

RUIN-OPHILIA

Preserving Cultural Narratives of a Lighthouse
through Controlled Ruination

by

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ABSTRACT

Once vital aspects of safer navigation routes and icons of industrial development, the Imperial Towers of Lake Huron and the Georgian Bay dominated over the Bruce Peninsula coastal landscape for almost two centuries. Their contribution to the development of their respective regions rendered them cultural landmarks and embedded them in the larger cultural narratives of their locales. However, advancements in technologies, like many other engineering works, led these structures to become obsolete. Among these is the Nottawasaga Island Lighthouse, now with all alternative use options exhausted, awaiting its end. This thesis explores a way to turn this ruination process into an architectural experience. Through “controlled ruination” the transmission of larger cultural narratives is enabled while the man-made melts into nature.

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Figure 1
Rose Blanche Lighthouse,
New Foundland.

*When rocks impregnable are not so stout, nor
Gates of steel so strong but time decays?*

_Shakespeare (Sonnet 65)

INTRODUCTION

RUINS OF THE POST-INDUSTRIAL LANDSCAPES & THE COMMUNAL IDENTITY

"if we want to understand ourselves, we would do well to take a searching look at our landscapes." _Pierce Lewis.¹

"Landscapes give us an informative impression about the economic and technical development of a particular society; they are, in fact, more informative as they give us a comprehensive, detailed and precise account of the state of the environment in a far better way than any museum could possibly do." _Walter Benjamin, *Passagenwerk*²

▼ In his paper presented at the 3rd International Memory and the World Conference in 2008, Ken Taylor asks "what is landscape?" and what are its connections to human memory?³ Landscape is related to, but not simply identical to, nature, or scenery, or region, but it is a dynamic combination of all of these touched by the human man, creating a place, or a locale. It is an ensemble of ordinary features which constitute an extraordinarily rich exhibit of the past, the present and the possible future of any society. Thus, if read carefully, landscapes can reveal one of the richest historical records of the humankind.⁴

"To understand [a society] we need to look at our landscapes for they are a clue to culture."⁵ Unlike static sceneries, landscapes are repositories of evolving cultural processes through which identities are formed. The layers of narrative within a community dictate their ideologies, which then at large determine the changes that happen to the built environment. Narratives of places, as outlined by Paul

1 Paul Groth and Todd W. Bressi, ed., *Understanding Ordinary Landscapes*, (New Haven: Yale University Press, 1997), 2.

2 James Douet, ed., *Industrial Heritage Re-tooled*, (Walnut Creek: Left Coast Press, 2012), 142.

3 Ken Taylor, "Landscape and Memory" (paper presented at 3rd International Memory of the World Conference, Canberra, Australia, February 19-22 2008), 1.

4 Jackson, J.B., *Landscape 1* (Spring 1951): 5.

5 Taylor, "Landscape and Memory", 2.

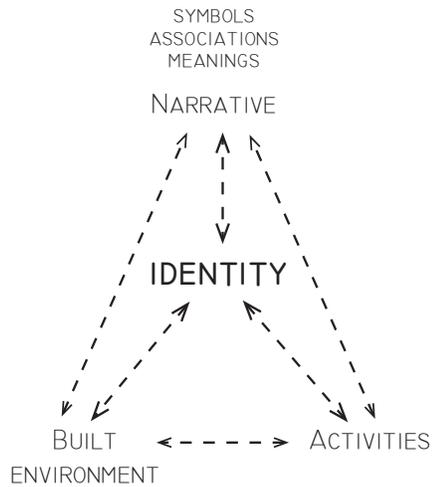


Figure 2 Place identity and its components.

Ricoeur, are generated by past innovations, current significances and expectations for the future. Assembling these layers results in the perception of a cultural identity. Thus, traces of the past need to be appreciated in order for cultural identities to persist.

Scattered over the North American landscape are the post-industrial remains of manufacturing facilities, industrial sites and engineering works. These left-over places of the age of man-power and production come in manifold forms and styles, reflecting their time of construction and former functions. Some are left to linger for a while and some are demolished at the first signs of obsolescence. Whatever the situation may be, these “ruins” tell a great deal about the economic development of regions across the continent as well as the shaping of the identity of their respective communities. In the Canadian context, lighthouses are a part of this collection of “industrial ruins”¹. Once a part of a global network of safe navigation routes, with the advancement of technologies many of these structures were rendered obsolete, abandoned and are slowly being vanished.

¹ In this thesis, *industrial ruins* refer to abandoned, unused buildings or structures that were created for purposes other than habitation; existed primarily to produce goods or provide services for the benefit of human needs, such as manufacturing facilities and engineering works.

Buildings that are threatened with death are usually adaptively-reused so that they can have a new life. But, what happens when they are diagnosed as 'terminal', as it is in the case of lighthouses? How do they spend their last days? How do they die? In the following pages, this thesis explores a way of conveying larger narratives of industrial ruins without interfering with their natural decay process is explored.

The first chapter is a scene-setter and offers key intellectual coordinates for the reflections that the design proposal follows and builds upon. The idea of "memento-mori" in architecture, the concept of ruination and various accepted theories on their preservation are discussed. The second chapter introduces the 'shadow narratives' of the case study topic: the Nottawasaga Lighthouse. Presenting its story from the broad to the specific, the chapter provides a general history of the Canadian Lighthouse, and the construction of the Imperial Towers, narrowing down on their obsolescence and the current state of the Nottawasaga Lighthouse. Also in this chapter, the history of Collingwood, the importance of the shipbuilding industry for the development of the region and how it plays a significant role in the preservation of the intangible narrative of the community are brought forward. The central part of this thesis, Chapter 3, reveals the design approach for the "controlled ruination" of the Nottawasaga Lighthouse. As an architectural quest, the proposal assembles the narrative of the place as a collage within the decaying structure and discovers how ruination can nurture architectural creativity in heritage conservation practices. In conclusion, the final chapter reflects on successes and failures of the design in blurring the boundaries between nature and culture, as well as merging the vanishing past and the improbable future in the tangible present.

CHAPTER 1

THE RHETORIC OF THE [INDUSTRIAL] RUIN: "MEMENTO MORI" IN ARCHITECTURE

"[architecture] carries within itself the traces of its future destruction, the already past future, future perfect, of its ruin... it is haunted, indeed signed, by the spectral silhouette of this ruin, at work even in the pedestal of its stone, in its metal or its glass." (Derrida, 11)⁶

"(...) the greatest glory of a building is not in its stones, nor in its gold. Its glory is in its Age, and in that deep sense of voicefulness, of stern watching, of mysterious sympathy, nay, even of approval or condemnation, which we feel in walls that have long been washed by the passing waves of humanity."⁷ John Ruskin

▼ Although they are inanimate objects, architectural creations are most often assumed to have lives. Like the living beings, buildings and structures are assumed to have breathing existences, with spirits, memories and many stories to tell. But even when they are given such lively associations, their "seniority" is not widely considered.

The ends of buildings come in a multitude of ways; they are on-going processes and present themselves incrementally. It is said that the slow, mundane process of decay starts when the last mason moves out. "A building is always tearing itself apart."⁸ At first, it is not apparent as deterioration affects smaller building components. "Foundations may survive for a thousand years, while the roof structure may be replaced after a thousand months. The sanitary fittings in the bathroom could last a thousand weeks, the external paintwork a thousand days, and the light bulbs a thousand hours."⁹

⁶ Jacques Derrida, "Letters to Peter Eisenmann", *Assemblage 12* (1990): 11.

⁷ John Ruskin, "Lamp of Memory" in *The Seven Lamps of Architecture*, 1849.

⁸ Stewart Brand, *How Buildings Learn: What Happens After They're Built*, (New York: Viking Press, 1994), 13.

⁹ Stephen Cairns and Jane M. Jacobs, *Buildings Must Die: A Perverse View of Architecture*, (Cambridge: MIT Press, 2014), 42

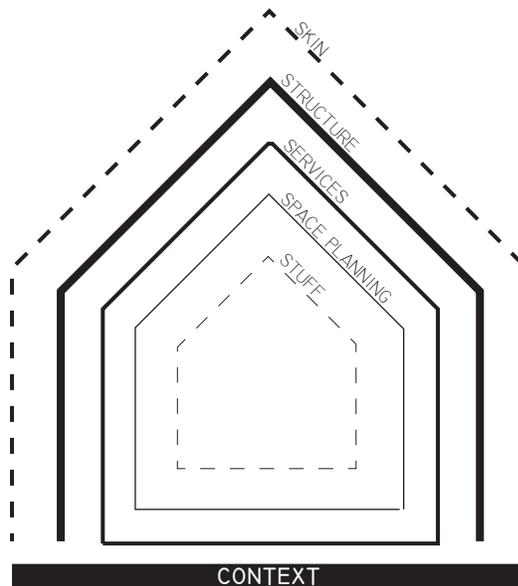


Figure 3 Shearing of layers of change. Due to different rates of change of building components, a building is constantly tearing itself apart.

However, the “official” meeting of architecture and death happens when a structure becomes obsolete. Generally designed for a given place, time, and use, most buildings don’t enjoy the plasticity of some of the other smaller creations. As argued by the Adaptable Futures group “[architectural] designers tend to ignore these temporal aspects, focusing on an aesthetic fixation and functional performance, freezing out time in pursuit of a static idealized object of perfection.”¹⁰

ⁱ Sirat, according to [Islam](#), is the hair-narrow bridge which every person must pass on the “Day of Judgment” to enter [heaven](#).

This abandonment starts architecture’s journey across the Siratⁱⁱ. The passage towards the end is often most apparent to those who conduct their everyday lives in the vicinity. Unlike smaller, more transient objects that can be hidden away or disposed of at the end of their use, it is hard to justify the demolition of a building in both economic and cultural respects. As it is hard to exercise “amnesia or economy of ignorance with respect to structures,”¹¹ even when architecture falls out of time, it remains in place.

¹⁰ Cairns and Jacobs, *Buildings Must Die*, 125.

¹¹ Cairns and Jacobs, *Buildings Must Die*, 111.

These buildings that are in an in-between status slowly turn into eyewitnesses of culture and humanity. Eventually acquiring a ruin status, they become truthful, tangible results of the passing of time as well as a symbol of architecture's vulnerability against time, nature and technology.

Gionata Rizzi describes a ruin as:

*"a building that has lost its natural defences, unarmed against the ravages of atmospheric agents and consequently more vulnerable to the destructive effects of time; a building that has stopped to fulfill its functions, to shelter human activities and which, in a sense has begun its journey towards progressive decline and final disappearance- here, between architecture and nature, in a sort of no-man's land, lies the ruin."*¹²

However, the meaning of ruins has a long-winded history. Before the Enlightenment, ruins were mostly seen as artifacts of the pre-Christian Era, conveying a failed religious and political order, and thus in a way symbolizing the providence of Christianity.¹³ The "Age of Reason" brought about a shift towards a more scientific view. Instead of debris, ruins began to be seen as artifacts that serve in the study of history and civilizations. Later on in the 19th century acquiring a more symbolic notion ruins became symbols of Man's struggle against time and the forces of nature. As John Ruskin states, it is through ruins that "we recognize our past and roots," as they constitute what "people have handled, and their strength wrought and their eyes beheld all the days of their life."¹⁴

¹² Gionata Rizzi, "Preface," in *Conservation of Ruins*, ed. John Ashurst (Amsterdam: Elsevier, 2007), xx.

¹³ Iwor Shearer et.al, *Restless Debris*, (Irvine, California: UCI Claire Trevor School of the Arts, 2015), 2.

¹⁴ John Ruskin, *The Complete Works of John Ruskin*, (New York: DeFau, 1971) Vol: VIII. 233-234.



Figure 4 Mackenzie King Estate Ruins in Gatineau Park, Quebec near Ottawa, Ontario.

By the 20th century, with the creation of man-made ruins during the World Wars, the remnants of structures became sites of remembrance, signifying humanity's capacity for self-destruction.

While in contemporary times, the ruin is understood as an apparent final stage of architecture, it also provides an inspirational source for aesthetic experiences and architectural creativity. In one dimension, ruins offer an unusual physical merging of human history into the natural setting.¹⁵ As can be seen in British landscape gardens, which are often highly designed and marked by fake ruins, decaying architecture is effective in creating an atmosphere of awe. Representing notions of change, transition, decay and wilderness, these gardens can also be seen as reflections of the sublime and ephemera.

On the other hand, however mundane they may seem, ruins have the potential to create unexpected architectural experiences. Since the original use of the space has passed, they present limitless possibilities for creative interpretation, unobstructed from everyday constraints. They

¹⁵ Walter Benjamin, *The Origins of German Tragic Drama*, (London: New Left Books, 1977), 178.

allow one to see the fatality of architecture and all things tangible from a certain imaginative perspective that is simultaneously hopeful and tragic. The ruin offers the architect an invaluable opportunity to be both utilitarian and poetic, promoting a spatial and temporal extension of the past to the future.

Ruins of the Industrial Era

▼ In contrast to the designed ruins of the British gardens, ruins in the North American landscape are descendants of the industrial era. Generally formed with material and functional efficiencies in mind, aesthetic intent is not an expected quality to be found in these ruins of former industrial structures and engineering works. Occupying contaminated sites, featuring seemingly unsophisticated elements and superhuman scales, these structures are normally associated with negative notions. However, paradoxically it can be argued that the value of such sites also lie in the sublime image they bear.

The ruins of post-industrial era tell the story of human development in the recent past. These sites not only tell a great deal about economic structures and “relations of productions” of their times, but also provide strong evidences of communities’ development. By enabling the development of their respective regions, these functional yet elegant structures have extended their dominance beyond their building envelopes, and become vital parts of their respective landscape’s narratives, which over time contributed to the shaping of a communal identity.

The value of these sites is not limited to their narratives. As Maasaki Okada argues in *Industrial Heritage Re-Tooled*, industrial ruins also have the possibility of generating an aesthetic value in something old and crude.¹⁶ This concept, which is known as Wabi-Sabi in traditional

¹⁶ James Douet, ed., *Industrial Heritage Re-Tooled*, 153.

Japanese aesthetics, constitutes an acceptance of transience and imperfection. In connection to this, Okada further states that the aesthetic value of the industrial ruin lie in the appreciation of their *sachlich* beauty.¹⁷ *Sachlich*, which means practical and material in German, is also used to describe things with qualities of irregularity, diversity and chaos. In this sense, the industrial ruin possess both of qualities of *sachlichkeit*, or sachlichness. Built as practical, and functional facilities using simple geometric shapes, these buildings take on the notions of sachlichness through the passage of time, which allows for the generation of aesthetic qualities along the way.

**Recording the
"Station Point between
Abandonment and Ruin"**

▼ The sachlich quality of the industrial ruins are explored by photographers of the last few decades including the Canadian photographers Robert Bourdeau and Thaddeus Holownia. Capturing the ways the humanity changes the landscape, how the forces of nature mould human structures and how the two coexist, their work create a photographic catalogue of transformation. Using altered landscapes marked with the ruins of industrial activities, they aim to convey the precarious relationship between man and nature. Through the lens of the camera, they explore permanence and change of nature in its progression of light and time. At the end, what is revealed to the viewer is a state of uncontrolled debris of human intervention, through which man once made his presence felt in nature and how nature has resisted that intervention.

¹⁷ Ibid.

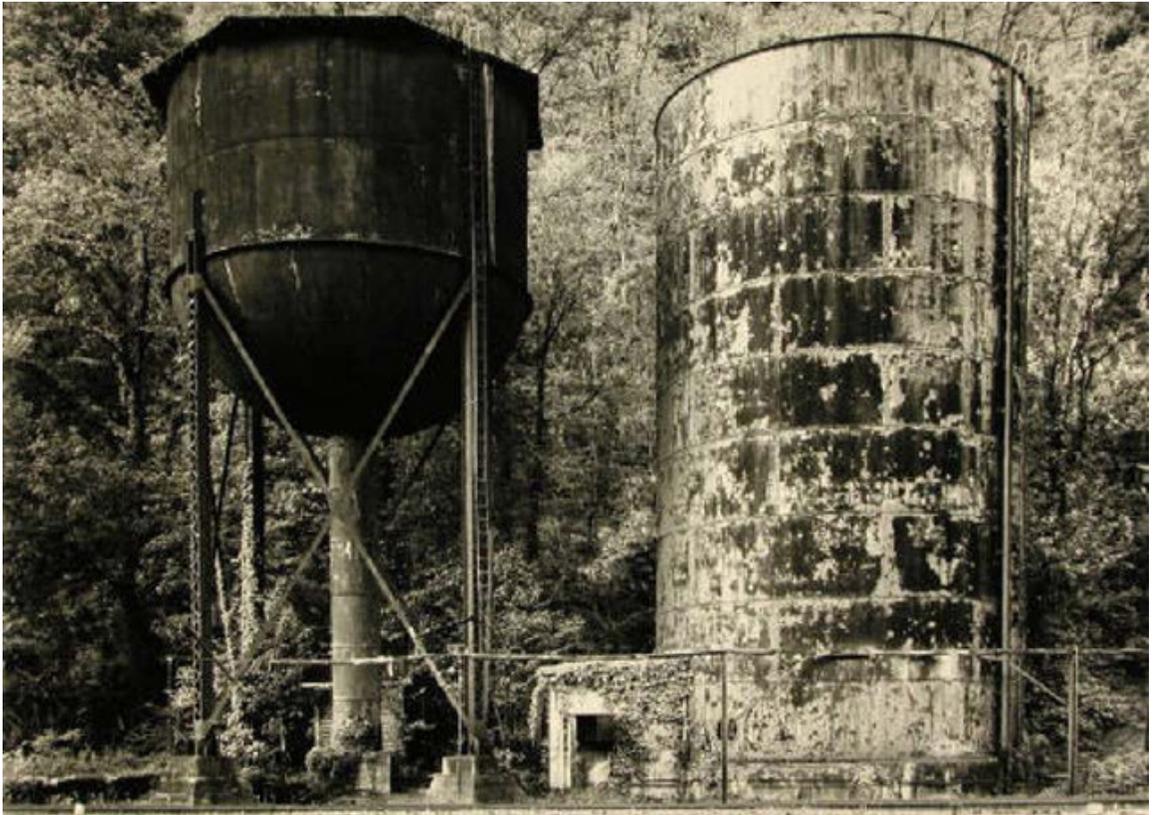


Figure 5 West Virginia, U.S.A. Robert Bourdeau. 1993.



Figure 6 Rockland Bridge. Thaddeus Holownia. 1981-2000

**On Conservation of
[Post-Industrial] Ruins**

▼ “The past itself is gone- all that survives are its material residues and the accounts of those who experienced it. No such evidence can tell us about the past with absolute certainty. For its survivals on the ground, in books and in our heads are selectively preserved from start and further altered by the passage of time. Past cant by itself tell us everything for certain. Thus why restore?”¹⁸

_ David Lowenthal

Such changing perspectives on ruins, make the way we look at ruins today merely a historical contingency informed by a long line of connotations that were passed through time and cultures.¹⁹ Therefore, as scholars Julia Hell and Andreas Schonle argue, “ruins cannot exist without creative appropriation.”²⁰

However, the accumulated meaning is, as Hell and Schonle states, that ruins have always been the reminders of the past and its irretrievable loss in the present. The ruin’s patina tells the narrative of the place, transforming it into a living messenger between past and present cultures. Therefore, any act to these marks of decay would mean “total destruction out of which no remnants can be gathered.”²¹ Thus any impulse to preserve ruins would contradict the aim of preserving them as a trace of the past.

This idea was likened by the art historian Charles Mereweather to Sigmund Freud’s psychoanalytic theory.²² Freud speculated that

18 David Lowenthal, *Past is a Foreign Country*, (Cambridge: Cambridge University Press, 1985), xxii.

19 Iwor Shearer et.al, *Restless Debris*,2.

20 Ibid.

21 Ruskin, 1952,page 242.

22 Michael Roth , “Traces of Loss,” in *Irresistible Decay: Ruins Reclaimed*, ed. Lynne Kostman and Rebecca Frazier (Los Angeles: The Getty Research Institute for the History of Art and the Humanities, 1997), 25.

people's memories and impressions of the past are likely affected by their current desires, concerns and thoughts. He believed that present thoughts and feelings retroactively project themselves onto the fragments of memories and reconstruct the past in the present. He argued that such a past is not authentic.

Further arguing the inappropriateness of act of preservation for ruins, in his introductory essay for the catalog of the Getty Center's exhibition entitled *"Irresistible Decay: Ruins Reclaimed"* in 1997, Michael Roth cites the example of a semi-fallen gateway in Baalbek, Lebanon.²³ As it was in the process of falling, the archway's keystone was supported by a column, which in effect 'stalled time' by prohibiting the natural process to take core. This, he states, is what John Ruskin meant by "restoration equals total destruction."

Reconstruction of buildings has also been a controversial topic discussed amongst the professionals in the heritage field and in international legislation and guidelines, as it is a practice that is strongly discouraged. The UNESCO *Operational Guidelines for the Implementation of the World Heritage Convention*, which is a legally binding document to its member states, addresses the issue as follows:

"In relation to authenticity, the reconstruction of archaeological remains or historic buildings or districts is justifiable only in exceptional circumstances. Reconstruction is acceptable only on the basis of complete and detailed documentation and to no extent on conjecture."

²³ Ibid.



Figure 7 1841 *Painting of the Entrance of the Temple of Bacchus in Baabek, Lebanon.*



Figure 8 "Fallen Keystone Arch". 2010.

More recently, the Burra Charter (The Australian ICOMOS Charter for Places of Significance, 2013) also states on issue:

*Article 20.1 " Reconstruction is appropriate only where a place is incomplete through damage or alteration, and only where there is sufficient evidence to reproduce an earlier state of the fabric. In some cases, reconstruction may also be appropriate as part of a use or practice that retains the cultural significance of the place."*²⁴

*Article 20.2 "Reconstruction should be identifiable on close inspection or through additional interpretation."*²⁵

In addition, specifically addressing industrial heritage; *the Nizhny Tagil Charter for the Industrial Heritage* (2003) states that:

*"Reconstruction, or returning to a previous known state, should be considered an exceptional intervention and one which is only appropriate if it benefits the integrity of the whole site, or in the case of the destruction of a major site by violence."*²⁶

24 ICOMOS Australia, *The Burra Charter*, (the Australia ICOMOS Charter for Places of Cultural Significance, 1999, 1.

25 Ibid.

26 TICCIH, *The Nizhny Tagil Charter for the Industrial Heritage*, Nizhny Tagil, Russia: ICOMOS, 2003), c 5.7.

On a national scale, *The Standards and Guidelines for the Conservation of Historic Places in Canada* state that “reconstruction, or reconstitution of a disappeared historic place or landscape, is not considered conservation.”²⁷

In addition to these documents, reversibility and minimum intervention for alterations regarding places of heritage significance lie at the heart of the ever-growing library of code of ethics and charters for heritage practices. In fact, at a time when most projects are concerned with pushing the boundaries of conservation technology, supporting the idea that a building may have greater value in its incomplete state than if it is reconstructed contrasts with the spirit of the practice.²⁸

However, if reconstruction, reuse or recycling of ruined buildings and their components is in paradox with the idea of preserving the past, how then, even temporarily, can these decaying structures be ‘invited to speak’? How can their *sachlich* beauty be appreciated, allowing their vanishing past narratives to be transmitted to posterity?

27 Parks Canada, *Standards and Guidelines for the Conservation of Historic Places in Canada*, (Ottawa: Parks Canada, 2010), 37.

28 Nicholas Stanley-Price, “The Reconstruction of Ruin: Principles and Practice,” in *Conservation: Principles, Dilemmas and Uncomfortable Truths*, ed. Alison Richmond and Alison Bracker (London: Elsevier, 2009), 32.

CHAPTER 2

SHADOW NARRATIVES OF THE NOTTAWASAGA LIGHTHOUSE

"... [It] might be said for the lighthouse that they lost their battles with the time and vanished. By celebrating them in words and pictures, we keep their beacons shining. By honoring them we may very well make it easier to navigate our own future. Like the schooner captain who could remember where the beacon was even though he could not see it anymore, we will have a light to guide us."²⁹

"...for in the last resort, these lights... are the most reliable and unmistakable signs of danger and guidance at sea..."³⁰

For communities established along the Canadian shores, lighthouses are a part of this very large landscape of ruins of former industrial sites and engineering works. As it is with any industrial ruin, the significance of every lighthouse is defined mainly by their larger cultural landscapes. Thus it is especially important to think of them not as singular objects but as part of a greater narrative.

Building the Canadian Lighthouse

▼ The sky, land and sea intersect the stories of the past, present and future, on islands, rocks and coast lines that lighthouses sit on, confidently occupying the wild Canadian coastal landscape. Built for the establishment of safe navigation routes, for over two centuries these engineering marvels were signifiers of guidance, safety and civilization.

The development of the 'Canadian Lighthouse' and lighthouse networks parallel the rise and decline of sea trade following European colonization and the industrial revolution. The first documented Canadian lighthouse was built in 1734, in Louisbourg in Cape Breton, Nova Scotia, and was destroyed and rebuilt several times throughout its history. The oldest surviving lighthouse was built in 1758 at the

29 Tim Harrison and Ray Jones, *Lost Lighthouses: Stories and Images of America's Vanished Lighthouses*, (Connecticut: The Globe Pequot Press, 2000), 12.

30 Patrick Beaver, *The History of Lighthouses*, (London: Peter Davies, 1971), xi.



Figure 9 *Louisburg Lighthouse, Nova Scotia.*

mouth of Halifax Harbour on Sambro Island.³¹ Burgeoning levels of commerce between Canada and Europe as well as across the Great Lakes called for safer navigation routes. By the 1840s, major land lights were placed along the coast of Newfoundland and at the entrance of the St. Lawrence River.³²

However, most coastal shores and the Great Lakes remained in darkness until the middle of the century. Lighthouses in this region started to appear in the 1850s with the first lighthouse building boom. On the Pacific Coast, it was not until the second building boom in the 1870s, when the first lighthouse came into service. Over the course of these few decades, hundreds of lighthouses were built and lit up Canadian shores.³³

As icons of globalization, Canadian lighthouses are structures that demonstrate advances in structural engineering and efficient lighting equipment, aspects which made the construction of these engineering works easier, safer and in many cases just simply possible. Their remote locations, exposed to harsh marine environmental conditions led to the invention of pioneering materials and construction techniques.

³¹ Ibid.

³² Historica Canada, The Canadian Encyclopedia, "Lighthouses", accessed November 20, 2016, <http://www.thecanadianencyclopedia.ca/en/article/lighthouses/>.

³³ Ibid.

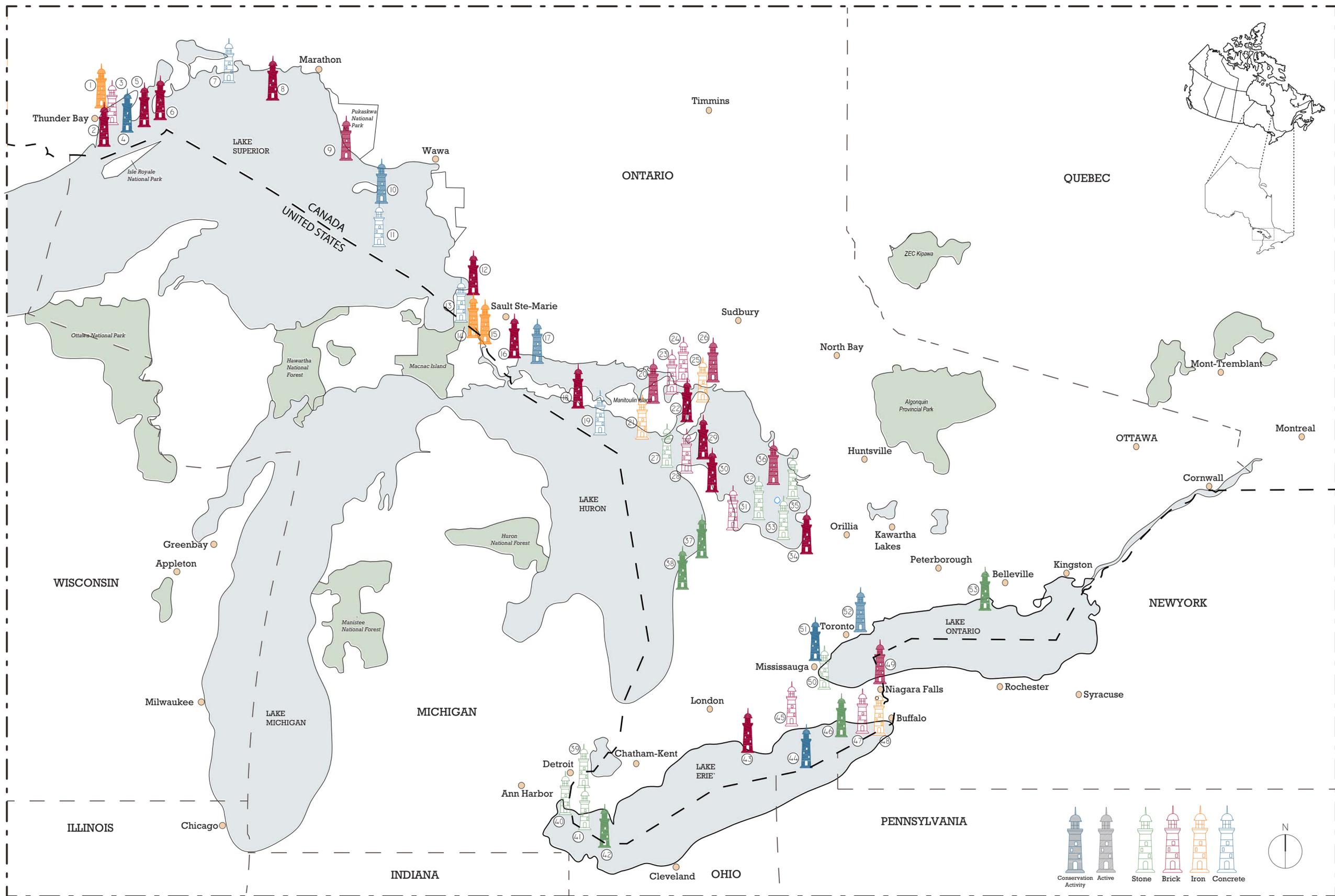


Figure 10 Lighthouses of Ontario

Canadian lighthouses are set in a great variety of environments- in the rainforest of the Pacific coast; along canals and rivers, on tops of small islands in the Great Lakes. This led to a diversity of construction types and materiality, that depended on the locale, availability and the time of construction. Smaller wooden lighthouse towers, with attached light keeper's residences, are characteristic of the Canadian lighthouse service. Examples of this early typology are found mostly in east and west coast landscapes. Stone towers were built mostly around the Great Lakes and St. Lawrence River from stone that was available nearby. By the 1920s, reinforced concrete became the main material to be used for light tower construction. At this time, many older wooden towers were replaced with concrete ones, which allowed for the towers to be taller and equipped with bigger, more advanced lenses. The art of building reinforced concrete light towers reached its ultimate expression with flying buttresses, which can be seen at the Caribou Island Lighthouse in Lake Superior and Estevan Point Lighthouse on Vancouver Island. Although not very common to the Canadian typology, steel caisson lighthouses and even fibreglass towers were also built in place of wooden towers along the coast and inland waterways.³⁴

Similar to the material selection, the form and design of lighthouses are also dictated by efficiency and functionality. The need to make the structure recognizable from different directions called for a symmetrical form.³⁵ Tapered sides streamlined the tall structure against wind and water, as well as increasing the structural stability as the towers grew higher.

34 Ibid.

35 Edward F. Bush, "The Canadian Lighthouse", in *Canadian Historic Sites Volume 9: Occasional Papers in Archaeology and History*, ed. Conservation Group, (Ottawa: Indian and Northern Affairs Canada, 1975), 8.



Figure 11 Father Point Lighthouse



Figure 12 Sambro Island Lighthouse



Figure 13 Kincardine Lighthouse



Figure 14 Southampton Range Light



Figure 15 Sheringham Point Lighthouse



Figure 16 Peggy's Point Lighthouse

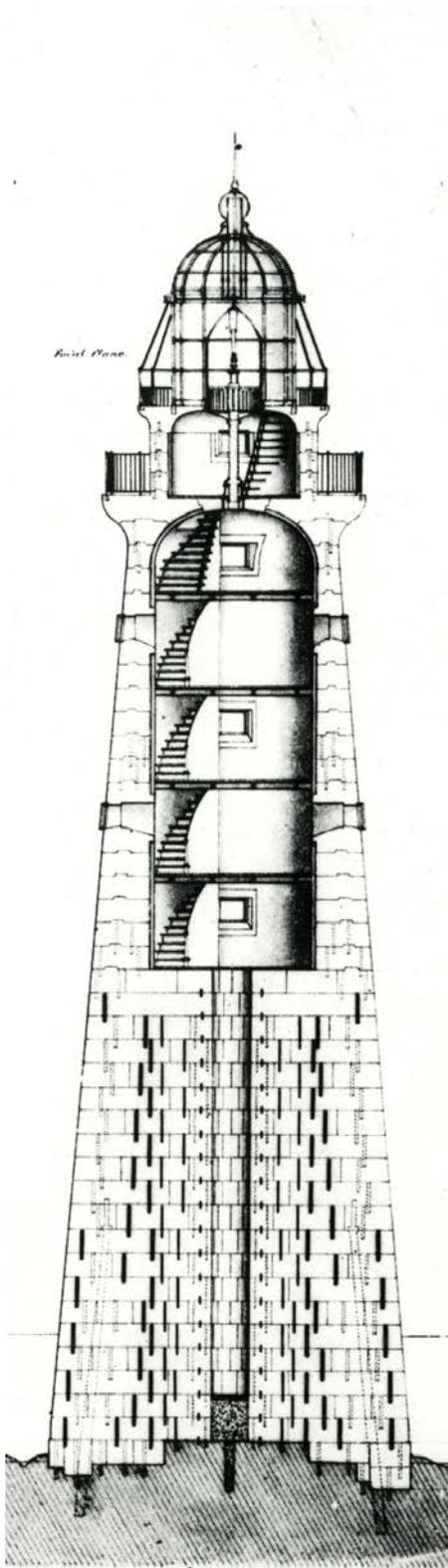


Figure 17 Minot's Ledge Lighthouse Section

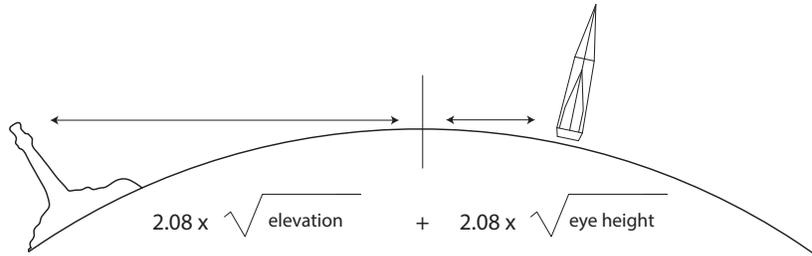


Figure 19 Diagram illustrating calculation for determining lighthouse tower height.

The form of the towers is also determined based on site conditions. The height is calculated using a trigonometric formula in order to optimize the economic construction of the tower while providing necessary illumination.

Tall, cylindrical towers were usually constructed when dangerous shoals are located far off coastal shores. Smaller towers were used at the entrances of harbours. At locations where frequent fogs or low clouds occur obscuring the refraction of the light, shorter towers were built to ensure that they can still be seen. For the construction of lighthouses in the water itself, wave washed light towers were constructed using dovetailing techniques which allowed for the tower to withstand the constant water impact.

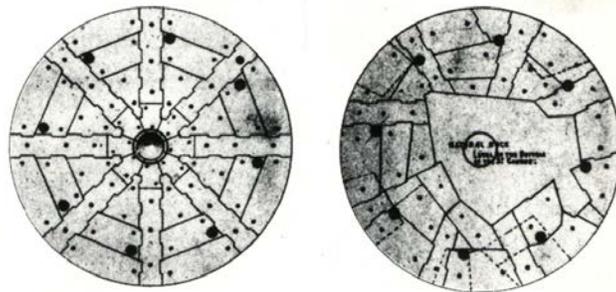


Figure 18 Minot's Ledge Lighthouse Plans showing dovetailing details.

As much as the structural advancements, illumination technology also altered the shape of the light towers. In the 18th and 19th centuries, the illumination was done using candles, which was not a very effective method to illuminate a vast landscape. By 1800, this method was

replaced by oil lamps with wicks, using a variety of vegetable, whale, fish or seal oils, depending on their availability. With the invention of the kerosene lamp by Abraham Gesner in Nova Scotia in 1846, came the extensive use of it in Canada after the 1860s, as it presented a cheaper, safer and more efficient system of illumination.³⁶ In the early 19th century, reflector systems increased the effectiveness of lighthouses significantly. In particular, the Fresnel Lens was a widely-used type of lens which was developed by French physicist Augustin-Jean Fresnel designed to capture more light from a light source and reflect over greater distances.

These inventions allowed lighthouses to have a considerable amount of brilliance until the arrival of electric powered lights at the beginning of the 20th century. Modern mercury-vapour and xenon bulbs were so powerful that they replaced all other types of illumination by the 1970s. New lamps were operated the same way as airport beacons, requiring no daily maintenance. This automation made the role of the light keeper obsolete, replacing him with a helicopter and a travelling technician to change bulbs and batteries every so often.

Before their automation, lighthouses were tended by light keepers. At the turn of the century, there were 800 keepers tending for the maintenance of Canadian Lighthouses.³⁷ Mostly working in pairs, the duties of these men and women included lighting up at sunset, lighting out at sunrise, maintaining the station facilities, and when necessary, performing rescue operations. Unique to Canadian light-keeping tradition were light-keeper families, who lived at the light stations and helped out with the tasks.³⁸

³⁶ Ibid, 10.

³⁷ Ibid.

³⁸ Chris Mills, *Lighthouse Legacies: Stories of Nova Scotia's Lightkeeping Families*, (Halifax: Nimbus Publishing, 2006), 47.

Although often starkly functional in setting and design, for most people today, lighthouses are not the symbols of industrialization or technological advancements, but signifiers of more romanticized narratives. It can be argued that the powerful hold that the lighthouse has in imagination may come partially from its ability to confidently occupy a wild landscape, to evoke wider horizons as well as civilization and reassurance.

Even before their widespread existence, lighthouses appeared in painted and literary landscapes, creating a metaphysical aspect that most people associate them with.³⁹ While providing a distant focus for the eye in the background, they also had a symbolic presence in these painted contexts.

In a late 18th century painting of *Dido & Aeneas*, for example, while the foreground is devoted to depicting two lovers in the countryside, a lighthouse is visible in the background. Here, the vertical form of the lighthouse at the entrance of the city's harbour is used as symbol of the concept of *civitas*, or civility, marking the seaward arrival to civilization. The lighthouse is used as an abbreviation of guidance, safety and order standing in sharp contrast with the rugged nature on the edge of the raging gulf.

Similarly in literature, lighthouses and their keepers were symbols of isolation and self-dependence. In Virginia Woolf's 1927 novel, *To the Lighthouse*, the lighthouse is depicted as the inaccessible, illuminating and infinitely interpretable. It stands for a certainty that is unobtainable, lying across the bay. Memoirs of light keepers also allude to the challenge of the existence removed from society, finding people with

39 Frans Nicolas, "The Conservation of British Lighthouses", *Transactions 18* (1993): 29.



Figure 20 *Dido Conducting Aeneas to the Palace at Carthage.*

one's self and knowing personal limits and capabilities.⁴⁰ But perhaps above all, the light that is reflecting from the lens, illuminating the night sky is the utmost symbol that is both embedded in the artistic landscape and people's memories as the signifiers.

Starting in the 1950s, following the advancements of navigation technology, most lighthouses got automated, which led them towards their obsolescence. The demise was furthered more recently with the development of the Global Positioning System (GPS), eliminating the need for lighthouses as visual guidance markers. Without the need for keepers or keeper families on site to tend the light on a daily basis, duties of lightkeepers were discontinued, hundreds of light stations across the country were abandoned and later on torn down, vandalized, burned, sold or relocated. Finally in 2010, the Fisheries and Oceans Canada declared a large portion of its portfolio of lighthouses as surplus to its operational requirements.⁴¹

Also in 2010, the Bill S-215 The Heritage Lighthouse Protection Act

⁴⁰ Ibid.

⁴¹ "Places at Risk: Lighthouses", National Trust for Canada, accessed December 21, 2016, <http://www.nationaltrustcanada.ca/issues-campaigns/places-risk/lighthouses>.

(HLPAs) came into force, allowing for the conservation and protection of lighthouses as well as facilitating their sale or transfer.⁴² The Act aims to achieve this goal through providing heritage designation for lighthouses, supplying consultation during their transfer and making sure that the properties are restored appropriately by their new owners.⁴³ Under this same Act, twenty two lighthouses were given the highest level of federal protection.⁴⁴ The HLPAs also increased the public attention to the rapid decommissioning and the state of disrepair of these towers, which led many communities to claim them as local heritage. However, with limited resources to undertake maintenance or transformation, this situation put lighthouses that are exposed to very harsh environmental conditions in a very vulnerable place.

**The Imperial Towers
of Lake Huron and the
Georgian Bay**

▼ The “Imperial Towers” were added to the larger Canadian Lighthouse Network in the mid-19th century. By this time, it was apparent that the economic development of British North America was affected by the lack of navigational aids. This resulted in a building-boom, and an ambitious three-year building program, where all material and construction cost of these aids would be supplied by Great Britain. These towers were to be “Imperial” and withstand the ages.

The Imperial Towers of Lake Huron and the Georgian Bay were built during this boom. Prior to this, mariners that navigated through Lake Huron were unaided by any lighthouses along the Canadian shores. The need for additional lighthouses for the area was noted in the report of Commissioners of Public Works for the Province of Canada for 1852-1853:

42 Fisheries and Oceans Canada, *Alternate Use Study Surplus Lighthouses*, (Ottawa, Canada, 2011), <http://www.dfo-mpo.gc.ca/rp-bi/lh-ph-eng.htm#ch1>.

43 Ibid.

44 Ibid.

"On Lake Huron, there has been as yet, but little progress made towards the erection of the several Light Houses, which are so much needed there. Along the entire of the Canada Coast of this vast Lake, the mariners are wholly unaided by either Lights or Buoys, with the exception of the Solitary Light at Goderich. The opening of the Toronto and Lake Huron Railway, and the wants of the numerous and rapidly increasing settlements in the section of the Province bordering on that Lake, make it necessary that no further delay should take place in establishing such Lights as are essential to the encouragement and safety of its commerce."⁴⁵

Both the opening of the Bruce Peninsula in southwestern Ontario for settlement and the free trade agreement of 1854 with the United States increased trades activities and the economic development in the region. The 1855 opening of the Sault Ste. Marie Canal expanded trading opportunities from the southern Great Lakes to Lake Superior as well. The arrival of the first railway station in Georgian Bay between Toronto and many cities along the Bruce Peninsula, also increased the importance of the region. As the economy grew, so did the urgency and demand for safe navigation paths along Lake Huron as the number of collisions and shipwrecks increased significantly. This demand grew even further after the use of steamships at night increased in order to maximize profits.

To rectify this situation, in 1855 the Board of Public Works contracted John Brown of Thorold, Ontario to design and construct a series of eleven stone light towers with dwellings and ancillary buildings. These light stations would illuminate the shores of Lake Huron from Point Clark

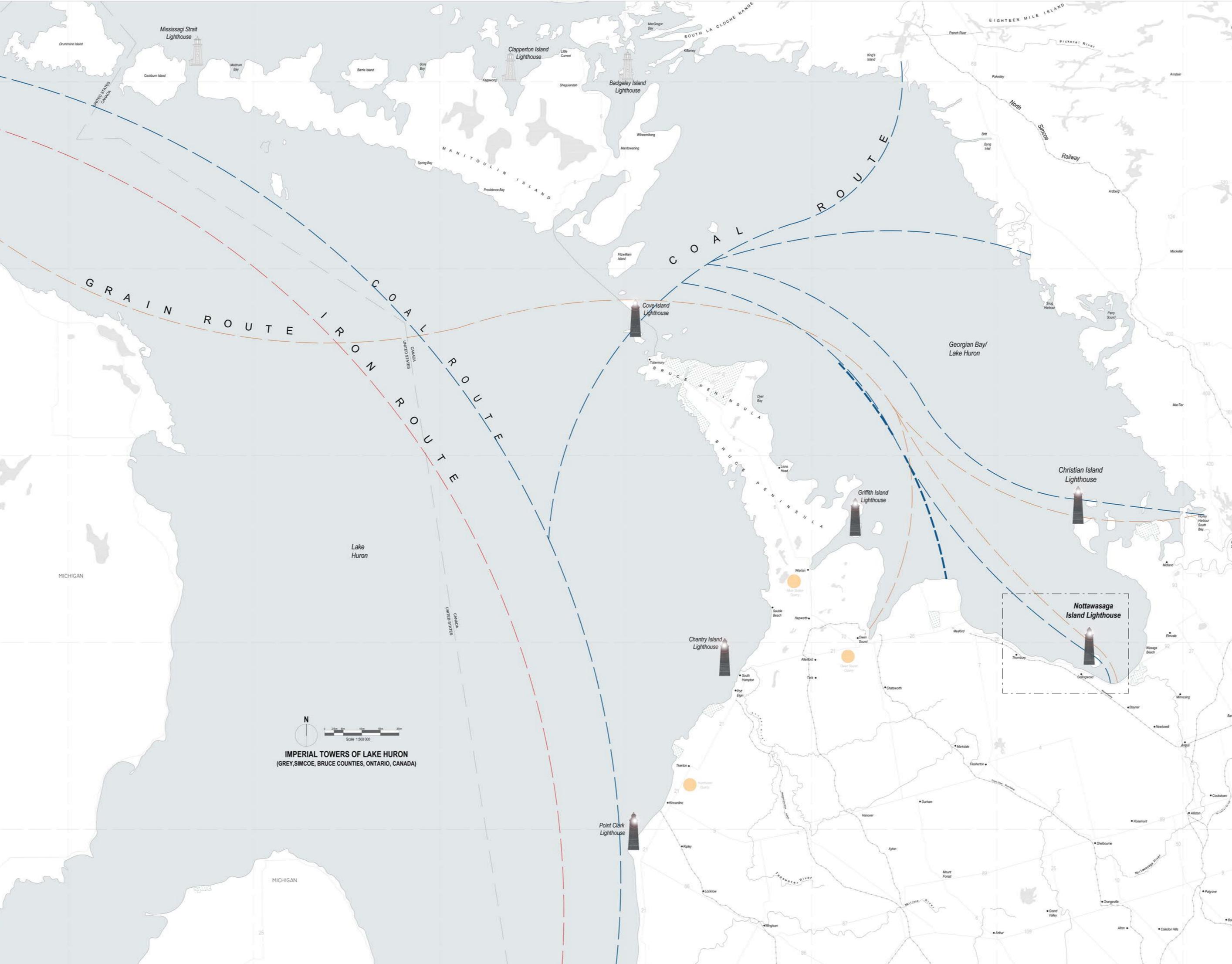
45 The Commissioners of Public Works for the Province of Canada, *Annual Report of the Department of Marine of 1852-53* (Ottawa: Department of Marine, 1853), Catalogue no. R1191-O-O-E, The Department of Marine Fonds, Library and Archives Canada.

to Christian Island. The sites of the original contract were at Point Clark near Kincardine, on Chantry Island near Southampton, on Cove Island off the coast of Tobermory, on Griffith Island near Lion's Head, on Nottawasaga Island off the coast of Collingwood, on Christian Island near Midland, on White Fish Island on the Mississagi Strait, on Isle St. Joseph, on Clapperton Island and on Badgeley Island.

The selection of these sites was based on known navigation hazards, predominant traffic patterns, and the proximity of good anchorage areas, where smaller ships could take shelter to wait out a storm when needed. As examples; the Cove Island Lighthouse marked the entrance of the Georgian Bay, and the Chantry Island Lighthouse warned the mariners of extensive shoals that radiate out from the shore.

Equally as logical as the site selection, John Brown was commissioned to erect these structures due to his previous experience in building engineering works. Immigrating to Canada from Scotland around 1838, by 1850 Brown had completed his first lighthouse project near Mohawk Island in Lake Erie; opened several mills and quarries in the region and built himself a reputation for high quality work. He was recognized as a leader in the manufacture of cements and mortars was awarded prizes at the Paris International Exhibition in 1855 for his samples of plaster and cement.⁴⁶ Moreover, he had sufficient capital to finance the necessary tools and equipment for the successful completion of these structures at isolated sites in harsh environmental conditions.

46 Heritage Conservation Program Real Property Services for Canadian Heritage and Environment Canada, "*Nottawasaga Island Lighthouse Condition Assessment*", (Ottawa: PWGSC, 1999), 4.



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 0 1000 2000 3000
 Scale 1:500,000
IMPERIAL TOWERS OF LAKE HURON
 (GREY, SIMCOE, BRUCE COUNTIES, ONTARIO, CANADA)

Mississagi Strait Lighthouse

Clapperton Island Lighthouse

Badgoley Island Lighthouse

Cove Island Lighthouse

Chantry Island Lighthouse

Griffith Island Lighthouse

Christian Island Lighthouse

Nottawasaga Island Lighthouse

GRAIN ROUTE

IRON ROUTE

COAL ROUTE

COAL ROUTE

MANITOULIN ISLAND

COAL ROUTE

Georgian Bay/
Lake Huron

MICHIGAN

MICHIGAN

BRUCE PENINSULA

BRUCE PENINSULA

North Simcoe Railway

THREWEATER RIVER

WILLIAMS RIVER

EIGHTEEN MILE ISLAND

SOUTH LA CLOCHE RANGE

WINDY HAYES CAULDRON

Spring Bay

Providence Bay

Fitzellian Island

Tabernash

Dyer Bay

Lions Head

Warton

Sauble Beach

Hepworth

Albion

Tara

South Hampton

Four Edge

Tierzon

Kincardine

Ripley

Lockport

Wingham

Owen Sound

Meaford

Chesley

Stuyvesant

Markdale

Flesherton

Durham

Homer

Ayton

Mount Forest

Grand Valley

Arthur

French River

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Figure 21 Point Clark Lighthouse



Figure 22 Chantry Island Lighthouse



Figure 23 Cove Island Lighthouse

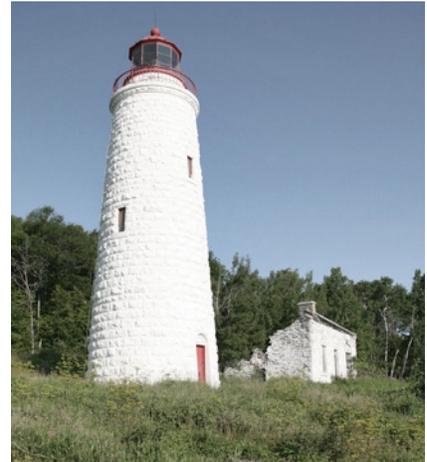


Figure 24 Griffith Island Lighthouse



Figure 25 Nottawasaga Island Lighthouse

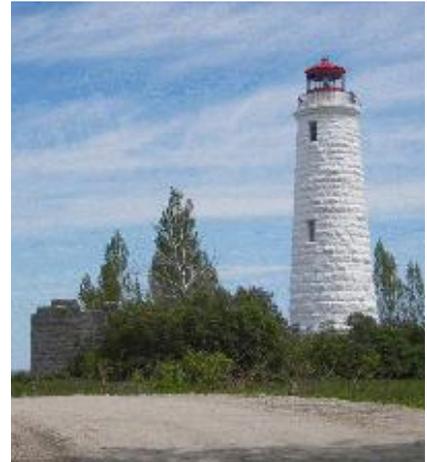
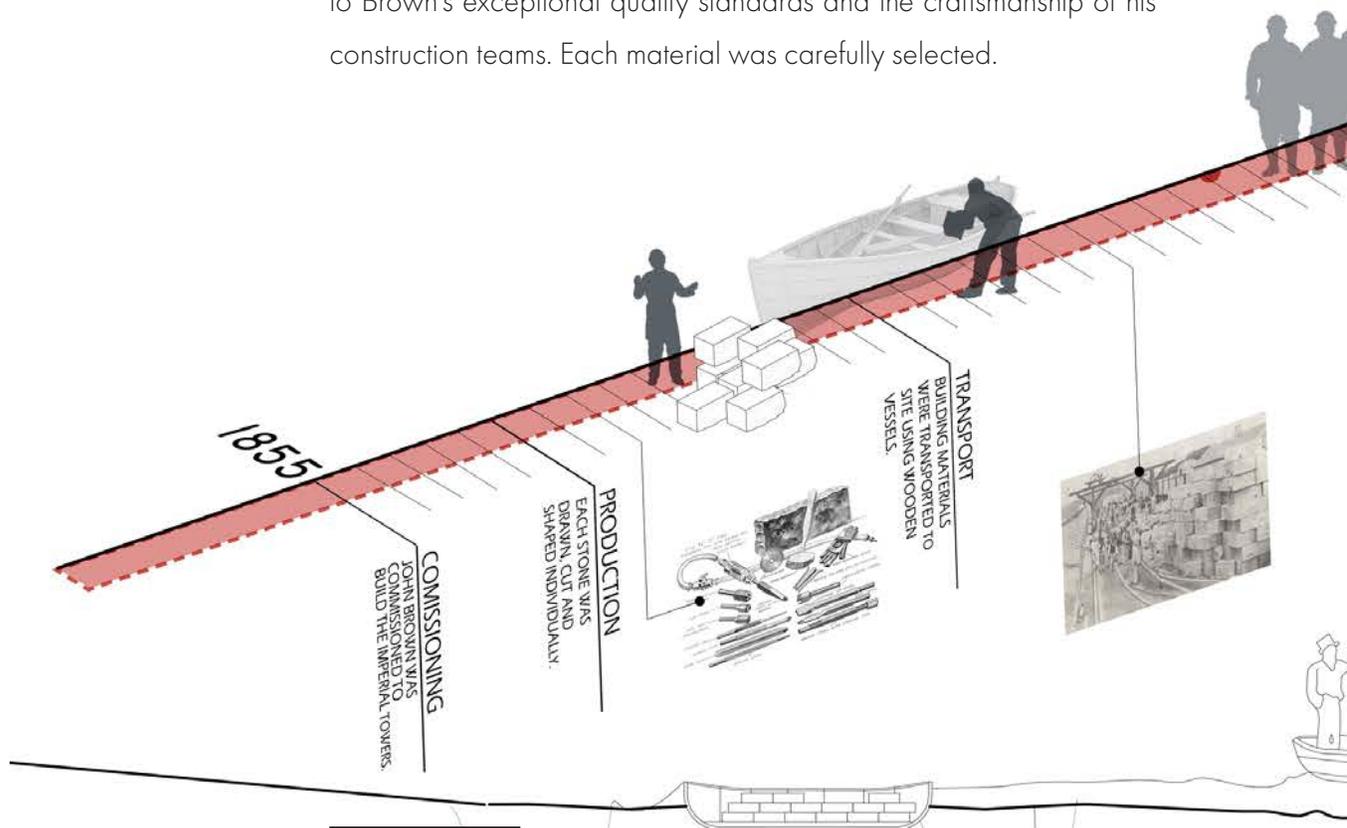


Figure 26 Christian Island Lighthouse

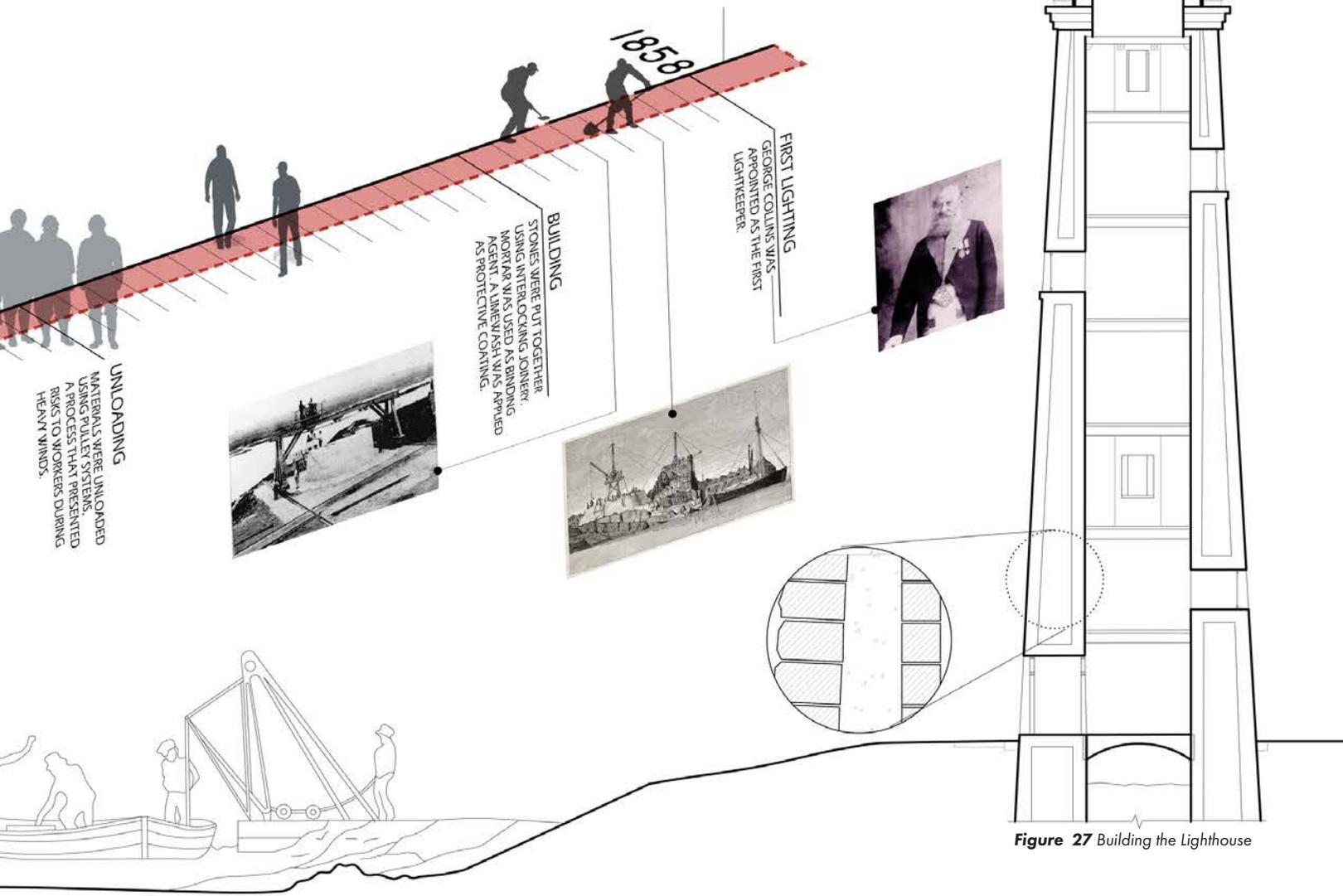
The Imperial Towers of Lake Huron and the Georgian Bay count among the very few Canadian Lighthouses constructed of stone.⁴⁷ The dolomite white limestone used for the construction of light stations was acquired from Brown's quarries at Owen Sound, Main Station, and Inverhuron. As smooth as the procurement process of the materials and workmen was, logistics and the transportation to the remote locations presented a challenge. Storms, harsh environmental conditions and lack of accessible landings caused constant delays. Capsized vessels furthered the losses in the process which resulted in the building of only six of the originally planned eleven Imperial Light Towers. Four of the remaining towers were later on constructed of wood, following different design and methodologies.

Regardless of such challenges, the Imperial Towers are a testament to Brown's exceptional quality standards and the craftsmanship of his construction teams. Each material was carefully selected.



47 Federal Heritage Building Review Office, Heritage Character Statement: Cove Island Lighthouse, (Ottawa: PWGSC, 1994).

The limestone to be used was picked to be crack-free to minimize moisture penetration to the interior core of the wall assembly. The complexity of the design, the limited construction times, and the required level of quality for structural stability did not allow for many decisions to be made on site. Thus, every stone was designed, drawn, quarried, hewn to fit in designated places before being shipped to site. This pre-manufacturing of the stone work in workshops on the nearby mainland, granted these lighthouses the right to be described as prefabricated. In this regard, the Imperial Towers can be regarded as products of the emerging industrialization, conveying the spirit of the time.



Once on site, Brown planned for the keeper's residences to be the first structure to be built, to provide shelter for both the workmen and the materials. Similar to the towers, these simple dwellings with rectangular plans were built from limestone. They were also given slate roofs. The towers were constructed in hollow cavity wall configuration. The exterior wythe had tapering walls while the interior was a vertical-sided cylinder. The void between the exterior and the interior was filled with rubble stone to tie the two assemblies together. This rubble core allowed for reduction of dead loads without compromising the strength of the structure.

All Imperial towers measure around 85 feet in height, with the exception of Christian Island Lighthouse which at around 60 feet is a bit shorter. At the base courses, the width of the wall measures over seven feet and tapers down to two feet at the top level. The walls flare out again at the lantern level to provide support for the outside gallery. Since the walls of the tower are the thinnest just below this lantern gallery, this course was constructed of granite rather than limestone to support the weight above. The lantern galleries are constructed of cast iron and glass and topped with a copper roof.

The interior diameter of the tower remains approximately at a constant 11' throughout the height of the tower. The towers accommodate 7 wooden floor landings, which also provide lateral stability and are reached by red painted, wood ladder-like stairs. Each floor has a window looking to alternating directions to provide a 360° view of the surrounding landscape as one ascends to the lantern.

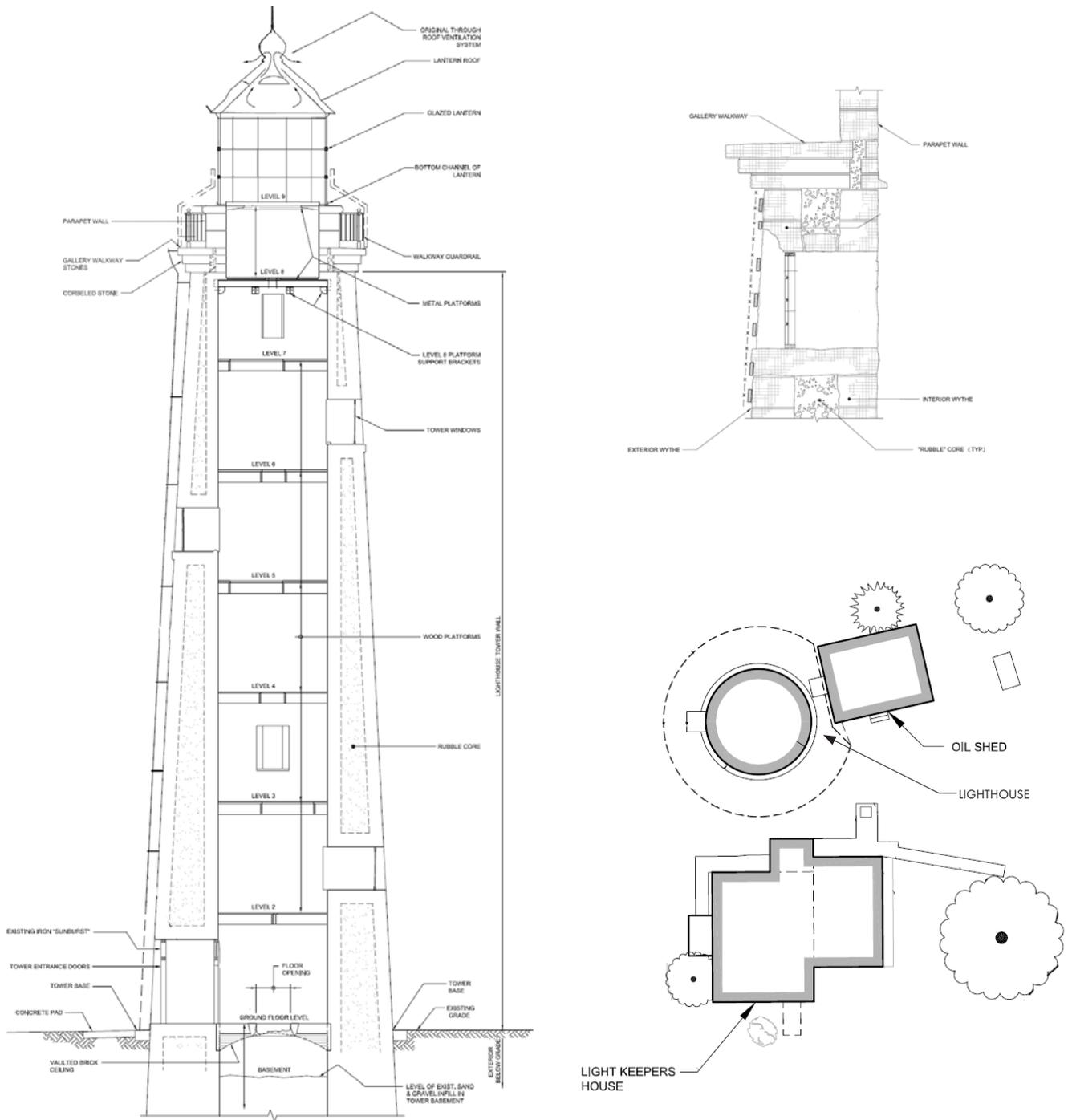


Figure 28 Point Clark Lighthouse Details. Demonstrating typical features of an Imperial Tower.

The Imperial Towers were the first in Ontario that were designed to be fitted with the recently designed Fresnel Lens. A Fresnel Lens allowed for the refraction of the light to wider distances without increasing dimensions of the light itself. The cast-iron frame, paneled with twelve panes of glass capped with a copper dome and the ventilator, were fabricated in France, transported to the site in pieces and installed at the top of the towers. Originally the lamps burnt various oils and later they were illuminated by either electricity or solar energy.

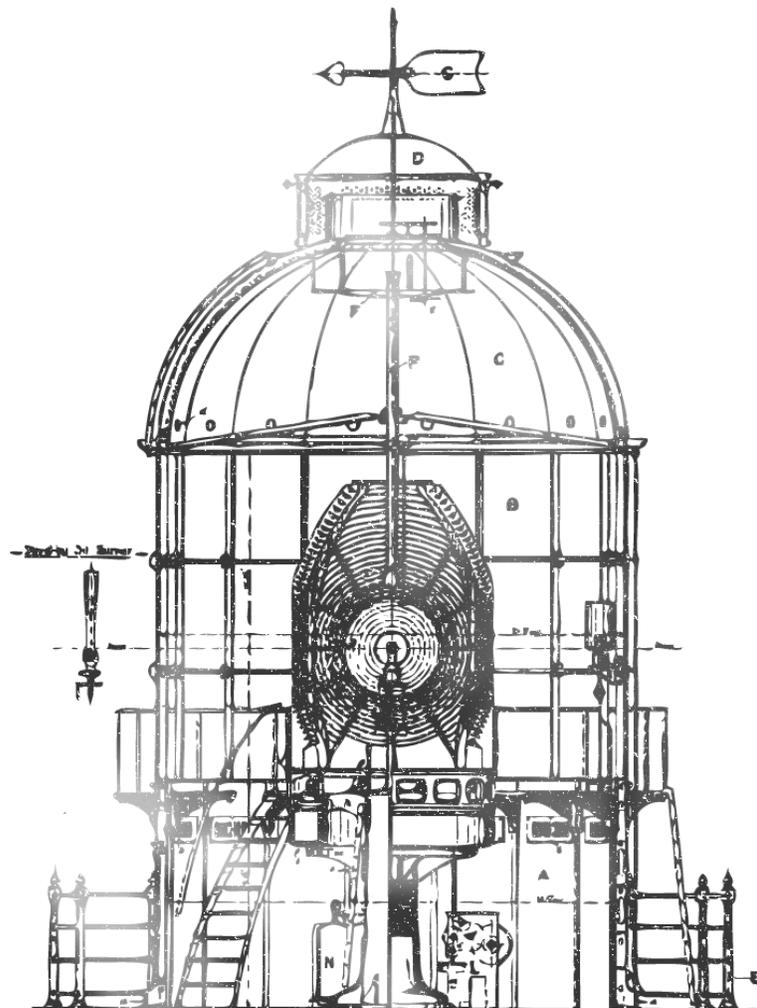


Figure 29 Section of a typical lantern with Fresnel Lens.

General detailing of the Towers is very restrained, reflecting the main purpose of the structure as an engineering work. The most notable decorative feature of an Imperial Tower is the artistically designed downspouts in the form of a lion's head around the dome of the lantern room in order to provide adequate condensation drainage by escaping from their waterspout mouths. In addition, in order to deal with the condensation created from the heat generated by the lantern and the cool outside air, eaves troughs were built into the mullions at the base of each pane of glass. All these sophisticated details allowed for easier maintenance of the towers throughout their use and prevented them from rapid deterioration after their automation despite the exposure to severe conditions.



Figure 30 Typical Imperial Tower Detailing at Lantern

Today, Point Clark Lighthouse is a National Historic Site of Canada and serves as a museum. Cove, Chantry and Christian Island Lighthouses are used as bird sanctuaries with limited public access to their grounds. However, Griffith Island Lighthouse and Nottawasaga Island Lighthouse are faced with severe deterioration. Both lighthouses were decommissioned from the Department of Fisheries and Oceans Canada in 2010 and are now cared for by community groups who are trying to put together funds for their restoration.



Figure 31 Nottawasaga Island Lighthouse

The Nottawasaga Island Lighthouse

▼ The Nottawasaga Island Lighthouse is located 5 km northwest of the entrance of Collingwood Harbour in southern Georgian Bay. Collingwood is a small, 19th century Ontario waterfront town in Simcoe County. It was established in 1846 with the opening of the Bruce Peninsula region to development and was incorporated as a town in 1858. Due to its strategic location, the town quickly developed into an important transfer point with a flourishing shipbuilding centre.

Early accounts for Collingwood describe it as “Ontario’s largest shipbuilding town”.⁴⁸ The shipbuilding industry was developed as a result of shipping activities with the extension of the Northern Railway stretching between Toronto and Lake Huron. Goods destined for the upper Great Lakes were transported to Collingwood Harbour, and then loaded onto freighters to be sent away. These activities produced a need for ship repairs, so it was not long after that organized shipbuilding and repair businesses were created. With the opening of the Collingwood Dry Dock Shipbuilding and Foundry Company Limited, later known as the Collingwood Shipyards, in 1883 the industry developed further. For over 100 years, Collingwood Shipyards built anything from freights

48 Hulls of Hurontario: Collingwood’s Marine Legacy, Collingwood Museum, accessed February 28, 2017, http://www.virtualmuseum.ca/sgc-cms/histoires_de_chez_nous-community_memories/pm_v2.php?id=exhibit_home&fl=0&lg=English&ex=00000324



Figure 32 Map of Collingwood, Ontario

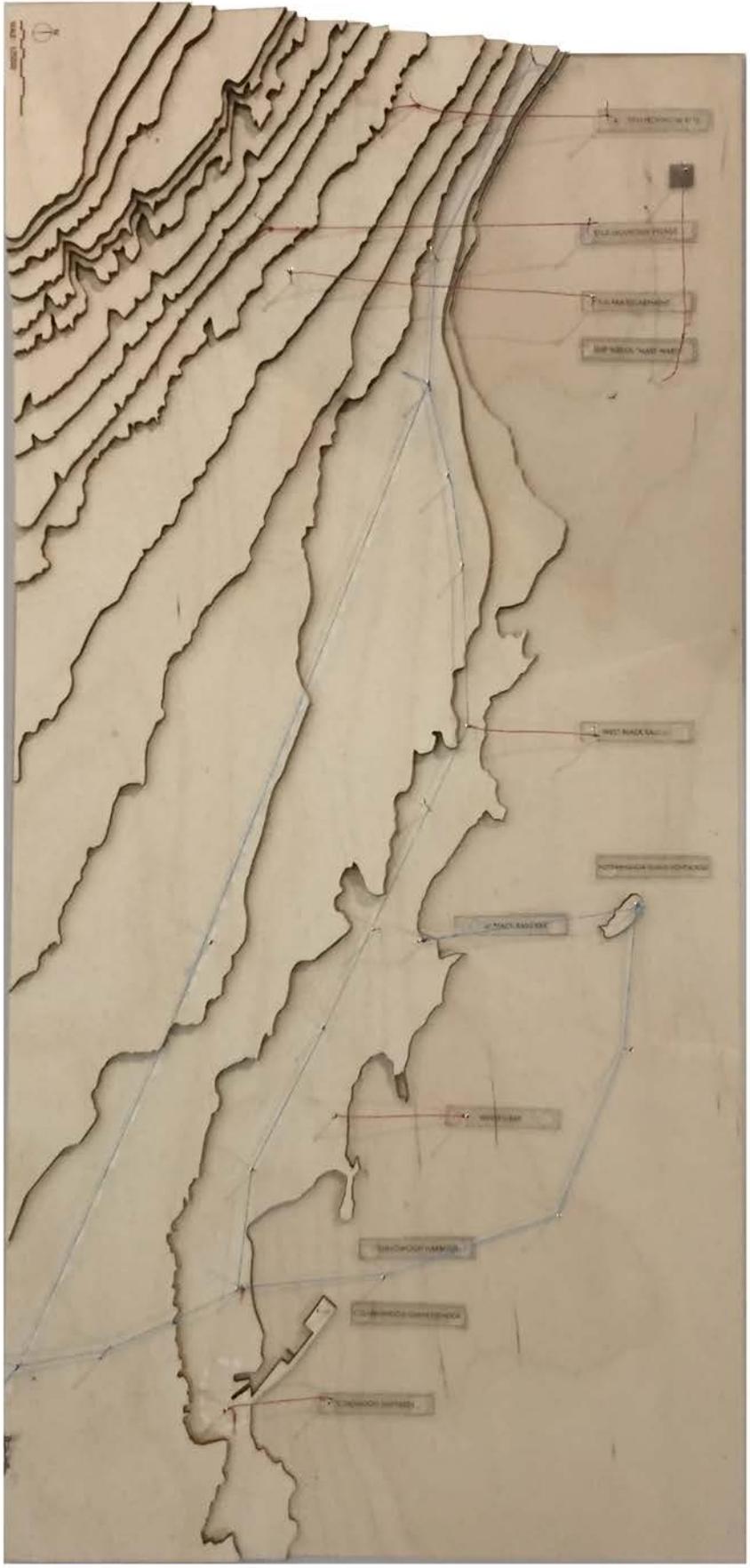


Figure 33
Model of Collingwood Coast



Figure 34 Collingwood Dry Dock

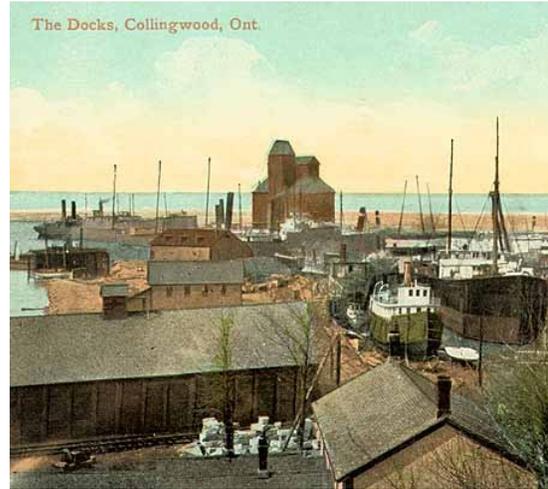


Figure 35 Collingwood Docks



Figure 36 Collingwood Shipyards



Figure 37 Workers at the Shipyard

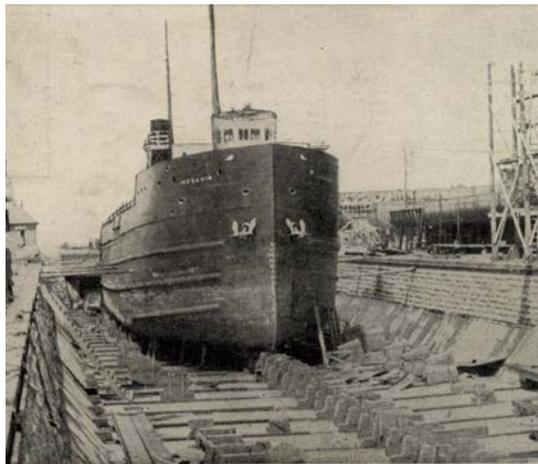


Figure 38 Queen's Dry Dock



Figure 39 Collingwood Harbour and Shipyards

to ice breakers that could sail on the Great Lakes and beyond until the closing of the yards in 1986.

Throughout the town's history from establishment, to when the harbour was used primarily for boat building and its years as a vital link between east and west North American trade, the town's importance for the shipbuilding industry was sustained. Even today, despite fluctuations and changes in the national and local economies, Collingwood's identity as a waterfront town with strong marine roots is still preserved.

The Nottawasaga Island Lighthouse, one of the six Imperial Towers of Lake Huron and the Georgian Bay, was lit in 1858; the same year that Collingwood was incorporated. Throughout its century long operation life, it has played an important role in warning the mariners from dangerous reefs around the harbour. Identical to the other Imperial Towers in design and construction, the Nottawasaga Island Station included a 85' tall tapered stone, white cement coated light tower, a light keeper's residence, a storage building and an oil shed. The tower contains nine levels that are framed with wood joists and covered with wood flooring.⁴⁹ Wood framed stairs connect the ground floor to level seven and a curved iron stair leads from level seven to the lantern at level eight.⁵⁰ A wave breaker to the north of the tower is unique to this site, and was built in 1876 to prevent the rising water levels from reaching the masonry structures.⁵¹

The light station's character defining elements as determined by

49 Heritage Conservation Program Real Property Services for Canadian Heritage and Environment Canada, "*Nottawasaga Island Lighthouse Condition Assessment*", 4.

50 Ibid.

51 "Nottawasaga Island Lighthouse", Lighthouse Friends, accessed October 11, 2016, <http://www.lighthousefriends.com/light.asp?ID=1059>.

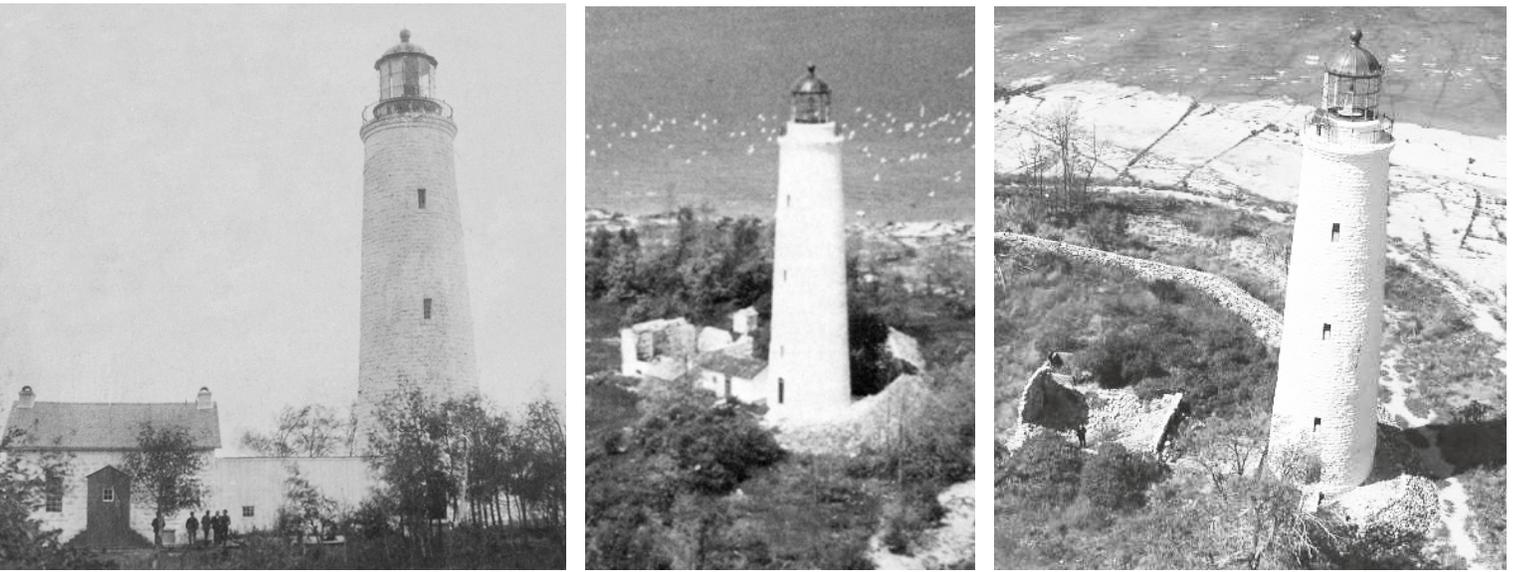


Figure 40 Nottawasaga Island Lighthouse- 1912 & 1956, 1980

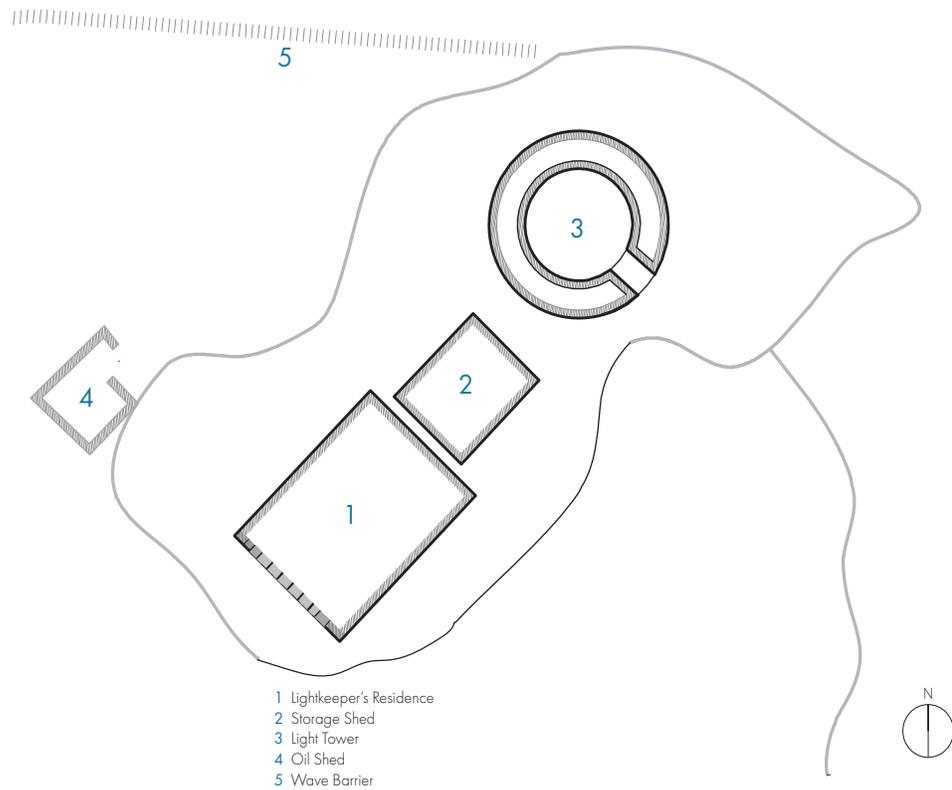


Figure 41 Nottawasaga Island Lighthouse Site Plan

FHBRO celebrate the structure's significance as a part of the Canadian coastal marine heritage. It draws attention to its importance in the safe navigation paths, its functional, yet elegantly tapering form, the efficient and simple use of wood on its interior as well as the towers contribution to the picturesque quality of the larger coastal landscape.

Following the initial lighting, in 1858, and until its automation in 1958, the station was tended by a full-time light keeper. Similar to many other lighthouses across the country, automation had a significant impact on the station. With the abandonment of the island as a residence, the structures suffered from numerous acts of vandalism and a lack of maintenance. The light keeper's dwelling was burnt down in 1959, and the remaining ruins were demolished in 1971, leaving only the masonry end walls and the footprint of the building. Without constant monitoring and maintenance, deterioration of remaining structures accelerated. In 2003, the Department of Fisheries and Ocean (DFO)- renamed Fisheries and Oceans Canada(FOC) in 2008- decommissioned the light due to the unsafe condition of the lighthouse, but installed a solar panel to continue autonomous operation.⁵² Finally, being declared as surplus to operational requirements of the FOC, the tower was unlit in 2010. In 2015, a volunteer, non-for-profit group The Nottawasaga Lighthouse Preservation Society (NLPS) was formed with aims to restore and protect the lighthouse. Their mission statement describes their goals as:

"working with various governmental agencies and gathering public support to restore and preserve the Nottawasaga Island Lighthouse with hopes to create a unique and accessible experience destination that will serve to illustrate and educate the public at large of the significant importance that this and the five other Imperial Towers around the Great Lakes have made to Canadian local maritime heritage and culture."⁵³

⁵² Ibid.

⁵³ "Mission Specifics", Nottawasaga Lighthouse Preservation Society, accessed September 20, 2016, <http://www.nlps.info/mission-specifics/>



Figure 42 Nottawasaga Island

However, the environmental conditions that the lighthouse is exposed to as well as its current physical state create a very challenging context for these restoration efforts. As it currently stands, Nottawasaga Lighthouse appears to be suffering from progressive deterioration brought on by water saturation of the core, resulting in cracking, fracturing and detachment of masonry units on the exterior core. The cause of the water saturation can be traced to the infiltration through failed mortar joints in the upper areas of the tower, and through areas where masonry units have fallen off. The deterioration is accelerated by being exposed to severe environmental conditions, where constant high humidity is coupled with an exposed location of driven rains and strong winds.

In 2004, as a measure to avert further damage and to stabilize the structure, a stabilization band was installed through the efforts of NLPS. More recently a shrink wrap was put in place in November of 2016. Nevertheless, the tower is still susceptible to moisture penetration through widening cracks on the exterior perimeter of the structure.

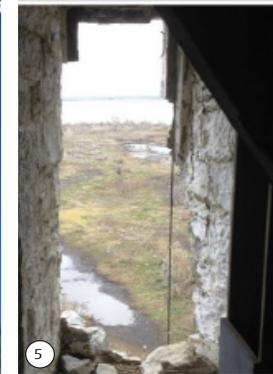
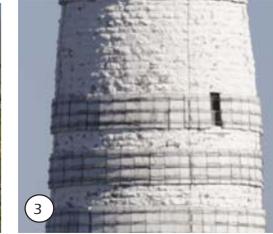
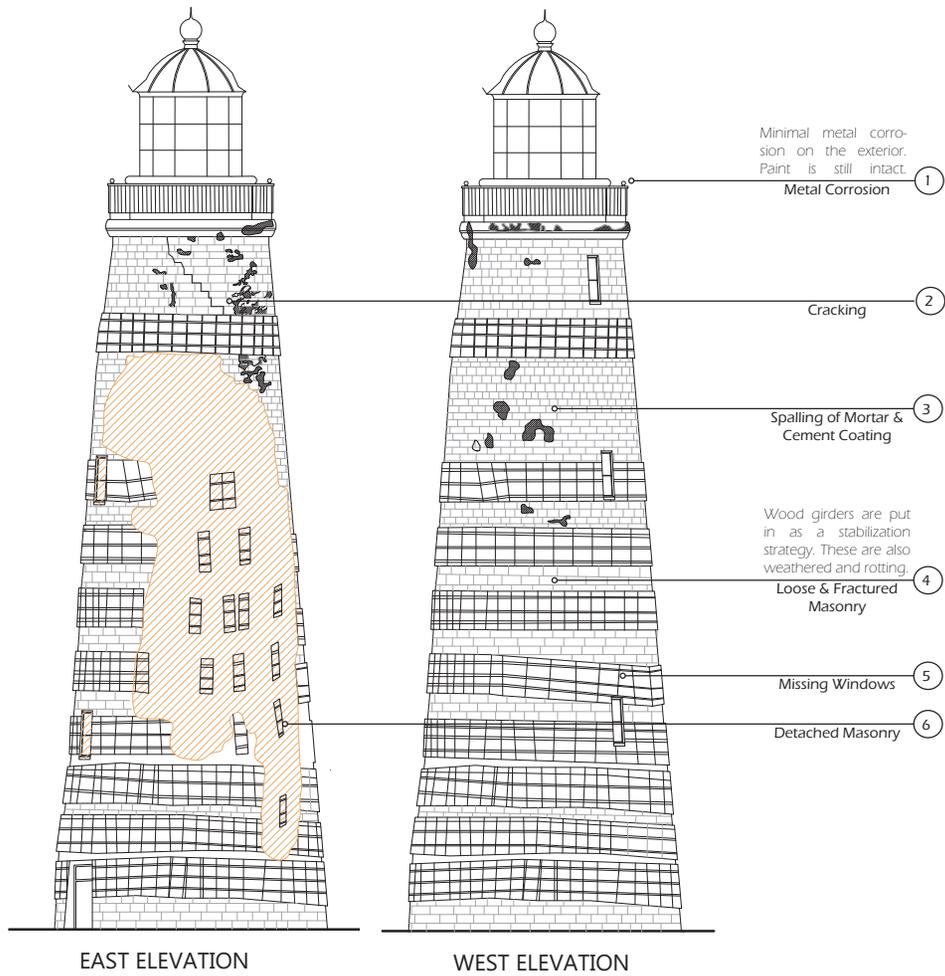


Figure 43 Nottawasaga Island Lighthouse Condition Assessment

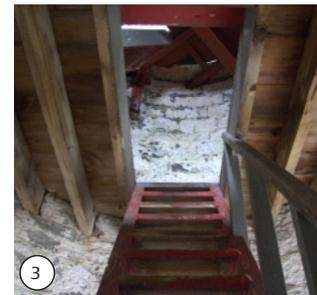
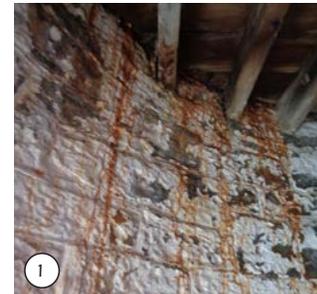
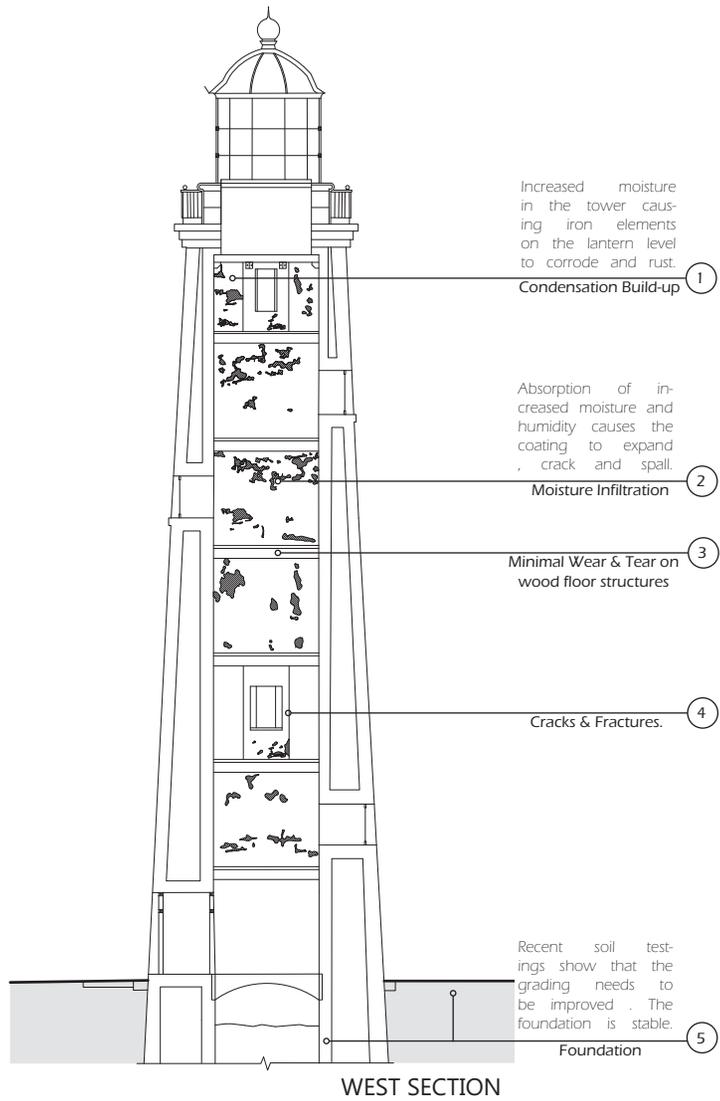


Figure 44 Nottawasaga Island Lighthouse Condition Assessment

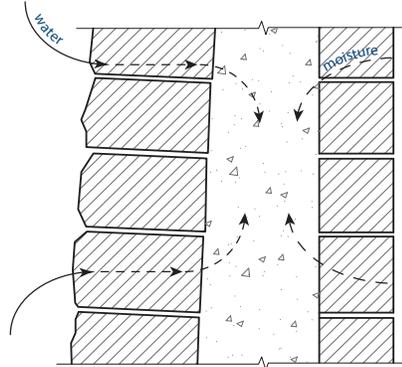
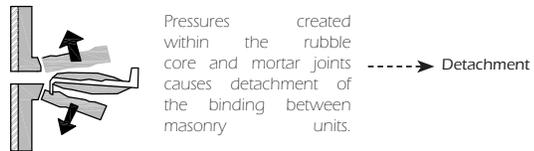
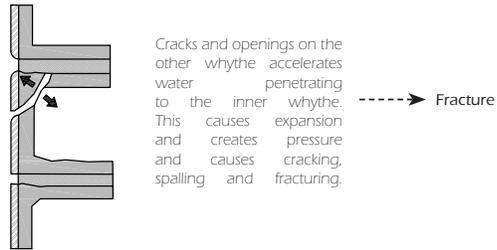
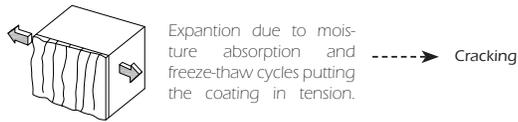


Figure 45 Diagrams explaining causes of deterioration.



Figure 46 Nottawasaga Island Lighthouse



Figure 47 Shrink Wrapping

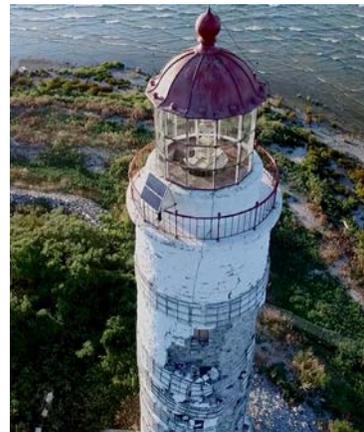


Figure 48 Lantern



Figure 49 Ruins of the Lightkeeper's Residence

CHAPTER 3

“CONTROLLED RUINATION” AS A DESIGN APPROACH

Challenges with Conserving Lighthouses

▼ Any effort to maintain the authentic appearance of lighthouses encounters many difficulties beyond the pathological issues that are briefly explained above. As these structures were not designed to be visited by untrained individuals, any adaptation or conservation project is faced with code issues regarding serviceability, accessibility and occupant safety.

With the introduction of the Heritage Lighthouse Protection Act in 2010, a platform for the sale and transfer of heritage lighthouses was facilitated. In alignment with this, the DFO ran a study in order to better understand the condition of these lighthouses and options for viable alternative uses to allow ongoing public access to their respective sites. This *“Alternative Use Study of Surplus Lighthouses”* identified a wide cross section of successful alternative programs for rehabilitated lighthouses, most of which are related to tourism or cultural heritage.⁵⁴ The study concluded that the potential success of the new use is largely defined by the combination of a few key criteria, which are described in the following table:

⁵⁴ Fisheries and Oceans Canada, *Alternate Use Study Surplus Lighthouses*, (Ottawa, Canada, 2011), <http://www.dfo-mpo.gc.ca/rp-bi/lh-ph-eng.htm#ch1>.

Criteria	Description	Importance
Accessibility	Accessibility to visitors and by vehicles. Assets that are accessible to the public are more successful as tourist establishments.	High
Proximity	Proximity to major roadways, population centres and other attractions. The relationship of the property to the surrounding uses and adjacent properties.	Medium
Symbolism	The significance of the lighthouse to its community, including its heritage profile, its character defining elements and its historical value.	High
Revenue Potential	Potential to generate revenue to cover both operating and recapitalization costs.	High
Condition	Condition of the asset. Assets that are in poor condition are less likely to be candidates for viable re-uses, unless there are sufficient capitalized funding.	Medium
Planned Use	The planned use and proposed ownership model. Support from outside organizations.	Highest
Complexity	Complexity and risk of the potential new use. Suitability of the proposed use with the historical and architectural significance of the property.	Low
Functionality	The usability and flexibility of the lighthouse for its new use.	Low
Site Flexibility	Presence of any excess land for further potential development and use.	Low
Operational Efficiencies	Operational efficiency and flexibility of the former lighthouse for the new owner.	Low

Table adapted from "Alternate Use Study: Surplus Lighthouses" of Fisheries and Oceans Canada.

Similar studies and research have been also undertaken in other countries with large numbers of lighthouses with a range of typologies including in the United States, Australia, the United Kingdom, Scotland, Norway, and Croatia. On a more global scale, The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) have published manuals to guide the new owners of lighthouses with the challenge of maintaining, restoring and converting these structures to new uses. Similar to the Canadian Alternative Use Study, the IALA Conservation Manual published in 2006 also recommends that accessibility, revenues, significance, condition, and the available financial capital should be considered before selecting an alternative use for a lighthouse.⁵⁵

⁵⁵ The International Association of Marine Aids to Navigation and Lighthouse Authorities, *Lighthouse Conservation Manual*, (Saint-Germaine en Laye, France: IALA Publications, 2006), 38

Over the years, these policies and guidelines have helped convert many former lighthouses into successful facilities such as parks, interpretive centres, bed-and-breakfasts, restaurants and private residences. However, there still are many lighthouses that do not pass as suitable for an alternative use. The Nottawasaga Lighthouse is one of these structures. Due to its severe deterioration, financial challenges and the complexity of finding a potential new use, its adaptation does not present a feasible future. Thus, with all new-life options exhausted, the structure, like many others across the country, is slowly passing away.

In the following pages, a proposal is presented for the Nottawasaga Island Lighthouse, that transforms its decaying process into an architectural experience that transmits the place's cultural narratives for posterity. On a broader scale, it is an architectural quest that seeks for a new way of walking alongside structures that are marked with the accumulated 'injuries of time' in the last stretch of their lives. At the same time, a new perspective is suggested for heritage conservation, one that speaks against architecture's delusion of permanence. Understanding that no physical object lasts forever, it calls on heritage conservation as part of architecture's 'memento mori'.

Controlling the Ruin of the Nottawasaga Lighthouse

▼ The term 'controlled ruin' is often used by heritage professionals to refer to conservation solutions that are implemented when restoration or demolition of any given building is impractical or undesirable.⁵⁶ The state of controlled ruin allows the remaining fabric of a structure to be kept without unnecessary interventions or changes, and establishes a way to stabilize a ruin until the opportunity for other kinds of interventions is possible. Based on this definition, controlled ruination is a temporary

⁵⁶ Bardsley Construction Limited, *Conservation Management Plan of Old Chapel Hall, Dukinfield, Tameside*, October 2008, accessed March 16, 2017 from <http://plandocs.tameside.gov.uk/anitepublicdocs/00117144.pdf>

solution for the preservation of a decaying structure. However, this thesis approaches the concept as a more long-term option; as a mutualistic symbiosis, in which nature and man-made constructs can co-exist until their relationship becomes parasitic.

This proposal follows John Ruskin's and many others' principles on reconstruction and conservation of ruins: "*the more a ruin is restored, the more it loses its authenticity; the more its evocative power is diluted, the more its archaeological truth is blurred.*"⁵⁷ The state of controlled ruination allows the ruin to be placed on the fine line between the systematic human process of control and the natural process of ruination. It lets nature develop new strengths by allowing it to graft onto an old structure, and thus creates a new form of unity, in which the creative spirit of humanity is conjoined with the continuous becoming of nature. It allows the state of the structure to be appreciated as it creates a new form and a new meaning. The control aspect allows for the site to be visited and appreciated safely while not interfering with the decaying process. The tension between two contrasting concepts creates a unique architectural experience, allowing the structure to speak for itself through its form, metaphors and structural language; thus communicating larger cultural narratives to the observer.

▼ The proposed design achieves control through pre-fabricated insertions that take on the original forms of the existing structures on site, as well as respecting the vernacular architecture of the region. In the light tower itself, the existing floor boards are taken out gradually, as the new insertion is put in. Functioning simply as a scenography stairway, the insertion provides a safer access to the lantern, while making the ascent a sequence of architectural experiences and stages for a unique

⁵⁷ Gionata Rizzi , "Preface," in *Conservation of Ruins*, xx.



Figure 50 Architectural Intent 1: Preserve the importance of light by inverting the way it is experienced.

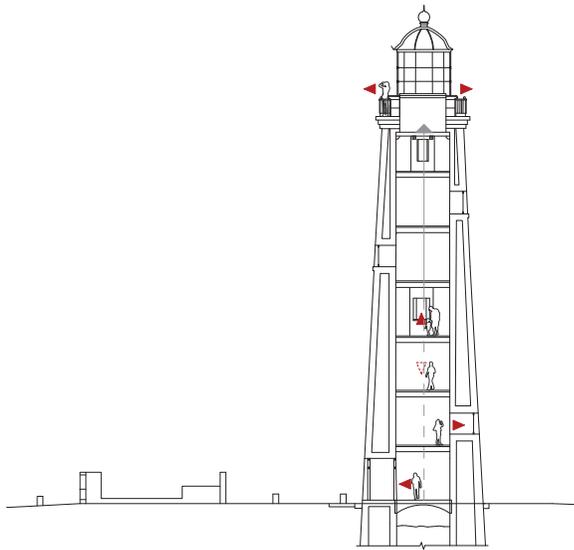


Figure 51 Architectural Intent 2: Preserve the importance of views and their location and their relationship to the ascent.

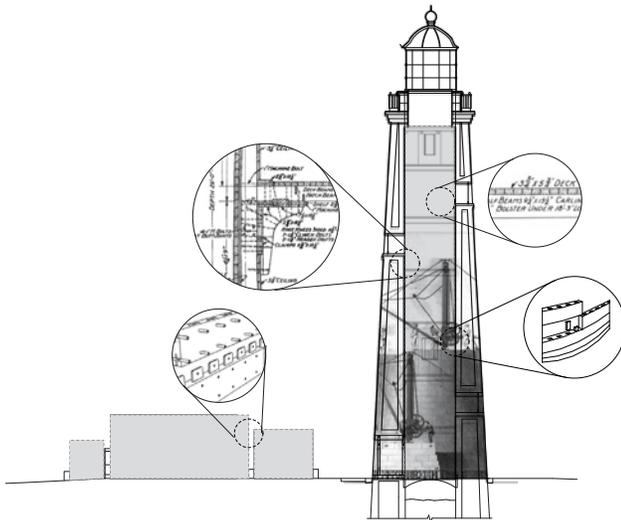
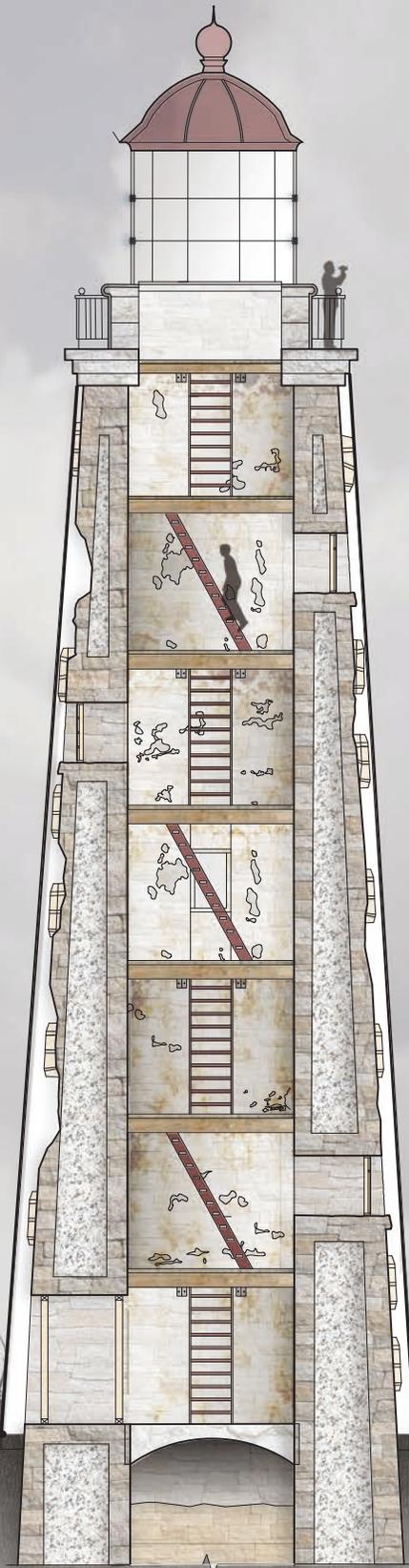


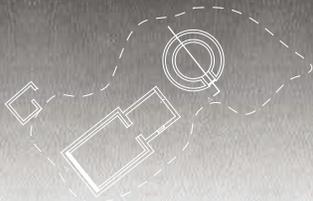
Figure 52 Architectural Intent 3: Preserve the larger narratives and building traditions of the place through embedding them in design details.

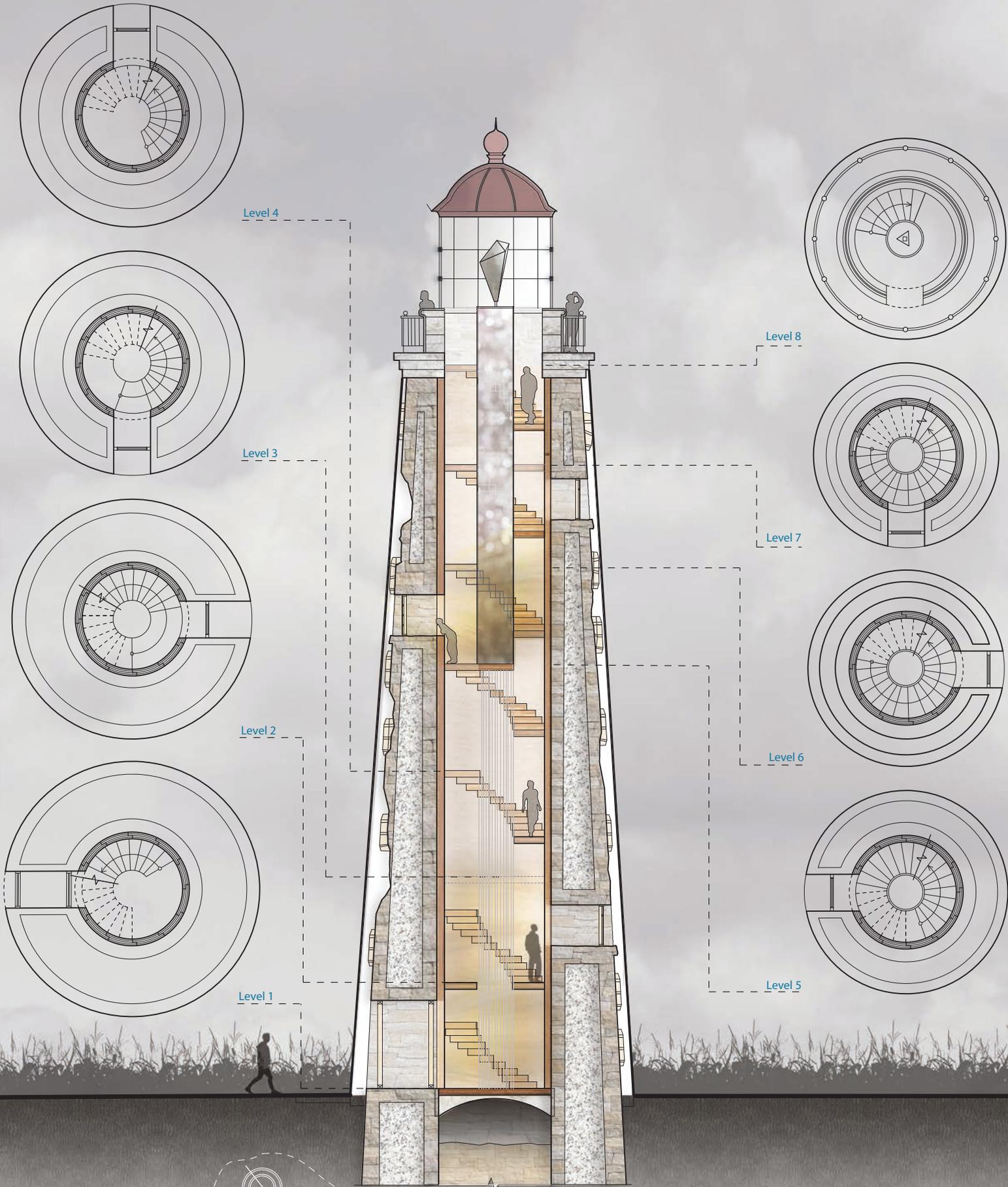
experience of the vertical space. The first half of the ascent directs the visitor's focus on the changing views of the land and the sea, as moments of rest at windows provide glimpses of outside. As one is familiarized with the 360-degree view around the light tower mid-way through the ascent, the user's attention is switched to the interior of the lighthouse. This is created through the placement of an oversized prism in place of the former Fresnel Lens, which was taken out a few years ago. This prism functions as a kaleidoscope, capturing natural light and reflection as it rotates and sends it inwards through the kaleidoscope core. As the user climbs the stair that wraps around this core, they are accompanied with a cascade of colors and glimpses of the surrounding landscape. Through this, the design aims to invert the understanding of the most important aspect of lighthouses: the light. The artificial light that used to illuminate the night sky, has been substituted for the natural daylight lighting up the interior.

This thesis design applies the controlled ruination strategy for the entirety of the Nottawasaga Island, complete with the lighthouse, the light keepers residence and ancillary buildings. The approach used in the light tower is repeated for these structures as these assume new functions as shelter spaces and a small library. The programming of these spaces was based on both the past function of the island as a refuge as well as its current use as a destination to visit by recreational boaters. The library space was created as a tribute to the lesser known rotating library network of the lighthouses, which periodically supplied the light keepers with new reading material. The interventions on these structures take a form that is similar to both the former light keepers residence as well as the regions vernacular style of architecture: log or timber frame buildings, with simple rooflines and wood shingle cladding showcasing exemplary craftsmanship. Inserted wood structures create flexible spaces with minimal furnishings that accommodate sleeping, lounging and food preparation activities.



SECTION A
YEAR: 2017
SCALE 1:150





Level 4

Level 3

Level 2

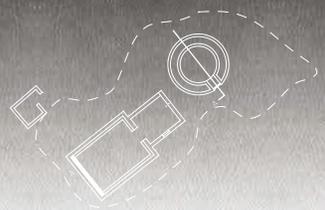
Level 1

Level 8

Level 7

Level 6

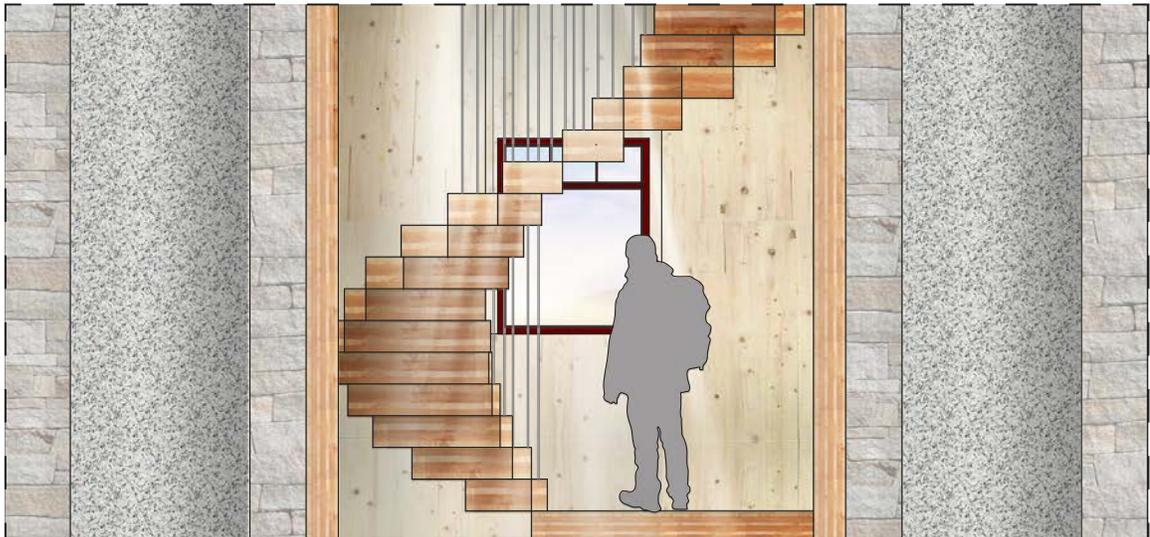
Level 5



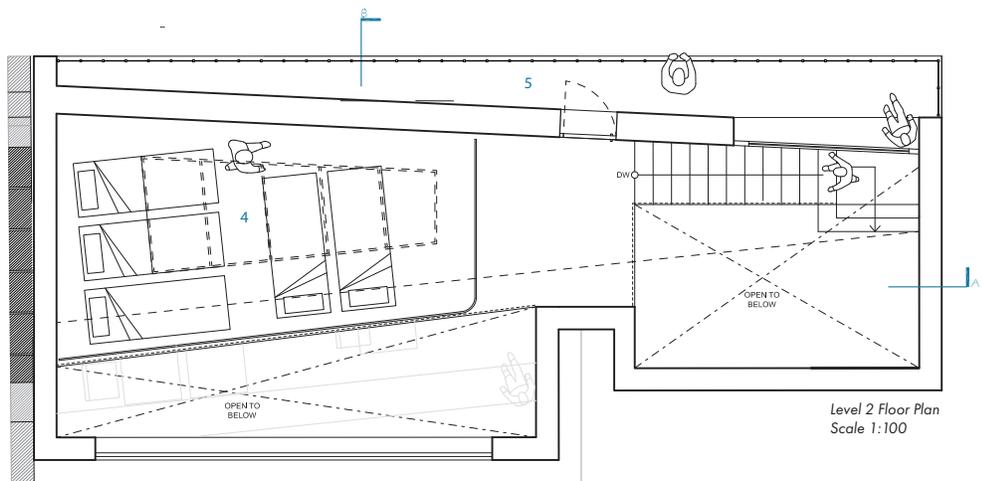
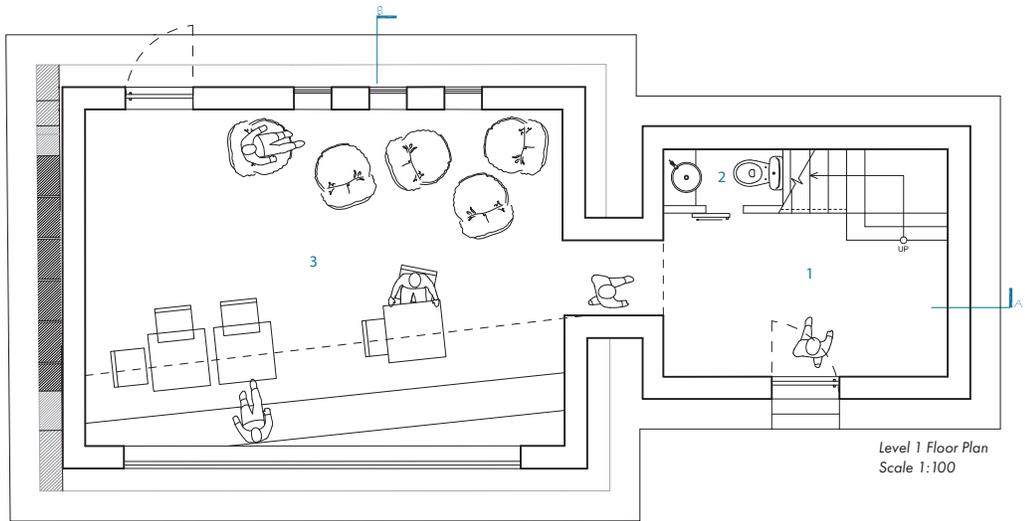
SECTION A
YEAR: 2018
SCALE 1:150



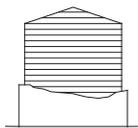
Rendering showing the view of the lantern level with the new prism insertion.



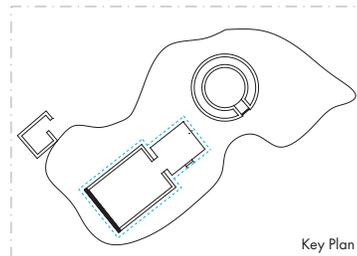
Rendering at level two, showing the architectural intent of preserving the view lines from the windows in the first half of the ascend.



- 1 Entrance
- 2 W/C
- 3 Sitting/Eating
- 4 Sleeping
- 5 Terrace

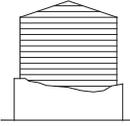


Former Lightkeeper's
Residence/Shelter Area
Section B

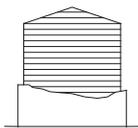
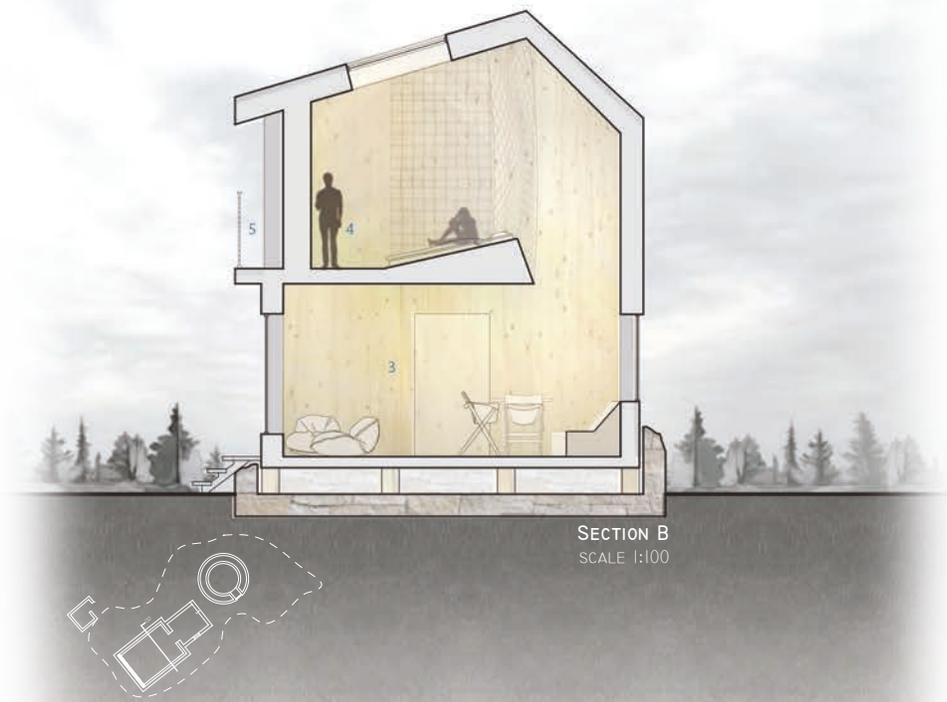




SECTION A
SCALE 1:100



Former Lightkeeper's
Residence/ Shelter Area
Section A

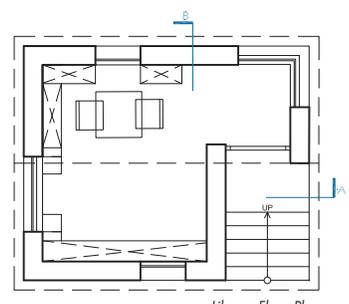
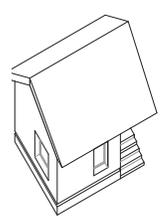


Former Lightkeeper's
Residence/ Shelter Area
Section B



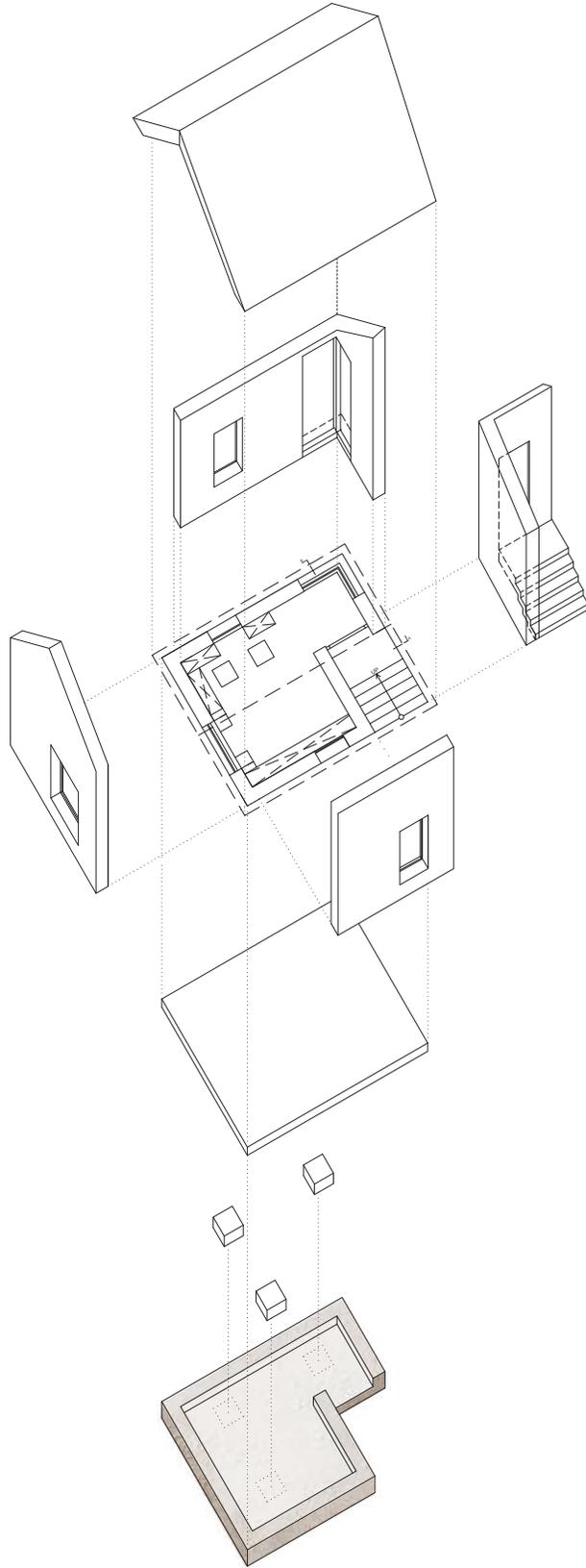
SECTION A
SCALE 1:100

SECTION B
SCALE 1:100



Library Floor Plan
Scale 1:100

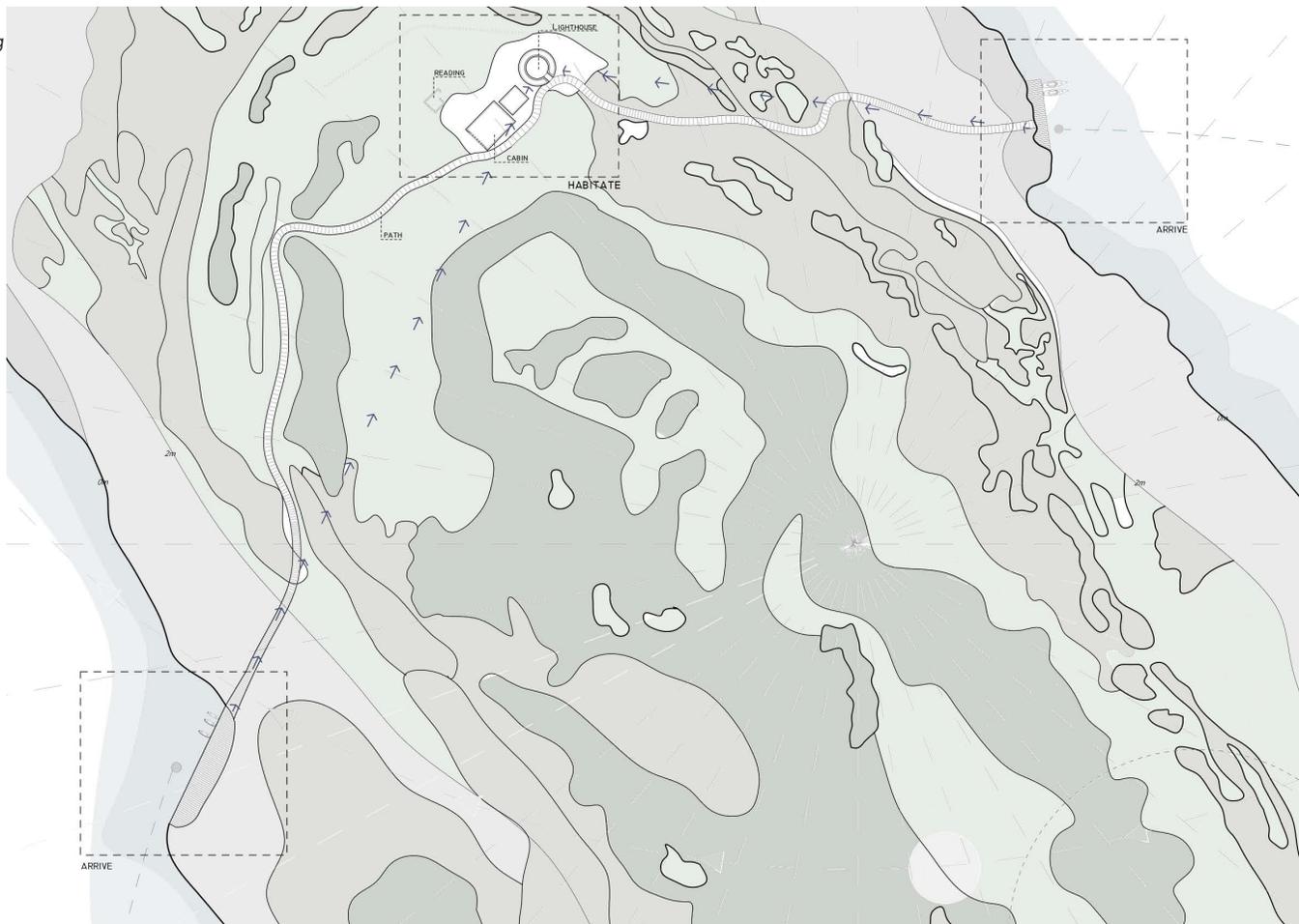
Former Oil Shed/ New Library
Plan & Sections



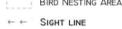
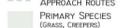
Former Oil Shed/ New Library
Axonometric Diagram Showing
Building Layers Connecting the
New Addition to the Existing Stone
Masonry Foundation Walls.

▼ The holistic island-wide consideration of the design strategy includes the immediate landscape surrounding the light station. Prior to the assembly and insertion of interventions on site, the stones that have fallen from both the lighthouse as well as the former light keeper's residence, are collected and integrated into the landscape in order to draw a formal pathway for the visitors to follow in order to reach the structures. The stone pathway, which runs from one end of the island to the other, is bookended by new wooden docks. The placement of these docks is in close proximity to the location of former docks prior to the abandonment of the island. In addition, the docks are built at the island's deepest water levels and, therefore provide direct and easy access for different types of vessels.

Site Plan showing locations of interventions



LEGEND

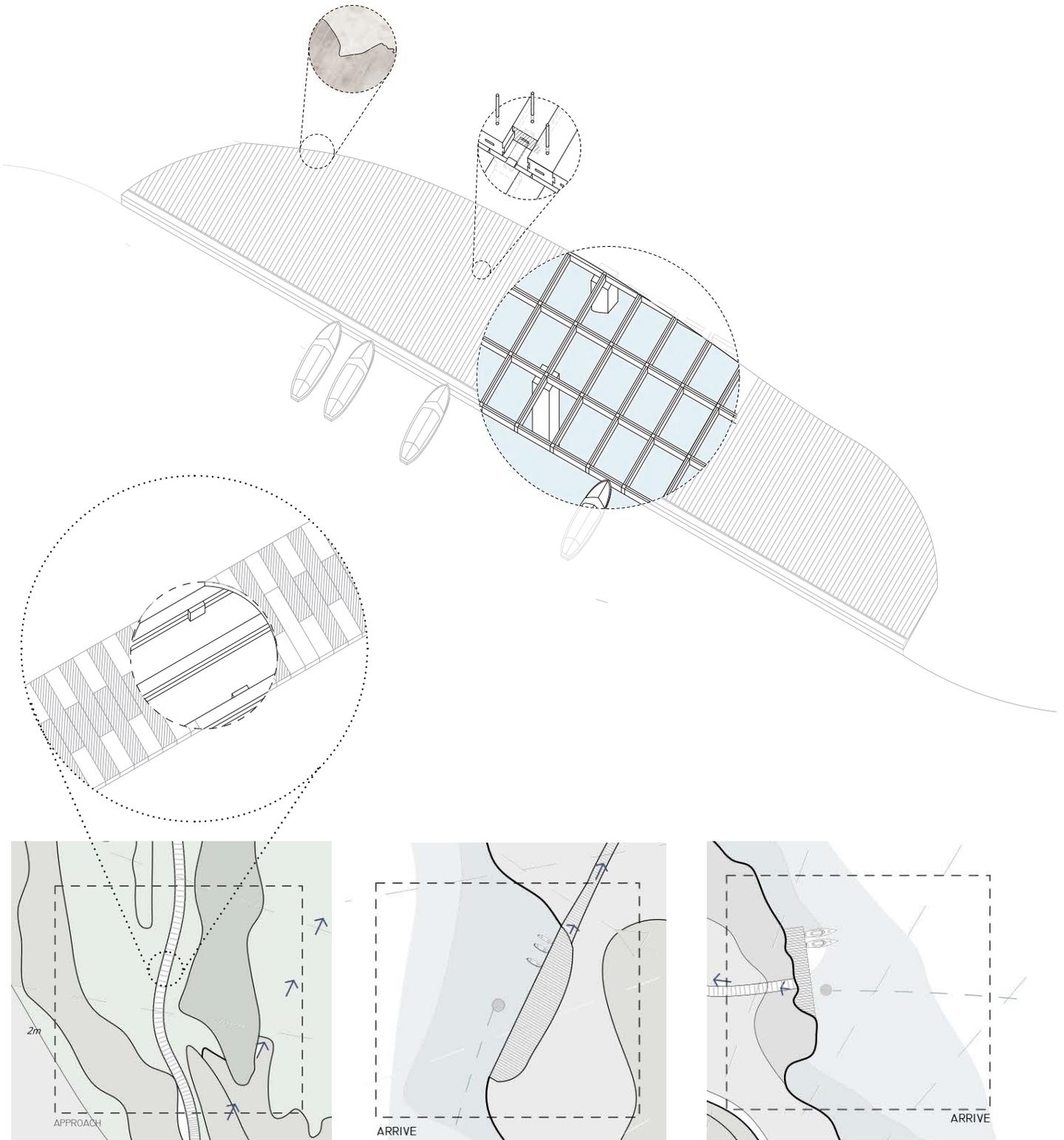
-  INTERVENTION AREA
-  BIRD NESTING AREAS
-  SIGHT LINE
-  APPROACH ROUTES
-  PRIMARY SPECIES (GRASS, CREEPERS)
-  SECONDARY SPECIES (GRASS, SHORT LEAF TREES)
-  STONE
-  WATER
-  SOIL



Nottawasaga Island
 Site Plan illustrating site
 conditions and locations
 of new interventions for
 habitation , arrival and
 approach.



Model of Nottawasaga Island Lighthouse



Site Details Illustrating
Arrival Dock and Walk Path
Details

▼ Architecture may not be a conventional language or communication medium; nonetheless it can be a very effective one. This proposal adopts the architectural theorist and scholar Marco Frascari's opinions on the possibility of achieving this communication, or the time-travel of narratives, through connections and design details. For Frascari, the unification of the tangible and the intangible can be created through carefully designed architectural details.⁵⁸ In the essay *The Tell-Tale Detail*, he states that details in architecture are minimal units of signification and thus they are the generators of meaning in architectural creations.⁵⁹ "The detail expresses the process of signification, the attaching of meanings to man produced objects."⁶⁰ Through carefully designed details, architecture can not only perform its utilitarian functions but also "unify any difficult and disorderly environment generated by culture."⁶¹ When we apply this theory within the context of cultural preservation, architectural details that create tactile sensations can be used to (re) establish the significance of a place by re-linking meaning.

In line with this theory, the insertions for the Nottawasaga Island Lighthouse are designed, created, and assembled together using adapted shipbuilding techniques. As explained in chapter two, shipbuilding was one of the major industries that helped the development of the lighthouse's larger landscape and it is a big part of the history of the community that it is related to. In addition to this, shipbuilding techniques are also very similar to those techniques used in the construction of the lighthouse itself. Making use of prefabrication, these methods also allow for better planning, easier transportation of pieces to site, shorter assembly times, little to no damage to existing structures, and minimal waste of resources. In addition, the precisely delineated character of prefabricated elements creates an aesthetic contrast with the organic form of the decaying material fabric.

58 Marco Frascari, "The Tell-Tale Detail", *Via 7: The Building of Architecture* ed. Paula Behrens and Anthony Fisher, (1984), 500.

59 Ibid.

60 Marco Frascari, "The Tell-Tale Detail", 501.

61 Ibid.

H=26m
D= 4m

$C_e = 0.9L (H/10)^{0.2} = 1.21$
 $C_g = 2.0$
 $H/D = 26/4 = 6.5 > 1$
 (per Fig I-15 of structural commentary tp NBC 2010)

Windward Face $C_p = 0.8$
 Leeward Face $C_p = -0.5$
 Roof $C_p = -1.0$
 Perpendicular to Wind $C_p = -0.7$

Windward Face $p = (1.8)(0.39 \text{ Kpa})(1.21)(2.0)(0.8) = 0.76 \text{ Kpa}$
 Leeward Face $p = -0.47 \text{ Kpa}$
 Perpendicular to Wind $p = -0.64 \text{ Kpa}$
 Roof $p = -0.94 \text{ Kpa}$

$$S = [\pi / 32] [(d_2^4 - d_1^4) / d_2] = 1.17 \times 10^9 \text{ mm}^3$$

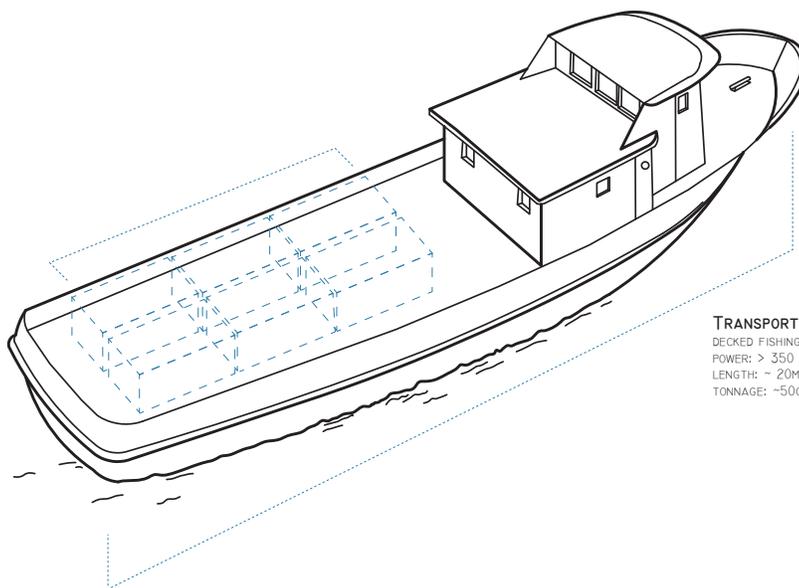
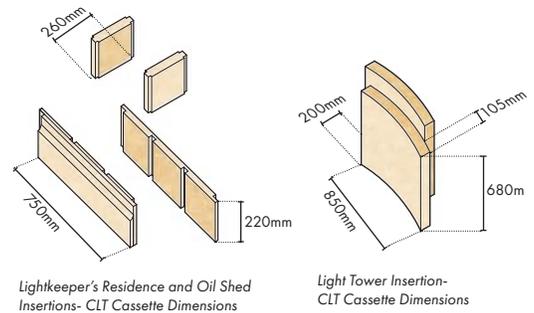
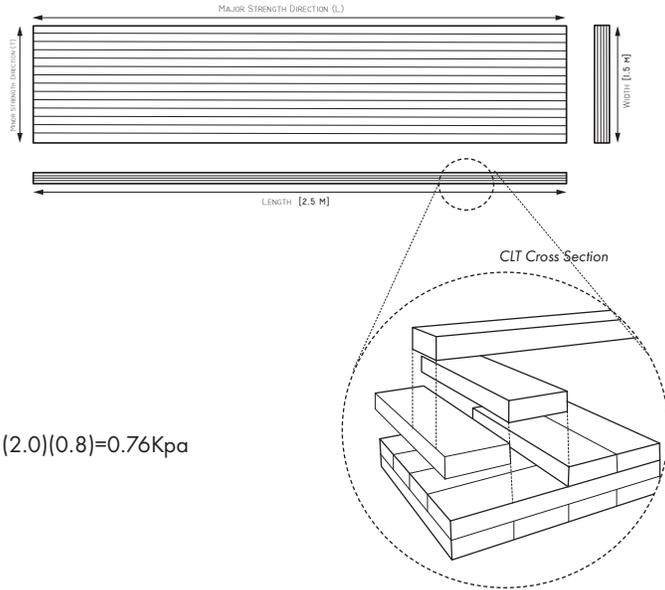
$M_f @ \text{base} = 1.234 \text{ Kpa}$
 $M_f \text{ over } 4 \text{ m width} = 4.9 \text{ KN/m}$
 $C_f = 15.34 \text{ Pa}$

Approximate Stress in Annular CLT Lateral Force Resisting System:

$$\frac{2300 \times 10^{3/6} \text{ N.mm}}{1.17 \times 10^9 \text{ mm}^3} \pm 15.3 \times 10^3 \text{ N/mm}^2 = 2.0 \text{ MPa (T/C)}$$

(bending moment) (self-weight)

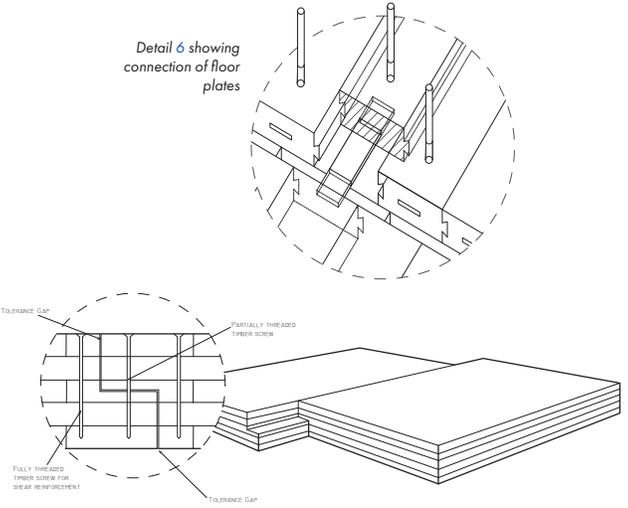
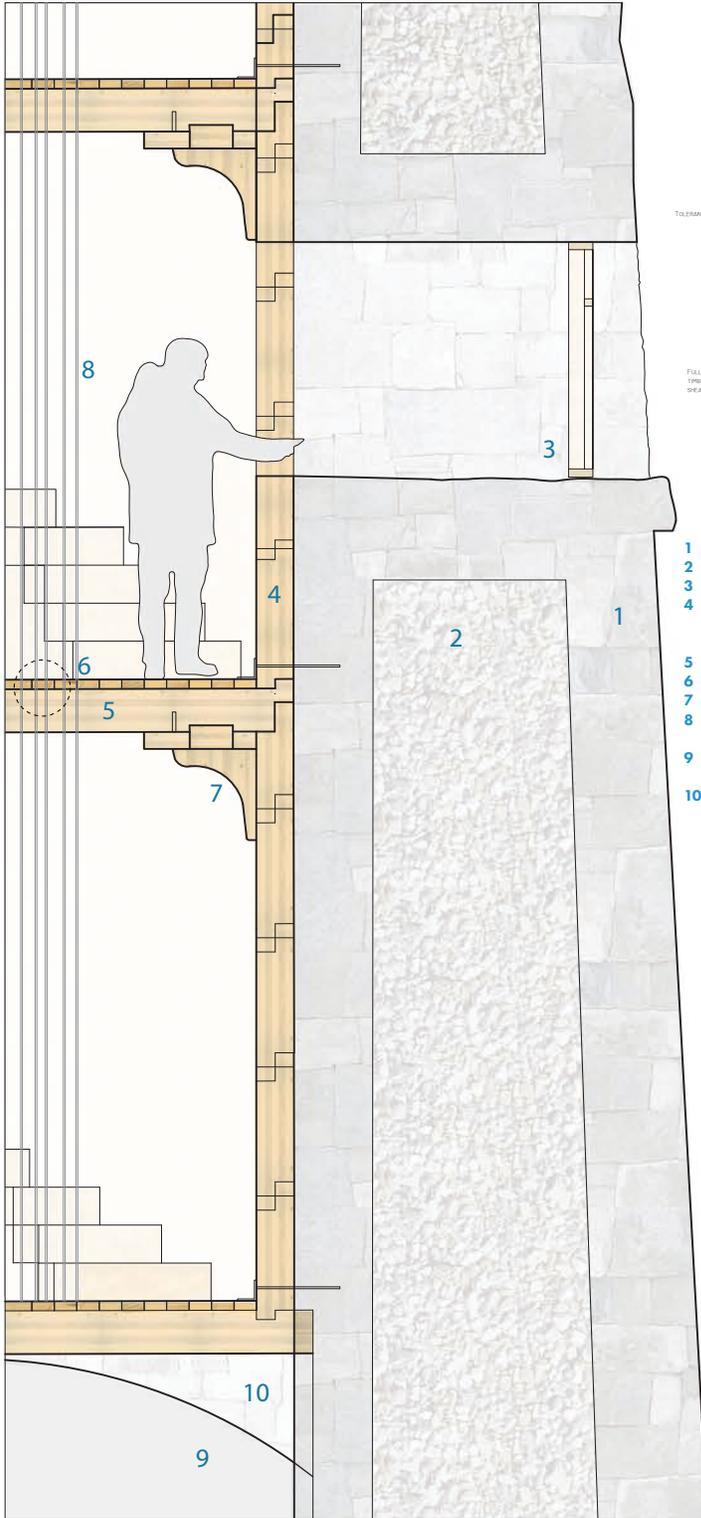
5 Ply CLT Ring ~ 200 mm thick



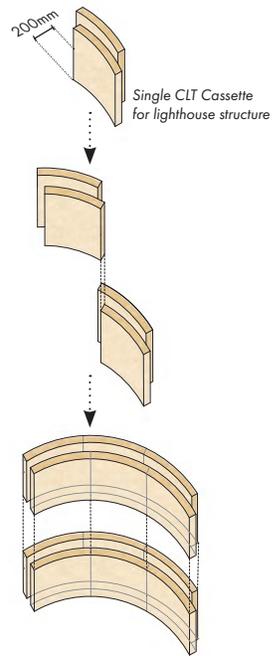
TRANSPORT:
 DECKED FISHING VESSELS OR TRAWLERS
 POWER: > 350 HP
 LENGTH: ~ 20M
 TONNAGE: ~50GT

Details for construction of members off-site.

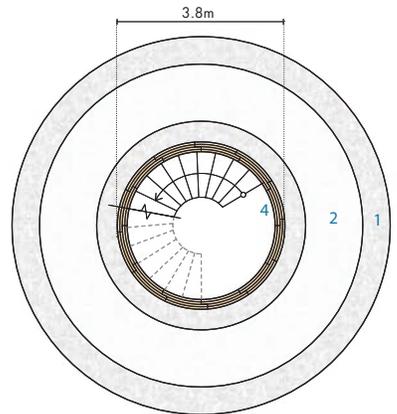
Wall Section through the Light tower showing connection between the new insertion and the existing stone.



- 1 Existing Masonry Wall
- 2 Existing Rubble Core
- 3 Existing Window
- 4 CLT Cassette Insertions bolted together using anchors
- 5 CLT Floor Framing
- 6 CLT Floor Panels
- 7 Shelf Angle
- 8 Tension Cable Structural Support and Handrails
- 9 Existing Basement with Sand & Gravel Infill
- 10 Existing Vaulted Brick Ceiling

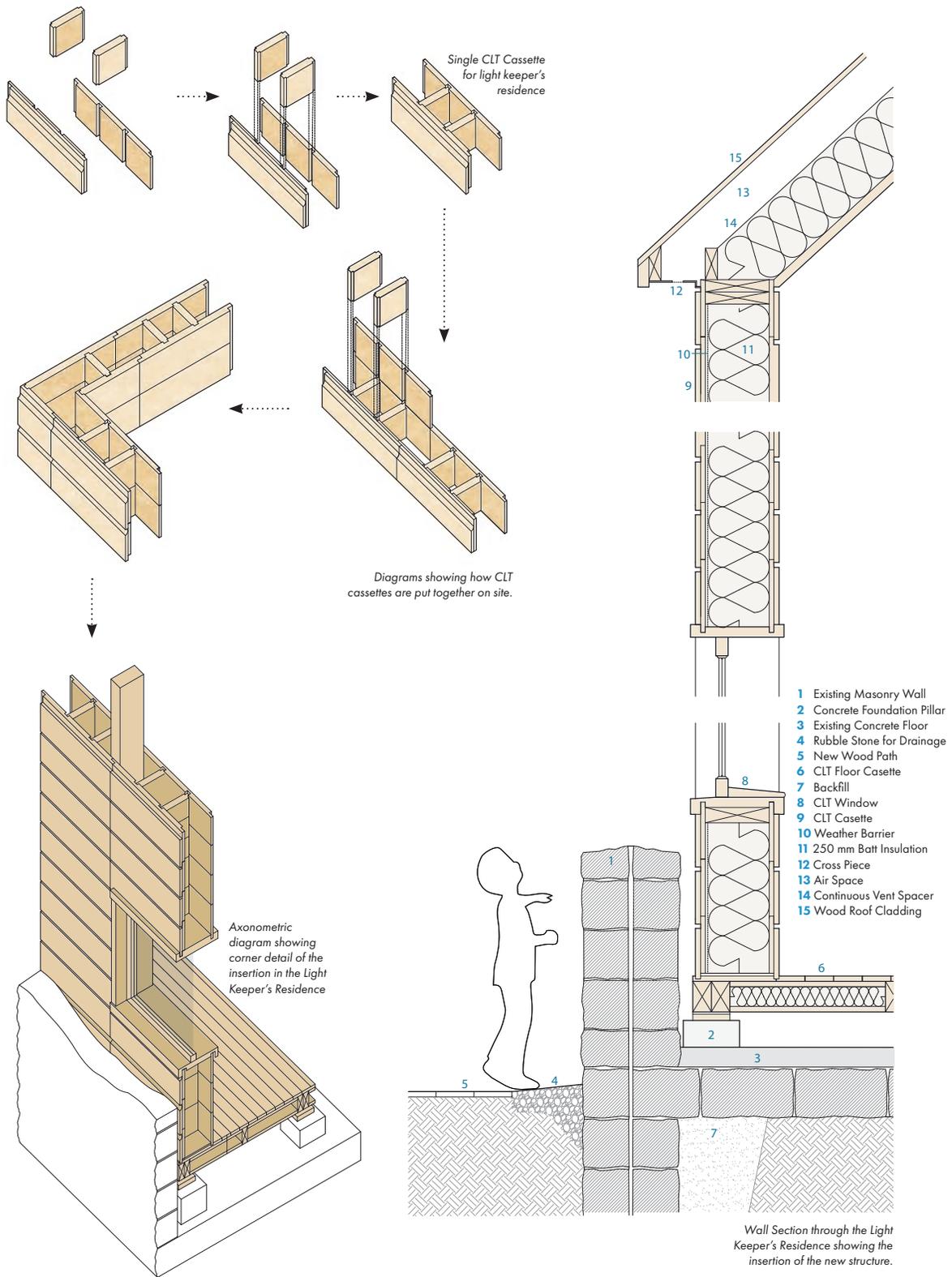


Diagrams showing how CLT cassettes are put together on site.



Plan showing the locations of the CLT cassettes.

Intervention Details for the Light Tower



Intervention Details for the Light Keeper's Residence

By their nature, prefabricated sections also allow for designing the disassembly of the structure. Over time, as the exterior structure decays the interior insertion will become more visible and will eventually take place of the lighthouse itself. In a way, the negative will become the positive.

As deterioration continues, the former "positive" or the fallen stones will be caught by the netting wrapped around the tower and, like a palimpsest, the ruin will merge with the landscape, creating a spontaneous harmony between nature and the man-made. In order to allow the tower to decline gracefully and to prevent the new materials from dominating the old ones, when the top stone layers are gone, the insertion will also be lowered. At this point, the lantern might have to be taken down as well, depending on the load-bearing capacity of the now exposed insertion.

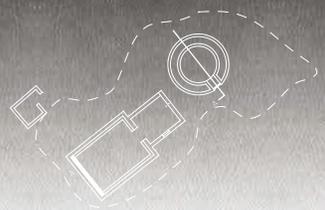
At the end of this slow and graceful moldering process, the stone of the former lighthouse will be entirely integrated to the landscape. When the time comes to give the island back to nature, any remaining wooden insertions will be transported off the island.



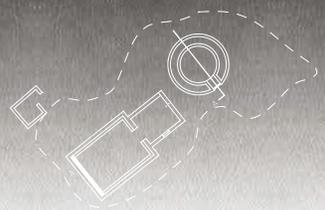
SECTION A
YEAR: 2018
SCALE 1:150



SECTION A
YEAR: 2025
SCALE 1:150



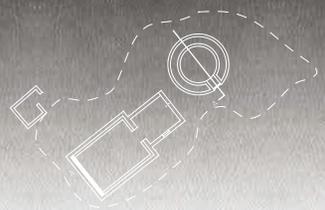
SECTION A
YEAR: 2030
SCALE 1:150



SECTION A
YEAR: 2035
SCALE 1:150



SECTION A
YEAR: 2040
SCALE 1:150





Render showing the Island with the anticipated post-controlled ruination remains of the Light Station. In the end, the island with the remains of past structures bears witness to human impact and stand as a testament to continuous human interaction with nature.

CONCLUSION

REFLECTIONS ON CREATIVE MOLDERING IN HERITAGE CONSERVATION

Deformation is not devaluation, permanence involves perpetual perishing, and duration depends on alteration.”⁶²

_ David Leatherbarrow

▼ The death of architecture is an on-going and incremental process, and similar to its life, it deserves to be celebrated. Although deterioration often seems to be the revenge of nature, in reality it returns us to equilibrium, where the man-made and the natural are equals. Decay and ruination blur the boundaries between nature and culture, past and present through their fragmentary nature and lack of fixed connotation.

Ruins, having cultural narratives embedded within them, provide a very intimate link with the past of a landscape. This reflective quality of the built environment has been widely discussed amongst researchers, architects and heritage professionals. This thesis explored an alternative approach to reveal these embedded narratives through a transitional architectural experience, while appreciating the aesthetic qualities of the ruin. The formulated answer presented itself as a controlled ruination strategy for the Nottawasaga Island Lighthouse, celebrating its state of ‘no-longer architecture, but not yet nature’. The design explored the use of pre-fabricated wood insertions mimicking the vernacular architectural style and building techniques in order to create a puzzle that presents a sophisticated collage of the place’s tangible and intangible narratives. Further metaphysical qualities and associations of the place were also communicated through sensory experiences activated through these inserted structures.

⁶² David Lowenthal, in *Buildings Must Die* by Stephen Cairn and Jane M. Jacobs, (Cambridge: MIT Press, 2014), back cover.

This thesis recognizes that the presented design is a proposal for a very specific site and its larger cultural narratives. However, it is hoped that further study on the applicability of the strategy in different contexts and for different layers of narratives would nourish much broader architectural thinking regarding the future of lighthouses and industrial sites at large. It can also be suggested that, further research should investigate the stories of the Aboriginal peoples with regards to lighthouses and sites of colonial impact as well and their perspectives on their rehabilitation.

The proposal of utilizing and adapting local building techniques also invites further investigation regarding its applicability as a strategy in different contexts. In addition, an exploration of how digital fabrication technologies, such as CNC machines and 3D printing techniques, can become a part of the realization of such a proposal would be worthwhile. Further investigation should focus on the use of these technologies with regards to designing for disassembly and minimal intervention/waste.

In this thesis, only a minor portion of the concepts regarding conservation and the value of decay are explored. It is recognized that the history of the idea of ruination is vast, and that the conservation of decaying structures have been widely discussed in the past. This thesis underlines the value of patina on structures of cultural significance and the importance of the preservation of the passage of time in heritage conservation practices. Such an appreciation of decay/death in architecture can lead to a new perspective on the values of ruins, cultivating imagination and the appreciation of the force of nature.

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