DESIGNING ENABLING INTERIOR ENVIRONMENTS

A Rehabilitation Clinic Optimizing Movement Controls
for People with Parkinson's

Meryll Samantha Raymundo

A practicum submitted to the Faculty of Graduate Studies of
The University of Manitoba in partial fulfillment
of the requirements of the degree of

MASTER OF INTERIOR DESIGN

Department of Interior Design
Faculty of Architecture
University of Manitoba
Winnipeg

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ABSTRACT

Physical environments, whether purposefully built or naturally existing, present significant challenges to those with Parkinson's. The relationship between Parkinson's Disease and interior design is an area of study that requires increasing attention due to the physical challenges and environmental risks associated with the surrounding environment. Delving into the subject can foster a better understanding of how interior design can be leveraged to support individuals with Parkinson's and how it can be used to create safer and more accessible spaces.

The practicum takes a comprehensive approach to analyzing the practical implications of intrinsic and extrinsic factors associated with interior hazards. It examines the relation of these hazards with Parkinson's Disease and its effect on individuals' ability to interact with their environment. Lawton's Ecological Theory on Aging and Neuman's Systems Theory are used to determine the influence of environmental pressures on those with physical and cognitive disabilities. Furthering the analysis by determining how to leverage interior design to mitigate these problems using interior design elements. Additionally, the paper will investigate the interaction between mental hazards caused by both the traits of Parkinson's and the environment, utilizing the Theory of Supportive Design and the Theory of Positive Distractions in Physical Environments, both theorized by Ulrich and the methods of Evidence- Based Design. This comprehensive approach, backed by robust theories and evidence, determines how the traits of Parkinson's and the environment negatively influence one another and how it causes stressors for those with Parkinson's Disease. Interior design solutions such as suitable lighting, noise levels, and other environmental features will be identified. Determining how these design features can facilitate a supportive and hazard-free environment for those with Parkinson's.

Case study buildings worldwide are analyzed to provide supplementary design knowledge that can be directly applied in real-world settings. With their innovative use of interior design approaches in healthcare settings, these buildings will serve as a testament to the potential of supportive environments. An in-depth analysis of these buildings further assists in defining crucial design methods that can be applied to individuals with Parkinson's, making the findings immediately applicable and relevant.

A hypothetical interior design project was created using the theories and methodologies found within the paper. The information found was used to design a space that supports increasing the independence and confidence of people with Parkinson's while decreasing their likelihood of injuries due to fall-related incidences caused by the environment.

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INTRO DUCTION

INTRODUCTION

Interior design uses physical environmental design features that may have opposing roles: 1) they may be a hindrance, or 2) they facilitate the gaining of self-control by individuals. These two factors play a viable role in both housing and commercial environments in managing movement for those with Parkinson's. Up to this point, there has been a lack of inquiry highlighting the environmental needs of those with Parkinson's, with research primarily concentrating on neurological disabilities such as Alzheimer's or Dementia (Ramos, J. et al., 2020, p. 1302). The key concern for people living with Parkinson's disease is the risk of falling when navigating through their surroundings. Fall risks for individuals with Parkinson's pose as the leading cause for both non-fatal and fatal outcomes (Ryan, J. et al., 1993, p.2); both can be reduced and prevented through appropriate environmental design. Falls and near-fall incidents, like a loss of balance or stumbling, can significantly harm the confidence of these individuals and restrict their activity level (Ryan, J. et al., 1993, p.2).

The connection between Parkinson's and Interior Design is more than physical, as traits like cognitive impairment, anxiety, and stress maximize or minimize how built environments subconsciously alter how individuals feel. Spaces often expose people to mental stressors, as they are usually designed without considering noise, light levels, privacy, and the need to provide social support in most environmental settings (Ulrich, S. 2000, p.98).

This practicum analyzes fall risk in people with Parkinson's by looking at the correlation between Parkinson's traits and interior environments, evaluating the hazards caused by the environment. The findings serve to enhance interior design features that support the well-being of individuals with Parkinson's and determine solutions that increase their confidence in performing daily tasks.

It has been found that environmental risk within interior spaces can be detrimental to the livelihood of those with Parkinson's. The research enables the creation of a fostering environment for these individuals, looking at accessible design that specifically targets the depletion of environmental hazards for this niche population. A wide array of written and graphical methodologies and tools can be found throughout the practicum, highlighting interior solutions that reduce the physical and mental stress and hazards placed on those with Parkinson's. The research was then applied to an interior design project in Winnipeg, whose objective is to foster the independence of individuals with Parkinson's by decreasing the physical and mental hazards found in interior spaces while promoting an encouraging and fulfilling user experience.

The practicum project is a rehabilitation clinic offering physical and clinical support for individuals with Parkinson's Disease. Winnipeg has been chosen as the location for this project as the city has a scarcity of targeted rehabilitation clinics for this population. Although Winnipeg offers centres catering to movement disabilities and medical clinics for cognitive disabilities, it is deficient in providing a personalized space for those with Parkinson's where they can be diagnosed, treated, and rehabilitated. The purpose is to highlight the importance of Parkinson's Disease and separate its complex traits from other cognitive and physical conditions.

RATIONALE

Justification for this project originates from an interest in Parkinson's engendered by the personal experience of a close relative. Parkinson's affects individuals' movement; this factor influenced the correlation between interior design and how those with this condition experience their surroundings. Environmental barriers are present everywhere, and while accessible design is being implemented, traits of disabilities are complex, and ecological experiences differ between individuals. Parkinson's and its effects are an inspiration for finding solutions to preventing hazardous environments while fostering a sense of control and confidence in individuals with this condition.

Parkinson's is the second-largest Neurodegenerative Disorder after Alzheimer's and affects thousands, with an impact on more than one percent over the age of sixty (Ramos, J. et al., 2020, p. 1302). In less than ten years, the number of people with Parkinson's over the age of fifty is expected to double by 2030, accompanied by an increase in challenges to society (Ramos, J. et al., 2020, p. 1302). Parkinson's Disease is a cognitive disorder that affects the extrapyramidal nervous system, heavily damaging the nigra and striatum area of the brain, both of which are responsible for an individual's ability to walk and maintain posture and balance (Burleson, L. 1993, p.13). Parkinson's presents itself as a perpetual challenge in maintaining independence due to the inability to restrain the constant movement of the body. Preventing environmental hazards for those with Parkinson's is dependent on acknowledging the traits that come with the condition. Understanding the ecological difficulties of those with Parkinson's will influence how built environments are designed.

PARKINSON'S IN CANADA

Statistics from the Canadian Chronic Disease Surveillance System (CCDSS) have shown that between 2004-2005 and 2013-2014, the number of Canadians living with Parkinson's increased from 8,000 to 10,000 (Public Health Agency of Canada, 2018). This staggering number has been shown to increase over time. That between 2013-2014, roughly 84,000 Canadians over the age of forty have been diagnosed with Parkinson's, with 10,000 accounting for newly diagnosed cases (Public Health Agency of Canada, 2018). Parkinson's has been found to affect considerably older generations. Those over the age of eighty-five have a higher fraction of attaining Parkinson's than those who are younger (Public Health Agency of Canada, 2018). The consistent incline in the number of individuals being diagnosed with Parkinson's underscores the importance of interior design intervention that minimizes the environmental burden placed on these individuals. Implementing supportive design features should not counteract the increased expectancy of diagnosed cases but as a solution that promotes individual well-being.

QUESTIONS OF INQUIRY

1. What effects do interior environments have on individuals experiencing Parkinson's Disease, and how does that constitute into the fall risks of those with PD? As well as what precautionary measurements can be put into place to minimize risk?

2. Does the layout of a building which includes wayfinding, circulation, and furniture placement have any effects on individuals with Parkinson's Disease?

3. How does colour and visual perception, pattern, and form amongst other interior design related elements affect those individuals with a cognitive disorder?

4. What role does materiality play in the way individuals with PD interact with their environments? How does choosing the right materiality decrease the likelihood of fall related injuries in individuals?

5. What roles do light, and acoustics have in the way individuals with PD experience their environment? How can they be implemented within interior spaces to reduce over stimulation and thus minimize mental stressors in people with PD?

6. How can the design of interior spaces, in connection to both intrinsic (the physical traits of Parkinson's) and extrinsic (the physical hazards of the environment) factors foster a sense of control in people with PD?

LEARNING OBJECTIVES

1. Explore the symptoms of Parkinson's and its effect on individuals with PD and how they function and interact within interior environments, and delve into the precautionary measurements taken to minimize fall, interior hazards, and stress amongst individuals living with PD.

2. Explore how design plays a significant role in the creation of independency for a person dealing with PD, by determining the environmental stresses brought forward by interior design hazards.

3. Identify interior design criteria that will be beneficial for designing an environment suited for individuals with PD.

4. Analyze present developments that are designed for individuals with a cognitive/neurological disease, and their design implementations that led to a successful project. While analyzing how these design recommendations are used to aid in promoting a safe & healthy environment for individuals with PD.

5. Graphically illustrates how these design recommendations are used in a rehabilitation setting created for individuals with PD using architectural drawings, 3D renderings, etc.

THEORETICAL FRAMEWORK

The theoretical framework presents a comprehensive understanding of the practicum project by offering practical insight into the effects of environmental stressors on those with Parkinson's Disease while providing preventative solutions. Designing environments catering to the wellness of those with Parkinson's can effectively alleviate the mental and physical stressors brought on by the environment. This, in turn, enhances the ability of these individuals to gain control over their abilities.

The practicum elucidates four significant theories highlighting Parkinson's traits and their connection to the environment. When applied, these theories provide substantial evidence for preventing fall risks in individuals with Parkinson's Disease. They serve as the foundation for developing environments that mitigate hazards while simultaneously fostering wellness for these individuals, emphasizing the theoretical basis of our research.

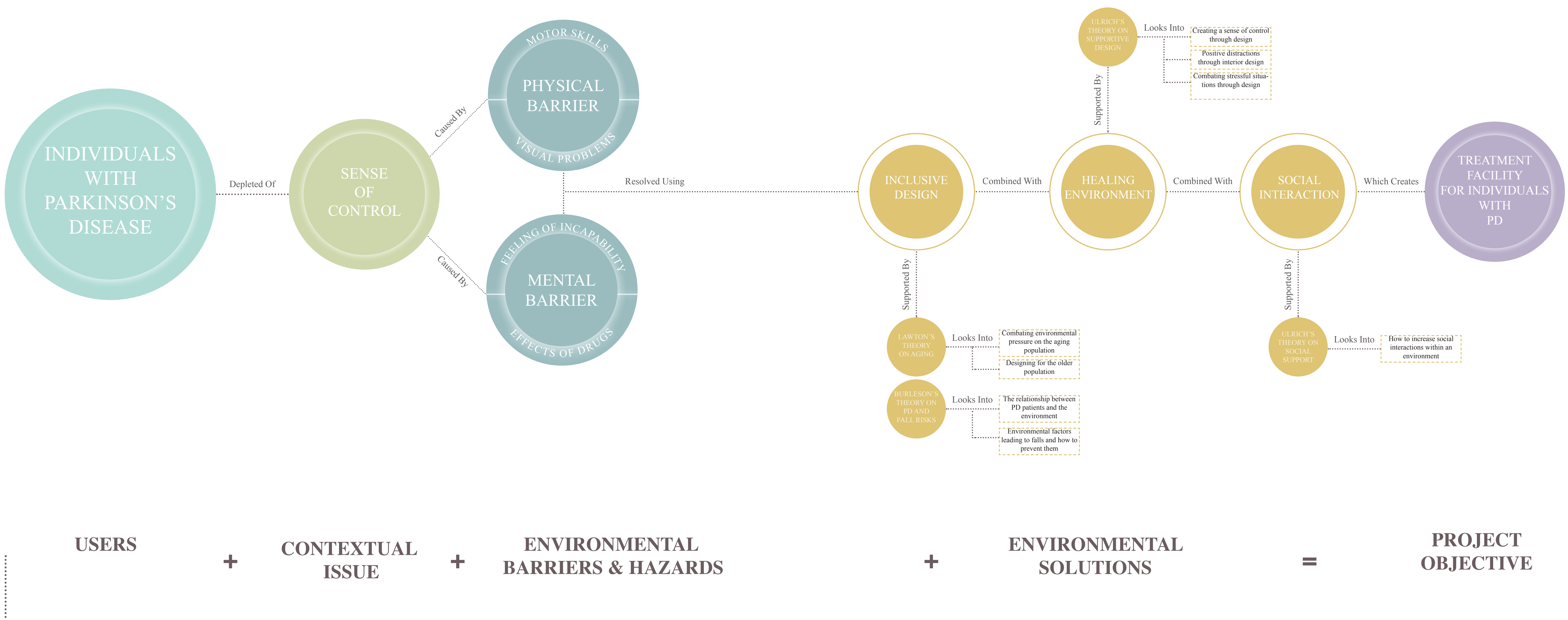
Lawton's Theory on Aging connects environmental pressures and barriers to the experiences of those with disabilities. It showcases the adverse effects of these barriers on the well-being of those with Parkinson's and their potential to induce a sense of alienation and self-efficacy among these individuals. Lawton's theory aims to identify and assess the hazards within environments that threaten the well-being of those with Parkinson's and the preventative actions that can be employed to minimize these dangers.

Newman's System Theory provides substantial insight into the intrinsic and extrinsic factors associated with fall risk among individuals with Parkinson's. Intrinsic factors present the effects of Parkinson's traits in the navigation and interaction of those with the condition to the environment. In contrast, extrinsic factors exhibit the influence of environments on these individuals. Newman's theory aims to examine the adverse effects of environmental elements on the traits of Parkinson's, looking at the overall compositions of interior spaces to determine how they can be designed to reduce potential dangers leading to fall risk and increasing independence in people with Parkinson's Disease.

Ulrich's Theory on Positive Distraction imparts a framework for identifying environmental disturbances that impede the mental wellness of individuals. The presence of environmental stressors and distractions in spaces has proven to cause mental affliction in individuals. For those seeking treatment, these distractions have been shown to compromise the rehabilitation of those with cognitive conditions, hindering their ability to participate in activities fully. Ulrich's theory explores the adverse effects of lighting, noise, and colour on those with cognitive disabilities and ways that can moderate these effects on individuals with Parkinson's.

Ulrich's Theory on Supportive Design offers interior design resolutions for enhancing social support among those with Parkinson's Disease. Access to essential support for these individuals is crucial in maintaining a healthy well-being. Eliminating mental and physical stressors has been proven to reduce anxiety and stress during treatments and rehabilitation. At the same time, social support provides positive benefits for the self-efficacy and health of those with Parkinson's. Ulrich's theory highlights the importance of supportive design in the welfare of those with Parkinson's and how effective design can uplift those with this condition.

Parkinson's Disease is a complex ailment with multiple traits. Those with this condition have varying mental and physical abilities, which leads to various environmental experiences. The research delves into these conditions and their correlation with interior design. The results will be applied to a hypothetical interior design project dedicated to the wellness of those with Parkinson's Disease, using the theories and methodologies to coalesce a supportive environment that enhances the well-being of this group of individuals.



THEORETICAL FRAMEWORK

Figure 1: Theoretical Framework

1.0

LITERATURE REVIEW

Disabilities and the Environment

1.0 Disabling Environments for Those with Disabilities

Those with disabilities often face societal isolation due to the marginalization they face through unintentional biases. The World Health Organization (WHO) estimated that 16% of the world's population or roughly 1.3 billion people identifies as someone living with a form of physical or mental disability (WHO, 2023). Right now, they represent the largest minority in the world. With a vast statistical number, it is without reason that environments should focus on enhancing all user experiences. However, environmental barriers are still present today as the world revolves around the standardization of non-disabled norms. The view and interpretation of disabilities and the lack of knowledge that follows dictate the social and political outlook on these sets of individuals. Where people neglect to acknowledge that those with physical and mental disabilities are not disabled by their conditions but by the way they are perceived and treated in society (Shakespeare, T., 2017), it is often forgotten that disabilities are not primarily a trait from birth but can also come at any given time with no warning (WHO, 2023). Despite the existence of accessible regulations preventing the creation of barriers, considerable adjustments in attitudes toward disabilities still need to be made. America's Disabilities Act (ADA) unequivocally states that inclusive spaces are a civil right for those with disabilities (Gray, D.B., et al., 2003), a matter that requires continued examination and concerted efforts to be integrated into society as it ensures justice and equality for those with disabilities.

The enabling and disabling of environments fall between ecological and psychological features, where ecological encompasses natural and built environments, and psychological comprises society's cultural, political, and economic principles (Pope et al., 1997), all of which dictate the lived experiences of those with disabilities. The Centers for Disease Control and Prevention (CDC) identified seven common environmental barriers within the scope of physical, transportation, programmatic, social, attitudinal, communication, and policy decisions that hinder enabling people with disabilities (CDC, 2020). The presence or absence of these barriers can significantly impact the functionality of individuals with disabilities and prevent them from accessing essential services. However, the interconnection of these barriers suggests that a change in one obstacle can have a sequential effect on the others. Preventing one barrier from occurring can potentially stop others from happening. Although addressing preventative measurements for these barriers poses a challenge, it is not entirely insurmountable. This is where the importance of inclusive design will play a pivotal role.

Programmatic and Physical Barriers

Programmatic barriers present themselves as the inability to provide equitable access to healthcare for those with disabilities— with obstacles being defined by the operation of healthcare offices, accessibility of required equipment, responsiveness and treatments of physicians and nurses, as well as the lack of available healthcare professionals responsible for providing primary care for those with disabilities (Mudrick, N., et al., 2017). Inaccessible healthcare is abysmal for the welfare of those with disabilities as it takes away the ability of these individuals to receive the necessary treatments and aid that they need. These barriers, however, are not only caused by the built environment but also by the way society responds to individuals with disabilities. However, it still stands that the most common programmatic obstacle for people with disabilities is the physical or structural barriers that are the by-product of man (Clarke, P., et al., 2008), that considerably impact mobility and access to health and public environments (Imrie, R., et al., 1998). Though regulatory codes exist, with the broad spectrum of disabilities present in the world, it has become a challenge to design for all ranges of conditions.

Attempts to create spaces that meet the regulations of accessible design far often hover to fit between the ideals of an accessible environment and the actuality of what has been built and is used by the public, including those with and without a disability (Gray, D.B. et al., 2003). This means that though building codes are being followed to create accessible spaces, it is not guaranteed that all spectrums of disabilities will benefit from this. Generally, codes are primarily developed for the more conventional disabilities. As designers and builders, it should be imposed upon us to explore other disabilities to

minimize these physical and programmatic barriers. In addition, though programmatic barriers are ultimately due to the physicality of the built environment, it is crucial to know that insignificant attention to colour contrast and tactile textures in environments, whether existent or absent within the space, is disabling and discriminative against the mobility requirements of those with disabilities (Imrie, R., et al., 1998). These factors can cause stress and hinder the welfare of those with disabilities and can be avoided. To reduce the number of programmatic barriers for those with disabilities, addressing physical barriers within the built environment is crucial for enabling social participation and inclusivity for people with some form of physical and mental conditions.

Transportation Barriers

For those living with disabilities, transportation plays a significant role in their mobility and their ability to access services essential to their well-being. According to research that reviewed over 115 studies on the travel patterns of individuals with disabilities, it is found that people with some form of disability make roughly 10%-30% fewer journeys and are found to prefer travelling shorter distances and using slower means of transportation when doing so compared to those who are non-disabled, (Park et al., 2022). This indicates that though the use of private or public means of transportation is available, those with disabilities tend to prefer to stay homebound due to the inaccessibility of most vehicles, and to further avoid additional stress that comes with accessing these services. A situation that is highly overlooked by many. However, suppose a person with a disability is to travel; their modes of transportation are reduced to public transport, such as paratransit, taxis, and other means of public transportation, and opting to ride with others rather than driving or walking. Nearly one hundred travel-related cases for people with disabilities revealed a stagnant range of 4.6% - 51% of individuals with disabilities prefer public transportation (Park et al., 2022). It is a staggering percentage of the overall population of people with disabilities. In addition, out of a study of 4,161 individuals, with a 92% respondent rate, a maximum of 74% of disabled users prefer the use of municipal busses compared to other modes of transportation services, with paratransit coming in second with 35.6% user preference

(Bezyak et al., 2017). Although it is evident that individuals prefer the usage of public transit, it does not take away from the overall issue of these services being inaccessible. Based on the study above, paratransit may be the best mode of choice due to its exclusive services. However, it is reported that barriers are still prominent and experienced by user groups with varying conditions while using this service (Park et al., 2022). It is prominent that most of these barriers are due to the contextual issues that arise with inaccessible physical design elements. In addition, non-physical barriers such as inadequate quality of responsiveness from companies operating these services are also one of the leading causes of transportation avoidance for those with disabilities. An example of these comes from a study that stated that those who are either blind or those presenting low vision have reported missing available pick-up windows or have faced scarce service times (Bezyak, J.L. et al., 2017). Those with mobile disabilities have faced higher rates of scheduling conflicts and have been found to face problems with negotiating reservation times, and those with mental disabilities are reported to have found themselves removed from the eligibility of attaining paratransit services (Park, KH. et al., 2022). This comes as a surprise as such resources are meant to minimize the stress on those with disabilities who require access to transportation services to get to and from various places.

Additionally, for those with a pronounced disability, freedom to travel from one place to another while being able to use any mode of transportation they please serves as a barrier to their everyday life. One individual stated that though they have a disability, they are just as ordinary as their counterpart; but are just subdued to doing things differently, such as the way they navigate through their environments (Imrie et al., 1998). Transportation barriers are present to this day, underscoring the importance of continually improving how these services are designed for people with disabilities. Accessible transportation is essential as it enables people with disabilities to gain access to critical services, such as public goods, healthcare, education, and employment, amongst other things. However, transportation barriers are still present no matter how they are changed to accommodate the disabled population (Shakespeare, T., 2017). Nonetheless, accessible transportation can begin by acknowledging the barriers and issues faced by the disabled community and ensuring they feel accommodated in every way possible.

Communication Barriers

The CDC has reported that individuals with disabilities that impact their speech, hearing, understanding, and ability to read and write are more likely to face communication obstacles compared to those without disabilities (CDC, 2020). In the same way that programmatic barriers can hinder the delivery of accommodations to those with disabilities, communication barriers can also have a detrimental effect. This is often due to the failure to communicate clearly and concisely, inadequate auditory support, and technological service shortcomings (NCODH, 2002). Despite efforts to create more inclusive environments for individuals with disabilities, there is still a significant amount of work and understanding needed to accommodate the diverse range of needs. According to a study on communication access, there are still barriers due to the lack of accessible communication options available for those with disabilities (Bigby et al.; E., 2019). Today, the issue of accessibility can manifest in various forms, ranging from the lack of simple signage to more complex challenges such as limited access to written or auditory information. At its worst, it can even include confusing and non- user-friendly services that make everyday tasks and activities difficult for specific individuals. Despite the common misconception that inaccessible environments are solely a result of ignorance, it is also due to lack of education and understanding. Fortunately, as technology advances and gains popularity, individuals are becoming more aware of the importance of minimizing communication barriers. This has led to a growing trend of designing devices and applications with accessibility in mind for all users. From closed captioning and image descriptions to inclusive design, efforts are being made to ensure that individuals with disabilities can access aid and community support through social networking websites. This shift towards inclusivity is crucial in creating a more equitable and accessible society.

Despite the advancements in technology, individuals with cognitive and vision impairments still rely on printed materials for information. However, when these technological services are not available, barriers can arise when published materials are inaccessible and lack features that aid in user understanding, such as unclear written dialogue, creating additional hurdles for these individuals

(Bigby, C. et al., 2019). Overcoming communication barriers is essential for creating an inclusive environment and can be achieved through simple solutions. We can effectively make a positive change by understanding which features and elements can be altered or added. Therefore, having a clear comprehension of these communication barriers is crucial. It has been pointed out that printed materials with larger text but smaller font sizes, lines that are too close together, and un-captioned video recordings can pose challenges for individuals trying to read and comprehend informational materials (Bigby C. et al., 2019).

To reduce communication barriers and ensure effective communication for individuals with vision and cognitive disabilities, addressing and understanding the various obstacles that may hinder their communication is essential. This includes using written documents with larger font and non-glossy paper to minimize eye strain and incorporating braille alternatives for those who are visually impaired (NCODH, 2002). By implementing these solutions, we can create a more inclusive and accessible environment for those with disabilities. Design is crucial in creating an inclusive environment for all individuals, regardless of their abilities. However, when design elements and features are not accommodating, it can quickly lead to exclusivity, especially for individuals with low visual acuity. This can be particularly challenging when printed materials are unavailable. To address this issue, adding auditory aids in the space can significantly reduce communication barriers and make the environment more accessible for those with visual impairments (NCODH, 2002). For individuals with disabilities, navigating through environments filled with communication barriers can be a challenging and frustrating experience. These barriers can create unconventional challenges and drawbacks, making it difficult for them to participate and engage in their surroundings fully. However, with simple changes and additions, these environments can become more accessible and inclusive for those with disabilities.

The advancement of technology has dramatically improved communication, making it easier and more accessible for everyone. Yet, despite this progress, there are still lingering issues within environments that create barriers for people with disabilities. By including accessible materials and

understanding the importance of proper communication, these barriers can be tackled and overcome. It is crucial to recognize that effective communication is essential for individuals with disabilities to thrive in their environments. By breaking down communication barriers and ensuring accessibility, we can create a more inclusive and accommodating society.

Social and Attitudinal Barriers

The social barriers faced by individuals with disabilities are complex and far-reaching, encompassing not only physical and environmental obstacles but also the attitudinal barriers that permeate their daily lives. These negative attitudes significantly impact how these individuals are treated and perceived within their communities, perpetuating the stigma surrounding disabilities. Discrimination, avoidance, condescension, and stereotyping are all too common for those with disabilities, painting a bleak and unfair image of their capabilities and worth.

The pervasive issue of social discrimination and avoidance towards individuals with disabilities has led to the creation of countless environmental barriers, hindering their ability to participate in society fully. This harmful attitude toward disabilities not only limits their understanding and acceptance but also significantly impacts their opportunities for education and employment, creating a stark contrast between disabled and non-disabled individuals (CDC, 2020). This stems from an underlying uneasiness and discomfort that people with and without a disability feel in the presence of one another. People with disabilities may feel a sense of inclusion, while those without may experience an uncomfortable feeling towards them. In-depth research on this issue has shown that in educational settings, most students with disabilities have not faced repeated barriers but have occasionally encountered negative attitudes from their non-disabled peers and professors (Stumbo et al., 2011). Recent research on workplace environments has found that many individuals with disabilities face difficulties securing jobs due to the discrimination, uneasiness, and discomfort they experience during the interview process; still, they did not encounter severe attitudinal barriers within the workplace (Stumbo, N.J. et al., 2011). It is essential to acknowledge that many negative attitudes towards individuals with disabilities stem from unconscious prejudice rather than intentional discrimination. This is often a result of the stereotypes and misconceptions that society places on those with disabilities. Many people may not even realize that they hold these biases, highlighting the need for greater education and understanding about proper treatment and inclusion of individuals with various physical and non-physical abilities. By advocating for acceptance and breaking down these stereotypes, we can work towards creating a more inclusive and understanding society for all.

People with disabilities often feel isolated from their communities not only because of societal attitudes towards them but also due to physical barriers. These barriers, such as inaccessible pathways, poorly designed buildings, and confusing wayfinding, create a social barrier that further restricts their inclusion in society. According to various reports, the lack of consideration for accessibility in the built environment contributes significantly to the isolation experienced by individuals with disabilities (Stumbo, N.J. et al., 2011). The lack of understanding and education about disabilities has led to a prevalent mindset that shapes the design of environments, resulting in physical barriers that hinder those with disabilities. However, there is a growing recognition that these barriers are a direct result of implicit stereotypes and a lack of knowledge, leading to a push for more inclusive and accessible environments.

To fully grasp the stigmatization faced by those with disabilities, it is crucial to recognize the origins of these harmful perceptions. The term ‘disability’ encompasses not just the limitations of one’s mental or physical state but also the notion of being abnormal or defective - a label that society often associates with fear and avoidance (Susman, J., 1994). Despite good intentions, the stigma surrounding individuals with disabilities usually stems from misunderstandings, discomfort, and a desire to offer sympathy. This can lead to patronizing attitudes and the perpetuation of harmful misconceptions. Sympathetic responses are often presented as praise or compliance but can ultimately contribute to further marginalization of those with disabilities (Susman, J., 1994). Many people fail to recognize that individuals with disabilities are just as extraordinary as those without disabilities and that their version

of normality may be different but still valid. There should be no distinction in how these groups are viewed and treated, as they all deserve equal respect and opportunities.

Policy Barriers

Barriers challenge the lived experiences of those with disabilities and are part of a collective matter that dictates their presence in these environments. Due to the way these environments are designed and the views of the public, people with disabilities may face adverse treatment and struggle to integrate into society. This is mainly due to the numerous policies that hinder rather than enhance the lives of these individuals. Despite building codes and accessibility requirements, the construction of built environments still falls short of genuinely accommodating the diverse range of disabilities. It has been recognized since 1998 that the authoritative controls overseeing accessible regulations are flawed in some ways (Imrie et al., 1998). Though it has long been a contentious issue, evidence suggests that it has improved over the years, with growing efforts being made to address these problems and regulations being put forward to introduce more inclusive environments by targeting and removing as many environmental barriers as possible.

A 1998 study conducted by Imrie et al. on built environmental strategies exhibited that for several respondents, accessible policies appear primitive and exclusively confiding to a few public environments rather than all (Imrie et al., 1998). Despite being conducted several decades ago, the study remains relatively true and provides valuable insights to this day. In Canada, it was not until 2019 that the Government of Canada introduced Bill C-18, the Accessible Canada Act, which identifies, removes, and prevents barriers in federal jurisdiction, ensuring a barrier-free Canada by 2024 (Government of Canada. 2022). The enactment of the bill is a step towards recognizing the barriers faced by those with disabilities and ensuring that every individual in Canada receives equal participation in society. The recent passing of the Act has set in motion a necessary step towards creating a more inclusive society, as it mandates that the government, parliament, and various organizations must work together to develop accessibility plans; these plans will focus on identifying and eliminating barriers in built environments, such as workplaces, communications, and transportation services, by actively consulting with individuals with disabilities (Government of Canada., 2022). Additionally, the Act emphasizes the importance of establishing a feedback system to update and continuously improve accessibility regulations, taking significant measures to promote equal opportunities and rights for individuals with disabilities in all aspects of life (Government of Canada., 2022). Despite the changes that have happened over time, there is still an underlying social bias against individuals with disabilities, leading to misunderstandings among planners and builders. This harmful mindset must be addressed and corrected. It is not solely the responsibility of planners and builders to create accessible environments but also those responsible for implementing and enforcing these policies. Policymakers, planners, and builders must adopt a positive attitude toward creating fully accessible environments, as any negativity toward individuals with disabilities only serves to build further barriers to their inclusion and independence (Shakespeare, T., 2017).

Policies go beyond just shaping physical spaces and implementing design strategies; they also reflect the deep-rooted social prejudice towards individuals with disabilities. This prejudice is prevalent in all communities and dramatically influences the creation of policies. Unfortunately, this bias often leads to the development of harmful attitudes and policies that further hinder the social inclusion of people with disabilities in society. One clear example of this is when individuals with disabilities are habitually separated from their non-disabled peers, which is often unintentional. This unequal treatment only perpetuates the discrimination and exclusion faced by those with disabilities. According to a recent study, many individuals with disabilities who have pursued higher education have faced a common struggle: feeling socially isolated during exams. This is because these students often require extra assistance with writing and reading, separating them from their peers and having to transcribe their exams in a separate space (Stumbo, N.J. et al., 2011). The issue of limited access and support for individuals with disabilities extends beyond the educational setting and can be observed in all types of environments. This is especially evident in clinical settings, where people with disabilities often

encounter obstacles in obtaining proper healthcare treatments. Due to restrictions imposed by specialists, the frequency of important questions asked during examinations is often limited, leading to infrequent health maintenance and wellness checks for these individuals (Hamilton et al.; N., 2022). The failure to implement policies that cater to the needs of individuals with disabilities highlights the ongoing societal issue of their marginalized status. This invisibility and lack of consideration is also reflected in the inadequate healthcare assistance provided to this group. Tragically, women with disabilities are even more neglected when it comes to essential screenings for breast and cervical cancer due to the lack of proper communication from healthcare providers (Havercamp et al.; M., 2004). Further perpetuating the cycle of discrimination and neglect against those with disabilities. To ensure equal access to healthcare is given to those with disabilities, policy changes focused on the collaboration and training between people with disabilities and healthcare specialists must be implemented (Hamilton, N. et al., 2022). The transformation of society’s treatment of individuals with disabilities requires the elimination of policy barriers, encompassing both physical and attitudinal aspects, through positive reformation. This calls for proper training of experts in the creation of a barrier-free built environment where they are to be taught to understand the needs and challenges faced by those with physical and mental impairments.

Conclusion

The issue of environmental barriers presents a complex challenge for individuals with disabilities, as it hinders their full participation and engagement in society. It comprises various layers, influencing how individuals with disabilities are perceived and treated. Though it may appear primitively impossible to do, the negative factors that influence the livelihood of individuals with disabilities are susceptible to change. From physical barriers like inaccessible buildings and public spaces to attitudinal barriers such as discrimination and stigma, these hindrances are a result of policies and systems that disable rather than enable individuals with disabilities. Addressing and dismantling these barriers is crucial in promoting the inclusion and empowerment of people with disabilities in their environments. To break down these barriers, policymakers must initiate serious reformation. It is essential to recognize that disability and accessibility are not uniform concepts and vary significantly among those with disabilities. Therefore, effective policy reconstruction requires a thorough understanding of the challenges and advantages experienced by these groups of individuals within their environment. This can be achieved by actively listening to the perspectives of those with disabilities. The provision of accessible environments is crucial to ensuring the well-being and fundamental rights of individuals with disabilities. Such environments must be seen as a requirement rather than optional measurements. Regardless of their abilities, everyone deserves equal access to civil liberties. Likewise, it must be remembered that disability can affect anyone at any stage of life and should not be considered a fixed trait.

Environmental Wellness for those with Parkinson's Disease

Due to insufficient control over one's body, those with Parkinson's disease often face physical and mental difficulties when navigating through and around environments. The following section highlights various scholarly sources to help in understanding the conditions that affect the overall well-being of these groups of individuals and identify ways to prevent and reduce environmental risks and hazards that contribute to fall risk incidences.

Lawton's Ecological Theory on Aging

The Ecological Theory on Aging suggests that difficulty in navigation and environmental pressures on individuals increase with age (Nilsson et al., 2016, p.2). This is closely connected to those who exhibit a progressive chronic disease like Parkinson's, as its traits and aging are interlinked through the gradual loss of both the physical and mental abilities of a person. Lawton theorized that the decrease in independence caused by the relationship between physical environmental barriers and cognitive disabilities negatively influences one's perception of public and personal space (Nilsson et al., 2016, p.5), where individuals not only feel alienated within the environment but from their homes as well. The traits of aging, partnered with physical environmental barriers, not only challenge those with Parkinson's but can also be threatening to their well-being. It is theorized that the decrease in independence contributes to low self-efficacy and depression in individuals with Parkinson's (Nilsson et al., 2016, p.7). Lawton's Ecological Theory on Aging highlights the importance of creating spaces that enhance independence and self-perception through the minimization and prevention of negative attributions from both the traits of Parkinson's and physical environmental barriers.

2.0 Physical Interior Environmental Hazards

Neuman's Systems Theory

For those with Parkinson's Disease, maintaining physicality presents itself as a constant challenge brought by the traits of the disability and the surrounding environment. The Systems Theory theorized by Neuman is an example that links the traits of Parkinson's and environmental design to fall risks, suggesting that the perception of spaces is a combination of intrinsic and extrinsic factors (Wolf, E., 2012, p.10). Intrinsic factors are the traits of Parkinson's that pose a threat to the daily lives of individuals, ranging from the depletion of muscle controls to the intake of prescripted drugs. When combined with the complexity of navigating through environments, it can be hazardous to those with Parkinson's Disease. Whereas extrinsic factors are the physical hazards found within built environments that are threatening to those with disabilities as this can decrease confidence in individuals through the lack of control during near fall incidences while also causing fall-related injuries. For instance, a person with bradykinesia, a symptom that causes individuals to drag their feet rather than lift their legs during each step, can trip and fall when floor surfaces are uneven. This scenario is a simplified example of both factors working alongside one another and how this type of inattention to interior design is not ideal, as it threatens these individuals' safety and wellbeing. Understanding the risk of falls within environments ultimately involves exploring intrinsic and extrinsic factors. However, the two varieties of falls must be understood before further examination of these factors. Fall can be divided into two categories: the loss of balance that results in faltering to the ground and near fall, where one could catch oneself before landing on the ground (Ryan et al., K., 1993, p.3). Once understood, it can simplify designing accommodating spaces and potentially minimize fall-related injuries caused by hazardous and inaccessible environments.

2.0.1 Symptoms and Corresponding Physical Interior Environmental Hazards

The leading cause of injuries for those with Parkinson's Disease are falls associated with the characterization of the disability, such as postural swaying, shaking, impaired visual perceptions, short steps commonly known as shuffling gait, and sudden quickness in gait known as festination (Burleson, L. 1993, p.12). All of which are responsible for changing the way individuals with Parkinson's navigate and experience environments. Additionally, weak muscles, poor vision, decreased reflexes, hearing deficits, and the effects of drugs are other factors that increase the risk of falls in individuals (Ryan et al., 1993, p.2). Thus, designing environments unaccommodating of these traits heightens the risk of falls for those with Parkinson's as it cannot provide the proper support needed to prevent these incidences. Recent studies show that falls are the common cause of detrimental outcomes to those with disabilities, such as non-fatal injuries and are the second leading cause of death (Ryan et al., 1993, p.2). Environmental design focusing on minimizing risk and fall prevention not only benefits people with Parkinson's but also those depleted of both motor and non-motor functions that face similar ecological struggles. It is determined that the lack of considerate and accessible regulations decreases the self-efficacy of individuals with disabilities and increases the risk of fatal and non-fatal falls. This highlights the importance of upholding higher responsibility for designers to produce accessible environments that prevent user harm.

Shaking or Tremors

Shaking and tremors are common traits of Parkinson's that worsen over time and are among the leading causes of fall incidences for those with the disability (Hultquist et al., 2013, p.13). Burleson defines shakiness as the inability to control equilibrium that causes a forward incline of the body with the chin tucked inwards towards the chest (Burleson, L. 1993, p.16). The inability to maintain proper postural balance can be troublesome to those with Parkinson's as it heightens the risk of fall-related

injuries. Still, inadequate, and unsupportive environments hold responsibility for its occurrence. For those exhibiting tremors, navigating through confined spaces is a critical task that requires repositioning one's feet to stop and turn (Burleson, L. 1993, p.18). Other environmental factors are types of floor finishes, like smooth, glossy, and slippery surfaces that do not provide sufficient grip and support for those with tremors. Though flooring finishes may provide beneficial features, such as adequate durability, cleanliness, and resistance, its composition and overlay may be hazardous to those with disabilities. Finishes like glazed concrete and ceramic tiling must be avoided as these surfaces provide insufficient grip and can be slippery when wet (Winchip, S.M. 2011, p.144). Ideally, hard surfaces should not be used in spaces dedicated to those with tremors and shakiness, as they can increase the number of detrimental injuries to users who are susceptible to falling. Collapsing in solid surfaces has been found to cause severe bruising and bodily pain in individuals, with death being a grievous outcome (Burleson, L. 1993, p.30). Preventing fall injuries ultimately falls in using soft finishes that are slip-resistant, soft, and durable. Fortunately, most flooring companies offer affordable, high-quality soft surfaces that are widely used in many environments.

Irregularity in floor surfaces is another factor that contributes to fall-risk injuries, as uneven tiling, inadequate slip-resistance, loose carpets, and extruding seams are tripping hazards to those with disabilities and for those using mobility aids (Burleson, L. 1993, p.30). Preventing missteps from unlevelled surfaces falls under the responsibility of proper installation from contractors, who are expected to be vigilant in noticing irregular flooring and fixing these issues. Even surfaces ensure preventative measures for fall injuries and decrease the chances of mobility aids from being caught on loose surfaces (Hultquist et al., 2013, p.17).

Table 1: Flooring Design Hazards

Flooring Design Hazards	***Safety Risks***
Irregular flooring surfaces	Can be a tripping hazard
Uneven tiling	Can be a tripping hazard
Inadequate slip-resistance flooring	Most flooring are slippery and can cause slips and trips
Loose carpet and seams	Can be a tripping hazard due to unsuspecting floor movement
Glazed ceramic or tile flooring	Can be slippery when wet and cause severe injuries due to hardness

Shakiness and tremors are conditions found in Parkinson's that cannot be removed or minimized through treatment, making the risk of near-fall and fall incidents from these traits inevitable. However, proper environmental design can prevent these incidents from occurring.

Bradykinesia

Bradykinesia, a trait associated with muscle stiffening and restriction in movement, can be a daily struggle for individuals with Parkinson's. This condition often leads to dragging and sliding one's feet, making voluntary leg movement difficult (Hultquist et al., L., 2013, p.15). Like shakiness, bradykinesia increases the risk of tripping and falling, especially on irregular floor surfaces. In the environment, narrow corridors can induce frustration, as those with this trait often have a slower- than-normal walking pace (Burleson, L. 1993, p.19). To alleviate these challenges, vast and spacious walkways are recommended to ensure constant and uninterrupted traffic flow.

Likewise, those with bradykinesia experience sudden halting, as they are subdued to decide and force themselves to move their muscles, as those with this trait cannot operate their legs voluntarily (Hultquist et al., L., 2013, p.15). Providing sufficient environmental spaces certifies the ability of these individuals to maneuver their bodies without burdening others or subjecting themselves to fall risks.

Physical tasks such as sitting and rising are challenging for those with this trait; performing these activities can result in stumbling backwards, potentially causing severe damage (Burleson, L. 1993, p.27). Furniture consideration is essential in preventing these circumstances from transpiring, as furnishing containing assistive features can help those with Parkinson's achieve these tasks without fear of injury.

Although the traits of Parkinson's are all too complex, they are similar in how they affect a person's physical ability. When designing spaces, focusing on one trait of Parkinson's can inevitably minimize hazards for another.

Freezing or Halting

For those with Parkinson's, freezing and halting are common occurrences caused by various environmental factors such as obstruction, route changes, turning, floor changes, narrow walkways, and doorways (Hultquist et al., L., 2013, p.19). Like the previous traits, sudden halting can lead to fall-related incidents, especially when environments lack supportive design features to prevent falls from happening during an unexpected loss of balance. Environments with insufficient movable space, especially for hallways, cause slow traffic and frustration when an individual freezes in place, potentially leading to shoving and pushing from users. Cluttered spaces are another factor that causes freezing in individuals with Parkinson's, as obstructed passages cause distraction and disrupt one's concentration. The occurrence of this results in suddenly halting and readjusting one's focus before moving once again.

One of the most challenging aspects for individuals with Parkinson's is coping with unanticipated changes in walking direction. These unforeseen changes, often caused by confusing wayfinding and circulation, can lead to sudden halts. This results from the individual losing concentration over their movement and being subjected to tricking their bodies into moving again (Hultquist et al., L., 2013, p.19). Those with limited control over their movement often experience uncontrollable loss of balance, which leads to fall-related incidences, an everyday affair for those with Parkinson's exhibiting sudden halts. Providing design features with balance assistance can offer physical support that can help prevent fall risks and injuries (Gazibara et al., T., 2017, p.52).

Visual Acuity & Perception, and Eye Movement

Visual acuity, a non-motor symptom experienced by those with Parkinson's, significantly impacts their navigation and physical balance. The challenges are manifold, stemming from the misperception of visual cues such as distance, surrounding objects and people, and the inability to discern surface changes that make navigating through environments daunting (Burleson, L. 1993, p.28). The damage to the visual system caused by Parkinson's traits can turn interior spaces into potential hazards. Designers must understand and consider these challenges when creating physical spaces. For colours, comprehending monochromatic contours has been found to cause difficulty for those with Parkinson's, as these hues have been established to reduce colour visual perception in individuals. (Armstrong, R.A. 2011, p.2). When objects are placed in front of backgrounds that bear resemblance in colour, confusion can develop as comprehension becomes strenuous. Therefore, designers must ensure contrasting colours to minimize visual stress on those exhibiting visual acuity traits.

People with Parkinson's Disease experience difficulties in their visual perception due to traits such as nystagmus and convergence. These conditions impair an individual's vertical eye movement, resulting in difficulty perceiving vertical lines (Armstrong, R.A. 2011, p.3-4). In preventing falls for those with low visual acuity, using floor material with heavy vertical patterns is not recommended as it can cause navigation confusion and difficulty. This is particularly crucial in stairs, where heavy patterns can cause severe fall-related incidents. Those with low visual perception would be unable to grasp the change in floor heights due to the jarring floor pattern, leading to severe fall incidents— highlighting the importance of considering floor designs that prevent the risk of fall-related injuries.

Table 2: Symptoms and Corresponding Physical Interior Environmental Hazards Summary

Symptoms	***Author***	***Physical Impairments***	***Relation to Interior Design***
Shaking or Tremors	• Burleson, L., 1993 • Hultquist, A., & Corrow, L., 2013	• Uncontrollable motion, such as swaying and shakiness • Forward inclined body • Regular repositioning of the feet • Easily loss of balance when required to bend, reach, regular movement, standing, and when bumped	• Confined spaces pose as a threat as this would indicate one to reposition themselves potentially causing a loss in balance • Irregular floor surfaces such as, uneven tiling, inadequate slip-resistance flooring, loose carpet, and seam can become a trip hazard • Hard surfaces such as tiles and concrete can cause mild to severe injuries such as bruises and sprains during an uncontrollable fall • Glazed concrete and ceramic tiles can become dangerous slippery when wet • Tripping on obstructions found in the way of their directional movement may cause one to fall
Bradykinesia	• Burleson, L., 1993 • Hultquist, A., & Corrow, L., 2013	• Stiff muscles will result in difficulty picking up one's leg, thus succumbing to dragging their feet • Stiff muscles will result in a slower walking pace	• Narrow hallways may cause frustration due to slow moving rate of an individual • Narrow hallways may cause frustration due to sudden halt and may cause a clog in the passageway

Bradykinesia Continued	• Burleson, L., 1993 • Hultquist, A., & Corrow, L., 2013	• May cause a sudden halt in movement causing one to think about moving their muscles to move forward • Difficulty rising from a seated position and may cause one to fall backwards due to loss of balance	• Seating that are unsupported from the back may cause fall related injuries due to loss of balance when getting up from a seated position and eventually falling backwards
Freezing or Halting	• Hultquist, A., & Corrow, L., 2013	• Occurs when there is a sudden change of route and will create a difficulty in processing movement • Sudden halting in place will cause a loss of balance that may potentially lead to fall	• Sudden change of route such as:Turning harsh corners, change in flooring materials, narrow hallways, passing through doorways •Hard surfaces may cause severe injuries when a fall occurs
Visual Acuity & Perception, and Eye Movement	•Burleson, L., 1993 • Armstrong, R.A., 2011	• Affects navigation and physical balance • Misinterpretation of visual cues such as: distance to the ground, visual perception towards surrounding objects and people, and the inability to determine changes in ground surfaces from up ahead • Reduced colour perception making it difficult to comprehend monochromatic contours • Deficit in visuo-spatial orientation causes an impairment in vertical eye movement and not so much affecting horizontal eye movement	• Sudden change of route such as: Turning harsh corners, change in flooring materials, narrow hallways, passing through doorways •Hard surfaces may cause severe injuries when a fall occurs

2.0.2 Extrinsic Interior Design Related Physical Hazards

Interior design can pose challenges for individuals with disabilities, especially those with Parkinson's Disease. Environmental factors such as built structures and design elements can impact how people with disabilities interact with their surroundings. Whether it is a personal residence or commercial space, creating safe interiors that accommodate all users, regardless of their physical and mental abilities is crucial. Unfortunately, certain interior design features may increase the risk of falls and injuries for individuals with Parkinson's, as well as those with temporary or permanent disabilities and the elderly population.

Flooring

Individuals diagnosed with Parkinson's Disease often encounter difficulties and potential hazards when traversing through hard, grip-free, and lifted interior floor finishes. For those with mobility issues, comprehending sudden changes in floor materials can impede their ability to move and maintain balance without the risk of falling. Uneven floor surfaces, such as raised edges or loose carpet seams, can pose a tripping hazard and result in injuries (Burleson, L. 1993, p.30). Identifying uneven floor surfaces can prove challenging, leaving individuals vulnerable to interior design-related falls. Additionally, carpeting and rugs in spaces without a rubber backing can lead to slips and falls and even obstruct wheelchairs and mobility aid users (Burleson, L. 1993, p.30). Hard surfaces like porcelain, concrete, or ceramic can pose a significant risk for injuries in the event of a fall on non- carpeted grounds. Specifically in finishes with a non-slip-resistance coating that can become slippery when wet, which can cause bruising, sprains, and even death (Burleson, L. 1993, p.30). The sudden floor changes that follow a change in rooms can cause individuals with Parkinson's to halt or freeze in place. This results from losing focus in their movement, leading to the recollection and adjustments of muscles before continuing with their activity (Burleson, L. 1993, p.107-108). Preventing fall incidents, even minimizing fall-related injuries, solely relies on properly considering floor materials.

Stairs

Individuals who experience both mobility and perception impairments, like those with Parkinson's, may encounter obstacles while navigating a set of stairs. Ascending or descending a flight of stairs can be challenging for such individuals, for a deficit in visuo-perception results in a false judgement in the width and depth of stairs, causing miscalculation in steps and potentially leading to possible injuries (Burleson, L. 1993, p.31). Therefore, exploring alternative options that can ensure their safety and comfort is crucial. Various structural elements in staircases can be hazardous to those with Parkinson's, such as nosing overhangs. When overhangs project more than what is regulated, individuals may easily catch their toes, leading to a loss of balance that can cause detrimental results due to stumbling (Burleson, L. 1993, p.30). Another unique challenge caused by staircases is the misperception of the last steps. This is a common occurrence that is shared between those with or without a disability. Misinterpreting steps can lead to fall-related injuries due to stumbling (Burleson, L. 1993, p.31). Another design element that leads to fall incidents is coverings in staircases. Stairs with narrow tenders that are carpeted using heavy patterns can become an optical illusion for those with low visual perception (Burleson, L. 1993, p.31). Without the proper perception of individual steps, those with a deficit in depth perception may find it challenging to ascend or descend without risking fall. With an abundant issue that leads to injuries, staircases have become the leading cause of fall-related fears among those with Parkinson's (Ramos et al., 2020, p. 1303).

Staircases can pose a significant challenge for individuals with Parkinson's Disease and those with mobility conditions. Not only do they create mobility issues, but they can also be a safety hazard. To enhance the mobility, confidence, and security of individuals with Parkinson's, various solutions can be considered. Depending on the severity of the condition, mobility aids like canes and walkers may help improve the mobility and overall well-being of people with Parkinson's (Constantinescu et al., 2007, p.134). However, staircases less than 32 inches in width can create further difficulties for those using mobility aids and may make a cramped space for the passage of two individuals (USA Department of Justice, 2010, p.118). Those dependent on wheelchairs face a unique challenge when navigating staircases, resulting in its avoidance. As such, it is crucial to consider this population when designing buildings and public spaces. Taking preventative measures in the design of environments promotes safety and accessibility for all individuals, regardless of their mobility status.

Furniture

Potential tripping hazards can arise in interior spaces, particularly for those with movement disabilities. Furniture and other objects that protrude into these spaces can create challenging obstacles, and shallow objects that can be hard to perceive can contribute to increasing fall risks (Burleson, L. 1993, p.32-33). Therefore, it is essential to be aware of these risks and take steps to minimize them.

Furniture that is either extremely low or high with plush cushioning and those with inadequate arm and back support can make it challenging for individuals with Parkinson's to get up from a seated position (Burleson, L. 1993, p.32-33). Awareness of these furniture nuances can prevent falls for those with mobility conditions and ensure that proper support is given to enhance the ability of these individuals to perform simple tasks. Additionally, castors at the foot of furniture can lead to increased loss of balance and fall when reaching for support (Burleson, L. 1993, p.32-33). This is due to the tendency of the furniture to roll away, which can be particularly hazardous for individuals who require support. Additionally, furniture finishes can become dangerous to those with Parkinson's, and careful choice in materiality is as essential as the furniture itself. According to Carol Chiang, an occupational therapist for people with Parkinson's, some furniture finishes can increase the risk of falls in these individuals. Particularly the use of glass for coffee tables, as they can be hard to perceive by those with visual perception deficiency (Chiang, 2024). With this, although individuals are aware of the presence of the glass coffee table, it may be troublesome to denote how far or close the table may be, increasing the occurrence of tripping or bumping into it. Thus, furniture's materiality and finishes must be appropriately considered to avoid the potential risk of falls and injuries in and outside of homes.

Evidently, it is essential to present supportive solutions through the arrangement and choice of furniture that can minimize the risk of falls and near-fall incidents for those with Parkinson's. The lack of furniture consideration can lead to increased vulnerability for individuals, as various factors can impact one's balance, resulting in stumbling and falling. Being mindful of these considerations can significantly enhance the safety and well-being of people with Parkinson's.

Entrances

Doors are often overlooked in interior design, but they play a significant role in the lives of those with Parkinson's. Parkinson's causes a range of physical conditions, including trembling and shaking. These tremors can make simple daily tasks challenging, as uncontrollable shaking of the hands can make grasping a doorknob and inserting a key into a lock difficult (Burleson, L. 1993, p.109). Resulting in frustration and stress due to aptitude deprivation among these individuals. Minimizing these complications relies on using knobs that offer a sufficient surface for grasping, such as those with a handle, rather than circular doorknobs (Davis Phinney Foundation., 2019). On the occasion when levered knobs are not viable, gripped knobs are a practical solution. Designing environments for individuals with Parkinson's requires a deep analysis of design features that may get overlooked. Features such as a doorknob that challenges and causes difficulty in performing simple everyday tasks.

Due to the change in setting, entryways can create visual barriers for those with Parkinson's and cause sudden halts in readjustments (Burleson, L. 1993, p.110). Halting in place increases the possibility of fall incidents due to a sudden loss of balance. This is particularly dangerous, as it heightens the risk of injuries for those with Parkinson's. Analysis shows that narrow-width doorways provoke gait disturbance while opening with no doors tends to slow the speed of individuals (Cowie D. et al., 2012). A study on the effects of entryways on gait found that individuals tend to freeze due to movement hesitations and the action to double-step when approaching openings or are subjected to rotating their bodies (Cohen, R.G. et al., 2011). Doorways with insufficient room can cause difficulty in rotation and

can induce falls. When the width of the entryways cannot be adjusted, near falls and falls can be avoided if openings are equipped with handlebars that can be used as leverage.

Additionally, narrow entryways can cause blockage and make it difficult for two individuals to pass through. For those using assistive devices, such as a walker or a wheelchair, narrow openings can be restrictive (Burleson, L. 1993, p.109) and hinder them from entering rooms. Designing wide openings prevents blockage among individuals while allowing those with mobility aids to pass through. For those with Parkinson's Disease, entryways and door features can pose great difficulty. Understanding and addressing these challenges can help improve the quality of life for those affected by this condition.

Extrinsic Factors Found Within Rooms

Indoor environments, whether personal homes or commercial buildings, can harbour extrinsic hazards. Awareness of these hazards is essential in promoting safety and supportive environments for individuals with Parkinson's. Research revealed that a staggering 80% of in-home injuries caused by falls commonly occur in the living room, kitchen, bathrooms, and bedroom (Ramos, J. et al., 2020, p. 1306). This alarming proportion of individuals injuring themselves in a personal place underscores the urgent need to address the extrinsic factors in these interior environments. Doing so ensures that those with Parkinson's are not alienated in their homes.

Frequent falls have been commonly detected in bathrooms caused by smooth flooring surfaces like vinyl or tile, which become dangerous when wet (Burleson, L. 1993, p.32 & 114). Other factors like getting in and out of bathtubs and showers and difficulty sitting or standing on the toilet are additional hazards that lead to fall-related incidences. Those with Parkinson's tend to incline when standing from a seated position, which leads to fall injuries; this can be prevented by equipping high- seated toilets fitted with grab bars (Burleson, L. 1993, p.32). Adding assistive supports in the bathroom is essential in minimizing falls and ensuring mobility for people with disabilities. The addition of these supports further benefits wheelchair users as it provides them with the ability to transfer themselves from one chair to another without difficulty. However, for wheelchair users, a substantial amount of space is crucial as it gives them the necessary room for rotation and repositioning (Burleson, L. 1993, p.18). This can benefit those who experience gait and tremors, providing sufficient room to reposition themselves without worrying about falling. When it comes to bathroom design, various factors must be considered to prevent falls and challenges for those with Parkinson's.

Reaching above the head is challenging for individuals with Parkinson's. Kitchens equipped with counters and storage above a person's height can cause difficulty and potentially lead to a loss of balance (Burleson, L. 1993, p.112). Subsequently, performing tasks that require bending the knee or the back can lead to a forward incline of the body, causing one to stumble headfirst. It is crucial to consider the movement and activities being performed in kitchens by those with Parkinson's as it prevents injuries and difficulties from occurring.

In commercial environments, navigation can create frustration, confusion, and anxiety among individuals, especially in commercial buildings with insufficient or difficult wayfinding mechanisms. To avoid such circumstances, proper signage indicating the name of the room and the number, if applicable, and equipment labels should be visually apparent and tactile (U.S. Access Board, 2022). This ensures that the signage can be seen and used by individuals with or without visual deficiency. This is especially relevant in clinical environments, where the space is often used by individuals with varying abilities and disabilities. Ensuring that signage is properly seen can promote a supportive environment for all users. The Americans with Disabilities Act (ADA) indicated that for signage to be legible, its written text and mounting board should have a succinct colour contrast, such as light on dark or dark on light (U.S. Access Board, 2022). Doing so ensures that the signage is still legible for those with low visual acuity. Additionally, the placement of signage is another key importance of good wayfinding. When individuals can locate signages, this creates a sense of ease, ensuring users are aware of their location. The ADA states that tactile signage should be no less than 48" and no more than 60" if they are to be placed beside

or on doors and should have an 18" 18" clearance from the door, with overhang signs to be no more than 80" (U.S. Access Board, 2022). By doing so, individuals with low visual acuity can read the signage up close without worrying about swinging doors and potential injuries. Therefore, for public spaces to facilitate a support environment, one of many varying physical features that can be implemented is the addition of appropriate and sufficient signage.

Table 3: Extrinsic Interior Design Related Physical Hazards Summary

Extrinsic Factors	***Author***	***Physical Interior Hazards***
Flooring	• Burleson, L., 1993	• Sudden change in flooring causes difficulty for people with PD to comprehend, resulting in a sudden halt in place • Loose carpet seams and raised edges can be a potential trip hazard as most people diagnosed with PD would find difficulty in raising their legs, thus resulting in individuals in dragging their feet • Additionally, rugs with no rubber backing may cause one to slip and fall • Irregularities in floor surfaces may potentially be difficult to perceive • Wet floors with non-slip-resistance finishes may cause one to slip and fall • Hard surfaces can cause severe injuries if one were to suddenly lose balance and fall
Stairs	• Burleson, L., 1993 • Ramos, J., Duarte, G., Bouca-Machado, R., Fabbri, M., Mestre, T., Costa, J., Ramos, T., Ferreira, J., 2020	• People with visuo-perception deficit will create false judgement in the width and depth of stairs • Nosing overhang in risers may cause one to catch their toe while ascending, potentially causing a loss in balance • Stairs are the leading causes in fall related fears amongst individuals with PD • Narrow tendered staircases accompanied with carpeted covers can highly cause people with PD to have a loss of balance • Patterned carpets on staircases cause an optical illusion that are difficult to comprehend by individuals with PD due to a lack of depth perception • A common occurrence for people with PD results from a misperception on the last thread of the staircase
Furniture & Objects	• Burleson, L., 1993	• Furnitures and objects protruding towards traffic can become a tripping hazard as they may be difficult to perceive

Furniture & Objects Continued		• Extremely low or high designed chairs with plush support will cause difficulty for an individual with PD to rise from a seated position due to stiff muscles • Inadequate arm and back rest on furniture may not provide sufficient support and assistance in aiding individuals with stiff muscle to rise from a seated position • Caster wheels on furniture are a potential risk to people with PD as they may roll away when reached for causing a loss of balance
Doors & Entryways	• Burleson, L., 1993	• Operating doorknobs and the ability to insert a key to a lock can be difficult for individuals with PD due to their uncontrollable trembling • Narrow designed entryways cause difficulty for those living with assisted devices such as a walker or wheelchair • Entryways can be a visual barrier for people with PD which would cause one to halt in place in order 80% of fall related injuries occur in living rooms, bathrooms, kitchens, and bedrooms to comprehend the sudden change in nature
Rooms	• Ramos, J., Duarte, G., Bouca-Machado, R., Fabbri, M., Mestre, T., Costa, J., Ramos, T., Ferreira, J., 2020	• 80% of fall related injuries occur in living rooms, bathrooms, kitchens, and bedrooms
Bathrooms	• Burleson, L., 1993	• Smooth floorings such as tiles and vinyl will become slippery when wet • Low toilet fixtures with no grab bars can make rising difficult • Confined bathrooms make walking for individuals with PD difficult as they are required to frequently reposition their feet to turn and step
Kitchen	• Burleson, L., 1993	• People with PD will find difficulty in reaching counters and storages higher than their head

Wayfinding	• U.S Access Board., 2022	• Insufficient wayfinding can create distress for individuals, especially in areas they are not familiar with • If signage do not have proper colour contrast, this can be unintelligible for those with low visual acuity • When signage are not appropriately placed, this can cause difficulty for people with visual deficiency to read

2.0.3 Intrinsic & Extrinsic Physical Hazard Solutions

Parkinson's Disease is a neurodegenerative condition that presents unique challenges for individuals as they interact with their environment. Its associated traits, including uncontrollable shakiness, stiff muscles, freezing, and visual acuity problems, can increase the chances of fall-related injuries among those with Parkinson's. As such, interior spaces can pose a potential risk for these groups of people due to the extrinsic factors present. For those with Parkinson's, suppressing their traits is not a viable option. Thus, the ability to control fall incidents depends not on the individual but on the design of interior spaces. Therefore, mitigating the risk of falls within environments requires thoughtful and well-considered design approaches.

Floor Surfaces

Fall prevention and alleviation are crucial in interior spaces and can be accomplished through considerate materials. Various environmental variables are associated with the prevalence of falls, with floor surfaces substantially influencing the occurrence of falls and near-fall incidents. Falls can occur due to multiple causes, such as the state of an individual's physical and cognitive ability and ground conditions (National Safety Council, 2017); these factors testify that entirely preventing falls for those with Parkinson's cannot be achieved, though lessening the injuries induced, is attainable. For those susceptible to falling, soft surface materials such as carpets are perceived to mitigate the probability of losing balance and prevent severe injuries for individuals with a disability (Burleson, L. 1993, p.107 & 108). The soft textile provides considerate cushioning for individuals, lessening the likelihood of induced pain and injuries associated with a fall. For places that cannot be carpeted, such as bathrooms, slip-resistant rugs in areas prone to liquid spills are an excellent addition to mitigate the risk of slips and falls for those with physical disabilities (Burleson, L. 1993, p.116). Understandably, carpeting is not an option for all places, so alternative soft surfaces should be utilized in their place, providing a safety net for those with Parkinson's Disease. Soft and resilient flooring materials like cork, linoleum, and rubber can be acceptable substitutes. These materials are gentle on the foot and provide cushioning that minimizes the impact of falls (NYC Department for the Aging, 2017, p.9). Their resiliency and feel make them valuable additions to the range of flooring choices available for reducing fall-induced injuries. Therefore, when falls cannot be prevented, the practical approach is to use materials that reduce the affliction placed on the body.

Table 4: Appropriate Safe Flooring Material

Appropriate Flooring Material	***Positive Attributes***
Linoleum	Surface traction, durable, soft surface for landing
Cork	Soft surface, slip resistant (not recommended for wheelchairs)
Rubber	Slip resistant, absorbs impact, durable
Low-Pile Carpet	Slip resistant, durable, soft to land on

The visual characteristics of flooring surfaces can substantially impact the navigation and experience of individuals with depth perception issues, making it imperative to evaluate flooring patterns for the safety of those with Parkinson's Disease. Overly complex patterns have been shown to cause confusion and adverse effects on those with poor depth perception. Specifically, optical patterns incorporated in flooring can result in disorientation, posing a significant risk to the safety and well-being of individuals (Burleson, L. 1993, p.31). The comprehension of flooring has been found to impact the likelihood of falls, as users are increasingly prone to losing their balance in such an environment. Considering this, the design of spaces must prioritize user safety over aesthetic considerations. Despite this, multiple design considerations are beneficial for those with Parkinson's Disease. Large transverse lines have been found to act as visual cues and an effective therapy for those with locomotor concerns (Ramos, J. et al., 2020, p. 1309). These lines have effectively been found to cause muscle movement as they act as a focal point for individuals entering a new space. Ultimately, the key to reducing freezing is predictability. Expected floor changes allow individuals with Parkinson's to be able to adjust their bodies accordingly ahead of time (Hultquist, A. et al., 2013, p.19). It is recommended that meticulous

consideration for flooring surfaces should be implemented to ensure a seamless transition between surfaces. This approach has been found to prevent sudden abruptions in individuals as the transformation is anticipated.

Furthermore, lighting can significantly impact flooring surfaces and become stress-inducing due to its adverse effects. Surfaces near windows or areas with intense lighting can be blinding due to severe glare. Preferably, materials placed in these spaces should be matted to reduce surface glare and harsh light reflectance (Winchip, S.M., 2011, p.159). This makes spaces understandable and reduces visual stress on individuals. Additionally, colour in materiality selection cannot be overstated, particularly in cases where analogous hues in furniture and flooring may pose significant risks for individuals with limited visual perception (Armstrong, R.A. 2011, p.2). Distinguishable furniture within the environment has effectively reduced fall incidences in those with troubled visual perception as it mitigates the risk of tripping. Therefore, various applications and material considerations must be implemented in reducing the risk of fall-induced injuries in those with Parkinson's Disease.

Space Clearance

Individuals with mobility challenges often have difficulty moving through narrow and confined spaces. This is a particularly pressing issue for those with physical disabilities and those who rely on mobility aids such as wheelchairs. Due to insufficient space, 25% of 990 surveyed individuals have admitted to experiencing motor blocks in their homes (Ramos J. et al., 2020, p. 1307). Motor blocks caused by compact spaces restrict individuals from performing tasks like rotating or self-adjustments. Often leading to freezing. Broad and spacious rooms have been found to reduce the chances of freezing in individuals with Parkinson's while providing sufficient space for wheelchair users. An increase in square footage for commonly confined spaces, such as a washroom, can reduce the difficulty for individuals when they are subjected to repositioning their feet to turn (Burleson, L. 1993, p.18). For wheelchair users, washrooms are required to have a 67" turning circle (Ontario Building Code, 2018).

This allows for adequate space clearance for moving and rotating. Other confined spaces that challenge those with mobility conditions are stairwells. Generally, stairwells are avoided by those with mobility issues, as these compact spaces make it difficult for those with physical disabilities to undertake. When staircases are required, it is important to consider the overall dimension of this feature. The width and depth of stairs must be carefully assessed, as making them narrow, too high, or too low can be dangerous for individuals with disabilities and poor visual perception (Burleson, L. 1993, p.31). Detrimental issues, such as severe falls, can arise when staircases are not designed to be accessible. Given the challenges those with disabilities face when navigating through compact spaces, it is crucial to consider their spatial and environmental needs. Not only is it a matter of convenience for those with disabilities, but it can reduce the risk of freezing and fall risk in these individuals.

Handrails

Implementing supportive interior design is crucial in preventing falls for those with Parkinson's Disease. For people with disabilities, loss of balance is a leading cause of falls. This event often compels individuals to reach the nearest object to help control balance and mitigate fall-related injuries. In the environment, areas such as bathrooms have the highest concentration of fall incidents. Reducing this event relies on supportive design features such as diagonal, vertical, and horizontal mounted grab bars near toilets and in and out of tubs and showers (Burleson, L. 1993, p.114). Adding these features minimizes slips and reduces the probability of falls caused by loss of balance. Handrails are essential in bathrooms as they reduce the chances of fall incidents and aid in movement control.

Likewise, navigating environments can be challenging for most and may require additional physical support. As people vary in height, alleviating falls in places such as hallways, stairs, and ramps requires multiple levelled handrails on either side of the walls (NYC Department for the Aging, 2017, p.10). Doing so guarantees inclusivity for all types of disabilities and body types. The suggested heights for high handrails are to be between 34" and 38" above floor level, while low-level handrails should be at a maximum height of 27" (NYC Department for the Aging, 2017, p.10). Any heights below or surpassing the maximum required is not ideal as this generally causes arm strain on individuals. In addition, the handrails should be between 1 1⁄4" to 2" in diameter and composed of a slip-resistant surface (NYC Department for the Aging, 2017, p.10). Any wider than the recommended would cause discomfort and painful muscle lock in the hand. Thus, following the required dimensions ensures a painless, secure grip for those with Parkinson's Disease. Additionally, handrails placed on stairs should extend up to one foot at the top and bottom of the stairs (NYC Department for the Aging, 2017, p.10). Allowing for expanded support for individuals before and after ascending and descending. Handrails for those with Parkinson's are crucial. Not only does it offer additional support and lessen injuries, but it also plays a vital role in independence.

In Home Features and Elements

The design elements for various rooms within residential and commercial spaces can be problematic for those with limited arm reach. It has been observed that most people with Parkinson's live with the traits of Hypokinesia, a condition characterized as having a reduction in amplitude that results in minimal reach span in individuals (Fasano A. et al., 2022). For many, the placement of design features in kitchens and bathrooms and the location of certain electrical fixtures can be challenging to reach and often can result in fall risks. Out-of-reach interior design elements frequently lead to an overextension of the arm, resulting in a forward inclination of the body. This event will be followed by stumbling and, ultimately, a fall. Thus, implementing attentive interior design can mitigate the chances of fall incidents.

Kitchen design in residential homes can be challenging for those with Hypokinesia, as cabinets are often placed too high or too low for a person's reach. This can be made accessible by placing cabinets within a reasonable arm's length. This entails placing high cabinets no taller than a person's head (Burleson, L. 1993, p.112), as any higher can impose great difficulty for individuals and may result in avoiding using these features. Additionally, bottom cabinets that require bending of the back or knee can not only be physically taxing on those with Parkinson's but can also be dangerous. Alleviating back strains caused by excessive bending requires equipping bottom drawers with D-type hardware (NYC Department for the Aging, 2017, p.33), allowing easy, tension-free access to these elements. Regardless of these design guidelines, falls among those with Parkinson's are inevitable, and additional safety measures should be implemented. The subconscious reaction to reach for the nearest object for balance control can often lead to unsafe situations. Grasping on unsecured furniture or objects can result in these elements plummeting onto the ground or person. This event can be prevented in kitchens by placing anti-tip brackets on the back of heavy appliances (NYC Department for the Aging, 2017, p.33), ensuring its stability during a sudden fall incident. Implementing supportive design features in kitchens supports mitigating adverse events in individuals with Parkinson's disease.

As previously noted, the probability of falls in bathrooms is significantly high as various interior design variables can pose challenges to those with Parkinson's Disease. Simple tasks such as sitting and standing can become insurmountable, mainly when using water closets, as most seat heights may not be suitable for individuals with Parkinson's. Toilets with a height of 15" have been discovered to cause difficulty in seating and standing (Burleson, L. 1993, p.115), as individuals are forced to bend their knees at an angle that can lead to stumbling. Falls and injuries caused by water closets can be mitigated by providing bathrooms with raised seats. Particularly those with a seat height between 17"-19" (NYC Department for the Aging, 2017, p.32). Any higher would subject individuals to forcibly elevate themselves, which can lead to a fall. Additionally, it is imperative to consider other interior features within bathrooms. Among these, the design of sinks is particularly crucial. For those who use wheelchairs, the lack of under-clearance can hinder individuals from accessing the sinks and cause difficulty in reaching them. According to the Ontario Building Code, the top of lavatories should be no more than 33" above the floor finish, with a 29" height at the front edge, a width of 36" and a depth of 20" for proper clearance (Ontario Building Code., 2018). This ensures that sinks are accessible to those in wheelchairs. Other notable features that should be implemented are lever-type or automatic faucets

mounted on the back centre of the basin and no more than 23" away from the front edge of the vanity (Ontario Building Code., 2018). Doing so allows individuals to reach the faucet without over-taxing their physical capabilities. As there is a higher probability of falls occurring in bathrooms, it is critical to implement supportive design features approved by the America's Disabilities Act (ADA), as this can reduce the risk of falls in individuals with Parkinson's.

Within environments, it is imperative to consider the supplementary elements that contribute to the space's functionality. In this regard, the height of controls and receptacles should be considered. For those with a limited reach span, the placements of these elements can be challenging to access. According to the American National Standards Institute (ANSI), accessible outlets and controls should be mounted between the ranges of 15" for lower receptacles and 48" for switches above the finish floor level (Barrier Free Environments, Inc., 1998). This allows individuals in wheelchairs with limited reach to access these elements without obstruction and difficulty while also benefitting those with Parkinson's Disease who have restricted physical abilities. Additionally, the placement of these elements within a room is crucial to its accessibility. For ease of use and visibility, light controls should be placed opposite the door hinge (Burleson, 1993), as placing them on the same side obstructs individuals from accessing them. Moreover, rocker, toggle, and touch-sensitive switches are advantageous for those with limited hand strength and dexterity (Barrier Free Environments, Inc., 1998). The ease of operation these switches provide allows for simple activation without complex motion. When developing accessible environments, it is vital to consider the interior features of environments and abilities linked with Parkinson's and other disabilities, as this ensures the inclusivity of all individuals by facilitating their access to the various elements.

Furniture

Furniture plays a crucial role in helping with Parkinson's Disease. Those with the condition often rely on furniture to alleviate its traits and for physical support. When modified appropriately, specific

furniture has been observed to foster independence in those with Parkinson's by providing physical reinforcement. Straight-back and automatic lift chairs equipped with arms have been found to assist those with Parkinson's as they ease the mounting process (Burleson, L. 1993, p.111). These furniture types further reduce the chances of falls because they allow individuals to regain their sense of balance by offering a secondary point of contact during a fall incident. Furthermore, furniture with adjustable mechanisms, such as raised beds, seats, and lift chairs, has fostered a sense of security and safety in those with Parkinson's while ultimately playing a vital part in improving the mobility functions of these individuals (Ramos, J. et al., 2020). When furniture is chosen accordingly, it can improve the livelihood of individuals with physical disabilities, providing them comfort and stability. However, certain pieces of furniture still require further modification to be accessible. For sofas and chairs that are commercially made, accessible features are not a viable option. Often, these soft seats are lower and deeper and can particularly be challenging for those with Parkinson's. For sofas and chairs to be accessible, they should possess a depth of no more than 18" and a seat height no lower than 15" (Burleson, L. 1993, p.113). This measurement can also be achieved through simple reformation. Adding pillows on the back and seat of chairs can increase the seat height while decreasing its depth.
Doing so reduces the physical tax on a person when ascending and descending from a seat.

Another notable piece of furniture that should be considered is a table for varying activities. The height of the tables is critical as it provides additional assistance for those with mobility issues. Standard dining tables ranging from 28" to 34" above floor level height are suitable for those in wheelchairs as they provide a minimum 27" knee clearance (NYC Department for the Aging, 2017, p.16). The height is particularly considerable as it acts as a secondary surface that can be used for mounting support. When choosing furniture, it is essentially vital to consider its influence on those with disabilities. Providing accessible furniture in environments ensures that those with physical disabilities, such as Parkinson's, would have the proper support necessary to foster independence while reducing the risk of falls.

Table 5: Intrinsic & Extrinsic Physical Hazard Solutions Summary

Intrinsic & Extrinsic Interior Factors	Author	Physical Interior Hazard Solutions
Materiality	• Burleson, L., 1993 • Ramos, J., Duarte, G., Bouca-Machado, R., Fabbri, M., Mestre, T., Costa, J., Ramos, T., Ferreira, J., 2020 • Hultquist, A., & Corrow, L., 2013 • Armstrong, R.A., 2011 • NYC Department for the Aging, 2017	• Soft materials, such as carpets give the perception of safety as they are seen to minimize the ability to lose balance in people with PD • Small area rugs with slip resistant backings decreases the possibility of a surface becoming slippery when wet • Floor patterns that incorporate visual cues, such as large transverse rectangular lines will benefit those who experience freezing and is an effective locomotor therapy for individuals with Parkinson's • Change in floor patterns must be thoroughly considered and must be seen from far ahead • Colours of objects must not be like its corresponding floor and wall as this may pose as a danger to those with a lack of visual perception • Soft and resilient flooring materials such as cork, linoleum, and rubber can be used as a substitute to carpet
Spaces	• Burleson, L., 1993 • Ramos, J., Duarte, G., Bouca-Machado, R., Fabbri, M., Mestre, T., Costa, J., Ramos, T., Ferreira, J., 2020 • NYC Department for the Aging, 2017	• Wide open spaces are effective in aiding in the navigation of spaces for people with mobility constraints • Wide hallways in high traffic areas decreases potential freezing in PD patients • Large square footage in bathrooms and other confined spaces decreases difficulty in turning amongst individuals with PD • Width and height of stairs should not be too high and low, as well as narrow as this pose as a danger to those with a depletion in visual perception • Hallways, stairs, and ramps shall be enforced with both low and high handrails on either side to prevent fall in occurring in individuals of varying heights
Bathrooms	• Burleson, L., 1993	• Diagonal, vertical and horizontal mounted grab bars located at the sides of toilets as well as inside and outside of showers and tubs aid individuals in rising from a seated position as well as getting out of the tub

Bathrooms Continued		• Raised water closet that those do not contain the average 15” seat height has been found to benefit those with PD
Kitchen	• Burleson, L., 1993	• Upper storage in kitchens should be no higher than a person’s head height • Light switches should be located on the opposite side of a door’s hinge, as well as located lower that 53” off the floor
Furnishing	• Burleson, L., 1993 • NYC Department for the Aging, 2017	• Built in arm rest on chairs aid individuals with PD from rising without difficulty • Pillows placed on the back and seat of a sofas will aid in heighten the height of chairs • Height of tables should be between 28”-34” with a minimum knew clearance of 27” and a 30”-48” floor space clearing to accommodate individuals using mobility devices such as a wheelchair

2.0.4 Physical Hazards Summary of Solutions

The traits exhibited by those with Parkinson’s and the interior environment influence one another in how individuals experience and interact with their surroundings. Lawton’s theory on aging looked at the similarities between the traits that come with old age and those with Parkinson’s, as both subjects are individuals with an increased risk of falls due to their condition. In Parkinson’s, traits such as tremors, bradykinesia, and poor visual acuity often lead to disability that significantly impacts the quality of life of these individuals—however, the potential for preventing these events from happening lies in the influence of interior design. By understanding the connection between the two, as Neuman’s Systems Theory highlighted, we can separate the factors into their categories: intrinsic, the traits, and extrinsic, the physical environment. This not only enhances our understanding of the effects of the characteristics and the environment on individuals with Parkinson’s but also shows how its adverse influence can be minimized through interior design.

Minimizing the physical hazards within environments requires considering a person’s mobile struggles and their corresponding interior design implications. For instance, those with Parkinson’s who exhibit tremors, bradykinesia, and freezing are susceptible to an increased likelihood of losing balance. When these concerns are addressed, there is an understanding that injuries caused by the event can be mitigated through carefully chosen flooring surfaces, among other interior design features. Thus, understanding the effects of these traits and how they trigger the risk of falls can help prevent it—underscoring the importance of carefully designed spaces supporting those with Parkinson’s.

2.1 Mental Interior Environmental Hazards

Ulrich's Theory on Supportive Design & Theory on Positive Distraction in Physical Environments

Those living with Parkinson's frequently face mental challenges due to intrinsic and extrinsic stressors that can pose significant obstacles to the rehabilitation process of individuals with disabilities and impairments. These stressors found within the environment have been shown to diminish one's perception of self-control. Physical-social environments that produce high noise and light levels and those with limited privacy have been linked to providing little to no social support for individuals with Parkinson's Disease (Ulrich, S. 2000, p.98). These factors within a healthcare setting can create a discouraging environment that prevents individuals from accessing necessary care.

Ulrich's Theory of Supportive Design states that healthcare environments should provide individuals with social support and interior features that enhance healing (Ulrich, S. 2000, p.99) – underscoring the importance of physical environments being designed to respect an individual's ability to maintain control over their surroundings while promoting additional wellness necessary for those living with this condition. Ulrich's theory suggests incorporating Positive Distractions to create an enriching environment. Using elemental features that elicit positive physical and psychological responses in patients, staff, and other facility users – that, when executed correctly, can maintain their interest and attention without overtaxing their mental capacity (Ulrich, S. 2000, p.99).

Individuals diagnosed with Parkinson's Disease often struggle with feelings of helplessness and loss of control over their lives. Thus, controlling external factors and interacting with others through social support is critical in regaining control. However, interior spaces can pose various mental hazards that, when combined with the traits of Parkinson's, can significantly impact an individual's overall well-being. Therefore, it is paramount to thoughtfully consider interior design choices, as they have the potential to either support or hinder the mental wellness of individuals diagnosed with Parkinson's.

2.1.1 Interior Design Factors That Posses as A Mental Hazard

Environments influence individuals in ways that can be supportive or detrimental. Research has indicated that inadequate consideration of the overall design of environmental spaces can negatively impact the psychological well-being of individuals with Parkinson's Disease, as unsupportive design elements can contradict the process of healing (Ulrich, S, 2000, p.97). Unsupportive design can stem from various factors, including the traits of the disorder and the environment itself. When both factors converge, it can result in significant mental stress for those with Parkinson's.

According to Ulrich's theory, individuals with health conditions are exposed to two stressors: the characteristics of the condition and the physical-social environment, where stressors found within environments can create a sense of helplessness that may heighten anxiety and depression in individuals (Ulrich, S, 2000, p.98). Additionally, the characteristics associated with Parkinson's and a deficiency of design considerations within interior environments can impede individuals from comprehending their surroundings. This, in turn, can lead to a lack of control, further heightening the psychological stress experienced by these individuals.

Noise

Parkinson's disease is a neurodegenerative condition with various complex traits which influence the way individuals live and experience their environment. Those with Parkinson's often experience difficulties with concentration and memory retention, which can be exacerbated by the design of interior spaces (Hultquist A. et al., 2013, p.21). Overstimulation caused by the environment has been shown to cause significant stress on those with Parkinson's. As for those with this condition, the ability to concentrate is an essential element in controlling their mental and physical abilities. That, when interrupted, can lead to an episode of freezing, which increases the risk of fall incidents due to loss of balance. Excessive noise levels, often present in healthcare facilities, can be particularly disruptive for individuals with Parkinson's (Hultquist A. et al., 2013, p.23), as this can cause significant disturbance in the ability to organize their thoughts and focus on current activities. Unwarranted noise levels not only affect the concentration of those with Parkinson's but can also influence their ability to speak with clarity. Speech hesitation is a common characteristic of those with Parkinson's (Burleson, L., 1993, p.20), with excessive environmental noises influencing its aptitude. Spaces that extrude a significant amount of unwanted noise commonly decrease the voice volume of those with Parkinson's, making it difficult to articulate thoughts and concerns in a manner that can be understood. This can lead to an increase in miscommunication or missed information. Therefore, designing environments that cause minimal noise interference from unwarranted sounds is essential, especially in a setting dedicated to those with substantial noise sensitivity.

Unwarranted sounds have been found to have a negative effect on the psychological well-being of individuals and can pose a threat to one's health. A deficiency in noise minimization or cancellation within environments can cause emotional exhaustion, annoyance, increased blood pressure, and sleep deprivation in individuals (Iyendo T. et al., 2016, p. 179). For those with Parkinson's, these factors can harm their well-being and rehabilitation while additionally affecting those providing them with necessary care. Emotional exhaustion caused by sensory overstimulation can lead to a loss of interest in activities among several physical non-environmental variables; for those with Parkinson's, this can be a loss of enthusiasm for activities and, for healthcare providers, a deficiency in delivering essential care. To prevent these events, the World Health Organization (WHO) recommended that sound levels in healthcare facilities should not exceed Leq 35 dB (A) during the daytime and Leq 30 dB (A) to a maximum of Lmax 40 dB (A) during the night (De Lima Andrade E. et al., 2021, p.12). This ensures that individuals are subjected to as minimal noise disturbance as possible to function efficiently.

When environments lack sufficient noise-cancellation features, unwarranted noises emanating from various sources can transcend through layers of physical barriers. This causes sensory overload while also minimizing speech privacy. Noises can particularly become stressful when they cannot be controlled. This can imply overhearing sounds coming from the room next door or the fear of private

matters being overheard by unintended listeners (Ulrich, S., 2000, p.100). When confidential information is regularly transmitted between patients and healthcare providers, environments must be designed to safeguard privacy and maintain confidentiality. Additionally, research shows that unintelligible information heard by unintended listeners can evoke similarity to speech privacy and be deemed acceptable to a degree by most individuals (Sato H. et al., 2017). In scenarios where absolute noise privacy cannot be attained, reducing the intelligibility of conversations between spaces to an incomprehensible extent is a plausible alternative. When conversations cannot be understandable, it safeguards classified information from being known by other individuals. However, it is imperative that the overall objective is to ensure speech privacy and the prevention of unwanted noise.

Lighting

The lack of consideration for lighting can be as critical as sound in causing sensory overstimulation in individuals with Parkinson's Disease. Inadequate lighting in spaces has been found to cause adverse psychological effects and an increased risk of falls for those with Parkinson's. Over time, those with this condition increasingly become susceptible to visual impairments. Many possess traits such as decreased visual acuity, pupil reactivity, eye movement, perception, and visual sensitivity (Armstrong, R.A., 2011. P.1). Navigating through environments already poses difficulties for those with visual disabilities; however, when these spaces are equipped with inadequate lighting, the chances of disastrous events from occurring increases. Research shows that the chances of falls for those with visual challenges commonly occur in dimly lit places (Hultquist A. et al., 2013, p.39). This is due to the inability to comprehend their surroundings, which leads to confusion and loss of balance. As it is already challenging for those without visual impairments to navigate through dim environments, envision how it must be for those with optic disabilities. Adequate natural or artificial lighting is essential for interior spaces as it can influence an individual's physical and mental experience.

However, overstimulation and stress can occur when lighting conditions are unsuitable, causing mental hazards for those with visual problems. Intense lighting from primary sources, such as sunlight through a window or reflected light, can cause glare and impede individuals' vision (Burleson, L., 1993, p.32); this exposure to an extreme concentration of light can create an unsafe environment for those with Parkinson's, mainly as it minimizes the ability to comprehend environments. Inadequate lighting can also make certain written elements illegible and prevent information from being properly delivered or identified. Thus underscoring the importance of lighting in environments and finding the balance between inappropriate and appropriate lighting conditions. Lighting for those with Parkinson's is more for safety than just visual presentation. Creating a safe environment for individuals with Parkinson's Disease is a crucial aspect of their care and the influence that lighting has played a significant role in this matter.

Obstructive Design

Obstructive design in interior spaces, particularly in healthcare settings, can negatively influence the creation of a healing environment. A study on the therapeutic impact of design in clinical environments has revealed that obstructive designs can result in a deprivation of privacy, isolation from nature, overly stimulating spaces, and confusing wayfinding (Iyendo et al., 2016, p.181). This can cause individuals to be deprived of accessing necessary resources and means that can aid in their welfare. Individuals who are exposed to obstructive environments may feel a sense of alienation, leading to increased stress. Findings suggest that individuals with Parkinson's and those with disabilities who are denied access to social support are likely to experience excessive stress and low levels of physical and psychological wellness (Ulrich, 2000, p.101). The conditions of Parkinson's are taxing on an individual. Thus, social support is crucial to their well-being, allowing them to engage in society and gain motivation. Within interior environments, there are design features that can hinder the socialization of individuals. According to studies, seats along walls or placed beside each other and having heavy, immovable furniture can reduce social interactions (Ulrich, 2000, p.101). This is because individuals are subjected to moving themselves

and furniture accordingly to interact with one another. For those with Parkinson's, this can be a daunting and challenging task and can lead to the avoidance of socially interacting with others. This can also pose a hazard, as attempting to lift heavy objects can increase the likelihood of falls. Thus, not only can obstructive design hinder those with Parkinson's from accessing social support, but it can also lead to fall-related events.

Access to environmental stimuli has been shown to be beneficial for the well-being of those with Parkinson's Disease, specifically views of nature, which have been proven to reduce stress and improve healing in individuals. Nature, in essence, provides a calm and serene atmosphere, with abundant studies proving its conviction. Research reveals that exposure to nature, whether real or artificial, positively impacts individuals due to its meditative ability to minimize stress (Beukeboom C.J. et al., 2012). When stress is decreased, the likelihood of healing increases. However, an environment that prevents views of nature has been shown to cause adverse effects on individuals. Studies indicate that inappropriately low environmental stimuli and sensory deprivation, such as a lack of natural view and windowless rooms, can lead to boredom, depression, increased stress and anxiety levels, as well as heightened psychosis and delirium (Ulrich, 2000, p.102). In healthcare settings, patients not exposed to environmental stimuli have a lower efficacy of recovery; this can be due to heightened stress caused by their surroundings. Integrating environmental stimuli, such as views of nature, is crucial in the recovery and healing process for individuals with medical conditions. For healthcare environments, ensuring that natural views are not obstructed or are integrated into spaces is fundamental to the well- being of individuals.

Table 6: Interior Design Problems That Posses as A Mental Hazard Summary

Interior Design Problems	Author	Corresponding Mental Hazard
Noise	• Burleson, L., 1993 • Iyendo, T., Uwajeh, P., Ikenna, E., 2016 • Ulrich, S., 2000	• Noise disturbance may cause distraction in those with PD and will potentially create a difficulty in getting back in track • Individuals with PD who experience speech delay may have a decrease in vocal volume and may be hard to hear in loud settings • Negative noises from unwelcome sounds are associated to sleep disturbance, emotional exhaustion, annoyance, an increase in blood pressure, as well as other negative side effects • Lack of control over sound level and music option are perceived as stressful noise
Lighting	• Burleson, L., 1993 • Hultquist, A., & Corrow, L., 2013 • Armstrong, R.A., 2011	• Inadequate lighting cause negative psychological effects as well as pose as a danger to those living with PD • Dimly lit spaces can increase fall risks in individuals with visual problems • Unsuitable and inadequate direct lighting may pose as a mental hazard for those with visual impairments • Intense lighting coming from a primary source may cause an environment to feel unsafe to the glare it produces
Unsupportive Design	• Iyendo, T., Uwajeh, P., Ikenna, E., 2016 • Ulrich, S., 2000	• Unsupportive environments deplete the ability to create a healing environments • Unsupportive environments in interior design exhibits a deprivation in privacy, isolation from nature, over stimulated spaces, complicated wayfinding • Low amount of access to clinical supports have been known to increase stress in individuals • Seating that run alongside walls and unmovable side by side chairs reduce user interactions • Inappropriate number of environmental stimulations and sensory deprivation produces boredom, heightened stress, and anxiety as well as an increase in psychosis and delirium

2.1.2 Interior Design Mental Hazard Solutions

Interior spaces emitting severely low or high levels of stimuli can create an unsupportive environmental setting that can induce psychological stressors for individuals with Parkinson's Disease. Respectively, healing environments, mainly designed for those with Parkinson's, play a critical role in the mental and physical well-being of these individuals. When environmental stressors are minimized, this can enable those with Parkinson's to regain management over their lives. This control over physical-social surroundings can inevitably decrease anxiety and stress, as well as elevate their ability to heal.

Lighting

Extensive research has been conducted on the therapeutic impacts of interior design in healthcare settings. One of these is the influence that lighting has on the wellness and recovery of those with medical conditions. Studies found that optimizing natural lighting and views in recovery rooms will positively impact patients' rehabilitation and recovery while increasing staff productivity (Iyendo T. et al., 2016, p.177). This is caused by the meditative qualities that natural elements exude and their ability to decrease stress. For patients, reducing stress allows for a positive outlook on their conditions, leading to increased motivation for healing. Additionally, reduced stress in staff creates unwavering attention to patient care and practical work efficacy. Various lighting solutions can improve patient welfare; however, the advantages of natural lighting are unparalleled. The use of natural daylight in healthcare facilities has been shown to create an enjoyable indoor environment, as it enhances user comfort, attention, and mood, helping in the reduction of fatigue, anxiety, and stress (Iyendo T. et al., 2016, p.177-178). However, artificial lighting is an alternative solution when spaces lack environmental views and stimuli. This lighting, when integrated inadequately, can negatively impact individuals. Excessive artificial lighting in interior settings can negatively affect patients' healing process, while dimly lit spaces have been found to affect users negatively. For healthcare facilities, it is recommended that a minimum of 60-watt equivalent lamps be used (Burleson, L. 1993, p.108), as this is sufficient for illuminating large spaces.

This is particularly relevant in high-task areas, ensuring users can effectively perform and comprehend their tasks. However, when there is inadequate lighting in these spaces, increasing the number of light fixtures to an appropriate amount should suffice (Burleson, L. 1993, p.108). However, it is imperative to be mindful of the number of light fixtures being added into spaces, as too much can cause eye strain, glare and mental stress in individuals

The amount, position and hierarchy of lighting can influence an environment's atmosphere, which is vital in how users perceive the space. For most people, healthcare facilities evoke a dreary, sterile and uninviting sense, which the distribution of lamp fixtures among other environmental factors can cause. It has been studied that most users find high-positioned and uniformly lit environments to feel overly institutional while conversely finding non-uniform, low-positioned lighting to be desirable (Mathiasen, N. et al., 2024). When clinical spaces feel too institutionalized, this can cause unnecessary fear and stress for users. As mentioned, these emotions can be minimized by adding natural lighting throughout the spaces. It is imperative to understand that while artificial lighting is easily accessible and, for the most part, essential, it should not surpass the importance of using daylighting when necessary and possible. Using daylighting has been shown to have a positive effect on individuals and influence how environments are to be perceived. It has been revealed that an adequate amount of natural light can lead to a reduction in fatigue and blood pressure, an increase in protein metabolism, and the release of endorphins (Iyendo T. et al., 2016, p.178). These positive effects contribute to emotional wellness, crucial to patients' recovery and rehabilitation and workers' efficiency. Thus, lighting is imperative in attributing to the welfare of individuals and should be highly considered within environments.

Sound

Sound has been proven to evoke therapeutic qualities in environments. However, excessive unwarranted sound produces the opposite reaction. In hospitals, sound plays a vital role in individuals' wellness and can aid in minimizing stressors associated with their condition and the environment.

Studies have shown that incorporating pleasant sounds like falling water, birds, and melodious music can mitigate physical and psychological stress among individuals while promoting relaxation and reducing tension (Iyendo T. et al., 2016, p.179). Reducing stress levels has been proven to decrease patients' recovery time while creating a positive overall outlook. Thus, implementing controlled therapeutic sounds in clinical spaces is essential for the well-being of individuals. Controlling sound output is particularly important for those with Parkinson's, as excessive, uncontrollable sound can create distractions. It is known that those with Parkinson's require a high amount of concentration to control their motor function. Thus, minimal and controlled noise levels are recommended to maximize concentration in individuals with Parkinson's Disease (Hultquist et al., L., 2013, p.32), as uncontrolled sound levels can cause a disturbance in concentration, leading to a loss of balance and the risk of a fall. This underscores the importance of incorporating sound controls in clinical private care rooms that can be adjusted according to individual needs.

The exchange of confidential matters between healthcare aids and patients is typical within clinical settings. It is imperative that classified information is kept private and away from unwanted listeners. Sound masking is a valuable technique in reducing unwanted noises and is another layer of protection for speech privacy. Following the concept of Source-Path-Receiver, where sound emission is controlled at its source, muffled along its path, and ultimately managed at the location where it is being received (Lang W.W. et al., 2007). It is aimed to incorporate non-intrusive additions in interior spaces often associated with ambient sounds. Effective use of sound masking requires a level of 45dBA, with a maximum allowance of 48dBA; anything beyond that will cause a substantial amount of annoyance and negate speech privacy (Bradley J.S. et al., 2004). Minimizing sound transmission can be done through increased sound absorption of materials. The value at which a material absorbs sound is denoted by its absorption coefficient (AC). This is the ratio of sound energy absorbed by surface materials and is graded on a range of 0 (total reflection) to 1.0 (total absorption); this helps to determine the suitability factor of surface materials in each environment (Binggeli, C., 2016, p.113). It is important to note that certain materials are more absorbent than others. Conversely, others are highly reflective. Knowing which materials can be used in clinical settings can be beneficial in minimizing sound annoyance and maximizing speech privacy. In this case, soft and porous materials such as wood, textiles, and most furnishings effectively absorb sound energy; in contrast, smooth, dense surfaces like painted walls and concrete absorb minimal sound energy (Binggeli, C., 2016, p.113). Dense surfaces have been found to reflect sound outwards and can be problematic in clinical settings as this reduces speech privacy and heightens sound annoyance. When smooth and dense surfaces are implemented in interior environments, sound can be minimized by other means, such as padded carpets and thick draperies that can easily be maintained and absorb sound effectively (Binggeli, C., 2016, p.113). However, when necessary and possible, the most effective solution for minimizing sound is using appropriate surface materials with an absorption coefficient ratio closer to 1.0.

Controlling the amount of noise and background sound level within environments is essential in minimizing mental stressors in individuals, specifically for those with Parkinson's Disease who are dependent on maximum concentration to control their motor function. For those with this condition, loud sounds can cause an inability to concentrate and speech hesitation. Thus, it is crucial to incorporate sound masking and appropriate sound-absorbing materials to create a therapeutic environment for these individuals.

Table 7: Absorption Coefficient of Materials Referenced from Binggeli, C., 2016, p.113)

Appropriate Surface Material	*250Hz*	*500Hz*	*1000Hz*	*2000Hz*
Acoustic tile	0.15 - 0.95	0.35 - 0.95	0.45 - 0.99	0.45 - 0.99
Thick carpet on concrete floor	0.06	0.14	0.37	0.60
Think carpet with padding	0.26	0.48	0.52	0.60
Gypsum board	0.10	0.05	0.04	0.07
Upholstered seat (in use)	0.74	0.88	0.96	0.93
Upholstered seat (unoccupied)	0.66	0.80	0.88	0.82
Thick draperies	0.35	0.55	0.72	0.70

Supportive Design

The supportive design approach upholds the need to use interior design to allow individuals to gain control of their environment. This has been shown to reduce the psychological stress on individuals, which is imperative to their well-being. Supportive design can also provide opportunities for social support and positive environmental stimuli. Research has revealed that access to visual and physical privacy, gardens, controllable electronic devices, and temperature regulation are instrumental in reducing stress, particularly for hemodialysis individuals (Ulrich, 2000, p. 100). Furthermore, community support for those with medical conditions, such as Parkinson's, is pivotal in reducing stress and promoting healing. Socializing and conversing with others with the same life experience has been shown to promote mental positivity. Access to social support also gives individuals the opportunity to reach for assistance, encouragement, and strength– factors that are essential in rehabilitation. Supportive design within environments can be achieved through programming and furnishings that increase user interaction; however, it is imperative to balance social interaction with privacy (Ulrich, S. 2000, p.101). It is essential to understand that increasing social interaction through interior design should not infringe on the privacy of others. Disrupted privacy possesses the ability to cause discomfort and stress, both of which can create an adverse effect on the mental health of those with Parkinson's. For clinical spaces, supportive design is essential in increasing the overall welfare of its users. Thus, it should be incorporated with vast consideration of individual needs.

Table 8: Interior Design Mental Hazard Solutions Summary

Potential Hazards	Author	Corresponding Mental Hazard Solutions	Interior Design Application
Lighting	• Burleson, L., 1993 • Iyendo, T., Uwajeh, P., Ikenna, E., 2016 • Ulrich, S., 2000	• Optimizing lighting and views have been discovered cause positive impacts on the rehabilitation and recovery of patients and increase staff productivity • Natural daylighting promotes user comfort as well as create an enjoyable environment • Incorporation of natural daylight increases attention and mood of individuals, while reducing tiredness, anxiousness, and strains • Intense artificial lighting should have a minimum of 60-watt lamp • Increased light fixtures are recommended for high tasks areas such as kitchens and bathrooms • Artificial lighting should not replace natural daylight as natural lighting facilitates positive healing • Ultraviolet lights have been discovered to cause a depletion in fatigue and reduced blood pressure, enhance healing through increased metabolism and release of endorphins	• Patient and offices should have optimal views of the outdoors to promote wellness and increase productivity • Maximize daylight to promote comfort • Intense lighting should have a minimum of 60-watt lamp • Increase fixtures for task areas, such as bathrooms, kitchens, and offices • As much as possible make use of natural daylight instead of artificial lights • Light fixtures should have ultraviolet light
Sound	• Binggeli, C., 2016 • Iyendo, T., Uwajeh, P., Ikenna, E., 2016	• Falling water and the sound of birds are considered as positive distractions as these sounds are pleasant to hear	• If applicable include sounds of nature in patient care rooms
Sound Continued	• Burleson, L., 1993 • Iyendo, T., Uwajeh, P., Ikenna, E., 2016 • Ulrich, S., 2000	• Music has the ability to mitigate both physical and psychological stressors, as music is used in therapy to decrease tension and promote relaxation • Minimal and controllable noise levels have been found to increase concentration in individuals with PD • Sound masking can be used minimize unwanted noises by controlling noise, background sounds, and manipulate unwanted noises while ensuring speech privacy • Absorption coefficient (AC) aids in determining the amount of sound energy absorbed by materials • AC ranges from 0 – 1 with zero being total reflection and one indicating total absorption (the closer to one the better) • Soft, porous materials like wood and textiles are known to absorb a large amount of sound energy • Smooth, dense surface like paint and concrete are known to absorb minimal amount of sound energy • Padded carpets and thick draperies are known to absorb a large sum of sound energy which will increase sound privacy	• If applicable calm soothing music should be played throughout the building rather than strong loud sounds • Use porous finishes such as fabric to minimizes sound level • Used sound masking to optimize privacy in offices • Use soft and porous materials such as wood and textiles • For areas that needs minimal privacy it plausible to use smooth and dense surfaces • If applicable for private spaces, use padded carpets and/or thick draperies to absorb sound

Supportive Design	• Ulrich, S., 2000	• Access to visual and physical privacy, accessible gardens, controllable electronic devices, and the ability to regulate temperature are attributes of supportive design • Incorporation of social spaces have been shown to decrease stress and an increase in patient wellness • Furniture should be light, comfortable, and movable to promote interaction amongst users • Excessive amount of social interaction cause by movable and placement of furniture may deny an individual to privacy	• Physical privacy should be considered when designing the space during the schematic part of the project • If applicable include access to the outdoors such as gardens or areas of rest • Users should have the ability to control settings such as temperatures, electronic devices, lights, etc. • Include social and gathering spaces • Light and comfortable modular furniture should be considered to promote social interaction • When creating spaces have a balance between promoting social interaction and privacy

2.1.3 Mental Hazards Summary of Findings

The design of interior spaces can significantly impact the healing process of individuals with Parkinson's Disease. Within interior spaces, some factors can exacerbate stress and hinder individuals' sense of control. Factors such as excessive noise and light that can cause overstimulation and inaccessible social support have been found to adversely affect individuals, affecting their overall well-being. It is imperative that environments be designed with consideration of user needs and conditions. When done appropriately, this can reduce stress and mental stimulation and further aid recovery and rehabilitation. Supportive interior spaces should consider noise and light reduction, privacy, social support, access to nature, and suitable furnishings, as these have been found to promote healing and a sense of control. Ulrich's Theory on Supportive Design and Positive Distraction in Physical Environments is a valuable tool for designing environments that foster healing and a sense of control for individuals with Parkinson's Disease.

2.2 Mitigating the Environmental Impacts on Healthcare Workers Through the Use of Evidence Base Design in Healthcare

Evidence Base Design

Evidence-based design (EBD) is a methodology for constructing the built environment's impact on occupants' physical and psychological well-being (Alfonsi et al., 2014, pp. 137). Environmental factors, such as noise, lighting, layout, and safety, have been found to influence the well-being of occupants and the job satisfaction of nurses and other medical personnel within healthcare facilities. When these elements are poorly implemented, it causes stress and dissatisfaction in individuals. Stress resulting from these design elements can lead to job dissatisfaction and burnout, which has been shown to culminate in high worker turnover rates nationwide (Applebaum et al., 2010, p. 2). The well-being of healthcare workers is as important as that of patients. Ensuring they are given a positive work environment results in exceptional upkeep and attention for those in their care. Throughout the years, healthcare designers have initiated a conceptualized framework for healing environments that mitigate workplace stressors in clinical environments. It has been revealed that to foster healing and environmental satisfaction, there should be improvements in access to resources, reduction of sound and light distraction, and optimal employee safety and comfort (Applebaum et al., 2010, p. 2). Evidence-based design will be used to analyze the negative impacts of the built environments on healthcare facilities and use the outcomes to determine the best possible results that can be implemented in designing healing environments. It has shown that fostering the well-being of those offering care can potentially enhance the wellness of those with Parkinson's.

Noise

It has been proven that environments influence the psychological well-being of individuals. Depending on their application, this influence can be beneficial or detrimental, whereas negative impacts can adversely affect workers and other users. In the context of healthcare environments, the degree of patient care quality is contingent on the level of job satisfaction experienced by workers, which can be caused by varying degrees of socio-economic factors, from social support and safety to environmental elements. As such, ensuring a high worker satisfaction level is paramount. Research states that environmental factors like high noise levels in clinical environments are among many significant sources of stress, annoyance, exhaustion, fatigue, and emotional burnout in healthcare workers (Applebaum et al., 2010, p. 2). This is caused by overstimulation through multiple sound sources that leads to mental disturbance and distraction. This event is unacceptable in clinical settings as it hinders concentration and task generation. This emphasizes designing healthcare environments with a moderate allowance of sound distribution. A study conducted by Blomkvist and colleagues compared the effects of high and low noise levels on nurses working in a coronary intensive care unit. After months of studies, it was revealed that low noise levels have positively impacted staff, resulting in better quality care, improved speech intelligibility, and increased social support (Applebaum et al., 2010, p. 2). Mitigating noise levels for enhanced worker satisfaction relies on implementing sound-absorbing materials where applicable. Proper acoustic design strategies have found that applying such materials to ceiling and floor surfaces has minimized sound disturbance (Lavy & Dixit, 2012; Ulrich et al., 2008). In contrast, sound-reflecting surfacing should be discarded as an option for clinical environments overall, as this has been found to have a detrimental effect on users. The study revealed that design applications implemented in real-world settings have yielded substantial results that benefit workers. The evidence gathered from the study underscores the significance of positive design applications and highlights the importance of design strategies as a means of promoting well-being in the workplace.

Lighting

Lighting has been proven to be one of many factors that significantly affect users' psychological well-being. Like noise, lighting can be beneficial and detrimental to individuals, depending on its application. Studies have found that natural lighting has a higher degree of benefitting individuals' wellness than artificial lighting. A study conducted at Akdeniz University Hospital in Turkey examined the effects of natural daylighting on 141 nurses. The results found that exposure to natural daylight for a minimum of three hours for several consecutive days has increased work satisfaction and decreased work-related stress among these individuals (Alimoglu M.K et al., 2005). Other plausible explanations for the observed outcome could be attributed to the stimuli associated with natural views, which have been shown to alleviate mental stressors through positive distraction. In contrast, a study conducted in North America revealed that healthcare workers exposed solely to artificial lighting are prone to exhaustion and fatigue (Applebaum et al., 2010, p. 3). This could be due to a disturbance in the circadian rhythm, as minimal exposure to natural daylight can affect the body's internal clock and cause task performance difficulty. In addition, improper lighting strategies can lead to an increased chance of worker incidence errors, as low or high light distribution affects task performance. Implementing natural lighting or a substantial amount of appropriately placed artificial lighting has improved performance levels among healthcare workers, particularly in areas requiring high levels of attention and focus (Cetin et al., 2019). The evidence discovered in these studies showcases the importance of daylighting in increasing work satisfaction within a healthcare setting. It underscores the importance of Evidence-Based Design in determining appropriate design strategies for clinical environments.

Obstructive Design

Navigating through built environments can be concerning for most users, as inadequate design can pose challenges and impede their ability to navigate effectively. In healthcare settings, efficient navigation is of the utmost importance, as this can minimize the stress set forward by difficult and long

walking routes. However, many clinical care environments must still provide adequate corridors as long, monotonous hallway designs can often be seen in various hospitals and healthcare settings. When hallways are designed as such, they can create a sense of boredom, uneasiness, confusion, and wasted time for users. Minimizing this effect is dependent on designing hallways with the consideration of user experience. It has been revealed that the overall layout of buildings has caused several inefficiencies among workers, where long hallways have been proven to cause excessive walking from one destination to another, leading to a decrease rate of 28.9% in time spent by staff on patient care (Alfonsi et al., 2014, p.140). This can be seen as unacceptable in healthcare environments, as it takes time away from performing essential tasks and for patients to receive adequate care from their providers. This also creates unnecessary stress for staff, pulling them away from performing their jobs effectively and promptly. In the United Kingdom, nurses have commented that the distance needed to travel between areas has significantly impacted their work performance, minimizing the time needed to tend to patients (Nazarian et al., 2018). To address this issue, the Clarian Methodist Hospital in Indianapolis was analyzed, as they exhibit exceptional results in minimizing walking distance by centralizing necessary spaces within the facility. It has been found that centralizing spaces and designing areas to be in proximity, such as nursing stations that include access to computer systems, patient rooms with provided supply closets, and workstations for staff situated outside of the room, has decreased walking time among workers and were effective in increasing patient care and optimize communication among peers. (Alfonsi et al., 2014, p.140). The result proves that centralized areas effectively maximize time and lower worker exhaustion. Thus, when applicable, healthcare environments should implement centralization of space as evidence-based design has revealed this to be a successful outcome.

Table 9: Evidence-Based Design Summary

Potential Hazards	Author	Negative Impacts fom Findings	Solutions from Finding
Noise	• Applebaum et al., 2010 • Lavy & Dixit, 2012 • Ulrich et al., 2008	• High noise disturbances are among one of many significant sources of stress, annoyance, exhaustion, fatigue, and emotional burnout in workers • Noise can create overstimulation which can lead to disturbances and distractions that hinders concentration and task generation • Sound refelcting materials should not be used in healthcare environments as this can have detrimental effects on users	• Low noise levels positively impacts staff which results in better quality care • Low noise levels have also been found to improve speech intelligibility and increase social support • Implementing sound-absorbing materials for both floor and ceiling surfaces can minimize sound disturbance and reflectancy.
Lighting	• Alimoglu M.K et al., 2005 • Applebaum et al., 2010 • Cetin et al., 2019	• Workers exposed solely to artificial lighting are more prone to exhaustion and fatigue • Workers who are rarely exposed to natural daylight are found to have a disturbance in there circadian rythm which causes task performance difficulty • Improper lighting strategies such as low or high light distribution can lead to increased chance of worker incidence errors	• Natural lighting has a higher degree of beneffiting individual's wellness compared to artificial lighting • Exposure to daylight for at least three hours a day can increase work satisfaction and help in decreasing stress • Positive stimuli associated with exposure to daylight and natural views has been found to alleviate stress due to positive distraction • Implementing natural lighting or a substantiall amount of appropriately placed artificial lighting can improve performance levels
Obstructive Design	• Alfonsi et al., 2014 • Nazarian et al., 2018	• Long and monotonous hallways can create a sense of boredom, uneasiness, confusion, and wasted time • Long hallways can cause excessive walking taking away time from workers to tend to patients and perform tasks	• Centralizing spaces and designing areas to be in proximity with one another can decrease walking time • Centralizing spaces has been found to increase patient care and optimize communication among peers

2.2.1 Evidence Based Design on Mitigating Environmental Impacts on Healthcare Workers Findings

Evidence-based design has proven to be an effective methodological tool for determining successful design solutions implemented in current structures. It has provided efficient and valuable interior design methods that optimize individual wellness and work satisfaction. Its use allows for examining built structures to determine design solutions informed and supported by evidence, making it a reliable source for effectual design resolutions. Therefore, outcomes using evidence-based design are more likely to be practical in achieving design solutions for its intended objective as it has proven to work in a real-world setting.

This methodology has shown a strong connection between patient care and staff wellness design in healthcare facilities, with both reported to be significantly impacted by sound and lighting disturbances and navigation hindrances caused by inefficient design. Moreover, the results shown using evidence-based design have strengthened the importance of materiality and design approaches in decreasing sound and light disturbances and walkability challenges within environments, as it further highlights the significance of natural lighting in optimizing positive psychological effects, using proper surfaces to increase sound absorption, and optimizing space for efficiency. Evidence-based design has proven to be a valuable tool that can be used to determine successful outcomes that can be implemented in the design of healthcare facilities that look to optimize worker satisfaction and well-being.

2.3 Literature Review Conclusion

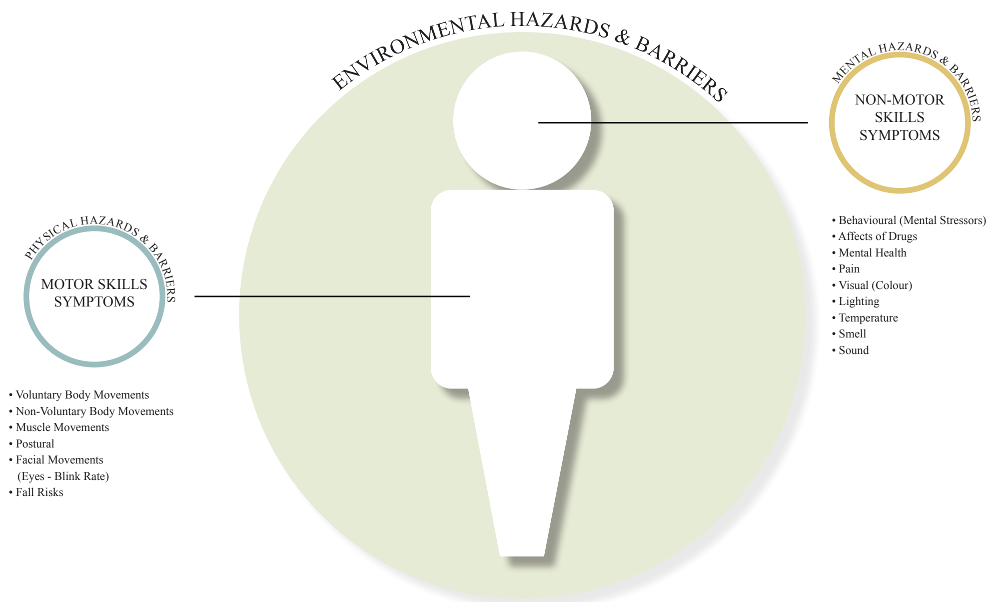


Figure 2: Environmental Hazards & Barriers Diagram

The literature study identified two primary considerations when designing for individuals with Parkinson's Disease. First, it pertains to identifying the physical hazards that environments pose to those with Parkinson's and how the condition's traits influence how they navigate and experience spaces. The second consideration examines mental hazards within the environment and their psychological effects on individuals. This section in the research highlights the importance of preventing fall incidents for those with Parkinson's Disease using design.

Neuman's Systems Theory plays a pivotal role in this research, providing a framework that exemplifies how extrinsic and intrinsic factors influence those with Parkinson's in their ability to navigate and experience environments. Extrinsic factors refer to the physicality of the built environment, while intrinsic factors refer to the non-physical aspects of spaces. This research establishes how these factors and the characteristics of Parkinson's affect individuals' mobility and perception of space— additionally revealing that a combination of the two factors can increase or decrease fall risks in these individuals and provide environmental solutions that prevent this detrimental outcome. This highlights the importance of inclusive design in eliminating physical and mental hazards within the environment for individuals with these conditions by looking at adequate design elements and applications and considering materiality and furniture choices.

Ulrich's Theory of Supportive Design and Theory on Positive Distraction in Physical Environments are valuable concepts for creating spaces that promote environmental and bodily control for those with Parkinson's. Both theories underscore the significance of identifying and addressing potential mental hazards within environments and establishing solutions that minimize stressors connected to this matter. It has been revealed that the leading cause of environmental stressors is over and under-stimulation engendered by high and low noise and light disturbance, as well as disconnection from social and environmental engagements. Ulrich's theories have been used to leverage the notion of designing comfortable and supportive environments conducive to healing.

Additionally, the well-being of clinical staff is on par with those receiving care and should be considered just as much as their counterparts. Evidence-based design is a methodological tool used to identify successful design implementations that promote healthy work environments for healthcare staff. It examines and identifies practical design applications that minimize workers' stress and dissatisfaction commonly found within these settings. Evidence-based design has taken the reports found in the theories and connected them to real-world settings, showcasing the successes of these design implementations. This approach allows for conclusive evidence regarding the practicality of developing healthcare environments that are conducive to healing, collaboration, and overall well- being of individuals.

2.0

PRECEDENT REVIEW

Introduction to Precedent Studies

The precedent study is a practical investigation of built environments that utilize interior design to enhance the user experience for those with Parkinson's Disease. The objective is to carefully analyze real-world applications to foster a new comprehension of design possibilities that can be used to develop new design ideas and knowledge. It will carefully delve into analyzing design successes and faults, which would offer tangible solutions for improving the lives of individuals with Parkinson's Disease.

2.0 Djavad Mowafaghian Centre for Brain Health

Stantec | Vancouver, British Columbia, Canada | 134,500 sqft | 2013

The Djavad Mowafaghian Centre for Brain Health integrates patient care and research, focusing on various cognitive disorders, including Parkinson's. Affiliated with the Vancouver Coastal Health Research Institute and The University of British Columbia (UBC), the facility aims to advance brain health research and treatment through a collaborative approach that combines neuroscience and psychological research with clinical practice within an academic setting (Vinnitskaya, 2012; Architecture Magazine, 2012). The facility's overall design is a prime example that inspires the idea of multi-practice integration and will be used to delve deeper into understanding the success of advanced space planning. With its integration of learning and healing, the centre facilitates the progression of patient care and the acceleration of cognitive research (Rosenstock, 2012). These will all be comprehensively analyzed to acquire valuable insights and enhance the knowledge of integrating design solutions into a real-world application.

Figure 3: Synapses Design on Glazing (Stantec, 2012)

Programming

The facility's design encompasses both clinical and research components. It focuses on enhancing interactions among interdisciplinary fields, primarily establishing a flexible environment that fosters collaboration and resource sharing to advance health-related research (Vinnitskaya, 2012). Thorough research on the building presents separation among fields that enhances interdisciplinary partnerships. Each floor is divided into three distinct regions dedicated to a specific department. The overall design showcases a testament to physical space having the potential to foster innovation and discovery that it represents. The division is as follows:

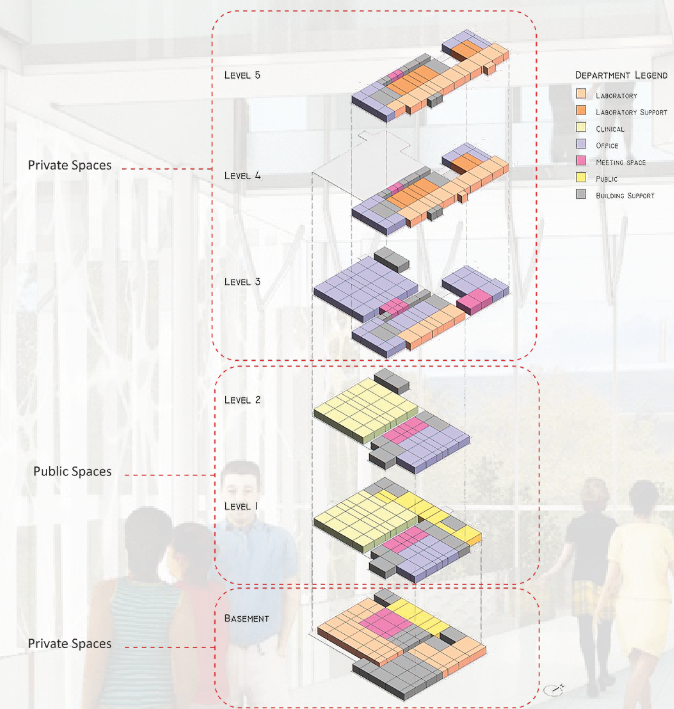


Figure 4: Building Programming (Stantec, 2012)

- The first two levels are designated clinical care units containing social support spaces for educational purposes and examination rooms (Rosenstock, 2012).
- The three upper levels serve as a conventional ground for treatment and research, composed of offices and conference rooms (Rosenstock, 2012).
- The basement primarily focuses on research, as it houses medical laboratories dedicated to psychiatric and neuroscience studies (Rosenstock, 2012).

Research indicates that in addition to the various interdisciplinary fields, the complex treatment needs of individual patients with cognitive disorders also aided the design guidance of the facility's layout. The building's floor plan demonstrates this. It is meticulously designed to prioritize simple circulation that minimizes physical and mental stressors in users while reducing the need for physical exertion and decision-making, enhancing patient and worker experience (Vinnitskaya, 2012). This excellent programming model demonstrates conventional consideration in enhancing user wellness, which can be used in the guidance of clinical environment design. In addition, further consideration in reducing mental stressors can be seen by incorporating natural elements, such as breathing spaces, access to natural light, and fresh air through open courtyards (Vinnitskaya, 2012). Research has proven that natural elements tend to enhance user well-being through their meditative qualities, having the ability to reduce stress exponentially. Therefore, the facility has showcased exceptional awareness in comprehending user needs and conceptualizing a design that is attentive to its intended user.

Figure 5: Collaborative Workstations (Stantec, 2012)

Design

Research indicates that the building's architectural design draws inspiration from the intricate network of synapses in the brain. These synapses facilitate the transmission of electrical impulses to form neuro connections; they are integral to cognitive function and serve as conduits for information dissemination from the brain to the body (Vinnitskaya, 2012). As illustrated in Figure 5, the building's exterior glazing design is conceptually derived from the pattern of electrical impulses caused by these synapses, resulting in unique lighting conditions within its interior. Further analysis suggests that these impulses may provide secondary privacy from the outside while providing sufficient daylighting to the inside. This can be beneficial for clinical spaces, as they require considerable privacy, while natural elements can aid in minimizing mental stressors in users.

The building's design also integrates energy conservation management and sustainability, attaining LEED Gold certification (Vinnitskaya, 2012). This can be seen throughout the facility through various sustainable features. This showcases that the clinic's design considers the importance of its effects on the environment and how it influences user experience. It also reflects excellent attention to how design can create a positive impact. As such, these environmentally conscious features are exemplified by incorporating green roofs for stormwater management, using reflective permeable surfaces, and promoting biodiversity through open spaces (Vinnitskaya, 2012). However, far more design considerations were made for the facility to receive high environmental design standards. Though the additions of environmentally friendly elements are vital, the overall design magnitude of the building is paramount. It has been mentioned that the building's orientation is mainly designed to optimize daylight penetration. It is partnered with implementing high-performance insulated glazing and shading systems to facilitate heat and energy conservation (Vinnitskaya, 2012). Considering the positioning of the building ahead of its construction ensures the maximization of sun penetration during its use, decreasing the building's entire power consumption entirely. This is supplemented by incorporating lighting sensors, such as motion, sound, occupancy, and daylight, that reduce lighting power density (Vinnitskaya, 2012). Thus, the design analysis proves that the facility is a great example that excels in sustainable design aside from its influence on user's well-being.

Figure 6: Synapses Design on Glazing (Stantec, 2012)

Figure 7: Synapses Design on Glazing (Stantec, 2012)

Limitations

The facility is dedicated to advancing treatment and research for various brain health conditions rather than solely focusing on the management of Parkinson's Disease. As such, though the facility is an excellent example of user consideration and sustainable design, its constraint is purely out of its general context. The precedent shall not be viewed as a model for designing for those with Parkinson's Disease but rather as a notable figure demonstrating the effective integration of patient care and research within a singular building. The limitation found within the analysis lies in the scarcity of relevant design materials to further enhance user welfare and movement control among those with Parkinson's.

Relation to Theoretical Project

The case study analysis demonstrates the effective integration of clinical research and patient treatment within a unified building. A strategy extracted from the precedent's investigation pertains to the strategic division of its programming, which can be applied to designing a rehabilitation clinic for those with Parkinson's Disease.

This provides exceptional guidelines in apportioning public and private spaces, a particularly crucial consideration for facilities catering to patients at varying stages of medical conditions and treatments. Furthermore, the building's LEED Gold certification is particularly noteworthy in designing structures prioritizing energy conservation and sustainable design. Though this is important and is a notable elemental consideration, the influence of its overall interior design and its significance in influencing user experience is vital information in understanding how to minimize environmental stressors. As evident in the analysis of the case study, access to natural elements, such as green spaces, can remarkably enhance user well-being, as these areas tend to cause meditative qualities that aid in reducing mental stress. Therefore, The Djavad Mowafaghian Centre for Brain Health is an exceptional case study demonstrating meaningful design considerations for users and the environment.

Figure 8: Synapses Design on Glazing (Stantec, 2012)

Table 10: Djavad Mowafaghian Centre for Brain Health Design Summary

Case Study Design Information	Case Study Design Constraint	Design Solution	Adaption to Theoretical Project
• Flexible spaces that promote collaboration and shared resources from all interdisciplinary fields found within the facility • Allows medical treatment and research studies to coexist in a singular building • Grounded on patient needs, through the ability to design for individuals with a diverse range of medical needs • Minimizing physical and mental stressors for patients through building layout and design • Separating public spaces from private spaces through building layout and design • Conservation of heat and energy through building design an orientation • Optimizes light penetration and by doing so reduces light power density	• Does not showcase design solution that would minimize physical hazards for people with PD	• The programming introduces the ability to separate various interdisciplinary fields into three separate regions within the floors of the building such us: • Separating levels into categories to ensure effective program flow among workers and users, and to put division between private and public spaces • The floorplan showcases a simple circulation to minimize physical and mental stressors the originates from physical exertion and decision making in patients • Includes breathing spaces that gives access to natural sunlight and fresh air • Proper integration of design in glazing that can be used as shading, as well as create privacy within public and private spaces	• The separation of programming shows how to successfully integrate clinical research with patient treatment that are found within a singular building • Division in the programming serves as a helpful guide in separating public areas from private spaces, most notably in facilities dealing with serious medical cases being perceived by an array of individuals going through different stages and treatments • Suggests how to conserve energy and heighten design sustainability through green roofs and glazing design • Suggesting the use of green spaces to increase patient welfare by decreasing mental stressors by allowing patients and staffs environments of relaxation that has access to fresh air and sunlight

		• Sustainability through the addition of green roofs that can aid in the management of stormwater, reflective and permeable roof surfaces, design that encourages biodiversity and energy • Orientation and design that maximizes natural light and shading that plays into the conservation of heat and energy • Increased lighting efficacy through the use of motion, sound, occupancy, and daylight sensors	• How to design a relaxing medical environment far from the looks of a medical facility that can be perceived as clinical and authoritarian by most patients and users.

Figure 9: Synapses Design on Glazing (Stantec, 2012)

2.1 Lou Ruvo Center for Brain Health

Frank Gehry | Las Vegas, Nevada, USA | 60,000 sqft | 2010

The Lou Ruvo Center for Brain Health is dedicated to the advancement of research and the dissemination of information for the treatment of cognitive maladies. It provides diagnostics and treatment for those with cognitive conditions, including Parkinson's, while offering exceptional social services for individuals and their families (Lou Ruvo Center for Brain Health, n.d.). Located in the United States of America, the facility is open to both residents and visitors. It provides accommodations and custom clinical care for a comprehensive set of individuals, encouraging those who face challenges caused by their condition to live independently with its provision of access to agility and mobility assistance. (Lou Ruvo Center for Brain Health, n.d.). The precedent will be carefully analyzed to gain insight into the successes of designing for those with cognitive conditions, gaining significant knowledge to enhance user well-being.

Figure 10: Lou Ruvo Exterior Shot

Programming

Research reveals that The Lou Ruvo Center consists of two main buildings connected by a central gathering space. Both structures operate independently and are utilized in distinct ways. However, they share similarities in offering medical aid to those in need, whether research or treatment. The first building encompasses four levels and houses a healthcare facility focusing on patient care and research, containing spaces such as medical consultation rooms, research areas, patient treatment rooms, a museum, and an auditorium (Cleveland Clinic, 2019). Analysis shows that the first building is separated into two definite sectors, public and private, ensuring that those receiving treatment have considerable privacy while providing access to social spaces for other visitors, such as families and caregivers. This can be shown through the facility's breezeway, which connects both buildings and provides a secondary area of relaxation, such as a seated café for all visitors to unwind and enjoy (Basulto, 2010). This is an exemplary example of considerate design for multiple users. They ensure that individuals are accommodated regardless of their visit and condition.

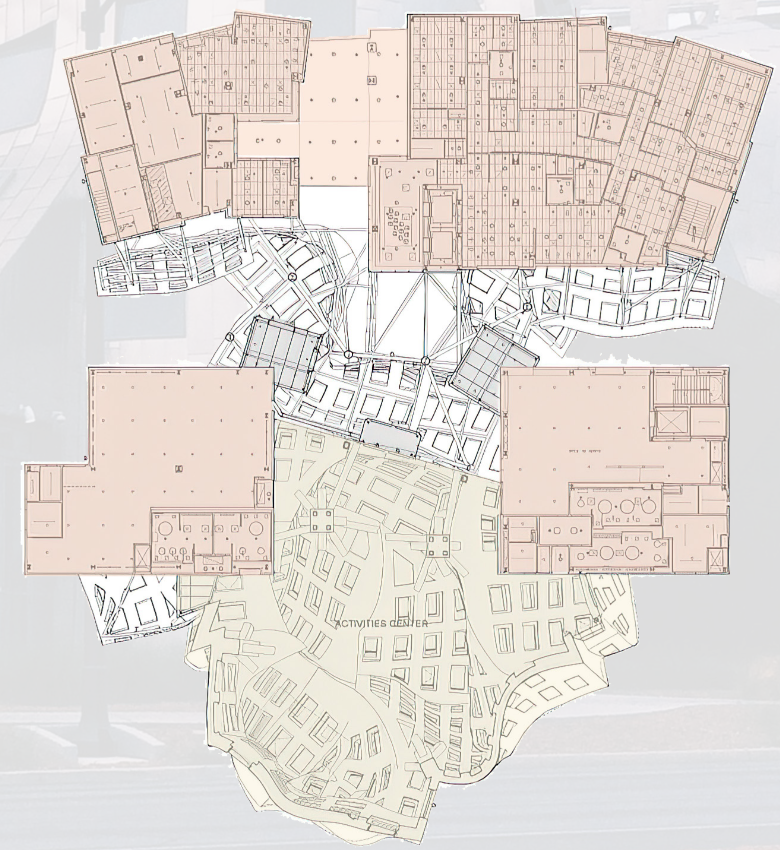


Figure 11: General Floor Plan
Ruvo_Final_Drawings_Compiled-10
Copyright: Courtesy of Frank O. Gehry & Gehry Partners, LLP, 2024

The second building, which is considerably known as the Life Activity

Design

From a distance, the Lou Ruvo Center for Brain Health appears to be an intriguing architectural marvel, far from its intended use. At first glance, with its captivating free-form design, the Life Activity Center leaves passersby to speculate on its utilization. However, initially, it is difficult to discern that another building, designed in a different style, is connected to the abstract-styled structure. From a different perspective, it is apparent that the facility consists of two separate buildings, each boasting a different pronounced architectural style.

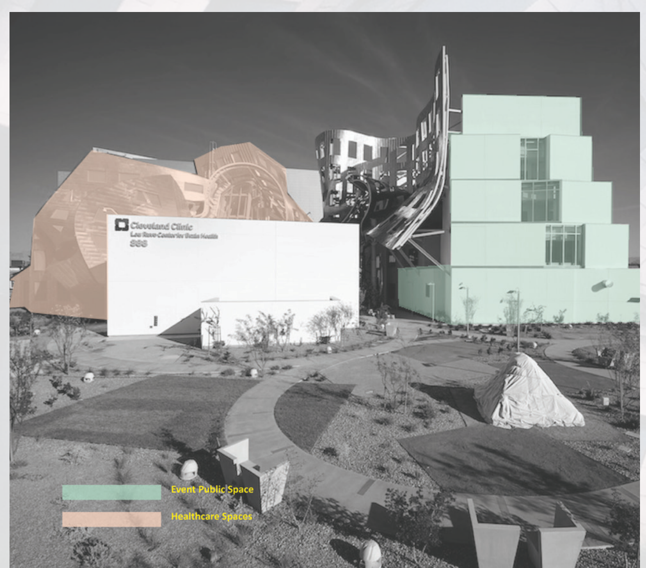


Figure 13: Exterior Division (Carbone, 2010)

The healthcare facility, situated behind the Life Activity Center, boasts a linear, straight-forward exterior design comparable to stacked white boxes. This was intentionally done to deviate from the conventional medical appearance commonly seen in hospital designs (Giovannini, 2011). Though it is linear in form, much like most clinical structures, the Lou Ruvo facility is distinguishable in that the design is disparate as a healthcare facility but not so much that it exudes a similar essence as its counterpart. Conversely, it is understandable why the Life Activity Centre exhibits its distinguishable design, as this may be due to it being publicly facing and should be the prominent feature of the facility. This notion is proven by being declared to be objectified to create a memorable reputation for spectators (Giovannini, 2011). Analyzing the exterior design of these two buildings proves the success of incorporating two distinct structures with different intended uses into a singular building with similar intentions.

Figure 12: Lou Ruvo Exterior Shot

Further analysis of its interior reveals deliberate consideration in the selection of materials. Notably, the selected materials are intended to evoke calmness and tranquility in patients while disassociating from the conventional clinical ambiance. Analysis reveals that Douglas Fir has been widely utilized in the interior design of the building, as adding natural elements such as wood would serenely affect its overall atmosphere (Giovannini, 2011). It has come to be commonly known that access or the incorporation of natural elements within interior spaces can positively influence the mental well-being of individuals. However, incorporating natural elements is not the only design feature known to minimize mental stressors but also the ability to provide privacy

Figure 14: Medical Interior Design (Carbone, 2010)

privacy to users when necessary. It was mentioned that careful considerations were taken when designing the facility's corridors, which were meticulously designed to separate public spaces from private. Corridors were made to follow a curvilinear form to promote limited restrictions on patient interaction while ensuring their privacy during the discussion of confidential medical matters (Giovannini, 2011). By doing so, it can be said that the choice of corridor design allows for positive social interaction without sacrificing privacy. As such, the analysis showcases that Lou Ruvo's design thoroughly considered the influence it would have on users and designed it in accordance with their needs and well-being.

Limitations

The Lou Ruvo Center for Brain Health is dedicated to advancing cognitive research, including Parkinson's Disease. The limitation does not fall directly onto the overall design of the space as it provides sufficient practical design applications catering to its users with cognitive conditions, but solely on the limited information centred around those with Parkinson's. The limitation also falls on the insufficient information about its interior design, thus preventing further analysis from being discussed. Therefore, information taken from the analysis of the building on how the building was designed to prevent physical and mental stressors for those with cognitive challenges and how the facility was designed to facilitate independent living for these individuals falls short.

Relation to Theoretical Project

The Lou Ruvo Center for Brain Health exemplifies considerate architectural planning for a medical facility tailored to those with cognitive conditions. It showcases meticulous, effective design strategies for separating medical facilities from non-medical environments while successfully incorporating these spaces into a singular built structure. Additionally, the spaces it provides allow for new sets of inspiration, underscoring the potential of adding supplementary areas to its advantages, such as event spaces responsible for secondary means of monetary support and bringing attention to the ongoing research occurring within its facilities. Lastly, the centre carefully considers the design layout and features that prove practical success in a real-world application—making the Lou Ruvo Center for Brain Health an excellent model for healthcare design.

Figure 15: Lou Ruvo Exterior Shot

Table 11: Lou Ruvo Center for Brain Health Design Summary

Case Study Design Information	*Case Study Design Constraint*	*Design Solution*	*Adaption to Theoretical Project*
• Divided into two separate buildings that provides both a clinical environment as well as a space that aids in the funding and profit for clinical research • Provides a programming that includes social services for families • The overall design of the building aids in providing individual care for patients • Provides additional room information and its amount • Provides areas for relaxation, such as a garden • Using natural elements such as wood to create a non-medical like atmosphere within a healthcare setting • Corridors follows a curvilinear path as to limit interactions between confidential cases occurring with patients	• Lacks in providing additional information as to how they were able to achieve a non-clinical like atmosphere within a healthcare facility • Does not provide sufficient information on how interior design was used in the navigation, and provision of care for those dealing with a mobility challenges	• Using greenspaces as a division between two separate building. Which in turns plays an important role in minimizing stress within healthcare settings • Used natural elements such as wood to evoke calmness in an otherwise stressful environment • Carefully chosen materiality that used colours that would invoke calmness as well as minimize over stimulation of colours • Tackling privacy through space layout by designing a corridor that would follow a curvilinear form	• Can be used as a tool to separate research and non-research facilities with one another • The thoughtful consideration in the placement of greenspaces can be used as an example in providing spaces of relaxation in clinical settings • Applying additional spaces that can add as another. Means of profit that would in turn aid in the funding of further research • Separating the programming between two different spaces based on design and function • The use of materiality to create a calming atmosphere that does not invoke a medical-like setting • Proper consideration of design layout to separate private spaces from public areas as well as to create a non-confusing wayfinding

2.2 Muhammad Ali Parkinson Center and Movement Disorders Clinic

ARCHSOL, Architect Brian McDonald | Phoenix, Arizona, USA | 26,865 sqft, | 2014

The Muhammad Ali Parkinson Center and Movement Disorders Clinic, affiliated with the Barrow Neurological Institute located at St. Joseph's Hospital and Medical Center, has recently undergone renovations to accommodate the needs of people with Parkinson's Disease and to bring education through social gatherings to families and friends (Barrow Neurological Institute, n.d.). This precedent showcases excellent consideration for the needs of those with a Parkinson's diagnosis, excelling in its design to ensure safety and aid for these individuals. The centre primarily focuses on bringing assistance and awareness to Parkinson's Disease. It has been shown to lead in this field, being renowned for providing exceptional clinical care and is recognized as a global leader in Deep Brain Stimulation (DBS) surgery (Barrow Neurological Institute, n.d.). Its design is a magnificent model for determining proper programming and design catering to a specific condition. The precedent analysis will delve into the facility's functionality, looking at its range of offered programs. This will reveal how the multitude of therapies enhance the physical well-being of those with Parkinson's, how workshops have been designed to support their mental health and the programs offered to provide support groups for patients, their families, and caregivers (Barrow Neurological Institute, n.d.). The centre demonstrates exceptional and thorough design for Parkinson's, focusing on encouraging patients to lead productive lives and regain control over their health.

Programming

Image Removed For Copyright Purposes

Figure 16: Programming and Section Breakdown (Kitchellftp, n.d)

Analysis reveals that the facility offers diverse areas for the consultation and treatment of people with Parkinson's Disease. Understanding the programming implemented within the facility is essential for comprehending its functionality and the roles that these spaces play in enabling individuals with Parkinson's to live independently from their condition.

- Patient care rooms
- Physical and speech therapy
- Occupational therapy rooms with built in kitchen and bath to help patients learn methods they can bring with them when they go home
- Pharmaceutical and surgical care
- Patient education rooms
- Outreach program
- Rehabilitation gym
- Gait and balance lab that aids patients to gain independence and be able to walk and balance themselves
- Conference facility
- Exam and consultation room
- Resource centre with computers and books to aid staff, patients, and family learn more about the disorder

Design

Research reveals that the new facility's design was done by an architect who had personal experience living with Parkinson's, thus creating a practical layer on the environment's influence on those with this condition (Barrow Neurological Institute, 2017). Appointing an individual with Parkinson's to oversee the design of the building assures significant intel in the appropriate design considerations for this group of individuals. This information can be leveraged to its fullest as it has been proven to promote the well-being of individuals with Parkinson's effectively.

Image Removed For Copyright Purposes

Figure 17: Therapy Room (ARCHSOL, n.d)

Emphasis on integrating functionality and comfort was vital in the facility's design. As such, wide corridors were built to ease the movements of those with mobility challenges and therapy areas were incorporated with mock-up home settings that educated patients about various methodologies they could utilize and adapt post-session (Barrow Neurological Institute, 2017). These additions are integral to the rehabilitation of those with Parkinson's and would aid in the allowance of living independently from their condition. When those with Parkinson's can learn to live with their conditions directly, it allows for a heightened sense of autonomy and capability.

When furnishing the facility, the designers carefully ensured that furniture further assisted the specific needs of those with Parkinson's. This included incorporating seating with higher backs, solid arms, and suitable heights and widths to provide supplemental support for those facing mobile difficulties (Barrow Neurological Institute, 2017). It is commonly known that those facing mobility

challenges are at a higher risk for fall-related events. Ensuring the furniture is meticulously chosen to aid those with these issues would guarantee fewer movement difficulties and fall risks. Additional mental and physical needs of individuals with Parkinson's were considered, such as the influence that floor and wall materials will have on their well-being. It is commonly known that the design of most hospitals can appear institutionalized. This ambience can cause unnecessary stress and fear for individuals, potentially leading to care avoidance. Analysis revealed that the Muhammed Center utilized natural wood to promote a calm and serene atmosphere while incorporating anti-glare surfaces and light wells, to not only soften the space or for colour recognition but also to disassociate themselves from a typical clinical environment (Barrow Neurological Institute, 2017). A thorough analysis reveals the design success of the precedent in catering to the needs of those with Parkinson's, and it can be deemed an excellent model for designing for those with this condition.

Image Removed For Copyright Purposes

Figure 18: Recreation Room (ARCHSOL, n.d)

Relation to Theoretical Project

The Muhammad Ali Parkinson Center and Movement Disorder Clinic is an exemplary model for a facility tailored to enhance the welfare of individuals with Parkinson's disease. The facility's analysis has provided valuable insights into the programming and design considerations for this specific group of individuals and has proven successful in promoting their independence. The precedent has illustrated vital knowledge in the designs of therapy rooms that aid in stimulating home settings, proving beneficial in establishing mobility assistance that can be utilized and adapted post-therapy. Additionally, the clinic further demonstrated the value of considering furniture and material choices in enhancing the wellness of those with Parkinson's. Furthermore, the precedent analysis established the importance of catering to the needs of those with Parkinson's and the influence of environmental design on their condition.

Table 12: The Muhammad Ali Parkinson Center and Movement Disorder Clinic Design Summary

Case Study Design Information	***Design Solution***	***Adaption to Theoretical Project***
• The clinic offers knowledge in the functionality of the building as well as offer additional knowledge in determining the programming the space • The use of occupational therapy rooms that mock home settings was used to aid patients in being able to live an independent life even after leaving the clinic • The center offers accommodation for those living within the State, as well as for those travelling for treatment • Supportive design was used in the incorporation of social spaces that would educate and aid those with the disorder, as well as their families and care takers • Surface materials were used that would minimize glare coming from intense light sources • The incorporation of natural elements such as wood to facilitate calmness and a non-clinical atmosphere • The incorporation of wide corridors to further assist PD patients in moving	• Using low gloss finishes in surfaces such as walls and flooring to minimize glare coming from a light source • To increase independency, occupational areas the mimic home like setting were added in the space • Lighting was used to illuminate and soften environments that would aid patients in seeing and differentiating colours • The use of natural elements was done to give the clinic a calm, non-medical like atmosphere	• The programming of the clinic can be used as a basis to determine the programming of the theoretical project • To further increase sense of control amongst individuals as well as heighten user wellness after rehabilitation, spaces mimicking home settings can be incorporated • The incorporation of temporary residential spaces to accommodate those travelling for treatment and those needing to stay in the clinic for a long period of time • Incorporating surface materials that does not evoke additional mental stressors in individuals with PD • The use of lighting that does not evoke over stimulation in patients

2.3 Rehaklinik Zihlschlacht Rehabilitation Clinic

Carlos Martinez Architekten | Zihlschlacht, Switzerland | 3,000m | 2020

Rehaklinik Zihlschlacht Rehabilitation Clinic is recognized as one of the foremost rehabilitation centres for treating neurological disorders in individuals with brain and nerve injuries and is globally renowned for its comprehensive medical treatment programs, professional clinical care, and specialized therapies (Health Tourism, 2023). Though not specifically centered around Parkinson's Disease, the facility caters to a wide array of cognitive and physical conditions like Parkinson's. Still, it ensures that essential care and optimized design considerations have been implemented in the facility's construction.

The clinic prides itself on its advanced integration of technology-based care, such as a synergistic, interdisciplinary, holistic, and robot-assisted treatment approach that provides therapeutic aid for neuro-urological disorders, gait management therapy, neuro-ophthalmological rehabilitation, and treatments for individuals facing swallowing challenges (PremiumEurope, 2023), which majority of these conditions are faced by individuals with Parkinson's Disease. Additionally, the clinic's design follows an approach dissimilar to healthcare facilities offering similar treatment approaches. The precedent will be carefully analyzed to understand the clinic's successes and design approach that can be leveraged to cater to those with Parkinson's.

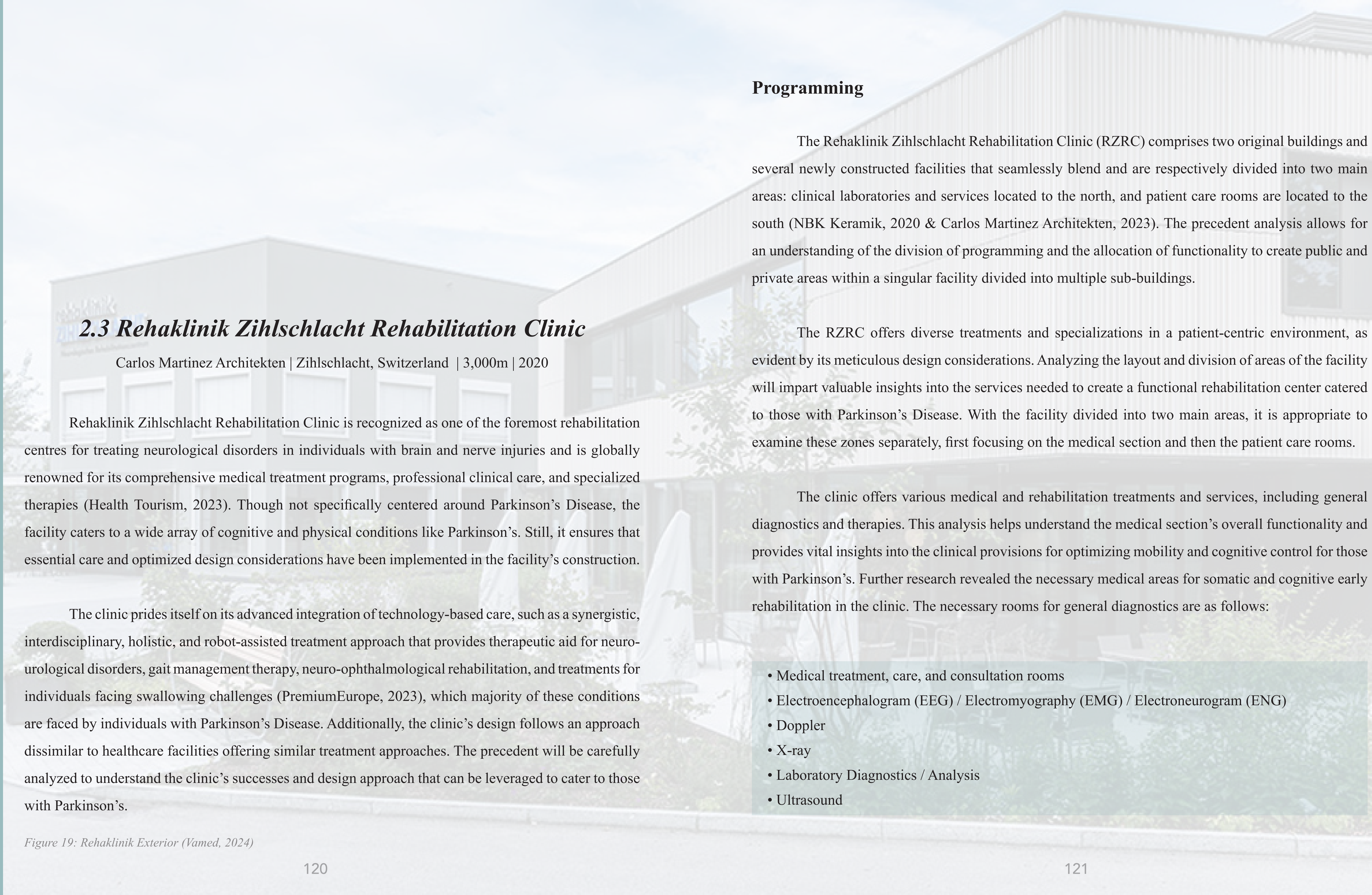


Figure 19: Rehaklinik Exterior (Vamed, 2024)

Programming

The Rehaklinik Zihlschlacht Rehabilitation Clinic (RZRC) comprises two original buildings and several newly constructed facilities that seamlessly blend and are respectively divided into two main areas: clinical laboratories and services located to the north, and patient care rooms are located to the south (NBK Keramik, 2020 & Carlos Martinez Architekten, 2023). The precedent analysis allows for an understanding of the division of programming and the allocation of functionality to create public and private areas within a singular facility divided into multiple sub-buildings.

The RZRC offers diverse treatments and specializations in a patient-centric environment, as evident by its meticulous design considerations. Analyzing the layout and division of areas of the facility will impart valuable insights into the services needed to create a functional rehabilitation center catered to those with Parkinson's Disease. With the facility divided into two main areas, it is appropriate to examine these zones separately, first focusing on the medical section and then the patient care rooms.

The clinic offers various medical and rehabilitation treatments and services, including general diagnostics and therapies. This analysis helps understand the medical section's overall functionality and provides vital insights into the clinical provisions for optimizing mobility and cognitive control for those with Parkinson's. Further research revealed the necessary medical areas for somatic and cognitive early rehabilitation in the clinic. The necessary rooms for general diagnostics are as follows:

- Medical treatment, care, and consultation rooms
- Electroencephalogram (EEG) / Electromyography (EMG) / Electroneurogram (ENG)
- Doppler
- X-ray
- Laboratory Diagnostics / Analysis
- Ultrasound

- Encephalogram
- Electronystagmography
- Focused treatments for multiple disabilities and disorders, which in the case of the study of Parkinson's would be:
  - o Dyskinesia
  - o Pain management
  - o Unsteady gait
  - o Speech and Swallowing
  - o Neurology
  - o Neuro-ophthalmologic rehabilitation (visual disturbances)

(PremiumEurope, 2023 & Health Tourism, 2023)

In addition to general diagnostics, therapy and treatment rooms offered at the RZRC diagnostics are as follows:

- Orthoptics
- Physiotherapy
- Occupational therapy
- Swallowing therapy
- Nutrition counselling
- Physical therapy
- Qi-Gong
- Acupuncture
- Sports therapy
- Robot assisted therapies
- Speech and language therapies
- Neuropsychology
- Neuro-urology
- Water therapy
- Music therapy

(PremiumEurope, 2023 & Health Tourism, 2023)

The clinic delivers not only effective rehabilitation aid and treatments but also provides exceptional patient-centric services that are reflected in its architectural design. Patients with their families and caregivers are afforded fully equipped private rooms customized to their unique needs

Figure 20: Rehaklinik Exterior (Vamed, 2024)

(Health Tourism, 2023). Furthermore, the clinic provides additional care facilities for patients and caregivers, such as:

- International offices aiding in administrative work that would provide user support before, during, and after treatment
- Visa assistance for international patients
- Multiple prayer rooms for various religions
- Concierge and shuttle services
- Restaurants and cafeterias
- Laundry
- Parking facility
- Cosmetology and grooming
- Relaxation pools
- Gymnasiums
- Training centre

Design

The Rehaklinik Zihlschlacht Rehabilitation Clinic's exterior facade features an elegantly modern cubist shape with a white terracotta finish, contrasting its dark windows surrounding the entire structure (NBK Keramik, 2020). The building's position relative to its environmental surroundings and the seamless integration of old and new structures create a calm and welcoming

Figure 21: Rehaklinik Zihlschlacht Centre Exterior View (Vamed, 2024)

environment reminiscent of a retreat rather than a medical facility.

The tranquil atmosphere in its exterior sips into the facility's interiors, embodying calmness. Subtle hints of medical references from a monograph mural by artist Liliane Eberle envelop the reception area and are reflected throughout the facility's design details (Carlos Martinez Architekten, 2023). Aside from the magnificently curated mural, the entire interior of the facility is far from looking like a generic healthcare facility, which plays an integral role in minimizing stress otherwise felt in common clinics.


Figure 22: Cafeteria Interior Design (Vamed, 2024)

A closer look at the clinic's interior reveals a nature-inspired design approach, as it seamlessly integrated outdoor elements into its insides. Further analysis suggests the use of multiple wood tones, neutral colour palettes such as white, beiges, and blues and the influence of biophilia be known in standard contemporary Scandinavian interior design style. Additionally, from close inspection, the interior appears to capitalize on the surrounding windows, as it incorporates natural views and greenery to enhance the overall serene ambience and aesthetic of the clinic.

Further analysis shows that patient and therapy rooms have been designed to depart from the traditional medical environment, as they evoke a sense of exclusive hospitality comparable to a hotel room. They are characterized by spacious layout, comfortable seating, comprehensive telecommunications facilities, and, in many cases, integrated balconies offering striking views of the surrounding landscape. These designs for a private room are vital in enhancing the stay of those receiving treatments as they provide a therapeutic atmosphere known to decrease unnecessary stress.

Figure 25: Rehaklinik Exterior (Vamed, 2024)


Figure 23: Private Patient Room (Vamed, 2024)

This home-like design additionally provides supplementary comfort due to the familiarity it brings to its inhabitants. These are imperative for the wellness of those with medical conditions receiving treatments.

Furthermore, therapy rooms appear to be designed with simplicity and straightforwardness. Plain white walls accentuate all the necessary equipment without the addition of extravagant accents that cause overstimulation. The design gives the impression of purposefully prioritizing the activities rather than the space's design. However, though plain, views of the outdoors transcend the space and act as a supporting element that evokes peace and calm. Thus, although the design is simple, the therapy rooms appear more practical and meditative.


Figure 24: Therapy Room (Vamed, 2024)

The overall design of the Rehaklinik Zihlschlacht Rehabilitation Clinic, encompassing its exterior and interior, is characterized by simplicity rather than complexity. Its design evokes a sense of serenity, calm, and familiar sanctuary rather than clinical hostility. This underscores the institution's commitment to providing care while considering the wellness and welfare of its users.

Limitations

The limitation does not necessarily depend on the facility's design but on its overall square footage. The clinic is located on a vast expanse of land, featuring multiple buildings with ample square footage. This allows the design and programming of the center to be expanded in many ways. Though it is desirable to have all the necessary therapy and general diagnostics rooms, this may not be feasible in environments and structures that do not have the same amount of square footage that Rehaklinik is fortunate to have. This can lead to strategically prioritizing programming crucial to the treatment and rehabilitation of those with Parkinson's. Although the precedent is an exemplary model for a rehabilitation clinic, various design considerations must be deliberated.

Relation to Theoretical Project

The Rehaklinik Zihlschlacht Rehabilitation Clinic presents a commendable case study for a centre dedicated to enhancing the wellness of those with cognitive challenges. Its interior composition diverges from the conventional characteristics of clinics, using design to emphasize essential matters, such as the minimization of stress and institutionalization, as it amplifies the focus on treatments and therapies while ensuring an overall meditative environment. The precedent upholds a prime example of a non-traditional design that illustrates the attributes of a patient-centric medical facility without sacrificing functionality, design, and user considerations. The Rehaklinik Zihlschlacht Rehabilitation Clinic is a valuable model for identifying proper functioning and programming, dedicated to comprehensively treating cognitive conditions like Parkinson's disease.

Table 13: Rehaklinik Zihlschlacht Rehabilitation Clinic Design Summary

Case Study Design Information	***Case Study Design Constraint***	***Design Solution***	***Adaption to Theoretical Project***
• Taking advantage of the multiple buildings found within the centre to divide and differentiate areas as exclusively medical or residential • The center offers accommodations for emigrants, immigrants, and visitors, while also taking into consideration different cultures and religious beliefs • The clinic's specialization in multiple neurological disabilities not only puts focus on designing for one general condition but for a wide array of disabilities • Simplistic interior design approach that puts focus on the treatments and patients rather than creating a distracting environment • The clinic offers a substantial amount of knowledge on its functionality and gives insight on the treatments and services being offered and provided within its core, which ultimately gives insight on its programming	• Does not provide sufficient information on the design layout of the buildings • The centre uses an abundant amount of square footage that gives it the opportunity to offer a wide number of programs that cannot be translated into the small space that is being used for the practicum	• Using surrounding glass façade to maximize lighting within the interior of the space, while also brining in views of nature to create a calm environment • To take away physical and mental distractions and stressors, most treatment and therapy rooms are plain and simplistic in design • Using neutral and soft colour palettes to create a calming environment that is apart from a medical type setting • The use of natural elements was done to give the clinic a calm, non-medical like atmosphere	• Illustrates a programming that divides medical use with non-medical use • Taking advantage of its location, to ensure lighting, building orientation, and views are being optimally used • Taking into consideration not only the welfare of the patients but as well as other users of the space such as medical personnel, families, and other visitors • Taking into consideration the design of the space to eliminate distractions • The use of colour and lighting to create a calm atmosphere that does not invoke a medical-like setting • Creating a retreat like setting in private patient rooms to mimic close to a home like setting and not so much in creating a medical patient room

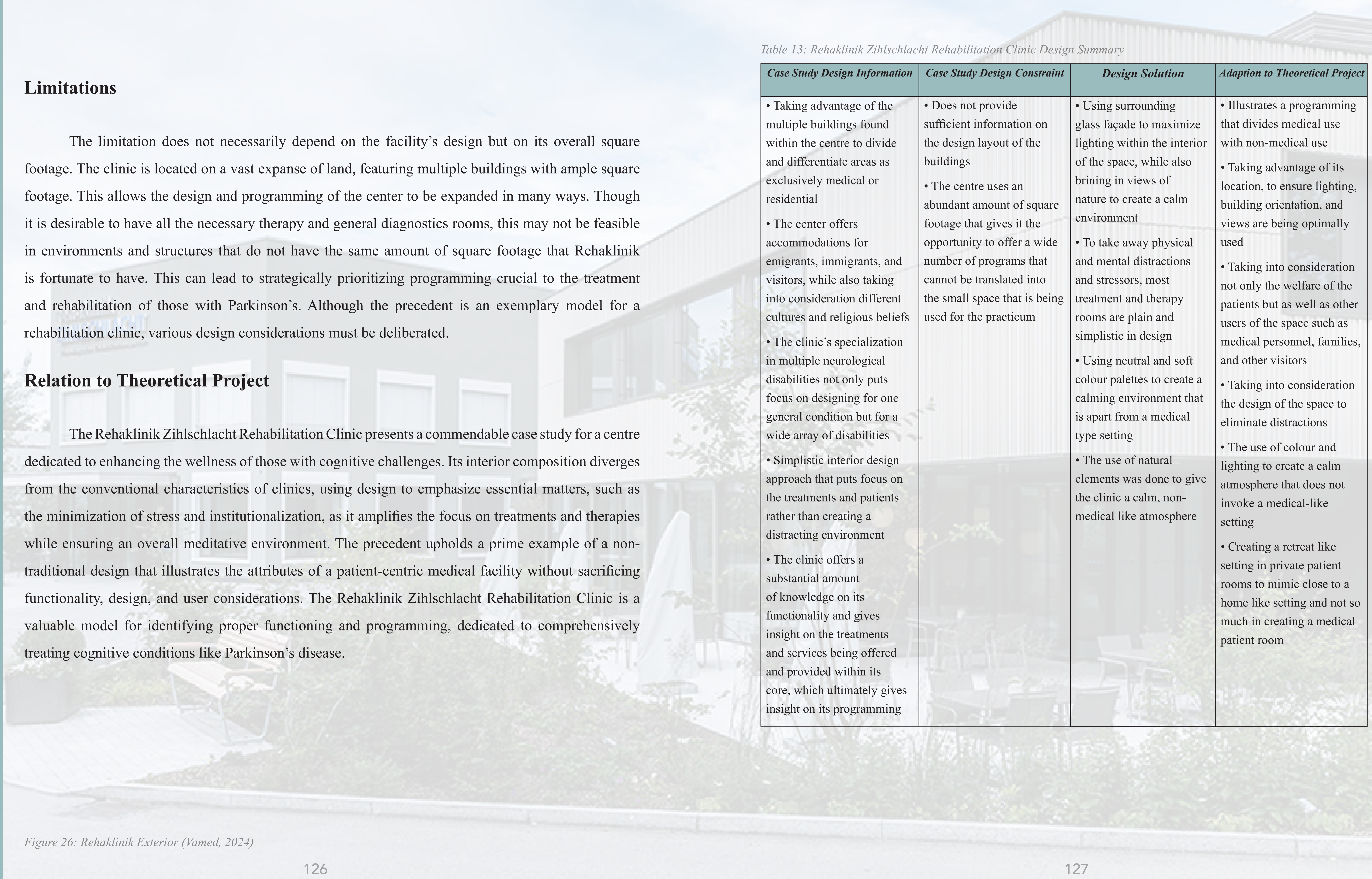


Figure 26: Rehaklinik Exterior (Vamed, 2024)

3.0

DESIGN PROGRAMME

Introduction Design Programming

The design programming for the Parkinson's Rehabilitation Clinic will merge the evidence found in the literature review and precedent study and implement these findings into a hypothetical interior design project that prioritizes the essential needs of those with Parkinson's Disease. This will enable the curation of an interior environment that fosters the independence and confidence of individuals living with Parkinson's while upholding user safety principles by reducing physical and mental environmental hazards. This project will be developed at Five Donald Street in the centre of Winnipeg, Manitoba, where it will be redesigned with an emphasis on detailed design aspects that will positively influence individuals with Parkinson's Disease physical and psychological conditions. The overall objective is to create a rehabilitation clinic focused on the design practicality intended for enhanced welfare for those with Parkinson's.

3.0 Programme Objective

- Provide an interior environment that minimizes physical stress and hazards for individuals with Parkinson's
- Provide a mentally restorative environment that minimizes mental stressors to individuals with Parkinson's
- Create a physically and mentally revitalizing environment for all users
- Establish a supportive and secure environment for patients to undergo treatment and rehabilitation, enabling them to experience control over their minds and bodies.

3.1 Site Analysis

Located within the split of the Red River in the River Osborne district, Five Donald sits near one of Winnipeg's reputable healthcare facilities, St. Boniface Hospital. This hospital is affiliated with Neuromdclinic, one of the city's limited clinics specializing in neurology and movement disorders. This proximity fulfills the site's requirements and criteria for the practicum, as it is accessible to one of the city's main health centres. Furthermore, the site's central location hits adjacent to a major bus transitway which provides easy access to the city center and neighbouring active districts such as Osborne Village, Broadway-Assiniboine, and Central St. Boniface, offering convenient access to nearby amenities. The following site analysis will explore the connection between the site and its neighbourhood and its fundamental relations to nearby resources.

3.1.1 Programme Overview

Location

River Osborne, Winnipeg, Manitoba

- Located in the heart of the city
- In close proximation to public transportation
- Nearby or a few meters away from major medical facilities

Users

Individuals with Parkinson's Disease

- Mid-aged to senior adults
- Individuals with PD, medical staff, support staff, family members, care givers, support animals

Building Construction

Existing construction

- Renovated work on pre-existing building
- Natural elemental and earthy materials
- Wood elements such as birch and walnut, existing concrete wall, glass façade

Typology

Healthcare Facility

- Physiotherapy Centre
- Medical Examination Facility

Clients

Individuals with Parkinson's Disease

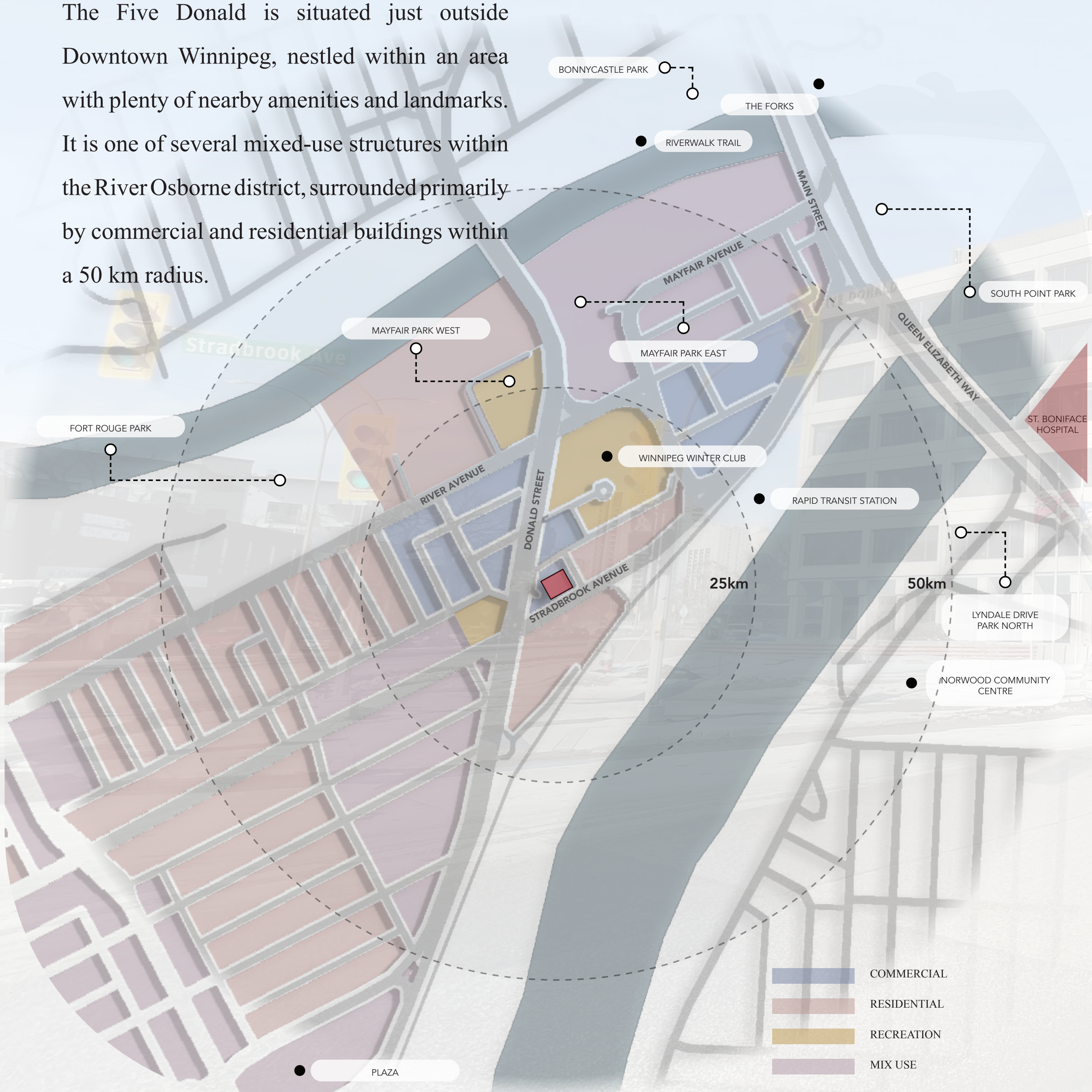
3.1.2 Site Criteria

Movement disorder facilities are available in multiple medical centres across Winnipeg. For the practicum, a rehabilitation clinic with a primary focus on Parkinson's Disease was chosen as research reveals a limited number of established facilities concentrated on this niche condition. The design's success relies on carefully considering the site's essential characteristics, including accessibility, proximity to neighbouring hospitals, and potential for expansion. Furthermore, the site's location and orientation are vital as this determines the consideration for privacy, the optimization of natural daylighting and the outside view, and road access. All these considerations are pivotal in providing the utmost user-centric facility for those with Parkinson's.

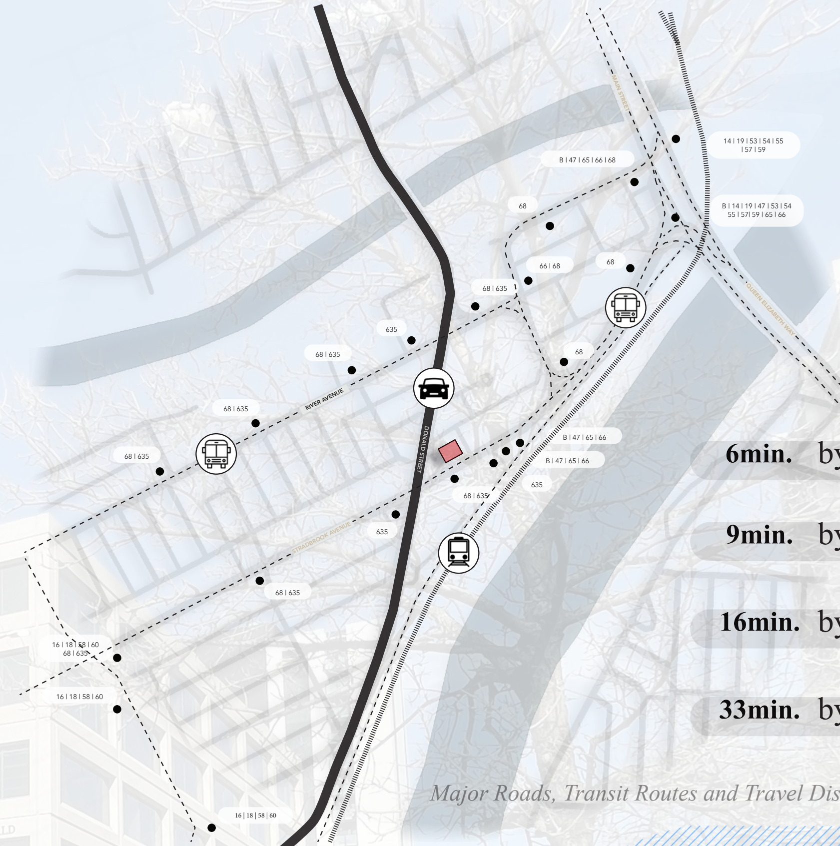
3.2 RIVER OSBORNE

Regional Analysis

The Five Donald is situated just outside Downtown Winnipeg, nestled within an area with plenty of nearby amenities and landmarks. It is one of several mixed-use structures within the River Osborne district, surrounded primarily by commercial and residential buildings within a 50 km radius.



Proximity, Land Use, and Landmarks



The site is situated at the corner of two major intersections and sits adjacent to a major transitway which offers services to nearby amenities and hospitals.

6min. by car to St. Boniface Hospital

9min. by car to Health Science Centre

16min. by bus to St. Boniface Hospital

33min. by bus to Health Science Centre

Major Roads, Transit Routes and Travel Distant

The building is oriented where it can fully take advantage of the sun and prevailing wind, which can be used for daylight and energy conservation.

Summer Solstice 05/21/2022

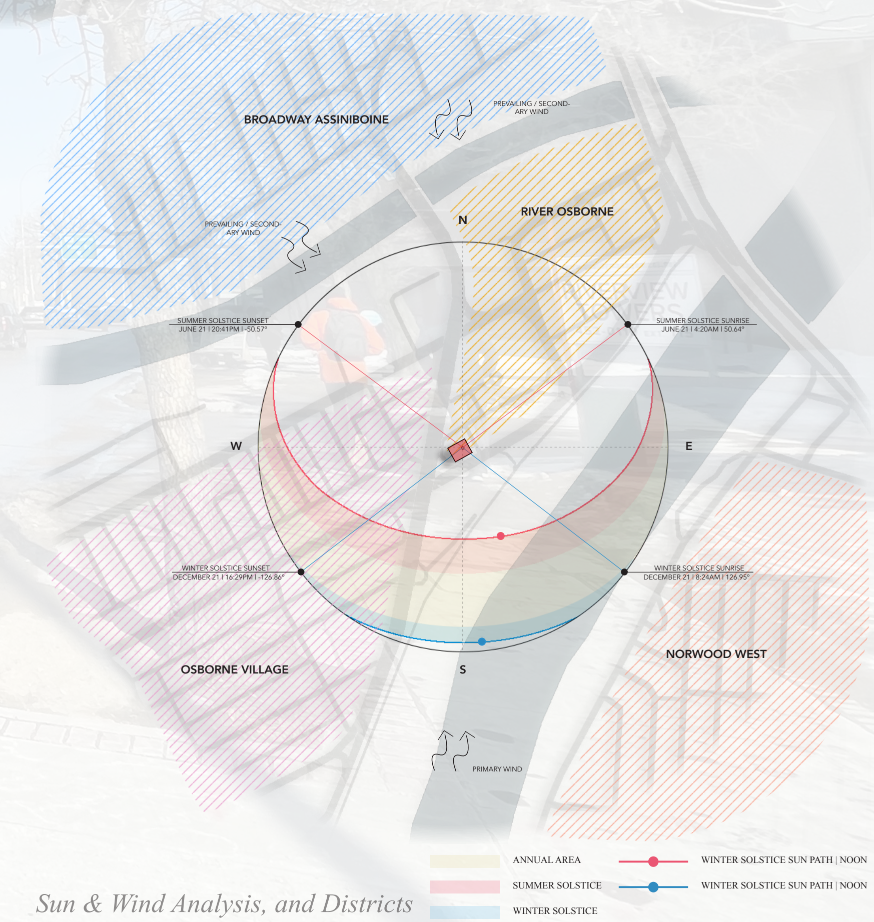
June Sunrise | 5:19AM | 50.44º

June Sunset | 21:41PM | 309.38º

Winter Solstice 12/21/2022

December Sunrise | 8:23AM | 126.69º

December Sunset | 16:29PM | 233.03º



Sun & Wind Analysis, and Districts

Figure 27: Site Analysis

Figure 28: 5 Donald Exterior

Site Opportunities

- Located in the outskirt of central Winnipeg easily accessible by varying types of public and private transportation
- Proximate to bustling neighbourhoods allowing access to amenities
- Nearby one of Winnipeg's largest hospitals that specializes in neurology and movement disorders
- Situated between the split of the river giving views of the riverbend and nearby recreational parks
- Orientation of the building allows for optimal utilization of daylight
- Adjacent to a public transitway

Site Constraints

- The tenant requirement of the building may oppose to the idea of a medical facility
- Main roads surrounding the building may pose as a sound nuisance to patients and other users
- Difficulty in navigation due to road directions may cause confusion in entering the building
- Adjacent buildings, specifically to the East and South may cause visual interference and privacy loss due to its proximity
- Rush hour congestion in the intersection of Donald and Stradbrook may cause drop of and pick issues

3.2.1 Building Analysis

Five Donald Street currently accommodates a diverse range of small and independent businesses, including but not limited to financial brokers and regional health authorities, making it an ideal location for growing operations. The building is at the junction of two bustling intersections and experiences significant daily traffic before and after working hours.

The building comprises six floors; each level is conjoined with a central elevator shaft and connected fire escape stairwell. Additionally, shared washrooms and a central corridor are available on each floor with multiple tenants. Available paid outdoor parking stalls are situated on the northeastern exterior side and are complemented by street parking at the south entrance. However, indoor parking is conveniently accessible to visitors on two below-ground levels. The comprehensive analysis of the building will closely investigate the exterior and interior design of the structure, determining pivotal factors that affirm the suitability of the chosen site.

Figure 29: 5 Donald Exterior Facade

Building

Five Donald

Address

5 Donald Street
Winnipeg, Manitoba, Canada
R3L 2T4

Use/Type

Mixed-Use

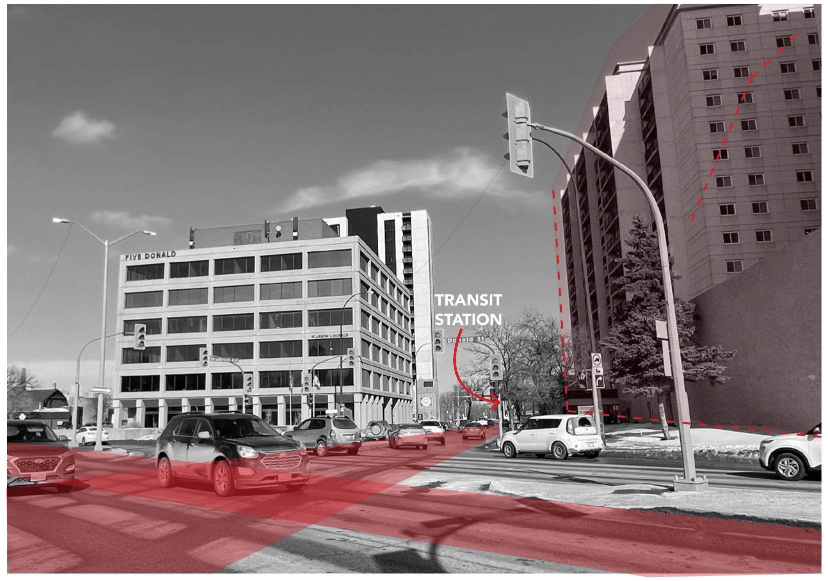
Square Footage

Level 5: 12,963 sqft
Level 6: 12,963 sqft
Total Square Footage: 25,926 sqft

Exterior Analysis

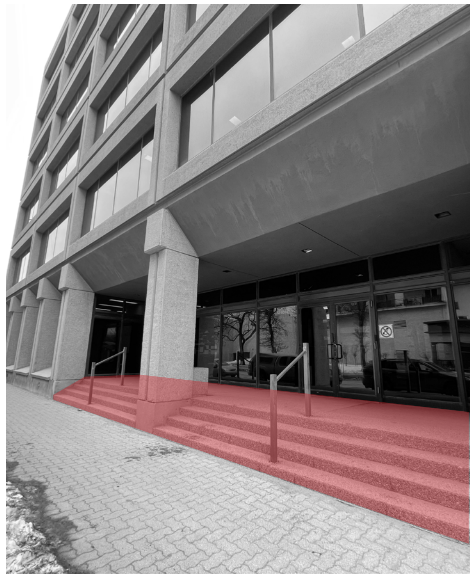
The structure exemplifies the Brutalist architectural style, composed of a concrete facade and expansive glass panels. Access to the parking lot is available on the building's Southeast side, encircled by many available parking stalls for visitors. In contrast, the gated underground parking garage is accessible from the West perimeter and can be accessed by security approval. Furthermore, the primary entrance is located on the southeast side. However, this presents accessibility challenges due to integrated steps without accompanying ramps, which can pose difficulties for individuals with mobility impairments who use mobile aids.

Additionally, being surrounded by two intersecting main roads can cause noise disturbances, and its position between towering structures can create a rough wind tunnel effect. Additionally, being surrounded by two intersecting main roads can cause noise disturbances, and its position between towering structures can create a rough wind tunnel effect. Consequently, despite being conveniently located near a transit station, individuals must navigate and cross a bustling roadway to reach the main entrance. This can be difficult and dangerous for individuals with leaden speed and mobility aids. Furthermore, the building is nestled among adjacent residential buildings, which offers a clear glimpse into private residential suites. The structure reveals obvious negative factors; however, its positive attributes should not be dismissed. The selection of the building hinges on its proximity to amenities, with its architectural design and orientation as secondary considerations that can be adjusted.



North-East view of 5 Donald - Intersection of Donald & Stradbrook

Figure 30: Exterior Analysis Donald Street



Non-accessible main entrance

Figure 31: Exterior Photo

Stradbrook East bound West view of 5 Donald showcasing main and parking lot entrance

Figure 32: Exterior Analysis Stradbrook Avenue

East bound view of Stradbrook from inside 5 Donald overlooking transit station

Figure 33: Transit Terminal View

Interior Analysis

The building's interior features an out-of-date office design, with the main lobby exhibiting a mid-century interior style seemingly unchanged for an extended period. Conversely, the upper levels have undergone several renovations over recent years and are still under development due to new tenants, allowing for potential interior renovations. Shared floors among multiple tenants are interconnected through a main elevator shaft and a primary emergency stairwell, which leads to a central corridor that exudes a dull and lonely ambiance.

Due to the enveloping glass facades, ample daylight surrounds the vacant space, particularly on the north and west perimeter, which provides unobstructed city views. Although overshadowed by adjacent buildings, the north and east perimeter still maintain impeccable lighting conditions. This is beneficial in energy conservation, as the amount of daylight penetrating the space can be optimized. Design-wise, vertical elevation alterations are limited, as the height between the floors and the ceiling is 8'5". However, this should not pose an issue to the design of the space, as this height is a common standard. Likewise, tenants are free to make potential interior modifications, as each floor contains non-bearing partition walls that can be removed.

North-West view from fifth floor 5 Donald - View of Donald St

Figure 34: View of Outside

Light penetrating throughout corridor also showcasing ceiling height

Figure 35: Interior Height

East View from the fifth floor offices

Figure 36: View of Adjacent Building

Corridor view analyzing sun penetration from surrounding windows

Figure 37: Interior Photograph

Building Opportunities

- Abundant number of indoor and outdoor parking spaces available for staff and visitors
  - > Indoor parking connected to the main elevator shaft for easy access to each level
- Located less than a few meters away from the nearby transit station
- Building façade allows for optimal use of daylight
- Re-programming of space can be possible

Figure 38: 5 Donald Exterior Photograph

Building Constraints

- Inaccessible public entrance due to a staircase with no ramp option
- Possible noise disturbance due to busy intersection
- Busy roads may cause pedestrian hazard
- Enclosed high towering buildings may cause rough wind tunnels
- Adjacency to residential buildings may cause privacy issues
- Limited vertical elevation changes due to low ceilings
- All floors sharing a main corridor, emergency stairwell, and public washrooms may cause privacy concerns and confusion

3.3 Human Factors

3.3.1 Client Profile

The client represents a specialized medical organization dedicated to enhancing and improving the health and wellness of individuals with Parkinson's Disease. However, the primary clientele for the project design is those with Parkinson's, with staff and families being secondary clients. The organization's principal goal is to offer aid and support to those with neuromotor conditions, specifically Parkinson's, and allow these individuals to live an independent lifestyle. The centre will be publicly operated but will work closely with private healthcare divisions as they focus on identifying suitable medical interventions and treatments for individuals with Parkinson's. Additionally, the organization is committed to advancing therapies and pursuing a cure for the condition.

Goal

- Promote wellness through physical and mental therapy
- Discover groundbreaking clinical treatments and improve medical regimes
- Engage and educate the community about neuromotor conditions while also imparting information to support patients, families, caregivers, and friends.

Site Needs

- Located near a healthcare facility that specializes in neuromotor conditions
- Proximate to amenities
- Located near a transportation route
- Access to parking

Building Needs

- Can be expanded for future growth
- Commercial building that can be bought or lease
- Must be able to accommodate the required minimum square footage
- A building a full window facade for the allowance of optimal natural light penetration

3.3.2 User Profiles

The user profile is divided into three categories, determined by individuals that would be seen frequently using the space. These users with a rough estimation on its numbers are as follows:

Table 14: Users and Rough Estimate of Quantity Per Day

USERS		QTY.
Primary	Outpatients	20
	Family & Caregivers	30
	Nurses	1
	Physiotherapists	5
	Receptionists	2
	Security	2
Secondary	Neurologist	3
	Neuroscientist	2
	Radiologists	1
	Lab Technicians	4
	Data Analysts	2
Tertiary	Volunteers	5
	Delivery Personnel	2
Estimate day to day users		81

Primary Users

Primary users consist of seven major occupant groups that are deemed to occupy the building for most times. These individuals possess a complex sets of job positions and requirements.

OUTPATIENTS

These individuals are those with Parkinson's Disease who frequent the space for treatments, therapies, and health diagnosis.

FAMILIES & CAREGIVERS

These individuals will accompany the patient and communicate with nurses and doctors regarding the patient's well-being and needs.

NURSES

These individuals are responsible for patients' wellness, assessing concerns, and overseeing their overall health. They build a strong rapport with patients and assist practicing doctors in providing patient care. Additionally, they are involved in managing all patient treatments and care.

MOTOR MOVEMENT PHYSIOTHERAPISTS

These individuals are responsible for providing physical care for those with a cognitive condition. Physiotherapists provide physical treatments and oversee educating and helping patients manage their motor skills. They also aid in preventing the disease from worsening rapidly through daily exercises and physical movements (CollegePT, 2021).

RECEPTIONISTS

These individuals welcome visitors upon arrival and address any medical or facility-related inquiries. Receptionists also guide visitors to their destinations and manage additional facility requirements.

SECURITY & ADDITIONAL STAFF

These workers oversee the safety of the entire facility and help maintain its function.

Table 15: Primary User, Age, Duration, Activities, Psychological & Physical Needs

Users	***Age***	***Duration***	***Activities***	***Psychological Needs***	***Environmental Needs***
Outpatients	40+	2-5hrs	• Check ups • Consultations • Diagnosis • Examinations • Therapy sessions	• Easy to understand wayfinding • Acoustic privacy • Non-stimulating lighting • Secure space • No confusing patterns • Access to nature and daylighting • Access to privacy • No high contrast colours • Access to social interactions • Non-medical like atmosphere	• Places of rest • Extruding features that would help prevent fall • Soft surfaces • Surfaces with floor grips • Non-extruding flooring • Smooth and curved edges • Comfortable upholstery • Non-confined and narrow spaces • Supported furniture
Family & Additional Guests	Varies	2-3 hrs per day during visitation hours	• Accompanying patients during treatments • Visiting patients • Consulting with specialists and volunteers to better aid family member while outside of the treatment centre	• Access to social interaction • Temperature control environment • Cleanliness Calm atmosphere • Secure space • Simple wayfinding	• Comfortable furniture • Places to eat and rest
Nurses	22+	8hrs per shift	• Specialized care for patients • Treatment management	• Controlled lighting • Acoustic privacy	• Ergonomic furniture • Comfortable upholstery

Nurses Cont.			• Assess patient paperwork • Assists patient concerns • Aid doctors in patient diagnostics	• Simple office design • Secure space • Calm atmosphere • Temperature control	• Breakout spaces • Spaces to eat and rest
Physiotherapist	20+	As needed Typical 8hrs per day	• Provides specialized physical activities • Responsible for aiding in manual neuromotor exercises • Aid in managing excessive tremors • Aid in controlling movement and creating accessible solutions	• Secure environment • Cleanliness • Calm atmosphere	• Breakout spaces • Spaces to eat and rest • Comfortable upholstery on furniture • Uncluttered spaces
Receptionist	20+	Roughly 8hrs per shift	• Takes inquiries from patients and medical personnel • Assess paperwork • Receive deliveries • Answer calls • Direct visitors	• Secure environment • Cleanliness • Calm atmosphere	• Breakout spaces • Spaces to eat and rest • Comfortable upholstery on furniture • Uncluttered spaces • Ergonomic furniture
Security	18+	18hrs Typical 8hrs per shift per person	• Secures the safety and protection of the facility • Controls building access and entry • Fire safety and emergency response planning	• Floor grips • Places to rest	• Breakout spaces • Spaces to eat and rest

Secondary Users

Secondary users are frequent inhabitants of the facility, which has four major occupants. Like the primary users, these individuals possess complex requirements and needs.

NEUROLOGIST

These professionals oversee the development of specialized treatments for individuals with Parkinson's and are responsible for treating patients with neurological disorders (URMC, 2021).

RADIOLOGIST

These highly skilled professionals are trained in interpreting and executing medical imaging and are responsible and qualified to operate medical machines such as MRIs and CT scans (ARC, 2021).

NEUROSCIENTIST

These professionals specialize in studying and researching the human nervous system and provide research on the diagnosis, treatment, and potential cure for Parkinson's Disease (CareersInPsychology, 2020).

CUSTODIAN

They are responsible for overseeing the overall maintenance of the entire facility.

Table 16: Secondary User, Age, Duration, Activities, Psychological & Physical Needs

Users	***Age***	***Duration***	***Activities***	***Psychological Needs***	***Environmental Needs***
Custodians	18+	18hrs 8hrs per shift	• Maintaining the cleanliness of the facility • Responsible for minor repairs and maintenance works • Restocking facility amenities	• Easy to understand wayfinding • Non-stimulating lighting • Secure space • Access to social interactions • Calm atmosphere	• Breakout spaces • Spaces to eat and rest
Radiologists	30+	As needed Typical 8-10 hrs per day	• Assessing medical imagery findings • Perform medical imaging procedures	• Light controls • Temperature control environment • Secure space • Cleanliness • Calm atmosphere • Acoustic privacy	• Private office space • Ergonomic equipment • Comfortable furniture
Neurologist	30+	As needed Typical 8-10 hrs per day	• Executes examinations • Performs diagnosis • Facilitate personalized treatments • Assess required patient paperwork	• Controlled lighting • Acoustic privacy • Physical privacy • Simple office design • Secure space • Cleanliness • Temperature control • Calm atmosphere	• Ergonomic furniture • Private office space • Comfortable upholstery
Nuero-scientist	30+	As needed Typical 8hrs per day	• Conducts validated on-site experiments • Execute neurological research	• Controlled lighting • Acoustic privacy • Physical privacy • Simple office design • Secure space • Cleanliness • Temperature control	• Ergonomic furniture • Private office space • Comfortable upholstery

Secondary Users

Tertiary users enter the facility less frequently than primary and secondary users. They mainly consist of two kinds of occupants, and like their counterparts, these workers possess complex job positions and requirements.

DELIVERY PERSONNEL

These individuals are responsible for the input and output of packages such as medical supplies, mails, groceries, and other needed items in the facility.

VOLUNTEERS

These individuals usually assist staff with necessary responsibilities. However, they are mainly responsible for educating patients and their respective families about Parkinson's and any other associated neurological conditions.

Table 17: Tertiary User, Age, Duration, Activities, Psychological & Physical Needs

Users	*Age*	*Duration*	*Activities*	*Psychological Needs*	*Environmental Needs*
Volunteers	18+	As needed	• Educate patients and families about PD • Responsible for providing additional support • Aid medical personnel, if necessary, work is required	• Access to social interaction • Temperature control environment • Secure space • Cleanliness • Calm atmosphere	• Breakout rooms • Comfortable furniture • Places to eat and rest
Delivery Personnel	18+	As needed	• Delivering supplies • Collecting and sending packages and medical samples • Obtaining signatures	• Secure space • Simple wayfinding	• Easy access to facility

3.4 DESIGN REQUIREMENTS

3.4.1 Functional and Spatial Requirements

Table 18: Functional and Spatial Requirement

Spaces	Furniture, Fixture + Equipment	Desired Atmosphere	Quantity of Rooms Needed	Required Square Footage
Lobby/Reception	Seating, desk, phone, computer system, printing station, filing	Welcoming, safe, calm	1	240
Waiting room	Modular and non-modular comfortable seating, small tables, television	Calm, clean, bright	1	120
Conference room	Long desk, seating, computer system, audio system, projector system	Functional, clean	2	240
Classrooms	Stackable chairs, desks, audio system, computer system, shelving units, whiteboard/smart board, projector system	Clean, bright, welcoming, calm	2	240
Staff lounge	Seating, table, locker unit, kitchenette, refrigerator, sink, outlets, couch,	Relaxing	2	360
Offices	Seating, desk, phone, computer system, shelving unit, small lighting	Relaxing, peaceful, bright	10	1,000
Security	Computer system, audio system, desk, chair, television, phone	Functional	1	100
Breakout room	Couch, table	Peaceful	1	100
Examination rooms	Examination bed, seating, shelving unit, counter, desk, computer system, storage	Calm, relaxing, bright, clean	4	432
Outpatient rooms	Bed, comfortable seating, table	Calm, relaxing, bright, clean, safe	4	480
Radiology	Computer system, seating, MRI, X-ray equipment, phone, printing station, shelving unit	Functional, calm, relaxing	1	240
Physiotherapy	Bed, exercise equipment, seating, mobility equipment, mats, balls, storage, shelving unit	Safe, clean, functional	5	540
Daily Living Activity	Kitchenette, tub/shower, mobile staircases	Safe, clean, relaxing, functional	1	960
Washrooms	Toilet, sink, grab bars, garbage	Accessible, clean	12	480
Laundry	Washing machine, dryer, storage, sink, shelving unit, counter, workstation	Utilitarian	1	120
Housekeeping	Shelving unit, sink, cleaning equipment	Utilitarian	2	72
Loading/Garbage	Garbage/recycling bins	Utilitarian	1	56
Areas of Rest	Comfortable seating, table	Areas of Rest	1	120
Total square footage				5,900
+30% Circulation				1,770
+ 10% Partitioning				590
Total Square Footage Required				**8,260**

3.4.2 Occupancy Calculation

Table 19: Occupancy Calculation

Rooms	Min. SQFT	Area Per Person	Occupancy
Lobby/Reception	240	8ft	30
Waiting room	120	10ft	12
Conference room	120	10ft	12
Classrooms	120	10ft	12
Staff lounge	180	10ft	18
Offices	100	10ft	4*
Security	100	10ft	5*
Breakout room	100	10ft	2*
Examination rooms	108	10ft	5*
Outpatient rooms	120	10ft	4*
Radiology	240	10ft	5*
Physiotherapy	108	10ft	4*
Daily Living Activity	960	10ft	15
Washrooms	40	8ft	1
Laundry	120	8ft	3*
Housekeeping	36	8ft	2*
Loading/Garbage	56	8ft	2*
Supply Storage	60	8ft	3*

3.4.3 Adjacency Matrix

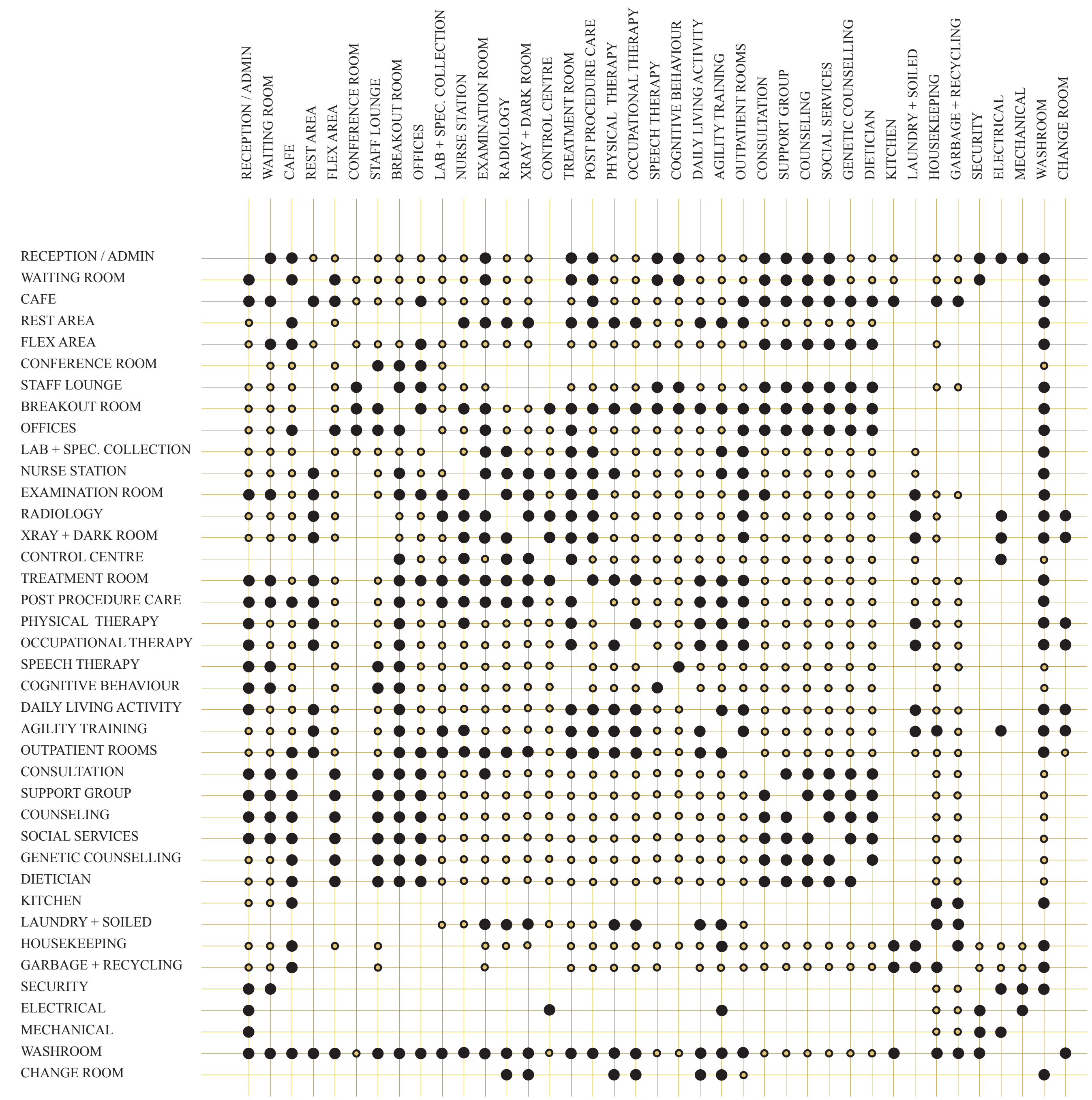


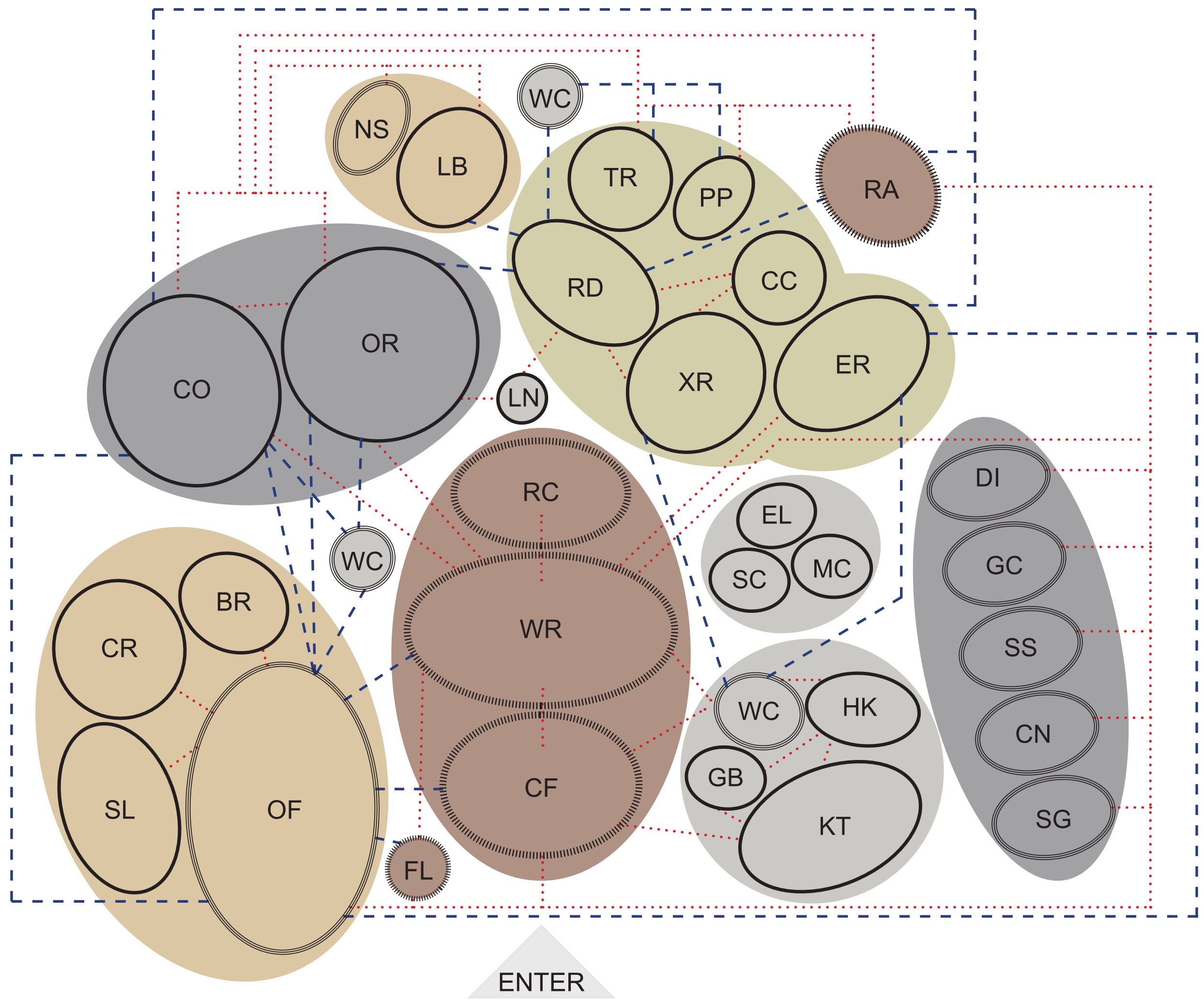
Figure 39: Adjacency Matrix

LEGEND

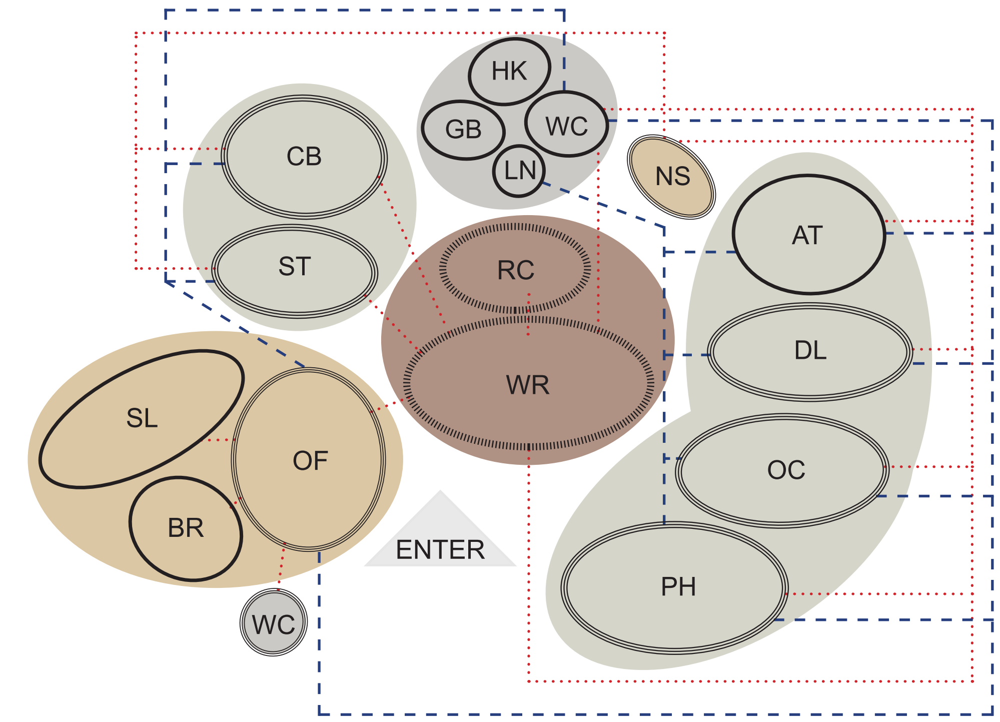
- DIRECT CONNECTION
- INDIRECT CONNECTION
- CONNECTION UNIMPORTANT

3.4.4 Bubble Diagram

500th FLOOR



600th FLOOR



COMMON AREAS	*WORKSPACE*	*MEDICAL / EXAMS*	*THERAPIES*
RC - RECEPTION / ADMIN	CR - CONFERENCE ROOM	ER - EXAMINATION ROOM	PH - PHYSICAL THERAPY
WR - WAITING ROOM	SL - STAFF LOUNGE	RD - CT SCAN	OC - OCCUPATIONAL THERAPY
CF - CAFE	BO - BREAKOUT ROOM	CC - CONTROL CENTRE	ST - SPEECH THERAPY
RA - REST AREA	OF - OFFICES x8	XR - XRAY & DARK ROOM	CB - COGNITIVE BEHAVIOUR
FL - FLEX AREA	LB - LAB + SPECIMEN COLLECTION	TR - TREATMENT ROOM	DL - DAILY LIVING ACTIVITY
	NS - NURSE STATION	PP - POST PROCEDURE CARE	HT - AGILITY TRAINING

SUPPORT / SERVICES	*MISCELLANEOUS*
OR - OUTPATIENT ROOMS	KT - KITCHEN
CO - CONSULTATION	LN - LAUNDRY + SOILED
SG - SUPPORT GROUP	HK - HOUSEKEEPING
CN - COUNSELLING	GR - GARBAGE + RECYCLING
SS - SOCIAL SERVICES	SC - SECURITY
GC - GENETIC COUNSELLING	EL - ELECTRICAL
DI - DIETICIAN	MC - MECHANICAL
	WC - WASHROOM

LEGEND

PRIVATE
PUBLIC
SEMI-PRIVATE
DIRECT CONNECTION
INDIRECT CONNECTION

Figure 40: Bubble Diagram

4.0

DESIGN SOLUTIONS

4.0 Design Development

The design development integrates the evidence from the literature review and applies it to a hypothetical real-world application. This section will illustrate the research in a practical interior design context, demonstrating attentiveness to the design consideration of programming, interior finishes, materiality, and furniture and fixtures responsible for enhancing user well-being for individuals with Parkinson's Disease.

4.0.1 Design Concept / Language

The tulip has been a widely known symbol for the awareness and support of Parkinson's, dating back to 2005, when it was officially introduced during the 9th World Parkinson's Day Conference held in Luxembourg (Parkinson Canada, 2016). However, using tulips as an icon for Parkinson's dates back decades. It had been revealed that the first association of the tulip began in the 1980s when Dutch horticulturalist J.W.S Van der Wereld, who at the time was diagnosed with the condition, received accolades for the development of a new variety of white and red tulips, which he honoured and named after Dr. James Parkinson, the first person to document the medical condition (Parkinson Canada, 2016).

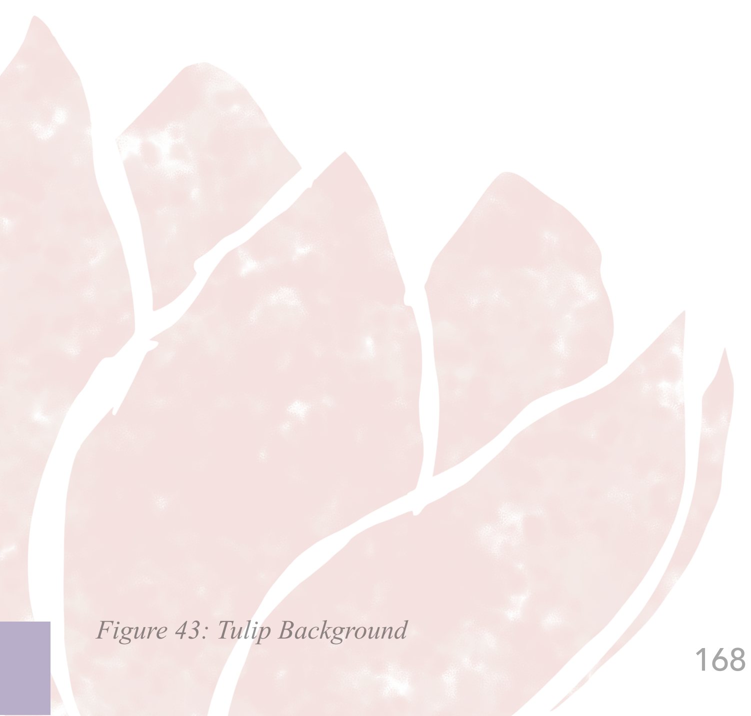


Figure 43: Tulip Background

The decision to adopt the tulip as the facility's primary design motif is based on its symbolism of bringing awareness to Parkinson's Disease, which is the facility's principal goal. The center is dedicated to providing continued support for individuals with Parkinson's and using the tulip as the central design element particularly fits this context.

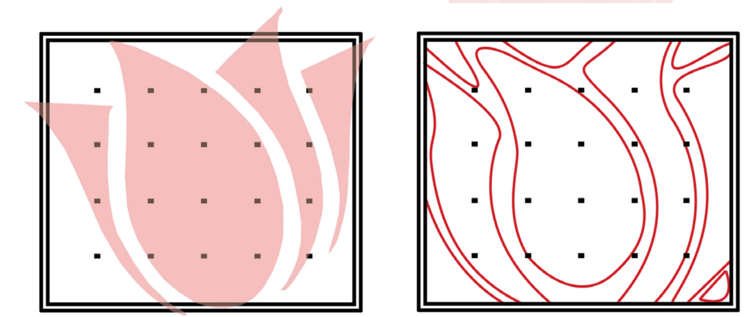


Figure 41: Tulip on Plan

Additionally, the tulip was used to create the design language and overall ebb and flow of the space. Most specifically, the top of the flower itself as it follows an intricate curvilinear form. The tulip was also used to determine design features that would be found throughout the space. Specifically, the petals' overlapping features, shape and size, and soft curvilinear silhouette were used for inspiration. These will be implemented on light fixtures and wall features throughout the space.

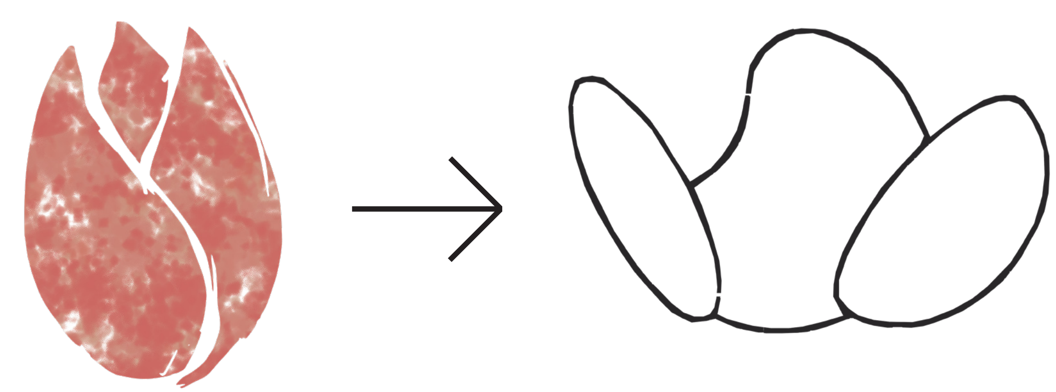


Figure 42: Design Language Form

Fifth Level Floor Plan
NTS

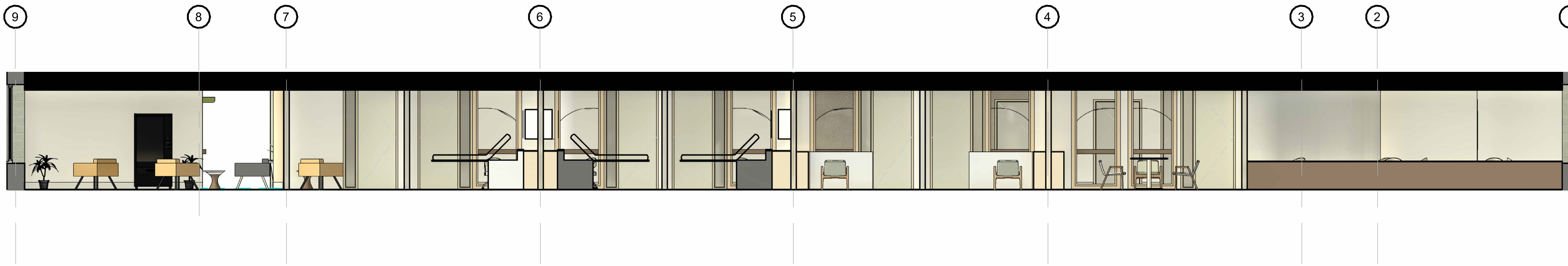
Figure 44: 5fth Floor Plan

4.0.2 Fifth Level

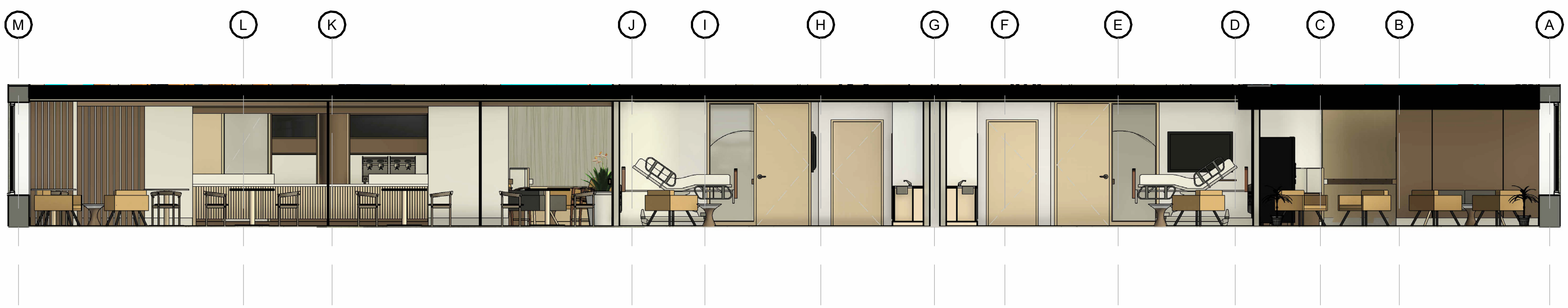
The fifth level of Five Donald functions as the clinical and examination floor of the rehabilitation clinic, where initial consultations and subsequent medical assessments are conducted. The space intends to provide healthcare assistance and support that focuses on the non-physical symptoms of Parkinson's, such as speech and language pathology, nutrition counselling, and specialized counselling for patients, families, and caregivers. Additionally, the clinical floor houses an in-house medical laboratory for medical testing and a radiology department for necessary diagnostic imaging processing.

The floor plan has been meticulously designed to facilitate ease of wayfinding for individuals with Parkinson's Disease. The curved pathways allow for a direct and continuous flow of movement, reducing the occurrence of reaching dead ends and unnecessary turns, thus minimizing confusion during navigation. The spatial arrangement of the floor plan strategically situates crucial medical areas along the perimeter while centralizing non-medical spaces nonessential to those with Parkinson's. This interconnected layout guarantees a smooth transition from consultation to treatment, eliminating the necessity to traverse through extraneous areas. The strategic placement of rooms also prioritizes user privacy. Private areas are positioned to maximize city or river views, while public areas are positioned towards neighbouring structures.

Figure 45: 5fth Floor Plan Isometric



S1 Southeast - Southwest Fifth Level Section
NTS



S2 Southwest - Northwest Fifth Level Section
NTS

Figure 46: Southeast - Southwest Fifth Level Section

Figure 47: Southwest - Northwest Fifth Level Section

Figure 48: Lobby Perspective

Lobby

The two floors of the rehabilitation center open directly onto the facility's lobby, which is dissimilar to its counterpart levels where the elevator shaft is shared among tenants. Upon entering, occupants are greeted with a design characterized by neutral colour palettes inspired by nature. This was meticulously considered as natural elements evoke serenity and create a welcoming environment. Additionally, bariatric soft seating was implemented to ensure proper accommodation for users and allow for ease in seating and standing motions without the fear of stumbling or falling.

Figure 49: Hallway Resting Area Perspective

Hallway

The hallway of the rehabilitation clinic functions as the primary access point for all the rooms within the facility. As such, it has various accessible features to accommodate individuals with disabilities. A continuous line of handrails has been strategically placed throughout the building to support individuals with physical challenges and mitigate the risk of falls. Additionally, constant floor strips run along the perimeters of the hallway – nearest to the doors – to prevent freezing in individuals with Parkinson's as they attempt to enter rooms. This design feature has been revealed to prevent freezing, giving individuals a point of reference that can assist them with moving.

Figure 50: Main Hallway Perspective

Figure 51: Patient Room Hallway Perspective

Furthermore, prominent signage was added that carefully considered height, colour, and visibility. A bright-coloured tone was used for its overall look, allowing for a contrast among the neutral tones. Additionally, the signage had been designed to extrude from the wall rather than being hung as a plate, as this allows for legibility upon approach. For privacy concerns, frosted glass is utilized throughout the building to maintain confidentiality while optimizing natural light penetration within the space. Moreover, rest areas are strategically positioned throughout the hallways, offering individuals a respite when needed while serving as secondary support to reduce the impact of falls. Lastly, natural elements were incorporated within the corridors, which has been reported to create a tranquil and meditative environment that reduces stress.

Nurse Station

The nurse station serves as an information hub for clinicians and provides a vantage point overlooking the patient rooms. It is in a prime location that is accessible to the various consultation rooms within its parameters. Adjacent to the nurse station is a designated relaxation area accessible to all users. In this space, users can lounge and repose while enjoying the city’s view while waiting for a family or friend to finish a consultation or treatment. Additionally, bariatric furniture is implemented in the space, allowing for accessibility in sitting and standing. Lastly, the openness of the rest area allows natural daylight to permeate the hallway and nurse station throughout the day. This can decrease energy consumption while promoting healthy well-being for users through the benefits of natural daylight.

Figure 52: Nurse’s Station

Medical Consultation

The room's primary purpose is to provide an initial medical consultation between a specialist and a patient. It is designed to evoke calmness and relaxation, as most consultations can create psychological stress among patients. The surfaces for the consultation room were meticulously chosen to increase privacy while reducing environmental stimuli such as light and sound. To improve speech privacy, thick carpeting, draperies, and acoustic ceiling boards were used, as these materials have a high probability of absorbing sound. When sound is absorbed, speech tends to get muffled, leaving confidential matters exclusively between clinician and patient. Using sound-absorbent surfaces also allows sound to be contained within a specific area, reducing noise transfer between rooms. This benefits all users by significantly reducing noise annoyance, which is responsible for stress.

The design and placement of the consultation rooms were meticulously planned, with a strong focus on privacy considerations. Privacy glass was incorporated into the interior windows to prevent unwarranted visibility from passersby while allowing natural light from the exterior windows to permeate the hallways. The consultation rooms' location was planned to minimize obstructions from neighbouring structures while preventing potential unauthorized observation from occurring.

Figure 53: Medical Consultation

Private Treatment Room

The private treatment room serves as an in-house medical care space focused on preventive care and is intended to be used by patients staying for an extended time. The deliberate design of the room aims to evoke a meditative and familiar ambiance reminiscent of a retreat or a hotel room. Research reveals that calming environments alleviate the stress commonly associated with medical settings, contributing to expedited recovery. This was intentionally done with the room's design as it has bariatric beds, chairs, and amenities like a television. The room was meticulously designed to simulate the comforts of a hotel room, where users can experience the same sensation as being on holiday. In addition,

Privacy was emphasized in the room's overall design, incorporating sound-absorbing materials such as acoustic ceiling boards and thick draperies for sound absorption and noise reduction. In addition, the draperies are utilized for both aesthetic purposes and privacy, ensuring seclusion from external views.

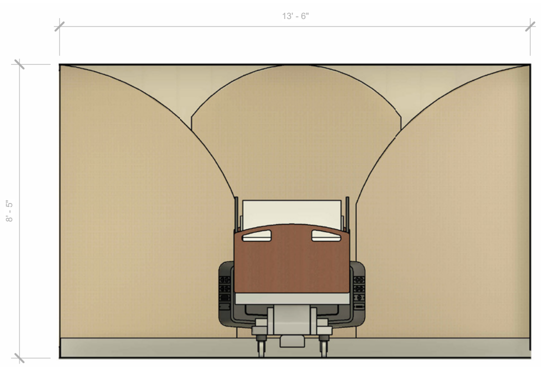


Figure 54: Patient Treatment Room Elevation

Figure 55: Patient Treatment Room 1

Figure 56: Patient Treatment Room 2

Sixth Level Floor Plan

NTS

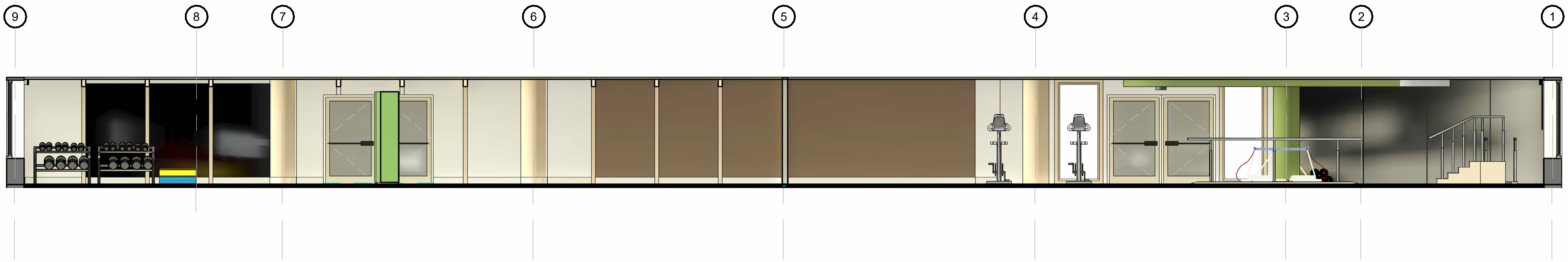
Figure 57: 6th Floor Plan

4.0.3 Sixth Level

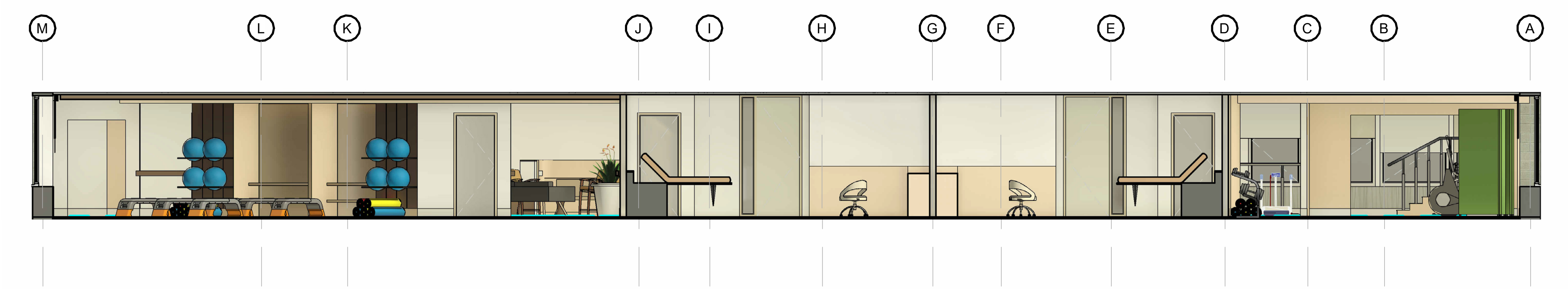
The sixth floor of the building has been designated as the center's therapy unit, offering tailored rehabilitation spaces for individuals with varying degrees of movement abilities attributable to the conditions of Parkinson's. Given the diverse nature of physical and cognitive traits associated with the condition, certain activities proved more manageable for specific individuals, while they may be overly complex for others. Thus, the therapeutical spaces for this floor have been carefully curated to ensure that individuals with Parkinson's receive the proper physical support appropriate to their specific movement abilities.

This level's design follows the same wayfinding, overall aesthetic, and supportive design as the medical unit. This allows users to easily navigate the space without worrying about getting lost or confused. The spatial arrangements of the spaces were also meticulously planned, ensuring the public areas are hidden from unwarranted outside views, while public spaces optimize the view of nature for additional therapeutic benefits.

Figure 58: 6fth Floor Plan Isometric



S1 Southeast - Southwest Sixth Level Section
NTS



S2 Southwest - Northwest Sixth Level Section
NTS

Figure 59: Southeast - Southwest Sixth Level Section

Figure 60: Southwest - Northwest Sixth Level Section

Figure 61: Agility Room Perspective 1

Agility Training

The agility training room is a specialized space designed for individuals exhibiting mild to moderate physical impairments associated with the traits of Parkinson’s. Its primary focus is to optimize and refine individuals’ physical capabilities, emphasizing comprehensive training practices to improve their physical coordination.

The area’s design follows a neutral tone with hints of green and is accented by the colours of the equipment found within the space. The purpose of the design is to evoke a serene atmosphere and to focus on the training rather than the space’s design, which can contribute to overstimulation for some individuals with Parkinson’s. Aside from the outside views, the room is accentuated with elements of nature, such as patterned walls showcasing a greenery design feature, as nature elements can evoke a serene atmosphere in interior spaces.

Figure 62: Agility Room Elevation

Figure 63: Agility Room Perspective 2

Multipurpose Therapy Room

The multipurpose therapy room is intended to facilitate a wide range of activities that support the prevention of worsening physical conditions for those with Parkinson's. The space plans to provide transitional exercise and rehabilitation programs tailored to varying degrees of motor functions.

List of Potential Activities:

- Pilates
- Aerobics
- Tai Chi
- Weight Lifting
- Dancing
- Yoga
- Non-Contact Boxing
- Exercise Balls
- Stretching

and more

Figure 64: Multipurpose Perspective 1

The space is designed to be versatile and can be utilized for various programs and activities the facility offers. Its design is simplistic to direct attention towards the activities and reduce potential distractions caused by the environment. Due to its large size, the room can easily be partitioned into two spaces to accommodate concurrent activities. The overall design is like the agility training room, to evoke serenity through minimal design features while positively influencing the well-being of the users through the implementation of natural elements, such as wood and nature tones. Additionally, preventative measurements have been implicated in reducing fall events that exercise can cause. Like the majority of the floor surfaces found throughout the two levels, acoustic soft rubber flooring had been implemented as this had been proven to reduce the negative impact caused by falls. Most rubber floorings are also known to be tactile, which adds to the benefits of fall prevention. In addition, acoustic flooring is known to dampen noise, which is crucial for areas known for excessive movement, as this ensures the reduction of sound transference from one floor to another.

Figure 65: Multipurpose Perspective 2

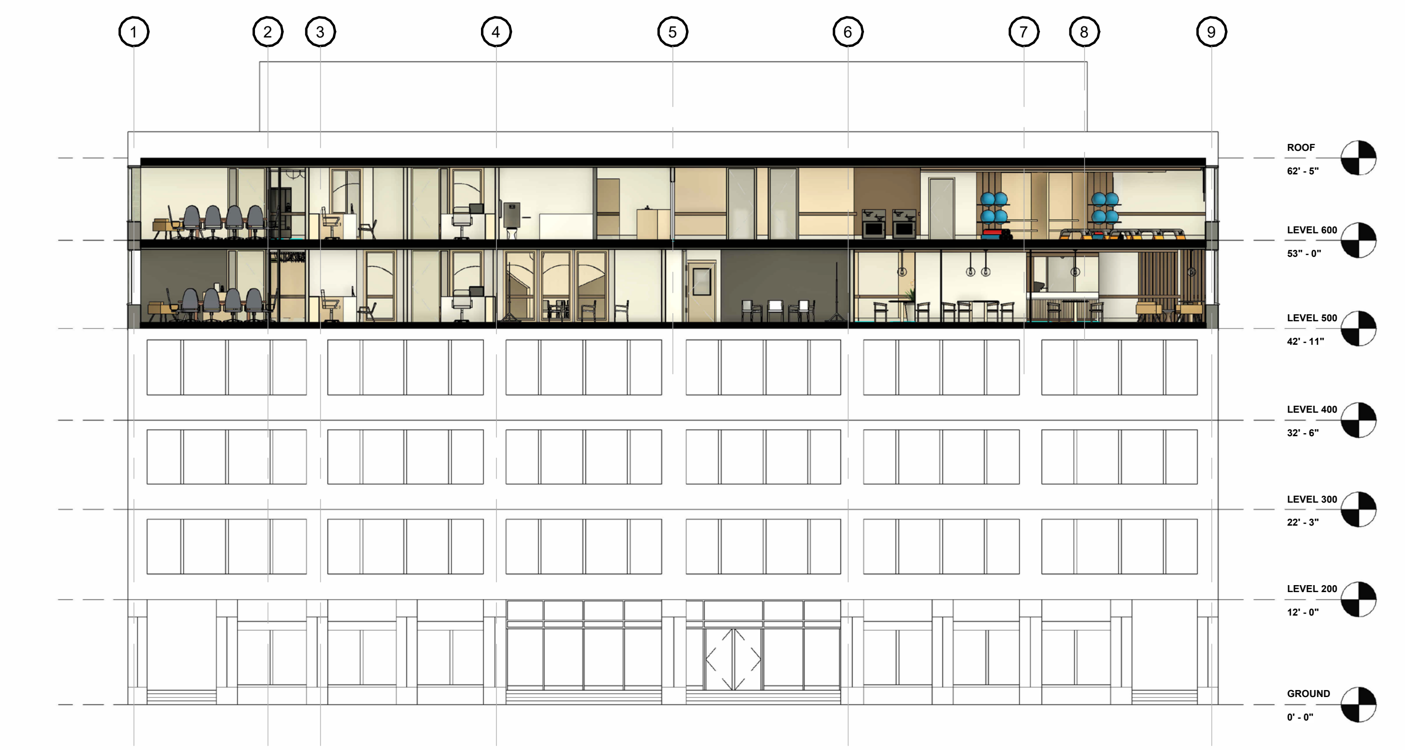
Physical Therapy

Like the previous rehabilitation rooms, the physical therapy area is a specialized space that integrates all aspects of motor-function therapy. It caters to individuals with traits ranging from mild to severe and aims to improve the movement ability of those with Parkinson's. Here, individuals can get assistance in gait control and other physical movement abilities crucial to daily life.

Figure 66: Physical Therapy 1

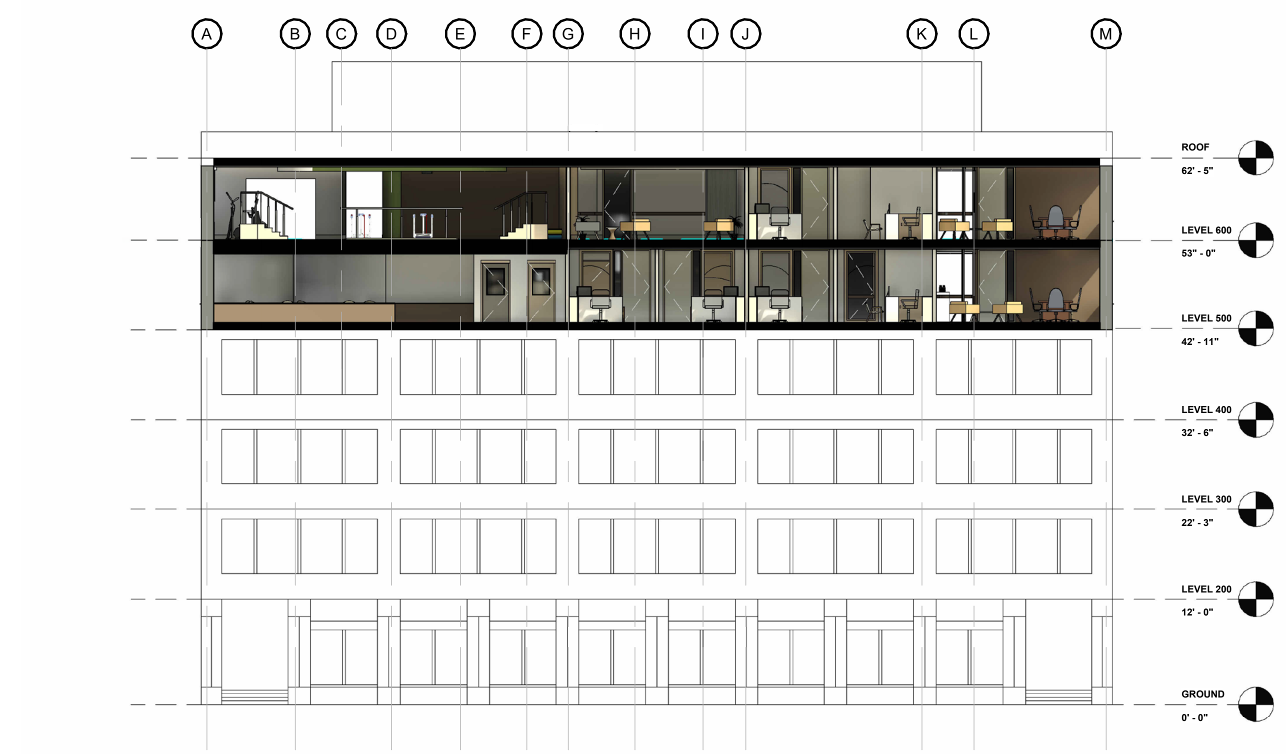
The room follows the same design concept as the previous rehabilitation units, primarily focusing on the activities rather than the design, which reduces overstimulation and allows for optimal participation. Similarly, the physical therapy room integrates tactile rubber flooring to reduce the risk of falls and for additional gait assistance during physical motion. Two flooring surfaces were used, one for the primary walking surface and the other as a walking path. The walking path is enclosed by a strip bearing a similar tone, as this will enable individuals to move from one surface to another without needing to freeze in place, which many individuals with Parkinson's tend to exhibit during this occasion. Walking aids, such as the stairs and the parallel walking bars, are equipped with tactile surfaces to give additional frictional support when walking. Similarly, the overall design of the space boasts neutral colours accentuated by tones of green to further the concept of bringing nature into an urban setting.

Figure 67: Physical Therapy 2



S1 Northwest - Northeast Building Section

NTS



S2 Northwest - Southwest Building Section

NTS

Figure 68: Northwest - Northeast Building Section

Figure 69: Northwest - Southwest Building Section

4.0.4 Materials, Finishes, and Colour

Soft, neutral materials and finishes were utilized throughout the interior to cultivate a serene atmosphere reminiscent of nature. Additionally, secondary colours were chosen to introduce gentle contrasts amidst the prevailing neutral tones. This colour palette was selected to introduce a touch of nature into an otherwise urban location lacking a natural landscape. Research has revealed that natural views or atmospheres evoking natural elements minimize psychological stressors and bring meditative comfort to individuals. Additionally, deliberate considerations were made in material selection to mitigate fall risks among individuals with Parkinson's Disease. This includes integrating soft floor materials such as carpets, rubber tiles, and slip-resistant flooring. All these elemental considerations were meticulously selected as they are proven to enhance the overall well-being of individuals with cognitive conditions.

Figure 70: Material Board

As stated, the facility's colour scheme boasts neutral tones, alluding to the colours of nature. Soft light and dark browns were used throughout the space to contrast the stark white; this was intentionally done to move away from a clinical and authoritarian look. The floors are light in colour, with high-traffic areas being a light warm grey and supporting rooms being a medium-hued grey, with occasional dark carpeting in select areas and rooms. The intention is to use colour to make the rooms appear taller than they are. Light-coloured flooring, partnered with a light-colour ceiling, can create the illusion of a bigger room. However, the colours selected for the floorings ensure that they contrast with the walls so that individuals can differentiate them so as not to cause anxiety and confusion. In addition, grab bars are coloured with a dark brown stain, which allows individuals to disassociate them from the wall and easily find them when needed. Secondary colours were used, such as green, as this is a reminiscence of nature, and its complementary colour, yellow. Greens can be found within hallways and therapy rooms, either through the feature glass walls or wallpaper, exhibiting the natural element of green grass. Signages are also coloured with a similar hue so users can easily spot them. Light green and yellow fabrics are used throughout the space through draperies or furniture, creating a calming contrast between the browns and whites within the facility. Other colours can be seen throughout the space, primarily in therapy rooms through equipment. However, the primary reason for the colour palette is to create a calm and serene environment disassociated from clinical settings. Thus, the majority of the colours chosen follow that of nature.

4.0.5 REFLECTION

Table 20: Research Reflection and Design Implementation

Page	Author	Design Implementation	Research
168 & 186	Burleson, L., 1993 Hultquist et al., L., 2013 Alfonsi et al., 2014	• The floorplan of the space follows a curvalinear path that allows users to foresee changes which can help them prepare for readjustments • The width of hallway ensures that there is sufficient space for movement • The curvalinear form of the hallways ensures that individuals are not walking in straight long hallways and corridors are equipped with serene visual elements	• Sufficient movable spaces gives individuals the ability to maneuver themselves without burdening others or subjecting themselves to the risk of fall • Unforeseen changes often caused by confusing wayfinding and circulation, can lead to sudden halts • Long and monotonous hallway designs can create a sense of boredom, uneasiness, confusion, and wasted for users
172 - 179	Burleson, L., 1993 NYC Department for the Aging, 2017	• Grab bars run along the entire length of hallways ensuring that individuals are able to grab onto a support whenever needed • The height of the grab bars follow the ADA standard ensuring individuals are able to reach them without trouble • Handrails are found on either side of the hallways	• Loss of balance is one of the leading cause of fall related injuries for those with Parkinson's, grab bars allow them to catch themselves before falling • Hallways, stairs, and ramps shall be enforced with both low and high handrails on either side to prevent fall to occur in individuals of varying heights
172,174, 180 - 184, 190 - 199	Armstrong, R.A. 2011 Imrie, R., et al., 1998	• Although the facility has a neutral colour palette, the design ensures that it is not monotonous. Secondary colours are added to break up monotonous colour groupings in all spaces. • The choice of colours for furnitures ensures that they are easy to comprehend and are not similar to the colours of floors and ceiling surfaces	• Comprehending monochromatic contours can be difficult as these hues have been established to reduce colour visual perception in individuals • Objects that are placed in front of backgrounds that bear resemblance in colour, can cause confusion • Analogous hues in furniture and flooring may pose significant risks for individuals with limited visual perception
172 - 177	Burleson, L. 1993 Armstrong, R.A. 2011 Ramos, J. et al., 2020	• Monotonous coloured flooring surfaces were use to ensure that those with low visual acuity will feel safe within the space and to minimize the risk of fall due to dizziness and disorientation • Large traverse lines run along the hallway acting as visual cues to prevent freezing when individuals are subjected to pass entryways	• Using floor material with heavy vertical patterns can cause navigation confusion and difficulty for those with low visual acuity • Optical patterns incorporated in flooring can result in disorientation, posing a significant risk to the safety and well- being of individuals • Large transverse lines have been found to act as visual cues and an effective therapy for those with locomotor concerns
172 - 177 & 190 - 199	Burleson, L., 1993 Winchip, S.M. 2011 Hultquist, A., & Corrow, L., 2013 NYC Department for the Aging, 2017	• Tactile flooring are added in high traffic and high activity areas to ensure maximum grip in order to prevent fall injuries during physical activities • Soft surfaces like rubber flooring and carpets were added all throughout the space to lessen injuries during a fall	• Floor finishes, like smooth, glossy, and slippery surfaces do not provide sufficient grip and support for those with tremors • Tactile flooring is recommended as this ensures a decrease in the likelihood of a fall to occur • For those susceptible to falling, soft surface materials such as carpets can mitigate the probability of losing balance and prevent severe injuries • Soft and resilient flooring materials like cork, linoleum, and rubber can be acceptable substitutes for carpet
176, 196-198	Burleson, L. 1993 Davis Phinney Foundation., 2019	• Circular doorknobs are replaced with bar handles or push doors, as this allows individuals with tremors to easily grasp and open doors with ease	• Grasping a doorknob and inserting a key into a lock difficult for those with tremors. Using knobs that offer a sufficient surface for grasping, such as those with a handle, rather than circular doorknobs is recommended

Page	Author	Design Implementation	Research
176, 180 - 184, 194 - 199	Cowie D. et al., 2012 Cohen, R.G. et al., 2011	• The width of doorways was increased to 4ft as this allows individuals to have substantial room when rotating their bodies • The design of the facility ensures that doorways are added only when necessary as to not create unnecessary gait disturbances in individuals	• Narrow-width doorways provoke gait disturbance while opening with no doors tends to slow the speed of individuals • Individuals tend to freeze due to movement hesitations and the action to double-step when approaching openings or are subjected to rotating their bodies
168, 186 & 261	Burleson, L. 1993	• The design of the bathrrom ensures that it is ADA approved and follows the National Building Code • Theseat height of toilets ensures that individuals will have no trouble in sitting or standing when using them • Grab bars are added behind and on the sides of the toilet for assistance • The space clearance of the bathrooms ensures that substantial space is provided for wheelchairs and for rotation	• Those with Parkinson's tend to incline when standing from a toilet, which leads to fall injuries; this can be prevented by equipping high-seated toilets fitted with grab bars • Grab bars benefits wheelchair users as it provides them with the ability to transfer themselves from one chair to another without difficulty • Substantial amount of space is crucial as it gives them the necessary room for rotation and repositioning which is also beneficial for those with gait and tremors as it provide enough room for repositioning
168 & 186	Iyendo et al., 2016	• The overall design of the facility allows for private and public areas to be separated into two floors	• Obstructive designs can result in a deprivation of privacy, isolation from nature, overly stimulating spaces, and confusing wayfinding
180 - 184, 190 - 199	Beukeboom C.J. et al., 2012 Ulrich, 2000	• Private and therapeutic spaces are provded with views of nature to alleviate stress, improve overall mood and to improve healing and rehabilitation • Hallways with no views of nature are designed with a wall element that features natural elements • Windows with privacy glazing line the hallways for daylight to penetrate all throughout the space	• Views of nature, which have been proven to reduce stress and improve healing in individuals • Exposure to nature, whether real or artificial, positively impacts individuals due to its meditative ability to minimize stress • Inappropriately low environmental stimuli and sensory deprivation, like a lack of natural view and windowless rooms, can lead to boredom, depression, increased stress and anxiety levels, as well as heightened psychosis and delirium
172, 174, 180, 182-184	Burleson, L., 1993 Ramos, J. et al., 2020	• The chosen furnitures derive from companies specializing in clinical equipments • The the furniture were meticulously chosen to ensure that they provide sufficient support for individuals with disabilities and Parkinson's • Stationary furniture such as the beds can be lifted and moved sideways to help individuals mount with ease • The colours of furnitures are vibrant as to differentiate it from its surroundings	• Extremely low or high furniture with plush cushioning and inadequate arm and back support can make it challenging for individuals with Parkinson's to get up from a seated position • Straight-back and automatic lift chairs equipped with arms have been found to assist those with Parkinson's as they ease the mounting process • Furniture with adjustable mechanisms, such as raised beds, seats, and lift chairs, can foster a sense of security and safety in those with Parkinson's while ultimately playing a vital part in improving the mobility functions of these individuals

Page	Author	Design Implementation	Research
172, 174- 176, 180 - 185 190 - 199	Burleson, L., 1993 Armstrong, R.A., 2011 Hultquist A. et al., 2013 Iyendo T. et al., 2016	• Lighting placement ensures adequate light provisions • Light temperature ensures that it is appropriate for the setting and that it does not cause overstimulation or harsh reflections • Daylighting was exploited to reduce daylight efficacy during the day • The design of the facility ensures that there is sufficient daylight penetration all throughout the space • Sun shading is added in areas with a high amount of windows, such as adjustable blinds and window glazings equipped with UV protection film	• Chances of falls for those with visual challenges commonly occur in dimly lit places • Intense lighting from primary sources, such as sunlight through a window or reflected light, can cause glare and impede individuals' vision • Exposure to an extreme concentration of light can create an unsafe environment for those with Parkinson's • Studies found that optimizing natural lighting and views in recovery rooms will positively impact patients' rehabilitation and recovery while increasing staff productivity • Natural daylight in healthcare facilities has been shown to create an enjoyable indoor environment, as it enhances user comfort, attention, and mood, helping in the reduction of fatigue, anxiety, and stress
190 - 185	Hultquist A. et al., 2013 Burleson, L., 1993 Binggeli, C., 2016	• Spaces are design with fibreglass insulated walls to ensure maximum speech and noise privacy • Carpets and draperies are added in private areas to ensure maximum speech and noise privacy • Acoustic ceiling boards was used to increase noise absorption	• Unwarranted noises can lead to speech disturbance and leaked privacy • Minimizing sound transmission can be done through increased sound absorption of materials. • Padded carpets and thick draperies are known to absorb a large sum of sound energy which will increase sound privacy

Page	Author	Design Implementation	Research
174, 176, 178, 180 & 262	U.S Access Board, 2022	• Wall signage follow ADA approved height and are tactile to be legible by those with visual acuity • Colour of the signage is in contrast with its text • The location of location signage ensure optimal viewing from different directions and are placed in high traffic spaces and at every turn • Rooms are equipped with both tactile door signage and overhang signs	• Insufficient wayfinding can create distress for individuals, especially in areas they are not familiar with • Signage should have a colour contrast to be legible for those with low visual acuity • Signage should have proper information indicating, room, number, and labels • To be legible by various individuals, signage should be tactile • Signage should be no more less than 48" and no more than 60" to be manually legible and overhang signs should be no higher 80"

5.0

BIBLIO GRAPHY

2010 ADA Standards for Accessible Design. (2010). United States. Department of Justice.

Alfonsi, E., Capolongo, S., & Buffoli, M. (2014). Evidence based design and healthcare: an unconventional approach to hospital design. Ann Ig, 26(2), 137-43.

Alimoglu, M. K., & Donmez, L. (2005). Daylight exposure and the other predictors of burnout among nurses in a University Hospital. International journal of nursing studies, 42(5), 549-555.

Applebaum, D., Fowler, S., Fiedler, N., Osinubi, O., & Robson, M. (2010). The impact of environmental factors on nursing stress, job satisfaction, and turnover intention. The Journal of nursing administration, 40(7-8), 323–328. https://doi.org/10.1097 NNA.0b013e3181e9393b

ARCHSOL. (n.d.). Muhammad Ali Parkinson Center and Movement Disorders Clinic. Retrieved from http://archsolteam.com/portfolio-item/muhammad-ali-parkinson-center-and mov ment-disorders-clinic/

Architecture Magazine. (2012, September 17). Djavad Mowafaghian Centre for Brain Health. Retrieved from https://www.architectmagazine.com/project-gallery/djavadmowa aghian-centre-for-brain-health-560

Armstrong, R. A. (2011). Visual symptoms in Parkinson’s disease. Parkinson’s disease.

AZBio. (2015). Faces of Parkinson’s Disease at the Muhammad Ali Parkinson Center in Phoenix. Retrieved from https://www.azbio.org/faces-of-parkinsons-disease-at-the-muhammad ali-parkinson-center-in-phoenix

Barrier free environment inc (1998). FAIR HOUSING ACT DESIGN MANUAL. Retrieved from https://www.huduser.gov/portal/publications/pdf/fairhousing/fairch5.pdf

Barrow Neurological Institute. (2017, November 9). Architect Who Designed Muhammad Ali Parkinson Center Calls It His Lifesaver. Retrieved from https://www.barrowneuro.org press-releases/architect-muhammad-ali-parkinson center/

Barrow Neurological Institute. (n.d.). Muhammad Ali Parkinson Center. Retrieved from https: www.barrowneuro.org/get-to-know-barrow/centers-programs/muhammad-ali parkinson-center/

Basulto, D. (2010, June 22). Cleveland Clinic Lou Ruvo Center for Brain Health / Frank Gehry. Retrieved from https://www.archdaily.com/65609/center-for-brain-health

Beukeboom, C. J., Langeveld, D., & Tanja-Dijkstra, K. (2012). Stress-reducing effects of real and artificial nature in a hospital waiting room. The Journal of Alternative and Complementary Medicine, 18(4), 329 333.

Bezyak, J. L., Sabella, S. A., & Gattis, R. H. (2017). Public Transportation: An Investigation of Barriers for People with Disabilities. Journal of Disability Policy Studies, 28(1), 52–60. https://doi.org/10.1177/1044207317702070

Bigby, C., Johnson, H., O’Halloran, R., Douglas, J., West, D., & Bould, E. (2019). Communication access on trains: a qualitative exploration of the perspectives of passengers with communication disabilities. Disability and rehabilitation, 41(2), 125-132.

Binggeli, C. (2016). Acoustic Design Principles. In Building Systems for Interior Designers (3rd ed., pp. 105–113). essay, John Wiley & Sons, Inc.

Bradley, J.S., Gover., B.N. (2004). Criteria for Acoustic Comfort in Open-Plan Offices. Retrieved from https://nrc-publications.canada.ca/eng/view/accepted/?id=54853140 0093-40aa-9c48-9727013f3442

Burleson, L. K. (1993). Parkinson’s disease: relationship between environmental design and falls risk (Doctoral dissertation, Texas Tech University). https://ttu- ir.tdl.org/bitstream/ha dle/2346/21462/31295007613960.pdf?sequence=8&isAllowed=y

Carlos Martinez Architekten. (2023). Rehaklinik Zihlschlacht. Retrieved from https://carlosmart nez.ch/arbeiten/rehaklinik-zihlschlacht/

Centers for Disease Control and Prevention. (2020, September 16). Disability and health ove view. Centers for Disease Control and Prevention. https://www.cdc.gov/ncbddd/disabil tyandhealth/disability.html

Cetin, C., Ballice, G., & Ultav, Z. (2019). Satisfaction of Healthcare Staff with the Quality of Working and Resting Areas: Healthcare Interiors in the City of İzmİr, Turkey. Journal of Science, 7(3), 365–385.

Chiang, Carol. (2024, June 27). Tips and Tools for Home Safety with Parkinson’s [Webinar]. Davies Phinney Foundation. https://www.youtube.com/watch?v=jrxQ-n38-yw

Clarke, P., Ailshire, J. A., Bader, M., Morenoff, J. D., & House, J. S. (2008). Mobility disability and the urban built environment. American journal of epidemiology, 168(5), 506-513.

Cleveland Clinic Lou Ruvo Center for Brain Health: Frank Gehry. (2019, February 12). Retrieved from https://www.arch2o.com/cleveland-clinic-lou-ruvo-center-for-brain-health-frankgehry/

Cohen, R. G., Chao, A., Nutt, J. G., & Horak, F. B. (2011). Freezing of gait is associated with a mismatch between motor imagery and motor execution in narrow doorways, not with failure to judge doorway passability. Neuropsychologia, 49(14), 3981-3988.

Constantinescu, R., Leonard, C., Deeley, C., & Kurlan, R. (2007). Assistive devices for gait in Parkinson's disease. Parkinsonism & related disorders, 13(3), 133-138.

Cowie, D., Limousin, P., Peters, A., Hariz, M., & Day, B. L. (2012). Doorway-provoked freezing of gaitin Parkinson's disease. Movement disorders, 27(4), 492-499.

Davies Phinney Foundation for Parkinson's (2019) The Parkinson's Home Checklist. Retrieved from https://davisphinneyfoundation.org/wp-content/uploads/2019/07/Home-Safety-Checlist-DIGITAL.pdf

De Lima Andrade, E., da Cunha e Silva, D. C., de Lima, E. A., de Oliveira, R. A., Zannin, P. H. T., & Martins, A. C. G. (2021). Environmental noise in hospitals: a systematic review. Environmental Science and Pollution Research, 28(16), 19629-19642.

Dignity Health. (n.d.). Muhammad Ali Parkinson Center. Retrieved from https://www.dignithealth.org/arizona/locations/stjosephs/services/neurology neurosurgery/muhamad-ali-parkinson-center

Fasano, A., Mazzoni, A., & Falotico, E. (2022). Reaching and grasping movements in Parkinson's disease: a review. Journal of Parkinson's disease, 12(4), 1083-1113.

Gazibara, T., Tepavcevic, D. K., Svetel, M., Tomic, A., Stankovic, I., Kostic, V. S., & Pekmezovic, T. (2017). Near-falls in people with Parkinson's disease: circumstances, contributing factors and association with falling. Clinical neurology and neurosurgery, 161, 51-55.

Giovannini, J. (2011, April 7). Cleveland Clinic Lou Ruvo Center for Brain Health. Retrieved from https://www.architectmagazine.com/design/buildings/cleveland-clinic-lou-ruvo-center for-brain-health_o

Gilmour, H., Ramage-Morin, P., Wong, S. (2014). Parkinson's Disease: Prevalence, Diagnosis, and Impact. In Statistics Canada Health Reports. Statistics Canada. https://www150.statcan gc.ca/n1/en/pub/82-003-x/2014011/article/14112- eng.pdf?st=SU5NsdB4
Gray, D. B., Gould, M., & Bickenbach, J. E. (2003). Environmental barriers and disability Journal of architectural and planning research, 29-37.

Government of Canada. (2022). Summary of the Accessible Canada Act. Retrieved from https://www.canada.ca/en/employment-social-development/programs/accessible-canada/act summary.html

Gray, D. B., Gould, M., & Bickenbach, J. E. (2003). Environmental barriers and disability. Journal of architectural and planning research, 29-37.

Hamilton, N., Olumolade, O., Aittama, M., Samoray, O., Khan, M., Wasserman, J. A., Weber, K., & Ragina, N. (2022). Access barriers to healthcare for people living with disabilities. Journal of Public Health, 30(5), 1069–1077. https://doi.org/10.1007/s10389-020-01383-z

Havercamp, S. M., Scandlin, D., & Roth, M. (2004). Health disparities among adults with developmental disabilities, adults with other disabilities, and adults not reporting disability in North Carolina. Public health reports, 119(4), 418-426.

Health Tourism. (2023). Rehaklinik Zihlschlacht. Retrieved from https://www.health-tourism.com medical-centers/rehaklinik-zihlschlacht/

Hultquist, A., & Corrow, L. (2013). Can I tell you about Parkinson's disease? a guide for family, friends, and carers. Jessica Kingsley Publishers.

Imrie, R., & Kumar, M. (1998). Focusing on disability and access in the built environment. Disability & Society, 13(3), 357-374.

Iyendo, T., Uwajeh, P., & Ikenna, E. (2016). The therapeutic impacts of environmental design interventions on wellness in clinical settings: A narrative review. Complementary Therapies in Clinical Practice, 24, 174–188. https://doi.org/10.1016/j.ctcp.2016.06.008

Lang, W.W., Malinh Jr, G.C. (2007). Noise as a Technology and Policy Challenge. Retrieved from https://www.nae.edu/7673/NoiseasaTechnologicalandPolicyChallenge

Lavy, S., Dixit, M. K. (2012). Wall finish selection in Hospital Design: A survey of facility managers. HERD: Health Environments Research & Design Journal, 5(2), 80–98.

Lou Ruvo Center for Brain Health. (n.d.). Retrieved from https://my.clevelandclinic.org/departments/neurological/depts/brain-health

Mathiasen, N., Øien, T. B., & Volf, C. (2024, March). Empathic Lighting Design for Healthcare Enviroments. In IOP Conference Series: Earth and Environmental Science (Vol. 1320, No. 1, p. 012031). IOP Publishing.

Mudrick, N. R., & Yee, S. (2007). Defining programmatic access to healthcare for people with disabilities.

National Safety Council. (2017). Slips, Trips and Falls on Floors. Retrieved from https://www.nsc.org/getmedia/1147377f-594a-47de-9a8f-15fbc3c39df7/stf-floors.pdf.aspx

Nazarian, M., Price, A., Demian, P., & Malekzadeh, M. (2018). Design lessons from the analysis of Nurse Journeys in a hospital ward. HERD: Health Environments Research & Design Journal, 11(4), 116–129.

NBK Keramik. (2023). Rehaklinik Zihlschlacht. Retrieved from https://nbkterracotta.com /project/rehaklinik-zihlschlacht/

Nilsson, M., Ullén, S., Ekström, H., & Iwarsson, S. (2016). The association between indicators of health and housing in people with Parkinson's disease. BMC Geriatrics, 16(1), 146–. https-//doi.org/10.1186/s12877-016-0319-x

NYC Department for the Aging. (2017, July). Aging in Place Guide for Building Owners: Recommended Age-Friendly Residential Building Upgrades. Human Centered Design. https://ihcdhome.humancentereddesign.org/pdf/Aging%20in%20Place%20guide%20 for%20Building%20Owners.pdf.

Ontario Building Code. (2018). 2018 Ontario Building Code. Retrieved from https://www.oshawa.ca/ en Document-Feeds/Building Permits/Accessibility_Barrier_Free_ Washroom_requirements.pdf

Park, K., Esfahani, H. N., Novack, V. L., Sheen, J., Hadayeghi, H., Song, Z., & Christensen, K. (2023). Impacts of disability on daily travel behaviour: A systematic review. Transport reviews, 43(2), 178-203.

Parkinson Canada. (2016). World Parkinson's Day and the Tulip Background. Retrieved from https://www.parkinson.ca/wp content/uploads/World_Parkinsons_Day_and_Tulip_Bac grounder_Feb26.doc

Pope, A. M., & Brandt Jr, E. N. (Eds.). (1997). Enabling America: Assessing the role of rehabilitation science and engineering.

Premium Europe. (2023). Rehaklinik Zihlschlacht. Retrieved from https://www.health-tourism com/medical-centers/rehaklinik-zihlschlacht/

Premium Switzerland. (2023). Leading Clinic Near St. Gallen with the Best Treatments. Retrieved from https://premiumswitzerland.com/en/medical/rehabilitation/hospitals/rehaklinik-zihlschlacht

Public Health Agency of Canada (2018). Parkinsonism in Canada, including Parkinson's disease: highlights from the Canadian Chronic Disease Surveillance System. Public Health Agency of Canada = Agence de la santé publique du Canada. https://www.canada.ca/content dam/phacaspc/documents/services/publications/diseases-conditions/parkinsonism/pa kinson-eng.pdf

Ramos, J. L. B., Duarte, G. S., Bouca-Machado, R., Fabbri, M., Mestre, T. A., Costa, J., ... & Ferreira, J. J. (2020). The Role of Architecture and Design in the Management of Parkinson's Disease: A Systematic Review. Journal of Parkinson's disease, (Preprint), 1-14.

Rechel, B., Buchan, J., & McKee, M. (2009). The impact of health facilities on healthcare workers' well-being and performance. International Journal of Nursing Studies, 46(7), 1025–1034. https://doi.org/10.1016/j.ijnurstu.2008.12.008

Rosenstock, A. (2012, April 30). Centre for Brain Health. Retrieved from https://archpaper com/2012/04/centre-for-brain-health/

Ryan, J., Dinkel, J., & Petrucci, K. (1993). Near falls incidence. A study of older adults in the community. Journal of Gerontological Nursing, 19(12), 23–28. https-//doi org/10.3928/0098-9134-19931201-06

Sato, H., Morimoto, M., Ohtani, S., Hoshino, Y., & Sato, H. (2017). Subjective evaluation of speech privacy at consulting rooms in hospitals: Relationship between feeling evoked by overhearing speech and word intelligibility score. Applied Acoustics, 124, 38-47.

Shakespeare, T. (2017). Disability: the basics. Routledge.

Stantec. (n.d.). University of British Columbia - Djavad Mowafaghian Centre for Brain Health. Retrieved from https://www.stantec.com/en/projects/canada-projects/u/university-of Bri ish-Columbia-djavad mowafaghian-centre-for-brain-health

Stumbo, N. J. (2009). An Exploration into the Barriers and Facilitators Experienced by University Graduates with Disabilities Requiring Personal Assistance Services. Journal of Science Education for Students with Disabilities, 14(1), 1–24. https://doi.org/10.14448jsesd.03.0001

Susman, J. (1994). Disability, Stigma and Deviance. Social science & medicine, 38(1), 15-22.

The North Carolina Office on Disability and Health, NCODH (2002). Removing Barriers: Tips and Strategies to Promote Accessible Communication

Ulrich, R. S. (2000). Effects of Healthcare Environmental Design on Medical Outcomes. The International Academy for Design and Health. 49□59. Retrieved from https://www.bri base.org/sites/default/files/Roger□Ulrich□WCDH2000.pdf

Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H.-B., Choi, Y.-S., Quan, X., & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. HERD: Health Environments Research & Design Journal, 1(3), 61–125.

U.S. Access Board. (2022). U.S. Access Board Technical Guide: Sign
Retrieved from https://www.access-board.gov/files/ada/guides/signs-ADA.pdf

U.S. Department of justice Civil Rights Division. (2010). 2010 ADA Standards for Accessible Design
Retrieved from https://www.ada.gov/law-and-regs/design-standards/2010-stds/

Vinnitskaya, I. (2012, May 21). DjavadMowafaghian Centre for Brain Health / Stantec. Retrieved from https://www.archdaily.com/235712/djavadmowafaghian-centre-for-brain-health Stantec

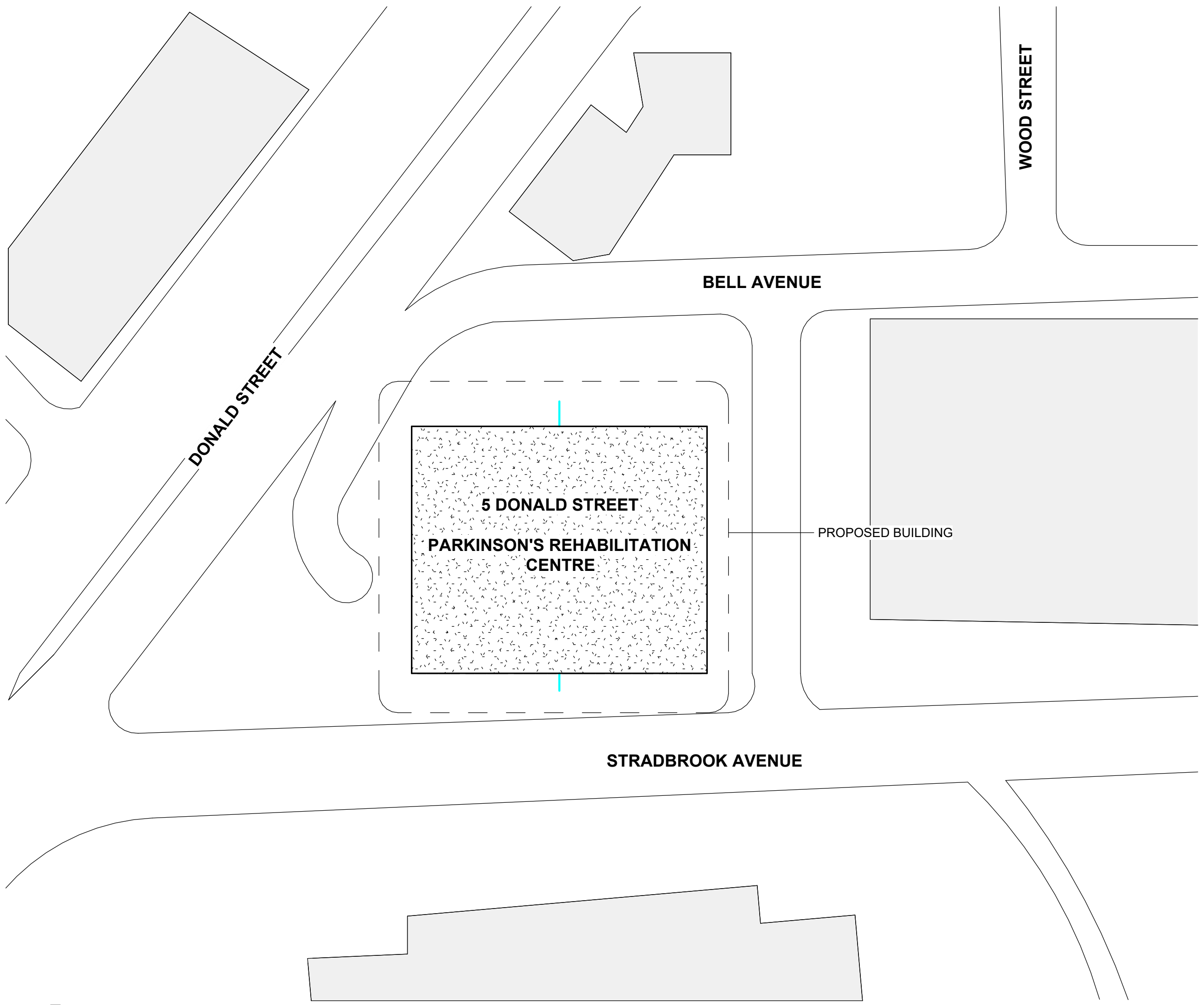
Winchip, S. M. (2011). Sustainable Design for Interior Environments Second Edition. A&C Black. 159

World Health Organization. (2023). Global report on health equity for persons with disabilities. World Health Organization

Wolf, E., (2012). Core Phenomenon: Risk for Falls.

6.0

TECHNICAL DRAWINGS

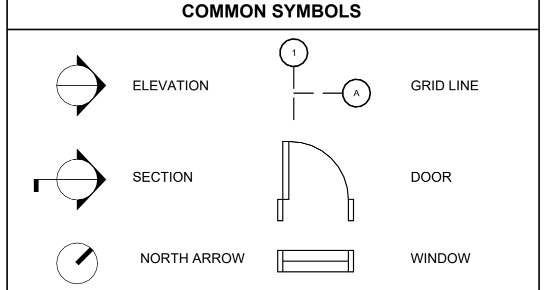


1 A01 **SITE PLAN**
1/64" = 1'-0"

ABBREVIATIONS

SERV	SERVICE	M.D	MOBILITY DISORDER	QTY	QUANTITY
UNI	UNIVERSAL	NEURO	NEUROLOGY	MT	METAL
W/C	WATER CLOSET	MAN	MANAGEMENT	GL	GLASS
W/	WITH	PHYSIO	PHYSIOTHERAPY	PT	PAINT
PATH	PATHOLOGY	TYP	TYPICAL	MAT	MATERIAL
COUN	COUNCIL	AFF	ABOVE FINISH FLOOR		
MED	MEDICAL	G.W.B	GYPSUM WALLBOARD		

COMMON SYMBOLS



DRAWING LIST

A01	SITE PLAN
A02	BUILDING CODE ANALYSIS
A03	5TH FLOOR PROPOSED PLAN
A04	6TH FLOOR PROPOSED PLAN
A05	5TH FLOOR PLAN
A06	6TH FLOOR PLAN
A07	5TH FLOOR REFLECTED CEILING PLAN 5TH FLOOR LIGHT FIXTURE SCHEDULE
A08	6TH FLOOR REFLECTED CEILING PLAN 6TH FLOOR LIGHT FIXTURE SCHEDULE
A09	5TH FLOOR FINISH PLAN 5TH FLOOR FINISH SCHEDULE
A10	6TH FLOOR FINISH PLAN 6TH FLOOR FINISH SCHEDULE
A11	5TH FLOOR DOORS AND WALLS PLAN
A12	5TH FLOOR WALL ASSEMBLY 5TH FLOOR DOOR SCHEDULE 5TH FLOOR DOOR TYPES
A13	6TH FLOOR DOORS AND WINDOWS PLAN
A14	6TH FLOOR WALL ASSEMBLY 6TH FLOOR DOOR SCHEDULE 6TH FLOOR DOOR TYPES
A15	5TH FLOOR FURNITURE PLAN 5TH FLOOR FURNITURE & EQUIPTMENT SCHEDULE
A16	6TH FLOOR FURNITURE PLAN 6TH FLOOR FURNITURE & EQUIPTMENT SCHEDULE
A17	5TH FLOOR ELECTRICAL AND COMMUNICATIONS PLAN
A18	6TH FLOOR ELECTRICAL AND COMMUNICATIONS PLAN
A19	SECTIONS
A20	ELEVATION 1
A21	ELEVATION 2
A22	WALL CABINET CONSTRUCTION
A23	BUILDING SECTION
A24	BUILDING ELEVATION

DRAWING DETAIL LIST

D01.0	SITE PLAN
D02.0	5TH FLOOR PROPOSED PLAN
D03.0	6TH FLOOR PROPOSED PLAN
D04.0	5TH FLOOR PLAN
D05.0	6TH FLOOR PLAN
D06.0	5TH FLOOR REFLECTED CEILING PLAN
D07.0	6TH FLOOR REFLECTED CEILING PLAN
D08.0	5TH FLOOR FINISH PLAN
D09.0	6TH FLOOR FINISH PLAN
D10.0	5TH FLOOR DOORS AND WALLS PLAN
D11.0	6TH FLOOR DOORS AND WINDOWS PLAN
D12.0	5TH FLOOR FURNITURE PLAN
D13.0	6TH FLOOR FURNITURE PLAN
D14.0	5TH FLOOR ELECTRICAL AND COMMUNICATIONS PLAN
D15.0	6TH FLOOR ELECTRICAL AND COMMUNICATIONS PLAN
D16.1	SOUTHEAST - SOUTHWEST SECTION
D16.2	SOUTHWEST - NORTHWEST SECTION
D17.1	PATIENT ROOM ELEVATION
D17.2	UNIVERSAL WASHROOM ELEVATION
D17.3	HALLWAY ELEVATION
D18.1	CAFE BAR ELEVATION
D18.2	AGILITY TRAINING WALL ELEVATION
D18.3	PHYSICAL THERAPY WALL ELEVATION
D19.1	PRIVATE TREATMENT ELEVATION
D19.2	PRIVATE TREATMENT CABINET SECTION
D20.1	NORTHWEST - NORTHEAST BUILDING SECTION
D20.2	NORTHWEST - SOUTHWEST BUILDING SECTION
D21.1	NORTHWEST - NORTHEAST BUILDING ELEVATION
D21.2	NORTHWEST - SOUTHWEST BUILDING ELEVATION

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

SITE PLAN

SCALE: 1/64" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A01

BULDING CODE ANALYSIS

1.0 INTRODUCTION

BASED ON THE 2020 NATIONAL BUILDING CODE OF CANADA

THE PROPOSED PROJECT IS TO CONVERT TWO LEVELS FROM AN EXISTING SIX-STOREY STRUCTURE CURRENTLY BEING USED AS COMMERCIAL OFFICES INTO A HEALTHCARE REHABILITATION CLINIC

2.0 BUILDING CODE

1.1.3.2: EXISTING BUILDING FOOTAGE:
77,800sqft (7,227.8m^2)

BUILDING HEIGHT: 6 STOREYS

BUILDING FACING: 2 STREETS

PROPOSED TENANCY

1.1.3.2: OVERALL AREA OF RENOVATED SPACE: 13,000sqft (2,406m^2)

GROSS AREA OF RENOVATED SPACE:
26,000sqft (2,415m^2)

3.2.1.1: HEIGHT OF RENOVATED SPACE:
2 STOREYS

MAJOR OCCUPANCY

3.1.2.2: THE PROPOSED USED COMPLIES WITH GROUP B DIVIDION 2 AND 3
CARE AND TREATMENT OCCUPANCIES

OCCUPANT LOAD

IN ACCORADANCE TO 3.1.17

5TH LEVEL TOTAL OCCUPANT: 449

6TH LEVEL TOTAL OCCUPANT: 279

HEALTH REQUIREMENTS

IN ACCORADANCE TO 3.7.2.2 (7)

5TH LEVEL TOTAL NUMBER OF UNIVERSAL WASHROOM: 9

6TH LEVEL TOTAL NUMBER OF UNIVERSAL WASHROOM: 11

ACCESSIBILITY

BARRIER-FREE PATH OF TRAVEL IS REQUIRED AND SHALL COMPLY WITH NBC SECTION 3.8

ENTRANCE INCLUDING MORE THAN ONE DOORWAY SHOULD COMPLY WITH SUBSECTION 3.8.3

BARRIER-FREE PATH OF TRAVEL SHALL COMPLY WITH SUBSECTION 3.8.2.3 (3),(4),(5),(6)

OPERATION OF BUILDING AND SAFETY DEVICE INTENDED FOR THE USE OF THE OCCUPANT SHALL COMPLY WITH SUBSECTION 3.8.2.6

POWER DOOR OPERATORS SHALL COMPLY WITH SUBSECTION 3.8.2.7

BARRIER-FREE PLUMBING FACILITIES TO COMPLY WITH SUBSECTION 3.8.2.8

ASSISSTIVE LISTENING SYSTEMS SHALL COMPLY WITH SUBSECTION 3.8.2.9

SIGNS AND INDICATORS TO COMPLY WITH SUBSECTION 3.8.2.1

SIGNS AND INDICATORS TO COMPLY WITH SUBSECTION 3.8.2.1

BARRIER-FREE DESIGN STANDARDS TO COMPLY WITH 3.8.3.1

CLEAR WIDTH FOR BARRIER-FREE PATH OF TRAVEL SHOULD BE NO LESS THAN 1000mm IN ACCORDANCE TO SUBSECTION 3.8.3.2(1)

SAFETY WITH FLOOR AREAS

THE MINIMUM UNOBSTRUCTED WIDTH OF A CORRIDOR SHALL BE NO LESS THAN 1100mm IN ACCORDANCE TO SUBSECTION 3.3.1.9

DOORS AND HARDWARE SHALL COMPLY WITH SUBSECTION 3.3.1.13

TACTTILE WALKING SURFACES SHALL COMPLY WITH SUBSECTION 3.3.1.19

FULLY TRANSPARENT GLAZED DOORS, SIDELIGHTS, OR PANELS SHALL BE ENHANCED THROUGH MULLIONS, MARKINGS, AND OTHER ELEMENTS IN ACCORDANCE TO SUBSECTION 3.1.1.20

BULDING FIRE SAFETY

A FLAMESPREAD RATING OF 150 IS REQUIRED FOR INTERIOR WALL AND CEILING FINISHES FOR AN AREA THAT IS SPRINKLED IN COMPLAINCE TO SUBSECTION 3.1.13.2

FACTORY-ASSEMBLED WALL, FLOOR, AND CEILING PANELS USED IN A WALK-IN COOLER AND FREEZER THAT CONTAINS FOAMED PLASTIC INSULATORS SHOULD HAVE A FLAME SPREAD RATING OF NO MORE THAN 500 IF THE BUILDING IS DEEMED TO BE OF NO NON-COMBUSTIBLE CONSTRUCTION AS PER SUBSECTION 3.1.5.7

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

BUILDING CODE ANALYSIS

MERYLL RAYMUNDO

JUNE 30, 2024

A02

1
A03

5th FLOOR PROPOSED FLOOR PLAN
1/16" = 1'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

5th FLOOR PROPOSED PLAN

SCALE: 1/16" = 1'-0"

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JUNE 30, 2024

A03

1
A04
6th FLOOR PROPOSED FLOOR PLAN
1/16" = 1'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

6th FLOOR PROPOSED PLAN

SCALE: 1/16" = 1'-0"

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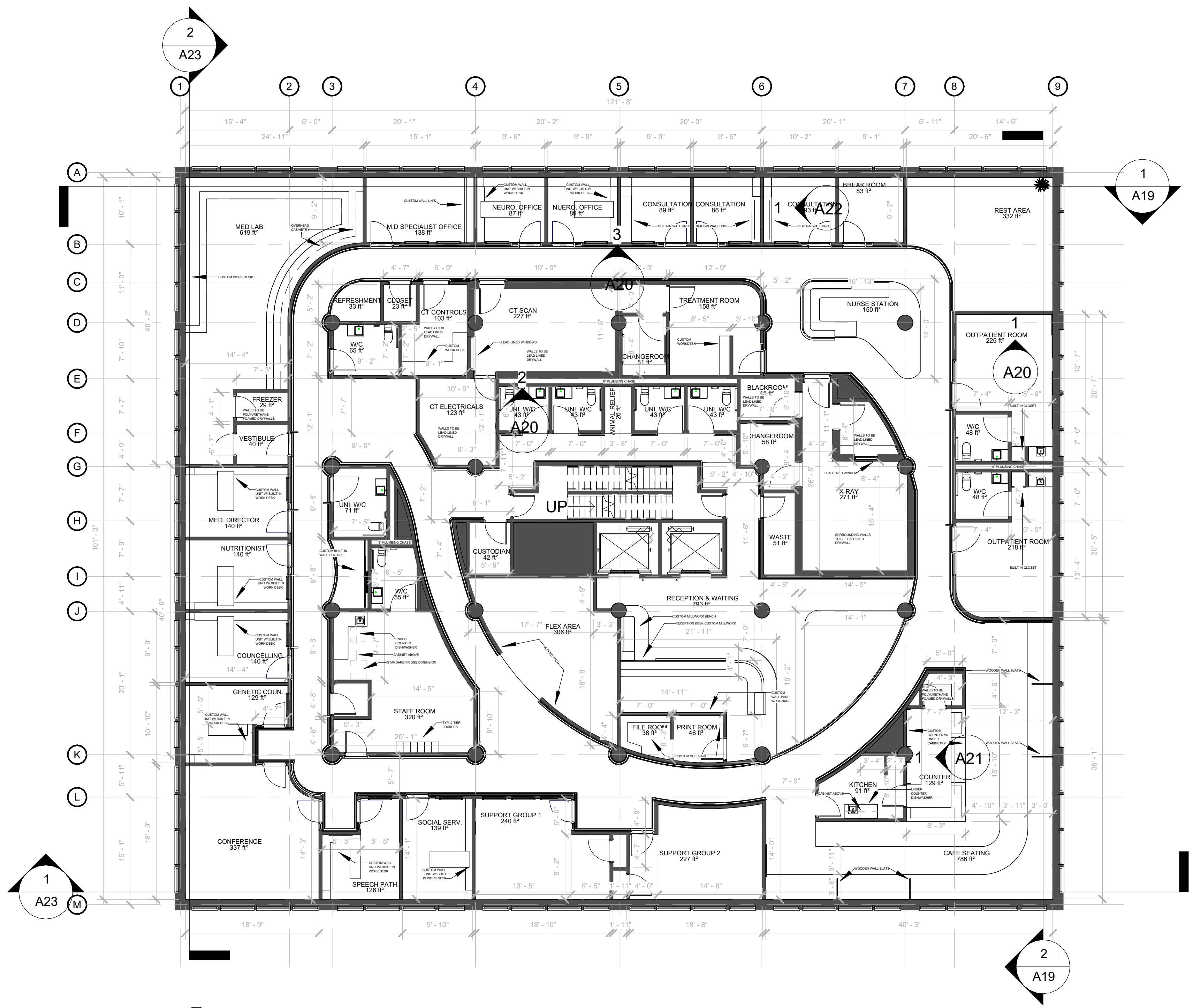
A04



1 A05 **5th FLOOR PLAN** 1/16" = 1'-0"

ABBREVIATIONS	
SERV	SERVICE
W/C	WASHROOM
PATH.	PATHOLOGY
COUN.	COUNCIL
UNI.	UNIVERSAL
MED.	MEDICAL
M.D	MOBILITY DISORDER
NEURO.	NEUROLOGY
MAN.	MANAGEMENT
TYP.	TYPICAL

SYMBOL LEGEND

WALL

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

5th FLOOR PLAN

SCALE: 1/16" = 1'-0"

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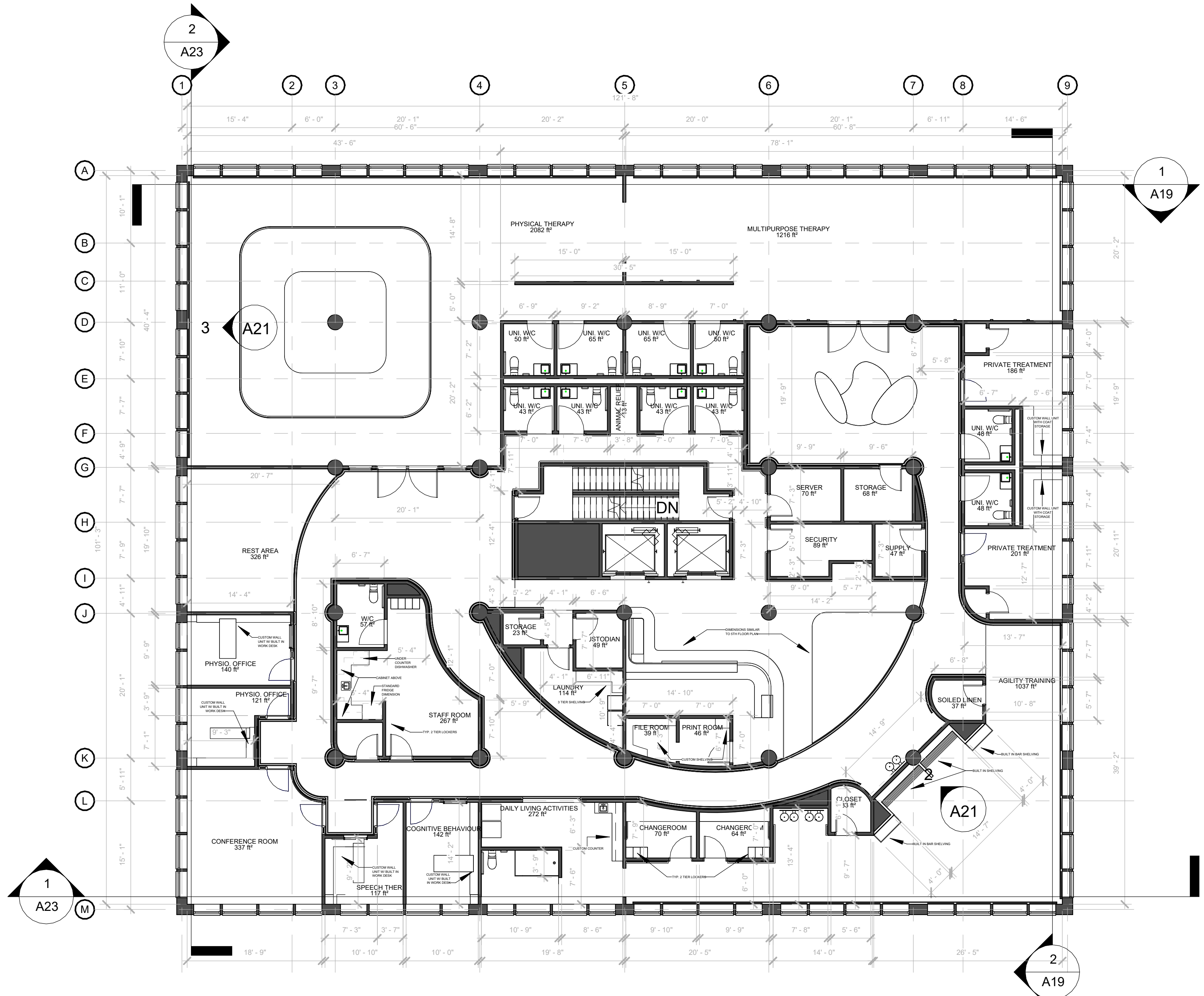
A05



1
A06
6th FLOOR PLAN
1/16" = 1'-0"

SYMBOL LEGEND

(wall symbol)	WALL

ABBREVIATIONS

W/C	WASHROOM
UNI.	UNIVERSAL
PHYSIO.	PHYSIOTHERAPY
TYP.	TYPICAL

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

6th FLOOR PLAN

SCALE: 1/16" = 1'-0"

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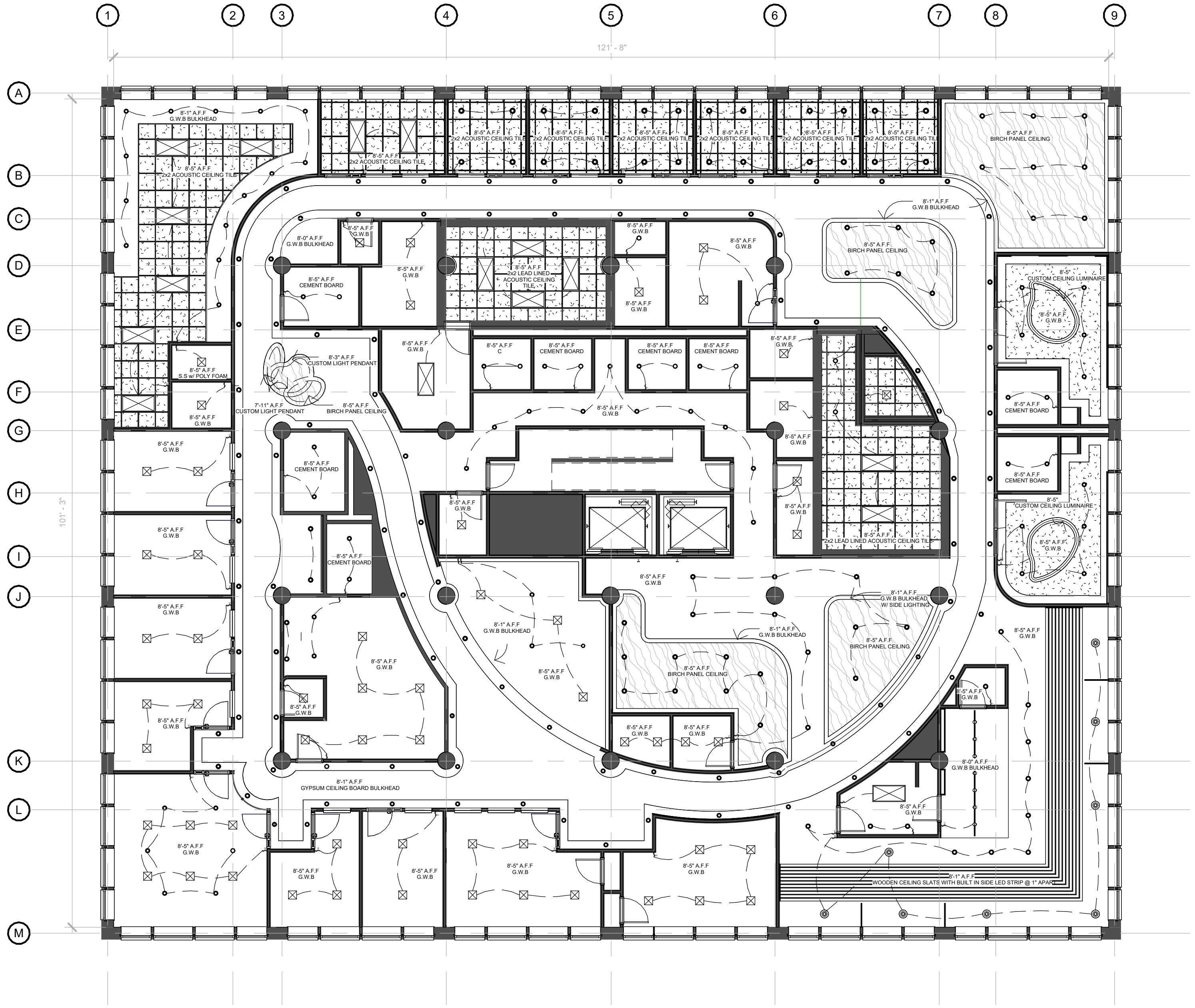
JUNE 30, 2024

A06



1
A07
5th FLOOR REFLECTED CEILING AND LIGHTING PLAN
1/16" = 1'-0"

LIGHT FIXTURE SCHEDULE

NAME	SYMBOL	MANUFACTURER	DESCRIPTION	QTY.	LIGHT INDEX
1'x1' LIFT		PINNACLE ARCHITECTURAL LIGHTING	SQUARE RECESSED LUMINAIRE	58	N/A
XR1		WHITECROFT	RECESSED DOWN LIGHT	232	3000K - 4000K 1188 - 1987 LUMENS
LED GLOBE PENDANT LIGHTING		ALCON LIGHTING	ROUND PENDANT LIGHTING	8	3000K - 5000K 1000 - 2000 LUMENS
2'x4' DTFU		WHITECROFT	RECTANGLE RECESSED LUMINAIRE	16	4000K 3300 - 4100 LUMENS
ACCENT WALL MOUNT ADJUSTABLE TRACK LIGHT		WHITECROFT	TRACK SPOT LIGHT	1	3000K - 4000K 1000 - 2000 LUMENS

SYMBOL LEGEND

- CIRCULAR RECESSED LED FIXTURE
- ROUND PENDANT LIGHTING
- 12" SQUARE RECESSED LED FIXTURE
- 2x4 RECTANGULAR RECESSED LIGHT FIXTURE
- CUSTOM RECESSED LED LIGHT FIXTURE
- SPOT TRACK LIGHTING
- $ SINGLE POLE SWITCH
- $O OCCUPANCY SWITCH
- $DC DAYLIGHTING CONTROL SWITCH
- $T TIME SWITCH
- $D DIMMER SWTICH

GENERAL NOTES

1. PATCH AND REPAIR EXISTING CEILING WHERE WALLS HAVE BEEN REMOVED
2. GYPSUM CEILING TO BE CONSTRUCTED WITH 5/8" GYPSUM BOARB
3. SEE ELECTRICAL AND COMMUNICATIONS FOR SPRINKLER LOCATION
3. HALLWAY, REST AREA, AND NURSE STATION TO BE CONNECTED TO CENTRAL SWITCH RUNNING ON TIMER

CEILING LEGEND

- WALL
- GYPSUM WALL BOARD
- ACOUSTIC CEILING BOARD
- BIRCH WOOD BOARD

ABBREVIATIONS

A.F.F	ABOVE FINISH FLOOR
G.W.B	GYPSUM WALL BOARD
W/	WITH
QTY.	QUANTITY

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

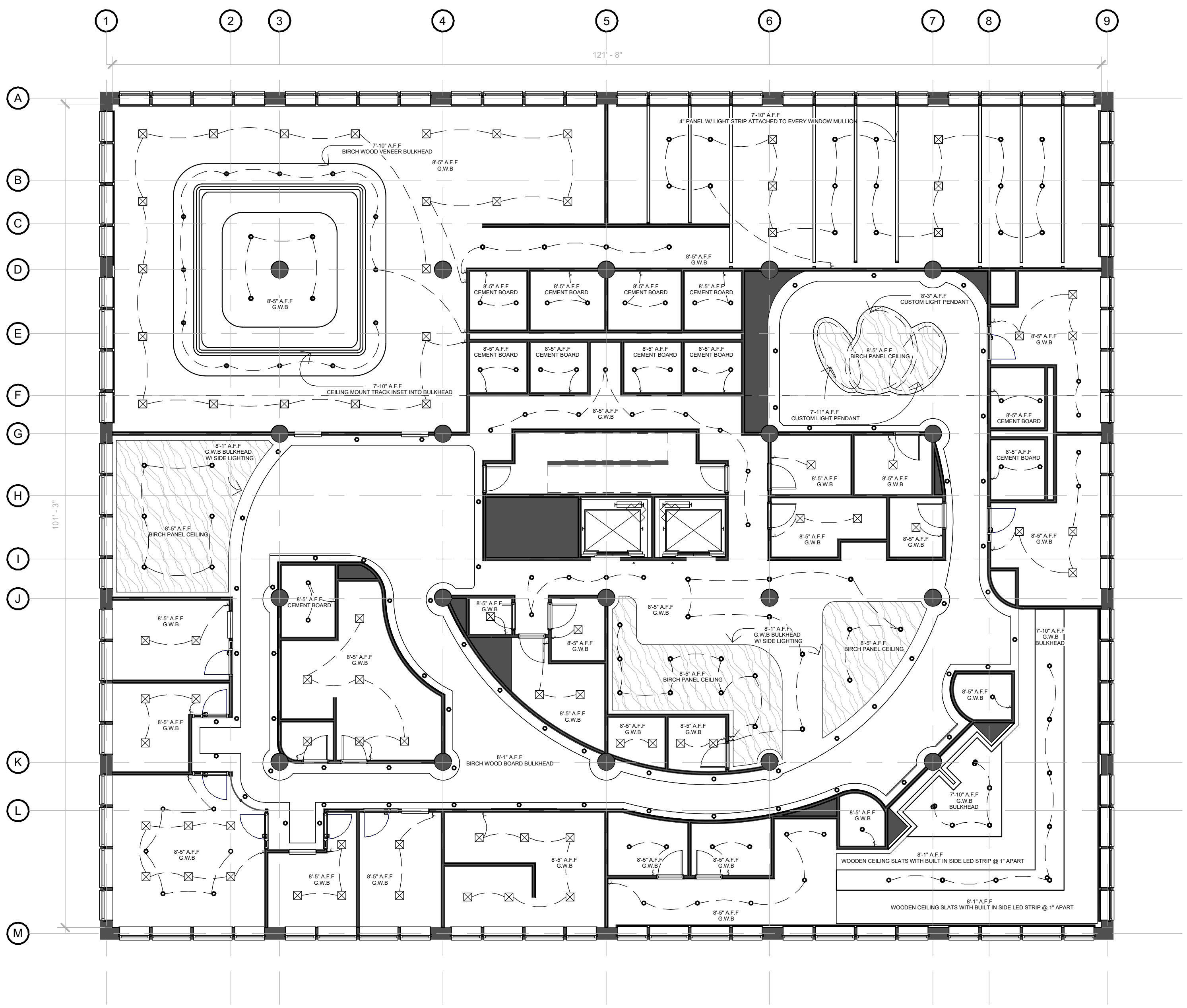
5th FLOOR RCP

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A07



1 / A08

6th FLOOR REFLECTED CEILING AND LIGHTING PLAN
1/16" = 1'-0"

LIGHT FIXTURE SCHEDULE

NAME	SYMBOL	MANUFACTURER	DESCRIPTION	QTY.	LIGHT INDEX
1'x1' LIFT		PINNACLE ARCHITECTURAL LIGHTING	SQUARE RECESSED LUMINAIRE	73	N/A
XR1		WHITECROFT	RECESSED DOWN LIGHT	185	3000K - 4000K 1188 - 1987 LUMENS

SYMBOL LEGEND

- CIRCULAR RECESSED LED FIXTURE
- ROUND PENDANT LIGHTING
- 12" SQUARE RECESSED LED FIXTURE
- 2x4 RECTANGULAR RECESSED LIGHT FIXTURE
- CUSTOM RECESSED LED LIGHT FIXTURE
- SPOT TRACK LIGHTING
- $ SINGLE POLE SWITCH
- $O OCCUPANCY SWITCH
- $DC DAYLIGHTING CONTROL SWITCH
- $T TIME SWTICH
- $ DIMMER SWTICH

GENERAL NOTES

1. PATCH AND REPAIR EXISTING CEILING WHERE WALLS HAVE BEEN REMOVED
2. GYPSUM CEILING TO BE CONSTRUCTED WITH 5/8" GYPSUM BOARB
3. SEE ELECTRICAL AND COMMUNICATIONS FOR SPRINKLER LOCATION
3. HALLWAY, REST AREA, AND NURSE STATION TO BE CONNECTED TO CENTRAL SWITCH RUNNING ON TIMER

CEILING LEGEND

- WALL
- GYPSUM WALL BOARD
- ACOUSTIC CEILING BOARD
- BIRCH WOOD BOARD

ABBREVIATIONS

A.F.F	ABOVE FINISH FLOOR
G.W.B	GYPSUM WALL BOARD
W/	WITH

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

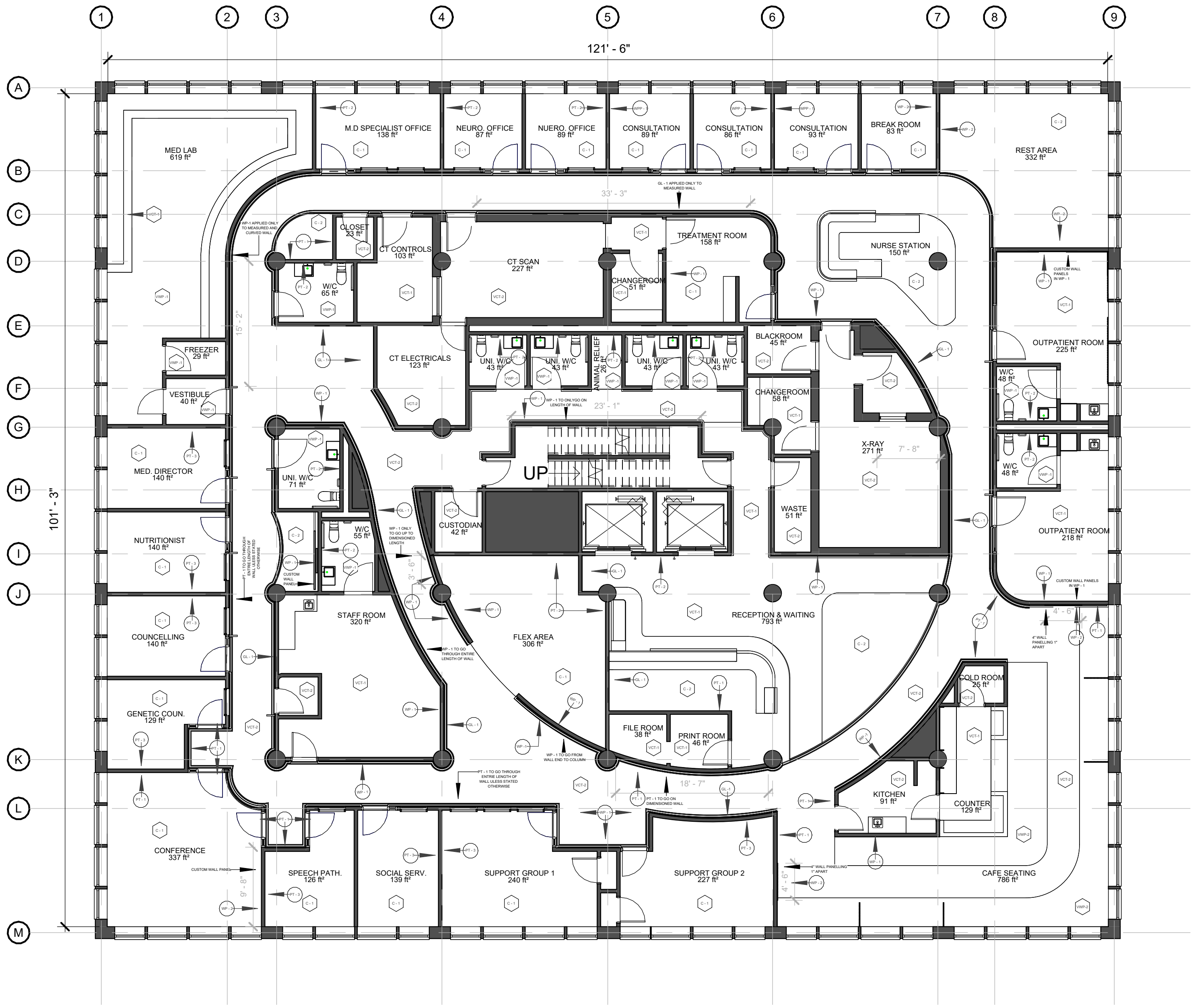
6th FLOOR RCP

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A08



1
A09
5th FLOOR FINISH PLAN
1/16" = 1'-0"

FINISH SCHEDULE

WALL FINISHES

CODE	TYPE	MANUFACTURER	COLOUR	REMARKS
PT-1	SUPERPAINT INTERIOR W/ AIR PURIFYING TECH.	SHERWIN WILLIAMS	EGGSHELL SW9541 WHITE SNOW	
PT-2	SUPERPAINT INTERIOR W/ AIR PURIFYING TECH.	SHERWIN WILLIAMS	EGGSHELL SW0046 WHITE HYACINTH	
PT-3	SUPERPAINT INTERIOR W/ AIR PURIFYING TECH.	SHERWIN WILLIAMS	EGGSHELL SW6089 GROUNDED	
WP-1	CUSTOM WOOD PANELLING	ARMSTRONG	NATURAL BIRCH	
WP-2	CUSTOM WOOD PANELLING	ARMSTRONG	NATURAL WALNUT	
GL-1	CUSTOM LAMINATED GLASS	CCG LTD.	WHEAT	
WPP-1	CUSTOM WALLPAPER	N/A	WHEAT	

FLOOR FINISHES

CODE	TYPE	MANUFACTURER	COLOUR	REMARKS
VCT-1	ACOUSTIC RUBBER FLOOR	NORA FLOORING	SIGNA 7035	
VCT-2	ENVIRONCARE RUBBER FLOORING	NORA FLOORING	SNOW SHOEING 7035	
C-1	CARPET TILE	INTERFACE	BERTOLA PALLIDO	
C-2	CARPET TILE	INTERFACE	BRESCIA PALLIDO	
VWP-1	LVT FLOORING TILE	INTERFACE	CACTUS DUNEDUST	
VWP-2	LVT FLOORING TILE	INTERFACE	NORTHERGRAIN OAKSTAIN	
FC-1	SLIP RETARDANT FLOORING	ARMSTRONG	SHALE GRAY 57001	

GENERAL NOTES

1. WALLS SHOULD BE COATED IN BASE PAINT PT-1, UNLESS OTHERWISE NOTED
2. INDICATOR STRIPS RUNNING ALL THROUGHTOUT THE FLOORS TO BE IN VWP-1
3. CONTRACTOR SHOULD REVIEW DETAIL SHEETS, FINISH PLANS,AND ELEVATIONS FOR ALL CUSTOM WALL PANELS AND MIRRORS
4. PLEASE SEE DESIGNER FOR ANY UNCLEAR INFORMATION TO RECEIVE PROPER INSTRUCTIONS

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

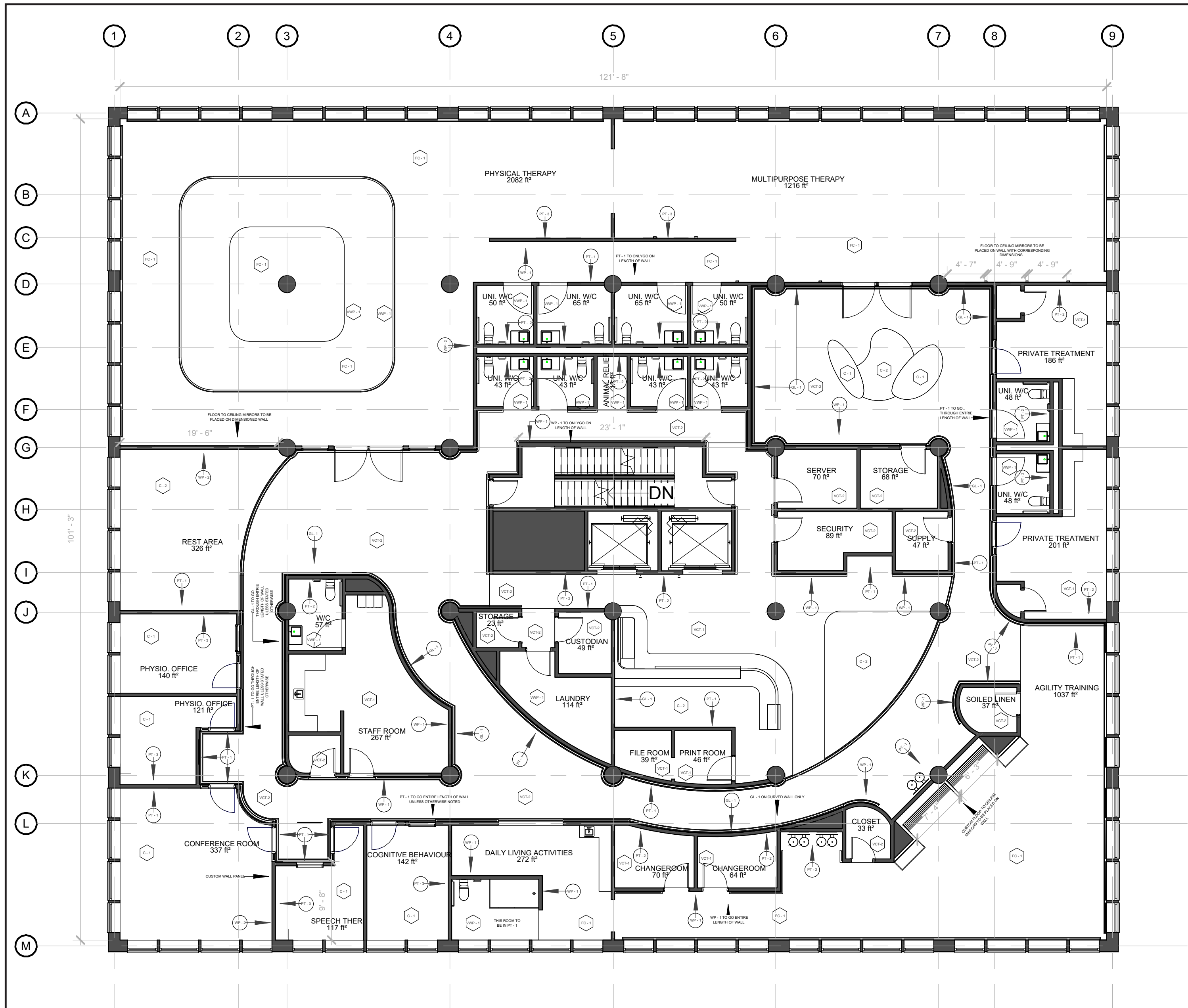
5th FLOOR FINISH PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A09



1
A10

6th FLOOR FINISH PLAN
1/16" = 1'-0"

FINISH SCHEDULE

WALL FINISHES

CODE	TYPE	MANUFACTURER	COLOUR	REMARKS
PT-1	SUPERPAINT INTERIOR W/ AIR PURIFYING TECH.	SHERWIN WILLIAMS	EGGSHELL SW9541 WHITE SNOW	
PT-2	SUPERPAINT INTERIOR W/ AIR PURIFYING TECH.	SHERWIN WILLIAMS	EGGSHELL SW0046 WHITE HYACINTH	
PT-3	SUPERPAINT INTERIOR W/ AIR PURIFYING TECH.	SHERWIN WILLIAMS	EGGSHELL SW6089 GROUNDED	
WP-1	CUSTOM WOOD PANELLING	ARMSTRONG	NATURAL BIRCH	
WP-2	CUSTOM WOOD PANELLING	ARMSTRONG	NATURAL WALNUT	
GL-1	CUSTOM LAMINATED GLASS	CCG LTD.	WHEAT	

FLOOR FINISHES

CODE	TYPE	MANUFACTURER	COLOUR	REMARKS
VCT-1	ACOUSTIC RUBBER FLOOR	NORA FLOORING	SIGNA 7035	
VCT-2	ENVIRONCARE RUBBER FLOORING	NORA FLOORING	SNOW SHOEING 7035	
C-1	CARPET TILE	INTERFACE	BERTOLA PALLIDO	
C-2	CARPET TILE	INTERFACE	BRESCIA PALLIDO	
VWP-1	LVT FLOORING TILE	INTERFACE	CACTUS DUNEDUST	
VWP-2	LVT FLOORING TILE	INTERFACE	NORTHERGRAIN OAKSTAIN	
FC-1	SLIP RETARDANT FLOORING	ARMSTRONG	SHALE GRAY 57001	

GENERAL NOTES

1. WALLS SHOULD BE COATED IN BASE PAINT PT-1, UNLESS OTHERWISE NOTED
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4. PLEASE SEE DESIGNER FOR ANY UNCLEAR INFORMATION TO RECEIVE PROPER INSTRUCTIONS

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

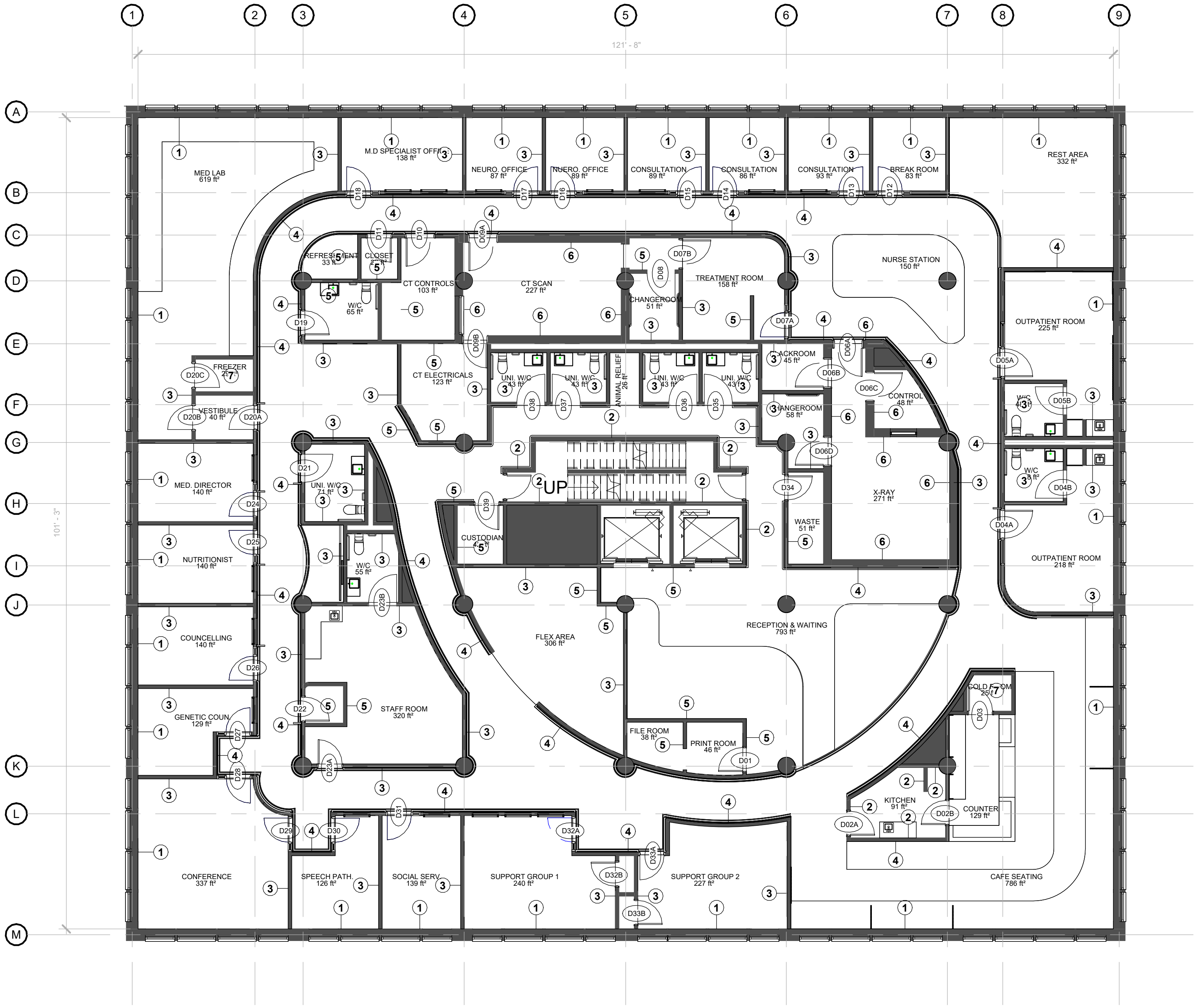
6th FLOOR FINISH PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A10



WALL ASSEMBLY

CODE	DESCRIPTION
1	PRE-EXISTING CONCRETE EXTERIOR WALL
2	3 HOURS FIRE RATED WALL: WITH TWO LAYER 1/2" GYPSUM WALLBOARD ON BOTH SIDE OF 3 1/2" COMMON METAL STUDS @ 24".
3	ONE LAYER 1/2" GYPSUM WALLBOARD ON BOTH SIDE OF 3 1/2" COMMON METAL STUDS @ 16" WITH FULL FIBREGLASS INSULATION WITH STC RATING OF 55
4	1/4" WOOD PANEL ON 1/2" GYPSUM WALLBOARD WITH SMOOTH FINISH ON ONE SIDE OF 3 1/2" COMMON METAL STUDS @16" WITH FIBRE INSULATION WITH STC RATING OF 55
5	1/2" GYPSUM WALLBOARD WITH SMOOTH FINISH ON BOTH SIDE OF 3 1/2" COMMON METAL STUDS
6	1/2" GYPSUM WALL BOARD ON EACH SIDE OF 12" SOLID CEMENT BLOCK WITH 5/8" UNPORFORATED LEAD LINING
7	1/2" GYPSUM WALL BOARD ON 1/2" THICK STEEL PLATE ON BOTH SIDE WITH FOAM INSULATION

1 A11 **5th FLOOR DOORS AND WALLS PLAN**
1/16" = 1'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

5th FLOOR DOORS AND WALLS PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

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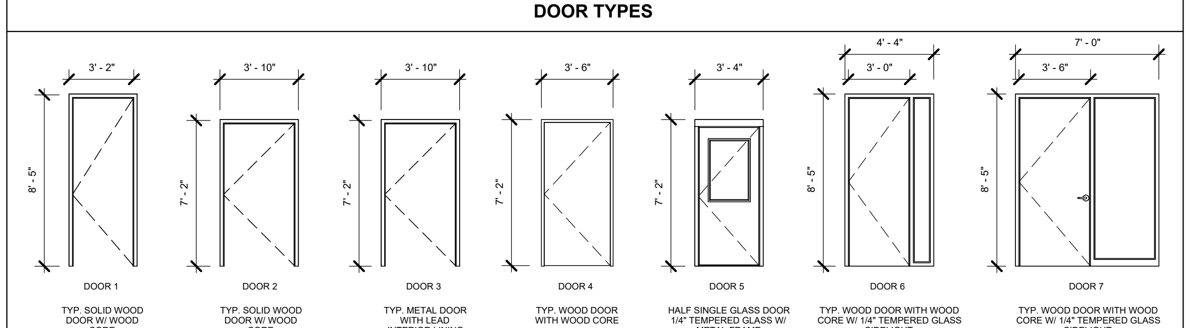
DOOR SCHEDULE

DOOR NUMBER	DOOR			SIZE		REMARKS
	MAT.	TYPE	FINISH	DIMENSIONS	THICKNESS	
D01	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D02A	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D02B	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D03	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D04A	WD & GL	DOOR 7	PT	8' 5" - 7' 0"	1 3/4"	
D04B	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D05A	WD & GL	DOOR 7	PT	8' 5" - 7' 0"	1 3/4"	
D05B	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D06A	MT	DOOR 3	MT	7' 2" - 3' 10"	1 3/4"	
D06B	MT	DOOR 3	MT	7' 2" - 3' 10"	1 3/4"	
D06C	MT	DOOR 3	MT	7' 2" - 3' 10"	1 3/4"	
D06D	MT	DOOR 3	MT	7' 2" - 3' 10"	1 3/4"	
D07A	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D07B	MT	DOOR 3	MT	7' 2" - 3' 10"	1 3/4"	
D08	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D09A	MT	DOOR 3	MT	7' 2" - 3' 10"	1 3/4"	
D09B	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D10	WD	DOOR 2	PT	7' 2" - 3' 10"	1 3/4"	
D11	WD	DOOR 2	PT	7' 2" - 3' 10"	1 3/4"	
D12	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D13	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D14	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D15	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D16	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D17	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D18	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	

DOOR SCHEDULE

DOOR NUMBER	DOOR			SIZE		REMARKS
	MAT.	TYPE	FINISH	DIMENSIONS	THICKNESS	
D19	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D20A	MT	DOOR 5	MT	7' 2" - 3' 6"	2"	
D20B	MT	DOOR 5	MT	7' 2" - 3' 6"	2"	
D20C	MT	DOOR 5	MT	7' 2" - 3' 6"	2"	
D21	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D22	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D23A	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D23B	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D24	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D25	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D26	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D27	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D29	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D30	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D31	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D32A	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D32B	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D33A	WD & GL	DOOR 6	PT	8' 5" - 4' 4"	1 3/4"	
D33B	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D34	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	
D35	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D36	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D37	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D38	WD	DOOR 4	PT	7' 2" - 3' 6"	1 3/4"	
D39	WD	DOOR 1	PT	8' 5" - 3' 2"	1 3/4"	

DOOR TYPES



ABBREVIATIONS

TYP.	TYPICAL
W/	WITH
WD	WOOD
MT	METAL
GL	GLASS
PT	PAINT
MAT	MATERIAL

PARKINSON'S REHABILITATION CENTRE

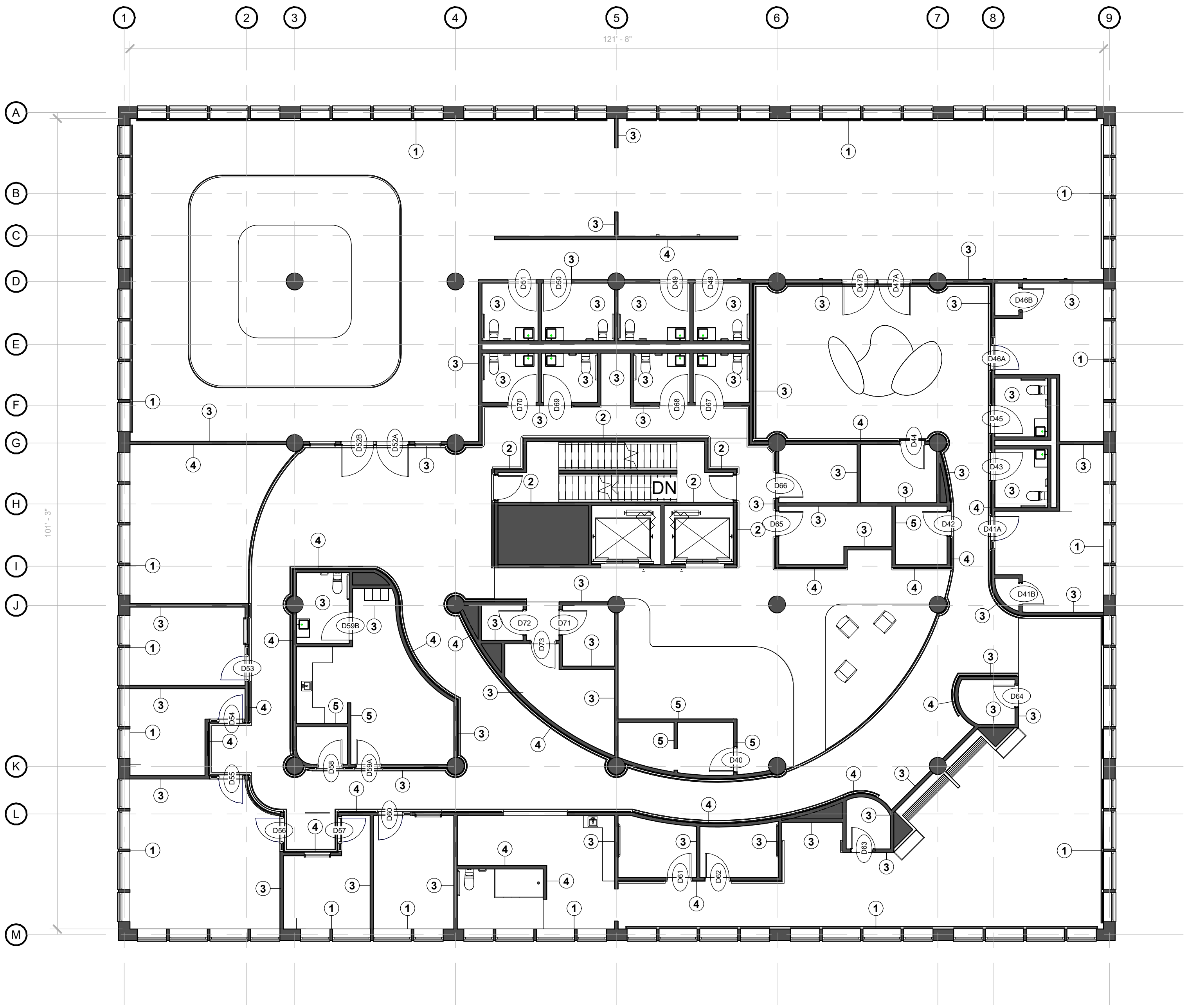
5 DONALD AVENUE
WINNIPEG, MB

5th FLOOR DOORS SCHEDULE

MERYLL RAYMUNDO

JUNE 30, 2024

A12



1 A13 **6th FLOOR DOORS AND WALLS PLAN**
1/16" = 1'-0"

WALL ASSEMBLY

CODE	DESCRIPTION
1	PRE-EXISTING CONCRETE EXTERIOR WALL
2	3 HOURS FIRE RATED WALL: WITH TWO LAYER 1/2" GYPSUM WALLBOARD ON BOTH SIDE OF 3 1/2" COMMON METAL STUDS @ 24".
3	ONE LAYER 1/2" GYPSUM WALLBOARD ON BOTH SIDE OF 3 1/2" COMMON METAL STUDS @ 16" WITH FULL FIBREGLASS INSULATION WITH STC RATING OF 55
4	1/4" WOOD PANEL ON 1/2" GYPSUM WALLBOARD WITH SMOOTH FINISH ON ONE SIDE OF 3 1/2" COMMON METAL STUDS @16" WITH FIBRE INSULATION WITH STC RATING OF 55
5	1/2" GYPSUM WALLBOARD WITH SMOOTH FINISH ON BOTH SIDE OF 3 1/2" COMMON METAL STUDS

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

6th FLOOR DOORS AND WALLS PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

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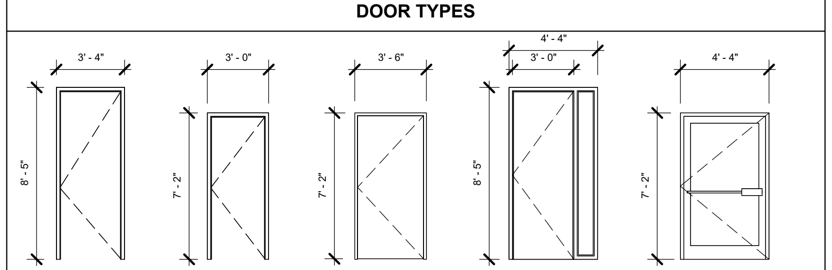
DOOR SCHEDULE

DOOR NUMBER	DOOR MAT.	DOOR TYPE	DOOR FINISH	SIZE DIMENSIONS	SIZE THICKNESS	REMARKS
D40	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D41A	WD	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D41B	WD	DOOR 2	PT	7' 2" - 3' 0"	1 3/4"	
D42	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D43	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D44	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D45	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D46A	WD & GL	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D46B	WD	DOOR 2	PT	7' 2" - 3' 0"	1 3/4"	
D47A	GL	DOOR 5	MT	7' 2" - 4' 4"	1 3/4"	
D47B	GL	DOOR 5	MT	7' 2" - 4' 4"	1 3/4"	
D48	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D49	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D50	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D51	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D52A	GL	DOOR 5	MT	7' 2" - 4' 4"	1 3/4"	
D52B	GL	DOOR 5	MT	7' 2" - 4' 4"	1 3/4"	
D53	WD & GL	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D54	WD & GL	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D55	WD & GL	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D56	WD & GL	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D57	WD & GL	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	
D58	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D59A	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D59B	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D60	WD	DOOR 4	PT	8' 5" - 4' 4"	1 3/4"	

DOOR TYPES



DOOR 1 — TYP. SOLID WOOD DOOR W/ WOOD CORE

DOOR 2 — TYP. SOLID WOOD DOOR W/ WOOD CORE

DOOR 3 — TYP. SOLID WOOD DOOR W/ WOOD CORE

DOOR 4 — TYP. WOOD DOOR WITH WOOD CORE W/ 1/4" TEMPERED GLASS SIDELIGHT

DOOR 5 — 1/4" TEMPERED DOUBLE GLASS DOOR W/ METAL FRAME

DOOR SCHEDULE

DOOR NUMBER	DOOR MAT.	DOOR TYPE	DOOR FINISH	SIZE DIMENSIONS	SIZE THICKNESS	REMARKS
D61	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D62	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D63	WD	DOOR 2	PT	7' 2" - 3' 0"	1 3/4"	
D64	WD	DOOR 2	PT	7' 2" - 3' 0"	1 3/4"	
D65	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D66	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D67	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D68	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D69	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D70	WD	DOOR 3	PT	7' 2" - 3' 6"	1 3/4"	
D71	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D72	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	
D73	WD	DOOR 1	PT	8' 5" - 3' 4"	1 3/4"	

ABBREVIATIONS

TYP.	TYPICAL
W/	WITH
WD	WOOD
MT	METAL
GL	GLASS
PT	PAINT
MAT	MATERIAL

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

6th FLOOR DOORS SCHEDULE

MERYLL RAYMUNDO

JUNE 30, 2024

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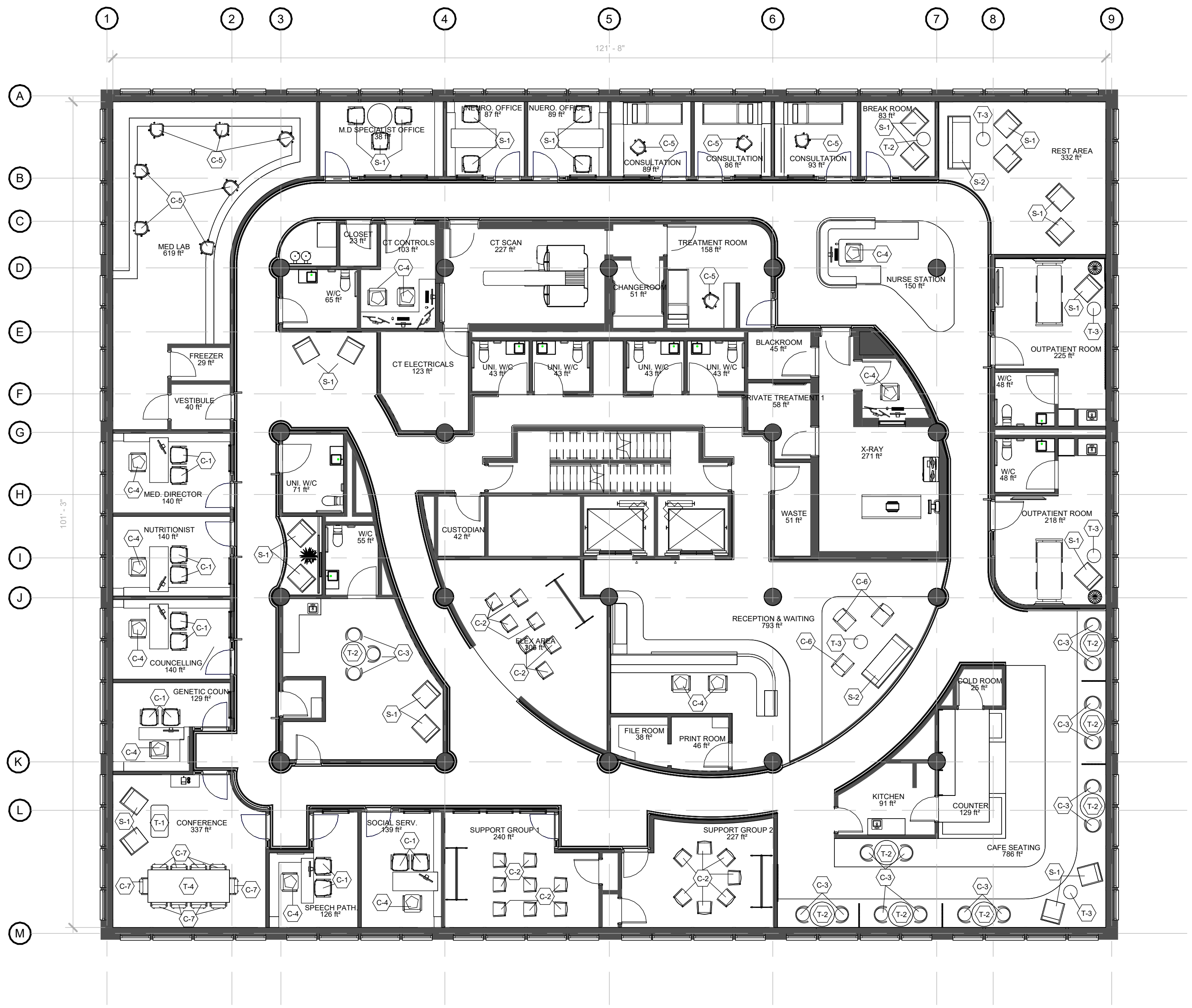

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A15
5th FLOOR FURNITURE PLAN
1/16" = 1'-0"

FURNITURE AND EQUIPTMENT SCHEDULE

MARK	QTY.	MANU. / TYPE	DESCRIPTION	UPHOLSTERY & FINISHES	DIMENSIONS
C-1	12	STEELCASE RADIA CHAIR	METAL FRAMED UPHOLSTERED SEAT AND BACK WITH BUILT-IN ARM CAPS. CURVED BACK WITH SIT AND STAND SUPPORT	7278 BRONZE METAL FRAME WITH 100% POLYURETHANE IN METALLO PARCHMENT	24 3/4" x 25 1/2" x 33"
C-2	20	STEELCASE ENEA STACKER CHAIR	METAL FRAME WITH THERMOPLASTIC POLYPROPYLENE SEAT AND BACK. HIGH BACK	GREY METAL FRAME WITH WHITE SEAT AND BACK FINISH	22 1/2" x 25 1/2" x 33 1/2"
C-3	17	HERMAN MILLER COMMA WOOD ARMCHAIR W/ UPHOLSTERED SEAT	WOOD FRAME WITH CURVED BACK AND UPHOLSTERED SEAT	OAK WOOD FRAME WITH PACE LEATHER IN GRIFFIN	24" x 20" x 28"
C-4	11	ACTIU TNK500 ERGONOMIC OFFICE CHAIR	SWIVEL CHAIR ON CASTORS WITH SEAT ADJUSTMENT AND BACK RECLINER, ARM REST AND LUMBER SUPPORT	WHITE ALUMINUM FRAME WITH UPHOLSTERED SEAT AND BACK IN TEX AE21 LIGHT BEIGE	46" x 44" x 110"
C-5	11	HERMAN MMILLER ZEPH SWIVEL	SWIVEL CHAIR ON CASTORS WITH UPHOLSTERED SEAT AND CURVED BACK SUPPORT	BASE IN ALPINE WHITE WITH UPHOLSTERED SEAT IN SPLASH FALCON 5H110	24" x 18" x 30"
C-6	3	STEELCASE MITRA GUEST SINGLE CHAIR	WOOD BASE WITH UPHOLSTERED SEAT AND BACK AND ARM REST	LAMINATE FRAME IN GRAPHITE WALNUT AND UPHOLSTERED SEAT AND BACK IN 100% VINYL RISE BEACH	54 1/2" x 26 1/2" x 33"
C-7	10	HERMAN MILLER BUMPER CONFERENCE CHAIR	UPHOLSTERED SWIVEL CHAIR WITH CASTORS AND ARM REST	CHROME FRAME WITH LEATHER UPHOLSTERY IN PRONE ESSENCE	28" x 27" x 35"
S-1	18	STEELCASE LEELA SINGLE SEATING	UPHOLSTERED SOFT SEATING ON METAL LEGS WITH HIGH BACK, ARM SUPPORT, AND WOOD ARM CAPS	BLACK METAL LEGS WITH UPHOLSTERED BODY IN 100% VINYL RISE BEACH AND GRAPHITE WALNUT ARM CAPS	28 1/2" x 27 1/2" x 33 3/4"
S-2	2	STEELCASE LEELA 3-SEATER	UPHOLSTERED SOFT SEATING ON METAL LEGS WITH HIGH BACK, ARM SUPPORT, AND WOOD ARM CAPS	BLACK METAL LEGS WITH UPHOLSTERED BODY IN 100% VINYL TROVE BACK AND GRAPHITE WALNUT ARM CAPS	63 x 27 1/2" x 33 3/4"
T-1	1	STEELCASE TURNSTONE BASSLINE OCCASIONAL TABLE	ELLIPSE TABLE WITH LAMINATE WOOD TOP AND METAL LEGS	METAL LEGS PAINTED IN 7243 SEAGULL AND 2825 VANADIUM SPECKLE LAMINTE TOP	36 x 24" x 13"
T-2	8	EMEECO NENDO SU SOUND CAFE TABLE	ROUND 36" WOOD TOP WITH METAL LEGS	WOOD TOP IN WHITE LAMINATE AND METAL LEGS IN CLEAR IODIZED	36"D x 28"
T-3	6	STEELCASE CAMPFIRE PAPER TABLE	ROUND 25" PLASTIC TOP WITH TAPERED WOOD BASE	WALNUT BASE IN VIRGINIA WALNUT WITH PLASTIC BASE IN ARCTIC WHITE	25"D x 22 1/2"
T-4	1	STEELCASE CONVENE CONFERENCE TABLE	RECTANGULAR LAMINATE WOOD TOP WITH 3 LEG LAMINATE WOOD BASE AND CENTRAL OUTLET	TOP AND BASE IN LAMINATE WOOD BISQUE WENGE	120" x 48" x 28 1/2"

GENERAL NOTES

1. FURNITURE PLACEMENT CAN BE ADJUSTED ACCORDING TO SPACE
2. ADDITIONAL FURNITURE THAT IS NEEDED SHALL GET DESIGNER APPROVAL
3. ALL FURNITURE AND EQUIPTMENT SHOULD BE PURCHASED 5 - 6 MONTHS BEFORE END OF CONSTRUCTION
4. MEDICAL INSTRUMENTS, MACHINES, AND FURNITURE SHALL BE CHOSEN BY A MEDICAL OPERATIONS DIRECTOR

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

5th FLOOR FURNITURE PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

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A16
6th FURNITURE PLAN
1/16" = 1'-0"

FURNITURE AND EQUIPTMENT SCHEDULE

MARK	QTY.	MANU. / TYPE	DESCRIPTION	UPHOLSTERY & FINISHES	DIMENSIONS
C-1	12	STEELCASE RADIA CHAIR	METAL FRAMED UPHOLSTERED SEAT AND BACK WITH BUILT-IN ARM CAPS. CURVED BACK WITH SIT AND STAND SUPPORT	7278 BRONZE METAL FRAME WITH 100% POLYURETHANE IN METALLO PARCHMENT	24 3/4" x 25 1/2" x 33"
C-2	20	STEELCASE ENEA STACKER CHAIR	METAL FRAME WITH THERMOPLASTIC POLYPROPYLENE SEAT AND BACK. HIGH BACK	GREY METAL FRAME WITH WHITE SEAT AND BACK FINISH	22 1/2" x 25 1/2" x 33 1/2"
C-3	17	HERMAN MILLER COMMA WOOD ARMCHAIR W/ UPHOLSTERED SEAT	WOOD FRAME WITH CURVED BACK AND UPHOLSTERED SEAT	OAK WOOD FRAME WITH PACE LEATHER IN GRIFFIN	24" x 20" x 28"
C-4	11	ACTIU TNK500 ERGONOMIC OFFICE CHAIR	SWIVEL CHAIR ON CASTORS WITH SEAT ADJUSTMENT AND BACK RECLINER, ARM REST AND LUMBER SUPPORT	WHITE ALUMINUM FRAME WITH UPHOLSTERED SEAT AND BACK IN TEX AE21 LIGHT BEIGE	46" x 44" x 110"
C-5	11	HERMAN MMILLER ZEPH SWIVEL	SWIVEL CHAIR ON CASTORS WITH UPHOLSTERED SEAT AND CURVED BACK SUPPORT	BASE IN ALPINE WHITE WITH UPHOLSTERED SEAT IN SPLASH FALCON 5H110	24" x 18" x 30"
C-6	3	STEELCASE MITRA GUEST SINGLE CHAIR	WOOD BASE WITH UPHOLSTERED SEAT AND BACK AND ARM REST	LAMINATE FRAME IN GRAPHITE WALNUT AND UPHOLSTERED SEAT AND BACK IN 100% VINYL RISE BEACH	54 1/2" x 26 1/2" x 33"
C-7	10	HERMAN MILLER BUMPER CONFERENCE CHAIR	UPHOLSTERED SWIVEL CHAIR WITH CASTORS AND ARM REST	CHROME FRAME WITH LEATHER UPHOLSTERY IN PRONE ESSENCE	28" x 27" x 35"
S-1	18	STEELCASE LEELA SINGLE SEATING	UPHOLSTERED SOFT SEATING ON METAL LEGS WITH HIGH BACK, ARM SUPPORT, AND WOOD ARM CAPS	BLACK METAL LEGS WITH UPHOLSTERED BODY IN 100% VINYL RISE BEACH AND GRAPHITE WALNUT ARM CAPS	28 1/2" x 27 1/2" x 33 3/4"
S-2	2	STEELCASE LEELA 3-SEATER	UPHOLSTERED SOFT SEATING ON METAL LEGS WITH HIGH BACK, ARM SUPPORT, AND WOOD ARM CAPS	BLACK METAL LEGS WITH UPHOLSTERED BODY IN 100% VINYL TROVE BACK AND GRAPHITE WALNUT ARM CAPS	63 x 27 1/2" x 33 3/4"
T-1	1	STEELCASE TURNSTONE BASSLINE OCCASIONAL TABLE	ELLIPSE TABLE WITH LAMINATE WOOD TOP AND METAL LEGS	METAL LEGS PAINTED IN 7243 SEAGULL AND 2825 VANADIUM SPECKLE LAMINTE TOP	36 x 24" x 13"
T-2	8	EMEECO NENDO SU SOUND CAFE TABLE	ROUND 36" WOOD TOP WITH METAL LEGS	WOOD TOP IN WHITE LAMINATE AND METAL LEGS IN CLEAR IODIZED	36"D x 28"
T-3	6	STEELCASE CAMPFIRE PAPER TABLE	ROUND 25" PLASTIC TOP WITH TAPERED WOOD BASE	WALNUT BASE IN VIRGINIA WALNUT WITH PLASTIC BASE IN ARCTIC WHITE	25"D x 22 1/2"
T-4	1	STEELCASE CONVENE CONFERENCE TABLE	RECTANGULAR LAMINATE WOOD TOP WITH 3 LEG LAMINATE WOOD BASE AND CENTRAL OUTLET	TOP AND BASE IN LAMINATE WOOD BISQUE WENGE	120" x 48" x 28 1/2"

GENERAL REMARKS

FURNITURE C-2 NOT INCLUDED IN PLAN BUT ADDITIONAL WILL BE NEEDED FOR EXERCISE PURPOSES. EXTRA CHAIRS TO BE PLACED IN STORAGE UNTIL NEEDED.

GENERAL NOTES

1. FURNITURE PLACEMENT CAN BE ADJUSTED ACCORDING TO SPACE
2. ADDITIONAL FURNITURE THAT IS NEEDED SHALL GET DESIGNER APPROVAL
3. ALL FURNITURE AND EQUIPTMENT SHOULD BE PURCHASED 5 - 6 MONTHS BEFORE END OF CONSTRUCTION
4. MEDICAL INSTRUMENTS, MACHINES, AND FURNITURE SHALL BE CHOSEN BY A MEDICAL OPERATIONS DIRECTOR

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

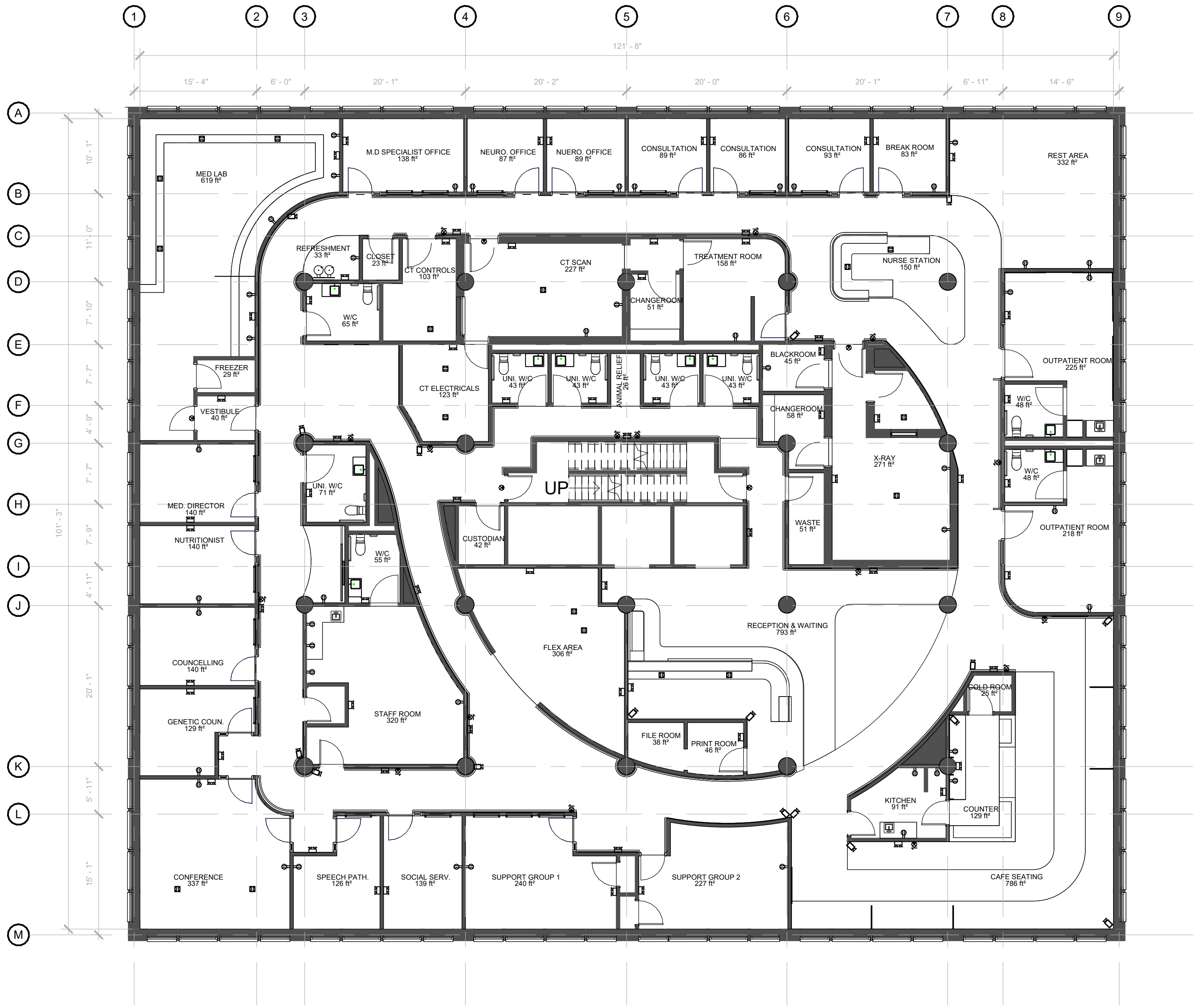
6th FLOOR FURNITURE PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A16



1 A17 **5th FLOOR ELECTRICAL & COMMUNICATIONS PLAN**
1/16" = 1'-0"

GENERAL NOTES

1. REFER TO ORIGINAL BUILDING DRAWING FOR SPRINKLER PLAN
2. ALL SYSTEMS MUST BE BRAND NEW AND APPROVED FOR PARTICULAR LOCATION
3. ALL ELECTRICAL WORKS SHALL COMPLY IN ACCORDANCE TO THE ELECTRICAL CODE

SYMBOL LEGEND

- FLOOR MOUNTED OUTLET
- DUPLEX RECEPTACLE OUTLET
- SURVEILANCE CAMERA
- EMERGENCY LIGHT
- EMERGENCY EXIT SIGN
- DIRECTIONAL EMERGENCY EXIT SIGN (RIGHT)
- DIRECTIONAL EMERGENCY EXIT SIGN (LEFTT)

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

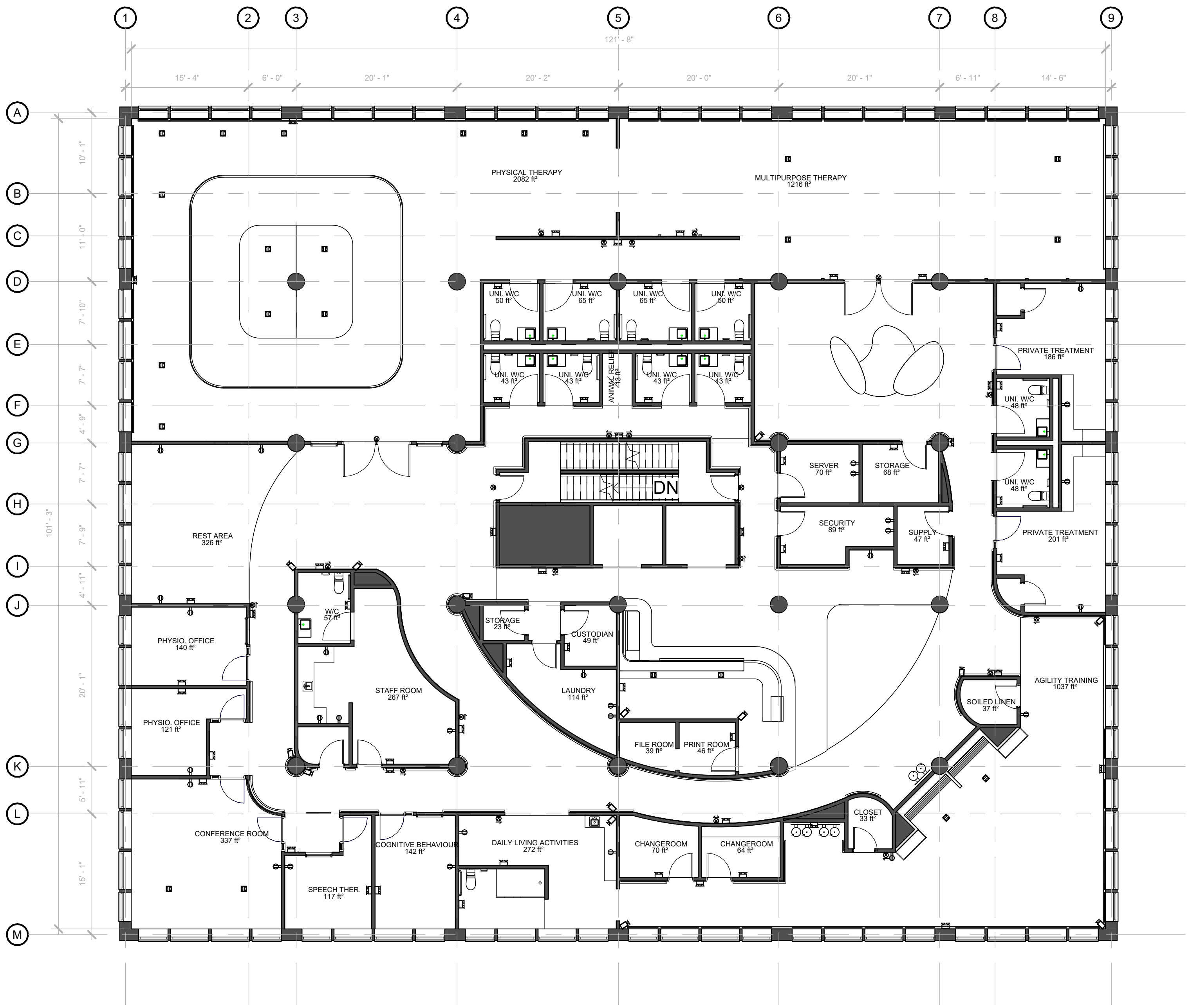
5th FLOOR ELECTRIC AND COMMS PLAN

SCALE: 1/16" = 1'-0"

MERYLL RAYMUNDO

JUNE 30, 2024

A17



1 A18 **6th FLOOR ELECTRICAL & COMMUNICATIONS PLAN**
1/16" = 1'-0"

GENERAL NOTES

1. REFER TO ORIGINAL BUILDING DRAWING FOR SPRINKLER PLAN
2. ALL SYSTEMS MUST BE BRAND NEW AND APPROVED FOR PARTICULAR LOCATION
3. ALL ELECTRICAL WORKS SHALL COMPLY IN ACCORDANCE TO THE ELECTRICAL CODE

SYMBOL LEGEND

- FLOOR MOUNTED OUTLET
- DUPLEX RECEPTACLE OUTLET
- SURVEILANCE CAMERA
- EMERGENCY LIGHT
- EMERGENCY EXIT SIGN
- DIRECTIONAL EMERGENCY EXIT SIGN (RIGHT)
- DIRECTIONAL EMERGENCY EXIT SIGN (LEFTT)

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

6th FLOOR ELECTRIC AND COMMS PLAN

SCALE: 1/16" = 1'-0"

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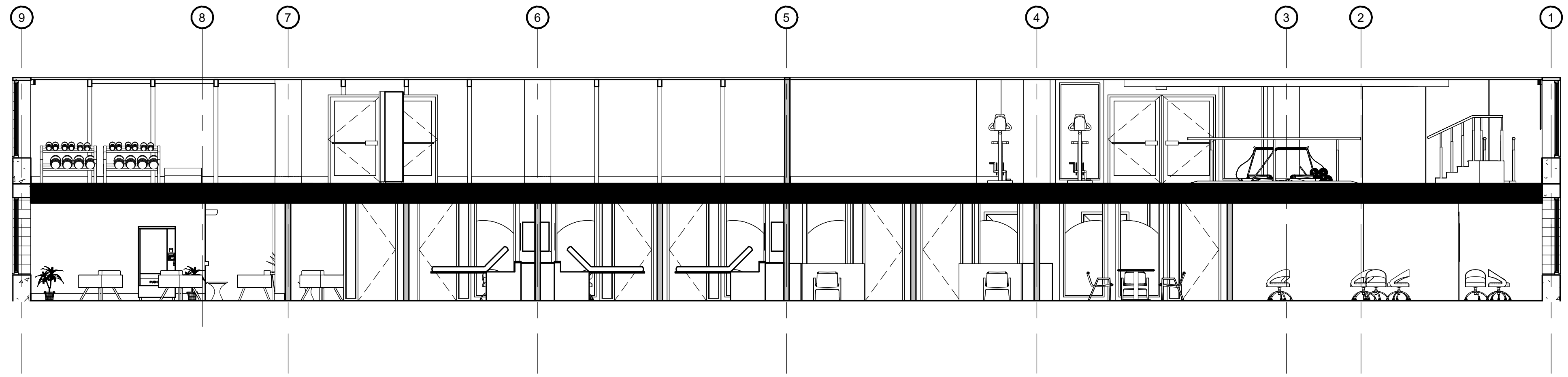
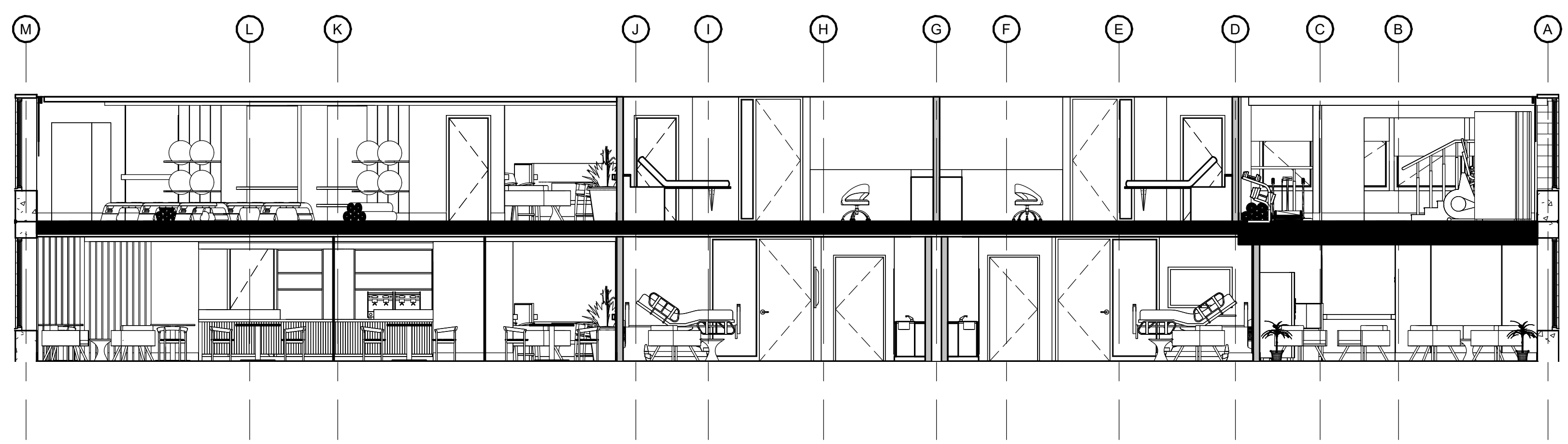
A18



1
A19
SOUTHEAST - SOUTHWEST SECTION
3/32" = 1'-0"



2
A19
SOUTHWEST - NORTHWEST SECTION
3/32" = 1'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

SECTIONS

SCALE : 3/32" - 1'0"

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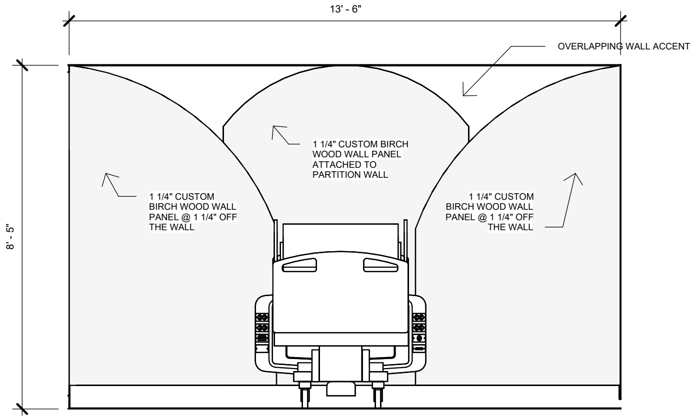
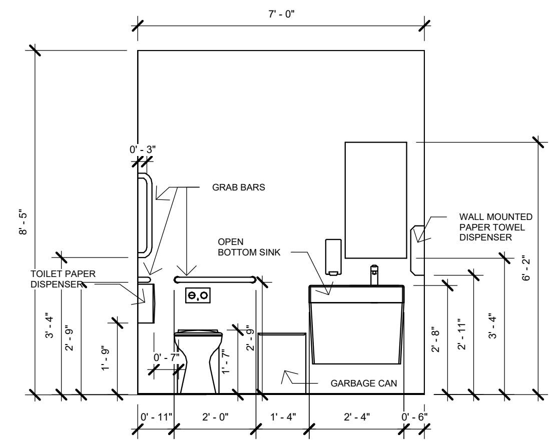
JUNE 30, 2024

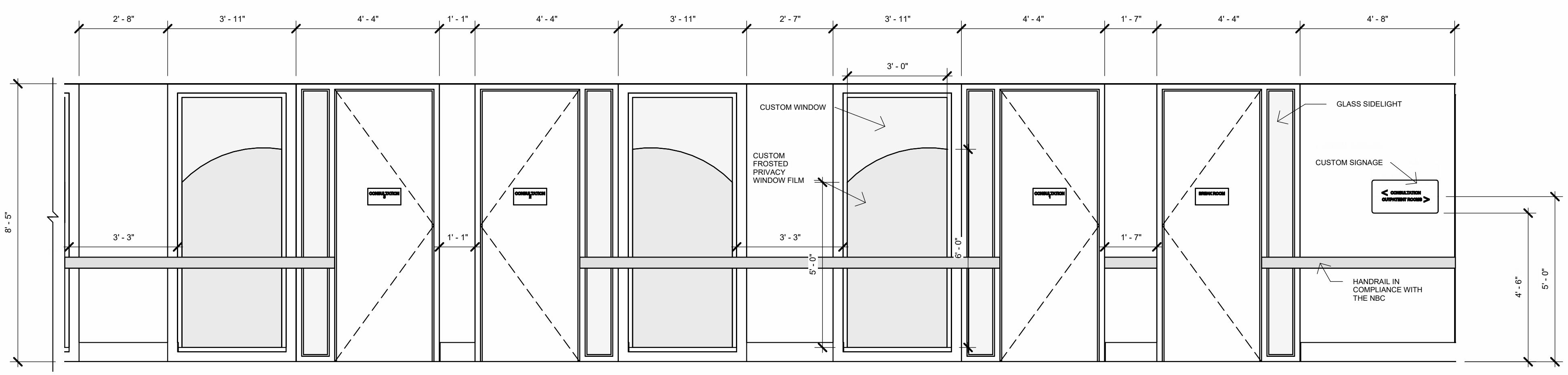
A19



1
A20
PATIENT ROOM ELEVATION
1/4" = 1'-0"



2
A20
UNIVERSAL WASHROOM ELEVATION
1/4" = 1'-0"



3
A20
HALLWAY ELEVATION
1/4" = 1'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

ELEVATIONS 1

SCALE : 1/4" - 1'0"

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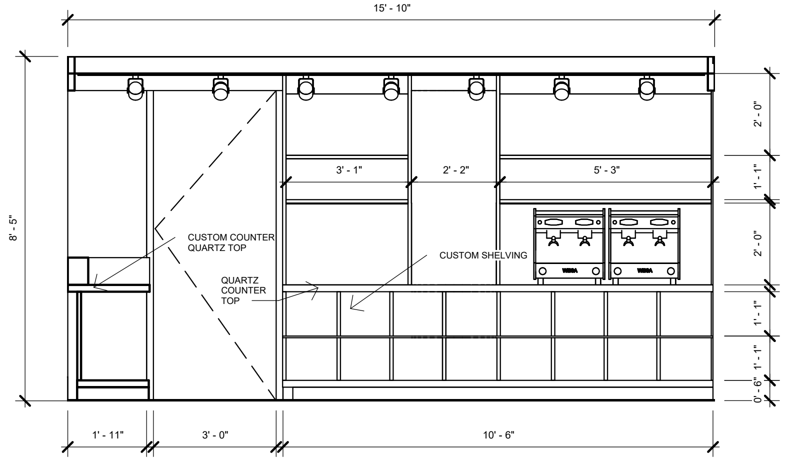
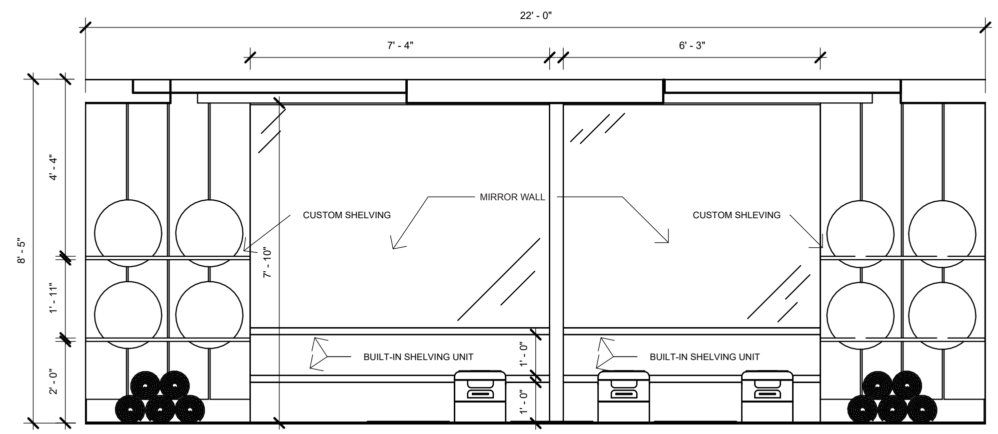
JUNE 30, 2024

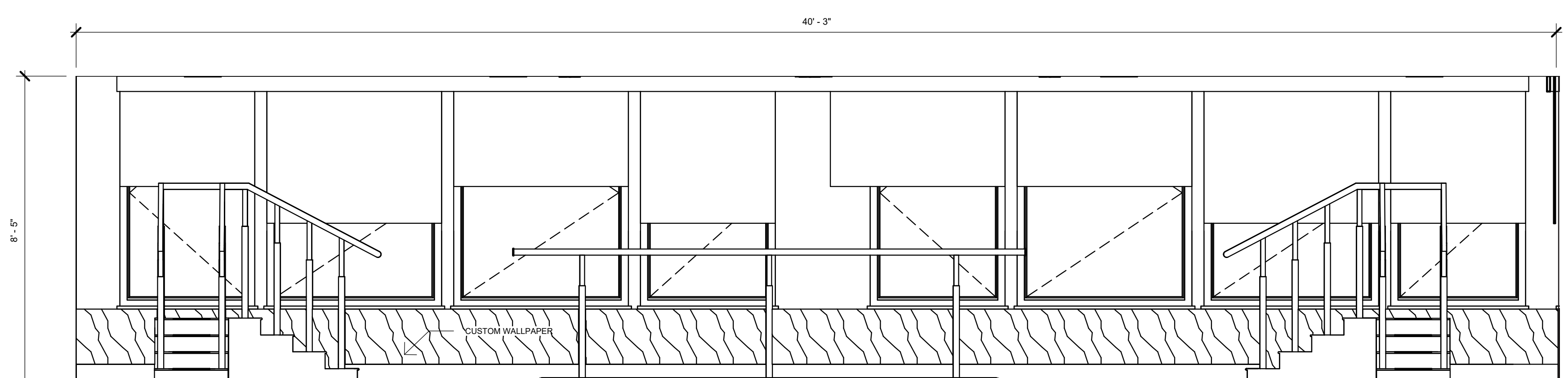
A20



1 A21 **CAFE BAR ELEVATION**
1/4" = 1'-0"



2 A21 **AGILITY TRAINING WALL ELEVATION**
1/4" = 1'-0"



3 A21 **PHYSICAL THERAPY WALL ELEVATION**
1/4" = 1'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

ELEVATIONS 2

SCALE: 1/4" = 1'-0"

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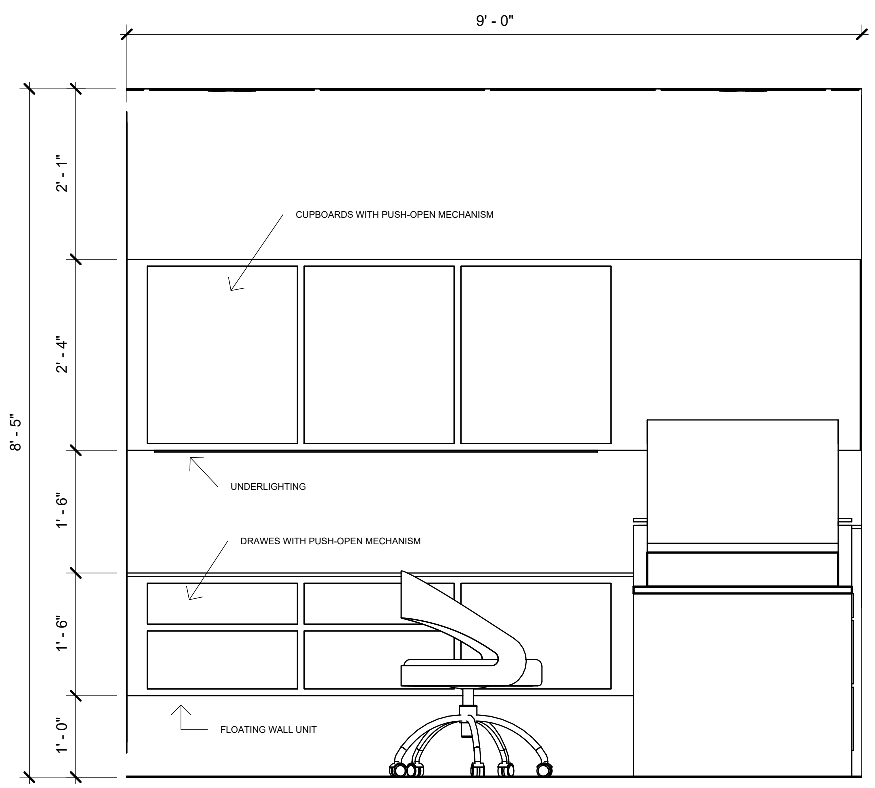
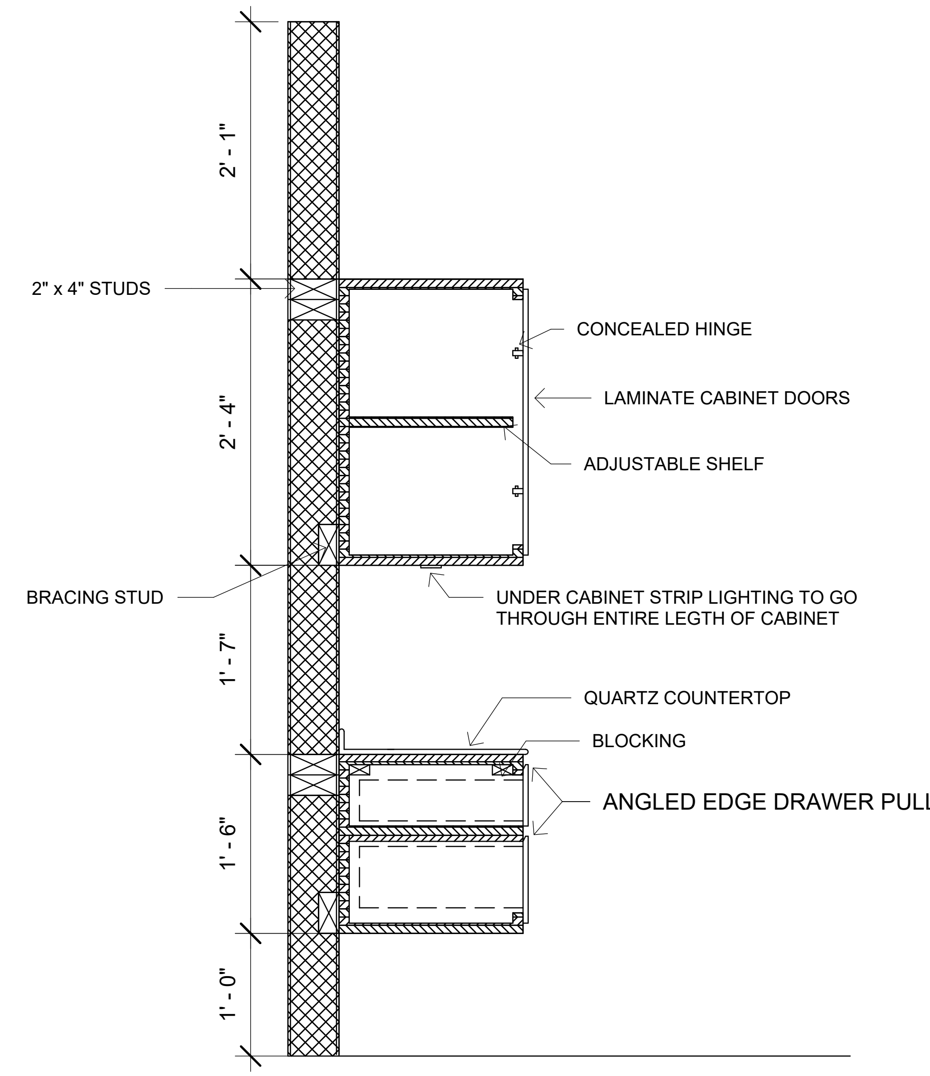
A21



1 A22 **PRIVATE TREATMENT ELEVATION**
1/2" = 1'-0"



2 A22 **PRIVATE TREATMENT CABINET SECTION**
3/4" = 1'-0"

PARKINSON'S REHABILITATION CENTRE
5 DONALD AVENUE WINNIPEG, MB
WALL CABINET CONSTRUCTION
SCALE: AS INDICATED
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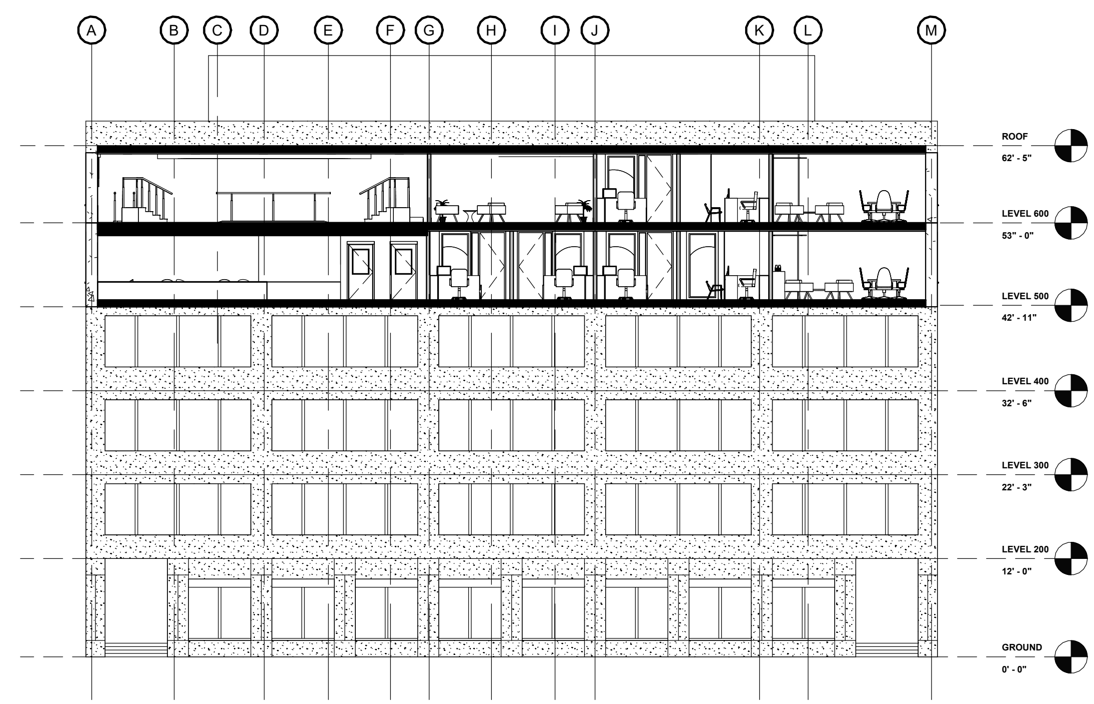
A22

1
A23
NORTHWEST - NORTHEAST BUILDING SECTION
1" = 20'-0"



2
A23
NORTHWEST - SOUTHWEST BUILDING SECTION
1" = 20'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

BUILDING SECTION

SCALE: 1" = 20'-0"

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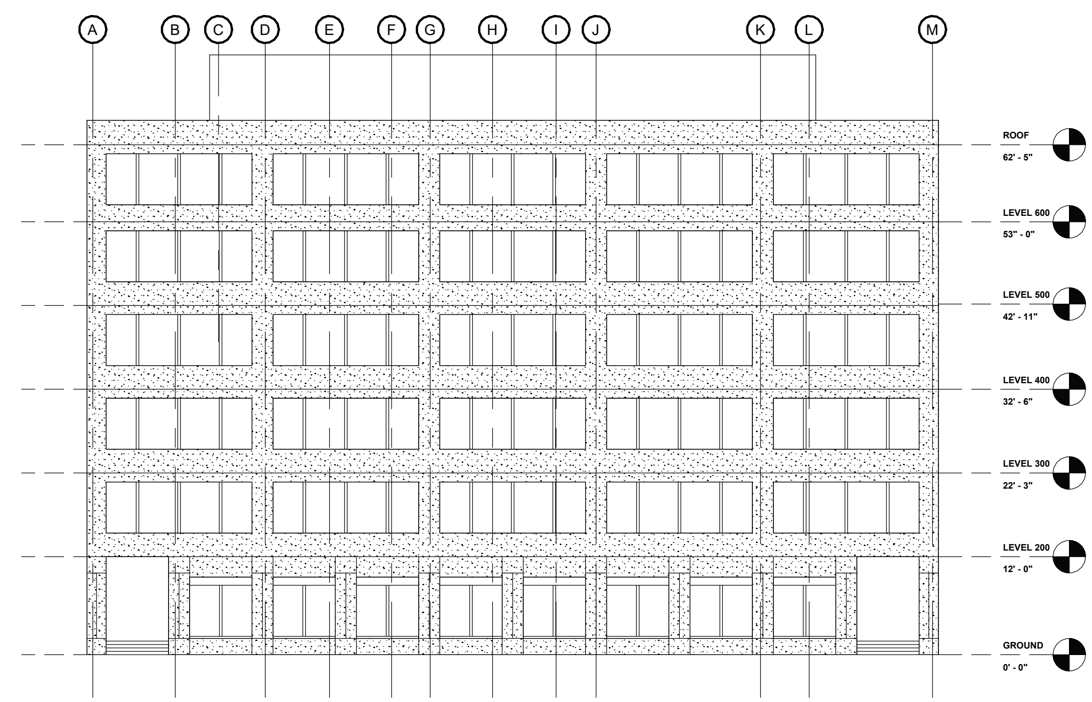
JUNE 30, 2024

A23

1
A24
NORTHWEST - NORTHEAST BUILDING ELEVATION
1" = 20'-0"



2
A24
NORTHWEST - SOUTHWEST BUILDING ELEVATION
1" = 20'-0"

PARKINSON'S REHABILITATION CENTRE

5 DONALD AVENUE
WINNIPEG, MB

BUILDING ELEVATION

SCALE: 1" = 20'-0"

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JUNE 30, 2024

A24