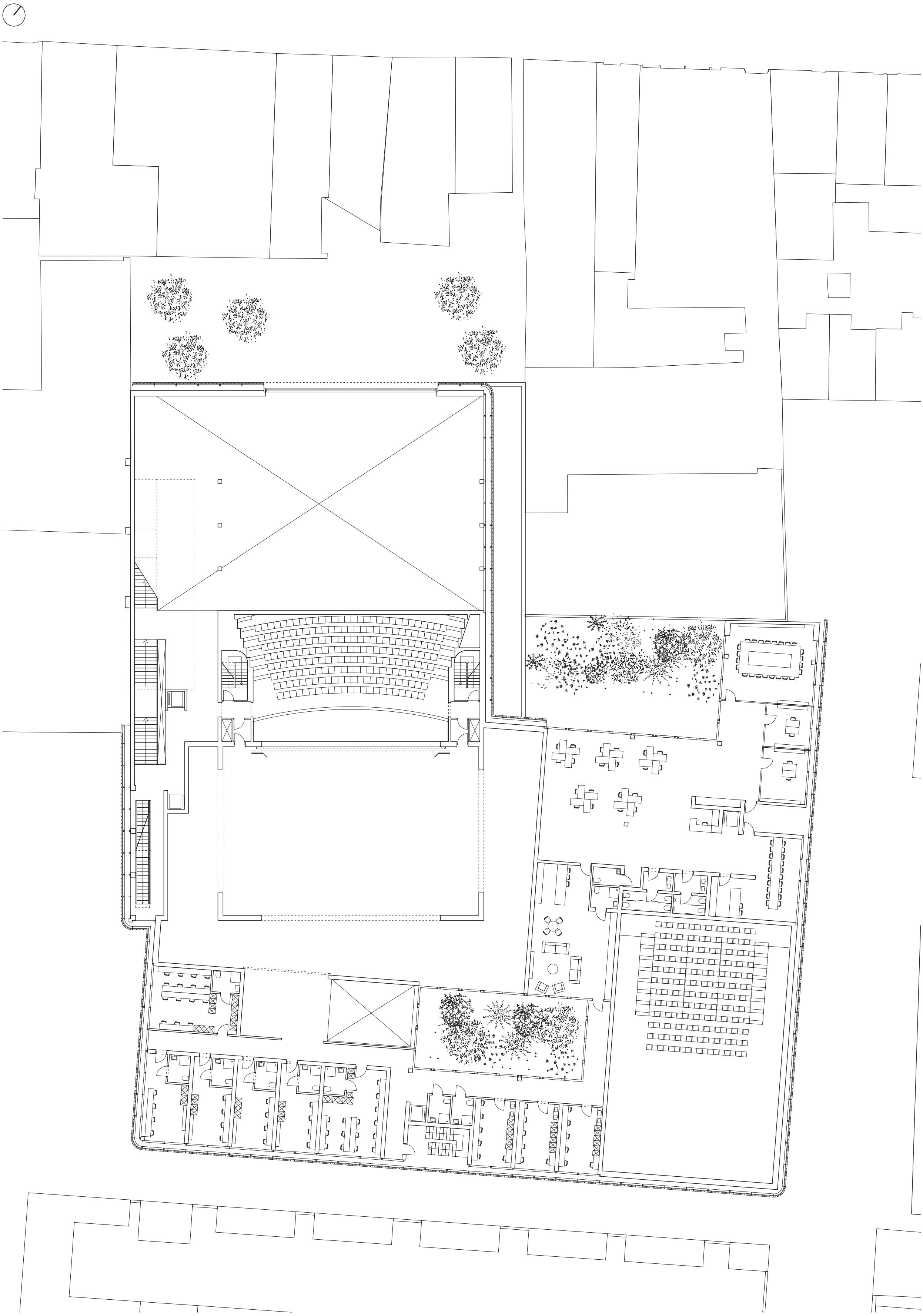
Appendex I

1:200 plans, sections and elevations of the new theatre building

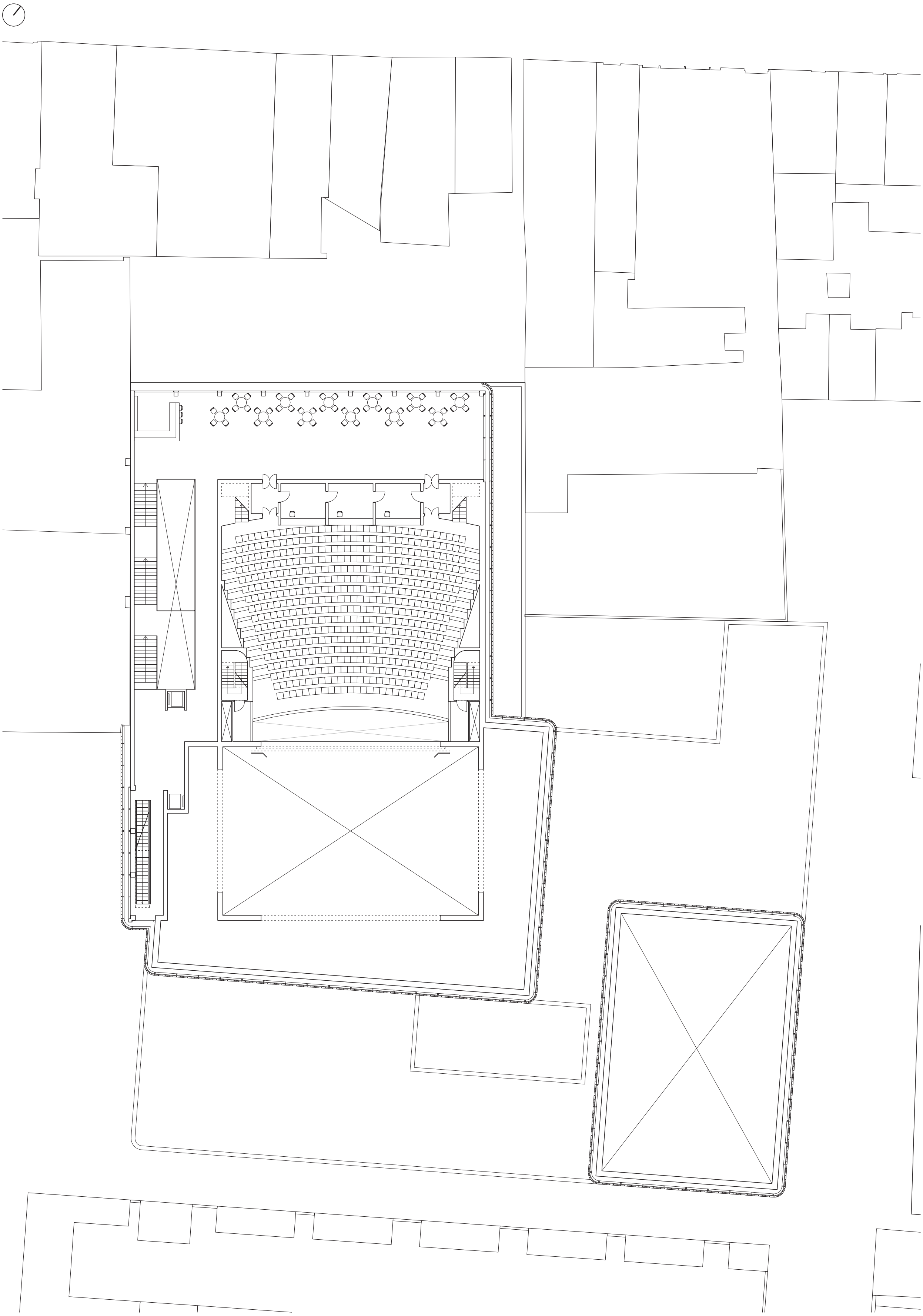


Urban embeding 1:1000

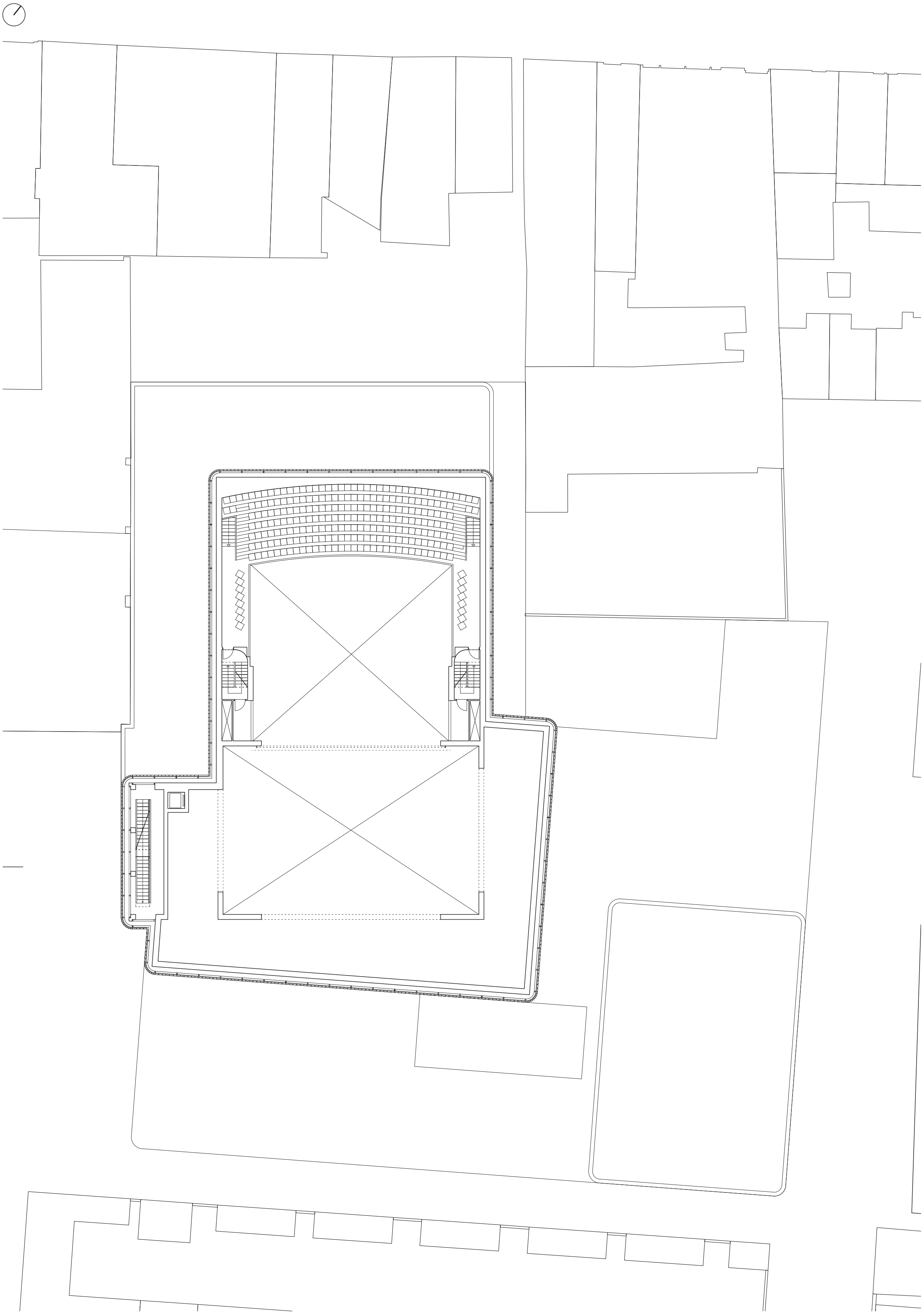
Ground floor 1:200 (scaled to 1:500 to fit the page)



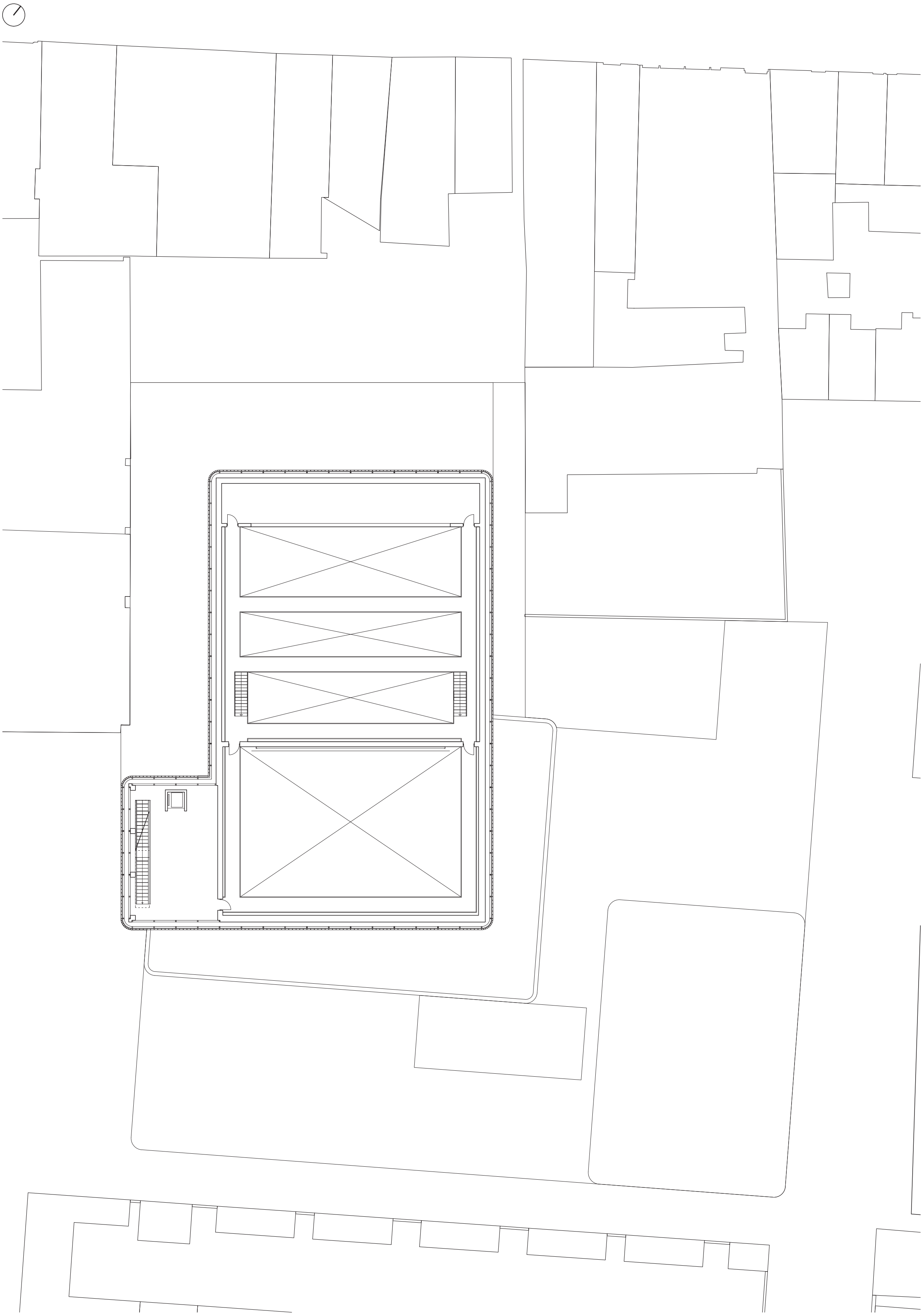
First floor 1:200 (scaled to 1:500 to fit the page)



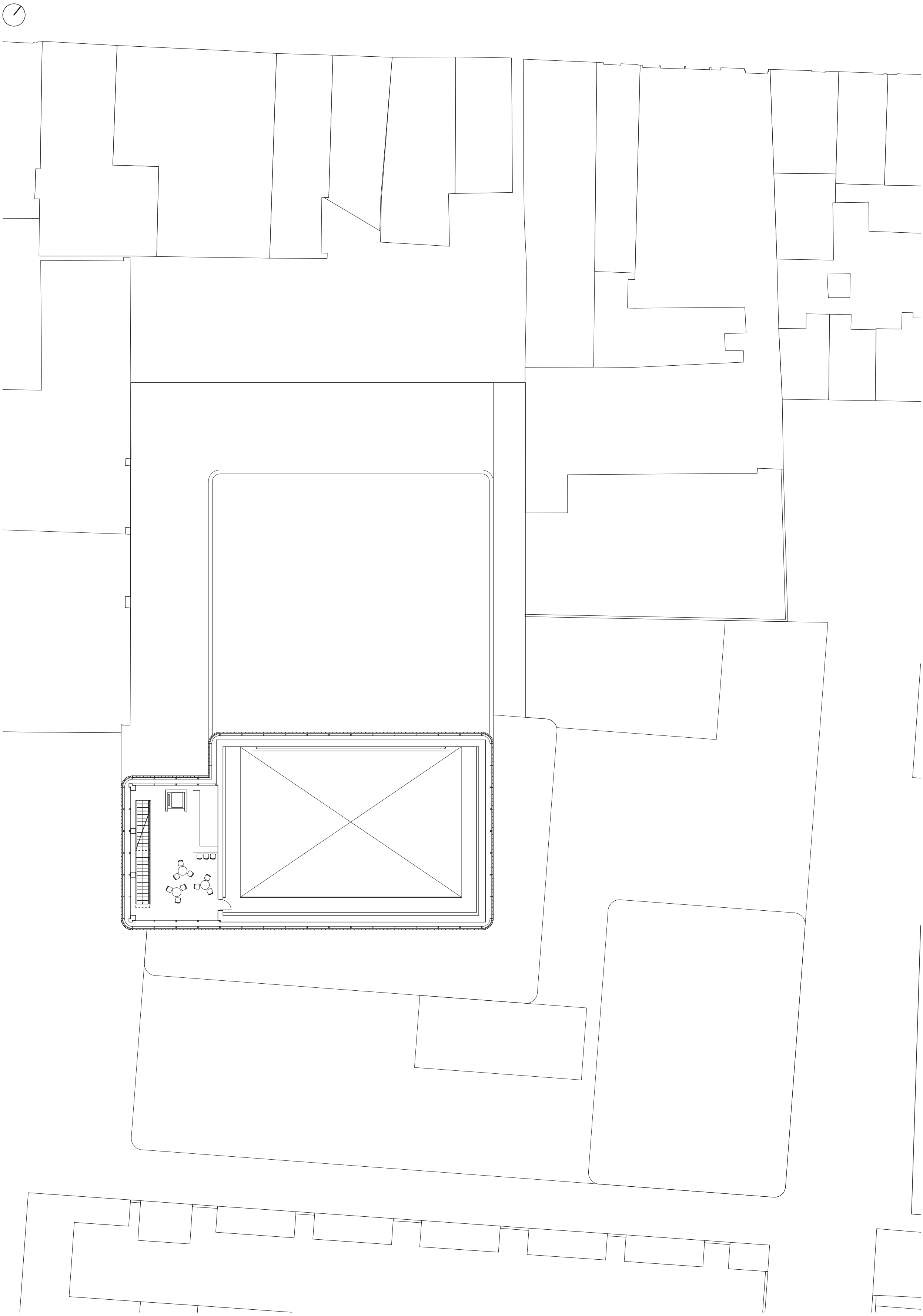
Second floor 1:200 (scaled to 1:500 to fit the page)



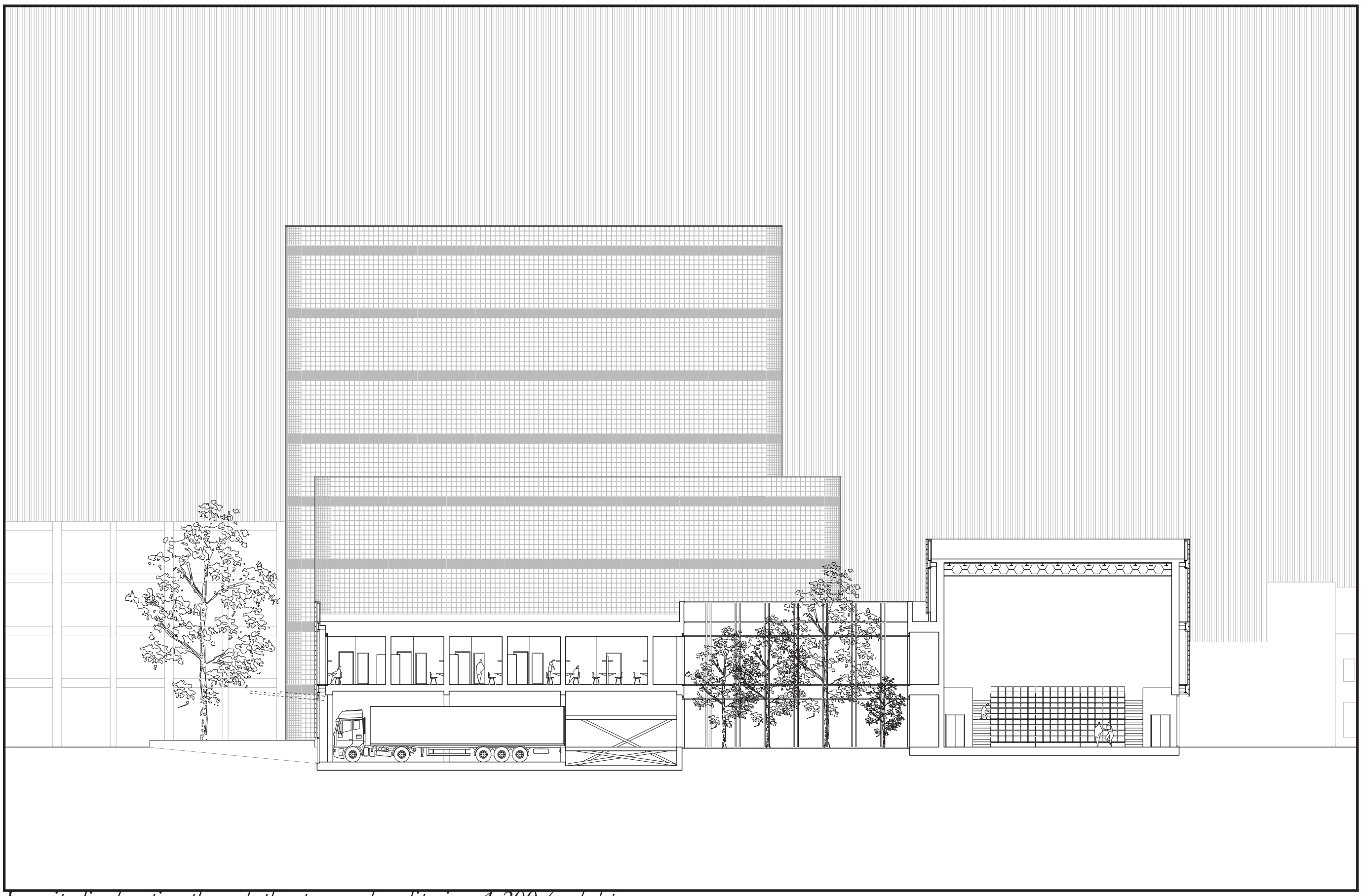
Third floor 1:200 (scaled to 1:500 to fit the page)



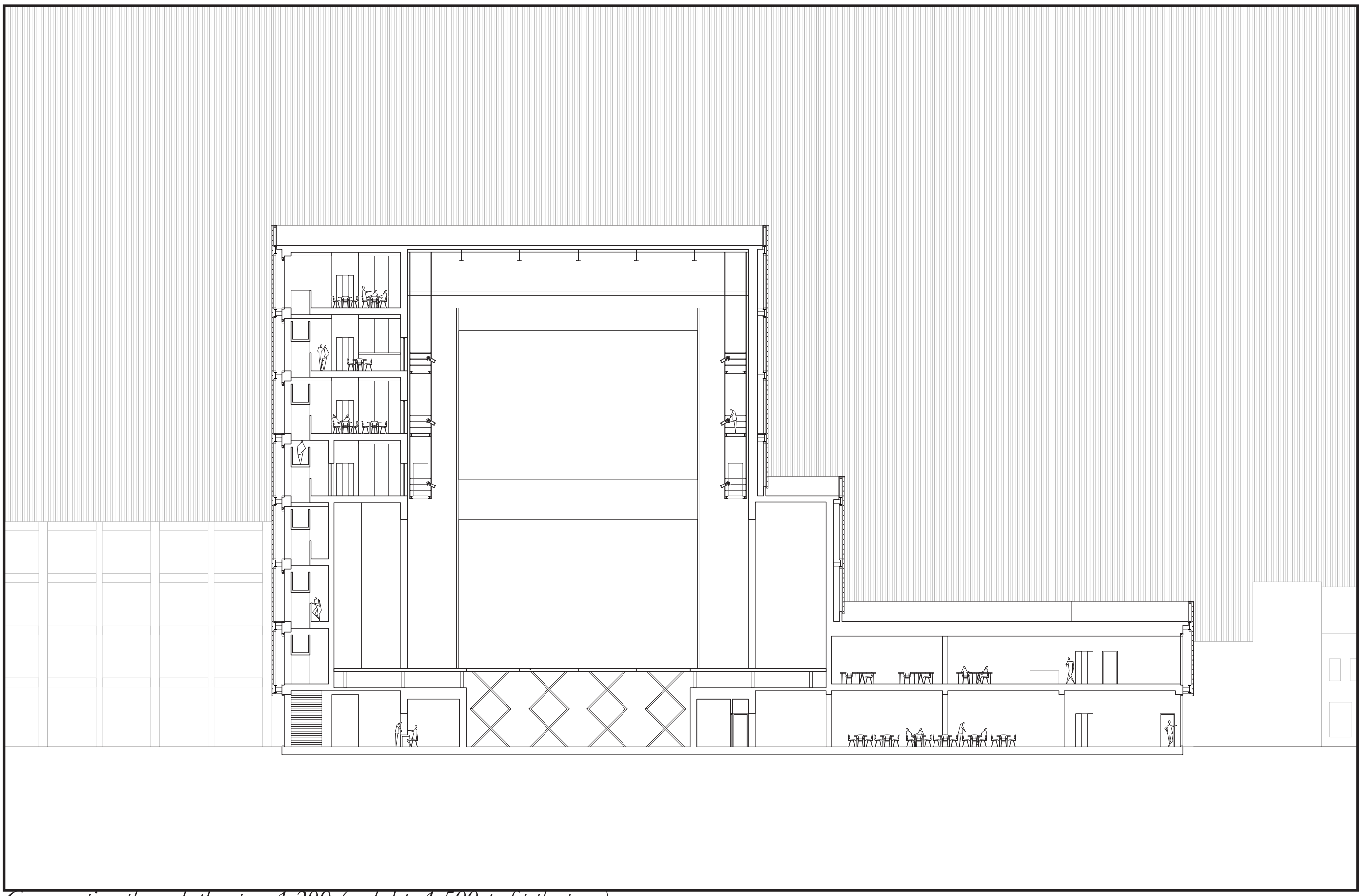
Fourth floor 1:200 (scaled to 1:500 to fit the page)



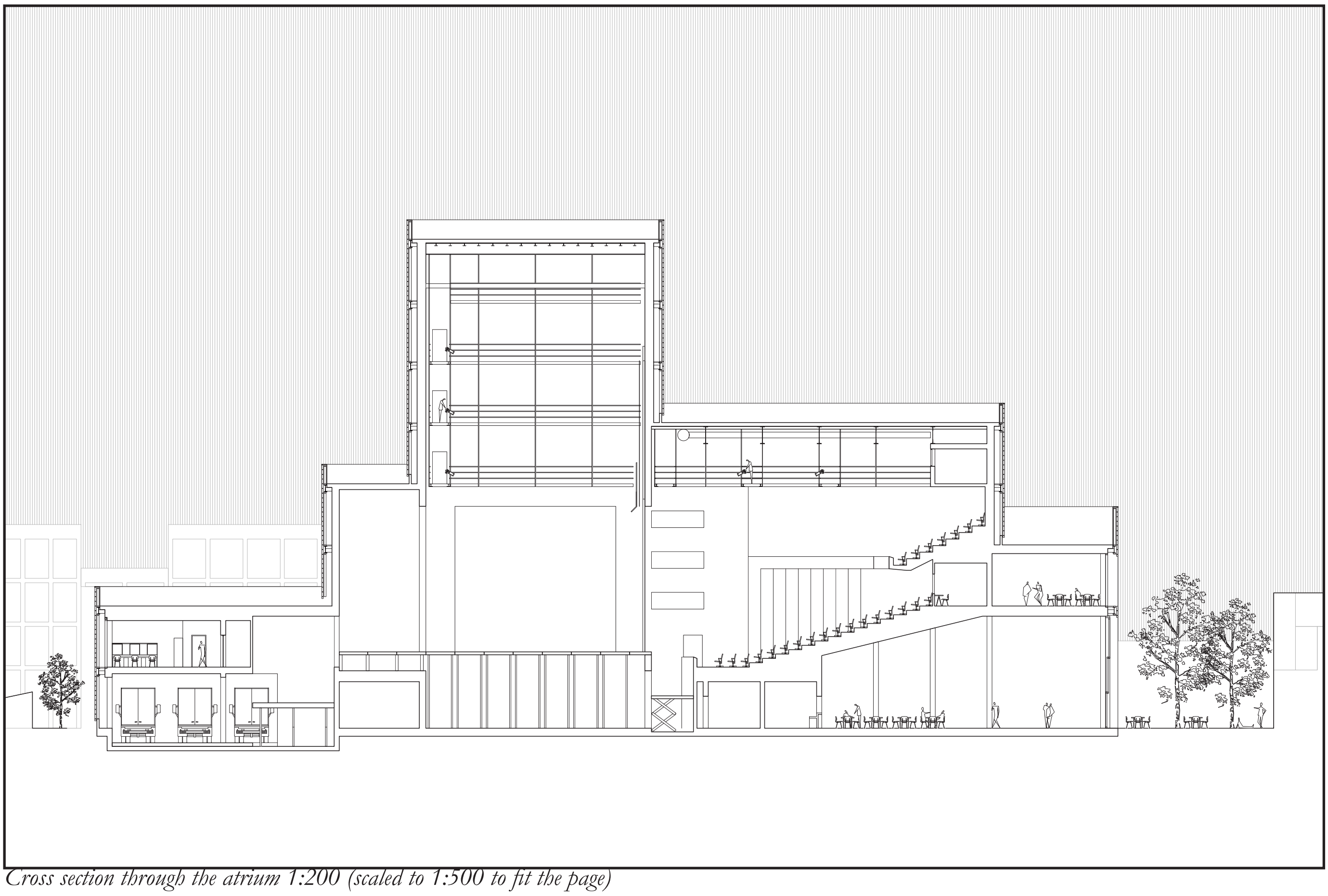
Fifth to seventh floor 1:200 (scaled to 1:500 to fit the page)

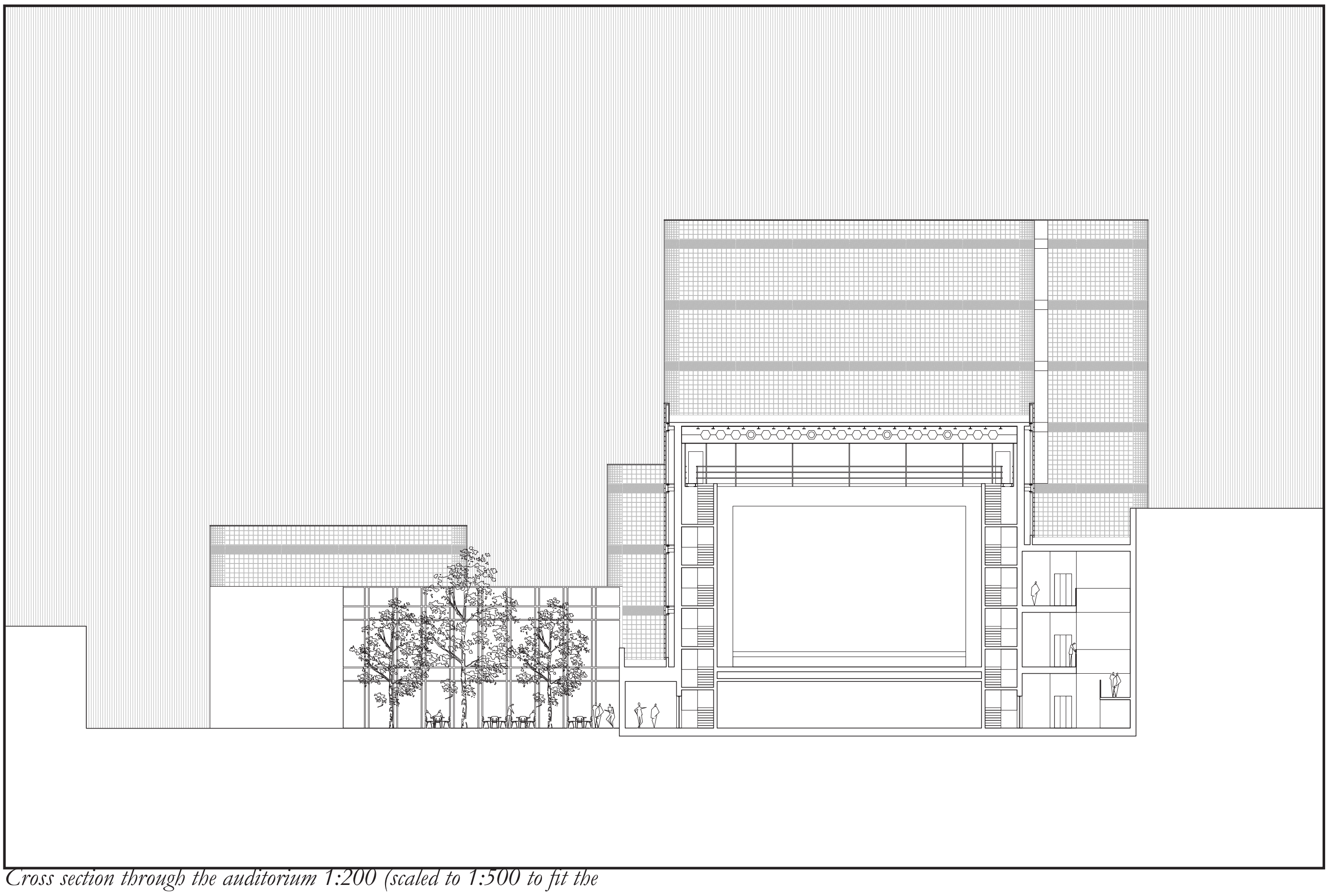


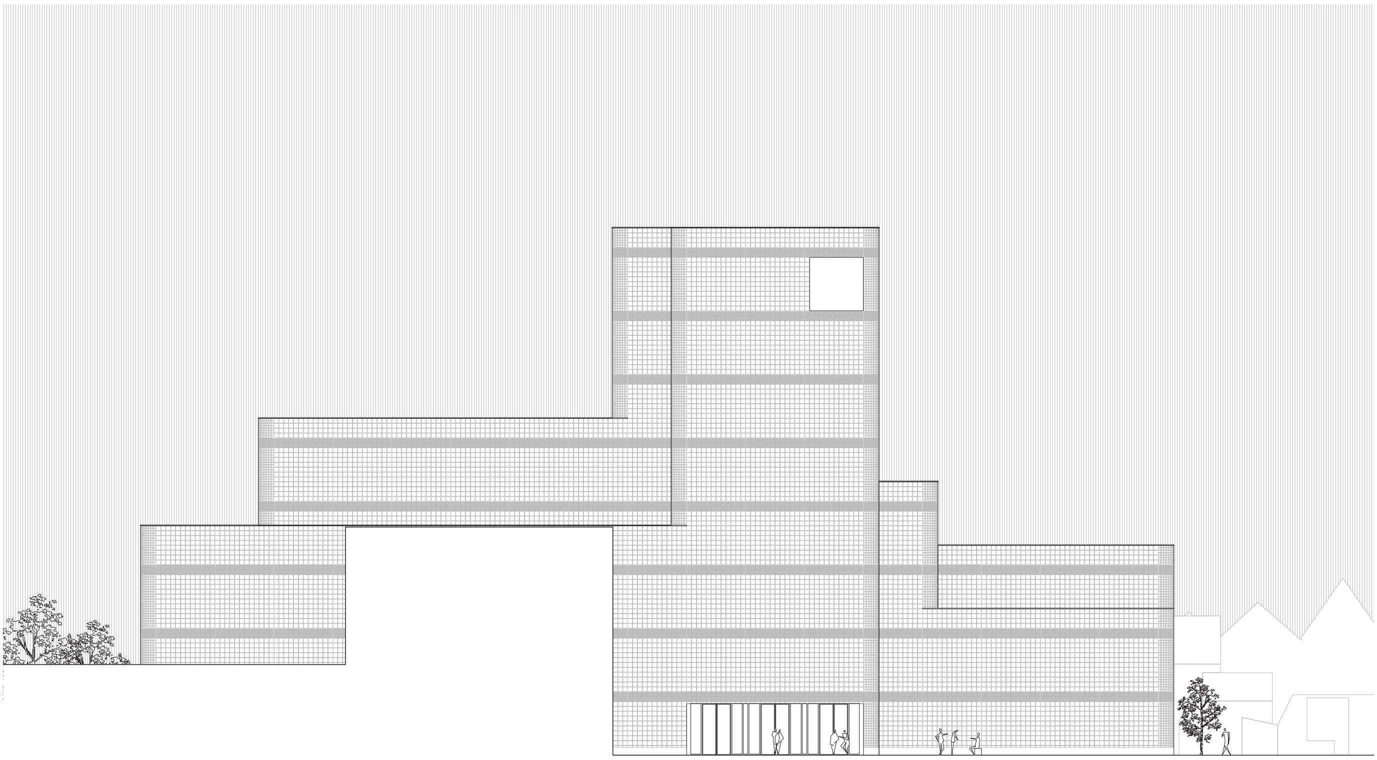
Longitudinal section through the stage and auditorium 1:200 (scaled to 1:500 to fit the page)



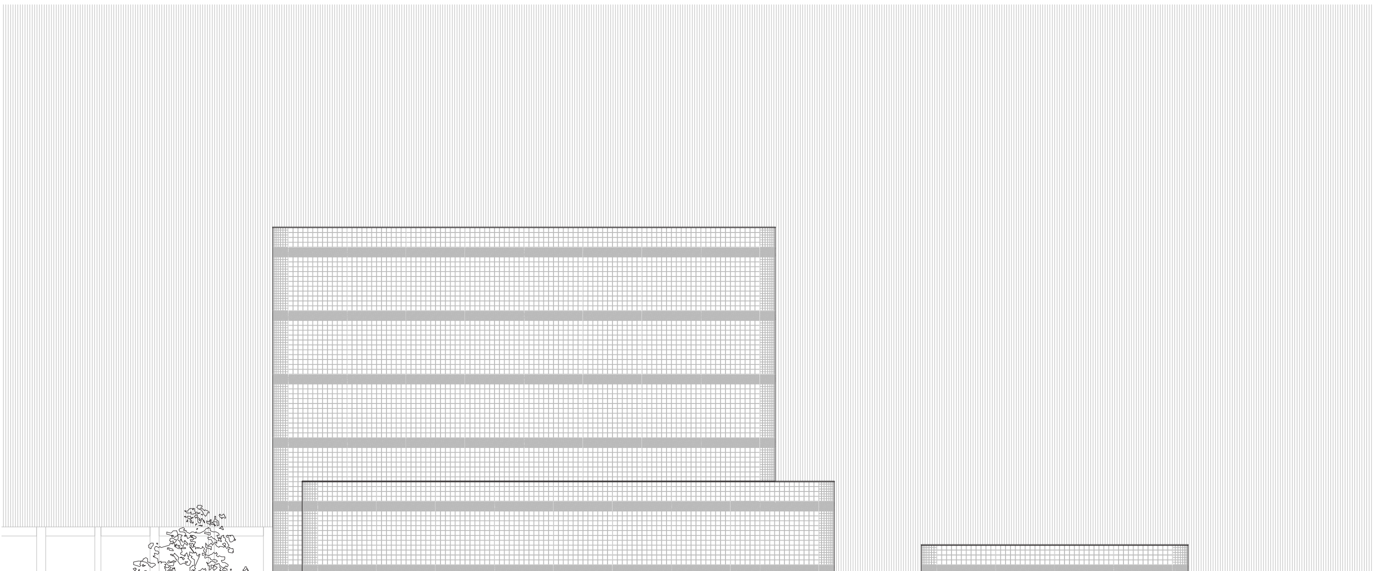
Cross section through the stage 1:200 (scaled to 1:500 to fit the page)


Cross section through the atrium 1:200 (scaled to 1:500 to fit the page)


Cross section through the auditorium 1:200 (scaled to 1:500 to fit the page)



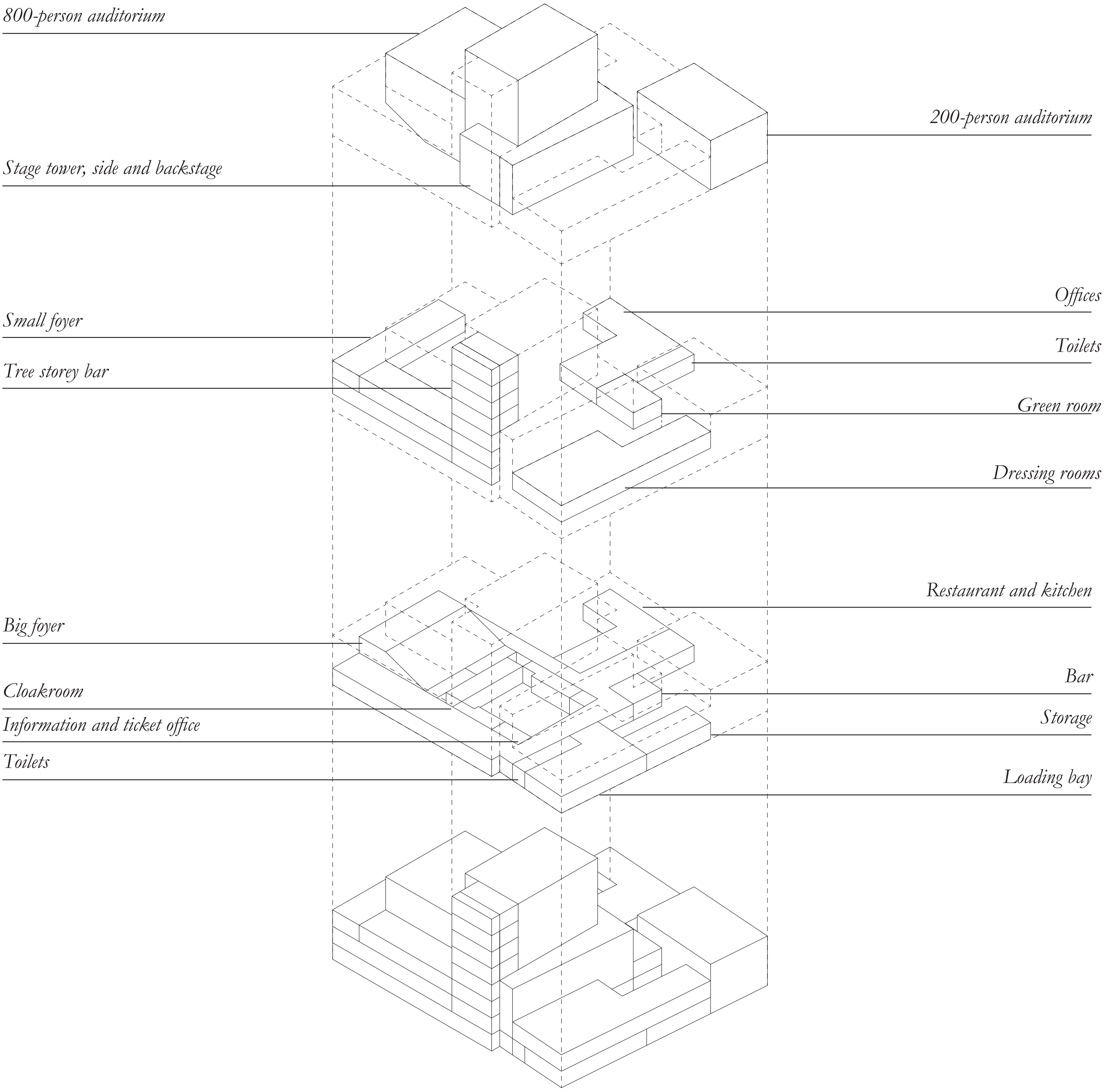
Southwestern facade 1:200 (scaled to 1:500 to fit the page)



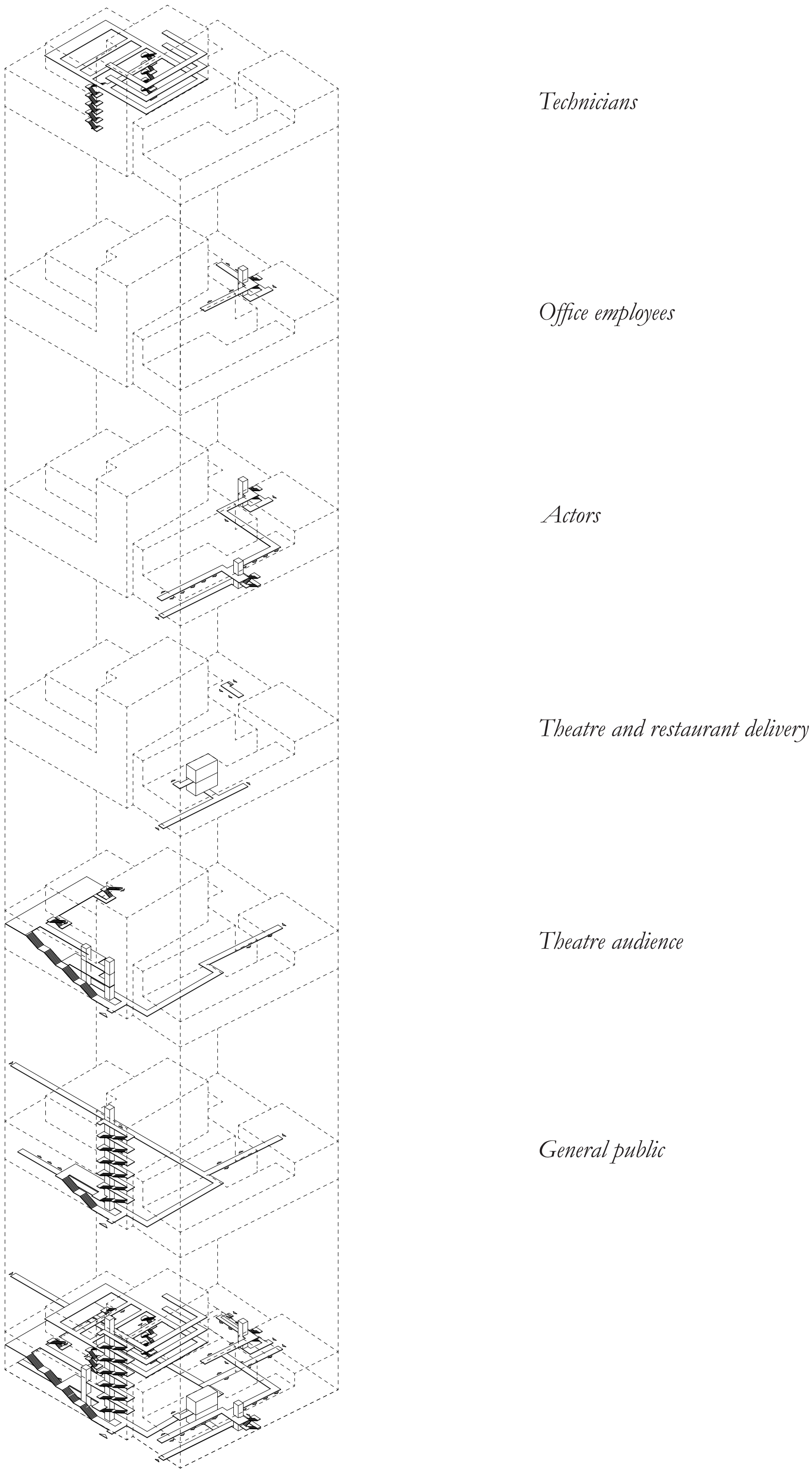
Southeastern facade 1:200 (scaled to 1:500 to fit the page)

Appendex II

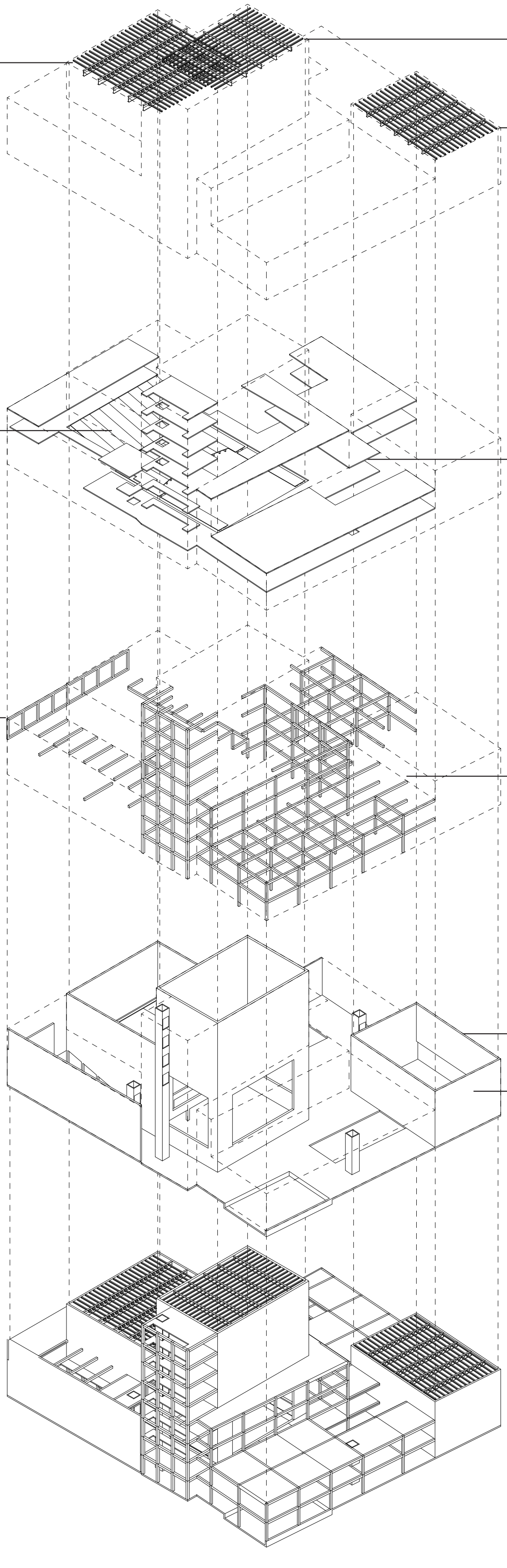
Circulation, structure and climate diagrams



Function diagram



Circulation diagram



Primary HE900B castellated beam
Secondary HE200B beam

Primary HE800B beam
Secondary HE200B beam

Primary HE600B castellated beam
Secondary HE200B beam

Prefabricated concrete TT plates

Concrete floor slabs

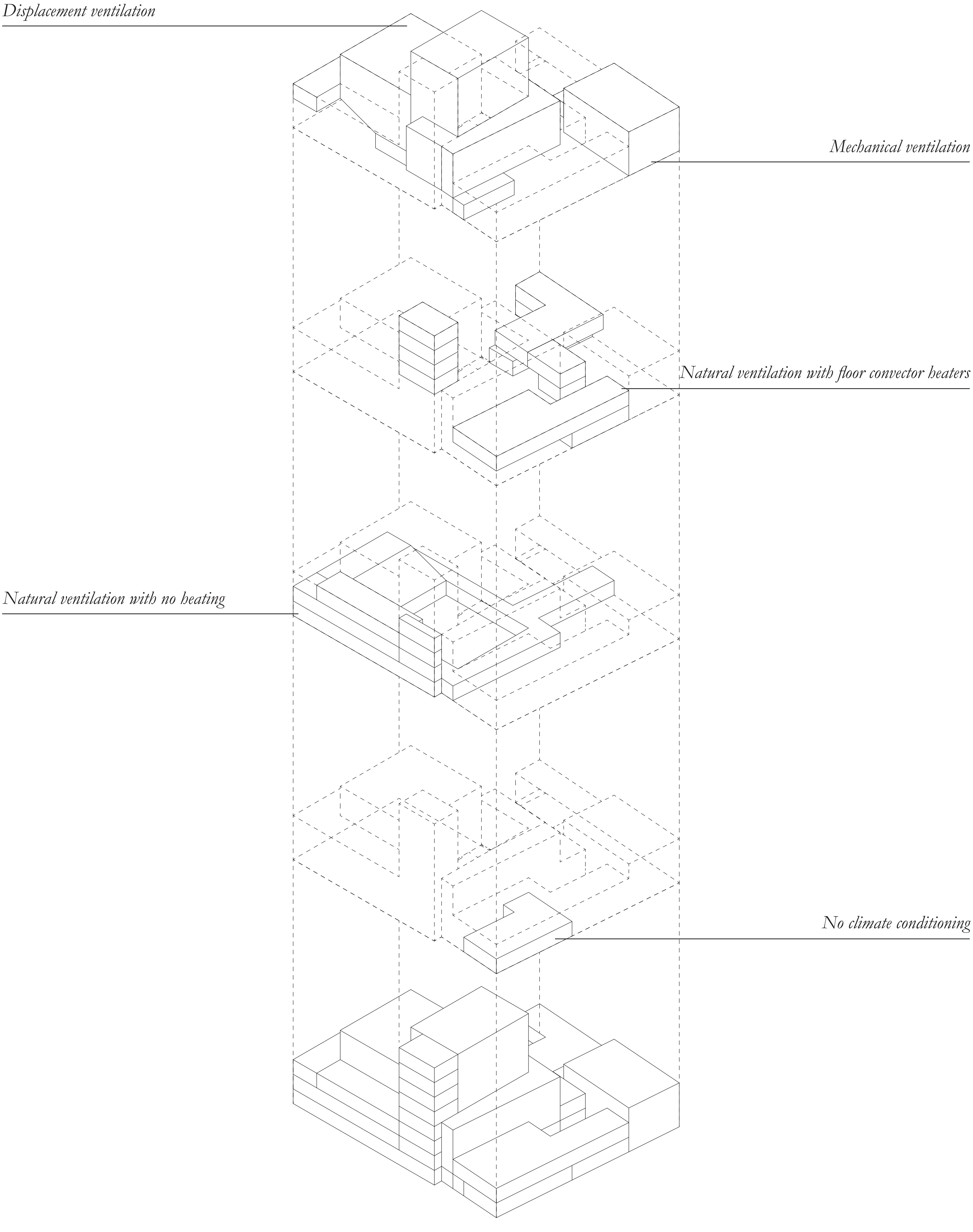
Concrete Vierendeel truss

Concrete beams and columns

Concrete load-bearing wall

Concrete shearing wall

Load-bearing structure diagram

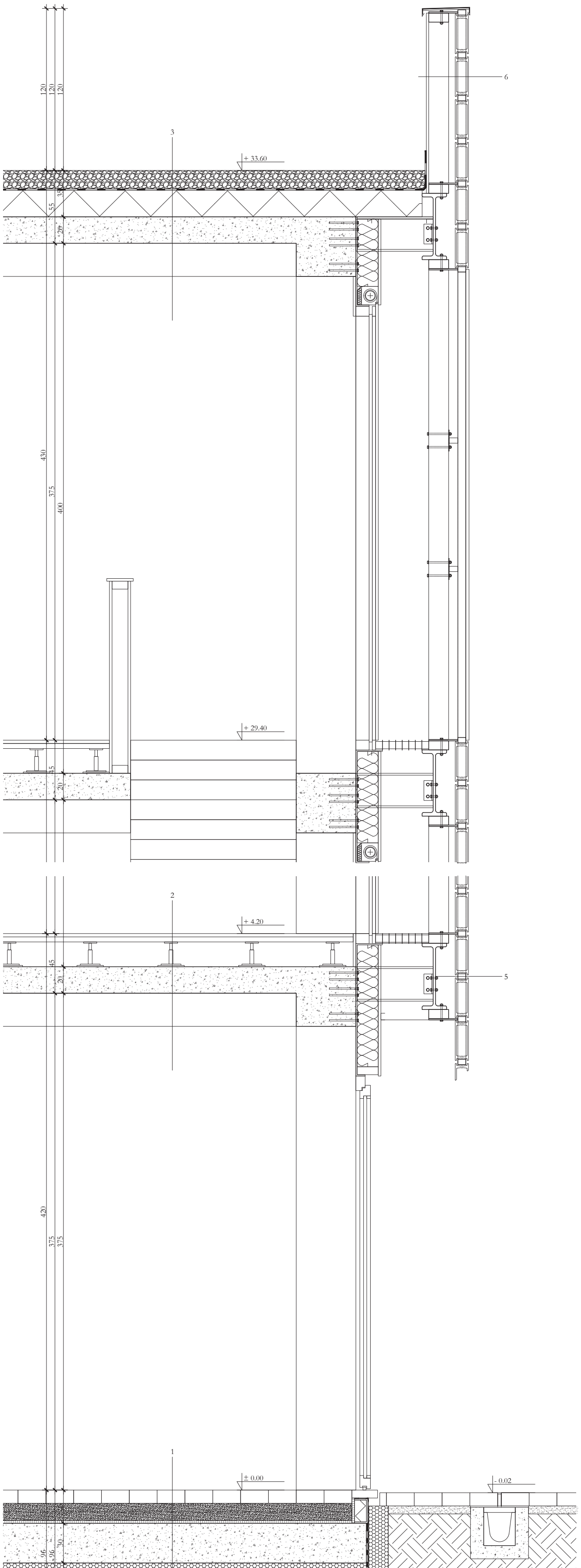


Climate diagram

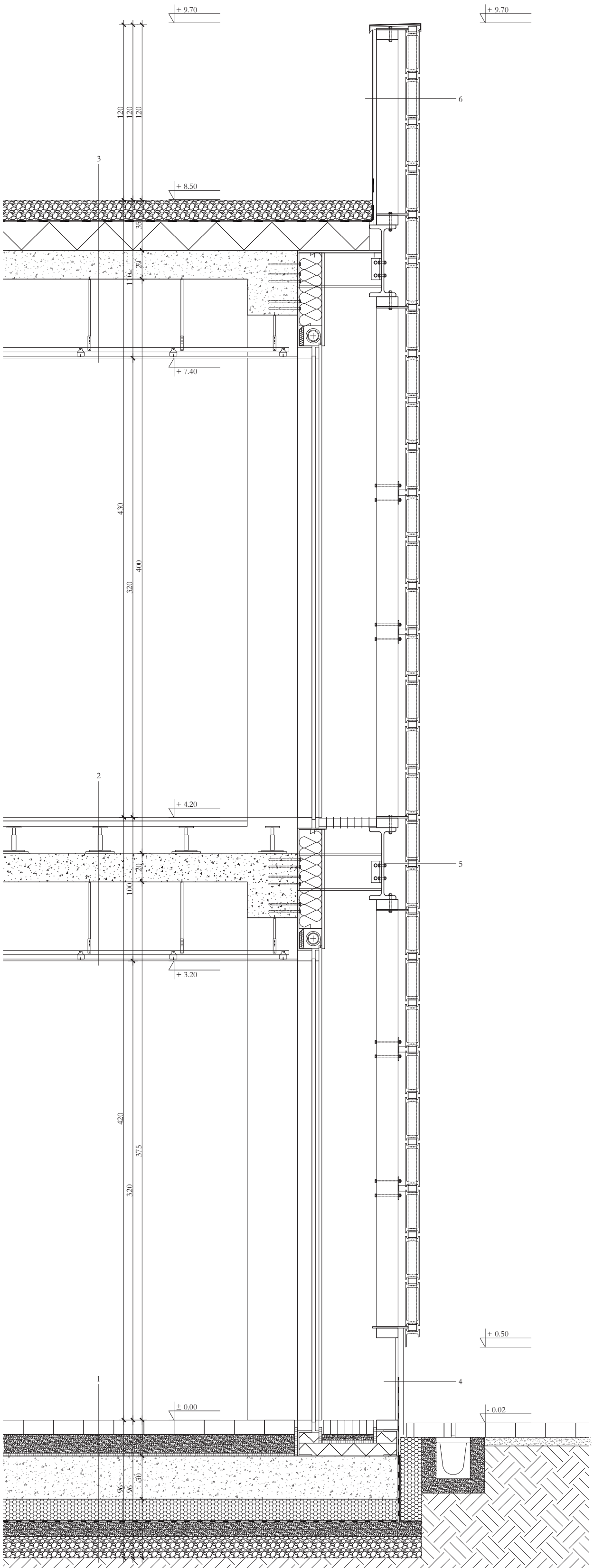
Appendex III

1:50, 1:20, 1:5 elaboration of the facade system

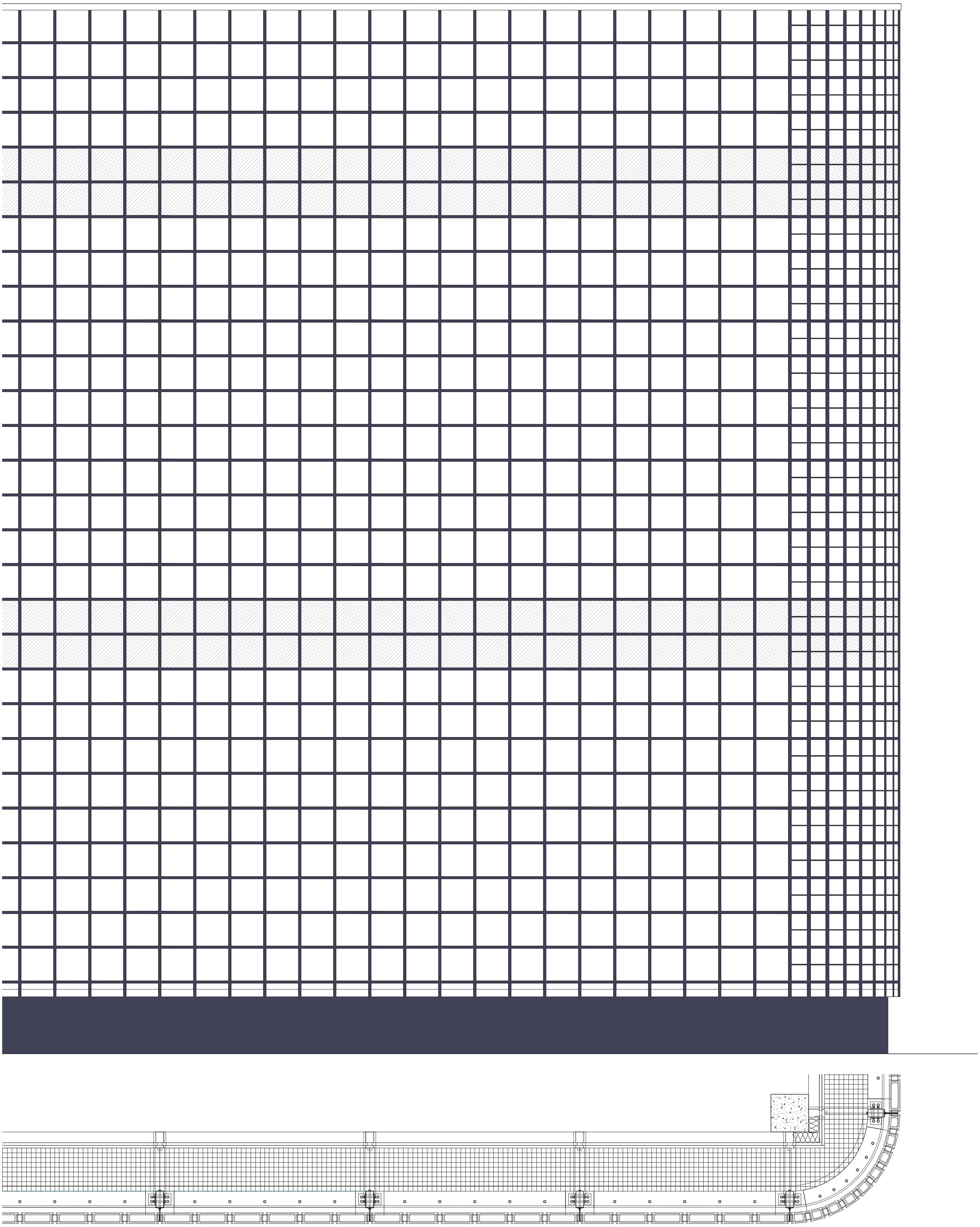
1	*Floor on the ground*	*Clincker brick (waal format)*	*100.0*	*mm*
		Lightly reinforced concrete screed	*130.0*	*mm*
		Impact sound insulation	*20.0*	*mm*
		Reinforced concrete slab	*300.0*	*mm*
		Thermal insulation (XPS)	*150.0*	*mm*
		Bitumen felt waterproofing	*10.0*	*mm*
		Lightly reinforced concrete screed	*100.0*	*mm*
		Compacted gravel	*150.0*	*mm*
		Geotextile	*1.0*	*mm*
2	*Interior floor*	*Wooden parquet flooring (chevron pattern)*	*20.0*	*mm*
		Plasterboard screed on metal risers	*230.0*	*mm*
		Reinforced concrete slab	*200.0*	*mm*
		Lowered ceiling (plasterboards on metal frame)	*550.0*	*mm*
3	*Flat roof*	*Gravel*	*80.0*	*mm*
		Felt PES or PE	*2.0*	*mm*
		Waterproofing synthetic foil, UV stabile	*2.0*	*mm*
		Rigid thermal insulation (sloping 160- 200 mm)	*200.0*	*mm*
		Vapour barrier	*1.0*	*mm*
		Reinforced concrete slab	*200.0*	*mm*
		Lowered ceiling (plasterboards on metal frame)	*550.0*	*mm*
4	*Plinth*	*OSB (fixed to the metal frame)*	*18.0*	*mm*
		Bitumen felt waterproofing	*5.0*	*mm*
		Thermal insulation (XPS)	*30.0*	*mm*
		Steel sheet (fixed to the OSB)	*1.0*	*mm*
5	*Steel beam IPN 500*			
6	*Parapet*	*Steel sheet (fixed to the OSB)*	*1.0*	*mm*
		waterproofing synthetic foil, UV stabile	*2.0*	*mm*
		OSB	*18.0*	*mm*
		steel substructure (hollow rectangular)	*150.0*	*mm*
		Air gap	*50.0*	*mm*
		Glass block (fixed to a steel frame)	*100.0*	*mm*
7	*Glass block 300/300/100 mm*			
8	*Steel section 60/40/4mm*			
9	*Steel plate 220/10 mm*			
10	*Glass block edge element*			
11	*M12 steel screw*			
12	*Steel L profile 70/70/10 mm*			
13	*Steel section 150/70/4 mm*			
14	*Sunshade*			
15	*Sunshade rail*			
16	*Steel sheet grid (façade maintenance)*			
17	*Steel profile IPN 260*			
18	*Steel L profile 200/300/10 mm*			
19	*Steel L profile 100/350/10 mm*			
20	*Steel L profile 100/60/5 mm*			
21	*Floor convector*			
22	*Steel C channel 50/30/2 mm*			
23	*Wood planks*			
24	*Wood frame window*			
25	*Steel profile UPN 180*			



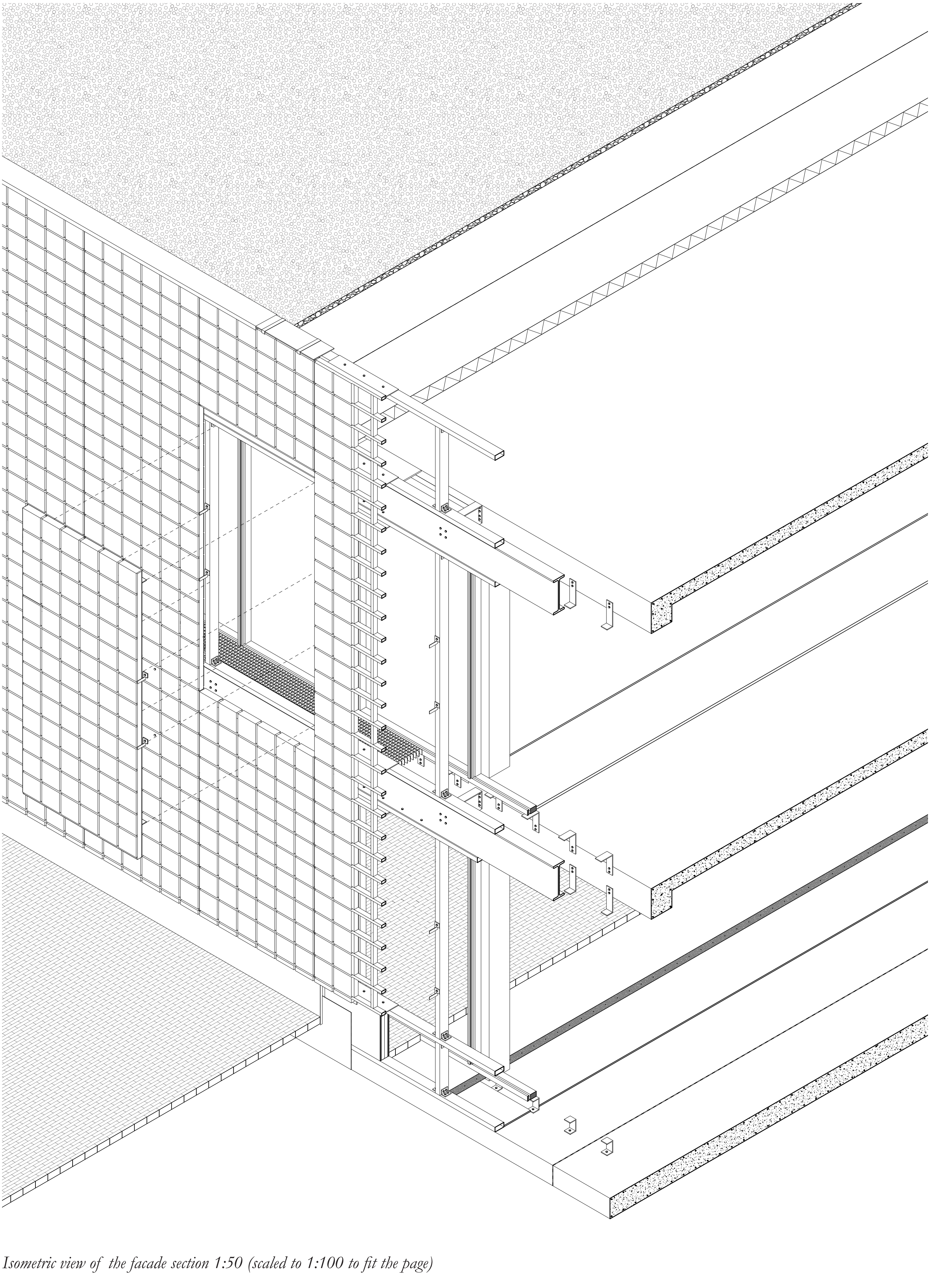
Entrance facade fragment 1:20 (scaled to 1:50 to fit the page)



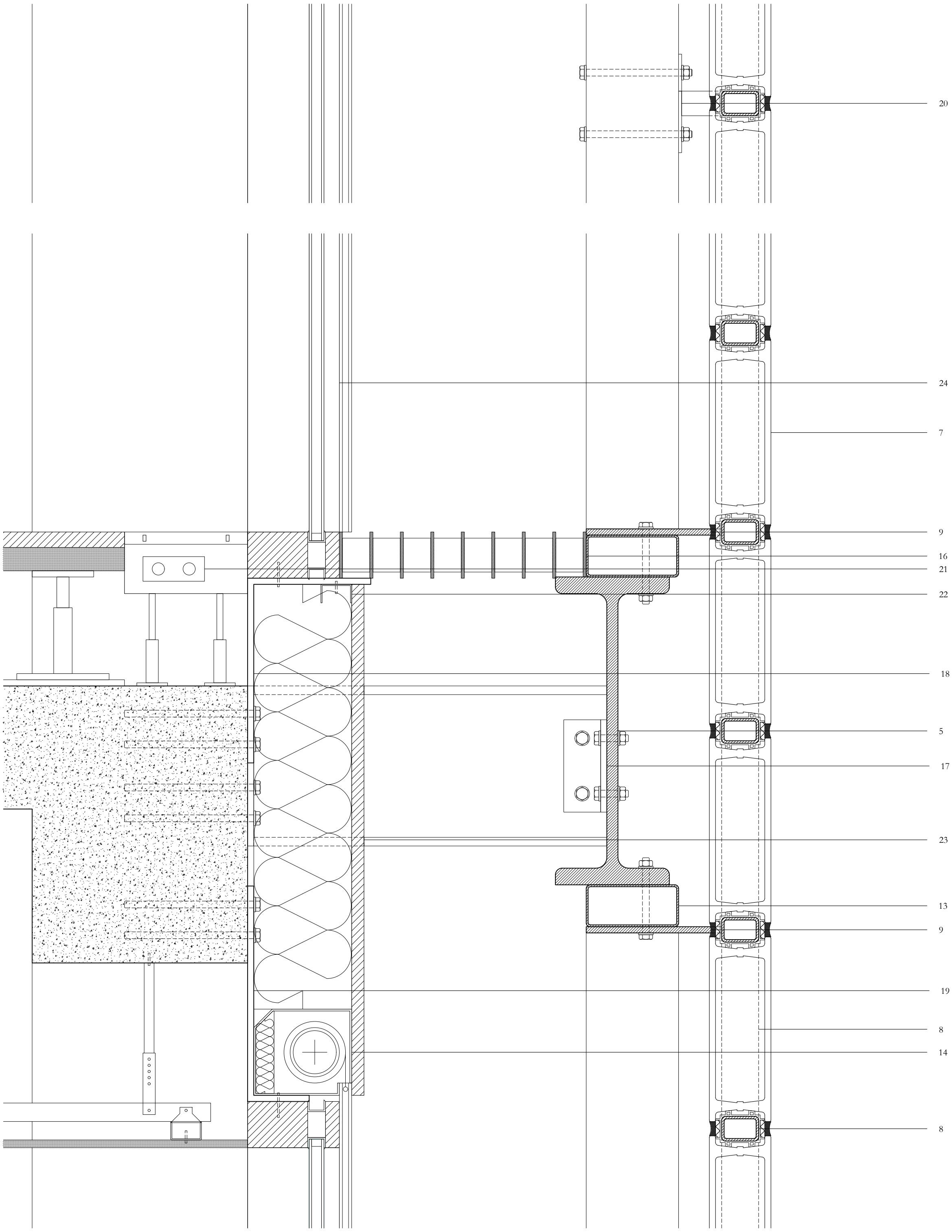
Facade fragment 1:20 (scaled to 1:50 to fit the page)



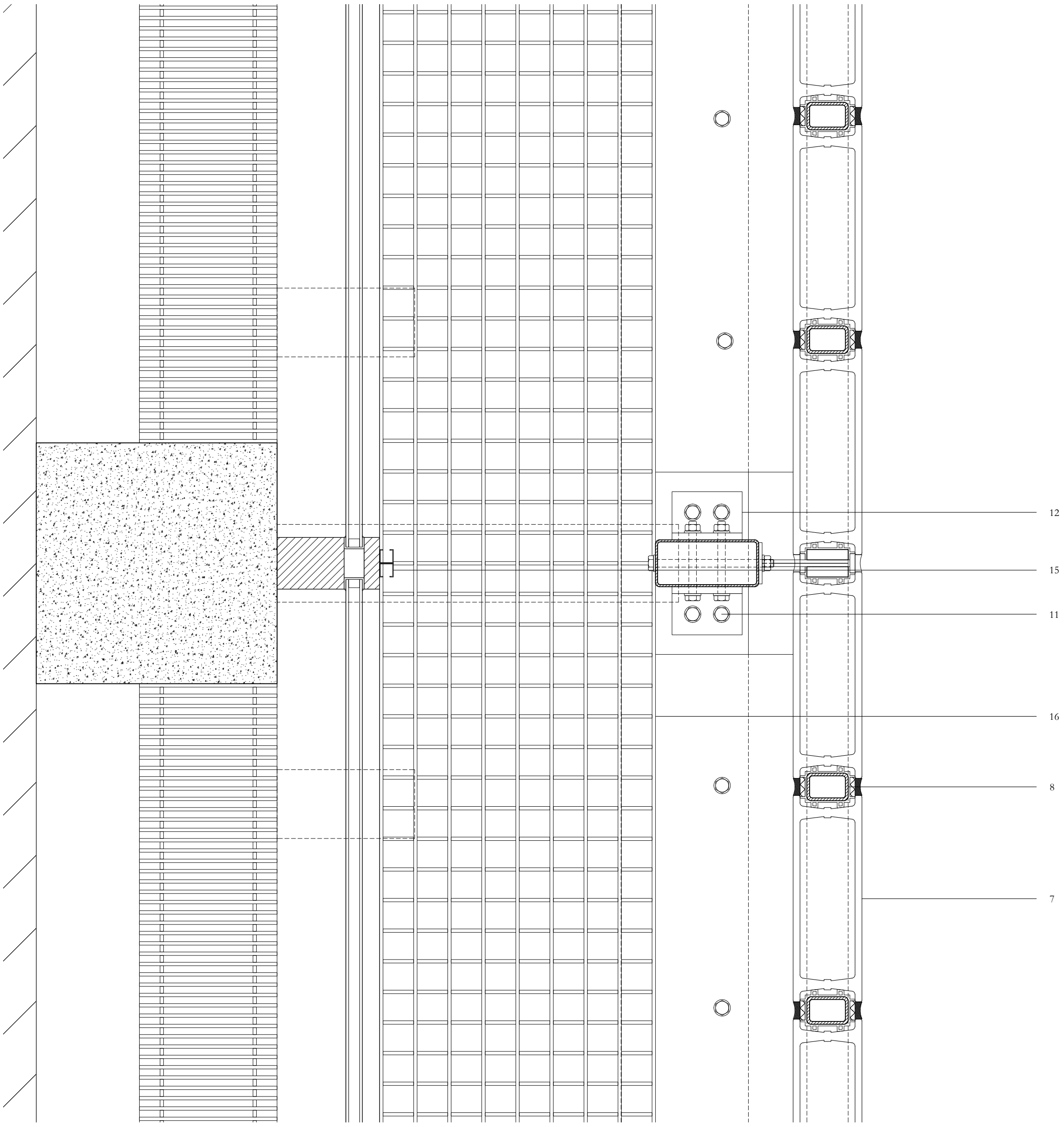
Facade fragment plan and view 1:20 (scaled to 1:50 to fit the page)



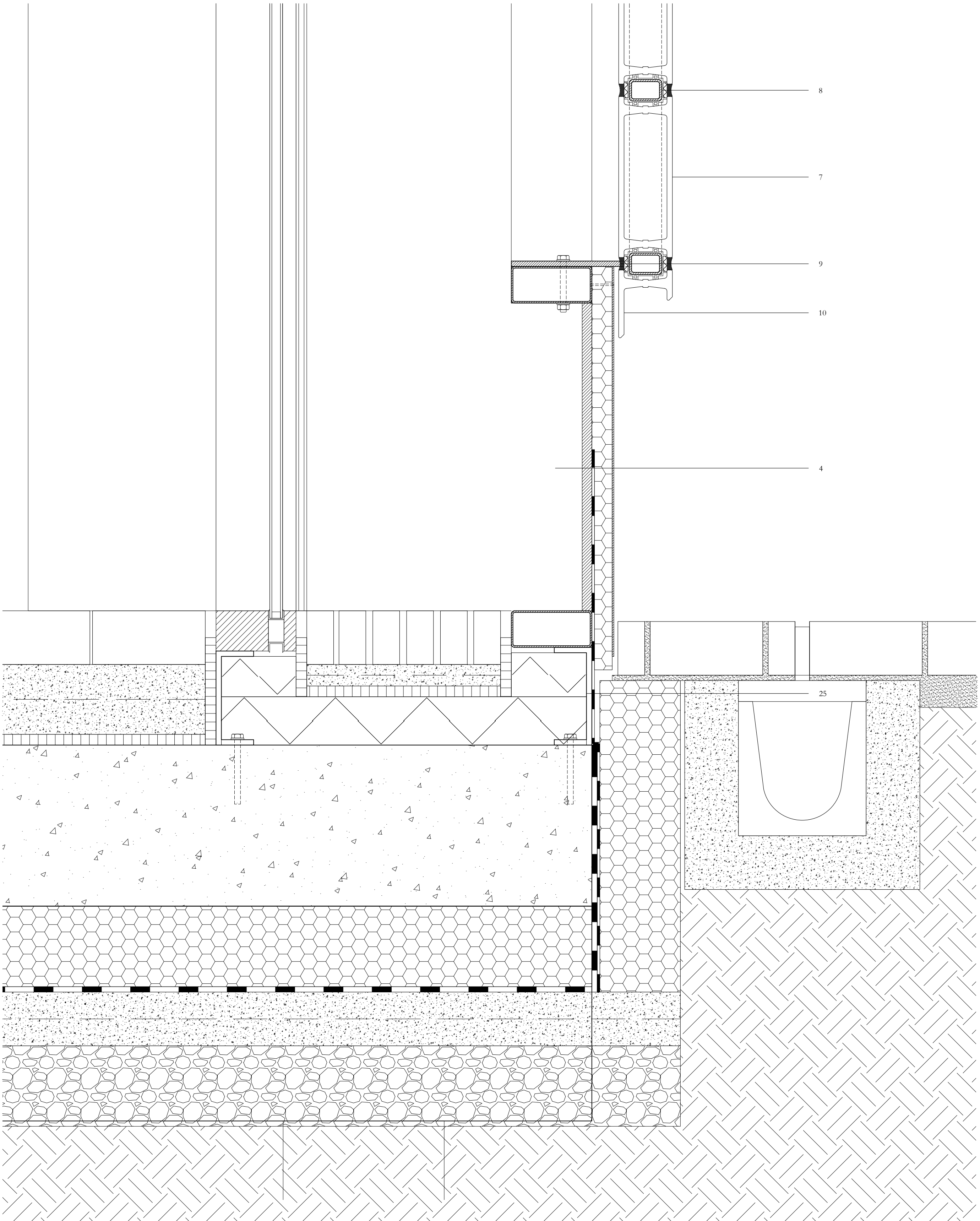
Isometric view of the facade section 1:50 (scaled to 1:100 to fit the page)



Vertical detail of the facade panel connection 1:5 (scaled to 1:10 to fit the page)



Horizontal detail of the facade panel connection 1:5 (scaled to 1:10 to fit the page)

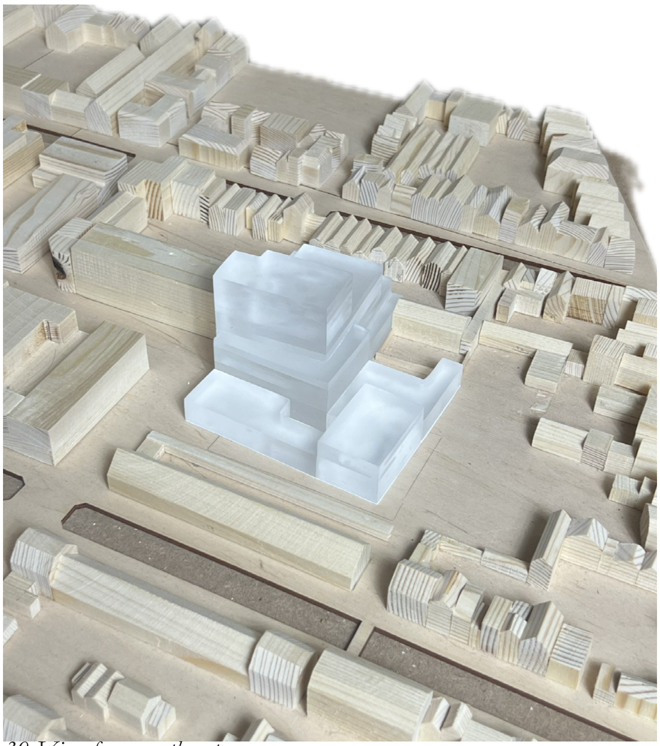


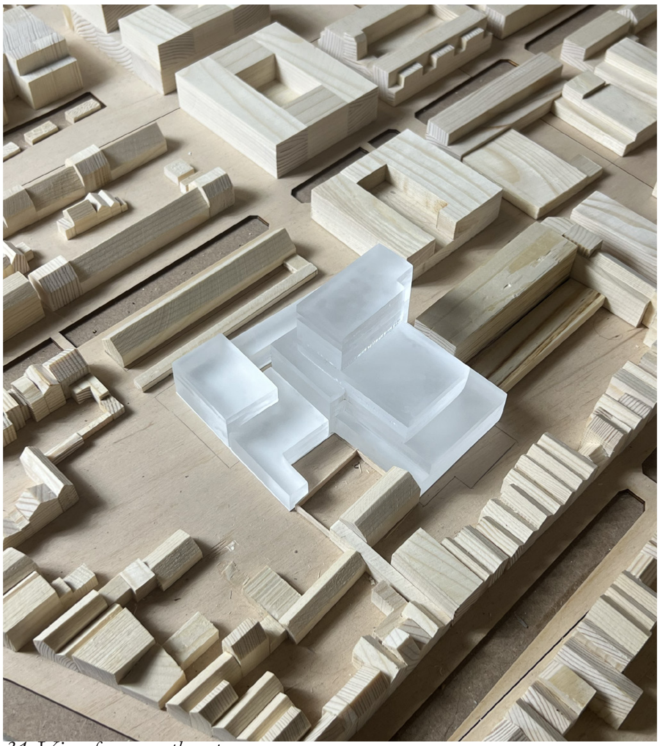
Footing detail 1:5 (scaled to 1:10 to fit the page)

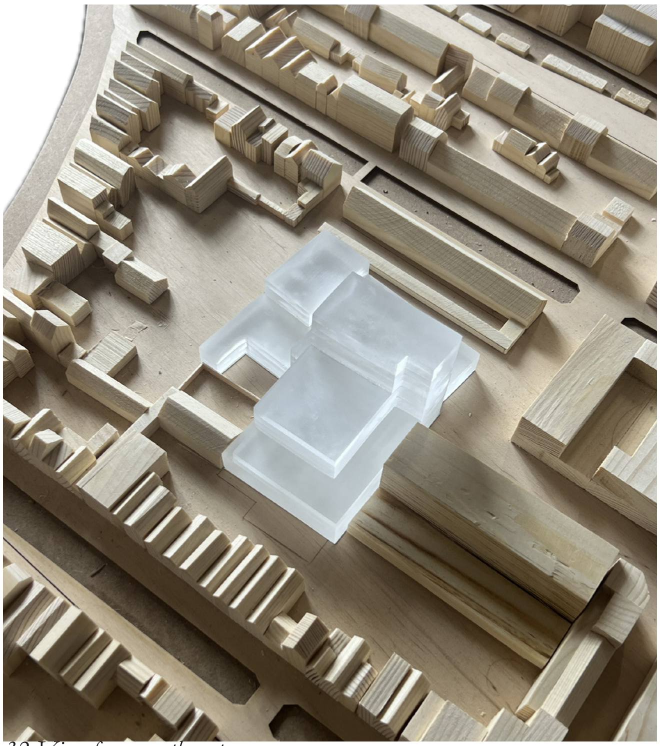
Appendex IV

Model photographs


29 View from southwest

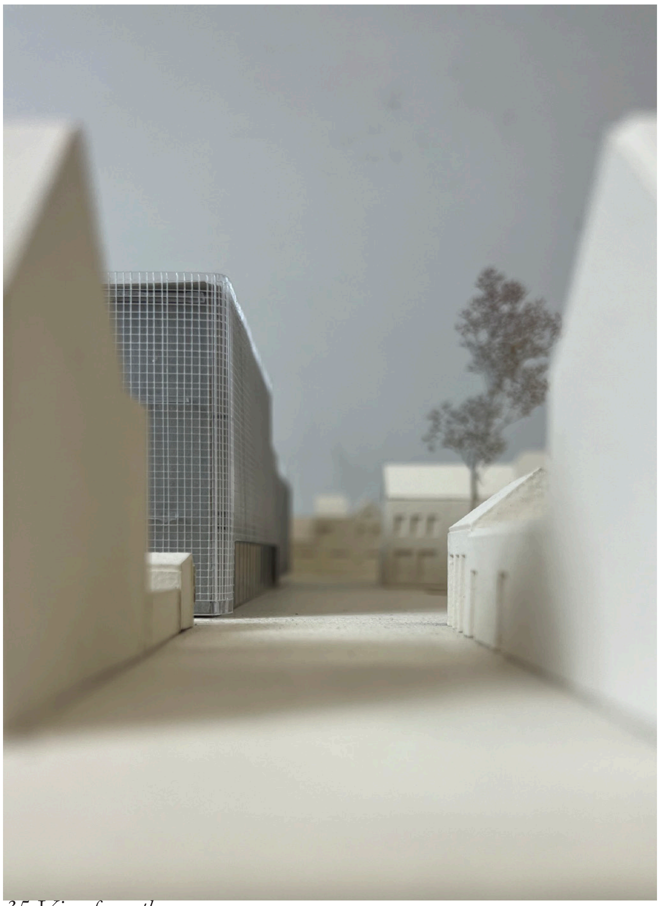

30 View from southeast


31 View from northeast

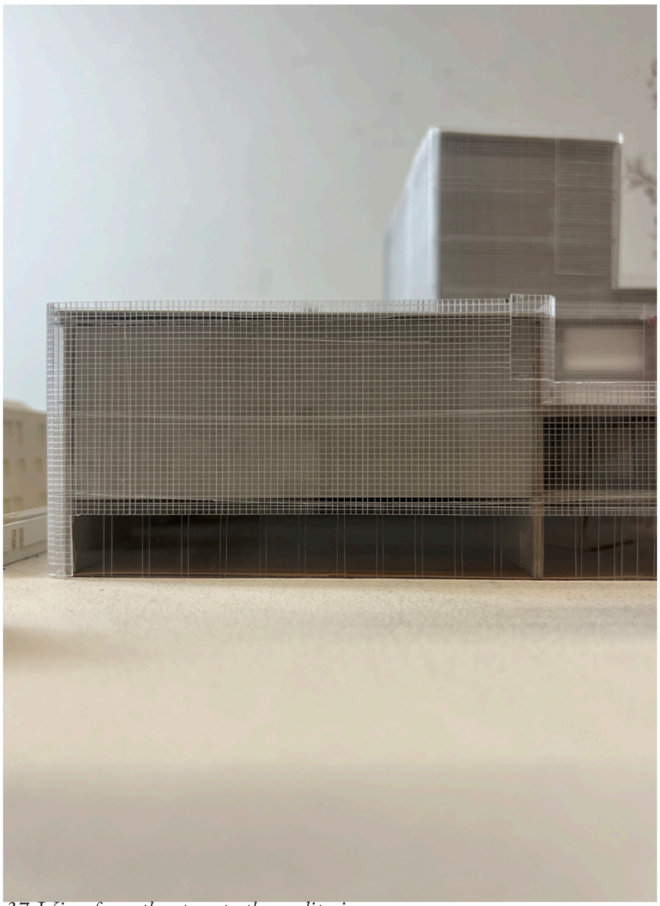

32 View from northwest


33 View from the Kruisstraat

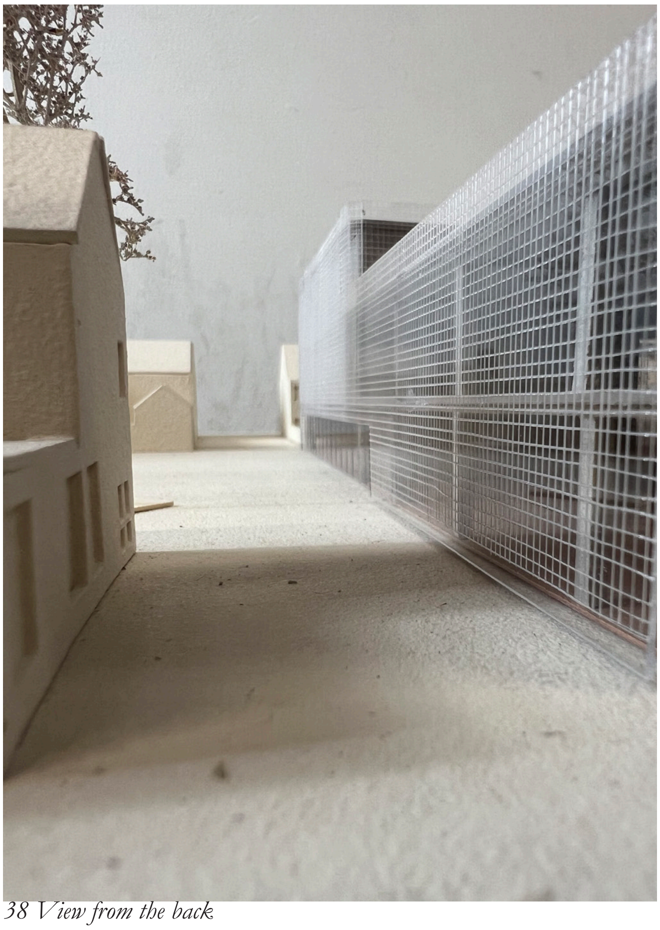

34 View from the Gasthuislaan


35 View from the


36 View from the Yperstraat



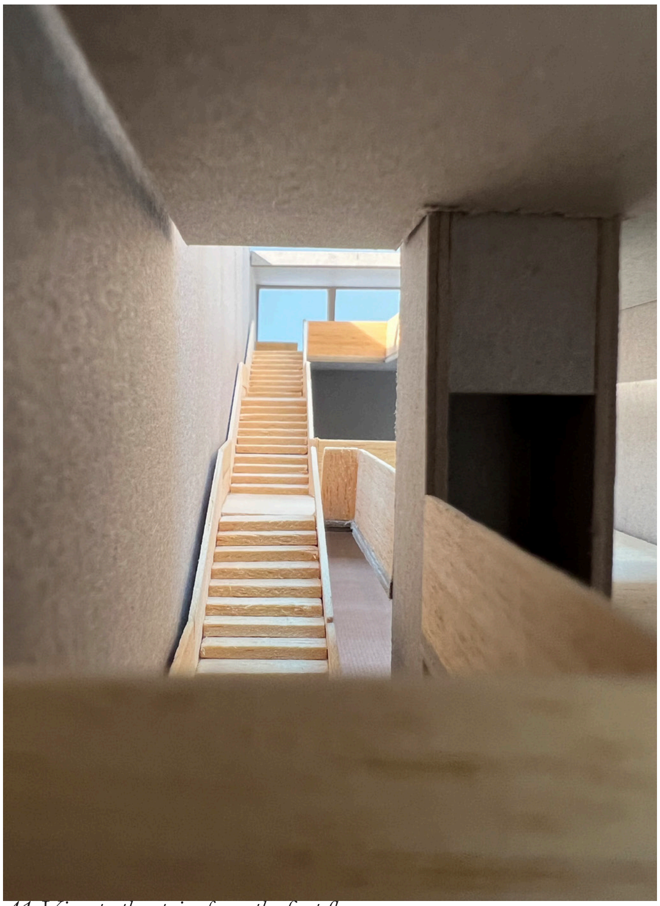
37 View from the stage to the auditorium



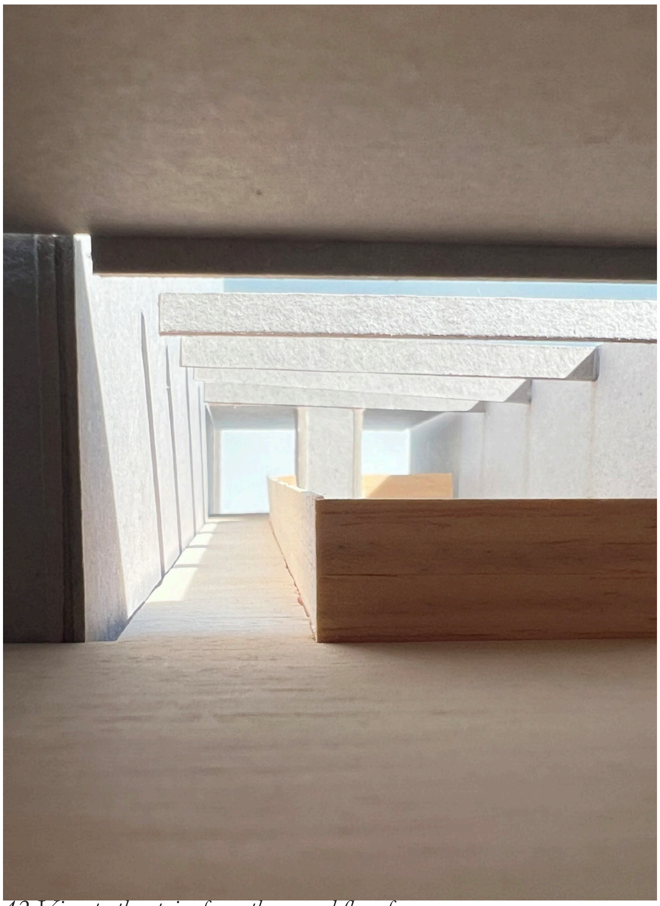
38 View from the back

39 View from the Kruisstraat at night

40 View to the stairs from the entrance



41 View to the stairs from the first floor



42 View to the stairs from the second floor foyer

43 View from the entrance to the big foyer

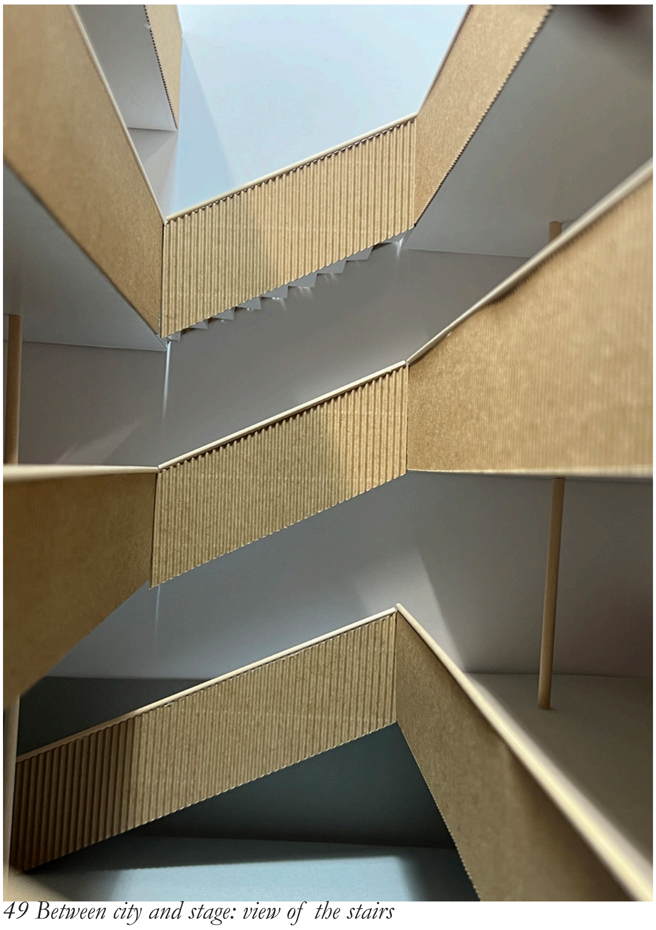
44 View from the foyer to the entrance

45 View from the foyer to the stairs

46 View from the stage to the auditorium

47 View from the stage to the auditorium


48 Between city and stage: top view


49 Between city and stage: view of the stairs


50 Between city and stage: view of the landing

Image references

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20 Drawn by: Chantal Booi, Floyd Shazly
21 File:Palais Garnier Grand Escalier d'Honneur - Garnier 1880 vol2 plate8.jpg. (2026, March 11). Wikimedia Commons. (https://commons.wikimedia.org/w/index.php?title=File:Palais_Garnier_Grand_Escalier_d%27Honneur_-_Garnier_1880_vol2_plate8.jpg&oldid=1179344841).
22 Teatro Dee y Charles Wyly, Dallas. From "Arquitectura Viva," 2011 (https://arquitecturaviva.com/works/teatro-dee-y-charles-wyly-4#lg=1&slide=20)
23 Dee and Charles Wyly theatre rex oma. by Iwan Baan, 2011 (https://iwan.com/portfolio/dee-and-charles-wyly-theatre-rex-oma/#2653)
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