

Responding to AUD in Sudbury, Ontario Through the Senses of Architectural Intervention:

A Metamorphosis of Body, Mind, and Soul

By

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Table of Contents

Abstract.....	vi
Acknowledgments.....	viii
List of Figures.....	xii
Definitions and Terms.....	xvi
1 Introduction.....	2
1.1 The Spectrum of AUD.....	2
1.2 What is Alcohol Use Disorder?.....	4
2 Responding to AUD in Northern Ontario, Canada.....	6
2.1 The City of Greater Sudbury.....	6
2.2 Existing Rehabilitation Centres.....	8
2.3 Monarch Recovery Service.....	48
3 Choosing the Ideal Location for Recovery.....	51
3.1 Place.....	51
3.2 Site Analysis.....	53
3.3 Design Precedents.....	56
4 Designing for Recovery.....	61
4.1 Concept Evolution.....	61
4.2 Building Program.....	64
4.3 Courtyards.....	76
4.4 Patient Area.....	83
4.5 Treatment Area.....	85
4.6 Admin Area.....	88
4.7 Public to Private.....	90
4.8 Rooftop Garden.....	95
4.9 Connection to the Forest.....	97
5 The Road to Recovery.....	104
5.1 Conclusion.....	104
Appendix.....	106
Bibliography.....	128

Abstract

Responding to AUD in Sudbury, Ontario
Through the Senses of Architectural Intervention:
A Metamorphosis of Body, Mind, and Soul

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Life is a story of recovery. Some people that undergo a traumatic experience try to cope in an unhealthy way. “When humans face a challenge or threat, they have a partly physical response. The body activates resources that help people either stay and confront the challenge or get to safety as fast as possible.”¹ After these traumatic experiences, often adults turn to alcohol and substances to numb their feelings and, as a result, this behaviour can lead to addictions. Major health issues can arise from substance abuse and in worse case scenarios, death. An article from Health Essentials explains that “patients who show up with liver problems have been long time drinkers but have also experienced something in their life that’s caused an uptick in their recent alcohol use.”²

In the year 2020, the COVID-19 pandemic has affected the entire world. This pandemic has caused people to remain in their home for extended periods of time. Due to increased stress levels from this experience, there has been an increase in alcohol consumption. As an article in Addition Rehab Toronto stated, “with increased feelings of anxiety and stress resulting from COVID-19, alcohol intake has increased in Canada. According to new data, alcohol sales have increased considerably compared to last year’s number.”³

Architecture plays a significant role in our daily lives and these spaces are specific to our experiences which influence our choices. Bars have been designed for the consumption of alcohol, drinking culture is heavily embedded into human societies. Some of the oldest bars first established in Canada date back to 1789.⁴ The concept of Rehab centres is relatively new in our global culture. “Small rehab facilities have been operating since 1840.”⁵ Rehab centres are designed to support patients with addictions through the rehabilitation process. How can architectural design foster the recovery of people recovering from addiction?

The city of Greater Sudbury, Ontario, is in need of a new type of Health facility. One which enhances the assets of the addiction rehabilitation task force composed of organizations such as Ontario Addiction Treatment Centres, Monarch Recovery Services, Health Science North, Northwood Recovery Clinic, CAMH and AA. This thesis will explore the connection between our built environments, the senses and how these spaces can contribute to the recovery process.

Key Words

- Alcohol Use Disorder (AUD)
- Architectural Senses
- Metamorphosis
- Rehabilitation
- Healing Addictions

¹ “Stress: Why Does It Happen and How Can We Manage It?,” March 12, 2020, <https://www.medicalnewstoday.com/articles/145855>.

² “Millennials and Alcohol: More young People are Drinking to the Point of Liver Damage,” But many may not realize they’re at risk, *Health Essentials, Digestive*, Oct 9, 2018.

³ “Are You Drinking Too Much During the COVID-19 Lockdown?,” *Addiction Rehab Toronto*, April 5, 2020.

⁴ “Our History Us | Our History & Ghost Story,” *Olde Angel Inn*, Accessed July 13, 2021, <http://oldeangelinn.com/about/>.

⁵ Ben, Lesser, “History of Rehab Facilities | Dual Diagnosis,” *dualdiagnosis.org*, Accessed July 13, 2021, <https://dualdiagnosis.org/drug-addiction/history-rehab-facilities/>.

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My late cousin, Michael Christopher Radvansky (Figure 1), suffered from AUD. After his mother passed away from cancer, he became more reliant on substances to numb the pain of his loss. Near the end of his life, he became sick and acquired jaundice. This effect is the yellowing of the skin because of abuse to the liver. During this time, he needed to do a series of dialysis blood transfusions. He ended up with a blood disorder and needed multiple blood donations. The doctors told him that he needed to stop drinking immediately. He was forced to stop. He had the support of my parents and his estranged father. He lived with his father for a time. After he showed signs of improvement, he decided to move back into his home. Michael lived in his home by himself. My parents would continuously visit him and show him support. He had seemed to be healing and given a second chance. When one lives by themselves, it is easier to become influenced by addictions. He returned to drinking in secret. The doctors told him that his system was so delicate that they would not help him anymore if he continued to drink. Our family had not heard from him in a few days. My parents went to his house and found him on the floor in his mother's bedroom. On the table next to him was half a bottle of alcohol. He passed away in 2009; he was only 38 years old.



Figure 1. Michael Christopher Radvansky.

Thank you Michael for being my brother, I miss you.

This Thesis is dedicated to his memory.

List of Figures

Figure 1. Michael Christopher Radvansky, Photo taken by Author, 2005.

Figure 2. Spectrum of Problem Drinking. Rare TV Stuff. “HBO Documentary: Risky Drinking (2015).” Accessed July 13, 2021. https://www.youtube.com/watch?v=_1gQ4iM6N4M.

Figure 3. Addiction Services Available, but May be Restricted, during COVID-19. Apr 18, Jordan Gill · CBC News · Posted:, and 2020 12:30 PM AT | Last Updated: April 18. “Addiction Services Available, but May Be Restricted, during COVID-19 | CBC News.” CBC, April 18, 2020. <https://www.cbc.ca/news/canada/new-brunswick/addiction-services-available-covid-1.5537236>.

Figure 4. Google Map Sudbury. Image created by Author.

Figure 5. Map of Sudbury Mental Health & AUD Treatment Centres. Image created by Author.

Figure 6. OATC - Sudbury. https://www.google.ca/maps/@46.5036974,-80.9864399,3a,75y,84.4h,78.73t/data=!3m7!1e1!3m5!1sEif7JTHR09efc-jmWfS8bqw!2e0!6s%2F%2Fgeo2.ggpht.com%2Fcbk%3Fpanoid%3DEif7JTHR09efcjmWfS8bqw%26output%3Dthumbnail%26cb_client%3Dmaps_sv.tactile.gps%26thumb%3D2%26w%3D203%26h%3D100%26yaw%3D266.99185%26pitch%3D0%26thumbfov%3D100!7i16384!8i8192?hl=en&authuser=0.

Figure 7. Withdrawal Management Service. <https://www.google.ca/maps/place/336+Pine+St,+Sudbury,+ON+P3C+4E5/@46.4945563,-81.0086441,209m/data=!3m1!1e3!4m5!3m4!1s0x4d2fab1e66c-1052b:0xef932f2e74212ee4!8m2!3d46.4948724!4d-81.0080487>.

Figure 8. Women’s After Care. https://www.google.ca/maps/@46.4935093,-80.9978683,3a,75y,263.97h,99.55t/data=!3m6!1e1!3m4!1sdeWgrMtyk-ndDtu3_hdtY-A!2e0!7i16384!8i8192?hl=en&authuser=0.

Figure 9. Salvation Army Church AA Meeting. https://www.google.ca/maps/uv?pb=!1s0x4d-2faadfdf7b0349%3A0x8ca323d9ee9b-beca!3m1!7e115!4s%2F%2Fgeo1.ggpht.com%2Fcbk%3Fpanoid%3DBvHOE9kH1tW70Yvo-jUuHNw%26output%3Dthumbnail%26cb_client%3Dsearch.gws-prod.gps%26thumb%3D2%26yaw%3D0.529548%26pitch%3D0%26thumbfov%3D100%26w%3D465%26h%3D156!5salcohol%20rehab%20in%20sudbury%20-%20Google%20Search!15sCglgAQ&imagekey=!1e2!2sBvHOE9kH1tW70YvojUuHNw&hl=en.

Figure 10. CMHA - Canadian Mental Health Association. <https://www.google.ca/maps/@46.4936453,-80.9965758,3a,60.5y,212.01h,83.47t/data=!3m6!1e1!3m4!1sftHEiD-IgBp-pxD-FQ0KpSw!2e0!7i13312!8i6656?hl=en&authuser=0>.

Figure 11. N'Swakamok Native Friendship Centre. https://www.google.ca/search?q=N%27Swakamok+Native+Friendship+Centre&sxsrf=ALeKk03HzaoKhFx0g6L78n_wltSCUXBi-g:1609563804552&source=inms&tbm=isch&sa=X&ved=2ahUKEwiZ1MC2vPztAhXr-FIkFHd9iD5UQ_AUoAnoECAoQBA&biw=2144&bih=1016#imgrc=1L3Dtf6Tf5KXCM.

Figure 12. Men’s Day Treatment. https://www.google.ca/maps/@46.4935093,-80.9978683,3a,75y,263.97h,99.55t/data=!3m6!1e1!3m4!1sdeWgrMtyk-ndDtu3_hdtY-A!2e0!7i16384!8i8192?hl=en&authuser=0.

Figure 13. Northwood Recovery. <https://www.google.ca/maps/@46.4936453,-80.9965758,3a,60.5y,212.01h,83.47t/data=!3m6!1e1!3m4!1sftHEiD-IgBp-pxDFQ0Kp-Sw!2e0!7i13312!8i6656?hl=en&authuser=0>.

Figure 14. Alcoholics Anonymous - Northeastern Ontario Area 84. https://www.google.ca/maps/uv?pb=!1s0x4d2faae5b47aaaab%3A0xa25b95d-1f6434afd!3m1!7e115!4s%2F%2Fgeo2.ggpht.com%2Fcbk%3Fpanoid%3DiuYR3l68YKcbXp-0gZ21aiw%26output%3Dthumbnail%26cb_client%3Dsearch.gws-prod.gps%26thumb%3D2%26yaw%3D336.4936%26pitch%3D0%26thumbfov%3D100!7i16384!8i8192?hl=en&authuser=0.

[v%3D100%26w%3D465%26h%3D156!5salcohol%20rehab%20in%20sudbury%20-%20Google%20Search!15sCglgAQ&imagekey=!1e2!2siuYR3l68YKcbXp0gZ21aiw&hl=en](https://www.google.ca/maps/@46.4922037,-80.9922587,3a,89y,164.21h,108.07t/data=!3m7!1e1!3m5!1sIWax-2IKoF3Q0xOxGCAYLgw!2e0!6s%2F%2Fgeo0.ggpht.com%2Fcbk%3Fpanoid%3DIWax-2IKoF3Q0xOxGCAYLgw%26output%3Dthumbnail%26cb_client%3Dmaps_sv.tactile.gps%26thumb%3D2%26w%3D203%26h%3D100%26yaw%3D79.06922%26pitch%3D0%26thumbfov%3D100!7i16384!8i8192?hl=en&authuser=0).

Figure 15. Positive Steps. https://www.google.ca/maps/@46.4922037,-80.9922587,3a,89y,164.21h,108.07t/data=!3m7!1e1!3m5!1sIWax-2IKoF3Q0xOxGCAYLgw!2e0!6s%2F%2Fgeo0.ggpht.com%2Fcbk%3Fpanoid%3DIWax-2IKoF3Q0xOxGCAYLgw%26output%3Dthumbnail%26cb_client%3Dmaps_sv.tactile.gps%26thumb%3D2%26w%3D203%26h%3D100%26yaw%3D79.06922%26pitch%3D0%26thumbfov%3D100!7i16384!8i8192?hl=en&authuser=0.

Figure 16. Rockhaven - Men’s Recovery Home. https://www.google.ca/maps/@46.4931069,-80.986005,3a,75y,222.06h,97.85t/data=!3m6!1e1!3m4!1stnkCs8_CwIJZv6cnR-W7upA!2e0!7i13312!8i6656?hl=en&authuser=0.

Figure 17. Men’s Transition Home. https://www.google.ca/maps/@46.4931069,-80.986005,3a,75y,222.06h,97.85t/data=!3m6!1e1!3m4!1stnkCs8_CwIJZv6cnR-W7upA!2e0!7i13312!8i6656?hl=en&authuser=0.

Figure 18. Iris Addiction Recovery For Women - Administration/Women’s Treatment. <https://monarchrecovery.com/who-we-are>.

Figure 19. Sudbury Outpatient Centre - Health Sciences North. https://www.google.ca/search?q=sudbury+outpatient+centre+health+sciences+north&sxsrf=ALeKk01GPC-CYEphSi-clTtaA4xmS3Hx6-g:1609565736665&source=inms&tbm=isch&sa=X&ved=2ahUKEwi_suf-Pw_ztAhVmUd8KHQhALIQ_AUoA3oE-CAsQBQ&biw=2144&bih=1016#imgrc=w6Qxm-lqLINQ9YM.

Figure 20. CAMH - Centre for Addiction and Mental Health. https://www.google.ca/maps/@46.4718638,-81.0068352,3a,47y,121.97h,90.17t/data=!3m6!1e1!3m4!1shru0EvO_5MJ-tFa-v07W27w!2e0!7i16384!8i8192?hl=en&authuser=0.

Figure 21. Health Science North. https://www.google.ca/maps/@46.4673649,-80.9952289,3a,90y,292.86h,97.69t/data=!3m7!1e1!3m5!1s-7fIU4aXqw8NzV3ZieF8NtQ!2e0!6s%2F%2Fgeo3.ggpht.com%2Fcbk%3Fpanoid%3D7fIU4aXqw8NzV3ZieF8NtQ%26output%3Dthumbnail%26cb_client%3Dmaps_sv.tactile.gps%26thumb%3D2%26w%3D203%26h%3D100%26yaw%3D335.3153%26pitch%3D0%26thumbfov%3D100!7i13312!8i6656?hl=en&authuser=0.

Figure 22. NISA/Northern Initiative for Social Action. <https://www.google.ca/maps/@46.4934238,-80.9965557,3a,49.2y,62.85h,97.24t/data=!3m6!1e1!3m4!1sxnEcrnai3FW52hJIAjOP-iA!2e0!7i13312!8i6656?hl=en&authuser=0>.

Figure 23. BC’s Largest Drug Addiction Rehabilitation Centre Proposed for East Vancouver. “BC’s Largest Drug Addiction Rehabilitation Centre Proposed for East Vancouver | Urbanized.” Accessed November 3, 2020. <https://dailyhive.com/vancouver/1636-clark-drive-and-1321-1395-east-1st-avenue-vancouver-drug-rehabilitation-centre>.

Figure 24. Withdrawal Management Addiction and Treatment Clinic in London, Ontario. Ontario Drug Rehabs. “Withdrawal Management.” Accessed November 3, 2020. <https://ontariodrugrehab.com/centres/london/withdrawal-management/>.

Figure 25. Alcohol Addiction & Rehab Treatments Toronto. Freedom Addiction. “Alcohol Addiction & Rehab Treatments Toronto | Freedom From Addiction.” Accessed November 3, 2020. <https://www.freedomaddiction.ca/alcohol/>.

Figure 26. Canadian Centre for Addictions. “Canadian Centre for Addictions | A Rehab Center in Toronto, Ontario, Canada.” Accessed November 3, 2020. <https://luxuryrehab.com/canadian-centre-for-addictions/>.

Figure 27. Monarch Recovery Service. Monarch Recovery Services. “Who We Are.” Accessed July 17, 2021. <http://monarchrecovery-services.ca/who-we-are>.

Figure 28. CEO Roxane Zuck. <https://www.facebook.com/photo?fbid=10159422721077755&set=ecnf.617202754>

Figure 29. Map of Monarch Recovery Services. Image created by Author.

Figure 30. Site Plan 1:200. Image created by Author.

Figure 31. Arcgis.com Base Map, Mapping Site Plan Analysis. Image created by Author.

Figure 32. Site Visit Photo, Photo taken by Author, 2021.

Figure 33. Site Visit Photo, Photo taken by Author, 2021.

Figure 34. Site Visit Photo, Photo taken by Author, 2021.

Figure 35. The Caravanserai, National Geographic Society. National Geographic. “Caravanserai.” National Geographic Society, July 23, 2019. <http://www.nationalgeographic.org/encyclopedia/caravanserai/>.

Figure 36. Sainte Marie de La Tourette by Le Corbusier. ArchDaily. “AD Classics: Convent of La Tourette / Le Corbusier,” December 15, 2010. <https://www.archdaily.com/96824/ad-classics-convent-of-la-tourette-le-corbusier>.

Figure 37. Amsterdam Orphanage by Aldo Van Eyck. ArchDaily. “Gallery of AD Classics: Amsterdam Orphanage / Aldo van Eyck - 1.” Accessed July 17, 2021. <https://www.archdaily.com/151566/ad-classics-amsterdam-orphanage-aldo-van-eyck/50380ed428ba0d599b000bcb-ad-classics-amsterdam-orphanage-aldo-van-eyck-photo>.

Figure 38. Japanese Gardens. DigsDigs. “45 Calm Japanese-Inspired Courtyard Ideas,” July 17, 2019. <https://www.digsdigs.com/27-calm-japanese-inspired-courtyard-ideas/>.

Figure 39. Maggie’s Centre. ArchDaily. “Maggie’s Leeds Centre / Heatherwick Studio,” June 12, 2020. <https://www.archdaily.com/941540/maggies-leeds-centre-heatherwick-studio>.

Figure 40. Parti Diagram Movement, Image created by Author.

Figure 41. Parti Diagram, Image created by Author.

Figure 42. Concept Diagram No.005, Image created by Author.

Figure 43. Concept Diagram No.002, Image created by Author.

Figure 44. Building Program Diagram, Image created by Author.

Figure 45. Building Program Diagram No.005, Image created by Author.

Figure 46. Concept Diagram No.009, Image created by Author.

Figure 47. Concept Diagram No.030, Image created by Author.

Figure 48. Concept Diagram No.032, Image created by Author.

Figure 49. Concept Diagram No.034, Image created by Author.

Figure 50. Concept Diagram No.040, Image created by Author.

Figure 51. 1st Floor Plan 1:100, Image created by Author.

Figure 52. 2nd Floor Plan 1:100, Image created by Author.

Figure 53. 1st Floor Plan Circulation 1:100, Image created by Author.

Figure 54. 2nd Floor Plan Circulation 1:100, Image created by Author.

Figure 55. Render Patient Entrance, Twinmotion, Image created by Author.

Figure 56. Cross Section 8 1:100, Revit, Image created by Author.

Figure 57. Render Serenity Corner, Twinmotion, Image created by Author.

Figure 58. Render Serenity Dock, Twinmotion, Image created by Author.

Figure 59. Cross Section 2 1:100, Revit, Image created by Author.

Figure 60. Render Safety Courtyard, Twinmotion, Image created by Author.

Figure 61. Cross Section 6 1:100, Revit, Image created by Author.

Figure 62. Render Admin Courtyard, Twinmotion, Image created by Author.

Figure 63. Render Corridor to Admin, Twinmotion, Image created by Author.

Figure 64. Render Family Room, Twinmotion, Image created by Author.

Figure 65. Render Corridor Treatment, Twinmotion, Image created by Author.

Figure 66. Render Fire Pit, Twinmotion, Image created by Author.

Figure 67. Cross Section 4 1:100, Revit, Image created by Author.

Figure 68. Render Admin Entrance, Twinmotion, Image created by Author.

Figure 69. Render Admin Court, Twinmotion, Image created by Author.

Figure 70. Render Bedroom Lobby, Twinmotion, Image created by Author.

Figure 71. Render East Elevation 1:100, Twinmotion, Revit, Image created by Author.

Figure 72. Render Catwalk to Exterior, Twinmotion, Image created by Author.

Figure 73. Render North Elevation 1:100, Twinmotion, Revit, Image created by Author.

Figure 74. Cross Section 19 1:100, Revit, Image created by Author.

Figure 75. Render Roof Top, Twinmotion, Image created by Author.

Figure 76. Render Roof Top Moon, Twinmotion, Image created by Author.

Figure 77. Render Aerial View, Twinmotion, Image created by Author.

Figure 78. Render South Elevation 1:100, Twinmotion, Revit, Image created by Author.

Figure 79. Site Plan 1:400. Image created by Author.

Figure 80. Cross Section 3 1:200, Revit, Image created by Author.

Definitions and Terms

Met·a·mor·pho·sis
/ˌmedəˈmɔːfəsəs/

A change of the form or nature of a thing or person into a completely different one, by natural or supernatural means.

AA = Alcoholics Anonymous

ACC = Anterior Cingulate Cortex

AUD = Alcohol Use Disorder

AWS = Alcohol Withdrawal Syndrome

CBT = Cognitive Behavioural Therapy

CLT = Cross Laminated Timber

DBT = Dialectical Behavioural Therapy

DSM = Diagnostic and Statistical Manual of Mental Disorders

HSN = Health Science North

IC = Insular Cortex

MAT = Medication-Assisted Treatment

MRS = Monarch Recovery Services

OFC = Orbitofrontal Cortex

PAWS = Post-Acute Withdrawal Syndrome

VTA = Ventral Tegmental Area

“The Journey of a Thousand Miles Begins with a Single Step.” - Lao Tzu

1 INTRODUCTION

1.1 The Spectrum of AUD

In Canada, it has been reported that Canadians consumed 8.2 litres of pure alcohol per year. 23% of Canadians reported drinking heavily.⁶ In the United States of America, Americans reported drinking 8.7 litres of pure alcohol per year. With 24.5% of them drinking heavily.⁷ In the United Kingdom the numbers are even higher. Citizens reported drinking 10.4 litres of pure alcohol per year and 33.4% of those drinkers drink heavily.⁸ Across the world in Australia, reports show that Australians consume 10.4 litres of pure alcohol per year and 13% of those stats are heavy drinkers.⁹

Alcohol is an important part of the global social culture. The consumption of alcohol is used in many life events, celebrations and rites of passage. There are many environments where people drink alcohol to an excessive level such as weddings, concerts, bars, wineries, restaurants, sporting events, home, etc. The heavy consumption of alcohol at these places is socially acceptable and encouraged. "Struggling with an alcohol use disorder is difficult on its own. However, being in an environment where alcohol is served and consumed at alarming rates can make sobriety all the more difficult. Being aware of potential triggers at certain events is key to being prepared, but being educated on alcohol dependence and available treatments can be lifesaving."¹⁰ These concerns affect people from city to province to country. Alcohol Use Disorder (AUD) affects people globally. "Alcohol use is among the top three leading risk factors for death from cancer worldwide. It is estimated that 3.6% of all cancers are attributed to alcohol drinking. A causal link has been established between alcohol drinking and cancers of the oral cavity, pharynx, esophagus, colon, rectum, liver, larynx and breast."¹¹ It is essential to recognize the social and spatial environments created for consuming alcohol and how they affect people with AUD.

6 "The Chief Public Health Officer's Report on the State of Public Health in Canada, 2015: Alcohol Consumption in Canada," *Canada, Public Health Agency of, Transparency - other. aem*, January 18, 2016, <https://www.canada.ca/en/public-health/services/publications/chief-public-health-officer-reports-state-public-health-canada/2015-alcohol-consumption-canada.html>.

7 Ibid.

8 Ibid.

9 Ibid.

10 "An Occasion to Drink," *Alcohol.org*, Accessed November 25, 2020, <https://www.alcohol.org/guides/an-occasion-to-drink/>

11 "Alcohol (Canadian Drug Summary) | Canadian Centre on Substance Use and Addiction," Accessed October 26, 2020.

The bar; it's easily identifiable as a place to drink. However, rehab centre precedents that will be mentioned in chapter 2.2, are not easily identified as a place of recovery. Due to inconsistent architectural typologies, it makes it harder for the average person to identify them as recovery centres. The standard rehabilitation treatment process includes treatment initiation (Detox), early abstinence, maintaining abstinence, and advanced recovery.¹² AUD can happen to all demographics in life. There is a stigma about AUD and the patients become shunned by the global social culture. "Little progress has been made in removing the stigma around substance use disorders. People with addiction continue to be blamed for their disease. Even though medicine long ago reached a consensus that addiction is a complex brain disorder with behavioral components, the public and even many in healthcare and the justice system continue to view it as a result of moral weakness and flawed character."¹³ Can a new typology of architecture be designed to break the stigma of AUD and become socially acceptable as a disorder in the brain and not a choice?

How can architecture provide a place of recovery from people suffering from AUD?

12 "4 Stages of Alcohol and Drug Rehab Recovery," *Verywell Mind*, Accessed October 24, 2020.

13 "Addressing the Stigma That Surrounds Addiction," *National Institute on Drug Abuse*, April 22, 2020, <https://www.drugabuse.gov/about-nida/noras-blog/2020/04/addressing-stigma-surrounds-addiction>.

1.2 What is Alcohol Use Disorder?

The term for people who drink alcohol to excess is usually referred to as alcohol abuse or alcoholism, although psychiatrists and other medical professionals now formally use the term Alcohol Use Disorder.¹⁴ This is due to previous definitions not capturing the total spectrum of symptoms that are included in AUD.¹⁵ The term AUD comes from the “Diagnostic and Statistical Manual of Mental Disorders, or DSM.”¹⁶ The spectrum of excessive drinking spans from one extreme to the other. Rating levels of alcohol use disorder can be ranked from, 1) No-Risk, 2) Low Risk, 3) Mild, 4) Moderate, 5) Severe, 6) Death.¹⁷ The red colour shows the area of AUD before death, including mild, moderate and severe (Figure 2).

People who form addictions are often influenced by traumatic experiences, their environments, family history of mental health issues. “Low levels of alcohol use is associated with health benefits resulting in lower risks of illness and premature death, notably from ischemic heart disease, ischemic stroke and diabetes. However, higher levels of alcohol use are a significant risk factor for numerous chronic health conditions, such as heart disease, cirrhosis of the liver and several types of cancers.”¹⁸

Addiction is a disorder of chemical imbalances in the brain. To understand the six categories that affect addiction refer to the appendix.

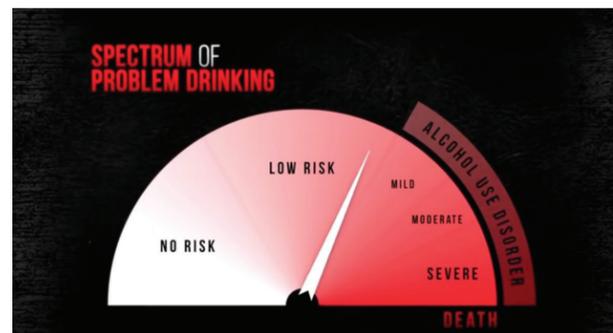


Figure 2. Spectrum of Problem Drinking.

¹⁴ “What We Get Wrong About “Alcoholism”,” *SciShow*, 2019, <https://www.youtube.com/watch?v=cZ1ZJa6A5TY>. 0:36

¹⁵ *Ibid.*, 0:49

¹⁶ *Ibid.*, 1:33

¹⁷ “HBO Documentary: Risky Drinking (2015),” *Rare TV Stuff*, Accessed July 13, 2021, https://www.youtube.com/watch?v=_1gQ-4iM6N4M, 40:50 min.

¹⁸ “Alcohol (Canadian Drug Summary) | Canadian Centre on Substance Use and Addiction.” *Ccsa.ca*, Accessed October 26, 2020, <https://www.ccsa.ca/alcohol-canadian-drug-summary>

When examining the neuroscience of addiction, there are debates as to whether it is a “Choice” or a “Disease”¹⁹ On the one hand, we are presented with a recurring choice, to drink or not to drink. Although it is not this simple, because of the chemical imbalances in the brain it is difficult to make the correct choices, ones that will benefit our bodies in the long term. AUD becomes a disease, if we analyze the word, dis-ease, this signifies that the body is not at ease. Addiction becomes a disorder of chemical imbalances in the brain which inhibit our rational thinking. These six categories of AUD are all disfunctional concurrently which leads to this repetitive and self-destructing behaviour.²⁰



Figure 3. Addiction Services Available, but May Be Restricted, during COVID-19.

¹⁹ “The Brain and Recovery: An Update on the Neuroscience of Addiction,” *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDAiFylhy&index=6, 17:35.

²⁰ “HBO Documentary: Risky Drinking (2015),” *Rare TV Stuff*, Accessed July 13, 2021, https://www.youtube.com/watch?v=_1gQ-4iM6N4M.

2 Responding to AUD in Northern Ontario, Canada

2.1 The City of Greater Sudbury

In 1883, the construction of the Canadian Pacific Railway commenced through the European settlement of Sainte-Anne-des-Pins by the french Jesuits.²¹ Throughout the railway construction, blasting and excavation uncovered high concentrations of nickel-copper ore. This discovery brought a wave of European settlers to the region to work at the mines and build a service station for the workers of the railway.²² This settlement was then named Sudbury (Figure 4). Mining became the dominant industry replacing lumber production in the 20th century. The mining workers lived in one community and worked in another. The two primary mining companies established at that time were Inco in 1902 and Falconbridge in 1928.²³

The majority of the city's population were employed by these two mines and they became two of the world's largest producers of nickel. From September 15, 1978, to May 30, 1979, approximately 11,600 workers were on strike for 8 ½ months. This was the longest strike in Canadian History. INCO workers strike in the Sudbury Basin. The strike involved the wages of families representing 43,000 individuals or 26% of the population. In Sudbury City, there was a decrease in alcohol consumption (-9.4%) because they couldn't afford it, whereas, in the remainder of Sudbury there was an increase in alcohol consumption (10.2%). Although beer proportions increased during the strike compared to other wines or spirits.²⁴

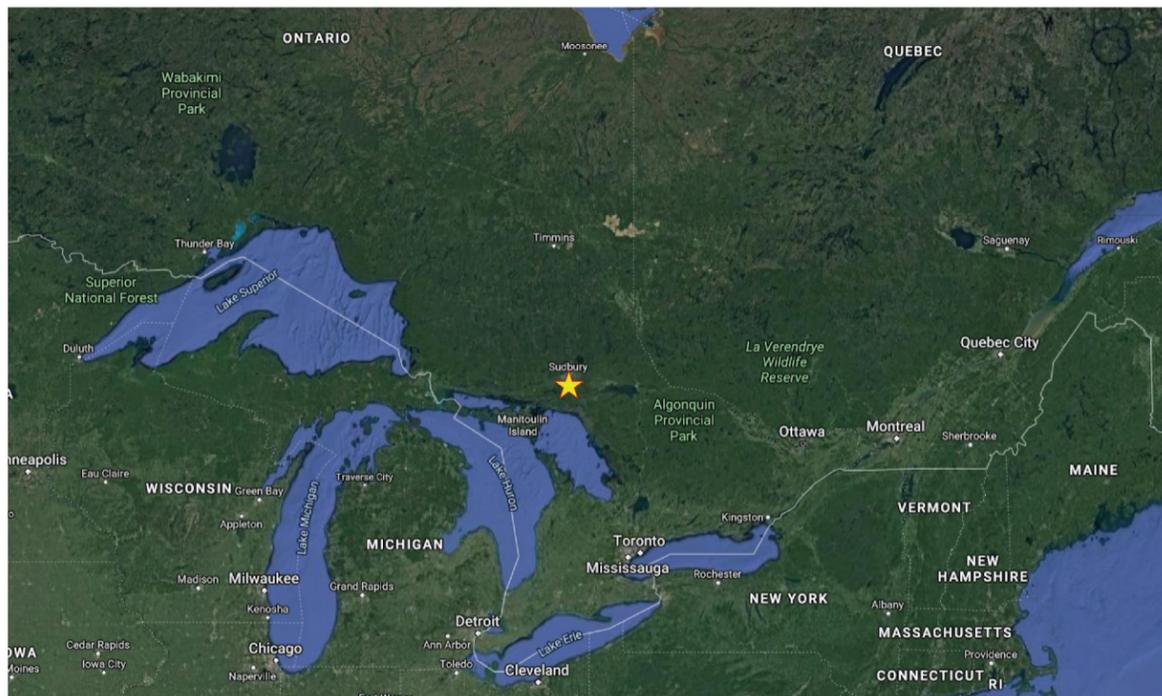


Figure 4. Google Map Sudbury.

21 "Sainte-Anne Des Pins Historical Plaque," *Web.archive.org*, Accessed July 14, 2021, https://web.archive.org/web/20160204132646/http://www.ontarioplaques.com/Plaques/Plaque_Sudbury03.html.

22 "History," *Invest Sudbury*, February 8, 2016, <https://web.archive.org/web/20160208160218/http://www.investsudbury.ca/index.php?lang=en&Itemid=222>.

23 C. M. Wallace, and Ashley (Eds.) Thomson, "Sudbury: Rail Town to Regional Capital (3rd Ed.)," Dundurn Press, 1993, https://en.wikipedia.org/wiki/Greater_Sudbury#cite_note-railtown-15.

24 Norman, Giesbrecht, Glen Markle, and Scott Macdonald, "The 1978-79 INCO Workers' Strike in the Sudbury Basin and Its Impact on Alcohol Consumption and Drinking Patterns," *Journal of Public Health Policy* 3, no. 1 (1982): 22–38, <https://doi.org/10.2307/3342064>.

2.2 Existing Rehabilitation Centres

There are 17 resources available throughout the downtown Sudbury area to address various addictions. Some of the key players in the health network are Health Science North and Monarch Recovery Services. This thesis is focusing on the Monarch Recovery services support system. They have five main buildings including Rockhaven Men's Recovery Home, Iris Addiction Recovery for Women, the Men's Treatment home, Men's day treatment and the Women's aftercare program.

Alcoholics Anonymous (AA) also has a presence downtown with regular meetings at the Salvation Army church. This map shows the distribution of centres around the downtown (Figure 5). These centres are located in close proximity to where addictions are taking place near the restaurants, bars and houses.

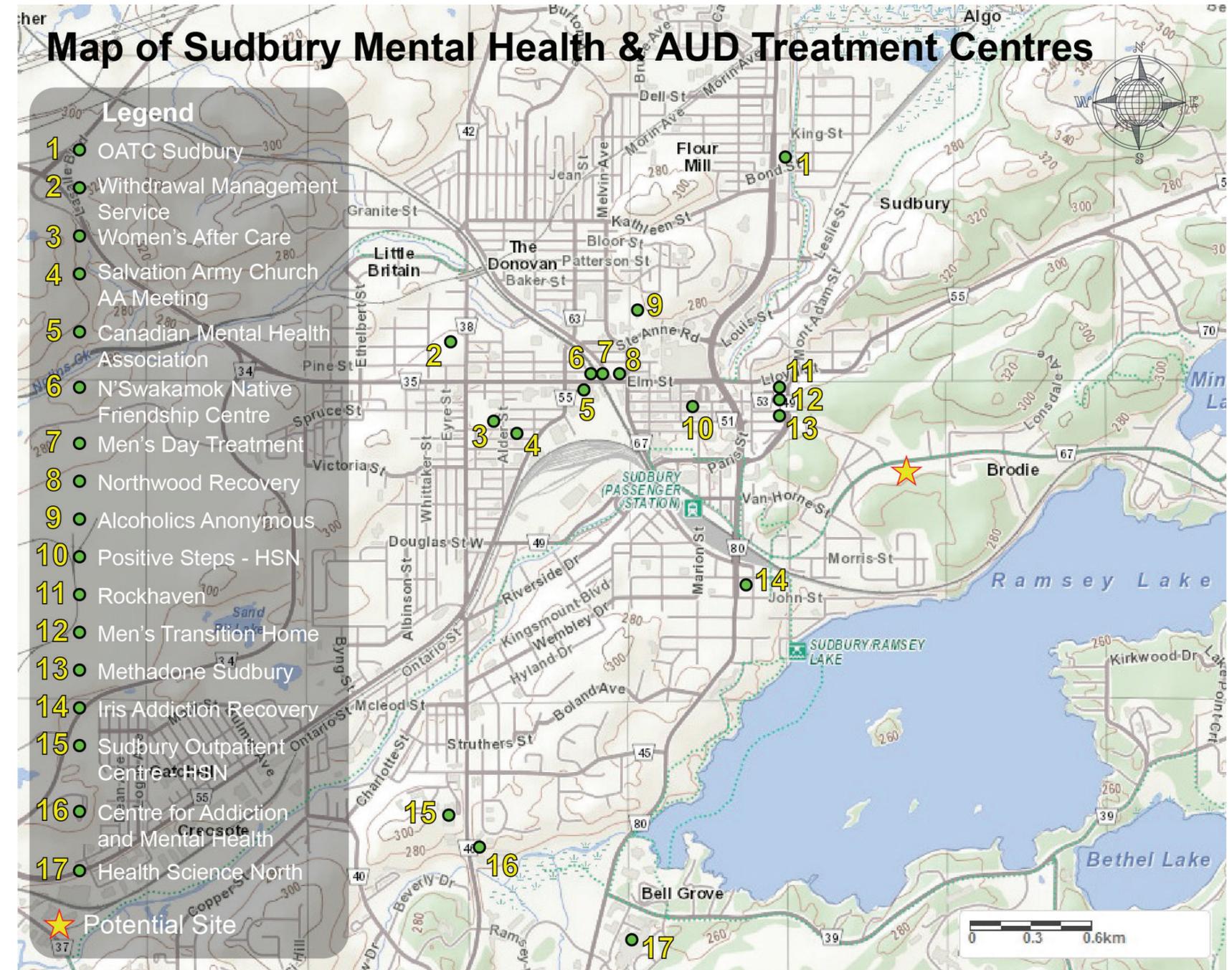


Figure 5. Map of Sudbury Mental Health & AUD Treatment Centres

Alcohol Rehab Centres in Sudbury

OATC - Sudbury

Address: 450 Notre Dame Ave, Sudbury, ON P3C 5K8

Hours:

Monday & Friday 8:00am-3:00pm

Tuesday to Thursday 8:00am-6:00pm

Saturday & Sunday 9:00am-12:00pm

Phone: (705) 673-1116

Province: Ontario

Organization: Ontario Addiction Treatment Centres

“Today, OATC services over fifty communities throughout Ontario, treating over ten thousand patients daily. Our staff is highly dedicated to ensuring optimal care and great effort is made toward encouraging long term sobriety from all illicit substances. While the goal may be **abstinence for some**, OATC focuses on a **model of harm reduction**. This is not a new concept. Quite simply, it promotes the notion that left untreated, drug addiction causes many harmful outcomes included victimization, overdose, incarceration, relationship and financial struggles and even death. Harm reduction principles seek to engage individuals in therapy using a **non-judgmental approach** in an attempt to motivate individuals to a healthier life style.”²⁵

“In addition to treating opioid addiction (painkillers such as codeine, morphine, oxycodone, heroin, fentanyl, etc), we have taken steps to also address use of other addictive substances by our patients (nicotine, cocaine, **alcohol**, marijuana) as well as offering therapy to some of the unfortunate medical consequences of addiction, such as Hepatitis C and HIV care.”²⁶



Figure 6. OATC - Sudbury.

25. "About OATC Clinic | Opioid Addiction | Methadone Clinic," OATC | Ontario Addiction Treatment Centres, Accessed January 1, 2021, <https://www.oatc.ca/about-oatc-clinics/>.

26. Ibid.

Withdrawal Management Service

Address: 336 Pine St Sudbury, ON P3C 1X8

Hours:

Open 24/7

Phone: (705) 671-7366

Province: Ontario

Organization: [Health Sciences North](#)

“WMS offers detoxification beds for males and females 16 years of age and older, who are under the influence of, or in withdrawal from alcohol or drugs. The centre is open 24/7 to provide an environment free from substance use. It is a level 2 withdrawal management service where individuals receive supportive care to help them through their withdrawal symptoms and the withdrawal process. Individuals must be conscious and medically stable to enter the facility. Tapering protocols to manage withdrawal symptoms may be initiated in co-operation with the individual’s own physician.

During the detoxification period, information is provided to individuals about outpatient and residential drug and alcohol assessment and treatment processes, and referrals for treatment can be facilitated. Support group meetings are made available to individuals on-site. Early recovery issues are also discussed in an educational group.”²⁷

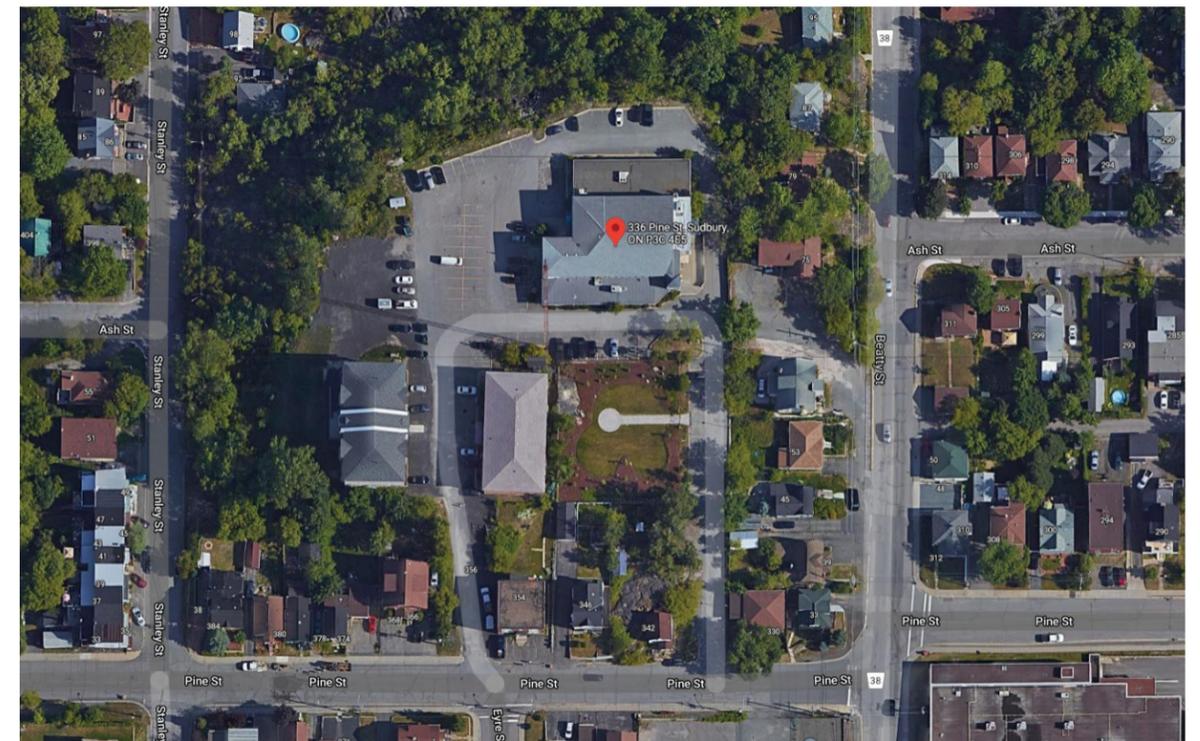


Figure 7. Withdrawal Management Service.

27. <https://www.hsnsudbury.ca/portalen/Programs-and-Services/Mental-Health-and-Addictions/Addictions-Care>.

Women's After Care

Address: 260 Oak St. Sudbury, Ontario P3C 1M9

Hours: Mon-Fri 10:00am-3:00pm

Phone: (705) 674-4193 X2245

Province: Ontario

Organization: **Monarch Recovery Services**

“Monarch Recovery Services offers a comprehensive 5 week residential treatment program to women (*) 16 years and older who want to abstain from alcohol and drugs and learn effective coping strategies to be successful in their recovery. The treatment program is based on the 12 Step philosophy of AA and NA as well as a holistic approach to addressing substance abuse and core issues that are linked to an unhealthy lifestyle. Clients of the treatment program work one on one with an assigned Primary Counsellor, attend group sessions, are provided with information and education relating to substance abuse and life issues, and participate in healthy activities such as light exercise and social activities. They are provided with safe and comfortable accommodations during their stay, nutritious meals, attend self-help meetings and may attend a religious service if they choose to.”²⁸



Figure 8. Women's After Care.

28. <http://monarchrecovery.com/i-want-help/making-changes/119-2>.

Salvation Army Church AA Meeting

Address: 107 Lorne St, Sudbury, ON P3C 4P3

Hours: Mon-Fri 10am-5pm

Phone: (705) 674-6217

Province: Ontario

Organization: Salvation Army

“The Salvation Army offers support to people who suffer from substance use disorders (SUDs) and who are unable to cope with their problems and provide for themselves. Our centres seek to provide an environment that allows those suffering from substance abuse disorders both the space and time to regain their health.”²⁹



Figure 9. Salvation Army Church AA Meeting.

29. <https://salvationarmy.ca/what-we-do/in-your-community/social-services/addiction-services/>.

CMHA - Canadian Mental Health Association

Address: 111 Elm St #100, Greater Sudbury, ON P3C 1T3

Hours:

Mon-Tues 8:30am-4:30pm

Wed 8:30am-6:00pm

Thur-Fri 8:30am-4:30pm

Phone: (705) 675-7252

Province: Ontario

Organization: Canadian Mental Health Association
Sudbury/Manitoulin, Mental Health & Addiction Services

“The Canadian Mental Health Association – Sudbury/Manitoulin (CMHA-S/M) was established in 1984 and is a not-for-profit organization with a volunteer board of directors.

The branch is mandated to provide services to individuals with mental health issues or a diagnosis of a mental illness (though it is not required) within the Sudbury and Manitoulin districts. Our purpose is to support healthy people and communities through advocacy and the provision of safe, inclusive and accessible mental health and addictions services.

CMHA is primarily funded by the Ministry of Health and Long Term Care and also receives funds from the Ministry of Child & Youth Services and the City of Sudbury.”³⁰



Figure 10. CMHA - Canadian Mental Health Association.

30. <https://sm.cmha.ca/about-cmha/>.

N'Swakamok Native Friendship Centre

Address: 110 Elm St, Sudbury, ON P3C 1T6

Hours:

Mon-Fri 9:00am-4:00pm

Phone: (705) 674-2128

Province: Ontario

Organization: N'Swakamok Native Friendship Centre

“The Friendship Centre was first established in 1967 through the efforts of the Nickel Belt Indian Club. By that time, the Directors and some of the Members of the Club were already involved in voluntary work such as courtwork and referral work. To this day, the Friendship Centre has had four previous locations. It was first located on Ignatius Street , which was a one room establishment. It then moved to Douglas Street , which provided more office space. It was also located on Larch Street . Due to the growing needs of the Aboriginal community, the Friendship Centre moved to our present location on Elm Street.

The N'Swakamok Native Friendship Centre is a wholistic, healthy indigenous community centre which promotes culture, language and well-being in a balanced way.

To provide a medium for the meeting of Native and non-Native people and the development of mutual understanding through common activities.”³¹



Figure 11. N'Swakamok Native Friendship Centre.

31. <http://www.nfcsudbury.org/about/>.

Men's Day Treatment

Address: 17 Froad Rd. Sudbury, Ontario, P3C 4Y9

Hours: Mon-Fri 10:00am-3:00pm

Phone: (705) 674-4193

Province: Ontario

Organization: **Monarch Recovery Services**

“MONARCH Men's Day Treatment offers a 5-week intensive day treatment program to men, 16 years and older, who want to address their substance abuse issues and learn effective coping strategies to be successful in their recovery. Clients work with an assigned Primary Counsellor, attend group sessions, and are provided with information and education relating to substance abuse and life issues.

Includes Cognitive-Behavioural Therapy, Motivational Enhancement, Refusal Skills and Relapse Prevention.

Eligibility Criteria:

1. Male 16 years old and older.
2. Must complete or have completed an assessment process in the last 6 months.”³²



Figure 12. Men's Day Treatment.

32. <http://monarchrecoveryservices.ca/i-want-help/making-changes/mens-day-treatment>.

Northwood Recovery

Address: BACK of 80 Elm Street, Sudbury, ON P3C 1T2

Hours:

Mon - 8am to 6pm

Tues - 8am to 5pm

Wed - 8am to 5pm

Thurs - 8am to 5pm

Fri - 8am to 5pm

Sat and Sun - Closed

Phone: (705) 806-3737

Province: Ontario

Organization: Northwood Recovery Clinic

“We offer access to individual and group counselling for youth, adults and family members. Options could be discussed with your treatment and recovery team. We provide information and support to link you up First Nations support and other specialize options that can assist in your treatment and recovery. We also offer support services to make sure you have follow-up treatment options in your community, where available. We can create tailored treatment plans that offer cultural support.”³³



Figure 13. Northwood Recovery.

33. <https://www.northwoodrecovery.ca/services.php>.

Alcoholics Anonymous - Northeastern Ontario Area 84

Address: 30 Ste Anne Rd, Sudbury, ON P3C 5E1

Hours: Mon-Fri 10am-5pm

Phone: (705) 674-6217

Province: Ontario

Organization: North East Health line

“Provides a community outreach service that allows men and women to share experiences and to assist each other in recovering from alcoholism * services include self help meetings (time and locations), information, pamphlets, displays, public speakers and presentations”³⁴

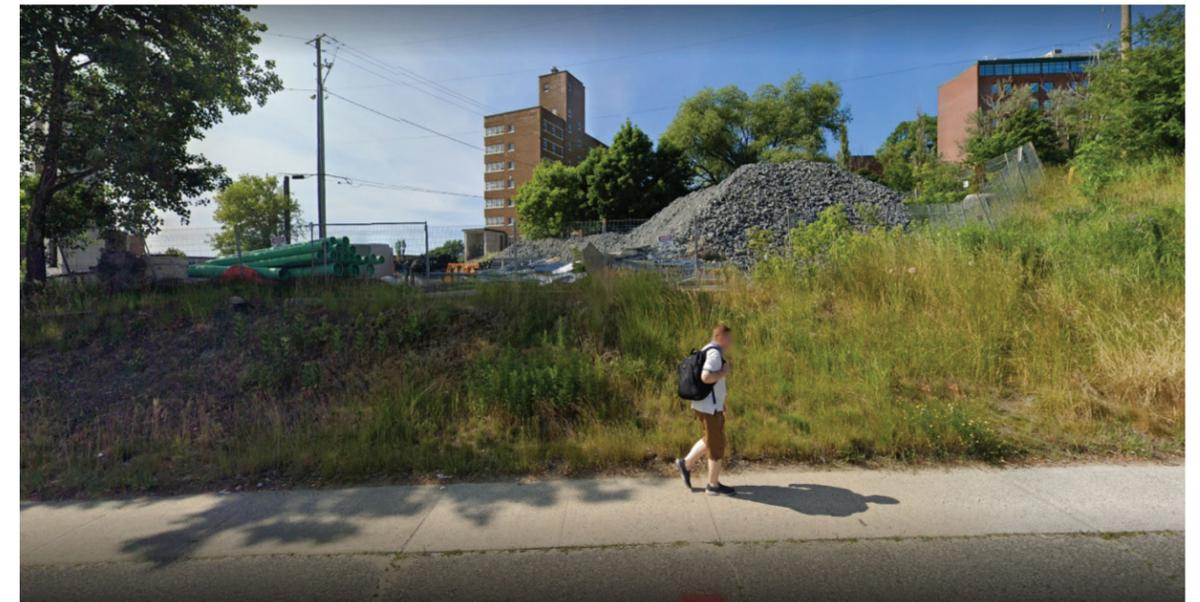


Figure 14. Alcoholics Anonymous - Northeastern Ontario Area 84.

34. <https://www.northeasthealthline.ca/display/service.aspx?id=90020>.

Positive Steps

Address: G.L. Tower Building 127 Cedar St Sudbury, ON P3E 1B1

Hours: Mon-Fri 8:30am-4:30pm

Phone: (705) 523-4988 ext 4221

Toll-Free: 1-866-244-4344

Province: Ontario

Organization: [Health Sciences North](#) / Horizon Sante-Nord - Sudbury Mental Health and Addictions Program

“The program serves individuals who are 16 years of age and older, who have been diagnosed with a severe mental illness such as schizophrenia, schizoaffective disorder or other psychotic disorders; and individuals who have multiple and complex needs. The program consists of: case management, Community Treatment Order Planning (CTO), administration of long acting medication, and rehabilitation and recovery programs. Model of service is psychosocial rehabilitation.”³⁵

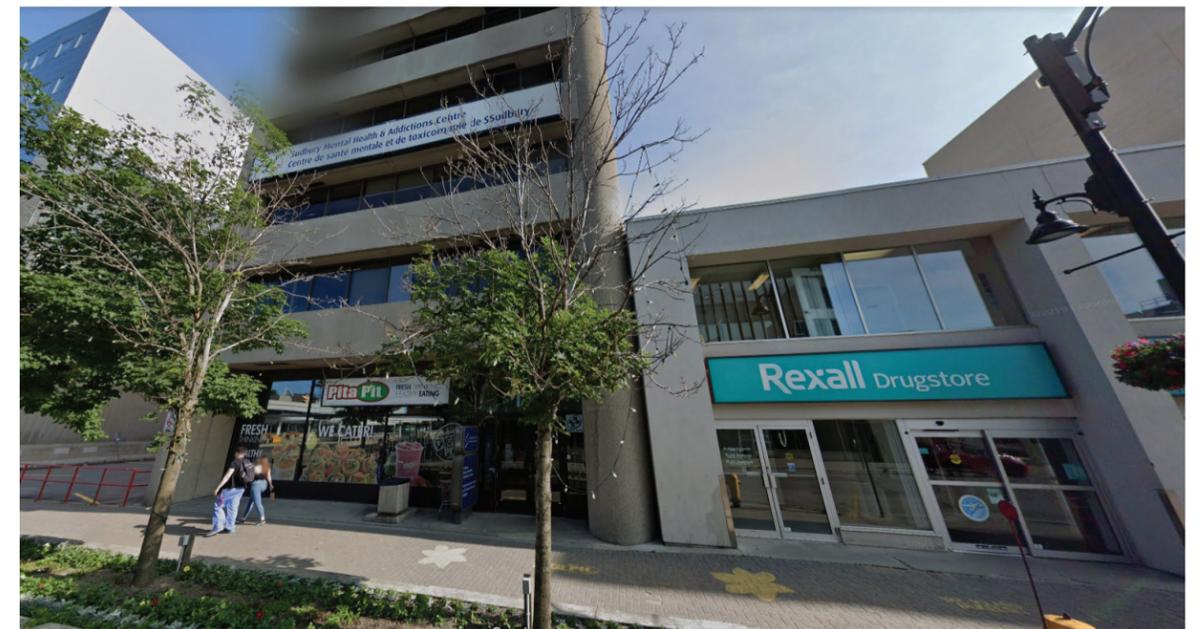


Figure 15. Positive Steps.

35. <https://www.northeasthealthline.ca/display/service.aspx?id=165322>.

Rockhaven - Men's Recovery Home

Address: 402 Brady St, Sudbury, ON P3B 2P6

Hours:

“Frontline counseling staff work 16 hours a day for 5 days a week. Supervision is available on weekends.”

Phone: (705) 675-1179

Phone: (705) 674-4193 X3225

Province: Ontario

Organization: **Monarch Recovery Services**

“Since 1968, Rockhaven has provided **men** with a safe, optimistic environment to facilitate recovery from substance abuse. The Rockhaven environment is one in which clients, surrounded by others in similar situations, can feel safe while learning or re-learning skills for a satisfying, **substance free lifestyle**. It is the only all male recovery in the Manitoulin-Sudbury district.”³⁶

“A man with an income will pay room and board, while those with no income do not pay. The **maximum length of stay is six months**. The men at Rockhaven are given the opportunity to share their thoughts, feelings and problems in peer oriented group sessions, where they can practice their new recovery skills supported by others who share a similar commitment to recovery.”³⁷ “The framework of the program at Rockhaven is the **12-step philosophy** (focusing on the first three steps.)”³⁸

“Every resident must be committed to maintaining his sobriety, through work, education, volunteering, re-training and recreational activities.”³⁹



Figure 16. Rockhaven - Men's Recovery Home.

36. https://www.greatersudbury.ca/sudburyen/assets/content/div_councilagendas/documents/Rockhaven_Sept_22_2008.pdf.

37. Ibid.

38. Ibid.

39. Ibid.

Men's Transition Home

Address: 396 Brady St. Sudbury, Ontario P3B 2P6

Hours:

"Unknown"

Phone: (705) 674-4193 X3246

Province: Ontario

Organization: **Monarch Recovery Services**

"The Monarch Men's Residential Recovery Program level 1 is an 18 bed all male facility located in the downtown of Sudbury, Ontario. We operate a Three Phase Program that encourages clients to progress within the program in an abstinent environment. Following intake, the client and staff work together to design a program of recovery specific to his needs. Every man must be committed to his own way of maintaining his sobriety, through work, education, and volunteering, re-training and recreational activities.

At Monarch, our clients are supported while adjusting to their new lifestyle. All clients participate in household maintenance, chores and group activities. Counselling staff are available 5 days a week and the house is supervised 7 days a week. There are at least 2 group sessions in-house per weekday, including two recreational activities weekly. The men can attempt new skills of recovery supported by people who share a similar commitment to sobriety." ⁴⁰



Figure 17. Men's Transition Home.

40. <http://monarchrecoveryservices.ca/i-want-help/making-changes/mens-recovery-home>.

Iris Addiction Recovery For Women - Administration/Women's Treatment

Address: 405 Ramsey Rd. Sudbury, Ontario P3E 2Z5

Hours: Mon-Fri 8:00am-4:00pm

Phone: (705) 674-4193

Toll-Free: 1-877-431-6713

Province: Ontario

Organization: **Monarch Recovery Services**

"We are an Addiction Centre of Excellence in the Sudbury Manitoulin area. We serve men and women ages 16 and over, who are struggling with drug and/or alcohol addictions." ⁴¹

"Monarch Recovery Services has addiction recovery services for many steps of your recovery. The Men's Recovery Program gives you support, empowerment and assistance in learning the 12 steps, finding a sponsor, setting up your home group, learning life skills and daily living while staying in a safe and therapeutic home. The Women and Men's Treatment Programs will allow you to explore your recovery further, educate yourself and empower you to live a life of sobriety. The Women and Men's Aftercare Programs allow you the opportunity to use your new found knowledge of recovery based living and practice living life on life's terms. All of these phases allow you to slowly build your wings – preparing you to take flight in your new life in recovery." ⁴²



Figure 18. Iris Addiction Recovery For Women - Administration/Women's Treatment.

41. <https://monarchrecovery.com/who-we-are>.

42. Ibid.

Sudbury Outpatient Centre - Health Sciences North

Address: 865 Regent St, Sudbury, ON P3E 3Y9

Hours: N/A

Phone: (705) 523-7100

Province: Ontario

Organization: [Health Science North](#)

“Health Sciences North (HSN) is a new approach to delivering the highest quality patient care, research, teaching and learning to our region and beyond. It is a network of integrated facilities and programs working together for the benefit of our patients, communities, physicians, researchers, staff and learners in the areas of prevention, diagnosis, treatment and care.

HSN offers a variety of programs and services that meet many patient care needs, with leading regional programs in the areas of cardiac care, oncology, nephrology, trauma and rehabilitation.”⁴³



Figure 19. Sudbury Outpatient Centre - Health Sciences North.

43. <https://www.hsnsudbury.ca/portalen/>.

CAMH - Centre for Addiction and Mental Health

Address: 888 Regent St, Sudbury, ON P3E 6C6

Hours:

Mon-Fri 9:00am-4:00pm

Phone: (705) 675-1195

Province: Ontario

Organization: Centre for Addiction and Mental Health

“The Centre for Addiction and Mental Health (CAMH) is Canada’s largest mental health teaching hospital and one of the world’s leading research centres in its field. CAMH is fully affiliated with the University of Toronto and is a Pan American Health Organization/ World Health Organization Collaborating Centre.

With a dedicated staff of more than 3,000 physicians, clinicians, researchers, educators and support staff, CAMH offers outstanding clinical care to more than 34,000 patients each year. The organization conducts groundbreaking research, provides expert training to health care professionals and scientists, develops innovative health promotion and prevention strategies, and advocates on public policy issues at all levels of government. And through our Foundation, we’re working to raise tens of millions of additional dollars to fund new programs and research and augment services.”⁴⁴



Figure 20. CAMH - Centre for Addiction and Mental Health.

44. <http://www.camh.ca/en/driving-change/about-camh>.

Health Science North

Address: 41 Ramsey Lake Rd, Sudbury, ON P3E 5J1

Hours: 24/7

Phone: (705) 523-7100

Province: Ontario

Organization: Hospital in Sudbury [Health Science North](#)

“Health Sciences North (HSN) is a new approach to delivering the highest quality patient care, research, teaching and learning to our region and beyond. It is a network of integrated facilities and programs working together for the benefit of our patients, communities, physicians, researchers, staff and learners in the areas of prevention, diagnosis, treatment and care.

HSN offers a variety of programs and services that meet many patient care needs, with leading regional programs in the areas of cardiac care, oncology, nephrology, trauma and rehabilitation.”⁴⁵



Figure 21. Health Science North.

45. <https://www.hsnsudbury.ca/portalen/>.

NISA/Northern Initiative for Social Action

Address: 36 Elgin St Second floor, Sudbury, ON P3C 5B4

Hours: Mon-Fri 8:30am-4:00pm

Phone: (705) 222-6472

Province: Ontario

Organization: Northern Initiative for Social Action

Mental Health service in Sudbury, Ontario

“NISA/Northern Initiative for Social Action is an organization run by and for consumers of mental health services. We develop occupational skills, nurture self-confidence and provide resources for recovery by creating opportunities for participants to contribute to their own well-being and that of their community.”⁴⁶

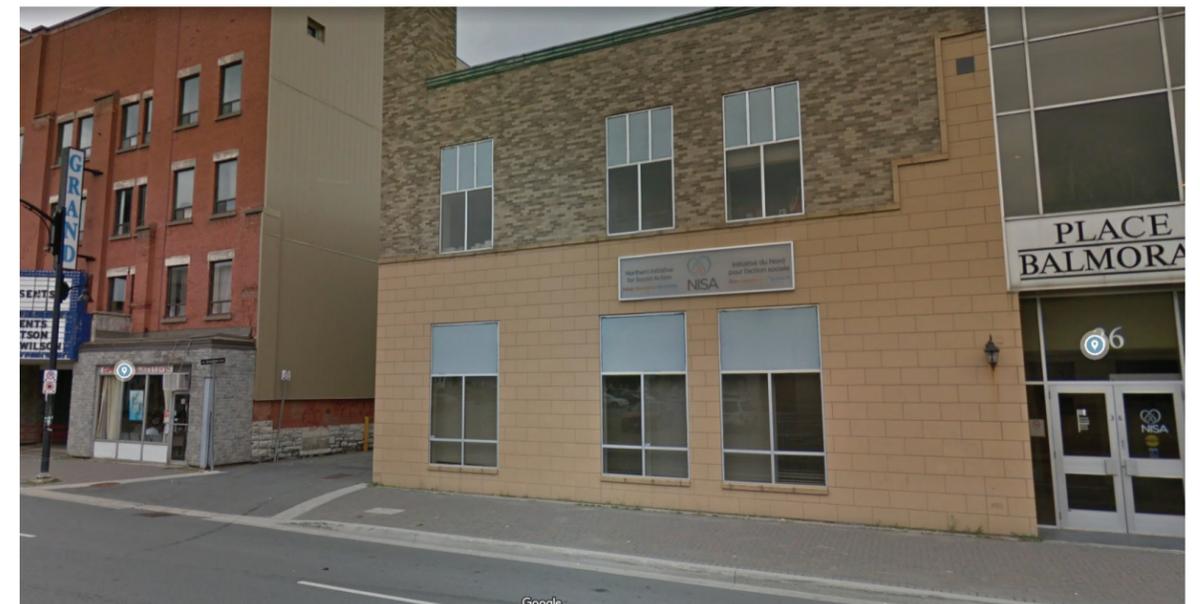


Figure 22. NISA/Northern Initiative for Social Action.

46. <http://nisa.on.ca/contact/>.

If we look at Rehab centres' existing designs, we notice that buildings' typologies tend to look somewhat like other building typologies. This image (Figure 23) is British Columbia's largest drug rehabilitation centre proposed for East Vancouver. If we analyze the facade, this building looks as if it could be a courthouse. The bottom portion of the building resembles a jail, with small slit windows, minimal light and hard surfaces. The top portion resembles a residential apartment style. With rough surfaces, nothing is comforting about the architecture. It does not look like a place for people who need to recover from AUD.



Figure 23. BC's Largest Drug Addiction Rehabilitation Centre Proposed for East Vancouver.

Looking at another example, we can analyze this withdrawal management addiction and treatment clinic in London, Ontario (Figure 24). This structure resembles the building typology of a strip mall. There is nothing specific that makes it a place of recovery. The architecture has hard surfaces, displayed through its material palette. The covered porch entrance has deep overhangs, which cast many shadows. There are windows but notice that the blinds are closed. The visual connection to the exterior is disengaged from the users. This disengagement is due to a privacy issue with the parking lot being right next to it.



Figure 24. Withdrawal Management Addiction and Treatment Clinic in London, Ontario.

Looking at one last example, we can see an Alcohol rehab centre in Toronto, Ontario (Figure 25). The architecture resembles the building typology of a restaurant because of material choices and location. There are also residential building typological elements incorporated into this building on the upper levels. Is this building trying to hide the idea of going to rehab by portraying the architecture as another building typology?

In general, the rehab typology's interior spaces have a material palette that creates a neutral feeling. Notice that nature is not incorporated, and this interior space could be located anywhere. The interiors are lit by fluorescent lighting, which can be irritating to our senses and cause discomfort. Therefore, it's important to incorporate, as much as possible, natural and thoughtfully controlled lighting for the patients to avoid discomfort.



Figure 25. Alcohol Addiction & Rehab Treatments Toronto.

There are also Canadian luxury centres for addictions, (Figure 26). If we analyze the facade, we can see a decorative entrance and columns. There are also many hard edges created by the use of a residential brick, making this resemble a residential mansion. This centre is located by the lakeside in Toronto, away from locations where excessive alcohol consumption occurs. The location of the building is situated so far away from the downtown that it is difficult for patients without vehicles to visit this centre. One needs to pay \$18,000 per month for a stay of between 30 and 90 days to use this centre. There are many luxurious amenities to assist in the recovery process, but one needs to have a considerable amount of money to utilize its resources. Yet, the stigma around going to rehab centres is equal for all the social classes.

This thesis will focus to improve upon rehab centre buildings and create a new building typology. The new building typology will include principles such as; (responsible aesthetic) using the appropriate exterior and interior materials, creating a sense of privacy, incorporating nature into the design, locating the building near a forest with walking trails, maximize natural daylight, controlled lighting, water element features, intervals seating areas, barrier-free, maximize circulation space, social inclusivity and affordable for all social classes, to successfully recover from AUD.



Figure 26. Canadian Centre for Addictions.

2.3 Monarch Recovery Service

Here is a brief history of the Monarch Recovery Services (MRS) in Sudbury. The first initiative started with the Mennonite mission and services opening Rockhaven for men in 1968. The women's recovery Home opened on Riverside Drive in 1976. The women's recovery home changed its name and became the Lakeside Centre Treatment Program in 1979. The women's program amalgamated and chose a new name of Northern Regional Recovery Continuum (NRRC) in 1996. Yet again the NRRC changed its name to Iris Addiction Recovery for Women in 2005. In 2014, the Iris addiction Recovery for women and Rockhaven for Men joined forces to form Monarch Recovery Services (**Figure 27**). The legend with the yellow numbers shows the location of the Monarch facilities (**Figure 29**). Their future plans are to amalgamate these buildings and construct a new facility under one roof. ⁴⁷



Figure 27. Monarch Recovery Service.

47 Roxane, Zuck, "Questions about Recovery Thesis Student," *Mail.google.com*, January 29, 2021, <https://mail.google.com/mail/u/1/#label/Masters+of+Architecture%2FThesis+with+Thomas/QgrcJHrtvXfhMQZbZFBgZfTRkBbNvpSrPxy>.

After conversations with Roxane Zuck, the CEO of Monarch Recovery Services (**Figure 28**) about the recovery process, she informed key design principles for this thesis. ⁴⁸ I began to draw concepts about the importance of natural daylight, surrounding greenery, warm colours, well-tempered environments, water elements (such as ponds or fountains), openings, thresholds between patients and staff areas, separate entrances for both patients and staff, courtyards and places that invoke conversations.



Figure 28. CEO Roxane Zuck.

48 Ibid.

If all these concepts are all incorporated into the design, patients and staff can successfully interact, experience moments of calmness and have constructive conversations. Roxane also emphasized how crucial it is for the patient to experience serenity, calmness and safety.⁴⁹

This thesis will design the proposed amalgamated Monarch recovery services facility. This new facility will serve as an important AUD recovery hub in hopes to decrease the stigma of AUD. The building will be a community vehicle for change by invoking a conversation about AUD, and educate people that it is not a choice (AUD is a disease), to recover the people who suffer from AUD and integrate them back into the community in a healthy way. Elevating the local community's quality of life by offering downtown Sudbury more serenity, calmness and safety.

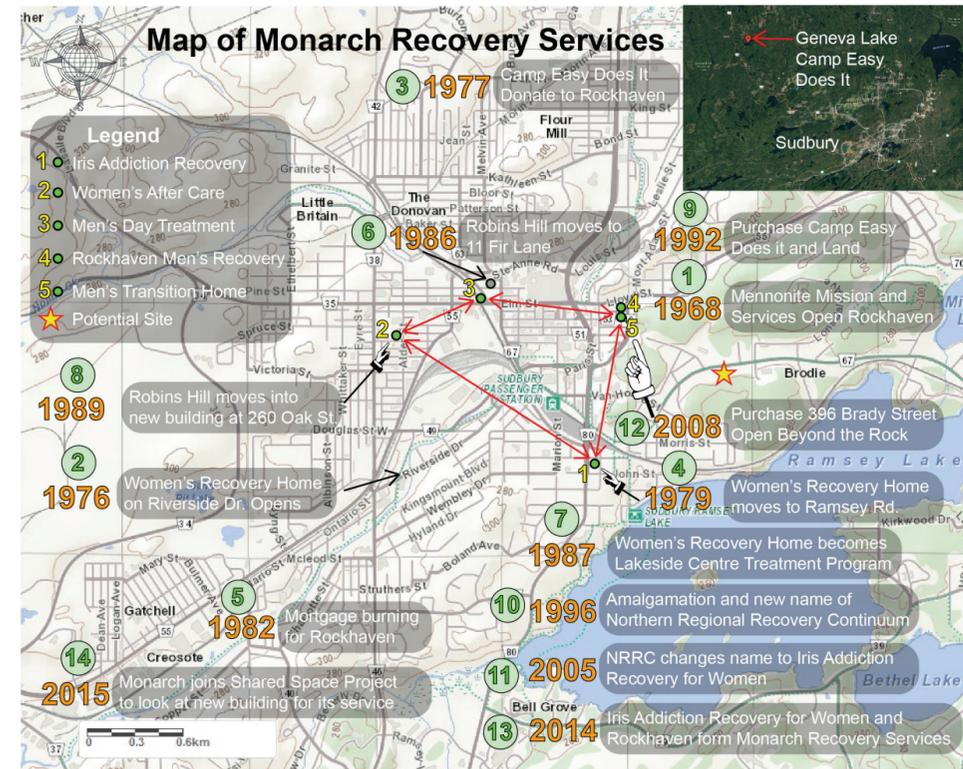


Figure 29. Map of Monarch Recovery Services.

49 Ibid.

3 Site and Design Analysis

3.1 Place

The site is located in the City of Greater Sudbury, Ontario, Canada. Finding the ideal location required specific necessities. Such as close proximity to nature, close to the resources of downtown (e.g.; the pharmacy, clinic, YMCA, yoga centers), space for parking and a sense of privacy.

Due to the stigma surrounding AUD, going to rehab is a big step for someone to take, it requires support and the right resources. As a result, the proposed site is intended to be located near the downtown but not in the downtown where all the bars and drinking areas are situated. The radius illustrated in Figure 31, identifies how patients will be well within the walking limits of the resources they need to support recovery.

Through the search for the ideal site location, this site off of Howey drive was selected as it meets specific requirements of the facility. The planning department at the City of Greater Sudbury stated that the land was owned by Dalron Construction and the former owners being the Christakos family. The future development of this site is proposed to be zoned residential. The city plans to clearcut the majority of the forest to accommodate the housing units in addition to building a water treatment plant.⁵⁰

⁵⁰ Glen, Ferguson, "Preliminary Materials - Howey/Wessex Lands," *Mail.google.com*, February 4, 2021, <https://mail.google.com/mail/u/1/#label/Masters+of+Architecture%2FThesis+with+Thomas/FMfcgxlSkFNqdzwpQLCtJ-vDIHmNHxH>.

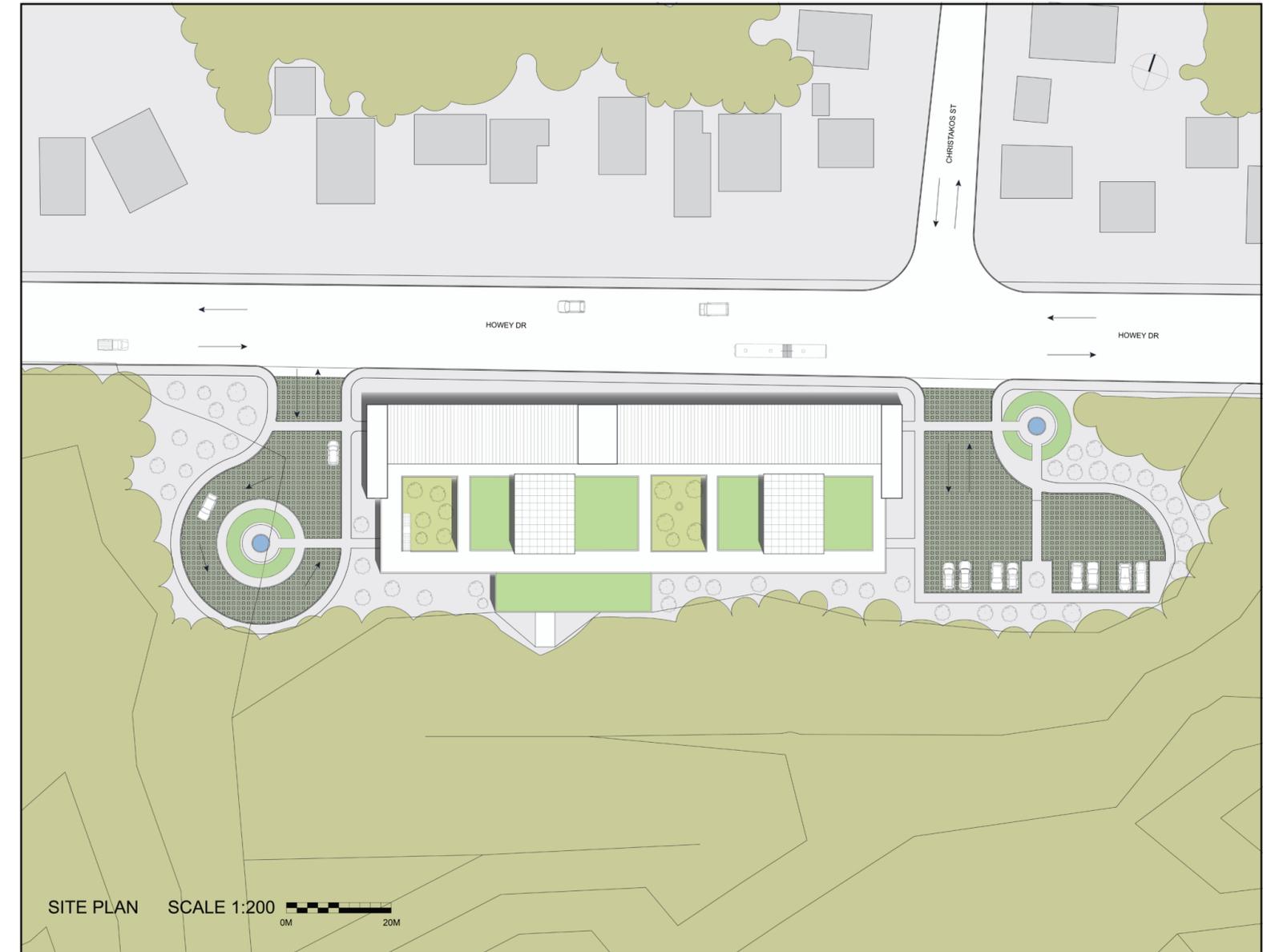


Figure 30. Site Plan 1:200

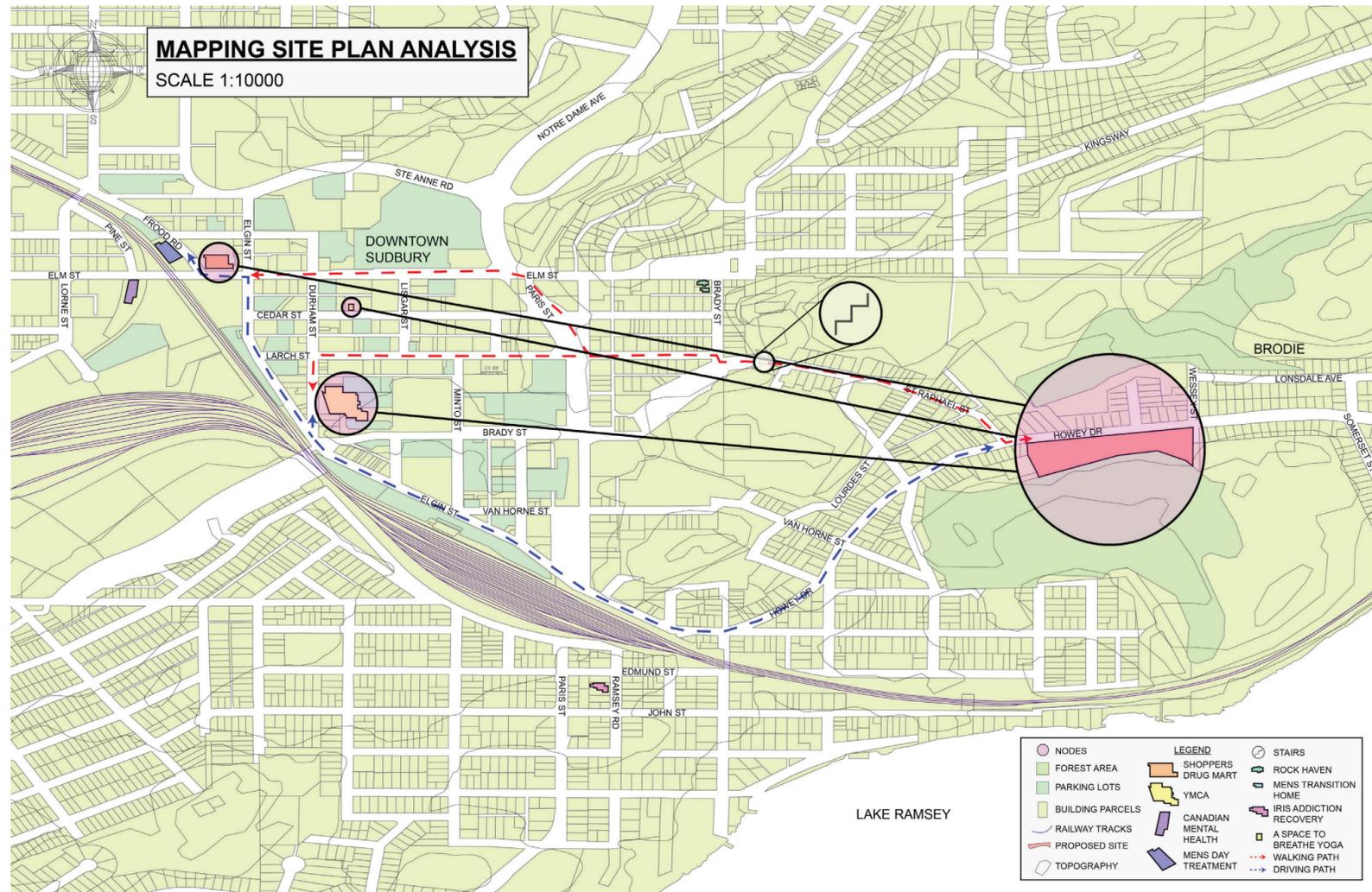


Figure 31. Arcgis.com Base Map, Mapping Site Plan Analysis.

The proposed thesis project will keep the forest intact thereby supporting biodiversity of this existing forested area. The building is to be located in an existing clearing at the edge of the forest and parallel to Howey Drive, ensuring a connection to people travelling downtown (West) and to New Sudbury (East). The building thus becomes a node between two main city neighbourhoods. The road way offers public transportation to the site through the bus route system, with two stops in the vicinity of the site. On average a person walks 75 meters per minute. As a result, the people walking to or from downtown from this site takes an average of 20 minutes.

3.2 Site Analysis

The proposed site is nestled within the neighbourhood of Brodie, which is a residential area on the outskirts of the downtown. It is well within walking distance of downtown Sudbury, which has amenities such as the YMCA, Yoga centres, and pharmacies. The proposed lot size is estimated to be 50m by 195m, which will be primarily situated in a clearing in front of the forest of birch trees and young pine, (Figure 32). The site slopes upward from North to South, the top edge is defined by a stone outcropping and the edge of the forest. The forest area itself rises up to a height of 8.9 metres and then gradually slopes downwards towards lake Ramsey to the South. A marked trail runs East to West through the first half of the forest, eventually returning to the proposed building site. The new facility will be a good launching point to expand on the existing trail systems with new routes eventually being added through the southern portion of the forest. Having walking trails will be beneficial to the patients recovering from AUD as they are required by the MRS to take daily walks.



Figure 32. Site Visit Photo.

The proposed site is exposed to the sunlight, having this exposure in the clearing makes it ideal for the patients (Figure 33). The architecture of the building can take advantage of this Southern sun exposure and utilize it to create places of serenity, calmness and safety. The architecture responds to the solar angles that are observed throughout the four seasons. The implementation of skylights over the courtyards are angled to receive maximum sunlight. Solar shades are incorporated to impede the exposure of steep angled harsh summer rays of light but allow for the low angled winter light to penetrate the interior spaces.

While the demographics of the city are diverse in ethnicity and spiritual practices, AA meetings most often take place in the Salvation Army Church. The existing health network will benefit from the implementation of the new MRS health facility that has no particular religious or ethnic affiliation within the community of Greater Sudbury.



Figure 33. Site Visit Photo.



Figure 34 . Site Visit Photo.

3.3 Design Precedents

Caravanserai Style Courtyards

A caravanserai was a roadside inn where travelers, caravaners could rest and recover from the day's journey (Figure 35). The lessons learnt from this precedent informed the design based on how the courtyard offers protection from the exterior world, created microclimates within the courtyard space and the architectural program wraps around the void of the courtyard.⁵¹



Figure 35. The Caravanserai, National Geographic Society.

51 "Caravanserai," *National Geographic Society*, July 23, 2019, <http://www.nationalgeographic.org/encyclopedia/caravanserai/>.

Sainte Marie de La Tourette by Le Corbusier

La Tourette is a monastery building constructed in Lyon, France designed by Le Corbusier (Figure 36). This building is intended to be a spiritual awakening for its inhabitants. The monastery consists of four perimeter walls that create an interior courtyard space. The lessons learnt from this precedent included the concepts of visual openings from the interior courtyard to the exterior through openings and elevation changes. These openings create visual connections between the exterior and interior spaces. The concept of permeable walls, solid masses of walls that have openings and rows of columns that invite the occupants into the space.⁵²



Figure 36. Sainte Marie de La Tourette by Le Corbusier.

52 "The Architectural Work of Le Corbusier, an Outstanding Contribution to the Modern Movement," *UNESCO World Heritage Centre*, Accessed July 14, 2021, <https://whc.unesco.org/en/list/1321/>.

Amsterdam Orphanage by Aldo Van Eyck

The building Amsterdam Orphanage is a design of a home and small city by Dutch Architect Aldo van Eyck (Figure 37). This design was commissioned as an orphanage for children. The lessons learnt from this precedent include the concept of many points of interaction and how a variety of programs intersect into one another. Understanding the conditions that inform the hierarchy of spaces. This building uses a series of modules that can be replicated and pushed and pulled to create masses and voids. The facades consist of glass walls and solid walls. This design also hinted at the use of the programs laid out on a grid and how the programs wrap around the courtyards creating a balance between voids and masses.⁵³

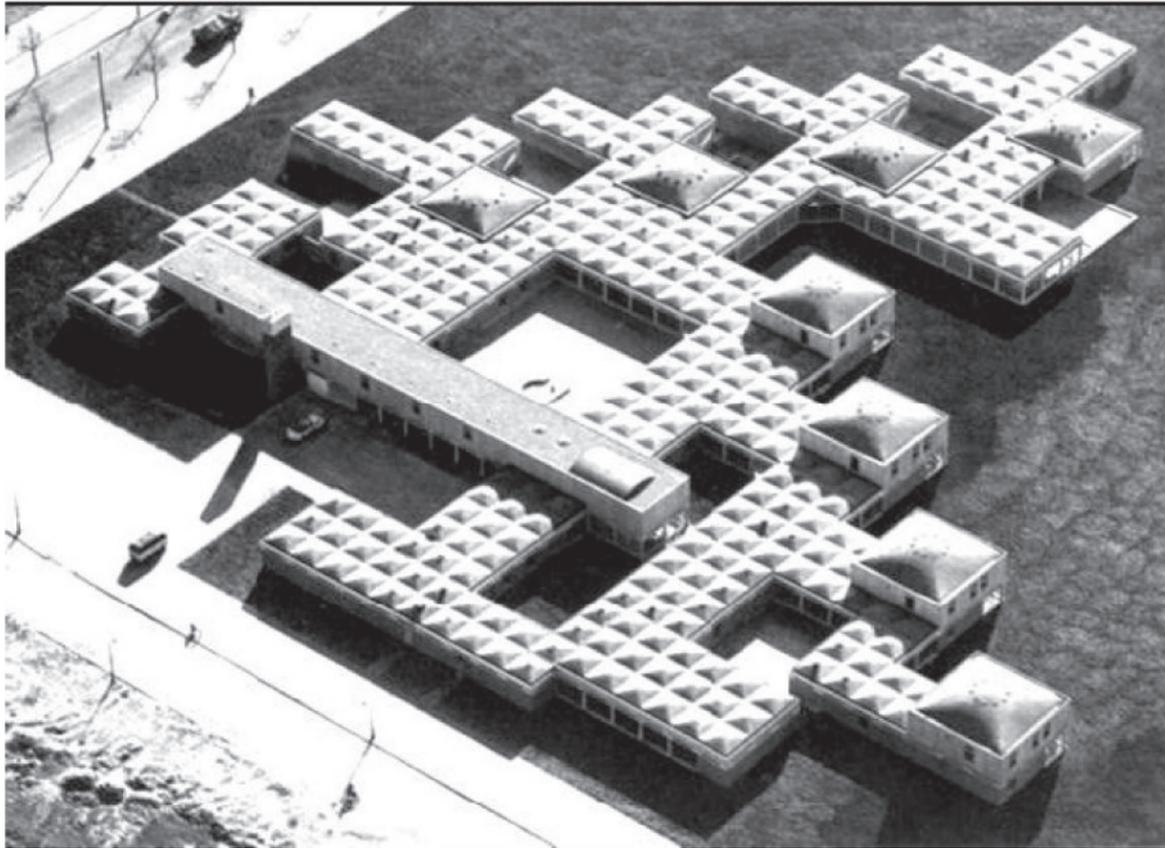


Figure 37. Amsterdam Orphanage by Aldo Van Eyck.

⁵³ "AD Classics: Amsterdam Orphanage / Aldo van Eyck," *ArchDaily.com*, January 21, 2019, <https://www.archdaily.com/151566/ad-classics-amsterdam-orphanage-aldo-van-eyck>.

Japanese Gardens

Japanese gardens are traditional gardens whose designs are accompanied by Japanese aesthetics and philosophical ideas, avoid artificial ornamentation, and highlight the natural landscape (Figure 38). The lessons learnt from this precedent include incorporating planted trees within the courtyard and drawing a connection to the surrounding nature. These courtyards also inspired the idea of having sliding doors within the building.⁵⁴



Figure 38. Japanese Gardens.

⁵⁴ Wybe, Kuitert, "Themes in the History of Japanese Garden Art," *Honolulu: University of Hawai'i Press*, 2002.

Maggie's Centres

For cancer patients, various architects have created Maggie's centres around the world. There are currently 30 Maggie's Centres in the U.K and around the world, (Figure 39). The concept of recovery spaces is a precedent to be analyzed closely. "Since the first Maggie's Centre opened in 1996, these ideas of supporting people with cancer as well as their families and friends in a nonclinical way, and in a non-clinical environment."⁵⁵ The concept of Maggie's centres is to incorporate nature into recovery spaces that are "intended to elevate the human spirit through the integration of architecture and landscape design."⁵⁶ If architects put this much thought into care and consideration for Maggie's Centres, why is this method not applied to AUD centres?



Figure 39. Maggie's Centre.

⁵⁵ Dina, Battisto, Jacob J, Wilhelm, *Architecture and Health Guiding principles for practice*, Routledge Taylor & Francis Group, New York and London, 2020, P 98.

⁵⁶ Ibid., P 101.

4 Designing for Recovery

4.1 Concept Evolution

The parti diagram consists of a long horizontal bar form that runs parallel to the street (Figure 40). In front of this form are a series of rectangular courtyards which divide up the zones of the building (Figure 41). A dialogue is created between the form and the forest. Movement is created back and forth between the forest and building, through visual connections and physical interactions.

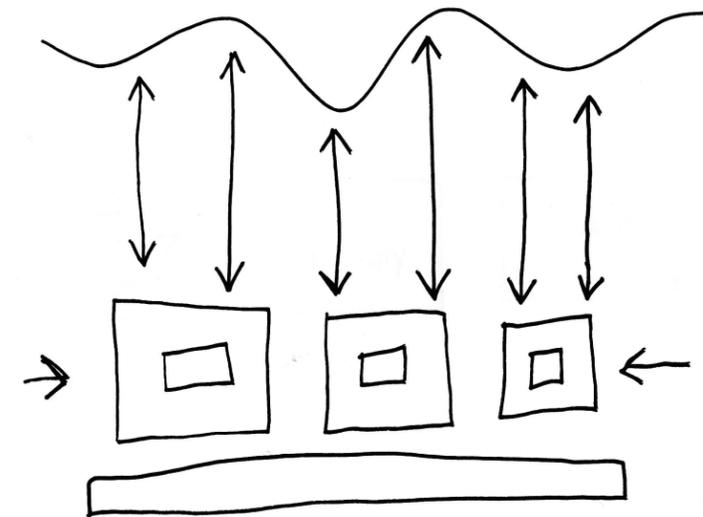


Figure 40. Parti Diagram Movement.



Figure 41. Parti Diagram.

4.2 Building Program

Roxane stated that it is not a good idea to mix women and men together as some patients have been physically and mentally abused. She mentioned that Sudbury is in need of a Men's residential recovery program. This Thesis will focus on a Men's Recovery program only.⁵⁸

This building will be categorized into three distinct zones, the Patient, Treatment and Admin. Each zone will serve a unique purpose to the overall recovery process. The building program is sketched out to analyze the required spaces (Figure 45). Roxane also emphasized the importance of maintaining two separate entrances for patients and staff because of confidentiality of the patients. This design will include a residence for the patients on the second floor, in this way patients will be able to temporarily live and recover within the proposed building. This allows for the patients to experience an uninterrupted recovery process.⁵⁹

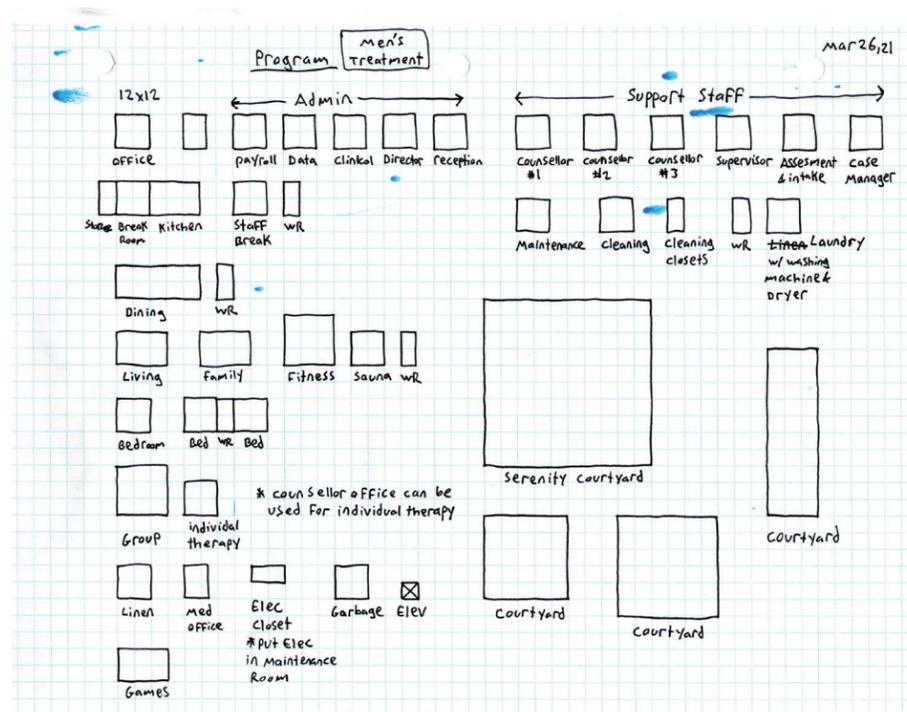


Figure 44. Building Program Diagram.

58 Zuck, *Questions about Recovery Thesis Student*.

59 Ibid.

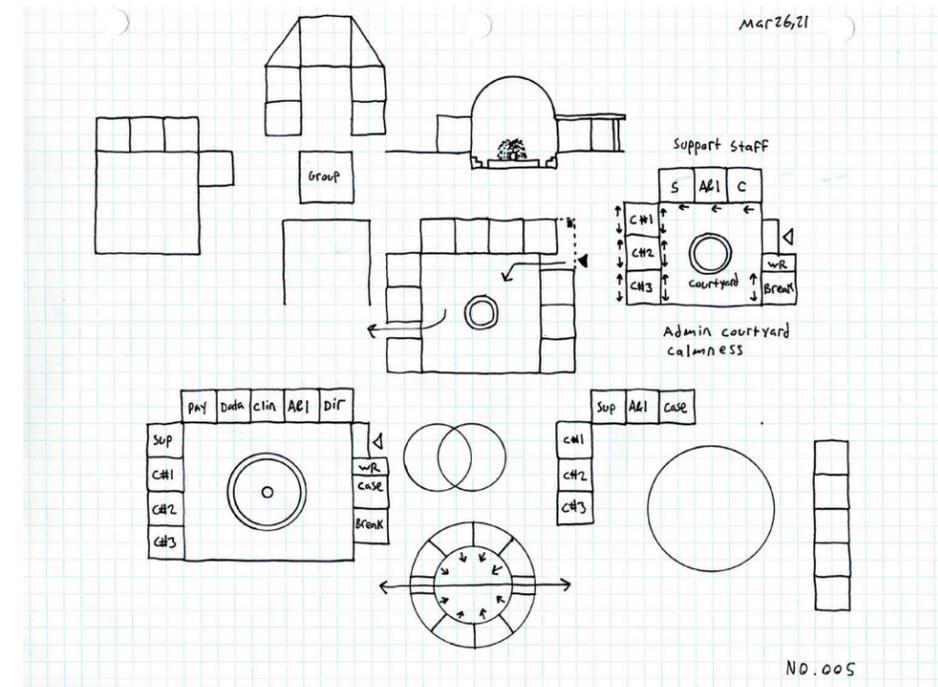


Figure 45. Building Program Diagram No.005.

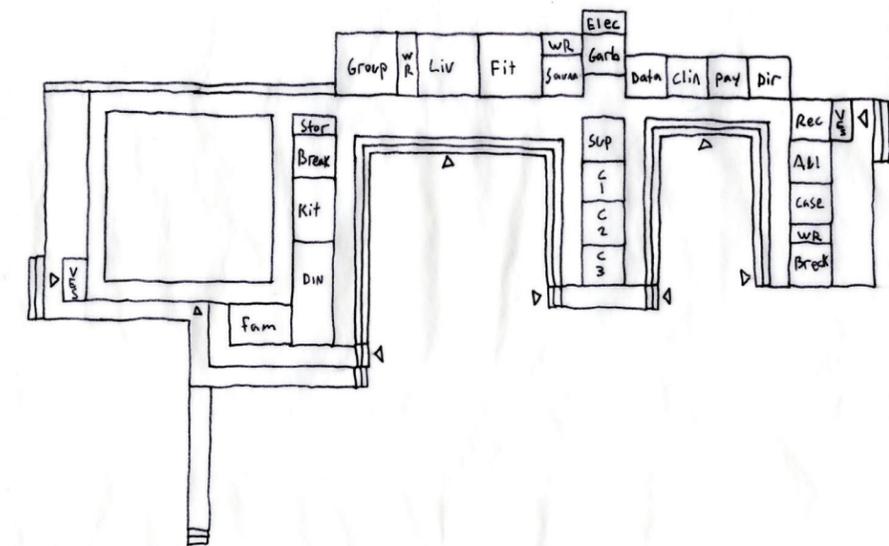


Figure 46. Concept Diagram No.009.

The design process included organizing the volumes of the various programmatic spaces required for the Men's treatment program. Once the volumes were distinguished, I began to organize the volumes into a pattern language. The programming is wrapped around a square void, which is the courtyard. In this way, all the spaces will have a direct correlation and view back to the courtyard. The courtyards are the main factor in the design concept, they are the voids in the mass. All the programming is designed around these spaces. There are four courtyards that offer unique experiences (Figure 47).

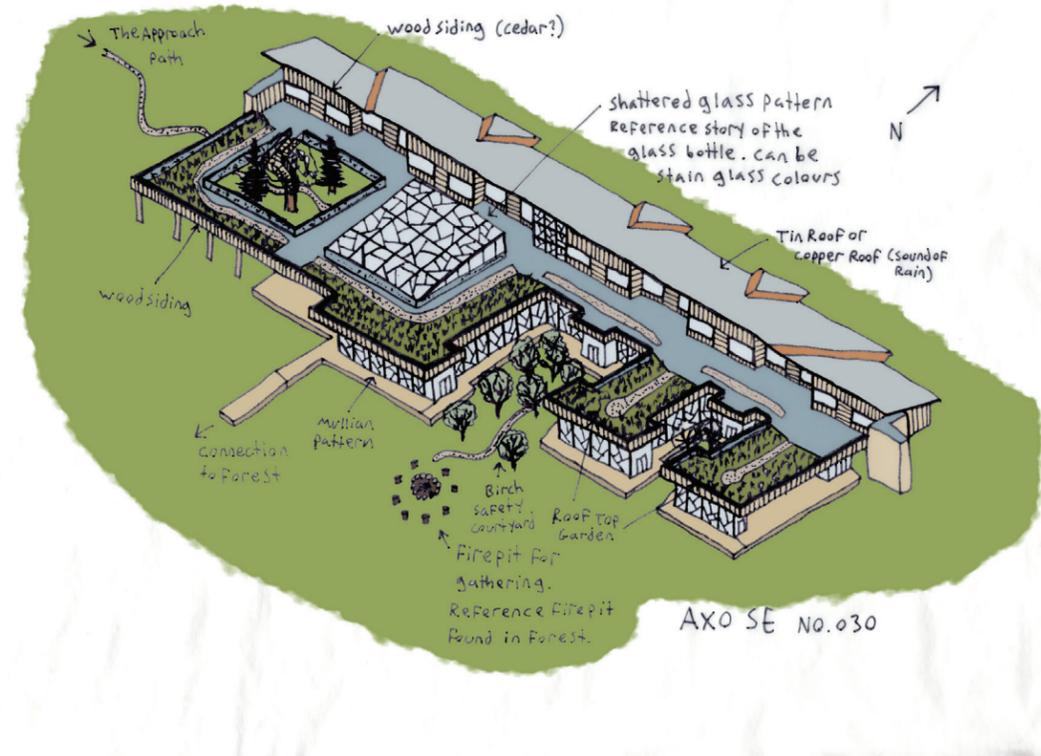


Figure 47. Concept Diagram No.030.

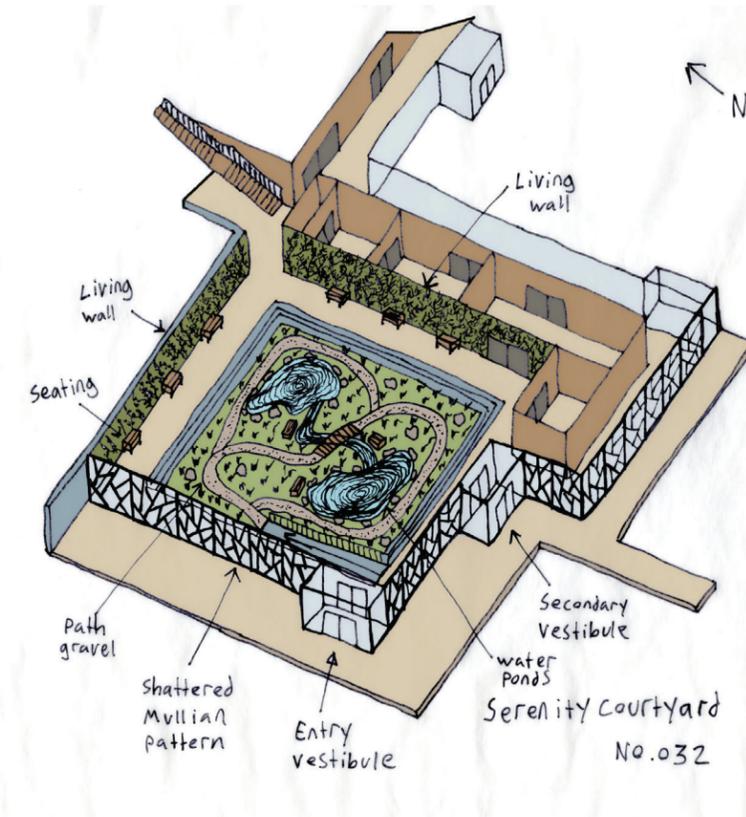


Figure 48. Concept Diagram No.032.

Early iterations were drawn to distinguish the form of the courtyard. This space will include water elements, greenery and seating areas that invoke verbal interactions (Figure 48).

This is another hand drawing of the exterior Birch courtyard which provides a sheltered space that acts as a transition before you enter the interior main building (Figure 49). This concept includes the idea of replanting the birch trees on the site into this designated void area.

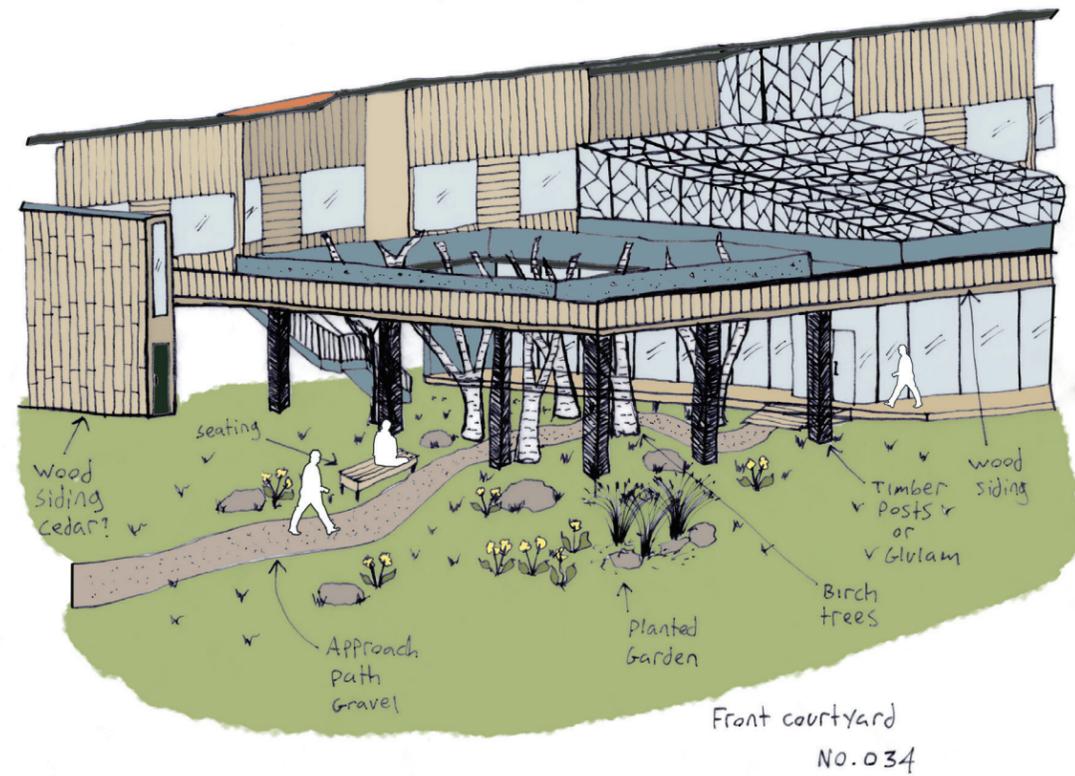


Figure 49. Concept Diagram No.034.

Early sections were drawn to analyze the solar angles and understand the volumes of the spaces. This concept drew upon the idea for the use of solar shading above the residential areas on the second floor (Figure 50).

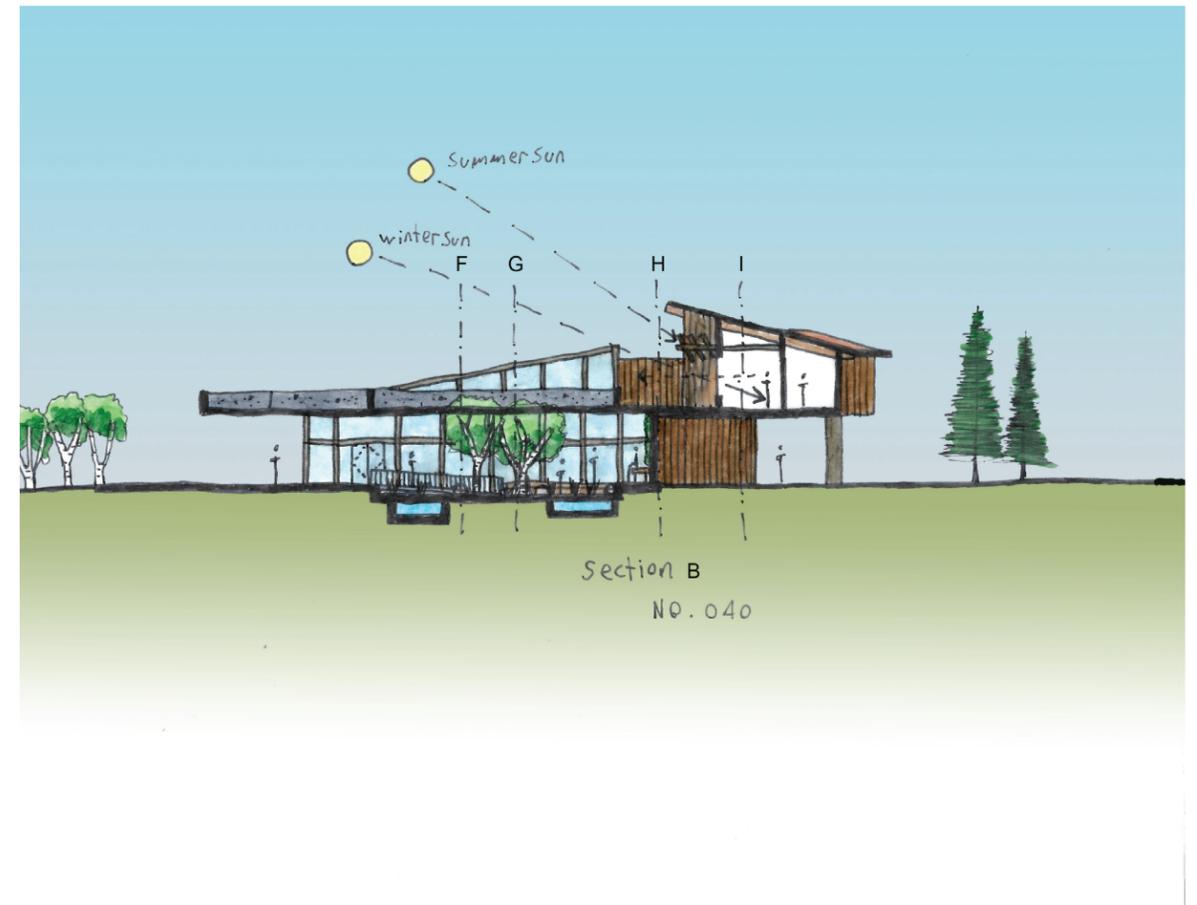
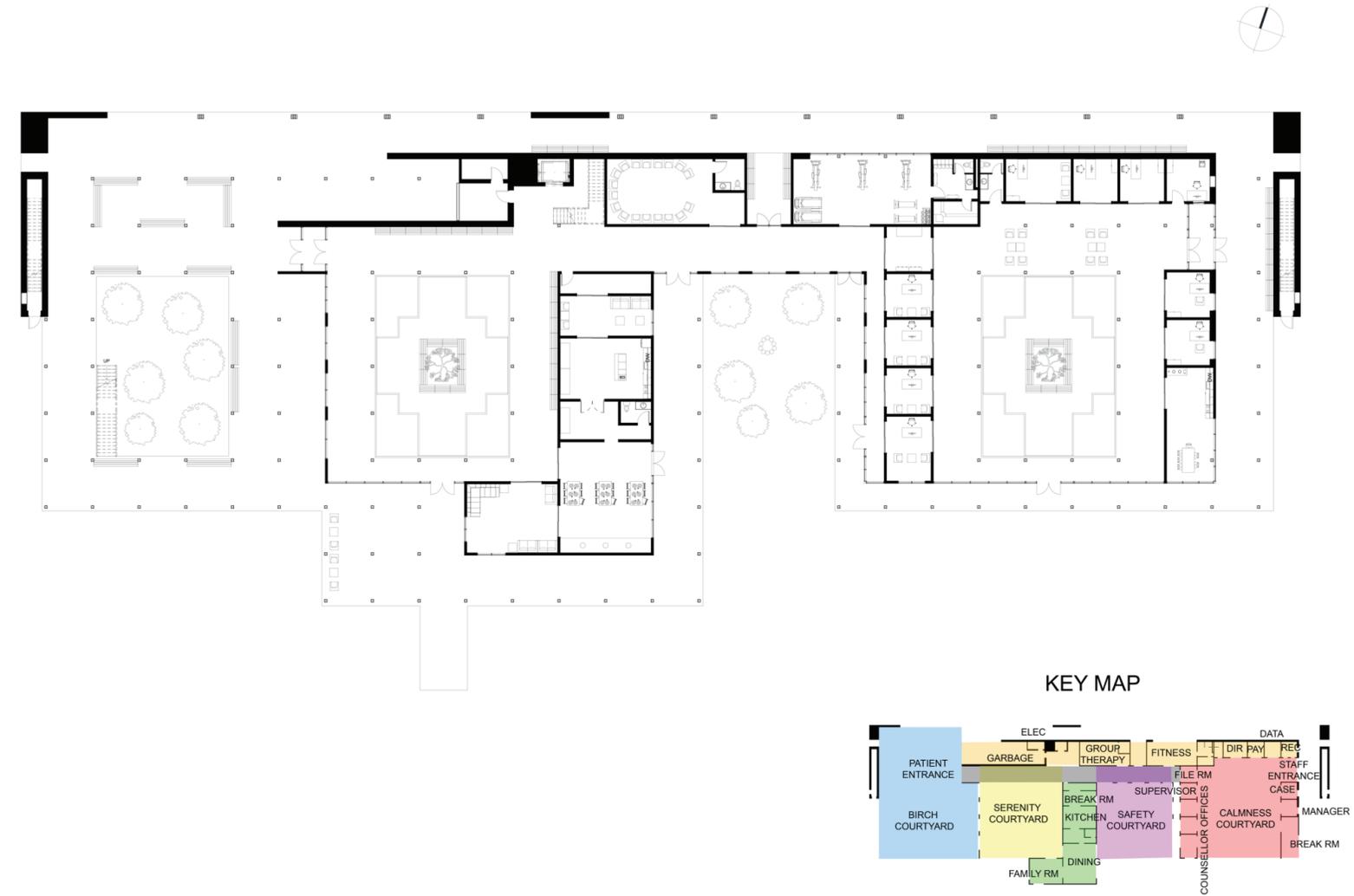


Figure 50. Concept Diagram No.040.

This is the proposed first floor plan (Figure 51), if we refer to the key plan in the bottom right corner this will help distinguish the programmatic areas. The blue zone is the patient entrance and birch courtyard. This is the primary entrance for patients and the public. The orange zone houses the garbage and electrical room, group therapy, fitness room with a change room and 4 person sauna. As well as the directors' office, payroll office, data specialist office and reception which has a direct correlation to the staff entrance. The yellow zone is the serenity courtyard which is one of the interior courtyard spaces and the main entrance for patients. The green zone is designated for the kitchen and dining areas, along with a kitchen break room. The bottom left portion of the green zone is the family room. The purple zone is the safety courtyard which is an exterior courtyard space, this space also has re-planted birch trees and a fire pit area. The red zone is the calmness courtyard which is the second interior courtyard space. The programming around the building includes the counselling offices and supervisor office on the left hand side. The top left portion of the red zone is the file room which acts as a buffer between the patient and staff areas. The right hand side includes the case manager's office, manager office and staff break room. The building is organized around a circulation core depicted in grey. The solid walls on the north face become permeable opening up the space with columns and openings creating interactive movement.



1ST FLOOR PLAN SCALE 1:100

Figure 51. 1st Floor Plan 1:100.

This is the proposed second floor plan (Figure 52), the stairs and elevator are depicted in orange on the keymap, this zone also has a catwalk that leads to the exterior rooftop gardens. They open up into the green zone which is designated for the patient's residence bedrooms. In front of each bedroom is a semi-private lounge space. There are a total of 12 bedrooms and a shared full bathroom for every two bedrooms. The red zone is designated for the withdrawal area. These are bedrooms for patients who arrive but are still going through post-withdrawal symptoms and need extra privacy and time. The red zone on the right hand side is a medical room with a designated medical staff member to care for the withdrawal patients. The green zone on the left hand side is a combination of a laundry room where patients are responsible to wash their own clothes, a computer room with workstations that are utilized for AUD research, education, and to search for career opportunities after reintegrating into society. As well there is a tv room where patients have the opportunity to watch educational videos and movies. The architecture of the southern facade of the second floor is designed to be pushed and pulled. In this way exterior nooks are created where patients have the opportunity to have a place to hang out and socialize amongst each other. The exit stairs are book-ended on the building and are well lit with good views, this ensures there are no dark places in the building.

The following pages show the circulation diagrams (Figure 53 & 54), that depict the movement of patients, staff and visitors through the proposed building.

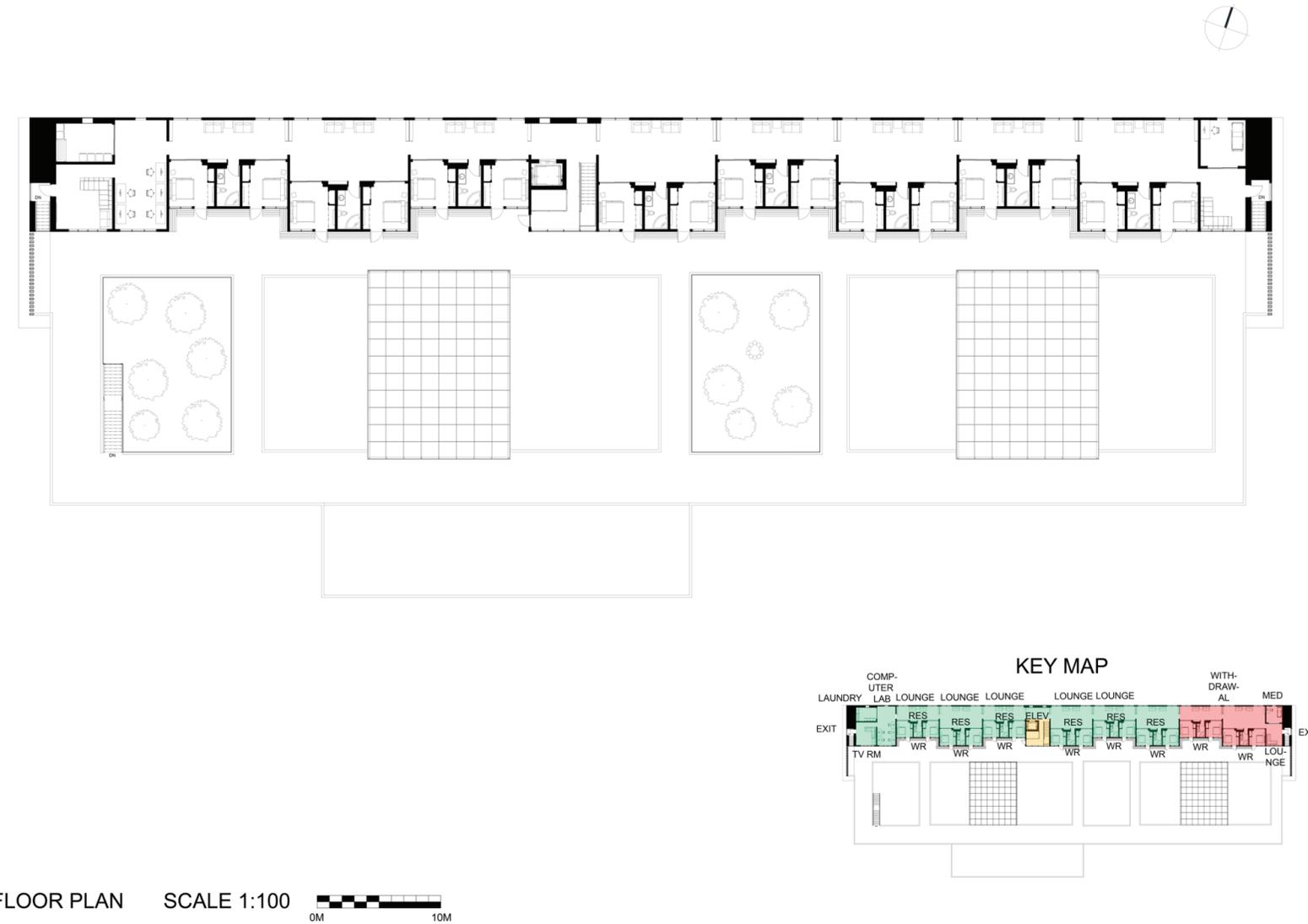
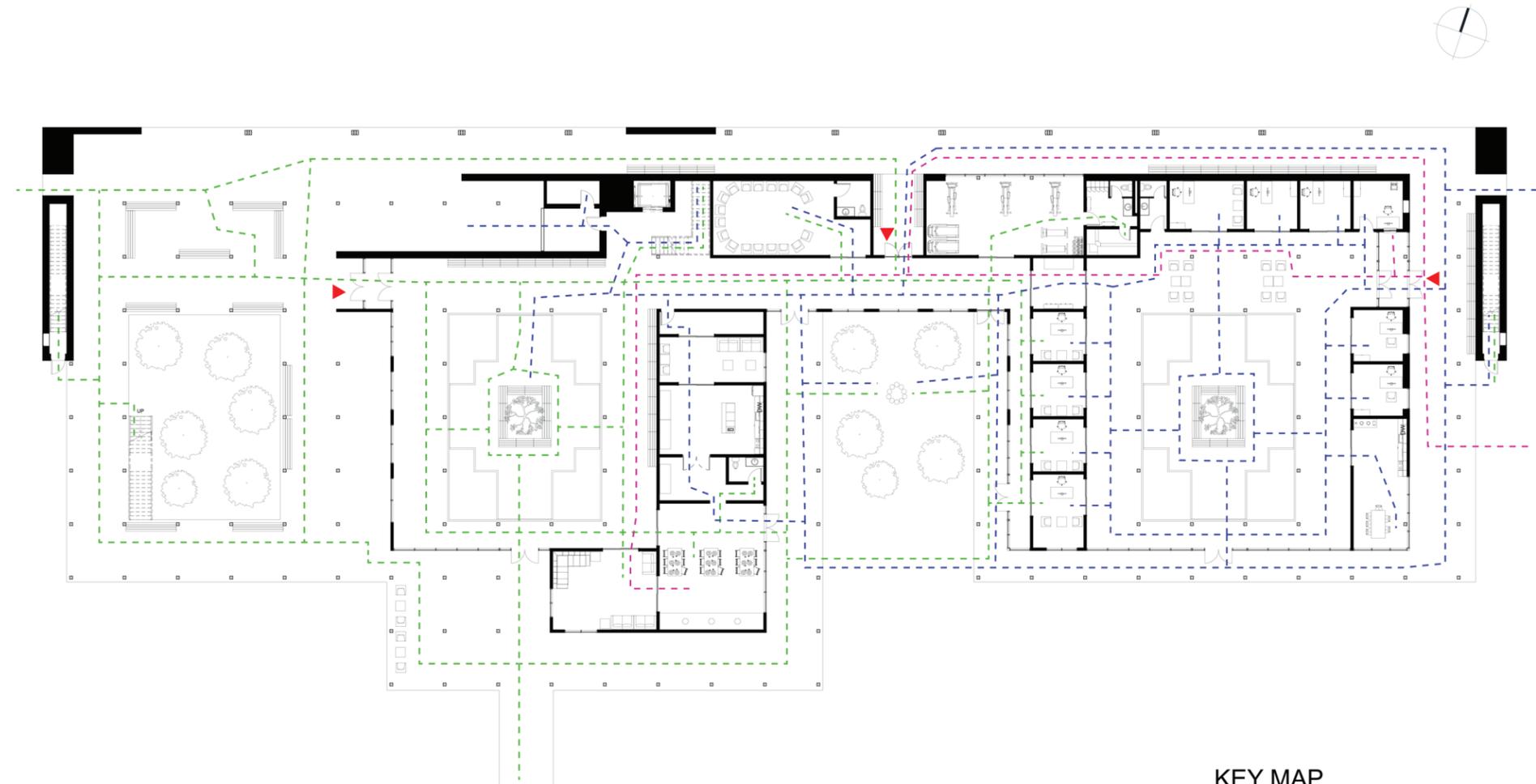


Figure 52. 2nd Floor Plan 1:100.



- LEGEND CIRCULATION**
- STAFF
 - PATIENT
 - VISITOR
 - ▶ SECURITY DOOR

1ST FLOOR PLAN SCALE 1:100 0M 10M

KEY MAP

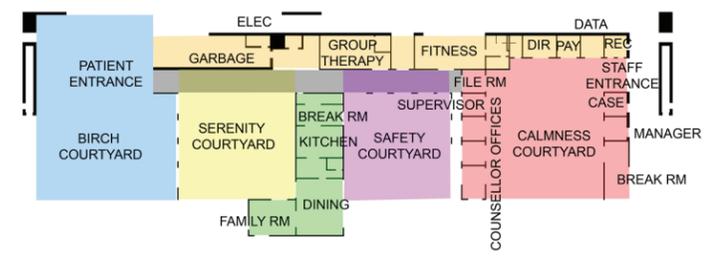


Figure 53. 1st Floor Plan Circulation 1:100.

4.3 Courtyards

The courtyards are the main factor in the design concept, they are the voids in the mass. All the programming is designed around these spaces. There are four courtyards that offer unique experiences.

When the patient arrives at the entrance of the patient area they will encounter the exterior Birch Courtyard ([Figure 55](#)). This space offers a transition from the parking lot and exterior world, into the first threshold. The courtyard is open to the air but is partially sheltered from the elements by the Birch trees and arrival porch. The porch extends through this space offering an area to traverse around the building. The courtyard has a void in the roof which allows for the birch trees to grow through this open air ([Figure 56](#)). There is seating available that allows the patients and visitors to sit, meet, and reflect before entering the main building. The main doors to the entrance are located off to the Northside of the courtyard, this passageway enters into the second threshold.



Figure 55. Render Patient Entrance.

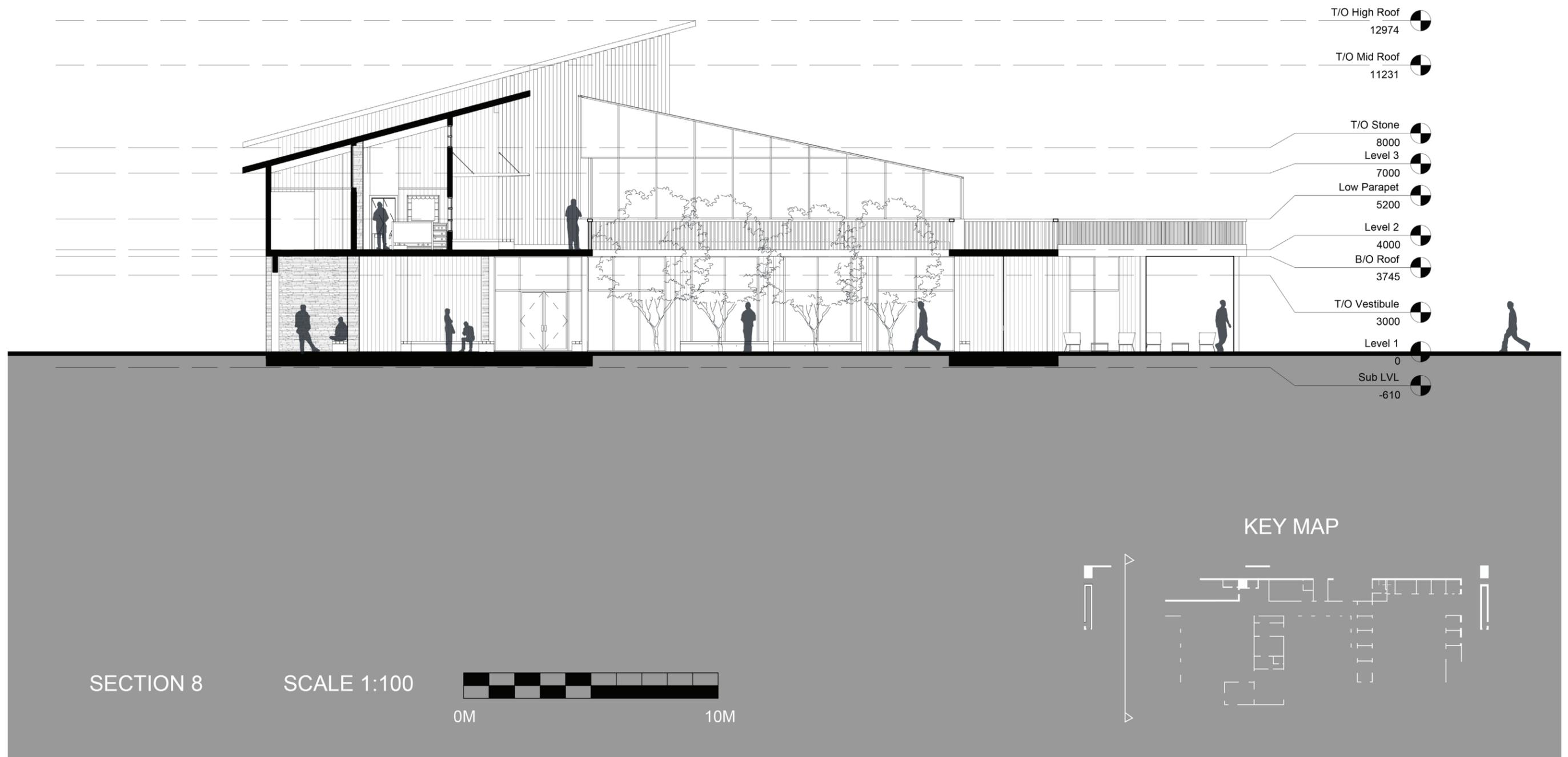


Figure 56. Cross Section 8 1:100.



Figure 57. Render Serenity Corner.



Figure 58. Render Serenity Dock.

The second threshold space is the Serenity Courtyard (Figure 57), which is an interior well-tempered space. This space is well lit from exterior sunlight through plentiful glazed openings. The skylight overhead is angled towards the southern sun allowing for maximum exposure (Figure 59). This space offers quiet and peaceful surroundings for the patients. The Koi pond and the trickle of water add to the ambiance of the space. Roxane stated the importance of a body of water and the effect this element has on the patients in keeping them calm.⁶⁰ Over the top of the pond is a raised deck that sits on a series of concrete pillars. In the middle of the deck is the tree of Hope, which is a symbol of the perseverance of the patients (Figure 58). The tree is a Japanese cherry blossom, which becomes a relic of the building. The building environment is uniquely designed to offer a place of sanctuary within the profane of the city. There are two trees of hope in the building, one in the Serenity courtyard and the other in the Administration Courtyard (Figure 61). The concept is that these trees are held in balance, representing the patient and the care worker. Both must be respected and nourished, this building offers quality spaces to both patient and care worker because they both need each other to evolve.

⁶⁰ Zuck, *Questions about Recovery Thesis Student*.

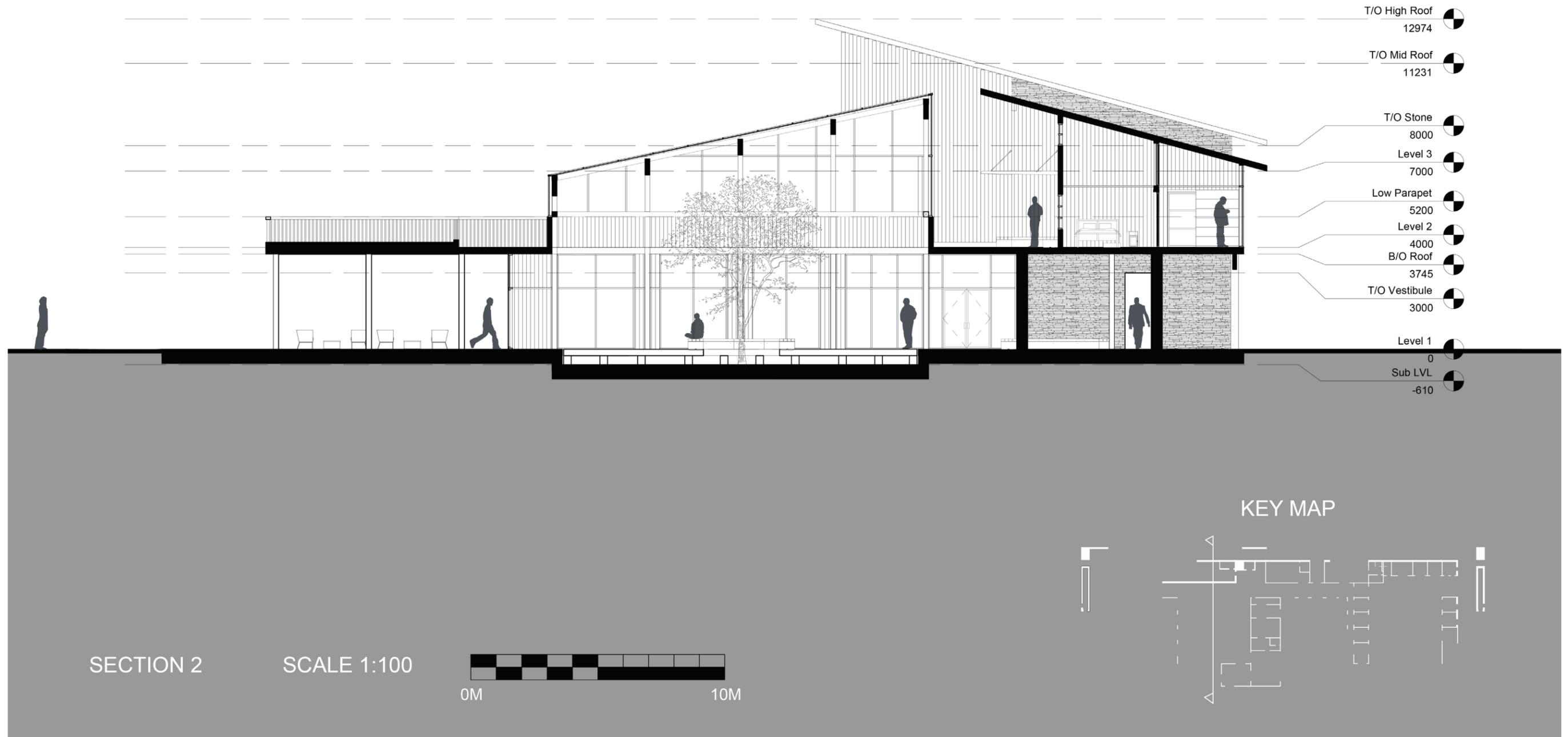


Figure 59. Cross Section 2 1:100.



Figure 60. Render Safety Courtyard.

The third courtyard is the second exterior space, named the Safety Courtyard (Figure 60). The shape of this courtyard is the same proportion as all the others in the building. This void within the building allows for birch trees from the site to be re-planted in this space. The birch trees are planted right up to the glazing facade and extend all the way back to the forest to the south. The covered porch wraps around the building on either side of the courtyard but is not continuous to allow for patients to enter into this patch of trees. The building wraps around this space offering a sense of security for the patients. The glazing and programming around this courtyard offer a visual connection to the inside.

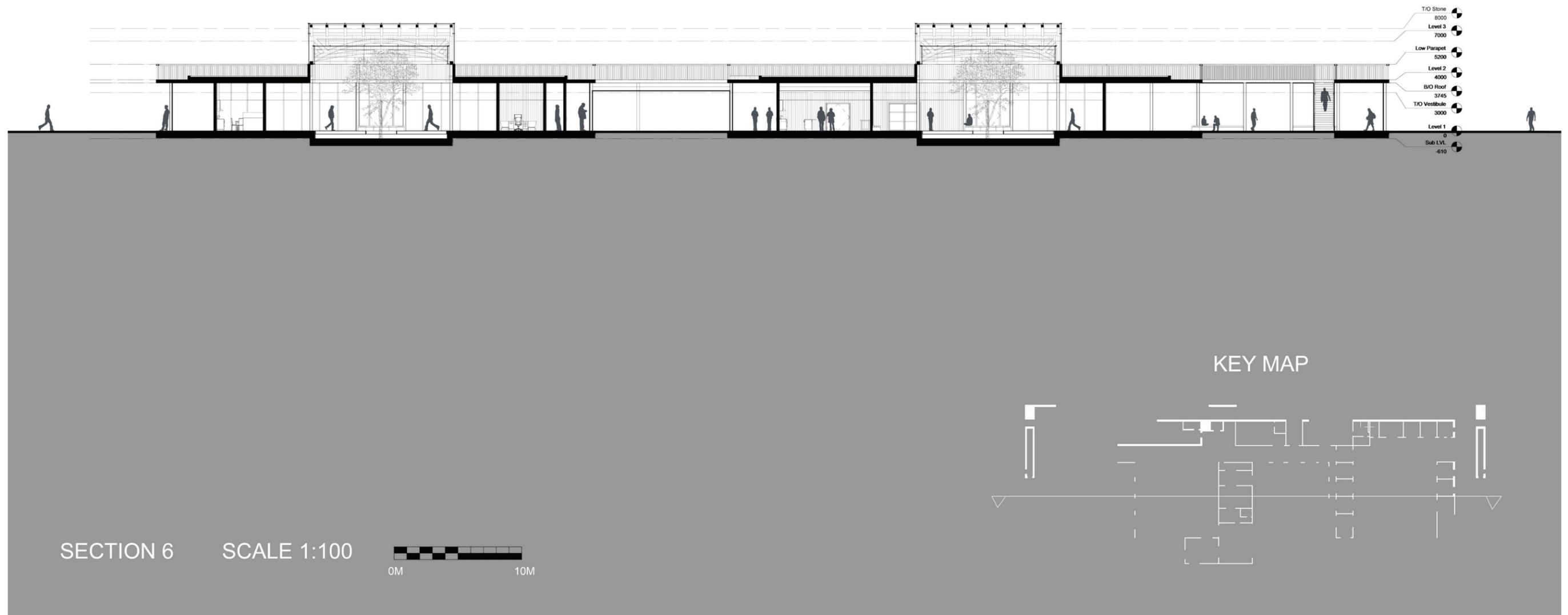


Figure 61. Cross Section 6 1:100.



Figure 62. Render Admin Courtyard.

The fourth and final courtyard is the second interior courtyard in the administration space, it is named the Calmness Courtyard (Figure 62). This space is a mirror image of the patient Serenity courtyard in its proportions and aesthetics. Although, this space is strictly for the admin staff and care workers. It is vital that the administration has the same quality of space as the patients, as their work is demanding as well. All offices have a connection and view to the courtyard, which is protected from the elements. Ample sunlight infuses this space.

4.4 Patient Area

This area of the building focuses on the requirements of the patient, and the programming necessary to assist in the healing process (Figure 63). The programming consists of the Serenity Courtyard, family room and dining hall. The Serenity Courtyard is the heart of this space and offers a meditative sanctuary. When the patients are meeting with the intake staff for the first time, this is where they will meet. The patient can enter the space via the front entrance, this would be the space where they would experience the beginning and conclusion of their journey. This space has to be specially designed to be a calm transition before entering the treatment area.



Figure 63. Render Corridor to Admin.

When the patient's family comes to visit or are waiting while the patient is being assessed, they have a special space that is situated at the edge of this courtyard (Figure 64). The family room has a visual connection to the forest and the exterior deck. This space offers seating and privacy where the family can reflect, communicate and spend time with the patient. There is a sliding door that grants access to the dining hall where waiting families can grab a bite to eat. Roxane stated the importance of involving the families in the healing process, by educating the family and patient on how they can support each other.⁶¹

The dining hall is critical in the design, as it becomes a gathering place for the patients where they share in eating together as a sober family. Nutrition plays an important factor in the success of sobriety. The patients also have chores to accomplish throughout their stay, for example cleaning dishes, taking out the garbage and doing laundry. The kitchen portion run by the cooking staff will offer cooking lessons to patients, educating them on the type of nutrition they should be intaking.



Figure 64. Render Family Room.

⁶¹ Zuck, *Questions about Recovery Thesis Student*.

4.5 Treatment Area

The treatment area is the core of the building for the patients (Figure 65), this is where the majority of treatment sessions happen. These spaces include group therapy, a fitness room with a sauna, and counselling offices. These programs are wrapped around the Safety Courtyard space, which offers visual connections to the exterior. The group therapy room is ample in size to accommodate 18 seats in a circular formation. Roxane stated the importance of communicating within a circle, where everyone can view each other.⁶² There are a series of clear story windows on the North stone wall which allow for a neutral light to enter the space. In this way privacy is maintained from the exterior, while still illuminating the room.

The fitness centre is located adjacent to the group therapy room. This space allows for exercise equipment such as treadmills, elliptical machines and free weights. The patients will be able to use this space in a scheduled way. Fitness is another pillar on the path to sobriety, it is important to give the body a fighting chance while going through withdrawals and recovery. This space also accommodates a change room and a sauna.



Figure 65. Render Corridor Treatment.

⁶² Zuck, *Questions about Recovery Thesis Student*.

This area also incorporates individual counselling offices for patients to have one on one time with counsellors (Figure 67). The patients enter from sliding doors on the west side of the offices and the staff enter from the east side of the offices. In this way the staff and patient have their own entry path. When the patient leaves the counselling office they view the exterior safety courtyard with the planted birch trees. There are several ways for the patient to exit the building from this space. Roxane stated the importance of not blocking the path of the patients and giving them ways to escape in the situation where they become anxious.⁶³ In this courtyard is the fire pit which offers a balance of the elements in the design (Figure 66). With water elements in the interior courtyards and fire elements in the exterior space. The experience of the outdoor fire is appropriate to the region as it is customary for people in the North to enjoy sitting around a fire and having conversations. There is something very soothing and calming about staring into the fire.

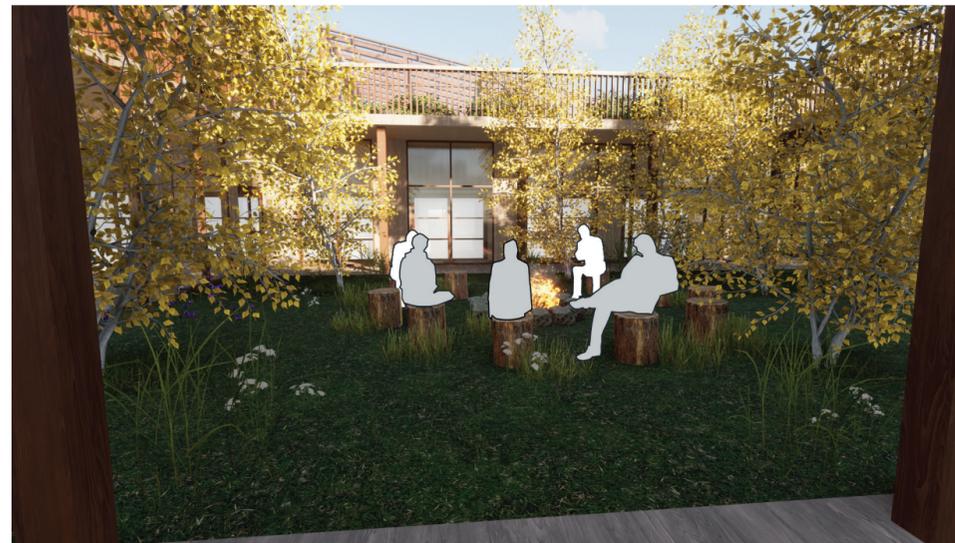


Figure 66. Render Fire Pit.

63 Zuck, *Questions about Recovery Thesis Student*.

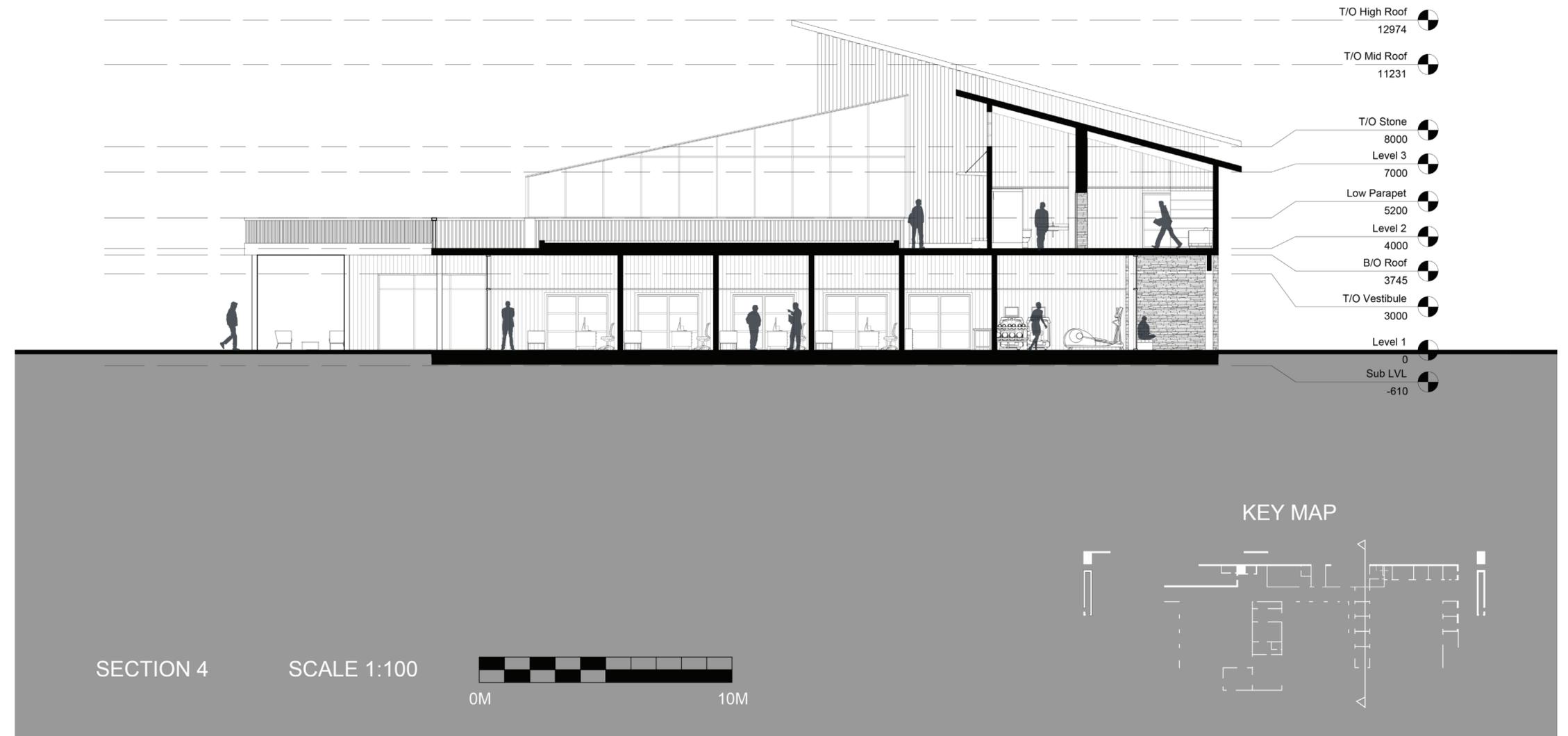


Figure 67. Cross Section 4 1:100.

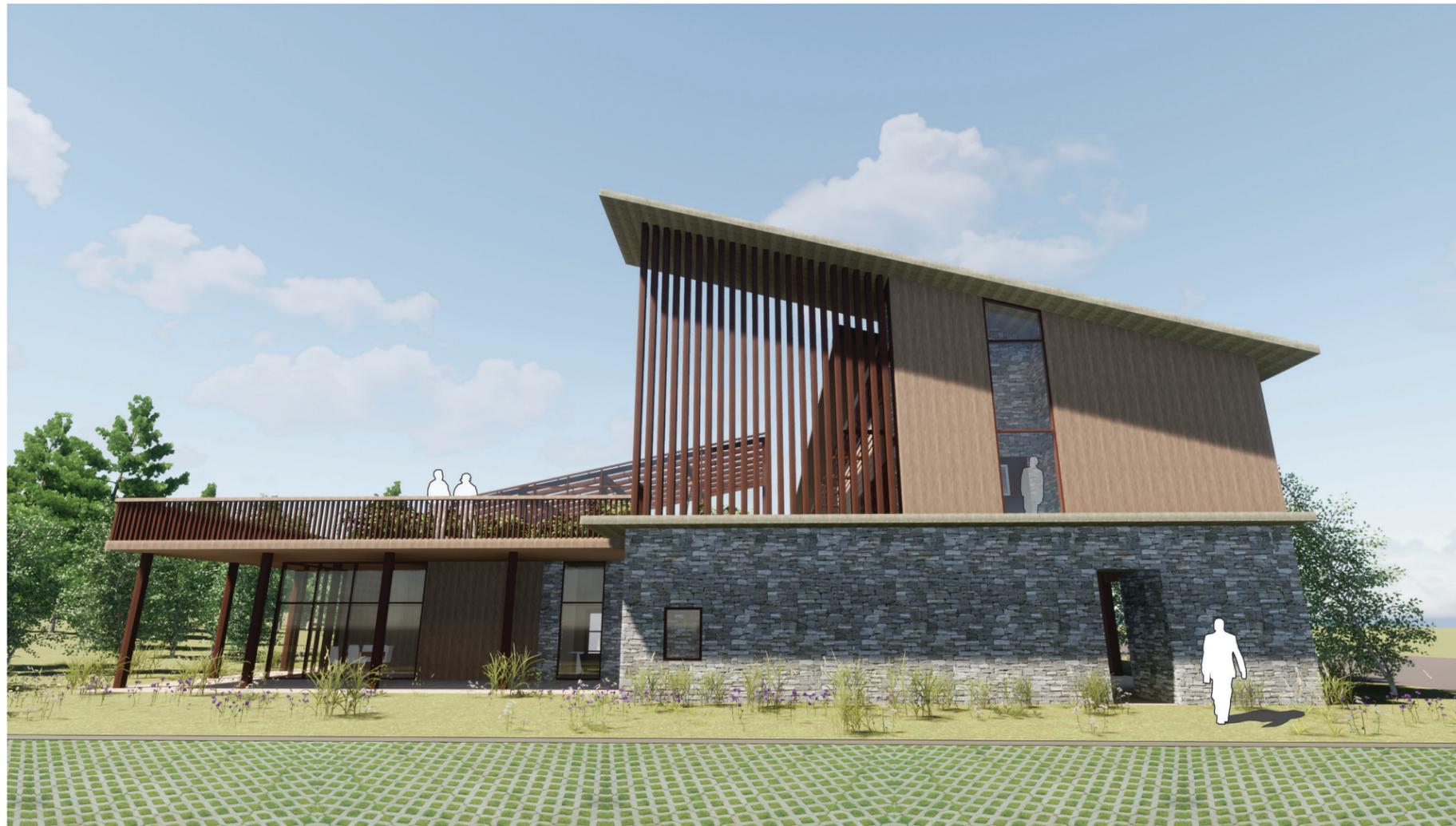


Figure 68. Render Admin Entrance.

4.6 Admin Area

Beside the fitness room is a transitional passage room which is off limits to the patients but offers entry into the admin zone. This room becomes a place where staff can enter from the admin side through sliding doors and have access to the patients files. When the assessment and intake staff goes to meet the patient for the first time, they will leave their office and enter this transitional room. There is a table where they can make a coffee, grab the patient's file and then traverse down the corridor to the Serenity Courtyard. The admin area comprises the data specialist, clinical manager, payroll, director, assessment and intake, case manager, washroom, staff break room and reception. This programming is designed around the Calmness Courtyard, which is the parallel to the Serenity Courtyard for patients. It is important for the staff to have a quality space where they can also reflect and recharge their mind. To the north of the courtyard is a seating area where staff and staff visitors can sit down to converse (Figure 69). The washroom shares a plumbing wall with the washroom from the change rooms, in this way it is cost effective. The offices on the north facade have clear story windows which let in the ambient light while maintaining privacy. The reception office has a pass through window which is located within the vestibule for security purposes. The staff have visual connections to the forest to the south through a portion of glazing to the south of the courtyard. The entrance to the Admin zone is through an opening in the stone mass (Figure 68) where staff and visitors can enter the Calmness courtyard.



Figure 69. Render Admin Court.

4.7 Public to Private



Figure 70. Render Bedroom Lobby.

The second floor houses the patient residence area, with twelve individual bedrooms. Each bedroom comprises a queen size bed for extended comfort, a closet and a dresser. Each pair of bedrooms share a full bathroom. It is important for each patient to have their own private space for sleeping due to potential anxiety and restlessness. In this way, the bedroom becomes the most private area of the building. When the patients step outside their rooms they enter into a semi-private space designed for the patients to share a space with their neighbours (Figure 70). This space has seating and bookshelves with books about self-help and recovery. The main bookshelf for a patient book exchange is integrated into the stone feature wall in between both bedrooms. The seating area in front of window glazing visually connects the patient to the exterior world and lets in ambient Northern light. The table in the middle of the seating will offer the patients a coffee maker, in this way the patients can have their morning coffee and compose themselves in this nook before heading downstairs for breakfast and treatment. The corridor is open and connects the bedrooms together. There are wall partitions that divide up the corridor into more manageable spaces.

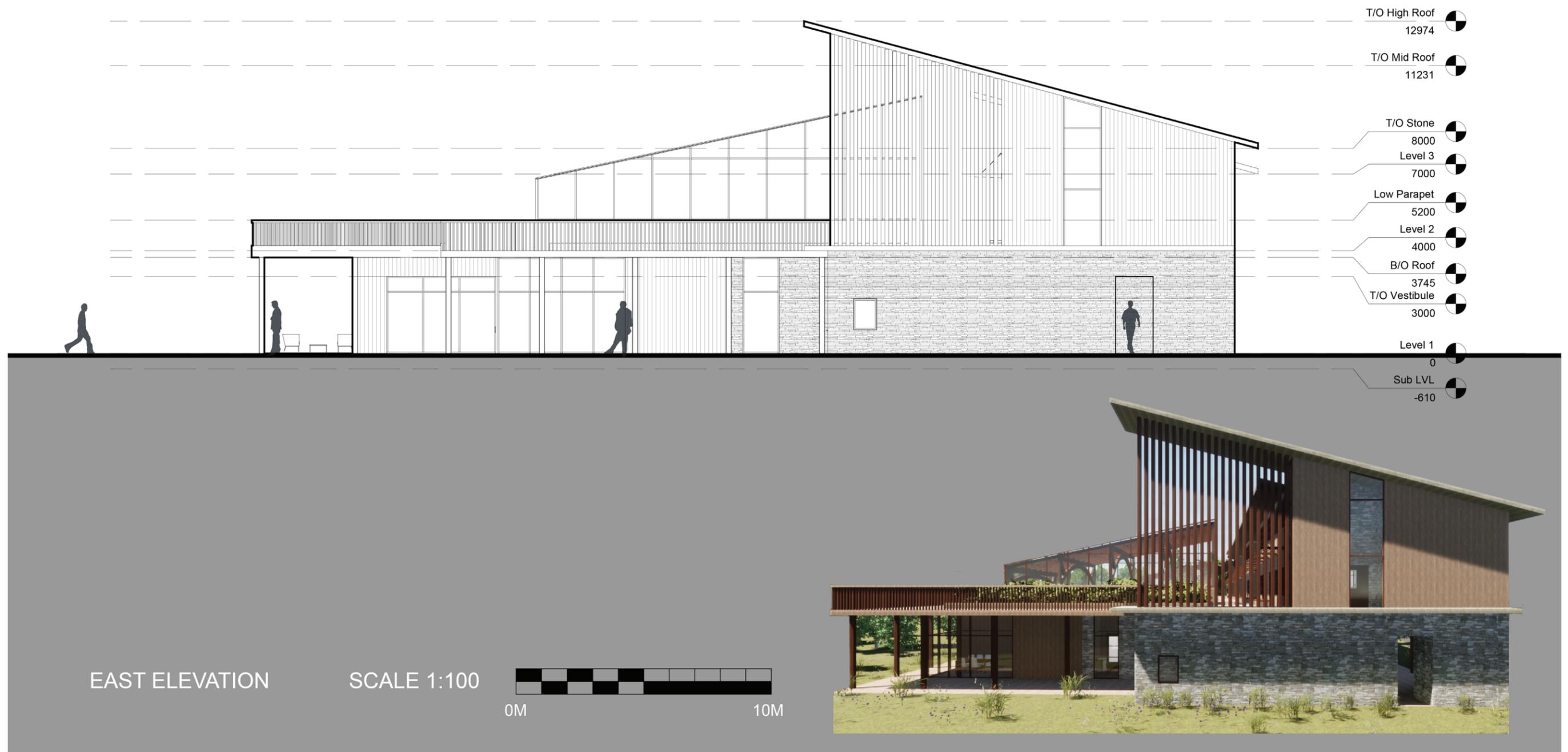


Figure 71. Render East Elevation 1:100.

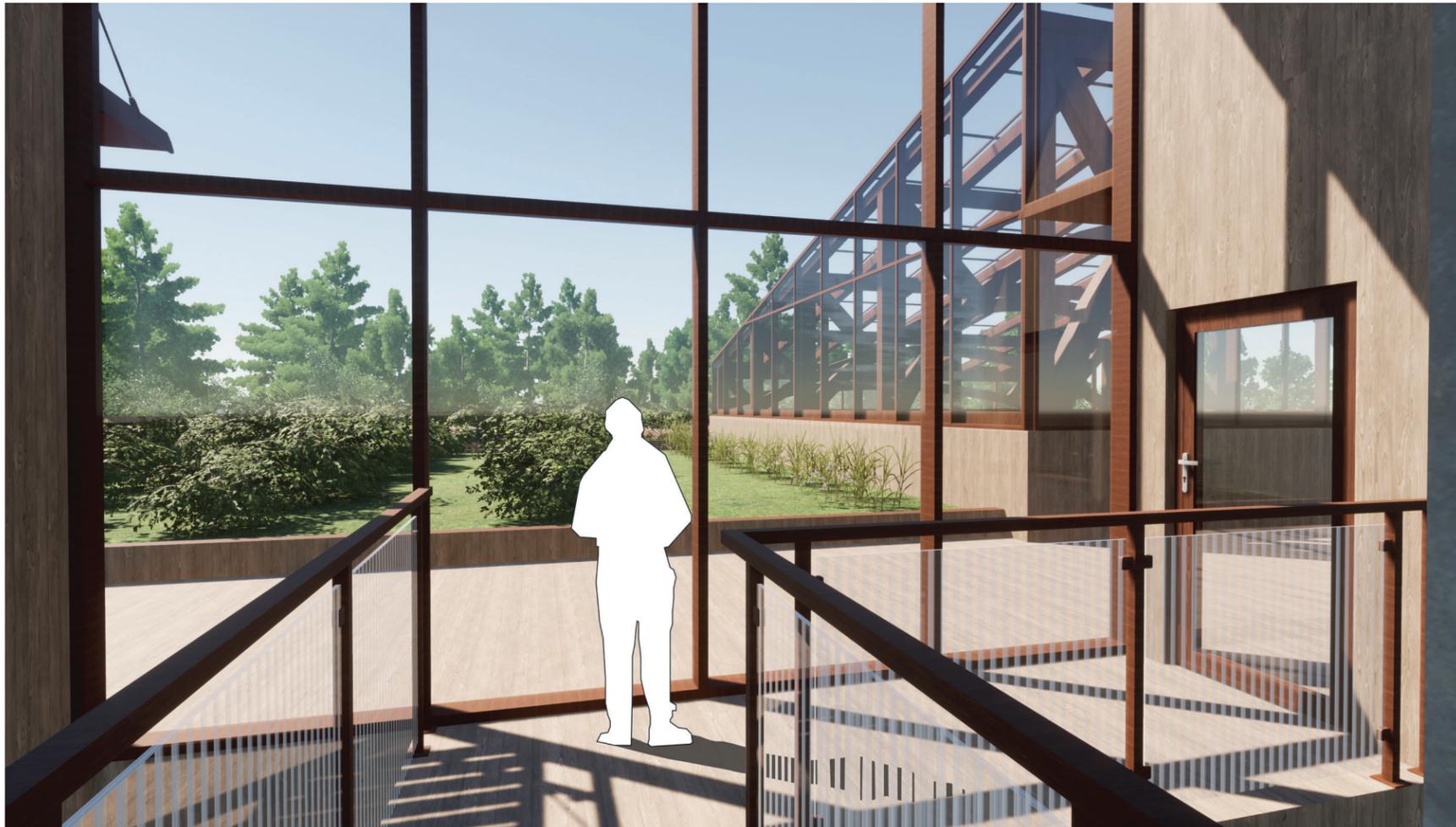


Figure 72. Render Catwalk to Exterior.

The second floor is anchored by the games room to the west and the medical room to the east. The east portion of the second floor houses four additional bedrooms which are for patients still going through withdrawal symptoms. This area is monitored 24/7 by medical staff. There is a small lounge area with seating where medical patients can relax and a medical room with a medical bed and computer terminal for the medical staff.

The games room to the west portion of the building houses five computer terminals which are utilized for research purposes and job searching. There is also a lounge area with seating and a wall-mounted tv where patients can have a movie night or educational viewing. Lastly, the laundry room is located in the corner of this space. Patients are to do their own laundry as part of their chores.

As the patients move downstairs they move from the more private zone to the semi-public zone of treatment (Figure 74). This area is the catwalk which extends from the top of the stairs and elevator (Figure 72). This area provides a direct connection to the exterior portion of the rooftop gardens and exterior nook areas. A visual connection to the forest is created from this vantage point. The architecture offers transitions from public to private zones through the material palette. Starting from the forest and moving South to North toward Howey Drive, the architectural elements consist of columns, glazing, openings, wood walls and finally stone walls (Figure 73). As the building recedes back to the street the thicker the materials become and as the building moves towards the forest the building materials become more open and lighter.



Figure 73. Render North Elevation 1:100.

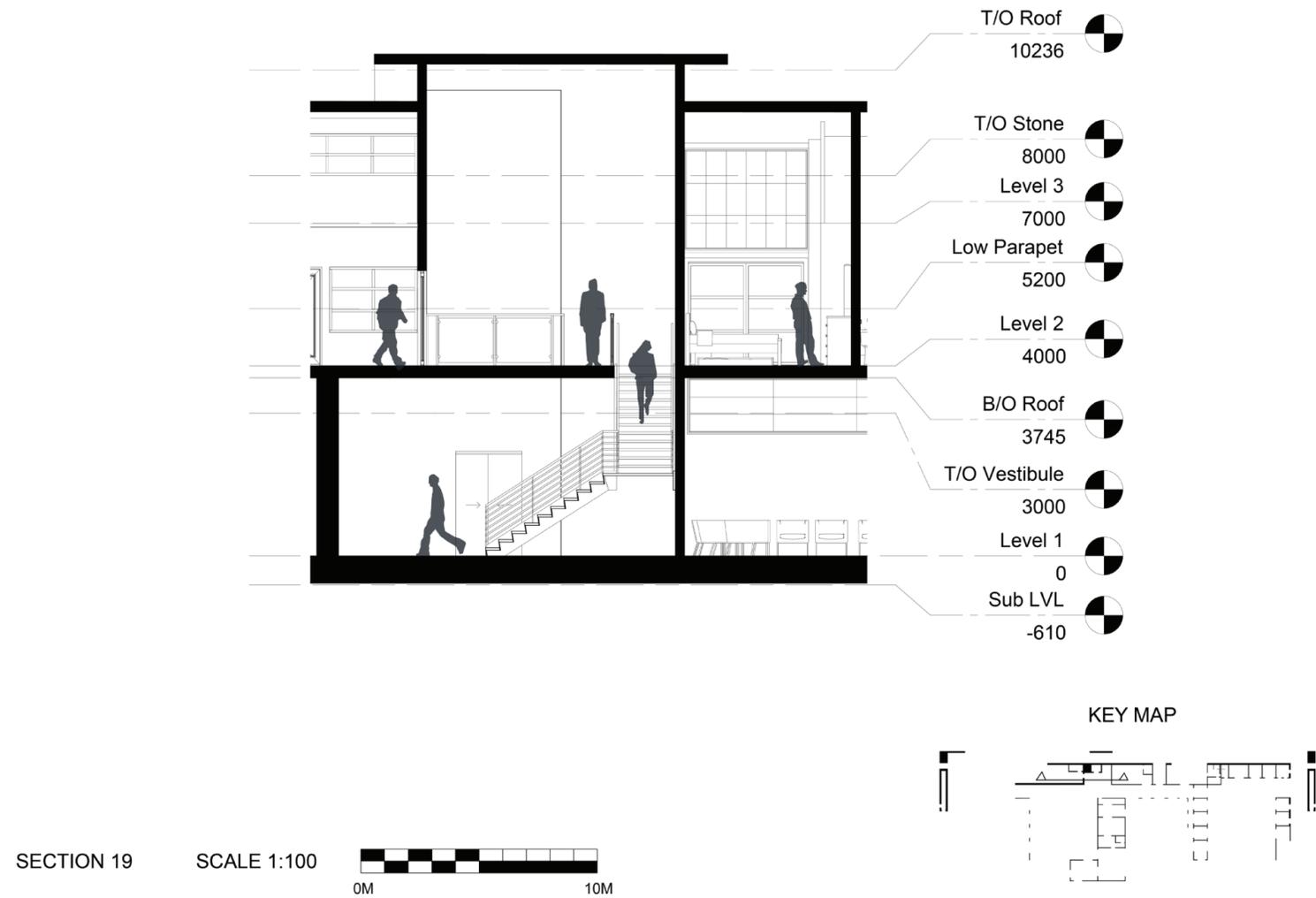


Figure 74. Cross Section 19 1:100.

4.8 Rooftop Garden

The rooftop garden is accessible in two ways, from the second floor in front of the elevators and from a set of stairs traversing through the birch courtyard. Roxane stated the importance for patients to be connected to nature.⁶⁴ This rooftop has a series of built up roof portions which support an intensive roof system. In this way the patients can learn and take care of their own garden plot, where they can grow vegetables (Figure 75). These vegetables can eventually be used in the kitchen as part of their nutritional routine. The rooftop also allows for patients to get exercise and walk outside while remaining safe and secure within the building limits. The architecture of the southern facade of the second floor is designed to be pushed and pulled. In this way, exterior nooks are created where patients have the opportunity to have a place to hang out and socialize amongst each other.



Figure 75. Render Roof Top.

⁶⁴ Zuck, *Questions about Recovery Thesis Student*.

These nooks are protected overhead from a series of horizontal sunshades which run along the whole portion of the southern facade. The sunshades extend over the top of these nooks creating microclimates. From the vantage point of the rooftop, it is evident that each courtyard consists of the same proportions and is replicated throughout the roof. This adds a structural sense of symmetry throughout the building design. At either end of the rooftop garden, there are wooden screens that extend from the exterior exit stairs. These screens add a visual aesthetic as well as providing privacy from the street while still allowing partial visibility (Figure 76).

4.9 Connection to the Forest

The parti diagram explained the importance of the connection back and forth from the building to the forest. The building has a deck that wraps around the courtyards and in front of the Serenity courtyard the deck reaches out towards the forest. This vantage point shows the relationship between the four courtyards. The rooftop space provides an area where patients can walk outside but feel a sense of safety and protection by walking on the roof (Figure 77). The skylights over top of the Serenity and Calmness courtyards are angled to receive maximum sunlight. The voids of the birch and safety courtyard allow for the birch trees to grow within these spaces.

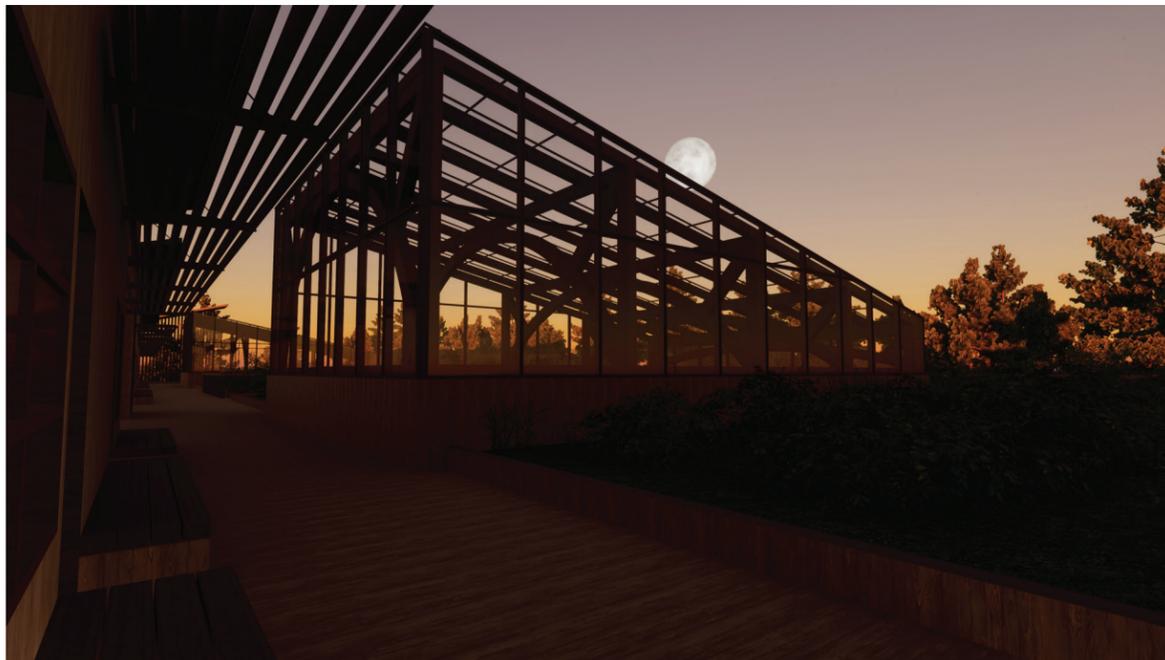


Figure 76. Render Roof Top Moon.



Figure 77. Render Aerial View.

This image (Figure 78) shows the southern facade material palette and the importance of the building opening up to the forest. Moving from open air towards columns and a protected porch, transparent glazing, CLT walls, voids of courtyards and stone masses.



Figure 78. Render South Elevation 1:100.

This extension offers the patients to traverse into the forest on a series of timed walking trails (Figure 79). The patients are required to go on mandatory daily walks and it is most beneficial to them as walking boosts our mood and rejuvenates our mind. When the patients are feeling more vulnerable they can stay and walk within the building, either around it on the ground floor or on the rooftop garden. But when they are more comfortable they can venture into the forest.

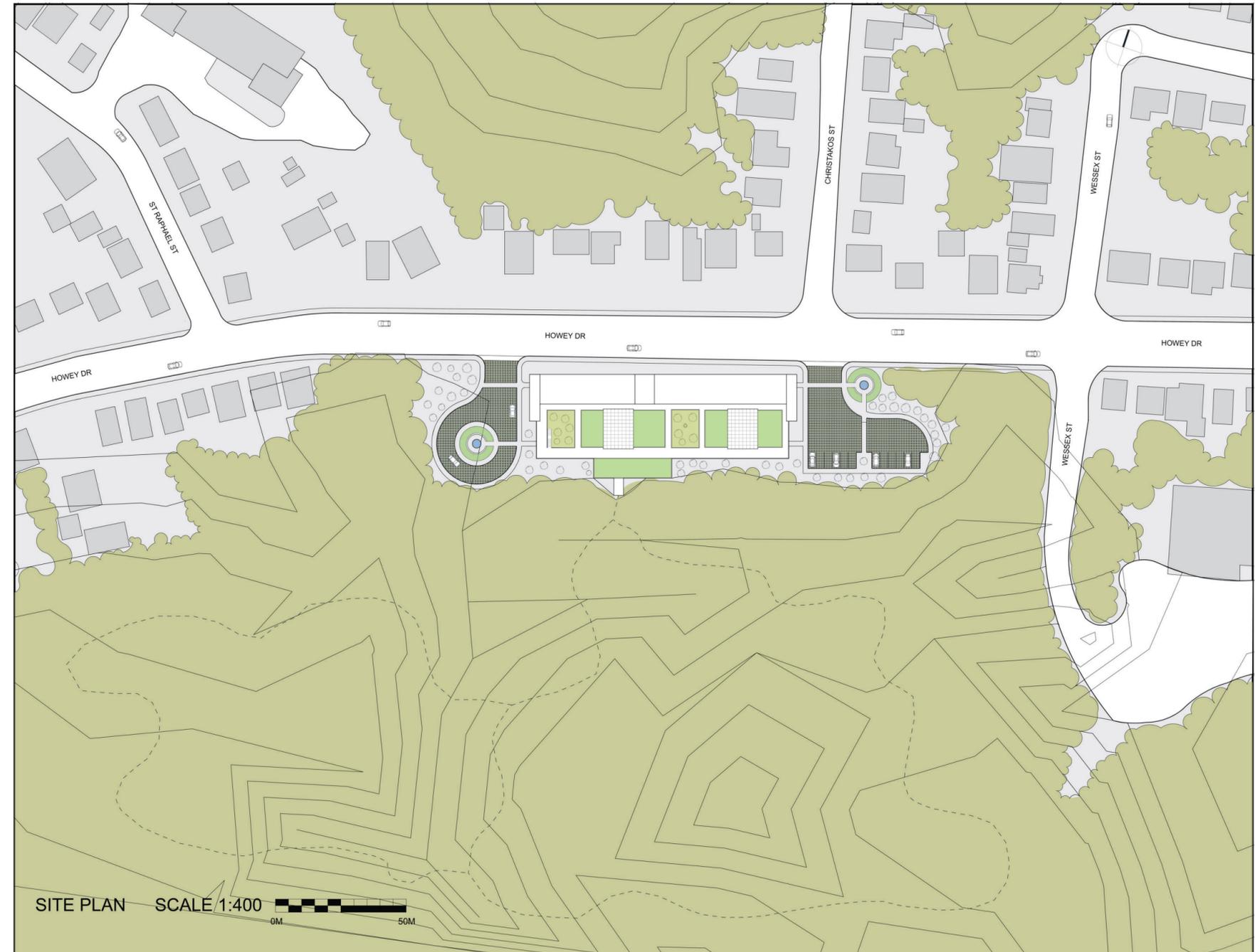


Figure 79. Site Plan 1:400.

This section (Figure 80) shows the connection from the street level of Howey drive, to the building and reaching out towards the forest. Patients will have direct access to nature, which provides a grounding sensation.

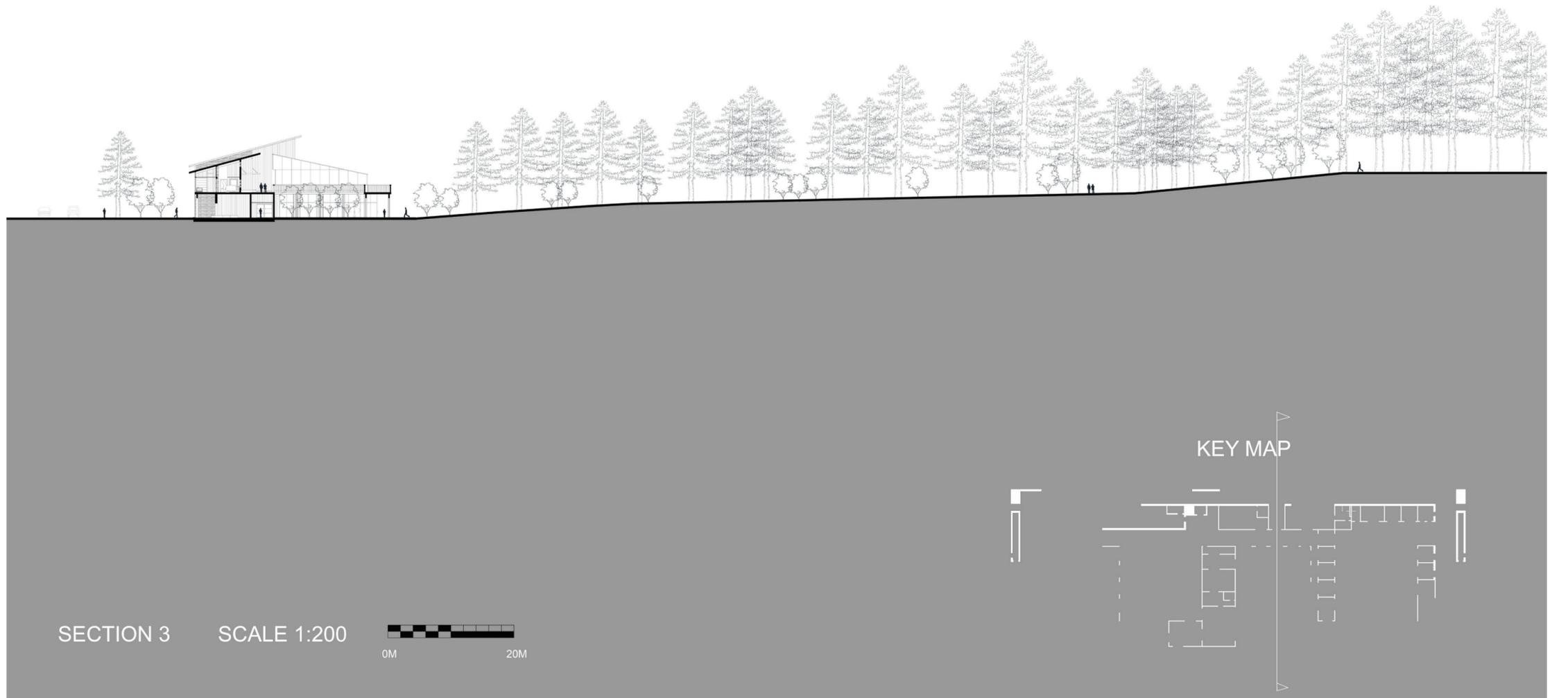


Figure 80. Cross Section 3 1:200.

5 The Road to Recovery

5.1 Conclusion

By breaking the stigma towards AUD, architecture can provide a place of recovery that incorporates serenity, calmness and safety into masses and voids. These architectural spaces have a direct correlation to the surrounding nature, bringing the trees from the forest into the exterior courtyard spaces. The interior courtyard spaces allow for the patients to have an ongoing connection to nature. This is achieved through visual connections to the forest, water elements, well-lit interior spaces and a material palette of wood, stone and glass.

These spaces affect our moods, and our moods trigger our inner healing capacity. There is a saying by Alexander Den Heijer, "When a flower doesn't bloom, you fix the environment in which it grows, not the flower."⁶⁵ Architecture can fill the gap between the current Detox Centre Typology and what this thesis proposes to provide a solution for. Current studies have shown that there are several methods that need to come together to have a successful recovery from AUD. These methods include therapy (group and individual), connection to nature, fitness, nutrition, a network of support, a connection to a higher power, the willingness to want to change, and having an architectural space that is calming and uplifting.

Addiction is a disorder in the brain. Once patients and families realize this they begin to understand that it is possible to re-train the neural networks in our brain. Addiction is a disorder of Genes, Reward system including dopamine, our Memory glutamate system which trigger our habits and cues, Stress system, our choices including our motivations in the OFC, ACC, IC, and our self meaning, our spiritual connection to a higher power. With all of these systems in a disarray this is why addictions take hold.

This new architectural typology will serve as a prototype of a space of recovery for future proposals around the world. The intention of this thesis is to inspire others to investigate more into this topic and give hope to patients that they are worthy of a second chance. That it is possible to change the way our brains are hard wired and the path to sobriety is achievable. Architecture is a catalyst for the road to recovery. Much thought and intention has gone into the designing of spaces where people drink. Now it is time to put forth that same dedication to spaces of recovery which offer a sense of serenity, calmness and safety.

⁶⁵ "When a Flower Doesn't Bloom, You Fix the Environment in Which It Grows, Not the Flower," *Julie Parker Practice Success*, August 23, 2019, <https://julieparkerpracticesuccess.com/when-a-flower-doesnt-bloom-you-fix-the-environment-in-which-it-grows-not-the-flower/>

Appendix

Addiction is a disorder of the following six categories listed A-F in the Appendix.

- A. Genes (vulnerability) polymorphisms, epigenetic changes
- B. Reward (incentive salience) dopamine, dopamine receptors
- C. Memory (habits, cues) glutamate, synaptic remodelling
- D. Stress (anti-reward system) HPA axis
- E. Choice (motivation, insight) OFC, ACC, PFC, IC
- F. Meaning (spirituality)

Section G explains withdrawal symptoms and section H explains AUD.

A. GENES

DNA is a sequence of genes, which are chemicals in our body that come in four types A (Adenine), C (Cytosine), T (Thymine) and G (Guanine).⁶⁶ The Gene is the most basic functional and physical unit of heredity.⁶⁷ The purpose of genes is to be a set of instruction manuals for your body, instructing your cells to produce proteins. The gene is just a section of the entire DNA strand in your body. When you put together the whole sequence of genes and bases, this is called your genome.⁶⁸

“Epigenetics is an emerging field of science that studies heritable changes caused by the activation and deactivation of genes without any change in the underlying DNA sequence of the organism.”⁶⁹ Epigenetics include Modifications in DNA methylation and Histone acetylation that affect gene expression. This phenomenon tells the cells what genes to express. Environmental factors can affect heritable changes in gene expression, although these changes are reversible. This sequence allows the passage of information from one generation to the next that is not encoded in the DNA sequence.

It is an inheritance without a DNA sequence modification.⁷⁰ This phenomenon can be related to people who have had severe traumatic experiences, which have been passed down to the next generations. It has been recorded that Holocaust survivors with PTSD have inturn passed down this symptom to their children without them being exposed to trauma.⁷¹

What happens with one generation can be passed down to two generations in the future. AUD can be passed down through alcohol genes. This becomes our genetic vulnerability and in some cases because of our ancestors and their habits, we have inherited a susceptibility. Although, as mentioned before these traits are reversible and we can use “Strategies to deal with the GENETIC (Vulnerability) component of addiction.”

⁷² Some of these strategies include, Careful framing (vulnerability > adaptation), using adaptive strategies to overcome the addiction, risk assessment and stratification for all future medications, and pharmacogenomics.⁷³

⁶⁶ “Genes Made Easy | East London Genes & Health,” *Genesandhealth.org*, Accessed February 17, 2021, <http://www.genesand-health.org/genes-your-health/genes-made-easy>.

⁶⁷ “What Is a Gene?: MedlinePlus Genetics,” *Medlineplus.gov*, Accessed February 17, 2021, <https://medlineplus.gov/genetics/understanding/basics/gene/>.

⁶⁸ “Genes Made Easy | East London Genes & Health,” *Genesandhealth.org*, Accessed February 17, 2021, <http://www.genesand-health.org/genes-your-health/genes-made-easy>.

⁶⁹ “Epigenetics,” *Genome.gov*, Accessed February 17, 2021, <https://www.genome.gov/genetics-glossary/Epigenetics>.

⁷⁰ “The Brain and Recovery: An Update on the Neuroscience of Addiction,” *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDaiFylhy&index=6. 34:57

⁷¹ *Ibid.*, 34:57.

⁷² *Ibid.*, 38:47.

⁷³ *Ibid.*, 38:47.

B. REWARD

The reward pathways in the brain are rarely under voluntary control. The brain senses when an activity constantly gives it pleasure, it will rewire the brain chemistry to make the person change their activities to receive more of it. The consumption of alcohol is the activity in this case that leads to addiction.⁷⁴ “Thus, alcohol is a powerful drug. It affects several neurological pathways and causes significant changes in the brain. Some of the neurological pathways known to be affected by alcohol consumption include the dopaminergic, serotonergic, γ -aminobutyric acid (GABA) and glutamate pathways.”⁷⁵ Alcohol affects the central nervous system just like any other drug. The typical type of alcohol consumed is Ethanol, with varying percentages. Ethanol when consumed depresses brain function, compared to the style of an anesthetic.⁷⁶ When consuming “Ethanol at low blood concentrations releases behaviours that are otherwise inhibited and usually produce feelings of relaxation and good mood which may facilitate socializing.”⁷⁷ Ethanol is good at low doses and possibly even useful. This is to say that not all-consuming of alcohol is bad but when it becomes a constant abuse of the system and an addiction is formed, this is when the person’s life can be jeopardized.

The longer someone abuses their system with alcohol, this produces physiological changes in the brain, for instance, physical dependence and increased tolerance. These chemical changes in the brain maintain the person’s compulsive inability to stop consuming alcoholic beverages which result in alcohol withdrawal syndrome (AWS) once the person decides to stop drinking.⁷⁸ “An alcoholic is therefore aware of the harm caused by alcohol on his or her health but is unable to control such compulsive drinking impulses.”⁷⁹

74 Niladri, Banerjee, “Neurotransmitters in Alcoholism: A Review of Neurobiological and Genetic Studies.” *Indian Journal of Human Genetics* 20, no. 1 (2014): 20–31. <https://doi.org/10.4103/0971-6866.132750>.

75 Ibid.

76 Ibid.

77 Niladri, Banerjee, “Neurotransmitters in Alcoholism: A Review of Neurobiological and Genetic Studies.” *Indian Journal of Human Genetics* 20, no. 1 (2014): 20–31. <https://doi.org/10.4103/0971-6866.132750>.

78 Ibid.

79 Ibid.

There are two means by which alcoholic addiction takes place. “The first is a positive reinforcement method and the second is a negative reinforcement method.”⁸⁰

1. “Positive reinforcement represents an environmental situation in which a rewarding stimulus or experience (e.g., alcohol reinforcement euphoria) increases the chances that the individual displays a certain response (e.g., alcohol-seeking behaviour).”⁸¹

2. “Negative reinforcement refers to an increase in behavioural patterns, such as alcohol ingestion, if the behaviour facilitates the individual to circumvent or avoid an aversive stimulus.”⁸²

The stress and reward circuits in the brain are the underlying changes and neuroadaptations. A series of neurons is a neural circuit that then sends electrochemical signals to each other. When the neuron is activated it sends neurotransmitters which are chemical signalling molecules through the neural circuit to be bound to receptors (specific molecules). Certain binding of neurotransmitters may cause inhibitory or excitatory signals to pass further along the circuit depending on which circuits are involved. “Alcohol interacts with several neurotransmitter systems in the brain’s reward and stress circuits. These interactions result in alcohol’s acute reinforcing effects. Following the chronic exposure, these interactions in turn cause changes in neuronal function that underlie the development of alcoholism.”⁸³

80 Ibid.

81 Ibid.

82 Ibid.

83 Ibid.

Dopamine Pathway

One of the neurotransmitters that are primarily involved in the mesolimbic circuit system is named Dopamine. This neurotransmitter projects “from the brain’s ventral tegmental area to the nucleus accumbens.”⁸⁴ Incentive motivation is one of the main circuits that is affected by Dopamine. This is how a person reacts to changes in the environment fueled by incentives. In recent studies, it has been proven that dopamine has a role in incentive motivation in conjunction with acute alcohol intoxication.⁸⁵ Even the simple anticipation of alcohol can result in the production of dopamine in the nucleus accumbens and this is determined by the fluid outside the neurons from the increased levels of Dopamine.⁸⁶ When alcohol-dependent people go through alcohol withdrawal, this phenomenon produces decreases in dopamine function which in turn may add to the withdrawal symptoms and trigger an alcohol relapse.⁸⁷

84 Niladri, Banerjee, “Neurotransmitters in Alcoholism: A Review of Neurobiological and Genetic Studies.” *Indian Journal of Human Genetics* 20, no. 1 (2014): 20–31. <https://doi.org/10.4103/0971-6866.132750>.

85 Ibid.

86 Ibid.

87 Ibid.

Serotonin Pathway

There is a well-established link between serotonin depletion, alcohol drinking and impulsivity behaviour between humans and rats. Serotonin is a neurotransmitter also known as 5-hydroxytryptamine or 5-HT. It has been an area of interest for potential pharmacotherapy for alcoholism.⁸⁸ “During alcohol withdrawal, serotonin release in the nucleus accumbens of rats is suppressed and this reduction is partially reversed by self-administration of alcohol during withdrawal.”⁸⁹ Serotonin is the primary hormone that stabilizes our happiness, mood, and feelings of well-being. This hormone affects the entire body, enabling brain cells and other areas of the nervous system to communicate with one another. Serotonin also assists with eating, digestion, and sleeping.⁹⁰

88 Ibid.

89 Ibid.

90 “Serotonin | Hormone Health Network,” *Hormone.org*, Accessed February 21, 2021, <https://www.hormone.org/your-health-and-hormones/glands-and-hormones-a-to-z/hormones/serotonin>.

GABA Pathway

The major inhibitory neurotransmitter in the brain is GABA. It functions through two receptor subtypes named GABAA and GABAB. GABA activity in the brain is activated through two general mechanisms, which are increased by alcohol.⁹¹ “It can, for example, act on the GABA-releasing (i.e., presynaptic) neuron, causing an increase in GABA release; or it can act on the signal-receiving (i.e., postsynaptic) neuron facilitating the activity of the GABAA receptor.”⁹² The intake of alcohol is repressed by compounds that impede the operation of the GABAA receptor in addition to compounds that trigger the GABAB receptor in the ventral pallidum, nucleus accumbens, bed nucleus of the stria terminalis and amygdala.⁹³ After persistent circumstances of alcohol exposure, the GABA system in the brain will be altered. It has been acclaimed that in some regions of the brain, “the expression of genes that encode components of the GABAA receptor is affected due to alcohol.”⁹⁴

91 Niladri, Banerjee, “Neurotransmitters in Alcoholism: A Review of Neurobiological and Genetic Studies,” *Indian Journal of Human Genetics* 20, no. 1 (2014): 20–31, <https://doi.org/10.4103/0971-6866.132750>.

92 Ibid.

93 Ibid.

94 Ibid.

C. MEMORY

Glutamate Pathway

The major excitatory neurotransmitter in the brain is glutamate and it applies its repercussions throughout several receptor subtypes, including one termed the N-methyl-D-aspartate (NMDA) receptor.⁹⁵ For a long time, glutamate systems have been investigated to be involved in the “acute reinforcing actions of alcohol and the effect of alcohol on an organism can be mimicked with the help of NMDA receptor antagonists.”⁹⁶ Dissimilar to the case with GABA, glutamate activity in the brain is inhibited by alcohol. It has been proven that acute alcohol exposure generates a drop in the levels of extracellular glutamate in a specific region of the brain named the striatum which carries the nucleus accumbens and other structures.⁹⁷ Due to modifications in the function of NMDA receptors and another receptor subtype called glutamate subtype 5 the transmission of glutamate is most likely affected.⁹⁸ NMDA receptors are entangled in alcoholism as they play a role in neuroplasticity, a procedure distinguished by a neural reorganization that most likely assists in hyperexcitability and cravings in the course of alcohol withdrawal.⁹⁹

95 Ibid.

96 Ibid.

97 Ibid.

98 Ibid.

99 Ibid.

D. STRESS

Stress on the mind and body can play a significant factor in how people deal with life situations. People can be stuck in constant stress situations or are constantly intoxicated by substances. Individuals become pleasure deaf to ordinary pleasurable experiences like going for a walk in the sunshine, they are not excited by more basic natural pleasures that would have stimulated them in the past. They can only be excited by pleasures that 'shout' as drugs do.¹⁰⁰ This now becomes the way that the person deals with little stress and big stress, by immediately going for the substance to mask their emotions. The motivator of stress can be crucial to survival, our body has a fight-or-flight mechanism that indicates to a person how to counter dangerous situations. Although, when there is an influx of stressors at one time and the human body becomes triggered too easily, this can diminish a person's physical and mental health and become detrimental.

¹⁰¹ When faced with a threat or challenge, the body activates chemicals that help the person confront their fears and rise to the challenge or to run away and hide. The body deals with normal stress through a part of the brain, the HPA Axis, this natural cycle operates by the Hypothalamus to release CRH (Corticotropin-Releasing Hormone) to the Anterior Pituitary which in turn releases ACTH (Adrenocorticotropic Hormone) to the Adrenal Cortex. When the stressful situation is dealt with, the system reverses itself and shuts down.¹⁰²

The human body will produce substantial amounts of the chemicals cortisol, epinephrine, and norepinephrine. The following physical reactions are triggered by this chemical release:¹⁰³

- increased blood pressure
- heightened muscle preparedness
- sweating
- alertness

A faster heart rate is caused by Norepinephrine and epinephrine. A constant bombardment of substances keeps the body in an indefinite state of stress. "Stress slows down some normal bodily functions, such as those that the digestive and immune systems perform. The body can then concentrate its resources on breathing, blood flow, alertness, and the preparation of the muscles for sudden use."¹⁰⁴

There are two recognized types of stress indicated by the National Institute of Mental Health (NIMH), these include acute and chronic. Each type of stress requires distinct levels of management.¹⁰⁵ Some examples of types of stressors are identified by the NIMH, these include:¹⁰⁶

- routine stress, such as childcare, homework, or financial responsibilities
- sudden, disruptive changes, such as a family bereavement or finding out about a job loss
- traumatic stress, which can occur due to extreme trauma as a result of a severe accident, an assault, an environmental disaster, or war

¹⁰⁰ "The Brain and Recovery: An Update on the Neuroscience of Addiction," *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDAiFylhy&index=6, 56:50.

¹⁰¹ "Stress: Why Does It Happen and How Can We Manage It?," *Medicalnewstoday.com*, March 12, 2020, <https://www.medicalnewstoday.com/articles/145855>.

¹⁰² "The Brain and Recovery: An Update on the Neuroscience of Addiction," *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDAiFylhy&index=6, 55:35.

¹⁰³ "Stress: Why Does It Happen and How Can We Manage It?," *Medicalnewstoday.com*, March 12, 2020, <https://www.medicalnewstoday.com/articles/145855>.

¹⁰⁴ Ibid.

¹⁰⁵ "Stress: Why Does It Happen and How Can We Manage It?," *Medicalnewstoday.com*, March 12, 2020, <https://www.medicalnewstoday.com/articles/145855>.

¹⁰⁶ Ibid.

Acute Stress

Acute stress is the most common and is labelled as short-term. This form of stress often progresses when people contemplate the pressures of life events that they have experienced or are about to in the near future.¹⁰⁷ Often acute stressors are current and require an immediate response. Acute stress does not inflict an identical amount of damage on the individual as long-term stress. Tension headaches and an upset stomach, and moderate amounts of distress can be caused by short-term effects.¹⁰⁸

¹⁰⁷ Ibid.
¹⁰⁸ Ibid.

Chronic Stress

The more concerning stress related to AUD is that of Chronic stress, long-term effects that leave an individual to turn to substances to cope with their stress levels. "Ongoing poverty, a dysfunctional family, or an unhappy marriage are examples of situations that can cause chronic stress."¹⁰⁹ This occurs when an individual can not find an escape from their stressors and cease to seek out solutions. An early life encounter with trauma may also bestow chronic stress.¹¹⁰ It is very difficult for the body to restore itself to normal levels of stress hormone activity due to chronic stress. These factors can contribute to complications in the following systems:¹¹¹

- cardiovascular
- respiratory
- sleep
- immune
- reproductive

Being in a continual state of stress can escalate an individual's risk of "type 2 diabetes, high blood pressure, and heart disease. Depression, anxiety, and other mental health disorders, such as post-traumatic stress disorder (PTSD), can develop when stress becomes chronic."¹¹²

Behaviours associated with stress include:¹¹³

- food cravings and eating too much or too little
- sudden angry outbursts
- drug and alcohol misuse
- higher tobacco consumption
- social withdrawal
- frequent crying
- relationship problems

¹⁰⁹ Ibid.
¹¹⁰ Ibid.
¹¹¹ Ibid.

¹¹² "Stress: Why Does It Happen and How Can We Manage It?," *Medicalnewstoday.com*, March 12, 2020, <https://www.medicalnewstoday.com/articles/145855>.

¹¹³ Ibid.

E. CHOICE

The Orbitofrontal cortex (OFC) give things value ¹¹⁴

- Decision-making guided by rewards
- Integrates sensory and emotional information from lower limbic structures
- Flexible assignment of value to environmental stimuli to motivate or inhibit choices and actions
- Self-monitoring and social responding

“Something has gone wrong with the evaluation in the brain.” ¹¹⁵

Anterior Cingulate Cortex (ACC) picks up on things in the environment and helps guide your behaviour. Observe one’s self through the eyes of others. ¹¹⁶

- Works with OFC: decision-making based on reward values
- But also generates new actions based on past rewards/punishments
- Appreciation and valuation of social cues
- MRI: active in tasks requiring empathy and trust

“Losing self-cognition, losing a part of them.” ¹¹⁷

Things that can be done to improve and repair social cognition. It’s hard to recover from addictions in social isolation; it requires social interaction.

Insular Cortex (IC) part of the brain that attaches our consciousness to our body. ¹¹⁸

- Abrupt cigarette smoking cessation with IC lesions (Naqvi et al)
- Important in emotional awareness, empathy, interoceptive representation
- Impairment is one part of craving

¹¹⁴ Ibid., 27:37.

¹¹⁵ Ibid., 28:36.

¹¹⁶ Ibid., 29:28.

¹¹⁷ Ibid., 30:03.

¹¹⁸ “The Brain and Recovery: An Update on the Neuroscience of Addiction,” *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDAiFyIhy&index=6. 32:01.

“Choice” vs “Disease” ¹¹⁹

“Three sentences about addiction” ¹²⁰

- Addiction is a disorder of pleasure
- Addiction is a disorder of choice
- Addiction is caused by stress

In Brain ¹²¹

Reward system=nucleus accumbens

Memory=hippocampus and amygdala

Motivation and related circuitry=ACC, basal forebrain

“Strategies to deal with the Frontal Cortex (choice) component of addiction” ¹²²

- Medical/craving/psychiatric stabilization
- Abstinence
- Peer support (small, single-gender, long term)
- Agency-building exercise
- Service work, working with newcomers
- Purposeful, meaningful goals
- Subject > Object

¹¹⁹ Ibid., 17:35.

¹²⁰ Ibid., 20:09.

¹²¹ Ibid., 21:28.

¹²² Ibid., 1:03:36.

F. MEANING

The connection to a higher power helps patients get through the rest of the steps. Programs such as the AA focus on this connection especially as it is embedded into their methodology. As human beings it is important for all of us to believe in something, whether it be a higher power, science or just believing in ourselves. By believing in something, meaning is created in that person's life. While going through recovery from AUD, meaning, inspiration and hope is required to complete the journey to sobriety. The patient should have the support of their family, caretakers, friends, themselves and by this support network hope is kindled. Knowing that we are here for a reason and this is the journey that the higher power wants us to take hopefully gives comfort to the patient that their life is valuable.

“AA: using Non- Rational Concepts”¹²³

Tribe
Myth
Ritual
Faith
Hope
Acceptance

Alcoholics Anonymous AA

There is not just one golden method for achieving sobriety. It is important to use all the resources at hand to remain sober. One of the original methods is Alcoholics Anonymous, AA. This organization takes a spiritual approach to sobriety including the 12 steps.

¹²³ “The Brain and Recovery: An Update on the Neuroscience of Addiction,” *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDaIFyIhy&index=6, 1:06:19.

The 12 Steps of AA¹²⁴

1. We admitted we were powerless over alcohol and that our lives had become unmanageable.
2. Came to believe that a Power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God as we understood him.
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked Him to remove our shortcomings.
8. Made a list of all persons we had harmed, and became willing to make amends to them all.
9. Made direct amends to such people wherever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and when we were wrong promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God, as we understood Him, praying only for knowledge of His will for us and the power to carry that out.
12. Having had a spiritual awakening as the result of these Steps, we tried to carry this message to alcoholics and to practice these principles in all our affairs.

Scientific Approach

For people who are non-faith-based, one of the more popular methods is Smart Recovery which takes on a secular and science-based approach focusing on cognitive behavioural therapy and non-confrontational motivational methods.¹²⁵

1. Medication-assisted treatment (MAT): helps people with certain addictions, like opioid addiction, cope with overwhelming cravings.
2. Cognitive behavioural therapy (CBT): teaches people new ways of thinking to handle difficult emotions or situations in healthy ways.
3. Dialectical behavioural therapy (DBT): Like CBT, this therapy teaches people how to manage emotions and decrease conflicts within relationships.
4. Contingency management: uses positive reinforcement and rewards to help people continue working toward recovery.
5. Recreational therapy: uses holistic approaches, such as yoga exercise and creative activities like art, music and dance, to help the whole person heal.

¹²⁴ “The 12 Steps Of AA | Alcoholics Anonymous Program.” *Alcohol.org*. Accessed November 11, 2020, <https://www.alcohol.org/alcoholics-anonymous/>.

¹²⁵ “Introduction to SMART Recovery.” *SMART Recovery*, Accessed July 15, 2021, <https://www.smartrecovery.org/intro/>.

G. WITHDRAWAL SYMPTOMS

For withdrawal symptoms, there are 3 timelines including mild, moderate, severe.¹²⁶

- Most experience withdrawal symptoms within 24 hours.
- We are all biochemically different.
- Not everyone has the same symptoms or timelines.
- Symptoms and timeline depend on the severity of dependence.

Timeline #1: Mild Alcohol Withdrawal¹²⁷

- Symptoms generally peak and go away within 24 hours
- Exacerbated (and extended) hangover symptoms:
- Unease / Nausea
- Trouble sleeping
- Shaky hands
- Mild sweating
- Fatigue
- Mild depression

Timeline #2: Moderate Alcohol Withdrawal¹²⁸

- Symptoms generally peak and go away within 48 hours
- Mild withdrawal symptoms with some more disturbing ones:
- Increased blood pressure
- Increased sweating
- Heightened anxiety
- Mood swings
- Sense of impending doom
- Hypersensitive reflex responses

Timeline #3: Severe Alcohol Withdrawal¹²⁹

- Symptoms generally peak around 72 hours
- Quitting can produce symptoms only a few hours after last drink:
- High fever
- Uncontrollable negative thoughts
- Visual, auditory, and/or tactile hallucinations
- Full body seizures, usually within 1-2 days of the last drink
- Delirium Tremens - confusion/hallucinations that can last up to a week (untreated)

Severe withdrawal warning¹³⁰

- Severe alcohol withdrawal can be fatal - Get to a doctor
- What will the doctor do?
- Probably prescribe benzodiazepine/drugs that will calm down your hyperactive brain, prevent seizures and help to restore normal blood pressure
- You may be required to detox under medical supervision

Why does this happen - Gaba/Glutamate mechanism¹³¹

- Alcohol mimics GABA
- Alcohol suppresses glutamate
- Dependent drinkers' brains adapt to alcohol
- Decrease natural GABA activity
- Increase glutamate activity
- Quitting produces the perfect storm: Rebound of glutamate in midst of GABA deficiency

¹²⁶ "The Stages of Alcohol Withdrawal," *Fit Recovery*, 2019, <https://www.youtube.com/watch?v=QfMZdwAPbLU>, 0:52.

¹²⁷ *Ibid.*, 2:29.

¹²⁸ *Ibid.*, 4:03.

¹²⁹ *Ibid.*, 5:03.

¹³⁰ "The Stages of Alcohol Withdrawal," *Fit Recovery*, 2019, <https://www.youtube.com/watch?v=QfMZdwAPbLU>, 8:10.

¹³¹ *Ibid.*, 11:08.

Why do episodes get worse?- Kindling ¹³²

- “A person who suffers from withdrawal symptoms and continues drinking is likely to experience worse withdrawal symptoms in the future.”
- Brain’s compensatory manipulation of GABA and glutamate leads to long term consequences
- Kindling studied in monkeys

Why do I still feel so bad? - PAWS ¹³³

- Post-Acute Withdrawal Syndrome
- Discomfort can continue for weeks, months, or years if underlying biochemical imbalances are not addressed
- Alcohol cravings
- Anxiety
- Depression
- Insomnia

What can I do to shorten the post-acute withdrawal? ¹³⁴

- Nutritional Supplementation
- Diet Changes
- Adequate Rest/Sleep
- Social Support
- Exercise (Endorphin Deficiency Syndrome)
- Building New Neural Pathways

132 Ibid., 13:01.

133 Ibid., 14:01.

134 “The Stages of Alcohol Withdrawal,” *Fit Recovery*, 2019, <https://www.youtube.com/watch?v=QfMZdwAPbLU>, 16:57.

H. AUD

The term for people with drinking problems is usually referred to as alcohol abuse or alcoholism, although psychiatrists and other medical professionals now formally use the term Alcohol Use Disorder or AUD. ¹³⁵ This is due to previous definitions not capturing the total spectrum of symptoms that are included in AUD. ¹³⁶ The term AUD comes from the “Diagnostic and Statistical Manual of Mental Disorders, or DSM.” ¹³⁷ The spectrum of Problem Drinking spans from one extreme to the other. Rating these levels of alcohol use disorder can be ranked in order from, 1) No-Risk, 2) Low Risk, 3) Mild, 4) Moderate, 5) Severe, 6) Death. ¹³⁸

Throughout history, people have faced the issue of AUD and addictions. This empowerment over the brain has influenced people globally affecting families and individuals. People who form addictions are often influenced by traumatic experiences, their environments, family history of mental health issues.

“Low levels of alcohol use is associated with health benefits resulting in lower risks of illness and premature death, notably from ischemic heart disease, ischemic stroke and diabetes. However, higher levels of alcohol use are a significant risk factor for numerous chronic health conditions, such as heart disease, cirrhosis of the liver and several types of cancers.” ¹³⁹

A snapshot of alcohol’s impacts on Canadians: ¹⁴⁰

- In 2002, 4,258 deaths in Canada were related to alcohol abuse, representing 1.9% of all deaths.
- Costs related to alcohol in Canada equalled approximately \$14.6 billion in 2002.
- From April 2013 to March 2014, \$20.5 billion worth of alcohol was sold in Canada.
- In 2008, impaired driving was the leading cause of criminal death in Canada.
- Among psychoactive drugs, alcohol-related disorders were the top cause of hospitalizations in Canada in 2011.

135 “What We Get Wrong About “Alcoholism,”” *SciShow*, 2019, <https://www.youtube.com/watch?v=cZ1ZJa6A5TY>, 0:36.

136 Ibid., 0:49.

137 Ibid., 1:33.

138 Stephen Ross, MD, “HBO Doc: Risky Drinking,” 2015, 40:50 min.

139 “Alcohol (Canadian Drug Summary) | Canadian Centre on Substance Use and Addiction,” *Ccsa.ca*, Accessed October 26, 2020, <https://www.ccsa.ca/alcohol-canadian-drug-summary>.

140 “The Chief Public Health Officer’s Report on the State of Public Health in Canada, 2015: Alcohol Consumption in Canada,” *Canada, Public Health Agency of, Transparency - other. aem*, January 18, 2016, <https://www.canada.ca/en/public-health/services/publications/chief-public-health-officer-reports-state-public-health-canada/2015-alcohol-consumption-canada.html>.

In Canada, it has been reported that Canadians consumed 8.2 litres of pure alcohol per year. 23% of Canadians reported drinking heavily.¹⁴¹ In the United States of America, Americans reported drinking 8.7 litres of pure alcohol per year. With 24.5% of them drinking heavily.¹⁴² In the United Kingdom the numbers are even higher, with citizens reported drinking 10.4 litres of pure alcohol per year. With 33.4% of drinkers drinking heavily.¹⁴³ Across the world in Australia, reports show that Australians consume 10.4 litres of pure alcohol per year and 13% of those stats are heavy drinkers.¹⁴⁴

“Various events that happen over a person’s lifespan affect drinking patterns and the risk for impacts from alcohol.”¹⁴⁵

- Poor academic performance
- Problems at school
- Dropping out
- Moving from high school to university/college
- Unemployment
- Stress at work
- Divorce
- Marital conflict/dissatisfaction
- A partner who drinks heavily
- Stressful life events
- Marriage
- Becoming a parent
- Retirement
- Ageing

141 “The Chief Public Health Officer’s Report on the State of Public Health in Canada, 2015: Alcohol Consumption in Canada,” *Canada, Public Health Agency of. Transparency - other. aem*, January 18, 2016, <https://www.canada.ca/en/public-health/services/publications/chief-public-health-officer-reports-state-public-health-canada/2015-alcohol-consumption-canada.html>.

142 Ibid.

143 Ibid.

144 Ibid.

145 Ibid.

Addiction is a disorder of chemical imbalances in the brain. The following are the six categories that affect addiction. Including our Genes and Epigenetics, this is our vulnerability. The reward system is affected by alcohol consumption giving an excessive surge of pleasure, more than the normal amounts. Some of the neurological pathways include the dopaminergic, serotonergic, γ-aminobutyric acid (GABA) and glutamate pathways. Memory is affected, which triggers habits and cues. The Glutamate pathway is the major excitatory neurotransmitter and is known to reinforce the actions of alcohol, it is the most abundant neurochemical in the brain. The long term stress is associated with the anti-reward system, for long-term drinking, the body doesn’t get a chance to be in a calm state, it is always under stress. Decision-making and choices are guided by the rewards of alcohol. The Orbitofrontal cortex (OFC) gives value to choices and the Anterior Cingulate Cortex (ACC) picks up on things in the environment and helps guide behaviour. Spiritual meaning and the connection to the higher self is often lost.

When Learning the neuroscience of addiction, there are some that debate the topic of “Choice” vs “Disease”¹⁴⁶ On the one hand, we are always presented with a recurring choice, to drink or not to drink. Although it is not this simple, because of the chemical imbalances in the brain it is difficult to make the correct choices, ones that will benefit our bodies in the long term. AUD becomes a disease, if we break down the word, disease, this signifies that the body is not at ease. Addiction becomes a disorder of chemical imbalances in the brain which inhibit our rational thinking. More than one thing going wrong in the brain with addictions at a time leads to this repetitive and self-destructing behaviour.

“Addiction is a disorder of...”¹⁴⁷

1. Genes (vulnerability) polymorphisms, epigenetic changes
2. Reward (incentive salience) dopamine, dopamine receptors
3. Memory (habits, cues) glutamate, synaptic remodelling
4. Stress (anti-reward system) HPA axis
5. Choice (motivation, insight) OFC, ACC, PFC, IC
6. Meaning (spirituality)

146 “The Brain and Recovery: An Update on the Neuroscience of Addiction,” *Lounge Music*, 2018, https://www.youtube.com/watch?v=zYphZvRHm6Y&list=PLf6Vt5xKR82to4Ta9_-CxWc6CDAiFylhy&index=6, 17:35.

147 Ibid., 24:12.

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