

**More Stories about Ports and Polar Bears:**  
A Future for Churchill, Manitoba

by

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in partial fulfillment of the requirements for the degree of

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M.Arch (Professional)

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## **ABSTRACT**

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In the summer of 2016, the only arctic seaport of Canada in Churchill, Manitoba, faced a controversial and complete closure of operations. Currently, the port's vacant grain elevators tower over the coastal tundra landscape as a landmark to the town's existence as a former outpost of northern prosperity shaped by the railway and past technological advancements and scientific ambitions. This project imagines a re-appropriation of the Churchill sea port and its infrastructure through themes of nature and technology. A narrative of the relationship between human and nature is explored through the advent of an optimistically changing climate and the effects on buildings. This thesis substantiates a reconsideration for how climate change might influence long term decisions for the built environment in northern Canada.

## **ACKNOWLEDGMENTS**

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*To my parents, Carol and Perry, and my sister, Alyssa, for their unconditional love, understanding, and support through this and everything else in my life.*

*I heard what was said of the universe,  
Heard it and heard it of several thousand years;  
It is middling well as far as it goes—but is that all?*

Walt Whitman, Leaves of Grass, Philadelphia: David McKay, 1981-2.

*Don't delay, our day is short, we can't afford to wait.*

*So, take that laminate out of your wallet and read it,  
and recommit yourself to the healing of the world,  
and to the welfare of all creatures upon it.*

*Pursue a practice that will strengthen your heart.*

“Postdoc Blues”

John K. Samson

2016

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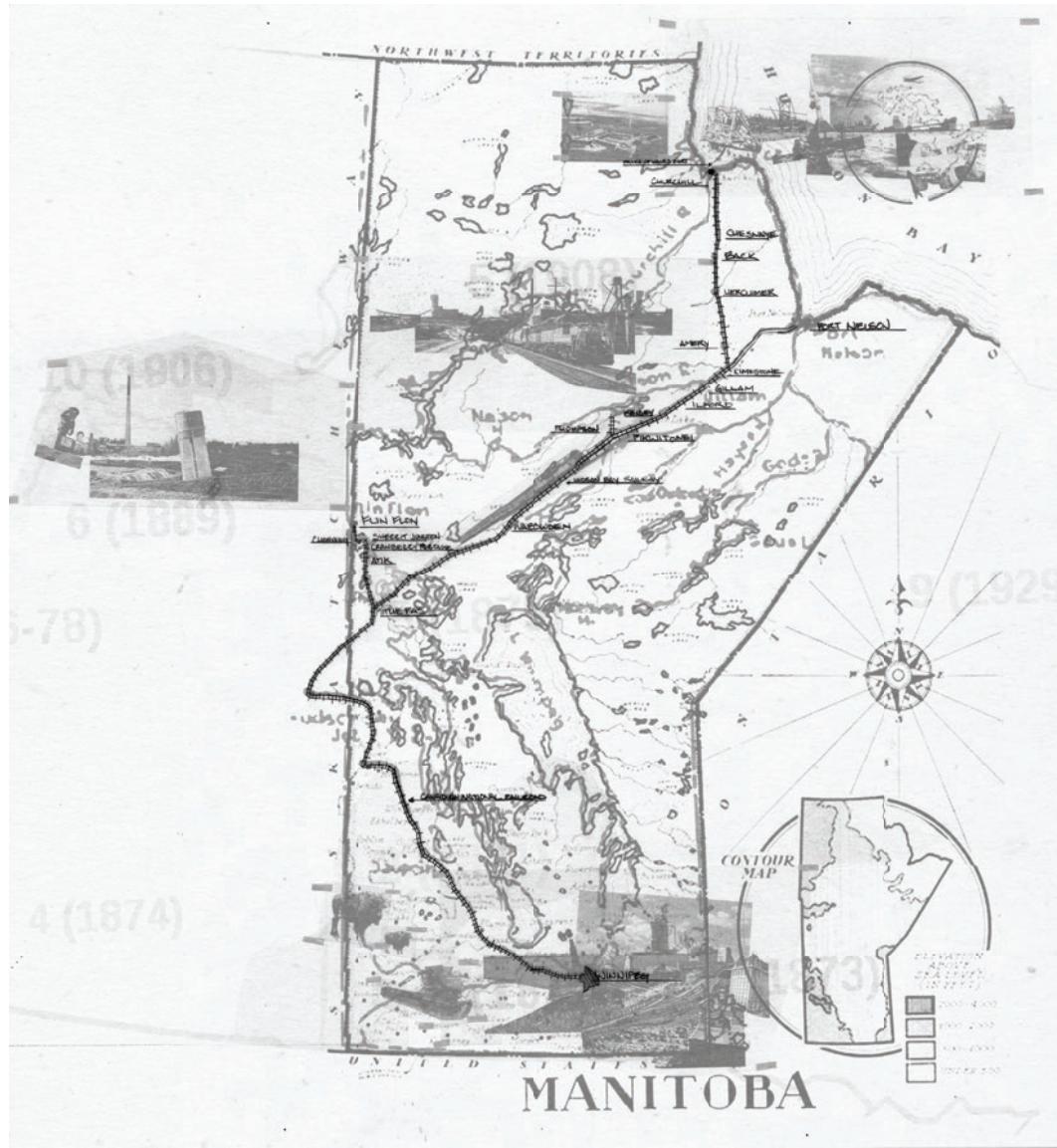
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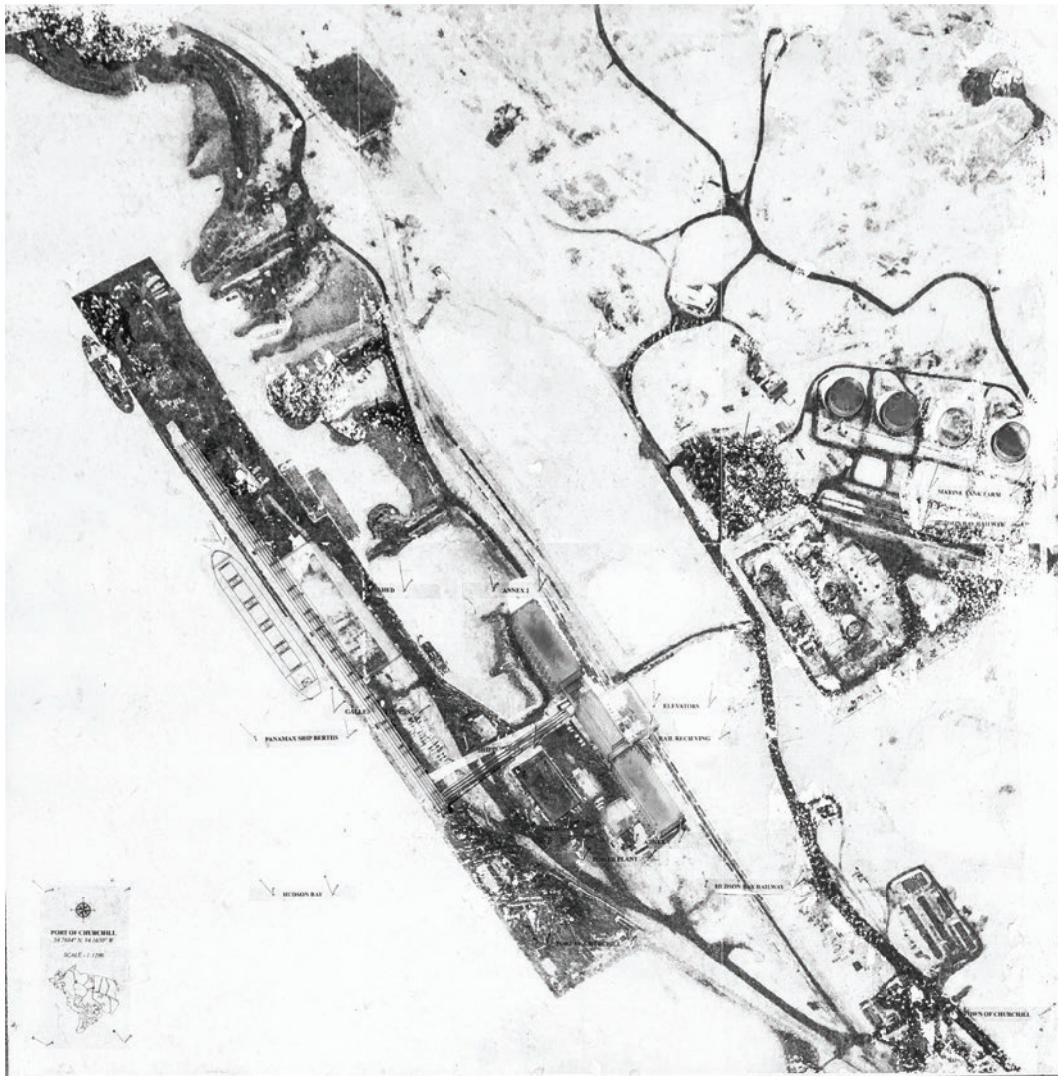
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## INTRODUCTION

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The sole arctic seaport of Canada lies in Churchill, Manitoba. In the summer of 2016, it faced a controversial and complete closure of operations. The effects of the dismantlement of the Canadian Wheat Board, finalized in 2012, would see the beginnings of a decrease in transportation and export traffic. Presently, the port's grain elevators tower over the coastal landscape as a landmark to the town's existence as a former outpost of northern prosperity shaped by the railway, past technological advancements and scientific ambitions. As the fate of the port is still uncertain, any economic future for the town of Churchill must include the presence of the port and its infrastructure.

Over the past few decades, eco-tourism has become a major economic source for the remote town and has seemingly overshadowed the previous industrial significances. The migration of arctic animals such as polar bears, beluga whales and birds, and seasonal sub-arctic foliage attract international tourists to the Churchill area each season.

The project explores the history of Churchill in multiple facets. Positions of understanding nature and the environment implicate humanity's perceptions and active relations to climate cycles. The expansive tracts of uninhabited land in northern Manitoba brought forth a sublime appeal to conquer the landscape with the advent of large earth-moving machinery. The technological advancements lead to a push in the late 19th century to rapidly expand rail connectivity and deep-water shipping opportunities through the arctic. Re-situating and contrasting a perspective with another can lead to new understandings of the whole context. Processes of layered and imaginative drawings became a method of realizing speculative forms and narratives of the port's future occupation. Analogue and digital hybridization of orthogonal

engineering and architectural drawings inspire the re-interpretations of infrastructural components into inhabitable spaces.

As the experiential effects of climate change and global environmental systems have become increasingly prevalent and frequent, the advent of emergent technologies and political movements have been created in an attempt to negate future alterations. Envisioning beyond the present conditions one can speculate a potential environmental condition in which the town and the port of Churchill might exist. Here, climate change is approached with an optimistic point of view, envisioning a potential future narrative where humanity's actions act positively on the earth. This thesis seeks to re-situate the defunct port infrastructure as a container for ongoing architectural responses to this changing climate. As the port holds historic value to the community, the continued usage and existence of the port reflects onto the entire town. What could the role of existing architecture and infrastructure take on when confronted with a changing climate?



## A HISTORIC WEATHER EVENT, CHURCHILL EDITION

MARCH 2017



On March 6, 2017, Churchill experienced the onset of a three-day blizzard, bringing in over 60cm of snow and wind with gusts of over 120km/h. A succession of blizzards in the following three weeks isolated the remote town from supplies, instigating a local state of emergency.

The occurrence of an abnormal weather event echoes an underlying narrative in this thesis of responding to extreme climate events and effects on the entire town.

## INITIAL INQUIRIES: THE ANTHROPOCENE

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1.



## **INITIAL INQUIRIES: THE ANTHROPOCENE**

Through industrial and technological advancements since the Industrial Revolution, humanity has begun to act on the planet as a geophysical force. This new age is called the Anthropocene, defined by the Oxford English Dictionary as “the era of geological time during which human activity is considered to be the dominant influence on the environment, climate, and ecology of the earth.”<sup>1</sup>

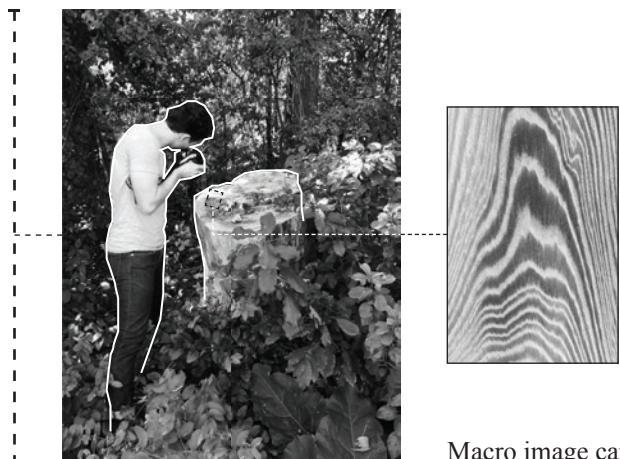
1 “Anthropocene, n. and adj.”, OED Online, March 2017, Oxford University Press, <http://www.oed.com/view/Entry/398463?redirectedFrom=anthropocene> (accessed March 13, 2017).

## INQUIRY #1: TEXTURE SURVEYS

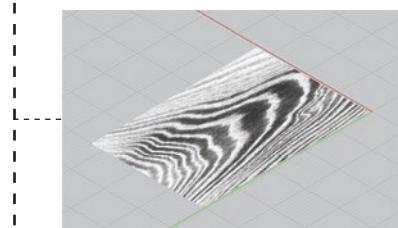
The Texture Surveys explore the scalar relationships and perceptions between anthropocentric objects at the human-scale and their impressions at the scale of the landscape. American historian of technology Lewis Mumford describes in *Technics and Civilization* that the advancement of technology developed through three specific and interwoven phases: eotechnic, paleotechnic, and the neotechnic. Each phase became responsible for the creation of new forms of landscapes. Evolving through the development of new energy systems, agrarian actions to the harvesting and manipulation of natural processes and resources, each phase reflected a distinct relationship between humanity and the natural world.

The history of Ottawa formed a basis to study anthropocentric technological effects; the capital city area was a former forestry industry, paper and wood mill production hub, and the site of major military engineering and infrastructural installations. Forms of these actions were discovered adjacent to the Carleton University campus: locks #7 and #8 at the Rideau Canal, a recently felled tree stump, and a memorial to a formal naval radio station. Micro images of these sites were captured through digital photography and translated from two-dimensional photos into three-dimensional surfaces, expanded vertically by the photograph's light and dark values. The resulting poly-surfaces were processed and smoothed before being sliced into contours of height differentiations.

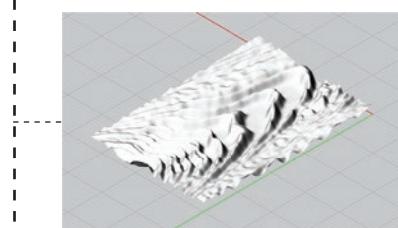
The result of these processed images developed into six two-dimensional maps. Each map, with their respective coordinates in relation to the site where they were sampled, become a visual manifestation of the nature-human relationship in the nearby environment. Mapping conventions of grids, dimensions and notational graphics furthered the impression of scalar relationships. This work was carried out in collaboration with Andrej Iwanski.



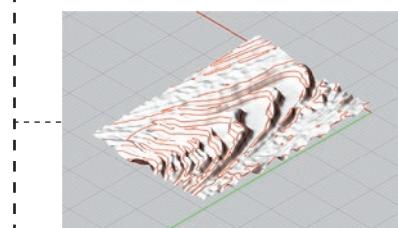
Macro image captured on site



Imported image edited for *Heightfield* command



*Heightfield* command applied, 3D surface created



Surface contoured vertically, defining height variances

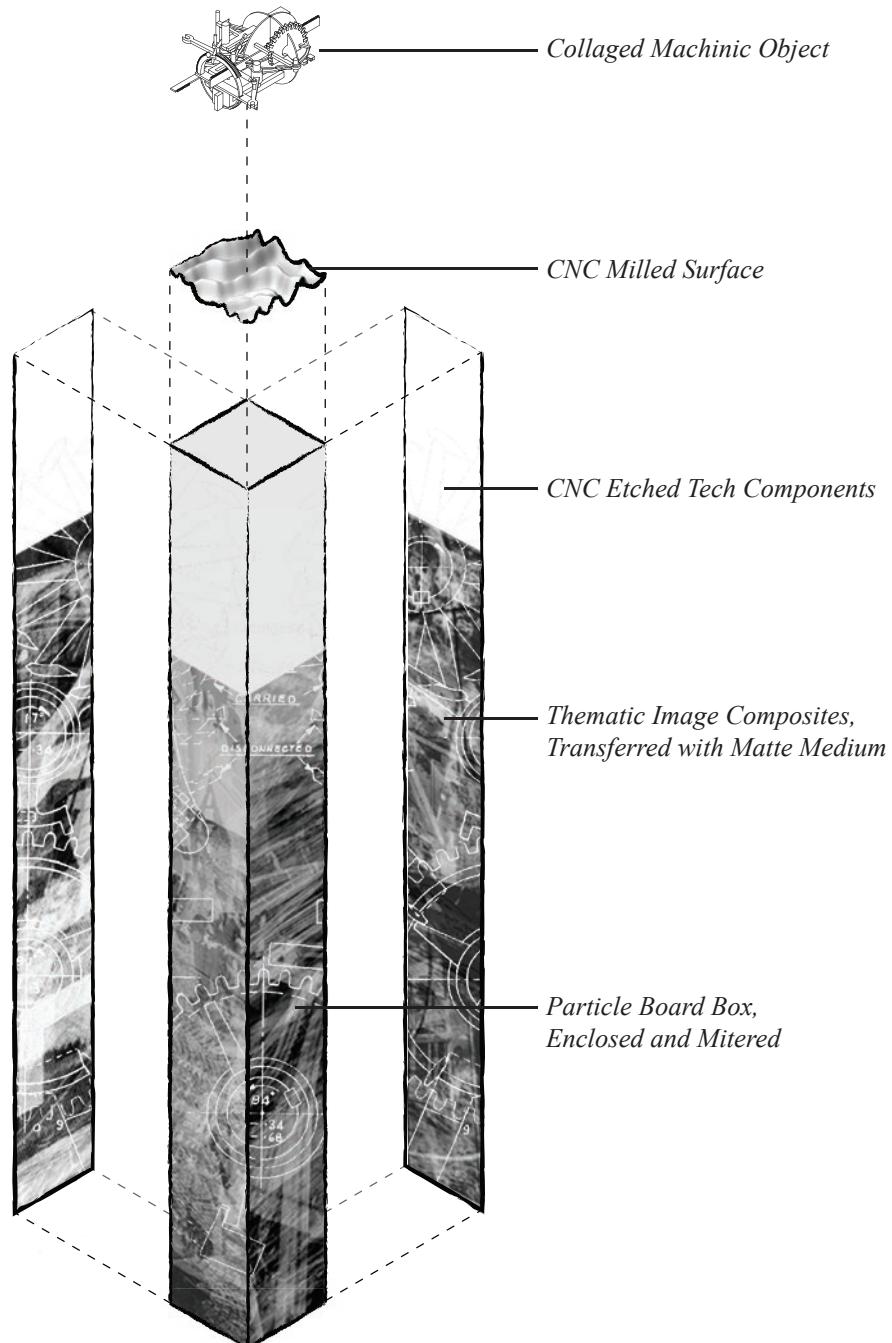


## INQUIRY #2: CORE SAMPLES

Continuing the visual manipulations of scales the narrative of the previous exercise promoted the physical representation of understanding geological strata through nature-human relations. Appropriating the six digital surfaces into physical models formed into core samples theoretically extracted from the respective site.

As the previous exercise concerned the visual relationships of scales and surveys of human-instigated textures, the focus here was embodying impressions of technological and cultural effects on the layers of earth. Inquiries into topics of the Anthropocene included studies of art works, science fiction stories and popular culture in films, and comic books, environmental changes by means of mass industrial excavations and installations, altered landscapes by a changing climate, and the technological achievements of urban and rural built environments. The samples display an abstraction of this research through four image composites that follow a perspective of art, fiction, landscape, and technology. Each side is milled with CNC etchings, inscribing the cultural images with tracings of mechanical engineering drawings.

The “core samples” were arranged in relation to their respective locations on the maps. The arrangement forms a horizontal field of three-dimensional surfaces created through the mapping exercise and vertical images collected from the cumulated themes of research. This work was carried out in collaboration with Andrej Iwanski.





## THEMES OF RESEARCH

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2.



*A course for disturbance rests in the fact that more time is used in a long time than in a short time. There is no criticism when the time is long. The time is so long that an answer comes promptly. This is so much the more satisfactory as the occasion for an answer is whenever there is cause for a question. The difference between this and no elaboration is extreme. No elaboration is not achieved in a question nor in an answer and this which is so eminently satisfactory is that there is no doubt that there will be no reason for the occasion. To be faithful is to be accustomed and the custom which is without that reservation has no circumstance to replace it. The time to state that is when there is no reason to doubt a result. There is never a reason to doubt a result if there is a promise. If there is a promise it means that idleness is only another name for a thing.*

Rob Kovitz, “You Mean That as a Question,” *GEIST*, No. 103, Winter 2016. 19-21.

## THEMES OF RESEARCH

Exploring various aspects of the Anthropocene became a point of departure towards a historical and contemporary study of humanity's desire to understand, utilize and conquer the expanses of the environment. It is important to investigate areas of theory that are implicit toward understanding the history of humanity's ongoing actions upon the earth in direct and indirect forms creating effects at the scale of a geophysical force.

Four themes are explored to construct a conceptual framework to situate the future of the arctic seaport in relation to the history of Churchill, Manitoba. The concept and social perceptions of nature must be acknowledged towards an understanding the complexities of the term itself and how humanity might refocus this perception towards a better nature-human relationship. Technology holds an accelerating constructive, and in-turn destructive, role in humanity's actions upon earth. The railroad and infrastructural constructions aimed to extend, connect, and complete the view of human experiences and the developments of these technologies are crucial to Churchill's modern existence.<sup>2</sup> Lastly, a consideration of perceptive shifts through multiple impressions of the Port of Churchill by way of a narrative of a changing climate can draw out unnoticed and unconsidered possibilities for future architectural responses.

2 David E. Nye. *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), 109.

## NATURE

*“What is nature? First, all conditions of human nature itself, its global constraints of rebirth or extinction, the hostelry that gives us lodging, heat and food. But nature also takes them away from us as soon as we abuse them. It influences human nature, which, in turn, influences nature. Nature behaves as a subject.”*

Michel Serres, *The Natural Contract* (Ann Arbor, MI: Univ. of Michigan Press, 1995), 36.

The sub-arctic climate in northern Manitoba, in its remoteness, lends itself to certain forms of natural phenomena. As the climate changes, the natural world around will also change; but what is nature?

The perception of how nature is discussed and treated in contemporary contexts must be clarified and examined amid climate change. Since the early modern period, nature has increasingly represented a realm outside human intervention and occupation. Nature and weather takes on other-worldly forms as something separate from human activity. Nature seems to work independently from us - our direct actions on earth do not yield a response beyond what might be noticed at the scale of the body, rather than at that of the landscape or the globe. In *The Natural Contract* the French philosopher Michel Serres discusses a reconsideration of the dualistic relationship between humans and nature towards a synchronic one. Serres equates the work lives of a peasant and a sailor as those who depended on an understanding of the state of the weather and climate.<sup>3</sup> As daily work and life developed away from relying and interpreting the weather to lives of successive conditioned indoor spaces, humanity has become indifferent to climate. We have become distanced from the climate, or it has become an afterthought in our routines “except during their vacations when they rediscover the world in a clumsy Arcadian way.”<sup>4</sup> The spaces we occupy create their own controlled climates, our indirect

3 Michel Serres, *The Natural Contract* (Ann Arbor, MI: Univ. of Michigan Press, 1995), 28.

4 Ibid, 28.

perspective of the natural world only continues as the human species is confronted with consequential global environmental change. As humankind and the earth are inherently related humanity's outward actions, direct or indirect pollution, are collected in global systems of water, air and soil. The resulting compounding effects are reciprocated back into the world in the form of climate.<sup>5</sup> Serres defines short term voices as administrators, journalists, and scientists focus their specialized work on short term thought, focusing on near-future solutions. He argues that for a long-term problem like climate change, a broad and long term solution must be invented to match scales.<sup>6</sup> “(The) rights of symbiosis are defined by reciprocity: however, much nature gives man, man must give that much back to nature.”<sup>7</sup>

The environments that the human population inhabits, the built environment, should allow and adjust to accept the confrontations of day-to-day natural events. In turn, long term visions and study of global climate change can form a framework to change the perception of nature to a symbiotic one.

5        “We have lost the world. We’ve transformed things into fetishes or commodities, the stakes of our stratagems; and our a-cosmic philosophies, for almost half a century now, have been holding forth only on language or politics, writing or logic. At the moment when we are acting physically for the first time on the global earth, and when it in turn is doubtless reacting on global humanity, we are tragically neglecting it.” Michel, Serres, *The Natural Contract* (Ann Arbor, MI: Univ. of Michigan Press, 1995), 29.

6        Ibid, 31.

7        Ibid, 38.



## TECHNOLOGY

*“However far modern science and technics have fallen short of their inherent possibilities, they have taught mankind at least one lesson: Nothing is impossible.”*

Lewis Mumford, *Technics and Civilization*. (Rahway, NJ: Quinn & Boden Company Inc., 1938), 435.

The progression of technological advancements from early simple tools and machines to forms of production and processing factories and regulated labour practices created shifts toward contemporary working ideals.<sup>8</sup> In *Technics and Civilization* Lewis Mumford designates these shifts into three phases: 1. Eotechnic, 2. Paleotechnic, 3. Neotechnic which are marked by a shift in energy source developments. Transitioning machine operations from coal-burning, to petroleum-based fuels, to electricity created opportunities for further refinements in efficiencies in energy and labour, a lesser number of humans required in operation, decreases in the size of spaces required to house the technology and drastic improvements in the cleanliness of the spaces required for housing the machinery.<sup>9</sup>

Evolutions in the capabilities of technologies altered the position of the worker in the process of machine operations, specifically in factory production. Time became a measurement of efficiencies and volume of work which could be accomplished.<sup>10</sup> Standards in the timing of work made time a commodity and the speed and efficiency of production a factor against cost. Changes in machine abilities transitioned the roles of

8 Here; tool is defined as an object created which lends itself to physical manipulation (skill of user) of another object (ie. a hammer), a machine lends itself to automation and automatic action of work (ie. spinning mule). Further, a machine-tool will equate the action of the machine to the skill of the craftsman (ie. lathe).

9 Lewis Mumford, *Technics and Civilization* (Rahway, NJ: Quinn & Boden Company Inc., 1938), 109-112 and 196-199.

10 Mumford cites the clock (originating in monasteries) as the key machine in the modern industrial age due to the gains in coordination and mechanical efficiencies. Lewis Mumford, *Technics and Civilization* (Rahway, NJ: Quinn & Boden Company Inc., 1938), 12-19.

human workers into that of resources; human workers became a means to an end in mass production.<sup>11</sup> Material and engineering developments created opportunities for lessened machine repairs and longer cycles of operations. Capital gains through the developments of mass production meant a continued desire to do more work with less continued inputs and maintenance. Images celebrated advancing technics and the advancement of machines became continually accepted into daily life. The term technics derives from the Greek term ‘tekhne’, meaning craftsmanship, craft or art and the applied knowledge and skill on the craft-person’s behalf. The term technology is a physical manifestation of this principle, but we generally limit the idea of technology to devices and machines, something acting as an extension of the human body, rather than expansively to techniques, languages, and systems of information.

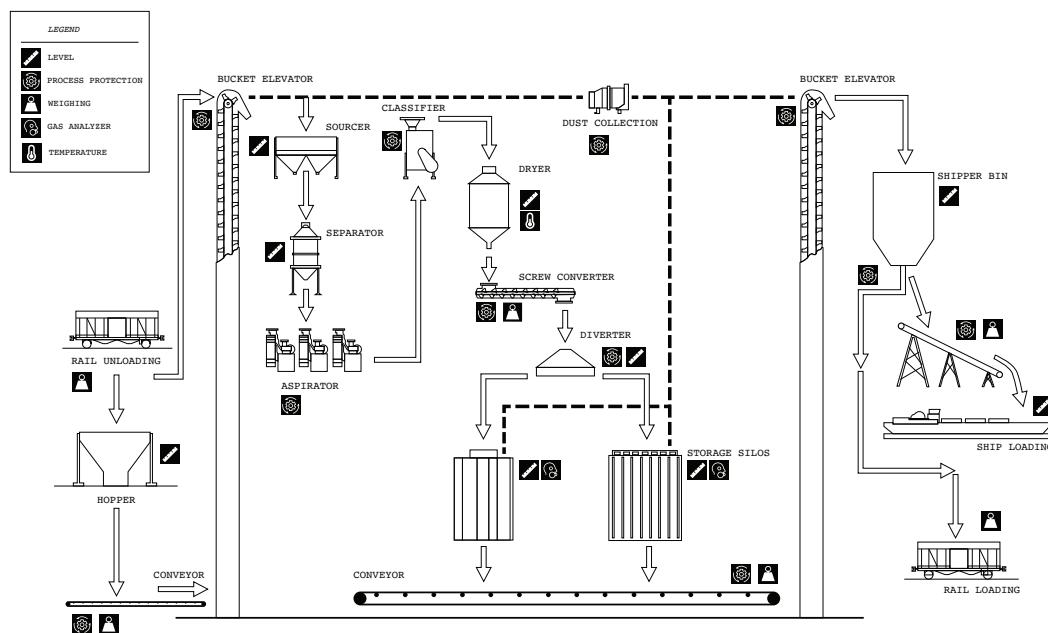
As technology developed into the 20th century engineers and designers turned to designing by way of biological influences. Inventions and developments in technology inspired by beings in the natural world; in aircrafts steering issues were solved through the study of soaring birds, moving pictures and modern photography developed through cinematically studying anatomical movements by Eadweard Muybridge and Joseph Plateau in the 19th century, and Alexander Bell’s telephone design reflected the make-up of bone structures within the human inner-ear.<sup>12</sup> In turn, a desire to conserve the natural world began to become a concern over the desire to simply destroy it for the resources in maintenance and fueling of the machines.<sup>13</sup> The advent of biologically-based ideals prompted artificial environments to turn technologies in tune with cycles of the natural world.

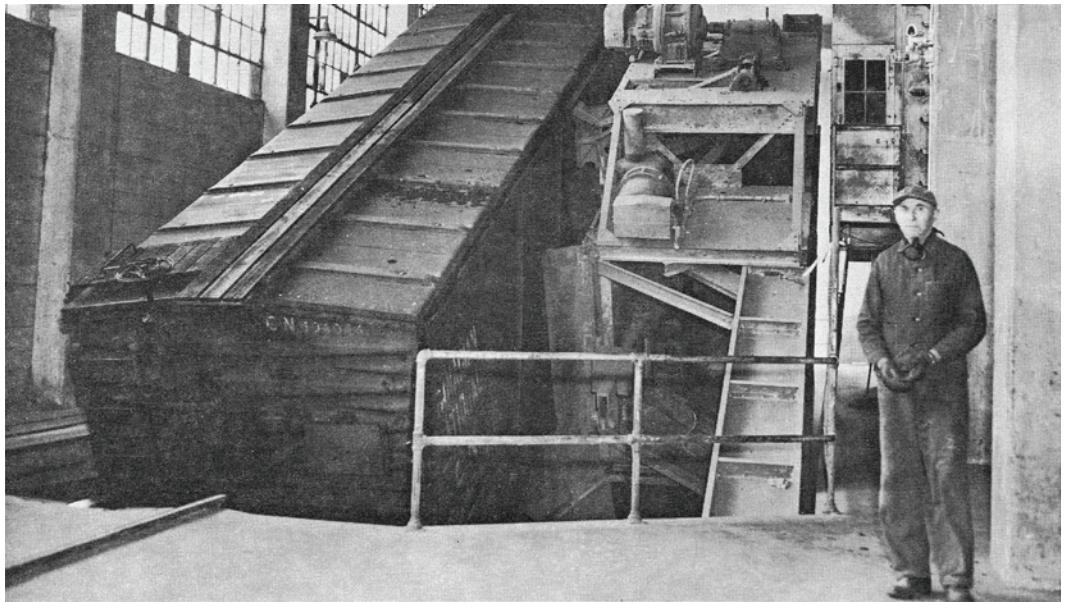
11 Lewis Mumford, *Technics and Civilization* (Rahway, NJ: Quinn & Boden Company Inc., 1938), 212-215.

12 Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Los Angeles, CA: Univ. of Calif. Press, 1990), 90-95. Lewis Mumford, *Technics and Civilization* (Rahway, NJ: Quinn & Boden Company Inc., 1938), 250-259.

13 Lewis Mumford, *Technics and Civilization* (Rahway, NJ: Quinn & Boden Company Inc., 1938), 250-259.

Technology has become a crucial role in the exploitation of the natural environments around us. In large human-made constructions, like sea-ports, which collect goods and people from around the world in systems of trade and manufacturing, landmark technology is constructed to process and distribute mass amounts of raw materials. Technology should account for the environmental situation in which the production and processing happens, working as an integrated part of the nature that envelopes it.





## THE SUBLIME

[...] *The passion caused by the great and sublime in nature, when those causes operate most powerfully, is astonishment: and astonishment is that state of the soul in which all its motions are suspended, with some degree of horror. In this case, the mind is so entirely filled with its object, that it cannot entertain any other, nor by consequence reason on that object which employs it.”*

Edmund Burke, ‘A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful’, *The Philosophy of Edmund Burke: A Selection of his Speeches and Writings*, ed. Louis Dredvold and Ralph G. Ross, University of Michigan Press, Ann Arbor, 1967, pp. 256-57; 262.

The notions of the sublime originates in the 17th century as the European wilderness and ancient ruins were toured by wealthy families. Feelings of awe and fear experienced during these expeditions by vastness of scales, size, or power. Until the natural world became conquerable by way of technological advances, wild landscapes were a subject of sublime imagery and the consumption of the sublime landscape was a source of experiencing the unfathomable.

Industrial advancements allowed for larger and more impressive technological instruments to act upon the earth, the sublime shifted attention to the steadily advancing machine. According to the historian of technology David Nye “any man-made object can be sublime... (and) like every sublime object (it) cannot be comprehended through words and images alone. When visited, it outskirts expectations.”<sup>14</sup> In American Technological Sublime David Nye quotes Emile Durkheim’s view on sublime intentions as “a society... not simply constituted by amass of individuals who compose it, by the things they use and the actions they perform, but above all by the idea it has about itself.”<sup>15</sup> The attraction of the sublime lies in a desire to conquer and visually consume something that has not been done so previously.

14 David E. Nye. *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), xiv.

15 Ibid, xiv.

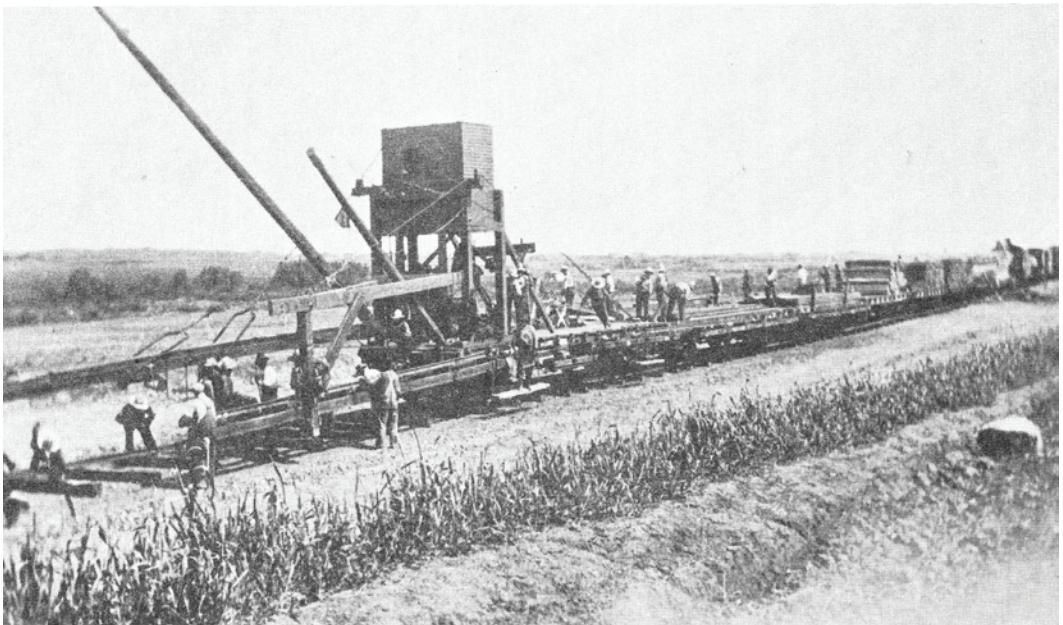
After the Industrial Revolution, the advancements of technological development aimed at conquering expanses of space over any landscape. The creation of cross-continental railroad networks decreased the time between distances across the landscape it would be possible to connect places, products, and humans.<sup>16</sup> As the railway technology became increasingly faster and powerful, it drew a focus to the train itself, as the ability of the machine is seen to equal the power of humanity over nature. The railroad was embraced as a mediator towards humanity's continued claim of power across a wild landscape. The sublime is embodied in the abilities of the machines that began to dominate the vast landscape.<sup>17</sup> The railroad quickly covered expanses of uninhabited territories and connected resources and transportation abilities. Railroad tracks became part of the sublime landscape's image while also being a mobile method of viewing the landscape.<sup>18</sup> The trains forward and steady progress was seen to tame a savage landscape and unite distanced societies. However, the aims of the railroad development did not always bring the intended economic fortune on its own.<sup>19</sup> The railway was an investment in a physical connection of many places, and as civilizations grew along the line, some connections remained strong and economically lucrative more than others.

16 “Machines (railroads) enables society to unite and realize its common needs.” “The natural sublime would inspire the engineer to produce works in harmony with (nature).” David E. Nye. *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), 62.

17 Here, the line of thought is that the landscape, conquered by the construction of the railway, now no longer belonged to “savage” Native Americans. Nature is humanized to the white man, as if it was not humanized before. David E. Nye. *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), 63.

18 “Travelers learned to focus on the immediate experience of seeing the mechanical perfection of power.” David E. Nye. *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), 71.

19 David E. Nye. *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), 58,71.



## RECONSIDERING PERCEPTIONS

Approaching the topic of climate change and the politics associated with the topic of the Anthropocene is a matter of understanding the perspective from which it is presented. The impression we get of a changing climate is one made up of multiple sources and pieces of data, predictions, patterns and estimations which together form a unified concept. However, we only see the physical results of these conclusions in parts, and not as a complete whole. “Climate change tethers us to a perspective that oscillates between the impossible and the inevitable, already and not yet, everywhere but not here, not quite.”<sup>20</sup> Humanity has collectively yet to see a full impression of climate change, but once it is seen it will be too late to act upon. An attempt to view climate change as a whole could form an omniscient position by which to establish a more complete perception of the situation.

American political philosopher Jodi Dean believes that re-framing the perceptions of the Anthropocene through an anamorphic perspective can create an understanding between the collective components of climate change. By breaking free of the fascination of a singular image through “adopting another perspective—a partial or partisan perspective, perspective of a part.”<sup>21</sup> To Dean, this approach rejects a static viewpoint of a subject and instead re-frames the subject through a reconstruction of gaps and separations so that “the whole will not appear as a whole... it will appear with a hole.”<sup>22</sup> By shifting and overlapping perspectives these gaps form outlines of missing information through which new understandings of the subject can be seen.

The perspective we see, or the one we are directed at, forms the position of how we understand the situation. Laws, land treaties, military alliances and infrastructural networks are all examples that form a specific view of the environment and humanity’s place in it. The frame in which we view climate change is predominantly an ignorant one.

20 Jodi Dean. “The Anamorphic Politics of Climate Change,” *e-flux*, Journal #69, published January 2016, accessed 7 November 2016, <http://www.e-flux.com/journal/69/60586/the-anamorphic-politics-of-climate-change/>.

21 Ibid.

22 The example the author gives here is Hans Holbein’s 1533 painting “The Ambassadors.” An indistinguishable smear in the foreground of the image where at a certain angle a skull appears. Ibid.

By overlapping the considerations towards the situation new potentials to accommodate the built environment in a changing climate can be discovered. In *Words and Buildings* architectural historian Adrian Forty describes “nature as a construct of the viewer’s perception,” as its value is accrued through the ways it is accepted by the human mind.<sup>23</sup> Through multiple perspectives can bring out opportunities that a singular narrative can abstain from considering within the same contexts.

## SUMMARY

The preceding research outlines themes of humanity’s desire to conquer the landscape and to create the technologies by which to do so. By constructing a historical narrative of human activity, a localized narrative of the Port of Churchill can be understood. In the town of Churchill, Manitoba, the themes of taming a wild and undeveloped nature and environment through technology, specifically of products and goods by way of the railroad carrying southern Canadian products and international water-borne transportation to the Arctic Ocean. By appropriating multiple understandings of climate events a richer perspective of how future architectural responses can be approached. In the following chapter, past and present day Churchill are be explored through its history in the vast number of historical events and cultural occurrences. While the future conditions of the town’s identity are still uncertain the significance and continued importance of the existing port infrastructures that embody the town will play a key role in any of the town’s future realizations.

23 Adrian Forty. *Words and Buildings: A Vocabulary of Modern Architecture* (London, UK: Thames and Hudson, 2000), 228.

## CHURCHILL, MANITOBA

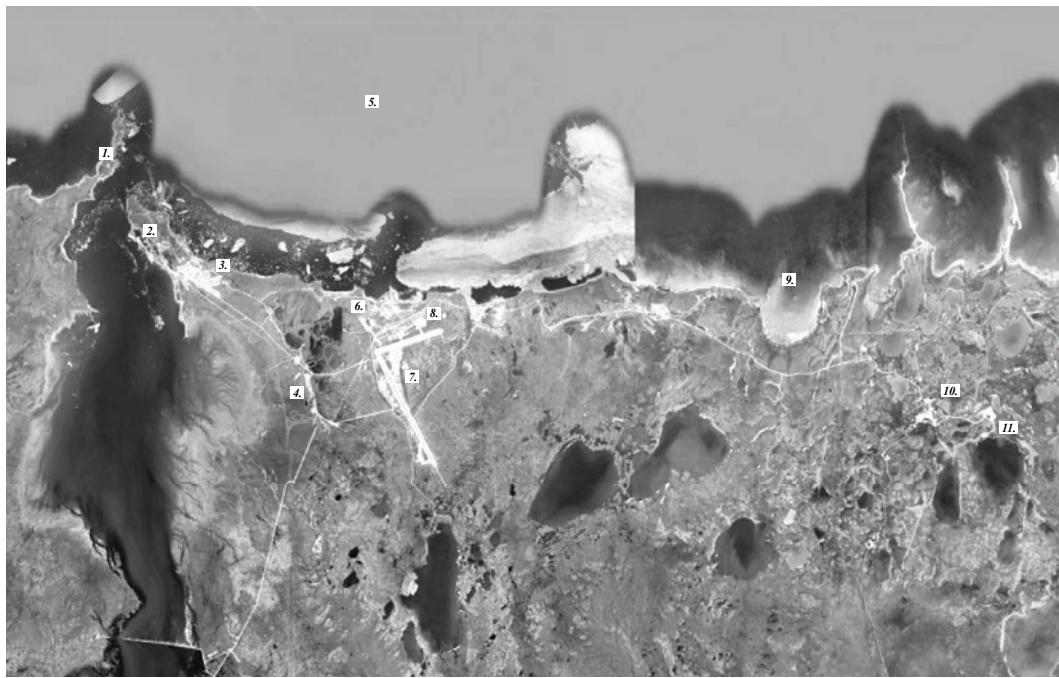
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3.



## CHURCHILL, MANITOBA

58°46'09"N, 094°10'09"W



1. Fort Prince of Wales
2. Port of Churchill
3. Town of Churchill
4. Dene Village site
5. Hudson Bay
6. 'Miss Piggy' C-47 airplane wreck
7. Churchill Airport
8. Fort Churchill Military Base site
9. MV Ithaka wreck
10. Northern Studies Centre
11. Churchill Rocket Range site



## HISTORY OF A PORT TOWN

Located near the most north-eastern point of the province of Manitoba, the town of Churchill has been a site of trade and exchange for several hundred years. At various times throughout the past millennia the Inuit and Dene First Nations people have nomadically occupied the land on which Churchill now stands. The area was first settled as a colonial English outpost in 1689, then permanently with the successful water-borne landing, construction, and occupation of Fort Prince of Wales in 1717, a Hudson's Bay Company fur trading fort. Through the 19th century as the fur trade began to wane, Churchill's importance shifted to the railway and larger international shipping opportunities. Railways began drawing north as southern agricultural production afforded the economic opportunities of grain yields and other commodities to be transported by way of the sea. The Town of Churchill was named after the river it heads, the Churchill River. The river was named for John Churchill, the 1st Duke of Marlborough, a governor of the Hudson's Bay Company, and ancestor of Sir Winston Churchill. Churchill was not open for settlement, aside from Hudson's Bay Company employees and construction workers who held a claim on the Hudson Bay watershed until the establishment of a federally funded railroad and construction of the arctic seaport in the late 1920s.

Due to its semi-remote sub-arctic location, Churchill has been subject to several, and since defunct, technological and military operations and constructions. Their remnants are still visible. The oversized Churchill airport is all that remains of Fort Churchill, a 3000-person military and radar base constructed and operated by the US Air Force and the Canadian army during World War 2.<sup>24</sup> The Churchill Northern Studies Centre is built among the remaining buildings of the Churchill Rocket Range which launched over 3500 experimental rockets and low-orbit satellites between 1954 and 1990.

<sup>24</sup> Jerry Proc, "H.M.C.S. Churchill," Accessed online from Radio Communications Signals Intelligence in the Royal Canadian Navy website, <http://www.jproc.ca/rrp/rrp2/church.html>

The efforts of government land allocations and incorrect assumptions by wildlife officials in Manitoba on the impacts of traditional caribou hunting methods forced the relocation of the Sayisi Dene First Nation group at Duck Lake, Manitoba between 1956-1973 to the outskirts of Churchill into a segregated community called Dene Village. During this time of colonial integration, the Sayisi Dene were subject to sickness and unfamiliar living conditions. During their re-location, one third of their population perished, before they could return onto the land and settle at Tadoule Lake, Manitoba. Remnants of this village remain as ghostly dismantled foundations and grown in streets outside of the town.<sup>25</sup>

Today, Churchill is known for being the key location to view migrating polar bears, beluga whales and other seasonal flora and fauna during various times of the year. A significant rise in eco-tourism has overshadowed the closure of the landmark grain port. The fate of Churchill rests on the future development of these significant infrastructures and economic possibilities.

25 Scott Gilmore, “How Ottawa Abandoned our only Arctic port,” Accessed online from Macleans website <http://www.macleans.ca/news/canada/abandoned-churchill/>

## THE BATTLE FOR THE ONLY ARCTIC SEA PORT

The push to develop the north was advanced through the myths of an undeveloped and unexplored territory. As most Canadian settlements began within a few hundred kilometers from the southern border of the United States, the connections to the north seemed to be only a distant and expensive achievement. For 200 years, due to private English occupation by the Hudson's Bay Company, the Hudson Bay water system only allowed the fur trade to exist.<sup>26</sup> Western farmers sought to obtain this same right to an international market opportunity through a Hudson Bay route, rather than pay tariffs through shipments through Quebec to the St. Lawrence seaway route.<sup>27</sup>

The push to construct a railway connecting Winnipeg, an already established transportation hub, to Hudson Bay was promised by the Canadian government. By the mid-1890's initial schemes – at first grand connections from Mexico to the Hudson Bay - were followed by local plans bringing the proposed railway from Winnipeg, through The Pas and northeast to the sea.<sup>28</sup> The aim to conquer the vast sub-arctic landscape, covered in sandy muskeg and soft, permafrost soils, brought unforeseen engineering challenges.<sup>29</sup> Soft soil embedded with permafrost which freezes and thaws in various degrees annually lead to frequently sinking and shifting railroad tracks which wound around the uneven muskeg landscape.<sup>30</sup>

Originally, the envisioned seaport was planned for Port Nelson, but was abandoned during the construction process due to shallow shoreline depths. By 1927, the government decided to continue the railway construction north to Churchill. In 1929 the last line of track was laid at the port site in Churchill with the port already under construction. Two years later, the new grain elevators would load and ship out the

26 Grant MacEwan, *The Battle for the Bay* (Saskatoon, SK: Western Producer Book Service, 1975), 6.

27 Ibid, 6.

28 Ibid, 86-87.

29 Ibid, 178-179.

30 Lynda A. Dredge, Field Guide to the Churchill Region Manitoba. *Geological Survey of Canada: Miscellaneous Report 53*, (Ottawa: Geological Survey of Canada. 1992), 15.

first shipment of grain. Aside from some dormant time during World War 2, the Churchill port remained active annually since its debut shipment. Although primarily equipped to house the processing and shipment of grain, the port could send and receive industrial and manufactured goods such as foreign vehicles and fertilizers. The close distance to foreign nations in the northern hemisphere attracted various political connections. Noticeable foresight into climate changes brought forth the considerations of shrinking arctic sea ice coverage that could eventually allow for uninhibited year-round transportation through the Arctic Sea. The Arctic Sea Bridge project proposed by the Government of Manitoba aimed to connect Churchill's port with various ports in northern Russia and Europe, bringing trade opportunities to central North America, as opposed to solely the coastal ports.<sup>31</sup>

The port infrastructure and the rail line connecting south to The Pas was sold from the Federal Government to the American transportation company OmniTRAX in 1997. OmniTRAX controlled operations until the port suddenly closed in August 2016. One can blame the closure on the dismantlement of the Canadian Wheat Board which had ensured annual shipments of grains through Churchill.<sup>32</sup> With the port now idle, and given the unemployment of nearly one hundred people (of the town's approximate population of 820 inhabitants), the immediate future of the port is, in fact, left to a First Nations collective, led by the Mathais Columb First Nation who collectively purchased the port and its infrastructure systems in early 2017. The First Nations buyers and the future intentions of the port and the master plan of the Hudson Bay Railway are crucial in maintaining and advancing northern Manitoba's material industries and rail-based economies. Until its closure, the Port of Churchill was the only arctic ocean sea port connected to the North American railway grid.

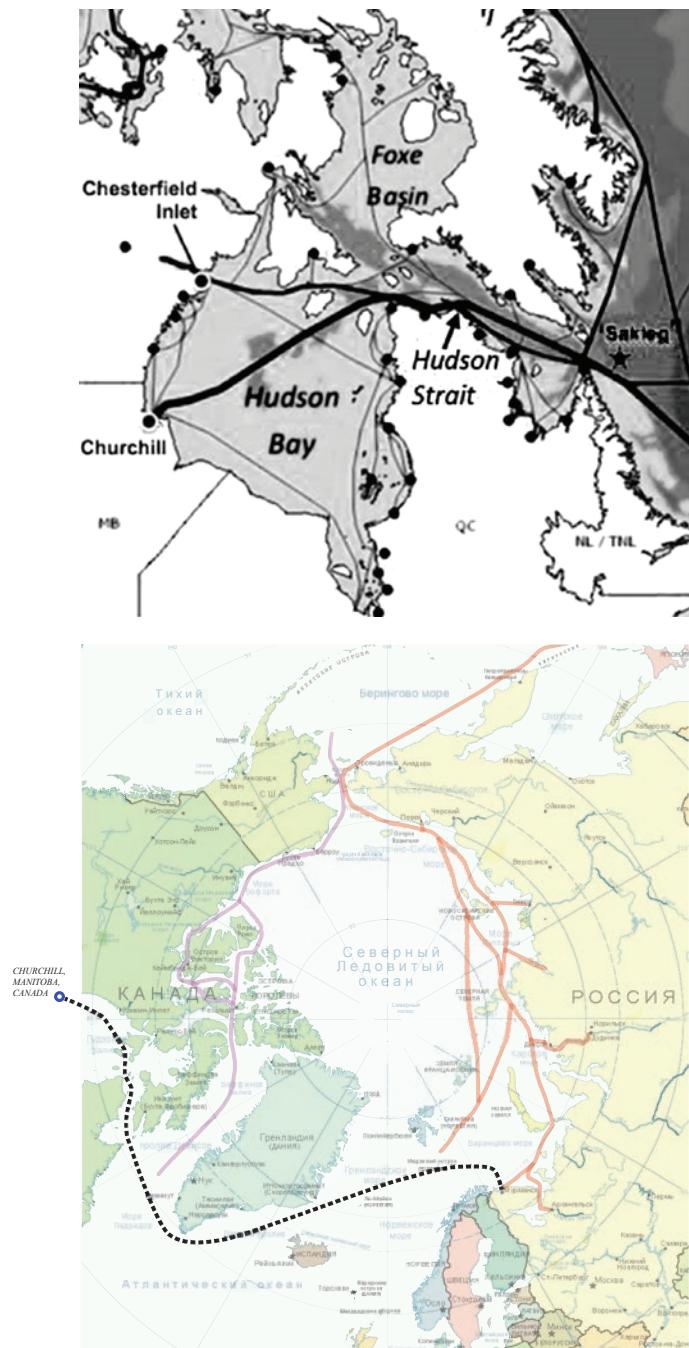
31 Excerpt from the Arctic Sea Bridge & Gateway website: "Manitoba is at one end of an international Arctic shipping route connecting Churchill, Manitoba—Canada's only major international Arctic seaport—to the Port of Murmansk, Russia. The Arctic bridge offers the opportunity to shorten shipping routes, open new trade avenues for Manitoba and Canada with international partners, reaffirm Canada's sovereignty position in the Arctic, and integrate northern Manitoba into the world trade framework" "Key to Northern Development," Accessed online from The Arctic Bridge Gateway website: <http://arcticbridge.com>

32 Scott Gilmore, "How Ottawa Abandoned our only Arctic port," Accessed online from Macleans website, <http://www.macleans.ca/news/canada/abandoned-churchill/>

## CONSTRUCTION OF THE PORT OF CHURCHILL



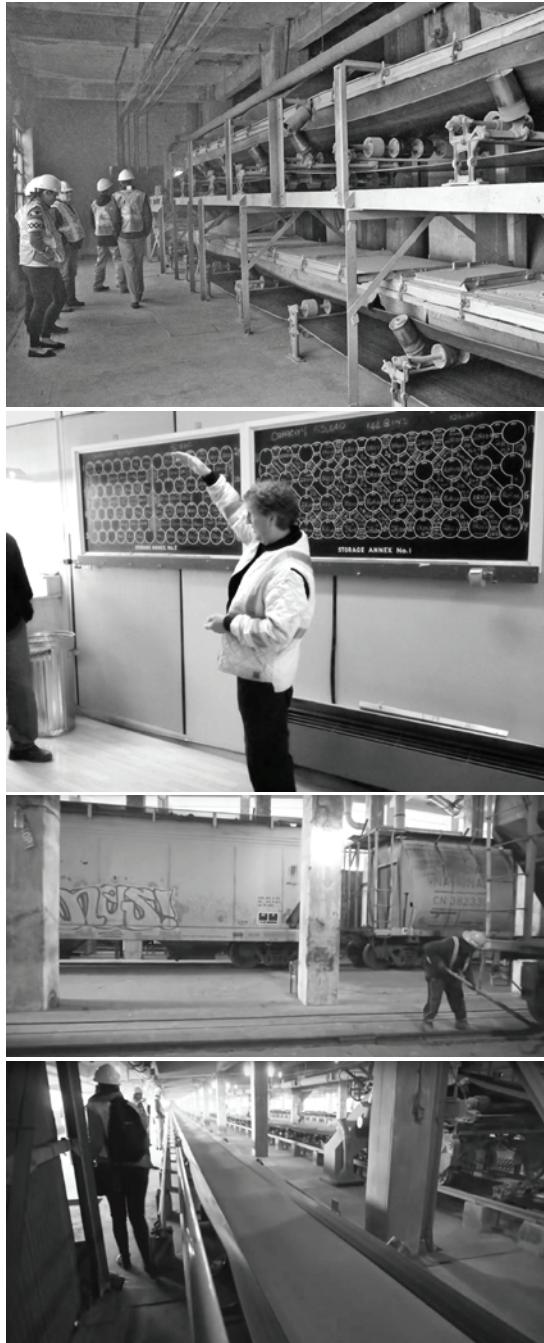
## INTERNATIONAL TRANSPORTATION ROUTES



**THE PORT OF CHURCHILL EXTERIOR, PRESENT DAY**



## THE PORT OF CHURCHILL INTERIOR, PRESENT DAY



## **ECO-TOURISM**

Churchill is situated at the confluence of three major biomes: marine (Hudson Bay), boreal forest (to the southeast) and tundra (to the northwest), each supporting unique varieties of flora and fauna. Churchill sits above the tree line, and the plants and animals which survive the harsh landscape are resilient to the climate. Over the past few decades, the town developed a growing tourism industry focused on the migration habits of many arctic animals. Each year approximately 10,000–12,000 eco-tourists visit the Churchill area.<sup>33</sup>

Churchill has earned a name as “The Polar Bear Capital of the World.” Tourists join guided tours and roam the tundra landscape and safely view migrating polar bears from specially modified off-road buses. October and early November are typically the best times to see polar bears, waiting on the land around the town until the ice freezes over on Hudson Bay before returning to hunting atop the sea ice. Thousands of beluga whales, which move into the warmer waters of the Churchill River estuary during July and August to calf, are a major summer attraction. Churchill is also a destination for bird watchers from late May until August.

## **PLIGHTS OF MONO-INDUSTRY**

The closure of Churchill’s sea port represents a common situation in other single-industry towns across Canada. This boom-bust cycle of raw resource commodification is often experienced in fur trade, farming, mining and fishing economies. In many cases a township is borne from a nearby resource commodification and capital exploitation. The town flourishes through the economy created to process the resource. Once the resource is expended, the economy collapses and the town dismantles.

33        “Things to Do,” The Town of Churchill, Web, <http://churchill.ca/main.aspx?parentCode=2AA3ECE7-8A1F-4E99-9C65-B239F0847E6B&pageCode=6DE88588-400B-4160-BEA7-6BF93357AAE6>

This topic is explored by Canadian economics historian Harold Innis as the “staple theory.” Innis studied relationships between economies of raw materials outside of city centres in the ‘peripheries’ of northern and western Canada. As the north and west of Canada was developed, successful expansion was based upon the continual search and accrual of what he called ‘staple’ economies.<sup>34</sup> To Innis the creation of the railroad was Canada’s answer in cross-country unification across a vast landscape. The railroad instigated economic, political and technological efforts in connecting a country from east to west and into the periphery.<sup>35</sup> The railroad fueled the speed of establishment and exploitation of staple communities.

Churchill, first a former fur trade staple, succeeded into a raw agricultural processing and shipping staple. Currently, the sea port industry has waned to a close, and it’s economy has been overtaken by a new staple industry of tourism. For the time being, current environmental conditions and contemporary migratory patterns of the wildlife that pass through Churchill will allow for the town to flourish in this capacity. However, tourism is also a temporary staple. As the climate continues to change the tourism staple will collapse leaving the town to take up another source of economy.

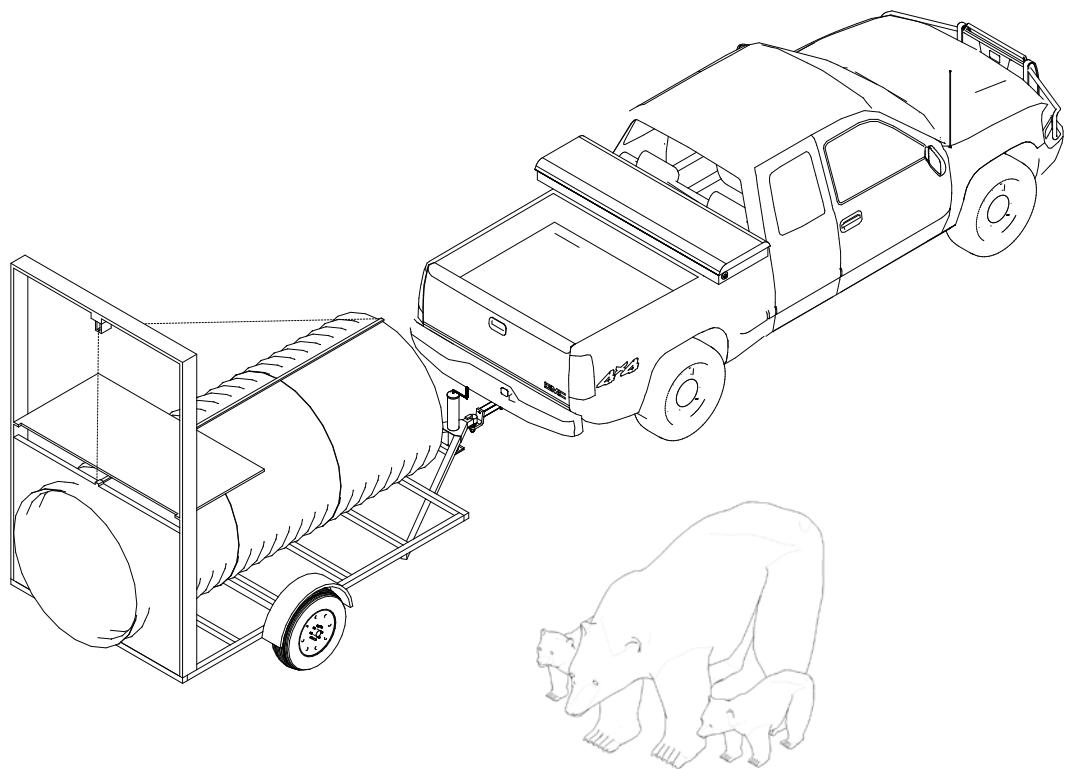
## SUMMARY

Understanding the unique history and contemporary culture of Churchill brings forth a sense of the importance to the place. These preceding studies and inquiries are rooted in various respective intentions and desires but their future uses and designations are open for interpretation. The future of Churchill is certainly uncertain but the role of the contemporary forces of local economics and the continually changing environment, alongside the existing constructions, form a basis for the continuation of imagining a future of the port. How might the future of the port be envisioned that is rooted in the town’s rich history, framed through a reconsideration of nature and technology?

34        “Staples Theory,” *Old Messengers, New Media: The Legacy of Innis and McLuhan*. Library and Archives Canada. Web. <http://www.collectionscanada.gc.ca/innis-mcluhan/030003-1020-e.html>

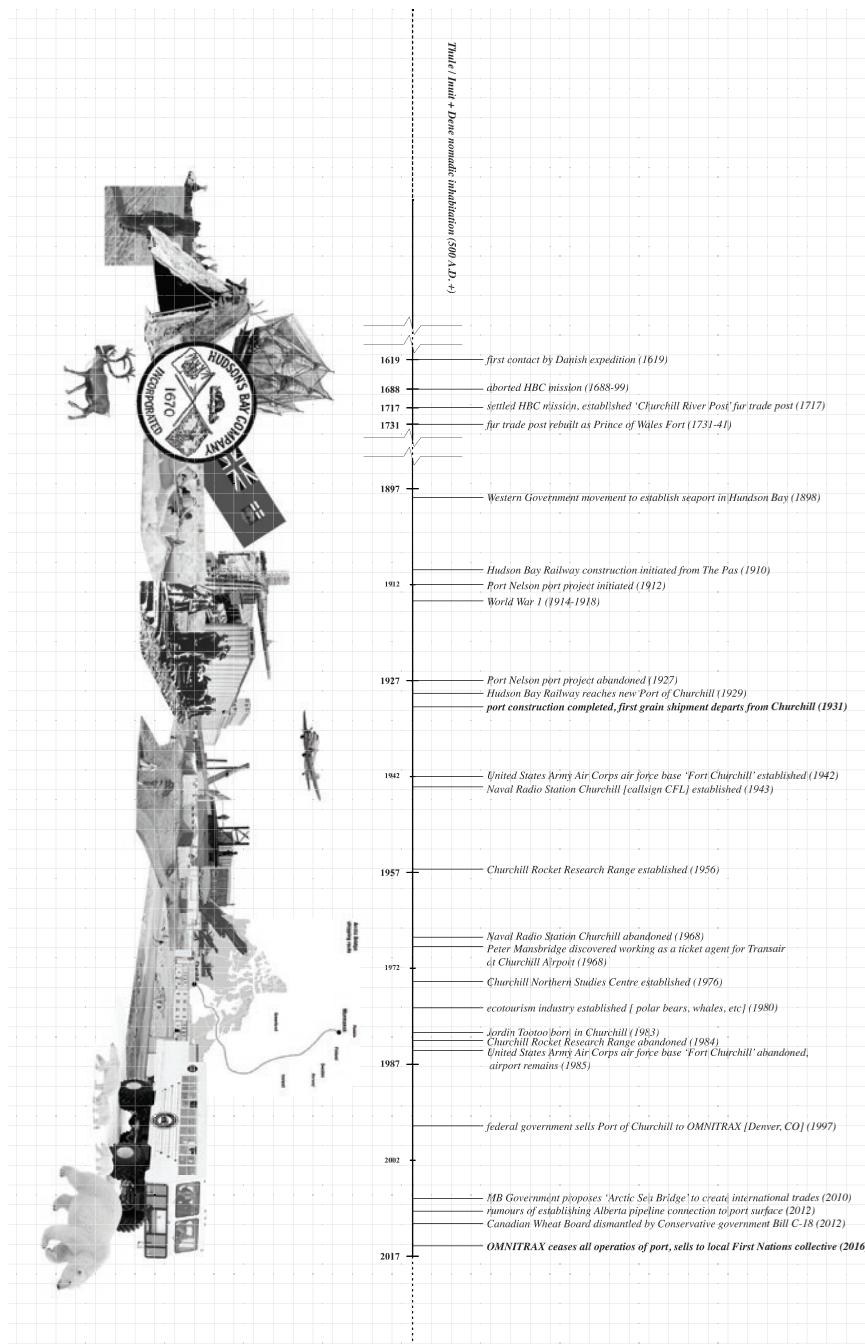
35        Ibid.





*In Churchill, traps to catch polar bears are made from large metal culverts. The traps are placed on trailers to humanely contain the bears that wander into the township. When captured the bears are driven out into the tundra and released.*

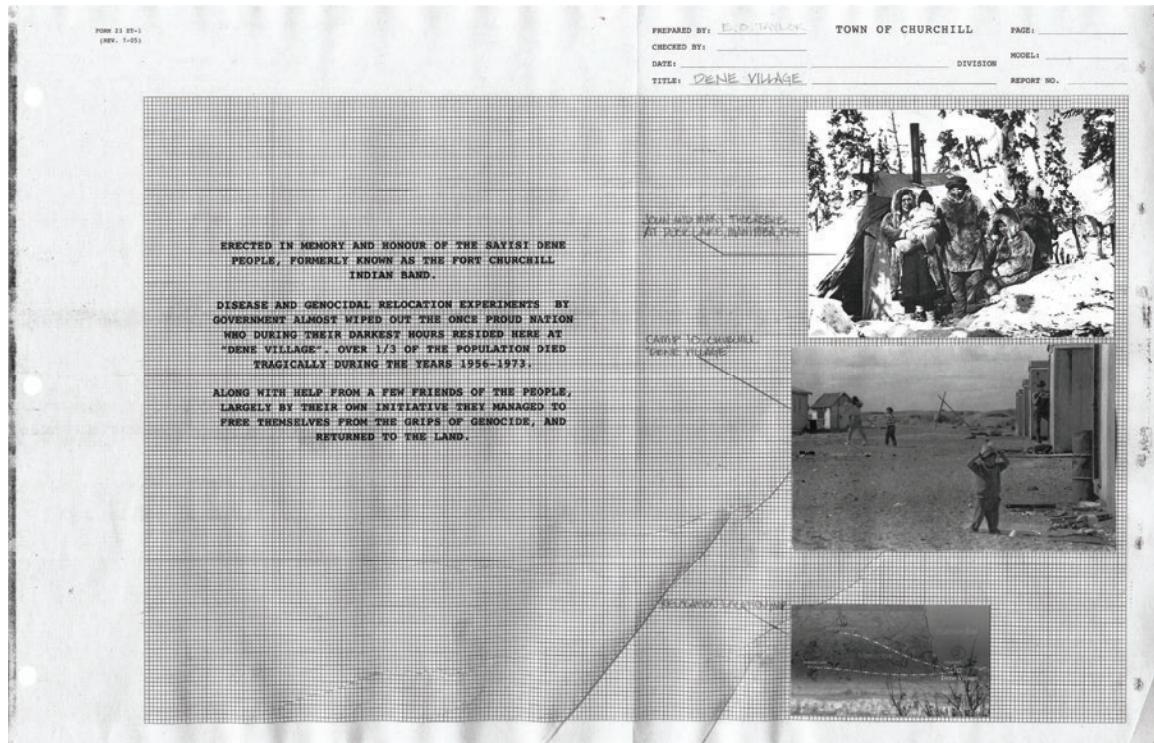
## HISTORICAL TIME LINE OF CHURCHILL



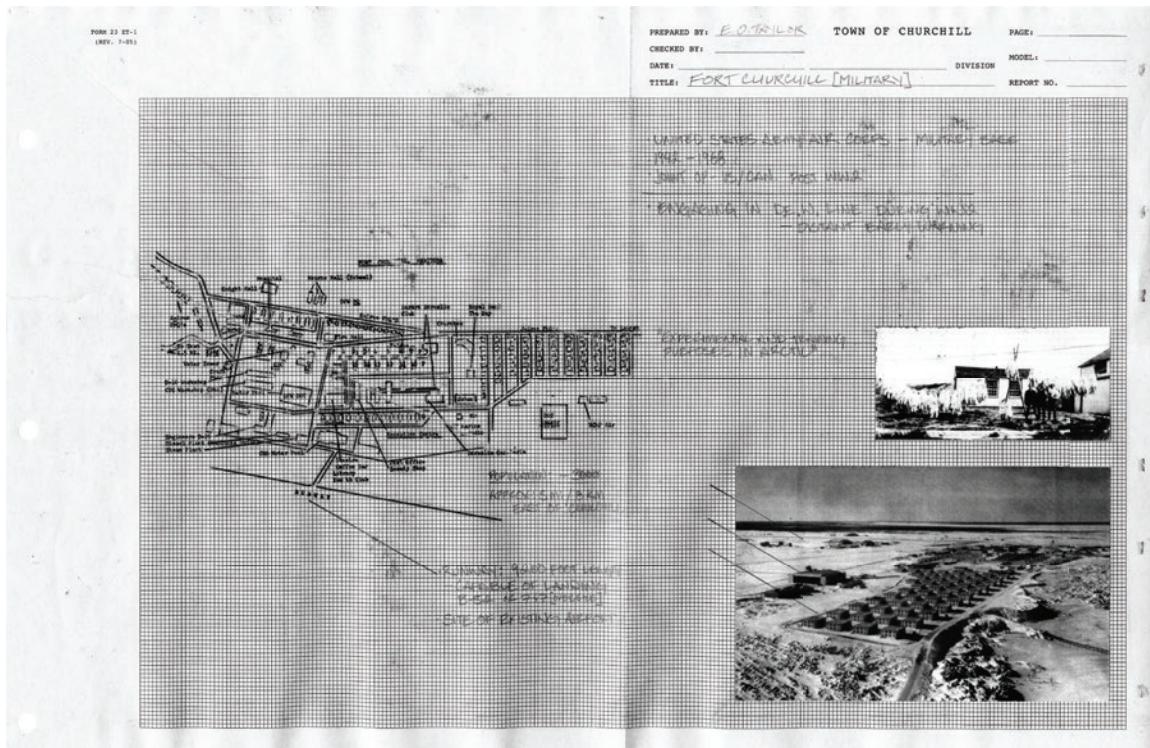
## **EXCURSUS: NEW ARCHIVAL MATRICES**

Churchill's history is rich with cultural anomalies, some of which are presently apparent and visible. The following studies, the New Archival Matrices, collect drawings and images of eight unique subjects that are found in Churchill and the surrounding area. These matrices are treated and depicted as field notes as collected on-site, forming a historical narrative of the town.

*New Archival Matrix #1*  
**DENE VILLAGE**



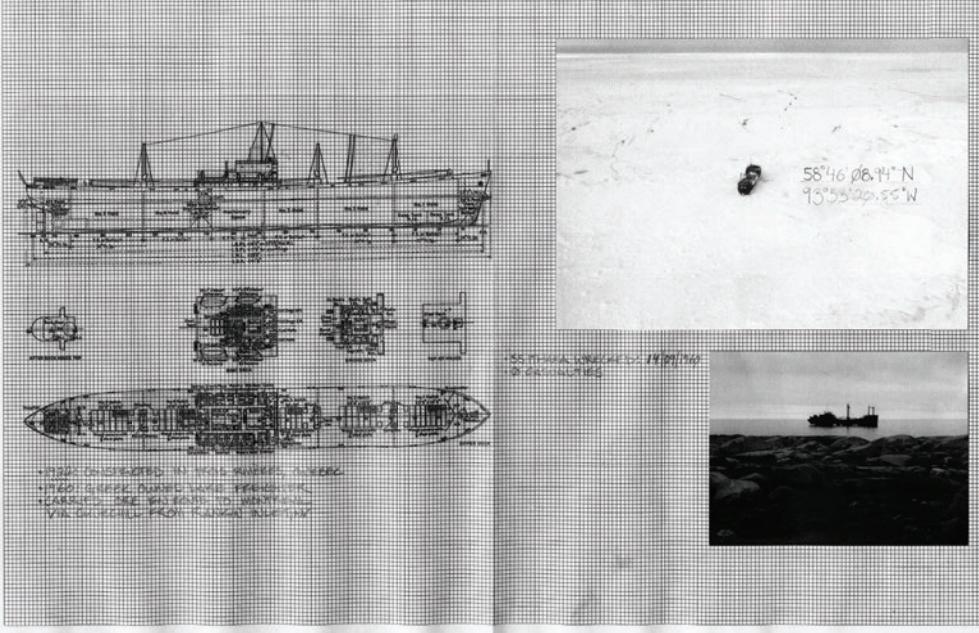
*New Archival Matrix #2*  
**FORT CHURCHILL MILITARY BASE**



*New Archival Matrix #3*  
**MV ITHAKA WRECK**

FORM 23 RT-1  
(REV. 3-65)

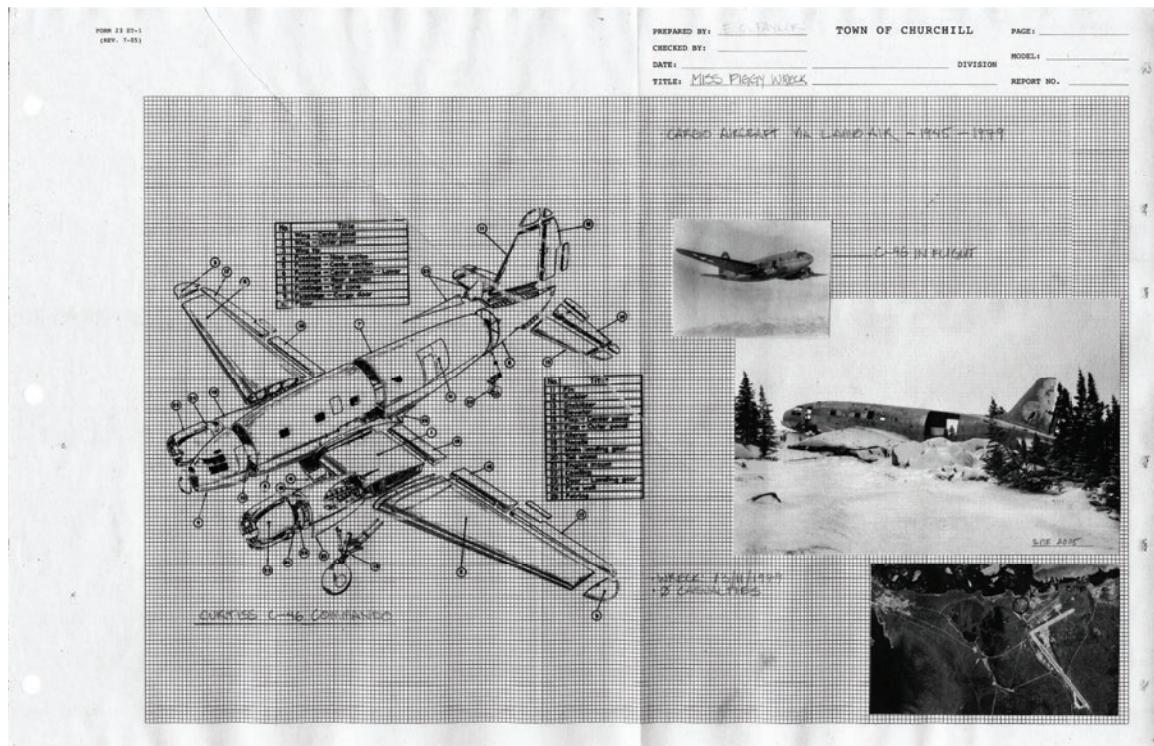
PREPARED BY: Eduardo T. Tavares TOWN OF CHURCHILL PAGE: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
DATE: \_\_\_\_\_  
TITLE: MV ITHAKA WRECK DIVISION MODEL: \_\_\_\_\_  
REPORT NO. \_\_\_\_\_



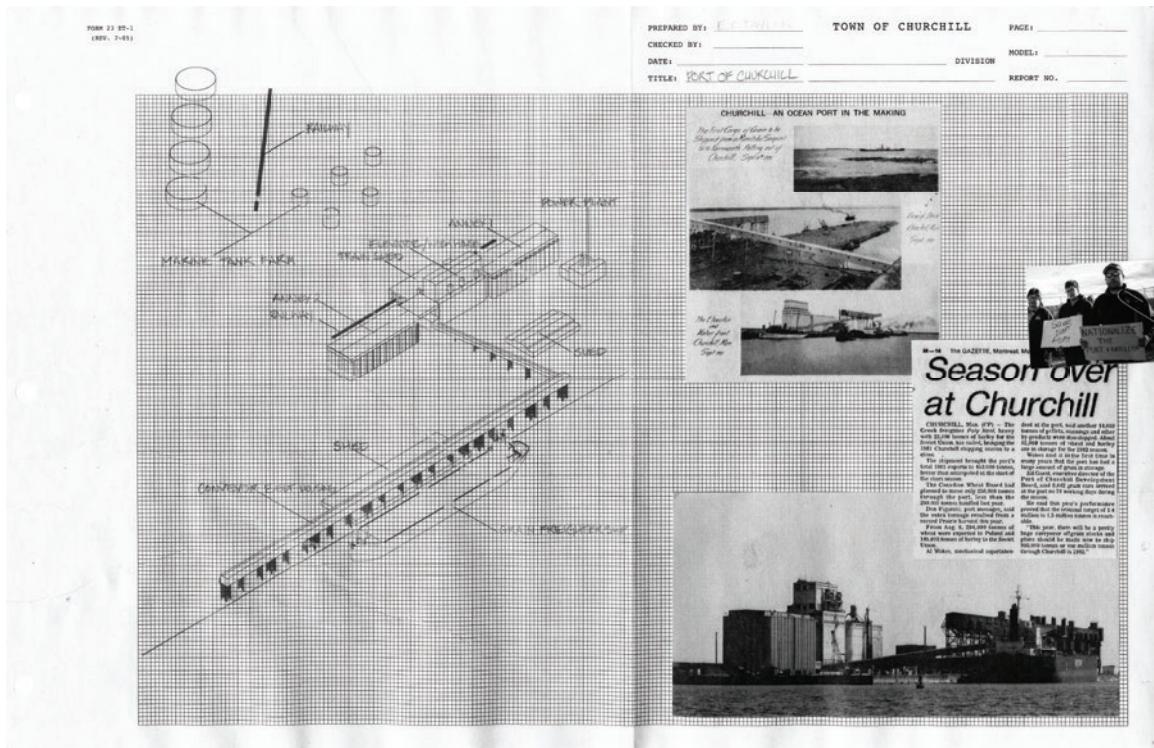
SS ITHAKA WRECK - 14/09/1990  
00000000000000000000000000000000

58°46'08.44"N  
93°55'20.55"W

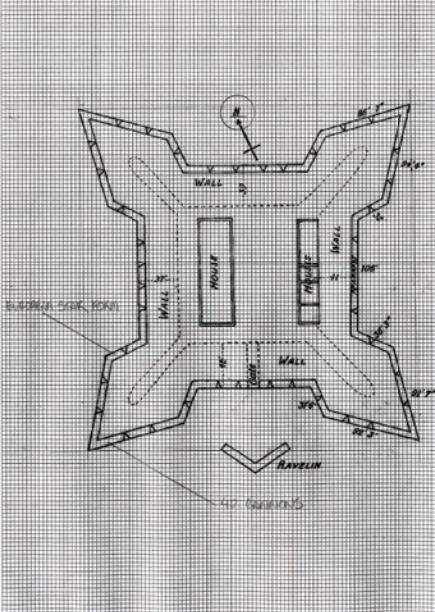
*New Archival Matrix #4*  
**MISS PIGGY WRECK**



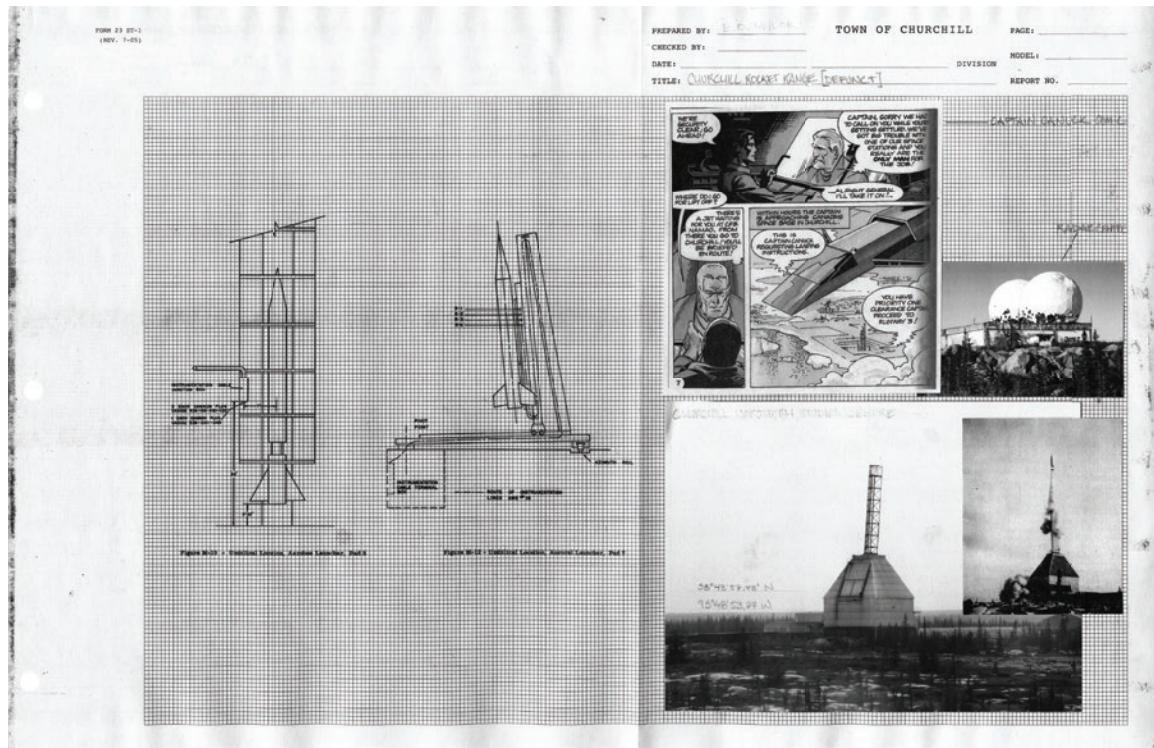
*New Archival Matrix #5*  
**PORT OF CHURCHILL**



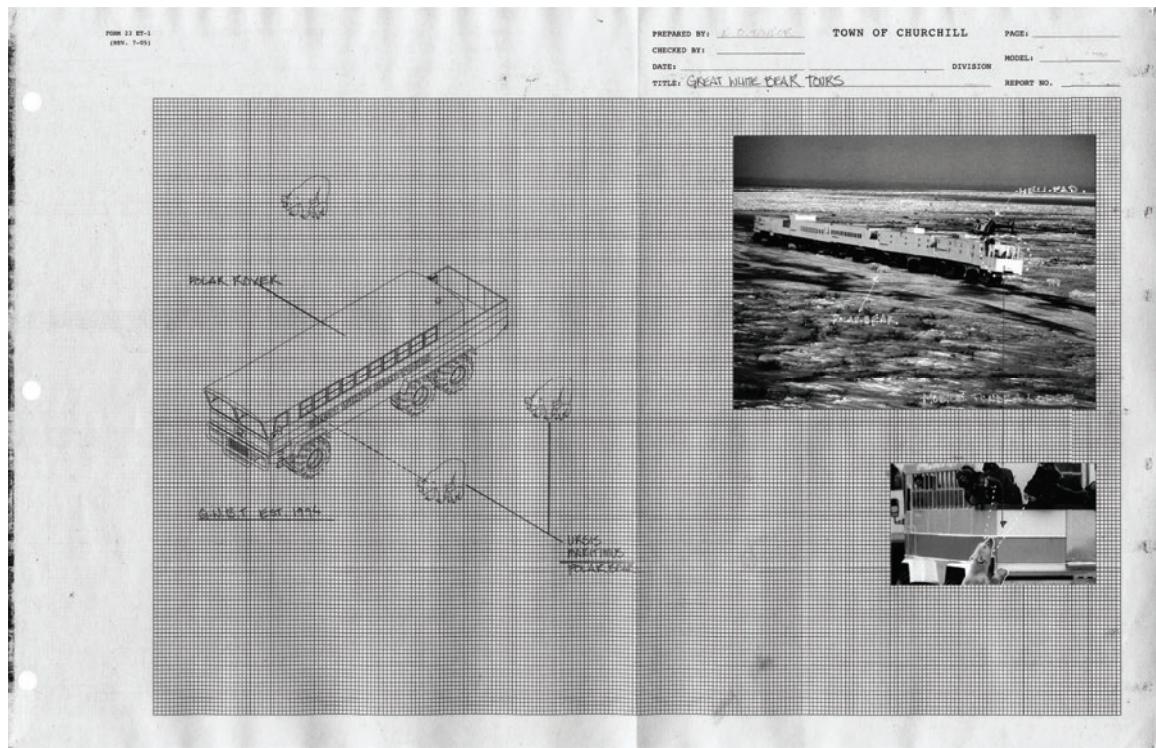
*New Archival Matrix #6*  
**FORT PRINCE OF WALES**

FORM 13 ST-1 (REV. 7-65)	PREPARED BY: <u>E.O. TULLOR</u> TOWN OF CHURCHILL PAGE: _____ CHECKED BY: _____ DATE: _____ DIVISION: _____ TITLE: <u>PRINCE OF WALES FORT [HEC]</u> MODEL: _____ REPORT NO. _____		
 <div style="position: absolute; left: 258px; top: 375px;">           BASTION CHAMBERS WALL HORN WALL HORN WALL RAVELIN GATEWAYS         </div> <div style="position: absolute; left: 575px; top: 375px;">             Photo credit: Churchill Archives NB-48-28         </div> <div style="position: absolute; left: 575px; top: 475px;">           FRONT WALL OF THE FORT IN 1861 - THE 1860 HORN BATTISON - THE 1860 ANTICIPATION - LATER - SHOT DOWN IN 1860         </div> <div style="position: absolute; left: 725px; top: 475px;">           FRONT BATTISON TO THE FORT THE HORN BATTISON - THE 1860 ANTICIPATION - LATER - SHOT DOWN IN 1860         </div> <div style="position: absolute; left: 575px; top: 515px;">           CANNON BATTISON POLISH SWORD - 1860 CANNON BATTISON - 1860 HORN BATTISON - 1860 CANNON BATTISON - 1860         </div> <div style="position: absolute; left: 725px; top: 515px;">           CANNON BATTISON         </div> <div style="position: absolute; left: 575px; top: 625px;">            Photo credit: Churchill Archives NB-48-28         </div>			

*New Archival Matrix #7*



*New Archival Matrix #8*  
**TUNDRA BUGGIES, POLAR BEAR TOURS**



## **EXCURSUS: A CORE SAMPLE OF CHURCHILL**

Following the form of the geological studies explored earlier in the project a “core sample” model was constructed to conceptually reflect the historical discoveries of the town of Churchill. The model’s exterior surface was treated with images of four themes: environment, technology, the port infrastructure, and development of northern Canada.

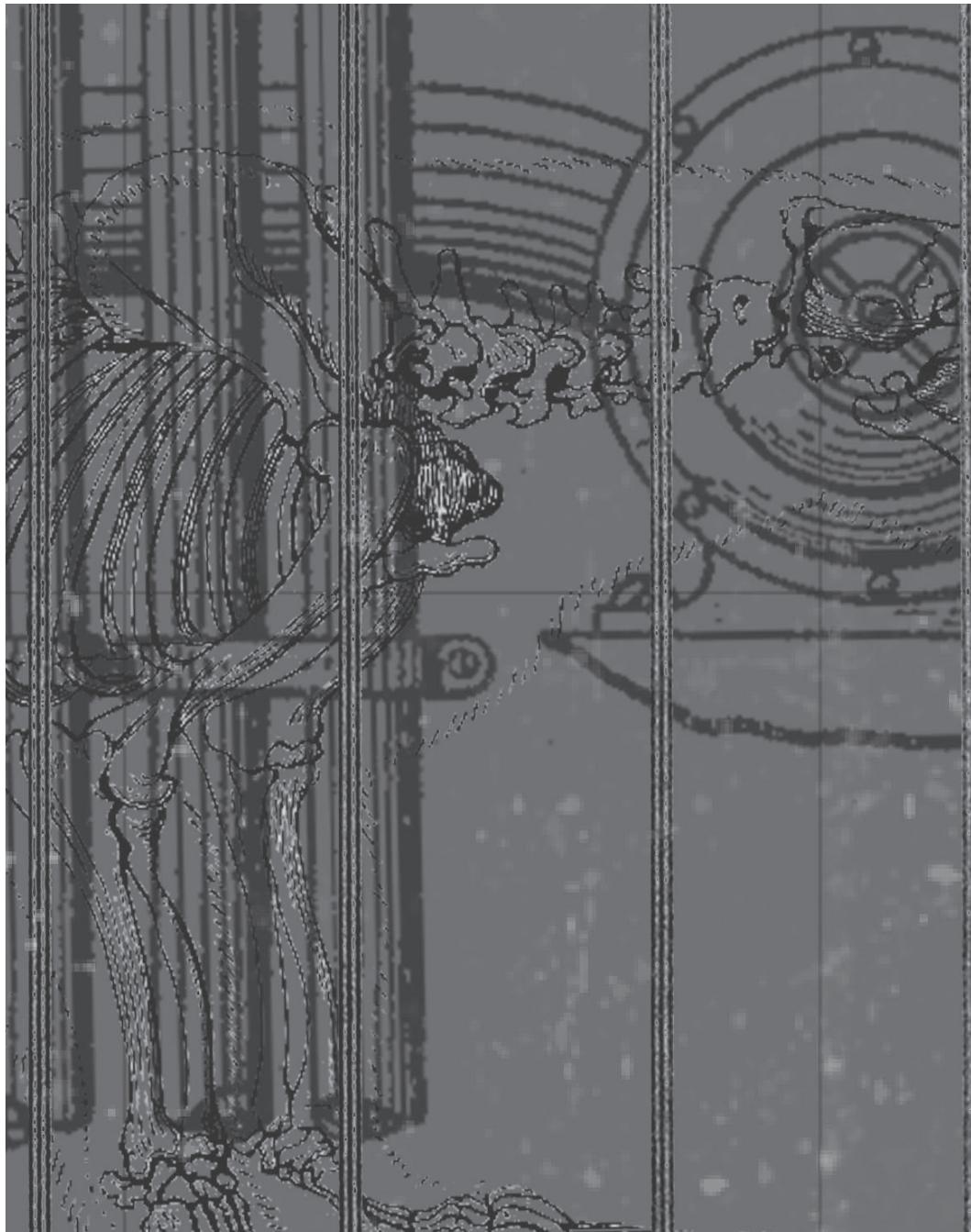
The model is cast with miniature model components that reflect the past technological attempts at developing industry in the Churchill area. The components are cast in place along the vertical length of the model as an impression of the site’s surface and local history. A lone polar bear figure is placed on the top referencing the contemporary culture of Churchill as a “Polar Bear Town” and eco-tourism becoming an economic keystone.



## PROCESS

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4.

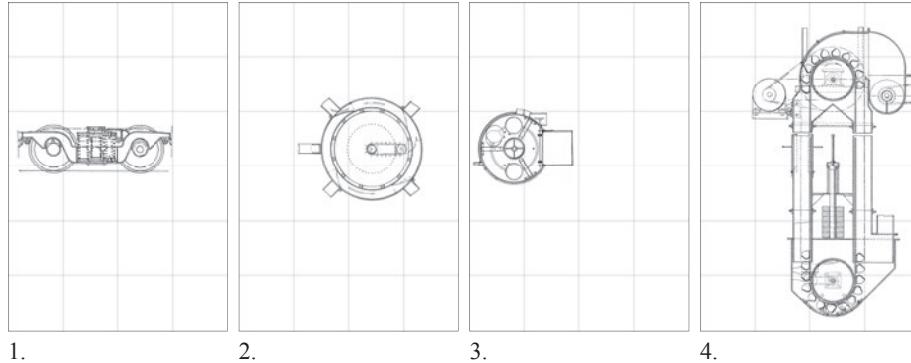


## **DRAWING COMPOSITES**

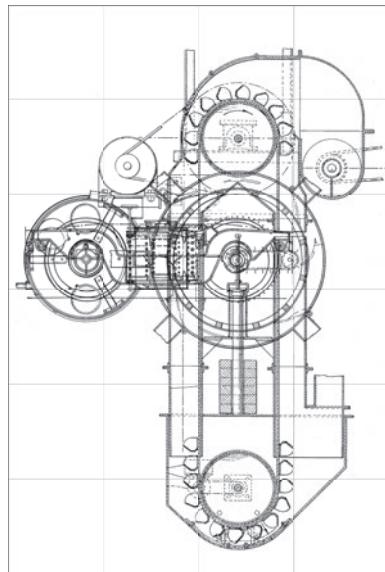
The preceding research explored many layers of information about Churchill and the historical themes that would develop from conception to present day. In this spirit, layered drawing became a method to realize these concepts in a formal and spatial manner.

Drawing upon the image-based composite projects of architect and artist Douglas Darden, a series of overlaid technical line drawings, that reference the natural, cultural, technological, and existing constructed conditions of the Port of Churchill, were explored to instigate potential future architectures and establish a way of drawing.

**COMPOSITE DRAWING #1:**  
Ice Core Turbines & Circulators

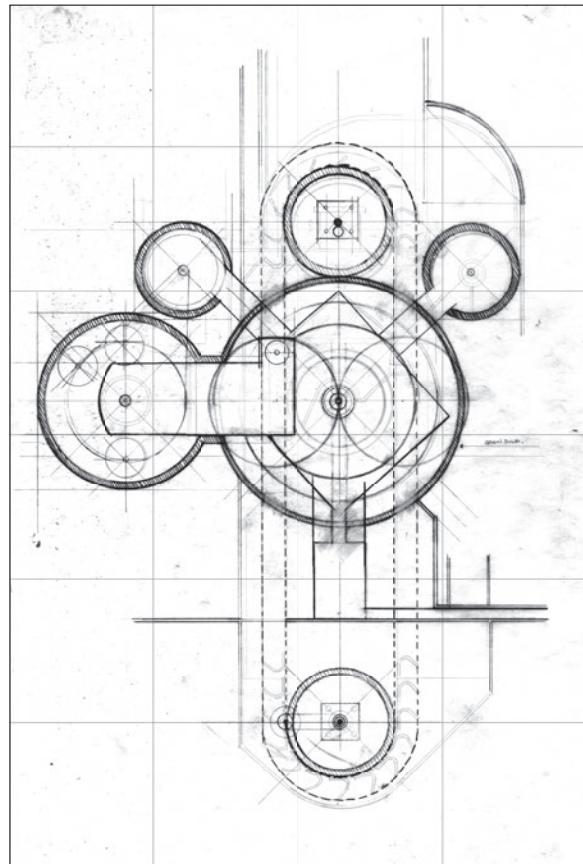


1. 2. 3. 4.

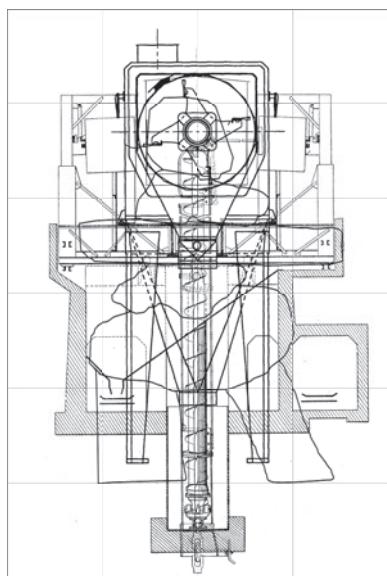
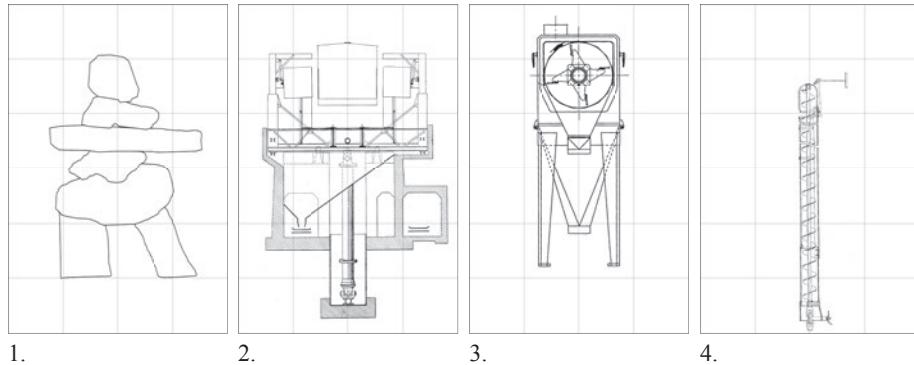


5.

1. Boxcar Wheel Assembly
2. Concrete Grain Silo (Plan)
3. Grain Aerator
4. Bucket Elevator
5. Image Composite
6. Composite Drawing

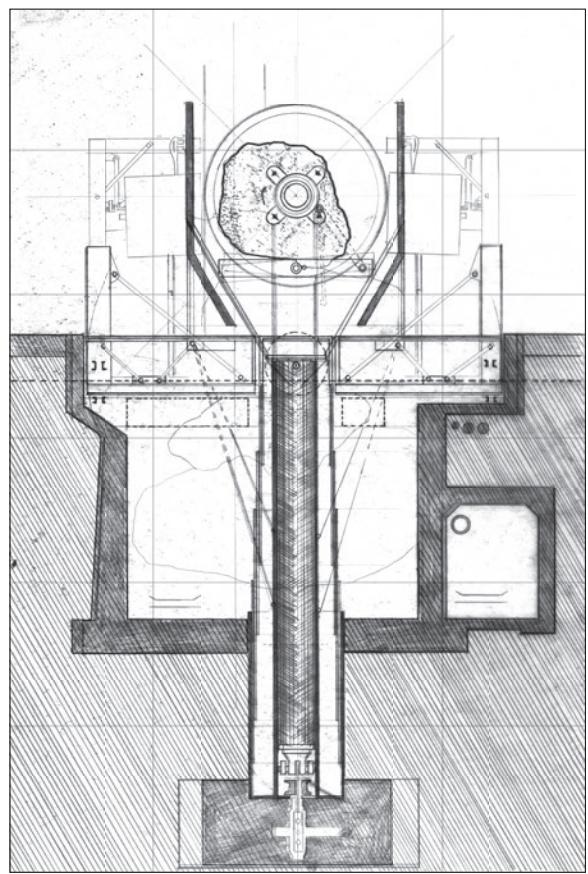


**COMPOSITE DRAWING #2:**  
Transit Load Adjuster

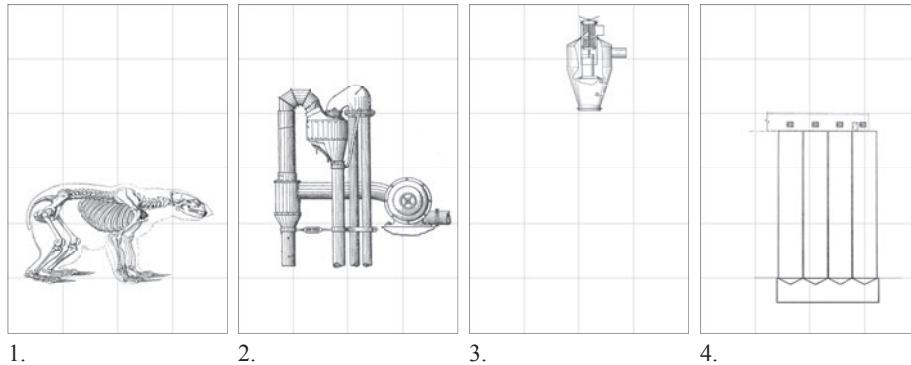


5.

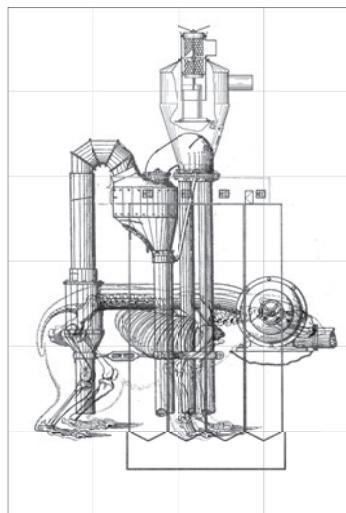
1. Inukshuk
2. Boxcar Tippler
3. Upright Grain Separator
4. Receiving Auger
5. Image Composite
6. Composite Drawing



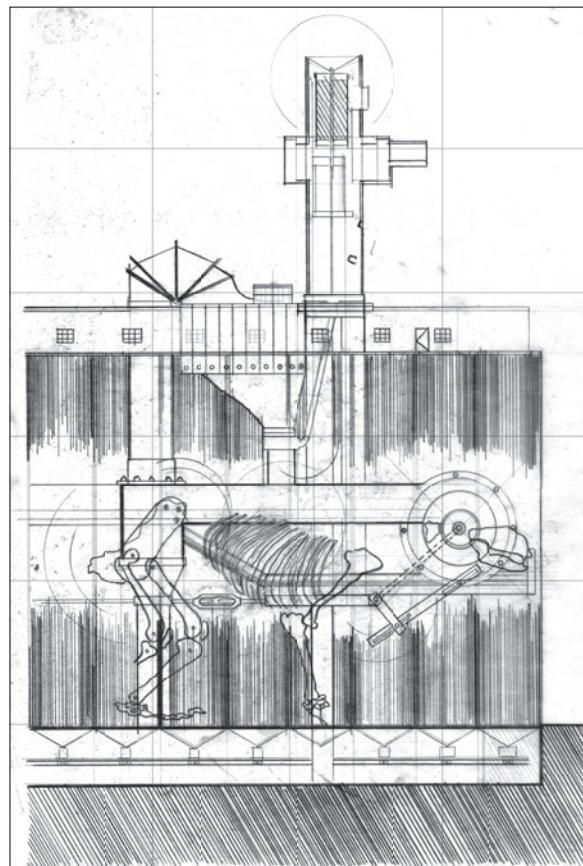
**COMPOSITE DRAWING #3:**  
Material Reception/Analytical Systems



1. 2. 3. 4.

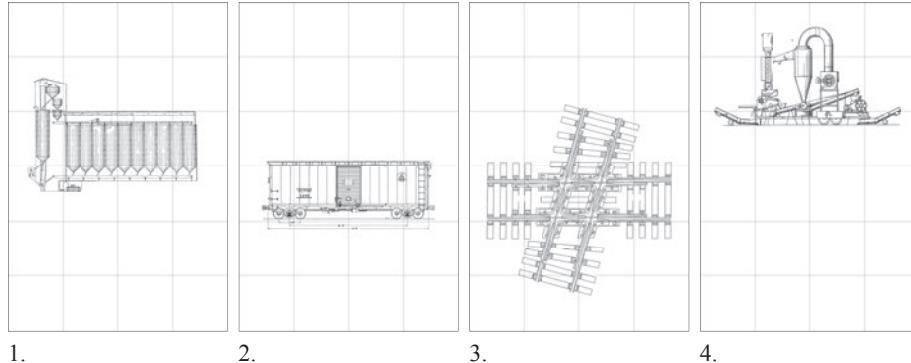


5.

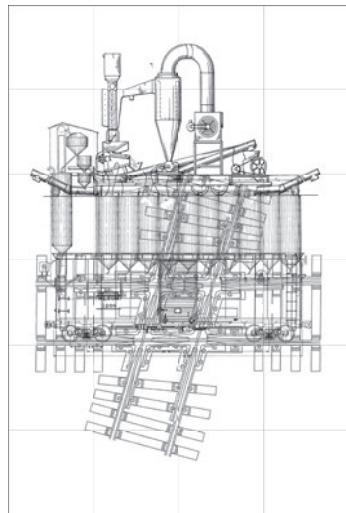


1. Ursus maritimus (Polar Bear)
2. Grain Aspirator Assembly
3. Grain Cleaner
4. Concrete Grain Silos (Elevation)
5. Image Composite
6. Composite Drawing

**DRAWING COMPOSITE #4:**  
Sub-Silo Material Conveyors

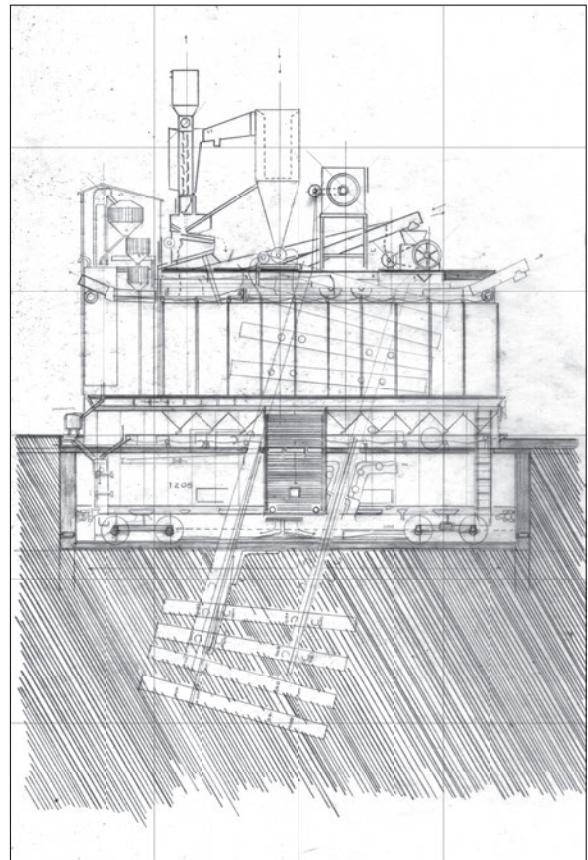


1. 2. 3. 4.

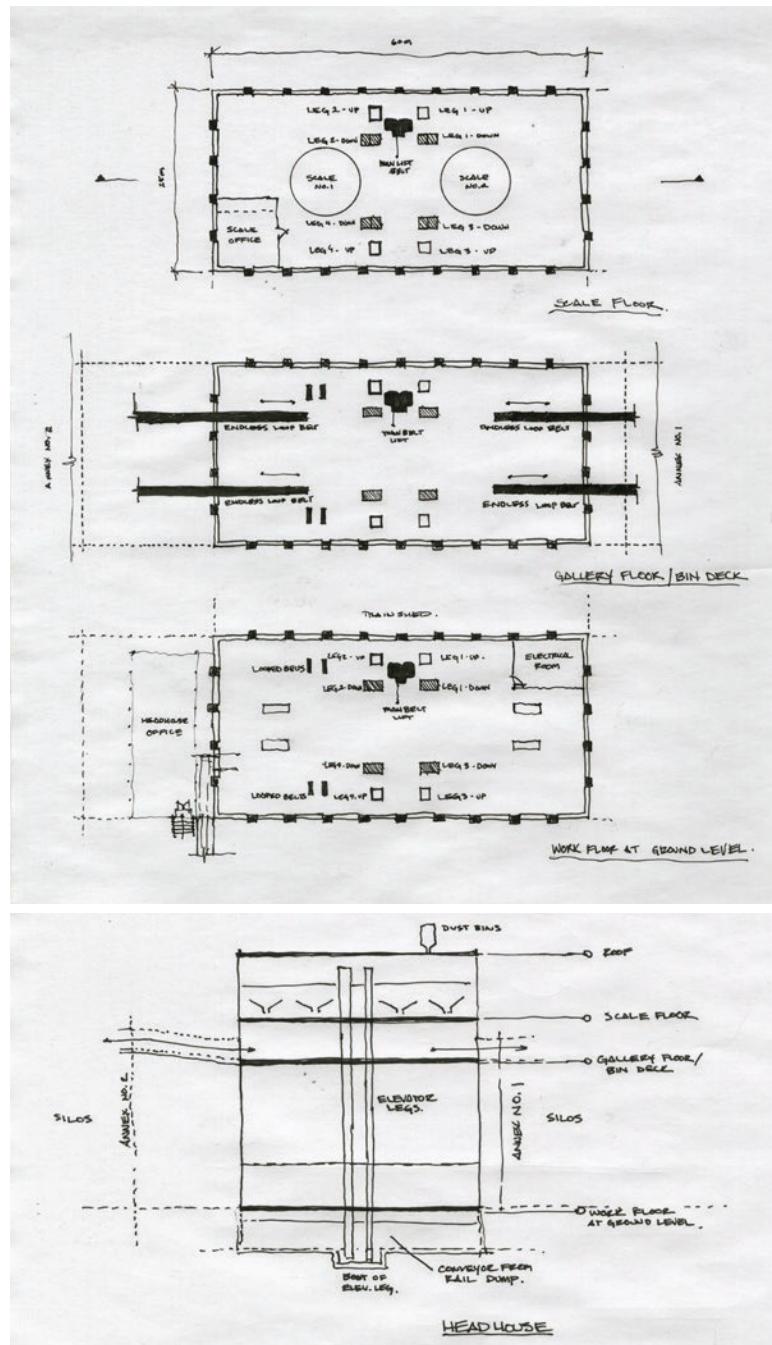


5.

1. Railway Grain Elevator and Conveyors
2. Boxcar (40')
3. Railway Stationary Crossing
4. Suction Separator
5. Image Composite
6. Composite Drawing



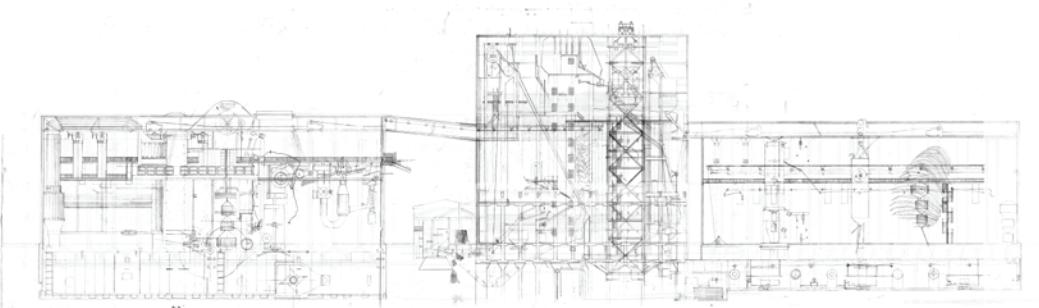
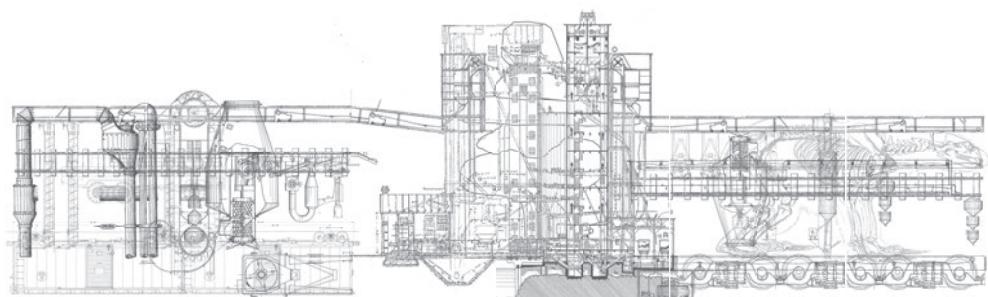
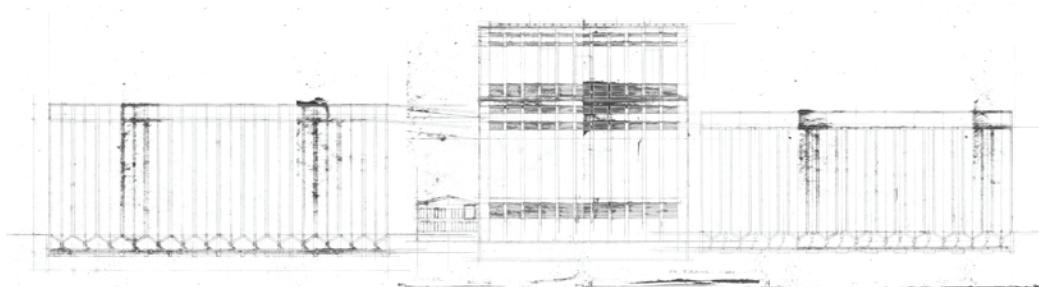
## SPECULATIVE BUILDING PLANS



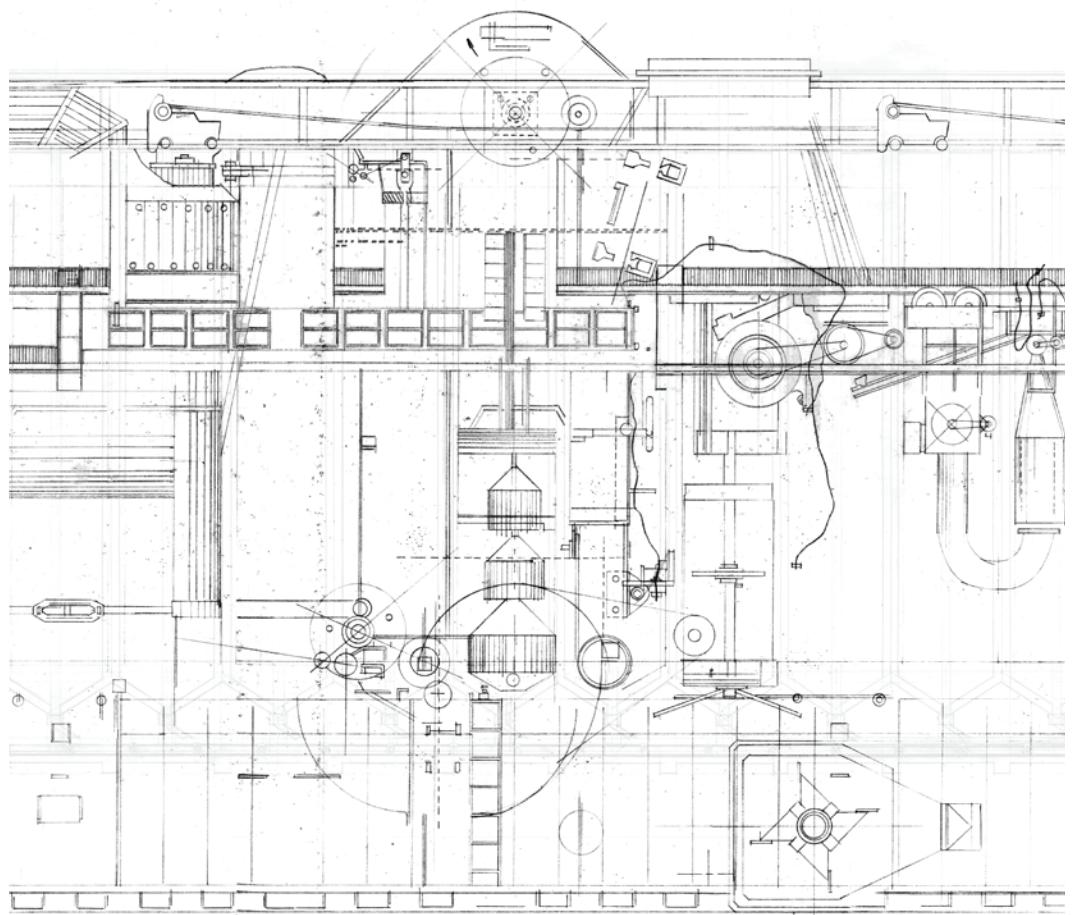
## **SPECULATIVE BUILDING SECTIONS**

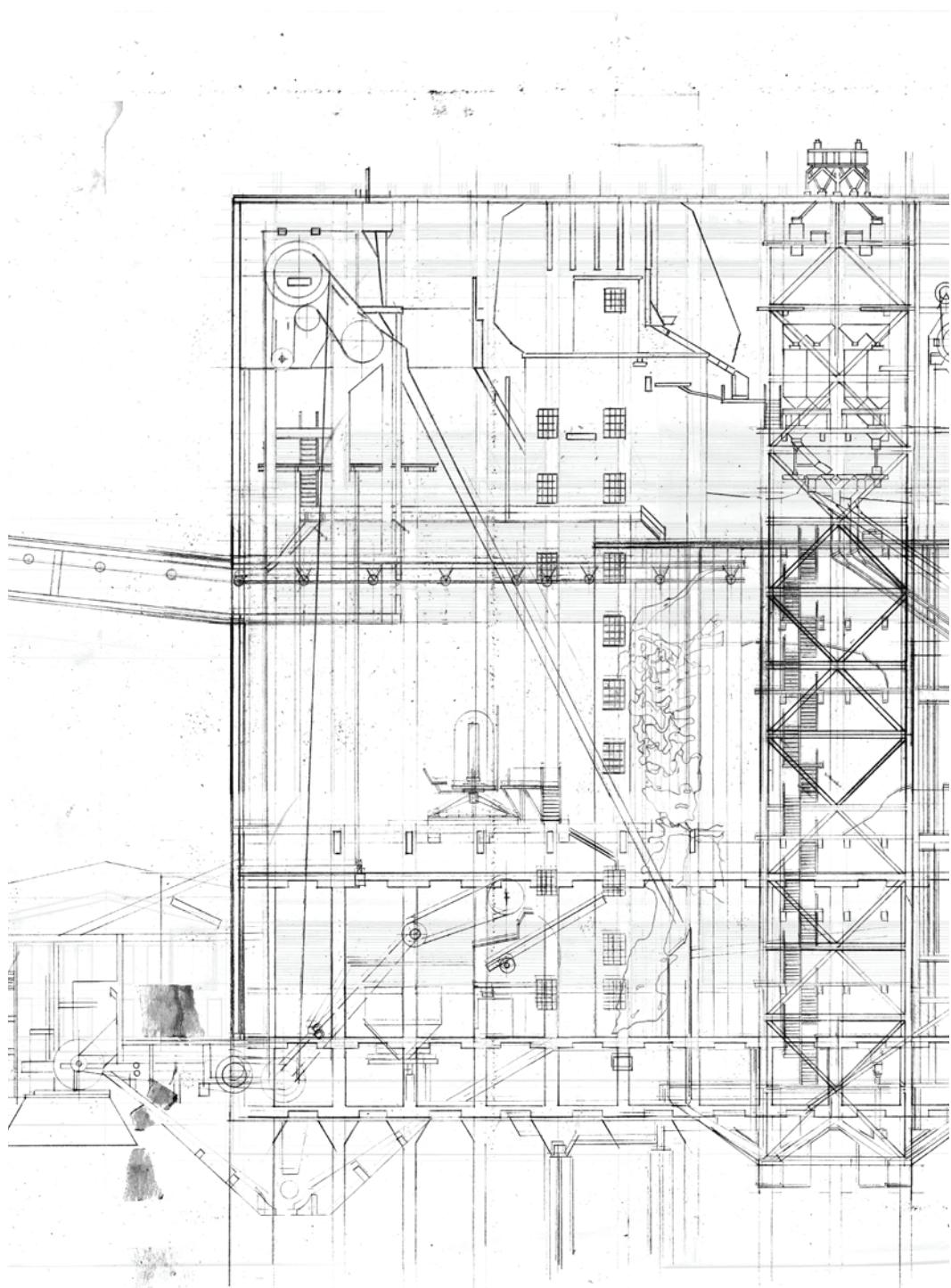
Original architectural or engineering construction drawings for the Port of Churchill could not be located to reference for a basis of design. The approximate dimensions of the building's elevations were established and drawn from dimensioning satellite site maps and photographs. To develop and imagine what the interiors of the port buildings might contain, the process of compositing superimposed engineering drawings and diagrams of similar grain elevators was continued. The resulting drawings imagined into the layers of drawn information towards speculative and fantastical interior sections.

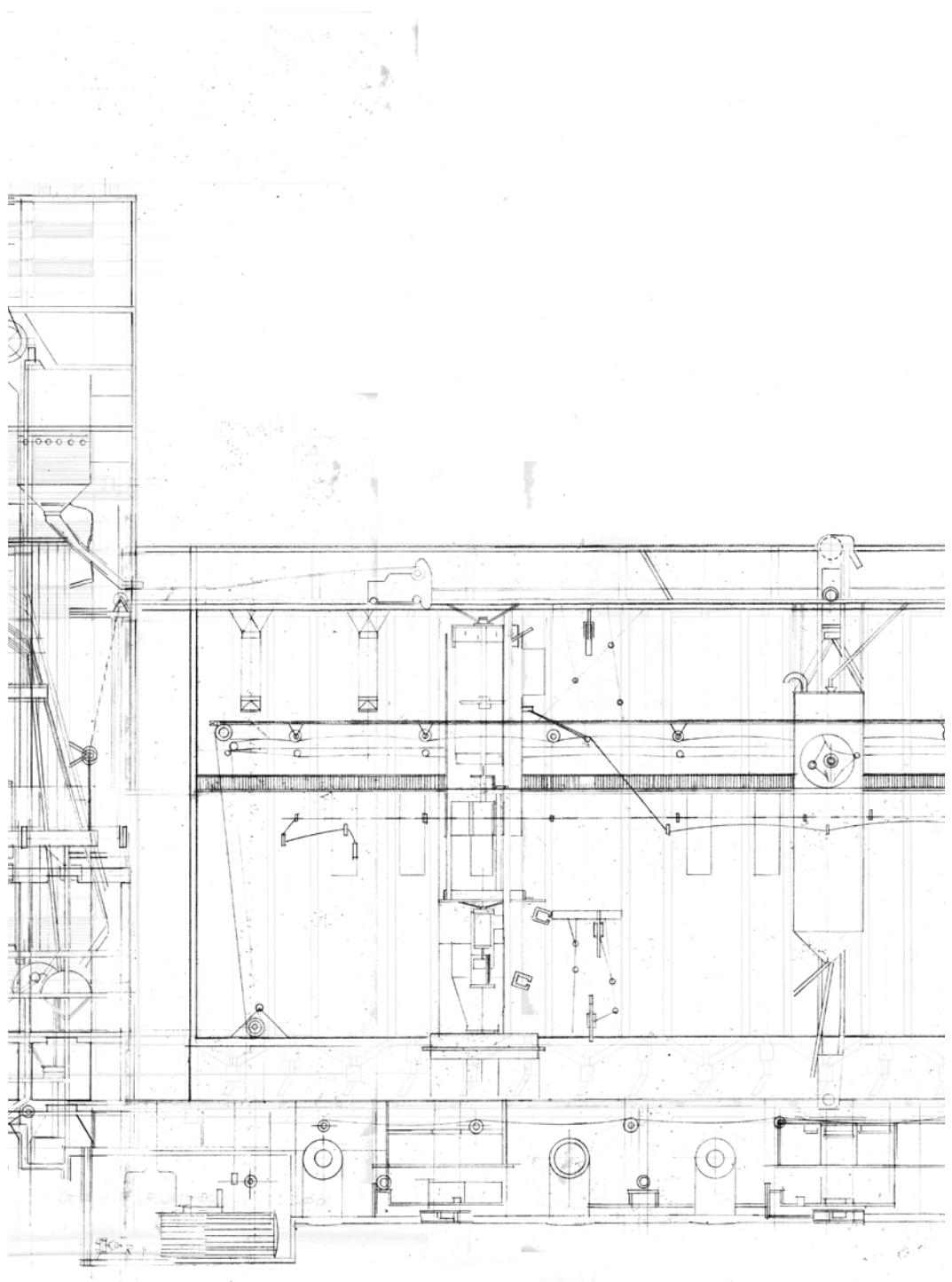
## SPECULATIVE LONGITUDINAL BUILDING SECTION



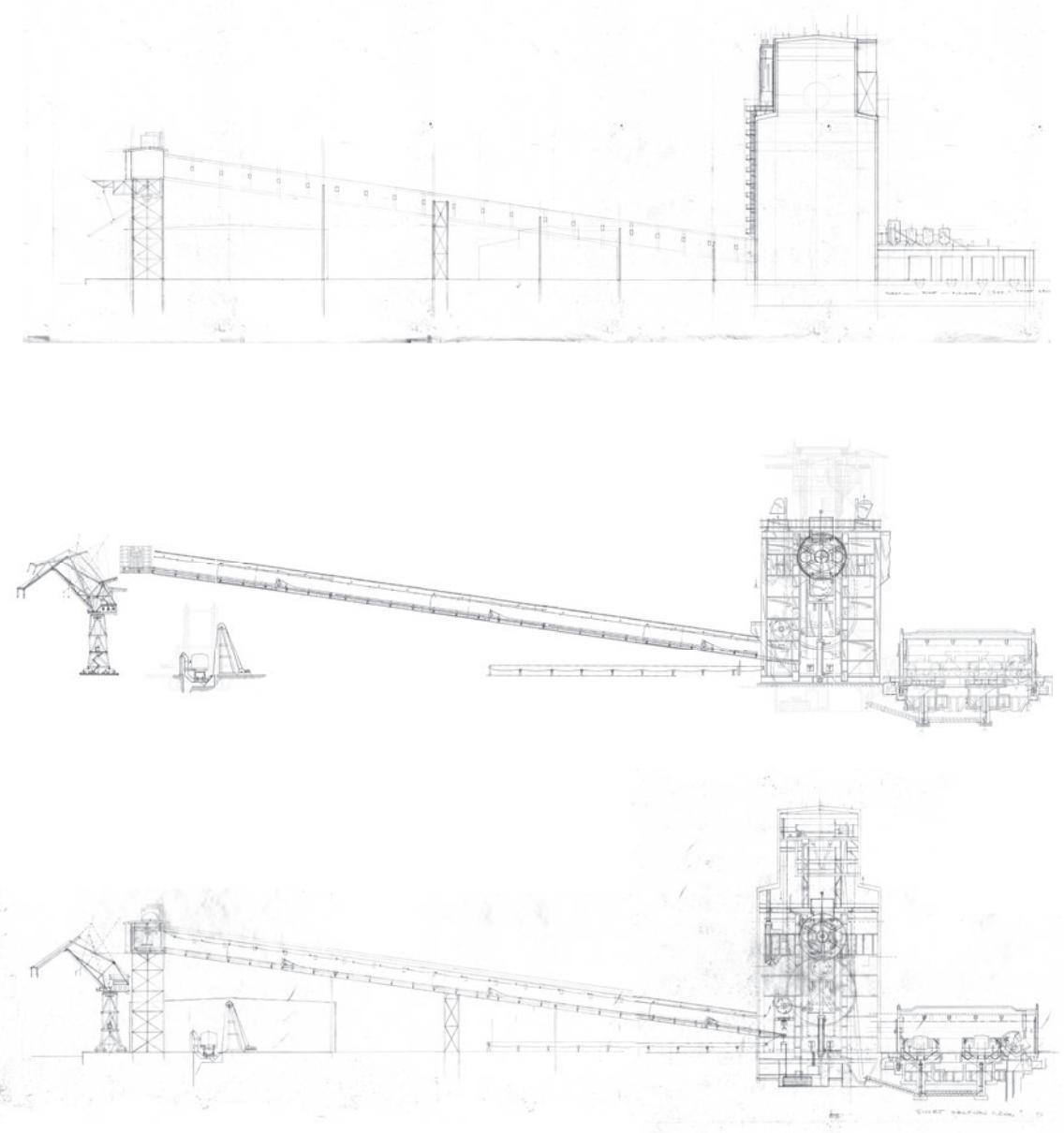
Top: Existing section/elevation (18" x 80")  
Centre: Overlaid technical composite (18" x 80")  
Bottom: Composite section drawing (18" x 80")



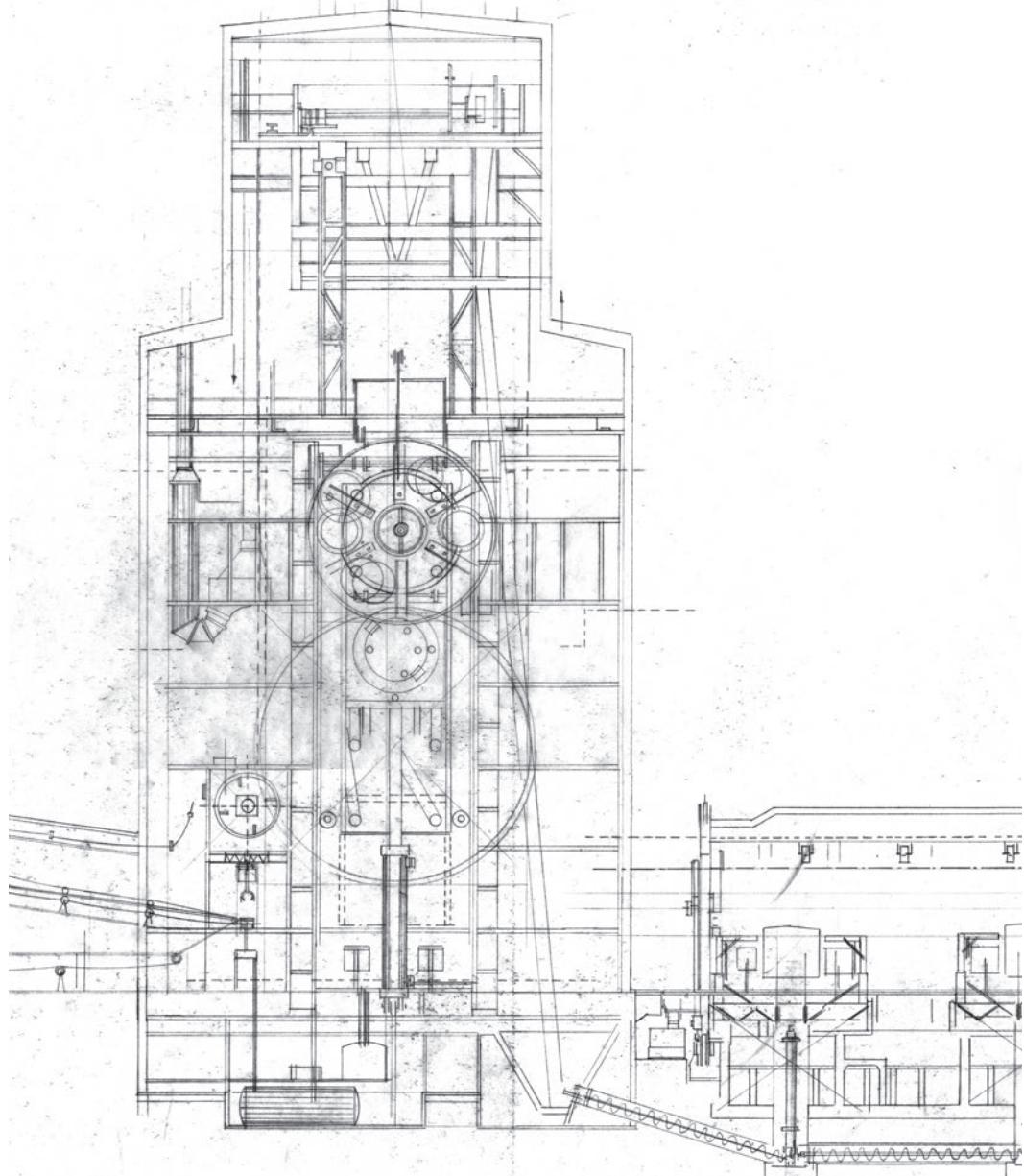




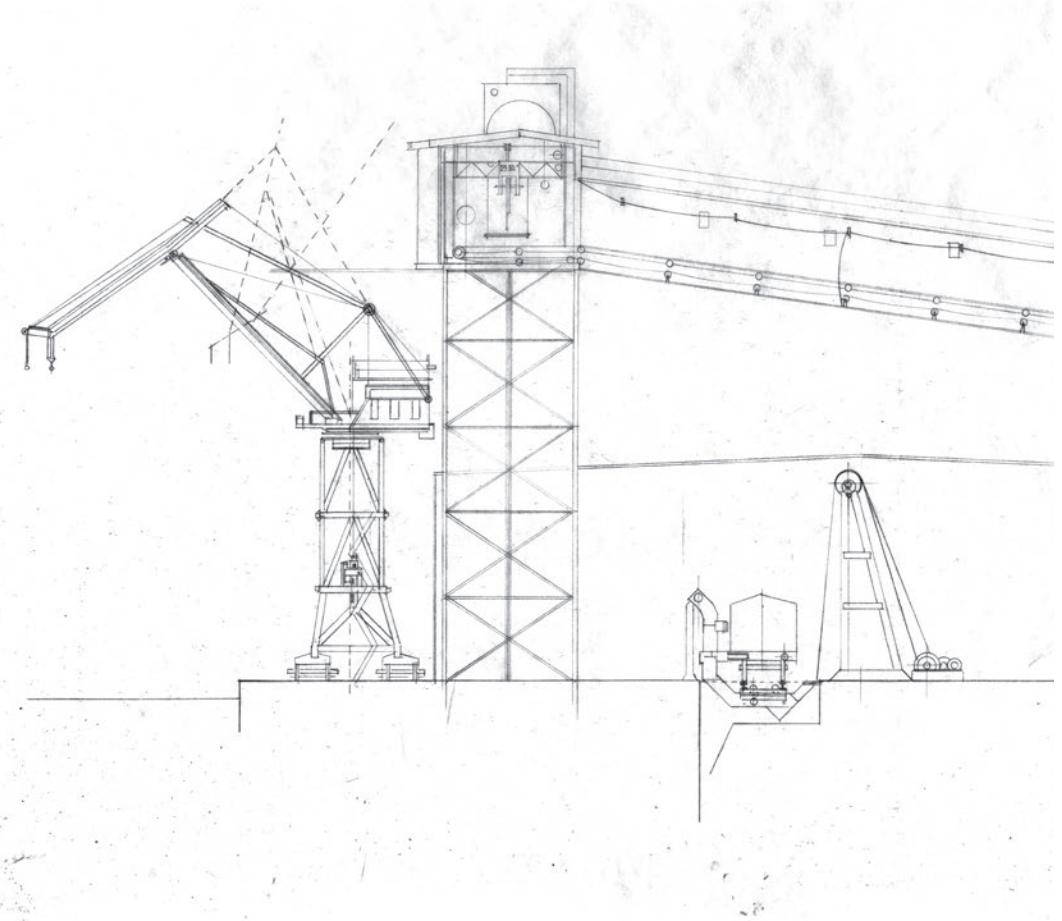
## SPECULATIVE SHORT BUILDING SECTION



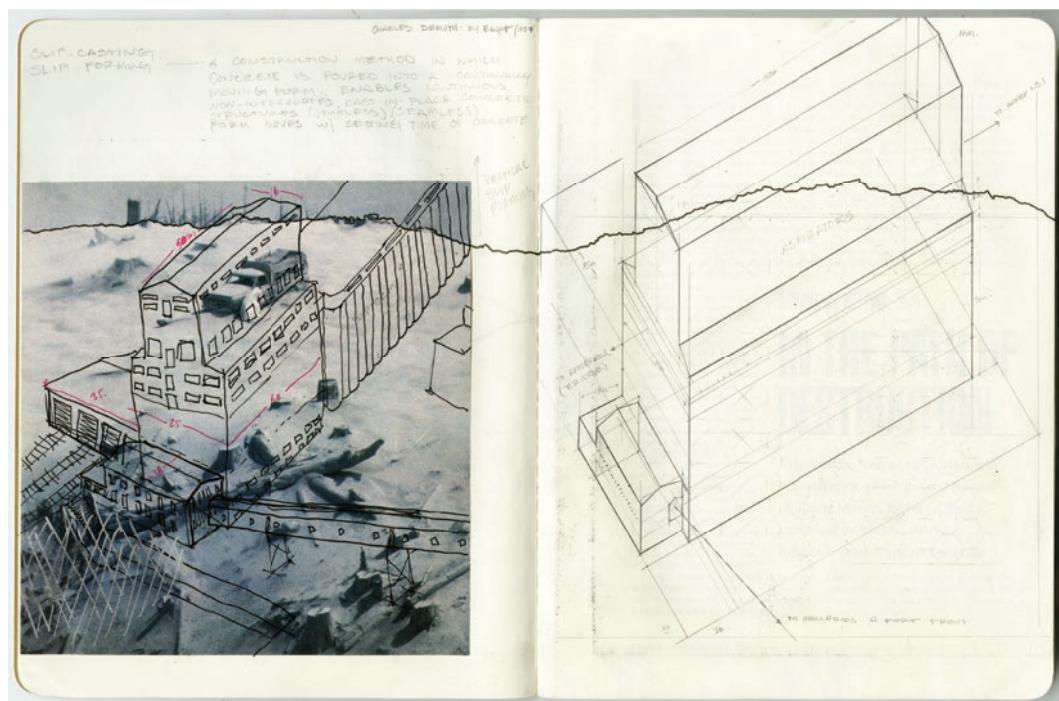
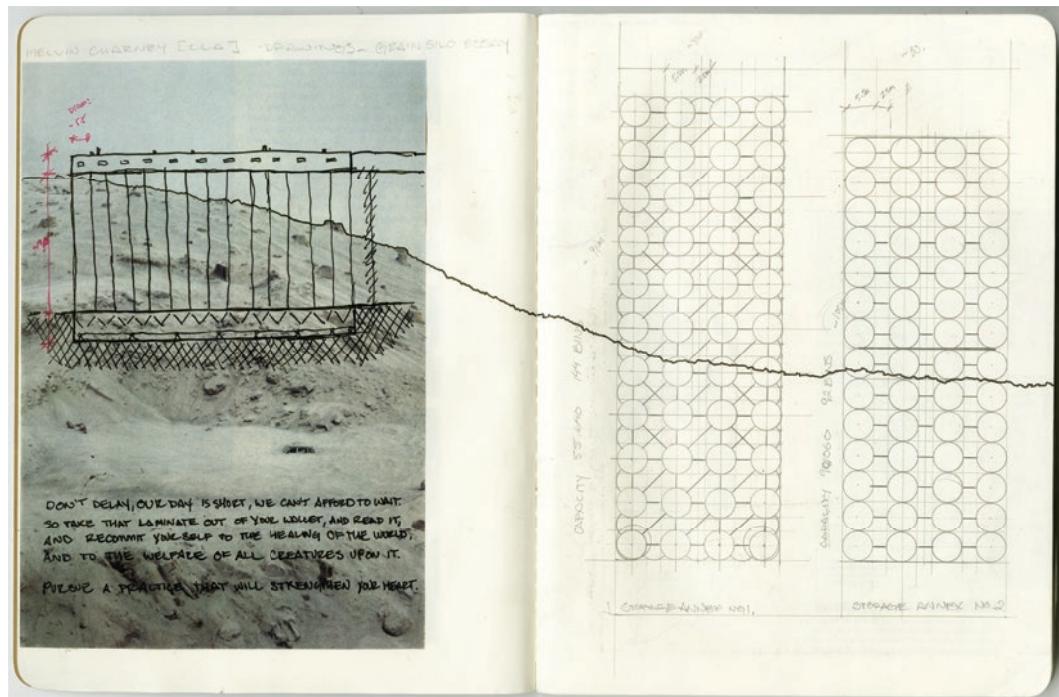
Top: Existing section/elevation (18" x 80")  
Centre: Overlaid technical composite (18" x 80")  
Bottom: Composite section drawing (18" x 80")

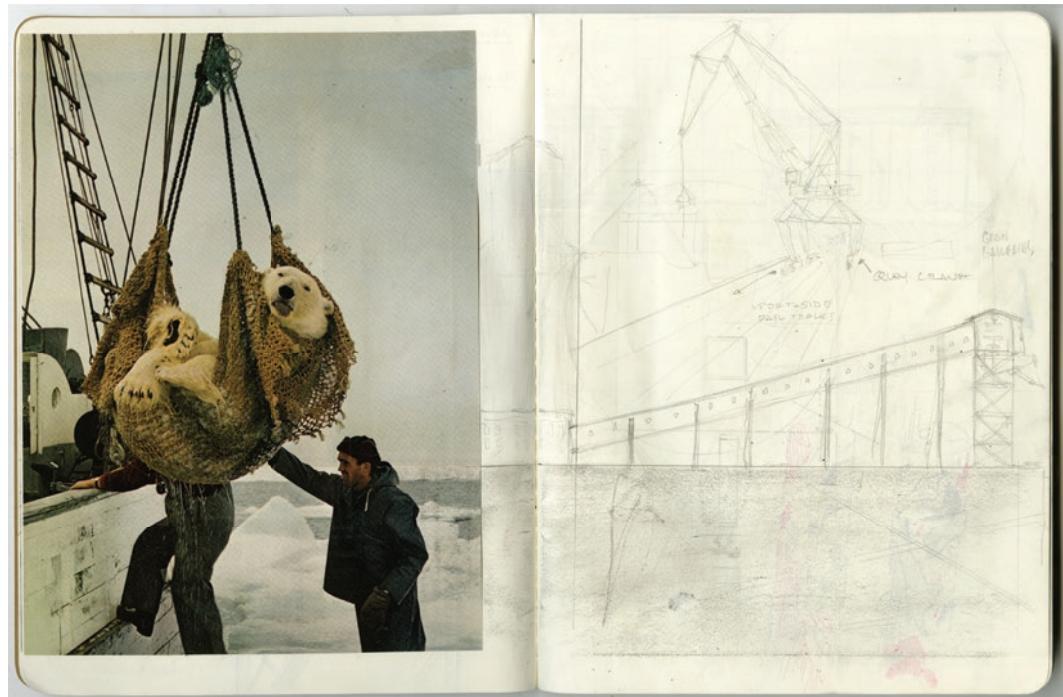
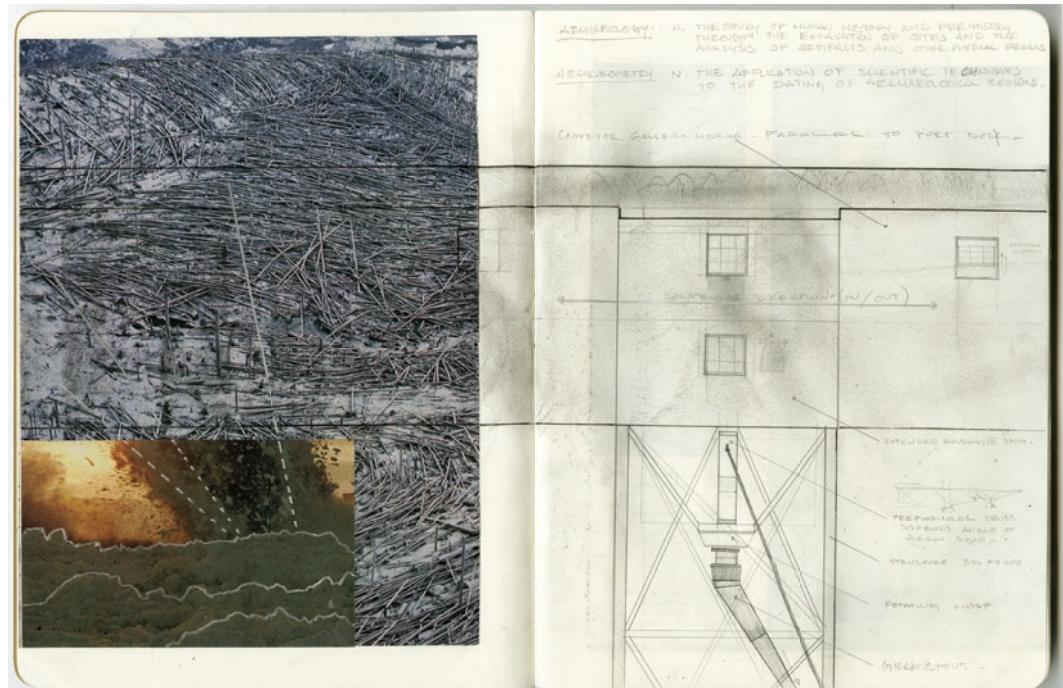


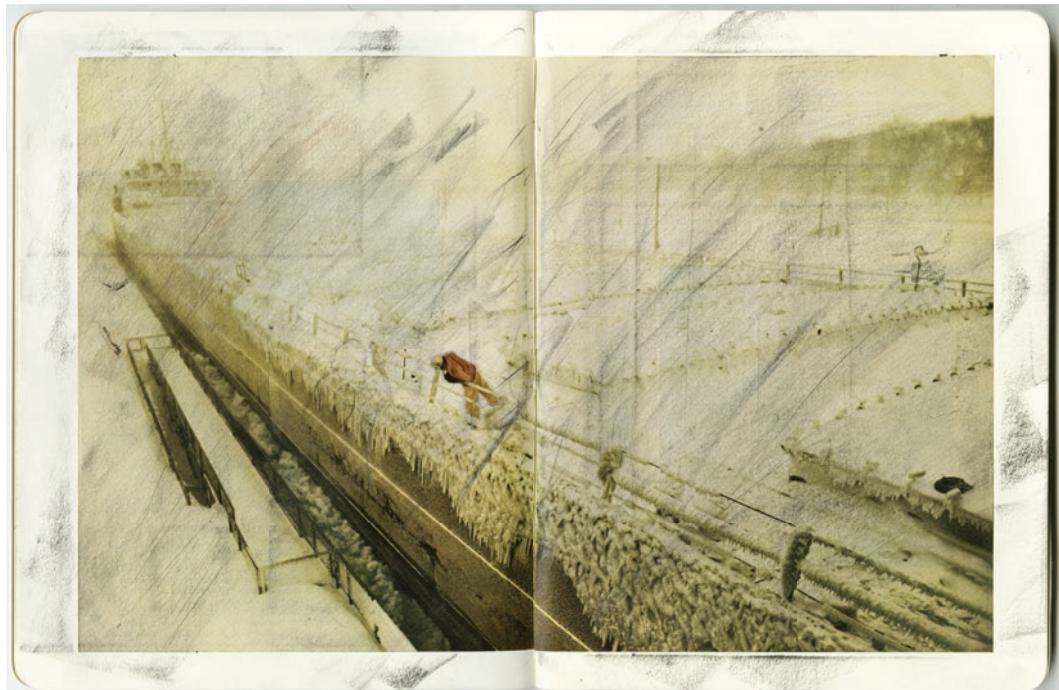
SHORT SECTION

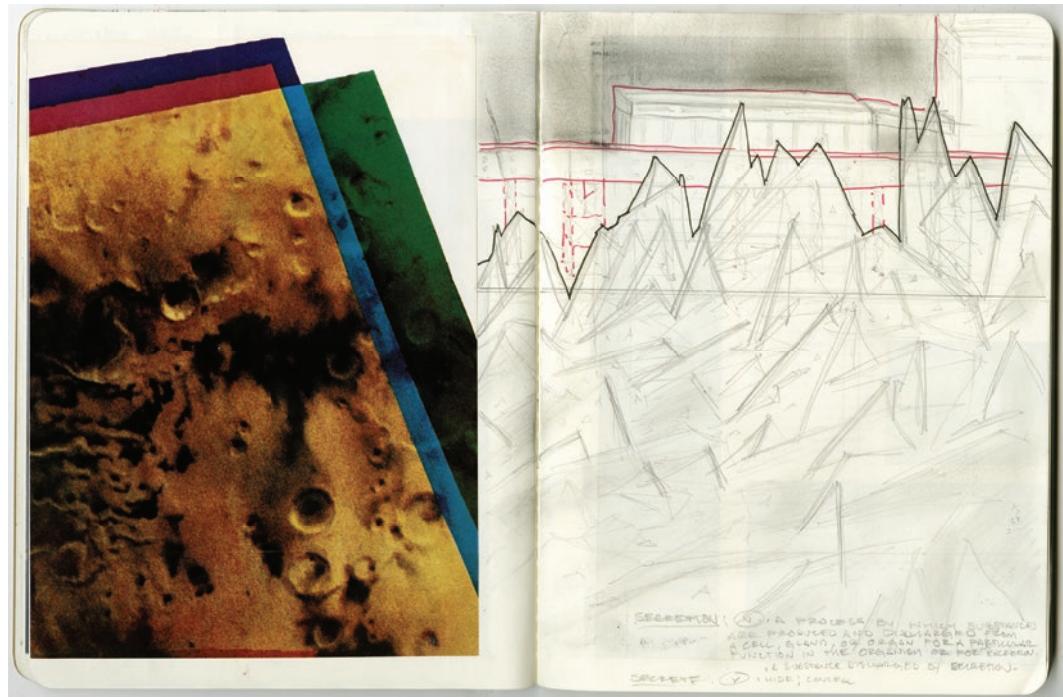
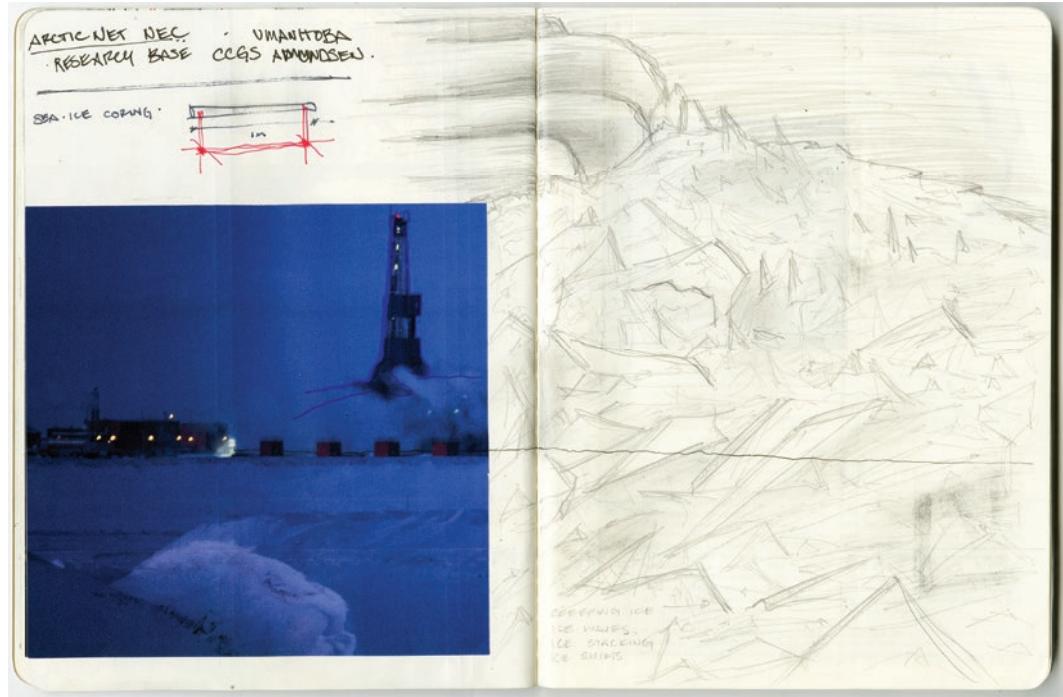


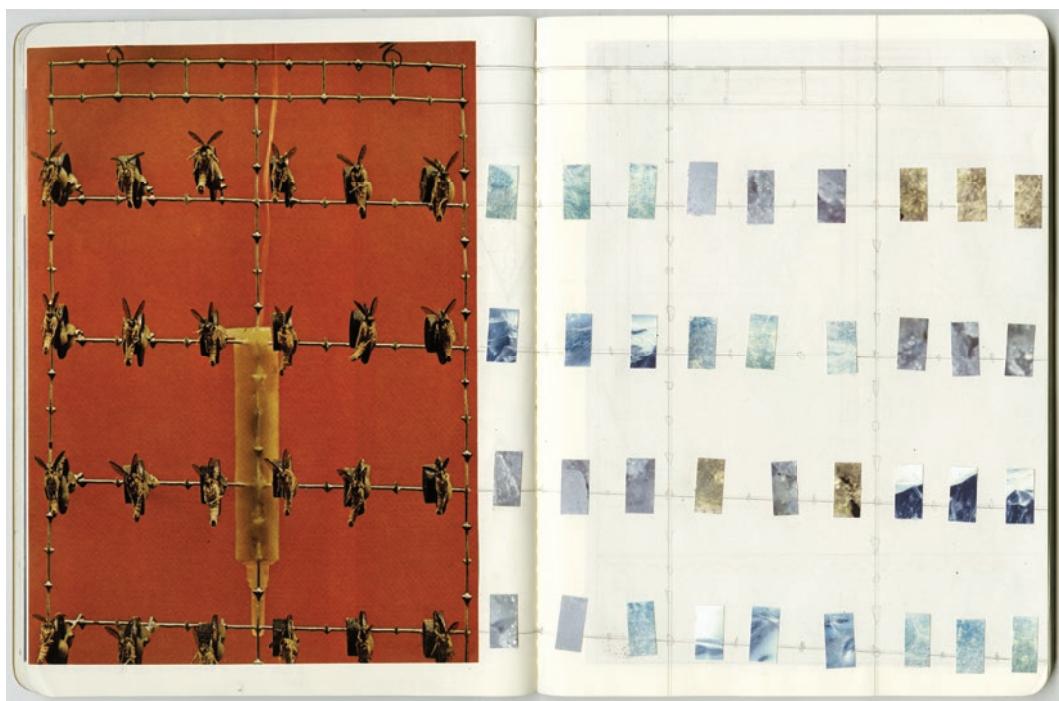
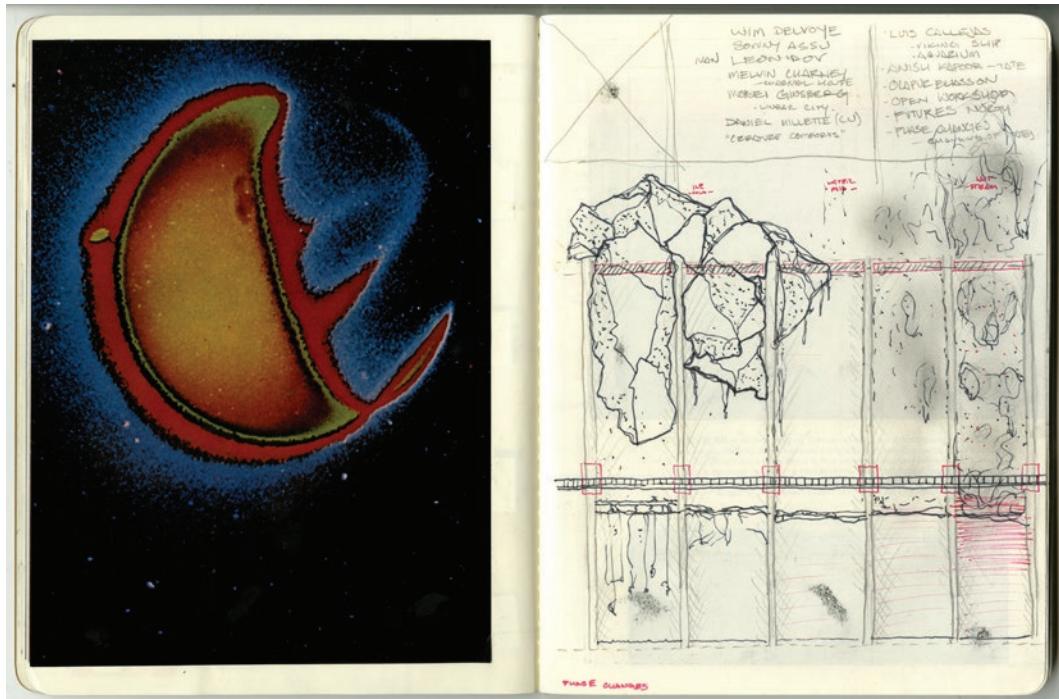
## SKETCHBOOK DOSSIER









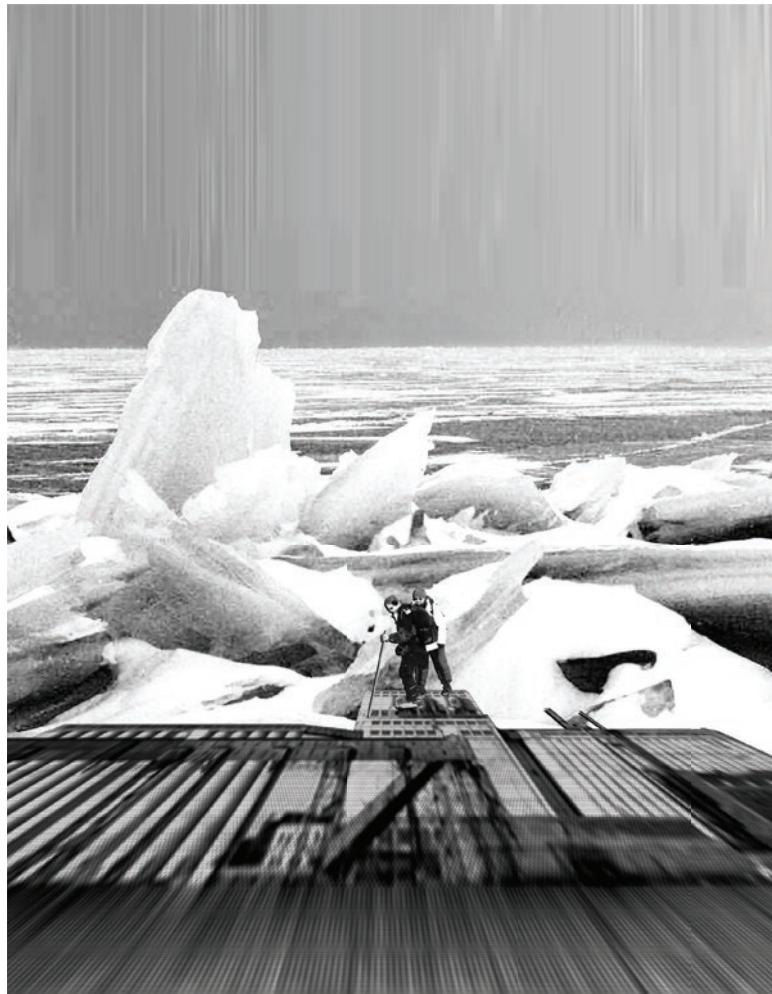


## COLLAGE DRAWINGS





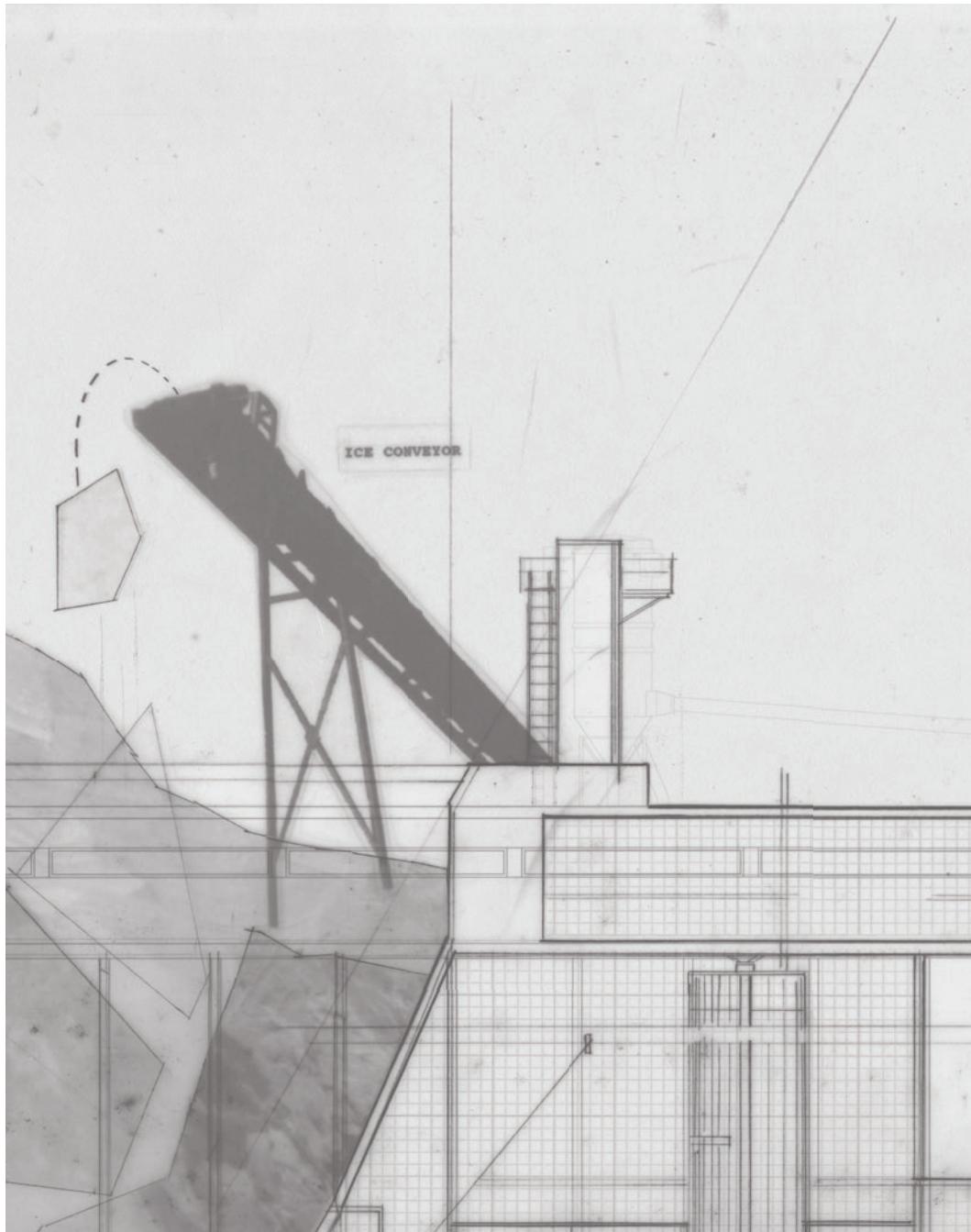




## THE PROJECT: A FUTURE FOR THE PORT OF CHURCHILL

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5.



## ESTABLISHING A SUBSEQUENT ARCTIC

In December 2016 U.S. President Barack Obama, in an attempt to preserve his presidential legacy, announced a flurry of decrees of extreme environmental conservation.<sup>36</sup> In joint partnership with Canadian Prime Minister Justin Trudeau, the nation leaders vowed to stop the advent of climate change and the apparent detrimental effects on the “Last Sea Ice” area in the Arctic.<sup>37</sup>

After the agreements of global methane expulsion at The Paris Agreement in 2016 and the carbon emission standards appropriated by the United Nations, the American and Canadian leaders agreed to set the bar much higher than the rest of the world. Their joint agreements focused on preserving the conditions of the northern communities and Arctic ecological landscapes. This was done through newly developed science-based research technologies and decision making in consultation with First Nations communities who inhabit the remote parts of the continent.<sup>38</sup>

The projection of these actions could, it is argued here, reshape the Arctic’s annual ice generation into the near and distant future. By thinking of the most optimistic outcomes, we can imagine possibilities of open sea ice re-growing each year, expanding the frigid territory once thought to be an irreversible environmental decline. As the Last Sea Ice recovers its annual presence, the Hudson Bay ice floes will also regain their presence along the coasts.<sup>39</sup>

36 Justin Trudeau, “United States-Canada Joint Arctic Leader’s Statement,” published 20 December 2016, accessed 2 January 2017 from Government of Canada website: <http://pm.gc.ca/eng/news/2016/12/20/united-states-canada-joint-arctic-leaders-statement>

37 The “Last Sea Ice” refers to the marine and land area which covers the northern most portion of Arctic Canada and the United States. The high Arctic is the only region that is expected to retain summer sea ice until 2050. As permanent ice cover recedes, the “last ice area” will be essential for the communities that depend on ice-dependent species for food, shelter and cultural use. Justin, Trudeau, “United States-Canada Joint Arctic Leader’s Statement,” published 20 December 2016, accessed 2 January 2017 from Government of Canada website: <http://pm.gc.ca/eng/news/2016/12/20/united-states-canada-joint-arctic-leaders-statement>

38 Justin Trudeau, “United States-Canada Joint Arctic Leader’s Statement,” published 20 December 2016, accessed 2 January 2017 from Government of Canada website: <http://pm.gc.ca/eng/news/2016/12/20/united-states-canada-joint-arctic-leaders-statement>

39 Ice along the coasts of the Hudson Bay typically recedes in the late summer before icing over again in early December.

## CREEPING ICE ON LAKE MANITOBA



“Several homes have been destroyed and many damaged in the Canadian province of Manitoba after ice from a nearby lake was pushed up onto land by the wind. Strong winds pushed floes towards the water’s edge - creating cascades of ice crystals which pushed up against trees and houses.”<sup>40</sup>

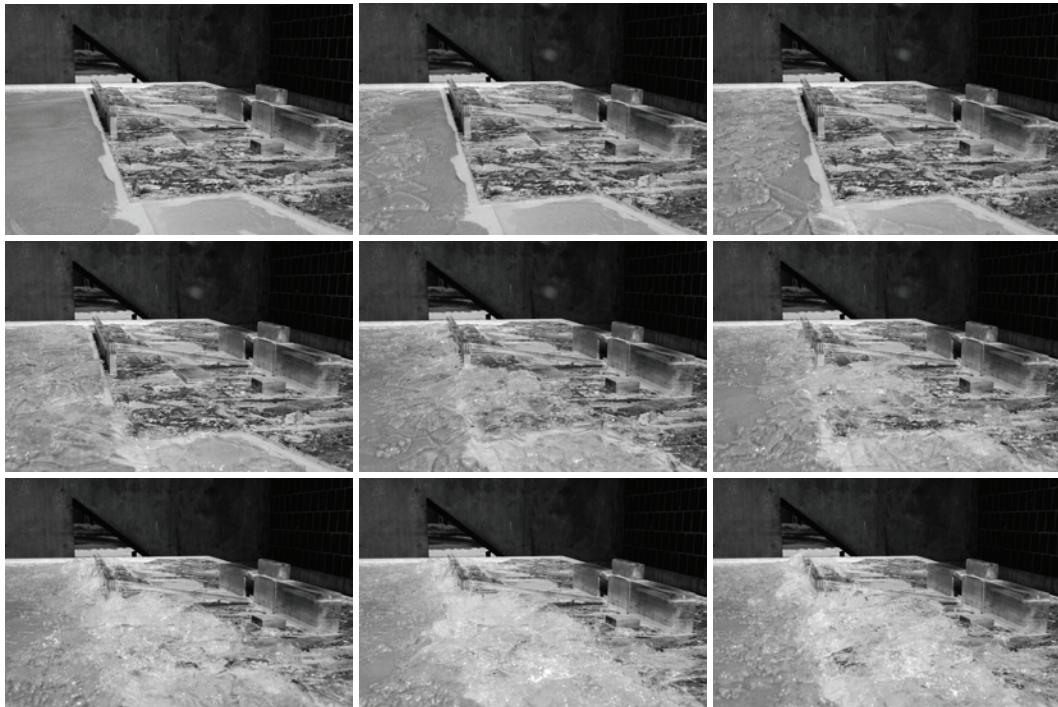
40 “Creeping wall of ice destroys homes in Canada,” *British Broadcasting Corporation*, Web, Published 12 May 2013, Accessed 03 Feb 2017, <http://www.bbc.com/news/world-us-canada-22505232>

## MODELING A FROZEN SEA PORT



A 1:1000 scale model of the site was built, flooded with water and left outside to freeze. As it froze, the accruing ice was pushed toward the port to study how creeping sea ice might encroach and cover the edges of the port

## MODELING A FROZEN SEA PORT



Photographic sequence of ice accruing onto and over the edges of the port deck.



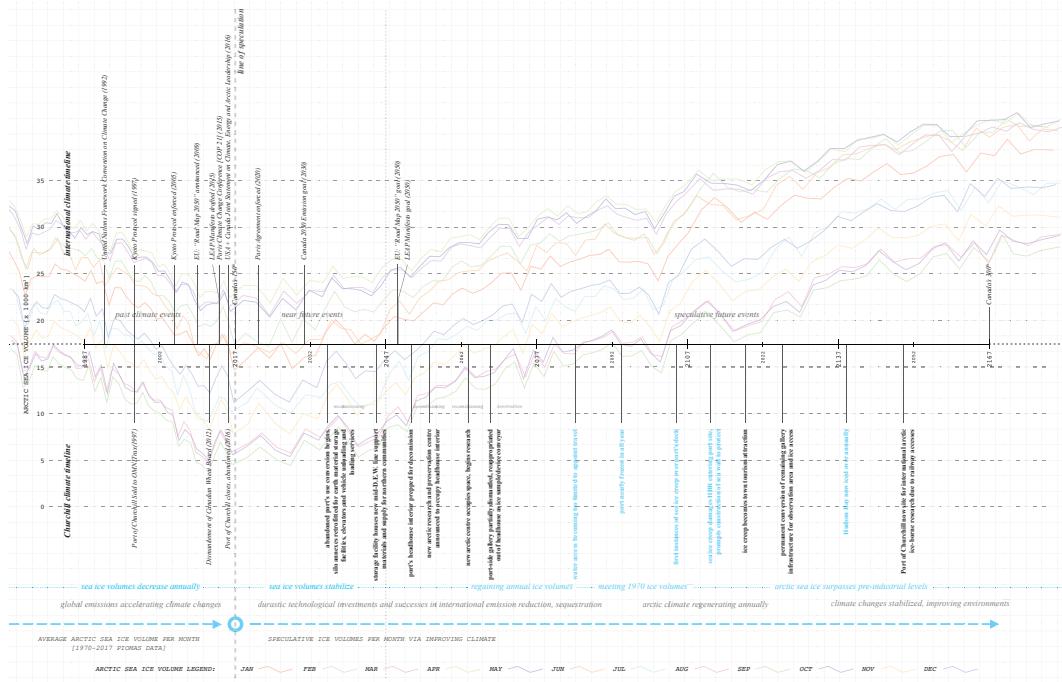
Above: Before sea ice creep.  
Below: After sea ice creep.

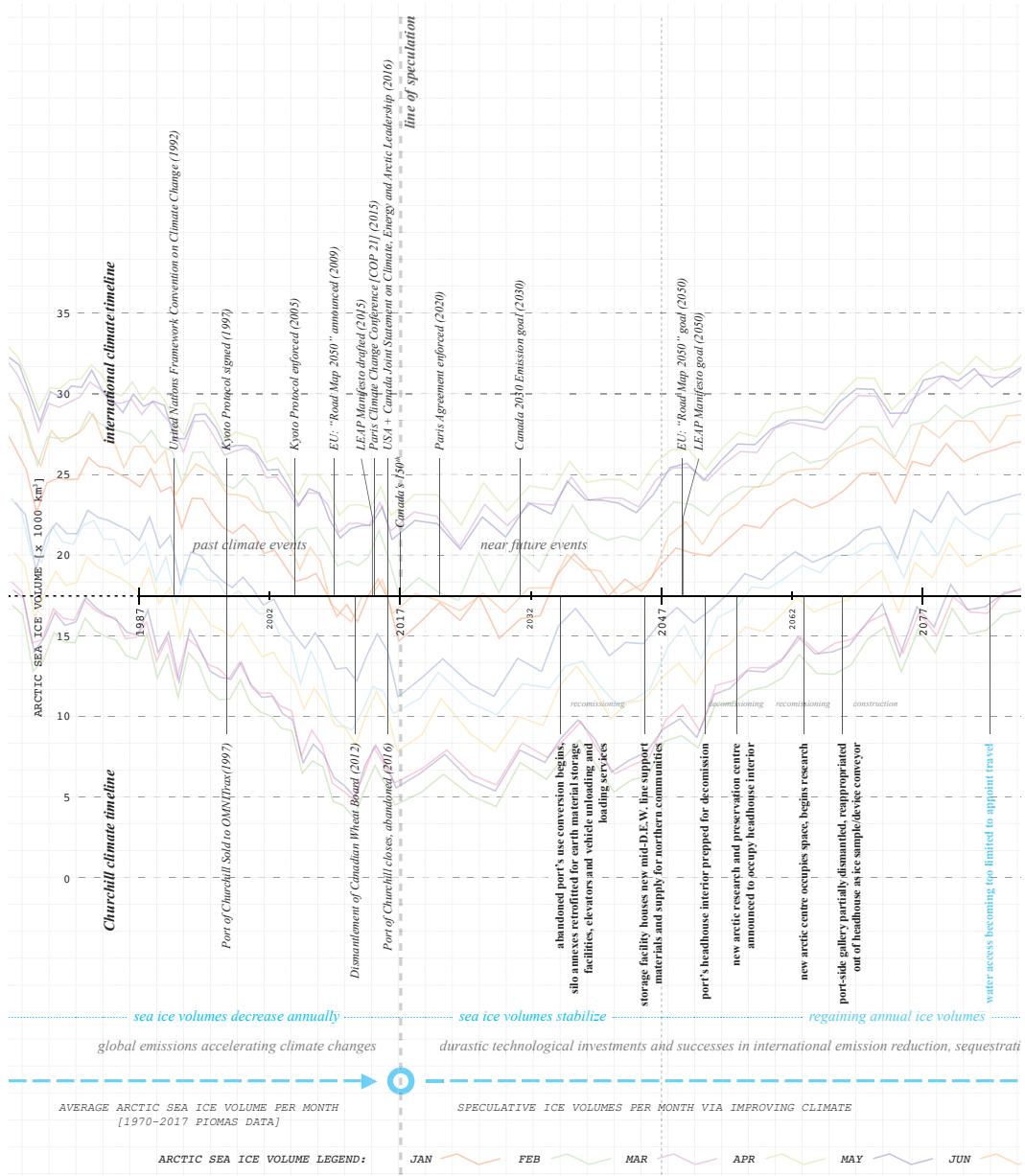
## RE-IMAGINING A FROZEN SEA PORT

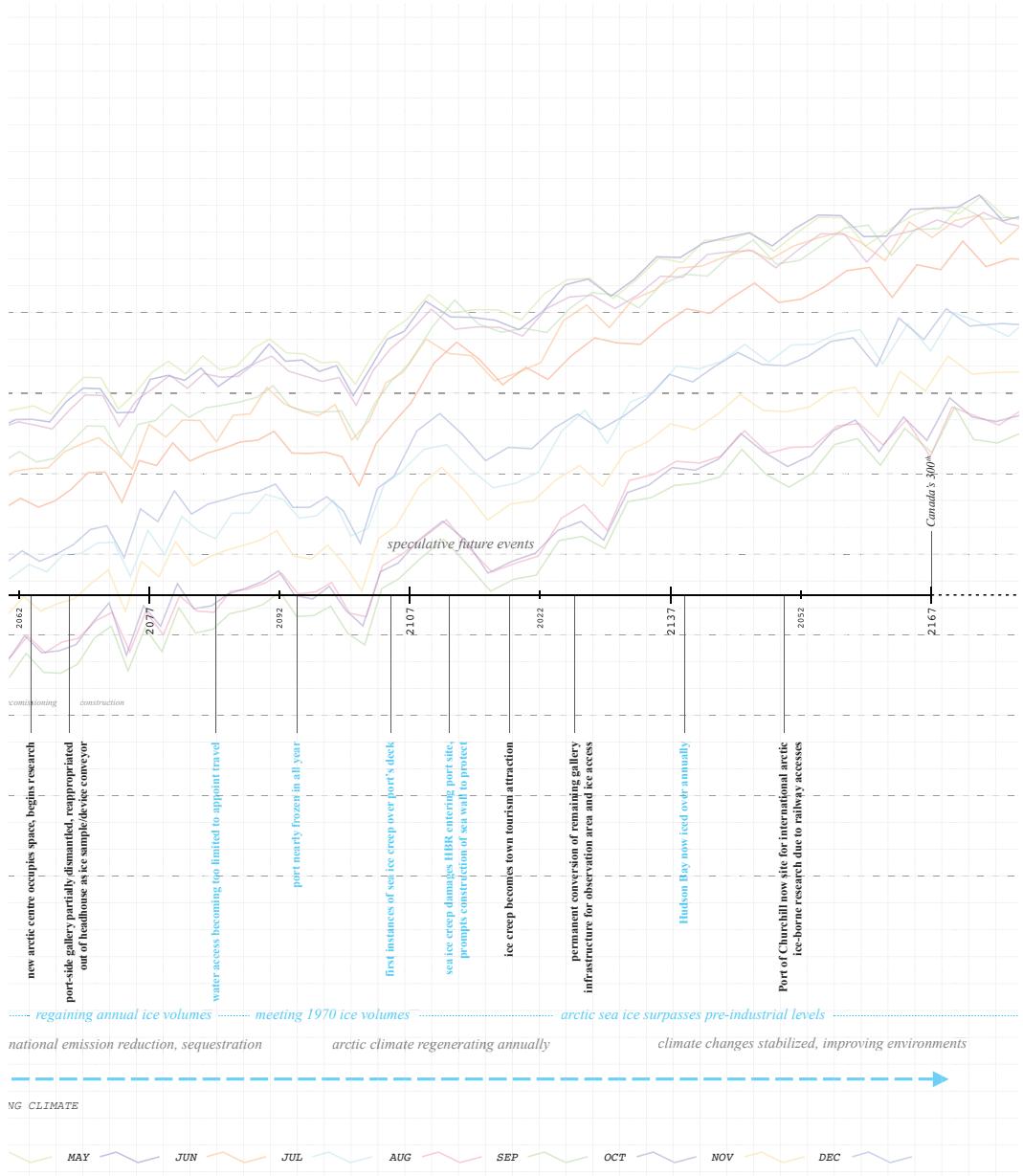


The sea ice will begin acting upon the shores of Churchill in durations and amounts not in years. Through the freeze thaw cycles of the changing seasons, floes of the abundant ice sheets will push up into the harbour and bay areas, breaking up, compounding and creeping over the edges of the port's deck. To maintain the existing site grounds and infrastructural processes, the dormant sea port infrastructure will make continual adjustments through on-site interventions and programmatic alterations aimed at celebrating and adapting to the changing environmental conditions.

## A FUTURE TIME LINE OF CHURCHILL







## MORE STORIES ABOUT PORTS AND ICE

In response to the US-Canada joint-agreements of 2016 several explorations of new technologies and building design practices are proposed to integrate the social, cultural, environmental and economic inputs into the future of the Arctic. The Churchill port and its infrastructure are envisioned to be acquired before adapting the existing buildings. Environmental changes will force shifts in the programmatic requirements of the port towards continuing the scientific studies of the ocean waters, increasing sea ice volumes, and the greater arctic and sub-arctic environment. The exteriors of the port structures are left as a visual sentinel to Churchill. The interiors of the concrete grain silo annexes and central head-house components are re-imagined to house installations of specific technological and cultural impressions, a tourism venue, and centre for arctic science with satellite research stations distributed out onto the harbour ice.

The project is imagined and described through a series of five short narrative-based stories. In chronological order, the stories discuss a first-person experience exploring different aspects of the port during its ongoing adaptations through the changing climate. Each account is accompanied by drawings and model photographs that illustrate the described architectural organizations and the layered nature of information through which they were created.

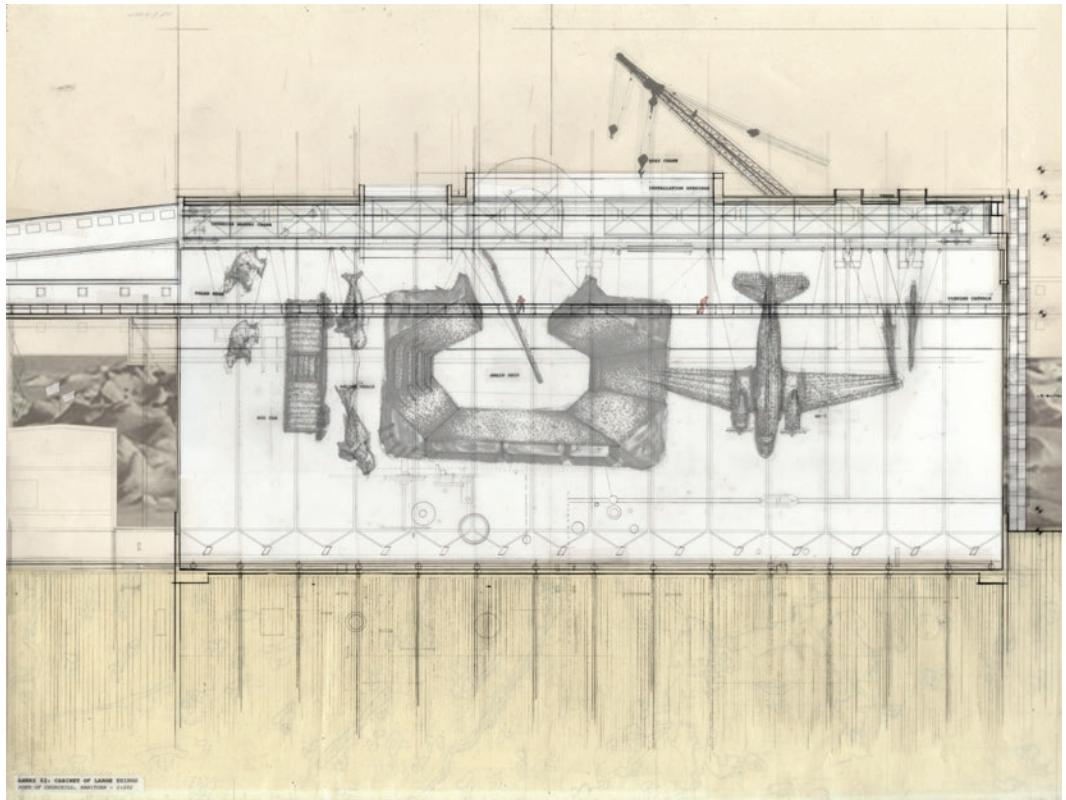


## **THE CABINET OF LARGE THINGS**

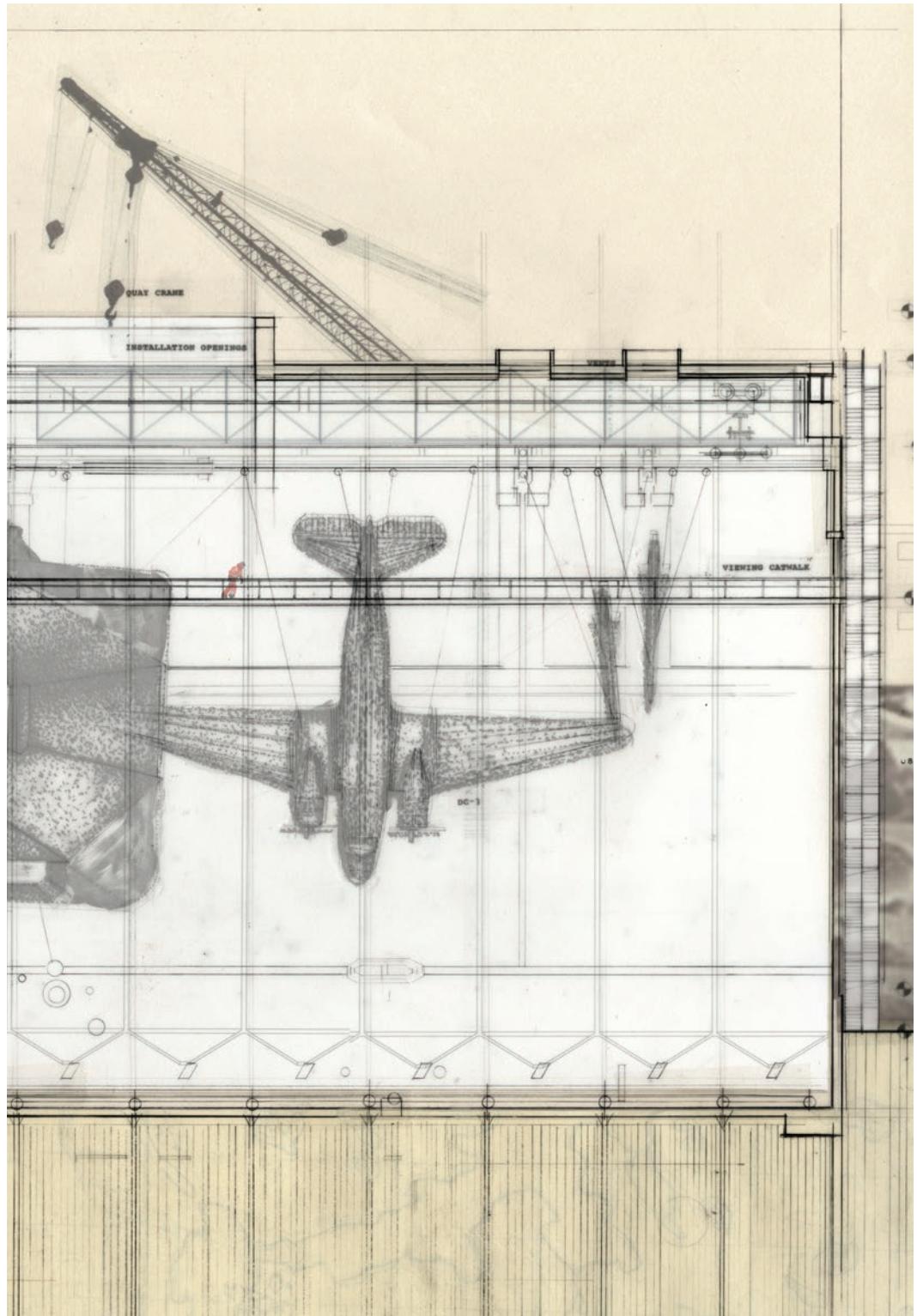
*The first major alteration to the defunct port was the establishment of the Cabinet of Large Things. The town saw the opportunity to develop Annex 1 into a space for a new kind of gallery and museum. It's not visible from the outside, but the centre portion of the silos were excavated into a container for large technological and cultural objects.*

*Entering the head-house through the harbour-side doors at the main office we are guided through the main floor towards the elevator which brings us up to the scale floor – adjacent to the top of the silo annexes. To the north is Annex 2, the bridge brings us to the entrance of the Cabinet of Large Things.*

*We enter through a narrow doorway, and the gallery expands before us. Enormous machines and preserved animals hang like scientific specimens from the roof structure. Twin steel walkways hang onto each side of the carved silos. The silos are roughly cut, concrete is chipped away and structural rebar is exposed. The polar bear we encountered at the beginning of the gallery, as big as they appear in reality, seemed minuscule in comparison to the silver DC-3 cargo plane beyond it. A box car hangs within a slice of a Panamax grain ship, presumably which would have docked at the port when it was operational.*



The Cabinet of Large Things (18" x 24")





## **A CHANGED CLIMATE**

*My parents used to talk about the climate changing and that with global warming the north wouldn't be the same as they knew it. But I haven't seen that happen in my lifetime, but if anything, it's the opposite.*

*We haven't seen the entirety of the harbour area ice-free in a few years now. Usually in the late summer months we could take the boat out and ride across the channel to the Prince Wales Fort for the day, but the summers haven't been warm enough to melt the ice completely. The sea ice freezing into the peninsula off the Hudson Bay has been coming into shore more and more each year. Waters from the bay flow into the river and bring the ice sheets in with it. Shards of sharp and clear ice pile up on the shore, creeping and pushing onto itself, lapping over each other, almost like ramps for the next. The ice in the harbour shifts and cracks every day. When there is no wind you can hear constant cracks pierce through the air like thin, shattering panes of glass.*

*The old port takes the brunt of the ice floes, being near the edge of the river's mouth and north of the town. Each year the port's deck takes a beating from the ice pushing up on to it. Some people here are worried that the ice might tear out some of the old structures at the harbour. The concrete sea walls they built from town to the port seems to be protecting the tracks though.*

*Although the port hasn't been operating for a long time now, the VIA brings swaths of tourists up here to see the history of Churchill, the animals and now the ice. Freight trains of box cars make runs up here a few times each month that stop at the port shed. The town has been using the port ground as a science station for a while. They still use some of the old machinery there to unload the cars.*



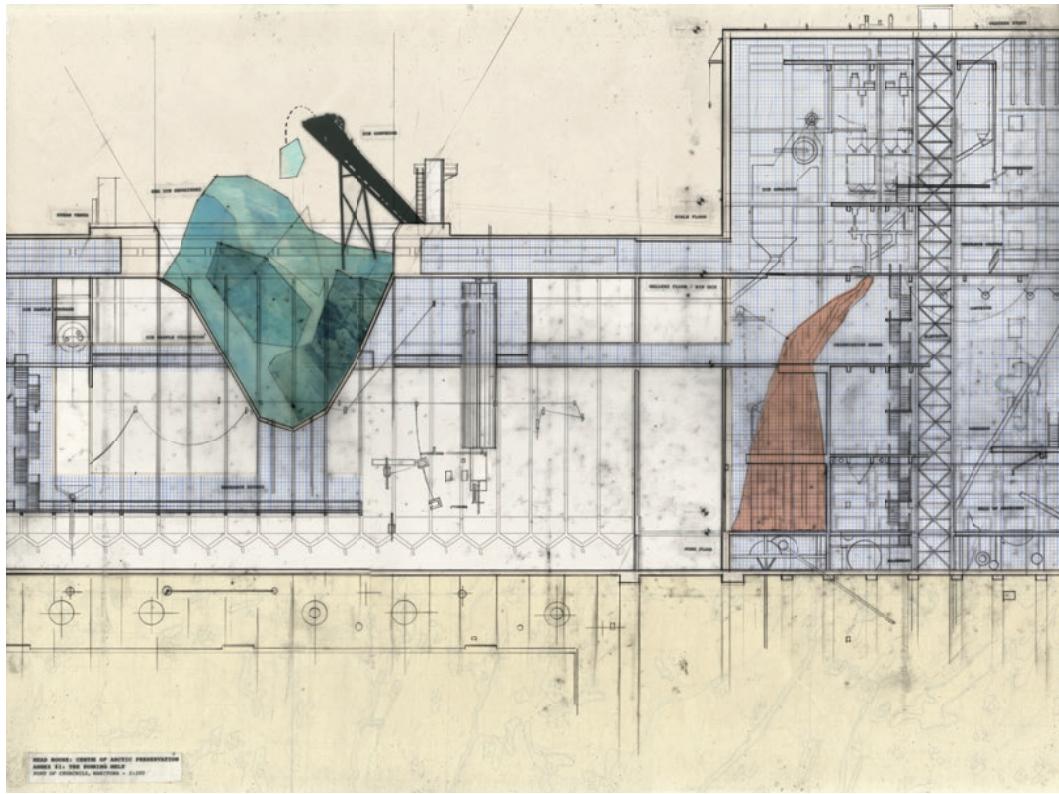


## **THE CENTRE OF ARCTIC PRESERVATION**

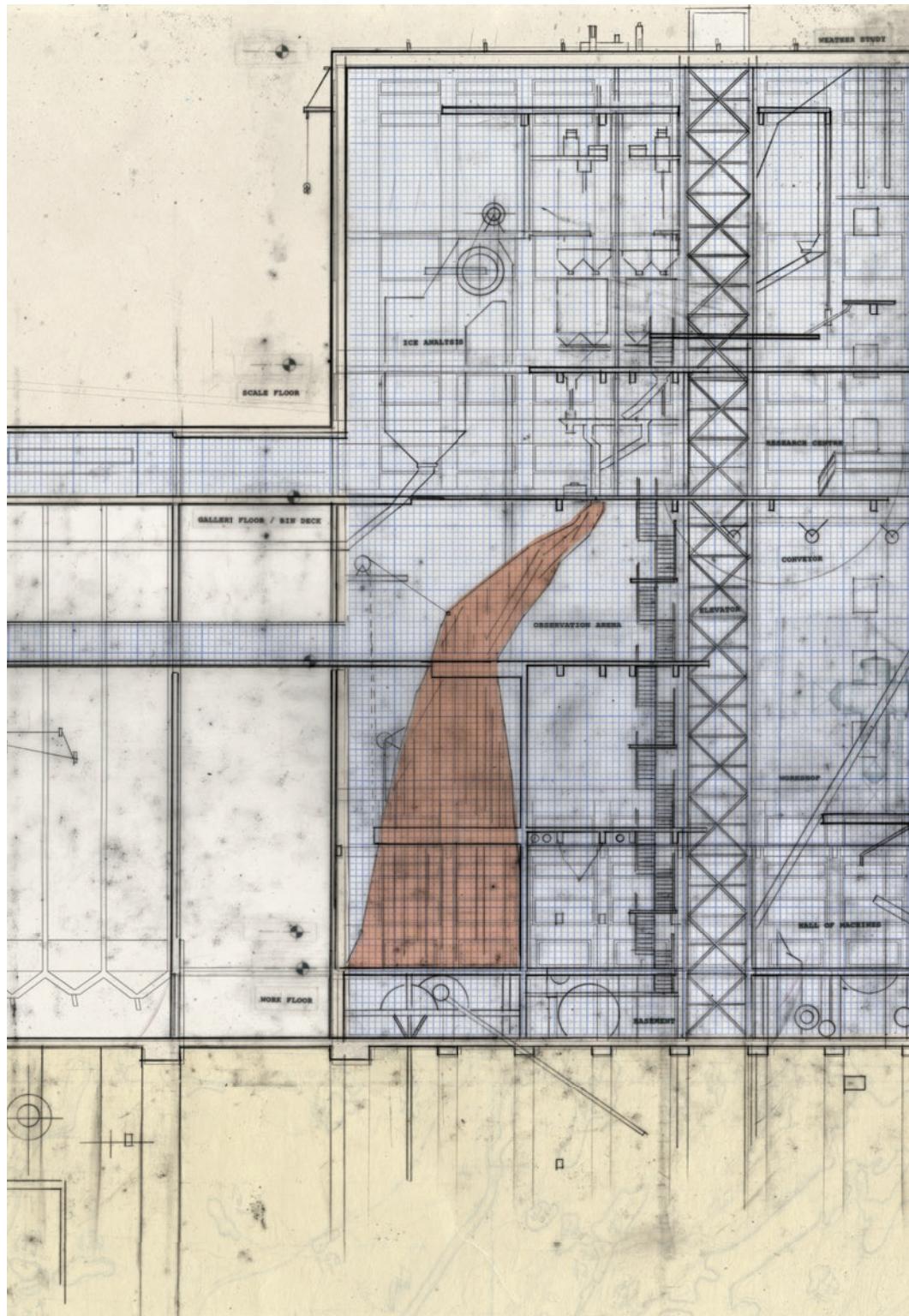
*Suspended below the main research floor; a naked steel bridge spans the space between the conveyor dock and full-height space-frame containing the elevators and stairwells. The space below is occupied with remnants of the decommissioned grain elevator. A mobile research station in repair is strung-up between the bare concrete framework as a lone engineer twists a wrench attaching a steel panel to its hull. The research station above occupies the gallery floor and bin deck of the head house. The work area has been developed around much of the existing floors, structures and machinery components from the previous grain elevator. We opted to build our part of the facility at the top of the head house to inhabit the rooftop – the tallest possible area around for our atmospheric studies.*

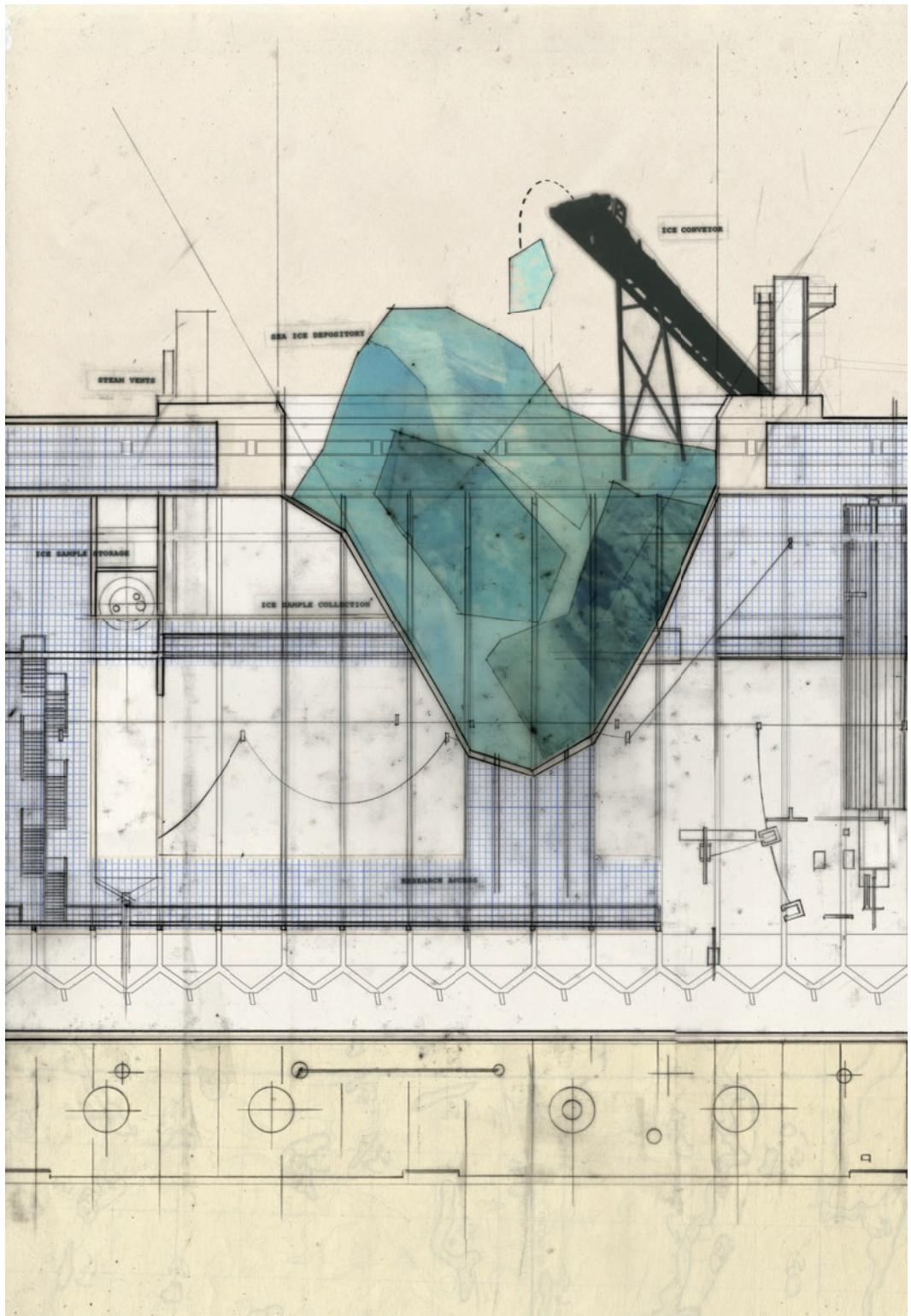
*Ice specimens are contained in the ice collectors in Annex 1. Ice is brought from the harbour by conveyors and dropped into the silos. We measure the ice through its phase changes and study the chemical makeup of the new ice. Today we're bringing in a specific specimen from the collector to be studied.*

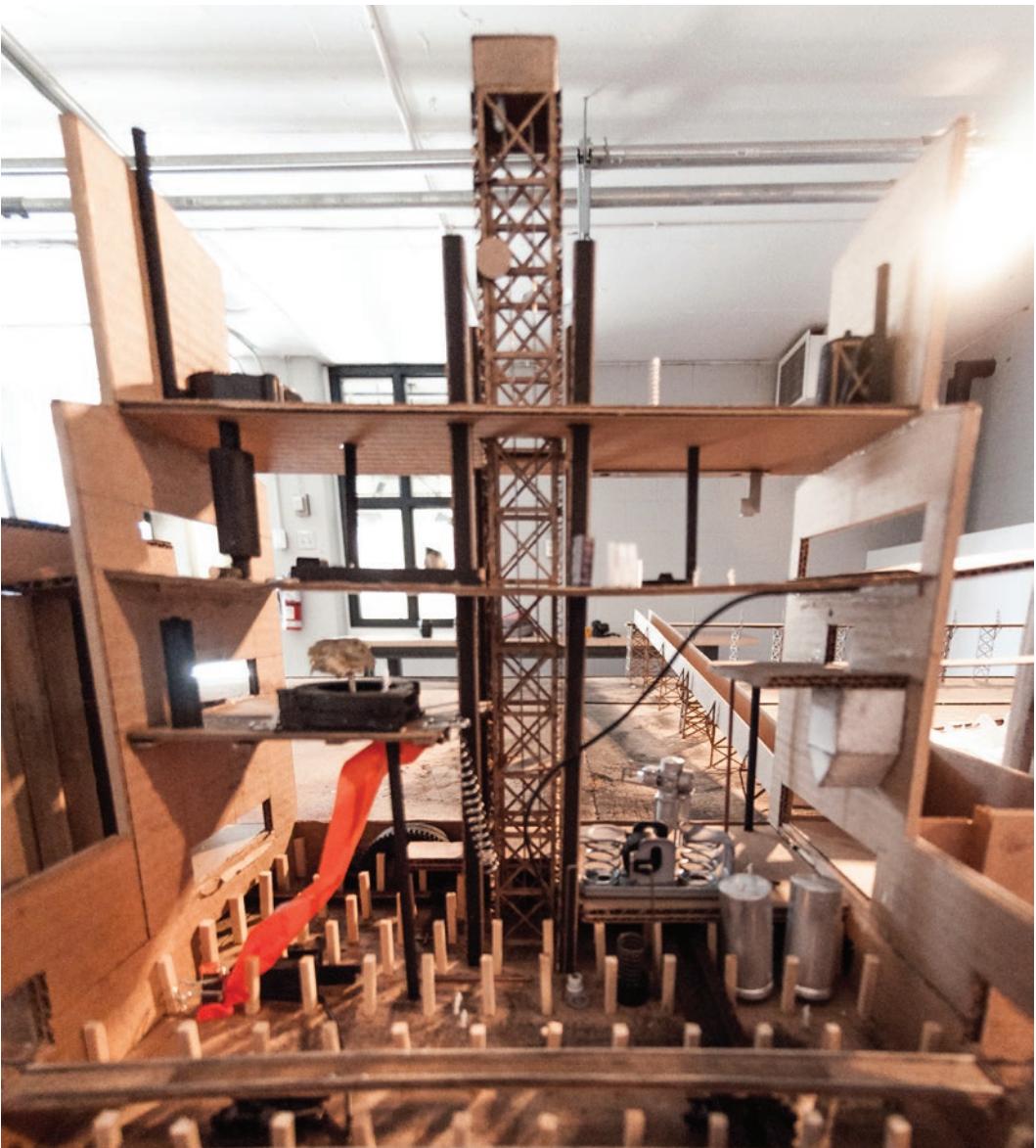
*We wheeled the ice samples into the observation arena for initial studies. It took two of us to tilt specimen number one upright and load it into the viewing chamber's base. A glass dome lowered overhead and restored the ice sample to a below-freezing resting temperature. Dew forms on around the outer edges of the dome as the air temperature inside stabilizes. A central light illuminated the ice sample from the centre base, revealing the strata of years of snow and ice. Reams of isotope analysis data fill the computer screens, marking dates by vertical densities of snow and ice and the presence of mineral qualities from specific times within the sea water. After the samples are analyzed they are gathered by a belt-driven trolley and transferred into the cold-climate storage silos for indexing.*

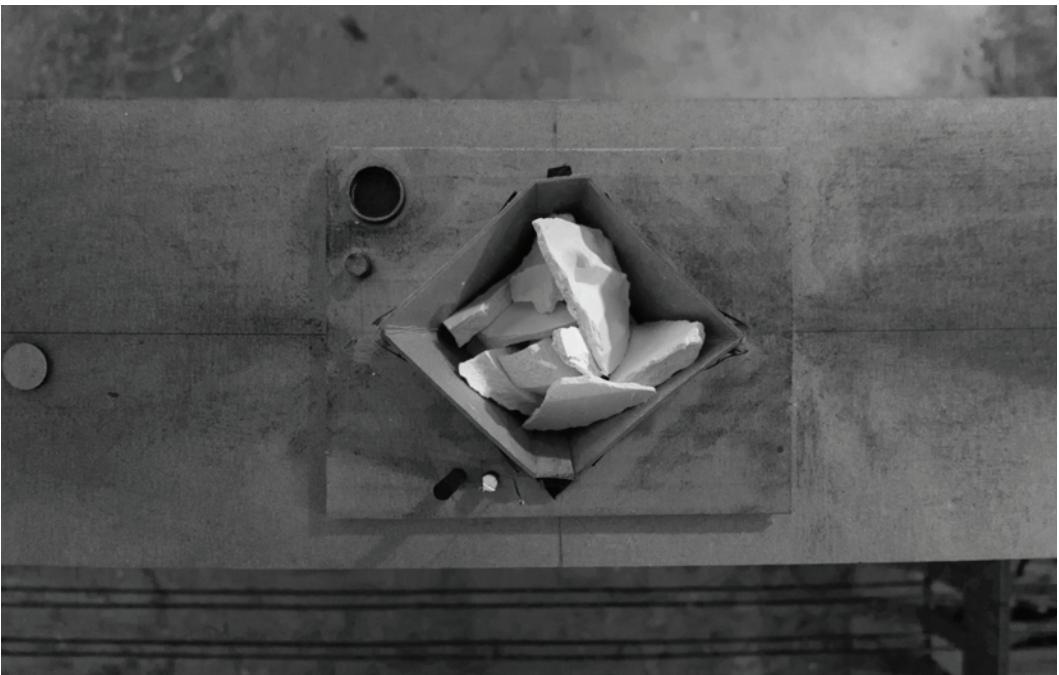


The Centre of Arctic Preservation (18" x 24")





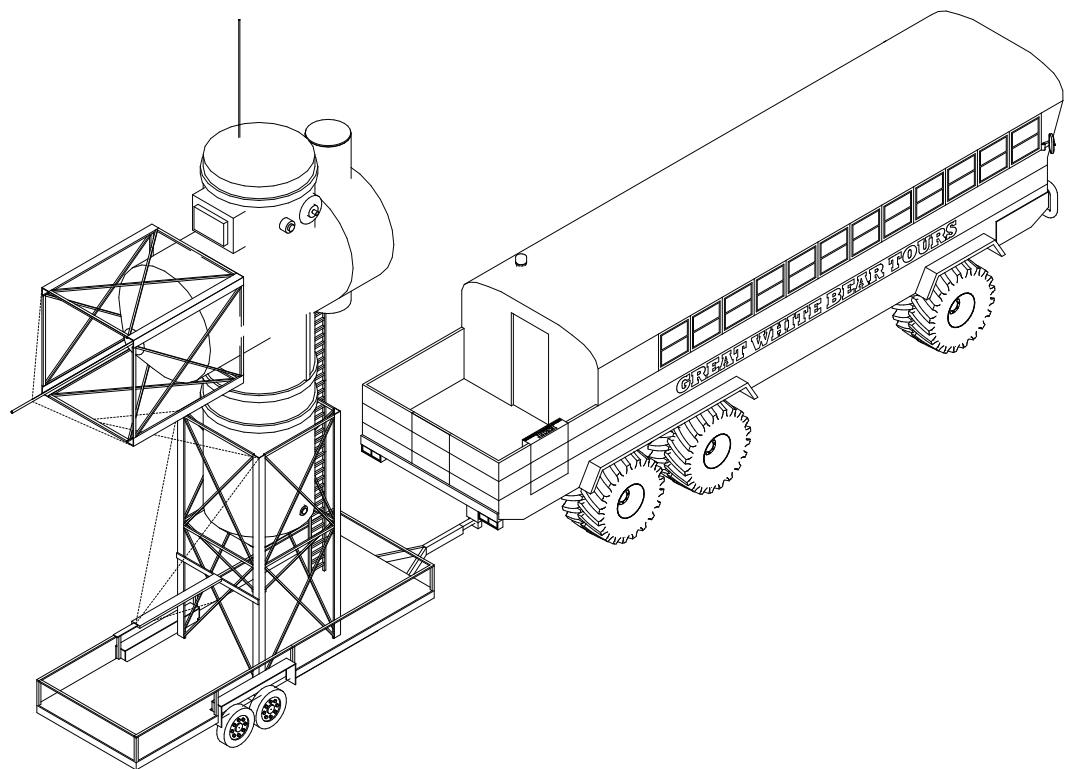




## ***DEVICES OF RESEARCH AND WARMTH***

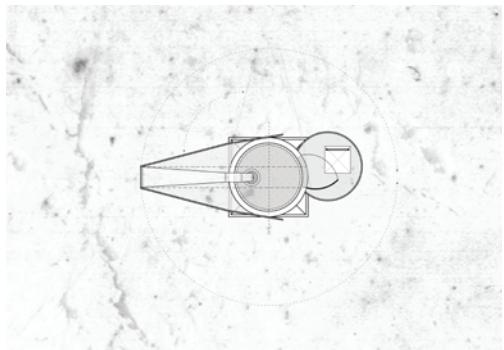
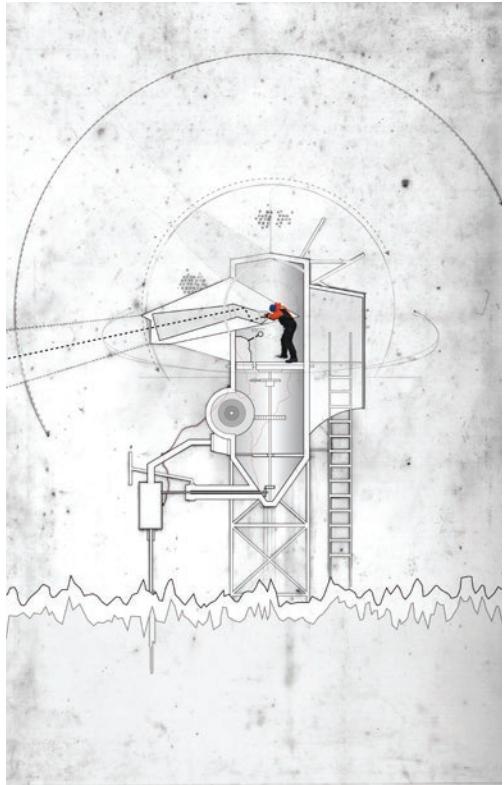
*Another day, another specimen. We donned our heavy gloves, canary red down-filled parkas, and backpacks of gear setting off towards the harbour. Old pressure ridges act as foot holds for scaling atop the upturned floes. The fresh snow drifts hide some of the sharper edges. The blanketed-white snow terrane is too difficult to safely navigate by sled or vehicle so we are forced to traverse by foot today.*

*Today marked the second month since we began testing the research stations. More than anything they are a godsend to escape from the wind out on the ice. The winds coming off the bay are a lot stronger than yesterday. The station we're heading to is located at the mouth of the Churchill River, along the centre line of the dredged channel. As we scaled ridge, the sky-blue research station emerged from between two shards of white, snow covered, ice. They are constructed of recommissioned dust collectors and metal framework pulled off the port and brought out onto the ice using the big tundra-touring vehicles. This was the first of four small research stations were spread out within the frozen harbour. Closing the hatch door behind us we checked the ice monitoring instruments, marking the status of current ice depths and consistencies. We noted the locations for today's core extraction in our note books and left the research station into the icy harbour.*

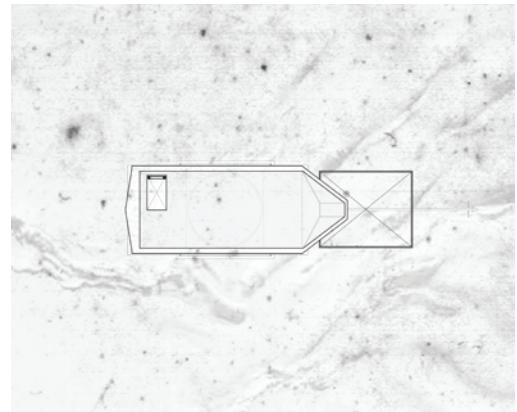
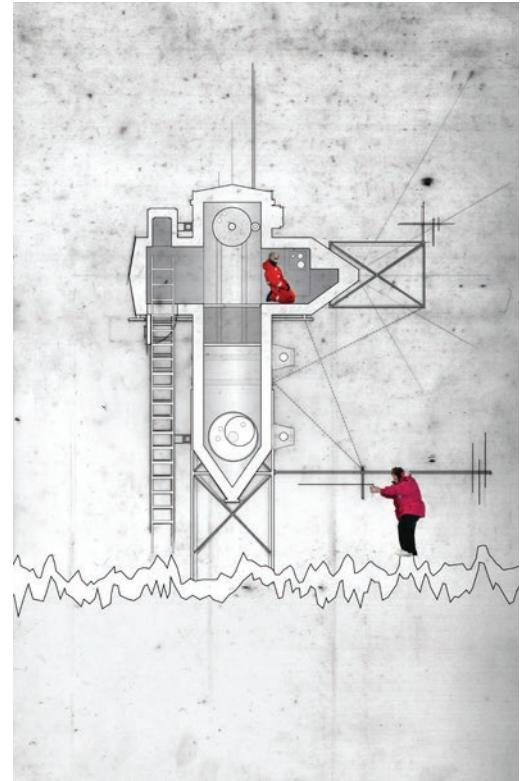
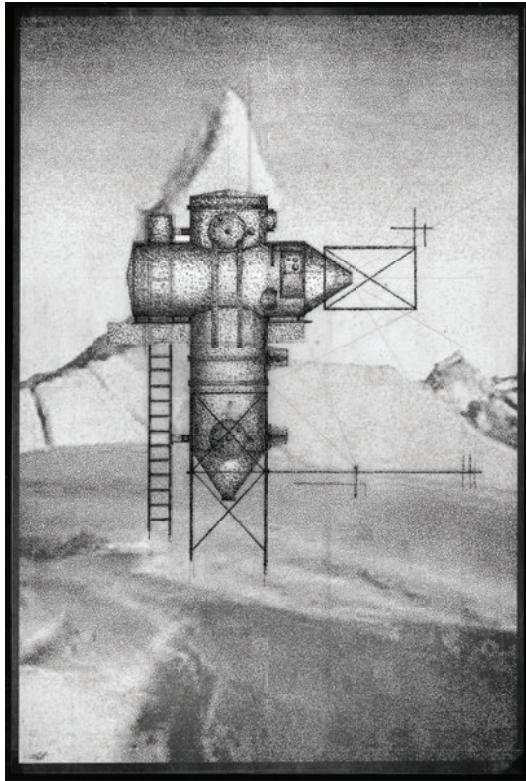


*The research devices are imagined to be hauled out towards the ice surfaces by rough-terrain buggies.*

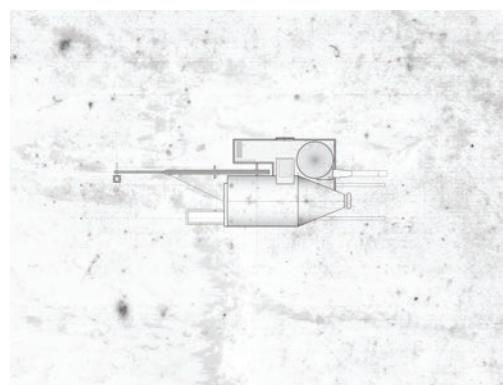
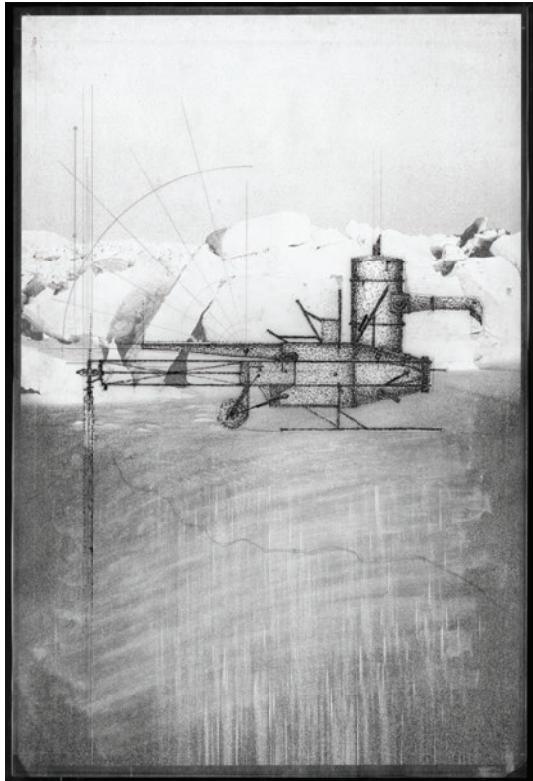




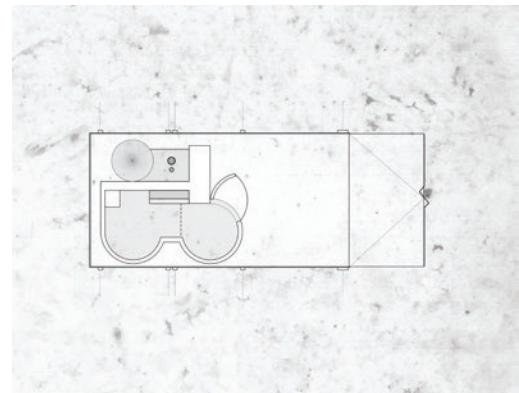
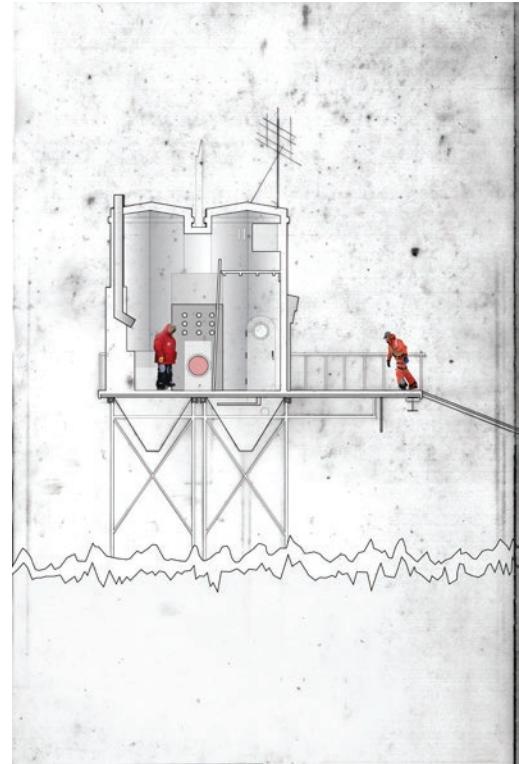
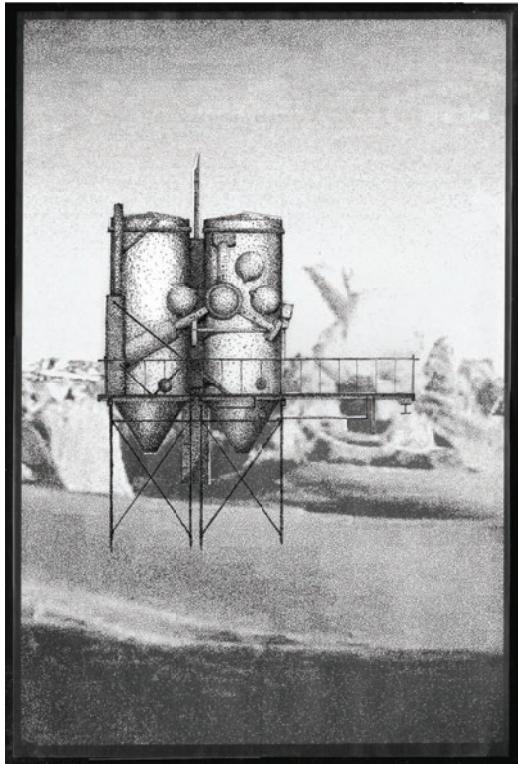
Top Left: Device #1, Elevation (12" x 18")  
Top Right: Device #1, Section  
Right: Device #1, Plan



Top Left: Device #2, Elevation (12" x 18")  
Top Right: Device #2, Section  
Right: Device #2, Plan



Top Left: Device #3, Elevation (12" x 18")  
Top Right: Device #3, Section  
Right: Device #3, Plan



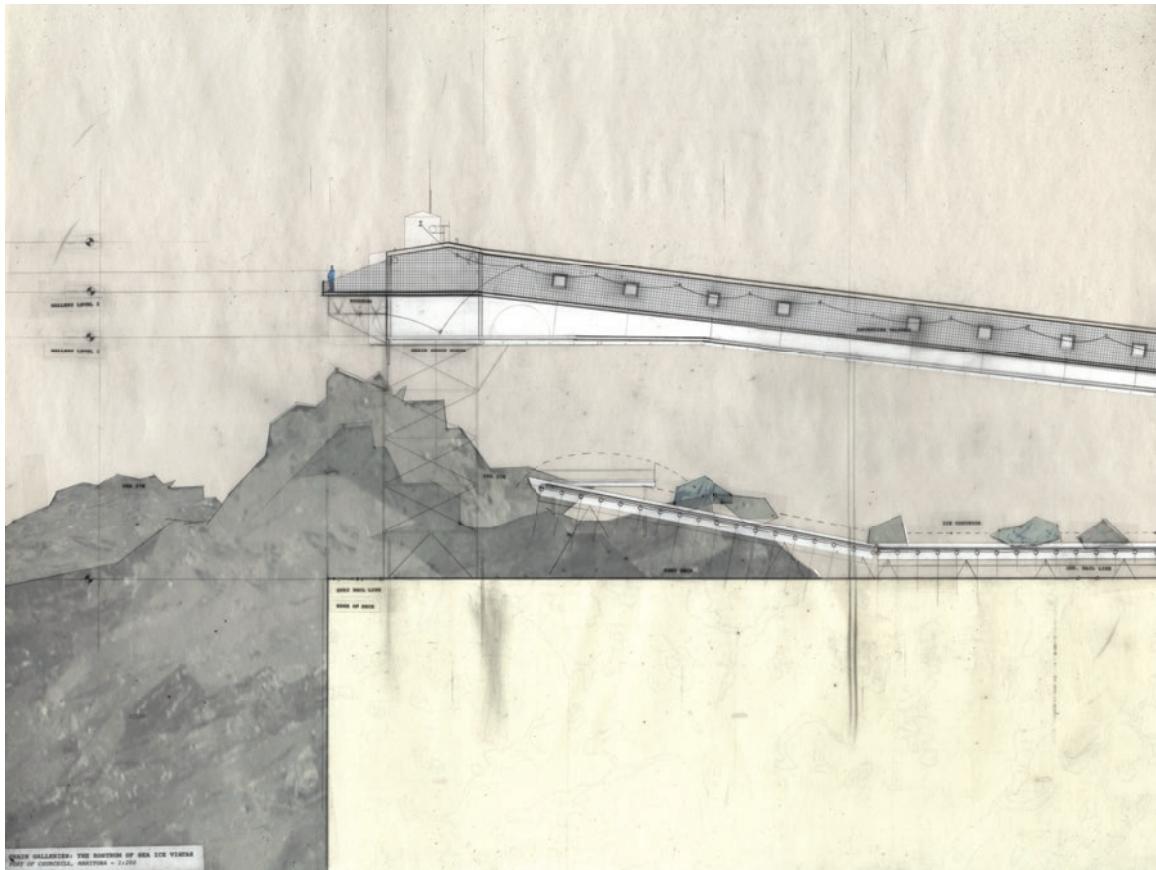
Top Left: Device #4, Elevation (12" x 18")  
Top Right: Device #4, Section  
Right: Device #4, Plan

## **THE ROSTRUM OF SEA ICE VISTAS**

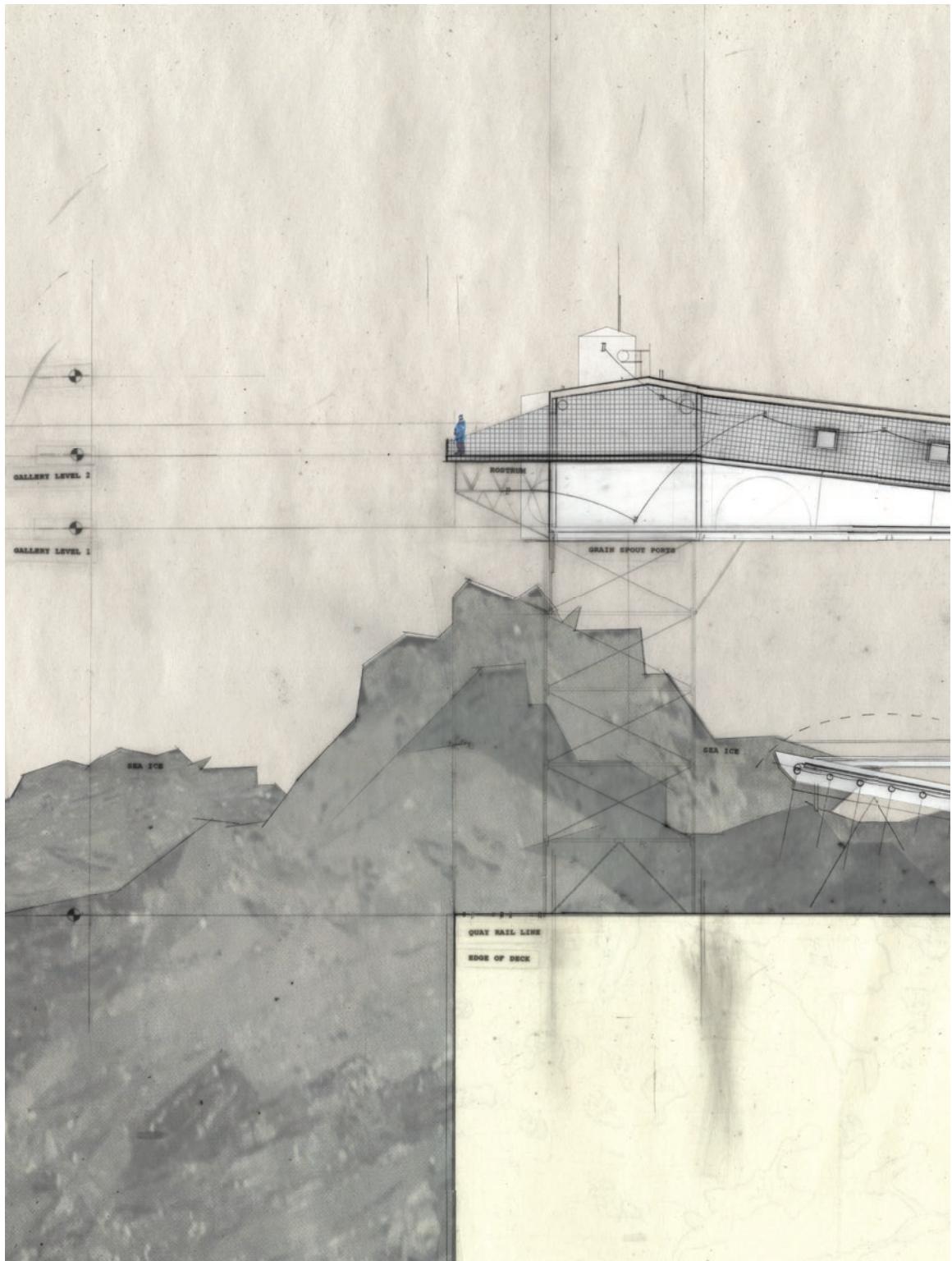
*We arrived from Winnipeg yesterday after a long and winding two days on the VIA. A shuttle train took us and a small group of others on the secondary line from the Churchill train station up to the port. The tourism guides said that the sea ice moves differently here, and the observation deck at the port is the best place to see it.*

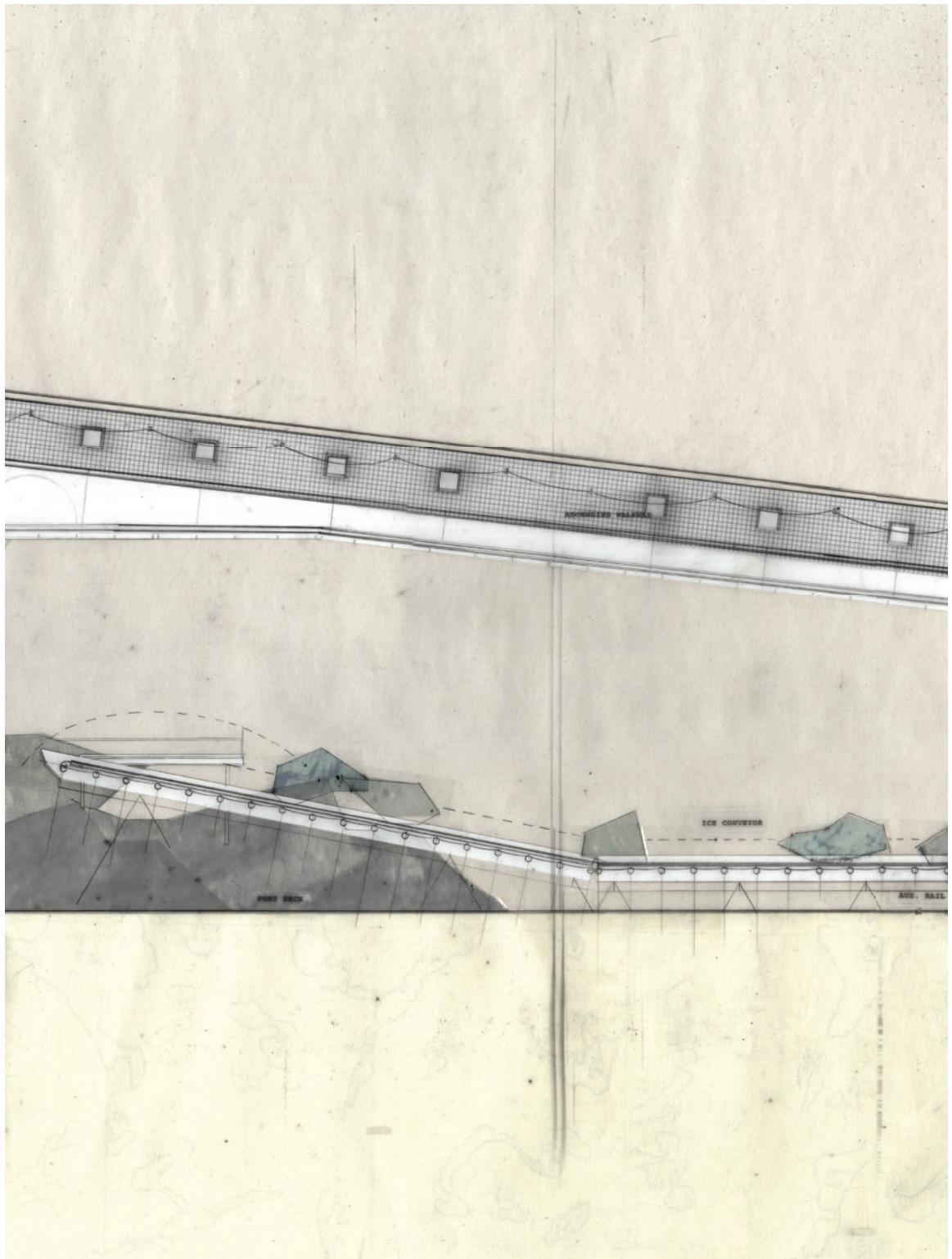
*Entering the locomotive shed, being escorted by our guide off the car down to the tracks. Descending below the tracks into the boot trench, ghosted figures of old augers, grain dumping compartments, and conveyor belts line a maze of thick concrete columns lit by yellowed construction lights above. Four square shafts of muted daylight pierce through the darkness, emanating from the top of the building. As we ascended into the open belly of the head house, old machinery of the grain elevator, towered up through the concrete framing and into the upper ceilings. Groans and squeaks echoed down from conveyors and loop belts above. The building was dimly lit aside the thin streams of light from above us, illuminating intricate equipment and a tall steel frame structure, emerging from the floor below. Sparks flew from across the room as some masked figures welding a tank-like object with skis. Massive steel beams and cables hang from one side of the ceiling to the other, spinning gears grind their teeth, hissing pumps and containers expel plumes of steam enveloping the space above us. We had never seen a mechanical operation this impressive before.*

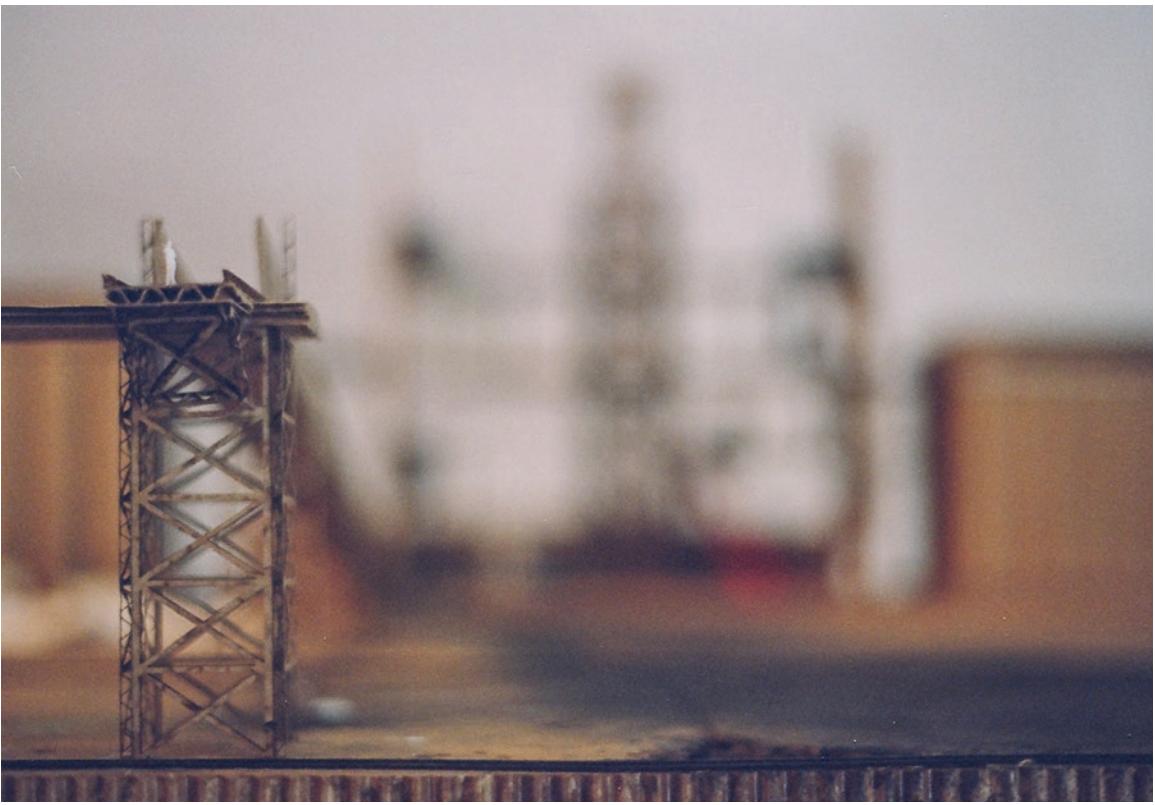
*The hallway we entered was dimly lit by fogged windows. The sounds from the machine halls muted behind us. A long, ascending ramp lead us to an apex at a lone windowed alcove. We were immersed in a panorama of jagged ice erupts from the frozen harbour. Although now we were some eighteen metres above the ground, the reaches of the ice extend nearly a few metres below us, almost within an arm's reach. The sounds of cracking ice shake through the former grain galleries. Our cameras couldn't capture the immensity of this feeling.*



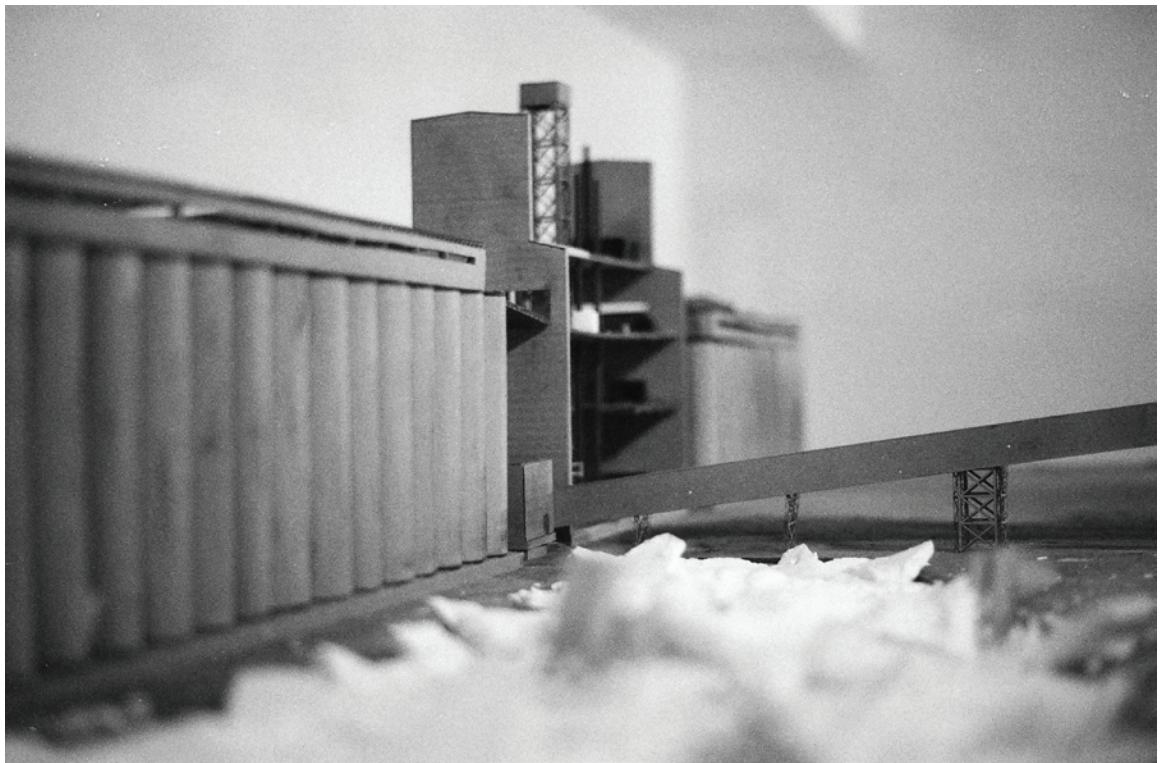
The Rostrum of Sea Ice Vistas (18" x 24")











## POST SCRIPT

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As an iconic landmark to Churchill and the connections through the Canadian north, the Port of Churchill holds national significances that are worth maintaining. Through an understanding of historical positions on nature, technology and humanity's relationships a clearer set of understandings can be realized. Churchill occupies a barren, harsh and unforgiving area, and the eventual outcomes of a global environment will determine how the future local landscape is utilized.

Layered ideas and perspectives towards climate change allow for the construction of new relationships and formal conditions for architectural responses to exist. The orthogonally drafted drawings developed through this thesis aim to be evocative solely to the narrative in which they are conceived. The drawings explore the past, present, and future conditions of the architecture and the components that operate in and around them. Through re-composition and re-imagination new functions are adapted to suit the intentions and usefulness to their desired need.

The practice of drawing became a method of invention and decision making through the project's development. Rationality and irrationality of existing architectural representations and the imagined are drawn together into new composites where the decisions for new forms of architectural spaces are made quickly in order to advance to the next decision. The practice of architectural drawing can shift ways of interpreting, considering and re-interpreting a subject at various scales - architectural, landscape, environment, climate - in the process of design. This praxis aimed to reject erasure and temptations of reduction as an aesthetic. Evidences of early drawn marks, scuffs and smudges show through the composited drawings. The intention is to avoid the oversimplification and elimination of past information too early in the design process. Revealing the duration and latent structures of drawing is crucial. The past drawn marks

reveal more of the processes and histories of the design than the produced design object itself. The drawings are cultivated to reap the benefits of triggered spatial imagination and curiosity as they do not tell a complete story.

This project is not meant to state a case for architecture's implicit role in changing the climate, or a direct architectural solution, but instead pose a position for a building's place within an altering environment. Through a fictional climate scenario, determinations of a building's transformation, in construction and use, can come into question.

The air of climate change in contemporary media poses a negative and dystopian endgame for humanity and the global environments that we live in. By taking an optimistic stance on the subject positive futures can be imagined as long term solutions. Humanity can work towards healing the environment, but we need to attempt to foresee the potential for positive results before any global effects will ever be realized. These events and repercussions are long term in cause and effect. For long term results we need long term plans, and the continual political and commercial acceptance, adaptation and support to these conditions.

In the coming years, it is projected that the province of Manitoba will begin to experience seasonal climate similar to the state of Texas.<sup>1</sup> In this scenario it is very likely that the arctic sea ice in the Hudson Bay will continue to recede, opening to year-round transportation and shipping potentials. In this case, the Port of Churchill will become more of an asset to central Canada than ever. This is a major economic opportunity at the cost of a catastrophic environmental loss. As this thesis is completed the port remains closed with no further plans to restart operations. The question remains as to what is next for Churchill and the only Canadian arctic sea port.

41 Bartley Kives, "Hotter, drier summers on way: Climate change models predict Manitoba will be more like Texas," Winnipeg Free Press, May 13, 2016.

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