

## PART TWO: HISTORIC CONTEXT AND CHRONOLOGY

### **Historic Context**

#### ***The U.S. Lighthouse Board, Bureau of Lighthouses and the US. Coast Guard***

The United States Lighthouse Establishment was created as one of the very first undertakings by the first Congress in 1789, turning the jurisdiction and maintenance of all existing and future lighthouses under the jurisdiction of the federal government. From the time the federal government took possession of the lighthouses they were, with the exception of a brief period, under the direction of the Secretary of the Treasury.

From 1820 to 1852 the lighthouses in the United States were under the direction of the Fifth Auditor of the Treasury, Stephen Pleasanton, who was commonly known as the general superintendent of the lights. By 1838, the President divided the Atlantic Coast into six districts and the Lake coasts into two districts, with each being assigned an engineer, inspector, and superintendent.

In 1852, a Lighthouse Board was established to administer the lighthouse system. The Beaver Head Light Station was originally located in the Eleventh District, but by 1889 was reassigned to the Ninth District, which included all aids to navigation on Lake Michigan, Green Bay and tributary waters lying west of a line drawn across the Straits of Mackinac just east of old Mackinac Point Light-Station, Michigan (Report of the Lighthouse Board, 1906).

In 1910, Congress reorganized the lighthouse system into the Bureau of Lighthouses with one person as its head. The Bureau of Lighthouses was eventually merged into the Coast Guard under the Presidential Reorganization Act of 1939. The civilian employees of the lighthouse bureau were given the option of remaining as civilians or converting to a military position. About half chose each option.

Although America's lighthouse system over the years has come to be called the Lighthouse Service, no agency by this name has ever existed. The term "Lighthouse Service" had official status only during the life of the Bureau of Lighthouses. The name has been applied to other periods of time mainly as a convenience in writing.

During World War II, the Coast Guard was briefly absorbed into the Navy, returning to the Department of Treasury in 1946. As part of these changes, all of the light stations within the Great Lakes became part of the Ninth Coast Guard District. The Coast Guard was transferred from the Treasury Department to the Department of Transportation in 1967.

#### ***Light Station Building Types***

It was common in the Great Lakes to modify typical designs for the construction of light towers, keeper's dwellings, fog signal buildings, and various outbuildings. Records from the Light House Board dated 1861

include "Specifications for a First Order Light-House (Brick Tower)." Other records related to the construction of new stations and buildings state to "duplicate" other stations' buildings. Beaver Island Light Station exemplifies this trend, as several similar, some identical, attached keeper's dwellings, light towers, fog signal buildings and oil houses can be found throughout the Great Lakes. At the other end of Beaver Island, the St. James Harbor Light Station also had an attached keeper's dwelling, which was demolished sometime during World War II. The attached keeper's dwelling with a brick passageway leading to the tower is the typical design used for many of the dwellings built during the boom of lighthouse construction. Standard plans were also often used for the construction of various outbuildings. Traveling Lighthouse Board crews in each district would be responsible for the construction and maintenance of these outbuildings, resulting in virtually identical outbuildings at most of the stations in each district. The brick oil house is an example of such a standard plan. Often, the only differences between oil houses at different stations were their size and the type and color of brick used.

### *History of Lighting*

The Fresnel Lens was invented by the French Engineer Augustin Fresnel in 1822. This invention marked a major technical improvement for lighthouse apparatuses over any systems that had previously been utilized. The lighting apparatus until the adoption of the Fresnel lens was a lamp and parabolic reflector system, patented by Winslow Lewis, which was never very reliable. The Fresnel lens was a system of projecting light from a single light source through a set of beehive shaped ridged lenses that were set at the focal plane of the light. The design of this lens system caused all of the light rays that were emitted to bend parallel to the horizon, thus sending much more light out to sea. Pleasanton was resistant to the idea of adopting the Fresnel lens, ostensibly because of the high cost, but perhaps because of his close relationship with Lewis.

Several military engineers pointed out to him that the lenses would pay for themselves within a few years through savings in oil, but Pleasanton maintained his opposition. Eventually, after the Lighthouse Board took control of aids to navigation in 1852, it began installing Fresnel lenses in lighthouses.

There are six sizes of Fresnel lenses, referred to as orders. The orders range from one to six, with one being the largest (six feet diameter, eighteen feet tall) and six being the smallest (one foot diameter, eighteen inches high). The original Fresnel lens at Beaver Island was a Fourth order lens, and is said to have been the second oldest in the United States (State Historic Preservation Office). The CPS has a Fresnel lens on display at the light station, however, the original lens was removed and replaced with an electric arc in 1938 and its whereabouts are unknown.

At the time the United States adopted Fresnel lenses, lighthouse lamps were using sperm whale oil, which burned brightly and evenly. Shortly after the Fresnel lens came into use, sperm oil began to cost \$2.25 per gallon, up sharply from an 1841 price of 55 cents per gallon. The price increase can be attributed to growing industrial use and whalers taking fewer sperm whales. Therefore, calling Beaver Head Light Station's oil house a "whale oil house" is incorrect, since the likelihood the station used sperm whale oil in the light is slim.

After sperm whale oil prices shot up, the Lighthouse Board began using colza or rapeseed oil; an oil the French were using, unfortunately few farmers grew rape in this country. Further experimentation brought lard oil and finally in 1870, kerosene (popularly called mineral oil) was used. Through the years the United States experimented with a number of other fuel oils, including fish, porpoise and olive oils, but each failed the rigors of keeping the lamp lit.

Conversion to electricity went slowly, mainly because most lighthouses were not near power lines and electric generators were expensive and difficult to use. Electrical use was not widespread until the 1920s, when the Bureau of Lighthouses (successor to the Lighthouse Board) converted all remaining lighthouses to electricity. This change not only reduced the need for personnel but also opened the door to eventual wholesale automation of lighthouses. By the late 1960s, fewer than 60 lighthouses still had a keeper, and keepers were permanently retired by 1989-90.

All lighthouse lights are white, red, green, or a combination of all three colors. A ship captain times the flashes and refers to a light list to determine which lighthouse is sending the signals and thus pinpoint the ship's position. Before the introduction of machinery, lights were usually fixed. Once an apparatus became available to enable the lens to revolve, light and dark periods could be made to produce variations, sometimes referred to as the light's characteristic. The basic types include fixed, flashing (a single flash at regular intervals), fixed and flashing (a fixed light varied at regular intervals by a single, greater flash), group flashing (groups of flashes at regular intervals), and occulting (a steady light suddenly and completely eclipsed by two or more periods of total darkness at regular intervals). These characteristics all refer to lights of one color (generally white); lights that change color are known as "alternating." "Flashing" means the length of the flash is shorter than the time of darkness; "occulting" indicates that the dark period is shorter than or equal to the duration of light. (American Landmarks, "The Lighthouse")

### ***Fog Signal Development***

As commercial shipping increased, audio warnings were added at light stations to help aid mariners along the coasts of the Great Lakes. At the Beaver Island Light Station, this became increasingly important because of shifting shoals and sand. Fog signals were steam-operated whistles, which required constant attention for their operation. The addition of fog signals at light stations required additional staff (assistant keepers) for their operation, as a lightkeeper's days were full with duties related to the light.

### ***Automation of Lighthouses and Fog Signals***

Although there had been experimentation since the mid-1880s, the use of automated equipment at light stations accelerated from 1910-1939, and by 1925, 74 light stations in the United States were fully automated. Most of these were secondary light stations that had more simplified equipment, whereas larger stations, such as Beaver Island, still required lightkeepers and assistants. The conversion of light stations to electricity increased rapidly

after 1925 and by the early 1940s, nearly all light towers and fog signals at light stations on the Great Lakes were automated. Automatic timing mechanisms for turning the light on and off were also installed at the stations. The light at Beaver Island was electrified in the late 1930s, and the Coast Guard replaced the light with an automated radiobeacon tower in 1962. With several beacons located along a coast, and sending signals at the same time, mariners could easily determine their position by taking bearings on the various signals.

### ***History of the Beaver Head Light Station***

Throughout its history, physical change at the Beaver Island Light Station was usually undertaken as a result of necessity. Changes were often the result of the need to improve the light station as an aid to navigation, ranging from replacing a crumbling tower, to maintenance and upgrades, to continually improving the technology at the station. What follows is a chronological history of the Beaver Island Light Station, which is divided into five distinct episodes of time. These episodes are based upon archival documents and known physical changes at the station. Episode Three is the most important in the history of the Beaver Island Light Station. This period, from 1906-1962, saw the addition of the Keeper's Dwelling, a Fog Signal Building and sadly, the eventual decommission of the light station.

It should be noted that most government records pertaining to the light station refer to it as Beaver Island Light Station, while local historical records and some reference books call the station Beaver Head Light Station. For the purposes of this report, the station will be referred to as the Beaver Island Light Station.

### **Episode 11850-1891**

#### ***Establishment of funds through original Fog Signal Building Construction***

In the middle of the nineteenth century, navigation on Lake Michigan was steadily increasing. Leaders in Washington decided a lighthouse was needed on Beaver Island to aid the growing number of ships sailing between Chicago and the Straits of Mackinac. On September 28, 1850, Congress appropriated \$5,000 for a lighthouse on Beaver Island. The station would mark the west side of the approach used by most vessels passing from Lake Michigan into the Straits of Mackinac. (Laws of the U.S., 1855) President Millard Fillmore laid aside a tract of land for the proposed lighthouse on November 21, 1850, and the area designated was 158.2 acres that comprised the Cheyenne Point. The following January, a diagram of the tract of land was sent to Washington and approved. In March, a contract was drawn up at Mackinac Island between Charles E. Avery, Collector of the District of Michilimackinac, and John McReynolds of Detroit. McReynolds agreed to build a tower, a light and a dwelling for the sum of \$4,480.00. The contract included detailed specifications for the structure to be built, and stipulated that it be completed by October 1, 1851. The building was to be erected on the spot designated by Avery. The agreement was witnessed by James T. Birchard. (Contract between U.S. Government and John McReynolds, 1850)

About a month after the contract was witnessed, the lighthouse property was sold by Lorenzo Birchard (a relative) to James Birchard, who proceeded to sell it back to Lorenzo (Charlevoix County Records). Lorenzo Birchard later approached the U.S. Government for money, as they had built a lighthouse on his property; he however, could produce no deed. After battling the federal government for nearly five years, Lorenzo Birchard really did buy the property for \$73.56.

Although the real estate dealings between James and Lorenzo Birchard were shady, the land was still available five years later. Why? The lighthouse was completed in October, 1851, as specified, however, it had been built two miles east of the area approved by President Fillmore.

Apparently, though, the first Beaver Island Light Tower was not built well. About seven years after it was finished the tower toppled over and slid downhill from its foundation. A new 46-foot cylindrical yellow brick light tower with a ten-sided lantern room was finished in 1858. The fourth-order Fresnel lens in the tower was the second oldest of its type in the United States (Michigan State Historic Preservation Office) and produced a flashing light 103 feet above water, visible for 18 miles. The light would remain fixed, with a 1.3 second flash every 20 seconds.

The original two-story yellow brick keeper's house, built in 1866, was home to a keeper and an assistant keeper and their families. The 1851 contract stipulated the dwelling house be built

of brick, thirty four feet by twenty, one story, of eight feet high, divided into two rooms with an entry between the stairs to be in the entry to go into the chambers, which are to be lathed and plastered, a chimney near the middle of the house, with a fire place in each room iron or stone-pieced, cellar under the whole of the house with sufficient walls of stone or brick laid up in lime mortar, the roof to be rectangular, the boards of which to be jointed and halved, and well secured and covered with good merchantable shingles. Three windows in each room, of sixteen lights of eight by ten glass each, and one of the same dimensioned in each chamber. The door to be four paneled, with good hinges and thumb latched to each and a good lock and the outside doors, closets in each room back of the chimney, all of the floors to be double and well-nailed the inside wall and ceilings to be lathed and plastered, and all the inside to be fixed in a plain decent style, and with good seasoned timber.

Also a porch or kitchen attached to the dwelling house fourteen by twelve feet in the clear, the walls of stone, eight feet high, the room to be lathed and plastered with double floors two windows and a door, a chimney with a fire place and a sizable oven with an iron door, craned trammers and hooks in the fire place, in the porch or kitchen, on one side of the chimney a sink, with a spout leading through the stone wall. All the wood work inside and out to be painted with two coats of good paint -gutters to lead around the house -with spouts to carry off water. An out house of brick, five feet by four, the roof shingled and painted. (Contract dated 1851 between Charles Avery and original builder John McReynolds)

The Engineer's report of 1867 notes that several large trees were blocking the efficiency of the light and should be

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removed. The cistern also needed rebuilding, he noted.

In 1869, the Engineer's report noted that "The tower and dwelling are in good repair, but some of the windows of the latter require new shutters. The cistern should be put in a serviceable condition in case of the recurrence of fire in the adjacent woods, which endangered the property during the past year. A boat is also recommended." (National Archives, Record Group 26, Clippings file)

In 1886, according to the Eleventh District Report of the Light-House Board, a boat-landing displaced by ice was moved back into its proper position. An additional crib, 10 by 18 feet in plan, was built and filled with stone, making the landing 50 feet long, and various minor repairs were made.

The boat-house and tramways were destroyed by the sea in November, 1886, and were rebuilt the following summer. An additional crib 10 by 29 feet was built to protect the tramways and the boat-house. Other repairs to the tower and other building were made that year to keep the station in good condition. (National Archives Clippings file).

In 1888, the Engineer requested a fog signal building for the light station in his annual report to Congress.

A fog whistle is needed at the light-station on the west side of the island in aid of navigation between Green Bay and the Straits of Mackinac. The boilers and machinery should be in duplicate and of the latest type erected on the lakes. Such a signal was recommended at an estimated cost of \$5,500, as the northern passage is as yet unprovided with the usual lights and signals, though provision was made for opening this channel by an appropriation for lighting Seul Choix Point. An act has been passed authorizing the establishment of this aid to navigation, but no appropriation has been made for doing the work. The Board, therefore, renews its recommendation for this purpose. (National Archives Clippings file)

By 1889, the Beaver Head Light district had been changed to the Ninth District. A civil act of March 2, 1889, provided \$5,500 for the construction of a fog-signal at the station, "which will be of marked benefit to the numerous vessels trading to and from the Straits of Mackinac, which is the outlet for Lake Michigan. The proper place to establish the signal is westward from the light station on a bench or plateau about 30 feet above the lake. As this is outside the reservation, it will be needful to procure title." (1889 Annual Report of the Light-House Board)

The site for the new fog signal was surveyed in October 1889. There was much delay in negotiating the sale of the 10 acres west of the light station. In the 1890 report, it was also noted that the fog-signal apparatus, machinery, and boilers were completed under contract and delivered at the light-house depot in Detroit, awaiting transfer to Beaver Head Light Station.

The materials and men arrived on the island in August, 1890, and the building of the wood framed, corrugated iron-sided fog signal, including a landing and a water-supply crib, eight feet wide, 32 feet long, and 27 feet high was completed by November. The siren was transferred from Skilligallee Light Station for use at Beaver Island. A tramway, 142 feet long and 5 feet wide, for landing coal and supplies, was built to lead from the landing to the

signal.

Other work that year included 167 feet of wooden sidewalk, 3 feet wide, laid around the tower. The dwelling was also rebuilt. The platform and stairs leading from the tower on the bluff to the lake, which were dangerous and rotten, were renewed. Five flights of stairs and five platforms in all were replaced. A hand rail for the inside tower stairs was also put in place. (1891 Report of the Light-House Board). No substantiating documentation can collaborate the fact that the dwelling was rebuilt. It is assumed that repairs were made, and the entire dwelling was not rebuilt.

## **Episode II 1892-1909**

### ***Barn construction through Fuel Oil Building Construction***

The materials required for the construction of a barn and for making repairs to the dwelling were delivered to the station by the tender *Warrington*. The barn was built that summer, 16 by 20 feet, 14 feet high to the eaves, with a roof of one-half pitch. Various repairs were also made to the dwelling. (1892 Report of the Light-House Board) (Appendix I, Document 25)

With the construction of a fog signal building, a second assistant keeper was needed to operate the siren. In 1902, additions and alterations were made to the keeper's dwelling to provide for the accommodations of three keepers and their families. (1902 Report of the Light-House Board) It is assumed the brick kitchen lean-to on the east end of the building (Appendix I, Document 6) was altered to accommodate the second assistant keeper.

A brick fuel oil building was also constructed in 1902, the Annual Report notes. The building is red brick, with steel door jambs. Similarly constructed buildings appear at other lighthouses throughout the Great Lakes, so it is assumed that standard construction plans were used for the building.

In 1906, the wooden plank walks around the dwelling were replaced with 223 running feet of concrete walk. Plank walks were laid from the north gate to the drive well, and from the south gate toward the fog signal building. The wooden tramway down the bluff at the site of the fog signal was renewed and extended 32 feet. (1906 Report of the Light-House Board). The long dock was necessary for the arrival of supply ships and official visitors. Shallow water made the approach dangerous, and the long dock facilitated the transfer of supplies and passengers. (Appendix I, Document 17).

## **Episode III 1910-1962**

### ***Keeper's Dwelling addition, New Fog Signal Building through Decommission***

In 1910, a wood frame addition was added to the keeper's dwelling, with the brick kitchen lean to on the east end of the building being demolished to make way for the new structure. This made it possible for the keepers and their families to live more comfortably at the site. The interior was divided into three apartments. The keeper and

the assistant were allotted two apartments in the brick keeper's dwelling, with the third apartment located in the addition for the fog signal operator. Each apartment had its own entrance. (Appendix I, Document 9, 10,21,22, 23, 24)

A screened porch was added in 1920 to the east side of the addition. The porch entrance was a single door, leading to the separate apartment doors.

In 1913, the fog signal building was replaced by a red brick structure located a few yards from the water's edge. The building housed huge coal-fired steam boilers which sounded fog horns, and in later years produced electricity for the entire lighthouse complex. (Appendix I, Documents 14, 16, 17,26,27,28,29,30,31,32,33,34)

A 1930 government inventory valued the existing buildings on the light station site:

Circular Tower of Brick attached to brick dwelling together with Frame addition to dwelling	\$12,993.28
Storage Building (frame) covered with corrugated iron formerly used as Fog Signal Building	2,300.00
Fog Signal Building (brick) with stone trim	2,077.18
Barn (frame) used as a garage	337.92
Boat House and boat car track	443.52
Oil House (brick)	249.43
Privy (brick)	56.88
Privy (frame)	190.00

In 1939, the U.S. Coast Guard assumed control of the Bureau of Lighthouses. An electric arc replaced the oil lantern; and the tower and the keeper's quarters were painted a typical Coast Guard white. It is assumed that the light station complex was connected to electricity at about the same time.

Interestingly, 103 years after the setting aside of Cheyenne Point, the land allotment mistake made in 1851 was rectified. The wheels of bureaucracy grind slowly: on August 19, 1954, President Eisenhower rescinded President Fillmore's order of December 21, 1850. .

The lighthouse was decommissioned by the Coast Guard in 1962, and the illuminant and the lens were removed. An automated radio beacon tower was erected across the road to the north from the station.

#### **Episode IV 1963-1974**

##### ***Abandonment and Neglect through GSA Surplus Property***

After decommissioning, the lighthouse was then leased to four individuals and was used as a hunting lodge.

In the years that followed the decommissioning, abandonment and neglect would take a toll on the light station. Vandals stole nearly everything the Coast Guard did not remove, while the buildings stood exposed to the ravages of harsh weather. Several interior walls were peppered with gunshot holes and nearly all of the windows and doors were broken. The grounds surrounding the lighthouse were filled with tall weeds and broken branches. (Appendix I, Document 20)

In the early 1970s, the General Services Administration of the Federal Government declared the lighthouse and 64 acres of land as surplus federal property. Several colleges and organizations showed interest in the property. The site was listed on the State Register of Historic Places in April, 1974.

#### **Episode V 1975-2000**

##### ***Charlevoix Public Schools purchases property through current conditions***

In 1975 the property was deeded over to Charlevoix Public Schools for \$1.00. The purchase included one-half mile of Lake Michigan shoreline, the lighthouse with three apartments, a maintenance building, the oil house, and the fog signal building, all on 65 acres. Later, through a DNR grant, an additional 113 contiguous acres were obtained; and a lakefront lot was purchased with grant funds.

In 1978, the Comprehensive Employment and Training Act (CETA) funded a work-study program to teach teenagers environmental awareness and practical skills such as painting and carpentry.

During the summer of 1978, a DNR grant funded the water-blasting and tuck-pointing of the tower and keeper's dwelling, exposing the original yellow brick. The grounds were cleared, and plumbing and electricity systems were repaired.

The Beaver Island Light Station was listed on the National Register of Historic Places in December 1978, further insuring its continued preservation as a landmark to America's maritime history.

Beaver Island high school students donated their weekends that winter to strip paint, patch walls and scrape linoleum from the maple floors. (Beaver Island Historical Society)

The summers of 1979 and 1980 saw another CETA program focused on restoration of the lighthouse. Underprivileged youth lived in tents and worked all summer painting the addition and working on the garage and

outbuildings. During the winters, Beaver Island high school students again donated their time to convert the maintenance building into a cafeteria and adding a kitchen. (Beaver Island Historical Society) The restoration of the interior of the keeper's dwelling and addition continued, as windows were repaired and the floors sanded and varnished.

The station is now run as the Beaver Island Lighthouse School, available to students in northwest Michigan and defined as a coeducational school for students who may be having difficulty making positive choices academically and socially. The school is available to students 16 to 21 who have dropped out of school or are at risk to complete high school.

The hard work of these teens not only saved this valuable historic site, but also preserved the area's natural beauty. An unintended result of all this restoration was the tourist response to the lighthouse. The public is invited to climb the 152 steps and catch the breathtaking view from the top of the tower spring to fall, every day from 9 a.m. to dusk.

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