



Vision

The existing buildings, the Zoological Gardens and the urban context are of world-class stature, we propose to deliver a design worthy of such an environment – a jewel in a perfect setting – an innovative and contemporary concert hall complex for Antwerp, which will provide a new and active public space, a world class symphonic hall and an International conference centre, all embedded in this unique historic setting.

Together, we can create a striking and unique complex which can become a cultural beacon for Antwerp, Flanders and beyond.

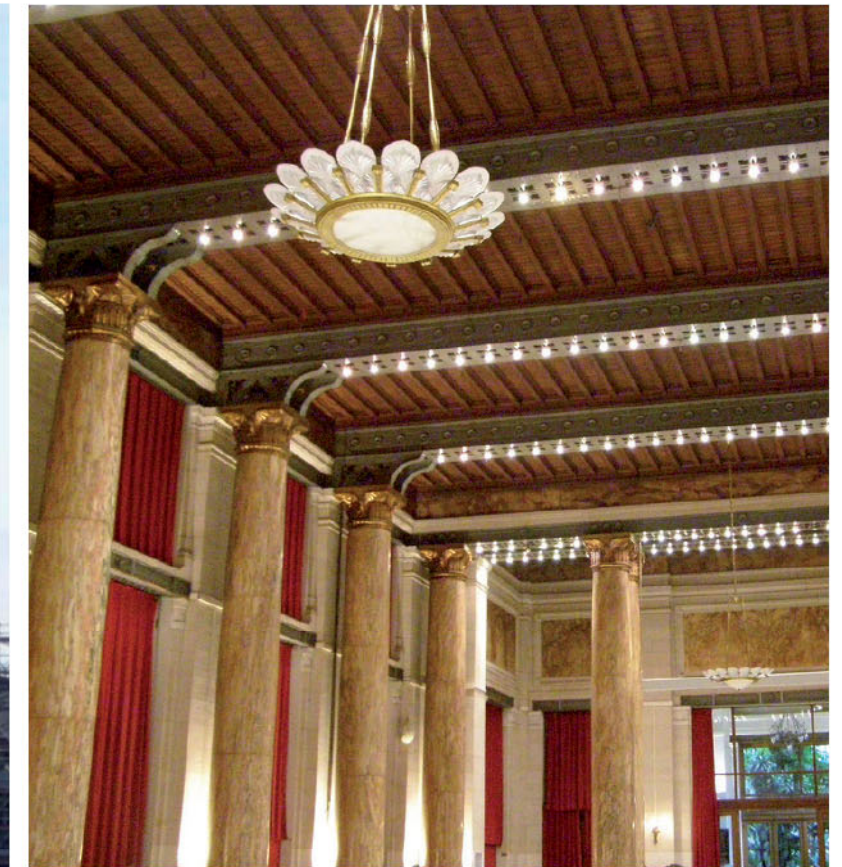




1.0 Introduction

The Queen Elizabeth Hall site is a truly unique site with an incredible potential.

The setting onto the rejuvenated Astrid Square adjacent Central Station is magnificent. The Zoo itself is a magical oasis, striking a perfect balance between contemporary Zoo design and its rich historical heritage at the heart of the city. The intricate facade to Astrid Square including golden mosaics, tiling and cornicing is mesmerising, leaving one with lasting impressions of history and importance to the City of Antwerp. Inside the Zalencomplex, the scale and wonder of the Marble, Darwin, Verlat Halls and Wintergarden are equally impressive.





It is surprising that in total contrast to these exquisite buildings and spaces, the Loos Hall is totally underwhelming. It is long and wide, but it lacks any sense of arrival or grandeur. Entrances and exits are numerous and confusing, whilst the main stair is almost redundant.

Circulation lacks simplicity or intuition, winding, and is disorientating and dark. These same claustrophobic circulation corridors conceal the famous Zalencomplex, "hidden gems", rather than celebrated cultural icons of world stature.

The inadequacies of the Loos Hall entrance and confusing circulation routes are underlined by the contrasting scale of the QEH. The capacity and size of the Hall and the scale and range of de Filharmonie repertoire undoubtedly deserve a better setting. In a diamond city maybe this needs to be reversed, the setting is beautiful – the diamond is flawed.

Despite the apparent grandeur of the QEH, further technical investigation reveals a Hall on a knife edge. Its lack of logistical and back-of-house facilities are well-documented, but its out-dated services, lighting and technical systems are also totally inadequate. The finishes throughout need a new lease of life and in most areas need to be totally replaced. Structurally, the hall and its circulation corridors are inextricably linked into the structure of the Zalencomplex and Queen Elizabeth Hall through an unnecessarily complex array of beams and columns allowing sound and vibrations to pass through different spaces.



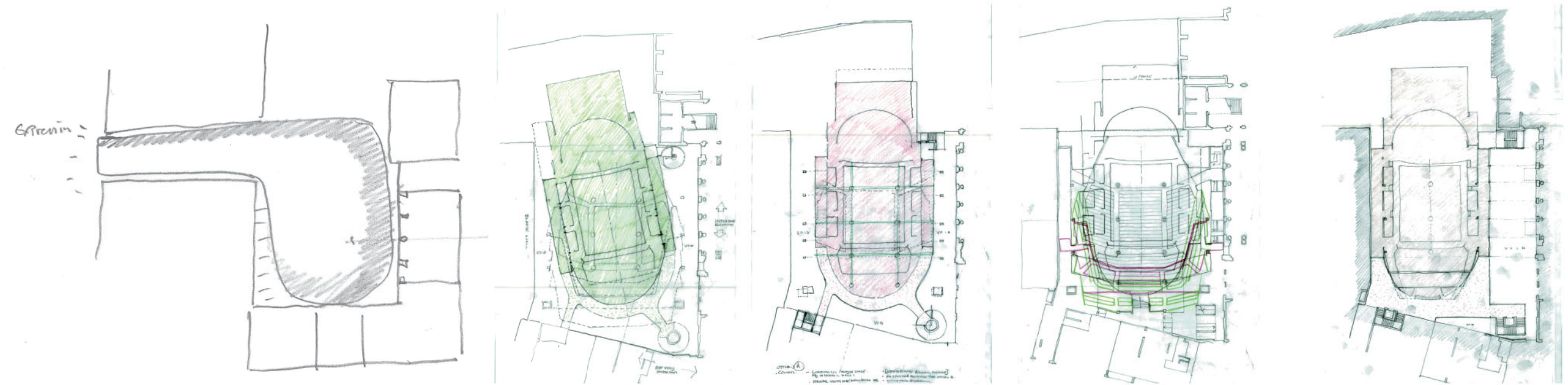
2.0 Architectural Design Response

2.1 Design Principles

A series of design principles have emerged from a period of extensive and lively discussion and debate and the detailed exploration of a number of design options. Clearly, the overriding priority has to be the creation of a concert hall which will achieve the highest possible acoustic performance, but any design for the Queen Elisabeth Hall should also aim to:

- > Create significant acoustic separation between the concert hall and the surrounding complex of buildings.
- > Improve the experience of the building complex for the visitor, the audience, the orchestra, choir and other performers.
- > Bring some legibility and some clarity to the plan. Any modern interventions should be expressed as clearly contemporary and, wherever possible, the significant historic building fabric should be opened up and celebrated.
- > Create the best possible connections into, and make the best possible use of, the magnificent sequence of halls within the nineteenth century buildings. If possible, we should create the potential for the audience to spill out easily onto the south facing terraces in Kiosk Square or even, on occasion to enter the complex of buildings from Kiosk Square, thus reinstating the original, 1897, point of entrance (through the Marble Hall)
- > Improve the concert hall's relationship with Koningen Astridplein and, if possible, create a greater presence on the square.
- > Create a dramatic promenade – celebrate the procession from the Koningen Astridplein to the seat in the concert hall – a promenade which in some way might help to explain the story of the history of the building complex and to create a sense of growing excitement and anticipation as the audience approaches the auditorium.
- > Ease access from the Loos Hall to the concert hall – create clear, legible, fully accessible circulation routes to each destination.
- > Test solutions against a rigorous examination of the existing structure, and gain a detailed understanding of the restrictions that this places on the design.

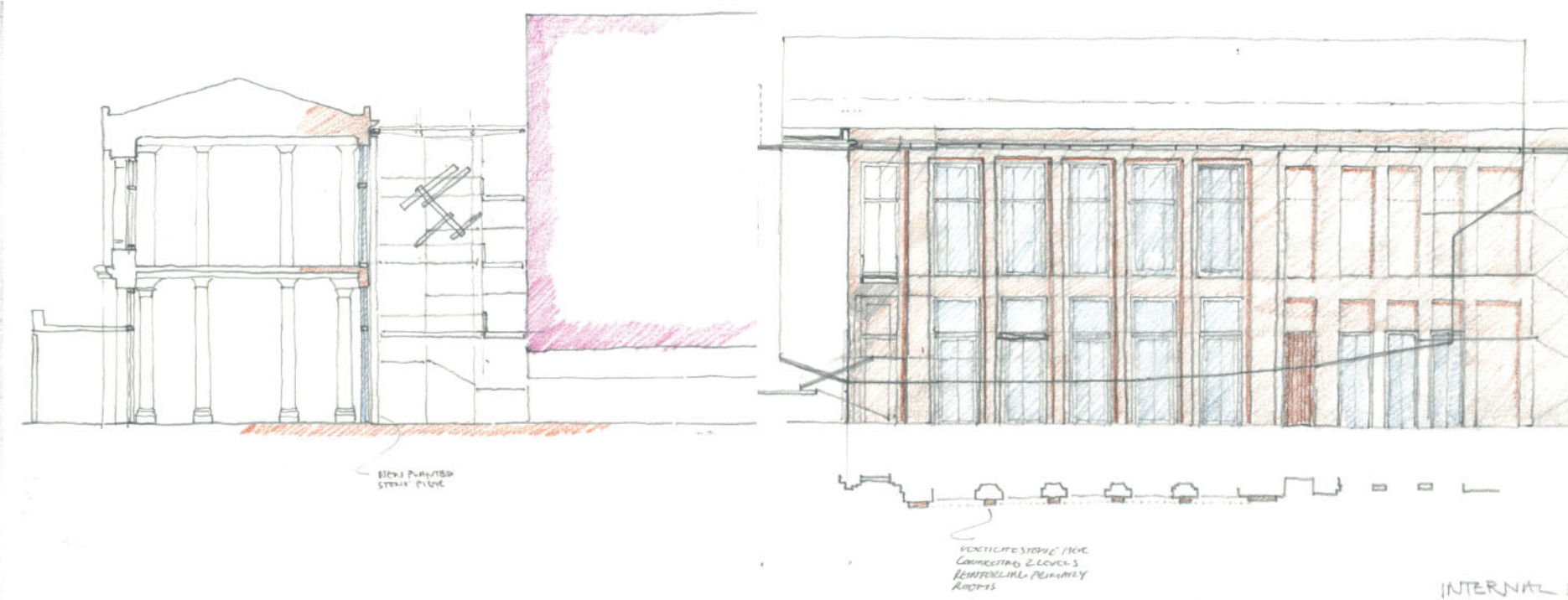
At all times during the process of design development we aimed to test each idea against the key question...
 ...“How does this help us to achieve the primary goal – the creation of a world class symphonic hall?”



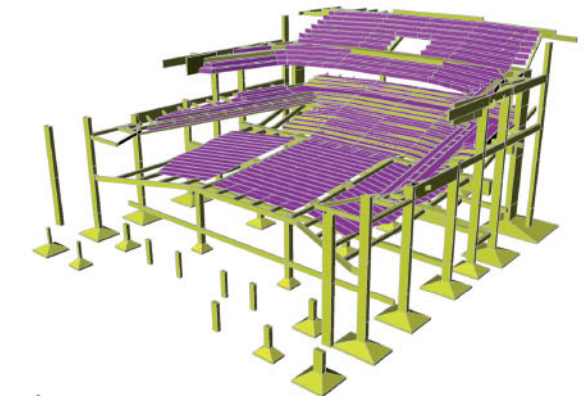
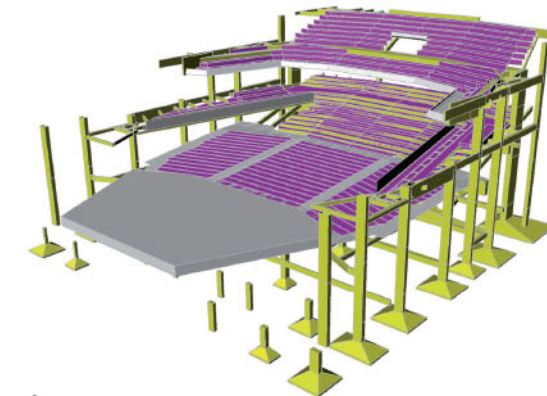
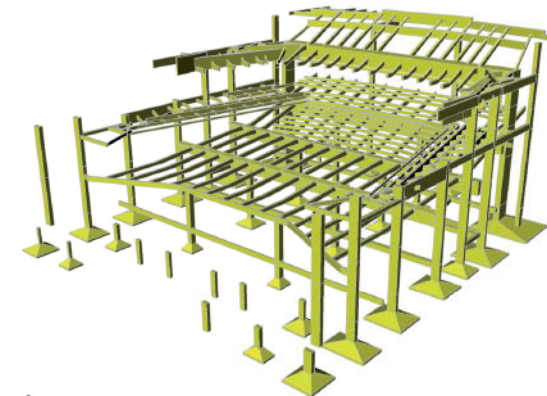
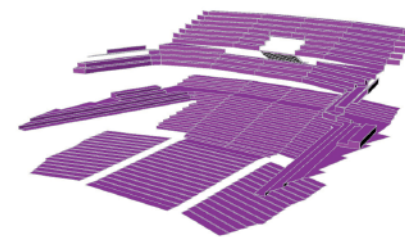
Development sketches – Concert hall



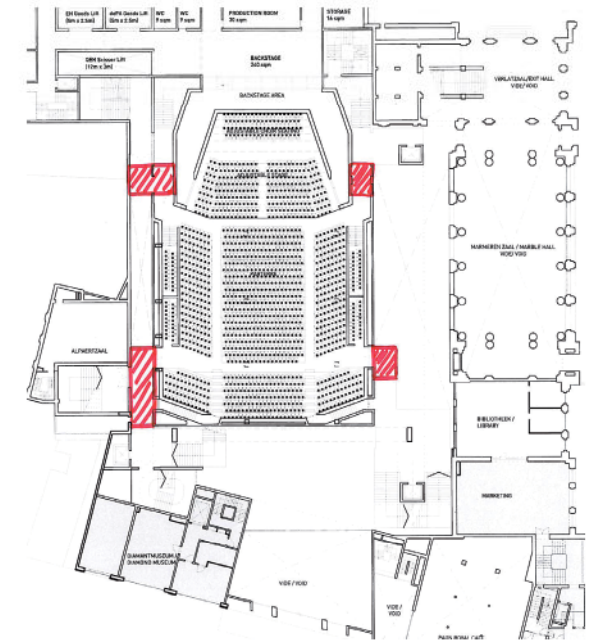
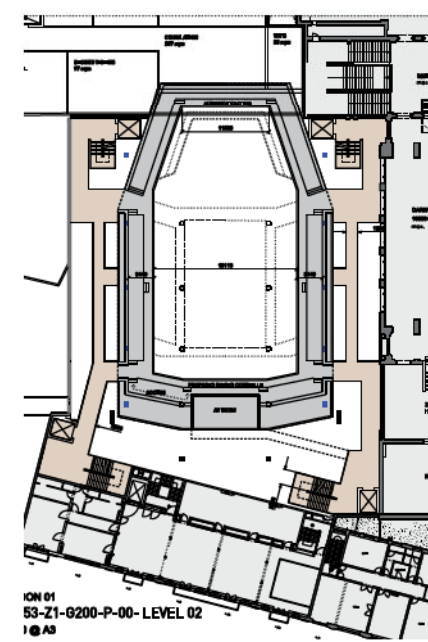
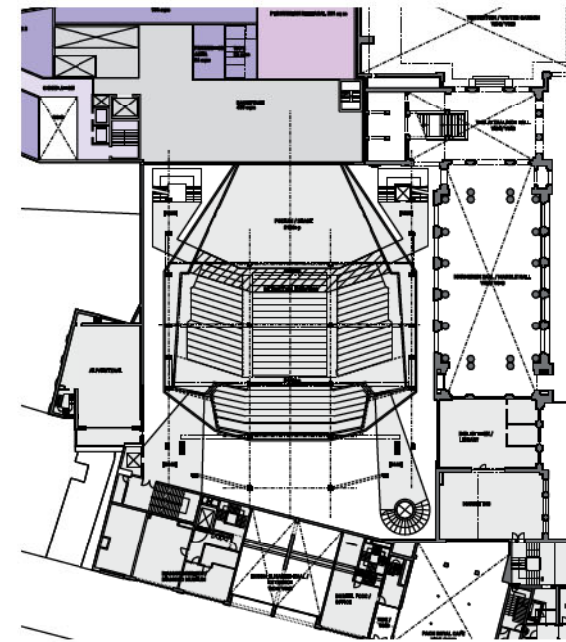
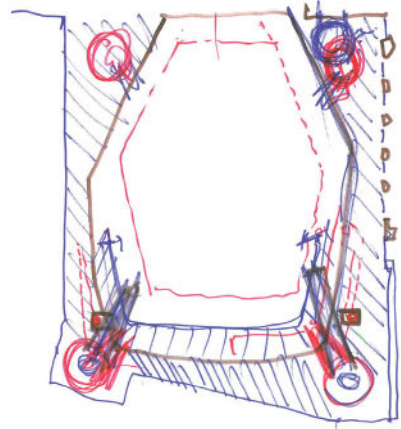
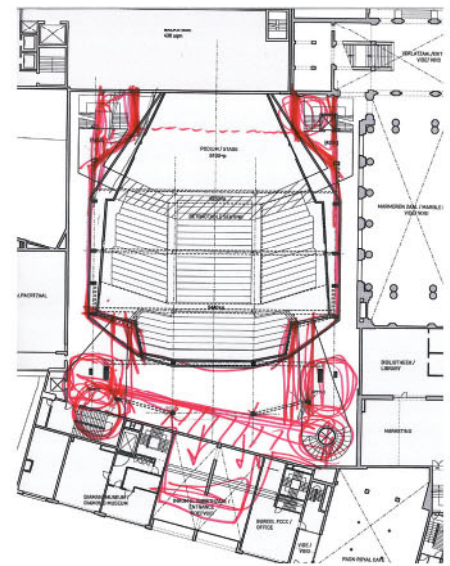
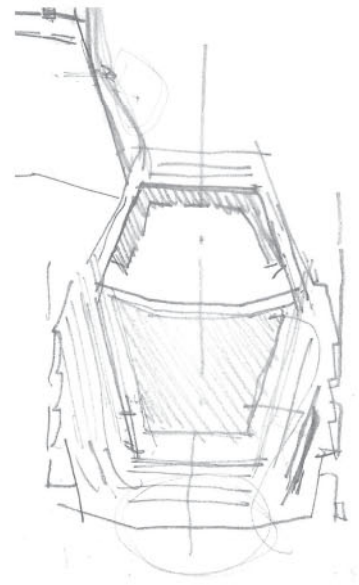
Original layout of 1897 Festzaal, Marble Hall and Kiosk square



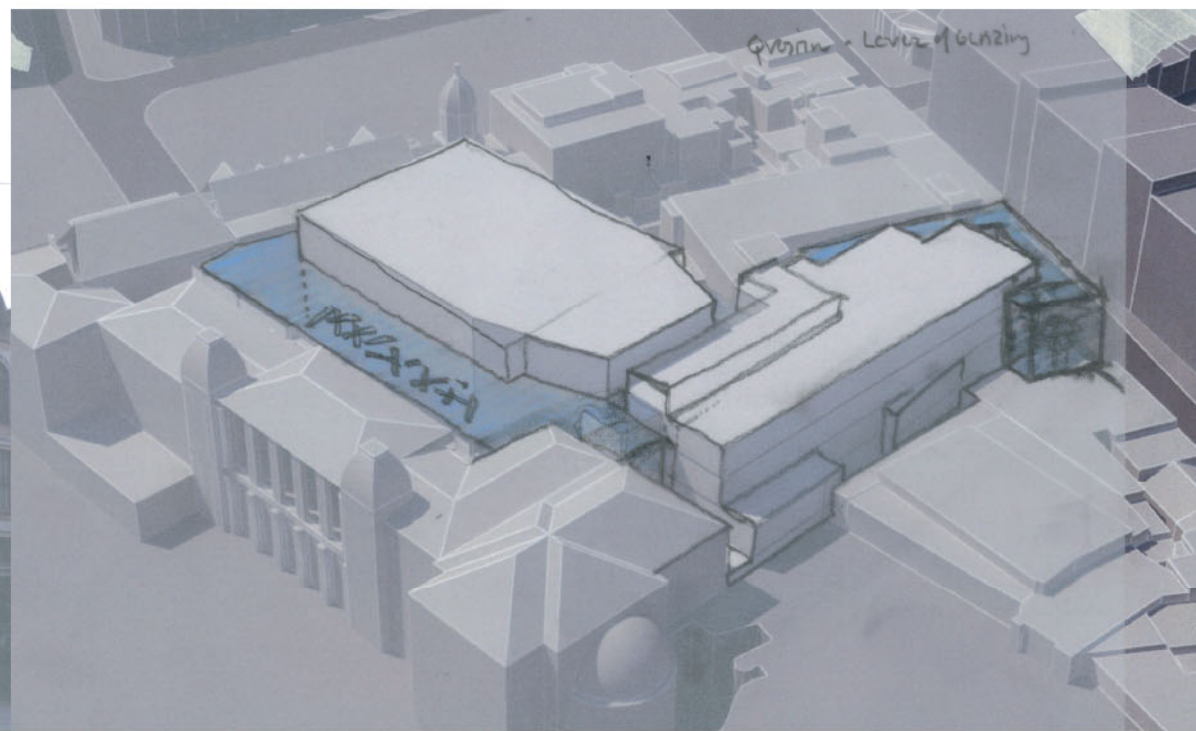
Sketch drawings – Atrium space



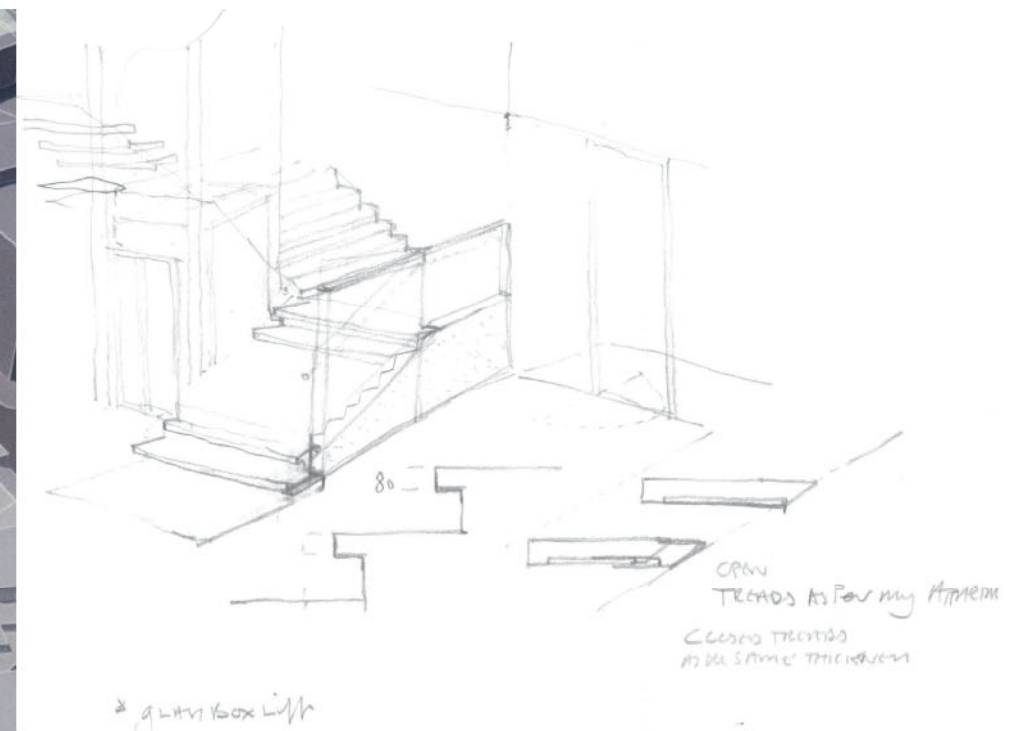
Exploratory drawings – existing structure



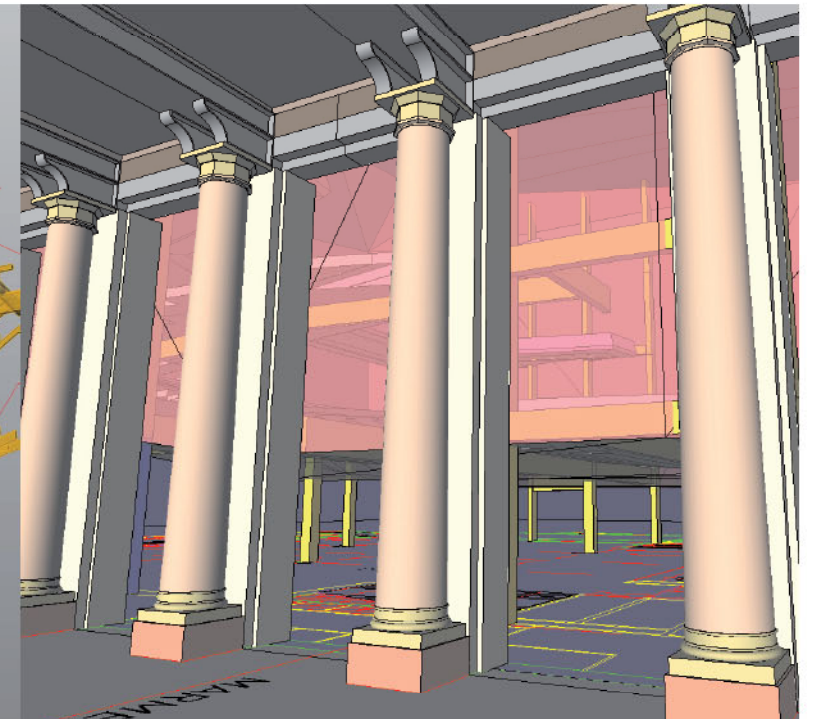
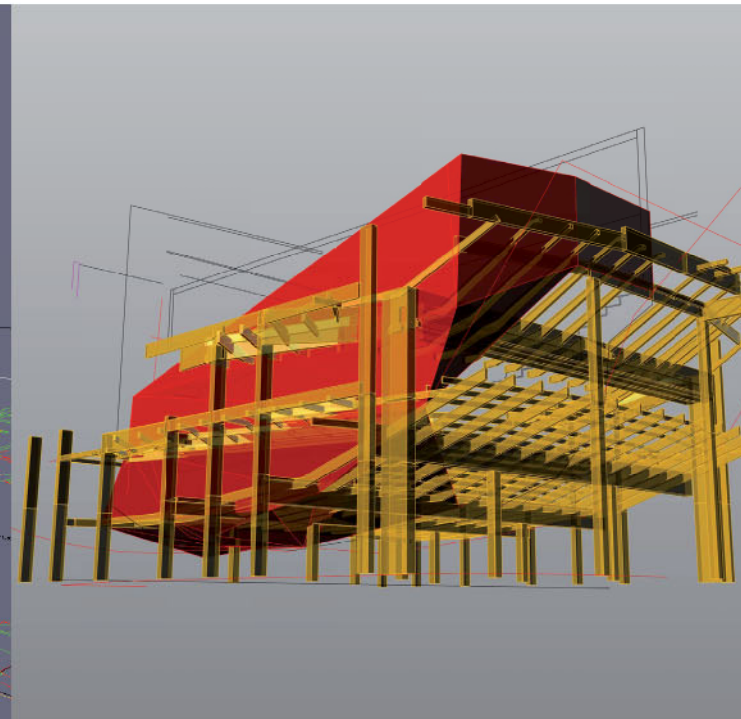
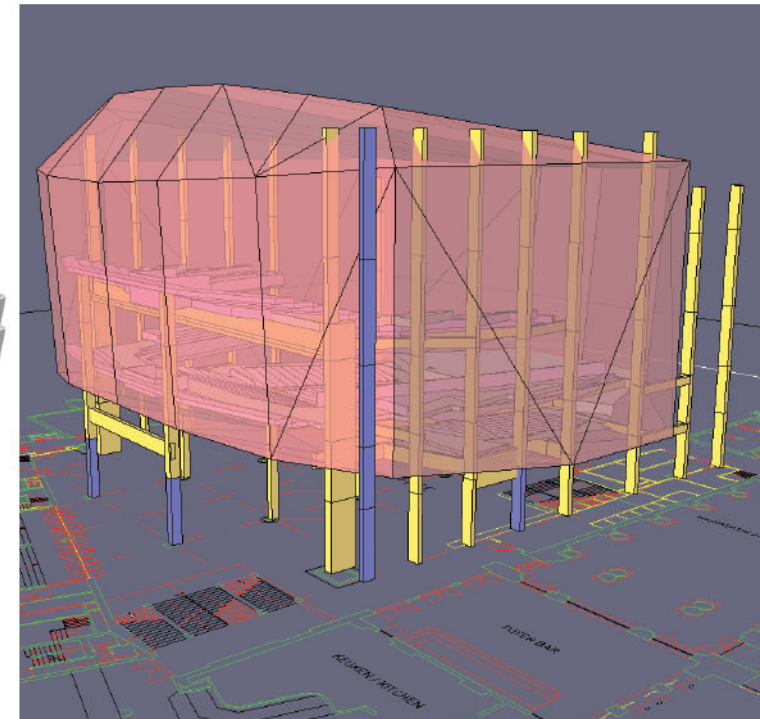
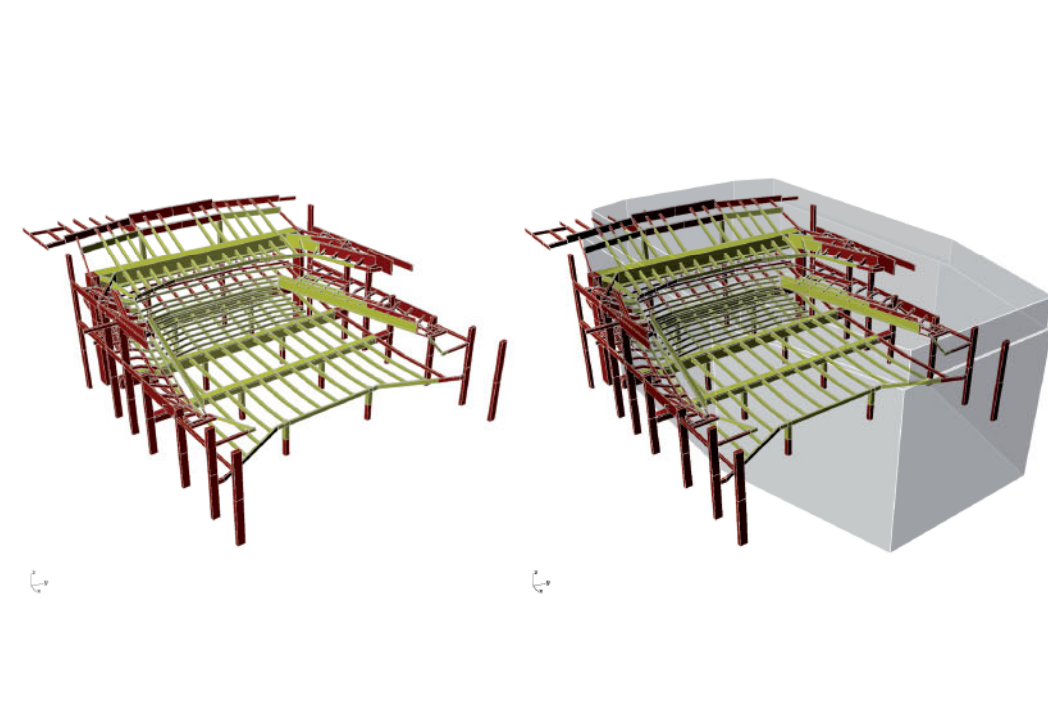
Entrance facade



Aerial view



Detail sketch: staircase



2.2 Design Response

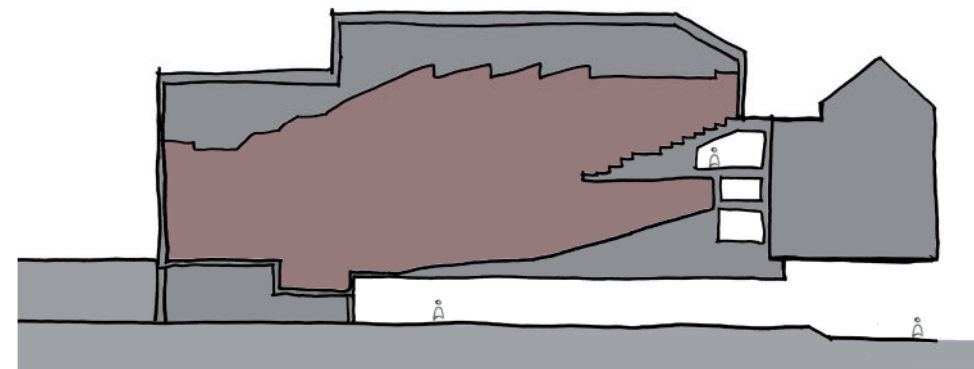
Following considerable design development and the consideration of a number of alternative proposals, the solution which has emerged uses the simple strategy of introducing a void space between the concert hall and the adjacent nineteenth century buildings. The claustrophobic circulation corridors and winding steps which sit between the concert hall and the magnificent buildings of the Zalencomplex are cut away. This creates the potential for a series of triple height atrium spaces between the concert hall and the retained facades to the nineteenth century buildings, which can be opened up, repaired and restored to their former glory.

These atrium spaces, which extend around all four sides of the concert hall:

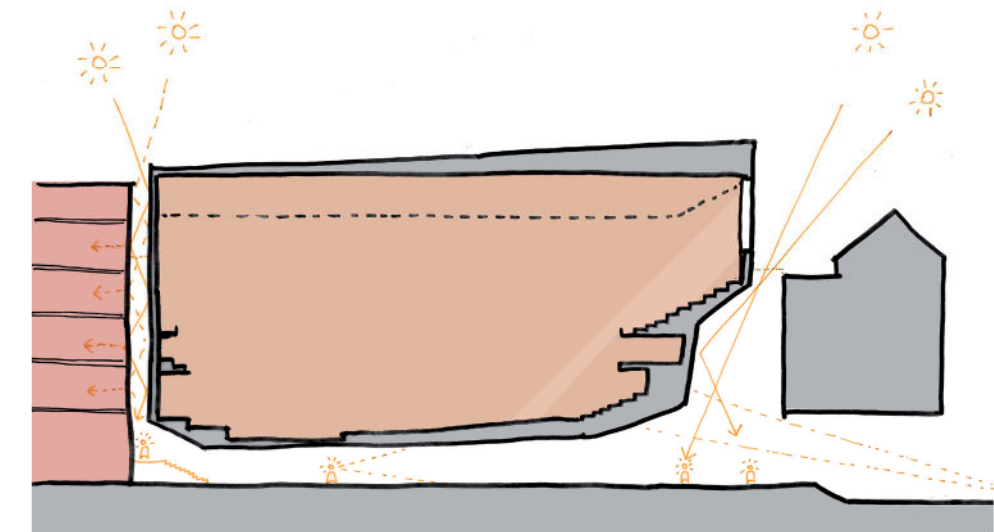
- > Allow daylight to flood into and invigorate the Loos Hall
- > Break the acoustic link between the Zalencomplex and the concert hall and creates an acoustic "buffer".
- > Create a space through which the audience can circulate from the Loos Hall to the auditorium or up into the Darwin Hall
- > Help to provide a clear distinction between the historic fabric and the modern interventions.

The concert hall itself is celebrated and revealed as the beating heart of the entire complex. It is expressed as clearly contemporary – revealed like a jewel in a box, or a diamond in a setting and visible from Koningen Astridplein in glimpsed views through the main entrance foyer.

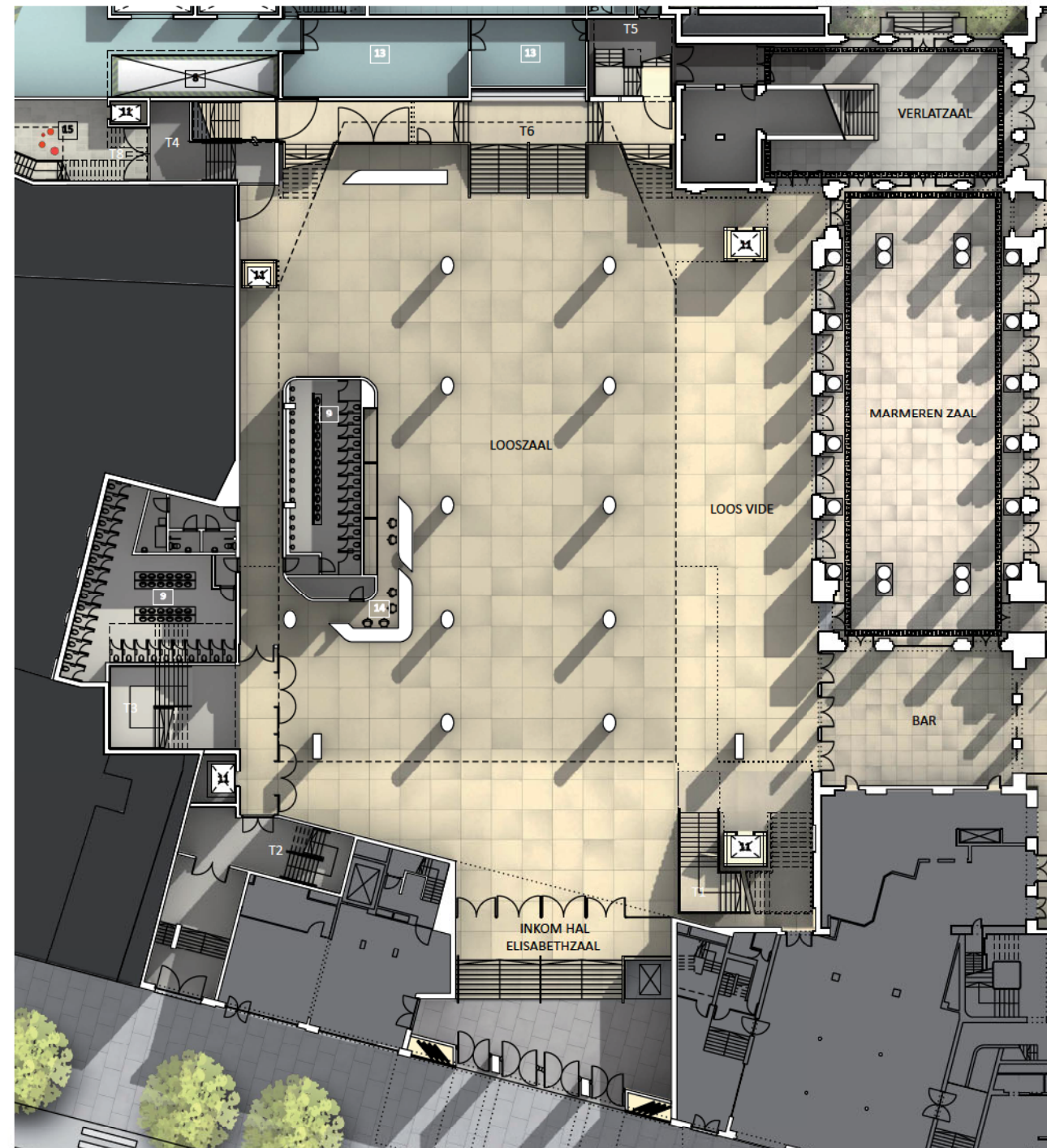
The footprint of the concert hall has been derived through an exploration of the ideal shape for the concert hall, which is described in more detail in the following section of this report, alongside a realisation that the need for additional structure to support the massive walls necessary to achieve some of the fundamental acoustic requirements make it economical to consider exploring the potential for removing some elements of the existing structure and reducing the width of the hall.



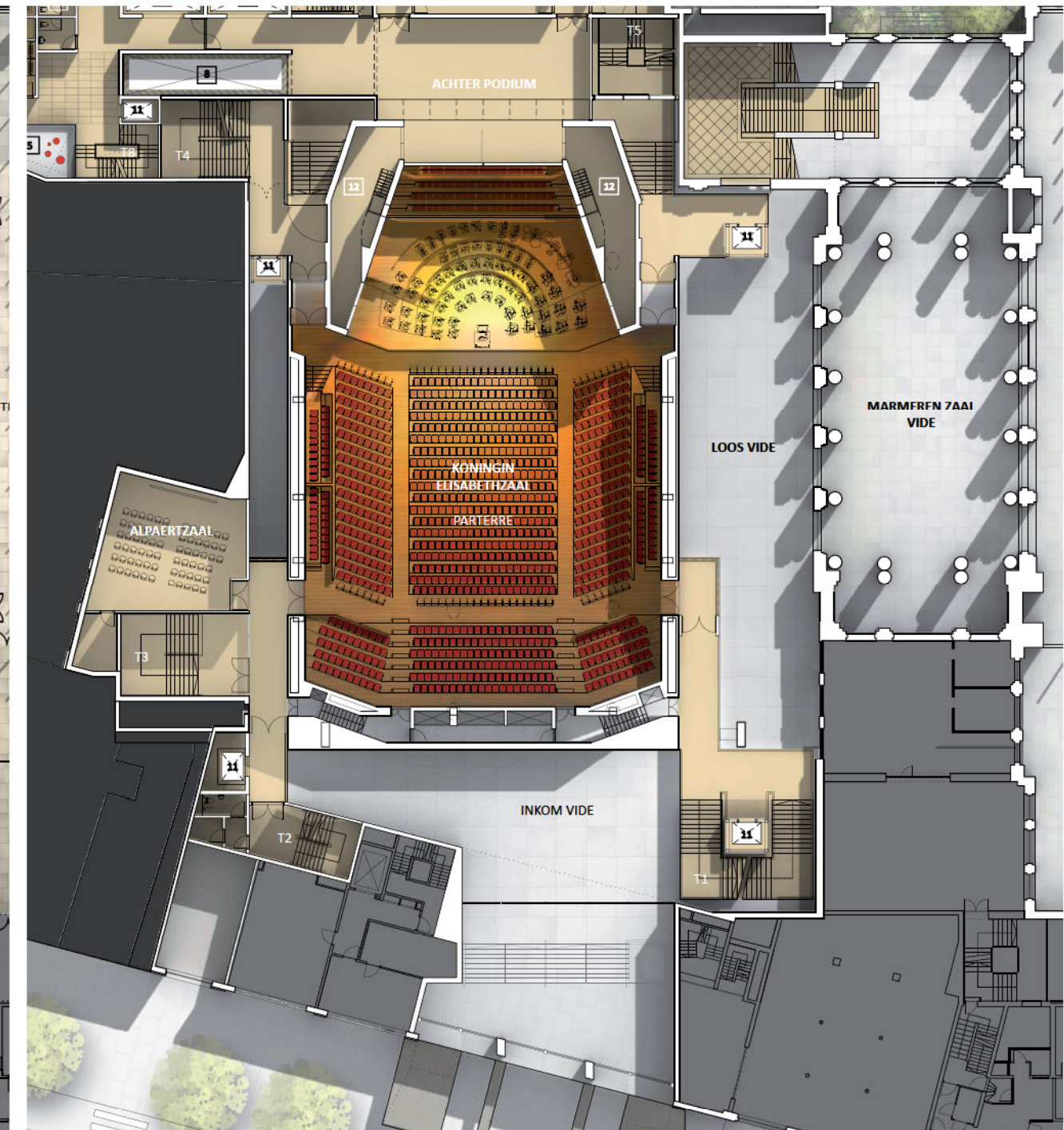
Existing hall – claustrophobic circulation



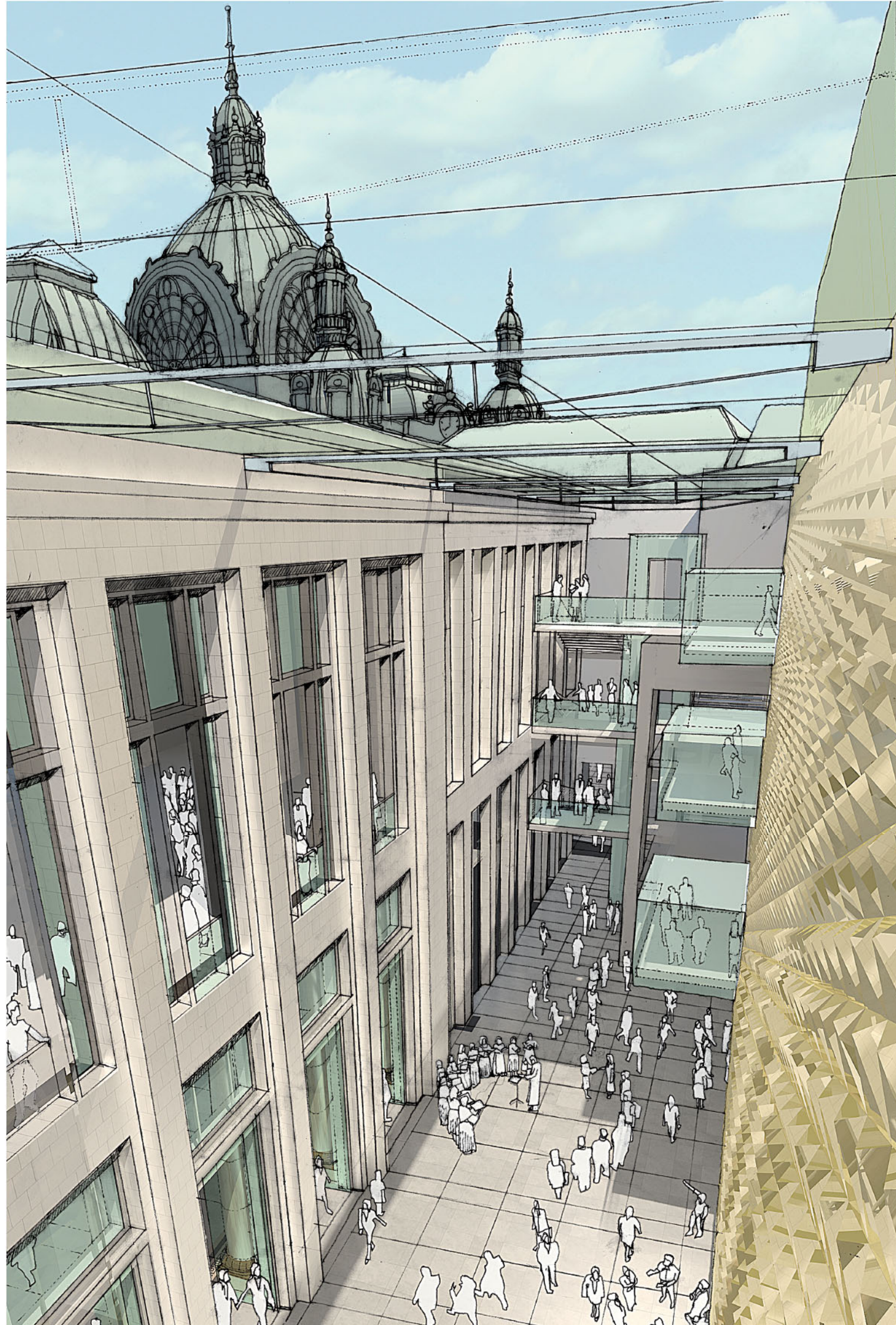
Proposed hall – light floods Loos hall



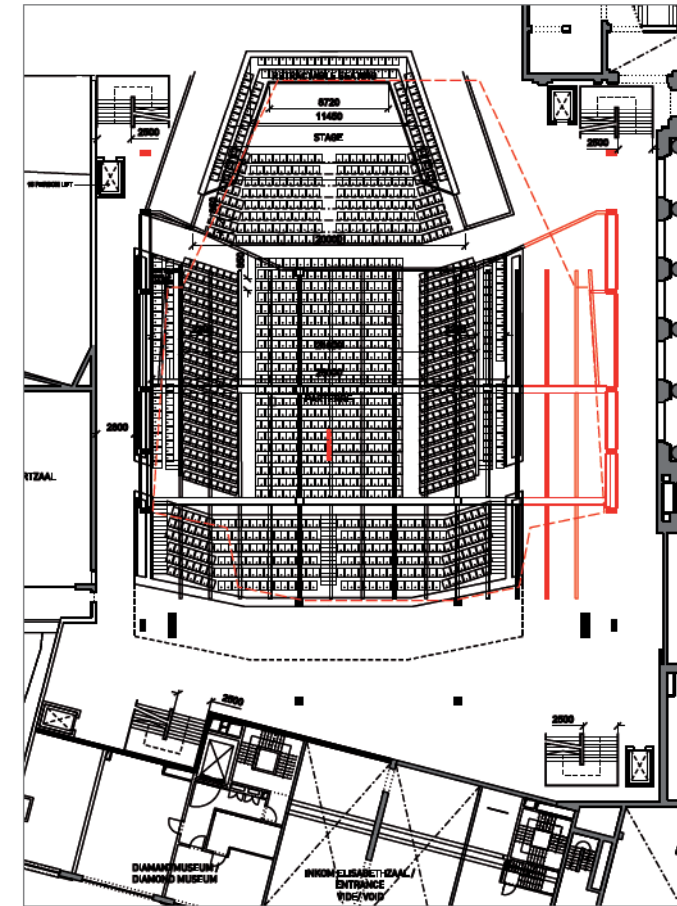
Ground floor



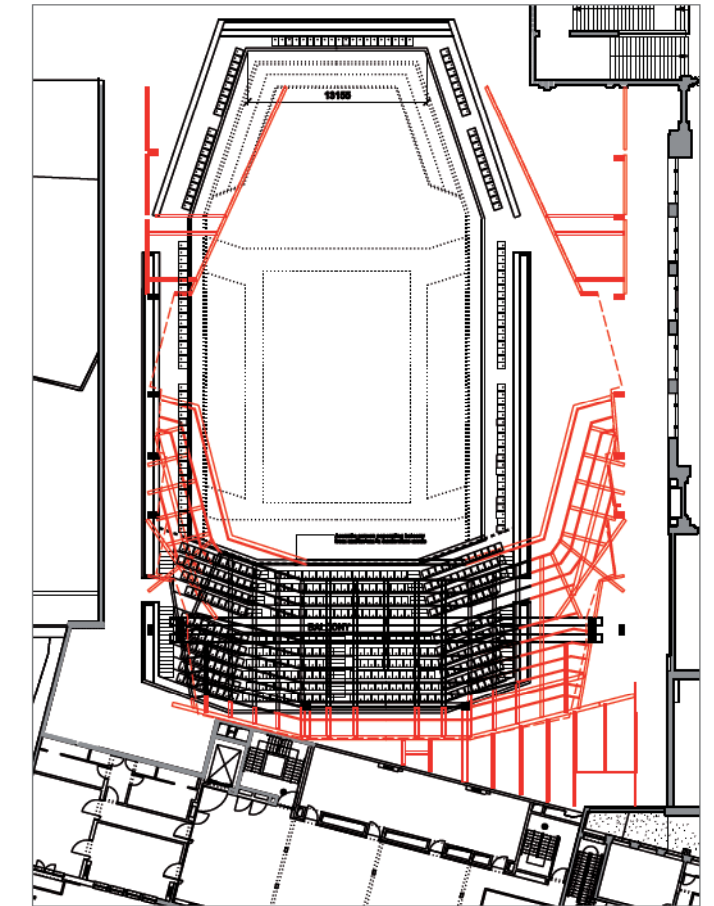
Level 1



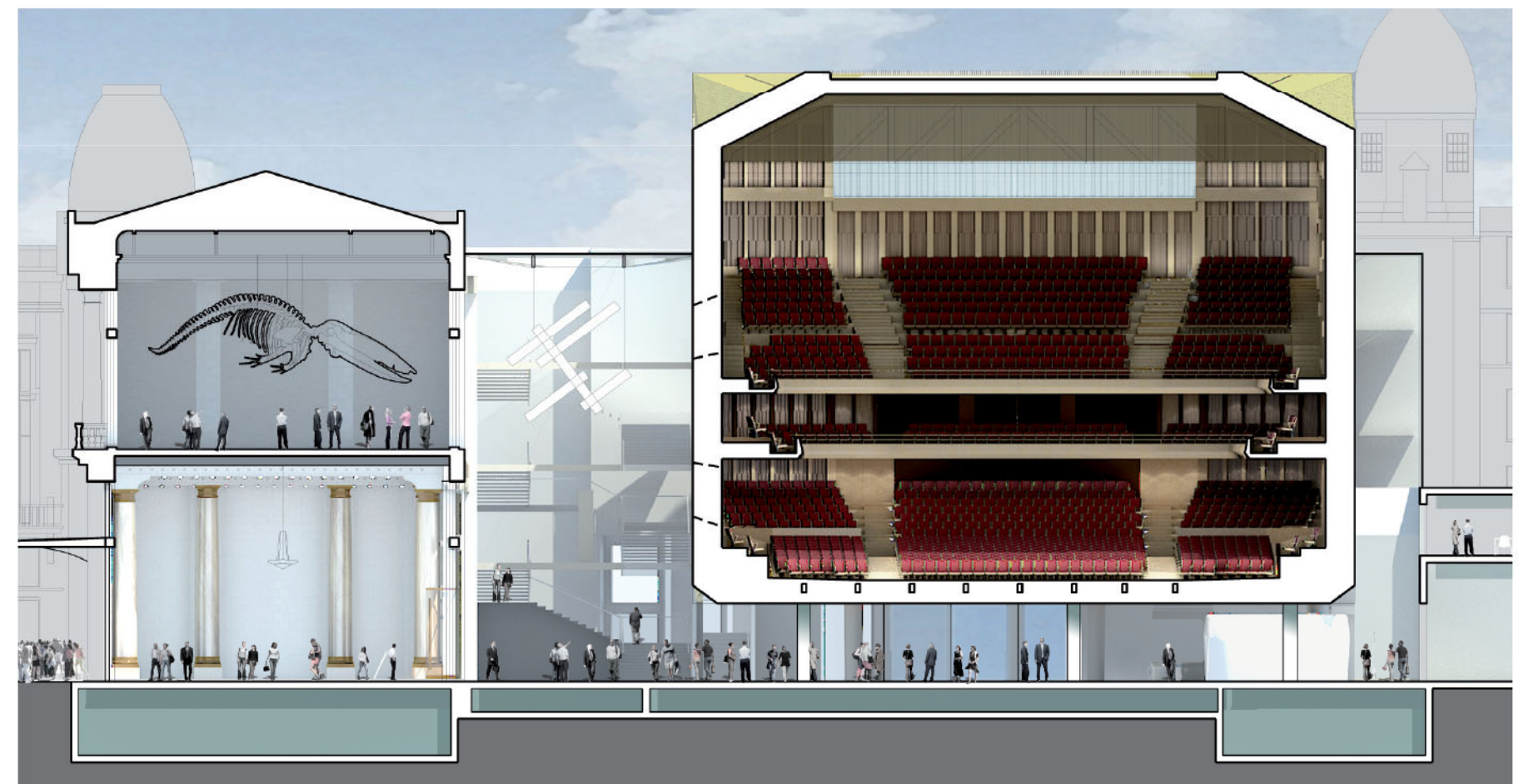
Perspective view - Atrium



Level 1 plan - Structural study



Level 2 plan - Structural study



Section - Atrium

2.3 Flexible/Conference Space

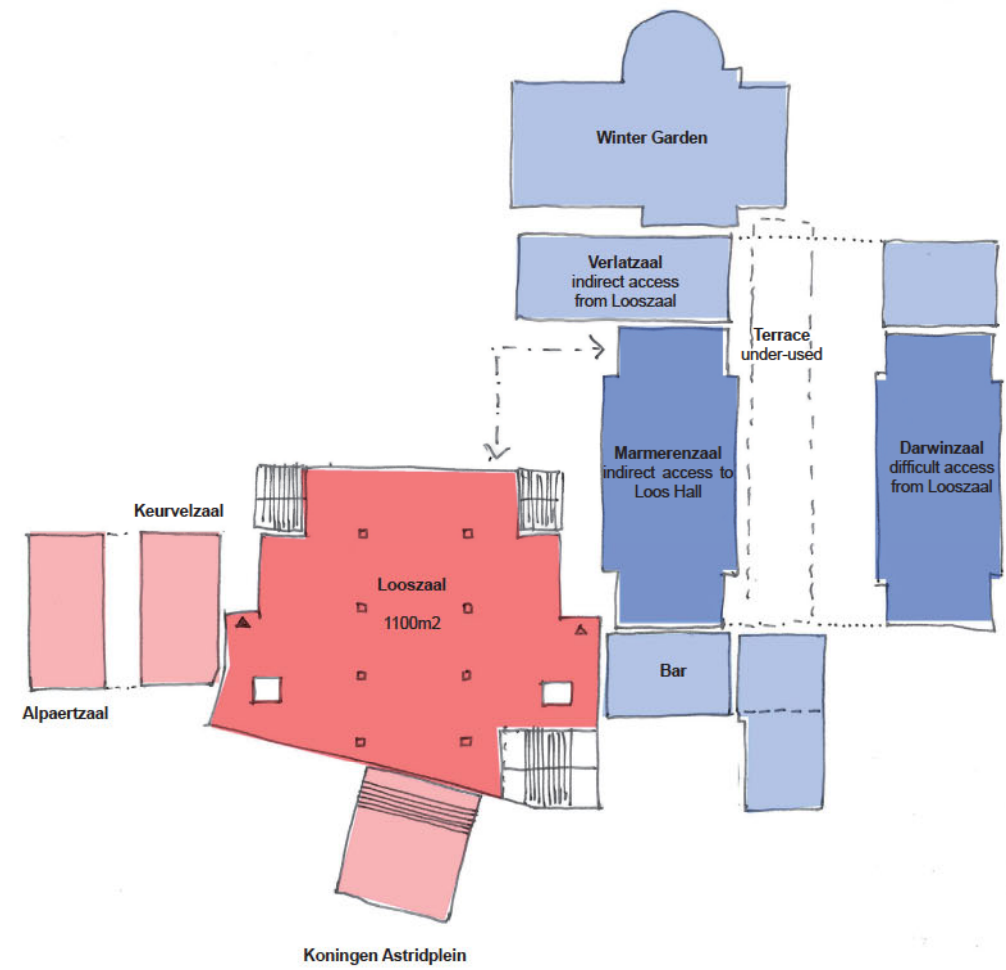
Narrowing the concert hall footprint allows an atrium space of generous proportions between the concert hall and the Marble Hall which acts as in its own right as one of a series of interesting and varied spaces which contribute to the flexibility in use of the conference offer. This space also acts a key orientation point for concert goers and conference delegates, as a 'hub' onto which the main function rooms open and from which they are all accessed.

The Loos Hall is opened up to the atrium to become a large and generous hall, capable of showcasing international exhibitions. It now comprises two distinct and different spaces – a space defined by the volume of the concert hall above, and the dramatic triple height atrium space, each with clearly different potential uses.

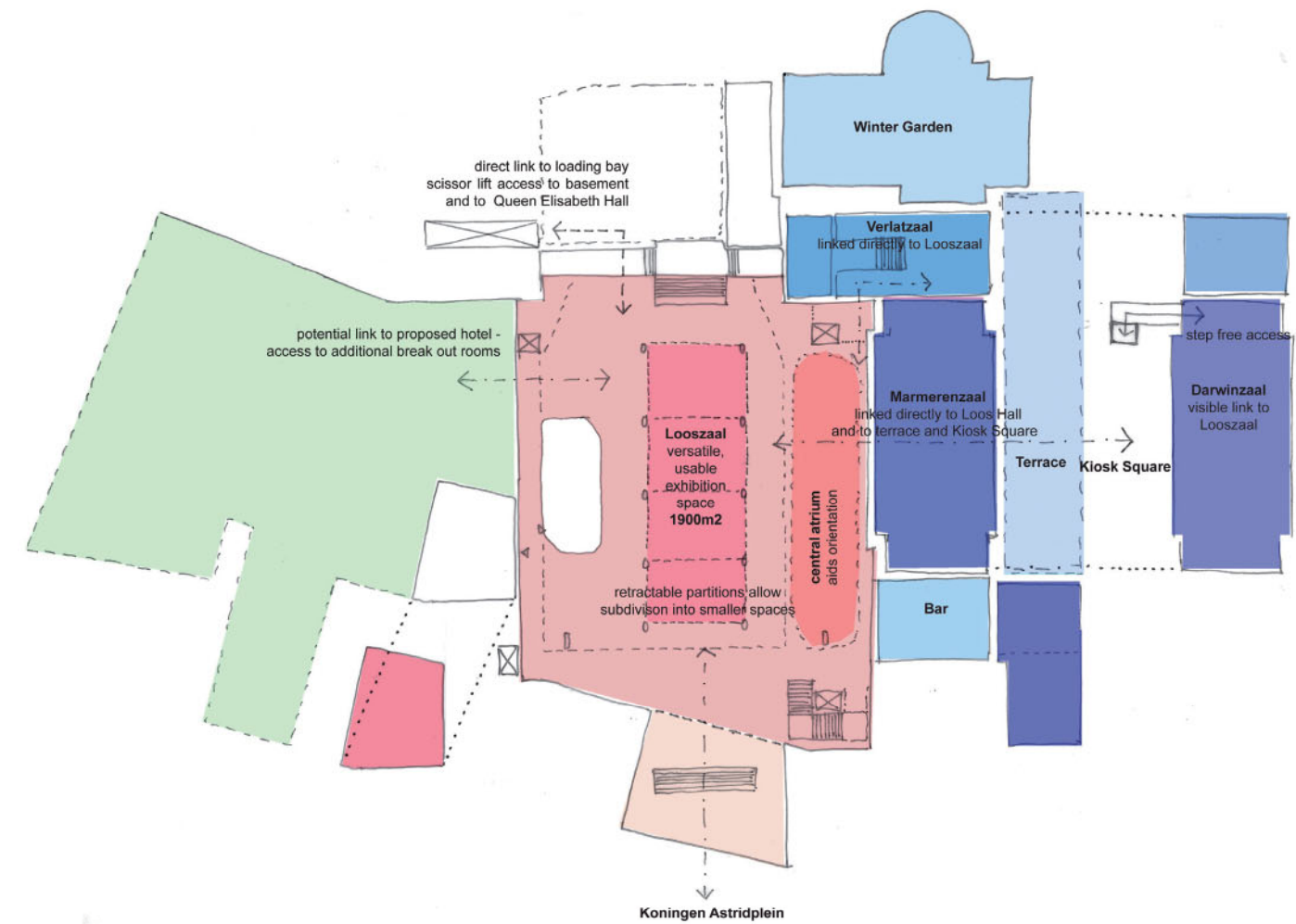
We have proposed that the entrance hall is reorientated to provide a more direct relationship between the concert hall and Koningen Astridplein. We have also proposed that the ticketing kiosk is brought into the Loos Hall, as we see advantages to bringing members of the public into the Loos Hall, where they will be seduced by the drama of the space, in order to purchase tickets or collect details of forthcoming events. We would also like to explore the possibility of introducing small, potentially moveable, commercial 'pods', say cafes or retail units within the Loos Hall, in order to increase public use of this amazing space. We recognise the potential need for tickets to be sold whilst the Loos Hall is occupied and would therefore also like to investigate the potential for the use of flexible 'pods' as ticketing booths, which can be moved into the entrance foyer, or even out onto Koningen Astridplein or into Kiosk Square to sell tickets.

The revealed facades give the Marble, Darwin and Verlat Halls a presence onto the atrium and opening doors and 'Juliet' balconies provide a direct physical connection between these spaces and the Loos Hall. New circulation routes provide direct, obvious, step-free access between all rooms whilst heavy acoustic drapes, concealed within reveals, allow the spaces to be separated and used independently.

The result is a conference facility with a series of spaces, the Loos Hall, the Queen Elisabeth Hall, the Marble, Darwin and Verlat Halls which can be used independently or linked together, allowing a function to proceed from the Queen Elisabeth Hall, through the Loos Hall and Marble Hall and onto the south facing terraces within Kiosk Square.



Existing conference facilities



Proposed conference facilities



View from Koningen Astridplein

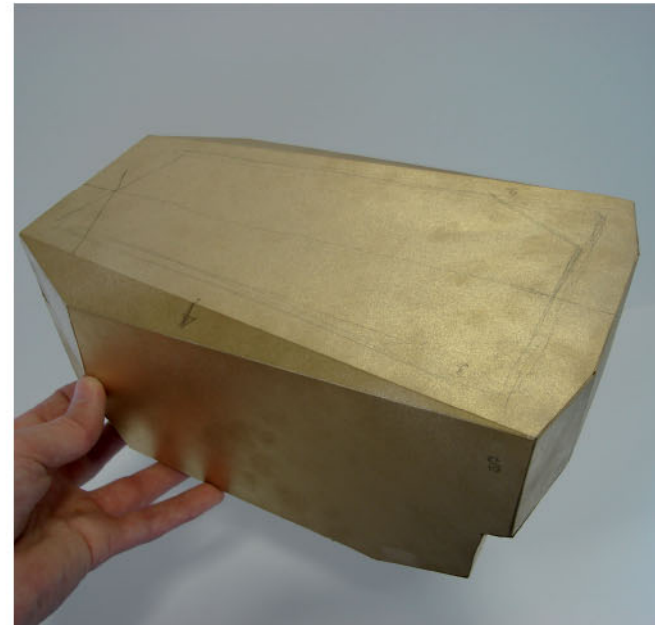


View from Loos Hall to Marble Hall

2.4 Queen Elisabeth Hall

The faceted volume of the Queen Elisabeth Hall takes inspiration from the diamond cutting techniques pioneered in Antwerp.

The surface treatment of the hall is modulated by a series of repetitive, diamond shaped panels, with facets that vary in texture and surface treatment, reflecting the light in varied and interested ways and creating a stippled effect reminiscent of the gold mosaics prevalent in the existing facades to the Koningen Astridplein.



Model studies – faceted volume

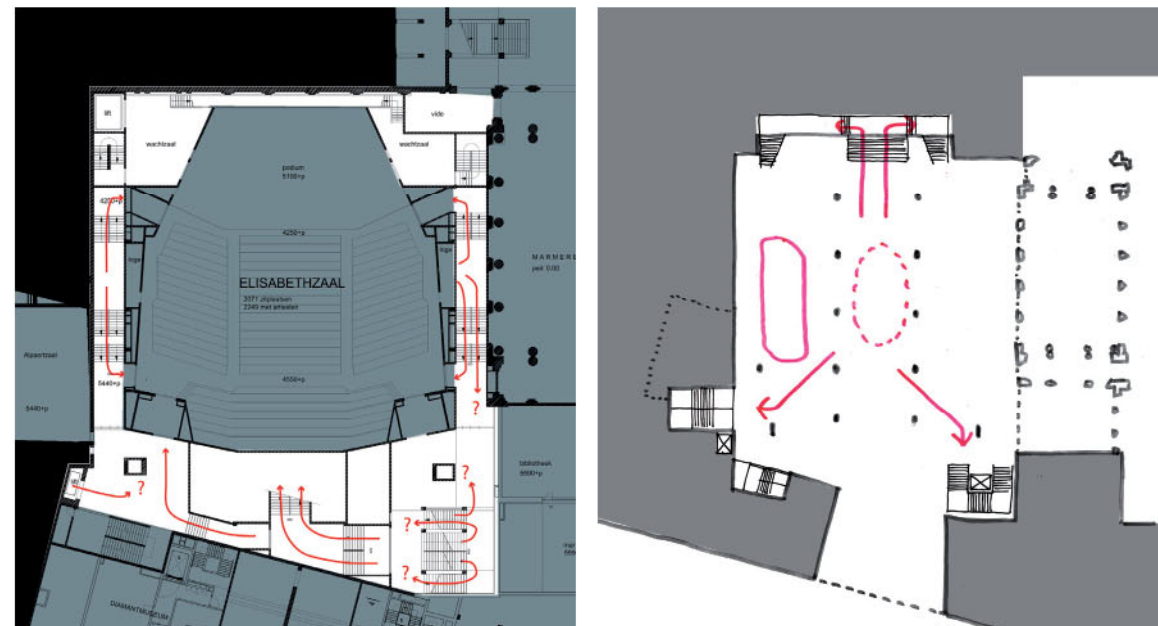


View from Marble Hall to Queen Elisabeth Hall



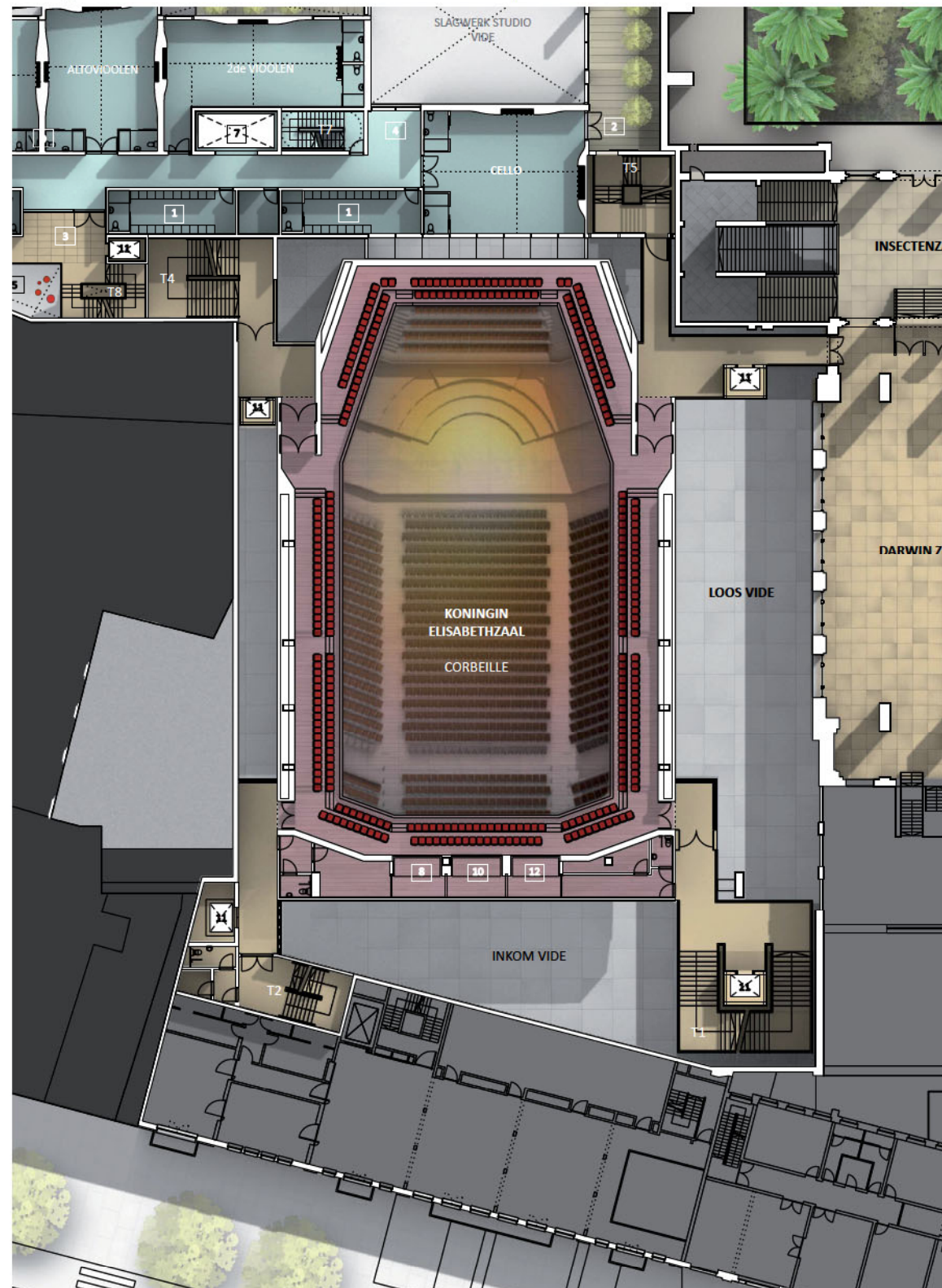
Study of surface treatment





Existing circulation

Proposed circulation



Level 2 plan



View of Loos Hall showing lift access to auditorium and Darwin Hall

2.5 Circulation

The route from the square to the concert hall is now intuitive and clear. There are four access points to the auditorium at each level. These are reached from four different staircases, each with an associated lift, all visible from the main entrance lobby. The stairs are expressed as beautiful sculptural objects which progress up through the new atrium spaces and contribute to the drama of the journey to the concert hall entrance.

3.0 Queen Elisabeth Hall: Acoustics & Interior Design

3.1 Acoustics

The Elisabethzaal was conceived to be a great concert hall and for many listeners over the years, it successfully enchanted their musical experiences. Memories of great music performed in this hall have imbued it with a certain dignity that one must respect. At the same time, those listeners who had heard great performances in halls that were acoustically superior realized the shortcomings of the Elisabethzaal's acoustic qualities.

Elisabethzaal is now challenged by the increasingly good concert venues being built around the world - halls designed with the functional capabilities needed to accommodate successfully very broad ranges of performance types. To regain its pride of place, Elisabethzaal must go through a thorough transformation to be able to serve future audiences... Audiences in a plural sense because each of the many performance types will bring its own audience and each audience will wish to feel that the hall was transformed specifically for its enjoyment and appreciation. We as acousticians, architects, theatre consultants and other design professionals must strive to achieve the highest possible acoustic/architectural/functional excellence in each of its performance configurations. Acoustics for symphonic performances surely must be the highest design priority for the 'new' Elisabethzaal to achieve - Acoustics excellence is the most challenging goal. At the same time, the design must also seek to serve well each of the other performance types, including those yet to be created. Such is the challenge of this project and what we hope will be our mission.

How do we begin to address these issues? Carefully - collaboratively - creatively... pursuing as many options as necessary to discover the most elegantly simple solution. The option that addresses all the issues without forcing any of them into compromise - certainly not a "cut to measure and pound to fit" approach!

The Design Team toured the hall from basement(s) to attics. We asked probing questions, ventured into dark corners, pounded on walls, clapped hands and recorded sounds that we could analyze later. When we were in the balcony and realized that the sound was much less live than the rest of the hall, we discovered that all the upper wall surfaces in the audience chamber were intentionally sound-absorptive - apparently because the room was so wide that the corners of walls and ceiling (would have) created disturbing echoes.

The Design Team studied original architectural and engineering drawings - asking 'what if' questions of them. We asked questions of the building itself. What if this? Why not that?... Until options began to form.

Acoustically the shape is wrong, the walls and ceiling, too light in mass, the volume too small, the surfaces too absorptive, the systems noisy, the neighbouring spaces too close, and the budget too tight! Architecturally there was a similar set of constraints: the goals are set high, the building is complicated, the schedule is short, and space is limited. The Theatre Consultant and engineers sang the next verses of the same song! Somewhere among all the constraints would be the right solution. We just needed to keep searching!

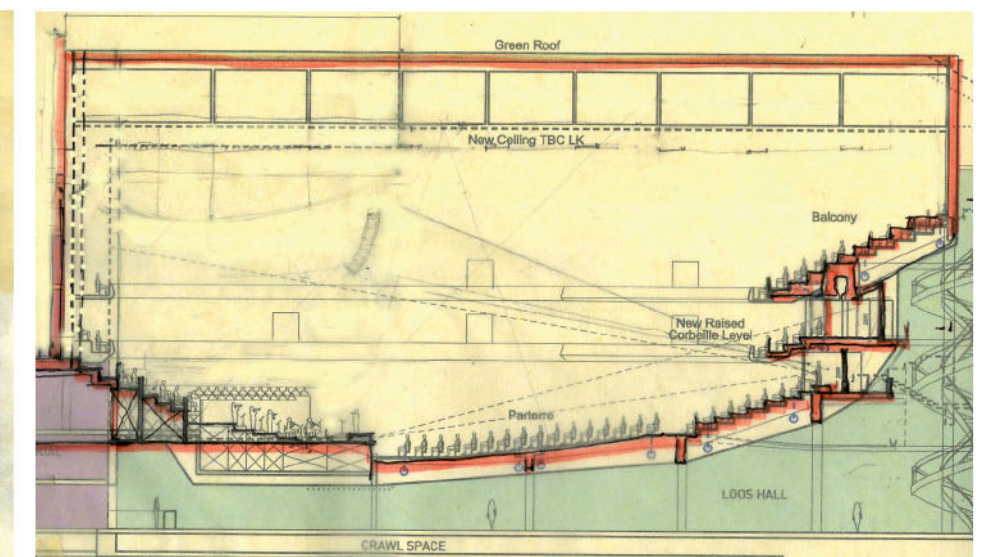
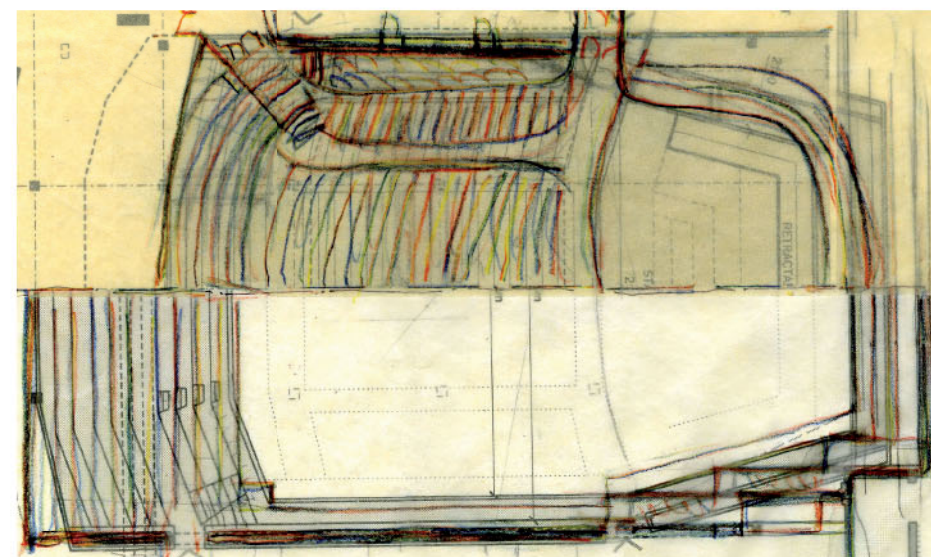
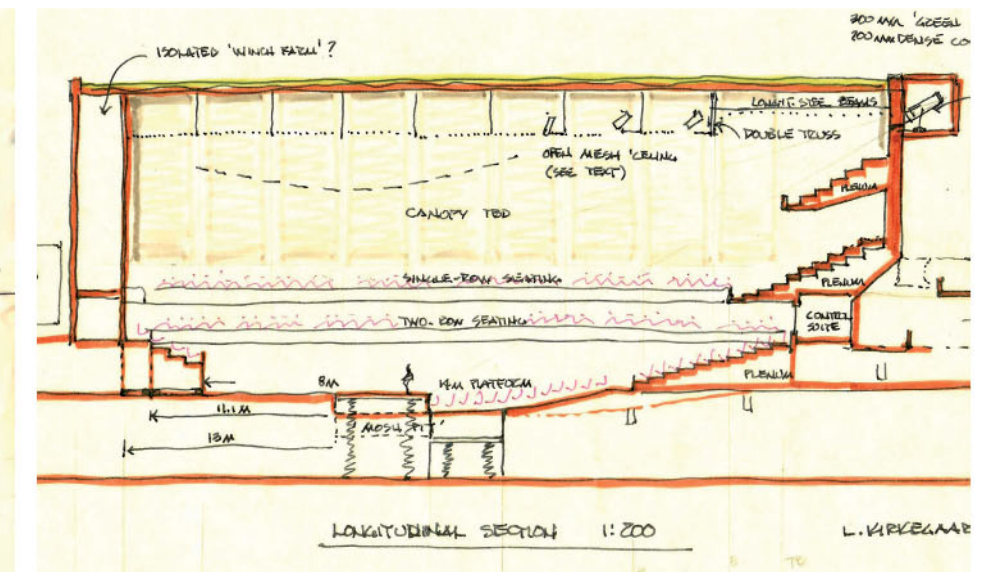
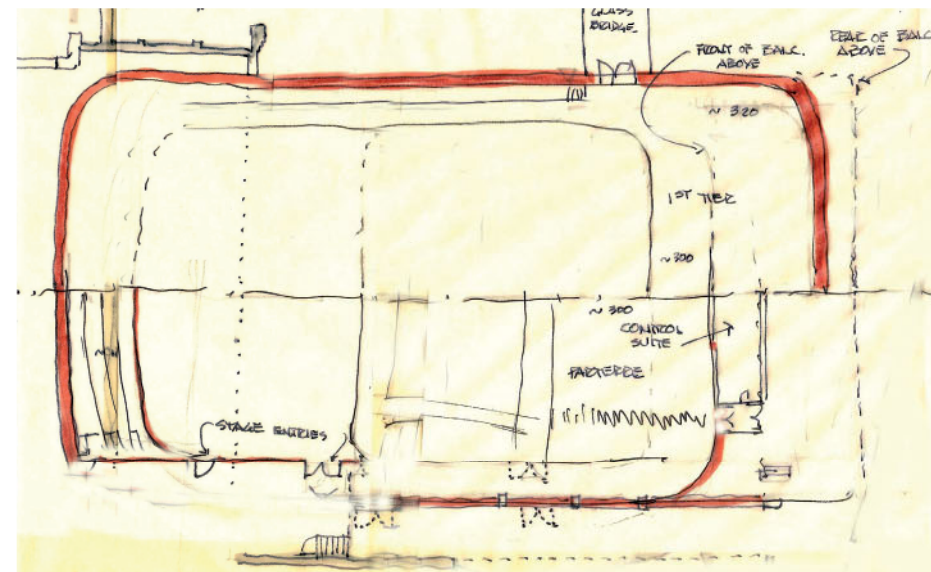
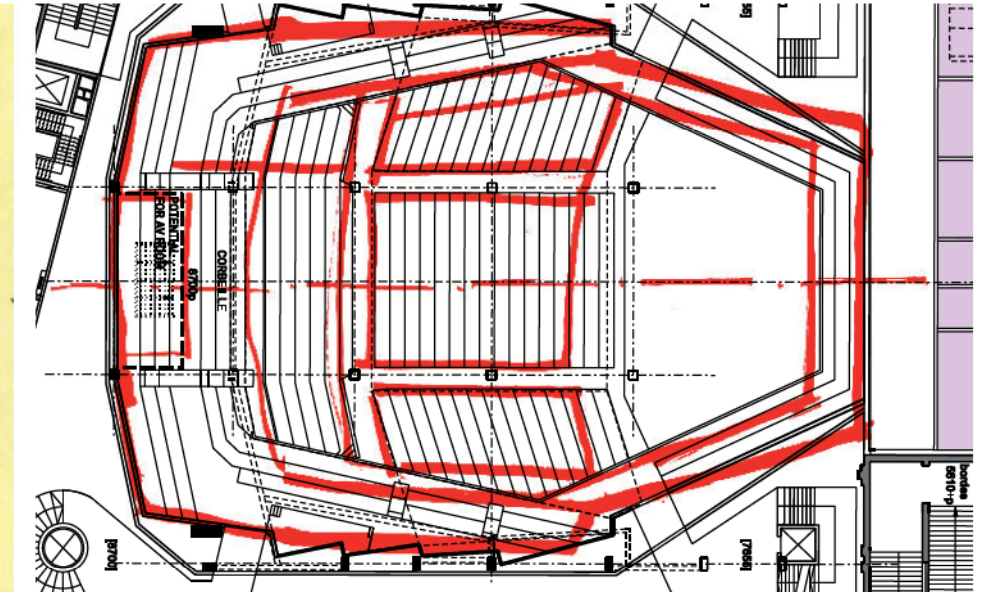
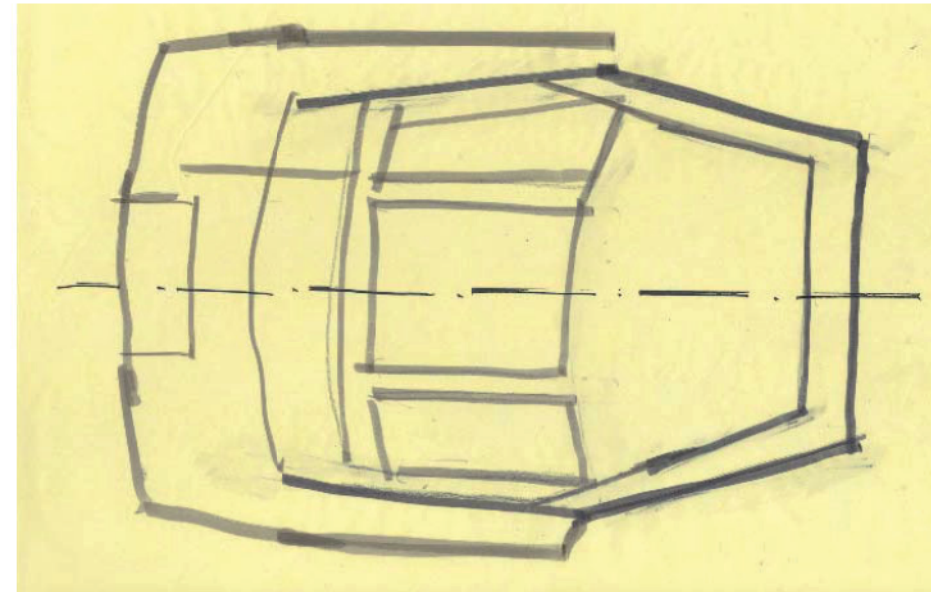
The first important realization was that the existing structure would be unable, without additional help, to support the acoustically essential massive walls necessary to assure the strong low bass response of the greatest concert halls. To musicians in the orchestra, low bass sound represents the 'fundamental' of a musical chord that keeps their sounds on pitch - intonation.

The greatest of the world's concert halls were built of meter-thick masonry bearing walls. Concrete half that thickness would be acoustically sufficient now, but even this would require additional foundations supporting additional walls if true acoustic excellence is to be achieved.

If additional walls and additional foundations are acoustically essential, then why not alter the dimensions of the hall to create a hall of an optimum width? Next thoughts: One reason might be that the building will become too long to fit in the footprint of the current hall. Then, Why not break through the wall and extend the length into the backstage area? Great idea, but is there room for everything else that must be provided there? Only if the truck turntable leaves the project...

What about the ceiling height that was said to be too low? It was intriguing to realize that the volume represented in the height of the trusses is just about the perfect amount of volume needed for the hall. We could use that volume by having a completely sound-transparent ceiling similar to those we have successfully used in the past...

But what about environmental noise? This is an urban site and a single layer of concrete, even if it is very thick, has weakness in a certain frequency ranges because it isn't a well damped material. Ah, but if we place a deep green roof on top of the insulation and membrane of the roof we add needed mass and we also gain the inherent damping of the earth under the green. Voila!



Early studies



Carnegie Hall



Royal Festival Hall

Is it possible to provide natural light for performers? During rehearsals when production lighting is not needed, A great window could be placed in the rear wall of the balcony. The window could be designed in two layers so that a room-darkening curtain could control the daylight without adding absorption during symphonic concerts. The glass could be sculpted to provide dispersed shaping that would send just the right amount of sound energy back to performers. This is the feedback they will need to be able to place their own sound in the sound of the hall – timbre, loudness, balance. Controlled optics would allow the light to be spread to the side walls to illuminate the room while avoiding glare for the performers.

When amplified performances need that return energy to be diminished, a mid and high frequency sound absorptive material would be placed in front of the glass. To assure a 'tight bass response' we could place a purpose-designed, deep low-frequency absorber system at the rear of the attic volume. That absorption could be deployed when needed to control the strong, deep bass we have supported by the heavy walls. 'Bigger engine needs stronger brakes!'

Sculpting the audience space involves placing seating propitiously around the hall. Considerations for audience placement involve acoustic and sightline concerns as well as social and psychological opportunities. Our design places some of the audience around the platform for them to experience the extraordinary sensual delight of being close to the sound, close to the performers, and able to see the conductor's interactions with the musicians. By their presence, these audience members bridge the distance for other members of the audience, creating an intimacy and sense of proximity that belies the actual distance. Enjoyment is contagious...What causes a performance to take wing, to rise above the stage with an indescribable energy and transforms a simple performance into a magical one There is something about how the audience relates to the performers and to each that is enhanced by the way an audience is sculpted. Sightlines are important, but slightly subservient to these relationships.

Retaining the great 'goal post beam' allowed us to place a shallow row of boxes between the raised parterre and the balcony. This Corbeille level is very like the rings of boxes at Carnegie Hall. When we were working to improve Carnegie's acoustics after its unfortunate 1986 renovation, we appreciated that although the box seats at Carnegie are three rows deep, they have only a single step located at the rear of the front row. This allows the second row to see over the first and, by placing third-row audience members on stools with footrests, they are able to see over both the first and second rows. The charm in

this is that the seating is loose and the eight box holders in each box are able to rearrange themselves to suit the relationships among them.

The Corbeille Boxes extend around the back and along the sides of the hall. These boxes occur at a very desirable elevation for the people seated in them. They also provide an important horizontal surface that interacts with the side walls to reflect sound into the middle of the main floor audience. Perfect!

The Corbeille level connects with the seating at the sides and rear of the platform and can be used by the chorus for access to their seating. Such access has been known to allow processions from the rear of the hall to the chorus seating, dramatically accompanied by candlelight and a capella singing - no further description needed.... When the chorus arrives at the Choral Terrace they will have had to take the seats that classical music audiences normally will have occupied. If the chorus is part of a smaller ensemble, they will descend removable steps to access their seating which is on low risers close to the orchestra.

The height of the chorus risers will be adjustable so that the chorus can be in the perfect relationship with the musicians accompanying them. If there is a large ensemble and the percussion and brass players are elevated on high risers, the chorus can be raised to allow a wall in front of them to serve as a necessary acoustic reflector for tympani and horns who depend on the wall for projection of their sound. This place the top of the reflective wall at about 1.4 meters above the percussion/brass platform elevation. There will be a limited number of such elevations, so that a few stairs units will suffice. A massed chorus will occupy both the side seating as well as the upstage seating.

There will be an acoustic canopy above the stage. For the chorus, the canopy will have the ability to reflect some sound back to them, while reflecting the power of their voices over the orchestra to the audience beyond. There will be special lighting to permit them to read their scores as well as to light them as performers.

The acoustic canopy also will serve the ensemble needs of orchestra members. We have learned during our long engagement with London's Royal Festival Hall that a canopy does not need to be a massively heavy element to serve the musicians. In fact, a very gentle amount of sound provides the musical cues that they need to perform well. It is important for them to hear the sound coming back from the hall as well as to hear sound from overhead and from walls adjacent to them.

The engineered fabric we developed for the RFH stage has the advantages that loudness buildup on stage is diminished so that potential hearing damage is reduced.

Fortissimo passages get loud but not painful. The other advantage is that the space above the canopy also is energized by sound from the stage, creating a wholeness of acoustic space within which the sound can develop.

The canopy addresses some of the other performance types that will be using the Elisabethzaal. By having the canopy modular in construction, individual elements can be tilted and raised to permit deployment of theatrical lighting and rigging elements. When not in use, those lighting trusses and battens are hidden from view by the canopy. When needed they are readily deployable with minimum crew time and expense.

The technical attic space above the platform will contain an assembly of winches and hanging points suitable for acoustic, lighting and audio support for touring productions. One of the winches will be used to suspend a heavy fabric surround-curtain that will close-off unseated areas adjacent to the stage. In addition to visual masking of unseated areas, these curtains also provide effective sound-absorbing material that helps to control back-radiated sound from the powerful loudspeaker systems that support these performances.

Additional acoustic banners/curtains can be deployed around the audience area. These adaptable acoustics systems would be designed to control echoes produced by strongly amplified sound, as well as to provide gentle control of reflection patterns and reverberation during some non-amplified performances. These systems would be modular in nature and incremental in their operation so that very subtle fine-tuning could be done for chamber music and recitals or acoustic jazz performances. The low bass absorbers described earlier may also be designed into the truss volume above the platform to extend the frequency range of acoustic control for the platform volume. For most heavily amplified performances the canopy would be tilted vertically and stored overhead.

Another winch assembly will control a projection screen. The projection screen would 'live' in the space above the upstage canopy element. This screen could be used for projected video and/or image magnification for performances that are suited to or rely on such capabilities.

The screen and projector system that supports it also would be available for the conferencing activities. We have included mechanized stage lifts that when lowered to audience level will maximize the seating capacity during times when the stage may be reduced in size.

A full orchestra pit would be a desirable addition to the performance and commercial capabilities of the hall, but... We believe that the multiplicity of uses of Loos Hall probably would preclude having a lift pit below the front

of the platform. One could be integrated into planning, but with serious challenges in space, cost and possible acoustic isolation, its costs may not be justified.

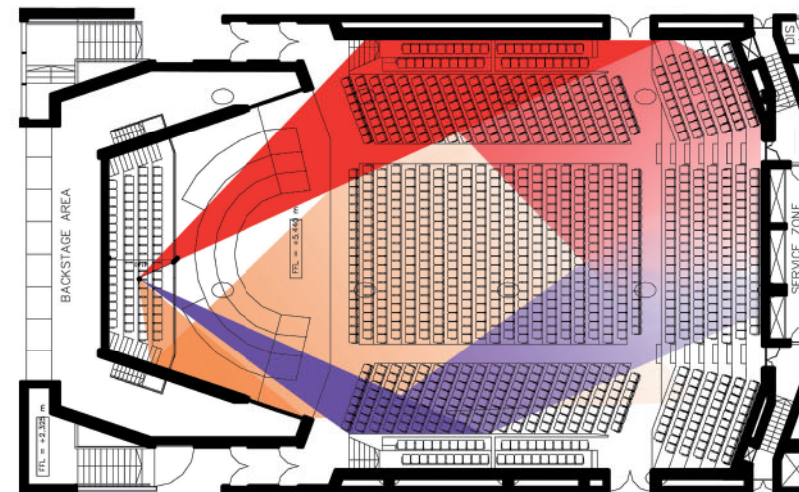
The Stage is flexible in its configurations and just right in its scale. The current stage is overlarge for nearly everything that is performed there. The affect is that performers are diminished in scale and appear to be under-sized and more distant than they actually are. There will need to be a carefully studied rostra system to accommodate the full needs of the orchestra with and without chorus, Chamber ensembles and recitals will need to be considered as well. To accommodate large chorus with large orchestra the chorus will wrap the stage, utilizing the side stage seating as well as the upstage.

The flooring system of the platform would be resiliently supported. Musicians appreciate a resilient stage just as dancers do, but somewhat less flexible than that required for dance. The issue for them is not musical, it is stability of their music stands. Our approach has been developed and refined during our work on improving Carnegie Hall and with the Boston Symphony when they decided they wanted a full set of risers for their stage. The result is a detailed floor system design that simply feels right for performers. Pegged instruments lose none of their projection and the sound they produce is clear, warm and absolutely authentic in attack and timbre.

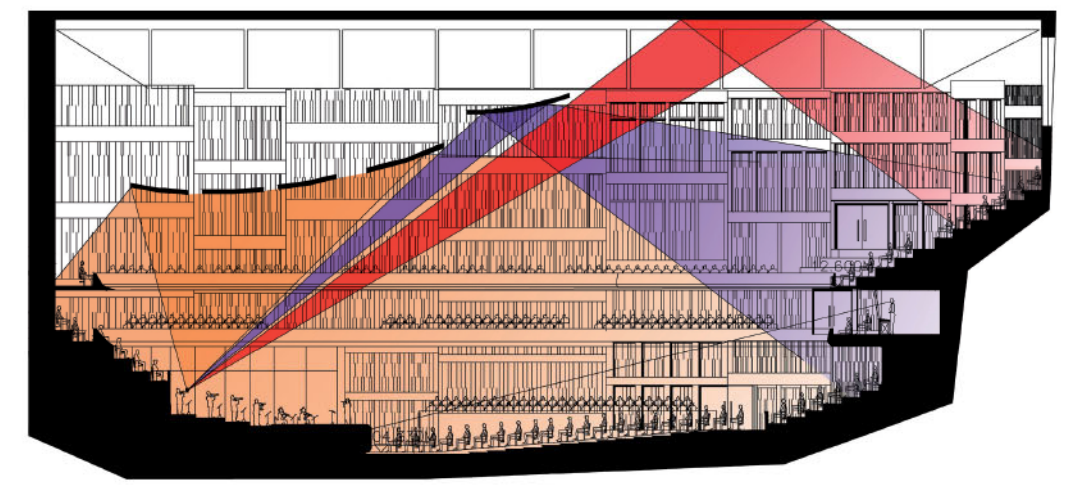
Seating Design and Acoustics In our journey through we now have reached the front of the audience, all seated in comfortable and acoustically designed seating. We will have designed the seats to provide a modicum of sound absorption to stabilize the acoustics of the hall for rehearsal and small performances with partial audiences. But it is acoustically important that the seats not be designed to provide any more sound absorption than audience comfort permits. Any further accommodation for the absence of audience can be accomplished using the deployable absorption in the hall.

Supply air may be introduced through perforated pedestals supporting the seats or from grilles in the floor. By having the air delivered from this way, drafts that are often present with overhead supply are significantly reduced. Of even greater importance to our design is that under-floor supply allows elimination of nearly all ductwork in the acoustic volume of the truss space, thus freeing that space to serve as acoustic volume needed to sustain reverberation.

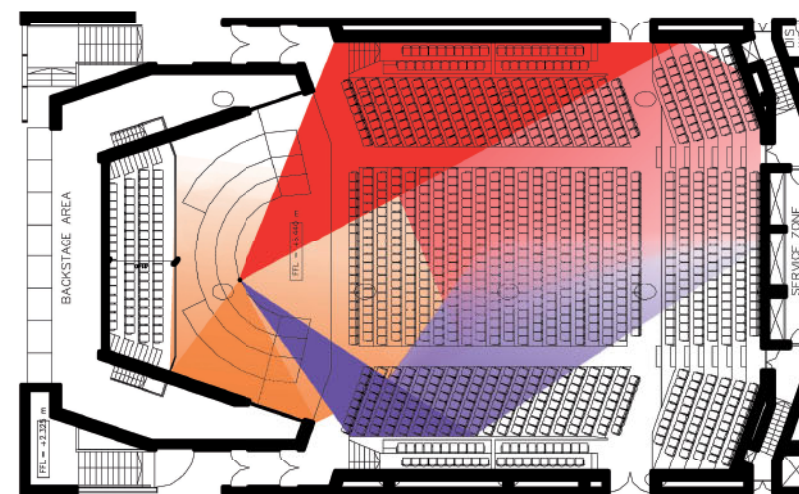
Design for the disabled would be thoroughly considered. Disabled seating would be well integrated in the seating and aisle arrangements. Infrared transmitters would broadcast show audio to those with hearing problems. There could also be a channel dedicated to those



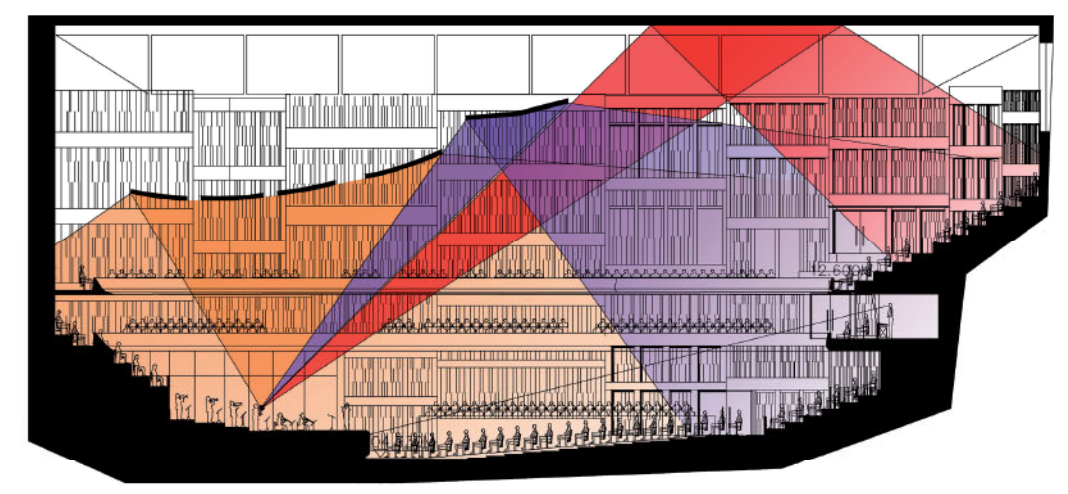
Plan – reflections – chorus



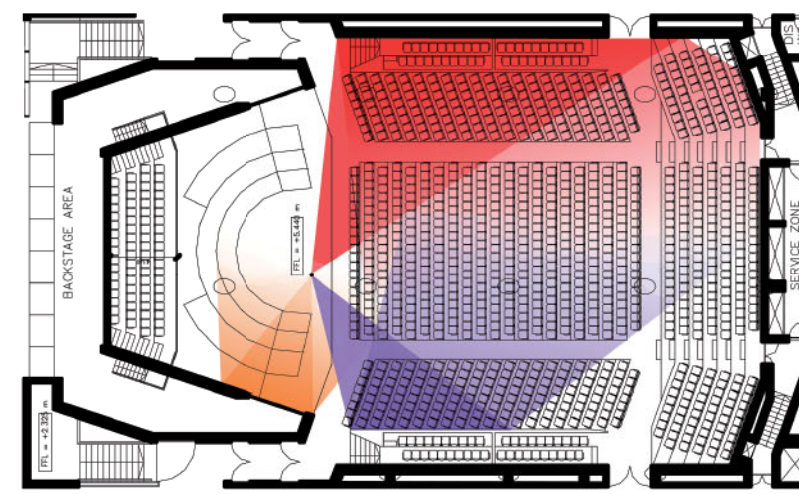
Section – reflections – chorus



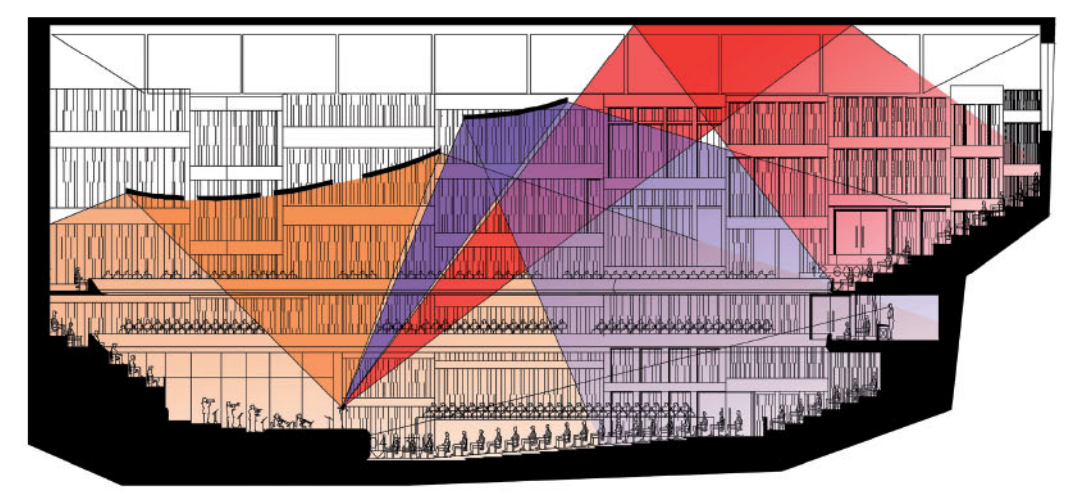
Plan – reflections – midorchestra



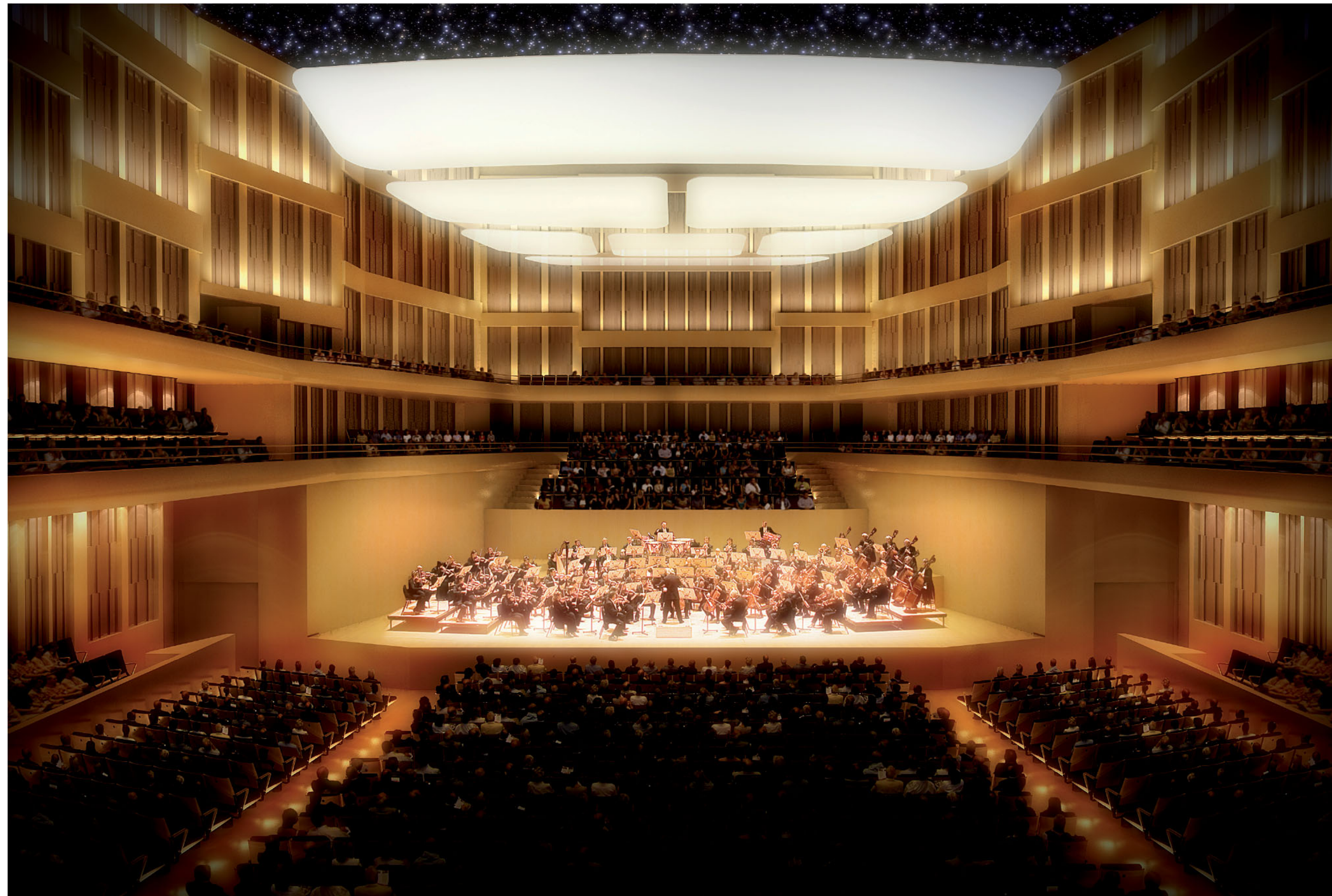
Section – reflections – midorchestra



Plan – reflections – soloist



Section – reflections – soloist



with visual impairments so that a sighted person can describe can describe the visually important aspects of a performance to those who cannot see, but can visualize what is described. This same system can be expanded to serve as a multilingual translation system if needed. It is not the purpose-built system that would be ideal, but it would have usefulness if needed.

Loos Hall as a multi-use venue We believe that it is critically important for Loos Hall to complement the dramatic vertical spaces that surround the concert hall. While impromptu performances can take place anywhere in the Foyer, Loos Hall probably would be the most suitable location. With further study we would develop a comprehensive system of lighting and AV infrastructure to support a variety of meeting, performance, exhibition, display and banqueting functions in Loos Hall and areas of the Foyers.

Fast-forwarding to the opening nights of this hall – one for each of its audiences.

Opening night for deFilharmonie will be the most special in many ways. It is the occasion for which so much design effort and research have been committed. The occasion will have been preceded by critical listening to various musical groups. The hall will have been fine-tuned to the extent possible without a full audience, but the moment that the first full audience arrives takes on very special meaning. This is the moment of truth when all the efforts of designers and craftsmen, artists and technicians are transformed into a palpable reality that they will share, perhaps with a tinge of reluctance, with the audiences for whom this hall was built. This is the magical experience of hearing music in all its dimensions - refined, touching, inspiring, enriching and delightful.

This is what this building is about. This is what we hope to bring to you.

Calculated RT-30 Occupied

These Reverberation Time data are derived from an acoustic model of the proposed hall design. The data for the existing hall were obtained from a computer model of the existing hall that we constructed to explore alternative designs that would retain the main structure of the hall. We calibrated the existing hall model based on unoccupied reverberation data that we measured during one of our site visits.

The values that we have achieved are very close to ideal for the occupied condition as configured for symphonic performances. The extraordinary reduction in reverberation time for amplified performance is based on data that we have obtained on other project work of ours where we have utilized the low-bass absorption system we developed together with more standard wool serge fabric in curtain and banner configurations. We are very pleased with these results.

Calculated RT-30 Unoccupied

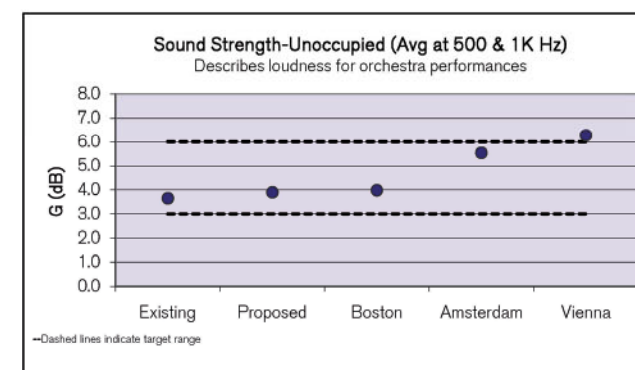
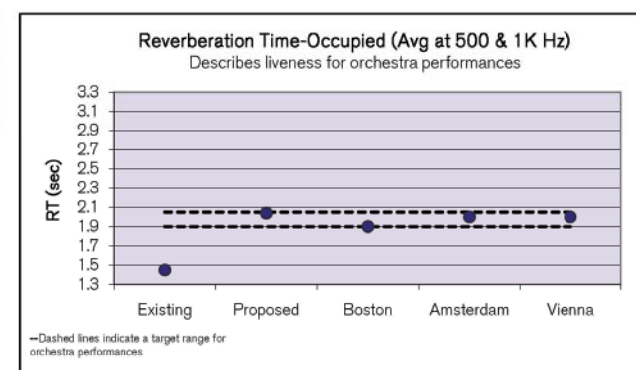
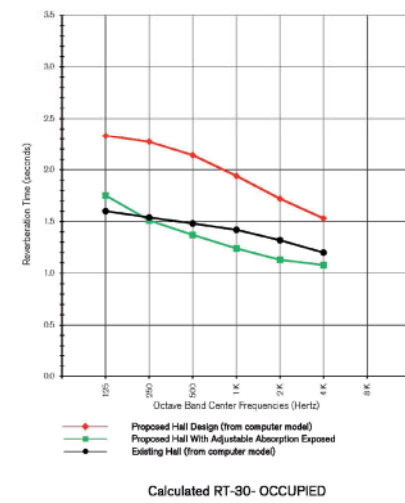
The increases in reverberation times in the unoccupied condition result from the fact that seat do not and should not replicate the absorption of an audience seated in upholstered seats. Excessive absorption in the seats in an attempt to equal audience absorption simply increases the overall absorption in the hall, thereby forcing increases in volume to achieve required reverberation. The increased volume reduces loudness, intimacy and presence.

Comparison of Occupied Reverberation Times

The Proposed design is intentionally a slight bit high to account for possible adjustments later in design. It's heritage with Amsterdam and Vienna are clear. Boston is slightly less reverberant though still well loved in the music community. The calculated values for the existing were predicted based on our measurements of unoccupied and applying the same seating coefficients as used in the Proposed Design for sake of consistency.

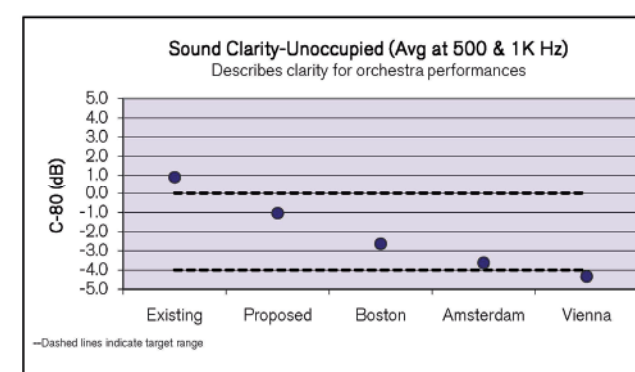
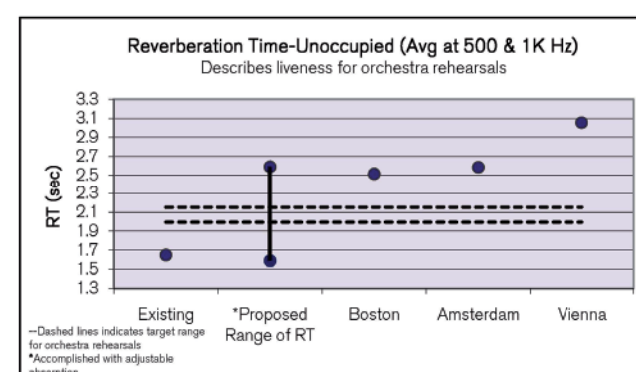
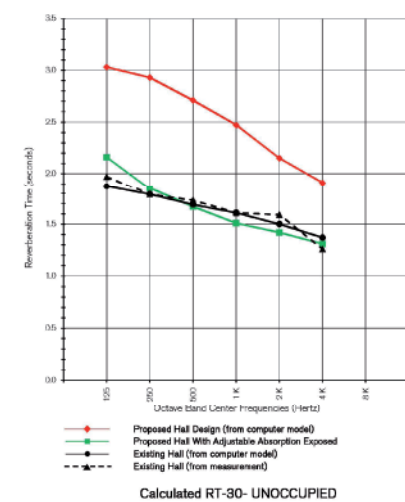
Occupied Bass Ratio

These data compared reverberation times in the octave below Middle-C to the reverberations time for the second octave above Middle-C. It is not a measure of real bass response which extend much lower than this value addresses, but the parameter does reflect a quality of warmth. Unfortunately, at the upper end of the parameter range, the reported measurements ignore the higher frequencies that would indicate harshness, stridency and distortion. We are measuring these values in our work with full size halls and bringing the results into our modeling to avoid the disasters that we keep encountering in our corrective acoustics work.



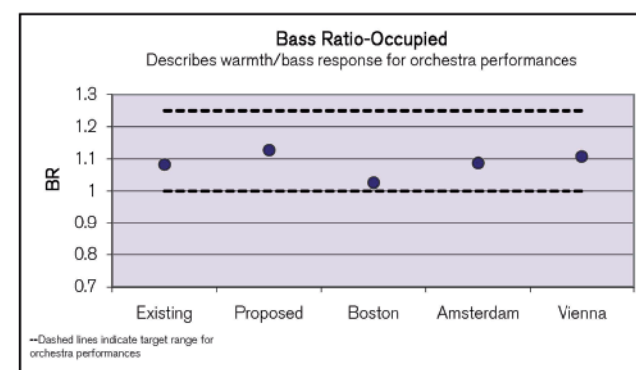
Sound Strength – Unoccupied (Average of 500 and 1000 Hz)

This value measures the relative sound level of a known source. It is a misleading value when measured in an unoccupied space because it is so strongly dependent on the absorptive behavior of audience seating. Vienna is so high because the chairs are made of upholstered molded plywood, Amsterdam's seats are moderately upholstered and a very efficient space because of its flat floor and large wall surfaces. Boston's values are somewhat anomalous and may represent the unoccupied condition in which a large canvas rehearsal curtain is suspended from the ceiling to reduce echoes and mostly to eliminate the strange frog croak sound that comes back to the stage from the rows of thinly upholstered leather seats. The Proposed design shows the influence of comfortably upholstered seating and a volume that is proportionately greater than either Amsterdam or Vienna because of the tight seat spacing in those halls. The existing hall data reflect its comfortably upholstered seating together with absorptive wall paneling and its tight volume.



Sound Clarity – Unoccupied (Average of 500 and 1000 Hz)

This value is inversely related to unoccupied reverberation values. In our experience the values that are shown for our Proposed Design are in a very appropriate range, since they change very little with occupancy because of the upholstered seating. The halls with unupholstered or lightly upholstered seating are muddy and inarticulate when unoccupied and without rehearsal curtains are nearly worthless for rehearsal purposes. The Existing Hall values are excessively high because the reverberation times are so low.



Summary

While we would never predict successful acoustics based simply on these parameter values, we are very pleased with the characteristics that they do portray reasonably well. Where they fall short in their predictive skills, our experience with halls good and bad all over the world allows us to extend our surety well beyond their ability to predict. We support this design with utmost confidence and enthusiasm.



3.2 Hall Interior

The warm, rich interior of the hall is intended as an extreme contrast to the crystalline, jewel-like exterior and is inspired by the Guild Houses in Grote Markt at the heart of the old city of Antwerp, the facades of which evoke the pages of a musical score.

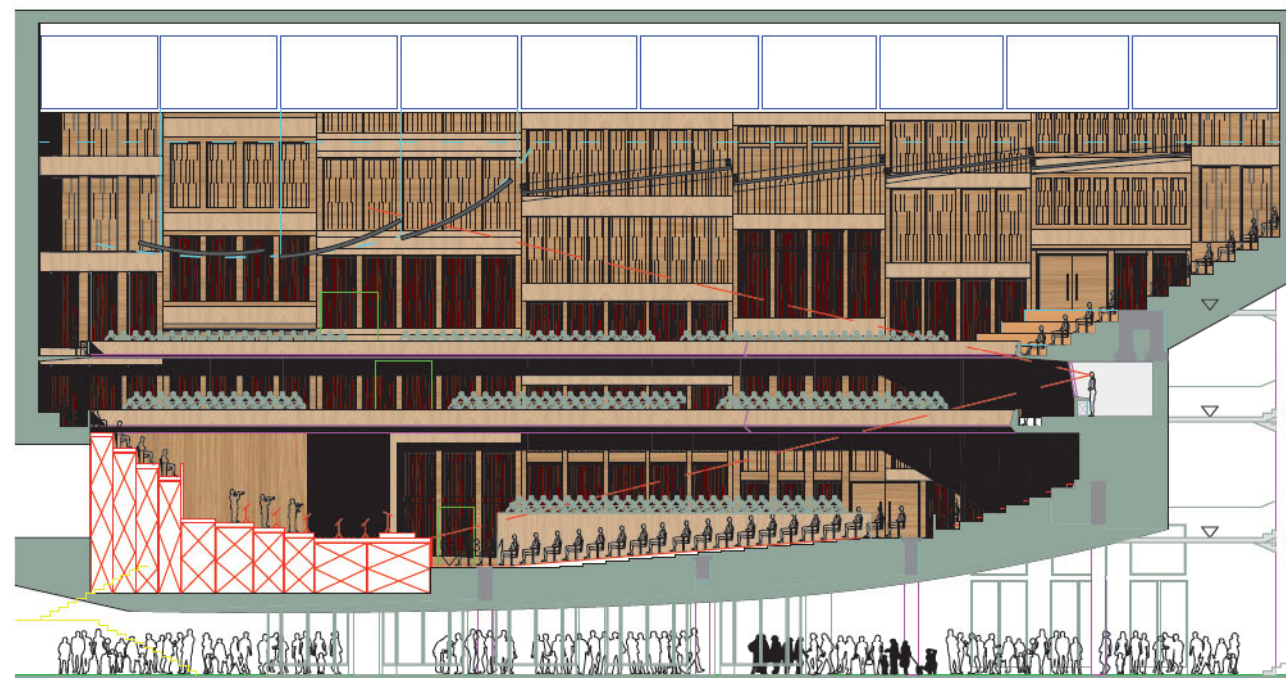
We propose to line the interior surfaces of the concert hall in panelling, in a range of timber finishes, arranged as an abstracted version of the Guild House facades. This connection with the Grote Markt is intended to emphasize the Queen Elizabeth Hall's place at the cultural 'heart' of Antwerp.

The required acoustic absorption is integrated into 'spandrels' as roller banners or blinds and a great window in the rear wall of the balcony gives the potential to bring natural light into the hall, further reinforcing the Grote Markt analogy.

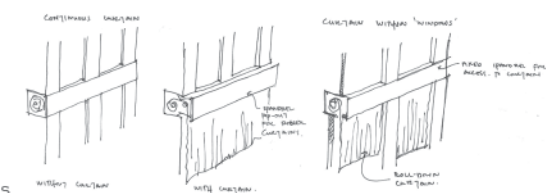
The acoustic canopies are lightweight, translucent structures, intended to resemble a series of clouds floating above the orchestra.



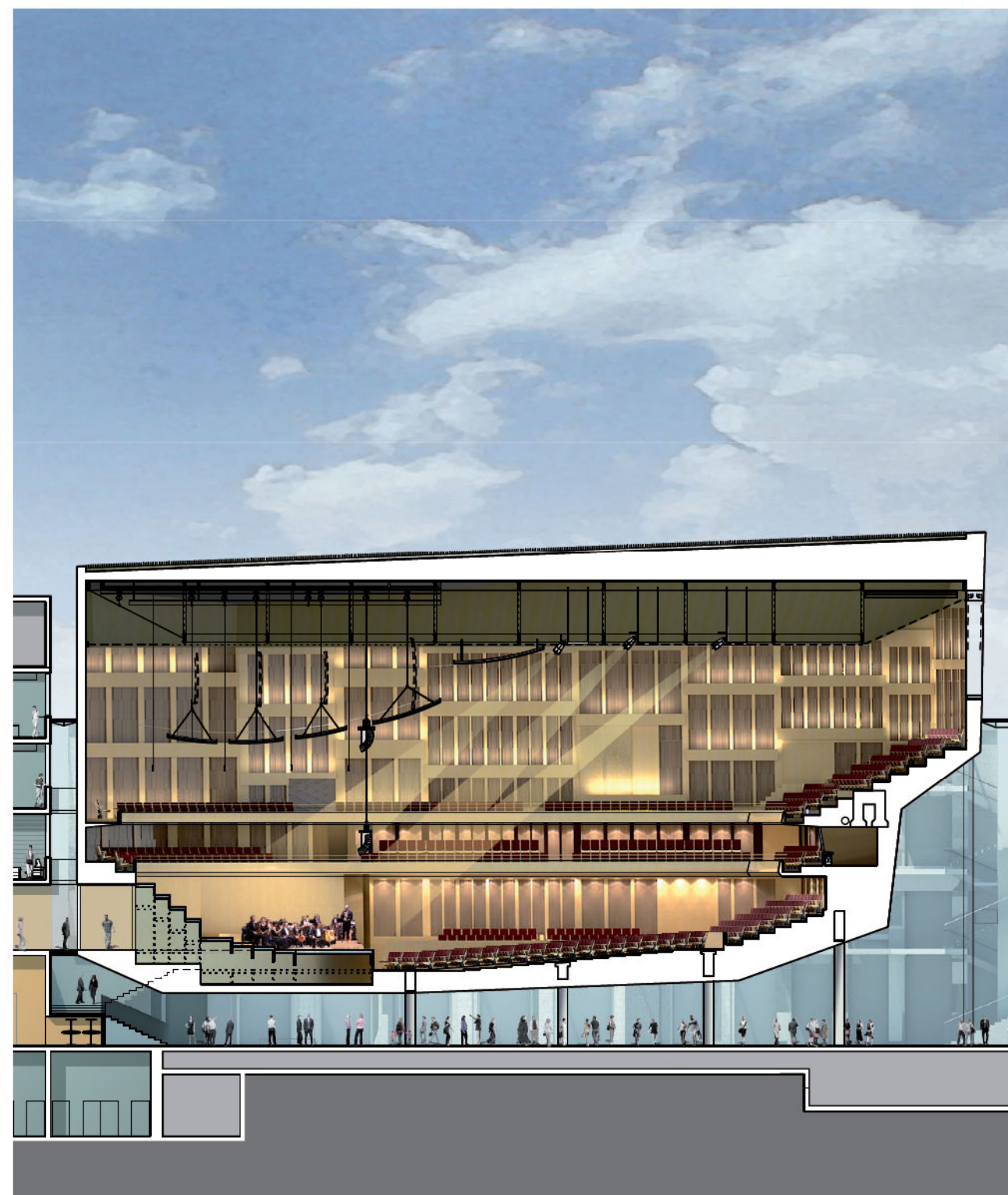
Design development: internal lining



Sketch section: acoustic blinds deployed

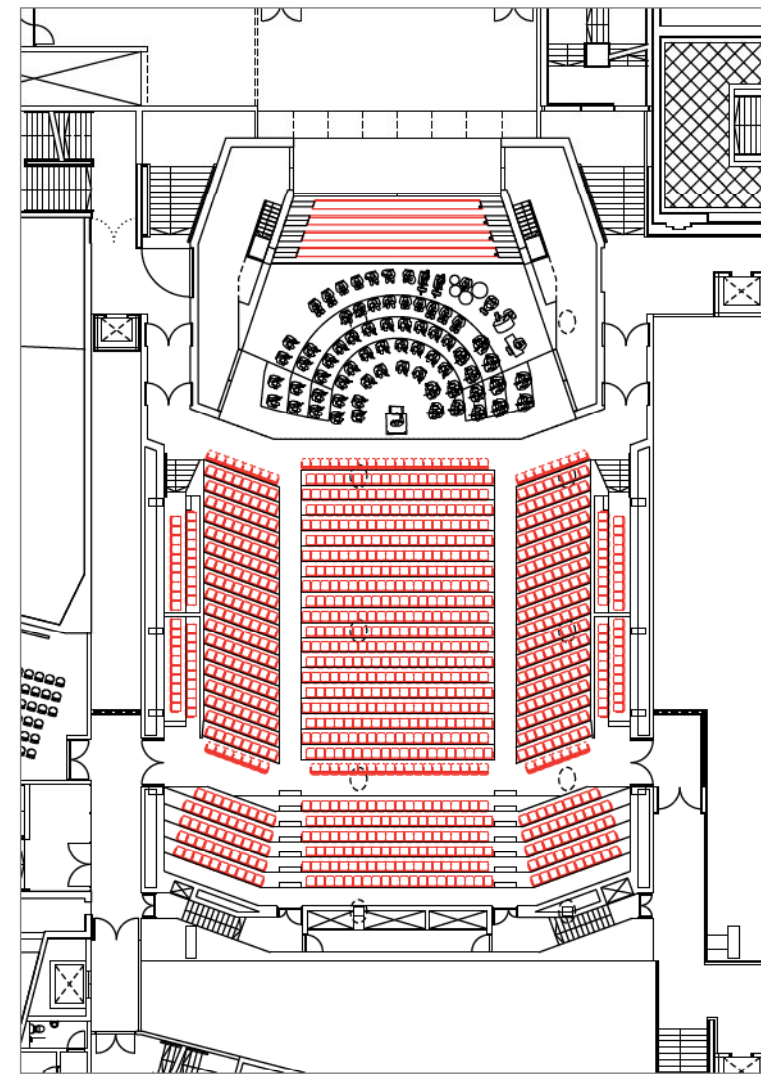


Sketch details - blinds

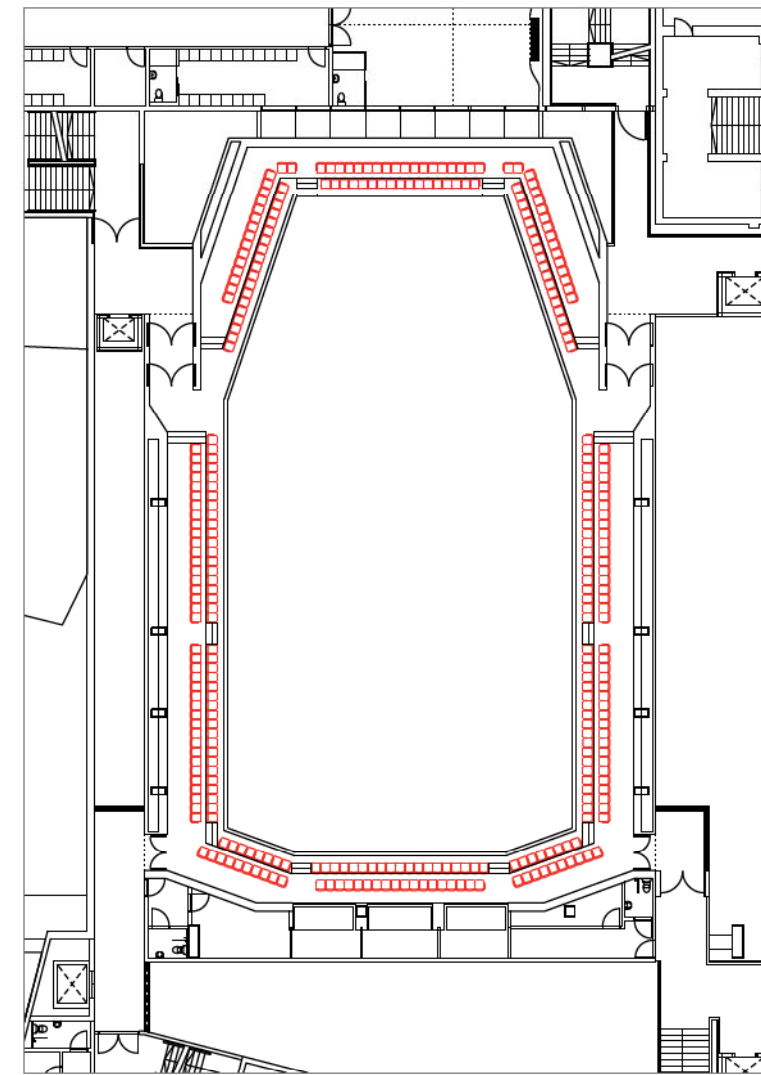


The hall currently provides 1851 seats for a symphonic concert, with the potential to place an additional 75 members of the audience on the Chorus terrace to bring them even closer to the orchestra. The seats can be rearranged to provide 2088 seats for popular music and conference events. This is achieved by lowering the front lifts of the stage and providing additional seating here. Nb. This calculation discounts the seats to the rear and sides of the stage for popular music and conference events.

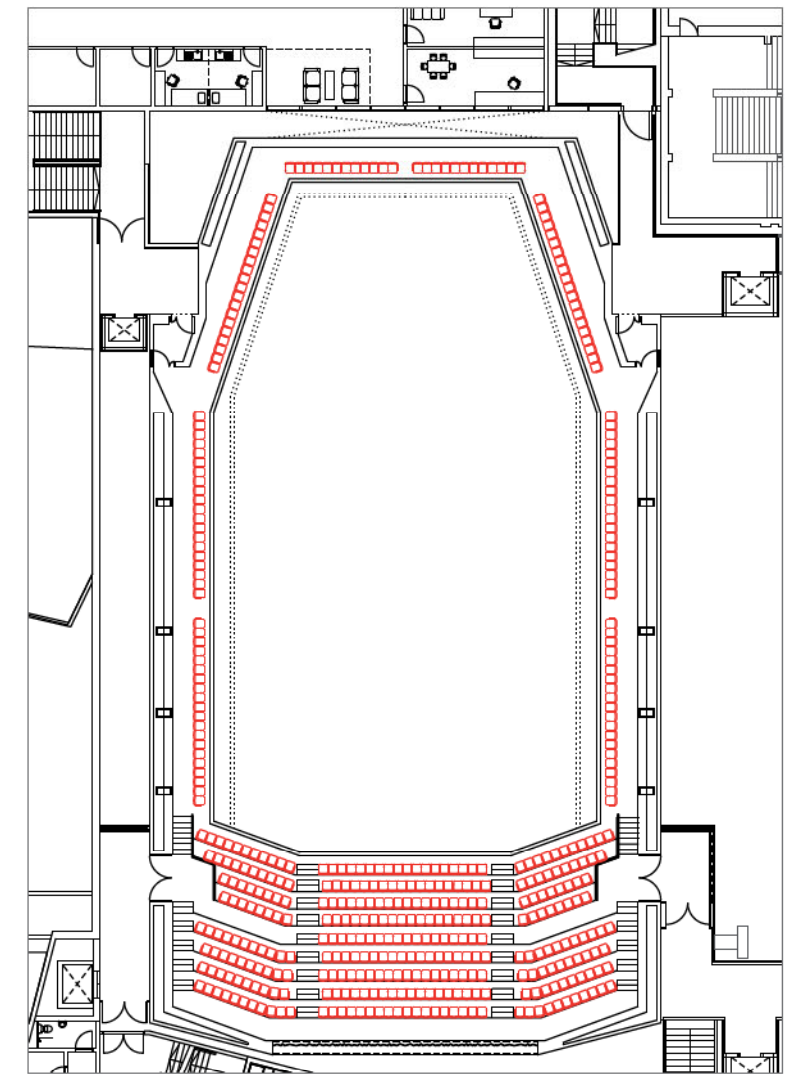
Seating arrangement:
symphonic concert
1851 seats, with the
potential for another 75
using the choral terrace



Level 1

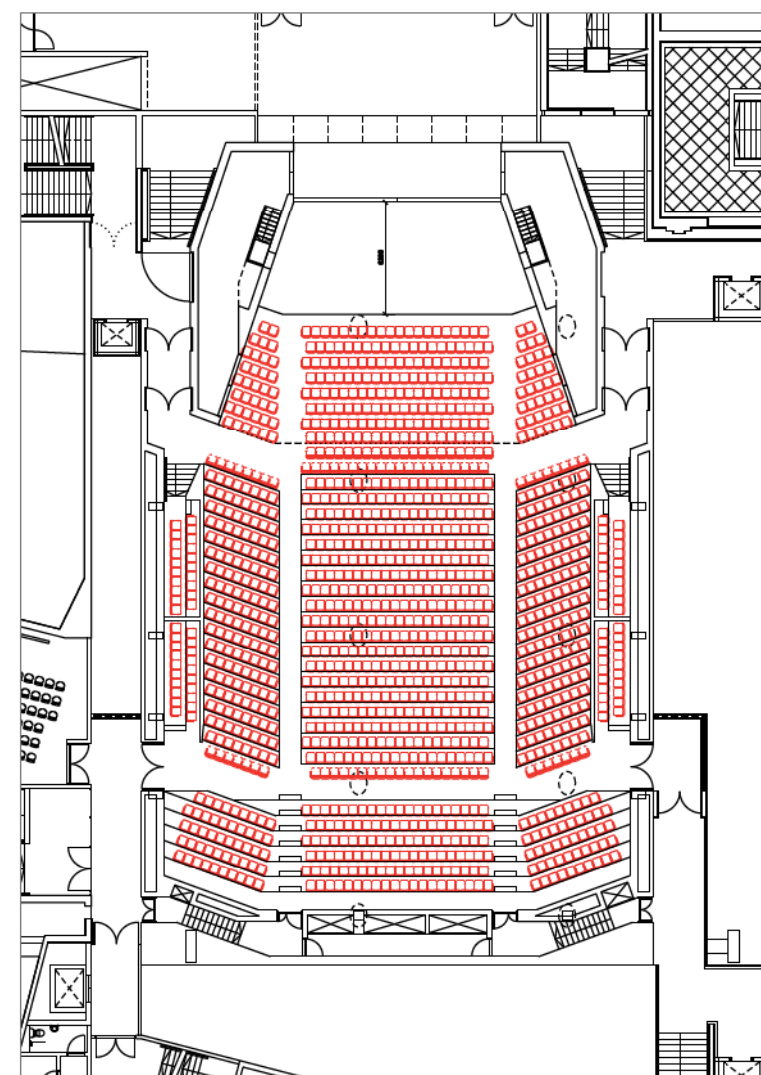


Level 2

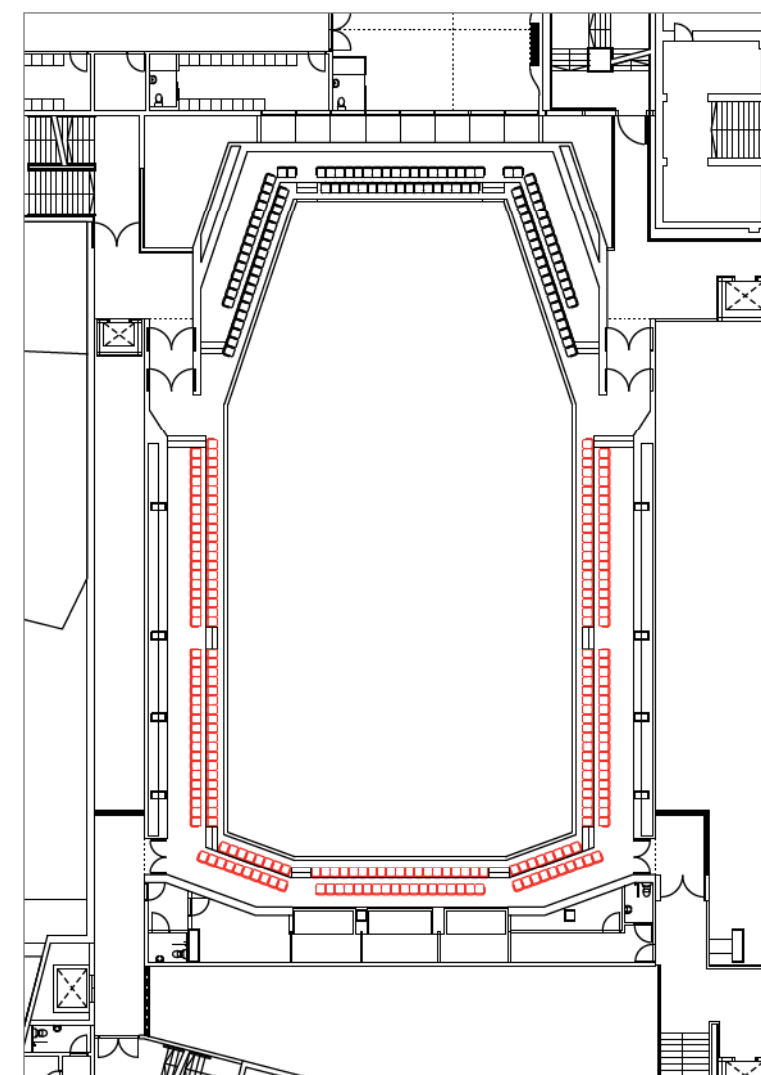


Level 3

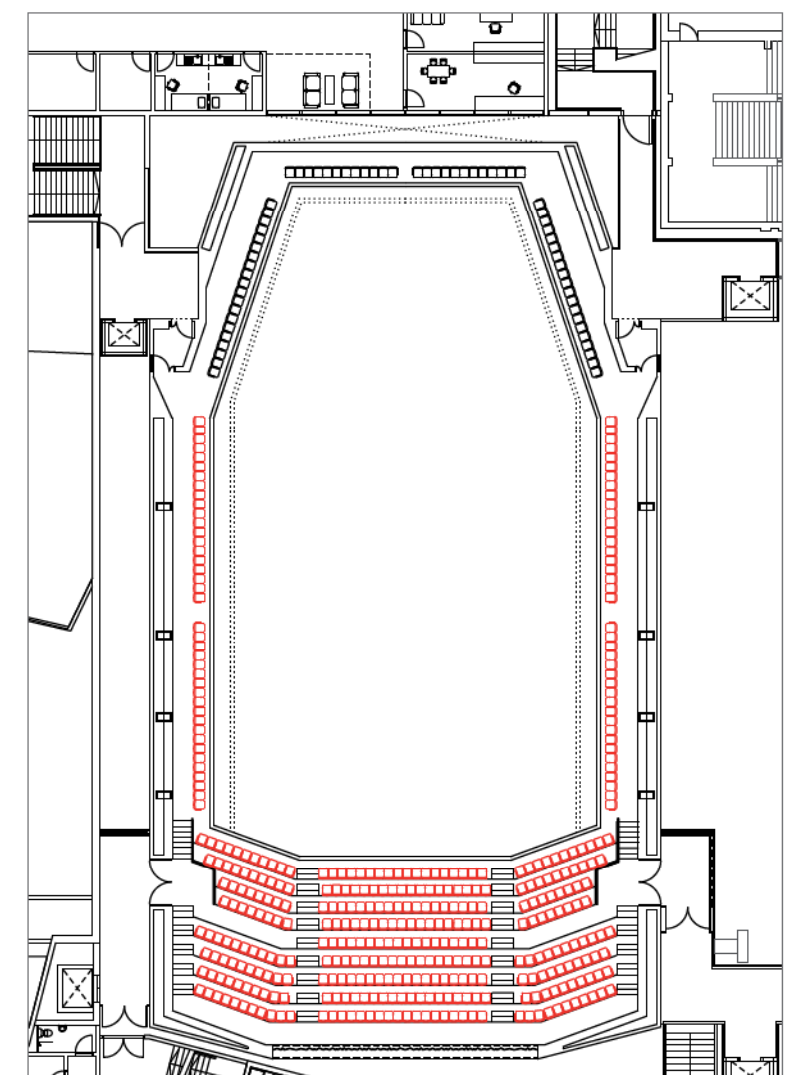
Seating arrangement: con-
ference/popular music
2088 seats



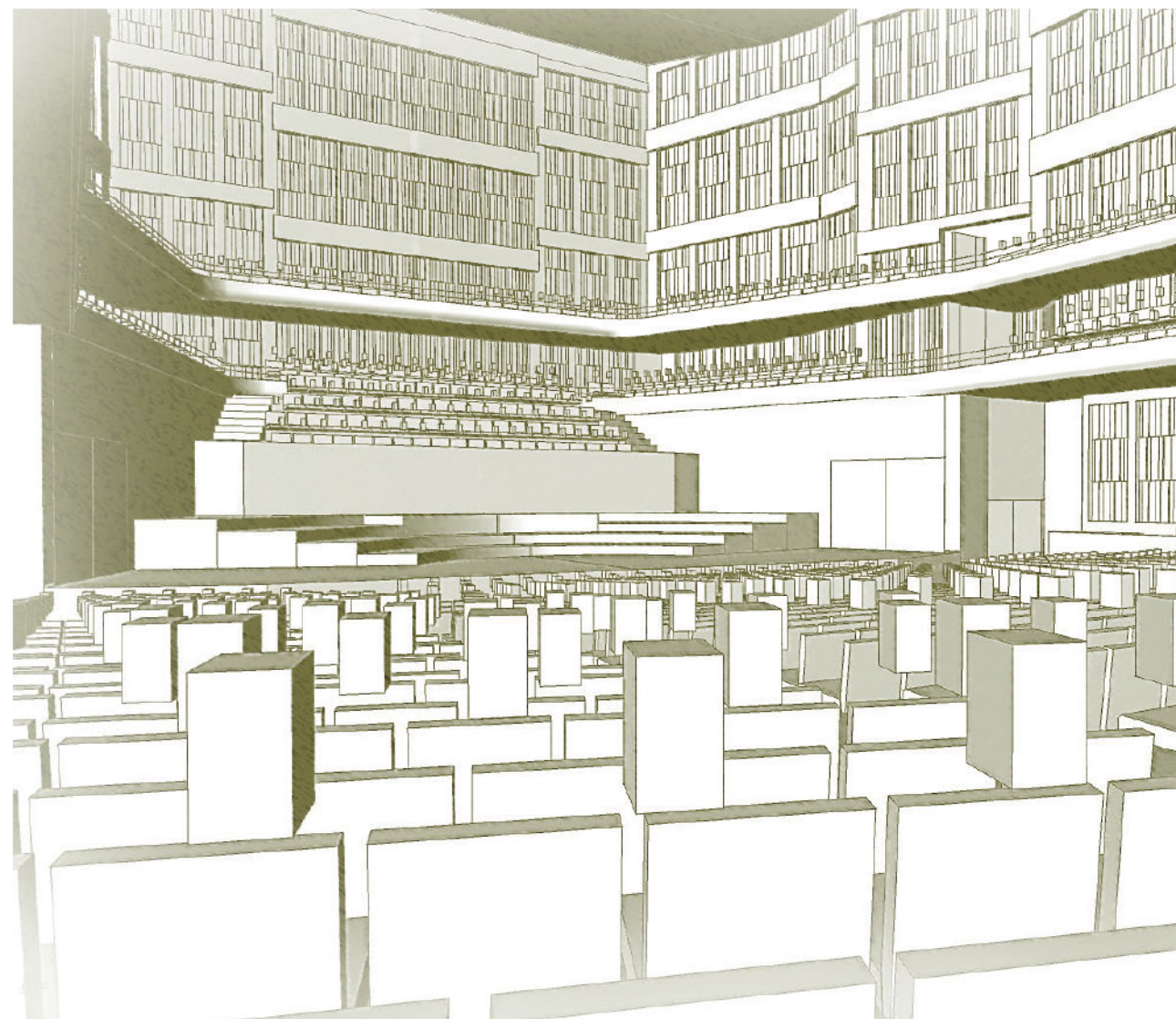
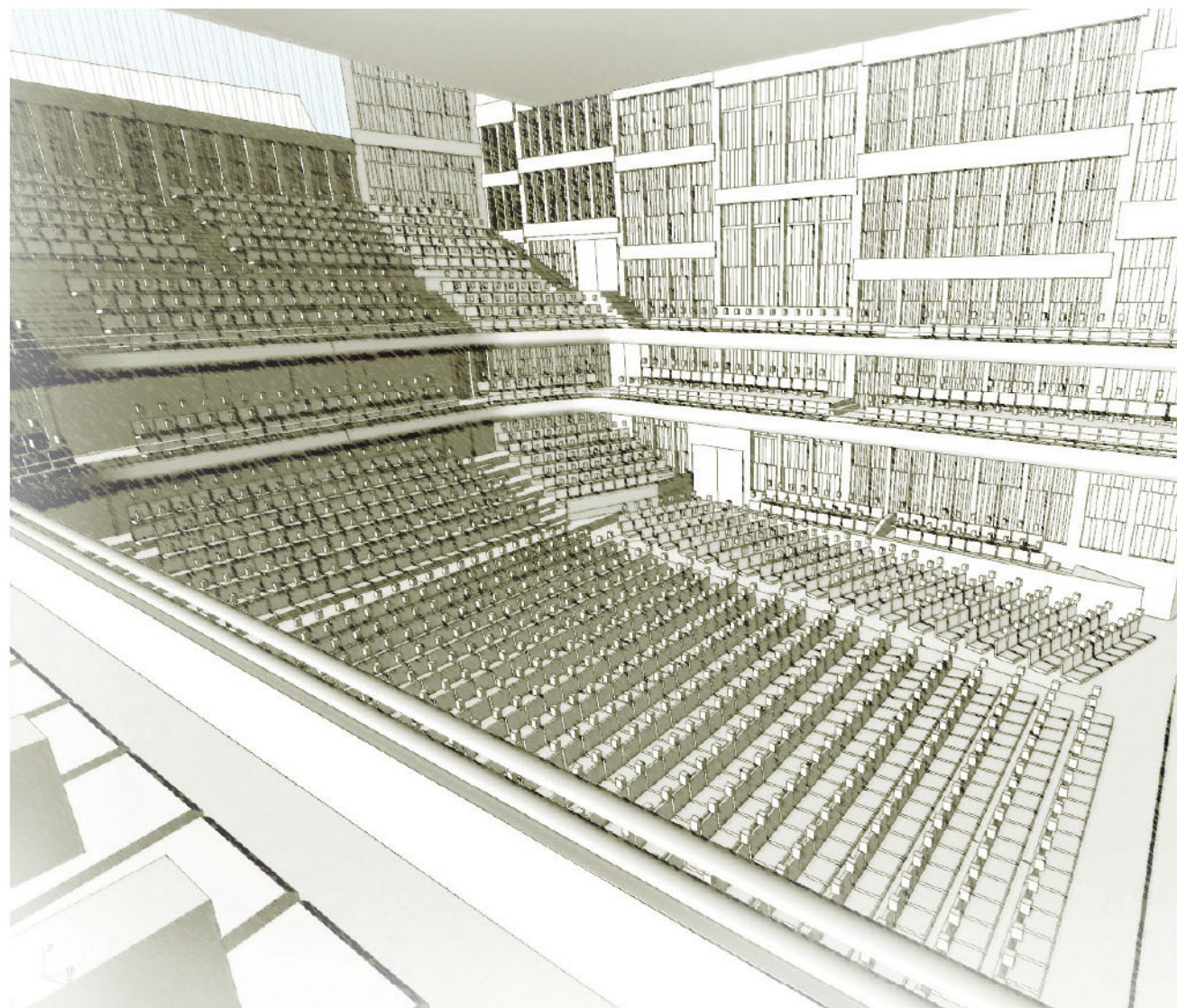
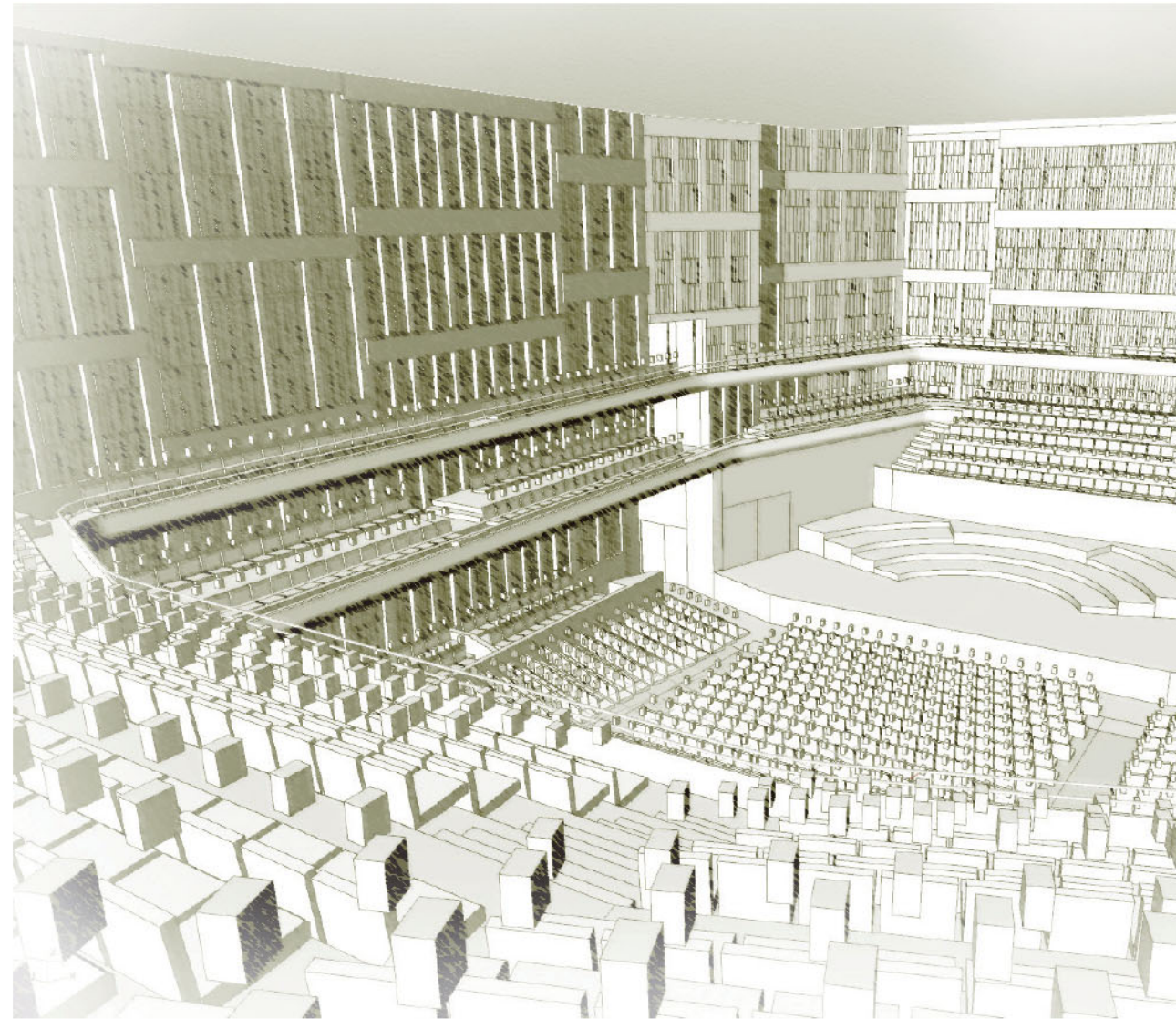
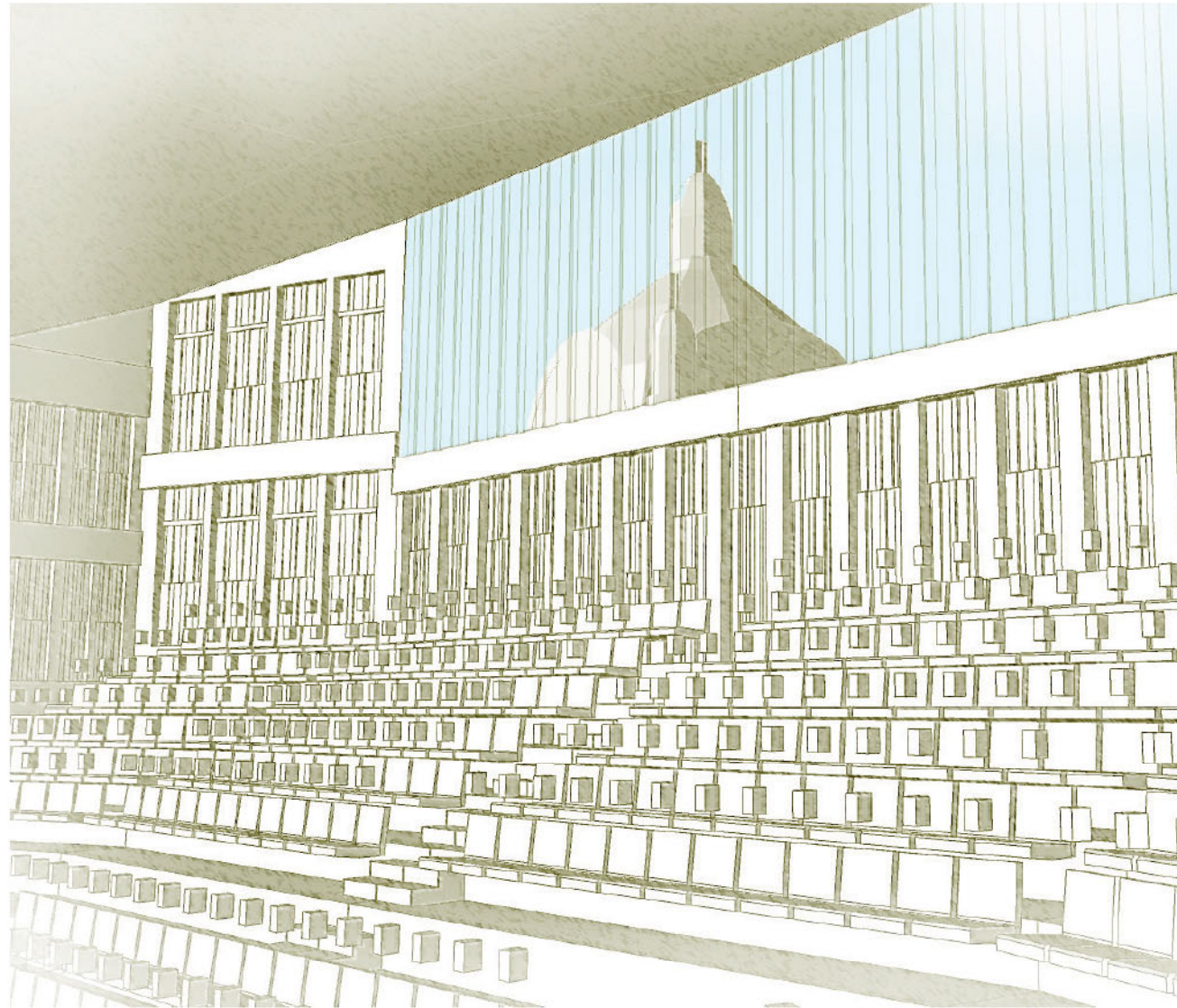
Level 1



Level 2



Level 3



4.0 Carnot Street

4.1 The Site

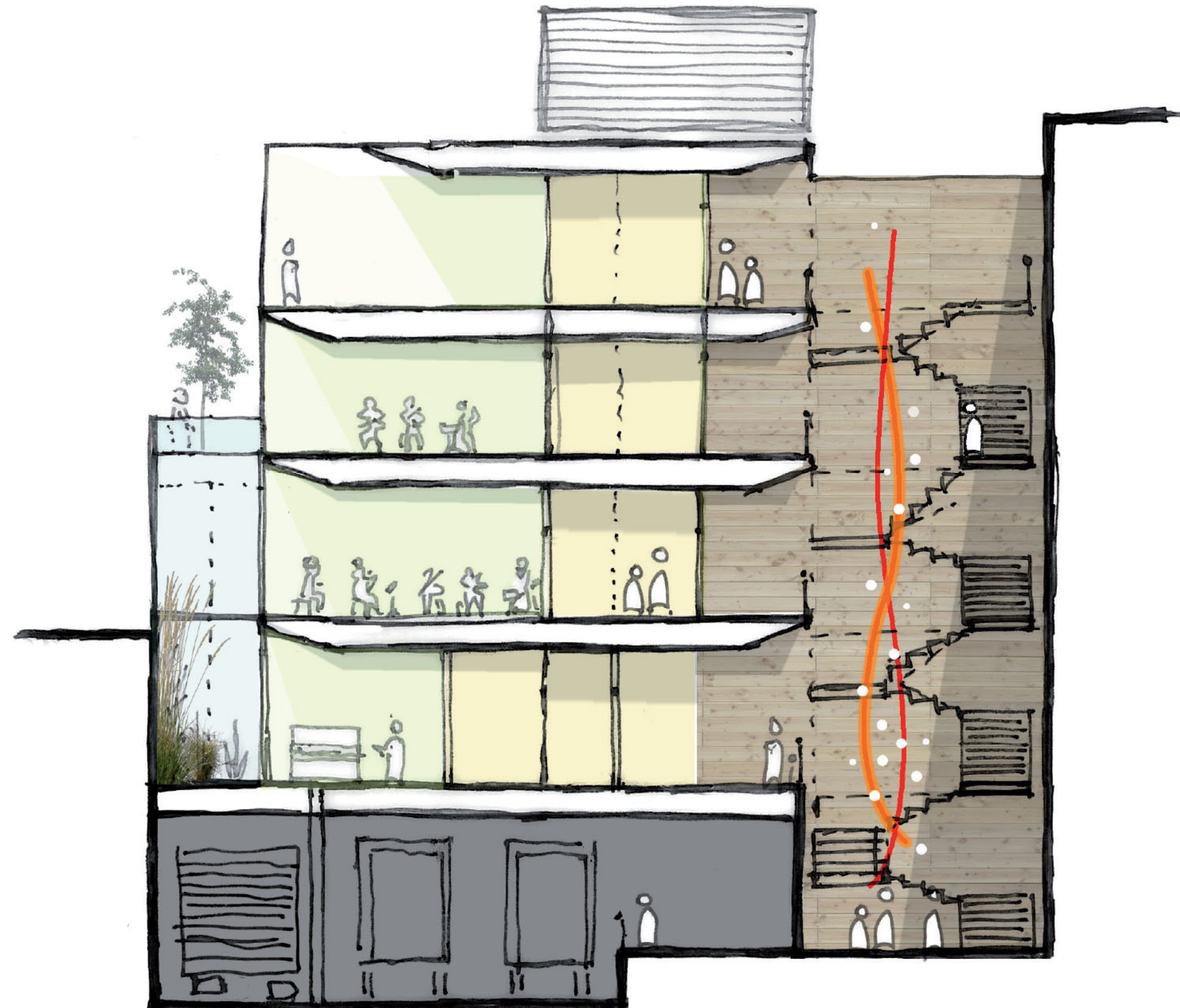
This site is ideally situated behind the Loos Hall and QEH to relieve the unacceptable logistical pressures the QEH currently faces. The site is long, linear and enclosed on three sides. The challenge will be to find ways of maximising daylight penetration into as many of the day-to-day areas as possible and to prioritise the critical backstage level to adequate storage and logistical necessities for any kind of stage performance. With this in mind, there are some fantastic opportunities to maximise views across towards the Zoo's over the small Monkey buildings at higher level. The busy Carnot Street offers great opportunities for brand exposure and raising the public profile of deFilharmonie.

4.2 DeFilharmonie

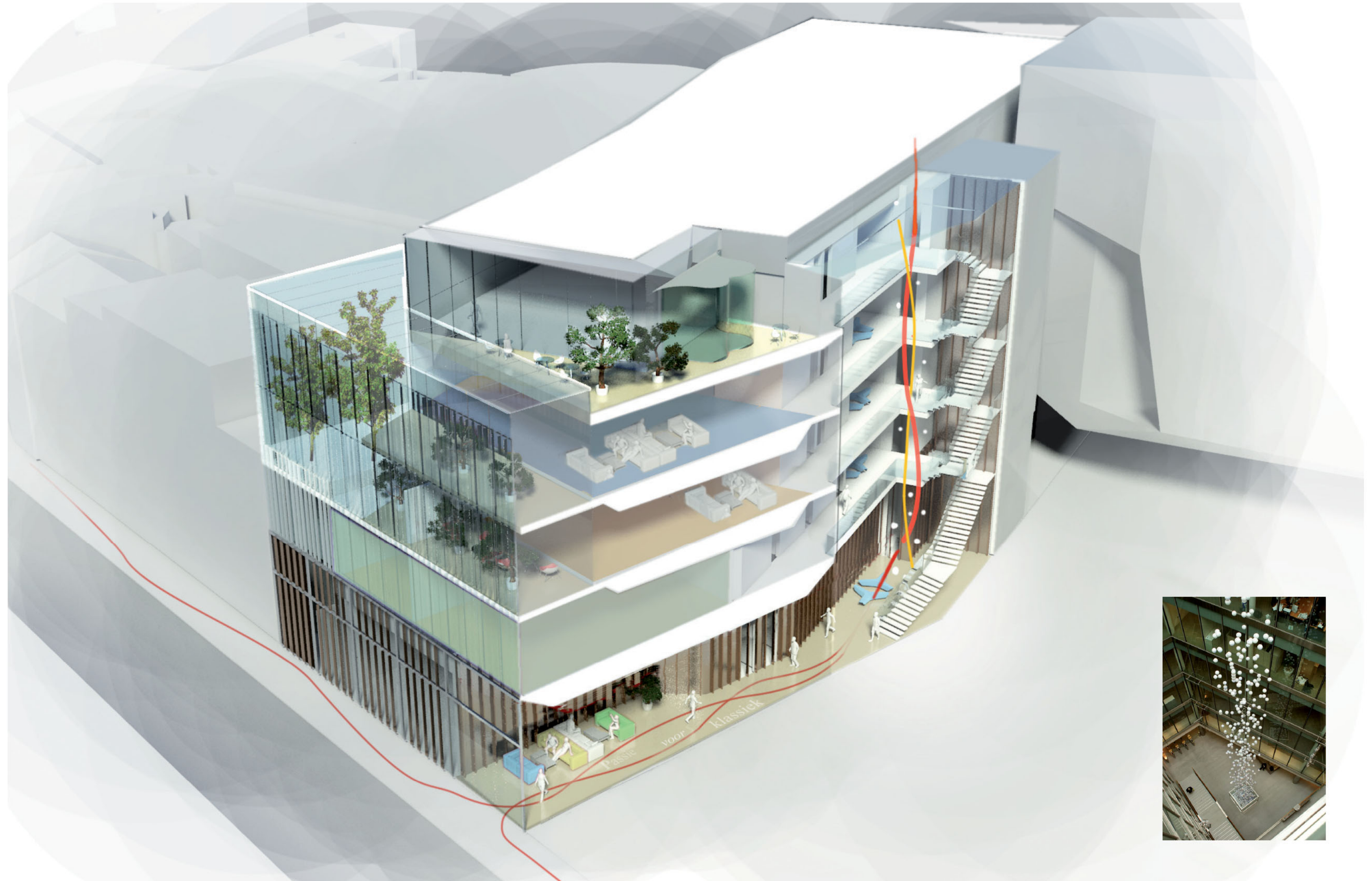
DeFilharmonie have a world-rekknowned "Passie for Classiek", its orchestral team "Jong en Dynamisch". DeFilharmonie need a new proud home at the heart of Antwerp next to a fantastic new gleaming jewel of the Queen Elisabeth Hall. Carnot Street is a place where DeFilharmonie will live, rehearse, study, entertain, teach, relax and innovate. The space must be flexible, intelligent and inspiring. We propose to create an exciting new home for DeFilharmonie, a place where interaction is embraced, inspiration is encouraged, and as much daylight as possible is harnessed and distributed around the spaces to create an exciting and dynamic environment for DeFilharmonie.

4.3 The Design

The crux to achieving this is to create a vertical atrium within the heart of the linear site, flooding the circulation stairs and lift with natural light. It will provide daily inspiration and a feeling of well-being to its occupants. Whether as resident or visitor, this atrium will engage and invite you towards the sweeping staircase leading up the building. This dramatic vertical space would be an ideal location for a dedicated piece of vertical art sculpture, one that might animate and move like compositions of music. It might be almost within grasp of the staircase, leading up the atrium and creating a visual link between the stepped floor levels above. Equally from the street the artwork, washing light and feature staircase would provide a natural point of intrigue for anyone passing, encouraging them to find out more about the fantastic opportunities, resources and programmes deFilharmonie offer.



Sketch section through entrance atrium



Sketch model - Carnot Street atrium

4.4 Circulation

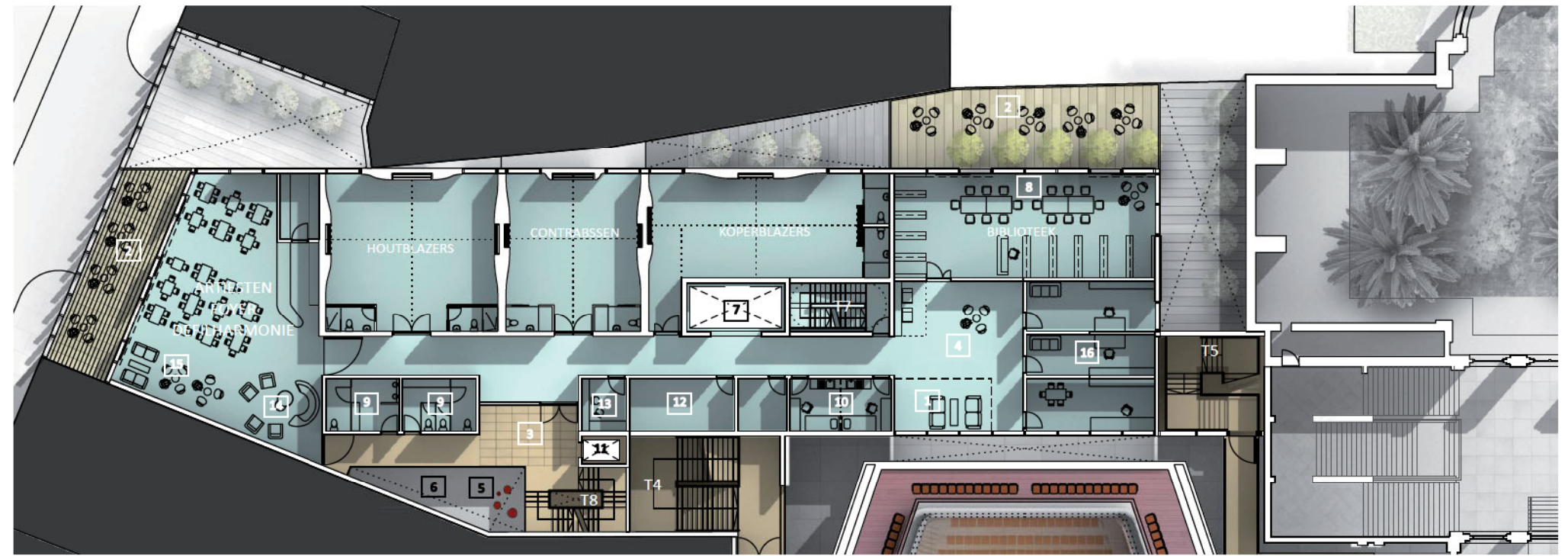
A linear site can often lead to long narrow corridors layouts with little daylight and a bland overtone. We have kept our circulation space wide and generous, punctuated by the animated day-lit heart to the building. The Artist Foyers, Chill-out areas and breakout spaces remain open as destinations at either end of the building, avoiding any dark and unattractive spaces and creating areas to spark innovation and ideas, converse with friends, and happy accidental meetings with colleagues and others.

4.5 Rehearsal Spaces

The rehearsal spaces will contain glazed sections of wall, enough to diffuse natural daylight both into and out of them, but maintaining essential privacy. The walls are of substantial acoustic construction between rooms, sinuous in elevation to optimise acoustic properties of the rooms.

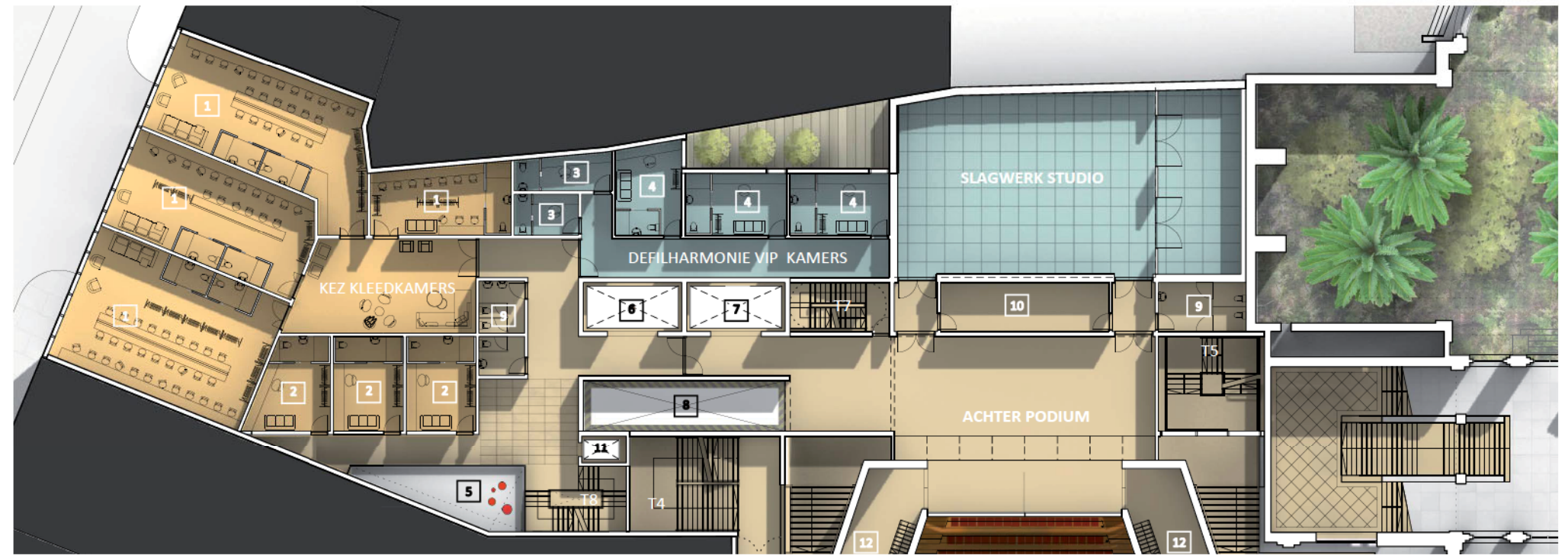
4.6 Terraces

The Carnot Street Elevation is busy and bustling. The artists need an oasis, a place to think, to relax, to entertain and to dine – a private garden with lots of daylight, peace and quiet. Our design creates a “Wintergarden” at higher level – a garden and terrace space, with trees in double-height spaces. These spaces would be partially enclosed and protected by glass louvers which can be opened and shut depending on the climate conditions – even if it rains the gardens can remain dry!



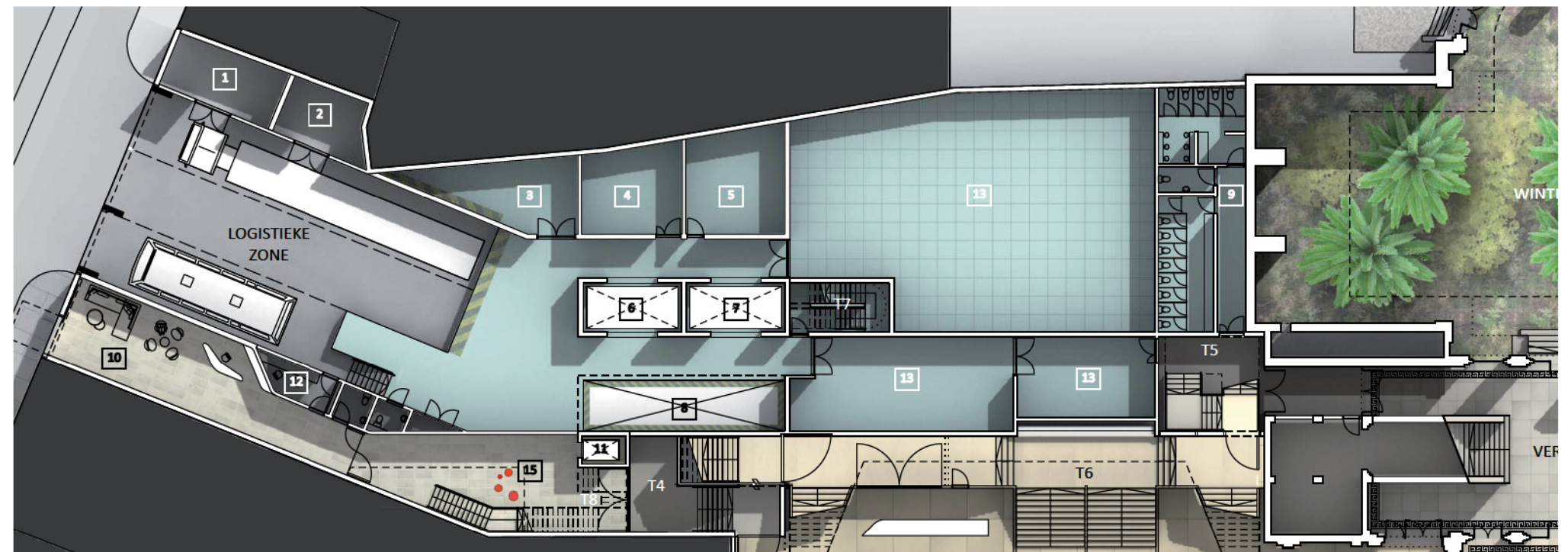
- Key - Level 2
1. KLEEDKAMER KEZ
 2. DAK TERRAS
 3. ONTMOETINGSRUIMTE
 4. UITKLIJK RAAMPJE EN BREAKOUT
 5. LEVEND KUNSTWERK "KLOPPEND"
 6. VIDE MET VEEL DAGLICHT "HART"
 7. SERVICE LIFT DEFILHARMONIE
 8. LICHT CONTROLE
 9. SANITAIR
 10. PROJECTIE KAMER
 11. PERSONEN LIFT
 12. GELUID CONTROLE

Level 2



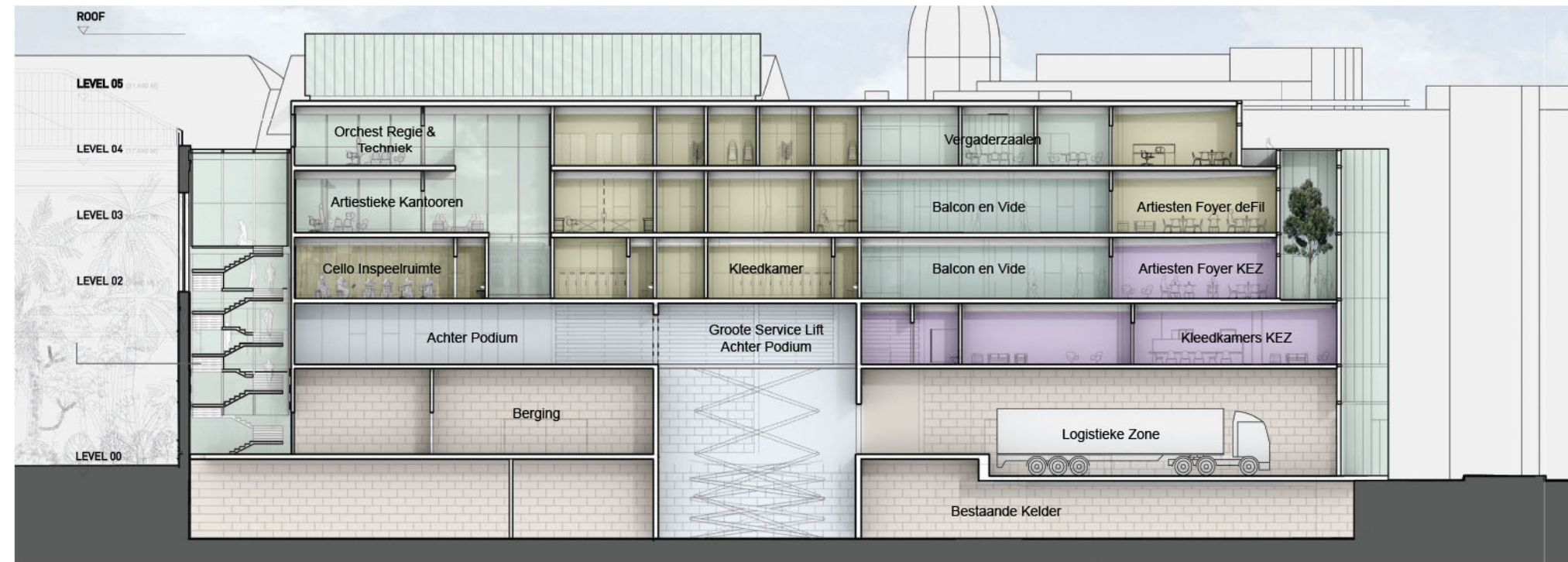
- Key - Level 1
1. KLEEDKAMER KEZ
 2. VIPKAMER KEZ
 3. LUXEKAMER DEFILHARMONIE
 4. VIPKAMER DEFILHARMONIE
 5. KUNSTWERK IN VIDE "LEVENDE HART"
 6. SERVICE LIFT KEZ
 7. SERVICE LIFT DEFILHARMONIE
 8. SERVICE LIFT ACHTER PODIUM
 9. SANITAIR
 10. PRODUCTIE LOCAAL
 11. PERSONEN LIFT
 12. AKROESTISCHE LOBBY

Level 1

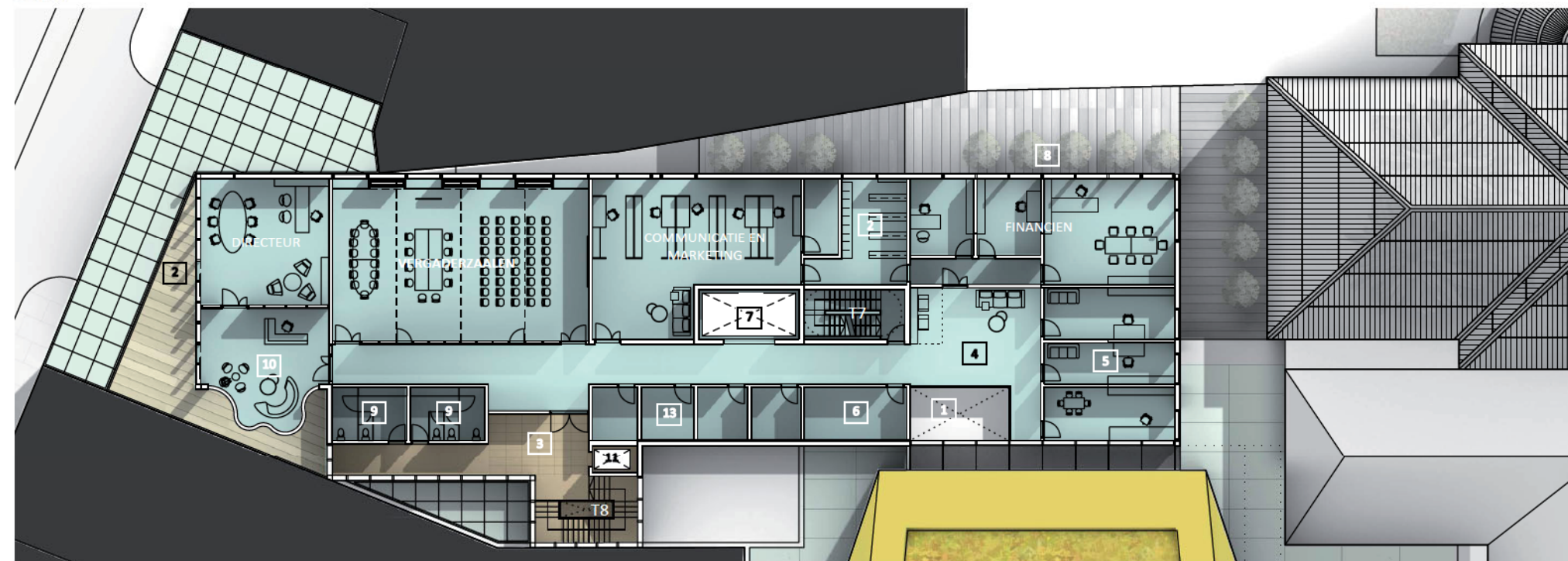


- Key - Ground Floor
1. HOOGSPANNINGSCABINE
 2. ZWAKSTROOMSCABINE
 3. AFVAL
 4. WAS EN DROOG RUIMTE
 5. KEZ BERGING
 6. SERVICE LIFT KEZ
 7. SERVICE LIFT DEFILHARMONIE
 8. SERVICE LIFT ACHTER PODIUM
 9. SANITAIR
 10. RUIMTE INKOM HAL CARNOT ET
 11. PERSONEN LIFT
 12. CENTRALE INGANGS CONTROLE
 13. BERGING
 14. INFORMATIE EN BOXOFFICE
 15. LEVEND KUNSTWERK IN GROOTE VIDE MET VEEL DAGLICHT

Ground floor

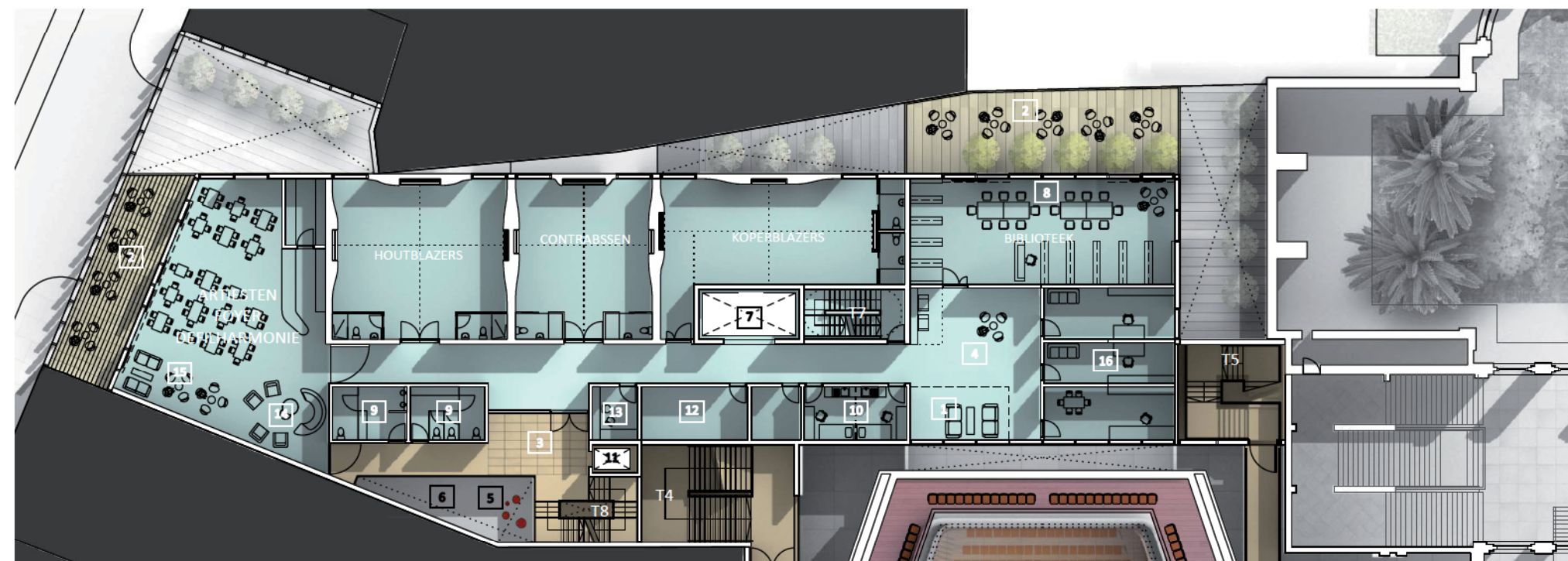


Section



Level 4

- Key - Level 4
1. KLEINE VIDE - INTERACTIE
 2. DAK TERRAS MET PRACHTIG UITZICHT
 3. ONTMOETINGS RUIMTE
 4. KOPIER EN ONTMOETINGS RUIMTE
 5. ORKESTRERIE EN TECHNIEK
 6. IT SERVER RUIMTE
 7. SERVICE LIFT DEFILHARMONIE
 8. VEEL DAGLIGT EN UITZICHT 2001
 9. SANITAIR
 10. DIRECTIE ASSISTENTE EN ONTHAAL RUIMTE
 11. PERSONEN LIFT
 12. GREEN ROOF (MOGELIJKHEDEN BIODIVERSITEIT)
 13. BERG RUIMTES

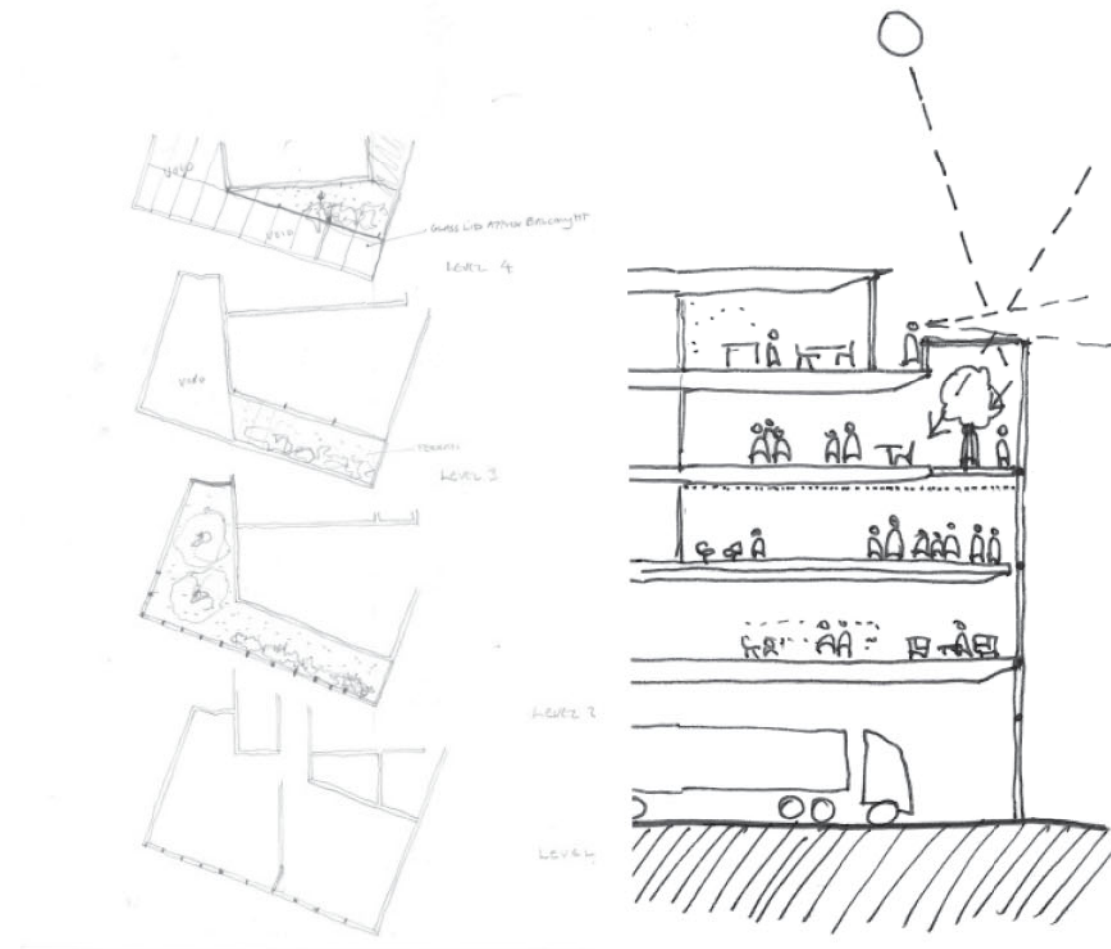


Level 3

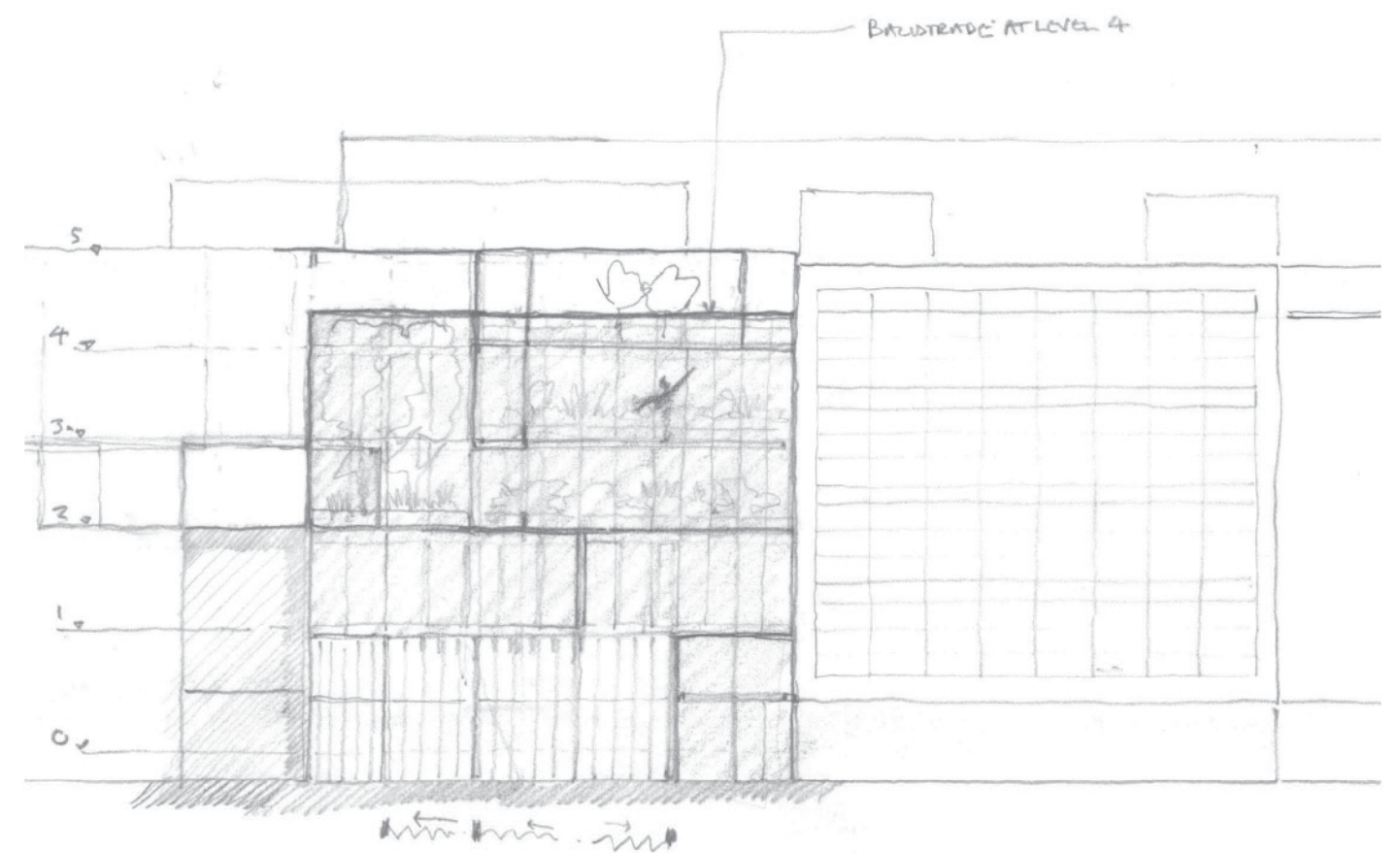
- Key - Level 3
1. KLEINE VIDE BOVEN - INTERACTIE
 2. DAK TERRAS MET VEEL DAGLICHT
 3. ONTMOETINGS RUIMTE
 4. ARTISTIEKE RUIMTE EN CHILL OUT
 5. LEVEND KUNSTWERK 'KLOPPEND'
 6. VIDE MET VEEL DAGLICHT 'HART'
 7. SERVICE LIFT DEFILHARMONIE
 8. VEEL DAGLIGT EN UITZICHT 2001
 9. SANITAIR
 10. KINESIST EN EHBO RUIMTE
 11. PERSONEN LIFT
 12. OPNAME STUDIO
 13. ONDERHOUDSMATERIAAL
 14. MULTIMEDIA HOEK
 15. RELAXZONE
 16. ARTISTIEKE KANTOOREN

4.7 Loading Bay & Backstage

The building layout is designed to be as logical and efficient as possible at the critical ground and backstage levels. Ample room has been allowed for the Loading Bay and drop off areas. We felt it important that the Artist's entrance has street presence; a generous lobby leads visitors from the street into the building and towards the atrium. A comfortable waiting and informal meeting area is located in front of the central security control room with eyes to both the loading bay and entrance. At the first floor level the backstage, changing, percussion and VIP rooms have been jostled into optimum positions, with clear denominations between QEH and deFilharmonie areas.



Sketch section – Carnot street



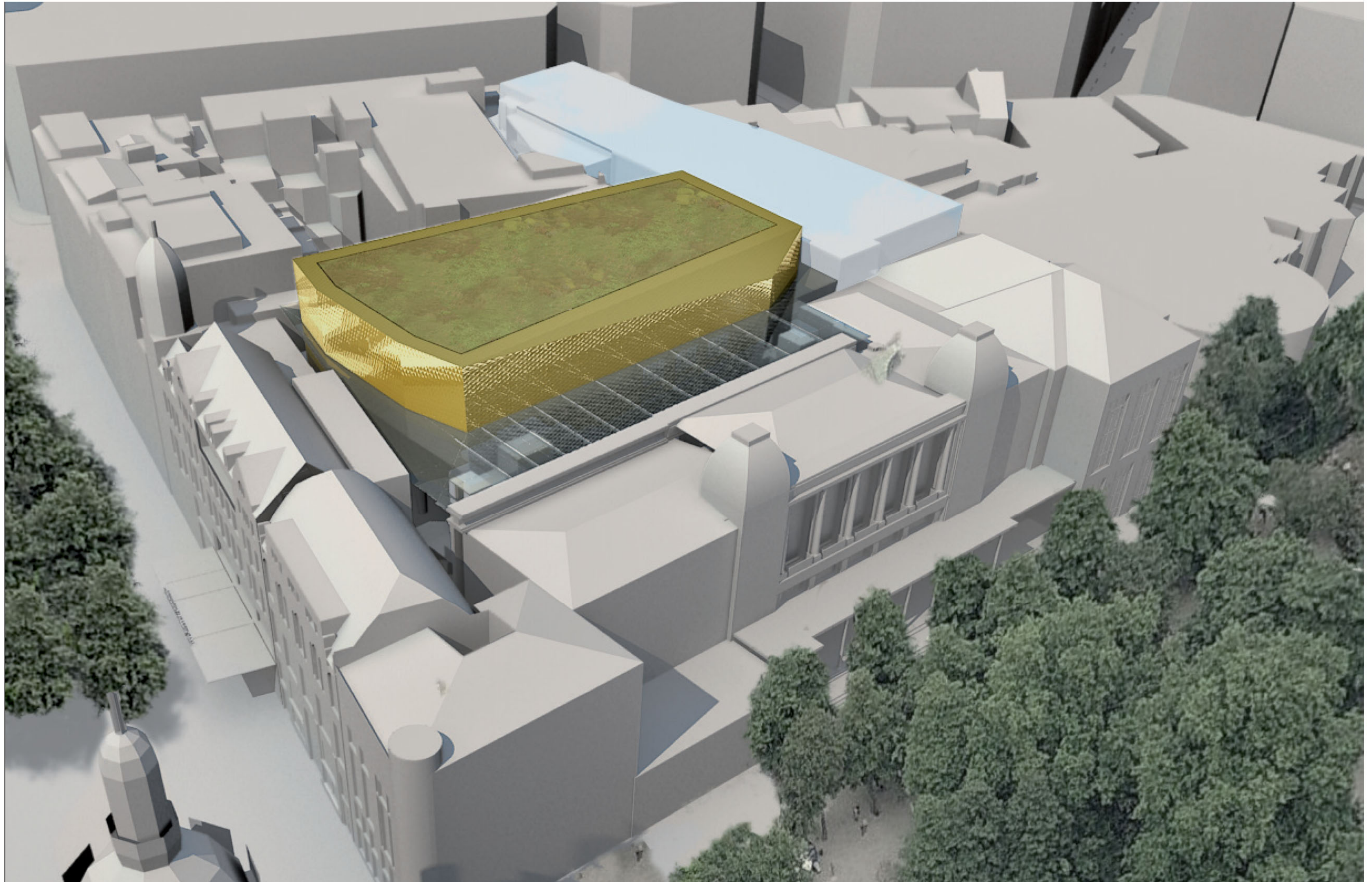
Sketch elevation – Carnot street

4.8 Offices

On the top floor are the office areas, meeting rooms and visitor's reception. The Director can truly make a lasting impression upon visitors with magnificent views across a roof terrace and the cityscape. We are keen to avoid "boxing in" dark, cellular office spaces and instead encouraging open plan offices wherever possible. Where walls are needed, preference would be for them to be glazed to encourage day-to-day interaction and strengthen spirit.



Diagrammatic elevation – Carnot street



Aerial view

