HOME INTERIORS & FURNISHINGS IN REMOTE NORTHERN FIRST NATION COMMUNITIES:

EXPLORING SUSTAINABLE AND CULTURALLY APPROPRIATE SOLUTIONS THROUGH THE BOREAL BUILDERS

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ABSTRACT

The First Nations (FN) communities of Northern Manitoba, Canada have been facing an extreme housing crisis. Overcrowding paired with insufficient funding, low quality materials and mould-contamination has created an uninhabitable environment where diseases such as hepatitis, acute rheumatic fever, asthma and tuberculosis are nine times more prevalent on remote northern reserves. Given that adequate shelter is considered one of the fundamental requirements of life, the circumstances as seen on reserves are unacceptable and the need for serious improvements should be regarded as critical.

Through a series of literature reviews, interviews and precedent analysis this Master of Interior Design Practicum project explores ways in which to address the housing crisis. Literature regarding Indigenous design philosophy helps to define what Indigenous design and architecture is, creating the foundation for a culturally appropriate housing solution to build upon. Theories of Resiliency, sustainability and the Honourable Harvest uncover ways to build homes that not only sustain the people living within them but also sustains the land in which the raw materials are harvested from. The complexity that is home ownership on-reserve is addressed as building strategies and energy independence contributes to self-determination. Lastly it is with the lessons learned from historical and modern Indigenous home design that grounds findings from literature in real life housing solutions. Looking into a wide range of Indigenous housing solutions, helps bridge the gap between traditional ways of knowing and modern schools of thought.

Understanding theories regarding Indigenous philosophy, sustainability, resiliency and self-determination as well as considering various applications of Indigenous housing solutions from communities around the subarctic and plains, aids in creating appropriate and healthy housing solutions for remote FN communities.

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The First Nations (FN) communities of Northern Manitoba, Canada have been facing an extreme housing crisis. Overcrowding paired with insufficient funding, low quality materials and mold-contamination has created an uninhabitable environment where diseases such as hepatitis, acute rheumatic fever, asthma and tuberculosis are nine times more prevalent on remote northern reserves (Natalie, 2017). Given that adequate shelter is considered one of the fundamental requirements of life (Adelson, 2005), the circumstances as seen on reserves are unacceptable and the need for serious improvements should be regarded as critical.

One of the challenges of building in remote FNs is the design of the homes themselves. Housing subsidies administrated by the government have been unsuccessful in remote northern communities, as the unique needs of remote northern homes are not considered (Sawchuk, 2018). In these circumstances the homes were poorly constructed resulting in a life span of 15 to 20 years, which is less than half of the national average (Sawchuk, 2018).

Wasagamack First Nation (WFN) and Garden Hill First Nation (GHFN) are two of the remote Island Lake Northern Manitoban FN communities working with the University of Manitoba partners in what is known as the Mino Bimaaiziwin Partnership. The aim of this community-led collaboration is to not only bring healthy, culturally appropriate and sustainable housing to these communities, but also provide opportunities for education, self-determination and home ownership (Bimaadiziwin, 2018). In the fall of 2018, Mino Bimaaiziwin launched the Boreal Home Builders Program in both communities (Bimaadiziwin, 2018). The Boreal Home Builders project-based training program that aims to equip local FN students with the skills and tools needed to build homes from wood sustainably harvested from local sources (Bimaadiziwin, 2018). Over the next five years, as part of the project-based training, students will build two new houses in each community per year. This Master of Interior Design practicum has been aligned to Boreal Home Builders Program to specifically concentrate on the development of interior solutions that potentially could be used in the initial residential prototype.

1.1. OBJECTIVES

The scope of this Master of Interior Design practicum includes the interior design of two homes. The first home is a simple but thoughtful design based on what is currently feasible and the second home will explore the possibilities of Indigenous interior beyond some of the current limitations. The first home is undertaken in parallel with the activities of the 2018-2019 Boreal Home Building Program in WFN and GHFN. This basic three bedroom house is designed specifically to be used as a part of the Boreal home Builders training, from the stages of harvesting and milling wood, framing, plumbing, electrical, final finishes and everything in between. Although the home on first glance appears simple in comparison to the second design, it is in this phase that the basic needs and the unique challenges of buildability are established and addressed given the remoteness of the site.

The second design is intended for the communities to undertake when the local home building skills are more practiced, thus allowing for a more challenging design composition. This design builds on the basic findings of the first home, in order to improve and expand on solutions in terms of sustainability, efficiency, resiliency and durability. In addition, the second house design involves a much deeper exploration of history, heritage, culture, tradition, social and family organization participatory design activities in the community. These factors translate into interior design language and determines the function of the built environment. Southern Canadian and western ideologies are not fitting into northern remote First Nations communities so understanding the unique technical and cultural requirements of these two FN is an important aspect of design process that cannot be over looked. Although both homes will appear to be different, they share the same common goal of providing design solutions that address the interior design needs of housing in remote FN communities. In order to achieve this goal, the interior design solution should meet the following objectives:

- Accommodate daily tasks and life style
- Support the unique culture and identity of these First Nations communities
- Reduce reliance on resources outside of the community
    - Use locally-sourced materials and finishes (e.g. wood, recycled/salvaged)
    - Be affordable and straightforward to build/install.
    - Be durable and easy to maintain with locally available resources
    - Promote energy independence through integration of energy efficient and bio-fueled equipment and environmentally responsive indoor systems (e.g. passive lighting, heating, ventilation)
    - Support the safe collection, storage & treatment of potable & rain water.
    - Cold storage, and solid waste disposal/recycling
- Provide support for healthy living
- Be flexible and accessible to meet needs of multi-generational, multi-family households

1.2. DESIGN PROCESS

As a non-indigenous person from the Greater Toronto Area, I acknowledge that I inherently have western ideologies and have approached this research as an outsider. Through my design inquiry I have sought to learn more about Indigenous ways of knowing in order to provide a design program that not only promotes health and wellness but also encompasses culture, heritage and traditional knowledge. My design inquiry includes literature review (Chapter 3. Literature Review) precedent studies (Chapter 4. Precedent Anaylsis) and Interviews (Chapter 5. Interviews). The following questions served to guide my design inquiry for the development of the interior solutions for the Boreal Builder's house:

1. How can interior design support the unique Anishiniwuk cultural identity of both WFN and GHFN within a residential typology?
2. Given the remote and northern location of WFN and GHFN,
    a. What are the unique challenges that directly correlate with the remote northern site conditions? (e.g. extreme weather, dust/mud and moisture conditions)
    b. With efficiency, reliability and sustainability as a priority, what interior solutions can effectively address these challenges?
3. What local materials can be respectfully harvested and used as interior design elements?

CHAPTER 2: METHODOLOGY

2.1. INTRODUCTION

This chapter describes the methodology used in this study, which includes literature reviews, precedent studies and interviews.

2.2. LITERATURE REVIEW

To gain multiple perspectives on theories regarding indigenous cross-cultural lenses, resiliency, sustainability and ownership a literature review has been conducted. The Two-Eyed Seeing framework by Indigenous elders, Albert and Murdena Marshall as well as biologist Cheryl Bartlett help to frame how Indigenous and Canadian settlers can effectively collaborate and learn from one another. This over-arching framework is important to the practicum design because it is being conducted by a third-generation Canadian designer with inherit Western ideologies and bias. Understanding collaborating methods will aid in filling the gaps between Indigenous and Western schools of thought.

Indigenous Design Philosophy is explored and explained by looking at Joy Monice and Frank Vodvarka book of *New Architecture on Indigenous Land* (2013). Their book explores in great detail modern Indigenous architecture and how identity, culture, heritage and history are embedded in the design and design processes. Additionally, Monice and Vodvarka's work additionally provides a set of design criteria and form determinates which not only aid in the designing of house one and house two, but also provide an outline of how to analyze traditional and cultural information from an outside perspective.

This literature investigation then turns to an in-depth look at resiliency and sustainability. Dr. Joseph Fiksel argues for the designing of resilient systems, improving on the current standards of sustainability through a Systems Consideration Diagram. Dr. Fiksel analysis strategies help to ensure that the needs of remote FN communities are understood and met. Similarly, Dr. Robin Wall Kimmerer argues for the creation of ecological relationships into sustainable systems. Dr. Robin Wall Kimmerer is a botanist, indigenous woman, and mother and offers a unique perspective on the Indigenous gift giving in her book *Braiding Sweetgrass*. Dr. Kimmerer looks at the honourable harvest as a way to improve the current sustainable standards. Looking at Indigenous ways of honourably harvesting materials, products and systems will aid in the material and system selection in the design phase of the study.

Lastly this literature review will look into home ownership on reserves as it is significantly different than what is experienced in non-indigenous communities. Researchers Bailie and Wayte review the relationship between housing and health specifically in Indigenous communities in Australia. They provide an argument for the importance of Indigenous home ownership as it effects the health and well-being of the residence. Considering Bailie and Wayte's argument, ways in how ownership can be achieved in WFN and GHFN are explored. Lastly, the literature review section concludes with examining the goal of self-determination, as to empower Indigenous leadership and promote independence.

2.3. PRECEDENT STUDIES

In order to create the grounds for meaningful analysis of Indigenous design precedents, a design criteria that is relevant to Indigenous design philosophy is first outlined in Chapter 3.2. Indigenous Design Philosophy. The design criteria establishes a foundation where meaningful and successful analysis can begin. In addition, this design criteria helps to shed a light on what does and does not work in Non-Indigenous design thus allowing for a better understanding of differences between the Indigenous and Western design philosophies.

This extensive precedent exploration highlights both historical and modern examples of Northern Indigenous residential design. Historical precedents include Indigenous dwellings found on the traditional territories of the Subarctic and Plains, as they overlap the Island Lake site. Of these territories this historical study explored the Cree, Ojibway, Assiniboine and Dakota people as well as their traditional dwellings and heritage. Modern precedents examine how traditional knowledge and modern solutions come together to create successful and meaningful dwellings. It is here were I analyze how FN designers carry their traditional philosophy into their work both on and off reserves, as well as look at the creative ways that housing in remote FN communities are being addressed. Precedents that also showcase resiliency and sustainability are included in this study to explore what systems can be implemented in the northern subarctic climate.

2.4. INTERVIEW

The focus of this study is on the remote communities that make up the Island Lakes Traditional Territory, specifically GHFN and WFN. In order to properly design within these communities, it is critical to understand the unique heritage and history connected to the site and its people. However, given the remoteness of Island Lake, this critical information regarding history and heritage has yet to be documented in existing secondary sources. In order to uncover and document this information interviews with representatives from WFN were conducted. The interview process contributes to the accuracy of the evaluation of site and client, but also ensures that the research and design phases proceed respectfully, and does not make generalizations or assumptions regarding the heritage and history of the First People of Island Lakes. It is traditional for this community to pass on information, stories, and teachings orally and therefore an interview with experts from the Island Lake communities is the most fitting research method.

CHAPTER 3: LITERATURE REVIEW

3.1. INTRODUCTION

Chapter 3 explores literature which includes; having a cross cultural lens, Indigenous design philosophies, resilient design strategies, the honourable harvest and home ownership. In addition to reviewing relevant literature, an analysis on how the findings in each review influences my practicum's design process and final design is discussed.

3.2. CROSS CULTURAL LENS

3.2.1. CULTURAL BIAS AND WESTERN IDEOLOGY

The first step in organizing a culturally oriented design framework is to first understand one's own bias. As a Canadian settler, I acknowledge the inherent and arguably conflicting Western (Euro-American) ideologies that I have as a person who is not of Indigenous ancestry. Many of the Western ideologies in architecture and interior design are not appropriate, or lack the criteria needed to correctly assess and contribute to Indigenous design. According to the thoughtful and detailed work by Joy Monice Malnar and Frank Vodvarka in *New Architecture on Indigenous Lan*d, more often than not, Western architecture and design revolves around the personal ego, which in turn places an emphasis on an individual's artistic view (Malnar, Vodvarka, 2013). This ego-based design that is common in Western practice creates friction between the practices seen in Indigenous design, where personal ego is set aside and replaced with a community vision informing the designs (Malnar, Vodvarka, 2013). Since Indigenous design removes the personal ego, the Indigenous compositions have fundamental differences than the West, in various aspects from the design's point of conception to its point of completion.

Western architecture and designs are conceptually developed and abstractly composed based on the designer's visions (Malnar, Vodvarka, 2013). This abstract composition often celebrated and expected by Western designers should not be the expectation when considering Indigenous practice. Instead it is more common for Indigenous design to be heavily informed by culture and topographical surroundings, resulting in major differences between the two stems of design knowledge (Malnar, Vodvarka, 2013). The indigenous ways of knowing validates aesthetics by basing design elements on Indigenous customs, climate and available natural materials, rather than the West's emphasis on the artist's vision (Malnar, Vodvarka, 2013). In addition, the role of the designer, construction and client is hierarchal within Western practices, whereas Indigenous design these rolls are seen as equal (Malnar, Vodvarka, 2013). Understanding the Western bias and creating a design process and program that acknowledges these biases well, contributes to the assurance that someone who is not within that school of thought or of Indigenous ancestry can deliver a fair and valid Indigenous design and architecture analysis.

3.2.2. TWO EYED SEEING

One might assume that Western knowledge and Indigenous knowledge are best kept separate, that collaboration between both ways of knowing is advised against, however the Two Eyes Seeing Framework argues otherwise. The Two Eyes Seeing Framework is the concept of mutual respect and collaboration between Western schools of knowledge and Indigenous ways of knowing. Indigenous elders Albert and Murdena Marshall, representing Indigenous ways of knowing, and biologist Cheryl Bartlett, representing Western ways of knowing, created the framework together, and in doing so simultaneously put the Two Eyes Seeing Framework to use. This framework suggests that the weakness of both ways of knowing can be improved or eliminated as the fusion of knowledge begins to fill the gaps within the opposing school of thought (Malnar, Vodvarka, 2013). As carefully outlined in the Journal of Environmental Studies,

> "To see one eye with the strengths of Indigenous ways of knowing, and to see from the other eye with the strengths of Western ways of knowing, and to use both of these eyes together for the benefit of all" (Bartlett, Marshall, Marshall, 2012, p.335)

Joy Monice and Frank Vodvarka later support this concept in their book *New Architecture on Indigenous Lands* when acknowledging that the two approaches are not purely distinct from one another, writing,

> "… People forming this division have an optimism in a dialogue between those who represent traditional leadership and local culture and those who represent the 'modern' Western ways of planning." (Monice, Vodvarka, 2013, p.4)

This perspective suggests that the architectural and design discourse and influence can come from both Indigenous and Western ways of knowing. Considering my inherit Western Bias and Southern Canadian based education, it was important that the Two Eyes Seeing Framework would act as a tool to create meaningful balance between both schools of thought.

The Two Eyed Seeing framework was applied in both the primary and secondary research methods within this Master of Interior Design practicum study. In order to implement both Indigenous and Western schools of thought it was imperative to include a primary research method that would allow for Anishiniwuk voices to shape the design discourse and final design for house one and two. Therefore, semi-structured interviews became essential for not only the cultural accuracy of the practicum but also the implementation of the Two Eyed Seeing framework.

Secondary research provided the opportunity to present Indigenous schools of thought through literature and precedents. The challenge in presenting secondary research as a part of the Indigenous Lens was first differentiating the ways in which one should attempt to analyze literature and precedents through the Indigenous lens given the inherent western background. Exploring Monice and Vodvarka's study of Indigenous architecture and the Center for American Indian Research and Native Studies (CAIRNS) Indigenous design concepts helped to shape the Indigenous lens within this study. Both Primary and secondary research methods mentioned in this section will be discussed in length in their respected chapters.

3.3. INDIGENOUS DESIGN PHILOSOPHY

3.3.1. INTRODUCTION

Frank Vodvarka and Joy Monice Malnar co-authored, New Architecture on Indigenous Land, an extensive and thoughtful study of contemporary Indigenous architecture located in the United States and Canada (Malnar, Vodvarka, 2013). Frank Vodvarka is a Professor Emeritus at Loyola University of Chicago as a professor of fine art and has taught design, colour theory, photography and history of architecture (Vodvarka, N.D). Joy Monice Malnar was a member of the faculty of the School of Architecture at the University of Illinois at Urbana-Champaign for nearly two decades (Illinois Architecture College, 2017). After co-authoring Sensory Design, which focused on Poetics of Space and Phenomenology of Perception, Malnar and Vodvarka shifted their focus to the application of a sensori-cultural basis of design (IAC, 2017) Malnar and Vodvarka went on to co-authored New Architecture on Indigenous Land, which presented and celebrated contemporary Native architecture and the resurgent's of Native culture.

As mentioned in Chapter 3.1.1. Cultural Bias and Western Ideology, there are significant differences between Western and Indigenous design, one of which revolves around the Western personal ego verses the Indigenous community vision. In order to better understand how prioritizing Indigenous community vision informs design I explore in more detail the work of Malnar and Vodvarka in New Architecture on Indigenous Land.

In addition to Malnar and Vodvarka, the Center for American Indian Research and Native Studies (CAIRNS), an Indigenous-controlled non-profit dedicated to advancing knowledge and understanding of American Indigenous communities and issues, provides the designer with Indigenous design concepts that outline what community vision-based design entails.

3.3.2. DESIGN CRITERIA: SOCIAL IDENTITY AND COHESION

Within New Architecture on Indigenous Land, reoccurring design elements and concepts became evident and, consequently, a list of possible features that Indigenous architecture and design might include. Monice and Vodvarka's findings suggest that, given the emphasis on community vision, Indigenous Design includes a broad range of cultural aspects. The designer must then be aware of the specific group of people's cultures of which the building was intended, thus questioning how the culture is translated through a design language. While acknowledging that every project and culture differs in their authority of heritage and building characteristics, one can begin with the assumption that culture can be represented spatially in the following: (Malnar, Vodvarka, 2013).

- Beliefs
- Rituals
- Values

Expanding on Malnar and Vodvarka's heritage and building characteristics, the Center for American Indian Research and Native Studies (CAIRNS) promote its own list of uniquely Indigenous design concepts, all of which speaks to the design process that prioritizes the community vision. CAIRNS does so by looking at how traditional Native architecture philosophy is evaluated. CAIRNS description of their evaluation philosophy is stated as followed,

> "Conventional evaluation emphasizes the measurement of quantitative data and the use of qualitative data to provide a narrative in places where the hard numbers are unable to measure. Traditional Native evaluation emphasizes qualitative approaches, telling the unique stories of the people and using quantitative data to support the narratives." (CAIRNS, 2018)

Further outlined by CAIRNS (2018), there are four dimensions that the evaluation of Indigenous design should include, all of which have been listed below:

1. Spatial (CAIRNS, 2018)
    - Recognize that peoples and lands are intimately interconnected
    - Locations have a multitude of stories that speak to:
        - Migration
        - Revelations; and
        - Historical incidents
2. Social (CAIRNS, 2018)
    - Land Identity
    - Community Identity
    - Individual Identity
3. Spiritual (CAIRNS, 2018)
    - The relationship between the people and their land
    - Spiritual instructions, moral and ethical standards of with both the land and people
    - The incorporation of traditional information
4. Experiential (CAIRNS, 2018)
    - Recognizes an ongoing relationship with their:
        – Land,
        – Families
        – Spiritual Powers

3.3.3. DESIGN CRITERIA: FORM DETERMINATES

Indigenous architecture can often be complex, profound and meaningful as Indigenous design philosophies weaves land, community and individuals together. Before effectively designing both home one and two as well as analyzing a wide range of historical and modern precedents, it was first essential to explore form determinates and how traditional meaning is embedded. According to Monice and Vodvarka various modifying factors distinctive to Indigenous design provides the condition in which these complex and profound solutions can develop (Malnar, Vodvarka, 2013). Modifying factors will vary group-to-group creating a multitude of possible solutions (Malnar, Vodvarka, 2013). Form determinates include, but are not limited to:

-Technology
- Climate
- Economics
- Social organization
- Religion
- History

Other types of form determinates as highlighted in New Architecture on Indigenous Land, are considered social and symbolic characters (Malnar, Vodvarka, 2013). Much like form determinates, Indigenous Design's unique influence by social and symbolic characters contributes to the complex and profound design that has been developing. The reference to social and symbolic characters can often carry names and stories thus giving the design language a spatial role that is not purely aesthetic (Malnar, Vodvarka, 2013). Social and symbolic characters can be translated through but are not limited to shapes, texture, colour and material.

3.3.4. APPLICATION

Spatial, social, spiritual and experiential dimensions provide a foundation of what the architectural and interior design Indigenous lens entails. It is with this understanding that both house one and two can be designed with a cultural narrative that weaves the land, the community and the users together. This weaving is seen in house one and two in multiple ways. Spiritually the designs of home one and two practice honourably harvesting local materials such as river rocks and local timber, utilizing the natural gifts given by the land. Socially and experientially by considering family and community interaction through the use of porches and shared spaces while maintaining a balance for individual space. Spatially by accommodating the functional needs of trappers with dedicated spaces for tools, processing hides, butchering game and storing meat. The dedicated spaces for trappers feature various wall applications that provide a visual of the traditional storey of the moose harvest which explains the sacred pact between humans and animals.

In addition, Indigenous design philosophy also influences how precedent studies have been analyzed. Design criteria that is specific to Indigenous architecture and design has been used as a tool to understand not only the individual, the community and the land identity but how that identity is embedded into design. It can be suggested that what constitutes as Indigenous design, cannot simply be thought of as spaces occupied by Indigenous people, or located on Indigenous land (Malnar, Vodvarka, 2013). In many cases, Western designs have been imposed on reserves as well as imposed on Indigenous people who reside elsewhere. To assure that one is analyzing a project that is true to Indigenous design, that project should be specific to a particular Indigenous people (Malnar, et al 2013).

3.4. RESILIENCY AND SUSTAINABBLITY

3.4.1. INTRODUCTION

One of the many reasons southern housing solutions do not meet the needs of remote FN communities is that the homes do not withstand the extreme weather conditions of the North.

Island Lake communities utilize hydro electricity from Manitoba Hydro landline electrical systems (Province of Manitoba, 2016), however this does not mean that Island Lake is immune from frequent blackouts, causing health and safety issues especially in the winter months. Energy independence would mean that the community or household would have created a balance between various low energy design strategies and on site or district energy generation.

In addition, many remote FN communities, including WFN and GHFN, are only accessible via boat, helicopter or winter roads thus complicating home maintenance. These sites specific needs require new perspectives and considerations that go beyond the southern sustainability philosophies. Dr. Joseph Fiksel is an internationally recognized authority on sustainable business practices specializing in life cycle management and designing for the environment (Fiksel, 2018). Although Dr. Fiksel focus is on sustainable development as it affects economics and corporate stakeholders (Fiksel, 2018), his strategies and philosophies can apply to many different systems throughout various typologies.

3.4.2. DESIGNING RESILIENT, SUSTAINABLE SYSTEMS

In Designing Resilient, Sustainable Systems, Dr. Fiksel challenges the current standards of sustainability with the concept of resilience, arguing that more positive environmental impact can be achieved when focusing on a broad range of systems level issues rather than limiting the focus on the function and form of a product or service (Fiksel, 2003). The broad range of system level issues that Dr. Fiksel refers to includes: safety, security, manufacturability, serviceability, material and energy efficiency, end-of-life recovery, environmental emissions and the long-term impacts on quality of life, all of which can be scaled to apply to a small residential typology. Fiksel challenges sustainability as a goal with the idea that it is a characteristic of dynamic, evolving systems.

In order to integrate some of the language Fiksel uses to describe his concepts, it is important to look at housing as a system. Houses are systems, in which many other systems, like plumbing and electrical, are working within to make it function. The home is also a system that is working within the natural environment, responding to the conditions and utilizing its resources. The people who reside in the home, from Fiksel's perspective, would be stakeholders and corporations that are weighing out the profitability of resilient and sustainable system design. When these systems work together in a dynamic, nonlinear and self-organized way, the system can then sustain its own existence. Self-sustaining systems are modeled after the closed-looped systems seen in ecosystems, such as bees collecting pollen from flowers (Fiksel, 2003). The very process sustains the flower through pollination and sustains the bee in creating honey and its hive.

The housing crisis in remote First Nation communities such as Island Lake presents an opportunity to implement resilient system design at various stages of development starting with the conception of the home. Although various green protocols such as LEED begin to achieve sustainability, Fiksel warns the designer to not focus on provided building performance checklists alone. In order to ensure that the designer is making informed decisions that go beyond protocol checklists, Figure 1 - Fiksel's Systems Considerations Diagram can be used as a tool in questioning and selecting resilient systems.

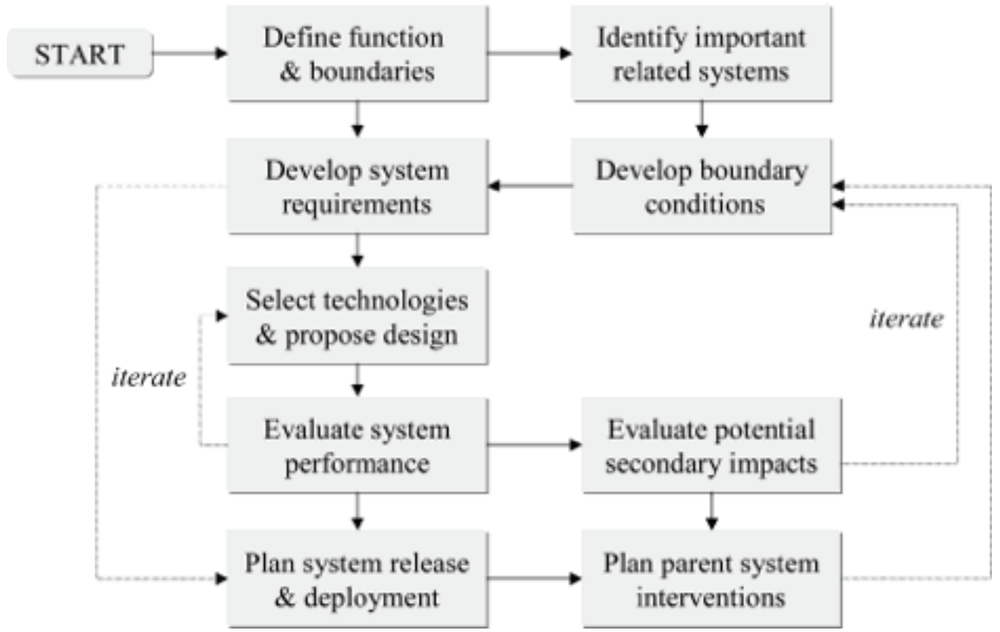


Figure 1: Fiksel's Systems Considerations Diagram

Define Function and Boundary: Given that a system can be as large as water treatment or as small as an efficient plumbing fixture, it would be too abstract to make direct comparisons to the systems found in ecosystems (Fiksel, 2003). Fiksel argues that it is more practical to consider related systems and that by doing this can spark innovation (Fiksel, 2003). Establishing the system scope, design methodology and technology starts the defining process, while implementing of life-cycle analysis of varying systems help solidify the boundaries of the system (Fiksel, 2003).

Developing System Requirements: Typically, there are three main requirement-processing functions;

1. Requirement Analysis – customer needs,
2. Requirement Tracking – analysis of design, project risk, schedule, coat and performance goal; and
3. Requirement Verification – whether a system meets requirements (Fiksel, 2003).

However, Fiksel recommends that one must also look beyond the typical supply chain in order to consider broader industrial and social context. Fiksel suggests that this is done by looking at both human survivals needs such as air, water, nourishment/land and ecology as well as socio-economic needs such as mobility, community/belonging, growth/wealth, respect, shelter/security and health. What connects both sets of needs are the requirement for energy (Fiksel, 2003). Given that these needs vary from site to site, the requirements cannot fit into a "one size fits all" list. This detailed evaluation helps to determine the system requirements specifically to the site and client.

Selecting Technologies: Weighing out the requirements and boundaries creates a selection of technology and the design of the system (Fiksel, 2003). Here the designer along with specialists should distinguish between existing product and processes in order to evaluate what is most fitting for the site and client. It is at this stage were the designer must withstand the checklist mentality as many new and impressive systems or products may not thrive in certain conditions (Fiksel, 2003). For example, southern building systems, such as green roofs, although functional in and around cities are not as effective in northern remote communities. Implementing Green roofs in remote northern communities would require materials to be sourced off site and then shipped to site, additionally maintaining this system becomes complicated over the long and extremely cold winters.

Evaluating System Performance: Evaluating anticipated performance is key for system development. There are many approaches that can be taken to effectively evaluate. Completing life-cycle assessments identify environmental burdens (Fiksel, 2003). A life-cycle inventory can detect energy and material consumption as well as waste generation (Fiksel, 2003). Life-cycle impact assessments help to evaluate how these systems affect humans and ecosystems (Fiksel, 2003). Similarly, performance indicators highlight the consequences of the design choices (Fiksel, 2003). It is important to not only evaluate performance outcomes but also the characteristics that contribute to system resilience (Fiksel, 2003).

Planning System Deployment: The final step is the development of a plan for the systems, release, introduction and deployment (Fiksel, 2003). Considering the downstream effects is what set resilient systems apart from other systems (Fiksel, 2003). Issues such as waste disposal, maintenance and the potential for further development were considered during the design phase, helping avoid future delays, unnecessary cost and over consumption of resources. In additional including stakeholders helps to establish agreements on values and ethics, by considering socio-economic needs (Fiksel, 2003).

Outlined below are some of the systems considerations done for this practicum up until the selecting technologies stage. The final two stages, Evaluating System Performance and Planning system deployment require the building to have been built and in use in order to complete the evaluation and therefore are not included at this time.

3.4.2.1. APPLICATION

Define Function and Boundary: Heating and Cooling Systems

System Scope: The current issues regarding heating in Island Lake is it reliance on the current hydro system in place. In addition, maintaining heating and cooling systems can be problematic given the remoteness of Island Lake. Baseboard heaters and HVAC systems are often the standard practice in southern design homes however, by looking back into more traditional housing one will consider including wood burning ovens and cross ventilation as they require no electricity to function.

Design methodology: In order to improve on the current system scope, a secondary heat source will be integrated into the home.

Technology: Wood burning stoves will allow for heating and cooking opportunities in the case of power outages or to save money on electricity bills. In addition, passive design will help regulate solar gain and loss which will create a more efficient building

Define Function and Boundary: Energy Systems

System Scope: The current system scope in Island Lake is hydro electricity from the Manitoba Hydro landline electrical systems (Province of Manitoba, 2016). However as mentioned this energy source often experiences black outs leaving the residents of Island Lake without power in extreme weather conditions.

Design methodology: In efforts to create a more resilient system scope, this project intends to provide an additional source of energy, preferably one that is renewable and local. This source should offload all lighting for the building. Additionally, is should create the opportunity to gain independence from government hydro.

Technology Considerations:

- Solar Energy: Small solar field to service house 2
- Geothermal: adjacent water access allows for geothermal services

3.4.3. THE HONOURABLE HARVEST

Dr. Robin Wall Kimmerer is a biologist, citizen of the Potawatomi Nation and a student of traditional teachings. In Dr. Kimmerer's book Braiding Sweetgrass and her lecture on Reclaiming the Honourable Harvest, she provides a unique perspective on sustainability as her wisdom lies at the intersection of both scientific and indigenous ways of knowing. Using storytelling Dr. Kimmerer weaves science and indigenous teachings together in order to provide an all-encompassing explanation of the reciprocal relationship between humans and earth.

In both written work and lecture, Dr. Kimmerer explains that in her Indigenous ways of knowing humans are not the only species that is regarded as persons, rather humans, plants and all other beings are persons as well. All persons provide gifts as they have an intrinsic role in the democracy of species, and are sovereign beings with their own intelligences, wisdom and responsibilities (Kimmerer, 2012). Understanding that there is equality between humans, plants and any other living beings abolishes any hagiarchy constructed by the Western Ego and sets the foundation in which the concept of the Honourable Harvest can build upon. Dr. Kimmerer considers the state of environmental damage and poses the following questions:

1. How do we respond to the gifts of the earth?

2.How can we be ecological consumers in a way that honours those gifts?

Dr. Kimmerer looks at the current model of sustainability as a flawed practice (Kimmerer, 2013). Dr. Kimmerer, along with her Elders challenge the current sustainable model, arguing that the answers to these questions is not to simply continue to find ways to take from the earth but instead find ways to give gifts back (Kimmerer, 2013). This will create a bio-cultural relationship where the earth is good for humans and humans are good for the earth, better known as reciprocity (Kimmerer, 2013). This reciprocity has been maintained by Indigenous peoples by the traditional practice of the honourable harvest, which among many other things, is the practice of understanding raw materials as gifts given by the earth. The key practices that makeup the Honourable Harvest as outlined in Dr. Kimmerer's lecture, Reclaiming the Honourable Harvest, have been described in table one:

Table 1: The Honourable Harvest as described by Dr. Kimmerer at a TEDx (2012)

Honourable Harvest (Kimmerer, 2012)	
Practice	**Description**
Never Take the First One	It could be the last one. Taking the first plant without consideration risks the prosperity of that plant. It is important to support regeneration to ensure the cycle of reciprocity to continue.
Ask Permission	It is respectful to address the plant, give it thanks and blessings. This traditional practice calls back to plants as persons, not asking permission and taking anyway is stealing.
Listen for Answers	After asking for permission one must listen for answers. Look to see if the plants are neuromas and having plenty to share. If not, then you do not have permission to take. Plants are teachers. They can recycle water, produce food, build soil, provide shelter. It is important to not just take these gifts but to observe and listen to the answers the gifts provide us.
Take Only What You Need + Take Only What is Given to You	It is not enough to only take what you need; you must only take what is being given to you. For example, the sun, wind and water give us energy freely whereas coal, tar sands oil and shall gas are not given to us, we forcefully remove such materials without asking or listening.
Use Everything You Take	It is disrespectful to waste a life given.
Minimize Harm	Take in a way that benefits the plant. For example, do not clear cut if only one tree is needed, do not use a shovel if a digging stick will do the job.
Be Grateful	See the world as made up of gifts and not commodities. Being grateful is enriching. Kimmerer speaks of gratitude as radicle in an economy that pressures people to constantly want more.
Share	Share with all peoples, human and not human. Consider having more than enough as having enough to share.
Leave Gifts	Unlike the western culture where gifts are seen as a type of commodity, gifts in Indigenous culture are acted out in sharing with one another and providing favours in order to create relationships where people harmoniously support one another. This is also the perspective that is taken when receiving gifts from earth. The gifts we give back can be gifts of honour such as tabaco or a gift of care such as scattering the plants seeds.
Defend	Defending the gifts can mean many different things such as; sharing this wisdom with others, passing on the honourable harvest to future generations, planting seeds among various other ways to ensure that these gifts continue to flourish.

Dr. Kimmerer believes that reclaiming the traditional practice of the Honourable Harvest can mend the damaged relationship between humans and Mother Earth (Kimmerer, 2012). She describes this traditional practice as it applies to plants and land, however this concept is transferable to any type of decision making as consumers in the marketplace (Kimmerer, 2012). The goal of the Boreal Home Builders is to practice the honourable harvest in the upcoming and future housing endeavours. Harvesting local material allows the Boreal Home Builders to utilize traditional harvesting knowledge.

Local materials such as wood are carefully selected based on if they are plentiful and are used in various ways as to not create waste. Logs are only gathered if they have a 15" diameter, creating an exterior wall with a 22 R-Value, or if they are large enough to be milled into boards for construction or furniture making. Log construction and local milling allows for gatherers to know roughly how many logs are needed. The careful selection of logs eliminates clear cutting from construction in these communities. Furthermore, local wood reduces the amount of materials shipped into the community from external sources.

Another local material that will be sourced are smooth stones. Stones found at the shores of lakes or in one of the many riverbeds will be used rather than shipping tiles from southern suppliers. These smooth stones are plentiful, constantly being created by the natural force of water brushing up against the earth. There is little too no damage done in gathering stones as they are loose and require no digging or force when removing them from their resting spots. These smooth stones reflect the Island Lakes natural environment and contribute to land identity within the interior. If the stones used within the interior become damaged, they can easily be removed and replaced. Once damaged stones are removed, they can be returned to the water where they came from.

In Dr. Kimmerer's lecture Reclaiming the Honourable Harvest, she discusses the sun, water and wind as constant and accessible gifts (Kimmerer, 2012). Rainwater collection and solar energy are two ways that these gifts can be honourably harvested. Rather than relying on hydro energy where the damming of waterways alters the natural environment and eco systems, a small on-site solar field will help to off load hydro energy consumption.

Rainwater will be gathered and used for laundry and toilets reducing the amount of potable wasted for greywater applications. Rainwater can be stored and filter in the case of water shortages, making sure that it is not just used, but shared in times of need.

3.5. OWNERSHIP AND SELF-DETERMINATION

3.5.1. INTRODUCTION

This section outlines on-reserve housing and the complexities regarding ownership. The implications of this type of home ownership is specific to those who reside on reserve and cannot be overlooked as a major factor in the current state of the housing crisis.

3.5.2. ON-RESERVE HOME OWNERSHIP

Home ownership, or lack of ownership on reserves is vastly different than what is typically seen off reserve. The Constitution Act of 1867, states that Parliament has authority over "Indians and land reserved for the Indians" (Northern Affairs Canada, 2019). The Indian Act then outlines to the Minister of Indigenous and Northern Affairs the land management responsibilities which include, activities related to the ownership, use and development of land for personal, community and economic purposes (Northern Affairs Canada, 2019). Additionally the Minister must approve or grant most land transactions under the Indian Act (Northern Affairs Canada, 2019). Reserve lands are notably different as the legal title of land is held by the Crown, and not by individuals or organizations, or as stated in the Indian Act; "a tract of land, the legal title to which is vested in Her Majesty, which has been set apart by Her Majesty for the use and benefit of a band" (Northern Affairs Canada, 2019). However, it is on reserve land that FN's have the right to exclusive occupation, inalienability and communal nature on the land. Furthermore the land cannot be seized by legal process or be mortgaged or pledged to non-members of the FN (Northern Affairs Canada, 2019).

Under the Indian Act the Band Council and the Minister approve then give allotments to FN member (Northern Affairs Canada, 2019). Allotments holders have "lawful possession", the right to used and occupy a parcel of reserve land. These allotments can be transferred to other band members or written into a will for another band member, however the legal title to the land remains with the Crown (Northern Affairs Canada, 2019).

3.5.3. OWNERSHIP

Bailie and Wayte review the relationship between housing and health specifically in Indigenous communities in Australia. When discussing housing affordability, housing tenure and housing assistance Bailie and Wayte consider the implications of owning verses renting property. They argue that owning a home instils a sense of security, control and mastery, which is believed to impact health and well-being (Bailie and Wayte, 2006).

Bailie and Wayte's findings suggest the government's involvement in controlling and addressing housing only perpetuates the deep-rooted effects of colonialism. However, when Indigenous communities regain the control, these issues begin to naturally be addressed from within (Bailie and Wayte, 2006). Bailie and Wayte argue that this reinstated power provides a sense of security and independence to Indigenous people regarding their homes that contributes to improvements in health and well-being (Bailie and Wayte, 2006).

3.5.4. SELF-DETERMINATION

Ryan Walker examines low-cost-housing in Winnipeg to understand how changes in Indigenous citizenship have intersected within urban settings. Walker addresses the pursuit of self-determination among Indigenous communities as the right was reinstated in 1994 (Walker., 2006). Since then, Indigenous groups have been able to self-govern, which has begun to give Indigenous people back the control in their housing and human services sectors (Walker., 2006).

Although self-determination has positively increased on a national and international scale, when addressing issues such as low-cost housing and welfare, Indigenous populations tend to be excluded from decision-making. Walker argues that the most effective low-cost living and welfare solutions for Indigenous peoples would be most successful if they were governed and conducted by Indigenous leaders (Walker., 2006).

3.5.5. APPLICATION

It is beyond the scope of this Master of Interior Design practicum to rework the flawed colonial system of ownership on-reserves. However, one cannot ignore the importance that self-determination and sense of ownership has on health and well-being. House one and more notably house two were design with self-determination in mind. Implementing systems and strategies that consider how to live “off the grid” helps to reinstate power to the Anishiniwuk. Although many of these strategies were mentioned in Chapter 3.3 Resiliency and Sustainability for their environmental and resilient benefits, it is in this section that design strategies are outlined based on their potential to allow for WFN and GHFN to regain control over their homes. Affordability, passive design strategies and locally sourcing labour and materials are all ways in which Anishiniwuk can eliminate the need for shipping foreign materials, outsourcing labour and reliance on government water and hydro.

Community lead design and local labour can lead to ownership as the people have control over their own housing issues. When solutions are determined with in the community and by the community there is cohesion and mutual understanding. When the housing solutions are carried out by local labour, the community then has the ability or maintain or change it using local labour. Something that is a major aspect of the BHB in house one and that carries forward in to house two.

Although legal ownership of homes and land is undoubtably complicated in FN communities, evaluating the building, land and the client’s needs helped to identify self-determination opportunities. Solar panels, rainwater collection, wood burning stoves and community gardens reinstates independence. All four features distance the building from relying exclusively on government power sources, water distribution services and grocery stores.

CHAPTER 4: PRECEDENT ANALYSIS

4.1. INTRODUCTION

It is the goal of this precedent analysis to provide a more in-depth understanding of how designers implement indigenous design philosophy as well as sustainability and resiliency within the built environment in a meaningful and functional way.

In order to conduct a successful case study, one must first go about selecting an appropriate design project. Having analyzed the works of Monice and Vodvarka, who have studied Indigenous architecture at great length, it can be suggested that what constitutes as Indigenous design cannot simply be thought of as spaces occupied by Indigenous people or located on Indigenous land (Malnar, Vodvarka, 2013). In many cases, Western designs have been imposed on reserves as well as imposed on Indigenous people who reside elsewhere. To assure that one is analyzing a project that is true to Indigenous design, the project should be designed by an indigenous person or specific to a particular Indigenous people (Malnar, Vodvarka, 2013). This selection method is important, as the use of iconography is a defining element of Indigenous design and plays a role in the analysis of the design (Malnar, Vodvarka, 2013). In addition, various tribal groups (United States term) or Indigenous groups (Canadian term) differ greatly in the ways in which they view the authority of their own heritage, furthermore, deciding on a buildings character (Malnar, Vodvarka, 2013).

In addition to exploring Indigenous design, projects have also been selected based on their excellence in sustainability and resiliency. Selection criteria for projects that fall under the category of sustainability and resiliency, must include systems that can be implemented in the subarctic climate experienced in Island Lakes.

4.2. HISTORICAL PRECEDENTS

4.2.1. INTRODUCTION

According to the Canadian Encyclopedia, the Indigenous peoples of Canada are divided into six broad cultural regions that are defined by climatic, geographical and ecological characteristics. The six cultural regions are the Artic, Subarctic, Northwest Coast, Plateau, Plains and Eastern Woodlands (Ridington, 2012). Each region developed architectural forms that not only reflected their unique site conditions but also the available materials, livelihood, and their social and spiritual values (Ridington, 2012). While all six regions are specific to the people and the site, a feature that was consistent across indigenous architecture was the integrity between the structural form and cultural values. These structures functioned as expressions of the occupant's spiritual beliefs, cultural values as well as a means of linking the people with the universe all while meeting the primary needs for shelter (Ridington, 2012). Historical residential design precedents that will be explored in this practicum pertains to groups that were found in regions that exist within Manitoba, including the subarctic and the plains. My particular focus is on groups that still exist within these regions. Thus, the historical background will act as a starting point for looking at works of residential design that followed.

4.2.2. SUBARCTIC - DOMED WIGWAMS

Wigwams, although not exclusive to the subarctic, were a typical winter dwelling among many nations. The Cree Nation located mostly within the subarctic, as well as the Ojibwe, who to settle just south of the eastern subarctic, were nations who utilized the wigwam. Although the basic forms of the domed wigwams were similar between nations, specific social and cultural practices determined the wigwams use as well as its role within the social order.

The wigwam is more than a structure that supported a nomadic people, it is a home that reflected Mother Earth, the people and the spirituality they shared. In order to understand how this land, community, and spiritual identity is woven into the historical architecture, it is imperative to understand the daily tasks, the ceremonies as well as spirituality that was practiced by the historical Cree and Ojibwe Nation.

Figure 2: Map of the Subarctic Region (Mills, Edward, and Harold D. Kalman, 2019)

4.2.2.1. THE CREE

The name Cree is an English spelling of the French name Cri that was originally placed on the Nation by settlers (Preston, 2018). It is not uncommon that Cree people use this name when speaking to English or French people, but would refer to themselves as Nehiyawak, or variations of the word that reflected the land (Preston, 2018). The Cree nation is geographically distributed from the Plains region in Alberta to the Subarctic region in northern Quebec, a span larger than any other Indigenous group in Canada (Preston, 2018). Due to the diversity across this large span of land, environment and dialects, four main divisions and one subgroup of Cree were created and thus land identity within this nation is embedded with the very way in which the Cree (Nehiyawak) refer to themselves (Preston, 2018). The four divisions and subgroup are as followed[1]:

- The Plains Cree (pakwâwinyiniwak or Nehiyawak) in Alberta and Saskatchewan
- The Woods Cree (Sakâwiyiniwak) in Saskatchewan and Manitoba
- The Swampy Cree (Maskêkowiyiniwak) in Saskatchewan, Manitoba and Ontario
- The Eastern/James Jay Cree (Eeyouch) in Quebec
- The Moose Cree a large and notable subgroup within Ontario

The land also affected the way that the historical Cree people sustained and carried out life. Known as a nation of hunters or Ndooheenou, the Cree followed seasonal animal migration to obtain meat for food and hides for making tools and clothes (Bishop, 2018). This meant that the Cree traveled constantly, effecting the nature of the design items and dwellings that were used. In order to accommodate movement over the land, wigwams were organized in clusters upon settling in temporary locations for a season.

Cree people lived in small hunting groups or "bands" for a majority of the year (Preston, 2018). In the warmer season these bands would gather into larger groups where different bands could socialize, exchange with one another and have larger ceremonies (Preston, 2018). The Cree strived for a communal and egalitarian society, although some individuals were regarded as leaders, specifically in activities such as hunting and spiritual practices (Preston, 2018). Leaders in hunting had authority in directing tasks within hunting, raids and trading (Preston, 2018). Outside of hunting, leaders were expected to lead by example.

Leadership and spirituality were based around mutual respect between people and nature, having a direct impact on health and happiness (Bishop, 2018). This respect allowed for the Cree to have cultural and social relations with the Algonquin Nation and the Ojibwe Nation, sharing a common language (Preston, 2018).

Spiritual stories were used to teach mutual respect, often referencing a cultural and spiritual figure know as a Trickster Wîsahkêcâhlk (Preston, 2018). A common intellectual but also mischievous trickster in the Cree nation is Wisakedjak, a demigod and cultural hero that is present in some of the Cree creation story's (Preston, 2018). Other notable symbols or natural spirits included in the Cree creation story is the Otter, Beaver and Muskrat (Preston, 2018).

Table 2: Cree Spiritual Ceremonies (Preston, 2018).

Cree Spiritual Ceremonies (Preston, 2018).	
Ceremony	**Description**
Sun Dance	Arranged by a shaman, as a request for supernatural aid or in response to a vision. Required four days to erect the dance pole and sacred lodge. On the last day various version of the same dance took place. This was an emotional experience and an opportunity to renew kinship ties, arrange marriages and exchange property
Powwows	Cultural exchanges that are used as part of healing ceremonies, and to celebrate Indigenous dance, music, food and art
Vision Quests	Adolescents went on vision quest to reveal guardian spirits. It was practiced commonly with young men; however young women also participated
Pipe Ceremonies	Used to open negotiation between different nations. Regarded as the way participants would be truthful, respectful and abide by the decisions and agreements made during the meeting
Sweats Lodges	A purification ceremony, it can be performed by itself or as a prelude to other ceremonies such as the Sun Dance
Walking Out	Welcomes children into the community. Children's feet do not touch the ground outside the tent or wigwam until the ceremony takes place and is typically done as soon as the child learns to walk.

1 For the purpose of this analysis the above stated names have been used. It should be acknowledged that the many different dialects within the Cree Nation may have their own translation or names.

4.2.2.2. THE OJIBWE

The Ojibwe (Ojibwa, Ojibway and Chippewa) are a part of a larger cultural group called Anishinaabeg (Bishop, 2018). The Ojibwe people are closely related to the Odawa and Algonquin people while sharing many traditions to the neighbouring Cree Nation (Bishop, 2018). The Ojibwe where typically found in regions surrounding the Great Lakes, however, were a nomadic hunting group that required dwellings that were portable. For reasons related to the fur trade, a large amount of people moved northward and westward. The people who migrated are called the Plains Ojibwe (Bishop, 2018).

In Ojibwe Nations, society was divided into patrilineal totem-based clans, which were considered as close family (Bishop, 2018). On a larger scale the Ojibwe divided up into independent and politically autonomous bands, however shared culture, common traditions and intermarried with one another (Bishop, 2018). Communal collection of maple sugar and wild rice were activities among various communities (Bishop, 2018). In addition, the Great Lakes also provided a place where large numbers of Ojibwe people would gather for large-scale fishing (Bishop, 2018). It was these communal harvests that allowed for gatherings where people gave gifts and socialized (Bishop, 2018). It is the internal band and clan relationships within the respective nations along with the relationships these nations had with one another that form the community identity of these historic people. Much like the Cree Nation, the Ojibwe's health and happiness was depended on mutual respect, and the interconnectivity between people and other living spirits (Bishop, 2018).

Achieving this meant to live a balanced life with nature, a statement that broadly explains the spirituality in these groups. It was believed that both good and evil spirits called Manitou made up the natural world (Bishop, 2018). Tricksters were commonly used to convey lessons. In addition to Ojibwe oral mythology serving a moral purpose, it was also entertaining (Gadacz, 2019). A notable trickster was called Nanabozo, a shape shifter, which varied in gender, acted as the creator and the arranger of the earth (Gadacz, 2019). Much like the Cree Nation, Ojibwe adolescents went on vision quest to reveal guardian spirits (Gadacz, 2019). Ojibwe shamans cured the ill and performed shaking tent rites, which took place in small dome shaped structure similar to the wigwam (Gadacz, 2019).

4.2.2.3. FORM DETERMINATES: THE WIGWAM

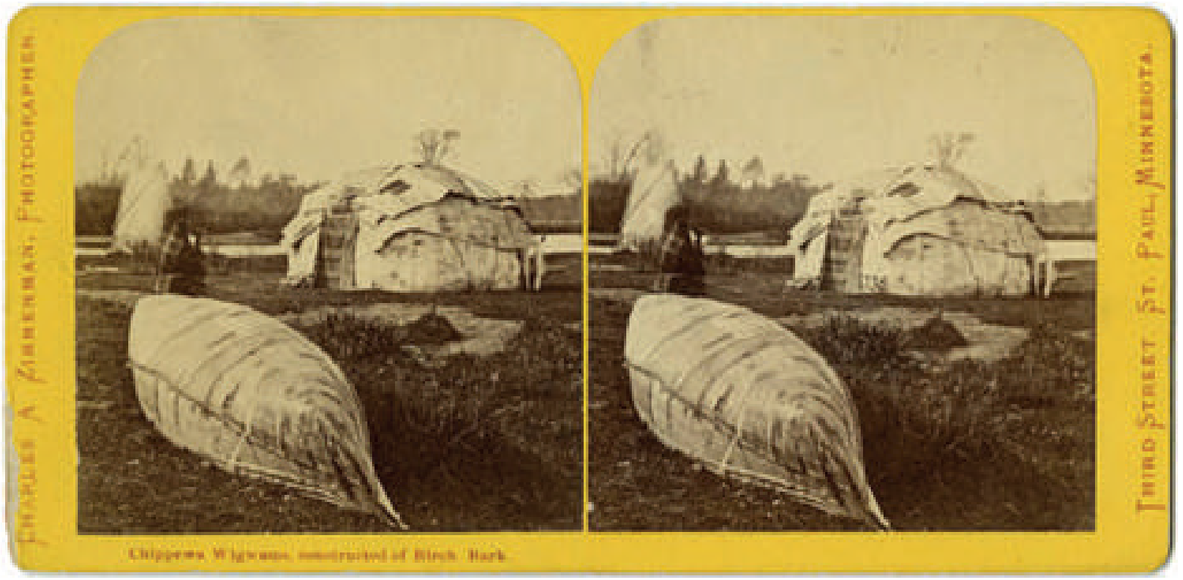


Figure 3: Chippewa domed wigwam made from birch bark, birch bark canoe. (Charler Zimmerman, 1800)

The Cree and Ojibwe people traveled over land using canoes in the summer and snowshoes and toboggans in the winter (Preston, 2018). In both Nations women and men typically were responsible for different tasks. It was typical for both Cree and Ojibwe men to be responsible for big game hunting, while Cree and Ojibwe women were often tanning and processing hides into bags, moccasins and clothing. As the fur trade became common, intricate beadwork developed (Preston, 2018). The Cree and Ojibwe both put tremendous value on mutual respect resulting in a united people who shared food in times of hardship, and in times of prosper with celebratory feasts (Preston, 2018).

Domed Wigwams are structures that meet these unique nomadic and social needs (Preston, 2018). Wigwams could be assembled and dissembled as required when it came time to follow the migration as the materials used to create wigwams are plentiful in and around the Boreal forest (Ridington, 2012). The materials available determined the form of the wigwam and often included but are not limited to; spruce roots, moss, grass, cattails, animal hides, available saplings and bark (Gadacz, 2019).

The Wigwam is typically built in circular, elongated and dome-like shapes. However, there are instances where they were elongated into lodges that resembled a longhouse, a more permanent dwelling seen primarily in Eastern Woodland nations (Ridington, 2012). Cut saplings were set upright and place into the ground at intervals of about 60 cm (Gadacz, 2019). Poles (saplings) opposite each other are bent towards the centre of the circle and then fastened together with twine and strips of wood (Gadacz, 2019). Horizontal members are added to provide strength to the sapling frame (Gadacz, 2019). The lower half of the wigwam could often be sheathed with a row of mats made from weaving cattails, whereas the upper half of the wigwam was sheathed with sheets of bark (Gadacz, 2019). Lastly a smoke hole was left in the centre of the domed roof (Gadacz, 2019). In the winter months it would not be uncommon for fur pelts to be added to better insulate the dwelling (Gadacz, ,2019). Highlighted form determinates found within the Cree and Ojibwe heritage include but are not limited to:

1. Shapes
    - Wigwams and tipis are often circler
    - An important item to Cree people is the drum, an item that also is circler
2. Texture
    - Beadwork is notable for the Cree and Ojibwe people
        • This work is not only seen on clothes and bags but also furniture
3. Colour
    - Colours are taken from the environment.
        • Materials and pigments can be traded between bands as their paths intersect in the warmer months
    - Colours are found within beads and paint
4. Material
    - Tree saplings
    - Bark
    - Cattails
    - Animal Hides
    - Moose, Caribou, Rabbit, Beaver and Buffalo – in the plains region

Figure 4: Wayish-ky's lodge, Sault Ste-Marie, Ontario, Sketch by Anna Jameson 1837

4.2.3. THE PLAINS - PRAIRIE TIP

The Plains region generally spans from southern Alberta and Saskatchewan to the southwest of Manitoba (Figure 5) and was home to a number of traditional territory groups (Brasser, 2019). Of those groups, the Nations that were traditionally located in the southwest of Manitoba were the Dakota, Assiniboine and the Cree Nation (Brasser, 2019). It should be noted that during the same historical period, there was also a very prominent and influential Métis population in this region, however the architecture of The Metis is outside the scope of this Practicum study.

The Canadian plains region experiences an extreme climate, where summers were very hot and dry while winters were notoriously cold. The flat lands and rolling hills are iconic natural features of the region and were carved by many large and powerful rivers (Brasser, 2019). It was on the forested areas that followed along the banks of these rivers where the Plains Indigenous peoples lived (Brasser, 2019). The plains people created dwellings called tipis, which were cone shaped homes comprising of poles covered with bison skins (Brasser, 2019).

Figure 5: The Plains Indigenous Cultural Region

4.2.3.1. ASSINIBOINE, DAKOTA AND CREE NATIONS

The Indigenous people of the Plains, although made up of a number of different nations, shared many common practices, spiritualties and languages. The Assiniboine, Dakota and Cree nation identities are deeply embedded and reflective of the land they resided on (Brasser, 2019). The Dakota traditionally occupied areas in Saskatchewan and western Manitoba before moving to Ontario and eastern Manitoba (Brasser, 2019). It was after contact with the fur trade that the Dakota people moved south along the Red, Mississippi and Rainy Rivers (Getty, 2018).

The Dakota Nation was closely related to the Assiniboine Nation as they shared land and a common language (Getty, 2018). At the peak of the Assiniboine historical people, their territory ranged from the Saskatchewan and Assiniboine River valleys to the northern region of the Milk and Missouri rivers (Getty, 2018). In addition, it was not uncommon for the Assiniboine peoples to live amongst the Cree Nation, as they would share hunting techniques (Preston, 2018). As described in detail in section 4.2.2. the Cree Nation was spread over the large subarctic region. The Cree nations that most often were to reside in the Plains are the Plains Cree (Pakwâwinyiniwak or Nehiyawak) primarily in Alberta and Saskatchewan (Preston, 2018).

Figure 6: The Assiniboine Encampment (left) and the Dakota (Sioux) at Rocky Mountain foothill (right)

The Indigenous peoples of the plains where nomadic, and much like the wigwam, the tipi was a reliable dwelling that met the needs of a moving people. The Dakota Nation like many others moved from their winter settlements along the woods that flanked the Missouri River, up north to hunt for buffalo (Preston, 2018). Although not exclusive to the Assiniboine, dogs were used to haul tipi poles, hides and other possessions. In addition, snowshoes were used in the winter, most notably among the Cree (Preston, 2018).

4.2.3.2. THE PLAINS TIPI

Once the plains people arrived at their camp, people would start to build their tipis. Tipis were typically 4-6 meter in diameter at the base, tapering upwards to create a smoke hole at the narrower top (Gadacz, 2017). Tipi frames comprised of as many at 20 polls, reach a typical height of 5-6 meters and where draped in sewn bison skins. The Cree and Dakota Nations preferred to use a three-pole system (Gadacz, 2017). An important feature of the tipi is that they faced east, towards the rising sun, the place of honour for the owner or oldest man was opposite the entrance. Tipis camps were arranged in large circles, where all entrances faced east (Gadacz, 2017). This made a central space for celebrations of ceremonies (Gadacz, 2017). These camps created a type of subdivision organized by band or family (Gadacz, 2017).

Figure 7: Painted Sun Dance Tipi, Calgary

The Plains people were artistic and used their talents to express spirituality. Tipis had powerful and symbolic associations. The floor was the earth and the mother while the cover represented the sky and the father (Gadacz, 2017). The tipi pole, leading from the earth up into the sky connected the two together, creating a trail where prayers can reach up to the heavens (Gadacz, 2017). A select few tipis among camps bared painted covers, transforming the dwelling into a specific sacred lodge (Gadacz, 2017). The painting reflected the Nation, having both literal and cosmological meaning. Designs at the base of the tipis embodied the earth and elements associated to the earth, while painting at the top reflected the sky and elements associated to the sky (Gadacz, 2017). When the covers became worn, new hides were prepared and the art was transferred over (Gadacz, 2017). A beautiful tradition with these specially painted hides ensured that the art and the stories were carried on to generations.

4.2.3.3. SPIRITUALITY

As mentioned earlier, the tipis were organized into circles allowing for a space to host feasts and ceremonies. Spirituality among these people was very communal; the Plains people are credited to have held the first powwows. Powwows allowed for various Indigenous nations to come together to have a cultural exchange, was used as part of healing ceremonies, and also celebrated Indigenous dance, music, food and art (Brasser, 2019). The most sacred ceremony was the Sun Dance, conducted after the spring buffalo hunt (Brasser, 2019). It involved praying singing, drumming, dancing and fasting. Some of the artistry was displayed yet again in this ceremony by including clothing that was painted and embroidered (Brasser, 2019). This ceremony also included regalia with eagle feathers, beads and colourful items that were worn (Brasser, 2019). The Sun dance ceremonies were done before bands separated in the autumn season moving into protected winter campsites in river valleys, foothills and parklands for the winter (Brasser, 2019). Additionally, young men embarked on vision quest to commune with guardian spirits and practice sacred song. Individuals seeking guidance or power also fasted and prayed until a guardian would appear in a dream (Brasser, 2019).

4.2.3.4. SOCIAL ORGANIZATION

As discussed in greater detail in section 4.2.2, the Cree Nation lived in small hunting groups called bands and were often open to their neighbouring Indigenous Nations, partaking in large hunts and ceremonies alongside them (Brasser, 2019). Chiefs would be leaders in hunting and making large decisions, however mutual respect and leading by example was a requirement in their social structure (Brasser, 2019). Similarly, an extended family system of nomadic camps made up the Assiniboine social and political structure (Brasser, 2019). Much like the Cree and other Plains Nations, men generally held power positions, making important decision for the community and dealing with outsiders (Preston, 2018). A council made up of representatives from each family group would often all come together as a band or nation, to guide the headman or chief (Brasser, 2019). Leadership was earned by superior hunting skills however the leader was required to be a “good person” showing kindness and generosity to others,

a standard held to leaders from many Indigenous Nations (Brasser, 2019). On the circumstances such as war or large-scale hunting, sometimes nations required occasional leaders and were chosen accordingly (Brasser, 2019).

4.2.4. CONCLUSION

Historical architecture and traditional people helped to create a foundation of which modern interpretations of Indigenous architecture builds upon. Wigwams and tipis were not only dwellings but hosted ceremonies, sweats and feasts. Multifunctional dwellings are one of the many elements learned from historical Indigenous architecture. House two strives to achieve a multifunctional residence through the design of a modular housing system. A large communal building that contains shared utilities is the central hub to the numerous single-family units that branch out of it. This communal building is utilized daily but can transform into a space for large celebrations and feasts.

Social organization and cohesion are components of traditional life that influenced the spatial organization in house two. Historically wigwams were organized in clusters, whereas tipis were organized around a central point. House two's modular design invites additional dwellings to connect onto the communal building. Modular systems allow for families to stay in close proximity, much like clusters of wigwams, but also revolves around a center space as seen in the organization of tipis.

Second consideration is a place of honour for elders. In house two, the modular units for elders are closest to the central communal building. Elders accessibility needs are met by this adjacency while simultaneously creating a strong association between Elders and the heart of the modular housing system.

Lastly the materiality of both house one and two is influence by the traditional structures of both the wigwams and tipis. The smell, feeling and appearance of these local materials are a direct reflection of the natural gifts that surround the homes. Traditional people used materials that were along the path of migration, as well as materials found on temporary settlements sites. House one and two do not over complicate the building process by outsourcing materials, rather harvest materials found on and around the site.

4.3. MODERN RESIDENTIAL DESIGN PRECEDENTS

In this section modern examples of indigenous residences are explored. While some of the projects are specific to a particular First Nation, other projects have been selected based on their Indigenous architect or designer. It was the intention of that all projects embodied the philosophy and spirituality of the Indigenous people. Projects that have been selected for this study include the One House Many Nations house, Cowichan Tribes Multi-Family Project and the Pilot Nunavik Duplex.

4.3.1. ONE HOUSE MANY NATIONS

Opaskawayak Cree Nation (OCN) is a Swampy Cree community that sits on the Saskatchewan and Manitoba border. In 2018 there was a shortage of roughly 700 houses in OCN (Kennedy, 2018). The figure 700 represents much more than one person per home, but rather 700 families without a place to call their own. In addition to the housing shortage, the subdivision grid system that is imposed on OCN has strong colonial roots thus making it an inappropriate system to implement (Kennedy, 2018).

In a 2018 CBC Radio broadcast, Ideas: One House Many Nations: Building Sustainable Homes to Solve a National Crisis, Dr. Alex Wilson spoke about the history of the subdivision grid system as a colonial war strategy used to map out a territory and take inventory, in order to remove resources and people (Kennedy, 2018). Dr. Wilson also explains how this grid strategy implements a social structure that pushes the myth of the “Canadian Dream” in which land, resources and the home are commodities and perpetuates white supremacy (Kennedy, 2018). Dr. Wilson is a professor in the department of Education Foundations and Academic Director of Aboriginal Education Research Centre at the University of Saskatchewan. Additionally, Dr. Wilson is a member of Idle No More, spear heading the One House Many Nations campaign, which is addressing the housing crisis taking place in her own community of OCN.

One House Many Nations (OHMN) is a collaborative project that lives up to its name. Community members, Design Lab at the University of Minnesota, as well as local design and carpentry trainees and supervisors came together to create a system of affordable housing based on Indigenous perspectives, transgenerational housing opportunities that enhance traditional art, language and knowledge transfer,

Figure 8: The One House Many Nations prototype house completed in 2018 (Kennedy, 2018).

and use material, technological systems that can be sourced and maintained locally. This first house was designed by members of OCN and is intended to be transferable to all Boreal communities.

One of the major design considerations discussed by architect Jacob Mans in, Ideas: One House Many Nations: Building Sustainable Homes to Solve a National Crisis, is to design homes to meet the correct use patterns of all users (Kennedy, 2018). Typically, the standard dwelling intended use pattern in the southern designed homes that are implemented in OCN only considers one family utilizing the dwelling at a time (Kennedy, 2018). However, it is common that three or more families live in one dwelling together in remote FN communities (Kennedy, 2018). Given the amount of people living in a home designed for one family often means that the users are taking turns sleeping (Kennedy, 2018). In this case the building not only under performs but also causes stress, lack of privacy, security and the ability to sleep (Kennedy, 2018).

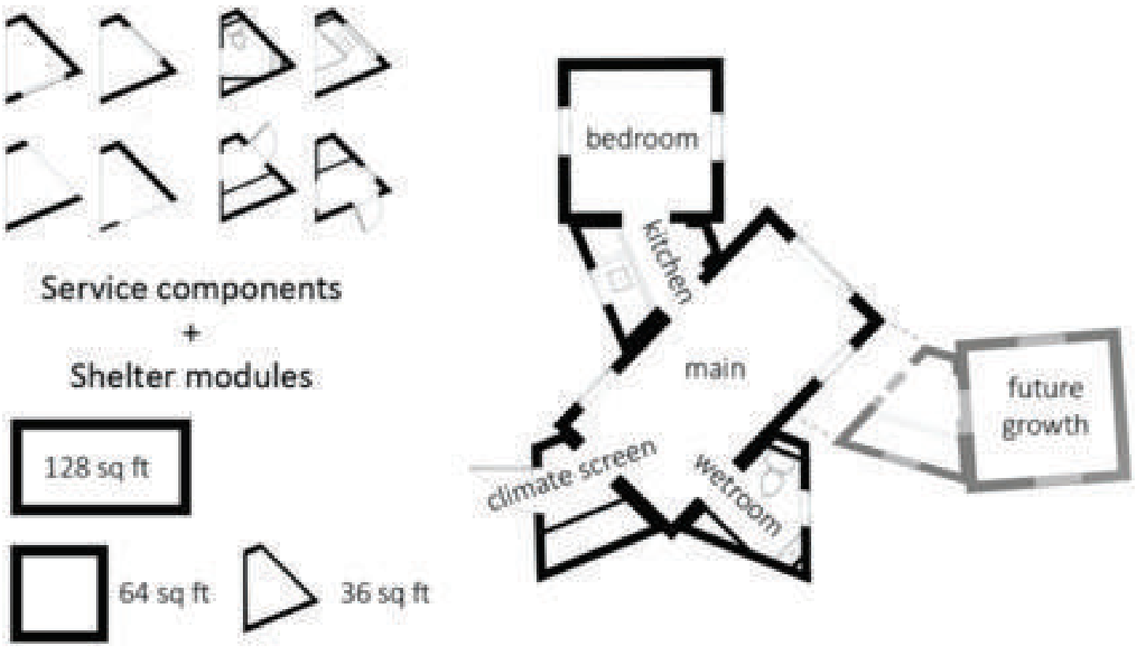


Figure 9: Diagram of how modular housing system uses a series of service components and shelter modules to accommodate an expanding household (Heid & Tallman, 2017).

To address these issues of underperforming and overcrowded buildings while creating a transgenerational housing opportunity, a module housing strategy was developed. As seen in figure 9, the house design is customizable and expandable by adding additional shelter modules through triangular service components that link the spaces together (Heid & Tallman, 2017). This allows for families of various sizes to expand their dwelling as their family grows and their needs change.

This modular housing system is made up of a series of Cross Laminated Timber (CLT) panels as seen in Figure 10. CTL gains its strength from perpendicular lamination across the grain of the pervious layer, comparable to how plywood is created (Heid & Tallman, 2017). However, unlike plywood, which is relatively thin, these panels are at a thickness that exceeds typical framing systems (Heid & Tallman, 2017). Given the mass of the timber panels, the walls perform as insulation (Heid & Tallman, 2017). These panels are manufactured in the community and are made of wood from deconstructed palettes as well as wood that is locally harvested and milled (Heid & Tallman, 2017).

Figure 10: Cross Laminated Timber Panels design like jigsaw pieces to fit together (Heid & Tallman, 2017).

Additionally, these panels can be assembled efficiently. According to Land Based Ventures, in which Chris Tallman who directed the building training program is co-founder of, the house required 168 CTL panels (Heid & Tallman, 2017). The rate of production of the panels was more than 15 completed panels a day (Heid & Tallman, 2017). The trainees produced the core components of the 700 square foot 2-bedroom home in less than 12 days (Heid & Tallman, 2017).

An important aspect of this project is the OCN community and homeowner collaboration. Jason Mans explains that rather than imposing simple solutions in FN communities, problem solving works best when working with a community to see how they intend to solve their own problems, then building up an idea with the community (Kennedy, 2018). When problem solving is done in such a way, the community has ownership of the idea and also an understanding of how it works so they can maintain it and evolve it. This also allows for solutions to be found by looking into the history of the community, looking at indigenous knowledge and principles of how to live with the environment. The homeowner's participation in building empowers them to maintain their own home and the homes in the community.

It is the future goal of this One House Many Nation's project to turn this modular housing system into a village. The village is made up of various family structures and housing to accommodate them, revolving around a central space referred to as the "brain" which houses all amenities. Figure 11 Provides a visual for how this village is organized around the "brain".

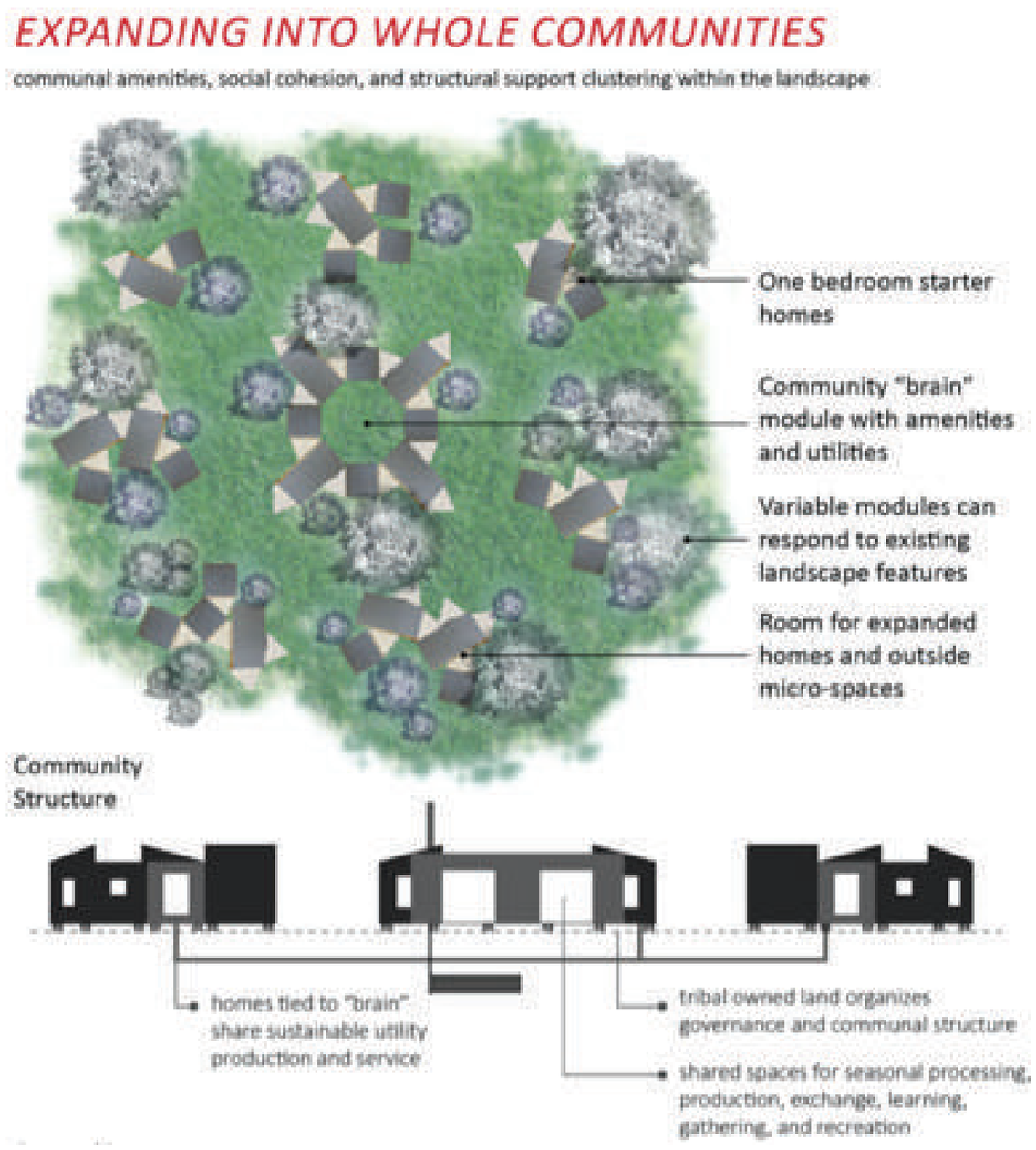


Figure 11:Village organization and community structure (Heid & Tallman, 2017).

Modular housing systems and community participation are two major take-aways from the OHMN precedent. Community led problem solving is a way in which ownership and power over housing can be placed back in the hands of the community. Having the ability to choose how the community wants to solve their own housing problems not only empowers all who are involved but simultaneously embeds indigenous wisdom into the architecture and interior far beyond aesthetic applications. This practicum considers what the island lake communities have done for living in the past as well as the contributions made toward the first BHB house that is currently being built in both GHFN and WFN.

Furthermore, one of the major goals of the second house is to create a modular housing system with a central communal space that houses amenities. This communal space provides a solution for the current housing configuration seen in WFN and GHFN where families live in grids, sharing houses and amenities. The current grid configuration of deteriorating homes is not designed to accommodate the sharing of space and amenities. A modular solution provides functionality through intentional adjacencies.

4.3.2. COWICHAN TRIBES MULTI-FAMILY PROJECT

In traditional society, the many communities that made up the Cowichan Tribes relied on spawning salmon, which is a gift from the First Ancestor Syalutsa (Cowichan, 2019). In order to assure the reciprocity of this gift of salmon, Elders carefully managed the capture and distribution. Much like the careful care taken towards salmon, the Cowichan ancestors touched the land and waters lightly, to respect and protect it (Cowichan, 2019). These ancestors took such care of their land that there is very little evidence of their presence (Cowichan, 2019).

In the summer months, the Cowichan used canoes to travel along the Fraser River with relatives for fishing opportunities (Cowichan, 2019). During this time, summer villages were located in at the mouth of the Fraser River (Cowichan, 2019). These summer homes were made of planks and were bound together with leather, this allowed for the homes to be disassembled in order for families to move from camp to camp (Cowichan, 2019).

The Cowichan both historically and presently are anchored in their families, believing that all are related through the traditional territory (Cowichan, 2019). Households consisted of several related families. Much like the governing practices in the present Cowichan Tribes, the elders were the respected leaders along with a village chief (Cowichan, 2019). The Cowichan have seven traditional villages including Kw'amutsun, Qwum'yiqun', Hwulqwselu, S'amuna', L'uml'umuluts, Hinupsum, and Tl'ulpalus. According to archaeologist, the Cowichan Tribes occupied their territory for as far back as 4,500 years, though historical and traditional memory says that the tribe has existed as long as time (Cowichan, 2019).

Figure 12: Cowichan settlements, leather bound dwellings in the background

While the Cowichan is now a modern society, their rich traditions and cultures are woven into their daily life. Today the Cowichan Tribes are the largest single First Nation Band in British Columbia with over 4,900 members (Cowichan, 2019). The people of the Cowichan Tribes are self-governing and self-sustaining with policies and projects directed by a Chief and Council. The Chief and Council, ensuring that the Cowichan Tribes progresses as a united First Nation, have delegated various services to a variety of different community leaders (Cowichan, 2019). While about half of members reside on the Cowichan Tribes reserve, there are over 600 members displaced, waiting on reserve housing. One of the purposed solutions for these displaced people is the Cowichan Tribes Multi-Family Housing Project by Formline Architecture.

Formline architecture is founded by one of Canada's few registered First Nations architects, Alfred V. Waugh, culturally affiliated with the Fond Du Lac (Denesuline) Nation in Saskatchewan (Waugh, 2019). Located in Vancouver, Formline specializes in environmentally responsible and culturally sensitive projects that reflect reflect and reinforce the values and visions of the client (Waugh, 2019). Formlines solution for the Cowichan displacement was a mixed housing unit equipped with amenities. Their goals for the project were to provide flexibility for families, integrate culture, create spaces of community and be sustainable before during and after the project (Waugh, 2019).

Figure 13: Section of various units. Note the size of the dining tables and how many people they accommodate

In order to address flexibility, Formline created a variety of unit types, ranging from bachelor units to 4-5 bedroom units, to accommodate larger families. Formline understood that apartment style living could often lack community (Waugh, 2019). Understanding the social structure of the Cowichan Tribes, both historically and in present day, meant that this living solution would require spaces that allowed for community interaction, making the pushed for the integration of communal spaces one of the top priorities. Formline surveyed the community members to uncover the spaces that the community felt would best allow for this relationship to flourish, the result; playgrounds, meeting rooms, study rooms, day care and community garden were included (Waugh, 2019).

As mentioned earlier, integrating culture into the design language was a priority of Formline. To make the character of the building match the unique identity of the Cowichan, integration of cedar, and artwork such as woodcarvings are embedded within the space (Waugh, 2019), as seen in Figure 14. In addition, the orientation of the building would greatly impact the spirit of the space (Waugh, 2019).

Figure 14: Community space with fire pit and wood carving cedar pergola

This ties into the sustainable aspects of the space, considering the sun path and natural ventilation opportunities. Units would have the potential to have windows on both sides of the unit. This allows for cross ventilation and maximizes sunlight; refer to figure 13 to see these opportunities.

Much like the One House Many Nations Village model, the Cowichan Tribes Multi-Family Project has put an emphasis on community shared spaces. Considering that people of various ages will be a part of this community Cowichan Tribes Multi-Family Project made sure to not only listen to what the Cowichan people wanted but also ensured that spaces for children were also considered. This aspect of this precedent inspired playground spaces as well as specific toy and school supply storage mounted at an accessible height within house two.

The consideration that is presented in the Cowichan Tribes Multi-Family Project that is particularly useful is the specific configuration and sizes of unites according to various family structures. Lastly, the Cowichan Tribes Multi-Family Project carefully integrated culture and storytelling into the built environment.

4.3.3. PILOT NUNAVIK DUPLEX

Nunavik is located in the northernmost region of Quebec, bordered by Hudson Bay in the west, Hudson Strait in the North and Ungava Bay in the east. The natural landscape is a remarkable display of wild untamed tundra, taiga forests, mountains, rivers and lakes (Tourism Nunavik, 2019) It is on this land that the Inuit of Nunavik have lived in harmony with nature for thousands of years. The ancestors of the modern Inuit people were hunters and gathers, moving from one camp to another as hunting changed seasonally (Tourism Nunavik, 2019). Today Nunavlk is inhabited by 10,000 Inuit and reside in 14 villages along the Hudson Bay (Tourism Nunavik, 2019).

Figure 15: Pilot Nunavik Duplex exterior

The Nuhavik are among the many Indigenous groups struggling with the housing crisis, specifically with obtaining healthy, functional and culturally appropriate homes. Native architect Alain Fournier and Société d'habitation du Québec (SHQ) set out to address the housing crisis with a collaborative design project (Atkins, 2018). In order to improve on housing design a steering committee was created (Atkins, 2018). The committee invited community stakeholders to participate in a two-day design charette

incorporating elders, families, mothers, youth, young adults, hunters and traditional women sewers in order to best represent the community (Atkins, 2018). The charette established major themes and design goals. The committee was in overwhelming agreement that the housing project must go beyond standard safety, energy and environmental consideration in order to embrace culture re-appropriation and empowerment (Atkins, 2018).

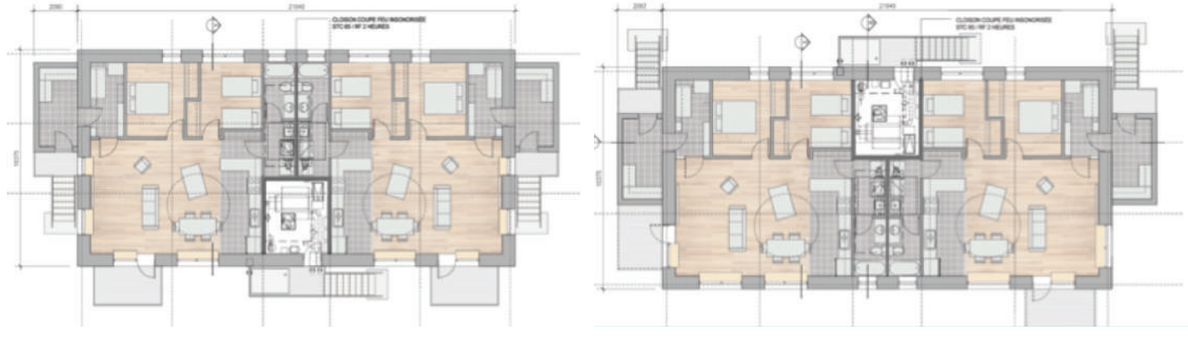


Figure 16: Duplex Floor plans – featuring living space facing south and multiple entrance options (Atkins, 2018).

A passive house approach was first taken to improve on the current energy standards. The home had to have greater insulation and an airtight envelop, requiring excellent doors and windows and reduced thermal bridging (Atkins, 2018). Using the sun as a source of free energy, the design team paid close attention to the home's orientation and window placement (Atkins, 2018). This resulted in the house orientation to require that the living spaces are facing south, brightening and warming the interior (Atkins, 2018).

In order to accommodate a consistent southern orientation, two versions of the duplex were created, maintaining the same interior layout however altering the entrances, allowing the entrance to always face the road (Atkins, 2018). The house also features a warm porch for coats and boots, and a cold porch used for secure storage for hunting gear and butchered game (Atkins, 2018). The warm porches are the main entrance into the home while the cold storage is accessible from the interior, refer to Figure 16 for floor plans.

The interior addresses the cultural needs of the Nuhavik. The communal gathering and traditional "country food" feasts are eaten on the floor requiring different kitchen and dining layouts. To address this, the kitchen features a movable island to allow for a flexible space as seen in Figure 17. What is for the most part a simple adjustment to the kitchen island makes a monumental functional and cultural improvement in an Inuit home.

Figure 17: Kitchen island on wheels

In summary the Nuhavik Duplex is a successful design endeavor that utilized community knowledge and energy efficient design strategies. For the third time in this modern precedent analysis a participatory design process is acknowledged to be a key component to successful Indigenous design. Although this practicum project could not conduct its own charrette, design charettes originally conducted by the BHB along precedent charette results are indirectly drawn upon. For example, the Nuhavik Duplex charette as well as the BHB charette both included a porch. Undoubtedly the porch is a functional and important element and will continue to be improved upon in this practicums design exploration.

Large communal spaces should take advantage of the constant energy the sun gives. Although remote FN home design complicate importation of building materials, quality windows and doors are a worthwhile investment, both contributing to energy efficiency and the homes overall atmosphere and beauty.

Lastly traditional feasts and other cultural needs should be integrated into the final design. This sets western design and indigenous design apart. As previously mentioned, southern suburban designs do not meet the unique needs of Indigenous groups. While each group has cultural differences, it is the designer's job to understand those cultural needs and create space that accommodates them.

CHAPTER 5: INTERVIEWS

5.1. CHAPTER OVERVIEW

The proposed semi-structured interview will be conducted with the intention to uncover information regarding the Island Lake's heritage and history that is not welll-documented in academic or other secondary sources. Interview participants from Wasagamack First Nation and Garden Hill First Nation, identified by the community, will be invited by letter to pass on information in the traditional oral way of teaching and sharing. All participation will be voluntary and written consent will be confirmed prior to the collection of any data. The Interview Guide contains a list of questions that the interviewer will use to prompt the interviewee on topics related to the history and heritage of the First People of Island Lake. Open ended questions allow participants to expand on relevant topics, allowing for themes to emerge that might not originally anticipated by the interviewer. The interview will not, however, be used to discuss individual personal experiences of the interviewee, but rather the broader community experience.

5.2. PARTICIPATES

Participants will be people from the communities within the Island Lake, the traditional territory of Anishininew who are experts, or teachers of their land. The potential participants will be referred to this practicum by the tribal council offices in the communities. The referral will be on the basis of the Council's acknowledgment of the participant's knowledge, expertise and ability to communicate information regarding the history and heritage of their traditional territory. The goal will be to interview at least one individual from each community. There is no funding for translation services, so interviews will be conducted in English, which will exclude non-English speakers.

5.3. FINDINGS

It is at this time that interviews are still in the process of being completed. The finial presentation will have results of interviews and will help to improve upon the design presented during this intermediate stage.

5.3.1. HERITAGE

5.3.2. HISTORY

CHAPTER 6: SITE

6.1. INTRODUCTION

Located in the Hayes watershed, Wasagamack is embedded within an abundance of naturally flowing water and undisturbed wildlife. Balsamic granite carves out the shores of the thousands of islands that make up the Island Lake territory (Thompson et al, 2019). In addition to the remarkable undisturbed water systems, a large intact Boreal Forest ecosystem also thrives in and around Island Lake (Thompson et al, 2019).

Surrounded by water, there is no roads that lead in or out of the Island Lake communities. Planes, helicopters, boats, and skidoos are used to travel over the land. The Anishininwuk live off their territory, harvesting beaver, duck, geese, moose, muskrat, barriers and various medicines (Thompson et al, 2019).

6.2. SITE ANALYSIS MAP

As previously stated, the BHB are constructing four homes that will be completed in the summer of 2020. Of the four homes, two will be located in GHFN, while the remaining will be located in WFN. One of the sites located in WFN has been selected to serve as this practicum projects primary location. As there are no street names, landmark adjacencies, and land formations are described to help identify the exact location.

The selected site is located on the long winding shore that defines the entire east side of WFN. Nuzzled between two peninsulas, house one and two will enjoy having direct access to water, allowing boat travel in the warmer months and skidooing in the winter.

There is one main road in WFN that runs parallel to the winding shoreline. Smaller roads branch off leading to pockets of homes. The closest landmark to the site is the George Knott School which is located on the main road. From the George Knott School a small road branches out south east, leading directly to the small clearing serving as the chosen site.

Wasagamack experiences all four seasons. Given the remote location, access to and mobility within Wasagamack is greatly impacted during the freeze up and thawing seasons, which is typically experienced in the fall and spring. The hottest month of the year occurs in July with an average temperature of 16 degrees Celsius (Meteoblue, 2020). Coldest month occurs in January with an average seasonal low of minus 24 degrees Celsius (Meteoblue, 2020). August is the wettest month with an average precipitation rate of 46.4 mm (Meteoblue, 2020). The annual precipitation experienced is a total of 266.0 mm (Meteoblue, 2020).

The longest day of the year occurs in mid-July with a total of 17 hours and 7 minutes of sunlight. During high noon, which takes place at 1:20pm on the longest day, the sun is positioned with an altitude of 60 degrees heading 180 degrees south (Timeanddate, 2020). The shortest day of the year occurs at the end of December with a total of 7 hours and 24 minutes of sunlight (Timeanddate, 2020). During high noon, which takes place at 12:16pm on the shortest day, the sun is positioned with an altitude of 13 degrees heading 180 degrees south (Timeanddate, 2020). The sun path seen of the site analysis map expresses the difference in altitude, with the outer ring representing the longest day and the smaller ring representing the shortest day (Timeanddate, 2020).

SUN PATH

The wind rose indicates the direction the wind blows (Meteoblue, 2020). The peddle indicates the speed of wind, the larger indicating faster speeds for longer periods of time (Meteoblue, 2020). Island Lake experiences strong winds from December to April while June to October are calm (Meteoblue, 2020).

WIND ROSE

DUMPING GROUNDS

BAND OFFICE

NORTHERN GROCERY STORE

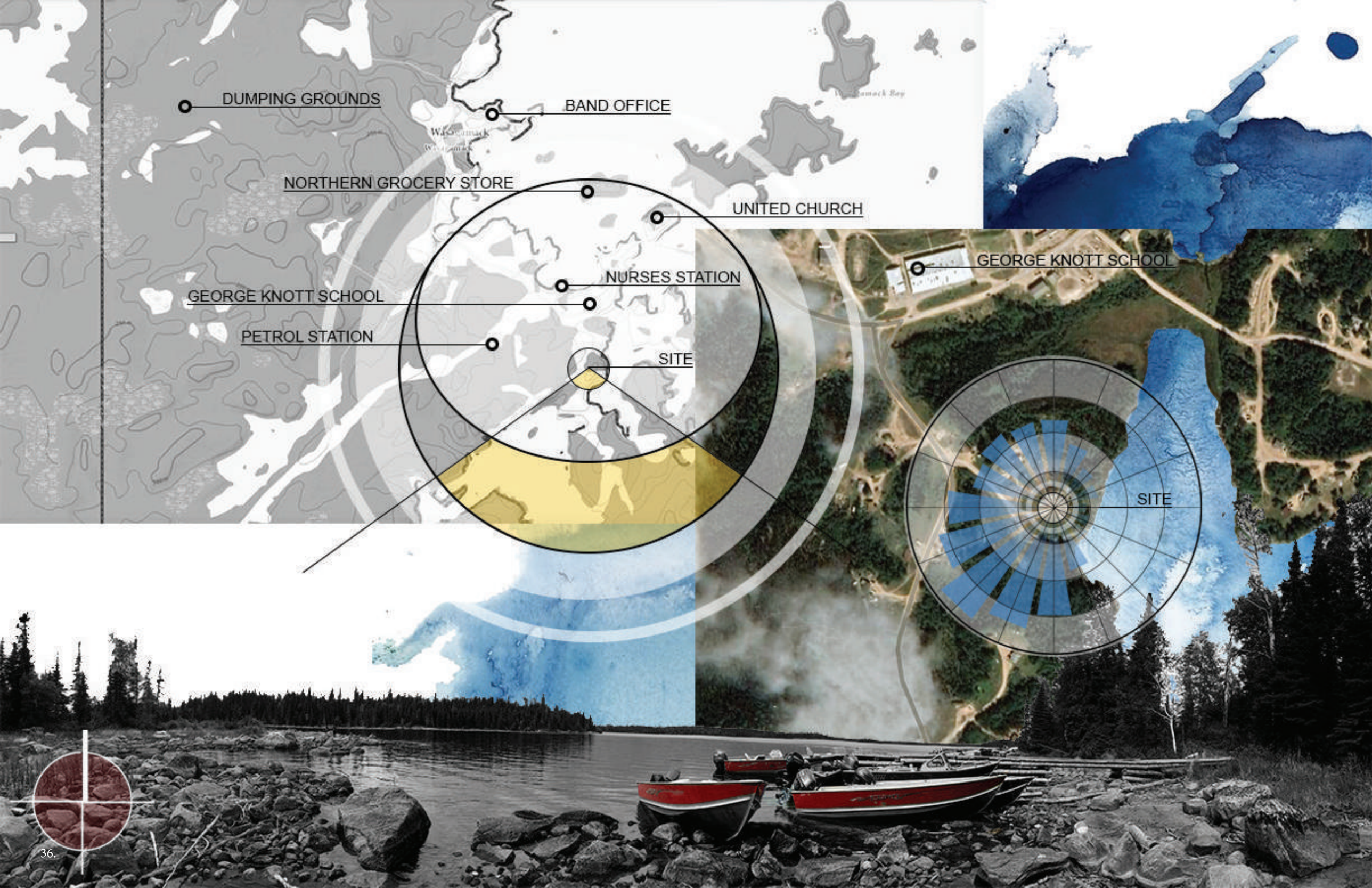
UNITED CHURCH

NURSES STATION

GEORGE KNOTT SCHOOL

PETROL STATION

SITE



CHAPTER 7: CLIENT

7.1. LANGUAGE

According to Associate Professor, Dr. Shirley Thompson and elders Norah Whiteway and Victor Harper's journal, Our Home on Native Land: Wasagamack First Nation Ancestral Land Use, Oji-Cree has been used to describe the Island Lake dialect by the government and settlers. However, the people of Island Lake consider this term misleading as it implies that the community is half Ojibway and half Cree (Thompson et al, 2019). Considering that the Island Lake people have their own distinct dialect, Oji translates to offspring of fly, or in other words maggot and therefore is considered derogatory (Thompson et al, 2019).. The Island Lake people have their own heritage and culture that is not communicated or respected when referred to as Oji-Cree.

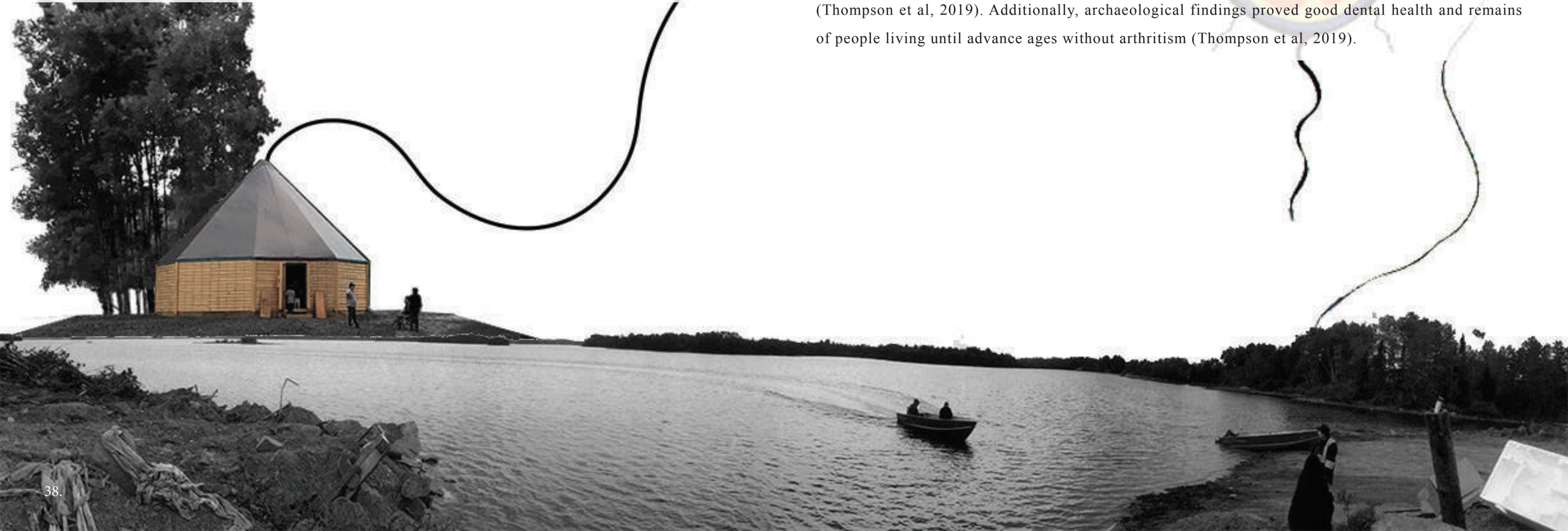
When referring to the people of Island Lake the correct term is Anishiniwuk, when referring to the community the correct term is Anishininew and when referring to the dialect the term Anishinimowin should be used. This correct terminology helps the Anishiniwuk reclaim their identity. However, it is important to acknowledge that although this terminology is preferred by the Island Lake tribal council some community members favour Baskwinaksimon – Island Lake Dialect, Baskwinaksiing – Island Lake, or literally place of many islands, and Baskwinaksi'ininwak – Island Lake people (Thompson et al, 2019).

7.2. HISTORY

7.2.1. PRE-COLONIAL ISLAND LAKE

Dr. Thompson and elders Whiteway and Harper described the pre-colonial Island Lakes of having material prosperity, spiritual wellbeing and healthy people. Material prosperity and spiritual well-being came hand-in-hand as the people of Island Lakes harvested and hunted sustainably ensuring reciprocity between the people, the animals and the land (Thompson et al, 2019). Harvesting and hunting was a spiritual practice as the Anishiniwuk provided offerings to the earth, land and animals in return for plant and animal sacrifice (Thompson et al, 2019). These honorable sacrifices where used for food and material and the Anishiniwuk were careful not to take more than what was required (Thompson et al, 2019).

The Anishiniwuk where healthy as the way of life allowed for a healthy lifestyle naturally. Not only was the pre-colonial diet comprised of natural foods, but also the very act of hunting, gathering and moving throughout the land allowed for various physical benefits. This pre-colonial way of life protected the Anishiniwuk from diseases such as obesity, diabetes, cancers and cardiovascular diseases (Thompson et al, 2019). Additionally, archaeological findings proved good dental health and remains of people living until advance ages without arthritism (Thompson et al, 2019).



7.2.2. ISLAND LAKE COLONIAL IMPACT

Prior to contact in 1818, the four separate communities that currently make up Island Lakes, St. Theresa Point (STP), Wasagamack, Garden Hill and Red Sucker, were originally a singular group, who resided on Linklater Island or as commonly referred to as Old Post (Thompson et al, 2019). Although settlers did not settle in Island Lakes specifically, residential schools and land surveyors still managed to impose colonial assimilation and the exploitation of natural resources (Thompson et al, 2019).

Settlement and housing underwent major change after colonial impact. In 1925 it was common for Island Lake to have log homes along the water's edge for ease of access to unpolluted water (Thompson et al, 2019). In 1960 the log homes then became replaced by the inappropriate side-by-side homes that are typical to southern suburban design (Thompson et al, 2019). If it was not already paralyzing enough to have unfit southern designed homes imposed on the Anishininew, these homes did not have electricity or any running water at the time, making this replacement and relocation a significant downgrade.

Seven years into the implementation of southern homes, electricity came to Island Lakes however was, and still remains to be undependable (Thompson et al, 2019). Island Lake was later connected to the Manitoba Hydro grid in 1999, which imposed Hydro costs to what once was a cashless economy (Thompson et al, 2019). It was not until 2004 that piped water and sewage became a part of this new infostructure, first starting in STP, then later in 2009 in GHFN and WFN (Thompson et al, 2019). It was in the 2000's where high rates of diabetes were reported which can be attributed to this drastic change in life (Thompson et al, 2019). The table below outlines significant life altering events that transpired as a result of colonial impact in 1818 (Thompson et al, 2019).

Table 3: Colonial Impact breakdown

Colonial Impact (Thompson et al, 2019).	
Year	**Description**
1818	- Impact in 1818 at original settlement, Old Post on Linklater Island, by the HBC abandoning it until 1864 when HBC built a permanent structure.
1903	United Church of Canada missionary resides at Island Lake
1909	August 13, 1909 Treaty 5 signed
1909-1955	- Island Lake people chose to canoe to Norway House to Attend the Methodist residential school. Further detail in section 7.2.3. Residential Schools - This education led to the Cree Syllabics becoming widely used in Island Lake.
1913	- Land Surveyors arrive. - Old Post never made a reserve due to government interest in minerals. Mining interest in the mineral rich greenstone belt created immense land pressure
1925	Communities built log homes along water's edge to access unpolluted drinking water.
1940	Trap lines registered under Manitoba Wildlife Act
1956-1970	The 60s Scoop: - Children stolen from parents to attend residential school - Parents began to raise children on the trap lines to escape - Further detail in section 7.2.3. Residential Schools
1950	no cash economy at this time
1960	- Due to Compulsory schooling and crash of fur trade people became more dependent on the government - Log homes became replaced with inappropriate southern side-by-side homes with no running water
1967	- Electricity come to Island Lake Island Lake splits into four smaller reserves: St. Theresa Point, Wasagamack, Garden Hill and Red Sucker
1970	Local schools built in communities
1999	- Island Lake connected to Manitoba Hydro electricity grid - There is no sewage management within the community at this time
2000	High Rate if Diabetes are reported
2004	Piped water and sewer for STP begin
2009	Piped water and sewer for GH and WAS begin water conditions are assessed and show third world conditions

7.2.3. RESIDENTIAL SCHOOLS

Eight years following the establishment of Canada, the Canadian government began a cultural genocide on the indigenous peoples through the implementation of 139 residential schools between the years of 1876 – 1996 (Chrétien, Donald, and Karen Restoule, 2013). The intention of these schools where to 'whitewash' Indigenous children by isolating them from their families, homes, language and cultural practice… to "Kill the Indian in the child." An estimated 150,000 First Nation, Inuit and Métis children between the ages of four to sixteen attended these schools (Restoule et. al, 2013). Aside from the forceful implementation of haircuts, uniform, religion, and language these children were subjected to extremely inhumane treatments and punishments, all of which have been listed below.

Traumatic Experiences and Punishments: (Restoule et. al, 2013).

- Use of toxic chemical to clean children's hair and skin
- Lack of nutritious diet
- Insufficient quantities of food
- Served spoiled food
- Segregation based on gender
- Sexual assault
- Forced abortions
- Electrical shock
- Force-feeding of own vomit
- Exposure to freezing temperatures
- Withholding of medical attention
- Exposure to contagious illness
- Forced labour in unsafe work environments
- Needles inserted into tongues for speaking Indigenous language
- Leather strap used to hit various areas of body
- Beating with fists
- Burning and scalding hands
- Inflicting beatings until unconscious
- Starvation

Given the remote and difficult to access location, European settlers did not impact Island Lake until 1818 (Thompson et al, 2019). Due to Island Lake's late encounter by the Europeans, the imposition of Residential Schools was delayed but not avoided. Following the presence of the United Church of Canada missionary in 1903 and the signing of Treaty 5 in 1909, children began to canoe to Norway House in order to attend school (Thompson et al, 2019). In 1956 the government implemented residential school policies as well as the Indian Act that gave the Royal Canadian Mounted Police (RCMP) more access to remote communities (Thompson et al, 2019). Access came from the use of floatplanes, making remote locations previously protected by their complex terrain and lack of road or air access defenceless, and thus making the devastating "60's Scoop" possible (Thompson et al, 2019). It was between 1956 and 1970 that Anishininew children were kidnaped by RCMP and taken to residential schools (Thompson et al, 2019). Following this devastation, a local school was built and the Ainshininew began to settle around it in order to protect their children. By settling this allowed for students to attend day school however the children were disconnected from their family, land, culture and language.

7.3. LAND, COMMUNITY AND INDIVIUAL IDENTITY

7.3.1. LAND IDENTITY

Balsalt igneous rock along with the remains of ancient eroded volcanic mountain formations make up what is the shores of Island Lake (Thompson et al, 2019). The rocks the define the land are considered to be alive and are often referred to as grandfathers (Thompson et al, 2019). Depending on the language translation, Wasagamack translates to “bay” and Paskonakosiwin wak, another word commonly used to refer to the Anishiniwuk, translates to “smooth earth people” or “smooth rock people” (Thompson et al, 2019).

7.3.2. COMMUNITY IDENTITY

7.3.3. INIVIDUAL IDENTITY

Infromation pending on interview results

7.4. SOCIAL AND FAMILY ORGANIZATION

Island Lake's family organization has historically been comprised of various clans. According to Our Home and Native Land: Wasagmack First Nation, Thompson et al, 2019, the clans in Wasagamack were primarily bear and wolf clans who then married into moose, eagle, sucker, crane, sturgeon and caribou clans. All members of a clan are considered family regardless if all were blood relatives or not and therefore could not marry within the clan. This made for a sophisticated mating system that prevented inbreeding (Thompson et al, 2019). Given that the traditional peoples of Island Lakes were noematic due to harvesting, it was common for Anishininwuk to marry into clans as far south as Sault-Ste Marie, Ontario (Thompson et al, 2019).

Today families are typically organized in homes within the island lake communities. Households in Island Lake are considered crowded with an average of 4.9 people per home, in comparison to what is the national average at 2.4 persons per household (Statistics Canada, 2016). Homes in these communities are often small, but welcome in extended family and friends.

7.5. SPIRITUALITY AND RELIGION

Traditional Anishininwuk harvesting reveals much about the spiritual relationship between humans and all other life. Harvesting and hunting involved a combination of ceremonies, stewardship and protocols to maintain balance between people and earth (Thompson et al, 2019). In Anishininew the word for earth is Aki. All life and Aki are gifts from the Creator. In order to care for these gifts, animals and plants agreed to sacrifice themselves for food, shelter and clothing and in return humans would care for and protect the land (Thompson et al, 2019). This agreement not only is an important part of Anishininwuk culture but also creates reciprocity, balancing humans, animals and plants. Harmony between humans, land, animals and plants is what defines human nature for the Anishiniwuk (Thompson et al, 2019).

The Anishiniwuk use the land orientation as directions of prayer. According to Elders from Island Lake, there are seven directions. Six of the directions represent the powers of the universe including; north, south, east, west, heaven and earth (Thompson et al, 2019). The seventh direction is found within and represents the power of the Creator in each person (Thompson et al, 2019). The Anishiniwuk see nothing but good in every direction. There is no evil, rather "crooked good" only needing to be straightened out (Thompson et al, 2019). The Anishiniwuk seek out guidance and knowledge from all directions, as well as directly from the creator within.

CHAPTER 8: PROGRAMMING

8.1. CLIENT AND USER PROFILES

8.1.1. CLIENT PROFILES

The client for both House One and Two is the GHFN and WFN Band Counsels and community members. As discussed in section 3.5.2. On-Reserve Home Ownership, the use of land is determined based on allotments given out by the Band Counsel and the Minister. After allotments have been granted, the creation and construction of the houses are a community led effort. Therefore, both the Band Counsels and both GHFN and WFN community members make up the broad client profile.

8.1.2. HOUSE ONE: THE HARPER FAMILY

The occupancy structure of house one includes three generations of the fictional Harper family. Sharon and William Harper, their son Brandon and daughter in-law Norah live together along with Brandon and Norah's children Jason and Serena. Given the current limitations in GHFN and WFN, the goal of house one is to utilize all 865 square feet to its functional potential while creating spaces of privacy. Although profiles are realistic and detailed they are fictional and do not represent any specific community members.

Mature Adults (M):

M1: Female, 59 – M1 has been a council member for WFN for the past 8 years. Aside from the day to day responsibilities she carries out at the Band Office, she is passionate about teaching children how to cook traditional foods. She involves children and teenagers in community celebrations by encouraging them to participate in preparing food along with her.

M2: Male, 63 – M2 is a retired carpenter, now providing water taxi services in his spare time. M2 can often be found volunteering his time with the Boreal Home Builder students, passing on his knowledge of carpentry to young men and women. When he is not taxing or volunteering, he can be found playing cards at the and office or fishing with his family and friends.

Together, M1 and M2 have been in a thriving partnership since their mid-twenties. They have three children together and are the proud grandparents to five grandchildren and counting. Both M1 and M2 have been and continue to be very active in their community and take tremendous pride in their heritage and strong family values.

Young Adults (Y):

Y1: Male, 28 – Y1 has been working with the WFM Water Distribution Centre for two years, however, is an aspiring carpenter taking on work as it arises in WFN. Y1 is very family-oriented spending most of his free time with his parents, wife and young children. One of his favourite pass times is wood working and crafting with the company of his children.

Y2: Female, 25 – Y2 has been a receptionist at the nurses' station since she was nineteen years old. Norah is very passionate about health care and has been preparing to begin nursing courses once both her children begin school. Y2 is originally from GHFN but moved over is WFN when she started working at the nurses' station and married Y1. Much like M1, Y2 enjoys fishing as well as hunting with her family.

Y1 and Y2 are an are hardworking and an ambitious young couple. Much like their parents they have strong family values and would like to create futures for themselves and their children within Island Lakes. Y1 and Y2 are inspired by the community involvement of their parents and try to involve themselves and their children in community events.

Children (C):

C1: Male, 4 – C1 loves art, music and dancing. He often puts on performances for his family. Jason is very excited to start school, specifically C1 is very eager to participate in arts and crafts.

C2: Female 5 – C2 recently completed first year of primary school and her favorite subject is math. He favorite thing to do is cook with her grandma C2. She wants to be a chef when she grows up.

C1 and C2 along with their cousins are often cooking with their grandmother or fishing with their grandfather. They are curious and imaginative which allows for endless hours of drawing, fort making and make believe. C1 and C2 are very attached to their parents and love to include them into their craft and play.

8.1.3. HOUSE TWO: THE STURGEON CLAN

House two is a modular housing strategy that pushes to the next phase of evolution of the design. Given the issue of overcrowding faced by many families on reserve, a modular design allows for a constantly growing family to add additional living units while maintaining a large shared space. The occupancy structure for house two is constantly evolving as the sturgeon clan grows. This means that there will be various generations living harmoniously. Multiple units will be created to address the needs of mature adults, families of various sizes and individuals alike.

8.2. BUILDING CRITERIA

This practicum was undertaken in parallel with the activities of the 2018-2019 Boreal Home Building Program in WFN and GHFN. The building's architectural and structural design is adapted from one used "Standing Tree to Standing Home Program". The first home design to be constructed in the spring of 2019 in each community is 576 ft2 and made from locally sourced and locally milled timber. The scope of this practicum project is the interior spatial design, furnishing and fit-out. The goal of the proposed practicum is to provide interior home design solution(s) that address the interior design needs of housing in this remote FN community. In order to achieve that goal, the interior design solution(s) should meet the following objectives:

- Accommodate daily tasks and lifestyle
- Support the unique culture and identity of these First Nations communities
- Reduce reliance on resources outside of the community
    - Use locally sourced materials and finishes (e.g. wood, recycled/salvaged)
    - Be affordable and straightforward to build/install.
    - Be durable and easy to maintain with locally available resources
    - Promote energy independence through integration of energy efficient and bio-fueled equipment and environmentally responsive indoor systems (e.g. passive lighting, heating, ventilation, and so on)
- Support the safe collection, storage and treatment of potable and rainwater.
- Cold storage, and solid waste disposal and recycling
- Provide support for healthy living
- Be flexible and accessible to meet needs of multi-generational, multi-family households

8.3. HOUSE ONE - THE HARPER FAMILY

8.3.1. INTRODUCTION

House One is a simple but thoughtful design based on what is currently feasible in WFN and GHFN. This three-bedroom home is intended to be used by the Boreal Home Builders for training various skilled-trades students. Although ordinary upon first glance, subtle but key details address the unique needs of northern communities that are currently not addressed by the imposed southern housing solutions. Examples of these key details include:

1. Wood burning stove - a reliable heat source, centrally located for equal heat distribution
2. Enclosed porch that creates a barrier between outdoor elements and the interior
3. Glazing on north and south exterior walls maximizes sun exposure
4. Strategically stacking all plumbing in one location to simplify plumbing

8.3.2. SPATIAL REQUIREMENT

Table 4: House 1 Spatial Requirements

Spatial Requirements Chart					
Type	**Room Name**	**Sq. Ft.**	**Furniture + Equipment**	**Lighting**	**Description**
House 1	Master Bedroom	100+	- Queen bed - Storage	RD F/TL	1. Sleeps 2 people comfortably
	Bedroom 2	100+	- Twin bed x2 - Storage	RD F/TL	1. Sleeps 2 people comfortably
	Bedroom 3	100+	- Twin bed x2 - Storage	RD F/TL	1. Sleeps 2 people comfortably
	Mud Room	40+/-	- Boot and Jacket Storage	RD	1. Easily accessible storage for 6-10 people
	Laundry	15+	- 30x30" Front Loading Washer - 30x30" Front Loading Dryer - Storage	TL RD	1. Avoiding stacking appliance 2. Storage for cleaning product
	Kitchen Dining	140+/-	- 30x30" Stove - 30x30" Fridge - Electric Water Heater 24" diameter - Dining for 6	TL RD	1. Counter space for preparing food is essential 2. Ventilation is required
	Living Space	140+/-	- Soft Seating - Coffee Table -Television - Wood Burning Stove 15.5" W x 22"L x 31.75" H	RD F/TL	1. People may sleep in this space.
	Bathroom	55+	- Toilet - Sink - Bathtub 32x65"	RD WM	
	Enclosed Porch	160	- Chest Freezer 44x24"	RD WM	1. Meat storage 2. Face north

Legend			
Abbreviation	**Definition**	**Abbreviation**	**Definition**
F/TL	Floor or Table Lamp	Sq. Ft.	Square footage
TL	Task Lighting	L	Length
RD	Recessed Downlights	W	Width
WM	Wall Mounted Lighting	H	Height

8.4. HOUSE TWO - THE STURGEON CLAN

8.4.1. INTRODUCTION

House Two explores the possibilities of Indigenous interiors beyond some of the current limitations. The basic but essential findings from the actual building of Home One establishes the foundation that allows for House Two to improve on sustainability, resiliency and Indigenous design philosophies which can be implemented in both form and function.

8.4.2. SPATIAL REQUIREMENT

Table 5: House 2 Spatial Requirements

Spatial Requirements Chart					
Type		**Room Name**	**Sq. Ft.**	**Furniture + Equipment**	**Lighting**	**Description**
House 2	**Longhouse**	Kitchen Dining	160+/-	- 30x30" Stove - 30x30" Fridge - Dining for 10+	RD TL	1. Counter space for preparing food 2. Flexible space to allow for large gathering 3. Ventilation required
		Mud Room x2	40+/-	- Boot and Jacket Storage	RD	1. Easily accessible storage for 6-10 people 2. Face North/South
		Laundry	120+	- 30x30" Front Loading Washer x2 - 30x30" Front Loading Dryer x2 - Seasonal Storage	TL RD	1. Avoiding stacking appliances 2. Counter space for folding 3. Storage for cleaning product
		Living Space	120+/-	- Soft Seating 10+ people - Coffee Table -Television - Wood Burning Stove - Wood storage	RD F/TL	1. Main shared gathering space. 2. Ventilation required 3. No fixed furniture for flexibility
		Washroom	55+	- Toilet - Sink - Bathtub	RD WM	1. Accessible Standards to be applied
		Butchery	160	- Chest Freezer x2 - 30x30" Fridge - Sink - Ceiling mounted rack - Seating for 6 - Work space for 6	RD WM	1. For butchering of animals and cleaning fish 2. cold storage 3. Drainage required
		Utilities	50+/-	- Water heater - filtration system	RD	1. Houses major utilities connecting all units
House 2	**Two Bedroom Unit**	Master Bedroom	100+	- Queen bed - Storage	RD F/TL	1. Sleeps 2 people comfortably
		Bedroom	100+	- Twin bed x2 - Storage	RD F/TL	1. Sleeps 2 people comfortably
		Kitchenette	40+/-	- 30x30" Stove - 30x30" Fridge - Sink - Electric Water Heater	TL RD	1. Seating for 4
		Bathroom	55+	- Toilet - Sink - Bathtub	RD WM	1. Accessible Standards to be applied
		Living Space	120+/-	- Soft seating for 4 - Tv - Wood Burning Stove	RD F/TL	
	Two Bedroom Unit	Master Bedroom	100+	- Queen bed - Storage	RD F/TL	1. Sleeps 2 people comfortably
		Kitchenette	40+/-	- 30x30" Stove - 30x30" Fridge - Sink - Electric Water Heater	TL RD	1. Seating for 4
		Bathroom	55+	- Toilet - Sink - Bathtub	RD WM	1. Accessible Standards to be applied
		Living Space	120+/-	- Soft seating for 4 - Tv - Wood Burning Stove	RD F/TL	
	Landscape	Shared Gathering Space	N/A	- Fire pit and wood storage - seating for 15+ - Outdoor dining - Seasonal Storage	N/A	1. Should be flexible to accommodate various celebrations and ceremonies.
		Continuous Porch	N/A	- Outdoor seating to accompany every unit	WM	1. Allows for a more private outdoor experience
		Shared Garden	N/A	- Rainwater storage - green house and outdoor garden		

Legend			
Abbreviation	**Definition**	**Abbreviation**	**Definition**
F/TL	Floor or Table Lamp	Sq. Ft.	Square footage
TL	Task Lighting	L	Length
RD	Recessed Downlights	W	Width
WM	Wall Mounted Lighting	H	Height

8.5. CHALLENGES

The remoteness and the means required to reach the communities within Island Lakes present the most prominent challenge when considering the design and construction limitations. Although GHFN has air access, WFN specifically does not have its own designated airport (Thompson et al, 2019). WFN is only accessible by flying to St. Teresa Point airport, then traveling 15 km over open water by boat in the summer or via winter road in the winter to reach the community. This journey becomes even more complicated during freeze up and break up seasons as the conditions do not allow for safe on foot, boat, skidoo and truck traveling. It is in this season where the use of very expensive helicopters is used as required (Thompson et al, 2019). Traveling on land within WFN and GHFN does not come any easier as both communities are roadless.

In addition, the distance to the largest city in Manitoba is 1500km away and will take upward of 17 hours via winter roads. Almost all material and equipment required on a typical job site would likely have to be shipped over from larger cities via winter roads. Winter roads have a reputation for their dangerous conditions and small window of operation. Unlike designing in the south, one does not have access to a hardware store or material supplier, thus making the process is much more strung out, complicated and expensive.

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CHAPTER 9: DESIGN DEVELOPMENT

9.1. PRELIMINARY CONCEPT DEVELOPMENT

Spatial Requirements

- Mud room
  - Boots /coat storage
- Laundry
- Storage
  - Tools hunting/fishing
  - General
- Kitchen/dining
- Meat and Hide prep
  - Butchering
  - Cold storage
- Bathroom
- Bedroom
  - Two single beds
- Master bedroom
  - one queen
- Living
  - Soft seating

-Enclosed porch
-Porch

Must include:
- Wood storage
- Wood burning stove

Adjacencies:

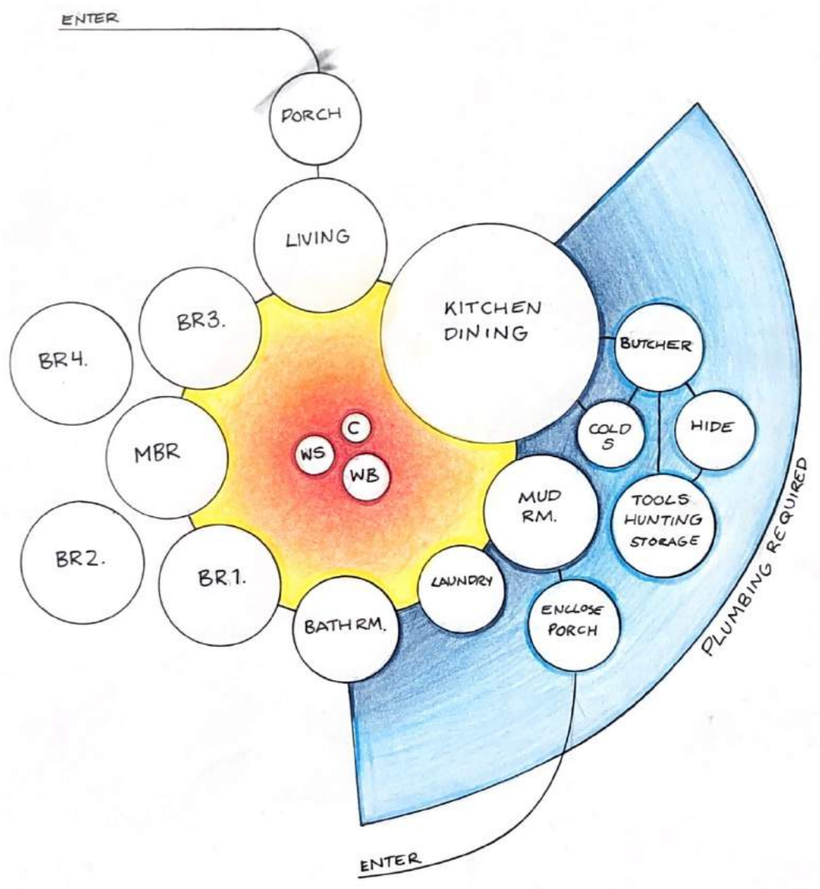


Figure 18: Bubble Diagram

The first stages of space planning involved an exploration into Spatial Requirements and Adjacencies through bubble diagrams. Having worked alongside with the BHB team and attended countless meetings regarding the design and function required to suit life in remote FN communities, it be game apparent that plumbing and heating would become a defining aspect of space planning.

Plumbing should be ganged up. Given the Extremely cold weather experienced in Island Lake, it is essential that all plumbing lines are insulated and receive heating in order to prevent damaged caused by freezing in the winter. Scattering water lines that run in and out of the house is wasteful as the homeowner would have to heat more than one location. In addition, scattering water lines over complicated the building process when considering the goal of simplicity and learnability for House One. Figure 18 shows all of the spaces that require water ganged up on the right side of the diagram connected by blue.

Heating in the remote north is an additional aspect of life that tends to be misunderstood in standard southern home design. This disconnect is linked to the lack of energy security the community of Island Lake and countless other remote FN communities have. It is not enough to rely on one source of heat as power outages can become dangerous when occurring in the winter. To combat this problem a wood burning stove should be located in the centre of the home. By centrally locating the stove, heat produced has the potential to be carried into all the surrounding rooms. This distribution on heat is represented by a gradient of red orange and yellow, stemming from the centre of the diagram moving outward.

Land, Water and Animal Inspiration:

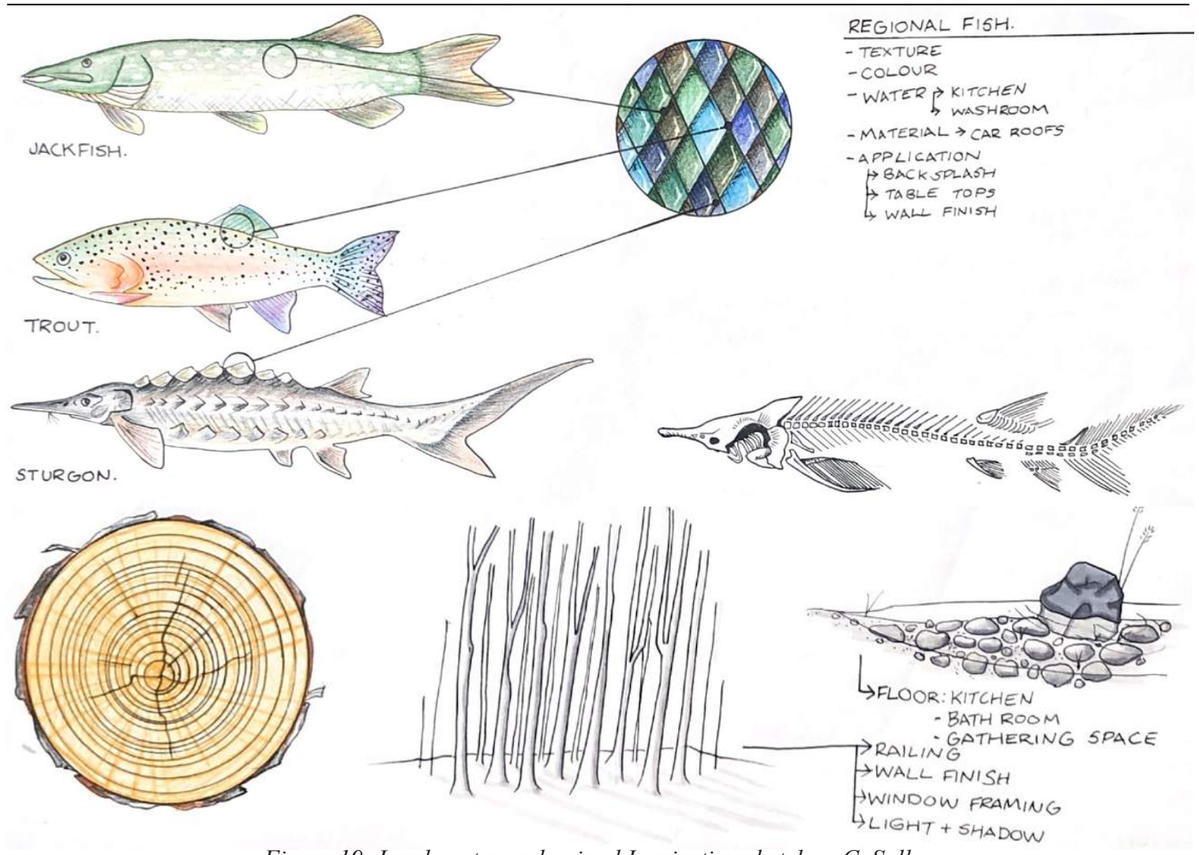
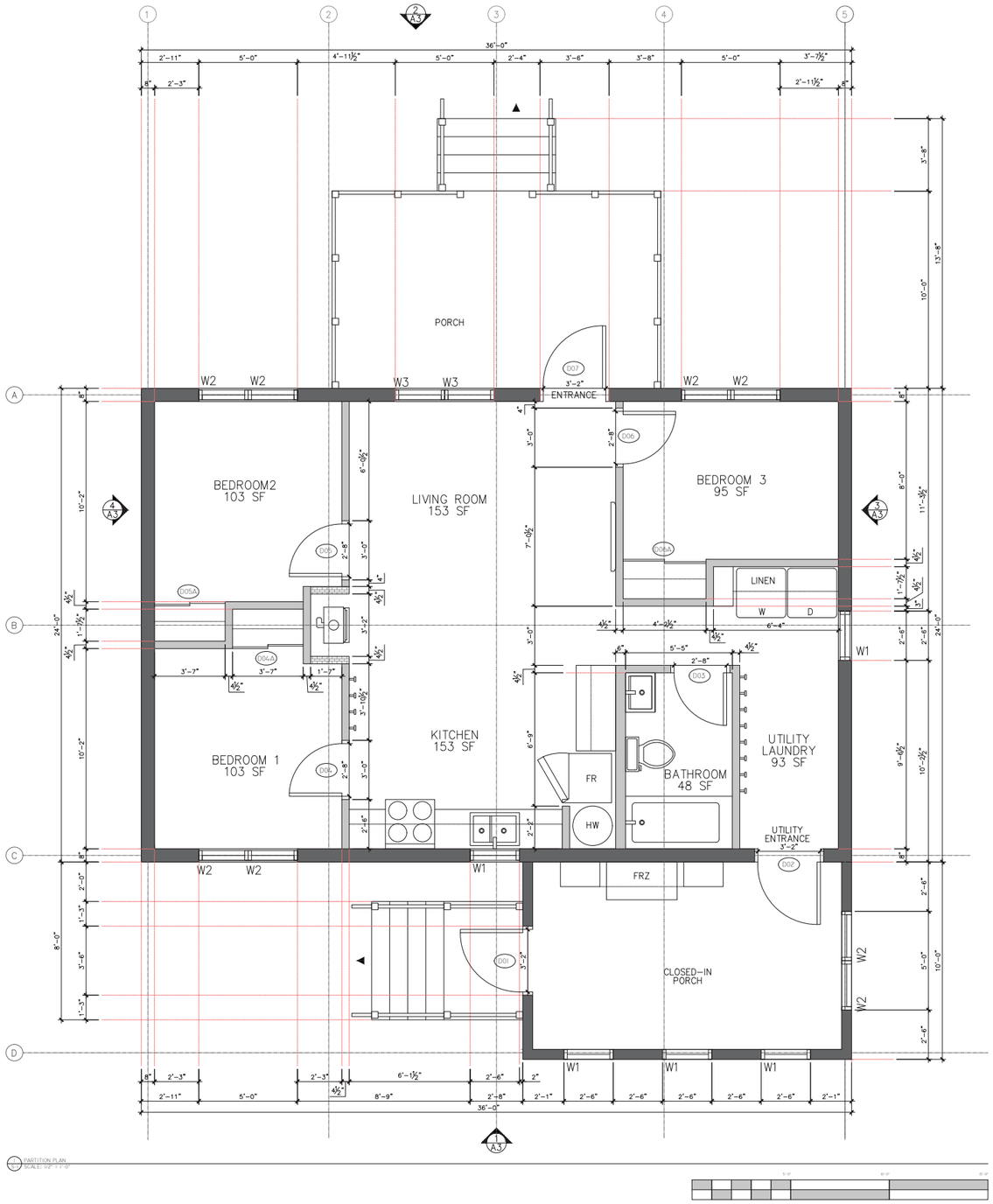


Figure 19: Land, water and animal Inspiration sketches, C. Sallese

The colour and pattern of fish scales is a source of inspiration for some of the interior finishes that is seen in the final design. Local fish including jackfish, trout and sturgeon were looked at for colour and shape. In addition to fish, tree rings, the woods and river rocks are feature of the land that are undoubtably beautiful and therefore were considered during the selection of materiality and colour palette.

9.2. HOUSE ONE

9.2.1. PARTITION PLAN



PARTITION PLAN
SCALE: 1/2" = 1'-0"

KITCHEN

9.2.2. FLOOR FINISHES PLAN

Local Wood can be harvested and milled locally. A defining material of the home, lining walls, ceiling and floors a well as all furniture and cabinetry.

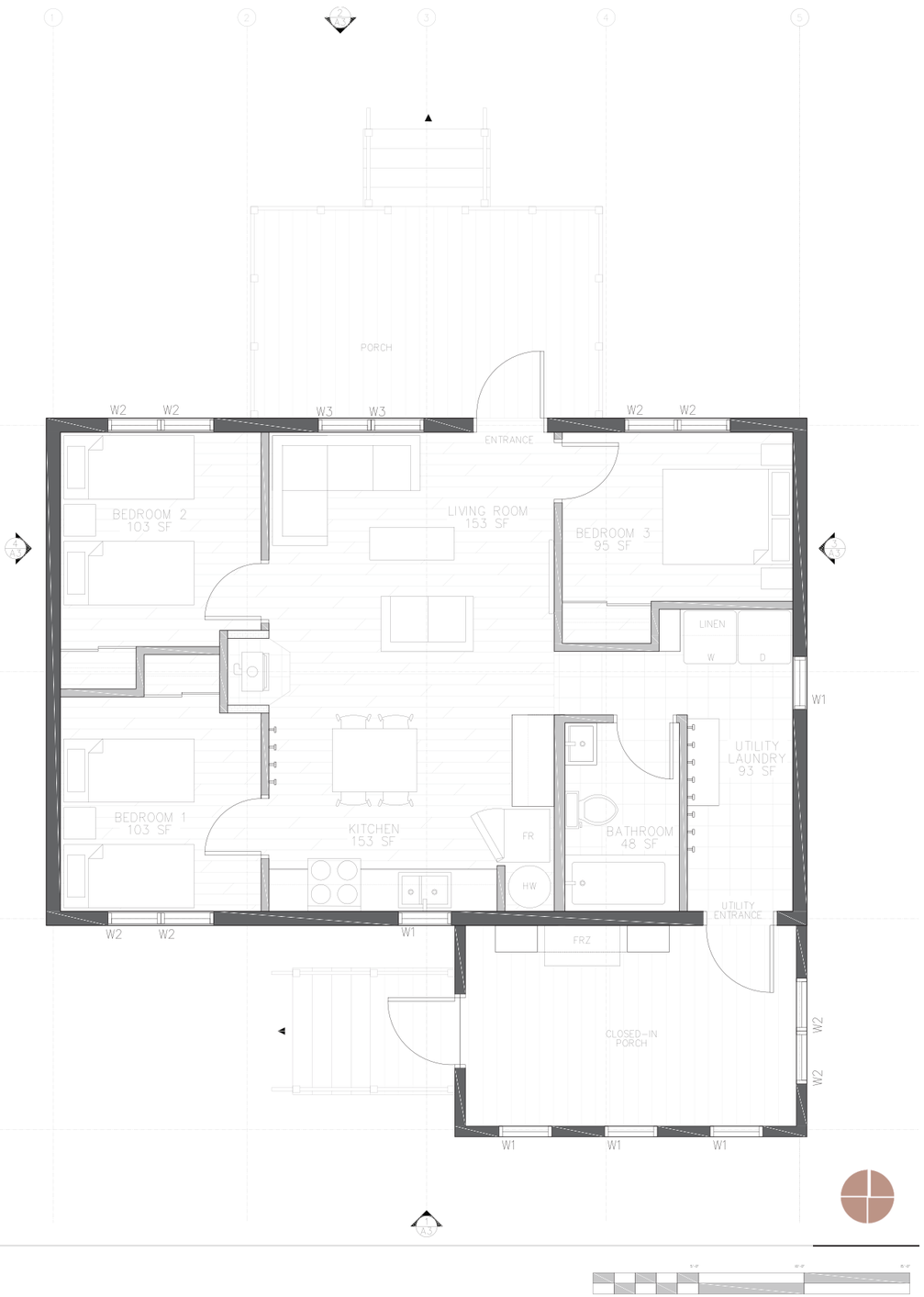
Poured concrete is a durable and cost effective solution for solid surfaces such as counter space.

Animal hide can be used in various tactile application. Pillows, seat cushions and area rugs can all be made from animal hides.

When vehicles die the metal sits relatively untouched and begins to rust. This material would be otherwise wasted if not harvested and used for this fish scale inspired wall application.

Quilts can be made for bed coverings as well as for couch cushions. They can act as simple pops of colour or as comfortable art pieces that tell stories throughout the home.

River rocks are a part of the land identity. Bring this material into the home helps reflect the gifts of the earth into the interior. TheseAre featured around the wood burning stove and flooring in the bathrooms and kitchen



9.3. CONCEPT: WOODLAND ART

Jackson Beardy was a member of the Woodland School of Indigenous art before becoming a part of the Indian Group of Seven in 1974 (Phillips, 2011). Beardy's work was stylized, painted on canvas, birch bark and beaver skins and often focused on the interdependence of humans and nature (Phillips, 2011). As seen in Figure 18, Beardy often aimed to depict figures from his traditional heritage (Phillips, 2011). For nearly twenty years Beardy promoted Indigenous art as a valid category of contemporary art (Phillips, 2011). Jackson Beardy died in 1984 at the age of 40, however his legacy will be remembered as one of the many Indigenous artists who developed contemporary Indigenous art in Canada.

However, before Beardy started his successful career as an indigenous artist, he was born and grew up in Island Lake, spending his time between GHFN and WFN (Phillips, 2011). Beardy told stories learned from his land and home, therefore forever connecting his art to the long and inter-woven history of the Anishininwuk. This connection provided a source of inspiration for this practicum project, prompting the creation of an original piece of Woodland art (Figure 19).

Beardy work often displayed warm colours and curving ribbons, aiming to create a sense of natural balance in each piece (Native-Art, 2015). These curving ribbons symbolize lines of communication, indicating all the relationships that are strung together (Native-Art, 2015). The divided circles that can be seen connected to this ribbon represent dualities present in the world, such as: good and evil, night and day, sky and earth, honesty and dishonesty (Native-Art, 2015).

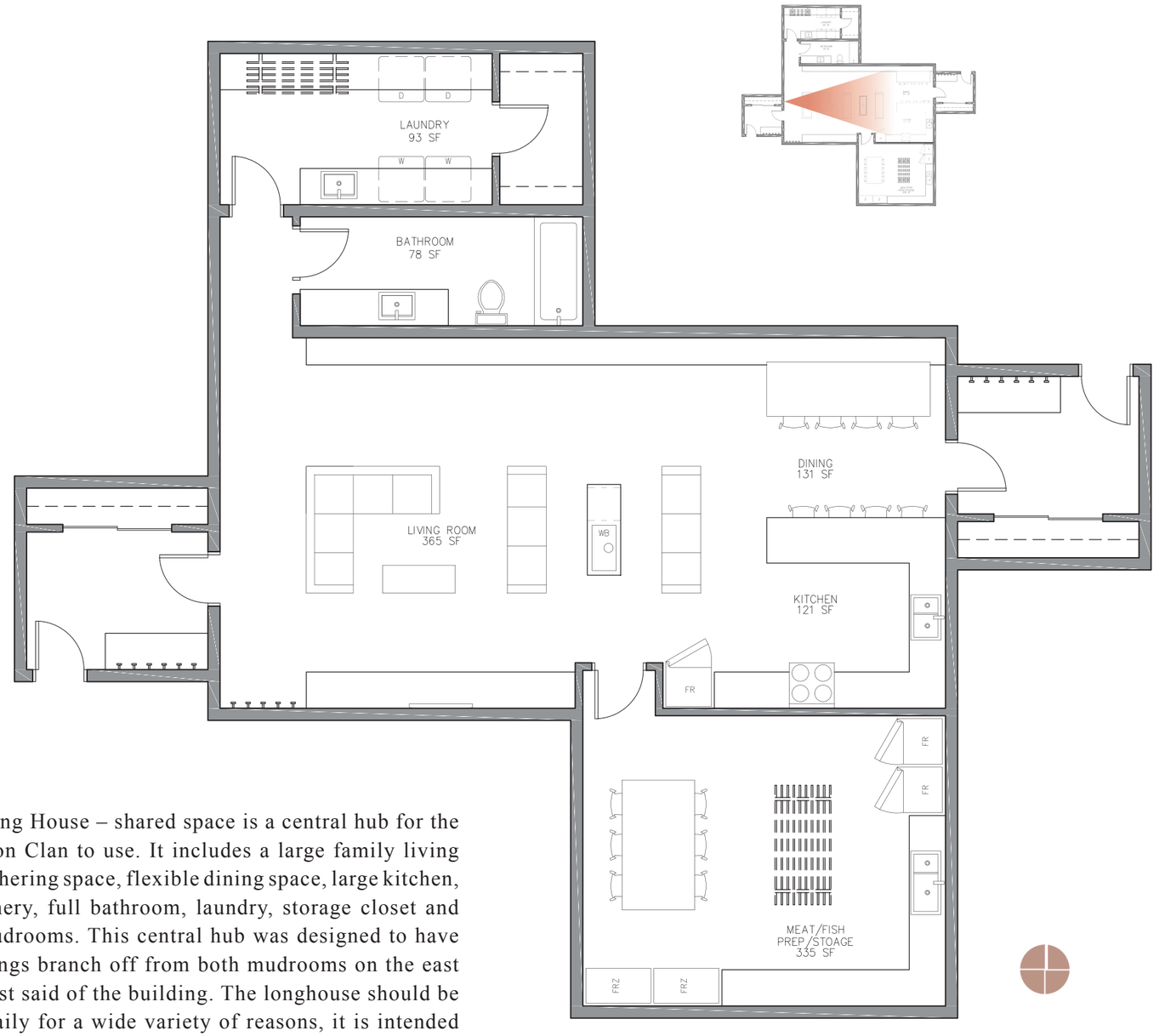
Figure 20: Paintings Waterbird 1796 (left), Sturgoen Clan 1979 (right), J. Beardy

Figure 21: Untittled 2019, C Sallese

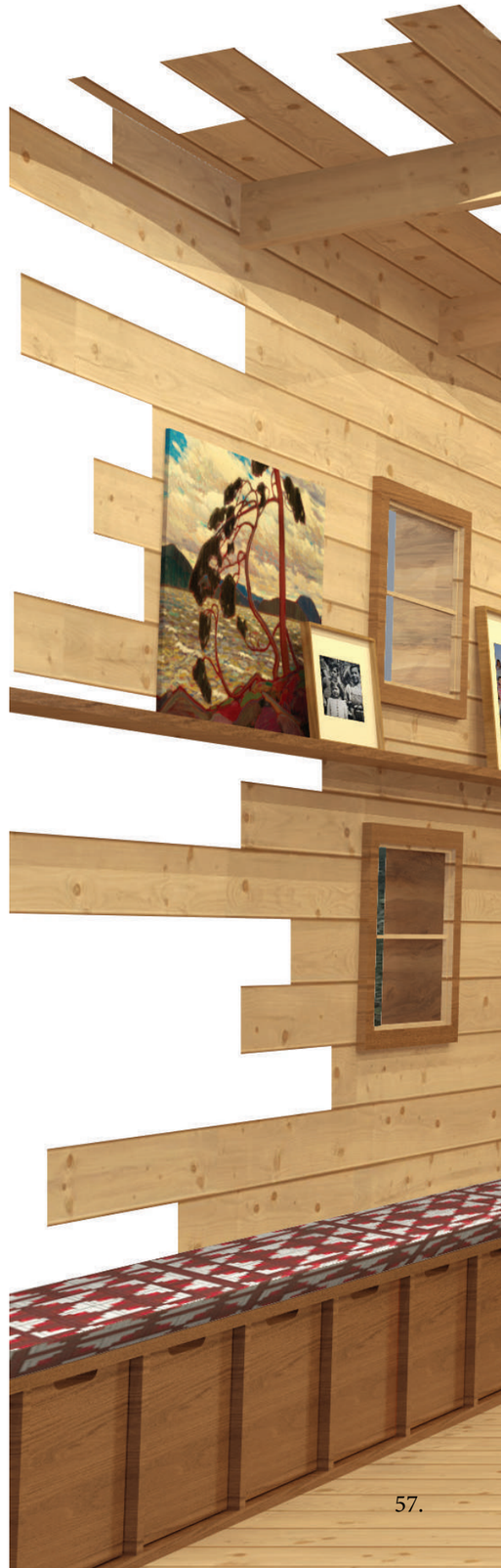
9.4. HOUSE TWO

9.4.1. MODULAR HOUSE PLAN

9.4.2. LONG HOUSE - SHARED SPACE

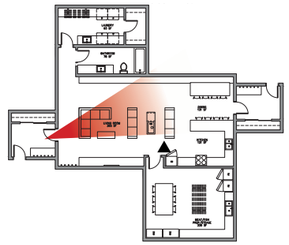


The Long House – shared space is a central hub for the Sturgeon Clan to use. It includes a large family living and gathering space, flexible dining space, large kitchen, a butchery, full bathroom, laundry, storage closet and two mudrooms. This central hub was designed to have two wings branch off from both mudrooms on the east and west said of the building. The longhouse should be used daily for a wide variety of reasons, it is intended to have the ability to entertain upward of twenty-five people for feast and celebrations.



9.4.3. FAMILY WALL

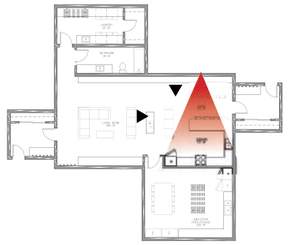
The family wall provides a space to showcase pictures of the entire clan as well as a place to display family relics and ceremonial objects. In addition, this wall includes a long bench with storage tucked beneath it. This bench not only provides an abundance of storage for the family but also provides seating for large feasts and celebrations. Additional tables and chairs can be added to accommodate twenty-four people comfortably. Windows on this wall face north to address solar gain and loss strategies. Two removeable racks are hung on this wall. These racks are used for drying winter gear around the wood burning stove.



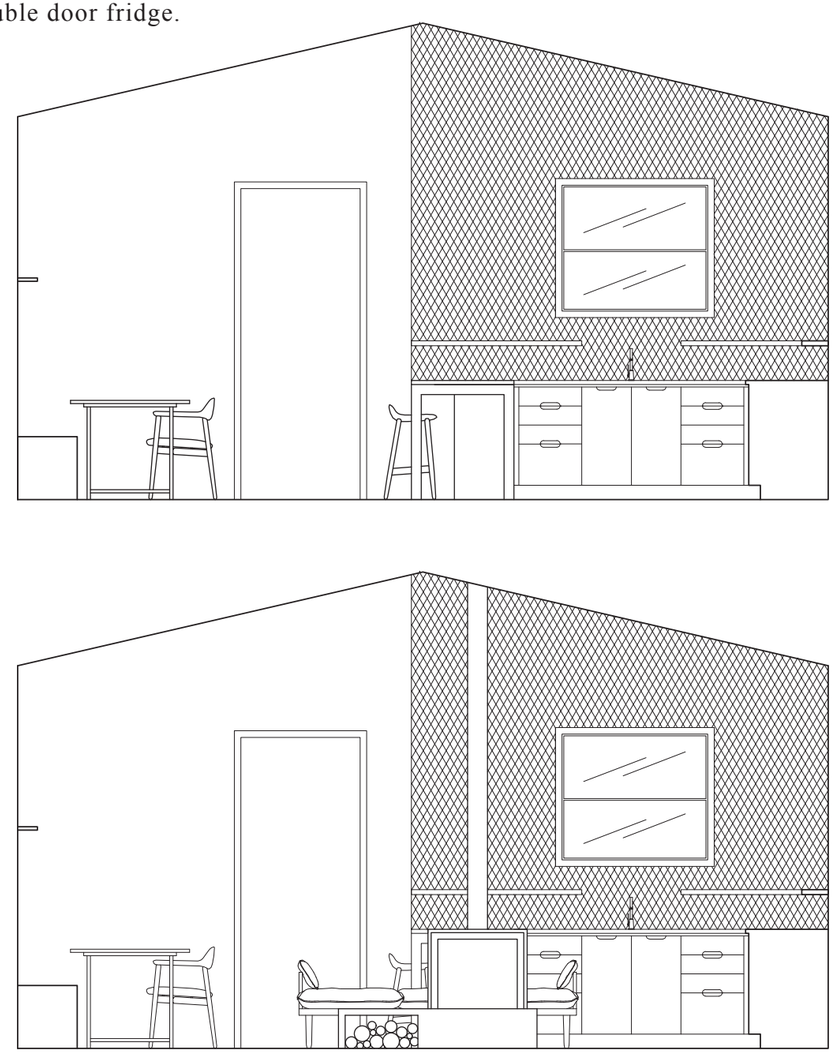
9.4.4. STORAGE AND ENTERTAINMENT

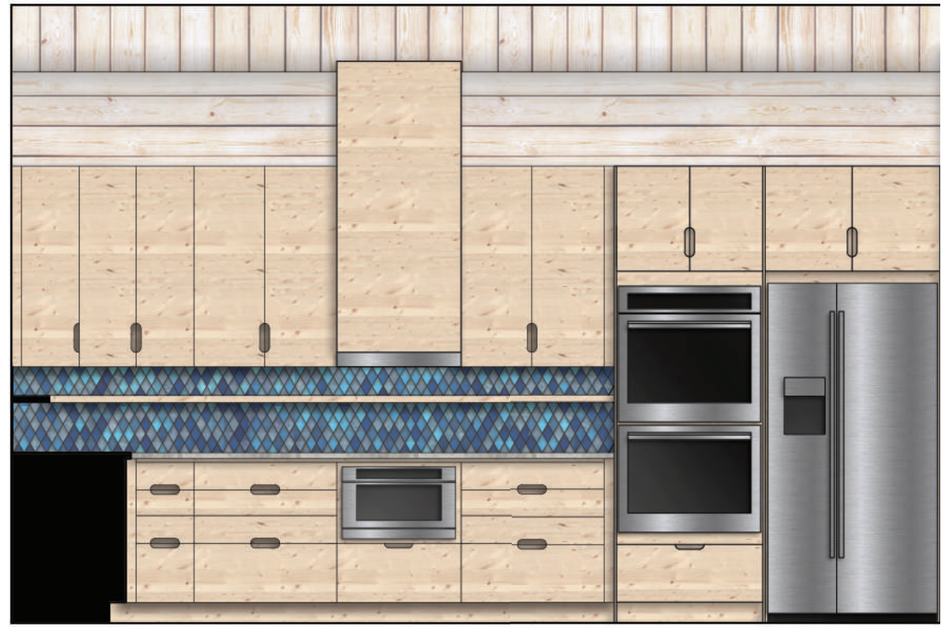
Considering that the entire extended family would be utilizing this shared space, providing storage was an absolute necessity. A locally built wall unit was designed with low drawers for people of all ages and capabilities to easily access. This wall unit also provides interior storage for wood that feeds the central wood burning stove. A shared entertainment system is included in this space for friends and family to gather and watch movies, sporting event etc. The open concept design allows for the wood burning stove to be central and unobstructed, allowing heat to disperse throughout the entire building envelope. There is custom lounge seating on either side of the wood burning stove. The wood burning stove is a transition area between dining and lounging but also provides a space for gathering and storey telling. Couch cushions are locally made and display a variety of colourful quilts. All windows on this wall face south to address solar gain and loss strategies.

9.4.5. KITCHEN



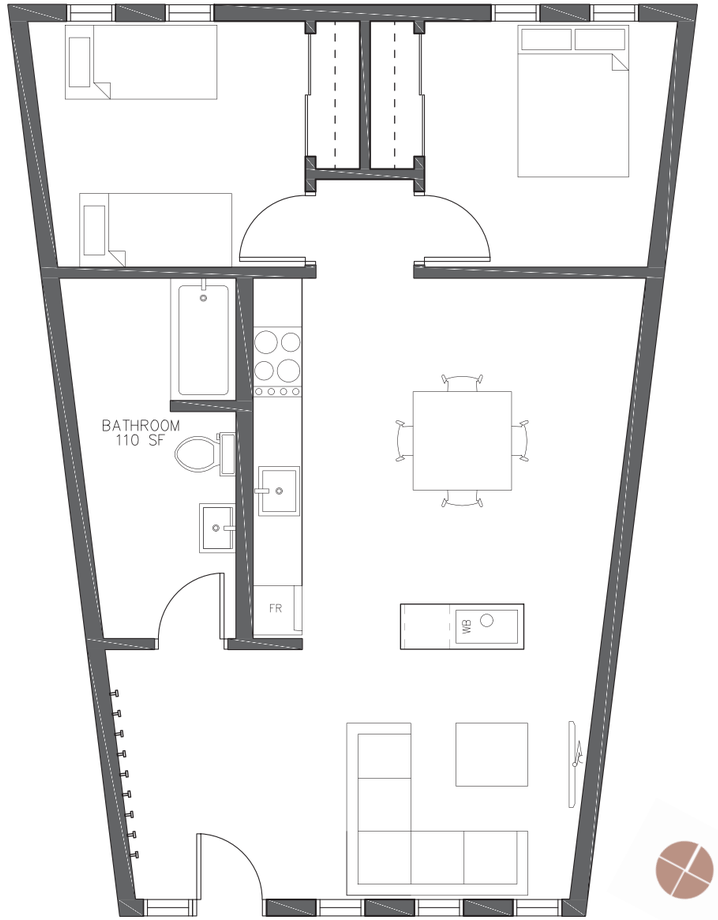
The kitchen features a recycled car roof wall in leu of a standard tile backsplash. The diamond pattern is gradually extruding off the wall resulting in a texture that creates shadow and movement. This wall is inspired by the sharp diamond shaped scales of the sturgeon while the shiny blues and silvers refer to the twinkly skin of the colourful trout. All metal can be salvaged from junk metal found in Island Lakes as there are an abundance of scrap cars with no purpose or place to be disposed of. This shared kitchen is indented to be used for large feast and therefore has been equipped with a double stacked oven, electric stove top, microwave and double door fridge.

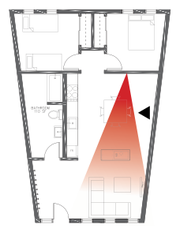




9.4.6. FAMILY UNITS

There are two family units to choose from, the one-bedroom and the two-bedroom unit. Each unit is equipped with a wood burning stove, ally kitchen, living space and washroom. The same materiality is used in the family units as in the long house shared spaces. However, a family wall is also included in each unit for the individual family to display their own pictures and objects.





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