MASTER-/DIPLOMARBEIT

Re-Habitation

Rehabilitation- und Wohnmöglichkeiten für psychiatrische Patient/Innen in Anatolien

Rehabilitation and Housing Possibilities for Psychiatric Patients in Anatolia

ausgeführt zum Zwecke der Erlangung
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Manfred Berthold
Prof Arch DI Dr

E253 - Institut für Architektur und Entwerfen

eingereicht an der Technischen Universität Wien
Fakultät für Architektur und Raumplanung

Zeynep Altın
Matr. Nr. 01328617

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Re-Habitation:

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Diese Arbeit untersucht die Gestaltung eines Rehabilitationszentrums für psychiatrische Patienten in der Türkei, wobei der Schwerpunkt auf der Integration architektonischer Prinzipien mit der psychischen Gesundheitsfürsorge liegt, um den Bedürfnissen von Menschen ohne familiäre oder betreuende Unterstützung gerecht zu werden. Ausgehend von der Internationalen Klassifikation der Krankheiten (ICD-10) richtet sich das Projekt an Störungen wie Substanzmissbrauch, Schizophrenie und affektive Störungen, die häufig mit hohen Raten von Krankenhausaufenthalten und Wiederaufnahmen verbunden sind. Durch eine Kombination aus Literaturrecherche, Standortanalyse und Entwurfsmethodik wird in dieser Studie das therapeutische Potenzial von gebauten Umgebungen zur Unterstützung der Rehabilitation und Wiedereingliederung der Patienten in die Gesellschaft hervorgehoben.

Die Forschung beginnt mit einer Untersuchung des aktuellen Zustands der Behandlung psychischer Erkrankungen in der Türkei, im Vergleich zu globalen Trends im Design von Einrichtungen für psychische Gesundheit. Dabei wird besonderer Wert auf gemeinschaftsbasierte Pflegemodelle und benutzerzentriertes Design gelegt, die die Würde des Patienten, soziale Interaktionen und Heilung in den Vordergrund stellen. Die Standortanalyse identifiziert einen geeigneten Ort für das Zentrum, wobei wesentliche Gestaltungselemente wie der Zugang zu natürlichem Licht, Außenbereiche und Gemeinschaftsräume integriert werden, um die therapeutische Umgebung zu verbessern.

Das Projekt wird durch evidenzbasierte architektonische Praktiken geleitet, die berufliche Trainingsräume, Therapieeinrichtungen und Wohneinheiten integrieren, die typische Wohnprojekte nachahmen, um Stigmatisierung zu verringern und ein Gefühl von Normalität zu fördern. Durch die Verbindung von nachhaltigen Designprinzipien mit den spezifischen Bedürfnissen von psychiatrischen Patienten zeigt diese Arbeit, wie Architektur als Werkzeug für die Behandlung von psychischen Erkrankungen dienen kann und zur langfristigen Genesung und zum Wohlbefinden der Bewohner beiträgt.

Abstract

Re-Habitation:

Rehabilitation and Housing Possibilities for Psychiatric Patients in Anatolia

This thesis explores the design of a rehabilitation centre for psychiatric patients in Türkiye, focusing on the integration of architectural principles with mental health care to address the needs of individuals without family or caretakers. Drawing from the International Classification of Diseases (ICD-10), the project targets disorders such as substance use, schizophrenia, and mood disorders, which are frequently associated with high rates of hospitalization and rehospitalisation. Through a combination of literature review, site analysis, and design methodology, this study highlights the therapeutic potential of built environments in supporting patient rehabilitation and reintegration into society.

The research begins with an examination of the current state of mental illness treatment in Türkiye, juxtaposed with global trends in mental health facility design. Emphasis is placed on community-based care models and human-centred design, which prioritize patient dignity, social interaction, and healing. The site analysis identifies an appropriate location for the facility, with key design elements such as access to natural light, outdoor spaces, and communal areas incorporated to enhance the therapeutic environment.

The project is further guided by evidence-based architectural practices, integrating vocational spaces, therapeutic areas, and residential units that mimic typical housing projects to reduce stigma and promote a sense of normalcy. By merging sustainable design principles with the specific needs of psychiatric patients, this thesis demonstrates how architecture can serve as a tool for mental health treatment, contributing to the long-term recovery and well-being of residents.

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01 Introduction

01.01. State of Mental Illness Treatment and Hospitaliziation In Türkiye

Fig. 1: A Psychiatric Hospital In Turkey
Photo Credit: Ruhisak, 2013

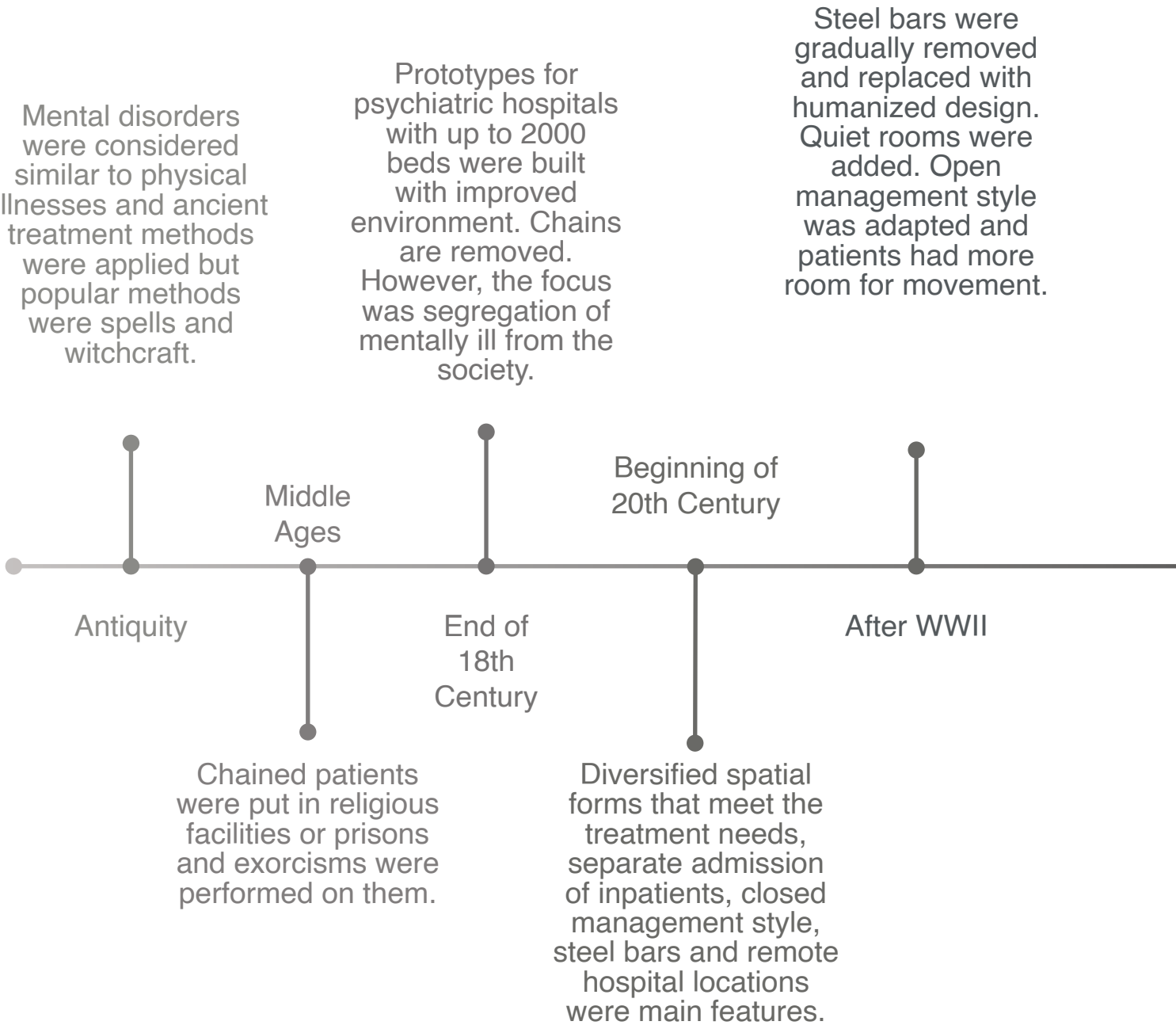
The prevalence of mental illness in Türkiye was determined to be 17.2% in a comprehensive study conducted in 1998. Despite this significant figure, six out of seven people suffering from mental illness do not seek medical treatment due to factors such as ignorance, social stigma, and economic constraints.

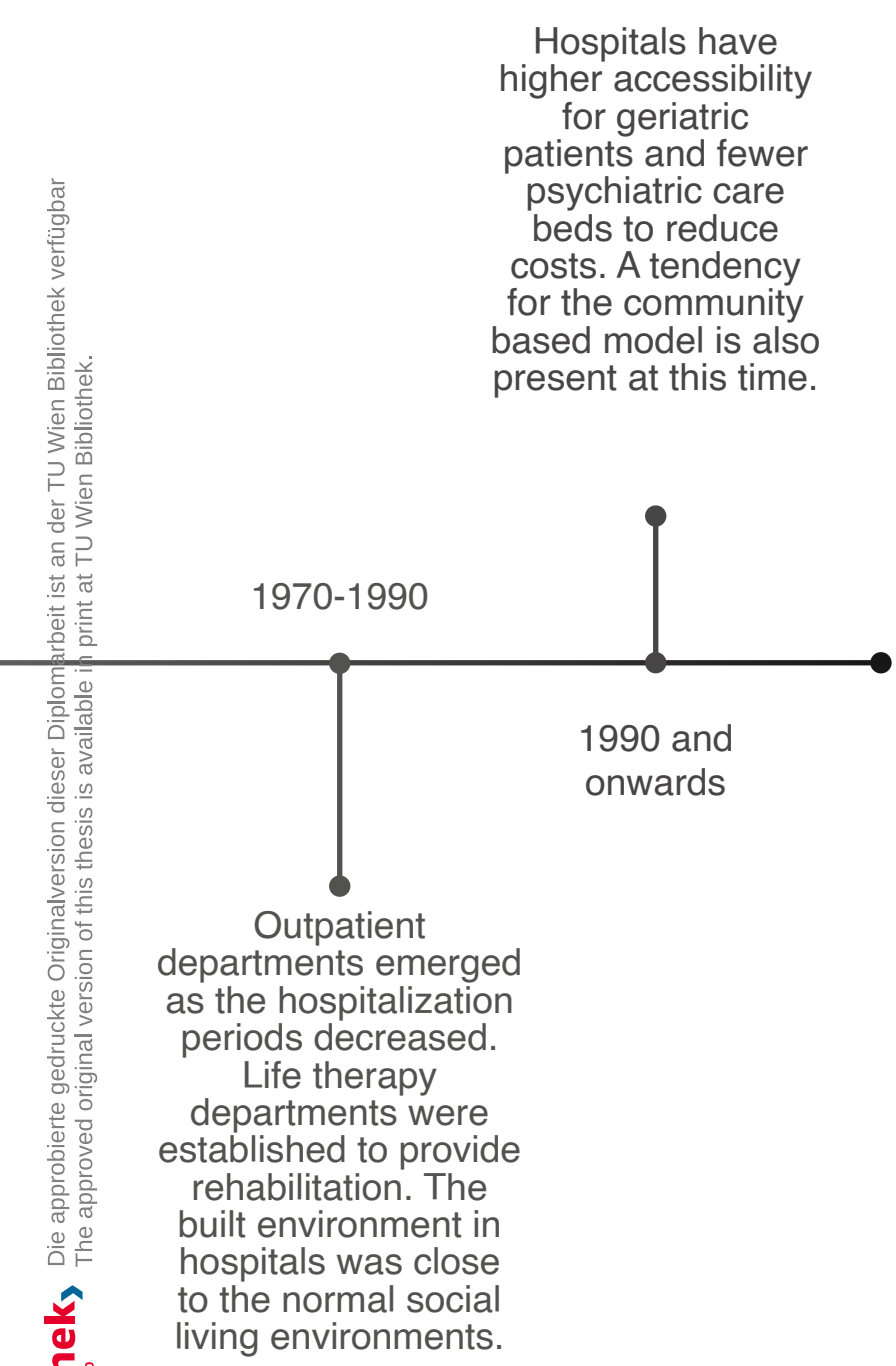
Currently, Türkiye has only eight public psychiatric hospitals that provide inpatient treatment, and none of these facilities are located in the Central Anatolian Region, which is the second largest of the seven regions in Türkiye, with a recorded population of 12,896,255 in 2022. According to the National Mental Health Action Plan (2011-2023), published in 2011, patients whose diagnosis, treatment, and rehabilitation cannot be provided locally are referred to regional hospitals. However, according to WHO data from 2008, Türkiye has the second lowest number of psychiatric beds in the European region, with only 10 beds per 100,000 inhabitants—a figure that includes beds used for forensic, chronic care, and addiction treatment.

Moreover, the existing psychiatric hospitals in Türkiye are reported to be inadequate, underfunded, and **lacking in essential rehabilitation and therapy services** for patients. There is also **no evidence of a community-based approach** to mental health care for people with mental disorders.

To address these issues, the National Mental Health Action Plan outlines a transition to a community-based mental health system, with the **establishment of community mental health centres and rehabilitation units. Additionally, the plan includes the development of a care system for patients who do not have access to family support.**

01.02. Evolution of Psychiatric Care and Facility Design





Modern Take on Psychiatric Treatment and Institutions

There is a global trend toward reducing hospitalization periods for patients with mental disorders. This shift has led to community-based models, such as halfway houses or „hospital houses," where patients stay for six to twelve months before moving to group homes with five to six residents and visiting staff.

While the role of psychiatric facilities is still evolving, modern institutions have adopted characteristics similar to general hospitals, achieving a certain level of socio-spatial complexity. Recently, there has been a push towards creating more „homelike" environments, which aim to offer a normalized setting that meets patients' clinical needs while being less institutional. Although „homelike" is not yet precisely defined, it generally implies a more comfortable and less clinical atmosphere.

By the late 20th century, three care models coexisted: ordinary housing, community-based care with hospital cooperation, and modernized hospital care with its own community network.

Architecturally, the gap between architecture and health sciences has often led to psychiatric environments being designed intuitively rather than through a collaborative, evidence-based approach.

01.03. Rehospitalisation and Importance of Rehabilitation

Patients receiving inpatient treatment have a high rate of rehospitalisation. A study reported that 17.1% of schizophrenic patients return to the hospital within a six-month period, particularly those with a family history of psychosis, older age of onset, or a history of multiple discharges (Gültekin et al., 2013). Similarly, another study found that patients with depression have a rehospitalisation rate of 35.9% (Geniş et al., 2019), while a more recent study indicated a 24.2% rehospitalisation rate within six months for patients with addiction. The risk was notably higher for patients with a family history of depression, addiction, or other mental illnesses. In these cases, there was also a marked increase in anxiety disorders, psychotic symptoms, and substance abuse during the second hospitalization, although the length of hospital stay decreased. Additionally, patients diagnosed with alcohol dependence were later diagnosed with substance dependence (Geniş et al., 2021).

Despite the prevalence of rehospitalisation, research in Turkey has not extensively explored the underlying causes. However, it is possible to infer that rehospitalisation may be strongly linked to a lack of continuity in treatment following patient discharge. In Turkey, where the availability of inpatient psychiatric facilities is limited, ensuring continuous treatment and support for individuals reintegrating into their social environments after inpatient care is vital. For successful reintegration, a coordinated and comprehensive approach involving psychosocial services—such as discharge education, home care, and rehabilitation services—is essential.

All patients receiving treatment for mental health disorders potentially require rehabilitation services as part of their long-term care. Psychiatric rehabilitation, akin to physical rehabilitation, seeks to mitigate the detrimental effects of mental illness by addressing the limitations and challenges individuals face in performing essential life skills. The principal aim of psychiatric rehabilitation is to provide patients with the necessary social support and skills to enable them to fulfil roles in their social, occupational, educational, and familial lives, often with the assistance of professional caregivers. The origins of psychiatric rehabilitation stem from the growing recognition of the need to equip individuals with severe mental illness with opportunities to live, learn, and work within their communities. These rehabilitation programs play a crucial role in supporting patients as they transition from psychiatric hospitals to independent living, by providing the skills and resources necessary for their adjustment.

Psychiatric rehabilitation utilizes three main interventions:

1.Developing the individual‘s strengths and potential.

2.Teaching life skills.
3.Increasing environmental support.

The community support system in psychiatric rehabilitation is centred on providing care for individuals with mental illness without completely isolating them from society. This model ensures that their developmental and social needs are met through institutional and professional supervision. It also addresses the stigma that mentally ill individuals often face and advocates for a supportive environment that fosters growth and recovery. The system emphasizes providing the individual with a clean, safe, and comfortable living environment, fostering relationships free from prejudice and societal myths (such as the belief that mentally ill individuals are inherently violent), and offering meaningful work that is valued by society (Pektaş & Çam, 2002).

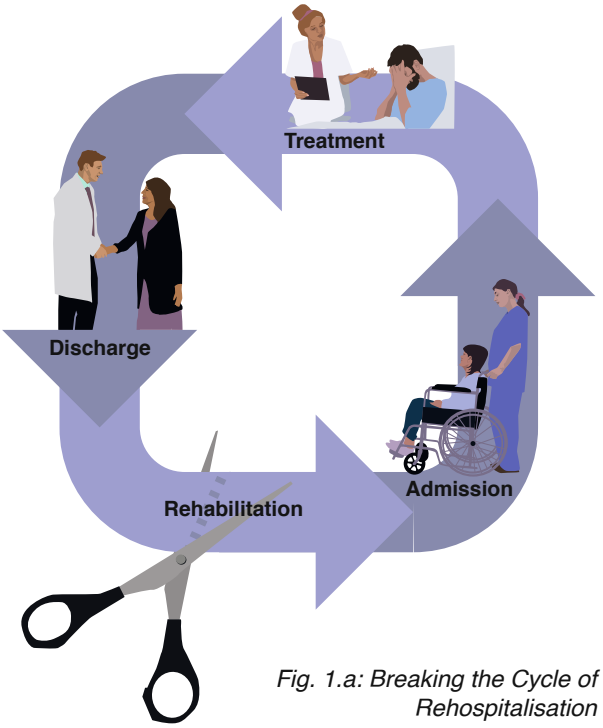


Fig. 1.a: Breaking the Cycle of Rehospitalisation

Fig. 1.b: Horticultural Therapy

Impact of Horticultural Therapy on Mental Health

Horticultural therapy has shown to have significant therapeutic benefits for patients with schizophrenia, improving symptoms, rehabilitation outcomes, quality of life, and social functioning. Different environmental settings have been shown to influence treatment effectiveness, with non-hospital environments producing better outcomes than traditional hospital settings (Lu et al., 2021). Furthermore, interventions provided at care farms have yielded positive effects on individuals with mental health issues, offering meaningful occupational engagement. These experiences are linked to improvements in mental health, self-efficacy, coping abilities, and attentional capacity. Participants reported feeling distanced from their everyday stressors, increased social activity, and enhanced social support within the farm environment, all contributing to their overall well-being (Pektaş & Çam, 2002).

01.04. Architecture As Design Tool for Mental Health

The design of built environments profoundly influences mental health and well-being, making architectural considerations critical in the creation of psychiatric rehabilitation centres. Effective architectural design for mental health not only addresses the immediate needs of patients but also contributes to their overall recovery and quality of life. This chapter explores how architectural design can be harnessed as a tool to enhance mental health, drawing insights from recent research and historical developments in the field.

Influence of Architectural Morphology on Mental Health

Architectural morphology, which involves the spatial configuration and layout of a building, plays a crucial role in psychiatric facilities. Research underscores that a well-designed physical environment can significantly impact therapeutic outcomes, patient behaviour, and mental health. For psychiatric institutions, this means creating spaces that ensure safety, reduce stress, and promote healing. Key design elements such as natural light, calming colours, and the integration of nature can alleviate anxiety and agitation among patients. The design should also provide flexible spaces that cater to diverse therapeutic needs and facilitate wayfinding to minimize confusion and stress. Balancing safety with a non-institutional feel remains a central challenge, and including mental health professionals in the design process is essential to address these needs effectively. (Chrysikou, 2019)

Historical Perspectives and Evolving Principles

The mid-20th century saw significant shifts in the understanding of how environmental design affects human behaviour, particularly within institutional settings. Robert Sommer‘s observations highlighted the need for a deeper understanding of how architectural decisions impact individuals. Sommer’s work indicated that decisions about the built environment often lacked sufficient behavioural data, leading to a disconnect between design and user needs. This period marked a transition from merely making psychiatric facilities „homelike“ to recognizing these institutions as crucial sites for developing broader design principles applicable to various urban environments. The emphasis shifted to understanding spatial behaviour within psychiatric settings and applying these insights to a range of institutional and public spaces, fostering better design practices that cater to mental health across different contexts (Ramsden, 2019).

Built Environment and Mental Health Outcomes

Modern research continues to explore how various features of the built environment affect mental

health. Environments characterized by overcrowding, noise, and lack of natural elements are associated with negative outcomes, including increased psychological distress and aggression. Conversely, well-designed spaces that reduce noise and crowding, incorporate natural elements, and support social interactions promote psychological well-being and resilience. Evidence shows that natural views and sounds, as well as access to green spaces, contribute significantly to mental recovery and attentional restoration. For instance, environments with ample greenery and water features have been linked to reduced crime rates and improved psychological health outcomes. Effective wayfinding systems further enhance mental well-being by reducing anxiety related to navigation. (Jiang et al., 2022)

In conclusion, the intersection of architecture and mental health is a dynamic field that underscores the importance of design in creating therapeutic environments. By integrating insights from historical perspectives and contemporary research, architects can develop spaces that not only meet the immediate needs of psychiatric patients but also foster long-term mental health and well-being.

Design Elements to Include

Based on the research presented in this chapter, specific design elements can be strategically chosen to ensure that the architectural layout of the rehabilitation centre fosters a therapeutic environment conducive to residents‘ recovery and well-being:

- **Floor Plan:** Layout of different areas within the facility.
- **Room Types:** Private rooms, group therapy rooms, common areas.
- **Circulation Paths:** Hallways, corridors, and access routes.
- **Outdoor Areas:** Gardens, courtyards, or therapy gardens.
- **Safety Features:** Secure entrances, surveillance points.
- **Wayfinding Elements:** Signage, landmarks, and navigational aids.
- **Natural Elements:** Windows, green spaces, water features.
- **Privacy Zones:** Areas designed to ensure patient privacy.

01.05. Residents of the Rehabilitation Centre

Example Profiles

Fig. 2: Resident 1

Resident 1: Elif Demir

Age: 46

Diagnosis: Alcohol Dependence (F10)

Background: Elif has battled alcohol dependence for over two decades, a struggle that has led to the breakdown of her marriage and estrangement from her children. After multiple failed attempts at detox and short-term rehabilitation programs, Elif finds herself without a stable home or support system. Her addiction has led to several hospitalizations, each time resulting in a brief period of sobriety followed by relapse. The rehabilitation centre offers Elif a unique opportunity for long-term recovery. Through horticultural therapy, Elif reconnects with a sense of purpose and finds solace in tending to the centre's gardens. The communal atmosphere provides her with much-needed social support, helping her rebuild her life free from the constraints of her addiction.

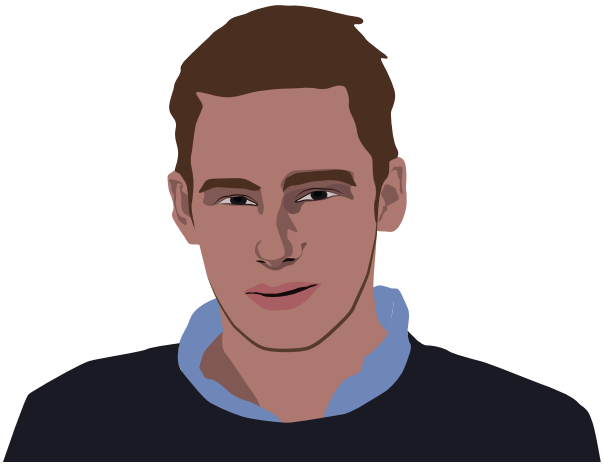


Fig. 3: Resident 2

Resident 4: Mehmet Aksoy

Age: 28

Diagnosis: Bipolar Affective Disorder (F31)

Background: Mehmet was diagnosed with bipolar disorder during his teenage years. His condition has been marked by extreme mood swings, including periods of intense mania and debilitating depression. Despite efforts to maintain employment, his condition has made it difficult to sustain a job, leading to financial instability and social isolation. Mehmet has been hospitalized several times after manic episodes, and without family support, he has struggled to find a stable living situation. The rehabilitation centre provides Mehmet with a long-term housing solution where he can participate in structured daily routines, including work therapy and communal living activities. The centre's environment helps him stabilize his mood, gain confidence, and develop the skills needed to manage his condition independently.

Fig. 4: Resident 3

Resident 3: Ali Korkmaz

Age: 52

Diagnosis: Schizoaffective Disorder (F25)

Background: Ali has been living with schizoaffective disorder for much of his adult life, a condition that combines symptoms of schizophrenia with mood disorder features. His condition has led to social withdrawal and difficulty maintaining relationships. He was once an engineer, but his condition gradually affected his ability to work, leading to unemployment and homelessness. After severe depressive episodes with psychotic symptoms, Ali was hospitalized multiple times. Without family or friends, he found it impossible to manage life outside the hospital. The rehabilitation centre offers Ali a safe, structured environment where he can receive the consistent care he needs. Through therapy sessions and training programs, Ali slowly begins to rebuild his life and re-establishing a sense of purpose.

Fig. 5: Resident 4

Resident 2: Ayşe Yılmaz

Age: 34

Diagnosis: Schizophrenia (F20)

Background: Ayşe was diagnosed with schizophrenia in her early 20s. She has experienced multiple hospitalizations due to acute psychotic episodes, particularly during periods of high stress. Without a stable family support system, Ayşe has struggled with medication adherence and managing daily life. She has lived in temporary shelters and has been in and out of psychiatric facilities due to a lack of long-term housing solutions. Ayşe's primary needs are stability, a supportive community, and a structured environment where she can engage in therapeutic activities such as gardening and art therapy. The rehabilitation centre offers her the chance to develop life skills and build a sense of belonging, reducing her risk of rehospitalisation.

02 Location

02.01. Ankara

An Overview of the City

Ankara has been a city that witnessed continuous settlement and the rule of various civilizations since ancient times. Archaeological findings from studies conducted in and around the area that encompasses today's Ankara reveal that communal life persisted in the region from the Palaeolithic period, extending through the Neolithic and Chalcolithic Ages, and these findings have been recognized as cultural values. Therefore, the city's settlement history dates back to very ancient times. However, despite all the archaeological evidence, the exact founder and the date of the city's establishment remain unknown

Throughout history, the city has served as the capital for many states. It successively came under the control of the Hittites, Phrygians, Lydians, Galatians, Persians, Romans, Seljuks, Ahis, and Ottomans. Following World War I and the proclamation of the Republic of Turkey, it became the capital of the Turkish Republic. After being designated as the capital, the city underwent rapid and large-scale development projects, shaping it into its present form (T.C. Ankara Büyükşehir Belediyesi, 2024).

The city of Ankara covers an area of 25,706.00 km² and as of today has a population of 5,803,482. It consists of 25 districts and 26 municipalities (T.C. Ankara Valiliği, 2024).

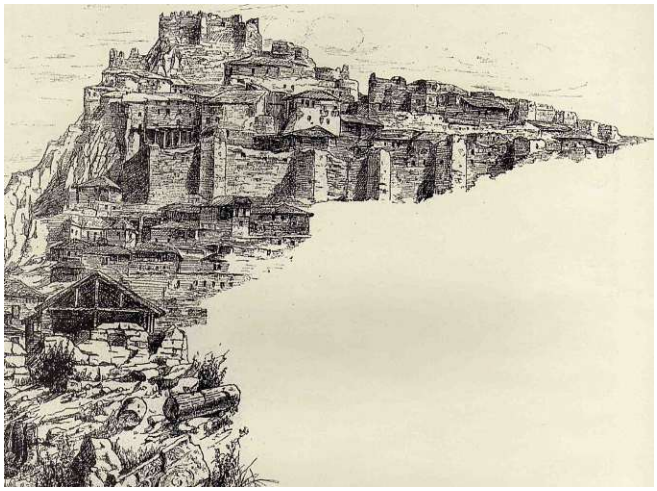


Fig. 6: Ankara Castle from the book "Vom Goldnen Horn zu den Quellen des Euphrat" by German geologist Edmund Naumann, München, Leipzig, 1893

Fig. 7: Ankara in 2024
Photo Credir: Adem Albayrak, 2024

02.01. Ankara

Building Traditions: Adobe

In Turkey, particularly in Central Anatolia, it is known that the tradition of adobe construction dates back to the early periods of settlement (Tuztaşı & Çobancaoğlu, 2006). The similarities between the construction techniques used in Central Anatolia around 5000 B.C. and those in surviving examples today demonstrate that regional architectural styles are not isolated but rather influenced by one another, with similar techniques being used across regions. (Tuztaşı & Çobancaoğlu, 2006).

In Anatolian adobe construction, where clay and water were sufficiently available, adobe was typically prepared and used on-site. Unwanted materials, such as broken pottery, ash, and settlement debris, would often appear in the clay if it was taken from near the settlement site. Straw, chopped animal feed, reeds, sand, and small pebbles were deliberately added to the clay to loosen the bricks and create mechanical bonds between the materials. It has been observed that plant fibres were added in large quantities to the adobe mortar, a practice that has been documented as unchanged for thousands of years (Tuztaşı & Çobancaoğlu, 2006).

It is difficult to draw clear boundaries between regions regarding housing construction techniques, as these are shaped by local influences. In Central Anatolia, adobe is predominantly used as the primary building material, though in other regions, it is combined with stone and wood in different techniques. The application of adobe can be classified into three groups: the solid-wall system, the wooden frame with adobe infill system, and the mixed system, which are explored through examples of traditional adobe houses with a history extending 150 years. (Tuztaşı & Çobancaoğlu, 2006).

Fig.8: A Traditional House in Ankara built in 1926
Photo Credit: Karaçağ, 2017

Although few adobe buildings remain in Ankara today, there are still some examples where adobe is used as a material alongside brick and wood within a timber frame system. (Fig.8) (Karaçağ, 2017).

02.02. A Municipality of Ankara: Gölbaşı

Fig.9: Türkiye
Photo Credit: Google Earth, 2024

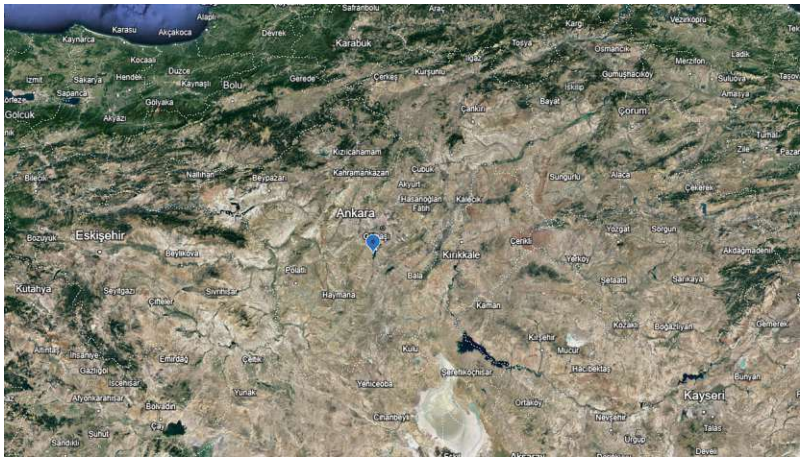


Fig.10: Ankara
Photo Credit: Google Earth, 2024

Fig.11: Gölbaşı and Mofan Lake
Photo Credit: Google Earth, 2024

Why Ankara?

The project will be located in Gölbaşı, Ankara.

Although there isn‘t an official capital to the central Anatolian region, Ankara is a good place to start, since it is the second most populated city in the country and at a close distance to other cities in the region. There are also a lot of hospitals with psychiatric departments in Ankara as well.

Gölbaşı as a Leisure Town

Gölbaşı, a district located 20 kilometres from Ankara, is well-known as a recreational area for the residents of the city, primarily due to the natural beauty of Mogan Lake and the surrounding forest. As Ankara expands toward Gölbaşı, new residential and commercial buildings are being developed, transforming the district into a blend of urban growth and natural preservation. This unique characteristic makes Gölbaşı an ideal location for the proposed rehabilitation

02.02. A Municipality of Ankara: Gölbaşı

Gölbaşı 1:10000

centre, offering patients proximity to a normalized, everyday setting while still maintaining a buffer from the stresses of urban life. The centre will be situated at a comfortable distance from local amenities, enabling patients to meet their basic needs and relax by the lake, promoting both independence and well-being.

The district has a population of 140,649 as of 2023 and features Mogan and Eymir Lakes, which support various recreational activities such as water sports, fishing, and cycling. These lakes, alongside the scenic forest, contribute to Gölbaşı's reputation as a major tourist and recreational destination. The area is home to many restaurants, cafes, and hotels, and offers ample recreational facilities including picnic spots, bike paths, and a variety of water activities (2024 - Gölbaşı Belediyesi).

Gölbaşı experiences a continental climate, with cold, wet winters and hot, dry summers, and receives an average annual rainfall of 400 mm. Its economy

Fig.12: Gölbaşı, 1:10000
Graphic Creditt: Open Steet Map, 2024

is primarily based on agriculture and livestock, with significant production of fruits and vegetables. In recent years, tourism has also become a major economic driver due to the attractiveness of the lakes and recreational infrastructure. Additionally, the region's clay-rich soil has long supported the production of bricks, tiles, and pottery, industries which continue today in smaller workshops (Goller. gen.tr, 2024).

The district's proximity to Ankara offers excellent transportation links, with the E-5 highway running through it and well-established public transport options. Gölbaşı has seen significant investment in education, healthcare, and social services, further enhancing its infrastructure and appeal for future development (T.C. Kültür ve Turizm Bakanlığı, 2024).

02.03. Building Site and Surroundings

Building Site and Surroundings 1:5000

Fig.13: Building Site and Surroundings in 1:5000 Scale

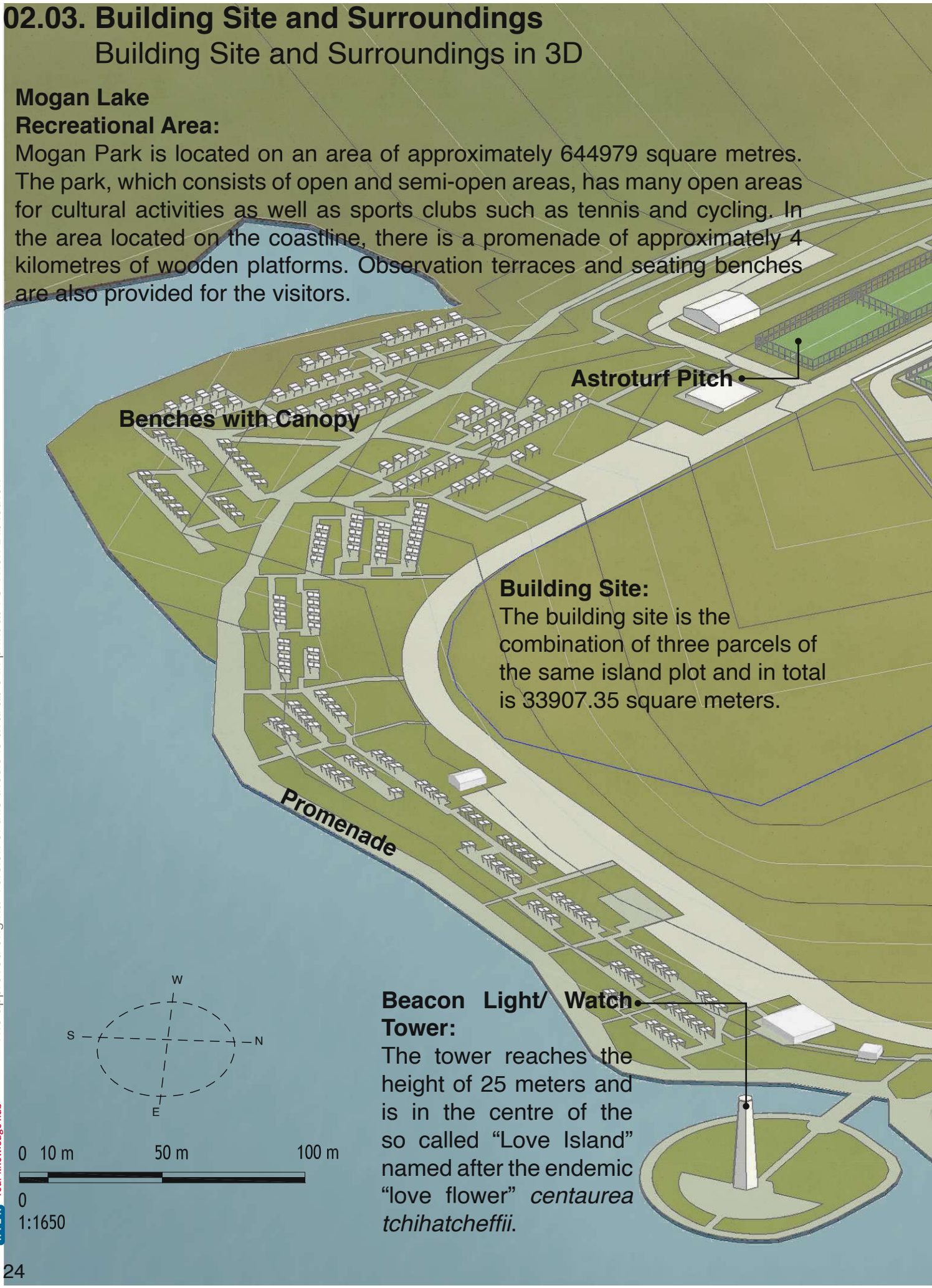
Instances from the Mogan Lake Recreational Area

Figures 14,15,16,17: Mogan Lake Recreational Area
Photo Credit: Murat Taşkın, 2013

02.03. Building Site and Surroundings

Building Site and Surroundings in 3D

Mogan Lake
Recreational Area:
Mogan Park is located on an area of approximately 644979 square metres. The park, which consists of open and semi-open areas, has many open areas for cultural activities as well as sports clubs such as tennis and cycling. In the area located on the coastline, there is a promenade of approximately 4 kilometres of wooden platforms. Observation terraces and seating benches are also provided for the visitors.



Building Site:
The building site is the combination of three parcels of the same island plot and in total is 33907.35 square meters.

Beacon Light/ Watch Tower:
The tower reaches the height of 25 meters and is in the centre of the so called “Love Island” named after the endemic “love flower” *centaurea tchihatcheffii*.

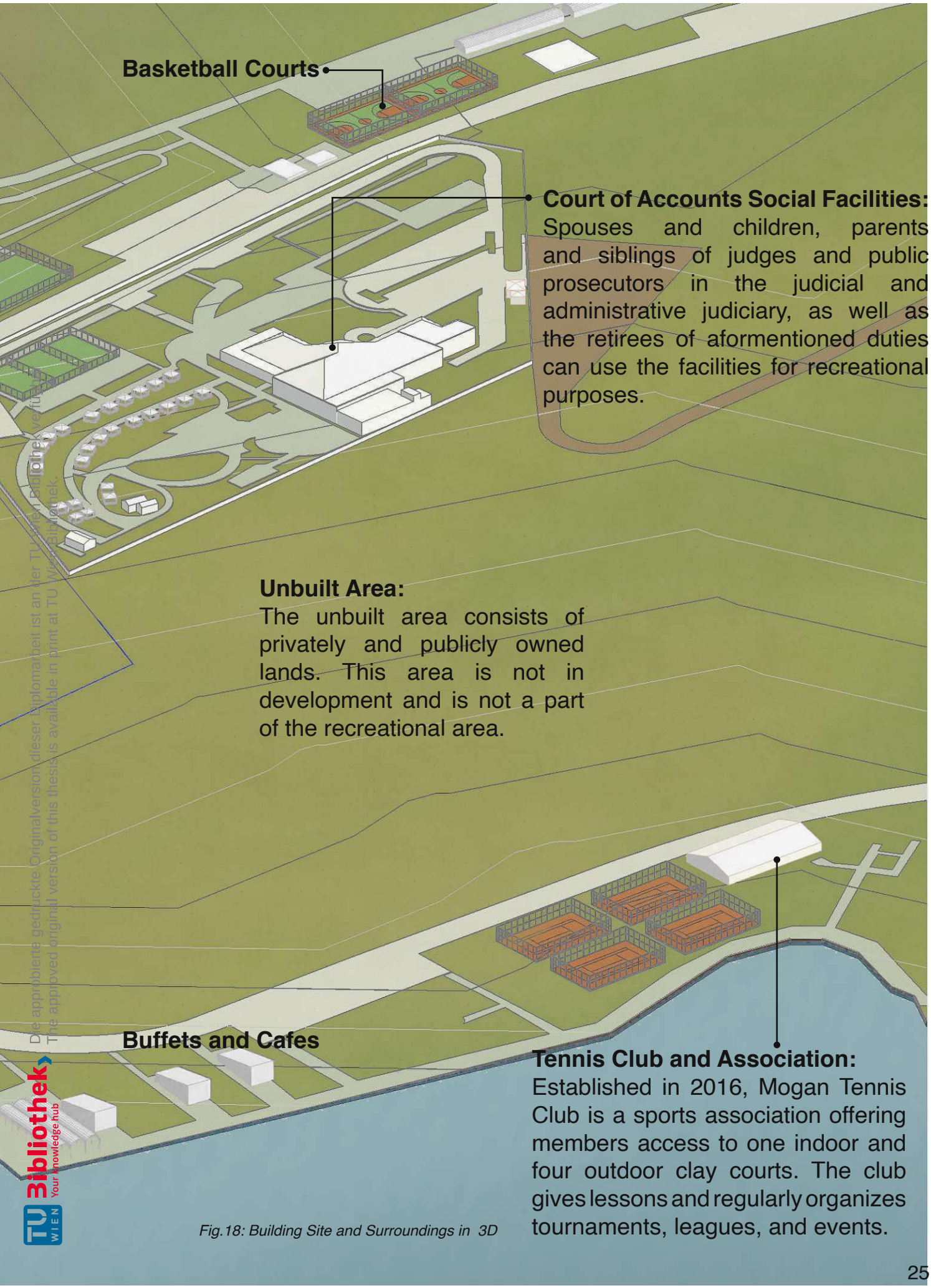


Fig.18: Building Site and Surroundings in 3D

02.04. Site Analysis

Building Site 1:2000

Legend:

- Buildings
- Greenhouses
- (Sports) Court
- Building Site
- Mogan Lake
- Roads and Pavements
- Dirt Road
- Topography Lines (1m)
- Topography Lines (0.5m)

Fig.19: Building Site and Surroundings in 1:2000 Scale

02.04. Site Analysis

Analysis 1:2000

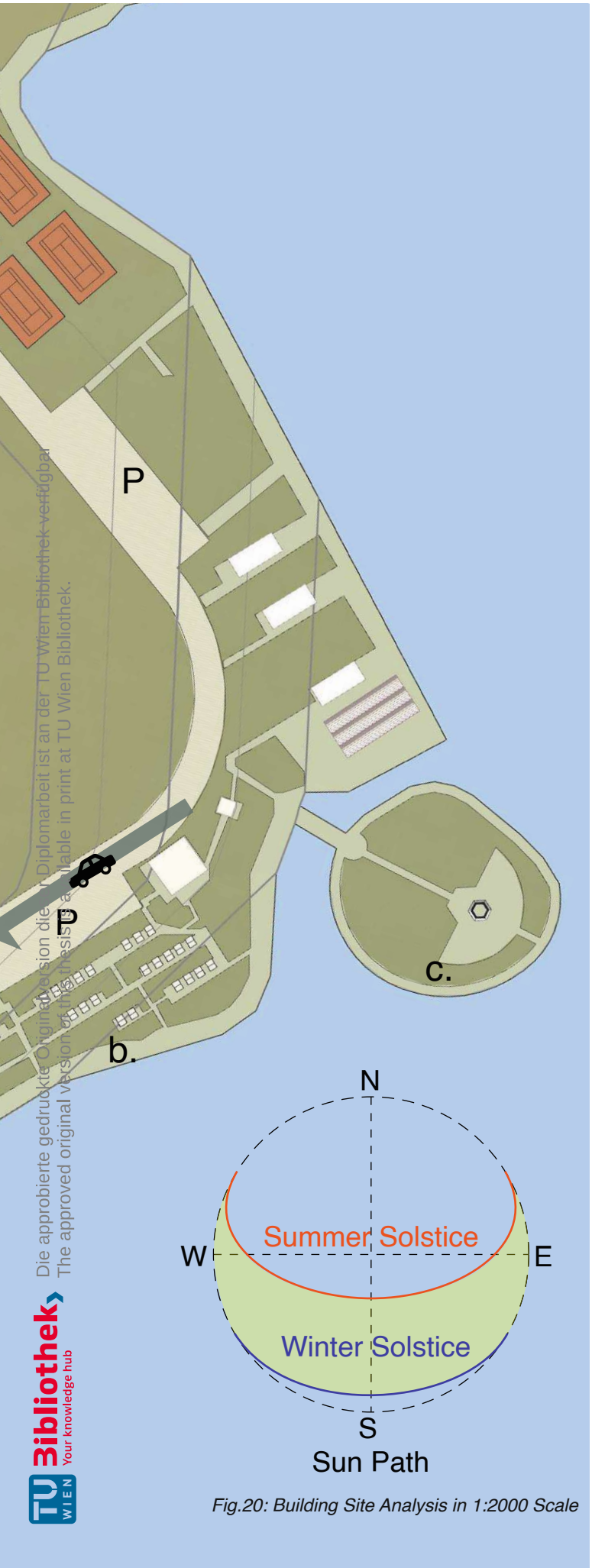


Fig.20: Building Site Analysis in 1:2000 Scale

a.

b.

c.

d.

Fig.21,22,23,24: Mogan Lake Recreational Area
Photo Credits:
a) Ankarafirma.net, 2020
b,c) ANFA Genel Müdürlüğü, 2020
d) Google Maps, 2023

02.04. Site Analysis

Analysis 1:2000

The surrounding spaces exhibit varying degrees of privacy and land use characteristics. The adjacent vacant lands are either privately owned or form part of public property under government control. The social facilities serve as a semi-public space, accessible exclusively to employees of the Court of Accounts and their families. In contrast, the coastline functions as a recreational area, fully open to the public and available for general use.

Consequently, the building site is situated within a diverse context of spatial uses. This diversity supports the centre's multifunctionality, ensuring its compatibility with the surrounding environment.

Public

Semi- Public

Private

Fig.25: Building Site Analysis in 1:2000 Scale

03 Goals

03. Goals of the Rehabilitation Centre

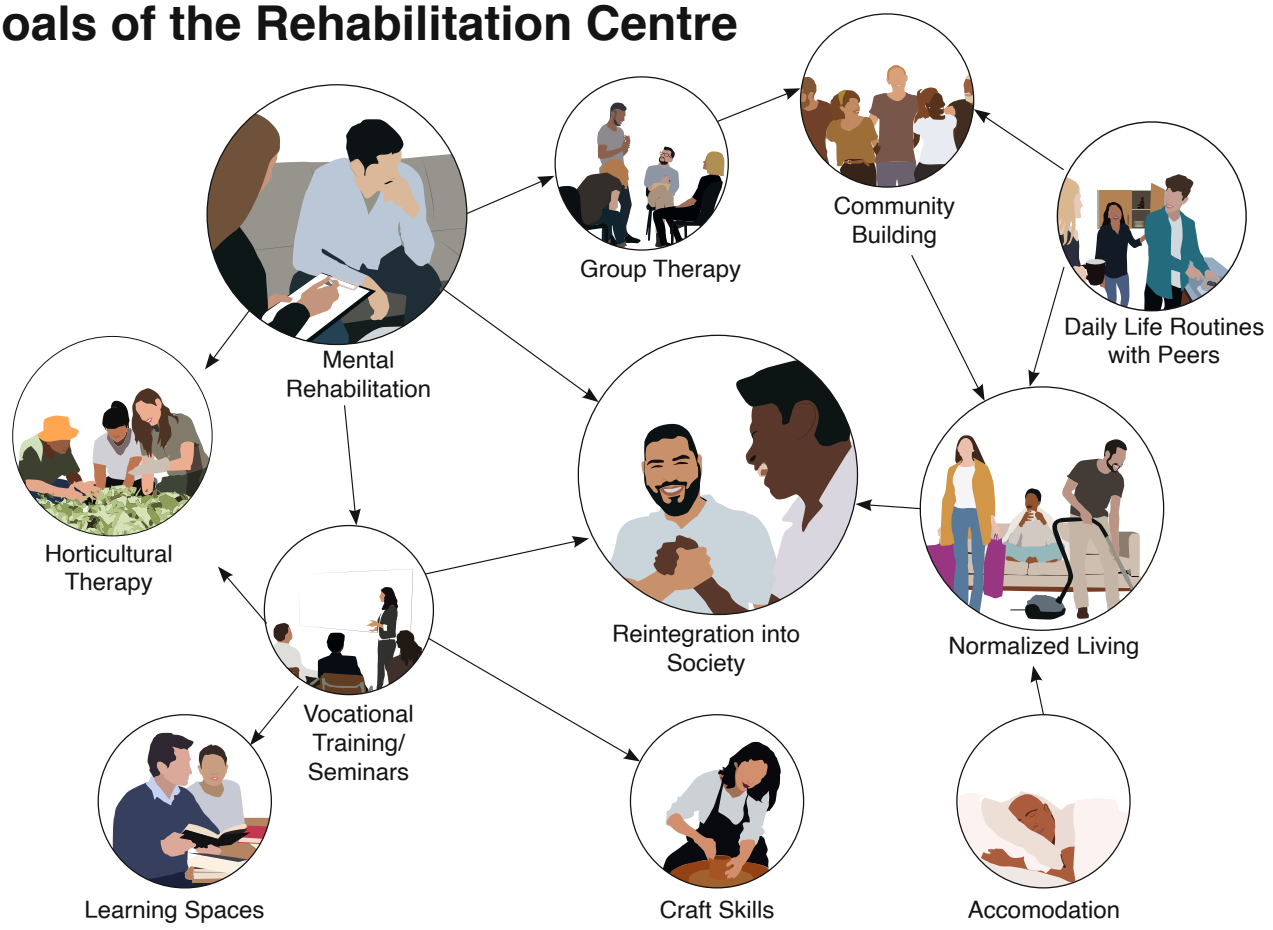


Fig.26: Goals of Rehabilitation Centre in Relation to Eachother

The primary goal of the rehabilitation centre is to support the mental rehabilitation of psychiatric patients, ultimately facilitating their reintegration into society. To achieve this, the centre must offer a comprehensive range of services designed to address the complex needs of these individuals.

Successful reintegration requires a multifaceted approach. While cognitive behavioural therapy (CBT) is crucial for helping patients manage their mental health conditions, it is equally important to provide them with the skills necessary for independent living. This project proposes the creation of dedicated spaces where patients can learn life and craft skills, equipping them to enter the workforce and sustain themselves after discharge. Additionally, the integration of horticultural therapy, through the development of on-site greenhouses, is recommended. This therapeutic approach not only allows patients to connect with nature but also offers them the opportunity to develop valuable skills in a calming environment, which can be beneficial for their overall mental health.

As highlighted in the research, continuity of care post-discharge is essential in preventing rehospitalisation. To support this, the centre emphasizes a normalized living environment, providing shared accommodation where patients can establish daily routines and build a supportive community. This living arrangement is designed to help patients transition back into their social environments, reducing the likelihood of relapse and fostering a sense of belonging that is critical for long-term recovery.

04 Methodology

04. Methodology

Literature Review

The research process began with a literature review focusing on the current state of mental illness treatment and the quality of mental healthcare facilities in Turkey. This provided a foundational understanding of the local context and highlighted the gaps and challenges within the existing system. To gain a broader perspective, the evolution of mental healthcare facilities on a global scale was also examined, along with modern approaches and best practices in psychiatric care. The literature emphasized the critical role of rehabilitation in the long-term treatment of psychiatric patients, particularly the need for structured rehabilitation opportunities to reduce rates of rehospitalization. From this, the project adopted a community-based care model coupled with a human-centered design philosophy. This approach underscores the therapeutic potential of the built environment, demonstrating how architectural design can significantly impact mental health outcomes.

Determination of Goals and Philosophy

Following the literature review, specific goals were established to guide the project. These goals were informed by the key findings of the research, particularly the necessity of integrating mental health treatment with rehabilitative and community-oriented care. The philosophy underlying the rehabilitation center was then developed, rooted in the principles of inclusivity, dignity, and support for mental health recovery. The design aims to create an environment that not only facilitates healing but also reintegrates patients into society, challenging the stigmatization often associated with mental illness.

Site Analysis

A site that would best support the project‘s goals was selected. The selected site was evaluated based on its geographical, environmental, and socio-cultural characteristics, ensuring it met the necessary criteria for a therapeutic environment. Key considerations included the site‘s accessibility, the availability of natural light, and the potential for integrating outdoor spaces, such as gardens and care farms, which are known to have positive effects on mental health. The analysis informed critical design decisions, such as building orientation and the relationship between indoor and outdoor spaces, all aimed at maximizing the healing potential of the environment.

Design Process

The design process was iterative, beginning with the development of several conceptual frameworks. The first step was the creation of an urban concept, which was shaped by the site analysis and included determinations regarding building

heights, volumes, and overall site layout. Following this, a form concept was developed to enhance the architectural quality and significance of the project, ensuring it aligns with both aesthetic and functional objectives. The living concept was then articulated, drawing on insights from the literature review to create spaces that support the day-to-day lives of residents, fostering a sense of community and belonging.

These concepts were further refined into detailed space allocations and floor plans, which guided the spatial organization of the facility. The final stage involved selecting appropriate construction methods that align with the project‘s goals, ensuring feasibility and sustainability. With these elements in place, the project was brought to completion, culminating in rendered images that encapsulate the holistic vision of the rehabilitation centre and its underlying philosophy.

Design Philosophy of the Rehabilitation Centre

The core of this project is human centred design. Architecture should prioritize the needs, experiences, and well-being of its users. Patients and residents should be viewed as active participants in their healing process, and the environment should be designed to support their mental, emotional, and social needs. It is important to create spaces that uphold the dignity of all individuals, particularly those who are marginalized or stigmatized, such as psychiatric patients. This includes ensuring that the design does not feel institutional or alienating but rather warm, inviting, and homelike. Additionally, access to green spaces and the use of natural, sustainable materials are important elements. The built environment can play a crucial role in healing. This draws from the principles of environmental psychology and therapeutic architecture, which suggest that spaces can positively influence mental states and recovery.

The implication here is to create spaces that are not just functional but also therapeutic, using design elements like natural light, access to nature, privacy, and communal spaces to promote mental health. Design decisions are informed by evidence-based research on how different environmental factors (such as light, colour, materiality, and spatial organization) impact mental well-being. The design incorporates features that make the space feel less like a traditional hospital and more like a community or home, aiming to reduce stigma and promote a sense of belonging. In order to achieve that the connection with nature is emphasized and using materials like rammed earth will support the facilities atmospheric qualities. Integrating gardens or care farms to connect patients with nature will be a part of their rehabilitation.

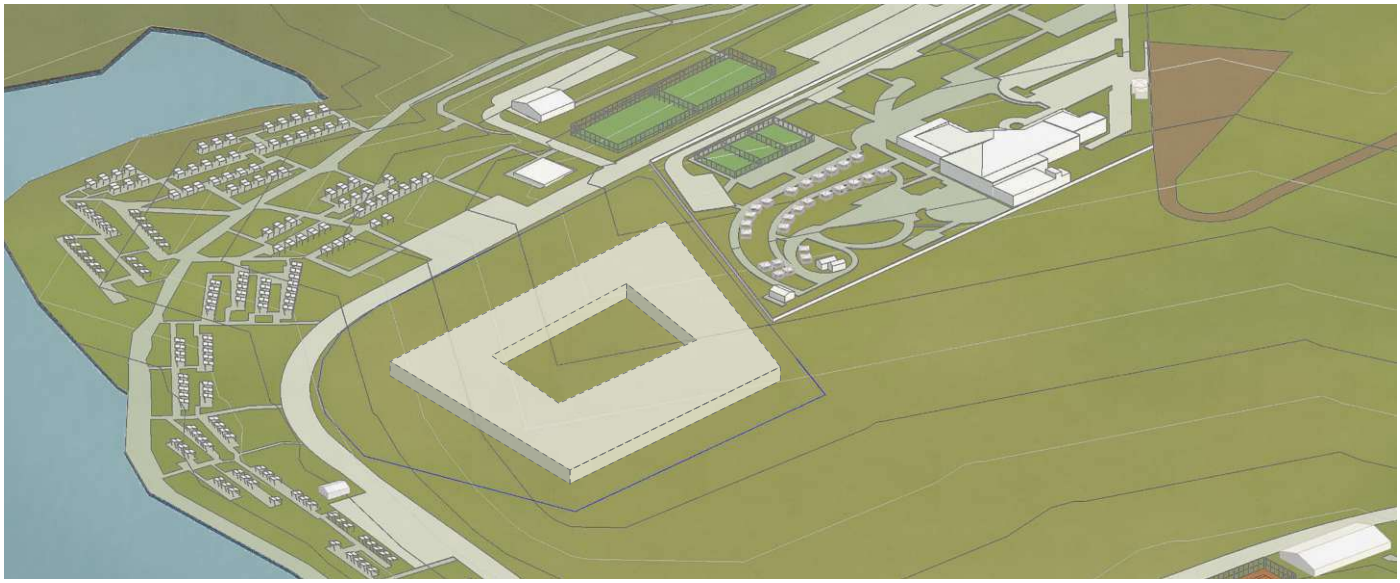


Fig.27: Urban Concept

04.01. Urban Concept

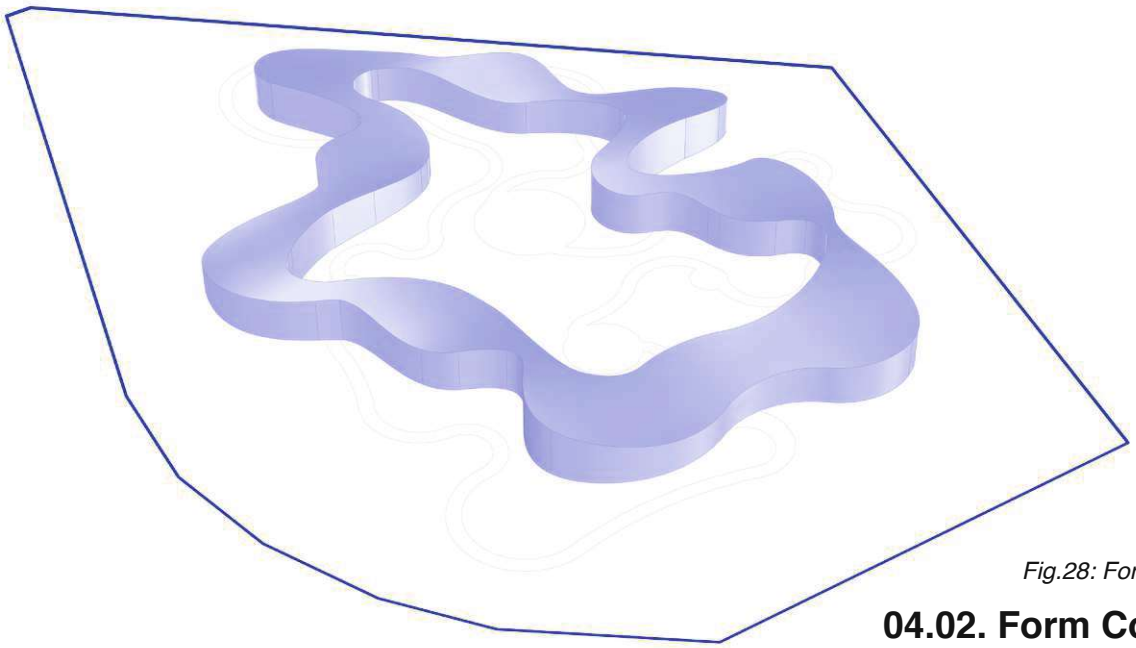


Fig.28: Form Concept

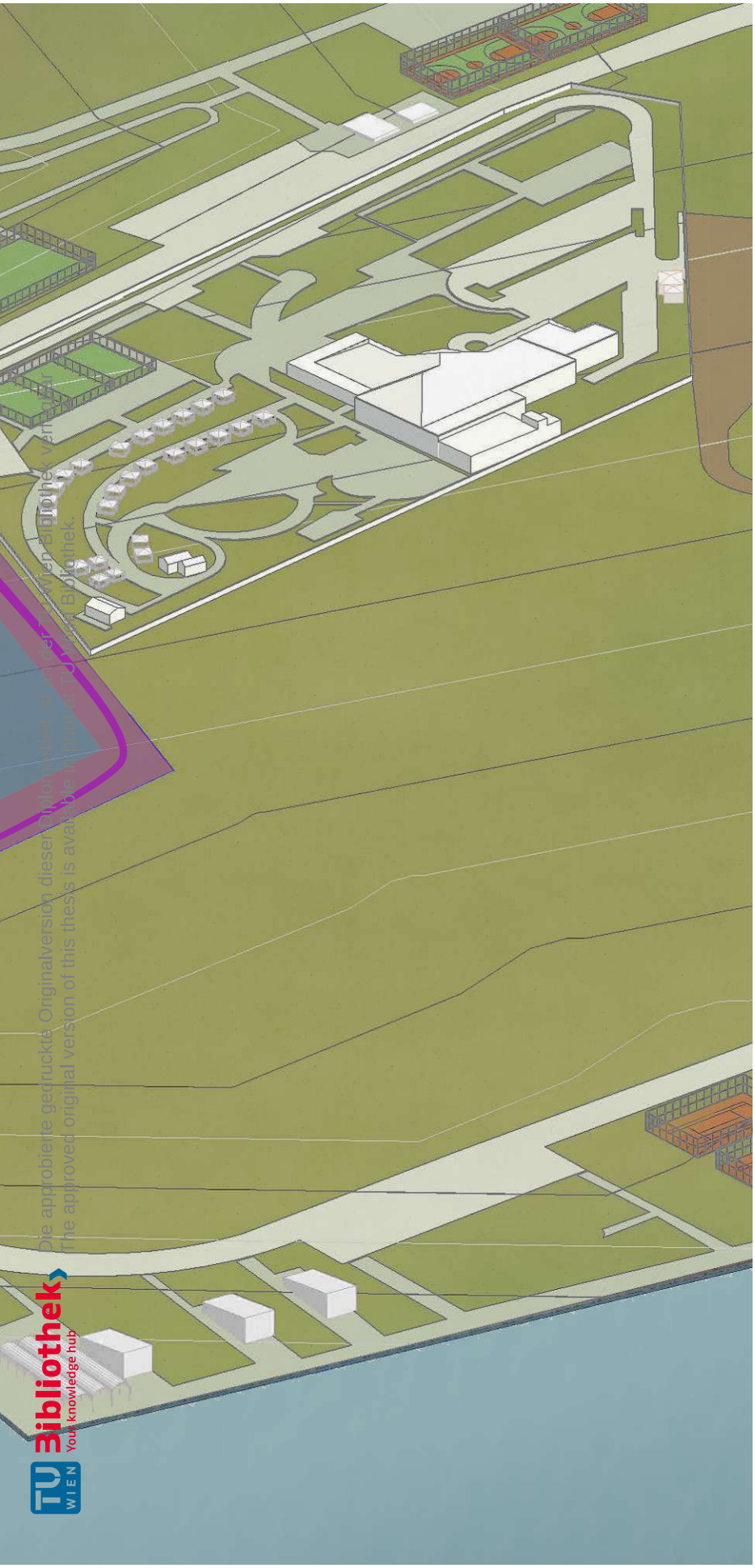
04.02. Form Concept

Fig.29: Living Concept

04.03. Living Concept

04.01. Urban Concept

Access



Asphalt road encircle the building site so that it isolates the middle zone to create a “safety zone” that omits the disturbance that can come from the outside stimulants. This way it is possible to also create a world within a world and a village-like setting for the patients.

The encirling road also enables access to the middle zone for various services such as waste management and emergency access to all quarters of this rehabilitation village. It also serves as fire safety road. In case of fire emergency the fire extinguishing teams can come in with their vehicles and equipment to carry out operations and evacuation.

Pedesterians can come in and out from the entry and exit points. The centre can then also carry out excursions with the patients in the recreation area and if allowed the patients can come and go at their free will as well when it is helpful to their recovery process.

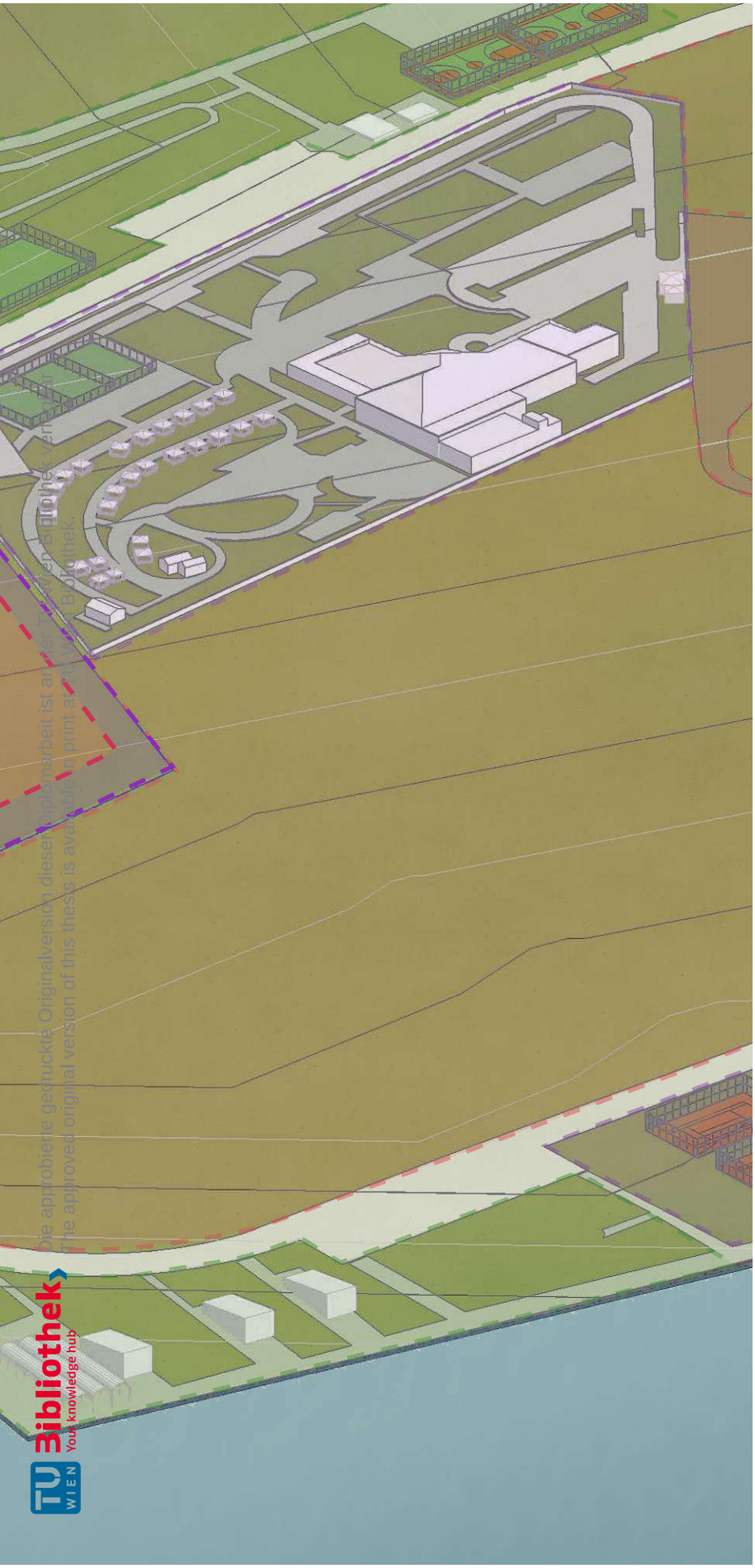
Pedesterians

Motor Vehicles

Fig.30: Urban Concept - Access Diagram

04.01. Urban Concept

Public-Private Relations



The surrounding space has a clear divide between the public and private functions. As in the nature of the rehabilitation centre the complete of the building has to be a semi-private space but since there will be patients residing in the premise for their rehabilitation process, it is appropriate to close this area only for the patient and the staff tasked with checking in on the patients.

This is the reason the semi-public area including the vehicle zone and the educational part of the rehabilitation centre will protect the private zones by encircling it. The wider area of the semi-private are will be to the public side while the private part is closer to the surrounding private area.

Public

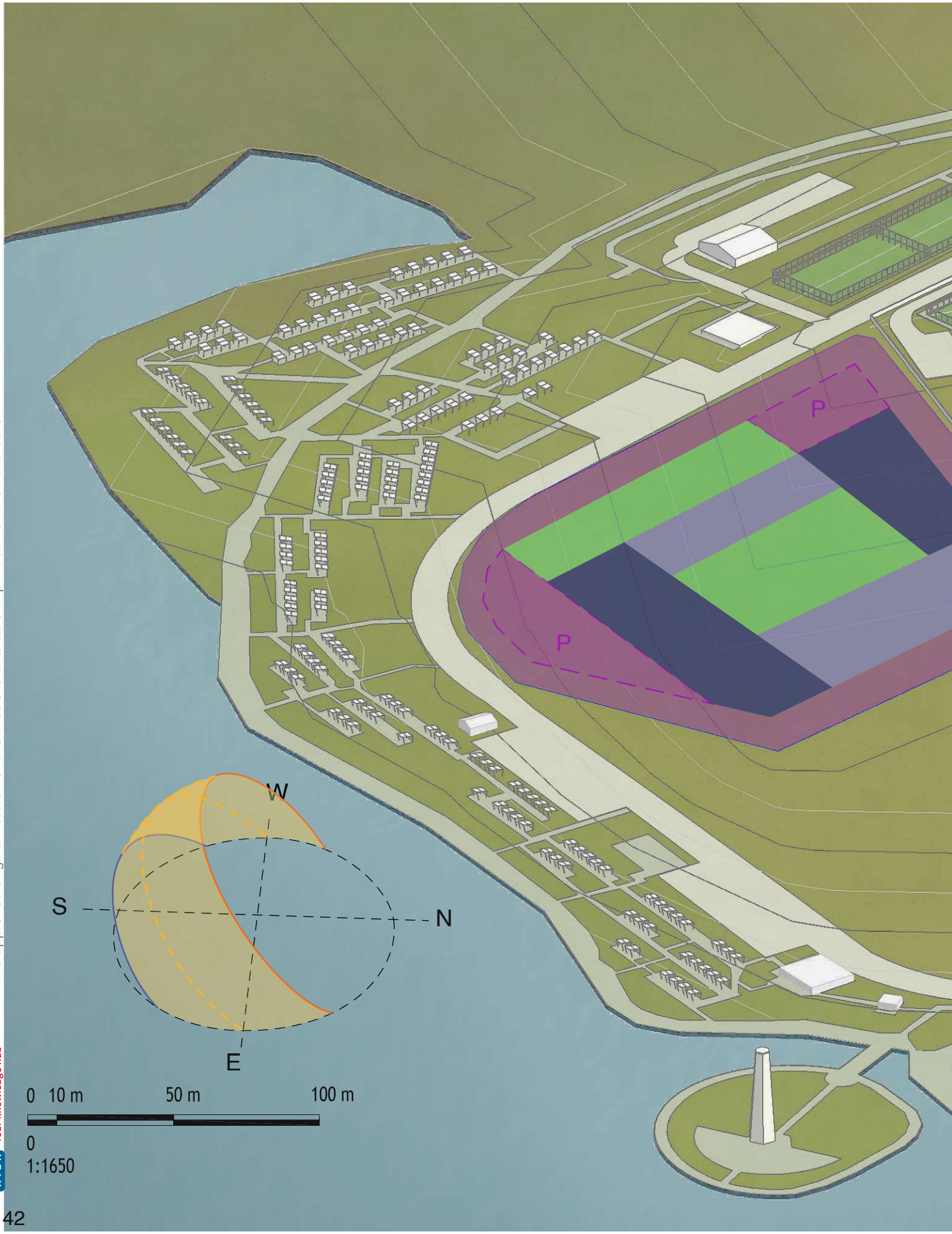
Semi- Public

Private

Fig.31: Urban Concept - Public-Private Diagram

04.01. Urban Concept

Function Separation



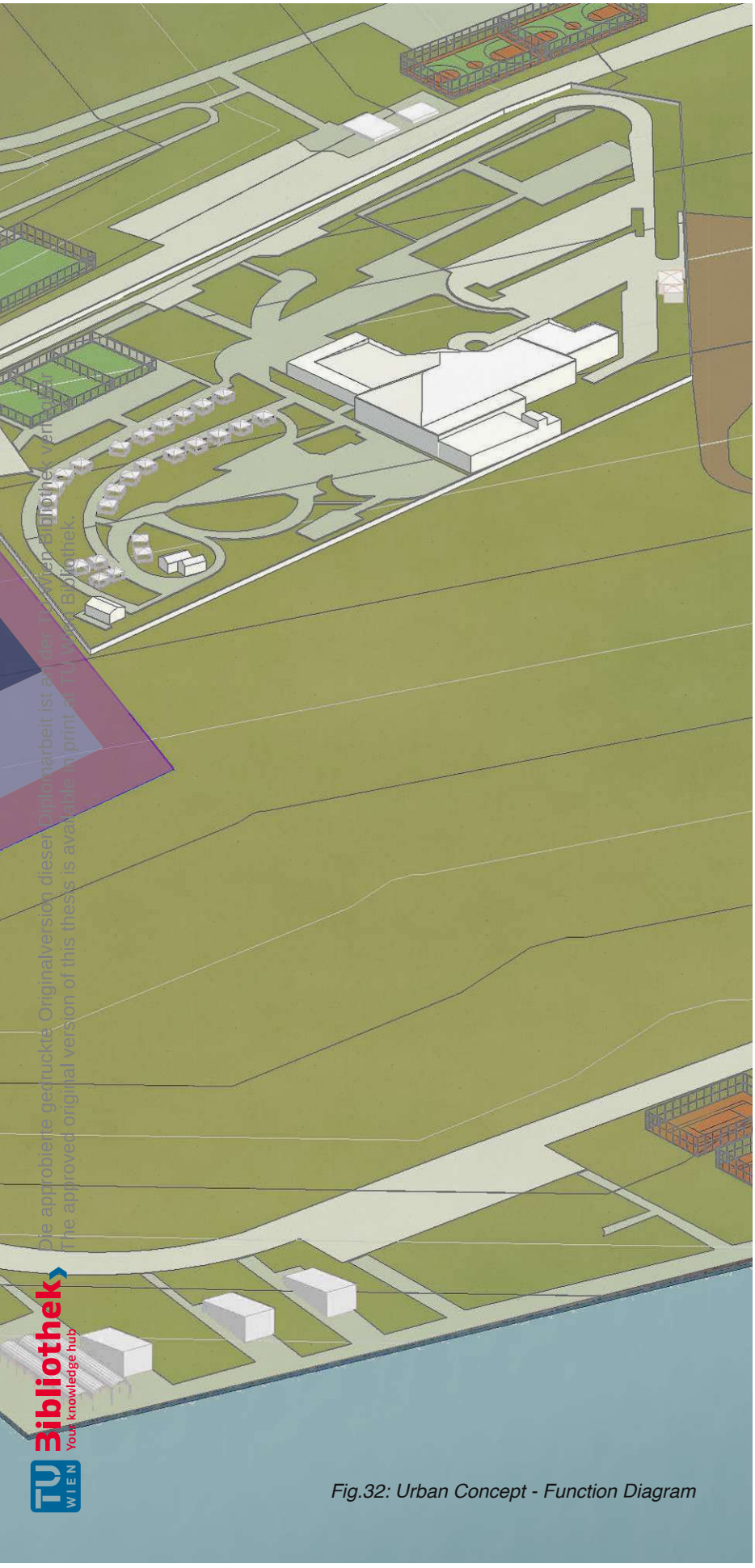


Fig.32: Urban Concept - Function Diagram

After the access and the privacy issues are resolved, the three distinct functions should be highlighted: Living Spaces, Rehabilitation Centre and the Greenhouses/Vegetation.

Rehabilitation centre welcomes the people at the entry point and oriented mostly to southern region. This again creates a puffer zone for the living areas. The second part of the rehabilitation centre is on the back side, which will create a puffer zone between the living spaces and the social facilities. The social facilities are a semi-public space as well and the back part of the rehabilitation centre could serve more intimate functions related to rehabilitation such as therapy instead of occupational education.

The living spaces are oriented in east-west directions which is ideal for residential purposes.

There can be greenhouses situated in the open courtyard that is created by the placement of previous functions. The vegetation area between the entry and exit points serves as another puffer room for the living quarters.

- Living and Private Activity Spaces
- Rehabilitation Centre
- Greenhouses and Vegetation
- Parking and Roads

04.01. Urban Concept

Potential Space and Heights

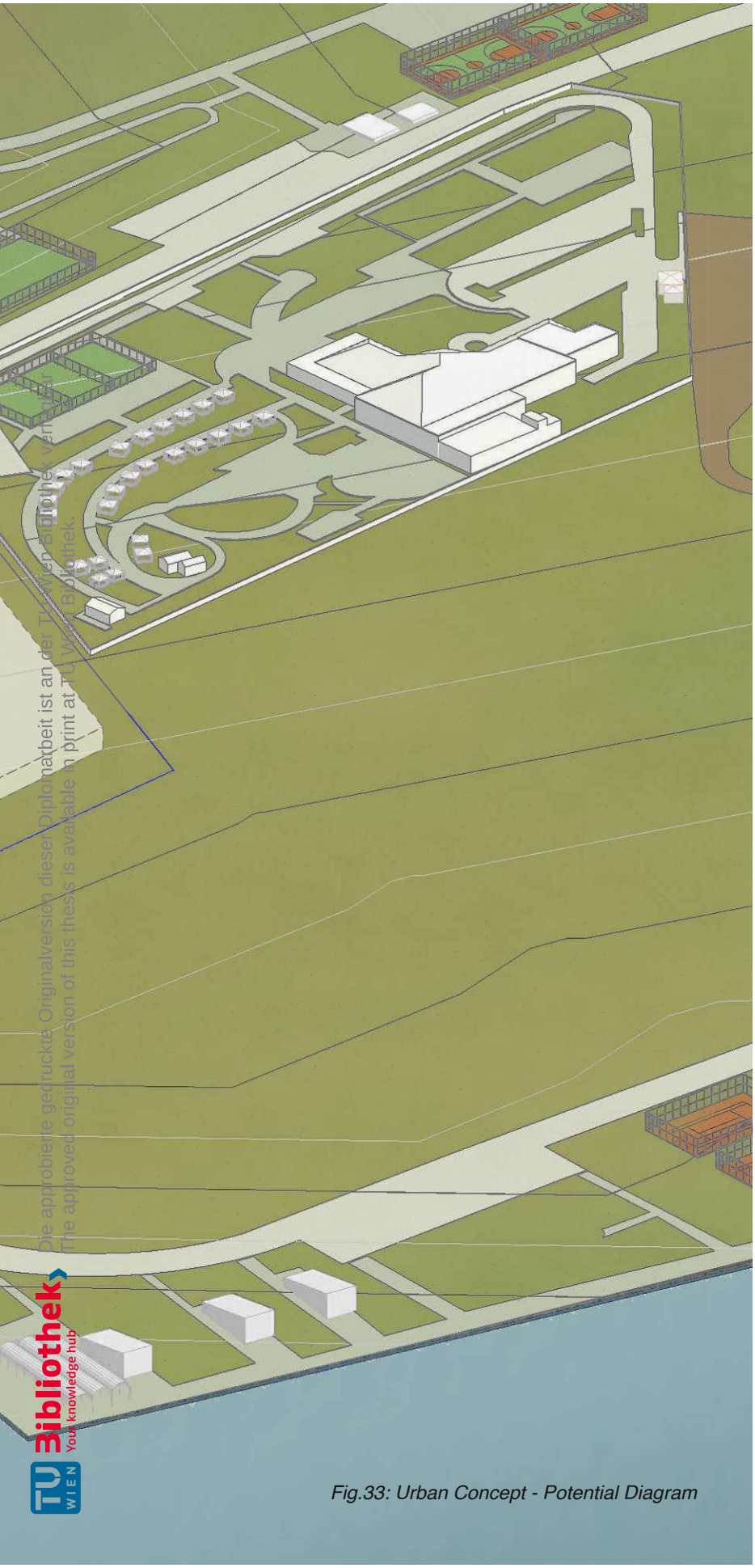


Fig.33: Urban Concept - Potential Diagram

After the assessment of the functional division of the building space, this leaves us the potential closed space. In order to match the heights of the surrounding buildings the strategy is to use floor space instead of heights, which means it is a “low-rise” strategy. This means the building height will be two to three storey high similar to the social facilities next door.

Utilizing this strategy, the project also mimics the idea of a village built for patients. It is also safer and makes space for reassuring and peaceful rehabilitation.

04.02. Form Concept
Variants of Conceptual Forms

Reference Photos

3D Reconstruction of Neurons

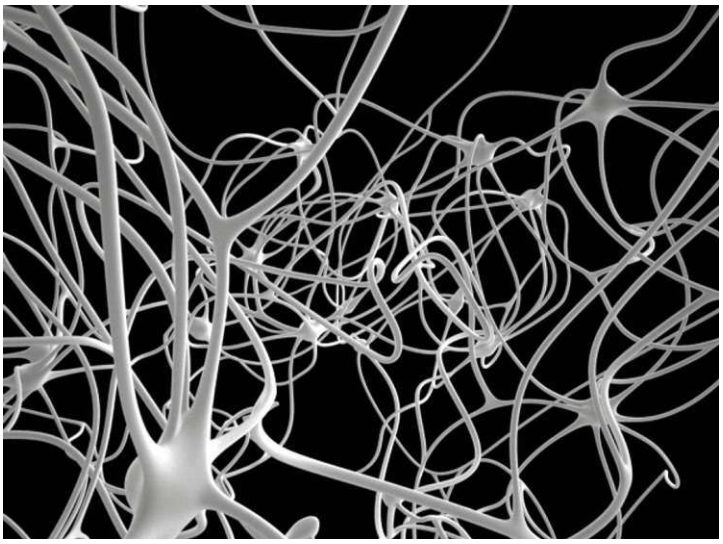


Fig.34: 3D Reconstruction of Neurons
Image Credit: User "AhearnART3D" in Turbo Squid, 2011

3D Reconstruction of Neurons

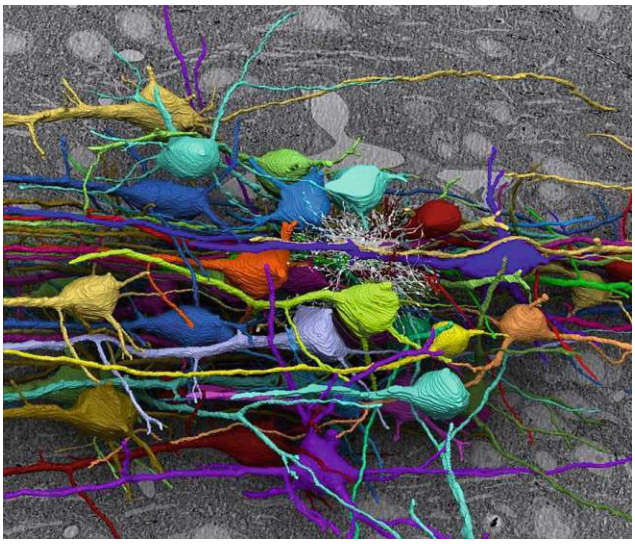


*Fig.35: 3D reconstruction of neurons from ZEISS Atlas dataset, mouse brain, ultrathin sections on wafer, ATUM preparation, image width 50 * 50 µm, ZEISS FE-SEM. Image Credit: Daniel Berger, Group of S. Seung, Dep. Brain and Cognitive Sciences, MIT. G. J. Lichtman, Molecular and Cellular Biology, Harvard, USA*

The form concept is deeply rooted in the intricate structure of the brain, drawing both inspiration and symbolism from its neurological architecture. The initial images reflect the way neurons are interconnected within the brain, with synaptic pathways forming a complex, cohesive network. These connections are represented as strands, where the cell bodies are symbolized by bulges along the strings.

The first variant explores an overlapping network of pathways, akin to a fully connected neural web, emphasizing the dense interconnectivity characteristic of brain function.

Variant 1

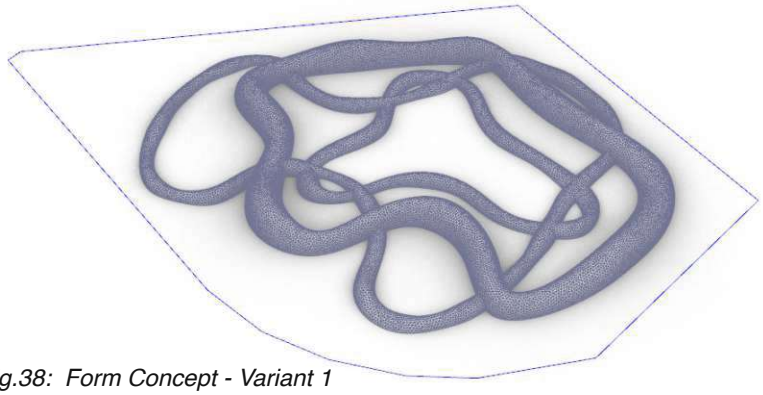


Fig.38: Form Concept - Variant 1

Variant 2

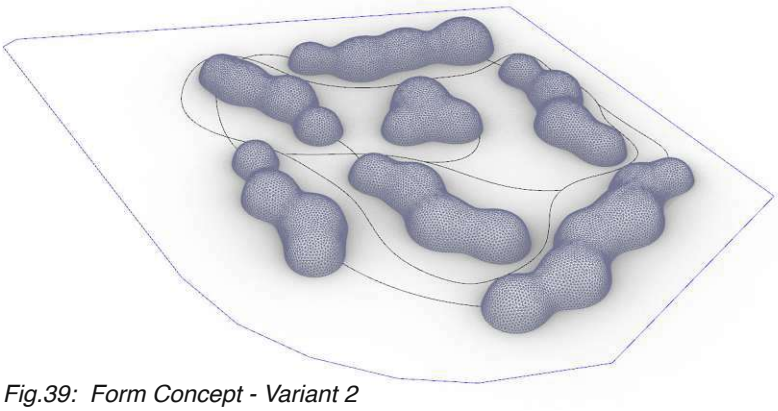


Fig.39: Form Concept - Variant 2

Histopathology of Human Brain

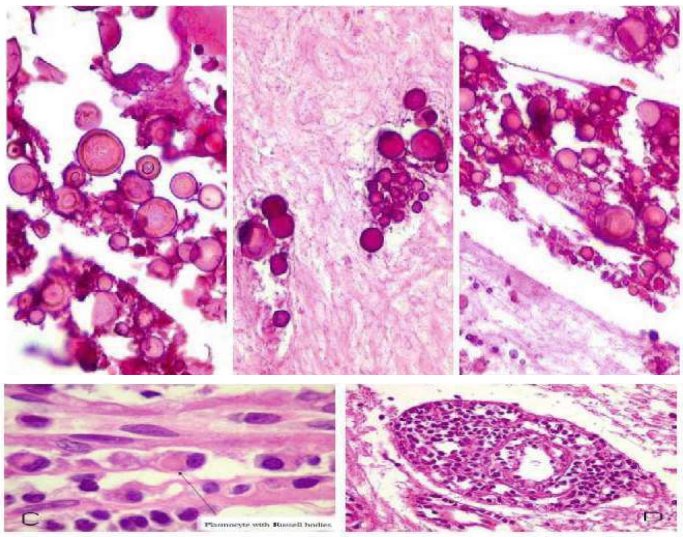


Fig.36: Histopathology of the Human Brain in Neurocysticercosis
Photo Source: E. Dametto, 2016

MRI of Human Brain

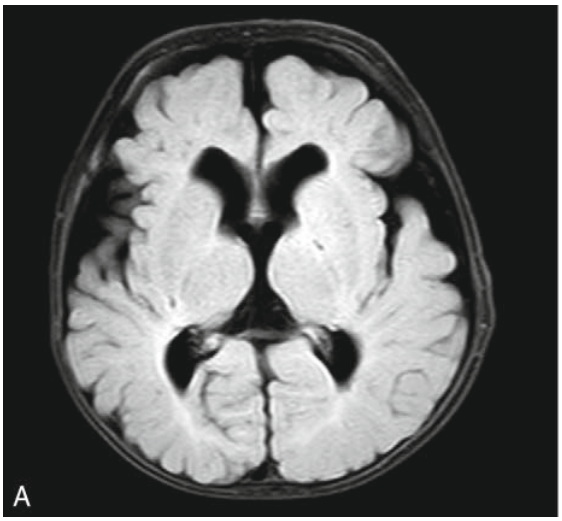


Fig.37: Somatic KRAS mutation in an infant with linear nevus sebaceous syndrome associated with lymphatic malformations
Image Credit: Jiang Lihua, MD, Gao Feng, MD, Mao Shanshan, MD, Xu Jialu, MD, Jiang Kewen, PhD,, 2017 in Medicine Journal

Variant 3

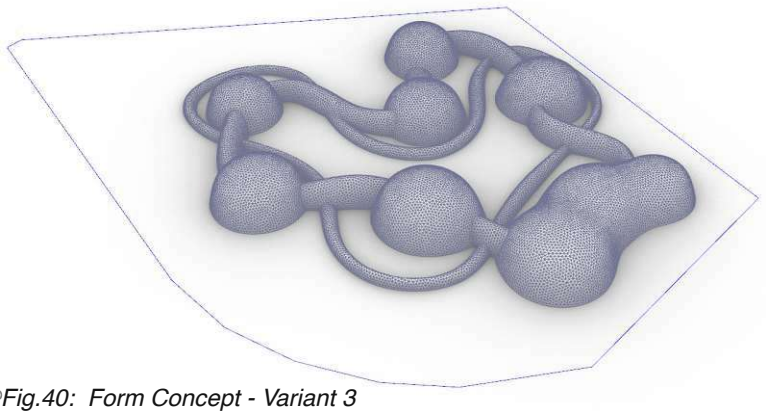


Fig.40: Form Concept - Variant 3

Variant 4

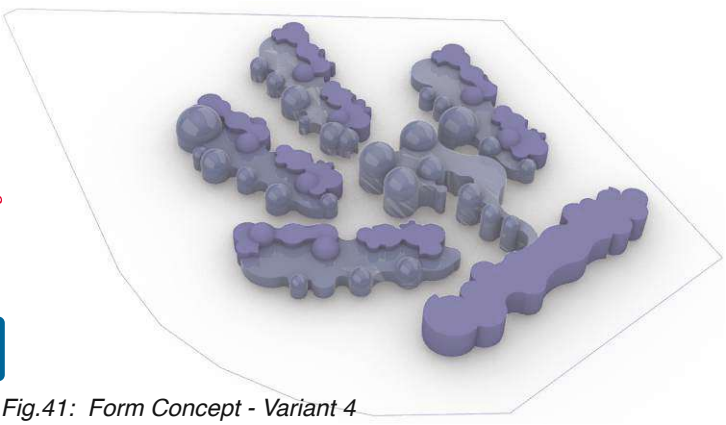


Fig.41: Form Concept - Variant 4

The second variant envisions these pathways as open connections between the bulges, creating a more segmented but still linked system.

The third variant presents a more literal interpretation of the strings and bulges, directly referencing neural structures.

The final and fourth variant takes inspiration from the cross-sections of the brain, echoing the forms seen in MRI scans and histopathological slides, translating the brain's organic sections into architectural form.

04.02. Form Concept

Variants of Conceptual Forms

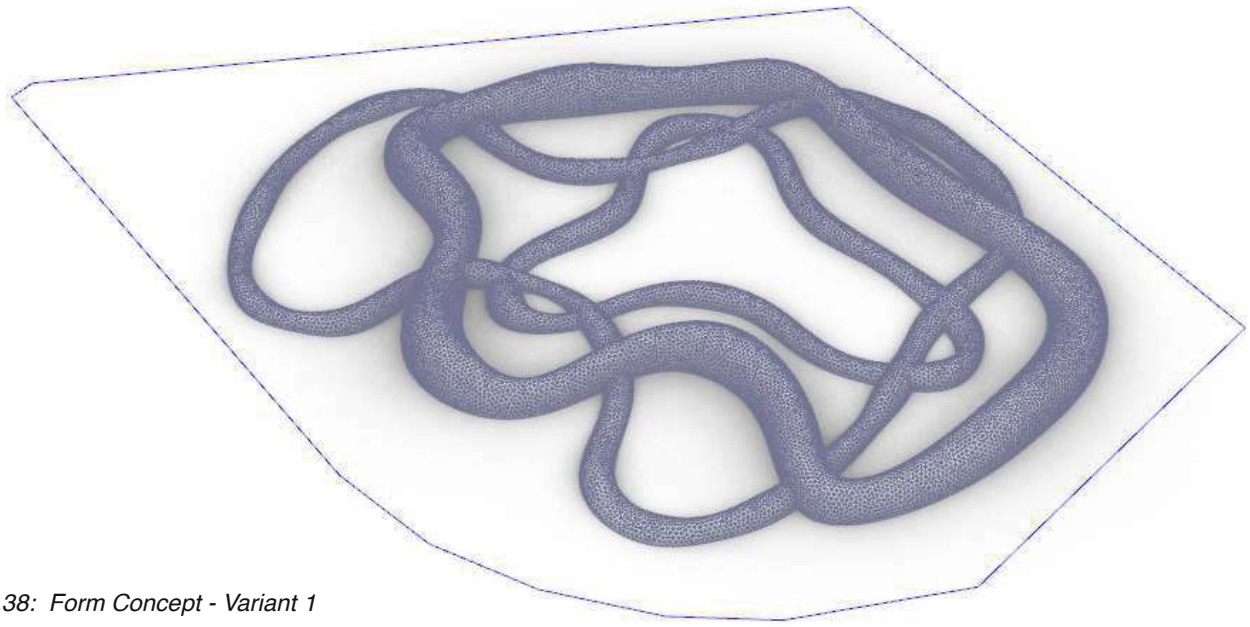


Fig.38: Form Concept - Variant 1

Variant 1

Loop forms that resemble neuron connections that narrow and widen.
Gross floor area of the first variant approx. 10311 m², 30.4% of the building site.

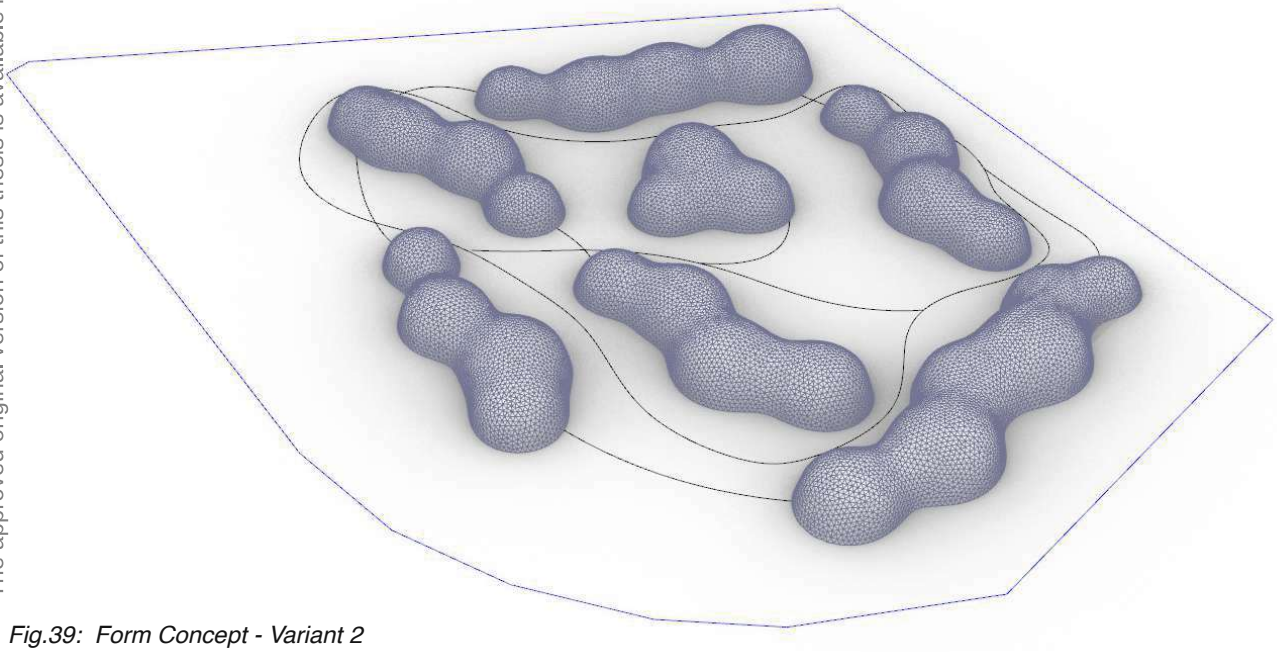


Fig.39: Form Concept - Variant 2

Variant 2

Spherical shapes that represent the cell of the neurons and outside connections that resemble the cell connectivity.
Gross floor area of the second variant approx. 9270 m², 27.3% of the building site.

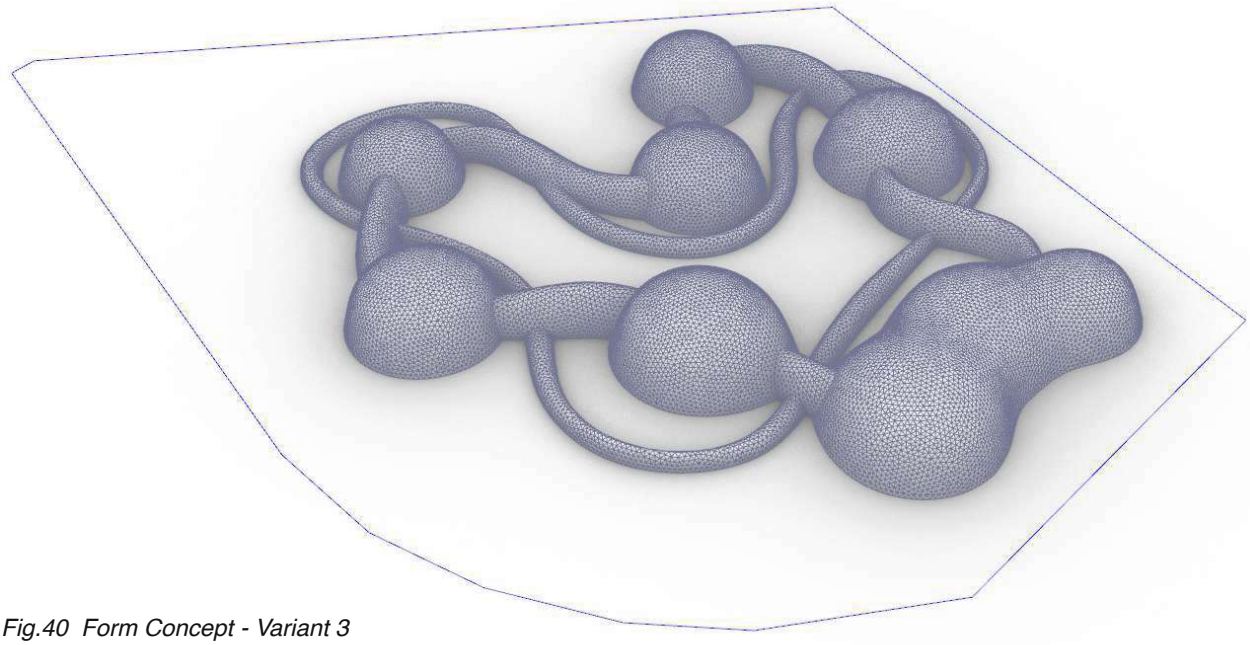


Fig.40 Form Concept - Variant 3

Variant 3

Spherical nodes that represent the cell body and loops that represent the connections to them.
Gross floor area of the third variant approx. 11265 m², 33.2% of the building site.

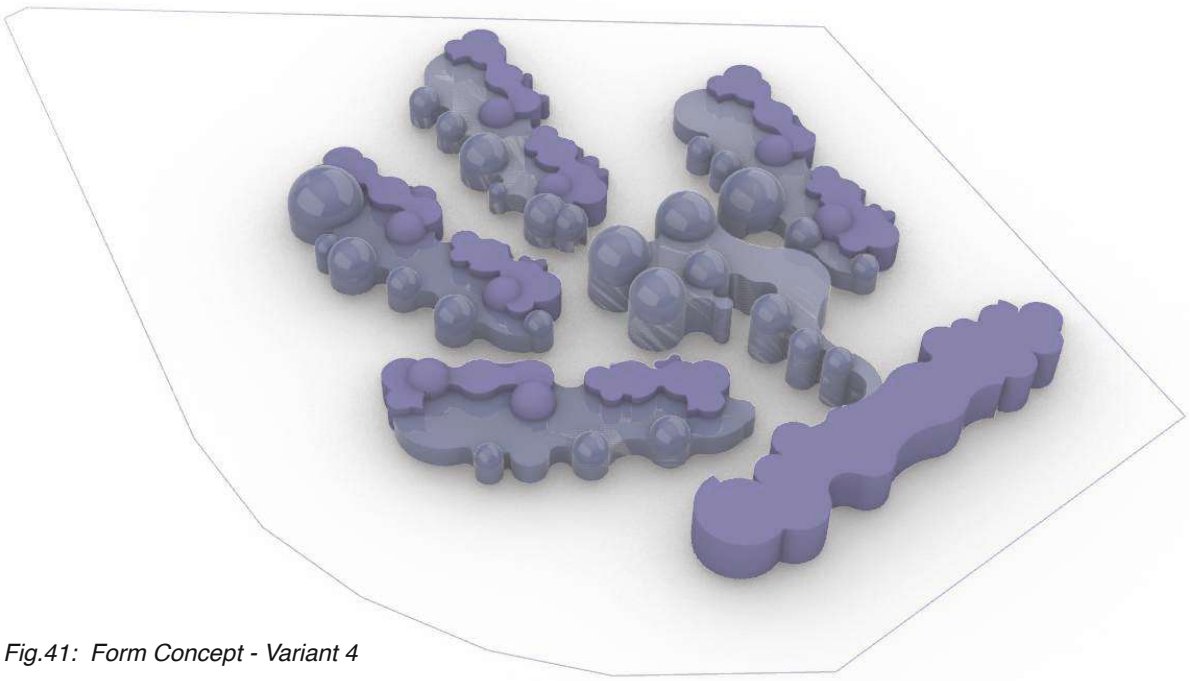


Fig.41: Form Concept - Variant 4

Variant 4

Curvy floor plan with spherical attachments that resemble the section of the brain seen on the MRI and histopathologic examination.
Gross floor area of the fourth variant approx. 8435 m², 24.9% of the building site.

04.02. Form Concept
Evolution of the Form

Variant 1

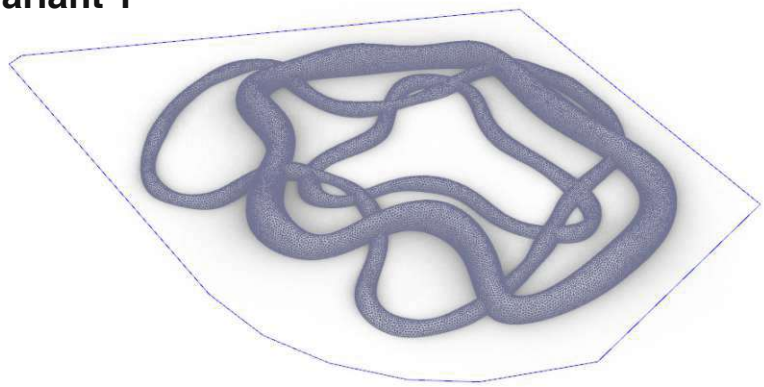


Fig.38: Form Concept - Variant 1

Loop forms that resemble neuron connections that narrow and widen.

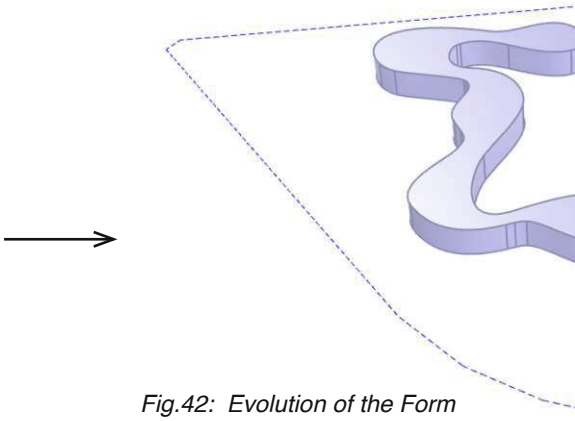


Fig.42: Evolution of the Form

Main structure of the rehab
widens quasiperiodically.

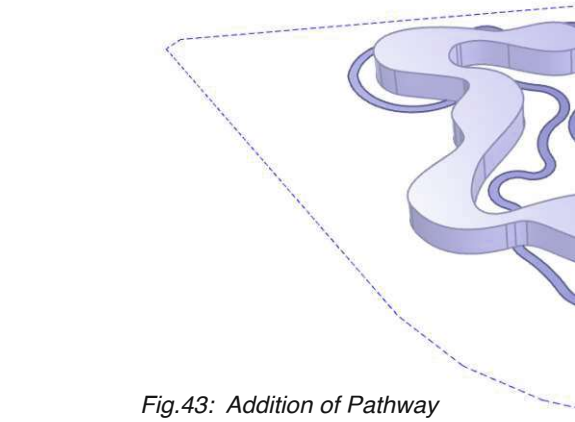


Fig.43: Addition of Pathway

A secondary loop is added
the courtyard, main buildin

Variant 3

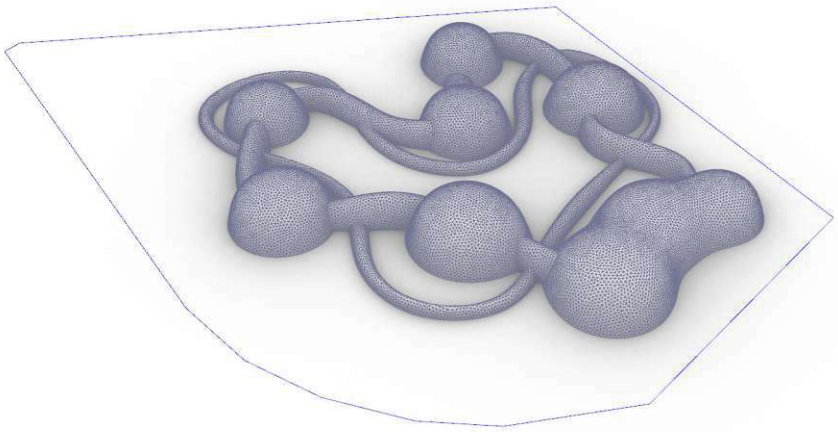


Fig.40: Form Concept - Variant 3

Spherical nodes that represent the cell body and loops that represent the connections to them.

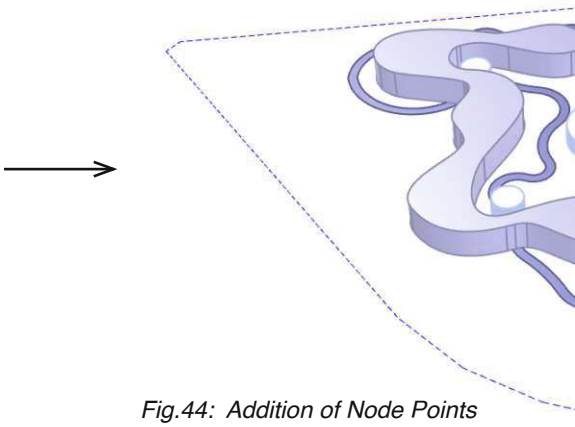
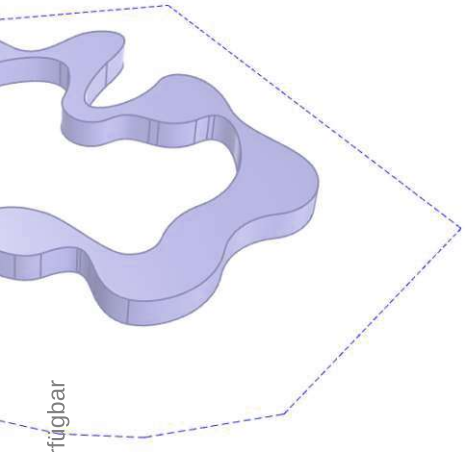
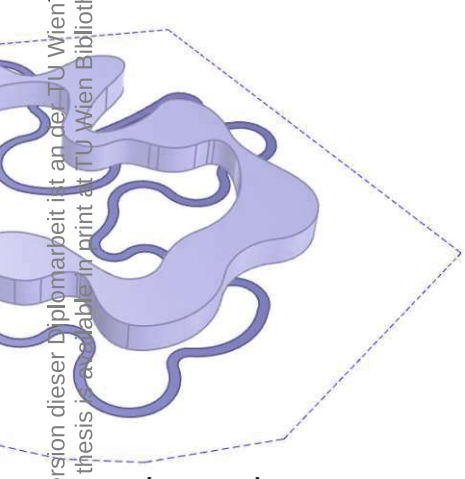


Fig.44: Addition of Node Points

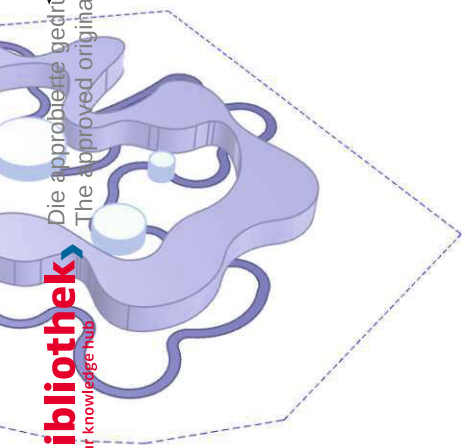
Cylindric shaped leisure sp
as node points of the pathw



ilitation centre as a loop that



as a pathway that connects
g and the extenal garden.



paces added to the courtyard
way

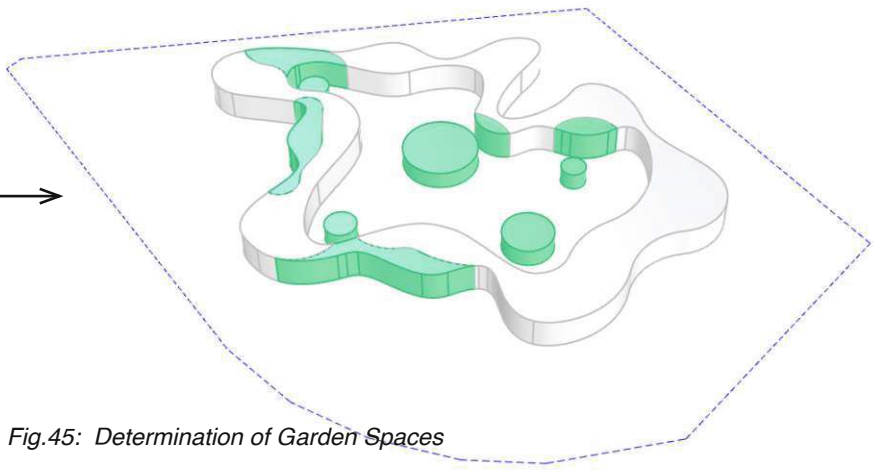


Fig.45: Determination of Garden Spaces

Transparent greenhouse and wintergarden spaces represented with green and rehabilitation centre represented with grey.

04.02. Form Concept

Final Conceptual Form

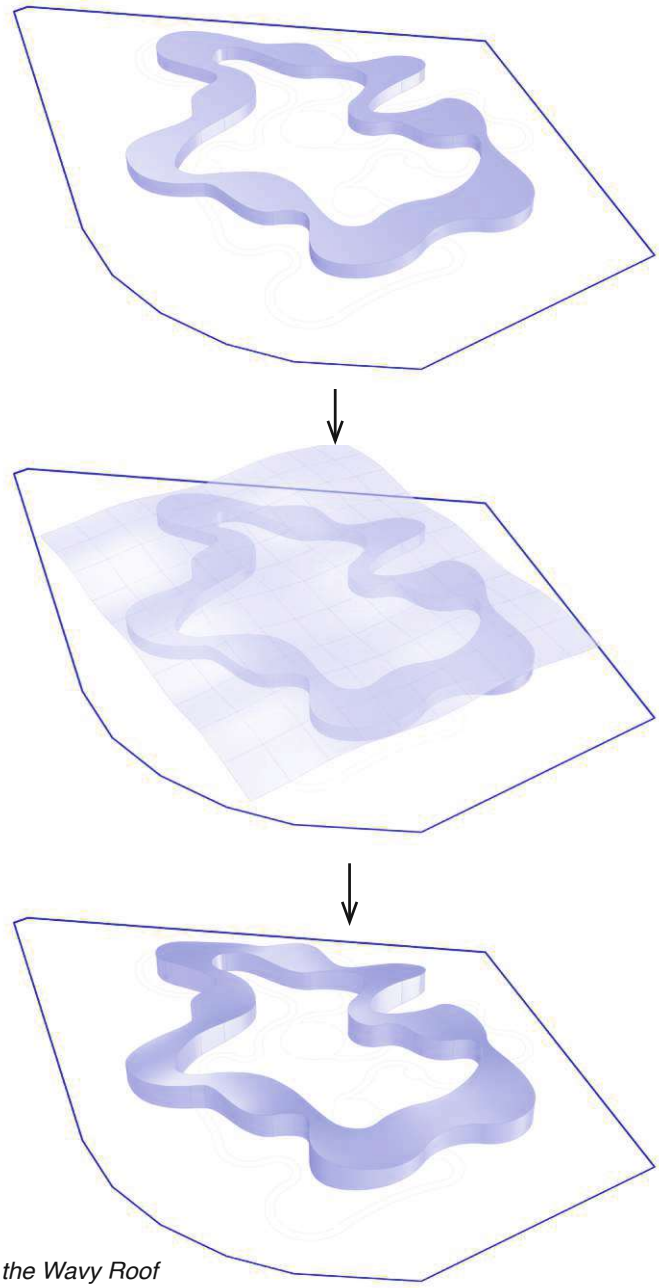


Fig.46: Creation of the Wavy Roof

Conceptualized dynamic floor plan cannot be thought with a simple flat roof form. In order to continue this dynamic form, some inspiration from the first variant that can be seen in the previous pages and the location has been drawn.

The surface of the lake and the arches of the prototype are simulated with a wavy shaped surface created with four lines that were drawn with sinus functions. These four lines would be the four edges of the wavy surface. The level difference of the lowest point to the highest point is in this case 3m. This surface is then laid on the main form and the main form is cut with this surface. Thus the final form for the main building is achieved.

Fig.47: Final Form

04.03. Living Concept

This collage encapsulates the essence of a healing environment designed for holistic rehabilitation. The centre integrates natural materials, such as rammed earth, with abundant green spaces to create a therapeutic atmosphere that fosters both physical and mental well-being. The design emphasizes the seamless connection between indoor and outdoor spaces, encouraging residents to engage with nature through activities like gardening and communal living.

Central to this concept is the idea of community support. The spaces are designed to facilitate social interactions, whether through group discussions, shared meals, or collaborative projects, all of which are vital for recovery. The inclusion of meditation areas and spaces for mindfulness practices further enhances the focus on personal growth and self-care.

This environment is not just a place to reside, but a nurturing space where individuals can rebuild their lives, reconnect with nature, and find strength in community. The design aims to support residents in their journey towards recovery, providing them with the tools and spaces they need to thrive.

Fig.29: Living Concept

04.04. Space Allocation

As previously discussed, certain functions are crucial to supporting the residents' healing and development. Vocational training and craft skills require dedicated classrooms and spacious workshop areas, while access to a library and study spaces will further enhance their learning opportunities. Additionally, the presence of a guidance counsellor is essential to help residents identify and advance skills necessary for the next phase of their lives. A small treatment area is also necessary, including a doctor's office, an examination room, and a group therapy space. Nurses responsible for supervising residents will require both an office and accommodations for overnight shifts. Physical well-being is encouraged through the provision of a fitness area. While residents are expected to prepare their own meals in private apartments, the facility will include a large cafeteria and a mini-market, fostering social interaction in a restaurant-like environment and allowing residents to practice independent living skills. Social spaces are also available for gatherings or small events organized by the residents. The residential area is designed to resemble a typical housing project, with living arrangements tailored to the residents' diagnoses, allowing for either shared or private accommodations. Based on these considerations, the space allocation has been determined as outlined below:

Ground Floor:

- Entrance (1)
- Reception Area (2):
  - Reception (2.1)
  - Office (2.2)
  - Storage (2.3)
- Management (3)
- Education Area (4):
  - Classrooms [1 to 6] (4.1)
  - Workshops [1 to 4] (4.2)
  - Guidance Counsellor (4.3)
  - Staff Room (4.4)
  - Storage Rooms (4.5)
  - Trash Collection (4.6)
  - Technical Rooms (4.7)
  - WC's:
    - Men's (4.8)
    - Women's (4.9)
    - Accessible (4.10)
- Seminar Rooms (5)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1)
    - Bedrooms (6.2)
    - Living-Kitchen Areas (6.3)
    - Living Room (6.4)
    - Kitchen (6.5)
    - Bathrooms (6.6)
    - WC (6.7)
    - Storage Room (6.8)
    - Hallway (6.9)
  - Laundry Rooms (6.10)
  - Common Room (6.11)
  - Storage Units (6.12)
  - Bicycle Storage Room (6.13)
  - Technical Rooms (6.14)
  - Trash Collection (6.15)
- Hallway + Common Areas (7)
- Treatment Area (8):
  - Doctor's Office (8.1)
  - Examination Room (8.2)
  - Group Therapy Room (8.3)
  - Nurses' Office (8.4)
  - Staff Room (8.5)
  - Overnight Quarter (8.6)
  - Staff Bathrooms (8.7)
  - Storage (8.8)
  - Trash Collection (8.9)
  - Technical Room (8.10)
- Fitness Area (9):
  - Fitness Room (9.1)
  - Locker Rooms (9.2)
  - WC's (9.3)
  - Showers (9.4)
- Gastronomy Area (10):
  - Cafeteria (10.1)
  - Mini Market (10.2)
  - Kitchen (10.3)
  - Storage Rooms (10.4)
  - Freezer Room (10.5)
  - WC's:
    - Men's (10.6)
    - Women's (10.7)
    - Accessible (10.8)
    - Staff (10.9)
  - Technical Room (10.10)
  - Trash Collection (10.11)
  - Hallway (10.12)
- Elevator Shafts (11)
- Fire Exits (12)
- Ramp Room (13)
- Courtyard (14)
- Green Houses (15)
- Car parks (16)

First Floor:

- Library Area (17):
  - Library (17.1)
  - Archive and Management (17.2)
  - Individual Study Area (17.3)
  - Private Study Rooms (17.4)
  - Computer Lab. (17.5)
  - Storage (17.6)
  - WC's:
    - Men's (17.7)
    - Women's (17.8)
    - Accessible (17.9)
- Cafeteria [1. Floor] (10.1)
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1)
    - Bedrooms (6.2)
    - Living-Kitchen Areas (6.3)
    - Living Room (6.4)
    - Kitchen (6.5)
    - Bathrooms (6.6)
    - WC (6.7)
    - Storage Room (6.8)
    - Hallway (6.9)
- Elevator Shafts (11)
- Fire Exits (12)

Fig.48: Space Allocation Chart

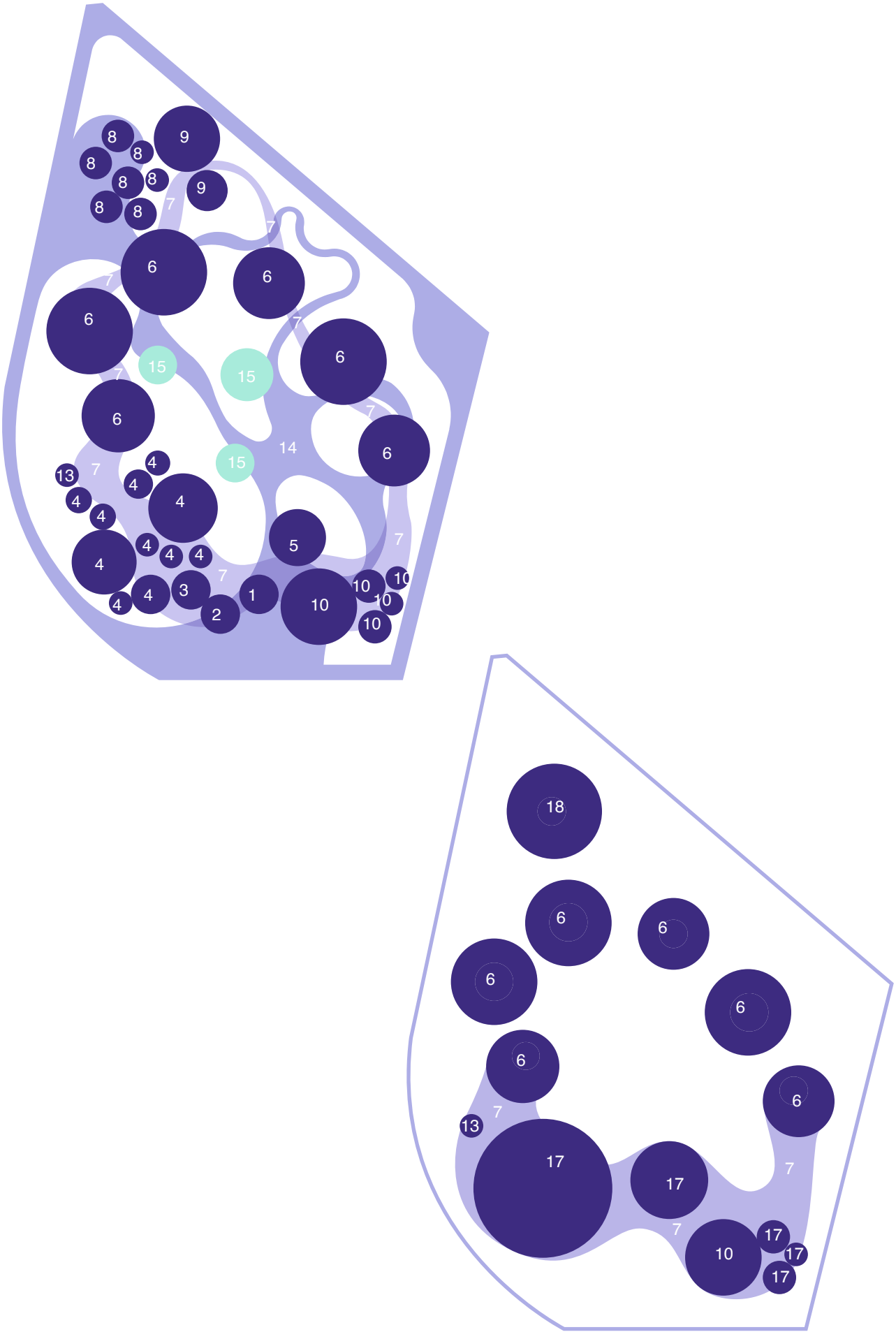


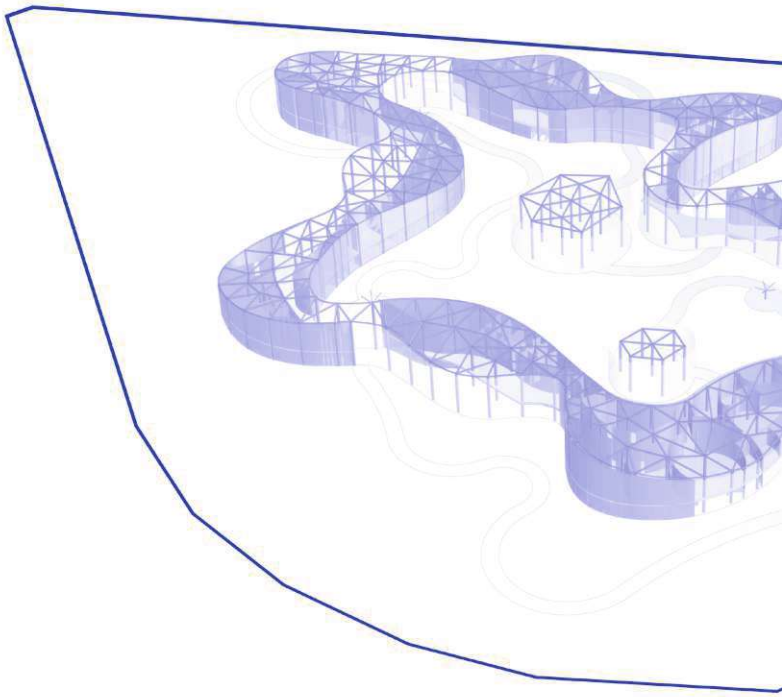
Fig.49: Abstract Space Allocation Diagram for Both Floors

04.05. Construction
Variants

Main construction consists of steel columns that will carry the ceiling and roof structures. However, two variants were thought in order to achieve this type of roof.

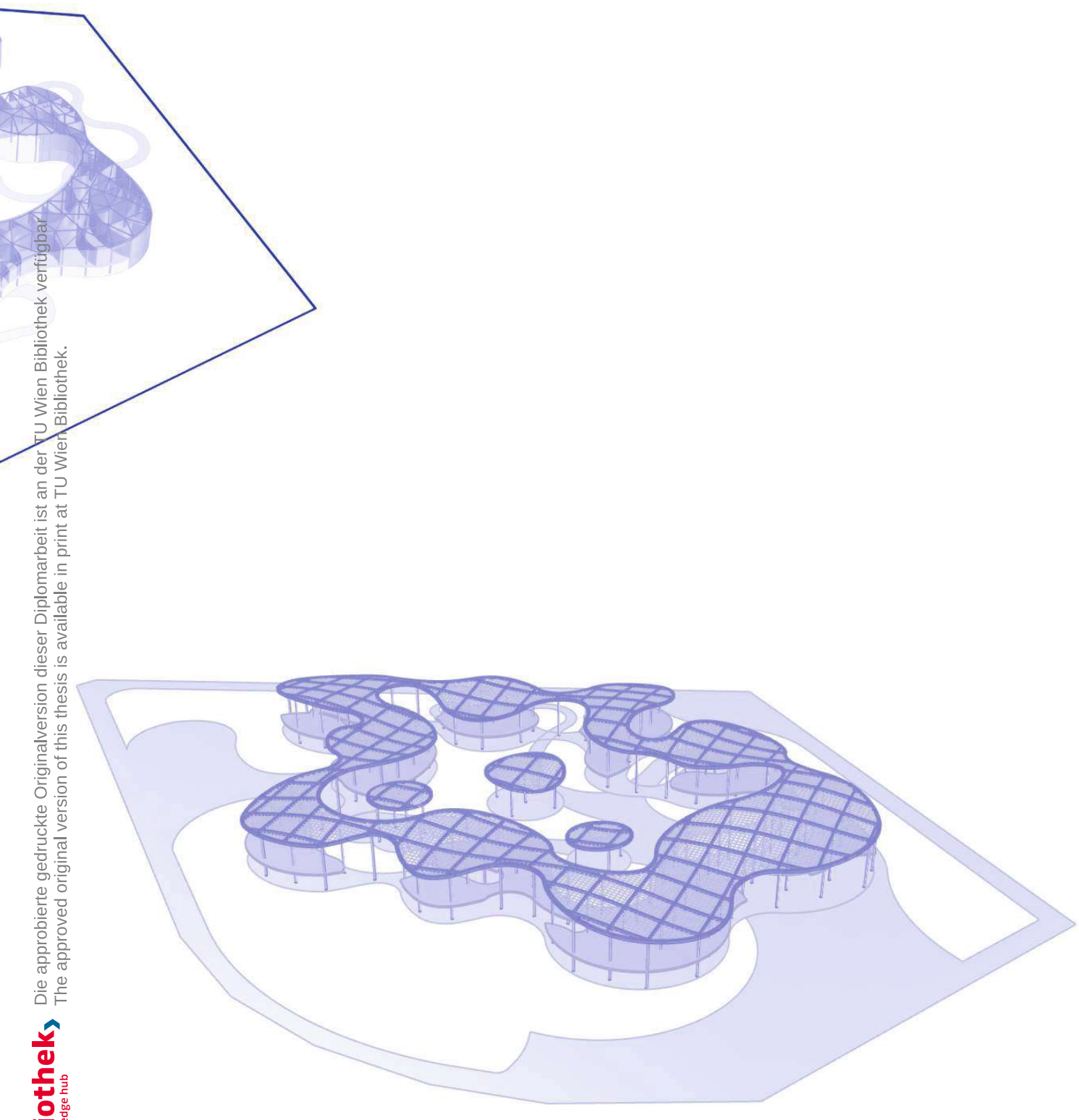
In the first variant the columns are placed with a maximum span of 6.5 meters but without a specific pattern. This lack of a pattern creates a freedom in creating the floor plans. In order to achieve the load bearing structure of the desired roof shape a triangular beam structure from a delauney mesh is created. However, this variant is less stable due to unpredictability of the load bearing structure, so a second variant is conceived.

A grid is used in the second variant. This could be a 7mx7m, 8mx8m or a 8mx10m grid. After the steel columns and the intermediate ceiling are added the grid continues on the desired roof shape and creates the rectangular load bearing main structure of the roof. On top of the main load bearing beams purlins with smaller spans are added to carry the panels of the roof. The same logic of design is then used for the greenhouses but with thinner profiles of beams and purlins.



Variant 1

Fig.50: Construction Variant 1

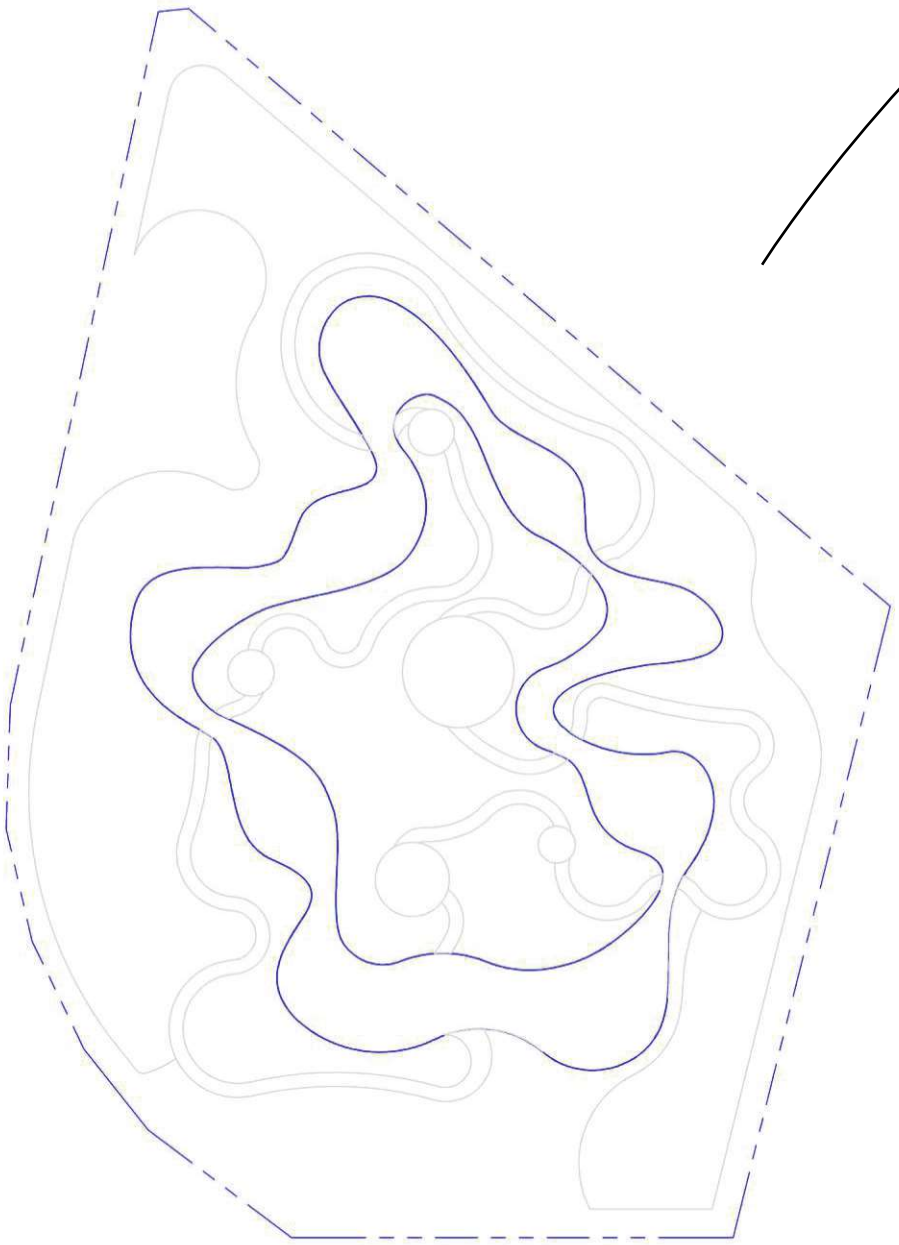


Variant 2

Fig.51: Construction Variant 2

04.05.01. Steel Frame Construction

Various grid dimensions were evaluated against the original floor plan to determine the most efficient configuration for the room program. After careful analysis, an 8-meter by 8-meter grid was selected, as it provided an optimal balance between structural requirements and spatial dynamics. The placement of the columns within this grid created sufficient depth, enabling the arrangement of rooms along the building's perimeter while allowing for the development of a central corridor. This corridor facilitated a continuous circulation loop, ensuring efficient movement throughout the building and enhancing the overall functionality of the interior layout.



Original Form

Fig.52: Adjusments on the Form and Floor Plans According to the Steel Frame Construction Grid

04.05.01. Steel Frame Construction

The form of the building has been optimized according to a regular 8-meter by 8-meter grid, facilitating more efficient space allocation and functional planning within the building. This configuration ensures that the span between the columns and the supporting beams adheres to an 8-meter module, allowing for both structural stability and flexibility in the internal layout. By aligning the structural grid with the architectural design, the column spacing minimizes interruptions within the interior space, creating unobstructed areas suitable for various uses, while maintaining an efficient load transfer system.

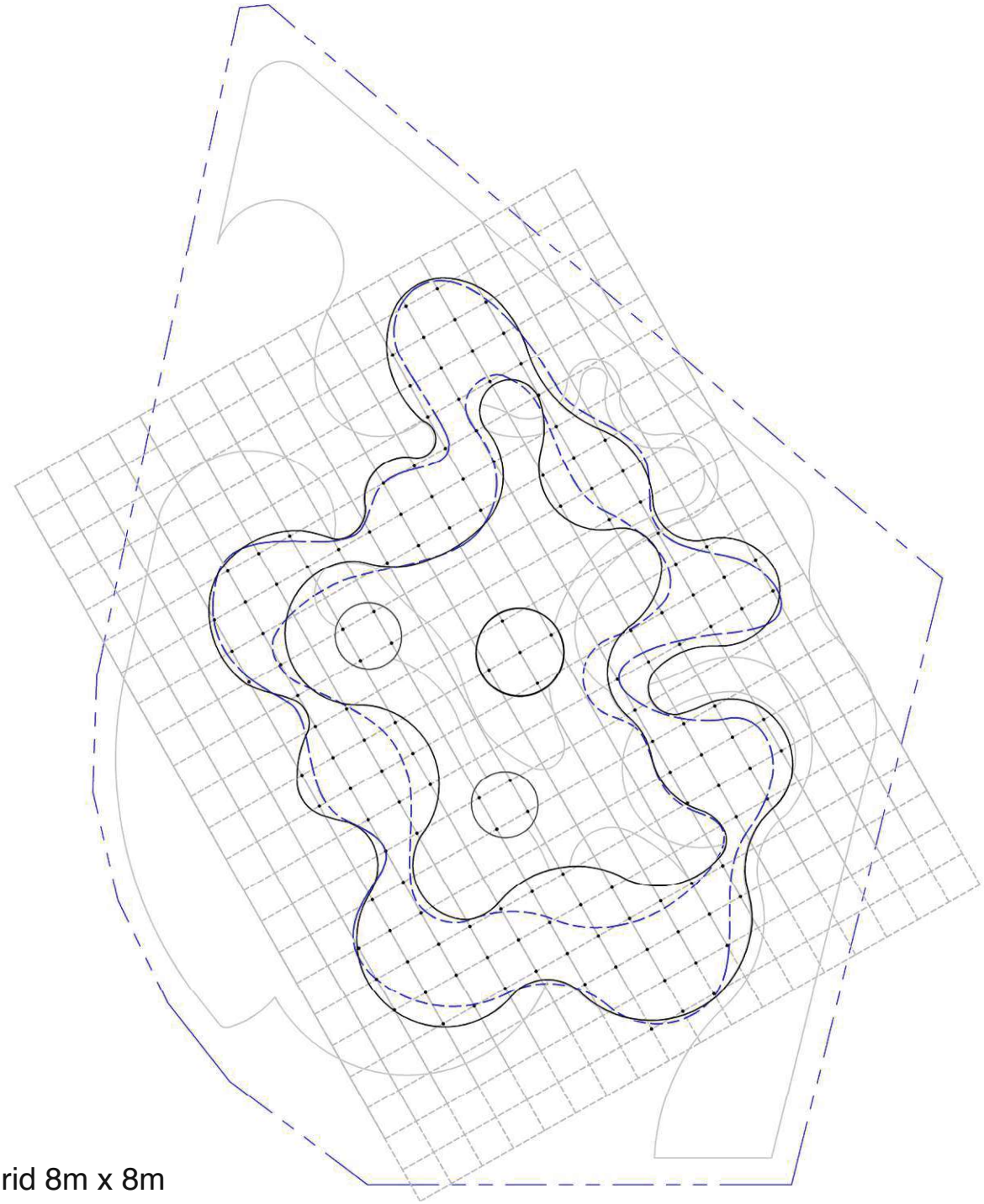


Fig.53: Adjusments on the Form and Floor Plans Using 8 x 8 Meters Grid

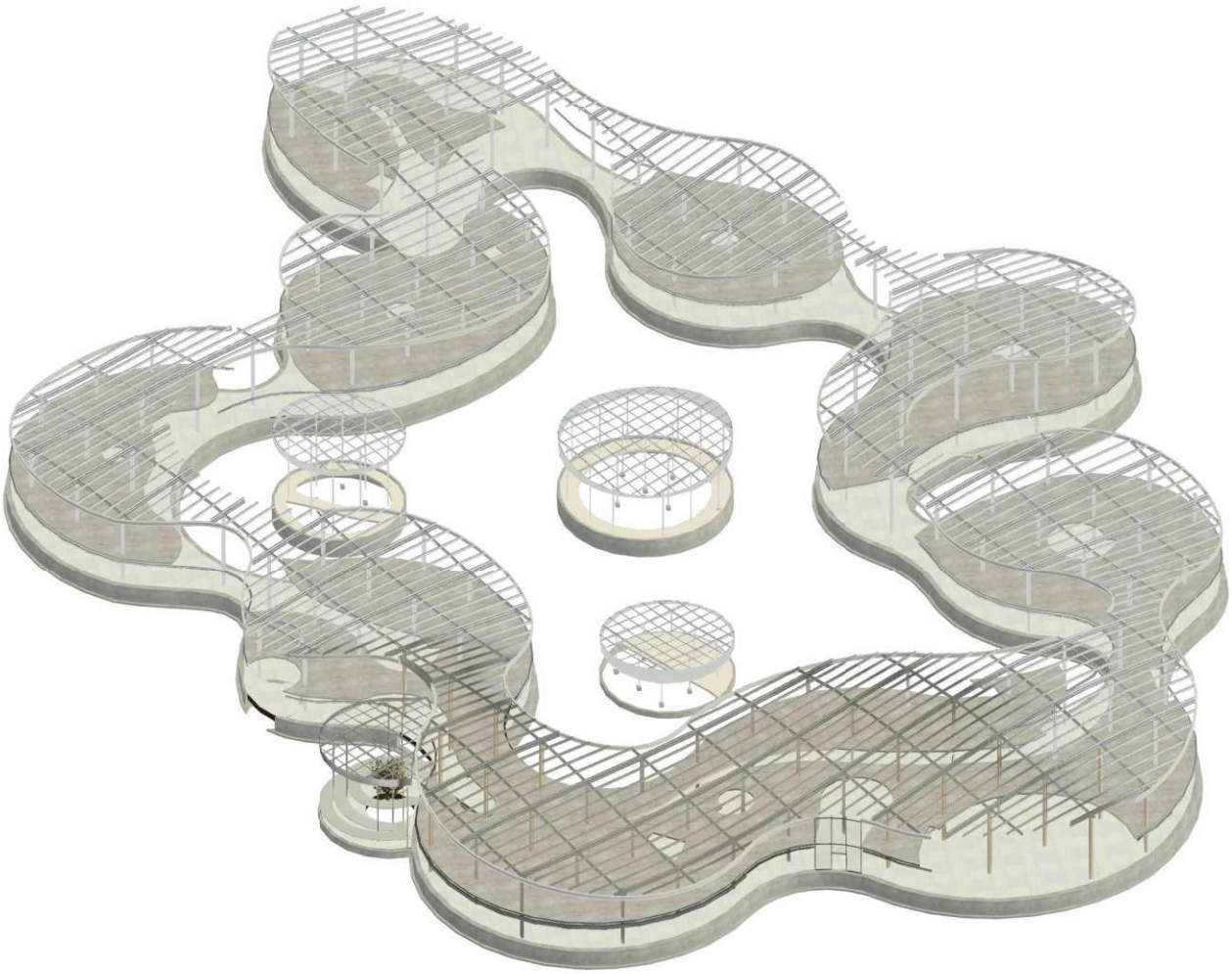


Fig.54: Steel Frame Construction and the Intermediate Floor

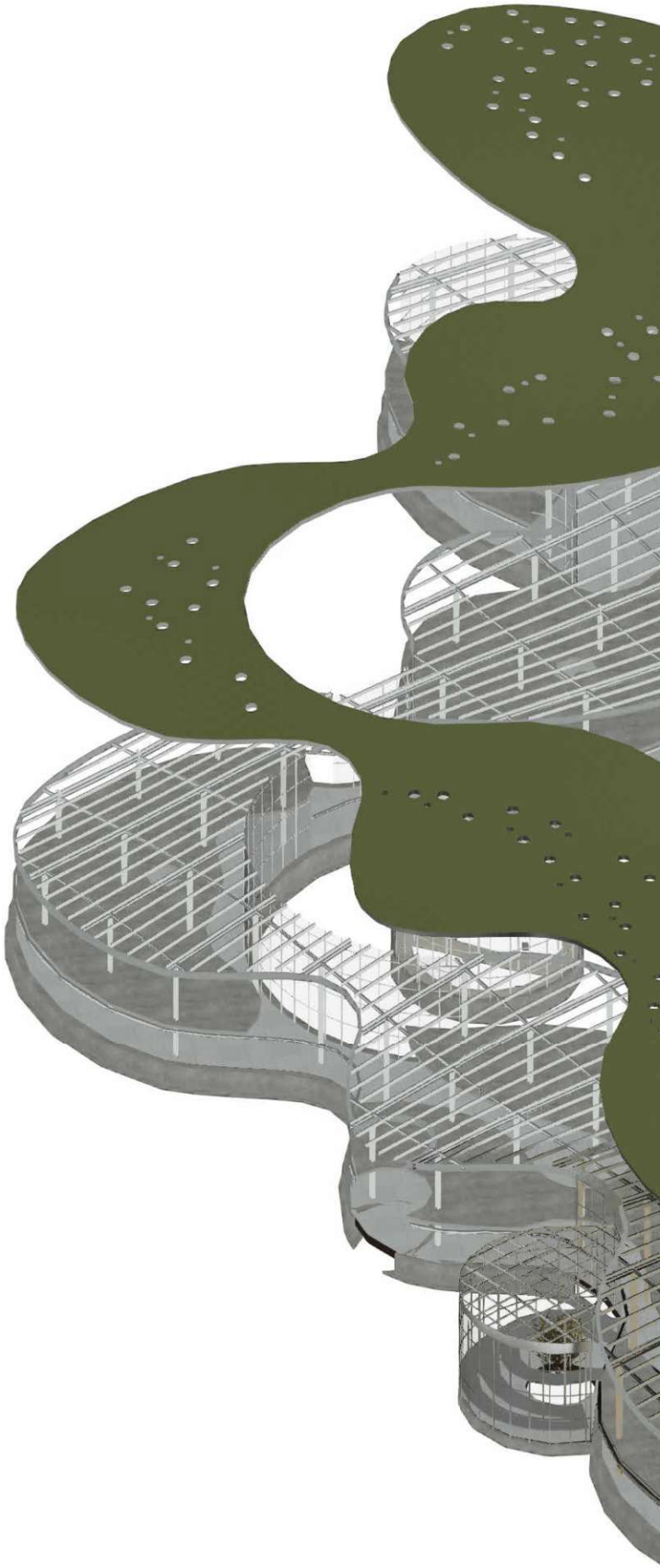
The building's vertical support system consists of steel columns strategically placed to carry the roof load. These columns are designed to withstand both vertical loads from the roof and horizontal forces such as wind or seismic activity. The intermediate floor is constructed using a grid of steel beams, which are part of the building's overall steel frame structure. These beams are aligned with the vertical columns and roof beams to ensure uniform load distribution. The floor system is designed as a composite structure, combining steel and concrete to create a strong, efficient, and durable intermediate floor. The composite system is particularly effective for absorbing dynamic loads, such as foot traffic or equipment, while minimizing deflection.

04.05.02. Waffle Roof Construction

The wavy waffle roof construction for the main building combines advanced structural engineering with aesthetic design, providing a robust framework while enhancing the building's visual appeal.

The construction process begins with the installation of the steel beams, which are arranged according to the wavy design. These beams are connected to the perimeter beams anchored to the rammed earth walls. Purlins are then installed within the 8x8 meter grid, providing additional support and reinforcing the overall roof structure.

The roof is designed to accommodate an extensive green roof system. This system includes layers of waterproofing, drainage, and growing medium, supported by the steel and purlin framework. The green roof not only enhances the building's environmental performance but also contributes to its aesthetic appeal. The extensive green roof system is integrated seamlessly into the wavy profile of the roof, providing both functional benefits and visual continuity.



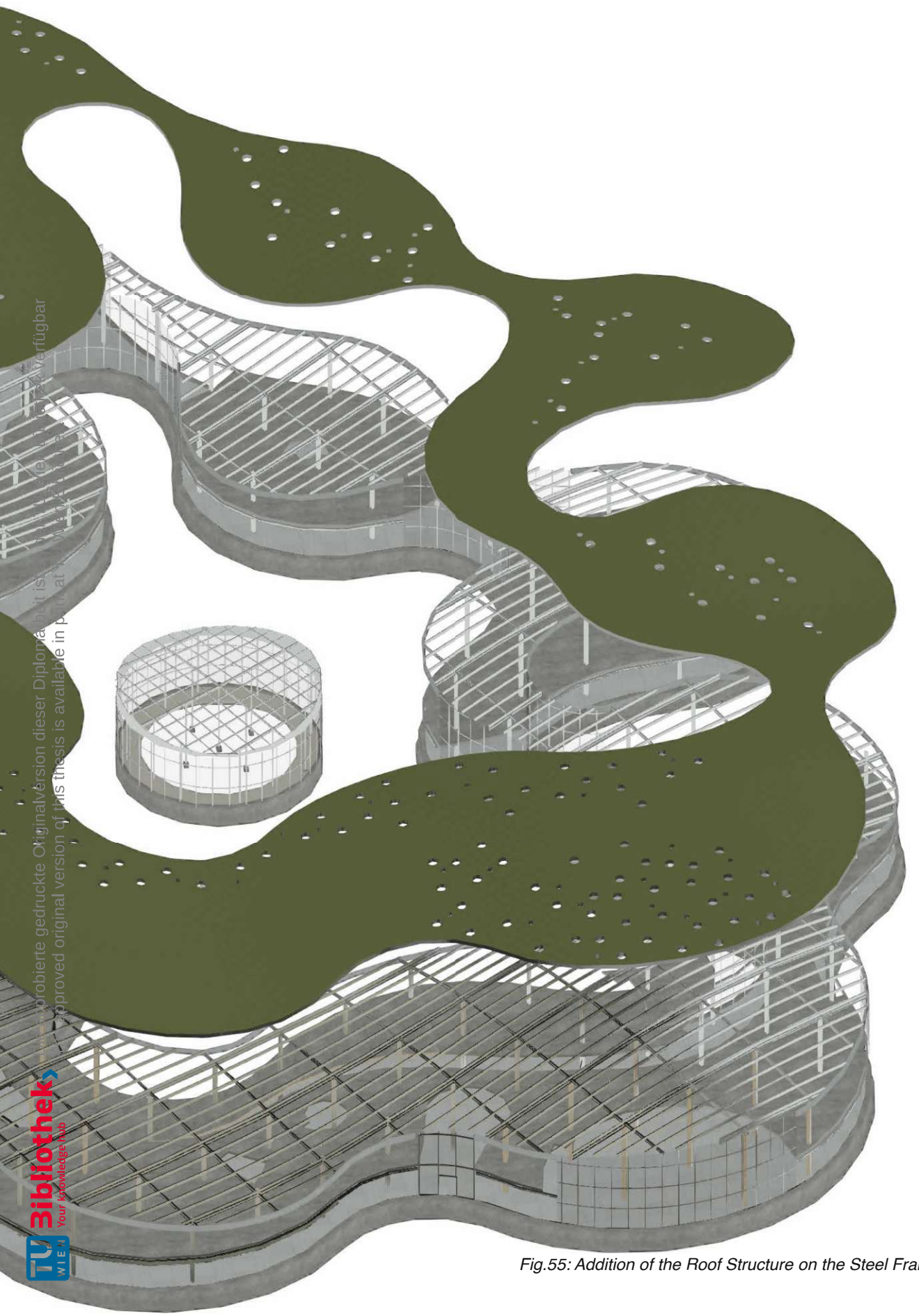


Fig.55: Addition of the Roof Structure on the Steel Frame Construction

04.05.03. Reinforced Rammed Earth Walls

Building with earth has been a widely used construction technique for centuries, originally adopted for its simplicity and accessibility. In modern architecture, rammed earth is increasingly favoured for its sustainable properties, particularly in the context of reducing carbon emissions in construction. Traditional construction materials like cement have significant environmental costs due to the high CO2 emissions associated with their production. By contrast, rammed earth walls (REW) are a low-energy, nature-friendly alternative that minimizes air pollutants, making them an ideal choice for green buildings (Yıldız, 2018).

Rammed earth construction is especially suited for climate-responsive, energy-efficient design. Its high thermal mass helps regulate internal temperatures and humidity, reducing the need for active heating and cooling systems. In hot, humid climates, wide porches and large screened windows allow cross-ventilation; while in dry, hot areas, thick walls and small windows help utilize thermal mass to counteract daytime heat. Similarly, in colder regions, rammed earth's ability to store heat can be combined with large south-facing windows (in the northern hemisphere) to reduce winter heating demands (Maniatidis & Walker, 2003).

Moreover, rammed earth walls have significantly lower embodied

Fig.56: Reference Project: Nk'mip Desert Cultural Centre Source: Nic Lehoux

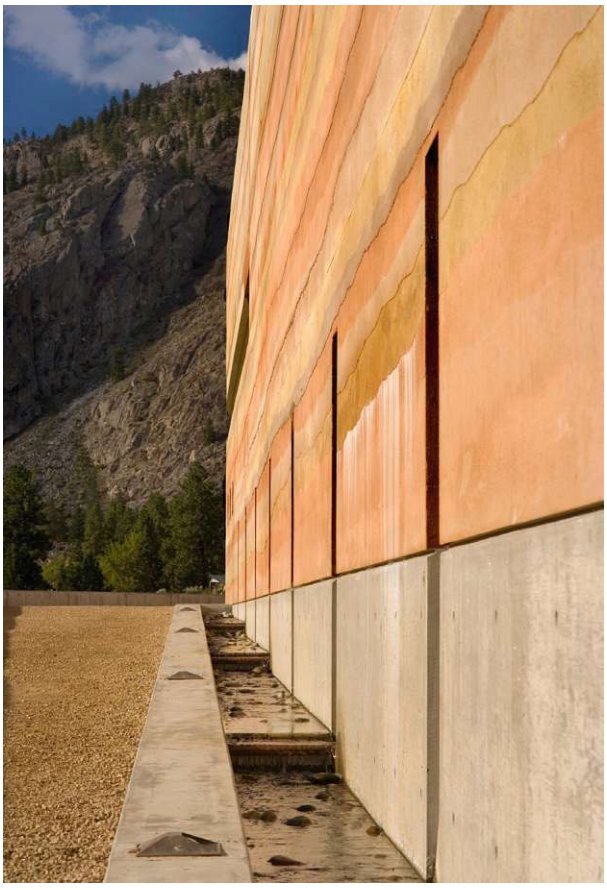


Fig.57: Reference Project: Nk'mip Desert Cultural Centre Source: Nic Lehoux

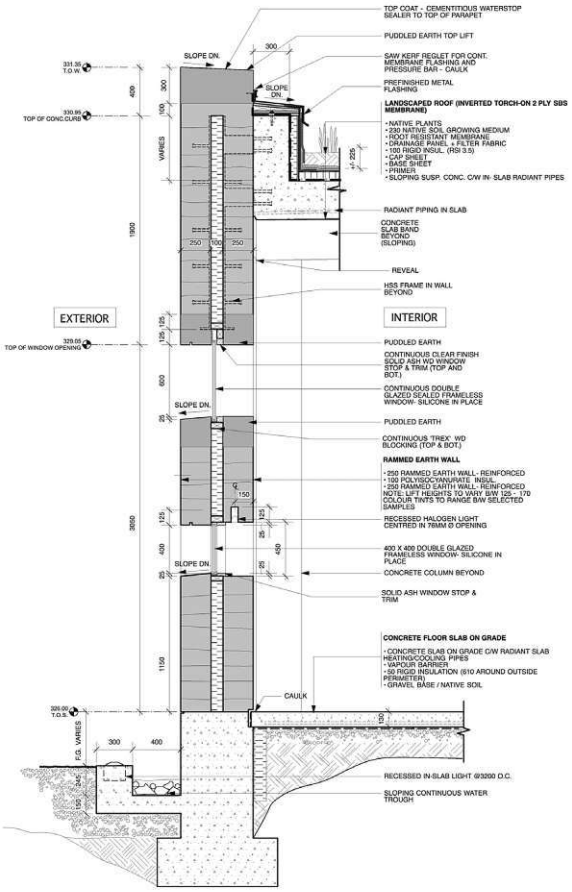


Fig.58: Reference Project: Section of Nk'mip Desert Cultural Centre Source: DIALOG, 2006

Fig.59: Cutaway of Rammed Earth Wall Source: Sirewall, 2024

energy compared to materials like concrete and brick, making them a sustainable solution for modern construction. Their dense, porous structure provides excellent humidity regulation and sound insulation, creating ideal interior environments for various uses, including homes, studios, and even concert halls (Yıldız, 2018).

Reinforced Rammed Earth Walls (RREW) and Structural Performance

Despite their sustainability and thermal benefits, rammed earth walls face limitations, particularly in terms of tensile strength and water resistance. To overcome these, reinforced rammed earth walls (RREW) incorporate steel or timber elements to improve load-bearing capacity and seismic resilience. In this project, RREW are employed to strengthen the structure against lateral earthquake forces by integrating vertical and diagonal steel rebars. This reinforcement not only increases the walls' strength but also mitigates their inherent brittleness (Yıldız, 2018).

Thick rammed earth walls provide the necessary mechanical resistance while also enhancing insulation and thermal mass. However, design considerations, such as confinement hoops in compression zones, further optimize the walls' ability to absorb and dissipate forces during seismic events (Yıldız, 2018).

04.05.03. Reinforced Rammed Earth Walls

Building Process

Site Preparation and Excavation

The construction begins with site preparation, where soil is sourced ideally from the foundation excavation. However, most in-situ soils require processing, such as drying or screening, to meet the structural integrity needed for rammed earth construction (Maniatidis & Walker, 2003). Topsoil, which contains organic matter, is removed for landscaping use, as it is unsuitable for the wall composition (Easton, 1996). Mechanical equipment like bulldozers and excavators are used for soil extraction. The soil is then screened, moisture-adjusted, and stockpiled for use in the construction.

Formwork Setup

Modern formwork, similar to that used in concrete construction, is essential for shaping the walls. Steel or timber sheeting and structural supports such as walers, ties, and soldiers are used to create the forms for the rammed earth. For curved walls, custom formwork designs are required, which increases the complexity and cost (Maniatidis & Walker, 2003). The formwork accommodates the insulation layer, allowing the creation of the 250mm earth, 100mm insulation, and 250mm earth sandwich wall.

Foundation and Footings

The foundation for rammed

1)

Fig.60: Extraction from the Building Sites

2)

Fig.61: Preparation of the Foundation and Mixing of the Soil

3)

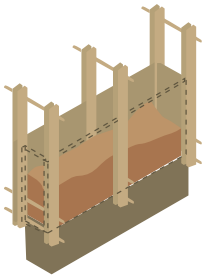


Fig.62: Preparation of Formwork

4)

Fig.63: Soil Mixture Being Transported in the Formwork

5)

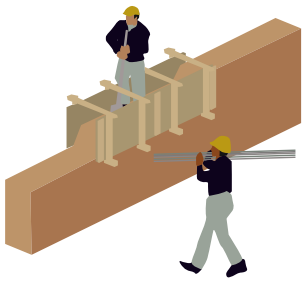


Fig.64: Addition of Reinforcements and Compaction of Rammed Earth Walls

earth walls typically uses slab or strip footings, depending on soil conditions. Concrete strip footings are common for low-rise buildings, but cement-stabilized earth footings are an option in certain areas, such as Australia (Maniatidis & Walker, 2003). Footings must be deep enough to avoid frost damage, with drainage systems and damp-proof courses installed to protect against water infiltration.

Soil Preparation and Compaction

Soil for rammed earth construction is transported to the formwork via bobcats or other mechanical means. It is compacted using mechanical impact rammers at its optimal moisture content, layer by layer (Houben & Guillaud, 1994). The process involves compacting a 250mm layer of earth, placing a 100mm insulation panel, and then compacting another 250mm of earth. This layering ensures both structural integrity and thermal efficiency.

Reinforcements

To enhance structural integrity, particularly in seismic areas, vertical and diagonal steel reinforcements are placed during the ramming process (Yıldız, 2018). These reinforcements, inserted as the earth is compacted, increase the wall's resistance to lateral forces, improving its performance in earthquake-prone regions. The reinforced design also includes the use of confinement hoops in high-compression zones to prevent cracking and brittleness (Yıldız, 2018).

Insulation and Thermal Performance

The 100mm insulation layer within the sandwich wall significantly improves the thermal performance of the building, complementing the natural thermal mass of rammed earth (Maniatidis & Walker, 2003). This combination reduces the need for active heating and cooling, contributing to energy efficiency. The sandwich structure provides enhanced insulation, making it suitable for a range of climates.

Final Touches and Formwork Removal

After ramming, formwork can be removed immediately, allowing quick reuse. This aspect of rammed earth construction is more efficient than concrete formwork, which must stay in place until the material has set (Maniatidis & Walker, 2003). Once the formwork is removed, any imperfections are patched, and the wall is prepared for final surface treatments. This process highlights how reinforced rammed earth construction, integrated with insulation, can create walls that meet modern sustainability standards while being durable and energy-efficient.

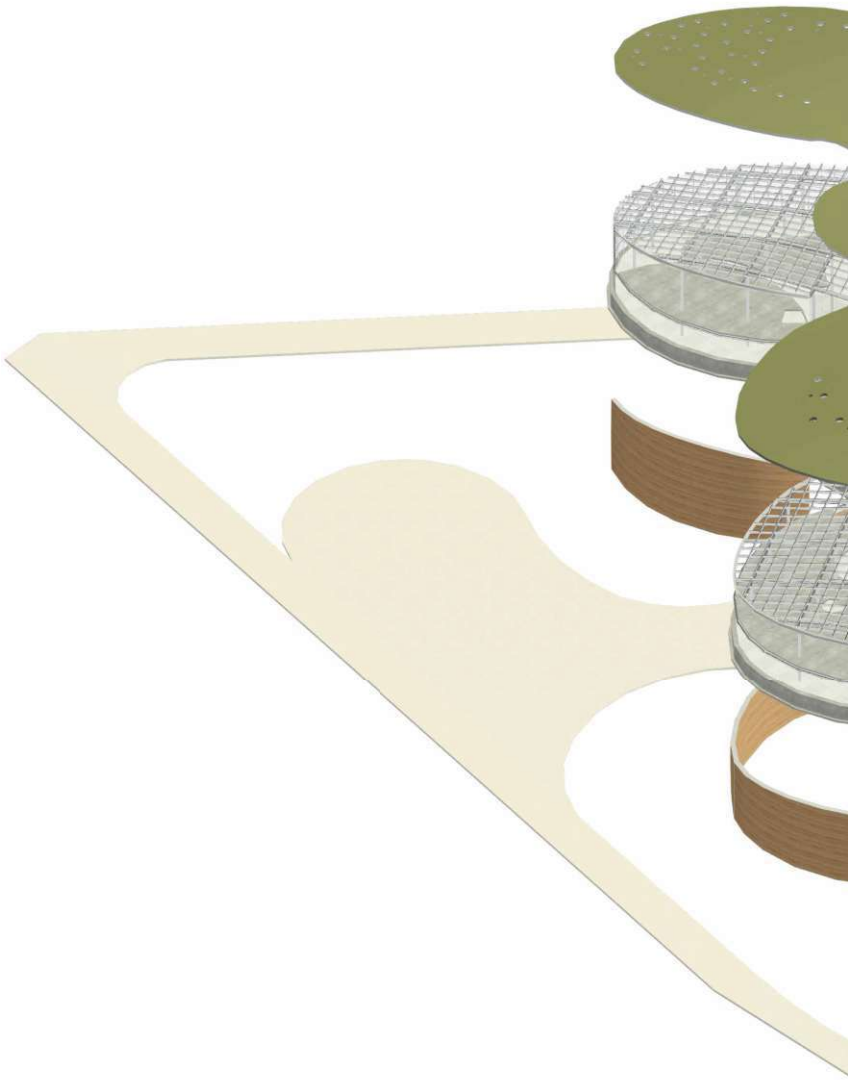
04.05.04. Load-Bearing Construction and Outer Walls

The primary load-bearing system of the structure is composed of steel columns and beams, with additional reinforcement provided by secondary beams on the intermediate floor, which is a steel-concrete composite system. This design ensures structural stability and load distribution throughout the building.

The roof structure follows an 8-meter square grid, with beams shaped to reflect the roof's undulating form. These beams support the steel panels and roof windows, as well as the imposed loads from snow, water, and wind, making the roof highly resilient under varying environmental conditions.

The outer walls employ a reinforced rammed earth (RRE) construction. The RRE walls are designed as sandwich walls, consisting of two 250mm layers of earth with a 100mm insulation layer in between, providing superior thermal and acoustic performance while maintaining structural integrity. Part of the external wall system follows a post-and-beam structure, connecting to the roof via vertical steel panels, thereby integrating different material systems harmoniously.

The foundation consists of reinforced concrete strip footings that follow the perimeter of the outer walls, with isolated footings located beneath the steel columns to ensure adequate support and load transfer to the ground.



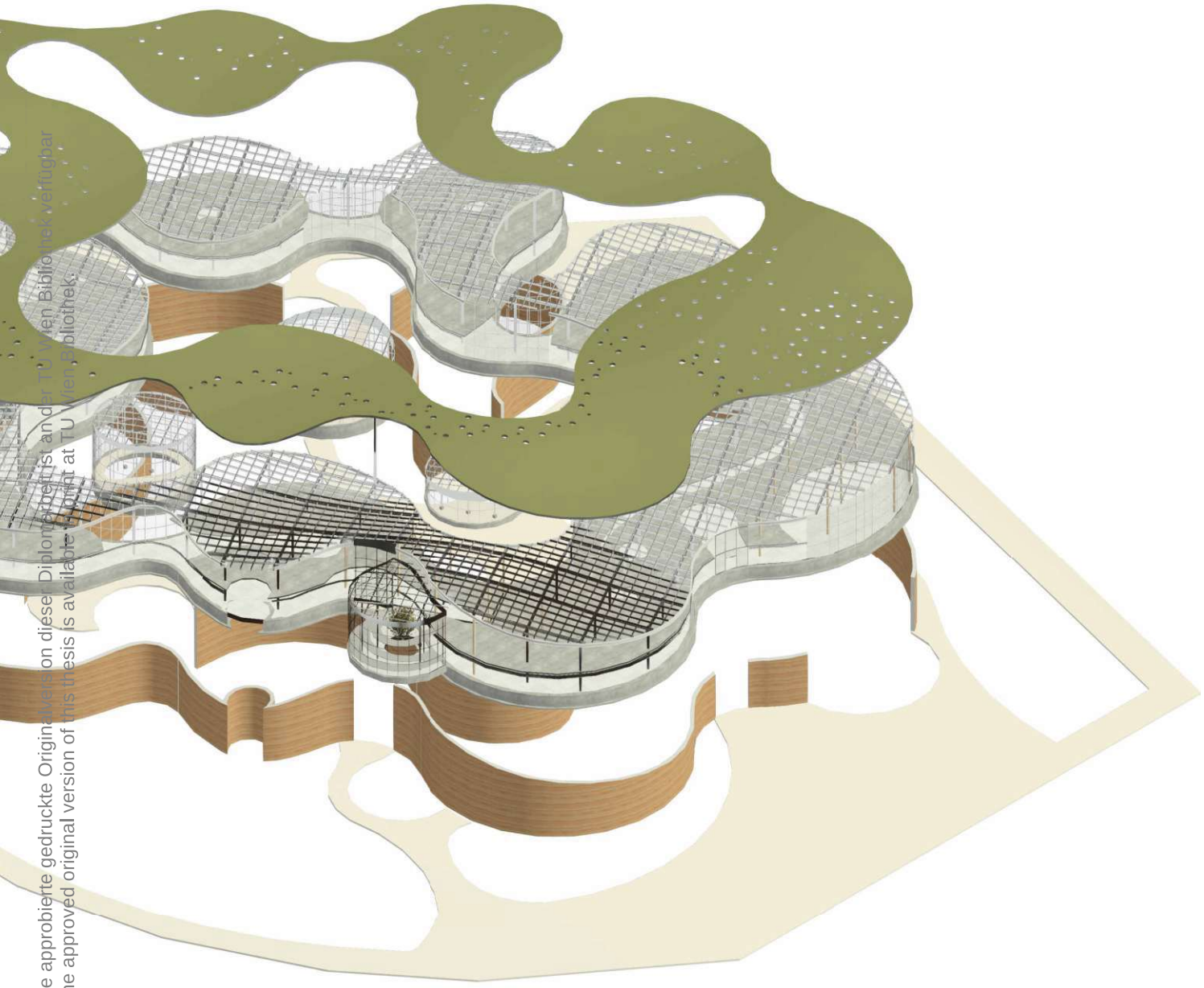


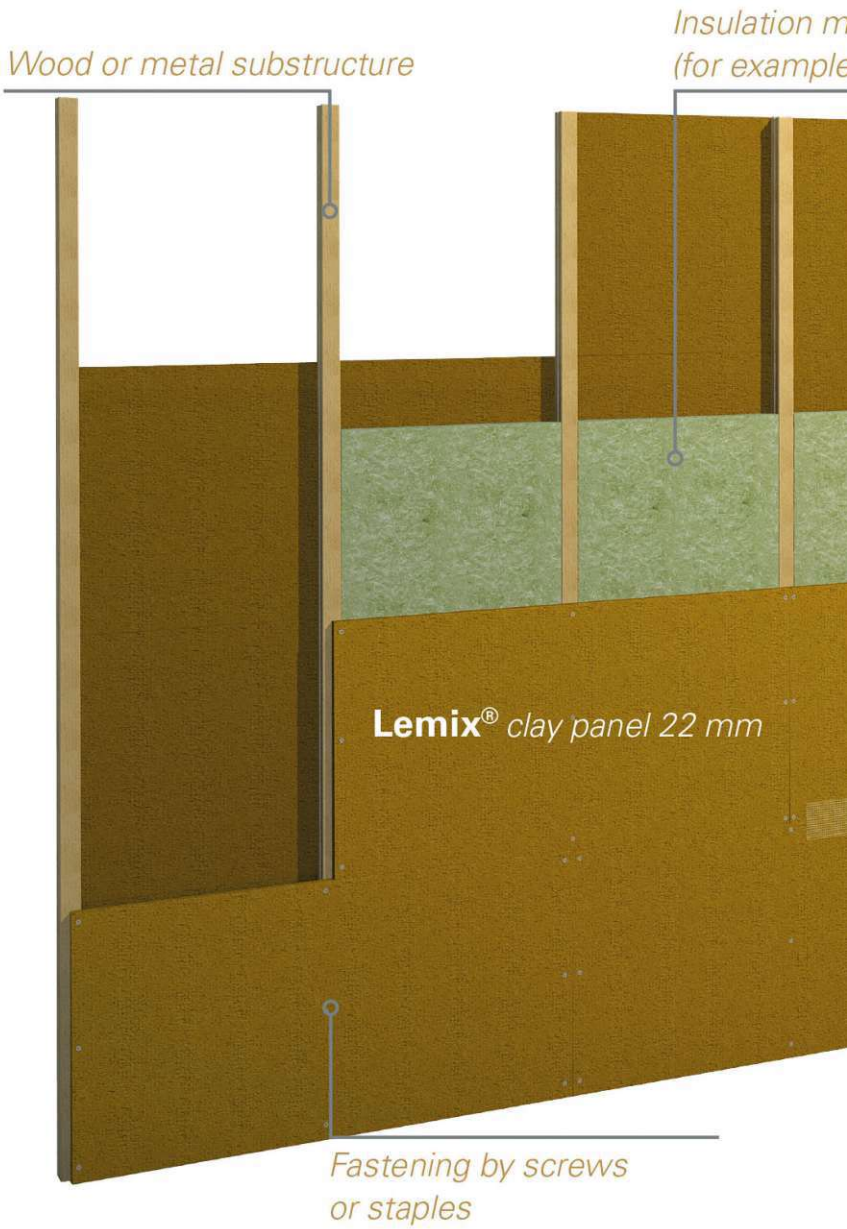
Fig.65: Load-Bearing Constructon of the Rehabilitation Centre

04.05.05. Interior Walls
Clay Panels

For the interior walls, clay panels have been selected due to their versatility and sustainable properties. Formerly known as “clay building slabs,” these panels can be easily cut and shaped using standard tools, making them adaptable to various design requirements. Installed in a bonding pattern with an offset, the panels provide stability and alignment, ensuring structural integrity (Lemix, 2020).

In terms of electrical and HVAC installations, the use of clay panels does not differ significantly from conventional drywall construction. Installations can be positioned behind the panels without complications, and cavity sockets can be created using a compass saw. Lightweight fixtures can be affixed using cavity dowels, while heavier items, such as kitchen cabinets, require substructures, consistent with standard drywall practices (Lemix, 2020). The panels are mounted vertically or horizontally in a bonding pattern and secured to walls with screws, disc heads, retaining plates, or broad back staples, depending on the type of substructure involved (Lemix, 2020).

Clay, as a building material, has long been recognized for its superior physical properties, contributing to its use in construction for thousands of years. In contemporary applications, these properties have been optimized to meet modern building demands. Clay panels are not only a sustainable alternative for lightweight construction but also an



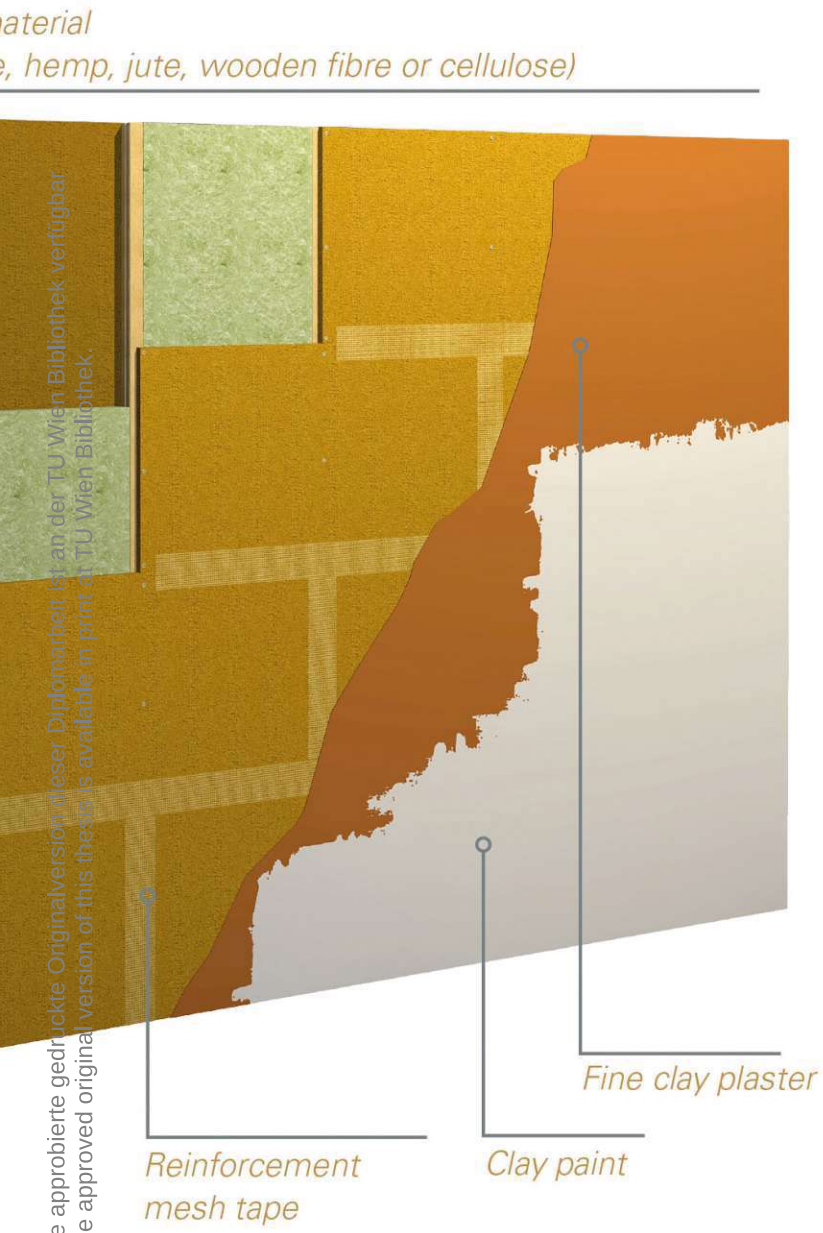


Fig.66: Clay Panels
Source: Lemix, 2020

environmentally compatible material offering significant benefits for interior finishing. They are installed similarly to gypsum plasterboards but provide enhanced performance in regulating indoor climate and improving acoustics (Lemix, 2020).
A major advantage of clay is its low equilibrium moisture content, which dehumidifies adjacent materials, such as wood, thereby reducing the risk of fungal growth and insect infestations. This attribute has been demonstrated in centuries-old timber-framed buildings where clay has preserved the integrity of organic materials. Additionally, clay functions as a thermal mass, making it particularly advantageous in drywall construction, where lightweight materials typically lack significant storage capacity. By incorporating clay panels, which have a high heat storage capacity, a more stable indoor climate can be achieved, along with effective humidity regulation (Lemix, 2020).
Clay's thermal properties allow it to absorb heat uniformly and release it gradually, akin to solid brick. This capacity enables the panels to retain heat during winter and prevent overheating in summer. Such thermal regulation not only improves occupant comfort but also contributes to the energy efficiency of the building, highlighting the ecological and practical advantages of using clay panels in modern construction (Lemix, 2020).

04.05.06. Detail Sections

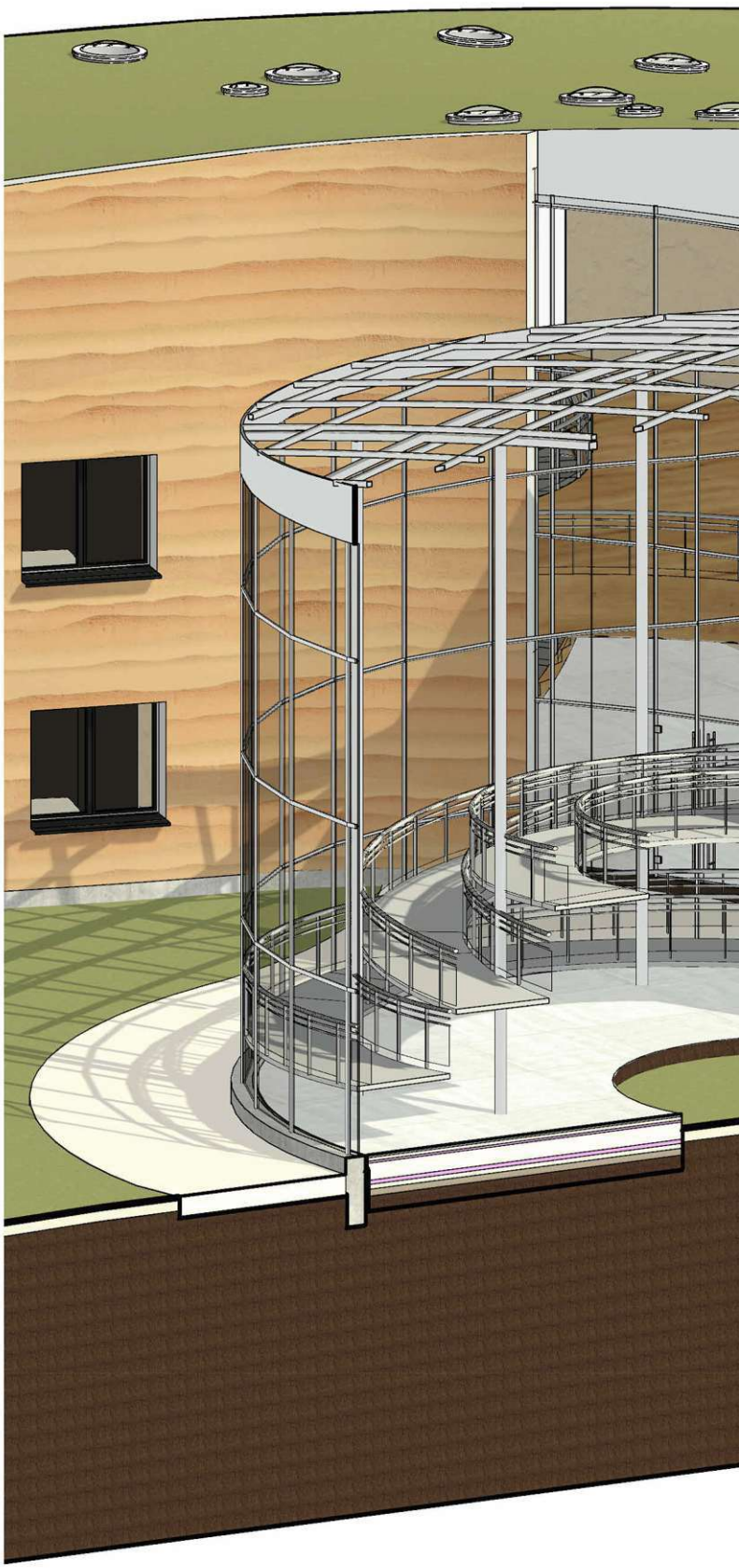
Detail Section 1

Load Bearing Construction and Intermediate Floor:

Steel columns are covered with plaster. As mentioned before, the intermediate floor is supported by main beams and perpendicular rafters steel beams. These beams are then connected to the outer walls with perimeter beams. The intermediate floor is steel-concrete composite floor, which means above the steel beams stand the concrete slabs creating the surface for the first floor. The concrete is then covered with floor covering and the beams are hidden with hanging ceiling.

The Roof:

The roof is supported by steel beams Steel beams are hidden with hanging ceiling that follows the wave shape.



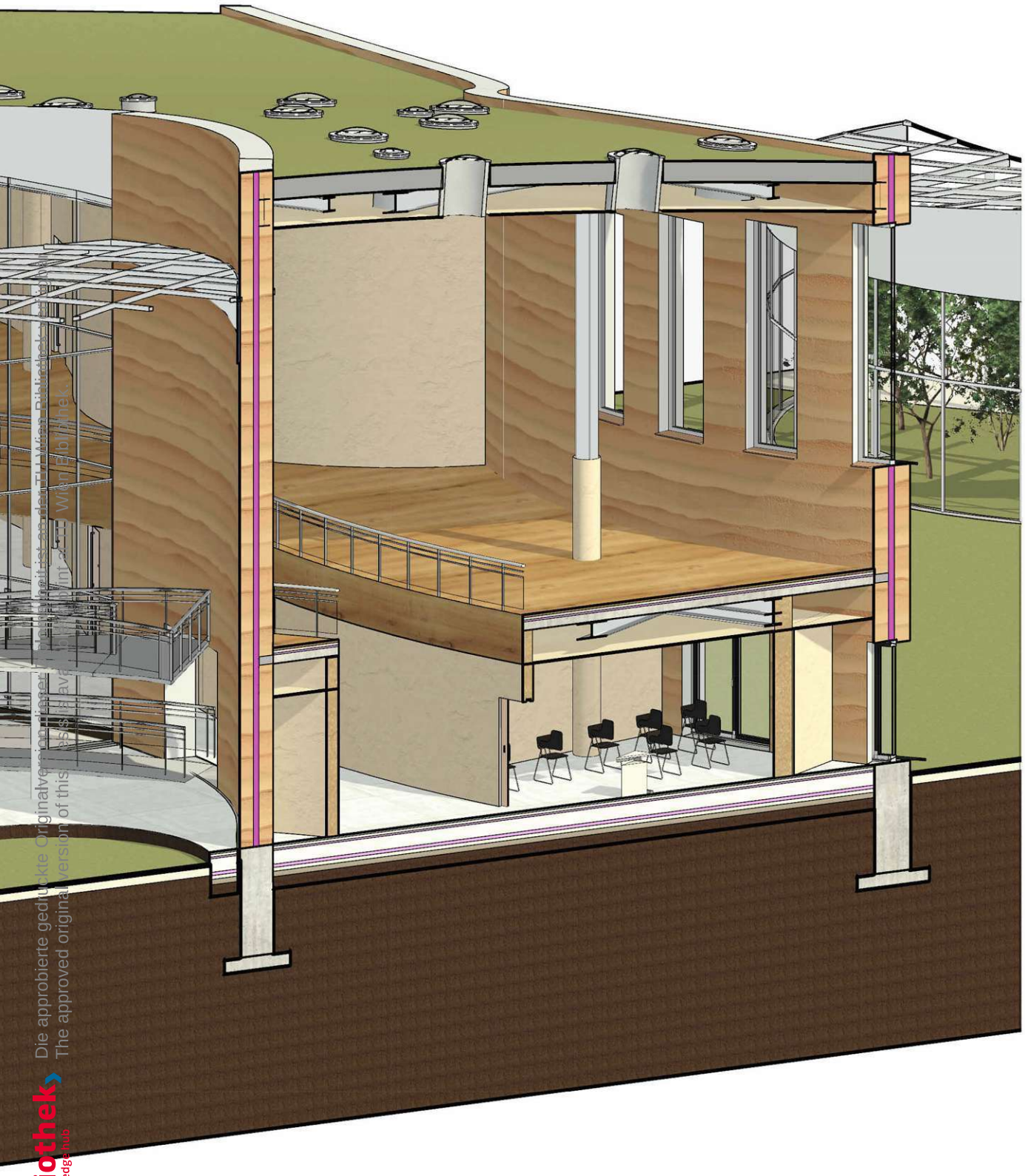


Fig.67: Detail Section 1

04.05.06. Detail Sections

Detail Section 1A - 1:20

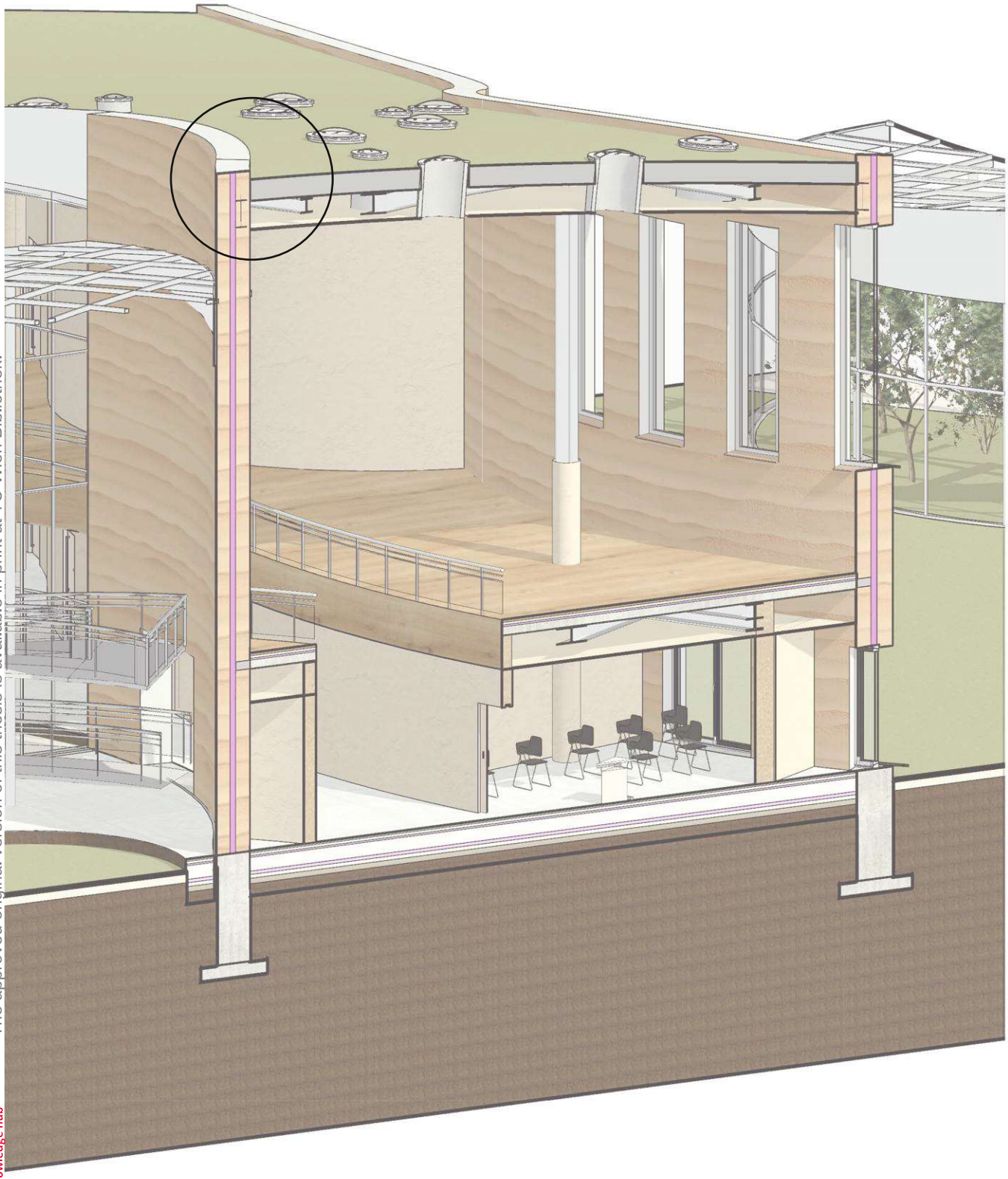
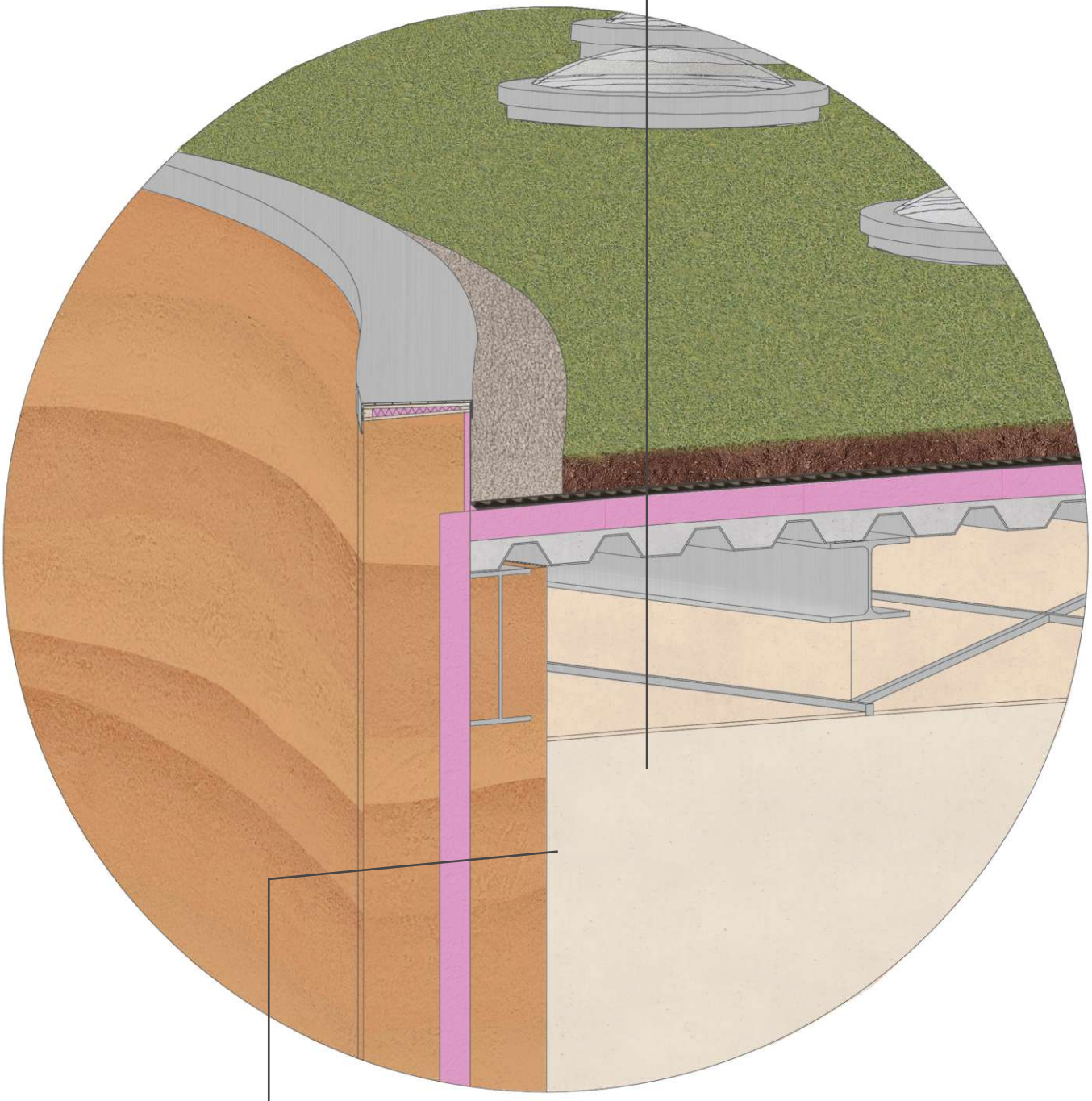


Fig.68: Marking Detail 1A in 3D Section Detail 1



Ceiling Structure
Grass
Soil/Growing Medium: 100 mm
Filter Fabric: 2 mm
Drainage Layer: 40 mm
Root Barrier: 1 mm
Waterproofing: 2 mm
Mineral Wool: 100 mm
Concrete Slab: 100 mm
Steel Decking: 50 mm
Steel Waffle Grid: IPE/HEB Beams 300 mm
Hanging Ceiling with Plaster Board

Outer Walls
Rammed Earth Wall (Reinforced): 250mm
Mineral Wool: 100mm
Rammed Earth Wall (Reinforced): 250mm

Fig.69: Detail 1A 1:20

04.05.06. Detail Sections

Detail Section 1B - 1:20

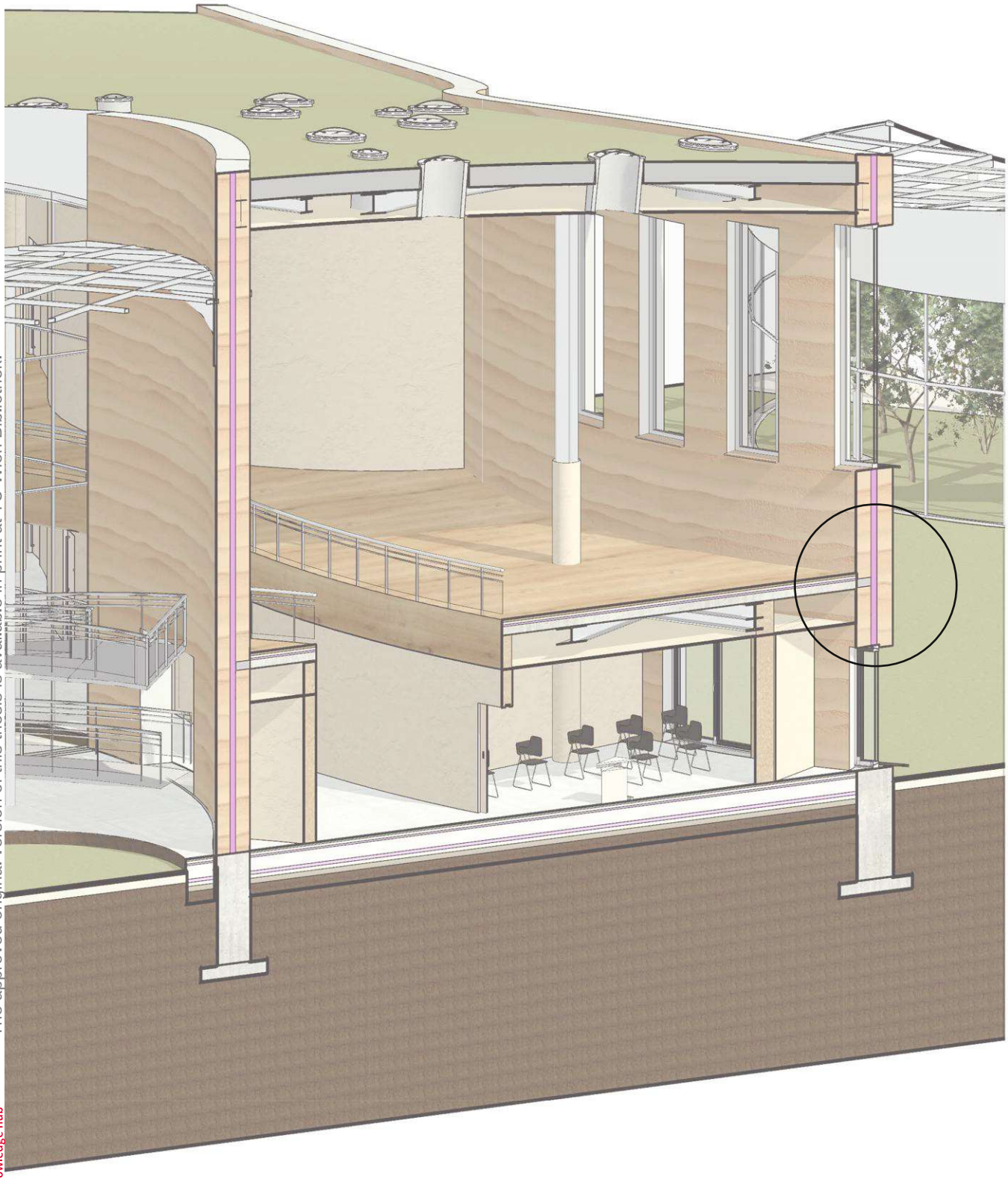
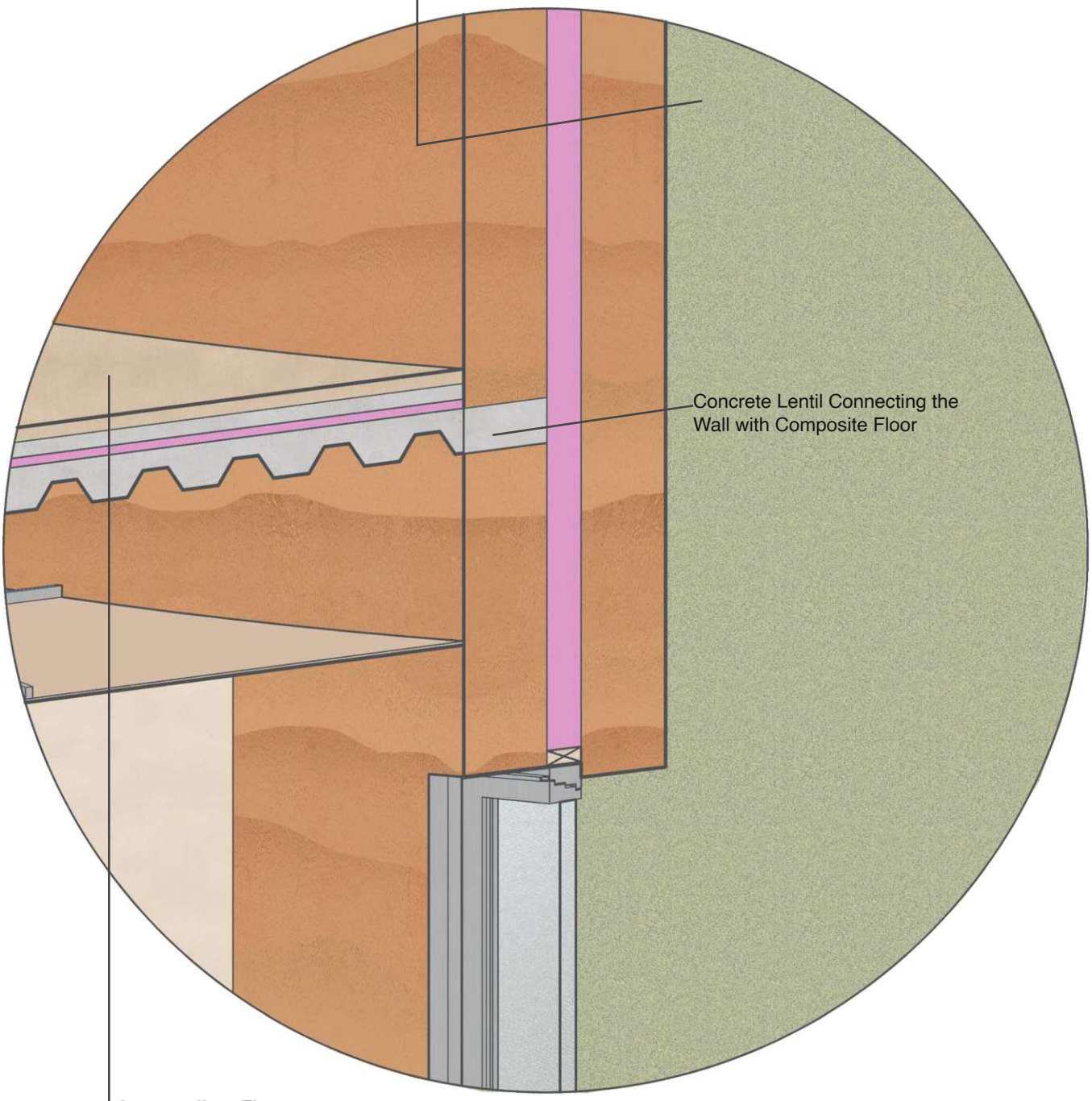


Fig.70: Marking Detail 1B in 3D Section Detail 1



Outer Walls
Rammed Earth Wall (Reinforced): 250mm
Mineral Wool: 100mm
Rammed Earth Wall (Reinforced): 250mm

Intermediate Floor
Flooring 50mm
Screed 50mm
Vapor Barrier 2mm
Acoustic Insulation 30mm
Separation Foil 2 mm
Steel-Concrete Composite Floor 100mm
Steel Grid 400mm
Hanging Ceiling with Plaster Board

Fig.71: Detail 1B 1:20

04.05.06. Detail Sections

Detail Section 1C - 1:20

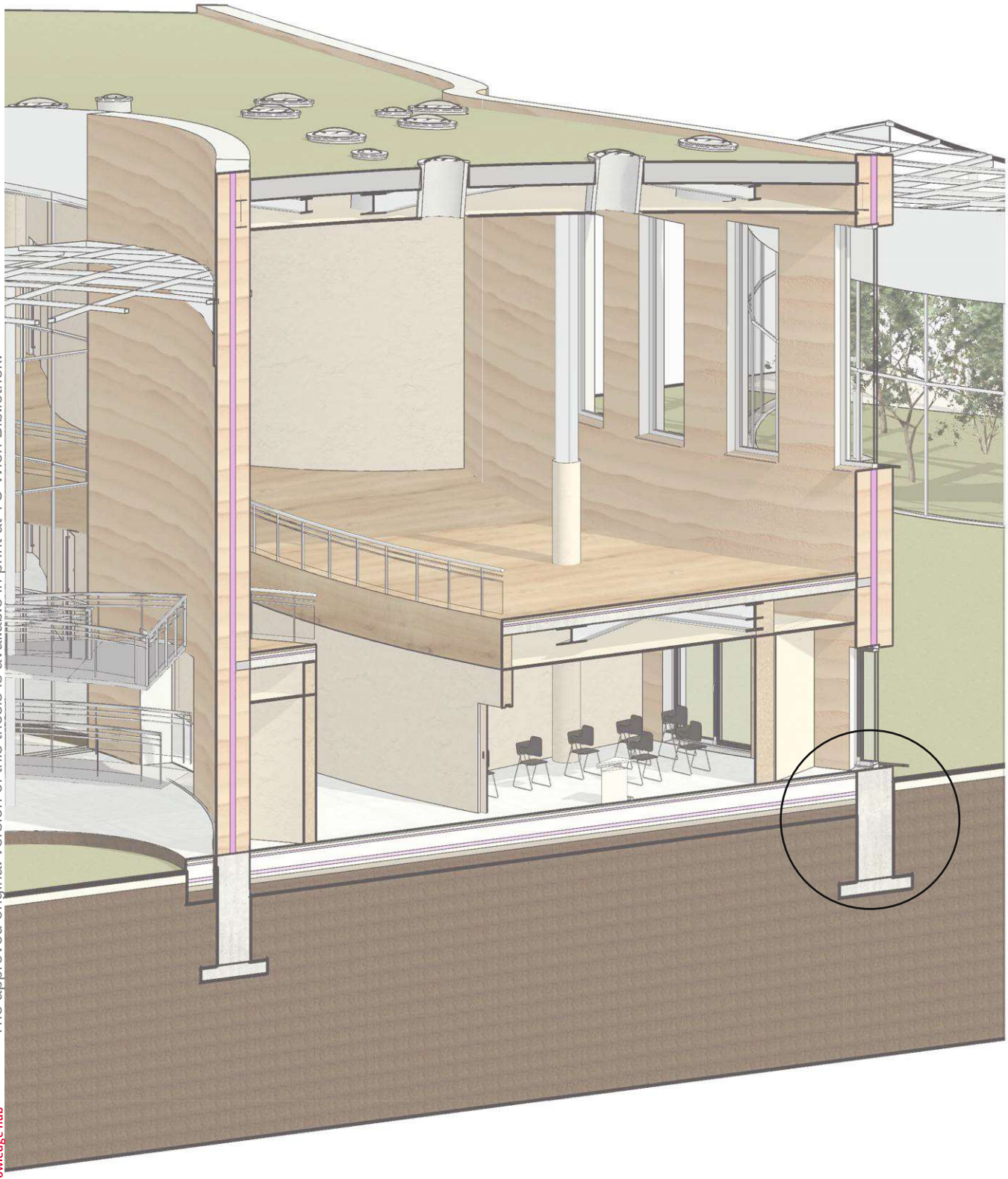


Fig.72: Marking Detail 1C in 3D Section Detail 1

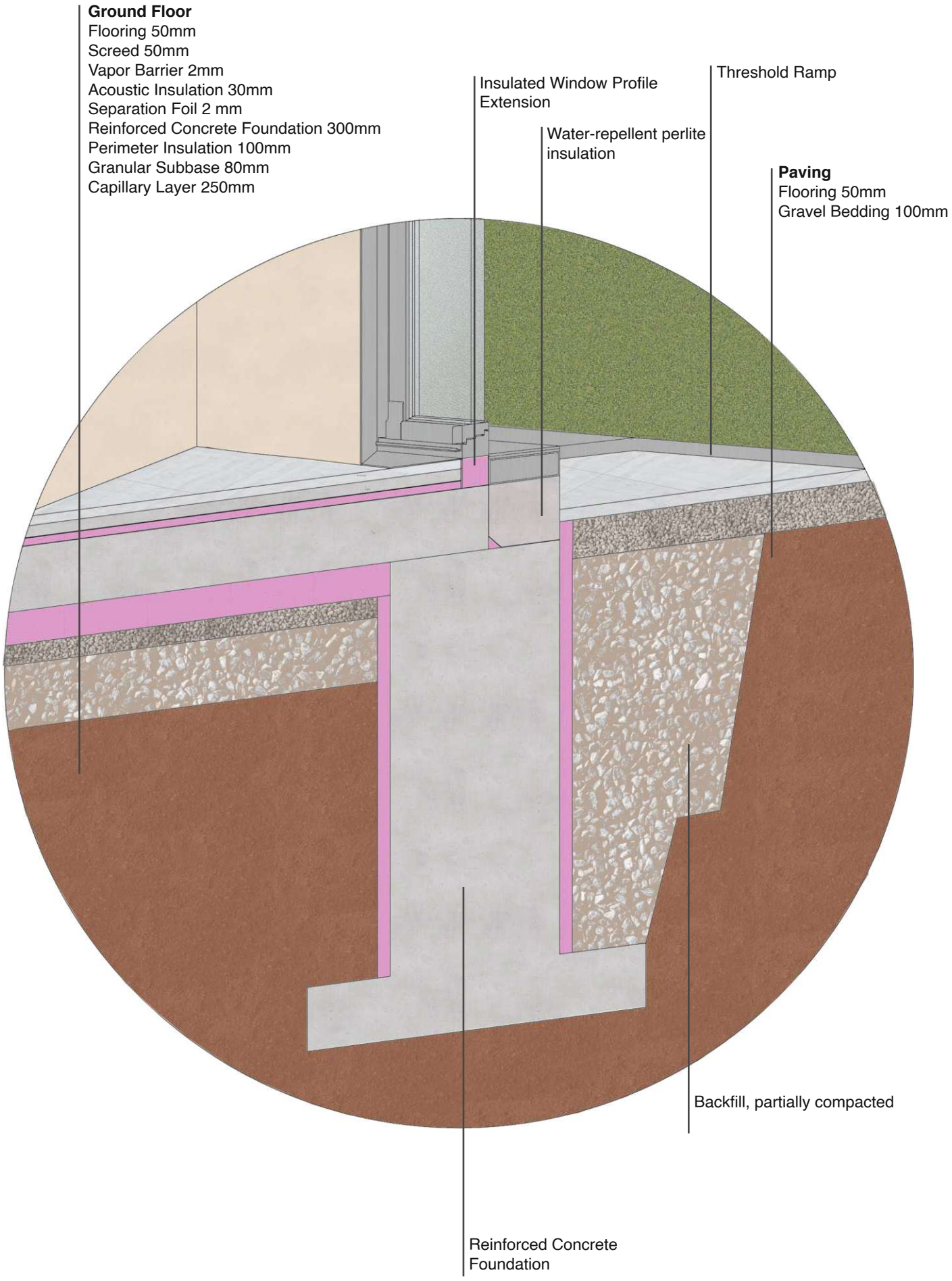


Fig.73: Detail 1C 1:20

04.05.06. Detail Sections

Detail Section 2

Outer Walls:

Building with earth has always been a part of Ankara's architectural history and there is an abundance of extracted soil in Ankara due to just increasing building projects in Turkey. (According to TÜİK Data in May 2024 area of buildings with building permits increased by 33.4%.) Rammed earth walls also have complementary qualities to the continental climate of Gölbaşı region. That's why outer walls are conceived rammed earth walls reinforced with steel bars.The walls are reinforced with steel in order to improve the tensile strength of the walls.

There is a 100mm insulation layer in the middle made of XPS with good moisture and rot resistance and high compressive strength. This insulation layer consolidate the already high thermal mass of the rammed earth walls for the extreme temperature differences due to low moisture of the climate of Ankara, despite the building being located near a lake in Gölbaşı county.

Inner Walls:

Inner walls are built with clay panels compatible with the outer walls. Adobe walls have good thermal and acoustic insulation qualities and are fire resistant. They will also provide a relaxing aesthetic appeal to the patients residing in the premises.

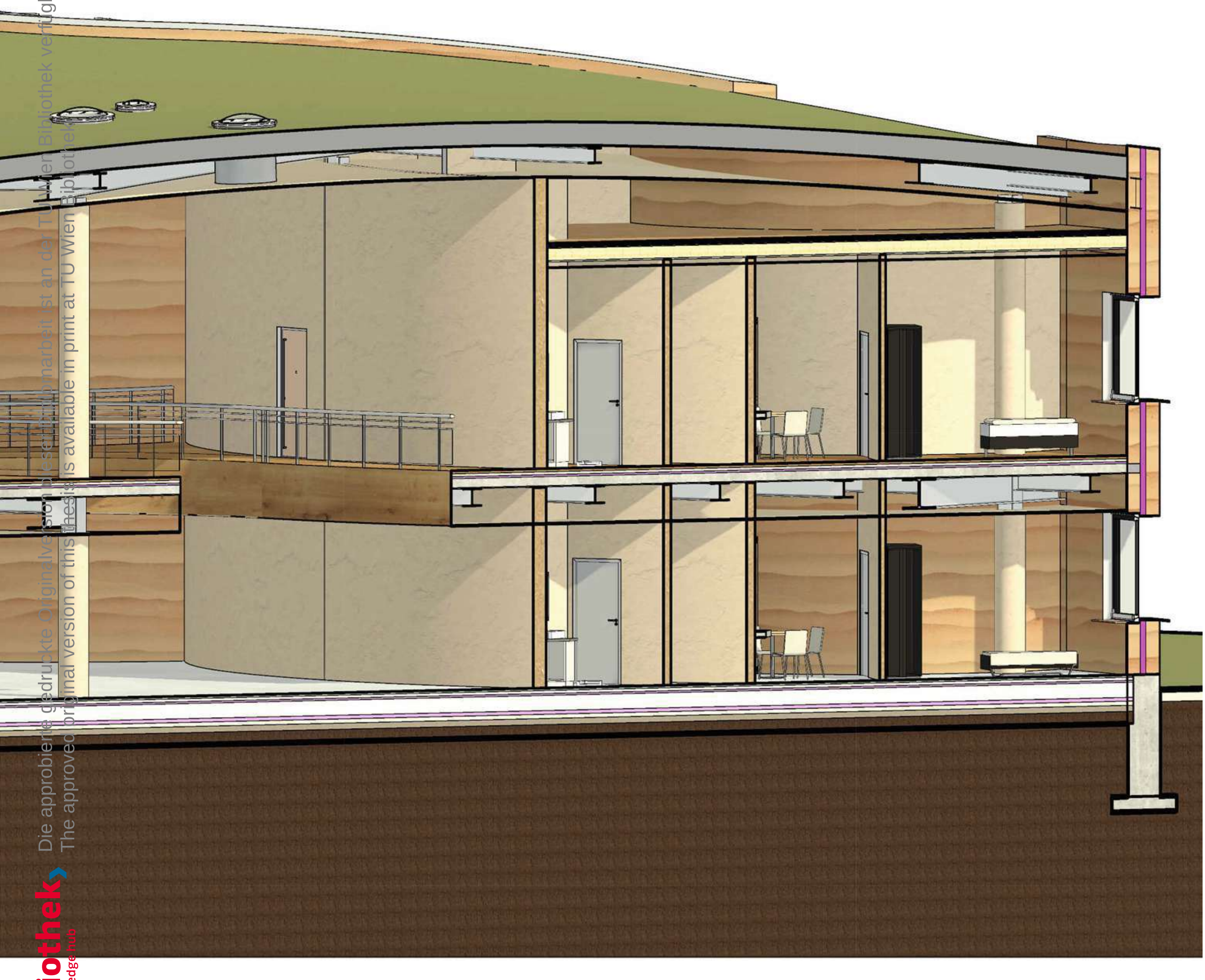


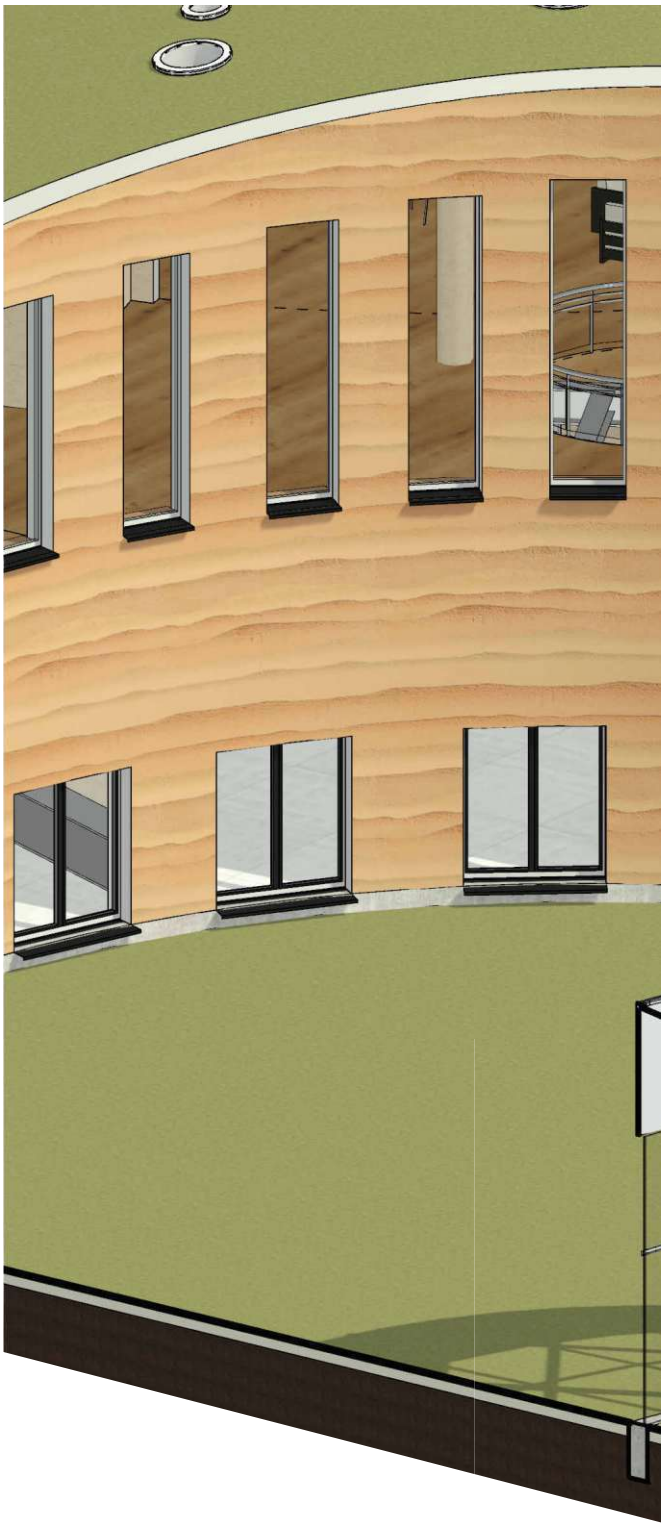
Fig.74: Detail 2

04.05.06. Detail Sections

Detail Section 3

Greenhouses:

Greenhouses are essentially built with steel columns and steel beams just like the main building. Differently on top of the main beams there are purlins that hold the polycarbonate panels. There are also facade mullions that create the post-and-beam construction that again carry the polycarbonate panels on the facade. The facade and the roof structure are then connected to each other through metal panels that follow the height of the wavy roof pattern, so that the panels at the facade could stay at a certain height for horizontally pivoted panels to be installed.



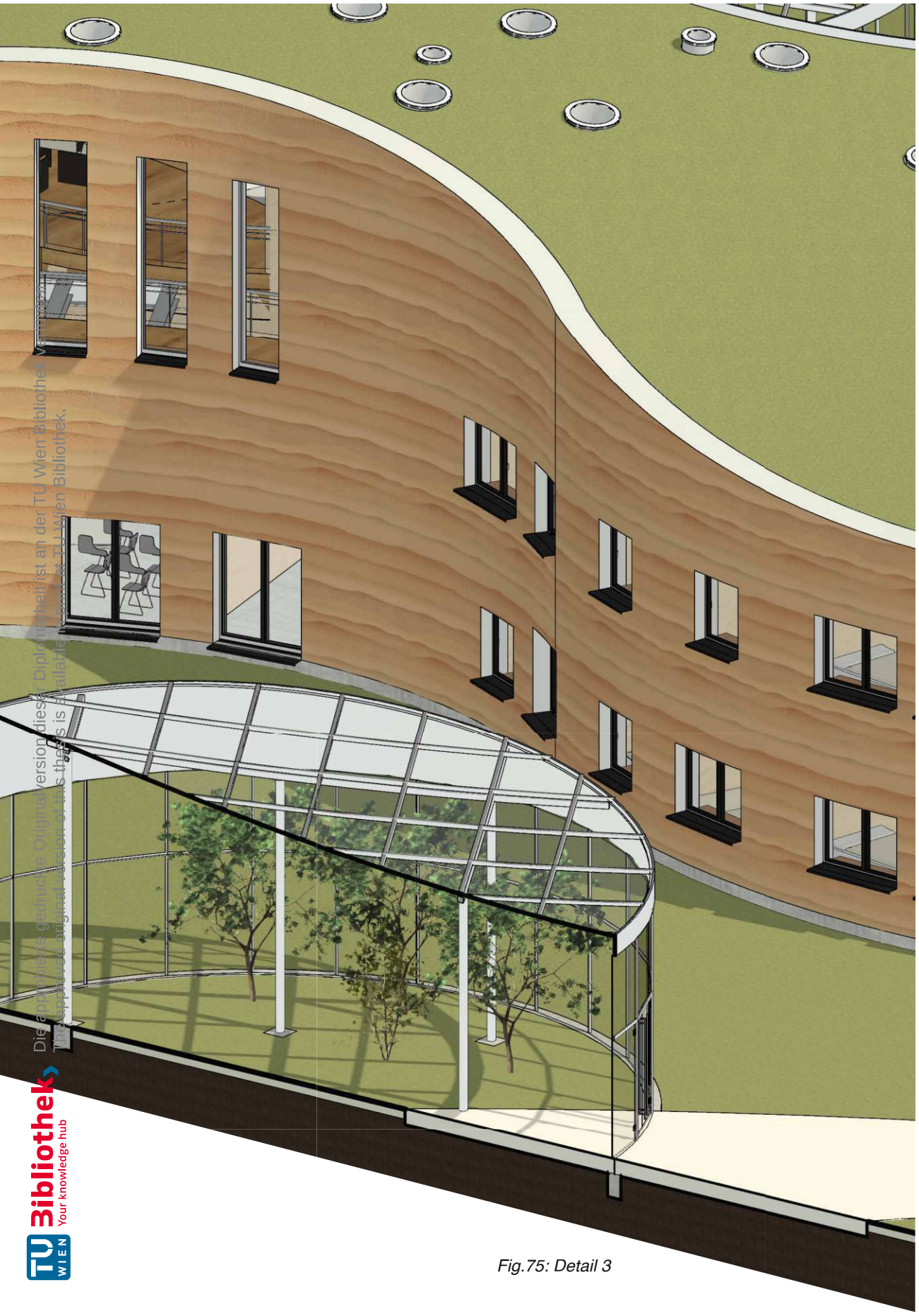


Fig.75: Detail 3

04.06. Multifunctional Circulation Areas

A key aspect of the design is the transformation of circulation areas and hallways into multifunctional spaces that encourage social interaction and therapeutic engagement. These hallways, rather than serving merely as passageways, are designed to foster connection between residents and create opportunities for natural communication.

Forming a continuous loop throughout the building, the hallways are lined with large glass facades that blur the boundaries between indoor and outdoor spaces. This design strategy allows natural light to permeate the interior, creating a sense of openness and spaciousness. The visual connection to the outside also reduces the feeling of confinement, helping the hallways feel less institutional and more welcoming.

The circulation spaces not only provide access but also become dynamic areas where residents can pause, interact, and engage with their surroundings. By offering visual and physical connectivity throughout the building, these hallways support the therapeutic goal of fostering socialization and community within the rehabilitation centre. This design approach aligns with the broader aim of creating a supportive, inclusive environment that promotes recovery and well-being for the residents.

Fig.76: Circulation Areas

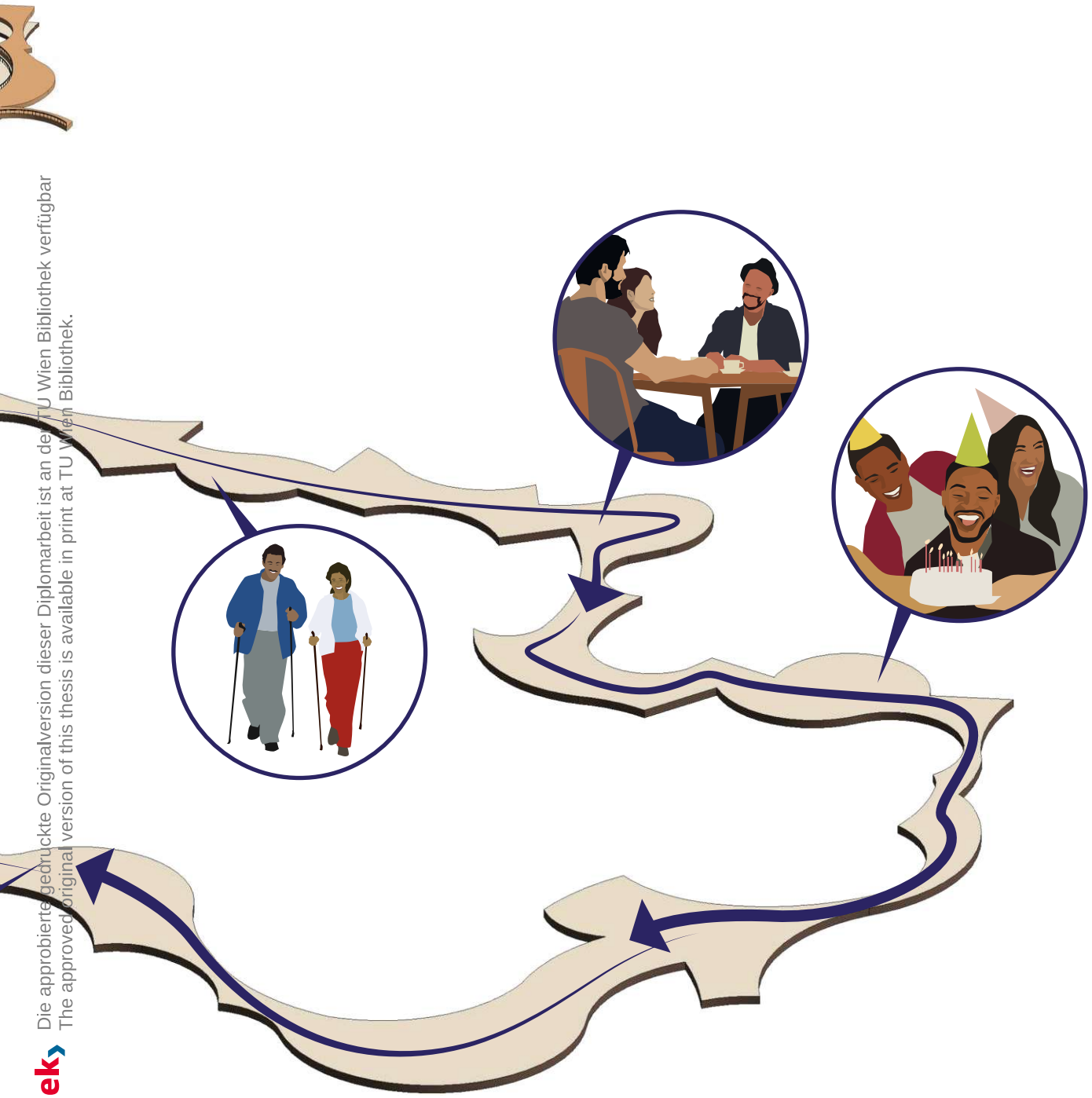


Fig.77: Circulation Concept

04.07. Shading Concept for the Glass Facades of Cafeteria and Fitness Area

Fig.78: Reference for the Facade Design, Suites Avenue Hotel in Barcelona Photo Credit: Darrell Godliman 2009

Fig.79: Reference for the Facade Design, Photo Credit: GNEE, 2024

In the cafeteria and fitness areas, corten steel panels are designed to overlay the glass curtain wall, enhancing the building's aesthetics inspired by wall patterns of rammed earth buildings. These corten panels are custom-cut into wavy shapes to complement the architectural design, adding a layer of texture and colour to the transparent glass surfaces. The corten panels are mounted using a secondary support structure that connects to the existing profiles of the curtain wall. This substructure consists of lightweight steel brackets, which are carefully aligned with the mullions and transoms of the glass facade. The brackets are fastened to the profiles using concealed fasteners, ensuring that the load of the corten panels is effectively transferred to the primary frame without compromising the integrity of the glass facade.

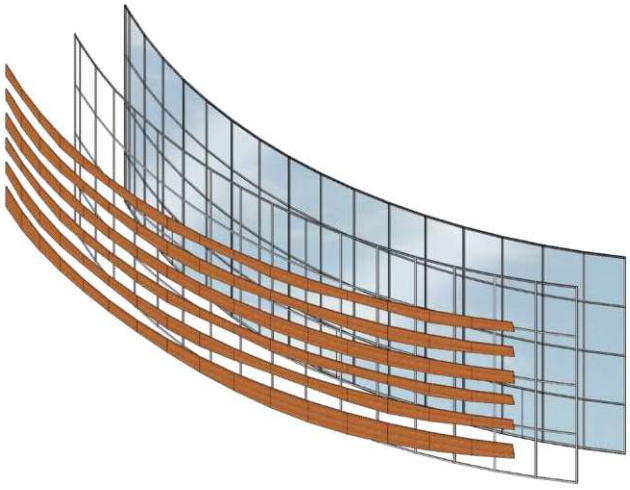


Fig.80: 3 Layers of the Glass Facades: Curtain Wall, substructure that carry the panels and corten panels

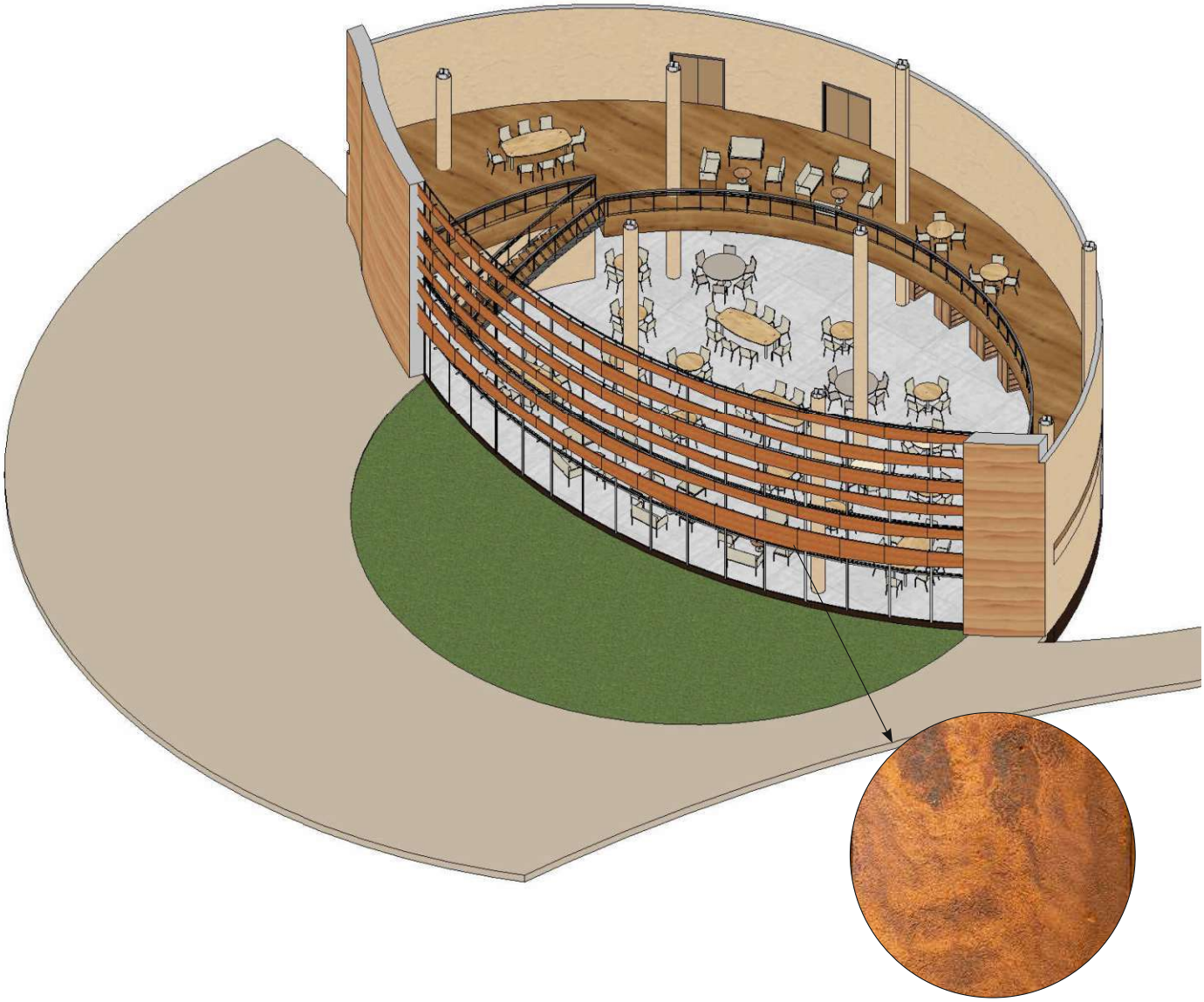


Fig.81: 3D of Cafeteria

Fig.82: Corten
Photo Credit: Castelatto, 2024

Fig.83: Corten Panels on Glass Facade of the Cafeteria
1:200

04.08. Photovoltaic Systems

Solar Canopies on Parking Lots

Solar panel shading structures in car parks are a growing trend due to their potential for optimizing unused spaces and generating renewable energy. These structures, often called solar carports, offer several benefits, including shade for vehicles, energy cost savings, and enhanced sustainability. By converting large, sun-exposed areas into power-generating hubs, car parks can offset their energy consumption while providing comfort to users.

The primary advantage of solar panel shading in car parks is their ability to reduce overall operational costs by harnessing solar energy to power lights, ticket machines, and other electrical systems. Additionally, excess energy can be sold back to the grid, further improving the return on investment. With the increasing prevalence of electric vehicles (EVs), car parks equipped with solar panels can also serve as EV charging stations, positioning them as sustainable energy sources for the future (Coniff, 2021)(Abeni, 2023).

Although solar carports require substantial initial investment, with costs varying based on the scale and location, they are a smart long-term investment due to the decreasing price of solar technology. Maintenance and potential weather-related damage are challenges that need to be considered (Abeni, 2023).

Fig.84: Parking Lot

In addition to financial benefits, solar carports also contribute to reducing the urban heat island effect, an important environmental benefit. As the benefits are even more appreciated day by day, renewable energy becomes a priority globally. (Coniff, 2021)(Abeni, 2023).

By integrating solar shading into car parks, both private and public entities can make significant contributions to sustainability, reducing their carbon footprint while enhancing the value of their properties and infrastructure.

04.09. Use of Operable Walls in the Seminar Room

Fig.85: Operable Panels Reference Photo
Photo Credit: Modern Fold, Dormaka Group, 2023

The seminar room is designed as a large, multifunctional space that accommodates a wide variety of activities, including seminars, conferences, theatrical performances, and other events. Flexibility is key to maximizing the usage of the room. To this end, the space can be easily adapted to meet different needs by using operable walls, which allow the room to be divided into smaller sections or opened up into one large space.

When required, the operable walls can be used to subdivide the seminar room into three distinct smaller rooms, each capable of functioning independently as a classroom, meeting room, or breakout area for smaller discussions. This feature enables the room to serve multiple events or activities concurrently, thereby enhancing its utility. The walls are designed to provide sound insulation, ensuring that activities in adjacent rooms are not disrupted.

During larger events, the walls can be retracted, transforming the space into a single, cohesive environment that accommodates a greater number of participants. This versatility is essential for facilities that host diverse functions, as it allows them to quickly and efficiently reconfigure spaces without the need for permanent partitions. Moreover, the operable walls contribute to the overall aesthetic, seamlessly blending into the architectural design when not in use.

In addition to they may feature acoustic properties to enhance the sound quality within the subdivided spaces, as well as integrated technology such as screens or whiteboards to support educational or corporate activities. The use of operable walls ensures that the seminar room remains an adaptable and dynamic environment, capable of evolving to meet the changing needs of its users.

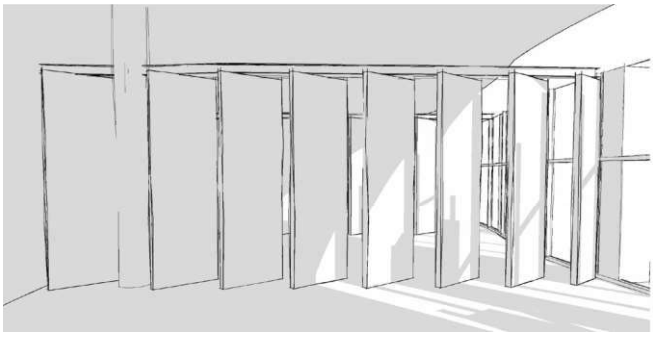


Fig.86: Operable Panels in the Seminar Room (Open)

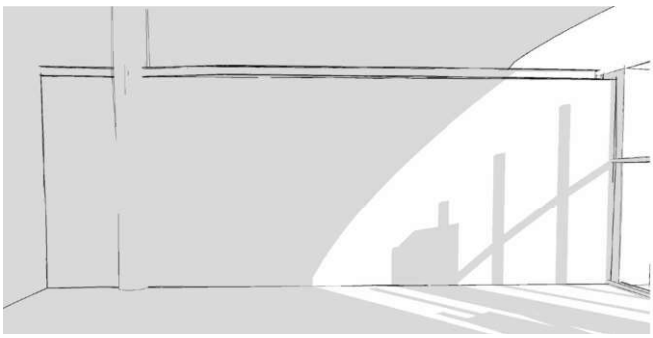
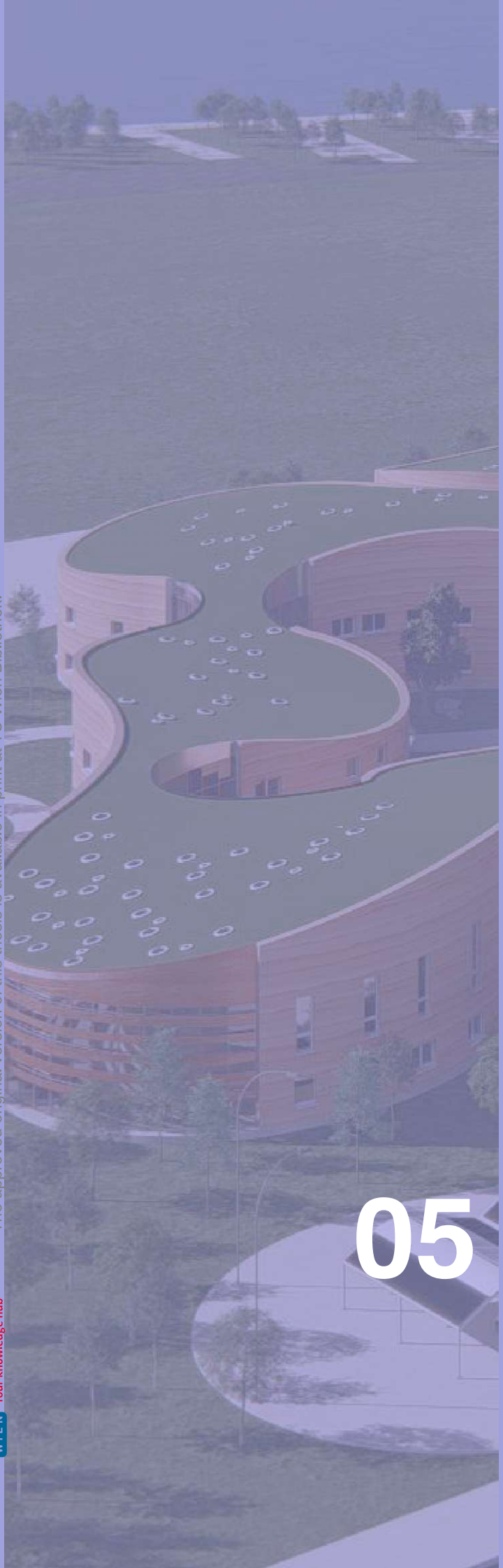


Fig.87: Operable Panels in the Seminar Room (Closed)

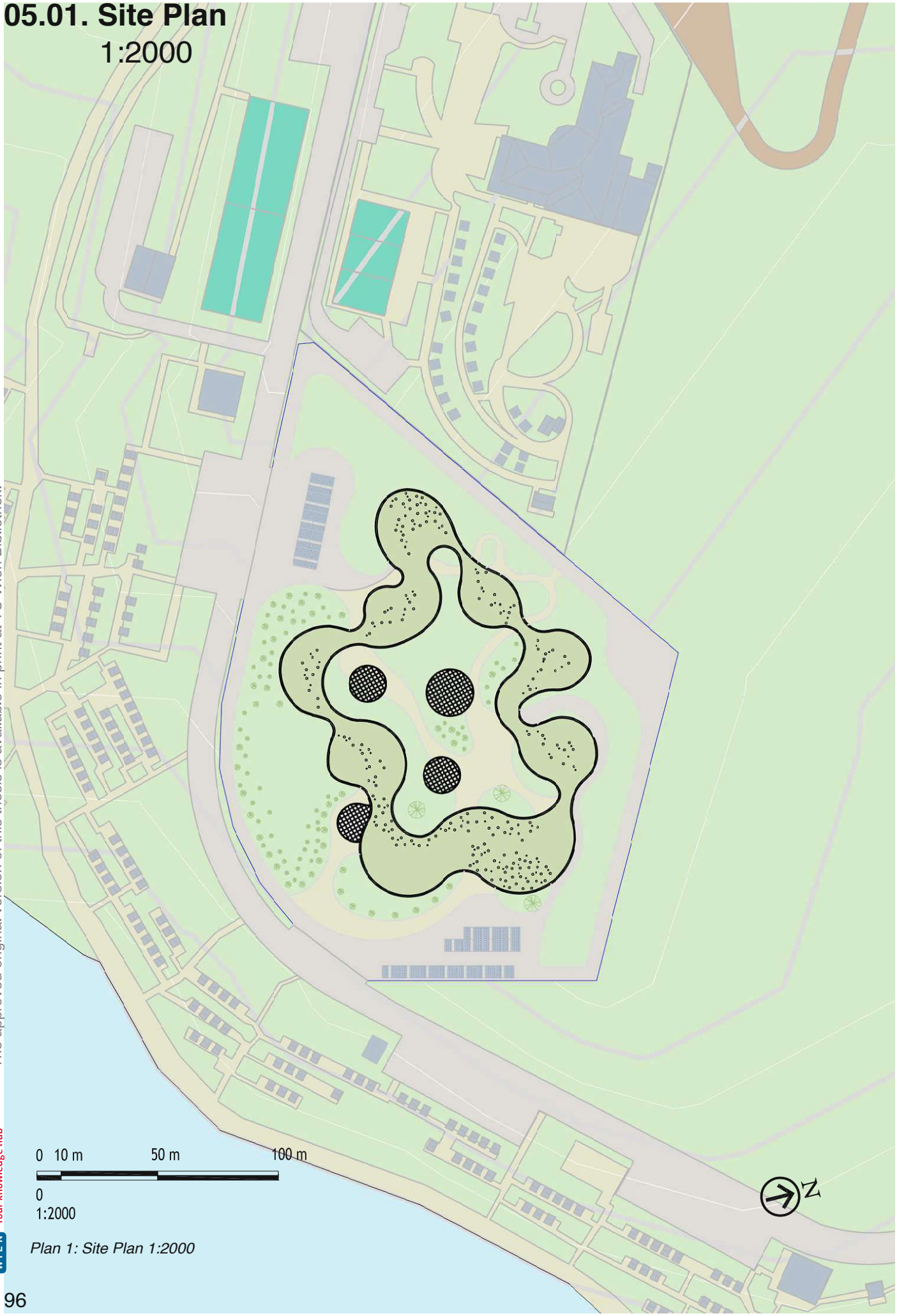
Fig.88: Operable Panels in the Seminar Room



05 Results

Render 1: Bird's Eye View to The Centre

05.01. Site Plan
1:2000



Plan 1: Site Plan 1:2000

05.01. Site Plan
1:1000

Plan 2: Site Plan 1:1000

05.02. Ground Floor
1:1000

Plan 3: Ground Floor 1:1000

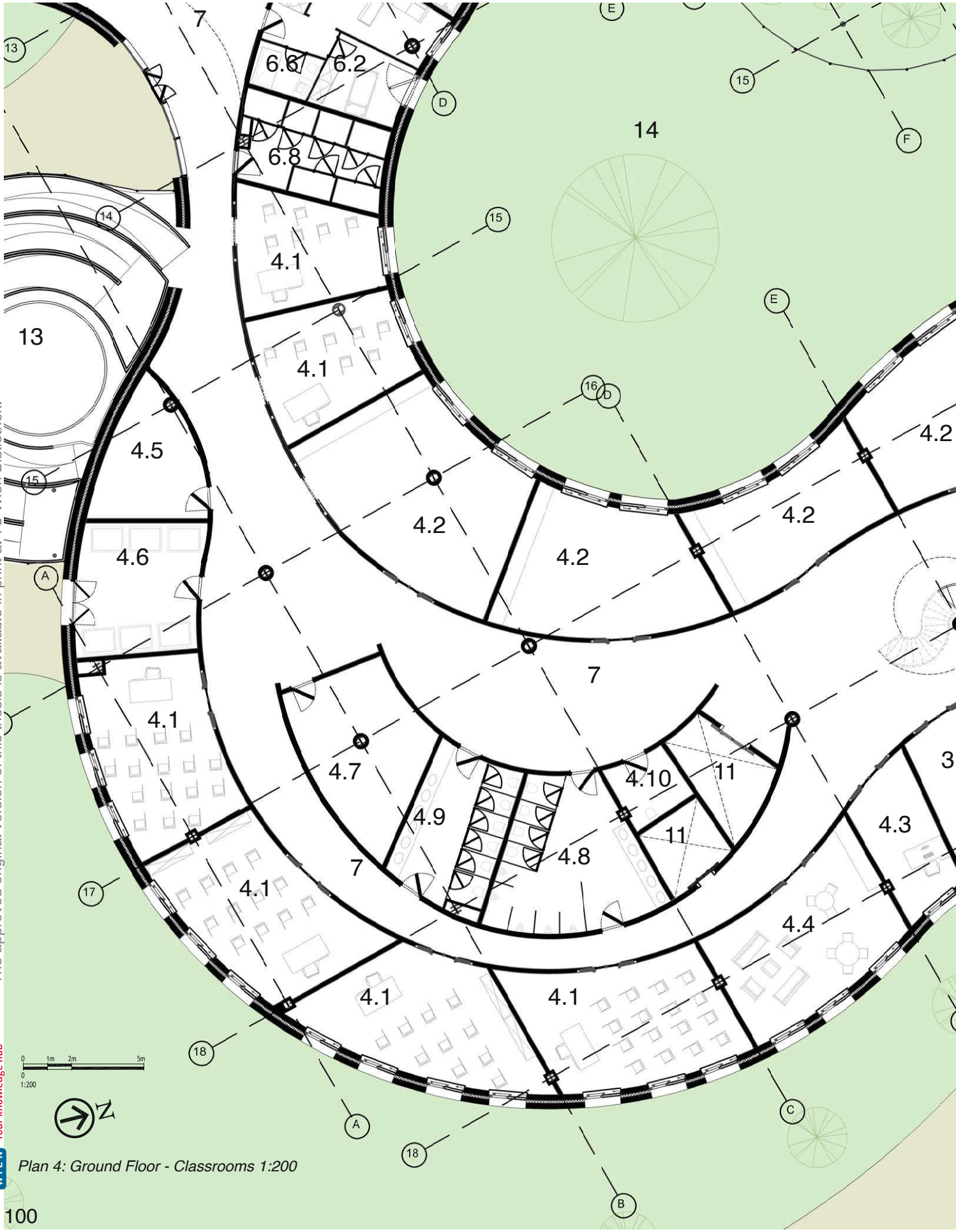
Ground Floor:

- Entrance (1): 240.17 m²
- Reception Area (2):
  - Reception (2.1): 6.93m²
  - Office (2.2): 26.77m²
  - Storage (2.3): 4.19m²
- Management (3): 21.22m²
- Education Area (4):
  - Classrooms (4.1): 24-42m²
  - Workshops (4.2): 31-57m²
  - Guidance Counsellor (4.3):17.02m²
  - Staff Room (4.4): 39.91m²
  - Storage Rooms (4.5): 6-19m²
  - Trash Collection (4.6):26.96m²
  - Technical Rooms (4.7): 28.97m²
  - WC's:
    - Men's (4.8): 33.94m²
    - Women's (4.9): 22.98m²
    - Accessible(4.10): 7.06m²
- Seminar Rooms (5): 208.97m² in total
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
  - Laundry Rooms (6.10): 13-23m²
  - Common Room (6.11): 30.15m²
  - Storage Units (6.12): 18-46m²
  - Bicycle Storage Room (6.13): 10.21m²
  - Technical Rooms (6.14): 7-25m²
  - Trash Collection (6.15):14-16m²
- Hallway + Common Area (7): 2714,15m²
- Treatment Area (8):
  - Doctor's Office (8.1): 22.08m²
  - Examination Room (8.2): 19.89m²
  - Group Therapy Room (8.3): 25.23m²
  - Nurses' Office (8.4): 23.59m²
  - Staff Room (8.5): 16.08m²
  - Overnight Quarter (8.6): 13.50m²
  - Staff Bathrooms (8.7): 4-9m²
  - Storage (8.8): 10.05m²
  - Trash Collection (8.9): 11.53m²
  - Technical Room (8.10): 21.57m²
- Fitness Area (9):
  - Fitness Room (9.1): 258.63m²
  - Locker Rooms (9.2): 28-30m²
  - WC's (9.3): 9-10m²
  - Showers (9.4): 7-10m²
- Gastronomy Area (10):
  - Cafeteria (10.1): 278.13m²
  - Mini Market (10.2): 137.77m²
  - Kitchen (10.3): 49.25m²
  - Storage Rooms (10.4): 8-17m²
  - Freezer Room (10.5): 7.04m²
  - WC's:
    - Men's (10.6): 23.64m²
    - Women's (10.7): 19.67m²
    - Accessible (10.8): 4.63m²
    - Staff (10.9): 3.44m²
  - Technical Room (10.10): 8-15m²
  - Trash Collection (10.11): 12.06m²
  - Hallway (10.12): 5-15m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²
- Ramp Room (13): 160.32m²
- Courtyard (14): 5175.83m²
- Green Houses (15): 177-303m²
- Car parks (16): 1550-1768m²

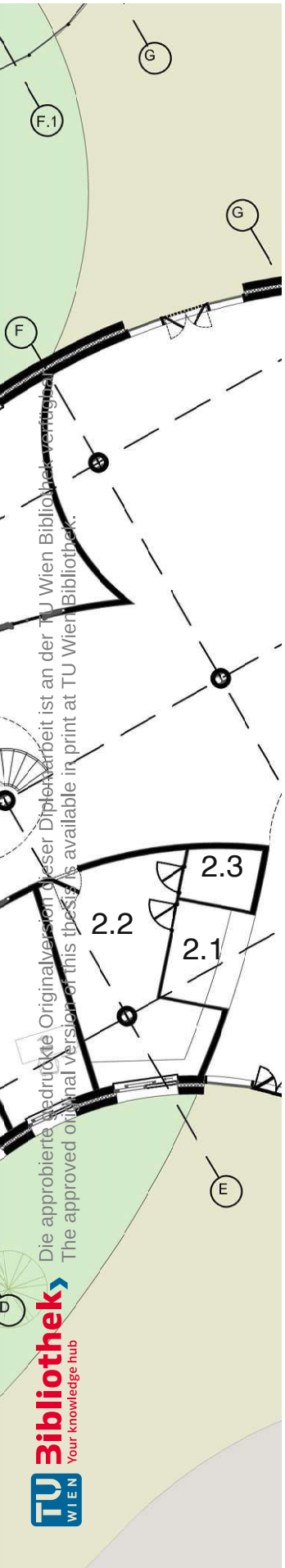
Fig.89: Space Allocation Chart of Ground Floor

05.02. Ground Floor

Classrooms 1:200



Plan 4: Ground Floor - Classrooms 1:200



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  - Staff Room (8.5): 16.08m²
  - Overnight Quarter (8.6): 13.50m²
  - Staff Bathrooms (8.7): 4-9m²
  - Storage (8.8): 10.05m²
  - Trash Collection (8.9): 11.53m²
  - Technical Room (8.10): 21.57m²
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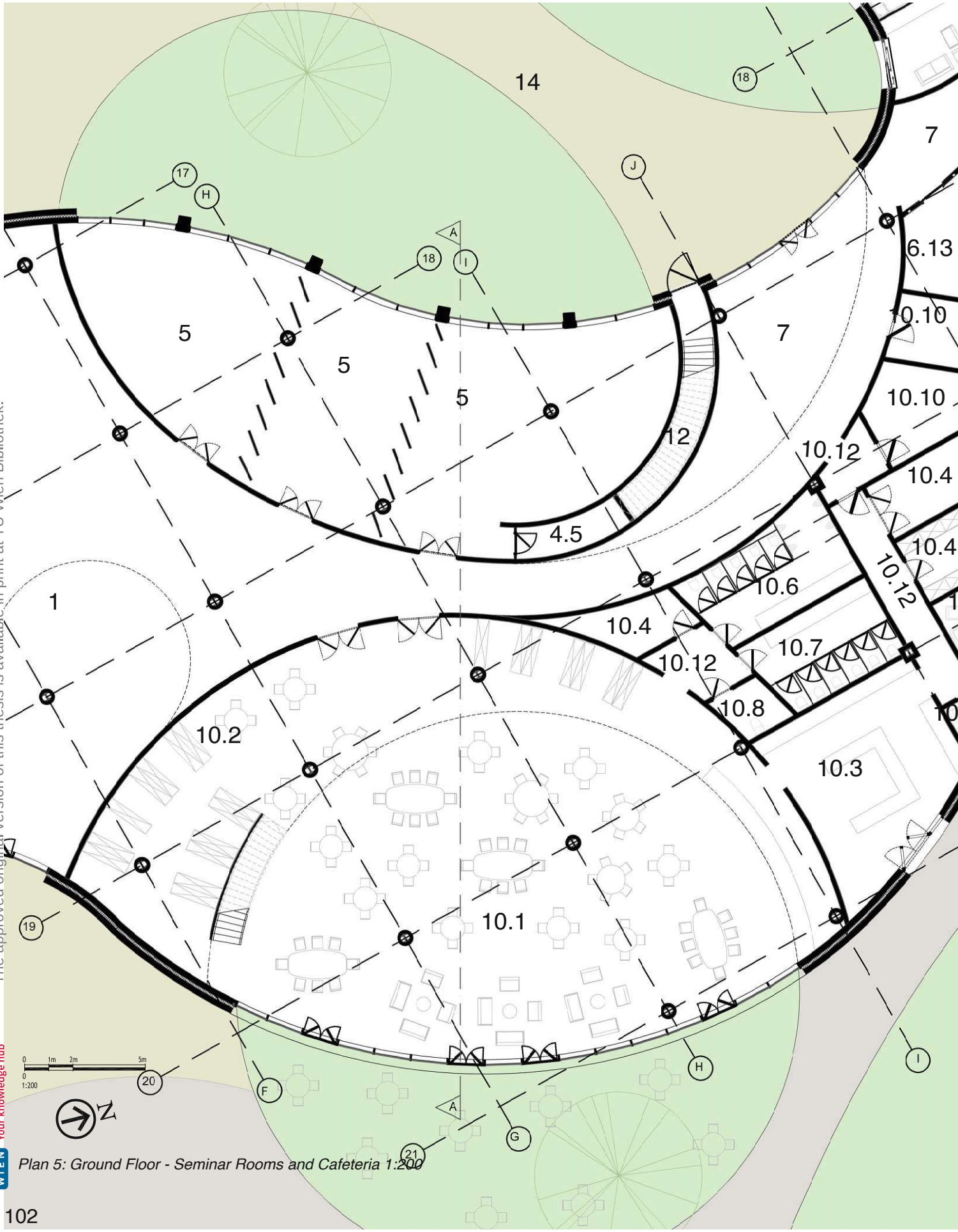
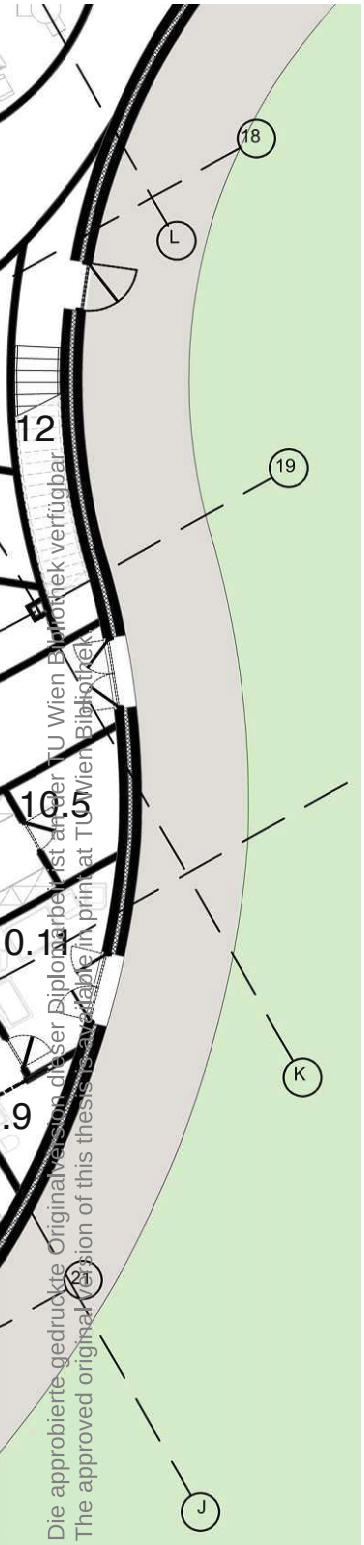
Fig.89: Space Allocation Chart of Ground Floor

05.02. Ground Floor

Seminar Rooms and Cafeteria 1:200



Plan 5: Ground Floor - Seminar Rooms and Cafeteria 1:200



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  - Overnight Quarter (8.6): 13.50m²
  - Staff Bathrooms (8.7): 4-9m²
  - Storage (8.8): 10.05m²
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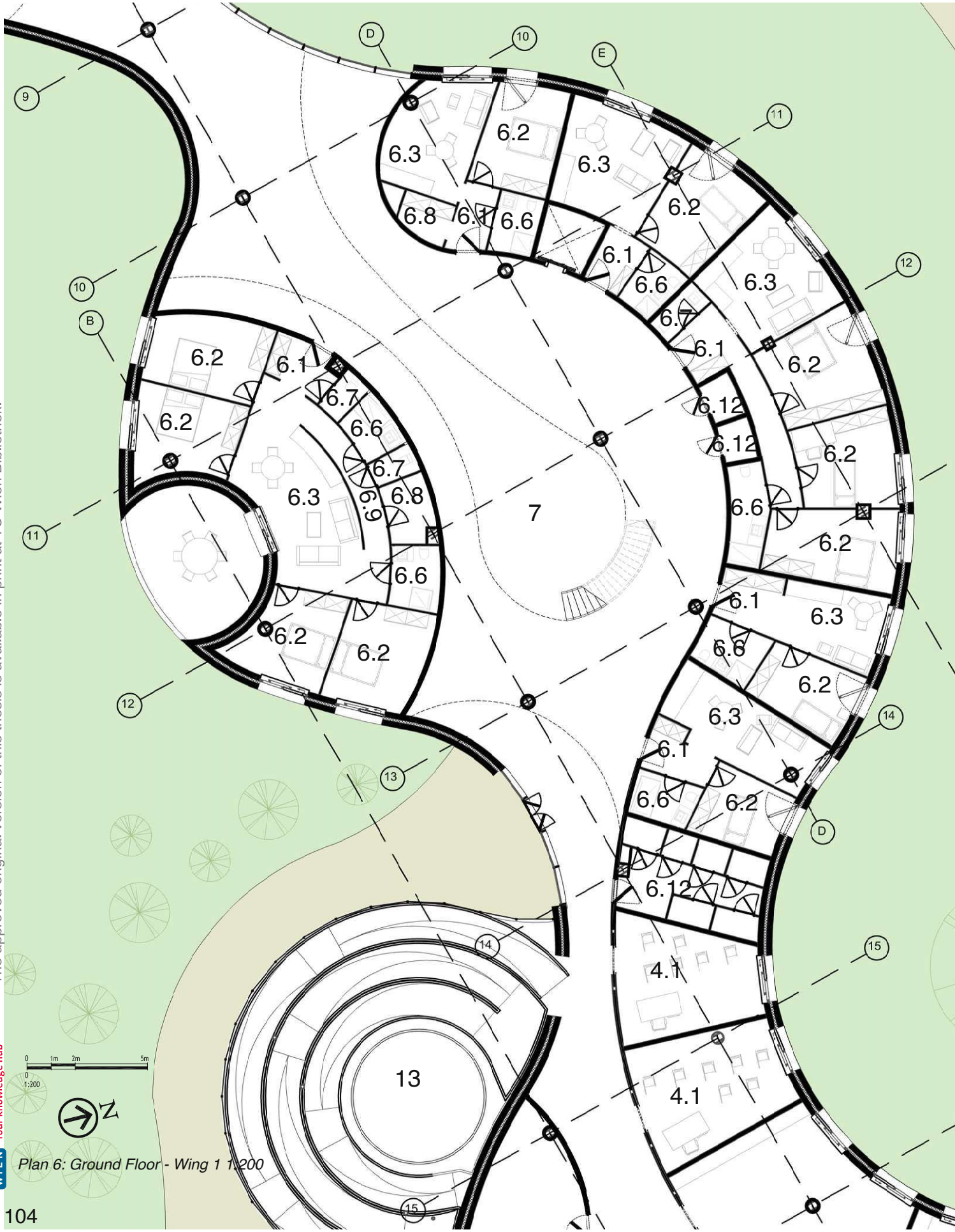
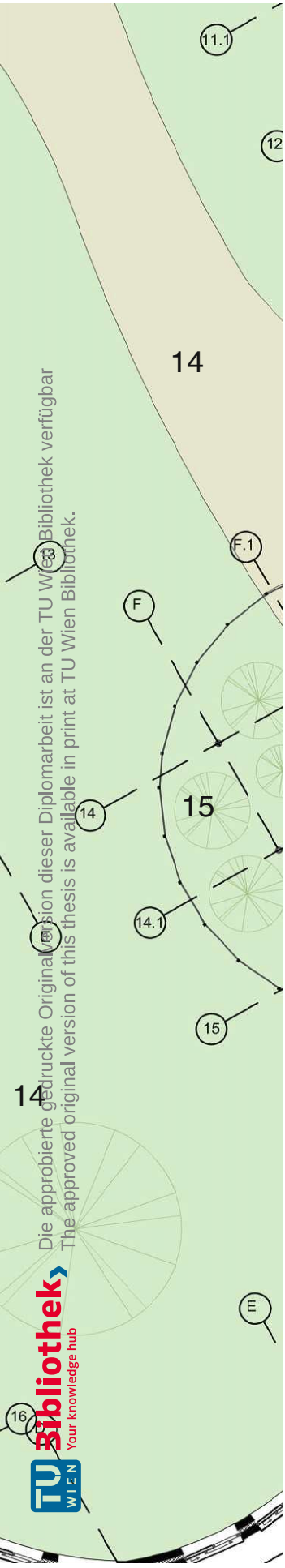
Fig.89: Space Allocation Chart of Ground Floor

05.02. Ground Floor

Apartments in Wing 1 1:200



Plan 6: Ground Floor - Wing 1 1:200



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  - Nurses' Office (8.4): 23.59m²
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  - Storage (8.8): 10.05m²
  - Trash Collection (8.9): 11.53m²
  - Technical Room (8.10): 21.57m²
- Fitness Area (9):
  - Fitness Room (9.1): 258.63m²
  - Locker Rooms (9.2): 28-30m²
  - WC's (9.3): 9-10m²
  - Showers (9.4): 7-10m²
- Gastronomy Area (10):
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  - Kitchen (10.3): 49.25m²
  - Storage Rooms (10.4): 8-17m²
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    - Accessible (10.8): 4.63m²
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- Fire Exits (12): 10-15 m²
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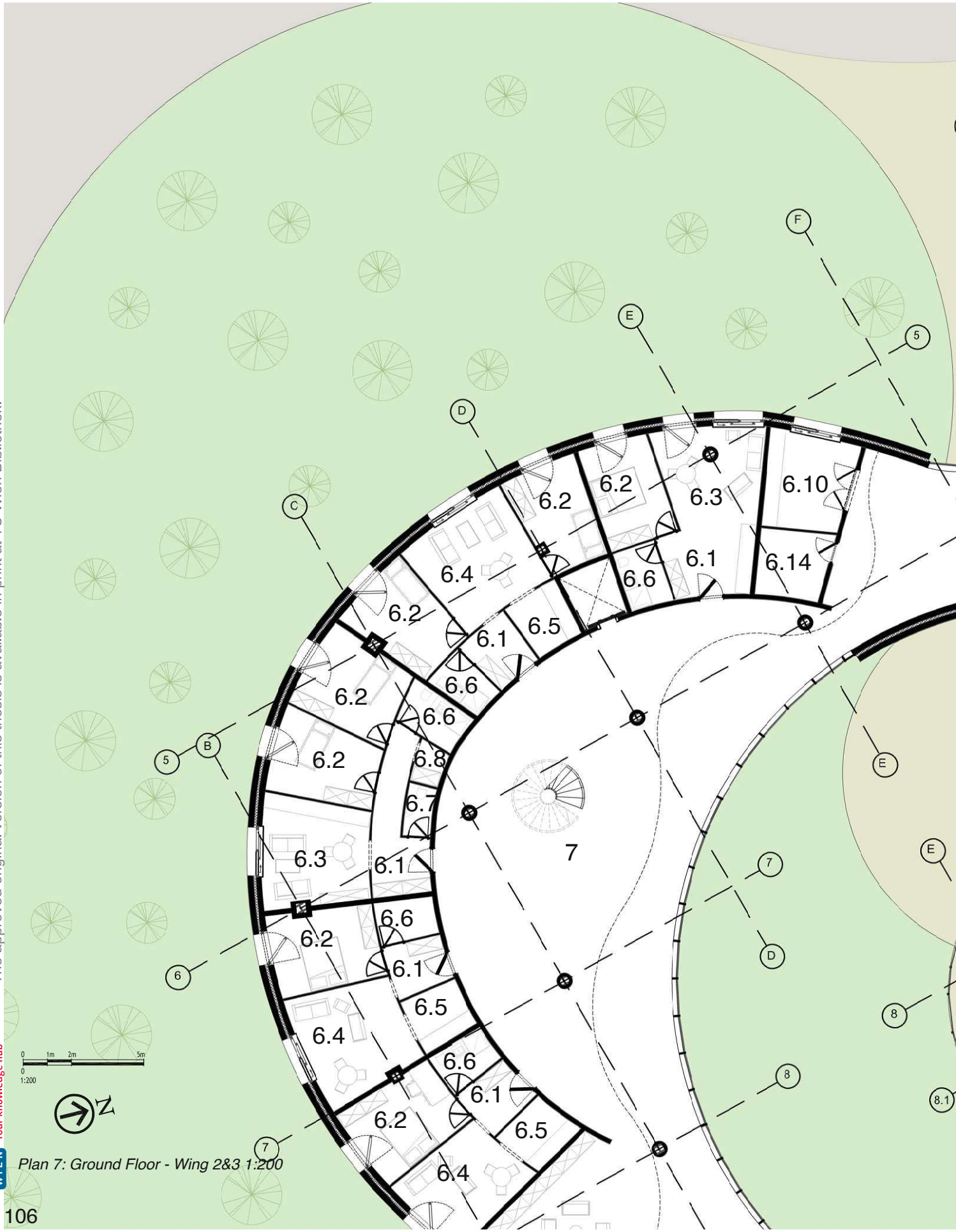
- Courtyard (14): 5175.83m²
- Green Houses (15): 177-303m²
- Car parks (16): 1550-1768m²

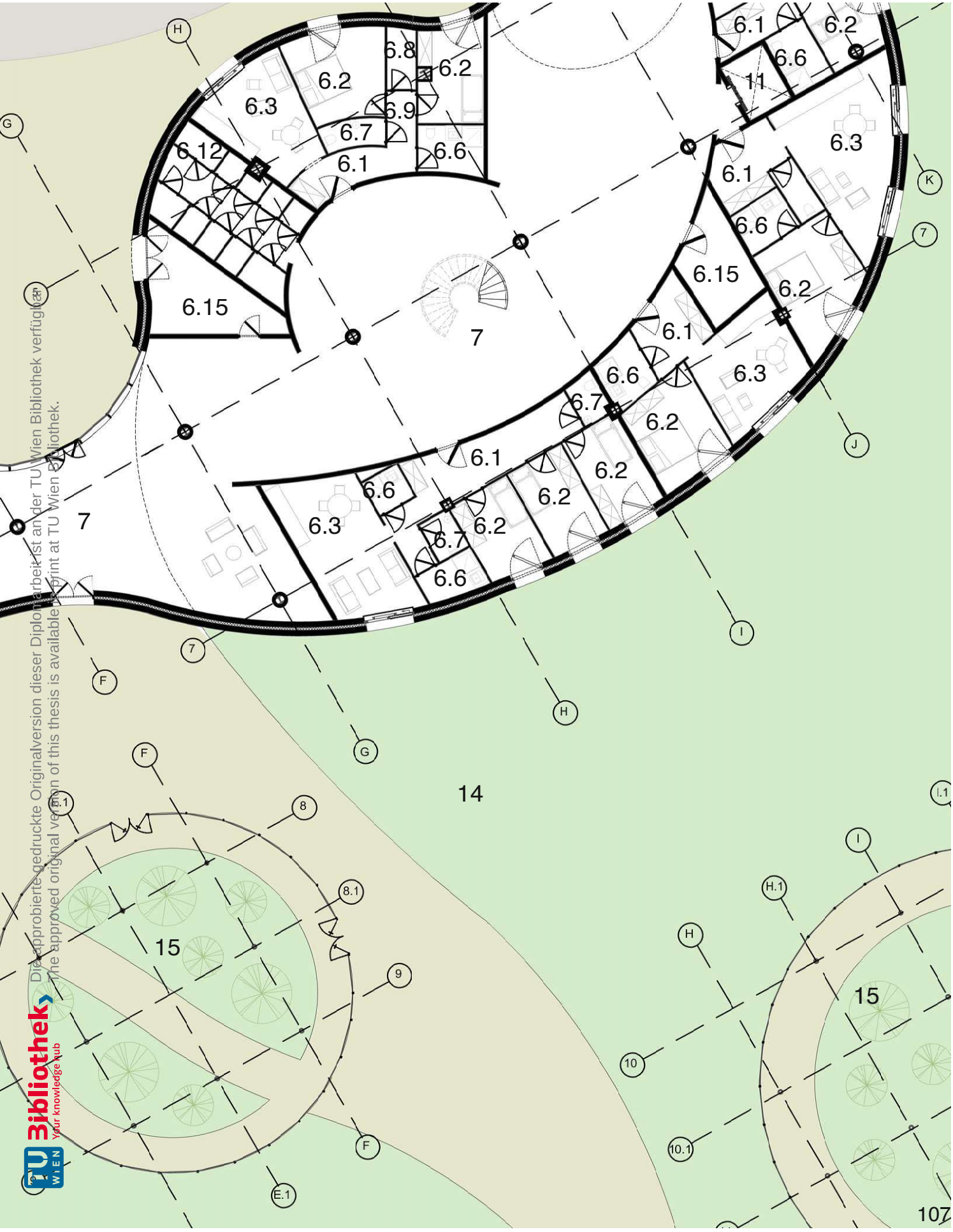
Fig.89: Space Allocation Chart of Ground Floor

05.02. Ground Floor

Apartments in Wing 2 and 3 1:200

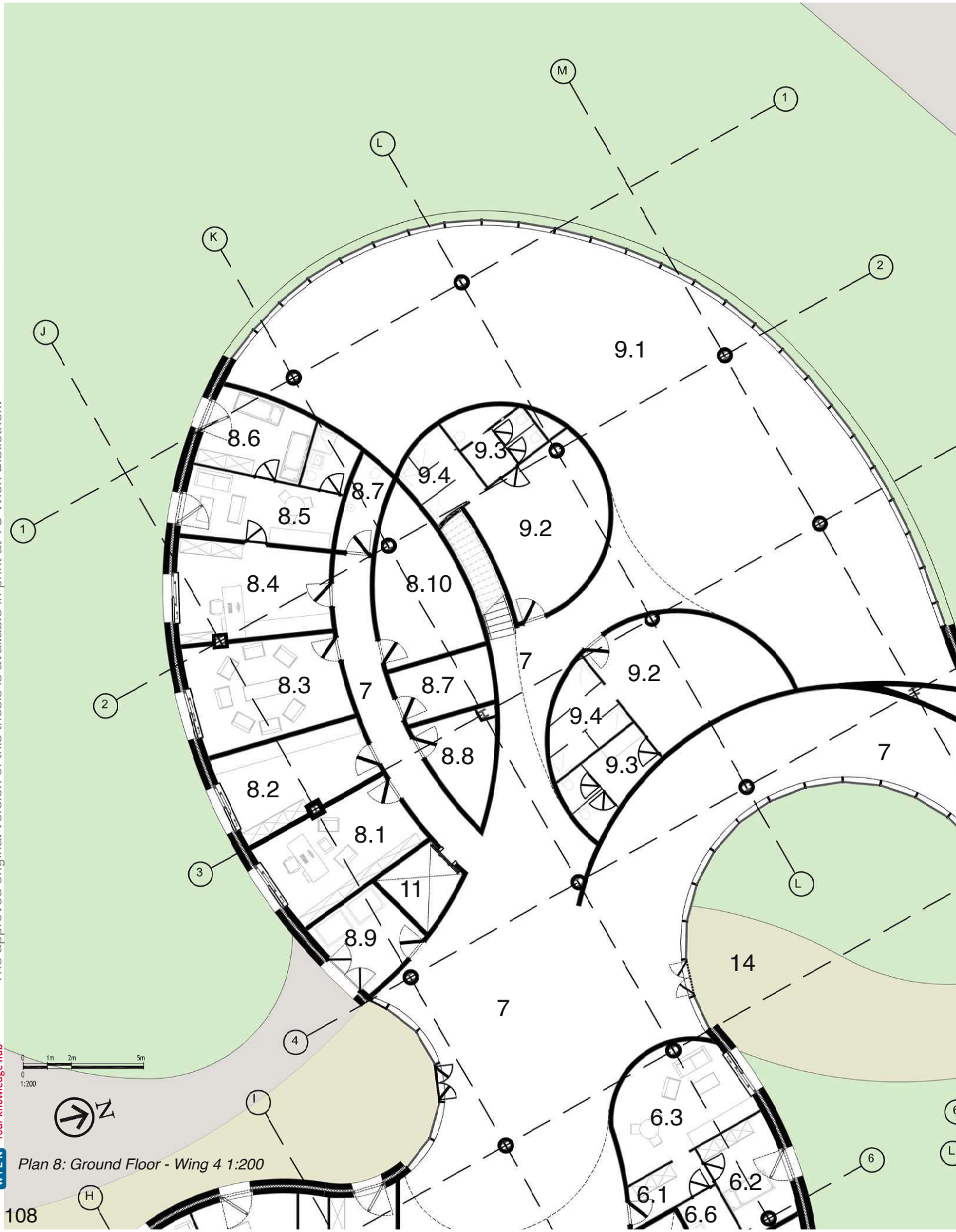


Plan 7: Ground Floor - Wing 2&3 1:200

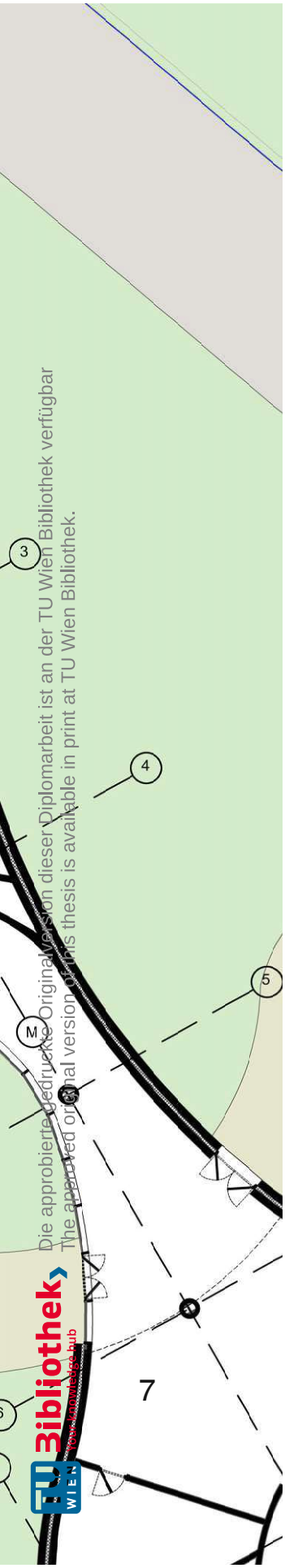


05.02. Ground Floor

Fitness and Therapy Centre in Wing 4 1:200



Plan 8: Ground Floor - Wing 4 1:200



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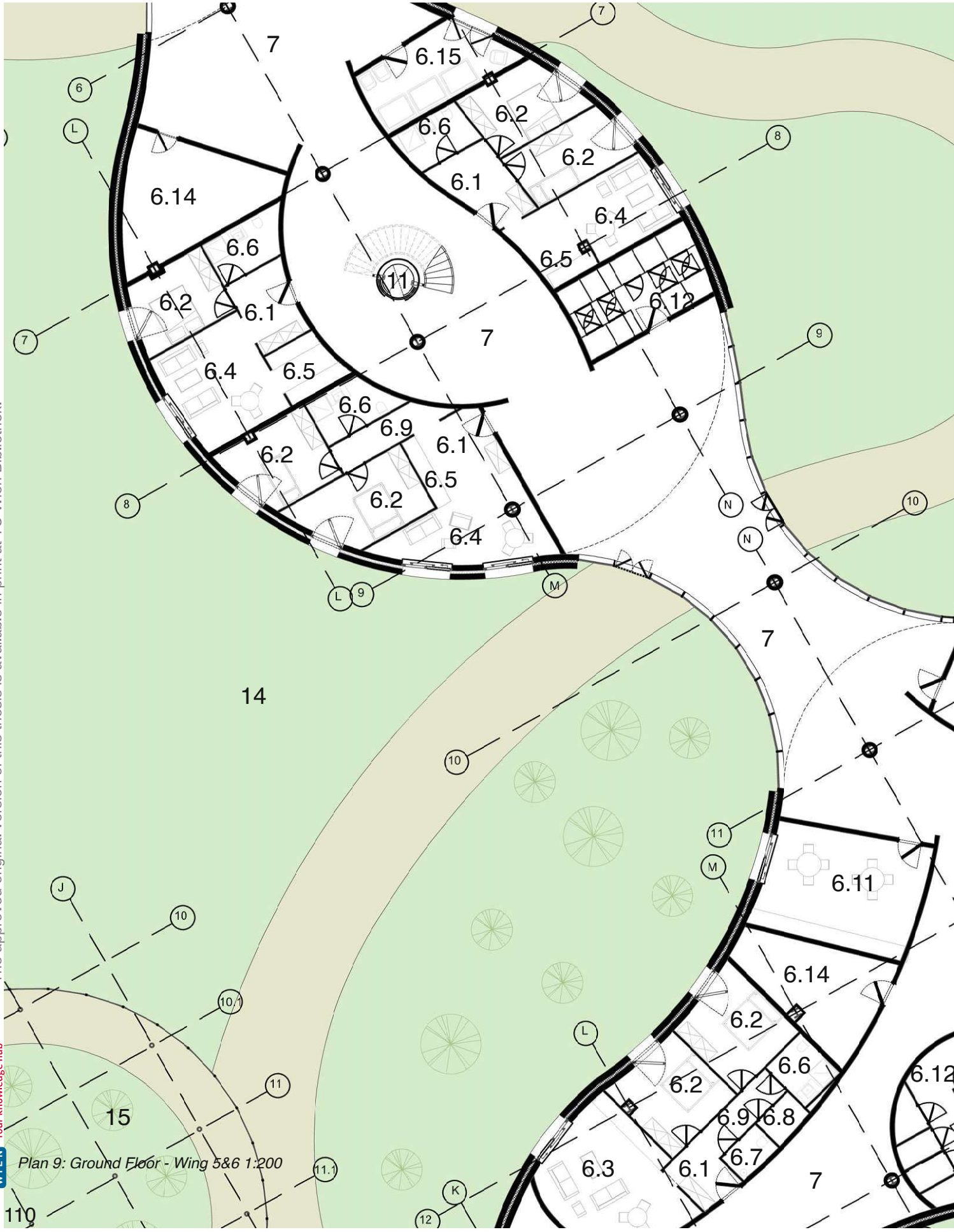
  - Storage Rooms (4.5): 6-19m²
  - Trash Collection (4.6):26.96m²
  - Technical Rooms (4.7): 28.97m²
  - WC's:
    - Men's (4.8): 33.94m²
    - Women's (4.9): 22.98m²
    - Accessible(4.10): 7.06m²
- Seminar Rooms (5): 208.97m² in total
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
  - Laundry Rooms (6.10): 13-23m²
  - Common Room (6.11): 30.15m²
  - Storage Units (6.12): 18-46m²
  - Bicycle Storage Room (6.13): 10.21m²
  - Technical Rooms (6.14): 7-25m²
  - Trash Collection (6.15):14-16m²
- Hallway + Common Area (7): 2714,15m²
- Treatment Area (8):
  - Doctor's Office (8.1): 22.08m²
  - Examination Room (8.2): 19.89m²
  - Group Therapy Room (8.3): 25.23m²
  - Nurses' Office (8.4): 23.59m²
  - Staff Room (8.5): 16.08m²
  - Overnight Quarter (8.6): 13.50m²
  - Staff Bathrooms (8.7): 4-9m²
  - Storage (8.8): 10.05m²
  - Trash Collection (8.9): 11.53m²
  - Technical Room (8.10): 21.57m²
- Fitness Area (9):
  - Fitness Room (9.1): 258.63m²
  - Locker Rooms (9.2): 28-30m²
  - WC's (9.3): 9-10m²
  - Showers (9.4): 7-10m²
- Gastronomy Area (10):
  - Cafeteria (10.1): 278.13m²
  - Mini Market (10.2): 137.77m²
  - Kitchen (10.3): 49.25m²
  - Storage Rooms (10.4): 8-17m²
  - Freezer Room (10.5): 7.04m²
  - WC's:
    - Men's (10.6): 23.64m²
    - Women's (10.7): 19.67m²
    - Accessible (10.8): 4.63m²
    - Staff (10.9): 3.44m²
  - Technical Room (10.10): 8-15m²
  - Trash Collection (10.11): 12.06m²
  - Hallway (10.12): 5-15m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²
- Ramp Room (13): 160.32m²
- Courtyard (14): 5175.83m²
- Green Houses (15): 177-303m²
- Car parks (16): 1550-1768m²

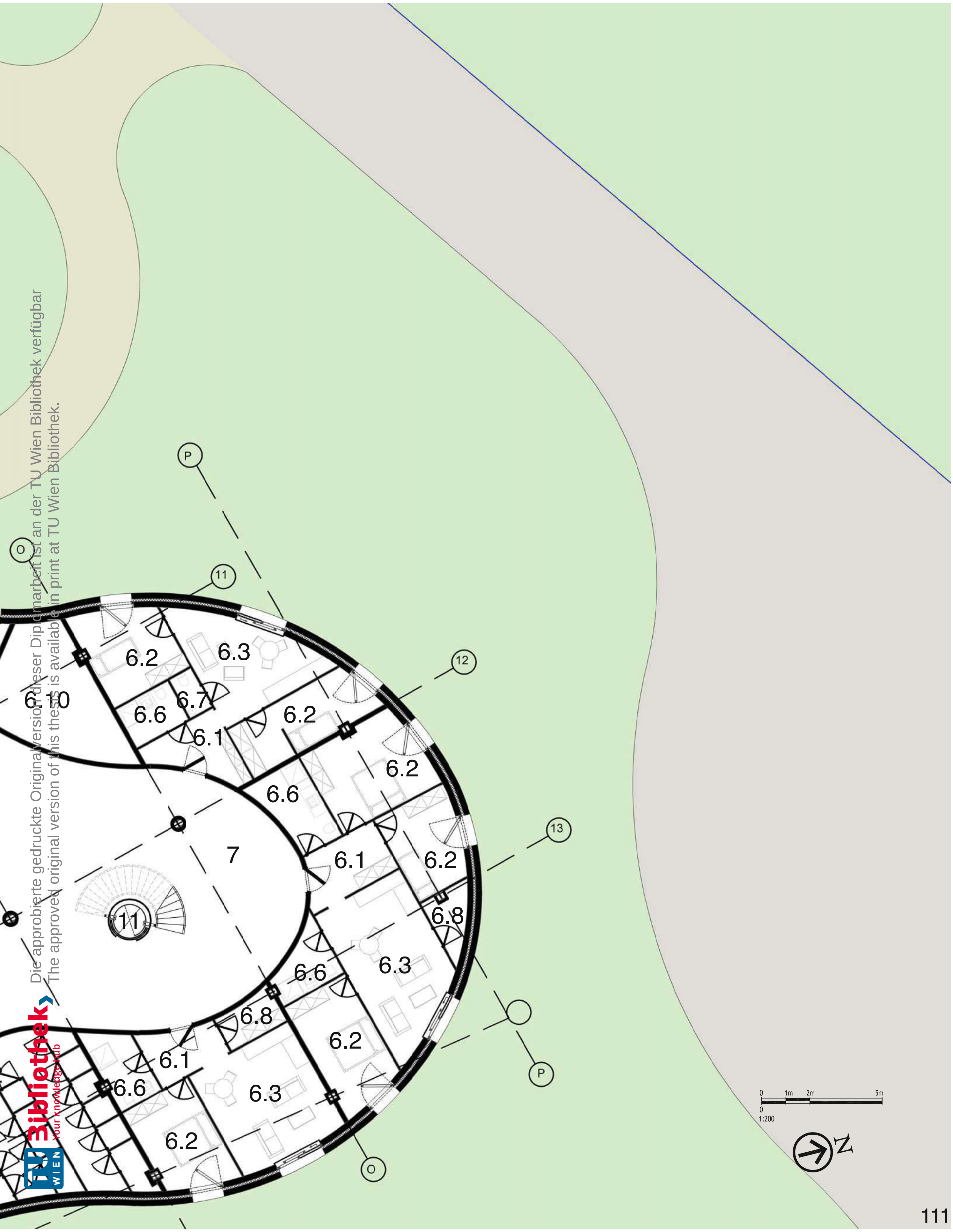
Fig.89: Space Allocation Chart of Ground Floor

05.02. Ground Floor

Apartments in Wing 5 and 6 1:200

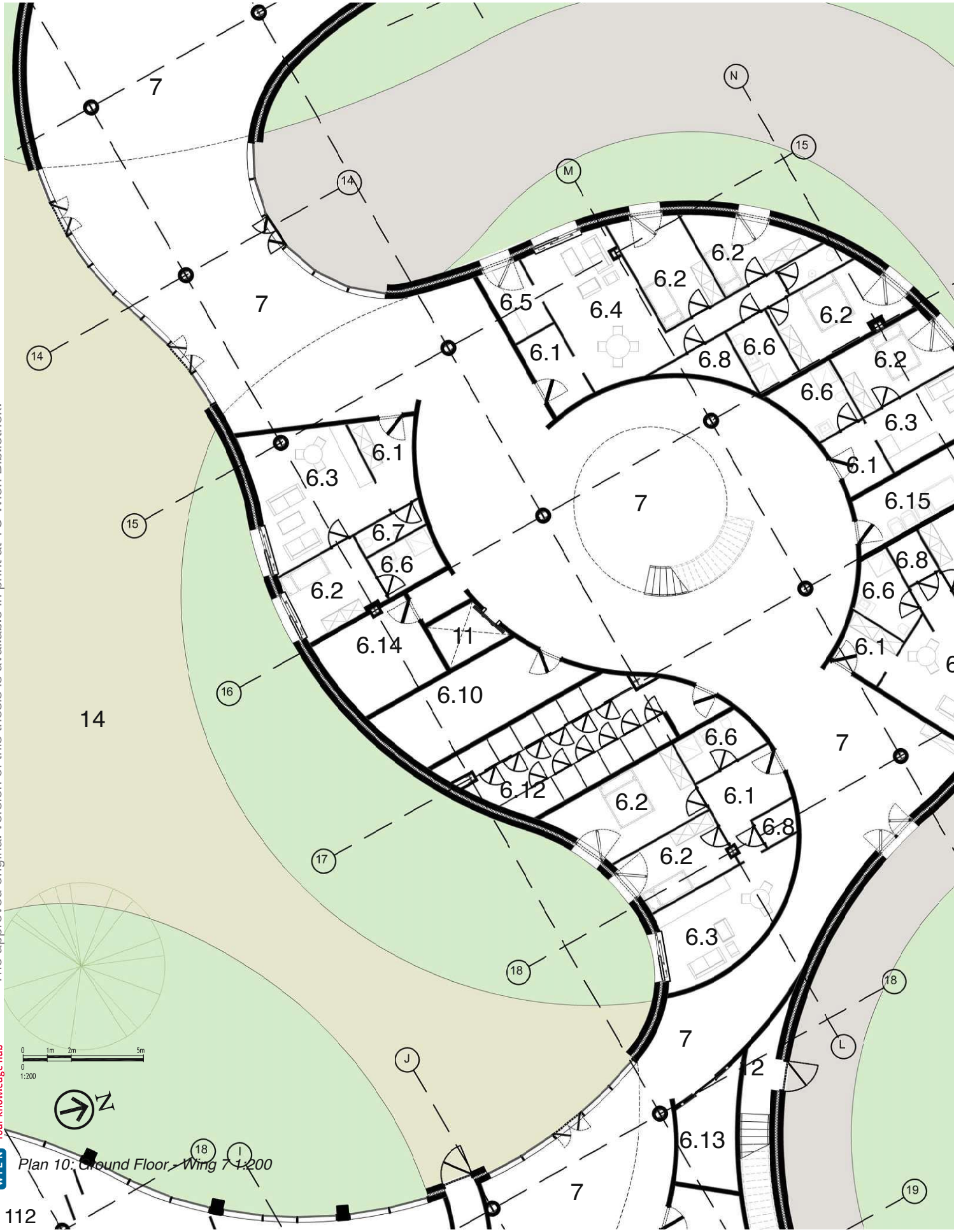


Plan 9: Ground Floor - Wing 5&6 1:200

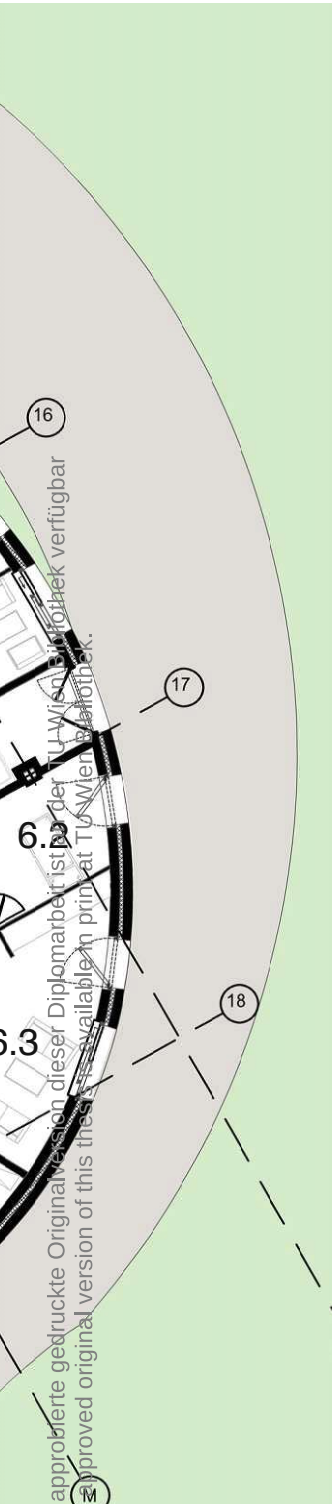


05.02. Ground Floor

Apartments in Wing 7 1:200



Plan 10: Ground Floor - Wing 7 1:200

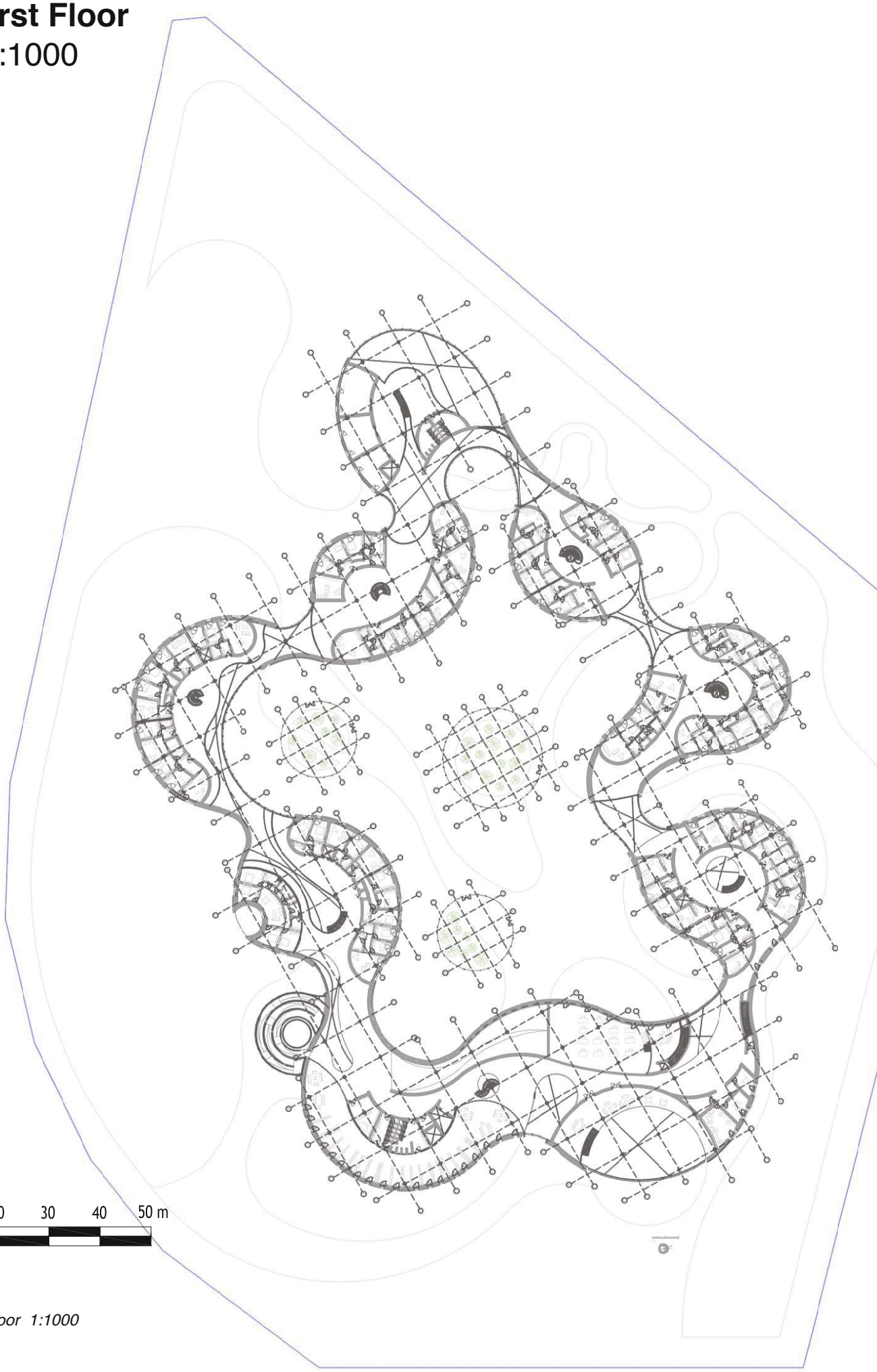


Ground Floor:

- Entrance (1): 240.17 m²
- Reception Area (2):
  - Reception (2.1): 6.93m²
  - Office (2.2): 26.77m²
  - Storage (2.3): 4.19m²
- Management (3): 21.22m²
- Education Area (4):
  - Classrooms (4.1): 24-42m²
  - Workshops (4.2): 31-57m²
  - Guidance Counsellor (4.3):17.02m²
  - Staff Room (4.4): 39.91m²
  - Storage Rooms (4.5): 6-19m²
  - Trash Collection (4.6):26.96m²
  - Technical Rooms (4.7): 28.97m²
  - WC's:
    - Men's (4.8): 33.94m²
    - Women's (4.9): 22.98m²
    - Accessible(4.10): 7.06m²
- Seminar Rooms (5): 208.97m² in total
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
  - Laundry Rooms (6.10): 13-23m²
  - Common Room (6.11): 30.15m²
  - Storage Units (6.12): 18-46m²
  - Bicycle Storage Room (6.13): 10.21m²
  - Technical Rooms (6.14): 7-25m²
  - Trash Collection (6.15):14-16m²
- Hallway + Common Area (7): 2714,15m²
- Treatment Area (8):
  - Doctor's Office (8.1): 22.08m²
  - Examination Room (8.2): 19.89m²
  - Group Therapy Room (8.3): 25.23m²
  - Nurses' Office (8.4): 23.59m²
  - Staff Room (8.5): 16.08m²
  - Overnight Quarter (8.6): 13.50m²
  - Staff Bathrooms (8.7): 4-9m²
  - Storage (8.8): 10.05m²
  - Trash Collection (8.9): 11.53m²
  - Technical Room (8.10): 21.57m²
- Fitness Area (9):
  - Fitness Room (9.1): 258.63m²
  - Locker Rooms (9.2): 28-30m²
  - WC's (9.3): 9-10m²
  - Showers (9.4): 7-10m²
- Gastronomy Area (10):
  - Cafeteria (10.1): 278.13m²
  - Mini Market (10.2): 137.77m²
  - Kitchen (10.3): 49.25m²
  - Storage Rooms (10.4): 8-17m²
  - Freezer Room (10.5): 7.04m²
  - WC's:
    - Men's (10.6): 23.64m²
    - Women's (10.7): 19.67m²
    - Accessible (10.8): 4.63m²
    - Staff (10.9): 3.44m²
  - Technical Room (10.10): 8-15m²
  - Trash Collection (10.11): 12.06m²
  - Hallway (10.12): 5-15m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²
- Ramp Room (13): 160.32m²
- Courtyard (14): 5175.83m²
- Green Houses (15): 177-303m²
- Car parks (16): 1550-1768m²

Fig.89: Space Allocation Chart of Ground Floor

05.03. First Floor
1:1000



Plan 11: First Floor 1:1000

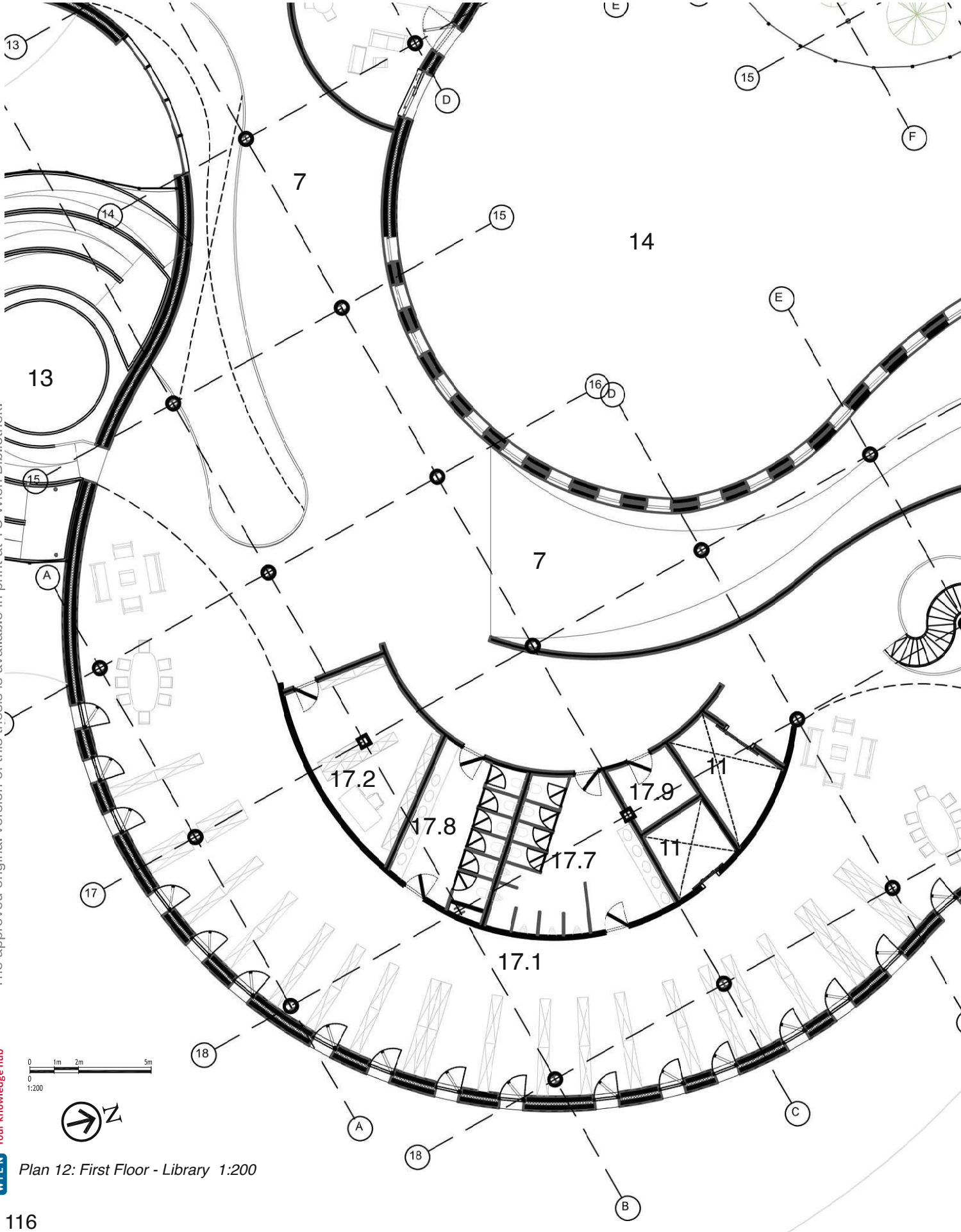
First Floor:

- Library Area (17):
  - Library (17.1): 396.40 m²
  - Archive and Library Management (17.2): 28.88 m²
  - Individual Study Area (17.3): 256.80 m²
  - Private Study Rooms (17.4): 15-20 m²
  - Computer Lab.(17.5): 32.82 m²
  - Storage (17.6): 14.83 m²
  - WC's:
    - Men's (17.7): 34.13 m²
    - Women's (17.8): 22.89 m²
    - Accessible (17.9): 7.06 m²
- Cafeteria [1.Floor] (10.1): 157.96 m²
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²

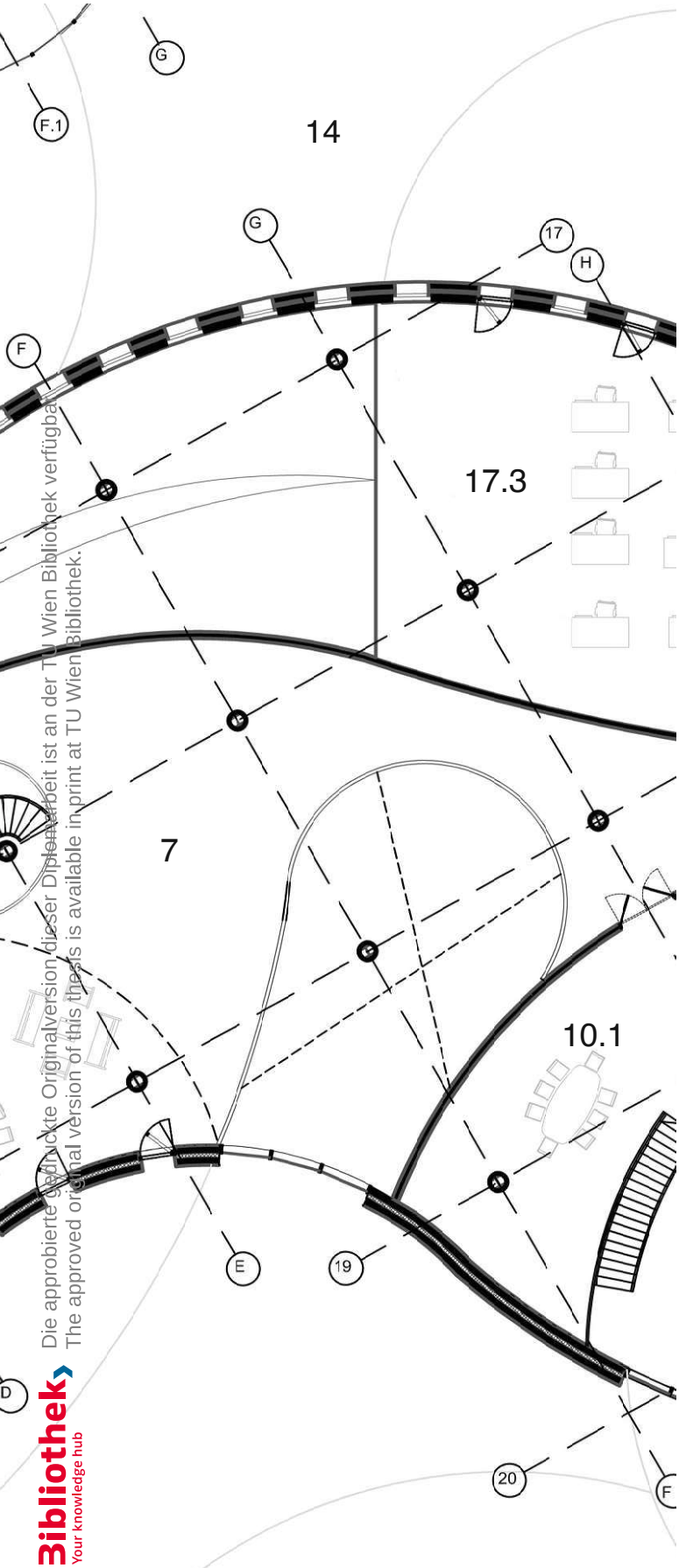
Fig.90: Space Allocation Chart of First Floor

05.03. First Floor

Library 1:200



Plan 12: First Floor - Library 1:200



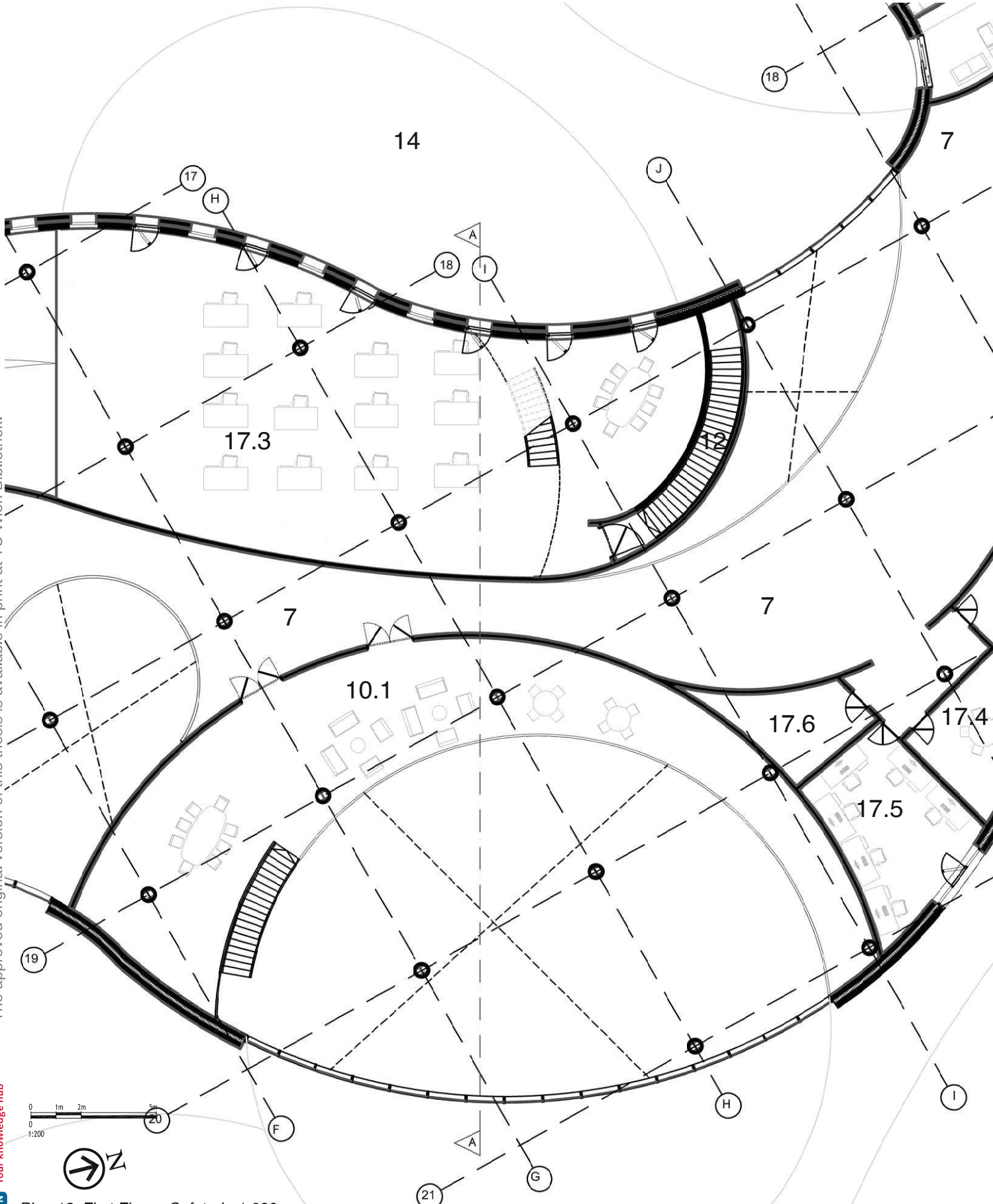
First Floor:

- Library Area (17):
  - Library (17.1): 396.40 m²
  - Archive and Library Management (17.2): 28.88 m²
  - Individual Study Area (17.3): 256.80 m²
  - Private Study Rooms (17.4): 15-20 m²
  - Computer Lab.(17.5): 32.82 m²
  - Storage (17.6): 14.83 m²
  - WC's:
    - Men's (17.7): 34.13 m²
    - Women's (17.8): 22.89 m²
    - Accessible (17.9): 7.06 m²
- Cafeteria [1.Floor] (10.1): 157.96 m²
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²

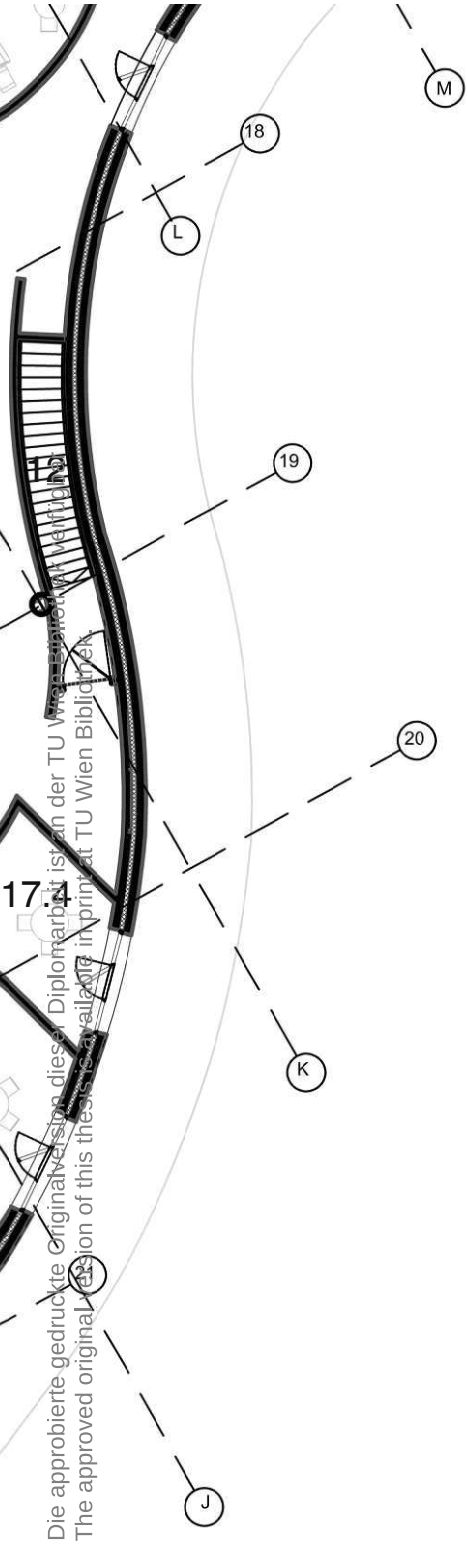
Fig.90: Space Allocation Chart of First Floor

05.03. First Floor

Cafeteria 1:200



Plan 13: First Floor - Cafeteria 1:200



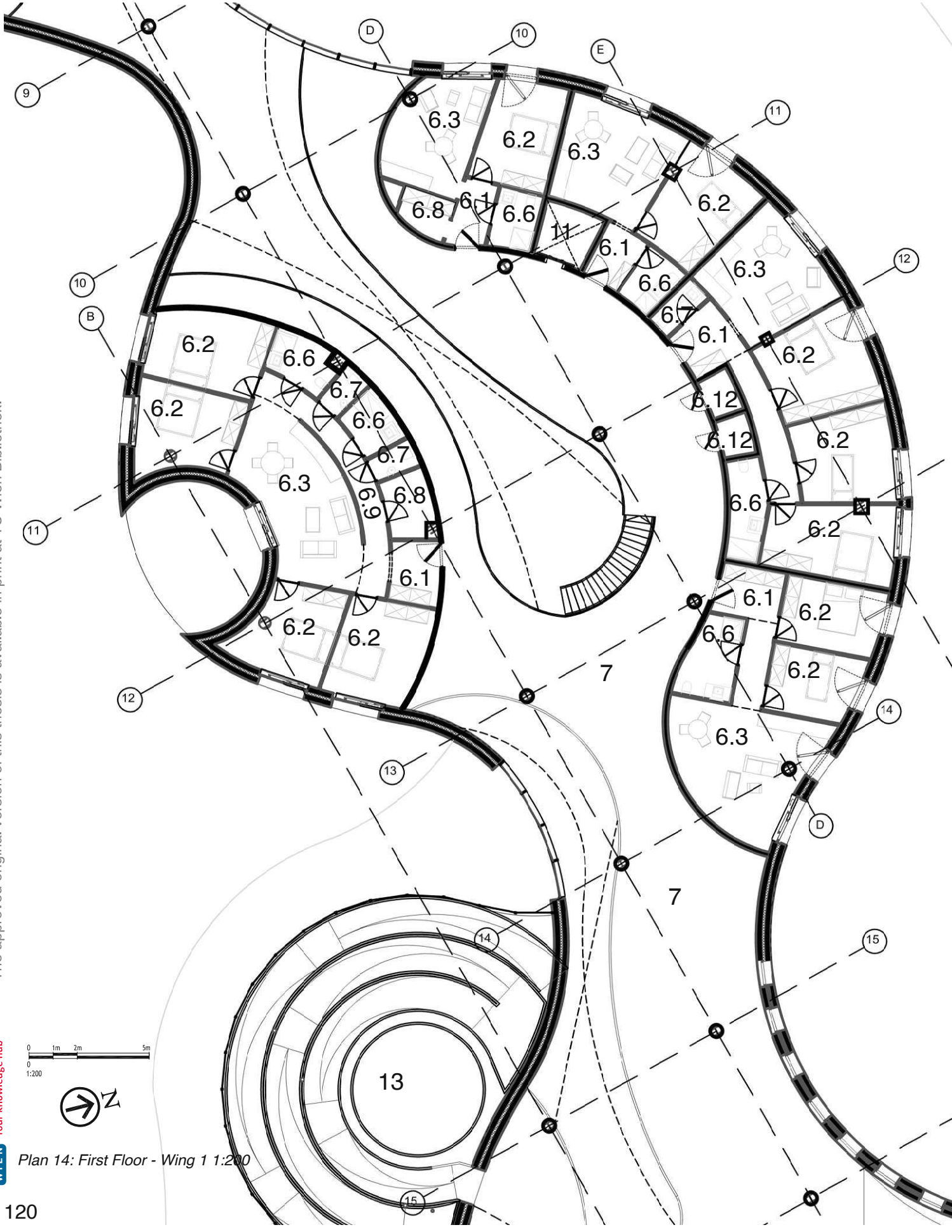
First Floor:

- Library Area (17):
  - Library (17.1): 396.40 m²
  - Archive and Library Management (17.2): 28.88 m²
  - Individual Study Area (17.3): 256.80 m²
  - Private Study Rooms (17.4): 15-20 m²
  - Computer Lab.(17.5): 32.82 m²
  - Storage (17.6): 14.83 m²
  - WC's:
    - Men's (17.7): 34.13 m²
    - Women's (17.8): 22.89 m²
    - Accessible (17.9): 7.06 m²
- Cafeteria [1.Floor] (10.1): 157.96 m²
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²

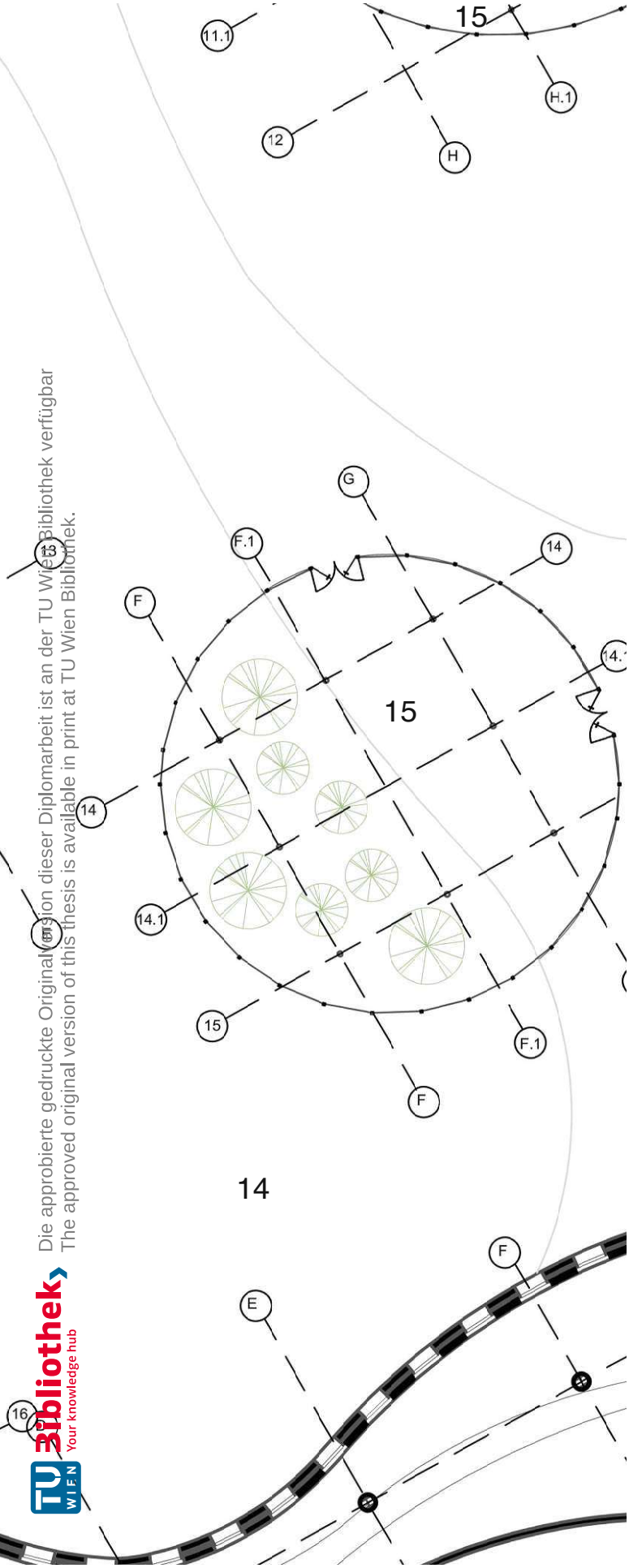
Fig.90: Space Allocation Chart of First Floor

05.03. First Floor

Apartments in Wing 1 1:200



Plan 14: First Floor - Wing 1 1:200



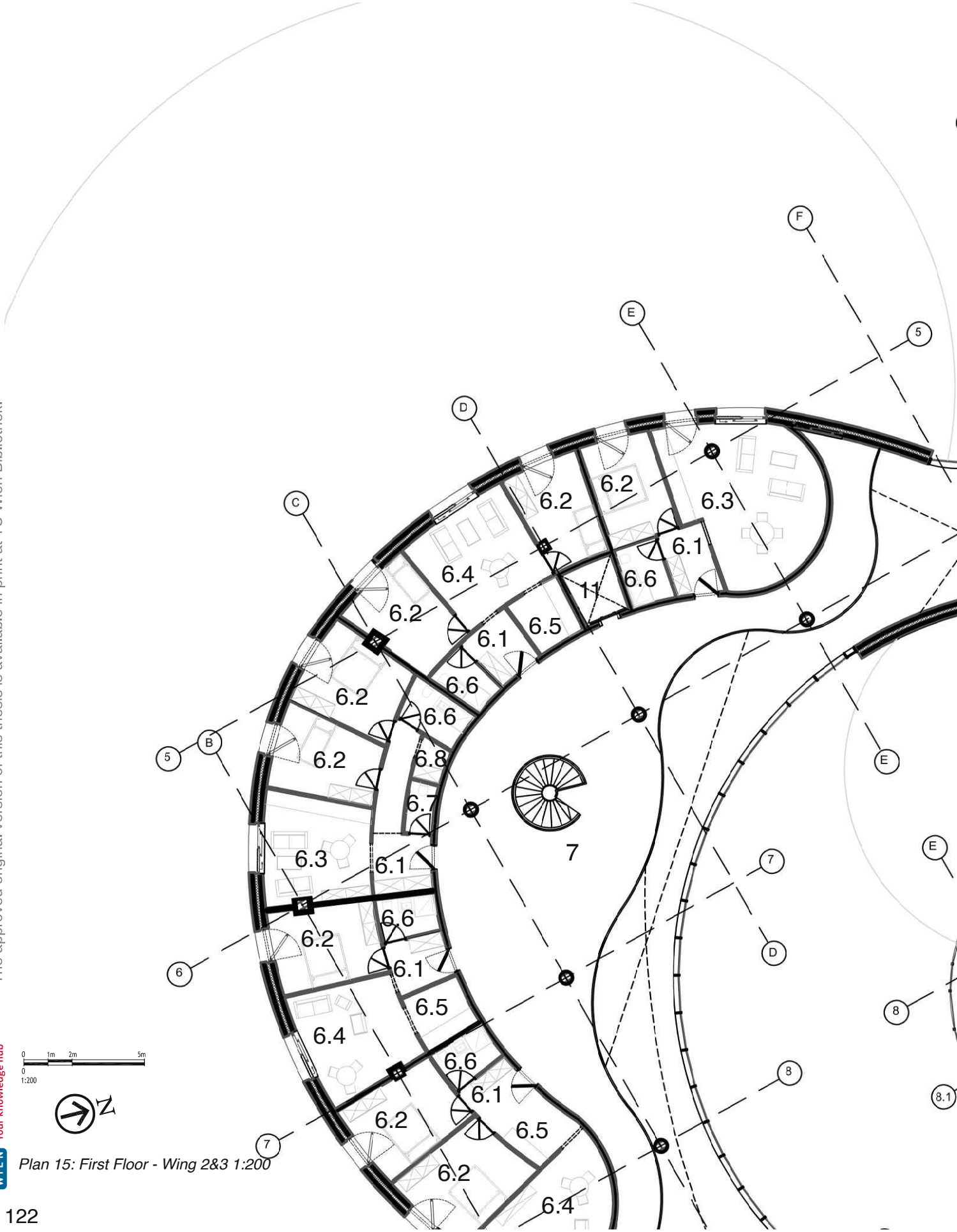
First Floor:

- Library Area (17):
  - Library (17.1): 396.40 m²
  - Archive and Library Management (17.2): 28.88 m²
  - Individual Study Area (17.3): 256.80 m²
  - Private Study Rooms (17.4): 15-20 m²
  - Computer Lab.(17.5): 32.82 m²
  - Storage (17.6): 14.83 m²
  - WC's:
    - Men's (17.7): 34.13 m²
    - Women's (17.8): 22.89 m²
    - Accessible (17.9): 7.06 m²
- Cafeteria [1.Floor] (10.1): 157.96 m²
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²

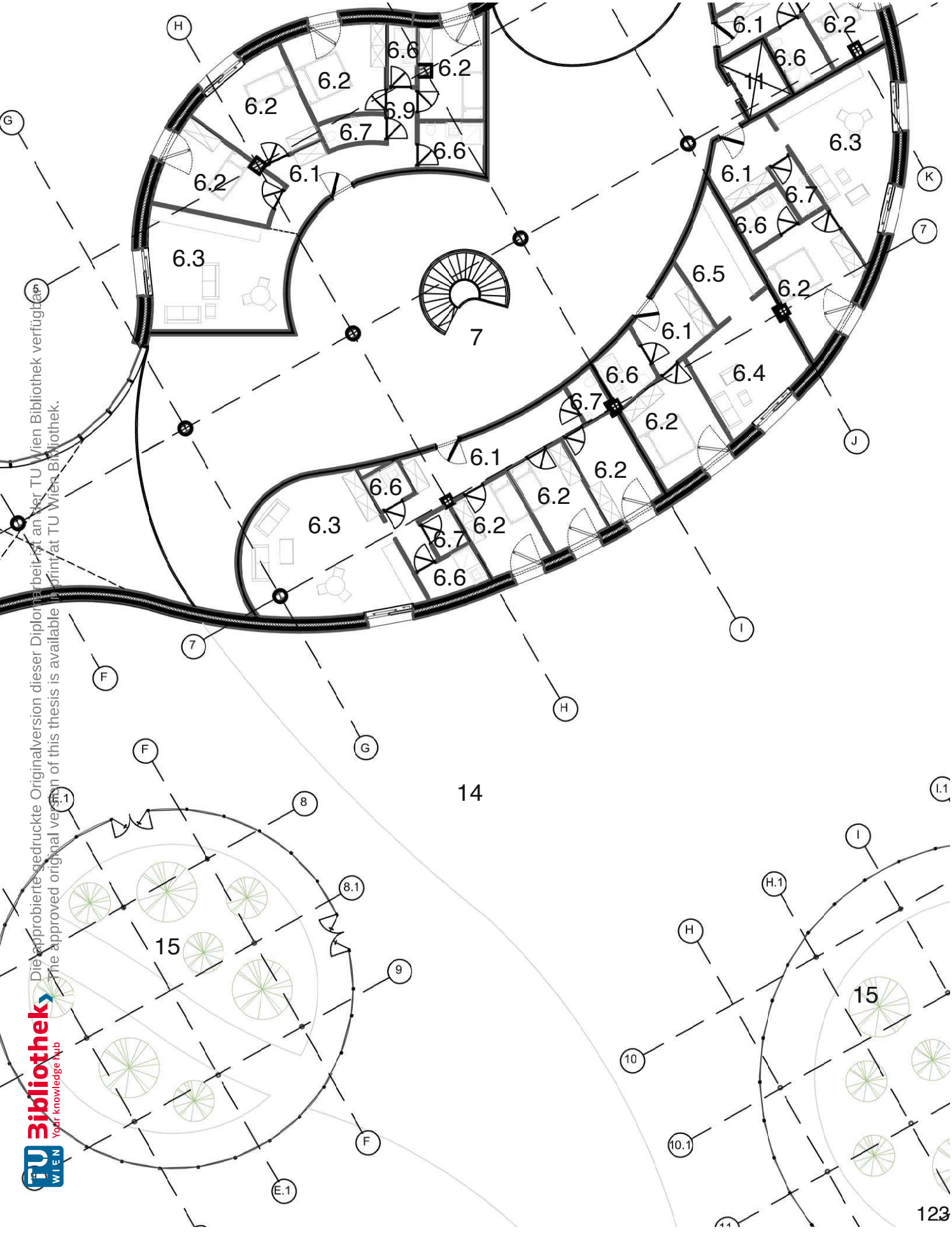
Fig.90: Space Allocation Chart of First Floor

05.03. First Floor

Apartments in Wing 2 and 3 1:200

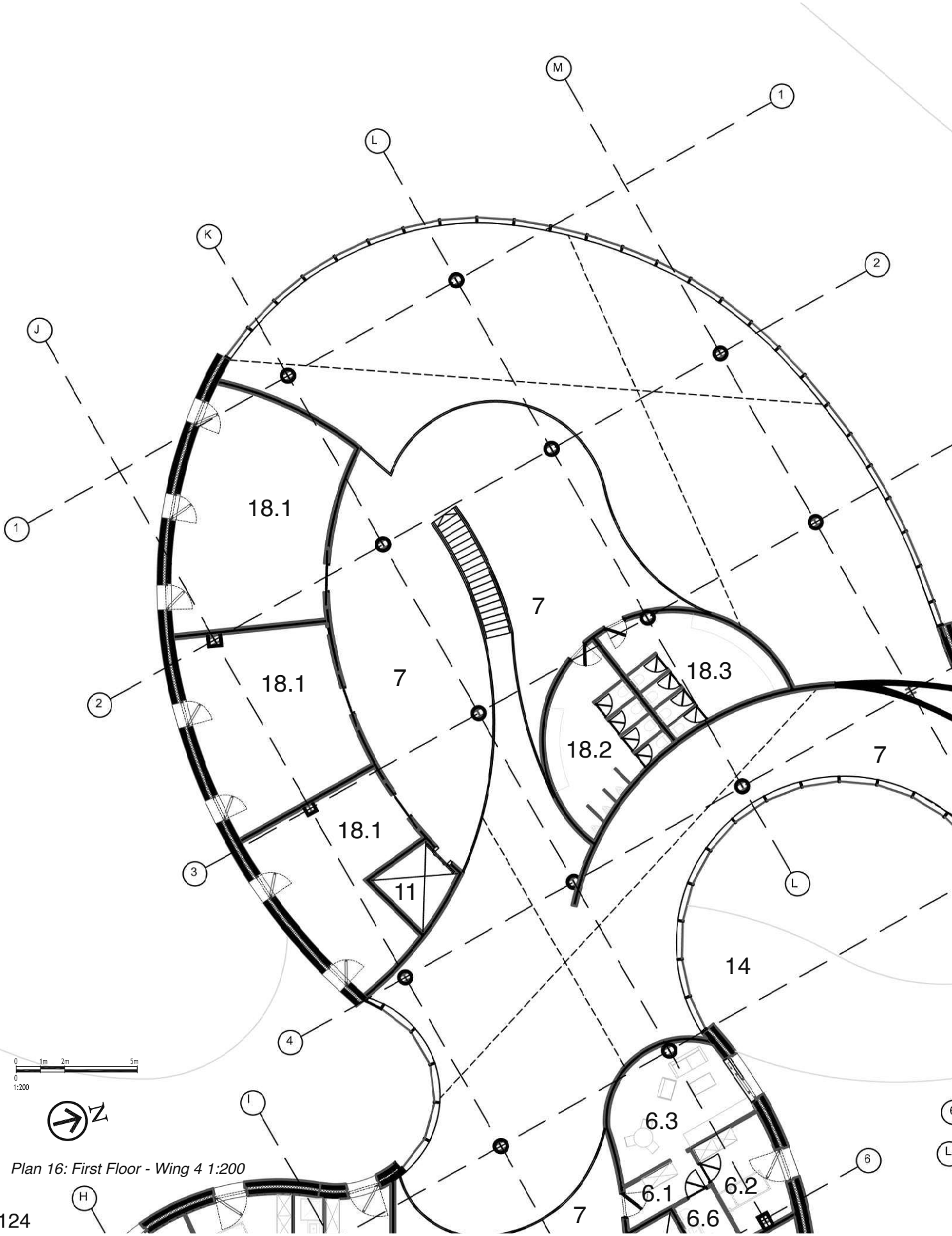


Plan 15: First Floor - Wing 2&3 1:200

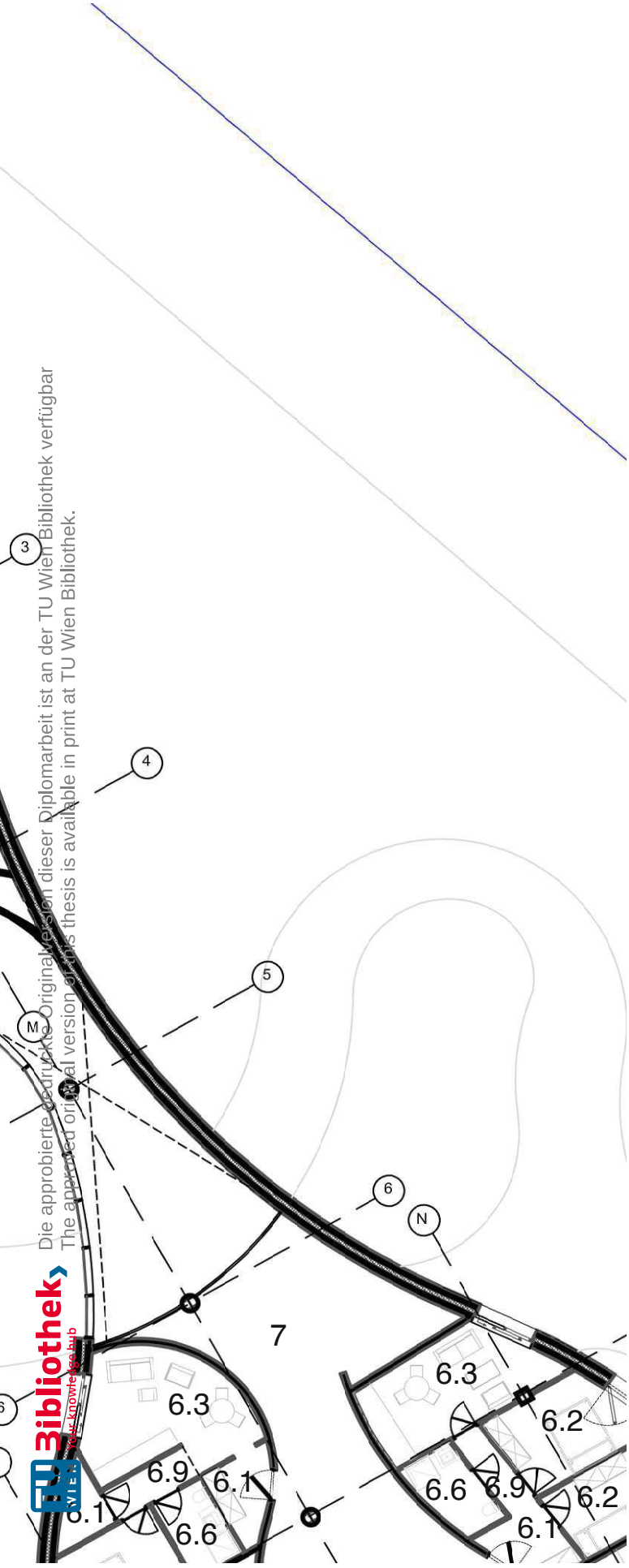


05.03. First Floor

Gathering Space in Wing 4 1:200



Plan 16: First Floor - Wing 4 1:200



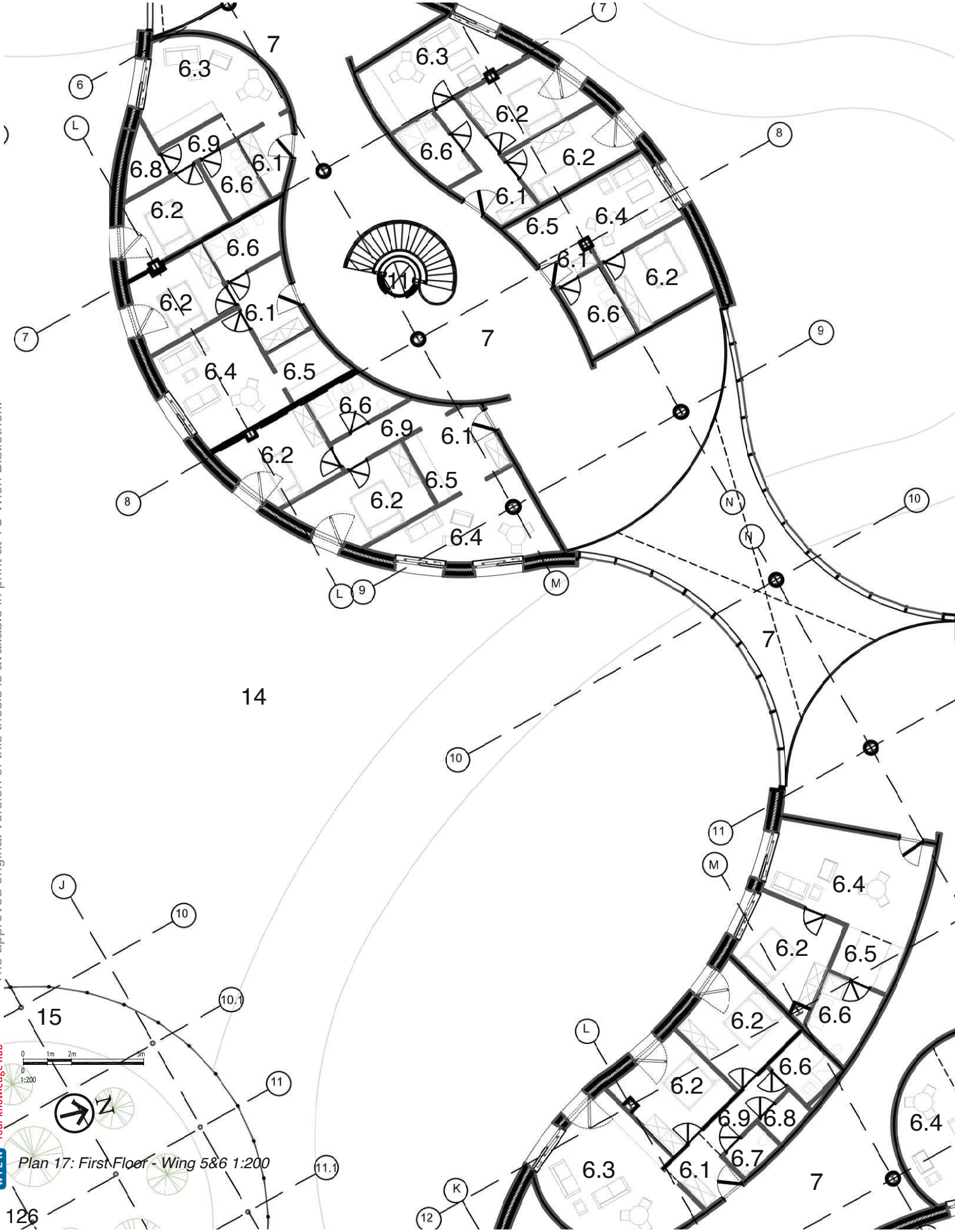
First Floor:

- Library Area (17):
  - Library (17.1): 396.40 m²
  - Archive and Library Management (17.2): 28.88 m²
  - Individual Study Area (17.3): 256.80 m²
  - Private Study Rooms (17.4): 15-20 m²
  - Computer Lab.(17.5): 32.82 m²
  - Storage (17.6): 14.83 m²
  - WC's:
    - Men's (17.7): 34.13 m²
    - Women's (17.8): 22.89 m²
    - Accessible (17.9): 7.06 m²
- Cafeteria [1.Floor] (10.1): 157.96 m²
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²

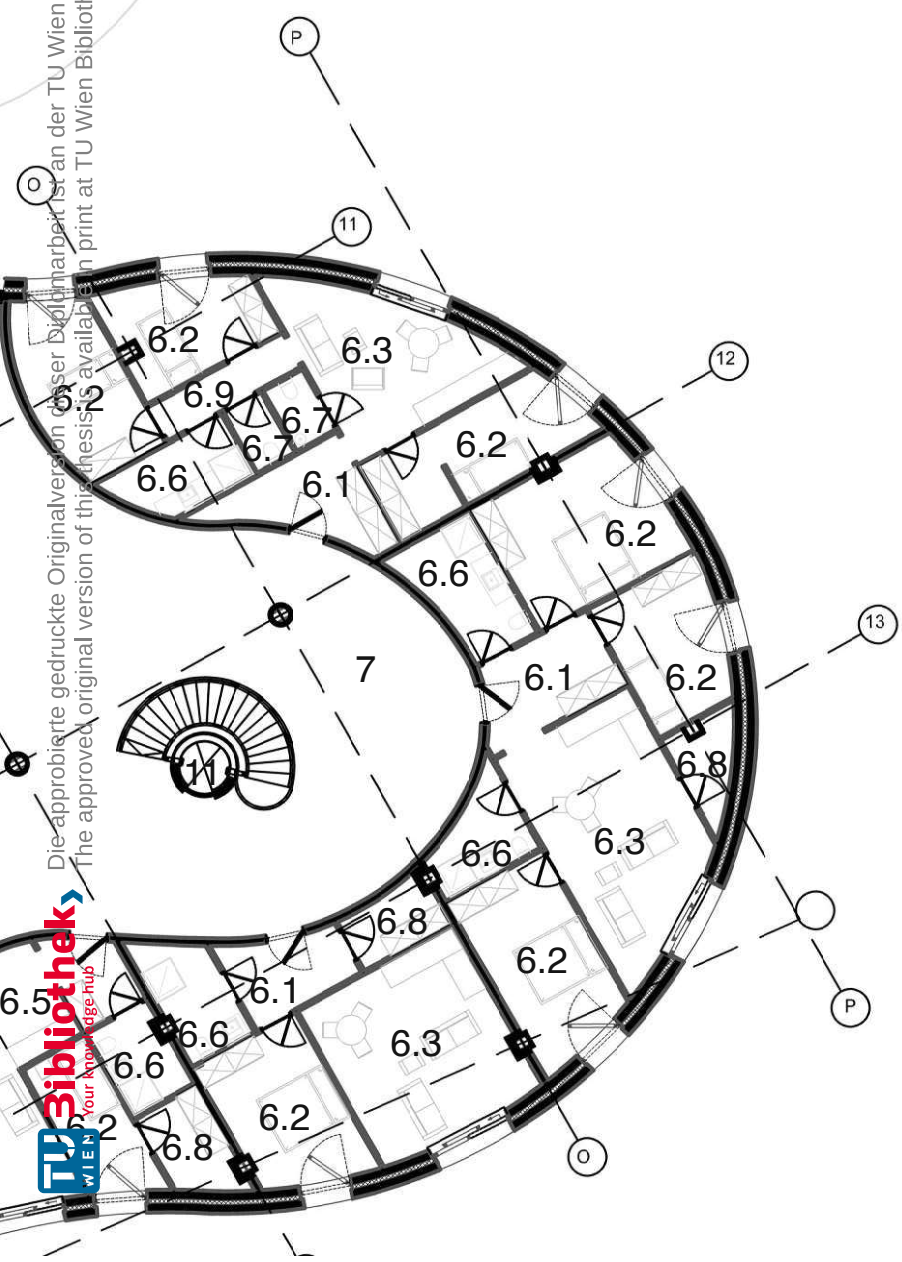
Fig.90: Space Allocation Chart of First Floor

05.03. First Floor

Apartments in Wing 5 and 6 1:200

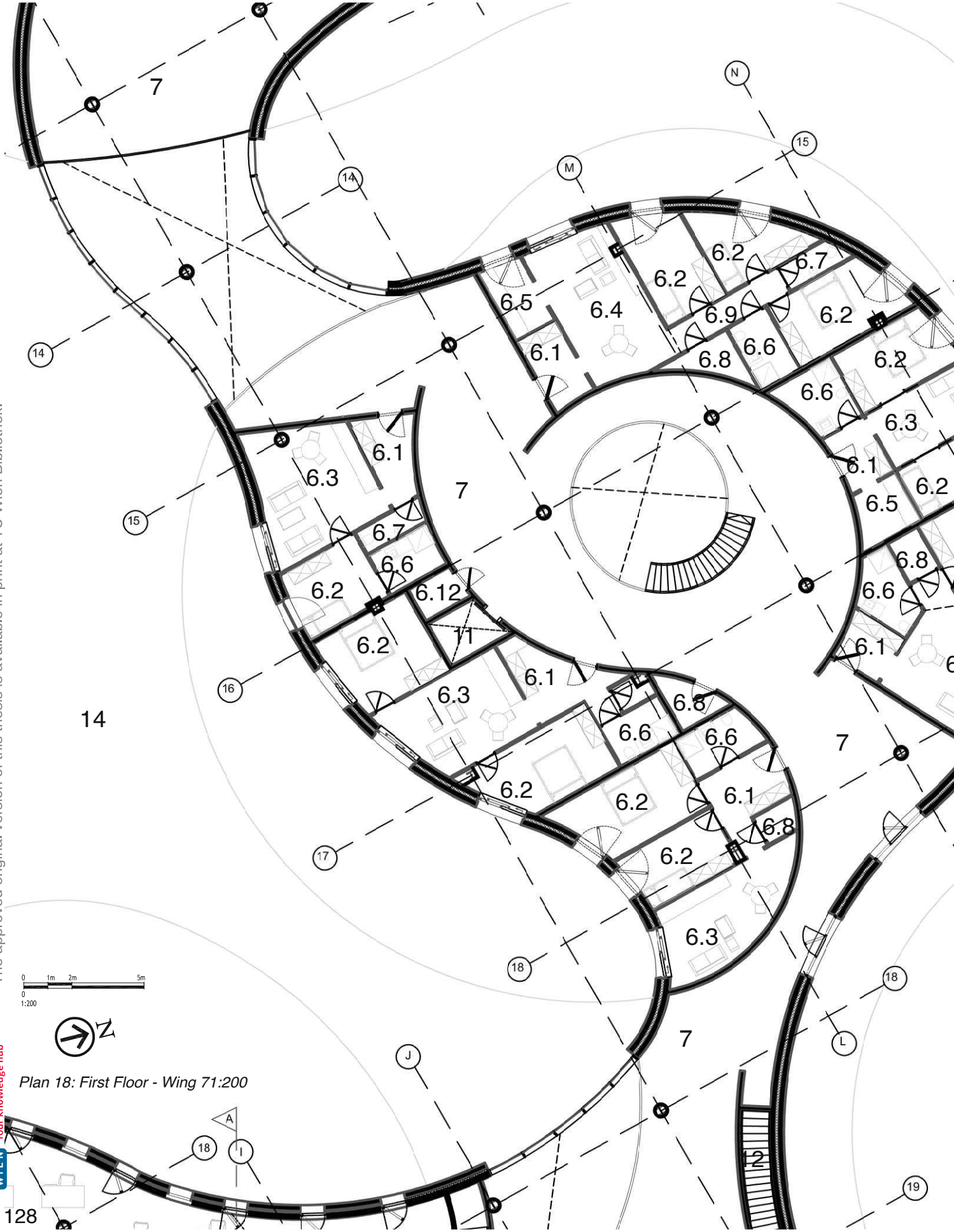


Plan 17: First Floor - Wing 5&6 1:200

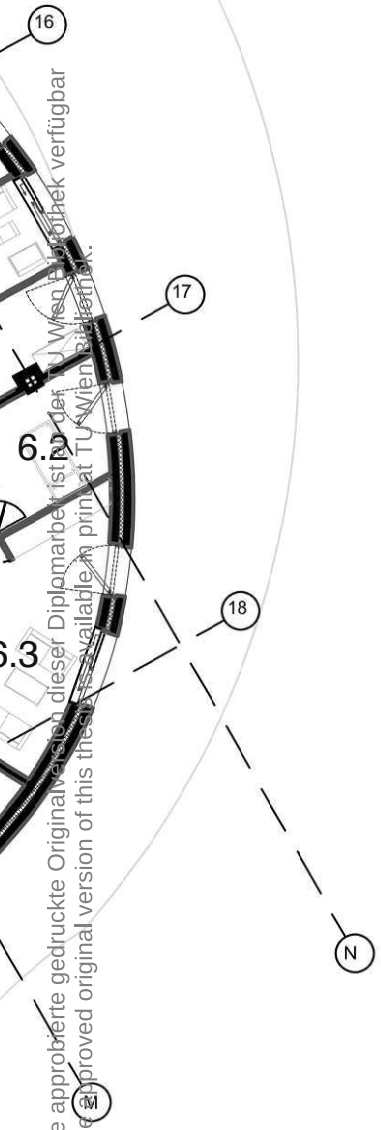


05.03. First Floor

Apartments in Wing 7 1:200



Plan 18: First Floor - Wing 71:200



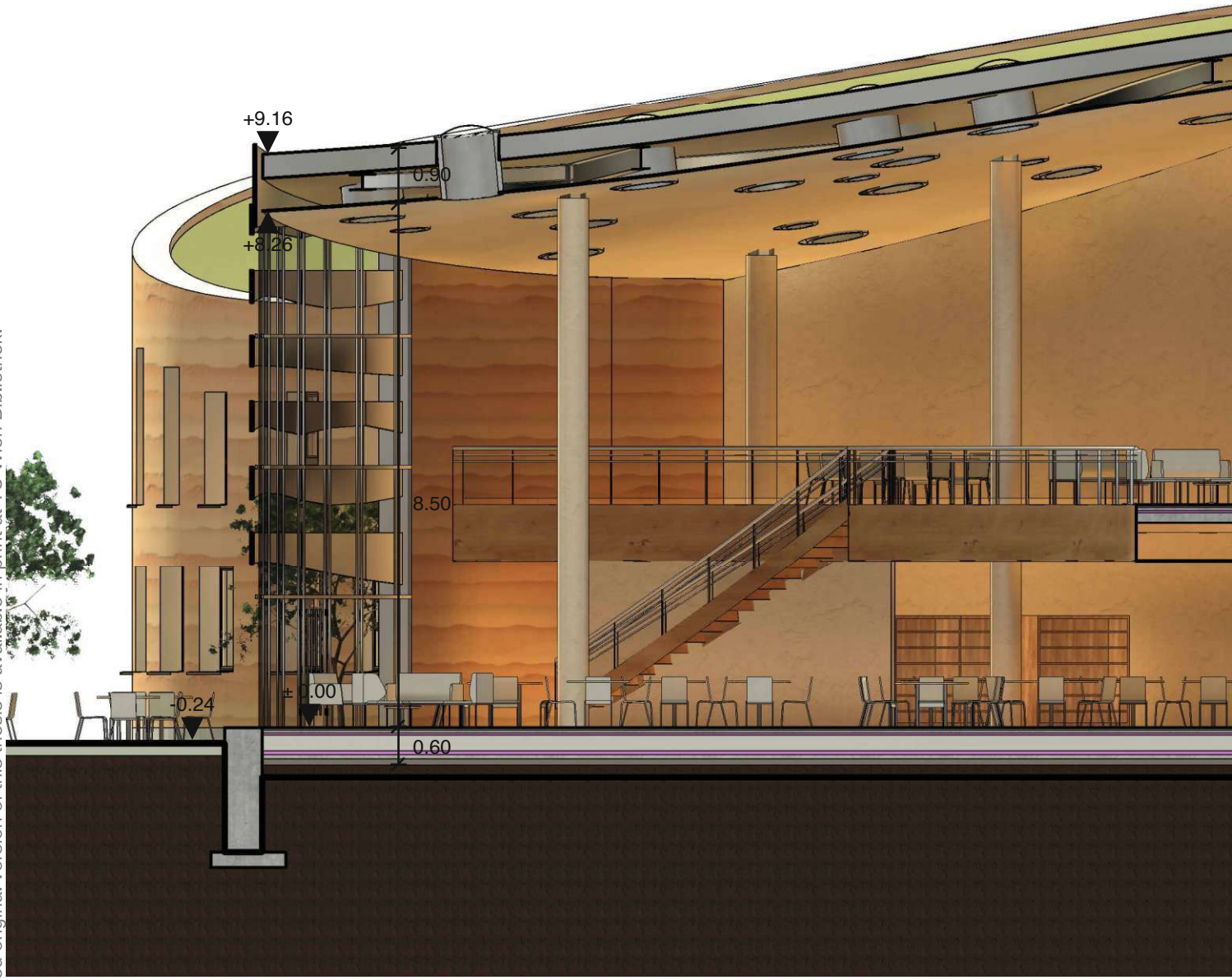
First Floor:

- Library Area (17):
  - Library (17.1): 396.40 m²
  - Archive and Library Management (17.2): 28.88 m²
  - Individual Study Area (17.3): 256.80 m²
  - Private Study Rooms (17.4): 15-20 m²
  - Computer Lab.(17.5): 32.82 m²
  - Storage (17.6): 14.83 m²
  - WC's:
    - Men's (17.7): 34.13 m²
    - Women's (17.8): 22.89 m²
    - Accessible (17.9): 7.06 m²
- Cafeteria [1.Floor] (10.1): 157.96 m²
- Common Area (18):
  - Gathering Rooms (18.1)
  - WC's:
    - Men's (18.2)
    - Women's (18.3)
- Residential Area (6):
  - Apartments (for 1 to 4 People):
    - Anteroom (6.1): 4-18m²
    - Bedrooms (6.2): 10-18m²
    - Living-Kitchen Areas (6.3): 16-29m²
    - Living Room (6.4): 11-24m²
    - Kitchen (6.5): 5-6m²
    - Bathrooms (6.6): 3-8m²
    - WC (6.7): 1.8-3m²
    - Storage Room (6.8): 1.6-4m²
    - Hallway (6.9): 4-8m²
- Elevator Shafts (11): 4-11m²
- Fire Exits (12): 10-15 m²

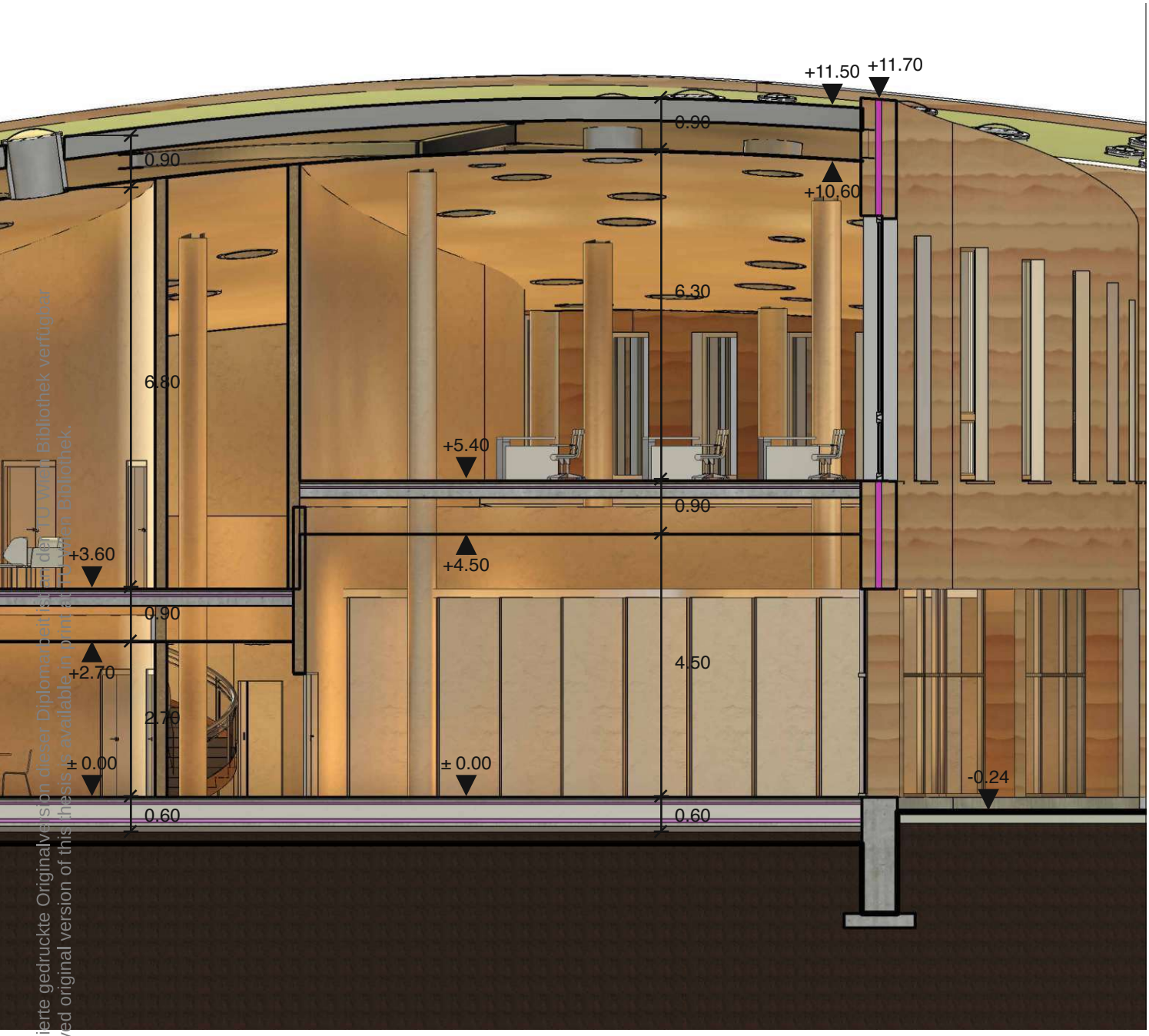
Fig.90: Space Allocation Chart of First Floor

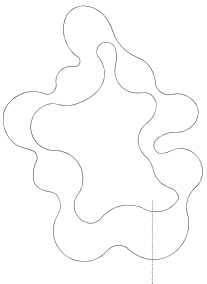
05.04. Section A-A

1:100



Plan 19: Section A-A 1:100





05.05. Room Typologies

One to Four Bedroom Apartments

One to four-bedroom apartments provide flexible living arrangements that can be tailored to the specific needs of the residents. This is especially important in a psychiatric rehabilitation setting where patients may require different levels of privacy, social interaction, and support. Individuals in early stages of rehabilitation or those who are more vulnerable may benefit from shared accommodations, while those more advanced in their recovery may require privacy in single apartments. One-bedroom apartments offer residents the opportunity for solitude and reflection, which is critical for many individuals in recovery. Personal space allows for a retreat from communal areas when needed, giving patients control over their environment and interactions, which can significantly contribute to their mental well-being.

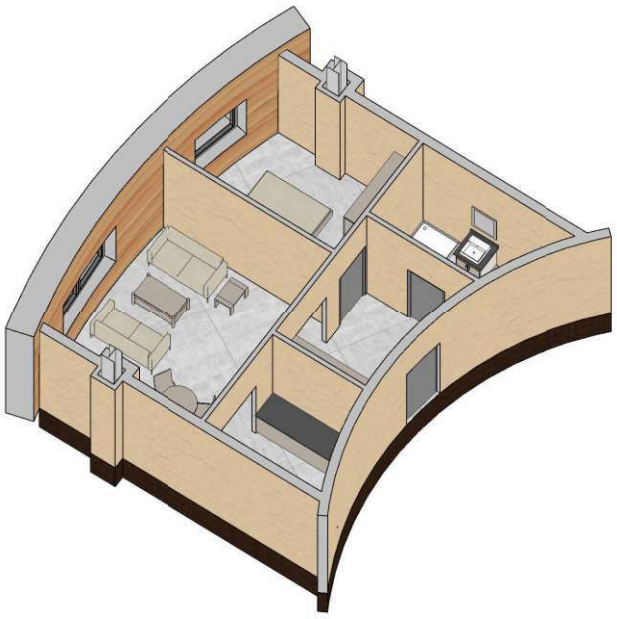


Fig. 91: One Bedroom Apartment

For patients sharing apartments, the selection of roommates can be done thoughtfully, based on compatibility in terms of diagnoses, therapeutic goals, and social dynamics. This can help foster a supportive living environment, where residents can interact socially while maintaining a sense of independence. Multi-bedroom apartments promote gradual integration into communal living. They offer residents the chance to practice cohabiting in smaller, controlled environments before transitioning back into broader social settings, such as shared housing

Fig. 92: Two Bedroom Apartment

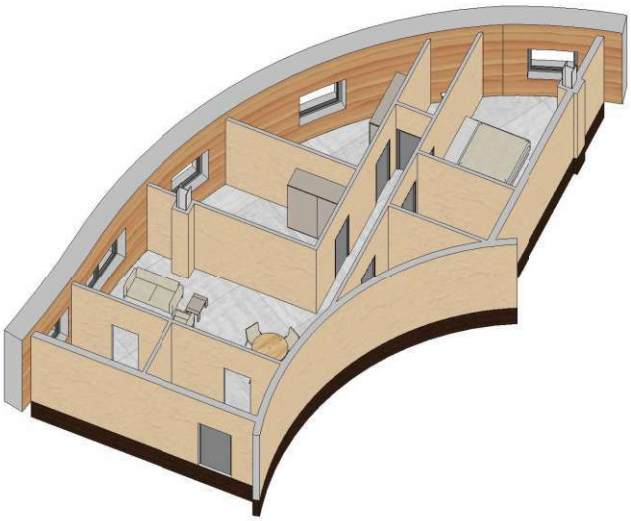


Fig. 93: Three Bedroom Apartment

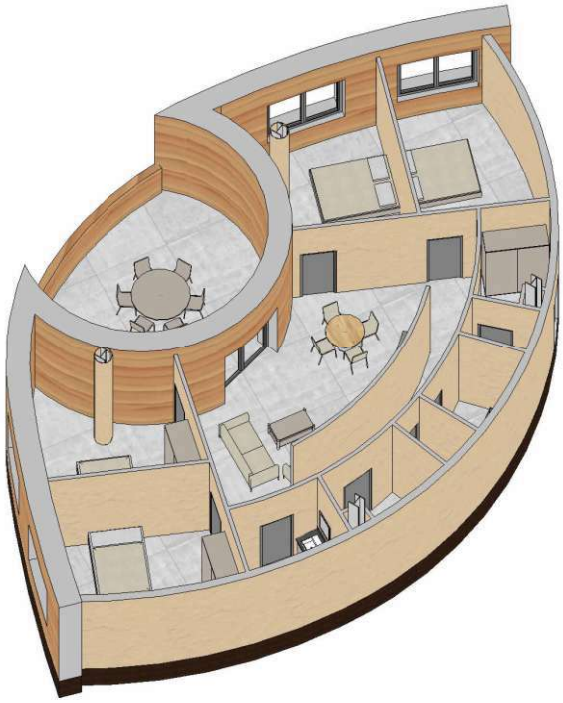


Fig. 94: Four Bedroom Apartment

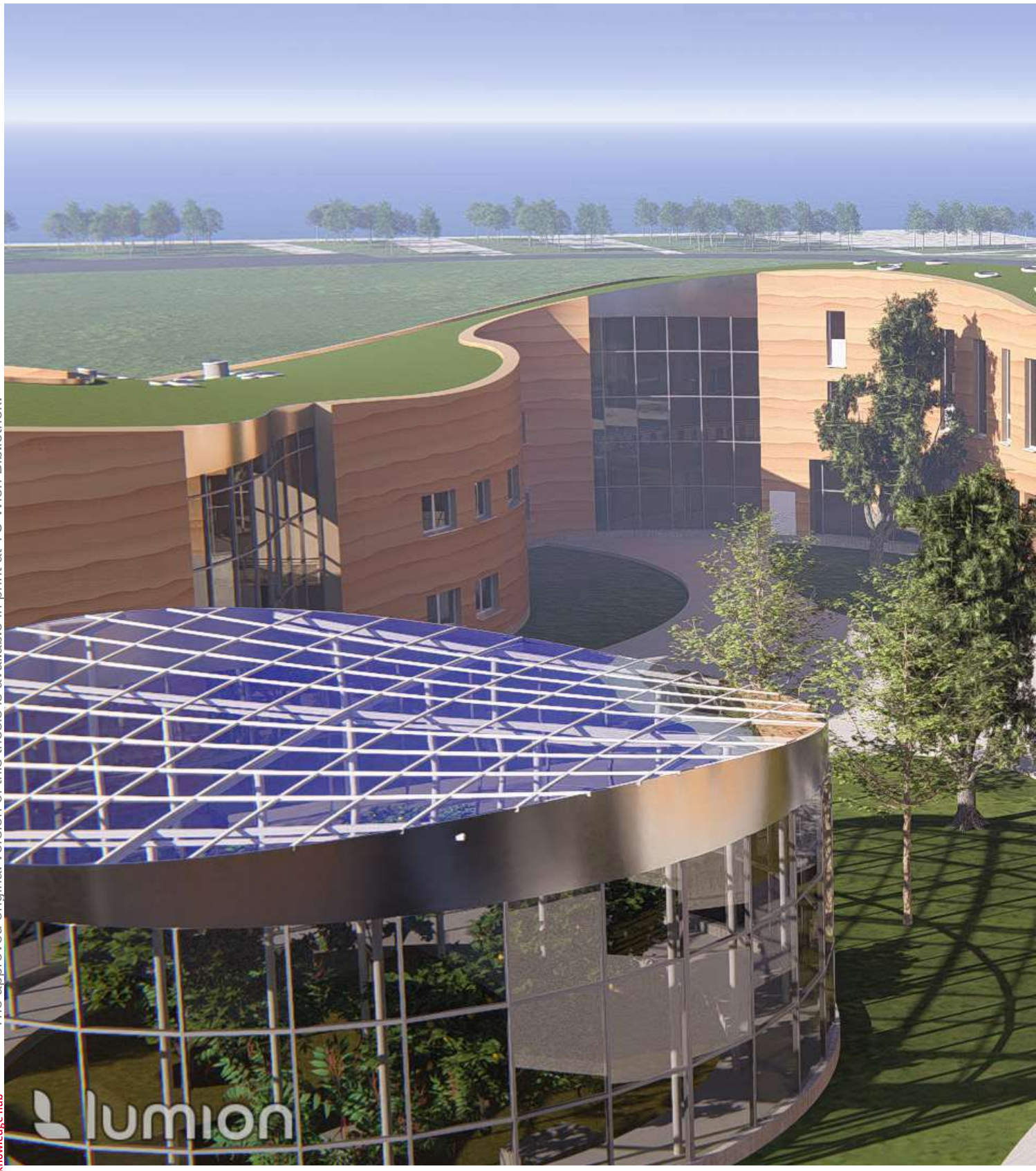
or society outside the rehabilitation facility. Shared responsibilities like cooking, cleaning, and organizing living spaces can foster a sense of community and accountability. This collaborative environment can mirror real-world living situations, preparing residents for life post-rehabilitation.

Each apartment is equipped with facilities like kitchens, which encourage residents to cook their own meals, do laundry, and manage their personal spaces, thereby promoting independent living and daily routine management. This serves as a vital part of the rehabilitation process, as it builds confidence and practical skills necessary for reintegration into society.

05.06. Visualisations

Render 1: Bird's Eye View to The Centre

05.06. Visualisations

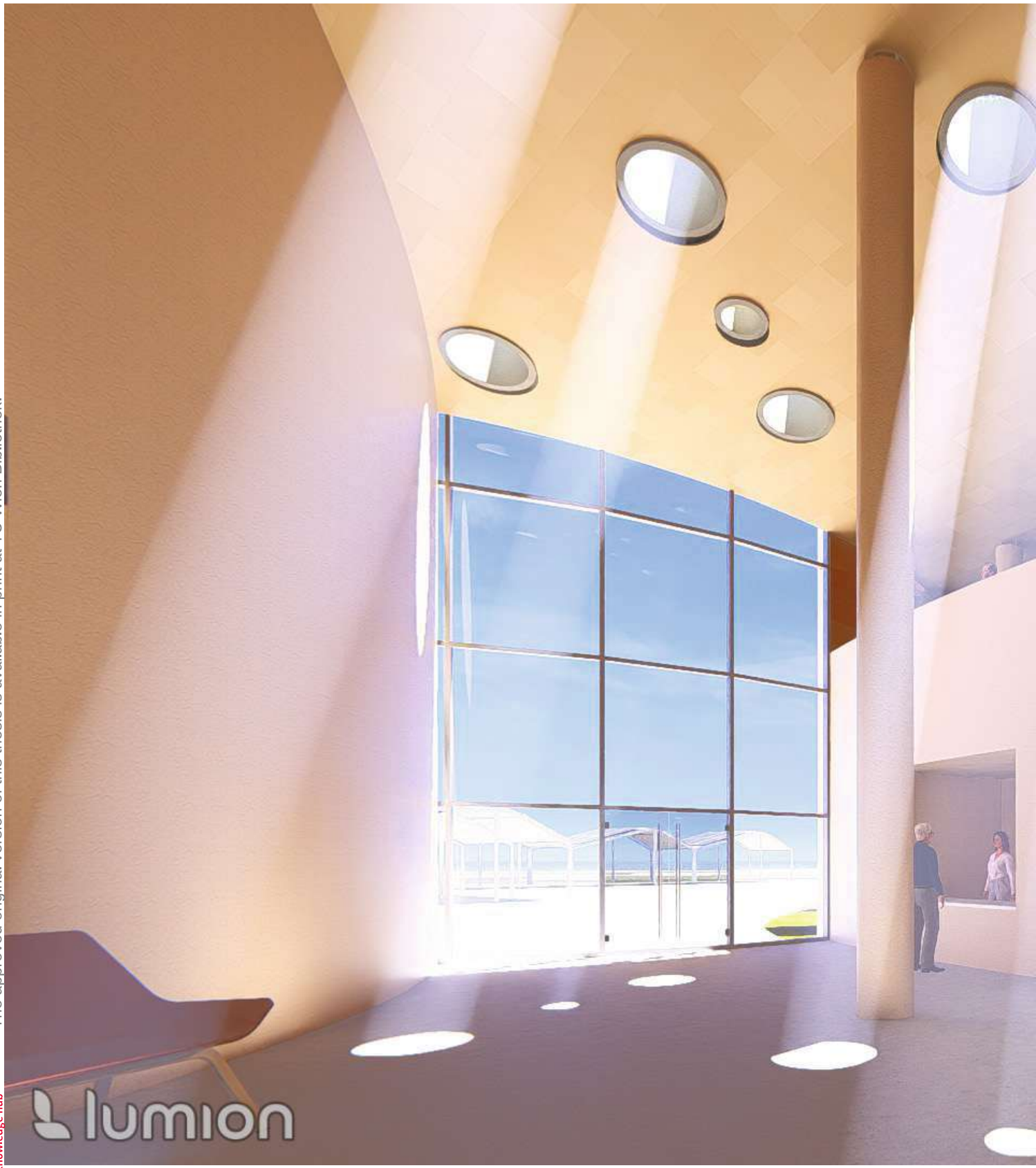


Render 2: The Courtyard

05.06. Visualisations

Render 3: The Courtyard

05.06. Visualisations



Render 4: The Entrance

05.06. Visualisations

Render 5: Hallway

05.06. Visualisations

Render 6: Cafeteria

05.06. Visualisations

Render 7: Study Area

06 Evaluation

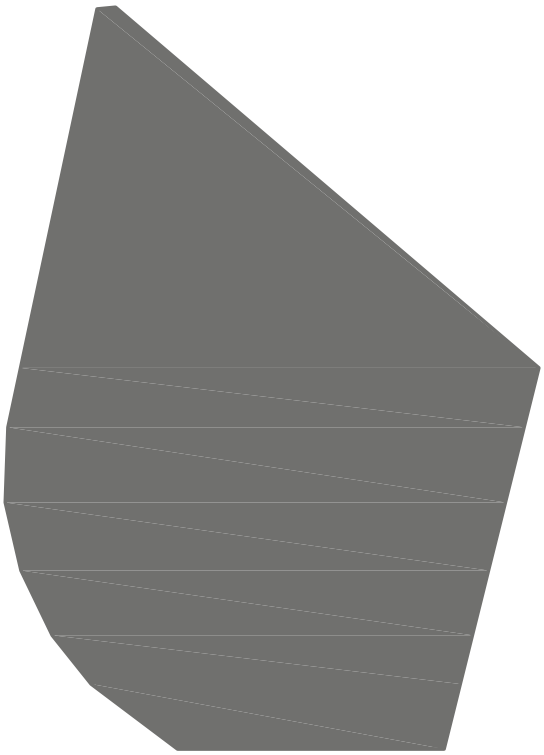


Fig. 95:

Building Plot Area (FBG):
33907m²

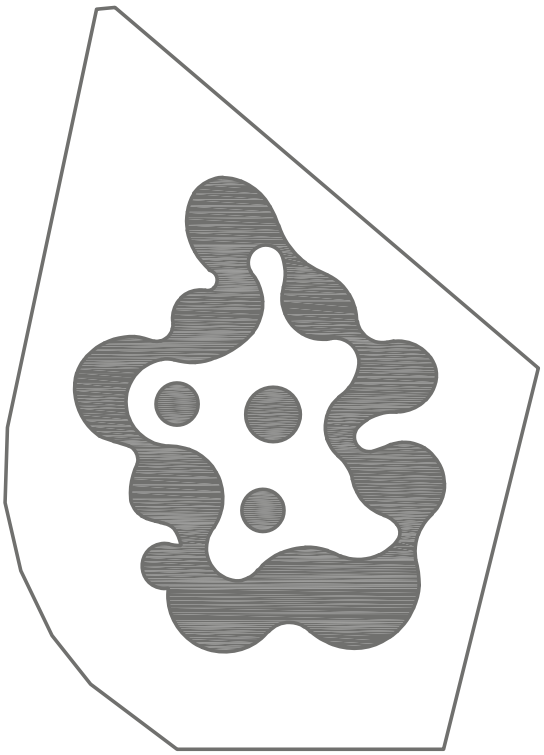


Fig. 96:

Gross Floor Area (BGF):
8919,28 m²
26% of FBG

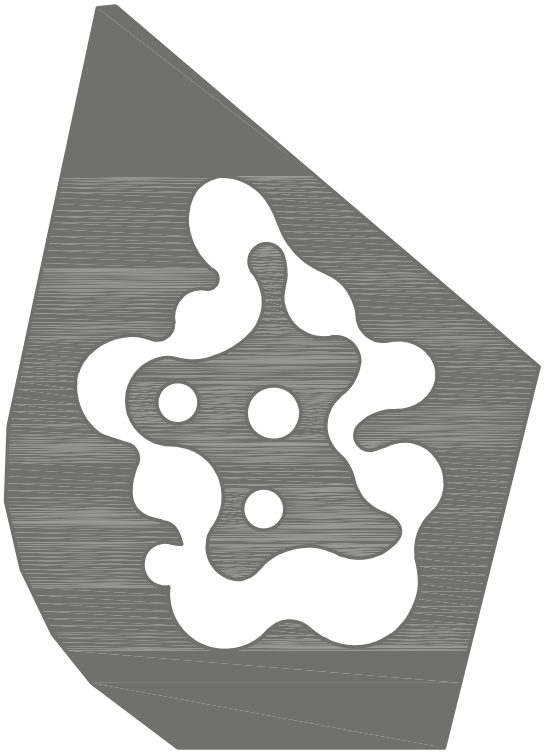


Fig. 97:

Free Space:
24987,72 m²
74% of FBG

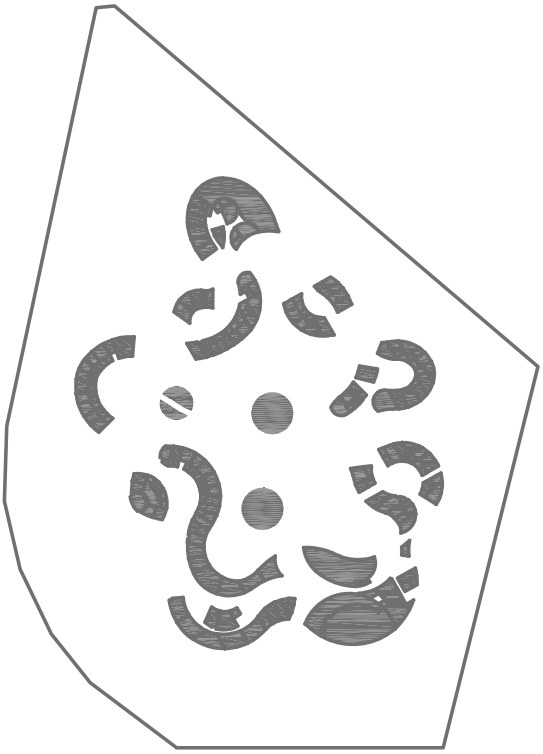


Fig. 98:

Usable Area (NF) of Ground Floor:
4208,97 m²
47% of BGF

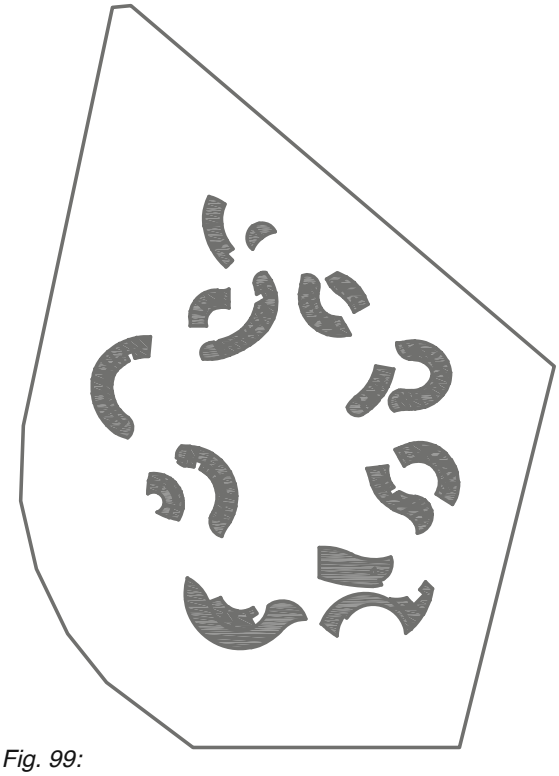


Fig. 99:

Usable Area (NF) of First Floor:
3295,22 m²
36% of BGF

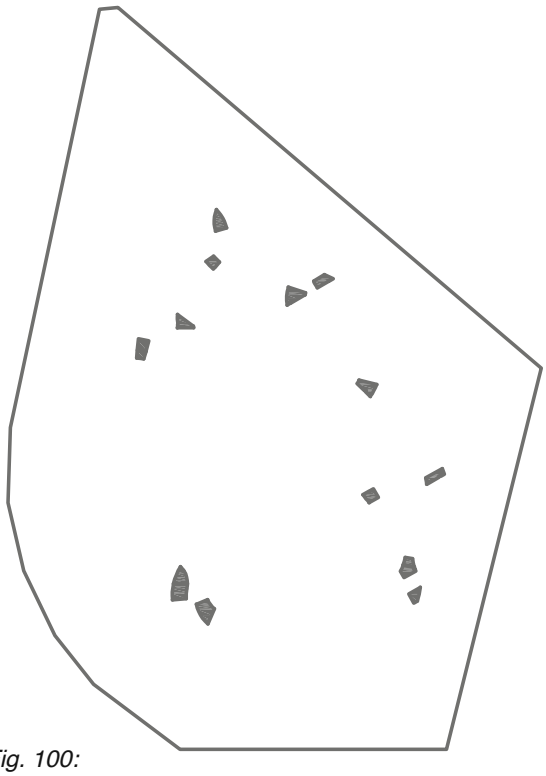


Fig. 100:

Technical Function Area (TF):
272,40m²
3% of BGF

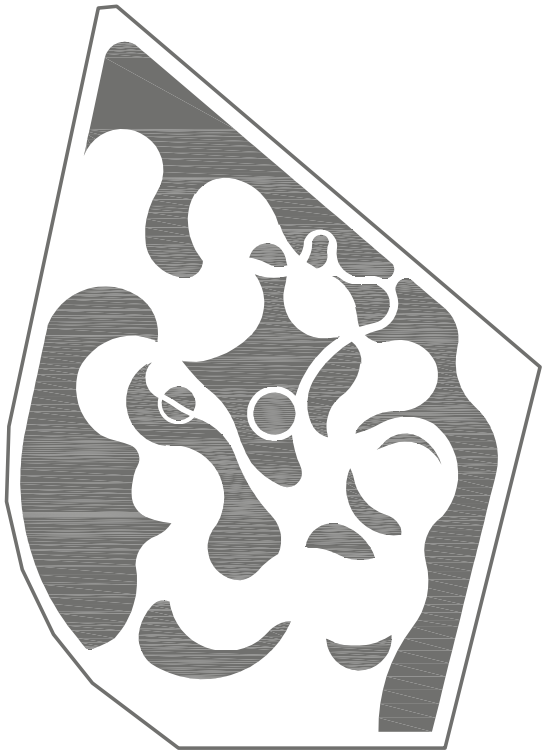


Fig. 101:

Green Area (GF):
13943 m²
41% of FBG
53% of FF

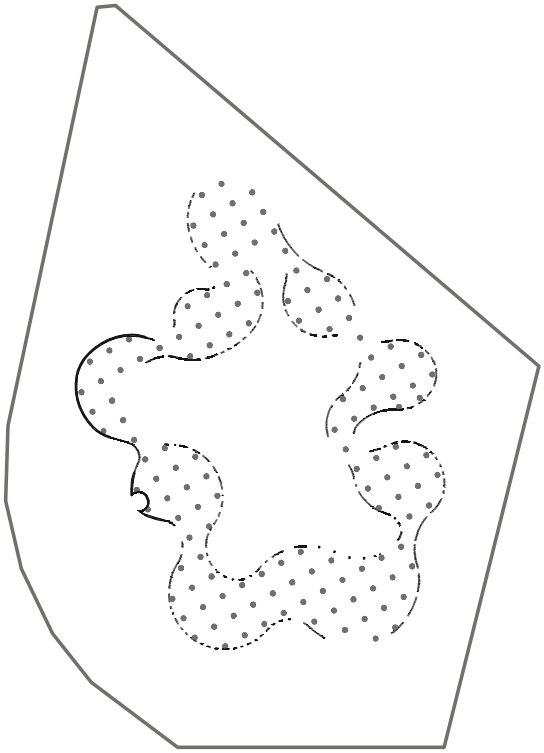


Fig. 102:

Constrcution Area load-bearing (KFt):
684,11m²
7,6% of BGF

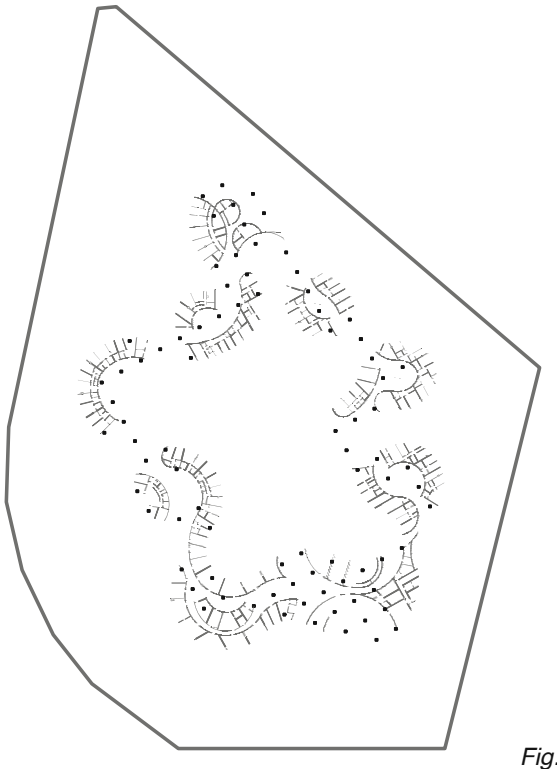


Fig. 103:

Constrcution Area inner walls (KFn):
313,27m²
3,5% of BGF

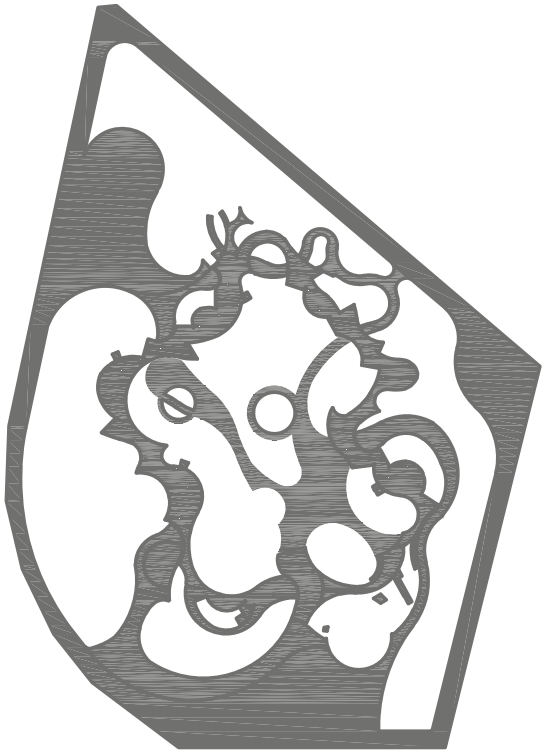


Fig. 104:
Circulation Area (VF):
14933,55 m²
44% of FBG

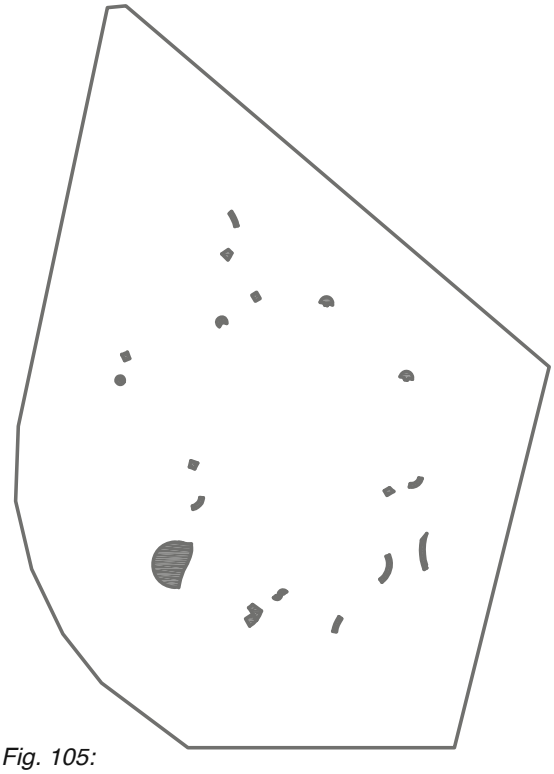


Fig. 105:
Circulation Area vertical (VFv):
299,89 m²
1% of FBG
3,3% of BGF

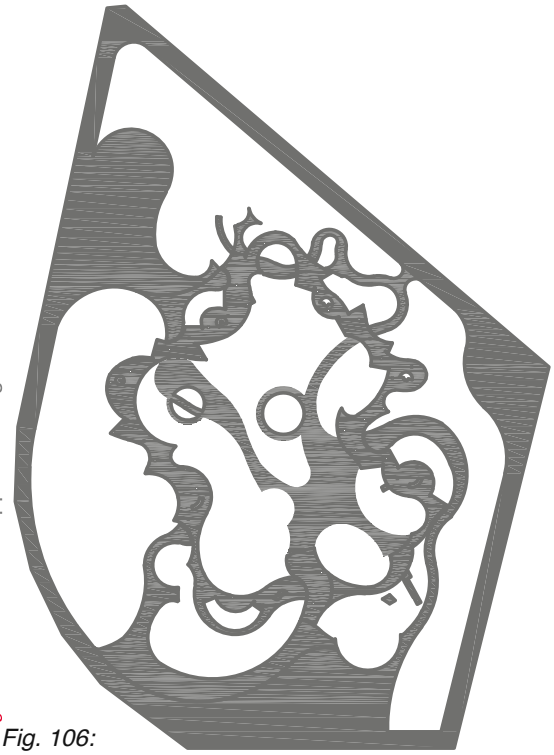


Fig. 106:
Circulation Area horizontal (VFh):
14633,66m²
43% of FBG

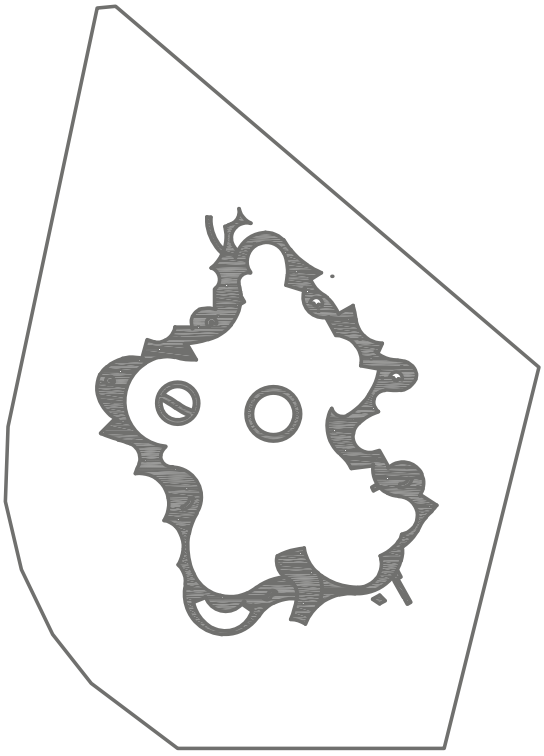


Fig. 107:
Circulation Area horizontal (VFhi)
inside: 3140,64m²
9,2% of FBG
35% of BGF

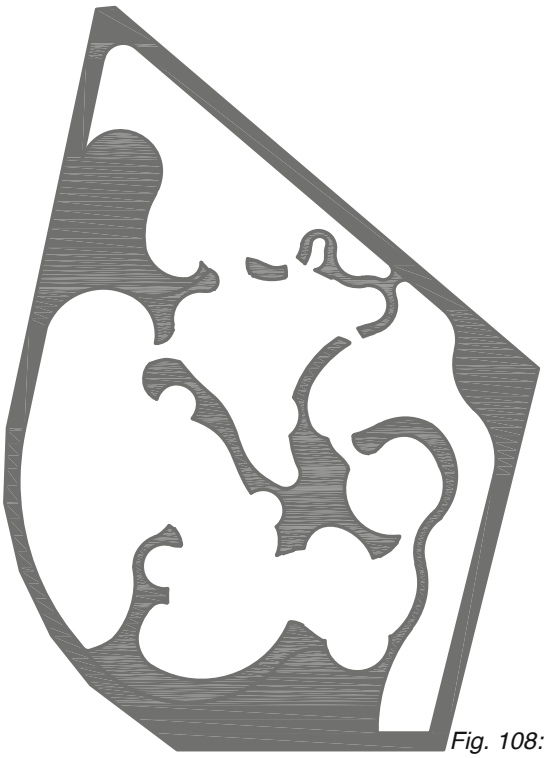
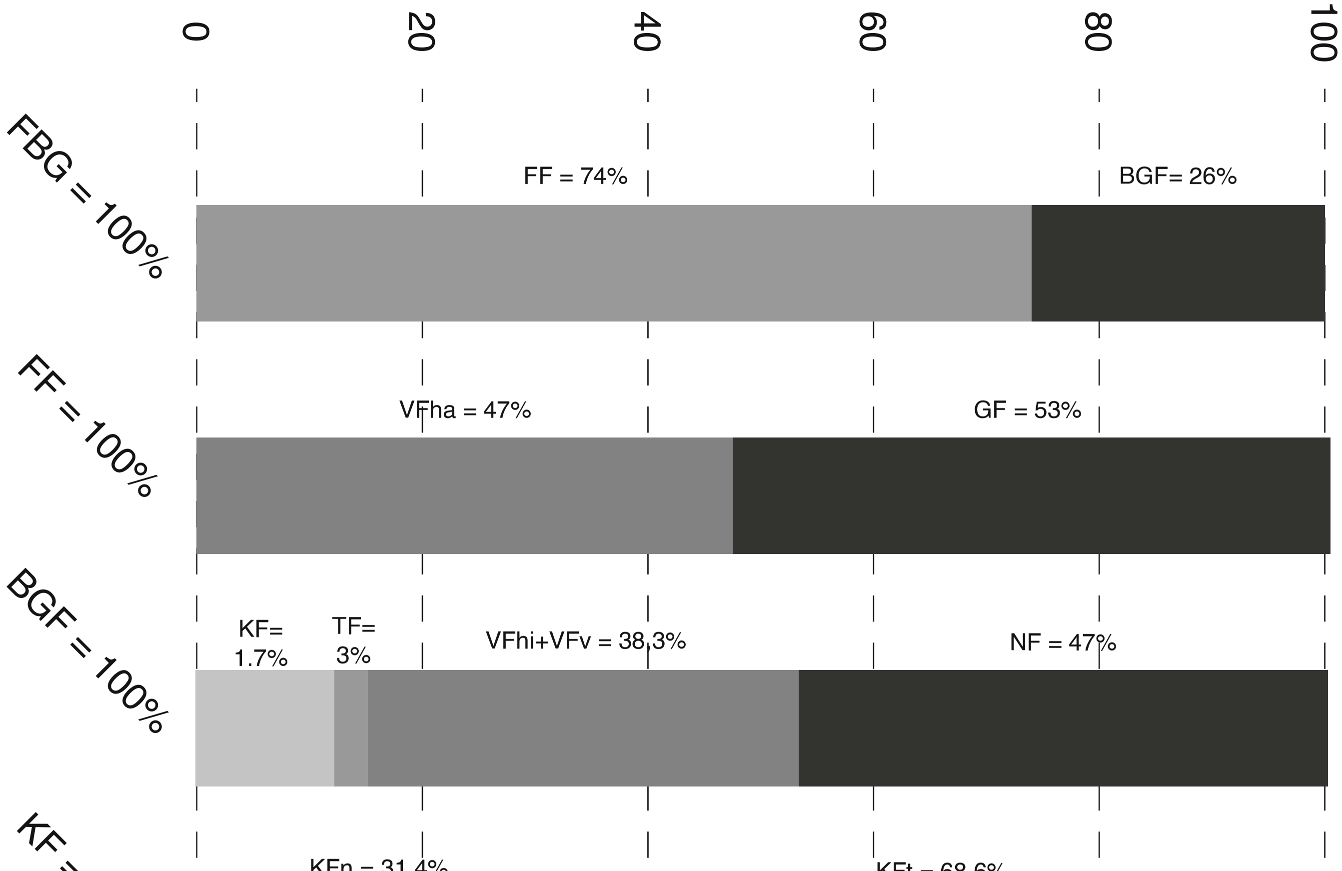


Fig. 108:
Circulation Area horizontal (VFha)outside:
11493,02m²
33,9% of FBG, 46% of FF



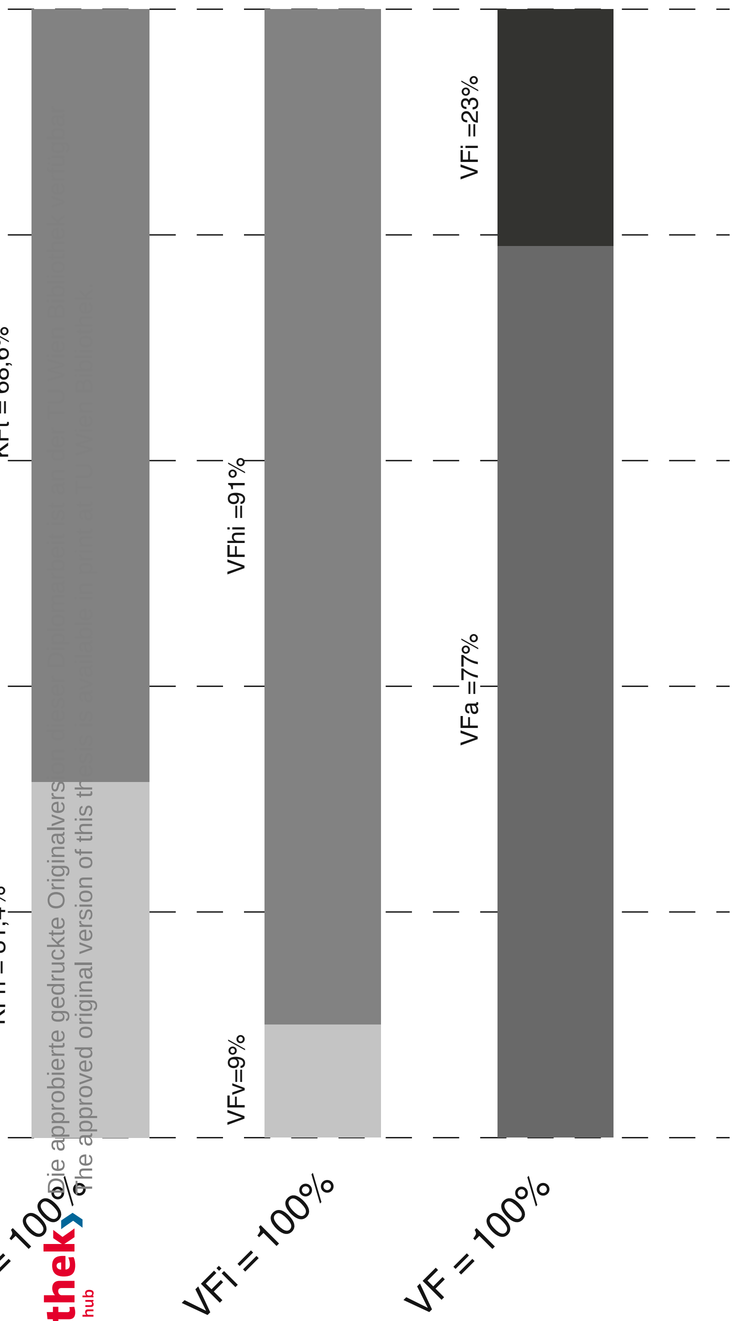


Fig. 109: Area Analysis

07 Conclusion

This thesis has explored the intersection of architecture and mental health through the design of a rehabilitation centre for psychiatric patients in the Central Anatolian Region. By combining modern design principles with therapeutic strategies, the project seeks to create an environment that supports healing, independence, and social reintegration for individuals dealing with mental illnesses such as schizophrenia, mood disorders, and substance abuse.

The study identified significant gaps in Türkiye's mental health care system, particularly the lack of long-term rehabilitation facilities for individuals without family or caretakers. In response, this project introduces a community-based, human-centred approach that emphasizes the role of the built environment in promoting positive mental health outcomes. By drawing on global best practices in psychiatric facility design, the rehabilitation centre provides a normalized living environment that fosters autonomy while delivering the necessary medical and social support for recovery.

The design of the rehabilitation centre reflects key principles of privacy, social interaction, and personal growth. The one-to-four-bedroom apartments offer flexible living arrangements that cater to the diverse needs of the residents, promoting a gradual transition from supervised care to independent living. Communal spaces encourage socialization and help residents develop the interpersonal skills necessary for reintegration into the workforce and society. The inclusion of outdoor areas and green spaces plays a vital therapeutic role, offering residents the chance to connect with nature, which is known to have positive effects on mental health.

A distinctive feature of the design is the broad hallway that loops through the building, enhanced by expansive glass facades. These facades blur the distinction between indoor and outdoor spaces, creating an open, airy atmosphere. This hallway functions not only as a circulation space but also as a dynamic, multifunctional area where residents can interact and socialize, fostering a sense of community within the centre.

The choice of Gölbaşı as the project site reinforces the importance of context in architectural design. Its proximity to both nature and the expanding city of Ankara offers an ideal balance between isolation and access to essential services. This setting helps ensure that patients can engage with a normalized environment while being protected from the pressures of urban life.

In conclusion, this project demonstrates that architecture plays a pivotal role in mental health care. By addressing the spatial, social, and therapeutic needs of psychiatric patients, the design fosters both immediate healing and long-term personal development, serving as a model for future rehabilitation centres in Türkiye.

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09 Author and Acknowledgement

Zeynep ALTIN

curriculum vitae

Experience

04.2022 - 04.2024 **Architect**
BEX Architektur, Vienna

Responsibilities
- Design, submission and execution plans
- 3D Modelling of Projects
- Assistance with various office tasks

09.2021 - 03.2022 **Intern**
Construction Company of Dipl.-Ing. (FH) Kiymet Adali, Vienna

Responsibilities
- Submission Plans
- 3D Modelling of Projects
- Assistance with various office tasks

08. 2015 - 09. 2015 **Intern**
Meteksan Printing and Technical Industry Trade Ltd, Ankara

Responsibilities
- Book cover design
- Supporting customers in the final decision about their products

Skills

CAD-Programmes
AutoCAD
Revit
Rhino & Grasshopper
SketchUp

Adobe CC
Adobe Illustrator
Adobe InDesign
Adobe Photoshop

Sontiges
Microsoft Office Suite
Unity 3D
QGis

Education

2020-2024 Vienna University of Technology, Architecture MSc

2014-2020 Vienna University of Technology, Architecture BSc

2009-2013 Ümitköy Anatolian High School, Ankara

Other

08. 2017 - 09. 2017 Super Adobe Workshop mit Obaruhu Architecture & Art

Language Skills

English Advanced
German Upper Intermediate
Turkish Native speaker level

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