An Exploration of University Campus Design Standards for Student Mental Health

by

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ABSTRACT

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Mental health and well-being are increasing topics of concern, as one in five Canadians will experience a mental illness. This issue is especially prevalent amongst children and adolescents aged 15-24, making this demographic the most vulnerable. Although there is significant evidence linking the positive connection between the natural environment and mental health, many University Campus Master Plans do not recognize the value in planning for restorative landscapes on campus. This study explores the current Campus Master Plan at the University of Guelph and how the creation of an evaluative toolkit can aid in future planning and design guidelines for restorative spaces. The examination of campus planning policies, post occupancy evaluation and input from key informants helped to inform and validate the restorative landscape assessment toolkit. It is ultimately intended to determine the restorative and therapeutic value of an environment on campus and subsequently demonstrate both the value of preserving and planning for these spaces on campus.
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1 Introduction

1.1 Overview

The overall quality of one’s mental health and well-being has become a topic of concern as of late. Over 6.7 million Canadians are currently struggling with mental illness and, of that population, 1.6 million expressed that their mental healthcare needs were not being met (Government of Canada, 2006, as cited in CMHA, 2018). This issue is especially prevalent amongst those aged 15-24, as 70% of mental health issues have their onset during childhood and adolescence (Smetanin et al., 2011, as cited in CAMH, 2019). The lack of available treatment and access to therapy and counselling services has negatively impacted this younger demographic resulting in many developing a mental illness and experiencing feelings of anxiety and depression.

Many students who are pursuing post-secondary education are entering a transitional period in their life. It is generally their first time away from home and they must quickly learn to adapt to a new academic and social environment. They are faced with a new set of responsibilities and challenges that can be overwhelming to navigate without the proper resources and support systems. Although many campuses across Canada offer health and wellness resources, the wait times to receive these treatments or speak regularly to a counsellor can vary from weeks to months according to executive director of the CMHA’s Guelph and Waterloo-area branch, Fred Wagner (The Star, 2017). The University of Guelph offers a wide range of resources, including mental health support groups, stress management workshops, online self-help modules and a Student Support Network (SSN) (Counselling Services, University of Guelph, 2019);
however, those who need ongoing, professional, and even medication, are often unable to receive immediate attention.

There have been a number of studies and subsequent research put forth that explores the positive impact that exposure to nature can have on one’s mental health and well-being. Being in nature has been linked to overall stress reduction (Ulrich, 1983) as well as directed attention recovery and mental restoration (Kaplan and Kaplan, 1989). Additionally, Kellert’s and Wilson’s work *The Biophilia Hypothesis* (1993) suggests that there is an inherent and biological need to be surrounded by nature and that “human identity and personal fulfillment is dependent on our relationship with [it]” (Kellert and Williams, 1993). Although professional counselling and therapy do aid in the recovery for those experiencing mental illness, restorative landscapes and access to natural environments have a place in the facilitation of mental, physical and psychological restoration.

This thesis explores the impact and effect of University campus design standards on the overall mental health and well-being of the student population. Campus design standards and campus master plans exist; however, these guidelines and policies do not highlight the value in planning for or preserving natural green spaces within a campus environment. At the University of Guelph, there is very limited information within the Campus Master Plan that explores the value of planning and designing with a mental health and well-being focus. It is important to bring awareness to an issue that is affecting a significant population and offer possible design solutions in order to help mitigate the daily stressors with which many students are currently struggling.
1.2 Defining Health and the Landscape

For the purpose of this research, it is important to distinguish the difference between a few key terms that are often used interchangeably yet carry different meanings when referring to health and the landscape. Healing, therapeutic, horticultural therapy and restorative gardens and restorative landscapes have an immense impact on their users and are designed with a specific intent or purpose in mind. The American Horticultural Therapy Association (AHTA) released a position paper that defines the key qualities and characteristics associated with the aforementioned types of gardens and the positive impacts that each can have on the intended user (AHTA, 2017).

HEALING GARDENS

Figure 1.1: Mary & Al Schneider Healing Garden, Seidman Cancer Center. (Source: OALA, 2013).
- plant-dominated environments (green plants, flowers, water, nature)
- associated with hospitals and health care settings; designated by the facility
- accessible
- designed to have beneficial effects on the user
- designed as a retreat and place of respite for clients, visitors and staff
- can be further divided into specific types of gardens (AHTA, 2017)

THERAPEUTIC GARDENS

Figure 1.2: Prison Garden at Elmore County Correctional Facility. (Source: Therapeutic Landscape Network, 2008).

- designed for use as a component of a treatment program (occupational, physical or horticultural therapy)
- designed to meet the needs of a specific user and accommodate client treatment goals
- designed as part of a multi-disciplinary collaborative process by a team of professionals
- exists on its own as an extension of an indoor therapeutic program area or as part of a larger healing garden (AHTA, 2017)
HORTICULTURAL THERAPY GARDENS

Figure 1.3: Patient at vegetable and herb garden. Magee Rehabilitation Hospital. (Source: Magee Rehabilitation, 2017).

- a type of therapeutic garden designed to accommodate client treatment goals and to promote primarily horticultural activities
- designed so that the clients are able to take care of the plants in the garden (AHTA, 2017)
RESTORATIVE GARDENS

Figure 1.4: Rock Garden – Royal Botanical Garden. (Source: Author, 2017).

- public or private garden that is not associated with a healthcare setting
- uses the restorative value of nature to create an environment conducive to mental repose, stress-reduction, emotional recovery and the enhancement of mental and physical energy
- design focuses on the psychological, physical and social needs of the user (AHTA, 2017)
“An environment that promotes [and permits] restoration – the process of renewing, recovering, or reestablishing physical, psychological, and social resources or capabilities diminished in ongoing efforts to meet adaptive demands” (Hartig, 2004, p. 275).

The environment should “afford the experience of being away, fascination, extent (large enough to explore and entertain) and compatibility” with the user’s needs (Kaplan and Kaplan, 1989 as cited in Hartig, 2004, p. 275).

Natural environments work best for restoration as they are “rich in aesthetically pleasing features”, there are limited reminders of stress, less people and more opportunity for reflection (Hartig, 2004, p. 275)
1.3 Research Problem

The University of Guelph Master Plan and Implementation (1965) has been well received since its inception. It was awarded the CSLA Legacy Project Award in 2017 and has served as a prime example for campus master planning. As time progressed and the values and needs of the campus evolved, the original master plan was updated. Building on the 1965 Master Plan and the more recent 2002 Campus Master Plan, Urban Strategies Inc. revised the existing framework and implemented new strategies that “prioritized the renewal of existing places and facilities” as well “improved arrival, circulation and way-finding while strengthening the physical relationship to the city” (Urban Strategies Inc., 2013).

Both the original and the current plan have been celebrated for its focus on “pedestrian primacy” (CSLA, 2017) and its ability to link and unify the built infrastructure and roads through the existing open space networks. Additionally, the overall layout was designed to be walkable, convenient, accessible during all four seasons and to promote social and community engagement, especially in hubs such as Branion Plaza. Although the plan’s intended design was carefully constructed and planned for a range of future scenarios, including population growth and technological advancements, the health and well-being of the campus population is scarcely referenced in both the 2013, Volume 1 and Volume 2 University of Guelph Campus Master Plan document. The Project Overview section of the document prioritizes the renewal of the built environment while placing less emphasis on the value of preserving or introducing open
greenspaces on campus and the subsequent effect that these spaces can have on the
overall mental health and well-being of the campus population.

The overall campus vision highlights four main planning principles:

1. Support the University of Guelph’s Academic Mission
2. Enhance the Image and Experience of Campus
3. Foster a Better Campus to Achieve Sustainability
4. Integrate the Campus

(University of Guelph Campus Master Plan, Volume 1, 2013)

These principles effectively begin to demonstrate the University’s ultimate goal of
creating a compact, sustainable and cherished community that “ensures a high-quality
campus image and experience” (University of Guelph Campus Master Plan, Volume 1,
2013, p. 5). However, the second principle could be further elaborated to include a goal
or vision that directly relates to the enhancement of open greenspaces and their
subsequent impact on the user’s overall mental health and well-being. The campus
vision initially expresses the value in planning for open spaces, stating that they will
provide “places of respite and reflection within the busy campus environment,
and…support community building and place-making” (University of Guelph Campus
Master Plan, Volume 1, 2013, p. 5) but, as the document progresses, there is limited
information that demonstrates how these spaces will be assessed, maintained or
implemented within the existing campus framework. There is no set of guidelines or way
to evaluate the strengths and weaknesses of an open space and whether or not it possesses restorative qualities that will ultimately serve to positively impact the user.

1.4 Research Question

It is evident that the University of Guelph campus layout is thoughtfully designed and constructed; however, there is a disconnect between the design intent of these spaces and understanding or evaluating how they impact the user’s mental health. Determining the restorative strengths and weaknesses of an existing or proposed setting would be beneficial in enhancing the University’s image and experience, as well as help to provide students with a restorative or therapeutic environment to alleviate some of the daily stressors that many face. This lack of an evaluative tool is ultimately what led to the purpose of this research, which is to determine whether a toolkit and subsequent set of guidelines that highlight the value as well as aid in the planning of restorative environments can be included in a future Campus Master Plan. The resulting toolkit would potentially be able to improve on the University’s approach to campus expansion and provide students with an enhanced and healthy University experience.

**Question:** Can an evidenced-based toolkit help to assess and aid in both the preservation of and planning for restorative environments on campus at the University of Guelph?
1.5 Goal and Objectives

1.5.1 Goal

The intended goal of this research is to develop a reliable, valid and useful toolkit that can be used to evaluate the restorative qualities of current and proposed settings on the University of Guelph campus and subsequently aid in future campus master planning. This toolkit can help to determine the restorative and therapeutic value of any landscape or setting on campus as well as whether or not the elements within the setting have the potential to positively or negatively impact the user’s mental health and well-being. Ultimately this instrument will be able to demonstrate the value of both preserving and planning for restorative environments on campus.

1.5.2 Objectives

The following objectives outline and support the intended goal of this research:

1. Determine the attributes and characteristics of a healthy and restorative environment through a critical review of health, planning and environmental psychology literature.

2. Explore, evaluate and critique both Volume 1 and Volume 2 of the University of Guelph’s Campus Master Plan (2013), with a specific focus on identifying key themes related to well-being and the environment.

3. Explore, evaluate and critique previously developed evaluation tools or checklists, used to assist in the planning and design of campuses or healthy environments.
4. Use the literature, University of Guelph Campus Master Plan documents and previously developed evaluation tools to create an evaluative toolkit specific to health and planning on university campuses.

5. Apply the toolkit to spaces on campus and evaluate its effectiveness and usefulness.

6. Have Key informants, who are related to health, wellness and design and planning, critique the toolkit and further evaluate its utility, reliability and validity.

1.6 Significance of Research

This research is valuable not only to landscape architects and planners, but also to the faculty, staff and students who frequently use these spaces. As the mental health and well-being of students is at risk and immediate access to therapeutic resources are limited, it is important to create alternative solutions that can help mitigate and alleviate some of the daily stressors that many students face. If designers and planners are better informed and aware of the value that restorative environments have on the mental health of the user, they can subsequently design and plan for the inclusion and preservation of these spaces across campus.

Additionally, the results of this research can be used to assist in future Campus Master Plan guidelines and land use development policies at the University. The information gathered from the toolkit can expand on the existing campus vision and four main planning principles to include a fifth subsection with a set of design guidelines that pertain specifically to psychological well-being and the environment. These additional guidelines or set of criteria would function to highlight what potential key characteristics
or qualities should be included within a restorative environment in order to best facilitate mental restoration and recovery for the user.

2 Literature Review

2.1 Overview

The literature concerning health and wellness is extensive, especially in regard to its relationship to the environment and outdoor spaces. Numerous studies support and have proven that natural environments have a positive impact on an individual’s mental health and well-being; as urbanization increases, it is vital to preserve places that facilitate mental, physical and emotional restoration.

The following section explores key theorists, restorative landscape principles and evaluative techniques that have been identified from a critical review of health and planning related literature. Books, Campus Master Planning policies, peer-reviewed papers and evaluative landscape frameworks were used as the basis for this analytical research.

2.2 History and Key Theorists

Research exploring the correlation between the natural environment and human health has gained significant traction over the last 50 years. Theorists including Rachel and Stephan Kaplan, as well as Roger Ulrich and Terry Hartig have played an instrumental role in developing key ideas and principles that have ultimately guided current research on restorative environments.
Attention Restoration Theory (ART), developed by Rachel and Stephan Kaplan (1995), explores the idea that an individual is able to more clearly concentrate after spending time in nature or by simply looking at natural elements such as trees, wildlife, or water. The theory suggests that an individual’s attention is separated into two different components: “involuntary attention, where attention is captured by intriguing stimuli, and voluntary or directed attention, where attention is directed by cognitive-processes” (Berman, Jonides, Kaplan, 2008, p. 1207). The Kaplans believe that the increased use of an individual’s directed attention and inability to reduce competing stimuli, in order to sustain their attention and focus, has negative effects on their mental health and well-being. The more effort it takes to cognitively re-direct all attention to a specific task or stimuli, the more likely it is for the individual to experience “irritability, failure to recognize interpersonal cues, reduced self-control, and increased error in performance of tasks requiring directed attention” (Hartig, 2004, p. 275); this process is described to by the Kaplans as “directed attention fatigue”. Both directed attention fatigue and the “cognitive effects and aftereffects of stress or informational overload” (Hartig, 2004, p. 275) are similar as the individual’s cognitive capabilities and mental capacities are being diminished and, as a result, negatively impacting their overall state of well-being and ability to function properly.

Kaplan and Kaplan (1995) believe in the importance of directed attention and that when one’s attention is fatigued, it can cause “devastating impacts” on the individual. It negatively impacts one’s ability to problem solve, properly regulate inhibition, focus, think, act and feel. To mitigate these effects and restore one’s attention, Kaplan and
Kaplan (1995) suggest that the individual’s attention should be altered, and instead be involuntary. Involuntary attention requires no effort and is resistant to fatigue, which ultimately allows the individual to rest and restore their mental capabilities. In order to achieve this state of involuntary attention, an individual should be exposed to nature or a natural environment. This particular setting allows for “fascination”, more specifically “soft-fascination” that provide the individual with an opportunity for reflection and restoration which “further enhances the benefits of recovering from directed attention fatigue” (Kaplan and Kaplan, 1995).

Although fascination is believed to be vital in Kaplan and Kaplan’s (1995) understanding of the recovery process, they further propose three integral elements that should be found within a restorative environment, that similarly function to facilitate recovery from directed attention fatigue. They are as follows:

**ELEMENTS OF A RESTORATIVE ENVIRONMENT:**

**BEING AWAY**

- The environment should allow the individual to feel as though they are “getting away” and freeing themselves from an activity that requires directed attention.
- It allows for the escape to a new or different environment or view, either physically or conceptually.
- It offers the user a new perspective and mental shift and transformation.

**EXTENT**

- The environment must have extent.
- Must be rich and coherent enough that it constitutes a whole other world.
- The environment must be a sufficient scope in order to engage the mind.
- Provide enough to see, experience, and think about.

**COMPATABILITY**

- Compatibility between the environment and one’s purposes and inclinations.
- The setting must fit what the user is trying and would like to do.
- The individual can carry out their activities smoothly and without struggle
- They are comfortable doing what they want within the setting.

*Figure 2.1: Elements of a Restorative Environment. The Restorative Benefits of Nature: Toward an Integrative Framework. Kaplan, 1995.*

According to Kaplan and Kaplan (1995), fascination, being away, extent and compatibility are the four main requirements that should be found within a restorative environment. They further suggest that it is within natural settings that a majority of these elements are found and, therefore, the perfect environment for recovery from directed attention fatigue and the facilitation of mental rejuvenation.

**RESTORATIVE ELEMENTS AND NATURAL ENVIRONMENTS:**

**BEING AWAY**

- Natural settings are idyllic places for escape; mountains, the seaside, forests, meadows, lakes, parks, courtyards.
- Natural settings can be accessible from urban areas, they do not have to be distant escapes.
Nature is full of opportunities for fascination; clouds, sunsets, leaves

These elements offer the opportunity for involuntary attention resulting in reflection, contemplation and rest.

Large or small areas of land can provide a sense of extent.

Trails, paths, historic artifacts and planting design can help make a space feel larger and offer more opportunity to explore, connect and get lost.

Natural environments provide ample opportunity for a wide range of activities.

Human beings have an inherent connection with the natural environment and feel comfortable accomplishing activities in nature: fishing, hiking, bird watching.

Kaplan and Kaplan (1995) extensively highlight the value and positive impact that natural environments can have on the restoration of fatigued and stressed individuals. This sentiment is further echoed by Ulrich (1986), as he similarly explores this idea but takes a slightly varying approach. Ulrich focuses on “patterns of affective and aesthetic response to visual stimulus characteristics of an environment”, particularly analyzing the “range of reactions to what one sees in an environment” and focusing on those specific reactions that “promoted psychological stress reduction” (Hartig, 2004, p. 276). His “Stress Recovery” theory explores the “aesthetic, emotional and physiological response
to visual landscapes” (Ulrich, 1986, p. 42) and the individual’s preference for natural elements over built infrastructure or urban areas.

Urban environments have the ability to produce environmental stressors such as “crowding, community noise, and air pollution, that can elicit substantial stress in large groups of people” (Ulrich, Simons, Losito, Fiorito, Miles and Zelson, 1991) and further contribute to poor mental health. Through research and experiments, Ulrich proposed that human beings have an “aesthetic response” or a biological need to be exposed to nature and that being within a natural environment, as opposed to an urban environment, affords more opportunity for recovery from stress. The individual is not triggered by stressful encounters or experiences within a natural context and is more likely to recover from situational, physiological or psychological stress.

Similar to The Kaplans, Ulrich outlines specific “characteristics of high – and – low preference in natural landscapes” (Ulrich, 1986, p.32). The principles are as follows:

**CHARACTERISTICS OF HIGH – AND – LOW PREFERENCE IN NATURAL LANDSCAPES:**

- The number of independently perceived elements in the scene is moderate to high.

- The complexity is structured to establish a focal point and other order or patterning is also present.
There is a moderate to high level of depth that is clearly defined.

The ground surface has even or uniform length textures that are relatively smooth and the observer judges that the surface is favourable for movement.

A deflected or curving sightline is present, conveying a sense that new landscape information lies beyond the observer’s visual bounds.

Judged threat is negligible or absent.

Presence of a water feature.

Figure 2.3: Characteristics of High – and – Low Preference in Natural Landscapes. Human Responses to Vegetation and Landscapes. Ulrich et. al, 1986.

These principles were found to be most preferred by individuals, resulting in an environment that was more likely to elicit a positive response as well as reduce stress and anxiety. Ulrich highlights the powerful effects of aesthetic preference for natural
elements and the overall positive impact they can have on one’s mental health and well-being.

### 2.3 Benefits of Restorative Landscapes

Significant research has since developed from the guiding theories of the Kaplans and Ulrich, continuing to explore and validate the positive correlation between the natural environment and health and well-being. The restorative elements outlined above, as well as a multitude of other studies, have further demonstrated the restorative effects of natural environments as they function to reduce stress and mental fatigue, enhance one’s mood and help to prevent depression (Van den Berg, Hartig, & Staats, 2007).

Exposure to natural environments is evidently critical for one’s mental health; however, with the increase in urbanization and focus on the built environment, the landscape becomes secondary in many planning and design initiatives. One’s need for nature and natural elements is “more than merely a romanticized idealization of nature (Hartig, 1993; Kaplan and Kaplan, 1989; as cited in Van den Berg et al., 2007) and has been proven as an effective way to alleviate daily stressors. Van den Berg et al. explore the idea of “rural romanticism” versus “restoration”, further highlighting Ulrich’s notion of a biological desire to seek out nature and suggests that “human appreciation of contact with nature may in part be a distant effect of the conditions under which early humans evolved”. Nature was viewed as approachable and non-threatening and provided one with basic human needs such as shelter and food, which explains why humans have a predisposition and need to be exposed to the natural environment. Similar benefits exist
today as contact with these environments “provide some immediate relief from the demands of [urban] life, by providing opportunities for the renewal of cognitive resources and psychophysiological response capabilities” (Van den Berg et al., 2007).

Van den Berg et al.’s (2007) research includes a systematic review of current research, as well as two of their own experimental studies, that explores the relationship between health and the landscape and its restorative potential. The first study “tracked psychophysiological stress recovery and directed attention restoration over time in a natural and urban setting” while the second study explored “participants’ mood ratings before and after they were shown a frightening movie and then again after viewing an environmental video” (Van den Berg et al., 2007). Both experiments resulted in their participants’ health and mood significantly improving after being exposed to natural settings, views and environmentally-focused videos. In one experiment, it was also noted that “micro-restorative experiences that interrupt stress arousal or the depletion of attentional capacity” (Van den Berg et al., 2007) were even achieved by participants who were able to view nature from indoors, further highlighting the immense impact of natural environments and their ability to aid in psychological restoration.

The type of green space that one is exposed to can also facilitate different activities and can be designed in a way that promotes the mental health of one, or multiple, demographics. Characteristics or components such as playgrounds, large open spaces or trail networks serve a specific function and are conducive of certain types of activity. It is important to understand how implementing various elements can change the way a space is used as well as its effect on the individual using it. Wood,
Hooper, Foster and Bull (2017) explore and investigate the relationship between access, quantity and types of park and the effects that different park typologies have on mental health and well-being. They analyzed a set of parks in Western Australia using 44 different attributes and categorized them into 3 park types: recreational spaces, sports spaces and nature spaces. They were able to further synthesis their findings, resulting in a type classification and definition of public green space in Figure 2.4 below.

Figure 2.4: Public Green Space Definition. Public Green Spaces and Positive Mental Health – Investigation the Relationship Between Access, Quantity and Types of park and Mental Wellbeing. Wood et al., 2017.
Their findings suggest the importance of recreational environments or spaces that allow for both structured and unstructured activities. Allowing for physical activity or “green exercise” to occur within a green space has shown to have positive effects on one’s overall health and well-being as outdoor exercise is “more effective in improving cardiovascular and mental health than exercise in a non-natural environment” (Wolf & Wohlfart, 2014). Recreational trails, paths or tracks for running and even site furniture that promotes social engagement are a few elements that can be implemented. These components can function to increase the activity occurring within a natural environment, help to improve the way one uses these restorative landscapes and ultimately aid in the betterment of their overall health.

Thwaites, Helleur and Simkins (2005, p.525) also reiterate the positive and restorative effects that the landscape has on mental health and overall well-being; however, their article takes a slightly different approach as they present “a conceptual framework for restorative urban open space based on mosaics of linked and nested spaces woven into the [existing] urban fabric”. Thwaites et al. (2005) believe that an informed spatial arrangement of a restorative space can offer the ability for people to reconnect with innate forms or natural spaces and strengthen the relationship between human functioning and the spatial environment. To further inform their research, they draw on many notable figures and concepts including ecologist Richard Forman’s Land Mosaics, architectural theorist Christopher Alexander, Gordon Cullen and Christian Norberg-Schulz and suggest that the environment’s structure is capable of “induc[ing] reflective contemplation for psychological and spiritual replenishment” (Thwaites et al.,
2005). As evident in Norberg-Schulz’s (1971) concept, the configuration of location, direction and transition are vital in how one positively experiences and connects with a landscape.

![Image of figure 2.5: Location, direction and transition. Restorative Urban Open Space. Source: Norberg-Schulz, 1971; Thwaites et. al., 2005.]

Research by Thwaites et al. (2005) is extensive and concludes by offering a list of spatial properties and characteristics of restorative open space. This list is a significant tool that can be used to inform present designs and ensuring the functionality and effectiveness of restorative landscapes (see Appendix A for the complete list of characteristics).

### 2.4 Campus Master Plan

As previously mentioned, the University of Guelph Campus Master Plan (CMP) has received significant attention and accolades for its ability to create a pedestrian-friendly campus and overall functional design. Both Volume 1 and 2 of the CMP explore key aspects of future growth and development and how the institution intends to respond to forthcoming environmental and social changes. Although the document addresses important concerns regarding sustainability, renewal of built infrastructure and
implementation of future planning policies, there is a lack of information regarding the treatment and value of open green spaces on campus.

The document outlines the overall campus vision and begins to touch on important aspects of open green space development; however, this notion is not consistently carried out as the document progresses. Information regarding “land use and development, landscape and open space, and movement” (University of Guelph Campus Master Plan, Volume 1, 2013) is highlighted but what is lacking is the value of the land as well as the experience of the user within these areas that are intended to be developed. Built infrastructure is given priority as “new development will be concentrated in the core” (CMP, Volume 1, 2013) and planning for additional residential and mixed-use buildings dominate the Land use, Renewal and Development plan. Spaces that can accommodate alternative activities or that can be left unprogrammed are to be “intermingled across campus” (CMP, Volume 1, 2013) and seemingly an afterthought in the overall development of the environment. This similar sentiment is echoed in The Landscape and Open Space section as there is limited discussion on the specific guidelines or elements that should be included within these spaces in order to achieve part of the campus’ goal: to enhance the overall image and experience of campus.

Further into the CMP there is a section on the planning principles that are to be used to “provide comprehensive direction for the CMP and a means for evaluating future amendments and updates to the plan” (CMP, Volume 1, 2013). These principles expand on the initial four main planning principles and begin to provide a guideline for the way
in which campus development should progress and be evaluated (see Appendix B for the complete set of planning principles). Additionally, Volume 1 provides recommendations for the future development and treatment of landscapes and open space, which, again, begins to take into consideration some restorative elements that should be included as the landscape is further developed. Recommendations 2, 3, and 5 highlight the significance of designing spaces to reflect the campus identity as well as strategic placement of building entrances so as to promote an interior and exterior connection to outdoor environments.

Volume 2 of the CMP is similar in its approach to Volume 1 but goes into greater detail concerning the precinct plans for each parcel that is to undergo future development. Each of the University’s future initiatives is outlined in this Volume as well as the development parameters and frameworks that accompany each project. Both Volumes extensively explore how the growth and development of the campus is expected to unfold but is lacking in an evaluative instrument that is able to gauge the strengths and weakness of open spaces in regard to mental health and well-being. There are no design guidelines that explicitly respond to the growing concern and prevalence of mental illness on University campuses.

2.5 Mental Health at the University of Guelph

The University of Guelph offers several counselling services that can assist and support students during times of personal strife and crisis. Group and individual counselling as well as drop-in services, online resources and crisis lines are all available as well; however, mental illness is still a prevalent issue on campus (University of
Guelph Counselling Services, 2018). As outlined in a recent article by The Toronto Star, as well as numerous online petitions, the University of Guelph is being scrutinized for its ability to meet the needs of students struggling with mental health (“University of Guelph Struggling to Meet Students’ Mental Health Needs”, Goffin, 2017). The University is experiencing a high number of tragic student suicides, despite the services that are being offered. Panic attacks, anxiety and depression are common symptoms brought on by daily stressors and can be challenging to cope with, especially if the individual is unable to reach out and access therapy or counselling services. Goffin (2017) describes the efforts that the University has taken in order to assist those who are struggling with a mental health related illness.

Although the University has partnered with CAMH in order to create “long-term plans for mental health and suicide prevention strategies” (Goffin, 2017), mental health services are underfunded and wait times for one on one, regular counselling or therapy is difficult to receive. There is a disconnect between the services being offered and students feeling comfortable enough to access them. The article effectively highlights that there needs to be alternative solutions provided in order to reach those who are not immediately comfortable with seeking therapy. Raising awareness and creating an environment in which students feel comfortable enough to access services or reach out to a peer can have a great impact on the way mental health is viewed on campus.
2.6 Evaluating the Landscape

It is difficult to immediately gauge the strengths and weaknesses of a restorative environment, especially in regards to the impact it has on an individual’s health. For the purpose of this research, two evaluative toolkits have been analyzed in order to best understand how to develop an instrument that would successfully be able to evaluate the health-related impact of a landscape. The first toolkit was developed by Susan Rodiek (2009) in order to evaluate outdoor areas for seniors. Rodiek describes the tool as using “evidence-based design principles” to measure and identify “the strengths and weakness of existing outdoor areas and plan future developments” (Rodiek, 2009, p.1).

The toolkit is based on current research and uses seven principles to aid in the design of future healthy environments, specifically for seniors. The instrument asks the user to:

1. Choose a specific outdoor area to evaluate
2. Walk and sit in the area a few minutes, imagining yourself as a senior resident with various sensory and functional disabilities, who may use a walker or wheelchair
3. Evaluate the area based on how well it supports the activities or intent described in each item. Fill in all boxes on the following checklists, for each of the seven main design principles.

(Rodiek, 2009)
A rating of 0-10 is given by the user to each of the sub-principles and then used to assess the value of the chosen environment (see Appendix C for Outdoor Evaluation Tool). The layout of this toolkit is effective in that it is evidenced-based and therefore a measurable means in which a landscape assessment can occur. The ability to identify the strengths and weakness of a landscape that is designed for a specific user is beneficial for future developments and ensuring that the intended user feels comfortable and is ultimately able to use it in such a way that positively influences their overall health and well-being.

Rodiek’s (2009) toolkit is informative and begins to highlight the way in which an environmental assessment tool should be designed. It is, however, specifically tailored to a senior demographic. For a more well-rounded approach to aid in the understanding of landscape assessment tools, Clare Cooper Marcus’ and Trudy Wischemann’s (1998) design review checklist for campus outdoor spaces was also analyzed. Marcus and Wischemann (1998) explore the fundamentals of University campus design and touch on how the landscape is often overlooked in University campus planning texts and guidelines. The open space networks are treated as leftover space and many texts do not aid in the design of open space as the “focus is on fiscal issues, educational policy and large-scale planning” (Marcus and Wischemann, 1998). Marcus and Wischemann (1998) draw on specific campus design texts that focus mainly on “planting, irrigation and maintenance…and not at all on the use” and where there is mention of courtyards or open spaces, it is in reference to the architectural features of the space and not specifically how the landscape should function.
Although not evident or a major focus in campus planning literature, Marcus and Wischemann (1998) recognize the value and impact that these spaces can have on the individual and the overall campus. They established a set of criteria and design recommendations for outdoor spaces on campus that explore the fundamental components of what makes an outdoor space functional and successful. There are design recommendations for the “Home Base: Spaces adjacent to Specific Building”, “Common Turf: Campus Spaces Used by Everyone”, as well as how to design with “Crime and Fear of Crime” in mind, and for future “Campus Wear and Tear” (Marcus and Wischemann, 1998). Each design recommendation is subdivided into additional themes that touch on key attributes, specific to the place, that should be considered when designing; size, site furniture, tree coverage, layout of key features, pedestrian orientation, spatial attributes, proximity and comfort.

The culmination of their research and design recommendations results in their creation of a *Design Review Checklist* that can be used to evaluate both current and proposed outdoor space designs. The checklist uses the principles identified in their design recommendations section and separates them into categories that include “yes” or “no” questions that can be used to evaluate both the contents and characteristics of any outdoor spaces, as well as its overall value and effectiveness. (see Appendix D for *Design Review Checklist*, Marcus and Wischemann, 1998)
2.7 Summary

The literature on health and the landscape, as well as environmental psychology, is extensive and increasingly valuable given the state of many individuals’ mental health and well-being. Key theorists, including the Kaplans and Roger Ulrich, have laid the foundation for this specific research and highlighted its relevance in current society as continued efforts to explore the nature and health connection are being undertaken. These theories, and subsequent findings, are beginning to make their way into campus planning literature, as evident in the University of Guelph CMP; however, there is still significant policy implications and design guidelines that can be included in future documents in order to address some of the issues with which the University is currently struggling in regards to mental health and well-being.

Evaluative toolkits such as Rodiek’s (2009) and Marcus and Wischemann’s (1998) model are additionally beneficial as their evaluative measures have the ability to justify the value of a landscape and aid in future designs that function to positively impact an individual’s psychological health. This critical review of literature highlighted the relevance of this issue as well as provided possible solutions that can help address health-related issues on University campuses.
3 Methods

3.1 Overview

The following section describes the process and research design of the study. Through the completion of a literature review, the research question, goal, objectives and methods were established. Specific texts were then further analyzed and key themes, principles, policies and design guidelines were then extracted in order to create an evaluative toolkit that would be used to perform a post-occupancy evaluation on existing spaces at the University of Guelph. The evaluative toolkit was also sent to Key Informants for their critique, as well as to identify its usefulness, reliability and validity in future campus planning and design. Figure 3.1 illustrates this process.
Figure 3.1: Methods Map
3.2 Identification of Key Campus Policies

The current University of Guelph Campus Master Plan document was used to identify existing campus policies and guidelines in regards to the future growth and development of the campus. Both Volume 1 and 2 were analyzed and key search terms were applied to the document including: mental health, well-being, health, student experience, and restoration/restorative in order to immediately gauge the prevalence of health-related guidelines or sections within the document. The lack of these design principles and guidelines was noted.

The document was then further analyzed for sections pertaining specifically to the treatment of the landscape and outdoor spaces. Relevant policies, guidelines, maps and landscape-related themes were documented and categorized for future use and to aid in the creation of the evaluative toolkit.

3.3 Identification of Restorative Landscape Principles

Similar to the approach that was taken with the identification of key policies in the CMP, literature from key theorists were further analyzed and used to aid in the validity of the created toolkit. The Kaplan’s Attention Restoration Theory (ART) and Roger Ulrich’s Stress Recovery Theory were used as the guiding theories to inform some of the principles within the toolkit. Elements from their work were documented and evaluated for relevance and applicability to campus design. Theories or design principles that could be used to aid in the development of an evaluative toolkit were highlighted and added to the relevant information that was distilled from the CMP
document. Common themes or principles between the two documents were noted and underlined for their potential value and importance to developing campus related design principles.

3.4 Evaluation of Landscape Assessment Tool Frameworks

Landscape assessment tools were initially difficult to find and were not immediately considered as a source to be analyzed; however, through conversations with Key Informants, these evaluative tools were added to the list of critical literature to be analyzed. Rodiek’s (2009) Outdoor Evaluation Tool was the first to be analyzed, noting relevant restorative principles and more specifically the framework she used in order to evaluate a landscape. Although Rodiek’s Tool focuses specifically on the functionality and effectiveness of outdoor landscapes for seniors, relevant information that was also applicable to a more general demographic was noted and added to the running list of key themes, principles, restorative elements and guidelines that were previously documented from the above-mentioned sources. Themes such as safety, contact with nature, variability of environment, accessibility and engagement with community were key principles that were in line with previous research and findings from notable theories and were documented as being valuable items to include within a future developed toolkit that could be used on campus.

In addition to Rodiek’s (2009) framework, Clare Cooper Marcus’ and Trudy Wischemann’s (1998) work on outdoor campus design was analyzed. Their “Design Review Checklist” was cross-referenced with Kaplan and Kaplan’s and Ulrich’s theories as well as Rodiek’s evaluation tool in order to identify similar themes, guidelines, or
restorative design principles. Although this framework had a slightly different means of categorization than Rodiek’s model, similar key elements were still apparent and added to a running list that could potentially inform the creation of a campus-specific evaluative toolkit. Recurrent themes included: safety, nature exposure, opportunity for social engagement and interactions, accessibility, respite and comfortability.

3.5 Toolkit

After synthesizing the collected data and highlighting valuable, applicable and influential design principles, various iterations of a University of Guelph Campus Outdoor Space Evaluation Toolkit were created. Similar key restorative themes and principles that recurred throughout the analyzed literature were noted and developed into a framework that mimicked the structure used by Rodiek (2009) and Marcus and Wischemann (1998). A total of eight evaluative principles were identified as a result of the literature and used as a basis for the toolkit. Each principle was then further divided into subsections that explored the specificities and characteristics of the initial principle. Multiple iterations occurred in order to develop the most accurate rating system and means of evaluating the positive and negative impacts of the environment in question.

As the iterations of the toolkit were occurring, it became apparent that there was no definition or outlining characteristics that would help the user of the toolkit to clearly define the scope of the setting or environment in question. Definitions regarding place, place attachment, setting and restorative environment were consulted and documented as additional elements that should be included within the toolkit in order to help users identify potential environments that could be evaluated. Criteria for choosing definitions
of environment, setting and restorative environment were that there had to be a basis in environmental psychology and not limiting in describing a specific space or only applying to outdoor environments. Although the intention of the toolkit is to evaluate the outdoor environment, the eight principles can still, if need be, be used for indoor environments as well.

### 3.6 Post-Occupancy Evaluation

The following map outlines the boundaries of the University of Guelph campus, shown in red, as well as the University-Owned lands that extend beyond the main campus, shown by the dashed white lines. For the purpose of this research, the study area will follow what has been included in the Master Plan and therefore only include the areas considered to be part of the main university campus.

![Figure 3.2: The Campus Context and Study Area. (Source: University of Guelph Master Plan, Volume 1, 2013).](image-url)
Deming and Swaffield’s (2011) book *Landscape Architecture Research* was consulted in order to best understand the process of a post-occupancy evaluation (POE) and how to best evaluate the current landscape at the University of Guelph. As Deming and Swaffield describe, “evaluation is one of the most widely used and productive…research strategy in environmental design” and is used to “measure current conditions or outcomes…against a predetermined standard”. In order for a proper POE to occur, there needs to be an existing framework or “specific standards or criteria…available for comparison” (Deming and Swaffield, 2011). Although the University of Guelph does have an extensive CMP that includes a set of criteria and framework for the development of the overall campus, there is no existing framework specific to mental health and campus design currently. Because this research has yet to be conducted at the University of Guelph, there was no set of criteria that could be used to evaluate the potential value and impact of environments on campus in regards to mental health. Evidence, key theories, restorative principles and design guidelines that were distilled from health and planning literature were used to develop the University of Guelph Outdoor Evaluation Toolkit (UofG COSE-Toolkit) and subsequently as an evidence-based framework in order to perform a POE on campus.

### 3.6.1 Selection Criteria for Environments to be Evaluated

As depicted in Figure 3.2, the University of Guelph campus is an extensive landscape that stretches over 817 acres (University of Guelph: Campus, 2018). Due to time and limited resources, only specific locations were chosen to be a part of this research and the subsequent POE. In order to objectively choose locations to be
evaluated with the toolkit, the “Land Use, Renewal and Development” map was overlaid onto the “Landscape and Open Space” map (University of Guelph Campus Master Plan, Volume 1, 2013) and used to identify landscapes or open spaces that were zoned for future renewal, demolition or development. In addition to the map overlay, specific future University Projects that were outlined in the CMP were also taken into consideration when choosing environments to evaluate against the created framework.

Figure 3.3:: Land Use, Renewal and Development Map (Source: University of Guelph Master Plan, Volume 1, 2013).
Figure 3.4: Landscape and Open Space Map (Source: University of Guelph Master Plan, Volume 1, 2013).

Figure 3.5: University Projects. (Source: University of Guelph Master Plan, Volume 1, 2013).
3.6.2 Selected Environments

Through cross-referencing of anticipated University projects and a zoning map overlay technique, three locations were chosen for a POE, using the UofG COSE-Toolkit as the evaluative framework to measure the restorative effectiveness of each environment. The locations include:

1. South Residence; Mountain Hall – Open space between Stone Road East and Evergreen Drive
2. Branion Plaza
3. Reek Walk and Alumni Walk Intersection; Open space area
3.6.2.1 South Residence: Mountain Hall

The open space area behind Mountain Hall was chosen as the first location as it falls within an area of future development. The University is proposing that the area on the opposite side of Evergreen Drive, where a parking lot currently exists, will be used to accommodate a parking structure. The intended goal is to remove the more scattered or fragment-inducing parking lots and consolidate a majority of the displaced parking into strategically-placed parking structures across campus. In doing so, the students within the South Residences, specifically those in Mountain Hall, would be exposed to a large structure that has the potential to block significant restorative views. This location is an important area to evaluate in order to gauge if the current setting is providing students with a restorative environment and whether it has valuable features or mentally restorative spaces that should be preserved for the benefit of the students that reside in the adjacent building.

3.6.2.2 Branion Plaza

Branion Plaza is a significant location and is often referred to as the heart of the campus. The CMP outlines that a future University project is to “enhance Branion Plaza as a consolidated open space to support its intensive use at the [core] of the campus” (University of Guelph Campus Master Plan, Volume 1, 2013). The frequent use and pedestrian traffic that exist within this space further highlights the need for it to be evaluated by the UofG COSE-Toolkit in order to better understand its current impact on student mental health and well-being.
3.6.2.3 Reek and Alumni Walk Intersection

Lastly, this location was chosen as it, too, is zoned for future development. The existing open space is located behind Blackwood Hall, which is to undergo future facility renewal. The infrastructure will be redeveloped, and the surrounding open space network is currently zoned for future greenspace development. The utilization of the toolkit within this area would aid in understanding the current functionality of the environment and identifying the presence of restorative elements that should be preserved as the development of the surrounding area commences.

3.7 Key Informant Critique

Key Informants were chosen in order to provide an expert assessment of the toolkit and to obtain an alternative perspective on the usefulness of including such an instrument within future CMP documents. Informants were selected based on the following criteria:

- Background in landscape architecture or mental health and wellness
- Minimum of 5 years working within their current field
- Minimum of 2 years working within a campus environment
- Have direct or indirect contact with students on campus

The first Key Informant chosen was Dean Gregory, the Campus Landscape Architect at the University of British Columbia. Gregory's background is predominantly in campus planning and design, community engagement and sustainability. He has his Bachelor of Arts in Urban Studies as well as a Masters in Landscape Architecture, has
worked as the UBC campus landscape architect for close to 10 years and has been responsible for leading and implementing a successful campus landscape project as a part of the University’s Public Realm Plan.

The second Key Informant was Anne MacDonald who is currently the health and wellness coordinator and Manager of Compliance and Wellness at the University of Guelph. MacDonald has a Diploma of Holistic Nutrition, Foods Nutrition, and Wellness Studies, as well as a Bachelor of Engineering in Biological Engineering. She has worked in environmental sustainability fields for close to ten years and as a Program Counsellor for the School of Engineering at the University of Guelph.

Key Informants were given the UofG COSE-Toolkit as well as six questions to help guide the discussion and their evaluation of the instrument. The questions ranged from general queries regarding the current state of University campus design, in regards to mental health, as well as more specific questions that referenced the validity, reliability and usefulness of the toolkit. Both informants opted out of answering the questions provided with the toolkit via email and instead proposed a phone call that would allow them to further elaborate and discuss what was given to them. The conversations were guided by the initial set of six questions; however, the responses given were more open ended and led to further discussion and lines of inquiry. The conversations were not recorded but key themes, questions, thoughts and information were transcribed as the discussion progressed.
4 Results

4.1 Overview

The results were an outcome of the multi-method approach described in the previous section and highlighted the valuable data that was gathered from the creation of the toolkit, the POE of the three selected sites and the insight and knowledge gained from the key informant critique. The complete UofG COSE-Toolkit is included below in Figure 4.1, the results of its layout, creation and utility will be further explored within this section. Additionally, the POE findings and subsequent data, as well as the results from the critique, will be further examined.

4.2 University of Guelph Campus Outdoor Evaluation Toolkit (UofG COSE-TOOLKIT)

The UofG COSE-Toolkit was a result of an iterative process in which each iteration worked to better identify and express valuable health and wellness related design principles that could potentially be included in future planning and design guidelines at the University of Guelph. Key themes, theories, restorative principles, and policies were found within the reviewed health and planning literature and subsequently used to inform the basis of this toolkit. The toolkit consists of eight evaluative principles that explore the function, value and impact that the environment in question has on an individual. A rating system was also developed in order to achieve a more accurate and quantifiable measure of an individual’s overall experience of an environment, in relation to health and well-being. Each of the eight principles is divided into subsections that prompt the user to engage with their environment in a specific way. This is achieved
through a set of descriptions or phrases that the user can rate and identify whether or not they strongly disagree (rating of 0), disagree (rating of 1), somewhat disagree (rating of 2), somewhat agree (rating of 3), agree (rating of 4) or strongly agree (rating of 5) with the statements expressed within each subsection. This evaluative framework is shown in Figure 4.1 and Figure 4.2 below.
University of Guelph Campus Outdoor Space Evaluation Toolkit
(UofG COSE-Toolkit)

This toolkit is to be used in order to evaluate the positive, negative or neutral impact an outdoor setting has on its users. The following 8 principles have been informed by previous research, literature and campus planning policies, and distilled into common elements that are to be used to help determine the effect a setting has on the user’s overall mental health and well-being. This toolkit can help with the implementation or preservation of existing or proposed restorative green spaces on the University of Guelph Campus.

Definitions to Keep in Mind:

*Stress* - Negative emotions and short-term changes in physiological systems (i.e., cardiovascular, neuroendocrine, musculoskeletal) that are indicative of heightened autonomic arousal. (Hartig, 1996)

*Setting or Environment* - includes both natural and built settings, that is, natural resources, parks, homes, workplaces, public spaces, from the personal scale to the room, building, neighborhood, urban, wilderness, and global scale. (Gifford, 2019)

*Restorative Environments* - allow for recovery from directed attention fatigue and allow for recovery from psychological stress. (Hartig, 1996)

Directions:

1. Choose an *environment on the University of Guelph campus to be evaluated.*
2. Spend a few minutes immersing and familiarizing yourself with the chosen setting. Be aware of your surroundings; what is in the space? Is it noisy? Are you comfortable? What is around you?
3. When you are ready, use the **UofG COSE-Toolkit** to rate the overall experience of the chosen environment.

Rate each subcategory from 0-5 based on your personal experience of the environment.

- 0 – strongly disagree
- 1 – disagree
- 2 – somewhat disagree
- 3 – somewhat agree
- 4 – agree
- 5 – strongly agree

*Fill out all that apply:*

Chosen Location: __________________________________________

Evaluator: _______________________________________________

Student: □    Faculty: □    Other: □

Program: __________  Job Description: __________  Specify: __________

Academic Year: _________  Years Employed: __________  Specify: __________

Age (optional): _______
1. Being Away
(The absence of *stress ie. situational pressures or demands, noisy streets or unsafe spaces)*

- The environment is away from loud noises.
  User is able to concentrate and not be disturbed by loud noises from a nearby street, busy crowds or blaring music. Setting is quiet enough that the user is aware of and can hear their own thoughts and breathing.

- There are few visual distractions.
  Visual elements are calming and do not overstimulate the user. There are at least one or two calming focal points in which the user can direct their attention (Tree, statue, garden, water feature etc.)

- The environment is free of crowds.
  The setting is generally free of large, distracting crowds. 'People watching' can occur within the space and the user does not feel completely isolated from the rest of the campus and community.

- The setting is comfortable.
  The temperature is not an extreme (too hot or too cold). The environment has areas that are shielded from harsh winds or intense sun exposure. The user does not feel judged, watched or uncomfortable by others that are sharing the space.

- The user is not overstimulated.
  The setting is generally calming and can be well suited as a place for meditation, quiet focus or contemplative thought. It is not causing the user any added stress or anxiety. The user feels at peace and can destress.

Average Rating: [ ]

2. Accessibility of Environment

- The environment is located near and/or adjacent to highly trafficked areas on campus.
  The user does not feel isolated from central campus or as if they are completely disassociated with the rest of their community.

- It is less than a 10-minute walk from the student centre.
  The setting is easily accessible and conveniently located so that the user does not need to travel long distances to use it. The setting is easy to locate and in a well-known area so that all users are able to find it.

- Available for use during all 4 seasons.
  The setting is accessible during all seasons. User is able to view the space from an indoor environment and/or physically be in it throughout all seasons.

- Can be viewed from indoors.
  The environment is able to be viewed from an indoor location. User is still able to benefit from the settings elements even from inside. A window or doorway looks out onto the space.

- The environment is pedestrian and wheelchair accessible.
  The user does not need a vehicle or public transportation to access the setting. Additionally, the setting supports users with any functional or sensory disabilities.

- There is fencing or barriers preventing user from directly accessing environment.
  Fencing or barriers are present, limiting access to the user. It is not directly accessible or open to the public.

Average Rating: [ ]
3. Engagement or Connection with Environment

There is an element or characteristic that the user is drawn to.
The user is able to connect with a specific element or characteristic within the environment (a tree, monument, water feature, bench etc.) Additionally, the element provides a sense of comfort or familiarity.

The environment provides the opportunity to observe different events.
The user is able to observe various activities, events or calming visual stimuli (people-watching, nature, animals, social interactions). The setting provides a sense of fascination and allows the user to focus their attention on things besides their stressors.

A wide range of activities are able to occur within the space.
The setting allows a multiple range of activities and interactions to occur. It is not completely programmed, and the use or function of the space can be decided by the user.

The environment elicits a positive emotional response from the user.
The user experiences a positive emotional response when in the environment. Feelings of restoration, calmness, peace, tranquility, ease etc.

The opportunity for social interactions can occur within the space.
The environment facilitates social interactions. The user does not feel isolated or uncomfortable engaging with others in the space. Elements within the environment allow users to engage in conversation or activity.

Ability to manipulate the environment to user’s preferences.
The environment can be manipulated to suit the user’s need. User feels as though they have a sense of control over their space.

Average Rating: 

4. Access to Nature

The user is able to see a significant amount of vegetation from wherever they are.
50%-70% of the environment is greenery and viewable from wherever the user is located.

There is a wide variety of mature trees, healthy plants and/or wildlife to experience.
Large mature trees are located within or near the site as well as healthy plants. Greenery is in good condition (watered regularly, healthy, green, lush etc.)

There is more softscape and plant material than hardscape and built infrastructure.
Paving, asphalt, cement and built infrastructure do not dominate the space.

The user is able to touch or interact with the plant material
A majority (2-4) of the user’s senses are stimulated. The plant material/layout of greenspace engages sight, smell, touch, sound and/or taste.

If indoors, plants, mature trees and/or wild life can still be viewed.
a. Access to nature is not limited or diminished if user is indoors. A large window, overlooking an outdoor "restorative environment is present.
b. If window is not present, there is a plant, green wall or water feature present instead.

The environment contains a water feature.
A water feature is present or can be viewed from the environment (ie. fountain, waterfall, pond)

The environment is stimulating throughout all 4 seasons
Winter interest planting is present including plants that have texture, movement, attract wildlife and provide colour.

Average Rating: 

49
5. Safety

☐ The environment allows clear, unobstructed views of surrounding areas.
  The user has an unobstructed view of the space.

☐ The environment is not completely isolated or removed from highly trafficked areas on campus.
  The user is not isolated or far from heavily trafficked or populated locations on campus.

☐ The user can see others entering and exiting the environment.
  There is a clear view of those coming into and leaving the site.

☐ The environment is well lit and visible at night.
  The setting is well lit during all dark periods – during the night as well as during darkened time periods during the winter months.

☐ The user does not feel as though they are in immediate danger.
  There is a feeling of comfort and safety present within the environment. The landscape and layout allow the user to feel at ease.

☐ The environment can be directly viewed from surrounding buildings and pedestrians.
  The environment is not hidden from the rest of campus and surrounding buildings look down onto it.

Average Rating: ☐

6. Community Engagement

☐ There is opportunity to engage socially with other students within the space.
  The space is not fully programmed and allows the user the ability to engage with the space as well as other users as they desire.

☐ There is an element within the space that promotes user interaction.
  The space includes one or more of the following elements that engage the user in social interactions: a specific tree, seating (e.g., benches, tables, chairs) notice board, art installation, garden, path/trail, large rock, water feature, animal, planting, other: ______________________________

☐ The environment is large enough to facilitate physical activity.
  The user is able to engage in psychologically restorative activities including but not limited to: meditation, forest bathing, yoga, walking, running, other: ______________________________

☐ There are community engagement features present.
  Bulletin/notice boards are present within the environment that engage the user. Notices can include: various events occurring on campus, educational resources, mental health resources, outdoor exercises that can be performed within the space, calming or meditation techniques that can be performed within the space as well as during events of stress.

☐ Environment can be easily manipulated to accommodate a variety of social interactions.
  The setting is generally free of fixed elements that impede both the versatility and sociability of the space.

☐ Opportunity for outdoor classroom or classes and/or therapy.
  The space is versatile enough to accommodate outdoor learning opportunities, group or solo meditation, yoga, etc.

Average Rating: ☐
7. Time Spent in Environment –

- **Very minimal to no time spent in the environment.**
  The user views the space as an environment to just pass through; does not want to spend time in it.

- **Minimal time spent in the environment.**
  The user spends between 5-10 minutes in the environment.

- **Medium time spent in the environment.**
  The user spends between 10-20 minutes in the environment.

- **Prolonged time spent in the environment.**
  The user spends more than 20 minutes in the environment.

  Average Rating: 

8. Campus Vision (UofG Campus Master Plan Document; Volume 1, 2013)

- **The environment adds to the existing open space network.**
  The setting is easily integrated into the existing open space network and accessible from a wide variety of areas on campus.

- **The environment extends the character of the core campus to the campus edges.**
  The space embodies the overall character of the central campus and acts as an extension of the existing campus feel and experience.

- **It reflects and embodies the historical characteristics associated with the University of Guelph.**
  The environment utilizes existing elements that highlight the already well-known characteristics tied to the University of Guelph (Johnston Green, agricultural heritage and modern landscapes of the 60s-70s).

- **The space has a unique and cohesive identity and design.**
  While embodying historic elements, the setting also has its own unique place identity/attachment and feel/experience associated with it.

- **The space enhances the image and experience of campus whiles establishing movement and wayfinding patterns.**
  The user gains something (an experience, feeling, restoration) from the space and their overall mood is positively impacted by existing within the environment; they feel connected and apart of the campus community.

  Average Rating: 

*Figure 4.1: UofG COSE-Toolkit*
Once the evaluation of the landscape in question is complete, the user is to add the average rating from each of the eight sections in order to determine the final rating of their chosen environment. The subsequent rating can range from 0 – 40 and is associated with a specific category that describes the overall effectiveness and value of the environment in regards to the user’s mental health and well-being.
**Total Rating:**

<table>
<thead>
<tr>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 10</td>
<td>The chosen environment does not possess any or has very few restorative elements or qualities and has the potential to negatively impact the user.</td>
</tr>
<tr>
<td>11 – 20</td>
<td>The chosen environment possesses some restorative elements or qualities. However, the environment does not positively impact the user and poorly functions as a setting for mental health restoration.</td>
</tr>
<tr>
<td>21 – 30</td>
<td>The chosen environment possesses a good number of restorative elements and has the potential to positively impact the overall mental health and well-being of the user.</td>
</tr>
<tr>
<td>31 – 40</td>
<td>The chosen environment possesses an excellent number of restorative elements or qualities and has the potential to substantially positively impact the overall mental health and well-being of the user.</td>
</tr>
</tbody>
</table>

*Figure 4.2: Overall Impact of Setting Defined. UofG COSE-Toolkit*
The toolkit is intended to be used as an evaluative instrument that is able to measure the positive, negative or neutral impact an outdoor setting has on its users. Although the toolkit was designed to be used on outdoor spaces, the principles as well as the subsections are worded so as to be applicable to indoor environments as well and used to evaluate the restorative elements and qualities of that particular kind of setting if need be. The results of this toolkit are intended to aid in the implementation or preservation of existing or proposed restorative spaces on the University of Guelph campus.

4.3 Results of POE

Existing frameworks or checklists that function to evaluate the impact a setting can have on one’s overall mental health and well-being are not currently in existence at the University; because of this, it was difficult to accurately perform a POE. However, with the creation of the UofG COSE-Toolkit, a set of criteria, informed by research, was used in order to understand and evaluate the restorative impacts of selected environments on campus.

The POE was conducted at three locations including South Residence: Mountain Hall, Branion Plaza and the intersection of Reek Walk and Alumni Walk. The results of each evaluation are as follows:
4.3.1 **South Residence: Mountain Hall**

![Figure 4.3: South Residence: Site Location. Source: Google Earth, 2019.](image)

A printed copy of the UofG COSE-Toolkit was taken to the site (outlined in red) and used to evaluate the current conditions of the landscape. The environment was evaluated against the eight principles: being away, accessibility of environment, engagement or connection with environment, access to nature, safety, community engagement, time spent in environment and campus vision, and their accompanying subsections, to determine its restorative suitability and value on the individual.

![Figure 4.4: South Residence: Mountain Hall; NW View.](image)
BEING AWAY – *Average Rating: 2/5*

The setting is in close proximity to Evergreen Drive and South Ring Road, a highly trafficked area with public transit and bustling pedestrians. Additionally, loud noises from surrounding streets and crowds could be heard within the space, further diminishing the environment’s restorative potential and making it difficult to concentrate or feel as though you were “away” from stress.

![Figure 4.5: South Residence: Being Away.](image)

ACCESSIBILITY OF ENVIRONMENT – *Average Rating: 3/5*

The environment is conveniently located and accessible to a large number of students as the Mountain Hall Residence backs onto it; it is less than a 10 – minute walk from the Student Centre. The environment is also accessible during all 4 seasons and easily seen by those residing in Mountain Hall throughout the year.
ENGAGEMENT/CONNECTION WITH ENVIRONMENT – *Average Rating: 3/5*

The environment has some elements that are capable of engaging the user; large trees and rolling hills can be viewed within the space and allow for a sense of “fascination”. It is also a great location for nature or people watching to occur and large enough to facilitate social interactions and be environmentally compatible with the user’s specific needs.

ACCESS TO NATURE – *Average Rating: 4/5*

This setting scored highest in this section, as there was a significant amount of vegetation (over 50%) that can be viewed from a majority of locations. Mature trees and wildlife are present throughout the landscape, and the greenery is lush and thriving. Additionally, residents of Mountain Hall have the ability to view the greenery and mature trees from indoors, subsequently allowing them to reap similar benefits even if they are not directly in the space. One of the only lacking restorative elements for this specific section, is the absence of a water feature.
SAFETY – Average Rating: 2.5/5

Safety was rated as a potential concern for this environment. The slope of the land causes the setting to feel slightly isolated from the rest of campus and makes it challenging to directly see others entering and exiting the environment. Additionally, there are numerous residences windows that look down into the space making the user feel uncomfortable and as though they are under surveillance.
COMMUNITY ENGAGEMENT – *Average Rating: 3/5*

Community or social engagement can be improved within this site as it is large enough to accommodate activities and elements that would facilitate this type of interaction. Restorative elements are present however, the space is underutilized due to a lack of engaging features. The implementation of benches, art installations, moveable tables and chairs, community notice board or area dedicated to an outdoor class would help to animate the space and bring users into it in order to benefit from the pre-existing restorative elements.
**TIME SPENT IN ENVIRONMENT – Average Rating: 2/5**

Because of the lack of overall engagement with the environment and feeling generally uncomfortable being in the space alone, limited time was spent within the site. Additionally, the site visit occurred on a day in which the weather was less than ideal; it was overcast, a combination of rain and snow, low temperatures and high winds were present. The site did not include suitable areas for shelter or respite from the elements resulting in a range of 5 – 10 minutes being spent in the environment.

![Figure 4.8: South Residence: Time Spent in Environment.](image-url)
CAMPUS VISION – Average Rating: 2.5/5

The site embodied few elements that were outlined as being a part of the overall campus vision. It has the potential to be integrated into the existing open space network if elements that encourage individuals to use the space are added. Additionally, the environment lacked an overall identity and did not provide for a powerful restorative experience. The landscape was treated as leftover space and not fully connected or integrated into the surrounding campus. Doorways leading from Mountain Hall to the outside area were evident, however, with the lack of environmental engagement, there was no reason or desire for individuals to currently access this space.

OVERALL RATING: 21/40

Upon completing the UofG COSE-toolkit POE, the setting received a final score of 21 out of a possible 40 and was deemed as having some restorative elements but did not positively impact the user and poorly functioned as a setting for mental health restoration.

Figure 4.9: South Residence: Mountain Hall; NE View.
4.3.2 BRANION PLAZA

Figure 4.10: Branion Plaza: Site Location. Source: Google Earth, 2019.

The evaluative process from the first site was repeated at the second site (outlined in red). The average rating from each subsection was added together resulting in the final rating that measured the overall restorative impact of the environment.

**BEING AWAY – Average Rating: 2/5**

Branion Plaza is considered to be the heart of campus and as a result, heavily trafficked. There is significant movement in and out of this space which does facilitate the feeling of being away. The bustling campus core and proximity to campus infrastructure such as the Student Centre and several academic buildings, serves as a reminder of daily stressors as crowds of students make their way through at all times of
the day. The constant movement, overstimulation and visual distractions make it additionally difficult to feel calm or at ease. The environment is not suitable for quiet focus or meditation.

**ACCESSIBILITY OF ENVIRONMENT – Average Rating: 4.5/5**

Because of its location, Branion Plaza is easily accessible from a wide range of places throughout campus. Most of the space is accessible during all four seasons with the exception of certain areas being blocked off due to a lack of winter maintenance. The notable features and vegetation can also be viewed from an indoor setting, providing those in surrounding buildings with the opportunity for nature exposure experience and subsequent benefits.

![Figure 4.11: Branion Plaza: Accessibility of Environment.](image)

**ENGAGEMENT/CONNECTION WITH ENVIRONMENT – Average Rating: 3.5/5**

The layout of the environment offers opportunity for engagement with site elements as well as other individuals. Chance meetings and social interactions are more likely to occur within this setting due to the layout and high volume of people who use the space.
The environment is, however, limiting in what can and cannot occur as the open space is mostly reserved as a means of connection and for individuals to pass through.

**ACCESS TO NATURE – Average Rating: 3/5**

The environment is predominately composed of hard surfaces and built infrastructure with few staggered pockets of open greenspaces. Less than 50% of the environment includes greenery; however, there are large mature trees and significant groupings of plants that help to reduce the feeling that the environment is dominated by hardscape. The plant species are visually stimulating and have four-season interest but does not allow for much user engagement, especially during the winter season.

**SAFETY – Average Rating: 4.5/5**

The location, proximity to surrounding buildings and constant movement through the space clearly establishes a sense of safety. There are unobstructed views and those within the environment are able to see others who are exiting or entering the space. The populated and well-lit area makes it difficult to feel isolated or as if you are in immediate danger.
COMMUNITY ENGAGEMENT – *Average Rating: 4.5/5*

The site is well-known for its community engagement as many social activities often occur within this space. Community bulletin/notice boards are present; however, they are underused. The environment is large enough to accommodate certain events and activities but should not be used as a place to “get away” or for calming activities such as solo or group meditation. Small, contained forms of physical activity can occur within the space but cannot accommodate activities such as running, hiking, forest bathing or yoga.
TIME SPENT IN ENVIRONMENT – Average Rating: 4/5

An average of 10 – 20 minutes was spent within this space. Similar to the previous site, the POE occurred at a time when the weather was not ideal. The site does not allow for users to spend prolonged periods of time within the space if the weather conditions are not ideal; there is an absence of shelters or infrastructure in place that would be able to shield individuals from rain, snow, wind or extreme temperatures.
CAMPUS VISION – Average Rating: 4.5/5

The campus vision is clearly evident throughout this landscape as it reflects and “embodies the overall character of the central campus and acts as an extension of the existing campus feel and experience” (University of Guelph Campus Master Plan, Volume 1, 2013). The material palette additionally functions to highlight, unify and pay tribute to the historical identity of the University while simultaneously “establishing movement and wayfinding patterns” (University of Guelph Campus Master Plan, Volume 1, 2013).

Figure 4.14: Branion Plaza: Campus Vision.
OVERALL RATING: 30.5/40

Branion Plaza received a final score of 30.5 out of a possible 40 and is noted as having a good number of restorative elements. Users within this space have multiple opportunities to engage with their environment as well as with their peers. Branion Plaza is, however, lacking in the amount of vegetation and available open spaces that offer individuals the opportunity for quiet thought or meditation. The current environment has potential to positively impact the overall mental health and well-being of the user.

Figure 4.15: Branion Plaza.
4.3.3 Reek Walk and Alumni Walk Intersection

The same evaluative process from the first two sites was repeated at the third site (outlined in red). Similarly, the average rating from each subsection was added together, resulting in the final rating that measured the restorative impact of the selected environment.

**BEING AWAY – Average Rating: 3.5/5**

The environment is secluded in comparison to Branion Plaza and does not receive a constant flow of pedestrian traffic. It is free of crowds and provides the opportunity for focus and quiet contemplation under the right circumstances. The setting is adjacent to the Central Utilities Plant and is also in the direct route of many service and utility vehicles that frequently move about campus. Although this movement and subsequent noise from the utilities plant is not constant, it has the potential to create a distracting
atmosphere and disrupt an individual who is trying to find a place of respite and restoration.

**ACCESSIBILITY OF ENVIRONMENT – Average Rating: 3.5/5**

This open space intersection is not heavily trafficked but is adjacent to a number of buildings including Rozanski Hall, Blackwood Hall and the Landscape Architecture building. With future renewal of facilities and subsequent development of the surrounding land, this is a potentially beneficial location that could serve as a place for restoration. It can be viewed from indoors, is not blocked off by any barriers that prevent access to the site and is a ten-minute walk from the Student Centre and surrounding popular buildings.

![Figure 4.17: Reek Walk and Alumni Walk: Accessibility of Environment.](image-url)
ENGAGEMENT/CONNECTION WITH ENVIRONMENT – *Average Rating: 3/5*

This particular intersection has the potential to provide the user with a wide variety of opportunities to interact with the environment. It is large enough that it can accommodate a wide variety of activities and easily manipulated to suit the user’s needs. Although there are some trees throughout the space, it is lacking in specific elements that would allow a user to connect or emotionally respond to their environment.

ACCESS TO NATURE – *Average Rating: 2.5/5*

The environment does include some planting and large trees; however, it is relatively scattered and more than 50% of the surrounding environment is dominated by built infrastructure and hard scape elements. It is adjacent to a large parking lot as well which does not aid in the user feeling as though they are completely immersed in a natural environment and “away” from stress. A row of grasses along the North West wall as well as the coniferous trees and shrub plantings do help with the environments four-season interest but are again so scattered throughout the area that it does not create a large or powerful restorative impact.
Figure 4.18: Reek Walk and Alumni Walk: Access to Nature.

SAFETY – Average Rating: 2.5/5

Because of the environment’s location and subsequent lack of pedestrian traffic, the environment feels secluded and isolated from the rest of campus. The views are unobstructed, and the user can see those entering and existing the site, but this occurrence is somewhat rare as most individuals are on the periphery and traveling along Alumni Walk in order to get to another location. Additionally, the area does not seem as though it is well-lit at night; the surrounding buildings emit some source of light but the area itself is lacking in light fixtures that would animate the space and make it safer to be in. The close proximity of the parking lot, as well as the constant movement of service and utility vehicles that use the area as a route of travel, further add to feeling unsafe and not completely comfortable.
COMMUNITY ENGAGEMENT – Average Rating: 3/5

The environment’s overall scale and lack of existing programmed space allows the area to facilitate a wide variety of activities. Currently there are no immediate ways in which the environment aids in community engagement as it is rather barren and lacking in site elements that would facilitate this. However, with future development of the land, the space is easily able to be manipulated to provide users with an area in which engagement is possible. A revised planting design and implementation of site furniture could animate the space and allow it to become an environment in which outdoor classes, meditation, outdoor therapy or counselling, and social events could occur.
TIME SPENT IN ENVIRONMENT – *Average Rating: 3/5*

The environment lacked elements that engage the user, making them not want to spend a prolonged period of time within the space. The weather was, again, not ideal during the POE and the site did not provide any features that would help to shelter an individual from mild to extreme weather conditions, making it increasingly difficult to want to spend time within the space.

CAMPUS VISION – *Average Rating: 3/5*

The site does and has the potential to, further add to the open space network that currently exists on campus. With the redevelopment of the land, there is opportunity to inject more of the campus vision principles into this environment as well as create a space that both reflects the University’s image and historical characteristics, and facilitates a unique experience for the user.

*Figure 4.20: Reek Walk and Alumni Walk: Campus Vision.*
OVERALL RATING: 24/40

With the redevelopment of the land and the renewal of the surrounding built infrastructure, this environment has immense potential to be a place for respite and restoration. Currently, there are a good number of restorative elements within the site; it is free of crowds, has some interesting plantings and some environmental compatibility with the user's needs. It has the potential to positively impact the overall mental health and well-being of the user with the implementation of additional site features and redesign of the existing planting.

Figure 4.21: Reek and Alumni Intersection.
4.4 Key Informant Critique and Discussion

The final method was the key informant critique of the toolkit in order to determine the instruments utility, reliability and validity. This method was employed as the final approach as it was important to gain insight into whether what had already been created and used to perform a POE was a sufficient means of measuring the value and impact of an environment, as well as if this tool had the potential to be written into future planning and design documents in order to better develop restorative environments. The critiques were not intended to specifically focus on the process or development of the toolkit but were conducted as a means of gaining an objective insight into how this toolkit might function in future planning and design initiatives at the University. The following six questions were used as the basis for this critique by the key informants; however, additional topics and areas of discussion surfaced as the conversation progressed:

1. What are your thoughts on the current state of the University of Guelph campus (or campuses in general), specifically in regards to the ways student mental health and well-being are approached? Do you think the preservation of, or planning for open green spaces or restorative environments on campus are a priority?

2. Do you see the value or utility of this toolkit for use in evaluating a University campus?

3. Is this toolkit an efficient means of evaluation?

4. Do you think it has the ability to create a healthier environment on campus and influence future land use planning and campus design?

5. Do you think the toolkit is a valid way to evaluate current and proposed environments?
6. Does it completely and accurately measure the impact an environment has on the individual user?

4.4.1 Current State of Campus and Student Mental Health

Both Key Informants highlighted that there is a growing concern for the mental health and well-being of the students on campus. Dean Gregory, the campus Landscape Architect at the University of British Columbia, expressed that the University is making efforts to help students through crisis and offer a wide variety of resources in order to help alleviate some of the daily stressors that many students face daily. Gregory also noted that some of the resources being offered through the University, such as counselling, therapy or online mental health services, were great options for those willing and ready to seek out treatment; however, those who did not yet feel comfortable to do so continue to struggle alone. It is “difficult to document the impact of a landscape” or “the effect that simply viewing a tree” (Key Informant Gregory, 2019) can have on one’s mood, as Gregory stated, which is why it is important to plan for accessible places that students can visit that provide an alternative means to stress recovery and restoration. Universities want to provide students with the best resources and experience while they are studying, but there needs to be a way by which the value of restorative environments can be measured and communicated to those in administrative positions who are able to implement alternative nature-based strategies or services that function to aid those struggling with a mental illness.
Gregory’s comments were echoed by Anne MacDonald, the current Manager of Compliance and Wellness at the University of Guelph. MacDonald also believes that the University is attempting to address mental illness and student well-being on campus through various counselling-based services and online resources. She also highlighted that policies related to the treatment and use of the open space networks at the University are in place; however, they are more maintenance focused and do not touch on the value and impact that preserving or maintaining these spaces can have on an individual. Figure 4.26 and Figure 4.27 outline the current design standards and considerations taken in regards to the landscapes on campus.

### 2.3 Landscaping and Site Appurtenances

#### 2.3.1 Landscaping and Planting

Landscaping and Planting shall be in general accordance with the University’s Landscaping Standard.

1. Proposed approaches to Landscaping shall be submitted to the Landscape Advisory Committee (LAC) for review at the Schematic Design Stage.

*Figure 4.22: Design Standards: Design, Engineering and Construction. Source: Physical Resources, University of Guelph, 2015.*
It is evident that maintenance considerations and functionality are the main focus of these guidelines and do not explore how these considerations may potentially impact those experiencing the site. MacDonald believed that there is room for improvement and that the experience of the landscape should be considered in future planning and design initiatives (Key Informant, MacDonald, 2019). Further considerations regarding landscape treatment policies and standards were suggested by MacDonald; however, upon further review of the suggested literature, similar disregard for the landscapes impact on the user’s well-being were noted and the focus was again on the overall maintenance of the environment.
Figure 4.24: Architectural Design (Planning). Source: Physical Resources, University of Guelph, 2019.

Figure 4.25: Grounds Department. Source: Physical Resources, University of Guelph, 2019.
4.4.2 Utility, Reliability and Validity

Both Informants were asked to critique the UofG COSE-Toolkit and offer their insight as to whether there was a need or value for this kind of evaluative tool. Both Gregory and MacDonald agreed that the toolkit was a useful means of evaluating the restorative qualities of current or proposed environments and that the eight principles covered a majority of the considerations that would need to be taken when evaluating an environment’s impact on and individual’s well-being. Although MacDonald agreed with the second principle of “Accessibility of Environment”, she did suggest that there could be additional subcategories that further examine how those with an apparent or non-apparent disability would potentially navigate the space.

Gregory also expressed that the toolkit was “comprehensive and exhaustive” (Key Informant, Gregory, 2019) and that he could see its potential use and value in future planning and design initiatives. Both MacDonald and Gregory did raise an important question regarding how this toolkit would be brought to the attention of the right administration or council in order for it to be used as it was intended. Although the toolkit was deemed valid, useful and reliable by both key informants, it became apparent that unless the right group of people was made aware of it, it would not be used. The question then became, “How do you get people to realize the value in this tool as well as get them to use it?” (Key Informant, Gregory, 2019).
4.4.3 Use in Future Planning and Design

The semi-structured discussion with both Key Informants proved to be beneficial, as alternative points of view and questions were raised. The Key Informants’ varying backgrounds also helped in gathering differing yet informative perspectives and subsequent literature to examine further. Gregory and MacDonald did share similar opinions concerning the layout and functionality of the toolkit, comparing it to the current set of standards, rating system and certification process associated with the Leadership in Energy and Environmental Design (LEED) certification initiative. Although LEED certification is primarily about the built infrastructure, both believed that a similar framework could be used within future restorative planning and design initiatives and a similar rating system of bronze, silver or gold (Canada Green Building Council. LEED, 2018) could be given to spaces on campus that meet specific requirements. MacDonald additionally likened the toolkit to the WELL Building Standard (International Well Building Institute, 2018) which is a “leading global rating system…that focuses exclusively on the ways that buildings, and everything in them, can improve our comfort, drive better choices, and generally enhance, not compromise, our health and wellness” (IWBI, 2018). The standards were developed through “scientific and medical research” and, similar to the UofG COSE-Toolkit, function to “implement, validate and measure features that support and advance human health and wellness” (IWBI, 2018). Although the framework and evaluative process are similar to the UofG COSE-Toolkit, the WELL Building Standard primarily focuses on the built environment and rates as well as provides certification to buildings, as opposed to the outdoor environment.
5 Design and Policy Considerations

5.1 Future Design Considerations for Selected Sites

The results of the POE conducted at each site highlighted similar themes and design considerations that could potentially be implemented within these spaces in order to create more restorative environments. As outlined in the CMP, these areas are to undergo future development and renewal. The following list of design considerations for each site have the potential to increase the restorative value of these environments and subsequently positively impact the mental health and well-being of students using these spaces.

5.1.1 South Residence: Mountain Hall

The land adjacent to the Mountain Hall Residence, where the current parking lot stands, is intended to be further developed and is zoned for a future parking structure (University of Guelph Campus Master Plan, Volume 1, 2013). If poorly implemented and landscaped, this addition to the open space network could potentially have negative impacts on those able to view the structure from their residences as well as those who frequent the open space behind Mountain Hall. Increased and strategically-implemented tree and shrub plantings could help to reduce the visibility of the structure as well as provide students with a more comfortable space for restoration. Restorative elements including moveable benches, tables, chairs, increased lighting, water features, four-season planting, and community engagement features such as horticultural therapy gardens, community notice boards and art features could be implemented. This would further enhance the currently underutilized space and create an environment capable of
facilitating restoration for those within the space as well as those viewing it from inside the adjacent residence. The precedent images below highlight key restorative features that could be implemented within this particular space. Community engagement, safety, campus vision and time spent within the environment have the potential to increase with the addition of these restorative elements.

![Figure 5.1: Precedent Imagery. Buchanan Courtyard (left) and Health Science Courtyard (right) at UBC. Source: UBC Campus Landscape Architect, Gregory. The Field: ASLA Professional Practice Network’s Blog, 2014.](image)

5.1.2 Branion Plaza

The POE determined that Branion Plaza was the most restorative site that was evaluated according to the UofG COSE-Toolkit. It did, however, fall short in terms of allowing the user to feel as though they were away from stressful situations as well as
access to nature. According to the CMP, this area is zoned for future expansion and renewal, which would allow for additional restorative elements to be incorporated throughout the site. As noted from the POE, the area is dominated by hardscape elements and surrounding built infrastructure. With future development, additional planting areas or pockets of respite could replace the hardscape elements and create a space that allows students to feel more removed or away from the bustling crows or stressful situations. Strategic planting design would help to achieve this as well as further add to the open greenspace network on campus. The existing fixed site furniture could also be removed or redesigned in order to incorporate more moveable seating and allow the environment to accommodate a large range of activities to suit the user’s needs.

Figure 5.2: Precedent Imagery. UBC Campus (left) Buchanan Courtyard (right) at UBC. Source: UBC Campus Landscape Architect, Gregory. The Field: ASLA Professional Practice Network’s Blog, 2014
5.1.3 Reek Walk and Alumni Walk Intersection

The open-space intersection between Reek and Alumni Walk, as well as Blackwood Hall – the adjacent building, are also zoned for future renewal and development. As noted from the POE, this area successfully provides an area in which users are removed from the busy atmosphere associated with more centralized locations on campus and feel a sense of seclusion. It is unsuccessful, however, at creating a space that facilitates community engagement or engagement with the environment itself. Although the space is large enough to facilitate a wide range of activities and for additional opportunity for increased vegetation, it is currently not fulfilling its potential. Restorative elements including additional planting, therapeutic gardens, lighting, and community engagement elements could be implemented in this space, resulting in environment that is better able to positively impact the user’s mental health and well-being. Strategically-placed plantings could also be added within the site to block off the visual distractions caused by the service and utility vehicles that frequent the space. The additional restorative elements would also be able to positively impact those traveling along the adjacent walks and in the surrounding buildings. Figure 5.3 below illustrates what has already been incorporated at the University of British Columbia and University of Chicago campuses and how these same principles could be applied within this particular environment.
5.2 Future Policy Considerations

As a result of the Key Informant critique and discussion with both Gregory and MacDonald, it became evident that the utility, reliability and validity of the UofG COSE-Toolkit was irrelevant if it was not being used by the right administrators. MacDonald was able to provide a list of various departments that could potentially benefit from employing this evaluative instrument and expressed that “the toolkit would be the most valuable during initial or concept stage planning” (Key Informant, MacDonald, 2019). Departments such as Physical Resources and Architectural Planning would be the first step in attempting to further validate its usefulness in evaluating and subsequently designing restorative environments on campus. The results from the continued use of the toolkit could further be used to inform an additional subsection or set of restorative design considerations in future CMP documents.
6 Conclusion

6.1 Limitations and Future Research

Limitations were experienced during the development of this thesis and, because of this, future research is needed. An initial evaluative framework to assess the restorative impacts of an environment on campus does not exist; therefore the UofG COSE-Toolkit was created. Although this toolkit was developed as a result of identifying key themes and restorative design elements from health and planning literature and is evidenced-based, its utility, reliability and validity would benefit from additional assessment. Supplementary critiques from a wider range of Key Informants would have further solidified the toolkit’s overall value and effectiveness. Two additional Key Informants, one with a background in architecture and the other in Physical Resources, were contacted in order to provide their insight and expertise; however, due to a lack of response as well as timing, they were not included within the study.

The findings were further limited as the POE was conducted only in the spring. Additional POEs, varying throughout the four seasons as well as time of day, would have been beneficial to the overall study and, as a result, might have affected the rating value achieved by each selected site.

As the toolkit was only used on three campus locations and by one person, more data should be gathered from the additional use of the toolkit at varying locations, as well as by different users. Alternate ways of viewing and subsequently rating each environment has the potential to vary with the individual using the toolkit. Although the
The toolkit includes general descriptions that could in many instances be applicable to indoor environments, it can be further adapted to include evaluative principles that are specific to indoor restorative elements.

6.2 Summary

The examination of the existing University of Guelph CMP highlighted the lack of polices or set of design guidelines in place for the development or preservation of restorative environments on campus. The initial question that this research sought to answer was whether an evaluative assessment tool had the potential to measure the restorative value of an environment and subsequently aid in the preservation and implementation of these spaces throughout the campus open space network. The creation of the toolkit as well as the POE and Key Informant critique demonstrated that it is possible.

Although a wide range of resources and services are offered through the University, it is important to provide alternate solutions to those who are not ready to seek out treatment or are in need of an immediate restorative experience. Key themes and restorative design guidelines were highlighted throughout the literature and subsequently applied to the three selected sites that underwent a POE. With the development and renewal of future areas on campus, there is immense potential for the University of Guelph campus to plan, design, assess and implement restorative environments.
REFERENCES


Key Informant Interview: Anne MacDonald. (2019, April 15).

Key Informant Interview: Dean Gregory. (2019, April 12).


University of Guelph. (n.d.). Campus. Retrieved from https://www.uoguelph.ca/campus/


APPENDICIES

APPENDIX A:

Spatial Properties and Characteristics of Restorative Urban Open Space

Thwaites et. al., 2005

The network
- Density: evenly distributed on pedestrian routes (max 400m intervals)
- Size: generally small in scale and contained (15 – 20 x 30m)
- Location: adjacent to shops, places of work, public buildings, dwellings etc.

Individual spaces
Collectively they should:
- induce reflective contemplative sensations
- combine mental and physical worlds
- allow the mind to wander
- stimulate wonderment
- be compatible with expectations
- stimulate directional, transitional or locational sensations

Directional spaces
Engender sensations of continuity, a sense of there-ness and future possibility through, for example:
- deflective façades
- façade continuity
- rhythm of boundary treatment
- linearity of floorscape
- sense of perspective
- sense of mystery and anticipation
- views and focal points

Should contain along their length a range of transitional and locational spaces
Transitional spaces
Engender sensations of change or transformation through, for example:
- thresholds: boundaries between spaces marked by change in: material, texture, colour, form/shape, direction, level
- segments: spaces that break linearity and provide ‘softness’ through porticos, arcades, colonnades, shelters, low fencing, stoops, porches and landings etc.
- corridors and tunnels: narrow routes between buildings enabling access to interior courtyards or through routes to neighbouring spaces
- ephemeral: transient effects of sun and shade patterns, seasonal change in vegetation, sounds, smells etc.

Locational spaces
Engender sensations of here-ness, location and proximity through, for example:
- separation from distraction: removal of actual or perceived dangers (traffic, road crossing, muggers) or confusing or attention-grabbing features (signs, adverts, shop displays, crowds, beggars) to engender a feeling of security, retreat from stimulation—to allow one’s guard to be let down
- provision of access: physically and visually accessible to all and connected to main points of circulation. Welcoming
- provision for comfort: opportunities for physical and psychological comfort, physical and micro-climatic shelter, sedibility; sit, lie, sleep—a chance to ‘do nothing’
- opportunities for contact with nature: physical and visual access to flora, fauna, water, sky; ‘natural sounds’—wind, leaves rustling, bird song, moving water
- opportunities for interaction with the environment: physical and psychological engagement with space and contents; opportunities to make temporary spatial claims (moveable chairs); gradual attachment of significance over repeated visits, the building up of overlapping memories
- opportunities for social interaction: meeting places, chance encounters, features of interest as talking points, seating in social groupings
- imageability: functional uses, goals and motivations, memorable physical features and social meanings
APPENDIX B:
The Complete Set of Planning Principles CMP
University of Guelph Campus Master Plan, Volume 1, 2013)

3.1 Planning Principles

The planning principles are broad-based and mutually supportive to provide comprehensive direction for the Campus Master Plan and a means for evaluating future amendments and updates to the plan.

1. Support the University of Guelph’s Academic Mission
   1.1 Align campus planning with the university’s academic mission to cultivate academic excellence.
   1.2 Enhance and create open, collaborative and adaptable environments for the exchange of ideas and the nurturing of innovation.
   1.3 Provide sufficient and appropriate space to allow for innovative, efficient and effective academic discovery.
   1.4 Support interdisciplinary teaching, research and discovery with appropriate space, facilities and campus resources.
   1.5 Provide an effective campus environment in which to promote student engagement and development.

2. Enhance the Image and Experience of Campus
   2.1 Enhance and grow the open space network to ensure a legacy of diverse and memorable landscapes and to support a coherent, consistent and vibrant campus identity.
   2.2 Ensure consistency and quality in campus settings and landscapes to reflect the university’s reputation for excellence.
   2.3 Provide long-term clarity and certainty for all of Guelph’s landholdings and interests.
   2.4 Manage the larger land base to support the academic mission while serving the needs of the university community, campus neighbours and the larger ecosystem.
APPENDIX B:

The Complete Set of Planning Principles CMP

University of Guelph Campus Master Plan, Volume 1, 2013)
APPENDIX C:

Outdoor Evaluation Tool

Rodiek, 2009

-Outdoor Evaluation Tool (Version 0.1)

© 2009, Susan Rodiek, Center for Health Systems & Design, Texas A&M University, College Station, TX
Please do not disseminate, distribute, or post electronically without advance written permission.

This tool is designed to use evidence-based design principles to evaluate outdoor areas for seniors.

Based on ongoing research and analysis, the tool is being updated periodically – check to see if a later version may be available. This checklist can help identify the strengths and weaknesses of existing outdoor areas, and plan future developments.

www.accesstonature.org

INSTRUCTIONS - PLEASE READ BEFORE USING THIS TOOL:

STEP 1. Choose a specific outdoor area to evaluate, and use a separate checklist for each outdoor area.

You can have different people evaluate the same area (making sure everyone has read the instructions first), and compare results afterward.

STEP 2. Walk and sit in the area a few minutes, imagining yourself as a senior resident with various sensory and functional disabilities, who may use a walker or wheelchair. Look at the area from various positions – and try out the furniture. You can help simulate this process by half-closing your eyes to reduce visibility, lower your viewing to wheelchair height, open doors with opposite hand, etc.
STEP 3. **Evaluate** the area based on how well it supports the activities or intent described in each item.

Base your evaluation on *what you would reasonably expect to find* in a setting of this type and size. Consider the independence level of residents, the site context, the cultural and regional climate

(for example, is security a major issue? Is rain or sun protection more important in your climate?)

Fill in all boxes on the following checklists, for each of the seven main design principles.

**How to evaluate each item:**

- Enter a rating from 1 to 10 in each box.
- Rate each outdoor area based on *how well it meets the intent of each statement.*
- A rating of 5 would designate “average,” compared to other settings of this type.

The following ratings would mean:

- **10 =** this area very successfully supports residents’ outdoor usage; cannot imagine any better
- **5 =** this area meets some of residents’ needs, but not all; about average for this type of setting
- **1 =** this area supports residents’ outdoor usage very poorly or not at all, could hardly be worse
- **0 =** the feature is not found in this location  **N/A =** the feature is not appropriate here

Location ___________________________ Evaluator ___________________________ Date __________

Describe area to be evaluated ____________________________________________________________

_________________________________________________________
PRINCIPLE 1: INDOOR-OUTDOOR CONNECTIONS

Make outdoor areas extremely easy to see and reach, by making sure the doorway leading outside is very visible and convenient from the main places residents spend time. Develop comfortable sitting areas both inside and outside the doorway, inviting people to linger before and after going outdoors.

1. The outdoors can be reached directly from the main public areas.

The entry to this outdoor area is directly connected to the main lobby or the most commonly-used indoor activity spaces, rather than through private or less-commonly-used areas or hallways.

2. The doorway leading outdoors is highly visible and prominent from indoors.

The entry leading to the outdoor area can be easily seen and recognized from indoor common areas and circulation routes, even by residents in wheelchairs, or with impaired vision.

3. Residents can easily “preview” the outdoors, before opening the door.

The door and surrounding area have enough glass to allow residents (even those in wheelchairs or with impaired vision), to “pre-view” the outdoors before opening the door. Window sill should be as low as possible to maximize visibility from wheelchairs.

4. Residents can linger in comfort just inside the doorway leading out.

There is a comfortably-furnished indoor sitting space located adjacent or very close to the door leading to the outdoors, where residents can linger to look at the view, and consider going out.
5. **Residents can comfortably linger in a developed space just outside the doorway.**

The outdoor area just outside the doorway is inviting, paved, shaded, well-maintained, and comfortably furnished for outdoor sitting – making it easy to go outside “just for a moment.”

6. **Residents can view this outdoor area from a commonly-used indoor sitting area.**

There is at least one other important comfortable indoor sitting area that has good views of this outdoor space, *in addition to* the transition area next to the doorway.

7. **The doors are very easy for residents to open.**

The doors leading out are easy and comfortable for older people to operate, with lever handsets, and require minimal strength to open (evaluators should test this).

8. **There is an automatic door opener.**

There an automatic door opener that residents in wheelchairs can easily reach and operate.

9. **Residents using walkers or wheelchairs can easily navigate the door threshold.**

The level change at the doorway is minimal (less than ¼” rise in two inches, with maximum 1/2” rise total). There are no noticeable features that make it difficult or unpleasant to cross the threshold. Ideally, *evaluators should test the door threshold* using a walker or wheelchair.

10. **There is a wide and level paved landing on both sides of the door threshold.**

The landings on both sides of the doorway have at least 18-24” space at the side of the door with the handle or latch, allowing wheelchair residents to easily operate the door.

11. **The doors are easy for residents to pass through.**
The door does not close too quickly, allowing residents plenty of time to pass through the doorway.

**PRINCIPLE 2: CONTACT with COMMUNITY**

*Develop outdoor areas that provide contact with the larger world residents have left behind, with opportunities to watch and/or interact with people, elements, and activities beyond the facility.*

1. **Residents can reach this outdoor area without going through the main front door.**

   There is at least one way for residents to reach this area, without using the main front door.

2. **Residents can see off-site landscape features.**

   From this outdoor area, residents can glimpse natural elements that appear to be past the property boundaries, such as trees, hills, neighboring yards, or other natural features in the surrounding area.

3. **Residents can see off-site urban/suburban features.**

   From this outdoor area, residents can see parts of built elements that are clearly beyond the grounds of the facility itself, such as nearby buildings, neighborhoods, freeways, signboards, etc.

4. **Residents can watch off-site centers of human activity.**

   From the outdoor area, residents can watch one or more neighboring places where people are walking around, such as a store, gas station, library, post office, schoolyard, playground, loading dock, building entrance, bus stop, etc.

5. **Residents can watch off-site vehicular activity.**

   While seated in this area, residents can watch nearby parking lots, traffic passing by on streets and roadways, etc.
6. Residents can watch people driving up and parking (or can watch bus arriving).

From this outdoor area, residents can see at least part of the entry sequence, where vehicles approach and park, either in the parking lot or near the front door. If accessed by bus route, residents in this outdoor space can see the bus approach and stop to let people out.

7. Residents can watch people getting out of cars (or bus) and walking toward the door.

From this outdoor area, residents can watch people getting out of their vehicles (or passengers emerging from the bus or shuttle), walking toward the facility, and opening the front door.

8. From this area, residents can watch mail carriers and delivery services coming and going.

Outdoor area has a view of where mail and delivery service people park, and walk to and from their vehicle to enter the facility.

9. While SEATED in this area, residents can greet people arriving at the facility.

While seated outdoors, residents can say hello to people as they arrive at the main door to the facility, and/ or when they are leaving.

**PRINCIPLE 3: SAFETY and SECURITY**

*Develop outdoor areas that allow residents to feel safe and secure, especially in terms of the risk of falling. Through planning and maintenance, minimize elements that may be hazardous or dangerous.*

1. Paved areas are smooth, level, and non-skid.

In this area, paved surfaces are smooth, level, and reasonably free from cracks or level changes that might cause problems for residents using wheelchairs and walkers. Any cracks are shallow and not accompanied by level changes. Surfaces are not slippery, even when wet.
2. **Paved areas have little or no tree litter, leaves, or other debris.**

Residents do not need to worry too much about tripping or falling in this outdoor area, as it appears to be well-maintained on a regular basis, and there are few or no leaves, twigs, or plant litter on paved surfaces. Plants are trimmed back so they do not intrude on the pathways.

3. **Paving will not reflect glare in the sunlight.**

In this area, *unless* well-shaded most of the day and most of the year, the paved surfaces are a muted color and finish that reduces glare on sunny days; could be asphalt, tinted concrete, etc.

4. **Residents do not have to negotiate level changes.**

Any level changes in walking surfaces are minimal, and are made by low-slope ramps (preferably flatter than 1:20), with handrails, adequate landings, and non-slip surfaces.

5. **Residents can reach this area by walking entirely on sidewalks or paved patios, etc.**

This outdoor area can be reached by walking entirely on connecting sidewalks, paved patios, etc. Residents do not have to walk through any part of the parking lot or driveways to reach this area.

6. **From outdoors, residents can view indoor common areas, so they feel more secure outside.**

While outdoors, residents can maintain at least some visual contact with an indoor common area or main corridor, making it more likely that someone would notice them, in case they needed help.

7. **When outdoors, residents realize they can be easily seen from the main indoor areas.**

A substantial part of this outdoor area can be viewed from a public area frequently used by residents and/or staff - such as lobby, activity area, nurse station, front desk, etc. (NOT from resident rooms).
8. Residents can feel secure from external dangers in this area.

Taking the character of the surrounding neighborhood into account, this outdoor area seems fairly safe from external hazards and possible security threats such as errant traffic, teenage gangs, uninvited strangers, stray dogs, etc.

9. Seats are not likely to tip over, and have arms that support residents getting up and down. Benches and chairs have backs, and grippable arms that residents can use to support getting up and down from the seat (should protrude 2” beyond seat). The seats are at a height of 17.5” – 20,” to allow residents to get up easily, and shorter residents’ feet can reach the floor while sitting.

10. Lighting is provided to make outdoor areas visible at night.

The outdoor area is well-lighted at night, to look more comforting, and so residents can realize it would be possible for them to go outside if they choose to.

**PRINCIPLE 4: COMFORT and ACCESSIBILITY**

*Design and maintain outdoor areas to accommodate the diminished physical, sensory, and functional abilities of residents, so they can spend time in outdoor areas with ease and comfort.*

1. This area is designed to have a comfortable microclimate.

Based on this particular climate, the outdoor sitting areas are protected from the wind, and are bright most of the day, but without unpleasant glare. Ideally, at least some areas should be open to winter sun from the south, and part of each area should have shade overhead and from the west, to protect from midday and hot summer afternoon sun.

2. Residents can choose between sunny and shady places to sit.

Based on the conditions of this particular climate, this space has a balanced mix of outdoor areas in both sun and shade, with multiple places to sit in each.
3. Residents can use seating that is designed to be comfortable for older adults.

Outdoor seating is designed to be comfortable for older adults, with materials that do not get too hot or cold, such as exposed metal or concrete. Seats and backs have ergonomically-appropriate angles for sitting, and have cushions or pads. Materials may be wood, recycled/manufactured wood, plastic, metal/mesh, etc.; the suitability of materials will depend partly on climate and location of seating.

4. Residents have excellent views from fixed seating, if any.

Any seating units that are too heavy for residents to move are located where they look toward the best views and most interesting activities.

5. Residents in nearby rooms have privacy from nearby outdoor areas, if any.

This outdoor area is not so close to adjacent private rooms, that residents feel they must keep the curtains closed to avoid being seen by people using the outdoor area.

6. Residents in this outdoor area have privacy from nearby rooms, if any.

People using this outdoor area do not feel like they are in a “fishbowl”, surrounded by private resident rooms looking in at them from all sides. Where there are adjacent private rooms, there are sufficient plantings, distance, screening, and/or level changes, etc., to prevent feeling exposed to scrutiny.

7. The design and furnishings in this area have a homelike character to the extent possible.

This area would likely be psychologically comfortable to residents, because of having a homelike or residential character, scale, and furnishings, rather than feeling institutional.

8. Residents are not exposed to noise pollution.

This outdoor area is relatively free from annoying sources of noise, such as air conditioners, motors, compressors, loud traffic, etc.
9. Residents can still use this outdoor area when it is raining.

At least part of this outdoor area has a covered place where residents can sit and watch or listen to the rain, while staying dry and comfortable.

PRINCIPLE 5: FREEDOM, CHOICE, and VARIETY

*Develop outdoor spaces that tend to foster a sense of freedom in residents. Support their autonomy and independence by providing a variety of locations, activities, focal points, views, seating, and walkways that residents can choose between.*

1. Residents can reach this outdoor area by more than one doorway.

There are multiple ways to access this outdoor area, to help give residents a sense of choice.

2. Residents can obtain a sense of escape in this area.

This outdoor area affords residents a sense of escaping from the building, into an atmosphere that strongly contrasts with indoor areas.

3. Within this outdoor area, residents can choose among different places to spend time.

There are multiple “places” to occupy within this outdoor area, to provide residents with a sense of choice and variety as to where they can sit outdoors. These may be separate areas, or different parts of the same area.

4. Residents have their choice of different types of chairs and seating elements.

There are different types of seating available within this outdoor area, to allow residents to choose the type that best meets their preferences, size and body shape, and desire for privacy or socialization.
5. Residents can access inviting walkways from this outdoor area.
This outdoor area provides access to a paved and attractive outdoor walkway leading to other parts of the facility grounds, or at least beyond the immediate sitting area, to provide a sense of freedom.

6. Residents can easily change the position or angle of some of the seating elements.
At least some of the outdoor seating can be moved even by frail older residents, to allow placement at different sun angles, to create privacy or conversation groupings, etc.

7. Residents can see a rich variety of plants in this area.
This area contains many different types of plant materials, such as vines, shrubs, tall and short flowers, trees, ground cover, rather than only a few types and heights of plants.

8. Residents can focus on non-living elements with motion and interest.
From this outdoor area, residents can see, hear, and/or interact with features such as spraying fountains, windsocks, windchimes, sundials, gazebos, etc.

PRINCIPLE 6: CONTACT with NATURE:

Develop outdoor areas that allow residents to enjoy an abundance and variety of nature elements, especially those preferred by older adults, such as flowers, greenery, trees, water, and wildlife.

1. Residents can see abundant greenery and other plant materials.
From this outdoor area, residents can see a substantial amount of plants and greenery, compared with the amount of hardscape elements such as paving, planters, walls, etc. Typically should be at least 50% - 70% greenery viewable in the field of vision (60-degree cone).
2. Residents can see a broad range of plants.

Residents in this area can view plants of many different types, shapes, colors, and forms of foliage, such as trees, shrubs, vines, tall and short flowers, ground cover, lawn, etc.

3. Residents can see trees and/or other tall plants.

From this outdoor area, residents can see a substantial number of trees and other tall plants (at least 6’ high), rather than only ground cover, small plants and shrubs. Preferably, some of the trees are close enough to paved areas, to allow residents to be under their canopies.

4. Plants generally look healthy, full, and vigorous.

The plants generally look lush and healthy, instead of sparse, frail, spiky, or spindly-looking plants, or those that might look unwelcoming to older adults.

5. This outdoor area has plants with color, flowers, fragrance and/or seasonal change.

The outdoor area contains at least some plants with flowers that would be clearly visible to elderly residents when in season. Some plants may show seasonal change of color or foliage, and may also be fragrant. Older eyes can see red, orange, and yellow, more easily than blue, lavender, and white.

6. Some plants can be seen at close-up face level by residents walking or in a wheelchair.

At least some greenery and plantings are raised to be high enough to see up close without bending over – with the foliage located at approx 2’ to 5’ above the ground - and close enough so residents can see, touch, and/or smell the flowers and leaves without leaving the paved areas.
7. Water can be seen, heard, possibly touched.

Residents can come into contact with water in this outdoor area, whether a small fountain, pool, duck pond, or even a well-filled birdbath, or a nearby viewable stream, river, or lake. They can view it easily from comfortable places, and in some cases can even touch the water.

8. Residents can see natural and/or wild living creatures such as birds, wildlife, pets, etc.

From this outdoor area, residents have a good chance of being able to watch ongoing or occasional activity of wildlife such as squirrels in a tree, hummingbirds, a birdbath or bird feeder, butterflies attracted to butterfly plantings, fish or ducks in a pond, deer grazing in an adjacent meadow, cows or horses, pets or domestic animals, etc.–whatever might be found in this type of community.

PRINCIPLE 7: SUPPORT for ACTIVITIES

Develop well-landscaped, safe, and comfortable walkways for residents to use. Also develop places that support other activities such as outdoor stretching and exercise, social events, water aerobics, caring for pets or domestic animals, gardening, individual and group games, etc., as feasible.

1. Residents can walk in a round-trip loop.

Most of the walkways in this area allow people to make “round-trip” loops around an element, rather than dead-ends that force them to turn around to come back the same way.

2. Residents can choose from walking routes of different lengths.

There are multiple walkways of substantially different lengths, depending on how far different people want to walk.

3. The walkways are wide and level.

Pathways are sufficiently wide, level, and smooth enough for elderly residents to traverse without difficulty, even with walkers or wheelchairs.
4. Along any walkways in this area, residents can sit and rest often.

Seating is available at frequent intervals along walkway -- approximately 50’ between benches/chairs, and 20’ between landscape seating elements (e.g. planter edge), where residents might rest briefly.

5. Residents can connect to different paths while walking.

If there are multiple walkways, the majority connect with each other, so residents can go from one to the other. If there is only one walkway, it offers some sense of choice or variety in where residents can walk.

6. Residents can see pleasant/interesting views from walking areas.

The views in this area offer some variety, and allow a sense of exploration and surprise, to give residents a reason to move between different areas.

7. Residents can walk under the shade of trees or building elements.

Substantial parts of any walkways are shaded from the mid-day sun by trees, awnings, buildings, etc., so residents will not have to spend too long in the hot sun, or be bothered by glare from the paving.

8. Residents can engage in other activities outdoors.

Space is provided for one or more other outdoor activities, such as horticultural therapy, gardening, horseshoes, exercise stations, a putting green, bocce ball, shuffleboard, croquet, swimming pool or Jacuzzi etc.
APPENDIX D:
Design Review Checklist
Marcus and Wischemann, 1998

Design Review Checklist

The Front Porch
1. Do the campus buildings have front and back doors?
2. Is there some indication of a front porch at the main entry, with provisions for casual study, eating, and socializing?
3. In regions where cool to warm weather predominates during the academic year, is the front porch designed as a sun trap?
4. In latitudes with snowfall, can heat-air from the building be placed where they can help melt snow at the front porch?
5. In hot climates, can shading, planning, and natural breezeways be combined to create tolerable temperatures at the front porch?
6. Is the seating comfortable for one or two people to use singly and also for three or four to use as a group?
7. Are there tables for eating or studying?
8. Is there a source of reasonably-priced food and drink close by?
9. Are there adequate litter containers?
10. Is the main entry and name of every building well lit at night?
11. Are the different functions of each building cued beneath the building's name?
12. Where the climate precludes sitting outside for most of the year, is there an indoor equivalent of a front porch?

The Front Yard
12. Do visual cues indicate the presence of a front yard for all or most of the campus buildings?
13. Are there areas of sun and shade in each front yard area?
14. Will grassy areas—even under trees—be pleasant to walk on?
15. Is seating scheduled for right or early morning or so the grass will be dry enough to sit on during the day?
16. Is there seating along the perimeter of this space, and/or around any particularly impressive trees?
17. Do all or most campus buildings have backyard areas?
18. Is each backyard easily accessible to, and appropriated by, the users of the building it serves?
19. Does each backyard have the feeling of a buffer or green space away from major campus pedestrian and vehicular traffic?
20. Are the materials used in the backyard appropriate to the climate?
21. Depending on the local microclimate, are there sufficient number of shaded areas and entry structures, particularly during the lunch hour?
22. Is there seating in either edge or island format?
23. Are moveable benches and tables provided?
24. Can each backyard area be used for small graduation, assembly without seeming inappropriate to daily bands?

The Back Door
25. Does each campus building have a back door or entrance to a service entrance for deliveries, shuttle pickup, and so on?
26. Can trucks or other vehicles approach the building without disturbing the front porch or from points of the same or any other building and without disturbing nearby classrooms whose windows are open?

Campus Entrances
27. If the campus has one major entry, is location such that the majority of students will enter on foot, and is it signed for large pedestrian flows as well as vehicular traffic, casual studying, pursuing news, and the like?
28. Where vehicles and pedestrians share or enmesh, have the routes for each been carefully planned so as to avoid conflicts?
29. Do all campus entries have clearly designed bus stops?
30. Does the campus have adequate electrical for all major buildings?
31. If the campus roads have names, are they well marked?

Major Plaza Spaces
32. If the plaza area is intended as the principal program space on the campus, is it located on a major pedestrian route into or through the campus?
33. Is it bounded by buildings that generate a high degree of use throughout the day and into the evening? (student union, gym, theater, bookstore, student center, etc.)
APPENDIX D:
Design Review Checklist
Marcus and Wischemann, 1998

31. Is it designed to be large enough for rallies and performances yet not seem empty when few people are present?
32. Is it designed so that two major daily activities—walking through and sitting—are comfortably accommodated?
33. Is the edge of the space reasonably articulated at a scale appropriate for walking or sitting, and anchor spots where people might sit, study, or converse with friends, and so on?
34. Do the various forms of seating accommodate people watching, quiet study, or socializing, sitting alone, sitting in a group, and so on?
35. Are bicycle racks provided? Alternatively, have centralized bicycle parking areas been provided?
36. Are there noise barriers or other landscaping features to mitigate sound from neighboring buildings?
37. Are the trees, shrubs, or other vegetation sufficiently large or tall to provide shade and privacy for users?
38. Are there sources of reasonably priced food available, either on or close to the main plaza?
39. Does the plaza contain eye-catching features, such as a fountain or sculpture, to provide a visual focal point and an easily recognized meeting place?

Outdoor Study Areas

41. Are there areas for outdoor study at major building entrances? Are these areas visually prominent and well lit?
42. Are there areas for outdoor study with views of natural elements such as a pond, lake, or meadow?
43. Are there areas for outdoor study with views of buildings or other significant features in the surrounding environment?
44. Are there areas for outdoor study with views of the sky or the horizon?
45. Are there areas for outdoor study with views of the sun or the moon?
46. Are there areas for outdoor study with views of the stars?
47. Are there areas for outdoor study with views of the landscape?
48. Are there areas for outdoor study with views of the sky or the horizon?
49. Are there areas for outdoor study with views of the sun or the moon?
50. Are there areas for outdoor study with views of the stars?
51. Are there areas for outdoor study with views of the landscape?
52. Are there areas for outdoor study with views of the sky or the horizon?
53. Are there areas for outdoor study with views of the sun or the moon?
54. Are there areas for outdoor study with views of the stars?
55. Are there areas for outdoor study with views of the landscape?

Factors Inhibiting Campus Use

56. Is the campus well lit for nighttime use, especially in heavily planted areas and along well-used pedestrian routes?
57. Are there adequate numbers of emergency phones in prominent locations?
58. Are there sufficient safety patrols after dark, particularly along well-used routes?
59. Are there bicycle routes on campus clearly marked?
60. Is there adequate and secure bicycle parking at each campus entry, and at every major building entry? If not, are there bicycle parking areas provided?