Reformulating Underused Facilities Through Adaptive Reuse: Making and Remaking the Architecture of Copper Cliff, Ontario

by

Devin Tyers

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APPROVED/APPROUVÉ

Thesis Examiners/Examinateurs de thèse:

Prof. Ted Wilson
(Thesis Advisor/Directeur(trice) de thèse)

Patrick Danielson, OAA
(Thesis Second Reader/Deuxième lecteur(trice) de thèse)

Carol Phillips, OAA
(External Examiner/Examinateur(trice) externe)

Approved for the Faculty of Graduate Studies
Tammy Eger, PhD
Vice-President Research
Vice-rectrice à la recherche
Laurentian University / Université Laurentienne

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Figure 1: Mining Community Diagram.

KEYWORDS: Adaptive Reuse, Culture, Architecture, Industry, Restoration and Development

ABSTRACT:

Reformulating Underused Facilities Through Adaptive Reuse

Making and Remaking the Architecture of Copper Cliff, Ontario

Industries have a history of shaping the development and heritage of communities. In the case of Copper Cliff, the mining industry has influenced the architecture and culture of the community. However, these mining operations no longer operate how they were created. The community of Copper Cliff has transitioned from a miners' town into an extension of Greater Sudbury. This area encompasses a wide range of professionals that live and work across the city. The constant pursuit of a sustainable future has informed this evolution. Technology has permitted people to work from a distance, which has become a reality for many industries more recently with the pandemic. The industrial vision within Copper Cliff is to reduce the environmental impact, and to become world leaders in this sector. There are areas within this industry that have negatively impacted the land. Key issues that are relevant today are the waste management and water reclamation processes. A place for further research and development would benefit both the industry and this community.

The philosophy of tearing down underused facilities within industrial areas is still a major problem. To sustain a viable plan for growth and to maintain the existing community and surrounding areas it is essential to consider adaptive reuse. By analyzing the culture, mining industry and the architecture within Copper Cliff, the design proposal will provide a balance of these components. This community's unique making and remaking principles are represented within the following three elements. The *architecture* undergoes a new life through adaptive reuse principles. The *culture* emphasizes the arts and crafts of this built community and the reuse of materials and waste for a new purpose. The *industry* is represented by their long history of mining in this area, and their constant need to improve and remake these mining processes to increase sustainability. The purpose for this thesis document is to explore the methods and strategies of reusing facilities that are underused and proposing a new function for them before they become obsolete. This will provide the community with more options for the future and prevent the industry from demolishing and removing all community input. This project will consider the rich history of the community, and how this heritage can be represented through adaptive reuse. This will bring the architecture, mining, and culture together at the center of this design proposal.

THERE IS POTENTIAL FOR ARCHITECTURE, MINING AND CULTURE TO COHABITATE IN INDUSTRIALIZED COMMUNITIES

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01
INTRODUCTION

1.1 Premise / Problem

Copper Cliff holds a unique story that is unlike other parts of Greater Sudbury. The architecture, mining industry and culture are three streams, identified in this document, that highlight this community. These areas encompass the leading aspects of the design and development of Copper Cliff. However, over the years these elements have become disconnected from the community, and without an architectural intervention the identity of this place could be lost. This thesis will explore how the architecture, mining and culture can be brought together so that this community can learn more about their heritage and move towards a sustainable future. In addition, the mining operations have had a negative impact on the land, and today there is a lack of infrastructure to facilitate the engagement of the existing community and Greater Sudbury. This thesis will identify methods of adaptive reuse that can improve the health and sustainability of this community and help to bring people to the area to learn about this making and remaking heritage.

1.2 Historical Background

This thesis will investigate the Copper Cliff community and its extensive relationship with mining. This area is rich in historical value with the mining industry at the epicenter. The industry drew cultures and communities from around the world for work opportunities beginning in the late nineteenth century. These immigrants brought their cultures and skills of making to this community. Copper Cliff has made changes over the years. It was once a community made of entirely miners and their families, and over the years it has transitioned into more of a suburban neighborhood that offers housing to members that live and work across Sudbury. In the beginning, the mining culture was the main driver for the community planning and development. The neighborhoods and houses were designed, so that the community could be close to their place of work. Today, the community buildings and surrounding facilities need to cater to the Greater Sudbury population to maintain the existing community and draw more families.

1.3 Research Questions

How can the underused facilities in Copper Cliff act as a catalyst within the community and Greater Sudbury to plan for development and growth through adaptive reuse?
How can these spaces be repurposed in a form that will highlight the existing character of the community and embody the architectural, mining, and cultural heritage of this city?

1.4 Objectives

The purpose of this study is to show opportunities within the Copper Cliff community for the reclamation of derelict urban areas and the concept of urban recycling. The research for this thesis will study the impact of industrialization and corporate dependence. It will include a review of the historical culture in Copper Cliff and its changing relationship with the mining industry over time. The settler culture and the mining industry will also be explored to identify how they have influenced the architecture of the community.

Figure 2: Intersection in Copper Cliff Leading to Community Buildings.

This community driven method of approach will provide a connection to the cultural heritage of the site, and assist in revitalizing the community for the future. This will be completed through analysis specific to the site, and the consideration of design strategies arising from the research of adaptive re-use. This thesis will suggest new programs for this community that will represent the cultural initiatives for this city as identified within the Cultural Plan for Greater Sudbury. A balance between the preservation and conservation elements will help to inform the scale and intensity of the adaptive reuse.

Based on findings from the analysis, the thesis will argue that without an architectural intervention, the Copper Cliff Community and Greater Sudbury residents will be further disconnected from this heritage and the identity of this place could be lost. The investigation may include both a community-scale intervention and a building-scale proposal as related parts of the architectural intervention.

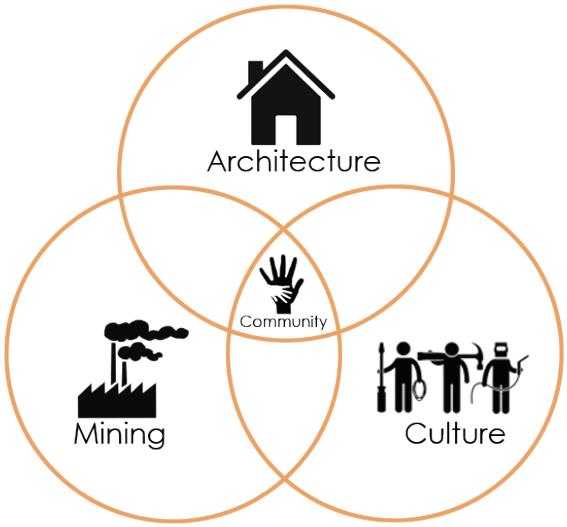


Figure 3: Architecture, Mining and Culture Diagram.

1.5 Methodology

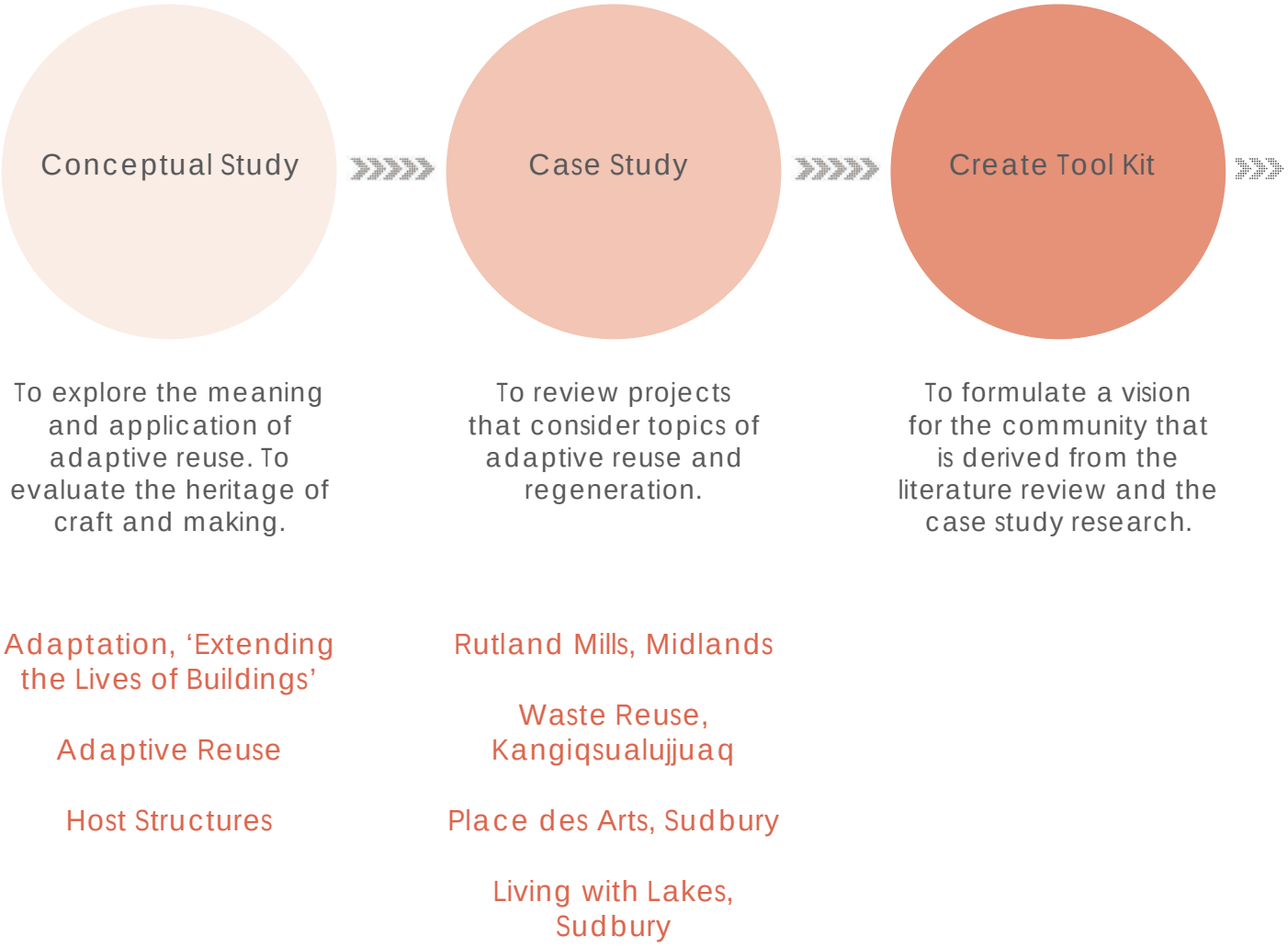


Figure 4: Methodology Diagram.

Site Analysis

To analyse the chosen site, the greater community and the factors that influence this place.

Location and Context

Demographics

History

Design Proposal

To propose a masterplan for the site that utilizes the tool kit and suggests levels of adaptive reuse over time.

Vision

Concept

Phasing Masterplan

Buildings Retained

Community Impact

Conclusion

To consider the limitations and analyse the proposal. To suggest ways that this tool kit can apply to other industrialized communities.

Critique

Analysis

Application

02

CONCEPTUAL REVIEW

2.1 Adaptation

The term adaptation is not restricted within the field of architecture or to one moment of time. Adaptation can represent the changes that occur over the years. From analysing the text, "Adaptive Reuse: Extending the Lives of Buildings" Liliane Wong outlined the meaning of adaptation before specifying the definition of adaptive reuse. Over the years this definition has evolved, and she recounts this change from 2006 to 2013. In 2006, James Douglas described adaptation as, "any work to a building over and above maintenance to change its capacity, function or performance."[1] In 2010, ICOMOS New Zealand described adaptation as, "the process(es) of modifying a place for compatible use while retaining its cultural heritage value. Adaptation processes include alteration and addition."[2] In 2013, the BURRA CHARTER, ICOMOS Australia described adaptation as, "changing a place to suit the existing use or a proposed use."[3] From these three definitions of adaptation, they are centered around an existing building that undergoes a change. This change is designed to replace the existing building with an improved design, but in a manner that will contribute to the history of that place. The adaptation provides the context, and the reuse initiates the concept of recycling through the preservation of building elements.

1 Liliane Wong, Adaptive Reuse Extending the Lives of Buildings (Basel: Birkhauser, 2017), 13.
2 Ibid.
3 Ibid.

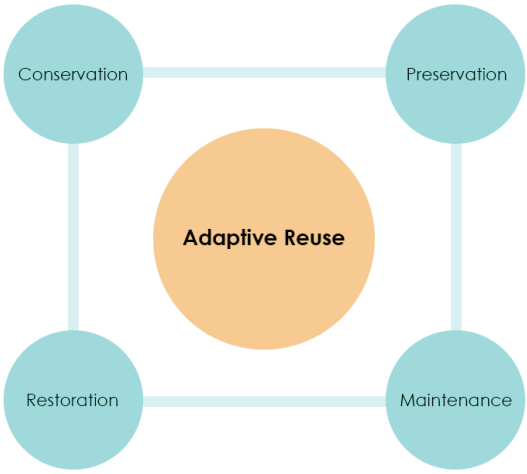


Figure 5: Adaptive Reuse Diagram.

2.2 Adaptive Reuse

To analyse the concept of adaptive reuse it is important to understand the theory behind the term, as depicted in the text by Liliane Wong. Adaptive reuse is seen historically in multiple forms. Different cultures around the globe have used adaptive reuse methods. An early example is seen with the reuse of caves for shelter, or animal skins for clothing.[4] People are resourceful and find ways to extend the life of an object, place, or thing. Adaptive reuse is found within the heritage of ancient monuments and seeks to save their legacy.[5] The policies developed to preserve these elements guide adaptive reuse methods within architecture. This process looks at *conservation* to *restoration* and *preservation* to *maintenance*.[6] This terminology reveals the history and the emergence of adaptive reuse, refer to figure 5.

4 Liliane Wong, Adaptive Reuse (Basel: Birkhauser, 2017), 6.
5 Ibid, 8.
6 Ibid.

Since the French revolution, the concept of preservation has undergone change and reflects the experience of man's interpretation of his surroundings.[7] Historically people did not directly use the term adaptive reuse, instead they considered it to be more about the preservation of buildings. The word adaptive reuse was developed in 1973 in response to the global oil crisis, which changed the way the world viewed sustainability and climate change.[8] Adaptive reuse principles consider the afterlife of buildings and how they can be recycled sustainably. Throughout history architects and archeologists have evaluated this concept, as it has applied to many different disciplines and areas around the world.[9] Adaptive reuse can be applied to the simple changes of a single building, or on a grander scale for an entire city or country.

Wong defines adaptive reuse as the, "Reuse of pre-existing structures for new purposes."[10] Buildings that are already built and that might be underused can still find a new life when they are reused for a new function. In addition, adaptive reuse is not a static element that exists on its own. "Adaptation perpetuates a continuum of growth and change... 'transforming an unused or underused building into one that serves a new use.'"[11] The context and landscape are important and contribute to the suburban fabric. Adaptive reuse must be fluid so that the form of adaptation is situated within its time and environment.

7 Liliane Wong, Adaptive Reuse (Basel: Birkhauser, 2017), 10.

8 Ibid, 30.

9 Ibid, 8.

10 Ibid, 30.

11 Ibid.

2.3 Host Structures

Adaptive reuse can be described through the following six types of host buildings, entity, shell, semi-ruin, fragmented, relic and group. These six principles reveal different forms of building structures that can be translated into adaptive reuse projects. There are many other factors to determine the feasibility, but these principles provide a starting point for adaptive reuse.

Entity

All host structures have an identity, which makes them an entity of their own. 'Entity' means that it is an object with a unique character.[12] Each building is different and has a story which surpasses the scale or age of the facility.

Shell

With the convention of a 'shell' host structure, the conversion considers all areas of the building except for the building envelope.[13] This option allows the exterior to go unchanged, but the interior will be renovated to suit a new program.

Semi-ruin

The 'semi-ruin' host structure utilizes the entire building, which may change the function, structure and building envelope.[14] This method allows the architect to have more freedom with the reuse of building materials and form.

12 Liliane Wong, Adaptive Reuse (Basel: Birkhauser, 2017), 105.

13 Ibid, 107.

14 Ibid, 111.

Fragmented

The 'fragmented' host structure utilizes older structures that may be condemned or out of use.[15] These buildings create an opportunity for the structure to be inhabited in a new form.

Relic

The 'relic' host structure utilizes an aspect of the existing building and adapts its identity within a new structure.[16] This form can be seen within churches and other historical buildings where a memory or physical part of the old structure is saved and carried into the design of the new construction.

Group

The 'group' host structure takes on a larger scale of adaptation that may involve several buildings.[17] This form can make changes to a larger suburban context or they can select several different elements in one complex of buildings.

Overall, the principle host structure that could apply to Copper Cliff may involve a combination of several of these strategies. If the proposal considers the changes of several buildings, then the group host method may guide this form of adaptive reuse. This proposal will consider how adaptive reuse can be used to extend the life of buildings through the addition of new and exciting programs. This investigation will study both the network of buildings and how they can better serve the overall urban context.

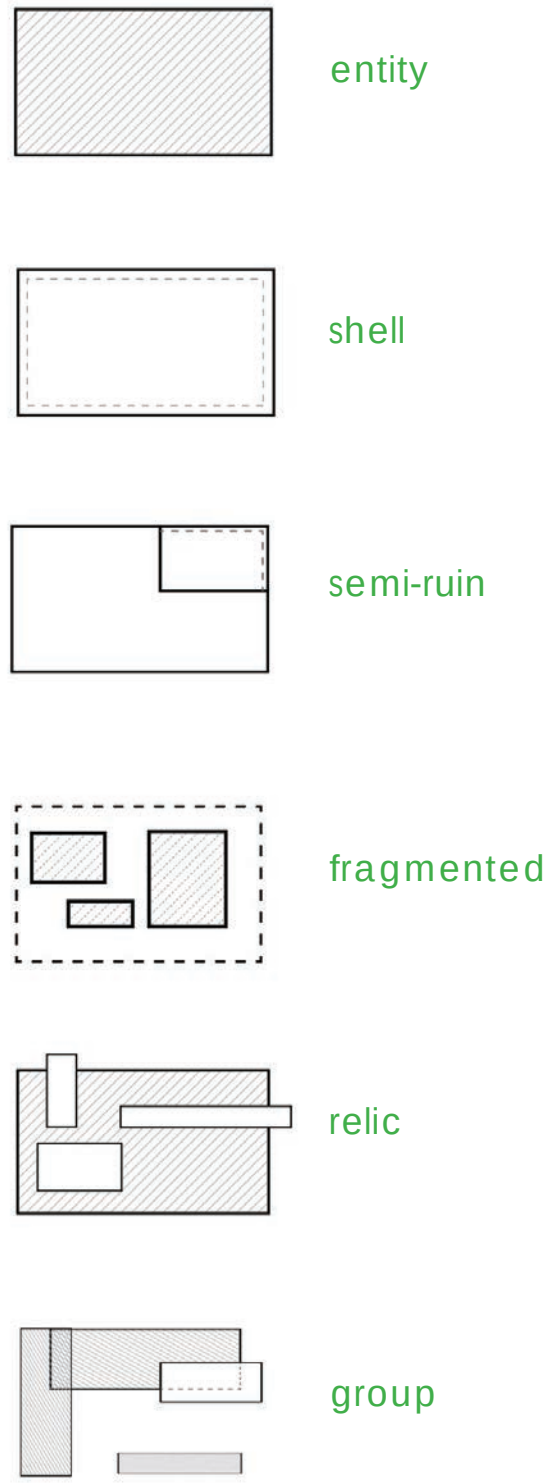


Figure 6: Host Structures Diagram, by Liliane Wong.

15 Ibid, 114.
16 Liliane Wong, Adaptive Reuse (Basel: Birkhauser, 2017), 118.
17 Ibid, 119.

03

CASE STUDIES

3.1 Rutland Mills, Wakefield

Rutland Mills is a project in Wakefield, United Kingdom, which is a community in the Midlands. The plan is a regenerative scheme for this area that considers the adaptive reuse of several old mill buildings that are derelict grade II listed structures.[18] These buildings are historical assets for this area, and it is essential to preserve and re-purpose these structures. After being neglected for nearly twenty years, this cluster of buildings will undergo a new regenerative process.[19] This space will provide new opportunities for this community and bring the people together. The project will have three phases that will take place over a four-year span.[20] This will provide an incremental approach that can grow with the community. The design considers the needs from the community, and aspects from the proposal may be altered in order to meet the community's goals. This space is designed to be a mixed-use, all-encompassing, innovative, and cultural grouping of buildings.[21] The project will consider both the outdoor spaces and indoor functions of the buildings. There are many programs that will function within this large adaptive reuse project. This will include spaces for the arts, retail, technology, making and crafts, commercial, retail, restaurant, gallery, and education.[22] The programs will flow outward from the buildings and into the courtyards. Overall, the purpose of this development is to bring people together and create a space for a multi-faceted community model that develops under-used spaces that will otherwise be neglected through adaptive reuse.

18 Hawkins\Brown Architects, "Rutland Mills," Hawkins\Brown (Architectural practice: London and Manchester, 2015).
19 The Newsroom, "Plan to Transform Rutland," Wakefield Express (Wakefield Express, April 12, 2018).
20 Ibid.

21 Hawkins\Brown Architects, "Rutland Mills," Hawkins\Brown (Architectural practice: London and Manchester, 2015).
22 Ibid.

Figure 7: Rutland Mills, by Hawkins\Brown Architects.

Figure 8: Garbage Dump in Kangiqsualujjuaq, photo taken by author.

3.2 Waste Reuse, Kangiqsualujjuaq

Within Northern Canadian Inuit communities, there is an understanding from all members that the environment is sacred, and objects can have another life after they are used. Kangiqsualujjuaq is second largest of the Inuit communities in Nunavik. Due to the remote location, all goods and products are shipped or brought in by plane. This community knows how to adapt and change, and this was an aspect evident within their culture. Therefore, the concept of reusing older items is considered normal, because this 'waste' could provide them with parts or materials immediately rather then waiting weeks or months for them to be shipped in from an external community. Their garbage dump was their version of a 'Canadian Tire'. Objects that may have been considered waste by others were like gold to this community, and they constantly found ways to extend the lives of these objects. These materials are free for anyone in the community to use or exchange. This example has shown that adaptation can go beyond the recycling buildings, and it can also be found within the reuse of objects that could otherwise be seen as garbage.

3.3 Place des Arts

Greater Sudbury has a growing arts community in both the musical and artistic sectors. Place des Arts is a new facility designed by Yallowega Bélanger Salach Architecture and Moriyama Teshima Architects.[23] It is currently under construction in downtown Sudbury, and it will be a place for modern art and culture. This facility will contribute towards the masterplan for the downtown Sudbury area. It will provide more spaces that are vibrant and engaging for all community members, which is important to the Sudbury community. This facility will include programs involving a theater, studio, gallery, youth area, children's art area, a bistro, gift shop and flexible office spaces.[24] The facility is meant to target both the francophone and anglophone communities in Sudbury towards an inclusive design. This facility will hold cultural activities, and it is expected to bring fifty-thousand visitors to Sudbury each year.[25] Place des Arts will be a cultural facility that embodies many of the needs of the community as described by the Cultural Plan for Greater Sudbury. The existing buildings in Sudbury are lacking with respect to the arts community, and this project will create a space for the community and professionals to practice their culture and support a growing audience.[26] The cultural sector within Greater Sudbury is moving towards Northern Ontario's shift towards culturally focused spaces. Overall, this facility will draw more people to the community, and it will satisfy many of the needs within the arts and cultural streams in Sudbury.

23 "Place des Arts," Greater Sudbury, (Place des Arts du Grand Sudbury, 2020.)
24 Greater Sudbury, "Place des Arts," Large Projects for Sudbury, (City of Greater Sudbury, 2020.)
25 Greater Sudbury, "Place des Arts," Large Projects for Sudbury, (City of Greater Sudbury, 2020.)
26 Ibid.

Figure 9: Place des Arts, Greater Sudbury.

Figure 10: Valé Living with Lakes Centre, Greater Sudbury.

3.4 Living with Lakes Centre

The Living with Lakes Centre is a facility within Greater Sudbury that was designed for the analysis of habitats. It is a research and observation institute designed by J.L Richards and Associates and operated by Laurentian University for the safeguard and management of aquatic ecosystems.[27] This facility contributes towards cleaner water through innovation and regeneration processes. The building has labs, workshops, conference rooms, and it brings together the local industries, universities, and government.[28] The building itself utilises sustainable principles within its design, from the green roof to the driveway water filtration systems. The purpose of this building is to contribute to the knowledge of the surrounding northern aquatic systems, and to improve the health and quality of these ecosystems.[29] This research will help to create awareness and foster new change to create a more sustainable regeneration within the natural built environment. These studies are applicable to both industrialized and Aboriginal communities across Canada towards the enhanced development of resources.[30] This facility will allow for the community to test and track these lakes in the area, as it is situated on Ramsey Lake. Although Sudbury does not reside alongside one of the Great Lakes, there are hundreds of freshwater lakes in the area which are connected to each other and to the Great Lakes through their watersheds. Overall, this building is a center of innovation where the protection, restoration and development of aquatic ecosystems is the main goal. This facility contributes to the Sudbury community, and the research can be applied to other areas across Canada for the improvement of ecosystems and water resources.

27 "Valé Living with Lakes," Laurentian University, (Valé Living with Lakes Centre, 2016.)
28 Ibid.
29 Ibid.
30 "Valé Living with Lakes," Laurentian University, (Valé Living with Lakes Centre, 2016.)

The first two case studies share a common theme of adaptive reuse. Rutland Mills is a smaller community that shares similar opportunities as Copper Cliff, Ontario. The industrial past and underused facilities have provided the necessary space for community involvment and growth. The second example, which highlights the dump in Kangiqsualujjuaq, expresses the need for a community to reuse what is existing for a new purpose. Elements that would otherwise be cast in the garbage can find a new use that goes beyond the typical restrictions of a project.

The third and fourth case studies reveal local buildings in Sudbury that foster similar missions for restoration and knowledge sharing. Place des Arts displays a great example of community development and a space for the arts sector that will impact the downtown core of Greater Sudbury. The proposal for Copper Cliff will take on a similar approach as these facilities, but at a smaller scale, and with the focus on making and water restoration.

04

SYNTHESIS

4.1 Conceptual Synthesis

The knowledge studied within the conceptual review has been synthesized into the following three principles.

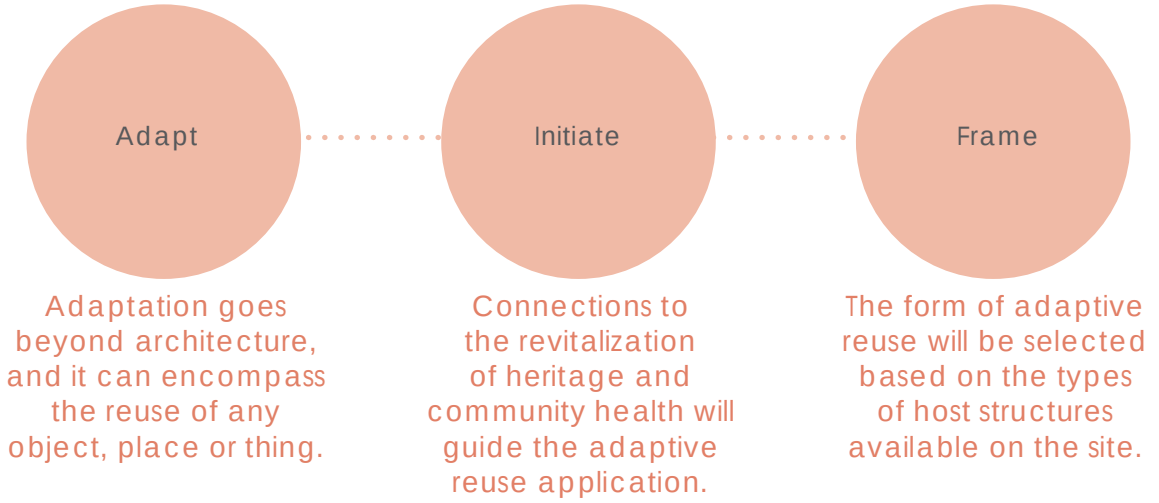


Figure 11: Conceptual Review Synthesis.

4.2 Case Study Synthesis

The knowledge analyzed from the case study research has been synthesized into these three principles.

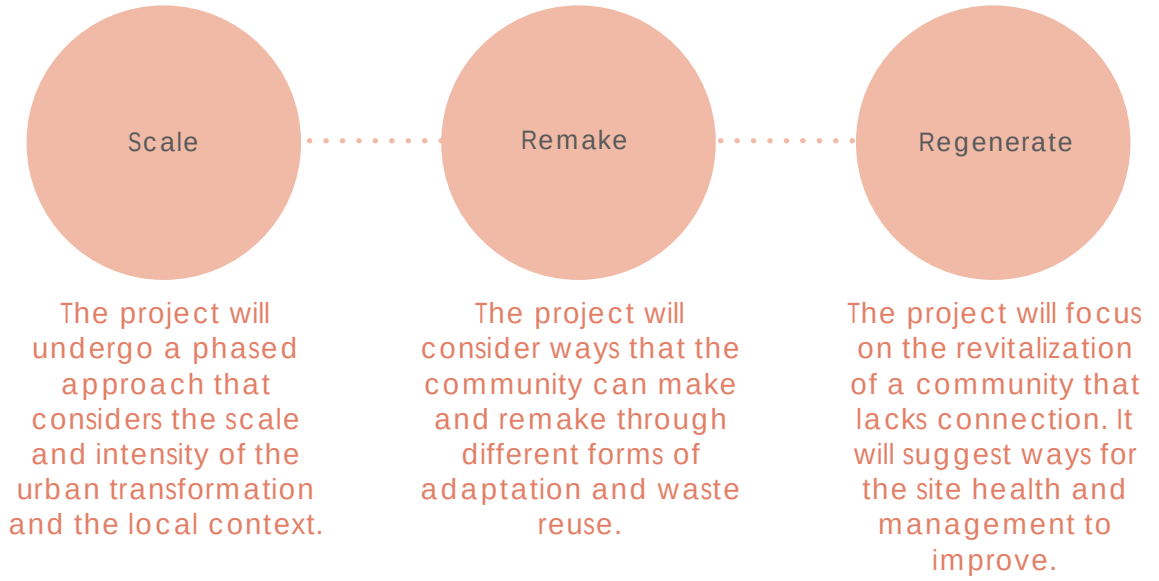


Figure 12: Case Study Synthesis.

4.3 Tool Kit

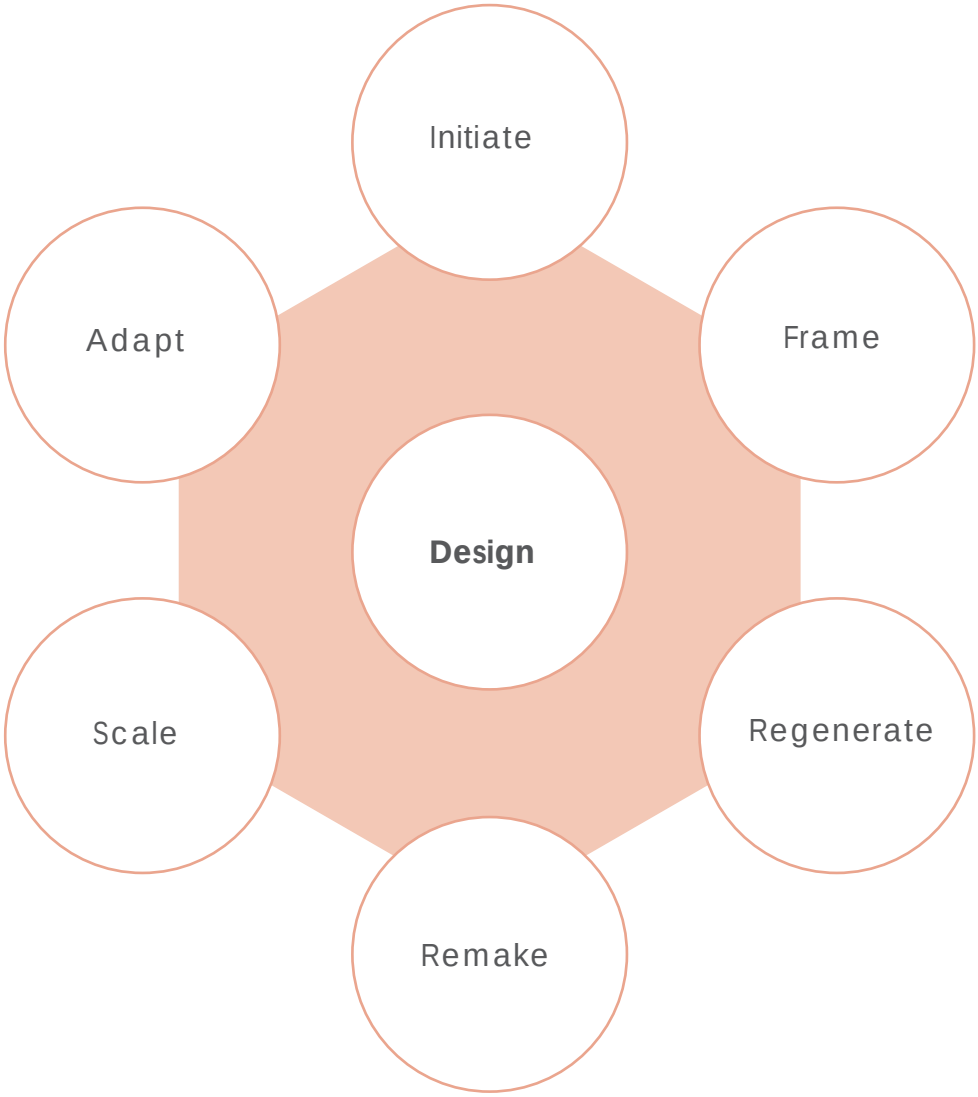


Figure 13: Tool Kit.

"To restore is not to repair it, nor to do maintenance, or to rebuild. It is to re-establish it in an ultimate state that never existed before."[31]

31 Eugène-Emmanuel Viollet-le-Duc, 'Restauration', in Dictionnaire raisonné de l'architecture, (Paris, B. Bance, 1866, t.VIII,) 14-34.

05

HISTORY

5.1 Location and Context

The community analyzed in this document is Copper Cliff, Ontario. The synthesis and documentation from this study can be applied to other industrialized communities in Northern Ontario. Copper Cliff is located within the city of Greater Sudbury. The discovery of rich metals, mainly copper and nickel, initiated the development of this mining community in the eighteen hundreds.[32] The landscape in the Greater Sudbury region was very open and rocky. Sudbury has undergone regreening efforts over the years to overcome its 'moonlike' terrain.[33]

32 Oliva W. Saarinen, "From Meteorite Impact to Constellation City" (Waterloo, Ontario, Canada: Wilfrid Laurier University Press, 2013) 10.
33 Amanda Sherrington, "Industrial Heritage in Northern Ontario," Unsettling Heritage (Carleton University Heritage Conservation Symposium, 2015) 3.

The residential developments in Copper Cliff were designed to have personal dwellings located close to the smelter entrances. The community originally only housed miners and their families. The miners built their own houses with whatever materials they had access to, and they used mining scraps and waste to build sheds and small buildings on their property to provide additional storage, since their homes were small. The industry owned most of the homes, and it was mandatory for the residents to work in the mines in order to live in a company owned home.

Over the years, Copper Cliff has transitioned from a miner's town into an extension of Greater Sudbury. It is located on the edge of the West end of Sudbury, and it is surrounded by rural landscape. This industry drew people from different cultures to the area for work opportunities.

Figure 14: Arial Photo of Copper Cliff, from Sudbury Library Archives.

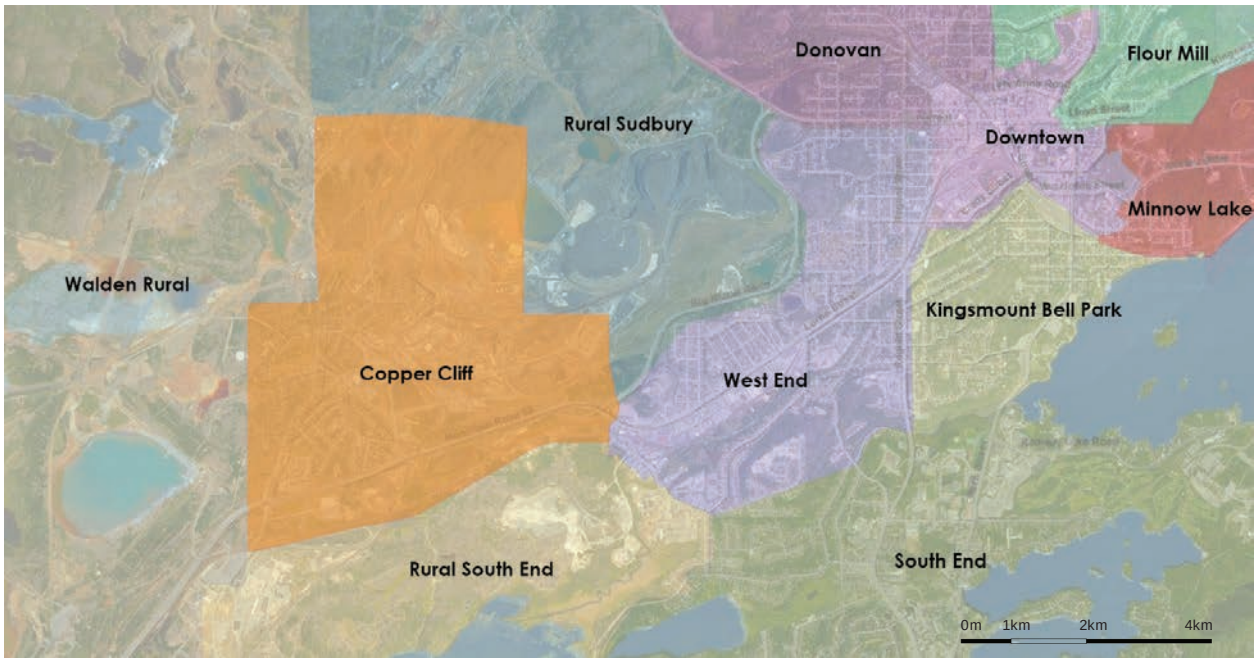


Figure 15: Context Map of Copper Cliff.

They brought their skills of making and remaking, which built this community from the ground up. These artisans also contributed to the construction of the main smelter building made of brick, which required hundreds of skilled workers to construct. There is a strong built heritage within the Copper Cliff community and Greater Sudbury. The preservation of this heritage and culture is integral to the intentions of the city. The masterplan for Greater Sudbury is centered around the revitalization and growth of recreation facilities, parks, trails, leisure activities and other new and exciting programs for the growing community.[34] The plan involves the feasibility assessment of existing facilities across the city. It suggests areas where the community can expand these facilities and programs while still maintaining the heritage of the community. The preservation of older heritage buildings is especially elevated within the Sudbury downtown core, where there are many historical buildings that require maintenance and restoration. Overall, these concepts of preservation and adaptive reuse are applicable to Copper Cliff and the historic and heritage buildings that reside within this community.

Copper Cliff is a distinctive community within the Greater Sudbury network, refer to figure 15. It is surrounded by Valé owned industrial lands. However, there are not many areas for new development within the community, and there are several facilities that are under-used and do not comply with the needs of the existing community or Greater Sudbury. These older buildings can have a new life through the implementation of adaptive reuse. Copper Cliff has a distinctive character, and it is a place that

34 "Parks, Open Space & Leisure Master Plane Review," Greater Sudbury, (Monteith Brown planning consultants: City of Greater Sudbury, June 2014.) 6.

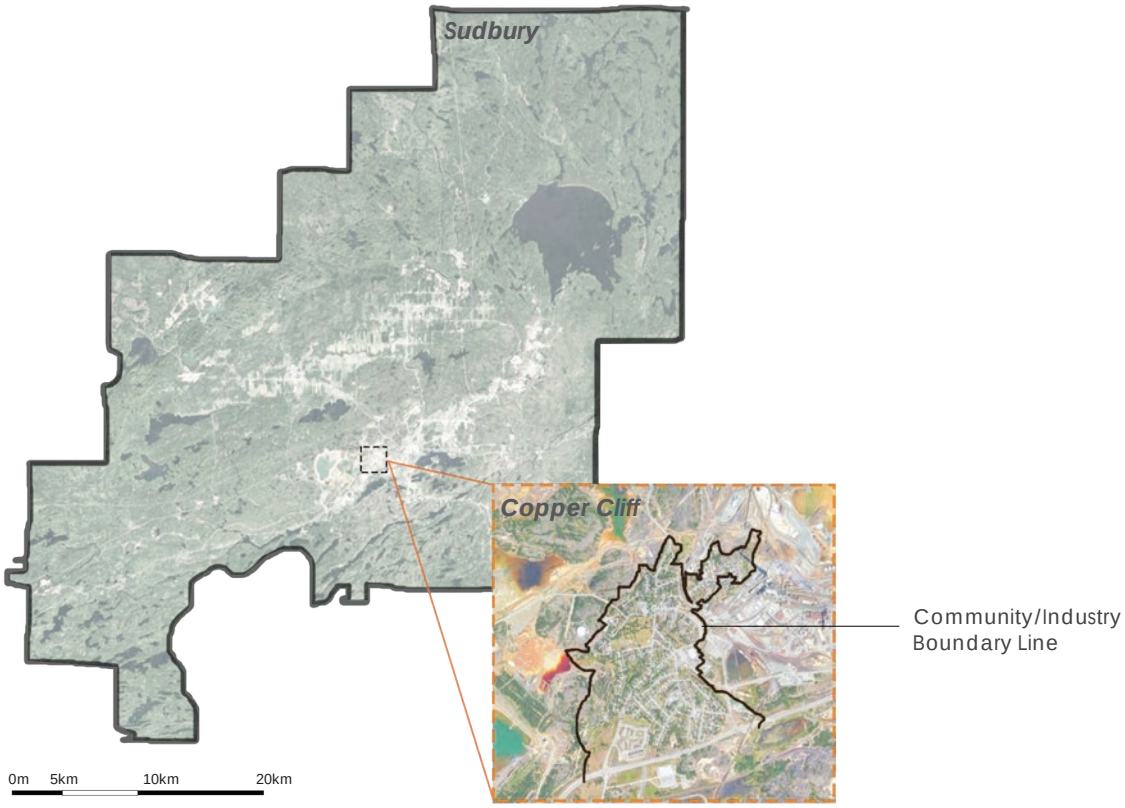


Figure 16: Industrial Boundary Surrounding Copper Cliff.

embodies a unique making and remaking culture. These spaces can be altered to better represent the community, and they can contribute towards the goal of sustainability and regeneration.

5.2 Demographics

Copper Cliff is a relatively smaller community with approximately 2,467 inhabitants.[35] This is roughly 1.5% of the population of Greater Sudbury which is approximately 165,500.[36] Despite this community's size, it plays a major role within the Sudbury economy because of the mining industry. Valé is one of the largest mining companies in the world, and it is the largest producer of nickel.[37] Within Sudbury there are six mines, a mill, a smelter, and a refinery. Copper Cliff is most recognized for the iconic smokestack, which was constructed in 1970, and it has been officially decommissioned. The site views for this community will dramatically change once the smokestack is removed.

35 "Demographic Data in the City of Greater Sudbury." In Population. (National Occupation Classification, Greater Sudbury, 2016.)

36 Amanda Sherrington, "Industrial Heritage in Northern Ontario," Unsettling Heritage (Carleton University Heritage Conservation Symposium, 2015) 2.

37 Ibid.

The industry is a big part of the community today, however there are less then 10 percent of the community members that work for the mining industry, refer to figure 17.[38] This is vastly different from the historical context, where the community was entirely miners and their families in the early to mid 1900s. Copper Cliff now acts as a residential neighbourhood for professionals that work all over Greater Sudbury. With transportation more accessible, and the housing costs more affordable than other parts of Greater Sudbury this community has the potential to grow if there were engaging programs for the city.

However, Copper Cliff is also an older community and most of the houses were built before the 1960s with a shortage of new construction after the 2000s, refer to figure 17. Forty percent of the community rent their homes.[39] This community is lacking exciting programs for learning and engaging with the community, which is essential to maintain the existing population and to promote future growth. Over a five year time frame, nearly 700 people have moved away from the community and only 145 have migrated to the area.[40] The community has an issue with maintaining their residents. This thesis will explore new ways that Copper Cliff can improve this suburban landscape and create growth in Copper Cliff.

38 "Demographic Data in the City of Greater Sudbury." In Education and Labour. National Occupation Classification, Greater Sudbury, 2016

39 "Demographic Data in the City of Greater Sudbury." In Housing. Greater Sudbury, 2020.

40 Ibid.

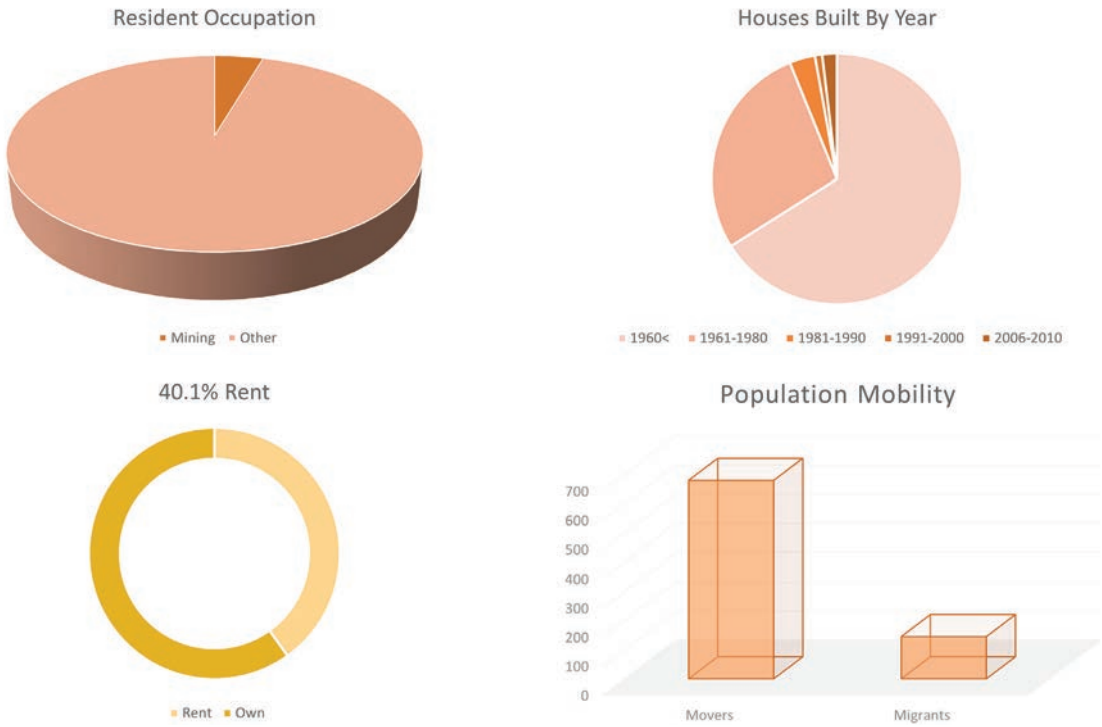


Figure 17: Copper Cliff Demographics.

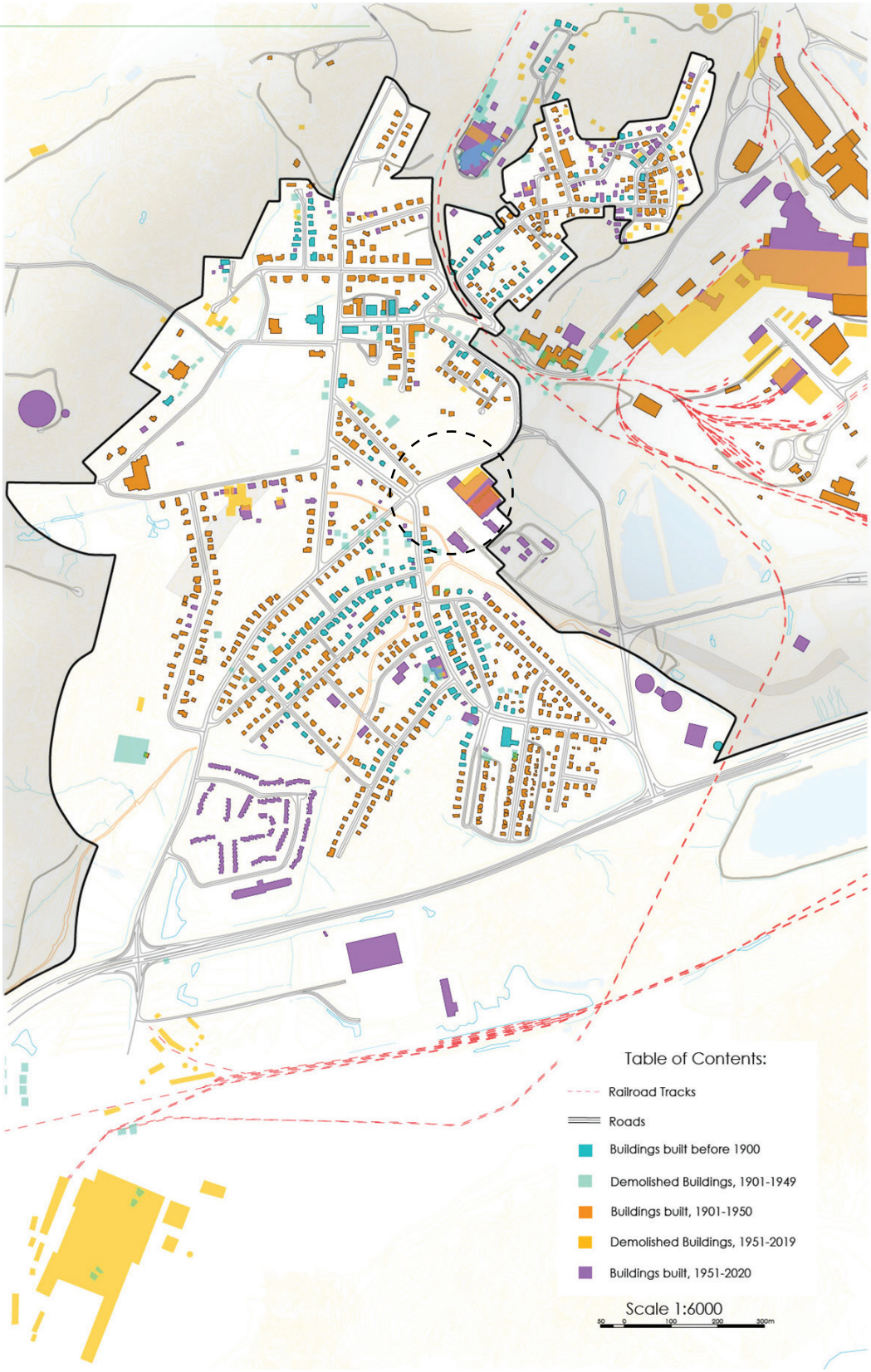


Figure 18: Copper Cliff Time Map, 1900 to 2020.

5.3 Copper Cliff

Copper Cliff has evolved over the past one hundred and fifty years. The community holds a rich heritage that is found within the industry and culture. Beginning in the early 1900s, Copper Cliff was coming together and forming as a community. The neighborhoods were under development, and the community was at its early stage of construction. The architecture, mining and culture were starting to work together.

Figure 19: Architecture, Culture and Mining Diagram, 1900.

Towards the 1950s the relationships between the architecture, culture and the mining industry grew stronger. The architecture began to reflect the culture of the community through the addition of vibrant community facilities that were built directly within the fabric of the neighborhood. The mining buildings grew in size and capacity as the industry expanded. The community was at its peak as a miners' town, where all of the members lived and worked in the community.

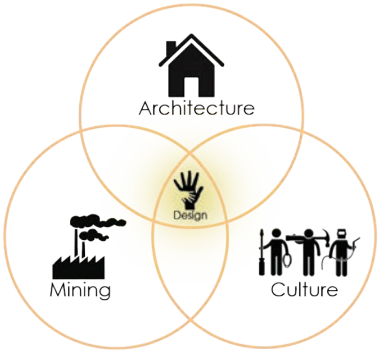


Figure 20: Architecture, Culture and Mining Diagram, 1950.

More recently, the community has become neglected. The existing infrastructure is underused and does not reflect the historic culture and identity of this community. The architecture, mining and culture have become disconnected from each other. This thesis seeks to use the design elements of the project to reunite these facets. With the design at the center, these elements must consider the cultural and regenerative movements for Greater Sudbury. This will inform the selection process and adaptive reuse application.

Figure 21: Architecture, Culture and Mining Diagram, 2020.

In Copper Cliff, there is a growing disconnection between the community and the industrial areas. There are fences, signs, hills, and gates, which create a divide between the community and the mining industry, as shown with the dark boundary line on each map. This thesis will explore how the selected site, which sits on the edge between the industrial and community lands, can become a place for architecture, mining and culture to come together.

This site will undergo a transformation that will improve the public spaces and create a destination that embodies the industrial, arts and community sectors. The historical analysis of Copper Cliff has revealed that there are areas within the existing community that lack connection. Many of these issues have risen because the community has transitioned from a miners' town into a commuters' town. In the past, there was a stronger relationship between the culture and industry because the entire community worked for the industry. This proposal will consider new ways for the community to interact with the industry workers, and provide an intermediate space that will accomodate these requirements.

06

CULTURE

6.1 Community

Copper Cliff has distinctive neighbourhoods that define certain areas of the community. There are 4 main neighbourhoods that have been around since the early 1900s, which are the following: Crows Nest, Little Italy, English Town, and Shantytown. Refer to figure 22. Each of these neighbourhoods had their own unique community dynamics where many of the essential public facilities could be found. The dominant factors that have shaped these neighbourhoods has resulted from the industry rather than environmental determination.

The Crows Nest and Little Italy were areas located nearest to the main smelter entrance. The miners built close to the smelter entrance so that their commute to work would be short. This area was considered 'uptown' because it had a higher elevation, but also because closer to the industrial areas and access points. The Crows Nest housed a variety of different cultures from around the world. Little Italy mainly housed the Italian community. The narrow streets and architectural planning on the hillside in this neighbourhood also mimics the rolling landscapes of Italy.

The English town area provided accommodations for the officials that ran the mining industry. With the engineering club and many other groups in this part of the community, this area was at the central core and it held the important stores and businesses. Today this area is considered the downtown of Copper Cliff.

Shantytown was a prominent neighbourhood that housed the Finnish community. This area was considered 'lower town' because of its further distance from the smelter entrance. Each of these neighborhoods had their own community buildings, churches, stores, etc. These facilities were built directly into the urban fabric of these neighborhoods, and not on the edge of the community.

"'environmental determination' should be considered the dominant factor shaping urban development, the case can be made that Sudbury serves as an exception to this rule."[41]

41 Oliva W. Saarinen, "From Meteorite Impact to Constellation City," (Waterloo, Ontario, Canada: Wilfrid Laurier University Press, 2013) 1-2.

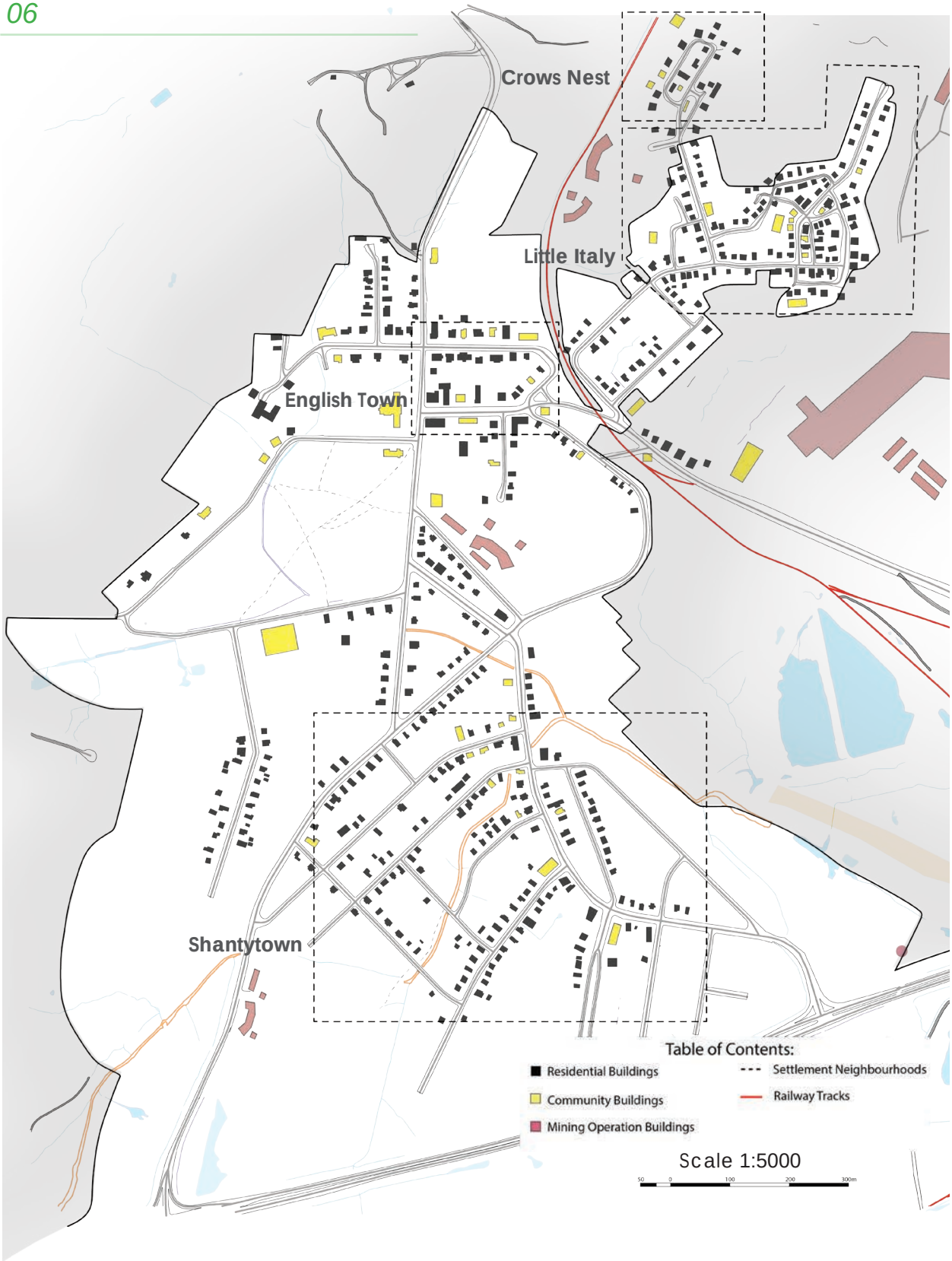


Figure 22: Copper Cliff Neighbourhoods, 1920.

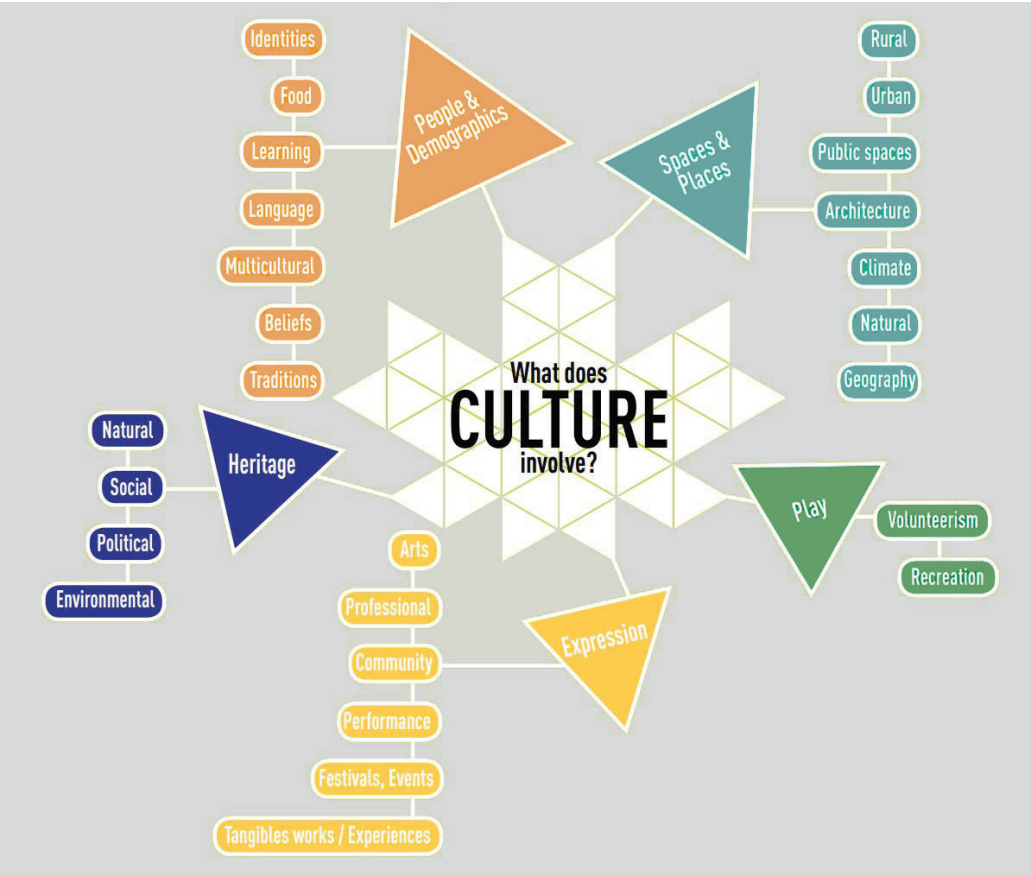


Figure 23: Culture Diagram, from Greater Sudbury's Cultural Plan.

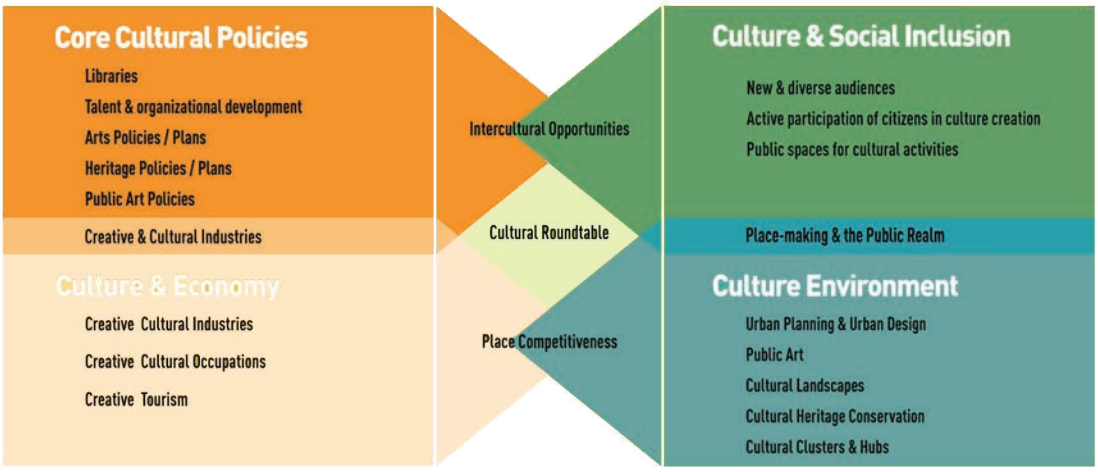


Figure 24: City Vision, from Greater Sudbury's Cultural Plan.

Figure 25: Sudbury Community Centers and Art Facilities.

6.2 Cultural Plan

Culture combines many different aspects of the community. It considers the people and demographics, the heritage, the expression, play, and the different spaces scattered across the community, refer to figure 23. Maintaning the culture and heritage is important to the Sudbury Community, and will help to inform the design. The city of Greater Sudbury highlights the relationships between culture, social and political considerations. These examples help to bring the cultural facets of the community together in order to create a space that is inclusive to all members.

The mining and community infrastructure that remains today, tells the story of this making culture for Copper Cliff, but there are not currently any community buildings where this knowledge can be shared and passed on. This community built their own houses, churches, community buildings, and now their descendants live and work in other areas of Sudbury. A place for making and sharing in Copper Cliff would help to fill this void within Sudbury's arts community.

The existing community centers and other buildings in the making and arts sectors are highlighted in figure 26. Across all of these facilities is an absence of making and remaking. The addition of a building workshop would provide a local building for Sudbury's creative community to have the equipment, square footage and storage that is unavailable at other locations. The production of this new facility would correspond to Sudbury's Cultural Plan for 2015 to 2020.

According to analysis and surveys completed, eighty-seven percent of the population in Sudbury want more places for arts, culture, and local heritage.[42] The reuse of existing infrastructure in Copper Cliff that is underused will help to revitalize this community and draw in more people from Greater Sudbury.

42 "Greater Sudbury Cultural Plan," In the Cultural Plan 2015-2020, Greater Sudbury Development Corporation, 2015.

6.3 Community Vision

This illustration shows the available facilities that are underused and the goals and needs of the community. This exploration considers how the addition of a place for making and remaking via community driven needs can take on a form of adaptive reuse within one of the facilities in Copper Cliff. The local organizations are lacking facilities, workshops, smaller facilities, studio space for creation, storage areas for the long term, parking, place for production and presentation of art for all disciplines.[43] Copper Cliff can use the available architecture to create spaces for making and re-making the mining and culture for this community.

43 ArtsBuild, "Sustainable Creative Spaces Sudbury," ArtsBuild Ontario, (City of Greater Sudbury, May 7, 2013,) 15-16.

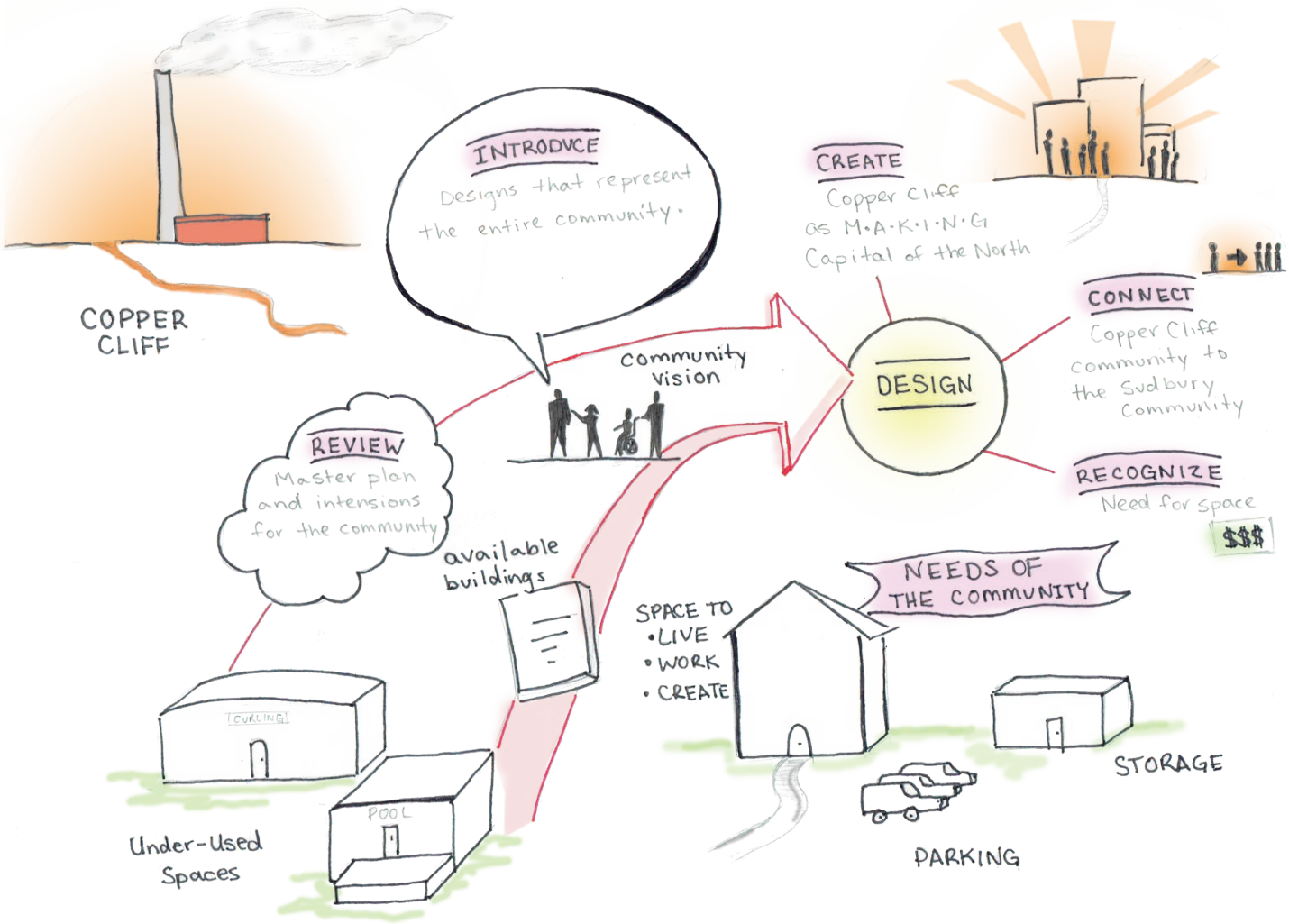
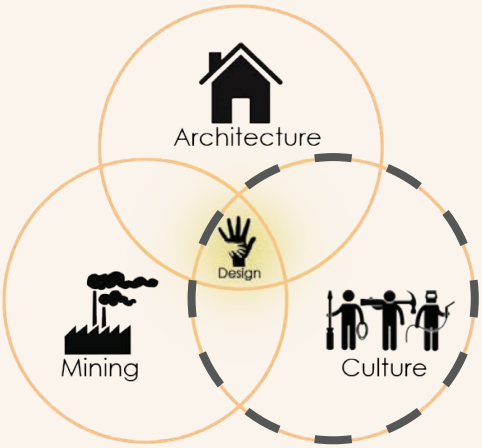


Figure 26: Community Vision Diagram for Copper Cliff.



Community Vision Through Design:

Copper Cliff has a unique industrial and making culture. Immigrants from around the world came to this community with different skills of making.

The mining and community infrastructure that remains today tells the story of this making culture for Copper Cliff, but there are no community buildings where this knowledge can be shared and passed on to the next generation.

This community built their own houses, churches, community buildings, and now the immigrants' descendants live and work in other areas of Sudbury. A place for making and sharing in Copper Cliff would help to fill this void within Sudbury's arts community.

Current Needs:

Creative Space
Making Space
Parking Space
Storage Space

Available Space:

Pool Facility
Curling Club
CUPE Union Building

07

INDUSTRY

7.1 Mining Industry

Industrial heritage is a concept within architecture that has become more prevalent over the last decade. It is now understood for its heritage value and application of creative adaptive reuse.[44] The Copper Cliff community did not exist before the industry. The community was created in order to provide housing for the mining workers and their families. This aspect is an essential part of Copper Cliff's history, and the industry, now known as Valé, plays a major role in Sudbury's economy.

The discovery of rich mineral deposits of copper and nickel created the need for a community in Copper Cliff that formed around this industry. The railway allowed for the ore collected from Copper Cliff to be refined and sent from coast to coast in Canada, refer to figure 28. This provided more opportunities for growth within Copper Cliff.

44 Amanda Sherrington, "Industrial Heritage in Northern Ontario," Unsettling Heritage (Carleton University Heritage Conservation Symposium, 2015) 1.

Figure 28: Connection to Canadian Pacific Railway.

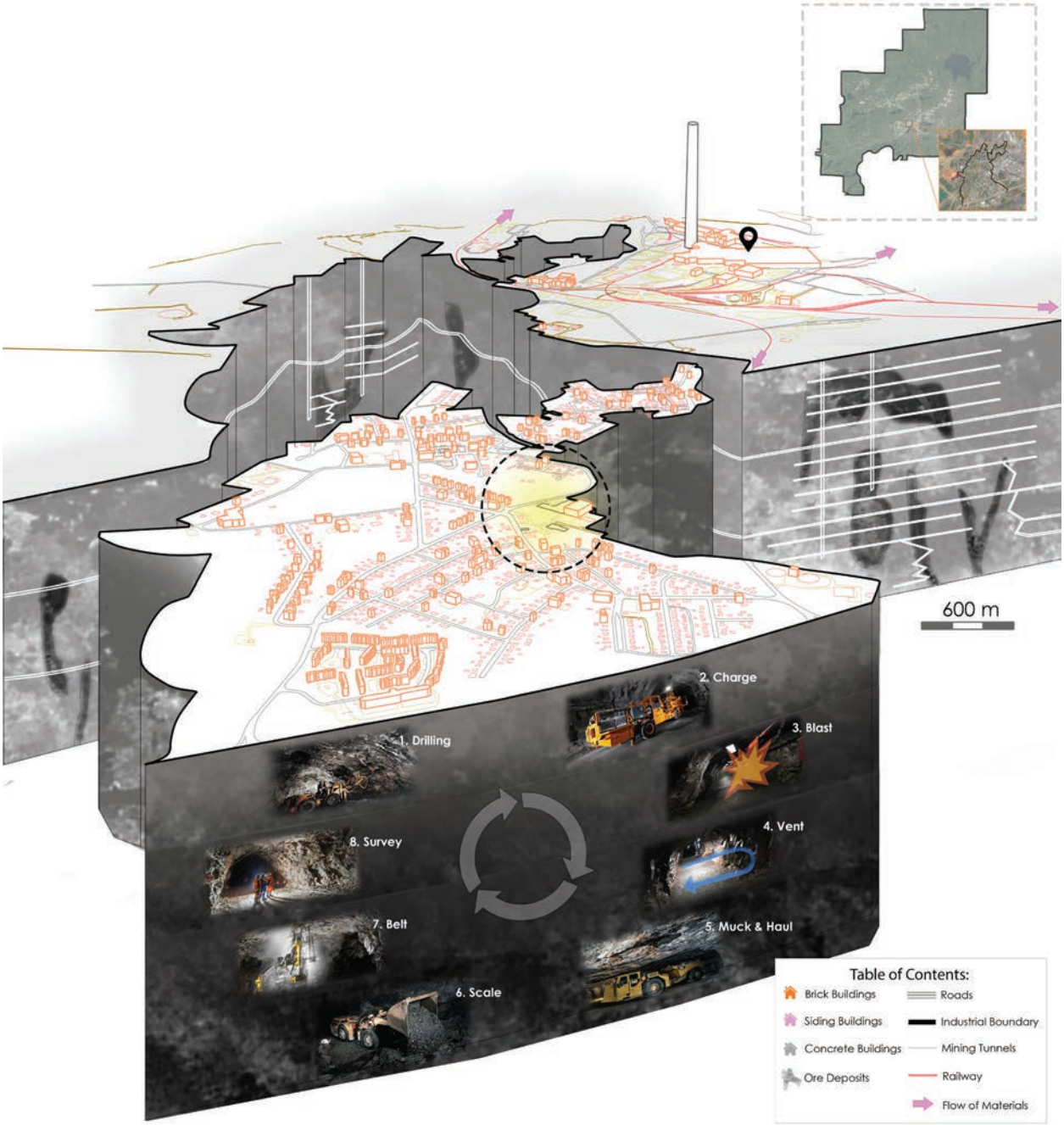


Figure 28: Copper Cliff Industry Diagram.

Copper Cliff is completely surrounded by industrial lands, and this has created an island condition between these public and private areas. The boundaries that envelope the community are both physical and invisible. There are fences, gates, and signage to divide these areas. The mining operations also run entirely beneath the community, and span hundreds of meters below the surface, refer to figure 28.[45] The industrial processes impact the community and can create a divide between the of Copper Cliff residents and the rest of Greater Sudbury.

The mines below the surface in Copper Cliff are far greater in scale and capacity than the community above the surface. The tunnels create a network of paths that stretch far beyond the town limits. These operations will continue in Copper Cliff for many years, until there are no minerals to be extracted.

The industry has demonstrated a firm effort to reduce greenhouse gases and to make their processes more sustainable over the past decade. To create a space that will work for both the industry and the community, it will require communication with both ends of the spectrum. Informing the community of what the industry is doing to mitigate the environmental damage that occurs from their operations is vital towards this growing relationship. Also, allowing the community to have a voice about how these industrial processes that have impacted their landscape will allow the restoration responce to operate accordingly.

45 Bob Turner et al., "Copper Cliff, Greater Sudbury: A Driving Tour of Greater Sudbury's Mining Industry," Health Science North (Queens Printer for Ontario, 2015) 4.

7.2 Current Issues

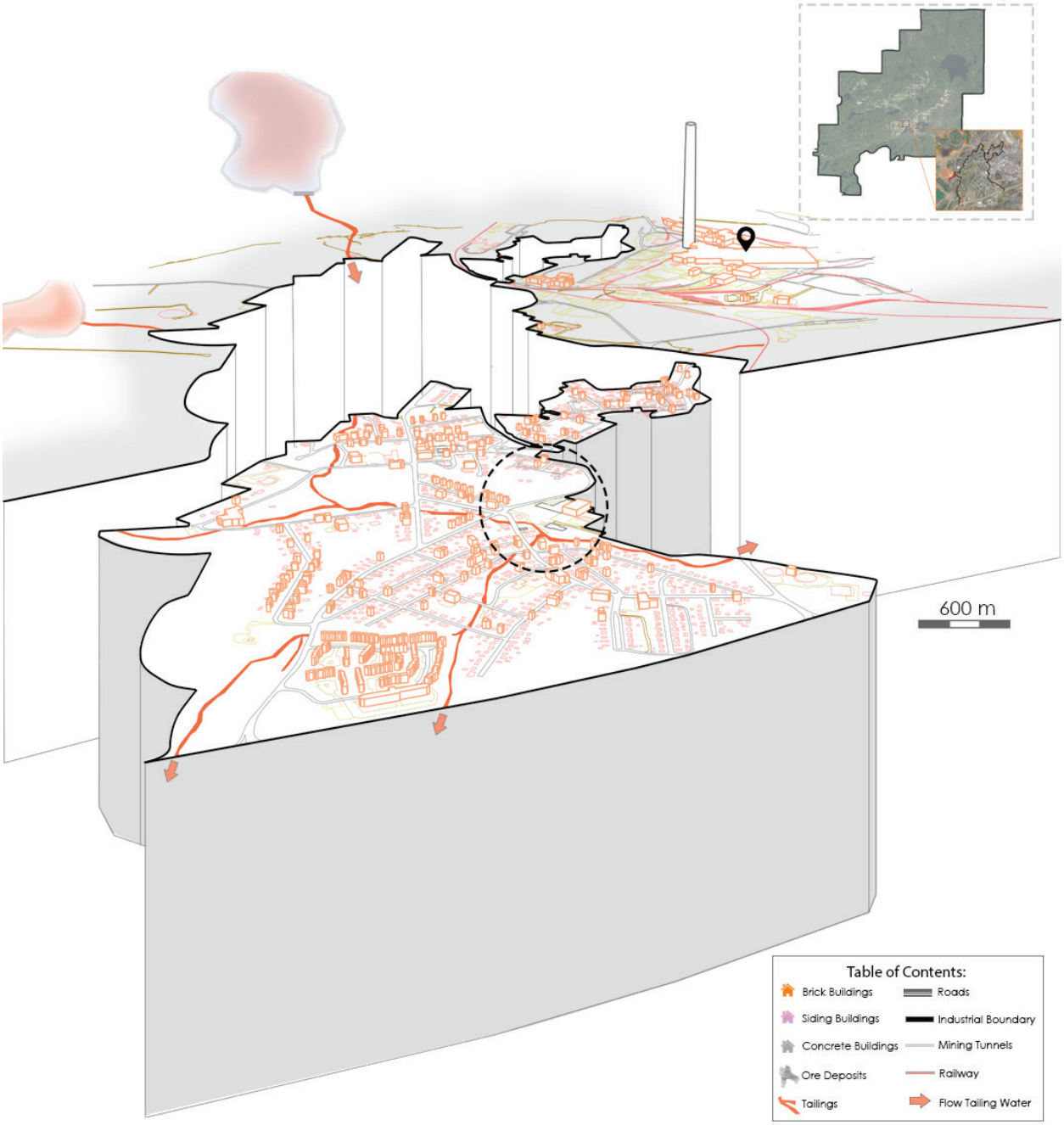
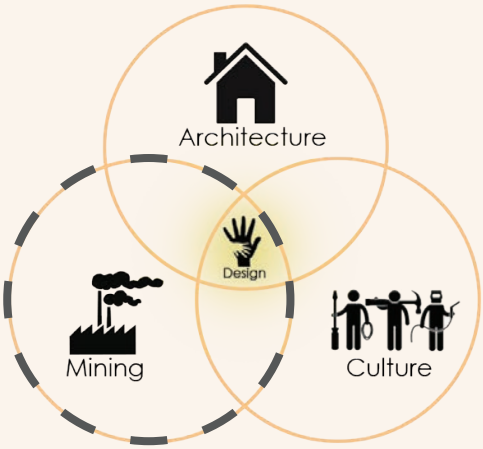


Figure 29: Copper Cliff Industrial Issues.



Industry Restoration Through Design:

Problem:
Valé, formerly known as INCO, is a Brazilian owned company with mines located all over the world. One of the key issues that is relevant in many of their mining locations are the industrial tailings' water and waste management.

Copper Cliff is on the list for having a highly unsafe talings dam because it is located upstream from the community and it is original to the construction of this mine. In the future, if the dam were to burst, then this entire community would be flooded.

In addition, the tailings process water currently run throughout the community, refer to figure 29, and they contain toxins that are partly purified by the air before they are dumped into Kelly Lake. The addition of a research facility would allow the industry to monitor the water qualities more closely and to revisit their water management process to create new forms of sustainability.

Target:
Valé is constantly trying to become more sustainable and improving their mining processes. Their goal is to become world leaders, and the addition of a Tailings Research Facility would help them to provide research for other mines across the globe that have similar issues.

Current Needs:
Tailings' Water Research Facility

Available Space:
Pool Facility
Curling Club
CUPE Union Building

08

ARCHITECTURE

8.1 Creative Vision

The architecture can bring the mining and cultural needs of this community together. The mining areas and the community have always been separated by a boundary line, refer to figure 30. How can the architecture bridge this gap between the community infrastructure and the mining operations?

The practice of making and remaking can be seen in the ways that the community built this area from the scraps left from the industry. As the needs of the community have changed over the years, the architecture has remained stagnant. In Copper Cliff, the reuse of existing buildings is essential because there is only a small amount of land available for new construction.

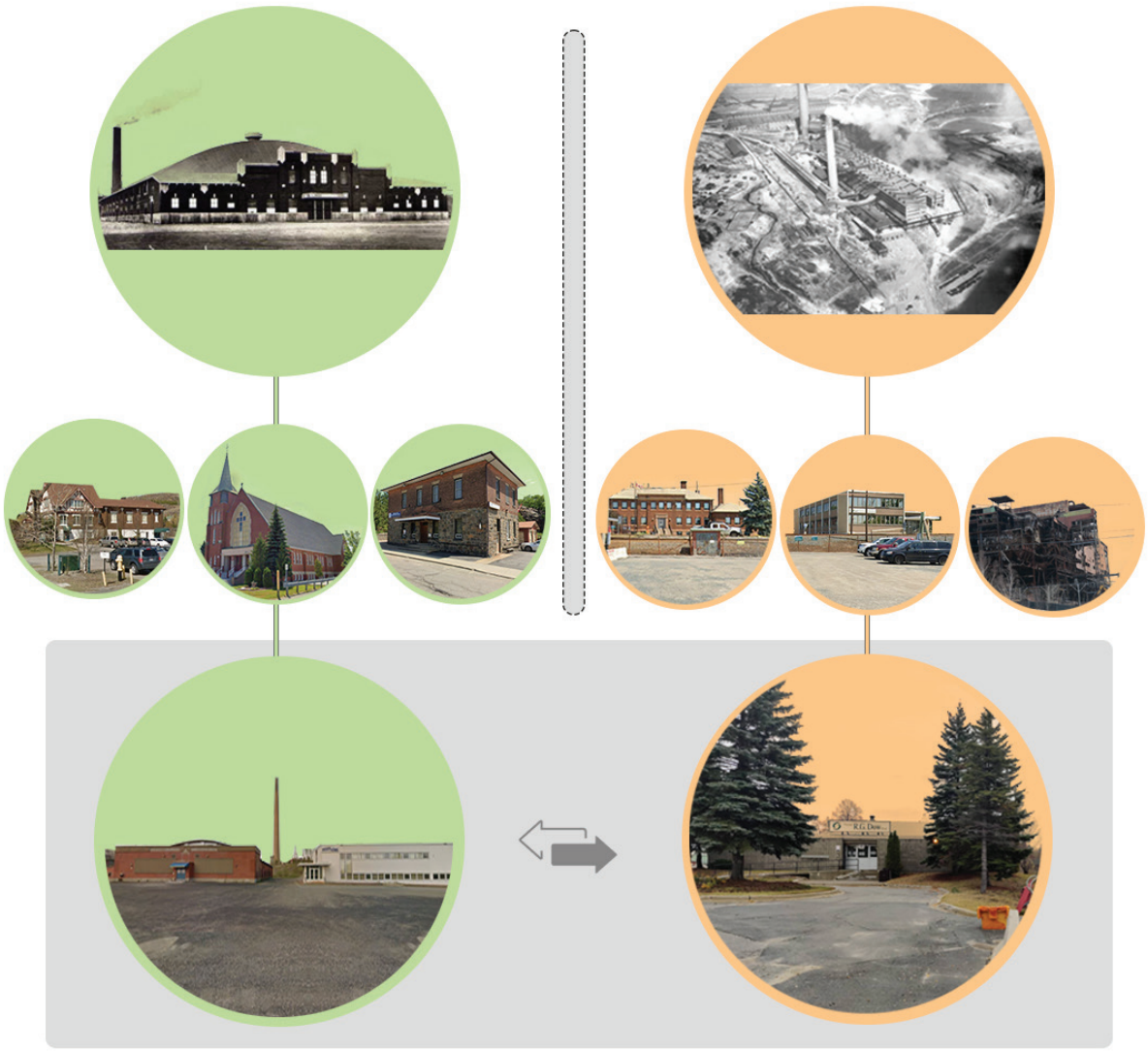


Figure 30: Architectural Change, Copper Cliff.

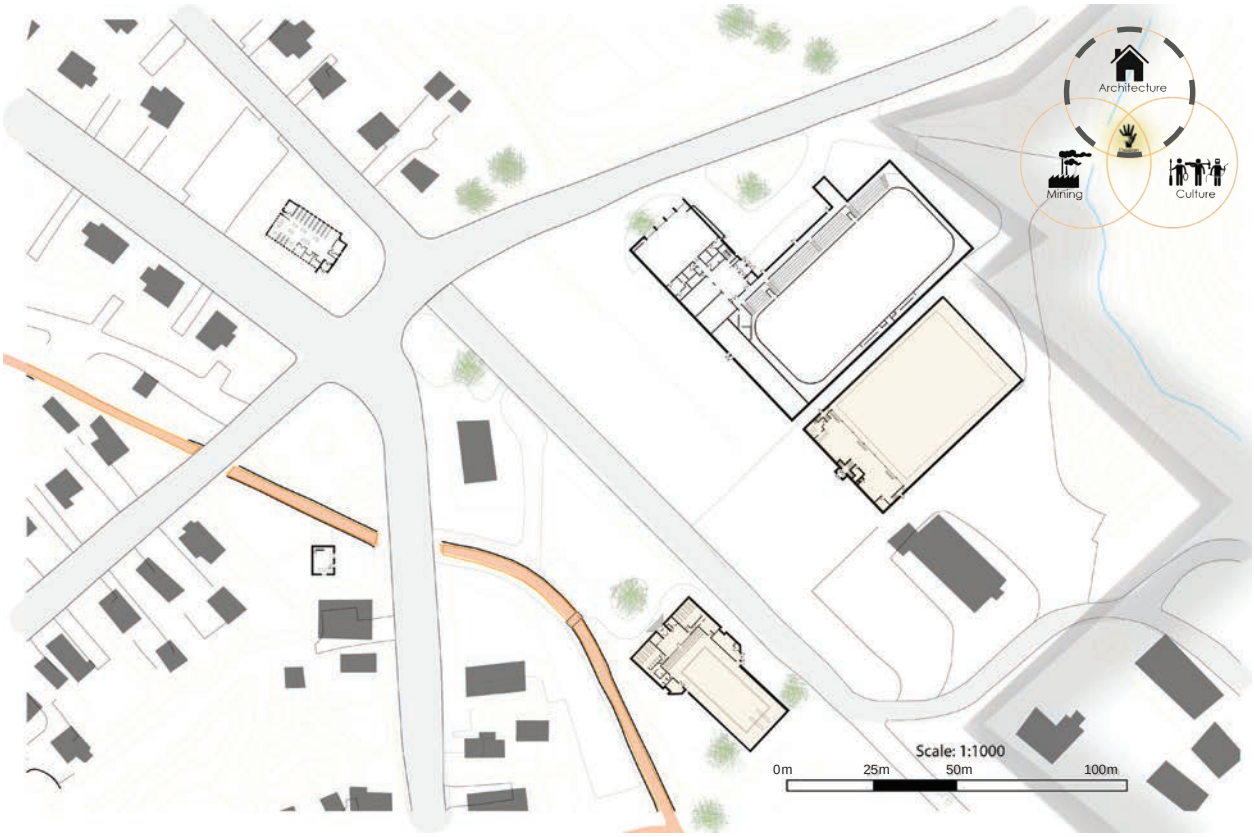


Figure 31: Community Facility Floor Plans.

8.2 Existing Facilities

From the Stanley Stadium to the Curling Club the community has maintained the importance of community driven architecture. These structures served the needs of the community, but the culture within this community is not the same as it was fifty years ago when these facilities were built. The Curling Club has since declined, and it nearly closed in 2017. When the community was booming and the Legion was located next door, curling was popular, but the overhead costs have increased, and the percentage of people that use the space during off season and weekends is very low.[46] It is a possibility that that the facility may close in the future. Therefore, an adaptive reuse of the Curling Club could be suggested to maintain this building for community purposes.

Located adjacent to the Curling Club is the old CUPE union workers building. This structure is underused, and it is at its initial stages of deterioration. This area has declined over the years, and there is less engagement from the community. With less eyes on the street, these buildings are more at risk for vandalism. Several windows on the CUPE building and the curling facility have been smashed and boarded over. The union facility could offer more workshop space to the community with a separate metal working area. This new function will pay tribute to the union workers and their skills and trades via this new workshop.

46 Lyndsay Moggy, "Copper Cliff Curling Club faces uncertain future," for Northern Ontario, (CTV News Ontario, August 9, 2017).

The support of the industry is important towards the future of this community. Creating spaces where the community and industry can learn and build a better future together will allow these two streams to cohabitate one area within this design. Through the making and remaking of mining sustainability, the industry can contribute towards improving the health and the regeneration of the land and the community. The R.G. Dow Pool is another underused facility in Copper Cliff that could be considered for an adaptive reuse plan. According to the master plan for greater Sudbury the pools in the community are under assessment and may be repurposed in the future.[47] Therefore, a new design and program for the pool facility would propose a new way to extend the life of this building.

47 Lyne Côté Veilleux, "Interim Review of Parks, Open Space and Leisure Master Plan," Greater Sudbury (Community Services Committee, June 15, 2020), 15.

Figure 32: Cluster of Community Buildings.

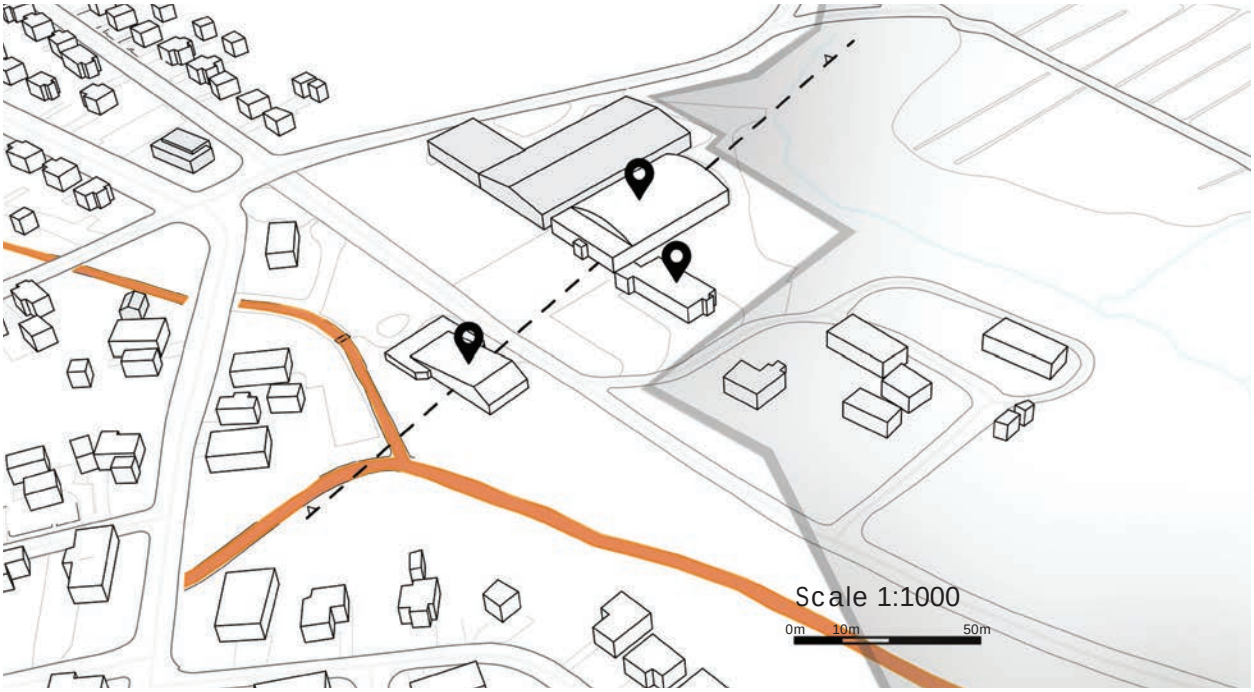


Figure 33: Arial of Existing Site.

The Curling Club and the R. G. Dow Pool are existing community facilities that sit on the edge of the industrial boundary. They can bring the mining and community elements together, but they can also defend against future demolition of these facilities and neighborhoods. This cluster of community facilities, refer to figure 33, will provide a new suburban grouping of buildings that will inflence the surrounding commuity. This community focus will bring the industry, culture, and the architecture together.

The proposal involves the adaptive reuse of both the curling facility and the pool facility. This selected area in Copper Cliff reveals a cluster of five community buildings, the arena/community centre, library, museum, Curling Club, and the pool. These facilities fall on the edge between the residential neighbourhoods and the mining industry. The oldest building out of this cluster is the Curling Club. With the community interest decreasing, the facility may close in the future. This structure is unique with its domed trusses, and the building has a red brick cladding which is beginning to deteriorate. In recent years, they have had to cover the structure and beams to insulate the roof over the ice rink.

This adaptive reuse will consider the immediate needs of the community, and it will be developed over several phases. This will allow the design to incramentally improve the site design and surrounding context. This proposal will consider how the architecture and culture come together to create a design that supports the local community and Greater Sudbury.

Figure 34: Features Removed From the Stanley Stadium to the McClelland Arena.

8.3 Historical Analysis

A common problem with new construction is when the character and architectural charm is removed. For example, this can be identified within Copper Clff when the Stanley Stadium was demolished in 1976 and the McClelland Arena was built in its place.

The stanley Stadium was designed and built for the needs of the community. The front facing windows helped to draw a greater connections between the community and the arena. The brick represented the masonry and artisans that built this community and the industry. The stepping architectural element on the front façade highlighted the front entrance to draw people inside of the building refer to figure 34. These were all elements from the Stanley Stadium that were lost in the construction of the McClelland Arena. This proposal will consider these elements to pay tribute to these historic buildings and their materiality within the design, and to highlight the architectural past in Copper Cliff.

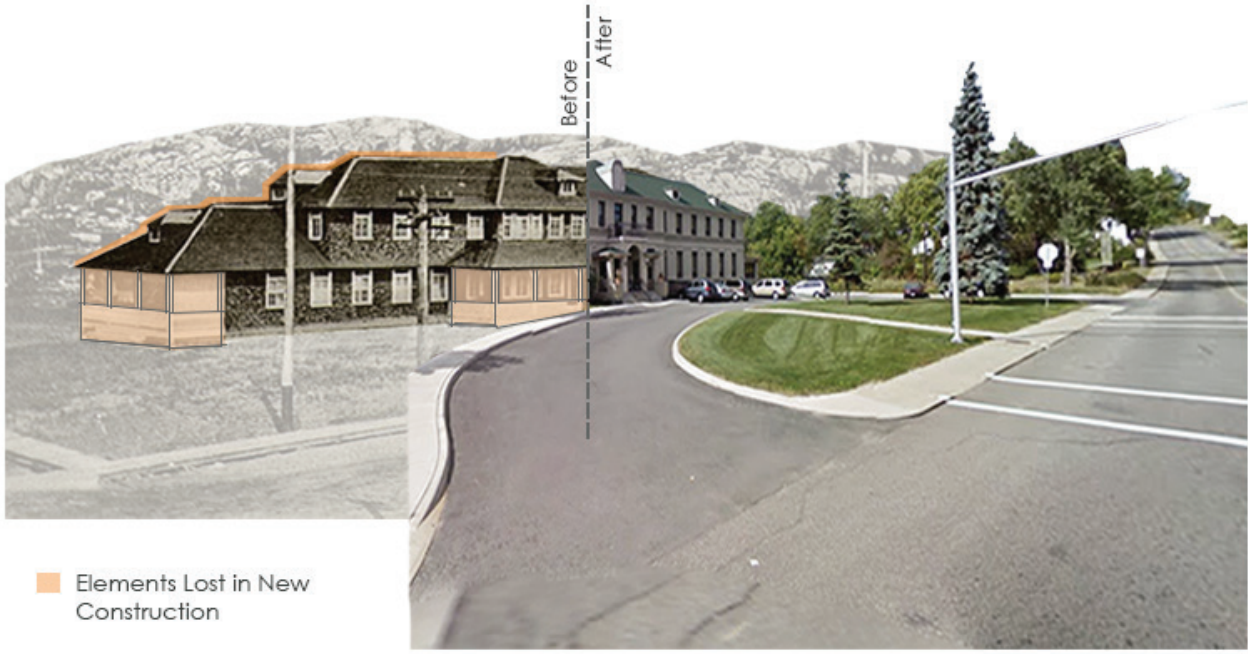


Figure 35: Features Removed From the Reconstruction of th Copper Cliff Hospital.

A second example in Copper Cliff that demonstrated the removal of the charm and heritage through new construction was the Copper Cliff Hospital. The original building burned down in 1912, and the existing facility was built in its place.

The original hospital had large porches on the sides and front of the building. Porches are a very important part of Copper Cliff because they provided the community with sheltered outdoor spaces. This building also was a brick building, which again highlighted the making culture of this industrial community. Lastly, the original hospital building also had a stepping roof structure which increased from the outer corners towards the center, refer to figure 35.

These architectural elements were forgotten in the new construction, but reveal the historical architecture within Copper Cliff. The question to consider is how to bring back these features within the community architecture that exists today. Can these elements help to revive these underused facilities, and to bring this community back to its historaical heritge and charm? This proposal will use the adaptive reuse principles to highlight the heritage of the historic and existing built architecture.

Figure 36: Residential, Community and Civic Porches in Copper Cliff.

Porches are an important part of the architecture in Copper Cliff. The size and intensity of the porch can be altered as they transform from the residential to community scale, refer to figure 36. Porches are very common in Copper Cliff, especially in the areas closer to the smelter entrance because these residential homes have a small footprint and little yard space. The porches help to extend the living spaces for these industry based homes, and to provide a useable outdoor space as well.

There were many community clubs as part of Copper Cliff's history as a miners' town. These community clubs also had porches, so the members could meet outdoors, but in a protected space from the elements. The porches also find themselves within the civic architecture in Copper Cliff, as seen in the historic Hospital building and the bank. These porches help to connect the buildings with the landscape and create a transitional point for the users of these facilities.

Having a porch within this thesis design will provide a space that is at ahigher elevation and that will look over the site. It will also be vital space for community interaction and enjoyment. T

8.4 Structure

The existing structure for the pool and curling facilities both have long span structures with vaulted high ceilings. These spaces create an opportunity for large open programs that require larger constraints. However, despite these structures being open and expansive internally, they do not currently connect or branch outward to the exterior.

The Curling Club facility is unique amongst the five surrounding community buildings. The structure over the rink is a barrel-vaulted wood post and truss structure, refer to figure 37. Over recent years, the structure has been covered to insulate the room. However, the new design will uncover the structure and highlight it within the program. The design of this facility is split level. The front room, connected to the rink, is a flat roof, post and beam structure. This space is at a higher elevation than the rink below. This allows the curling audience to watch the game from above. This concept will be maintained, under the new program, to allow the users of the building to watch the activities that occur below.

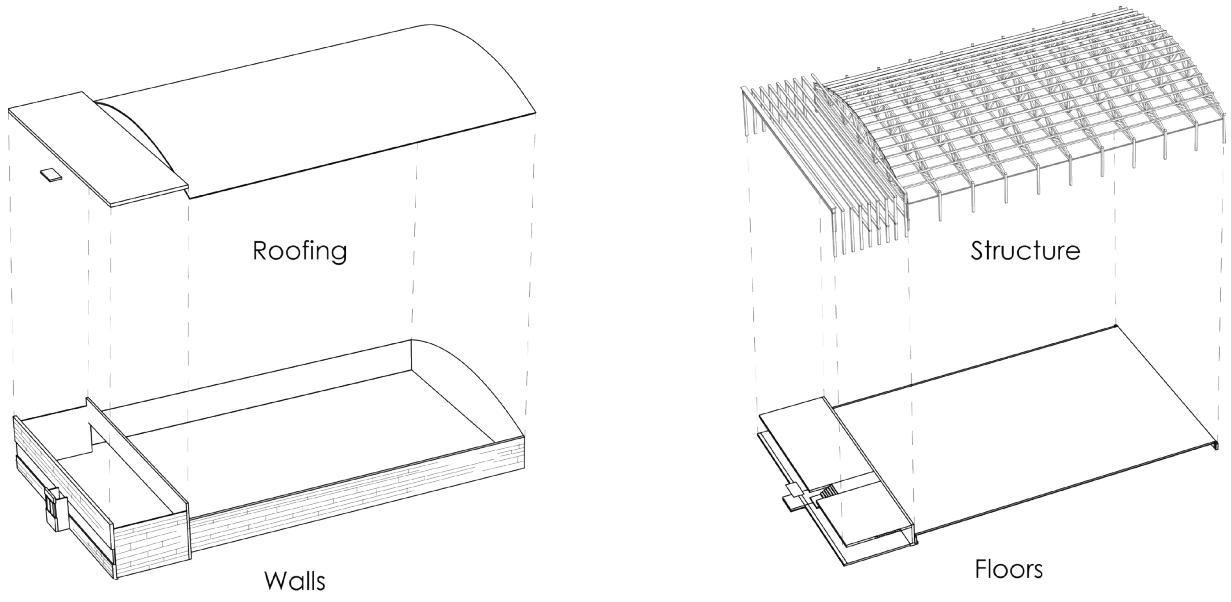


Figure 37: Curling Club Facility Structural Diagram.

The R.G. Dow Pool is a steel post and beam structure, refer to figure 38. The pool is located within the high vaulted section of the building. Like the Curling Club facility, the front volume of the building is at a higher elevation than the large open span area for the major program, in this case being the pool. Thus, allowing for parents and guests to watch others swim below. There are also bleachers and steps down to the pool area, which draws a greater connection between the two volumes.

The new proposal will maintain the existing structure of the building, but it will hold a new program. The large open span area that currently holds the pool, has the potential to be used for other programs that use water. The deep well created for the pool can be altered for water quality research for both the industry and community. This space has the potential to increase the sustainable efforts of the community, and help the industry to give back to the area.

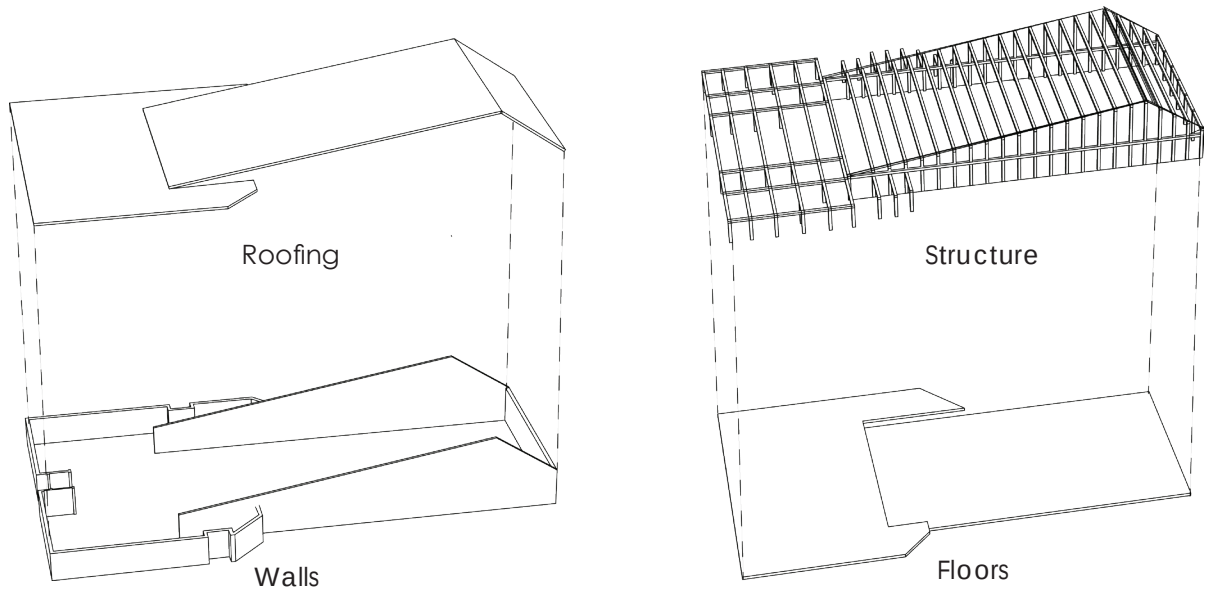


Figure 38: R.G Dow Facility Structural Diagram.

The CUPE building has a standard post and beam structure, refer to figure 39.. There are two levels within this building, and the majority of the building is currently underused. This facility has a flat roof, whereas the pool and curling buildings have a vaulted roofs for their major programs. Therefore, there is potential to collect the rainwater on the Union building's roof, which can be reused within the facility. Also, the structure on the interior can be highighted within the new design. The posts and beams can be exposed, which can be used as a learning tool for the proposed programs of making and remaking via metal fabrication.

The common issue amongst these aging community buildings and their structures is the lack of accessibility caused from the split-level design. The Curling Club does not have a ramp or any other accessibility measures in place, so wheelchair users cannot access the second level for viewing the games below. In addition, the pool facility currently has a ramp, but there is no elevator or internal ramp to allow the users to get from the second level to the pool below.

It is an important part of Sudbury's cultural plan that these community building provide equal access to all groups within the community. Therefore, the new designs for these facilities will consider the accessability for the new programs within these existing structures, while also preserving and restoring the building.

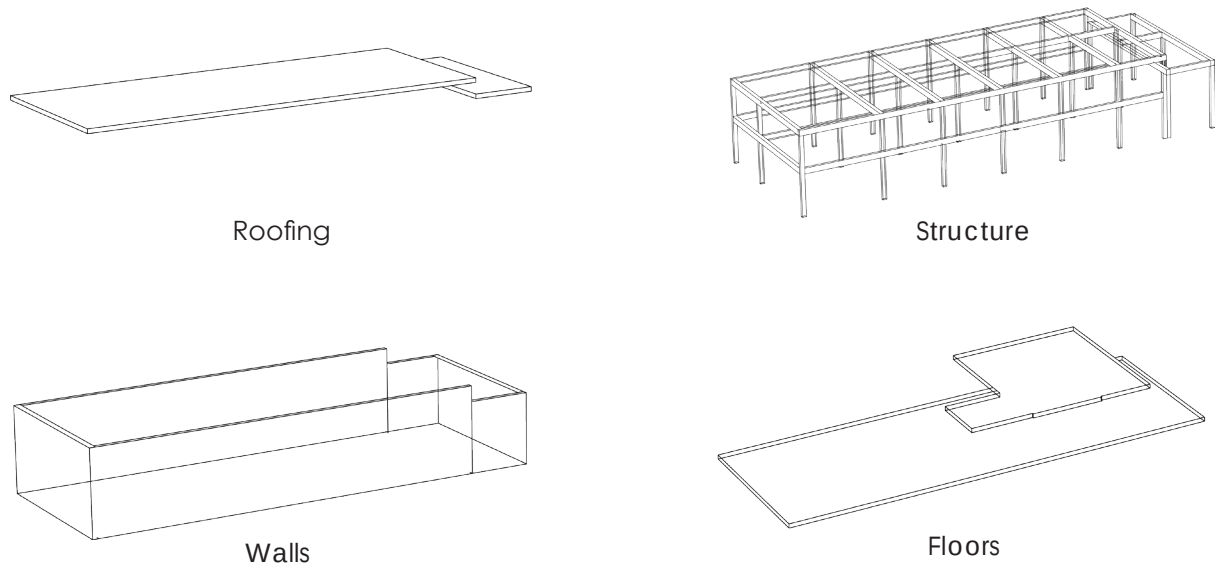


Figure 39: CUPE 4705 Facility Structural Diagram.

Figure 40: *Photo of Curling Club, CUPE and R.G. Dow Pool, photo taken by author.*

"Old ideas can sometimes use new buildings.
New ideas must use old buildings."[48]

48 Jane Jacobs, "The Death and Life of Great American Cities", (New York: Vintage Books, 1992),118.

09

PROGRAM

9.1 Craft and Making

The Curling Club and CUPE facilities will have a new function and a new program as equal parts of their adaptive reuse. The curling facility will transform into a Center for Wood Innovation. This program will require an open span area for large-scale and small-scale wood working projects with loading and garage doors that open to the landscape. This facility will also have flexible classrooms that can be used for various making classes for the community, like pottery, painting, crafting, sewing, etc. There will also be an exhibition space that will open to a large, covered porch, so that the users can display their wood and other creations to the community. Connected to the woodshop are storage spaces for materials, offices and kitchenette for the technicians, and lockers for the users to store their belongings. This facility will operate as a subscription-based program. The users will pay a daily or monthly fee to use the tools and other equipment, this will help to cover the costs for the technician and equipment rentals.

The CUPE union building will transform into a Center for Metal Innovation. This program will hold both a metal shop CNC shop. The metal shop will consist of a flexible open span area for steel working equipment.

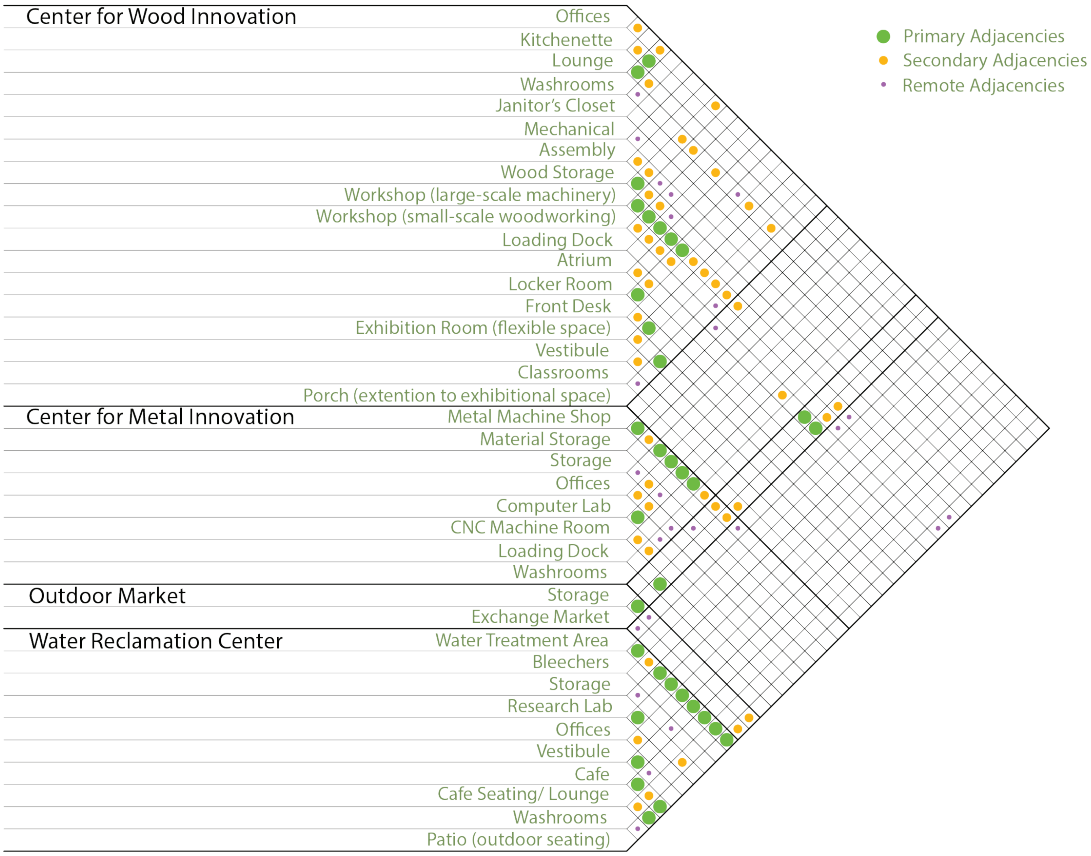


Figure 41: Program Diagram.

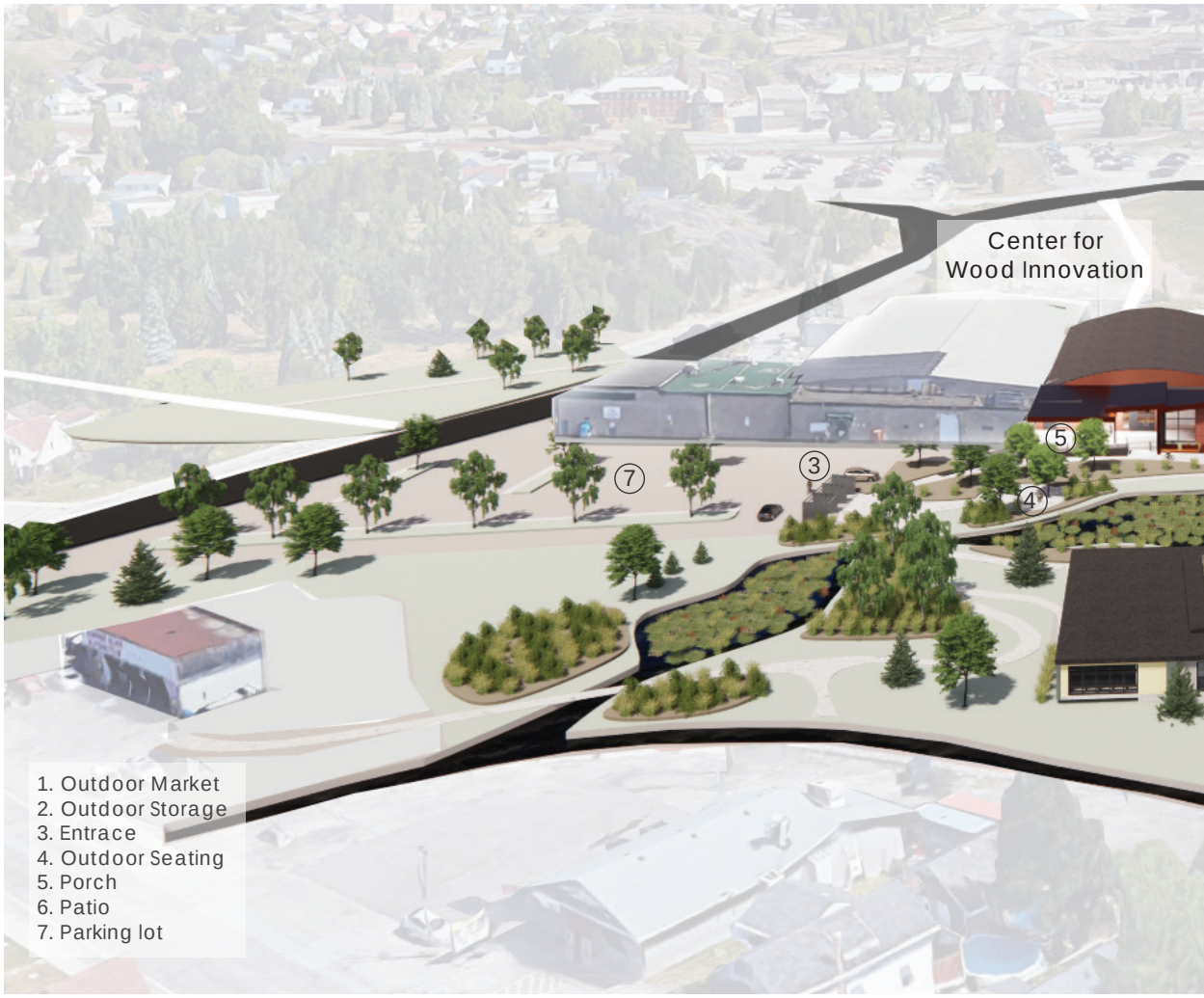
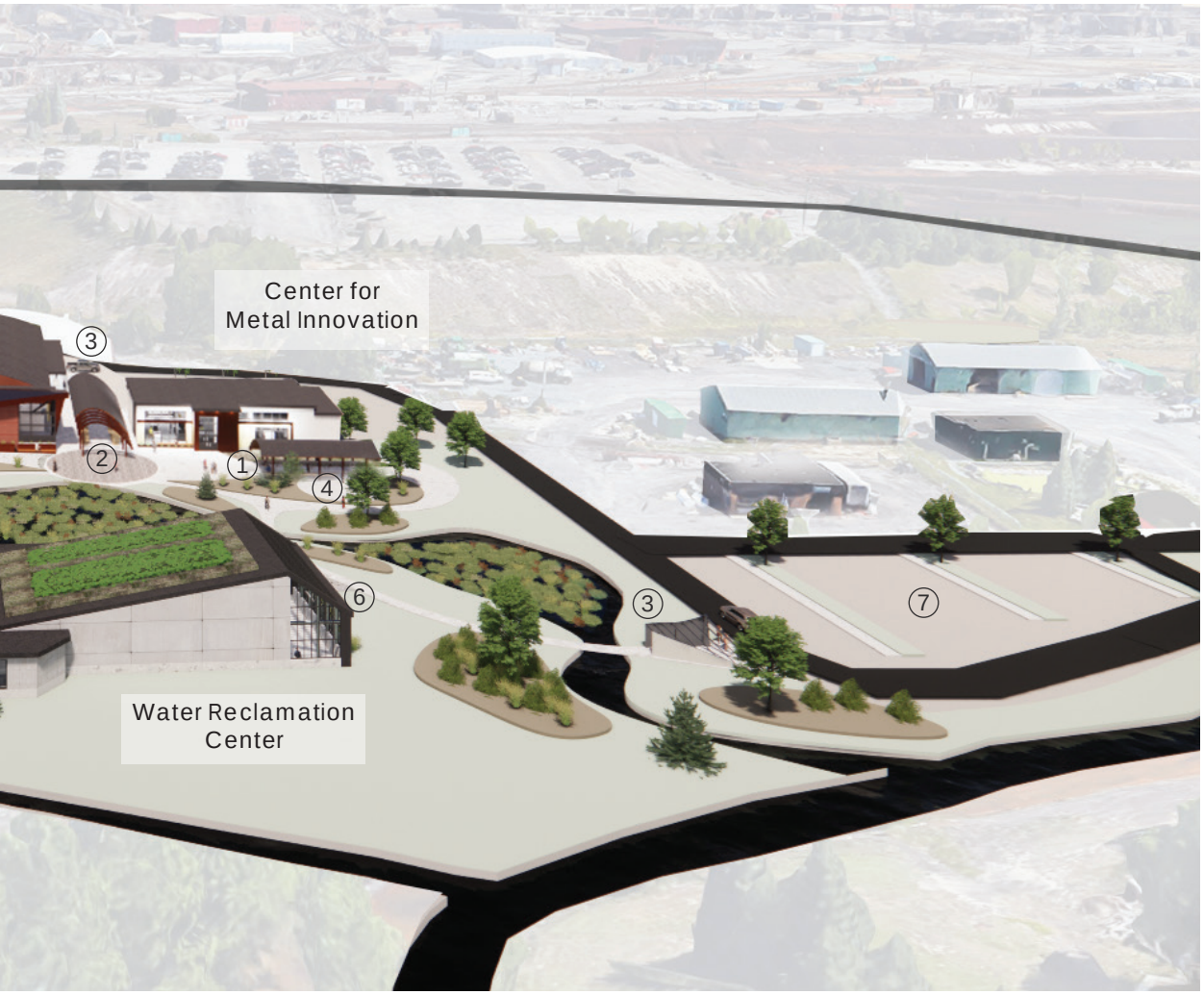


Figure 41: Arial Program Diagram.

The CNC shop will have robotic equipment and CNC machines. The computer lab will be positioned across from the CNC room so that the designs and modifications can be completed on site. The office and storage spaces are located off the metal lab for accessibility. This program will provide a new extension to the life of this facility, while still remembering the union workers that have built and established this community.

Between the Center for Wood Innovation and the Center for Metal Innovation is the outdoor storage canopy. This space will be used to store materials from around the community that are underused, or industry donated, and therefore would be free for the users to take for personal projects and building materials in the metal and wood workshops. This structure will be post and beam and made of corten steel with a metal roof but open on all sides. This space will also act as a transitional point, which takes the user from the loading areas of both shop buildings to the landscaped wetland and path network. In front of the metal shop will be an outdoor market. This space will be for material exchange where the community can bring construction materials that they do not have a use



for any longer and trade them for other materials they need. This structure will be a covered arched structure like the Curling Club. This market is located within the path network, so that the users can get the supplies they require and take them to the workshop.

9.2 Water Reclamation

The R.G. Dow Pool will undergo a new transformation via adaptive reuse. This facility will transform into a Water Reclamation Centre and Café. The old pool systems will become an indoor wetland to process the waste from these three facilities on a larger scale. The community can come to this centre to learn about waste recycling and to see the operations firsthand. The café is positioned adjacent to the external wetland to bring people to the facility. The outdoor patio will have windows facing into the water treatment areas to foster curiosity from the community about these systems. This program will have a green roof and rainwater collection for further water reclamation activities. There will also be a small laboratory for extended research for tailings' water in Copper Cliff and other water processes. The water collected at this site will be reused for flushing toilets and running tap water within these commmunity buildings.

9.3 Wetlands and Paths

Sudbury, Ontario, is full of wetlands and lakes across the city. There are a total of 330 lakes, and it is common for natural wetlands to occur between or around bodies of water. This study analysed a natural example and a manmade example of local wetlands, refer to figure 42. The research gathered from this assessment will guide the design for the site between the curling and pool facilities.

The first area of study focused on the natural marsh lands between different lakes located in Sudbury. This is displayed in the following example, where Hannah lake flows into Middle lake which flows into Saint Charles lake. In each case there is a wetland area between the lakes. This is a natural method for purification of water which cleanses the impurities before it enters a new body of water. This can be seen in the form of a creek or a river and the surrounding vegetation and ground composition is essential to this process.

The second example shows the Bennett lake marsh which is a manmade wetland. In this example, the marshland surrounds the body of water, and there are many different species of vegetation planted to improve water quality. This analysis also shows how these marshes are not straight paths on the land, but rather they are very organic. They bend and they twist and the different vegetation and species each play their role in the purification process.

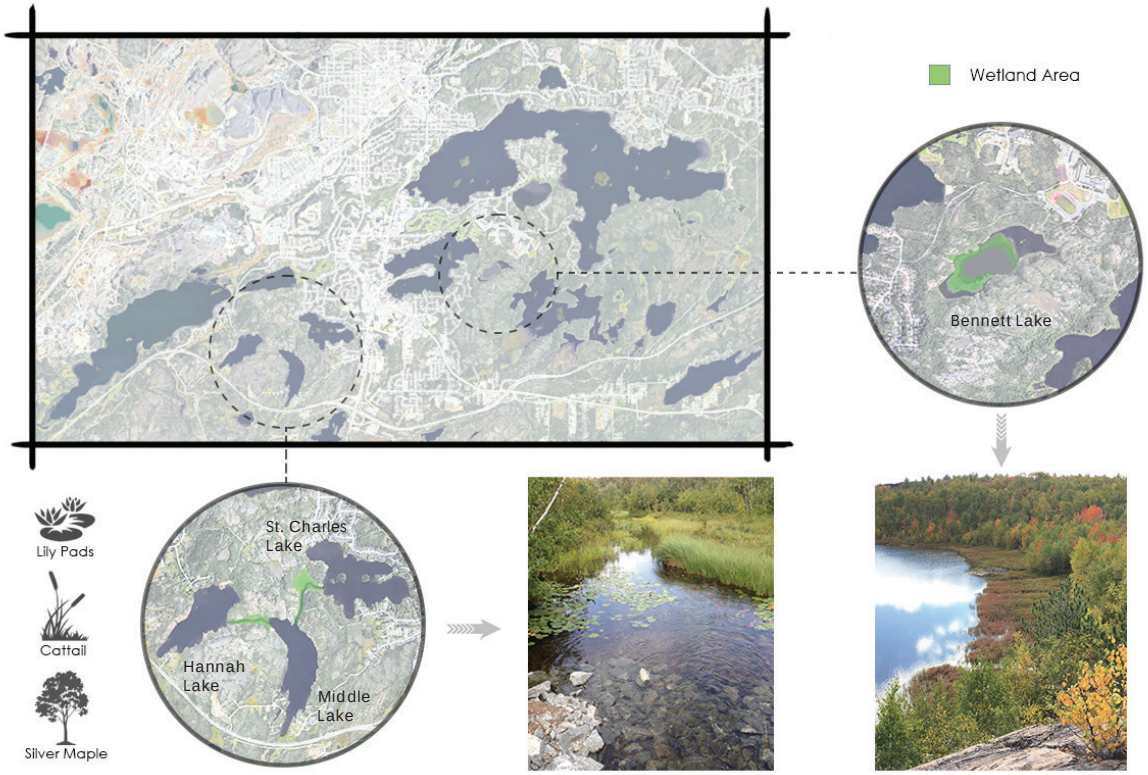


Figure 42: Sudbury Wetlands.

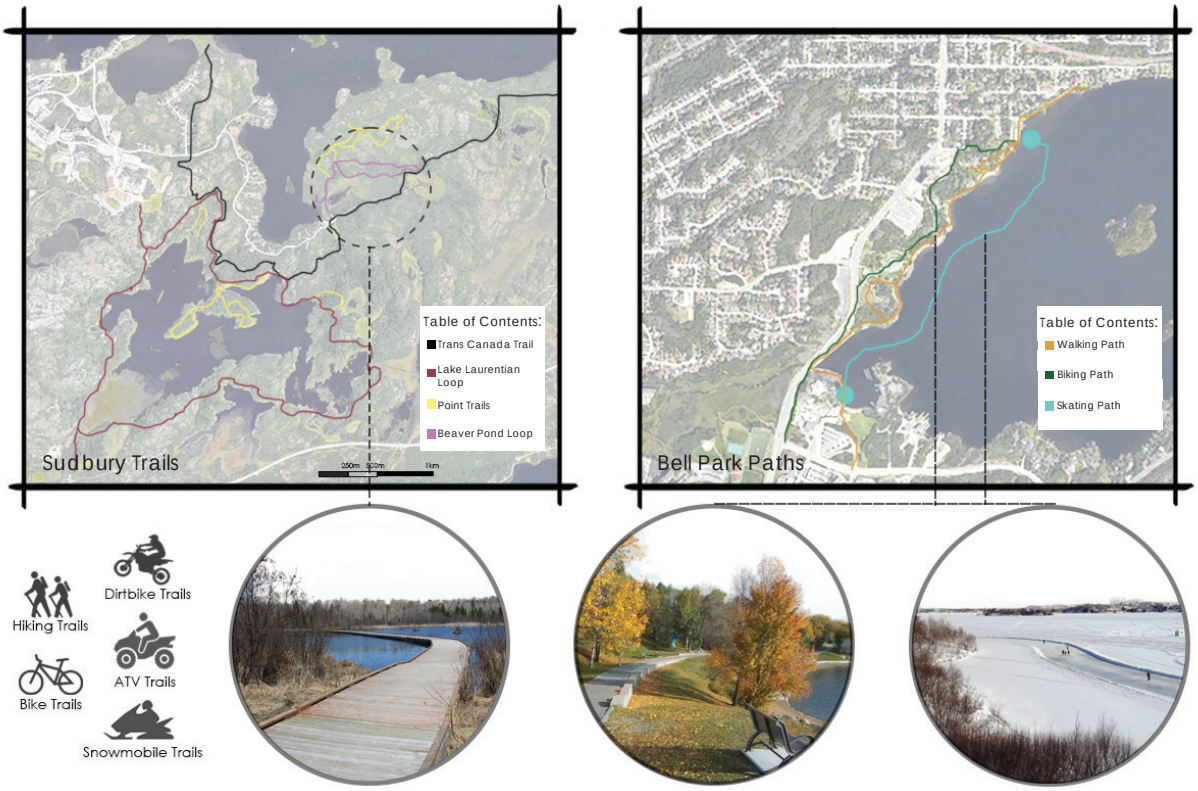


Figure 43: Sudbury Trails and Paths.

In addition to Sudbury having many lakes in the area, there are also many trails and pathways, refer to figure 43. The first example looks at the Trans Canada Trail and point trails. These paths show an example of how a trail can move around and through a body of water. The paths does not follow a direct route that only considers a Point A to Point B travel, but rather there are points of rest along the path, lookout areas, lakes, trees, and vegetation.

The second example shows the Bell Park boardwalk, cycle, and skating path. These trails are meandering, and they adjust to the terrain. They do not simply follow the rivers edge, but rather they curve and move fluidly. The paths in both examples consider the users and their mode of travel. They also have areas created along the paths, these are moments where the users can pause and immerse themselves into nature.

10

PLANNING

10.1 Phasing

Northwest of the proposed site in Copper Cliff, is the local park. This greenspace is expansive and an open area with mature trees and plenty of grass. The tailings' water runs directly through the park, and its bright rusted colour can be seen at a great distance. There are paths and trails that run through the park, and create multiple access points for the community refer to figure 44.

This proposal will maintain the existing park space for the community and suggest possible ways to expand and connect the proposed site to this natural greenspace that has become a center for this community for many years.

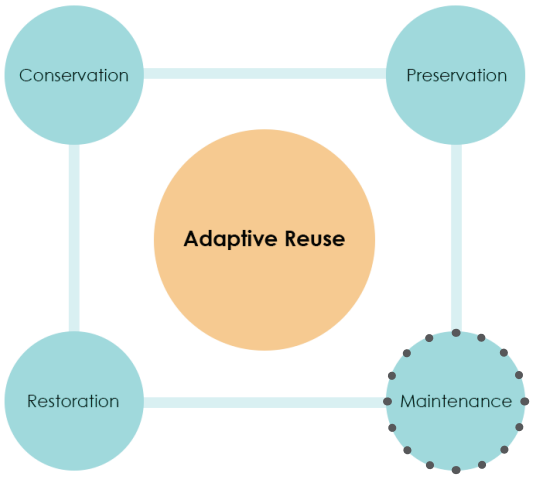


Figure 46: Maintenance Focused Design.

Figure 44: Existing Trails and Paths in Copper Clif.

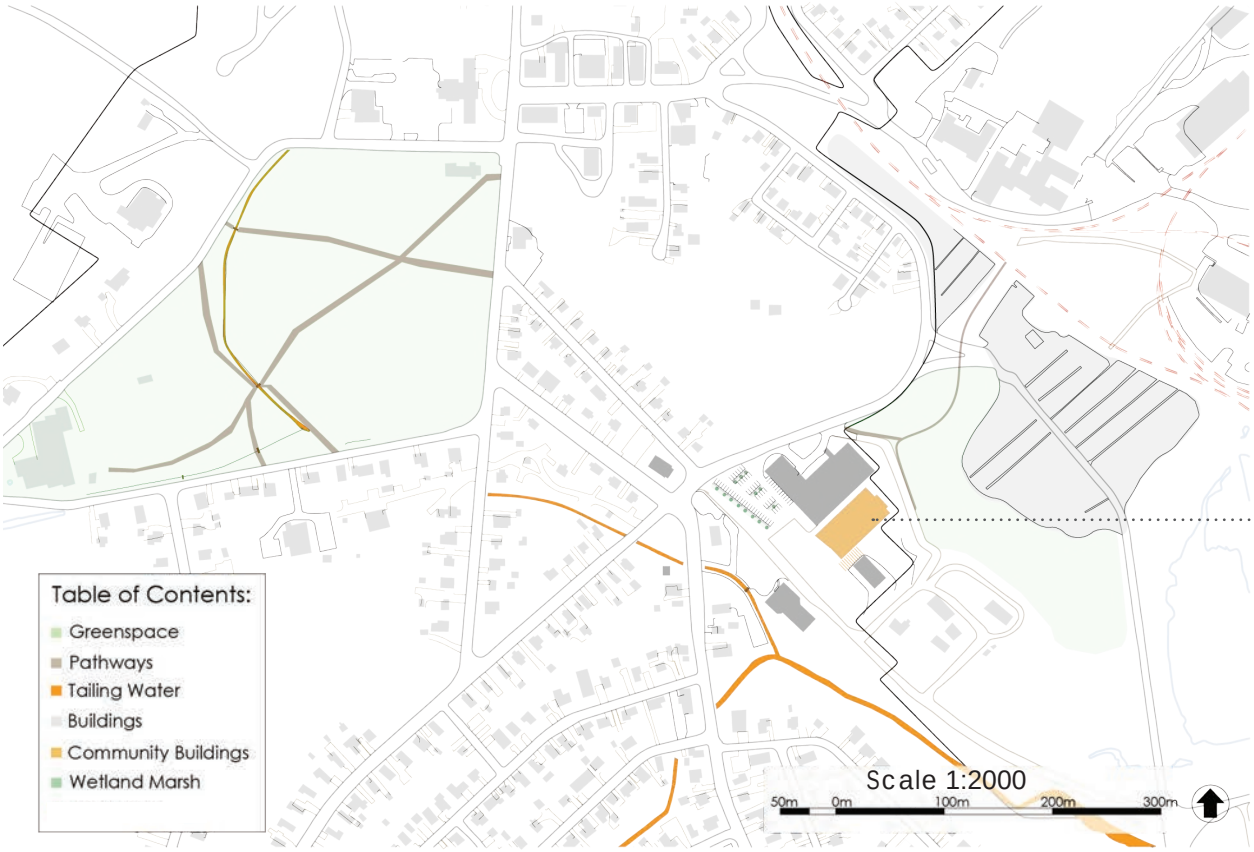


Figure 46: 5 Year Plan.

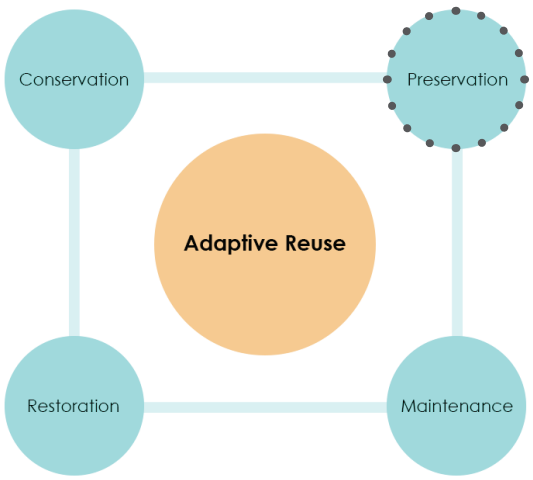
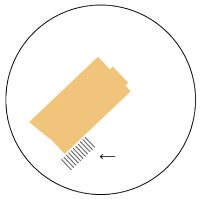


Figure 47: Preservation Focused Design.

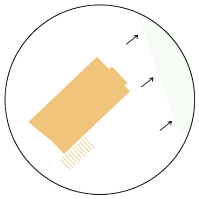
This proposal is designed to be carried out over three phases. This will provide the community the time to assess the development after each phase, so the design can be implemented accordingly.

5 Year Plan

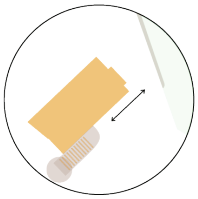
During the first five years of the project the focus will be on the 'making story', which will propose culturally driven and creative building programs. In particular, the existing Copper Cliff Curling Club will be adapted and changed into the Center for Wood Innovation, refer to figure 46. This space will provide the community with a building for woodworking, wood construction, flexible



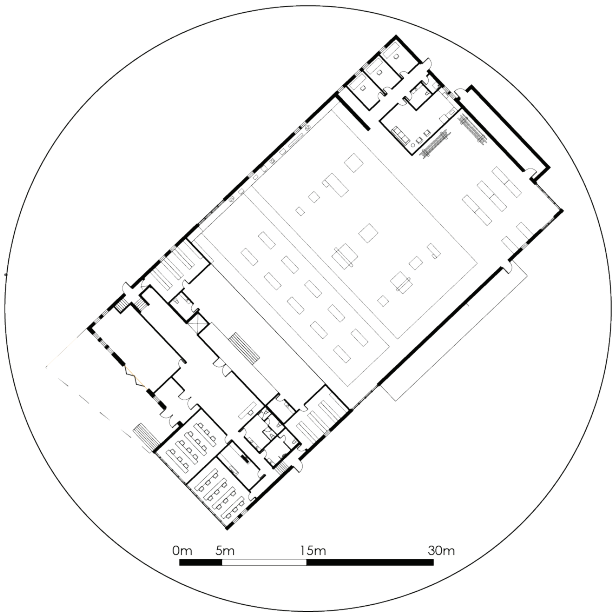
Outdoor Storage



Greenspace



Path to Valé Parking



Center for Wood Innovation

classroom spaces and also an exhibition area to display the works produced at the facility. The renovation will 'preserve' the structure and barrel vaulted ceilings.

In addition, the outdoor storage space for construction materials will also be built during this phase, it will provide the facility with an area to store adaptive reuse materials provided or extracted from the industry. In order to draw a greater connection between the existing site and Valé, a path and greenspace will be created. This trail will connect this property to the industrial parking lot and Valé entrance. This will allow the company employees to use the site during their off hours and or after their shift.

"Within the limits of a town or village, the connections among its people keep crossing and recrossing and this can make workable and essentially cohesive communities."[49]

There are opportunities within this site to bring the community and the industry together. This path and greenspace will allow for further interactions between these two sectors. The livelihood and action of this community falls within these areas of crossing and recrossing.

49 Jane Jacobs, "The Death and Life of Great American Cities", (New York: Vintage Books, 1992),118.

Figure 48: 10 Year Plan.

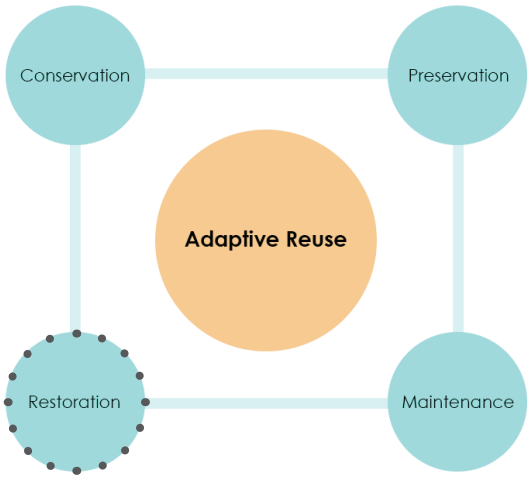


Figure 49: Restoration Focused Design.

10 Year Plan

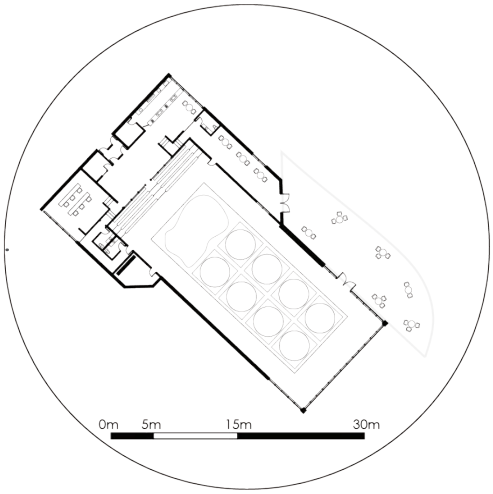
The focus during this phase of the development will be on the 'water story'. The existing pool building will undergo an adaptive reuse transformation into the Water Reclamation Center, refer to figure 48. This building will embody the water restoration initiatives for Copper Cliff. The center will have a wastewater treatment facility, a café, and a research center for tailings' water testing and analysis.

In addition to the interior 'water story', the water restoration will also occur on the exterior through the tailings' wetland transformation. The tailings' water currently runs from the SouthWest to

Redirect Tailings

Create Wetland

Path Network



Water Reclamation Center

the SouthEast of the site. This proposal will suggest for the tailings to be redirected through the site and into a manmade wetland condition. This will provide the tailings' waste an additional form of water purification before it gets deposited into Kelly Lake.

A path network surround the marshes on the site. These paths and additional greenspace will act as an extension to Copper Cliff's existing park. An additional path, north of the site, will connect the facilities to the park and industry. This wetland condition will create a small habitat for the community that highlights the restoration of the tailings rather than their environmental damage.

"Good small parks typically have a place somewhere within them commonly understood to be the center - at the very least a main crossroad and pausing point, a climax."[50]

Within the park setting will be multiple areas to pause and rest. These areas will have seating elements where the user can take a break right in the center of nature. The paths are designed to take the user from the ground level to the porch and into the building.

50 Jane Jacobs, "The Death and Life of Great American Cities", (New York: Vintage Books, 1992), 104.

Figure 50: 15 Year Plan.

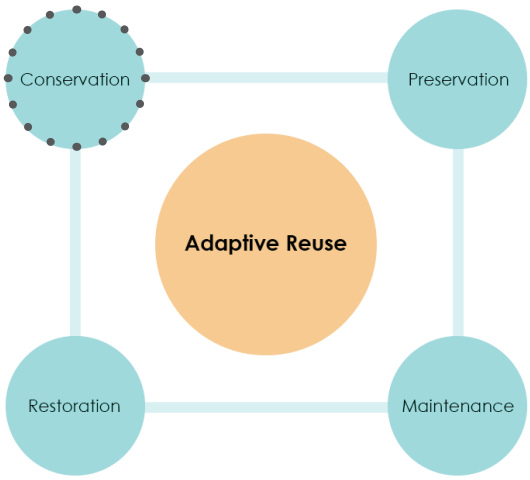
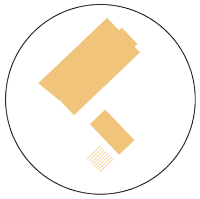


Figure 51: Conservation Focused Design.

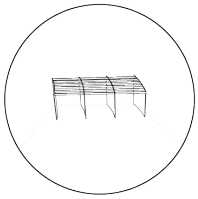
15 Year Plan

The priority of phase 3 will be the continuation of the 'making story' for Copper Cliff. Following the success of the Center for Wood Innovation and Water Reclamation Center, the Center for Metal Innovation will provide the community with the equipment to pursue a variety of steel fabrication methods.

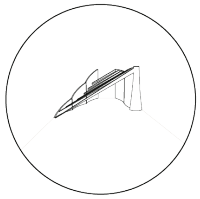
The extent of this conservation and adaptive reuse will also consider the material selection for the canopies, gateways and seating elements across the site, refer to figure 50. These objects can be built using the found materials from the industry, like the materials from



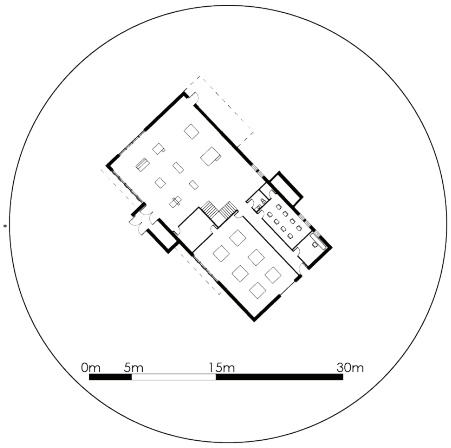
Outdoor Market



Accessibility



Entrances



Center for Metal Innovation

smokestack after in is taken down. This initiative will be a community driven approach because the users will have the opportunity to build and create these elements for the project.

During this phase, the project will expand into the surrounding community areas. The benches and gateway designs can also be used for the Copper Cliff park and other greenspaces around the community. The intension for these making facilities is for this site to become a hub for the community. Once on the site, the users can choose to connect with nature and the built wetland condition, or they can use the facilities to make or learn more about these initiatives.

Through the implementation of these phases, Copper Cliff has the potential to bring the architecture, via adaptive reuse, the culture, via community involvement, and the industry, via the conservation of material waste, together in this proposal to create a more sustainable future for Greater Sudbury.

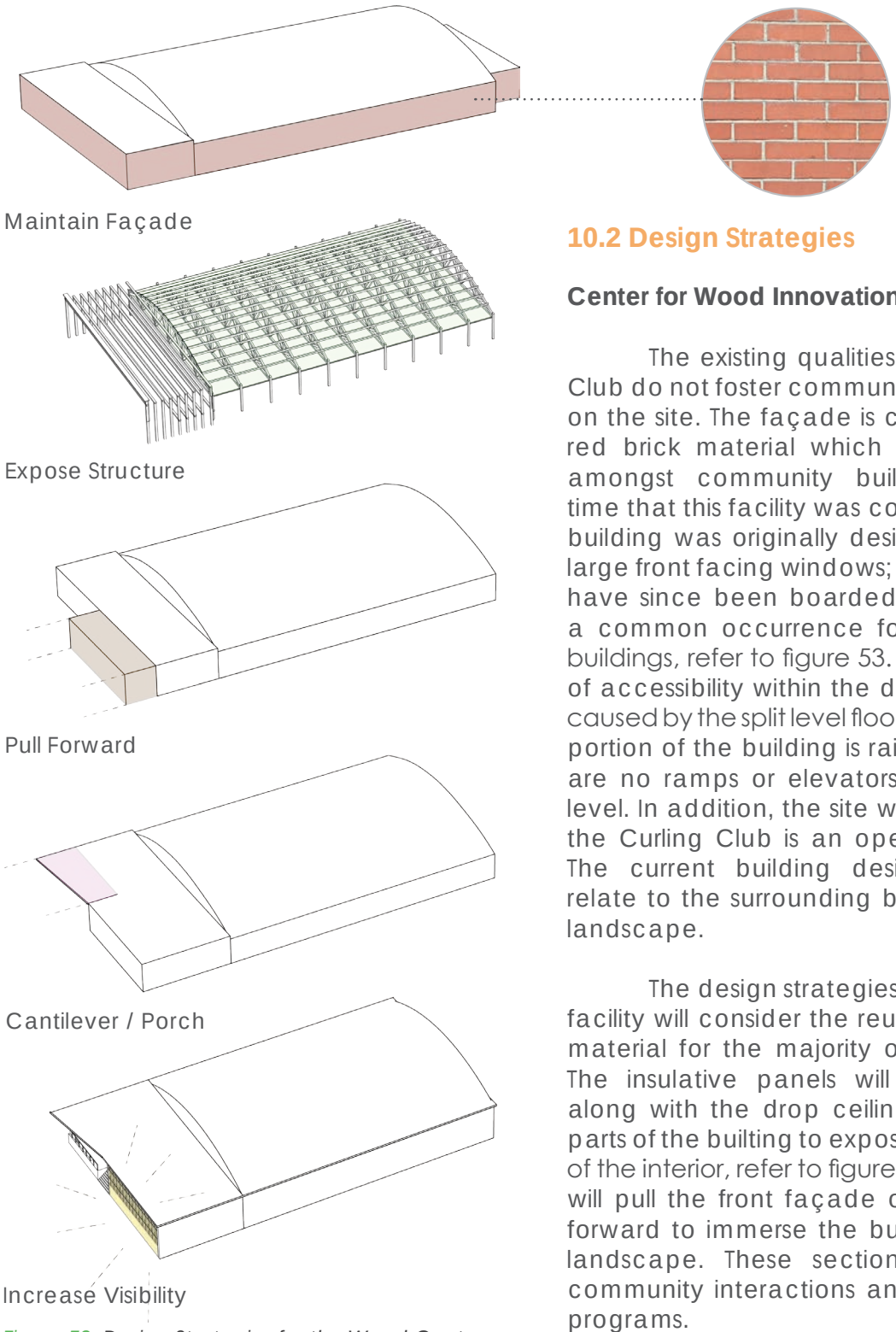


Figure 52: Design Strategies for the Wood Center.

10.2 Design Strategies

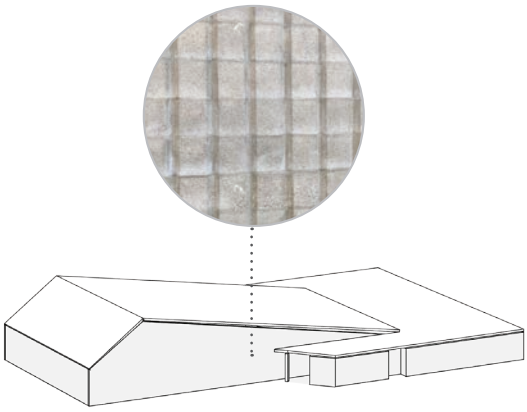
Center for Wood Innovation

The existing qualities of the Curling Club do not foster community interactions on the site. The façade is comprised of a red brick material which was common amongst community buildings at the time that this facility was constructed. The building was originally designed to have large front facing windows; however, they have since been boarded over which is a common occurrence for older arena buildings, refer to figure 53. There is a lack of accessibility within the design, which is caused by the split level floorplan. The front portion of the building is raised and there are no ramps or elevators to reach this level. In addition, the site which surrounds the Curling Club is an open parking lot. The current building design does not relate to the surrounding buildings or the landscape.

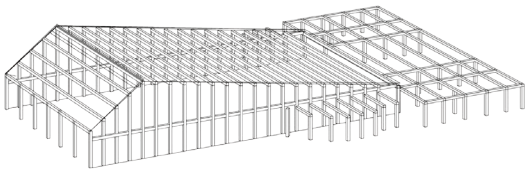
The design strategies for the curling facility will consider the reuse of the brick material for the majority of the façade. The insulative panels will be removed along with the drop ceiling in the other parts of the builting to expose the structure of the interior, refer to figure 54. The design will pull the front façade of the building forward to immerse the building into the landscape. These sections will be for community interactions and for didactic programs.

Figure 53: *Existing Exterior Conditions of the Curling Club.*

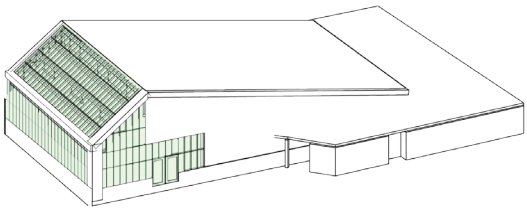
Figure 54: *Existing Interior Conditions of the Curling Club.*



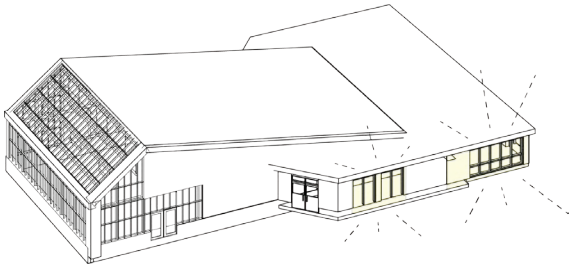
Maintain Façade



Expose Structure



Greenhouse Effect



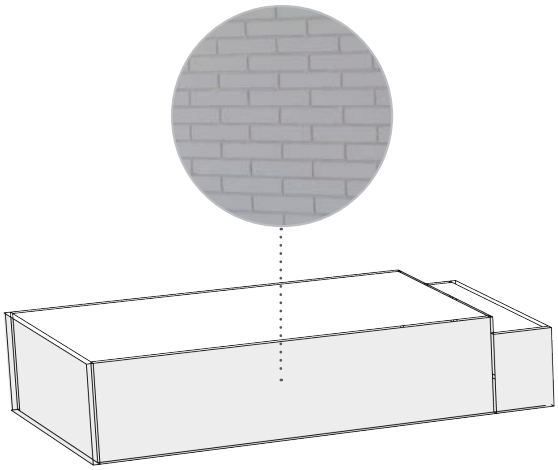
Increase Visibility

Figure 55: Design Strategies for Water Reclamation Center.

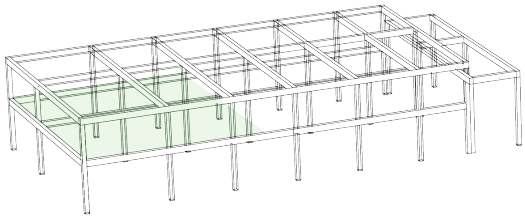
The addition of a shaded porch on the front of the building will create a space that is an external part of the building but is also protected from the elements. This area will be used to extend the exhibitional space to the exterior to showcase the local art, wood and metal installation and various other works completed by the community. The design of the porch is also positioned at a higher elevation than the wetland landscape below to create connections and views across the site. Lastly, the ramp design is integrated into the landscape. It is positioned to create an effortless transition from the parking lot to the front porch of the curling facility. The ramp becomes part of the path network and it is integrated within this composition. In addition, there will be an elevator in the building to increase the accessibility on the inside of the structure. The workshops are designed to remain open and wheelchair accessible, so that all community members can have equal opportunity to use the facility. The visibility becomes transformed thoughout this facility with the addition of windows and glass doors to create unobstructed views into the facility and also outward to the wetland condition.

Water Reclamation Center

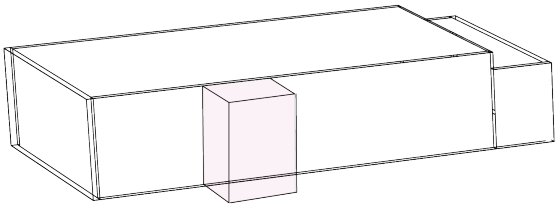
The existing pool facility is positioned adjacent to the tailings' river. This building has a concrete façade, and there are also sections of aluminum siding. The structure is currently closed off and there are no windows on the building. The facility is tucked back behind the trees on the site, which causes a lack of visibility and reduces connections.



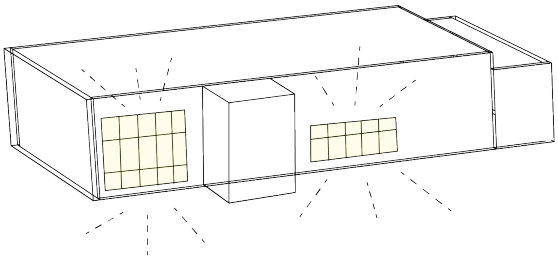
Maintain Façade



Expose Structure



Pull Entrance Forward



Increase Visibility

Figure 56: Design Strategies for the Metal Center.

The design strategies for the pool facility will maintain and restore the existing concrete and aluminum façade. It will showcase the existing architecture by removing the vegetation that is too close to the building which has created a barrier. The south facing walls and ceiling will have increased glazing to create a greenhouse effect within the water treatment facility. Lastly, the design will introduce light and visibility via the addition of windows. The windows in the café area will create sightlines from the lounge seating towards the wetland on the exterior.

Center for Metal Innovation

The CUPE building is cladded with a yellow and orange coloured brick which has been covered with white paint over the years. There are also sections of stucco siding around the window panels. The building has a flat roof which can be used to collect rainwater, and the majority of the existing windows will be maintained.

The design strategy for this facility will maintain the existing brick façade. On the interior, the structure will be exposed to showcase the metal structure and joinery. The entrance will be extended outward from the building to create a connection between the outdoor market and the metal shop. The front façade will have an updated window that will showcase the work that is going on within the shop. This will act as a glass box which will be illuminated at night so that people driving by can see the programs going on inside the building.

10.3 Adaptive Reuse Materials

Adaptive reuse is an essential aspect of this design. The material selection is not an exception to this adaptation, but rather it creates new possibilities for building materials that may otherwise be considered as waste or garbage. The material selection for these adaptations will explore the material waste that currently exists and will become available in the future in Copper Cliff. Most of the waste produced in Copper Cliff comes from the mining industry. This design will consider how materials can be harvested from this waste.

A local artifact that is symbolic to the Greater Sudbury community, the superstack, will create massive amounts of waste upon its removal. Since the smokestack has been officially decommissioned and it will be demolished in the following years,. This project considers how some of the material waste from this demolition can be reused in a form that will give back to the community, refer to figure 57. The first material that will be removed is the steel liner. The top half is comprised of stainless steel and the bottom half is made of carbon steel. The gateways to the pathways and the market structure will be made from this steel liner. The first step will be the removal of the liner from the stack, which will be a top-down approach. The liner will be removed in sections. After they reach the ground, they can be cut into panels and brought to the site where they can be used within the project, refer to figure 58.

The reuse of the smokestack material, that would otherwise be considered waste, will create a new artifact from an object that has become obsolete. This concept will also be seen in

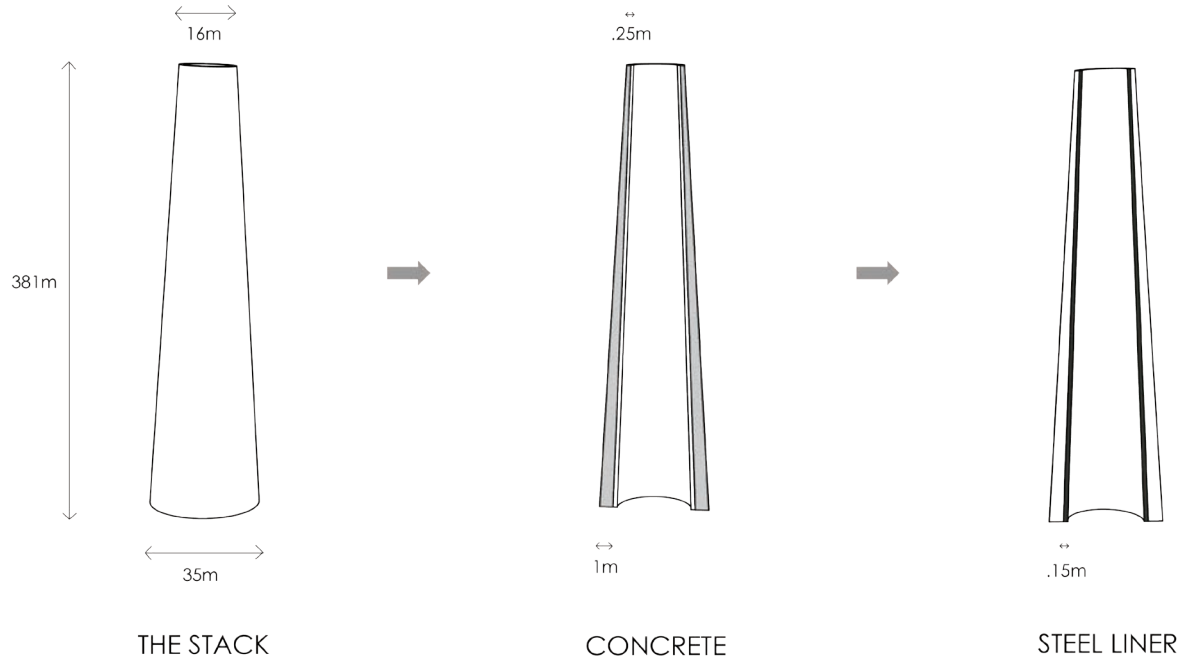


Figure 57: Source for Material Reuse of Sudbury's Smokestack.

the design of the building, furniture and canopies through the addition of steel building materials and finishes.

Due to the wetland condition the site will have paths for pedestrians, but not necessarily for cars and trucks to prevent contamination. Therefore, there is a need for a threshold where the users transition from a driver to a pedestrian on the site. This object will be the design of a gateway entrance to the site. This design considers the innovation through materiality, positioning on the site, the social and cultural implications. The gateway will act as a threshold for the users of the site. The term threshold is meaningful within an architectural setting. There are emotional, social, physical, and economic aspects of a threshold. "The idea of threshold... builds on the notion that there are certain concepts, or certain learning experiences, which resemble passing through a portal, from which a new perspective opens up, allowing things formerly not perceived to come into view."[51] In this case, the gateway will act as a point of transition for the users. The perspective of each person will change as they go from their car to walking through the threshold and into the site. The object is not meant to be a destination, but rather a passing point that the pedestrians must take to access the landscape.

51 Jan Meyer, R. Land and C. Baillie, "Editors' Preface: Threshold Concepts," (Sense Publishers, Rotterdam, 2010), ix.

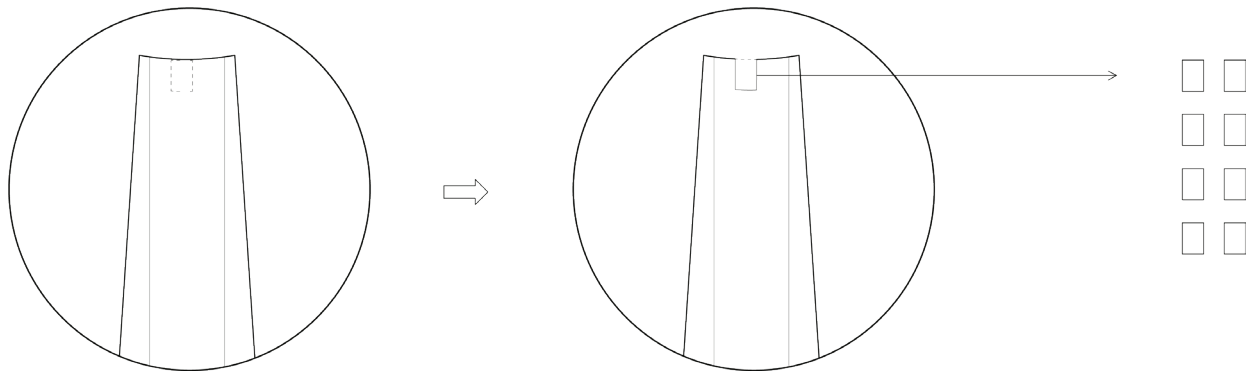


Figure 58: Material Extraction from the Smokestack.

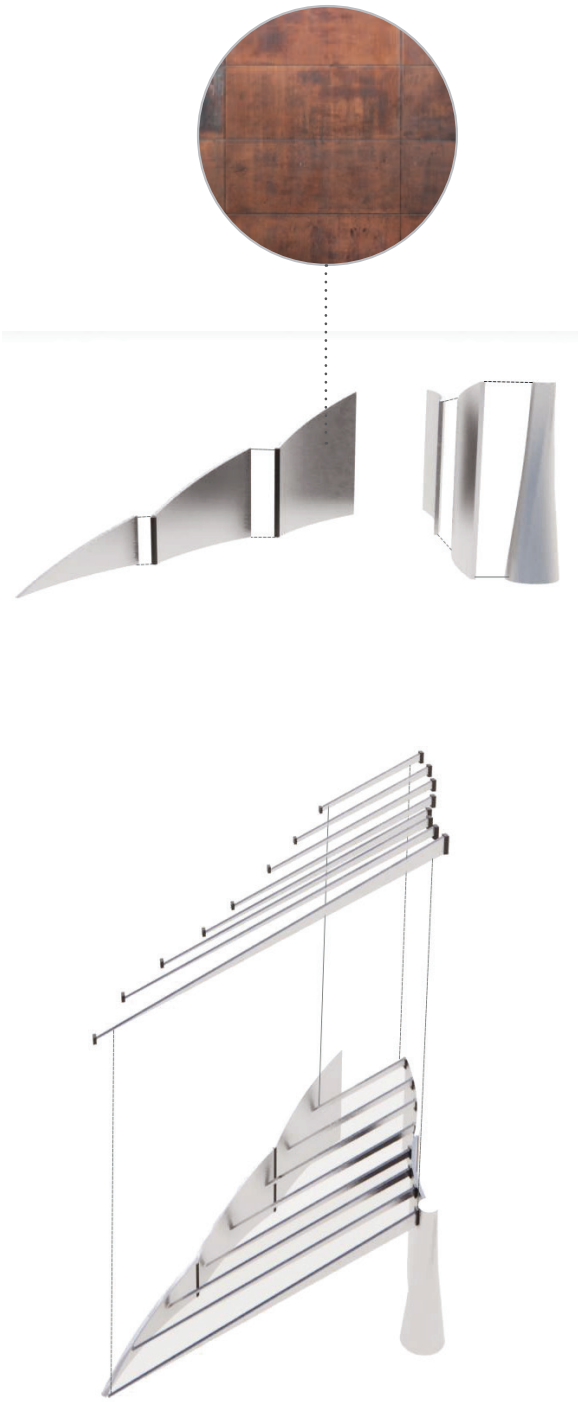


Figure 59: Gateway Entrance Fabrication.

"Lively, diverse, intense cities contain the seeds of their own regeneration, with energy enough to carry over for problems and needs outside themselves."[52]

The qualities of the materials relate to the site and its context. These materials have always been a part of the community and they can act as a seed to regenerate the area. The polished steel will reflect on the tailing water, which exposes the past and current impacts that Valé has had on the land. The tarnished corten steel will reflect on the new chapter that the industry is entering into now that the smokestack is no longer polluting the landscape, and how the industry is moving towards more sustainable methods. The reuse of these materials will showcase how the community can reuse mining waste that would be considered garbage and create meaningful objects that represent their story.

Many people in the community will miss the iconic smokestack. However, this thesis seeks to explore how to extend the life of an object or a building through adaptive reuse, and the reuse of the smokestack will become a new artifact for the comunity. The community culture has been driven by the industry over the years, and this object will be a way for the industry to give back to the community, and to highlight a new collaborative transition between the community and the mining industry.

52 Jane Jacobs, "The Death and Life of Great American Cities", (New York: Vintage Books, 1992),448.

Figure 60: Gateway Main Entrance.

Figure 61: Gateway Secondary Entrance.

10.4 Water Systems

Water Reclamation

The Water Reclamation Center will have two types of water reuse within the facility. The primary program for the building will be the reclaimed wastewater, which willl be collected from the surrounding community buildings. This center will recycle one hundred percent of this waste. The program that will operate on the interior of the facility will resemble the water story that occurs on the exterior. However, instead of using the wetland filtration for recycling the sewer water, the marshes will clean and filter the industrial tailings' waste. The following steps show the treatment process for the wastewater before it can be recycled back into the facility's water supply.

Step 1: Gathering
The wastewater is collected into the sewage tank.

Step 2: Mixing
Bacteria is added to the sewage to remove the biological waste.[53]

Step 3: Aeration
The sewage and bacteria pass through several tanks that are exposed to the air. These tanks have vegetation. The aquatic and terrestrial plants absorb nutrients and produce carbon dioxide, but most of the filtration is completed by the root systems of the plants where the bacteria grows and breaks down the sewage.[54]

Step 4: Seperation:
The gravity clarifier is a cone shaped tank that is not open to the air. The bacteria is collected at the bottom of the tank and the clarified water separates. The remaining bacteria is pumped back to the mixing tank to start the process over[55].

Step 5: Filtration
The clarified water is transported through the sand filter to simulate how water filters through soil. The sand eliminates the tiny particles in the water.[56]

Step 6: Wetland
The water from the sand filter passes through a constructed wetland where fecal collieform and metals are removed.[57]

Step 7: Additional Filtration
The water will travel through a system micron fiber screens where it is properly filtered.[58]

Step 8: Cleaning
The water is disinfected by first passing through ultra-violet light to remove pathogens, and then small traces of chlorine is added.[59]

Step 9: Gathering
The water is stored in tanks where it will rest until it can be used for toilet flushing and irrigation.[60]

Rainwater Collection

The addition of a living roof to the pool facility will help to minimize heat loss, but it will also help to integrate the building into the landscape. The green roof will not be used for rainwater collection. However, the front of the building has a flat roof, and this area can be used to collect the rainwater. This facility is designed so that it can produce enough water to be self reliant, however there will still be a backup connection to the municipal water supply. The rainwater will be filtered and disinfected at the building before it can be used within the washrooms and other water supply.

53 UBC, "Building Systems," CIRS, Digital (British Columbia: UBC, October 2011).
54 Ibid.
55 Ibid.

56 UBC, "Building Systems," CIRS, Digital (British Columbia: UBC, October 2011).
57 Ibid.
58 Ibid.
59 Ibid.
60 Ibid.

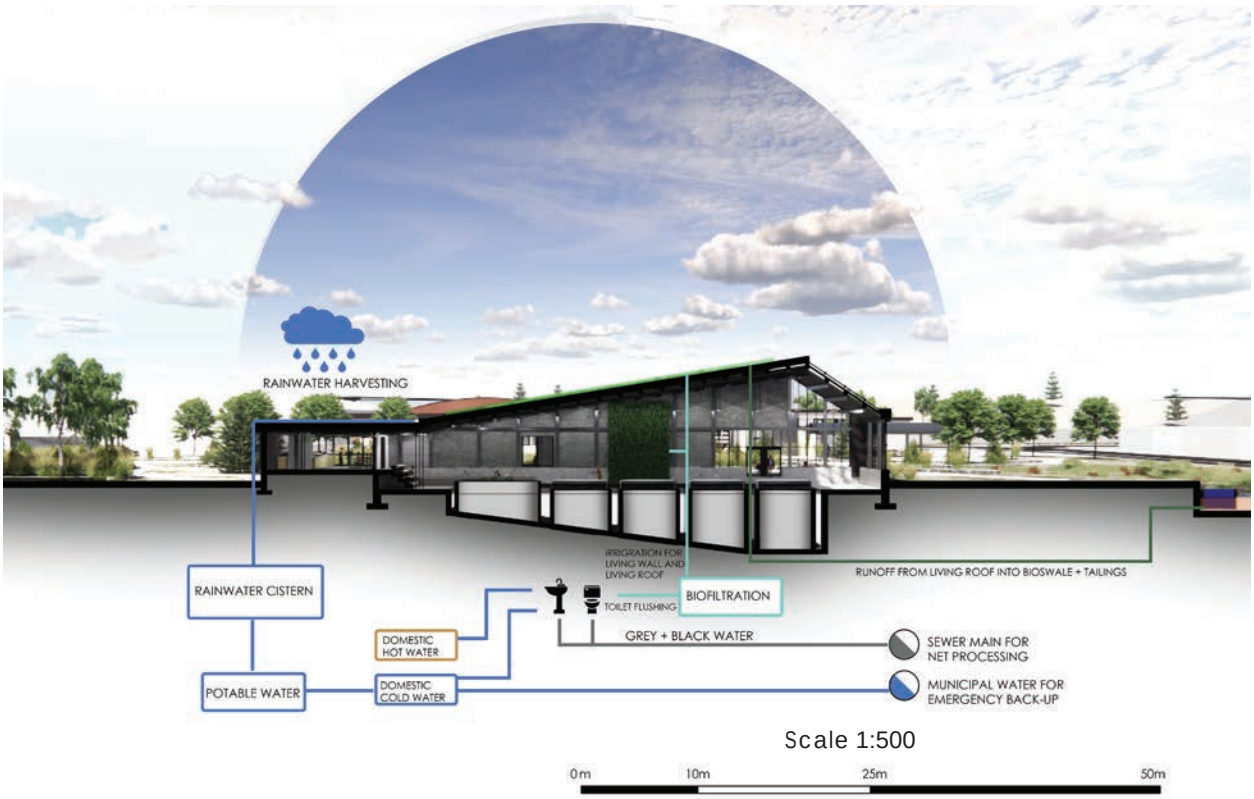


Figure 62: Water Reclamation Systems.

Step 1: Gathering
The rainwater is gathered on the rooftop and collected into the storage cistern below.

Step 2: Storage
The rainwater can be stored in the cistern for up to three months. Continuous circulation of oxygen in the water will reduce contamination, smell, and discoloration.[61]

Step 3: Filtration
The water is filtered through a sand filter to remove particles. Then it goes through a fine filter to remove smaller particles and parasites. Lastly, it will be filtered through a carbon filter to take out the metals and organic pollution.[62]

Step 4: Cleaning
The water is disinfected by first passing through ultra-violet light to remove pathogens, and then small traces of chlorine is added. [63]

Step 5: pH Levels
The rainwater will require additional sodium bicarbonate to adjust the alkalinity.[64]

Step 5: Pre-storage
The treated water is stored in a tank until it is dispersed throughout the facility.[65]

61 UBC, "Building Systems," CIRS, Digital (British Columbia: UBC, October 2011).
62 Ibid.
63 UBC, "Building Systems," CIRS, Digital (British Columbia: UBC, October 2011).
64 Ibid.
65 Ibid.

11

PROPOSAL

11.1 Making Story

Center for Wood Innovation

The design for the Center for Wood Innovation takes the user on a seamless journey from the trail, up the ramp, under the cantelevered roof and through the main entrance. The original roofline of the curling building is carried outward from the facility in order to create the porch below. From this perspective view, the red brick façade is maintained and the windows previously filled in with cinder blocks have been restored back into windows and glass doors. The building also has a layered architecture with the entrance peak at the highest point to draw the users into the building. This design pays tribute to the layering or stepped design that occured on the Stanley Stadium massing and main elevation.

Figure 63: Curling Club in Copper Cliff, photo taken by author.

Figure 64: Center for Wood Innovation.

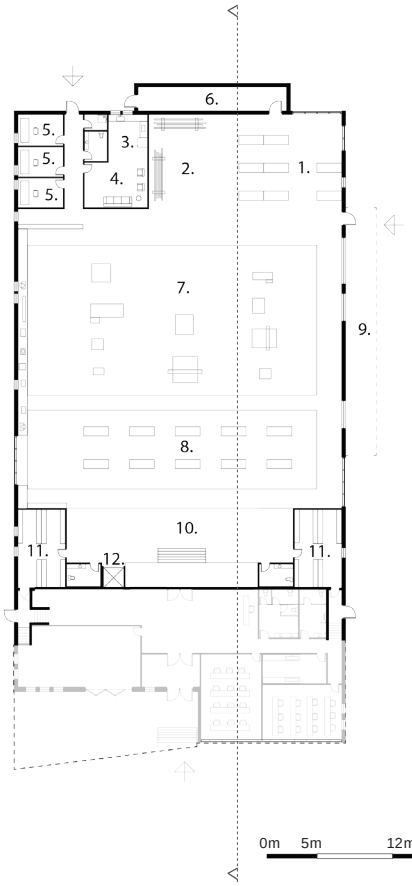


Table of Contents:
1. Assembly
2. Wood Storage
3. Kitchenette
4. Lounge
5. Office
6. Mechanical
7. Large Workshop
8. Small Workshop
9. Loading dock
10. Atrium
11. Lockers
12. Elevator

The ground floor will hold the major programs for the project, refer to figure 65. The workshop area will retain the longspan open floorplan to provide the opportunity for both large scale and small scale woodworking. The assembly space will give the users an area to put their projects together. The lockers will provide the space to store materials and have a changeroom. The large garage doors on the east face of the building will allow the workshop area to open up during the summer months and spill out onto the loading dock.

The section below shows a cut through the Water reclamation Center and Center for Wood Innovation. The exterior wetland condition resides between these two facilities. The different ground levels in the marsh provide areas for vegetation and

Figure 65: Ground Floor Plan, Center for Wood Innovation.

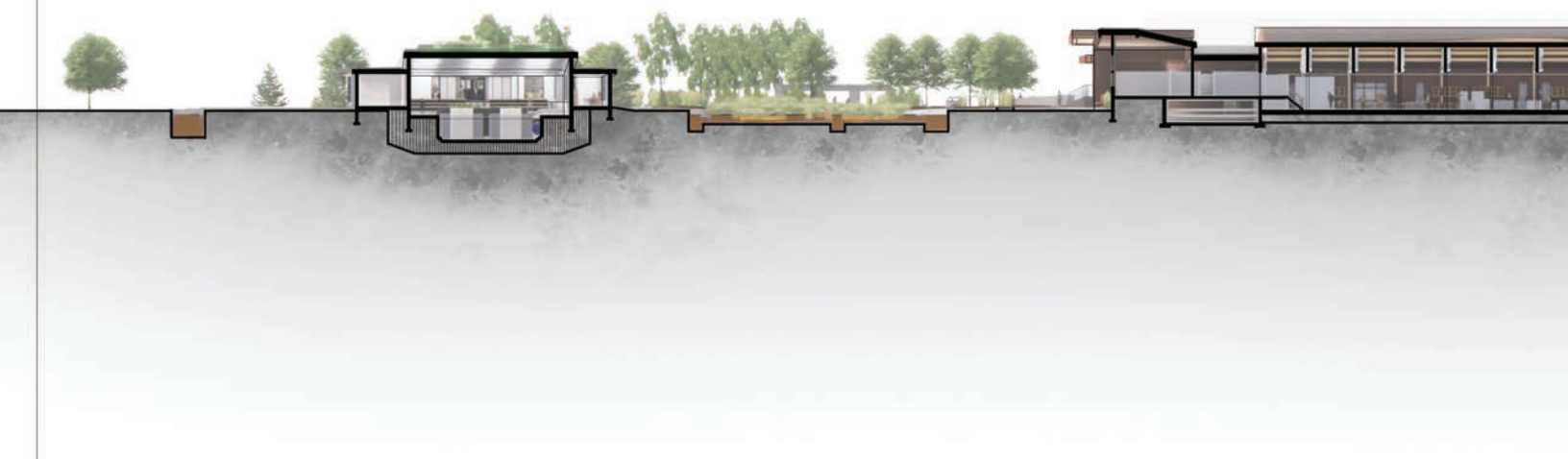


Figure 66: West Section Through the Water Reclamation Center and Center for Wood Innovation.

space for the sand and rock layers for water purification.

The second level will have the secondary programs for the facility, refer to figure 67. The front desk will allow the users to check in before they can access the facility. The classrooms will provide the community the space to learn about wood innovation and share this knowledge. The exhibitional room will be a flexible space that can be used for group meetings, workshops, or wood installations. However, during the winter months, this space will transform into the market.

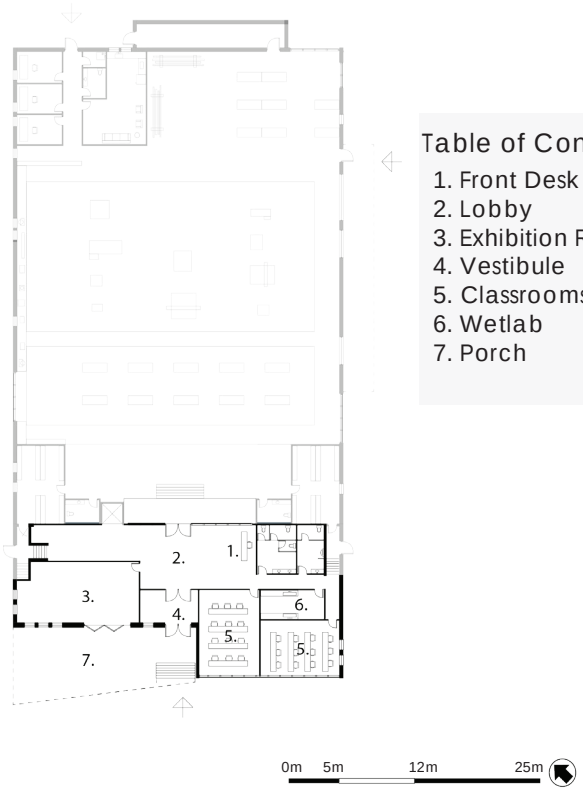
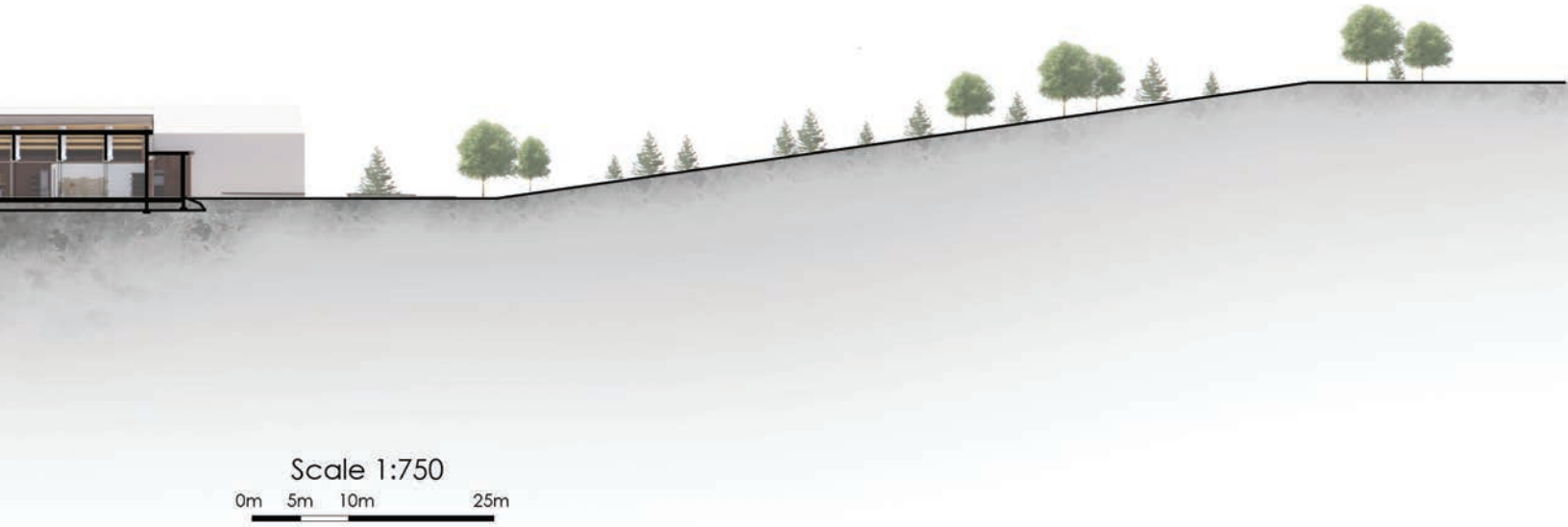


Table of Contents:

1. Front Desk
2. Lobby
3. Exhibition Room
4. Vestibule
5. Classrooms
6. Wetlab
7. Porch

Figure 67: Second Level Floor Plan of Center for Wood Innovation.



11

The adaptive reuse of existing facilities is integral towards this thesis proposal. The curling club facility is aging and the front of the building is lacking architectural details due to the straight lines, rectalinear volumes, and small entrance. The communities in Northern Ontario hold the potential for restoration through the implimentation of adaptive reuse principles.

The curling club has a brick façade and over the years the windows were removed, refer to figure 68. However, through conservation, preservation, restoration and maintenance of the exising host structure, this facility will become better situated with the surrrounding buildings and site. The implimentation of adaptive reuse materials, the extension of the deck, the cantilevered roof, and the addition of new windows will help to extend the life of this structure and contribute towards the growth of this community, refer to figure 69. This porch area will extend the exhibional space to the exterior of the building, and create a view to the landscape below.

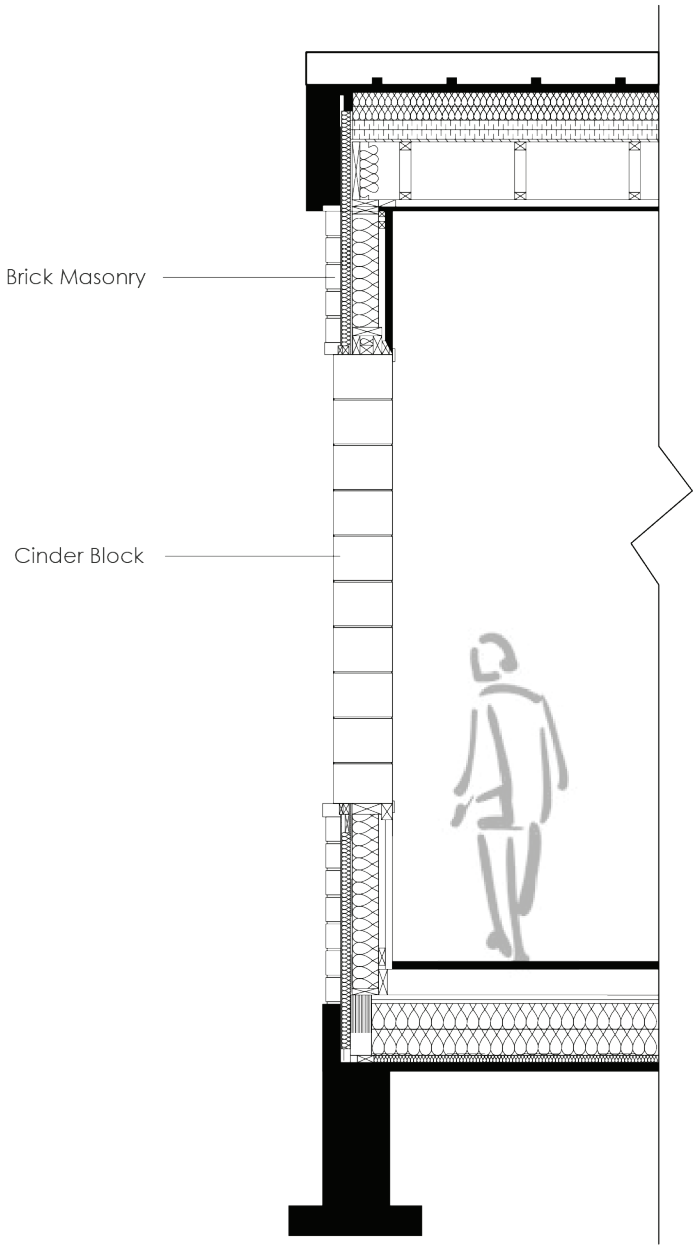


Figure 68: Detailed Section Through Existing Curling Building.

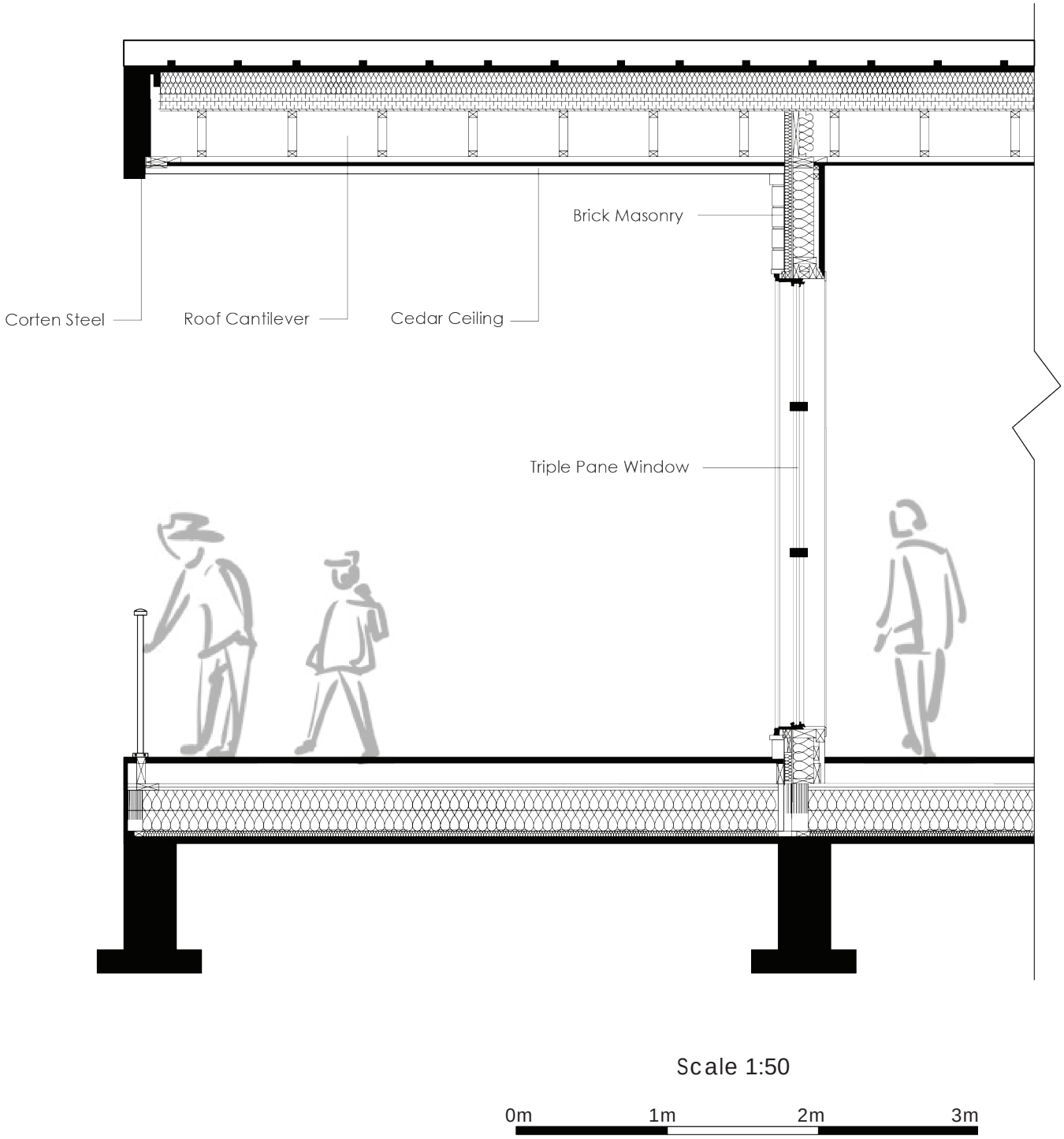


Figure 69: Detailed Section Showing Adaptation.

Figure 70: Connection Path to Valé.

A path to connect this site to the industry in Copper Cliff is vital towards the community and industry collaboration, refer to figure 70. . This will allow the company workers to access the site and use the facilities. This view will change dramatically once the smokestack is removed, but it will continue to provide a crossing point for the industry and community to come together.

The detail in figure 71 shows how the canopy structure will be fabricated for both the outdoor storage area and the outdoor market. The canopy will be constucted using the found materials from the industry, similar to the gateway structures. The canopy will use a corten steel post and a fabricated beam to achieve the flowing curves. The design contrasts the linear gradation of the Center for Metal Innovation and the Center for Wood Innovation. In additon, the canopies will have a metal roof to protect the spaces below from the elements.

The storage canopy will also act as a gateway to connect the industry to the wetland condition. In figure 72, the loading areas have the potential to open up with the large garage doors and they also provide a covered porch area to work under with additional lighting.

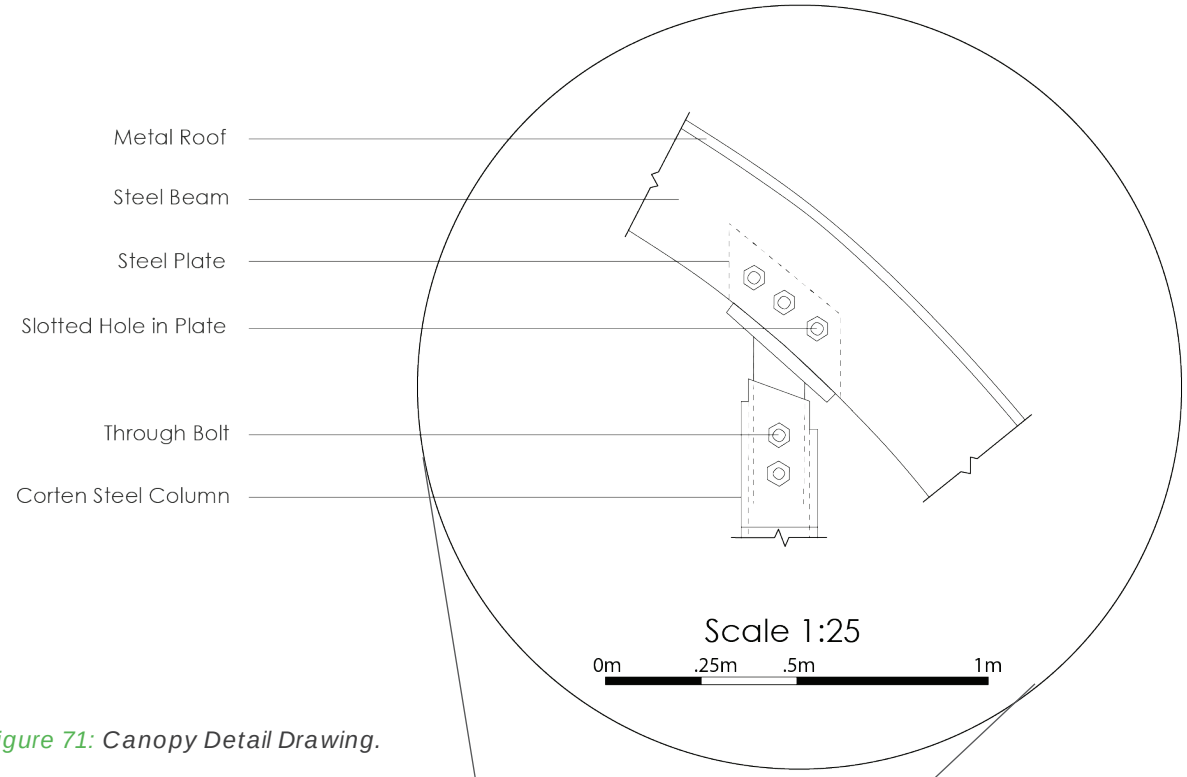


Figure 71: ***Canopy Detail Drawing.***

Figure 72: ***Entrance C and Loading Areas.***

Figure 73: Center for Wood Innovation Front Lobby.

Figure 74: Large Workspace in the Center for Wood Innovation.

Figure 75: Center for Wood Innovation Workshop.

Figure 76: Center for Wood Innovation and Storage Canopy.

PROPOSAL *(Part 2)*

11.2 Water Story

Water Reclamation Center

The design for the Center for Water Reclamation will take the user on a seamless journey from the trail, through the natural wetland, onto the outdoor patio and through the main entrance. The water treatment area opens to the exterior with heavy glazing on the south walls. The overall shape of the building will remain the same, and the entrance to the café reuses an existing side entrance to the building. However, this entrance will now act as the main entrance, and it is better suited for accessibility because it is at ground level.

Figure 78: *R.G. Dow Pool, photo taken by author.*

Figure 77: *Water Reclamation Center.*

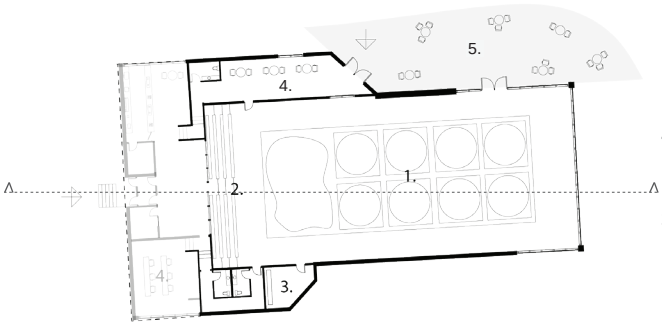


Table of Contents:

1. Water Reclamation
2. Bleachers
3. Mechanical
4. Café Lounge
5. Patio

0m 5m 12m 25m

The ground floor will hold the major programs for the facility, refer to figure 79. The Water Reclamation area will maintain the long open span structure that previously housed the pool. The large cisterns will pump the waste water through the different stages of water purification. The café lounge and outdoor patio are also at the ground level to provide a smooth transition into the building and improved accessibility.

The section below shows the cut through the wetland marshes on either side of the facility. The Water Reclamation Center will essentially be surrounded on all sides by the tailings' water, which will create an island condition. Therefore, the users will have to pass through the natural wetland before they can access the facility, which will intentionally create a transitional element for the journey to the building.

Figure 79: Ground Floor Plan of the Water Reclamation Center.

Figure 80 North Section Through the Water Reclamation Center.

The second floor will hold the lobby and secondary entrance, where the users can look from above and down into the water restoration treatment below, refer to figure 81. The café will also have windows facing down into the treatment area, and also on the north side facing the marshes. This level will also hold the research laboratory and office space for additional tailings' water research and analysis. This room will have large windows on the South facing the tailings' stream that currently flows beside the pool facility.

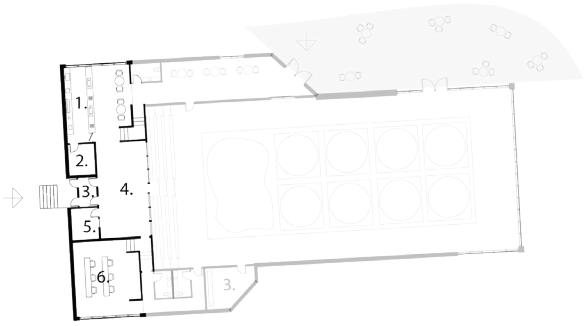


Table of Contents:

1. Café
2. Storage
3. Vestibule
4. Lobby
5. Office
6. Research Lab

0m 5m 12m 25m

Figure 81: Second Level Floor Plan of the Water Reclamation Center.

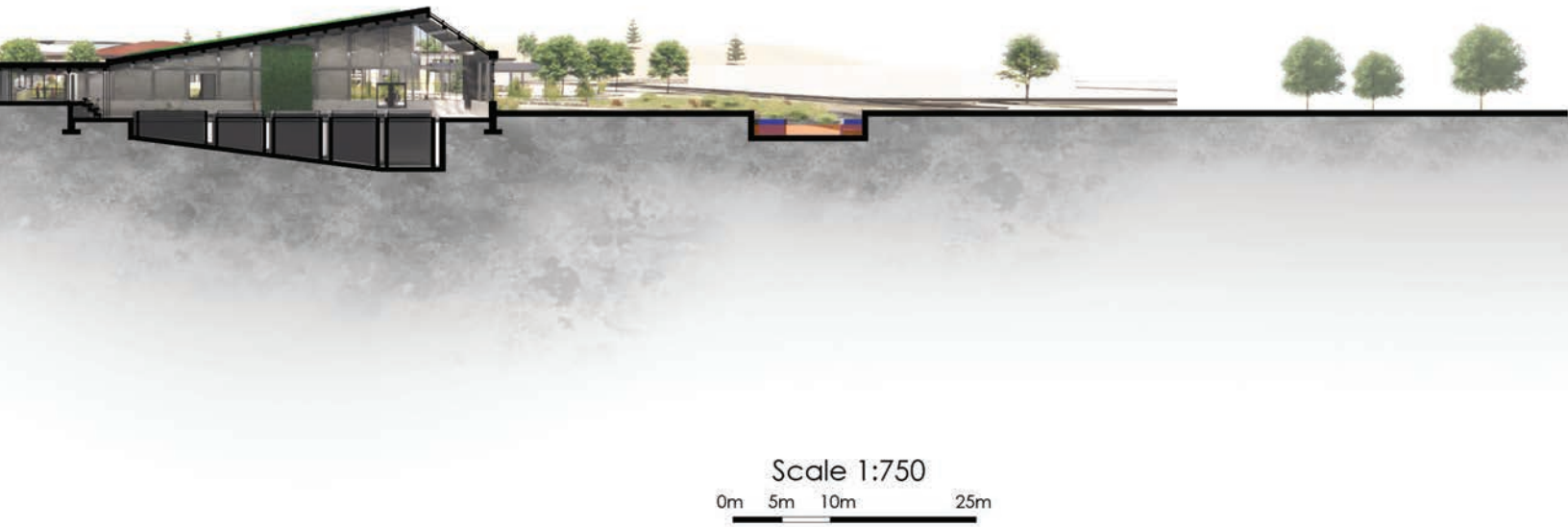


Figure 82: *Water Reclamation Center Treatment Area.*

Figure 83: *Water Reclamation Center Lobby.*

Figure 84: *Water Reclamation Center Café.*

Figure 85: *Water Reclamation Center Lounge.*

Figure 86: Site Plan.

The site planning for the wetland and paths adapts the principles learned from the local studies completed for Bennett Lake Conservation and the analysis of Sudbury's trails and paths. This site was originally an open gravel parking lot. The marshes were designed to have three points for water purification before it passes through the site. The path network meanders and loops around the marshes. These paths are not straight, fixed lines, but rather they create a journey for the users as they move through the site.

"Intricacy that counts is mainly intricacy at eye level, change in the rise of the ground, groupings of trees, openings leading to various focal points - in short, subtle expression of difference."[66]

The design for the site is delicate, however it also maintains an intricacy that cannot be found in the existing Copper Cliff park. There are ramps, porches, canopies, patios, flower beds, built-in seating and improved sightlines through the site. The natural vegetation and groupings of trees are designed to guide the user through the site. Similar to there being three buildings, there are three marshes, and three outdoor seating areas. This provides the users with several different focal points throughout the site and around the buildings.

66 Jane Jacobs, "The Death and Life of Great American Cities", (New York: Vintage Books, 1992),104.

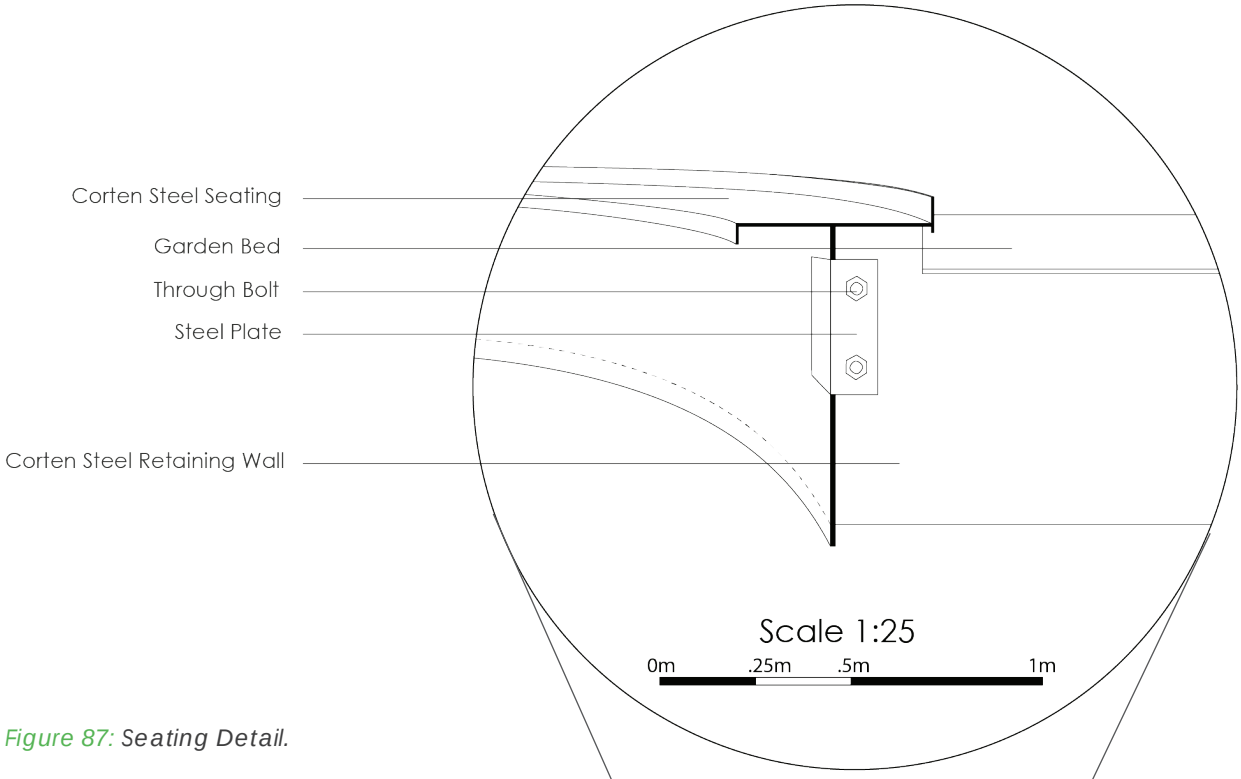


Figure 87: ***Seating Detail.***

Figure 88: ***Bench Seating near the Water.***

Figure 89: Bench Seating near the Market.

The garden beds around the site will be constructed with a corten steel retaining wall, which will tie into the materiality used for the buildings, canopies, gateways and seating, refer to figure 87. The pathways will reuse the pulverized concrete from the smokestack mixed with an aggregate material to create the trails that will run throughout the site and also for the paths that connect to the local park and the industry parking.

"Elements predominate in rural zones, organic and synthestic operate as a gradient of differing intensities that forms a continuum accross the surface of the earth."[67]

This bench detail brings the synthetic and organic elements together within this suburban landscape in Copper Cliff. The detail drawing shows how the seating will be constructed along the path. The seating elements are situated within the landscape and gardens to create a seperation from the working environment. The corten steel will extend from the garden beds and form a flat surface for seating. This is designed to become a smooth transition from the ground level, to the garden beds and onto the seating areas.

67 Diana Balmori and Joel Sanders, "Groundwork: between landscape and architecture", (New York: Monacelli Press, 2011), 30.

PROPOSAL *(Part 3)*

11.3 Remaking Story

Center for Metal Innovation

The design for the Center for Metal Innovation maintains the existing qualities of the CUPE union facility. The large front facing window will emphasize the active metalworking programs within, and the corten steel cladded entrance will highlight the steel fabrication and innovative design.

The outdoor market will allow the users to trade their unwanted building materials to reduce the waste production from the community. This exchange market is an adaptation of the adaptive reuse case study example from the Kangiqsualujjuaq Inuit community.

Figure 91: CUPE 4705 Union Facility, photo taken by author.

Figure 90: Center for Metal Innovation.

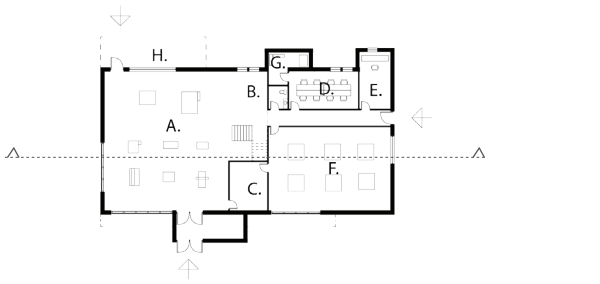
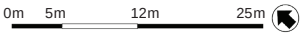


Table of Contents:

A. Metal Shop
B. Material Storage
C. Storage
D. Computer Lab
E. Office
F. CNC Room
G. Mechanical
H. Loading Dock



The ground level will hold the major programs for the building, refer to figure 92. The metal shop will provide the machines for steel fabrication, welding, cutting, etc. The CNC room will provide the community with the equipment that would surpass the average household machinery and allow the community to work at a larger scale. The computer lab is located directly across from the CNC room so that the users can work between these two spaces efficiently and prepare their designs. The large garage doors provide the necessary acces to the building and to allow for larger materials and machinery to enter the facility.

The section below cuts through the Center for Metal Innovation, the outdoor storage canopy and the Center for Wood Innovation. The two programs are positioned adjacent to one another to provide a connection between the wood and metal fabrication in Copper Cliff.

Figure 92: Ground Floor Plan of the Center for Metal Innovation.

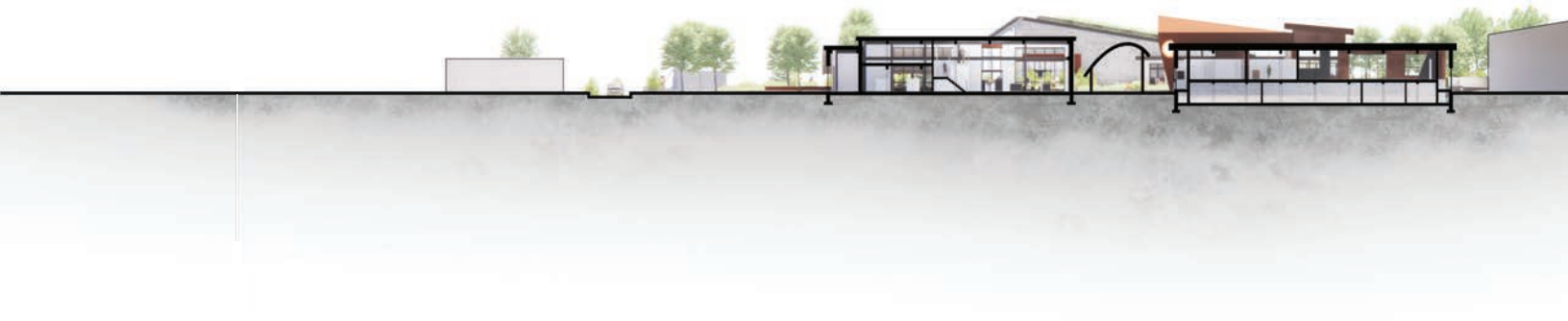


Figure 93: South Section Through Center for Metal and Wood Innovation.

The second level will hold the flexible hall space, so that the CUPE union workers can continue to operate their workshops at this location. The office space will provide the CUPE associates with the space to run their operations. This hall can also be used for didactic presentations and lectures about metal fabrication for the community and for students.

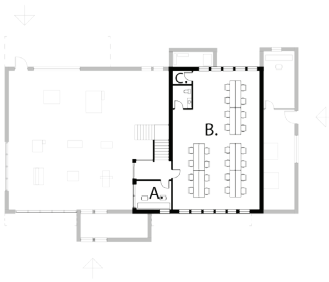


Table of Contents:

A. Office
B. Flexible Hall
C. Storage

0m 5m 12m 25m

Figure 94: Second Level Floor Plan of the Center for Metal Innovation.

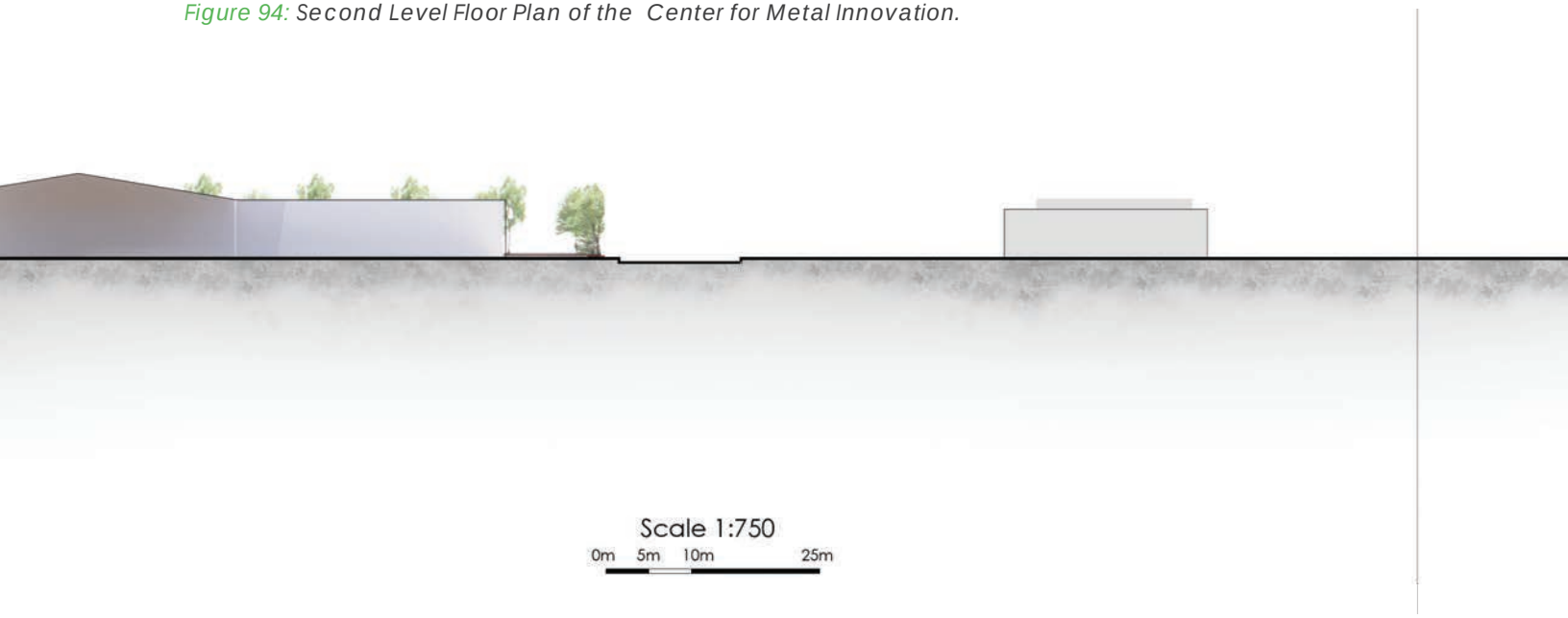


Figure 95: Center for Metal Innovation Metal Shop.

Figure 96: Center for Metal Innovation View From Staircase.

Figure 97: Center for Metal Innovation View to Exterior.

Figure 98: Center for Metal Innovation View to Outdoor Market.

Figure 99: Site Arial.

11.4 Target Audience

The target user for the Center for Wood Innovation and the Center for Metal Innovation would be community members that require workshop space, but do not have the dedicated area or equipment at home. In Copper Cliff, the property sizes are smaller, especially as the homes get closer to the stack. Therefore, most of the houses do not have a garage to complete their projects around the house or any other smaller construction needs. These facilities will also provide the necessary equipment for skilled and trained professionals that do not have the large-scale equipment that they require at their business or home. These programs will also have trained technicians to supervise the work being completed, but also to help train the users as well. This facility will not be a free service, the users will have to pay a fee to use the workshops, which will cover the overhead costs of maintaining the facility and for the salaries of the technicians. Thes programs can also operate alongside the universities and colleges in Sudbury. For example, the McEwen School of Architecture has many of the tools required for the average project. However, the school does not have a metal shop, and the woodworking tools are targeted towards smaller projects. So there is potential for students with reduced access to their facilities to use these workshops to further their projects and to work at a larger scale. There will be opportunities for the university or colledge students to interact with the community and exchange ideas

Figure 100: User Focus Diagram.

regarding construction and fabrication. The classrooms and exhibition space will be free for anyone in the community to use. The programs held will target the needs of the community as specified in the cultural plan for Sudbury. The users can come to these facilities to learn about making through different forms of culture, industry, materiality and adaptive reuse.

The target audience for the Water Reclamation Center and café would range from students for educational purposes, to the average person that wants to learn about water reuse systems. Students can come to the site to interact with the landscape and to learn about how wastewater and rainwater are recycled on site. The café will draw more people from the community and create an active facility with a steady flow of users. Also, the path network and natural wetland will encourage people from other parts of Sudbury to come use these facilities and enjoy the site.

Industry vs. Community

The outdoor wetland condition should be an industry-driven part of the project because the tailings' water has caused a lot of undesirable impacts to the land and to Kelly Lake. So, part of their improved sustainability plan for Copper Cliff should be the introduction of this wetland condition. In addition, the research lab on the interior of the old pool will not be the main story for the project but it will provide the space for further tailings' water testing and research.

This concept would promote the industry workers to use the site during their off hours or after their shift. This site will provide the potential for a worker to meet with a co-worker or grab a coffee since there currently are no coffee shops in Copper Cliff. Once on the site, they can grab some supplies from the market or build a project in the shop. Thus, bringing the community culture and the industry together through this adaptive reuse project.

"Flourishing diversity anywhere in a city means the mingling of high-yield, middling yield, low-yield and no yield enterprise."[68]

Bringing the industry and community together in this design will create a diversity in the community that embodies the different forms of enterprise.

68 Jane Jacobs, "The Death and Life of Great American Cities", (New York: Vintage Books, 1992), 118.

12

CONCLUSION

11.1 Critique

This thesis project goes beyond an individual building design and it encompasses an entire suburban planning development for the community of Copper Cliff. The seeds for regeneration are already available within the community. The cluster of community facilities in Copper Cliff provide the host structures. These facilities would be categorized under the group host dynamic because the design will impact more than one facility. The selected site was chosen because the existing facilities were becoming obsolete. This project seeks to explore the solution to this problem, which can also be found in other Indsutrialized communities across Ontario.

The research for this booklet analyzed the needs and requirements for the community of Copper Cliff. The majority of the population in Greater Sudbury desire more facilities within the arts and cultural sectors. This analysis showed that a place for making and remaking via community workshops for building and fabrication will meet the requirements outlined in Sudbury's Cultural Plan. Copper Cliff has a rich history of making and remaking because the community was built and constructed in a short period by skilled artisans that were drawn to the community by the industry. A space that will continue this making story today will allow the community to connect with this architectural heritage and bring the architecture and the culture of the community together.

The industry in Copper Cliff has influenced the design and configuration of the community. The homes were built closer to the stack for a shorter commute by the miners. This community was exclusive in the past for miners and their families, but has now become a commuter town in Sudbury. There are not many attractions, vibrant community buildings or active programs that exist in Copper Cliff today that focus on keeping the industrial workers within the community. Less than ten percent of the community that live in Copper Cliff work within the industry.

This thesis seeks to design a suburban landscape within the community of Copper Cliff that will bring the industry, architecture and culture together. The making story not only relates to the community, but it also highlights the industry in Copper Cliff and why the community came into existence. The water story creates a focus on sustainability, restoration and regeneration. The industry has polluted the landscape across Greater Sudbury for many years. It is their responsibility to consider new ways to restore the land. One of the waste products still produced by Copper Cliff today is the tailings' waste water. This rusted river is unsustainable, it runs throughout the community and it has polluted Kelly Lake. The wetland condition for the proposed site will provide the additional remediation required for the tailings' wastewater before it reaches Kelly Lake and further lakes downstream. These efforts will bring the industry and cultural focuses of the community together.

Figure 101: Outdoor Site Experience.

The project will also focus on the adaptive reuse of existing materials in Copper Cliff. The smokestack will be removed in the following years and this deconstruction will create large amounts of waste for the community. The waste will contribute to the remaking story outlined in this project. This will allow the users of the making facilities to remake the former smokestack into new objects that will encompass this site. The steel will be adapted for the corten steel panels, the canopy structures, the garden bed's retaining wall, the gateways and the seating structure. The concrete will be reused for the pathways and trails throughout the greenspace.

Overall, the making, remaking and water story will contribute to the growth and regeneration of Copper Cliff. This design will allow the community to regain these community facilities, and allow the industry to play a greater role in the environmental remediation and waste reuse. These actions and adaptive reuse principles will bring the architecture, culture and industry together, so they can operate cohesively.

11.2 Application

The strategies from this proposal can be applied to other industrialized communities that have underused facilities. The tool kit created from the adaptive reuse strategies and case study research outlines the conceptual synthesis and research examples to follow. These factors have guided the design strategies for this community driven project.

Adapt:

The type of adaptive reuse is not restricted to the building and its structure. The adaptation can represent a new identity for any object, place or thing that is given a new life and a new purpose through adaptive reuse. A great opportunity can be found with the reuse of mining waste in industrial communities.

Initiate:

The community knowledge must guide the design choices for the project. The site response and adaptive reuse application is initiated by the desire for community health and preservation. The restoration of heritage buildings, in particular, is vital towards the health and sustainability of older industrial communities.

Frame:

Selecting the type of host structures available will help to frame the focus of the design. The building or building(s) are selected based on their form of adaptive reuse. It is common to deal with group host structures in industrial communities because there is often more than one facility that is abandoned or obsolete.

Scale:

The design must consider the different levels of enterprise. The project will follow the human, building and suburban scales of the project. At the human scale, the users will experience the landscape and the site. At the building scale, the structure is revealed and the facilities are discovered. At the suburban scale, the site transformation will overflow into other areas in the community. This proposal will follow a phased approach to allow the project to incrementally expand and influence the surrounding areas.

Remake:

The adaptive reuse strategies for the buildings will provide an opportunity to remake something that was lost or has been forgotton. The concept of remaking can also embody a hands-on approach where the community can become involved in the growth and expansion of the city by reconstructing new and old artifacts.

Regenerate:

Revitalization is essential when the buildings in a community are disconnected from the people, which causes the health of the community to become at risk. The project will focus on the regeneration of these facilities and the site to bring the architecture, industry and culture together.

In conclusion, industrialized communities should not be forgotten. These areas have a unique history and architecture that will be lost if the heritage buildings are removed. The adaptive reuse of the community facilities in Copper Cliff will create an example that can be followed for other parts of the city. This project will serve towards Sudbury's goal to preserve the historic achitecture in the community. This thesis has shown how the community culture, heritage architecture and mining industry can collaborate and transform this site into a suburban landscape environment.

Figure 102: Alma and Daavid Laari and son Urho, 15 Evans Road, 1912.

Figure 103: Family of Ivar and Fanni Laakso with My Grandfather on the Left, 1961.

PERSONAL CONNECTION:

My family history in Copper Cliff, Ontario, dates back to the early 1900s. My grandmother's grandparents, Alma and Daavid Laari built this house on 15 Evans Road, in 1911, refer to figure 102. They paid their construction loan in three years and went back to Finland for a visit. They did not return to Canada and sold the house to Alma's sister. Eventually INCO purchased the home and converted it into a house for company workers.

My grandfather's parents, Ivar and Fanni Laakso, moved to Copper Cliff from Finland in 1928. They rented the same house from INCO until 1962, and raised their family of 7 children at 15 Evans Road.

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