The Effects of the Built Environment on Mental Health:

The Recovery & Re-Integration of Mental Health Patients into Society

Miranda N. George

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

"The basic principle that links our places and states is simple:

a good or bad environment promotes good or bad memories,

which inspire a good or bad mood,

which inclines us toward good or bad behaviour.

We needn't even be consciously aware of a pleasant

or unpleasant environmental stimulus for it to shape our states.

The mere presence of sunlight increases our willingness to help strangers

and tip waiters,

and people working in a room slowly permeated by the odor of burnt dust

lose their appetites, even though they don't notice the smell.

On some level,

states and places are internal and external versions of each other."[1]

[1] Winifred Gallagher, *The Power of Place: How Our Surroundings Shape Our Thoughts, Emotions, and Actions* (New York, NY: Harper Collins, 1993), 132.

Abstract

The architectural environment exerts a profound effect on the emotional well-being of those who experience it. Humans "adapt to their environment in both intentional and unintentional ways and are, in turn, changed by the places we inhabit."[2] Infinite combinations of social relationships and physical spaces can influence the state of mental health or mental illness of each individual. The impact of early family experiences and quality of group relations strongly relates to the physical space that surrounds us. Community, family, and interpersonal relationships continuously shape self-worth and motivation while the surrounding environment intensifies feelings and emotions. Whatever an individual's reaction, it can always be improved or obstructed by the environment.

According to the Canadian Mental Health Association (CMHA), recent statistics show that 1 in 5 people in Ontario are affected by mental health issues. Throughout Canada, an ever-growing amount of people are living with mental illness on a daily basis and, as the population increases, the need for recovery facilities continues to rise. While there are several different types of mental disorders, some are more affected by the surrounding environment than others, such as depression, anxiety, and other mood disorders. Although some patients are successful in their recovery, many who enter rehab facilities or psychiatric hospitals have difficulty coping as they transition back into general society and often 'fall through the cracks'[3] between large hospitals and community services. Others experience adverse problems and cannot adapt to living in institutional facilities. This difficulty is not only caused by a lack of support system but also by the drastic change of environment which can become overwhelming for someone dealing with an unstable state of mind. The challenge is bridging the disconnect that exists between institutional care and general society to ease the transitional period for ex-patients. Although many studies have examined the effects of natural environments on our behaviour and well-being, it is important to explore and thoroughly understand the relationship between the built environment and mental health since the man-made environment continues to represent more of the total environment for the majority of people. From this understanding, a set of guidelines have been formed to optimize the built environment for those who are particularly vulnerable.

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[2] Paul A. Bell, *Environmental Psychology, 5th ed.* (Belmont, California: PhotoDisc, 2001), 57.
[3] Reva Gerstein, "Mayor's Action Task Force on Discharged Psychiatric Patients," *The Preliminary Report of the Mayor's Action Task Force on Discharged Psychiatric Patients.* Toronto, ON. (1983): 13.

Acknowledgements

I would like to thank my supervisor, Scott Robinson, as well as my external support system, Peter Turner and Roberto Chiotti, for their guidance and participation throughout this project work. In addition, I would like to thank all of the mentors of the RAIC Syllabus Program for their support, input, and encouragement throughout this entire program. You have pushed me to think outside of the box and to continuously improve my ideas and designs.

I would also like to thank all the people who participated in my survey, as well as the medical and design professionals I have interviewed and met with throughout this process. The input and level of dedication to improving well-being for those with mental disorders has been truly inspiring.

Finally, I must thank my family and friends for their continued support and encouragement throughout the RAIC Syllabus program. All of you have been instrumental to my success.

Dedication

In loving memory of my mom,

Carolynn J. George

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PART ONE: THE RESEARCH

1.0 - Introduction

1.1 - Thesis Statement

The built environment impacts behaviour and can be manipulated to affect mental health in a positive way. The intent of this thesis is to examine the role architecture and the built environment can play in the re-integration of patients living with mental illness. The research will inform a set of guidelines outlining the effects of the built environment on human behaviour, how people perceive space, and which architectural elements can influence mood and behaviour in a positive way. Finding the connection between mental health and the built environment will add to the architectural discourse by providing a foundation for further research and application for future institutional developments and healthcare design. The new building design will have a positive effect on clients of the facility, and ease the transition between institutional environments and the surrounding community to promote social integration between patients and surrounding residents.

1.2 - Why Mental Health and Architecture?

This topic is important for society, and for me personally, for a number of reasons. First, mental health issues affect everyone. In Canada, 1 in 5 people will have a mental illness in their lifetime. Worldwide, approximately one person commits suicide every 40 seconds, with over 4,000 suicides occurring in Canada each year. All of these statistics are alarming, but not as disturbing as the fact that 90% of people who commit suicide have a diagnosable mental illness, and approximately 75% of those with mental illnesses will never seek or receive any treatment at all, which brings me to my next point.

The stigma associated with mental illness is not going away, which impacts the recovery of patients with mental disorders. The barrier created around mental illness due to stigma is so strong that approximately 42% of people say they would be uncomfortable revealing they have a mental illness, including health care professionals. And finally, the reason why this is so important to me personally, is because I have family members who are currently dealing with a mental health issue, and other family members who have passed away due to a mental illness.

1.3 - Introduction

The built environment can influence the experiences of occupants inhabiting a space. Whether direct or indirect, architecture affects humans socially, physically, and psychologically, in both negative and positive ways. For those who are dealing with mental illnesses, the environment can be more of an influence since they are often more vulnerable than those considered to be of "normal mental health." The objective of my thesis is to examine a number of strategies in order to determine the optimal environmental setting for those dealing with mental illnesses during their recovery, and after their recovery, as well as ways to integrate future mental health care facilities with the surrounding community. Three key themes guided my research throughout this project: how the built environment impacts behaviours and emotions, how the built environment can be manipulated to affect ones health in a positive way, and how architecture and the built environment can play a role in the re-integration of people living with mental illness into general society. The research in the following sections is structured to first look at the broad issues of human-environment relationships, then focus in to examine specific connections between the built environment, mental illness, and health care facilities.

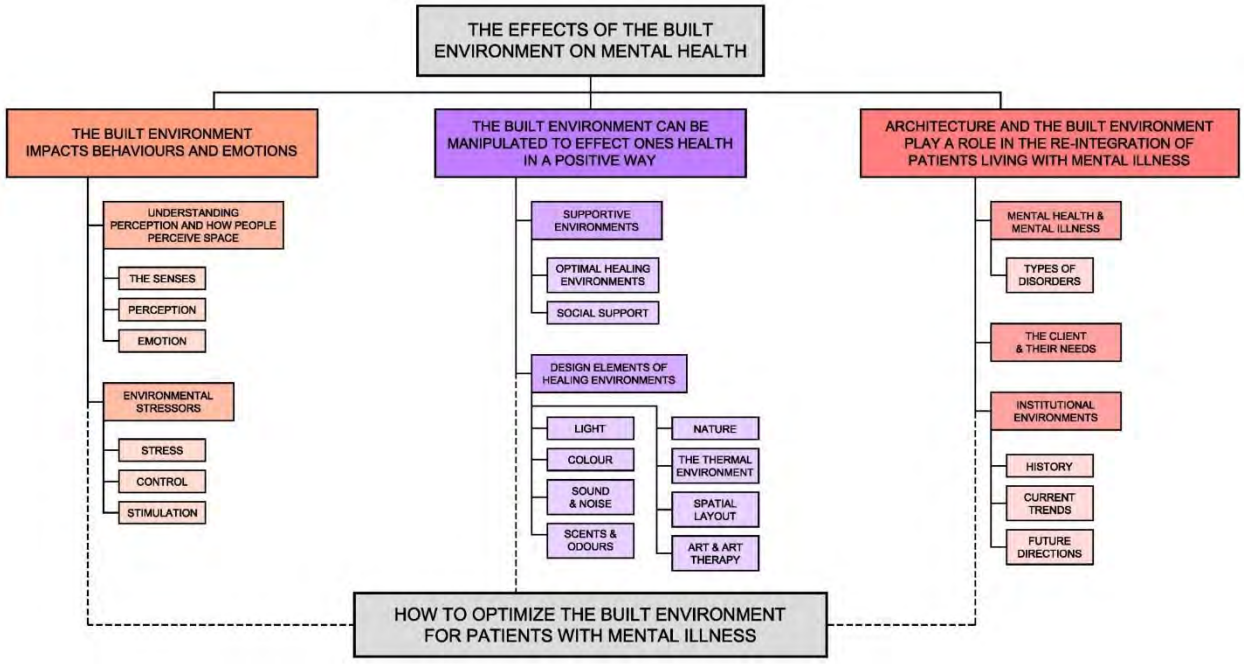

Figure 1: Organization of Research

2.0 - Understanding Perception: How We Perceive Space

In order to understand our relationship with space and how the environment affects us, we first need to explore how we become aware of our environment and what factors influence the particular ways we comprehend our surrounding physical settings. The purpose of this section is to understand the relationship between humans and the built environment by examining how humans respond to space in terms of perception of the space itself, how the space affects the body, and how humans respond to various environmental stimuli. My findings are then analyzed to understand how to improve specific elements that influence our thoughts and perceptions.

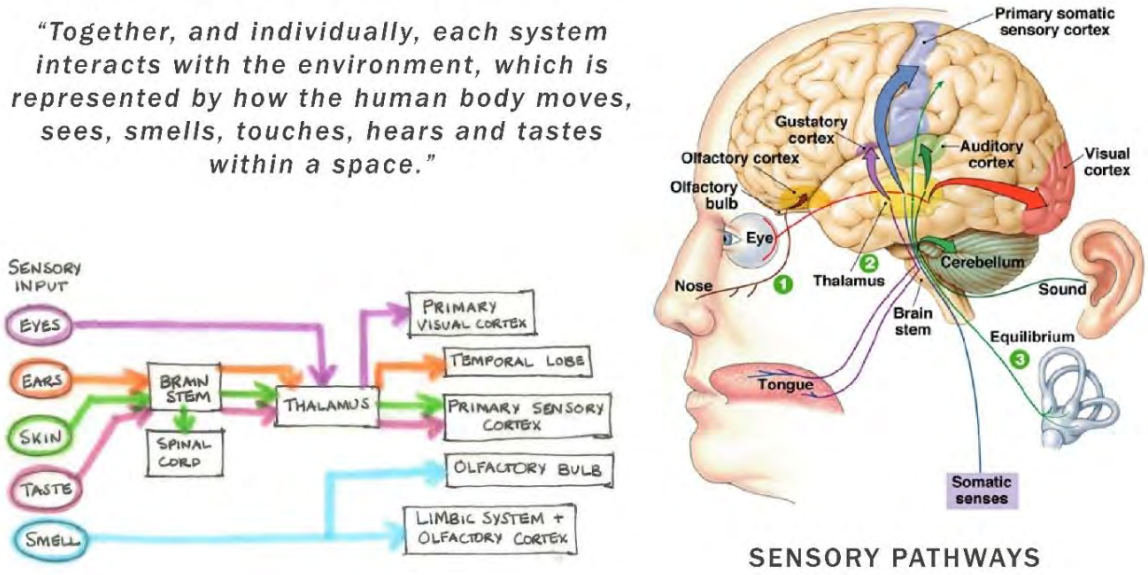

Figure 2: Connections between the Brain and the Senses[4]

2.1 - Architecture and the Senses

There is a strong connection between the senses and the formation of our perception. In order to receive information from the environment, each sensory organ is part of a system - visual, auditory, olfactory, gestation, and haptic (tactile) - which receives and transmits sensory information to the brain. How the human body engages space is of prime importance; as the human body moves, sees, smells, touches, hears, and even tastes within a space – the architecture comes to life.

[4] Sketch (left) by me. Image (right): Birkdale Neuro Physio, "Motor Learning Depends on Sensory Information," 2014.

2.1.1 - The Visual Sense

The sense of sight dominates our perceptions, in part because over two-thirds of the nerve fibres that enter our central nervous system are from the eyes.[5] Processing visual sensations into perceptions of the world around us involves a complex interaction of the eye and the brain. In simple terms, a transparent lens focuses and detects images of visible light on photoreceptors in the retina of each eye, and the retina then generates electrical nerve impulses that correspond to various colours, hues, and brightness. The visual system carries out a number of tasks, including the identification and categorization of visual objects, assessing distances to and between objects, and guiding body movements in relation to the objects seen. Through sight we detect and interpret information to build a representation of the surrounding environment which enhances our spatial experience.

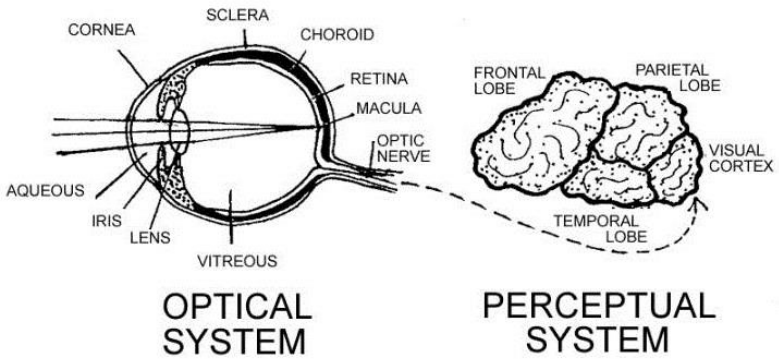

Figure 3: The Visual System[6]

2.1.2 - The Auditory Sense

The sense of hearing (or audition) is the ability to perceive sound by detecting vibrations in the surrounding medium (typically air). Unlike vision which is focused, sound does not usually come from a single source; it is omni-directional, approaching from multiple sources and directions, and is superimposed as it arrives at the ears. The brain then combines the input of our two ears to determine the direction and distance of sounds.

[5] Kathleen Karlsen, "Architecture and Design Psychology," in *Architecture Blogspot,* 2010.
[6] Hon-Vu Q Duong, "Visual System Anatomy," in *Medscape*, 2017.

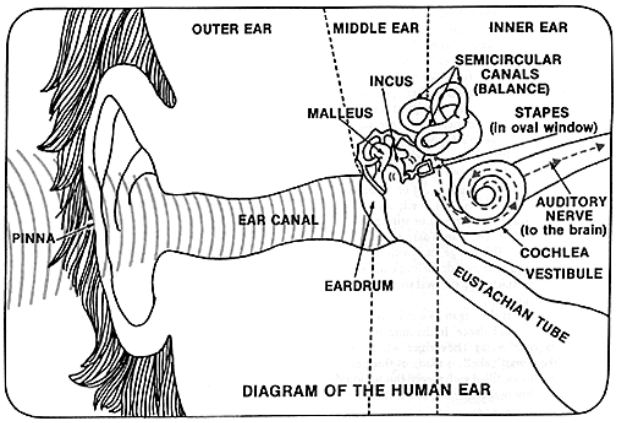

Figure 4: Parts of the Ear[7]

Although sound is often thought of as a negative aspect – noise – when sound is used in the right way the experience of a space can be further enriched, such as in Paley Park, New York City. Designed by landscape architectural firm Zion & Breen, the pocket park is located in a lively area of Midtown Manhattan hidden amongst office buildings on East 53rd Street. As one steps from the sidewalk and enters the narrow space, a sense of serenity develops as city noises begin to fade away. The side walls of the space are covered with dense, green ivy, while the rear wall of the space is a 20-foot (6.1m) high cascading waterfall spanning the entire back of the park.

Figure 5: Paley Park, New York City

[7] Gallaudet University, "About Hearing," 2015.

The powerful feature runs 1,800 gallons of water per minute, creating a backdrop of sound that completely masks the noises from the street and surrounding urban environment. Combined with the airy canopy formed by locust trees and simple spatial organization of furniture, the park offers a quiet urban oasis and creates a sense of privacy and tranquility. The park provides a perfect setting for reflection and the constant cycle of water further enhances the experiences of park occupants.

Figure 6: Waterfall at Paley Park, New York City

2.1.3 - The Olfactory Sense

The sense of smell influences us in such a basic way, yet can have the most impact on our emotional responses out of all the senses. The cavity of the nose is lined with mucous membranes that have olfactory receptors connected to the olfactory nerve. The smell receptors interact with the molecules of these vapours and transmit sensations to the brain. These olfactory receptors are directly connected to the limbic system, which is thought to be the seat of emotion. Smell sensations are then relayed to the cortex where cognitive recognition occurs. By the time we correctly name a particular scent as, for example, cinnamon, the scent has already activated the limbic system, triggering deep-seated emotional responses.[8] This is one of the reasons why smells have such a powerful influence on

[8] Fox, "The Smell Report: An Overview of Facts and Findings," 4.

our moods. In fact, surveys on reactions to odours show that many of our olfactory likes and dislikes are based purely on emotional associations.

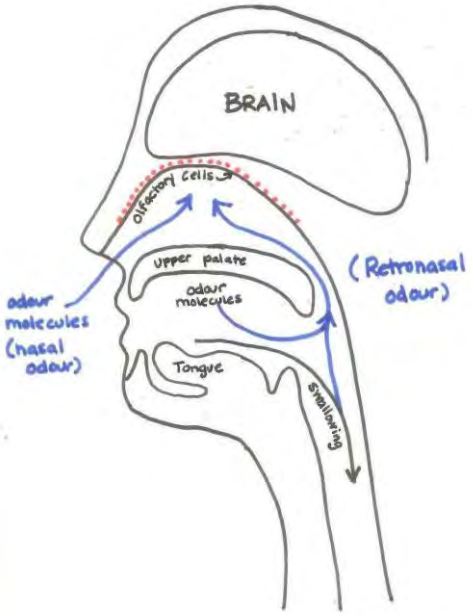

Figure 7: Connections between Scent, our Brains, and our Emotions

2.1.4 - The Gestation Sense

While the nose can distinguish among hundreds of substances, the human tongue can only distinguish among five distinct types of taste. However, the sense of taste functions in coordination with the sense of smell by amplifying our sense of taste. Given our cultures focus on eating as a social medium, incorporating the sense of taste into design can evoke the recall of positive memories and social experiences, ultimately adding to the overall ambiance of a space. Using elements that depend on fragrant spices such as cinnamon or vanilla can remind us of the tastes and foods we associate with those smells. In addition, colour affects the appetite, and in essence, the taste of food. Belinda Bennett, restaurant designer and owner of Bennett Design Group, says “certain colours and delicate details evoke oral sensation. A delicately coloured, polished stone surface is subliminally sensed by the tongue.”[9] For example, blue colour schemes for seafood restaurants, pink colour schemes for dessert establishments, and lighting can all positively impact the appearance of food.

[9] Harrington College of Design, “Interior Design: Focusing On The 5 Senses,” 2013.

2.1.5 - The Haptic Sense

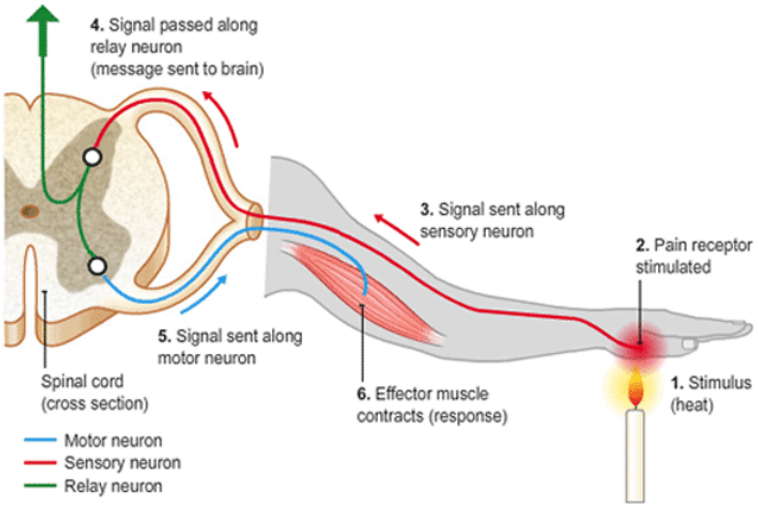

Figure 8: The Haptic System and the Body[10]

The sense of touch is distributed throughout the body by nerve endings in the skin and other parts of the body that transmit sensations to the brain. The sense of touch provides three-dimensional information of material bodies, such as texture, weight, density, and temperature, allowing us to experience something more than by a simple glance at it. Haptic perception relies on the forces experienced during touch adjacent to the receiver, by use of their body. Movement, balance, and scale are felt unconsciously through the body as tensions in the muscular system, positions of the skeleton, and inner organs.[11] Recent studies reveal that mental health can be strongly influenced by the sense of touch, and suggest that touch therapy can help treat mental illnesses such as depression and anxiety disorders.[12]

2.2 - Perception

Perception is affected by sensory functions that play an important role in the ways we receive and respond to information. It is an active process, in which the brain strives to comprehend sensory

[10] Raghav Rajan, "Understanding How Activity in the Brain Produces Movements," 2015.
[11] Pallasmaa, 46.
[12] Vaucelle, Cati, Leonardo Bonanni, and Hiroshi Ishii, "Design of Haptic Interfaces for Therapy," *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 467-470. ACM, 2009.

experiences and fit them to a familiar pattern to make sense of the world around us.[13] All perception involves signals in our nervous systems, which result from physical or chemical stimulation of our sense organs, and how we perceive environmental influences affects our behaviour, actions, and interactions.

Cognition results from the interaction of several mental processes including memory, language, perception, attention, and reasoning. Information is stored in the brain as spatial networks known as 'cognitive maps,' which link our recall of experiences with perception of present events, ideas, and emotions.[14] The brain then sifts through the information for relevant cues (signals) rather than irrelevant cues (noise) to actively organize an internal representation of our external world and make decisions based on the information received.[15] The goal is to optimize the signal-to-noise ratio (SNR), to minimize irrelevant information and clearly convey the message that is intended, which is especially important for visual and auditory information. Clear organization and meaning of designed spaces can make interpretation and perception of an environment easier for the receiver.

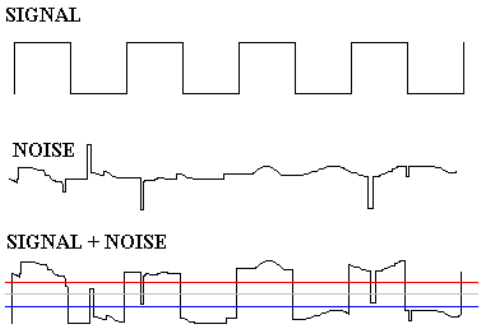

Figure 9: Signal-to-Noise Ratio[16]

Designers should therefore consider the 'psychological implications' of their design decisions.[17] In the 1950's, Jonas Salk was working on a cure for polio. After hitting a road block, he went to Assisi, Italy and wandered around a 13th century monastery to allow his mind to unwind. It was there that he experienced a breakthrough that led to the development of the polio vaccine. Salk was so convinced that the monastery had influenced his mind that he commissioned architect Louis Kahn to design the

[13] Karlsen, "Architecture and Design Psychology," 2010.
[14] Raymond De Young, "Environmental Psychology," *Encyclopedia of Environmental Science* (1999): 223-224.
[15] D. Marr, *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information* (San Francisco: W.H. Freeman & Company, 1982).
[16] "Noise (Signal Processing)," 2016.
[17] David V. Canter, and Kenneth H. Craik, "Environmental Psychology," *Journal of Environmental Psychology* Vol. 1, No. 1 (1981): 1-11.

Salk Institute in La Jolla, California in hopes that other scientists would benefit from similar serene surroundings.[18] Together, Salk and Kahn's visions manifested a timeless landmark that is a powerful and gracious place of discourse, reflection, and discovery.

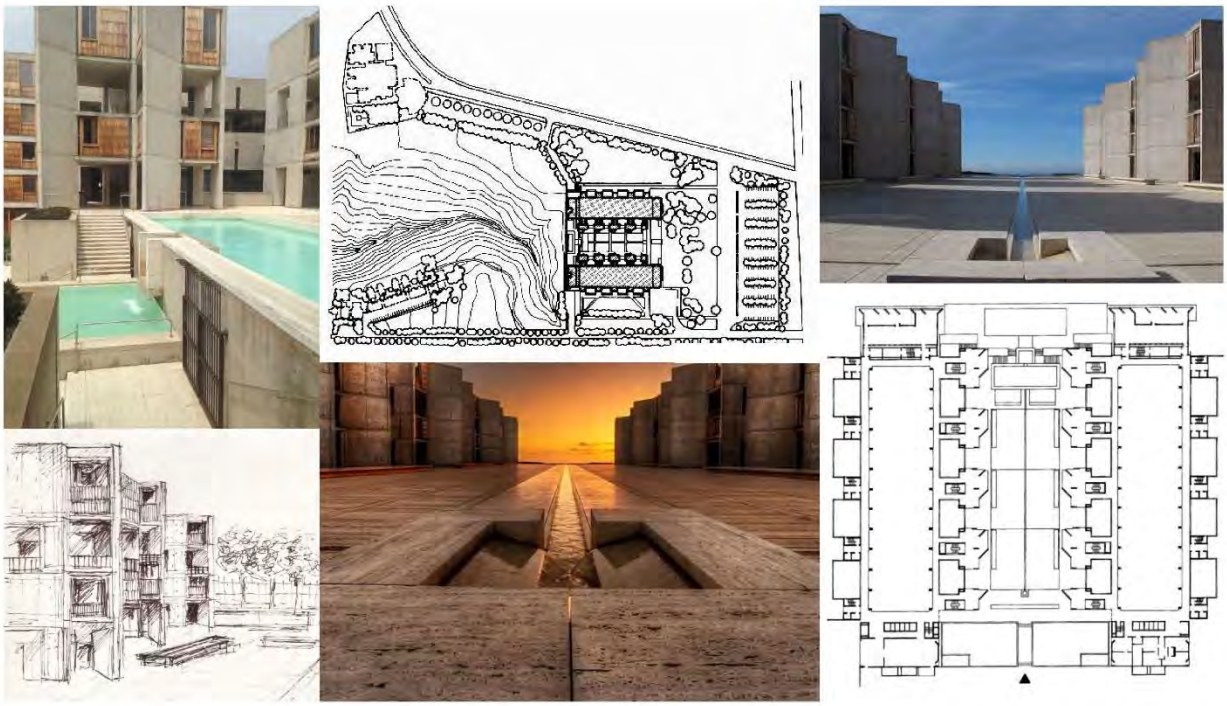

Figure 10: Select Images of the Salk Institute, La Jolla, California[19]

At the Salk Institute, the two six-storey laboratory buildings forming the north and south boundaries of the complex were designed to promote collaboration, with their symmetry symbolizing scientific precision. Centered between the two buildings is a channel of water that seems to pour into the Pacific below, and a powerful sense of peace is felt in conjunction with the calming sounds of the ocean. Jonas Salk's vision, coupled with the hard work and dedication of former and present Salk researchers, has resulted in a unique environment in which scientific discoveries have an important impact on our understanding of human health.

[18] Michael Cannell, "This Is Your Brain on Architecture," 2009.
[19] Luke Fiederer, "AD Classics: Salk Institute / Louis Kahn," in *Arch Daily*, 2017.

Figure 11: Salk Institute, La Jolla, California

As Salk and Kahn discovered, perception, and an understanding of its impact on humans, can be a useful design tool for an architectural language that suits its users; all behaviour occurs within a context that has the potential to affect it.[20] Research shows that individuals with a mental illness are sometimes unaware of their particular sensory needs or stress responses. Therefore, if the environment can be designed to change for and with the patient's sensory and perceptual abilities, positive outcomes can result. [21]

2.3 - Emotion

Emotion and perception are interconnected; emotion has influences on one's perception, while perception is fundamental to emotion. Information that is perceived influences affect, moods, and emotions, which are then revealed by our attention, judgments, and thoughts.

[20] H. C. Jr. Clitheroe, D. Stokols, and M. Zmuidzinas, "Conceptualizing the Context of Environment and Behavior," *Journal of Environmental Psychology* Vol. 18 (1998): 103.
[21] Harold M. Proshansky, William H. Ittelson, and Leanne G. Rivlin, *Environmental Psychology: People and their Physical Settings, 2nd ed* (New York: Holt, Rinehart and Winston, 1976), 20.

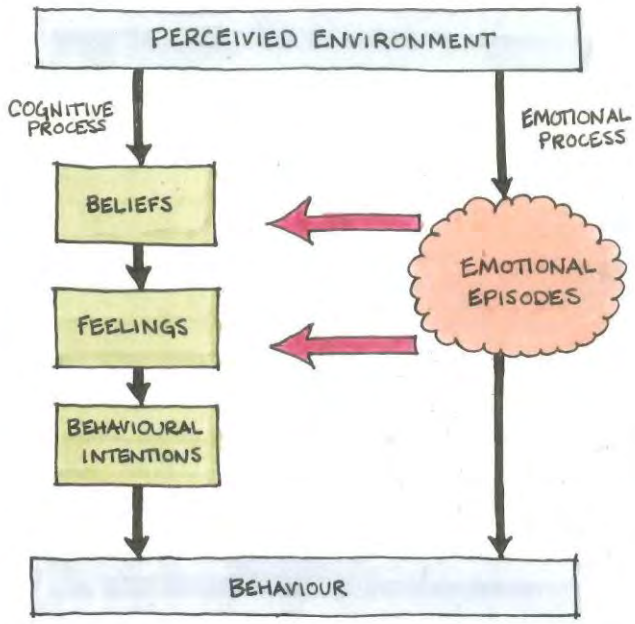

Figure 12: Connections between Emotion, Perception, and the Environment

Studies have shown that emotions influence many cognitive aspects such as attention, memory, perception, and information processing,[22] and even visual perception. Participants in a study at the University of Virginia campus were asked to stand at the bottom of a hill and judge how steep the hill was. To examine the influence of affective factors, researchers asked the students to make their judgments while listening to music on headphones chosen to be either 'cheerful and upbeat' or 'slow and sad'. (The same researchers had previously determined that music tended to alter people's momentary moods, and as a result they experienced either positive or negative affect as they made their judgments of the hill.) The results showed that the individuals feeling sad when they made their estimates saw the incline as steeper than those who felt happy or who were feeling nothing in particular.[23] In short, emotions will pull us towards 'good' stimuli and push us away from 'bad' stimuli, depending on whether we appraise it as favourable or harmful to our concerns. Fear will make us run in a threatening situation, whereas attraction will make us approach and initiate contact.

[22] Lusebrink, V.B. "Art Therapy and the Brain: An Attempt to Understand the Underlying Processes of Art Expression in Therapy." *Art Therapy: Journal of the American Art Therapy Association Vol. 21, No.* 3 (2004): 130.
[23] Gerald L. Clore, and Janet Palmer, "Affective Guidance of Intelligent Agents: How Emotion Controls Cognition," *Cognitive Systems Research* 10, no. 1 (2009): 21-30.

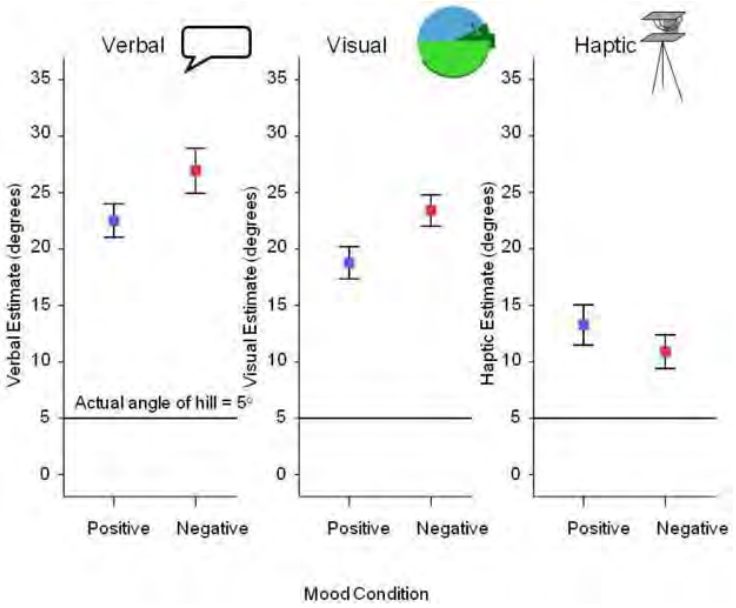

Figure 13: Perception of a Hill Based on Mood

As emotion is to perception, it should also be understood that perception is fundamental to emotion; all human interactions involve emotion, including interaction with our material world. A study of the design of multimedia learning environments indicated that applying emotional design principles (such as visual design principles, layout, colour, and sound) to the learning materials induced positive emotions, and the induced positive emotions also increased motivation, satisfaction, and perception toward the material. The results of the study proved consistent with several previous studies which found that positive emotions are direct and indirect factors in changing the observers' affective experiences such as attitude, judgment, evaluation, and satisfaction.[24] Brain scan studies also revealed that the sight of an attractive product can trigger the part of the motor cerebellum that governs hand movement. Instinctively, we reach out for attractive things; "beauty literally moves us."[25]

[24] Um et. al., "Emotional Design in Multimedia Learning," 496.
[25] RTKL Associates, "Why We Love Beautiful Things," 2013.

3.0 - Manipulating the Environment

3.1 - Environmental Stressors

Several factors can influence the relationship between the built environment and well-being, including both negative and positive aspects of the environment. Stress, control, and stimulation are all interconnected with other elements of the environment to add to - or inhibit - the experiences of a person within a space. In contrast, well-designed environments have a positive influence on moods and experiences within that space, and can even become part of the healing process for patients. This section examines both negative and positive aspects of the environment, and how to manipulate different elements to enhance the well-being of patients as well as the general population.

3.1.1 - Stress

Stress influences a variety of destructive psychological, physiological, and often behavioural manifestations that, in turn, impact our emotions and work against our wellness. It is a state of mental tension and worry that is initiated by external forces and which causes strong feelings of anxiety, and is an imbalance between what we need and are capable of, and what our surroundings offer and what it demands of us. Behaviourally, stress has been associated with a wide variety of reactions including verbal outbursts, social withdrawal, sleeplessness, alcohol abuse, and non-compliance with courses of medication. Psychologically, stress can manifest in a sense of helplessness and feelings such as anxiety and depression. For example, humans generally express an instinctual need for an escape route and recoil psychologically when confronted with cave-like rooms where we may feel trapped.[26] In healthcare environments in particular, patients experience considerable amounts of stress stemming from reduced physical capabilities, uncertainty, and painful medical procedures, while simultaneously experiencing physical-social environments that are noisy, invade privacy, and provide little social support,[27] which in turn have a variety of negative effects on our emotions and wellness.

[26] Karlsen, "Architecture and Design Psychology," 2010.
[27] Roger S. Ulrich, "Effects of Interior Design on Wellness: Theory and Recent Scientific Research," *Journal of Health Care Interior Design* 3, no. 1 (1991): 98.

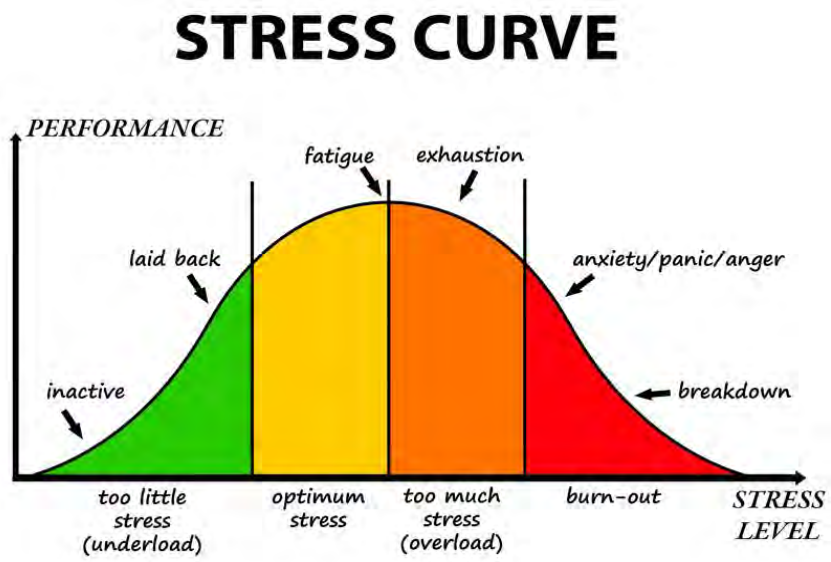

Figure 14: Relationship between Stress and Performance[28]

Stress has a number of impacts on our health and well-being, and can amplify a variety of conditions, including mood disorders, aggression, anxiety, panic attacks, depression, aches and pains, constant fatigue, migraine, nausea and dizziness, eating disorders, lack of appetite, impaired sleeping, and anti-social behaviour. Considerations to limit or reduce stress and promote wellness include environments that:

- Are understandable
- Are human scale
- Provide choice and flexibility[29]
- Increase a sense of control
- Provide access to social support
- Allow access to positive distractions[30]
- Provide balanced levels of stimulus and information

[28] Tanja Taljaard, "The Difference Between Good Stress and Bad Stress," 2016.
[29] Hall, Edward. "The Anthropology of Space: An Organizing Model." *Environmental Psychology (*New York: Rinehart & Winston, 1976), 223.
[30] Roger S. Ulrich, "How Design Impacts Wellness," *The Healthcare Forum Journal* 35, no. 5 (1992): 23.

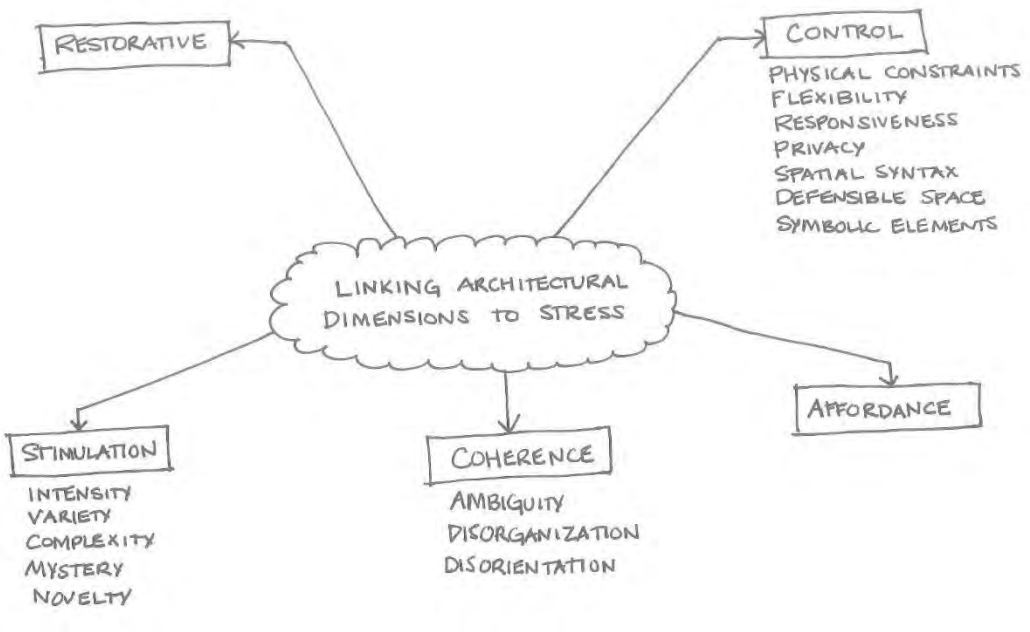

Figure 15: Linking Architectural Dimensions to Stress

To summarize, stress-inducing qualities of spaces should be eliminated, such as environments that are physically threatening, overloaded with information, deprived of stimulation, and cause decisional overload or require excessive amounts of attention and resources in transactions with the environment. Highly ambiguous spaces promote stress because people cannot make sense out of them—their meaning, function, or basic form and composition are hard to discern. Environmental stressors that impact our levels of stress include:

- Thermal stressors (temperature, humidity and indoor air quality)
- Sensory stressors (noise, odours, lighting and visual comfort)
- Manipulation of furnishings and equipment
- Lack of privacy, crowding, personal territory and personal comfort
- Orientation and wayfinding (confusing signage and layouts)

3.1.2 - Control

Humans have a strong need to feel a sense of control over their environment due to the power such control symbolizes, which can be hindered or enhanced by a number of parameters. Numerous studies support the notion that a diminished sense of control can result in manifestations such as depression, passivity, elevated blood pressure, and reduced immune system functioning.[31] This is due to the perception that a lower sense of control over a threatening stimulus increases the expected probability of danger; when a person feels in control over their surroundings they feel less anxious and less stressed, and in turn experience better mental health than a person who lacks a sense of control.[32] Rivlin and Evans note that, in hospitals and institutional environments in particular, the "large scale, sterility, uniformity of materials and furnishings, and restrictions on personalization options, all contribute to the institutional quality of buildings."[33]

> *"The structural design or arrangement of space imposes restrictions on behaviour. Doorways determine our access to a room and room dimensions restrict the kinds of behaviours that can take place inside a room."* [34]

Several strategies can be implemented to increase a patient's sense of control such as eliminating negative stressors and symbolic elements that deny visual privacy, prevent personal choice (such as being able to see out of or open windows), or present way-finding difficulties.[35] Creating interventions that allow individual participants to exercise choice over their surrounding environment helps to increase their decision-making skills while also increasing their personal allegiance to behaviour change, commitment to skill building, and improves overall health outcomes.[36] Allowing choice between interaction and solitude, creating opportunities for personal choice, and providing access to visual privacy and spatial composition all enhance a sense of control.

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[31] Andrew Steptoe, Jane Wardle, and Michael Marmot, "Positive Affect and Health-Related Neuroendocrine, Cardiovascular, and Inflammatory Processes," *Proceedings of the National Academy of Sciences of the United States of America* Vol. 102, No. 18 (2005): 6508-6512.
[32] Roger S. Ulrich, "Effects of Healthcare Environmental Design on Medical Outcomes," In *Design and Health: Proceedings of the Second International Conference on Health and Design. Stockholm, Sweden: Svensk Byggtjanst* (2001): 54.
[33] Evans and McCoy, "When Buildings Don't Work: The Role of Architecture in Human Health," 86.
[34] Ayers, Susan, et. al., *Cambridge Handbook of Psychology, Health and Medicine*. Cambridge University Press, 2007.
[35] Ulrich, "How Design Impacts Wellness," 23.
[36] Babcock, "Using Brain Science to Design New Pathways Out of Poverty," 13.

Although a sense of control is important to a person's well-being, it is noted that there are instances where structure and enforcement may be required when dealing with people who are severely mentally ill. Patients dealing with mental disorders are particularly vulnerable and some may feel a strong sense of structure provides security and safety. A study of acute care psychiatric units by Shattell, found that patients experienced freedom while in a locked unit but experienced confinement by the "freedom" of the outside world.[37] Patients were afraid to leave the safety of their space because they felt restricted in the outside world by their "self-destructive impulses."[38] Therefore, it is important to find an appropriate balance for all building occupants to feel comfortable yet safe within the built environment.

3.1.3 - Stimulation

Stimulation describes the amount of information an object or setting impinges upon the receiver, which influences their emotion and perception toward the object or setting. Exposure to visual and acoustic stimulation is strongly influenced by layout, orientation, circulation systems, and the individual's location within a space. Environmental stimuli also act through psychological processes of a cognitive or an emotional nature, as a result of sensory perceptions. For instance, the presence of plants in a room give a space a more home-like feeling resulting in less anxiety, which in turn promotes recovery. The determining factor is the amount, or level, of stimulation and the balance of all varying elements together as a composition.

Figure 16: Lack of Stimulation (Sensory Deprivation) vs. Over Stimulation (Sensory Overload)

[37] Shattell, Mona, "Eventually It'll be Over: The Dialectic Between Confinement and Freedom in the World of the Hospitalized Patient," (2002).
[38] Andes and Shattell, "An Exploration of the Meanings of Space and Place in Acute Psychiatric Care," 2006.

Levels of stimulation can run from low levels of sensory deprivation to high levels of overstimulation and produce varying results. In healthcare environments, studies have shown that patients exposed to sensory deprivation – the lack of positive environmental distractions – experienced negative results and found it difficult to cope with the sensory deprivation experienced within isolated environments.[39] Windowless intensive-care units also appeared to intensify the deleterious effects of low levels of environmental stimulation such as unvarying lighting and the repetitive sounds of respirators and other equipment.[40] In contrast, stimuli of extreme intensities such as overly complex or incoherent patterns are also potentially stress-inducing, especially in institutional environments where patients can become overwhelmed and easily irritated.[41] For example, loud noises, bright lights, unusual or strong smells, and bright colours (particularly at the red end of the spectrum), all appear to increase stimulation. Generally, human beings function optimally with moderate levels of stimulation; people like small amounts of change but do not adapt well to large amounts of variation. However, it should be noted that there are particular instances where more or less stimulation is preferred. For example, to create a place for relaxation, symbols that induce higher levels of mental stimulation, physical activity, or confusion such as clutter should be eliminated, while symbols of peace and tranquility such as calming colours and peaceful music should be evident.[42] The key is to provide moderate levels of stimulation or to match the level of stimulation to the intended use of the space.

3.2 - Supportive Environments

Therapeutic environments are spaces whose physical, social, and symbolic qualities affect relations between people and place to promote better recovery and healing by being welcoming, balanced, relaxed, and reassured, yet stimulating and inviting to expand.[43] The Samueli Institute, a medical research organization dedicated to the science of healing, coined the term “Optimal Healing Environment” (OHE) which it describes as “the social, psychological, physical, spiritual, and behavioural components of healthcare that support and stimulate the body’s innate capacity to heal itself.”[44]

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[39] Cortvriend, "The Effect of the Healthcare Environment on Patients and Staff,” 2.
[40] Ulrich, “How Design Impacts Wellness,” 24.
[41] Proshansky et. al., 416.
[42] Venolia, 48.
[43] Venolia, 7.
[44] Rosalinda Ghazali, and Mohamed Yusoff Abbas, "Paediatric Wards: Healing Environment Assessment," (2011): 65.

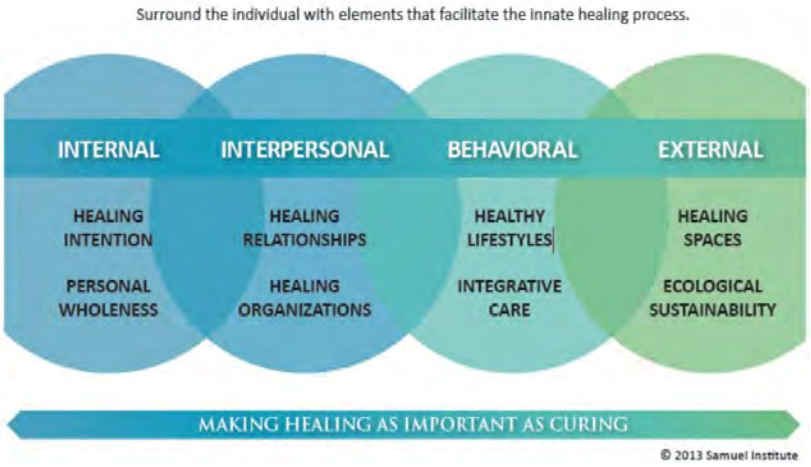

Figure 17: Optimal Healing Environments[45]

Enhancements to a person's well-being can be facilitated through a combination of efforts to enhance awareness, change behaviour, and create environments that support good health practices. In order for the environment to promote healing, the environment itself "should not hinder man in the performance of any activities essential to the satisfaction of his role in society, or require him to undertake activities to deal with the environment which he would not have to undertake if adverse characteristics were not present."[46] At a general level, the process of supportive healthcare design begins by eliminating environmental characteristics that are known to be stressful or can have direct negative impacts on outcomes (loud noise, for instance). The idea is to maintain the mental and physical states necessary for people to attain their goals by fulfilling certain physical, psychological, and symbolic needs. When these needs are not met, stress and other negative emotions can set in. In addition to eliminating negative stressors, supportive designs go a step further by emphasizing the inclusion of characteristics and opportunities in the environment that research indicates can calm patients, reduce stress, and strengthen coping resources and healthful processes.[47]

[45] Samueli Institute, "Optimal Healing Environments," 2016.
[46] Lawrence E. Hinkle Jr, and William C. Loring, "The Effect of the Man-Made Environment on Health and Behavior," *A Report of the Inter-University Board of Collaborators, U.S. Department of Health, Education and Welfare Center for Disease Control*, (1977), 204.
[47] Ulrich, "Effects of Healthcare Environmental Design on Medical Outcomes," 54.

3.3 - Elements of Healing Environments

Aesthetic enhancements are often used to make the look and feel of an environment appealing, which in turn influences humans in both negative and positive ways. This section critically examines the ways ambient features, architectural elements, and interior design dimensions of environmental stimuli can be manipulated to influence positive health and well-being. Those that are dealing with mental illness are particularly vulnerable, lack coping resources, and experience elevated sensitivities to a variety of environmental stimuli. The impact of each design element on various mental disorders, and its relationship to those dealing with mental disorders, is also reviewed to determine which design interventions are most beneficial to clients of mental health facilities.

3.3.1 - Light and Openings

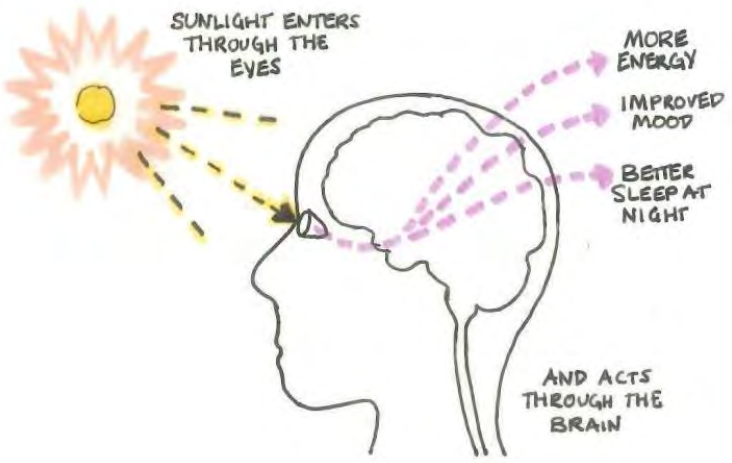

Figure 18: Impact of Sunlight on the Body

What we see, what we experience, and how we interpret a space is dependent on how light interacts with us (the observer) and the environment (the object). When used appropriately, light has very strong therapeutic values that influence positive psychological feelings and well-being, specifically for those dealing with eating disorders, depression, seasonal affective disorder, and Alzheimer's

disease.[48] Researcher Richard J. Wurtman calls light "the most important environmental input, after food, in controlling bodily function,"[49] due to its strong influence on human functioning. The constant cycle of the sun synchronizes our sleep-wake cycle (circadian rhythm), which in turn dictates our daily movements. For example, the body's circadian rhythm is governed by eating and regulation to natural light cycles; therefore, natural light is a key design consideration for those with eating disorders since they do not use food to regulate the body.[50]

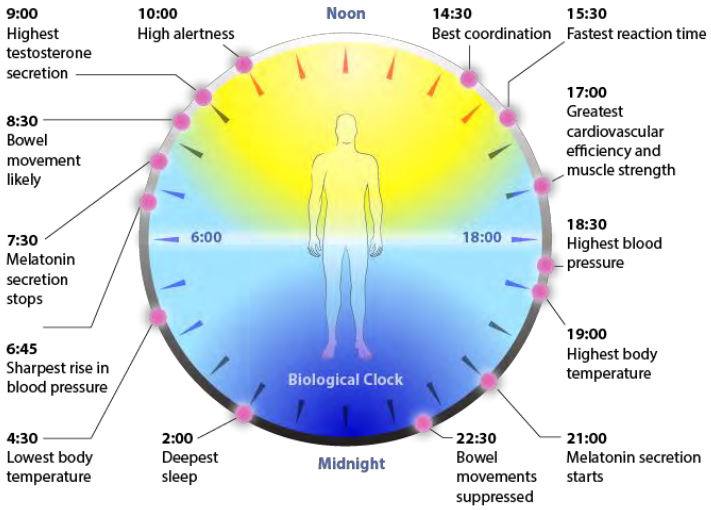

Figure 19: Circadian Rhythm and the Body[51]

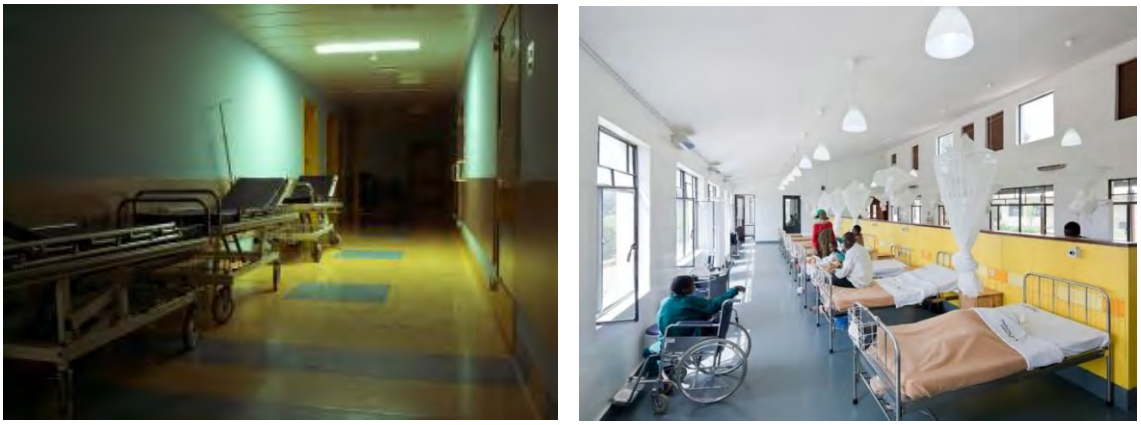

Figure 20: Poor Lighting[52] vs. Good Lighting[53]

[48] Connellan et. al., "Stressed Spaces: Mental Health and Architecture," 134.
[49] Venolia, 50.
[50] Connellan et. al., "Stressed Spaces: Mental Health and Architecture," 135.
[51] The National Institute of Mental Health, "Interpersonal and Social Rhythm Therapy," 2015.
[52] Koketso Motau, "All Theatres Repaired at Thelle Mogoerane Hospital," 2016.
[53] MASS Design Group, "Butaro Hospital," in *Arch Daily*, 2011.

The amount of exposure to (and orientation of) light sources also has a strong impact on our physical and emotional well-being. Findings from several studies concluded that patients in rooms with higher levels of sunlight recovered significantly quicker from depression,[54] and exposure to morning light is most effective for patients with depression and bipolar disorder.

Study	Patient Type	Light Source	Results
Beauchemin and Hays (1996) studied the relationship between amount of light exposure in patient rooms in psychiatric wards and their length of stay.	Patients with Depression	Sunny Rooms (max. 5000 lux)	16.9 days
		Dull Rooms (max. 300 lux)	19.5 days
Benedetti et al. (2001) studied the relationship between light exposure at different times during the day and length of stay of patients.	Patients with Bipolar Depression	Morning sunlight (max. 15,500 lux)	19.8 days
		Evening sunlight (max. 3000 lux)	23.5 days
	Unipolar Depression	Morning sunlight (max. 15,500 lux)	23.1 days
		Evening sunlight (max. 3000 lux)	20.9 days

Figure 21: Studies of the Built Environment and Light [55]

Based on my research, the following are conclusions and recommendations of appropriate lighting applications and principles for mental health facilities:

- Glare impacts mood and task performance, therefore it should be minimized in all spaces.
- Maximize natural light entering facilities to regulate our circadian rhythms and improve mood.[56] Where ample window area is not available, incorporate skylights and interior partitions (when possible).
- Construct windows without awnings or permanent immovable obstructions to sunlight.
- Maximize brighter exposures in the (southern northern hemisphere), and orient spaces facing south or east for exposure to morning light.

[54] Rubin, Owens, and Golden, *"*An Investigation to Determine Whether the Built Environment Affects Patients' Medical Outcomes*,"* 16.
[55] Dijkstra, 173.
[56] Haya Rahel Rubin, Amanda J. Owens, and Greta Golden, *Status Report (1998): "*An Investigation to Determine Whether the Built Environment Affects Patients' Medical Outcomes*,"* Center for Health Design, 1997, 16.

- Lighting must be chosen with respect to function, psychological reinforcement, visual appeal, colour rendition, and biological concerns.[57]
- Incandescent lamps and light fixtures with dimmer controls provide a calmer environment through the use of warm lighting, while also allowing occupants to feel a sense of control over the space using the dimmers.[58]
- When intensities are higher the space feels more invigorating, causing us to feel psychologically and physically stimulated. Rooms that are brightly lit with indirect lighting also seem more cheerful, while task lighting focuses us mentally on the subject material.
- If a depressed person is in a space that is too bright it may make them retreat even further into themselves,[59] therefore varying light from one area to another can combat monotony and enhance desired mood and function of each location.[60]
- Most people desire a dappled light such as what someone might experience while sitting under a tree on a sunny day. A similar effect can be achieved with interior lighting by using indirect light to create asymmetric lighting patterns on a floor or blank wall space.

Figure 22: Examples of Dappled Light and Sun Shading, Ismaili Centre, Toronto

[57] Ruth Brent Tofle, Benyamin Schwarz, So-Yeon Yoon, Andrea Max-Royale, and M.E. Des, "Color In Healthcare Environments: A Research Report," (2004), 48.
[58] Dahl, et. al.," Child-Adolescent Mental Health: Using Sensory Environments to Help Patients Discover A New Reality," 4.
[59] Venolia, 60.
[60] Venolia, 54.

3.3.2 - Colour

"Colour adds dimension to a world that is otherwise light and dark, form and motion."[61]

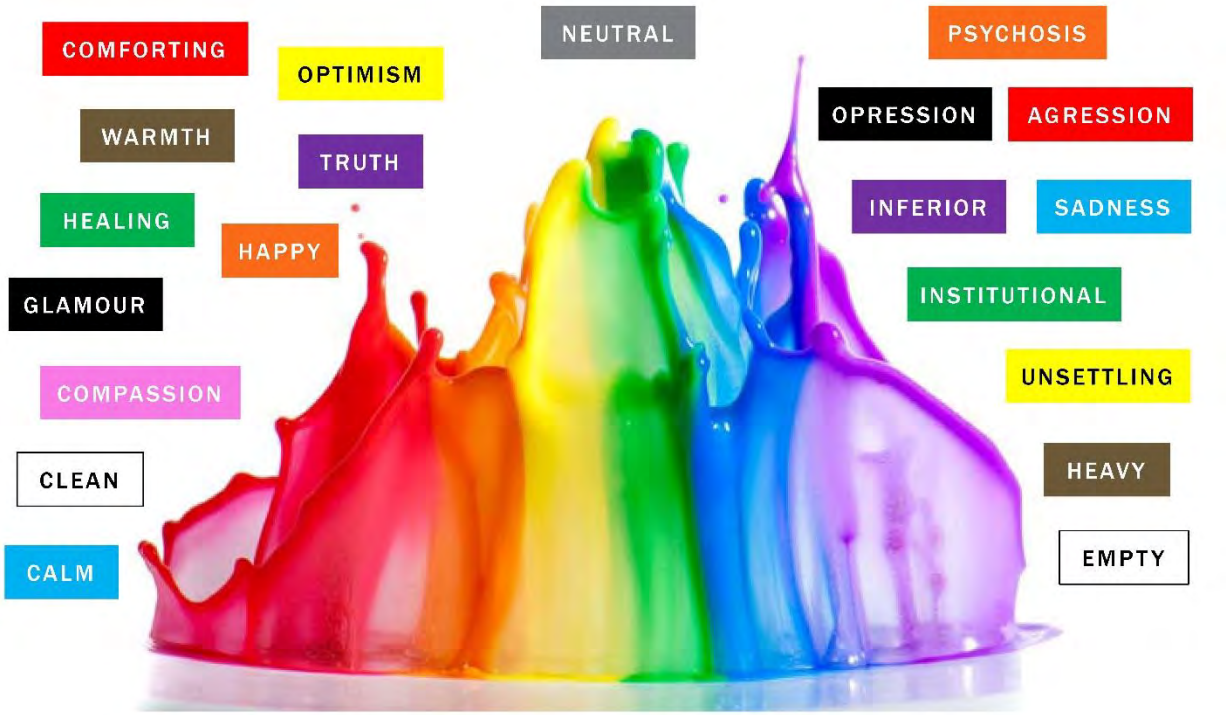

Figure 23: Symbolic Meanings of Colour

Colour is one of the most powerful elements in our environment; when looking at an object we first assess its colour which reaches us deeply and immediately on many levels. Emotional responses to colours are not only caused by culturally learned associations and by the physiological and psychological makeup of people, but also by the context of meaningful settings and situations. For example, researchers at the University of Rochester asked a group of interior designers to mock up cocktail lounges in red, blue, and yellow, and invited subjects to have a drink wherever they liked. Most gravitated to the yellow and red rooms, which proved to be the most socially active areas. However, participants in the blue room stayed longer, presumably because blue has a calming effect.[62] The appropriate application of colour can help change moods from sad to happy, dispel loneliness, encourage conversation, and create a sense of peace and well-being. In addition to our emotions, colour

[61] Venolia, 57.
[62] Michael Cannell, "This Is Your Brain on Architecture," 2009.

affects us physically and can unconsciously affect muscular tension, brain wave activity, heart rate, respiration, and other functions of the autonomic nervous system.[63] Although there may be variations in findings between a number of studies, general conclusions can be drawn that are beneficial in mental health facilities and for those with mental disorders:

COLOUR	POSITIVE EFFECTS & ASSOCIATIONS	NEGATIVE EFFECTS & ASSOCIATIONS	SUGGESTED USES
Yellow	• Energy and excitement • **Optimism** • Clarity and intellect • **Higher self-esteem** • Creativity and **confidence** • Most psychologically stimulating colour • Noted for its **mood-enhancing** properties	• Some shades can feel unsettling, and **seldom restful** • Can invoke fear or emotional fragility, sending us into a state of **depression** or **anxiety** • Can cause thought associations to jaundice and aging	• Settings where creative activity is desired and socialization encouraged • Can be used to increase illumination in poorly lit areas • Use low to medium intensities of yellow in rooms intended for high-energy activities
Orange	• Evokes warmth, **comfort,** and **reassurance** • Encourage verbal expression of emotions	• None	• Orange and variations of orange (peach and salmon), are cheerful colours and are popular in dining rooms and healthcare environments.
Pink	• Moderately intense pink **quickly calms** individuals • Yellow-based pinks provide pleasing surroundings for those with **dementia**	• None	• Pink appears to be appropriate for healthcare environments
Red	• Invokes the fight or flight syndrome • Symbolizes high energy, passion, and strength • Improves memory • Appropriate in the **depressed** person's environment and in the use of therapy	• Can cause defiance, aggression, and strain • Associated with blood and danger • Physical impacts such as elevated heart rates and raised blood pressure • Avoid for the **manic** and **schizophrenic**	• May be appropriate for mental tasks • Should be used very moderately to avoid causing excited and uncomfortable emotions • Best suited for creative activity and socialization, such as dining rooms

[63] Venolia, 59.

COLOUR	POSITIVE EFFECTS & ASSOCIATIONS	NEGATIVE EFFECTS & ASSOCIATIONS	SUGGESTED USES
Violet	• Symbol of spirituality, authenticity, truth, and quality • Some sources claim violet reduces stress and creates feelings of inner calm	• Associated with **nervous** and **mental disorders** • Can cause the perception of decadence, introversion, and inferiority	• It is considered a very disturbing colour by many, and is specifically **not recommended** to be used in mental health facilities
Blue	• Associated with serenity, tranquility, loyalty, calmness, and trust • Stronger blues stimulate clear thought while softer tones calm the mind • Excellent for healing **nervous disorders** • Lowers blood pressure, and relieves headaches	• Some shades cause feelings of unfriendliness, coldness, and lack of emotion, particularly for those who are dealing with **depression**	• Suggested for use in areas that require quieter, extended concentration and high visual acuity, particularly in spaces intended for relaxation and calming of the mind
Green	• Symbolizes growth and life • Invokes feelings of safety, harmony, refreshment, restoration, peace, healing, and reassurance • Gives the brain a boost of creativity and motivation • Subliminally associated with vegetation that symbolizes nourishment	• Can invoke feelings of boredom and stagnation • Some believe green looks too “institutional” when used in healthcare facilities • Yellow-greens should be avoided as they will give a sickly look if reflected on human flesh	• Green is appropriate in mental health facilities
Black	• Represents sophistication, glamour, modernity, security, emotional safety, and efficiency	• Associated with feelings of coldness, oppression, and darkness, and can amplify depressed feelings and negative emotions	• Black is not suggested as a dominant element in mental health facilities.

COLOUR	POSITIVE EFFECTS & ASSOCIATIONS	NEGATIVE EFFECTS & ASSOCIATIONS	SUGGESTED USES
White	• Symbol of modernism • Evokes feelings of purity, cleanness, simplicity, efficiency, and clarity • Enhances the eye's ability to focus and separate space • Contributes to maximum light reflection	• Associated with coldness, change, elitism, emptiness, and unfriendliness • White can appear clinical and cause sensory deprivation • Can cause glare and optical strain	• Recommended as a complimentary pallet for other colours, as well as on ceilings and overhead structures • Recommended in rooms where maximum light reflection is needed.
Brown	• Associated with warmth, earthiness, reliability, support, and nature • Soft browns relax people, provide comfort, and give the feeling of a residential setting	• Lack of humour, heaviness, and lack of sophistication	• Brown should be used in conjunction with other colours, as it tends to have a depressing feeling and drab atmosphere when used by itself.
Grey	• No strong associations with anything, and no direct psychological effects on people when presented in its truest form without any other colours present.	• The absence of colour can evoke lack of confidence, oppression, depression, and a lacking of energy	• Light greys are useful to set off other chromatic colours, and can be used in transitional spaces and group therapy areas

Figure 24: Poor Use of Colour vs. Good Use of Colour[64]

[64] Brani and Desi, "Garden of Colors," 2016.

Different properties of each colour can also affect our moods and emotions. In healthcare settings there are a number of ways to use colour to benefit patients and promote healing as outlined below:

PROPERTY	POSITIVE EFFECTS	NEGATIVE EFFECTS
COOL COLOURS	• Appropriate for agitated, hypertensive, or anxious individuals • Associated with quiet, relaxing, and contemplative spaces	• Can have a negative effect on the moods of patients with depression and low energy
WARM COLOURS	• Associated with extroverted responses and social contact • Can improve appetite	• Make objects look heavier
DARK COLOURS		• Prolonged exposure may contribute to depression and monotony
LIGHT COLOURS	• Best suited for rest	
HIGHLY SATURATED COLOURS	• Pleasurable and improves moods • Bolder colours for wayfinding and areas of movement	• Can contribute to confusion and anxiety • Overwhelming and intimidating • Can trigger unpleasant associations in the mind • Avoid with schizophrenics, and in rooms of psychotic patients
HIGH CONTRAST	• Defines volumes, forms, edge changes, and planes • Exaggeration of contrast increases visual accessibilities for those with colour deficits	
LOW CONTRAST		• Perceived as institutional, monotonous, and boring • Contributes to sensory deprivation

In summary, by taking what was learned from the effects of individual colours, and how colours interact within the environment, several conclusions can be drawn to help in the application of colour towards creating a mental health facility that evokes positive feelings and emotions:

- Recreation areas, lounges, and occupational therapy rooms should be in cheerful, stimulating colours selected specifically to serve the function of each area.
- Exaggerate contrast between foreground and background colours to increase the visual accessibility of the design for those with colour deficits.

- Appetite can be improved with warmer colour choices for dining, such as coral, peach, and soft yellow. Avoid violet, yellow-green, gray, olive, and mustard.
- Use intense colours only for accents and for contrast to improve visual organization. Brightly coloured grab bars, door-frames, levers, and switches, for instance, are easier to find than those that blend into the background.
- A monochromatic colour scheme throughout the building may be perceived as institutional, and can become monotonous and boring when viewed for an extended period. This contributes to sensory deprivation, which leads to disorganization of brain function, deterioration of intelligence, and an inability to concentrate. For those who suffer from a deficiency of perception, plan variety in colour, pattern, and texture.[65]
- Warm colour hues are often associated with extroverted responses and social contact. A quiet, relaxing, or contemplative atmosphere is created by cool hues.
- Colour can affect perceptions of time, size, weight, and volume. In a space where pleasant activities occur, such as a recreation room, a warm colour scheme makes the activities seem to last longer. In rooms where monotonous tasks are performed, a cool colour scheme can make time pass more quickly
- Colour has the power to compensate for noise—cool colours are relaxing, warm colours offer more stimulation.
- Colour is useful in transitioning rooms and spaces, such as the transitions from public to private.
- Certain colours may evoke senses of spaciousness or confinement in particular settings, and the perception of spaciousness is also attributed to the brightness or darkness of colour and contrast effects between objects and their background.[66]

[65] Connellan et. al., "Stressed Spaces: Mental Health and Architecture," 139.
[66] Tofle et. al., "Color In Healthcare Environments," 60.

3.3.3 - Sound, Noise, and Acoustics

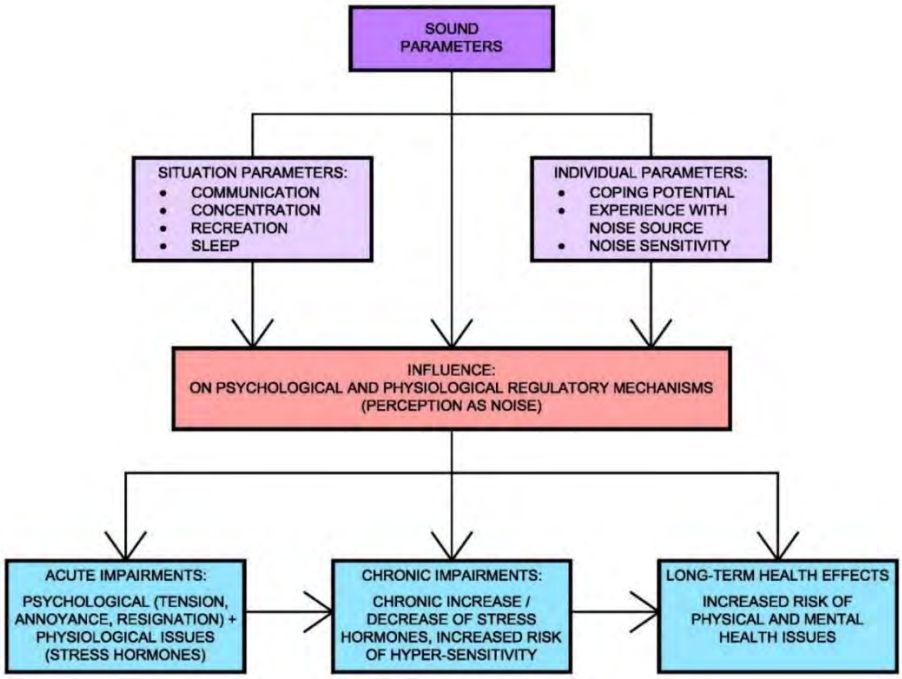

Figure 25: Short and Long Term Effects of Noise

Sound can enhance or hinder the overall ambiance of a space and can have a powerful influence on human emotions. Noise pollution such as road, rail, and air traffic, construction, industrial activities, loud music, and adjacent conversations can induce stress, increase heart rate and blood pressure, and interfere with sleep, communication, and relaxation.[67] This is especially important for those dealing with mental illnesses that are particularly vulnerable and easily agitated. Most findings suggest that noise detrimentally affects human behaviour and increased length of recovery for patients.[68] In institutional environments, noise levels are often too high (65-85 dB), and produce widespread annoyance among patients and perceived stress in staff.[69] These excessive noise levels are caused by a variety of factors including various medical equipment and hard, sound-reflecting floors, walls, and ceilings which create echoes and long reverberation times. Environmental psychologists discourage the use of long corridors in mental health facilities because of perceptual distortions experienced by some psychiatric patients.[70]

[67] Health Canada, *Health and Environment* (Ottawa: Minister of Health, 1997), 140.
[68] Ulrich, “Effects of Healthcare Environmental Design on Medical Outcomes,” 51.
[69] Ulrich, “Effects of Healthcare Environmental Design on Medical Outcomes,” 51.
[70] Karlin and Zeiss, "Best Practices: Environmental and Therapeutic Issues in Psychiatric Hospital Design," 1377.

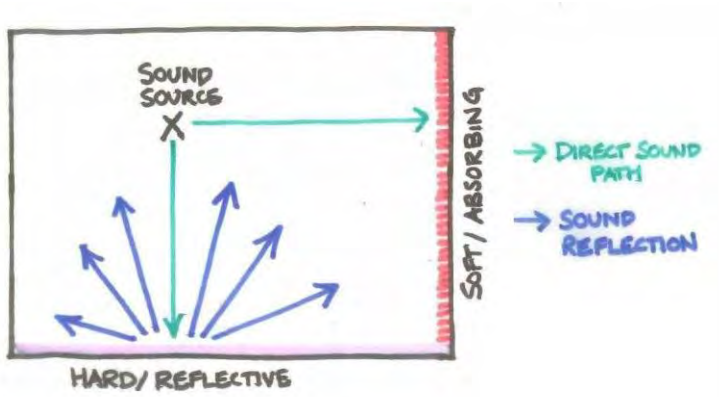

Figure 26: Sound Reflectance of Materials

Sound, as opposed to noise, has the potential to be relaxing and even healing. Gentle and harmonious white noise, such as soft music without words, also helped to mask distracting background noises while performing mental tasks, and music in hospital waiting rooms has proven to reduce stress of visitors.[71] In summary, the following are recommendations for mental health facilities:

- Elimination or insulation of noise sources
- Elimination of spaces and materials that cause echoes and long reverberation times
- Allocating specific rooms for “quiet time” and relaxation
- Using white noise to mask unpleasant noises while enhancing a space
- Organic sounds, such as rain, moving water, or songbirds improve function of the autonomic nervous system which helps to release endorphins.[72]

[71] Schweitzer, S-76.
[72] Fouts and Gabay, "Healing through Evidence-Based Design," 30.

3.3.4 - Viewing and Experiencing Nature

Nature can be experienced and engaged in a number of ways; first, by viewing nature either through a window, in a book, or in a painting. Second, by being in the presence of nature nearby which is incidental to some other activity such as walking or cycling to work, reading on a garden seat, or talking to friends in a park. And third, by active participation through activities such as gardening, farming, trekking, camping, running, horse-riding, hedge-laying or forestry.[73] In healthcare settings, viewing and experiencing nature benefits not only patients, but staff and the community as well.

Figure 27: Ways to Interact with Nature

Visual exposure to nature has proven to significantly aid in creativity, concentration, and memory, and has shown to significantly reduce stress and improve moods within only five minutes of exposure.[74] Natural environments are particularly helpful in restoring attention and mental energy, which are both beneficial for clients with mental disorders. A study by Roger Ulrich found that patients with a view to nature requested less pain medications and had shorter stays than patients with views of a brick wall.[75]

Views to and experiences of nature should facilitate psychological and physical “journeys” to help patients shift their perspective and focus in a positive way. Opportunities to provide clients,

[73] Pretty, Jules, " How Nature Contributes to Mental and Physical Health," *Spirituality and Health International* 5, no. 2 (2004), 68-78.
[74] Ulrich, R.S. “How Design Impacts Wellness,” 25.
[75] Hamilton, 171.

community, and staff with access to nature include indoor and outdoor gardens and views of nature through windows.[76] Following the plants throughout different periods of the year, and nursing the plants and flowers will provide constantly changing stimulation for building occupants and support the quality of responsibility and willingness in patients.[77] Providing retreats for patients, their families, and caregivers provides a non-institutional moment where patients, visitors, and staff are seen as equal, and if designed as a public space it can provide a setting for patients to interact with members of the surrounding community.

Figure 28: Views to and Experiencing Nature, Wayfarers Chapel, California

Indoor plants have shown to increase work efficiency and attentiveness as well as decrease perceived stress, lower blood pressure, and reduce physical discomfort.[78] The presence of plants creates a calming experience and enlivening symbolism for patients, which can release them from mental ruts, physical tensions, and sense of alienation.[79] Patients who are able to care for plants within their facility can become part of the plant and environment's flourishment. In addition, employees with access to restorative views perform at a higher level, and report less stress, better health status, and higher job satisfaction.[80] In summary, the following are recommendations for the incorporation of nature into mental health facilities:

[76] Schweitzer, S-76.
[77] Roessler, 85.
[78] Schweitzer, S-76.
[79] Venolia, 130.
[80] Schweitzer, S-76.

- Nature benefits patients, staff, and the community
- Nature can be experienced and engaged in a number of ways, and provides constantly changing stimulation
- Views to and experiences of nature should facilitate psychological and physical "journeys"
- Nature has positive effects on a variety of mental disorders
- Results of mood improvement have been seen within only five minutes of exposure
- Strategies to include natural elements can be interior or exterior

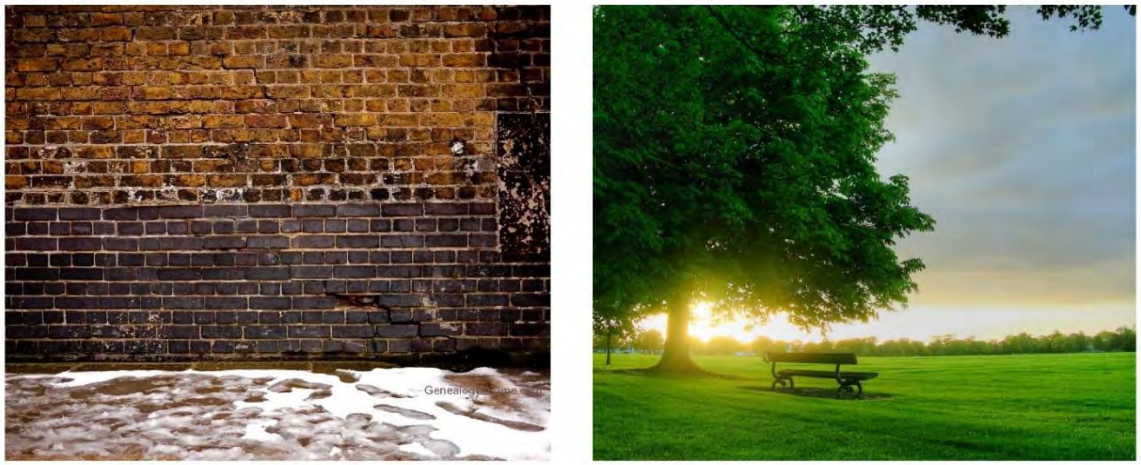

Figure 29: Views of a Brick Wall vs. Nature[81]

3.3.5 - Art and Art Therapy

When a view to nature may not be plausible, artwork of natural scenery can provide an alternative solution to alleviate stress, significantly benefitting patients. In addition, art therapy can be used to focus on visual and somatosensory information; that is, how images and their expression reflect emotional experiences and how the emotional experiences affect thought and behaviour. Art therapy offers the possibility to deal with basic sensory building blocks in the processing of information and emotions, which mainly benefits the rehabilitation of physical impairments, promotion of mental, emotional and physical healing, and enhancement of cognitive and emotional growth.

[81] Rooted and Relevant, "The Fruitful Tree," 2017.

For mental health patients, the engagement in art making can be a positive distraction from one's ongoing mental health issues.[82] The creative process encourages self-expression, promotes self-awareness, improves insight, and enhances general psychological well-being,[83] leading patients to feel empowered. Art making also encourages routine, stimulation, and motivation as well as continuous learning and expansion of skills, making it an active role in their journey to recovery. It provides a unique and participant directed atmosphere, which increases social connectedness by serving as a non-threatening setting where relationships can develop organically through shared experiences.[84] This form of psychotherapy is especially beneficial for schizophrenics (compared to other forms of psychotherapy) due to its ability to act as a buffer and reduce the intensity of the relationship between patient and therapist.[85]

Figure 30: Overstimulating Artwork vs. Art with Organic Form

In health care facilities, displaying art has proven to reduce stress and improve moods,[86] however, art that is over-stimulating or ambiguous negatively impacts us by raising anxiety levels. In fact, perceptions of mental health patients to highly interpretive art may be effected by their mental state and psychological disorder, and perceptual distortion is a larger risk in psychiatric patients than

[82] Van Lith, Theresa, Patricia Fenner, and Margot Schofield, "The Lived Experience of Art Making as a Companion to the Mental Health Recovery Process," *Disability and Rehabilitation* 33, no. 8 (2011), 656.
[83] Lamont et. al., "A Brief Report of Art therapy in an Inpatient Mental Health Unit–Consumer Feedback and Experience," 70.
[84] Van Lith et. al., " The Lived Experience of Art Making as a Companion to the Mental Health Recovery Process," 658.
[85] Lamont et. al., "A Brief Report of Art therapy in an Inpatient Mental Health Unit–Consumer Feedback and Experience," 71.
[86] Nanda, Upali, S. Eisen, R. S. Zadeh, and D. Owen, "Effect of Visual Art on Patient Anxiety and Agitation in a Mental Health Facility and Implications for the Business Case," *Journal of Psychiatric and Mental Health Nursing* 18, no. 5 (2011), 2.

other acute care patients who suffer from stress that is induced from a more physical origin.[87] Studies show that patients exposed to abstract pictures showed higher levels of anxiety than patients without any picture, which also contributed to less favorable recovery outcomes.[88] Therefore, when selecting art for mental health facilities, the following considerations are recommended:

- Avoid emotionally negative or provocative subject matter
- Avoid images with surreal qualities, ambiguity, or uncertainty
- Avoid views with restricted depth or claustrophobic-like qualities, and forms that are optically unstable or appear to move
- Avoid close-up animals staring directly at the viewer
- Avoid outdoor scenes with overcast or foreboding weather[89]

3.3.6 - Scents and Odours

Figure 31: Scent Tunnel[90]

[87] Upali et. al., "Effect of Visual Art on Patient Anxiety and Agitation in a Mental Health Facility and Implications for the Business Case," 3.
[88] Schweitzer, S-76.
[89] Schweitzer, S-76.
[90] Olafur Eliasson, “Duft Tunnel,” 2004.

Humans process both smells and emotions in the same part of the brain, which is why odours can influence us more than any other sense.[91] According to my research, exposure to certain odours serves as an ambient stressor for which individuals must develop coping mechanisms.[92] Offensive odours yield numerous unpleasant psychological reactions including annoyance, lower levels of interpersonal attraction, higher levels of aggression, and stimulation of anxiety, fear, and stress.[93] In contrast, pleasing aromas reduce blood pressure, slow respiration, lower pain perception levels, relax muscles, aid in concentration, and help produce endorphins.[94] Smells can also trigger associated memories, emotions of occupants, and enhance positive perception of the space. Some general scent associations proven through various studies are outlined below:

Scent	**Positive Associations**
Almond	Relaxing
Baby powder	Associated with good health
Basil	Energizing
Bergamot	Relaxing, Improves sleep
Blossom	Improves sleep
Cedar	Reduces tension, Relaxing
Chamomile	Relaxing
Cinnamon-vanilla	Improves mood, improves creativity
Cloves	Energizing
Essence of Benzoin	Improves sleep
Floral	Reducing anxiety
Heliotrope (Vanilla)	Relaxing, Improves sleep, Reducing anxiety
Jasmine	Completing tedious mental tasks, Improves sleep, Energizing
Lavender	Completing tedious mental tasks, Reduces tension, Relaxing, Best sleep-inducing scent, Sedates our central nervous system
Lemon	Completing tedious mental tasks, Improves mood, Energizing, Associated with good health
Oranges	Reducing anxiety
Orange Blossom	Improves sleep
Patchouli	Energizing
Peppermint	Completing tedious mental tasks, Working at physical tasks, Energizing, Increases alertness, Simulates central nervous system
Rose	Relaxing
Rosemary	Energizing, Enhances memory
Spiced apple	Relaxing
Ylang-ylang	Relaxing

[91] Augustin, 40.
[92] Kopec, *Environmental Psychology for Design*, 107.
[93] Mayer Spivack, *Institutional Settings: An Environmental Design Approach*, (Human Sciences Press, 1984), 32-33.
[94] Mayer Spivack, *Institutional Settings: An Environmental Design Approach*, (Human Sciences Press, 1984), 32-33.

It should be noted that many patients dealing with mental disorders experience the powers of scent differently. Schizophrenics, depressives, migraine sufferers, and very-low weight anorexics often experience olfactory deficits or dysfunctions. One group of researchers claims that certain psychiatric disorders are so closely linked to specific olfactory deficits that smell-tests should be part of diagnostic procedures.[95] Therefore, recommendations of scent and aroma for mental health facilities include:

- Peppermint is best for completing tedious mental tasks, and improves performance of physical tasks. People who smell peppermint while doing something physical not only feel less tired and frustrated, but they also believe they are performing better and with more vigor.
- Lemon and cinnamon-vanilla are strongly associated with improvement of moods, although pleasant scents in general are linked to good moods. Cancer patients undergoing Magnetic Resonance Imaging - a diagnostic procedure known to be stressful - reported 63% less anxiety when heliotrope (a vanilla fragrance) was administered during the procedure.[96]
- In addition, vanilla fragrance induces a sense of calm. A study at Tubingen University in Germany showed that vanilla fragrance reduced the startle-reflex in both humans and animals. The animal results indicate that the calming effects of vanilla may be due to some more essential property of the fragrance than the positive childhood associations.[97]
- In addition, any smell that puts us in a good mood is apt to increase our innovativeness, but cinnamon-vanilla is specifically been linked to improved creativity.
- Lavender and cedar are best for reducing tension, while oranges, vanilla, and floral scents can reduce anxiety. The smell of burning frank incense also reduces anxiety and depression. Lavender sedates our central nervous system, which is why it is the best scent for improving sleep. Jasmine will help someone sleep more soundly and they will wake up in a better state.

[95] Fox, "The Smell Report: An Overview of Facts and Findings," 2.
[96] Fox, "The Smell Report: An Overview of Facts and Findings," 9.
[97] Fox, "The Smell Report: An Overview of Facts and Findings," 9-10.

3.3.7 - The Thermal Environment

Temperature can influence how we feel in a space, both physically and emotionally, however we only tend to notice when the environment becomes particularly pleasant or unpleasant.[98] Our thermal comfort is determined by our satisfaction towards the thermal environment, with comfort being a subjective sensation. Air contributes to the overall ambience of a therapeutic space when a natural air-flow is provided, as opposed to an air conditioned space; what we feel with our skin affects how we perform particular tasks. The interactions of six fundamental factors define the human thermal environment and its sensation of thermal comfort, including the four basic environmental variables (ambient temperature, radiant temperature, humidity, and air movement). Thus, any consideration of thermal stress should explore these six factors, as well as insulation and moisture permeability. [99]

Different types of extreme weather events appear to relate to different mental health impacts, particularly at onset. Climate change influences mental health directly by exposing us to trauma, and indirectly by affecting physical health (for example, extreme heat exposure causes heat exhaustion in vulnerable people, and associated mental health consequences).[100] In colder climates, freezing induces insecurity and one has to keep working to warm up the body. People in such environments develop linear intelligence and become practical; their approach to the environment being characterized by aggression, competition, exploitation, and manipulation. In contrast, warmer temperatures (especially lengthy spells of hot weather) have been associated with higher rates of criminal and aggressive behaviour, as well as higher rates of suicide. The moderate climate is holistic, intuitive, and well balanced, and is characterized by an awareness of oneself and the relationship of the environment to one's adjustment. In order for a person to be in thermal comfort, the body should be in heat balance; the sweat rate is within comfort limits; and the mean skin temperature is within comfort limits. The comfort zone for the average person is between 23 to 27 º C in the winter and 20 to 25 º C in the summer, with a 30% to 60% RH when air is still.[101] In addition, the thermal environment should be varied to give feelings of connection with nature and awareness of internal and external cycles. Designing the health care environment in response to climate and employing “passive” or “natural” methods of heating and cooling is as healthy for us as it is for the planet.

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[98] Venolia, 69.
[99] Epstein and Moran, "Thermal Comfort and the Heat Stress Indices," *Industrial Health* 44, no. 3 (2006), 389.
[100] Berry, Bowen, and Kjellstrom, "Climate Change and Mental Health: A Causal Pathways Framework," 123.
[101] Venolia, 72.

3.3.8 - Form and Geometry

Studies have shown that geometry of a space can have a major impact on our emotional connection to a space. Angular, rectilinear forms are more masculine and generate an impression of action and efficiency, while curved and more feminine forms create a feeling of relaxation, which is generally preferred.[102] A study by neuroscientists at Harvard Medical School found that when faced with photographs of everyday objects—sofas, watches, etc.—subjects instinctively preferred items with rounded edges over those with sharp angles; our brains are hard-wired to avoid sharp angles because we read them as dangerous.[103] Other research has shown we associate circles with softness, happiness, goodness, love, life, brightness, lightness, warmth, quickness, and quietness, in comparison to squares and rectangles, which we associate with hardness, sadness, evil, hate, death, darkness, heaviness, cold, slowness, and loudness.[104] A curved object also has an organic appearance to it, which mimics the form of many elements found in nature. Curvilinear natural forms and smooth transitions between spaces found in nature also enhance the visual quality of space, similar to plants and water.[105]

In terms of space, the "L" shaped room has become popular because of its long diagonal distance, which provides the greatest separation within a given room size. The interior corner creates a sense of discovery where every part of the room is not necessarily visible. According to Humphrey Osmond, asymmetrical spaces are more "socio-fugal," which is better suited for learning settings where multiple and diverse activities are occurring, while the square was least desired, likely due to its monotony and lack of versatility. Below is a summary to consider regarding form and geometry of spaces:

- Balance of public to private, stimulation levels, etc, to provide stability and structure to the design without feeling institutional, as well as freedom without feeling chaotic and disordered.
- Balance also includes visual balance of colours, light, and scent
- Public and private spaces should be contrasting (in terms of visual stimulation, colour, light, scent, noise, etc), to provide a variety of spaces to accommodate the needs of all building users

[102] Augustin, 56.
[103] Michael Cannell, "This Is Your Brain on Architecture," 2009.
[104] Augustin, 57.
[105] Augustin, 58.

- Proximity helps to create organization and ease of access. Visually connecting similar elements and functions helps to create connections and relationships between complimentary functions, while also suggesting different circulation routes through the building.
- Colour can aid in the wayfinding and grouping of elements by user type throughout the building.

3.3.9 - Spatial Layout and Furniture Arrangements

Several studies have investigated the effects of changes in spatial layout on health and well-being. In institutional environments, the nurses station is often the central hub which also draws the boundary between patients and staff. The dynamics of location and boundary of nursing stations (centralized vs. decentralized) has been extensively debated in hospitals and other healthcare environments. Conventional floor layouts for patient-care units generally provide corridors organized around a central nursing and supply station.[106] In contrast, floor layouts with decentralized nurse stations and supplies allow staff to be close to patients' rooms, which decreases the amount of time spent walking, greatly increasing time for observation and care of patients.[107]

A multitude of research also focused on waiting areas, day rooms, and lounges, which demonstrated that arrangement of seating strongly inhibits or encourages social interaction. An interesting finding indicated that if clients have some control over the furniture in consulting or waiting rooms, such as moveable chairs, they experience a high degree of comfort, autonomy and equality. This means choice in seating and seating arrangements may promote a sense of personal autonomy in a context of experiencing low levels of personal control.[108] Providing clients with choice of seating, such as a mix of upright seats, lounge chairs and cushions, also increases choice and overall physical comfort. Levels of social interaction – and presumably enhanced social support – can also be increased by providing comfortable movable furniture arranged in small flexible groupings, in a variety of day rooms and public spaces. Arranging seating side-by-side along the walls of a room markedly inhibits social interaction among patients or other users,[109] while corner seating is the most preferred arrangement for

[106] Roger S. Ulrich, "Essay: Evidence-Based Health-Care Architecture," *The Lancet* Vol. 368 (2006): S38.
[107] Ulrich, "Essay: Evidence-Based Health-Care Architecture," S38.
[108] Pearson and Wilson, " Soothing Spaces and Healing Places: Is There an Ideal Counselling Room Design?" 5-6.
[109] Ulrich, "Effects of Healthcare Environmental Design on Medical Outcomes," 52-53.

seating during intimate conversations.[110] Other research on psychiatric wards and nursing homes strongly suggests that appropriate arrangement of movable seating in dining areas not only enhances social interaction but can have important positive effects on eating behaviours, such as increasing the amount of food consumed by geriatric patients.[111] Ceiling height also affects brain function and how people think. Rooms with higher ceilings tend to encourage more free and abstract thoughts, while rooms with low-ceilinged made subjects focus on specific details. "If you're in the operating room, maybe a low ceiling is better," she said. "You want the surgeon getting the details right."[112] In addition, designing spaces along a diagonal axis (instead of one parallel to walls) can add a level of comfortable complexity to a room.[113]

Overall, we prefer spaces that are interesting but not confusing; ordered, yet moderately complex; too much variety in a space creates excessive visual complexity and can become unpleasant. A space can be interesting if its intriguing elements are not obvious all at once, but revealed as someone moves through it. An example would be walking along a curved circulation route with elements of surprise occurring periodically, such as a window framing a view or a piece of artwork.[114] A number of conclusions can be drawn from the research encountered to provide recommendations for mental health facilities, including:

- Size of spaces for specific tasks; spaces that are too small create a claustrophobic feeling, while spaces that seems too large are perceived to create insecurity
- Rearrangement of furniture and fixtures can impact social interaction and patient comfort levels
- A variety of spaces is important to lessen feelings of being in a health care setting, increasing feelings of relaxation and friendliness
- Location of staff offices and workstations impact levels of care and sense of security and safety
- Strong consideration should be given to the building location and the ease with which patients are able to travel through the environment. Having to travel long distances for treatment can cause ‘additional psychological and social pressures on individual patients’

[110] Hall, "The Anthropology of Space: An Organizing Model," 162.
[111] Ulrich, “Effects of Healthcare Environmental Design on Medical Outcomes,” 53.
[112] Michael Cannell, “This Is Your Brain on Architecture,” 2009.
[113] Augustin, 58.
[114] Augustin, 57.

4.0 - Mental Health and Mental Illness

Health is not a static state of perfection but "a process of interacting with everything around and inside us in ways that promote growth and vitality."[115] Good health is more than absence of disease; it is having the flexibility and inner resources to respond to both assaults and opportunities,[116] and a balance of mental, emotional, physical and spiritual health. All humans experience emotions similar to those dealing with mental illnesses, and at various moments we can become anxious, depressed, withdrawn, suspicious, deluded, or antisocial. However, the difference is that our experiences are much more brief and less intense than those dealing with severe mental illnesses. Therefore, it is beneficial to understand that just as we often need a place to rejuvenate or de-stress, patients with mental disorders also need the same. This section investigates mental health and understands mental illness to be both a sickness that needs to be diagnosed and cured, and "a natural response to a troubling environment."[117]

4.1 - Mental Illness

Mental illness is a serious disturbance in thoughts, feelings, and perceptions that is severe enough to affect day-to-day functioning. It is a disorder characterized by a disequilibrium, derangement, and unbalanced condition of the mental processes. Such a derangement results in unrealistic thinking and behaviour where a person's perceptions are "out of focus," and the brain is not functioning well.[118] Contrary to beliefs throughout history, it has been discovered that mental illness is a disease - or other organic cause for malfunction of the brain - and differences have been found between the structures and functioning of the brains of normal persons and those who are mentally ill. Each disorder differs in their causes, symptoms, effects, and treatment, but all are characterized by alterations in thinking, mood or behaviour, and associated distress or impaired functioning.[119]

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[115] C. Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley, California: Celestial Arts, 1988), 7.
[116] Venolia, 7.
[117] David G. Myers, *Exploring Psychology*, (Macmillan: 2004).
[118] Esser and Lacey, 234.
[119] Berry, Bowen, and Kjellstrom, "Climate Change and Mental Health: A Causal Pathways Framework," 124.

4.2 - Types of Mental Disorders

A mental illness can be mild or serious, and can change the way a person feels and how they interact with other people and their surrounding environment. While there are several different types of mental disorders, some are more affected by the surrounding environment than others, such as depression, anxiety, and other mood disorders. Different mental illnesses change thought processes and perception, while others change moods, emotions and behaviours. It is noted that patients can also experience multiple disorders concurrently, as well as physical illnesses and issues with substance abuse. This section examines the most common types of mental disorders including schizophrenia, mood disorders, and anxiety disorders, along with their causes, symptoms, and respective treatments, and how they are affected by a variety of factors including the built environment. Based on my research, below is a chart summarizing the most common characteristics prevalent in a number of common mental disorders. The chart indicates similarities and differences between different types of disorders:

SYMPTOMS / CHARACTERISTICS	MENTAL DISORDERS										RANKING
	SCHIZOPHRENIA	DEPRESSION	SEASONAL AFFECTIVE DISORDER (SAD)	BI-POLAR DISORDER	ANXIETY (GAD)	POST-TRAUMATIC STRESS DISORDER (PTD)	OBSESSIVE-COMPULSIVE DISRODER (OCD)	EATING DISORDERS	IMPULSE CONTROL DISORDERS (ICD)	PERSONALITY DISORDERS	
EMOTIONAL ATTRIBUTES											
ANXOUS & EXCESSIVE WORRY				1	1	1	1	1	1	1	7
DEPRESSION (SADNESS)		1	1	1	1			1	1	1	7
FEAR & SUSPICION					1	1				1	3
INCREASED STRESS		1		1	1	1	1	1			6
LOW SELF-ESTEEM		1						1	1	1	4
MOOD SWINGS		1	1	1					1	1	5
NEGATIVE / SUICIDAL THOUGHTS	1	1	1							1	4
EMOTIONAL SUB-TOTAL	1	5	3	4	4	3	2	4	4	6	36
COGNITIVE ATTRIBUTES											
ATTENTION	1			1					1		3
CONCENTRATION		1		1	1	1		1	1		6
DECISION MAKING				1					1	1	3
DIFFICULTY WITH PERCEPTION	1									1	2
MEMORY	1	1						1			3
PROBLEM SOLVING	1										1
SENSITIVE TO STIMULATION	1				1	1					3
COGNITIVE SUB-TOTAL	5	2	0	3	2	2	0	2	3	2	21
BEHAVIOURAL ATTRIBUTES											
AGRESSION				1			1		1	1	4
DIFFICULTY EXPRESSING EMOTIONS	1								1	1	3
DIFFICULTY WITH EVERYDAY TASKS	1	1									2
IMPULSIVE / BIZZARE BEHAVIOUR	1			1	1		1	1	1	1	7
INTENSE HIGHS & LOWS					1						1
IRRITATED / SHORT TEMPER	1	1	1	1	1			1	1	1	8
LACK OF MOTIVATION	1	1									2
BEHAVIOUR SUB-TOTAL	5	3	1	3	3	0	2	2	4	4	27

SYMPTOMS / CHARACTERISTICS	MENTAL DISORDERS										RANKING
	SCHIZOPHRENIA	DEPRESSION	SEASONAL AFFECTIVE DISORDER (SAD)	BI-POLAR DISORDER	ANXIETY (GAD)	POST-TRAUMATIC STRESS DISORDER (PTD)	OBSESSIVE-COMPULSIVE DISRODER (OCD)	EATING DISORDERS	IMPULSE CONTROL DISORDERS (ICD)	PERSONALITY DISORDERS	
PHYSICAL ATTRIBUTES											
CHANGES IN APPETITE		1		1				1			3
CHANGES IN SLEEP PATTERNS		1	1	1	1	1		1			6
FATIGUE / LOW ENERGY		1	1	1	1			1			5
HIGH ENERGY				1					1		2
MUSCLE TENSION					1			1			2
PANICK ATTACKS					1	1					2
SELF HARM		1						1	1	1	4
SENSITIVE CENTRAL NERVOUS SYSTEM	1		1		1						3
VARIOUS PHYSICAL PAIN / ILLNESS					1			1			2
PHYSICAL SUB-TOTAL	1	4	3	4	6	2	0	6	2	1	29
SOCIAL ATTRIBUTES											
ISSUES WITH LARGE CROWDS					1	1					2
LOSS OF INTEREST IN ACTIVITIES	1	1	1	1	1	1					6
SOCIAL WITHDRAWAL	1	1	1	1	1	1		1	1	1	8
SOCIAL SUB-TOTAL	2	2	2	2	3	3	0	1	1	1	17
PSYCHOTIC SYMPTOMS											
DELUSIONS	1	1		1							3
HALLUCINATIONS	1										1
LOSS OF CONTACT WITH REALITY	1										1
PSYCHOTIC SUB-TOTAL	3	1	0	1	0	0	0	0	0	0	5
TOTAL ATTRIBUTES	17	17	9	17	18	10	4	15	14	14	135

Figure 32: Comparison of Mental Disorders

4.2.1 – Schizophrenia

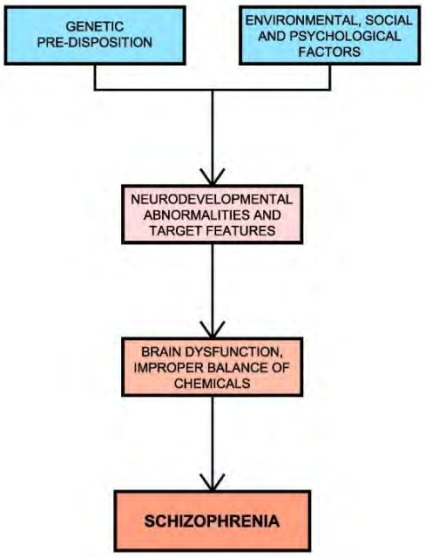

Figure 33: Causes of Schizophrenia

Schizophrenia is a serious emotional disorder characterized by personality changes and loss of contact with the surrounding environment. Despite common myths, schizophrenia does not refer to 'multiple personalities', but rather a loss of contact with reality. In Canada, approximately 1% of people have the disorder, which frequently manifests in youth, ages 15 to 25 years old.[120] The most common cause of death for people with schizophrenia is suicide,[121] with approximately 40 to 60% of people dealing with the disorder attempting suicide and approximately 10% of people dying by suicide.[122]

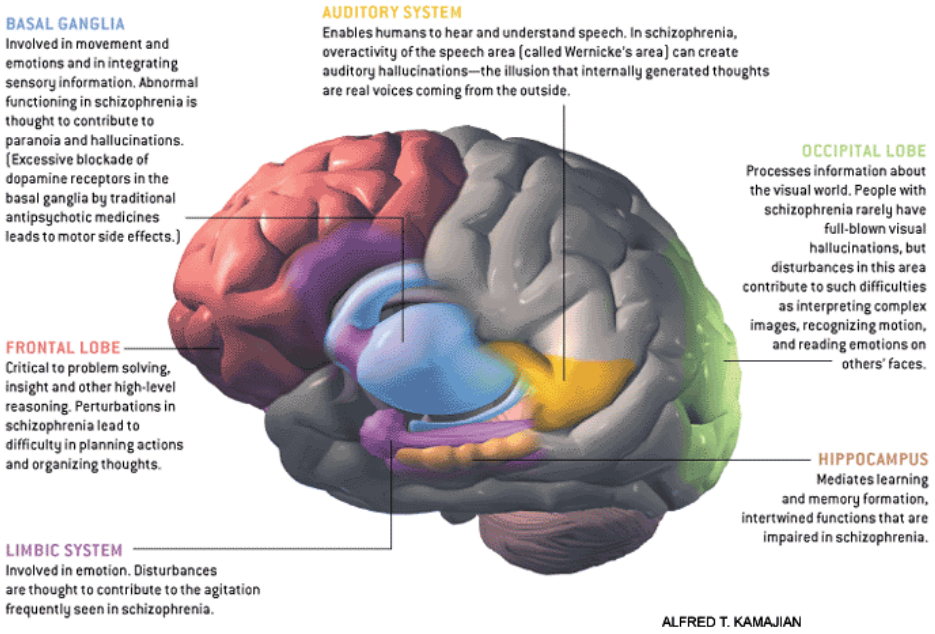

Figure 34: Schizophrenia and its Effects on Our Brain[123]

A person with schizophrenia often shows psychotic symptoms caused by disturbances of the ability to think or act rationally, and often has difficulties expressing or experiencing proper emotions.[124] Behavioural and emotional symptoms include displays of bizarre behaviours, difficulty expressing emotions, avoiding other people, lack of motivation, and a decrease in amount of speech. Other symptoms include difficulties with perception, thought processes, and social functioning, which can make simple tasks or following a conversation very difficult.

[120] Schizophrenia Society of Canada, "Learning About Schizophrenia: Rays of Hope," (2003).
[121] Canadian Mental Health Association, "Fact Sheet: Suicide Statistics."
[122] Canadian Mental Health Association, "Fact Sheet: Suicide Statistics."
[123] Collins, "Emotion on the Brain," 2014.
[124] Esser and Lacey, 7.

4.2.2 – Depression

Of all the mental disorders, depression results in the highest rate of suicide,[125] with approximately 15% of people diagnosed with chronic depression committing suicide in Canada,[126] and depression being the fourth leading cause of disability and premature death in the world.[127] By the year 2020, it is predicted that this number will increase, with depression becoming the second leading cause of disability in the world, after heart disease.[128] Approximately 5% of men and 10% of women in Canada will experience clinical depression at some point in their life. The age of onset for depression is during the teen years, with the highest rate of depression being in those under the age of 20 years old.

In major depression, people experience a profound change in mood that is manifested by a combination of behavioural, emotional, physical, social, and psychological symptoms. These symptoms often lead to feelings of persistent unhappiness, listlessness, unworthiness, excessive guilt or need for punishment, and a sense of failure. A lack of concentration or loss of memory can also transpire, which interferes with the ability to work, sleep, eat, and carry out regular tasks.[129] Depression also amplifies the functional disabilities produced by physical illness, interferes with treatment and rehabilitation, and further contributes to decline in physical and cognitive functioning.

4.2.3 – Bipolar Disorder

Bipolar disorder, previously known as Manic-Depressive Illness, is a mental disorder that is characterized by severe mood swings cycling between periods of intense "highs" (mania or hypomania) and periods of intense "lows" (depression). When experiencing a high, patients are over-energetic, talkative, and have difficulties sleeping. When experiencing the lows, patients experience symptoms such as depressed mood or sadness, loss of interest in most activities, decreased activities or social withdrawal, changes in appetite, increased or disturbed sleep, fatigue or low energy, decreased sexual desire, difficulties in concentration or making decisions, feelings of worthlessness and suicidal thoughts

[125] Esser and Lacey, 15.
[126] Canadian Mental Health Association, “Fact Sheet: What Happens if People with Mental Illness Can’t Get Help?” 2015.
[127] Public Health Agency of Canada, “Report on Mental Illness in Canada,” 2002.
[128] World Health Organization, “Gender and Women’s Mental Health,” 2008.
[129] Esser and Lacey, 13.

or plans. In more severe forms, clinical depression can be life threatening and require hospitalization, as suicide is a significant threat in bipolar disorder. The mortality rate among people with bipolar disorder, including suicide, is 2 to 3 times higher than the general population. In Canada, 2.2% of individuals experience bipolar disorder at some point in their lifetime.

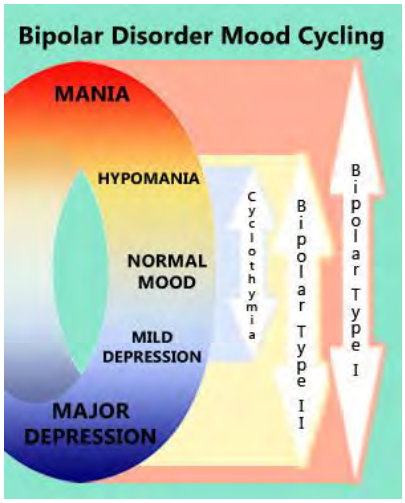

Figure 35: Types of Bipolar Disorder and Mood Cycling[130]

4.2.4 – Anxiety Disorders

Anxiety disorders are one of the most common mental illnesses in Canada with approximately 9% of men and 16% of women in Canada affected each year.[131] Anxiety is a psychological and physical reaction elicited under conditions that are perceived to be threatening and worrying, or demanding a high level of performance, which suggests anxiety plays a central role in the development of negative emotions.[132] In comparison to normal fears (where emotional reactions to real, external threats are appropriately related to the actual danger), anxiety disorders occur either without obvious external threat or when the response to the threat is excessive.

[130] Mayo Clinic, “Bipolar Disorder,” 2015.
[131] Public Health Agency of Canada, “Report on Mental Illness in Canada,” 2002.
[132] Chorpita and Barlow, "The Development of Anxiety: The Role of Control in the Early Environment," 3.

Figure 36: Types of Anxiety Disorders[133]

4.2.4.1 – General Anxiety Disorder (GAD)

General Anxiety Disorder (GAD) is the experience of chronic, excessive, and uncontrollable worry, where sufferers are continually tense and jittery, worried about bad things that might happen, and experience symptoms of autonomic nervous system arousal. GAD can lead to other problems such as fear of meeting people (social phobia), severe panic attacks (panic disorder), and depression. If left untreated, those with GAD are at greater risk of developing medical problems such as heart disease, diabetes, and cancer.

[133] US Department of Health and Human Services, "Types of Anxiety Disorders," 2014.

Figure 37: Cycle of Anxiety

4.2.4.2 – Post-Traumatic Stress Disorder (PTSD)

PTSD is a natural emotional reaction to traumatic experiences, with symptoms including intense fear, helplessness, difficulty sleeping, nightmares, and persistent re-experiencing of the event. Young children with PTSD may repeat their experiences in daily play activities, or may lose recently acquired skills, such as toilet training or expressive language skills. A person with PTSD may try to avoid the memory of a traumatic event, leading to progressive restriction of daily activities, loss of contact with other people, and reduced expectations about the future.[134]

4.2.4.3 – Obsessive-Compulsive Disorder (OCD)

Obsessive-Compulsive Disorder (OCD) is the experience of recurrent and persistent obsessions or compulsions that are time consuming, and cause marked distress or significant impairment. Obsessions are persistent thoughts, impulses, or images that are intrusive and inappropriate such as repeated doubts, requirements to have things in a specific order, and aggressive impulses, while compulsions are repeated behaviours or mental acts including hand washing, checking, praying, counting, and repeating words silently, that have the intent of reducing stress or anxiety. The obsessive thoughts and compulsive behaviours cross the fine line between normality and disorder when they

[134] Esser and Lacey, 17.

become so persistent that they interfere with the way we live or when they cause distress. Many with OCD know that their behaviours are extreme or unnecessary, but are so driven to complete their routines that they are unable to stop.

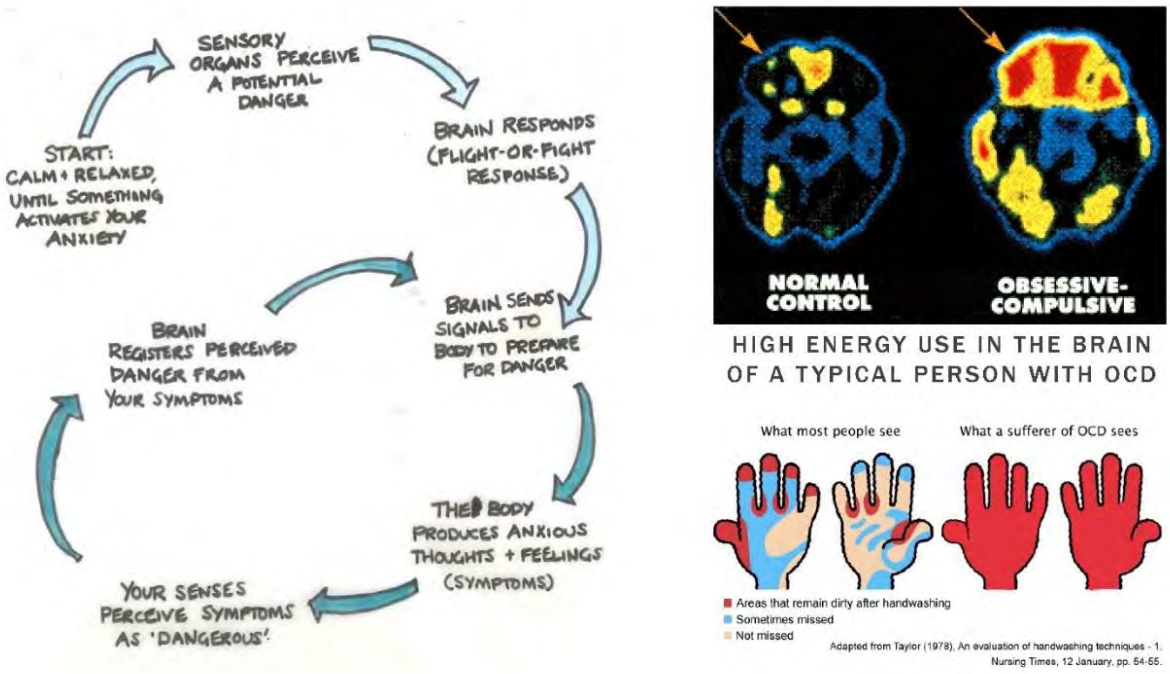

Figure 38: Effects of Obsessive Compulsive Disorder

4.2.5 – Eating Disorders

Eating Disorders include Anorexia and Bulimia. Anorexia Nervosa can be thought of as a "distorted body image" disorder, since many adolescents who have Anorexia see themselves as overweight and unattractive. In Anorexia Nervosa, the individual refuses to maintain a minimally normal body weight, is intensely afraid of gaining weight, and has no realistic idea of the shape and size of his or her body. Signs of anorexia nervosa include extremely low body weight, dry skin, hair loss, depressive symptoms, constipation, low blood pressure, and bizarre behaviours such as hiding food or binge eating.

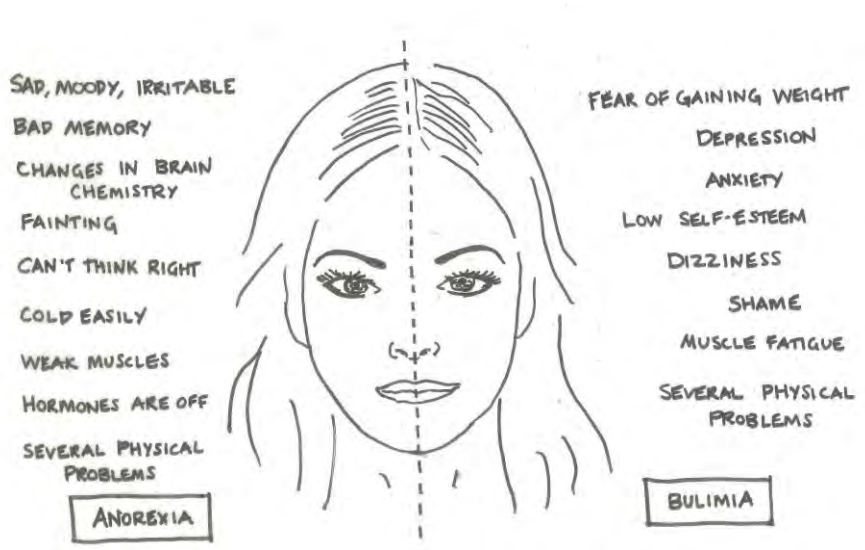

Figure 39: Anorexia vs. Bulimia

Bulimia Nervosa is characterized by episodes of "binge and purge" behaviours where a person will eat enormous amounts of food, then induce vomiting, abuse laxatives, fast, or follow an austere diet to balance the effects of dramatic overeating. Symptoms of Bulimia include the loss of menstruation, fatigue or muscle weakness, gastrointestinal problems or intolerance of cold weather. Mostly young women get these two disorders; at any given time, up to 70% or women and 35% of men in Canada are dieting with the highest rate of hospitalizations for eating disorders among teens aged 15 – 19 years old. Eating disorders have a high mortality rate with between 10 – 20% of people with eating disorders eventually dying from the effects.[135]

4.2.6 – Impulse Control and Addiction Disorders

Impulse control disorder (ICD) is a class of psychiatric disorders characterized by impulsivity, such as failure to resist a temptation, urge, or impulse that may harm oneself or others. Many psychiatric disorders feature impulsivity, including substance-related disorders, attention deficit hyperactivity disorder, anti-social personality disorder, borderline personality disorder, conduct disorder and mood disorders. ICD is characterized by five behavioural stages of impulsivity, which are: an

[135] Canadian Mental Health Association, "Fact Sheet: Eating Disorders."

impulse, growing tension, pleasure on acting, relief from the urge, and finally guilt (which may or may not arise).

4.2.7 – Personality Disorders

There are a number of Personality Disorders, which are outlined in the figure below. When someone is dealing with a Borderline Personality Disorder (BPD), they may have severe difficulty maintaining relationships, making decisions, and often place themselves in dangerous situations. People dealing with personality disorders also experience a number of psychological issues and a variety of mood changes. In Canada, hospitalization of young women with personality disorders is three times higher than the rate of young men,[136] and is most often a result of a history of child abuse, abandonment, or neglect.

Type of Personality Disorder	Symptoms
Borderline	volatile interpersonal relationships extreme impulsiveness
Antisocial	disregard for the rights of others violation of the laws of society
Histrionic	highly emotional in need of constant attention from others
Narcissistic	focused on self and own needs lack of empathy for others
Avoidant	social isolation extreme sensitivity to opinions of others
Dependent	submissive clingy
Schizoid	detachment from others limited range of emotional expressions
Paranoid	distrustful suspicious negative interpretation of others' intentions
Obsessive-Compulsive	ritual behaviours preoccupation with orderliness and cleanliness
Schizoidal	cognitive or perceptual distortions and eccentric behaviour

Figure 40: Types of Personality Disorders

[136] Public Health Agency of Canada, Government of Canada, "The Human Face of Mental Health and Mental Illness in Canada," 2006.

4.3 - Who is the Client and What are Their Needs?

Almost everyone, at some point in their lives, will either be directly affected or know someone who is affected by a mental illness. Mental illness affects people of all ages, cultures, genders, and beliefs, although some groups are more susceptible to specific mental disorders than others, as summarized in the figure below. To accommodate such groups, mental health centers should be accommodating to all, but make extended programs available to the groups that are most prevalent in the surrounding context, such as:

Children and Youth	• 18% of Canadian youth adults ages 15 – 24 are affected by a mental illness[137] • Anxiety is the most common (6.5%) • 70% of adults with mental illness develop their symptoms in their childhood or youth • Psychotic episodes are most common between the ages of 15 – 34[138] • 15% of preschoolers have significant levels of depression[139]
Women	• Women are twice as likely as men to develop depression in their lifetime[140] • 10% of women develop depression during pregnancy[141]
Seniors	• 80 to 90% of seniors in long-term care facilities become depressed or psychotic • 12 – 21% of seniors in long-term care facilities experience psychosis • Men over 80 years of age have the highest rate of suicide at 31 per 100,000[142]
Offenders	• 100% increase of mental illness among offenders in the last decade • 61% of female and 71% of male offenders were identified with mental illness upon admission to federal prisons (in the USA) in the last decade[143]

[137] Kirby and Keon, Parliament of Canada, "Report 1 - Mental Health, Mental Illness and Addiction: Overview of Policies and Programs in Canada," 2004.
[138] Ontario Ministry of Health and Long term Care, "Every Door is the Right door," 2009.
[139] Cote, S. M., "Depression and Anxiety Symptoms: Onset, Developmental Course and Risk Factors During Early Childhood," June 2009.
[140] Stewart, D. et. al., "Women's Health Surveillance Report: Depression."
[141] Canadian Mental Health Association, "Fact Sheet: Women's Mental Health."
[142] Kirby and Keon, Parliament of Canada, "Report 1 - Mental Health, Mental Illness and Addiction: Overview of Policies and Programs in Canada," 2004.
[143] Canadian Association of Elizabeth Fry Societies, "Human and Fiscal Costs of Prison," *Elizabeth Fry Fact Sheet.*, 2015.

	• 21% of women and 14% of men incarcerated attempted suicide in the last five years[144]
First Nations, Inuit and Métis	• Suicide is the leading cause of death of Aboriginal people under the age of 44[145] • 64% of Aboriginals experience Post-Traumatic Stress Disorder • 30% of Aboriginals have a major depression • 26% of Aboriginals have chronic depression[146]
Developmentally Disabled	• 38% of Canadians with a developmental disability are also dealing with a mental illness[147] • 12.5% (or 1 in 8) people in a tertiary care psychiatric hospital also have a developmental disability[148]
Homeless	• Approximately 86% of homeless people have a mental illness • In Toronto, 5.7% of homeless people have schizophrenia and 38% are dealing with mood disorders[149] • In the year prior to being homeless, 30% had been in jail, 6% had been in a psychiatric hospital, 25% had been clients of a mental health clinic, and 20% had received addiction services[150] • 22% of people that are homeless said that their illness was the reason they became homeless

[144] Boe, R. and Vuong, B., "Mental Health Trends Among Federal Inmates," *FORUM on Corrections Research* 14, no. 2, (2002).
[145] Health Canada, "First Nations and Innuit Health," 2015.
[146] Kirby and Keon, Parliament of Canada, "Report 1 - Mental Health, Mental Illness and Addiction: Overview of Policies and Programs in Canada," 2004.
[147] Dorothy M. Griffiths, Peggy Taillon-Wasmund, and Debra Smith, "Offenders Who Have a Developmental Disability," *Dual Diagnosis: An Introduction to the Mental Health Needs of Persons with Developmental Disabilities* (2002), 387-418.
[148] Lunsky, Yona, et. al., "The Clinical Profile and Service Needs of Hospitalized Adults with Mental Retardation and a Psychiatric Diagnosis," *Psychiatric Services* 57, no. 1 (2006): 77-83.
[149] Kirby, M.J., "The Homeless and Mental Illness: Solving the Challenge," In *Speech at Mental Health Commission of Canada Collaboration for Change Forum, Vancouver BC*, 2008.
[150] Tim Riordan, Parliament of Canada, "Exploring the Circle: Mental Illness, Homelessness and the Criminal Justice System in Canada," 2004.

4.3.1 – What are the Client's Needs?

Those dealing with mental disorders are a particularly vulnerable group of human beings who may experience feelings of helplessness, isolation, anxiety, depression, or feel incapable of coping with daily life. Whether symptoms are instigated by work-related stress, physical illnesses, or personal relationships, clients have a variety of motives for seeking mental health facilities and treatment. Some of the reasons why clients might inquire about services include:

- Feelings of isolation and loneliness
- In need of guidance
- A place to escape or avoid negative aspects of their life
- Ill health or chronic pain
- A change in their environment
- Experience of a traumatic life event such as death of a loved one, divorce, or illness
- Looking for answers to stress, anxiety, and depression
- Development of psychological problems

Figure 41: The Pyramid of Recovery

Recovery from mental illness not only requires medication and emotional treatments but a variety of activities and therapies to promote overall well-being. Life-style factors such as maintaining good physical health, religious or spiritual involvement, and a healthy work-life balance are all important factors in maintaining a strong and healthy emotional state. In addition, patients should develop their own personal insight and understanding of their mental health in order to sustain a mentally healthy state of wellness after recovering from a mental illness. This includes contextual awareness and understanding environmental factors and triggers that contribute to their emotional and physical states. To summarize my research, some of the emotional, physical, and psychological needs of clients include:

- Sensory comfort including elimination of factors which produce stress and anxiety
- Positive distractions that meet the psychological needs of patients and reduce levels of stress and anxiety
- Sense of control over their environment
- Ease of orientation, accessibility, and adaptability
- Allowance for privacy and personalization of space
- Stimulation of positive self-awareness
- Understanding of personal mental wellness
- Comfort in terms of spaces and sensory stimulation
- Enhanced connections with nature, culture, and people
- Social inclusion and support
- Sense of acceptance and familiarity
- Choice of services and activities

4.3.2 – Needs of Friends, Family, and the Community

Increasing social awareness and acceptance of mental illness can encourage use of the facility by the community and family members. The facility itself can promote visitation of family and friends by providing welcoming spaces for social interaction as well as a variety of activities that invite outsiders into the facility. Below are a number of factors to consider to promote community and family use of the building and its services and activities:

- Amenities and services that may not currently be available in the area
- A building that is welcoming and inclusive to all
- A facility that is easily accessible
- A facility that is safe

Architecture can heal and function as a parameter for an enlightened community, one that can even uplift the soul. The environment immediately surrounding a building can influence how patients interact with the surrounding community, and how the surrounding community will interact with the building and its occupants. Physical spaces play a very large part in formation of community relationships through their fostering of "passive social contacts."[151] Buildings that limit availability of and access to services can have adverse impacts on both physical and mental health and have the potential to generate anxiety over accessibility to services.[152] Providing courtyards and other outdoor seating areas provide instances for patients to interact with others outside of the facility. Urban features that enhance a sense of community include those which ensure residents and patients have easy access to amenities, parks, and recreation facilities, and offer pedestrian friendly spaces, and provide streetscapes that provide views of the surrounding neighbourhood.

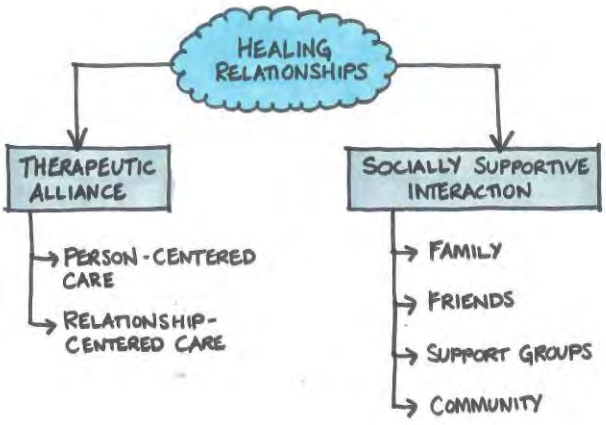

Figure 42: Types of Healing Relationships

[151] Clifford B. *Architectural Environment and our Mental Health,* (Horizon Press, 1968), 12.
[152] C. Ochodo, D.M. Ndetei, W.N. Moturi, and J.O. Otieno, "External Built Residential Environment Characteristics that Affect Mental Health of Adults," *Journal of Urban Health: Bulletin of the New York Academy of* Medicine Vol. 91, No. 5 (2014): 909.

Although the support of staff and visitors can aid in recovery, institutions often put patients in very dependent situations which disconnect them from the broader community environment. In addition, public attitudes toward mental illness and the facilities which serve them are of fundamental importance for the success of decentralized care. There is a need for public education and sensitization to the ex-patient community which can begin with better ways of designing buildings, towns, and cities to take into consideration the behavioural needs and responses of people.[153]

4.3.3 – Needs of Staff Members

In the United States, studies have found that noise, lack of patient contact, and chaotic and unwieldy environments all contribute to the low retention levels of nurses.[154] Research has repeatedly shown that staff members with high levels of emotional exhaustion and depersonalization are less likely to be aware of or implement innovative approaches to human services.[155] In order to improve medical environments for staff members, an area of refuge should be provided where staff can take proper breaks and mentally rejuvenate to provide adequate services to their patients. In a focus group, nurses stated that the following design and planning elements were of importance: [156]

- Visible security
- Sufficient workspace and wider doors to accommodate patients and equipment
- Flexible working spaces, layout and distance to be travelled between tasks
- Balance of exposure to artificial versus natural light and ventilation
- Dedicated spaces for staff rest and relaxation, including attractive areas outside as well as adequate staff facilities such as lockers and showers
- Provision of space for confidential discussions with patients and other staff
- Sufficient and functional storage space
- Quality of fixtures and fittings that facilitate good infection control
- Flexibility to accommodate future growth and changes in patient care

[153] Karlsen, “Architecture and Design Psychology,” 2010.
[154] Cortvriend, "The Effect of the Healthcare Environment on Patients and Staff,” 6.
[155] Patrick W. Corrigan et. al., “Strategies for Disseminating Evidence-Based Practices to Staff Who Treat People with Serious Mental Illness,” *Psychiatric Services* Vol. 52, No. 12 (2001) 1600.
[156] Cortvriend, "The Effect of the Healthcare Environment on Patients and Staff,” 6-7.

- Public spaces that encourage interaction so nurses feel part of the bigger picture rather than a discrete unit
- In larger facilities, provision of amenities such as banks, crèches, shops and cafes

A well-designed environment can play an important role in improving staff morale, decreasing sickness and absence, and improving recruitment and retention. Staff function better in environments that feel safe, calm, and spacious. A good design allows staff to engage with service users and deliver a better quality of care to patients. Staff need design solutions that build in a degree of flexibility. Where practical, rooms should be designed to allow for different functions or to respond to changing service user populations and needs. The design of the environment should also give careful consideration to safety and security for service users, staff, and the public to insure a low level of incidents. In addition, a variety of spaces should be provided for staff to do confidential work and hold meetings. There should also be areas for staff to rest located away from the main service user areas on the ward, and adequate facilities should be provided for the secure storage of personal possessions. Below is a summary of the environmental needs of staff:

- A pleasant environment with safe working conditions
- Flexible and efficient layouts to enable the safe movement, supervision, and management of service users
- Areas for staff privacy and storage
- Collaborative and social spaces

5.0 - Institutional Environments

Throughout history, health care has been influenced by the way society organized itself socially and economically, and was often dictated by current events, social hierarchy, and environmental conditions.[157] In turn, the evolution of the health care facility itself has continuously struggled to balance the needs of patients with the economical demands and social values of society. From various approaches, different facilities emerged for the protection, treatment, and rehabilitation of the mentally ill. Architecture and the treatment of mental health have been connected, either by design or lack thereof, throughout history, from the establishment of psychiatric units in churches and hospitals to the founding of community mental health clinics.[158] A review of the past helps to clarify the evolution of our health system and observe failures and achievements along the way which can be beneficial for future development. Throughout my research I studied a wide variety of building types relative to mental health treatment and recovery in order to understand what types of functions are currently in place in community health facilities, what trends are occurring in different types of health care facilities, and what program elements community facilities may currently be lacking.

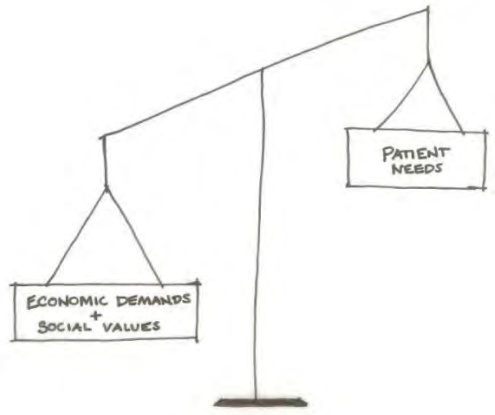

Figure 43: Balance of Society and Patient Needs

[157] Moran, "History of Madness and Mental Illness: A Short History of Care and Treatment in Canada," 2009.
[158] Patricia D. Barry, *Mental Health & Mental Illness, 4th ed* (Philadelphia: J. B. Lippincott Company, 1990), 82.

5.1 - History of Institutional Environments

In Ancient history, an ill person was shunned by society because they believed the affected person was possessed by a demon or had become subject to displeasure of the gods. It was not until the 6th century BC that humans began to accredit their actions and thoughts to sources within themselves. Hippocrates systematically distinguished medicine as existing apart from philosophy; he acknowledged mental disorders as diseases to be understood in terms of disturbed physiology, and argued that "the rationalist physician must possess a strong understanding of the influence of environmental determinants upon mental health."[159] He suggested that exercise and tranquility would be more beneficial than exorcism and punishment, which encouraged the Greeks to show compassion by building beautiful temples to care for the physically infirm.

One of the first known facilities was the Epidaurus in Greece, which emphasized the importance of the built environment on human well-being. The building was 24' deep x 108' long and completely open along the south to allow maximum natural ventilation and daylight to transmit into the interior. The natural environment became a central component of care settings during this time, with an emphasis on communality with nature and the outdoors involving exercise, respite, water, vegetation, sunlight, improvements in nutrition, and immersion in landscape.

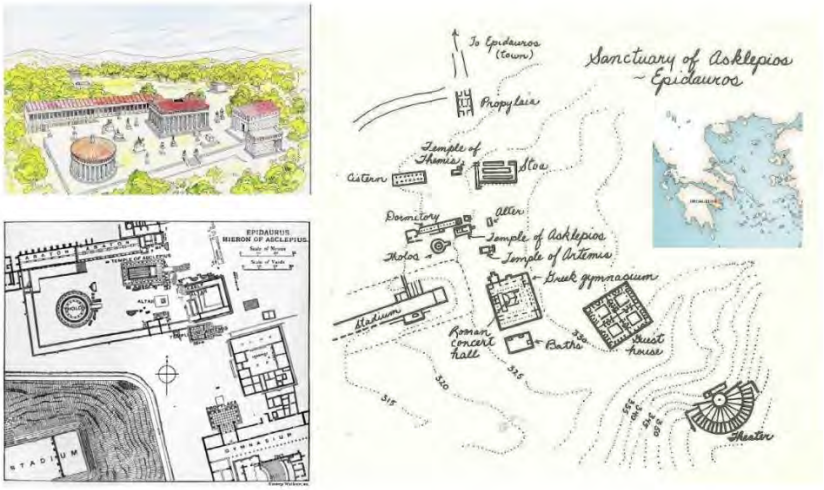

Figure 44: Sanctuary of Asclepius, Epidaurus, Ancient Greece[160]

[159] Verderber, 10.
[160] Warwick Faculty of Arts, "The Cult of Asclepius at Epidaurus," 2008.

Unfortunately, the views of Ancient times did not last and humane methods of treatment diminished during most of the Middle Ages. Those that did not respond to treatment were sentenced to miserable institutions where they were chained to walls, cruelly beaten, and tortured.[161] In an attempt to establish care for the helpless and homeless, the Christian religious orders stepped in and created open-plan chapel-wards connected to the churches. As demand increased, the size and number of these monasteries also expanded until they exceeded the size of the church, and a new building type – the insane asylum – was developed.

Figure 45: Bethlem Hospital - London, United Kingdom[162]

Although asylums were set up to care for the mentally ill, the conditions in these institutions were not much better than those in prisons, with extremely poor indoor air quality and natural light. The earliest recorded and possibly most infamous asylum, Bethlehem Royal Hospital in London, was established in the 14th century and is commonly cited as "a place of horror," exemplifying the terrible conditions endured by those on the margins of society and giving rise to "bedlam" as a term for "chaos and confusion." The asylum continued to evolve although deplorable conditions persisted until a number of key people stepped in and took a stance.

[161] Barry, 80.
[162] Warwick Faculty of Arts, "Sanctuary of Asklepios, Epidaurus," 2008.

From the mid-19th century, architecture and health as a specialized area evolved, rising to a place of recognized professional stature and relevancy.[163] Florence Nightingale spread the notion that the physical healthcare environment can affect well-being, and outlined five essential points in securing a sustainable, health-promoting environment, including pure air, pure water, efficient drainage, cleanliness, and natural daylight. Her discoveries and writings set the standards to which future hospitals would be judged until the outbreak of World War II.[164] In her opinion, each ward was to be 30' wide by 128' in length and should house no more than 30 patients. These wards could be replicated on the site and separated by courtyards in between. One end of the ward was connected to a corridor for circulation and supplies, while the other end usually had a terrace or screened porch to allow patients the opportunity to be outdoors. Up until 1860, Nightingale's pavilion plan appeared to be the best method to house patients in an attractive campus setting with landscaped grounds, and a reliance on natural ventilation, daylight, views, and terraces for patient use.[165]

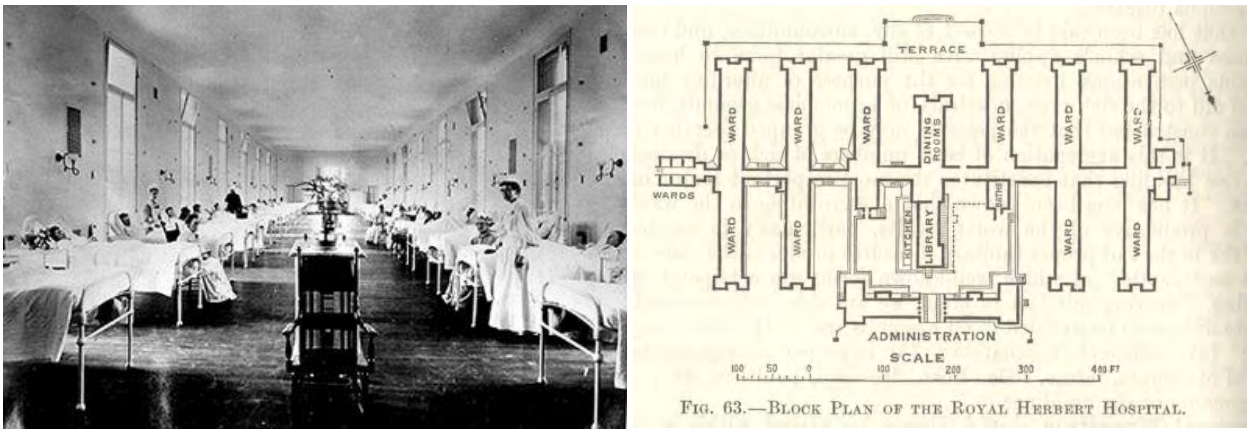

Figure 46: The Royal Herbert Hospital, Woolwich, England[166]

Dr. Thomas S. Kirkbride also introduced innovations in healthcare design during this period by separating patients by severity of illness and advocating for the incorporation of natural sunlight and ventilation. The 'Kirkbride System' was a series of patient units (250 beds total) connected along a long, linear building footprint. The form allowed for abundant light and ventilation through the use of large

[163] Verderber, 9.
[164] Verderber, 21-22.
[165] Verderber, 22.
[166] Essential Architecture, "The Royal Herbert Hospital," 2010.

operable windows and transoms, and patients were able to partake in normalized lifestyle activities, such as exercising outdoors, working, and educational activities. By the late 1800's, Kirkbride's standards for asylums no longer prevailed because of cost-cutting reforms and advancements in psychiatry.

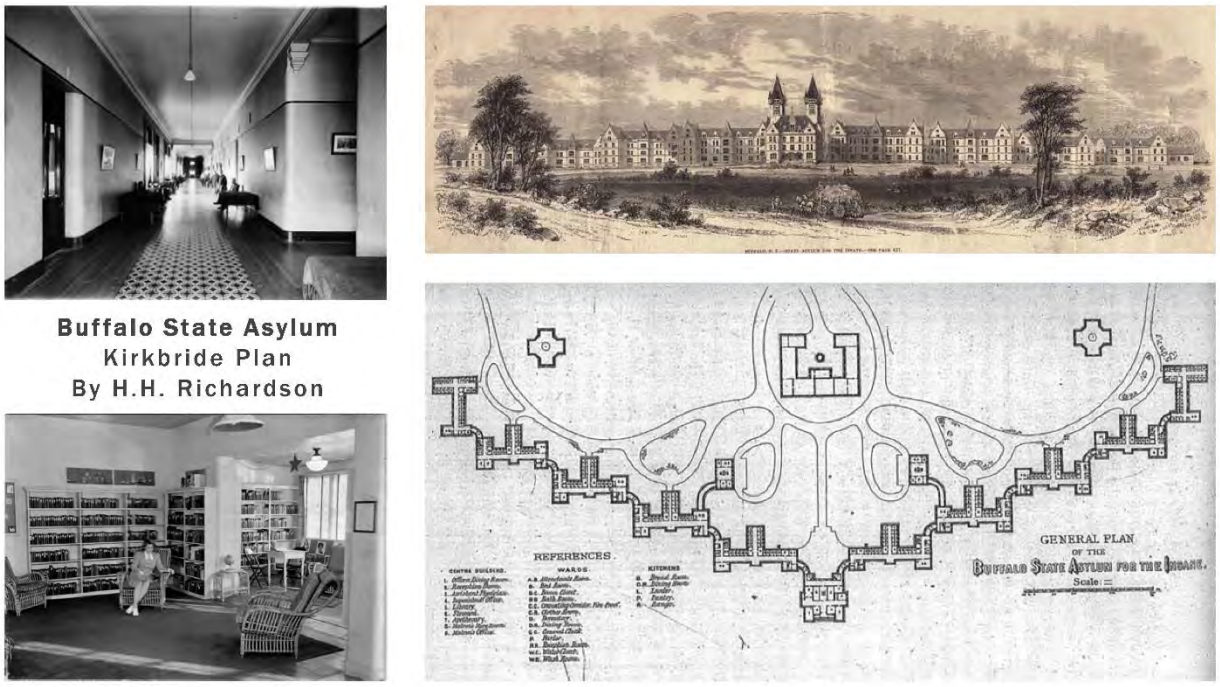

Figure 47: The Kirkbride System[167]

Although the guidelines put forth by Nightingale and Kirkbride were innovative, it was not until the end of the 1800's when several critics claimed that most people in mental hospitals exhibited their psychotic symptoms and behaviour as a direct result of being hospitalized. And yet asylums persisted with record numbers of patients until the number of hospitalized mentally ill people in Europe and North America peaked in the 1950's, with the asylum population in Canada estimated at 66,000 patients.[168] Around the same time, significant new treatment options were discovered that enabled patients to rely less on permanent care at a psychiatric hospital and live more independently in the general community, a change that would accelerate the movement to deinstitutionalization.

[167] The Richardson Olmsted Campus, 2016.
[168] Moran, "History of Madness and Mental Illness: A Short History of Care and Treatment in Canada," 2009.

At the beginning of the 1960's, the government no longer wanted to bear the burden of hospital costs associated with older psychiatric institutions, which led a major push to replace psychiatric care with general hospital psychiatric units and psychiatric services in the community. By the late 1970's, the median length of stay in a mental hospital ward had fallen by more than fifty percent, with the number of beds in provincial psychiatric hospitals reduced from 50,000 to 15,000 between 1960 and 1975.[169] In many instances, the rate of deinstitutionalization occurred far faster than the organization of community services, so much so that the demand for community facilities inevitably outreached the supply. This shortage led to enormous difficulties in providing adequate care services at the community level for those who needed or wanted it.

5.2 - Current Institutional Facility Design

Throughout my research I studied a wide variety of building types at different scales, from smaller establishments such as community health care facilities, to larger, more complex hospitals. The design of many healthcare facilities today has evolved from the restrictive institutions of the past by implementing new psychosocial approaches such as medicines with less disabling side effects, integrating services and promoting strengths rather than treating deficits, and promoting optimism regarding treatment outcomes. While these newer facilities have improved elements of care by providing spaces for patients to interact, it is evident that several issues still remain, such as the disconnect between patient care and the external environment. Below is a summary of my findings; a more detailed summary of some of my specific case studies can be found in **Appendix C.**

5.2.1 - Hospitals and In-Patient Psychiatric Facilities

Hospitals and psychiatric centres have a wide variety of facilities and programs including general hospitals, psychiatric hospitals, neuro-psychiatric nursing units, day hospitals and treatment centres, and alcohol and drug addiction treatment facilities. Psychiatric hospitals include in-patient nursing units and their associated diagnostic and treatment areas, as well as the necessary dietetic, supply,

[169] Donald Wasylenki, "The Paradigm Shift from Institution to Community," *Psychiatry in Canada* 50 (2001), 96.

housekeeping, and administrative spaces common to all hospitals. What separates psychiatric hospitals from general hospital facilities is that they do not generally include the complex and high-tech diagnostic areas that general hospitals provide, since psychiatric hospitals are tailored to the specific needs of mentally ill patients.

Based on my research, patient-centered and holistic design approaches can have profound effects on the psyche of a psychiatric patient. The New York Psychiatric Institute reported a significant drop in the number of patients required to be restrained after opening their new facility with bright, open spaces. Creating environments that are human-scaled and address the urban edges of the site also lend to a less intimidating design, while introducing public program components such as a public outdoor space or easily accessible café have also reduced the "institutional" feeling of larger hospitals. Other important planning and design considerations include:

- Providing maximum visibility within facilities to allow passive supervision by staff
- Minimizing travel distances between frequently used spaces to increase patient comfort and promote staff efficiency
- Making efficient use of space by locating support spaces so that they may be shared by adjacent functional areas
- Giving patients as much acoustic and visual privacy as possible

5.2.2 - Out-Patient Clinics and Community Mental Health Centres

Out-patient mental health care facilities started as a response to the decline in the need for large psychiatric hospitals, and to provide a transition between in-patient care facilities and the community. While some facilities intend to replace the in-patient model, many community-level outpatient clinics are satellites of larger medical centres or systems intended to provide a continuity of care to patients, and offer programs such as preventative care, primary care, and after care. Day treatment centres provide a supportive learning environment in a less institutional setting where patients who have difficulties with community adjustment and other psycho-social problems can continue to receive care or receive new help. Although out-patient facilities can vary in size and services

in comparison to the larger, more complex facilities and hospitals, they share many of the same goals, such as:

- Promoting staff efficiency by minimizing travel distances between frequently used spaces
- Making efficient use of space by locating support spaces so that they may be shared by adjacent functional areas
- Grouping or combining functional areas with similar system requirements

Although the needs of out-patients are generally less-intense than patients of hospitals and in-patient medical facilities, every effort should still be made to make the visit of out-patients as unthreatening and comfortable as possible. In addition to the needs listed above, the following are recommended specifically for out-patient types of facilities:

- Use modular concepts of space planning and layout when possible
- The facility should be easy to find, recognize, and enter, to encourage its use
- An inwardly directed environment that opens up to views of landscaped courtyards and other outdoor spaces
- Encouraging patient independence by a patient-orientated layout, with clear and uncomplicated patient routes, visual cues, and clear signage
- Providing quiet areas for meditation and spiritual renewal, such as, in larger facilities, quiet rooms, and meditation gardens
- Increased use of natural light, natural materials, and textures
- Attention to detail, proportions, color, and scale
- Bright, open, generously scaled in public spaces
- Homelike and intimate scale in patient rooms and offices

One of the benefits of a community-based facility is its smaller scale, which often allows patients to receive more personalized and intimidate care tailored to their specific needs. The facility itself is more human-scaled than a large hospital complex which also makes it less intimidating and more welcoming. However, one of the issues with smaller community-based facilities is that some are specialized, one-service facilities which limits the population that may be able to be served by the

facility. There is also no standard in place for community-based facilities and most are operated by a variety of non-profit organizations, which creates a discontinuity in the services that are offered.

5.2.3 - Community Centres

Figure 48: Zamet Sports and Cultural Center, Rijeka, Croatia[170]

Throughout my research I reviewed a number of other types of facilities, such as community centres, student centres, and senior wellness centres, to understand how elements from community facilities could be implemented into my new building type to encourage social interaction and community involvement. Community Centres are public buildings where members of a community can gather for group activities. In comparison to community mental health centres, which are very introverted, community recreational facilities are a hub of activity that are intended to be inviting and inclusive to all members of the community. It is a place where all ages and cultures can congregate to create a strong sense of belonging for the surrounding community. In order for a community centre to be successful it needs to be easily accessible and highly visible to the community, and provide a wide variety of services and activities that cater to the needs of that particular community, such as various group activities, social support, public information, and other amenities including counselling,

[170] Arch Daily, "Zamet Sports and Cultural Center," 2009.

employment support, local community services, and recreational activities. In addition, the form and function should be flexible in order to grow with the changing needs and demands of the community.

Most of the above types of programming listed above can be offered in three types of functional spaces: classroom and training spaces, resource rooms (such as libraries and computer labs), and program or counselling offices. Additional functional areas include administrative spaces, storage spaces, specific recreational spaces, and building support spaces. Key design considerations for Community Centres include:

- Creating a non-threatening environment where people will feel comfortable
- Physically separate private spaces from public spaces and provide acoustical privacy
- A sense of welcome and arrival at the entrance, lobby, and reception desk
- In counselling and therapy spaces use indirect lighting as main ambient lighting
- Avoid "institutional" finishes, textures, and colours and provide a home-like environment
- Maintain a safe and healthy environment
- Provide flexible environments with moveable partitions and multi-purpose spaces
- Encourage creativity

Figure 49: American Museum of Natural History Glider Center, New York (Studio Gang Architects)[171]

[171] Studio Gang, "American Museum of Natural History Gilder Center New York," 2004.

The pure intent of a community centre to provide a place where a variety of age groups and cultures can co-exist and co-mingle in a variety of programs and settings should be fused with the programming and holistic qualities of a community mental health facility to provide each community with a consistent level of wellness, care, and services, while also breaking down the barriers between those that are recovering from a mental illness and their surrounding community.

5.3 - Future Directions of Mental Health Facilities

After reviewing various types of health care and community facilities I would like to take what I have learned and apply it to a new type of facility that provides a more integrated approach to overall health and wellness. Larger health care facilities provide a variety of care for patients, however they feel very institutional and often intimidating. And although community mental health facilities are in high demand, they do not offer a standard in treatment and there is no “dominant model or paradigm.” Currently, both large and small scaled facilities are very introverted and create a divide between patients and the community, which encourages the stigma associated with mental health facilities. Many health care facilities have complicated and confusing layouts which can worry patients with anxiety disorders and increase their stress levels. There is also a need to implement patient-centered design features that have proven to increase patient comfort, staff efficiency, and ultimately aid in better patient outcomes and recovery. In summary, new mental health facilities should be designed to:

- Nurture and support patient’s physical, emotional, and spiritual health,
- Minimize restraint in both physical and social parameters, and
- Take patients on a journey through the process of recovery and
- Guide them through the process of re-integrating into the community.

Summary of Part One

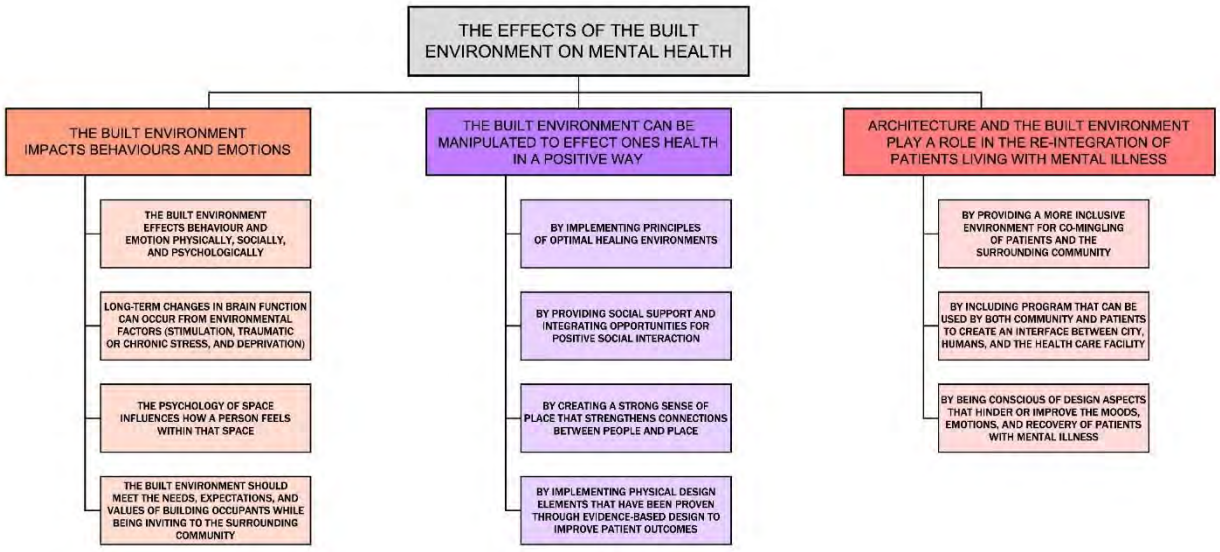

Figure 50: Summary of Research

The relationship between the built environment and well-being is influenced by several factors including our sensory systems, our emotions, our perceptions, and our interpretations of a space. The senses in particular play a significant role in our physical, psychological, social, and emotional experiences within a space. Information received from the surrounding context influences affect, mood, and emotions (internally), which is revealed externally by our attention, judgements, and thoughts. The importance of the 'human – environment' interaction is realized when a strong sense of place is developed through design interventions that are applied to modify environmentally destructive behaviour, while also improving our perceptions, interpretations, moods, and emotions.

Those that are dealing with a mental illness are particularly vulnerable and often experience elevated sensitivities to a variety of environmental stimuli, which can change the way they experience a space. Mental disorders in particular have several cognitive and behavioural effects that change the way people think, feel, and behave. Individuals with a mental illness who have developed problematic behavioural patterns are often unaware of their particular sensory needs or stress responses. Understanding the implications of each illness helps identify what changes can be made to the environment to meet the needs of those dealing with such disorders. By rethinking space and place with

people and the environment in mind, well-planned institutional facilities can promote wellness and reduce time of recovery for patients.

Mental health care facilities in particular have the great challenge of stimulating patients who are withdrawn and depressed, without over-stimulating patients who are manic and agitated, and simultaneously fostering a sense of optimism about hospitalization and rehabilitation. I also found that there is no dominant model or paradigm for current mental health facilities, and there is a strong disconnect between all types of health care facilities and their surrounding environment, which adds to the lack of community social support and prevalence of stigma associated with mental health facilities. It is clear to me that a new type of facility is needed to resolve issues of stigmatization and isolation, lack of funding, and lack of standards in care and treatments.

After completing extensive research and reviewing various mental health facilities I would like to take what I have learned and apply it to a new facility type that provides a more integrated approach to overall health and wellness. This new type of mental health facility will nurture and support the client's physical, emotional, and spiritual health, and minimize restraint in both physical and social parameters. The facility will take patients on a journey through the process of recovering and guide them through the process of re-integration into the community. When optimal conditions are met, clients and other building occupants can realize multiple benefits including higher participation accompanied by more responsibility, greater tendency to accept new social situations, and increased sense of self-identity through increased competence.[172] In summary, the architectural philosophy should meet the needs, values, and expectations of the building occupants, while also being inviting to the surrounding community, to provide an environment that is optimal to those inhabiting the space.

The next section (Part 2) of this document is a set of design guidelines I have developed based on my research and conclusions, to assist design and health care professionals with the planning and design of future community mental health care facilities. An example of this new building type is outlined in Part 3 of this document, to demonstrate the application of my guidelines, and how to promote overall wellness within a community mental health facility.

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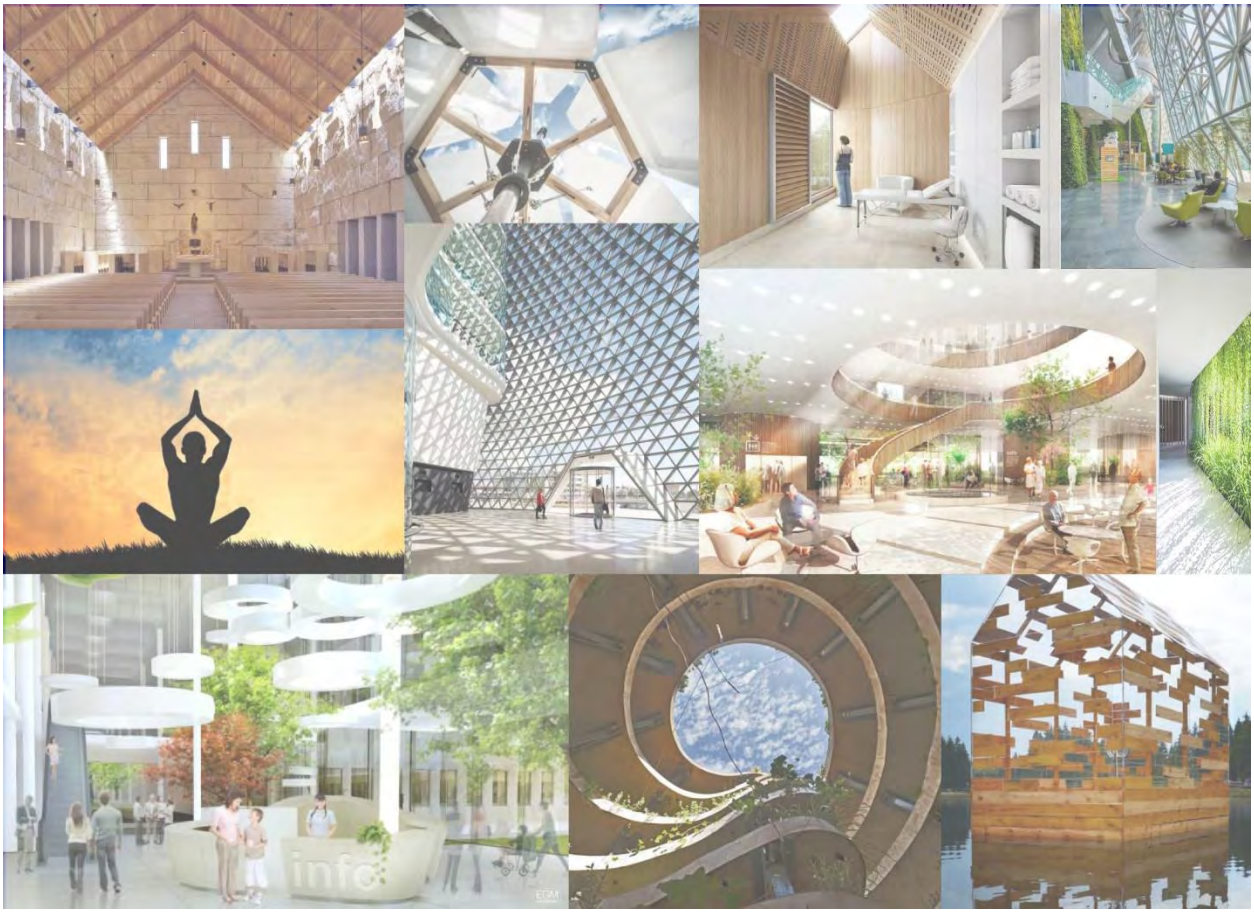
[172] Robert B. Bechtel, *Enclosing Behavior,* Vol. 31. (Stroudsburg, Pa: Dowden, Hutchinson & Ross, 1977), 163.

PART TWO: APPLYING THE RESEARCH

Mental Wellness by Design:

Planning and Design Guidelines for Community Mental Health Facilities



Miranda Nicole George

December 9th, 2017

6.0 - Nightingale Collective Design Guidelines

6.1 - Introduction

From the findings of my research, I have developed a set of design guidelines outlining the effects of the built environment on human behaviour to assist the Ministry, developers, designers, architects, and operators, and to set a standard for the future planning and design of community mental health facilities. The guideline includes an overview of this new facility type, along with design principles, site requirements, building scale, programming, and design recommendations, all which focus on positive mental health, rehabilitation, social interaction, and integration with the surrounding community.

6.1.1 - What is the Nightingale Collective?

The Nightingale Collective is an inclusive and holistic place that fuses the programming of a traditional community mental health facility and Community Centre into one. The facility takes an active role in the rehabilitation process of Clients by:

- Reducing stigma associated with mental health care facilities,
- Integrating facilities with their surrounding community,
- Increasing community support,
- Providing a standard of care for clients, and
- Easing the strain of program funding by creating dual-purposed facilities.

6.1.2 - Who Will Use The Facility?

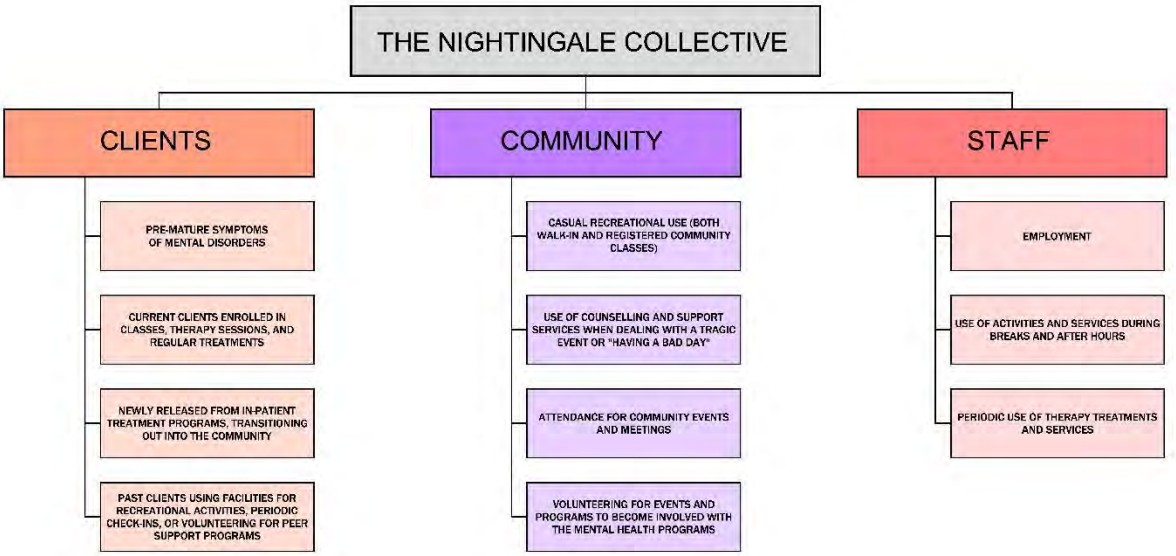


Figure 51: Client and Building Occupant Types

The Nightingale Collective aims to be a place with “something for everyone” including clients, members of the surrounding community, and staff. Clients for this type of facility may come from a variety of scenarios, from ambulatory clients with pre-mature symptoms of mental distress, to out-patients who have recently left institutional psychiatric facilities and are transitioning back into the community. Clients may have mild to medium cases of mental disorders including anxiety, depression and mood disorders, eating disorders, mental health and stress-related problems, and problems associated with various life challenges.

Community members may frequently visit the facility for casual use, or they may want to seek counselling and other support services when dealing with a tragic event or are just having a bad day. Members of the community may also want to become involved with the programming going on at the facility and volunteer their time for activities such as gardening, baking, or general operations. The building may also be used for community meetings or special events, similar to the way current community centres are used.

Staff may also use the facilities in a variety of ways. In addition to their regular employment, staff may use a variety of activities and services before, during, or after their scheduled work day,

including therapeutic treatments when needed. The point is that whether someone is a new, existing, or potential future client, all shall be welcome to participate, and allowing different user types to use the facilities in a variety of ways further blurs the lines between what is considered “Therapeutic Services” and “Community Services”.

Below is a table to demonstrate the desired mix of clients to staff and other building occupants. The intention is that the number of clients is equal to the number of community occupants to provide a balance between therapeutic and community use within the building.

BUILDING OCCUPANT TYPE	OCCUPANT RATIO	BUILDING OCCUPANTS	
		#	%
CLIENTS	NUMBER OF CLIENTS REQUIRED TO BE SERVED	100	**41.7%**
STAFF (FULL-TIME)	APPROXIMATELY 1 STAFF / 10 OCCUPANTS	20	**8.3%**
STAFF (PART-TIME)	APPROXIMATELY 1 STAFF / 10 OCCUPANTS	20	**8.3%**
PUBLIC (COMMUNITY)	EQUAL TO NUMBER OF CLIENTS	100	**41.7%**
TOTAL BUILDING OCCUPANTS		**240**	**100.0%**

Figure 52: Building Occupants (By Type)

Although the types of clients will vary for each facility based on the surrounding demographic, below is a base point for the approximate mix of clients a facility may have, based on national averages of each disorder:

CLIENT TYPE	% OF POPULATION IN CANADA AFFECTED	APPROXIMATE % OF CLIENTS	% OF BUILDING OCCUPANTS
SCHIZOPHRENIA	1.0%	**2.3%**	**1.0%**
DEPRESSION	8.6%	**20.2%**	**8.4%**
SEASONAL AFFECTIVE DISORDER (SAD)	3.0%	**7.0%**	**2.9%**
BI-POLAR DISORDER	1.0%	**2.3%**	**1.0%**
GENERAL ANXIETY DISORDER	12.0%	**28.2%**	**11.7%**
POST-TRAUMATIC STRESS DISORDER (PTSD)	4.0%	**9.4%**	**3.9%**
OBSESSIVE-COMPULSIVE DISORDER (OCD)	1.0%	**2.3%**	**1.0%**
EATING DISORDERS	3.0%	**7.0%**	**2.9%**
IMPULSIVE CONTROL DISORDERS	2.0%	**4.7%**	**2.0%**
PERSONALITY DISORDERS	7.0%	**16.4%**	**6.8%**
TOTAL CLIENT OCCUPANTS		**100.0%**	**41.7%**

*NOTE: CLIENT MIX BASED ON NATIONAL AVERAGE AND WILL VARY FOR EACH FACILITY BASED ON THE PREVALENCE OF EACH ILLNESS WITHIN THE CATHCMENTAREA.

Figure 53: Clients (By Type of Disorder)

6.1.3 - Why is This Facility Needed?

This type of facility is needed due to the high demand for mental health care facilities throughout Canada, as well as the need for a standard level of care and treatment for all. The Nightingale Collective focuses on out-patient care due to the high demand, and because it is preferred over in-patient care when possible to provide a seamless transition between treatment and everyday living.

Out-Patient Requirements:

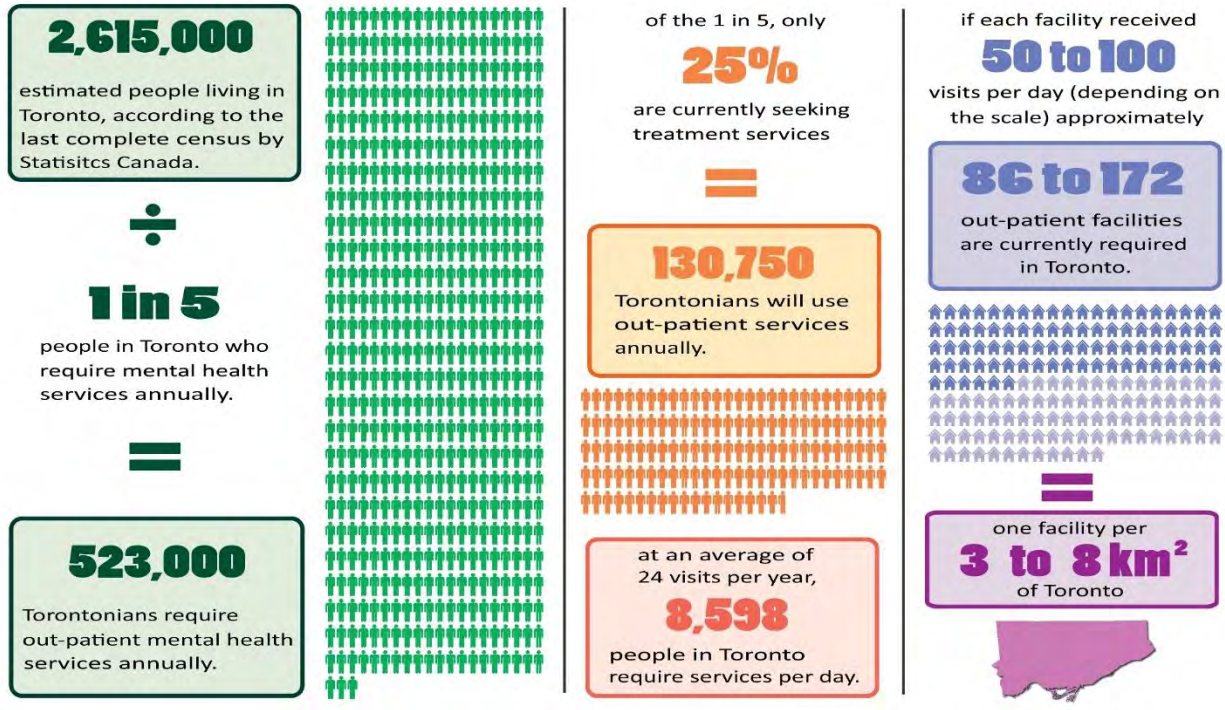


Figure 54: Need and Demand of Community Mental Health Facilities

With out-patient services required to service approximately 1 in 5 people annually, 523,000 of the 2,615,000 people in Toronto require out-patient mental health services annually. Of the 1 in 5, only 25% are currently seeking services, therefore approximately 130,750 people in Toronto will use out-patient services annually. At an average of 24 visits per year, 8,598 people require services per day. If each facility received approximately 50-100 visits per day (depending on the scale), approximately 86 to 172 out-patient facilities are currently required in Toronto. This is equal to approximately one facility per

3 to 8 km2 of Toronto, if evenly distributed. However, one of the objectives of this facility is to increase accessibility and in turn hopefully increase the number of people who will use community mental health services to improve their well-being. In addition to mental health clients, each facility would also service its surrounding community with a variety of public programming specific to their needs.

In-Patient Requirements:

Although in-patient facilities are not part of this guideline, it is important to consider the demand for in-patient facilities if they are combined with out-patient facilities. According to my research, approximately 1 in 200 people of Toronto require hospitalization for a mental illness annually (ie: 13,075 people in Toronto). With a program being 6 weeks on average, this means that 1,509 beds are required per day in the city of Toronto to service the current number of hospitalizations for mental illness. Based on the above numbers, if 40 in-patients are accommodated at each facility then 38 facilities would be required in the city of Toronto.

6.1.4 - How: Operations and Economics

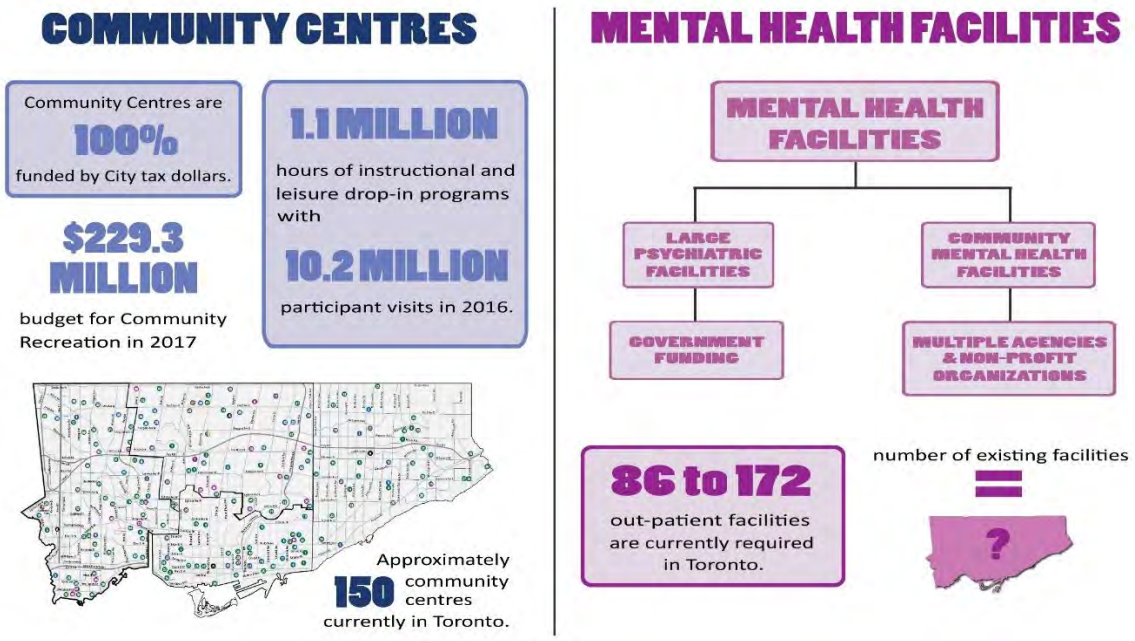


Figure 55: Economics of Community Centres and Mental Health Facilities

I also want to point out that there are currently 150 community centres in Toronto as shown on the map above, which is close to the number of Nightingale Collective facilities required based on my research. This is why the Nightingale Collective considers the ways both community centres and community mental health facilities are run in order to establish an efficient and economical way to fuse the two building types and services together. Community centers are generally run by the municipality they are located in and funded by City tax dollars, which helps to regulate the types of programs offered and general operations of the facility.

In contrast, the economics of mental health facilities can vary substantially. Larger psychiatric facilities are generally run and funded by the government, while smaller community mental health facilities are run by multiple non-profit organizations and agencies with limited capital resources. As a result, community facilities cannot provide the type and amount of services needed by their catchment area, which affects the quality and accessibility of care available to clients. Therefore, combining these two types of facilities will reduce costs, and utilize less space to run a variety of programs simultaneously. It will also be easier to understand the future needs of these types of facilities, allow for future adaptability, and provide more stable and consistent mental health services for each community.

The facility is also an opportunity for those without employment to work various jobs in the facility and gain experience, independence, and mingle with the community. A work setting also allows for passive supervision and a chance to practice social skills. Clients who are employed within the facility could either be paid and/or receive a reloadable “Wellness Card” to use for food and services within the building.

6.2 - Site Selection

When narrowing down the location of the Nightingale Collective, it is important to consider the site itself, its surrounding context, and a number of characteristics:

- The closer a facility is to a Client's home, the more likely they will use the services available.
- A facility that is accessible by multiple means of transportation such as public and private vehicles and cycling routes will also encourage use, while
- Emphasis on walkability and pedestrian access encourages healthy lifestyle choices.
- Access to green space, orientation, and exposure to natural light are also important aspects for this facility as they enhance the holistic qualities and provide opportunities for community integration.

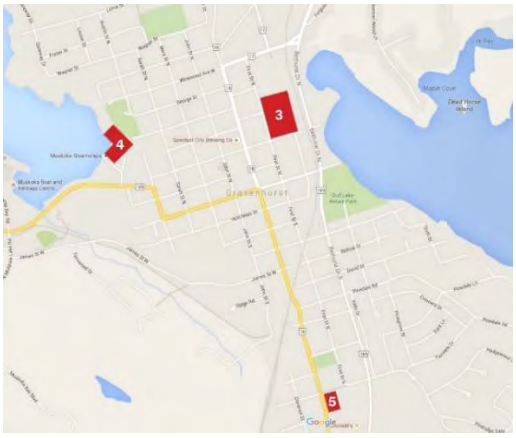
It should also be noted that the facility does not have to have its own site. Since community integration is important, it is beneficial to collaborate with other community services – especially in smaller neighbourhoods or towns. The facility can share a building or site with other uses, so long as the existing site and/or buildings can satisfy the required design principles necessary for this building to be effective. Below are various examples of site options for a new community wellness facility. At the end of this section is a chart that compares all of the examples.

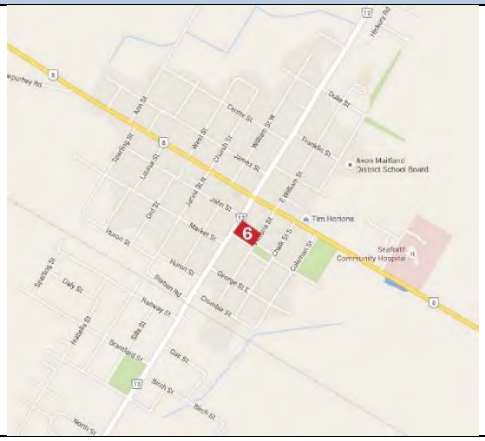
6.2.1 - Rural Examples:

<table>
<tr><th colspan="2">RURAL: Bayfield, Ontario</th></tr>
<tr><td> 
</td><td>SITE #1: The Square & John Ave

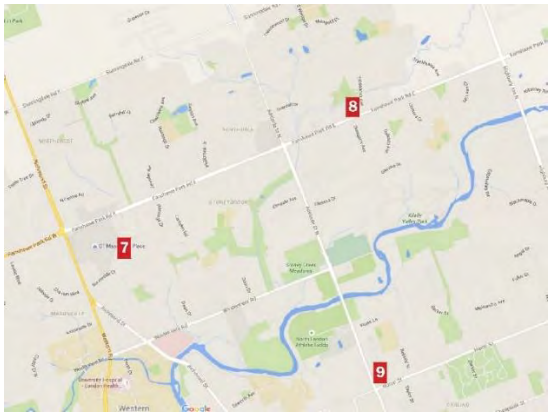
• Lot with existing house facing the town park
• Surrounded by low-rise historical houses, some converted into small businesses
• Exposure to natural light along east and south
• No access to public transit, but centrally located within the Town of Bayfield
• Ample parking provided around the park
• Less than a 2 minute walk to the shops on Main Street</td></tr>
<tr><td colspan="2">SITE #2: Bayfield Arena</td></tr>
</table>

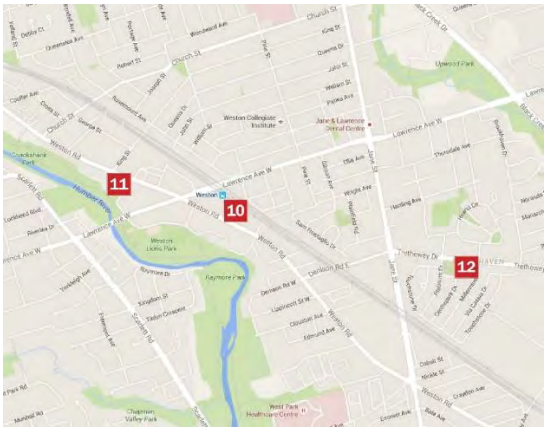
- Currently an existing arena which is heavily used for community functions in the upstairs space
- Existing facility is old and not easily accessible for large senior population (only one small elevator)
- Not accessed by any transit, but easily accessible by car from Highway 21, and walking distance for all residents of Bayfield
- Ample opportunity for street visibility and exposure to natural light on all edges of the site, with a large open green space to the south, currently used for organized sports and farmers markets

RURAL:	**Gravenhurst, Ontario**
	**SITE #3: First St & Church St** • Existing parking lot and newly built Gravenhurst Centennial Centre • Surrounded by low-rise residential to the west and north, a railway corridor to the east, and grocery store to the south • Plenty of exposure to natural light from south, east and west, with views of Gull Lake to east • Within close proximity to Gull Lake Rotary Park to the south-east • Not accessible by transit, but within a walkable area with ample parking
SITE #4: End of Isaac St • Wooded lot located at end of dead end street • Surrounded by residential to the north and east, a park to the north, a marina for the Muskoka Steamships to the south, and Muskoka Bay to the west • Exposure to natural light through the existing tree canopy • Less accessible in comparison to other sites, but setting is very calm and serene	**SITE #5: Lepage Site – Muskoka Road** • Existing real estate office and green space • Great community exposure along Muskoka Road, and adjacent to a pedestrian connection connecting the site to Town Hall • Surrounded by a mix of low-rise retail and residential buildings • Ample opportunity for exposure to natural light • Easily accessible from Highway 169 for clients outside of Gravenhurst

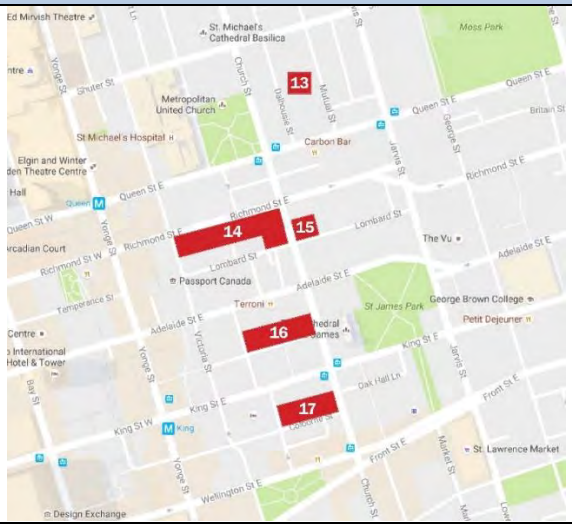
RURAL:	**Seaforth, Ontario**
	**SITE #6: Main St & Gouinlock St** • Existing 1-storey retail building located on historical main street • Surrounded by low-rise historical buildings with retail shops along Main Street to the north-west and south-west, and single family homes to the north-east and south-east • Gouinlock Street connects the site to a small green space to the south-east • Not accessible by public transit, but located in a central location within the community • Exposure to natural light to the south

6.2.2 - Suburban Examples:

SUBURBAN:	**London, Ontario**
	**SITE #7: Masonville Library Site** • Existing Public Library Branch surrounded by low-rise residential on the east and south, a large shopping mall to the west, and smaller retail plazas to the north • Bus stops less than a 5 minute walk at Fanshawe Park Road and at retail mall • This area has seen continuous growth over the last 20 years • Adjacent to a pedestrian pathway link from residential community to retail hub • Smaller site could be reconfigured or combined with an adjacent site
SITE #8: Fanshawe Park Rd & Trossacks Ave • Vacant lot with frontage on Fanshawe Park Road, surrounded by low-rise residential to the west and north, a large park to the north, single family homes to the south, and low-rise rental apartments to the east • The towns and rental apartments are lower-level market units which transition into middle-class neighbourhoods to the north and south, marking this site as a transition between social groups • Exposure to natural light along south and east edges of the site (both beneficial for mental health patients) • Fanshawe Park Road is a high traffic street which is good for exposure and public interest, but careful consideration is required for noise control • Access to public transit at the site on both Fanshawe Park Road and Trossacks Avenue • Site is slightly isolated (no opportunities for pedestrian links within the community)	**SITE #9: Adelaide Street & Kipps Lane** • Currently an existing synagogue • Corner exposure for light and visibility • A mix of low, mid, and high-rise rental apartments to the north-east and south-east, a water treatment plant and large park to the west, and smaller park to the north • Kipps Lane has long had a reputation for being unsafe, however there have been several improvements to the area in recent years, still disconnected from wealthier communities to north • An abundance of natural features surrounding the site, including outdoor community spaces and connections to paths and walkways along the river used by both communities • Creating an indoor community space in this location could create a space in which people from both neighbourhoods can co-exist

SUBURBAN:	**Toronto, Ontario**
	**SITE #10: 1667 / 1677 Weston Road** • Located on the north side of Weston Road just south of Lawrence Avenue West • This site is currently occupied by two 25-storey slab-style rental apartment buildings and a 1-storey amenity building located in between (portion of site recommended is the centre strip with the existing community center) • A railway corridor is located along the rear of the site, which is a concern in terms of noise, however the new Weston GO station is directly adjacent to the site, making it very accessible. Also accessible by bus along Weston Road • Adjacent uses include the GO station, existing rental towers, low-rise retail along the south of Weston Road, and a gas station and auto repair to the south-east • The area of Weston has a strong sense of community, however it also has a reputation for being crime-ridden and issues with drugs • Southern exposure to natural light (beneficial for mental health patients) • Close proximity to Weston Lions Park and Raymore Park to the south
SITE #11: Weston Road & Little Avenue	**SITE 12: Tretheway Drive & Millenium Drive**
• Currently a parking lot situated at the edge of the existing retail fabric of 'Old Weston' • Adjacent uses include retail along Weston Road to north, west, and east, and low-rise residential to the south • Site backs onto a green strip which links to Memorial Park and the Humber River Trail; Opportunity to extend green space to Weston with views of new facility fronting on green space • Site accessed by bus along Weston Road and within walking distance to the new Weston GO	• Currently a green space (Trethewey Park West) within the Brookhaven residential community • Adjacent uses include a portion of the park to the west (to remain), and low-rise residential homes in all directions • Site is located along Trethewey Drive which connects to Jane, Weston, and Black Creek Drive, but is less busy • Easily accessible by bus at either end of the green space • Facility could provide a much needed active indoor space for the community and complement the existing park space

6.2.3 - Urban Examples:

<table>
<tr><th colspan="2">URBAN: Toronto, Ontario</th></tr>
<tr><td> 
</td><td>SITE #13: 88 Queen St East
• Currently a parking lot
• Surrounded by low and mid-rise buildings on east, west and south (lots of sun exposure and high visibility)
• Along Queen St E street car route and less than 5min. walk to subway station
• Several newer developments happening to the north (community of growth and opportunity)
• Large site is beneficial for courtyard and/or sprawl floor plan which are desired by mental health facilities
• Large site allows more opportunity for green space (larger public green space)</td></tr>
<tr><td>SITE #14: Block between Richmond St E & Lombard St / Victoria St & Church St
• Currently a parking lot and low-rise buildings
• Lots of opportunity for exposure
• NW Corner of Church & Lombard is good for southern and eastern exposure to natural light (beneficial for mental health patients)
• Newer Social Housing project across the street on Richmond would be complimentary to this proposal
• High traffic street = good for exposure and public interest, but careful consideration required for noise control and security
• Taller buildings to the south (building in some shade occasionally)
• Large site allows more opportunity for green space (larger public green space)</td><td>SITE #15: NE Corner of Church & Lombard
• Currently a parking lot
• Corner Exposure for community visibility
• Taller buildings to the south (building in some shade occasionally)
• Tight site does not allow much room for outdoor green space (at-grade for public)</td></tr>
<tr><td>SITE #16: NW Corner of Church St & Court St
• Currently a parking lot
• NW Corner of exposure is good for southern and eastern exposure to natural light (beneficial for mental health patients)
• Close proximity to St James Park
• Exposure to heavy traffic along Church but also frontage along Court Street which is much more quiet and private
Existing public courtyard at the back of the adjacent buildings</td><td>SITE #17: NW Corner of Church & Colborne St
• Currently a parking lot
• NW Corner of exposure is good for southern and eastern exposure to natural light (beneficial for mental health patients)
• Close Proximity to Berczy Park and St James Park
Closest to waterfront and Union station</td></tr>
</table>

6.2.4 - Site Comparison:

While reviewing various sites, I created a table to outline all of the desired characteristics one would want in a site for this facility type. This allowed me to compare a variety of sites and get a sense of the needs, opportunities, and challenges of different sites, depending on their size, scale, location, and context. Sites with a higher total ranking (shown on the far right of the chart) meet more of the criteria than the lower ranking sites, and are therefore more desirable for this facility type. The guidelines recommend that sites meet a minimum of 65% of the criteria to be considered.

CHART 9: EXAMPLE SITE COMPARISON

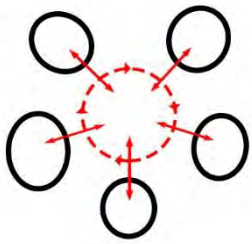
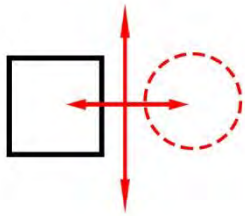
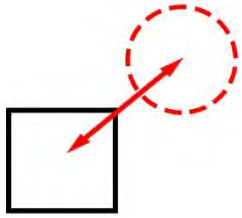
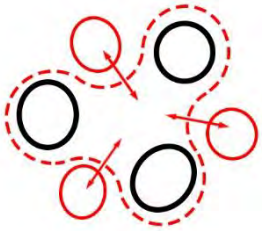
SITE #	SITE LOCATION		APPROXIMATE SITE AREA		SITE REQUIREMENTS & CHARACTERISTICS																												RANKING
					ACCESSIBILITY				LIGHT / EXPOSURE				CHARACTERISTICS								LOCATION			OTHER CONSIDERATIONS										
	CITY	INTERSECTION / DESCRIPTION	m2	ft2	PEDESTRIAN ACCESS	VEHICULAR ACCESS	PUBLIC TRANSIT	CYCLING ROUTE	NORTH	SOUTH	EAST	WEST	CORNER LOT	MID-BLOCK	DEEP LOT	WITHIN A NATURAL HAZARD (2-5 KM)	BEHIND A NATURAL FEATURE (>2KM)	SHELF FOR OUTDOOR ACTIVITIES	CITY / TOWN VIEWS	VIEWS OF NATURE	WORK IN HUMAN WORLD SITE	ALONG A MAIN STREET	REMAIN IN HUMAN REALITY (IN DISTRICT)	CLIENT PRIORITY (CLOSE TO SOCIAL SERVICES)	QUIET	IMPROVEMENT FOR PRIVACY							
RURAL LOCATION																																	
1	BAYFIELD, ONTARIO	THE SQUARE & JOHN AVENUE	1,000.0	10,764	1	1				1	1		1			1	1			1	1	1		1	1	1							13
2	BAYFIELD, ONTARIO	BAYFIELD ARENA SITE	7,500.0	80,730	1	1			1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1							15
3	GRAVENHURST, ONTARIO	FIRST ST N & CHURCH ST	10,000.0	107,640	1	1			1	1	1	1	1	1	1		1	1		1	1		1	1	1	1							16
4	GRAVENHURST, ONTARIO	END OF ISAAC STREET	2,500.0	26,910	1	1			1							1	1			1				1	1	1							9
5	GRAVENHURST, ONTARIO	ROYAL LEPAGE SITE (MUSKOKA ROAD)	2,500.0	26,910	1	1			1	1	1	1	1		1			1			1	1			1								11
6	SEAFORTH, ONTARIO	MAIN ST & SOUTH DOCK ST	1,875.0	20,183	1	1				1			1		1		1	1			1	1	1										13
SUBURBAN LOCATION																																	
7	LONDON, ONTARIO	MASONVILLE LIBRARY SITE	3,000.0	32,292	3	1	1	1		1	1	1								1	1	1	1											13
8	LONDON, ONTARIO	FANSHAWE PARK RD & TROSSACKS AV	6,400.0	68,890	2	1	1	1		1	1	1	1				1	1			1		1										15
9	LONDON, ONTARIO	ADELAIDE STREET & KIPPS LANE	2,500.0	26,910	2	1	1	1		1		1				1	1	1		1	1	1		1			1							17
10	TORONTO, ONTARIO	1667 / 1677 WESTON ROAD	3,788.0	35,352	3	1	1			1		1			1	1		1			1	1		1			1							14
11	TORONTO, ONTARIO	WESTON ROAD & LITTLE AVENUE	2,030.0	21,851	3	1	1			1	1		1			1	1	1		1				1										13
12	TORONTO, ONTARIO	QUEENSWAY DRIVE & MILLEDGE DRIVE	3,500.0	37,674	2	1	1			1		1	1	1		1	1	1			1			1		1	1							13
URBAN LOCATION																																	
13	TORONTO, ONTARIO	66 QUEEN STREET EAST	11,275.0	121,364	3	1	1	1	1	1	1	1	1	1	1		1	1	1			1	1	1	1	1								16
14	TORONTO, ONTARIO	RICHMOND ST E & CHURCH ST	7,313.0	78,717	3	1	1	1		1	1		1	1			1	1			1	1	1	1										15
15	TORONTO, ONTARIO	CHURCH ST & LOMBARD ST	1,142.0	12,292	3	1	1	1		1		1	1				1					1	1	1										13
16	TORONTO, ONTARIO	CHURCH ST & COURT ST	2,270.0	24,434	3	1	1	1		1	1		1	1		1	1					1	1	1										15
17	TORONTO, ONTARIO	CHURCH ST & COLBORNE ST	3,283.0	35,338	3	1	1	1		1	1		1	1		1	1				1	1	1	1										16

Figure 56: Site Comparison Matrix

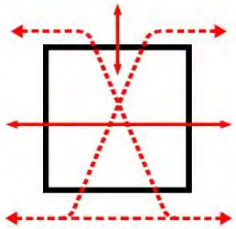
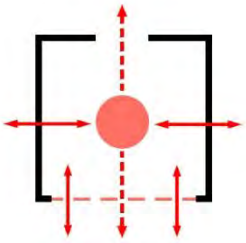
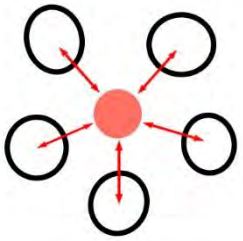
6.3 - Design Principles

The Nightingale Collective intends to have a positive effect on the well-being of all occupants of the facility, and to ease the transition between institutional environments and the surrounding community by promoting social integration between clients and surrounding residents. The facility will be a welcoming and inviting environment with extensive services that encourage both personal growth and community integration to improve and sustain ones mental wellness. The vision of the facility will be achieved by designing an environment that is conscious of the emotional, physical, social, and psychological needs of clients, staff, and the community, to support and take an active role in ones path to well-being and good mental health by applying the following principles:

Principle #1: Reduce Stress and Promote Wellness:

			
Clear Wayfinding and Visual Cues	Privacy and Comfort	Choice and Control of the Environment	Positive Distractions

Principle #2: Integrate and Connect the Facility with the Community:

			
Permeability and Connectivity	Adaptability and Flexibility	Providing a Non-Institutional Design	Promote Social Inclusion

6.3.1 - Principle #1: Reduce Stress and Promote Wellness

Stress stems from a variety of causes such as reduced physical capabilities, physical ailments, noise, and lack of privacy. These causes have a variety of negative psychological, physiological, and behavioural effects that influence our emotions and work against wellness. Therefore, it is imperative to eliminate known environmental stressors, which ultimately reduces stress on clients and other building occupants, by clear wayfinding, providing choice and control, privacy and comfort, and therapy.

In addition to eliminating factors that can cause stress, taking things a step further and promoting wellness throughout the building enhances the overall therapeutic setting and process. Optimal healing environments should stimulate positive awareness of ourselves by allowing the environment to embody reminders of things that make us happy or give us hope. When our physical, psychological, and symbolic needs are not met, stress and other negative emotions can set in. Therefore, eliminating negative stressors and emphasizing opportunities to regain our health and well-being are important, such as a balance of simulation levels, and positive distractions such as art and art therapy, and views to and experiencing nature.

Clear Wayfinding and Visual Cues

Many health care facilities have complicated and confusing layouts, which can worry clients with anxiety, disorders and increase their stress levels. Clear wayfinding should be provided to make perception of spaces easier to comprehend, including:

- Ample signage that is easy to understand
- Visually distinct zones to provide visual cues to building occupants
- Clearly identified staff areas, exit stairs, elevators, and washrooms, distinctly marked with familiar colours or materials to provide ease of access and a level of comfort to those who may experience anxiety
- Interactive maps near stairs and elevators in larger buildings to assist in navigation
- Lighting oriented in the direction of travel along circulation routes, patterns on glass screens and railings, and differentiation between floors, walls, and ceilings

- Simple building layout
- Easy to understand signage
- Interactive maps and schedules
- Visually distinct zones
- Staff, stairs and elevators clearly identified
- Contrast between floors, walls and ceilings
- Lighting oriented in the direction of travel

SIGNAGE
(Source: Codfish Design)

COLOUR
(Source: Guy's & St Thomas's)

SIGNAGE BY FLOOR
(Source: Studio Matthews)

SITE SIGNAGE
(Source: Apple Sign Systems)

Providing Choice and Control of the Environment

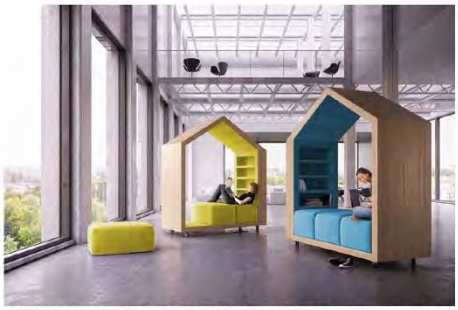
Choice and control of the environment are essential to accommodate the changing moods and needs of various Client types. Taking responsibility for the environment also combats feelings of helplessness and increases a sense of importance and capability. A mix of spaces should be provided in terms of size, stimulation, colour, light, scent, and noise, including:

- High-energy spaces that motivate,
- Low-energy spaces that are calm and relaxing,
- And neutral spaces that can adapt to different user needs.

A wide range of activities also provides choice between interaction and solitude. Breakout spaces and open concept circulation provide a sense of relief for Clients who experience anxiety from confined areas, while spaces with a partially depressed ceiling can create a sense of enclosure and comfort for those who are intimidated by open areas or large crowds. In addition, seating areas overlooking other activities provide opportunities for viewing other types of programming and may encourage someone to participate.

Choice (and control) Between:

- Interaction and Solitude
- Calm and Stimulating
- Open and Enclosed
- Indoor and Outdoor
- Viewing and Participating



A SENSE OF ENCLOSURE IN AN OPEN SPACE
(Source: Dymitr Malcew)

BREAKOUT SEATING OVERLOOKING ACTIVITIES. HARPA, REYKJAVIC.
(Source: Arch Daily)

BREAKOUT AREAS IN AN OPEN SPACE
(Source: Design Blitz SF)

Providing Privacy and Comfort

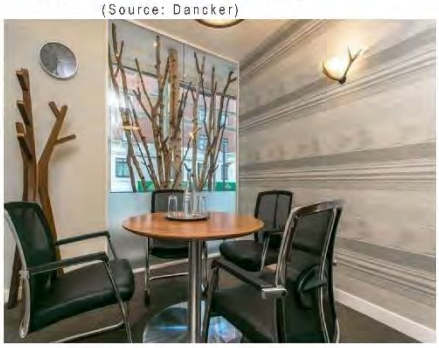
Privacy is also a concern when involving sensitive programming. At least one room for screening and interviewing should be provided near the main entrance so new clients feel comfortable to open up to staff. A more secluded secondary entrance, separate from the main entrance, allows clients to maintain their privacy and confidentiality if desired. Consideration should also be given to the location of potential noise sources in relation to private and sensitive areas. Adequate soundproofing should be installed between rooms, specifically in sensitive areas such as therapy and treatment spaces, and noisy mechanical equipment, fans, and light fittings should also be avoided. Visual privacy is also important in sensitive areas such as therapy and treatment spaces. Privacy screens and walls with horizontal slats provide a sense of enclosure in less private areas.

- Screening room for interviews and private discussions
- A secondary entrance that is less busy
- Soundproofing between sensitive areas such as therapy and treatment rooms
- Sound mitigation for potential noise sources (mechanical equipment and loud activities)

HOME-LIKE ATMOSPHERE
(Source: Dancker)

SCREENED AREA IN OPEN SPACE
(Source: Andrew Lewis Office Designs)

SOUND ABSORPTION
(Source: Ecophon)



SCREENING ROOM
(Source: Clarendon Business Centre)

Positive Distractions

Positive distractions such as views to nature and activities such as art therapy reduce stress and provide a diversion from negative thoughts. Integrating environmentally sensitive landscaping that also promotes wellness, such as a sensory garden with low-maintenance planting, provides a gentle stimulation that changes with seasons is positively distracting from our everyday life. Artwork of natural landscapes in common areas and other client spaces also enhance the therapeutic environment, while person-centered, relationship-centered, and recovery-focused programs and services have proven to be the most successful among various types of care facilities. Spaces that provide opportunities for self-expression and individuality, such as an arts and craft room or music studio allow clients to express their creativity and emotions. Open community classes and organized sports promote a healthy lifestyle and provide clients a place to interact with other people within the community.

Diversions from negative thoughts:

- Sensory Garden
- Artwork and Interactive Art
- Music and Dance Classes
- Bring Nature into Building

SENSORY GARDEN
(Source: University of Alberta Botanic Garden)

ART THERAPY
(Source: FSU Art Therapy Association)

VIEWS TO NATURE
San Carlos Center, California (Source: Bruce Damonte)

6.3.2 - Principle #2: Integrate and Connect the Facility with the Community

Current mental health facilities are very introverted and create a divide between patients and the community. This invisible barrier encourages the stigma associated with mental illness and mental health facilities, which ultimately adds another layer of challenges for clients to deal with during their recovery. Incorporating ambulatory amenities and services into the facility creates a safe environment for clients and the public to mingle, breaking down some of the barriers and stigma associated with mental illness, which ultimately aids in the recovery of patients and their overall morale. New mental health facilities should minimize restraint in both physical and social parameters, by reducing physical barriers, providing permeability and adaptability, and increasing community involvement.

The power of community allows people to interact with each other, share experiences, develop valued relationships, and work towards common goals. Providing spaces in which shared emotional connections can occur promotes social inclusion within the community, and encourages personal growth of both patients recovering from mental disorders and the community as a whole. Meaningful interaction between the new wellness facility and the surrounding neighbourhood can be encouraged by providing a non-institutional feel, creating a strong sense of belonging, breaking down barriers and promoting social inclusion.

Permeability and Connectivity

Current mental health facilities are introverted and create a divide between Clients and the community. This invisible barrier encourages the stigma associated with mental illness, and adds another layer of challenges for clients to deal with during their recovery. Reducing physical barriers on the site and within the building promotes integration with the community, including:

- Physical connections through the site,
- Open green spaces that are accessible to the public, and
- Connections between interior and exterior spaces to invite the community onto the property and encourage use of spaces within the building.

- Reduce physical barriers
- Permeability through site to integrate with the community
- Open & publicly accessible green space
- Highly transparent active at-grade uses
- Connections between interior and exterior

CAMH SITE (AFTER PHASE 5)
(Source: Urban Strategies)

EXISTING SITE CUT OFF FROM COMMUNITY
(Source: Master Plan Executive Summary)

CAMH (YELLOW) vs. NON-CAMH BUILDINGS
(Source: Urban Strategies)

Adaptability and Flexibility

Flexibility and adaptability are important in this type of facility, to meet changing needs of the community over time, and respond to the changing workloads, care objectives, and technologies of the future. Programs and services shall cater to the sporting, recreational and community needs associated with the area it will serve, and be flexible in order to accommodate a variety of functions on a weekly basis. During the planning and design of facilities, additional multi-purpose rooms (approximately 10-20% extra, when feasible) should be added to a facility to accommodate future expansion. Operable partitions can combine a number of smaller spaces into one large space for a variety of programs, and transform open-concept circulation used for informal seating into a defined space for activities and special events.

- Flexibility of spaces to accommodate a variety of functions on a weekly basis
- Operable partitions to combine and transform spaces
- Adaptable open-concept spaces and circulation
- Building designed to accommodate future expansion

FLEXIBLE WALLS AND SPACES
(Source: Stanford d.school)

CORRIDOR WITH WORK & SEATING SPACE
(Source: Beaver Country Day School)

MULTI-PURPOSE SPACES
New Aliah Hotel, Kolkata (Source: Arch Daily)

Providing a Non-Institutional Design

In order to strengthen community spirit and encourage participation, a key architectural objective of this facility is to reduce emphasis on institutional aspects of care and design, by:

- Maximizing natural light into the building,
- Providing views out to nature,
- Providing views in to social and recreational activities along street edges, and
- By changing the aesthetics of the building design, such as the use of warm wood and other natural materials, to provide an attractive, non-threatening environment.

- Comfortable and non-threatening
- Welcoming and inviting exterior
- Attractive colours and simple patterns used to enhance activities and emotions in each zone

MAXIMIZE VIEWS & NATURAL LIGHT
(Maggie's Centre, Gartnavel Source: OMA)

ACTIVE STREET FRONTAGE
(Source: Designing Streets: A Policy Statement for Scotland)

NATURAL MATERIALS
(Source: Mountain Home Interior Design)

Promote Social Inclusion

Increasing interaction between clients and the community increases social support, informally educates people, and creates a new level of social awareness. Incorporating ambulatory programs and services into the facility, such as cooking and art classes, creates a safe environment for clients and the public to mingle. Open community classes and organized sports encourage passive social interaction, and serve as a source of learning and reinforcement for attitudes and behaviour that affect our health. Positioning a variety of programs around a central public space creates a sense of unity between different uses and a hub for social activity. In addition, blurring the lines between different types of activities encourages mingling of different building occupants.

- Increase community interaction
- Unify various programs and spaces around a central public space
- Blur the lines between different spaces and activities
- Encourage mingling of different building occupants

OUTDOOR HUB
Scotch Oakburn College (Source: FNI)

OPEN RESOURCE CENTRE
Snagajob Headquarters (Source: Baskervill)

OPEN MUSIC SPACE
Sonorous Museum, Copenhagen (Source: Arch Daily)

6.4 - Program

The program requirements for the Nightingale Collective were developed based on the findings of my research, combined with the review of existing community centers and mental health facilities. First I compared different types of mental disorders and found that there were a number of characteristics common between different types of disorders. Next, I reviewed types of activities and services that are available in different mental health facilities and community centers that have therapeutic value. From this, I found there were also common categories of activities and services that are offered to meet a variety of needs. From these two reviews, I determined that the common characteristics of mental disorders directly relate to the categories of therapies offered. This direct correlation between the disorders and therapy types forms the five categories of basic needs required for the Nightingale Collective to provide an optimal healing environment for all client types.

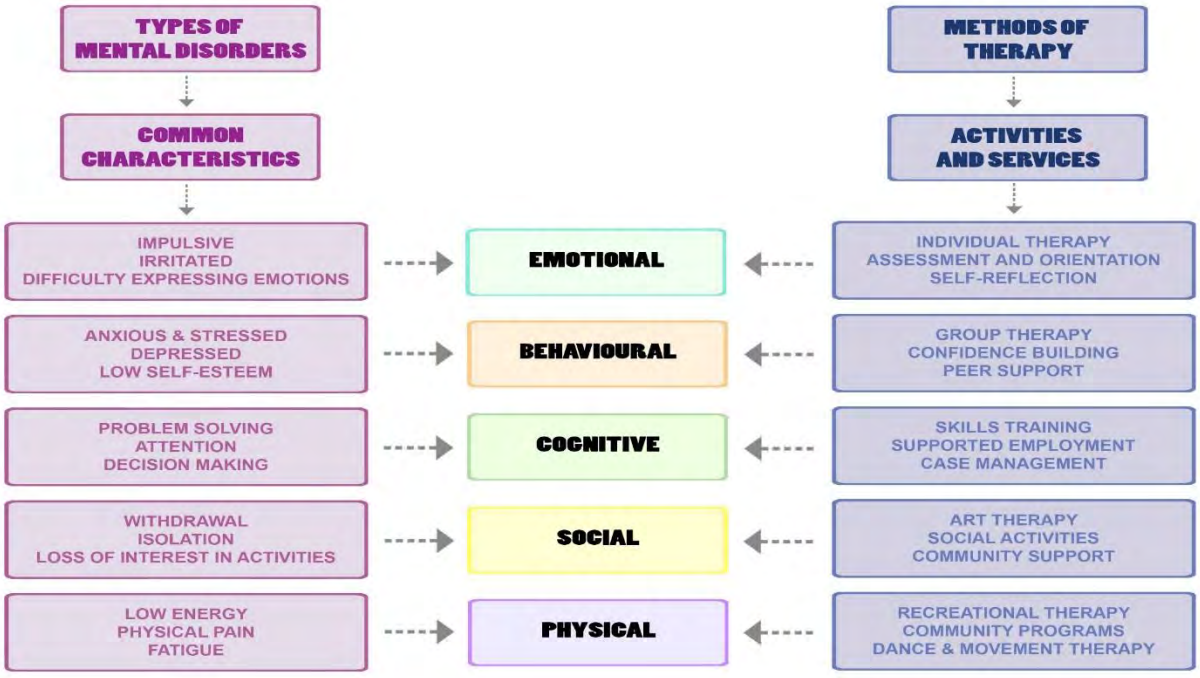


Figure 57: Development Process of Program For the Nightingale Collective

Programs at the Nightingale Collective focus on emotional, behavioural, cognitive, social, and physical health to promote overall well-being. Each facility will have a variety of services offered based

on the size of facility and needs of Clients served. Education and training programs such as skills training in healthy living, effective communication, and cooking classes help Clients feel confident about transitioning back into a regular daily routine when they are finished with their program and encourage people who are in recovery to maintain their goals.

Programs can be in different formats from Client-only classes, to drop-in activities open to the public, and classes shared between the public and clients. Incorporating ambulatory amenities and services into the facility creates a safe environment for the public and patients to mingle, breaking down some of the barriers and stigma associated with mental illness, which ultimately aids in the recovery of patients and their overall morale. Together, the diverse programs and services provide a healing network to connect to peers, support, and services.

6.5 - Zones and Spatial Relationships

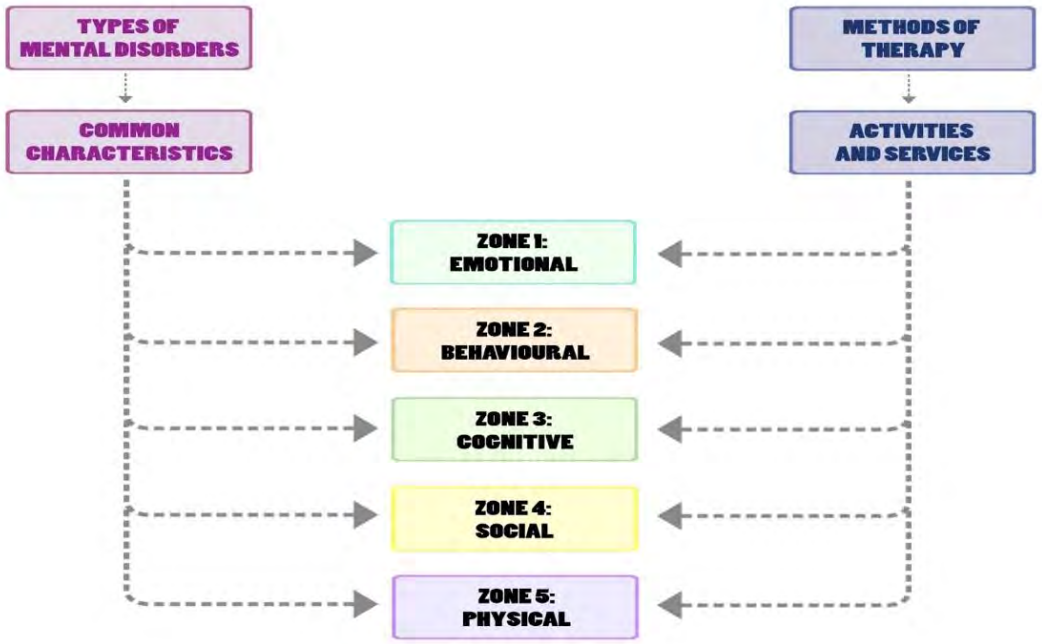


Figure 58: Relationship of Program Elements to Zones

This grouping of basic needs, programs, and activities led me to create the five zones required in the Nightingale Collective, which focus on emotional, behavioural, cognitive, social, and physical health to promote overall well-being. Program spaces are grouped into zones based on the activities that take place, from Zone 1 which is the most private and personal, to Zone 5 which is very active and open.

The idea is, to group types of programming and services that require similar levels of privacy, interaction, and stimulation, in order to accommodate the sensitivities of different building occupants. Building users do not have to move through the zones in sequence, and the intention of the zones is not to separate different building users, but to create five unique experiences within the building that set the mood for the activities taking place in each area. Clients and other occupants will move through the building differently depending on the services they are using and intended moods they want to achieve or maintain.

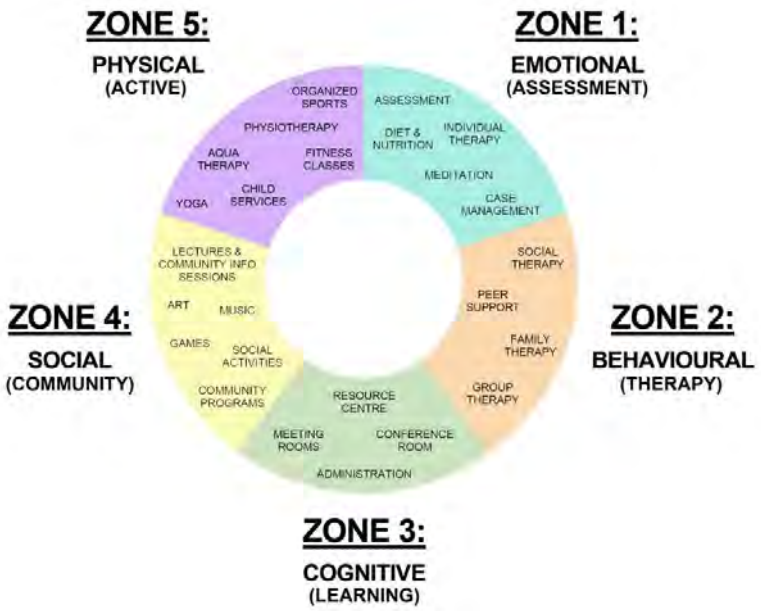


Figure 59: Diagram of Program by Zone

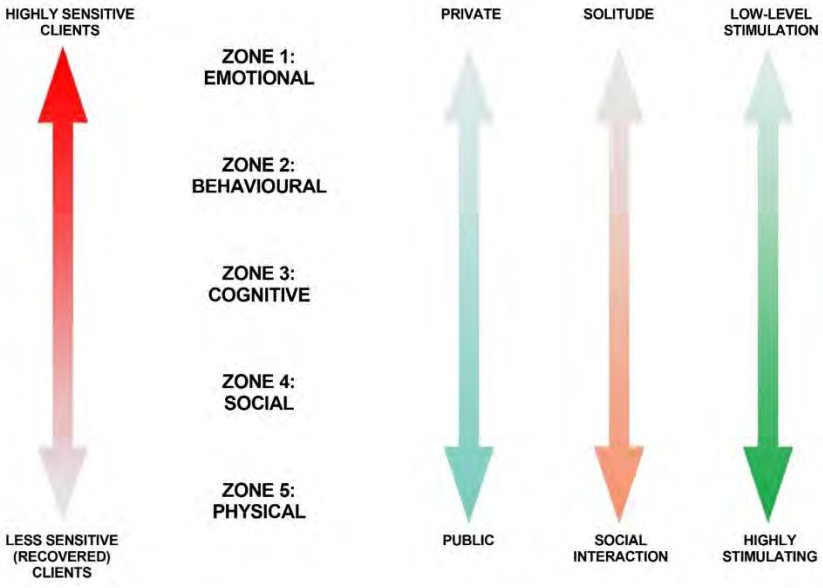


Figure 60: Characteristics of Zones within the Nightingale Collective

In order to create these unique experiences, each zone has unique design elements and characteristics. The requirements for each zone are outlined in my design guideline to respond to the needs and characteristics of different building occupants, and to evoke certain thoughts and feelings based on the desired outcomes of each space and activity.

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
USE	**EMOTIONAL:** Individual therapy and self-reflection	**BEHAVIOURAL:** Group therapy and peer support	**COGNITIVE:** Skills training, learning and education	**SOCIAL:** Community and social activities	**PHYSICAL:** Recreational and active activities
PRIVACY LEVEL (1 = Low, 5 = High)	5	4	3	2	1
SOCIAL INTERACTION (1 = Low, 5 = High)	1	2	3	4	5
STIMULATION LEVEL (1 = Low, 5 = High)	1	2	3	4	5
RELATIONSHIP TO PUBLIC SPACES	Physical connections to public areas through private circulation with restricted access from holistic lounge.	Physical connections to public areas through private circulation with restricted access from holistic lounge.	Direct link to hub and public circulation areas. Visually connected to public spaces.	Directly linked to hub and public areas. Some spaces located in open areas within the public realm.	Directly linked to hub and public areas. Some spaces located in open areas within the public realm.
LIGHT & ORIENTATION	Indirect, screened lighting is preferred to provide a sense of calming and comfort to those who are hypersensitive. East orientation is preferred for morning light.	Screened and dappled light with soft interior lighting provide a home-like ambiance for group therapy sessions. East orientation is preferred for morning light.	Uniform lighting levels combined with task lighting enhance focus on tedious tasks. Orient spaces to avoid glare while maximizing exposure to natural light.	Brighter illumination levels enhance the cheerful social atmosphere and activities within Zone 4 areas. Orient spaces to maximize exposure to natural light.	Bright, uniform levels of illumination are required in active spaces. Orient spaces to avoid glare while maximizing exposure to natural light.
COLOUR & MATERIALS	Blue is an excellent healing colour for nervous disorders. Softer blues calm the mind while stronger blues simulate clear thought.	Orange evokes warmth, comfort, and reassurance, and encourages verbal expression of emotions. Lighter pinks quickly calm individuals.	Green symbolizes growth and life, and subliminally gives the brain a boost of creativity and motivation.	Yellow is the most psychologically stimulating and energizing colour, and is noted for its optimism and mood-enhancing properties.	No specific colour requirement.
SOUND & NOISE	Sound insulation required for privacy. White noise used to enhance the peaceful atmosphere.	Sound insulation required for privacy + to reduce noise transfer from group spaces.	Sound insulation is required for privacy and concentration.	Sound absorbing materials should be used in highly use social areas.	Sound absorbing materials should be used in highly active areas.
POSITIVE DISTRACTIONS	Views to and experience of nature.	Views to and experience of nature.	Views to and experience of nature.	Experience + active participation with nature.	Active participation with nature.
SCENTS & ODOURS	Lavender is relaxing and reduces tension + anxiety.	Vanilla and cinnamon improve mood + creativity.	Rosemary is energizing and enhances memory.	Lemon is energizing and improves moods.	Peppermint stimulates our central nervous system and increases alertness.
THERMAL ENVIRONMENT	Provide control of thermal environment. Default temperature slightly above average for comfort.	Provide control of thermal environment. Default temperature slightly above average for comfort.	Provide control of thermal environment. Default temperature slightly below average for alertness.	Provide control of thermal environment. Default temperature appropriate for large assembly spaces (slightly below average).	Temperature appropriate for physically active spaces (slightly below average with monitoring of humidity levels).

Figure 61: Comparison of Characteristics of Zones

6.5.1 - Zone One: Emotional

At the beginning of their journey to recovery, clients are often the most vulnerable, and will need the most help and support. With a focus on emotions, Zone 1 spaces are designed to calm clients who may be highly sensitive and overwhelmed during this stage of their healing process. It represents the beginning of change and improvement of ones self through activities that focus on self-reflection, meditation, and individual treatment.

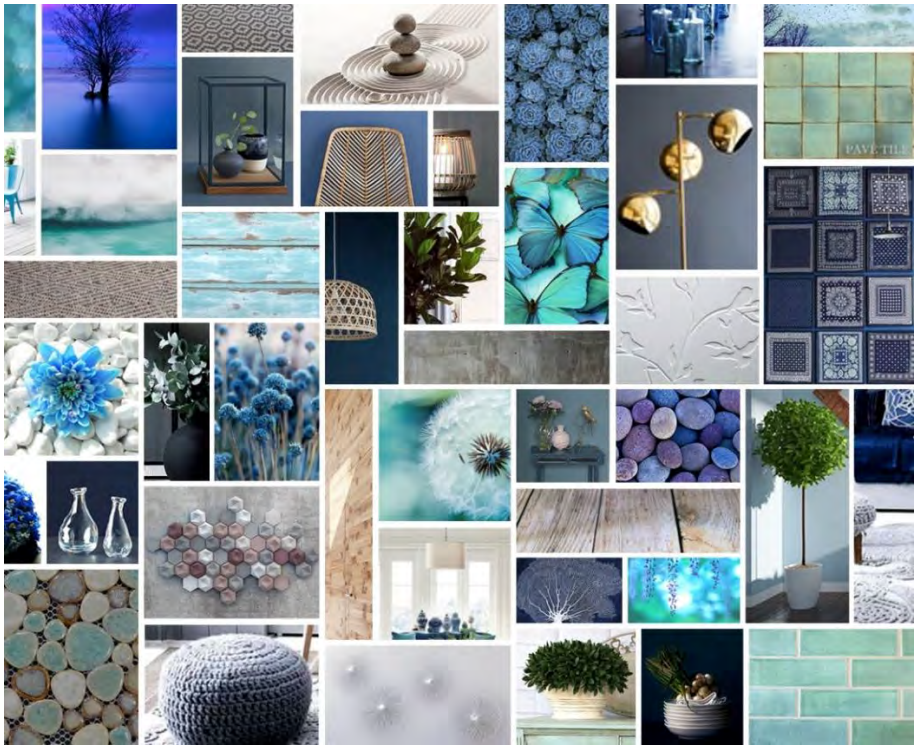


Figure 62: Colour and Material Scheme for Zone 1

Most Zone 1 spaces are grouped together in a quiet area of the building, and are physically connected to public areas through the Holistic Lounge. Both clients and the public can access services in this area, such as counselling and massage therapy, provided they have an appointment. Zone 1 spaces for meditation and reflection are also provided as breakout spaces in active and social areas for those who need a sense of control over their environment. The environment in zone 1 has a “home-like” feeling to it, with calming colours, soft patterns and textures, and natural materials. Many people with mental disorders are highly sensitive to light and sound, so control of light and noise are important in

this zone. An exterior cladding with operable screens provides a mix of shade and soft lighting, while allowing building occupants to control lighting levels and enhance their sense of personal comfort and privacy. Soft levels of white noise are also used to evoke feelings of comfort and peace in therapy spaces.

DESIGN REQUIREMENTS FOR ZONE 1:

PRIVACY	Privacy is extremely important in this zone. (see sound)
CONTROL	Zone 1 spaces provide a break in more active and social zones for those who need to control their environment (also adds a layer of comfort and reassurance)
STIMULATION	Low levels of stimulation (soft music, calming sounds of water, control of lighting levels, subdued colours and textures)
SENSES	Sound (water) = Calming Touch Therapy is calm and comforting for depression and anxiety. The environment and overall ambiance feels more comforting and home-like with people are able to physically interact with the environment and people.

LIGHT	Eastern and southern exposure to natural light are preferred for therapy spaces. Uniform, indirect lighting is preferred in this zone. If interior partitions are used they should be translucent for privacy. Dappled light is also great for Zone 1 as it provides a mix of light and shading and evokes a feeling of comfort.
COLOUR	Zone 1 is the blue zone, since blue induces feelings of relaxation, tranquility, calmness, and trust. A mix of blue tones should be used such as softer tones to calm the mind, and stronger blues to stimulate clear thought. Deep blue is optimum for meditation areas since if aids in slowing down the bodily processes to allow relaxation.
SOUND & NOISE	Soft music and organic sounds such as rain or songbirds could be used to reduce stress. Enhanced soundproofing for quiet areas and spaces used for sensitive discussions.
SCENTS	Scents are connected to our emotions, therefore may be useful in Zone 1. Scents can be used in controlled settings such as individual therapy and massage sessions, so not to irritate others with scent sensitivities. Cedar can be used to reduce tension, and lavender has several benefits, including reducing tension, relaxing, is sleep inducing, and sedates our nervous system. Other relaxing scents that could be used include almond, bergamot, chamomile, heliotrope (which also reduces anxiety), marjoram, rose, sandalwood, and spiced apple.
MATERIALS & FINISHES	Calming textures and natural materials provide a gentle stimulation without becoming overwhelming.

6.5.2 - Zone Two: Behavioural

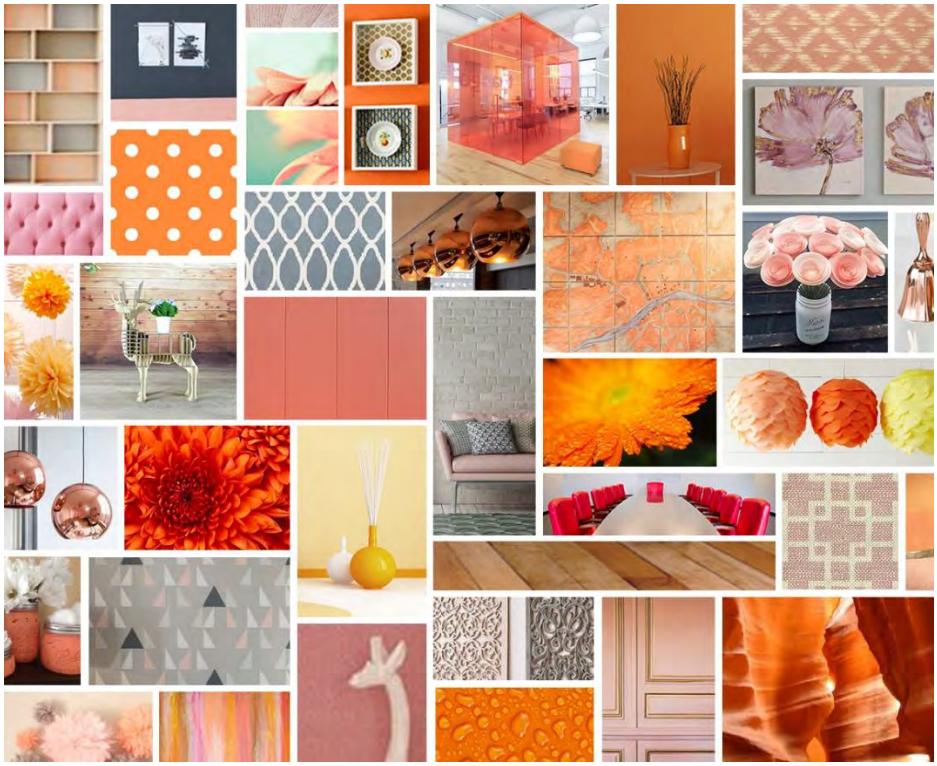


Figure 63: Colour and Material Scheme for Zone 2

After getting comfortable with one-on-one sessions, most Clients continue their growth by participating in group therapy sessions in Zone 2. Spaces in this zone are designed to promote behavioural and emotional growth, with a focus on healing, rejuvenation, and participation. This is the working stage where Clients gain strength and motivation, and grow their support system while also supporting others. Group therapy sessions and activities offer opportunity for interaction between Clients in larger groups to test their emotional capabilities. A holistic lounge is a focal point within this zone, which acts as a gateway to secluded group and individual therapy sessions while also providing informal therapeutic experiences and social support.

Oranges and pinks are used in Zone 2 to symbolize warmth, provide comfort and reassurance, and to encourage group interaction and verbal expression of emotions. Eastern exposure to natural light and control of sound are important in this zone to enhance comfort and privacy. Sound absorbing materials such as acoustic ceilings, wall treatments and soft seating are used to increase privacy and reduce noise transfer from group therapy spaces.

DESIGN REQUIREMENTS FOR ZONE 2:

PRIVACY	Group therapy spaces are private, but some have a level of exposure to other spaces (ie: visual transparency)
CONTROL	Control between therapy spaces and general public
STIMULATION	Stimulation levels of lighting and external noise sources can be controlled
SENSES	Sense of touch in group therapy.

LIGHT	Eastern and southern exposure to natural light are preferred for therapy spaces. In areas where there is little or no natural light, clerestory windows, skylights, and glazed partitions should be used. Dappled light is also great for Zone 2 as it provides a mix of light and shading and evokes a feeling of comfort.
COLOUR	Orange symbolizes warmth, comfort, and reassurance, and encourages verbal expression of emotions, which is why it is a great colour for the group therapy spaces in Zone 2. There are also no negative connotations with orange or variations of orange such as peach and salmon. Pink is also a great colour for therapy spaces. Moderately intense pink quickly calms individuals, and pale pink accents the skin's own natural pigmentation, making it the most flattering colour to human skin tones. There are also no negative connotations with pink.
SOUND & NOISE	Soft music and organic sounds such as rain or songbirds could be used to reduce stress. Enhanced soundproofing for quiet areas and spaces used for sensitive discussions.
SCENTS	Scents are connected to our emotions, therefore may be useful in Zone 2, although scents may want to be limited in this zone since group spaces will be used by sensitive Clients. The scent of lemon improves moods, while orange and lime reduce anxiety.

6.5.3 - Zone Three: Cognitive

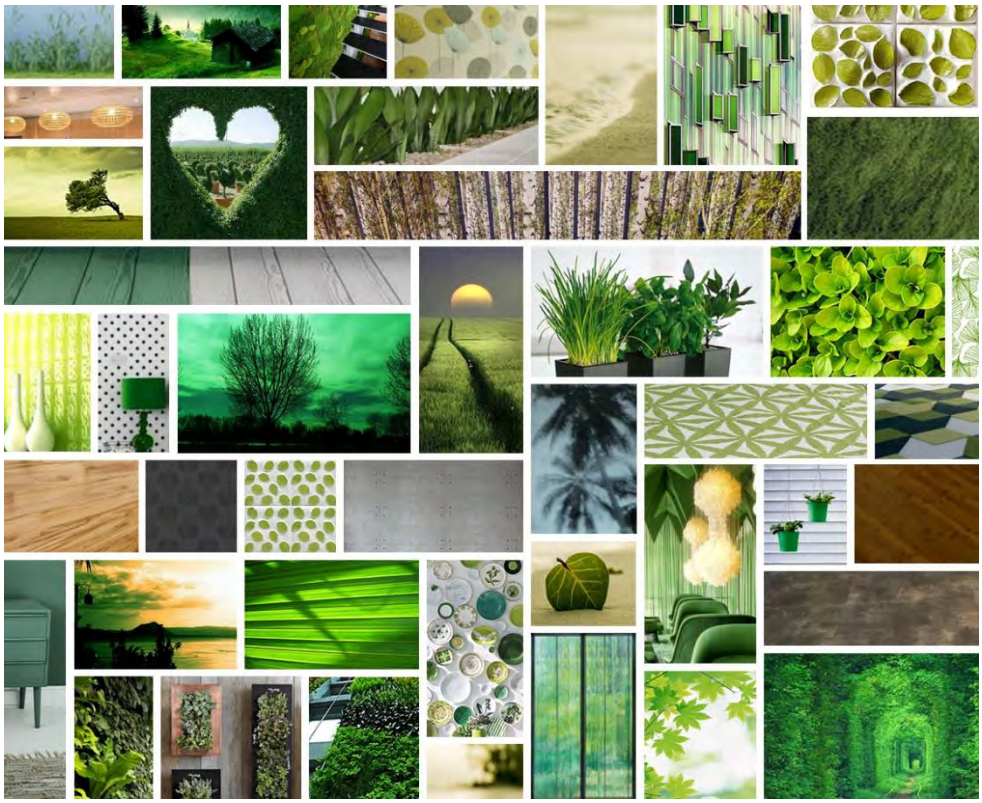


Figure 64: Colour and Material Scheme for Zone 3

Once clients have shown progress in their recovery, they can assess other aspects of their life. Zone 3 focuses on motivation, success, and pursuit of passion for all building occupants, with activities relating to business, education, skills training, and personal accomplishments. Zone 3 is the most balanced in terms of stimulation levels, privacy, and control, and blurs the lines between wellness and community services with a variety of functions such as conference and meeting facilities, a resource centre, and staff administration.

Zone 3 spaces are located throughout the building in order to provide multi-functional spaces that are shared and accessible by clients, staff, and the community, and to complement other uses throughout the building. Providing a Resource Centre in particular provides Clients and the public a place to learn about mental wellness and speak to a support team member if they have questions or would like to get involved with activities and services at the facility.

Since learning and education are the main focus of Zone 3, the environment has been designed to increase cognitive functions and improve concentration. Green is present throughout this zone, to enhance learning capabilities without causing overstimulation. Views to nature have been maximized in this zone, since nature significantly aids in restoring attention and mental energy, and improves memory, concentration, and creativity. Planting with subtle scents can further enhance learning capabilities, such as rosemary and cinnamon which enhance memory and creativity. Uniform lighting levels are used in combination with personally controlled task lighting in this zone to enhance focus on tedious tasks.

DESIGN REQUIREMENTS FOR ZONE 3:

PRIVACY	Some spaces in this zone need privacy such as private meetings and conferences.
CONTROL	Control of lighting and noise in task areas.
STIMULATION	Gentle stimulation that is not distracting.
SENSES	Sensory elements in this zone should stimulate the brain

LIGHT	Maximum natural light to enhance productivity. Canopies and other controls should be used to eliminate glare. Additional task lighting is useful in this zone to enhance various tasks.
COLOUR	Green is recommended in Zone 3 to symbolize growth, creativity, and motivation. Since green is the most restful and relaxing colour for the human eye to view, it can help enhance vision, stability, and endurance.
SOUND & NOISE	Locate any distracting noise sources away from meeting and conference areas and enhance soundproofing where concentration is important for productivity.
SCENTS	Only light scents should be used in this zone so not to distract those trying to concentrate. Cinnamon and vanilla can be used to improve mood and boost creativity, while rosemary can enhance memory. Jasmine and lemon may also be used to aid in tedious mental tasks.

6.5.4 - Zone Four: Social

Figure 65: Colour and Material Scheme for Zone 4

Part of ones journey towards recovery and feeling whole again is a reintroduction into social activities and community engagement while discovering personal interests. The focus of Zone 4 is to invite the public to participate in a variety of activities, such as art, music, and cooking classes, which also have therapeutic values, and allow clients to test their social capabilities. Most Zone 4 spaces are connected to a central hub or located in open, highly visible areas to encourage participation. Many Zone 4 spaces should also interconnect with each other, such as the greenhouse, café, and hub, and the theatre and gallery spaces, to encourage mingling of different building occupants.

The environment for Zone 4 spaces should be designed to complement the high-energy activities that take place throughout this zone. Spaces should be oriented to maximize exposure to natural lighting, and provide brighter illumination levels to enhance the cheerful, social atmosphere. Yellow should also be used throughout this zone since it is the most psychologically stimulating colour,

and is noted for its mood-enhancing and confidence boosting properties. Natural planting can also be used to provide a comforting experience and sense of enclosure in larger areas such as a central hub or greenhouse.

DESIGN REQUIREMENTS FOR ZONE 4:

PRIVACY	Privacy is limited in this zone due to the social nature of activities.
CONTROL	To provide a balance to the social nature of the spaces and activities in this zone, it is advised to include breakout spaces near highly open and large areas for sensitive clients to retreat to if needed.
STIMULATION	Yellow is highly stimulating and cheerful. Use in combination with other complementary materials to avoid the colour becoming overwhelming. Warm and neutral tones provide a good balance.
SENSES	Taste as a sense should be emphasized in this zone since it is a social experience and provides nutrition

LIGHT	All spaces should be oriented to maximize natural light exposure in this zone. In areas where there is little or no natural light, clerestory windows, skylights, and glazed partitions should be used. Light fixtures and use of light should be fun and creative in this zone to add to the social environment.
COLOUR	Yellow is a great choice for Zone 4 since it is creative, social, optimistic, and compliments high-energy activities. It is the most psychologically stimulating colour and is noted for its mood-enhancing properties and boost in confidence.
SOUND & NOISE	Spaces in Zone 4 are social and fun, and may be noisy. Limit echoes and reverberation in these spaces, and provide soundproofing where possible to reduce sound transfer from Zone 4 spaces to other quieter spaces.
SCENTS	Zone 4 will organically have the most scents out of all the zones because of all the spaces associated with food and nutrition. Basil, cloves, and rosemary are energizing while cinnamon and vanilla can improve mood and boost creativity. Special mechanical systems are required in kitchen facilities in order to control cooking scents from spreading throughout the building, particularly to more sensitive areas.

6.5.5 - Zone Five: Physical

In addition to emotional, behavioural, cognitive, and social needs, physical needs should also be improved to create a complete holistic approach to healing and wellness. Zone 5 spaces focus on high-energy activities to motivate and inspire clients while improving mind and body wellness, and encouraging social connectivity with the community through physical and recreational activities.

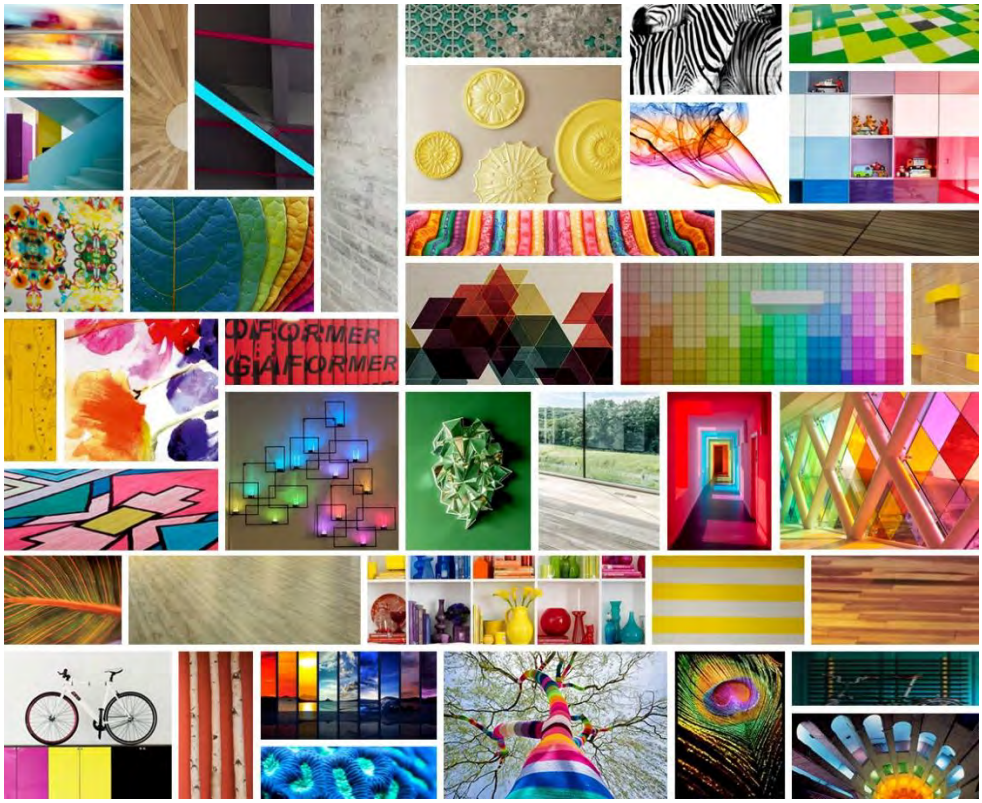


Figure 66: Colour and Material Scheme for Zone 5

All spaces in this zone are accessible to clients and the public, such as a fitness centre with group fitness classes, yoga studios, a therapeutic pool, physiotherapy, and a gymnasium for larger assemblies and activities. Most of the spaces in Zone 5 should be located in highly visible areas, with active spaces animating the building along street edges.

The design criteria for Zone 5 is much less restrictive than the other zones in order to provide an appropriate transition to life outside of the facility. There are no specific colour requirements for this zone, although use of a variety of colours is encouraged to increase stimulation levels, and to promote a

physically active environment. Control of the thermal environment is also important in this zone to provide healthy temperature and humidity levels for highly active areas.

DESIGN REQUIREMENTS FOR ZONE 5:

PRIVACY	Privacy is limited in this zone due to the social nature of activities.
CONTROL	To provide a balance to the active nature of the spaces and activities in this zone, it is advised to include breakout spaces near highly open and large areas for sensitive clients to retreat to if needed.
STIMULATION	Design elements can be highly stimulating (in comparison to other zones), but should still be balanced and not overwhelming.
SENSES	Physical (tactile) is important in this zone

LIGHT	All spaces should be oriented to maximize natural light exposure in this zone. In areas where there is little or no natural light, clerestory windows, skylights, and glazed partitions should be used.
COLOUR	This zone can use a mix of colours to provide a contrast to the other four zones and higher stimulation levels.
SOUND & NOISE	Spaces in Zone 5 are active and high energy, and may be noisy. Limit echoes and reverberation in these spaces, and provide soundproofing where possible to reduce sound transfer from Zone 5 spaces to other quieter spaces.
SCENTS	Scents should not be strong in Zone 5, but can be used in active areas to keep fitness spaces smelling fresh, and energize. Peppermint is great for working physical tasks, and lemon and baby power are associated with good health.

6.6 - Building Scale

Based on my research, the scale of each facility will vary based on the community it is serving, the needs of each specific community, and how many Clients are anticipated. Within the guidelines are examples of this facility at small, medium, and large scales to demonstrate the program's flexibility. Below are examples of small, medium, and large scale facilities, and how the program can be manipulated to work for each scale.

6.6.1 - Small Scale Facilities

Small-scale facilities accommodate up to 50 people, and are generally used in areas with a smaller client-base, and where limited space and funding are available. It is also quite common for agencies with limited funding to occupy existing buildings or tenant spaces, which pose additional design challenges. Therefore, providing flexible indoor and outdoor spaces is important at this scale to accommodate a wider variety of activities and services, and to allow better integration of the facility with its surrounding neighbourhood.

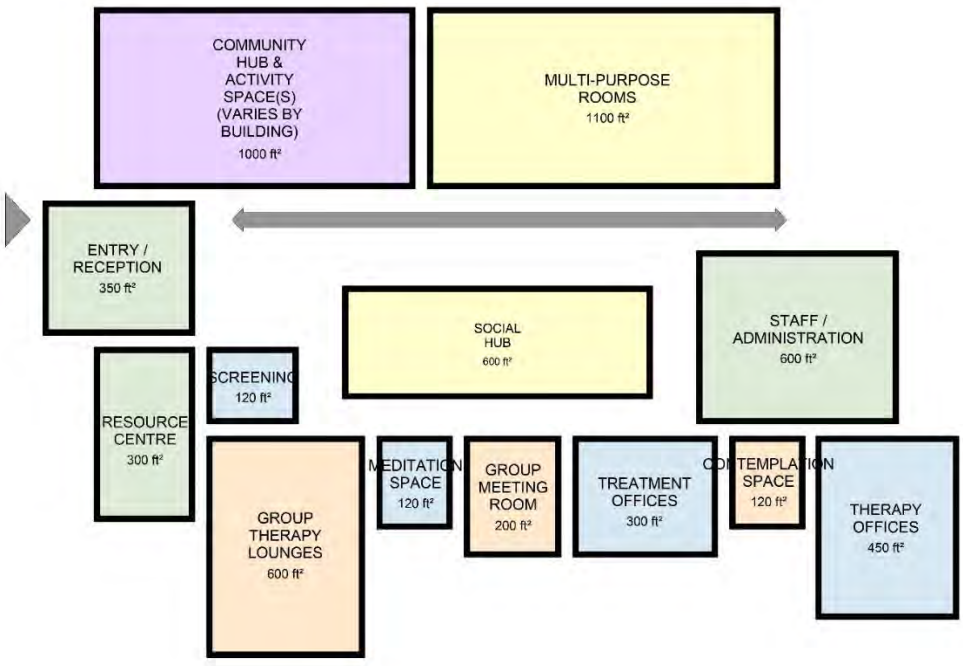


Figure 67: Small Scale Facility Diagram

SMALL SCALE WELLNESS FACILITY	NO. OF STAFF	5-10 FULL-TIME + 4-6 PART-TIME
	NO. OF CLIENTS / PUBLIC	UP TO 50 OCCUPANTS

ZONE / CATEGORY	AREA		FUNCTIONS & SPACES	
	m2	ft2		
Screening	11.2	120	Screening & Assessment	Meetings
Meditation	11.2	120	Meditation	Relaxation
Therapy Offices	41.8	450	Psychologist Case Management	Psychiatrist Diet & Nutrition
Treatment Offices	27.8	300	Massage Therapy	Chiropractor
Group Threrapy Lounges	55.8	600	Family Therapy Group Therapy	Peer Support Social Activities
Group Meeting Rooms	18.6	200	Family Therapy Group Therapy	Peer Support
Contemplation Space	11.2	120	Meditation	Relaxation
Entry / Reception	32.5	350	Welcome Area	Reception
Staff Lounge / Administration	55.7	600	Staff Administration	Staff Lounge
Resource Centre	27.9	300	Supported Employment Self-Help	Supported Housing
Social Hub	55.7	600	Social Activities	Multi-Use
Multi-Purpose Rooms	102.2	1,100	Peer Support Skills Training Art Therapy Music Classes	Horticulture Workspace Community Programs Community Meetings Games & Social Activities
Community Hub & Activity Space	92.9	1,000	Peer Support Dance Therapy Yoga / Recreational Youth / After School	Horticulture Workspace Community Programs Community Meetings Games & Social Activities

SUB-TOTAL	**544.4**	**5,860**
50% GROSS UP	272.2	2,930
TOTAL AREA	**816.6**	**8,790**

*NOTE: Functions and services offered may vary by building.

Figure 68: Small Scale Facility Program Requirements

6.6.2 - Medium Scale Facilities

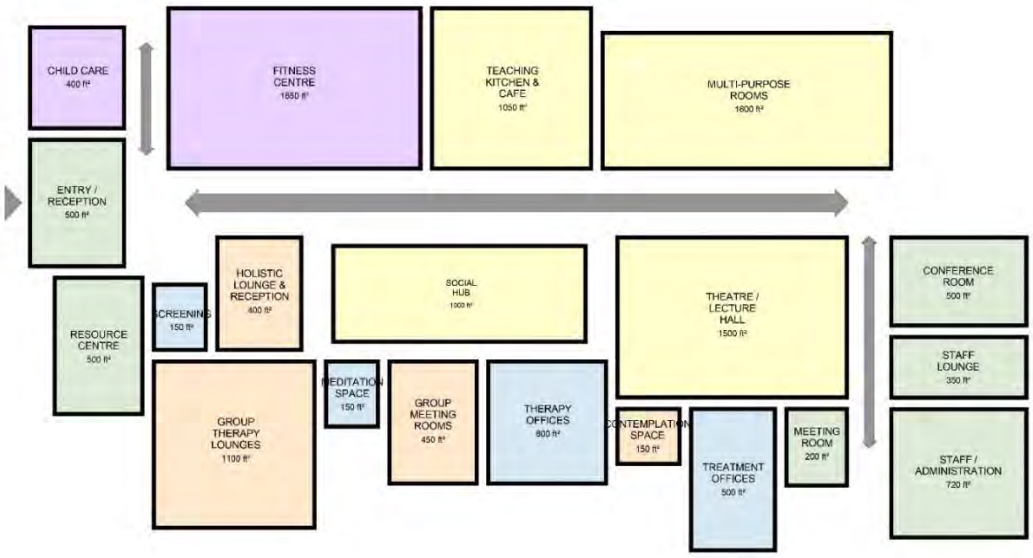


Figure 69: Medium Scale Facility Diagram

A medium scale facility can accommodate 50 to 200 people and is generally found in subdivisions and smaller communities. At this scale, larger assembly spaces and specialty uses such as a café and lecture hall provide additional opportunities for Clients to interact with the surrounding community. These types of facilities may be an addition to an existing building, or renovation of an existing space, however a new building is ideal at all scales to ensure the desired outcome and design principles are accommodated.

MEDIUM SCALE WELLNESS FACILITY	NO. OF STAFF	10-15 FULL-TIME + 10-20 PART-TIME
	NO. OF CLIENTS / PUBLIC	50-200 OCCUPANTS

ZONE / CATEGORY	AREA		FUNCTIONS & SPACES	
	m2	ft2		
Screening	13.9	150	Screening & Assessment	Meetings
Meditation	13.9	150	Meditation	Relaxation
Therapy Offices	55.7	600	Psychologist Case Management	Psychiatrist Diet & Nutrition
Treatment Offices	46.5	500	Massage Therapy	Chiropractor
Holistic Lounge & Reception	37.1	400	Waiting Area	Relaxation
Group Threrapy Lounges	102.2	1,100	Family Therapy Group Therapy	Peer Support Social Activities
Group Meeting Rooms	41.8	450	Family Therapy Group Therapy	Peer Support
Contemplation Space	13.9	150	Meditation	Relaxation
Entry / Reception	46.5	500	Welcome Area	Reception
Resource Centre	46.4	500	Supported Employment Self-Help	Supported Housing
Meeting Rooms	18.6	200	Private Meetings	Staff Meetings
Conference Room	46.5	500	Private Meetings	Staff Meetings
Staff / Administration	66.9	720	Staff Administration	Private Offices
Staff Lounge	32.6	350	Staff Lounge	
Social Hub	92.9	1,000	Social Activities	Multi-Use
Multi-Purpose Rooms	148.6	1,600	Peer Support Skills Training Art Therapy Music Classes	Horticulture Workspace Community Programs Community Meetings Games & Social Activities
Teaching Kitchen & Café	97.5	1,050	Diet & Nutrition	Food Services
Theatre / Lecture Hall	139.4	1,500	Open Lectures Community Meetings	Movies Educational Sessions
Fitness Centre	153.3	1,650	Peer Support Dance Therapy	Yoga / Recreational Youth / After School
Child Care	37.2	400	Social Activities	Youth / After School

SUB-TOTAL	**1,251.4**	**13,470**
50% GROSS UP	625.7	6,730
TOTAL AREA	**1,877.0**	**20,200**

*NOTE: Functions and services offered may vary by building.

Figure 70: Medium Scale Facility Program Requirements

6.6.3 - Large Scale Facilities

Large scale facilities can accommodate over 200 occupants, and over 600 therapeutic visits per day, and are great for dense urban areas, locations with a larger catchment area, and areas with a higher need for therapies and other community services. In dense locations, it may be common to see these types of facilities combined with other uses on the same site, such as affordable housing developments that are geared towards those with mental disorders, or seniors housing where occupants may require special care. Larger facilities also have the ability to provide a wider range of services to the surrounding community, which is why I chose this scale for my building example to demonstrate the full capabilities of this building type.

Figure 71: Large Scale Facility Diagram

LARGE SCALE WELLNESS FACILITY	NO. OF STAFF	20-30 FULL-TIME + 15-30 PART-TIME
	NO. OF CLIENTS / PUBLIC	200+ OCCUPANTS

ZONE / CATEGORY	AREA		FUNCTIONS & SPACES	
	m2	ft2		
Screening	13.9	150	Screening & Assessment	Meetings
Meditation	13.9	150	Meditation	Relaxation
Therapy Offices	139.4	1,500	Psychologist Case Management	Psychiatrist Diet & Nutrition
Treatment Offices	74.3	800	Massage Therapy Accupuncture	Chiropractor Light Therapy
Holistic Lounge & Reception	65.1	700	Waiting Area	Relaxation
Group Threrapy Lounges	167.2	1,800	Family Therapy Group Therapy	Peer Support Social Activities
Group Meeting Rooms	92.9	1,000	Family Therapy Group Therapy	Peer Support
Contemplation Space	27.9	300	Meditation	Relaxation
Entry / Reception	69.7	750	Welcome Area	Reception
Resource Centre	111.5	1,200	Supported Employment Self-Help	Supported Housing
Meeting Rooms	139.3	1,500	Private Meetings	Staff Meetings
Conference Room	102.2	1,100	Private Meetings	Staff Meetings
Staff / Administration	171.9	1,850	Staff Administration	Private Offices
Staff Lounge	60.4	650	Staff Lounge	
Social Hub	157.9	1,700	Social Activities	Multi-Use
Café	139.4	1,500	Food Services	Social Programs
Multi-Purpose Rooms	278.7	3,000	Peer Support Skills Training Animal-Assissted Therapy Games	Horticulture Workspace Community Programs Community Meetings Social Activities
Art Studio	111.5	1,200	Art Therapy	Crafts & Hobbies
Music Studio	69.7	750	Music Therapy	Public Studio Rental
Social / Games Lounge	55.7	600	Games	Social Programs
Teaching Kitchen	167.2	1,800	Diet & Nutrition	Community Classes
Theatre / Lecture Hall	167.3	1,800	Open Lectures Community Meetings	Movies Educational Sessions
Fitness Centre	185.8	2,000	Peer Support Dance Therapy	Yoga / Recreational Youth / After School
Fitness / Yoga Studios	125.4	1,350	Dance Therapy	Yoga / Recreational
Gymnasium	603.9	6,500	Recreational Activities Community Events	Youth / After School
Physiotherapy Clinic	111.5	1,200	Physiotherapy	Rehabilitation
Therapy Pool	92.9	1,000	Relaxation Group Therapy	Contemplation De-Stress
Child Care	83.6	900	Social Activities	Youth / After School

SUB-TOTAL	**3,599.9**	**38,750**
50% GROSS UP	1,800.0	19,370
TOTAL AREA	**5,399.9**	**58,120**

*NOTE: Functions and services offered may vary by building.

Figure 72: Large Scale Facility Program Requirements

Summary of Part Two: Design Guidelines

The environment can affect the quality and supportiveness of interpersonal relationships, and can affect people through the meanings that the individual ascribes to it.[173] It can be a source of stress, causing irritation and annoyance when designed poorly. Healthcare design can have a huge impact on the healing process when consideration is given during the early stages of the planning process. As outlined throughout this document, comfort, mood, sense of dignity, hope, enjoyment, self-esteem, fulfillment with life, and overall client satisfaction with the environment are important factors to consider to improve the built-environment and promote healing of mental disorders. Use of colour and lighting, views and access to the outside, experiences of nature, acoustics and sound-proofing, scent-scaping, and seating and furniture arrangements can all enhance or diminish our enjoyment when in a space.

I hope for these guidelines to be of value for designers and healthcare professionals when considering the healing qualities of spaces, and how to encourage interaction between a facility and its context.

[173] David Halpern, *Mental Health and the Built Environment: More than Bricks and Mortar?* (Bristol, PA: Taylor & Francis Inc., 1995), 173.

PART THREE: THE DESIGN

7.0 - The Nightingale Collective on Shuter

Based on my guidelines, I have created a conceptual building design for the Nightingale Collective on Shuter to demonstrate the application of my guidelines, and how to promote overall wellness while integrating the facility with its' surrounding community.

7.1 - Site and Context

Figure 73: Site Context

The site for this project is located on Shuter Street, just west of Jarvis in the Garden District of downtown Toronto. I selected this site because it is the highest ranking site out of all the locations I reviewed. The site is easily accessible by all modes of transportation, has great exposure to natural light, and is large enough to provide an outdoor public space.

The subject site is located steps from a main transit line (501 - Queen West Streetcar) which provides service through downtown and to the outlying neighbourhoods to the west and east sides of the city. The site is also within walking distance (approximately 500 metres) to the Dundas and Queen subway stations on Line 1 of the Yonge subway line, and is easily accessible by vehicle with direct access to the Gardiner Expressway south down Jarvis, and access to the Don Valley Parkway east on Dundas.

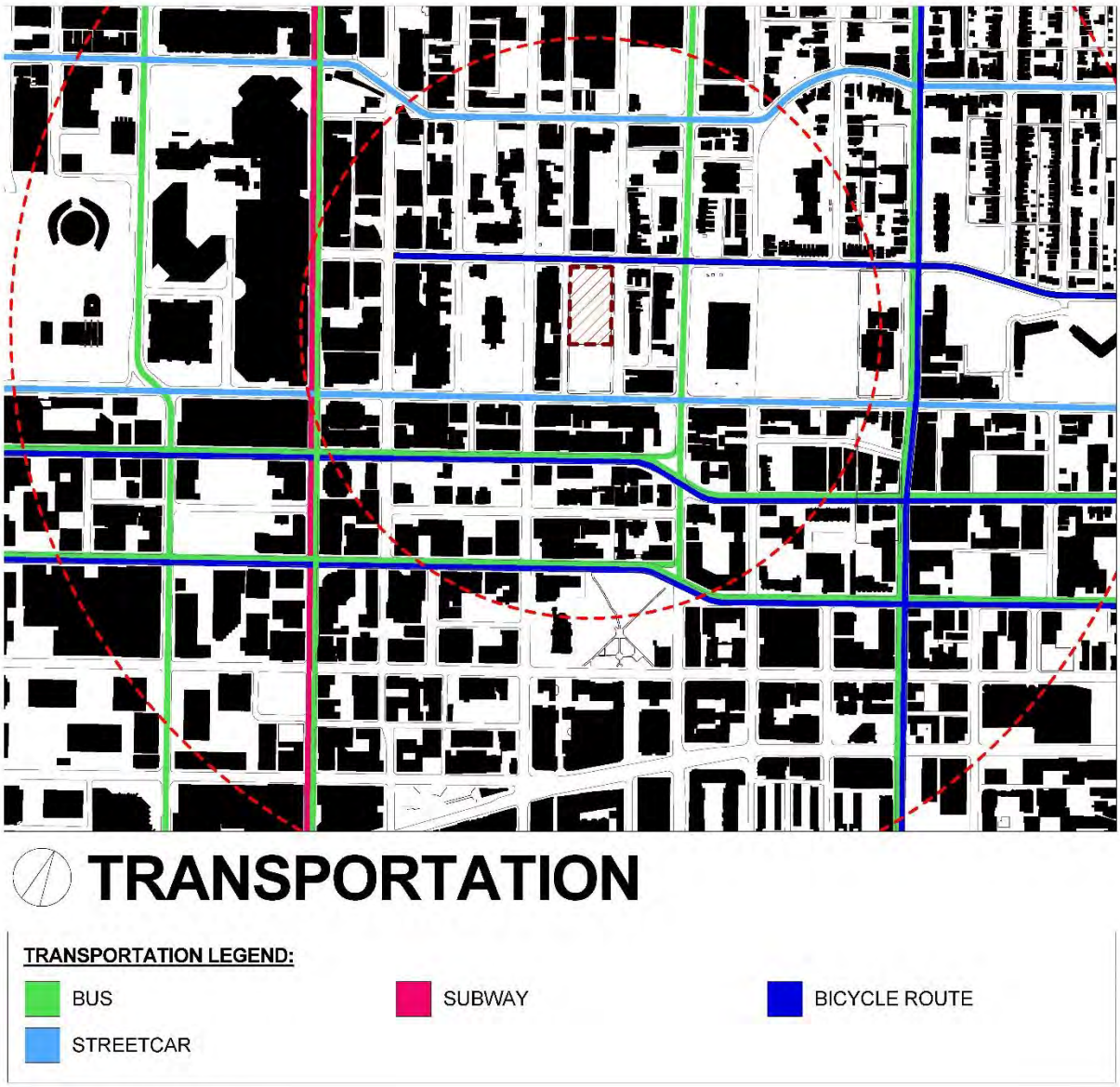


Figure 74: Transit Diagram

One of the best features of the site is that it is located in a very diverse area. To the west is Yonge Street, a lively retail corridor, as well as a hub of institutional buildings including St. Michaels Choir School, various churches, and St. Michael's Hospital. South-west of the site is a grouping of office buildings, and to the north is Ryerson University. To the north-east is a mainly low-rise neighbourhood with a mix of single family homes, apartments, and low-income housing, which may bring the most amount of clients to the facility. To the south-east is an area currently undergoing redevelopment, with a number of residential and mixed-use developments currently under construction. Several newer developments underway in the area symbolize a community of growth and opportunity.

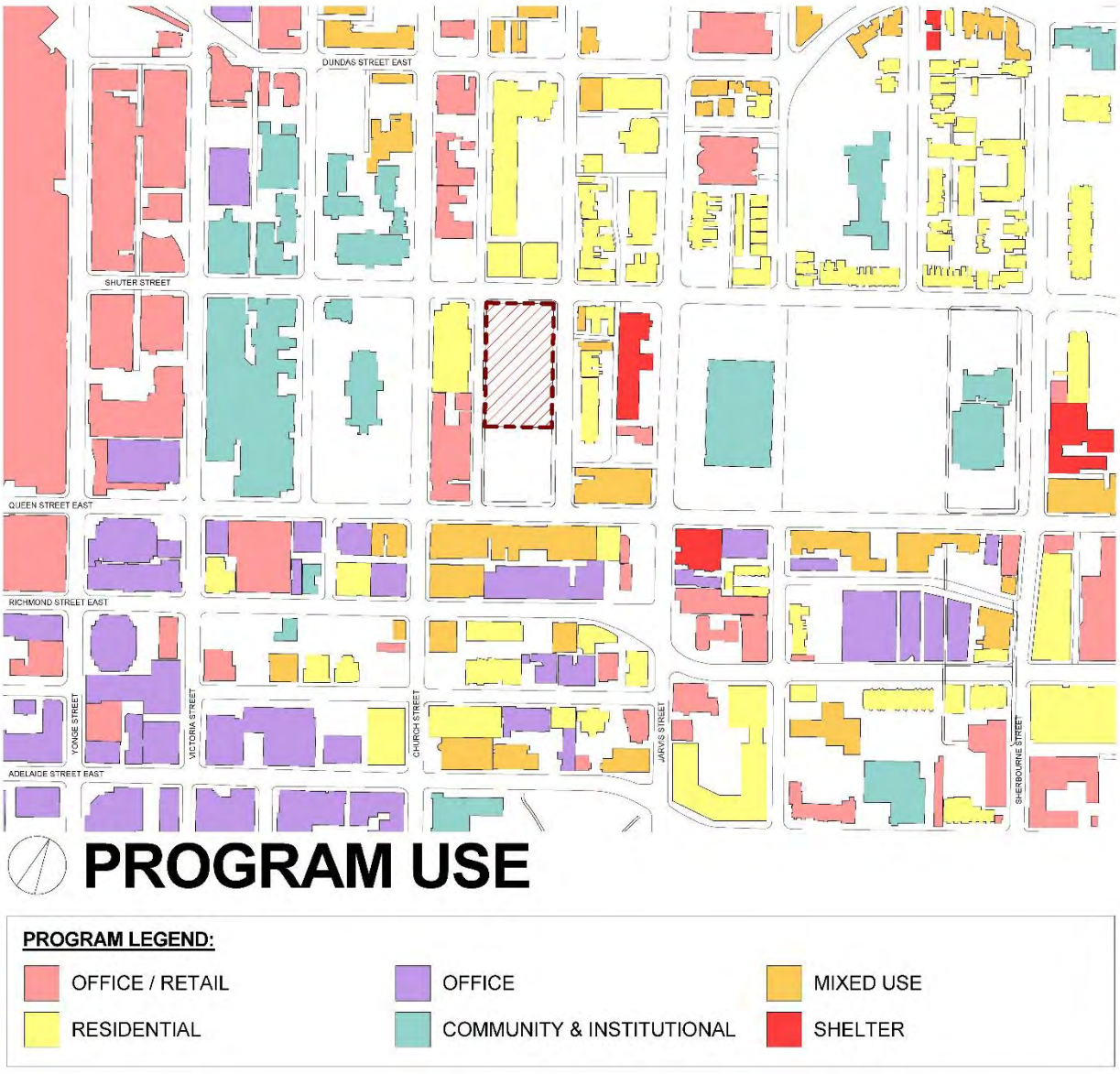


Figure 75: Existing Program Use Diagram

Overall, the area is serviced by several small community-based organizations which provide mainly health and housing support for the homeless, marginalized, and vulnerable, however there are no facilities in the area that are combined with recreational or other social functions. There also appear to be few programs geared towards children and youth or seniors within the area.

Figure 76: Photos of Existing Site and Context[174]

7.1.1 - The Garden District

Figure 77: Aerial Photograph, 1960[175]

[174] Urban Toronto, "88 North," 2015.
[175] Toronto Archives, 2015.

The Garden District is a neighbourhood on the east side of downtown Toronto, Ontario, Canada. The area was named by the Toronto East Downtown Residents Association (TEDRA) in recognition of Allan Gardens, an indoor botanical garden located nearby at the intersection of Carlton and Jarvis Streets. Part of the neighbourhood is within the official City of Toronto neighbourhood of Moss Park.

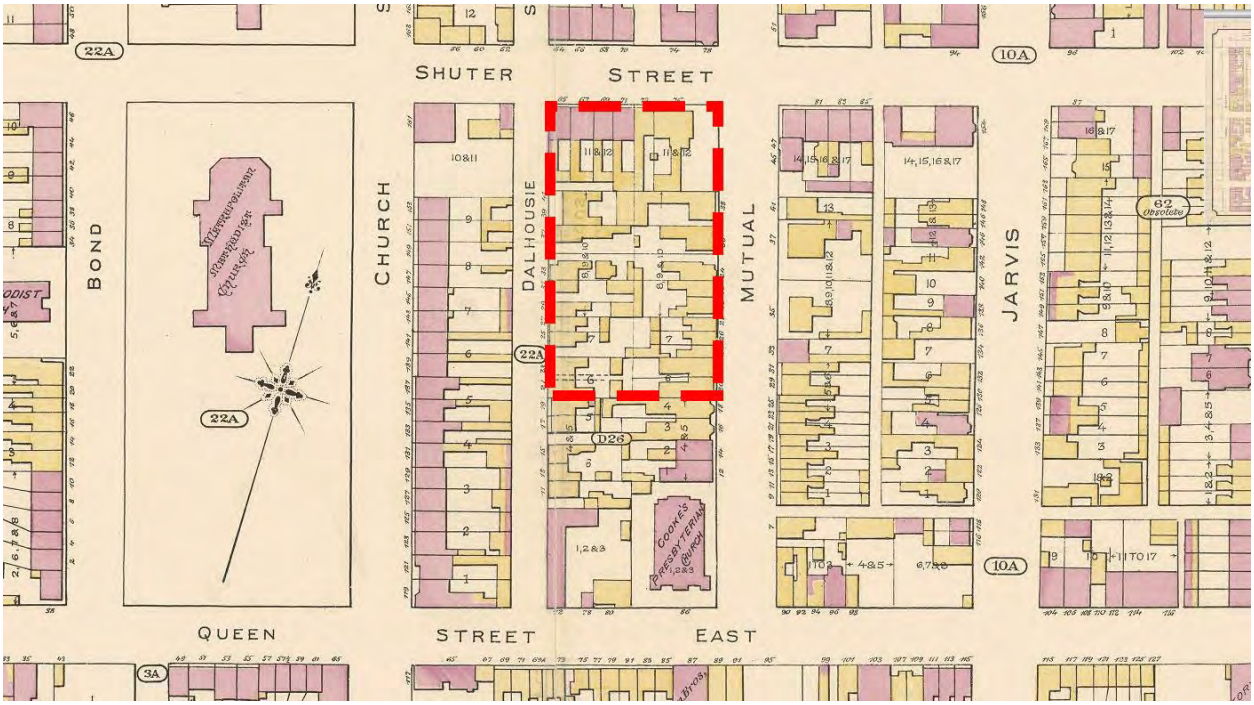


Figure 78: Fire Plan, 1884[176]

As defined by the Association, the neighbourhood is bordered by Carlton Street to the north, Yonge Street to the west, Sherbourne Street to the east, and Queen Street to the south, and consists of two distinct areas; the west and east portions. The west portion quickly formed due to overflow from central Toronto to the west. Buildings include a number of early, mostly non-government (especially religious) institutions such as the Metropolitan United Church, St. Michael's Roman Catholic Cathedral, the Roman Catholic Bishop's Palace, St. Michael's Choir School and St. Michael's Hospital. Various places of entertainment are within the area as well, including Massey Hall, the Elgin and Winter Garden Theatres, the Canon Theatre (formerly Pantages Theatre) and Maple Leaf Gardens as well as the Ryerson Model School (now a part of Ryerson University).

[176] Toronto Archives, 2015.

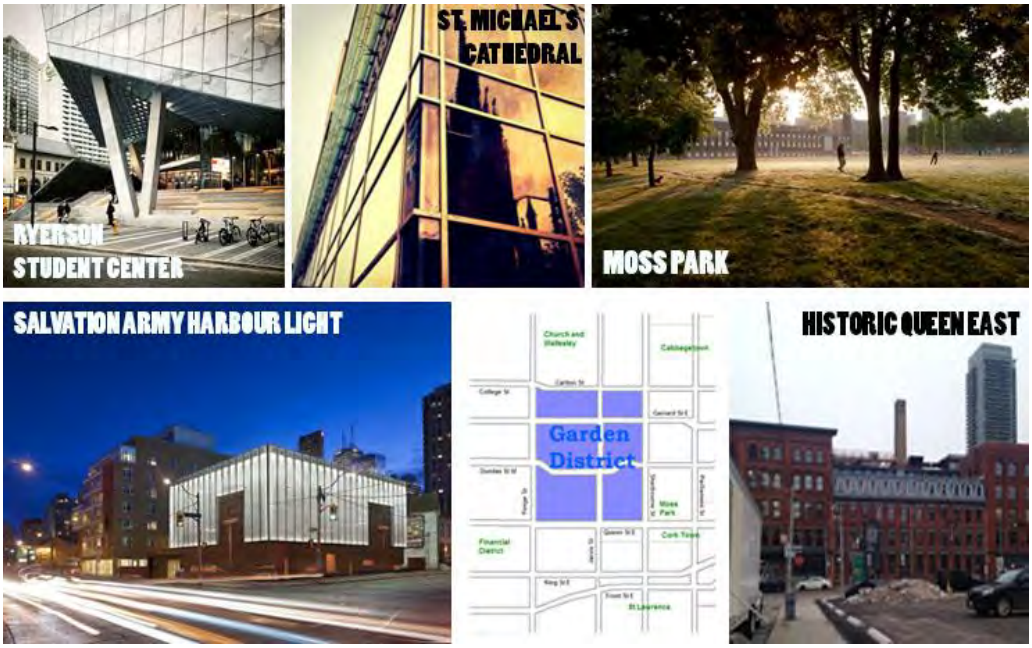


Figure 79: The Garden District is a Diverse Area[177]

The east portion of the Garden District is less built-up than the west, and remains largely residential with two parks (Moss Park and Allan Gardens). This areas north-south street grid is based on the street grid of the original Town of York and was originally a very exclusive district until the housing stock aged and smaller lots were built for workers. The neighbourhood in general includes a wide mix of housing, from multi-million dollar condos, renovated Victorian villas, and Edwardian row houses, to apartment co-operatives, subsidized housing units, hostels and shelters.

[177] Wikipedia Commons, 2015.

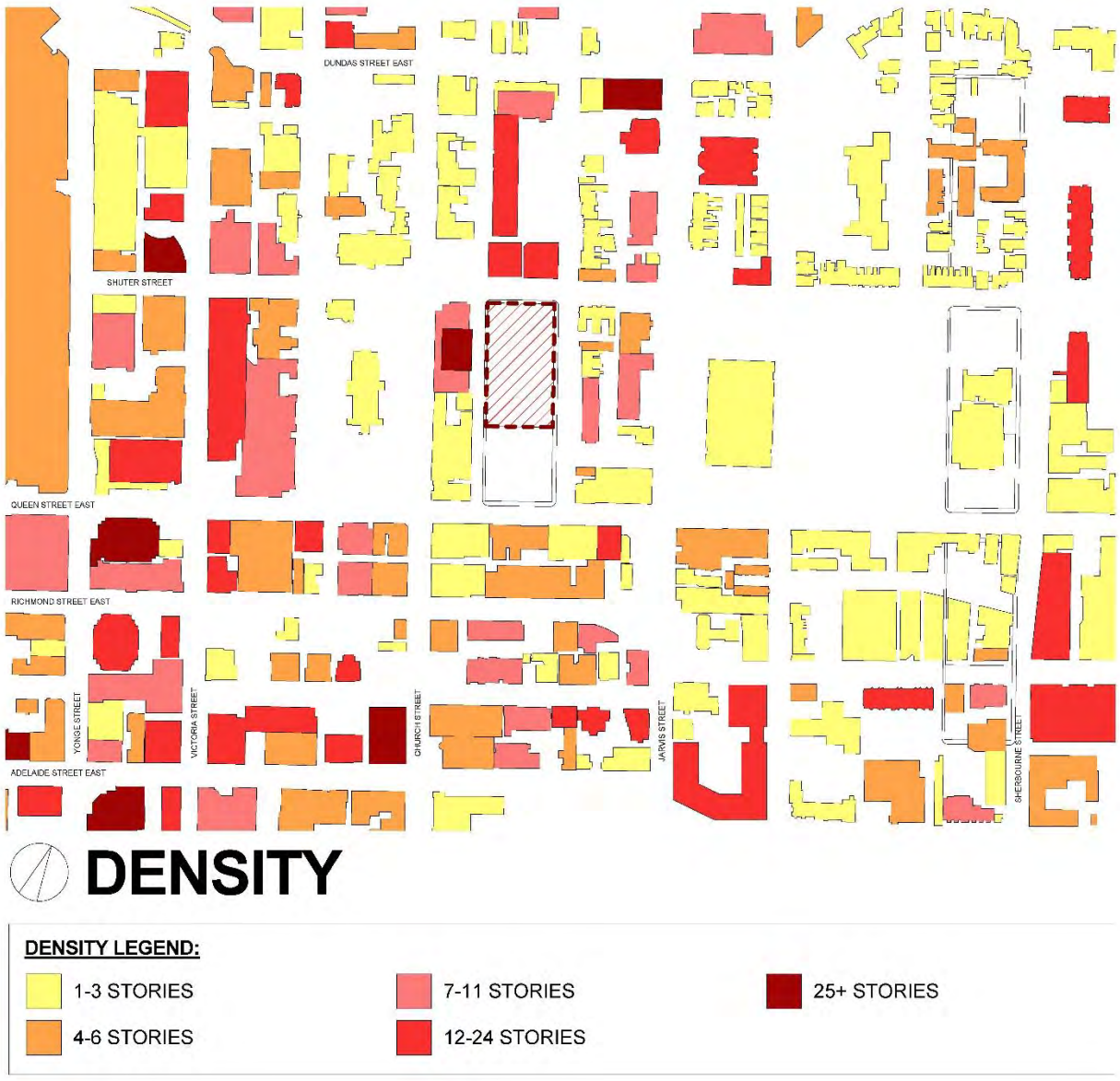


Figure 80: Existing Height Diagram

7.1.2 - Site Analysis

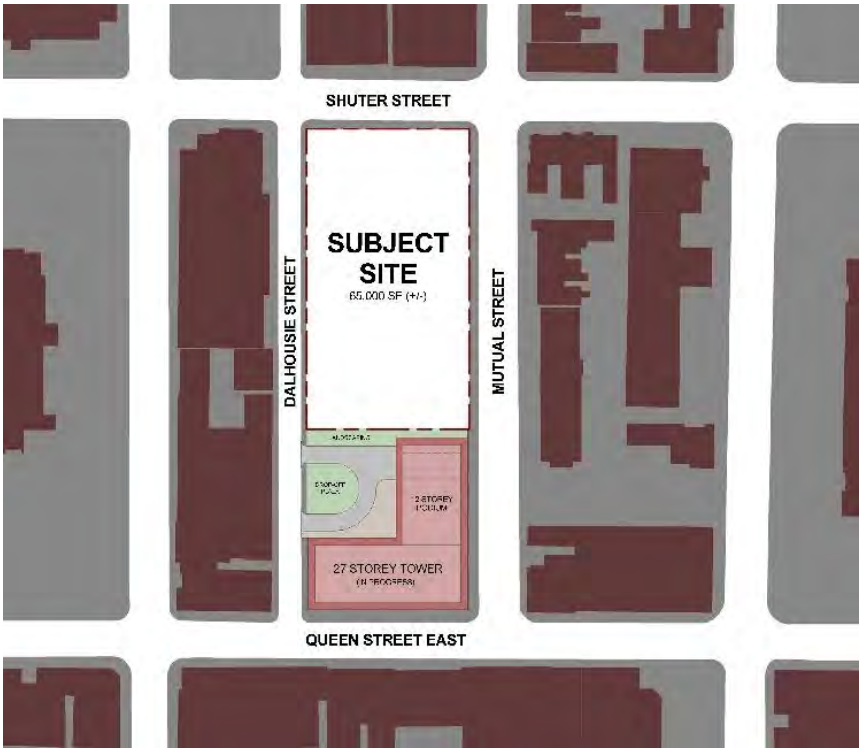


Figure 81: Site Plan

The site itself is bounded by three streets; Shuter Street to the North, Mutual Street to the East, and Dalhousie Street to the West. To the south is a separate development by others; a proposed 27-storey tower along Queen Street with a mid-rise base along Mutual Street. Other buildings surrounding the site are a mix of low, mid, and high-rise buildings, although many of the lower density sites are currently being redeveloped into mid-rise and high-rise condominium developments.

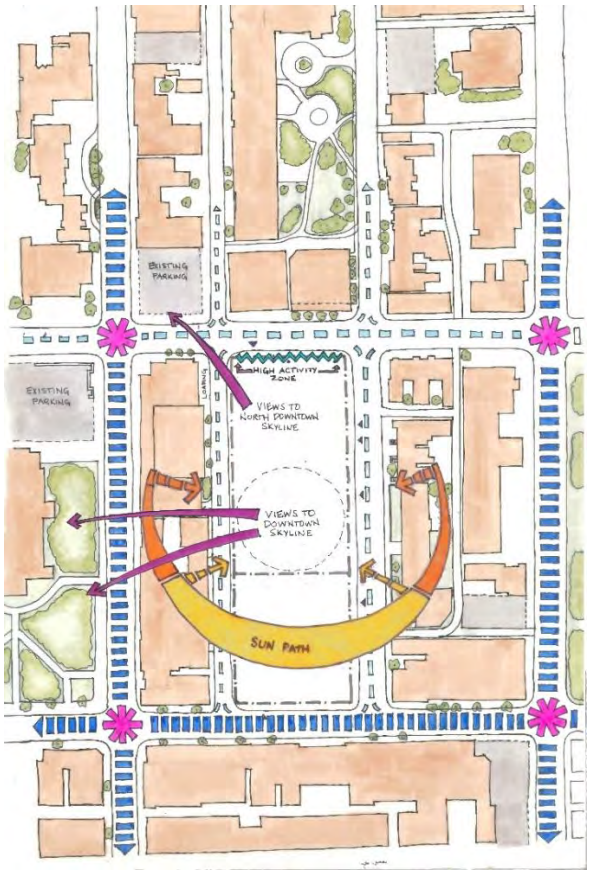


Figure 82: Site Analysis

The built form surrounding the site has a very straight forward urban edge which creates linear patterns of circulation restricted to the street edges, and limits opportunities for interaction between different people and properties. The existing buildings are too close to the street edges, which creates a bottle-neck effect at all four corners of the site. This feeling of compression limits natural lighting, landscaping, and other urban design elements that are generally encouraged to enhance the public realm and promote wellness; And although my building program could cover the entire area of my site as a response to the surrounding context, that is not in line with my research and design principles.

7.1.3 - Proposed Site Plan

The first move I made was pushing the built form north in order to provide a visual connection through the site and maximize views and natural light to the south. In this void area I added open green space and landscaped areas to pull the public onto the site. Walkways were also added to provide

physical connections through the site for the community to use on a daily basis. Next I cut back the built form on the north, east and west sides, to provide wider walkways for public circulation along street edges. The north-west and south-west corners of the building were also removed to provide enhanced landscaping and urban design at the north and south building entrances.

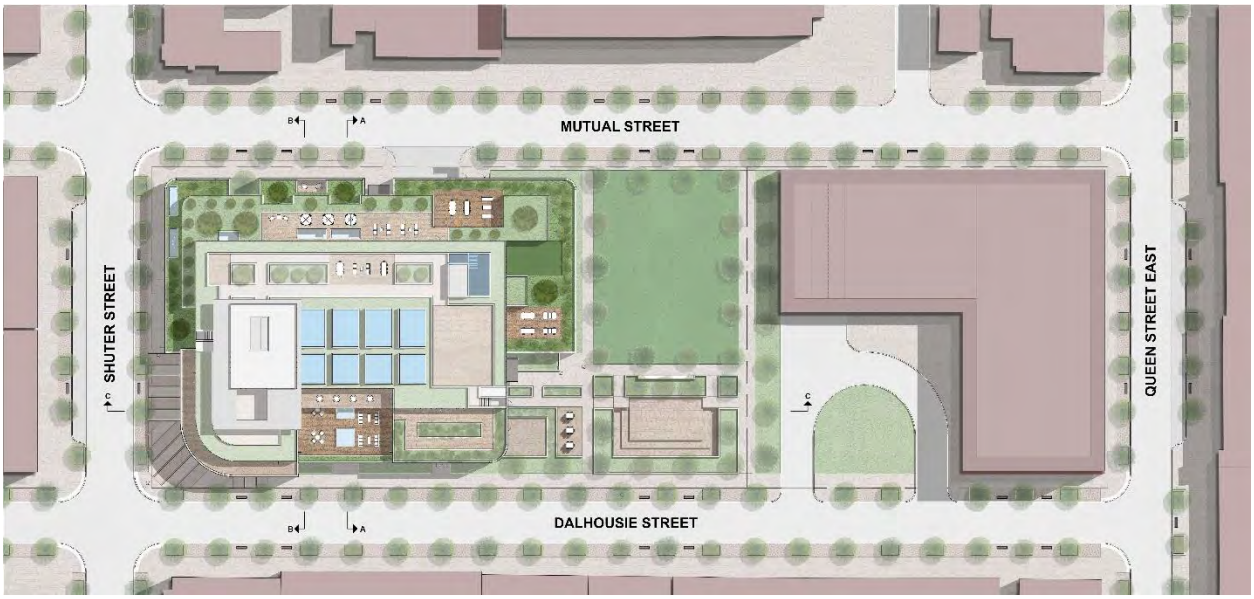


Figure 83: Proposed Site Plan

The result is a site that invites pedestrians onto and through the site, and a building that interacts with the community. Entrances are located on all 4 sides of the site, with a plaza at the north-west corner of the site to signify the main entrance of the building. A majority of the ground floor is animated with active uses such as a café, resource centre, greenhouse, children's play area, and fitness studios. To the back of the site are a variety of outdoor spaces such as a children's play area, picnic tables for eating, a small amphitheater for casual seating or scheduled events, and an open green space for active uses and community events such as farmers markets. In addition, green roofs, sensory gardens, enhanced streetscaping, and public connections have been provided throughout the site to allow for pedestrian permeability, and to seamlessly integrate the facility with the surrounding community.

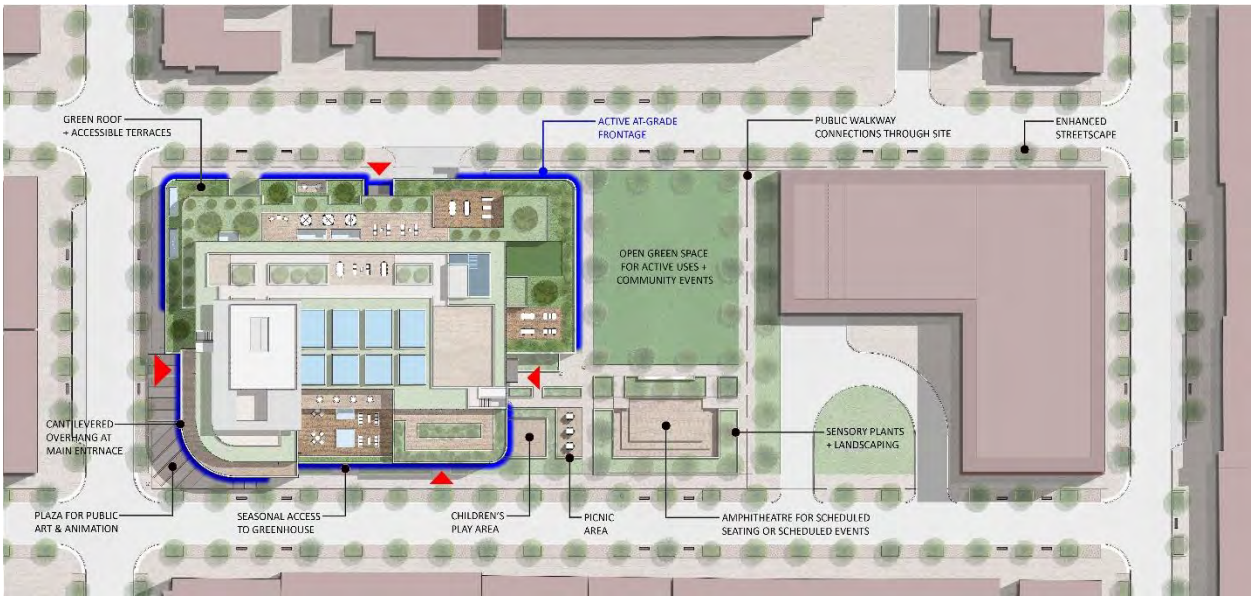


Figure 84: Site Diagram

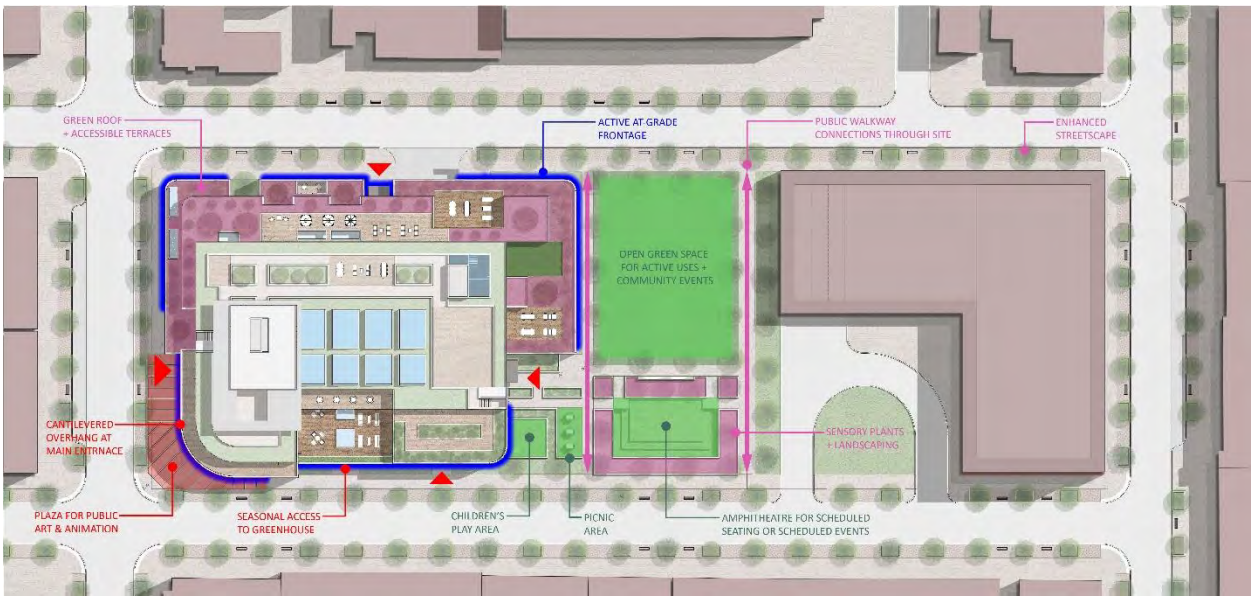


Figure 85: Site Diagram

7.2 - Building Program

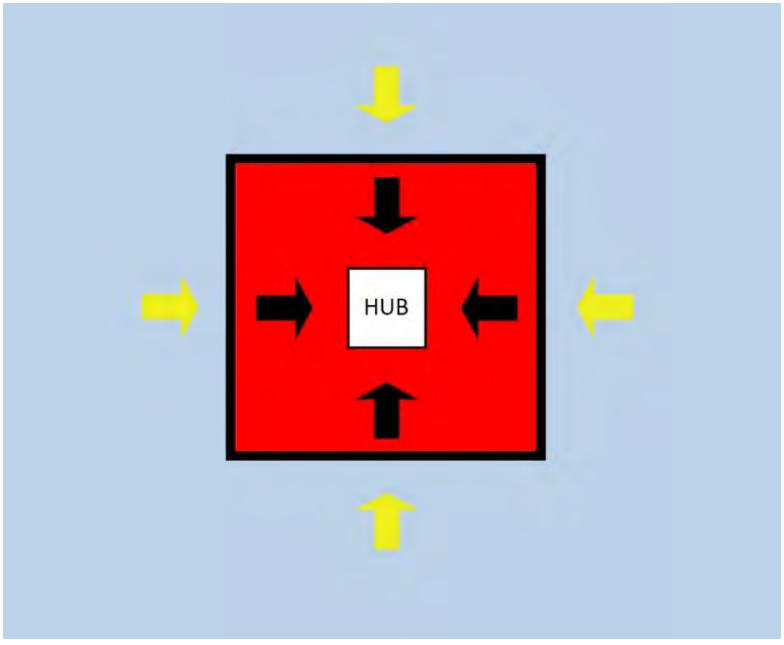
Taking the generic model for the large scale facility, I have modified the program based on my chosen site and to accommodate the specific needs of the Garden District community. This building can accommodate over 200 buidling occupants and over 600 therapeutic visits per day. The facility will have between 20-30 full-time staff and approximately 25-35 part-time staff. The program compliments the vibrant mix of retail, institutional, and residential uses surrounding the site. Small retail components such as a café and fitness centre provide continuity with the existing retail fabric in the community, while learning and educational spaces can connect with schools in the area including Ryerson University. Wellness and therapeutic services provide a transition for Clients who may be using other medical and outreach services in the area, such as the Harbour Light Centre and St Mike's hospital, while art, music, and other social spaces connect the facility with the surrounding residents. Below is the overall program organized by Zones:

ZONE / CATEGORY	AREA		FUNCTIONS & SPACES	
	m2	ft2		
ZONE 1 (EMOTIONAL)	350.0	3,767	Screening & Assessment Meditation Psychologist Individual Treatment	Case Management Diet & Nutrition Psychiatrist Individual Therapy
ZONE 2 (BEHAVIOURAL)	500.0	5,382	Contemplation Space Group Therapy Family Therapy	Holistic Lounge & Reception Peer Support
ZONE 3 (COGNITIVE)	1,000.0	10,764	Self-Help Supported Employment Conference Room Staff Administration + Lounge	Reception Supported Housing Meeting Rooms Resource Centre
ZONE 4 (SOCIAL)	1,900.0	20,452	Multi-Purpose Rooms Music Studio Open Art Workshop Social / Games Lounge	Social Hub Café Horticulture Workspace Teaching Kitchen
ZONE 5 (PHYSICAL)	1,350.0	14,531	Gymnasium Yoga / Fitness Studios Physiotherapy Clinic	Fitness Centre Therapy Pool Child Care
OTHER	2,850.0	30,677	Circulation	
	900.0	9,688	Service	
	3,000.0	32,292	U/G Parking Level (*Excluded from total area count)	
OUTDOOR - At Grade	2,900.0	31,216	(*Excluded from total area count)	
OUTDOOR - At Roof Level	2,000.0	21,528	(*Excluded from total area count)	
TOTAL FLOOR AREA	**8,850.0**	**95,261**		

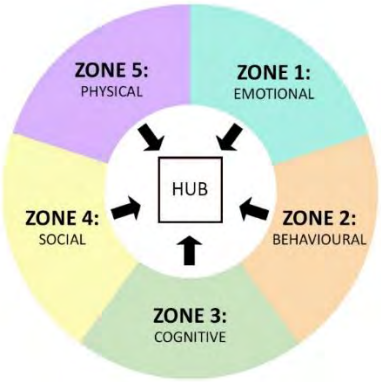
Figure 86: Program Summary of The Nightingale Collective on Shuter

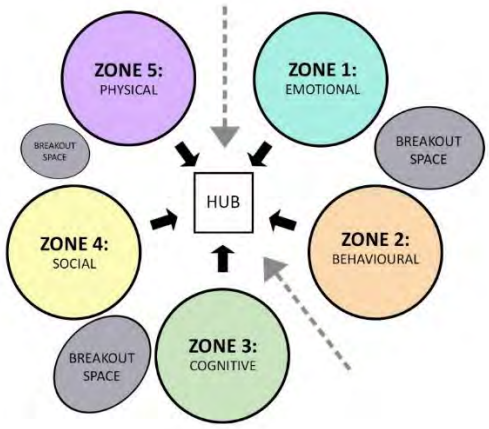
7.3 - Design Concept and Parti

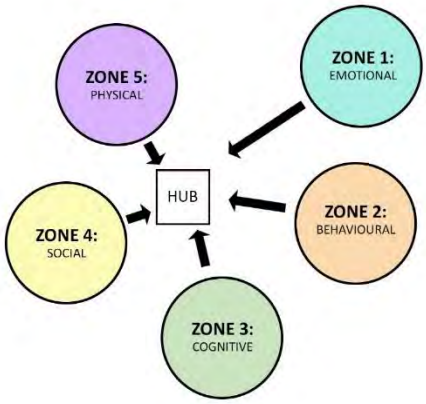
A number of moves were also made within the building to achieve my goals of promoting wellness and integrating the facility with the community. The whole intention of this project is to bring fractured people into a nurturing environment to make them whole again, while also creating a hub for the community. And just as the building is the hub of the community, I wanted to have a space within the building that was the core hub for all building occupants.

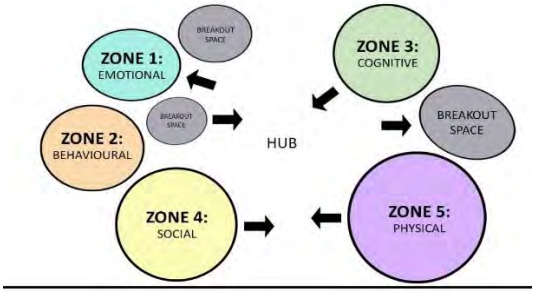


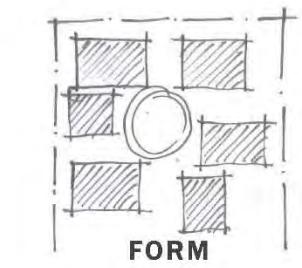
The hub is the anchor and heart of the building, and therefore the zones surround the hub. Gaps between the zones are used for circulation, access to the central hub, and breakout spaces to connect different program uses and building occupants to mingle. The zones gravitate towards and pull away from the core based on the relationships desired between each zone and the hub. And, this pushing and pulling happens in both horizontal and vertical directions.

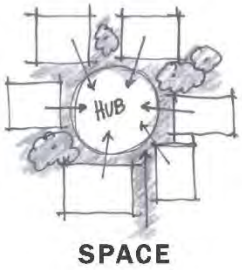


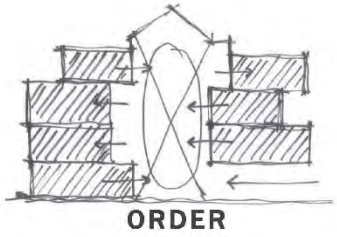




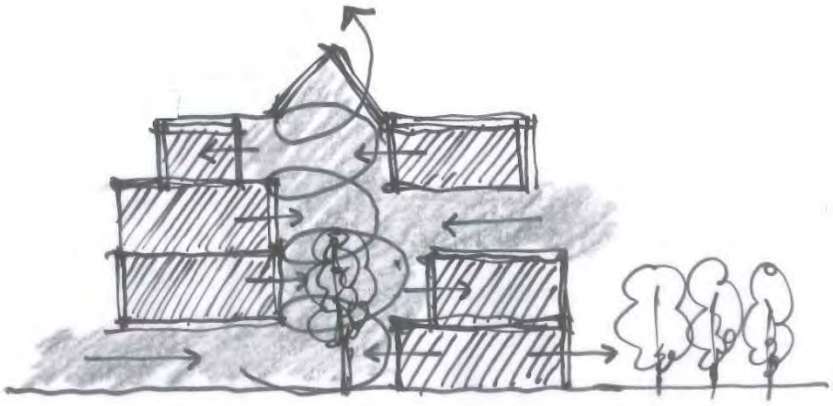








The result is, a series of alternating solids and voids radiating around a central hub. The “solid” forms house structured programming and activities, while the void spaces provide views out to nature which reduces stress and promotes healing, and open gathering spaces which are accessible to the community and provide flexibility for informal programming and social connectivity. The zones within the building create a hierarchy of space in terms of visual and physical connections to the hub and other public areas by pushing social programming closer and into the hub, and pulling sensitive and more private spaces away.



7.4 - Floor Plans

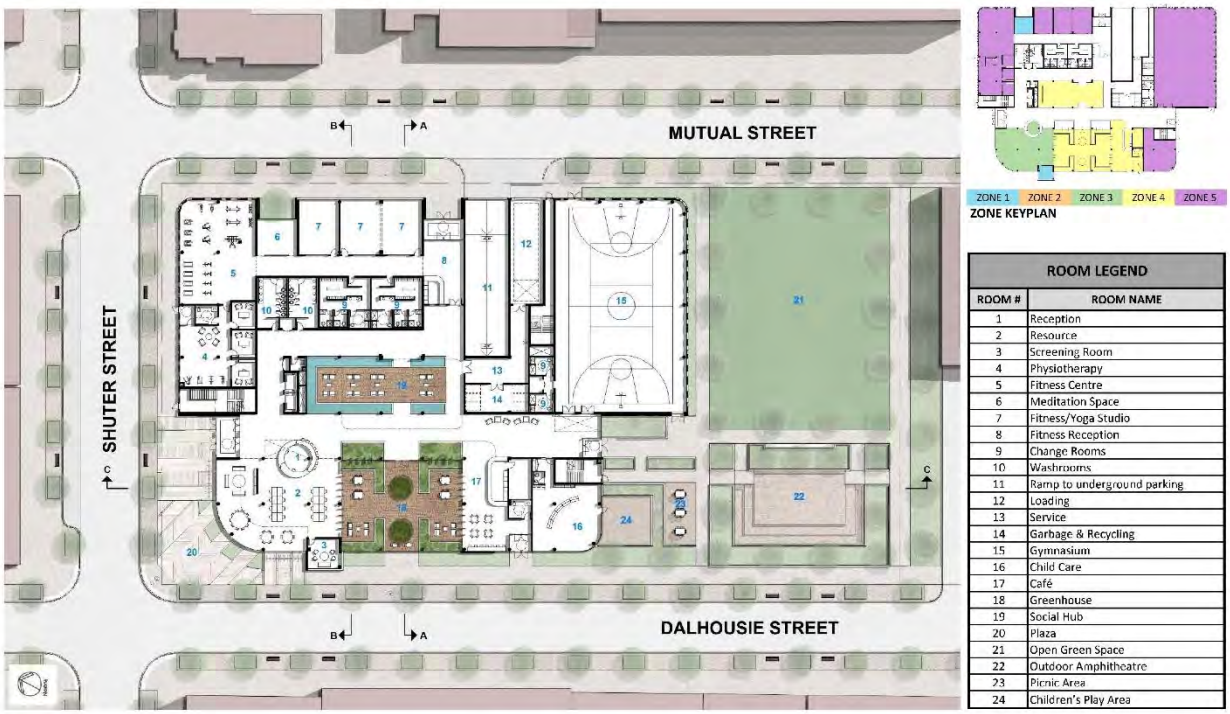


Figure 87: 1st Floor Plan

The first floor is organized to maximize active street edges and invite the community into the building. Active and social uses animate the street edges, while north-south and east-west connections invite the community into and through the building. In the center of the building is the hub, which symbolizes the heart of the facility and the community. On the west is a greenhouse with operable walls that open up to the resource centre, café, central hub, and street edge. These two spaces, together with the café, resource centre, and circulation, combine to transform into a large, open community hub. Smaller, intimate spaces located in larger active areas provide a sense of control over the environment, and an open reception desk provides passive supervision and creates a welcoming atmosphere to mingle and interact with the staff.

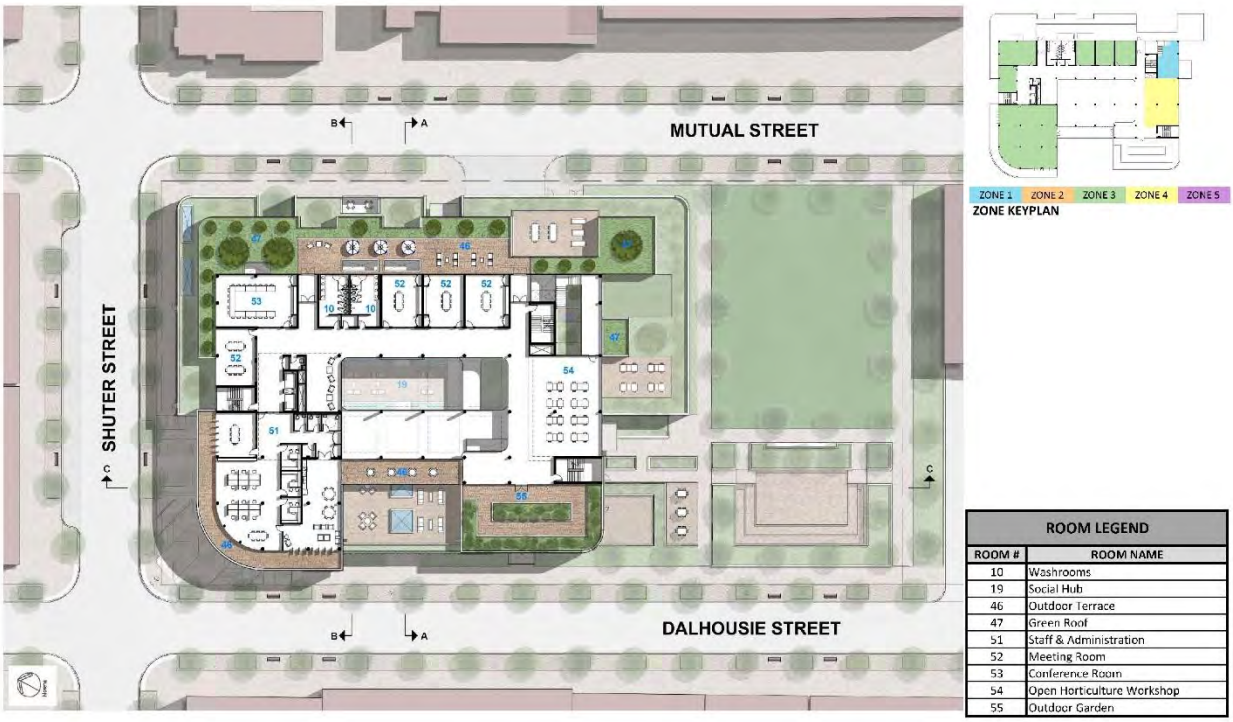
Figure 88: 2nd Floor Plan

The second floor is a mix of social and group therapy spaces. A holistic lounge is located adjacent to the elevators, which is the reception point for individual and group therapy spaces located in the private east wing. Social spaces such as the teaching kitchen and games lounge are arranged around the hub and easily accessible to the public, including informal seating areas and a viewing lounge located within the public realm. There are also a few adaptable, multi-functional spaces that are shared between the public and therapeutic programming.

The 3rd floor is laid out similar to the 2nd floor, with access from the upper lounge to a series of therapy spaces. Enclosed therapy spaces provide a place for individual treatments, while informal spaces for contemplation and informal therapy sessions provide natural lighting into the corridors. A mix of programmed social spaces, informal social spaces, and shared multi-purpose spaces are connected along public circulation routes surrounding the hub, along with a series of green spaces on the interior and exterior used for additional programming and views to nature.

ROOM LEGEND	
ROOM #	ROOM NAME
6	Meditation Space
9	Change Rooms
10	Washrooms
19	Social Hub
25	Gallery
26	Lecture Hall
28	Holistic Lounge & Reception
32	Multi-Purpose Room
37	Chiropractor
38	Massage Therapy
39	Quiet Room
40	Social Work
41	Contemplation Space
42	Individual Therapy
43	Yoga Pavilion
44	Interior Garden
45	Open Art Workshop
46	Outdoor Terrace
47	Green Roof
48	Outdoor Classroom
49	Outdoor Yoga
50	Outdoor Art Space
67	Therapy Pool

Figure 89: 3rd Floor Plan



ROOM LEGEND	
ROOM #	ROOM NAME
10	Washrooms
19	Social Hub
46	Outdoor Terrace
47	Green Roof
51	Staff & Administration
52	Meeting Room
53	Conference Room
54	Open Horticulture Workshop
55	Outdoor Garden

Figure 90: 4th Floor Plan

The programming on the 4th floor is fairly generic, in order to provide flexibility in the building for future demands of the community. A majority of this level consists of meeting and conference spaces, with access to green roof areas along the east. Staff areas are located in the north-west corner with access to both private and shared terraces, while an open horticultural workshop is located to the south. The workspace is flanked by an exterior garden to the west, and an interior garden to the east, both of which are used to grow plants and vegetables associated with the horticulture classes and used for meals prepared in the teaching kitchen on the 2nd floor.

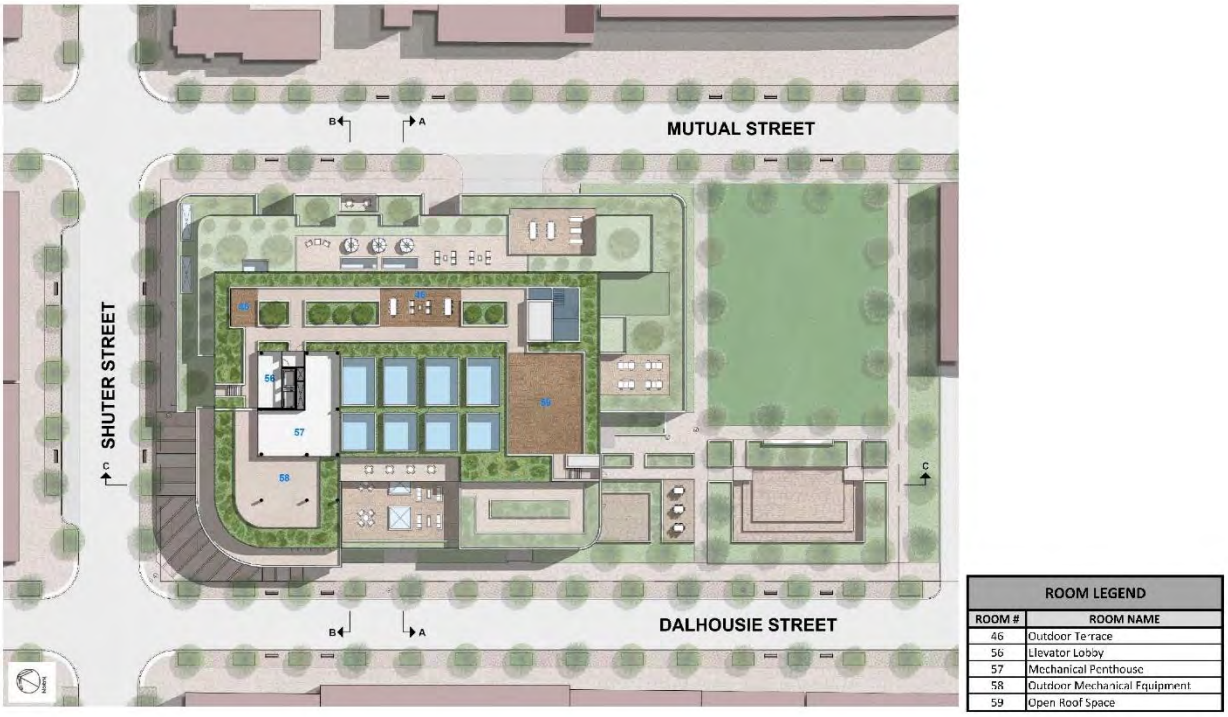


Figure 91: Mechanical Penthouse / Roof Terrace

Above the 4th floor is the mechanical penthouse level, which has a small pop-up for mechanical and electrical services, and elevator access to the green roof. The green roof is configured as a walking loop, which connects smaller seating areas to a larger open space used for yoga and other larger group programs. Eight large skylights in the center of the roof provide an abundance of natural light throughout the core of the building and down to the central hub.

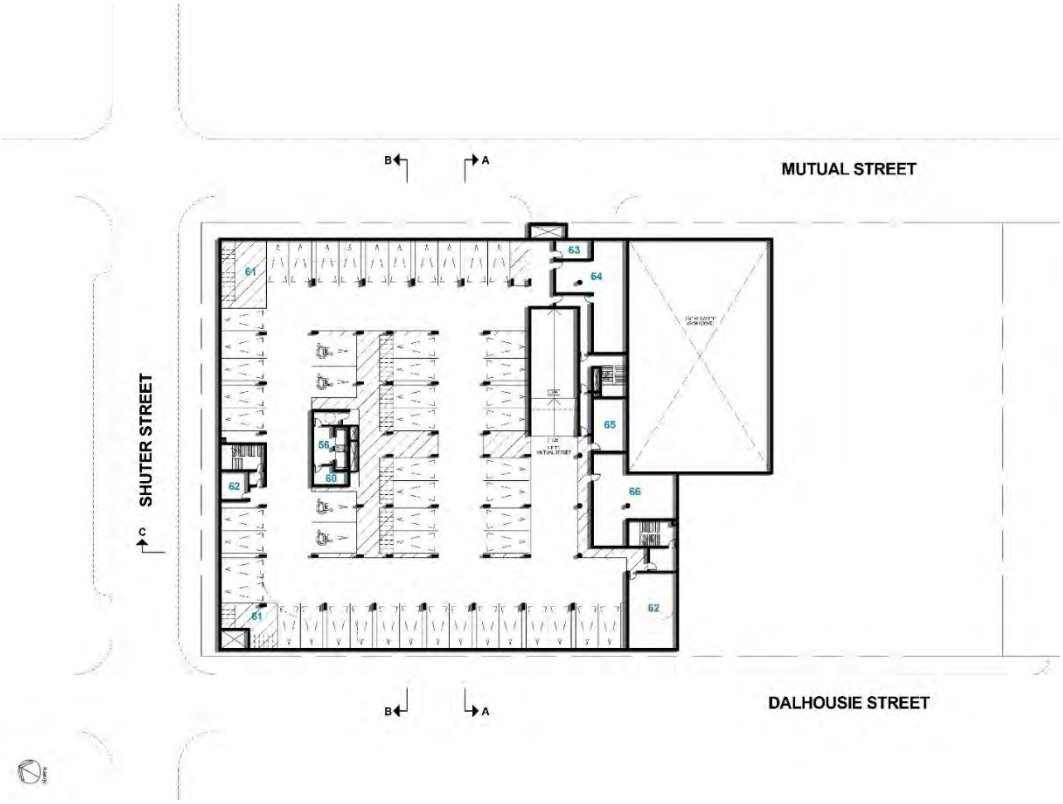


Figure 92: Underground Parking Level 1

Figure 93: Roof Plan

7.5 - Elevations

Figure 94: North Elevation (Shuter Street)

Figure 95: South Elevation (Along Green Space)

The first 2 storeys of the building are relatively uniform in elevation, however, the 3rd and 4th floors step back to provide an urban, yet human scaled edge along each side of the building, and to compliment the surrounding context. The step backs allow for intimate views to green areas, enhancing the holistic vibe of the facility. While the majority of the building follows this format, the exception is the north-west corner of the building where the form appears to fold upward and open up at the corner to signify the main entrance.

Figure 96: East Elevation (Mutual Street)

Figure 97: West Elevation (Dalhousie Street)

7.5.1 - Materials + Sustainability

Materials for the Nightingale Collective on Shuter were selected based on the site context, as well as each materials' use, functionality, and aesthetic qualities, and its contribution to user experience to provide a non-institutional feeling to the building. The style and time period of architecture surrounding site varies significantly from historical Victorian brick homes to larger brick buildings built within the last 40 years, to glass towers and other modern designs recently built or currently under construction. Since this is a unique building type, I decided not to try and match any of the styles of architecture in the area, but rather use colours of materials that complement the surrounding context, such as the warm tones of red and yellow brick on adjacent buildings, while also creating some contrast to signify the uniqueness of this building type. More importantly, the materials were selected based on their physical and sensorial properties to enhance the holistic qualities of the facility. Each material enhances building user's perception of spaces within the building by orienting materials based on the zones and activities taking place in each space. Selecting materials with warm features and positive associations can enhance moods and emotions while also improving wayfinding throughout the building.

Figure 98: Materials Selected for The Nightingale Collective on Shuter

The selected materials were located on the building based on the function of each material, the use of space, and the impact of each material on user experience. Horizontal wood screens are applied to the building face for texture where there are limited windows required, such as in the theatre. The horizontal screening is also used in sensitive areas where client privacy is of the utmost importance, such as in zone 1 and zone 2 therapy spaces. The horizontal screening provides natural light while also providing a layer of privacy and sense of control over the environment. In contrast, a highly transparent

glazed façade is located where active and social uses meet the street, and to maximize views to the exterior in public spaces. Semi-public and private spaces may also use this glazing on upper levels where the building is stepped back or to frame views to natural elements on the exterior. The patterned façade on the building provides a transition between the privacy of the screened façade and exposure of the glazed façade and combines elements from each to create a sense of harmony on the exterior of the building. This façade consists of panels of corten steel, glazing, and a living wall. The green features symbolize the holistic qualities of the facility and tie in with the green features on the roof and within the building interior.

Figure 99: Material Detail

Sustainability was also considered when selecting materials. Corten steel is low maintenance, has a long lifespan, and is not only made from pre and post-consumer recycled steel, but it is 100% recyclable itself. The living vertical façade and green roof have several functional and sustainable benefits, meeting a including energy and savings, enhanced acoustic insulation and thermal comfort, nutrients and water management, and the plants' photosynthesis reduces CO2 emissions. While a glazed façade is less sustainable than the rest of the materials selected, window glazing is important in this facility to provide views out to nature and natural light into the building. In order to increase thermal performance in glazed areas, low-e glazing will be used to reflect both heated and cooled are back into the interior instead of flowing through the glass to the exterior. Thermal breaks and spacers will also be used to reduce heat flow from the interior to exterior, and to keep the temperature consistent around the frame edges.

7.6 - Sections

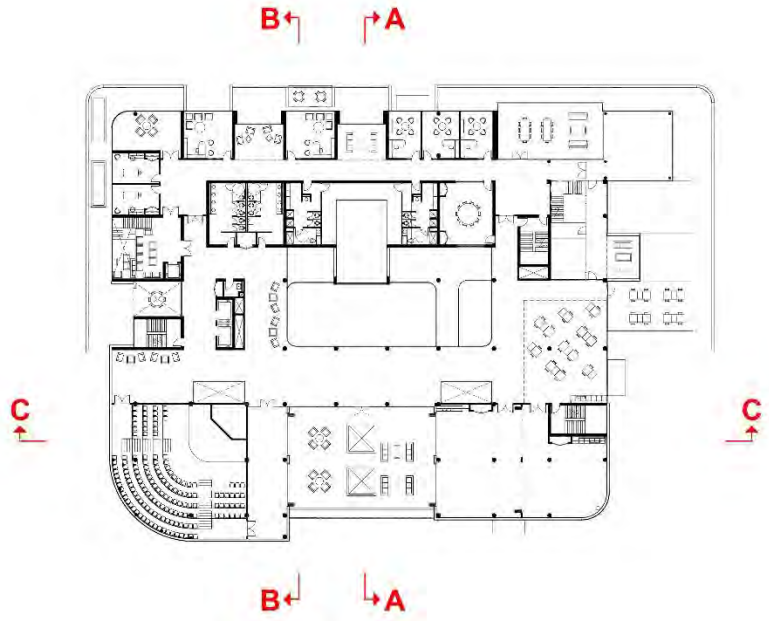


Figure 100: Building Section Keyplan

Figure 101: East-West Section A (Facing South) Through Central Hub and Greenhouse

Although the exterior form appears relatively uniform on the exterior, a number of voids and openings happen on the interior to maximize natural light, and provide visual connections between different zones and program uses. Large openings above the central hub connect all floor levels in the

middle of the building, while smaller light wells provide additional light in circulation areas. Viewing lounges and glazing in double-height spaces allow building users to overlook different types of social and physical activities such as the greenhouse and gymnasium. Creating these large, light-filled spaces also allowed me to pull nature into the building, and provide views to natural elements year-round. During warmer months, a number of private outdoor spaces can be used as an extension of the interior programming, such as an outdoor meditation space next to the Yoga Pavilion, and outdoor classrooms adjacent to multi-purpose rooms.

Figure 102: East-West Section B (Facing North) Through Greenhouse

Figure 103: North-South Section C (Facing East) Through Greenhouse and Theatre

7.7 - Zones

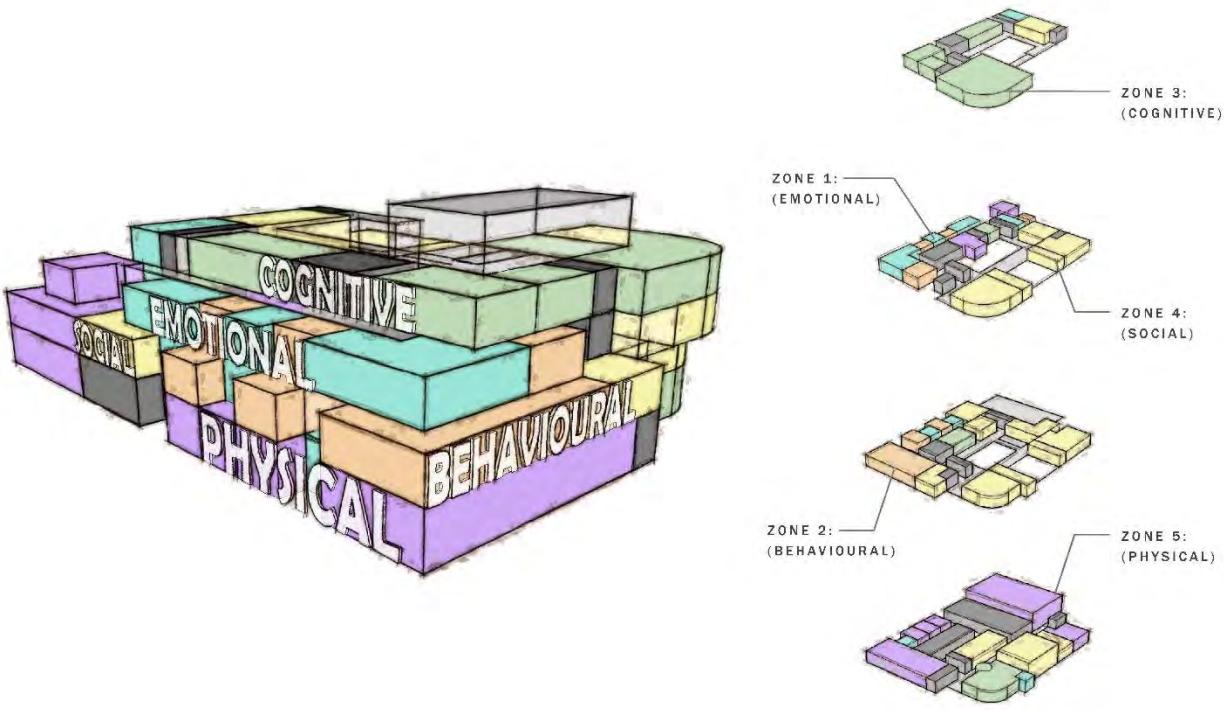


Figure 104: 3D Massing of the Nightingale Collective on Shuter

Lastly, I would like to briefly go through the zones of my building to demonstrate how I have applied design elements uniquely to each zone, and how I have applied the design principles of the Nightingale Collective to my building as a whole. Each zone implements design principles in different ways to evoke specific feelings, memories, and associations. At first glance it may look like the zones are segregated from one another. However, as shown in the diagram on the right, different spaces are mixed throughout the building to provide choice, variety, and relief for changing client and programming needs.

7.7.1. - Zone 1: Emotional

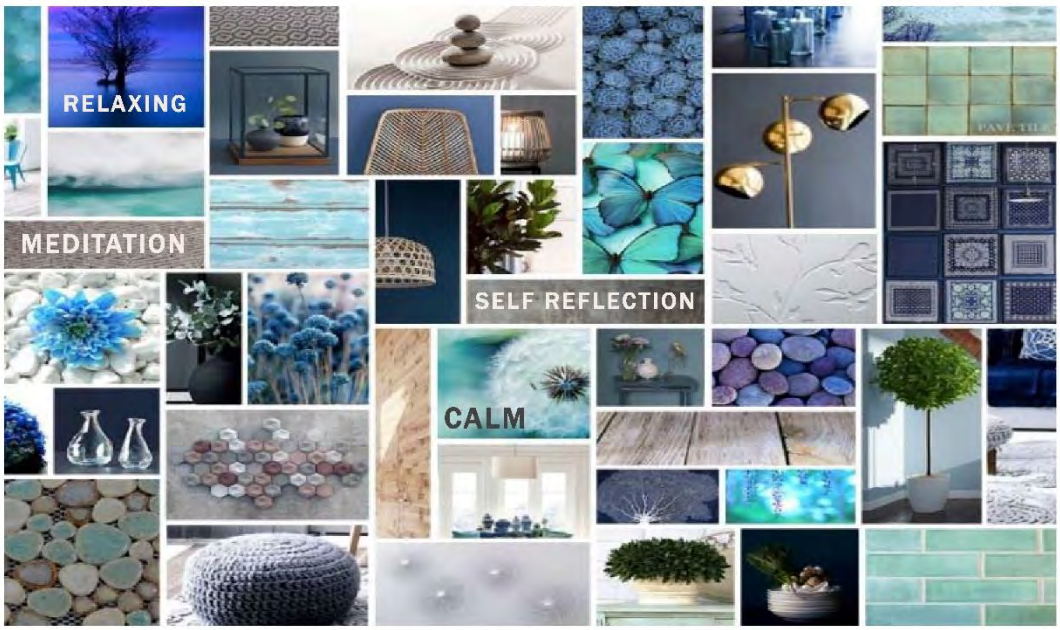


Figure 105: Moods of Zone One

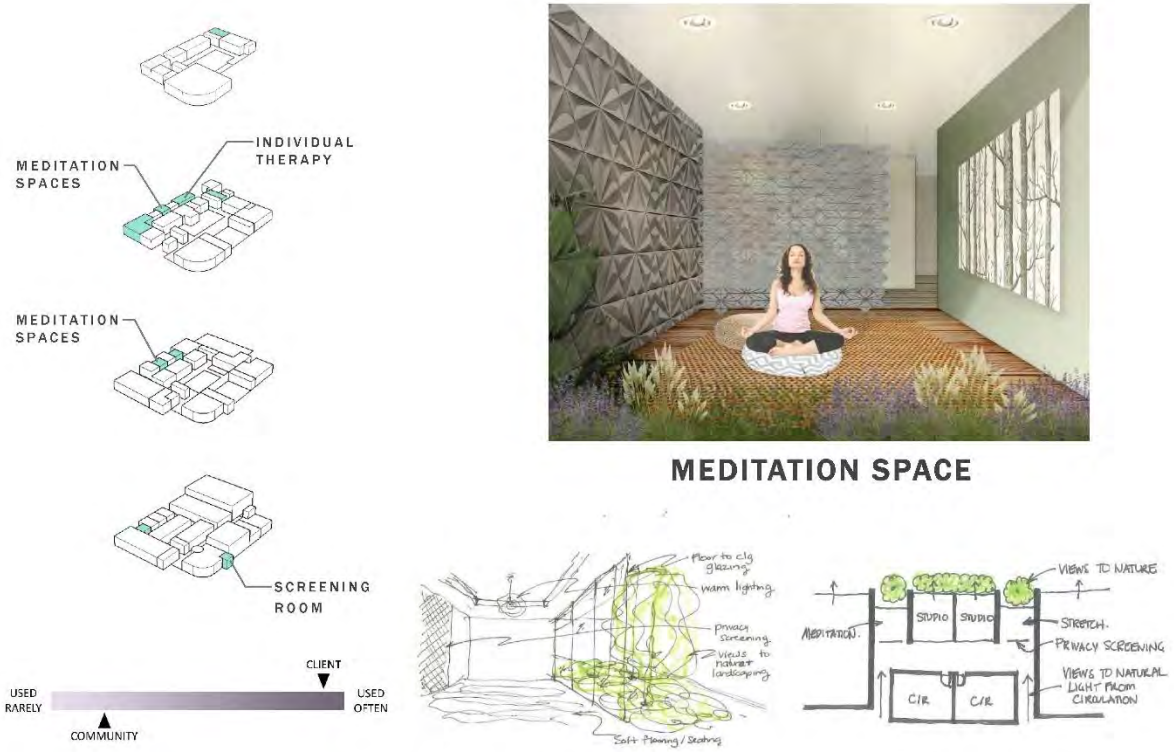
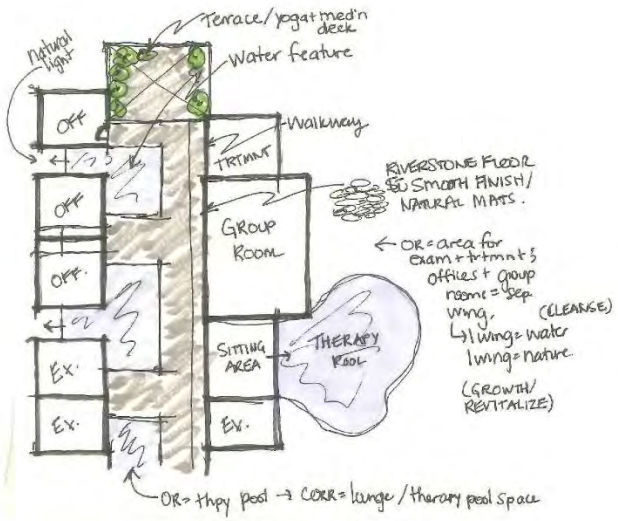


Figure 106: Zone 1 Spaces

At the beginning of their journey to recovery, clients are often the most vulnerable, and will need the most help and support. With a focus on emotions, Zone 1 spaces are designed to calm clients who may be highly sensitive and overwhelmed during this stage of their healing process. It represents the beginning of change and improvement of ones self through activities that focus on self-reflection, meditation, and individual treatment. Most Zone 1 spaces are grouped together in a quiet area of the building, and are physically connected to public areas through the Holistic Lounge. Both clients and the public can access services in this area, such as counselling and massage therapy, provided they have an appointment. Zone 1 spaces for meditation and reflection are also provided as breakout spaces in active and social areas for those who need a sense of control over their environment.

SCREENING ROOM

INDIVIDUAL THERAPY



CONCEPTUAL SKETCH OF THERAPY AREAS

Figure 107: Zone 1 Spaces

The environment in zone 1 has a “home-like” feeling to it, with calming colours, soft patterns and textures, and natural materials. Many people with mental disorders are highly sensitive to light and sound, so control of light and noise are important in this zone. An exterior cladding with operable screens provides a mix of shade and soft lighting, while allowing building occupants to control lighting levels and enhance their sense of personal comfort and privacy. Soft levels of white noise are also used to evoke feelings of comfort and peace in therapy spaces.

7.7.2. - Zone 2: Behavioural

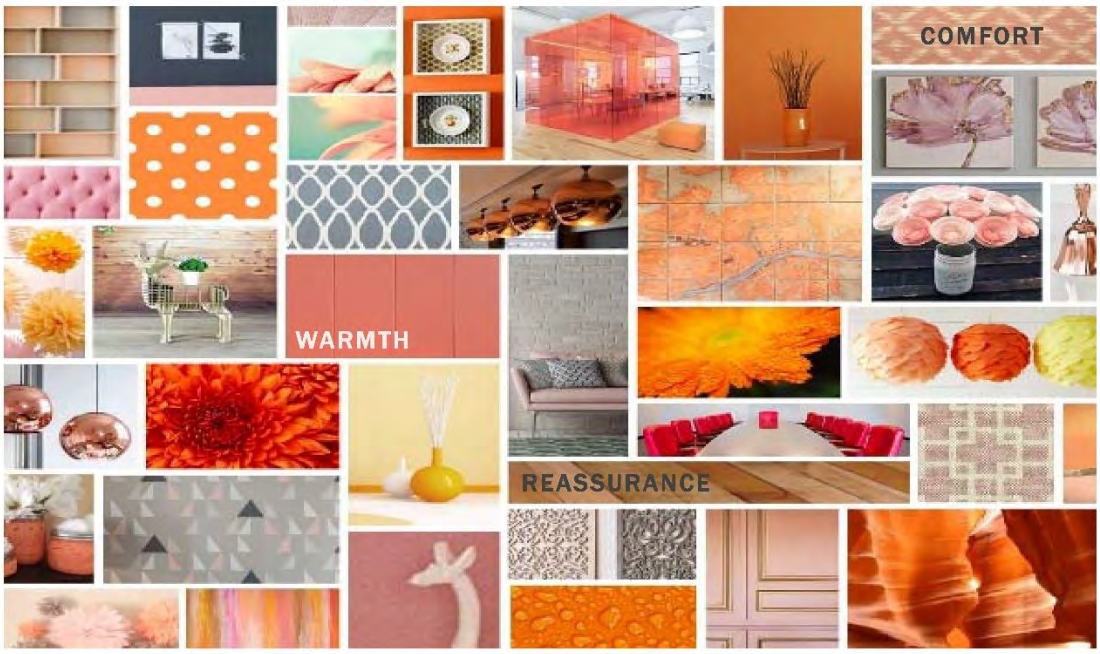
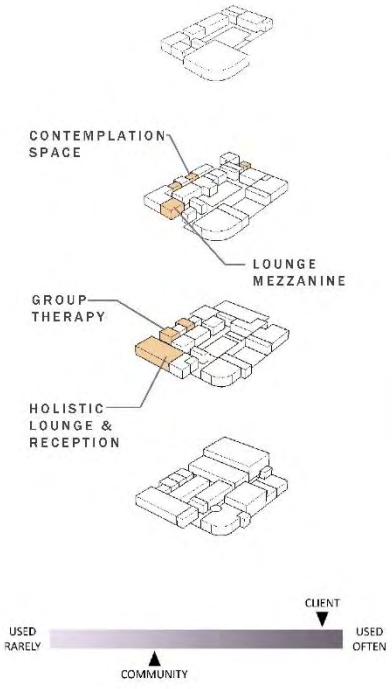


Figure 108: Moods of Zone Two



HOLISTIC LOUNGE & RECEPTION

Figure 109: Zone 2 Spaces

After getting comfortable with one-on-one sessions, most Clients continue their growth by participating in group therapy sessions in Zone 2. Spaces in this zone are designed to promote behavioural and emotional growth, with a focus on healing, rejuvenation, and participation. The holistic lounge on the 2nd floor acts as a gateway to the main hub of Zone 1 and 2 therapy spaces while providing informal therapeutic experiences and social support. The lounge leads to a range of group therapy spaces and informal breakout spaces for contemplation.

Figure 110: Zone 2 Spaces

Oranges and pinks are used in Zone 2 to symbolize warmth, provide comfort and reassurance, and to encourage group interaction and verbal expression of emotions. Eastern exposure to natural light and control of sound are important in this zone to enhance comfort and privacy. Sound absorbing materials such as acoustic ceilings, wall treatments and soft seating are used to increase privacy and reduce noise transfer from group therapy spaces.

7.7.3. - Zone 3: Cognitive

Figure 111: Moods of Zone Three

Once clients have shown progress in their recovery, they can assess other aspects of their life. Zone 3 focuses on motivation, success, and pursuit of passion, with activities relating to business, education, skills training, and personal accomplishments. Zone 3 is the most balanced in terms of stimulation levels, privacy, and control, and blurs the lines between wellness and community services with a variety of functions such as conference and meeting facilities, a resource centre, and staff administration.

Zone 3 spaces are located throughout the building in order to provide multi-functional spaces that are shared and accessible by clients, staff, and the community, and to complement other uses throughout the building. The Resource Centre in particular provides Clients and the public a place to learn about mental wellness and speak to a support team member if they have questions or would like to get involved with activities and services at the facility.

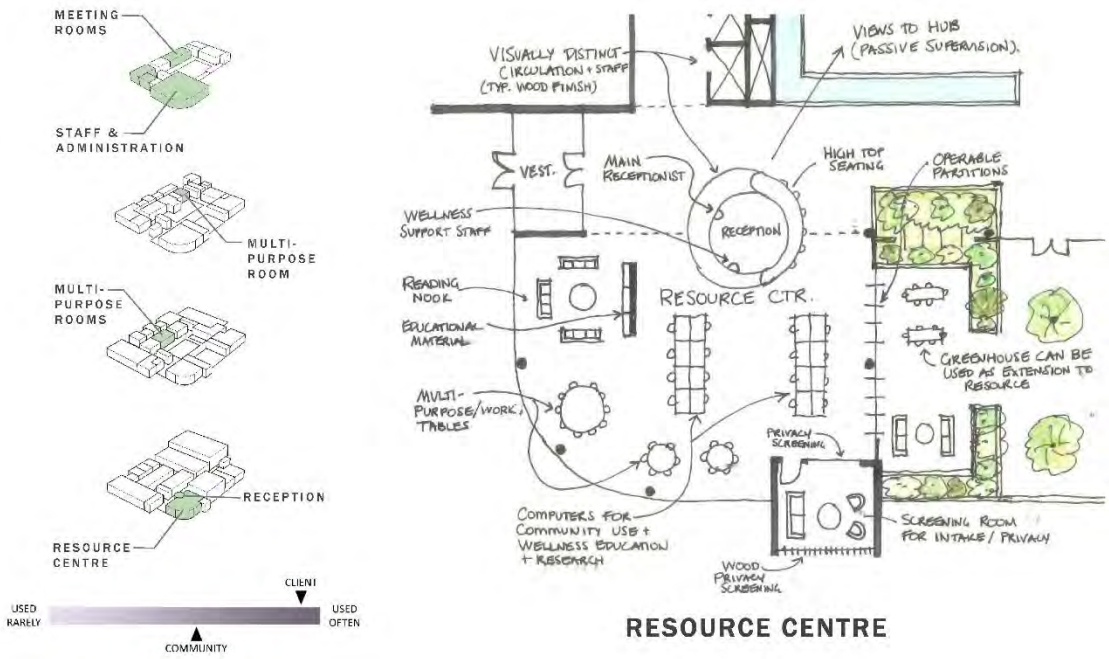


Figure 112: Zone 3 Spaces

Figure 113: Resource Centre

Since learning and education are the main focus of Zone 3, the environment has been designed to increase cognitive functions and improve concentration. Green is present throughout this zone, to enhance learning capabilities without causing overstimulation. Views to nature have been maximized in this zone, since nature significantly aids in restoring attention and mental energy, and improves memory, concentration, and creativity.Planting with subtle scents can further enhance learning capabilities, such as rosemary and cinnamon which enhance memory and creativity. Uniform lighting levels are used in combination with personally controlled task lighting in this zone to enhance focus on tedious tasks.

Figure 114: Zone 3 Spaces

7.7.4. - Zone 4: Social

Figure 115: Moods of Zone Four

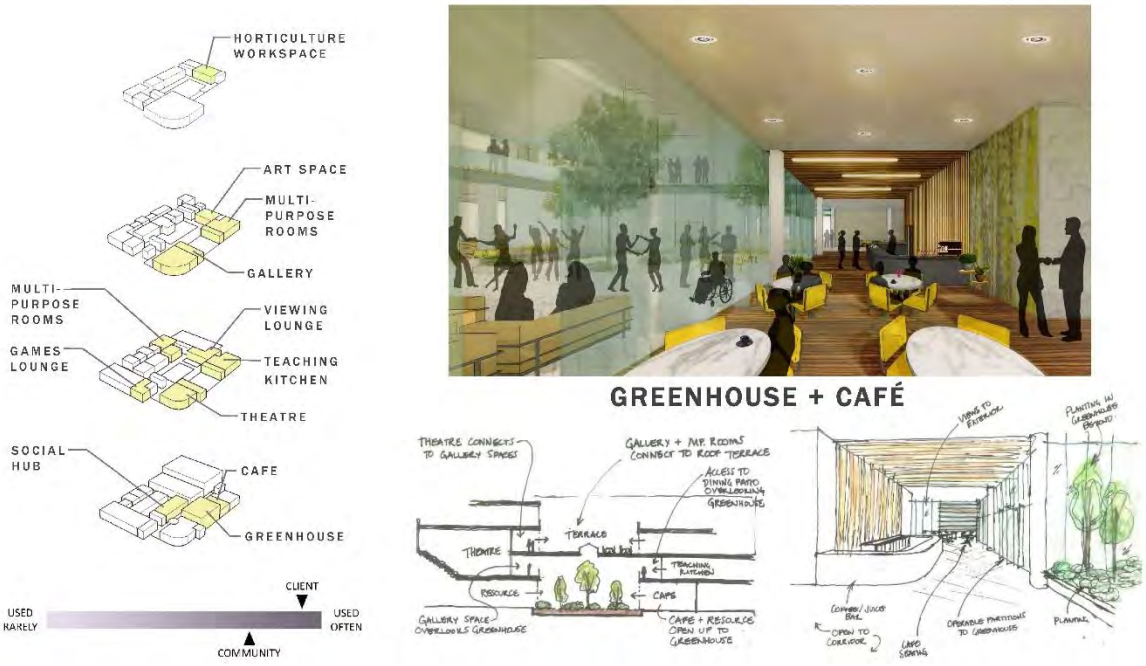


Figure 116: Zone 4 Spaces

Part of ones journey towards recovery and feeling whole again is a reintroduction into social activities and community engagement while discovering personal interests. The focus of Zone 4 is to invite the public to participate in a variety of activities, such as art, music, and cooking classes, which also have therapeutic values, and allow clients to test their social capabilities. Most Zone 4 spaces are connected to the hub or located in open, highly visible areas to encourage participation. Many Zone 4 spaces also interconnect with each other, such as the greenhouse, café, and hub, and the theatre and gallery spaces, to encourage mingling of different building occupants.

Figure 117: Zone 4 Spaces

The environment for Zone 4 spaces has been designed to complement the high-energy activities that take place throughout this zone. Spaces are oriented to maximize exposure to natural lighting, and brighter illumination levels enhance the cheerful, social atmosphere. Yellow is used throughout this zone since it is the most psychologically stimulating colour, and is noted for its mood-enhancing and confidence boosting properties. Natural planting is also used to provide a comforting experience and sense of enclosure in larger areas such as the central hub and greenhouse.

7.7.5. - Zone 5: Physical

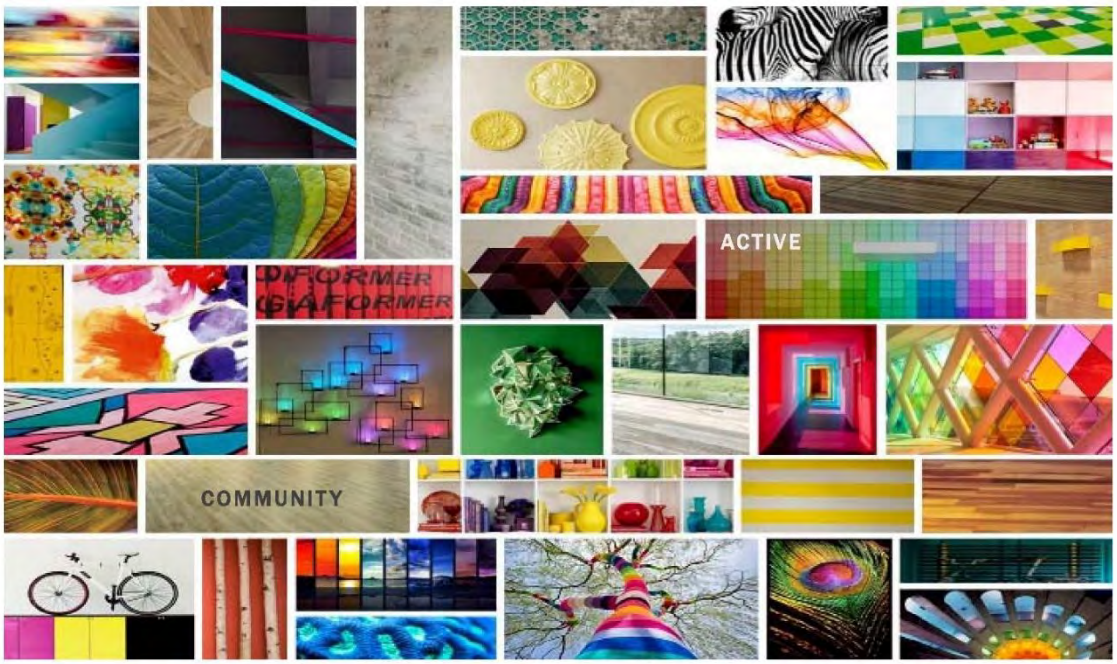


Figure 118: : Moods of Zone Five

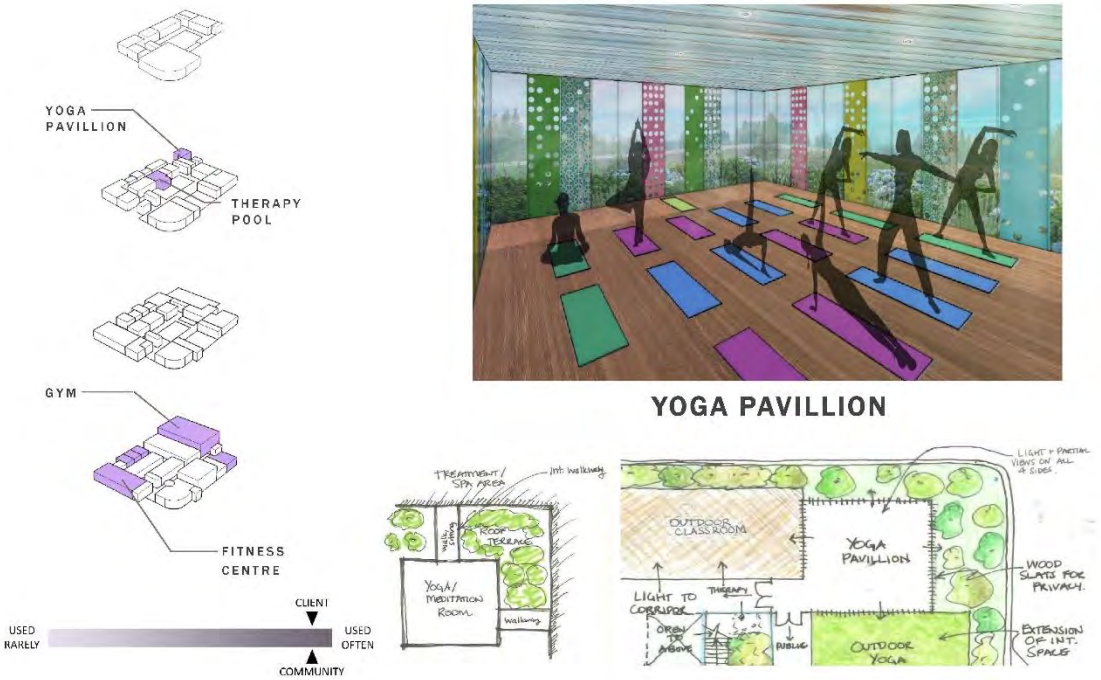


Figure 119: Zone 5 Spaces

In additional to emotional, behavioural, cognitive, and social needs, physical needs should also be improved to create a complete holistic approach to healing and wellness. Zone 5 spaces focus on high-energy activities to motivate and inspire clients while improving mind and body wellness, and encouraging social connectivity with the community through physical and recreational activities. All spaces in this zone are used by clients and the public, such as a fitness centre with group fitness classes, yoga studios, a therapeutic pool, physiotherapy, and a gymnasium for larger assemblies and activities. Most of the spaces in Zone 5 are located in highly visible areas, with active spaces animating the building along street edges.

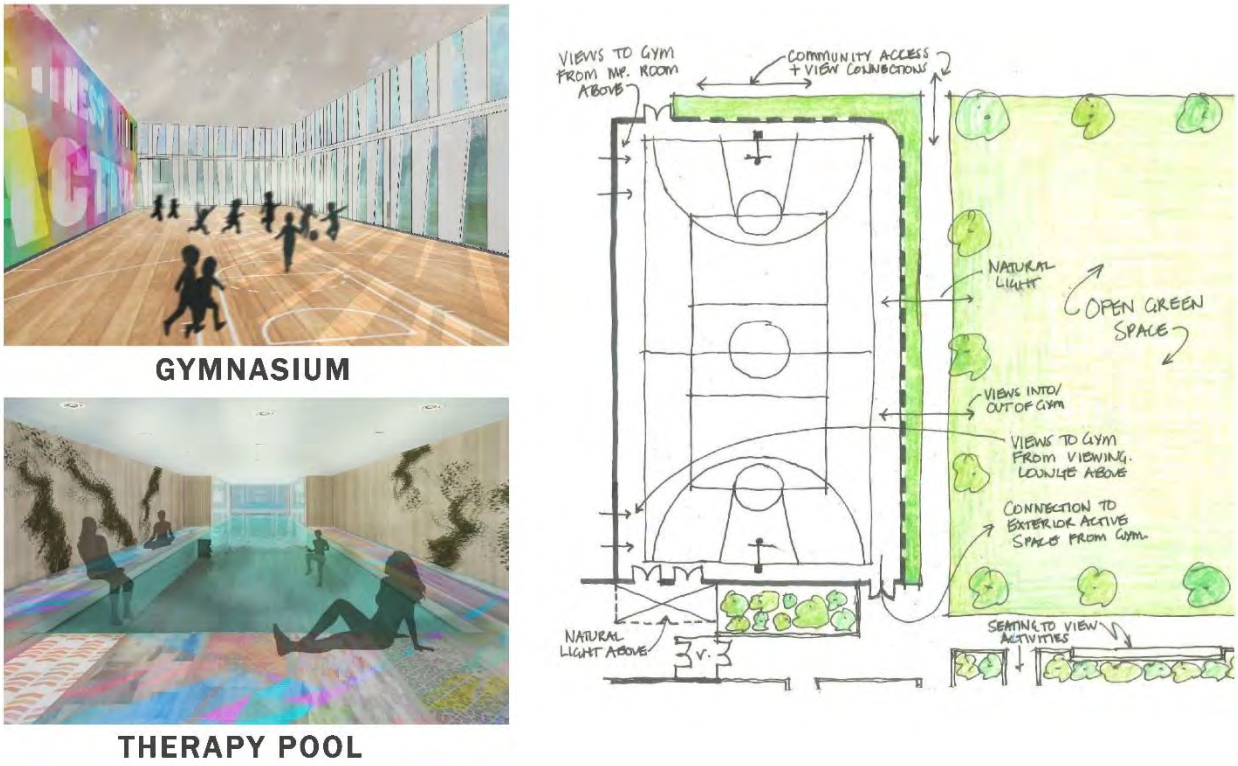


Figure 120: Zone 5 Spaces

The design criteria for Zone 5 is much less restrictive than the other zones in order to provide an appropriate transition to life outside of the facility. There are no specific colour requirements for this zone, although use of a variety of colours is encouraged to increase stimulation levels, and to promote a physically active environment. Control of the thermal environment is also important in this zone to provide healthy temperature and humidity levels for highly active areas.

7.8 - 3D Views + Sketches

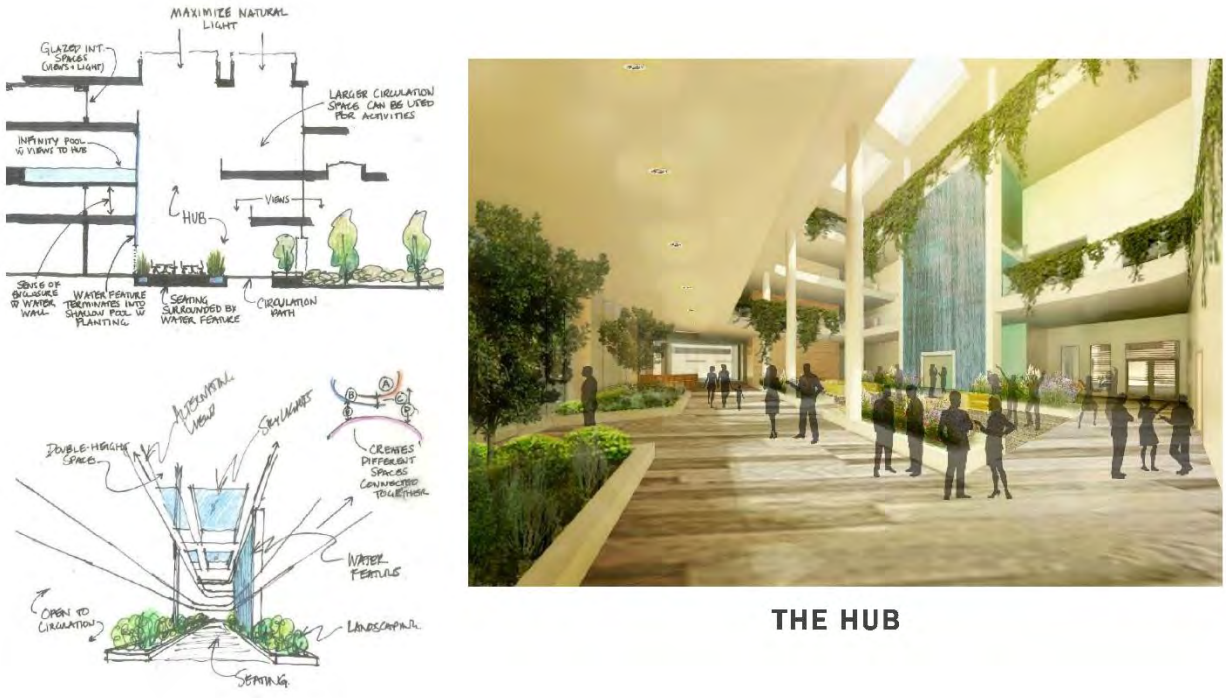


Figure 121: Interior Views + Sketches of the Hub

The hub, as the core of the building, is open and inviting to the community to signify that this is not just a mental health facility that is trying to invite the community in. It is a hub that is truly inclusive to all in the community by providing recreational activities, social engagement, and wellness for all; including those with mental disorders. I have also connected a variety of different program elements to encourage the mingling of different building occupants, such as:

- The resource centre, reception area, hub, greenhouse and café, which can adapt and transform based on programming needs
- Providing access to some of the multi-purpose spaces from both the therapeutic spaces and public circulation
- Creating visual and physical connections between different programming on different floors

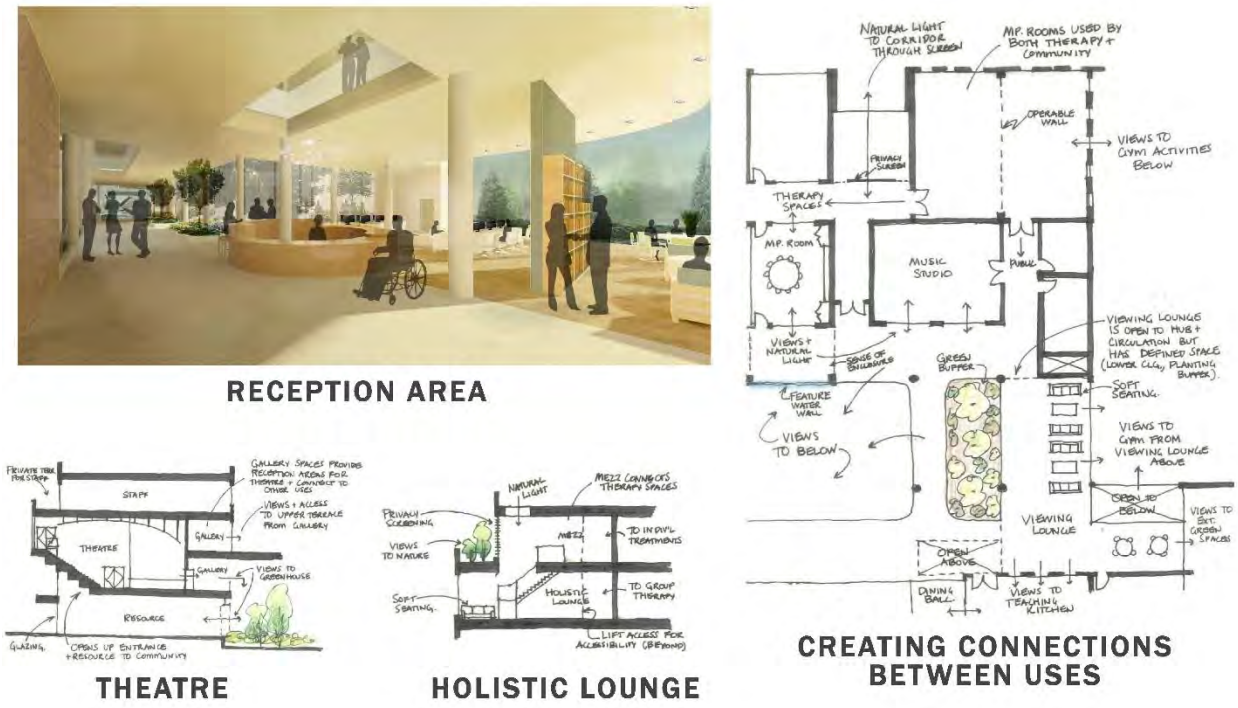


Figure 122: Interior Views + Sketches

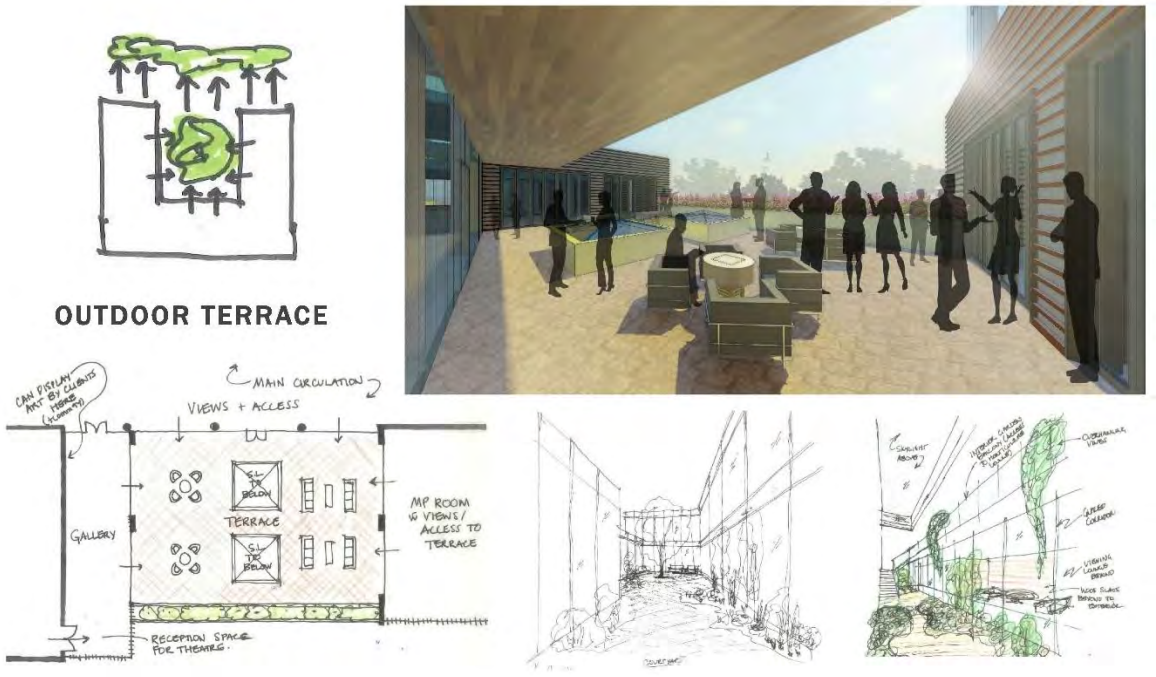


Figure 123: Outdoor Terrace

Figure 124: Outdoor Green Space

Exterior spaces surrounding the building welcome the community onto the property. The open green space provides a space for clients and community members to play, with seating for facing the space for others to observe. Surrounding the open space are a few other seating areas and walkways to provide pedestrian connections midway through the block. Private and semi-private exterior spaces are located on the roof terraces, and connect to interior programming. The roof terrace shown above is located on the 3rd floor and connected to the main circulation route, a large multi-purpose room, and a gallery space which doubles as a reception area for the theatre. Operable walls can open up the multi-purpose room and gallery spaces when private parties and special events are booked.

Figure 125: 3D View of Main Entrance

7.9 - Building Specifications

7.9.1 - Structural Design

The structure for this building is cast-in-place concrete with some steel for areas with longer clear spans. There is one underground level of parking and service areas, which is enclosed by cast-in-place concrete walls. The interior of the garage is mainly reinforced concrete columns with some of the core elements such as the stairs and elevators also being cast-in-place concrete. The floor slab of the garage is sloped from east to west for drainage and to provide headroom under landscaped areas which required additional depth for soil. The slab between the ground floor and lower parking garage is also thicker to provide a transfer for the structural columns that are offset above.

Above ground, cast-in-place columns are located in open areas to provide flexibility while shear walls used for core elements such as the stairs and elevators. Shear walls are located in sensitive areas where privacy is of concern in order to reduce sound transfer between treatment and therapy areas. The floor of the theatre is a stepped cantilevered slab tied into the structural columns below the second floor level.

Steel trusses and open web steel joists are used in areas that require longer clear spans such as the central roof with skylights over the hub. Steel structural is also used above the gymnasium and above the theatre. Using steel above the theatre reduces the columns required in the theatre. The lighter steel structure above the gym reduces the loads on the clear span trusses below. See below for diagrams of the structure for each level. Additional coordination and design development to be conducted through the next stages of the project development.

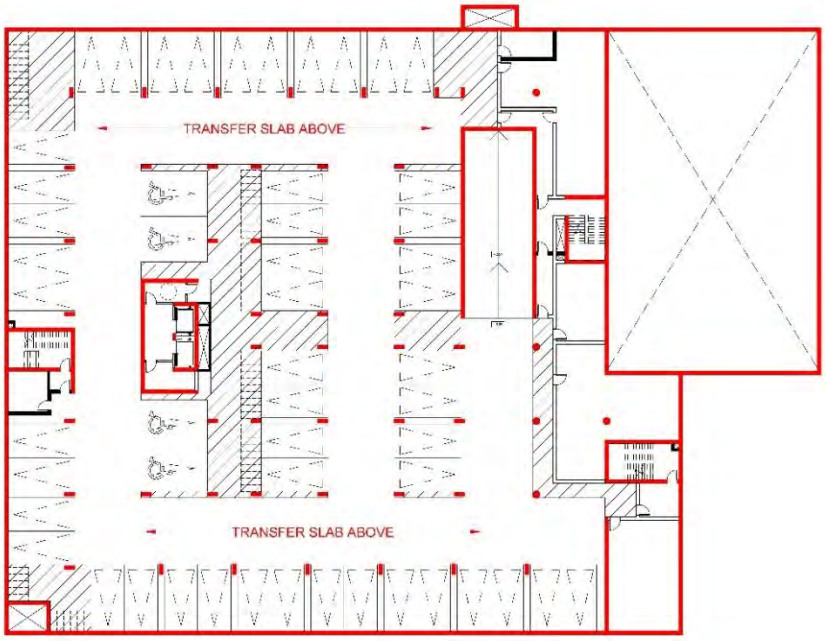


Figure 126: Structural - Underground Parking

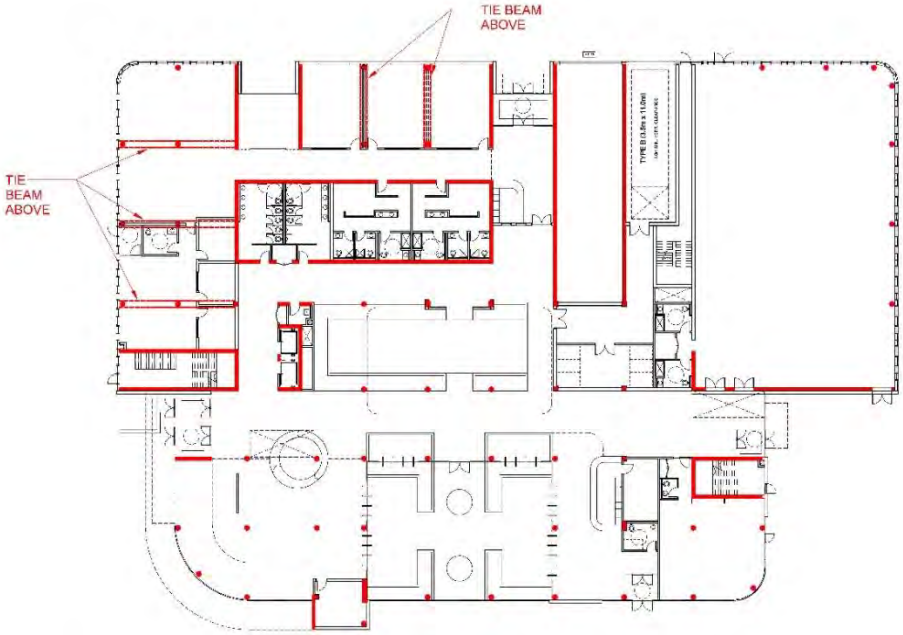


Figure 127: Structural - Floor 1

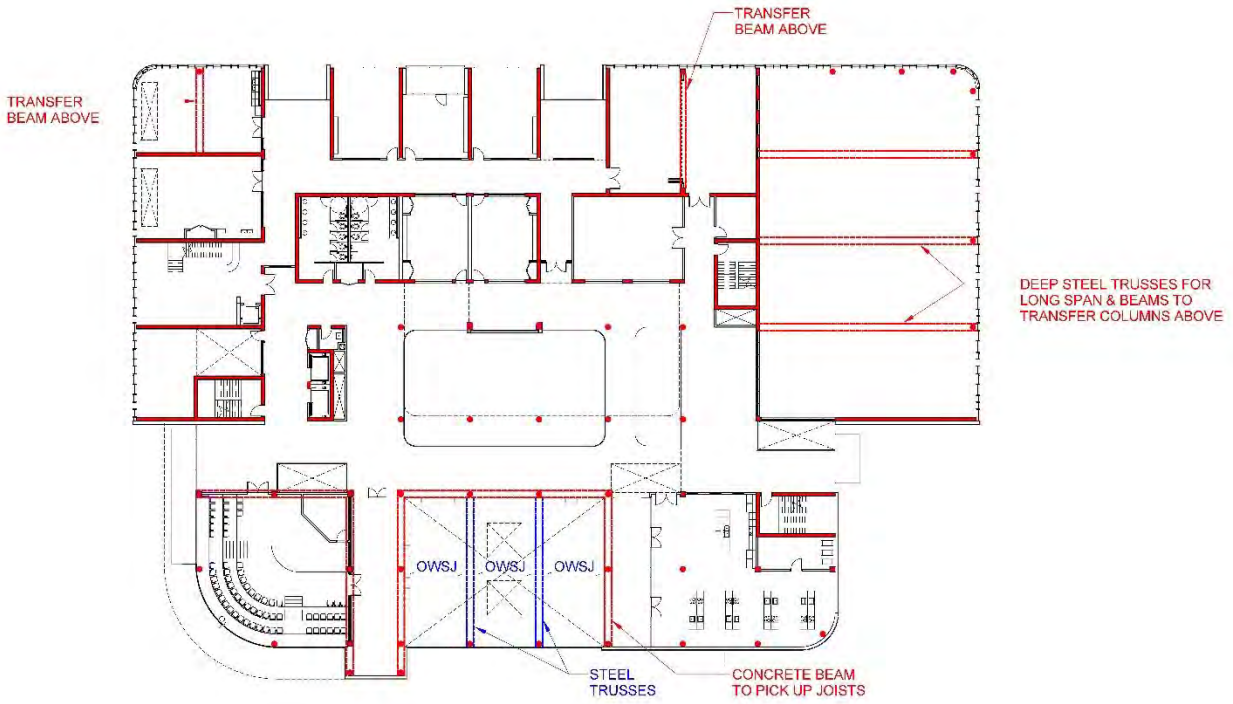


Figure 128: Structural - Floor 2

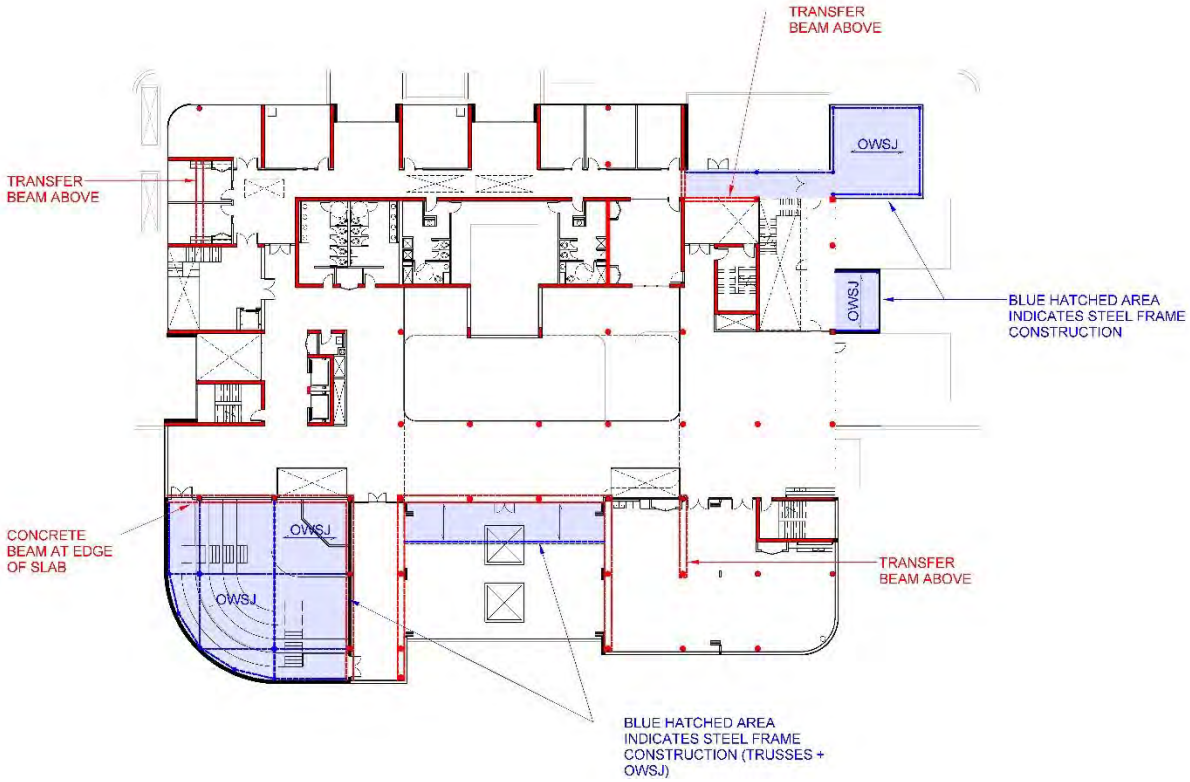


Figure 129: Structural - Floor 3

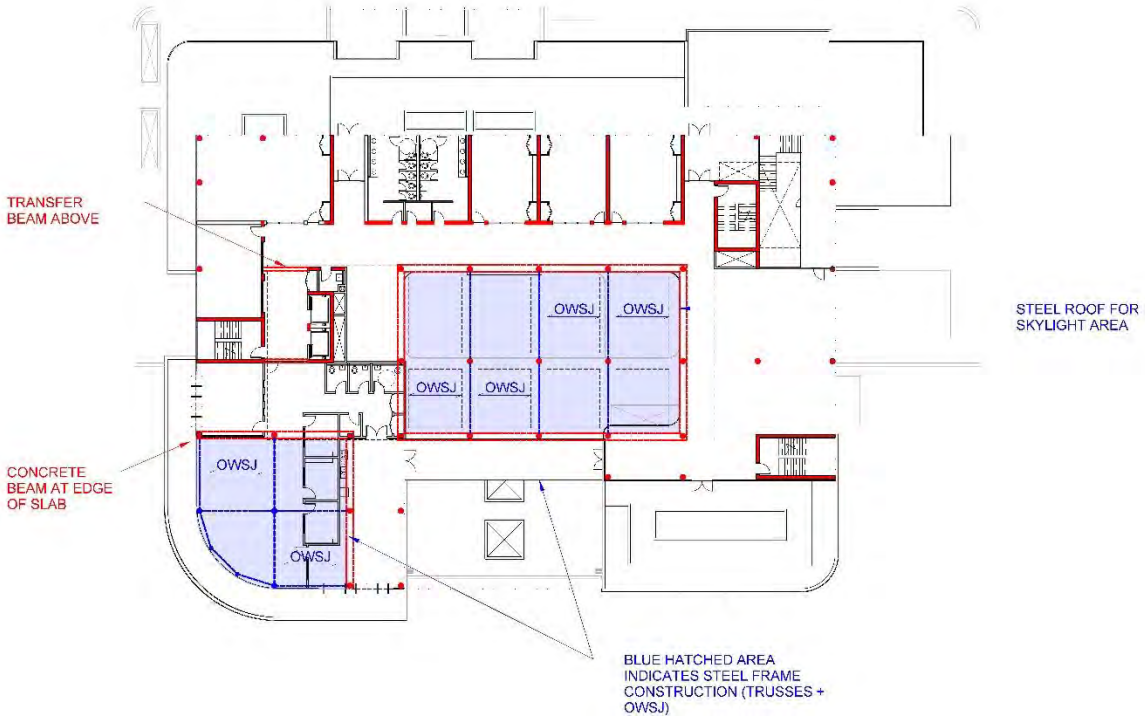


Figure 130: Structural - Floor 4

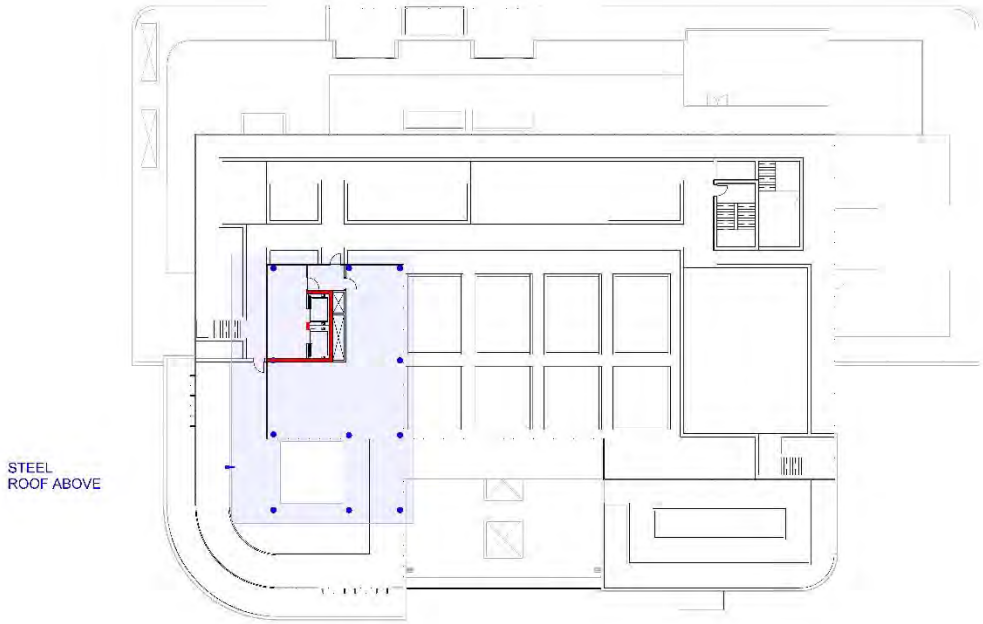


Figure 131: Structural - Mechanical Penthouse

7.9.2 - Mechanical

A preliminary review has been completed and coordinated with a mechanical consultant for this project. The proposed heating and cooling system is a 4-pipe fan coil system since it provides on-demand heating and cooling. This system maximizes the choice and thermal control for building occupants by allowing each room to be controlled individually while enhancing the overall thermal comfort for different building occupants by allowing both heating and cooling to be active simultaneously, unlike the 2-pipe fan coil systems. While the 4-pipe fan coil system is slightly more expensive up front, it maintains its longevity and requires less maintenance than a heat pump system requires over time. The 4-pipe system is also the quietest of the three system options, which is important in sensitive areas of the facility.

The 4-pipe fan coil system requires boilers for the heating plant which are located within the mechanical penthouse. A chiller, an outdoor cooling tower and an outdoor dry cooler are located outside on the west side of the mechanical penthouse for the cooling plant. This location is most appropriate to keep mechanical equipment away from occupied outdoor spaces and from learning spaces below. A landscaped green roof is used as a buffer between the outdoor mechanical equipment and the parapet to reduce visual impacts from the street level below. A separate boiler and holding tank for the domestic hot water, as well as all pumps and accessories for the equipment are also located in the mechanical penthouse. Alternatively, two gas fired on-demand water heater tanks can be used instead of the boilers and holding tanks if the domestic hot water load is low (to be determined during further design development).

In addition to the overall system, some of the finer details have been thought through for this preliminary design. Hydronic heating is provided at all entrance and exit vestibules to reduce heat loss and to provide consistent thermal comfort to building occupants during winter months. An exhaust shaft is located adjacent to Stair A (near the gymnasium), while an intake shaft is located adjacent to the elevators. Both are approximately 45 square feet in area. Another 20 square foot shaft is also located by the elevator core to provide a duct for pipe stacks to all levels. A janitor’s closet is also located in the central elevator core on all levels, each with an exhaust shaft. Additional shafts are provided for each of the stairs below grade for stair pressurization. All ventilation will be designed and sized as per ASHRAE 62.

The elevators in this building will be hydraulic elevators and designed as per load and speed recommendations provided by an elevator consultant. An elevator machine room, which houses all elevator control equipment, is located adjacent to the elevators on the P1 level. Cooling is provided in this room using a split A/C unit to keep the equipment at an appropriate temperature.

On the P1 level, a mechanical room is provided to house a fire pump and domestic booster pump along with incoming water meter assembly. Although the fire and booster pumps may not be required if the incoming city water pressure is high enough, I have provided enough space at this preliminary stage to accommodate the pumps in the main mechanical room as per recommendations received from my mechanical consultant. This room may need to be relocated through further design development and coordination once the location of the incoming municipal water source is determined in order to locate the room as close to the water source as possible. An emergency gas generator is also located in the lower level in a separate room.

Some of the active spaces require additional mechanical systems and equipment. A humidifier is required for physically active spaces such as the gymnasium and fitness centre. A separate heating and cooling system is provided for the indoor pool and will be designed as per my mechanical consultants recommendations using either a Seresco or Dectron unit which provides both heating and cooling on demand. All ventilation will be sized in accordance to ASHRAE 62 standards for pools.

The ventilation for all kitchenettes in multi-purpose rooms will be design in accordance with ASHRAE 62 standards for cooking spaces and dining areas. Both the teaching kitchen and café will have upgraded commercial-grade kitchen equipment therefore both of these kitchen exhaust systems will be designed as per HFPA 96 requirements. Additional coordination and design development to be conducted through the next stages of the project development.

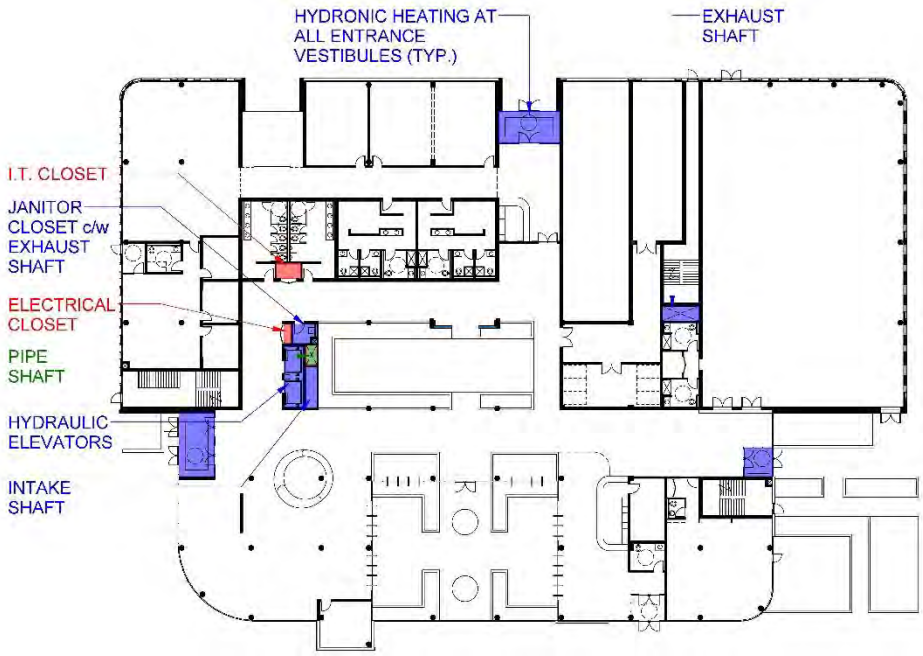


Figure 132: Mechanical + Electrical - Floor 1

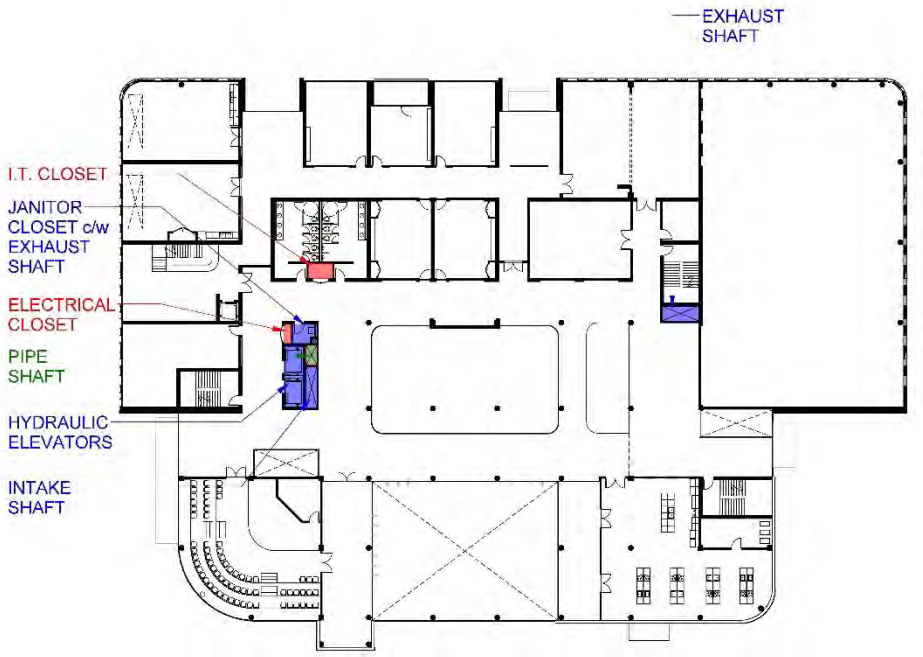


Figure 133: Mechanical + Electrical - Floor 2

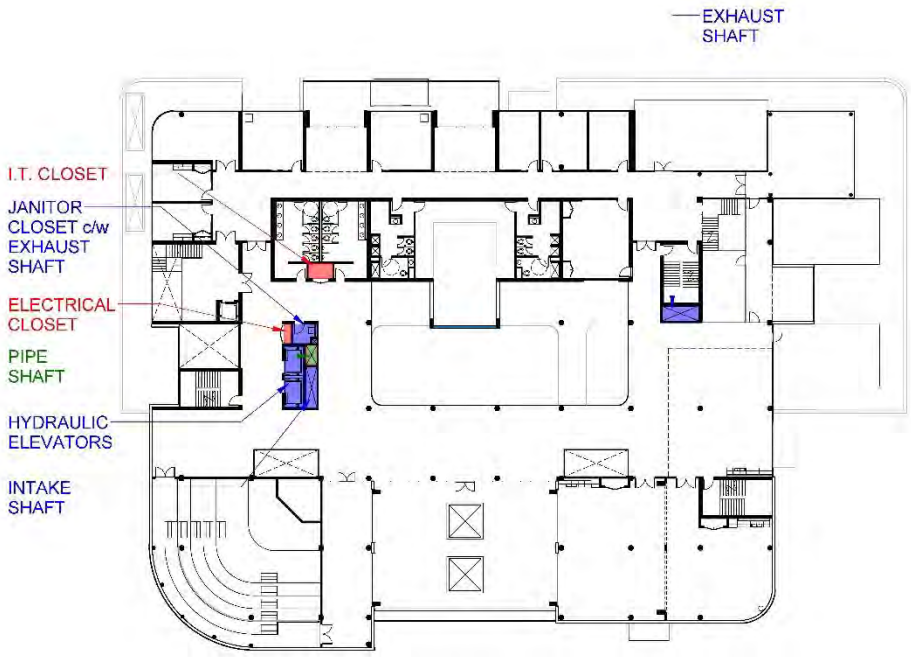


Figure 134: Mechanical + Electrical - Floor 3

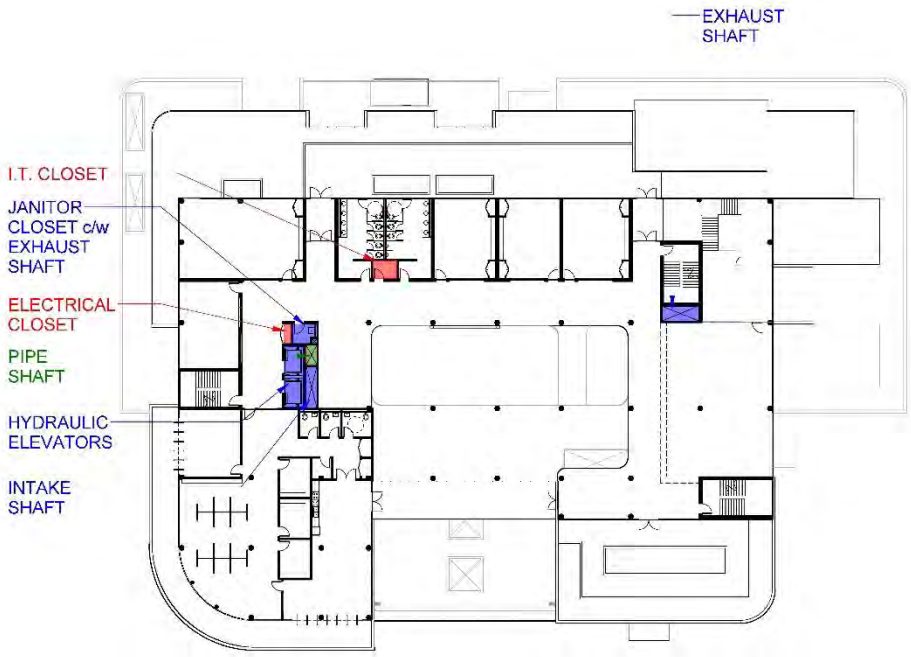


Figure 135: Mechanical + Electrical - Floor 4

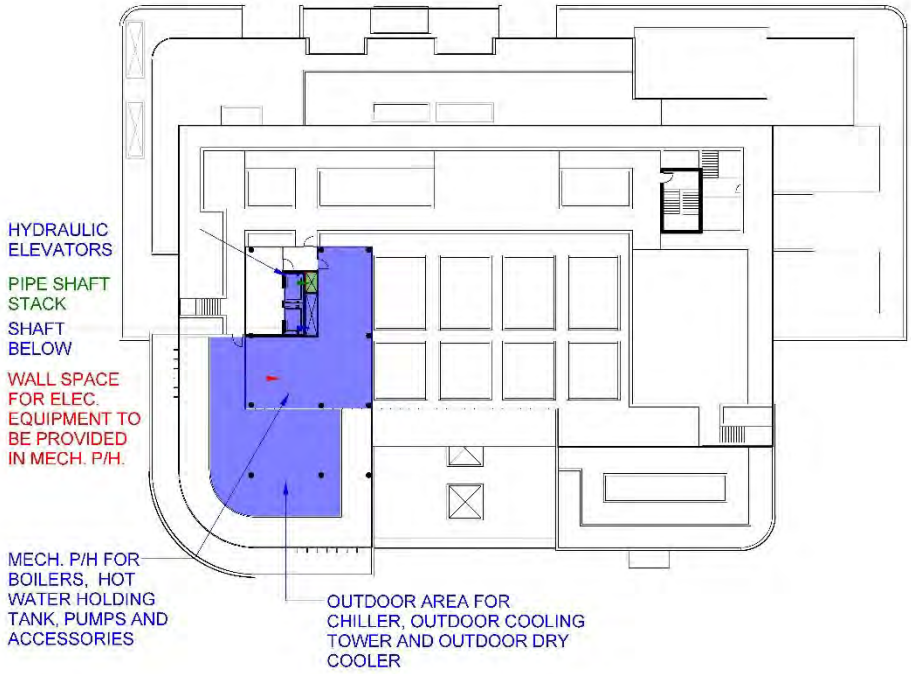


Figure 136: Mechanical + Electrical - Mechanical Penthouse

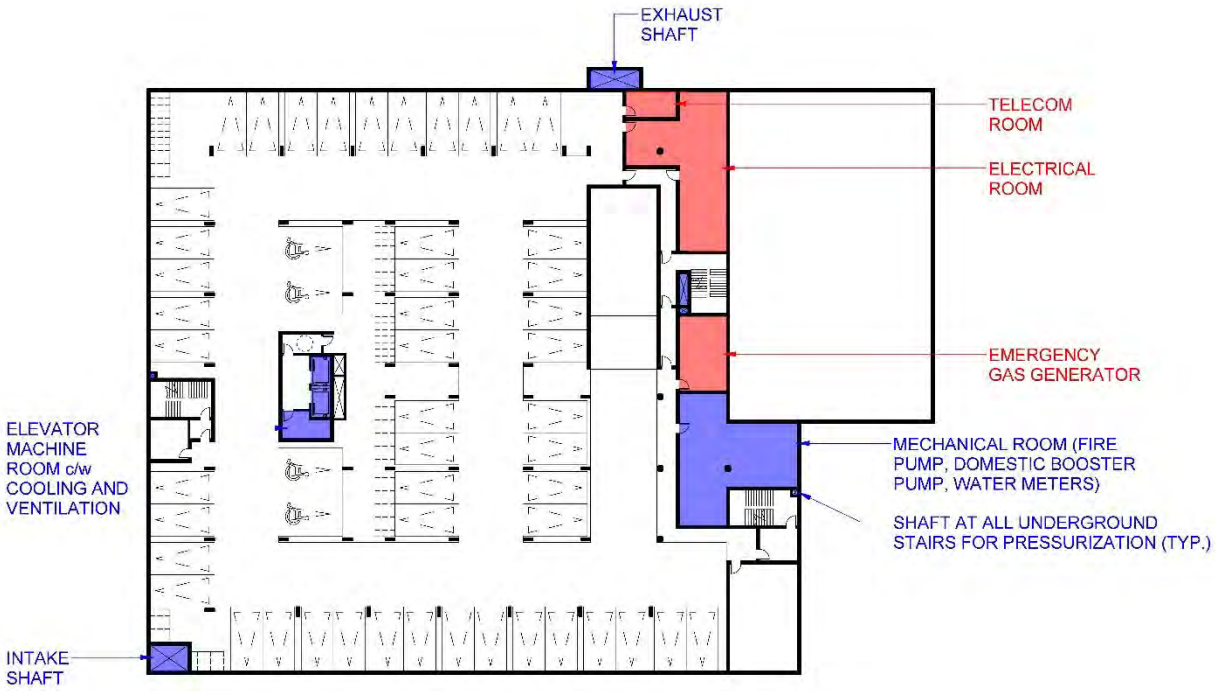


Figure 137: Mechanical + Electrical - U/G Level 1

7.9.3 - Electrical

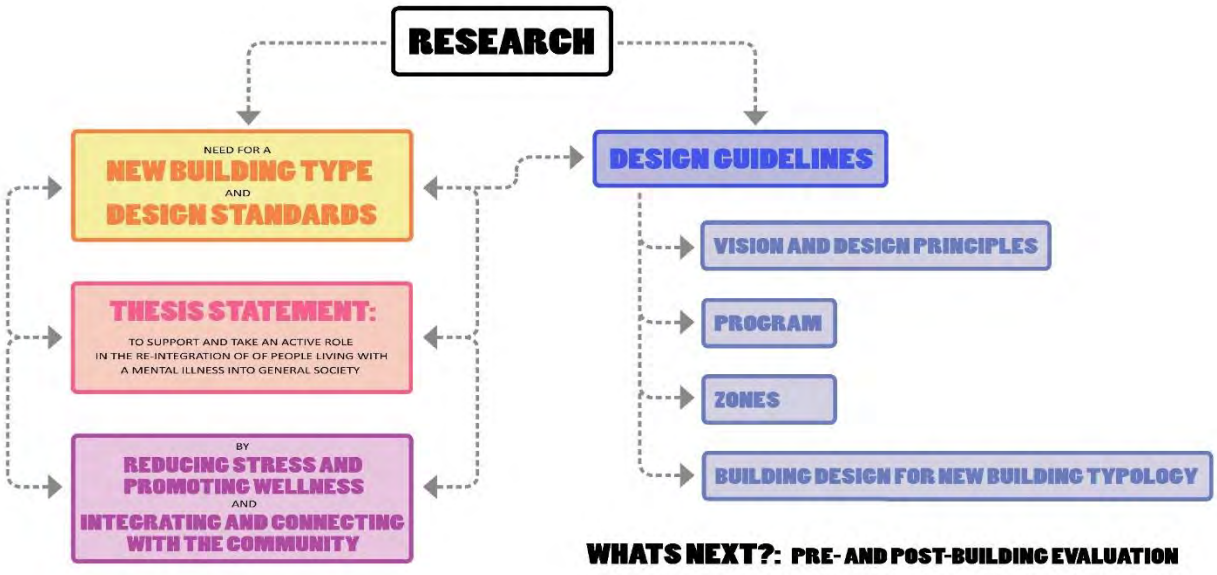
A preliminary review has been completed and coordinated with an electrical consultant for this project. Electrical and I.T. closets are provided on all floors. The main electrical room is located in P1 as well as a telecom room. The high voltage switchgear will be located adjacent to the incoming power source (to be determined during the next stages of design and coordination). Provided the source is on Mutual the switchgear will be accommodated in the main electrical room. If the power source is along Shuter then a 3m x 6m room will be provided along the north edge of the garage. Wall space for additional electrical equipment will be provided in the mechanical penthouse level. Exact equipment locations will be coordinated with mechanical equipment requirements during the next stages of design development.

7.9.4 - Ontario Building Code Summary

ITEM	ONTARIO BUILDING CODE MATRIX				OBC REFERENCE		
1	Project Description:			x New □ Addition □ Alteration	□ Part 11	x Part 3 2.1.1.	□ Part 9
			Change of Use □				
2	Major Occupancy(s) Group C	A2 (6,109.5 m2), D (750 m2), F3 (3,023m2)				3.1.2.1.(1)	
3	Building Area (m)²	Existing = 0 m²	New = 3,204 m²	Total = 3,204 m²		1.1.3.2	
4	Gross Area (m)²	Existing = 0 m²	New = 11,882.5 m²	Total = 11,882.5 m²		1.1.3.2	
5	Number of Stories	Above Grade = 4	Below Grade = 1			3.2.1.1 + 1.1.3.2	
6	Number of Streets/Fire Fighter Access: 3					3.2.2.10 + 3.2.5	
7	Building Classification: 3.2.2.24 (A2 up to 6 storeys, any area, sprinklered)					3.2.2.24	
8	Sprinkler System Proposed			x Entire building □ Basement only □ In lieu of roof rating □ Not required		3.2.2.20-83 3.2.1.5 3.2.2.17	
9	Standpipe Required			x Yes □ No		3.2.9	
10	Fire Alarm Required			x Yes □ No		3.2.4	
11	Water Service/Supply is Adequate			x Yes □ No		3.2.5.7.	
12	High Building			□ Yes x No		3.2.6	
13	Permitted Construction Actual Construction	□ Combustible □ Combustible		x Non-combustible x Non-combustible	□ Both □ Both	3.2.2.42	
14	Mezzanine(s) Area m : N/A					3.2.1.1.(3) - (6)	
15	Total Occupancy Load Based on:	□ m²/persons		x Design of building		3.1.17	
		Basement: 1st Floor: 2nd Floor: 3rd Floor: 4th Floor:	Occupancy = F3, Occupancy = A2/D, Occupancy = A2, Occupancy = A2, Occupancy = A2,	Load = 65 persons Load = 150/75 persons Load = 150 persons Load = 150 persons Load = 100 persons			
16	Barrier-free Design			x Yes	□ No (Explain)	3.8	
17	Hazardous Substances			□ Yes	x No		
18	Required Fire Resistance Rating (FRR)	Horizontal Assemblies FRR (Hours)		Listed Design No. or Description (SB-2)			
		Floors	1 Hour	200mm Poured Concrete		3.2.2.20-.83 & 3.2.1.4	
		Roof	1 Hour	200/300mm Poured Concrete			
		Mezzanine	N/A	N/A			
		FRR of Supporting Members		Listed Design No. Or Description (SB-2)			
		Floors	1 Hour	Poured Concrete		3.2.2.20-.83 & 3.2.1.4	
		Roof	1 Hour	Poured Concrete			
		Mezzanine	N/A	N/A			

Figure 138: Ontario Building Code Matrix

Conclusion



In summary, this project is not only about creating design guidelines and influencing the design of a new building type, but how to positively change the mentality around mental health facilities and our interaction with them. I have examined a number of strategies to determine the optimal environmental setting for those dealing with mental illnesses, as well as ways to integrate future community mental health facilities with their surrounding community.

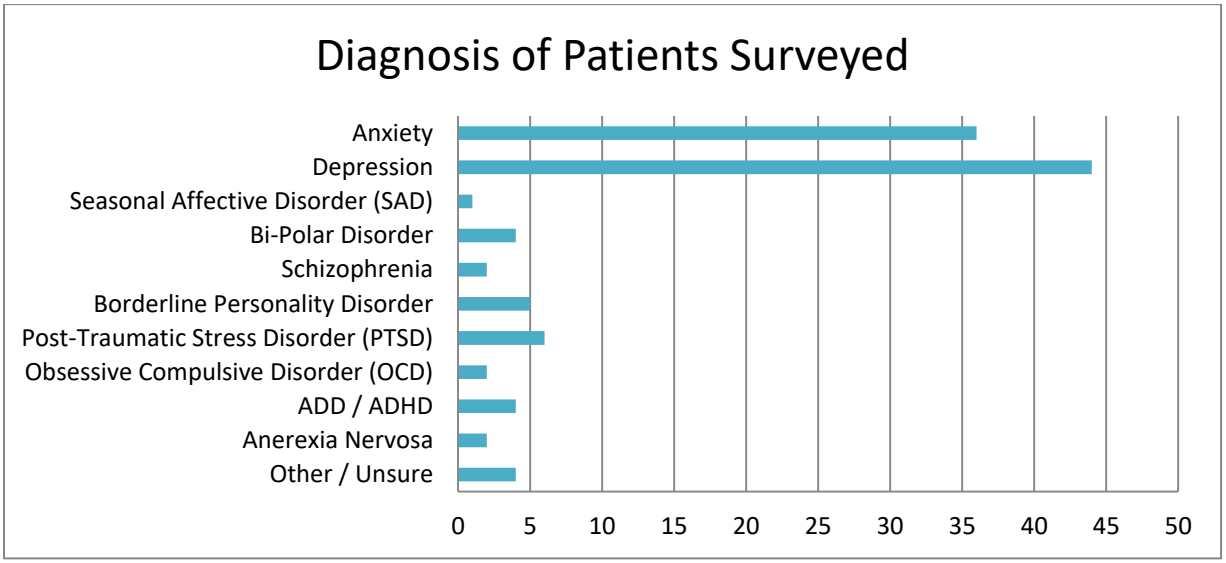
The Nightingale Collective provides a safe, holistic environment for clients to thrive during their recovery. It also serves as a stepping stone for clients transitioning out of in-patient facilities and back into the community, since continuity of care and support greatly improves rehabilitation outcomes. In addition, the facility can continue to be a familiar and comforting place for clients who have already completed their therapy, if they wish to continue to use the facilities for recreational and social activities. Staff and the community also benefit by having access to extensive programs and services that may not all be provided to their community in a traditional community centre. I am now applying much of my research on a daily basis to projects at work that are similar in nature, such as affordable housing, seniors developments and mixed-use developments with community services. I hope my guidelines will influence the design and overall thinking surrounding mental health facilities in the future.

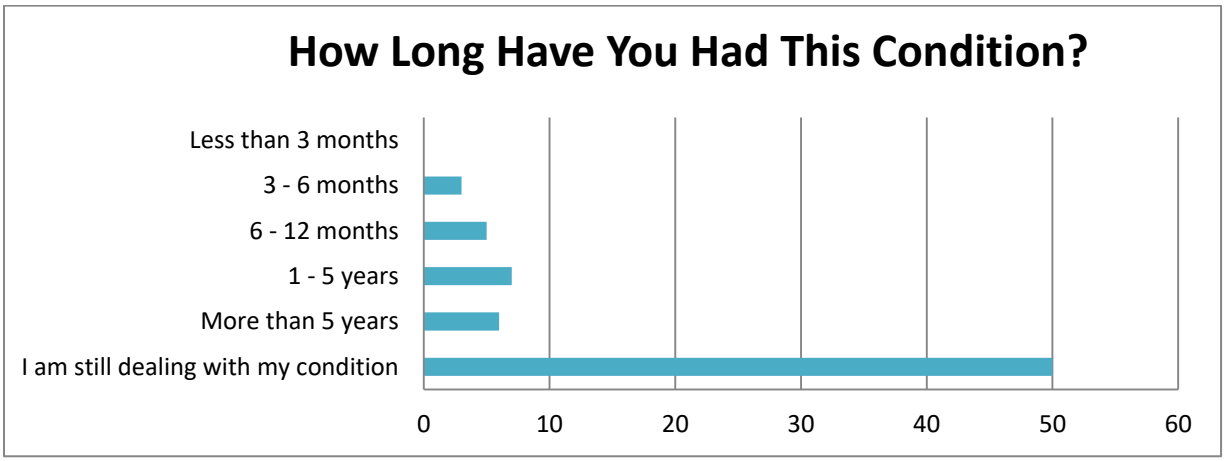
Appendices

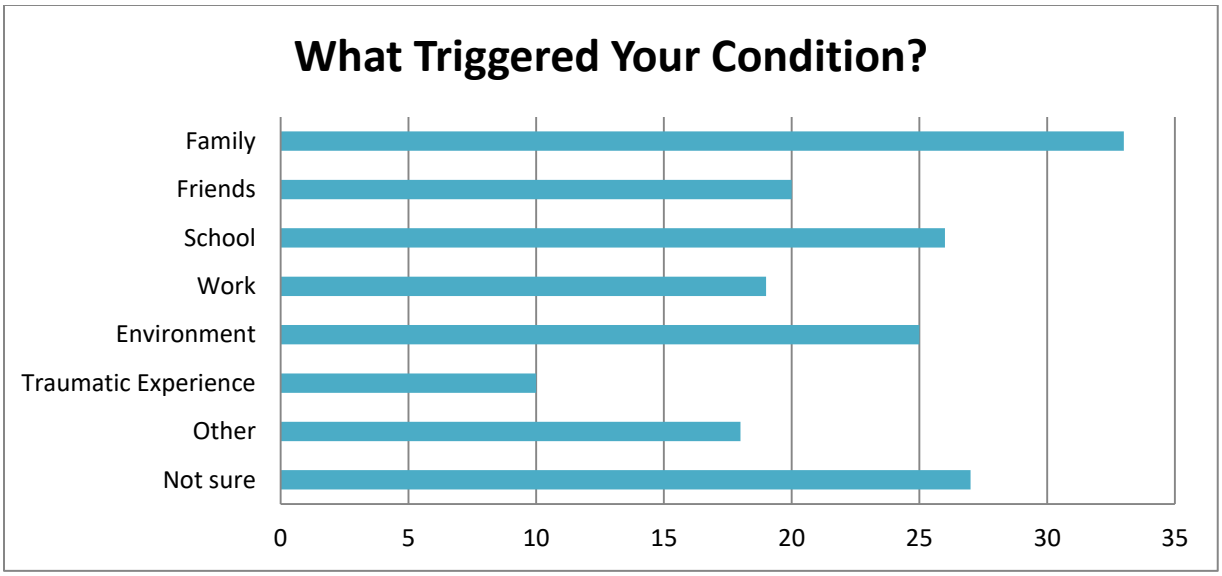
Appendix A: List of Figures

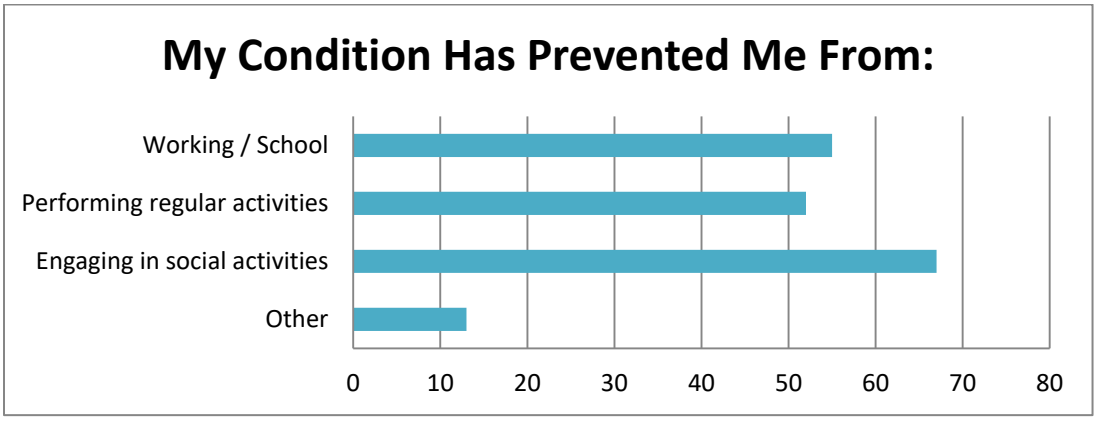
Appendix B: Survey Results

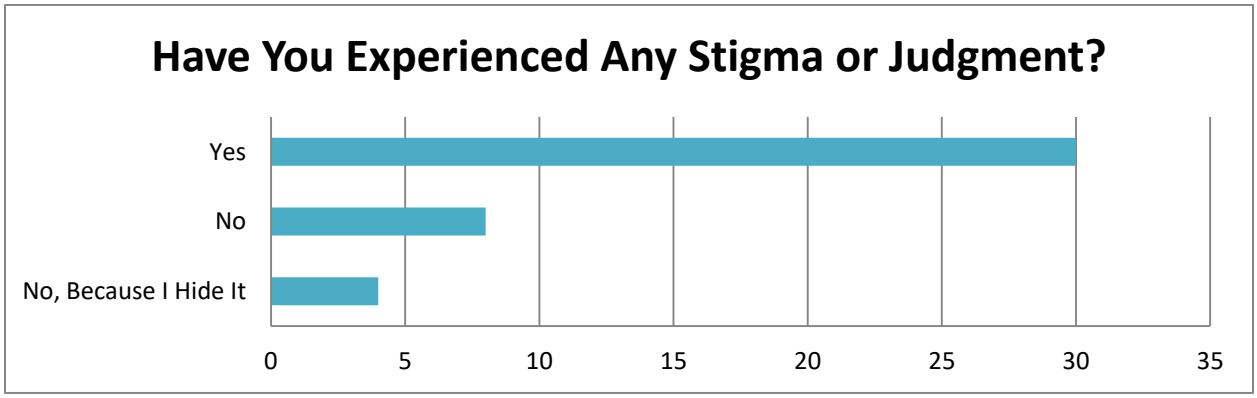
How can we design therapeutic environments if we don't understand the conditions we are attempting to alleviate? Engagement of patients and health care professionals in the design process enables a more thorough understanding of the complex issues within a mental health facility. During my research I found it difficult to directly interview patients due to confidentiality and protection of privacy. However, I felt the need to get some feedback from patients through surveys and interviews, as they are the end users of mental health facilities. I also surveyed a number of medical and design professionals to confirm some of my research and gain additional insight into the actual experiences of staff members and patients in various mental health facilities. Below is a summary of the information I received which will help me understand the needs of patients, clients and the staff members.

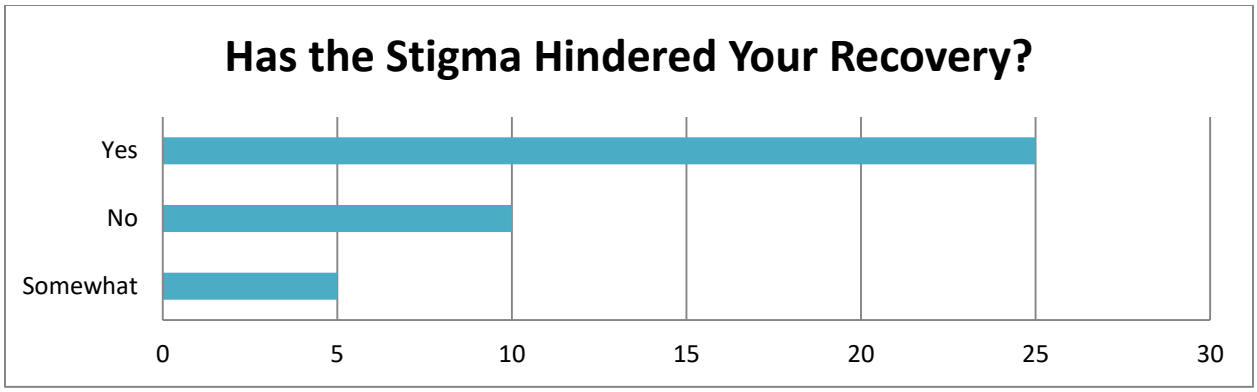


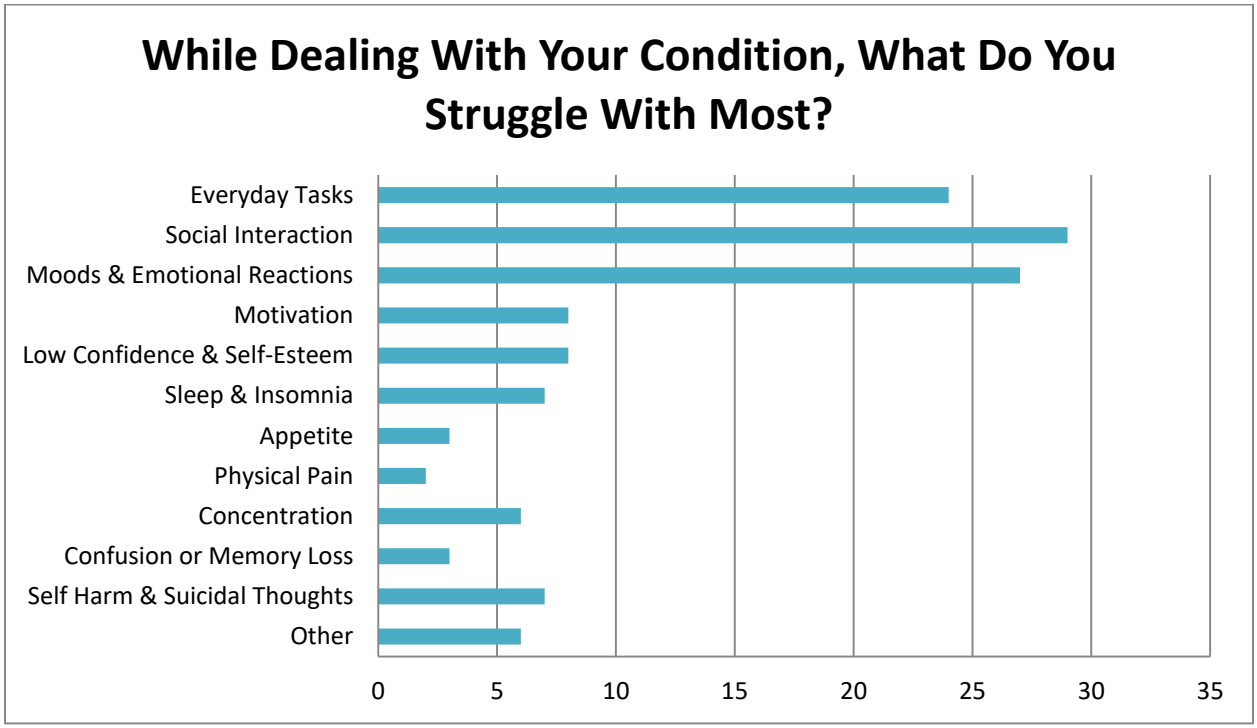


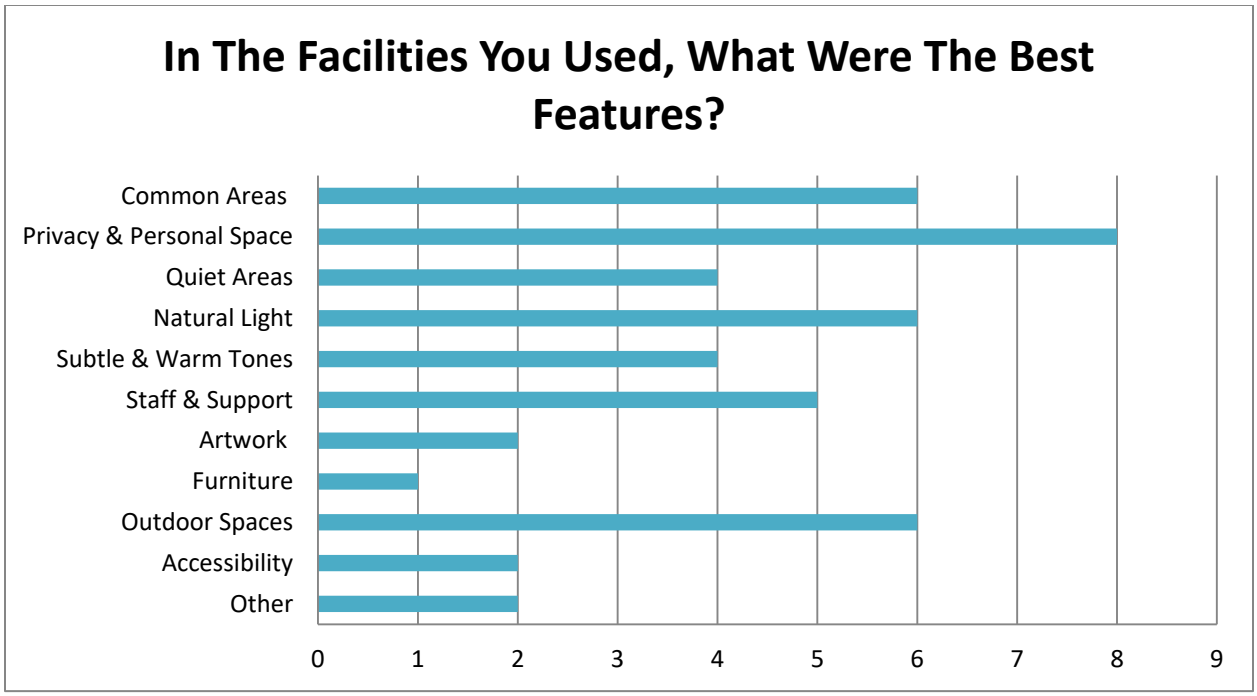

What Triggered Your Condition?
Family
Friends
School
Work
Environment
Traumatic Experience
Other
Not sure
0
5
10
15
20
25
30
35

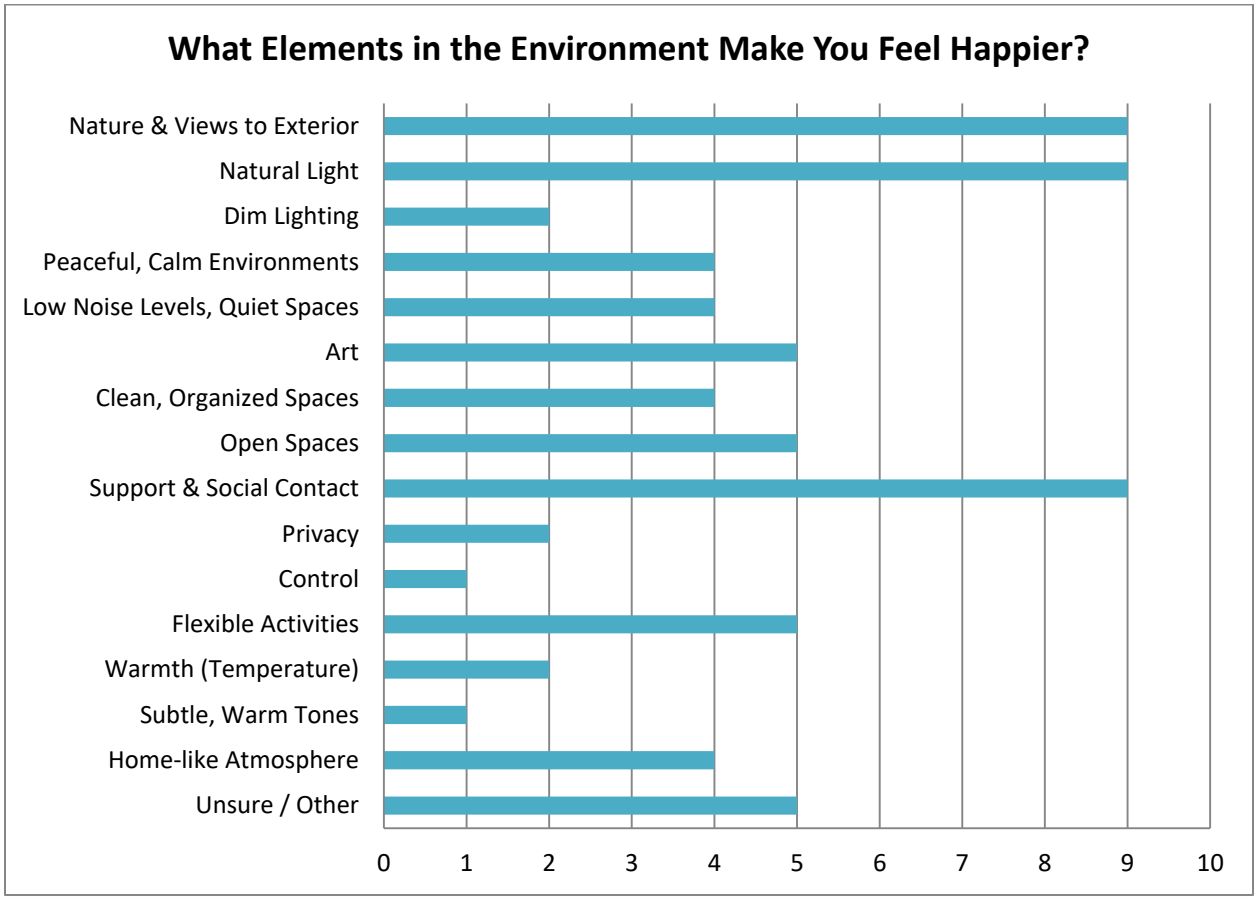

My Condition Has Prevented Me From:
Working / School
Performing regular activities
Engaging in social activities
Other
0
10
20
30
40
50
60
70
80

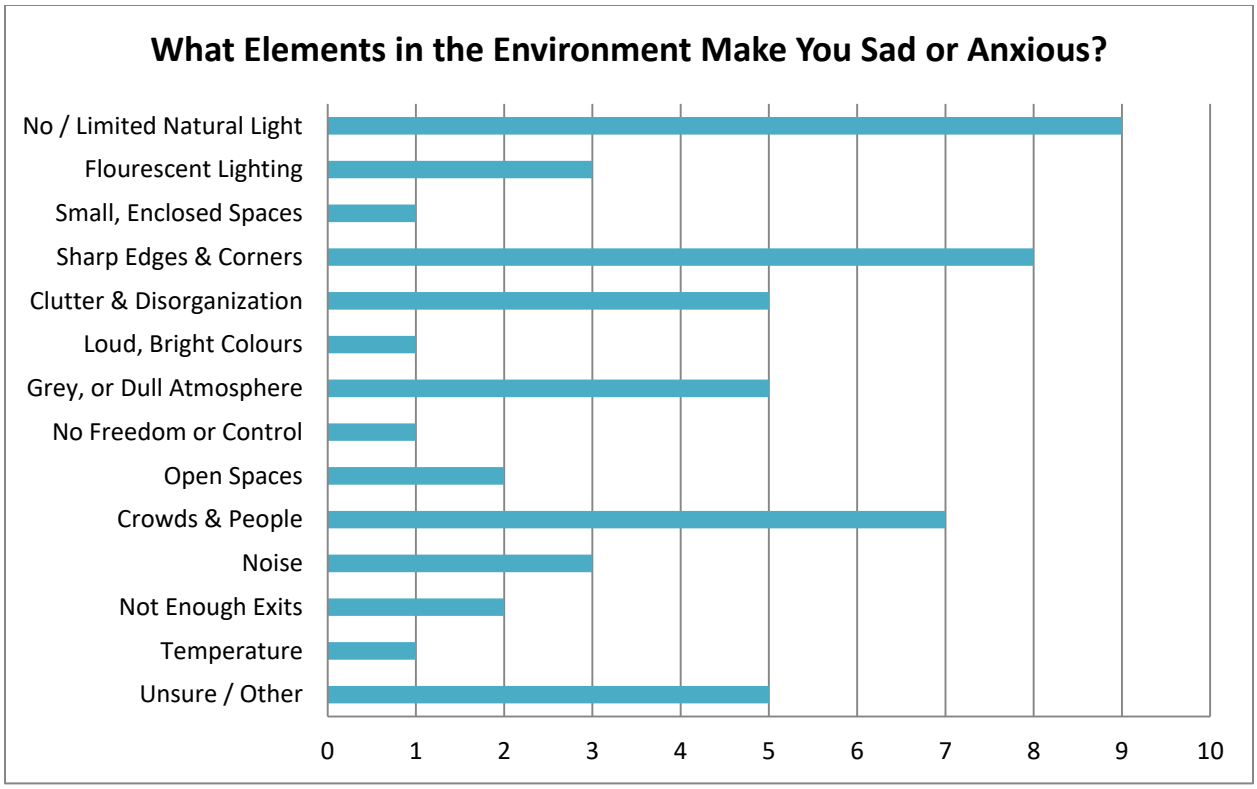

Have You Experienced Any Stigma or Judgment?
Yes
No
No, Because I Hide It
0
5
10
15
20
25
30
35


Has the Stigma Hindered Your Recovery?
Yes
No
Somewhat
0
5
10
15
20
25
30


While Dealing With Your Condition, What Do You Struggle With Most?
Everyday Tasks
Social Interaction
Moods & Emotional Reactions
Motivation
Low Confidence & Self-Esteem
Sleep & Insomnia
Appetite
Physical Pain
Concentration
Confusion or Memory Loss
Self Harm & Suicidal Thoughts
Other
0
5
10
15
20
25
30
35


In The Facilities You Used, What Were The Best Features?
Common Areas
Privacy & Personal Space
Quiet Areas
Natural Light
Subtle & Warm Tones
Staff & Support
Artwork
Furniture
Outdoor Spaces
Accessibility
Other
0
1
2
3
4
5
6
7
8
9


What Elements in the Environment Make You Feel Happier?
Nature & Views to Exterior
Natural Light
Dim Lighting
Peaceful, Calm Environments
Low Noise Levels, Quiet Spaces
Art
Clean, Organized Spaces
Open Spaces
Support & Social Contact
Privacy
Control
Flexible Activities
Warmth (Temperature)
Subtle, Warm Tones
Home-like Atmosphere
Unsure / Other
0
1
2
3
4
5
6
7
8
9
10



Results of Patient Survey:

As noted in my research, anxiety and depression topped the list of the most common mental illnesses. It is also noted that many who had either disorder are also dealing with one or more additional illnesses. This is one of the reasons why it is difficult to quantify exactly what individuals of each specific disorder might be experiencing; it would not be accurate to generalize conclusions specific to each disorder. Rather, concerns should be assessed and combined into an overview.

It was also noted that many people struggle with work, school, sleep, social situations and daily activities due to their conditions. Tasks that involve responsibility or social efforts top the list, and patients also found it difficult to control their moods and emotional reactions. Many also lack motivation and confidence. A number of factors appear to trigger all disorders, including family, friends, school, work, environment, stress, and traumatic experience. A number of respondents were also unsure of the exact cause of their illness.

When entering a facility patients experienced a wide array of emotions. Some felt institutionalized, uninspired, uneasy, overwhelmed, lonely, anxious, and even terrified, while others felt relaxed, calm, safe, and a sense of belonging. From the responses received, it appears patients have mixed feelings about the treatment they experienced. Those that had negative experiences noted mis-medication, lack of communication, lack of control, and inhumane treatment as issues experienced. Those that had positive experiences praised the support they received from doctors, other staff members, and other patients within the facilities. In addition to typical treatments such as medication and therapy, many patients found distractions such as social settings, physical fitness, breathing, yoga and meditation helpful during their recovery. Although most patients like to be alone when they are experiencing depression, many noted that having some social contact can be beneficial even when they don't feel like it.

In terms of the design of facilities, many appreciated abundant natural light, information and ease of access, outdoor spaces, privacy and personal space, and common spaces such as main lobbies and quiet areas in subtle, warm, and calming tones. In contrast, patients noted that limited or no natural light, small, enclosed or disorganized spaces, crowds, and lack of space made them feel sad or anxious. It was also noted that patients expressed they are more sensitive to bright and poor artificial lighting, darkness, smells, loud noises, and background voices. When asked about their ideal setting, many of the respondents described a place in their house, somewhere with gardens or nature such as a beach, and others were most comfortable in private solitude.

Survey Responses from Medical Perspective:

I also interviewed a few medical professionals to understand their perspective in regards to patients with mental illness and their perception of space, as well as their preferences in health care settings. It was observed that negative environmental stressors have the potential to strongly influence perception in a negative way, and the way patients interpret their environment is often distorted or skewed towards a negative way when they are dealing with a mental illness. These negative perceptions can, in turn, trigger negative emotions. In terms of mental illness, access to care, stigma, and acceptance are all current and important factors that need to be addressed with our current health care systems.

Acceptance, in addition to understanding and validation, are needs of patients in order to encourage recovery.

Medical professionals noted stress as a major risk factor for development of many non-psychotic mental disorders such as depression and anxiety disorders. Other aspects of the environment that effect mental health include:

- Pollution (increases anxiety + health issues, particularly respiratory);
- Noise (stressor);
- Availability and access to green spaces/parks and recreational centers (affects quality of life, exposure to sun and vitamin D;
- Lighting;
- Ceiling height;
- Safety (increases anxiety); and
- Opportunities to exercise (all which affect mental health)

Design solutions that have been proven to reduce levels of stress and anxiety include:

- Reducing exposure to stressful stimuli
- Exposure to music
- Exposure to pleasant aromas (especially those that evoke positive memories)

In addition, social programs can be beneficial to patients. Medical professionals believe that design interventions that are tailored to the individual, and that target the hypothesized cause of the disorder (neurotransmitter dysregulation needs medication; distorted thoughts needs therapy, etc.), can be most impactful to those dealing with mental disorders. Programs that include and facilitate involvement of caregivers can aid in encouraging social activity, while a combination of education and behaviour or attitude changes can attempt to create a positive impact in the fight against stigmatization.

Survey Responses from a Design Perspective:

In addition to medical professionals, I interviewed a number of design professionals who specialize in healthcare or healing-focused settings to determine what solutions they might have applied to healthcare settings that emphasize patient-centered care.

It has been noted several times that the environment can alleviate stress by integrating the built environment with nature, using calming colours, implementing positive distractions such as art and music, and social interaction. Removing elements that feel institutional, reducing noise, eliminating poor lighting (glare, insufficient lighting, or direct exposure to the lighting source), negative odours, and ensuring the olfactory environment is neutral or lightly positive can all aid in the reduction of stress. Clear wayfinding elements also alleviate stress in large, complex buildings.

According to respondents, there are a number of ways in which a place can have positive emotional influences. A non-threatening environment that is comfortable, nurturing, and provides choice and control is likely to help someone feel comfortable and open up. Smaller spaces where patients don't feel too exposed are better for intimate conversations, however providing a variety of interactive spaces from public to private, and quiet to engaging should also be incorporated to cater to a wide range of emotions. Development of edges, use of patterns, and use of hierarchy can all be used to provide breakout areas within larger spaces to provide additional options for patients. Finishes such as soft furniture, artwork of nature, and soft lighting might encourage a more relaxed feeling or mood, while harder furniture, abstract art, and finishes with sharp angular edges might encourage a sharper or stronger emotional expression. Similar principles can be applied in attempt to influence the way a person perceives information in a space. Design that responds to a broad array of senses and physical interactions can allow patients to experience a space in multiple ways. In addition, removal of non-essential distractions can allow for patients to focus on the information provided.

In mental health facilities, it is expected that patients may experience a variety of moods throughout their stay or visit. Many people dealing with depression or stress may become more introverted than usual; they want to close themselves off from the world which contrasts with the majority of the built environment which is often ideal for extroverts. To accommodate introverts, quiet nooks, and breakout spaces along the edges of spaces are ideal for those who may feel intimidated by

larger spaces. Providing elements of flexibility also allows occupants to feel more in control and provides a setting that responds to different activities and communication styles of occupants.

According to design professionals, particular elements of the building environment are more impactful for those dealing with mental disorders such as:

- Light
- Sounds
- Connectivity and “knowing where you are in the world”
- Wayfinding, landmarks
- “Normalized” spaces that are non- threatening and safe
- Choice and options for patients experiencing a variety of moods and feelings

Appendix C: Case Studies

Case Study 1 - Bridgepoint Hospital:

Figure 139: View of Bridgepoint Active Healthcare from Riverdale Park[178]

Project Details:

Location:	Toronto, Ontario, Canada
Project Size:	680,000sf (10 storeys, 472 beds)
Completion:	2013
Project Type:	Health Care

[178] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.

Bridgepoint Health has a rich, 150-year history and is a significant landmark within Toronto's Riverdale community. Its role has evolved considerably from being one of the first public hospitals in Toronto (the House of Refuge) established in 1860,[179] to its current state, Bridgepoint Health, which aims to be Canada's leader in complex care and rehabilitation. It is the largest health care facility of its kind in Canada and desires to be an organization that is dedicated to "changing the world" for people living with complex chronic diseases and disabilities.[180] The project includes the conversion of the old Don Jail to Bridgepoint administration offices, demolition of the existing Bridgepoint Hospital, and new landscaping and roadways to create new connections with its surrounding context.[181] The intention of the project is to provide increased ambulatory space for outpatient and community programming in a setting that defines the "salutogenic approach to healthcare."[182]

Figure 140: Site and Context of Bridgepoint[183]

"While architects make space functional, the true power of good design is realized when space inspires and empowers people." [184]

[179] Angela Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.
[180] Urban Toronto, "Bridgepoint Hospital,"2015.
[181] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.
[182] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[183] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[184] Harbourfront Centre, "Bridgepoint Active Healthcare: The Reinvention of a Hospital," 2015.

Bridgepoint Health believes that design can have restorative powers, and aims to create a "campus of care," integrating patient care, research, and teaching in the treatment of complex chronic diseases and disabilities. Several studies and interviews were conducted to determine the needs of the patients and staff in the new facility, which concluded with the following design recommendations:

- Patients need a view of their own with a direct site line to the outdoors – whether private or semi-private have an un-interrupted view regardless of whether the privacy drapes are drawn.
- Quality outdoor spaces, not quantity – the spaces require animation to attract users such as furniture to encourage patients and visitors to gather and some element of hospital or social programming.
- Social spaces need to be strategically located by hubs of activity – those that demonstrate higher volumes of usage are the cafeteria and seating located at the main entrance of the hospital

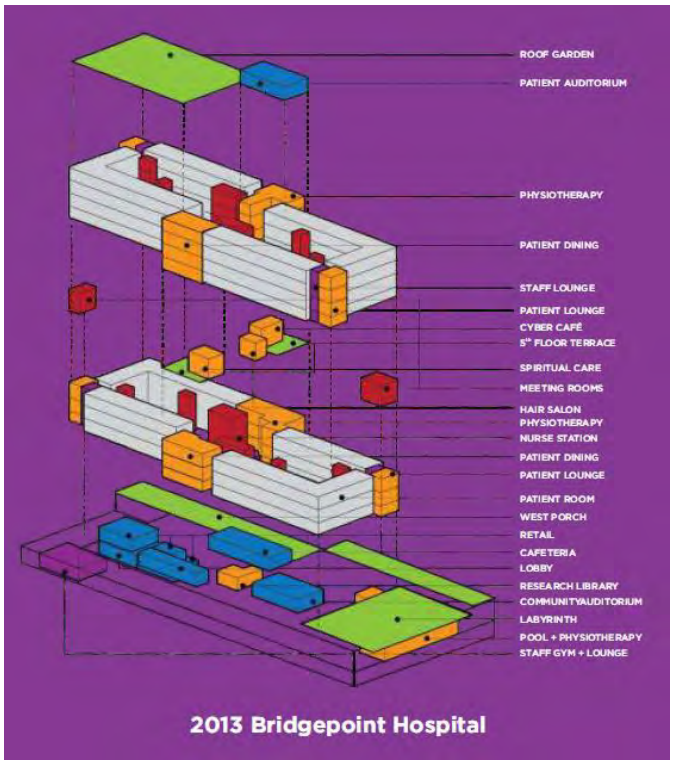


Figure 141: The New Bridgepoint Hospital[185]

[185] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.

Each element of the new Bridgepoint Hospital was planned with a specific purpose in mind – to create an environment that best supports patient living. Some of the principles that helped shape the design of the building and promote patient wellness, include: [186]

- Maximizing natural daylight and views
- Using natural materials and elements that support individuals as they progress through a gradual rehabilitation process
- Designing social and dining spaces that encourage interaction and good nutrition and promote self-efficacy
- Optimizing the therapeutic benefits of access to nature and landscape
- Air quality, wayfinding, and creating a sense of space and comfort

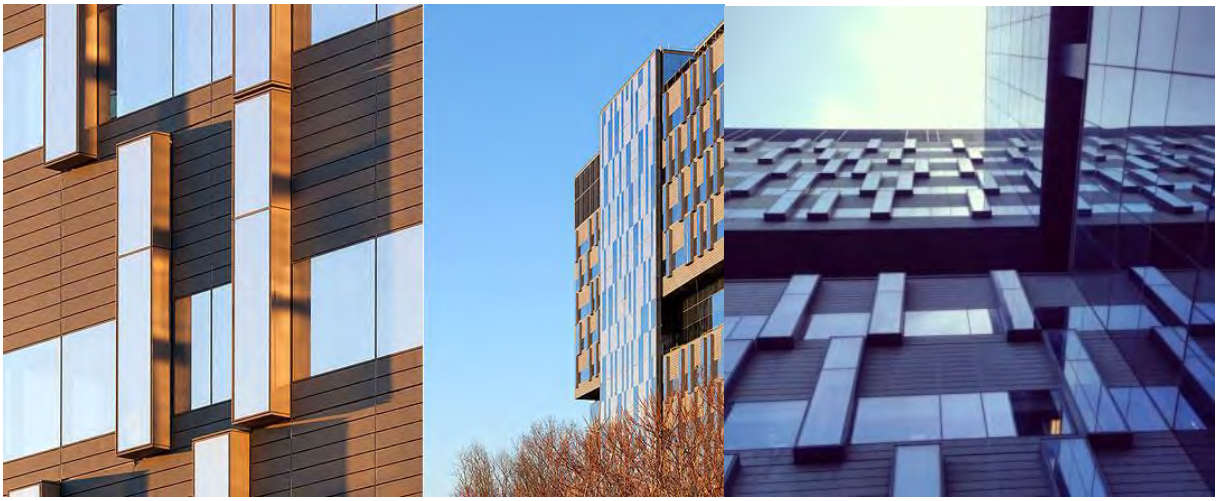


Figure 142: Windows at Bridgepoint[187]

"This hospital leads new thinking about the role of hospitals, how they're designed and the features that will aid the rehabilitative and restorative processes that inspire health and wellness," says Marian Walsh, president and chief executive officer of Bridgepoint Health.[188]

Every design detail attempts to bring the community into the hospital, maximize connections with the city, and connections with nature to optimize healing; all of which are understood to contribute

[186] Bridgepoint Active Healthcare, "Bridgepoint Design," 2015.
[187] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[188] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.

to improved patient outcomes. Each patient room has floor-to-ceiling windows with views of the city skyline to the west, Riverdale neighbourhood to the east, views of Lake Ontario to the south, and Riverdale Park to the north. The vertical orientation of the windows symbolically represents patients getting back on their feet and into their communities.

Figure 143: Typical Patient Room, Bridgepoint[189]

Although the patient rooms provide ample views and natural light, the facility appears to fall short in some of the public areas. When exiting their rooms, patients are immediately reminded they are in an institutional environment once they step into the typical hallways. There is nothing innovative about the circulation areas of the typical floors; the layout is familiar to a traditional hospital environment and the corridors offer no connections to the exterior. There are no lounges easily accessible on each floor, which discourages patients from interacting with their neighbours. However, other communal areas – accessible on other floors – offer a variety of social settings for patients to thrive. From dining rooms where patients will take their meals, to an Internet café, spiritual room, rooftop garden, visitor lounges, outside terraces, and hairdressing services – each space has been designed to get patients out of their rooms and motivated to manage their illnesses to return to their communities.[190]

[189] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[190] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.

Figure 144: Indoor pool at Bridgepoint with views to exterior[191]

> *"The role of family members and other visitors, and the whole social environment for patients is hugely important,"* explains Colucci, *"They need spaces that are conducive to a return to wellness.*[192]

The campus of wellness was designed to inspire health and innovation, support healing, and act as a welcoming, accessible focal point not only for patients, but for the benefit of staff and the community as well.[193] Decentralized nurses' stations are located on every floor, and the facility included a number of staff amenities such as a lounge, fitness centre, clinical training labs, and educational resources. The community is drawn into the building by visitor-friendly features, such as the grand entrance that leads to the main floor lobby with feature glass walls, food concessions, retail outlets, learning centres, office space, an auditorium, and an outdoor terrace with steps to parkland. [194]

[191] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[192] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.
[193] Bridgepoint Active Healthcare, "Bridgepoint Design," 2015.
[194] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.

Figure 145: Roof terrace at Bridgepoint[195]

Amenities, transportation infrastructure, and landscape as well as generous access to communication, information, and entertainment media have all been incorporated to encourage visitors, while interior and exterior gathering spots encourage visitor-patient interaction. Visitors can wander through Bridgepoint's gardens and walkways where interpretive displays will communicate the history and significance of the site. I have biked around the property a number of times and there are several interesting outdoor space to explore around the grounds. Along the west face of the building the trail system connects to a stair which provides access to a terrace overlooking the city. When ascending the stairs, there are a number of sculptures of people in various formations to signify movement and life. At the top of the stair is a large, covered terrace with tables and chairs which seems peaceful however no one was using the space. A green roof provides access to the outdoors on the upper levels of the hospital, and other outdoor landscaping features are sized for wheelchairs to promote mobilization.

[195] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.

Figure 146: The Labyrinth at Bridgepoint[196]

"That integration with the outdoors is critical," says Jane Merkley, vice-president of programs, services and professional affairs, and chief nurse executive for Bridgepoint Health. *"Many of our patients have eight or nine chronic health issues. For months they've been in acute-care hospitals and therefore have an illness focus. We want to take away the sense that the hospital is an end destination for them."*[197]

[196] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[197] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.

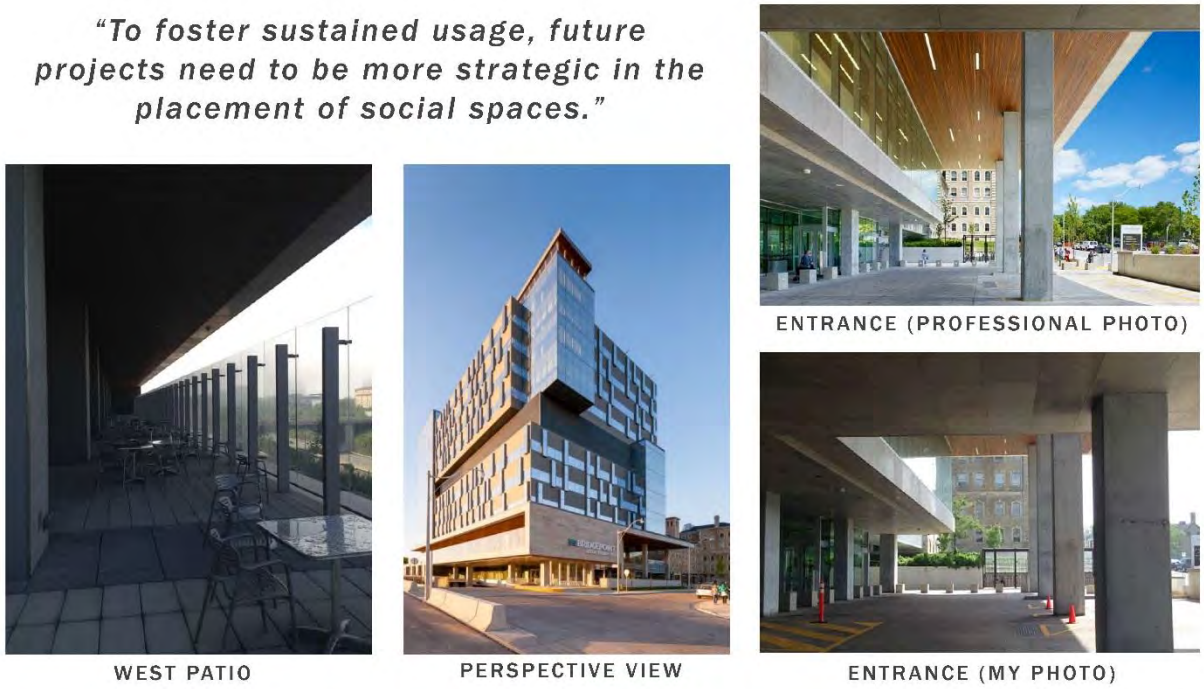


Figure 147: Various images of Bridgepoint[198]

I appreciate the thought that was put into these spaces in particular; however other areas such as the building entrance do not emanate the same feelings. Each time I arrived at the facility there were a number of patients and staff members smoking outside the main entrance, however there is no seating area in this location. In conclusion, once the urban park is open there will be several great outdoor spaces to choose from. The building connects to the community and with nature in unexpected ways, however, the entrance could be improved with more landscaping and seating areas, and typical floors could be improved by adding connections to the exterior and allowing natural light to permeate the core of the building. A 20-metre diameter public labyrinth – based on the medieval Chartres labyrinth near Paris – is sized for wheelchairs and promotes mobilization, meditation, and positive mental health,[199] however in the post-occupancy evaluation it was reported to be underutilized.

[198] Diamond Schmitt Architects, "Bridgepoint Active Healthcare," 2015.
[199] Kryhul, "Toronto's Bridgepoint Hospital Weaves Healing into its Design," 2012.

Case Study 2 - Ellsinore Psychiatric Clinic:

Figure 148: Aerial view of Ellsinore Psychiatric Hospital[200]

Project Details:

Location:	Helsingør, Denmark
Project Size:	6,000 m2
Completion:	2005
Project Type:	Psychiatric Hospital

[200] JDS Architects, "Helsingor Psychiatric Hospital," 2015.

Figure 149: Aerial view of Ellsinore Psychiatric Hospital[201]

In an attempt to redefine the traditional hospital typology, BIG + JDS Architects did extensive research during the design development of Ellsinore Psychiatric Clinic. The conversations did not give any clear answers as to what the hospital should be like, but rather, they pointed out several paradoxes and ambiguities that were incorporated into the project by transforming them into conflicting qualities of the program – to be AND not to be a psychiatric hospital. Paradoxes considered include:

Decentralized/Centralized: The psychiatric hospital is organized to effectively and rationally minimize walking distances for patients, while also providing individual sections with a maximum of autonomy and intimate spaces where the users can feel themselves almost at home.

Freedom/Control: Part of the hospital contains observed treatment areas where patients for the good of self-protection and their surroundings will have limited freedom to move, though without feeling claustrophobically trapped.

[201] JDS Architects, "Helsingor Psychiatric Hospital," 2015.

Openness/Closure: The day-and-night sections are spatially open, to allow overall views to the staff, without making patients feel observed or under surveillance.

Privacy/Sociability: The psychiatric hospital offers rooms for socializing and spontaneous meetings between people, as well as opportunities for seclusion and contemplation.[202]

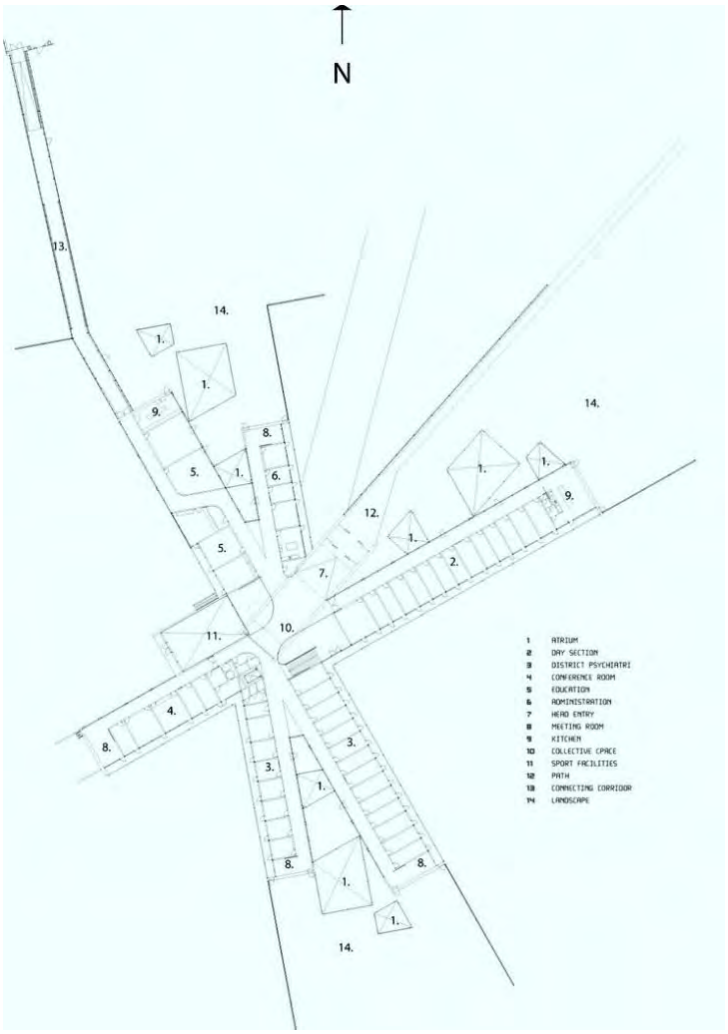


Figure 150: Floor plan of Ellsinore Psychiatric Hospital[203]

[202] Architizer, "Psychiatric Hospital Helsingor," 2015.
[203] JDS Architects, "Helsingor Psychiatric Hospital," 2015.

The facility not only wanted to experience nature, but it wanted to be a part of it. Grounded on two different levels, the building literally grows into the green and hilly context. The two-storey structure merges with the landscape as a green lawn slips over the roof, making the clinic a natural environment for the cure of mental illness. Half disguised in nature, the clinic thus avoids spoiling the view from the adjacent existing hospital and at the same time provides its users with a multitude of experiences of the lake and woods.

Figure 151: Common spaces wrap around a courtyard at Ellsinore Psychiatric Hospital[204]

Functionally, the psychiatric clinic is organized into two main programs: a program for living (patient bedrooms) on the ground floor, and a program for treatment (therapeutic facilities) on the upper level. By using a clover structure each patient's room is oriented toward its own part of the landscape - two sets of rooms facing the lake, and one set of rooms facing the surrounding hills. Between the functions emerges a collective space that is embraced by offices and bed units, and populated by small patios. Situated at the centre of the radial plan are the entrance, distribution zone

[204] JDS Architects, "Helsingor Psychiatric Hospital," 2015.

and a sports hall. The public treatment program placed on a level with the existing hospital and is organized as 5 individual pavilions, combined into a snowflake structure by the central space. Day sections, an out-patient's clinic, and the department of district psychiatry gather around the arrival areas. The individual units contain offices and treatment rooms to one side and waiting areas to the other side.[205]

Figure 152: Images of Less Desirable Design Elements[206]

Although most of the spaces seem warm and inviting, there are a few areas that appear to use odd shapes and colours which may be detrimental to the health of those dealing with a mental illness. The triangular shape in the above photo casts a glaring shadow with sharp edges on an interior corridor, which could appear to be frightening to those who may be experiencing psychosis. Other areas such as the squash court and corridors may also be overwhelming for patients. The bright green in the squash court is an eye sore and does not differentiate between the floor, ceiling, and walls, which makes perception of the space difficult to comprehend. The corridor offers windows to the exterior, however from this angle the connection is not legible, and there are no breakout spaces or resting points along the narrow path of travel.

[205] Architizer, "Psychiatric Hospital Helsingor," 2015.
[206] JDS Architects, "Helsingor Psychiatric Hospital," 2015.

Case Study 3 - Centre for Addiction and Mental Health (CAMH):

Project Details:

Location:	Toronto, Ontario, Canada
Project Size:	27 acres
Completion:	2012 (Phase 1), other phases currently in progress
Project Type:	Health Care

Figure 153: Rendering of CAMH[207]

CAMH's approach to the mental health facility strives to break down the barriers of isolation often attributed to healthcare facilities. The development aims to revitalize the community, and simultaneously change the attitudes toward those with mental illness and addictions.[208] Located on Queen Street West in Toronto, Ontario, the 27-acre site is being transformed into a welcoming, integrated community, weaving together new cutting-edge CAMH facilities with shops, residences, businesses, parks, and through-streets, aimed at creating an inclusive, healing neighbourhood.

[207] JDS Architects, "Helsingor Psychiatric Hospital," 2015.
[208] Centre for Addiction and Mental Health, "Innovative Site Design," 2015.

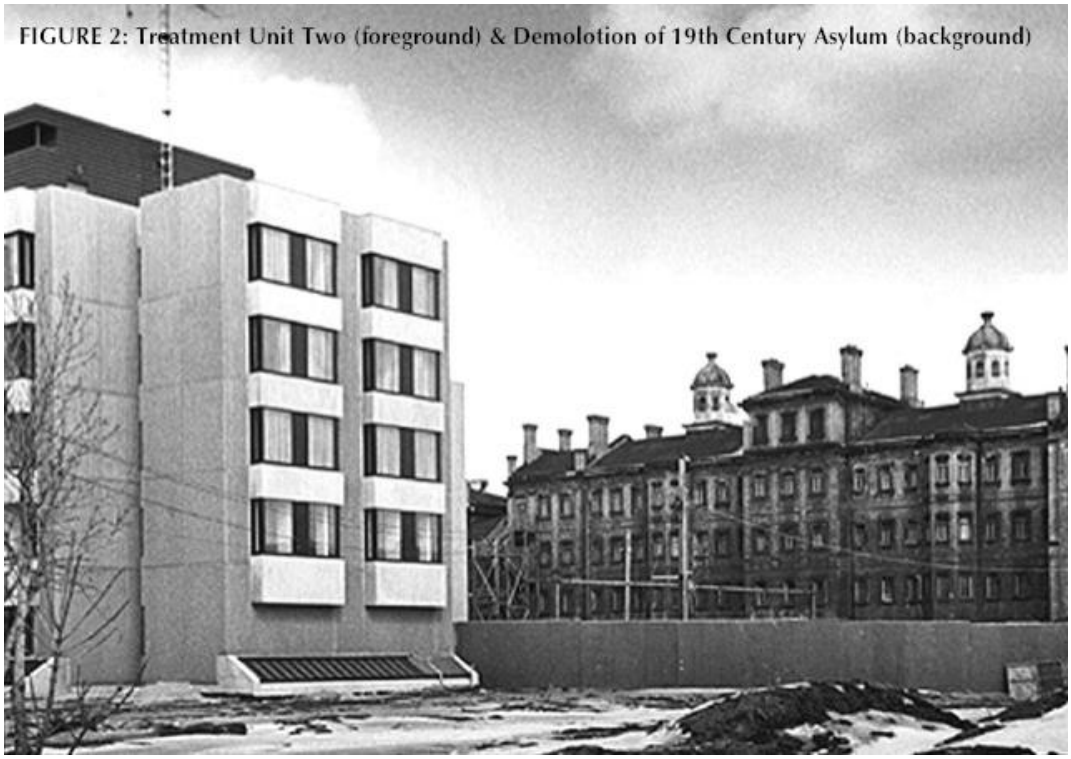


Figure 154: The 19th Century Asylum at CAMH (demolished)[209]

Over the years, the site has seen a number of physical transformations, beginning with the original 19th century facility —influenced by the theories of American physician Dr. Thomas Kirkbride — which featured "rigid lines and angles—believed to restore order and reason in the mind—and walls around the site that divided patients from the general populace."[210] By the mid-1900s, deteriorating conditions and changing public perceptions of mental illness led the asylum to represent the dark ages of mental healthcare, increasingly appearing as little but a warehouse for the mentally ill, poor, and disorderly. Overcrowding was severe while confinement and surveillance, rather than successful treatment, seemed more of a focus until the buildings were demolished in 1976.[211] The institution then moved to decentralized authority and de-emphasized the relationship between physical design and behavioural treatment. From this emerged the "mental health campus" model, which featured multiple scattered, detached treatment units rather than one massive centralized building. [212]

[209] JDS Architects, "Helsingor Psychiatric Hospital," 2015.
[210] Horowitz, "The Ongoing Evolution of CAMH," 2015.
[211] Horowitz, "The Ongoing Evolution of CAMH," 2015.
[212] Horowitz, "The Ongoing Evolution of CAMH," 2015.

Figure 155: CAMH Buildings (Yellow) vs. Non-CAMH Buildings (Red)[213]

Today, the treatment paradigm is the antithesis of the philosophy that inspired the site's creation. It aims to invest in the future of not only the site but the neighbourhood, as well as the development of mental health and addictions treatment as a whole. Dr. Catherine Zahn, CEO of CAMH, emphasizes the "need to transform care for people with addictions and mental illness, replacing outdated facilities with new, therapeutic buildings specially designed for independence, dignity, and recovery. We need to change attitudes while we revitalize our community."[214] The new CAMH is founded on patient empowerment through the contemporary "clubhouse model" of treatment, in which authority is fragmented; "members" (rather than patients), take more responsibility in their own voluntary treatment. Overall, the project intends to deliver a new model of care and provide a healthy environment that:

- Promotes recovery
- Bring together the best research, clinical, education, health promotion, and policy experts in one place to change the future of mental health and addictions

[213] Urban Strategies, "CAMH," 2015.
[214] Horowitz, "The Ongoing Evolution of CAMH," 2015.

- Revitalizes the city by opening up the site and creating an inclusive new nine-block neighbourhood that benefits all
- Changes attitudes by breaking down barriers to eliminate stigma[215]

Figure 156: View to Queen Street from CAMH Site[216]

Front and centre in the plan is the redevelopment of the local street network to bring the CAMH property into the surrounding urban fabric, and integrate the site with the broader community through an Urban Village format. The redevelopment involves a network of public streets, public and private open spaces, a series of cohesive development blocks, and a mix of CAMH and non-CAMH buildings that includes housing, commerce, and recreation, and incorporates CAMH facilities, staff, and members.[217] The Vision lays out the opportunity for CAMH to participate in the ongoing revitalization of the West Queen West neighbourhood, while combating the stigma formerly associated with the site, and with mental illness more generally. [218]

[215] Centre for Addiction and Mental Health, "Innovative Site Design," 2015.
[216] Centre for Addiction and Mental Health, "Innovative Site Design," 2015.
[217] Horowitz, "The Ongoing Evolution of CAMH," 2015.
[218] Horowitz, "The Ongoing Evolution of CAMH," 2015.

"Recreating the CAMH facility so that patients get as much (voluntary) exposure to the community as possible will put patients and the broader community on a collision course." [219]

Figure 157: Aerial view of CAMH (After Phase 5 Completion)[220]

Key thinking behind CAMH's urban village model is that patients who feel they are a part of a community will recover faster. There are several opportunities for patients and the general public to co-mingle throughout the campus, such as:

- A client-run "Out of This World Café"
- Bookable meeting and client assessment spaces
- A family support centre
- Child, Youth and Family and Geriatric Mental Health Programs

[219] Naheed Mustafa, "CAMH Turns its Main Toronto Campus into a Community to Help Mental Health Patients Recover Quicker," 2010.
[220] Centre for Addiction and Mental Health, "Innovative Site Design," 2015.

Figure 158: Typical patient room at CAMH[221]

Patient rooms are designed so that those living in them can see themselves as everyday people. "Their day to day life on the unit gives them a sense that they are in a normalized environment. If I showed you one of these apartment-like buildings right now and we'd go in it you wouldn't know you're in a so-called mental health institution because it's totally de-institutionalized," says Liang.[222] The facility is also designed for flexibility to meet changing health care needs, and not become obsolete in 20 or 30 years as the older buildings have. By better integrating its buildings and services into the surrounding community, CAMH hopes to lift the stigma of mental illness and support its members' growth.[223] Such normalization will best promote rehabilitation and help erase the lingering social stigma attached to mental illness and addiction.

[221] Centre for Addiction and Mental Health, "Innovative Site Design," 2015.
[222] Mustafa, "CAMH Turns its Main Toronto Campus into a Community to Help Mental Health Patients Recover Quicker," 2010.
[223] Horowitz, "The Ongoing Evolution of CAMH," 2015.

Case Study 4 - The Orchid:

Project Details:

Location: Palm Springs, Florida, USA
Completion: 2004
Project Type: Women's Rehabilitation Facility

Figure 159: Exterior common area at The Orchid[224]

Women have gender-specific treatment responses that can be successfully enhanced by the environment, both physical and social. At the Orchid Recovery Center for Women in Palm Springs, Florida, a holistic design and the pioneering female-sensitive substance abuse treatment approach of Karen Dodge, PhD, have been used to develop modalities that meet the specific needs of recovering women. [225] I have chosen to include this facility as an example since several innovative design solutions are used and cater to a specific audience in order to promote healing. Through the use of architecture and design, the facility has been able to greatly soothe clients while creating an environment that

[224] The Orchid Recovery Centre, 2015.
[225] Julie Queler, "The Aesthetics of Healing," 2006.

complements their treatment ideology of personal growth, through the encouragement of a high degree of interdependence, and trust among women during the treatment process.

The Orchid was founded in 2004 and is capable of treating up to 14 women at a time. The philosophy of the facility is a healing space which integrates a variety of environmental elements to create an ambiance that is not only attractive, but also has a measurable effect upon the health and well-being of those who use the space. The design intent of the facility is to:

- Enhance and support recovery goals within the facility by creating functional space and furnishing it both practically and beautifully.
- Create an environment specific to the specialized healing needs of women, in which we seamlessly meld 12-Step philosophies with modalities based on the latest empirical research
- Amplify the treatment in an environment that addresses all five senses, thus greatly reducing relapse

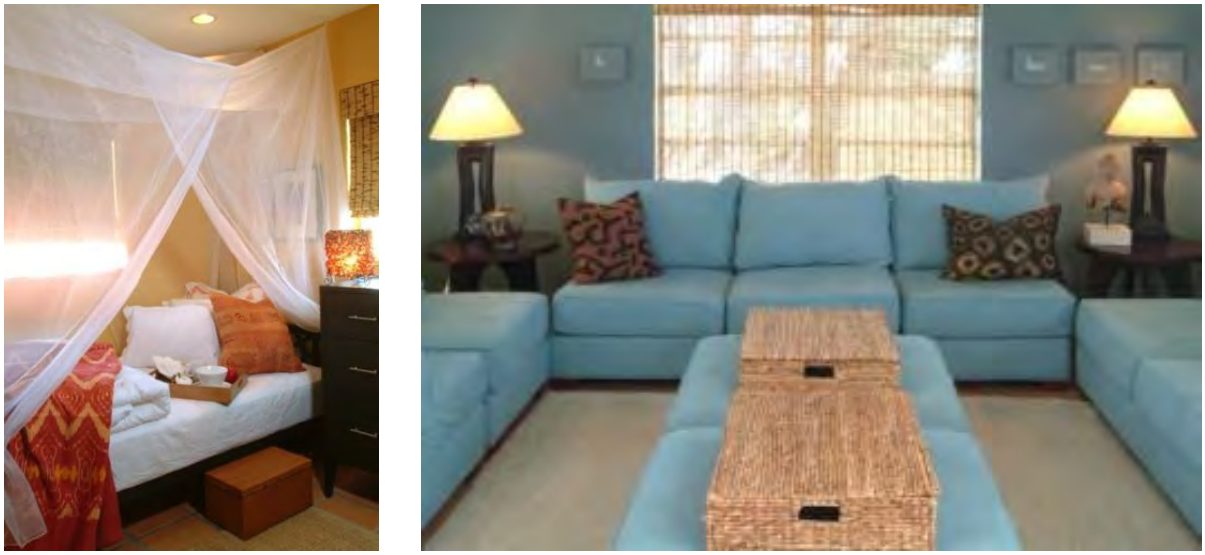


Figure 160: A bedroom and common area at The Orchid[226]

The Orchid incorporates art, colour, sound, and scents with powerful elements of interior design, in a deliberate attempt to create a living environment that is itself a therapeutic tool. Colours and furnishings throughout the Orchid reflect a feminine touch. Some walls are yellow to signify

[226] The Orchid Recovery Centre, 2015.

warmth, while a “Mexican pink” provides stimulation and evokes joy in an eating area. The large common area is a rich, pale blue and accented with simple, natural fabrics to inspire calmness. The floor in the residences is a warm, reddish, earth-coloured Mexican tile that is refreshingly cool to touch yet provides a natural anchor for the walls' rich colours. In the Orchid's sleeping quarters, mosquito netting simultaneously gives a sense of privacy and freedom, without promoting claustrophobic feelings.[227]

Marrying clinical concepts to aesthetics, the Orchid specializes in a variety of complementary and alternative therapies (as well as traditional 12-Step philosophies) to enhance serenity and balance, including meditation, massage, acupuncture, water therapy, and yoga. The Orchid's practitioners find that alternative therapies experienced in a healing space enhance and maximize their benefits and effectiveness. For example, careful attention has been paid to the acoustic qualities in the areas where sound therapy is performed. [228]

Figure 161: Exterior dining area at The Orchid[229]

[227] Queler, “The Aesthetics of Healing,” 2006.
[228] Queler, “The Aesthetics of Healing,” 2006.
[229] The Orchid Recovery Centre, 2015.

Case Study 5 – Gerstein House:

Project Details:

Location: Toronto, ON, Canada
Project Type: Mental Health Crisis Centre

Figure 162: Curb Appeal at Gerstein House

As I walked up to the facility, I noticed its great curb appeal. Surrounded by newer condominium developments, the historical house looks quaint and welcoming in comparison. However, as I tried to open the door it was locked. A doorbell needs to be pressed in order to get in. Once inside, a lobby with comfy couches and a central staircase welcome you into the space. The main floor is open concept with a dining room and large skylight being the focal point of the layout. A large wall of the dining space is filled with art created by people who have passed through the facility, while several pieces of art that were formally purchased by artists who once struggled with a mental illness cover the walls throughout the building.

One of the staff members who I met with gave me a bit of history about the place and how it came to fruition. After the deinstitutionalization of large psychiatric facilities, a task force was created in Toronto to deal with the need for additional mental health facilities in the city. The task force created a report that outlined the needs of patients and many of the items listed in the report were implemented into the Gerstein Centre.

Figure 163: The Dining Area at Gerstein House

The facility has 10 beds for short stay patients (2-3 days) that are in critical condition. It does not have any drop-in programs, however it does have a crisis hotline that is open 24 hours a day and a mobile crisis team that can meet people at their home or in a neutral setting such as a coffee shop. The facility is very welcoming and aimed to have a relaxed, residential feel to it, which in my opinion they successfully achieved. In addition to the natural lighting and artwork, the building has several plants throughout the building, an open kitchen that clients can use 24/7, quiet and social rooms, and an outdoor patio. One of the lounges has a fireplace and there is no fluorescent lighting in the facility.

The staff member I spoke with mentioned that the design of the facility has really benefitted the clients, and several other facilities have come to view the Gerstein Centre as a precedent for their renovations. Some of the features that she mentioned to be beneficial in a facility include open space, dimmers for lighting, and women only spaces.

Additional Precedent Studies:

Facilities (Small):

Name of Facility	Size of Facility	# of Patients	# of Staff	Program Elements (Mental Health)
Progress Place Toronto, ON Clubhouse Model		700+ members		• Music & Dance • Game and Movie nights • Sports • Peer tutoring & education
Fountain House New York City, NY Clubhouse Model		1,300+ members		Members work in 1 of 7 sections: • Communications • Culinary • Education • Horticulture • Reception and Membership • Research • Wellness
The Orchid Palm Springs, Florida Planetree Model (Womens Rehabilitation Center)				• Traditional medical care • Other methods of treatment (including acupuncture, yoga, fitness, meditation) • Fitness program • Nutritional counseling • Expressive therapies: art therapy, healing and sound therapy
Gerstein House Toronto, ON Crisis Centre		10 beds		• 2-3 day short term • Dining room • Kitchen • Art space • Living room • Outdoor patio

Facilities (Medium):

Name of Facility	Size of Facility	# of Patients	# of Staff	Program Elements (Mental Health)
Ellsinore Psychiatric Clinic Helsingor, Denmark (Psychiatric Hospital)	6,000 m2 (64,000 sf)	42 Patient Rooms		Offices, Reception, Meeting Room, Dining Room, Smoking Area, Kitchen, Day Section, District Psychiatrist, Conference Room, Education, Administration, Head Entry, Atrium, Sports Facilities, Change Rooms, Collective Space
The Southdown Institute Aurora, ON "Healing Retreat"	33,000 sf 37 acre site	22 private beds	50 staff (half are P/T)	14-week resident treatment program with Psychologists, Psychiatrists, Addiction Counsellors, Spiritual Directors, Nursing care, Nutrition & Health, Pottery, Fitness Integrated approach = Relationships, Spiritual, Emotional, Ministerial, and Physical Well-Being
VA Palo Alto Health Care System Palo Alto, CA Veteran Health	91,000 sf	80 beds (4 units of 20)		Outpatient Mental Health Services Integrated art program Design allows flex in size between 18-22 beds 2 gardens in each bed unit 11 outdoor spaces (gardens and courtyards)
Southwest Centre for Forensic Mental Health Care St Thomas, ON	235,000 sf	80 beds (5 in-patient units)		Specialized care individuals with mental illness who have come into contact with the criminal justice system. Interdisciplinary teams of health care providers from psychiatry, nursing, psychology, social work, spiritual care, nutrition, occupational therapy, therapeutic recreation and vocational rehabilitation provide care and clinical services.
Behavioral Health Pavilion & Crisis Response Tucson, AZ Psychiatric Hospital	136,000 sf	96 beds		A county courtroom, and a Crisis Response Center. Offices, physician offices, emergency department, patient accommodations, patient activity area, roof terrace, call center, lounge, clinical research

Facilities (Large):

Name of Facility	Size of Facility	# of Patients	# of Staff	Program Elements (Mental Health)
CAMH (Queen West)	27 acre site			Shops, residences, businesses, parks, new street grid, cafe
Homewood Health Guelph, ON		300 beds	650 regular 4,500+ total	Inpatient = 6-8 week programs, or 30-60 days 100 beds for addiction services Wellness, prevention, employment services, gift shop, café, walking trails, chapel, multi-purpose rooms, gardening, art therapy, bowling, pet therapy, gymnasium, day care
Parkwood Institute Mental Health Care Building London, ON	450,000 sf	156 beds		Courtyards, therapeutic gardens, auditorium, chapel, clothing shop, fitness club and gymnasium, hair studio, education services, library, café, pharmacy, research
Waypoint Centre for Mental Health Care Penetanguishene, ON (Psychiatric Hospital)	350,000 sf	312 beds	300 staff daily	Housing, employment services, rehabilitation, social club
Bridgepoint Active Healthcare Toronto, ON (Long-Term Acute Care Hospital)	680,000 sf	460 rooms (472 beds)		Roof garden, patient auditorium, physiotherapy, staff lounge, patient lounge, cyber café, spiritual care, meeting rooms, hair salon, patient dining, retail, cafeteria, research library, community auditorium, labyrinth, pool, staff gym and lounge

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