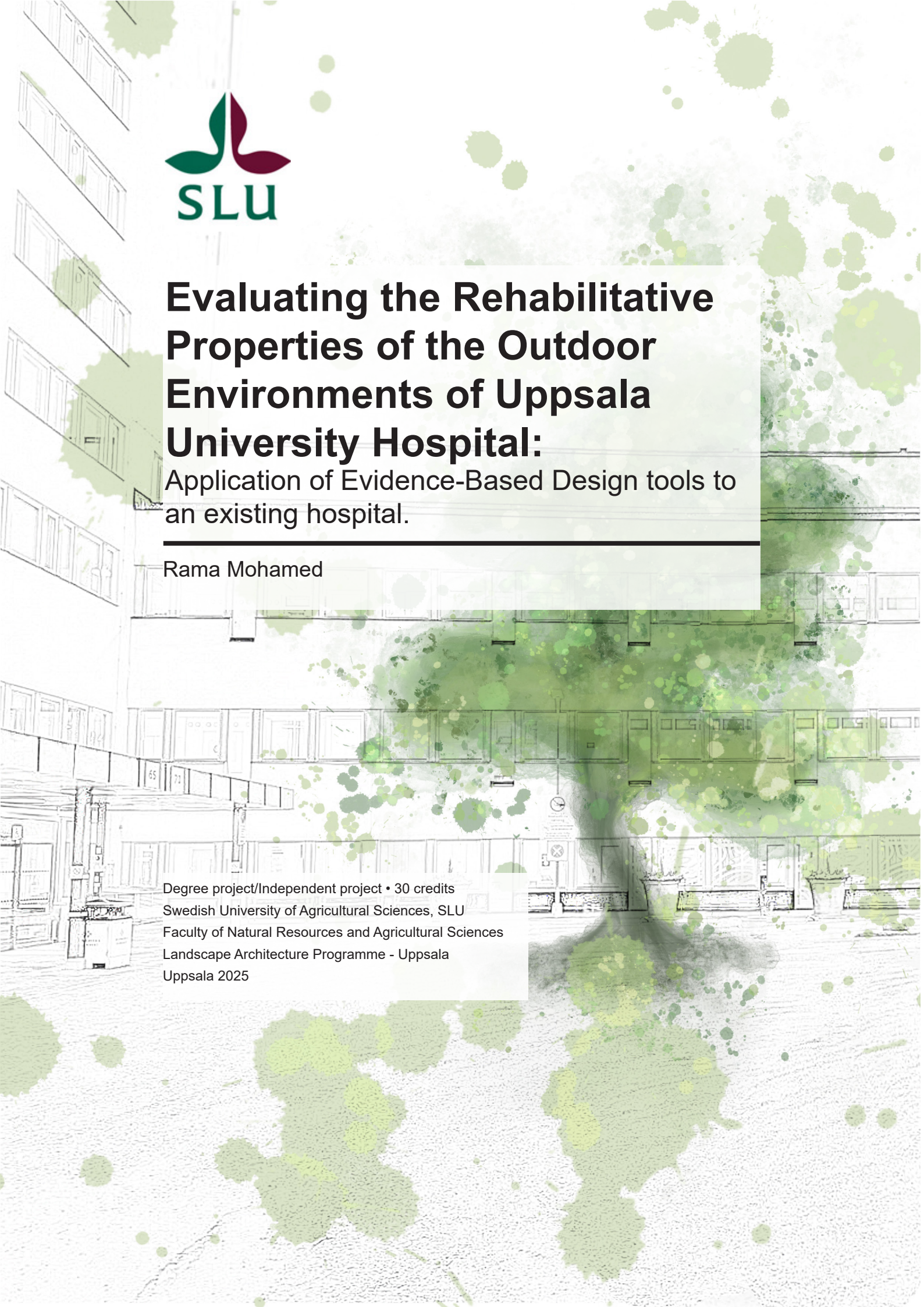

Evaluating the Rehabilitative Properties of the Outdoor Environments of Uppsala University Hospital:

Application of Evidence-Based Design tools to an existing hospital.

Rama Mohamed

Degree project/Independent project • 30 credits
Swedish University of Agricultural Sciences, SLU
Faculty of Natural Resources and Agricultural Sciences
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Evaluating the rehabilitative properties of the outdoor environments of Uppsala University Hospital: Application of evidence-based design tools to an existing hospital.

Utvärdering av de rehabiliterande värdena av utomhusmiljöerna kring Uppsala Akademiska Sjukhus: Tillämpning av verktyg för evidensbaserad design på ett befintligt sjukhus.

Rama Mohamed

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Abstract

The thesis evaluated the rehabilitative properties of the outdoor environments of Uppsala University Hospital by applying Evidence-Based Design tools to an existing healthcare environment. The method included a GIS analysis to categorise the existing green structure and an evaluation of Uppsala University Hospital's outdoor environments through a modified version of the Quality Evaluation Tool (QET). QET details 19 evidence-based environmental qualities to evaluate and improve when it comes to rehabilitating green environments. A new grading scale (1–5) was developed for the QET analysis to increase the consistency of the assessments. Along with this grading scale, grading criterions for each grade were developed for ease of thorough and systematic site analysis.

The results from the GIS analysis showed that the hospital area has a low proportion of greenery, with only 11.7% tree canopy coverage. The QET analysis showed that the rehabilitative properties were generally low within the hospital area itself. This was the case both for environmental qualities in the comfortable design category and in the access to nature category. Public areas outside the hospital grounds, such as nearby parks and forests, offered the best qualities for access to nature. Many qualities related to meaningful experiences of nature (for example tranquillity, wild nature, and refuge) were assessed as particularly deficient within the hospital grounds.

The thesis concludes that the outdoor environments at Uppsala University Hospital largely lack sufficient rehabilitative properties. To improve these, a suggestion is made that the hospital should prioritize rehabilitative qualities in its design, increase green spaces by, for example, de-paving parts of existing areas, and improving physical accessibility to the higher quality natural areas outside the hospital grounds. The study contributes to new knowledge by offering a clear methodology for analysing existing hospital environments with theories grounded in evidence-based design, and the development of gradings and grading criteria for the QET.

Keywords: Nature based rehabilitation, Evidence-Based Design, hospital outdoor environments, healing nature, rehabilitating outdoor design.

Sammanfattning

Uppsatsen utvärderade de rehabiliterande egenskaperna i utemiljöerna kring Uppsala Akademiska Sjukhus genom att tillämpa verktyg för evidensbaserad design på en befintlig vårdmiljö. Metoden inkluderade en GIS-analys för att kartlägga grönstrukturen och en utvärdering av Uppsala Akademiska Sjukhus utemiljöer genom en modifierad version av Quality Evaluation Tool (QET). QET omfattar 19 evidensbaserade miljökvaliteter som är viktiga att utvärdera och förbättra när det gäller rehabiliterande utomhusmiljöer. En ny bedömningsskala (1-5) utvecklades för QET-analysen för att öka konsekvensen i bedömningarna. Tillsammans med bedömningsskalan togs bedömningskriterium fram för varje betyg för att möjliggöra en grundlig och systematisk platsanalys.

Resultaten från GIS-analysen visade att sjukhusområdet har en låg andel grönska, med endast 11,7% krontäckningsgrad. QET-analysen visade att de rehabiliterande värdena var generellt låga inom själva sjukhusområdet. Detta gällde både för miljökvaliteter inom kategorin bekväm design och inom kategorin tillgång till natur. Allmänna utemiljöer utanför sjukhusområdet, såsom närliggande parker och skogar, erbjöd de bästa kvaliteterna för stimulerande natur. Många kvaliteter som rör mer betydelsefulla naturupplevelser (till exempel rofylldhet, vildhet och natur samt skyddat och tryggt) bedömdes som särskilt bristfälliga inom sjukhusområdets gränser.

Uppsatsen drar slutsatsen att utomhusmiljöerna vid Uppsala Akademiska Sjukhus i generellt saknar tillräckliga rehabiliterande värden. För att förbättra dessa värden föreslås att sjukhuset bör prioritera rehabiliterande kvaliteter i sin design, öka grönytorna genom exempelvis avhårdläggning av befintliga ytor, samt förbättra den fysiska tillgängligheten till de mer högkvalitativa naturområdena utanför sjukhusområdet. Studien bidrar till ny kunskap genom att erbjuda en tydlig metodik för att analysera befintliga sjukhusmiljöer med teorier grundade i evidensbaserad design, och genom utvecklingen av graderingar och kriterier för QET-verktyget.

Nyckelord: Rehabiliterande utomhusmiljöer, Evidensbaserad design, utomhusmiljöer kring sjukhus, läkande natur, rehabiliterande landskapsarkitektur

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Abbreviations

EBD	Evidence-Based Design
QET	Quality evaluation tool
SET	Supportive Environment Theory Pyramid
PTS	Programme for technical standard
PSD	Perceived sensory dimensions

1. Preface and thank you

In my own personal experience, my mental and physical health always gets at least slightly improved by enjoying beautiful nature. The reason I started my studies in landscape architecture was that one day, after having just visited my therapist, I made a stop on my way home through Uppsala City Park. There was a lovely pond there with beautiful plants and ornamental grasses, and I took a moment to lay down right there and dip my feet in the pond. The sun was shining on my skin, the water was cool and calming on my toes, and I saw the blue skies through the tree canopies. It made me feel that life really was beautiful after all. I decided then that creating these kinds of environments for others is my calling.

Having had this personal experience with rehabilitative nature, I wanted to investigate rehabilitative green spaces for hospital environments through evidence-based design, as it connected to my education. The subject connecting to hospitals first interested me because my fiancé works at a hospital in Gothenburg, and we have spoken extensively about how bad the outdoor environment is at his workplace. Hospitals are places where a lot of people stay, both staff and patients, often with limited freedom of movement. Staff can be very busy and often have little time to eat lunch. They would not have the time to walk very far to an outdoor recreation area or green space which is not easily accessible. Patients can have very significant mobility problems and therefore need the same easy access. Green spaces at hospitals affect many people, and they affect many of society's most vulnerable - i.e. patients and relatives, as well as overworked staff. Rehabilitative green spaces must be located in the property grounds or nearby. It seems that many times the green structure around hospitals is the thing that is least thought about during the construction process.

Research has proven time and again that green spaces can help improve people’s mental and physical health and even improve healthcare outcomes (World Health Organization 2022 and Bengtsson et al. 2018). Boverket aims to incorporate Evidence-Based Design principles of rehabilitating environments into the planning and design of healthcare facilities (Boverket 2022a). To that aim, tools such as Quality Evaluation Tool and PTS Outdoor Environment Tool have been developed by or with the help of researchers. However, PTS Outdoor Environment Tool specifically places heavy emphasis on new hospitals, and the importance of involving landscape architects and other experts early in the construction phase. Yet, currently, most hospitals and health centres that are already established, and we must make the best of what is available. The question is how? The goal of this thesis is to bridge the knowledge gap between research and practice. Can I as a landscape architect use the tools and develop an

Evidence-Based analysis of the current situation? Can this analysis then be used to guide improvements to that situation?

1.1 Thank you

Thank you to Marcus Hedblom for being a lovely and involved mentor, for always leaving me excited to continue working after our meetings and for detailed and thorough feedback. To Anna Åshage, for giving me an extensive resource list and helping me find a way into this broad topic. To my family, who have supported me in more ways than I can count, in particular my mom.

And to my fiancé, Mohammed Al-Dury: I could not have done this without you.

2. Introduction: The Role and History of Green Spaces in Healthcare, and the Need for Improved Hospital Outdoor Environments

The following chapter addresses healthcare in Sweden and in Uppsala University Hospital, as well as mental health considerations. It details how green spaces are essential for health and healthcare in terms of global goals and proven studies, and it explains why the thesis will focus on general rehabilitating outdoor environments. Furthermore, it discusses a brief history of outdoor environments in healthcare, as well as how they look today and why. Additionally, the application of Evidence-Based Design is discussed.

2.1 How Green Environments Improve Healthcare and Mental Health

This thesis focuses on the access to health promoting green infrastructure around larger hospitals with a case study of Uppsala University Hospital in Uppsala. There are several global goals within Agenda 2030 that prove how important and relevant the topic of accessing urban green health is (United Nations n.d.), and have been listed below:

> Goal 3: Ensure healthy lives and promote well-being for all at all ages.
>
> Goal 11: Made cities and human settlements inclusive, safe, resilient and sustainable
>
> Goal 13: Take urgent action to combat climate change and its impacts
>
> Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reserve land degradation and half biodiversity loss. United Nations n.d..

Certainly, the topic is important and affects many of society's most vulnerable. These include patients, staff, relatives and other visitors of hospitals as well as other health-care institutions. According to a report on Swedish hospital care statistics for the year 2022, there were roughly 1,2 million healthcare encounters registered within inpatient care (where patients are admitted into the ward for treatment), and where the average duration of care was around 3,8 days (Socialstyrelsen 2024). As for outpatient care (including specialised outpatient care, where patients have recurrent follow-ups at the hospital), there were roughly 11.5 million patient visits in the same year (Socialstyrelsen 2024). These statistics

are centred on hospitals, and as such exclude municipal health care institutions such as primary care and elderly care homes, as well as at home care.

As for Uppsala University Hospital, there were around 400,000 healthcare encounters in the year 2023 (Socialstyrelsen 2023a) (Socialstyrelsen 2023b). The average duration of stay for patients staying overnight was 4,9 days (Socialstyrelsen 2023b). The hospital employs around 8,600 staff, which includes doctors, nurses, midwives, care assistants and other healthcare personnel (Akademiska Sjukhuset 2023), in addition to numerous visitors on hospital grounds in form of relatives and other loved ones. Given the scale and diversity of individuals present at the hospital, the design of its outdoor environments plays a crucial role in supporting a broad spectrum of needs.

Outdoor environments have the potential to address a variety of users, and those include patients with mental health needs (Engström et al. 2022). According to The World Health Organization (WHO) it is clear that mental disorders are very prevalent and often go untreated on a global scale (World Health Organization 2022). In 2019, an estimated 970 million people were living with a mental disorder globally, which amounts to about 13% of the world's population (GBD 2019).

WHO highlights the significance of local built environments and natural green spaces in promoting mental health. Specifically, access to green and blue spaces, such as parks, forests, playgrounds, and waterways, has been linked to improved mental well-being. These spaces offer benefits such as reducing perceived stress, alleviating symptom severity, and providing both short- and long-term restorative effects (World Health Organization 2022).

Research increasingly links green spaces with reduced healthcare costs. One study found that higher levels of residential green cover were significantly associated with lower healthcare expenses, even after controlling for demographic, socioeconomic, and environmental factors (Van Den Eeden et al. 2020). Similarly, the development of a small urban park was shown to generate substantial annual healthcare savings through increased physical activity, improved mental health, and better air quality (Wilson & Xiao 2023). In the UK, parks and green spaces are estimated to save the UK National Health Service approximately £111 million annually (Lynch et al. 2020).

This thesis has a general focus on rehabilitating environments in hospital settings, without picking a particular user-group. However, rehabilitating outdoor environments can have a particularly strong stress-reducing and stress-relieving effect (Bengtsson et al. 2024), and healthcare environments are environments of stress and emotional fatigue for patients and staff alike (Jin et al. 2023).

Thoughtfully designed outdoor areas, including therapeutic gardens and green spaces, have been linked to psychological well-being, improved recovery and better overall patient outcomes. Exposure to natural elements can lower blood pressure (Zhao et al. 2022), reduce cortisol levels (Roe et al. 2013), and improve mood (Barton & Rogerson 2017), all of which are essential in high-stress healthcare contexts. As such, integrating evidence-based design principles of rehabilitating outdoor environments into hospital planning is increasingly recognized as a vital component of healthcare.

2.2 A History of Healing and Greenery

Throughout medical history, the interplay between nature and the built healthcare environment has been long and complex, deeply rooted in cultural and religious traditions. Historically, landscapes surrounding healthcare institutions were not merely aesthetic features but integral components of therapeutic practice, reflecting a holistic understanding of health that connected body, mind, and environment (Bengtsson et al. 2018).

The earliest recorded healing environments emerged in ancient Greece with the Aesclepion at Epidaurus (300 BCE to 500 CE), where architecture and landscape were deliberately combined to facilitate healing rituals. Here, patients would engage in purification practices using spring water and find solace within groves of trees, libraries, and theatres. They would then await their turn for dream-healing within the abaton, a sacred space for communication with the gods (Zhu & Sarah 2024) (Marcus & Sachs 2014).

During the medieval period, monastery hospitals and infirmaries in Europe integrated gardens, healing and spirituality within cloistered courtyards. This design provided sensory stimulation, offering the sight and scent of plants, the sounds of birds, and the tactile experience of grass underfoot. Bernard Clairvaux (1090-1153, designer of the hospice at Clairvaux, France) described these spaces as offering solace; enabling the sick to sit upon green lawns, shaded and secure, and be surrounded by nature's calming presence (Marcus & Sachs 2014). The gardens were regarded as crucial elements in the spiritual and physical healing process, showing an intuitive knowledge of the importance of nature’s sensory input as a part of healing. This knowledge was lost for nearly a thousand years and is only in modernity being rediscovered (ibid).

In the eighteenth and nineteenth century, growing awareness of the relationship between environmental conditions and public health shaped the design of hospitals across Europe. The emergence of infectious diseases, largely attributed to unsanitary urban living conditions, prompted architects and physicians to rethink hospital architecture as a means of promoting health through improved

ventilation. Hospitals were increasingly thought of as "ventilation machines" designed to provide patients with access to fresh, clean air. During this period, gardens surrounding hospitals functioned primarily as utilitarian landscape features, supporting air purification and aiding the facilitation of indoor ventilation, rather than serving therapeutic or recreational purposes for patients (Zhu & Sarah 2024). Florence Nightingale, a primary figure for modern nursing, strongly advocated for access to fresh air, sunlight, and views of nature, noting their importance for both physical and mental recovery (Marcus & Sachs 2014).

In the twentieth century, the advent of germ theory and advances in medical technology coupled with increased urbanization led to the decline of therapeutic gardens within hospitals (Bengtsson et al. 2018). Particularly, the use of antiseptics, antibiotics, and improved surgical techniques, reduced the necessity for the land-consuming hospital model, which had relied on physical separation and open-air designs to prevent infection (Marcus & Sachs 2014).

This shift led to high-rise “monoblock” hospitals, focused on efficiency, infection control, and the clinical treatment of illness. The connection between nature and healing, once central to hospital design, was largely abandoned. Outdoor spaces were relegated to parking lots and service areas, and gardens were reduced to minimal landscaping at hospital entrances. The idea of the mind-body connection was also abandoned, as psychology and the physical body were now studied in separate fields of medicine (Marcus & Sachs 2014).

2.3 Why Hospital Outdoor Environments Fall Short Today

During the early 1970s, a significant perspective shift occurred in medicine, moving away from the traditional biomedical model toward a more holistic "bio-psycho-social-environmental model" (Marcus & Sachs 2014). From the mid-1980s to the 2000s, interest in gardens and therapeutic spaces revived, with terms like "healing environments" and "humanistic care" regaining prominence (Bengtsson et al. 2018). This transition encouraged the integration and purposeful design of outdoor environments in healthcare settings, guided by principles of Evidence-Based Design. Later developments further tailored these outdoor spaces to better meet the specific needs of different patient groups, including paediatric patients, individuals undergoing neurological rehabilitation, and those with functional limitations (Marcus & Sachs 2014).

Contemporary design principles for outdoor healthcare environments prioritize several key elements. Foremost among them are safety, security, and privacy; every component of an outdoor healthcare space must ensure both the physical

and emotional safety of patients (Marcus & Sachs 2014). This complies with legal standards for patient security and confidentiality, as well as accessibility and universal design (further detailed below in section 3.1.1 Accessibility and Universal Design).

Direct engagement with nature remains a central principle in outdoor healthcare design, as strong evidence links exposure to nature to improved health outcomes. Outdoor spaces should therefore be deliberately designed to maximize meaningful interaction with natural elements, ensuring accessibility for the widest possible range of patient groups (Marcus & Sachs 2014).

The literature emphasizes that therapeutic gardens should exceed basic legal accessibility standards, promoting both physical and emotional comfort to foster a sense of inclusion and care. When patients feel safe and comfortable, they are more likely to spend extended time outdoors, enhancing the therapeutic benefits (Marcus & Sachs 2014). In addition to accessibility and comfort, the concept of stimulating environments is crucial. By offering varied experiences and points of interest, outdoor environments can help reduce stress, anxiety, and pain, in line with positive distraction theory. Finally, the maintenance, sustainability, and integration of outdoor spaces with their surrounding environments are essential for balancing cost-effectiveness with the creation of restorative, engaging settings (ibid).

However, the development of modern healthcare environments falls flat from the above recommendations. As Fanny Boberg notes, citing Fridell 1998, healthcare environments have traditionally been designed with a primary focus on practicality, aiming to facilitate the efficient delivery of medical services. In Sweden, this approach was particularly evident during the large-scale expansion of hospital infrastructure between the 1960s and 1970s (Fridell 1998 see Boberg 2014).

Boberg further explains, referencing Dilani 1998, that hospital development during this period was driven by industrial efficiency and productivity. Planning focused on rationality, standardization and centralization, while aesthetic and environmental aspects were largely neglected (Dilani 1998 see Boberg 2014).

Moreover, drawing on Stoneham and Thoday 1994, Boberg highlights that many hospitals face ongoing financial limitations that hinder investment in landscape architecture, affecting both the renovation of existing outdoor spaces and the development of new ones (Thoday 1994 see Boberg 2014).

Finally, Kallstenius 2012, states that many psychiatry departments are moving towards centralisation and big hospitals instead of small clinics. Large hospital

environments are left with fragmented and disconnected outdoor areas between buildings, where functional needs such as parking and additional construction are prioritized over the creation of cohesive and healing landscape environments (Kallstenius 2012).

2.4 What Evidence-Based Design is and how it is used in this thesis

Evidence-Based Healthcare Design focuses on creating environments that promote healing for patients, encourage family involvement, and support staff efficiency and reduction of stress. This approach relies on scientific research to guide design decisions, using evidence about how the physical environment can improve health outcomes (Stichler & Hamilton 2008).

This area of study expanded significantly following Roger Ulrich's pioneering research in 1984, which demonstrated that surgery patients with views of nature experienced fewer postoperative complications, required less pain medication, and had shorter hospital stays compared to patients whose rooms faced a brick wall. Subsequent studies have further established the profound impact of environmental factors on health outcomes and healthcare processes, contributing to the development of scientific, evidence-based approaches to the design of healthcare settings (Brambilla et al. 2019). Although EBD principles are scientifically thorough, many scholars caution against the mechanical application of design elements, which would compromise the tailoring of design approaches to the individual requirements of each project. This is why Boverket advocate for context, evidence, and best practice, wherein EBD is applied to the specific context of the construction project using relevant professional references (Boverket 2022a). More on that in Section 3.1 National Policies.

Boverket has recommended several established theories for applying EBD in outdoor healthcare environments in Sweden. These theories are described in Section 3.2 Methodology Theory. For this thesis, the main methodology selected is the Quality Evaluation Tool (QET), which is based on nineteen evidence-based environmental qualities. The QET comes from on an article by Bengtsson and Grahn from 2014, which has since been revised in multiple editions. This field of study is very new and is actively being established and explored at the time of writing this thesis.

2.5 Aim

The aim of this thesis is to examine the rehabilitative green spaces within existing hospital environments, using Uppsala University Hospital as a case study. The goal is to bridge the gap between research and practice by applying evidence-based design criteria to evaluate an existing healthcare setting.

2.6 Research questions

- What is the current balance between built infrastructure and vegetation in the outdoor environments of Uppsala University Hospital today?
- What do the outdoor environments of Uppsala University Hospital look like today in terms of rehabilitative values of greenery defined by evidence-based design?
- How can the rehabilitative values of the outdoor environments of Uppsala University Hospital be improved?

3. Background: National Policies, Evidence-Based Design and Methodology Theories

The following chapter addresses Boverket; which is the Swedish institution that governs the rules and regulations of built environments, including hospital outdoor spaces, and their accessibility requirements.

Finally, the various theories that ground the methodological analysis of the thesis are elaborated on. These are: the 3-30-300 rule, the Outdoor Environment Zones, the Quality Evaluation Tool, the Perceived Sensory Dimensions, The Needs Pyramid and PTS Outdoor Environment Tool.

3.1 National policies: The Swedish National Board of Housing, Building and Planning

Boverket (The Swedish National Board of Housing, Building and Planning) is a government administrative agency in Sweden responsible for matters related to the built environment. Its responsibilities include the management of land and water areas, physical planning, construction and management of buildings, housing, and housing finance (Boverket 2025). Their responsibilities are many, and include the comprehensive responsibility for managing the design of living environments (Boverket 2024a). This includes managing and developing the built environments of healthcare (Boverket 2022c), as well as being responsible for overseeing climate adaptation of the built environment (Boverket 2024b).

According to Boverket, work within the development of healthcare construction projects shall be based on evidence-based design (EBD). Boverket advocate for EBD where a weighing together of three types of knowledge occurs: best practice, context and evidence (Boverket 2022a). Evidence signifies knowledge which is proven through scientific research which has been validated and reviewed through multiple studies over time. Best practice and proven experience are the knowledge gained by the daily practice of a profession and should be given the same weight as scientific research. Context is the unique situation and local conditions of the healthcare construction project, including the needs of its target group. It is important to note that the weight of the three types of knowledge will vary depending on access to respective knowledge type (ibid).

Boverket has been working in collaboration with Anna Bengtsson and Patrik Grahn, amongst others, in the outlining and development of the use of Evidence-

Based Design and Evidence-Based Design theories in the national regulations of healthcare environments in Sweden (Boverket 2022b).

3.1.1 Accessibility and Universal Design

Ensuring high accessibility and user-friendliness in outdoor environments is critical for their functionality in healthcare settings. Legal requirements under Sweden's *Plan och Bygglag* (SFS 2010:900, Chapter 8, 1§, 4§, 7§, 9§) and *Plan och Byggförordning* (SFS 2011:338, Chapter 3, 4§, 18§, 23§) mandate accessibility and user-friendliness in both new developments and renovations of existing healthcare facilities. Boverket has further developed implementation guidelines to support these regulations (Bengtsson et al. 2022).

Complementing these legal frameworks, the concept of Universal Design provides a structured approach to creating accessible outdoor environments in healthcare. The principles are grounded in concepts of Evidence-Based Design, which are what Boverket requires be used in the design of healthcare settings today. Universal Design ensures that products, environments, or services are inherently accessible to all users without requiring additional adaptations (Bengtsson et al. 2022). Its seven principles are:

1. Equitable use: Usable by individuals with diverse abilities.
2. Flexibility in use: Accommodates a wide range of preferences and abilities.
3. Simple and intuitive use: Easy to understand, regardless of user experience or cognitive skills.
4. Perceptible information: Effectively communicates information, irrespective of sensory abilities or environmental conditions.
5. Tolerance for error: Minimizes risks and adverse consequences of unintended actions.
6. Low physical effort: Enables comfortable use with minimal fatigue.
7. Size and space for accessibility and use: Provides adequate space for access and use, regardless of body size, posture, or mobility.

These principles and legal requirements collectively aim to ensure that healthcare outdoor environments are inclusive, functional, and supportive of diverse user needs (Bengtsson et al. 2022). The Universal Design principles were initially planned to be used as guidelines for the suggested design measures portion of the thesis, however, they were difficult to utilize for a landscape architect as they were too limiting (more on this in Chapter 6 Discussion).

3.2 Methodology theory

To make sure the thesis rests on solid ground academically, several key concepts and theories concerning rehabilitating and healing outdoor environments, as well as how outdoor environments are perceived have been explained below. Because the thesis includes a GIS analysis of the outdoor environment makeup of Uppsala University Hospital, the 3-30-300 rule has been explained as a basis for what exactly will be looked at during the GIS analysis, and why it is Evidence-Based.

Furthermore, the Outdoor Environments Zones is a scientifically grounded guideline from Boverket which they recommend be used in this context. The Quality Evaluation Tool is also championed by Boverket, as the rest of these theories explained below. The QET as well as the PTS Outdoor Environment Tool are based on the scientifically grounded Perceived Sensory Dimensions and The Needs Pyramid concepts, amongst many other EBD theories.

3.2.1 The 3-30-300 rule

The 3-30-300 rule is an evidence-based guideline for making cities greener, healthier, and more resilient. Developed by urban forestry expert Cecil C. Konijnendijk in early 2021, this scientifically grounded approach helps ensure that everyone has access to trees and green spaces in their daily lives. It sets clear targets for tree visibility, canopy cover, and proximity to public green areas, making urban nature more equitable and accessible (Konijnendijk 2021). The rule is built around three key principles:

1. Every resident should be able to see at least three trees from their home, school, or workplace. Simply viewing trees can significantly improve well-being by reducing stress and enhancing focus, especially when direct access to parks is limited, helping people stay connected to nature.
2. Every neighbourhood should have at least 30% tree canopy cover. Trees do more than beautify a neighbourhood; they cool the air, clean pollution, support wildlife, and even strengthen community bonds. The 30% canopy goal applies at the neighbourhood level, ensuring that tree cover is distributed fairly, rather than being concentrated in wealthier areas.
3. Every resident should live within 300 meters of a public green space. Having a park or natural area within walking distance encourages exercise, social interaction, and relaxation. This guideline aligns with WHO recommendations, which suggest that everyone should have easy access to green spaces of at least one hectare.

One of the main aspects that this thesis has investigated is if there is a 30% tree canopy cover within the hospital grounds. Further the thesis evaluated public green spaces encompassed within a 300-meter buffer from the borders of the hospital grounds. There will be no measuring the number of trees seen from inside hospital buildings as this thesis touches solely on outdoor hospital environments.

3.2.2 Outdoor Environment Zones

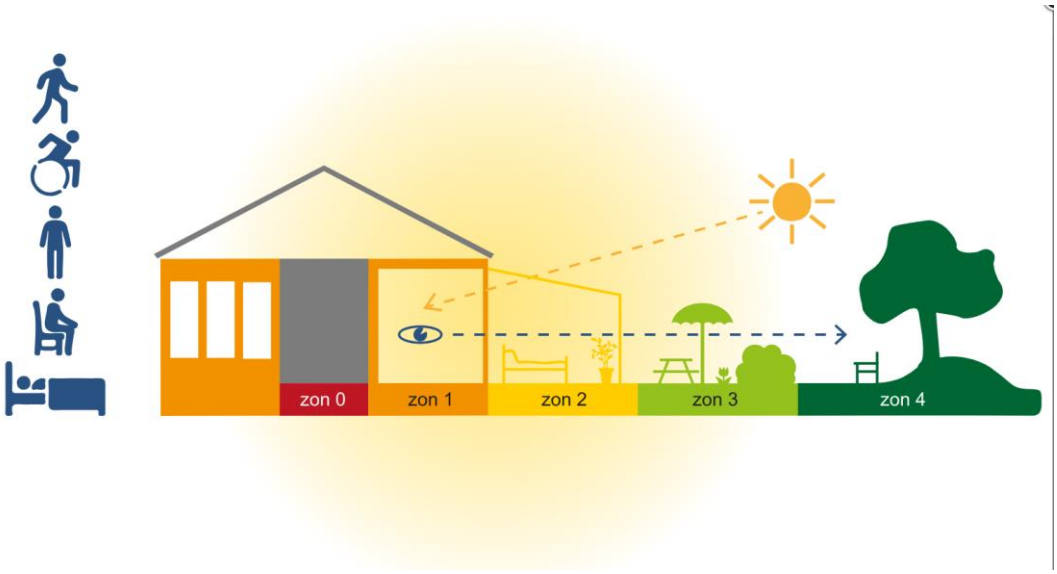


Figure 1. An illustration of the concept of the four zones of contact with the outdoor environment. Illustrated by Jenny Lilja from Boverket 2022b, based on a model by Anna Bengtsson from SLU.

The Outdoor Environment Zones are an Evidence-Based Design theory used in hospital settings which details degrees of contact between individuals and the outdoor environment (Bengtsson et al. 2018). The degrees of contact are split into zones (see figure 1 above) and are briefly described as follows:

> Zone 1: Visual contact with the outdoor environment from inside the healthcare building, for example through windows.
>
> Zone 2: Contact with the outdoor environment in transitional areas between indoors and outdoors, such as winter gardens, balconies, patios, and terraces.
>
> Zone 3: In parks and gardens located in the surrounding grounds, directly connected to a healthcare building.
>
> Zone 4: Contact with the broader outdoor environment, i.e., areas beyond the healthcare building and its grounds. Bengtsson et al. 2018 page 6, translated by author.

These zones by Anna Bengtsson are advocated by Boverket and are central to both QET and PTS Outdoor Environment Tool (Bengtsson et al. 2018 and Boverket 2022b). The Outdoor Environment Zones have been adapted and used extensively in the methodology of this thesis. Both usage and adaptation have been outlined in Chapter 4 Methodology.

To add further context to the above quote and figure 1, a detailed description of the zones and what they mean has been outlined below:

Zone 0 represents indoor spaces that lack any visual or physical connection to the outside world, and was added by researchers to the EBD theory to encompass all parts of the healthcare environment. During the absence of any connection to the outdoors, a study shows that visual elements simulating nature can offer psychological benefits, such as stress reduction and enhanced comfort (Bengtsson et al. 2018).

Zone 1 encompasses indoor areas that allow views of outdoor natural elements through windows. Research suggests that such visual contact can support a faster and more comfortable recovery, reducing medication use, and improving patient well-being (Bengtsson et al. 2018).

Zone 2 signifies the transitional space between indoors and outdoors. These transitional places can be located indoors, such as sunrooms or enclosed balconies, or outdoors, such as terraces, courtyards or patios. However, they are always located along the building's exterior walls. They offer both protection and access to the elements and are especially beneficial for individuals with cognitive impairments by promoting ease of orientation, social interaction, and sensory engagement (Bengtsson et al. 2018).

Zone 3 refers to outdoor spaces which are connected to the healthcare buildings, and are inside the grounds of the healthcare facility, such as gardens and parks. Several studies show that these environments should provide restorative experiences and be tailored to the needs of specific user groups, incorporating design principles that balance safety, stimulation, and therapeutic benefit (Bengtsson et al. 2018).

Zone 4 encompasses public environments outside the grounds of the healthcare facility, which can be resources for the healthcare establishment. These areas can contain meaningful qualities like forests, nature walks or views to water (Boverket 2022b). Research shows that different user-groups have varying needs from this contact, some benefit from engagement with the community, while others may require shielding from external stimuli (Bengtsson et al. 2018).

Briefly put, the zones indoors (zones 0 and 1) and parts of the zones which concern the interior of the buildings (zone 2) have been excluded from the scope of this thesis.

3.2.3 Quality Evaluation Tool and why it was chosen

Anna Bengtsson and Patrik Grahn, two prominent Swedish researchers in the field of rehabilitating green environments, developed the Quality Evaluation Tool through combining several evidence-based theories and proven research. Some of these include the Outdoor Environment zones, the Needs Pyramid and The Perceived Sensory Dimensions. The QET framework describes 19 evidence-based environmental qualities to evaluate and improve when it comes to rehabilitating green environments (Bengtsson & Grahn 2014).

The QET has been tested in a Swedish hospital context once before, in Region Jönköpings Län. It was recently tested on three hospital areas (Ryhov, Värnamo, and Eksjö) in Region Jönköping (Bengtsson et al. 2024).

Bengtsson and Grahn advocate for a three-step process. First, performing a thorough site analysis according to the environmental qualities. Second, performing a needs analysis of potential and existing users according to the environmental qualities. Finally, creating suggested design measures (Bengtsson & Grahn 2014 and Bengtsson et al. 2018). This thesis will, due to time restrictions, omit the second step of needs analysis in its methodology. Additionally, something entirely new that this thesis brings is gradings as part of the QET. More on this will be detailed in Chapter 4 Methodology.

Figure 2 below outlines the 6 environmental qualities for comfortable design (A1–A6) and the 13 environmental qualities for access to nature (B1–B13), also referred to as qualities stimulating design. These definitions are from the report by Bengtsson et al. 2018.

Section A: Comfortable Design
Qualities for comfortable design ensure security, accessibility, and usability of outdoor spaces.

A1: Closeness and easy access: Green (and Outdoor) spaces should be nearby, visible, and easily accessible from buildings, with clear paths and entrances. As most of the sites in Zone 2 assessed in this thesis, where this quality is most relevant, were not green, the author has revised the definition to encompass outdoor spaces more generally.

A2: Enclosure and entrance: The space should have a well-defined boundary that provides security and comfort without feeling restrictive.

A3: *Safety and security:* The environment should minimize risks, for example slippery surfaces and obstacles, and psychological discomfort, for example feeling exposed or unsafe.

A4: Familiarity: The space should feel intuitive, easy to recognize, and align with users' experiences.

A5: Orientation and wayfinding: Clear paths, landmarks, and signage should guide users effectively through the space.

A6: Different options in different weather: The space should offer shade, shelter, and seating to remain functional in different weather conditions.

Section B: Access to Nature
Qualities for access to nature focus on interaction with nature and the psychological benefits of green environments.

B1: Contact with surrounding life: The space should allow users to observe or interact with people, animals, or urban life, promoting connection.

B2: Social opportunities: There should be inviting places to sit, meet, and engage with others, encouraging social interaction.

B3: Joyful and meaningful activities: The environment should support a variety of activities, such as relaxation, exercise, gardening, or play.

B4: Culture and connection to past times: Historical, artistic, or cultural elements should evoke memories and provide a sense of place.

B5: Symbolism and reflection: The space should include elements that inspire personal reflection, such as natural metaphors or symbolic features.

B6: Prospect: Open, unobstructed views of nature or the surroundings should be available, creating a sense of space and clarity.

B7: Space: The space should feel expansive and immersive, providing a break from urban environments.

B8: Rich in Species: A variety of plant and animal life should be present, creating a dynamic and engaging environment.

B9: Sensual pleasures of nature: The space should stimulate multiple senses through textures, scents, sounds, and natural elements like water or flowers.

B10: Seasons changing in nature: The environment should display seasonal variations, such as flowering plants in spring or colourful leaves in autumn.

B11: Serene: The space should offer calm and quiet areas, away from excessive noise or visual disturbances.

B12: Wild nature: Some areas should be left more natural and untamed, fostering a sense of being in a wild, organic environment.

B13: Refuge: The space should include secluded spots where users can feel safe and undisturbed, offering privacy and relaxation.

Figure 2. The nineteen environmental qualities utilized in QET, as defined in the report by Bengtsson et al. 2018.

3.2.4 Perceived Sensory Dimensions and The Needs Pyramid

The Perceived Sensory Dimensions (PSD) is a concept first introduced by Patrik Grahn in his PhD thesis in 1991 to describe characteristics for parks (Grahn

1991). Since then, the concept has been continually evolving, building a more thorough scientific base and utilizing slightly different terminology.

In 2010 Patrik Grahn and Ulrika K. Stigsdotter explore how people experience and interact with urban green spaces, particularly in relation to stress relief and mental well-being. Based on survey data from 953 randomly selected people across nine Swedish cities, the researchers identified eight distinct dimensions that shape how people perceive these environments (Grahn & Stigsdotter 2010):

1. Serene: A quiet, calm, and undisturbed environment.
2. Space: An open, spacious area with a sense of freedom.
3. Nature: An environment that feels wild and untouched, with natural elements.
4. Rich in species: A space with a variety of plants and animals.
5. Refuge: A sheltered, safe area where people can feel protected.
6. Culture: A space with human-made elements like statues, fountains, and ornamental plants.
7. Prospect: An open area with views over the surroundings.
8. Social: A space equipped for social activities and gatherings.

These qualities are on octagonal spectrum, where qualities that are right next to each other are most similar, and qualities that are across from each other are opposed (Stoltz & Grahn 2021). Hence, attributes for each of the qualities may contradict each other. This does not mean that balancing them in the same site is impossible, rather it simply requires more careful consideration (ibid).

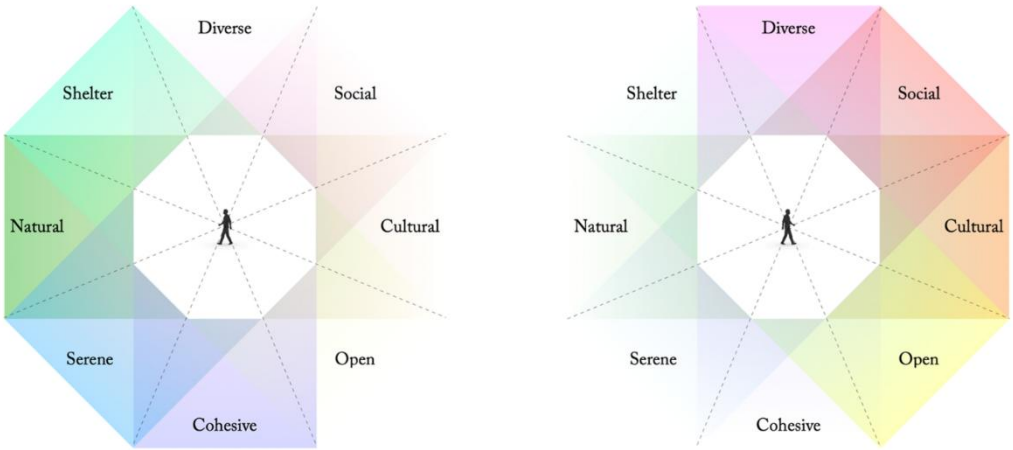


Figure 3. An illustration showing the octagonal spectrum of PSD, with opposing dynamics. The left side qualities are more important for restoration, meanwhile the right

are more important for stimulation, and are less restorative. Stoltz & Grahn 2021, page 7.

Figure 3 above explains that qualities within PSD with high importance for restorative process are on the left side of the octagonal spectrum. Meanwhile, properties with extra importance for stimulating environments are on the right side of the spectrum (Stoltz & Grahn 2021). The dynamic between the need for restorative environments versus the need for stimulating ones is further developed in the Needs Pyramid Theory below.

The Needs Pyramid, also known as the Supportive Environment Theory (SET) Pyramid, was developed by Patrik Grahn et al. to describe how individuals with different levels of executive function engage with their surroundings. This model is especially relevant in nature-based rehabilitation and is represented as a four-tiered pyramid (Pálsdóttir et al. 2014).

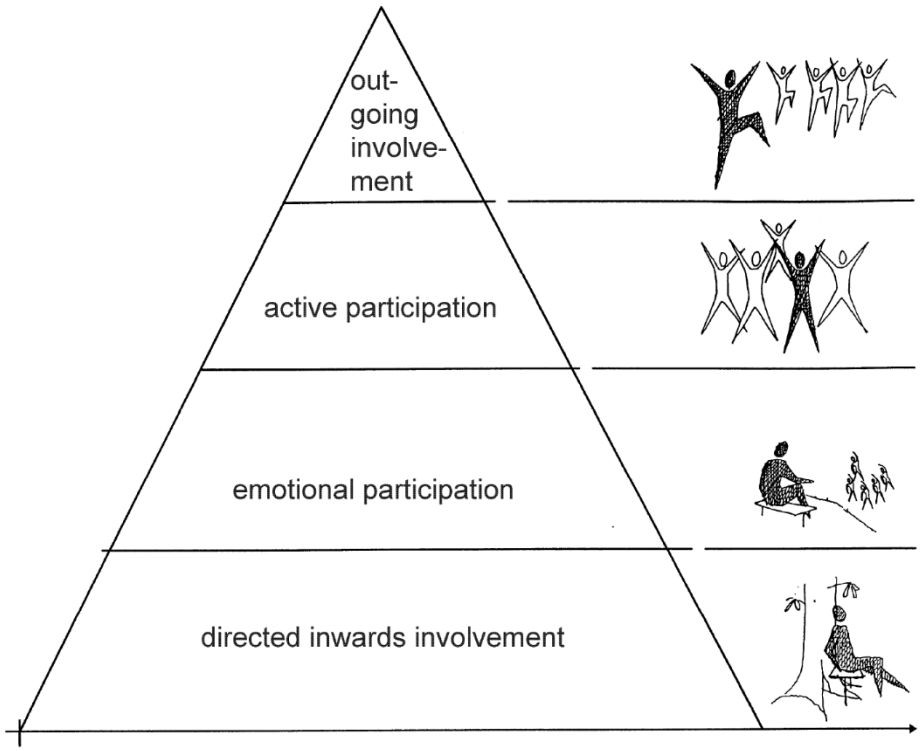


Figure 4. An illustration showing the needs pyramid split into four tiers. The width of the tier represents a higher need for support, and a lower executive function capacity. It gets smaller as it goes up the pyramid structure. Illustrated by Ulrika Pálsdóttir, page 7097, based on Patrik Grahn's model from 1991.

Figure 4 above shows that the pyramid is structured into four levels, with the lower levels representing individuals with lower executive function capacity, who require more supportive environments and tend to be more inward-focused. The lowest tiers have a higher need for restorative environments. In contrast, the

higher levels represent individuals with higher executive function capacity, who are more outwardly engaged and require less external support. The higher tiers have a higher need for stimulating environments (Pálsdóttir et al. 2014).

The bottommost and fourth tier in the pyramid, directed inwards involvement, represents the highest need for restorative environments. The third tier represents emotional participation, the second represents active participation, and the top and first tier represents outgoing involvement (Pálsdóttir et al. 2014).

These frameworks emerged from a growing recognition of the crucial role that the physical environment plays in mental health rehabilitation. The research was carried out at the Swedish University of Agricultural Sciences, with a particular focus on the Alnarp Rehabilitation Garden, a space specifically designed to support individuals recovering from stress-related disorders (Pálsdóttir et al. 2014).

3.2.5 PTS Outdoor Environment Tool and why it was not chosen

Programme for Technical Standard Forum (PTS Forum) is a national network where 19 out of 21 regions collaborate on standards for healthcare facilities in Sweden (PTS Forum n.d.). They have developed a national tool called PTS Outdoor Environment Tool (in Swedish PTS Utemiljöverktyg) from the Outdoor Environment Guideline 2023, which emphasizes the importance of involving landscape architects and other experts early in the construction phase of new hospitals (Nationellt brukarråd Utemiljö 2023). This tool is a new development and has thus far not been tried.

Programme for Technical Standards specifies that the national guideline is created for future projects as well as renovation of existing ones. They further say the tool can be used in all projects where the outdoor environment is affected (Nationellt brukarråd Utemiljö 2023);

> PTS Utemiljöverktyg is based on evidence-based research and ensures that health-promoting outdoor environments for patients, staff and visitors are created. Nationellt brukarråd Utemiljö 2023 page 1, translated by author.

This quote proves the ambition of this national guideline and the intent with which it was produced.

PTS Outdoor Environment Tool essentially describes some of the theories that have been explained above; the needs pyramid, the zones, as well as the need for comfortable and stimulating design, and combines them into a single tool. PTS Forum advocate for assessing the environment, the needs of the target group, and

then producing an overview map such as the one below (see figure 5) as their methodology (Nationellt brukarråd Utemiljö 2023).

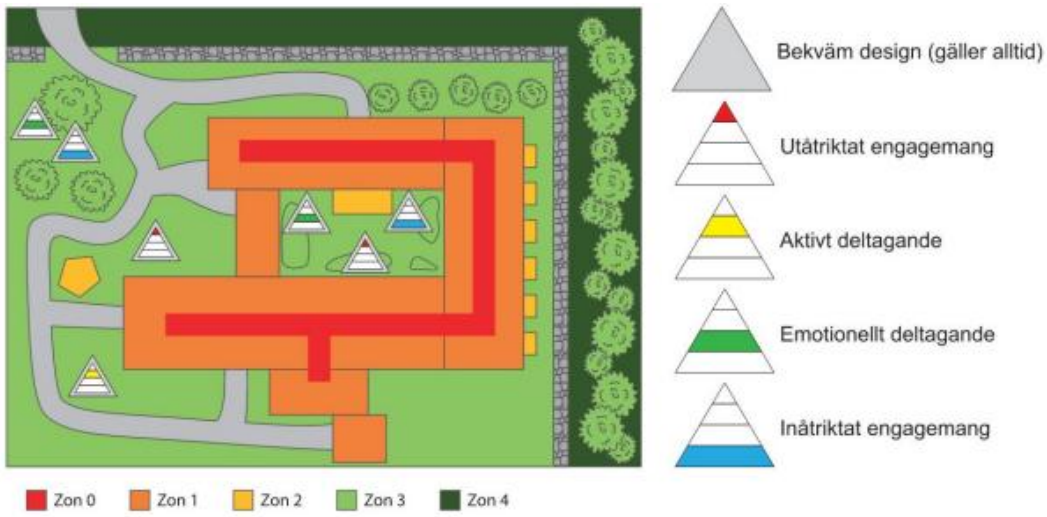


Figure 5. Illustration showing an example of how PTS Forum advocate that the PTS Outdoor environment tool be used. Illustration by Nationellt Brukarråd Utemiljö 2023, page 10. Used with copyright holders' permission.

Since PTS Outdoor Environment Tool consisted of several theories and tools which had been condensed and combined into one, the tool was too oversimplified and thus difficult to utilize. Additionally, there was a lack of concrete description in how the tool should be used. Especially when considering that no needs analysis was performed as part of this thesis; it became impossible to determine what was meant by the different pyramids and how to know which part of the pyramid goes where. The choice was instead made to use a simplified version of the QET, which will be explained below in Chapter 4 Methodology.

4. Methodology

As a brief overview of the methodology, it entailed three steps. One, using GIS analysis and on-site evaluation, the outdoor environments of Uppsala University Hospital were examined. Two, the study then explored how the Quality Evaluation Tool (QET) can be applied in established healthcare settings, with Uppsala University Hospital as a case study. Finally, the results were analysed, and potential issues and opportunities were identified for the qualities of the studied areas.

4.1 Limitations and Parameters

As a part of this thesis, certain limitations and parameters have been required to be set on the author because of limited time. Additionally, in the aim of maintaining ethical practices, the choice was made not to enter the interior of the healthcare buildings of Uppsala University Hospital. This has been further detailed in Section 4.3.1 Selection of sites

As evidenced by the theories mentioned above, a central perspective to have in mind when discussing or operating in the realm of outdoor restorative environments, particularly those around hospitals, is the needs of the imagined or existing users. The needs of the users can be determined through many methods, such as interviews or surveys of hospital staff, patients and loved ones (Engström et al. 2022). It is important to note that though outdoor environments can be rehabilitating for many different users, in many different ways, and an ideal scenario would be to meet each individual or use case need on a person-by-person basis, this was not possible to accomplish within the scope of this paper. Evidence-Based Design dictates time and again the requirement of focusing the outdoor environment on the users' needs.

However, in a hospital as large as this, with the time limitations that exist, interviews or surveys were excluded from the original method (as detailed in QET by Bengtsson and Grahn 2014). Thus, this thesis has had a general focus on rehabilitating environments in hospital settings, without picking a particular user-group. Rather the attempt was figuring out how to create an outdoor environment suitable for most use cases through a rehabilitation perspective with a foundation in the evidence-based theories developed through research. That effectively means that instead of using the entire QET, which would dictate performing an intricate needs analysis, only parts of it will be utilised.

Another thing to ascertain is though the topic of this thesis is interdisciplinary, touching upon medicine, sociology, psychology, ecology, architecture as well as

landscape architecture, the aim remained to focus on the landscape architects' point of view and what she has an ability to affect. The author's perspective is that of the landscape architect and the purpose was to discuss how to improve the outdoor environments to make possible the best outcomes for healing and rehabilitation to occur.

The author has not created a treatment in the form of an outdoor environment i.e. the outdoor environment alterations suggested will not necessarily in their own right be outdoor therapy gardens used as a treatment method. Rather the aim has been to point out areas and their strengths and weaknesses to make possible such use cases in future. What this thesis does not go into is how therapy should be performed or what activities should be performed. Further it does not touch on if and how the use of animals in outdoor therapy/rehabilitation should be done.

4.2 Step One: GIS Analysis

Through GIS analysis, the outdoor environment at Uppsala University Hospital, was examined, where polygons of different types of surfaces (grass, tree canopy, hard surfaces) were marked, and the results were compiled. The choice was made to exclude one hospital building and a private cancer clinic as they were located outside the main hospital grounds.

The program ArcGIS PRO was used, wherein type of green environments were mapped (grass and shrubs; trees). The main background map used was from Lantmäteriet called orthoRGB 025.050m from the year 2017 (Lantmäteriet 2017). As Uppsala University Hospital has gone through and is currently going through significant reconstruction, an on-site evaluation was performed in addition to said map to ensure accuracy of the green structure plan. This was done as the satellite imagery was inaccurate in re-constructed areas of the hospital grounds. Thus, Google Maps Street view was further complemented with on-site evaluation (Google 2025), as well as another map from Lantmäteriet through the tool Min Karta, where the year of photos remains unclear (Lantmäteriet). This all to make it as accurate to the present date as possible.

Instead of measuring tree canopy coverage and the composition of green structures through an arborist using specialized equipment, a rough estimation was made using the various maps and on-site visual approximation. The accuracy of the map and the resulting statistics have thus been affected. However, for the purposes of this study, for which the green structure analysis was done for the purpose of acquiring a thorough overview of the case study area, I think it is adequate.

Once types of outdoor environments in the hospital grounds were mapped, statistics as to their makeup were produced using the GIS program, and a 300m buffer zone was created using the marked edges of the hospital grounds.

4.3 Step Two: QET Site Analysis

The following text provides a brief overview of Step Two of the methodology: the QET site analysis. Firstly, a site selection was performed to determine which sites within Uppsala University Hospital grounds and the surrounding green areas would be analysed. Secondly, site analysis protocols were created for each of the outdoor environment zones that this thesis touched on. This is because not every environmental quality was relevant for every zone, as per the literature (Bengtsson et al. 2018). Thirdly, a 1-5 grading scale was defined and criterions for the gradings were established, as an organised method of grading the environmental qualities was lacking in the literature. Field inventory was then done and information gathered, which included notes, photographs and videos.

Following field data collection, a comprehensive and systematic evaluation of each environmental quality across all sites was done. For every quality assessed, the definition of the quality per the relevant literature was critically compared to the grading scale and associated criteria, and a judgement was made along with a motivational observation. The complete set of evaluations and observations is provided in *Appendix 1: QET Protocols and Analysis of Uppsala University Hospital.*

4.3.1 Selection of Sites

Exploration was done in how PTS Outdoor Environment Tool could be practically used at established healthcare facilities by using Uppsala University Hospital as a case study. In accordance with QET and PTS the grounds were divided into different zones, of which three pertain the outdoor environments of the hospital and have been included in this study.

Zone 0 and zone 1 pertain the inside views of greenery from within the hospital buildings, and have thus been excluded from the scope of this study. This was done as the hospital outdoor environment already was a large area to analyse, and adding the built portions of the hospital grounds to the analysis area would have rendered the scope of the project too large for this thesis. This limitation also affects sites chosen in zone 2, as has been detailed below. Furthermore, for ethical reasons, there was a deliberate intention not to disrupt ongoing patient care and staff duties.

In doing so, the limitations lead to a loss in information around the rehabilitative values for patients and staff who are stuck interacting with the outdoors environment from certain windows and balconies etcetera. For example, there might be a specific site of the outdoor environment visible from many angles from inside which would have been extra central to improve. This information has now been lost.

The remaining zones are described as follows:

> Zone 2: Contact with the outdoor environment in transitional areas between indoors and outdoors, such as winter gardens, balconies, patios, and terraces.
>
> Zone 3: In parks and gardens located in the surrounding grounds, directly connected to a healthcare building.
>
> Zone 4: Contact with the broader outdoor environment, i.e., areas beyond the healthcare building and its grounds. Bengtsson et al. 2018 page 6, translated by author.

It is important to note that I chose mainly entrances as sites to investigate in zone 2, though they are not specifically mentioned in the literature. According to the literature, as can be seen from the quote above, zone 2 mainly consists of balconies, winter gardens, patios and terraces i.e. places inside the hospital buildings.

Since the inside of the buildings have not been included in the scope of this thesis, for the reasons previously detailed, a re-definition of zone 2 has made for the purpose of this thesis. Zone 2 has been reinterpreted to include entrance areas and courtyards as they accurately fit the description of a transition zone between inside and outside. Furthermore, this decision was motivated as entrances receive the highest amount of traffic and thus affect the most people, and are the most visibly and physically accessible of a hospital's outdoor environments. The map of Uppsala University Hospitals environment zones and sites chosen per this new definition can be seen in figure 6 below.

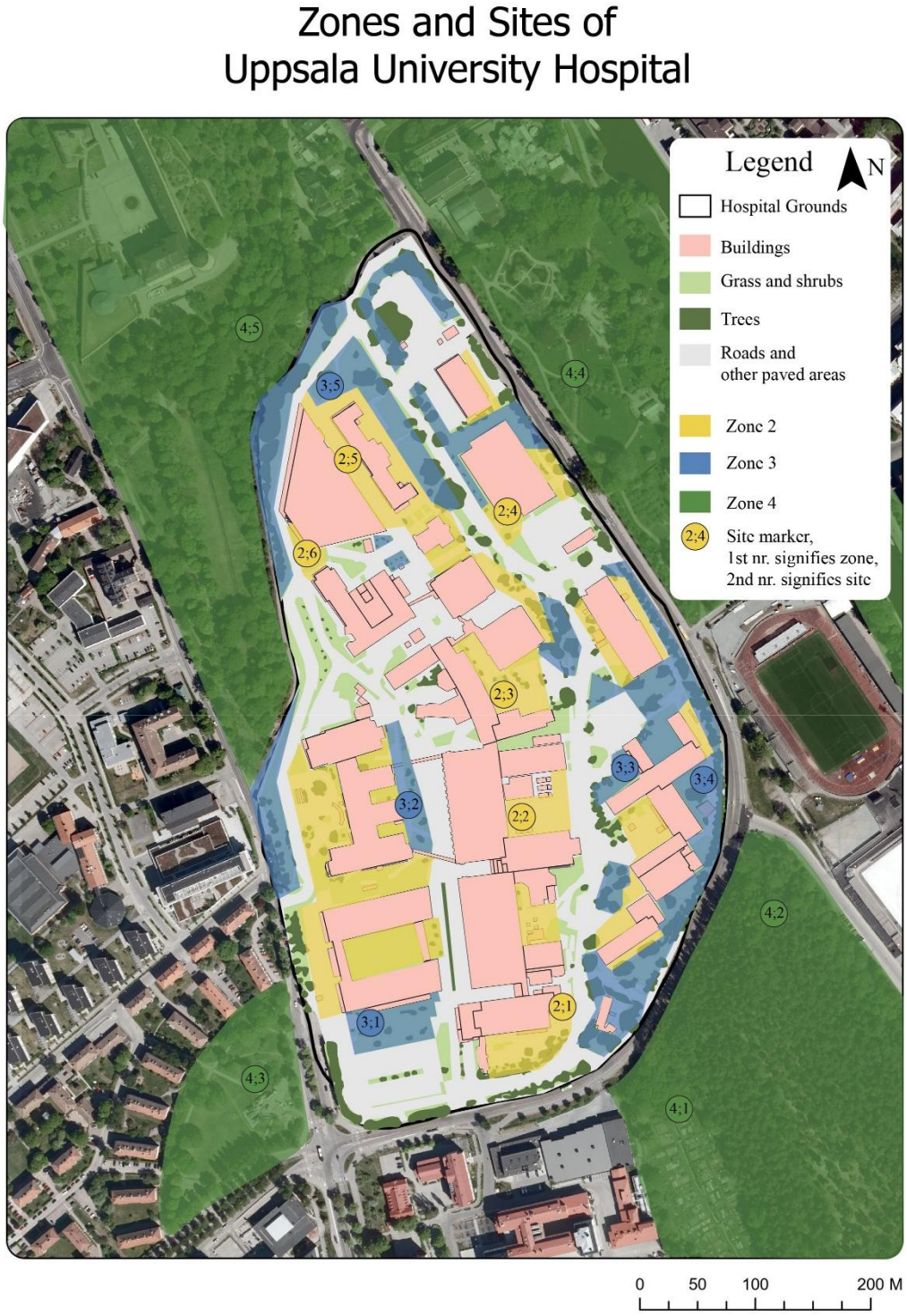


Figure 6. Orthophoto from Lantmäteriet with zones and sites marked out, as well as the outdoor structure makeup of Uppsala University Hospital. Yellow signifies zone 2, blue signifies zone 3 and green signifies zone 4. Thus, a site marked in yellow with 2;1 signifies the location of zone 2 site 1. Base map from Lantmäteriet 2017.

From zone 2 six sites were chosen, and for the remaining zones five sites were chosen. The sixth site is the only site chosen from zone 2 that is not by an

entrance. It was chosen to add fairness to the report, as it seems to be compensating for lacking green social areas in other sections of the hospital grounds. It should be noted that zone 2 site 6 is what the literature typically refers to as a zone 2, not the entrances that have been chosen for assessment instead, as was detailed above.

The six sites from zone 2 and the five sites each from zones 3 and 4 were chosen with an aim to get as much of an overview of the entire hospital grounds as possible. In the beginning, green sites such as parks and designed entrances were chosen for assessment. However, it became clear that such a selection would be mis-leading in how Uppsala University Hospitals outdoor environment actually function. Thus, a more spread out semi-randomised selection was done, with the goal of showcasing the reality of the hospital grounds as they stand today. In an ideal scenario and according to the literature, the whole of the hospital grounds should have been assessed.

This was again an issue of scope. The entirety of the hospital grounds could not have been assessed to the degree and meticulousness that the 16 sites chosen were. In further research, such a study which also includes a needs analysis should be done. This thesis can be considered the initial groundwork for that research.

In zone 4 the sites chosen were within a 300m walking distance of a hospital building entrance, in accordance with the 3-30-300 rule. Since so many varied green spaces were encompassed within this buffer zone, an effort was made to pick as varied a selection as possible.

4.3.2 Creation of Protocols for Site Analysis

In the following segment, the layout of the site analysis has been shown with my composition of the protocols for a zone 2 site, a zone 3 site and zone 4 site. Since each quality is not relevant for every zone, the protocols differ slightly in what qualities need to be considered. Thus, a different one has been created for each zone, in accordance with the literature from Bengtsson et al. 2018.

In *Appendix 1: QET Protocols and Analysis of Uppsala University Hospital* each site in each zone has a fully filled out protocol, including the observations/comments section. Please read the Appendix for substantially detailed site analysis. In the result of this document, only the gradings from Appendix 1 have been included in a chart form in order to condense the paper.

As mentioned, there was a lack of any grading or rating method within QET. Thus, one method to grade the sites was created for this thesis, and included in the protocols. The gradings of the QET were: 1- Not at all, 2– Inadequate, 3–

Partially, 4– Mostly and 5- Fully, and came from a combination of two reference studies. They were needed to determine the condition of each environmental quality for every site, and as a way to compare and analyse the different sites with each other.

In the first study investigating Perceived Sensory Dimensions, a 0-100 scale bar was used, where 0 was defined as *not at all*, and 100 was defined as *fully*. From 1-99 remained undefined (Stoltz et al. 2024).

The second study included compilations of gradings from protocols, which concerned nine evidence-based concepts for the perception of green outdoor environments. The protocols were shown in graphs on 1-5 scales and 1-10 scales but lacked definitions as to what these scales meant (Hedblom et al. 2011).

In combining the definitions *not at all* and *fully* with the 1-5 scale, and adding interim definitions for the grades 2, 3, and 4, a useful addition in methodology for QET was created. The protocols were as follows:

Table 1. Protocol of QET applied on site analysis of zone 2

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	1 – 2 – 3 – 4 – 5	
A2: Enclosure and entrance	1 – 2 – 3 – 4 – 5	
A3: Safety and security	1 – 2 – 3 – 4 – 5	
A4: Familiarity	1 – 2 – 3 – 4 – 5	
A5: Orientation and way finding	1 – 2 – 3 – 4 – 5	
A6: Different options in different kinds of weather	1 – 2 – 3 – 4 – 5	
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	1 – 2 – 3 – 4 – 5	
B2: Social opportunities	1 – 2 – 3 – 4 – 5	
B3: Joyful and meaningful activities	1 – 2 – 3 – 4 – 5	
B4: Culture and connection to past times	1 – 2 – 3 – 4 – 5	
B5: Symbolism/reflection	1 – 2 – 3 – 4 – 5	
B6: Prospect	1 – 2 – 3 – 4 – 5	
B7: Space	1 – 2 – 3 – 4 – 5	
B8: Rich in species	1 – 2 – 3 – 4 – 5	
B9: Sensual pleasures of nature	1 – 2 – 3 – 4 – 5	
B10: Seasons changing in nature	1 – 2 – 3 – 4 – 5	
B11: Serene	1 – 2 – 3 – 4 – 5	
B12: Wild nature	1 – 2 – 3 – 4 – 5	
B13: Refuge	1 – 2 – 3 – 4 – 5	

As table 1 above shows, the protocol for zone 2 included all nineteen evidence-based environmental qualities (Bengtsson et al. 2018).

Table 2. Protocol of QET applied on site analysis of zone 3

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A2: Enclosure and entrance	1 – 2 – 3 – 4 – 5	
A3: Safety and security	1 – 2 – 3 – 4 – 5	
A4: Familiarity	1 – 2 – 3 – 4 – 5	
A5: Orientation and way finding	1 – 2 – 3 – 4 – 5	
A6: Different options in different kinds of weather	1 – 2 – 3 – 4 – 5	
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	1 – 2 – 3 – 4 – 5	
B2: Social opportunities	1 – 2 – 3 – 4 – 5	
B3: Joyful and meaningful activities	1 – 2 – 3 – 4 – 5	
B4: Culture and connection to past times	1 – 2 – 3 – 4 – 5	
B5: Symbolism/reflection	1 – 2 – 3 – 4 – 5	
B6: Prospect	1 – 2 – 3 – 4 – 5	
B7: Space	1 – 2 – 3 – 4 – 5	
B8: Rich in species	1 – 2 – 3 – 4 – 5	
B9: Sensual pleasures of nature	1 – 2 – 3 – 4 – 5	
B10: Seasons changing in nature	1 – 2 – 3 – 4 – 5	
B11: Serene	1 – 2 – 3 – 4 – 5	
B12: Wild nature	1 – 2 – 3 – 4 – 5	
B13: Refuge	1 – 2 – 3 – 4 – 5	

As table 2 above shows, the protocol for zone 3 included eighteen evidence-based environmental qualities, but A1: Closeness and easy access was removed as it was

not deemed relevant for the zone according to the literature (Bengtsson et al. 2018).

Table 3. Protocol of QET-tool applied on site analysis of zone 4

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A3: Safety and security	1 – 2 – 3 – 4 – 5	
A5: Orientation and way finding	1 – 2 – 3 – 4 – 5	
A6: Different options in different kinds of weather	1 – 2 – 3 – 4 – 5	
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	1 – 2 – 3 – 4 – 5	
B2: Social opportunities	1 – 2 – 3 – 4 – 5	
B3: Joyful and meaningful activities	1 – 2 – 3 – 4 – 5	
B4: Culture and connection to past times	1 – 2 – 3 – 4 – 5	
B5: Symbolism/reflection	1 – 2 – 3 – 4 – 5	
B6: Prospect	1 – 2 – 3 – 4 – 5	
B7: Space	1 – 2 – 3 – 4 – 5	
B8: Rich in species	1 – 2 – 3 – 4 – 5	
B9: Sensual pleasures of nature	1 – 2 – 3 – 4 – 5	
B10: Seasons changing in nature	1 – 2 – 3 – 4 – 5	
B11: Serene	1 – 2 – 3 – 4 – 5	
B12: Wild nature	1 – 2 – 3 – 4 – 5	
B13: Refuge	1 – 2 – 3 – 4 – 5	

The protocol for zone 4 included sixteen evidence-based environmental qualities (see table 3 above). Three were removed; A1: Closeness and easy access, A2:

Enclosure and entrance and A4: Familiarity. These were removed as they were not deemed relevant for the zone according to the literature (Bengtsson et al. 2018).

4.3.3 Grading Criteria

The text in section 3.2.3 Quality Evaluation Tool outlined the 6 environmental qualities for comfortable design (A1–A6) and the 13 environmental qualities for stimulating design (B1–B13), also referred to as qualities for access to nature. This text was reviewed before each assessment to recall the specific meaning of the environmental quality being evaluated during the site analysis. In addition to the gradings and their definitions, there was a need for grading criteria to increase consistency in the site analysis.

Because the site analysis was conducted roughly over the course of a month, spanning 19 qualities and 16 sites, there was a need to ensure each environmental quality would be rated consistently and fairly across the duration of the thesis. The grading criteria are as follows:

1 - Not at all

The quality or feature is completely absent.
No attempt has been made to incorporate it.
The site does not provide any relevant experience or function.

2 - Inadequate

The feature is present but does not function well.
It does not meet basic requirements or fails in execution.
The experience is significantly compromised due to poor design.

3 - Partially

The feature exists and provides some level of function.
It is usable but has noticeable limitations.
Some users may benefit, but others may find it lacking.

4 - Mostly

The feature is well-integrated and works for most users.
Minor issues exist but do not significantly impact usability.
The design is effective, but improvements could enhance the experience.

5- Fully

The feature is optimally designed and fully functional.
It meets all intended needs without restrictions.
The experience is seamless and inclusive for all users.

These gradings and grading criteria were created according to the author's judgment as a landscape architect based on her interpretation of the relevant literature (Bengtsson & Grahn 2014 and Bengtsson et al. 2018).

4.4 Step Three: Synthesis of Case Study and suggested measures

Step three of the Methodology details the synthesis of the site analysis and how suggested measures were reached. It is important to note that the aim of this thesis has been to examine the rehabilitative green spaces within Uppsala University Hospital, and not to create a design proposal for the hospital grounds. The synthesis concerns the overall assessments from the QET Site Analysis and the reached conclusions.

Firstly, an overview of the different zones and their gradings was detailed in Part Three of the Result. Two charts were made to help in achieving a general view. Secondly, the environmental qualities that received high ratings were discussed, along with the reasoning behind their performance and suggestions for further improvement. Thirdly, the same analysis and suggested measures was done for environmental qualities grading lowly. In Chapter 6 Discussion, the most important general insights from the result have also been detailed and discussed further.

No specific synthesis methodology for Step Three has been created, rather the results were discussed and analysed in flowing text, with quotes and calling back to sections of interest from the different site evaluations. My suggestions for improvements came in a flowing form as they were deemed relevant. Had there been a synthesis methodology, this could have led to an increased legibility being achieved, or a more consistently analysed result and received insights. No map was able to be made to accurately portray the total result of the site analysis, as the result spanned 19 environmental qualities, 3 environmental zones, and 16 sites.

4.5 Critique of methodology

The entirety of Chapter 4 Methodology has included the critique of choices made, the reasonings behind them, and their potential effects. This was done in flowing

text as they were relevant. See the related sections for the full text. As a brief reminder, they have been listed below:

A *needs analysis* for the specific intended users of the outdoor environment was not done, see Section 4.1 Limitations and Parameters.

The *GIS analysis* was done mainly through partially outdated maps and was complemented by a rough on-site estimate, see Section 4.2 Step One: GIS Analysis.

The *Outdoor Environment Zones* were altered to exclude all interiors of buildings, see Section 4.3.1 Selection of Sites.

Sites were chosen instead of covering the entirety of the hospital's outdoor environments, also detailed in Section 4.3.1 Selection of Sites.

Gradings and Grading Criteria were created by the author, see Sections 4.3.2 Creation of Protocols for Site Analysis, and 4.3.3 Grading Criteria. This is a disruption from the rest of the methodology, which strictly used only research-backed methods.

There was a lack of a specific *synthesis method* for the result discussion, see Section 4.4 Step Three: Discussion of Site Analysis and Insights.

5. Result

The study result has been presented in three main phases. First, the map produced using GIS analysis and on-site evaluations to show the green structure composition of the outdoor areas at Uppsala University Hospital has been shown. Second, a summarization of the application of the QET Protocols was presented, focusing solely on the grading outcomes, without including specific site observations for each quality. Finally, the collected data were analysed in relation to the earlier site observations, identifying key issues and potential opportunities for improvement within the evaluated areas.

5.1 Part One: Green structure analysis

Figure 7. Map of Uppsala University Hospital, illustrating the various forms of infrastructure within the hospital area. A buffer zone has been created from the perimeter of the hospital grounds 300m outwards [map]. Base map from Lantmäteriet 2017.

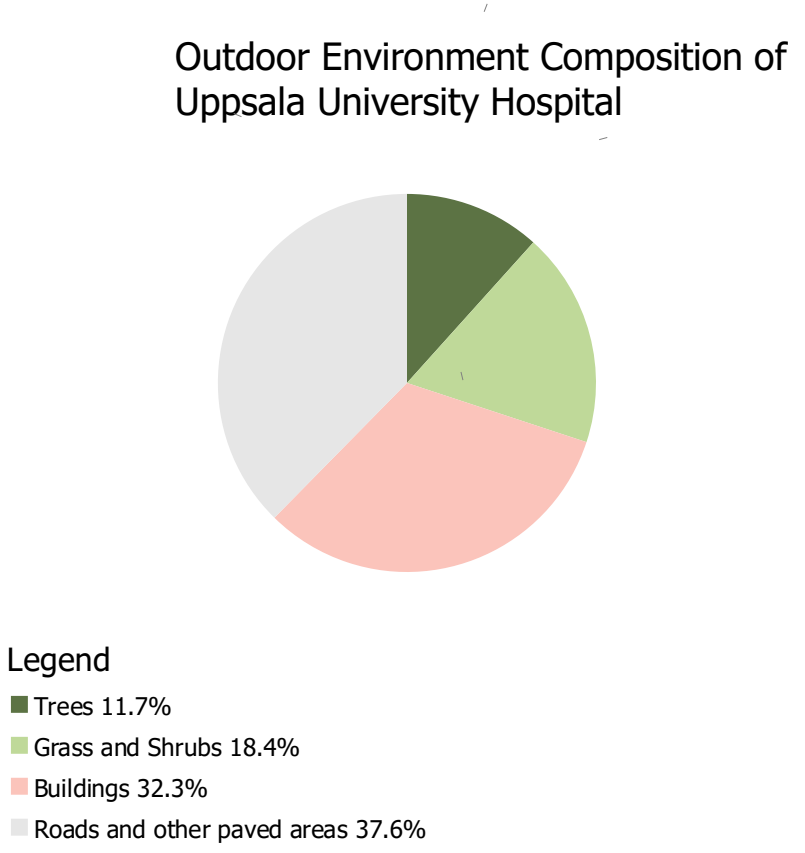


Figure 8. A pie chart of the various percentages of the outdoor environment composition of Uppsala University Hospital area [chart].

As is clear by figure 8 above, the division of outdoor environment composition is less than ideal for Uppsala University Hospital. Tree canopy makes up only 11.7%, which is significantly less than the necessary 30%, as stated by the 3-30-300 rule. Likewise, the infrastructure imprint of buildings, roads and other paved areas exceed 69%, falling significantly below the recommendations. This indicates a general predominance of pragmatic construction over the considerations of evidence-based design of green outdoor spaces.

As for the 300m buffer, the map clearly shows a significant number of expansive green spaces in zone 4, se figure 7 above. To the east of the hospital grounds there is Uppsala City Park, and the 300m buffer spans so wide as to encompass the river Fyris. To the northwest, the buffer spans up into a forested area, includes Uppsala Castle and part of its grounds. To the southwest it spans a park called Batteriparken. Finally, to the south of the hospital grounds, the buffer includes a forested hill and a community garden (Google 2025).

5.2 Part Two: QET analysis of Uppsala University Hospital

In the following segment a summary of the QET analysis performed on Uppsala University Hospital will be presented, without comments and reasonings around site evaluation. For each site there will be a spread containing a site description, as well as one figure showing photographs from site analysis, one figure showing site location, one figure showing a grading chart from QET, and one figure showing radar charts of the gradings for easier visual overview. For the full text of the description of each environmental quality at each site, see *"Appendix 1 QET Protocols and Analysis of Uppsala University Hospital"*.

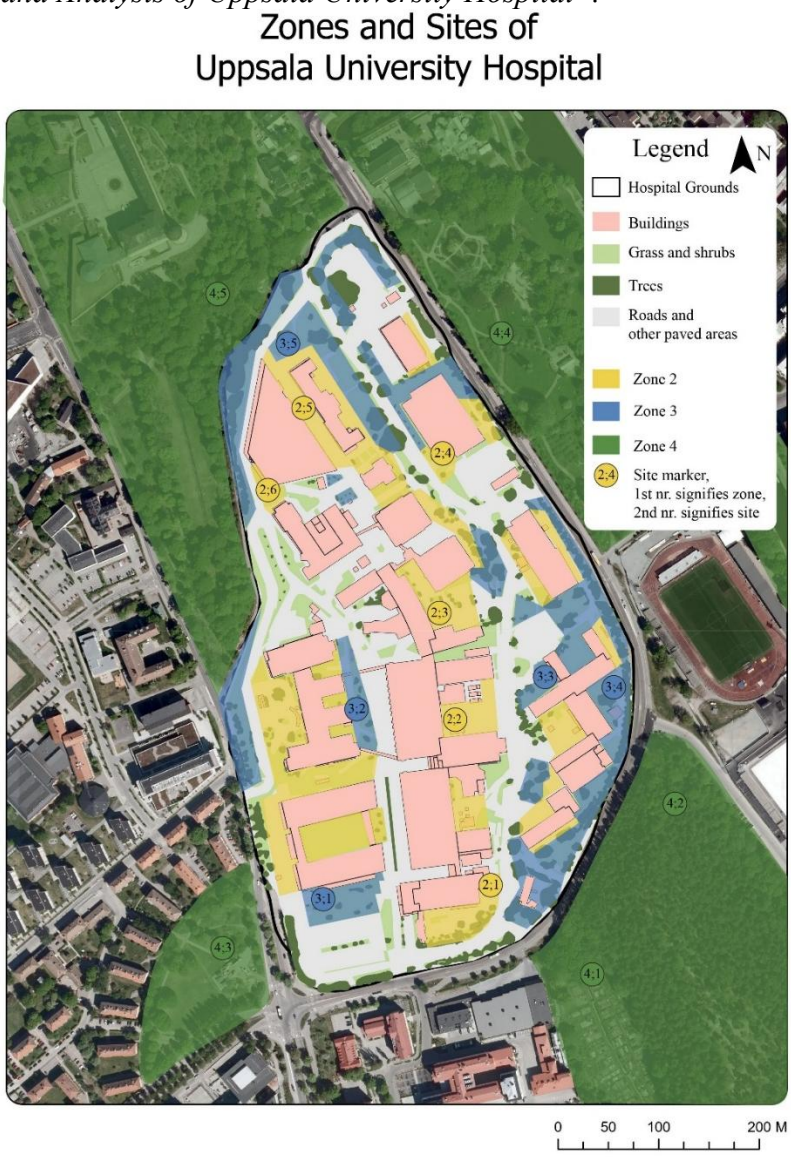


Figure 9. Orthophoto from Lantmäteriet with zones and sites marked out, same as figure 5. Repeated to show where the QET site analysis was performed. Yellow signifies zone 2, blue signifies zone 3 and green signifies zone 4. Thus, a site marked in yellow with 2;1 signifies the location of zone 2 site 1. Base map from Lantmäteriet 2017.

LEGEND	
1	Not at all
2	Inadequate
3	Partially
4	Mostly
5	Fully

		zone 2						zone 3					zone 4				
		2;1	2;2	2;3	2;4	2;5	2;6	3;1	3;2	3;3	3;4	3;5	4;1	4;2	4;3	4;4	4;5
Section A: Comfortable	A1: Closeness and easy access	5	5	5	5	5	2										
	A2: Enclosure and entrance	4	1	4	2	1	5	3	1	4	2	4					
	A3: Safety and security	3	2	4	4	1	2	5	2	1	1	2	2	2	5	5	2
	A4: Familiarity	5	2	5	5	1	5	5	2	2	1	5					
	A5: Orientation and way finding	5	5	5	5	1	5	5	1	4	4	4	5	5	4	4	4
	A6: Different options in different kinds of weather	5	3	3	1	1	4	2	1	2	4	2	2	2	2	5	2
	A Average	4,5	3,0	4,3	3,7	1,7	3,8	4,0	1,4	2,6	2,4	3,4	3,0	3,0	3,7	4,7	2,7
Section B: Access to nature	B1: Contact with surrounding life	4	5	5	5	5	5	5	4	4	2	5	5	4	5	5	5
	B2: Social opportunities	2	2	4	3	1	5	5	1	2	2	4	4	2	5	5	3
	B3: Joyful and meaningful activities	1	1	2	1	1	3	3	1	1	1	3	5	3	5	5	3
	B4: Culture and connection to past times	1	1	5	2	4	2	5	1	2	3	4	5	5	5	5	5
	B5: Symbolism/reflection	1	1	2	1	1	1	4	1	1	3	3	5	4	2	3	4
	B6: Prospect	4	1	1	4	1	3	5	3	4	5	2	5	2	5	5	2
	B7: Space	1	1	1	1	1	2	2	1	1	1	2	5	5	5	5	5
	B8: Rich in species	2	1	2	3	1	3	5	3	3	2	5	5	5	5	5	5
	B9: Sensual pleasures of nature	2	2	3	3	1	2	3	2	3	1	3	5	5	3	5	5
	B10: Seasons changing in nature	4	2	4	4	1	5	4	3	3	3	5	5	3	5	5	5
	B11: Serene	1	1	1	1	1	3	3	1	1	1	3	5	2	4	2	4
	B12: Wild nature	1	1	1	3	1	5	2	1	2	1	5	5	5	2	1	5
	B13: Refuge	2	1	4	3	1	2	1	1	1	1	2	3	5	5	3	5
	B Average	2,0	1,5	2,7	2,6	1,5	3,2	3,6	1,8	2,2	2,0	3,5	4,8	3,8	4,3	4,2	4,3

Table 4. A color-coded overview table of the grading results: site gradings of each of the nineteen evidence-based environmental qualities for rehabilitating green environments for each of the sixteen sites. The nineteen environmental qualities are listed in row order from A1-A6 in Section A, and B1-B13 in Section B. The zones and sites are listed in column order, first divided into zone 2 yellow, zone 3 blue, and zone 4 green, and then within each zone the site number has been specified where 2;1 signifies zone 2: site 1, and 2;2 signifies zone 2: site 2 and so on. The grading legend can be seen to the top left, where deep Red signifies 1 – not at all, light red signifies 2 – inadequate, beige signifies 3 -partially, light teal signifies 4 - mostly and deep teal signifies 5- fully [table].

5.2.1 Zone 2

QET analysis of zone 2 site 1

Figure 10. Photos from zone 2: site 1 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

Zone 2: site 1 is located by entrance 85 (Google 2025). The site consists of an entrance area with a marked pick up/ drop off area, walls with fencing plants to the east to address the height differences of the site. To the southwest there is a rest-area with smoking disposal bins, large trees, hedges and a grass field, as well as a loading dock for hospital operations. There is a significant height difference there which is addressed through a large concrete wall and chain link fencing, seen in the south facing image above (see figure 10).

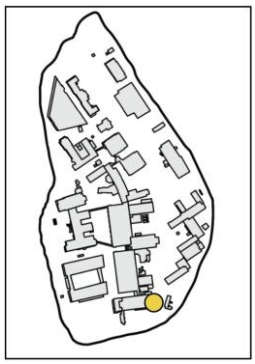


Figure 11. Index map showing zone 2: site 1 location marked in yellow [map].

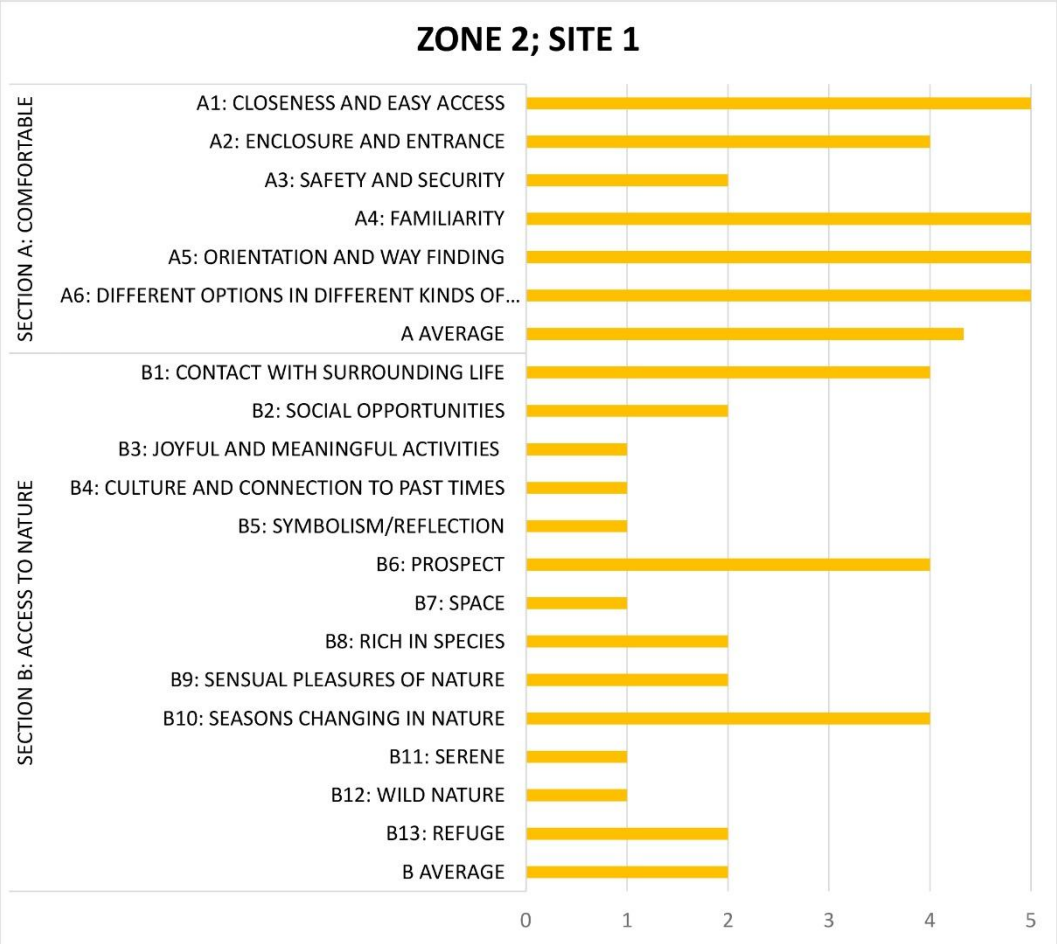


Figure 12. Gradings of QET applied on site analysis of zone 2: site 1 [chart].

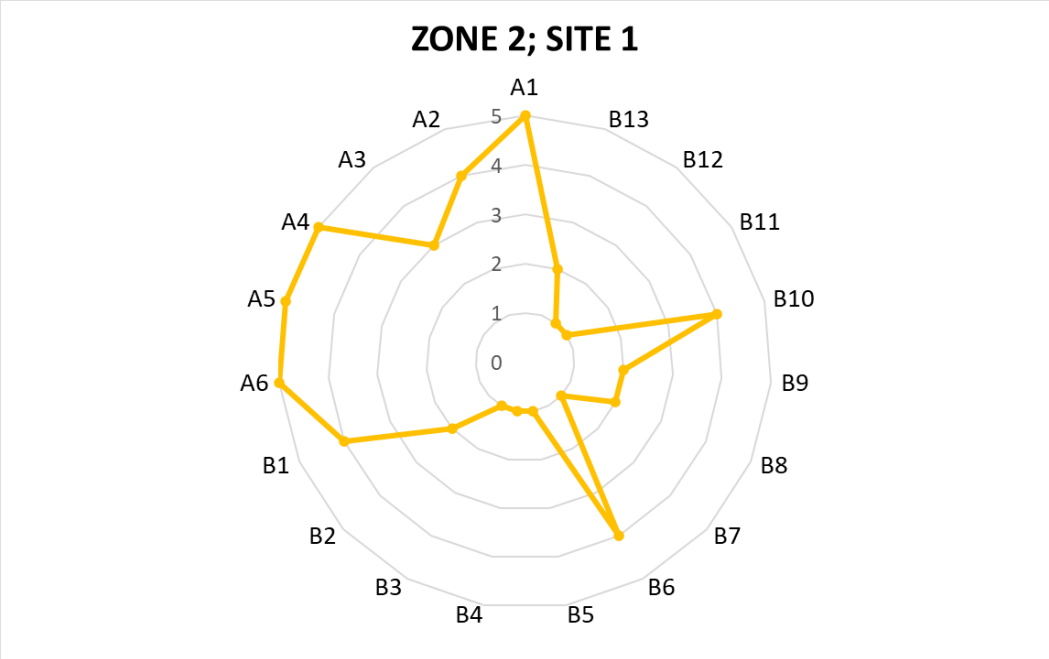


Figure 13. Radar chart of gradings for easier visual overview, from site analysis of zone 2: site 1 [chart].

QET analysis of zone 2 site 2

Figure 14. Photos from zone 2: site 2 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

Zone 2: site 2 is located by entrance 65/70 (Google 2025). The site is mainly a parking lot for cars and bicycles. The main form of greenery is large pots with plants by the entrance (see figure 14).

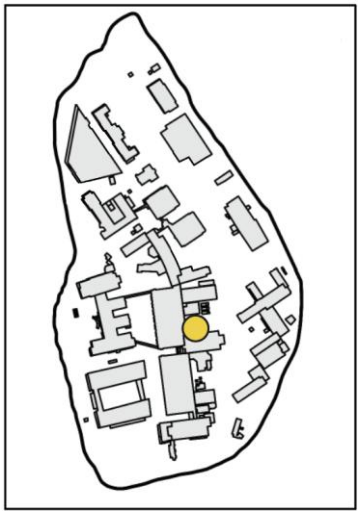


Figure 15. Index map showing zone 2: site 2 location marked in yellow [map].

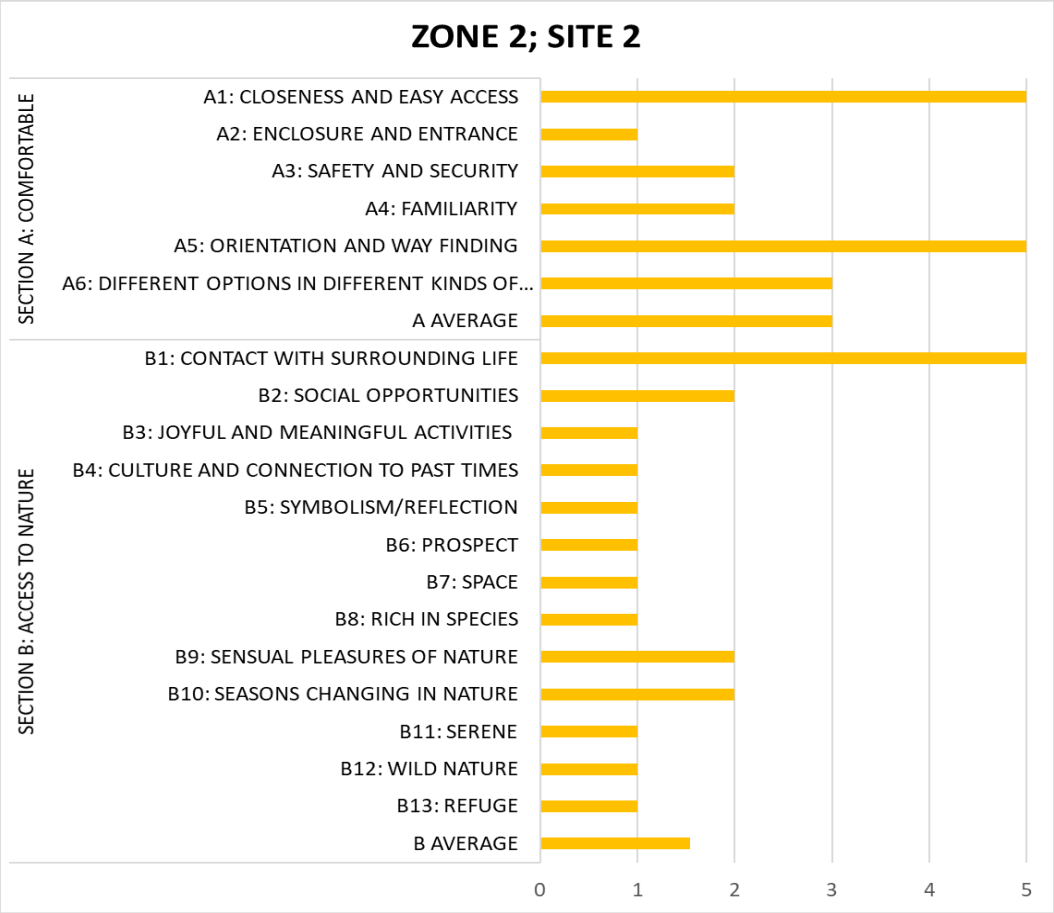


Figure 16. Gradings of QET applied on site analysis of zone 2: site 2 [chart].

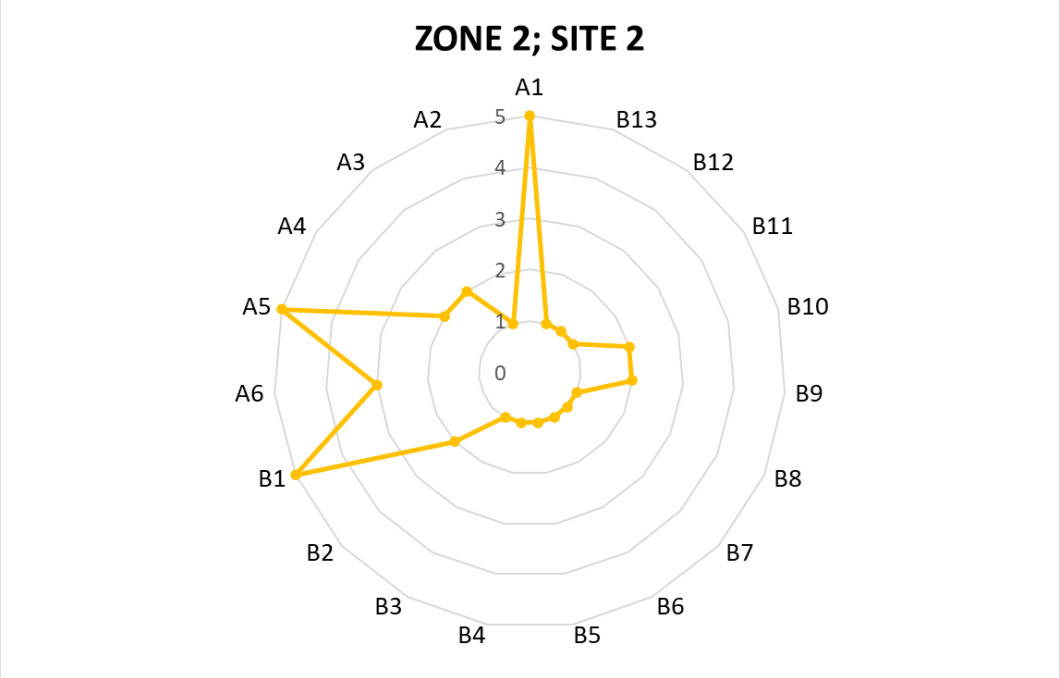


Figure 17. Radar chart of gradings for easier visual overview, from site analysis of zone 2: site 2 [chart].

QET analysis of zone 2 site 3

Figure 18. Photos from zone 2: site 3 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

Zone 2: site 3 is located by the entrance to the emergency ward (Google 2025). Right by the entrance there are smokers' cubes with seating. There is a cultural roundabout with an artwork in it, as well as an area to the northwest with additional seating, smoking cube, bicycle parking, trees and bushes (see figure 18).

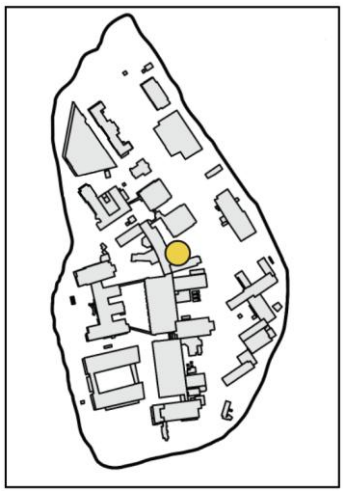


Figure 19. Index map showing zone 2: site 3 location marked in yellow [map].

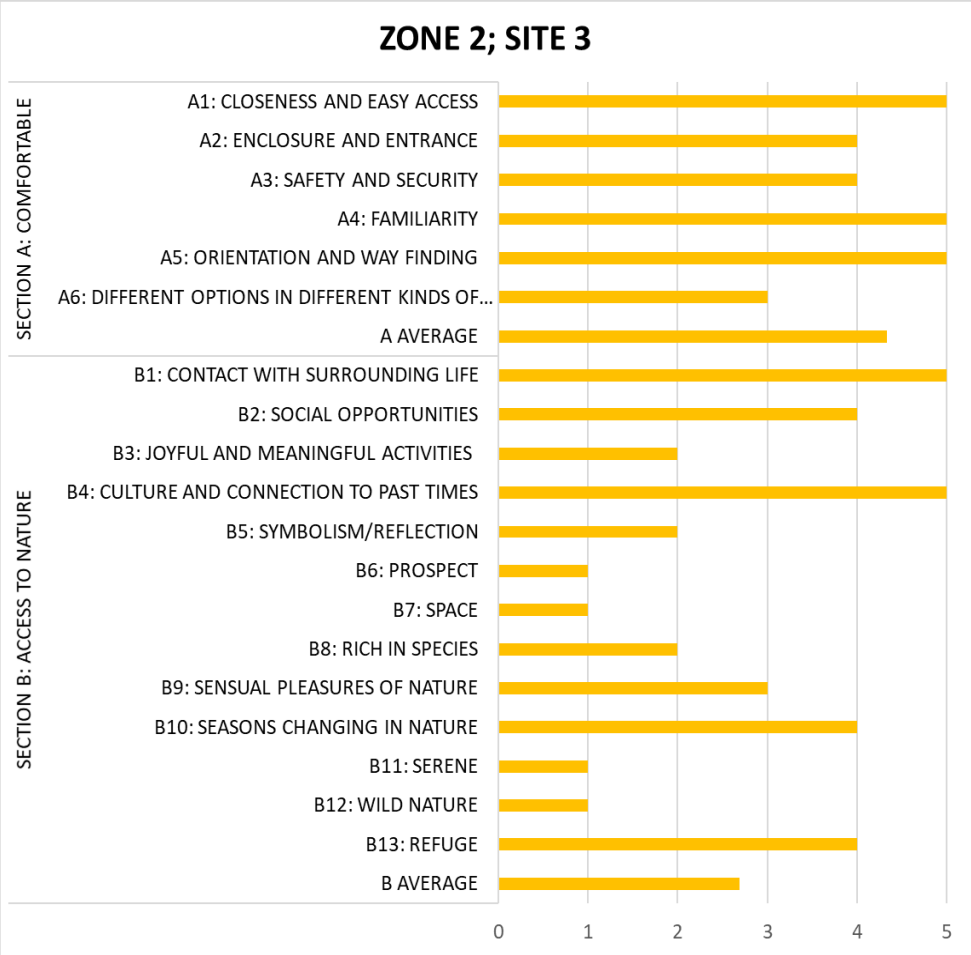


Figure 20. Gradings of QET applied on site analysis of zone 2: site 3 [chart].

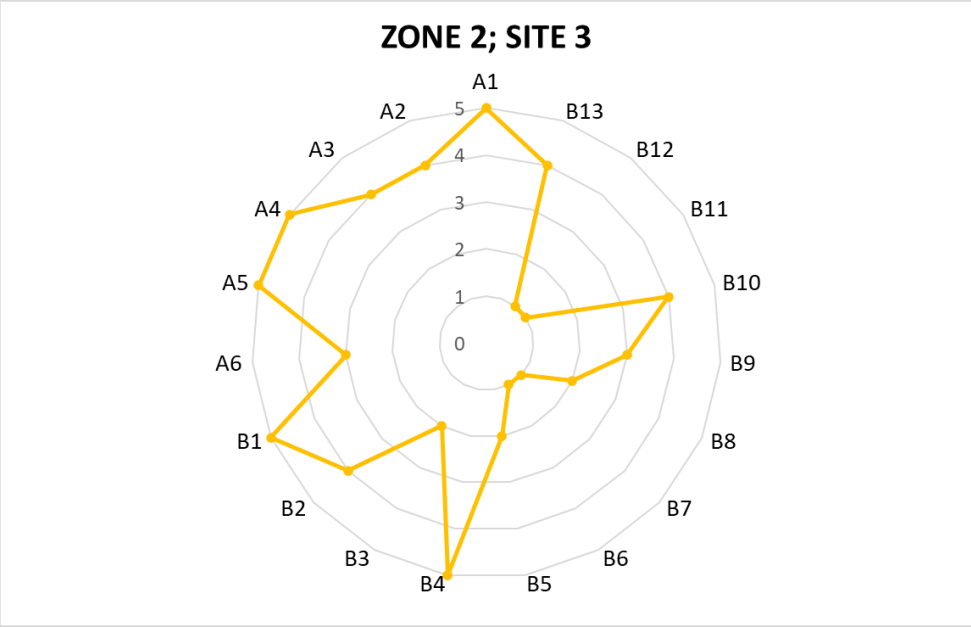


Figure 21. Radar chart of gradings for easier visual overview, from site analysis of zone 2: site 3 [chart].

QET analysis of zone 2 site 4

Figure 22. Photos from zone 2: site 3 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

Zone 2: site 5 is located by the entrance to the major parking garage of the hospital grounds (Google 2025). East and north of the site, the parking garage is adjacent. To the west of the site major construction is ongoing. A big tree can be seen to the south, and right by the entrance there is a statue/artwork (see figure 22).

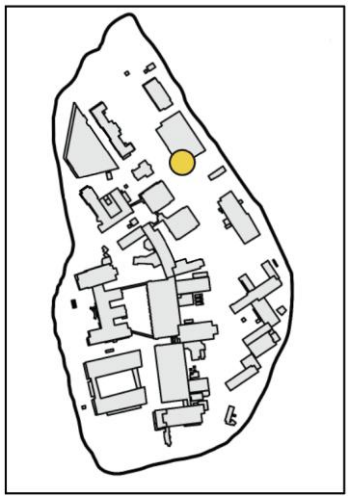


Figure 23. Index map showing zone 2: site 4 location marked in yellow [map].

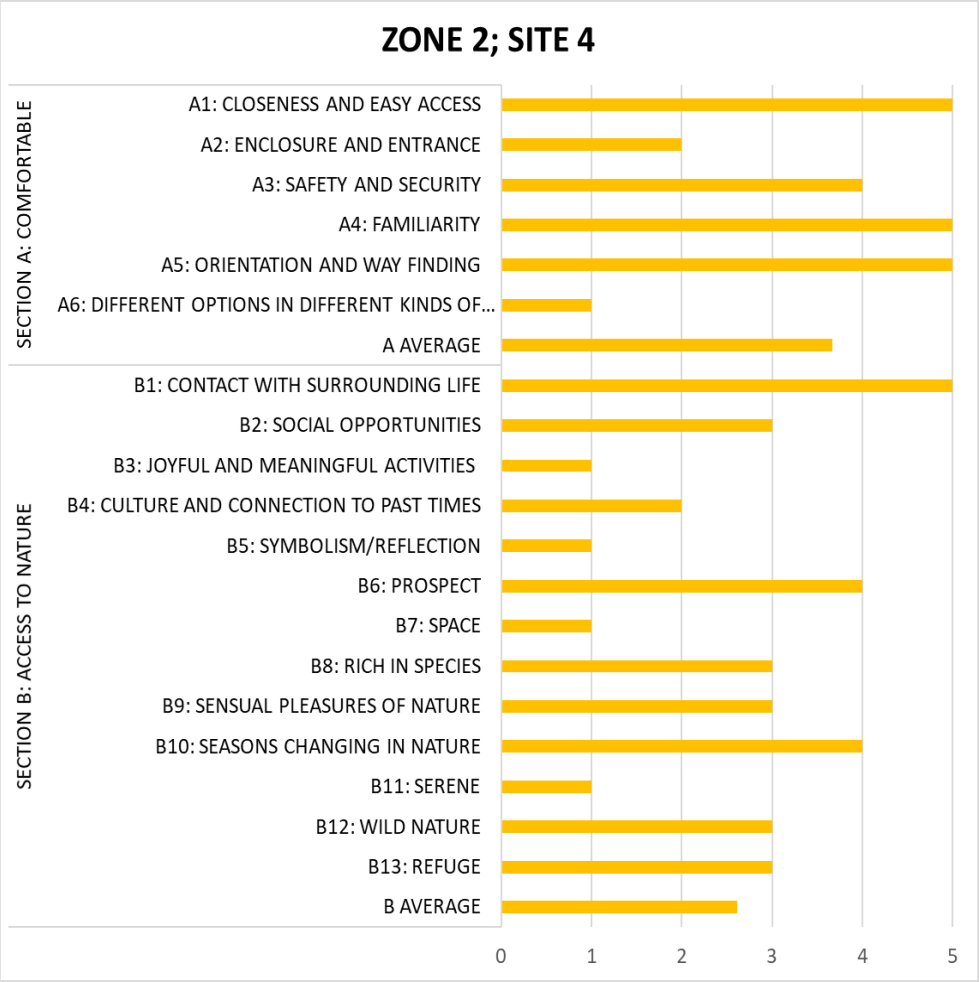


Figure 24. Gradings of QET applied on site analysis of zone 2: site 4 [chart].

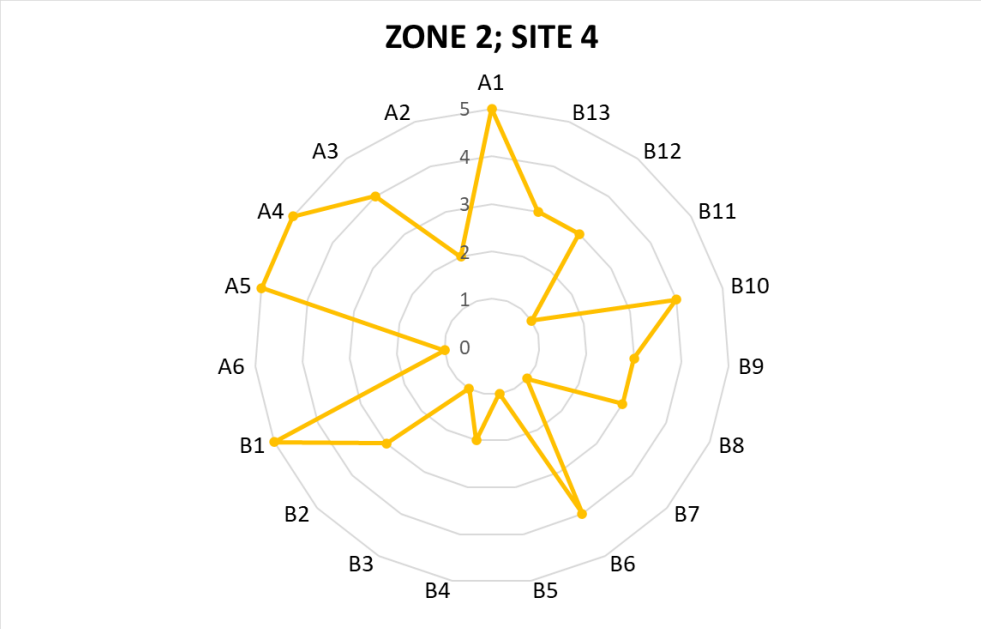


Figure 25. Radar chart of gradings for easier visual overview, from site analysis of zone 2: site 4 [chart].

QET analysis of zone 2 site 5

Figure 26. Photos from zone 2: site 5 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

Zone 2: site 5 is located by the entrance to the emergency ward for adult psychiatry (Google 2025). The area acts as a narrow passage between two buildings with mixed traffic utilising the cobbled area (see figure 26). Car parking on either side of the entrance to the south and west, and bicycle parking across on the other side. To the far northwest Uppsala Castle can be seen with large trees beneath it. To the southwest a single tree can be seen, as well as ongoing construction.

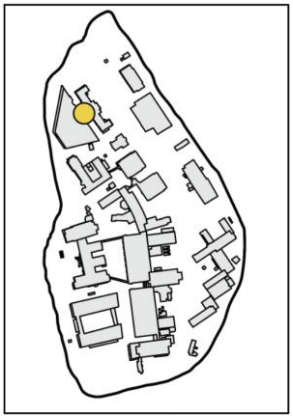


Figure 27. Index map showing zone 2: site 5 location marked in yellow [map].

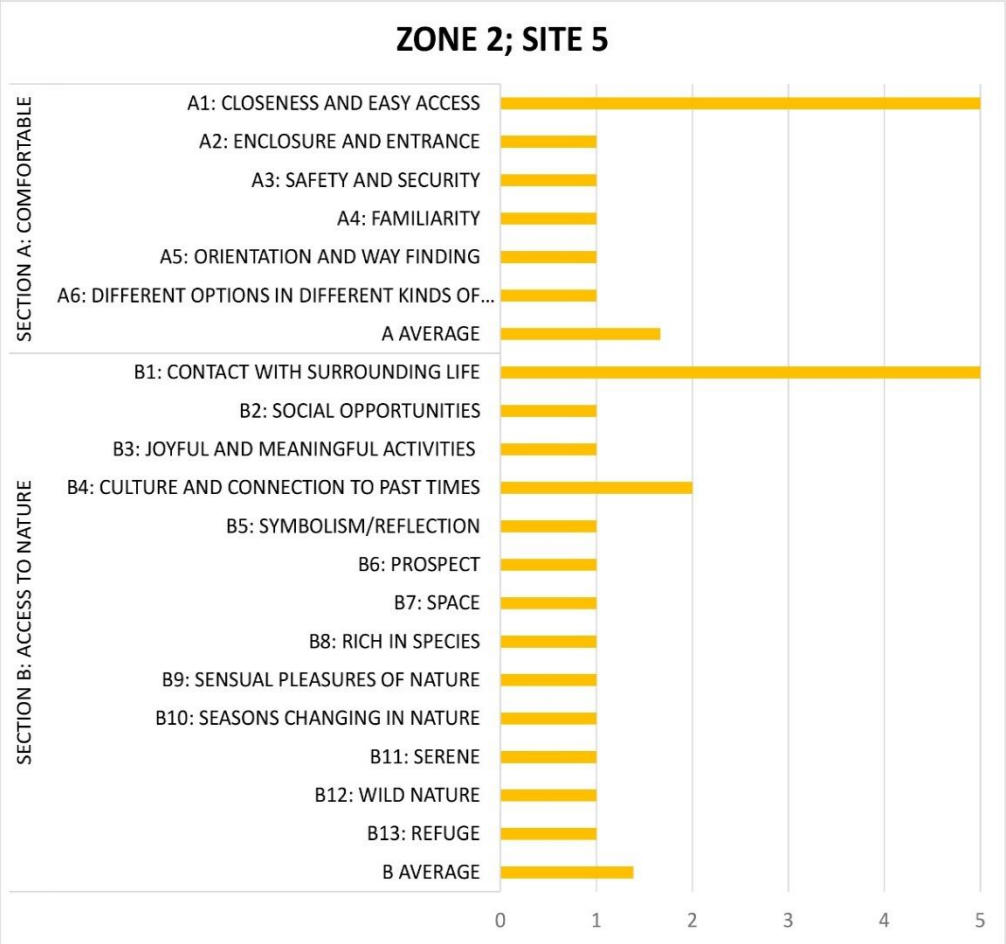


Figure 28. Gradings of QET applied on site analysis of zone 2: site 5 [chart].

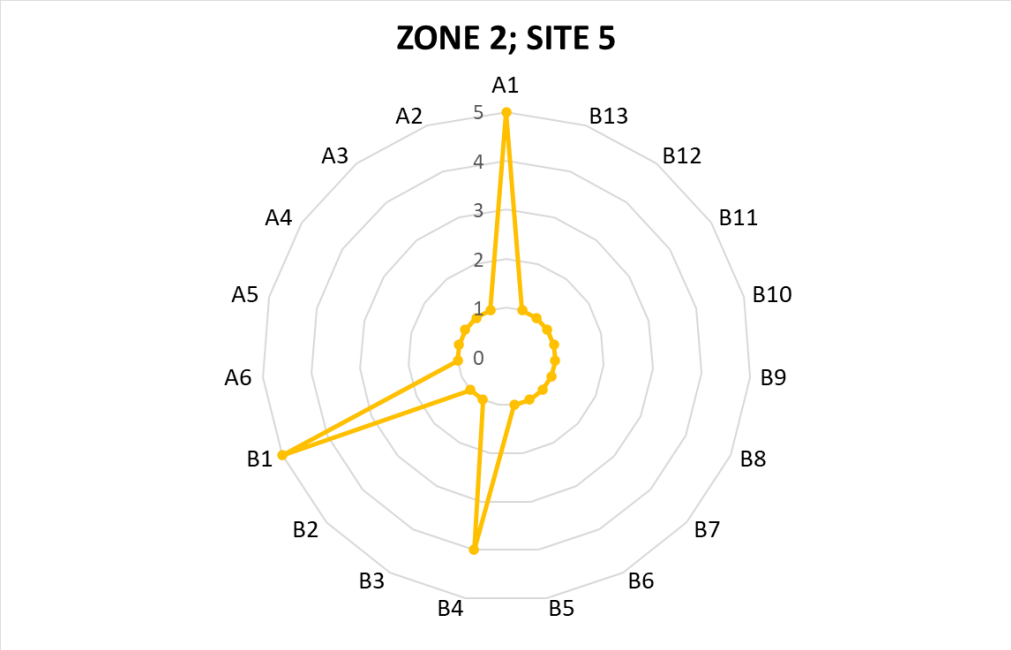


Figure 29. Radar chart of gradings for easier visual overview, from site analysis of zone 2: site 5 [chart].

QET analysis of zone 2 site 6

Figure 30. Photos from zone 2: site 6 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

Zone 2: site 6 is located on the back side of the psychiatry building (Google 2025) and is the only site in zone 2 not near an entrance. It was selected to balance the report, as it seems to compensate for limited green space elsewhere, particularly at zone 2 site 5. It consists of a semi-enclosed seating area with cobble stones and cast-in-place concrete that is about 30cm below road level with trimmed hedges surrounding the concrete. To the north, a covered cafeteria area is accessible via stairs. The site includes notable height differences, with a green, sloped area to the east and north showing wilder nature (see figure 30).

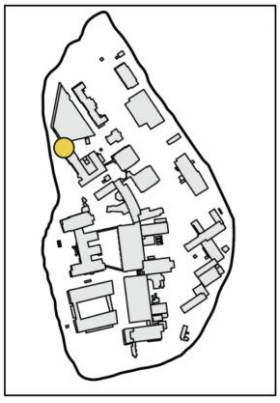


Figure 31. Index map showing location of zone 2: site 6 marked in yellow [map].

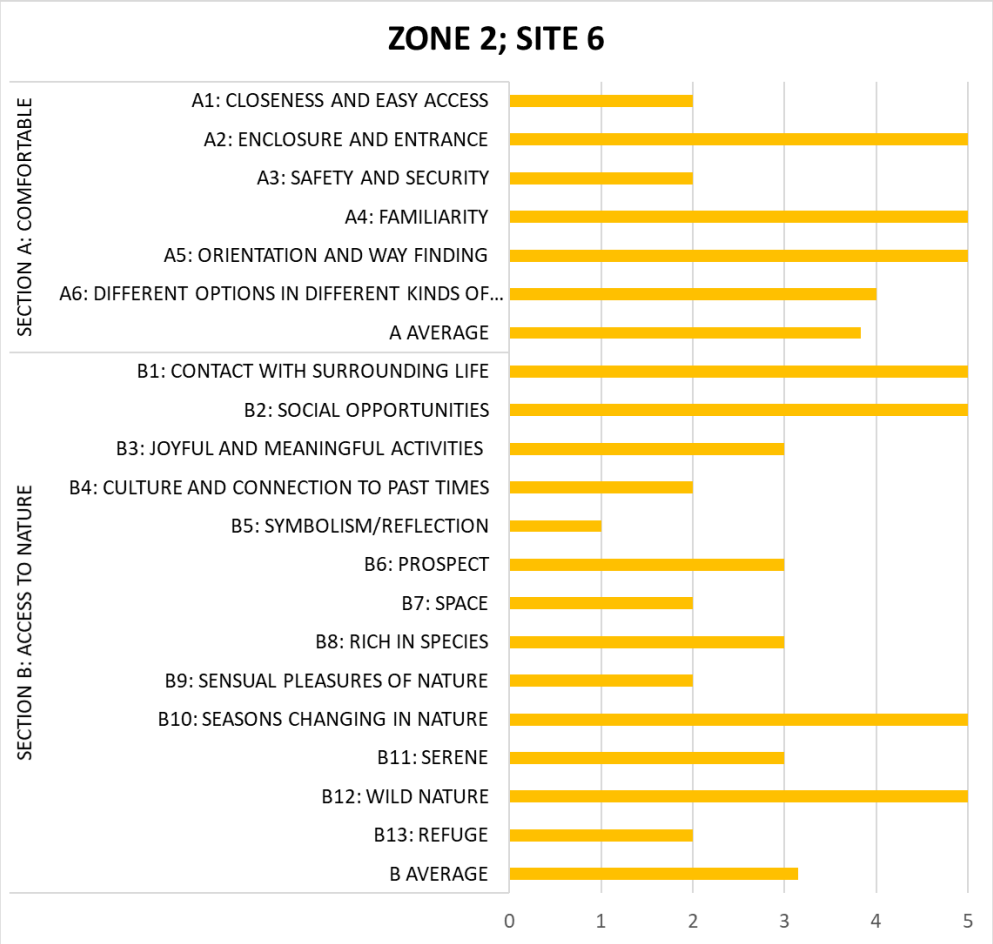


Figure 32. Gradings of QET applied on site analysis of zone 2: site 6 [chart].

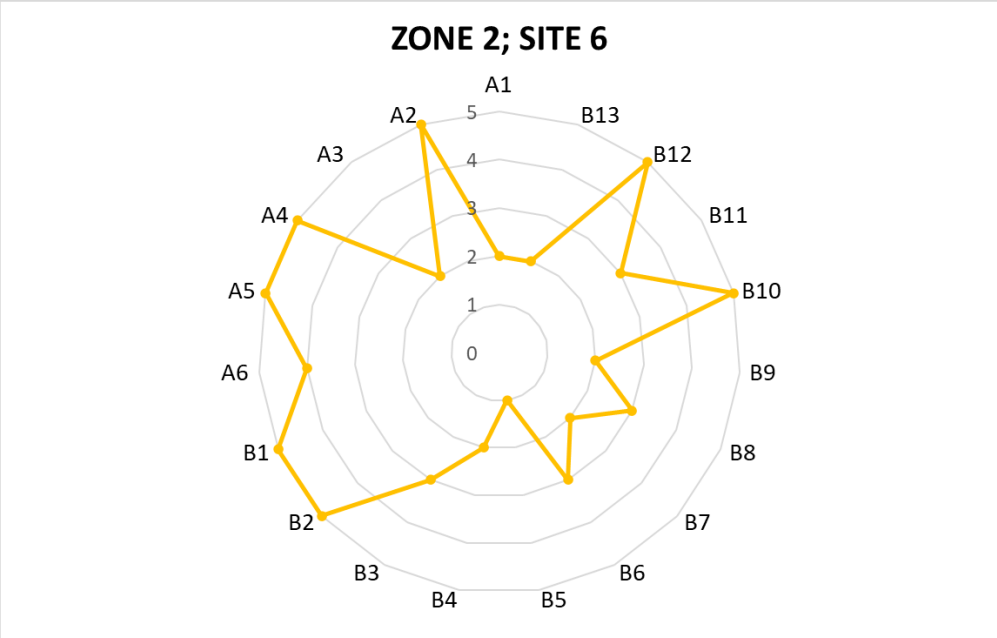


Figure 33. Radar chart of gradings for easier visual overview, from site analysis of zone 2: site 5 [chart].

5.2.2 Zone 3

QET analysis of zone 3: site 1

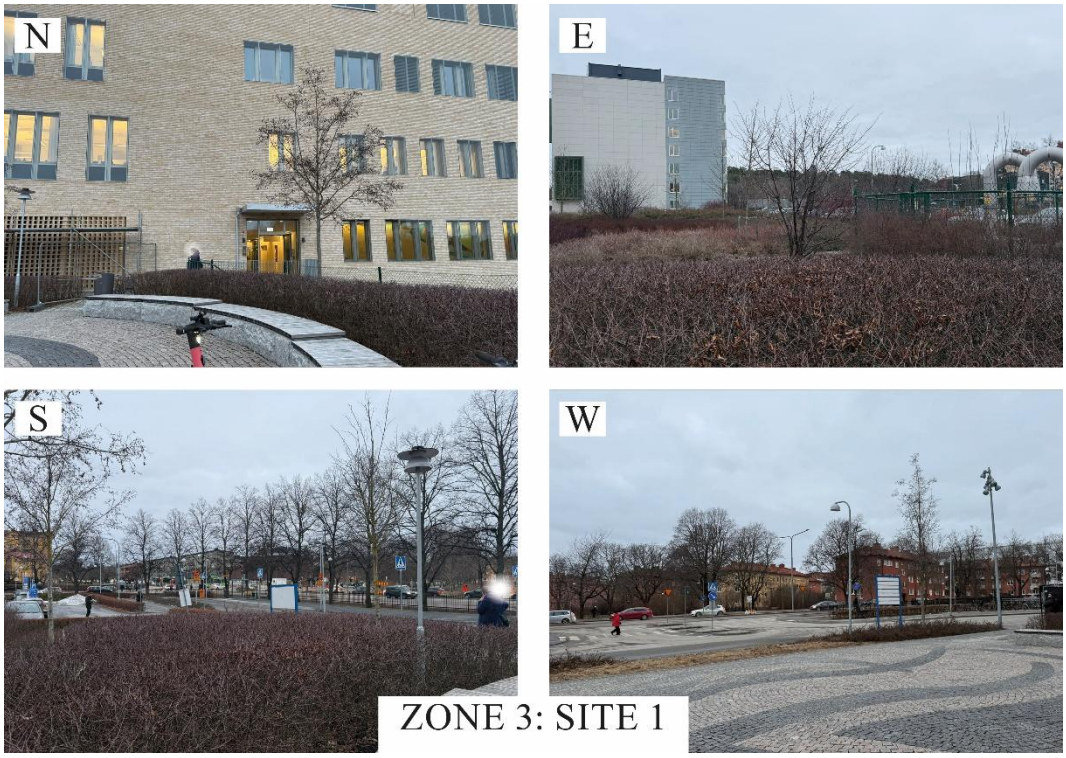


Figure 34. Photos from zone 3 site 1 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The green area where the exact site is marked is inaccessible trimmed hedges, and thus the closest reasonable area was chosen, a paved plaza area right next to it. The area is signified by a patterned cobble stones in light and dark stones, as well as stone seating made custom for the site with roughhewn sides and a wooden seating area (see figure 34).

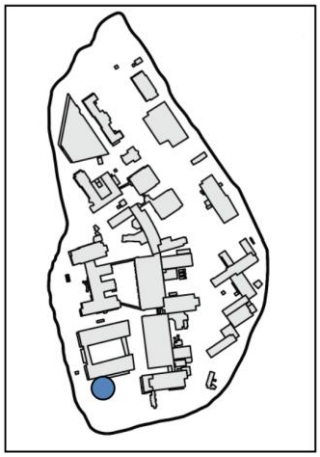


Figure 35. Index map showing location of zone 3: site 1 marked in blue [map].

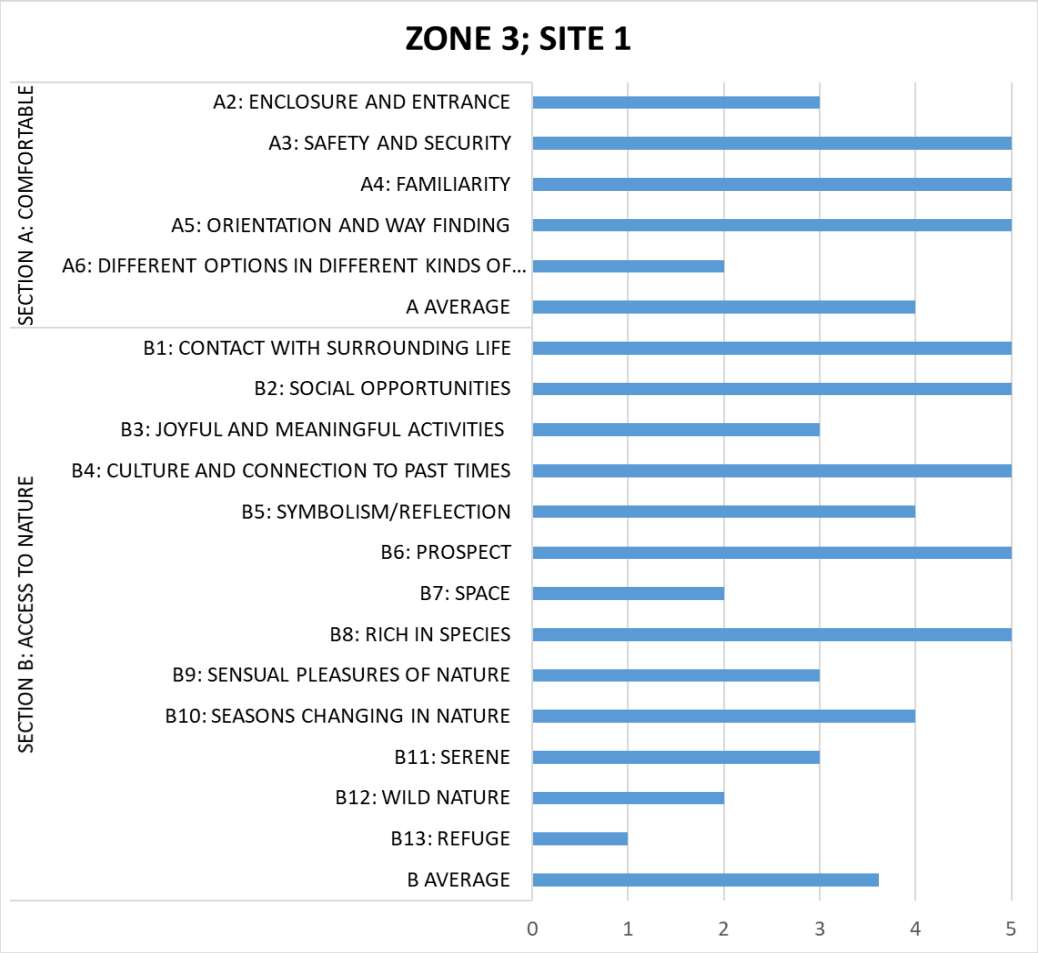


Figure 36. Gradings of QET applied on site analysis of zone 3: site 1 [chart].

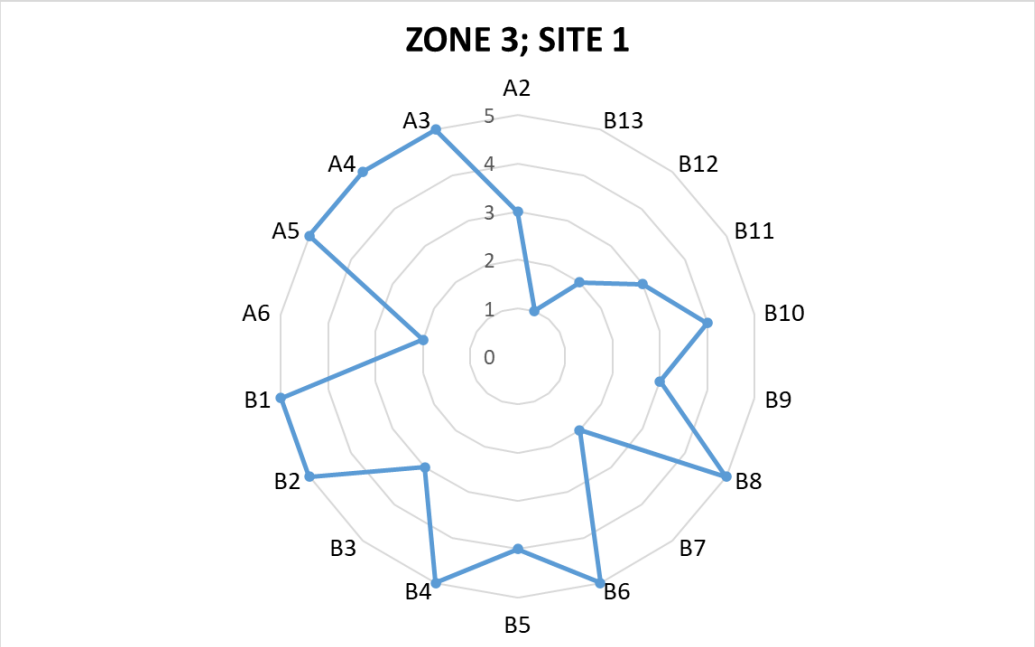


Figure 37. Radar chart of gradings for easier visual overview, from site analysis of zone 3: site 1 [chart].

QET analysis of Zone 3: Site 2

Figure 38. Photos from zone 3 site 2 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The actual site chosen was in the slope, in the bushes. As that location is inaccessible, the closest accessible site was chosen, just to the west of the originally marked site on a paved road. The site consists of a slope covered in low bushes, and a road above it connecting two different courtyards. The slope covers a large height difference and is largely inaccessible. It acts as a pathway between different departments, and as a way to take up the large height difference (see figure 38). The analysis is of the site in zone 3, not of the connecting courtyards defined as zone 2. Thus, the attributes of these courtyards will be excluded in the analysis.

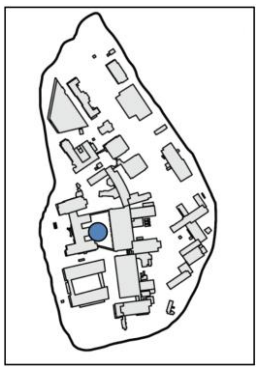


Figure 39. Index map showing location of zone 3: site 2 marked in blue [map].

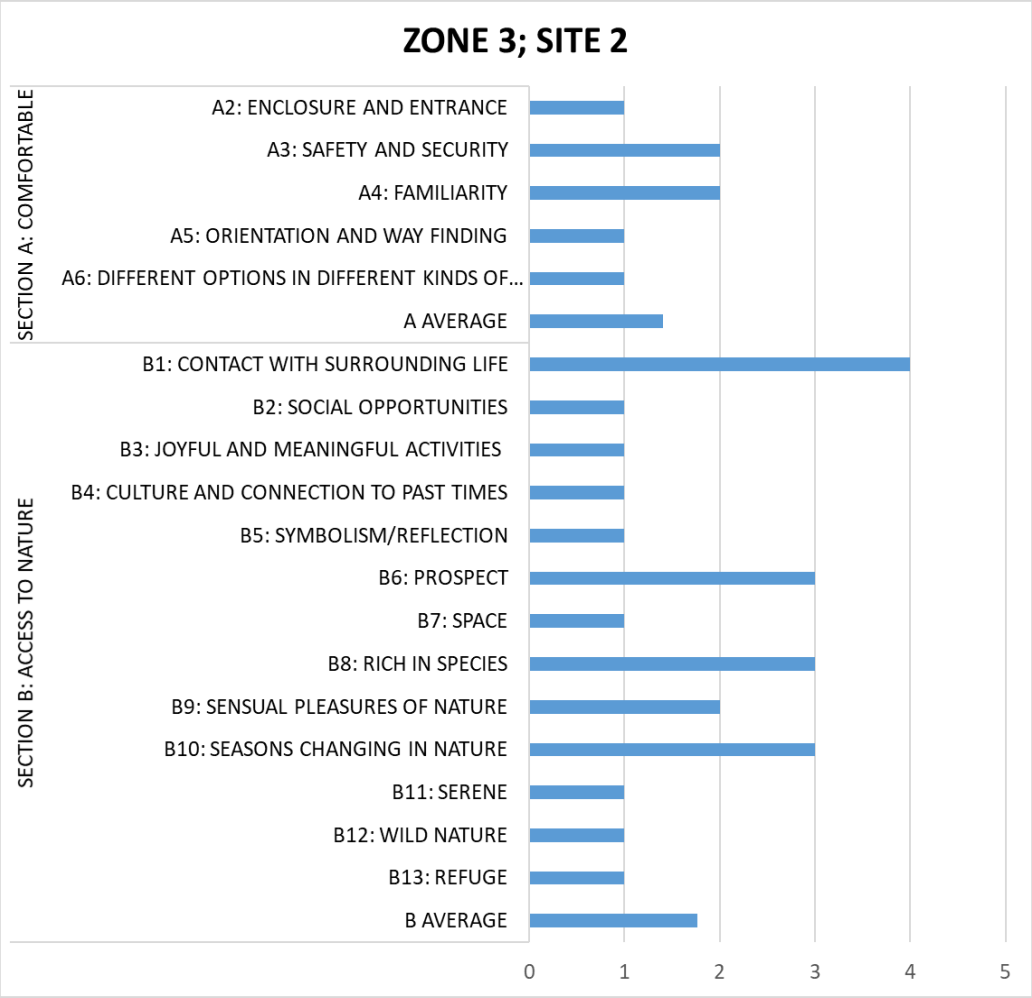


Figure 40. Gradings of QET applied on site analysis of zone 3: site 2 [chart].

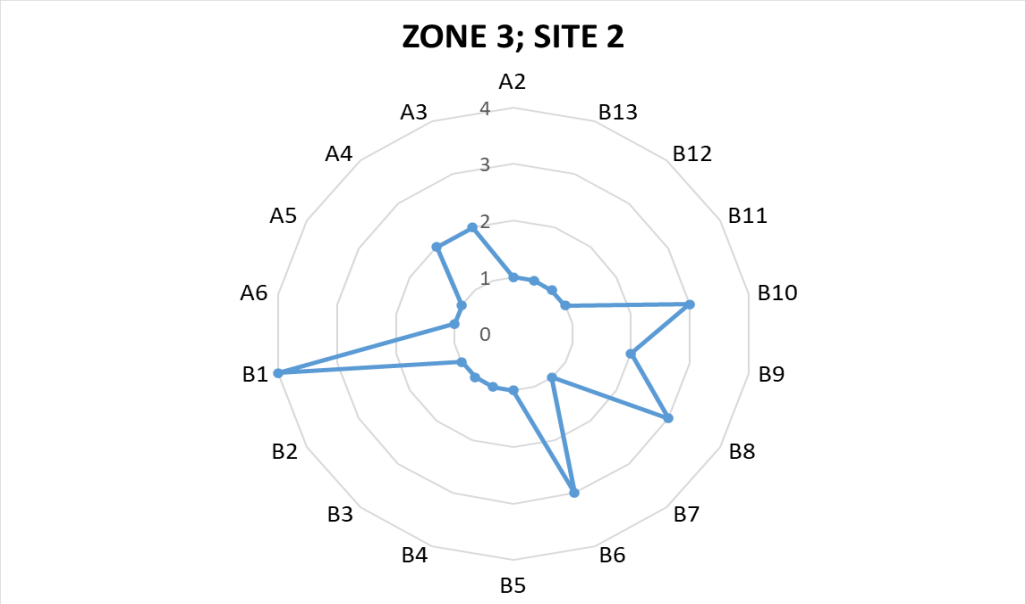


Figure 41. Radar chart of gradings for easier visual overview, from site analysis of zone 3: site 2 [chart].

QET analysis of Zone 3: Site 3

Figure 42. Photos from zone 3 site 3 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site consists of a bike and walking lane lined with bike racks all along the east side of the road. There are some large trees, some bushes and hedges, but the main vegetation type is grass. There is a statue of a man sitting to the southwest, and a bus stop with roofing and benches (see figure 42). The site is located at the backside of the building and faces Zone 2: site 2 to the west, which is located by entrance 65/70 (Google 2025).

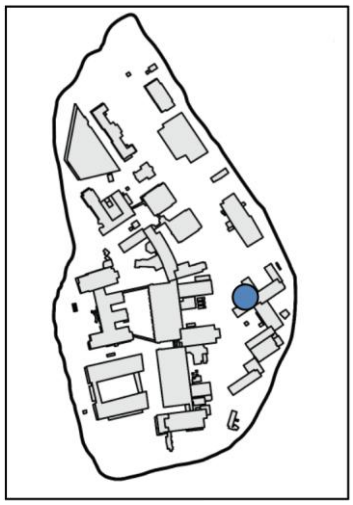


Figure 43. Index map showing location of zone 3: site 3 marked in blue [map].

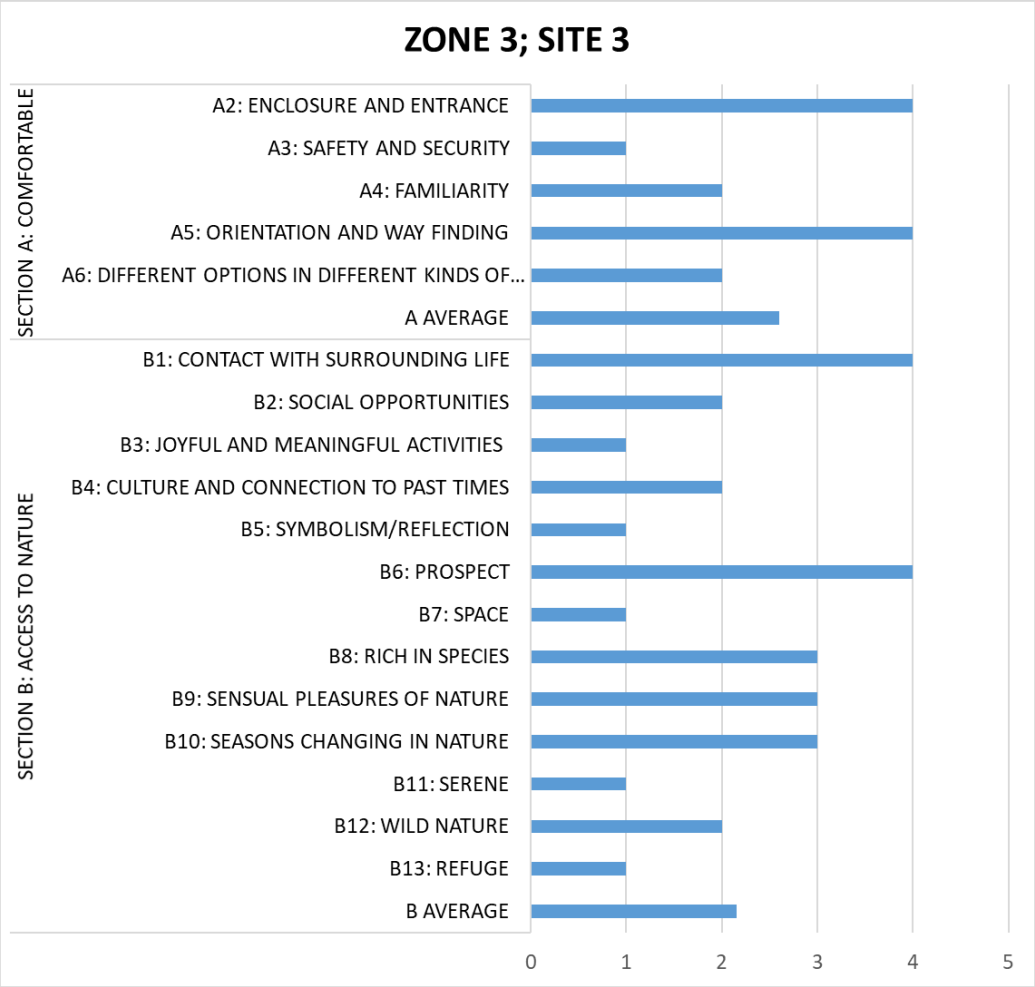


Figure 44. Gradings of QET applied on site analysis of zone 3: site 3 [chart].

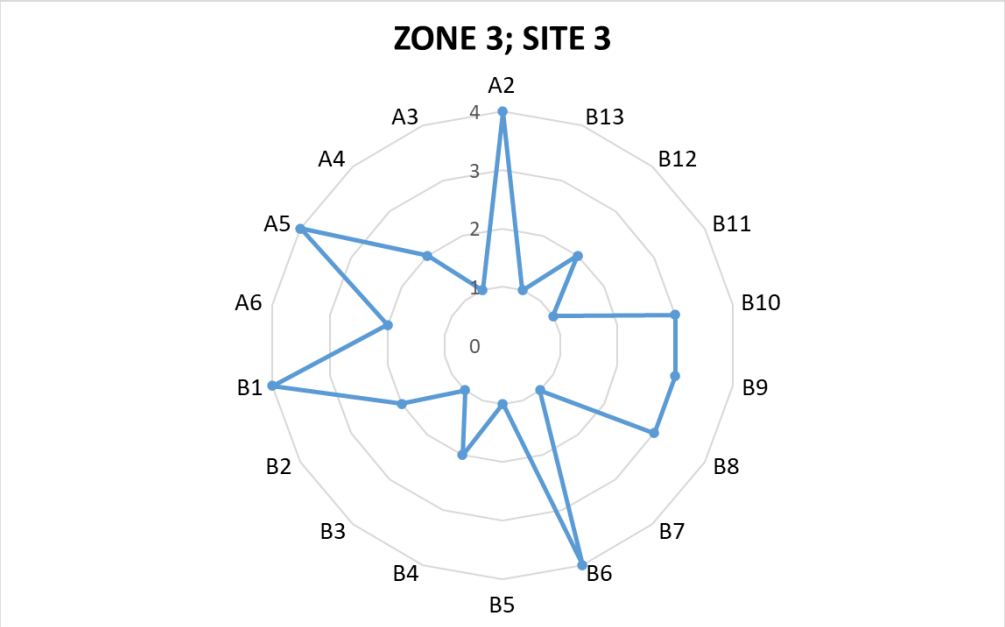


Figure 45. Radar chart of gradings for easier visual overview, from site analysis of zone 3: site 3 [chart].

QET analysis of Zone 3: Site 4

Figure 46. Photos from zone 3 site 4 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located at the backside of the building for nephrology department, between entrance 77 and entrance 79 (Google 2025). The site has significant height differences and consists mainly of a trimmed grass field enclosed by large trees and a black fence from east to south. To the north there is a paved road leading to the site which ends in a cul-de-sac. Trimmed hedges and a concrete wall solve the height difference of the building to street level there. To the south a culturally significant weeping birch stands alone (Betula Pendula “Youngii”). Informal seating exists in the form of plastic lawn chairs and table (see figure 46).

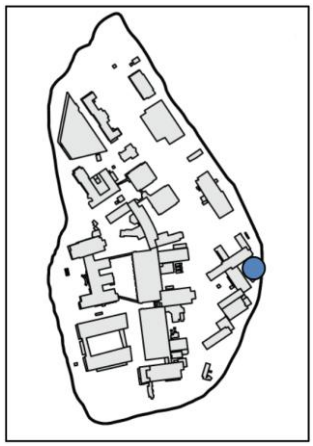


Figure 47. Index map showing location of zone 3: site 4 marked in blue [map].

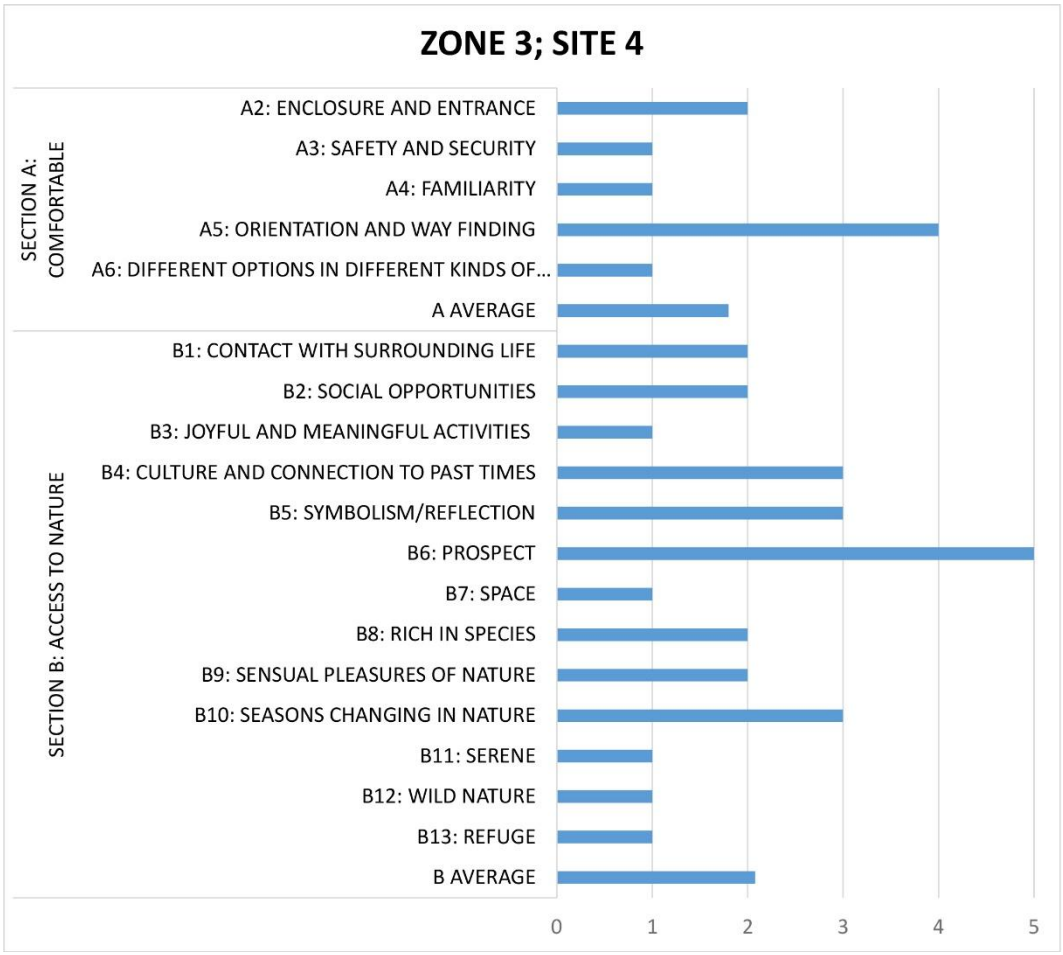


Figure 48. Gradings of QET applied on site analysis of zone 3: site 4 [chart].

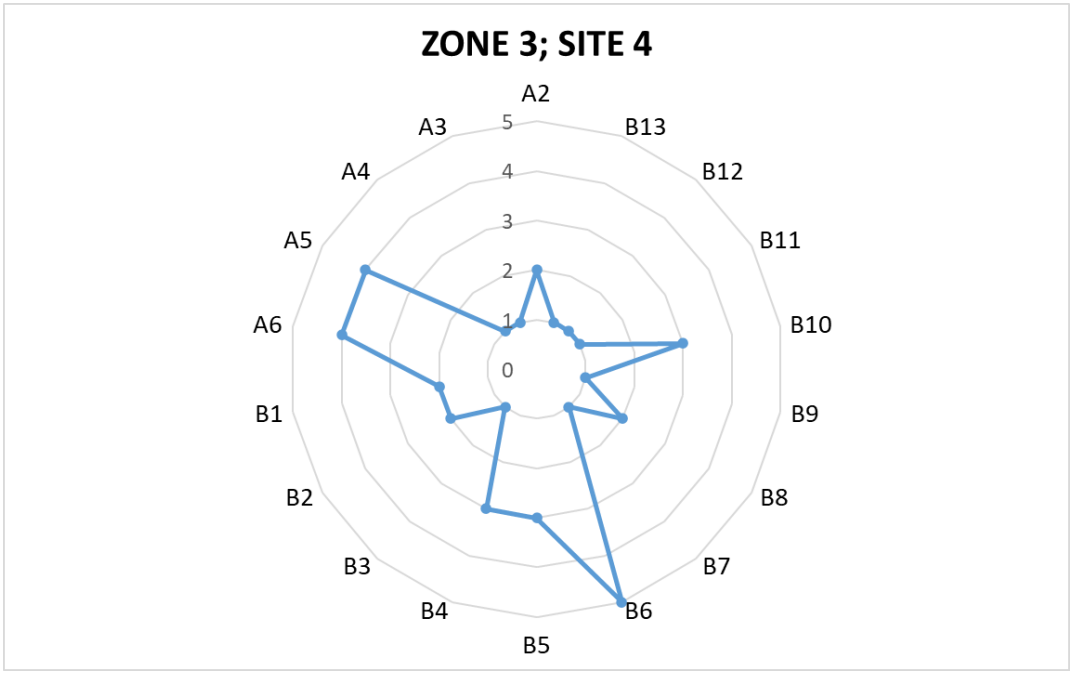


Figure 49. Radar chart of gradings for easier visual overview, from site analysis of zone 3: site 4 [chart].

QET analysis of Zone 3: Site 5

Figure 50. Photos from zone 3 site 5 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

The site is located at the main entrance of the psychiatry building, which is entrance 10 and can be seen to the south of the site (Google 2025). On the southeast there are benches backed by trimmed hedges, and beyond that is bicycle parking. To the west is a construction zone, and beyond it and to the north is a forest with large coniferous trees and significant height differences. Up on the hill to the west is Uppsala Castle. To the far north there is a fountain and designed area which is difficult to see. Beyond it, to the northeast, is the start of the city centre of Uppsala (see figure 50).

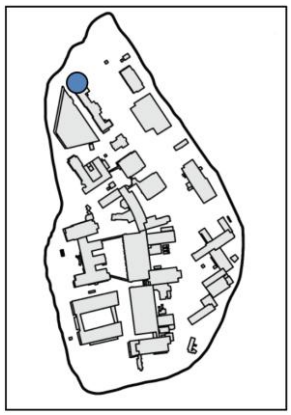


Figure 51. Index map showing location of zone 3: site 5 marked in blue [map].

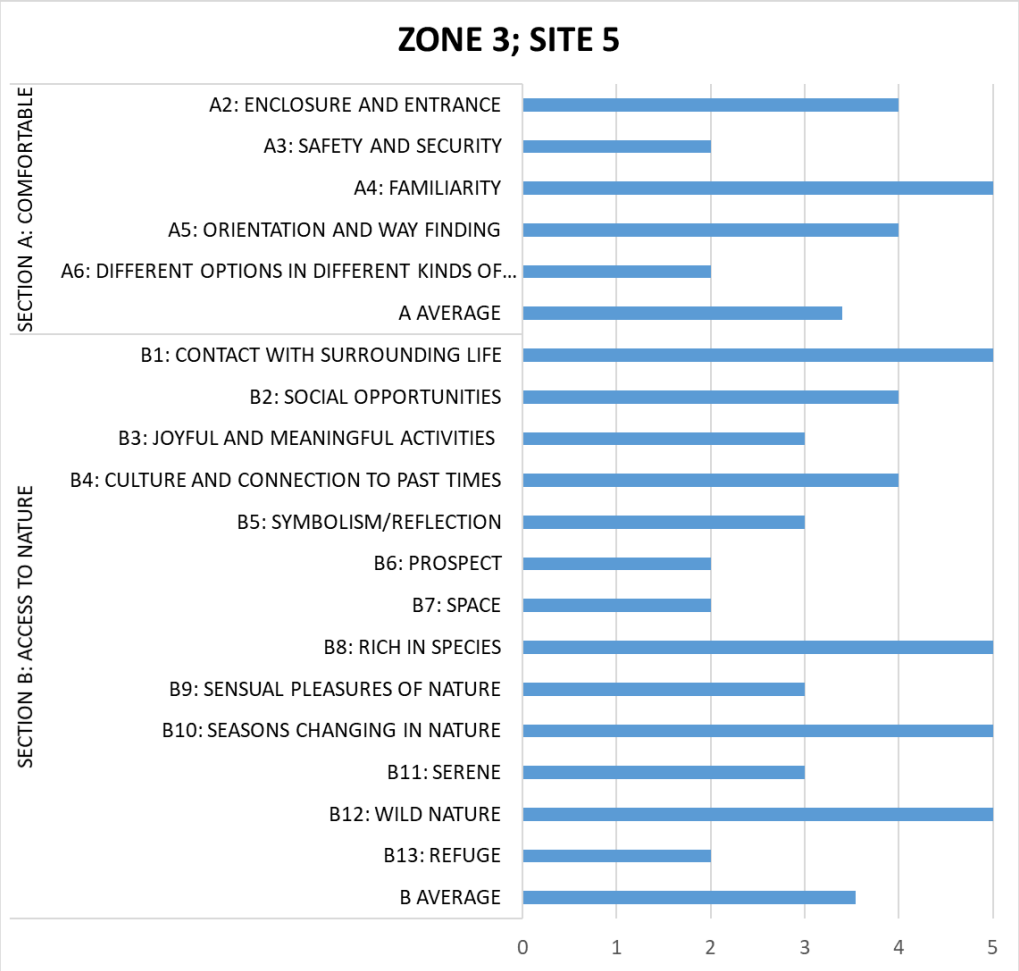


Figure 52. Gradings of QET applied on site analysis of zone 3: site 5 [chart].

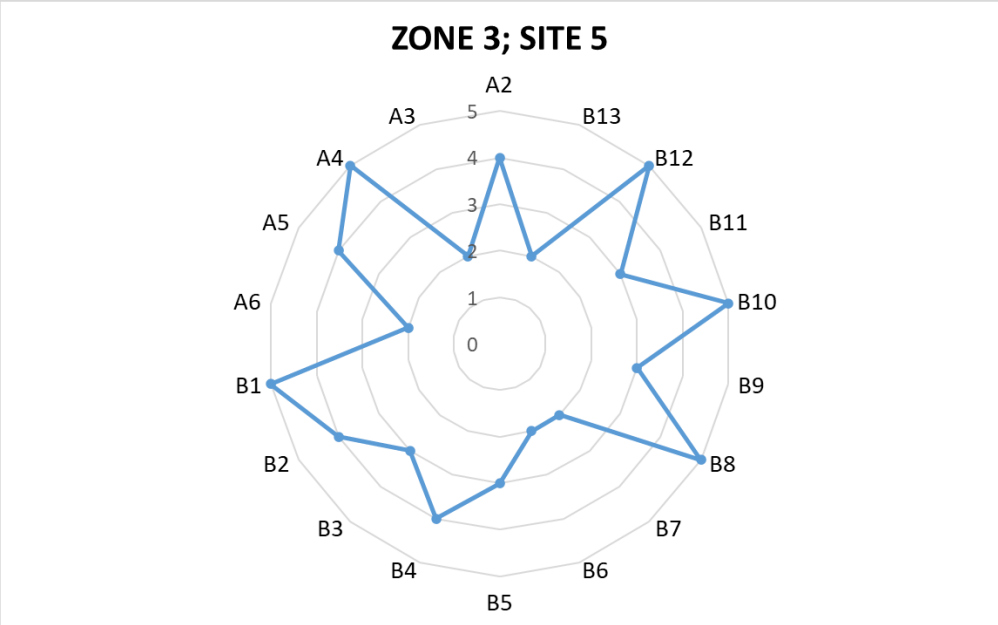


Figure 53. Radar chart of gradings for easier visual overview, from site analysis of zone 3: site 5 [chart].

5.2.3 Zone 4

QET analysis of Zone 4: Site 1

Figure 54. Photos from zone 4 site 1 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 155m away from the entrance 85 of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Zone 4 site 1 consists of a community garden called Ruddamsdalens odlarförening (Google 2025). Within the area is a body of water with bridges to allow crossing to the other side. There is also seating underneath tree canopy and signage to inform visitors. The north and east side of the site borders a forest mainly consisting of pine (see figure 54). The main function is gardening.

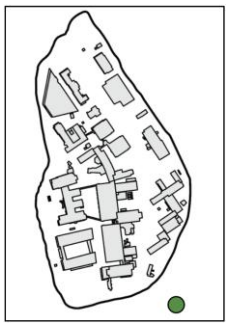


Figure 55. Index map showing location of zone 4: site 1 marked in green [map].

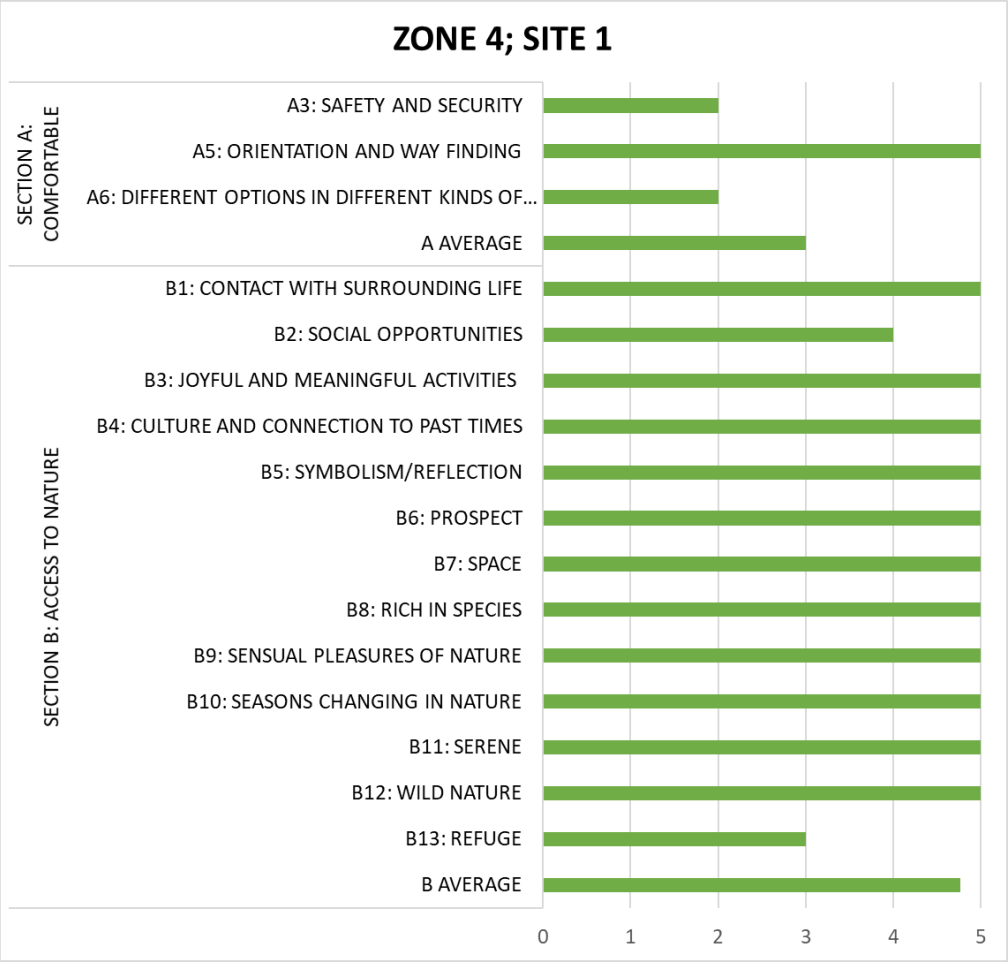


Figure 56. Gradings of QET applied on site analysis of zone 4: site 1 [chart].

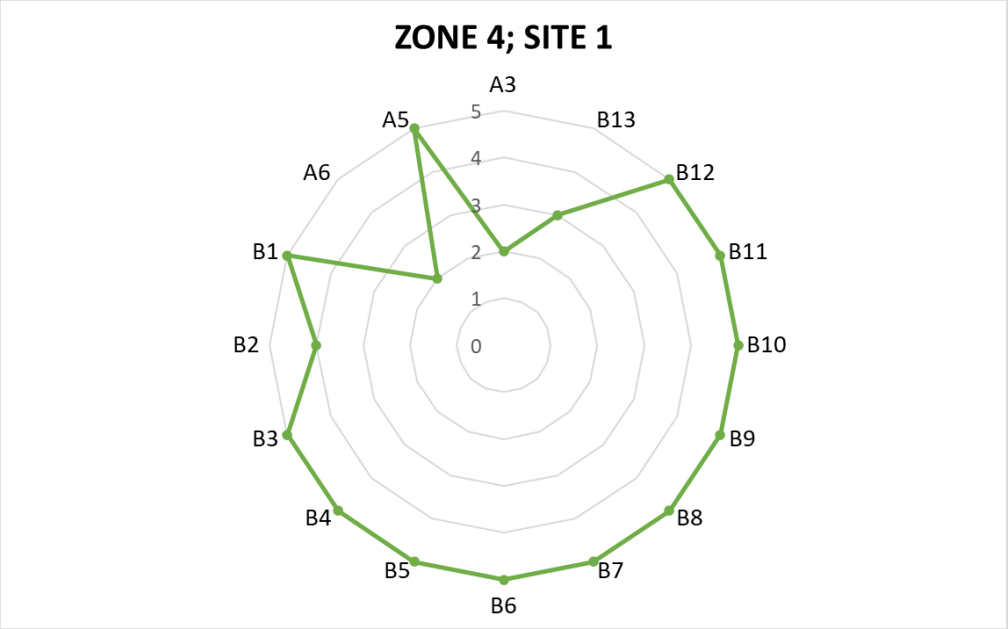


Figure 57. Radar chart of gradings for easier visual overview, from site analysis of zone 4: site 1 [chart].

QET analysis of Zone 4: Site 2

Figure 58. Photos from zone 4 site 2 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 350m away from the entrance 79/77 of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Because there is fencing along the road, the real-life distance is further than what it appears on the map initially. I chose to place Zone 4 site 2 far into the forest, 120m past the forest entry to allow for full immersion of the forest as the road separating the hospital ground and the forest is highly trafficked. The site consists of a pine forest on a hill (see figure 58), with significant height differences from the start of the path to the crest of the hill, 22m of height difference measured through the Lantmäteriet measurement tool. To the west, far into the forest, there are wooden benches with tables.

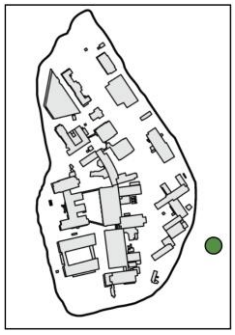


Figure 59. Index map showing location of zone 4: site 2 marked in green [map].

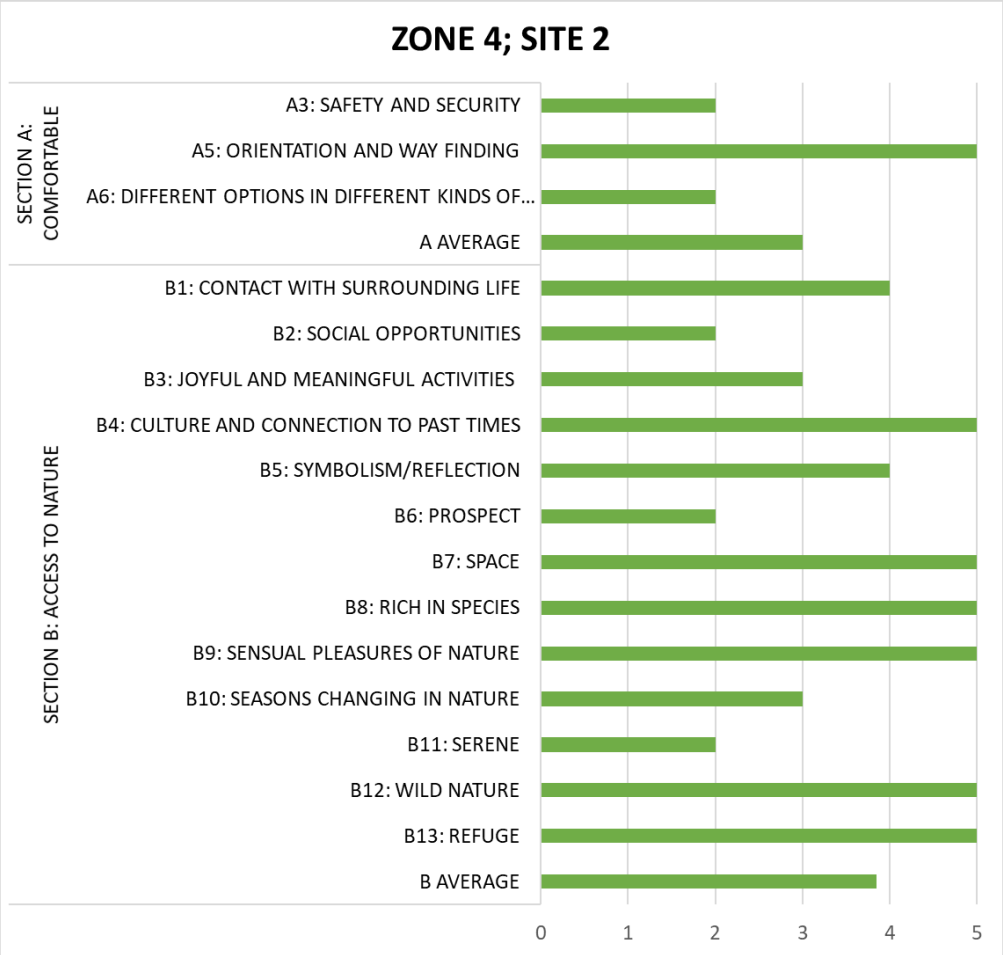


Figure 60. Gradings of QET-tool applied on site analysis of zone 4: site 2 [chart].

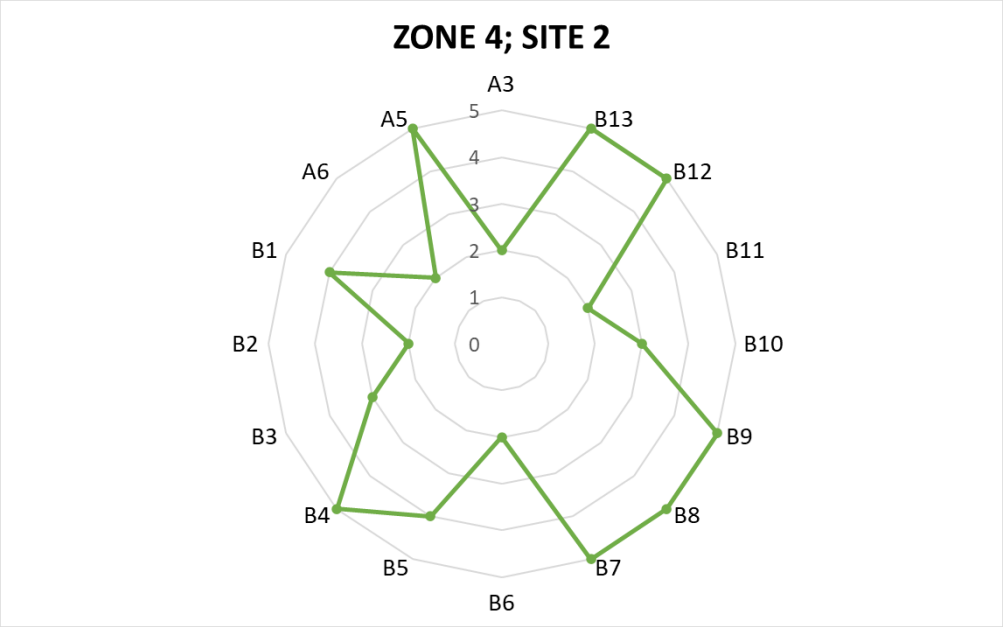


Figure 61. Radar chart of gradings for easier visual overview, from site analysis of zone 4: site 2 [chart].

QET analysis of Zone 4: Site 3

Figure 62. Photos from zone 4 site 3 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 160m away from the entrance 100/101 of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Entrance 100/101 is next to zone 3 site 1 (Google 2025). The site consists of a park called Batteriparken which consist of an open field of cut grass framed by large trees in all directions (Google 2025). There are playgrounds and different seating opportunities. The hospital grounds are to the east of the site, and to the south and west are residential buildings (see figure 62).

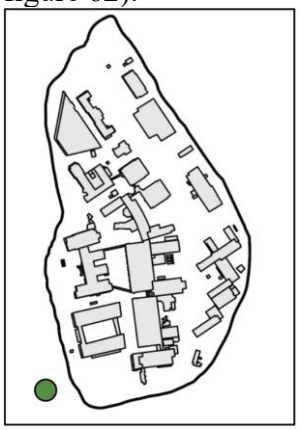


Figure 63. Index map showing location of zone 4: site 3 marked in green [map].

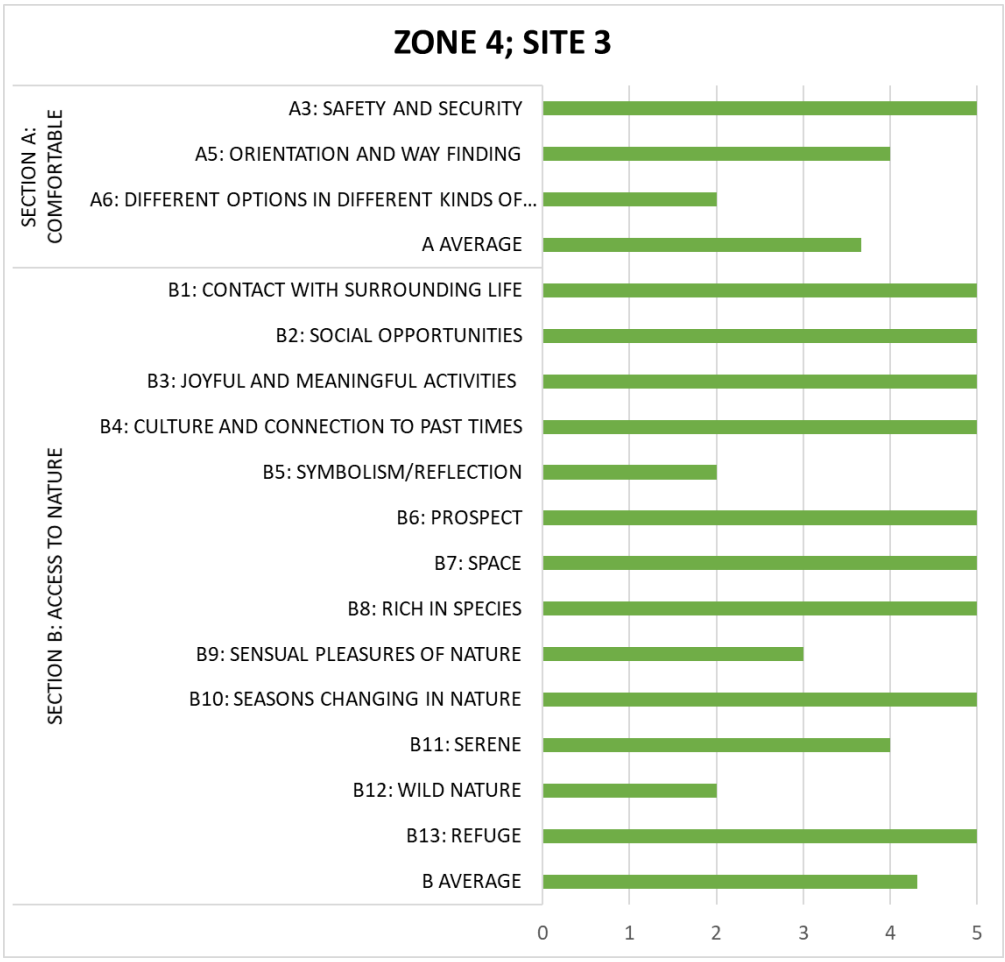


Figure 64. Gradings of QET-tool applied on site analysis of zone 4: site 3 [chart].

Figure 65. Radar chart of gradings for easier visual overview, from site analysis of zone 4: site 3 [chart].

QET analysis of Zone 4: Site 4

Figure 66. Photos from zone 4 site 4 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 160m away from the entrance to the staff gym facility of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). The entrance to the gym facility is next to the parking garage of the hospital grounds (Google 2025). The site consists of a park called Uppsala City Park (Google 2025). This is a park with high visitor traction in the centre of Uppsala and is highly funded. Among others, there are opportunities to watch children play on the playground, enjoy seasonal plantings in the form of summer flower beds, a large variety of cultural plants, and seating opportunities (see figure 66).

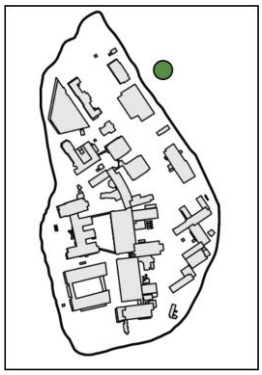


Figure 67. Index map showing location of zone 4: site 4 marked in green [map].

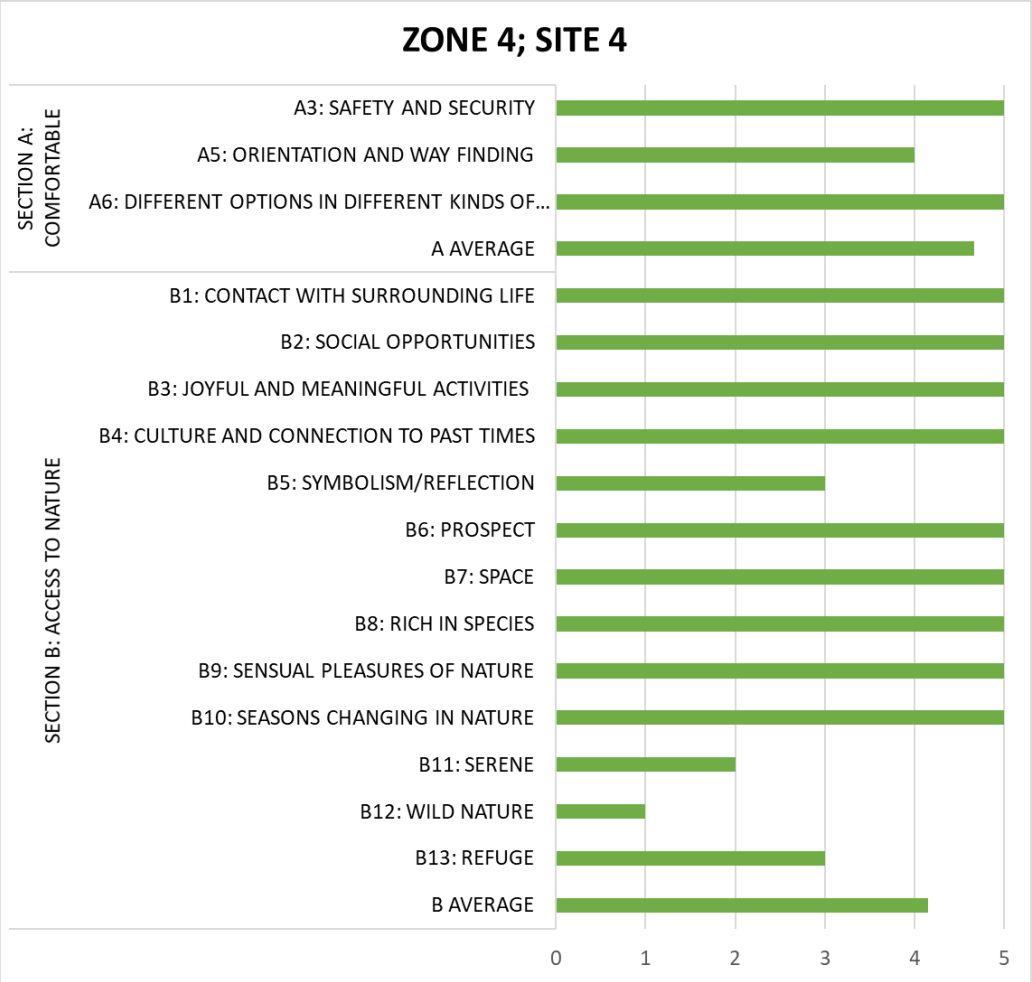


Figure 68. Gradings of QET applied on site analysis of zone 4: site 4 [chart].

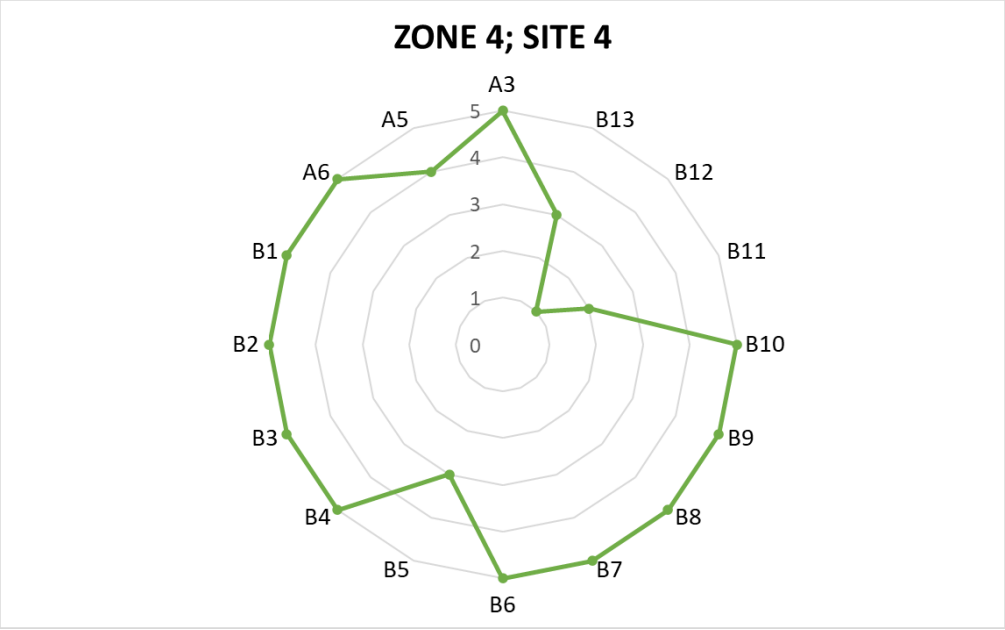


Figure 69. Radar chart of gradings for easier visual overview, from site analysis of zone 4: site 4 [chart].

QET analysis of Zone 4: Site 5

Figure 70. Photos from zone 4 site 5 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

The site is located about 120m away from the main entrance of the psychiatry building (entrance 10) of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Entrance 10 is next to zone 3 site 5 (Google 2025). The study area comprises a forested, sloping hill dominated by large coniferous trees, upon which Uppsala Castle is situated (see figure 70). Seating exists to the east.

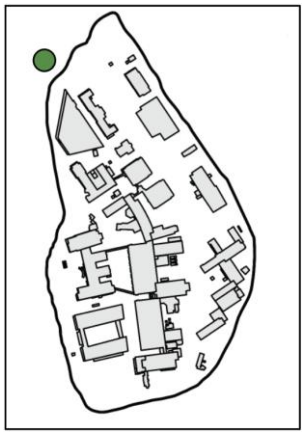


Figure 71. Index map showing location of zone 4: site 5 marked in green [map].

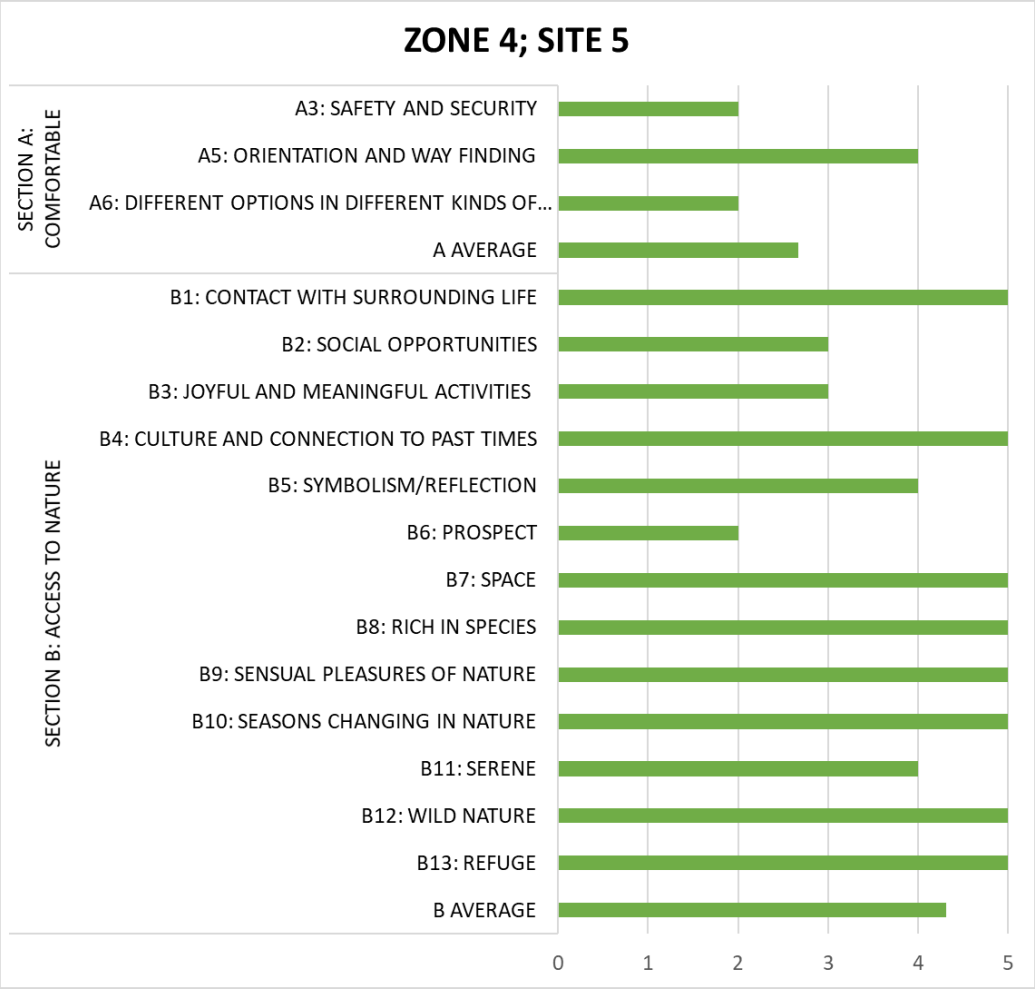


Figure 72. Gradings of QET-tool applied on site analysis of zone 4: site 5 [chart].

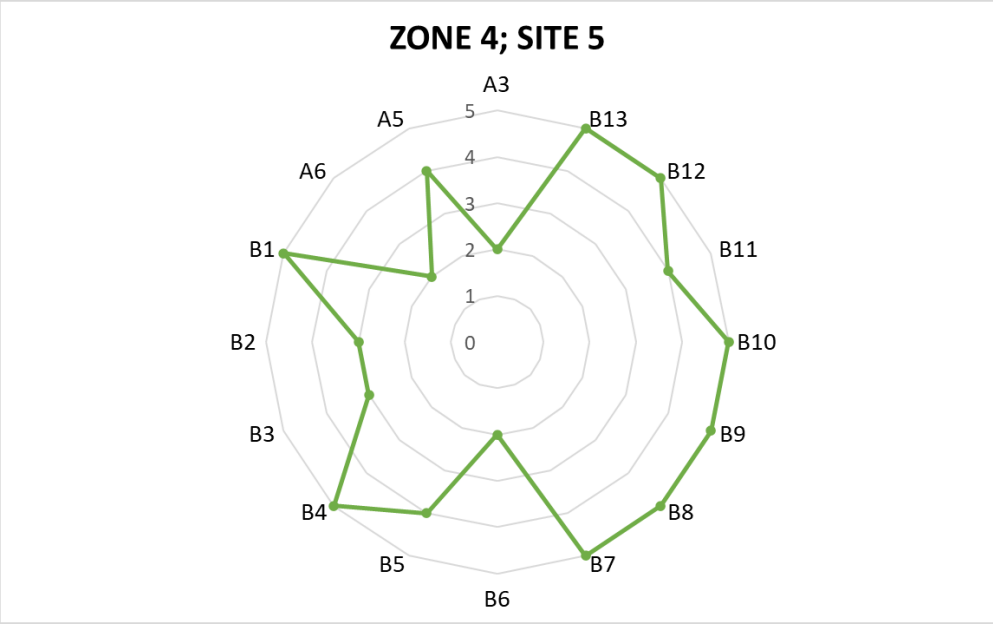


Figure 73. Radar chart of gradings for easier visual overview, from site analysis of zone 4: site 5 [chart].

5.3 Part Three: Assessment of Uppsala University Hospital and suggested measures

The overall assessment of Uppsala University Hospital has been explained and discussed in this segment, with quotes and calling back to sections of interest of the different site evaluations. My suggestions for improvements will come in a flowing form as they are relevant. It is important to note that the aim of this thesis is to examine the rehabilitative green spaces within Uppsala University Hospital, and not to create a design proposal for the hospital grounds.

A design proposal would require further research, as it is outside the scope of this thesis. The measures suggested are not to be taken as a mechanical application of Evidence-Based Design principles, which the research consistently warns against (more on this was detailed in Chapter 1 Introduction). Rather, the suggested measures detailed below are a stepping point to proceed of off in future project development.

5.3.1 Overview and comparison of zones

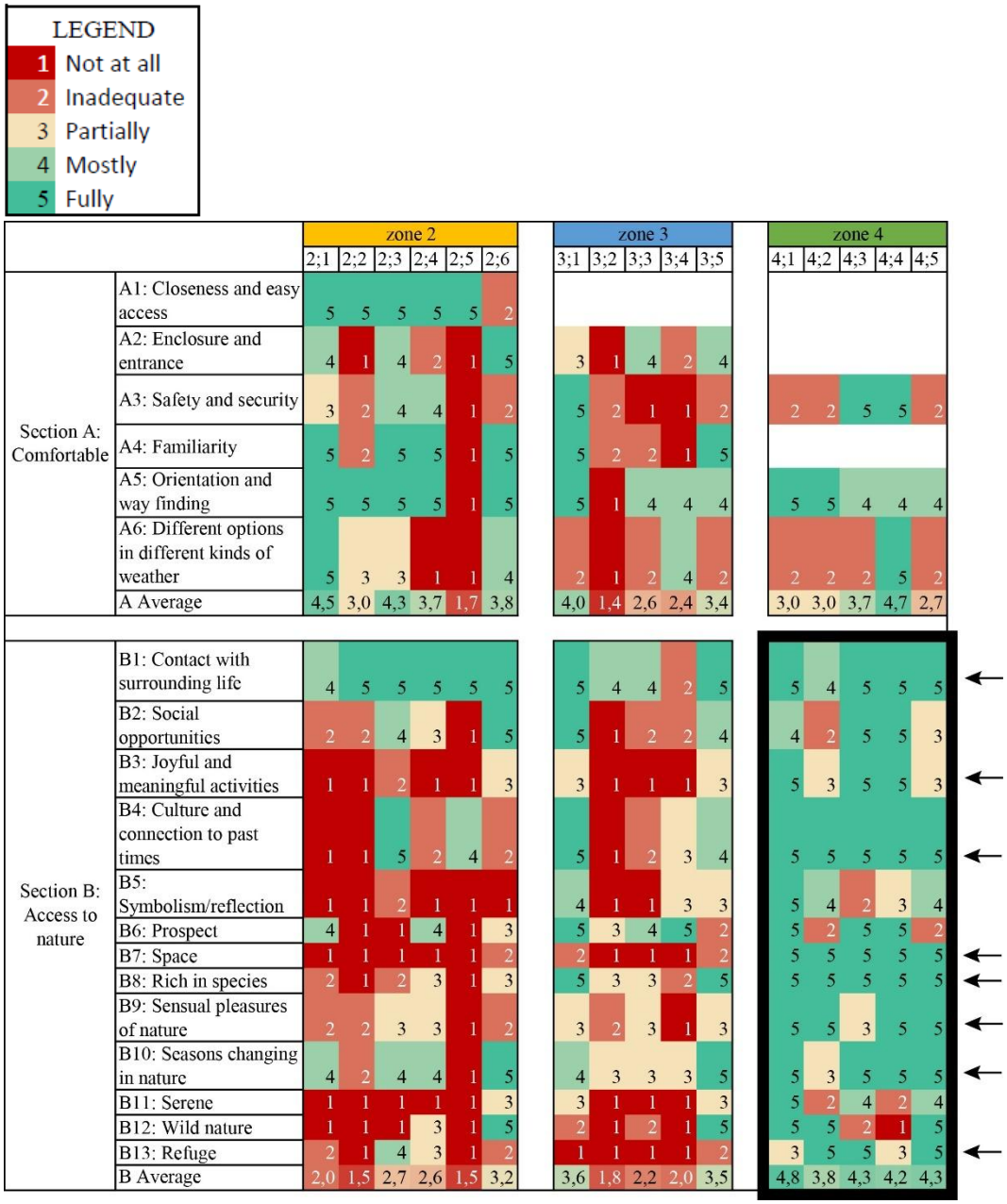
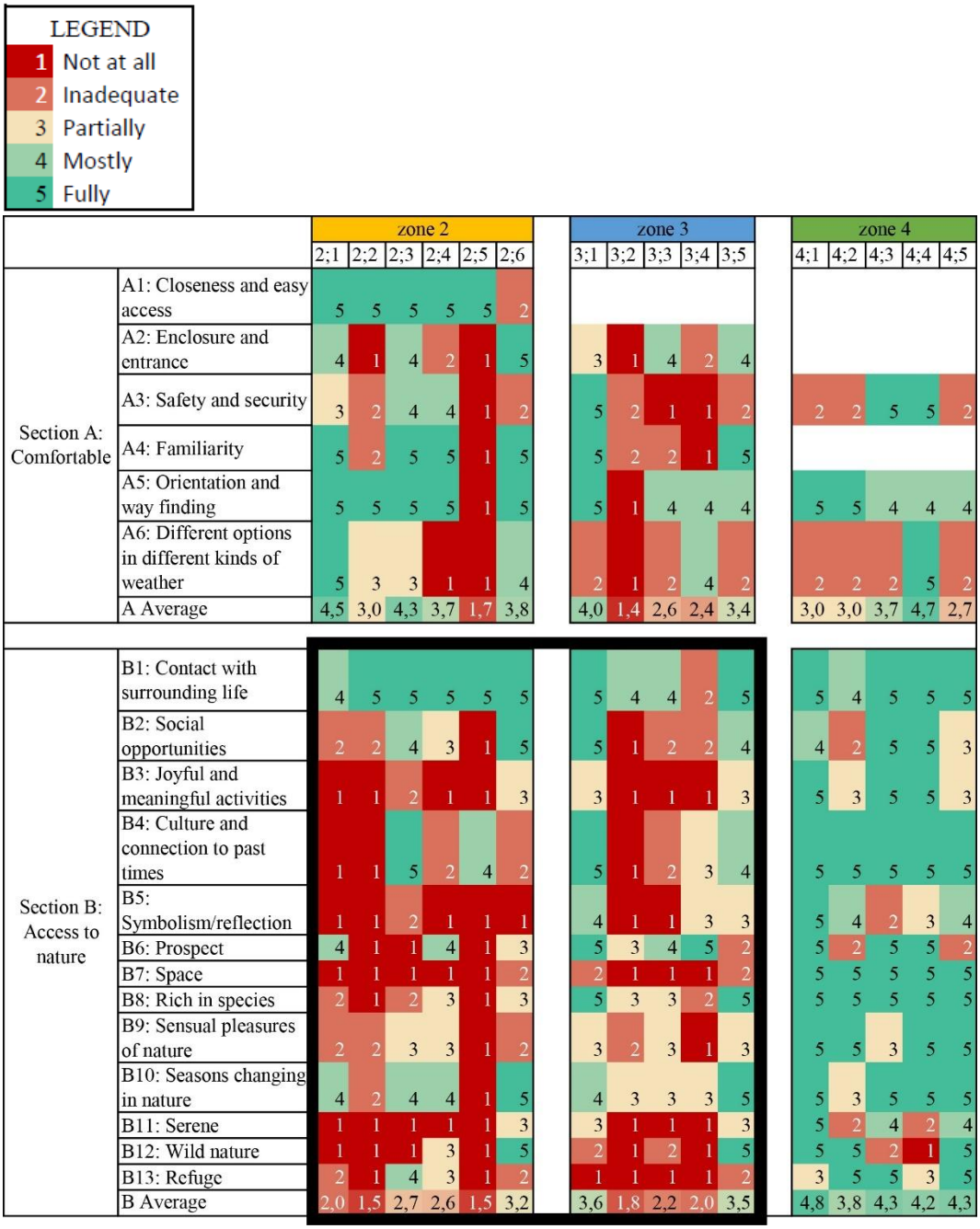


Table 5. A color-coded overview table of the QET grading results. The graph shows how zone 4 is superior when it comes to qualities for access to nature. Qualities receiving particularly high grades have been marked with arrows [table].

At a quick overview (see table 5 above) it becomes apparent that in section B: access to nature, zone 4 is superior to zone 3 and 2 when it comes to rehabilitating environmental qualities, where several qualities received a grade 5 – fully, across all sites in zone 4 (those being B4: culture and connection to past times, B7: space, and B8: rich in species). Additionally, the qualities of B1: Contact with surrounding life, B3: Joyful and meaningful activities, B9: Sensual pleasures of nature, B10: Seasons changing in nature, and B13: refuge scored high with only one or two sites receiving a mostly or partially score.



		zone 2						zone 3					zone 4				
		2;1	2;2	2;3	2;4	2;5	2;6	3;1	3;2	3;3	3;4	3;5	4;1	4;2	4;3	4;4	4;5
Section A: Comfortable	A1: Closeness and easy access	5	5	5	5	5	2										
	A2: Enclosure and entrance	4	1	4	2	1	5	3	1	4	2	4					
	A3: Safety and security	3	2	4	4	1	2	5	2	1	1	2	2	2	5	5	2
	A4: Familiarity	5	2	5	5	1	5	5	2	2	1	5					
	A5: Orientation and way finding	5	5	5	5	1	5	5	1	4	4	4	5	5	4	4	4
	A6: Different options in different kinds of weather	5	3	3	1	1	4	2	1	2	4	2	2	2	2	5	2
	A Average	4,5	3,0	4,3	3,7	1,7	3,8	4,0	1,4	2,6	2,4	3,4	3,0	3,0	3,7	4,7	2,7
Section B: Access to nature	B1: Contact with surrounding life	4	5	5	5	5	5	5	4	4	2	5	5	4	5	5	5
	B2: Social opportunities	2	2	4	3	1	5	5	1	2	2	4	4	2	5	5	3
	B3: Joyful and meaningful activities	1	1	2	1	1	3	3	1	1	1	3	5	3	5	5	3
	B4: Culture and connection to past times	1	1	5	2	4	2	5	1	2	3	4	5	5	5	5	5
	B5: Symbolism/reflection	1	1	2	1	1	1	4	1	1	3	3	5	4	2	3	4
	B6: Prospect	4	1	1	4	1	3	5	3	4	5	2	5	2	5	5	2
	B7: Space	1	1	1	1	1	2	2	1	1	1	2	5	5	5	5	5
	B8: Rich in species	2	1	2	3	1	3	5	3	3	2	5	5	5	5	5	5
	B9: Sensual pleasures of nature	2	2	3	3	1	2	3	2	3	1	3	5	5	3	5	5
	B10: Seasons changing in nature	4	2	4	4	1	5	4	3	3	3	5	5	3	5	5	5
	B11: Serene	1	1	1	1	1	3	3	1	1	1	3	5	2	4	2	4
	B12: Wild nature	1	1	1	3	1	5	2	1	2	1	5	5	5	2	1	5
	B13: Refuge	2	1	4	3	1	2	1	1	1	1	2	3	5	5	3	5
	B Average	2,0	1,5	2,7	2,6	1,5	3,2	3,6	1,8	2,2	2,0	3,5	4,8	3,8	4,3	4,2	4,3

Table 6. A color-coded overview table of the QET grading results. The differences between zone 2 and zone 3 when it comes to qualities for access to nature are not as clear as expected, but zone 3 remains superior [table].

The differences between zones 2 and 3 are less apparent when it comes to qualities for access to nature (see table 6 above). Initially, one might have had the hypothesis that zone 3 would be significantly superior to zone 2 when reading the different zone descriptions. However, that initial hypothesis is disproven, though zone 3 remains better. This is due to the randomized nature of the site selection,

where the aim was to see what zone 3 sites looked like as an overview of the whole hospital grounds. Some of the sites chosen, namely zone 3: site 2, zone 3: site 3 and zone 3: site 4, functioned more like tertiary or “in-between” green spaces rather than gardens and parks, which is the definition of what zone 3 is supposed to be.

Another pattern which becomes apparent from the overview table is that a site that scores highly in some environmental qualities for access to nature, is likely to score highly in several. It becomes apparent form the site analysis that sites that have been thoughtfully designed outdoor environments are better at being rehabilitating. The inverse relationship is true as well. A site that scores low in some is likely to score low in several. To illustrate the point one site scoring generally low (zone 2: site 5) and one site scoring generally high (zone 3: site 1) have been marked below (see table 7).

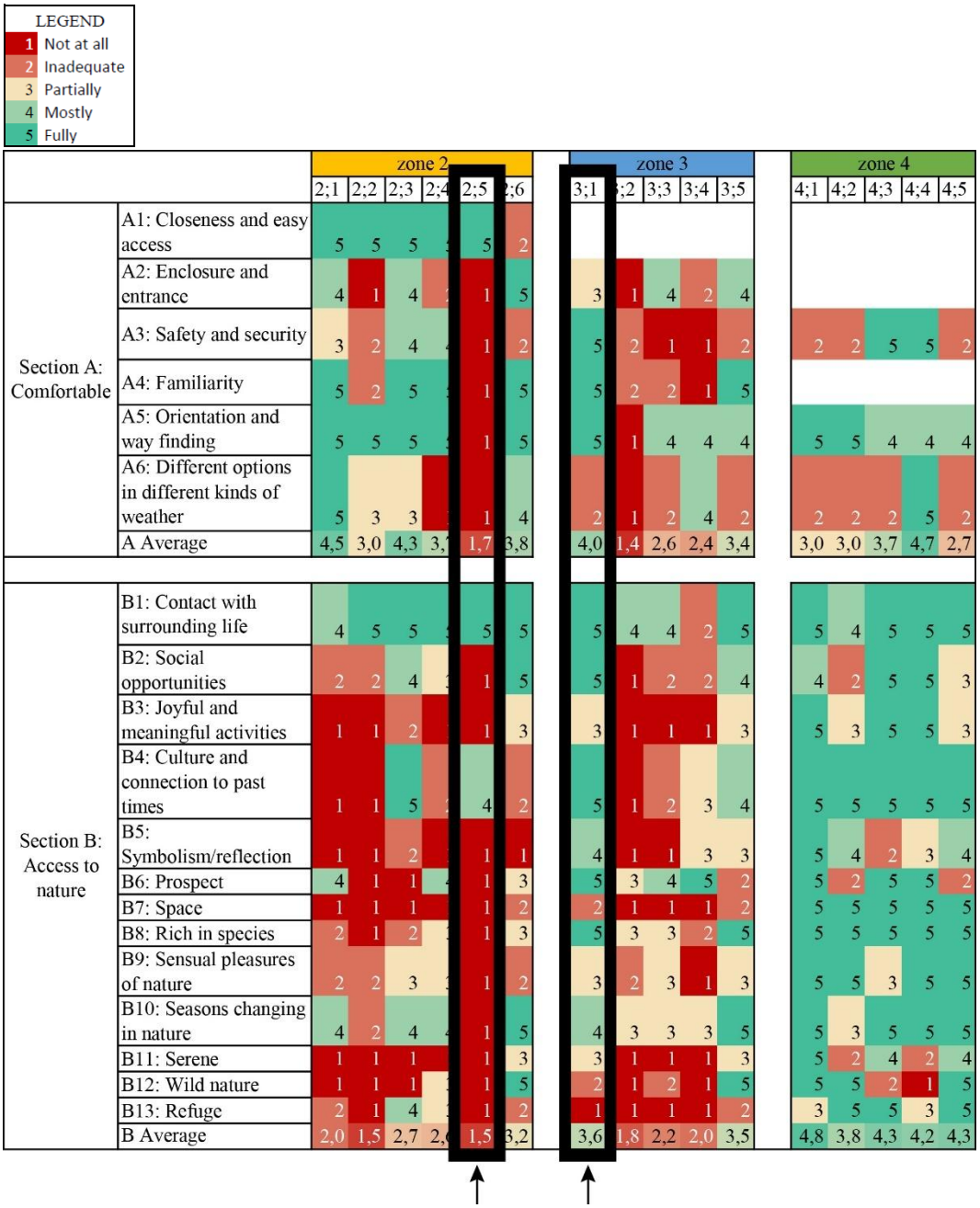


Table 7. A color-coded overview table of the QET grading results. Thoughtfully designed outdoor environments are better at being rehabilitating. Generally speaking, sites scoring high in some qualities are likely to score high in several. The inverse relationship is true. To illustrate, two sites have been marked with arrows [table].

To visualize further, a photograph from zone 2: site 5 can be seen below:

Figure 74. Photo from zone 2: site 5 facing north. This illustrates a prime example of a site scoring low in multiple qualities. Taken by author on 27-02-2025 [photography].

The site functions mostly as a passageway and parking lot for bicycles and cars (se figure 74 above). It is clear why it scored so low in all aspects of access to nature.

In order to more easily compare the different environmental qualities, an average grading of each quality has been created and compiled into a chart seen below (see figure 75).

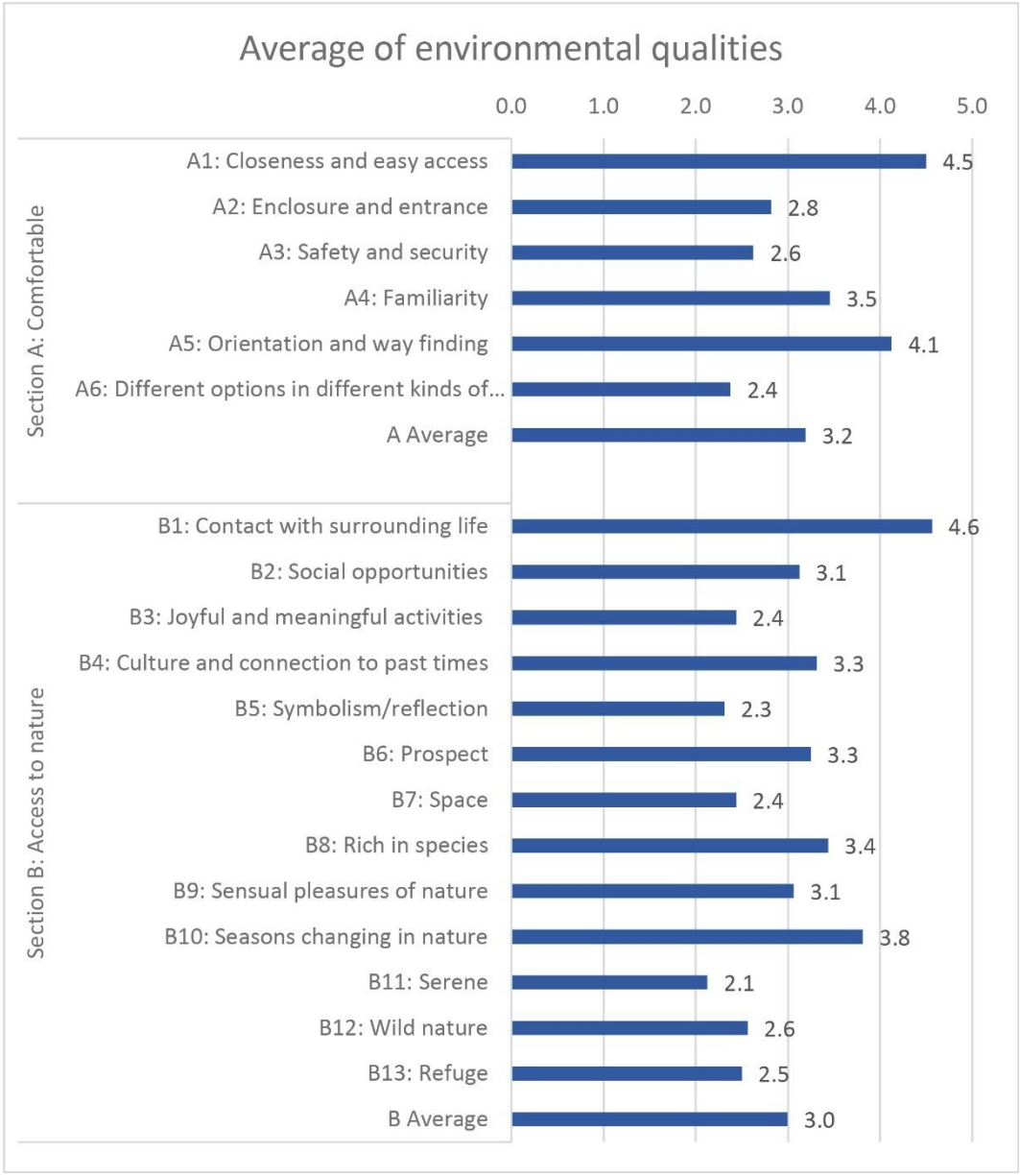


Figure 75. A chart showing the average ratings of each environmental quality for Uppsala University Hospital [chart].

5.3.2 Good environmental qualities for rehabilitation in Uppsala University Hospital and why

There are four overall best rated qualities A1, A5, B1 and B10 (see figure 75 above). One is A1: Closeness and easy access, which was only analysed in sites in zone 2. As a reminder, five out of six sites chosen to represent zone 2 in Uppsala University Hospital were entrances, and so the high overall rating is only to be expected. The definition of the characteristic can be seen below:

> Green (and Outdoor) spaces should be nearby, visible, and easily accessible from buildings, with clear paths and entrances. This thesis, figure 2.

As a characteristic, this one is the hardest to affect in an existing hospital environment as a landscape architect, as it concerns the geographical location of the outdoor environment and how easy or hard the way to get there from inside the healthcare building is. It would require extensive reconstruction, hence the reasoning for picking such close sites in zone 2.

Another highly rated quality is A5: Orientation and way finding. In addition to the environmental conditions mentioned below, I have also analysed how overlook-able and easy to take in a site is, as this greatly effects how orientable it renders the site:

> Clear paths, landmarks, and signage should guide users effectively through the space. This thesis, figure 2.

Many of the sites in Uppsala University Hospital were fairly simple and uncomplicated, which is why they graded so low in many of the other environmental qualities. As an example, my observation for zone 2 site 2 is:

> Largely uncomplicated and open area. Appendix 1, page 9.

Wherein the site received a 5–fully rating in this characteristic. It is important to ascertain that the aspect of A5: Orientation and easy access remains fulfilled after improvement in the other environmental qualities, when the sites become more stimulating and complex.

There is one environmental quality A4: familiarity that received a 3.5 average grading, and thus is functioning but has significant improvement potential. It has been defined as follows:

> The space should feel intuitive, easy to recognize, and align with users' experiences. This thesis, figure 2.

In my opinion, familiarity is one of the environmental qualities that is the most difficult to improve, as it has no easy quick fixes. The best ways to improve on familiarity is to thoroughly investigate the site, and its connection to the hospital buildings/establishments, ascertain the sites' main user group and make certain the character and use-cases of the site align with the hospital building seamlessly, as is necessary to do with every quality and site. The quality familiarity ties strongly with qualities A1: closeness and easy access, A2: enclosure and entrance, and A5: Orientation and wayfinding. The reasoning is simple; In order for the site to be familiar it needs to be clear how to access and navigate the site.

Two sites come to mind to exemplify what familiarity is when done poorly and when done well. The area in zone 3: site 4 is spacious and green with many old

trees, yet per the site analysis the rehabilitating potential for the site is largely squandered. See figure 76 below:

Figure 76. Photo from zone 3 site 4 west. This illustrates a lack in familiarity and welcoming feeling. Taken by author on 26-02-2025 [photography].

Zone 3: Site 4 graded 1 – not at all for familiarity. The comment accompanying the rating goes as follows:

> Unwelcoming and unintuitive site. Does not feel like visitors should be there. Appendix 1, page 25.

Had there been a back entrance from the building leading to the site, with a pathway connecting the building to the site this would be different (see figure 43 above). Currently, the lowered paved cul-de-sac is not enough, as performing the site analysis was marked by an atmosphere of discomfort and a sense of intrusion.

As a positive example of familiarity, we have Zone 3: Site 5, seen below (figure 77).

Figure 77. Photos from zone 3 site 5 facing east and south. They illustrate a seamless connection and sense of familiarity. Taken by author on 27-02-2025 [photography].

It received a 5–fully grading when it came to the environmental quality familiarity and this was the accompanying comment:

> Feels natural and intuitive as a part of the hospital grounds. Appendix 1, page 27.

The site connects seamlessly to the main entrance of the psychiatry building which is to the south of the zone (see figure 77 above). It also does the same to pink building to the southeast and meets the surrounding environments on the outside of the hospital grounds as a clear beginning and entrance of the entire hospital grounds.

As for qualities for access to nature, B1: contact with surrounding life, and B10: Seasons changing in nature were the two qualities that scored high. Contact with surrounding life is an environmental quality that is easily fulfilled in Uppsala University Hospital. It is defined as follows:

> The space should allow users to observe or interact with people, animals, or urban life, promoting connection. This thesis, figure 2.

Due to the large amount of pedestrian and vehicle traffic in this major hospital grounds, in addition to ongoing construction work in large parts of the grounds, the contact with surrounding life is high, sometimes to a detrimental level. This environmental quality can directly oppose that of serenity as well as refuge.

Finally, the last highly scoring environmental quality is B10: Seasons changing in nature. It is an environmental quality that is easily achieved. It simply requires the presence of some deciduous plants that can increase the connection with seasonal changes and time passing. However, to increase this quality in an artful and meaningful way, I recommend a variation of plants with different blooming cycles and differing aspects throughout the seasonal changes, an aspect of

landscape architecture called seasonal variation. This is in order to utilise the full effect of this quality.

5.3.3 Bad environmental qualities for rehabilitation in Uppsala University Hospital and why

Then come the remaining qualities for section A: comfortable, A3: safety and security, and A6: different options in different kinds of weather, which all received low gradings (see figure 75).

The environmental quality A3: safety and security includes both physical and psychological safety. As shown throughout the site analysis, it seems that consideration of both aspects of safety at the same time is difficult. As an example, there are two sites where one aspect was achieved but not the other.

Zone 4: site 5 received a 2-inadequate grading for safety and security despite being secure in the psychological sense with this reasoning accompanying the grading:

> Muddy incline on the path in the forest. Appendix 1, page 36.

The physical safety of the site was compromised due to the lack of accessibility and safety measures. In the opposite example, zone 2: site 1 lacked psychological safety and also received a 2-inadequate grading. This is the accompanying text:

> Physical comforts are good. Psychological not as much; viewed from inside, sitting next to a garbage can, wall+fence to the south is jarring. Cars keep coming. Appendix 1, page 7.

The sites that received a high rating in this environmental characteristic were both protected and calming by way of nature, while also maintaining accessibility through paved paths and minimal height differences.

A6: different options in different kinds of weather, despite being poorly graded, is one of the environmental qualities which can be most easily improved using simple means. Adding an awning or canopy over seating allows for protection from wind and rain, as well as overbearing sunlight. The environmental quality B2: Social opportunities is another that could be easily improved by adding benches and designated meeting points in the different sites.

B4: Culture and Connection to Past is a quality that rated an average of 3,3, which is better than most other environmental qualities. Today, the quality is mostly achieved through artwork present throughout the sites and being able to view Uppsala Castle (as can be seen throughout the site analysis). Because of the

position of Uppsala University Hospital within the city of Uppsala and namely being so close to Uppsala Castle and Uppsala City Park, this environmental quality has the unique ability to be achieved in this case study. This would be done through sightlines to the castle, and references to a rich and varied history.

Three qualities which are highly interconnected are B8: Rich in Species, B10: Seasons changing in nature, and B9: Sensual Pleasures of Nature, as many of the qualities for stimulating nature are. These can all be considered at the same time, and when the environmental quality B8: Rich in Species scored low, the likelihood of B9: Sensual Pleasures of Nature doing so increased. If, as I stated above, aspects of seasonal variation within B10: Seasons changing in nature are considered in the sites, this would naturally lead to a significant improvement in the other two qualities.

A key environmental quality for people experiencing high levels of stress, as well as just generally for rehabilitating environments to be achieved is B3: Joyful and meaningful activities. In Uppsala University Hospital, this environmental quality received an average rating of 2,4 and thus needs a significant improvement. Many sites within the hospital grounds were found lacking in this quality, however, one of the zone 4 sites stood out in its excellence, see figure 78 below:

Figure 78. Photos from zone 4 site 1 facing south, showing an expansive nature area with gardening beds. Taken by author on 26-02-2025 [photography].

Zone 4 site 1 rated a 5 – fully in grading with this accompanying comment:

> Rich opportunity for interacting with nature; planting, observing, plucking weeds etc. Unclear how open to the general public gardening opportunities are. Appendix 1, page 29.

The activities offer a way for the user of the green space to stop thinking inside of their brain and start interacting with the environment around them. They offer crucial and necessary distractions for many people. It is important that the activities offered follow the gradient of difficulty according to the Needs Pyramid as detailed in section 3.2 Methodology theory.

Finally, I will group several environmental qualities together based on a key similarity: the absolute necessity of expansive green spaces to achieve these qualities. These are B5: Symbolism and Reflection, B6: Prospect, B7: Space, B11: Serene, B12: Wild Nature and B13: Refuge. B5: Symbolism and Reflection is defined as follows:

> The space should include elements that inspire personal reflection, such as natural metaphors or symbolic features. This thesis, figure 2.

The example used in the original literature was a moss-covered stone (Bengtsson et al. 2018). There is no way that a person will be able to take in and process metaphors and symbolism, or that they would even consider something a metaphor, without first being in an environment that allows this frame of mind. If cars are stopping and going, the area is permeated with asphalt and smoking cubes, and construction noise is all you hear, the moss covering the stone will not even be perceived. These environmental qualities require a physical expanse of greenery. Here the measures I would suggest is a de-paving and redevelopment of Uppsala University Hospital outdoor environments so that the zone 3 areas specifically, in practice have the function of green parks, instead of being tertiary green spaces. The entrances in zone 2 require the same attention. More on this in chapter 6 Discussion.

6. Discussion of findings and conclusions

The following chapter ties together the thesis, bringing together information on global sustainability goals, research on health and green environments, with the outlook of modern-day hospital environments. The thesis aim and each research question are raised, answered, and discussed. Both difficult to use, and useful, evidence-based design theories are reviewed. Finally, conclusions are made, and the thesis' contributions to new knowledge within landscape architecture are listed.

At the beginning of the thesis, four global goals from Agenda 2030 relevant to the thesis topic were presented to highlight the subject significance, and its relation to current societal challenges for sustainable development. It touches on making cities inclusive, safe, resilient and sustainable, through advocating for access to greenery for society's most vulnerable: patients, visitors and healthcare staff. It touches on urgent action to combat climate change, through promoting green spaces. It touches on protecting, restoring and promoting sustainable use of land-based ecosystems, also through advocating for and promoting green spaces (United Nations n.d.). Finally, it touches on ensuring healthy lives and promoting well-being, which is done through advocating for the other three goals.

Research has shown that green environments are linked to improved mental and physical health, and even improved healthcare outcomes (World Health Organization 2022). Furthermore, green environments are increasingly linked to reduced costs in healthcare (Van Den Eeden et al. 2020). Studies show that green coverage is significantly associated with lowered healthcare expenses (Van Den Eeden et al. 2020), and that developing one urban park generates significant healthcare savings (Wilson & Xiao 2023). This effect is seen in healthcare for both mental and physical health (ibid).

Outdoor environments have the potential to address a variety of users, both individuals struggling with mental health as well as patients with physical or cognitive ailments (Engström et al. 2022). People experiencing high levels of stress, common in hospital settings, can particularly benefit from rehabilitative outdoor environments (Bengtsson et al. 2024).

Despite all that, and the deep history connecting green environments and hospitals (Zhu & Sarah 2024) (Marcus & Sachs 2014), modern day design principles for outdoor healthcare environments prioritize safety, accessibility and practicality (Boberg 2014). Taking heavy inspiration from industrial efficiency and productivity, as well as centralisation into bigger hospitals, functional needs of

fitting more construction into hospital areas was prioritized over rehabilitating and cohesive landscape environments (Boberg 2014) (Kallstenius 2012).

6.1 Aim and research questions

The aim of the thesis was to examine the rehabilitative green spaces within existing hospital environments, using Uppsala University Hospital as a case study. The goal was to bridge the gap between research and practice by applying evidence-based design criteria to evaluate an existing healthcare setting. To achieve the aim, three research questions were established. The first one was established to achieve a thorough understanding of the current green-structure make-up, and was:

What is the current balance between built infrastructure and vegetation in the outdoor environments of Uppsala University Hospital today?

The entirety of the green structure analysis (step one of the methodology), answered this question. The hospital environment was mapped out using a mix of several maps and on-site evaluation. The following ratios were established: Tree canopy coverage made up 11,7% of the hospital outdoor environment, meanwhile Grass and shrubs covered 18,4% and Buildings covered 32.3%. Roads and other paved areas covered the largest proportion of the hospital grounds, at 37.6%.

To contextualize and further aid in the analysis of the green structures in and around Uppsala University Hospital, the 3-30-300 rule was established, and parks and other green areas within 300 meters of the perimeter of the hospital grounds were visualised on the map.

However, the buffer created in ArcGis Pro measured 300m from an aerial viewpoint from the perimeter of the hospital grounds outwards. In practice, walking 300 meters outward from the hospital entrance proved more restrictive. Much of the hospital grounds were enclosed by fencing, and significant height differences between the hospital grounds and the surrounding areas further limited accessibility. Considering pathways and pedestrian crossings, 300m spans significantly less in practice than from aerial view. This becomes evident in Section 5.2.3 of the result (Zone 4), where the path taken to each site was measured using the Lantmäteriet measuring tool.

Additionally, the hospital grounds of Uppsala University Hospital are expansive. If a person is in the centre of the hospital grounds, just getting to the outer perimeter might take 300 meters or more. When considering construction and road blockings, this distance would further increase.

The second research question answered the main part of the aim, and was:

What do the outdoor environments of Uppsala University Hospital look like today in terms of rehabilitative values of greenery defined by evidence-based design?

This question is thoroughly answered within the result of the thesis, and particularly in Appendix 1. For an overview of the site analysis, see figure 8, which shows a color-coded overview table of the results. For discussion and synthesis of the result, see Section 5.3 Part Three: Assessment of Uppsala University Hospital and suggested measures. To give the reader a brief reminder, here are some of the main insights of the site analysis from that section:

> At a quick overview (see table 5 above) it becomes apparent that in section B: access to nature, zone 4 is superior to zone 3 and 2 when it comes to rehabilitating environmental qualities, where several qualities received a grade 5 – fully, across all sites in zone 4 (those being B4: culture and connection to past times, B7: space, and B8: rich in species). Additionally, the qualities of B1: Contact with surrounding life, B3: Joyful and meaningful activities, B9: Sensual pleasures of nature, B10: Seasons changing in nature, and B13: refuge scored high with only one or two sites receiving a mostly or partially score.
>
> The differences between zones 2 and 3 are less apparent when it comes to qualities for access to nature (see table 6 above). Initially, one might have had the hypothesis that zone 3 would be significantly superior to zone 2 when reading the different zone descriptions. However, that initial hypothesis is disproven, though zone 3 remains better. This is due to the randomized nature of the site selection, where the aim was to see what zone 3 sites looked like as an overview of the whole hospital grounds. Some of the sites chosen, namely zone 3: site 2, zone 3: site 3 and zone 3: site 4, functioned more like tertiary or "in-between" green spaces rather than gardens and parks, which is the definition of what zone 3 is supposed to be.
>
> Another pattern which becomes apparent from the overview table is that a site that scores highly in some environmental qualities for access to nature, is likely to score highly in several. It becomes apparent form the site analysis that sites that have been thoughtfully designed outdoor environments are better at being rehabilitating. The inverse relationship is true as well. A site that scores low in some is likely to score low in several. […]

The third and final research question was established to take the analysis one step further and begin the process of utilizing all the information gathered. The question was:

How can the rehabilitative values of the outdoor environments of Uppsala University Hospital be improved?

Firstly, one suggestion is that Uppsala University Hospital takes into consideration rehabilitating environmental qualities when designing their outdoor environment generally, as it is clear from the in-depth analysis outlined in this

thesis that when such considerations have been taken, the results speak for themselves. Sites that function mainly as an “in-between” space with no real use or design as an outdoor environment score low in qualities for both sections A: Comfortable and B: Access to nature.

Secondly, in certain aspects the different environmental qualities for section A and section B can seem to oppose each other. For example, the closer the access to the site, the harder it is to make the site rich in space (immersion), due to the nature of that environmental characteristic. Space is defined as:

> The space should feel expansive and immersive, providing a break from urban environments. This thesis, figure 2.

Achieving an immersive and expansive green environment would be exceedingly difficult right by the entrances of the buildings, or even in close proximity to them. At the end of the day, it is an issue of the ratio of how much Uppsala University Hospital is built or paved, which amounts to a total of 70% of the hospital grounds. A mere 11,7% is estimated to consist of tree canopy instead of the recommended 30%. De-paving is something that should be considered and is the removal of paved surfaces and replacing it with greenery (Werbin et al. 2020).

De-paving can be connected to a larger issue concerning sustainable development and landscape architecture. Uppsala University Hospital has a high ratio of built environment and would benefit from a de-paving effort. This reflects a larger problem seen throughout design of healthcare facilities as requirements for accessibility and utilitarian design get prioritized over building rehabilitative green spaces (Boberg 2014). This occurs despite extensive research has been conducted proving that green outdoor spaces increase positive healthcare outcomes and improve mental and physical health.

One study revealed that areas in Uppsala characterized by low canopy coverage, typically places dominated by warehouses, logistical facilities, or administrative buildings, would require extensive tree planting to approach the 30% canopy cover target. Even if nearly all paved surfaces, including parking lots and roadside spaces, were utilized for planting, achieving this threshold remains difficult. This finding highlights the focus on functionality in the planning of these areas (Lund & Nordh 2024). A similar situation can be found at Uppsala University Hospital, where the built environments seem to have been designed to optimize efficiency and therefore present low tree canopy coverage. Instead, the environment is dominated by paved surfaces, primarily in the form of roads, parking lots, and logistical infrastructure.

At the same time, accessibility and the laws and requirements that govern hospital design (Bengtsson et al. 2022), cannot be blindly overlooked as this would in turn create other ethical dilemmas. Thus, extensive research must be made for the balance rehabilitative landscape design and accessibility needs to be harmonious.

As the site analysis proved and was stated above when comparing the different zones, the superior zone for Section B: Access to nature environmental characteristics is zone 4 (see table 5). The question then becomes how to provide access to zone 4, which is outside the hospital grounds, and which proved a lack in comfortable qualities. There are numerous fences enclosing the hospital area, which need to be removed at the appropriate places to allow for easier access.

Another thing to improve accessibility to zone 4 would be rolling outdoor escalators, signage at the entrances of these sites, and maps produced by the hospital highlighting the existence of tranquil green spaces. This requires collaboration with the land managers or caretakers. This is not only a matter of physical access but also involves the distribution of knowledge. In the event of building escalators, ramps or staircases in zone 4 to allow for ease of access, this no longer is within the jurisdiction of Uppsala University Hospital management and would require collaboration with the relevant management agency of those parks or nature reserves.

For further discussion of the result and suggested measures for improvement, se again Section 5.3 Part Three: Assessment of Uppsala University Hospital and suggested measures.

6.2 Problems with Evidence-Based Design tools

The aim in trying to use the Universal Design Principles was to establish an Evidence-Based Design foundation upon which to discuss the suggested measures portion of the result. If the suggested measures were universally accessible and meeting the needs of all, the lack of a needs analysis in the form of interviews would not be as problematic. However, the design principles: equitable use, Flexibility in use, Simple and intuitive use, Perceptible information, Tolerance for error, Low physical effort and Size and Space for accessibility and use, were too difficult to work with in the synthesis of the analysis and suggested measures.

In essence, they were already included in the environmental qualities of Section A: Comfortable Design. Further integration, in the form of for example measuring the accessibility and clearance needed to comfortably move and rotate a hospital bed or measuring for tolerance in error for different users would require more specialized knowledge than a landscape architect has. If the focus of the thesis had been centred on accessibility, then experts in that field and significant

literature review in that sphere would have been required instead. It was not useful in this thesis as a way of establishing a general or universal user.

As for the PTS Outdoor Environment tool, the idea behind using the tool came from PTS Forum creating this new tool intended to help bridge the gap between research and practice when it comes to rehabilitating outdoor environments within healthcare, perfect for the scope of this thesis. However, as stated previously in the thesis, the tool was difficult to use as it was too simplified. It had briefly combined several EBD tools: the Needs Pyramid, the Outdoor Environment Zones, as well as the Need for Comfortable versus Stimulating Design.

In retrospect, after several months of extensive research into EBD for rehabilitating environments, it is clear what the authors of the PTS Outdoor Environment tool intended concerning the combination of the different tools. The tool by itself did not provide sufficient background information to be utilised. However, the difficulty in determining application and usage for the triangles in the proposed method of the programme plan (see figure 4) remains.

Determining whether a site should, for example, be assigned a fourth tier in the pyramid called *directed inwards involvement*, or a second tier in the pyramid called *active participation* remained problematic. How could this be applied practically in a way supported by evidence? This issue was enhanced by the lack of a needs analysis performed within the scope of this thesis. This is a shortage that can be improved through further research, more on that in Chapter 7 Further Research.

6.3 Useful Evidence-Based Design theories and tools

The QET tool, particularly accompanied with the gathered knowledge through literature review, and a deeper understanding of the 3-30-300 rule, the outdoor environment zones, the perceived sensory dimensions and the needs pyramid, was useful in the methodology of this thesis.

The gradings and comments made throughout the site analysis were the author's own subjective judgement, based on the established grading criteria and repeated review of the scientifically research-based theories. All site analysis made by individuals are inherently subjective, as they ultimately reflect personal interpretations and judgments. As an attempt to address this subjectivity, the QET tool was altered through adding gradings and grading criteria, as well as creating protocols for ease of thorough and systematic site analysis. This was useful in maintaining a clear basis on which the gradings and analysis were made. Had there been no grading system, covering such a large case study area in a clear and systematic way would have been difficult.

6.4 Conclusion

In conclusion, the thesis found the rehabilitative properties of the outdoor environments of Uppsala University Hospital lacking. The best outdoor environments providing stimulating qualities were in zone 4, outside of the hospital grounds. Even several environmental qualities in the comfortable category, within and outside the hospital grounds, left much to be desired.

The thesis brings new knowledge into the field of landscape architecture through establishing a thorough site analysis of Uppsala University Hospital upon which further research and a design proposal can be made. Further, the thesis explored the utilization of Evidence-Based Design tools in analysing existing hospitals and established a thorough methodology. This methodology can be utilized in other hospital projects for rehabilitating outdoor environments across Sweden. If need be, the protocols can be taken directly from the methodology section and used. Particularly, the addition of gradings and grading criteria to the QET tool brings new knowledge into bridging the gap between research and practice and acts as an aid for the analyst of the outdoor environments in maintaining consistency in site evaluation.

7. Further research

This thesis touches on several points that could be the basis for further research. These suggestions stem from the limitations and parameters of the thesis, methodology considerations and critique, as well as identified problem areas.

How can the identified areas of improvement at Uppsala University Hospital's outdoor environments be translated into concrete design proposals based on evidence-based design, which consider both site analysis and user needs? The thesis has not aimed at creating a design proposal but rather to evaluate existing environments and identify potential improvements. The next natural step would be to develop design strategies and suggestions based on the results of the site analysis, especially for zone 2 and zone 3, where the hospital has more authority to affect the design and large deficiencies in rehabilitative qualities were identified. Specifically, research can be conducted for the integration of specific therapeutic activities and uses, such as animal-assisted therapy or gardening, into the design. This falls into the environmental quality B3: Joyful and meaningful activities, but on a more thorough and wide scale.

How can an extensive needs analysis for the users of the outdoor environments at Uppsala University Hospital be conducted to understand the specific needs of different user groups, such as patients with different needs and disabilities, staff and visitors? The thesis omitted step two of the QET methodology, which includes a needs analysis of users, due to lack of time. Such an analysis, for example through interviews or questionnaires, would provide a deeper understanding of how Hospital Outdoor Environments can best support rehabilitation and well-being for the intended user-group. As a suggestion, investigating which departments are located where in the hospital grounds, and then researching what evidence-based and personal needs these patients, visitors, and staff in those locations have, can be a first step in that research. For example, patients dealing with a heart-attack might have different needs than those dealing with dementia.

What are the rehabilitative values of the view from the hospital buildings' windows (zone 1) and in the sunrooms and enclosed balconies (zone 1 and zone 2) at Uppsala University Hospital? The thesis focused solely on the external outdoor environments (zone 3 and 4, and parts of zone 2). However, research has shown that simply outlooks towards nature can improve patient outcomes, reduce stress and shorten hospital stays. An evaluation of these zones would complement the current analysis and provide more comprehensive information of the rehabilitative qualities and potentials. Further, if the entire hospital grounds were

to be analysed, instead of certain picked out sites, the analysis would be even more thorough and indicative of the current situation in Uppsala University Hospital.

Can PTS Outdoor Environment Tool be adapted or developed to become a more concrete and useful tool for evaluating and improving existing hospitals outdoor environments? The thesis found that the PTS Outdoor Environment Tool was too simplistic and lacked concrete descriptions of how it would be used in practice, especially considering the different "activity tier triangles" which the tool advocated for. If future research included a needs analysis, the tool should be considerably more useful, as the placement of the "activity tier triangles" could then be determined.

How can the accessibility to green areas outside the hospital area (zone 4) be improved for patients, staff and visitors? Chapter 4 Result showed that zone 4 had many of the best stimulating rehabilitative qualities (Section B: Access to Nature), but that physical access from the hospital area was limited in some places. Research can explore which physical measures are most effective in bridging these obstacles, is it escalators, paved pathways etcetera. Here, the requirement of a needs analysis becomes extra important, as research shows that different users have different needs when it comes to zone 4. Certain users may need to be protected from zone 4 all-together. Further, research can be made into if and how co-operation efforts to provide accessibility in zone 4 can be made.

How can Universal Design principles be applied more concretely and effectively in the design of rehabilitative outdoor environments within the framework of landscape architecture? The principles are both important and difficult to work with as a designer. Given the difficulties in using them as guidelines for design measures highlighted in the thesis, further research on this topic can be done to explore how to make them more accessible for a landscape architect to use.

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Appendix 1 QET Protocols and analysis of Uppsala University Hospital:

Appendix to Evaluating the rehabilitative values of the outdoor environments of Uppsala University Hospital

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1. Site analysis

In the following comes the site analysis of 16 sites for the rehabilitating environmental qualities of Uppsala University Hospital and surrounding area, ordered chronologically by zones.

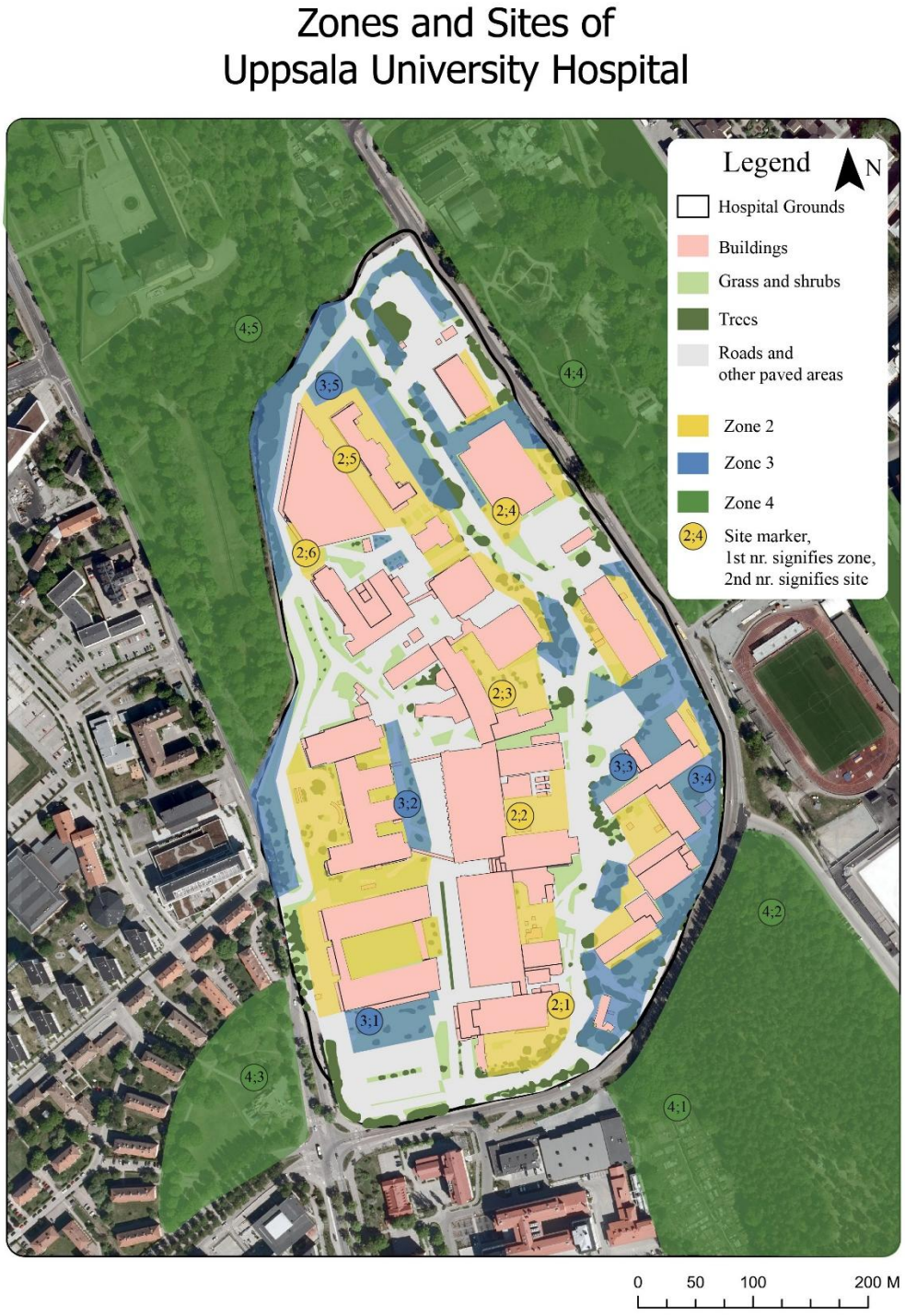

Figure 1. The map shows zones and sites using colour codes: yellow for Zone 2, blue for Zone 3, and green for Zone 4. E.g. a yellow marker labelled 2;1 indicates Zone 2, Site 1. Base map Lantmäteriet 2017.

1.1 Zone 2

1.1.1 QET analysis of zone 2 site 1

Figure 2. Photos from zone 2: site 1 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

Zone 2: site 1 is located by entrance 85 (Google 2025). The site consists of an entrance area with a marked pick up/ drop off area, walls with fencing plants to the east to address the height differences of the site. To the southwest there is a rest-area with smoking disposal bins, large trees, hedges and a grass field, as well as a loading dock for hospital operations. There is a significant height difference there which is addressed through a large concrete wall and chain link fencing, seen in the south facing image above.

Table 1. QET-tool applied on site analysis of zone 2: site 1

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	5	I am analyzing the entrance, so it is close.
A2: Enclosure and entrance	4	Surrounded nicely but the fencing/walls are visible.

A3: Safety and security	2	Physical comforts are good. Psychological not as much; viewed from inside, sitting next to a garbage can, wall+fence to the south is jarring. Cars keep coming.
A4: Familiarity	5	Simple and easy.
A5: Orientation and way finding	5	Simple and clear.
A6: Different options in different kinds of weather	5	Clear roof allows for sitting, standing, protection if needed.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = Mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	4	Plenty of people and cars coming and going. Major road visible. No animals.
B2: Social opportunities	2	There is one bench on either side of the entrance. There are also social places more in nature further away, to the southwest as well as across the road to the east, but this is not included in the site.
B3: Joyful and meaningful activities	1	Single purpose: entry. Smoking corner to the west of entrance only activity besides talking or sitting.
B4: Culture and connection to past times	1	None.
B5: Symbolism/reflection	1	None.
B6: Prospect	4	Open and green.
B7: Space	1	High traffic area.
B8: Rich in species	2	There are large beautiful planting pots by the entrance. Otherwise monotone vegetation.
B9: Sensual pleasures of nature	2	Limited ability to experience nature, besides the potted plants by the entrance with ljung.
B10: Seasons changing in nature	4	Many big old deciduous trees with changing leaves. Bushes also. Activity: Benches.
B11: Serene	1	High traffic area filled with noise.
B12: Wild nature	1	Highly trimmed bushes.
B13: Refuge	2	There's a smoking wall behind the corner where staff take breaks. A nearby bench spot exists, as mentioned above.

Zone 2: site 1 received an average grade of 4,3 for Section A comfortable qualities, and an average grade of 2 for Section B qualities for access to nature.

1.1.2 QET analysis of zone 2 site 2

Figure 3. Photos from zone 2: site 2 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

Zone 2: site 2 is located by entrance 65/70 (Google 2025). The site is mainly a parking lot for cars and bicycles. The main form of greenery is large pots with plants by the entrance.

Table 2. QET-tool applied on site analysis of zone 2: site 2

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	5	It is accessible easily as it is the main entrance of this building.
A2: Enclosure and entrance	1	No enclosure. Entirely glass entrance leads to observed feeling from inside.
A3: Safety and security	2	A hard-paved area equals good physical safety, no sloping etc. Phytologically the area feels oppressive due to the lack of green.
A4: Familiarity	2	Easy to get to but the character of the site is distinctly that of a parking lot, so while easily

		recognizable the association is not necessarily positive.
A5: Orientation and way finding	5	Largely uncomplicated and open area.
A6: Different options in different kinds of weather	3	There are benches placed both under roofing and outside of it, allowing for sun or protection from rain depending on weather. Opportunities for other activities are lacking.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	High traffic pick up/drop off area.
B2: Social opportunities	2	Seating is accessible as well as potted plants to observe or discuss, otherwise lacking in social opportunities.
B3: Joyful and meaningful activities	1	Seated activities available, any other activities not available.
B4: Culture and connection to past times	1	None.
B5: Symbolism/reflection	1	None.
B6: Prospect	1	Open view of paved parking, not greenery.
B7: Space	1	Open and high traffic area.
B8: Rich in species	1	Only green is the potted plants.
B9: Sensual pleasures of nature	2	The opportunity for wind, sun, rain exists. Possibly the sunrise could be visible. No other textures and tastes of nature.
B10: Seasons changing in nature	2	The potted plants presumably get changed every season.
B11: Serene	1	None.
B12: Wild nature	1	None.
B13: Refuge	1	None.

Zone 2: site 2 received an average grade of 3 for Section A comfortable qualities, and an average grade of 1,5 for Section B qualities for access to nature.

1.1.3 QET analysis of zone 2 site 3

Figure 4. Photos from zone 2: site 3 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

Zone 2: site 3 is located by the entrance to the emergency ward (Google 2025). Right by the entrance there are smokers' cubes with seating. There is a cultural roundabout with an artwork in it, as well as an area to the northwest with additional seating, smoking cube, bicycle parking, trees and bushes.

Table 3. QET-tool applied on site analysis of zone 2: site 3

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	5	It is accessible easily as it is the main entrance of this building.
A2: Enclosure and entrance	4	Main entrance is open but more enclosed area to the northwest is available.
A3: Safety and security	4	Protected both psychologically and physically. The parking areas are not as oppressive or intruding as they could be. High traffic area but the opportunity to go further away to a more protected area does much. The signage is

		neon red and could be psychologically disturbing.
A4: Familiarity	5	Easily accessed and familiar.
A5: Orientation and way finding	5	Distinct roundabout with artwork does much as a landmark for the site. Older trees add additional character.
A6: Different options in different kinds of weather	3	Three smoking cubes allow for resting and smoking outside, but there is a lack of roofed seating for non-smokers.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	High traffic pick up/drop off area.
B2: Social opportunities	4	Seating farther away allows for more restful conversation as well as potential other activities. Large trees to discuss.
B3: Joyful and meaningful activities	2	Allows for seating, smoking, bike-parking, pick up, drop off. However, the site is still too exposed and high trafficked to allow for therapeutic or physical activities.
B4: Culture and connection to past times	5	The roundabout in addition to the design of the outdoor area reminds of past times.
B5: Symbolism/reflection	2	Potentially through the artwork.
B6: Prospect	1	Enclosed by buildings, lacks open green space.
B7: Space	1	None.
B8: Rich in species	2	Seems like one species of tree and one species of hedge, however the age of the tree adds variety.
B9: Sensual pleasures of nature	3	Seating farther away allows more intimate experiences of nature, however they are limited. Sunlight, wind would be lacking due to enclosing buildings.
B10: Seasons changing in nature	4	Old deciduous trees with changing leaves. Bushes also. Activity: Benches, smoking.
B11: Serene	1	Hight traffic area with neon signage. Ambulances create noise and light disturbances.
B12: Wild nature	1	Cultivated area.
B13: Refuge	4	The area further away with benches allows some refuge.

Zone 2: site 3 received an average grade of 4,3 for Section A comfortable qualities, and an average grade of 2,6 for Section B qualities for access to nature.

1.1.4 QET analysis of zone 2 site 4

Figure 5. Photos from zone 2: site 3 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

Zone 2: site 5 is located by the entrance to the major parking garage of the hospital grounds (Google 2025). East and north of the site, the parking garage is adjacent. To the west of the site major construction is ongoing. A big tree can be seen to the south, and right by the entrance there is a statue/artwork.

Table 4. QET-tool applied on site analysis of zone 2: site 4

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	5	I am analyzing the entrance, so it is close.
A2: Enclosure and entrance	2	Trees at the back behind the benches add some sense of protection, but site is largely open. Fencing is visible.
A3: Safety and security	4	Open and easily overlookable area with plants at the back feels safe psychologically, with exception for visible fence (southeast) with height difference behind it. The ground is flat and paved with ground pavers.

A4: Familiarity	5	Easily accessed and feels accessible.
A5: Orientation and way finding	5	The artwork does much as a landmark for the site. The open layout of the site with benches backed with bush-trees acts as additional distinct characteristics.
A6: Different options in different kinds of weather	1	No roofing, only open air benches available.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	High contact, construction site nearby and a high traffic road for the hospital grounds close.
B2: Social opportunities	3	Seating with bushes, artwork to discuss.
B3: Joyful and meaningful activities	1	Seated activities available, any other activities not available.
B4: Culture and connection to past times	2	The artwork could be a cultural reference.
B5: Symbolism/reflection	1	None.
B6: Prospect	4	View to the south of green field with large tree.
B7: Space	1	None.
B8: Rich in species	3	Some effort has been made to add a variety of plants to the underbrush layer, as well as two species of bush-trees. The grass field and the large tree adds interest.
B9: Sensual pleasures of nature	3	The planting affords some interaction with nature, such as sitting beneath the trees as they bloom and looking at the ornamental grasses. The openness to the south allows for sunlight against the skin.
B10: Seasons changing in nature	4	Many deciduous trees with changing leaves. Bushes also. Activity: Benches.
B11: Serene	1	Construction noise is intrusive.
B12: Wild nature	3	To the northwest some older trees + underbrush have a wilder character.
B13: Refuge	3	Despite the openness of the site it does offer some refuge due to the fencing and bush-trees. The site is not as highly trafficked as others, which also adds to the sense of refuge.

Zone 2: site 4 received an average grade of 3,7 for Section A comfortable qualities, and an average grade of 2,6 for Section B qualities for access to nature.

1.1.5 QET analysis of zone 2 site 5

Figure 6. Photos from zone 2: site 5 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

Zone 2: site 5 is located by the entrance to the emergency ward for adult psychiatry (Google 2025). The area acts as a narrow passage between two buildings with mixed traffic utilising the cobbled area. Car parking on either side of the entrance to the south and west, and bicycle parking across on the other side. To the far northwest Uppsala Castle can be seen with large trees beneath it. To the southwest a single tree can be seen, as well as ongoing construction.

Table 5. QET-tool applied on site analysis of zone 2: site 5

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	5	I am analyzing the entrance, so it is close.
A2: Enclosure and entrance	1	No sense of enclosure. Site feels solely like a passage.
A3: Safety and security	1	The cobble stones are textured and can result in loss of mobility in certain users. Psychologically the site is oppressive.

A4: Familiarity	1	If not for the large red signage proclaiming this the entrance, you would not know it was an entrance at all.
A5: Orientation and way finding	1	The glass building of the psychiatry department is distinctive and adds some character, otherwise none.
A6: Different options in different kinds of weather	1	None.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	High traffic passage.
B2: Social opportunities	1	None.
B3: Joyful and meaningful activities	1	None.
B4: Culture and connection to past times	2	The castle adds cultural heritage and significance.
B5: Symbolism/reflection	1	None.
B6: Prospect	1	None.
B7: Space	1	None.
B8: Rich in species	1	None.
B9: Sensual pleasures of nature	1	None.
B10: Seasons changing in nature	1	The trees in the distance are too far to add any value in this aspect.
B11: Serene	1	None.
B12: Wild nature	1	The trees in the distance are too far to add any value in this aspect.
B13: Refuge	1	None.

Zone 2: site 4 received an average grade of 1,7 for Section A comfortable qualities, and an average grade of 1,4 for Section B qualities for access to nature. This is the site most needing improvement of all the sites in zone 2.

1.1.6 QET analysis of zone 2 site 6

Figure 7. Photos from zone 2: site 6 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

Zone 2: site 6 is located on the back side of the psychiatry building (Google 2025) and is the only site in zone 2 not near an entrance. It was selected to balance the report, as it seems to compensate for limited green space elsewhere, particularly at zone 2 site 5. It consists of a semi-enclosed seating area with cobble stones and cast-in-place concrete that is about 30cm below road level with trimmed hedges surrounding the concrete. To the north, a covered cafeteria area is accessible via stairs. The site includes notable height differences, with a green, sloped area to the east and north showing wilder nature.

Table 6. QET-tool applied on site analysis of zone 2: site 6

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A1: Closeness and easy access	2	Large height differences solved using staircase, no ramp available. Additionally, the site is far from the main exit.
A2: Enclosure and entrance	5	Enclosure of the site is well done.
A3: Safety and security	2	Psychologically the site is comforting. Physically, cobble stones are textured and can result in loss of mobility in certain users. Additionally, the cast in place concrete is slick. Lack of ramp.

A4: Familiarity	5	The area is well integrated while maintaining a distinct character.
A5: Orientation and way finding	5	Distinct character while still being easily overlookable.
A6: Different options in different kinds of weather	4	There are benches with tables placed both under roofing and outside of it, allowing for sun or protection from rain depending on weather. Opportunities for other activities are lacking.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	There's a trafficked road nearby, with traffic noise as well as birdsong being audible.
B2: Social opportunities	5	Excellent.
B3: Joyful and meaningful activities	3	Potentially protected enough to allow for therapeutic activities as well as the typical seated and social activities. Room for walks or gardening activities does not exist.
B4: Culture and connection to past times	2	The building to the south reminds of culture and history.
B5: Symbolism/reflection	1	None.
B6: Prospect	3	While enclosed, the hedges are trimmed low and allow overlook-ability. Wild character of slope adds prospect.
B7: Space	2	The site is comfortingly enclosed, but not enough to transport to a different world.
B8: Rich in species	3	To the east and north a large green slope signifies a wilder nature and variety.
B9: Sensual pleasures of nature	2	Some access to nature but largely monotone planting immediately by the site. The green slope is largely inaccessible.
B10: Seasons changing in nature	5	To the east and north a large green slope signifies a wilder nature with deciduous trees and underbrush.
B11: Serene	3	The area is calm but construction and road noise and traffic disturbs the serenity.
B12: Wild nature	5	To the east and north a large green slope signifies a wilder nature.
B13: Refuge	2	Area too open.

Zone 2: site 4 received an average grade of 3,7 for Section A comfortable qualities, and an average grade of 3,2 for Section B qualities for access to nature.

1.2 Zone 3

1.2.1 QET analysis of Zone 3: site 1

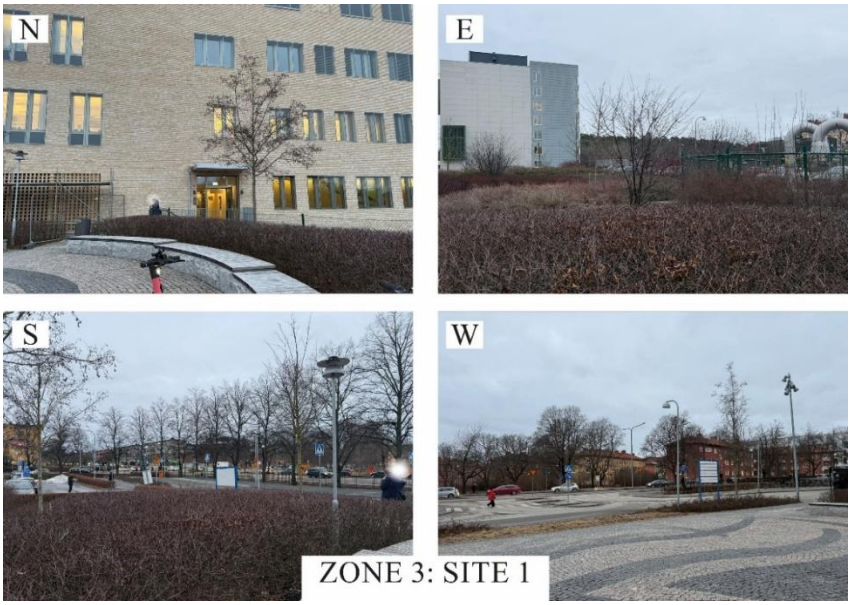

Figure 8.Photos from zone 3 site 1 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The green area where the exact site is marked is inaccessible trimmed hedges, and thus the closest reasonable area was chosen, a paved plaza area right next to it. The area is signified by a patterned cobble stones in light and dark stones, as well as stone seating made custom for the site with roughhewn sides and a wooden seating area.

Table 7. QET-tool applied on site analysis of zone 3: site 1

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially/** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A2: Enclosure and entrance	3	Open area surrounded by seating areas and bushes behind them. Inside of the green area there is inaccessible but visible fencing. The road to the west is close and imposing.
A3: Safety and security	5	Both physical and psychological comfort has been accounted for. No risk for slipping, no thorny hedges. Fencing has been tucked away in hedges.
A4: Familiarity	5	Easily accessed for visitors/staff utilizing entrance 100/101. Unique character that is easily recognizable.
A5: Orientation and way finding	5	Clear that the social area is meant to be utilized and the green area behind is meant to be

		viewed. No access to green area except for maintenance paths. The site is easily overlookable.
A6: Different options in different kinds of weather	2	Seating, social gathering point, artwork to discuss. Lacks roofing or other options for rain or snow.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	Highly trafficked road and bike lane are visually quite close. Birdsong audible.
B2: Social opportunities	5	Social gathering point, beautiful flooring and an artwork to discuss (a fairytale hand mirror) as well as surrounding greenery.
B3: Joyful and meaningful activities	3	Some activities are possible due to the large un-coded area, but therapeutic activities would be too exposing to perform. Garden or walk activities are not possible.
B4: Culture and connection to past times	5	The artwork and patterned flooring adds cultural meaning.
B5: Symbolism/reflection	4	The artwork inspires reflection through its nature (it is a mirror), and could lead to considerations of who else sat here and saw themselves, and what they saw and felt. Connection to nature specifically is lacking.
B6: Prospect	5	Open and overlookable.
B7: Space	2	The road feels too close and disturbs any transportation into another world.
B8: Rich in species	5	A variety of species have been planted in the green area behind the seating.
B9: Sensual pleasures of nature	3	The planting is largely inaccessible. Due to the open nature of the site, sunrise, sunset, wind, rain, would all be accessible to experience.
B10: Seasons changing in nature	4	Large and small trees and diverse bushes all exist with their own life cycles.
B11: Serene	3	Disturbance from major road, but some serene qualities remain, in particular bird song.
B12: Wild nature	2	Largely lacking due to the newly constructed nature of the site.
B13: Refuge	1	The site is too open to allow refuge in nature. And the green areas are largely inaccessible.

Zone 3: site 1 received an average grade of 4 for Section A comfortable qualities, and an average grade of 3,6 for Section B qualities for access to nature.

1.2.2 QET analysis of Zone 3: site 2

Figure 9.Photos from zone 3 site 2 facing north, east, south and west. Taken by author on 26-02-2025. [photography].

The actual site chosen was in the slope, in the bushes. As that location is inaccessible, the closest accessible site was chosen, just to the west of the originally marked site on a paved road. The site consists of a slope covered in low bushes, and a road above it connecting two different courtyards. The slope covers a large height difference and is largely inaccessible. Acts as a pathway between different departments, and as a way to take up the large height difference. The analysis is of the site in zone 3, not of the connecting courtyards defined as zone 2. Thus the attributes of these courtyards will be excluded in the analysis.

Table 8. QET-tool applied on site analysis of zone 3: site 2

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A2: Enclosure and entrance	1	No enclosure excepting the wall to the west.
A3: Safety and security	2	a) Physical discomforts are high as a large portion of the bushes have sharp thorns,

		and the way leading to the site from the main road was through a staircase of which one step was markedly loose despite having been recently built. b) Psychologically the site feels inoffensive.
A4: Familiarity	2	Clear function as a pathway between different departments, and as a way to take up the large height difference between the road below and the buildings.
A5: Orientation and way finding	1	None.
A6: Different options in different kinds of weather	1	None.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	4	High traffic road below, by cars and people. No animals noted.
B2: Social opportunities	1	None.
B3: Joyful and meaningful activities	1	None.
B4: Culture and connection to past times	1	None.
B5: Symbolism/reflection	1	None.
B6: Prospect	3	Open view over the slope.
B7: Space	1	None.
B8: Rich in species	3	Some variety exists. The plants are newly planted and have not yet had time to get established and thus it is difficult to tell.
B9: Sensual pleasures of nature	2	Limited ability to experience nature.
B10: Seasons changing in nature	3	Small trees and a few species of bushes exist with their own life cycles.
B11: Serene	1	None.
B12: Wild nature	1	None.
B13: Refuge	1	None.

Zone 3: site 2 received an average grade of 1,4 for Section A comfortable qualities, and an average grade of 1,8 for Section B qualities for access to nature.

1.2.3 QET analysis of Zone 3: site 3

Figure 10. Photos from zone 3 site 3 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site consists of a bike and walking lane lined with bike racks all along the east side of the road. There are some large trees, some bushes and hedges, but the main vegetation type is grass. There is a statue of a man sitting to the southwest, and a bus stop with roofing and benches. The site is located at the backside of the building and faces Zone 2: site 2 to the west, which is located by entrance 65/70 (Google 2025).

Table 9. QET-tool applied on site analysis of zone 3: site 3

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A2: Enclosure and entrance	4	Enclosure at the east of the site due to bushes and a large tree, which also acts as a roof. Large trees to the west compliment enclosure.
A3: Safety and security	1	The bike racks if used would block the bike lane and encroach on the space for the walking lane, which would be physically and

		psychologically uncomfortable for the user (risk of being run over by bikes).
A4: Familiarity	2	Seems as a backside or unconsidered area that you're not supposed to be in other than waiting for the bus or passing through it.
A5: Orientation and way finding	4	As a space it is markedly simple. The bike rack and statue add distinct built elements that help distinguish from other areas on the hospital grounds.
A6: Different options in different kinds of weather	2	Seating under roof.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	4	High traffic road nearby, by cars and people. No animals noted.
B2: Social opportunities	2	Seating under roof by the bus stop. Opportunity to discuss artwork though no benches or social area faces it.
B3: Joyful and meaningful activities	1	None.
B4: Culture and connection to past times	2	The artwork could be a cultural reference.
B5: Symbolism/reflection	1	None.
B6: Prospect	4	Open grass area to the west with large trees.
B7: Space	1	None.
B8: Rich in species	3	Some variety exists. Some bushes, and a few different species of old trees add variety.
B9: Sensual pleasures of nature	3	The planting affords limited interaction with nature, such as standing beneath the trees, or sitting on the grass.
B10: Seasons changing in nature	3	Large trees and few species of bushes exist with their own life cycles.
B11: Serene	1	Site functions too much as a passage way to afford serenity.
B12: Wild nature	2	Some bushes are more freeväxande otherwise no wild nature.
B13: Refuge	1	The site functions too much as a passage way to afford refuge.

Zone 3: site 3 received an average grade of 2,6 for Section A comfortable qualities, and an average grade of 2,2 for Section B qualities for access to nature.

1.2.4 QET analysis of Zone 3: site 4

Figure 11. Photos from zone 3 site 4 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located at the backside of the building for Nephrology Department, between entrance 77 and entrance 79 (Google 2025). The site has significant height differences and consists mainly of a trimmed grass field enclosed by large trees and a black fence from east to south. To the north there is a paved road leading to the site which ends in a cul-de-sac. Trimmed hedges and a concrete wall solve the height difference of the building to street level there. To the south a culturally significant weeping birch stands alone (Betula Pendula "Youngii"). Informal seating exists in the form of plastic lawn chairs and table.

Table 10. QET-tool applied on site analysis of zone 3: site 4

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A2: Enclosure and entrance	2	The mature tree canopy do act partially to enclose the site, though the expansive open field and exposing building façade diminishes the site's sense of enclosure. During the

		vegetative seasons the assessment might differ due to foliated trees offering greater visual and acoustic protection from the adjacent high-traffic road.
A3: Safety and security	1	Exposed paved cul-de-sac and steep incline on the grass, inaccessible.
A4: Familiarity	1	Unwelcoming and unintuitive site. Does not feel like visitors should be there.
A5: Orientation and way finding	4	The weeping birch tree acts as a landmark, and the site is easily overlookable and thus easy to orient.
A6: Different options in different kinds of weather	1	None.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	2	High visual contact to road but fenced off and physically inaccessible.
B2: Social opportunities	2	Only seating is in the form of informal plastic lawn chairs and table.
B3: Joyful and meaningful activities	1	None.
B4: Culture and connection to past times	3	The weeping birch tree.
B5: Symbolism/reflection	3	The weeping birch tree.
B6: Prospect	5	Site has expansive open views.
B7: Space	1	None.
B8: Rich in species	2	Large tree canopy adds some variety.
B9: Sensual pleasures of nature	2	Minimal through the large trees.
B10: Seasons changing in nature	3	Through the coniferous trees.
B11: Serene	1	The road has high visual and audible impact, ambulance sirens particularly jarring.
B12: Wild nature	1	None.
B13: Refuge	1	None.

Zone 3: site 4 received an average grade of 1,8 for Section A comfortable qualities, and an average grade of 2 for Section B qualities for access to nature.

1.2.5 QET analysis of Zone 3: site 5

Figure 12. Photos from zone 3 site 5 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

The site is located at the main entrance of the psychiatry building, which is entrance 10 and can be seen to the south of the site (Google 2025). On the south east there are benches backed by trimmed hedges, and beyond that is bicycle parking. To the west is a construction zone, and beyond it and to the north is a forest with large coniferous trees and significant height differences. Up on the hill to the west is Uppsala Castle. To the far north there is a fountain and designed area which is hard to see. Beyond it, to the northeast, is the start of the city centre of Uppsala.

Table 11. QET-tool applied on site analysis of zone 3: site 5

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A2: Enclosure and entrance	4	The trimmed hedges offer some enclosure, along with the large trees to the north and west.

A3: Safety and security	2	Less accessible cobblestones in combination with slick site-poured concrete, otherwise safe psychologically.
A4: Familiarity	5	Feels natural and intuitive as a part of the hospital grounds
A5: Orientation and way finding	4	Intuitive and clear pathways, high visibility. Lacks signage.
A6: Different options in different kinds of weather	2	The large central tree offers some shade and rain protection.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	High contact.
B2: Social opportunities	4	Good opportunities for social interaction.
B3: Joyful and meaningful activities	3	Large, paved area makes possible more multifunctional use.
B4: Culture and connection to past times	4	Strong connection to Uppsala Castle.
B5: Symbolism/reflection	3	Large central tree adds some symbolism and opportunity for reflection.
B6: Prospect	2	Site is too enclosed to offer open views.
B7: Space	2	Some sense of being immersed in nature.
B8: Rich in species	5	The forest to the north and west, along with the large trees central to the site, offer a large variety.
B9: Sensual pleasures of nature	3	Some exist through the trimmed edges and the large trees.
B10: Seasons changing in nature	5	Through the forest and the large trees.
B11: Serene	3	Site is protected and would be more serene if not for the construction.
B12: Wild nature	5	The forest adds a sense of wild nature.
B13: Refuge	2	The site is too exposed to offer proper refuge.

Zone 3: site 5 received an average grade of 3,4 for Section A comfortable qualities, and an average grade of 3,5 for Section B qualities for access to nature.

1.3 Zone 4

1.3.1 QET analysis of Zone 4: site 1

Figure 13. Photos from zone 4 site 1 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 155m away from the entrance 85 of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool. Entrance 85 is also zone 2 site 1 (Lantmäteriet 2025). Zone 4 site 1 consists of a community garden called Ruddamsdalens odlarförening (Google 2025).

Within the area is a body of water with bridges to allow crossing to the other side. There is also seating underneath tree canopy and signage to inform visitors. The north and east side of the site borders a forest mainly consisting of pine. The main function is gardening.

Table 12. QET-tool applied on site analysis of zone 4: site 1

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate**	**Observations/ Comments:**

	3 = partially **4 = mostly** **5 = fully**	
A3: Safety and security	2	Rates high on psychological safety. Soil pathway along with a steep fall into the body of water with primitive fencing limits physical safety.
A5: Orientation and way finding	5	Excellent wayfinding with clear landmarks, signage and paths.
A6: Different options in different kinds of weather	2	The large trees offer some shade and rain protection.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	Vibrant contact with nature.
B2: Social opportunities	4	Good opportunity for social interactions. Clear activity adds discussion points and ease in interaction with other users.
B3: Joyful and meaningful activities	5	Rich opportunity for interacting with nature; planting, observing, plucking weeds etc. Unclear how open to the general public gardening opportunities are.
B4: Culture and connection to past times	5	Agricultural and gardening heritage.
B5: Symbolism/reflection	5	Opportunity for observing and interacting with the circle of life.
B6: Prospect	5	Large open view in the southward direction.
B7: Space	5	Immersive nature.
B8: Rich in species	5	Very high biodiversity within the community garden, as well as through the forest to the north and east.
B9: Sensual pleasures of nature	5	Fully immersive through available activity: taste, smell, touch etc.
B10: Seasons changing in nature	5	Perceived even more strongly through gardening.
B11: Serene	5	High level of serenity.
B12: Wild nature	5	Through the forest to the north and east.
B13: Refuge	3	Large site with opportunity to enter the forest for retreat if wanted.

Zone 4: site 1 received an average grade of 3 for Section A comfortable qualities, and an average grade of 4,8 for Section B qualities for access to nature.

1.3.2 QET analysis of Zone 4: site 2

Figure 14. Photos from zone 4 site 2 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 350m away from the entrance 79/77 of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Entrance 77 is next to zone 3 site 3 (Google 2025). Because there is fencing along the road, the real life distance is further than what it appears on the map initially. I chose to place Zone 4 site 2 far into the forest, 120m past the forest entry to allow for full immersion of the forest as the road separating the hospital ground and the forest is highly trafficked and to crest the hill.

The site consists of a pine forest on a hill, with significant height differences from the start of the path to the crest of the hill, 22m of height difference measured through the Lantmäteriet measurement tool. To the west, far into the forest, there are wooden benches with tables.

Table 13. QET-tool applied on site analysis of zone 4: site 2

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**

A3: Safety and security	2	Muddy incline on the path in the forest, and railing towards the hospital grounds discourages access.
A5: Orientation and way finding	5	Clear path and signage.
A6: Different options in different kinds of weather	2	Some protection from weather through the tree canopy.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	4	Strong contact with animal life, while also maintaining visual and audible contact with the arena and trafficked road to the east.
B2: Social opportunities	2	Some seating off the track exists but far into the forest.
B3: Joyful and meaningful activities	3	Activities such as hiking, running, picking berries or sticks, and birdwatching are possible. Lacking in accessibility.
B4: Culture and connection to past times	5	The type of pine forest reminds of Swedish history of skogsbruk, and the arena adds a cultural connection as well.
B5: Symbolism/reflection	4	The 30m+ tall trees inspire reflection.
B6: Prospect	2	Only open where the path is.
B7: Space	5	Highly immersive.
B8: Rich in species	5	Thriving nature.
B9: Sensual pleasures of nature	5	Sound and scent are particularly strong in the immersive environment.
B10: Seasons changing in nature	3	Since the trees are evergreen, this is more lacking compared to other sites to a layman. However, the underbrush will still display the seasonal changes clearly.
B11: Serene	2	Due to high-traffic road and noise from arena, serenity is still lacking.
B12: Wild nature	5	Immersive wild-feeling nature.
B13: Refuge	5	Site feels private, with opportunity to step off the path for retreat if wanted.

Zone 4: site 2 received an average grade of 3 for Section A comfortable qualities, and an average grade of 3,8 for Section B qualities for access to nature.

1.3.3 QET analysis of Zone 4: site 3

Figure 15.Photos from zone 4 site 3 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 160m away from the entrance 100/101 of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Entrance 100/101 is next to zone 3 site 1.

The site consists of a park called Batteriparken (Google 2025) which consist of an open field of cut grass framed by large trees in all directions. There are playgrounds and different seating opportunities. The hospital grounds are to the east of the site, and to the south and west are residential buildings.

Table 14. QET-tool applied on site analysis of zone 4: site 3

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A3: Safety and security	5	Fully safe psychologically and physically with path adapted for accessibility (stenmjöl) and low risk of falling.

A5: Orientation and way finding	4	Intuitive and open, easy to orient.
A6: Different options in different kinds of weather	2	The large trees offer some shade and rain protection.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	Engaging contact with playground, birdsong, pedestrians, cyclists and car traffic further away.
B2: Social opportunities	5	Several well-designed meeting points.
B3: Joyful and meaningful activities	5	The site allows for a variety of activities due to the large uncoded open field, as well as watching children play in the playground.
B4: Culture and connection to past times	5	The layout of the park with the residential multistory apartment buildings is reminiscent of mid-century architecture.
B5: Symbolism/reflection	2	Large old trees allow for some reflection.
B6: Prospect	5	Expansive open views.
B7: Space	5	Fully immersive in nature.
B8: Rich in species	5	Rich variety of species.
B9: Sensual pleasures of nature	3	Partial sensory experience exists but lacking in hands on activity.
B10: Seasons changing in nature	5	Fully through the variety of large trees as well as fields of grass.
B11: Serene	4	Some traffic noise can be heard but sight is largely serene. The sound of children playing adds to serenity.
B12: Wild nature	2	Some high wilder-seeming bushes to the west exist, otherwise largely controlled park.
B13: Refuge	5	Clear opportunities for refuge.

Zone 4: site 2 received an average grade of 3,7 for Section A comfortable qualities, and an average grade of 4,3 for Section B qualities for access to nature.

1.3.4 QET analysis of Zone 4: site 4

Figure 16. Photos from zone 4 site 4 facing north, east, south and west. Taken by author on 26-02-2025 [photography].

The site is located about 160m away from the entrance to the staff gym facility of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). The entrance of the gym facility is next to the parking garage of the hospital grounds.

The site consists of a park called Uppsala City Park (Google 2025) the city park of Uppsala. This is a park with high visitor traction in the centre of Uppsala and is highly funded. Among others, there are opportunities to watch children play on the playground, enjoy seasonal plantings in the form of summer flower beds, a large variety of cultural plants, and seating opportunities.

Table 15. QET-tool applied on site analysis of zone 4: site 4

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A3: Safety and security	5	Highly comfortable and safe.

A5: Orientation and way finding	4	Intuitive with clear paths, entrances, signage etc.
A6: Different options in different kinds of weather	5	Exists within the park as a whole, behind the trees to the northeast.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	Through animal life, high inflow of visitors, and through traffic noise.
B2: Social opportunities	5	Multiple and varied designated social spots.
B3: Joyful and meaningful activities	5	The site allows for a variety of activities such as enjoying the different plants and sights of nature, sunbathing, walking the dog etc.
B4: Culture and connection to past times	5	Uppsala castle to the west, but the site itself has cultural and historical significance.
B5: Symbolism/reflection	3	Varied impressions and vegetation allow for symbolism.
B6: Prospect	5	Large open fields to the south.
B7: Space	5	Fully immersive in nature.
B8: Rich in species	5	Rich variety of species.
B9: Sensual pleasures of nature	5	Vision and textures are particularly strong in the immersive environment.
B10: Seasons changing in nature	5	Highly immersive.
B11: Serene	2	Highly trafficked road disturbs serenity. Some birdsong is audible.
B12: Wild nature	1	Largely cultivated and controlled nature.
B13: Refuge	3	Highly trafficked site, however some spaces to sit alone on a bench with plants behind you do exist.

Zone 4: site 4 received an average grade of 4,7 for Section A comfortable qualities, and an average grade of 4,2 for Section B qualities for access to nature.

1.3.5 QET analysis of Zone 4: site 5

Figure 17. Photos from zone 4 site 5 facing north, east, south and west. Taken by author on 27-02-2025 [photography].

The site is located about 120m away from the main entrance of the psychiatry building (entrance 10) of Uppsala University Hospital measured by pedestrian movement through the Lantmäteriet measurement tool (Lantmäteriet 2025). Entrance 10 is next to zone 3 site 5 (Google 2025). The study area comprises a forested, sloping hill dominated by large coniferous trees, upon which Uppsala Castle is situated. Seating exists to the east.

Table 16. QET-tool applied on site analysis of zone 4: site 5

Section A: Comfortable	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
A3: Safety and security	2	Muddy incline on the path in the forest.
A5: Orientation and way finding	4	Clear path and landmark, but missing signage.

A6: Different options in different kinds of weather	2	The large trees offer some shade and rain protection.
Section B: Access to nature	**1 – 2 – 3 – 4 – 5** **1 = not at all** **2 = inadequate** **3 = partially** **4 = mostly** **5 = fully**	**Observations/ Comments:**
B1: Contact with surrounding life	5	Strong contact with animal life, while also maintaining visual contact with the castle and the psychiatry building.
B2: Social opportunities	3	Seating exists close off the path.
B3: Joyful and meaningful activities	3	Activities such as hiking, running, picking berries or sticks, and birdwatching are possible. Lacking in accessibility.
B4: Culture and connection to past times	5	Strong connection to Uppsala Castle.
B5: Symbolism/reflection	4	The large trees in addition to the tree stump to the north inspire reflection.
B6: Prospect	2	Only open where the path is. Coniferous trees mean the site is more open in winter.
B7: Space	5	Highly immersive.
B8: Rich in species	5	Thriving nature.
B9: Sensual pleasures of nature	5	Sound and scent are particularly strong in the immersive environment.
B10: Seasons changing in nature	5	Highly immersive.
B11: Serene	4	Birdsong with low traffic interference. Bike lane as well as path, which is still highly trafficked.
B12: Wild nature	5	Immersive wild-feeling nature.
B13: Refuge	5	Site feels private, with opportunity to step off the path for retreat if wanted.

Zone 4: site 5 received an average grade of 2,3 for Section A comfortable qualities, and an average grade of 4,3 for Section B qualities for access to nature.

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