

**TIDAL TOWN:
REACTIVATING A TOWN'S CONNECTION TO THE WATERFRONT
THROUGH INDUSTRY AND PUBLIC PROGRAM**

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Architecture

at

Dalhousie University
Halifax, Nova Scotia
July 2018

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ABSTRACT

This thesis examines the potential for the adaptive reuse of post-industrial infrastructure located in or near rural towns. Many of these towns experience diminished industry and are directly affected, both socially and economically. The ambition of the thesis is to question the amalgamation of these restricted sites into the public sphere by taking on new programmatic life.

The strategy will be tested within the context of Hantsport, a Nova Scotia community located on the Avon river, adjoining the Bay of Fundy. As a historically industrial town, it has seen various transitions in industry such as ship building, forestry and gypsum mining. Currently, almost all of the industries have been decommissioned and have left Hantsport in a state of uncertainty. Although the thesis will be situated locally within Hantsport, the strategy will remain applicable for many towns globally which have experienced a similar decline in industry.

ACKNOWLEDGEMENTS

I would like to thank Diogo Burnay, Peter Braithwaite and Jonathan Mandeville for their enthusiasm and guidance that helped push the thesis to its full potential.

I would like to thank my parents, my aunt, my brothers and extended family for all the support I received during this time. I would not have been able to do it without them.

I would also like to thank my partner, Sarah, for her unending patience during the long process and her willingness to drop everything when I was in need.

Finally, I would like to thank Lucas, Kyle, Adam, Cheng, Robert and Tika for their contribution during the last weeks of the project, along with all the great friends I have made at Dalhousie Architecture who motivated me everyday.

CHAPTER 1: INTRODUCTION

Industrialization

In the last 200 years, we have seen more technological developments globally than ever before, both as a cause and a result of industrialization. By the turn of the 18th century, isolated industrial production was growing in many self-sustaining towns throughout Europe and North America. The main industries included forestry, textile production, shipbuilding, and coal mining used as energy for steam power.¹ In many small industrial towns, these industries were the main source of income for residents and a determining factor in the growth or decline of a town. Often times, these towns were first formed as the result of an industry created due to specific landscape features, such as a river, a harbor or a valley. The production of commodities, either material goods or food, had a huge influence on a town's economy and social structure. When one of these industries fails, it carries serious implications for residents and their livelihoods. If the industry is the reason for the existence of a town, then what happens to the town once the industry is gone?

The scales of these operations were mainly concerned with local and regional demands but by the mid-19th century, railroads opened up the market for mass production and standardization. The emerging infrastructure had large implications for new urban developments along with the landscapes they occupied. Large machines and warehouses were built to accommodate the demand for mass production and mass consumption. These giant structures were often

¹ Ellen Braae, *Beauty Redeemed: Recycling Post-Industrial Landscapes* (Ikaros: Birkhäuser, 2015), 22.

placed at the periphery or at the center of urban developments, playing an essential role in future connections and growth of the urban fabric.

By the late 20th century, a new movement known as globalization was reshaping industry. Better access to inexpensive materials and cheaper labor was made possible. Whereas previously there was an increase in industry and urban development almost everywhere, the time of globalization is associated with de-industrialization.² As manufacturers found other places to house their production, the number of jobs dropped dramatically which led to a halt of economic growth. Many factories were forced to close down, leaving residents in search of work in other cities. Some cities, like Detroit, were left barren almost overnight. The infrastructure and altered landscapes have been left to weather by wind and rain. These monumental structures and landscapes are a reminder of the rich history of a place, yet at the same time, of unsustainable and failed industries.

Industry Connected to Water

There are many small towns in Nova Scotia that were built around an industry, often referred to as company towns. Examples of this are the coal mines located in Stellarton, Bridgeport, and Sydney. The coal mines are responsible for the industrialization of Eastern Canada but started to dwindle after the Second World War. Similarly to coal, steel fabrication was a major industry in Sydney and New Glasgow, supplying 50% of all Canada's steel at the time and played a large role in the construction of railways.³ Steel manufactur-

2 Braae, *Beauty Redeemed*, 23.

3 "Nova Scotia Industry," *Museum Of Industry*, last modified July, 2018, <https://museumofindustry.novascotia.ca/novascotia-industry>.

ing in Nova Scotia concluded in 2001. It had been on a slow decline since the end of the Second World War.

Prior to the rapid industrialization of Nova Scotia as a result of coal and steel, manufacturing and industry had been inherently connected to the landscape. Shipbuilding, agriculture, and forestry were made possible by the widespread proximity to water, both as a resource and means of exportation. Once motorization was introduced with the advent of the steam engine, the connection between industry and landscape was severed and was replaced by connections via railroads and steam-vessels.

Towns such as Lunenburg and Hantsport were shipbuilding hubs for Canada and consequently became successful places. Many towns and their industries were established as a result of proximity to the ocean, and forests for the supply of timber; however, there is no better example of a town whose industry was formed around a specific landscape feature than Hantsport. Settled on the Avon River, connecting to the Bay of Fundy, the extreme tidal changes made it possible to build and launch the largest ships in the country. Once the shipping industry declined, the town turned to mine local gypsum and exporting it via the Fundy Bay, along with other raw resources such as timber and paper pulp. These industries replaced shipbuilding to become the new pillars on which Hantsport continued to grow, but as demand fell so did these industries, leaving them and their supporting infrastructure defunct. As a result, I have chosen Hantsport, Nova Scotia, as an appropriate town to test the thesis. It has undergone many changes in industry throughout the past 200 years as a result of its specific location and is a great candidate for the adaptive reuse of post-

industrial infrastructure.

The Fundy Tides

The Bay of Fundy is the coastal body of water located between the maritime provinces of Nova Scotia and New Brunswick. The bay experiences massive tidal changes as a result of its unique shape, featuring the highest tides in the world. This unique quality amplifies the tides to reach up to 16 meters in height, approximately 5 storeys tall.⁴ The region is well-known as a tourist attraction for its sea cliffs, rock formations, and fossils, drawing in thousands of people each year.



Figure 1: High Tide At Hantsport Gypsum Ship Pier.



Figure 2: Low Tide At Hantsport Gypsum Ship Pier.

To understand the implications of the tides and how they have shaped both the landscape and communities, one has to understand how the great tides are generated. Tides are the periodic rising and falling of the ocean's water. They are the result of the combined gravitational pull of the moon and sun onto the earth. Since liquid flows, it is more readily pulled back and forth compared to solid earth. This pull, combined with the Earth's rotation, results in a predictable tidal cycle. The bay itself has a very specific topography. By becoming more narrow and shallow near the mouth of the Minas Basin, it allows for Fundy to have its own natural oscillation, known as "seiche".⁵ The seiche acts similar to water rocking back and forth in a bathtub. The tides coming in and out of the Fundy Bay from the tidal cycle are drastically amplified by the natural oscillation. It is the only place on earth where this phenomenon occurs at such a scale.

4 "The Phenomenal Bay Of Fundy," *Bay Of Fundy*, last modified 2018, <http://bayoffundytourism.com/>.

5 "How The Tides Work," *Bay Of Fundy*, last modified 2018, <http://bayoffundytourism.com/worlds-highest-tides/>.

One can imagine how the extreme tides would play a primary role in the development of the coastal communities. How they dealt with a large portion of the shore turning from land to meters of water, twice a day. This is a major component in determining the built environment of a town.

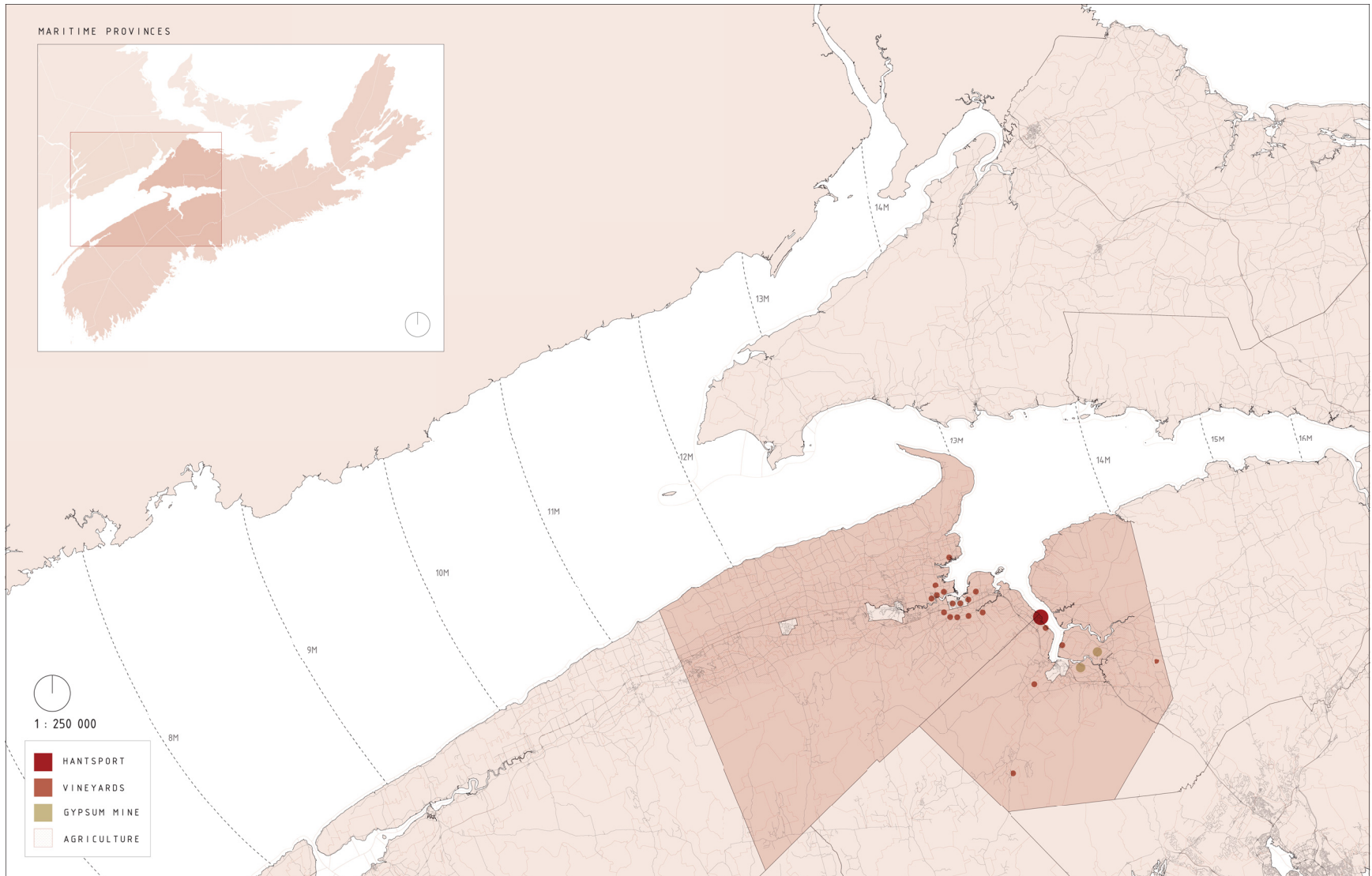


Figure 3: Bay of Fundy Region, Highlighting tide heights and location of Hantsport.

TIDE AMPLITUDE - HANTSPORT VS HALIFAX

■ HANTSPORT ■ HALIFAX

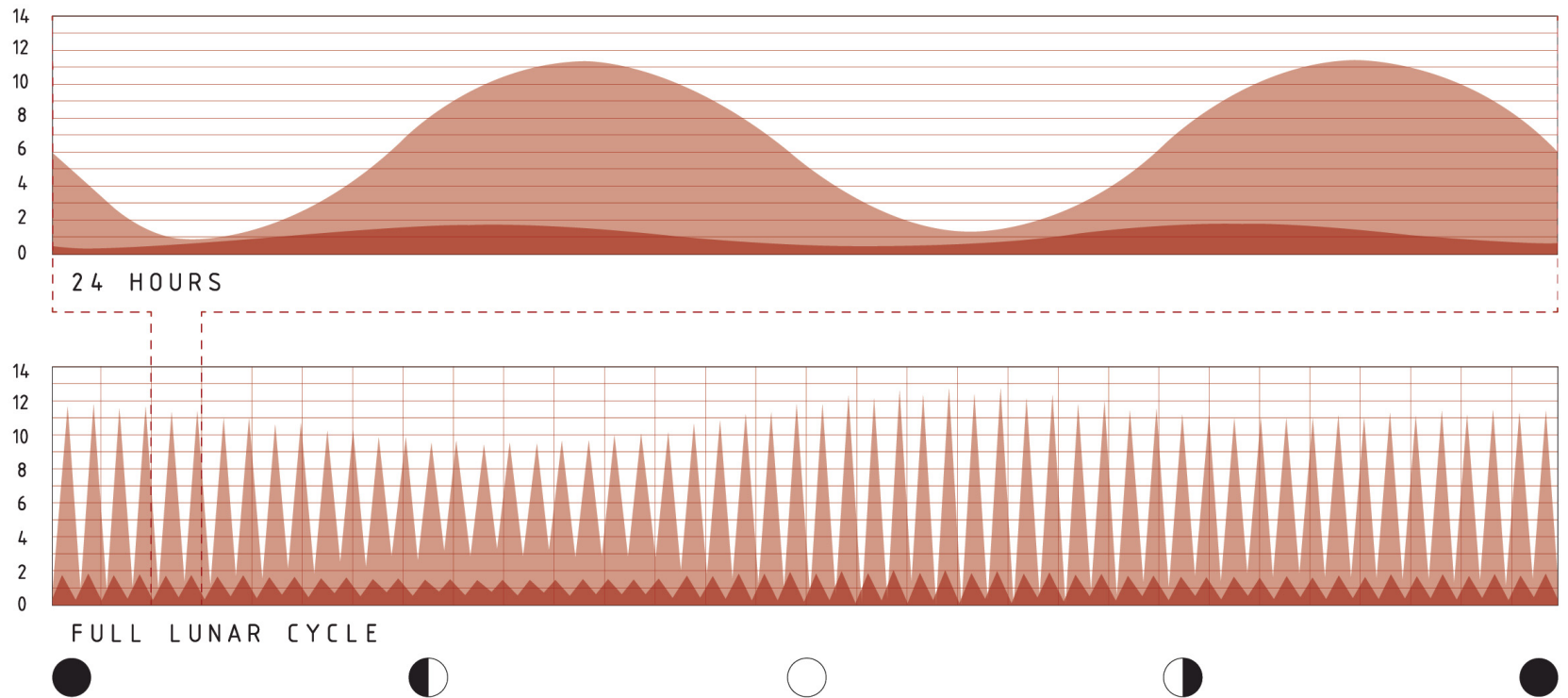


Figure 4: Comparing Tide Heights of Halifax and Hantsport according to lunar cycles; from Falmouth Dyke, NS, *Wind Finder*, 2018.

Industrial Remains

A history is assigned to these areas as 'empty, abandoned space in which a series of occurrences have taken place' while at the same time they are nominated as a new category in the urban landscape.⁶

Industrial machines have manipulated landscapes on a scale never before seen. What is to be done with the remains of such machines and their affected surroundings after they have been abandoned? Many of these sites have extracted raw materials and processed them to the point of toxicity, leaving landscapes uninhabitable or in need of major rehabilitation. Some steps may be taken in the reclamation of these sites, depending on the nature of the industry, although some may have to sit for a prolonged period to allow the time for the contamination to reach habitable levels. This can be a result of inefficient waste disposal leading to contamination of soil and water.

On the other hand, there are certain industries whose affected landscapes are less severe, either because there was no processing of materials, only extraction, such as mining or forestry, or there were no harmful chemicals used on site. This is not always the case, depending on the nature of the material be it toxic or radioactive, but in most cases, the sites allow for a more immediate intervention or adaptation. The site chosen for the thesis would be considered under this category since gypsum is a naturally occurring mineral and has no harmful effects when in contact with people. It was also simply the site where the gypsum was stored and exported. The mining of the mineral took place in the neighboring town of Windsor, leaving the landscape in Hantsport

6 Alan Berger, *Drosscape: Wasting Land In Urban America* (New York: Princeton Architectural, 2007,) 46.

mostly unaffected. Generally, many would consider these to be waste sites, no longer fit for use, but there is reason enough for the reclamation or conservation of these industrial leftovers.

Alan Berger suggests that wasteful landscapes are purposefully built within all types of new development located on the leading, peripheral edges of urbanization. Designers must discern which types of “waste” may be productively reintegrated for higher social, cultural, and environmental benefits.⁷

Many sites show signs of decay, which sparks interest for people, as some wish to protect these expressions of deterioration. This has led to many post-industrial sites being reprogrammed and preserved. There are many degrees of preservation depending on the condition of the infrastructure, ranging from the salvaging of certain original elements for an adaptive reuse project to a complete conservation of the existing conditions. Three projects will be examined within this context in the next chapter to better understand the preservation and reintegration of this new cultural history. The projects that will be investigated are Landschaftspark, Matadero Madrid, and Île de Nantes. This will inform the approach of the thesis.

Post-Industrial Town in Need

Hantsport, Nova Scotia, was settled in the 1790s as a prime location for farming and trade. Being located on the Avon River, there was boat access to other communities on the Minas Basin and the Bay of Fundy opened up the opportunity to other ports in New Brunswick. The village was shaped

⁷ Berger, *Drosscape*, 68.



Figure 6: Framing Unknown Schooner - Hantsport, 1895; from A.E. Cornwall, Nova Scotia Archives.



Figure 7: Framing Princess Avon - Hantsport, 1895; from A.E. Cornwall, Nova Scotia Archives.



Figure 8: Margaret F. Dick Before Launching, 1918; from A.E. Cornwall, Nova Scotia Archives.



Figure 9: Margaret F. Dick Being Launched, 1918; from A.E. Cornwall, Nova Scotia Archives.

by the sea, forests, and fields of its geography; the floodplains of the river offered rich and fertile soils. Agriculture and livestock was the main concern, like all small villages of the time, but something else was unique about this settlement which allowed it to grow as one of Canada's most important shipbuilding centers.

The families occupying the land had many ties to the military, among them were mariners and privateers. This “foreshadowed the blend of occupations among Hantsport settlers, one hand to the plough and one on a ship's rigging.”⁸ There was almost a 50/50 divide between farmers and mariners. Nowhere else in the region had such a concentration of seafarers. Many shipyards emerged as a result of this in the early 1800s. The E. Churchill & Sons and John Burton North yards were the two largest in the region, although there were many smaller yards constructing fewer vessels. From the 1830s to the end of the century, around 200 vessels were constructed on these shores, every one larger than the previous. As the shipping and export industry grew, so did the size of the vessels. The method of measuring the size of a ship would be to calculate the internal volume in tonnage (one ton is equal to 100 cubic feet of space).⁹ The size of vessels built ranged from the 57 ton ship *Paoli* to the 1856 ton ship *Loodiana*.¹⁰ Ship launching was the pride of the town. The entire community would gather on the shores in celebration of the spectacle. The ships were monumental in size, often many times larger than the nearby houses

8 Allen B. Robertson, *Tide & Timber: Hantsport, Nova Scotia, 1795-1995* (HMilton, Ont.: Global Heritage Press, 2001), 32.

9 “Tonnage,” Wikipedia, last modified April 7, 2018, <https://en.wikipedia.org/wiki/Tonnage>.

10 Allen B. Robertson, *Tide & Timber: Hantsport, Nova Scotia, 1795-1995* (HMilton, Ont.: Global Heritage Press, 2001), 61.



Figure 10: Train Station - Hantsport, 1895; from A.E. Cornwall, Nova Scotia Archives.



Figure 11: Stockpiling Gypsum, 1900; from A.E. Cornwall, Nova Scotia Archives.



Figure 12: Dumping Gypsum Into Schooner, 1900; from A.E. Cornwall, Nova Scotia Archives.



Figure 5: View Overlooking Hantsport, 1895; from A.E. Cornwall, Nova Scotia Archives.

and some of Canada's largest vessels. This is central to the identity of Hantsport and its residents. This celebratory aspect of the community will likely be lost in the future industrial endeavors of the 20th century.

By 1890, the shipbuilding industry had severely declined as a result of the new steam-powered iron vessels that dominated the seas, leaving the residents in search of new income. The shipyards were forced to close down, as it was too expensive to build wooden vessels compared to the competing steamers. The stakeholders in the shipping industry pushed for the industrialization of Hantsport as they wanted to produce machines locally rather than import the British equivalent. A foundry was formed in the late 1800's, which manufactured machinery and was a major driver in the economy during the decline of shipping¹¹. The large population of laborers favored the idea of further industrialization, although it was not as easy as one might think. The railway that had been laid in 1869 ran through the town and would ensure the export of products to Halifax, while ships coming into the Minas Basin would support export to New Brunswick and to the United States. Hantsport would not have been able to compete with Sydney and New Glasgow in the iron and steel industry and would neither benefit from the clothing and textile industries since the nearby town of Windsor had just opened a textile plant. The only foreseen industry would be in the export of raw materials, specifically timber and gypsum which had been a small part of the local economy since the 1850s.¹² The once-booming town was facing economic turmoil. People were moving away in

11 Allen B. Robertson, *Tide & Timber: Hantsport, Nova Scotia, 1795-1995* (HMilton, Ont.: Global Heritage Press, 2001), 91.

12 Ibid., 99.

search of work and it was clear that new enterprise was needed to support any future growth.



Figure 13: Aerial View Of Waterfront - Hantsport: Showing Fundy Gypsum Co. Storage Shed, 1967; from B.R. Alexander, Nova Scotia Archives.



Figure 14: Aerial View Of Waterfront - Hantsport: Showing Fundy Gypsum Co. Storage Shed, 2017; from "Hantsport Seaport Harbour in Hantsport, NS, Canada - Marina Reviews" Marinas light.

In the following decades, manufacturing came back to Hantsport in the form of the Minas Basin Pulp and Paper mill in 1929, the Canadian Keyes Fibre mill in 1933 and the Canadian Gypsum Company's large storage shed in 1947. With the railway and shipping connections to support the

new industries, they occupied the vacant shipyard lots and the town's population grew to over 1400 people in the 1966 census¹³. As a result of this industrialization, the town had been effectively blocked off from its historic waterfront which later became a problem, as this was once the community's source of pride and identity. At the turn of the century, there was a decline in activity, perhaps as a result of globalization and de-industrialization. The Canadian Gypsum Company had been supplying the housing market in the United States and the demand was no longer there. Similarly, the pulp and paper mill experienced a decline in business. The gypsum shed was shut down in 2011 and, a year later, so was the pulp and paper mill. The only remaining activity in the town is the Canadian Keyes Fibre Mill.¹⁴ The young generation has begun to move away and the town's identity and future are in question once again.

13 Robertson, *Tide & Timber*, 152.

14 Scott MacDonald, "Hantsport Deserves To Be Better Known," *The Chronicle Herald*, July 04, 2015, <http://thechronicleherald.ca/thenovascotian/1297322-hantsport-deserves-to-be-better-known>.

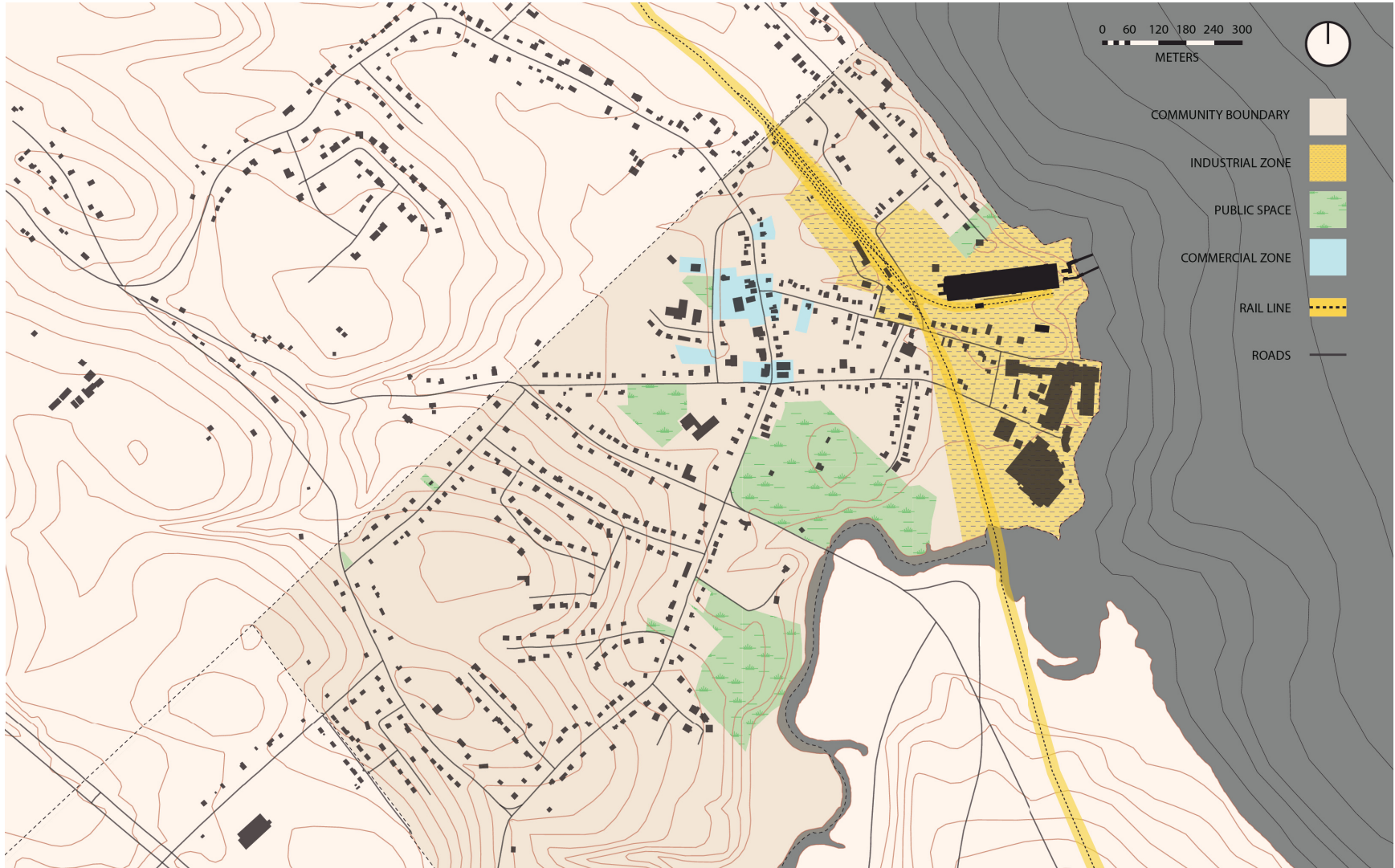


Figure 15: Map of Hantsport shows current zoning conditions . The railroad and industrial zone have effectively cut off the waterfront

Monumentality

The scale of such industrial structures suggests a monumentality, often a quality for preservation. The monumentality does not arise from the traditional sense of the word. Thordis Arrhenius speaks of the difference between intentional and unintentional monuments in his book *The Fragile Monument*. The definition of a monument is “a human creation, erected for a specific purpose of keeping single human deeds or events alive in the minds of future generations.”¹⁵ The value of an unintentional monument is often different than intentional. A statue will be erected with the intention of having commemorative value, whereas an unintentional monument is built for other purposes and is later given monumental status by observers for its historical value. In terms of industrial structures, they are built as infrastructure for the production of goods, but once the industry closes and time passes, the perception of the structure changes in the eyes of viewers. The size of such infrastructure that supported mass production is so removed from the human scale that it becomes overwhelming and difficult to grasp. This plays a large role in why some structures feel monumental and sublime. They evoke feelings of disbelief, awe and, sometimes, mysticism. They are a reminder of how small we are on this Earth. These monuments often rely on their visual effect on viewers, this brings up certain questions on the conservation of unintentional monuments.

Most intentional monuments are cared for in some fashion and may undergo restoration if showing signs of deterioration since they were constructed for the commemoration of specific moments in time. The monument should be as it

15 Thordis Arrhenius, *The Fragile Monument, On Conservation And Modernity* (London: Artifice Books, 2012), 96.

was when built, so restoration seems appropriate for the conservation of the monument. In contrast, for a structure to have age value it must “display truthfully the changes and evolutions it has undergone since its construction, communicating primarily the passage of time”.¹⁶ In agreement with this interpretation, the conservation of unintentional monuments such as industrial structures or architecture is best done through preservation by adaptive reuse, with a strong distinction between old versus new. The restoration of such a monument might diminish its validity by covering or removing the “truthfulness” of the structure. The weathering and deterioration of a structure is evidence of the passing of time. By removing this, the structure would no longer carry its age value.¹⁷ For this reason, a lot of adaptive reuse projects struggle with the idea of how much of the existing to keep and how much to add and how to differentiate between the two.



Figure 16: Model showing the massive gypsum shed towering over all trees and houses.

The monumental structure in Hantsport that will be the focus of the thesis is a gypsum storage shed on the town’s waterfront. It has become iconic for its massive size, towering over all surrounding buildings and trees, and can be seen from the highway exit. The inside space is so vast and filled with hills of gypsum, it almost seems otherworldly. The gypsum shed has been a huge part of the town’s image, but all industrial activity has since ceased, leaving the structure to be battered by the elements and, consequently, question the town’s identity.

There will be an examination of three successful adaptive

¹⁶ Ibid., 99.

¹⁷ M. C. Boyer, *The City Of Collective Memory: Its Historical Imagery And Architectural Entertainments* (Cambridge, MA: MIT Press, 2006), 144.

reuse projects of a similar scale in the next chapter. It will focus on identifying similarities which will inform the conservation of certain industrial elements moving forward in the design phase.

Memory

The life of a community is its people and their memories. Any written history arises from a genuine concern for the preservation of those remembrances, heritage, and sense of Identity.¹⁸

Monuments are often physical embodiments of the collective memory of a group of people. Memory is very important in forming the identity of a place. Since there is no deep-rooted identity to spaces, it is not until human actions have occurred in a specific location that it turns a space from objective to subjective. This is the premise for “geographical identity.”¹⁹ Physical things such as buildings or parks may act as monuments because they carry specific meanings associated with activities that have taken place in the past. The physical objects act as anchors, holding the history and memory of a place for new generations. One of the best local examples of this would be the lighthouse located at Peggy’s Cove, a small fishing village about 45 minutes outside the capital, Halifax. Its original purpose was for warning passing ships of the dangerous rocks in the area but has since become a tourist attraction for thousands of people every year because it embodies the memory of traditional east coast practices. The lighthouse has become one of the most well-known monuments in Atlantic Canada and a large part of Nova Scotian identity.

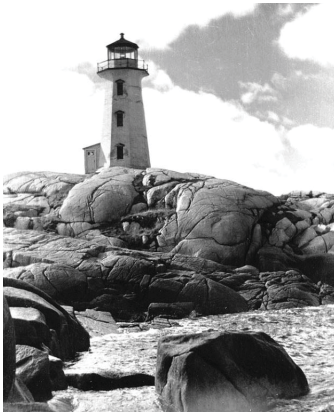


Figure 17: The Lighthouse At Peggy’s Cove, 1987; from W.R. MacAskill, Public Archives of Nova Scotia.

18 Allen B. Robertson, *Tide & timber: Hantsport, Nova Scotia, 1795-1995* (HMilton, Ont.: Global Heritage Press, 2001), 6.

19 Brian S. Osborne, “Landscape, Memory, Monuments, And Commemoration: Putting Identity In Its Place,” *Canadian Ethnic Studies Journal* 33 (2001), 56.

Critical Position

As a method for conserving the industrial past of a place, we can use the existing infrastructure to imagine and create new perspectives through reprogramming. By introducing much-needed public programming and recreation to the industrial town of Hantsport, the sustainable aspect of the community would be restored to what it once was. Using the gypsum shed as a paradoxical vehicle for the thesis, the landscape, and industrial history will be celebrated by the adaptive reuse of the structure, reconnecting the town to its waterfront, but will also put an emphasis on future possibilities. The site will serve as a monument of the past and act again as the focal point of the community.

Thesis Question

How might the adaptive reuse of a post-industrial site revitalize the fading town of Hantsport through combined public program and sustainable industry?

CHAPTER 2: POST INDUSTRIAL PRECEDENTS

Landschaftspark

Located in Duisberg, Germany, Landschaftspark is a large adaptive reuse project that converts an industrial landscape into a large public park. Previously functioning as a plant for the production of steel, it shut down in 1985 and was redeveloped in 1991 by Latz + Partner. The design for the new public park utilizes the existing infrastructure as a backdrop for memory and provokes new perspectives. As a park, recreation is largely the main purpose, although there are a vast number of programs incorporated throughout. By using the structures on site, new spaces have been re-imaged as rock climbing walls, scuba diving pools, hidden gardens, and bike paths, just to name a few. There is a large plaza near the center which acts as a flexible space that supports many events, exhibitions, and vendors.²⁰ The park transforms to a spectacle when night falls: the structures are lit up with color, which results in a completely different atmosphere, drawing different crowds. A fundamental part of the project was to reuse as much of the existing infrastructure as possible, for the conservation of materials and to act as a starting point for the creativity in its reprogramming.²¹ The interventions rely heavily on the creative interpretations of site-specific features, therefore it is not very standardized.

The similarities between Landschaftspark and the Hantsport gypsum shed come in the form of scale. Although Land-

²⁰ "Landschaftspark Duisburg-Nord," Wikipedia, last modified November 19, 2017, https://en.wikipedia.org/wiki/Landschaftspark_Duisburg-Nord.

²¹ Ellen Braae, *Beauty redeemed: recycling post-industrial landscapes* (Ikaros: Birkhäuser, 2015), 106.

schafts is located in a much more urban area with a greater population, the size of the structures closely resembles the massive size of the gypsum shed. The aspects of this project that I wish to relate to Hantsport are the new form of interactions with the industrial structures, along with the introduction of diverse programs. I believe this is a great example of adaptive reuse which allows for flexible programs that change from day to night and from winter to summer.

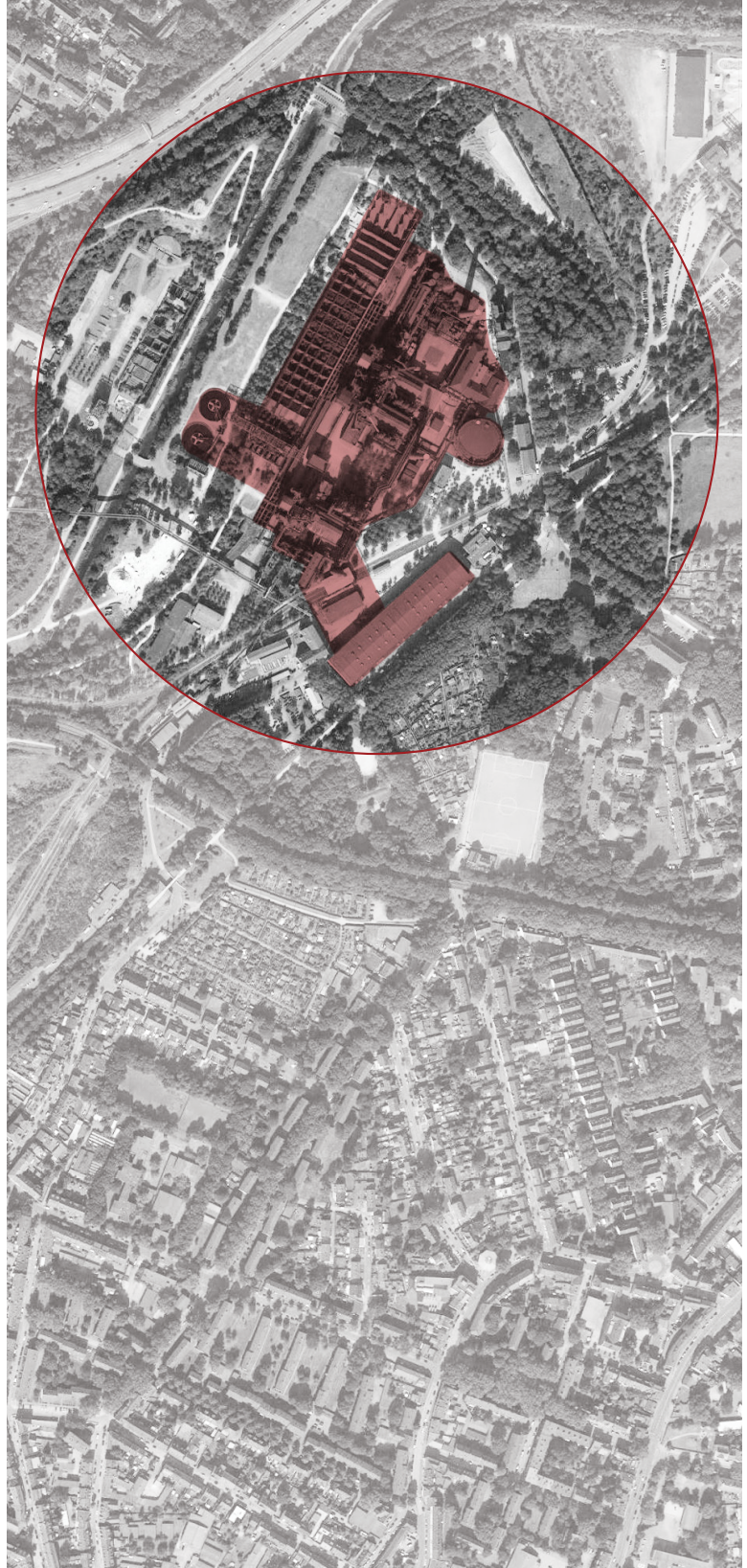


Figure 18: A plan view of Landschaftspark, Germany; from Google Maps 2018.



Figure 19: Landschaftspark lit up at night; from Einführung in Landschaftspark Duisburg-Nord.



Figure 20: An aerial view of Landschaftspark; from Fiylo in Kraftzentrale im Landschaftspark Duisburg-Nord.



Figure 21: Climbers enjoying the eroded concrete bunkers; from Duisburg wir kommen in Klettern in einer Industriearuine

El Matadero

A project located in Madrid, Spain, takes a large slaughterhouse and converts it to a contemporary center for art and experimentation. The former industry shut down in 1996 and the city decided to re-program the existing buildings. Matadero acts largely as flexible space to accommodate constantly changing programs and exhibitions. The center is a lab for the experimentation of contemporary art and cross-disciplinary interaction. The programs consist of exhibitions, performances and shows, even markets and creative classes. The old buildings surround a large plaza which has events and dining opportunities.²²

The similarity to the Hantsport gypsum shed is the scale. Infrastructure is largely made up of long span, enclosed buildings where the processing of meat would take place. The long span buildings allow for large, uninterrupted spaces. This characteristic is well suited for flexible programs such as exhibitions or shows. The spaces can change program from day to night, similar to Landschaftspark, although Matadero is mostly large, flexible spaces which may seem underutilized because of this. The gypsum shed will incorporate similar aspects of open, flexible spaces but will also include more permanent programs and structures to act as public amenities for the town of Hantsport.

²² "Matadero Madrid," Wikipedia, last modified December 29, 2017, https://en.wikipedia.org/wiki/Matadero_Madrid.

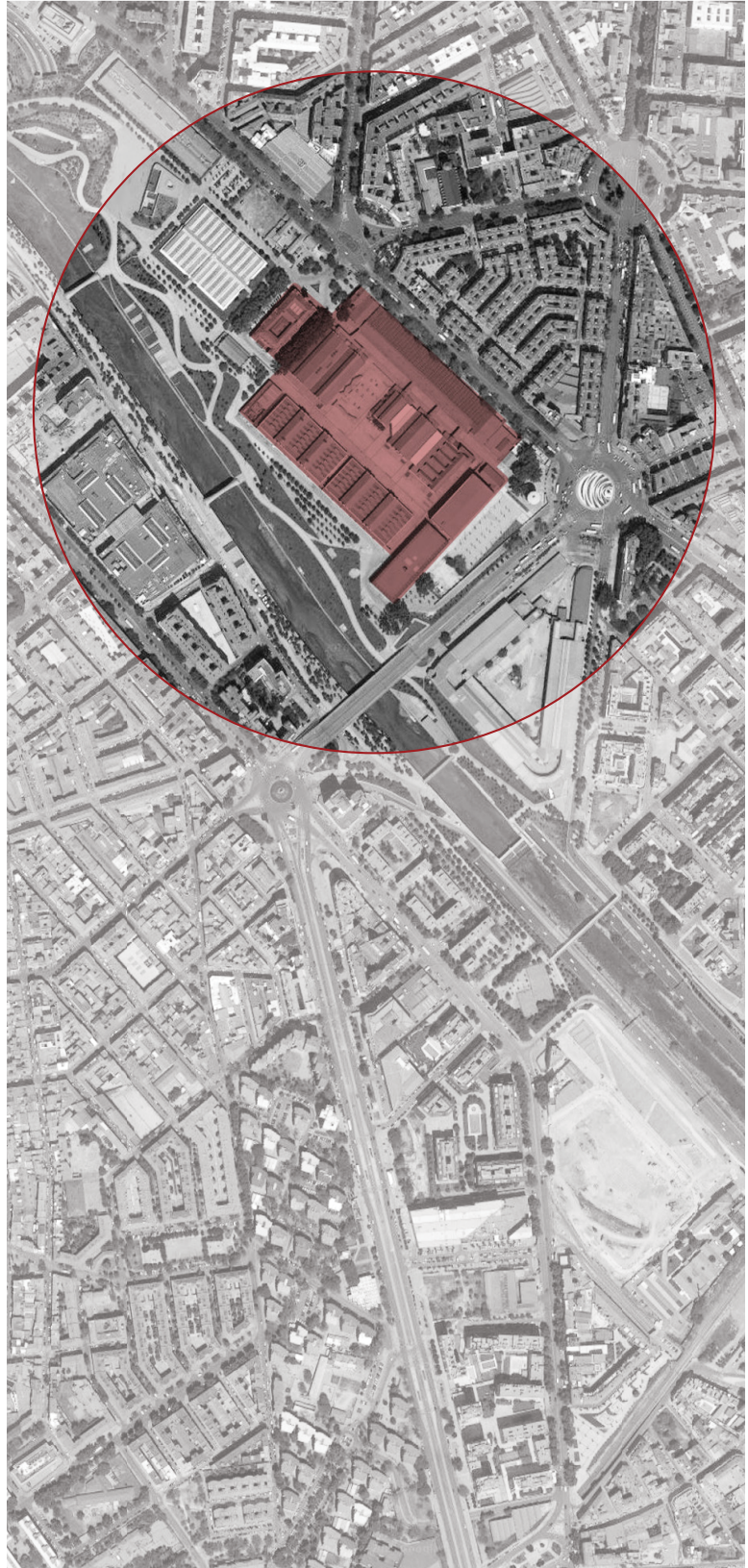


Figure 22: A plan view of El Matadero, Spain; Google Maps 2018.



Figure 23: An aerial view of the Matadero plaza and surrounding buildings; from Architectours in Madrid Río y Matadero Madrid.



Figure 24: An exhibition taking place in one of the buildings; from Matadero Madrid en La Ventana del Arte.



Figure 25: An event taking place in the evening; from Jorge in Matadero Madrid Review | Explore Madrid Like A Local.

Île De Nantes

Located on a small island in the middle of Nantes, France, this site once acted as a large shipbuilding port throughout the 19th and 20th century. The old warehouse buildings have been adapted to a cultural center for residents and tourists and opened in 2007. The structures house larger-than-life anatomical sculptures created by local artists in an attempt to create and promote the identity of a creative metropolis. The existing industrial structures act as over-arching roofs for the clusters of program taking place underneath, also housing the massive animal sculptures.²³

Many design decisions are based around local qualities, especially those that are associated with the atmosphere and feeling of the place.²⁴ Similar to Landschaftspark, there are considerations of the collective memory, previous life, and age of a place. The project acts as a gathering space for tourists and residents, creating a large social hub. The aspects of the project that I wish to translate into Hantsport are the social gathering of both residents and visitors, along with the construction of smaller permanent structures within the warehouse space, allowing the former industry to act as a backdrop.

23 "Machines Of The Isle Of Nantes," Wikipedia, last modified September 20, 2017, https://en.wikipedia.org/wiki/Machines_of_the_Isle_of_Nantes.

24 Ellen Braae, *Beauty Redeemed: Recycling Post-Industrial Landscapes* (Ikaros: Birkhäuser, 2015), 225.

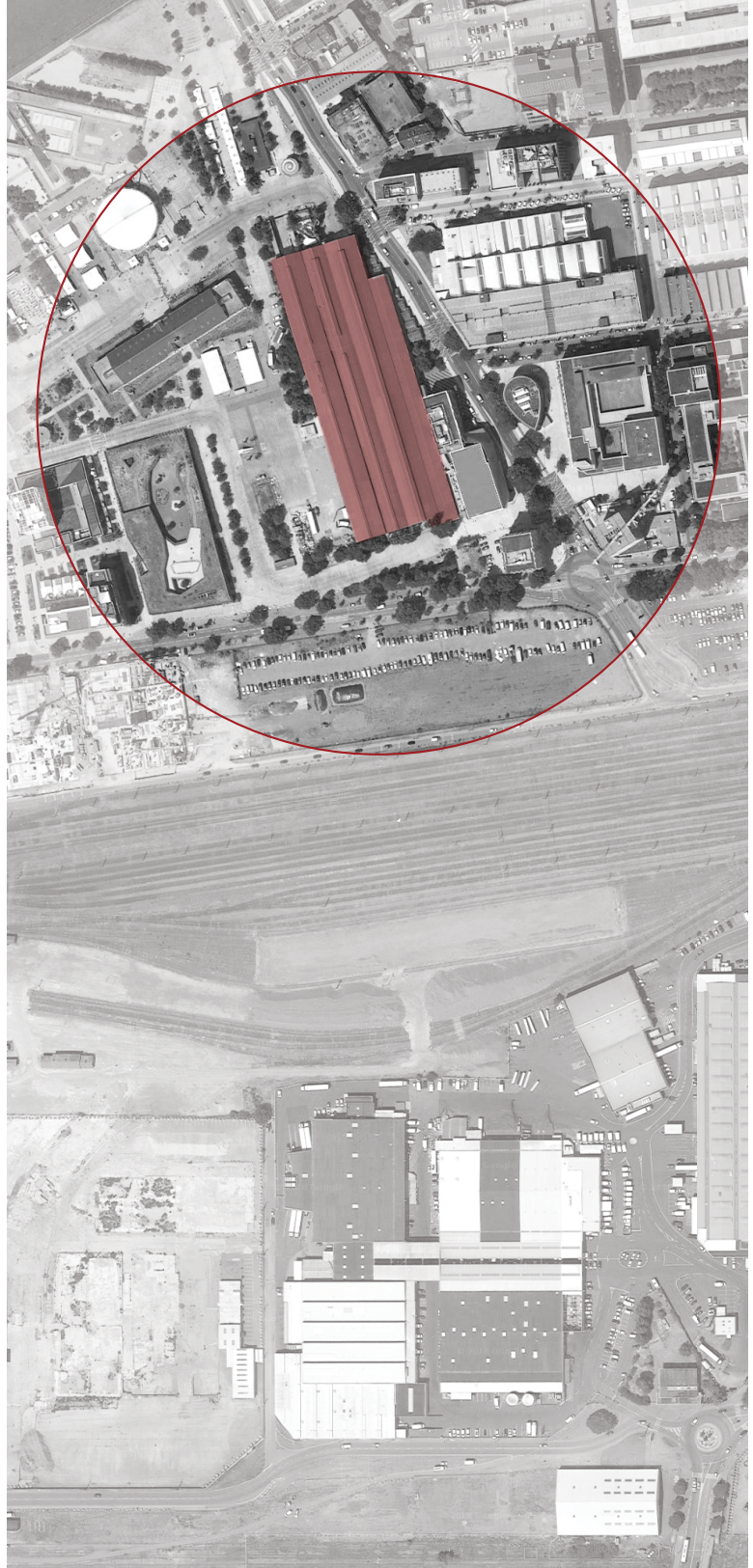


Figure 26: A plan view of Île De Nantes, France; from Google Maps 2018.



Figure 27: A gathering space for the public; from Île de Nantes in Hangar des machines.



Figure 28: The warehouses lit up at night; from Agile City in Cultural Regeneration - From heavy industry to poetic machinery in Nantes, France.



Figure 29: The integration of smaller programs under the large warehouse structure; from official website for tourism of France in the Machines de l'île in Nantes.

Findings

By examining the three projects, similar approaches have been taken in the adaptive reuse of these post-industrial sites. All three of them identify and retain important industrial elements in the final stage, such as the reuse of primary structure as a way of preserving the age value and atmosphere of the place. Some aspects of the existing sites are not seen as important and may or may not be removed or replaced depending on the needs of the proposed new use. Secondary elements such as cladding or partitioned walls are adapted for the many flexible programs. It is important to note that these projects are located in larger urban contexts with a greater supporting population. As a result, the necessity for economic development is not a concern in the projects since the cities are already heavily established.

On the contrary, Hantsport is in need of both employment opportunities and recreational programs. This will be made possible by introducing a diversity of programs to the gypsum shed which can accommodate both of these needs. The programs will need to accommodate both residents living in Hantsport and visitors to the town, with programs such as event spaces, markets, sports, recreation, dining, industry etc. as a way to establish a new social centre and give people a reason to make it a destination.

CHAPTER 3: SITE ANALYSIS

Existing Infrastructure

The Canadian Gypsum Company storage shed was built in 1947. It has eighteen 30ft bays which measure a total of 600ft in length, including the tapered ends of the structure. The trusses are 9'-6" deep, they span a distance of 196ft and are constructed from open webbed riveted steel and entirely clad in corrugated sheet metal. The raw gypsum is mined in two locations right outside of the nearby town of Windsor and is brought to Hantsport for export to the United States via large bulk carrier ships. At some point, the United States Gypsum company bought Canadian Gypsum, so the company was now owned by the States and was exporting to them. The success of the industry was completely dependent on the fluctuating United States housing market but was operated by residents in Hantsport and the surrounding towns. At the height of the industry, there were 170 staff working at the shed, the office and the mines.

In the building, there are two tunnels underground running the full length of the building. Each is 20ft high and 16ft wide. There are funnels, known as "hoppers" located on top of the tunnels to allow gypsum to drop down onto conveyor belts that aid in the moving of gypsum out of the building. The raw gypsum is stored in large piles according to colour and grade. The material arrives by rail to the south side of the building in what is known as "belly loader" cars because they release the material from their underside. The train usually arrives with ten cars full. The material is dropped into a chute onto a conveyor belt underground and is brought above ground, up and over the building to the peak of the

gable. The gypsum then drops onto another conveyer located at the top on the gable and is sent to a specific location and dropped onto a pile of comparable gypsum. There is a large garage building on the property that houses multiple bulldozers used to push the gypsum around and feed it into the hoppers. Once in the tunnels, they are sent out to the "stackers" which are extendable arms that pivot on a track to load the full length of the ships. There are two stackers, one per tunnel, and they extend out to the water, cantilevering over the long ship pier. At the time of their installation, the stackers were the fastest in the world to load an entire ship since they had to beat the tides. The ships had to be in and out of the bay within a few hours or risk getting stuck.

The ship pier is supported by piles that are driven into the earth up to 180ft deep, the reasoning for the angled piles is to resist any lateral loads exerted onto the thin pier by the large bulk carriers. The piles are covered during high tide, but low tide exposes their great height and the remnants of previous wooden piles which used to support older docks.

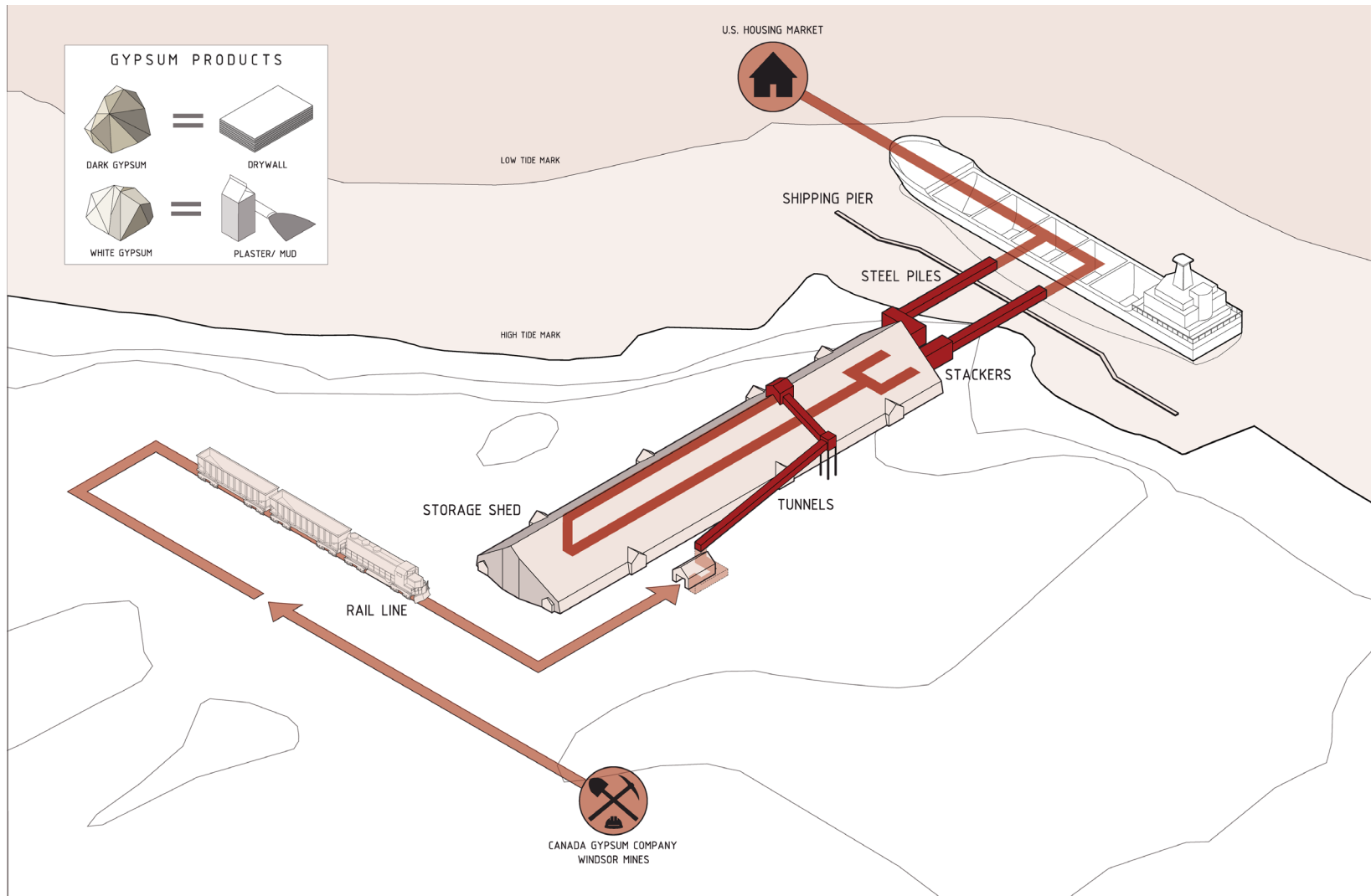


Figure 30: A flow diagram showing the circulation path of the gypsum from the mines to the ship.



Figure 31: Abandoned railroad line.



Figure 32: Interior of gypsum storage shed, gypsum piled high.

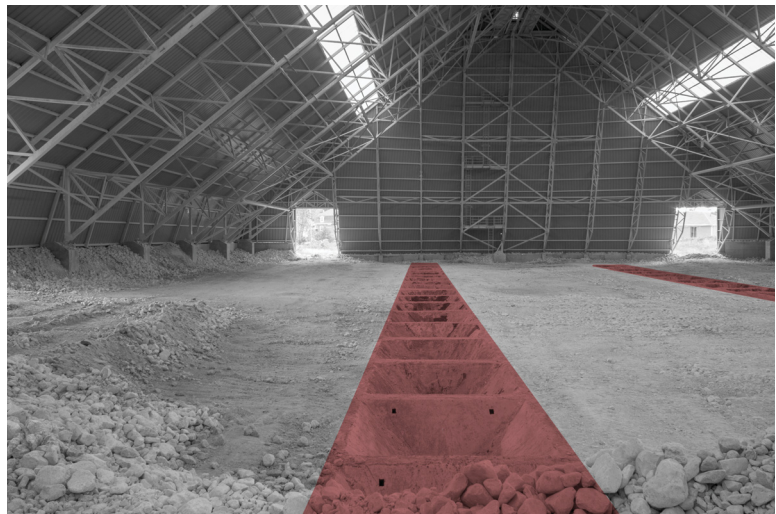


Figure 33: Both conveyer tunnels run the length of the building.



Figure 34: Stackers extend out, used to load ships.

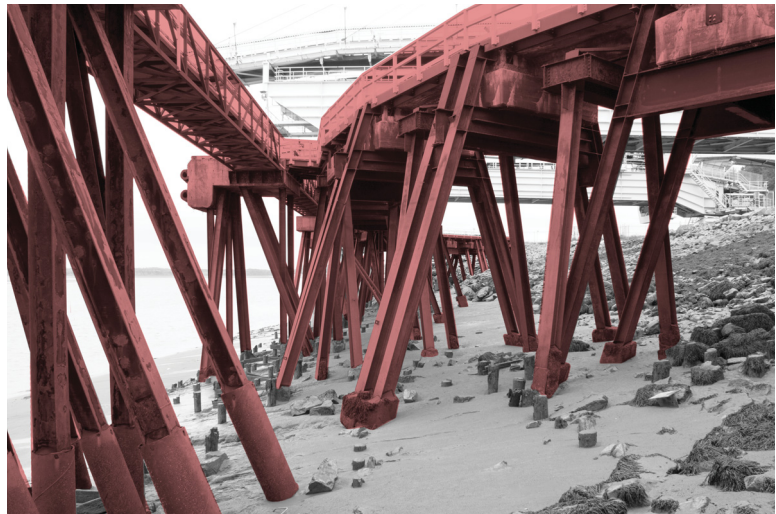


Figure 35: Steel piles extend up to 180' into the sand.



Figure 36: Long pier where ships would dock and be loaded.

In the year 2000, the storage shed received a large addition, adding another 300ft to its total length. The new structure, coming in 50 years after the original shows a few new characteristics: the trusses follow the same grid and are dimensionally the same, but rather than being constructed from open webbed riveted steel, they're made from closed box steel with welded connections. The total building now measures 150,000 sqft. Unfortunately for the town and workers, it wasn't long after, in 2011, that the industry was shut down.

By breaking down the building into its major components, I am able to determine the three areas which would be used in its adaptive reuse. The truss structure, the two circulation tunnels and the ship pier are the most important parts to the existing site. The secondary aspects of the building such as the cladding and the surrounding landscape will be adapted to accommodate the proposed programs. It's also important to maintain certain elements such as the vastness and the atmosphere of the space. It is as much an important part of the building as the primary structure.

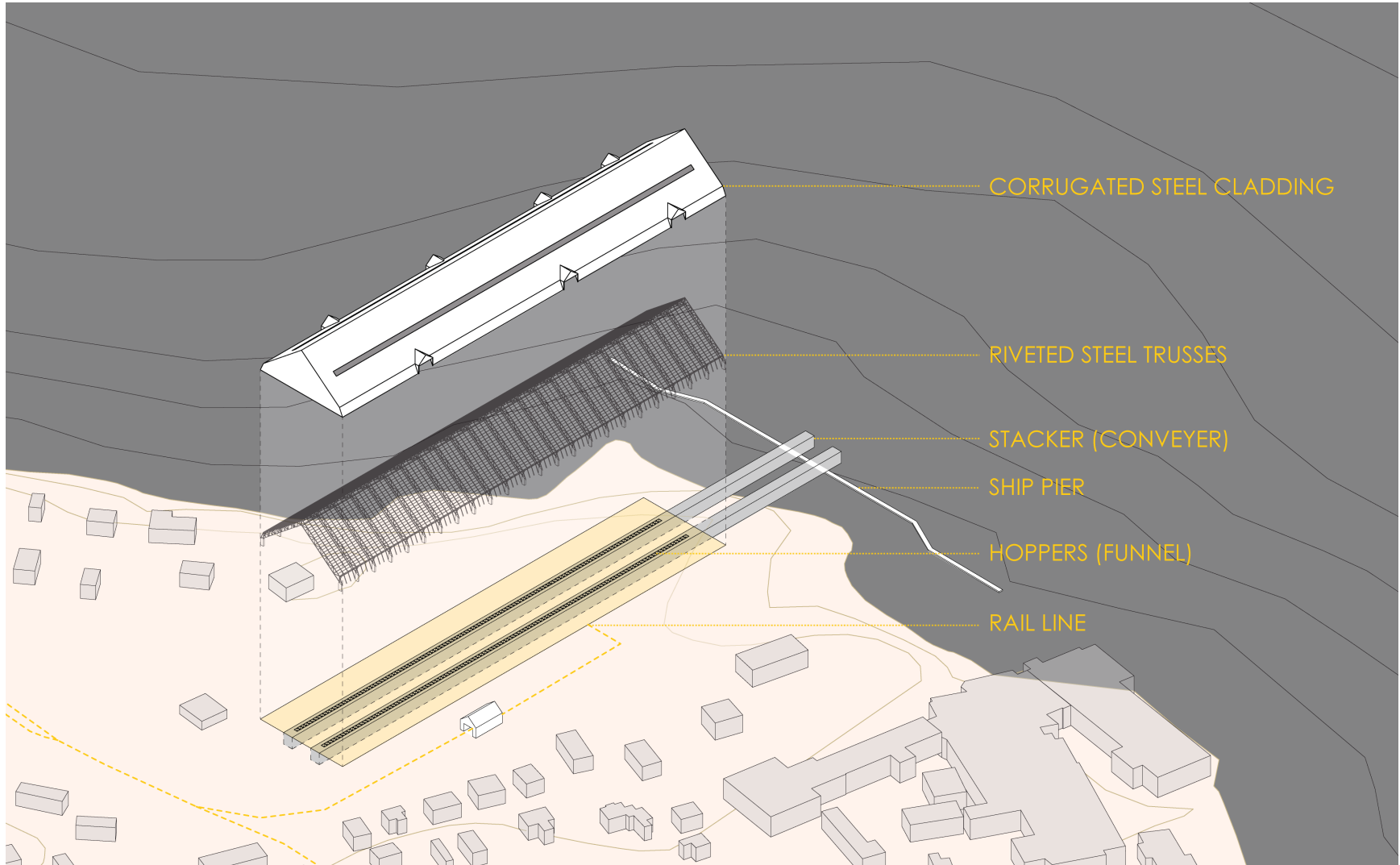


Figure 37: An exploded axonometric showing the primary elements of the existing infrastructure.

Gypsum

Gypsum, also known as calcium sulphate, is the primary mineral used in plasters and drywall. It's mostly used in the construction industry but it is also used to balance levels in soil for agricultural purposes and used to treat the PH levels in water prior to brewing beer and making wine. Food grade gypsum powder can also be used as an ingredient in ice cream, desserts, cheese, canned food and more.²⁵ There are primarily two grades of gypsum used in the construction industry: White gypsum and dark gypsum, determined by their colour. The darker material is used in drywall since it does not have an aesthetic appeal, and is usually covered up. The white gypsum is used in plaster of Paris and mudding plaster. It appears whiter and is cleaner looking as a finish.



Figure 38: Dark Gypsum, White Gypsum.



Figure 39: Crushed Gypsum.



Figure 40: Powdered Gypsum

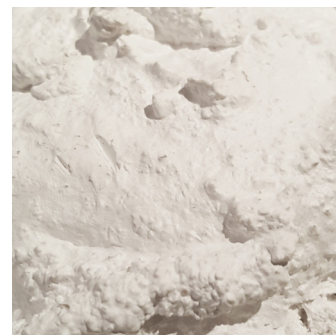


Figure 41: Gypsum that was baked and turned to plaster.

25 "Other Uses Of Gypsum," Gypsum Association, last modified 2018, <https://www.gypsum.org/about/gypsum-101/uses-gypsum/>.

The previous images show gypsum stones which I collected from the storage shed in Hantsport. I then proceeded to crush them into a powder and bake them in the oven at 500 degrees Celsius for an hour to dehydrate them. I then mixed the powder with water and was pleasantly surprised at how well it cured. The purpose of this study was to question the possibility of using some of the materials found on site, similar to the use of the existing structure. The cast gypsum could be used to articulate certain design principles such as memory and preservation by casting certain industrial elements such as the hoppers.

The two conveyor tunnels running beneath the gypsum shed are capped with "hoppers," large 12x12ft funnels that were used to drop gypsum onto the conveyor belt below. The two tunnels acted as the main circulation paths for the gypsum and will act as circulation paths for the new programs placed throughout.



Figure 42: Existing conveyor tunnel with hoppers.



Figure 43: Idea of public circulation tunnel.

New Industry

It's unquestionable that Hantsport has a deep-rooted history of fabrication and manufacturing across many industries, though all have experienced decline and closure. Hantsport has a much higher percentage of labourers than the rest of Nova Scotia. It only seems natural to propose a more sustainable industry at the regional scale so it directly benefits the town and will not perish as a result of outside influences. By looking back at what is historically available in the region as a sustainable source of industry, agriculture had been and still is, a surviving enterprise of the entire Fundy region. The rich soils are the most abundant in the province and have the largest percentage of farms. Hantsport borders between Hants and Kings counties. With a combined 956 farms, this makes up 25% of Nova Scotia's agricultural resources. As a way to promote tourism, local industry and cross-programming for the gypsum shed, the new proposed industry will be the production of craft beer. The valley region is already well-established as a mecca for vineyards on the east coast with an astounding 19 wineries within a 50km radius of the storage shed.

HANTSPO

TOWN POPULATION: **1560**

AVERAGE AGE: **50**

POPULATION WORKING IN INDUSTRY

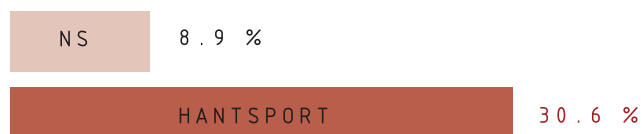


Figure 44: Industry data for Hantsport; from Hantsport - Town, NS, Canada, *Statistics Canada*, 2007.

Nova Scotia already produces barley as a grain crop and hops are known to do well wherever wine grapes can grow.²⁶ To become a locally sustainable industry, the crops to support the brewery would need to be grown in the region, similar to the neighbouring vineyards. If the brewery only occupied less than a quarter of the gypsum shed, it would need a reasonable 12 farms to support the grain for brewing, given they have 70 acres each. At this size, the brewery would be able to support 40 employees on site, not including farmers. This would act as a catalyst for the revival of the economy. The brewery would act as an anchor for the introduction of associated public programs such as a market space, restaurant, events venue etc. and perhaps programs that are not related to the project. The interaction between programs is a main theme that was evident in the case studies and should also be included in the thesis. The integration of recreation is also a theme that will be addressed.

26 Nova Scotia Department Of Agriculture, Research & Analytics, *Census Of Agriculture Profile*, 2011, 2.

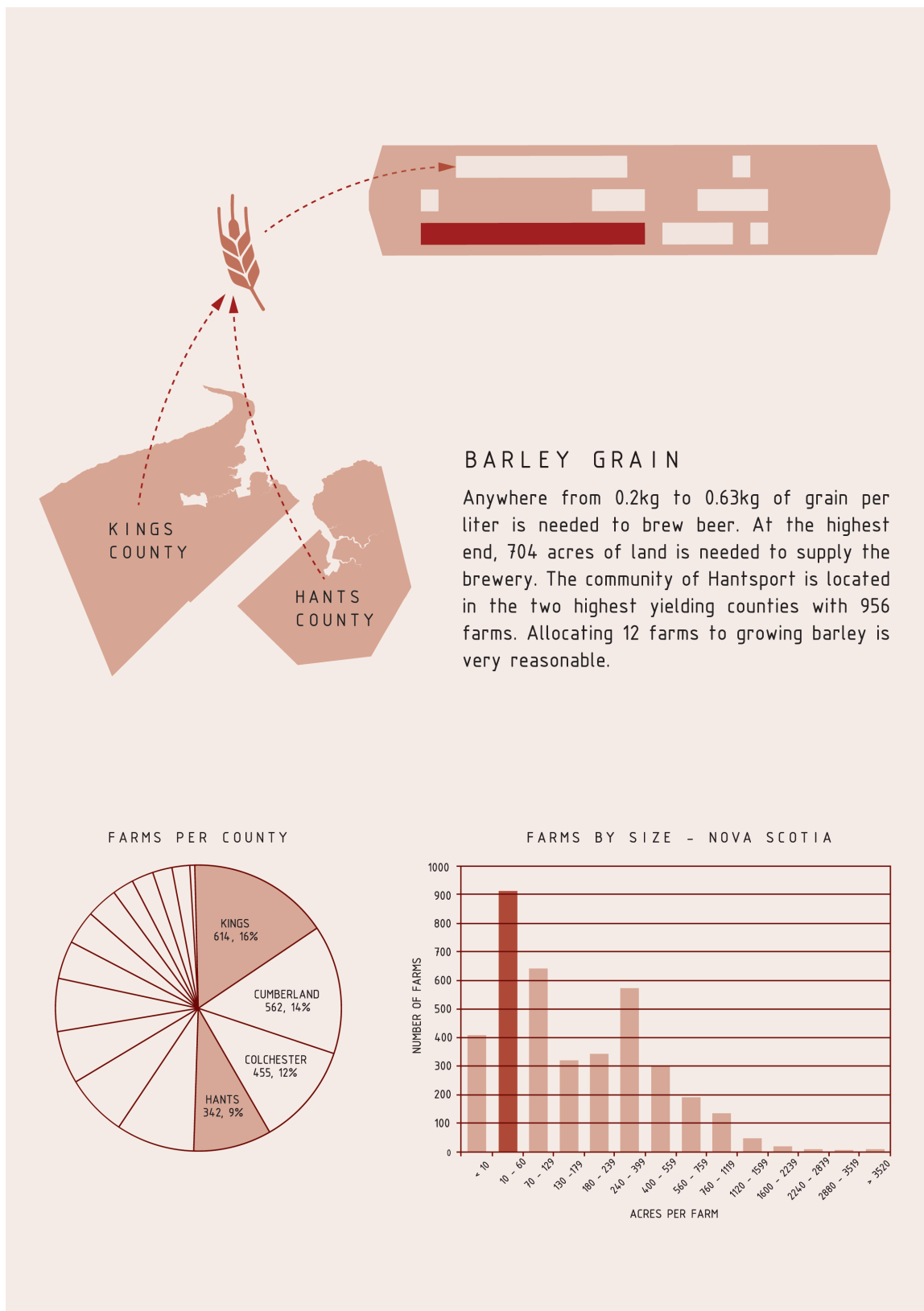


Figure 45: Data showing the farms in the region and potential for barley production; from Nova Scotia Department Of Agriculture, Research & Analytics, *Census Of Agriculture Profile*, 2011.

CHAPTER 4: DESIGN

Urban Strategy

The introduction of the railroad in 1869 was a necessity at the time for the operation of the town's industries and as a passenger train. It cuts straight down the middle of the town, dividing it into two halves. In the past, this was not an issue since the waterfront businesses were locally owned and at a scale that still invited the public to interact with the shoreline. It was a great spectacle to see the ships be launched into the basin. As the industries changed and developed over the years, more and more of the waterfront was becoming inaccessible to the town's people. The once-beneficial railroad now acted as a border between the industrial and residential zones, with everything between the tracks and the water now designated off-limits to the public.

Although there have been negative impacts from the railroad running down the middle of the town, it also means that its strategic placement makes it accessible to everyone in the town within a few minutes walk or bike ride. This could be seen as the most effective way to engage with the town and draw the public back to the waterfront via the railroad. The tracks currently terminate at the storage shed and would be the perfect method of arrival to the new brewery market. The new urban strategy would adapt the railroad to a public pathway similar to many other "rails to trails" plans throughout Nova Scotia.

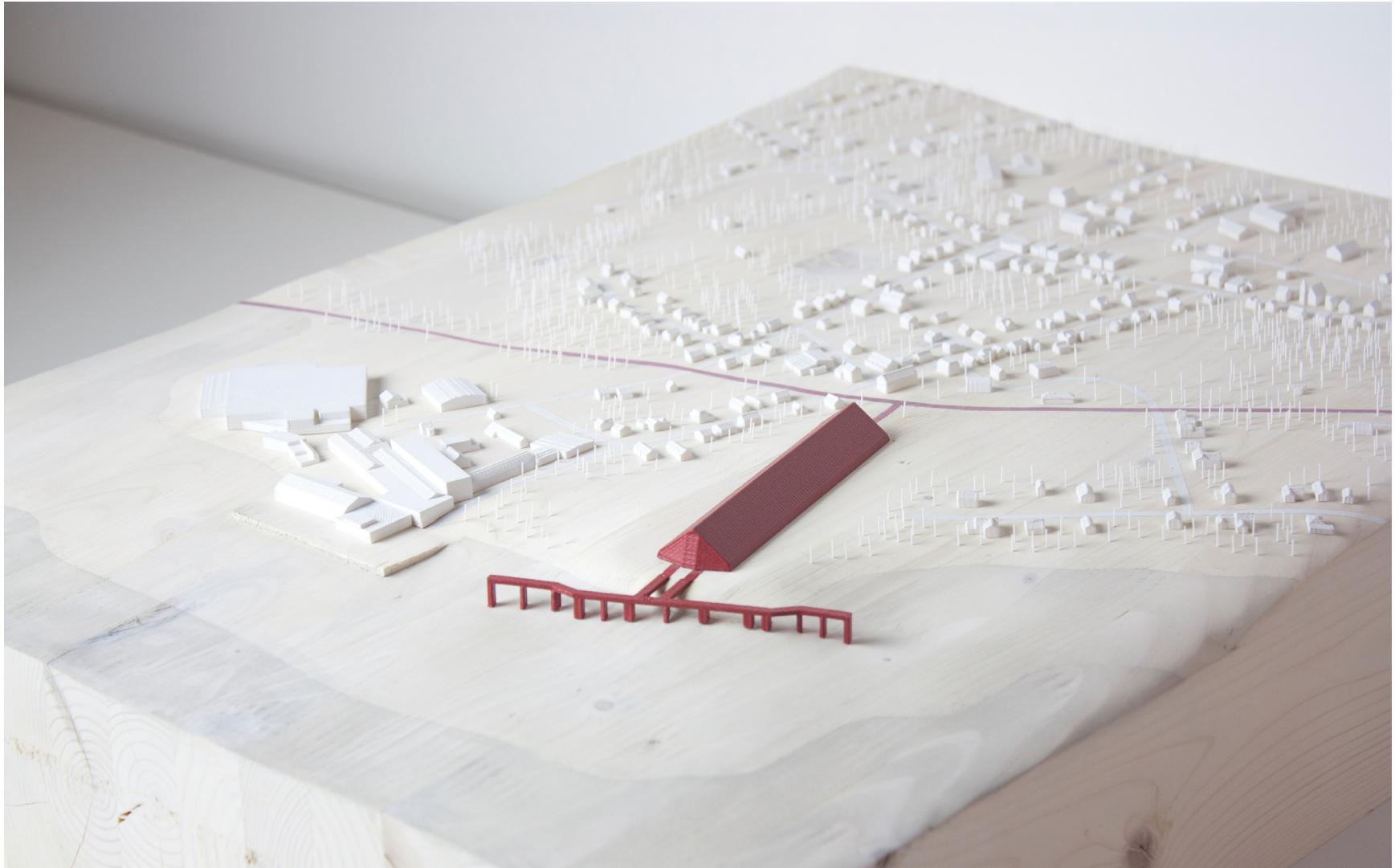


Figure 46: Site model of Hantsport shows gypsum shed, pier and railroad in red.

The new pathway will act as a mechanism to connect the town back to the waterfront, with the brewery market acting as the threshold between the two. The railroad that once divided the town will now stitch the urban fabric back together and serve as a public amenity. The section of track that is abandoned would be converted, as it already extends past

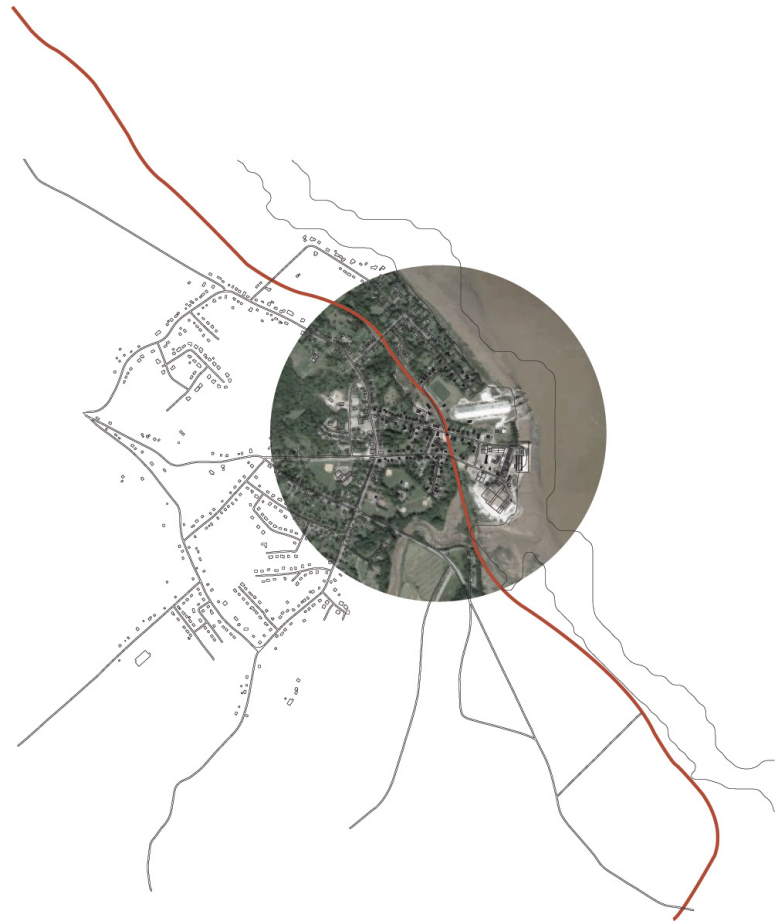


Figure 47: Map showing railraod converted to walkign trail; from Google Maps 2018.

the town limits and runs along the shoreline for many kilometres. It would make for a great walking trail both for residents and for visitors wanting to experience both the Fundy coastline and the agricultural landscape.

- PUBLIC SPACE
- RESIDENTIAL
- INSTITUTIONAL
- INDUSTRY
- INDUSTRIAL ZONE
- RAIL LINE
- PUBLIC TRAIL
- PUBLIC/INDUSTRY

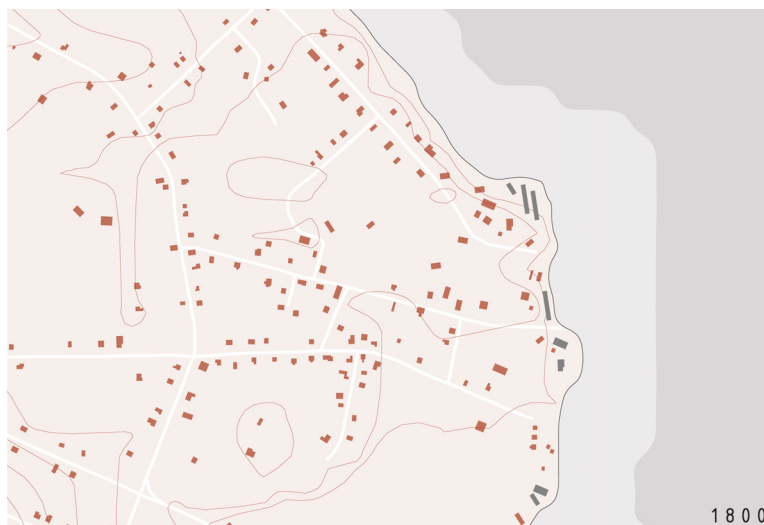


Figure 48: Hantsport prior to zoning.



Figure 49: Current day industrial zone cutting off waterfront.



Figure 50: Potential development with public pathway.



Figure 51: Perspective from the public pathway looking toward the brewery market.

Design Strategy

Looking at the existing infrastructure on site, the three main components that will be adapted are the over-arching structure, the underground tunnels and the ship pier. Once I identified those major components to be conserved, I was able to create a series of guidelines that translated to design strategies.

1. CIRCULATION TUNNELS

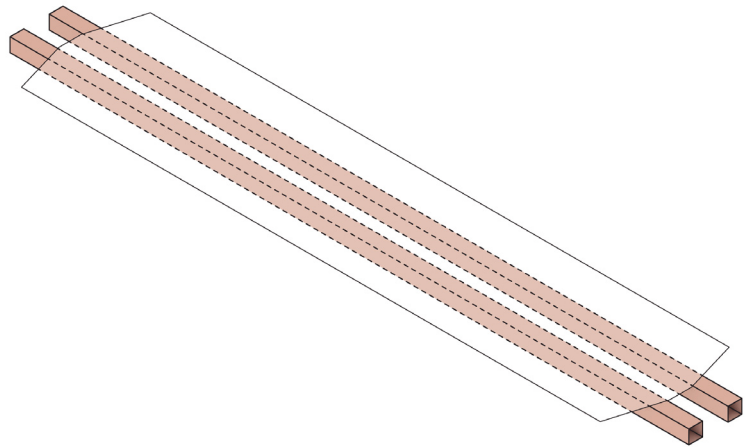


Figure 52: Tunnels act as building's circulation

The first design strategy is to adapt the conveyor tunnels to the main axis of circulation through the building. The tunnels would connect directly to the public trail running through the town and extend directly to the water, giving people 24/7 access to the waterfront and the Fundy tides. People will be able to enter the circulation tunnels and choose to climb up into the brewery market to enjoy the diverse activities or bypass the building and go straight through to the water. An important thing to add is that the tunnels act as an entrance to the brewery market but are also an extension of the walking trail and the main access to the shoreline, meaning it should be accessible to everyone at all times of day and night.

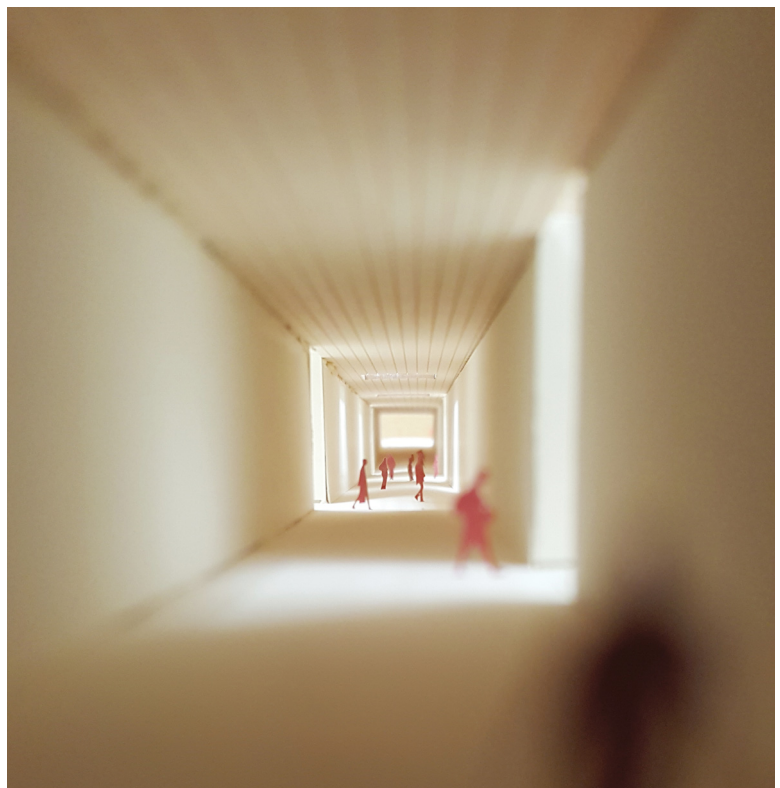
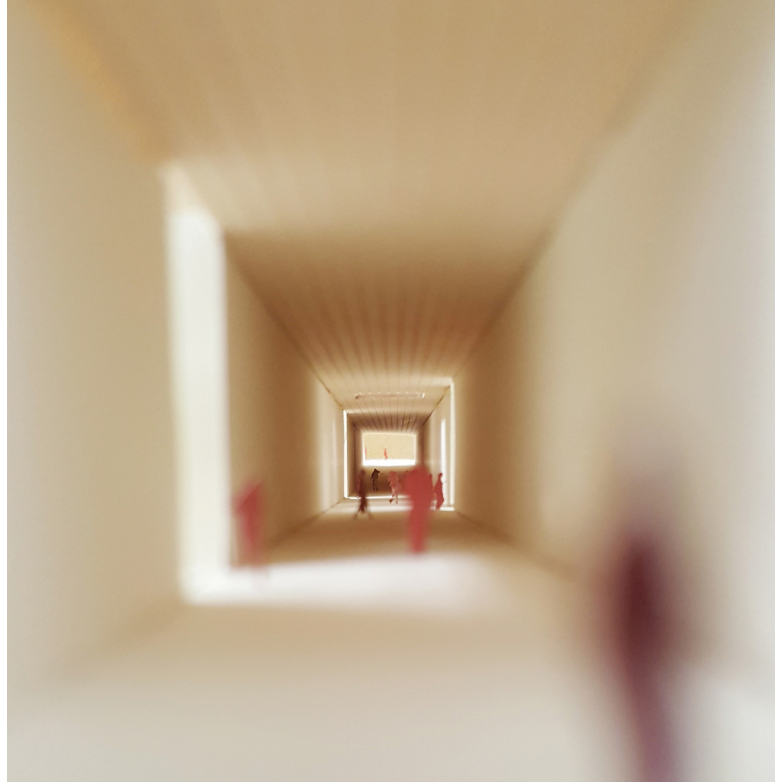


Figure 53: Both circulation tunnels looking toward public plaza. Stairwells and lightwells illuminate the space.

2. DIVIDE SPACE

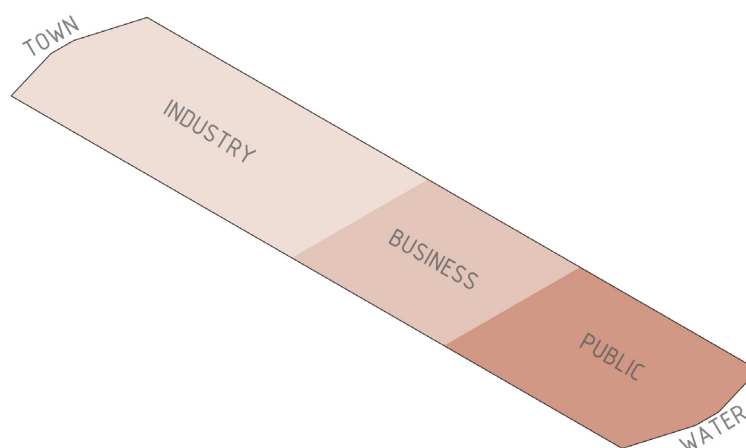


Figure 54: The interior space divided into programmatic zones.

The building footprint will be divided up into three general zones: Industrial, business and public. These zones are not physically divided, only conceptually, to later be able to organize where programs will be placed. The industrial zone is the end closest to the town, while the public zone is on the waterfront. This is the reverse of what we historically see in the area. This reversal can be seen as a way of giving the industry back to the town and encouraging the public to interact with it as they wander to the public programs closer to the water. This zone will hold the brewery, the greenhouse and a small information centre. The business zone is the melding of both industry and public; It will hold programs that have a connection to the brewery and greenhouse, such as a restaurant, and programs that are directed towards tourism, such as boutique shops and accommodations. The public zone will hold a large, flexible space that can be used as a farmers market, a venue space for concerts or even for walk-in movie showings. The space extends out to the water and give will visitors the chance to experience the world's highest tides.

3 . INSERT PROGRAM

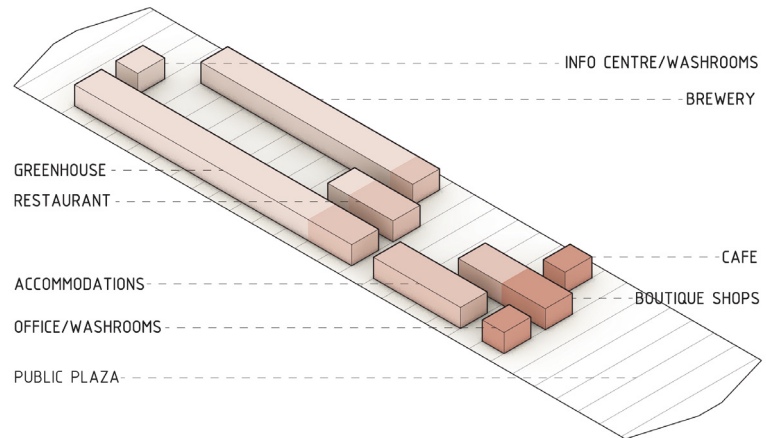


Figure 55: Building blocks placed according to program.

4 . REACT TO NEEDS

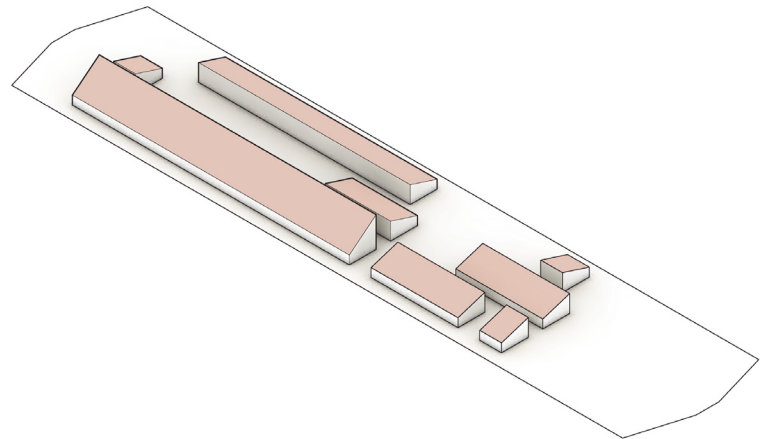


Figure 56: Roofs slope depending on program requirements.

Using the existing grid of the overarching structure, program blocks are inserted into the three zones based on activity. Certain programs overlap between zones because they share attributes of both. For instance, the brewery is industrial but the portion that overlaps into the business zone is a taproom for people to come and try the beer they have to offer. The boutique shops overlap the business and public zone because, by nature, the stores are opened up for people to purchase goods but also invite visitors to wander about just to look. The accommodations, on the other hand,

stay within the business zone since anyone can rent a room, but guests require a higher level of privacy. Programs are located on either side of the main circulation to maintain a visual connection through the warehouse structure, also allowing for various sized spaces between buildings to accommodate a diversity of activities.

The roof angles are then adjusted based on programmatic requirements but also so they do not interfere with the overarching structure. Buildings placed on the outer sides of the circulation tunnels have a roof slope that follows the directions of the structure. The buildings placed in between the circulation have roof slopes that are facing in both directions to create a more interesting relationship between building masses. In the case of the greenhouse that will be growing hops for the brewery, it requires a much higher ceiling height than other programs. The hop plants grow to be 20ft tall or more, so making the roof angle parallel to that of the large structure allows for the highest possible ceilings.

5. PUNCTURE TUNNELS

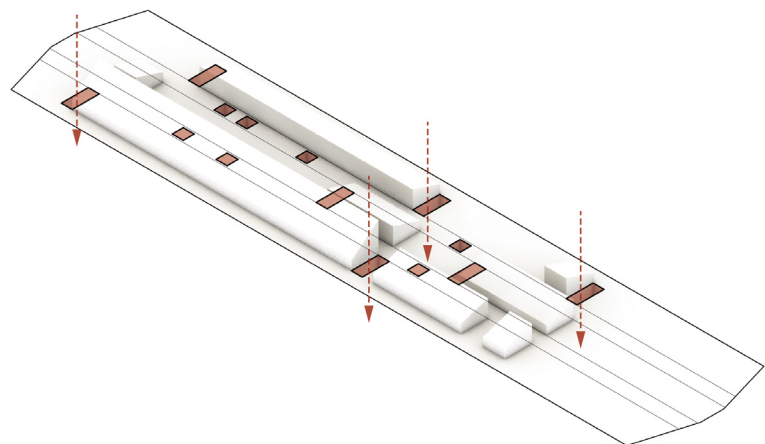


Figure 57: Punctures in circulation.

Since the circulation tunnels are below ground, getting light down to the space needs to be considered. The hopper fun-

nels that line the top would be removed and replaced with a floor slab to allow people to walk on the main level, but selectively leaving some of the hopper holes open would create a series of light wells. The light wells need to be placed in long sections of the slab that are in more open areas to allow people the room to walk around them since they will be uncovered and have a glass railing not to obstruct any daylight or direct sunlight from entering into the lower level.

Movement between the tunnels and upper level will be achieved with a series of cuts on either side of the tunnels to maintain a direct visual connection through the building, similar to the circulation above. The cuts are adjacent to the buildings above and follow the same structural grid. The stairwells will also bring a large amount of light down to the lower level.

6. BRIDGE PROGRAMS

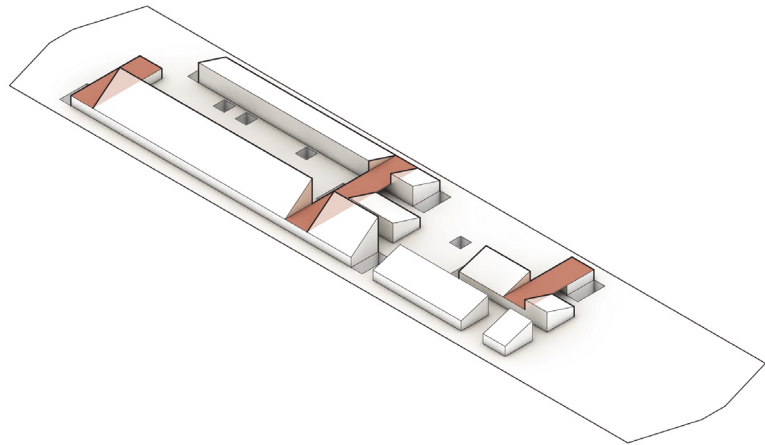


Figure 58: Bridges span between connected programs.

Connections between programs are made physical by adding a third level of bridges that span over the main circulation that are accessible by the same stairwells that lead you to the lower tunnels. In doing so, it introduces an op-

portunity for rest spaces such as lounge areas and patio dining for the restaurant and the cafe. the first connection is between the greenhouse and the information centre, as the centre is meant to inform people of the history of Hantsport and its previous industries. The second connection is made between the brewery, the restaurant and the greenhouse because the brewery will supply the restaurant with craft beer, while the greenhouse will also provide it with freshly grown vegetables and greens. The last connection is made between the cafe and the boutique shops as they will share similar clientele and some shops such as a bookstore lend themselves nicely to reading while sipping a cup of coffee.

7. DROP PUBLIC PLAZA

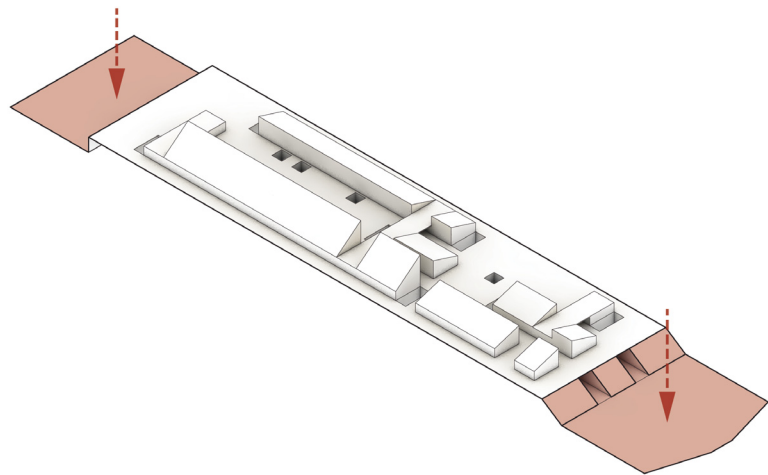


Figure 59: Dropping the entrance and plaza.

By dropping the entrance and the public plaza, they sit in a better position to allow for people to easily move between levels on either end of the building. The dropped down plaza can now act as an amphitheatre directed towards the waterfront and can host a multitude of events. With generous steps leading into the plaza with integrated seating, a person can eat their lunch or enjoy a concert.



Figure 60: Walkway approaching the brewery market.

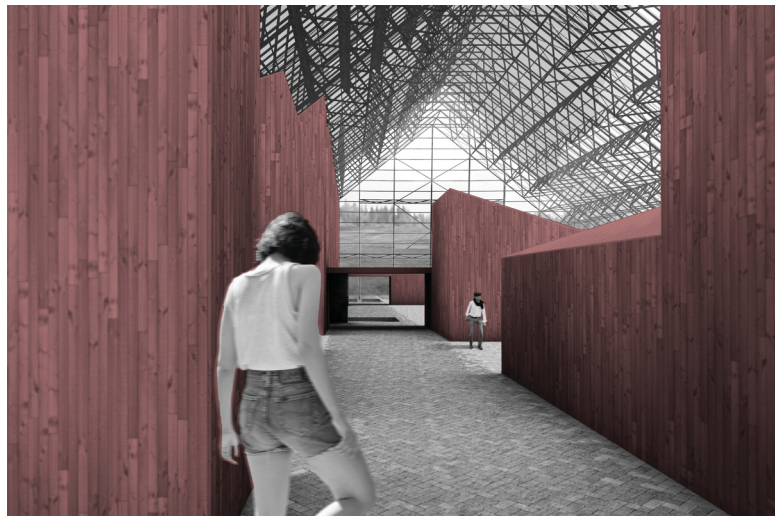


Figure 61: The vast interior space.



Figure 62: The gypsum pier tidal walk.

8. PUNCTURE CLADDING

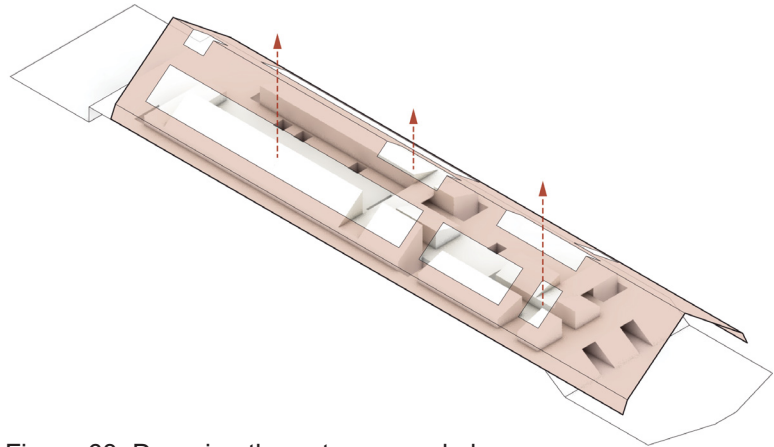


Figure 63: Dropping the entrance and plaza.

Finally, replacing the existing corrugated steel cladding with a translucent corrugated material will allow for a nice, evenly lit interior space. The cladding will be punctured and glazed wherever there is a building underneath to create a juxtaposition between space and void, while also bringing in direct sunlight, especially on the south side to help the greenhouse produce crops. Both ends will be kept open in keeping with the concept of visually connecting the length of the building. One structural bay in from the ends will be glazed with large curtain walls, making for an exposed bay on each end as a threshold condition of entering under the behemoth structure. The entire length of the ground level of the building will have large upward bi-folding doors that will allow for a seamless walk from inside to outside and vice versa at any point in the building. This will give the interior space the feeling of being an extension of the outdoors, with the overarching structure acting as a protective canopy. Throughout the year, the outer skin will open and close, breathing with the seasons, but will always be open for residents and visitors.

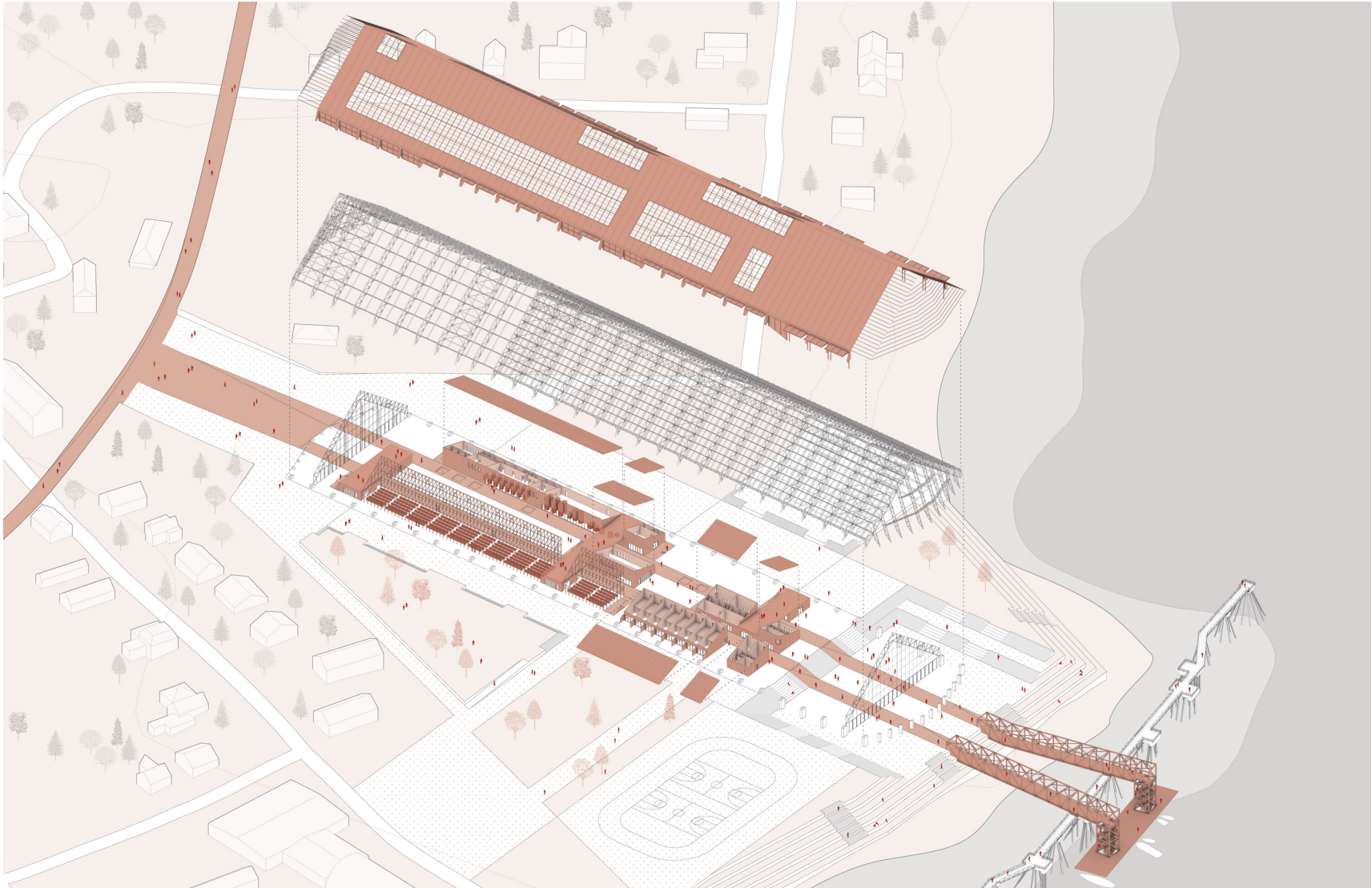


Figure 64: Exploded axonometric showing the proposed design components in red.

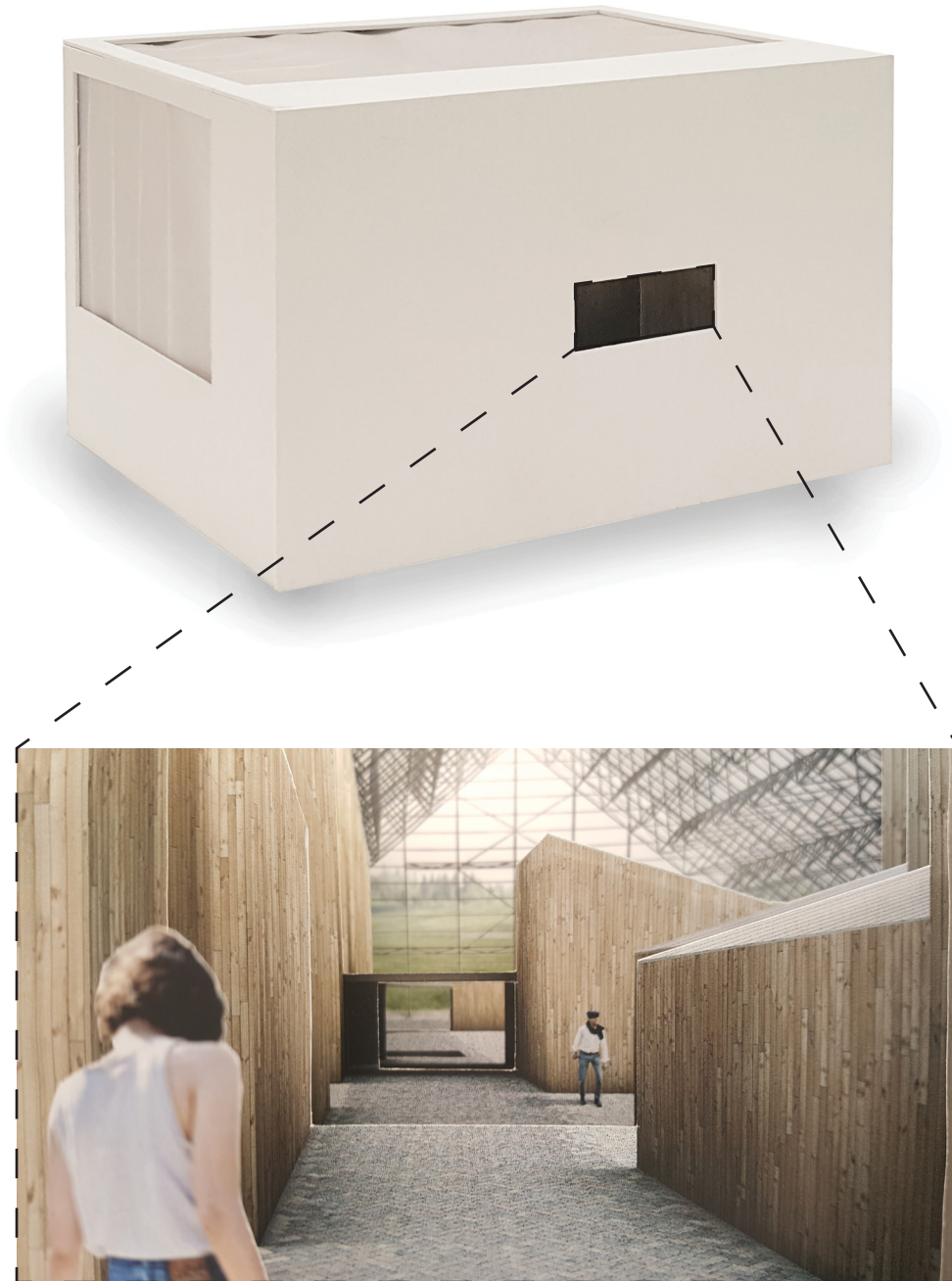


Figure 65: A diorama exercise in imagining spacial and atmospheric qualities.

Program

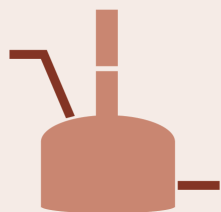
Brewery

In the last decade, we have seen the emergence of a craft brewery culture. People are now interested in assorted beers more than ever. Microbreweries are popping up yearly around Nova Scotia, and around the world, and it does not look like people are getting tired of trying craft beers. Hantsport is luckily located between the two most fertile counties in the province, offering the potential for growing local barley to use in the brewing of beer. This idea is not foreign to the region since there are 19 vineyards within a 50km radius of the site, who all grow their grapes on site and produce some of Canada's best wine.

Taking precedence from the region's deep-rooted agriculture industry and in this economic climate of craft beer, a brewery will be the new industry introduced to the gypsum storage shed in Hantsport. The brewery will be self-sustainable, meaning that it will grow its own barley in the region, grow its own hops on site and will serve beer on site along with exporting it to the rest of Nova Scotia. Ownership will be kept within the town, to directly benefit the local economy and the town's development, rather than depending on multinational corporations. The brewery building is located on the north side of the industrial zone within the overarching structure and has an 11,000 sqft footprint. The square footage would accommodate a 40 bbl brewing system. Barrel or bbl is the unit of measurement when brewing a batch of beer: 1 bbl is equivalent to 159 litres. This means that the system would produce around 6,360 litres per batch. Generally, one batch will be brewed every day and the output of the brewery would put it in the "regional craft brewery" category, mean-

BREWERY SIZE CATEGORIES

Nanobrewery	Produces less than 3 000 BBL/year
Microbrewery	Produces 3 000 - 15 000 BBL/year
Regional Craftbrewery	Produces 15 000 - 6 000 000 BBL/year
Large Brewery	Produces over 6 000 000 BBL/year



40 BBL brew system to be used, producing an average of 45 000 liters of beer per week.



Around 2 250 000 liters will be produced per year.
= 4 755 000 Pints



Size of brewery is measured in BBL (Barrels) produced per year. 1 BBL equals approx 117 liters.
= 19 230 BBL



11 000 SQ-FT BREWERY

BREWERY EXPERIENCE

Taking Precedence from the deep rooted history of locally crafted wine and agricultural goods, the brewery will serve as the towns main industry but will attract visitors and tourists interested in the drink culture of the region. There will be a taproom and visitor brewing space, to give people the chance to make their own beer.

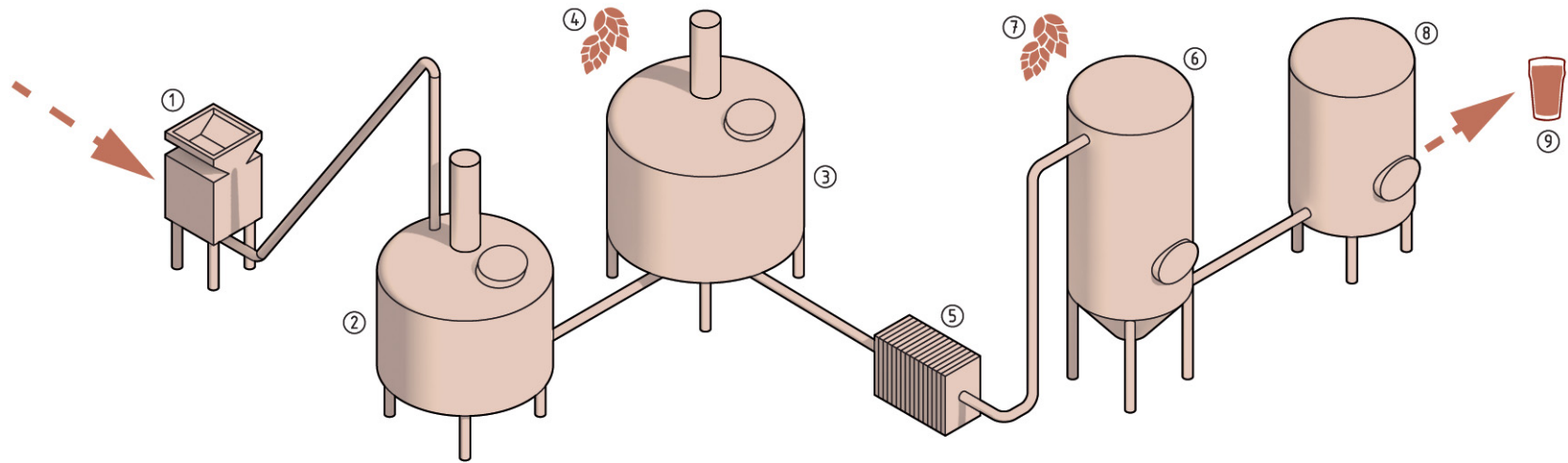
Figure 66: Data showing the farms in the region and potential for barley production; from Nova Scotia Department Of Agriculture, Research & Analytics, *Census Of Agriculture Profile*, 2011.

ing it produces between 15,000 and 6,000,000 bbl per year. A brewery of this size is appropriate for Hantsport since it is large enough to create many new jobs for residents, yet small enough to supply within Nova Scotia.

Something that would set apart the Hantsport brewery is the visitor experience. Not only would there be guided tours of both the facility and the hopyard along with the taproom, but people would be given the opportunity to brew their own small batch of beer. The visitor brewing stations would allow small groups to spend the day learning about the beer making process, where the ingredients are sourced and have the opportunity to experiment and make their preferred style of beer, along with creating their own labels to place on their bottles. The beer would be stored at the brewery to allow the fermentation process to occur and the group would be able to pick it up or have it delivered when it is bottled. The brewing experience would be great for parties, work-related events or even just a group of friends that want a fun activity to do over the weekend. The Hantsport brewery would also pair with the restaurant and provide catering services and be able to host events from weddings to drink festivals.



Figure 67: Brewery building.



1 MILLING

Barley and other grains are milled for easier extraction of the starches. Starch is the main source of sugar needed to produce alcohol.

2 MASHING

The crushed barley is mixed with hot water to create a wet cereal like mixture. Soaking the grains allows the sugars to be extracted to the liquid. The mash is then strained to separate the liquid.

3 BOILING

The strained liquid known as wort is the soon to be beer. The wort is boiled for 60-90 mins.

4 HOPPING

During the boiling of the wort, hops are added depending on the style of beer. Hops add bittering flavors and aromas.

5 COOLING

The wort passes through a chiller to be quickly cooled to avoid any unwanted bacteria to form. Any foreign bacteria would result in a bad batch of beer.

6 FERMENTATION

The wort is transferred to a fermentation tank where it is mixed with yeast. Over the next 1-3 weeks the sugars will be turned to alcohol.

7 DRY-HOPPING

Depending on the style of beer being made, hops can be added during fermentation. Known as dry-hopping, it further adds specific flavor and aroma.

8 MATURING

The beer will be kept in aging tanks or barrels to allow the flavor to further develop over the course of weeks or sometimes years.

9 SERVING

Once ready the beer is carbonated and transferred to kegs, casks or bottles and can now be served.

Figure 68: Diagram explaining the process of brewing beer.

Gypsum Tide Brewing

As an exercise for the development of the brewery, I took inspiration from the site and created the brand for the new Hantsport industry. The brewery takes its name from the two major existing elements, the gypsum and the tides, to form the Gypsum Tide Brewing Company. The logo is inspired by the unmistakable and locally iconic gypsum pier. This symbol is unique enough to be a recognizable logo and act as a tourist attraction for people visiting the town.

As an avid homebrewer, I thought it was appropriate to make a batch of beer, in the same fashion that of the visitor brewing experience that the brewery would offer, and also create the label design for the bottles. The colour scheme is directly inspired by both the red colour of the Fundy Bay mud that is seen during low tide along with the off-white tint of the gypsum stone. The graphic on the label is a scene of the iconic sprawled legged pier during low tide, something that will be a recognizable view for tourists and locals when visiting Hantsport. The label is a way of reminding people of Hantsport's rich industrial history.



Figure 69: Initial logo sketch.

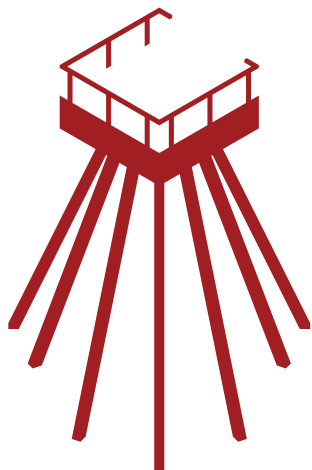


Figure 70: Final Gypsum Tide Brewing logo.



Figure 71: Hat with logo

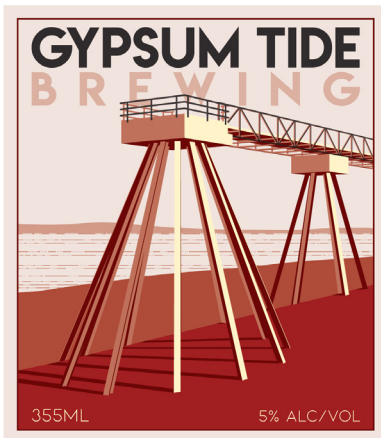


Figure 72: Gypsum Tide label.



Figure 73: Beer bottle with Gypsum Tide label.

Greenhouse

The brewery will use a greenhouse on site to grow a variety of hops that will be used in the brewing process. The greenhouse building is a total of 14,200sqft, with 10,900sqft dedicated to the growing of hop vines, and 3,300sqft dedicated to growing greens and vegetables for the restaurant. The greenhouse will use a hydroponic system to grow plants all year round, with the use of “bato” buckets that each hold a single plant and have irrigation lines connecting them. The advantage of being able to grow hops on site is that the cones which are used in beer will be freshly harvested before brewing. This technique of using fresh hops is known as “wet hopping” when the cones have been harvested within 24 hours before being added to the beer. Most breweries use dried hop pellets sourced from different locations, but the benefit of using wet hops is the desired fresh flavor it adds to a beer.

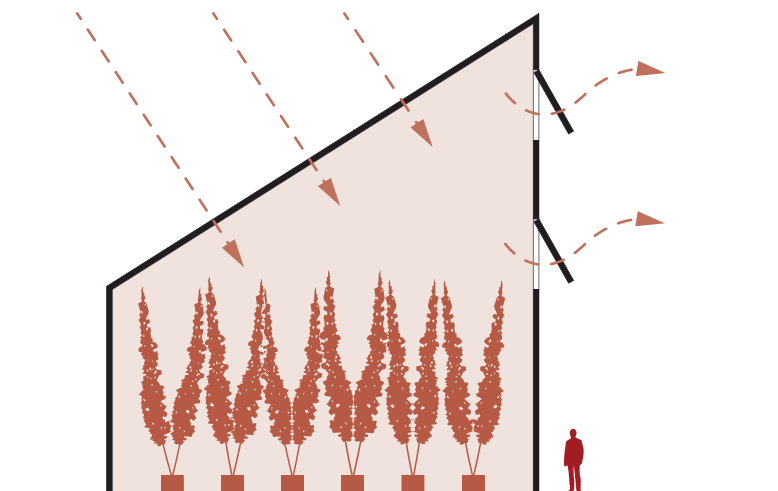


Figure 74: Cross section of greenhouse building with hopyard.

Similarly to grapes, hops are part of the vine plant family and are traditionally farm grown in long rows and require lots of space. Hops are the cone-shaped buds that grow on the vine plant and have special oils that give bittering flavors

and aroma to the beer.²⁷ The vines grow to be over 20ft tall in some cases, so they are generally spaced out to fit 1,200 plants per acre of land. A great benefit of using a hydroponic system is how densely the plants are able to be grown, around 2,000 plants per 5,000sqft of greenhouse space.²⁸ With the greenhouse space dedicated to hop growing, there is room enough to fit 4,360 plants.

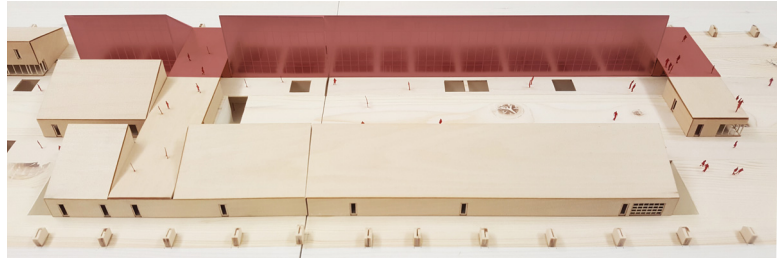
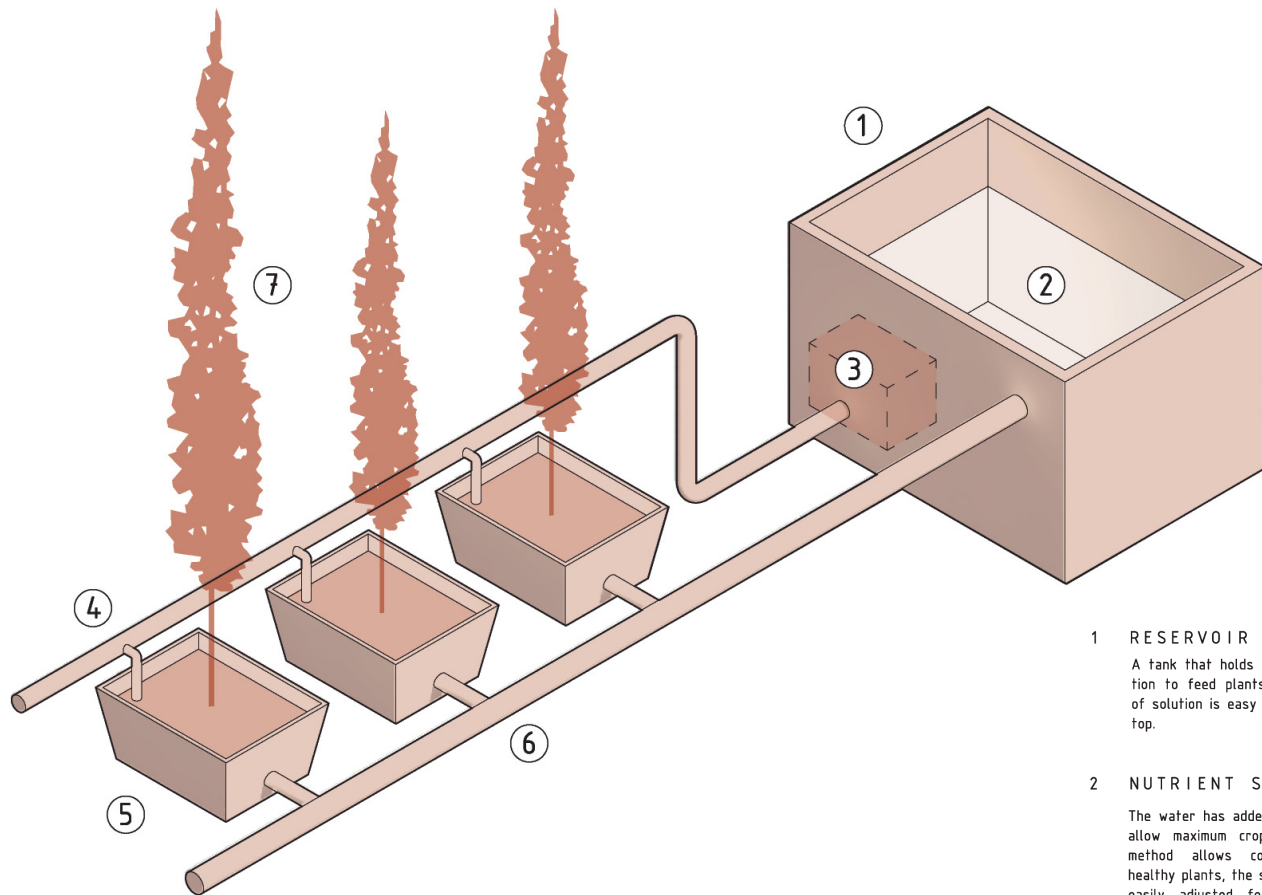


Figure 75: Greenhouse building.

27 John J. Palmer, *How To Brew: Everything You Need To Know To Brew Beer Right The First Time* (Colorado; Brewers Publications, 2006), 41.

28 Jonathan Shikes, "City Star Will Tap First Commercial Beer Made With Hydroponically Grown Hops," *Westword*, August 20, 2015, <http://www.westword.com/restaurants/city-star-will-tap-first-commercial-beer-made-with-hydroponically-grown-hops-7051367>.



- | | |
|---|---|
| <p>1 RESERVOIR
A tank that holds nutrient solution to feed plants. Management of solution is easy with the open top.</p> <p>2 NUTRIENT SOLUTION
The water has added nutrients to allow maximum crop yields. This method allows consistent and healthy plants, the solution can be easily adjusted for the plants needs</p> <p>3 PUMP
Pushes nutrient solution from the reservoir to the buckets.</p> | <p>4 IRRIGATION LINE
The pumped solution is brought to each bucket and passes through a drip emitter.</p> <p>5 BATO BUCKET
The bucket is filled with perlite, a sand like mixture, with good air and water holding capacity.</p> <p>6 RETURN LINE
When the solution level in the bucket is too high, the excess escapes and cycled back to the reservoir.</p> <p>7 HOP PLANTS
A vine plant that produces buds that are used in the brewing process. Plants can grow up to 20ft.</p> |
|---|---|

Figure 76: Diagram explaining the hydroponic system for the hopyard.

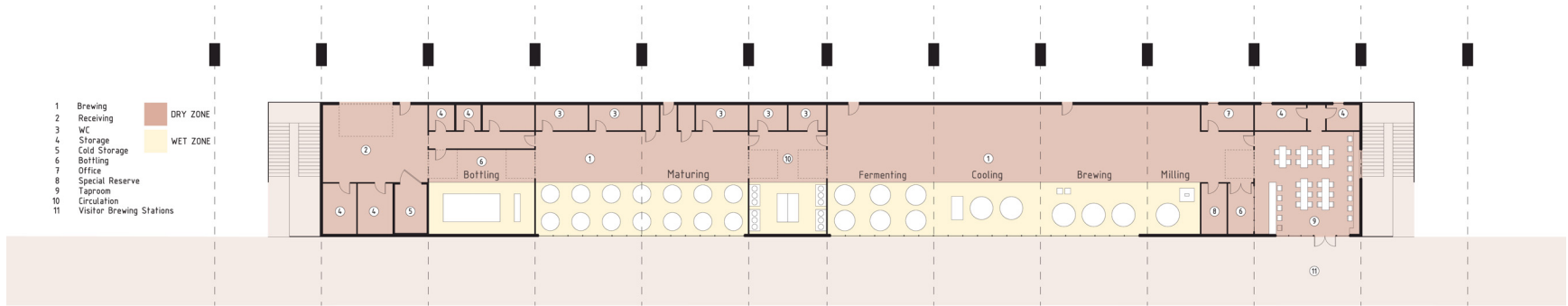


Figure 77: Plan of brewery.

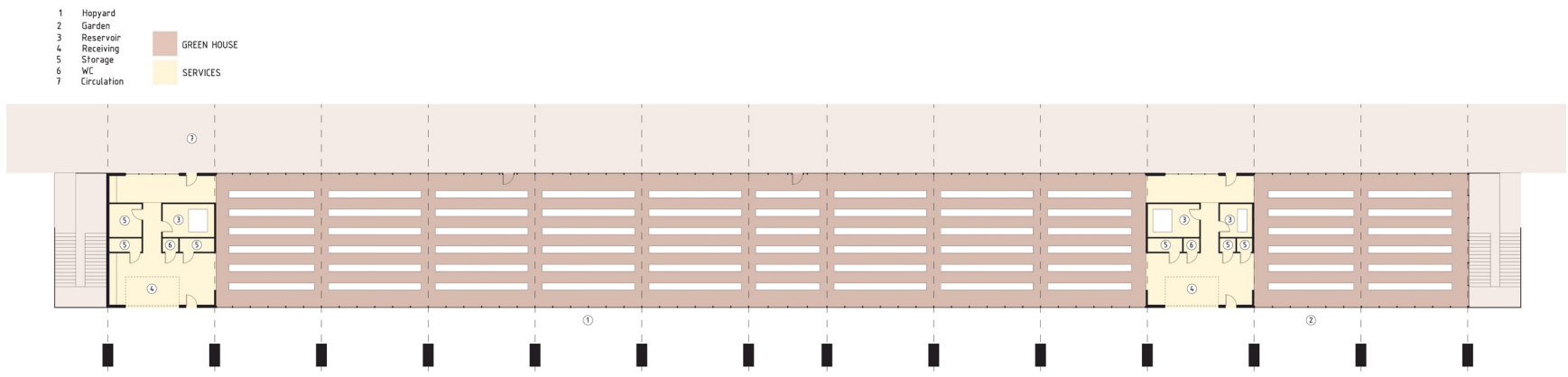


Figure 78: Plan of greenhouse.

Public Programs and Amenities

Bringing people back to the waterfront to experience the post-industrial site is one of the main focuses of the thesis. This will be achieved with the addition of multiple programs that attract tourism and provide recreation for local residents. The inserted public programs are to be interconnected with the proposed industry and consist of a restaurant, 8 boutique shops, hotel accommodations, a cafe, public washrooms, a large plaza and an information centre. The adjacent landscape will be designed to provide multi-use spaces along with a tidal walk component.

Restaurant

The restaurant, capable of seating over 100 people, will source its food locally whenever possible to support local agriculture and small businesses and will serve drinks from the Gypsum Tide Brewery along with vegetables grown from the on-site greenhouse. The dining space is divided up into a mezzanine level, the main level with an extended patio space, along with a patio space on the bridge connecting the brewery and greenhouse. The restaurant is rentable for wedding receptions, business events and festivals. Simple dishes are prepared and supplied to the brewery taproom and the cafe.



Figure 79: Restaurant building.

Hotel

There are accommodations for people who wish to stay overnight. The hotel building is made up of 8 loft-style rooms that can sleep up to 4. The office is located in a smaller detached building that also houses public washrooms. The town currently has no overnight accommodations, and the hotel would give visitors an option to stay.

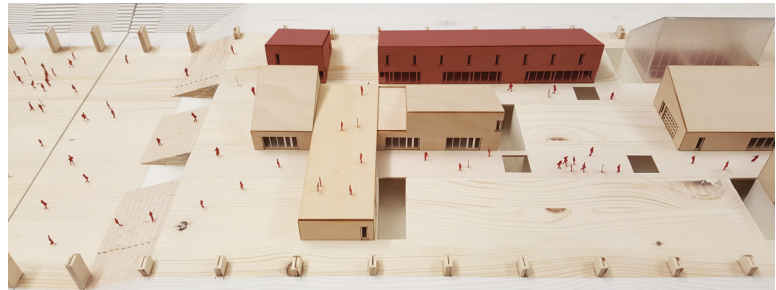


Figure 80: Hotel building.

Boutique Shops

The 8 small shops will attract tourism and be an opportunity for small local businesses to prosper. It is a way of diversifying the town's economy to ensure future development.

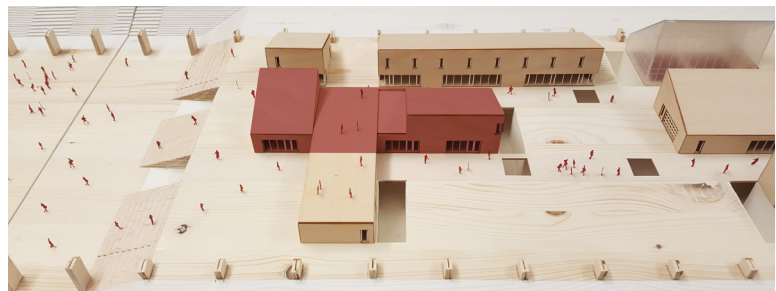


Figure 81: Shops building.

Cafe

A small cafe gives people a place to enjoy a book and coffee on an early morning or a place to hide from the cold with a cup of hot chocolate. The cafe has a connective walkway to the shops that can act as patio space when the weather is warm.

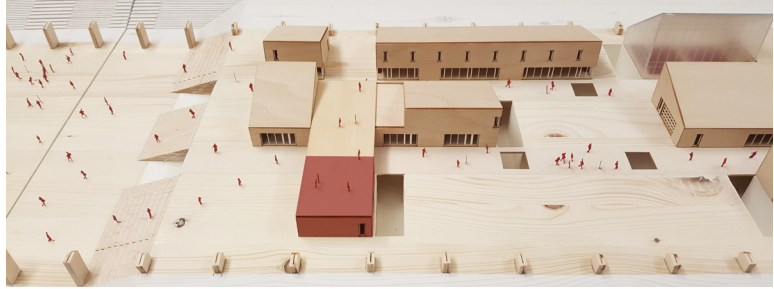


Figure 82: Cafe building.

Information Centre

A small centre where people can get information about the brewery market and other local attractions. People will also be able to learn about the town's rich industrial history. The info centre also houses more public washrooms.



Figure 83: Information Centre.

Public Plaza

The plaza acts as a large flexible space, capable of hosting many activities such as concerts, markets, etc. The circulation tunnels exit onto the plaza and reveal the view of the water and the tidal bridges. The space extends to the outdoors with its generous steps that make the plaza an amphitheatre, perfect for seating.

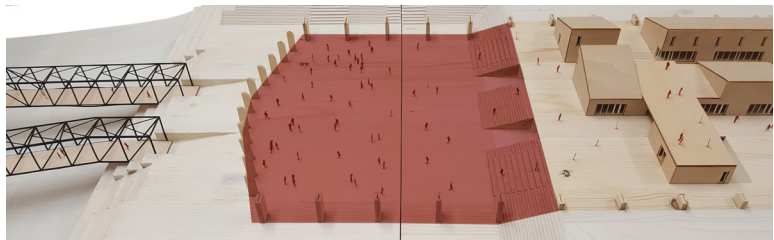


Figure 84: Public plaza.

Tidal Bridges

The conveyor belt arms that exist on site would be removed since they are blocking access to the pier, and would be replaced by two trussed bridges that connect the plaza to the pier. The shape and angle of the tidal bridges are reminiscent of the old stacker arms as they reach over the pier and extend down to the water. There is a large dock that slides along the vertical portion of the tidal bridges, giving people an opportunity to experience the tides from the level of the water. This gives people another perspective along with being able to view the tides from a static viewing platform on the pier. The dock is also used as the community marina where anyone can tie up their boat.

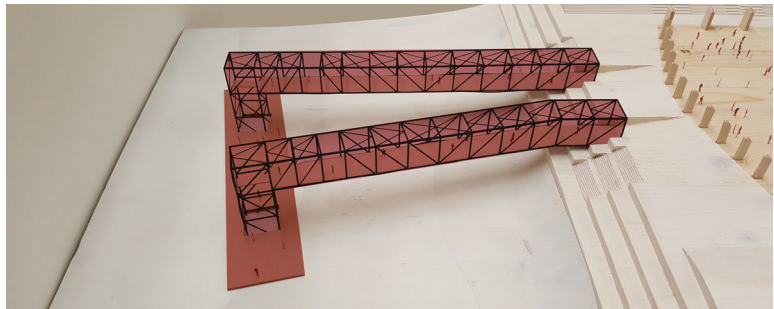


Figure 85: Tidal Bridges with dock, does not show existing pier.

Landscape

The property has many recreational components such as a running track with two basketball courts in the centre that also doubles as a skating rink in the winter. There are 4 volleyball courts that can also be used to play tennis and badminton. The courts are on a raised platform with seating for spectators. There are large terraced steps leading down to the water that gives people a place to lounge and enjoy the ocean breeze. The overall landscape is a combination of hardscape, vegetation and gardens.

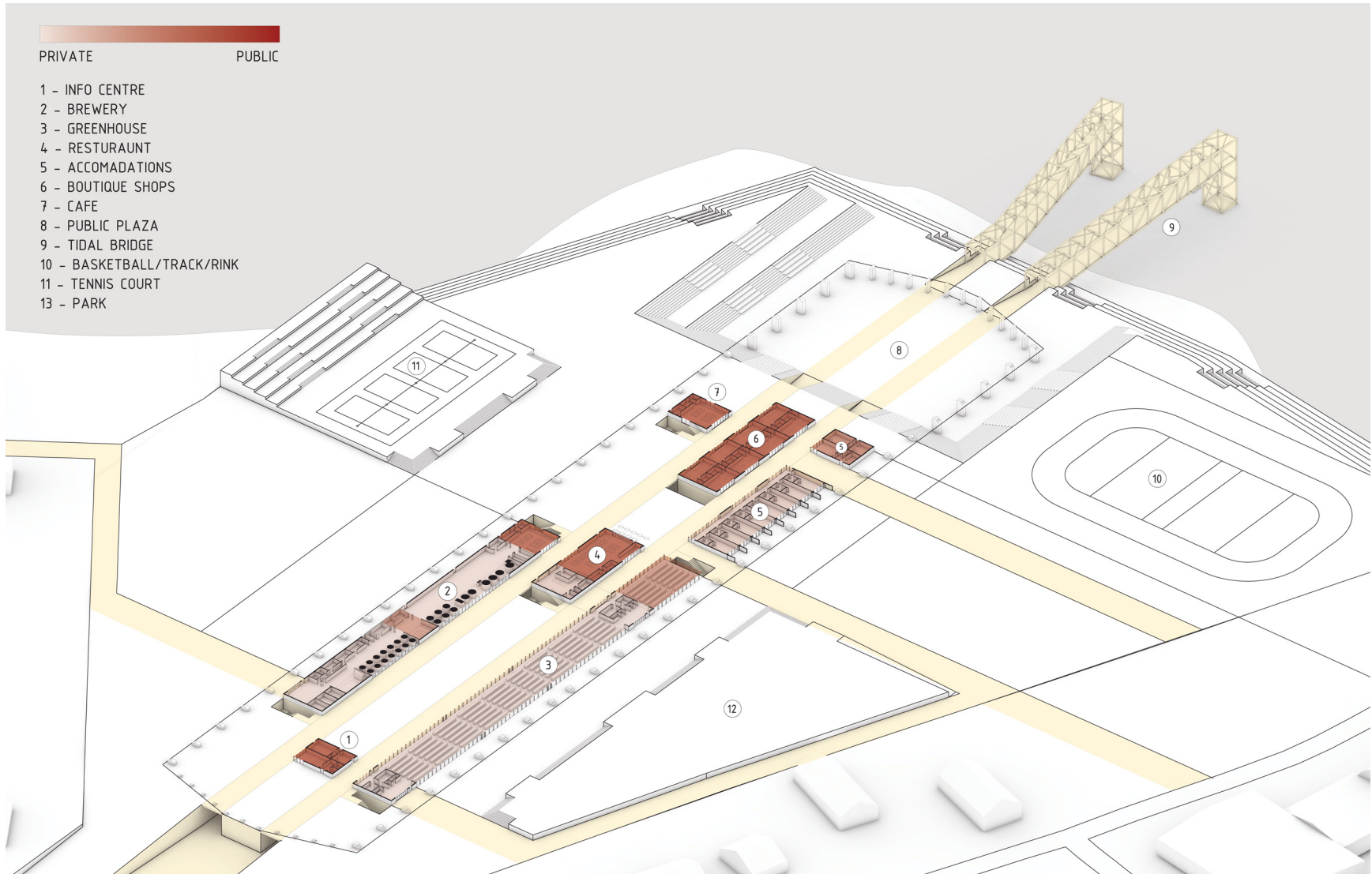


Figure 86: Axonometric showing programs of interior buildings and adjacent landscape.

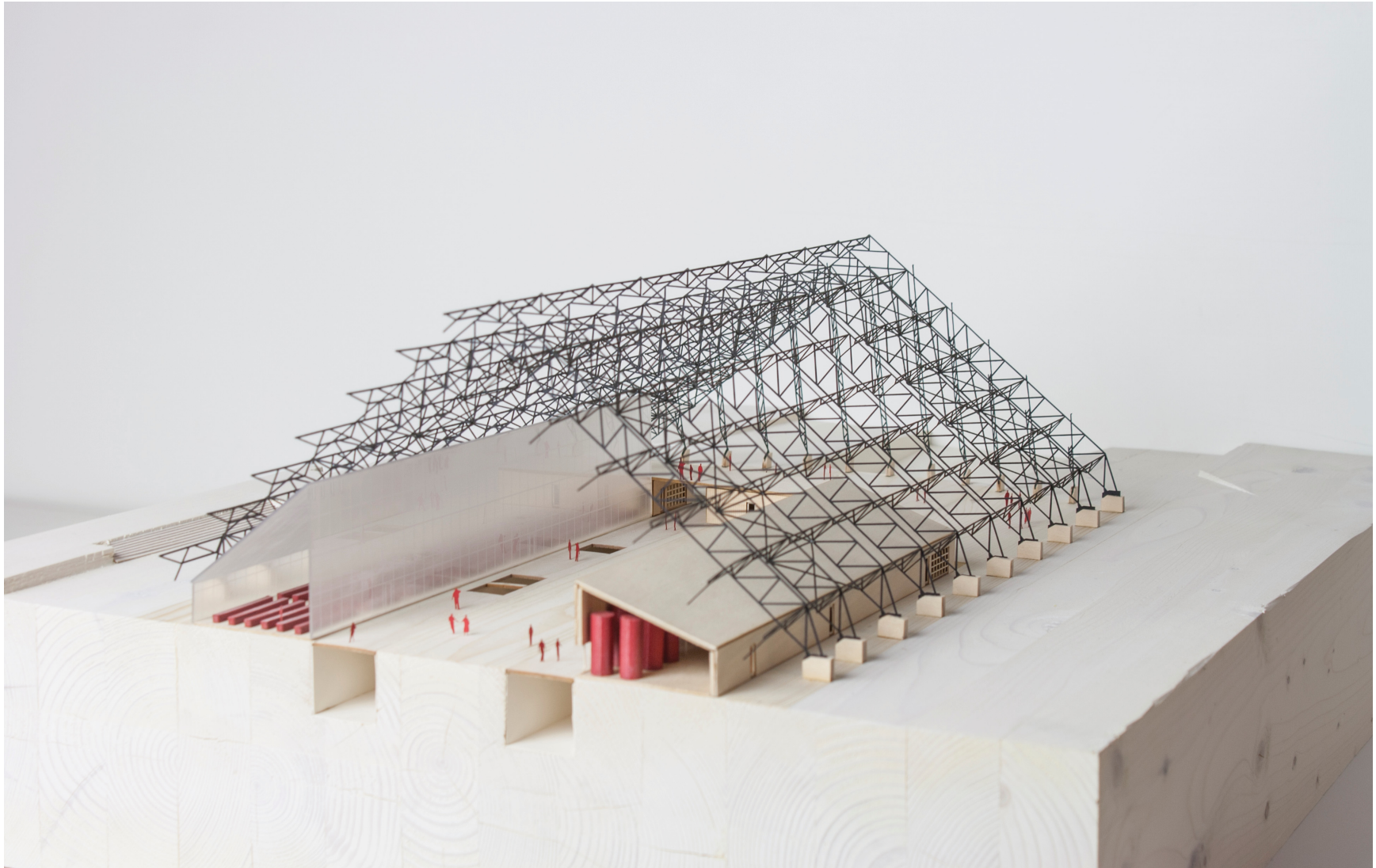


Figure 87: Perspective showing brewery and greenhouse.



Figure 88: Perspective from plaza looking towards public program (without structure).



Figure 89: Perspective from dock looking back to plaza (without structure).



Figure 90: Perspective showing plaza looking out to the water and tidal bridges.

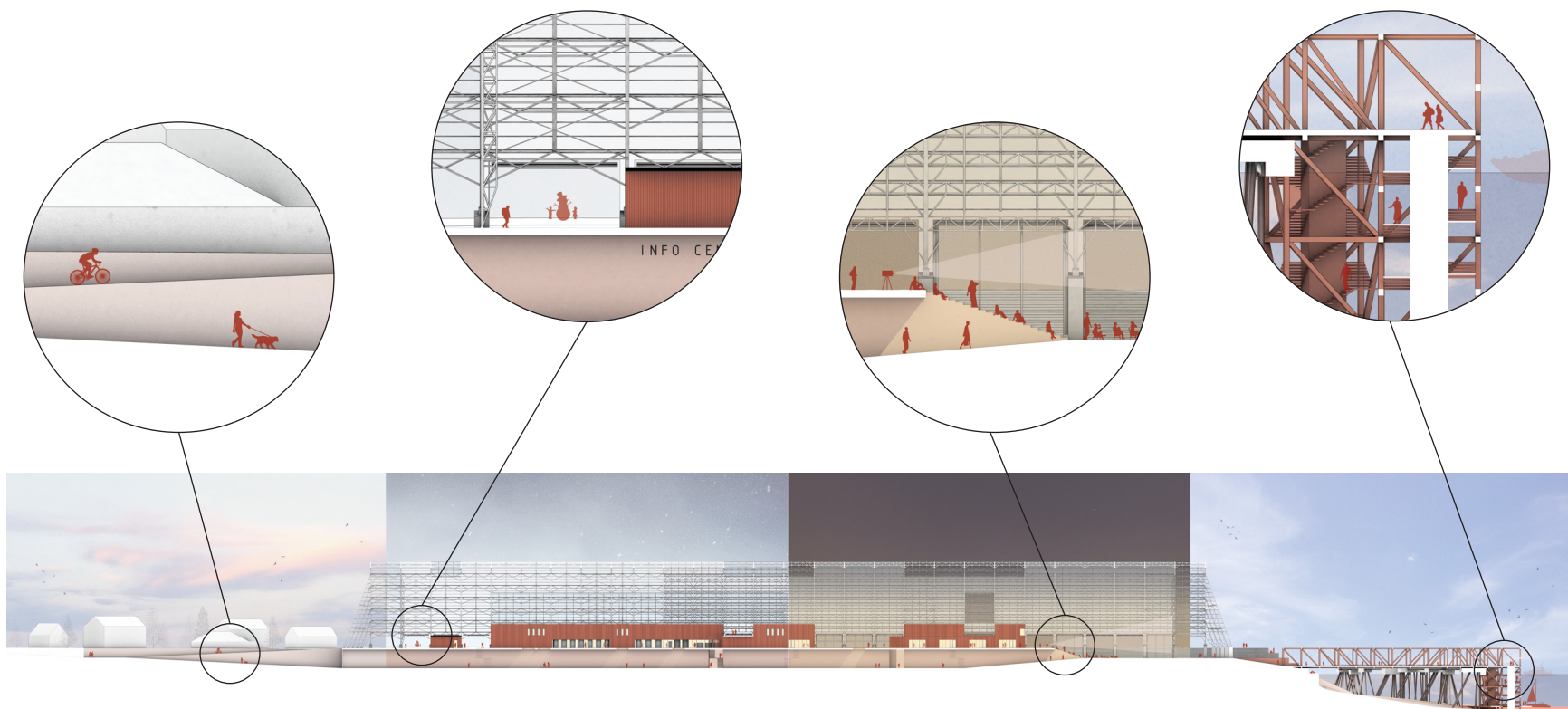


Figure 91: Complete long sections showing seasons and activities.

Seasonal Use

The brewery market is a place that will be used all year round, offering outdoor recreation both in the summer months and winter months. The Interior space can be opened up when the temperature permits and can be made less permeable in the cold to protect the public from the weather. With a diverse list of programs, people will have a reason to visit at any time of day or night, it is a place to go shopping, eat out, have a drink, go see a show, along with many other things. The flexible spaces make it possible to host a multitude of events, adding to the multi-purpose nature of the project.

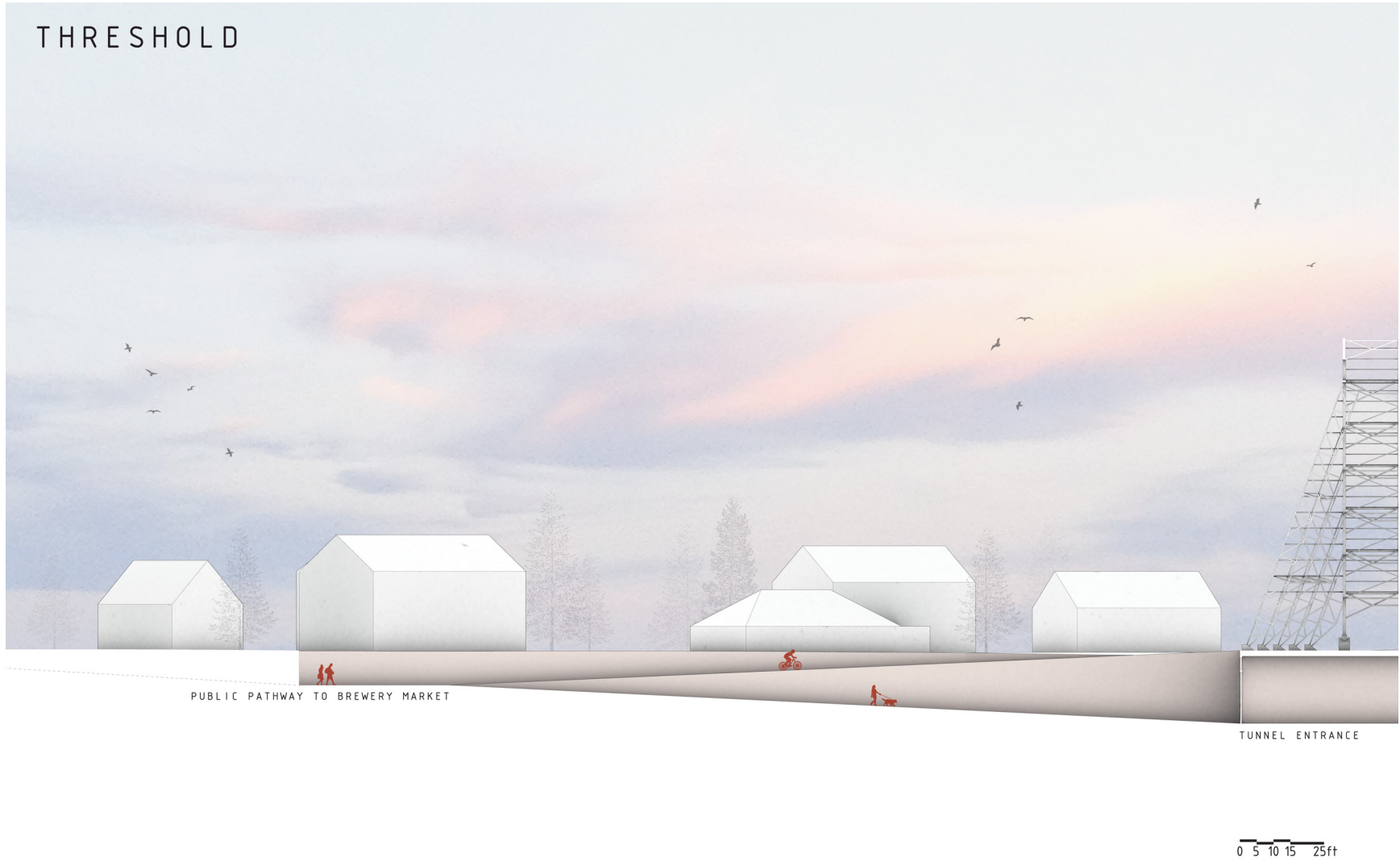


Figure 92: Long section showing the threshold condition of the brewery market in the early morning; 1 of 4.

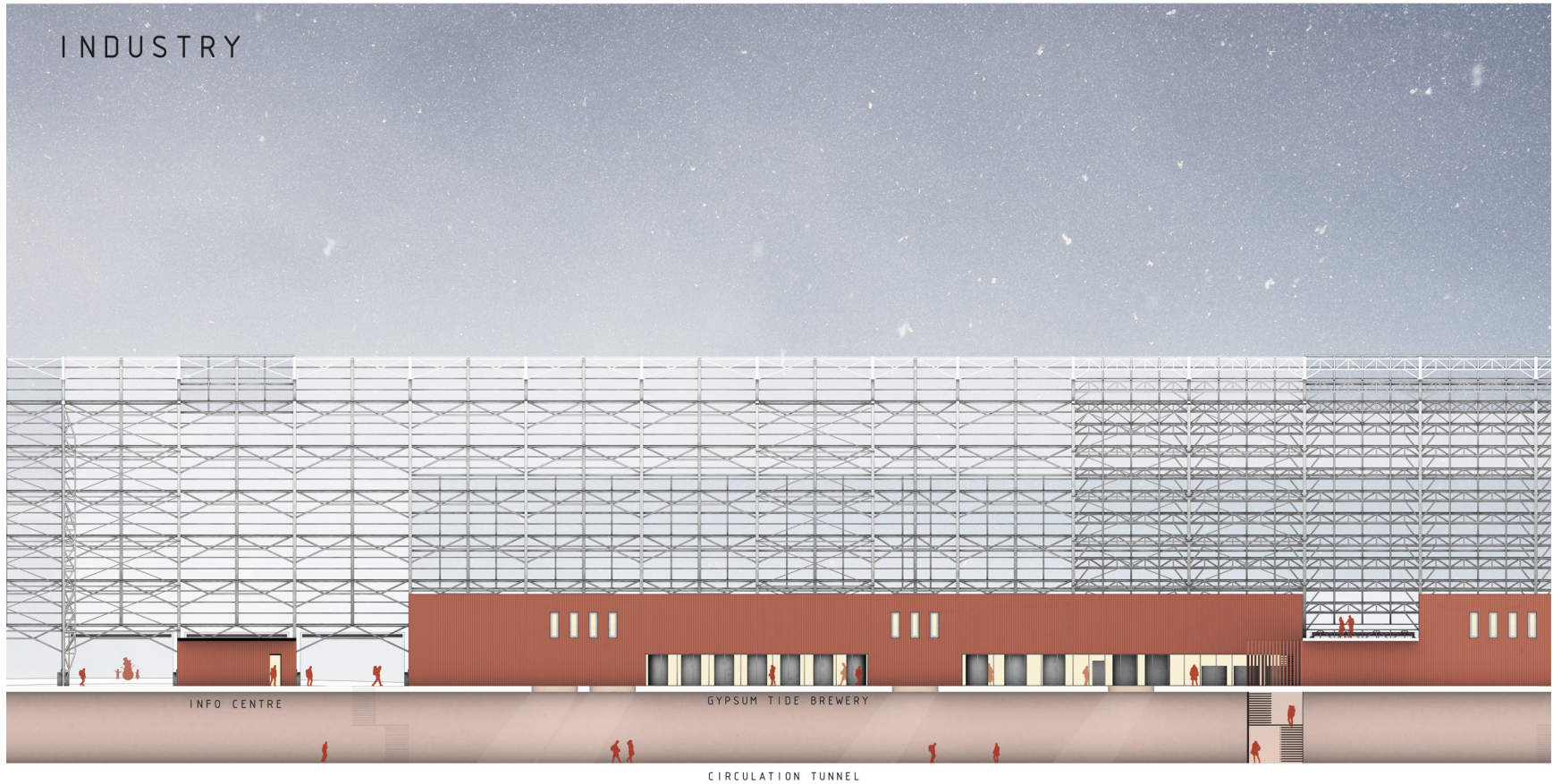


Figure 93: Long section showing the industrial zone of the brewery market on a winter's day; 2 of 4.

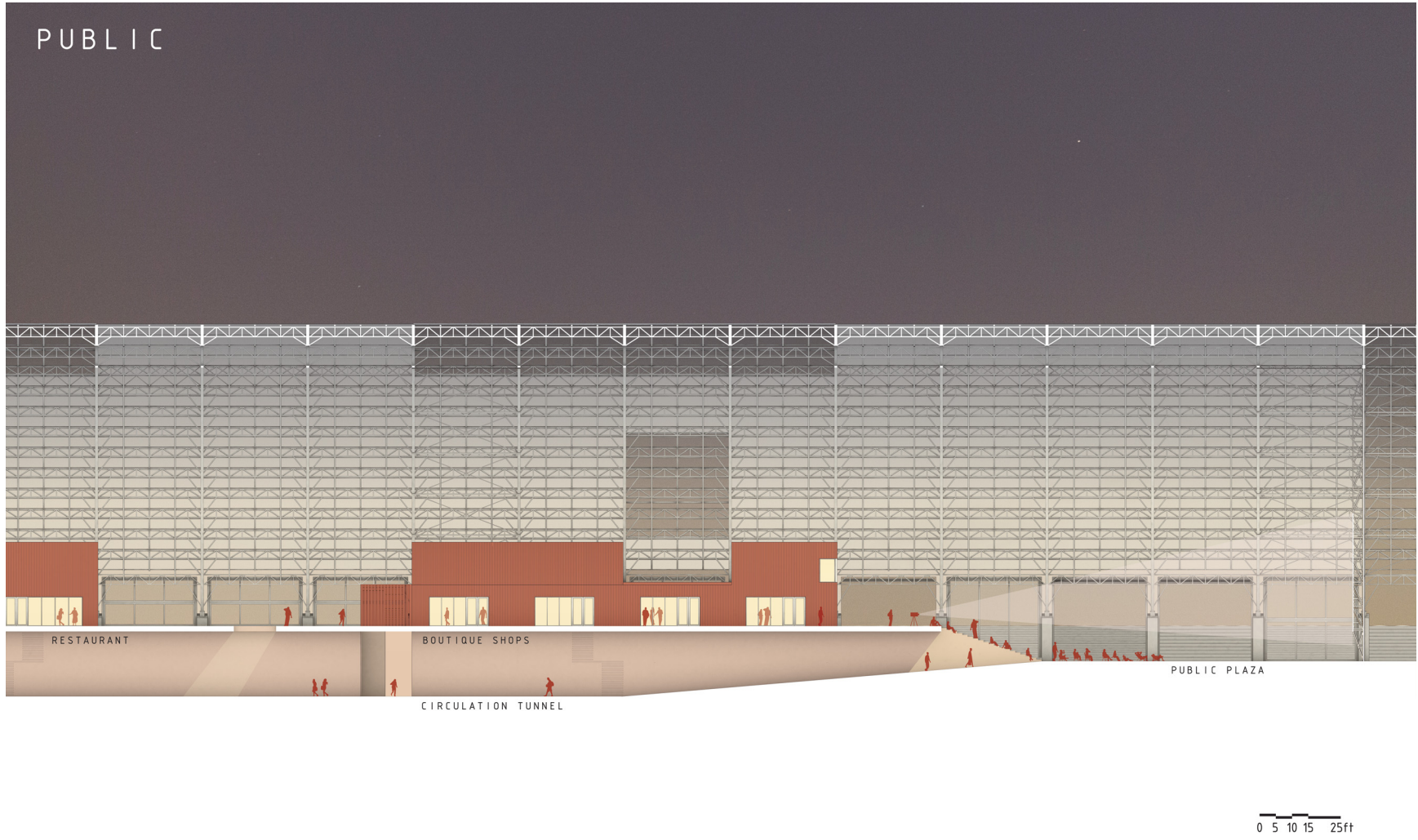


Figure 94: Long section showing the business zone of the brewery market in the late evening; 3 of 4.



Figure 95: Long section showing the waterfront of the brewery market on a summer's day; 4 of 4.



Figure 96: Model cross section 1 looking towards water.



Figure 97: Model cross section 2 looking towards town.

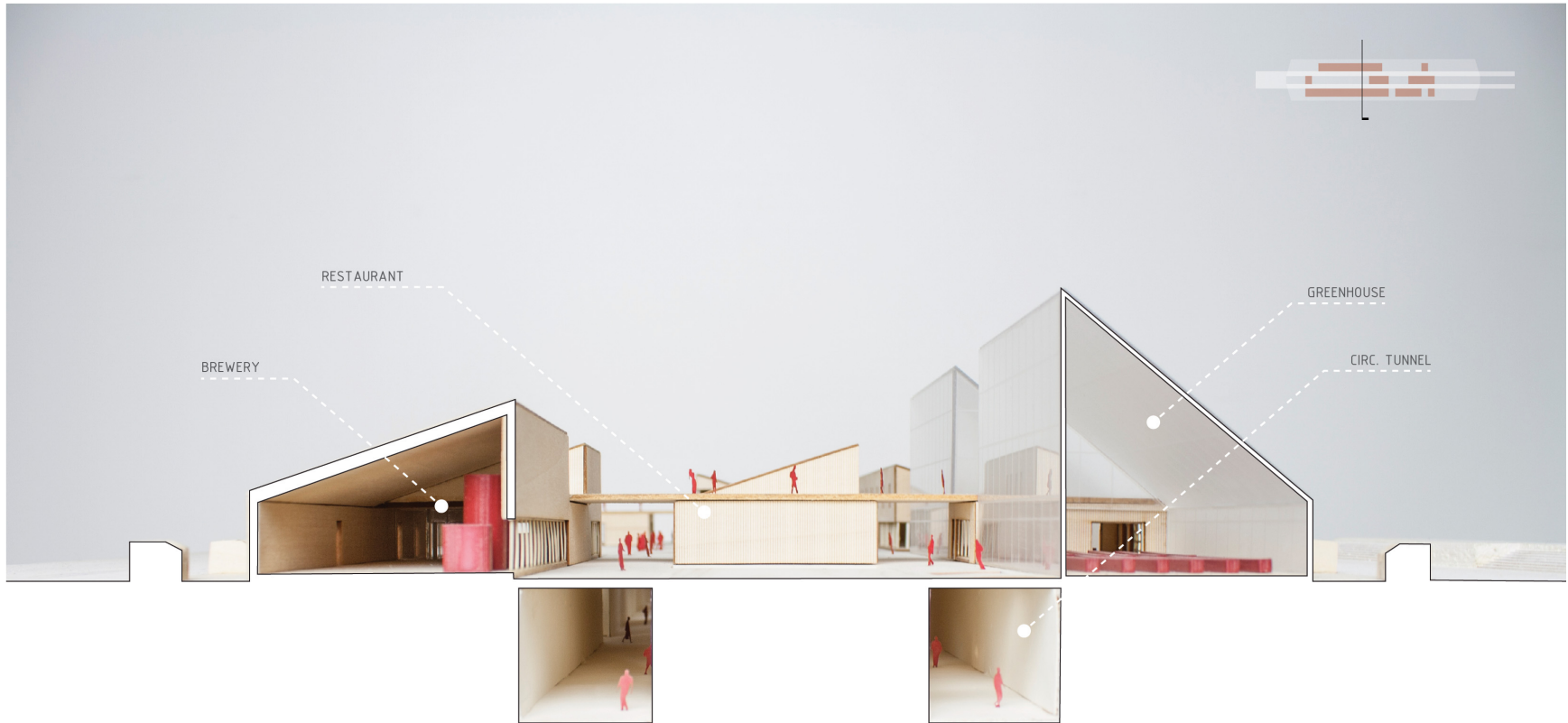


Figure 98: Model cross section 2 looking towards water, without structure.



Figure 99: Model cross section 3 looking towards town.



Figure 100: Model cross section 3 looking towards water.

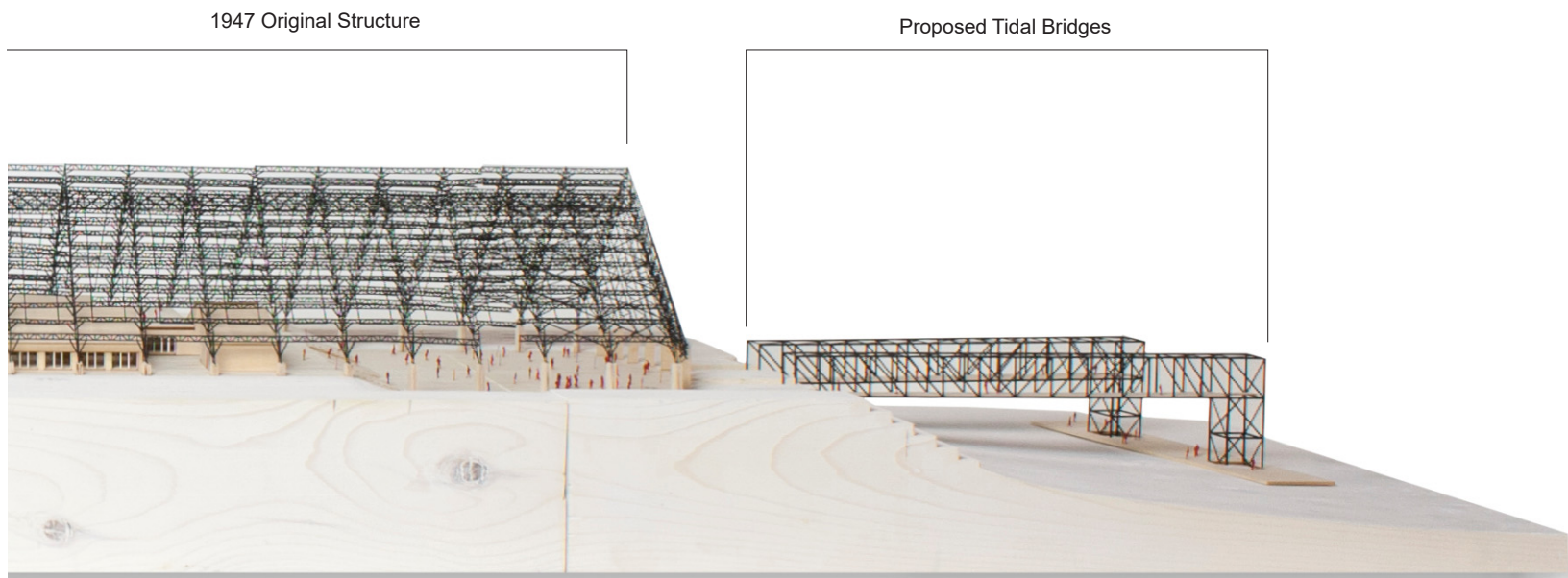


Figure 101: Final model with structure, 1 of 2.

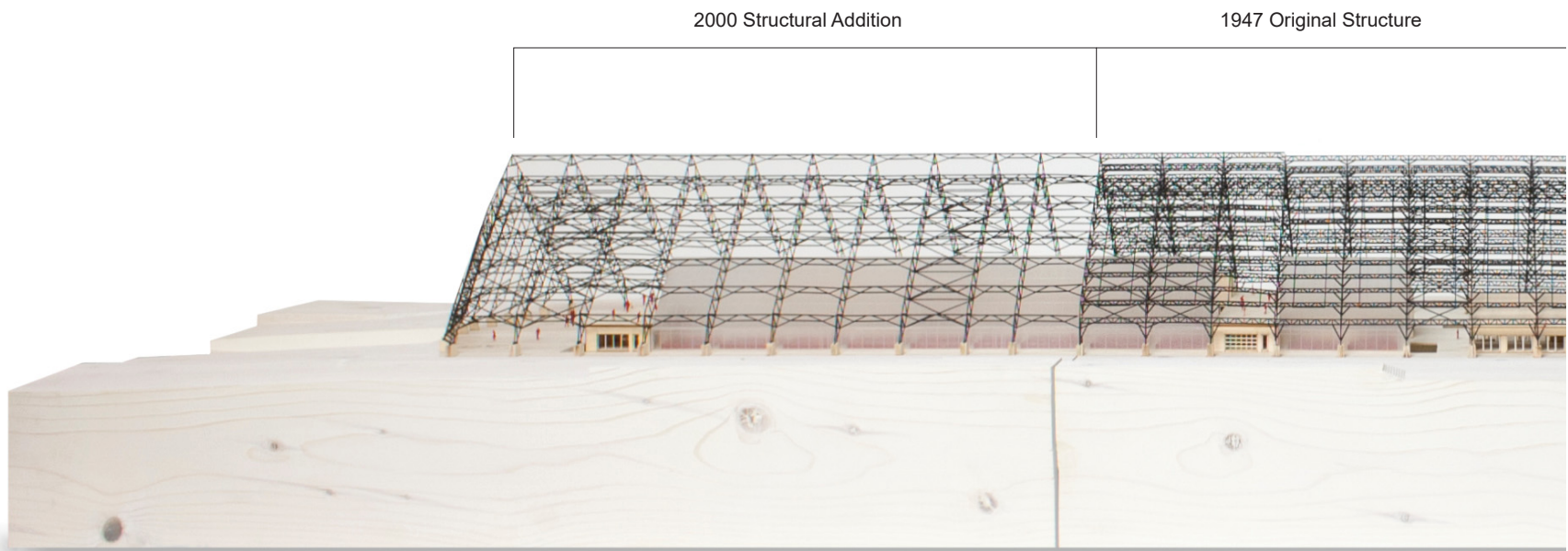


Figure 102: Final model with structure, 2 of 2.

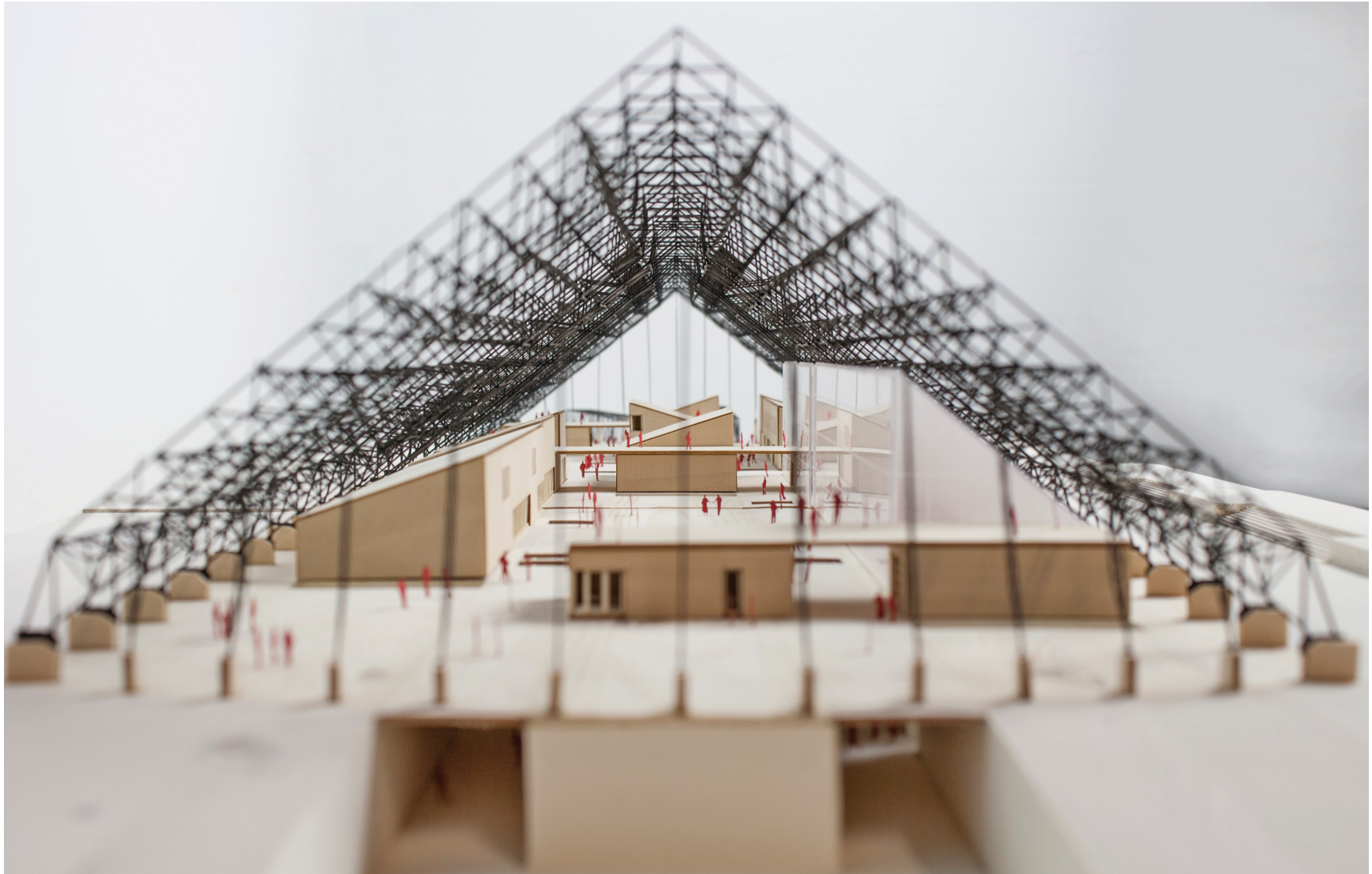


Figure 103: Model showing the expansive interior, view from town to water.

CHAPTER 5: CONCLUSION

Hantsport was the prime example of a successful industrial town, having already survived one economic collapse, by changing hats they were able to continue thriving. Unfortunately, since the halt of all current industry, the town has been left in a state of hibernation, waiting for the next kick-start.

The thesis has tested the adaptive reuse of the gypsum storage shed as a way to introduce new industry, a brewery, as an example of a more sustainable and appropriately scaled program for the town. Acting as a catalyst, the brewery paired with smaller businesses and public amenities, reconnects people back to the historic waterfront. The new brewery market responds both to immediate site conditions by preserving select industrial elements to maintain the deep-rooted identity of the place, along with responding to the regional scale by supporting and sourcing from local agriculture and tourism.

The brewery market would provide the town with many programs it currently lacks with the addition of the restaurant, overnight accommodations, shops and more to provide the economic push it needs for future growth and development. The structure would act as the town's anchor and form a new identity of sustainable industry rather than that of abandoned structures.

Although the thesis is tested locally within Hantsport, the approach to design is still applicable when dealing with the adaptive reuse of post-industrial structures in other towns around the globe.



Figure 104: View down circulation paths

BIBLIOGRAPHY.

- “Aerial View Of Waterfront - Hantsport: Showing Fundy Gypsum Co. Storage Shed.” *Marinas light*, 2017. https://marinas.com/view/marina/z4c8e6_Hantsport_Seaport_Harbour_Hantsport_NS_Canada.
- Alexander, B.R. “Aerial View Of Waterfront - Hantsport.” *Nova Scotia Archives*, 1967. <https://novascotia.ca/archives/alexander/archives.asp?ID=111>.
- Arrhenius, Thordis. *The Fragile Monument, On Conservation And Modernity*. London: Artifice Books, 2012.
- Berger, Alan. *Drosscape: Wasting Land In Urban America*. New York: Princeton Architectural Press, 2007.
- Boyer, M. C. *The City Of Collective Memory: Its Historical Imagery And Architectural Entertainments*. Cambridge, MA: MIT Press, 2006.
- Braae, Ellen. *Beauty Redeemed: Recycling Post-Industrial Landscapes*. Basel: Birkhäuser, 2015.
- Cornwall, A.E. “Dumping Gypsum Into Schooner.” *Nova Scotia Archives*, 1900. <https://novascotia.ca/archives/alexander/archives.asp?ID=46>.
- Cornwall, A.E. “Framing Princess Avon - Hantsport.” *Nova Scotia Archives*, 1895. <https://novascotia.ca/archives/alexander/archives.asp?ID=33>.
- Cornwall, A.E. “Framing Unknown Schooner - Hantsport.” *Nova Scotia Archives*, 1895. <https://novascotia.ca/archives/alexander/archives.asp?ID=22>.
- Cornwall, A.E. “Margaret F. Dick Before Launching.” *Nova Scotia Archives*, 1918. <https://novascotia.ca/archives/alexander/archives.asp?ID=26>.
- Cornwall, A.E. “Margaret F. Dick Being Launched.” *Nova Scotia Archives*, 1918. <https://novascotia.ca/archives/alexander/archives.asp?ID=25>.
- Cornwall, A.E. “Stockpiling Gypsum.” *Nova Scotia Archives*, 1900. <https://novascotia.ca/archives/alexander/archives.asp?ID=47>.
- Cornwall, A.E. “Stockpiling Gypsum.” *Nova Scotia Archives*, 1900. <https://novascotia.ca/archives/alexander/archives.asp?ID=47>.
- Cornwall, A.E. “View Overlooking Hantsport.” *Nova Scotia Archives*, 1895. <https://novascotia.ca/archives/alexander/archives.asp?ID=1>.
- “Cultural Regeneration - From heavy industry to poetic machinery in Nantes, France.” *Agile City*, 2015. <http://agile-city.com/cultural-project/cultural-regeneration-from-heavy-to-poetic-machinery-in-nantes-france/>.

- Google Maps. "El Matadero, Spain." 2018. <https://www.google.ca/maps/@40.3912894,-3.699933,983m/data=!3m1!1e3>.
- Google Maps. "Île De Nantes, France." 2018. <https://www.google.ca/maps/@47.2041664,-1.5516101,1754m/data=!3m1!1e3>.
- Google Maps. "Landschaftspark, Germany." 2018. <https://www.google.ca/maps/@51.4814085,6.7792117,1352m/data=!3m1!1e3>.
- "Hangar des machines, île de Nantes." *Commechezvous*, 2007. http://commechezvous.canalblog.com/albums/nantes_et_le_pays_nantais_/photos/14745816-hangar_des_machines__ile_de_nantes.html.
- "Hantsport - Town, NS, Canada." *Statistics Canada*, March 13, 2007. <http://www.city-data.com/canada/Hantsport-Town.htm>.
- "How The Tides Work." *Bay Of Fundy*. Accessed November 29, 2017. <http://bayoffundy-tourism.com/worlds-highest-tides/how-do-the-tides-work/>.
- "Klettern in einer Industrieruine." *Duisburg wir kommen*, 2017. <http://www.yournaturetrip.de/index.php/2016/05/24/klettern-in-einer-industrieruine-duisburg-wir-kommen/>.
- "Kraftzentrale im Landschaftspark Duisburg-Nord." *Fiylo*, 2017. <https://www.fiylo.de/location-duesseldorf/kraftzentrale-im-landschaftspark-duisburg-nord/>.
- "Landschaftspark Duisburg-Nord." *Wikipedia*. 2017. https://en.wikipedia.org/wiki/Landschaftspark_Duisburg-Nord.
- "Landschaftspark lit up at night." *Landschaftspark Duisburg-Nord - Einführung*, 2017. <http://www.landschaftspark.de/der-park/einfuehrung>.
- MacDonald, Scott. "Hantsport Deserves To Be Better Known." *The Chronicle Herald*, July 4, 2015. <http://thechronicleherald.ca/thenovascotian/1297322-hantsport-deserves-to-be-better-known>.
- "The Machines de l'île in Nantes." *Official website for tourism in France*, 2017. <http://uk.france.fr/en/discover/machines-ile-nantes>.
- MacAskill, W.R. "The Lighthouse At Peggy's Cove." *Nova Scotia Archives*, 1987. <https://novascotia.ca/archives/MacAskill/archives.asp?ID=696>.
- "Machines Of The Isle Of Nantes." *Wikipedia*. 2017. https://en.wikipedia.org/wiki/Machines_of_the_Isle_of_Nantes.
- "Madrid - Madrid Río y Matadero Madrid." *Artchitectours*, 2017. <http://www.artchitectours.es/de/touren/architekturfuehrungen-in-madrid/madrid-madrid-rio-y-matadero-madrid>.
- "Matadero Madrid." *La Ventana del Arte*, 2017. <https://www.laventanadelarte.es/centro/matadero-madrid/madrid/madrid>.

- "Matadero Madrid Review." *Explore Madrid Like A Local*, 2017. <https://www.likealocal-guide.com/madrid/matadero-madrid>.
- "Matadero Madrid." *Wikipedia*. 2017. https://en.wikipedia.org/wiki/Matadero_Madrid.
- Nova Scotia Department of Agriculture, Research & Analytics. "CENSUS OF AGRICULTURE PROFILE," 2011. <https://novascotia.ca/agri/documents/business-research/ag-profiles/NovaScotia2011.pdf>.
- "Nova Scotia Industry." *Museum Of Industry*. 2013. <https://museumofindustry.novascotia.ca/nova-scotia-industry>.
- Osborne, Brian S. Landscape, Memory, Monuments, And Commemoration: Putting Identity In Its Place. *Canadian Ethnic Studies*, 2001. <http://ezproxy.library.dal.ca/login?url=https://search.proquest.com/docview/215637580?accountid=10406>.
- "Other Uses Of Gypsum." *Gypsum Association*, 2014. <https://www.gypsum.org/about/gypsum-101/uses-gypsum/>.
- Palmer, John J. *How To Brew: Everything You Need To Know To Brew Beer Right The First Time*. Colorado; Brewers Publications, 2006.
- Pierce, Nathan. "How Big Should My Brewery Be?" *MicroBrewr*, October 3, 2015. <http://microbrewr.com/how-big-should-my-brewery-be/>.
- "The Phenomenal Bay Of Fundy." *Bay Of Fundy*. Accessed November 29, 2017. <http://bayoffundytourism.com/>.
- Robertson, Allen B. *Tide & Timber: Hantsport, Nova Scotia, 1795-1995*. Hamilton: Global Heritage Press, 2001.
- Shikes, Jonathan. "City Star Will Tap First Commercial Beer Made With Hydroponically Grown Hops." *Westword*, August 20, 2015. <http://www.westword.com/restaurants/city-star-will-tap-first-commercial-beer-made-with-hydroponically-grown-hops-7051367>.
- Tate. "Rachel Whiteread born 1963." Accessed December 14, 2017. <http://www.tate.org.uk/art/artists/rachel-whiteread-2319>.
- "Tonnage." *Wikipedia*. 2017. <https://en.wikipedia.org/wiki/Tonnage>.