GROUNDED SOUND

RETHINKING THE CONTEMPORARY CONCERT HALL THROUGH ECOLOGICAL INTEGRATION AT SJOBACKA TIPPEN

ALEKSANDRA MARIA BATOR

MASTER THESIS

2026

CHALMERS SCHOOL OF ARCHITECTURE | DEPARTMENT OF ARCHITECTURE & CIVIL ENGINEERING | SUPERVISOR: BJORN GROSS | EXAMINER: MIKAEL EKEGREN

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ABSTRACT

This master's thesis addresses whether public architecture can transcend its traditional role as a static monument to become an active participant in a new reality defined by nature, user experience, and sustainability. Historically, the design of public buildings has been driven by a desire to create visually striking icons, frequently emphasizing the importance of their expression while giving limited consideration to their broader ecological context.

This project challenges environmental isolation by re-evaluating the traditional concert hall, a typology typically characterized by its monumental detachment, by proposing instead a "Grounded Sound" that operates as an adaptive design situated in a natural environment. Based on the artificial landscape of Sjöbacka Tippen, a site defined by demolition waste, water, and low biodiversity, the research explores both land regeneration strategies and architecture that intends to shift from being a static, isolated element toward becoming an ecologically integrated design embedded within its terrain.

The methodology follows a three-stage approach. The first stage restores the site's topography through regenerative strategies, transforming the artificial industrial ground into an ecological foundation that supports natural habitats and enhances biodiversity. The second stage introduces a responsive architectural system in which the building envelope serves as an adaptive interface, adjusting to the surrounding landscape and blurring the boundary between architecture and nature. The final stage develops the detailed design of the concert hall, which integrates aesthetic quality with the recovering ecosystem and technical and acoustic excellence.

As a result, this concept demonstrates a shift in focus towards a more modest approach, illustrating how concert hall design can serve as a tool for ecological stabilization rather than disruption. By incorporating nature-oriented design and technical rigor, the resulting proposal proves that the primary function of a music hall can be enhanced through its relationship with the environment. Ultimately, the work suggests that the future of public architecture lies in its ability to foster a deeper, more balanced connection between humans and ecosystems, proving that sustainability and cultural excellence are not mutually exclusive but, in fact, deeply interdependent.

BACKGROUND AND DISCOURSE

While architecture is rooted in honored traditions, it often struggles to account for the environmental aspects of its heritage. Although the industry is shifting toward sustainability, this transition is currently applied only to residential design, failing to address the impact on cultural buildings.

THE BILBAO EFFECT

Public architecture continues to be criticized as one of the most unsustainable sectors of design, largely because these buildings are expected to be "screaming monuments" rather than humble, integrated structures. It is closely related to an urge of creating so-called "Bilbao Effect". The "Bilbao Effect" (also known as the "Guggenheim Effect") is a phenomenon in which a city undergoes a massive economic and cultural transformation through the construction of a single iconic piece of architecture. Witold Rabczynski, a Canadian architect, in his article "The Bilbao effect. " expresses a deep skepticism toward this trend, arguing that the high-pressure context of public competitions often encourages vividness over careful, functional thought. Witold Rybczynski illustrates the tension in architectural competitions by contrasting the approaches of Robert Venturi and Rafael Viñoly for the Philadelphia Concert Hall. Venturi's initial proposal was defined by its site-sensitivity, featuring a modest exterior that prioritized a high-quality performance space over outdoor appearance. However, as the trend for "trophy buildings", the city rejected this modest approach in favor of Viñoly's design. This shift saw the budget skyrocket from $80 million to $265 million. While Viñoly delivered the required "wow factor," the resulting structure was an expressive, almost alien form that disregarded its urban context in favor of pure architectural iconicity. (Rybczynski, 2002).

UNSUSTAINABLE ASPECTS

While new modern, public buildings can incorporate sustainable designs, a significant part of the sector relies on aging, inefficient, and carbon-intensive infrastructure and on old practices. Public industry still lags in adopting the circular economy rather than the linear economy. Its biggest challenge is low energy efficiency, which led to almost 28% of generated energy-related CO_2 emissions in 2018. (Foster, G., & Kreinin, J., 2020). The design should be checked through LCA calculations, aiming for the lowest possible CO_2 emissions and potential assessment of energy usage during its lifespan.

RELEVANCE FOR THE PROFESSION

There is an urgent need for a new cultural design language that exemplifies an Anthropocentric approach in which architecture serves people, context, and nature rather than mere 'iconicity.' In a broader sense, it could serve as a model global example for navigating complex design challenges, asking the right questions, and adapting to our shifting reality. I have chosen to tackle this challenge by proving that thoughtful, integrated design offers far more ecological and contextual value than a traditionally 'iconic.'

LOCATION & CONTEXT

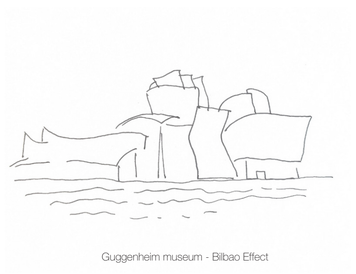
The project is designed at Sjobacka, Tippen in Gothenburg, Sweden. It is located in the west waterfront, opening onto the wide sea horizon. Sjöbacken was a shallow bay until 1966, when the City of Gothenburg began dumping demolition waste from Haga, rubble from the construction of the area at Frölunda Torg, and industrial waste. (Sjobacken (n.d.). Before, the area was filled with water. Initially, the bay was intended to be fully filled with waste with no canals adjacent to the site. Fortunately, the fisherman Eskil managed to secure a free waterway between Önnered and Fiskebäck through what is now called Eskil's canal. (Sjobacken (n.d.) Following the closure of the landfill in 1977, the canal remained biologically dead until the year 2000. Over the past two decades, the aquatic ecosystem has gradually regeneratec and now sustains mussels, benthic vegetation, and fish populations. A total of 900,000 cubic meters of construction waste was stored in the bay and later on covered with bark-mixed sludge. Today, the landfill is a large grassy area with wild bushes and a few trees. Its openness shines with special character and provides a huge space for local communities. This 191 000 m^2 land will be regenerated through natural enhancement strategies.

SITE CHOICE

As a general precondition, it was important that there is no intervention in a natural, virgin landscape that had not yet been touched by humans. The requirement was that the building has to be located on degraded terrain that requires intervention and regeneration. The second criteria was to find a site located at the intersection of different landscapes, characterized by water, grass, forest, and rocks, as these elements provide the greatest diversity of spaces and, consequently, a higher biodiversity rate, which will lay the foundation for further interventions and design choices.

SITUATION PLAN

Site design considers low-intensive interventions, without heavy paving or road building. It considers the adaptive reuse of already existing asphalt surfaces and gravel roads. As the site is heavily used by local people, the main elements, such as the path along the waterfront edge, will be retained and enhanced. The building sits in the central area of the plot, which is currently inaccessible because it is overgrown with wild bushes and mud. The current appearance of the site looks very artificial and is intended to be changed. To provide the best possible experience and introduce land regeneration strategies, the design will feature wetlands as a primary design strategy. Such water bodies can enhance biodiversity and human experience. The building located at the center opens onto both canals through a permeable structure, and thanks to its lift platform, it will create new viewpoints, encouraging local communities to visit, have a family picnic, or just have a conversation in nature with a beautiful view.



Guggenheim museum - Bilbao Effect

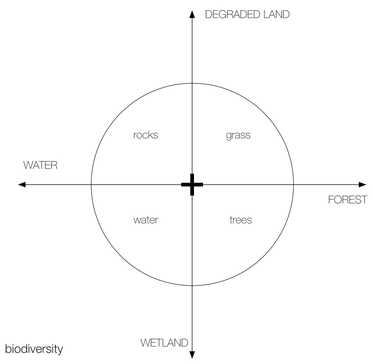
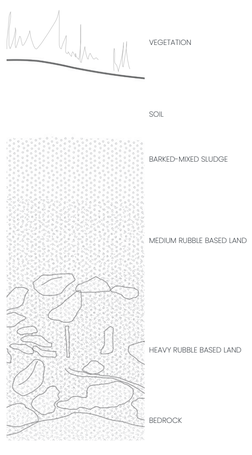


Diagram that shows the combination of elements desired in the project - site choice

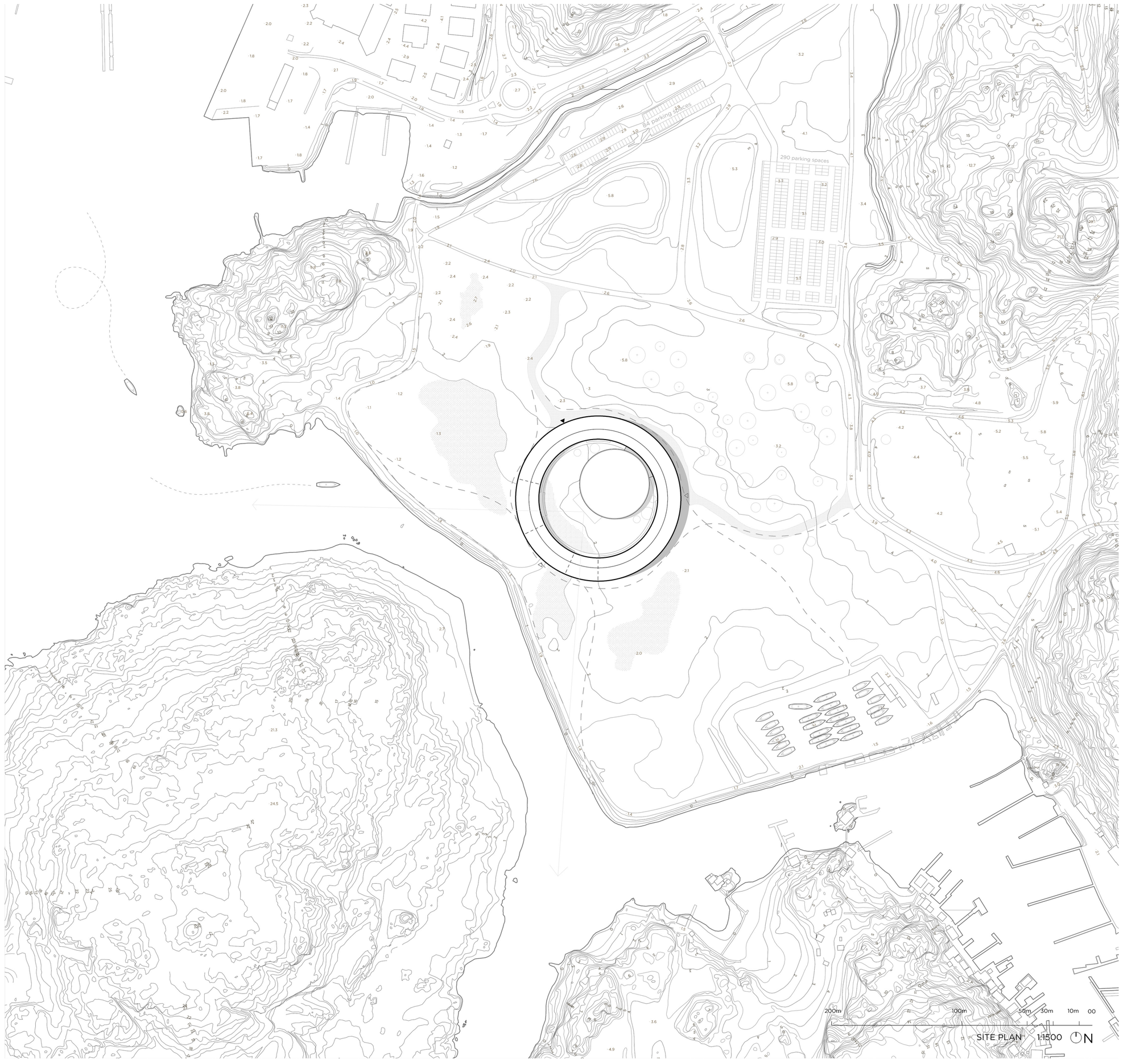
SITE CHOICE - DEGRADED DEMOLITION BASED LAND - SJOBACKA TIPPEN

LOCATION - SWEDEN - GOTHENBURG

SJOBACKA TIPPEN - DEMOLITION BASED LAND - ARCHIVAL PICTURE



SPECULATETD WASTE GROUND LAYERS



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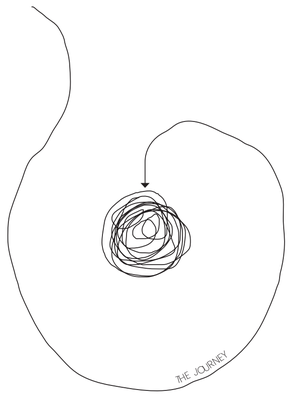
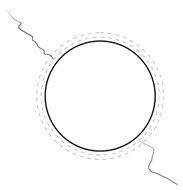
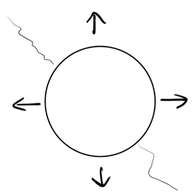


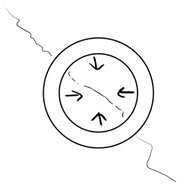
Abstract conceptual diagram showcasing the user experience of the building



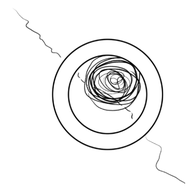
Creating volumetric interaction through modular expanding elements



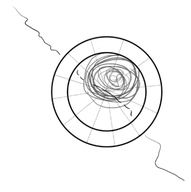
Visual connection with all surrounding landscapes



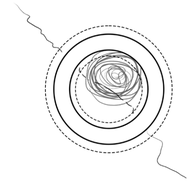
Opening the courtyard - green buffer



Placing concert hall - outer structure isolates acoustically



Applying modularity in the structure



Creating inner and outer decks for better experience

THE DESIGN

CREATIVE APPROACH: CONCEPT
The building design is meant to be not only beautiful but also create emotional space where the visitor can reflect and reconnect with his soul before entering the main event. With this in mind, the building is designed to lead the person through the outer ring, surrounded by nature and wildness. While admiring, the visitor can prepare himself as he goes along different landscapes and types of nature: starting with grassland, through wetland, and ending in a hill-like space. It not only fosters greater mindfulness state but also shows how the building can harmonize with nature while remaining functional and beautiful. The visitor ends his journey entering the event concert hall where the main performance takes place.

STRATEGIC DESIGN
The design concept operates on 3 STAGES:

THE FIRST STAGE focuses on restoring the site's topography through regenerative practices. Because the current site is heavily artificial and lacks ecological vitality, the strategies will reshape the land to foster natural habitats. This phase transforms a barren industrial footprint into a foundation where nature can finally thrive.

THE SECOND STAGE introduces a responsive building system. Rather than being static and solid, the facade is designed as an interactive interface that adapts to its immediate context and nature. Depending on the specific landscape, the building envelope adjusts to invite, frame, or protect, blurring the border between architecture and nature.

THE FINAL STAGE assumes a detailed architectural design of the concert hall. It will ensure that the structure is not just functional but also harmonizes with its surroundings. The design emphasizes aesthetic and site specificity, demonstrating that a world-class cultural space can coexist with a recovering ecosystem.

THE SHAPE

FORM AND ORIENTATION: The building design is based on a circular shape, a form that provides both panoramic views of the surrounding landscape and is also easily accessible from all sides. By positioning the structure at the site's central point, the architecture doubles as a public viewing deck, inviting visitors to engage with the scenery from every angle.
THE APPROACH: The main entrance is located to the north, leading from the local parking and bus stops. Hidden among the small hills, the building gradually reveals itself. From here, the visitor is open to discovering the full experience of space.
SPATIAL COMPOSITION: The design consists of two concentric circular volumes: The Inner Volume is a stone-covered concrete hall, with a concrete structure that ensures excellent building acoustics. The Outer Volume: Designed in wood, it acts as a protective "embrace" around the hall. This perimeter space functions as a light-filled circulation for the public while simultaneously serving as a highly effective sound buffer against the exterior environment. It is a modular system that gives huge flexibility. Compared with concrete structures, wooden structures can be easily adjusted, opened, or moved. The outer ring allows for more than just a journey through the structure, ensuring a profound experience in nature as it reaches far from the central point. Apart from nature as a core experience, it offers framed views of the main canals, enriching the walk.

SUSTAINABLE DEVELOPMENT

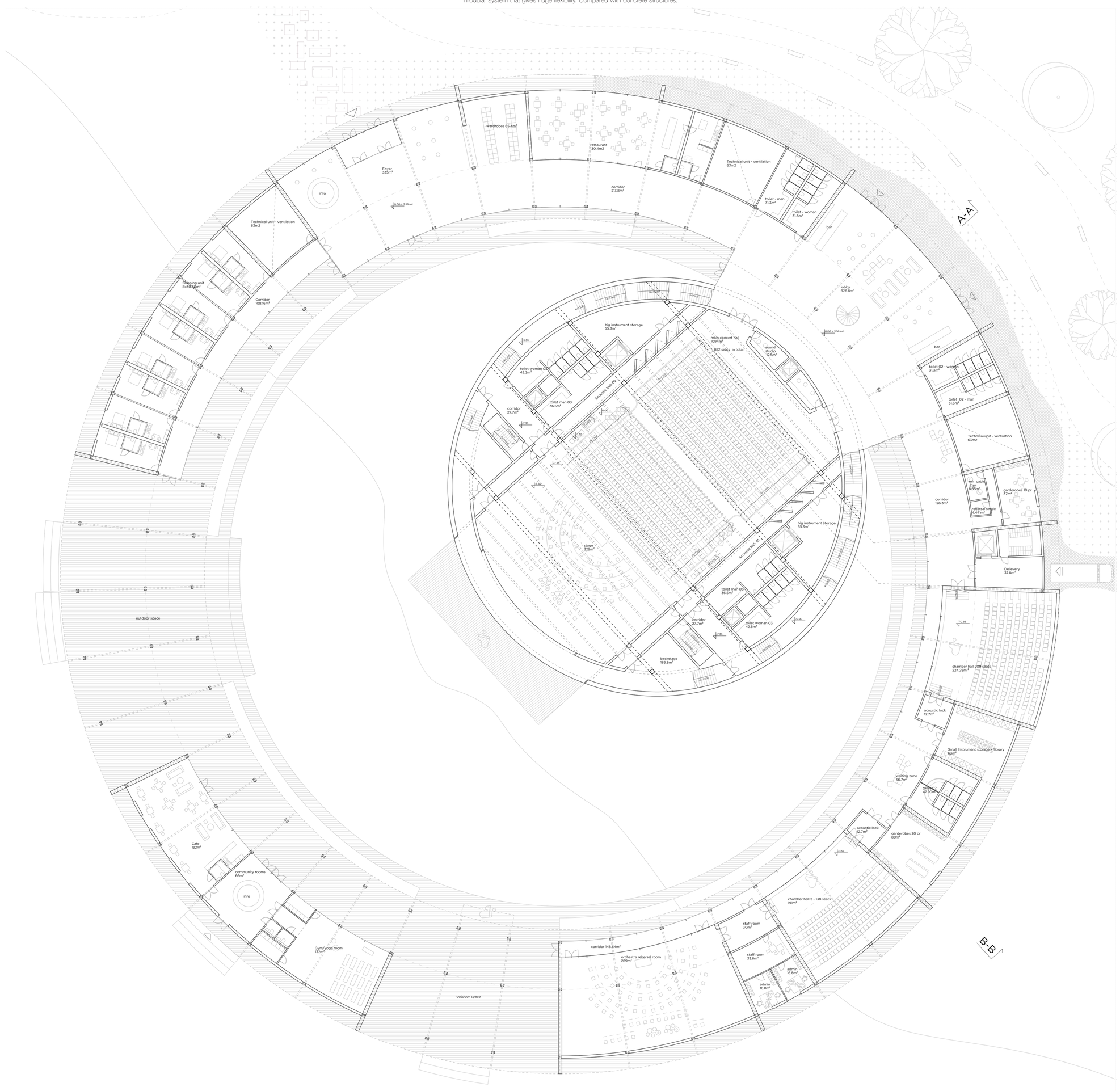
The project of the new concert hall strives to fulfill both technical requirements and to examine and apply sustainable principles through a landscape-responsive, adaptive architecture, the implements local materiality, maintaining technical rigour simultaniously. It uses landscape regeneration strategies to establish the base for the building design. Following "The Global Goals for Sustainable Development" the design will aim to align with potentially 3 of them, as listed below:

SUSTAINABLE CITIES AND COMMUNITIES
This thesis addresses the topic, as the design assumes close proximity to the city centre, promoting nature integration within the spaces. It is located only 20 minutes from the city centre of Göteborg, demonstrating a sustainable public design solution that can be implemented in the future. (United Nations Development Programme. (n.d.)

RESPONSIVE CONSUMPTION AND PRODUCTION
The design will assume responsible construction through the use of local materials and modular systems that incorporate repetitive elements, which can be produced with less energy and later replaced or modified as needed. It enables the implementation of concepts such as design for disassembly and creates an opportunity to adapt the building to a different function in the future. (United Nations Development Programme. (n.d.)

LIFE ON LAND
This principle calls for more regenerative designs, rewilding, and soil remediation. The design strives to suggest solutions that could be implemented on site, through biodiversity enhancements and many other practices. It is not only building design, but its integration with nature and humans, as they are highly interdependent. (United Nations Development Programme. (n.d.)

11 SUSTAINABLE CITIES AND COMMUNITIES · 12 RESPONSIBLE CONSUMPTION AND PRODUCTION · 15 LIFE ON LAND



20m 10m 5m 0m N FLOOR PLAN | 1:250

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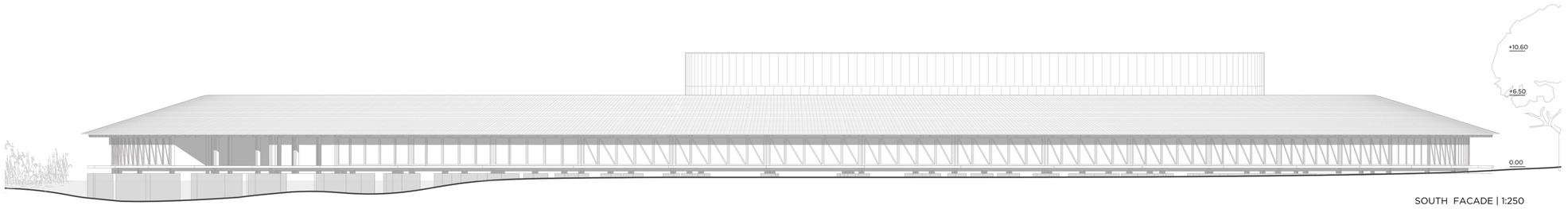
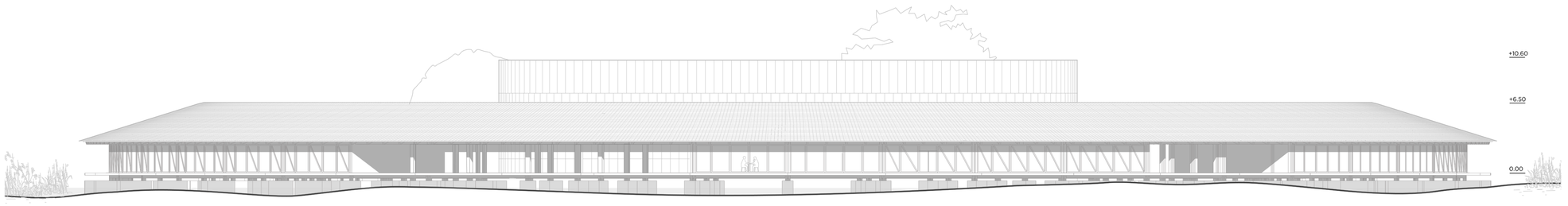


SOUTH FACADE | 1:250



WEST FACADE | 1:250

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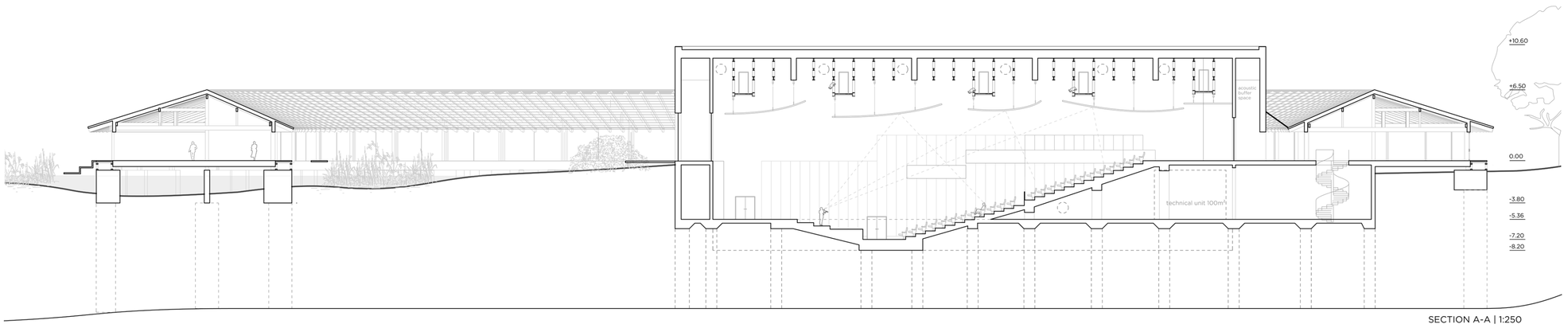
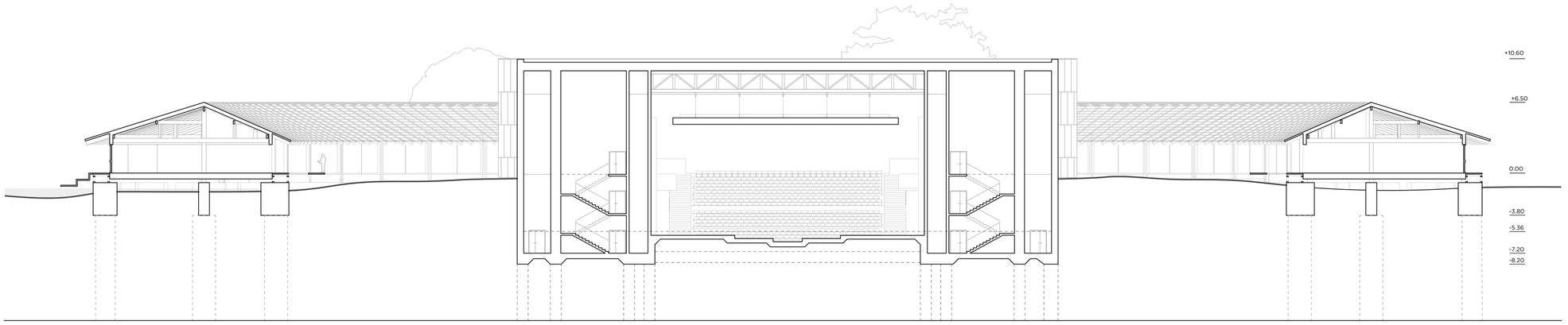


SECTION A-A | 1:250



SECTION B-B | 1:250

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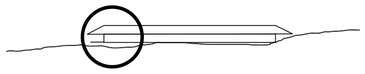
BUILDING VS LANDSCAPE

The design assumes a modular architecture that will enhance interaction between humans and nature. This establishes the fundamental basis for the modular design implemented throughout the project. As mentioned in site characteristics, it lies between 4 different elements - water, grass, forest, and the land itself is a degraded type of landscape. The regeneration assumes the introduction of a wetland and wildlife on the site. These elements ensured the diversity of spaces that can interact with the building.

Consequently, the design defines a series of spaces that connect the building, the hill, the grassland, and the wetland.

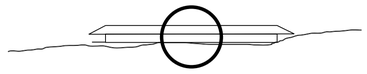
BUILDING VS. WETLAND

Modules located on wetlands are built with a base floor lifted 1 meter above the ground, allowing water to pass freely underneath the building. The wooden deck is designed with a modular pattern that can be repeated, expanded, and transformed to enhance interaction with the landscape. For example, it could consider wooden lower decks that bring visitors closer to nature. It can be developed further depending on the general local need.



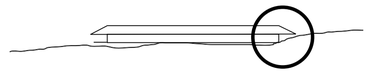
BUILDING VS. GRASSLAND

The moment when the building touches grassland seems to be the most accessible building section as it merges its base floor with the landscape almost seamlessly, making it more approachable. This creates an opportunity for people to enjoy the grassland and share spaces together with nature. Perhaps, the space could be a place for a local picnic and peaceful family time.

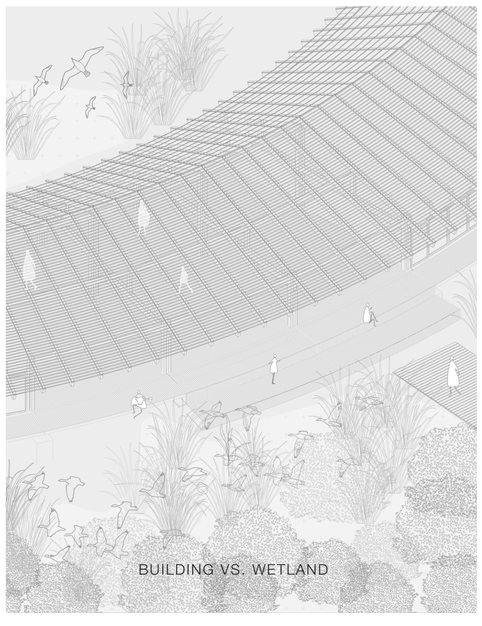


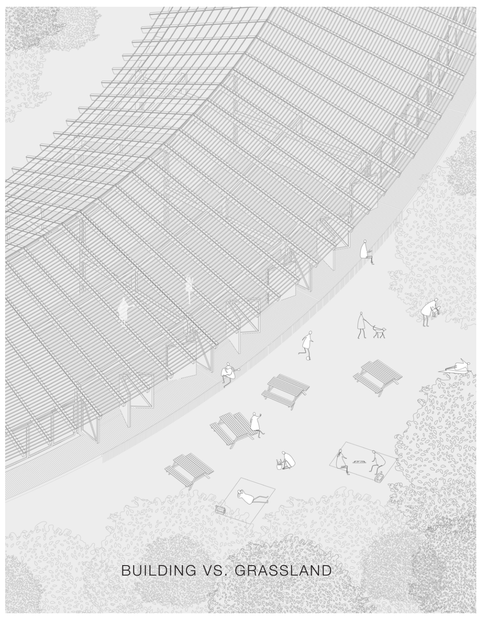
BUILDING VS. HILL

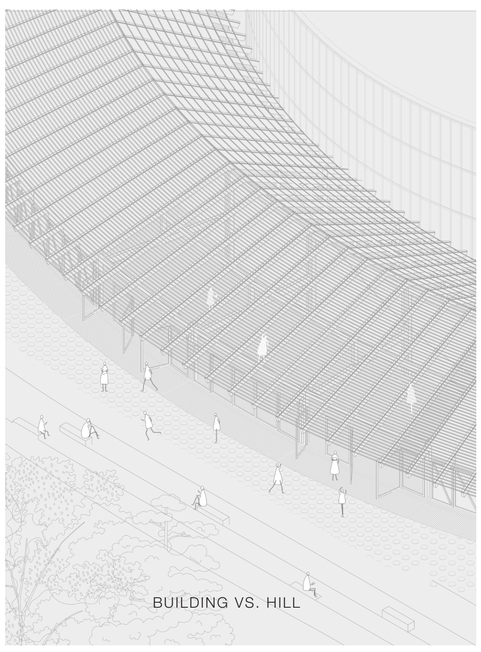
In places where the building approaches the hill, the spaces become introverted, preventing the lobby from unnecessary noise and intruders, ensuring the best experience. In this section, the building sits directly on the ground and faces a beautiful hill that provides both seating spaces and privacy. It is meant to be a quiet pace, where people do not disturb ecosystems but rather gather to share the same experience: preparation for the main performance.



BIODIVERSITY ENHANCEMENT STRATEGIES - DEMOLITION BASED LAND







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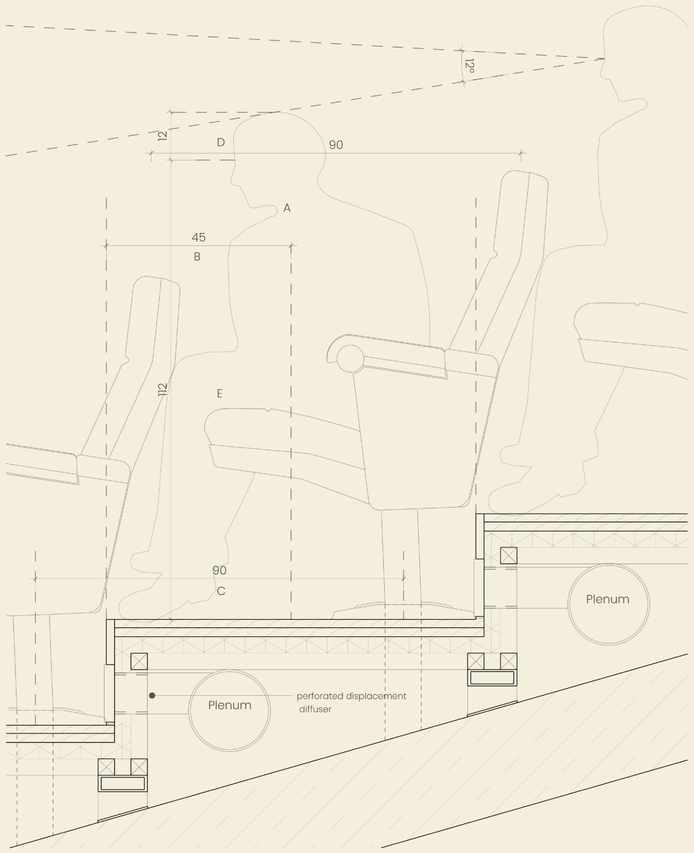
“Concert halls can be spectacular and captivating when they are not only beautiful but also functional. Stage facilities, access to light, and the functionality of a building are just as important as acoustics and beauty”

~ Dominika Cecot
musician, Academy of Music. K. Lipinski.

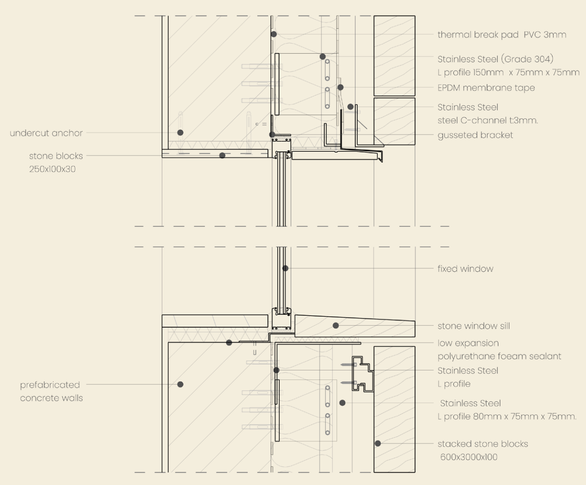
Conducted interview with musicians from Academy of Music. K. Lipinski to adress the most important needs - EVIDENCE BASED DESIGN

Each room inside the concert hall allows for interaction outside inside - enabeling for more profound connection with nature but also providing ideal spaces for musicians to work in, especially when it comes to concert hall typologies that very often lack windows and functionality.



Auditorium Riser and Seating Section 1:10

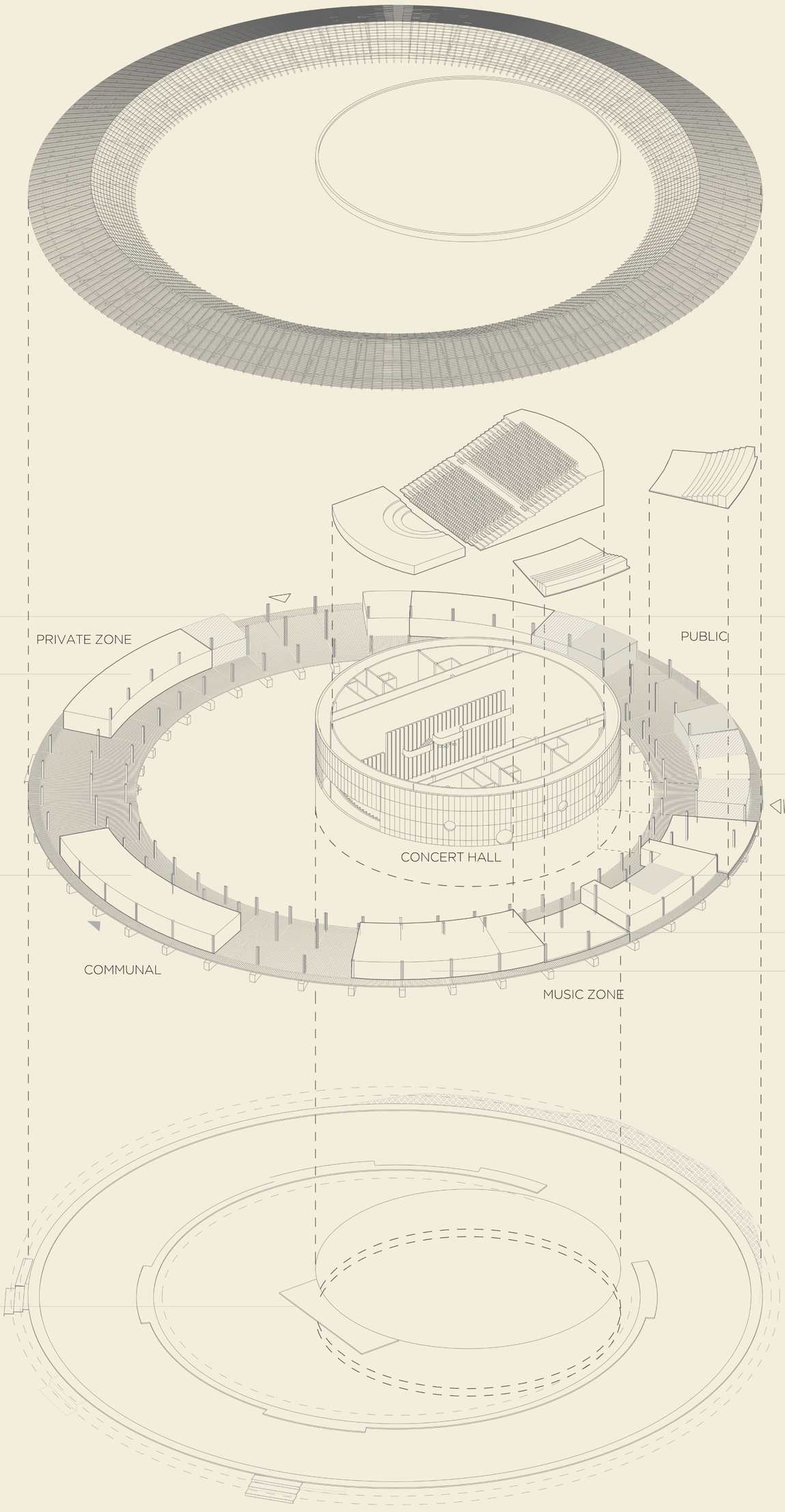
A - With of one row | B - Free space in front | C - Spacing between seats |
D - Distance from an eye to top of the head | E - Average eye height



Stone facade | Window detail | 1:10

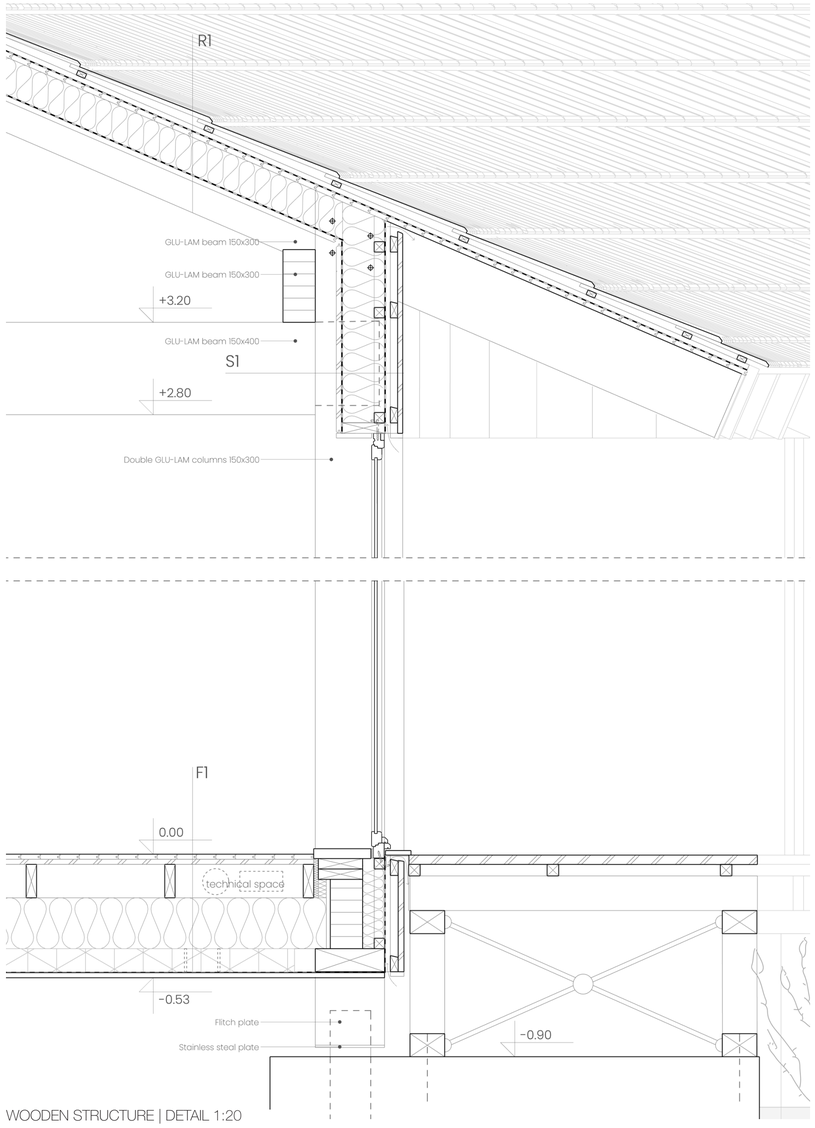
Building Program

The building is divided into two volumes, an outer and an inner circular shape, that share one facade. The inner cylinder houses the main concert hall, while the outer ring accommodates supporting functions, including rehearsal rooms, administration, restaurants, and sleeping units. What's more, it creates a place for an outdoor deck - the place where the journey through nature takes place, preparing the visitor for the main performance. This circular shape also creates an opportunity to use modular systems that can be multiplied, ensuring both easier construction and good plan layouts.



BUILDING PROGRAM | 5170m² PUBLIC ZONE | 1496m² CONCERT HALL | 1736m² SEMI PUBLIC | 268m² MUSIC ZONE | 925m² PRIVATE ZONE | 411m² COMMUNAL ZONE | 330m²

main entrance delievery community access technical toilet



WOODEN STRUCTURE | DETAIL 1:20

Fig. 41. Detail through wooden structure of the outer ring volume | scale 1:20

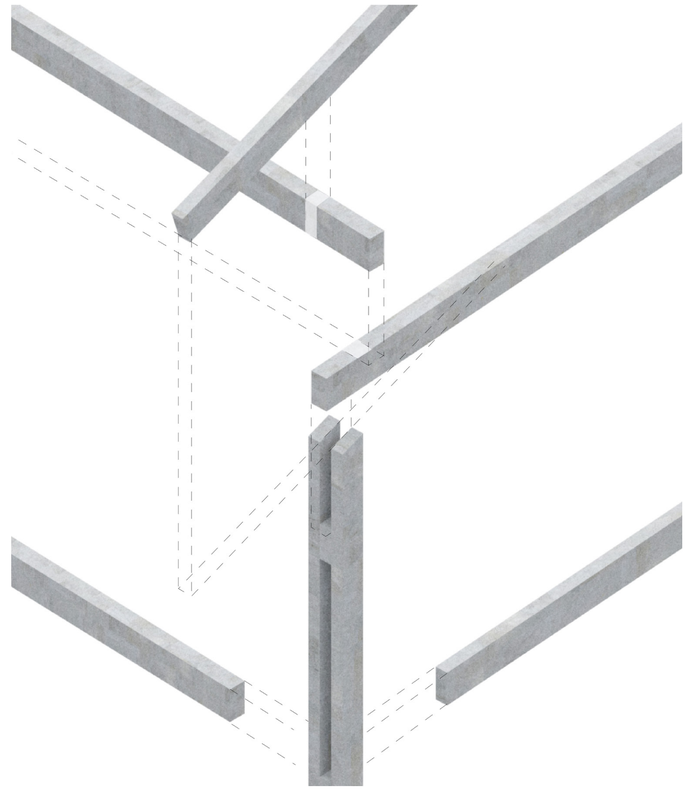
R1		F1		S1	
21	Skifter	22	Flooring	22	Interior finnish
22	Roof beam	22	Osb	2	Vapor Control Layer (VCL)
22	Roof beam cross	145	Floor beams/ technical	182	Timber & Insulation
2	Water membrane	2	Wind membrane	2	Wind membrane
22	Decking	220	Glulam Beam/ Insulation	56	Timber Batens
300	Roof beam/ insulation	10	Xps	22	Exterior Cladding
2	Wind membrane	2	Water membrane		
22	Cover panels	22	Cover panels		

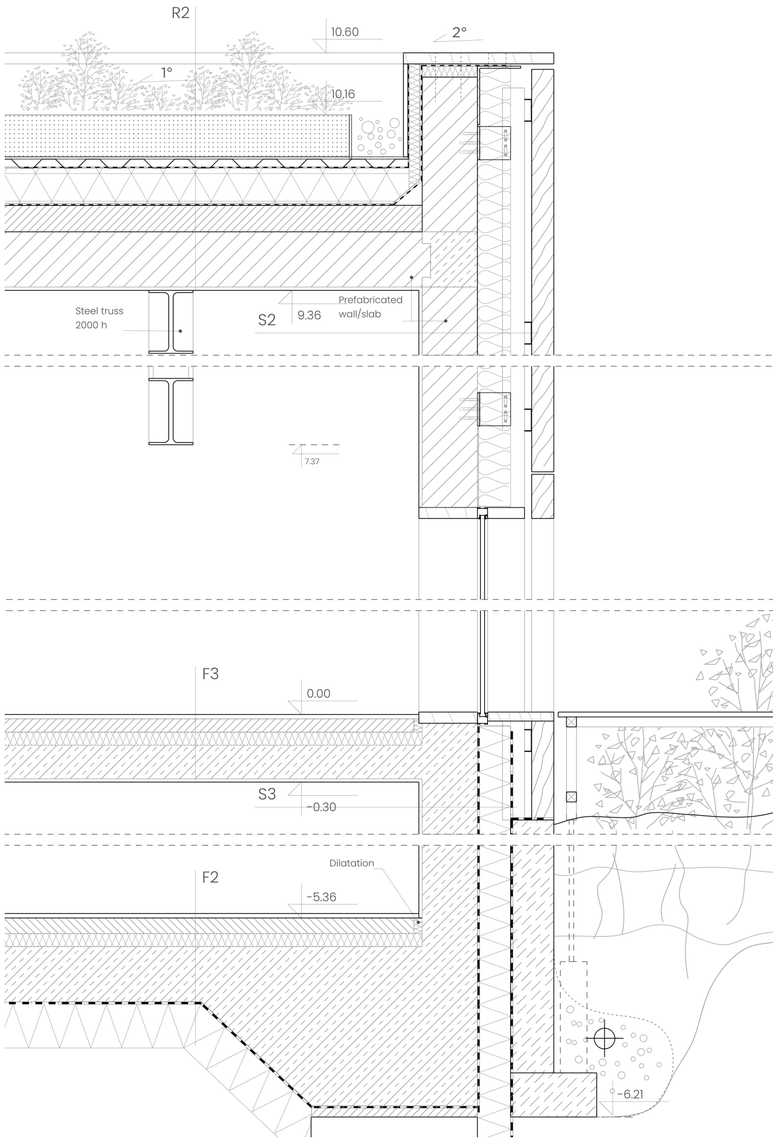
STRUCTURE

The project's structure is designed in both wood and concrete, with implementation based on space requirements and usage. The outer ring is made primarily out of a wooden glu-lam structure that supports a roof covered with skifter stone slate. Thanks to the circular shape, it was possible to provide a modular system that can be easily multiplied. This construction is based on concrete foundations embedded deeply in the ground, reaching the bedrock. As the ground is based on demolition waste, which is yet undocumented in terms of structural stability, it was necessary to assume a pile foundation as the leading solution. The concert hall's load-bearing structure is designed in concrete, including columns, beams, and concrete exterior walls. This solution ensures stability and improves acoustic parameters. Internal walls of this part, are designed in CLT, including walls surrounding the main concert hall. These are also designed with special acoustic panels to control the sound inside the hall.

LOCAL MATERIALITY

Building design considers the use of materials such as granite stone, GLU-LAM wood, concrete and slate roof coverings, such as skifter. Facades are designed with sawn lumber treated wood, and granite on the concert halls' main facades. All materials are locally sourced, which both lowers transportation costs and expresses the space's local character, where the use of wood and stone is highly appreciated. An aspect of local materiality helps to ensure a low CO2 footprint, even though the design considers a concrete structure. Each material is used according to the function or need.





R2		S2		S3	
19	Vegetative layer	100	Stone block	100	Stone block
2	Filer nonwoven		Air gap		Air gap
40	Dimpled membrane	100	Steel substructure	0.1	Glue
2	Waterproof membrane	150	Insulation EPS	150	Insulation XPS
180	Hard Insulation xps	250	Prefabricated wall	2	Waterproof membrane
2	Waterproof membrane	15	Plaster	250	Reinforced concrete
12	Concrete tilted layer			15	Plaster
250	Concrete slab				
15	Plaster				

F2		F3	
20	Wooden flooring	20	Wooden flooring
70	Concrete layer	70	Concrete layer
60	Insulation EPS	60	Insulation EPS
500	Concrete Foundation	500	Concrete Slab
2	Waterproof memrbane	15	Plaster
200	Insluation XPS		

STONE FACADE | DETAIL 1:20

Fig. 42. Detail through concrete external wall structure of the concert hall | scale 1:20

DIAGRAMS OF STRUCTURAL NON ADHESIVE ASSEMBLY IN THE WOODEN STRUCTURE

GROUNDED SOUND

RETHINKING THE CONTEMPORARY CONCERT HALL THROUGH ECOLOGICAL INTEGRATION AT SJOBACKA TIPPEN

DESIGN FOR ADAPTABILITY

While the concert halls are very often impossible to transform, this design assumes implementing method called design for adaptability enabeling for changes of the function through building lifespan strategies

DOUGHNUT FOR URBAN DEVELOPMENT - MAPPING

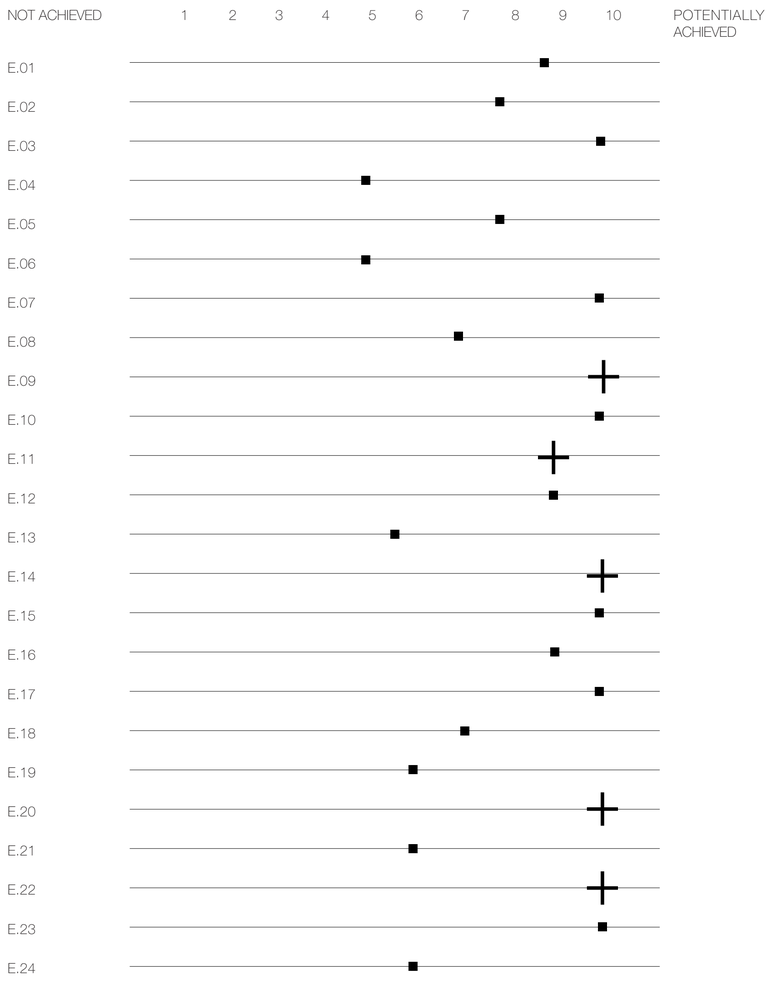
The design alignes with theoretical framework created by Kate Reworth and Home.Earth called "Doughnut for Urban Development" assessing the design and its sustainable aspects.

CLIMATE STABILITY | LOCAL

E.01 : Non-toxic materials
E.02: Waste management
E.03: Sustainable mobility
E.04: Renewable energy
E.05: Energy efficiency
E.06: Limit new construction
E.07: Optimised structure
E08: Flexible design
E.09: Circular design
E.10: Reversible connections
E.11: Low-carbon construction
E.12: Durable design

CLIMATE STABILITY | GLOBAL

E.13 : Carbon budget
E.14: Impact assessment
E.15: Transparent reporting
E.16: Waste management
E.17: Low carbon materials
E.18: Renewable energy
E19: Energy efficiency
E20: Life cycle thinking
E.21: Carbon sequestering
E.22: Responsible sourcing
E.23: Minimise transportation
E.24: Pollution mitigation



MAIN FOCUS

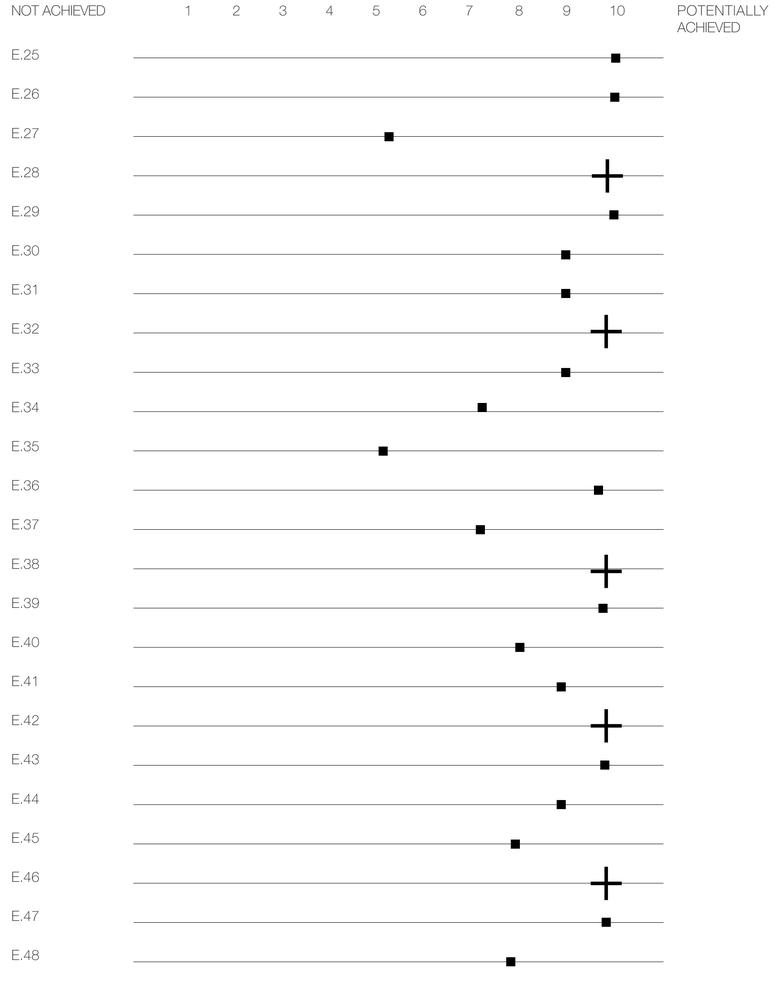
SECONDARY FOCUS

HEALTHY ECOSYSTEMS | LOCAL

E.25: No chemical fertilisers
E.26: Healthy maintenance
E.27: Integrated energy
E.28: Build on converted land
E.29: Grey water use
E.30: Water cycle support
E.31: Pollution avoidance
E32: Habitat preservation
E.33: Support biodiverse soil
E.34: No invasive species
E.35: Purify the air
E.36: Impact assessment

HEALTHY ECOSYSTEMS | GLOBAL

E.37: Set biodiversity target
E.38: Impact Assessment
E.39: Transparent reporting
E.40: Source organic materials
E.41: Chemical avoidance
E.42: Ecosystem protection
E.43: Avoid land conversion
E44: Limit freshwater use
E.45: Pollution avoidance
E.46: Support natural ecosystems
E.47: Restore natural resources
E.48: Maintain biotopes



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2026
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GROUNDED SOUND

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