Body as a House

Space, Experience and Mind in the Transformation of Trauma

Diploma Thesis
by Ajdin Vuković

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Body as a House:
Space, Experience and Mind
in the Transformation of Trauma

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Abstract

Trauma is a person's emotional response to a distressing experience. Few people can go through life without encountering some kind of trauma. Unlike ordinary hardships, traumatic events tend to be sudden and unpredictable, involve a serious threat to life - like bodily injury or death - and feel beyond a person's control.

Cognitive Behavioral Therapy has been the standard of care in the last 30 years. The client would recline on a couch, while the therapist would push conversations in order to evoke new realizations in the patients perception.

But trauma impacts much more than just our thoughts and actions. Trauma is far-reaching and systemic - it cuts us to our bones. It can dissolve our sense of identity, diminish our capacity to locate ourselves accurately in *time* and *space*, inhibit our tolerance for interpersonal relatedness, and so much more - just like architecture can.

New treatment methods, such as dance-, body- and constellation therapy, incorporate the body's wisdom and pave the way for promising big outcomes in trauma care. Through such different use, they demand radically different typologies in architecture.

The Thesis *Body as a House - Mind, Experience and Space in the Transformation of Trauma* investigates those novel treatments and uses neuroscientific achievement, to create new narratives for trauma-informed design. Pushing for the agenda of mental health as a public concern, the thesis project explores on the intersection of public life and mental health on a site at Donaukanal, Vienna.

Kurzfassung

Trauma ist die emotionale Reaktion einer Person auf eine belastende Erfahrung. Nur wenige Menschen können durchs Leben gehen, ohne ein Trauma zu erleben. Im Gegensatz zu gewöhnlichen Krisen treten traumatische Ereignisse plötzlich und unvorhergesehen auf, beinhalten eine ernsthafte Bedrohung für das Leben – wie Verletzungen oder Tod – und verleihen einem das Gefühl von Kontrollverlust.
Kognitive Verhaltenstherapie war in den letzten 30 Jahren der Standard der Behandlung. Der Klient lehnte sich auf einer Couch zurück, während der Therapeut Gespräche anregte, um neue Realisierungen beim Patienten hervorzurufen.

Jedoch beeinflussen Traumata viel mehr als nur unser Denken und Handeln. Sie sind weitreichend und systemisch. Ein Trauma kann unser Identitätsgefühl auflösen, unsere Fähigkeit, uns in Zeit und *Raum* genau zu verorten verringern, unsere Toleranz für zwischenmenschliche Beziehungen hemmen und vieles mehr – all dies trifft ebenso auf Architektur zu.
Neue Behandlungsmethoden, wie etwa Tanz-, Körper- und Aufstellungstherapie, integrieren die Weisheit des Körpers und versprechen große Erfolge in der Traumabehandlung. Durch diese alternativen Nutzungen entstehen radikal unterschiedliche Typologien für die Architektur.

Die Arbeit *Body as a House - Space, Mind and Perception in the Transformation of Trauma* untersucht diese neuartigen Behandlungsmethoden und nutzt neurowissenschaftliche Errungenschaften, um neue Narrative für traumainformiertes Design zu schaffen. Das Projekt untersucht die Schnittstelle zwischen öffentlichem Leben und psychischer Gesundheit an einem Standort am Donaukanal in Wien.

Introduction

Movement and Body in Trauma Therapy: Call for novel Spacial Solutions

Mental Health is a very topical issue, openly discussed in the field of professional healthcare and folk cure, but also currently widely shared through (social) media. Especially the demand of a resilient attitude towards life, documented in publications and lately spread by strong brands in the economy of lifestyle, fashion and design, indicates the desire of young people to become a more reflective generation. With the worlds population expected to rise to 8.5 billion by the year 2030 and 66% of its inhabitants expected to live in cities by 2050, such rapid urbanization showcases the complex interrelationships between the experience of living in increasingly dense cities and the status of their residents' mental health and well-being. (Verderber, 2018) Admission rates in psychiatric institutions are often significantly higher in urban areas compared to rural areas. [1]

Through cultural change the meaning of "madness" (respectively mental disorder) transformed - and so did the treatments in order to keep people "sane". Different treatments demanded various spaces and ultimately specified built typologies. Firstly the typology of asylums accrued, which reflected the narrative of exclusion through space. (Foucault, 1974). The patients were basically locked away from the rest of society, so as to create social, economic and medical order in the city. [2] Significant figures in psychology, such as Sigmund Freud, introduced new approaches to behavioural health treatment and influenced generations of psychologists, creating a new typology - e.g. the rehabilitation clinic and the private practice. All those transitions regarding built typologies started with reactions towards treatment of radical mental illnesses, such as schizophrenia or bi-polar disorder, and depicted with time the integration of small scale and less invasive mental issues, such as depression and trauma.

[1] Verdeber, „Innovations in behavioural health architecture", p. 16

[2] Knowlton; King; Elden, „Architecture and Discipline: The Hospital".

Today, another new generation of Therapists practises innovative ways of treatment. These „alternative therapies“ do have their roots in mediation, folk cure and/or psychoanalysis, but slowly get recognised as serious treatments with astonishing effects on their patients and clients. Especially Constellation Therapies and Body Therapies showcase promising results, dealing with systematically and transgenerationally rooted Trauma. A vast number of surveys showcases that trauma is not only created through individual experience, but also can be inherited from previous generations. It inweaves with the genes and may last up to three generations long - showcasing post-traumatic stress disorders based on departed distressing events that were not experienced personally, but by relatives in the past. [3]

The Methodologies of Constellation- and Body Therapy seem to be the most auspicious and efficient ways of treating transgenerational, but also self-experienced trauma. While practising such innovative approaches, the spaces and typologies of these recovery spaces remained the same, even though the demands are different: The performative attributes of Constellation Therapies require a radical change in their spaces of usage, regarding experienced **Dimension**, **Materiality** and **Relation to the Public Space**, which until now remain largely overlooked.

[3] Bohacek, Mansuy. „Molecular insights into transgenerational non-genetic inheritance of acquired behaviours“

Embodiment in Art & Architecture

References: the Body and the created Environment

The moment when humankind started manufacturing artificially joined elements in order to create shelter from the rest of the environment, demands to movement and ultimately to performative expression were set. Suddenly, there was an „outside“ and an „inside“ world - an exclusivley marked space, stating not only property, but also a place of safety.
Ever since Marc-Antoine Laugier explored the anthropological relationships between the human race and the natural environment with the concept of the primitive hut in 1755 [4], one could image the big potential in the fundamental elements of architecture, but also how they influence our possibilities to interact, both verbally and physically. (fig. 01)

From that quintessential point on, various constructed rooms occured through architectural history, setting perceptional statements for our minds and motoric requirements for our bodies.
With time, humankind created new spaces and at some point those spaces started to shape humankind. Especially the western seperation of „body and mind“ - or even biblically observed „body and soul“ - underlined the anthropomorphic idea of body awareness:
Even Platon himself described humankind by stating that the brain and the muscle are indipendent entities of the body.[5] On one hand the the physique, understood as a beautiful construction of flesh, meant to be a representation of strength and attraction, in all its caducity. On the other hand the mind, perceived as an unseizable load of consistency, immortal in its being.

[4] Williamson, „other lives: Charles Eisen- and Laugier's essai sur l'architecture“

[5] Lotter, „Körperwelten“, p. 34-37

fig. 01: „the primitive hut“ by Marc-Antoine Laugier

Both parts, mind and soul, exist disjointed from each other. Even after several academic or artistic movements had tried to underline that a healthy mind stays within a healthy body, the broad mass of society believed in that particular separated state of their bodies and their souls - mostly because all major religions preached that concept. [5]

Of course the rapid progress in medicine, the seperation of the clergy and the state and influences through eastern zen-culture via globalisation produced a big shift in the idea of body and mind. These unshakable western habits were confronted by artistic positions in the twentieth century.
French artist Louise Bourgeois confronted her memory after her fathers' death in 1951 by seeing a psychoanalyst in New York. She started to work on smaller pieces deeply rooted in her mind, dealing with childhood trauma, fear as an infant and the omnipresence of bodies she kept seeing.
After her husbands' death in 1973, Bourgeois began to work on artpieces of architectural size. This new scale to her work allowed her a new sense of freedom, creating a row of her currently most famous works; the Cells. (fig. 02)
The word "cell" holds different connotations, whether as a cage-like prison, as a contemplative unit in a monastary or even as a biological cell of living organisms, that both encloses and protects - all of them equally suggest a place of confinement.
Each Cell allows the pleasure of voyerism - an act of observing and being observed. While repelling or attracting each other, the cells create an urgent need in the visitor to combine, merge or disintegrate the singular pieces. [6]

[5] Lotter, „Körperwelten", p. 34-37

[6] Hivert, „Louise Bourgeois - Structures of Existence: the Cells"

fig. 02 „Cell XXVI" by Louise Bourgeois

Bourgeoius' idea of cells as the embodied reflection of the (traumatised) mind became a strong narrative in the fine arts and new media. The small, enclosed space was the perfect scale for even less imaginative minds to translate or relate to memory into space.

While Bourgeious' works tried to document past events in small spaces, Lennart Nielsen explored on the smallest possible spaces humankind will ever create: the pre-natal space.
In 1965, as the first person ever, he had the opportunity to photgraph the primary space that every human enters, - eventless, free of any memories, one could recognize the common humanity, regardless of man-made boundaries - everybody was the inheritor of the "family of man". Nielsen's pictures reminded people that everyone was born from a common process, everyone embodies the outcome of the same interior encounter and every single one shares the same emotions that drive one to seek or offer the protection of the parent.
The unborn child in the last stages of the pregnancy, its human features fully recognizable, is as beautifully photographed by Nielsen as the sacred newborn was once painted by Renaissance masters in the arms of the Madonna. [7]
Seeing the pre-natal space as the first room ever, untouched by harmful actions and specifically molded for one individual at a time, leaves a big mark on the idea of space. (fig. 03)
Architects like Stanko Kristl conducted research works into a kind of primal comprehension of space and the perceptions of an unborn child set the stage and direction for the radical design of the Mladi rod kindergarten in Ljubljana. [8] (fig. 04-05)

[7] Holborn, „Lennart Nielsen", p. 24

[8] Wall Street International, „Stanko Kristl - Architect"

fig. 03 „Foetus 18 weeks" by Lennart Nielsen

„Stanko Kristl consciously avoids repeating the same solutions, and within his projects constantly questions the true nature of basic architectural programmes – apartment, school, kindergarten, hospital, family house – and tries to redefine them over and over again. In each of his projects he goes beyond the mere search for functional spatial solutions to the given assignment; instead, with his comprehensive approach to architectural design he strives for change in established concepts of education, housing and healthcare, and seeks to design alternatives to the existing standards and modes of work. Multi-layered research into each individual program forms the basis of his architectural response, which often assumes the role of a built prototype. Adapting to the scale of the individual user, be it a child or an adult, the sick or the healthy, young or old, he demonstrates his absolute commitment to the idea of humanity in architecture.

The dominant characteristics of Kristl's work, such as experimentation, inventiveness and systemic approach intertwine on a spatial, technological and sociological level. He designs buildings as open structures that over time allow for a high degree of adaptation, change and development. Their appearance is largely determined by their visible structural design, experimental use of unconventional materials, and innovative details and technological patents in order to achieve economically efficient construction and later maintenance of the buildings. His research-based innovative approach resulted in architectures that transcended the borders of what was known and established, and so provoked both extreme enthusiasm and fanatical resistance from both the professional and general publics." [8]

[8] Glažar; Gregorič; Vardjan „Stanko Kristl - Architect"

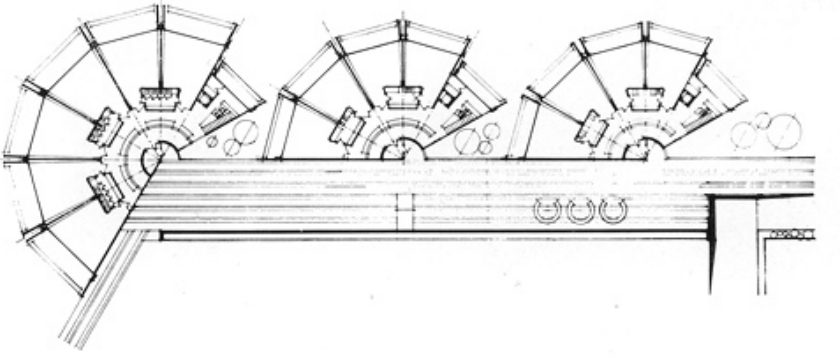

fig. 04-05 „Kindergarten Mladi Rod" by Stanko Kristl

Looking at the development of space from the perspective of an unborn child, a striking relation could be drawn between the adaptability of the motherly womb and the dynamics of Oskar Schlemmer's spaces described through dance and movement.

Bauhaus artist Oskar Schlemmer conceived a ballet named „Slat Dance" in the 1920s. (fig. 06)
With a specific costume featuring poles tied to the dancers body, Schlemmer was able to limit the performers' movements to the most necessary ones, but also underline the direction of movement in space. In his research he describes these poles as lines, that relate to the body and ultimatley create the abstract space needed for the action of movement. Schlemmer called it *the invisible linear network of planimetric and stereometric relationships*. [9]

Similarily to Bourgeois' *cells* there is an observer and an observed - both in deep interaction with each other. One in action. The other one in reaction.
Analogically to Kristl's *structures, one can read* a sense adaptability and a trace of human-centered use.
Almost equally adaptable are Nielsens documented *prenatal* spaces - as they grow with the needs of its user - the foetus.
And precisely as the *primitive hut*, the constructed singular pieces both create space, but also limit the motorical potentials of its inhabitant.

[9] Fabrizi, „When Body Draws the Abstract Space: 'Slat Dance' by Oskar Schlemmer".

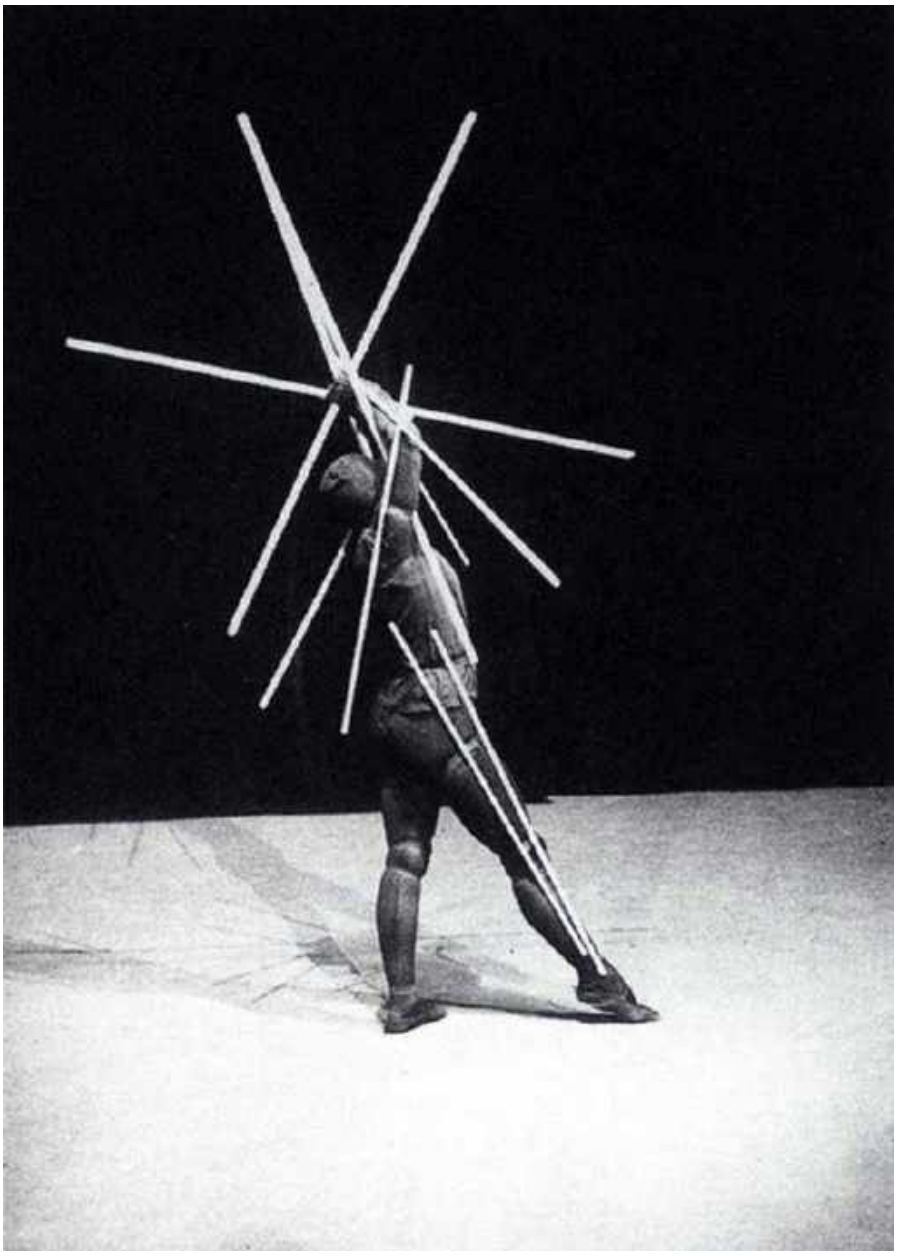

fig. 06: „slat dance“ by Oskar Schlemmer

Embodiment in Art & Architecture

Interpretation: Consequences for the Mental State

What one can learn from the works of Bourgeois, Schlemmer and Kristl is, that in fact the body is not ephemeral. Even if ancient western cultures seperated mind and physique, the mere consequences of human physical representation always leave a mark in our built environment.

„Architecture is a mediation between the world and our minds. So [good] architecture tells us something about the world. It tells us something about history, about culture, about how the society works and finally, it tells us who we are. And good architecture, or art in general, enables us to live a more dignified life than we could without art."

- Juhani Pallasmaa [10]

Spaces therefore have the power to convey the presence of the maker, which in case of Nielsen's documentations of the motherly womb is equally the user and maker. If those spaces are built resistant enough, they can last longer in one's existence, every human ever body could. Our bodies are structure space:
Volumes, abstract enough to allow a multiplicity of uses. Rooms, specific enough to evoke a sense of tailor-made silhouettes to the body. Shapes, flexible enough to adapt to the various mental states of the users. - Like a fly, that suddenly enters the interior of human-built space, it needs time to adjust to the completely new and radically shrinked dimension of space.
The central objective is to create spaces that do not generate this experience of sudden change in scale and atmosphere, but rather offer an intruduction to upcoming spacial transformations. This could be achieved through a progressive development of threshold areas, offering a step-by-stepy approch of forecourts, roofed spaces, wide entrances and layered system of anterooms. (fig. 07)

[10] Pallasmaa, „Art and Architecture."

fig. 07: Collage of Scattered Rooms & Threshold by Ajdin Vukovic

Embodiment in Art & Architecture

Design Response: Somatic Sensations and Space

Looking at embodied architectures as a multiplication, using physical participation and metaphysical experience as factors, the product might result in the term *emotion*.

Most people misconceive the definition of this particular word. We do not think our feelings, but feel them in our body. Such is the specific experience of emotion that gives our lives a sense of meaning and vitality.

Architecture therefore is about the experience of what psychologists call the "vitality affects", manifesting elusive qualities of emotions that live in the human body and that can be described - as psychoanalyst Daniel Stern put it in his landmark 1985 book *The Interpersonal World of the Infant* - in kinetic terms like surging, ebbing, bursting, or fading. It seems that in its ourest form, architecture is about the uniquely human emotion of awe. [11]

The emotional substance of built space lies not merely in the quality of morpholgical or typological aspects, but to a distinct part in materiality, light, haptics and temperature. Referring to Stern's use of kinetic terms, the haptics of the user's surface could serve as a main translator for emotional response in architecture.

These correlations observed from a neuroscientific point of view lead to the somatosensory cortex (fig. 08); a region of the brain which is responsible for receiving and processing sensory information from across the body, such as touch, temperature, and pain. Using sensory information to initiate important movements that may be required to deal with particular situations, this cortex consists of areas which are arranged in specific locations, receiving information from an exact part of the body. The surface areas

[11] DiCrescenzo, „The Case for a Feeling Architecture"

Understanding the most sensory parts of the body.

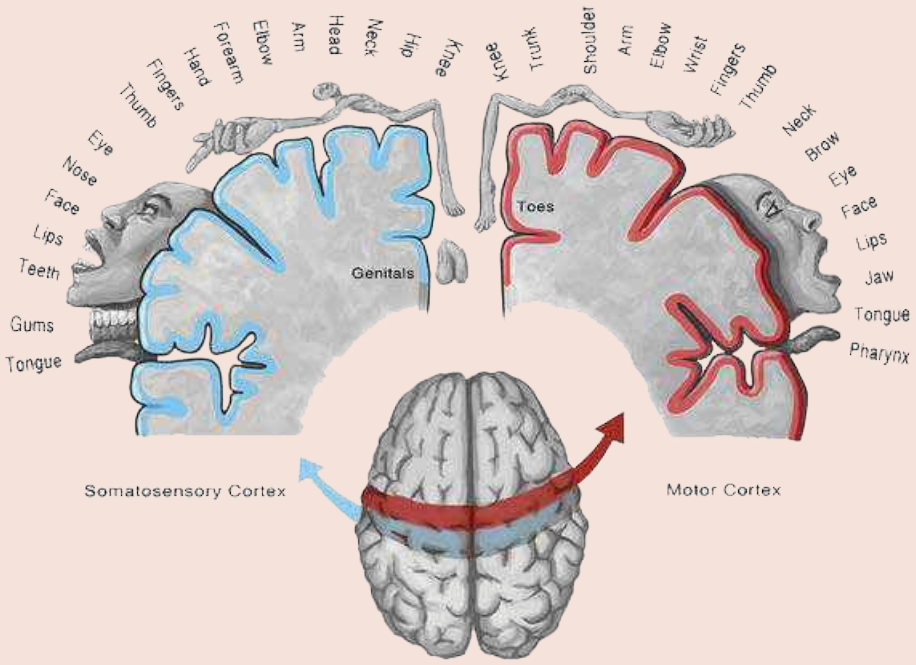

fig. 08: Somatosensory Cortex - Homunculus Map

of the cortex are dedicated to a part of the body, correlating with the amount of sensory information from that area. The *homunculus map*, a special illustration of the cortex, shows how some areas of the body are more sensitive than others; those represented areas of the body take up a disproportionate amount of space.
Therefore, the hands, arms, lips and hips are very sensitive to sensation, because there is a large area of the cortex that is dedicated to those body parts. In contrast, the back, shoulders and neck take up less area on the somatosensory cortex and are not as sensitive regions of human physique. [12]

This knowledge ultimately demands different surface qualities to key elements of the spacial envelope:
Floor. Walls or Pillars. Ceiling.

Using the example of concrete, it can be said that through the use of different grain sizes and the precise usage of post-processing actions, such as washing, grinding and polishing, can result in very different surface qualities.
Such contrasting granularities can serve as sensoric tools for architectural impression and create that particular sensoric one would need to convey emotional experiece.
If those various haptics cooperate with the proportions of the body, a made-to-measure room suddenly communicates with the user on a sensoric level.

Referring back to the key elements of the spacial envelope, the haptics of Floor, Wall or Pillar and Ceiling could transform as illustrated in fig. 09.

[12] Guy-Evans, „Somatosensory Cortex"

Making material handling choices based on the sensorics that relate to the body

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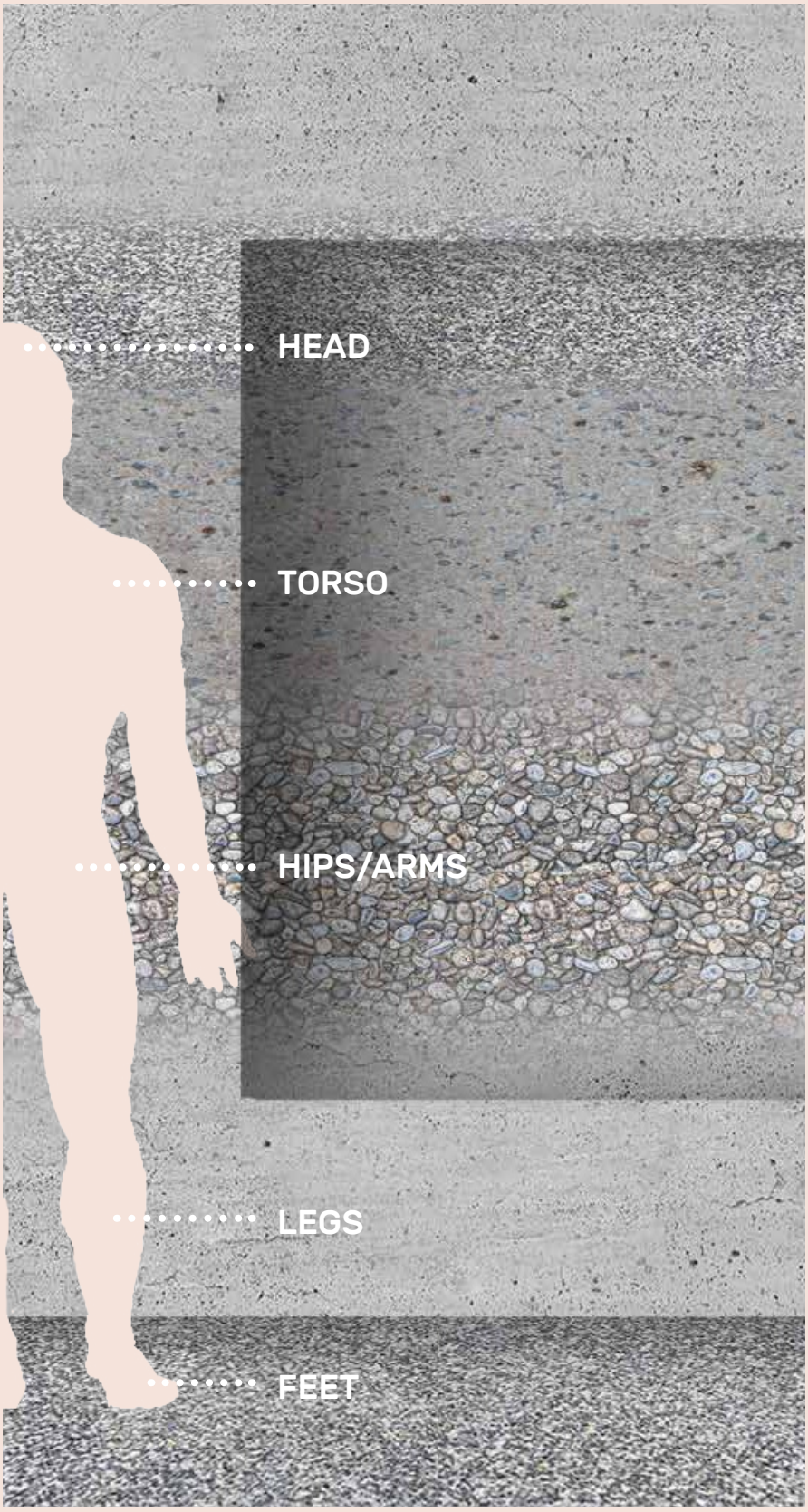


fig. 09: material handling choices based on relation to body sensorics by Ajdin Vukovic

Space and the Neurosciences of Emotions

References: Bodily Mapping of Emotions - mental vs. physical Health

Besides the mere sensory susceptibility, current research shows a much deeper understanding of the neuroscientific system of our bodies.

Since the neurosciences established themselves as a serious research discipline, a lot of other scholarly fields experienced radical change of realizations. The fields of medicine, psychology and sociology (to name a few) gained a lot of valuable knowledge from the latest achievements of neuroscientists whereas the field of architecture skillfully ignored those worthwhile understandings.

Recent publications by Juhani Pallasmaa and Sarah Robinson opened the gate of neuroscience as an integrative part of the architectural discourse. Most of the papers and conducted studies that followed the wisdom of Pallasmaa's and Robinson's research nevertheless concentrated on the atmospheric qualities of architectonic space and their relation to neuroscientific data.

Excluding the phenomenological perception, many theories focused on the term *atmosphere,* not realising that in the definition of architectural discipline, it initially seems to be a familiar, comprehensible, and harmless word. However, by exploring its profound, intimate meaning, it reveals itself to be uncertain, ambiguous, and unintelligible. [13] Atmosphere as a neuroscientific research term was rather understood as a spacial quality that is perceived, but not inherently felt or experienced. Virtual-Reality testing sessions were used as a tool for testing responses to perceived impressions of spaces. (fig. 10)

„Whether people are fully conscious of this or not, they actually derive countenance and sustenance from the atmosphere of the things they live in or with. They are rooted in them just as a plant is in the soil in which it is planted."

- Frank Lloyd Wright [14]

[13] Canepa, Scelsi, Fassio, Avanzino, Lagravinese and Chiorri, „Atmospheres: Feeling Architecture by Emotions"

[14] Pfeiffer, „The Essential Frank Lloyd Wright: Critical Writings on Architecture", p. 350

fig. 10: atmospheres box by Elisabetta Canepa

As precise as Wright's words are, they still imply personal experiences that are different to every individual user of a space. Every person has a specific relation to a material, a smell or even a sound of a room. Even Peter Zumthor stated that atmosphere for him is rather an aesthetic category. [15]

In order to move away from terminologies that juggle with topics of mere architectural sophistications, this thesis wants to replace the atomospheric wording with the narrative of *emotional response*.

Looking at architecture as a built manifestation of emotions, allows both the architect and the user to experience space on a much more organic level. The term involves not only the viewed space but incorporates also a multi-sensory meaning to experiencing architecture.

The research work of Lauri Nummenmaa and his team represents crucial facts that will influence design decisions in this thesis:

Studies show that we are prepared to meet challenges encountered in the environment by adjusting the activation of the cardiovascular, skeletomuscular, neuroendocrine, and autonomic nervous system. This correlation between emotions and our body is also reflected in the way we speak of emotions: a nervous person may suddenly have "cold feet", tragically disappointed loved ones may be "heartbroken", and a spooky movie scene may send "a shiver down our spine". In their study, different emotions were associated with statistically clearly separable bodily sensation maps (fig. 11) that were consistent across West European and East Asian samples, all speaking their respective languages.[16] The topographical distribution of emotions in our bodies is therefore culturally and personally universal. If one defines the earlier stated term of *emotional response* with the

[15] Zumthor, „Atmospheres", p. 7

[16] Nummenmaa, Glerean, Hari and Hietanen, „Bodily Maps of Emotions"

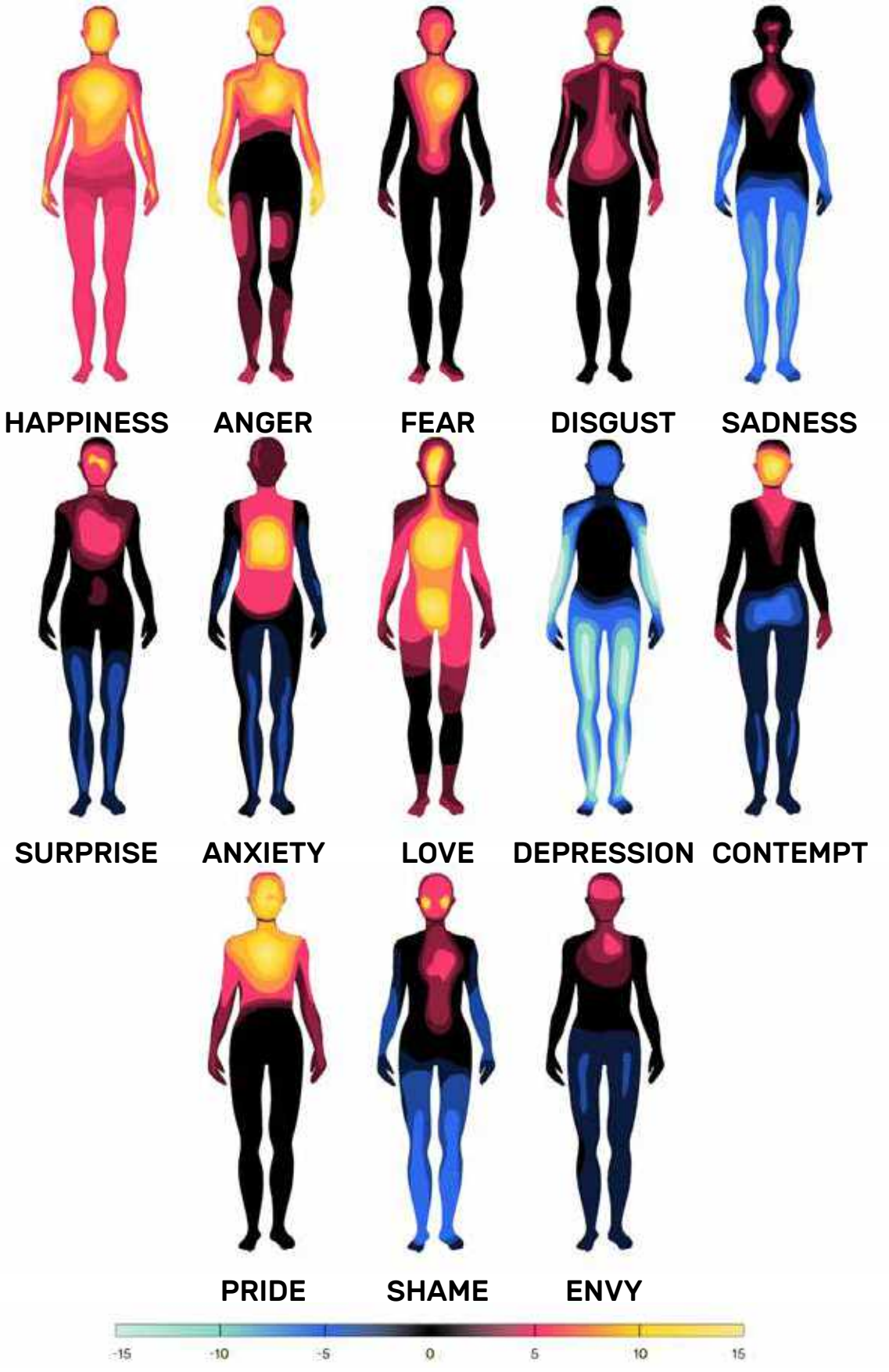


fig. 11: bodily map of emotions by Enrico Glerean

knowledge of Nummenmaas research, suddenly a general and non-subjective understanding for multisensory spacial experience could be established.

Besides the various sensitivities of body regions of our skin and its connection to the somatosensory cortex, the bodily map of emotions deals with the mere sensorics of the human envelope - the skin - but also examines the psychosomatic consequences throughout the whole physique.

Looking at two very specific emotional states conducted in the study, anxiety and depression represent two of the most frequent symptoms of trauma.

While anxiety showcases itself as an increased activation of above the pelvis and a decreased activation arms, legs and feet, depression reveals a general decreased activation in the whole body, especially in the lower body parts. [16]

These kind of conlusions do not only apply as pure gut feelings or the previously mentioned „cold feet", but also underline the correlations between the mental (and therefore emotional) well-being and the physical health.

Even if we are consciously aware of our emotional state, most people do not see the relation to actual consequences for the body. Psychosomatics are not a myth. They are based on our subjective feelings, which are a central feature of human life. Humans steadily experience a constant stream of subjective feelings that are only dissolved through sleep, brain damage or drugs, altering the states of the central nervous system. External or internal parts of information that pass beyond nonconscious processing may be transformed into reliably reportable subjective experiences (feelings) that bear distinctive subjective *qualia*. [17]

[16] Nummenmaa, Glerean, Hari and Hietanen, „Bodily Maps of Emotions"

[17] Nummenmaa, Hari, Hietanen, Glerean, „Maps of Subjective Feelings"

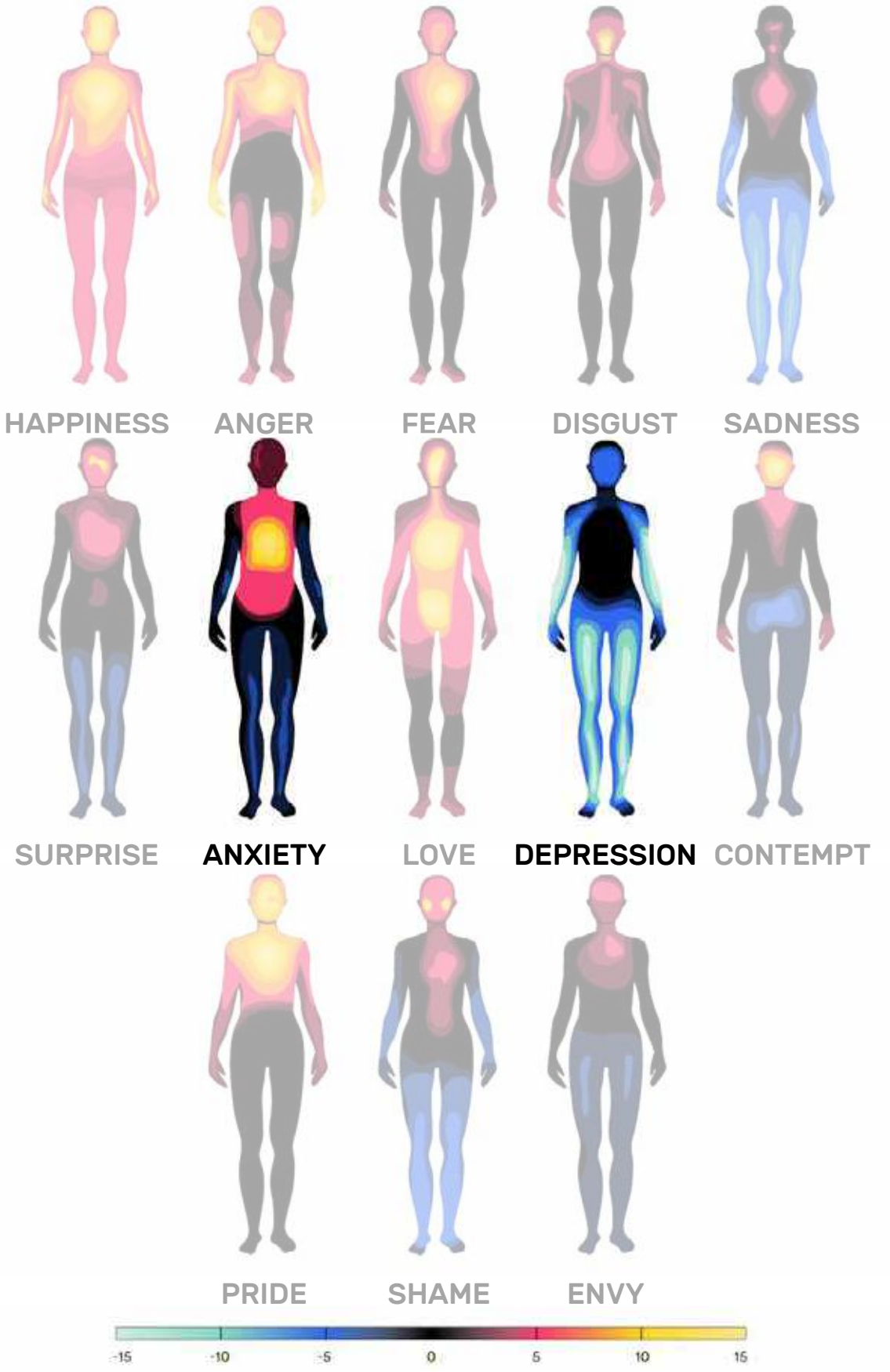


fig. 12: bodily map of emotions: anxiety and depression, by Enrico Glerean

Most Philosophers refer to the term *qualia* as introspectively accessible, phenomenal aspects of our mental lives - or the unique way how we *feel* different things. [18]

Feeling has multiple psychological and physiological definitions ranging from the subjectively accessible component of emotions to somatosensory experiences, ideas and beliefs. But Nummenmaa and his team used this term to simply refer to the current, subjectively accessible phenomenological state of an individual, in order to create their map of subjective feelings: (fig.13)

The inner sensations of such feelings organize our mental lives and are responsible for our well-being. Ultimately, a multitude of unpleasant feelings are the most frequent reasons for seeking medical care. Experiencing changes in the body often has a strong relation to physical activity, stress level and emotional state. The ability to consciously monitor and feel certain physiological states (such as thirst and hunger) and detect potential tissue damage has been critical already to our ancestors, because the survival of an organism depends on its ability to maintain its physiology within an optimal homeostatic range. These feelings vary strongly in their mental response; for example, heartbeat and digestive processes go unnoticed most of the time, whereas it is almost impossible to abolish the agony upon hearing of a loss of a dear friend. This way of functioning allows our bodies to prioritize what is physically the most urgent to repair. In this case it would be the solving the digestive problem. The burden of the loss of a good friend gets pushed to the side and will only come up once it is transformed into a more urgent and physical issue. [17]

[17] Nummenmaa, Hari, Hietanen, Glerean, „Maps of Subjective Feelings"

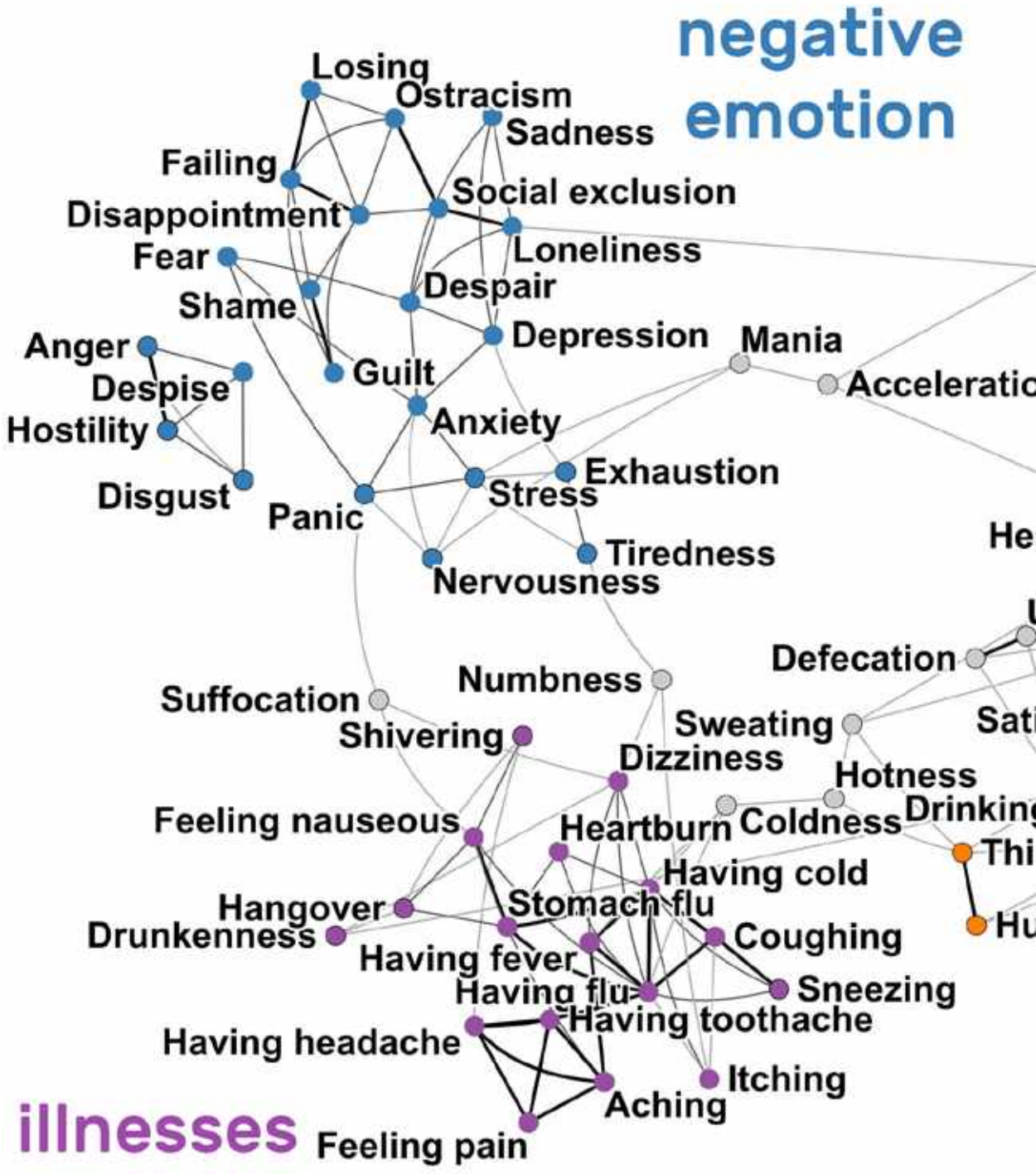
[18] Stanford Encyclopedia of Philosophy, „Qualia"

But the maps of subjective feelings illustrate clearly the complex interrelationships that the mind and the body have with each other.
Positive and negative emotions - physiological, motor, and cognitive programs - are inherently connected to each other and to terms of subjective feelings. Whether it is getting up at 4 AM to catch an early flight or choking down the intense grief at a friend's funeral - our ability to control different bodily and mental states varies greatly. This action of initiating, executing, and controlling thoughts and actions is a central tenet of human phenomenological experience. Subjective feelings are categorical, emotional and embodied. [17]

Author and founder of the „self-help movement" Louise Lynn Hay described physical symptoms as a merely tangible evidence of what is going on in our unconscious minds. She stated that our body actually becomes weaker or stronger depending on your mental state.
Lynn is convinced that shame resonates at the lowest vibration, followed by guilt, and then apathy, grief, fear, anxiety, craving, anger and hate. Conversely, trust, optimism, willingness, acceptance, forgiveness, understanding, love, reverence, joy, serenity and enlightenment strengthen a person and their *physical strength*. [19]
And suddenly another dimesion is added to the relations between mind and body; not only mere well-being, but also actual structural strenght are indicators for a healthy mind and a stable self-perception.

[17] Nummenmaa, Hari, Hietanen, Glerean, „Maps of Subjective Feelings"

[19] Hay, „Mapping Stored Emotions in the Body as a Means of Healing Physical Pain"



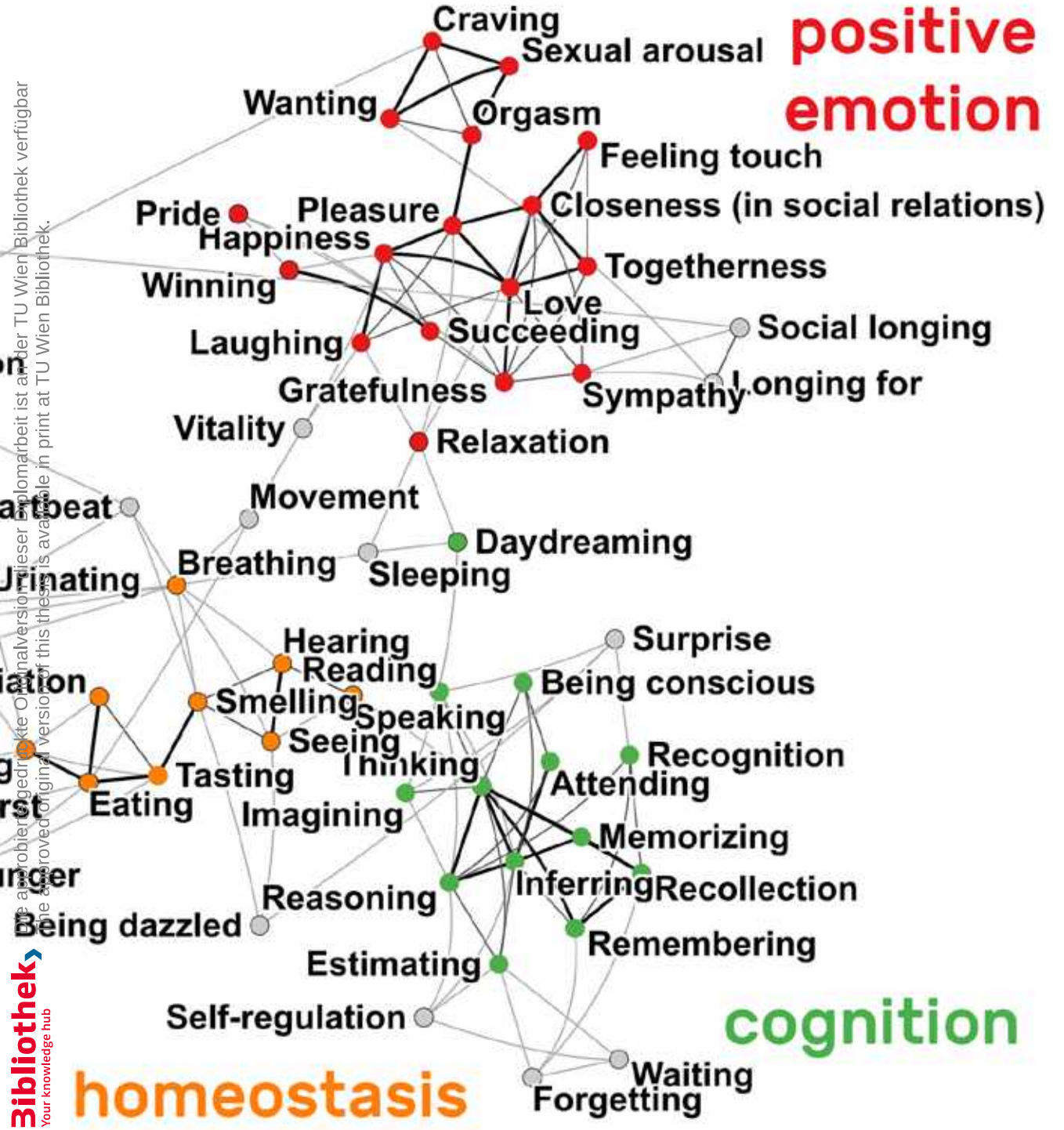


fig. 13: Maps of Subjective Feelings by Enrico Glerean

Space and the Neurosciences of Emotions

Interpretation: multi-sensory Trauma Treatment

Observed from the perspective of traumatised people in the healing process, it is essential to name the emotions that they feel. And this is actually the most difficult part - in fact, the act of telling the story of the traumatising event the patient had to experience, does not necessarily alter the automatic physical and hormonal responses of the body that remain hypervigilant, prepared to be assaulted or violated at any time. In order to provoke real change & transformation, the body has to learn that the danger has passed and to live in the reality of the present. [20]

Based on such realisations, it is clear that one cannot simply just think his or her way out of trauma. In the last thirty years, cognitive behavioral therapy has been the standard of psychotherapeutic care. The recent advances in neuroscience challenged the purely cognitive behavioral model completely - especially in the context of trauma. Psychotherapists learned with time, that trauma is not something that just merely deals with the cognition and the behavior behind it. Since trauma impacts so much more than thoughts and actions, it appeares to be systemic, far-reaching and has the power to dissolve the sense of identity, deminish the capacity to locate oneselve precisely in time and space, constrain the tolerance for interpersonal relatedness, disrupt the coherence of the experience and impair the capacity of emotional regulation. Therefore, trauma incorporates the whole being and has to be treated as a whole-being system. [21]

One of the most promising models, that inspired a lot of current trauma treatment methods, is Peter Levine's conceptualization of the constituents of phenomenological experience - the model of somatic experiencing or also in short: SIBAM. (fig. 14)

[20] Van der Kolk, „The Body Keeps The Score", p. 21

[21] Wong, „Why You Can't Think Your Way Out Of Trauma"

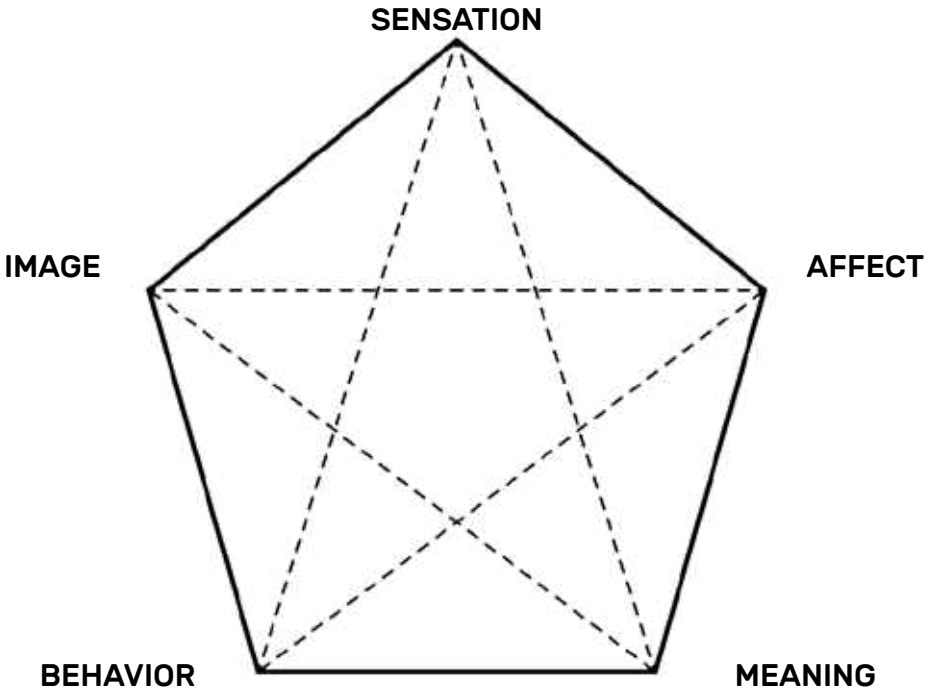


fig. 14: SIBAM model by Peter Levine

In his model of somatic experiences, Peter Levine states five components that are crucial for a complete phenomenological experience: *sensation, images, behavior, affect*, and *meaning* (SIBAM). In an ideal scenario, these five elements of consciousness flow freely and correlate to each other. The diagram of the SIBAM model (fig. 14-17) illustrates therefore very well how drastically interconnected each vertex of every element is. Under this model, a percept of experience - the fundamental building block of our subjective world - is comprised of the overall holistic gestalt of each of these elements. When one has an experience, those (at least) five parts are fundamental for a fully embodied understanding of the situation:

the *image* of what is going on,
the *affects* that accompany that experience,
the *sensation* that translates to one's body,
the *behavioral* impulses as responses to the moment,
and the *meaning* to which we ascribe the event. [21]

The absence or dominance of any of these channels are indicative of an inability to coherently organize experience. Additionally, the dominance or absence of any of the vertices can create mental disorders.
If someone is experiencing strong *psychotic hallucinations*, this person is being flooded with overly dominant images that are disconnected from underlying meaning, unable to sense them, respond to them or understand the meaning behind them. (fig. 15) Someone who feels deep anxiety and is consequently driven to behave in a certain way - without understanding why - may have *obsessive-compulsive disorder*. This may be understood as a dominance of their behaviour-affect vertices. (fig. 16) *Panic attacks* might be understood as an over-dominance of sensation and affect channels that are uncoupled from images, behavior or meaning. (fig. 17) [21]

[21] Wong, „Why You Can't Think Your Way Out Of Trauma"

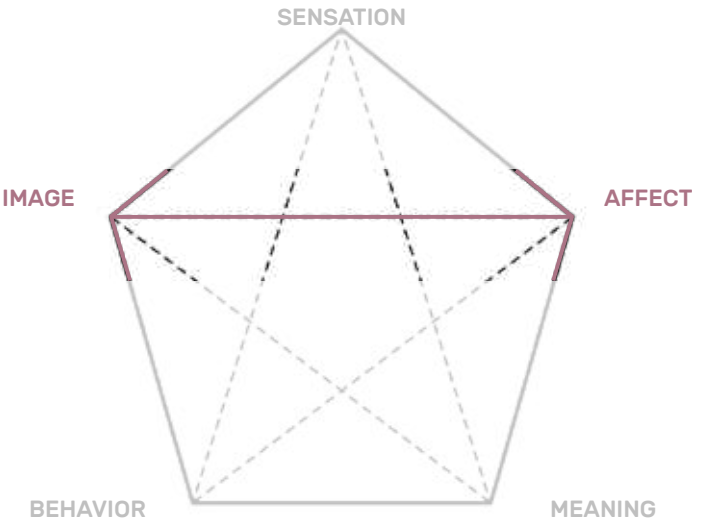


fig. 15: SIBAM through psychotic hallucinations by Peter Levine

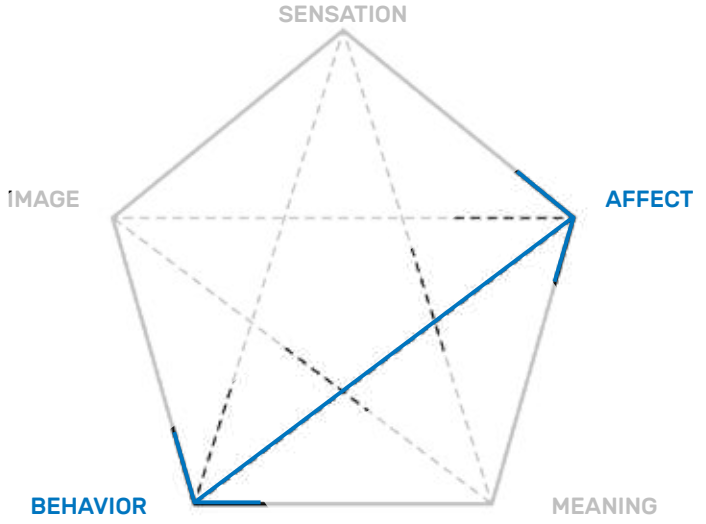


fig. 16: SIBAM through obsessive-compulsive disorder by Peter Levine

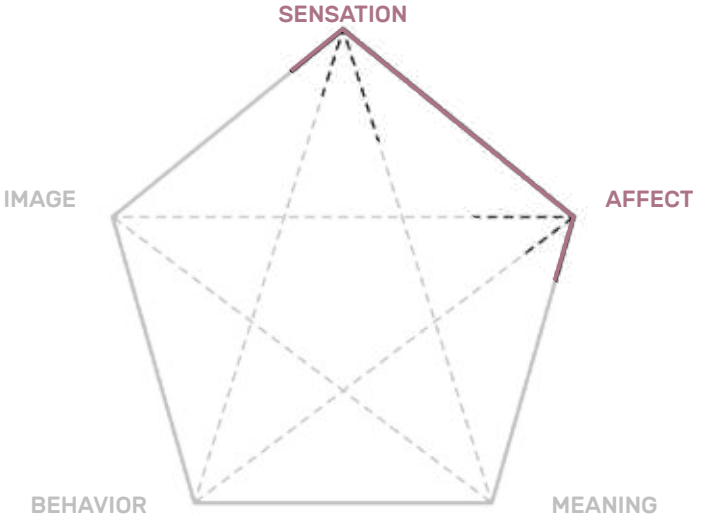


fig. 17: SIBAM through panic attacks by Peter Levine

Space and the Neurosciences of Emotions

Design Response: somatic Experiencing and Architectural Aspects

Levine's model helps one to understand the crucial aspects of experiencing. Through deconstructing the term into five key elements, the singular conditions appear as clear parts of human interaction with each other and the space that surrounds them.
Looking at Levine's terms from an architectural perspective, a provocative, yet promising view towards architectural design may be formed.
The earlier stated positions of Louise Lynn Hay's strong mind, which is rooted in a strong body and a strong body that fuels a strong mind [22], underline not only the intricate relation between the physique and the mental, but also imply that architecture has the power to tackle the body in order to strenghen it. Therefore, a strong mind would be a mere consequence.
To achieve this kind of transformation the key elements of the SIBAM model, translated into architectural aspects, can provide spacial tools that have the capacity to strengthen the user's body and mental state:

the *image* of what is going on, transcripted into the *ornament*, that bears narrative strengh,

the *affects* that accompany that experience, seen as the programmatic use, that specify a space,

the *sensation* that translates to one's body, ultimatley relating to *haptics* of certain user surfaces,

the *behavioral* impulses as responses to the moment, serving as a metaphor for acoustic reactions in a room,

and the *meaning* to which we ascribe the event, which in built presence describes the structure of a building. (fig.19)

[22] Hay, „Mapping Stored Emotions in the Body as a Means of Healing Physical Pain"

Translating somatic experiencing into architectural agendas.

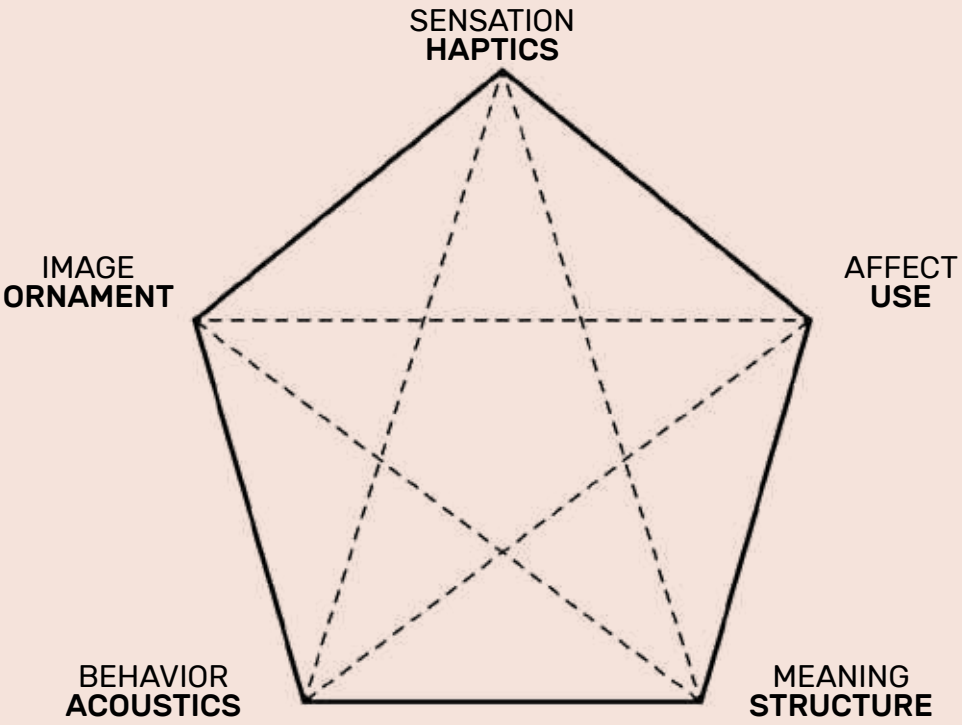
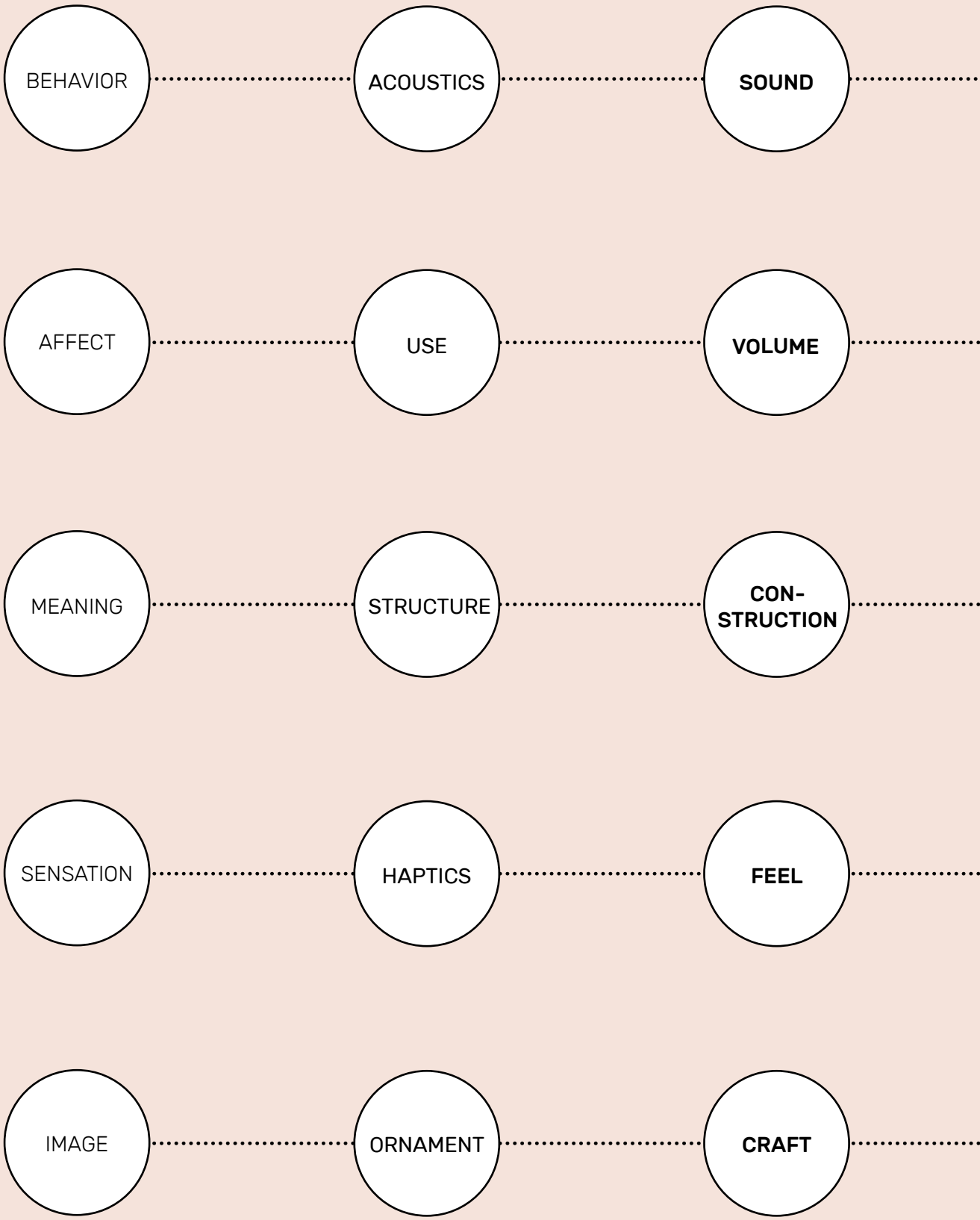


fig. 18: SIBAM through architectural agendas by Ajdin Vukovic



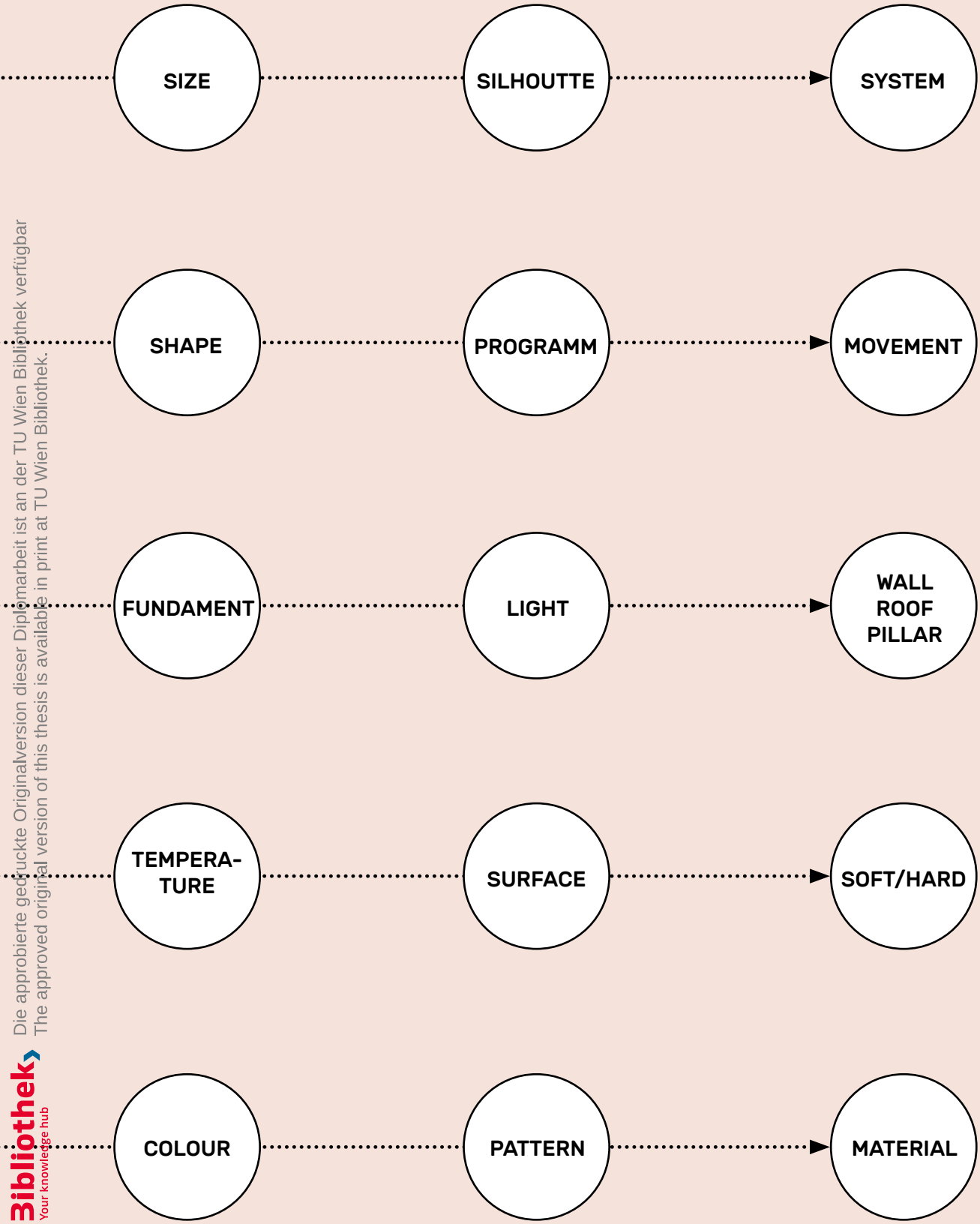


fig. 19: sensoric tools for creating trauma informed architecture by Ajdin Vukovic

The edifice (related to the verb to edify, which not only carries within itself the meaning to build but also to educate, strengthen and instruct [23]) of such sensoric and trauma informed spaces is constructed by those five contributions, as illustrated in fig. 20:

An echo enhances acoustical specificities of this trauma treatment space. No music, but just spoken words swing form the center of the space and hit the hard walls of the monolithic building structure. The heavy sound waves reflect from one curve linear silhouette of the space to the other, creating a flittering repetition of sounds. The echo of the users' voices scatter through a multitude of circulation spaces, that lead towards the center of the therapy. While entering the room, one can hear the jumps and the steps of the people in the therapy group, but does not feel the vibration of these movements. The walls are thick and structured and ask for interaction and touch as the patient walks through the buckled corridors. It is quite dark in the halls, and as the patients walk closer towards the treatment room, light appears and blends them for a second. Slowly the eyes accustom themselves to the new and bright space situation. The Sunlight, that enters the room through the ceiling, accentuates the patterns of stones in the terrazzo flooring and shows the deepness of reliefs in the washed out concrete walls.
Silence. The therapy begins.

[23] Frampton, Simone, „A Genealogy of Modern Architecture", p. 43

Defining sensory design decisions.

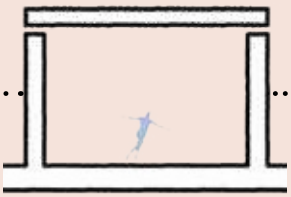
SOUND
SIZE
SILHOUTTE
SYSTEM
B.PHYSICS
TECHNOLOGY

A CIRCULAR SPACE, THAT ALLOWS A FLITTERING ACOUSTIC SYSTEM

VOLUME
SHAPE
PROGRAMM
MOVEMENT
DENSITY
ARRANGEMENT

MULTIPLICITY OF SPACES, THAT ARE ALLINGNED ON ONE SINGULAR CIRCULATION PATH

CONSTRUCTION
FUNDAMENT
LIGHT
ROOF
WALL
PILAR

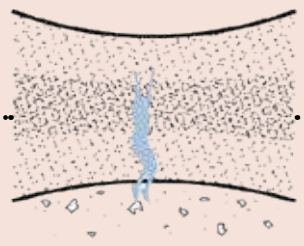


A MONOLITHIC STRUCTURE, TO RESIST ANY KIND OF DYNAMIC MOVEMENT IN THE PROGRAMM

FEEL
TEMPERATURE
SURFACE
SOFT
HARD
AGILE

WASHED OUT CONCRETE SURFACES ACCORDING TO THE SENSORY BODY REGIONS

CRAFT
EMBELLISHMENT
COLOUR
PATTERN
MATERIAL
ENVELOPE



DIVERSE TERRAZZO FLOORING TO PROVIDE A NARRATIVE PATTERN

fig. 20: sensoric design decisions by Ajdin Vukovic

Space and the Neurosciences of the Motions

References: Mind, Location and Motor Activities

It is crucial to accept that our minds can include aspects of our physical and cultural environments. That means that the kinds of environments we create can alter our minds and our capacity for thought, emotion and behavior.

"It is no exaggeration to say that we have learned more about our biological selves in the past half-century than in all of human history, and as a result of these developments the humanities - sociology, philosophy, psychology, and human paleontology in particular - have been forced to restructure their premises and research agendas radically. Yet architects have remained surprisingly incurious or seem little moved by these events."

- Harry Mallgrave [24]

Besides the mere emotional embodiment in the neurosciences, much more seasoned achievements in research delivered knowledge that are going to affect further design choices in this thesis. Just as John Dewey once declared, that life does go on in an environment; not merely in it but because of it, through interaction with it, every moment a living creature is exposed to dangers from its surroundings, it must draw upon something in its surroundings to satisfy its needs. [25] Through the use of *perceptual schema*, which is the ability to recognize the differences between a fruit and a person's face or a piece of furniture and a wall, one perceives his or her surroundings. Clearly, it is not enough to notice one object at a time. To make sense of the environments, one has to be able to recognize many different objects simultaneously and their spacial relationships to each other. Concurrently, *motor schemas* provide the ability to carry out the actions that have been determined through the everlasting cycle of action and perception.

[24] Pallasmaa, Robinson, „Mind in Architecture", p. 3-4

[25] Dewey, „Art as Experience", p. 13

Even though one executes a single action, various motor schemas perform in a rather „coordinated control program", modulating their activity as perceptual schemas. They update their representation of the current state of the actor's interaction with the environment. [26]

Inspired by the research of Marc Jeannerod and Jean Biguer from 1982, fig. 21 shows („preshape") the action of reaching towards an object in order to grasp it. The hand is not only getting in the right place but also preshapes itself in preparation for grasping the object.

The concept of these coordinated control programs is, that the perceptual schema first must recognize the location of a certain object in order to communicate the motor schema for grasping. Yet, another perceptual schema has to scan the size of the object to direct the motor schema for grasping - all four schemas must coordinate simultaneously for a well-managed reach-to-grasp procedure.

For most people it is an easy and intuitive action to perform. But people with a certain damage to the cerebrum are not able to execute this move or other motor-driven procedures seamlessly. [26]

Traumatised people may lose the abilty to coordinate their body according to various demands. In this case, a person would open his or her hand to a maximum and then use the sense of touch to shape their hand to grasp it, as shown in fig. 21 („touch-then-grasp").

A much more common and underestimated motor acitivity that can showcase the consequences of traumatical events is the simple act of walking. Since it does not only deal with a single object, but rather with the location of the body in space, walking implies much more components that are vital for a healthy neuro - system and therefore mind.

[26] Pallasmaa, Robinson, „Mind in Architecture", p. 79-80

BASELINE START

PRESHAPE

BASELINE START TRANSPORT

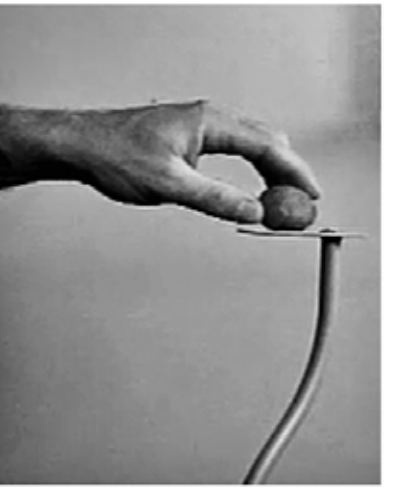
TOUCH - THEN - GRASP

PRESHAPE

GRASP

TOUCH

RELEASE



GRASP

fig. 21: the preshaping sequences by Jenni M. Karl

„Is it not truly extraordinary to realize that ever since [humans] have walked, no one has ever asked why they walk, how they walk, whether they walk, whether they might walk better, what they achieve by walking, whether they might not have the means to regulate, change, or analyze their walk: questions that bear on all the systems of philosophy, psychology, and politics with which the world is preoccupied?"

- Honoré de Balzac [27]

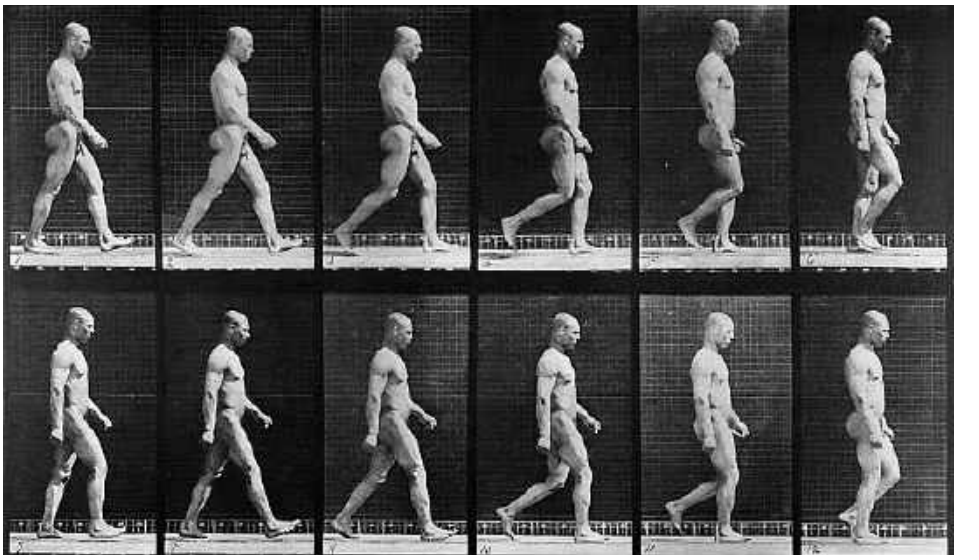
We normally think of buildings as permanent, stable and immobile, but in fact movement is at the very heart of architecture and practice. There is no architecture without walking. We experience architecture at this one-two, left-right rhythm. As soon as we begin to move, the built environment begins to change and transform. A building's contours immediately shift, adjust and recompose into new forms as we approach from a distance. We take walking for granted - and yet the act of walking itself is much more complex than we think.[28] Walking can be described as a dual process that combines muscular actions: the heel hits the ground, transferring weight down to the sole, the heel lifts, followed by the toes, as the lower limbs move and extend forward. The movements of the legs and feet are in turn coordinated with the rotating and flexing movements of the skeleton as a whole. Everyone sways. One thinks he or she is standing still, but actually they are drifting and shifting. Standing still requires constant correction, a series of micro-movements and adjustments. [29]

In photographic studies of the late 1880s, Eadweard Muybridge sought to dissect precisely these kind of micro-movements and adjustments that are made by the animated body, recording them as a series of still photographs which could then be shown sequentially. (fig. 22 and 23)

[27] Balzac, „Théorie de la démarche" in Ingold, „Culture on the Ground: The World Perceived through the Feet"

[28] O'Rourke, „Walking and Mapping: Artists as Cartographers", p. 42

[29] Manning, „Politics of Touch: Sense, Movement, Sovereignty", p. 94



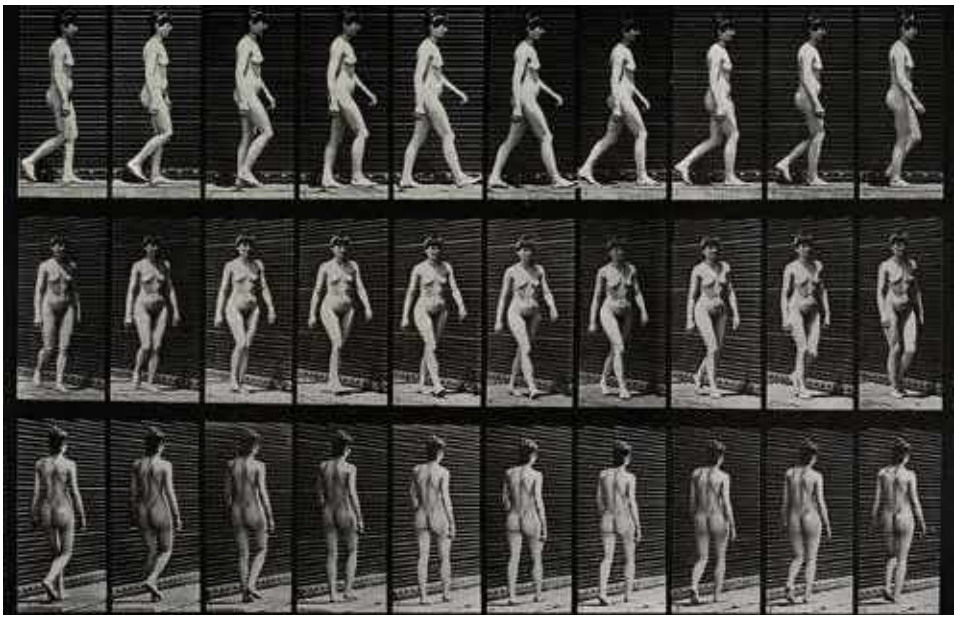


fig. 22: Man, walkng by Eadweard Muybridge

fig. 23: Older Woman, walking in cycle by Eadweard Muybridge

Space and the Neurosciences of the Motions

Interpretation: Navigation and Memory

As earlier stated, trauma can diminish one's capacity to locate himself or herself accurately in time and space.[30] Therefore the mere circulation spaces and paths, precisely designed and placed, can already be therapeutic.

In correlation to the act of walking, a specific region of the brain seems very relevant in this discussion - the *hippocampus* (fig. 24). It does not only play a crucial role for humans in navigation, but also in the production of the memory of episodes. Past events, that appear in our mind as singular stories, are considered as episodes. Perceived from a neuroscientific point of view, traumatic events are as much of an episode as reminiscences of the last nice holiday trip.

This makes the hippocampus very valuable for the insights it can offer into both the *navigation in time* and the *navigation in space*. That is why the neuroscience of the hippocampus and related brain regions become relevant not only in urbanistic building placement, but also to the way buildings can act as depots of human memory, which may be structured with special concern for populations *whose memory is impaired*. [31]

Trying to think of architecture as a neurosystem, an interactive infrastructure might contain something cognitively equivalent to the function of the hippocampus; the approach of a *neuromorphic architecture*. While the human hippocampus serves as a navigation tool, a building's hippocampus would pay close attention to the navigation of its users. [31]

This realisation points out the importance of navigations control systems - such as guideline illustrations or tactile orientation systems, which appear as carvings or other structural patterns in the flooring of both enclosed and free space.

[30] Wong, „Why You Can't Think Your Way Out Of Trauma"

[31] Pallasmaa, Robinson, „Mind in Architecture", p. 82-84

fig. 24: location of the hippocampus by Ajdin Vukovic based on Plasmaa's and Robinson's data

Space and the Neurosciences of the Motions

Design Response: Spacial Features as Tools for Memory Stimulation

Dr. Bessel van der Kolk noticed in his function as recreation leader, a person responsible for overseeing sports and other extra-curricular activities within the programm of trauma treatment, that groups of patients were strikingly clumsy and physically uncoordinated; When going for a camping trip, the majority of the people stood helplessly by as van der Kolk pitched the tents with his colleagues. He almost capsized in a squall on a river because the patients huddled rigidly in the lee, unable to grasp that they needed to shift position to balance the boat. In volleyball games, the medical staff was much better coordinated than the patients. Even during most relaxed conversations, people seemed stilted by lacking the natural flow of gestures and facial expressions that are typical among friends. [32]

In order to understand the variety of such challenging, environmental conditions to the body, a series of different spacial morphologies were tested. Inspired by Eadweard Muybridge's series of still photographs, the tool of research was body movement observation by photography. Through appropiation via dance (by a professional dancer), the documented sequences of of photographed content showcased how the human body would interact with radically different situations in a „best case" scenario. (fig. 25) The chosen places vary in dimension, surface material, relation to the public space and proportion, initiating different *postures* of the body and demonstrating which environmental morphology demands which *intuition of navigation* through it.

With time, three testing areas gained increased attention during the study (as marked in fig. 25). Evoking new design realisations of spaces that challenge the body, they deserve a closer look to their features.

[32] Van der Kolk, „The Body Keeps The Score", p. 26

Observing space appropriation through movement via documenting dance.

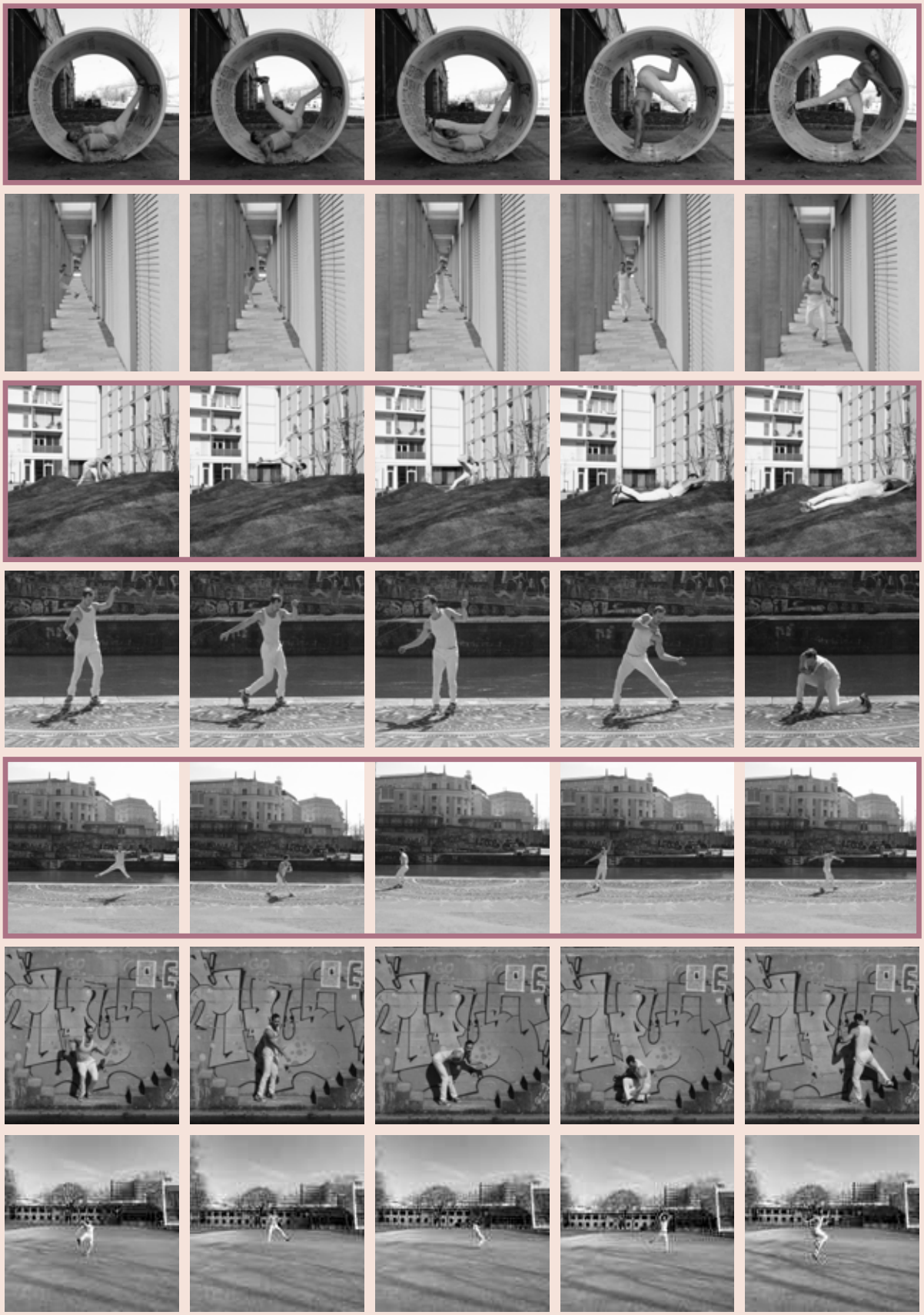


fig. 25: space appropiation through navigation by Ajdin Vukovic

Once the traces of traumatic memory (the original sounds, images and sensations) are reactivated, the frontal lobe shuts down, including the region necessary to put feelings into words, the region that creates our sense of location in time and the thalamus, which integrates the raw data of incoming sensations. From here on, the emotional brain (the limbic area and the brain stem) remains in charge. This part of the brain is not able to consciously control the body and communicate in clear words. The emotional brain expresses its altered activation through changes in emotional arousal, body physiology and muscular action. Such high arousals do not only change the balance between those rational and emotional memory systems, but also disconnect other brain areas, necessary for the proper storage and integration of incoming information - the hippocampus. [33]

In order to stimulate the user's ability to locate in space again, the three specific scenarios (fig. 26) depict radically different spacial approaches that trigger the body's capacity to locate or navigate itself.

The first row of the photographic series in fig. 26 shows a minimum space; through the tight measurements it allows the user to span his or her body from wall to wall. A homogenous pressure to the joints centers the body's relation to itself and helps the user to locate.

The second row in fig. 26 reveals another dimension to neuromorphic space - the inclined user surface - which, through precise application of researched steepnesses could provoke the body's balance and inner stabilisation. This topic will be explored in depth in the following chapter.

The last row in fig. 26 proofs, that mere patterning in the flooring intuitivley serves as a guidline for navigating through space.

[33] Van der Kolk, „The Body Keeps The Score", p. 176

Focusing on tiny rooms, inclined surfaces, and vast navigation patterns.

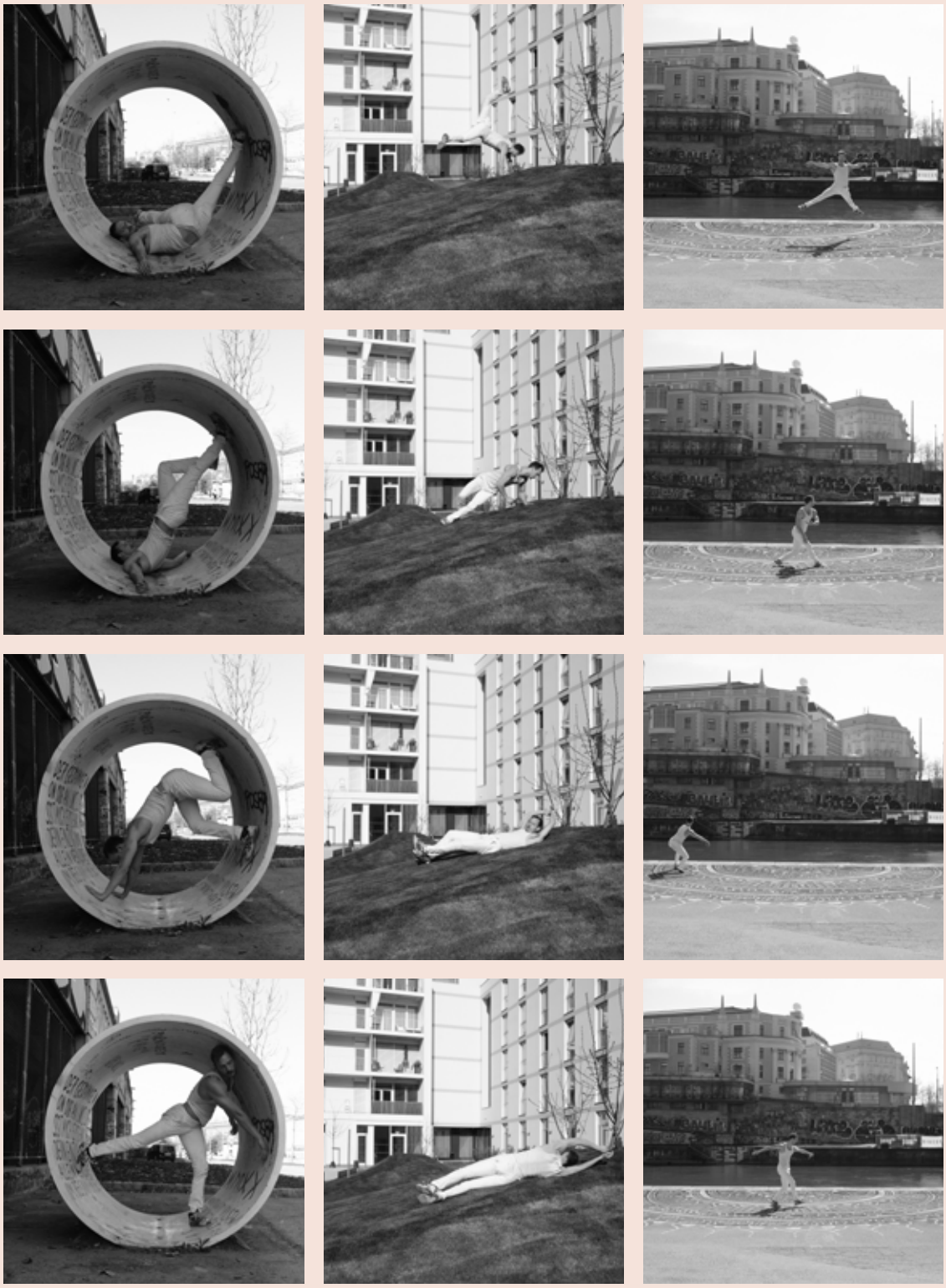


fig. 26: space appropriation: three specific scenarios by Ajdin Vukovic

Inspired by the study of the Kroppsrom project by Atelier Oslo, a sequence of experiences that allows the free movement of the user, depicts the needed space for mere human movement. (fig 27) It shows minimum path width of 55 cm is essential for proper naviagtion. [34]

Floor guidline patterning, serving as a navigation control system on vaster space sizes, could have an informal therapeutic effect on the users.
If applied on a public free space, such knowingly placed pathways can play a tremendous role in public mental health.
A vital aspect in this concept is, that the user has to concentrate on the mere act of walking. This can be achieved by instruction of the other people, but if such a system has to work on a public and informal level, it has to demand the focus on the walking by *spacial instruction*.
Therefore, the considered spaces have to correspond stongly with the context and have to show a coherent big pattern, in order to evoke curiosity and a sense of an expedition through space for the user.
As shown in fig. 28, the circular and echoing carvings in the floor are a dominant design feature in the space and animate the user to discover the bigger pattern on the whole site. The shapes do not only react to newly designed positions in the room, but also accentuate existing structures, e.g. an existing tree on the site.

[34] Architzer, „Kroppsrom (Corporeal Room)“

Animating navigation through public floor patterns.

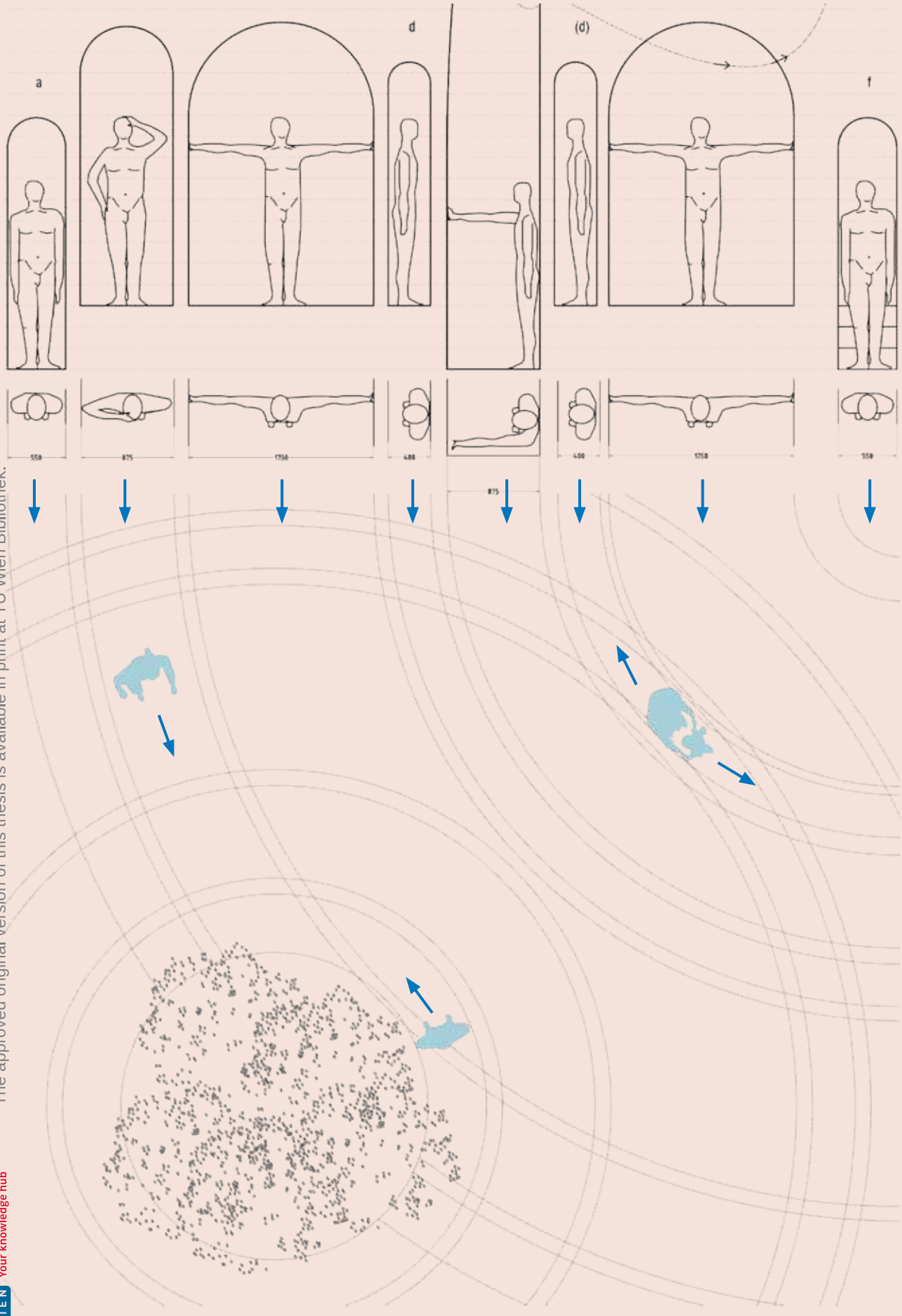


fig. 27: Kroppsrom (Corporeal Room) - body experiences study by Atelier Oslo

fig. 28: pathways for navigation - a public floor pattern by Ajdin Vukovic

Morphologies that challenge the Body

References: the Function of the Oblique

Referring to the photographic series study from the previous chapter, one distinct realization indicated a new dimension of spacial features; the appropriation of the inclined surface. That topic was already thoroughly examined by the „Architecture Principe Group" formed by Claude Parent and Paul Virilio in 1963. This association of architects investigated in new kinds of architectural and urban orders. While rejecting the two fundamental directions of *Euclidean space*, they declared an end to the vertical axis of elevation and the horizontal permanent plane space of inhabitation. In *the Function of the Oblique*, they saw a potential of multiplying usable space and therefore a benefit to programmatic order in architecture.(fig. 29). [35]

The principe was strongly inspired by a *Gestalt* psychology of from advertising continuous movement through space and *forcing the body to the constant challenge of instability*. By exeggerating the tilting of floors, this sense of disequilibrium in space translated „ordinary places" into architectures, where expe-rimentation replaced contemplation - spaces, that were experienced by movement and through the quality of that movement. In this way, the user is not only brought to a constant awareness of gravity,[35] but also to a centered concentration towards his or her own capabilty of the body. The desired conclusion of this way of design thinking was a tactile relationship with the building - a quality of space, that was perceived in a sensitive and sensual manner, freeing users from conventional navigation.

Paul Virilio himself understood his manifesto as a logical third step of architectural structuralisation; after the *horizontal order* of the rural habitat in the agricultural era being the first step and the second step of *vertical order* of the urban habitat and industrial era.[36]

[35] Parent, Virilio, Johnston (ed.), „The function of the oblique", p. 5-9

[36] Parent, Virilio, Johnston (ed.), „The function of the oblique", p. 11-13

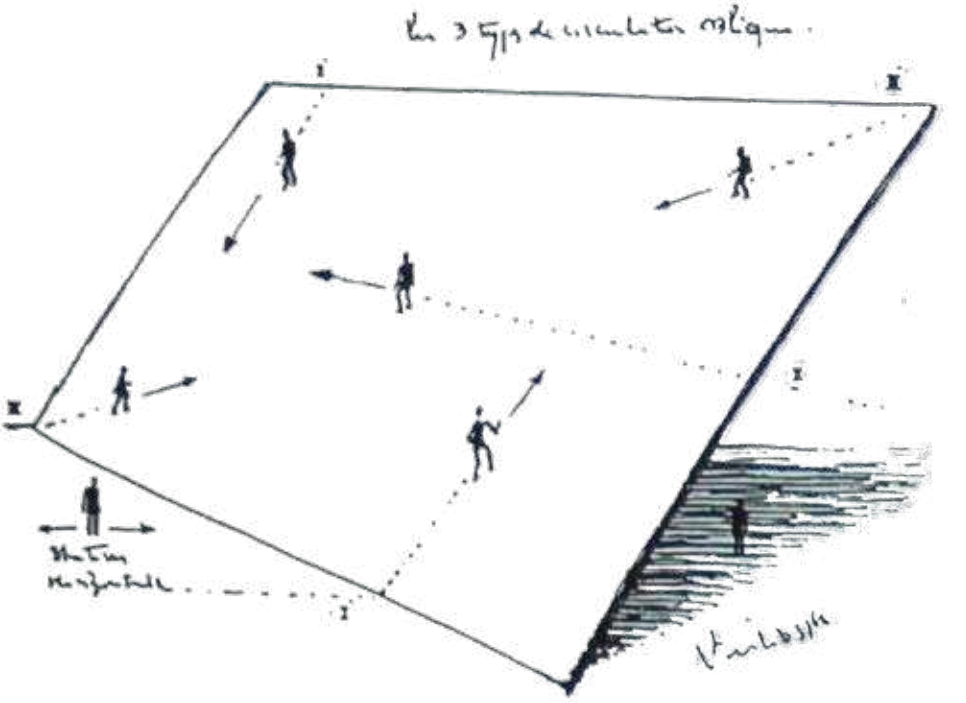


fig. 29: the function of the oblique circulation by Paul Virilio

The oblique order would have therefore represented an agenda for the post-industrial era. Instead of using walls as partitions, which provoke an opposition between *front* and *behind*, a combination of oblique and horizontal planes would merely result in an *above* and *below*. The central objective was to challenge outright the anthropometric precepts of the classical era - the idea of the body as an essentially static entity with an essentially static proprioception - in order to bring the human habitat into a dynamic age of the body in movement. [36]

In order to promote their manifesto of „the function of the oblique", Parent and Virilio published nine issues of the Architecture Principe from 1966-1969. Alongside many relevant positions towards architecture, one term will crucially influence design responses in this thesis: *Potentialism*. [37]

„In order to open up communication, to engage people and ultimately to win them over, it is necessary to draw them into an environment, to make them feel, deep down, that they are becoming part of a universal architecture. ‚Potentialism' entails the use of specifically architectural methods to bring out this state of mind, which is characterised initially by receptiveness, then by participation, and ultimately by a sense of belonging. The first step therefore is simply to promote awareness. The only means of doing so is to elicit such intense ‚displeasure' that people are forced into a state of refusal - of Repulsion.

The second step is to supply the means of overcoming this initial response, that is to say, of moving beyond refusal. The newly freed potential of architecture, Potentialism, activates an unconscious mechanism that absorbs people, integrates them into a movement which is of an architectural character."

- Claude Parent [37]

[36] Parent, Virilio, Johnston (ed.), „The function of the oblique", p. 67

[37] Parent, „Potentialism."

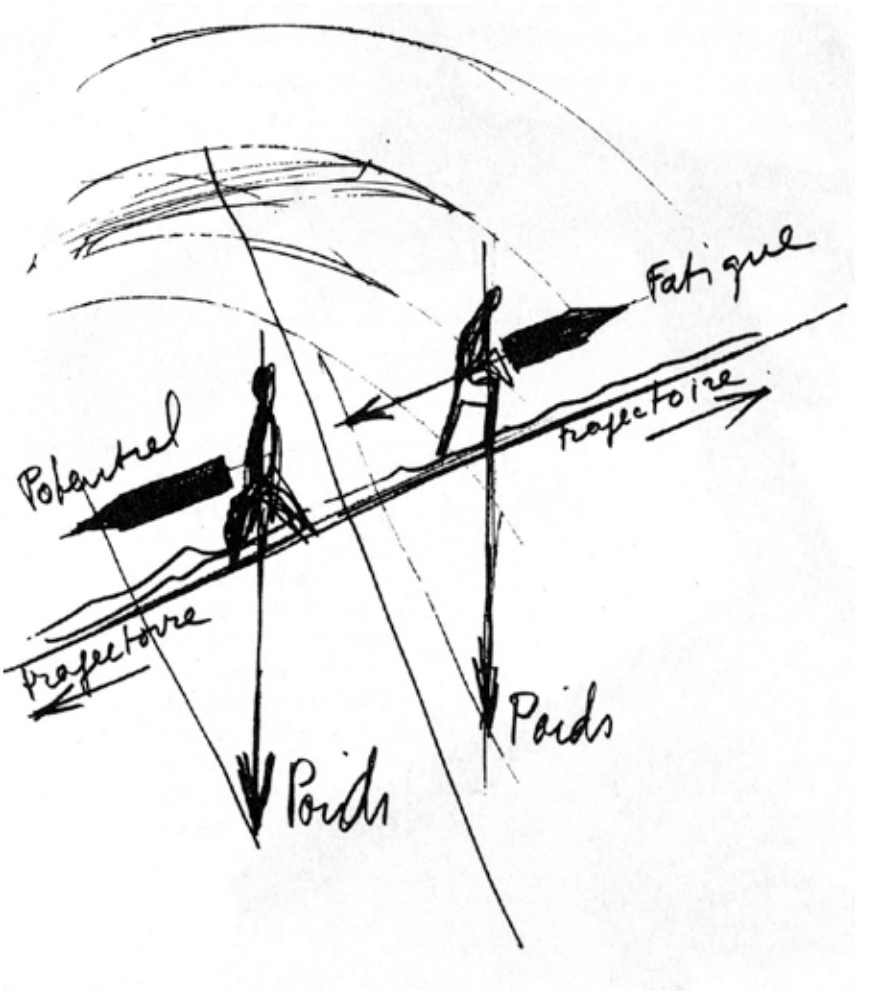


fig. 30: Explanatory diagram of Potentialism by Claude Parent in Architecture Principe

Morphologies that challenge the Body

Interpretation: inclined Elements of Architecture

Parent's two steps, provoking repulsion followed by evoking potentialism, should lead the user into a state of unconscious, non-prejudicing, not culturally influenced and unsceptical rediscovery of autonomous behaviour [in space]. Once thus liberated, he believed that users of such architectures will be able to develop unconventional means of communication and therefore consciously participate in architecture; An evidence of the unity of man and architecture. [37]

The provocative positions of Parent and Virilio, strongly relate to Louse Lynn Hay's thoughts on strong bodies, that create strong minds an vice versa. [38]
As much as Erin Manning stated that walking asks for constant correction and depicts a series of micro-movements and adjustments [39], inclining that particular navigation surface obviously is an even bigger challenge to the user's body. Linking back to Nummenmaa's bodily topographies of the distribution of emotions to specifically mapped regions of the body[40], walking on inclined surfaces stimulates certain muscle groups, which in turn are connected to the emotional epicenters located there.
When walking on a flat terrain, the body is perpendicular to the surface. But through walking on an inclined terrain, the abdomen must contract to keep the body upright to avoid arching the back so that the body is not perpendicular to the inclined surface. The movement of walking is constantly utilizing many muscle groups (or body parts). Though the quadrizeps, the hamstrings, the glutes and the lower leg muscels (as shown in fig. 31) are constantly active during walking, other body parts get more involved once the inclined percentage of the surface increases. [41]

[37] Parent, „Potentialism."

[38] Hay, „Mapping Stored Emotions in the Body as a Means of Healing Physical Pain"

[39] Manning, „Politics of Touch: Sense, Movement, Sovereignty", p. 94

[40] Nummenmaa, Glerean, Hari and Hietanen, „Bodily Maps of Emotions"

[41] Weir, „What Muscles Get Worked When Walking on an Incline?"

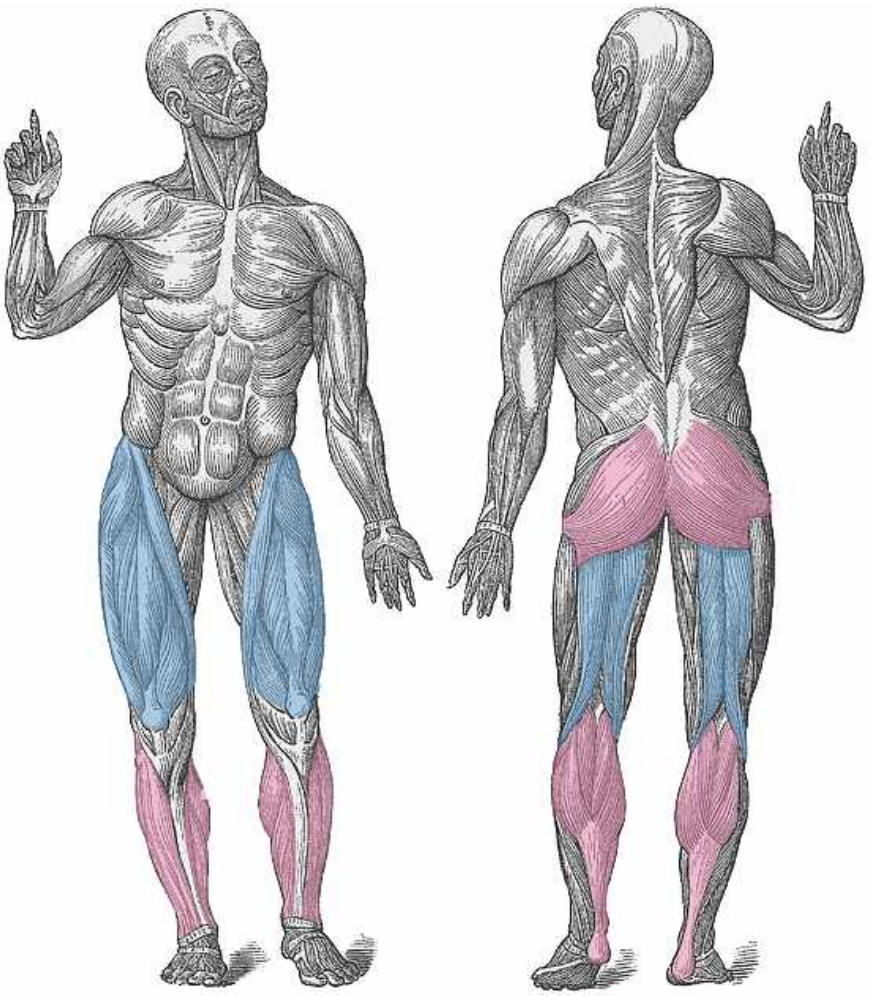


fig. 31: activated body parts while walking by Ajdin Vukovic based on Weir's data

In his diagram (fig. 32), Parent tried to illustrate the „adhesion limit" of inclined surfaces. He specifically did not raise the question „Can we live or walk there?", but only talked about adhesion. Even if Parent claimed that the maximum adhesion of the human physique is still duable on a terrain with a fifty percent inclination, he later realised, through work experience and feedback of clients, that he made a mistake. He was critisized by people who noticed the disequilibrium, saying that they were not able to walk. [42]

And yet, only steepnesses up to fifty percent require the physical strengh and stimulation of the complete body. Besides the constant encroachment of the upper and lower leg muscles and nerves, the abdominal fibres take an additional function of posture stabilisation, once the used surface is slightly inclined. As the incline increases, the back muscles and sinews are trying to keep the torso upright, in order to sustain a healthy shape for the spine. Steadily steeper terrains ask not only for muscular body stabilisation, but also demand a balancing through movement of other body parts: especially natural arm-swinging motions that accompany the walking movement evoke a vitalization of the chest, arm and upper back regions. Finally tha maximum inclination of approximatley fifty percent, according to Parent [42], feature a crawling-like motion, that sets the neck musculature under pressure. Those muscles and nerves flow seamlessly into the surface of the scalp and stimulate the blood circulation in the whole head area. [43] Those interesting realtionships between inclined space and body structure, shown in fig. 33, do not only apply to the architectural element of the ramp, but also are depicted in a more sequenced motion in various steepnesses of stairs.

[42] Koolhaas, Petermann, Trüby, di Robilant, „Elements of Architecture", p. 1560 -1564

[43] Weir, „What Muscles Get Worked When Walking on an Incline?"

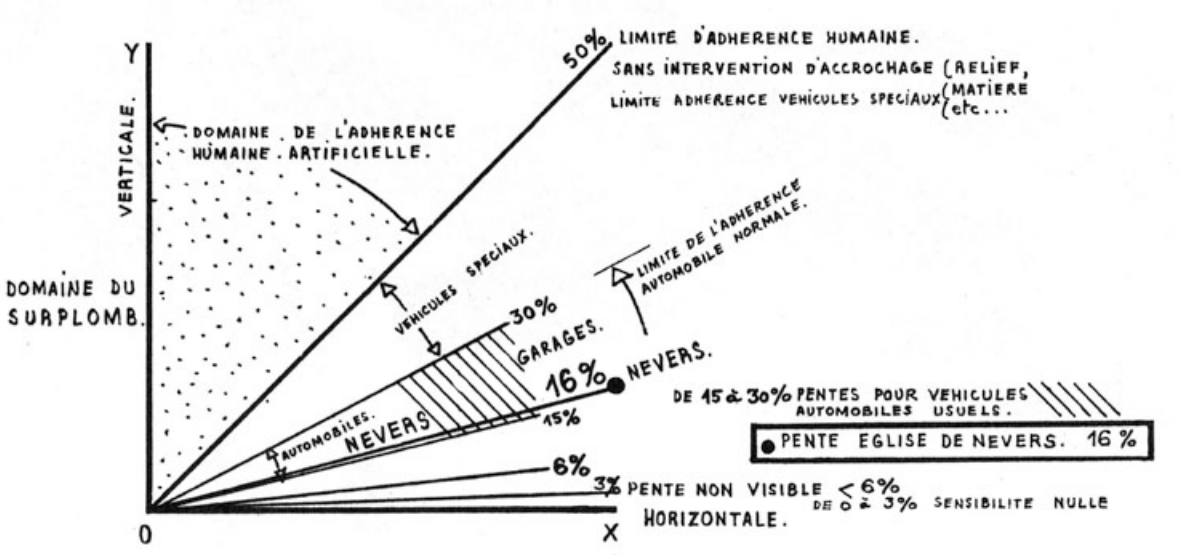
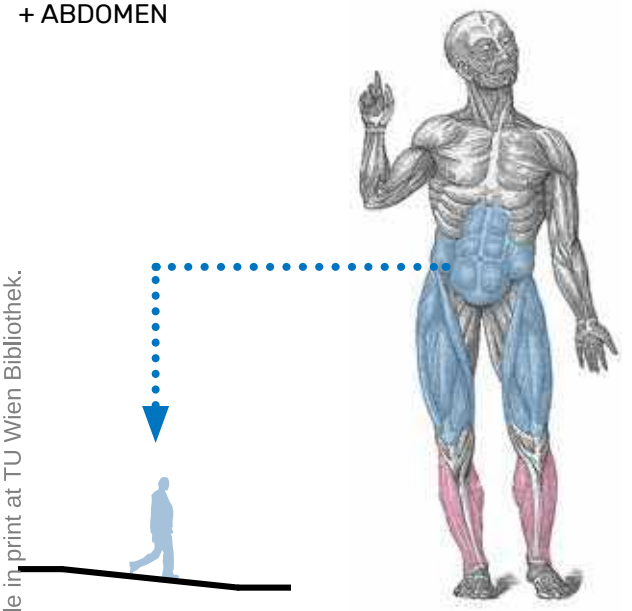


fig. 32: adherence diagram by Claude Parent

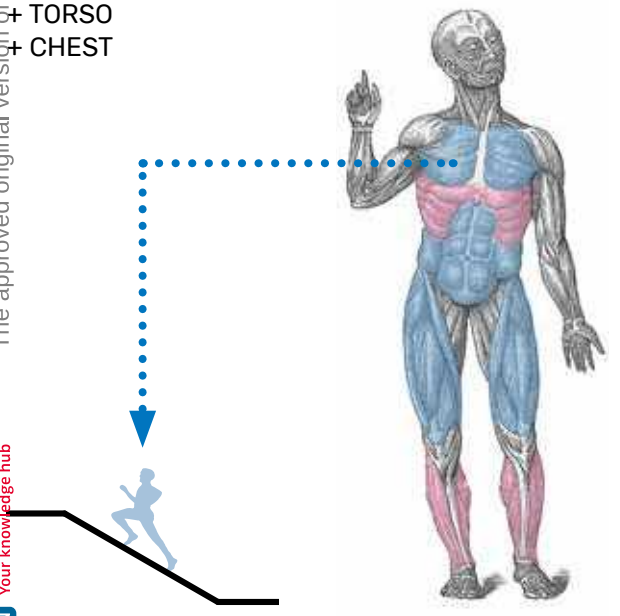
LEGS
+ ABDOMEN



2-6%

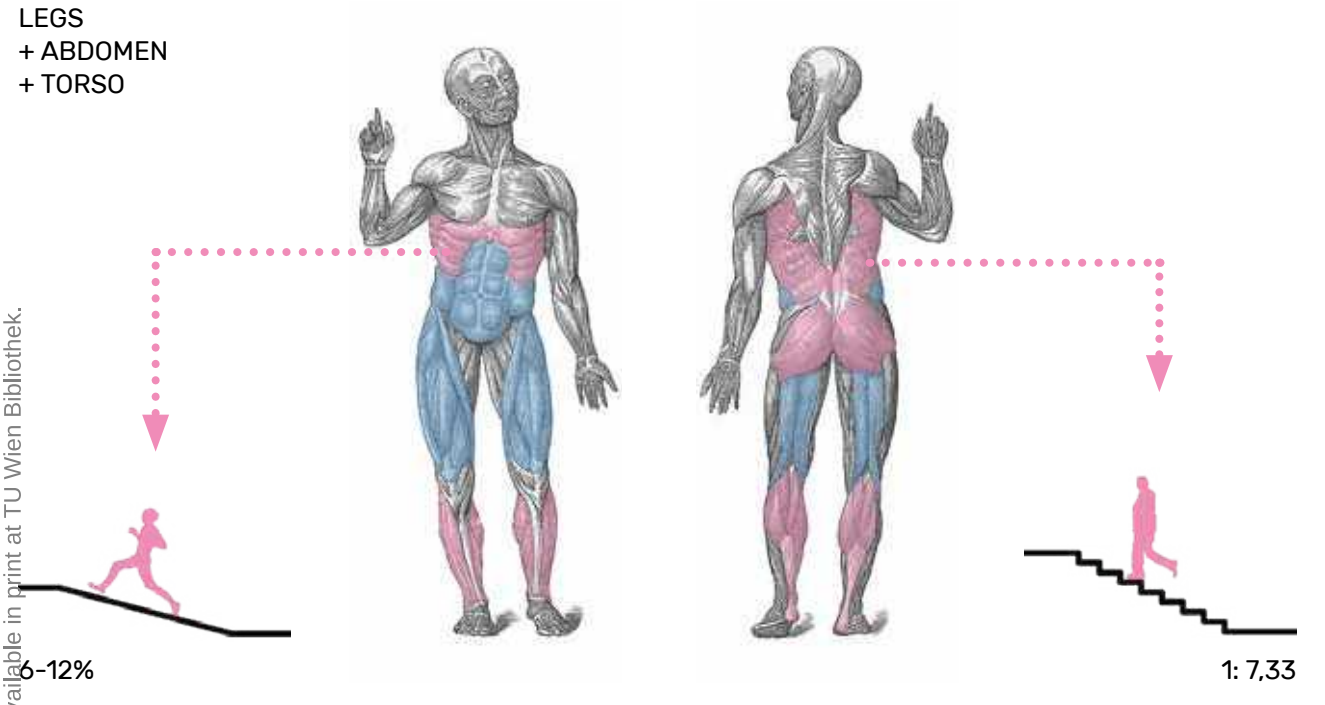
1: 15,66

LEGS
+ ABDOMEN
+ TORSO
+ CHEST



2-30%

1: 2,33



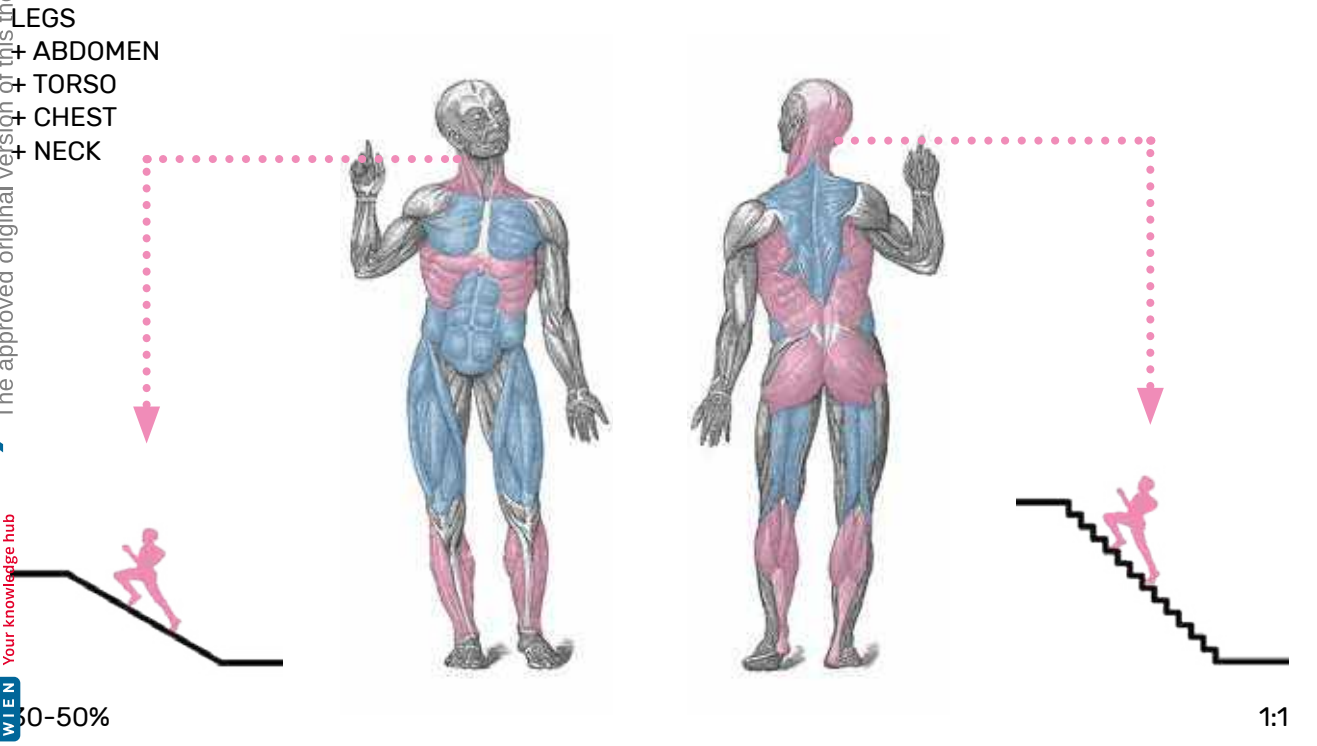


fig. 33: activated body parts while walking on inclined spaces by Ajdin Vukovic based in Weir's data

All these steepness percentages can be easyly translated into staircase proportions. Therefore a more plain steepness of two to six percent equals a maximum stair proportion 1:15,66, an inclined surface of twelve percent converts into a proportion of at most 1:7,33 and so on.

The advantage that stairs have over ramps is that the slope can basically change without an additional landing. An increasing or decreasing proportion of the stairs results in an exponential development of the staircase silhouette. The artist Laurin was frustrated by the ususal functionality of stairs; they started abruptly, one climbed up, and at the top, they stopped abrubtly. He wanted a softer transition into the inclination and back again onto the horizontal level. Scalalogist Friedrich Mielke designed together with the artist a staircaise with constantly changing proportions, called the „Laurin stair." [44] (fig. 34)

Friedrich Mielke also clarified in his Venice statement that the measurements and idiosyncracies of a strair illustrate conclusions relating to the manufacturer, the user and all other circumstances surrounding its creation. [45]

[44] Koolhaas, Petermann, Trüby, di Robilant, „Elements of Architecture", p. 1261 -1265

[44] Koolhaas, Petermann, Trüby, di Robilant, „Elements of Architecture", p. 1242

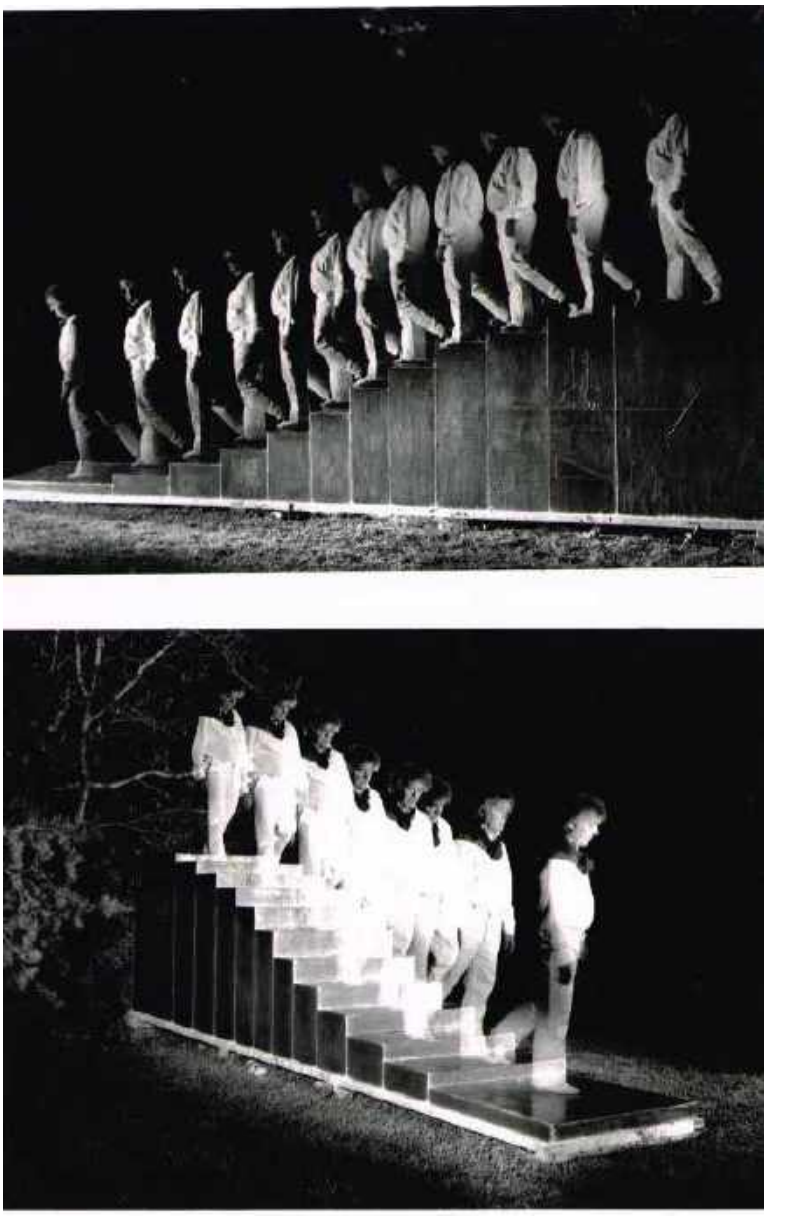


fig. 34: Laurin stair by Friedrich Mielke and Laurin

Morphologies that challenge the Body

Design Response: Ways towards a Neuromorphic Architecture

Analogous to the correlations between used surface steepness and bodily responses, a staircase of such dynamic proportional change serves as an ideal tool for informal trauma transformation; one singular architectural element arousing responses of the whole body, stimulating all the distributed emotional synapses and ultimately leading the mind to a contemplative action or thought. If designed precisely, such elements can be the future of trauma informed architecture.

In this sense, one has to take a closer look on such agendas of ramps and stairs, in order to understand their spacial presence and programmatic benefit. Eleven prototype models (fig. 35) showcase the transformed knowledge of their affects to a body-mind integrated experience. They are investigate on three categories:

a *linear, inclined surface* (four models on the left),
a *linear, stepped terrain* (four models in the middle),
and an *exponentially transformed topography* (three models on the right).

All of them work within the same program; body stimulization through provoked use by architectural shape. Through sheer physical presence, some of the prototypes showed greater spacial promise than others, which is why these specfic pieces needed further investigation.

Exploring inclined surfaces on a more detailed scale.

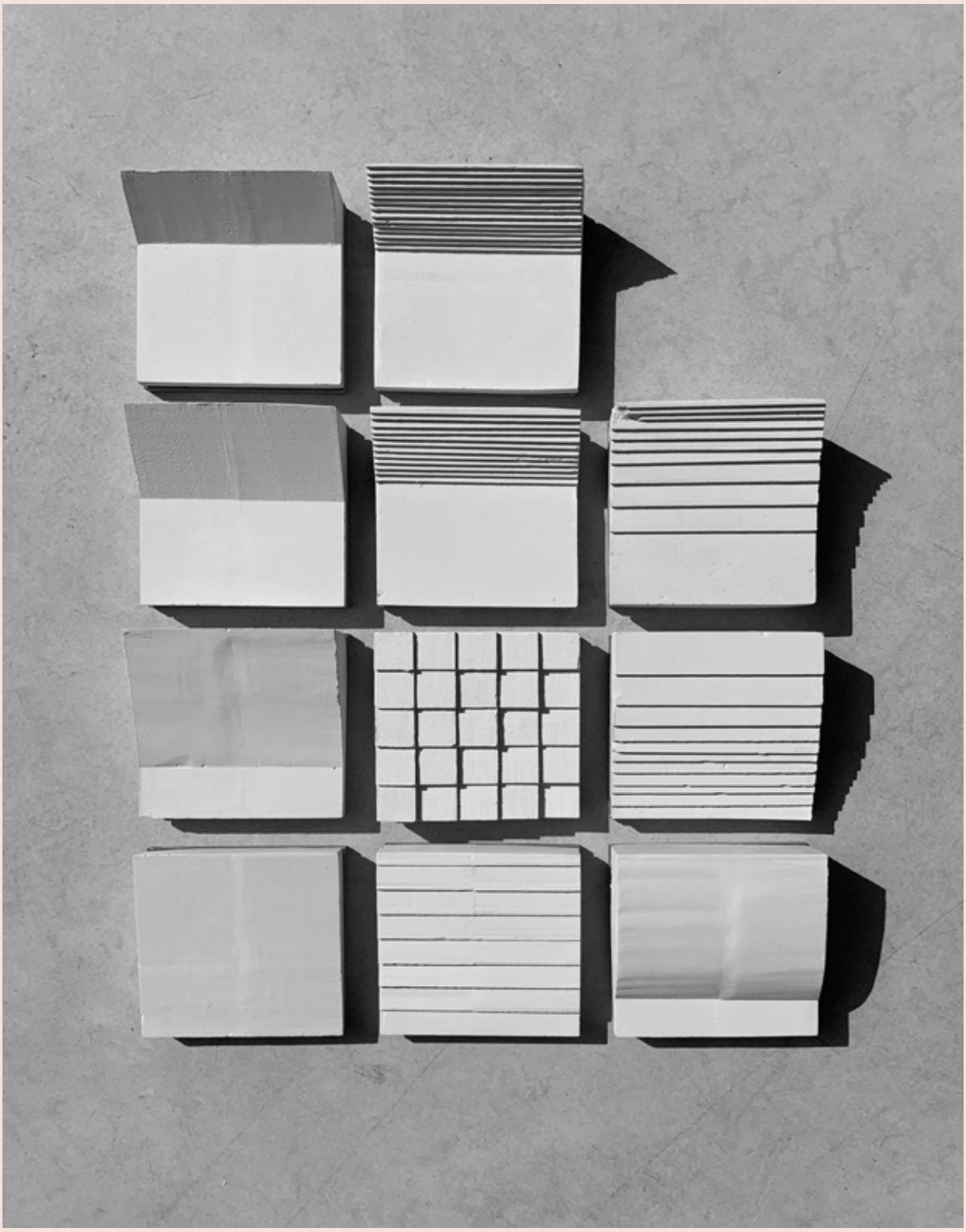


fig. 35: Prototype Models of Steepnesses by Ajdin Vukovic

Following Michael Arbib's conceptualization of neuro-morphic architecture [45], the four prototypes in fig. 36 represent crucial narratives that have been elaborated thus far. Thinking of them more as forms of "perceptual robots" than a static piece of equipment, may help one design environments that can dynamically respond to the needs of their users.[45]

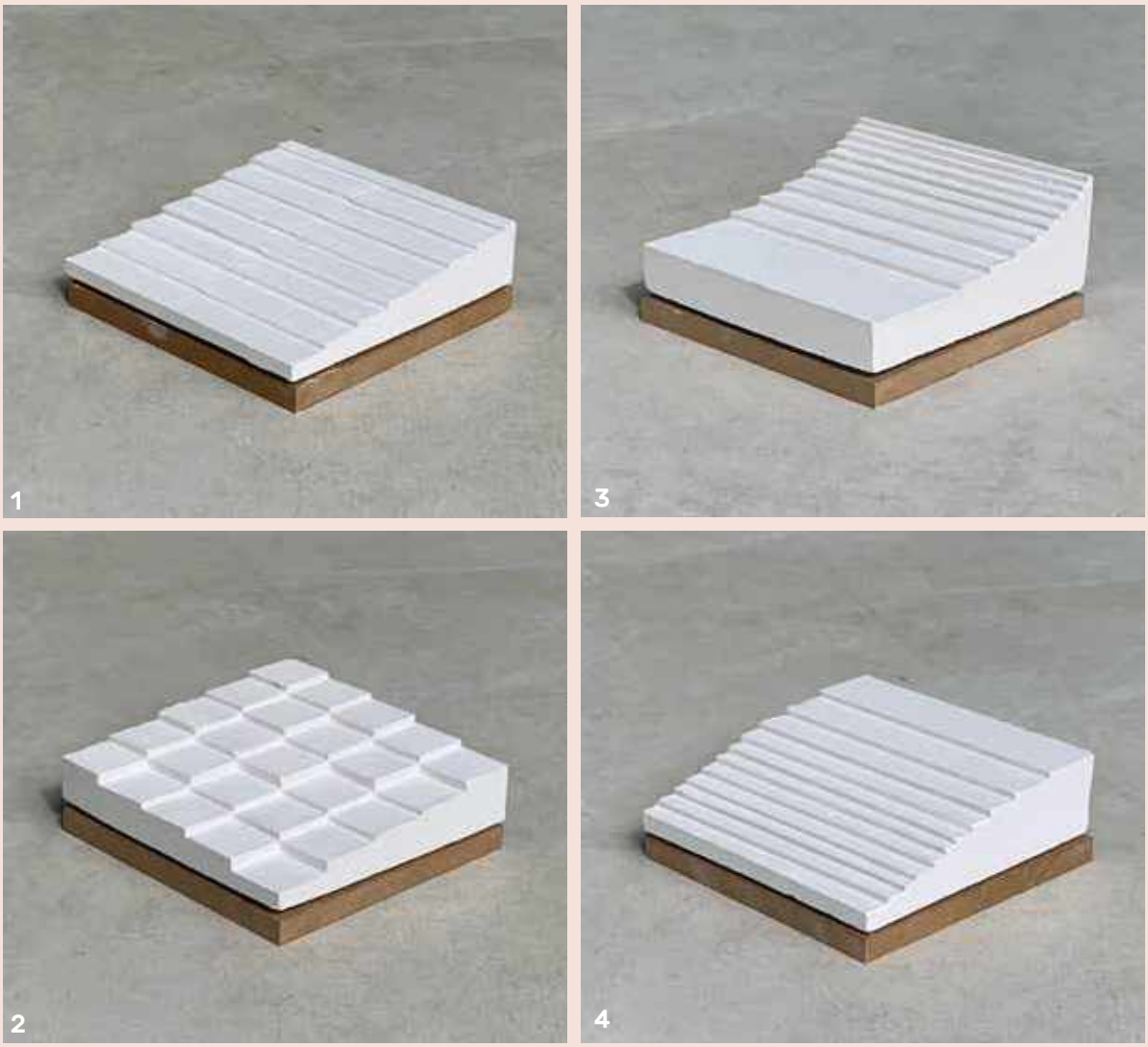
Strategically integrated, a flat stepped surface, as seen in prototype number one (fig. 36), may appear as a scattered viewing platform. Prototype number two could be integrated in a vast public space, allowing the users to communicate with each other. Whereas prototypes number three and four have the potential to surprise the user with an increasing growth of demands to the body.

If aligned on a curviliniear silhouette, all of these types of morphologies could not be perceived as a whole entity at once, which allows the space to be a dynamic narrator to the users physical or mental needs, as illustrated in fig. 37.

These approaches represent a system, dedicated to coupling sensory and motor abilities, and a degree of autonomy in its ability to respond to a person, or persons, in its environment. [45]

[45] Pallasmaa, Robinson, „Mind in Architecture", p. 82-84

Prioritizing exponential increase of steepness.



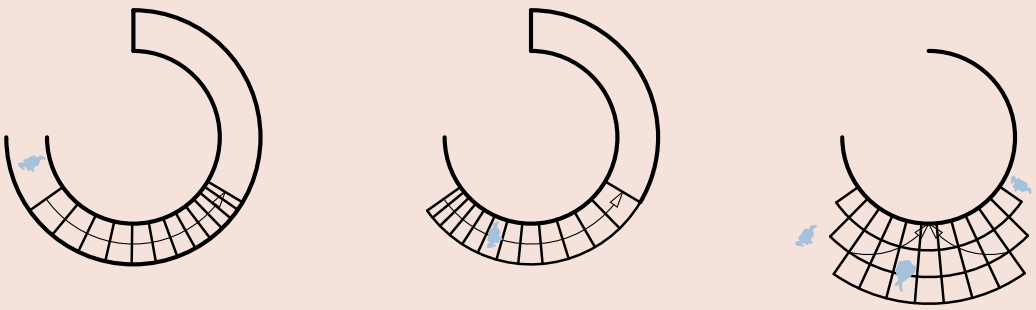


fig. 36: selected Prototypes towards a Neuromorphic Architecture by Ajdin Vukovic

fig. 37: application on a curvelinear silhouette by Ajdin Vukovic

Trauma Therapy Innovations and their Impact on Architecture

References: Reclining on the Couch versus embodied Therapy

A good example of the idea of such a „perceptual robot", being able to dynamically respond to the needs of their users, is in Michael Arbib's eyes the bed e.g. the couch; while trying to get up from the couch, it would recognize the user's intention and assist him or her in the act of motion. Despite its lack of humanoid form, the couch as well is a dedicated system with coupled sensory and motor abilities, and a degree of autonomy in its ability to respond to a person in its environment. But the furniture possesses a limited form of empathy in meeting the needs of its human users.[46] Famously, that particular piece of furniture became an influencial object in psychoanalysis and mental health care in general.

„The analyst sits in a chair out of sight while the patient lies on a couch facing away. It has been this way since Sigmund Freud, although, this practice is grounded more in the cultural history of reclining posture than in empirical research." (Kravis, Nathan[47])

Freud memorably explained, that the motive for using the couch was not the ability to endure being stared at by the therapist for multiple hours daily, but also finding also that the transference was best brought forward through this technique. Jung, however, rejected the idea of putting the patient upon a sofa and sitting behind, stating that he wants to see his patients in front of him and talk to them as one natural human being to another, exposing himself completely to reacting with no restriction. [48]

Since the eighteenth century, innovations around domestic space and furniture gave rise to the sofa or couch as furnishings to be distinguished from the bed. In the paintings from this period, the attention is drawn to the recurring figure of the reclining woman reader, highlighting the transgressive and erotic character of recumbent posture importantly tied to its psychoanalytic uses in later decades (fig. 38). [49]

[46] Pallasmaa, Robinson, „Mind in Architecture", p. 84-85

[47] Kravis, „On the Couch: A Repressed History of the Analytic Couch from Plato to Freud", p. 133-134

[48] Kravis, „On the Couch: A Repressed History of the Analytic Couch from Plato to Freud", p. 139

[49] Halton-Hernandez, „Nathan Kravis, On the Couch: A Repressed History of the Analytic Couch from Plato to Freud"

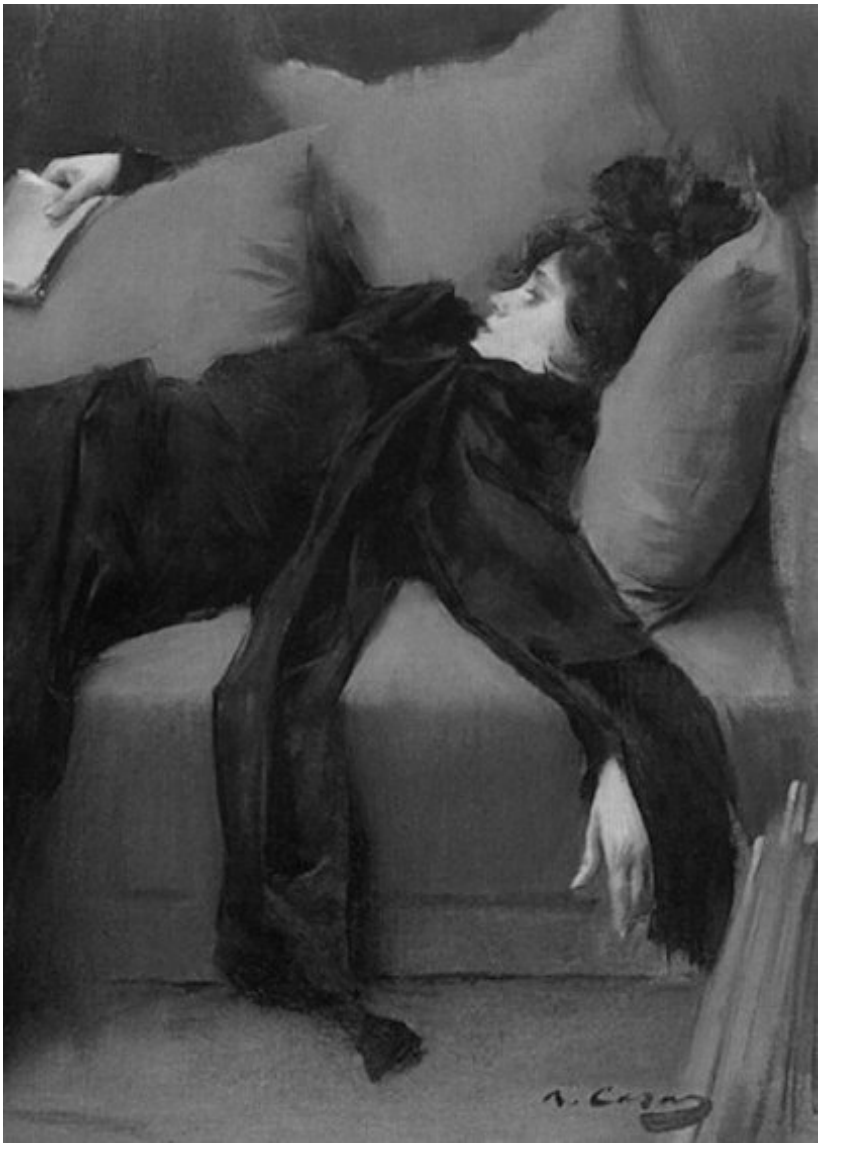


fig. 38: Young Decadent by Ramon Casas

Freud's couch also developed out of what Kravis calls the „medicalization of comfort"[50], the chaises longues and lounging positions used in the medical treatments, psychiatry and therapeutics of the period. Despite the couch's enduring role as the most powerful symbol of psychoanalysis in popular culture, it was through the influence of child analysis by Melanie Klein and other practitioners that the couch and recumbent speech's significance as a site for the exploration of the unconscious lost some of its centrality.[51] Ulimately, novel treatment methods erased the necessity of the couch in the treatment space.

Grounded in Freud's psychoanalysis, his longtime student Wilhelm Reich channeled his interest in the interplay between body and mind into the establishment of a set of body-oriented psychotherapeutic concepts and physiotherapeutic techniques. Noticing that certain life experiences manifested themselves in characteristic ways, Reich concluded that people adopted those experiences as „character armors". Referring to these physical and emotional manifestations, he developed a range of techniques that addressed both the body and the mind for the purpose of treatment. He termed this work character analysis, which laid the foundation for the practice of "vegetotherapy," now typically referred to as *body psychotherapy*, an approach to treatment, that is a versatile therapy that can be utilized in both individual and group therapy approaches. [52]

Building on Peter Levine's research of somatic experienceing [53] and influenced by family systems therapy, existential-phenomenology, and the ancestor reverence of the South African Zulus, Bert Hellinger established from the 1990s on the family constellation therapy, which later on would transform to

[50] Kravis, „On the Couch: A Repressed History of the Analytic Couch from Plato to Freud", p. 85

[51] Halton-Hernandez, „Nathan Kravis, On the Couch: A Repressed History of the Analytic Couch from Plato to Freud"

[52] GoodTherapy, „Body Psychotherapy"

[53] Wong, „Why You Can't Think Your Way Out Of Trauma"

the formally known *systemic constellation therapy*. Al-though it is rooted in the psychotherapeutic tradition, the method is distinguished from conventional psychotherapy in that the client hardly speaks and its primary aim is to identify and release pre-reflective, trans-generational patterns embedded within the family system, not to explore or process embodied, cognitive, or emotional content. [54]

However, over time the principles of family constellation stayed the same, but its implementation resulted in a more narrative, strongly cognitive and deeply emotional content. The so-called „Systematic Coaching" transformed into a performative way of group therapy and has helped lots of clients so far to deal with unspoken traumatic issues. Through directed movement and guided emotional expression by the Systematic Coach, the Representatives generate a possible solution array of the group in front of the eyes of the patient and offer therefore a introduction for the next important step to handle with in the Clients life. [54]

Furthermore, latest research has proven that *dance movement therapy* is an effective intervention in the treatment of adults with depression. It is understood as the psychotherapeutic use of movement to promote emotional, social, cognitive, and physical integration of the individual, for the purpose of improving health and well-being. [55] It emerged in the 1940s as innovators, most of them were dancers, began to realize the benefit of using dance and movement as a form of psychotherapy. It is a holistic approach to healing, based on the empirically supported statement that mind, body, and spirit are inseparable and interconnected. Dance movement therapy as an embodied, movement-based approach is often difficult to describe, as it is necessary to actively engage in the process to get a true sense of what it is. [56]

[54] Booth Cohen, „Family Constellations"

[55] Karkou, Aithal, Zubala, Meekums, „Effectiveness of Dance Movement Therapy in the Treatment of Adults With Depression: A Systematic Review With Meta-Analyses"

[56] American Dance Therapy Assiciation, „What is Dance/Movement Therapy?"

Observing these innovative approaches to psychotherapy, concluding that the couch as a main spacial feature in the treatment procedure vanished [57], one can easily see that the focus now shifts to the space itself. Suddenly, the disappearance of the rite of reclining got replaced by the mere opposite - big gestures, high jumps, agile movement. Such radical changes in treatment methodology influence not only the typological aspects of the healing space, but also leave a big imprint on their volumetric presence in the urban landscape.

The exercise of *body psychotherapy* and *constellation therapy*, practiced at least in small groups, may fit into the well known agenda of repurposed apartments, serving as therapy ordinations. At the latest, when practicing *dance movement therapy*, it becomes clear that the intuitive integration into an existing residential or office building is not an easy task to accomplish. Ususally performed in big groups, dance movement therapy sets the same design criteria to the room as common dance rehearsal spaces do;

Analogous to the space program of the *Tanzhaus Zürich* by Estudio Barozzi Veiga (fig. 39-40), the main rehearsal hall has a size of 21 x 13 m, which adds up to a size of approximatley 275 m^2. Considering that the dance hall is designed for 25 to 30 rehearsers [58], a similiar size would be needed for a dance movement therapy space. Beside a properly sized entrance area and shower rooms, according to local building restrictions every therapy unit should offer spces for personal retreat and reflection. (fig. 41)

[57] Halton-Hernandez, „Nathan Kravis, On the Couch: A Repressed History of the Analytic Couch from Plato to Freud"

[58] Astbury, „Barozzi Veiga creates trapezoidal riverside arcade for Zürich dance centre"

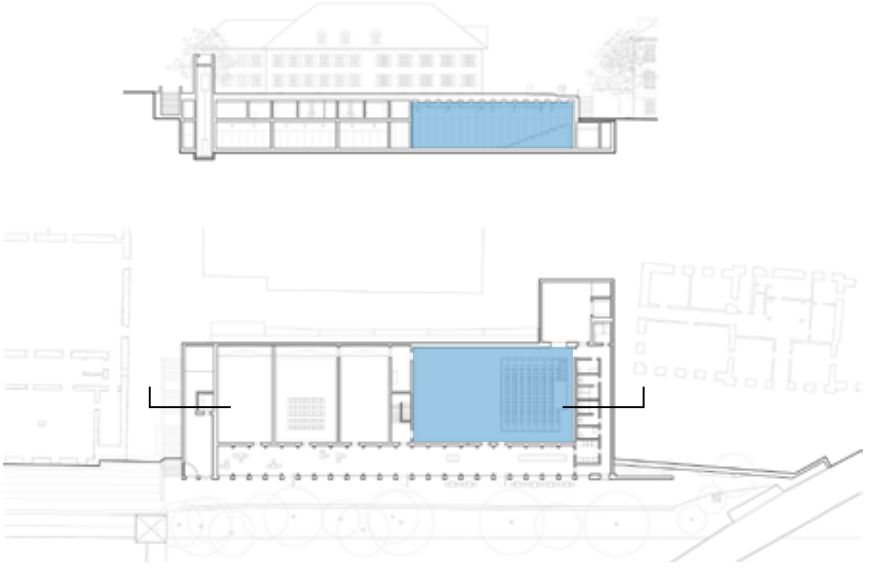


fig. 39: Tanzhaus Zürich by Estudio Barozzi Veiga

fig. 40: general access level and longitudal section of Tanzhaus Zürich, 1:1000

Whereas constellation therapy sessions in the best case consist of a group of at least five to six clients, the classes can grow up to a number of 15 participants, asking for flexible seating space, and a central area for performing the group therapy session. Since the procedure of constellation therapies is very demanding to the minds and bodies of the participants, a kitchenette for reinvigoration, and an anteroom, not only for arriving and stowaging one's wardrobe, but also for contemplation and regeneration is needed. (fig. 42) In most cases, such spaces are in fact integrated in repurposed residential buildings, being forced to fit into a specific structure, not necessarily emphasizing the bodily and sensorical needs of the therapy participants. [59]

Body Psychotherapies work on a much smaller scale. Being mostly a one-on-one session, the treatment unit is mostly structured into an anteroom for arrival, an intimate wardrobe to undress oneself and the actual treatment chamber, featuring an area for conversation with the therapist, and a storage part for the treatment supplies, such as oils, towels and tools.[60] (fig. 43)

The generic prototypical schemes, described by practitioners of those treatment methods, and derived from references of similar typologies do function well from a process oriented point of view. But they lack spacial qualities for an embodied experience, application of trauma-informed design strategies and notions of genuine contemplative character.

[59] Ardeljan, Tamara, Personal Interview with the Systemic Constellation Therapist, May 12 2021.

[60] Iraci, Valentino, Personal Interview with the Body Therapist, August 26 2021

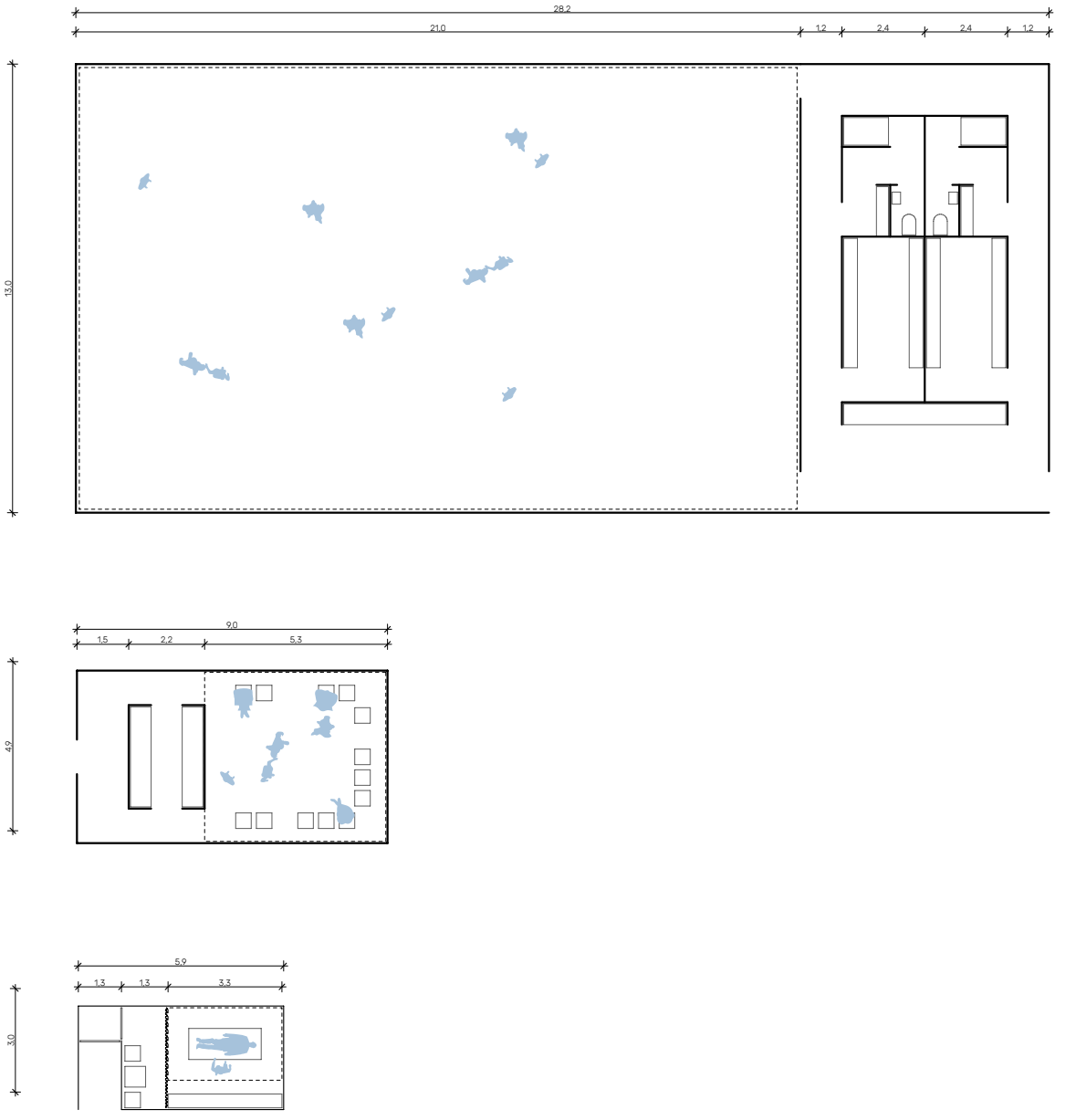


fig. 41: generic schemes of a dance movement therapy typology, 1:200 by Ajdin Vukovic

fig. 42: generic schemes of a constellation therapy typology, 1:200 by Ajdin Vukovic

fig. 43: generic schemes of a body psychotherapy typology, 1:200 by Ajdin Vukovic

Trauma Therapy Innovations and their Impact on Architecture

Interpretation: Qualities of contemplative Places

„When people need time to reflect, they usually look for places to retreat. Most often, such places are either sacred buildings or escapes into nature."

- Tamara Ardeljan [61]

There is a lot of significance to this sentence. The spacial quality of both scenarios, the sacred and the natural, rely on their radical contrast to the rest of our built environment. Whether it is the density of urban life or the rural landscape penetrated by human-made traffic networks, the void of religious spaces and forest clearings always calm the mind and body down. Isolated from the rush of daily routine, these places give people the chance to gaze attentively, to observe, to consider - in short - to *contemplate*. [62]

Philosophers like Plato, the Buddha or modern psychology forefathers William James and Wilhelm Wundt described the value of contemplation as a means of fostering well-being and wisdom, that has been known for a long time. Contemplative practices exist within a range of life contexts, including in religion, spirituality, arts and personal development.[63] Contemplation does not only work by oneself, but is strongly practised in groups, that was ever since our ancestors led fire into the circle. It made sense to put the fire in the center and to gather around it. That circle defined physical space by creating a rim with a common sense of sustenance lighting up the center.[64] Those circular agendas have stayed with human-kind until today; the structural connotation of Stonehenge, England (fig. 44) still serves as a scene of large gatherings for either religious or celebratory purposes. Initially, it was a site of pride for ceremonies and observatory markings of astronomical relationships.[65] Today, the architectural presence of Stonehenge expresses itself as a monumental intervention in the middle of a distinct topography, serving as an

[61] Ardeljan, Tamara, Personal Interview with the Systemic Constellation Therapist, May 12 2021.

[62] Etymology Dictionary, „contemplation"

[63] Van Gordon, „Why Should You Contemplate More?"

[64] Baldwin, Linnea, „The Circle Way: A Leader in Every Chair", p. 64

[65] Moore, „Exploring Architecture and Landscape Architecture"

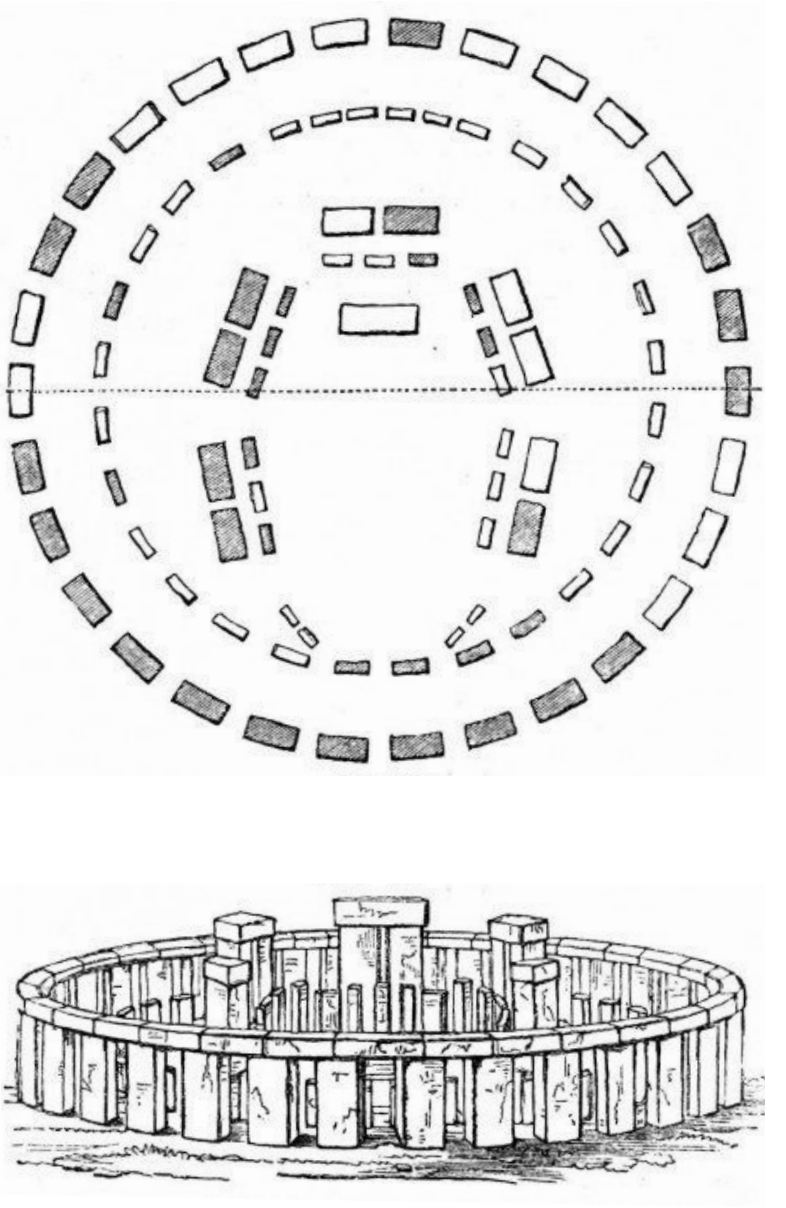


fig. 44: Stonehenge by Unknown

exclusively marked space, generating the earlier stated spacial and metaphysical contrast towards daily life. It is somewhere between sacred building and natural retreat.

The Memorial 22/3 (fig. 45) by the bureau of landscape architect Bas Smets in Brussles intervenes differently in a rural or greenwood environment. Unlike Stonehenge, the memorial rather densifies a void in the forest by the placement of additional trees, then constructs a contemplative space by placing edited material, like smoothed or axed stone. Each of the thirty-two trees represents one of the people killed in the terror attacks of Maalbeek metro station. The trees frame an empty, circular space in the forest while their branches draw a circle against the sky. [66] That particular omitted space creates almost a holy marking in the compactly intermingled woodland. This arrangement emphasizes the value of of the vast center and forms a contemplative space, appearing as a mere forest clearing.

[66] Navas, „Memorial 22/3“

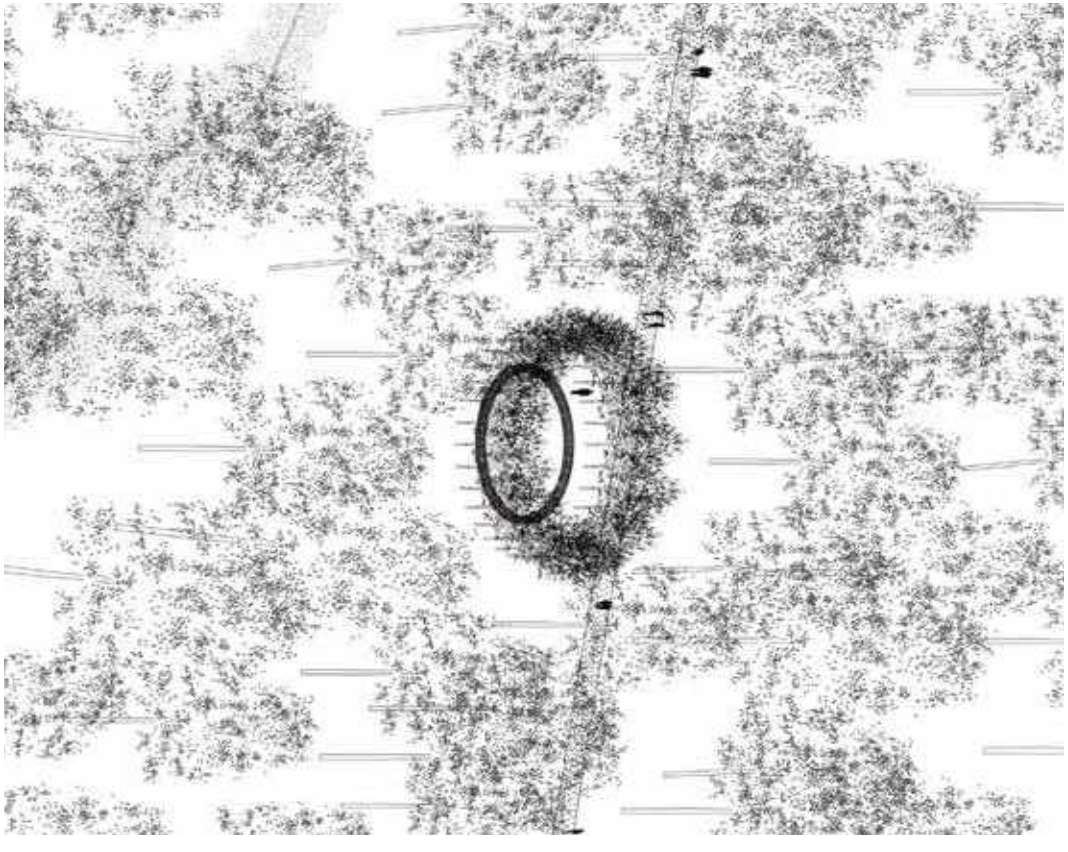


fig. 45: Memorial 22/3 by Bureau Bas Smets

One specific sacred building that is built as such a circular, physical space, creating a rim with a common sense of sustenance lighting up the center [67], is the Pantheon in Rome (fig. 46). Sticking out from Rome's city pattern of domes, the Pantheon is a marvelous example of antiquity that remains amongst the contrast of the contemporary streets that have evolved today in the modern city of Rome. Originally built as a pagan temple, the building's cubature is mainly defined by a cylindric silhoutte, intersected half of a sphere on top. The additive cubic morphology in the front emphasizes the main entry to the sacred, circular space. [68]

Yet again, an empty center faces the user while entering the interior of the temple. Astonished by its sheer dimension and possibly dazzled by the ray coming from the oculus overhead light, one is almost forced to stand there in the middle of the centric emptiness. The niches and carvings in the thick wall, formerly used as altars for multiple pagan godhoods, could serve as a retreat space, if overwhelmed by the vastness of the round hall.

All three references - Stonehenge, Memorial 22/3 and the Pantheon - follow a circular agenda, possibly based on the before mentioned concept of our ancestors, leading fire into a circle, putting it in the center and gathering around it.[67] All three spaces contrast their context in dimension, structure and volumetrics. All of them share a *spacial void* as a center. All of them are considered contemplative places.

„Let go your earthly tether. Enter the void. Empty, and become wind."

- Guru Laghima [69]

[67] Baldwin, Linnea, „The Circle Way: A Leader in Every Chair", p. 64

[68] Moore, „Exploring Architecture and Landscape Architecture"

[69] Dante DiMartino, Konietzko, Dos Santos, „The Legend of Korra—The Art of the Animated Series, Book Three: Change", p. 150-159

fig. 46: axonometric section of the Pantheon by Ajdin Vukovic based on illustration by Frank Fuentes

Trauma Therapy Innovations and their Impact on Architecture

Design Response: circular Spaces of Treatment and Leisure

Looking back on the generic functional schemes of treatment spaces for embodied trauma therapy, the programmatic patterns have to incorporate features of the previously analysed contemplative and circular spaces, in order to evoke fully embodied experiences to the user. [70] Inspired by the spacial organisation of Stonehenge, Memorial 22/3 and the Pantheon, a variety of the temple's structural conditions influences certain design decisions for new trauma treatment spaces. These architectural features have the power to transform the generic utility arrangements of the body psychotherapy, the constellation therapy and the dance movement therapy into places of reflection, and not just mere rooms of mental recovery, as depicted in fig. 47:

1. The spacial emphasis is on the void in the center of the typology, a place where either nothing or everything happens - best seen in floor plan number one, the Memorial 22/3, but also in the other two references.

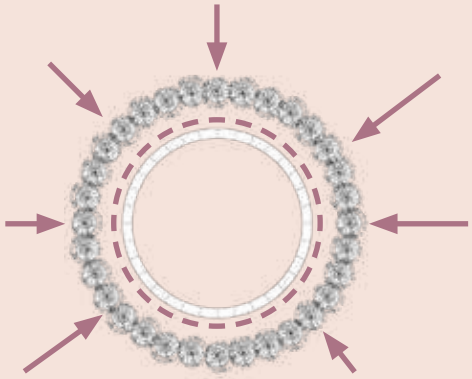
2. The access to that central space is not provided by a simple penetration of the outer shell, but rather through a sequence of offsett units, leading the user slowly into the center - precisely shown in floor plan number two, the Stonehenge.

3. The thickness of the space contours allows a certain distribution of niches and rooms. They do have a relation to the main center, but provide metaphysical shelter. - as shown in floor plan number three, the Pantheon.

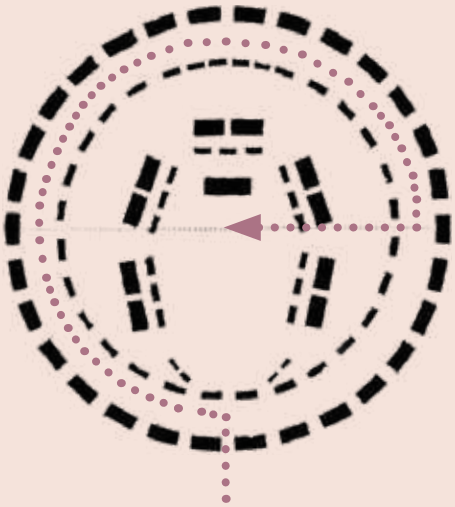
Applied to the generic treatment programms for embodied trauma therapies, the singular schemes transform into circular spacial organizations of different size, approach and of course use (fig. 48-49).

[70] Baldwin, Linnea, „The Circle Way: A Leader in Every Chair", p. 64

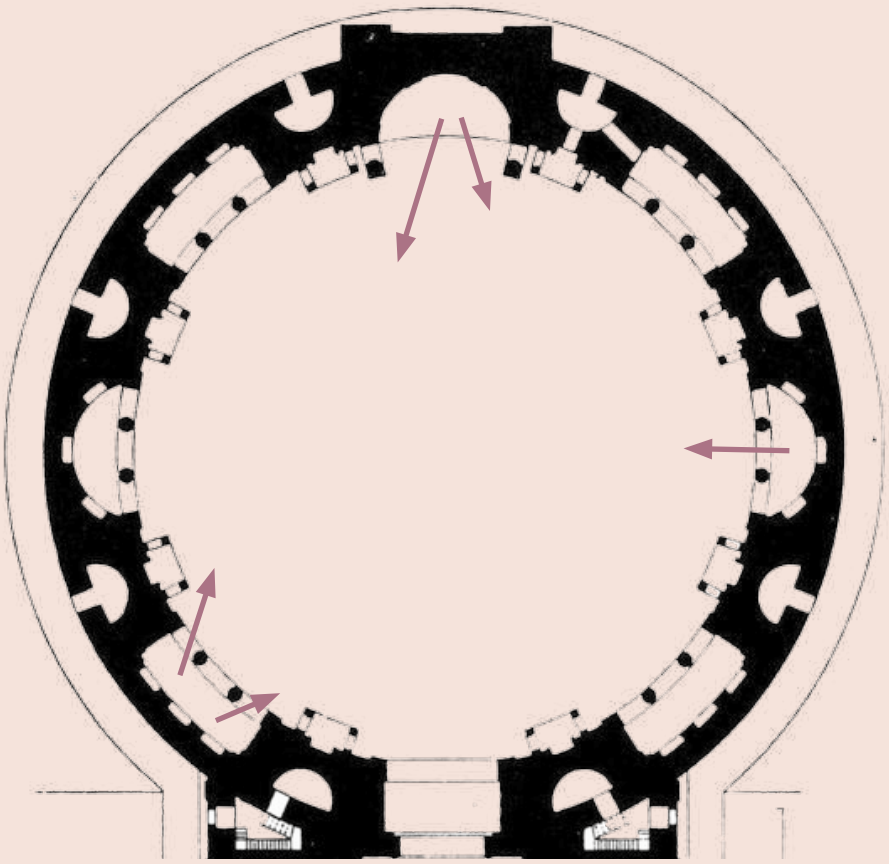
Investigating on contemplative and circular spaces.



1 Memorial 22/3



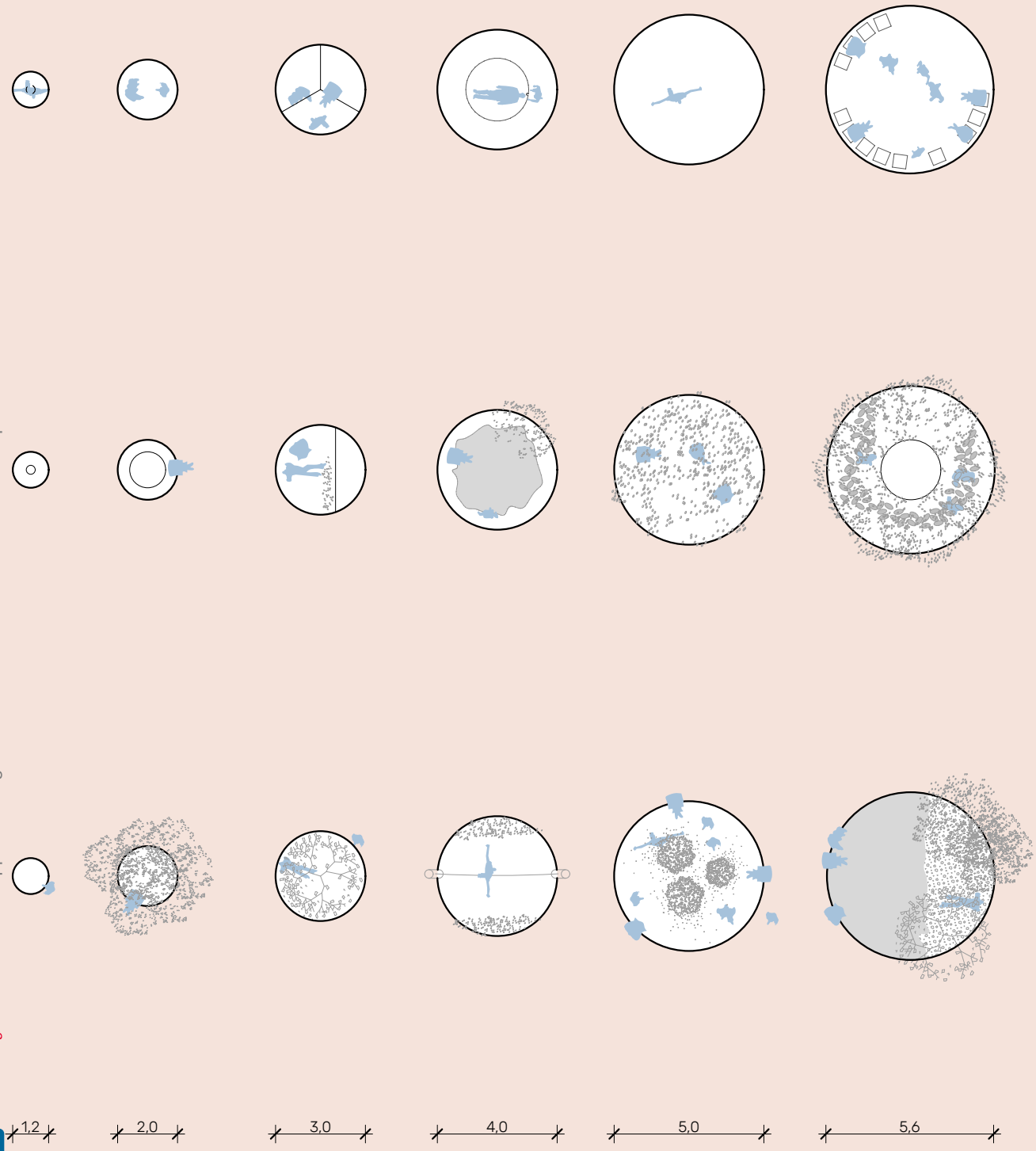
2 Stonehenge



3 Pantheon

fig. 47: architectural features in circular, contemplative references

Creating an matrix of circular spaces.



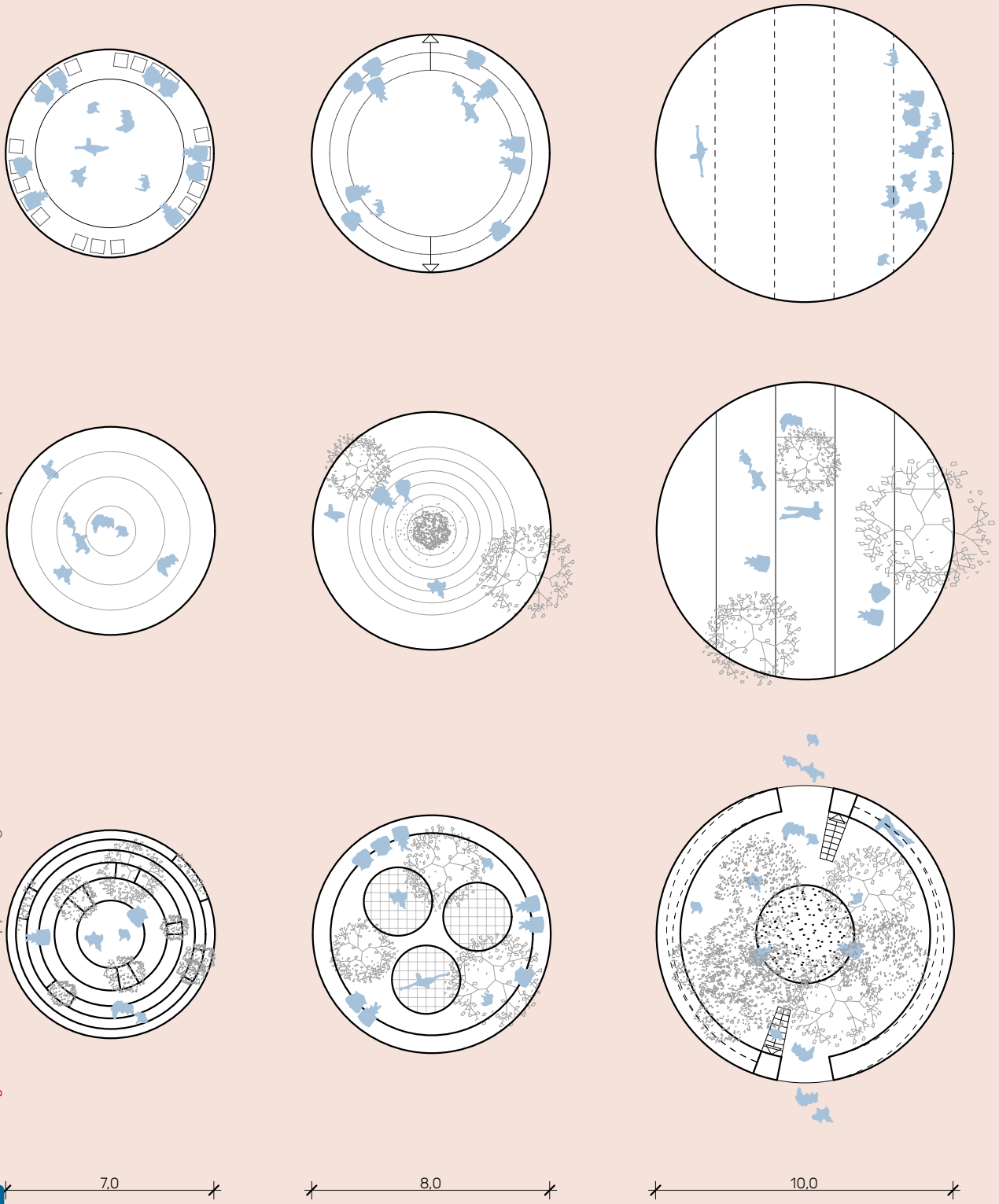
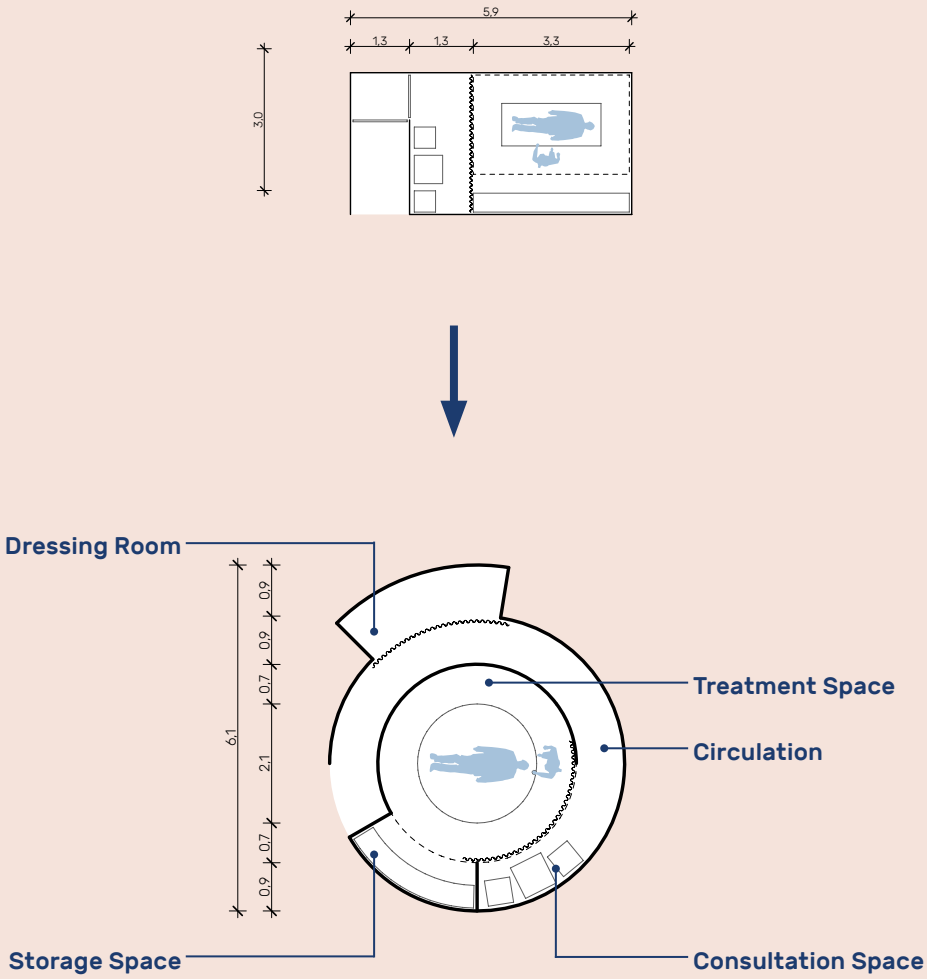


fig. 47.1.: agenda of circular, contemplative spaces, performing. by Ajdin Vukovic

Transforming the Body Psychotherapy Scheme into a circular chamber.



Convert the Constellation Therapy Scheme into a circular space.

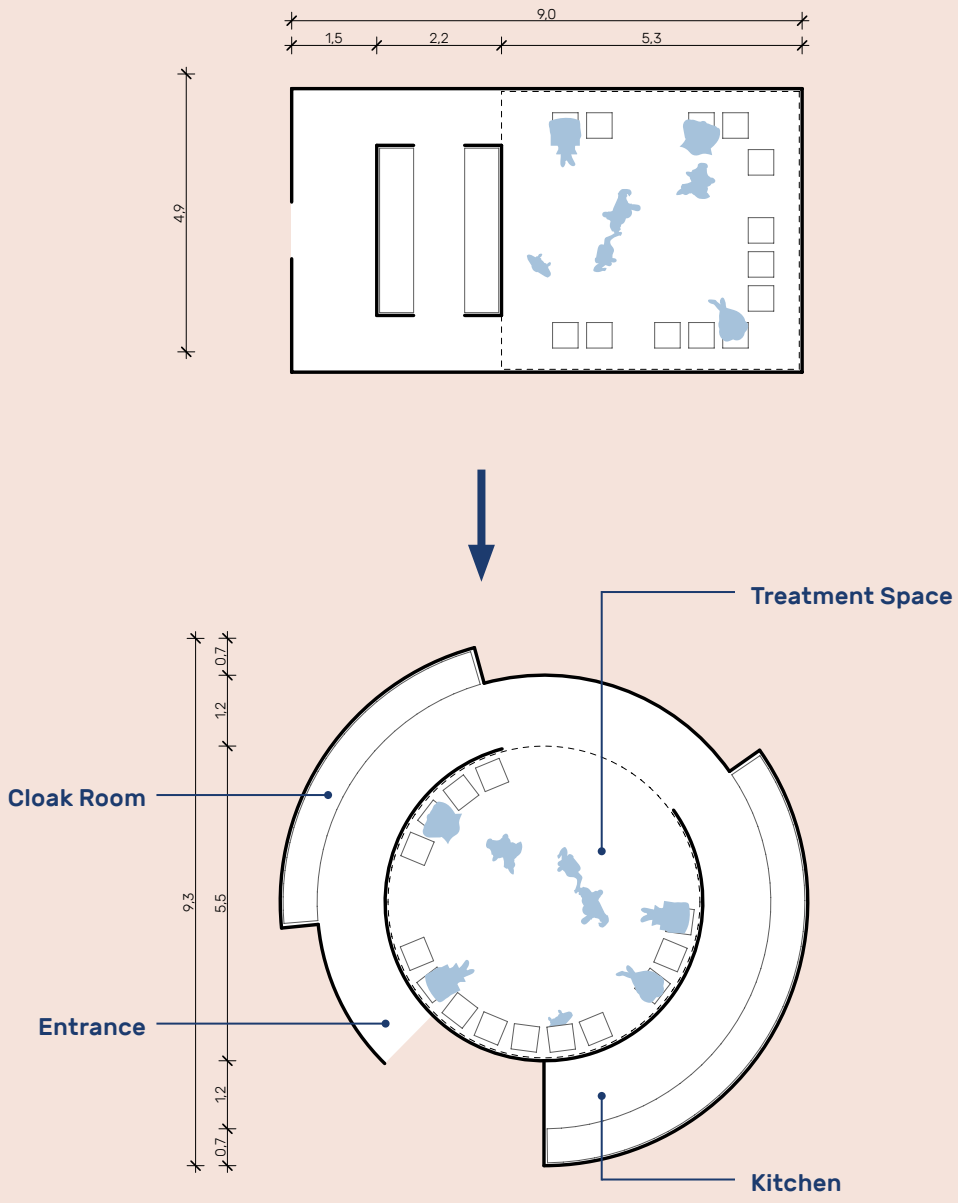
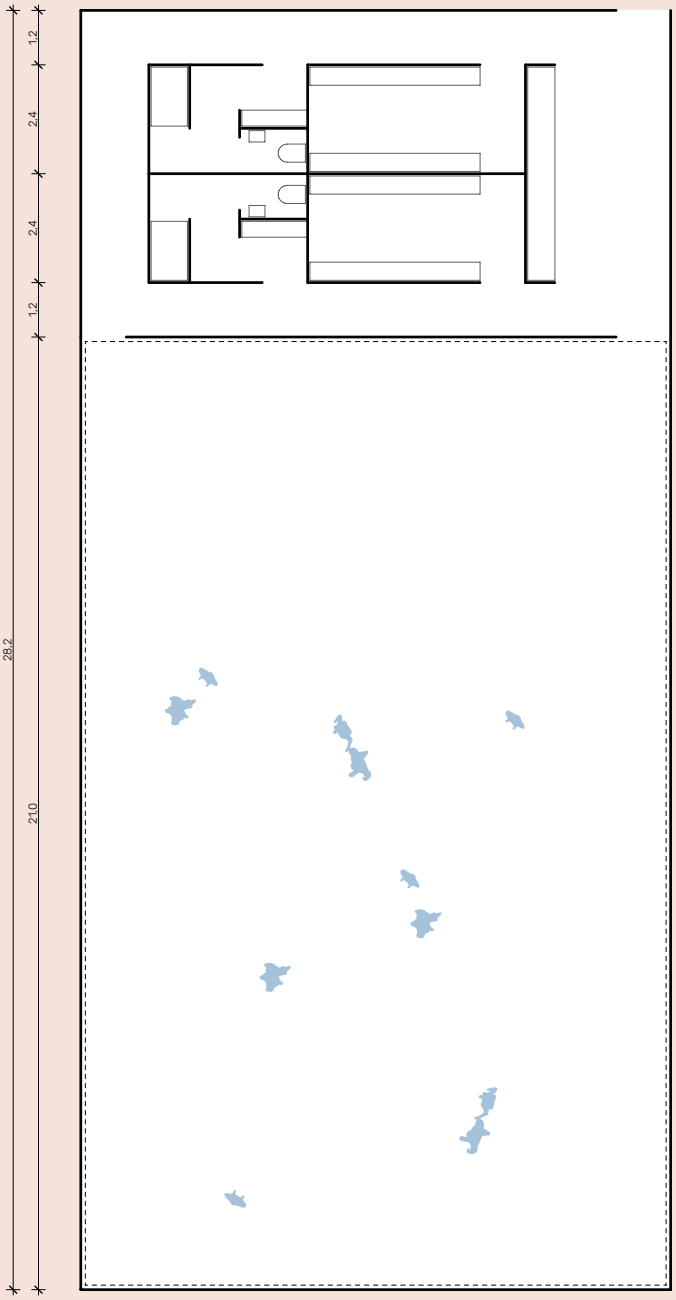


fig. 48: typological transformation of body psychotherapy and constellation therapy units
by Ajdin Vukovic

Interpret the Dance Movement Therapy Scheme into a circular hall.



public Toilet

Dance/Treatment Space

Entrance

Locker Room

Patients Toilet and Showers

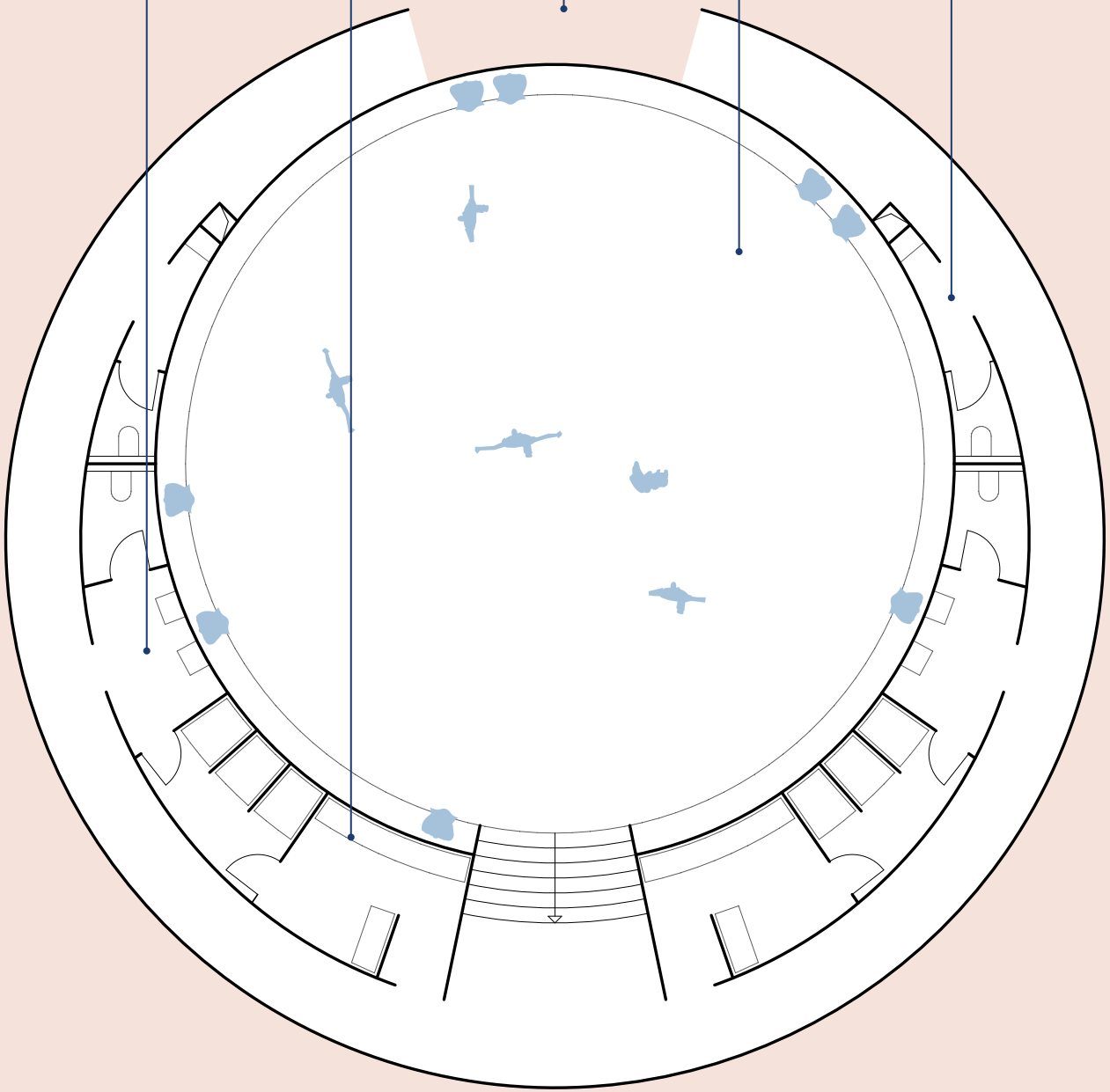


fig. 49: typological transformation of a dance movement therapy unit by Ajdin Vukovic

Based on such a first circulative agenda, the potentials appear endless. Shifiting in different scales, various diameters of circular rooms appear, that allow diverse appropriation and use. Influenced by the zenithal light of the Pantheon, a range of exposures of light through the ceiling or upper part of the shell correlate with the accumulations of user groups in the room. Therefore, also distinct types of roof shapes are generated, according to light situation and manipulation of the (oblique) floor according to Parent and Virilio. [71] In this sense, the morphology of the floor varies in relation to room size, use of therapy procedure and its obedience to the ceiling structure. (fig. 50)

[71] Parent, Virilio, Johnston (ed.), „The function of the oblique", p. 5-9

Generating a scope of circular, inclined therapy rooms. Defined through use, body movement and size.

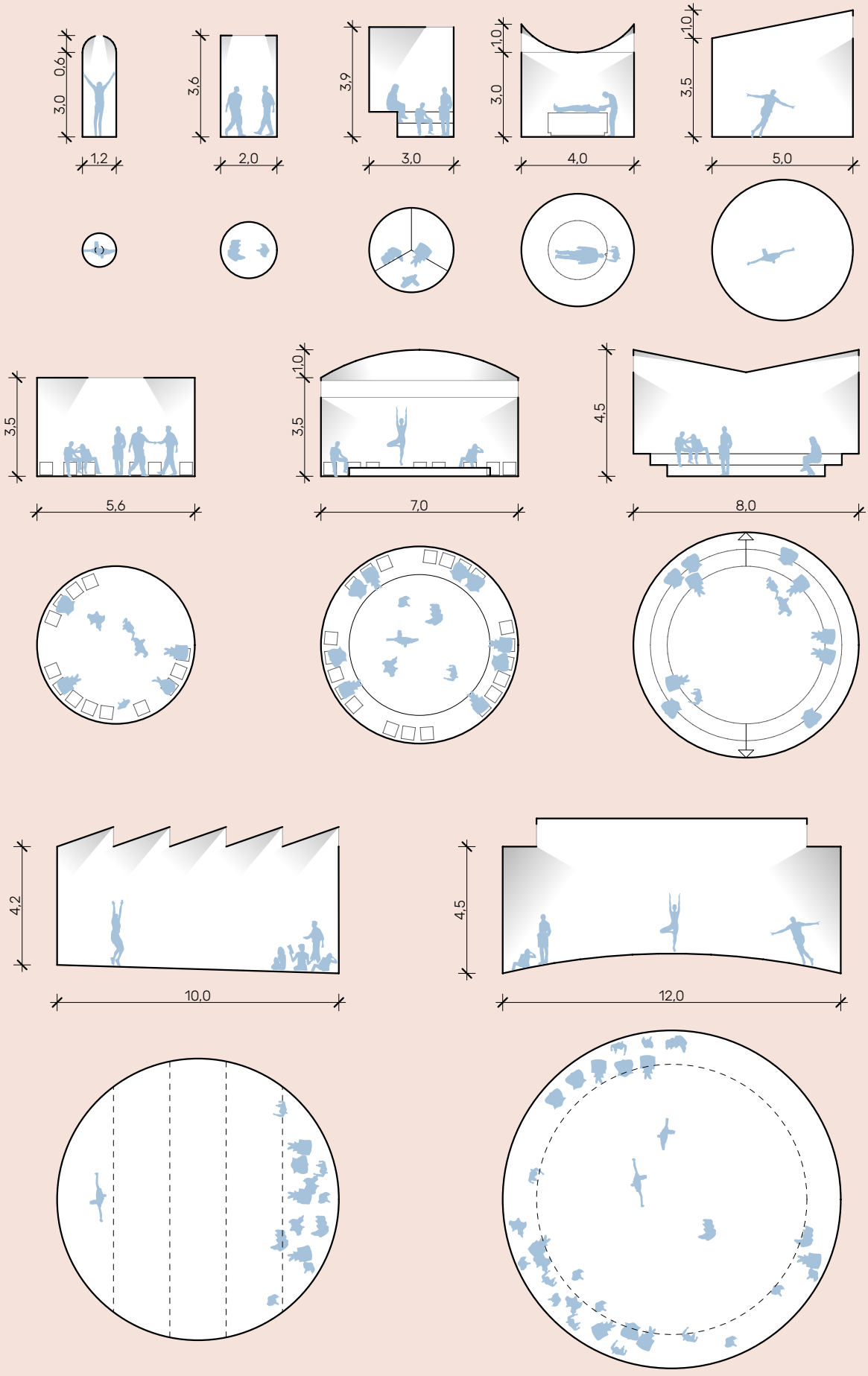


fig. 50: exploration on circular therapy rooms by diameter, scale 1:200 by Ajdin Vukovic

Analogous to the ceiling shapes, a diversity of usable rooftops of the previous typologies leave an imprint on the public space. They use earlier learned narratives from the importance of walking as a therapeutic tool [72] and increasing steepnesses as a body transformative element of architecture [73], to push for informal trauma transformation through space. Aside from that, prior findings about the significance of multi-sensoric sensations [74] find first applications in design examples like collecting ponds or fountains. (fig. 51)

[72] Manning, „Politics of Touch: Sense, Movement, Sovereignty", p. 94

[73] Weir, „What Muscles Get Worked When Walking on an Incline?"

[74] Wong, „Why You Can't Think Your Way Out Of Trauma"

Shaping possibilities of contemplative rooftop spaces.

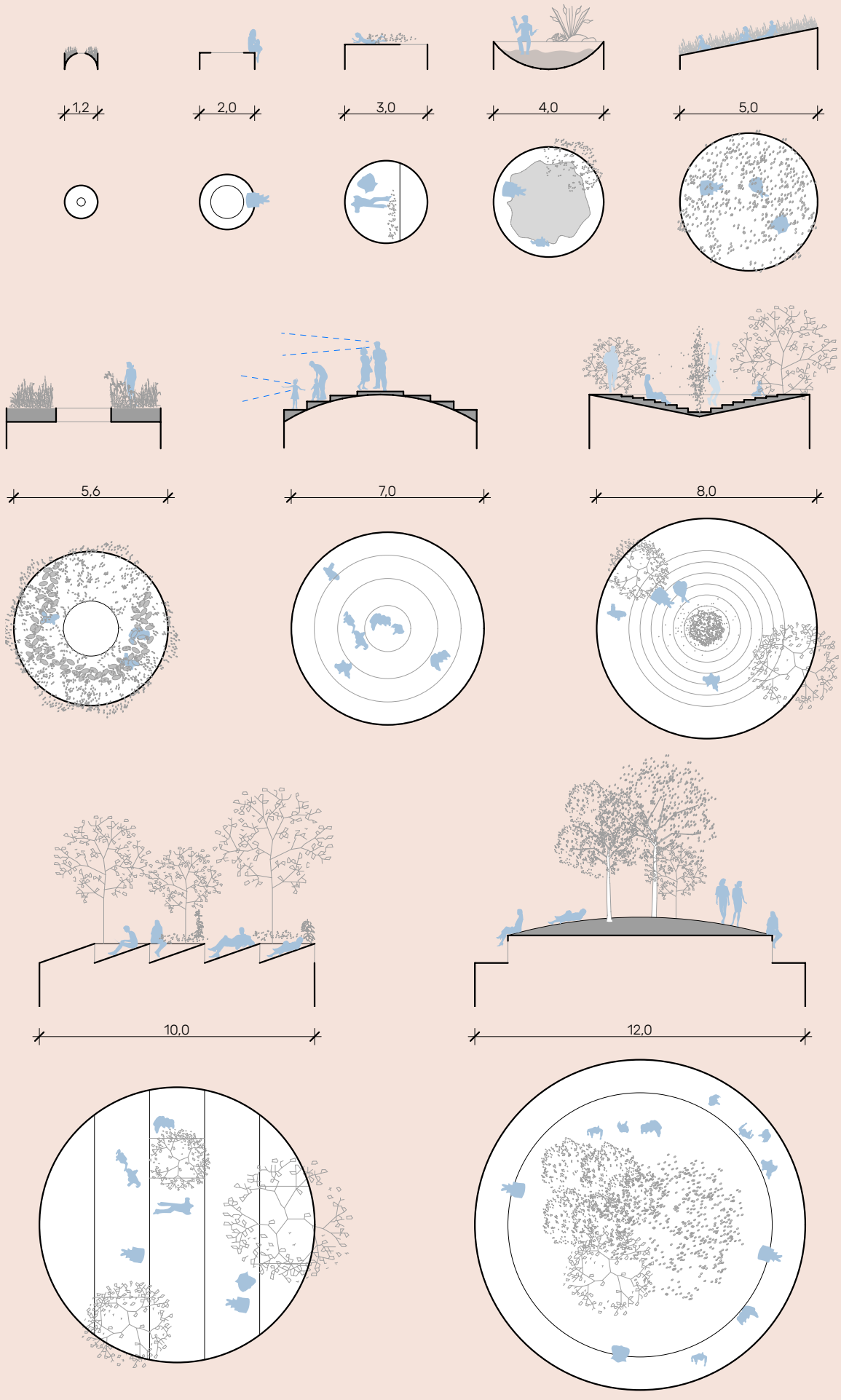


fig. 51: exploration on circular therapy rooftops by diameter, scale 1:200 by Ajdin Vukovic

Continuing the thought of trauma-informed design elements in public space, generally new circular structures, appearing as objects of leisure, sport or play, serve as components to close the metaphorical gap between public life and intimate, enclosed trauma therapy spaces. They pursue the idea of multisensoric and neuromorphic spaces [75], which is used in the circular spaces of leisure, sport and play (fig. 52).

[75] Pallasmaa, Robinson, „Mind in Architecture", p. 82-84

Developing a system of potential circular free spaces.

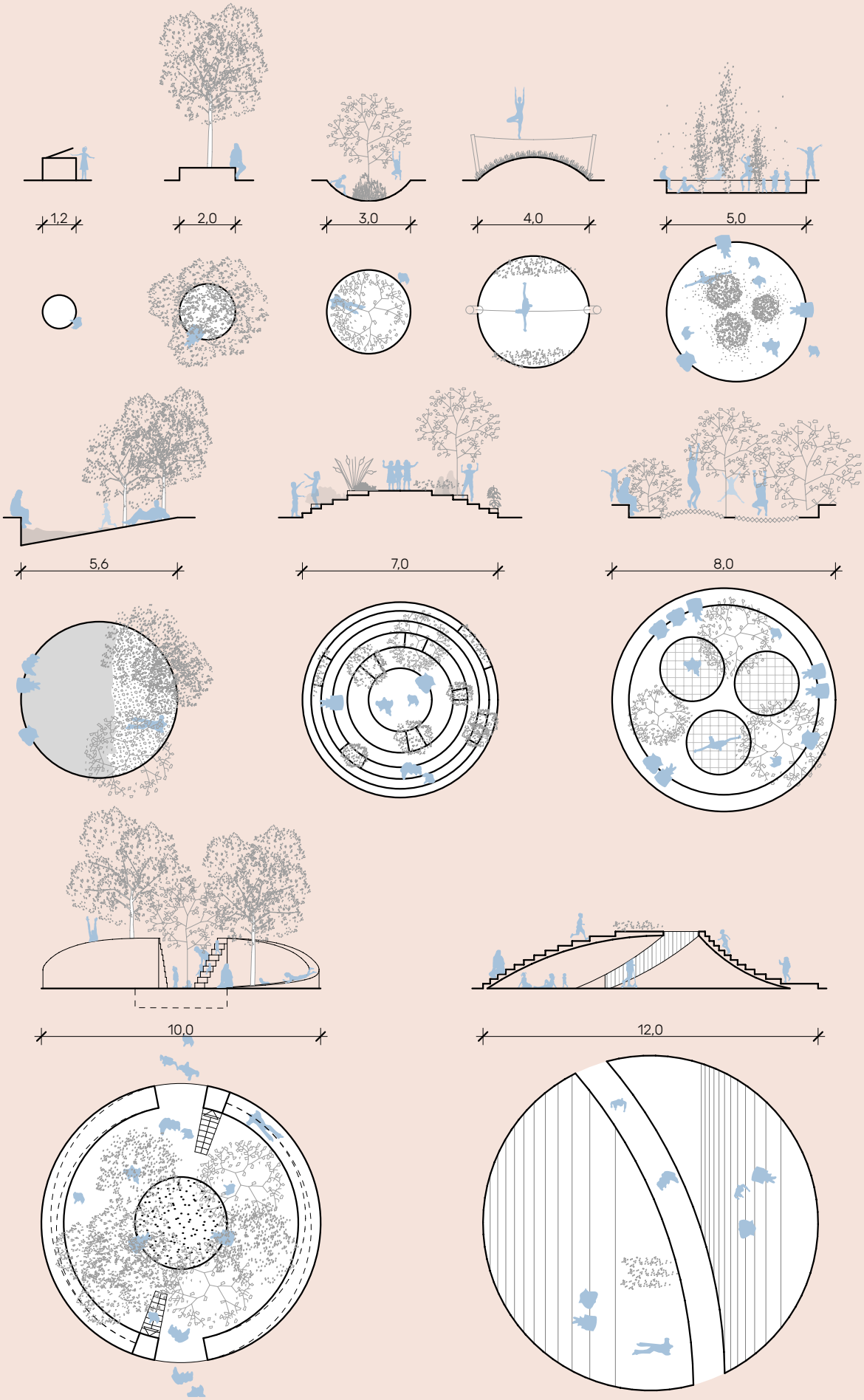


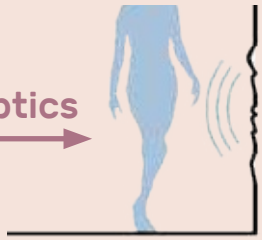
fig. 52: exploration on circular leisure, sport and play spaces by diameter, scale 1:200 by Ajdin Vukovic

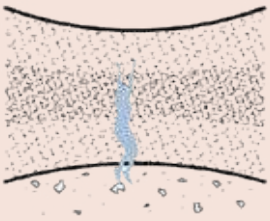
Ideogram of Design Responses

the interrelations of the empiric Design Research thus far

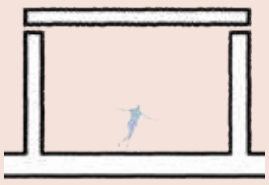
1. somatic sensations and space	2. somatic experiencing and architectural aspects	3. ways towards a neuromorphic architecture

spacial haptics

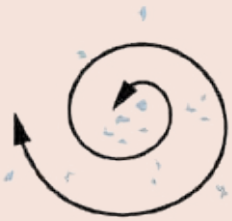


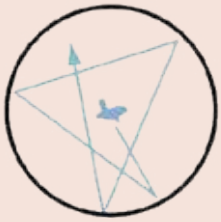


narrative potential of ornament and pattern

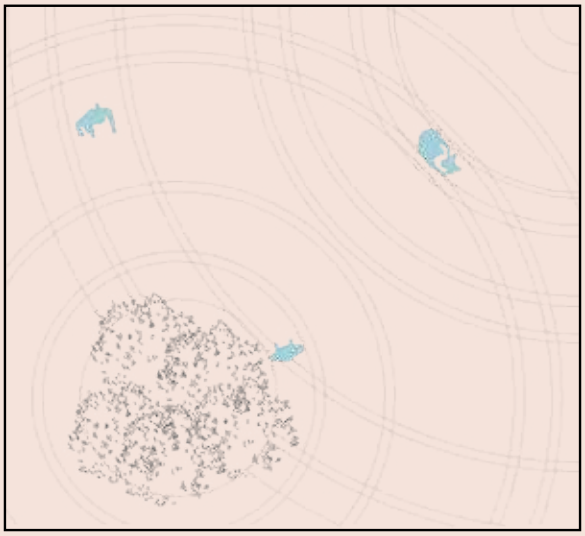


monolithic morphology





4. spacial features as a tool for memory stimulation	5. circular spaces for treatment and leisure



function of the oblique

curvelinear navigation

circular spaces

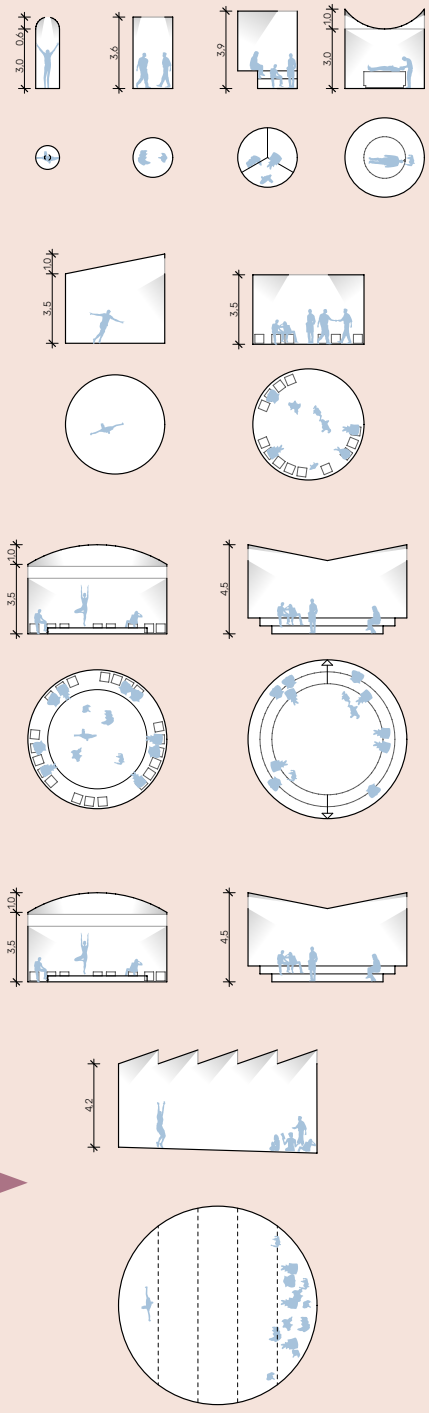
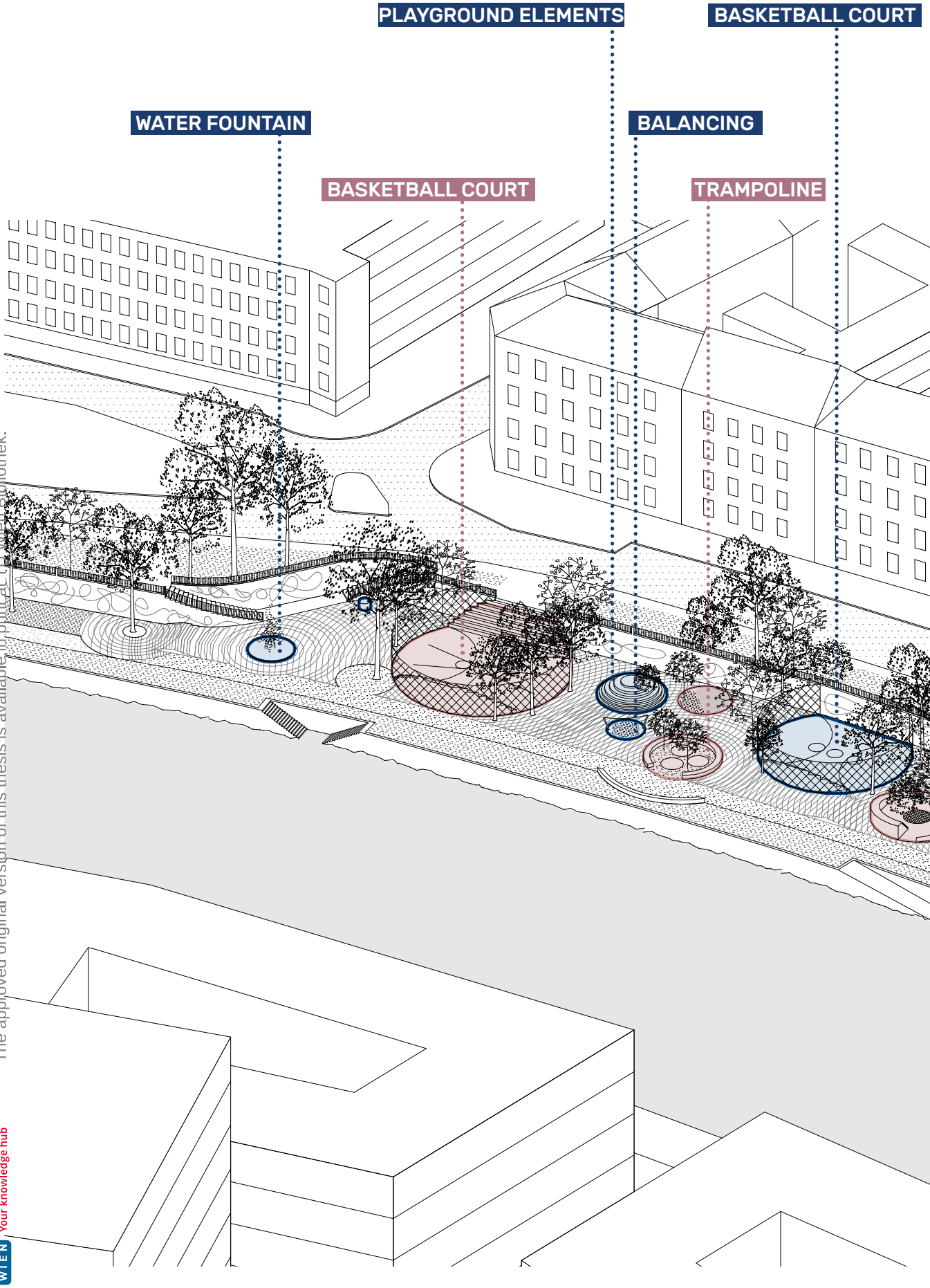


fig. 53: Ideogram of Design Responses by Ajdin Vukovic

The Project

Therapy Quarter at Donaukanal, Vienna, Austria

an exemplary Application of researched Design Responses



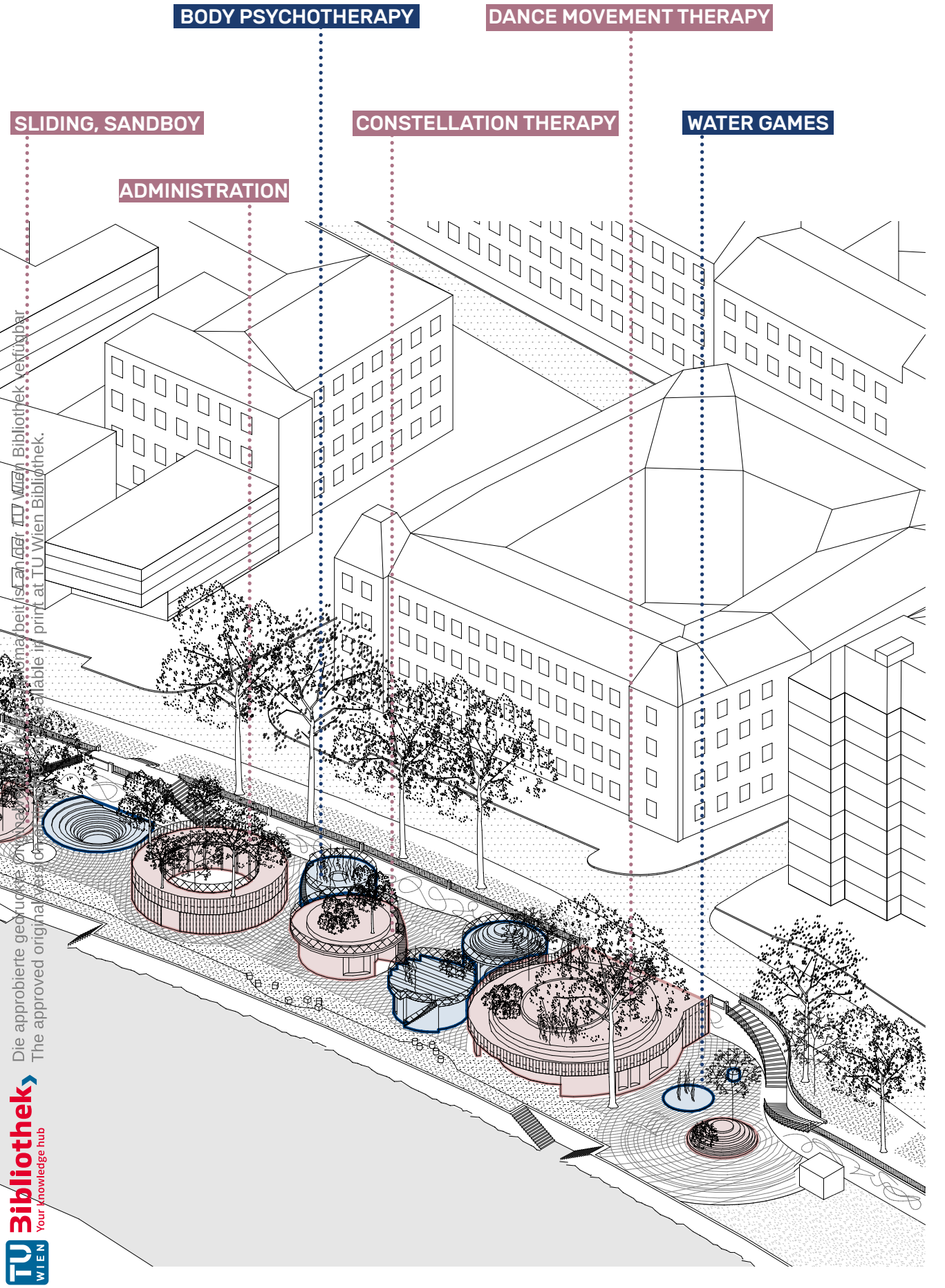


fig. 53.2.: Axonometry of the Therapy Garden

Site and existing Qualities

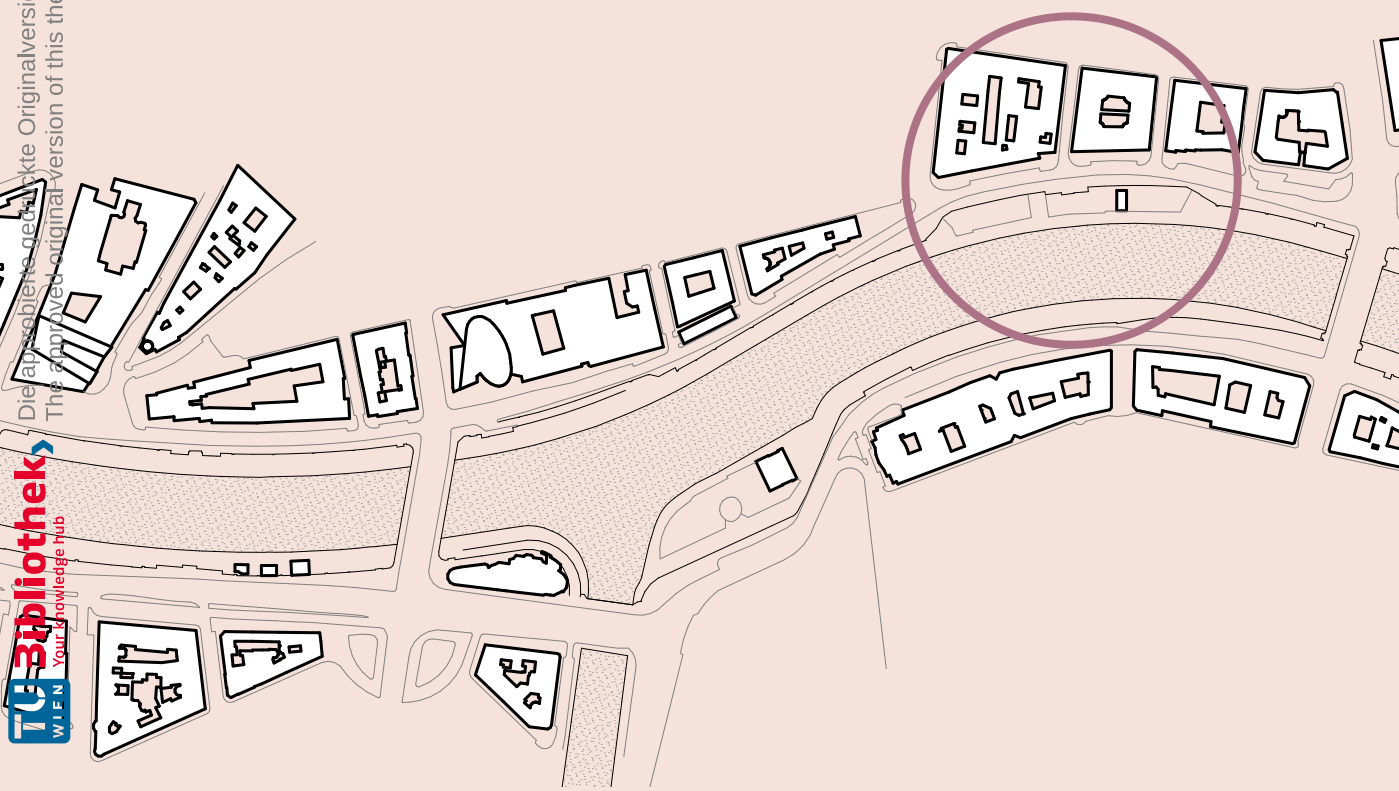


fig. 54: site plan Donaukanal, Vienna, 1:5000

Site Characteristics

Location, Orientation and Relevance

Vienna offers currently 1.776 Psychology Experts spread through the city. [76] The term „Experts" does not only apply to clinical Psychologists, but also tho alternative Therapists e. g. Art Therapists or energetic treatment Methods. That being said, only 52 Experts offer a specialisation on Trauma Therapy, mostly using the technique of EMDR (Eye Movement Desensitization and Reprocessing) besides other fields of psychological treatment.

Merely eight facilities in Vienna concentrate exclusively on Trauma Treatment, focusing their care as a reaction to previous traumatic events in their patiens lifes. (post traumatic stress disorder) Those practitioners therefore understand their therapeutic work as pathogenetic therapy. A slowly growing number of Psychology Experts realizes, that salutogenesis in mental healthcare practise is highly benefitial not only to a individual persons state of mind, but is also a crucial issue in public health. [77]

Especially in times of a global pandemic, the collective of a city is threatened by omni-present circumstances, that pushes even the most optimistic people to their boundaries of sanity. The anticipatory approach of salutogenical mental care prepares its clients for less joyful times and teaches them how to deal with dark thoughts, once they are by themselves.

In this sense, a publicly present and partly informal mental care facility is a crucial typology, that the Zeitgeist asks for. The Donaukanal with its urban significance has the potential to provide a site for such a task. (fig. 55)

Hospitals

Ordinations, private Facilities

a publicly present Mental Care Facility

[76] Psychologen.at, „PsychologInnen in Wien"

[77] Sozialinfo Wien, „Thema Trauma"

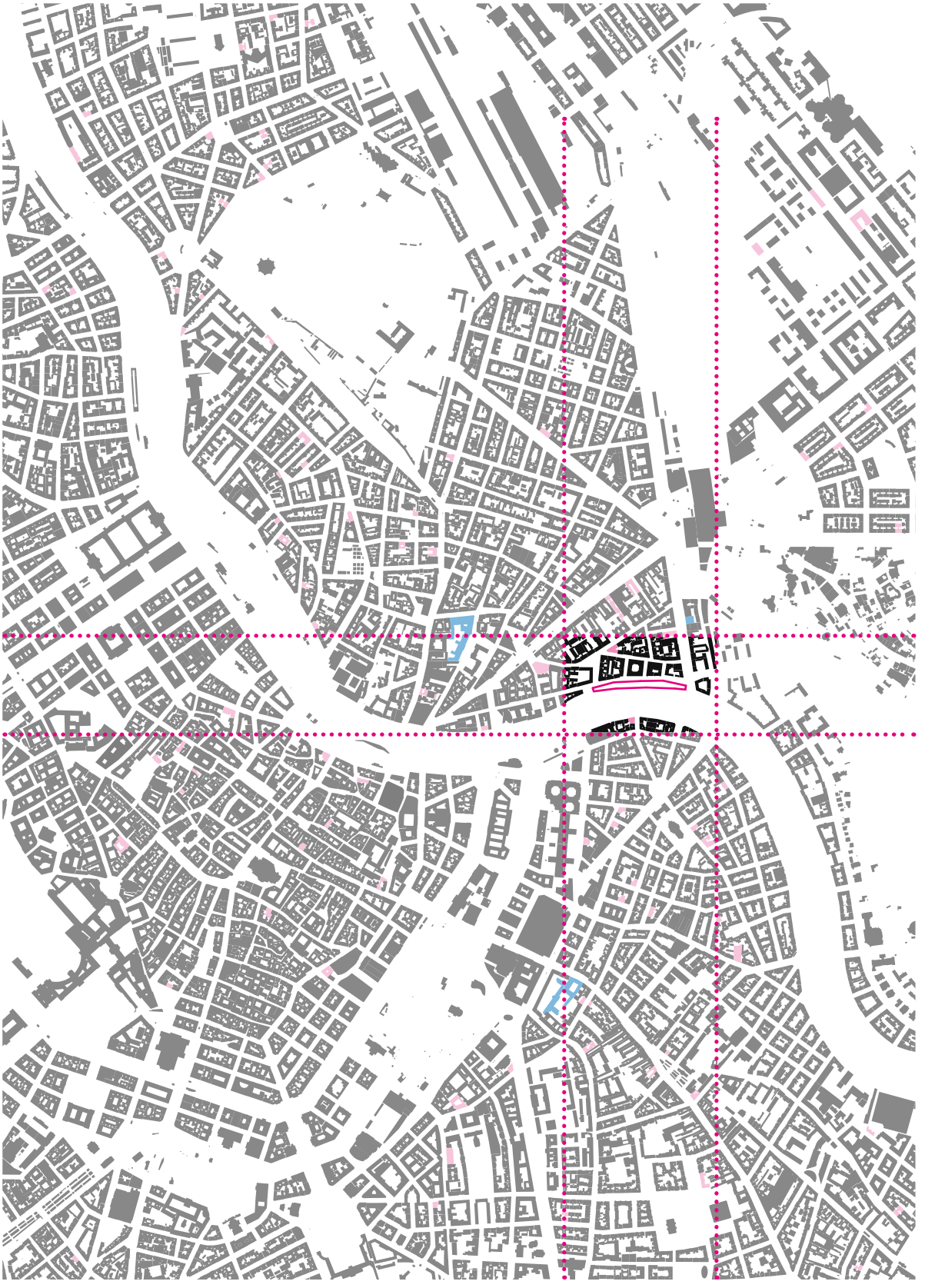
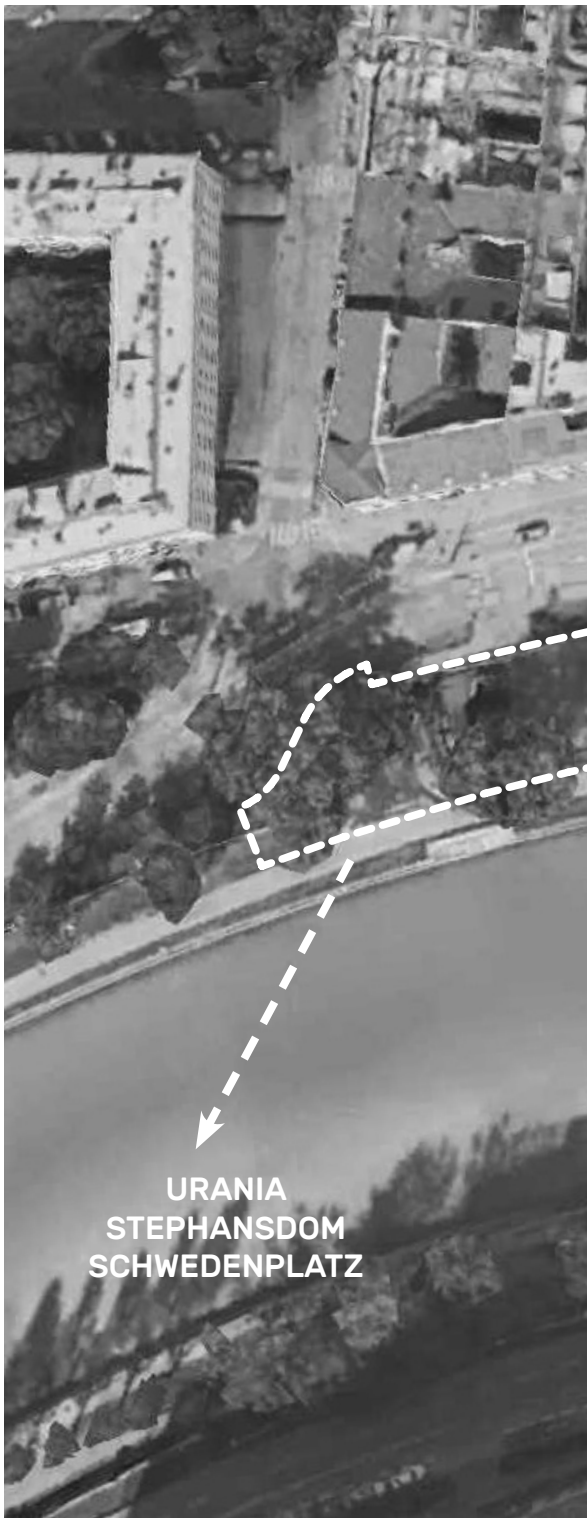


fig. 55: Cartography of central Viennas mental Healthcare Facilities, black plan 1:25.000

The specific site is located at the eastern end of the central Donaukanal in Vienna. Alongside the promenade next to the Danube waters, the site appears as a giant 190m long urban niche, coated by retaining walls, that mark the height difference towards the street on top. These walls at the northern side and the biking - and pedestrian path at the southern side draw the outline of the site for this project.

Located on the mere edge of the second district of Vienna, the position at the Danube shore allows visitors to have a critical distance towards the city center and explore various parts of the Viennese periphery, such as the Urania, the Stephansdom, and the Schwedenplatz at the western field of vision, the Stadtpark, the Belvedere and the Arsenal at the southern sighting field and also the Prater, the main Danube river itself and the city stadium at the eastern horizon, as depicted in the ortho-photo in fig. 56.



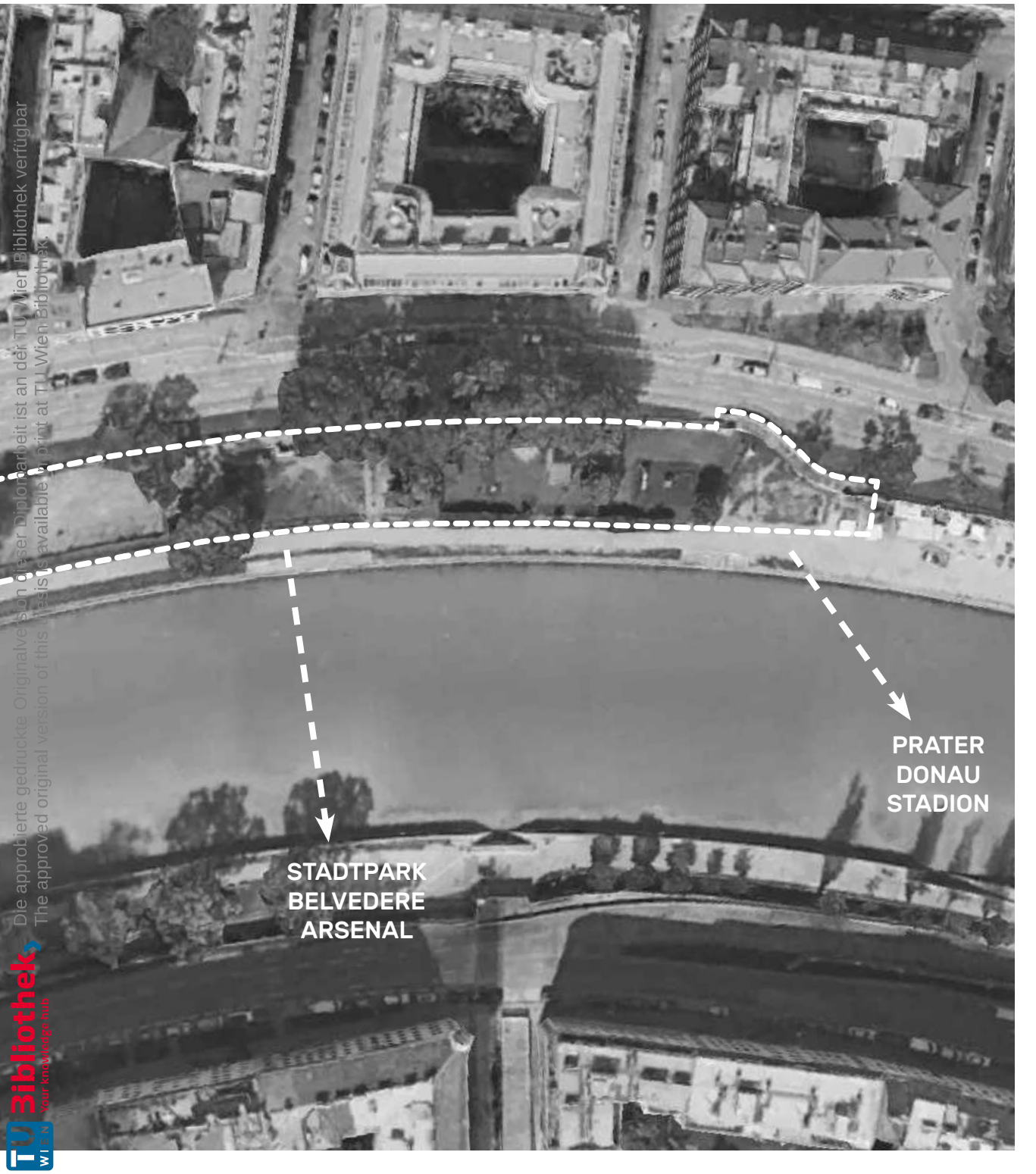


fig. 56: Orthophoto of the Site, 1:1000

Taking a look at fig. 57, the site has distinct qualitative features, that have to be kept, regardless of any transformations by the upcoming project concept:

A main element of the site, but also a specific identity of the Donaukanal itself, are the retaining walls, that are covered with murals by the various urban artist across the city (2).
As a part of a bigger, local urban heat regulation agenda, all the existing and healthy trees (1) add not only ecological value, but also an urban differentiation towards the street on the upper level to the site.
There are three main accesses to the site. Two double staircases, each placed on the western and eastern site part, and a central double staircase in the middle of the site, allowing visitors to change height levels from street to Donaukanal promenade (3).
Old paving patterns in the floor are witnesses of the initial flooring of the promenade and will have a crucial role in the project (4).
Already existing bars at the eastern end of the site can add value to new concepts at this place since they are already accepted and used by locals (5).
Finally, current sports activities, such as the two basketball cages and the playground facilities that surround them, may not be kept in their exact place, but have to reappear within a new spacial concept (6).

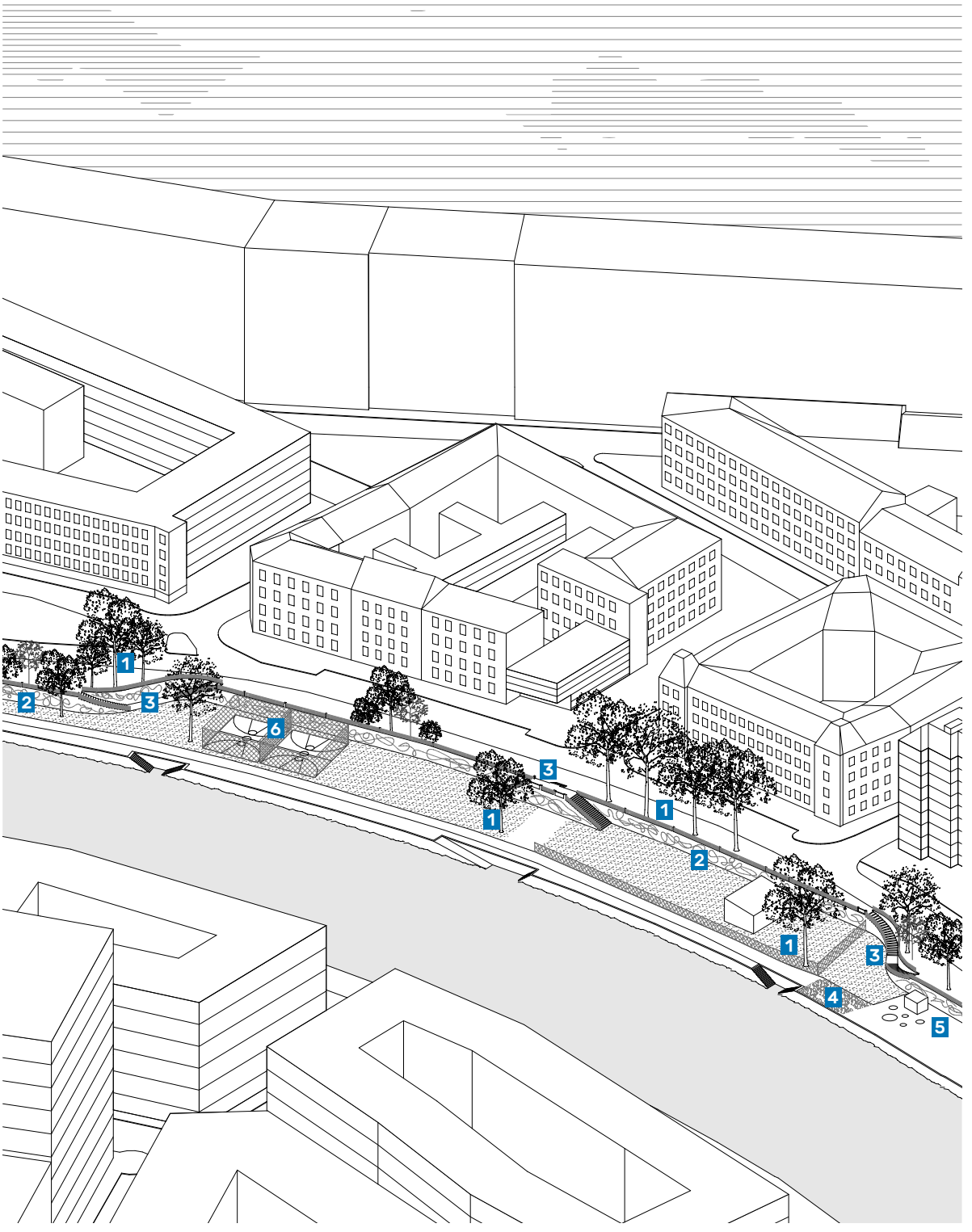


fig. 57: Axonometric projection of the existing Site

existing staircases, murals and playground facilities

centra access to the site

existing trees, fences and pavillons

paving stones and realtion to water front

fig. 57.1: photos of the existing Site

Program and Potentials

functional Sequences

existing functions and new programs

The existing functions of sports activities, gastronomy, and leisure leave a crucial imprint on the upcoming spacial program of the project. Intersected with the new program of therapeutic functions, such as Dance Movement Therapy, Constellation Therapy, Body Psychotherapy, and the administration that goes alongside these functional entities, new interrelations of usability occur.

Those interrelations have the potential to merge the therapeutic agenda with the public life and express themselves as calming, reflective, and contemplative places, such as the reference of Memorial 22/3[78] shows. Fig. 58 illustrates the programmatic coherence of leisure and mental healthcare, within a public and sensory agenda.

[78] Navas, „Memorial 22/3“

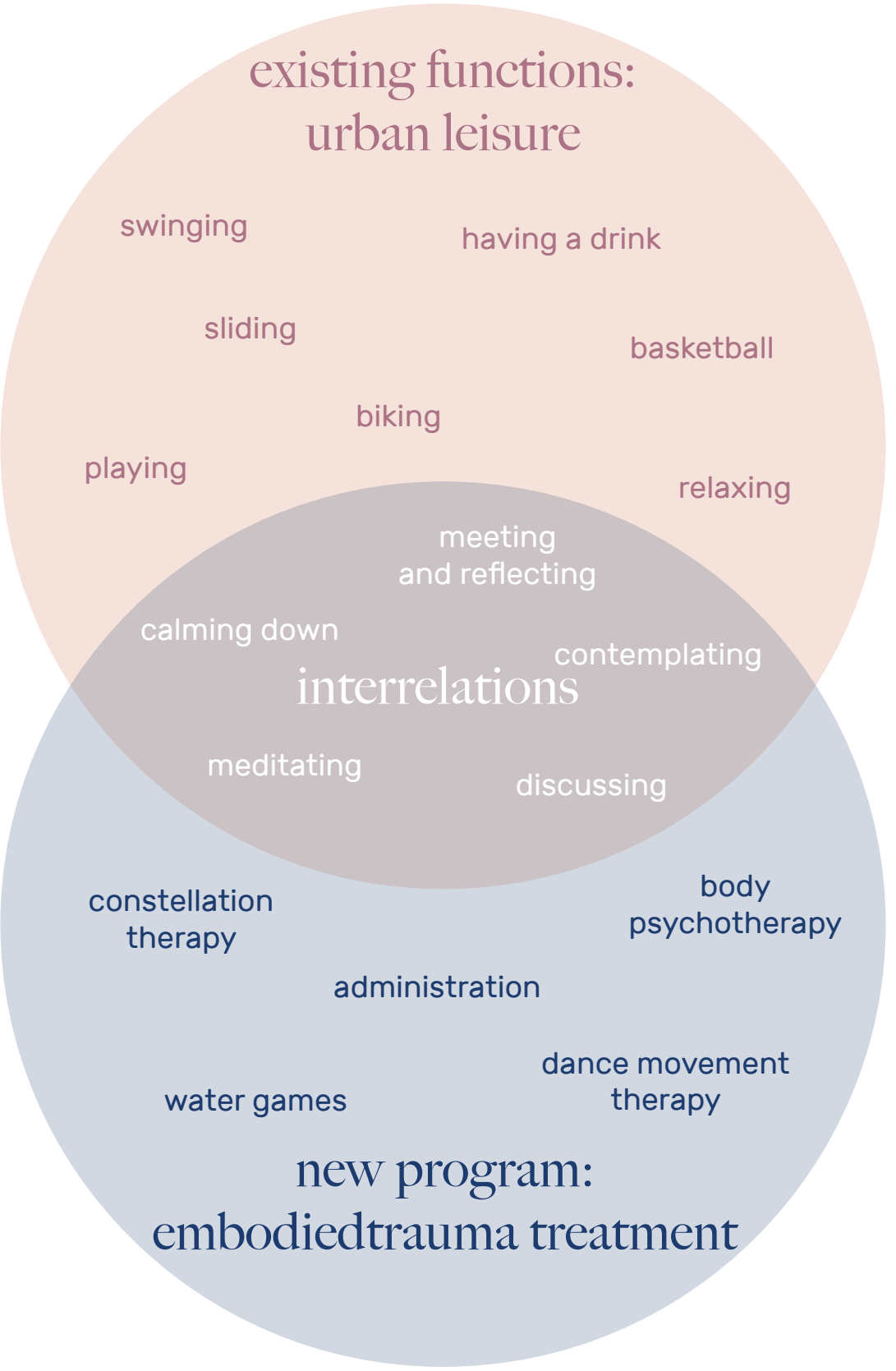


fig. 58: Interrelations between existing functions and new program

Elements of Leisure and Mental Healthcare

Dance Movement Therapy Hall

and a viewing Platform

Based on the previous design research, different typologies present themselves as circular elements with a variety of free spaces on the rooftop.
Since the Dance Movement Therapy demands a vast space, a big hall with surrounding niches and secondary spaces for contemplation or hygiene is generated. The main hall receives natural illumination through a big skylight in the ceiling.
The walk-on-able roof incorporates the skylight and is integrated into a public garden with a circular viewing platform. (fig. 59)

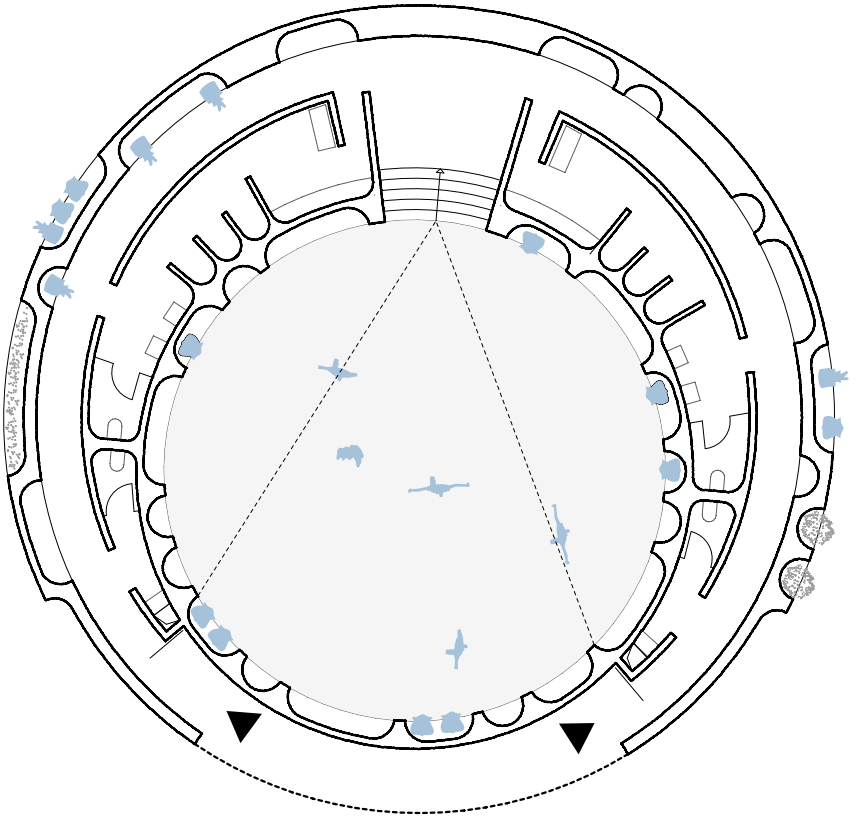
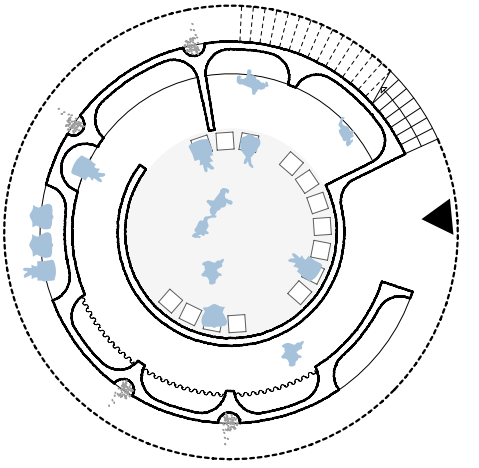


fig. 59: Dance Movement Therapy Hall and viewing Platform, scale 1:200

Constellation Therapy Space

and a Garden of Silence

Following the circular narrative, the procedure of the Constellation Therapy asks for a mid-sized space, that is circuited by wardrobes, again niches for reflection or discussion and a kitchen for refreshment. Covered by a green roof with integrated vertical skylights, this typology offers a small public garden for a little group of people. (fig. 60)



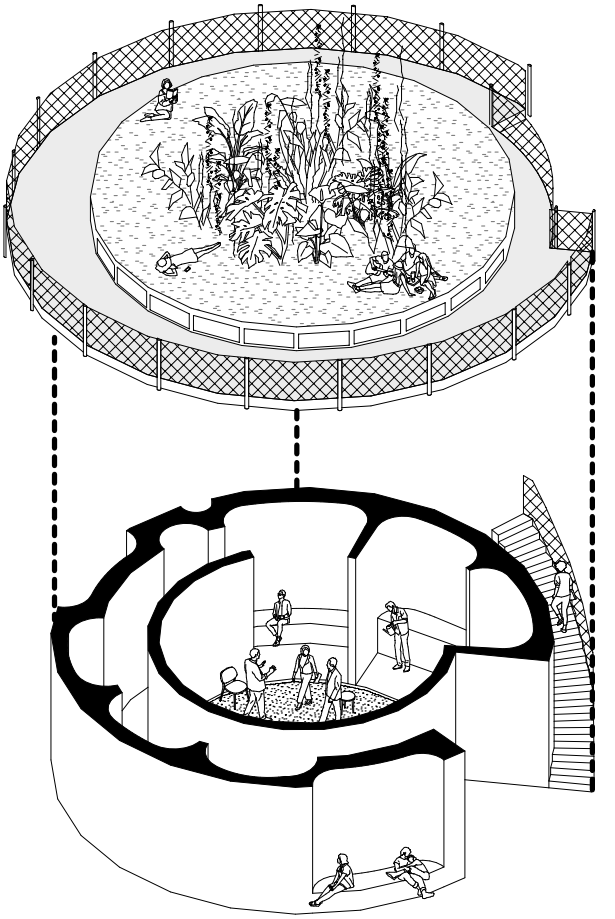
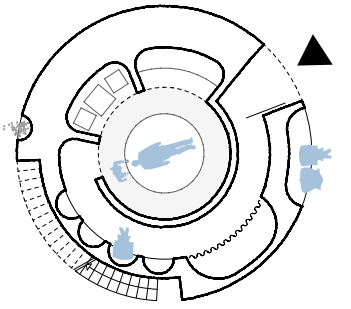


fig. 60: Constellation Therapy Space and a Garden of Silence, scale 1:200

Body Psychotherapy Chamber

and a hide and seek hedgerow

The third therapeutic typology is much smaller in size and use. The Body Psychotherapy Chamber consists of a singular room in the center, surrounded by secondary functions, such as storage, a niche for discussion, and a changing room for physical therapy preparation.
The roof is overgrown with high grass and structured by the central oculus skylight in the middle, providing the patient a free sight of the sky, while engaging in therapy. (fig. 61)



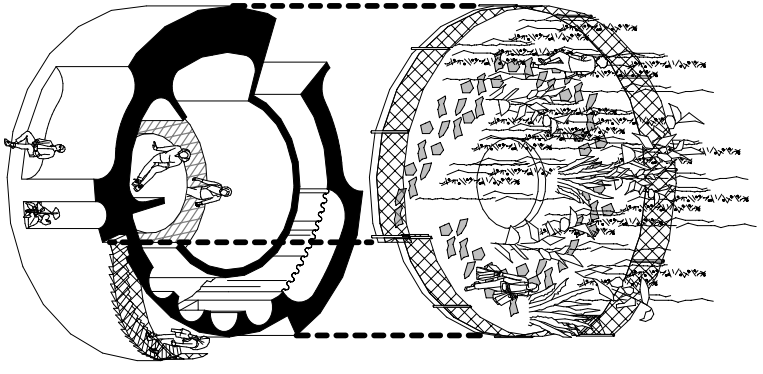
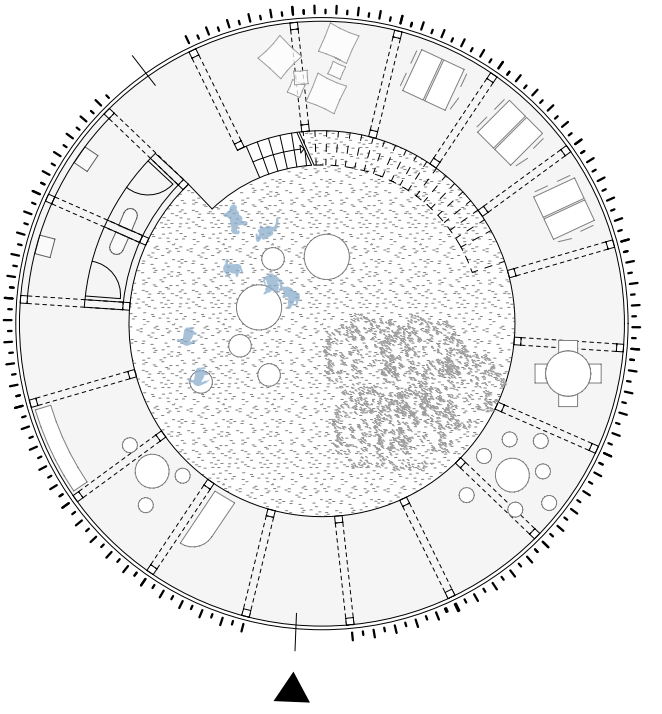


fig. 61: Body Psychotherapy Chamber and a hide and seek hedgerow, scale 1:200

administrative Building

and a contemplative Atrium and Roof Garden

Since all these therapy buildings need an infrastructure for registration, discussion, and getting to know each other, the administrative building is the first sequence of the therapy garden, before engaging with actual trauma treatment. The atrium building features two entrances, spaces for the registration work, an enclosed court for brakes and exchange, and a public rooftop space with scattered tree pods. (fig. 62)



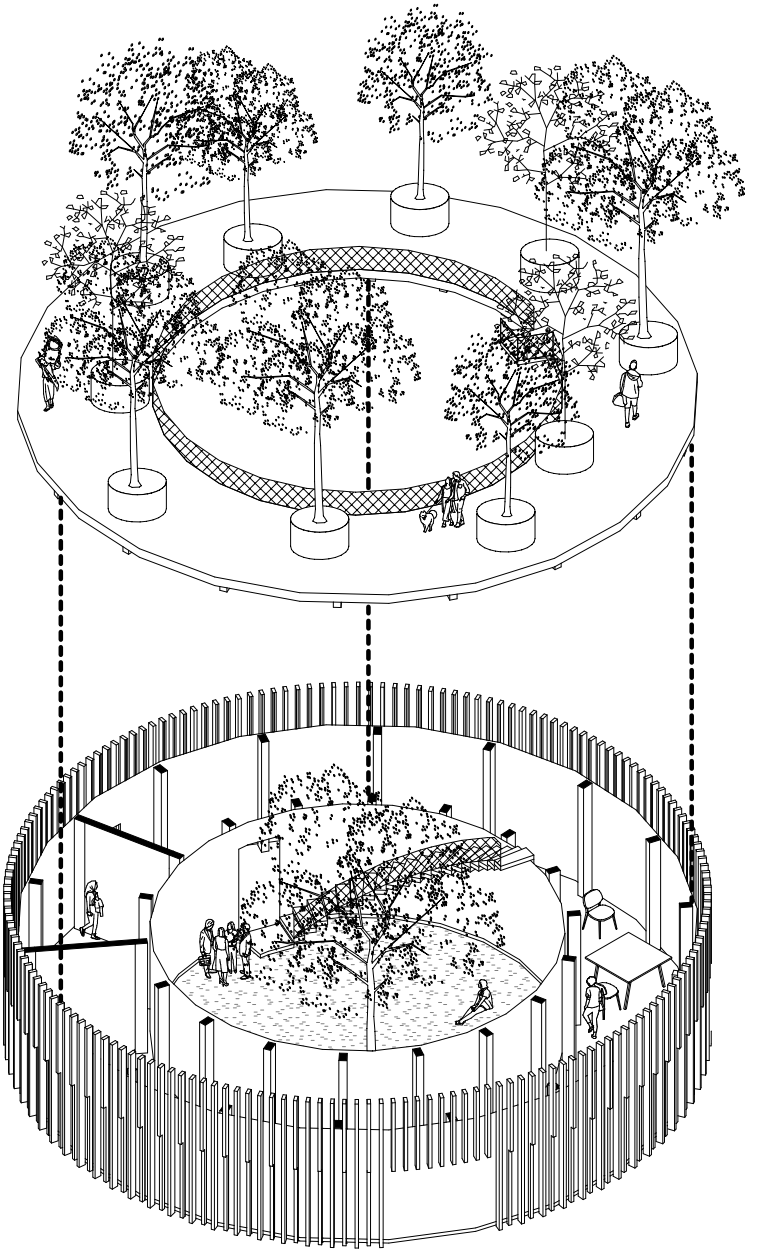
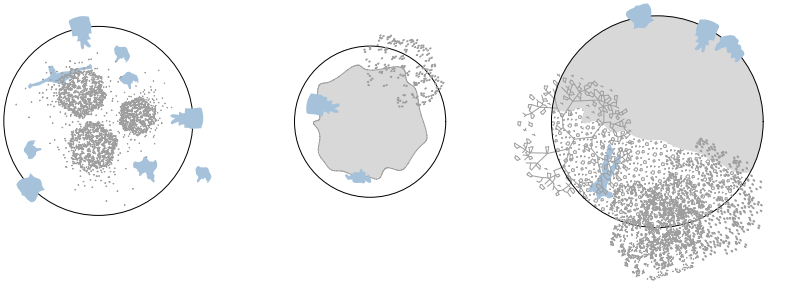


fig. 62: administrative Building and a contemplative Atrium and Roof Garden, scale 1:200

Water Game Places

as sensory spots

Referring to the research of sensory experiencing, the sound and feel of water have the power to calm a mind down. Also, they have the potential to provoke public life. with kids playing around fountains and people enjoying the cooling temperature on hot summer days. A variety of different Water game Places underline the sensory relevance over the whole site and articulate themselves as little natural ponds, or fountain spots. (fig. 63)



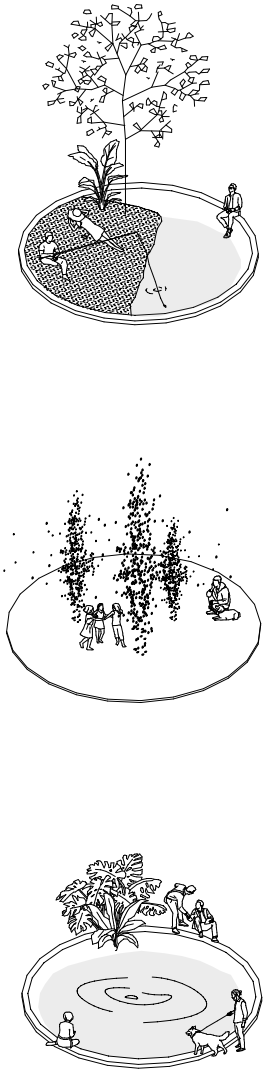
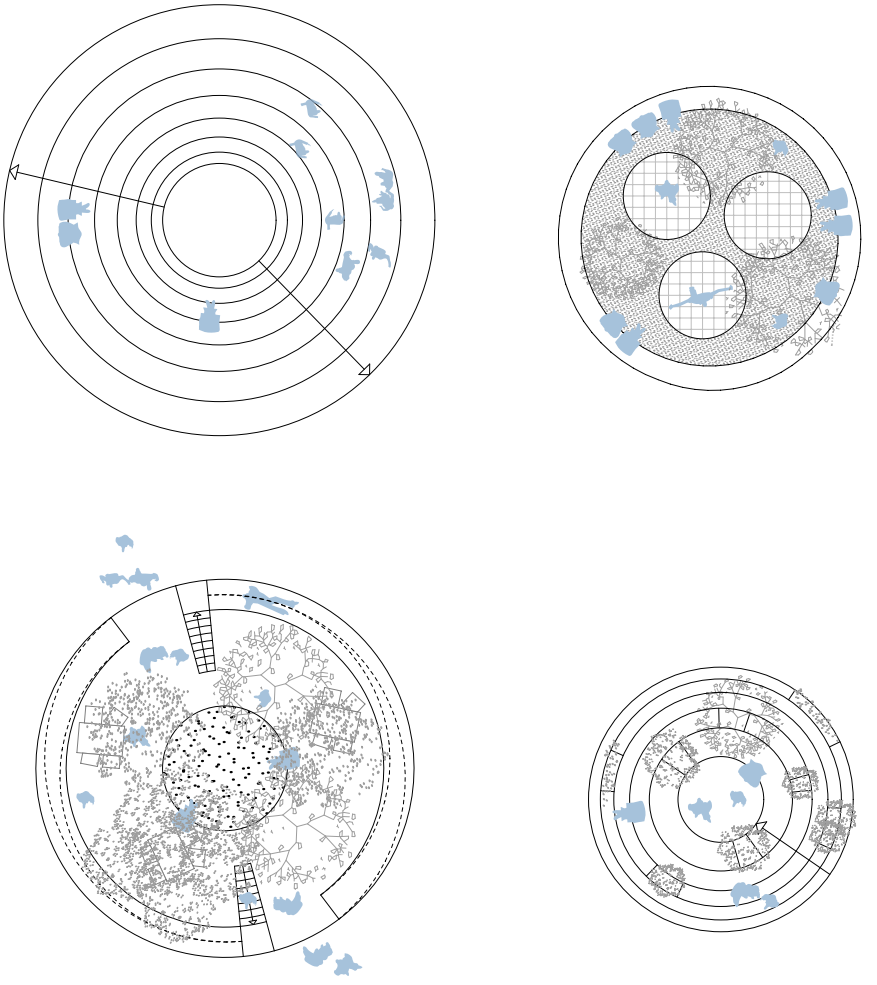


fig. 63: Water Game Places as sensory spots, scale 1:200

Playground Spots

as integrative parts of the City Quarter

Observing the existing functions on-site, different playground elements reappear within the circular morphology idea of the concept. They use balancing, jumping, sliding, or sandbox play and integrate them into the silhouette of a circle, to fit spacially to the rest of the project elements, but also to emphasize the narrative of body movement and activation on an informal level. (fig. 64)



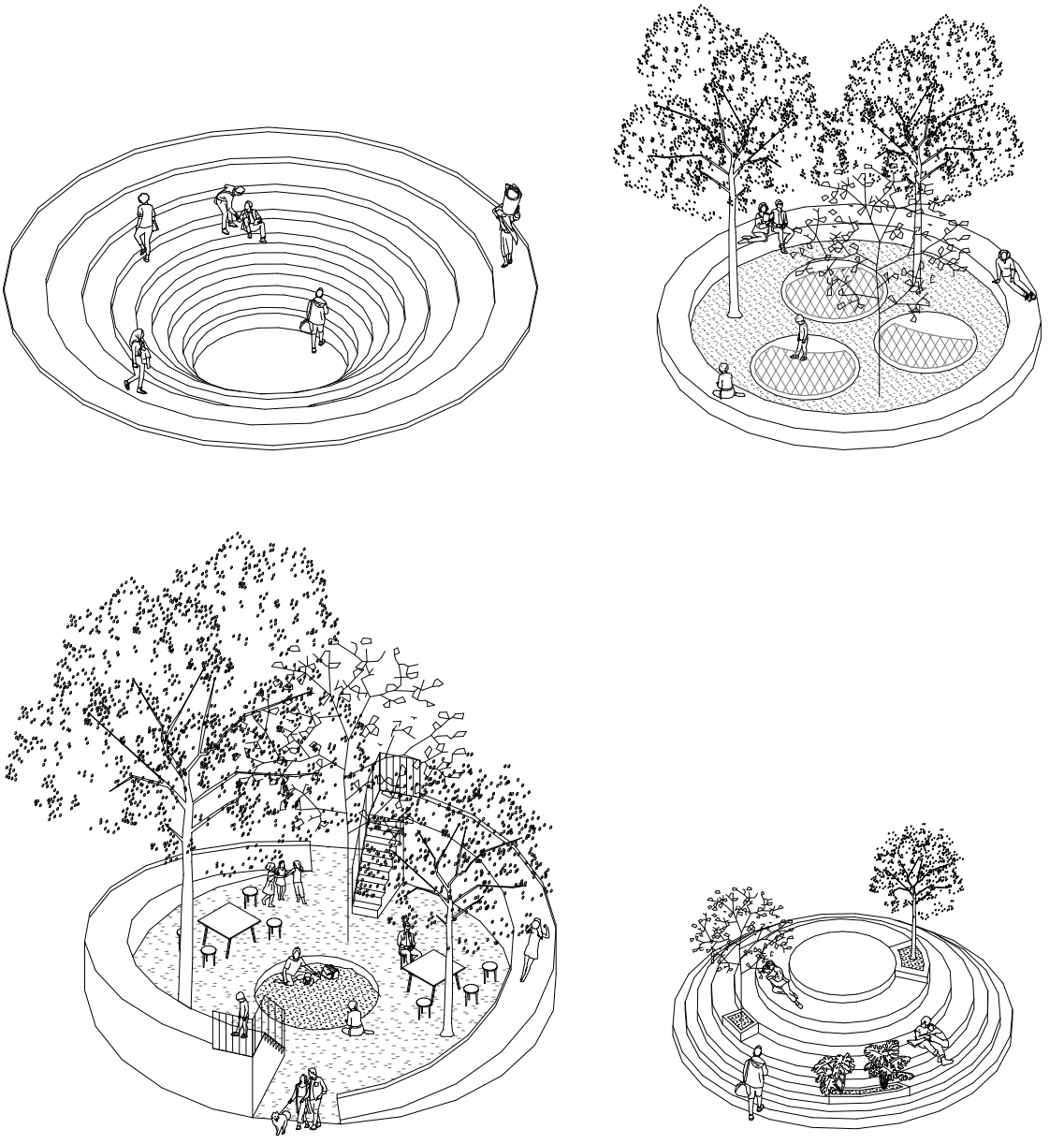
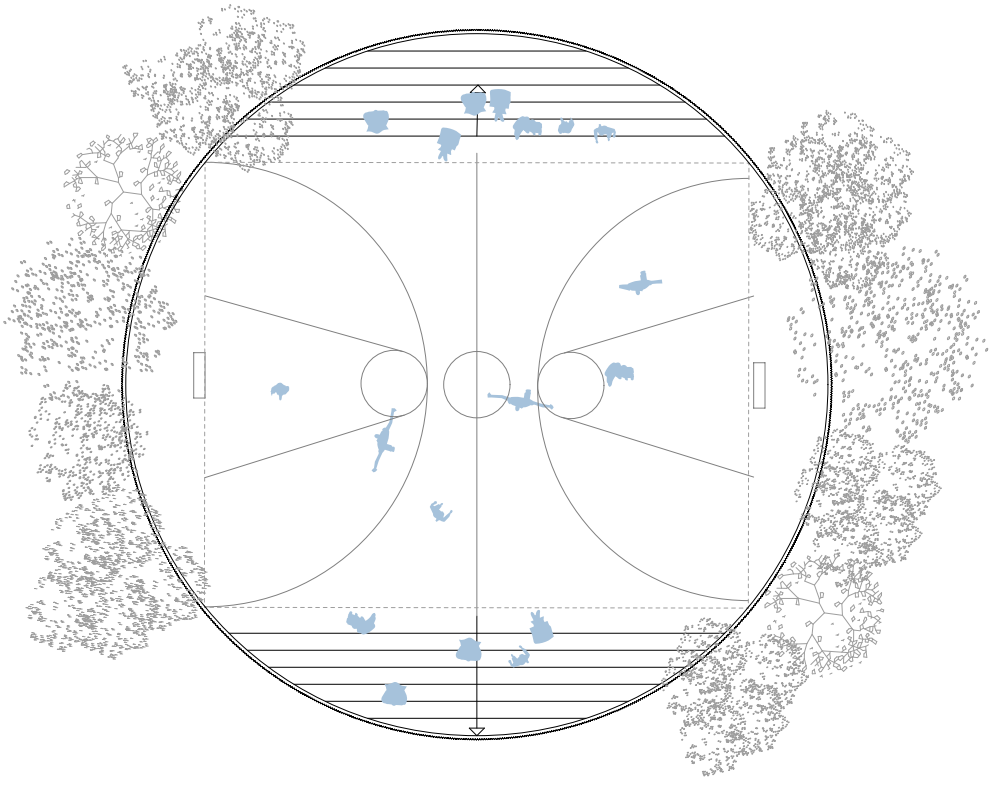


fig. 64: Playground Spots as integrative parts of the City Quarter, scale 1:200

Basketball Courts

as part of the Site Identity

Another existing element to reappear on site, are the basketball courts, which have now their bleachers to host visitors. Surrounded by a row of trees, inspired by the Memorial 22/3 they mark a place of activity and contemplation, depending on specific use. (fig. 65)



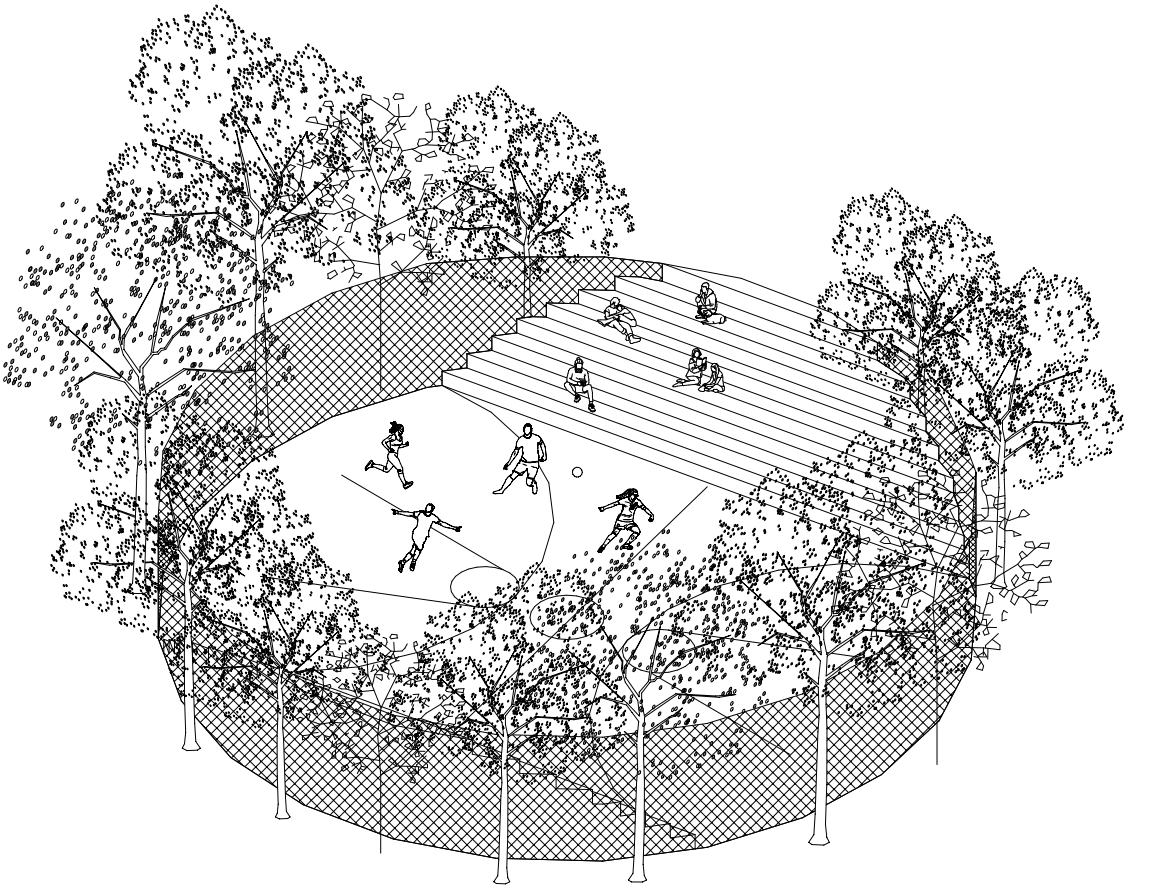


fig. 65: Basketball Courts as part of the Site Identity, scale 1:200

Architectural Concept and Site Appropriation

Site-specific prioritizing

keeping the value of the context

Cherishing the context is crucial. The only way for a project to be successful is to incorporate existing qualities of the site and embracing them as a part of the project agenda. Having in mind, that the path and the retaining walls are very distinct elements of the place and are responsible for the identity of the Donaukanal, one has to keep in mind, that they shall not be transformed radically. The existing paving stone floor is going to be a landscape design narrative and the staircases as found are also going to stay as they are - since they embrace the specific silhouette of the urban situation. (fig. 66)

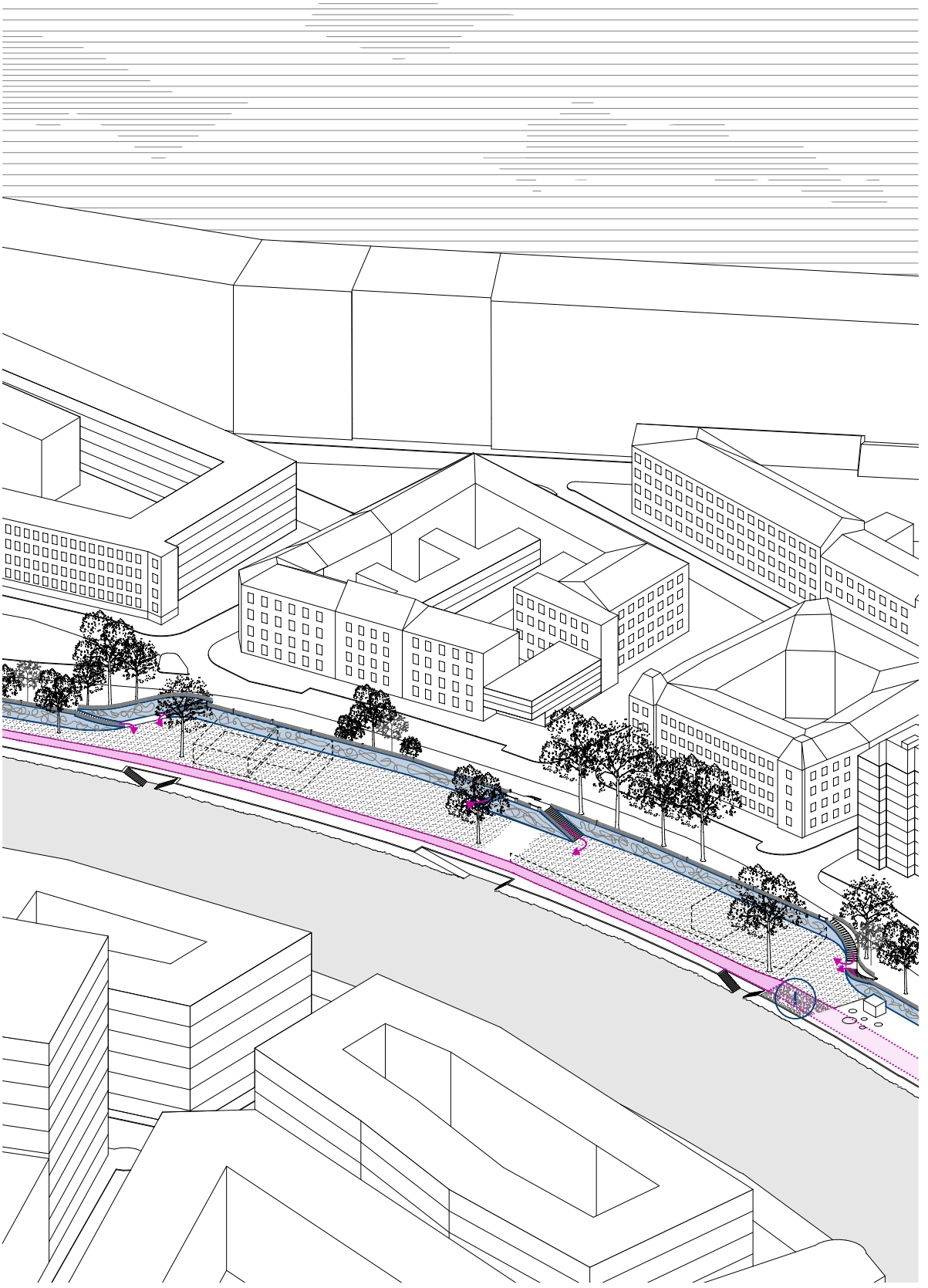


fig. 66: prioritize Site Features

Placement of designed Elements

emphasizing the potentials of the space

The placement of the previously designed elements of mental healthcare and leisure react to each other in size and arrangement. Bigger structures, such as the dance Movement Therapy Hall and the Basketball courts are rather on the edges of the site, while the smaller elements shape the in-between spaces towards the middle. Here the administrative building is positioned, which has direct access from both the promenade and the centra existing staircase from the street level. (fig. 67)

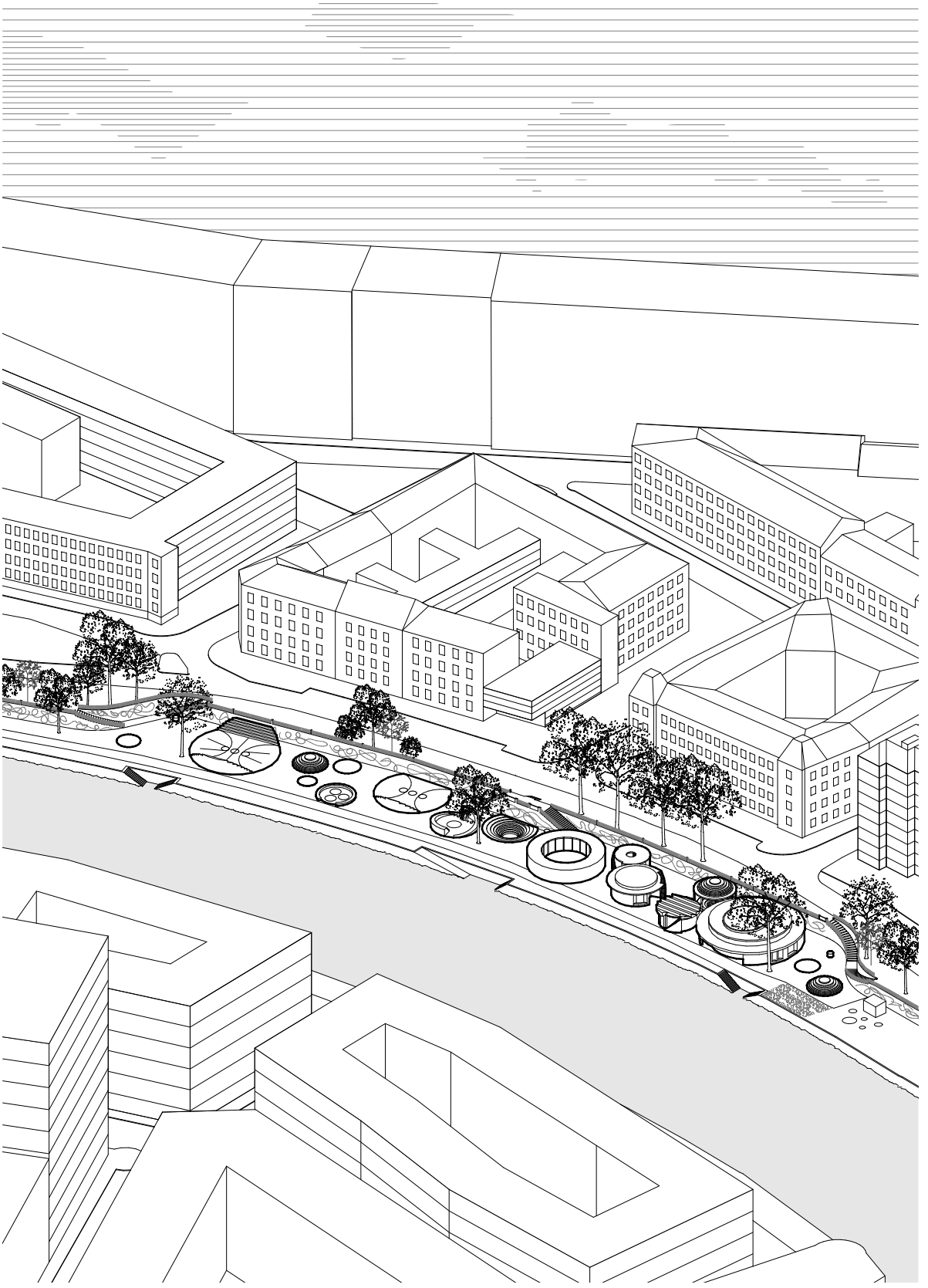


fig. 67: placement of Elements of Leisure and Mental Healthcare

Reshaping the Shore Silhouette

generating places, spots and patways

That specific arrangement of circular buildings and places leaves an imprint on the site's floor. Through the use of similar paving stone material as found on the site, a circular pattern animates for movement and reshapes partly the path of the promenade and the silhouette of the shoreline. Each paving surface that interferes with the path is an attention field for transpassing bikers to slow down, but also for pedestrian visitors to stop by. (fig. 68)

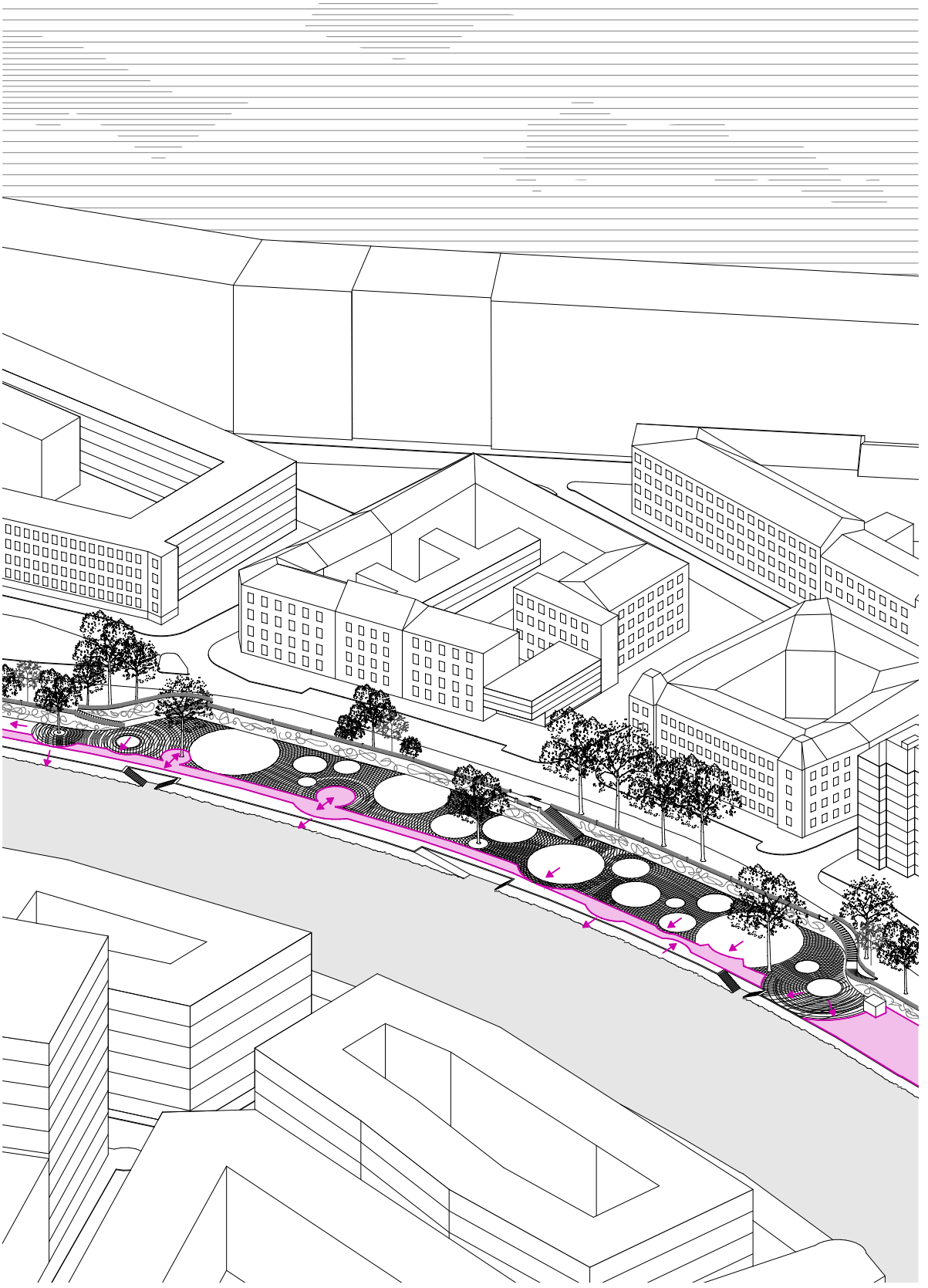


fig. 68: reorganizing the pathway structure, creating public spaces

Creating an artificial Landscape

stating the Function of the Oblique

The circular paving pattern and its intersections with each other offer the opportunity to incline certain surfaces where needed. In this sense, the navigation on-site is intersected with an artificial landscape that calls out the agenda of oblique functions and all its body-demanding perks to trigger embodied emotion. (fig. 69)

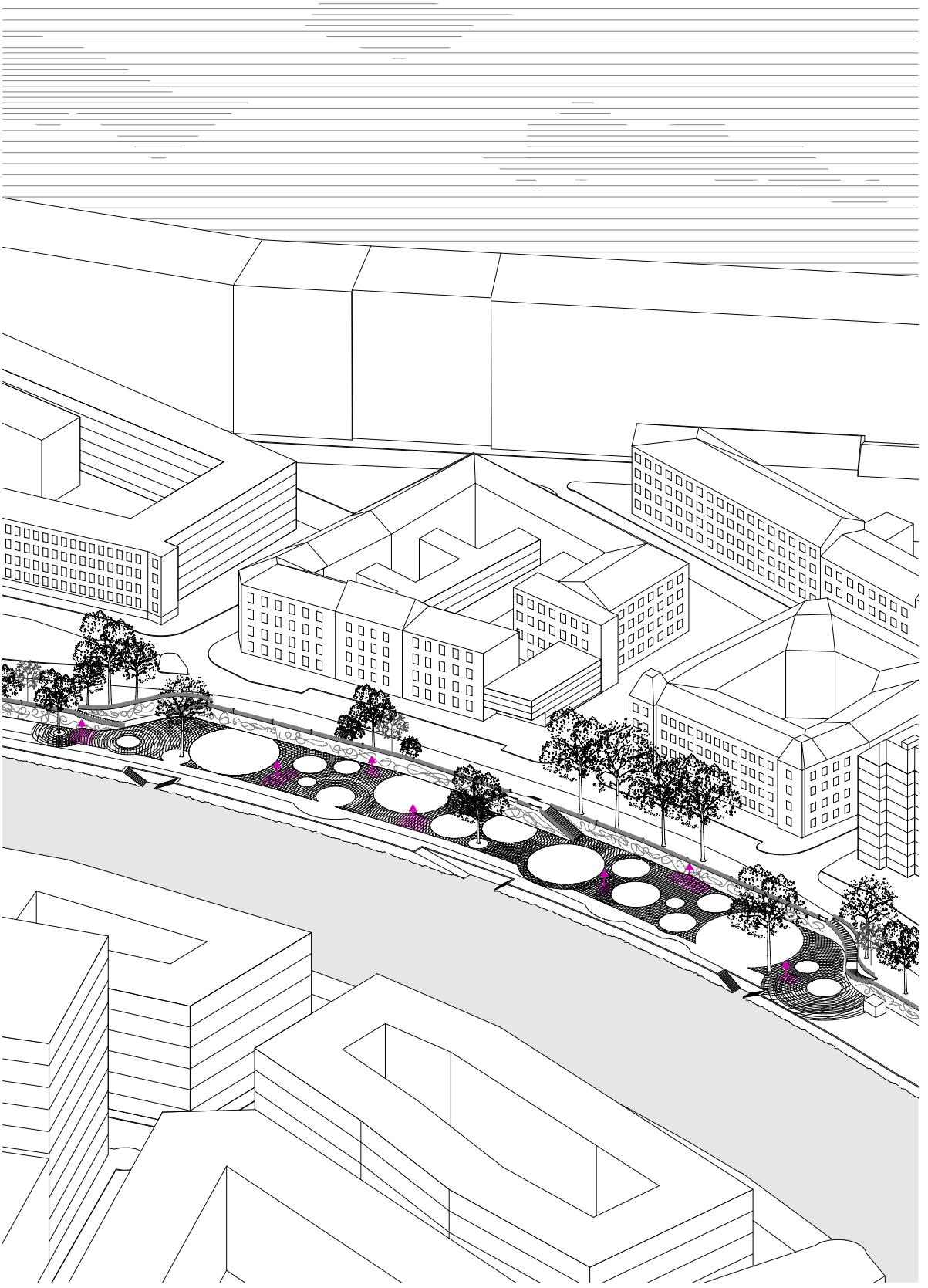


fig. 69: creating an artificial Landsape

Appropriate Architecture to Site

providing qualitative, public spaces

Looking back to the placed architectural elements, they now react to the site specificities, in order to provide new accesses from street to promenade (1), new reactions to existing accesses (2), and a viewing platforms (3). A variety of railings mimics either the mesh cage of the newly designed basketball courts or the existing railing above the retaining walls.
(fig. 70)

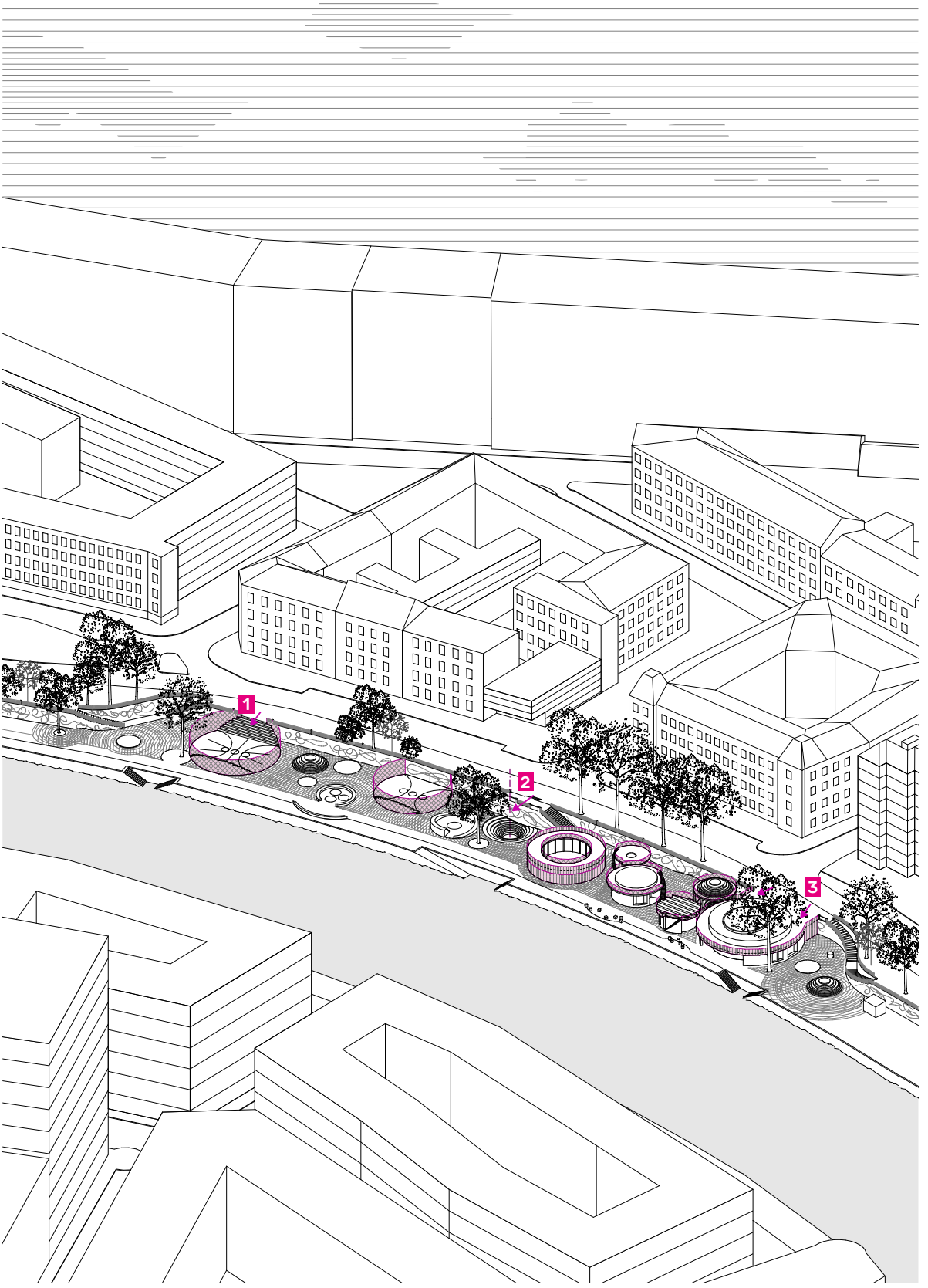


fig. 70: appropriate Architectue to the Site

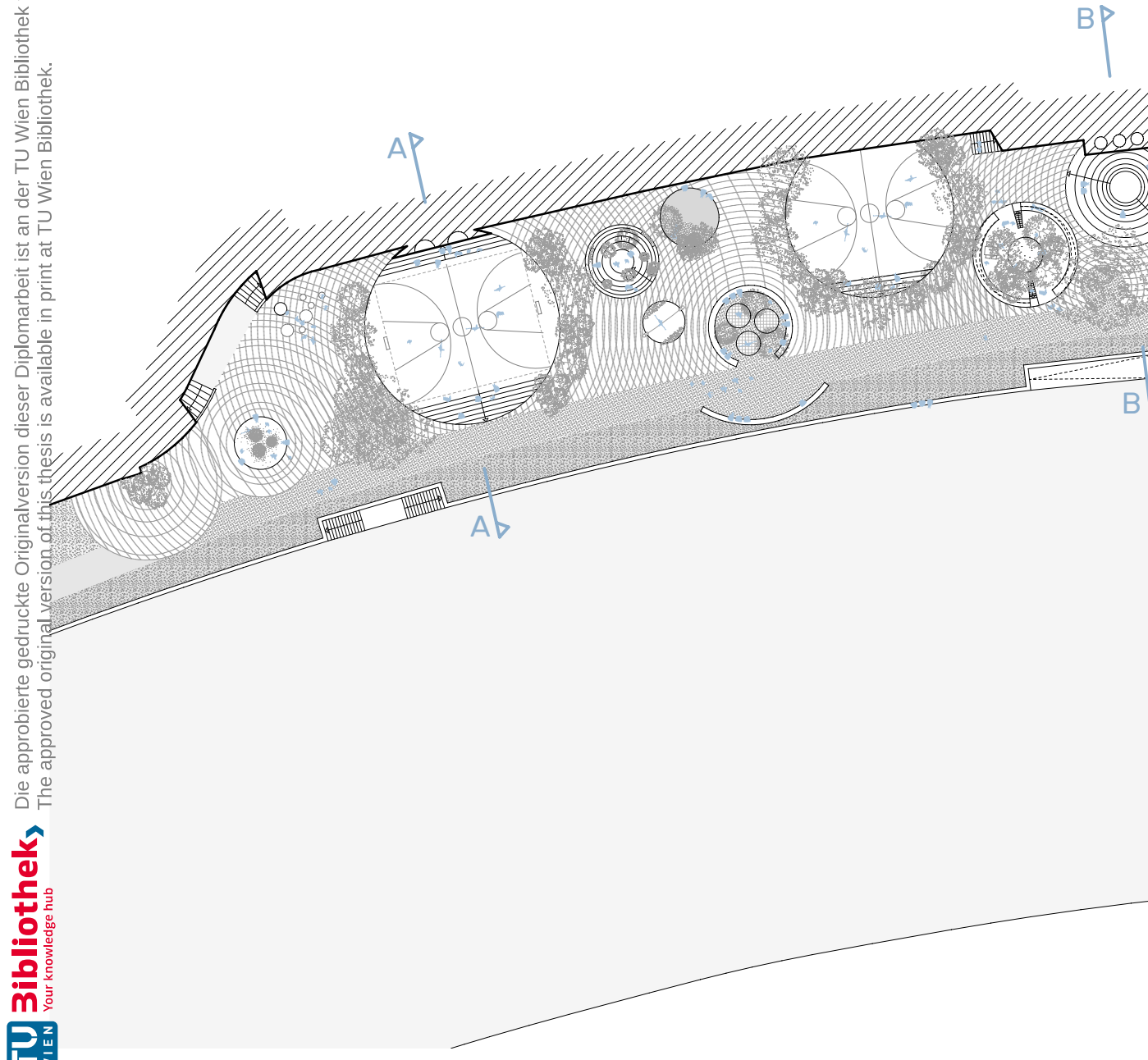
Cultivation of Green Spaces

cooling the City Part down

All the green roofs on each architectural element perform as singular public gardens, places of contemplation and interaction. Specific positioning of trees and grasses emphasizes the spacial quality and ecological importance of the spots. (fig. 71)

fig. 71: cultivation of Green Spaces

River Promenade Level



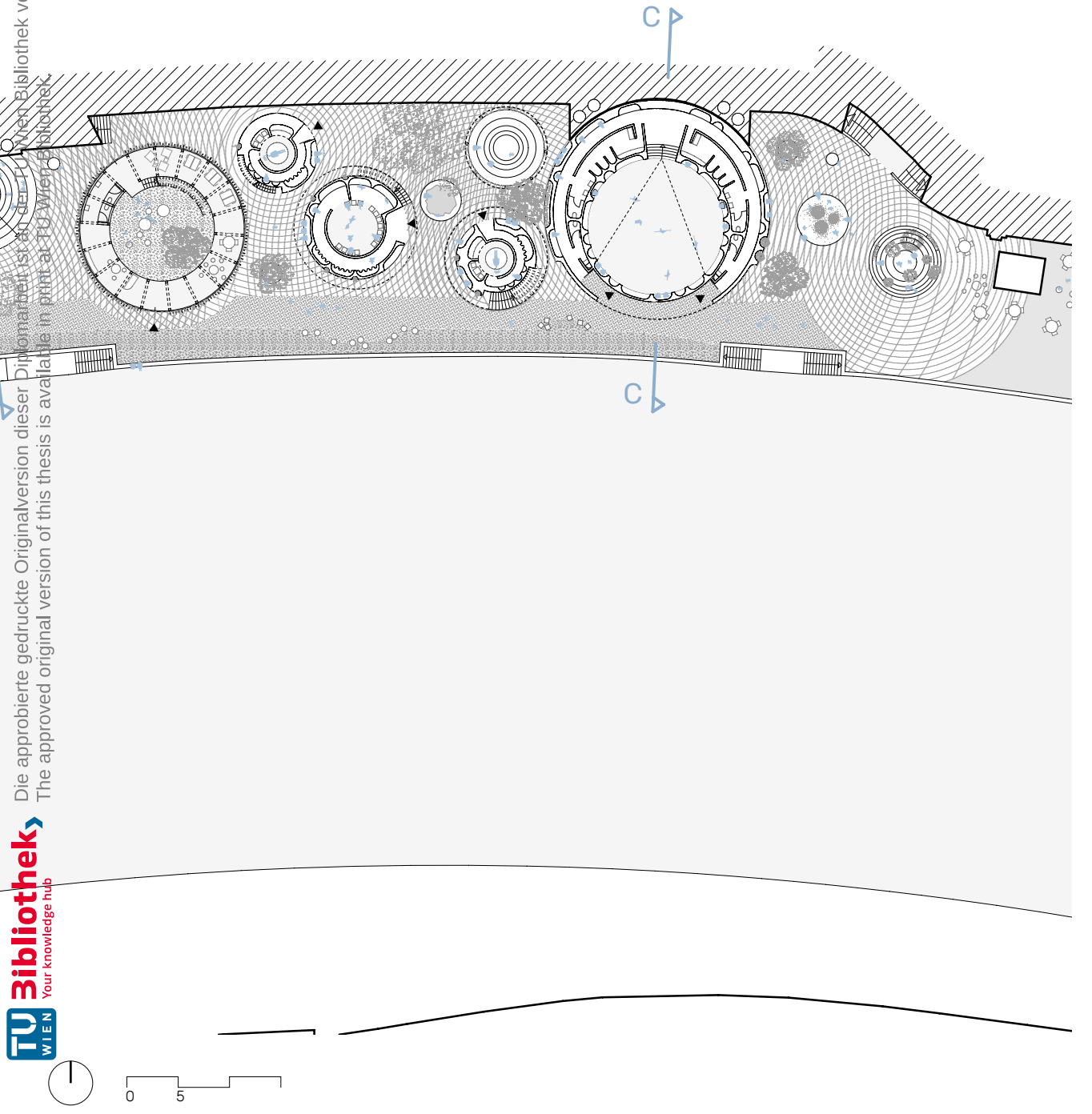
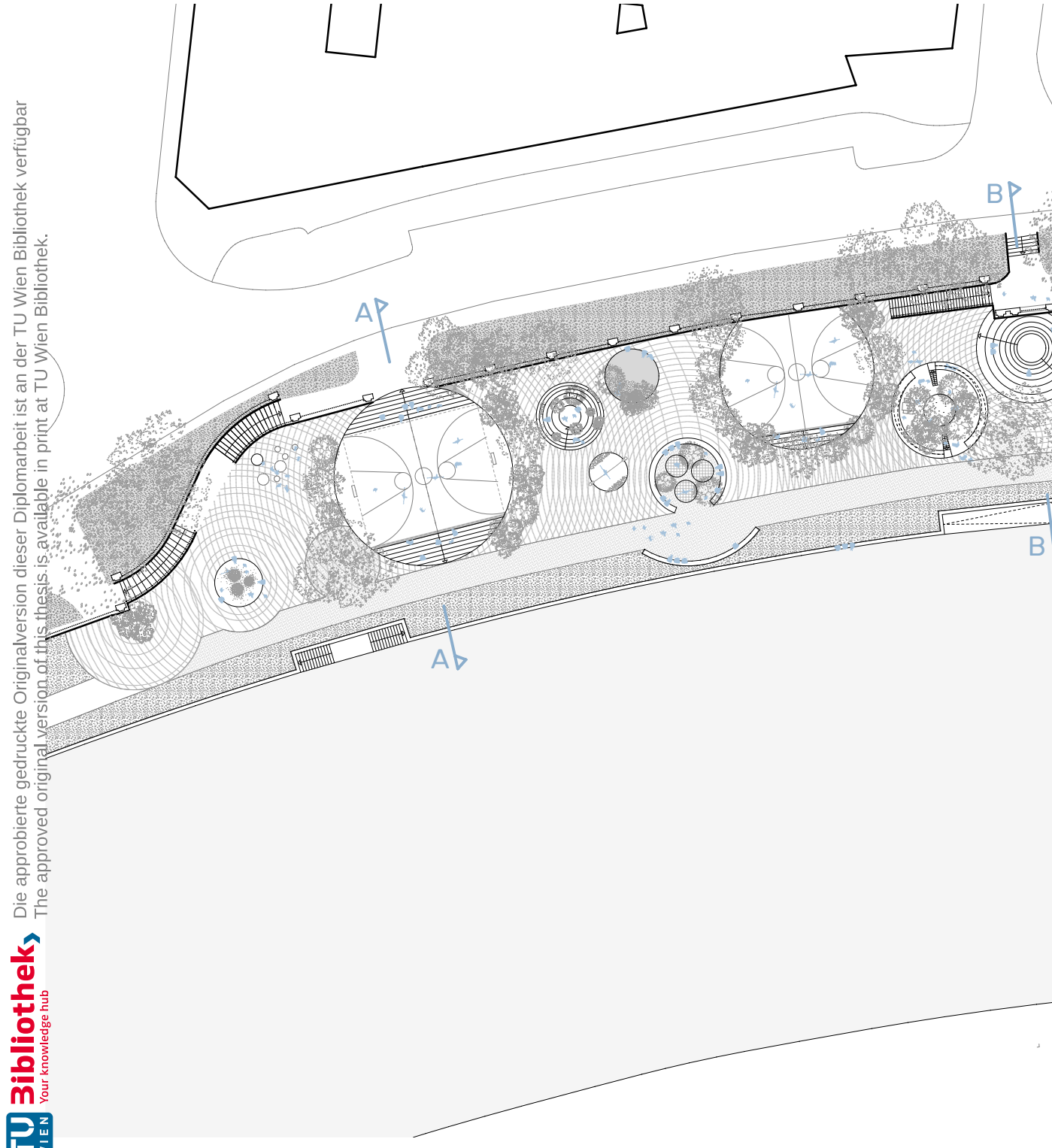


fig. 72: floor plan of the Therapy Garden Donaukanal, River Promenade Level, scale graphically attached

Urban Street Level



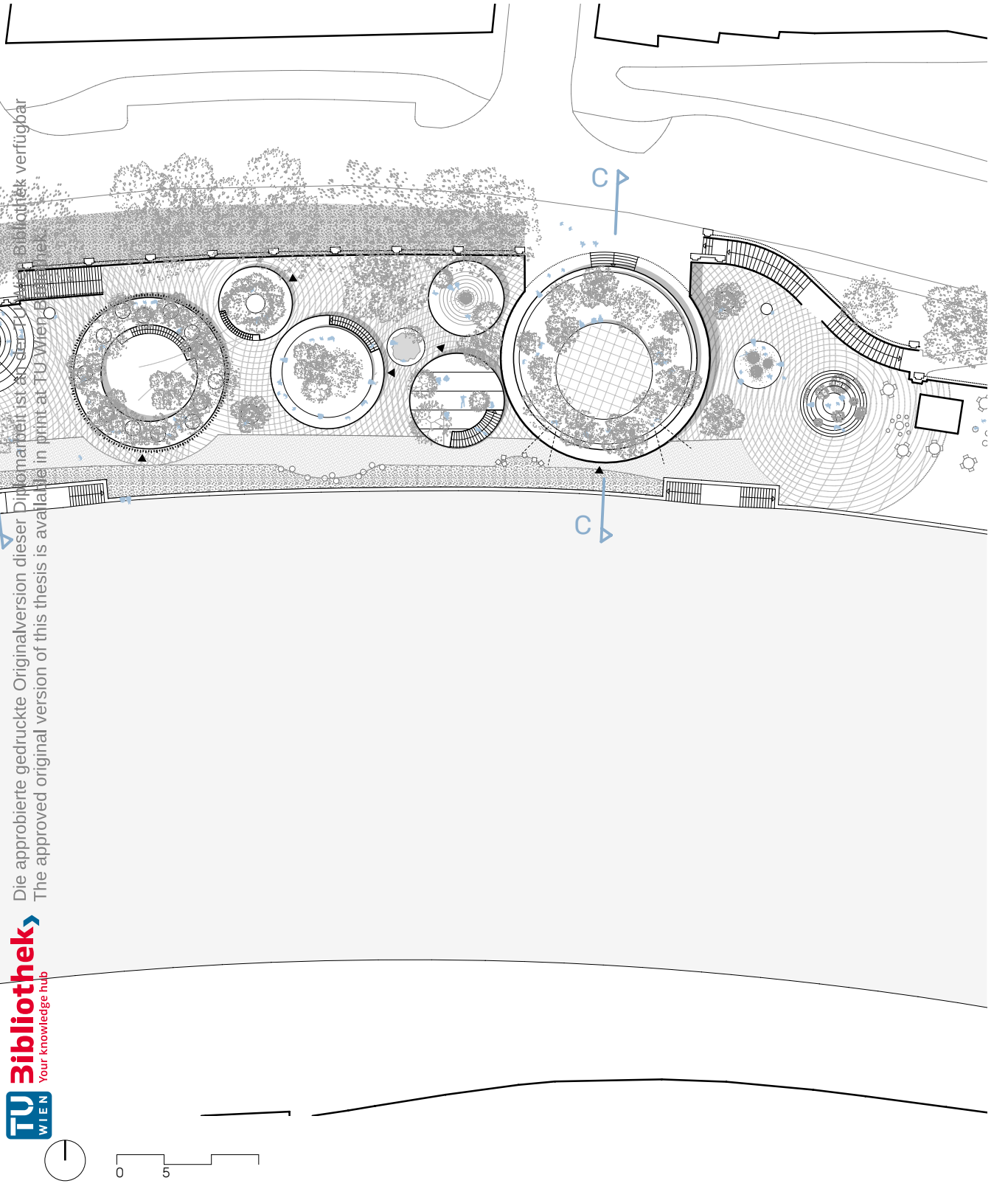
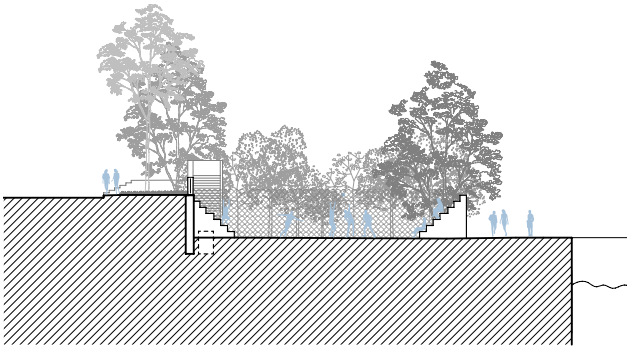


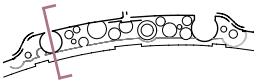
fig. 73: floor plan of the Therapy Garden Donaukanal, Urban Level, scale graphically attached

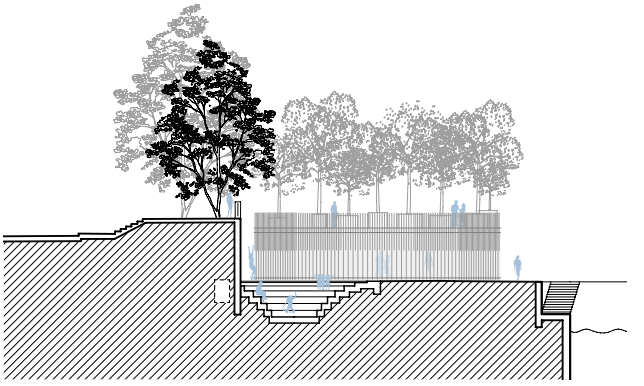
new relations between city and promenade

Through the intersection of newly designed structures and exiting retaining walls at the site, new opportunities for access from street to river promenade are generated. (fig. 74)

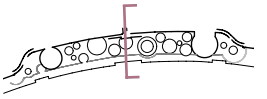


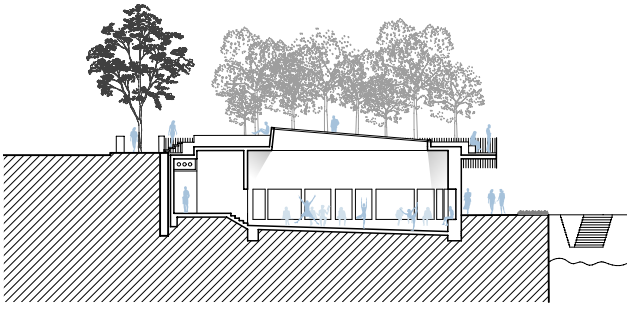
Section A





Section B





Section C

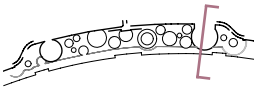


fig. 74: sections of new accesses to the Site, scale 1:500

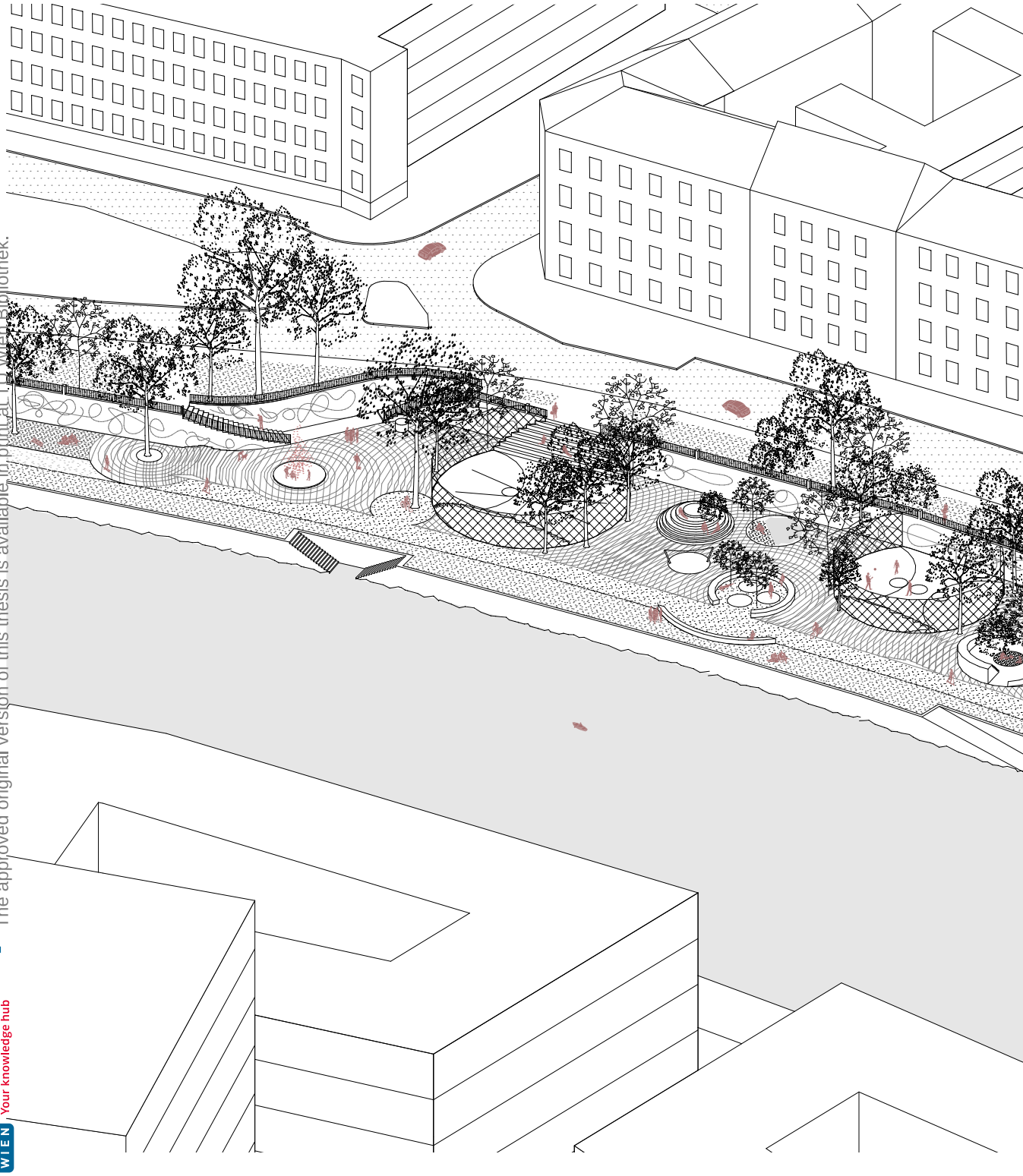


fig. 75: axonometric projection of the whole Therapy Garden

Materiality and Construction

One structural Agenda

circular isolating concrete structures with extensive green roofs

All therapy buildings are constructed in the same way:
A monolithic circular structure out of different layers of washed-out concrete types is pigmented in a beige color scheme through the use of different sandstone aggregates. Concerning the human proportion and the sensory areas of the body, the various haptic layers also define a proportioned outer facade pattern, that follows the whole curvilinear silhouette. Adding insulating materials to the concrete mixture and over-dimensioning the thickness of each wall, allows the structure to be a monolithic, yet isolated building shell.
The roofing is mostly a plain concrete ceiling with a warm roof insulation system and a variety of extensive green roofs, housing specific types of greenery and small trees - depending on the diameter of the rooftops and the thickness of the extensive greening granulate layer. (fig. 76)

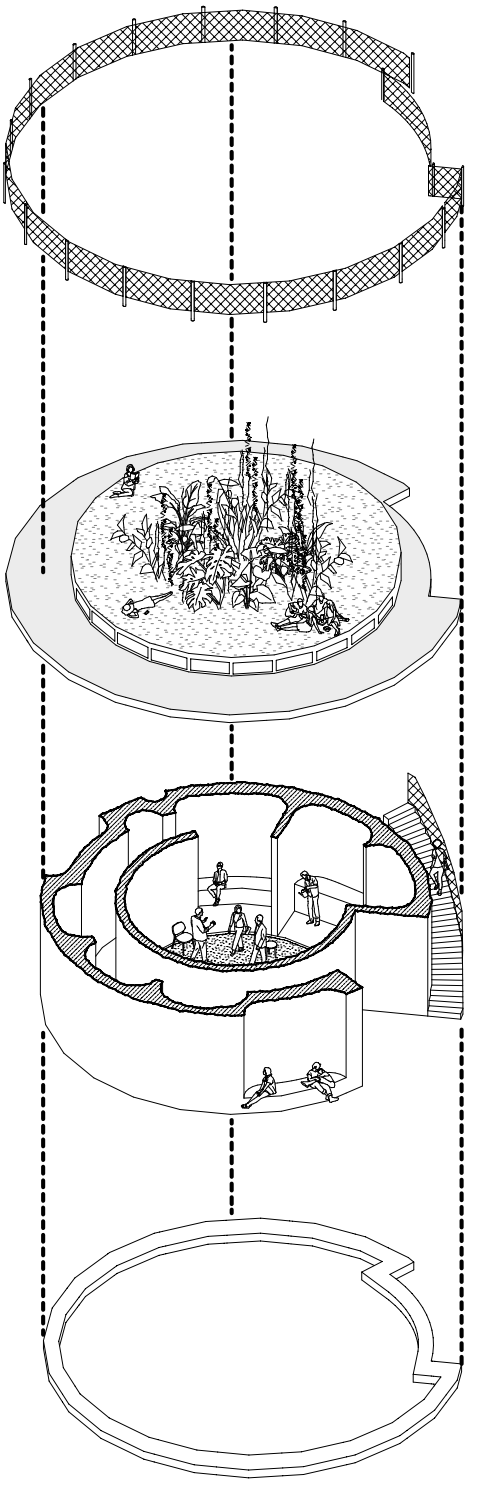


fig. 76: structural scheme of the architectural elements

In order to understand the behavior of different grain sizes of washed-out concrete in a curve-linear surface, prototype models provided clarity on that topic. Sandstone gravel, beige quartz crystals, and basalt flints add different dimensions to the wall surface and cast a multiplicity of shadows along the facade. (fig. 77)

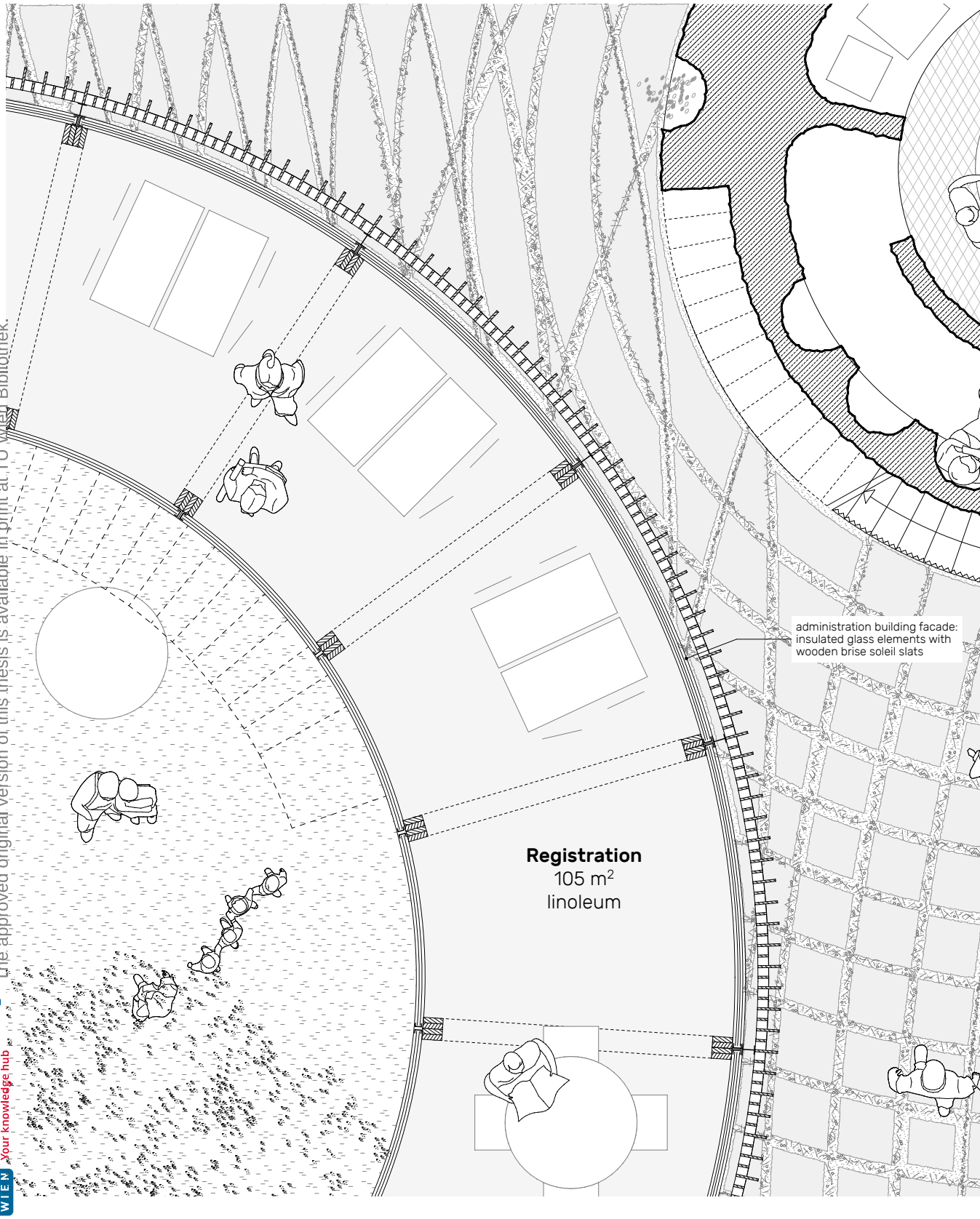
behaviour in a curvelinear surfaces

beige quartz crystal

sandstone gravel

basalt flinths

fig. 77: study of surfaces and their realtion to therapy use



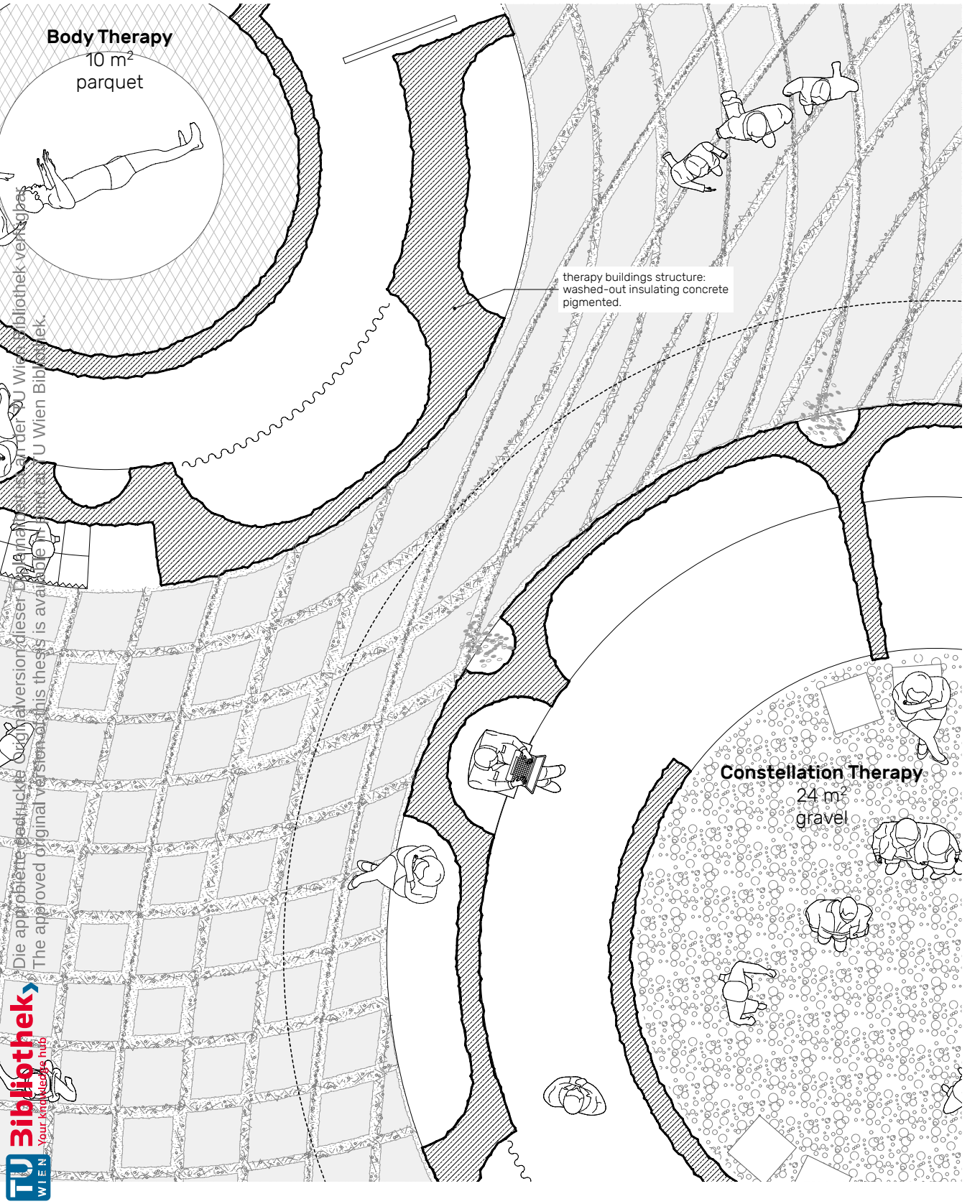


fig. 78: a project sequence as an execution plan, scale 1:50

Constellation Therapy Space

washed out concrete, gravel flooring

Not only the use of an inclined floor surface but also the use of certain materials, such as mere loose gravel flooring sets the body under constant posture regulation and emphasizes the body-mind integrated agenda of the Constellation Therapy. (fig. 79)

fig. 79: collage of the Constellation Therapy Space

Body Psychotherapy Chamber

washed out concrete, parquet flooring

Through being mostly barefoot during Body Psychotherapy, a different demand is set to the flooring here. Wooden parquet marks the center of the therapy room, while the patient is lying down, facing the clouds and greenery through the skylight. (fig. 80)

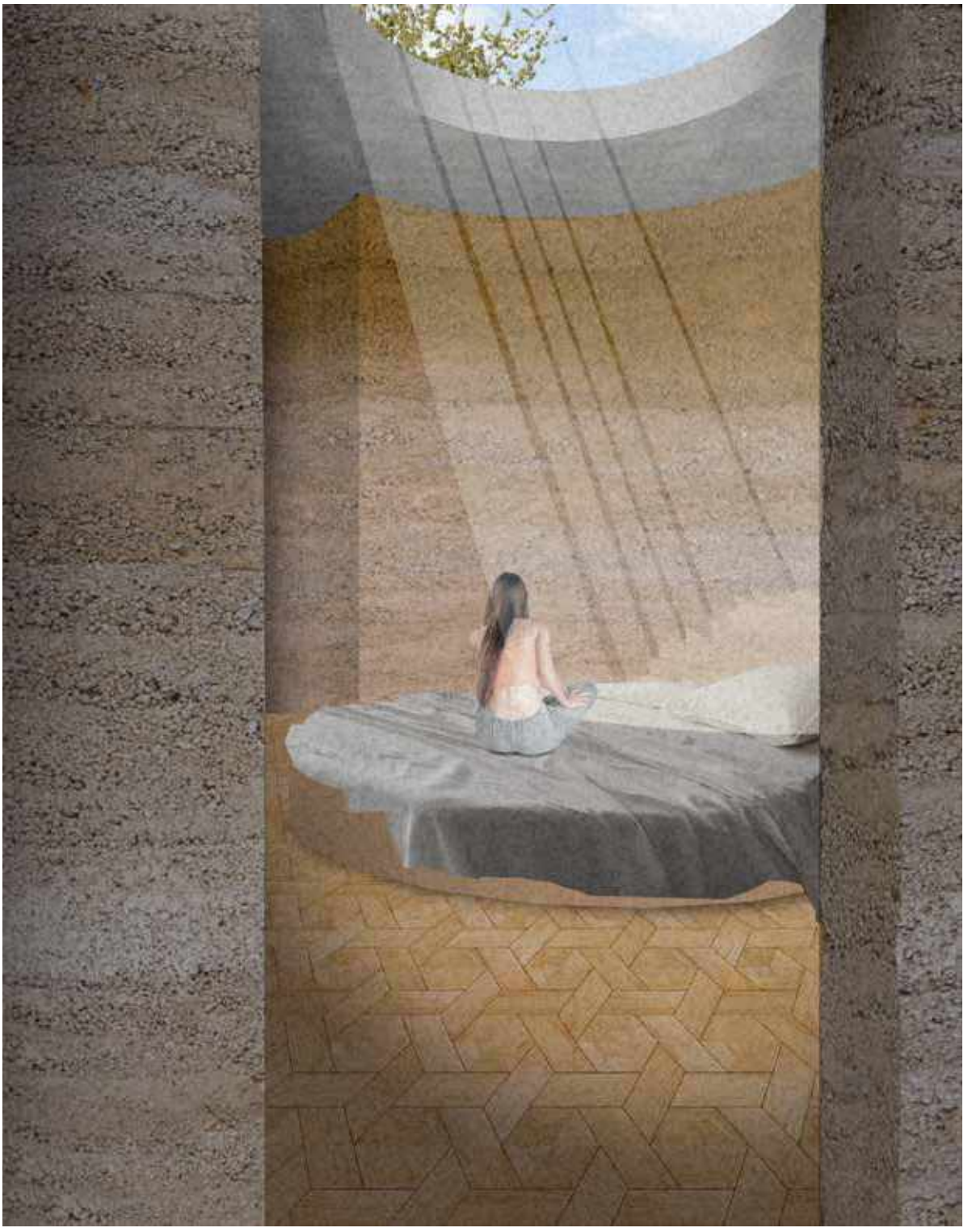


fig. 80: collage of the Body Psychotherapy Chamber

Dance Movement Therapy Hall

washed out concrete, terrazzo flooring

The giant hall asks for robust flooring for the use of dance movements - terrazzo. The pattern of the large-scaled terrazzo flooring reassembles the grain structure of the wall and the specific placement of joints reacts to the silhouette of the circular space. (fig. 81)

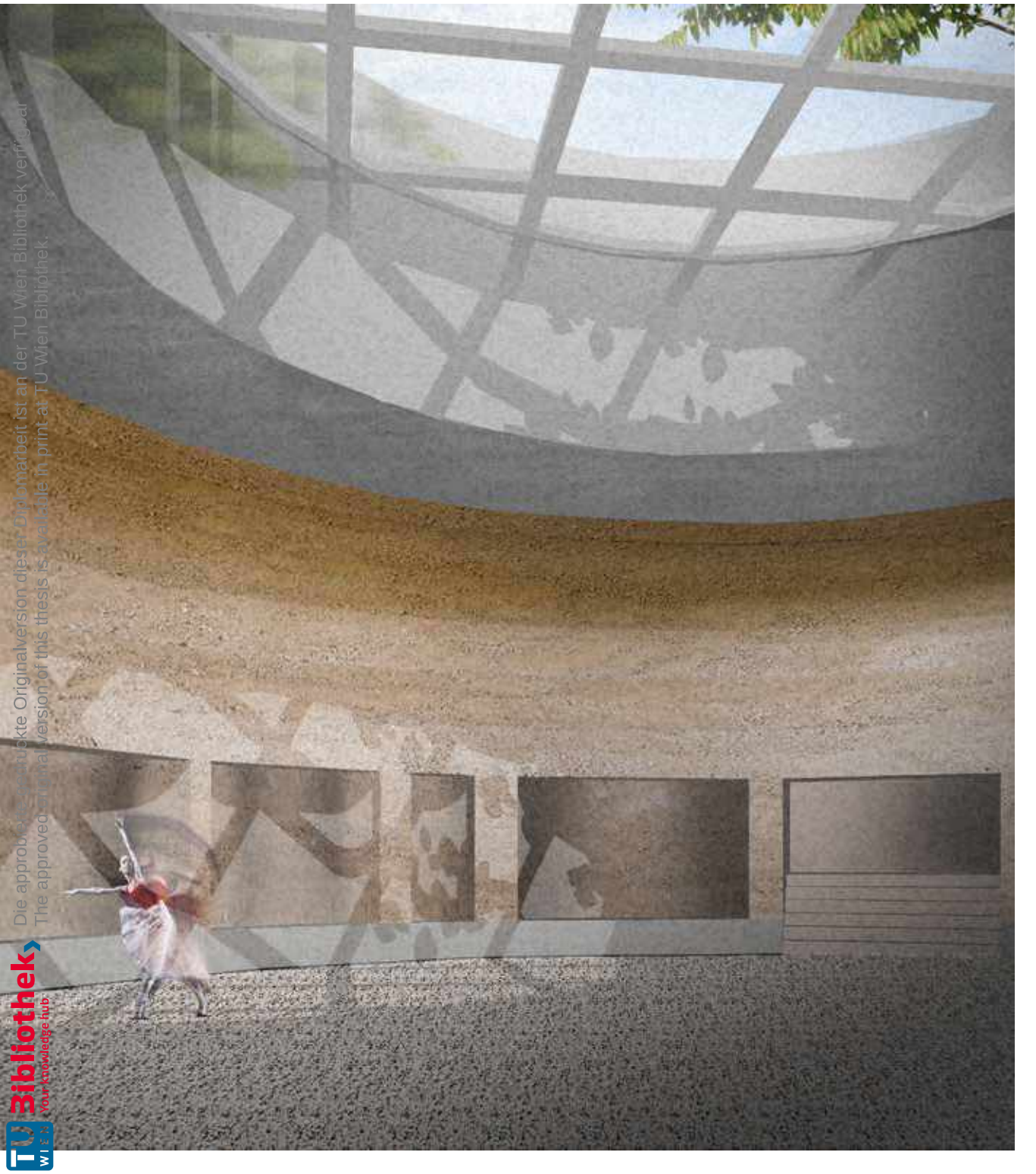


fig. 81: collage of the Dance Movement Therapy Hall

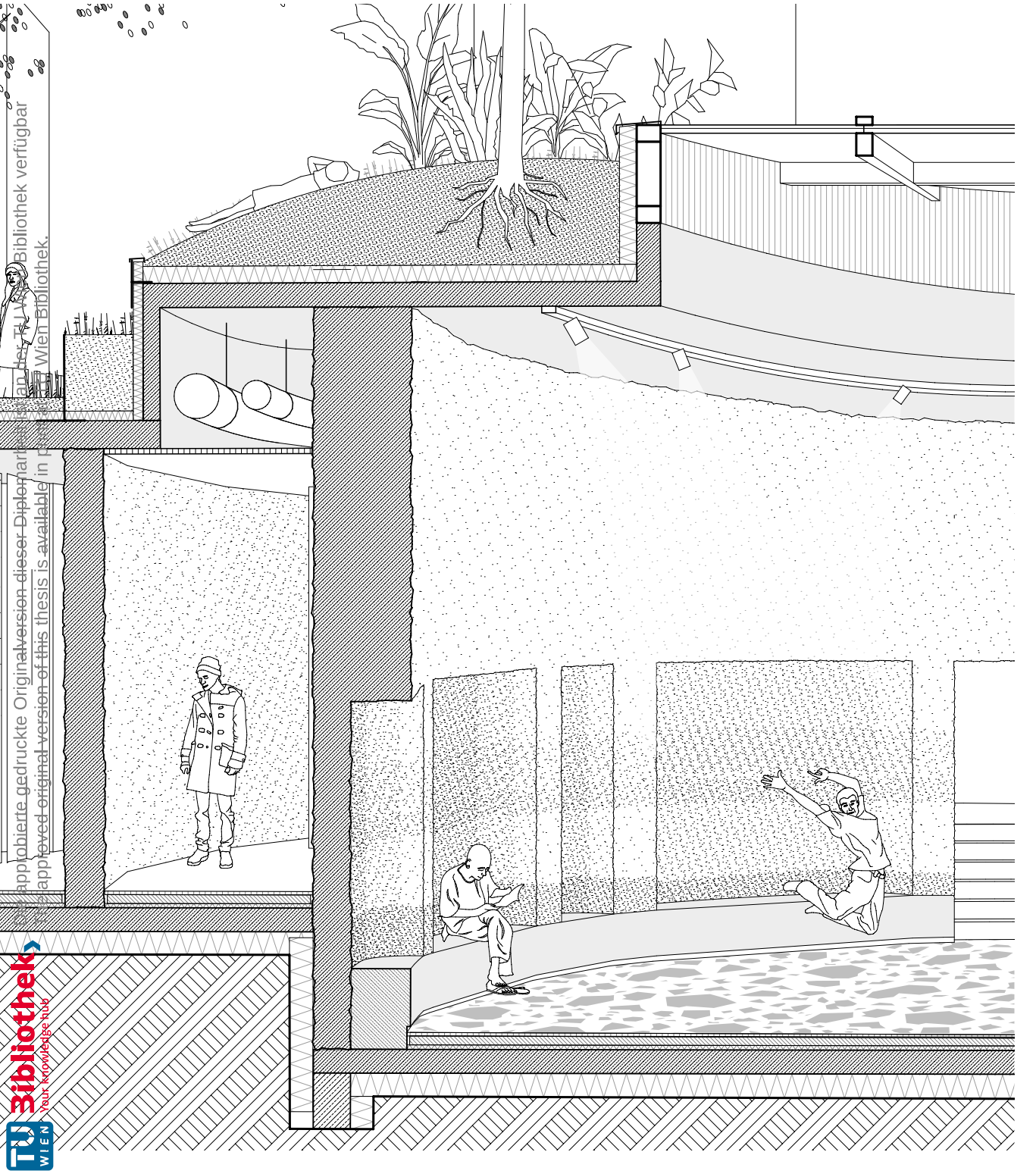


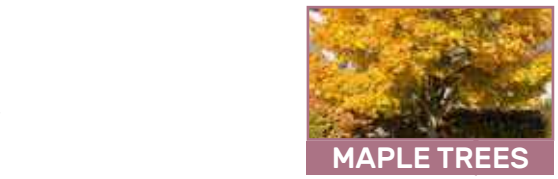
fig. 82: perspective section of the Dance Movement Therapy Hall, scale 1:50

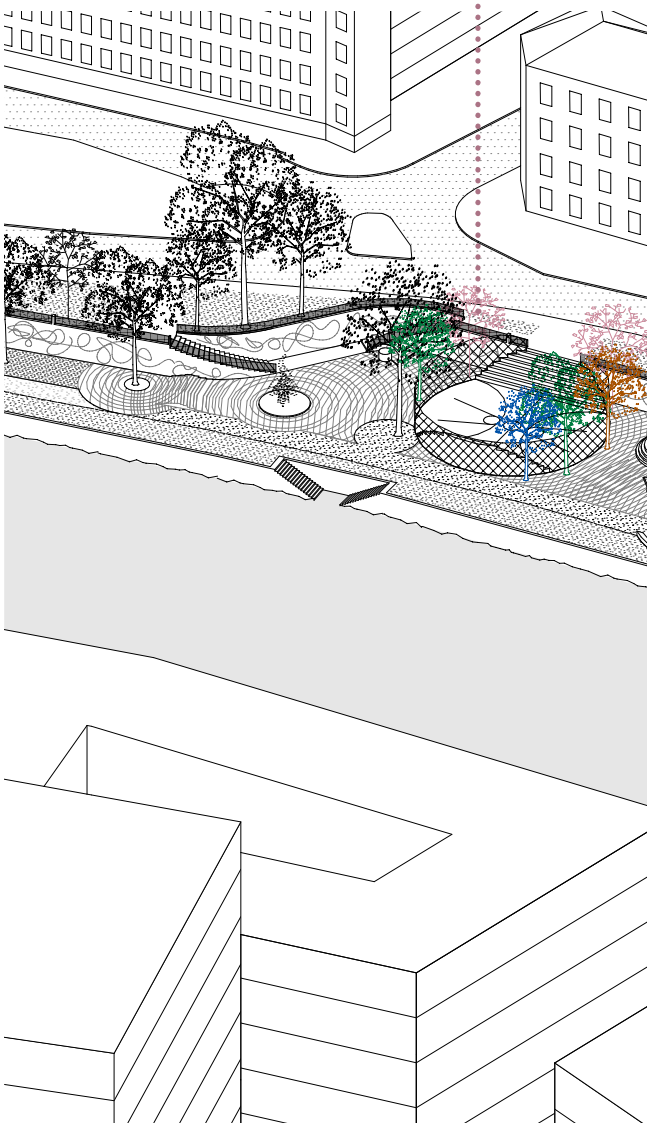
Landscape Design and green Space Concept

Biodiversity

a range of fauna and flora

Wether it is a big green circular space, allowing mid-scaled trees to be planted, or a smaller rooftop garden, providing a variety of grasses and flower types, biodiversity in the built environment is a crucial topic to take care of. Through the use of such different fauna and flora, the local ecosystem gets boosted up and bees and other important insects can benefit from that. The existing vegetation indicates, which type of trees, bushes and flowers do flourish in that specific city area and climate. (fig. 83)





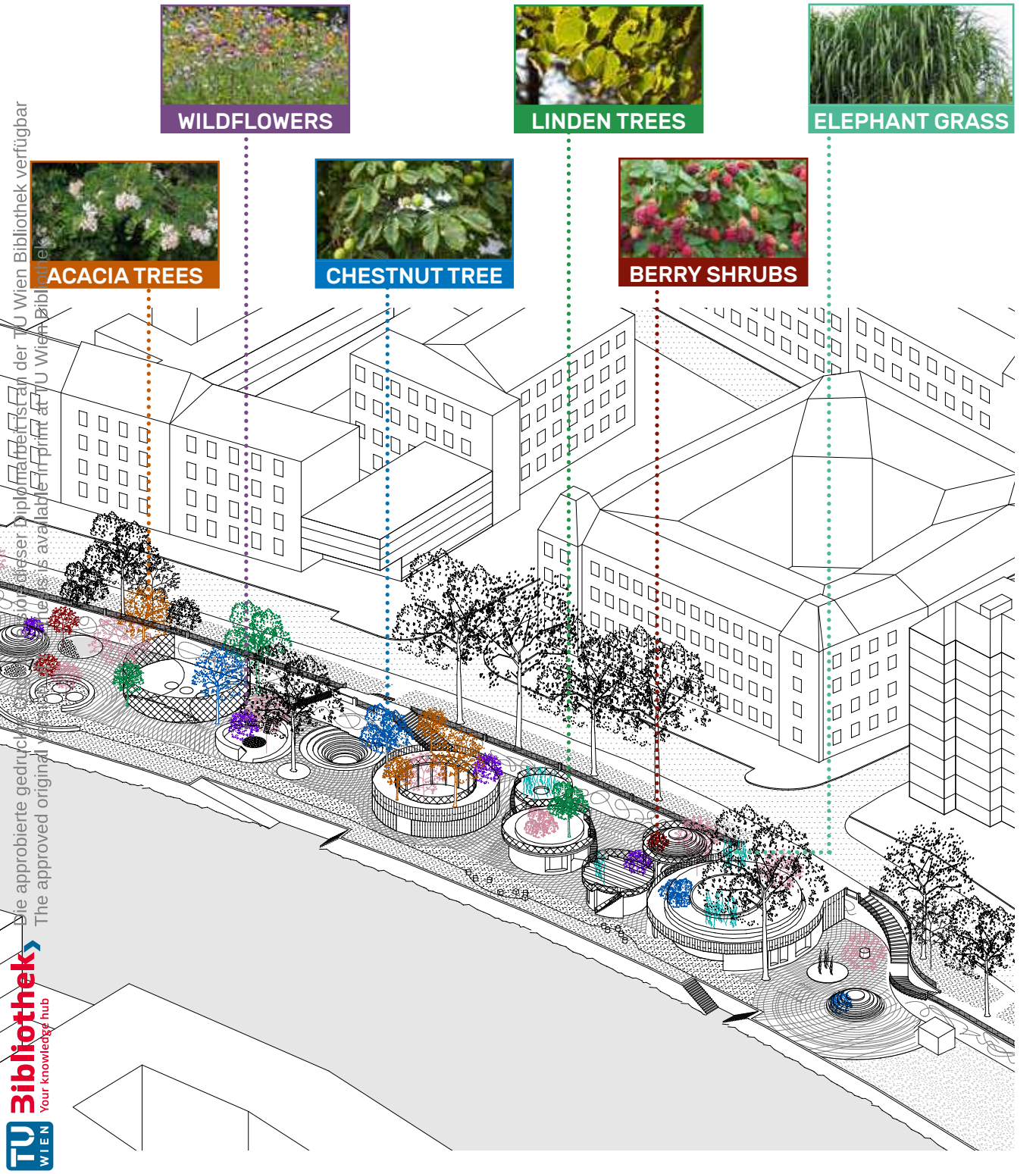
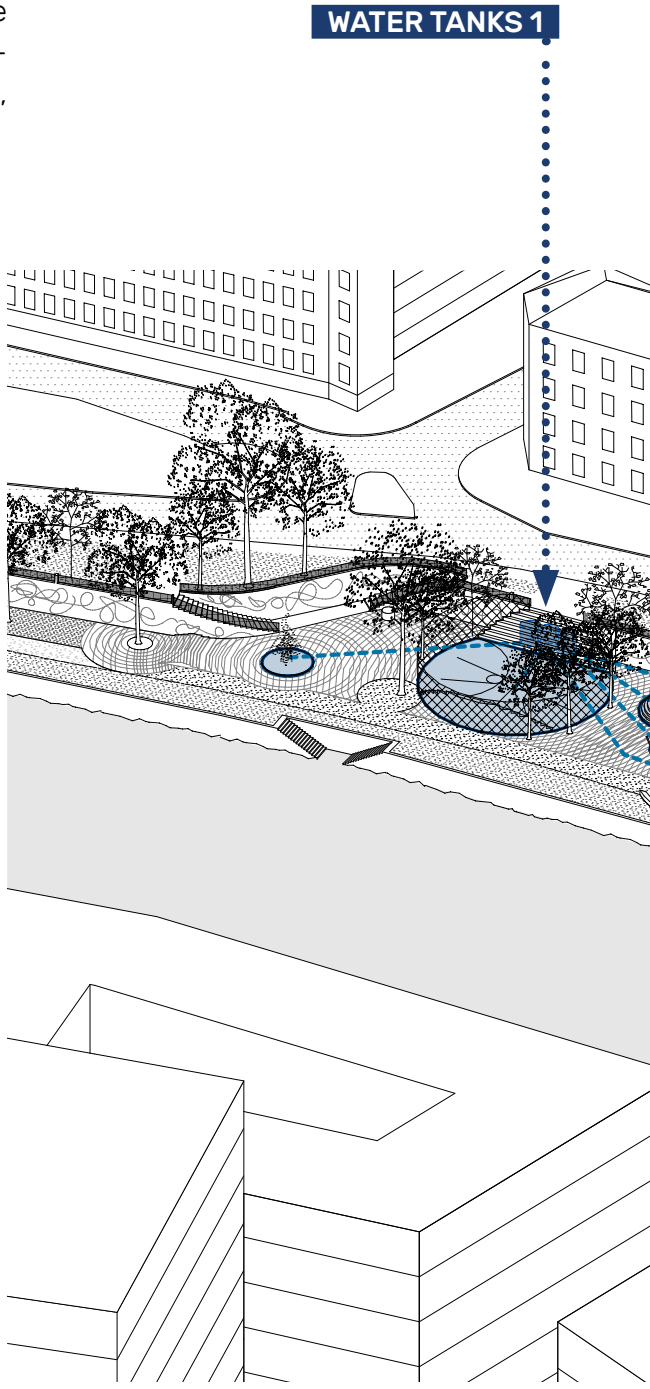


fig. 83: biodiversity of fauna and flora in the Therapy Garden

Water Harvesting System

for a sustainable water circulation

Three spots, partly within the newly designed structures, partly in the existing retained wall area, serve as water harvesting centers. The water from both, the paving stone floor and the public garden rooftops are collected to one of these three centers and get reused for irrigation of the plants - a small ecosystem, saving water for the local community. (fig. 84)



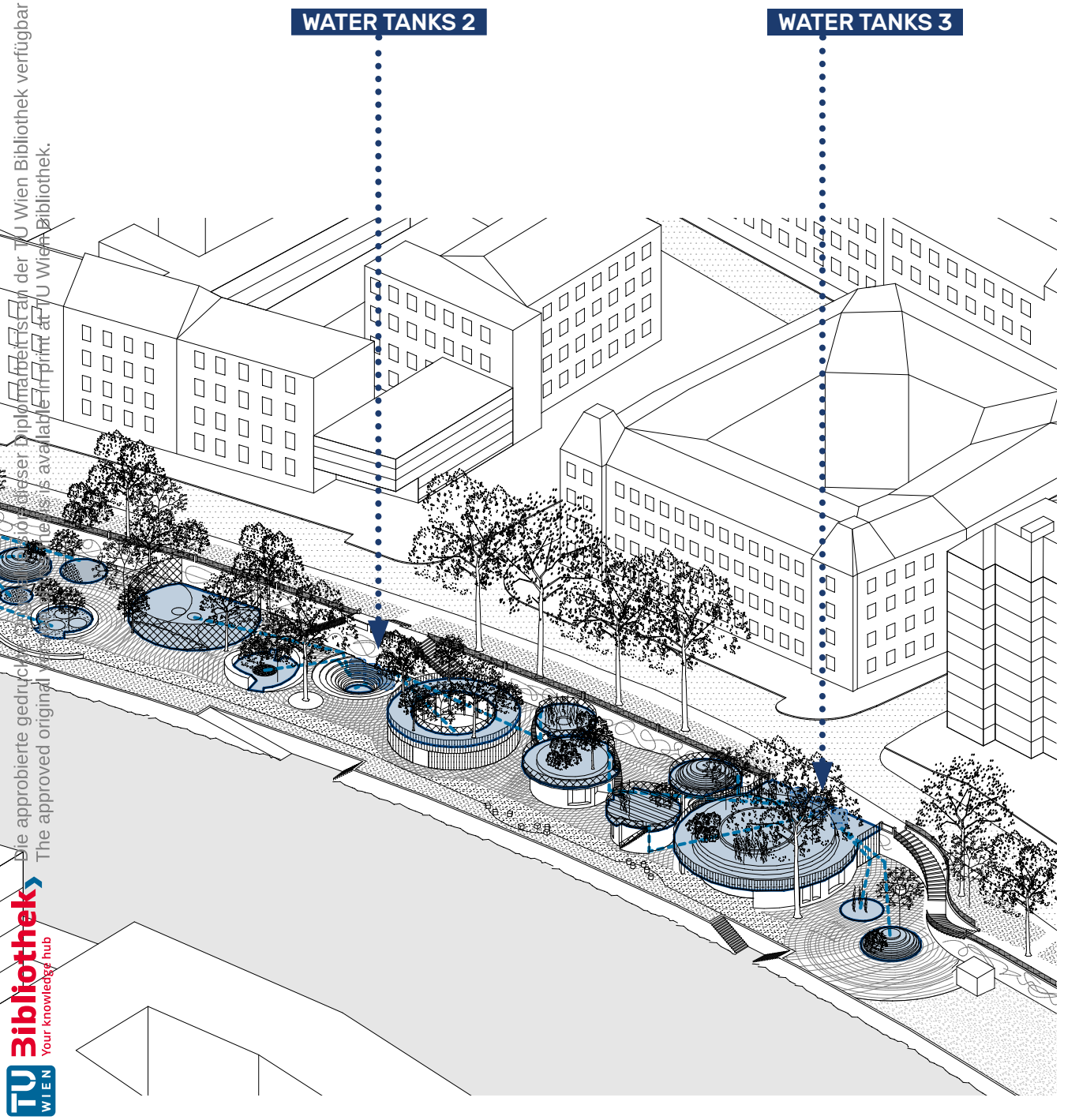
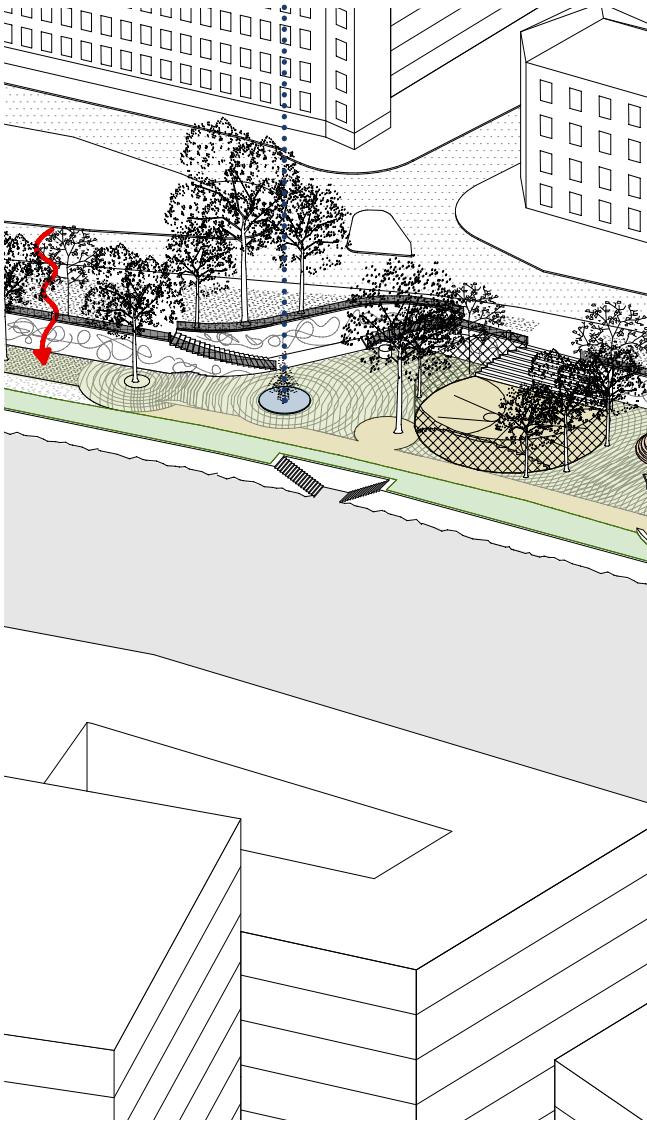


fig. 84: Water Harvesting System at the Therapy Garden

Urban Heat Reduction

cooling the City Part down

The sealing of a lot of surfaces in urban areas, also at the Donaukanal, does not only prevent the water from draining down but also represents a crucial factor for urban heat islands. The implication of water-bound ceilings, water-permeable floorings, such as the paving stone, and a vast number of trees and green spaces reduce the heating of the city quarter and regulate the local climate radically. (fig. 85)



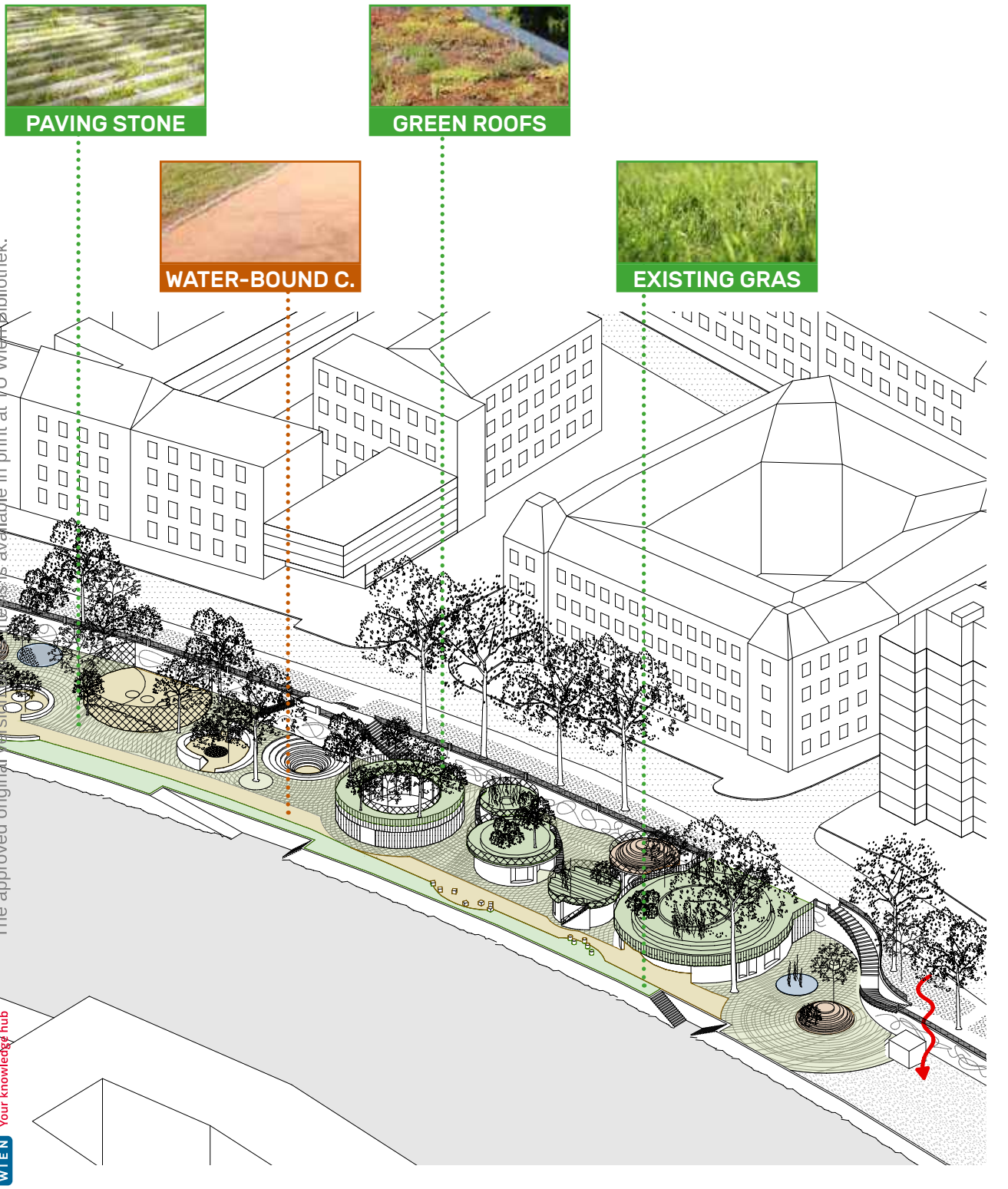


fig. 85: measures for urban heat reduction at the Therapy Garden

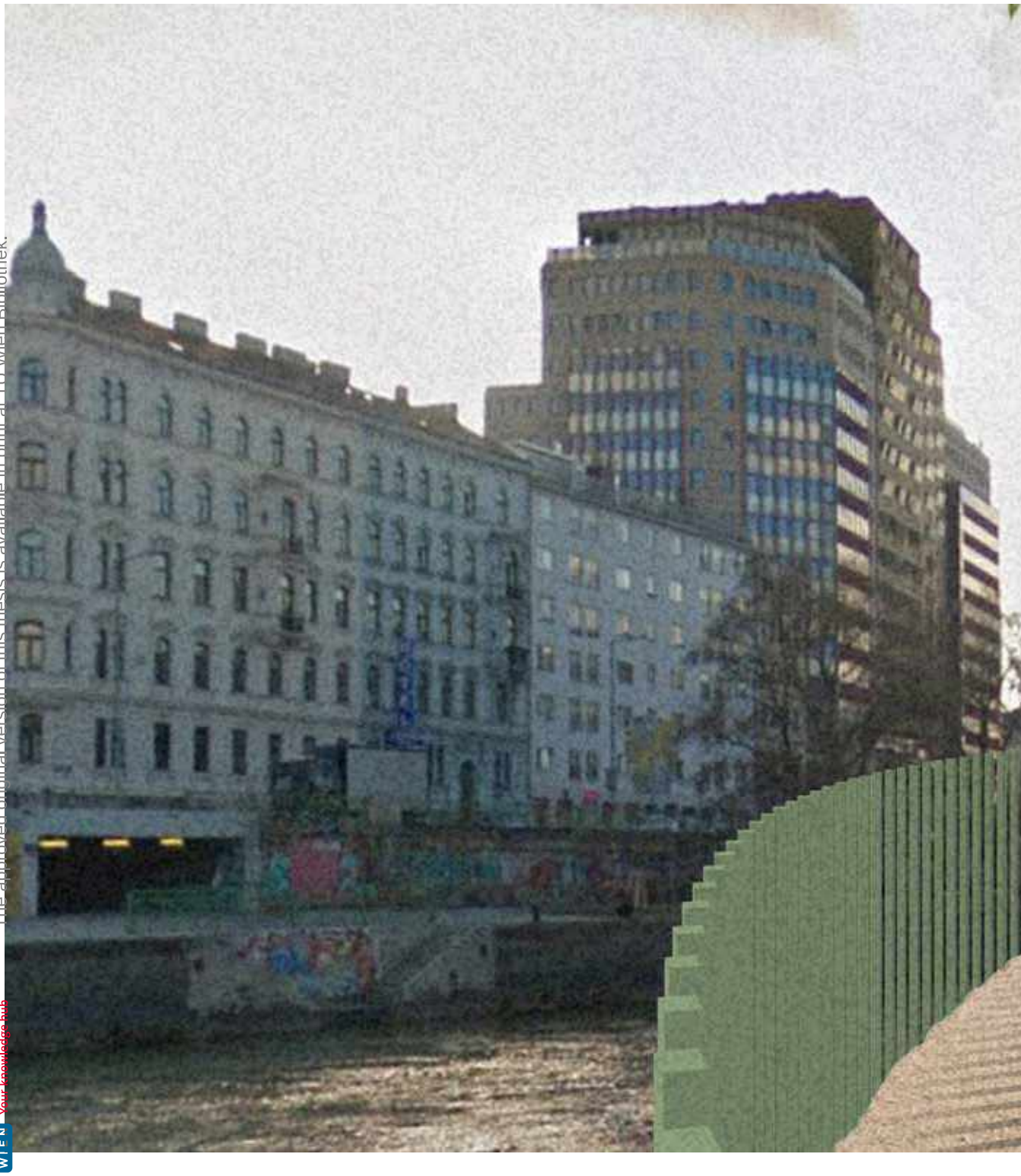


fig. 86: collage of the viewing platform above the Dance Movement Therapy Hall

fig. 87: collage of the pathway, facing the administrative building

Trauma Informed Design is a Public Concern

Especially in times of a global pandemic, trauma became not only an individual but also a collective concern. The threshold to give in to the procedure of mental care, to lean into that state of vulnerability is still preventing a lot of people to open their minds towards mental care.
But architecture has the power to trigger social processes through buildings and therefore also to create awareness towards immensely important topics, like mental health, and, especially the handling of traumatic experiences.

Through the implementation of neuroscientific knowledge and the understanding of embodied, sensory aspects in architecture, trauma-informed design can break this threshold with very little resources.

In such special times, even global politicians understood, that collective and rapidly grown mental issues demand collective and quickly appliable actions. I truly believe that a well-researched design can contribute massively to a possible solution.

Appendix

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List of Figures

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