ERDC/CERL TR-23-5

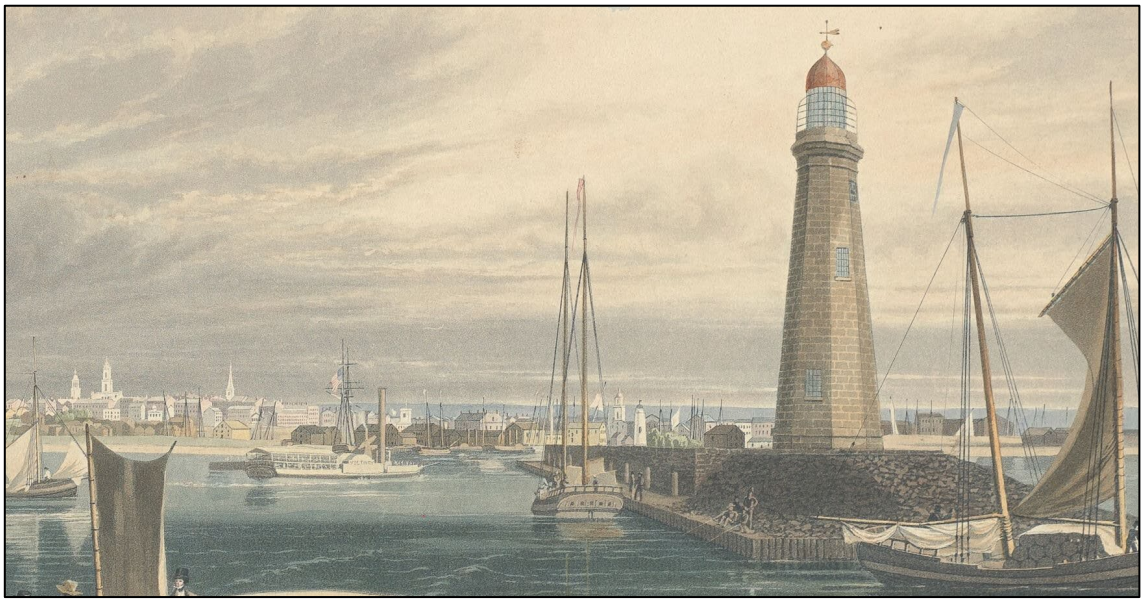
US Army Corps
of Engineers®
Engineer Research and
Development Center

ERDC
ENGINEER RESEARCH & DEVELOPMENT CENTER

Character-Defining Features of the Buffalo South Mole (South Pier), NY

Adam D. Smith and Megan W. Tooker

April 2023



Construction Engineering
Research Laboratory

The US Army Engineer Research and Development Center (ERDC) solves the nation's toughest engineering and environmental challenges. ERDC develops innovative solutions in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, the Department of Defense, civilian agencies, and our nation's public good. Find out more at www.erdc.usace.army.mil.

To search for other technical reports published by ERDC, visit the ERDC online library at https://erdclibrary.on.worldcat.org/discovery.

Cover Photo: Portion of William J. Bennet and John W. Hill's "*Buffalo from Lake Erie*," (National Gallery of Art, 1836). Public domain.

ERDC/CERL TR-23-5
April 2023

Character-Defining Features of the Buffalo South Mole (South Pier), NY

Adam D. Smith and Megan W. Tooker

US Army Engineer Research and Development Center (ERDC)
Construction Engineering Research Laboratory (CERL)
2902 Newmark Drive
Champaign, IL 61824

Final Technical Report (TR)

Prepared for US Army Corps of Engineers (USACE)
Buffalo District
Buffalo, NY 14207

Under Cross-Charge Labor Code 45D736

Abstract

The US Congress codified the National Historic Preservation Act of 1966 (NHPA), the nation's most effective cultural resources legislation to date, mostly through establishing the National Register of Historic Places (NRHP). The NHPA requires federal agencies to address their cultural resources, which are defined as any prehistoric or historic district, site, building, structure, or object.

The precursor to the Corps of Engineers erected the mole (a.k.a., the south pier) in the early 1820s at the entrance to the Buffalo harbor. The area on top of and surrounding the mole was modified through the past two hundred years, many of the character-defining features remain including the stone retaining walls, talus, stairs, and lighthouse identified in plans and drawings from the period of construction. Notably lost is the stone tow path, or banquette, and the stone incline on the south side of the mole is no longer visible. The researchers recommend a period of significance of c. 1820 through 1972 (50 years) since the mole has continued its original use of keeping the entrance to the Buffalo River open for freight and recreational boating traffic through the present day.

Contents

Figures

Preface

This study was conducted for the project manager, US Army Corp of Engineers–Buffalo District, under cross-charge labor code 45D736, "Character-Defining Features Analysis." The technical monitor was Mr. Lex Barker (Project Manager, Buffalo District).

The work was performed by the Training Lands & Heritage Branch of the Operational Science & Engineering Division, of US Army Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL). At the time of publication, Ms. Angela Rhodes was chief, Training Lands & Heritage Branch; Dr. George Calfas was chief, Operational Science & Engineering Division; and Mr. Jim Allen was the technical director for Operational Science & Engineering. The deputy director of ERDC-CERL was Ms. Michelle Hanson, and the director was Dr. Andrew Nelson.

COL Christian Patterson was the commander of ERDC, and Dr. David W. Pittman was the director.

1 Introduction

1.1 Background

The US Congress codified the National Historic Preservation Act of 1966 (NHPA), the nation's most effective cultural resources legislation to date, to provide guidelines and requirements for preserving tangible elements of the nation's past. This preservation was done primarily through creation of the National Register of Historic Places (NRHP). Contained within this piece of legislation are requirements for Federal agencies to address their cultural resources, defined as any prehistoric or historic district, site, building, structure, or object. Section 110 requires Federal agencies to inventory and evaluate their cultural resources. Section 106 requires the determination of effect of Federal undertakings on properties deemed eligible or potentially eligible for the NRHP.[1]

The US Army Corp of Engineers (USACE) Detroit District contacted personnel in the Land & Heritage Conservation Branch (now the Training Lands & Heritage Branch) at the Engineer Research and Development Center's Construction Engineering Research Laboratory (ERDC-CERL) on 23 June 2022 regarding if they would be able to assist on a mole that might be potentially eligible for the NRHP.

The Buffalo mole (sometimes referred to as the south pier) is located at the entrance to the Buffalo harbor in New York (Figure 1). The mole fronts the south side of the Buffalo River from the end of Furhmann Boulevard west to the Buffalo lighthouse (Figure 2).

[1] National Historic Preservation Act, Pub. L. No. 89-665, as amended by Pub. L. No. 96-515, Sections 110, 106 (1966).

Figure 1. Location of the Buffalo mole (image by Engineer Research and Development Center–Construction Engineering Research Laboratory [ERDC-CERL], 2023).

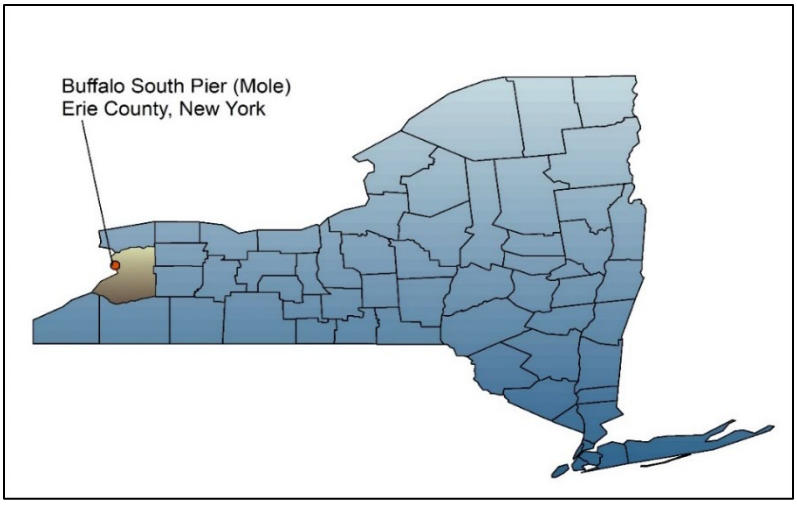


Figure 2. Location of the Buffalo mole shown in the *red box* on the south side of the Buffalo River. (Map data: Google, 2022, red box added by ERDC-CERL.)

1.2 Objective

The task was to treat the Buffalo south mole as potentially eligible for the NRHP, to develop a list of character-defining features for the mole, and to suggest a potential period of significance for the mole.

The south mole was modified through the decades as a variety of activities were placed on top of the mole. Specifically, a stone banquette (originally called a tow path on the drawings) that extended the length of the mole to the original seawall was replaced with a concrete banquette in 1901. This

concrete banquette was removed circa 1960 and replaced with debris from the demolition of the banquette.[2]

Through the subsequent decades the debris was moved by wave and storm action on Lake Erie. In 2021, without sufficient knowledge of the mole and its construction, new armor stone was placed as an emergency repair at the western end of the mole by the lighthouse. This armor stone does not extend down the entire length of the wall. Buffalo District's biggest concerns were that the land above the mole, which supports a variety of different Coast Guard buildings, is subsiding and various portions of the circa 1820s stone wall are giving way. The mole needs to be rehabilitated, but without a formal NRHP Determination of Eligibility, the requirements of the NHPA Section 106 process and the National Environmental Policy Act cannot be satisfied. This technical report will help in the consultation process during the design phase of the rehabilitation of the mole.

1.3 Researchers

This project was conducted by USACE, ERDC-CERL, in Champaign, Illinois. The research team consisted of Adam D. Smith, Master of Architecture with 25 years of experience in architectural history as architectural historian and Megan W. Tooker, Master of Landscape Architecture with 25 years of experience in landscape architectural history as project manager and landscape historian.

1.4 Approach

1.4.1 Site Visits

A site visit to the mole occurred 19–20 July 2022 where the team viewed and photographed original documents held at Buffalo District and toured the mole and Coast Guard facility by both walking the mole and viewing the mole from a boat on the Buffalo River.

ERDC-CERL researchers conducted a review of books, archival repositories, and online resources related to the Buffalo mole. Megan Tooker followed up this site visit with a visit to the cartography department at the National Archives in College Park, Maryland in July 2022 and Adam Smith visited the textual department at the

[2] "US South Mole, US Sea Wall, and Developments Thereon Historical Timeline," 20 December 2021

National Archives in Washington, DC, in August 2022. An analysis was performed decade by decade of all the documents gathered by Buffalo District and the research team[3]. The following places and sources were contacted and searched:

- The Buffalo District archive for historic drawings, maps, photographs, and other information
- The National Archives and Records Administration (NARA), Washington, DC (Textual)
- NARA in College Park, Maryland (Cartographic)

1.4.2 Analysis and Evaluation

After initial research was completed, the team analyzed the gathered information. Archival information and field information were integrated throughout the course of the project. The information available was contained in text documents, photographs, and historic maps. Using archival sources, the research team extracted relevant historical information for the character-defining features. The material was then combined to describe them in both text and images.

The evaluation followed guidelines published by the National Park Service in National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation*;[4] National Register Bulletin #16A, *How to Complete the National Register Registration Form*;[5] the National Register Bulletin, *How to Prepare National Historic Landmark Nominations*;[6] and *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.[7]

---

[3] Many thanks to the Buffalo District engineer for providing his research and historic documents for this report. He had previously gathered information and documents from the Buffalo Lighthouse Association and the Buffalo History Museum Resource Center.

[4] NPS, *National Register Bulletin #15: How to Apply the National Register Criteria for Evaluation*.

[5] NPS, *National Register Bulletin* #16A: *How to Complete the National Register Registration Form* (Washington, DC: US Department of the Interior, National Park Service, 1997).

[6] NPS, *National Register Bulletin: How to Prepare National Historic Landmark Nominations* (Washington, DC: US Department of the Interior, National Park Service, 1999).

[7] Weeks, K. D. and A. E. Grimmer. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings* [rev. of 1995 document by A. E. Grimmer] (Washington, DC: DOI-NPS, Technical Preservation Services, 2017). https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf.

2 Historic Documents Analysis

The following figures are details of maps, drawings, lithographs, and some photos that not only highlight eras in the history of the mole but also important features through the years to help determine character-defining features. Following the series of figures, is an analysis of these important features.

A mole is a nautical structure typically constructed out of stone or concrete with a pathway on top. Moles are perpendicular to the coastline providing moorings for boats and ships, a path to a lighthouse, or the ability for a railroad to transfer goods to and from ships. A quay is also typically constructed out of stone or concrete, but it is parallel to the coastline.

The US government erected a brick[8] lighthouse in 1818 at the old entrance to the Buffalo River. The Buffalo mole seems to have been constructed during the 1820s to help open the Buffalo River to navigation. It extended west of the 1818 lighthouse out into Lake Erie. Remnants of this structure are shown on some drawings and mentioned in some historical texts, but this structure's earlier existence is beyond the purview of this report and would need to be investigated as an underwater archeological site. In 1833, the US government erected a stone lighthouse at the west end of the mole. It is unclear from the historic documents whether that western portion of the mole was extended or simply rebuilt to erect the lighthouse. A pierhead is noted on an 1826 drawing of the lighthouse (Figure 3), but the materials of the pierhead are not shown. A stone talus encircles the base of the 1833 lighthouse as can be seen in Figure 3 and Figure 5.

The first drawing of the entire extent of the mole is from 1833 (Figure 4 through Figure 6). The entire structure is stone, with a stone incline plane that faces south, a stone wall with a walkway on top of it that runs the length of the mole, and a stone tow path that warps and bends into the stone talus at the base of the 1833 lighthouse. The 1818 lighthouse is marked at the eastern end of the mole (Figure 4).

[8] Historic drawings indicate that the 1818 lighthouse was constructed out of brick while some historic correspondence has it constructed out of stone.

Figure 3. Plan of mole head and lighthouse foundation, 1826. (Department of Commerce, Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

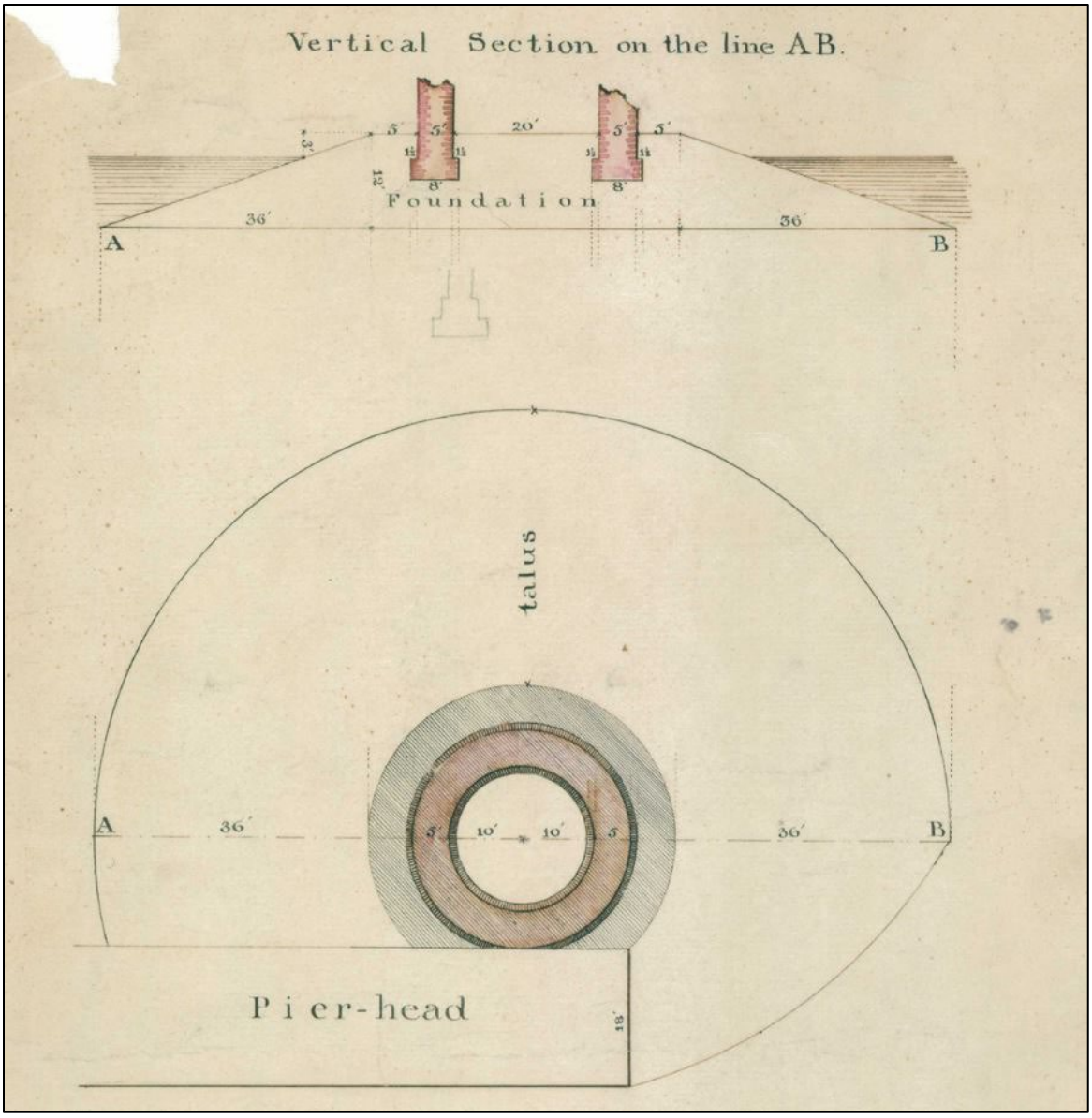


Figure 4. Portion of the 1833 drawing showing entire mole with the 1818 lighthouse on the east and the 1833 lighthouse on the west on the mole head. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

Figure 5. Detail of mole head and its surrounding stone talus, 1833. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

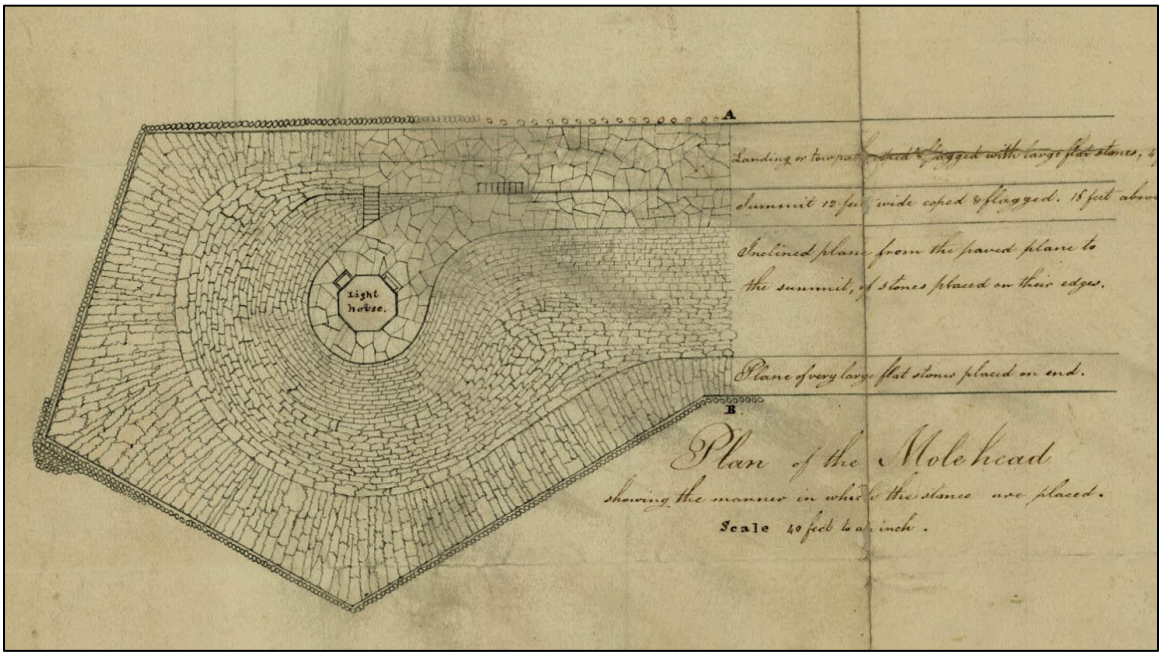
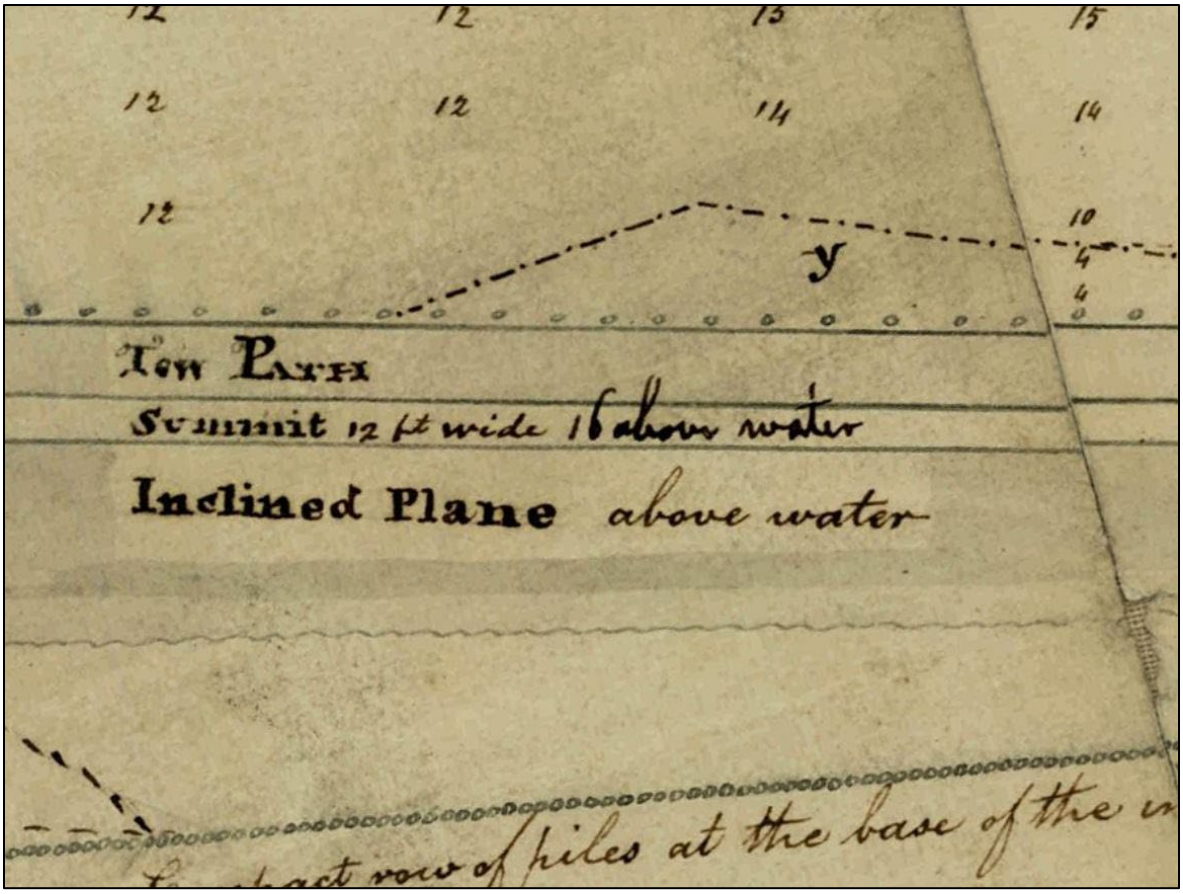


Figure 6. Detail of tow path, summit of wall, and incline plan, 1833. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



A drawing from 1835 is one of the best detailed drawings of the mole and the two lighthouses that bookend the mole from this era (Figure 7 through Figure 14). The drawing has a detailed elevation of the 1818 lighthouse (Figure 9) and a section through the 1833 lighthouse (Figure 10). The sections detail how the mole is constructed with its stone incline plan, stone wall, and stone tow path. Wood cribbing is used to the south of the incline plane and at the base of the stone tow path (Figure 11 and Figure 12). Close-ups of these sections detail the existence of stone stairs from the top of the stone wall down to the stone tow path and integrated into the tow path are stone cleats for the mooring of vessels (Figure 13). The elevation (Figure 14) shows how these stone stairs and stone cleats extended down the length of the mole.

Figure 7. An 1835 plan showing, elevation, and sections of the entire mole, 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

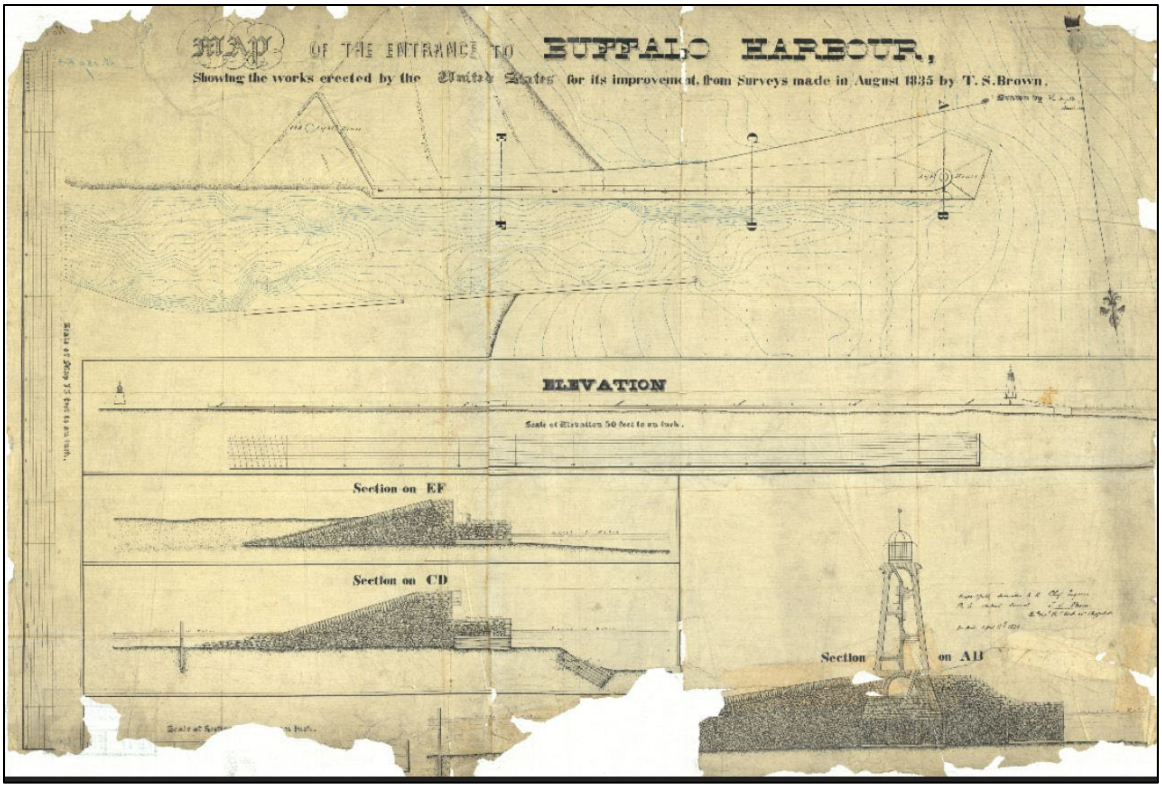


Figure 8. Detail of plan of mole, 1835 (north is the bottom of the map to keep the mole in same orientation as the other maps). (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

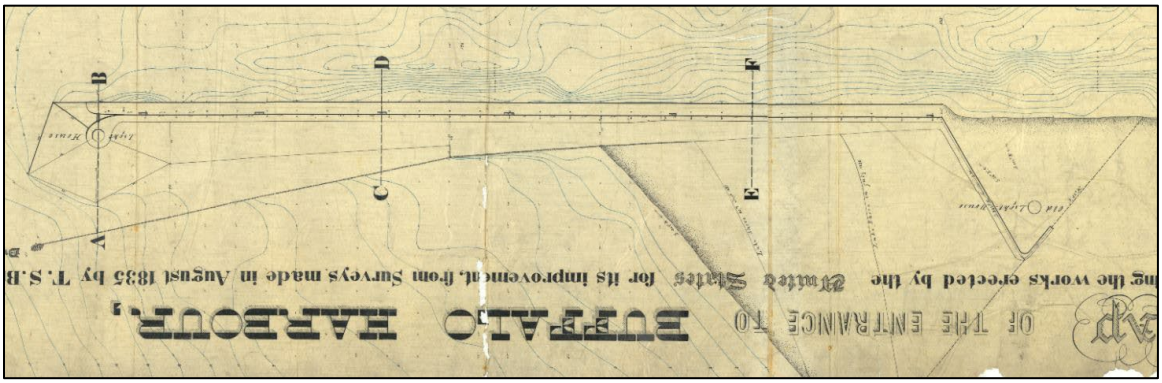


Figure 9. Elevation of the 1818 brick lighthouse, 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

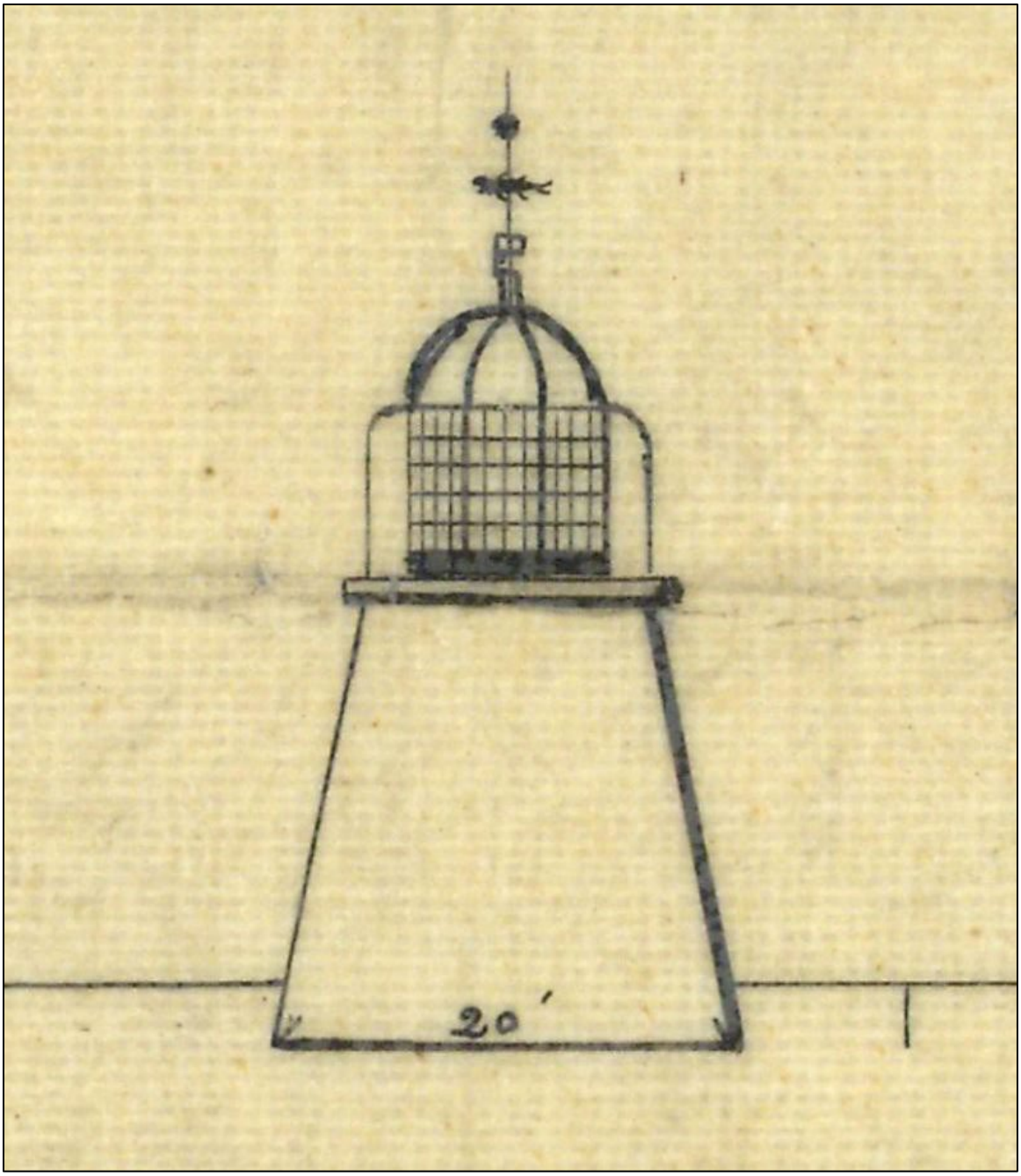


Figure 10. Section through mole head, talus, and the 1833 lighthouse, 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

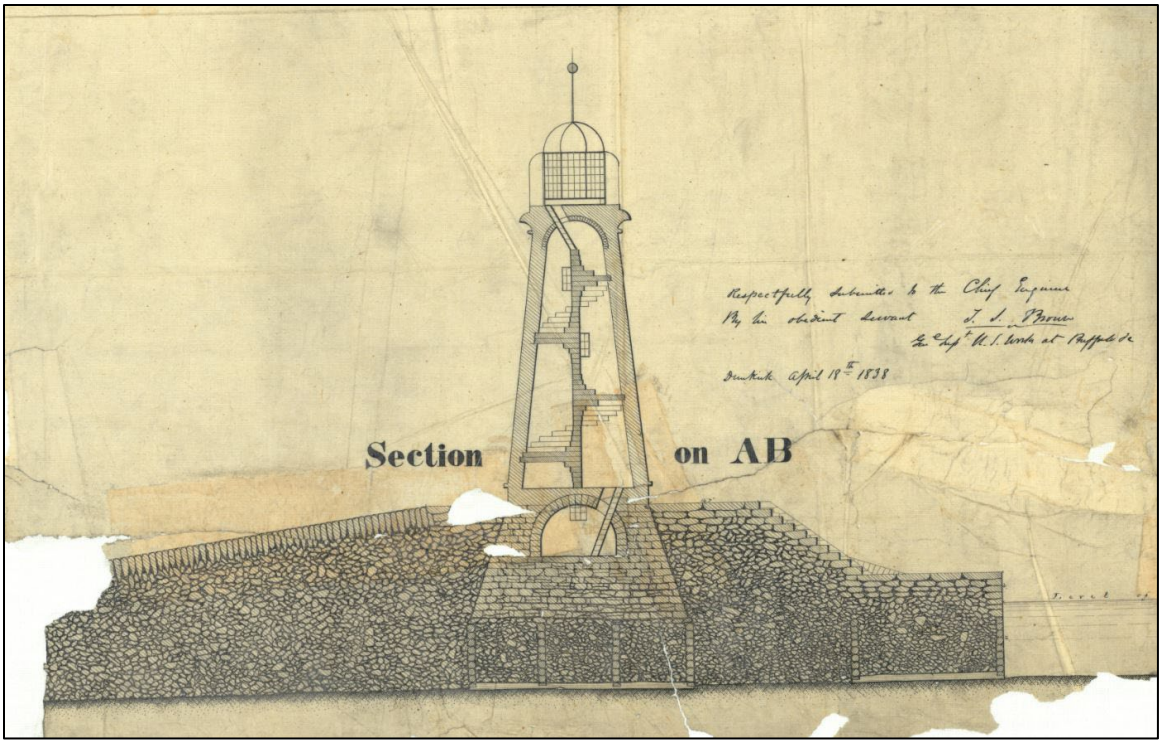


Figure 11. Section through base of lighthouse at the mole head, 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

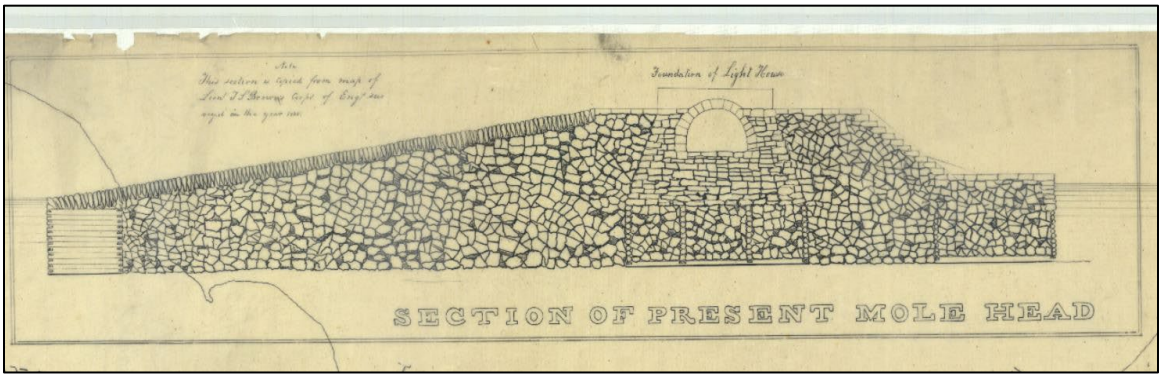


Figure 12. Sections through mole showing tow path, wall, and incline plane, 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

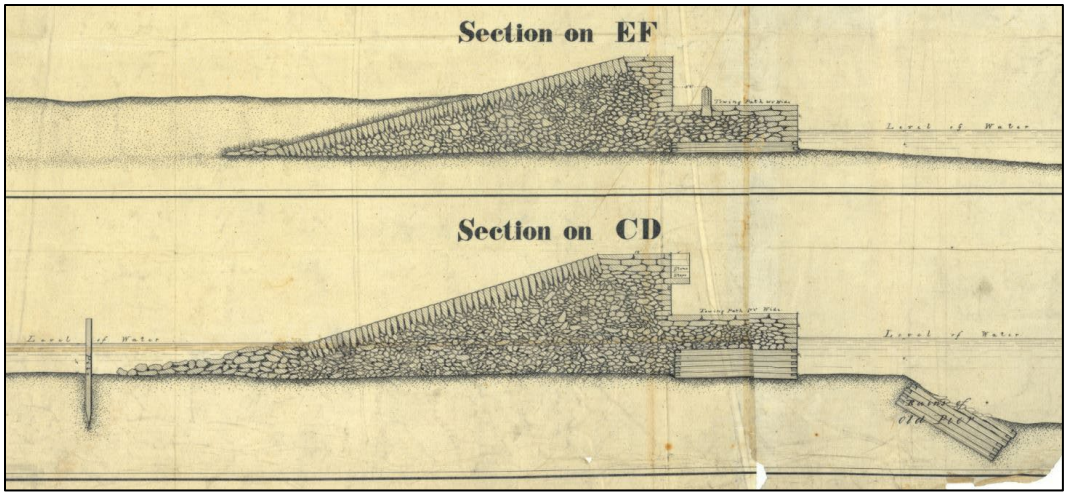


Figure 13. Detail of sections through mole showing tow path, wall, and incline plane (note stone steps and stone cleat), 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

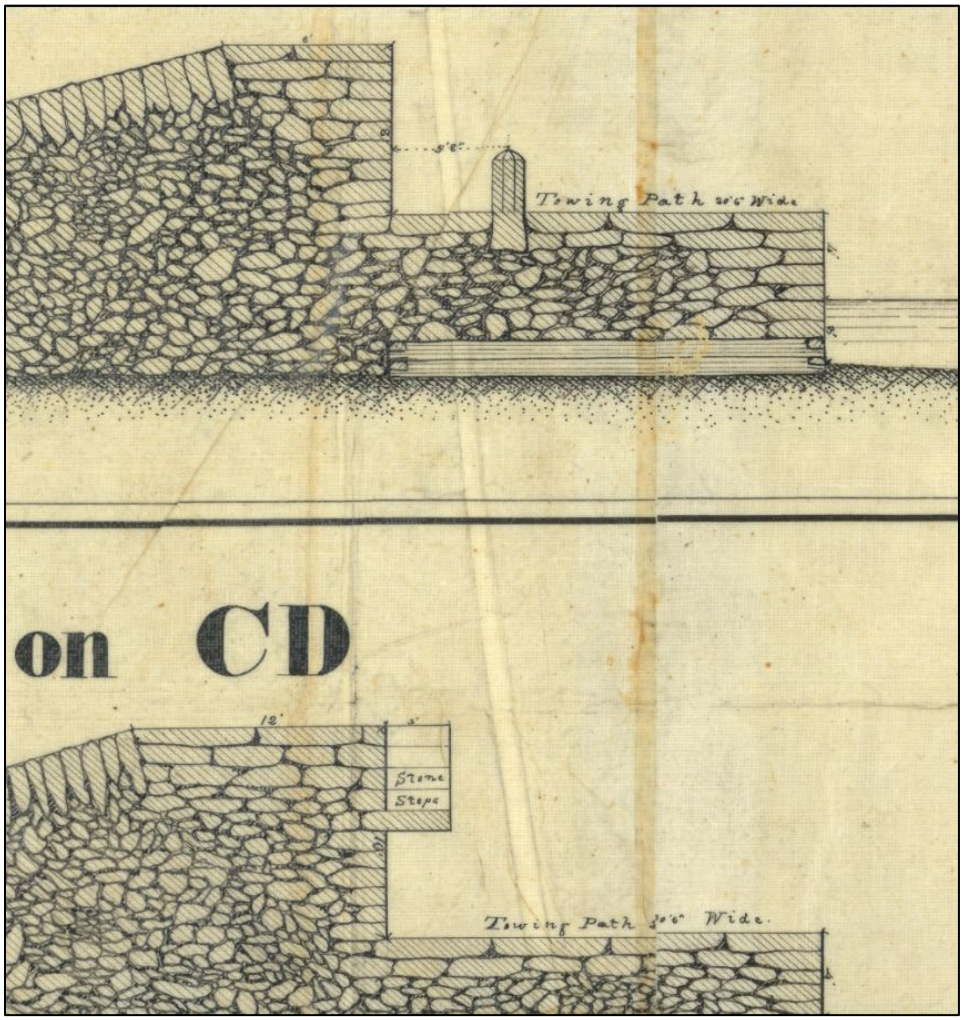
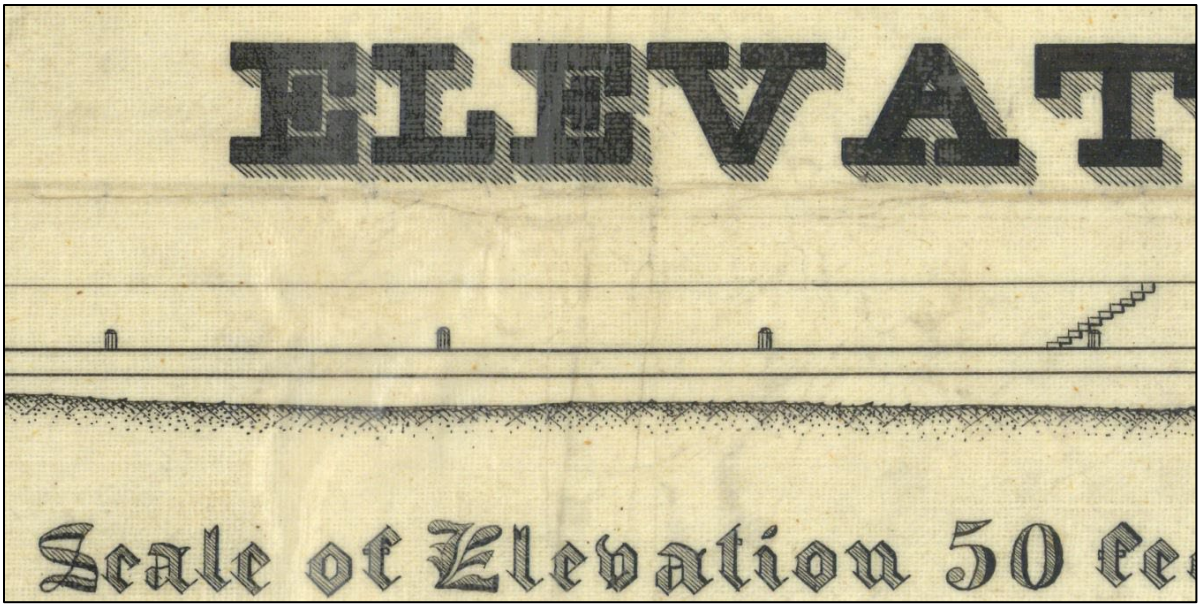
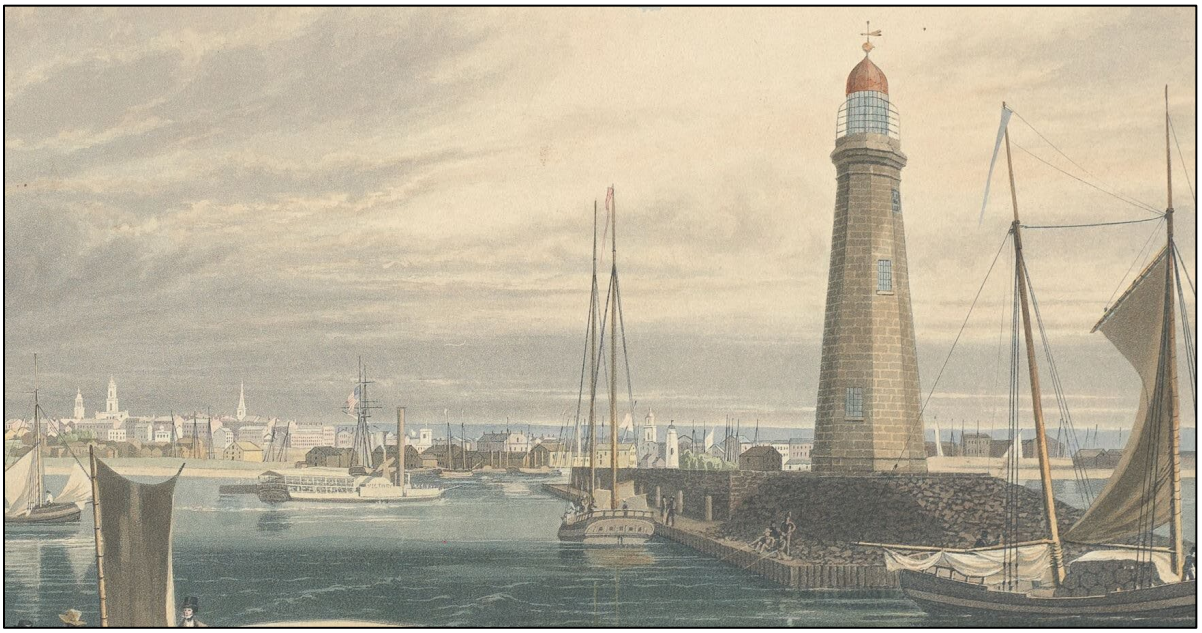


Figure 14. Detail of elevation of the mole wall showing stone cleats and stone stairs, 1835. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



The elements in the 1835 elevations and sections are clearly depicted in a hand-colored aquatint from 1836 (Figure 15).

Figure 15. Portion of William J. Bennet and John W. Hill's "Buffalo from Lake Erie" showing the 1833 lighthouse, stone talus, stone wall, and stone cleats, 1836. (National Gallery of Art. Public domain.)



The 1838 drawing does not have as much detail as the 1835 drawing; however, it does show a staircase leading from the tow path up to the 1833 lighthouse in the location of the current stone staircase, staircase leading from the top of the mole down to the towpath, and the location of the 1818 brick lighthouse (Figure 16 through Figure 18).

Figure 16. Detail of plan of mole, 1838. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

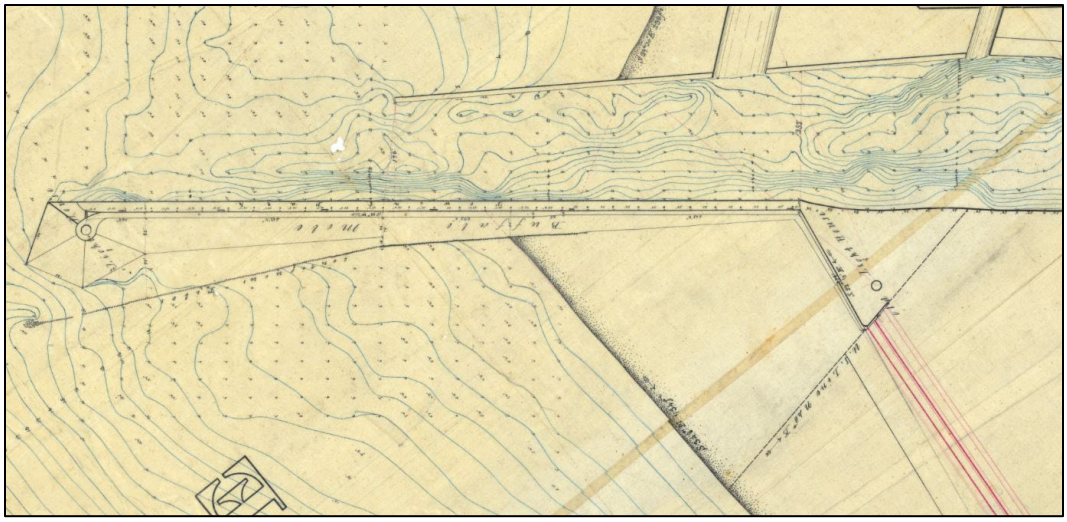


Figure 17. Detail of mole head with octagon outline of 1833 lighthouse and staircases down to the towpath, 1838. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

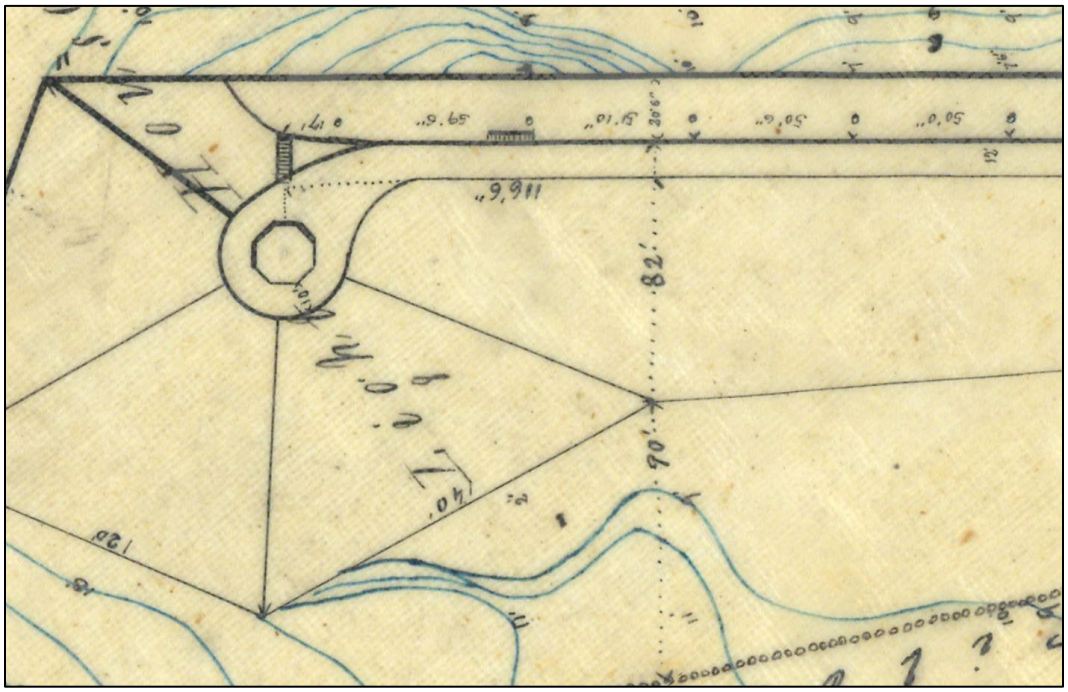
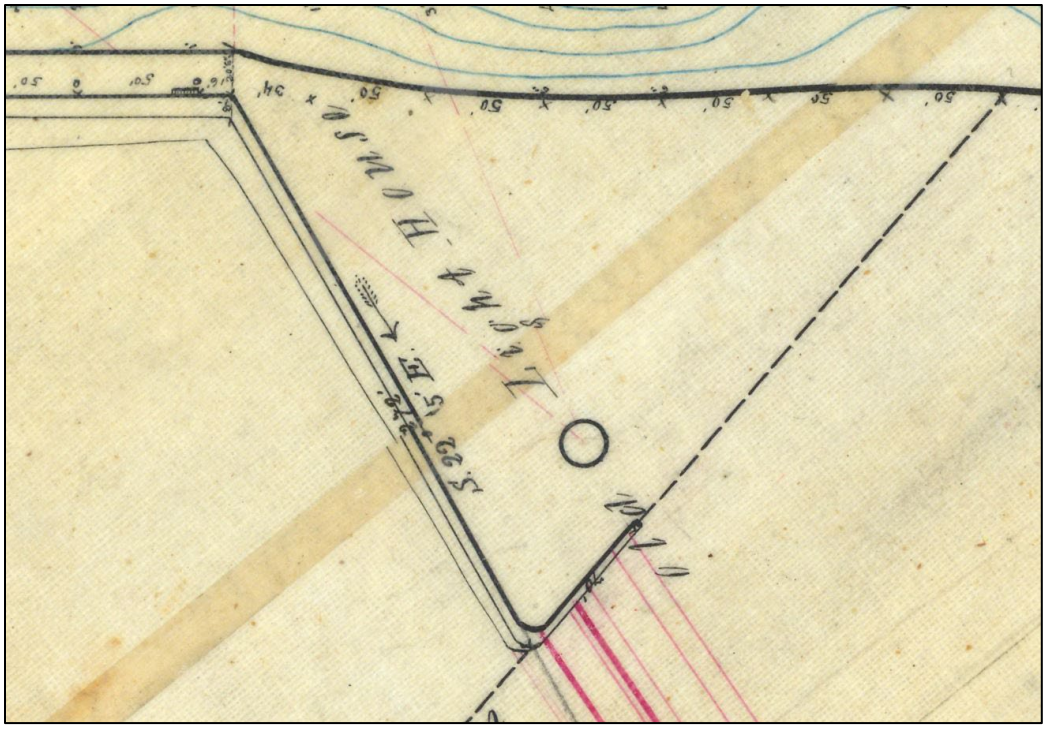
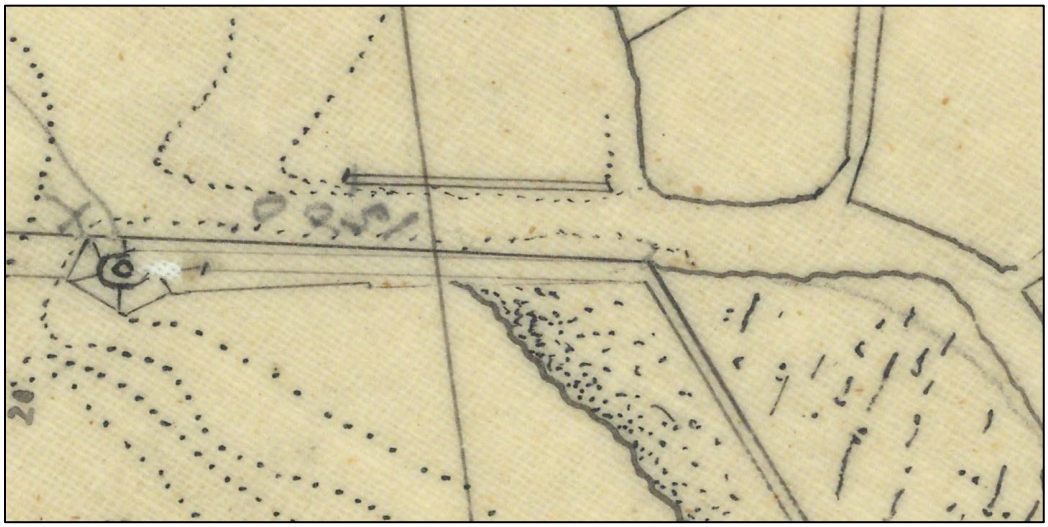


Figure 18. Detail of location (*round circle*) of the 1818 lighthouse on east end of the mole, and also note that the towpath and mole end where the seawall begins and heads southeast, 1838. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



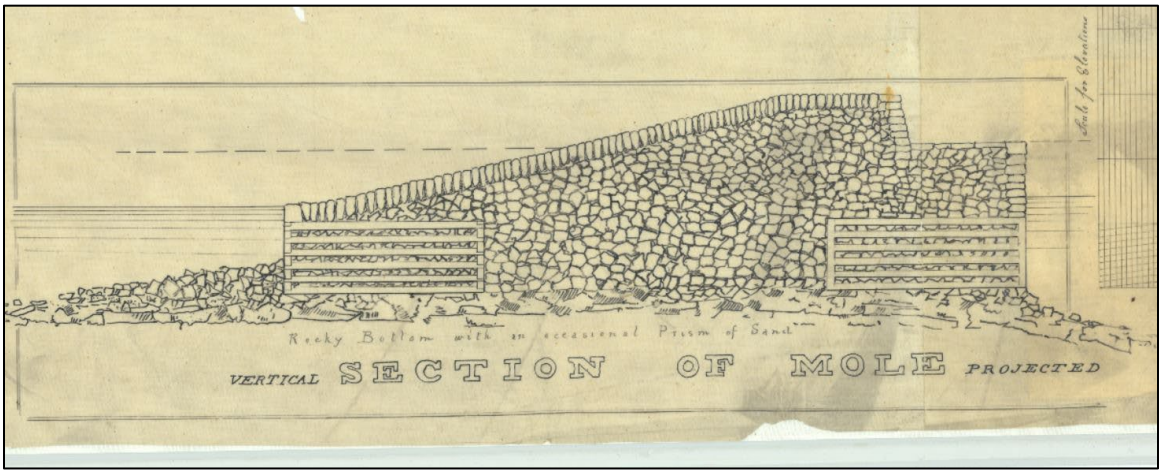
The drawing from 1839 shows that sand and soil are starting to accrete against the stone incline plane and the seawall that extends down the peninsula. It also shows that the mole ends where the seawall begins and heads southeast (Figure 19). The 1818 lighthouse to the east of the seawall is not marked on this drawing.

Figure 19. Detail of the mole on an 1839 drawing. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



A section through the mole from 1839 shows a slightly different construction with wood ties on both the tow path and incline plane sides of the mole (Figure 20).

Figure 20. Section through mole, 1839. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



The Great Storm of 18 October 1844 damaged parts of the mole. The mole was repaired in 1845 utilizing heavy stones averaging four feet in length that were dressed on the bottom and top while the face was rough. These stones were laid with hydraulic cement (Kolber and Wrobel 2021). No drawings or photographs were found for these repairs.

A photograph from 1858 shows the US lighthouse storehouse and other buildings at the eastern end of the mole structure (Figure 21). The photograph confirms what is shown on the drawing in Figure 18 that the mole structure ended at the seawall and the land on the eastern end sloped down into the river. The 1818 lighthouse which was shown on maps does not appear in this photograph, but the keeper's dwelling and the storehouse might be blocking it from this vantage point.

Figure 21. Photograph of the east end of the mole, looking southwest (US Lighthouse area), 1858. (Record Group 26: Records of the US Coast Guard, RG26-LG-44-5, NARA, College Park, MD. Public domain.)

A large drawing from 1870 is also one of the most detailed of any of the drawings examined by the researchers (Figure 22 through Figure 24). It specifically shows the differences in the stone for the incline plane, the wall, and the tow path (Figure 22 and Figure 23). A section of the mole from the 1870 drawing shows different wood cribbing aiding in the structure of the stone tow path (Figure 24). The stone stairs are shown along the length of the stone wall and at the base of the 1833 lighthouse (Figure 22 and Figure 23).

Figure 22. Detail of mole head showing talus, top of wall, and stone tow path, 1870. (Buffalo District files. Public domain.)

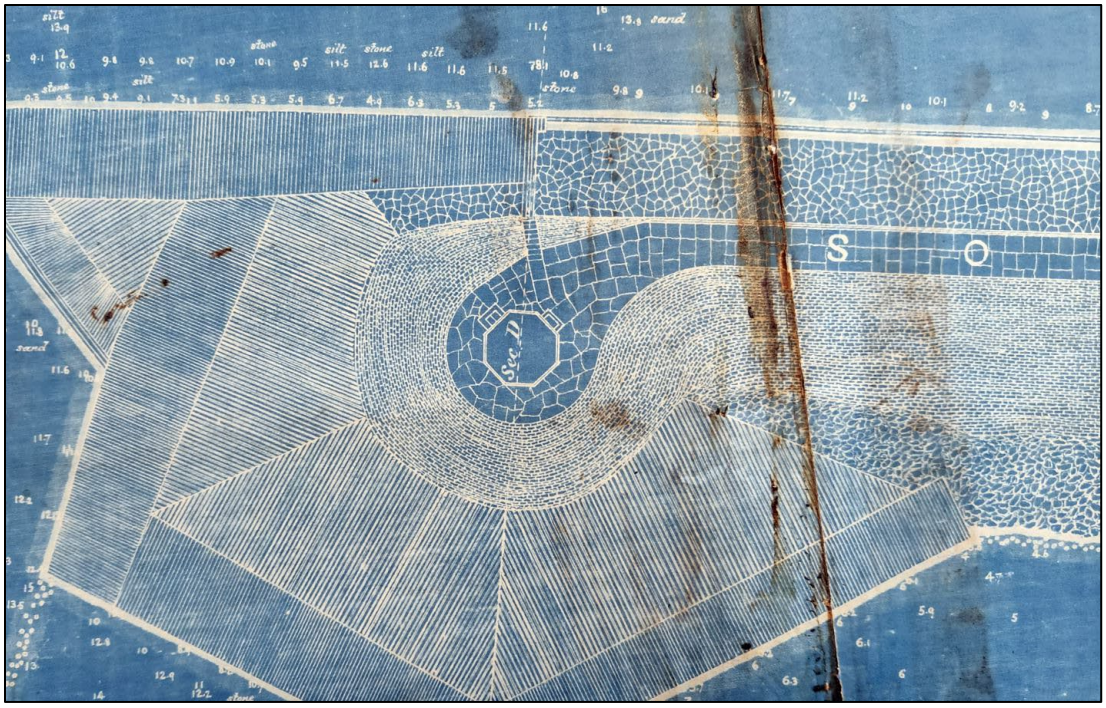


Figure 23. Detail of plan of mole showing incline plane, top of stone wall, and stone tow path, 1870. (Buffalo District files. Public domain.)

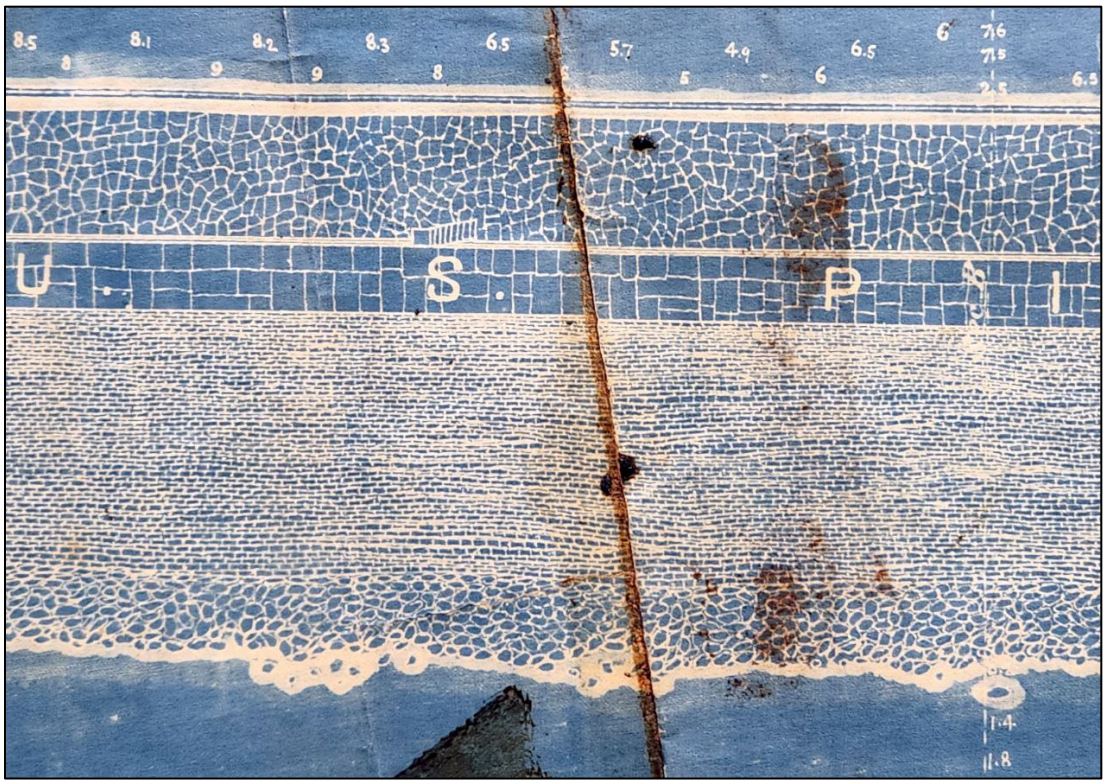
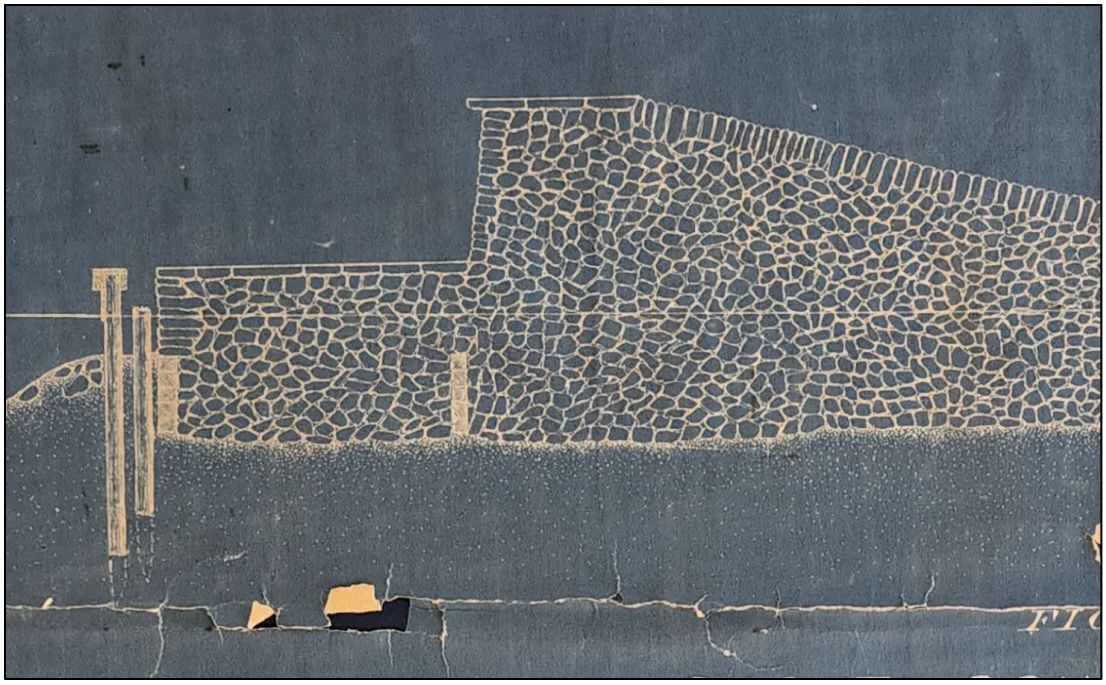


Figure 24. Section through mole showing stone tow path, stone wall, and incline plane, 1870. (Buffalo District files. Public domain.)



A drawing from 1879, while not as detailed as the 1870 drawing, does show the stone stairs (Figure 25 through Figure 27). The towpath is marked as 25 feet wide but construction materials are not noted.

Figure 25. Detail of an 1879 drawing showing entire mole. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

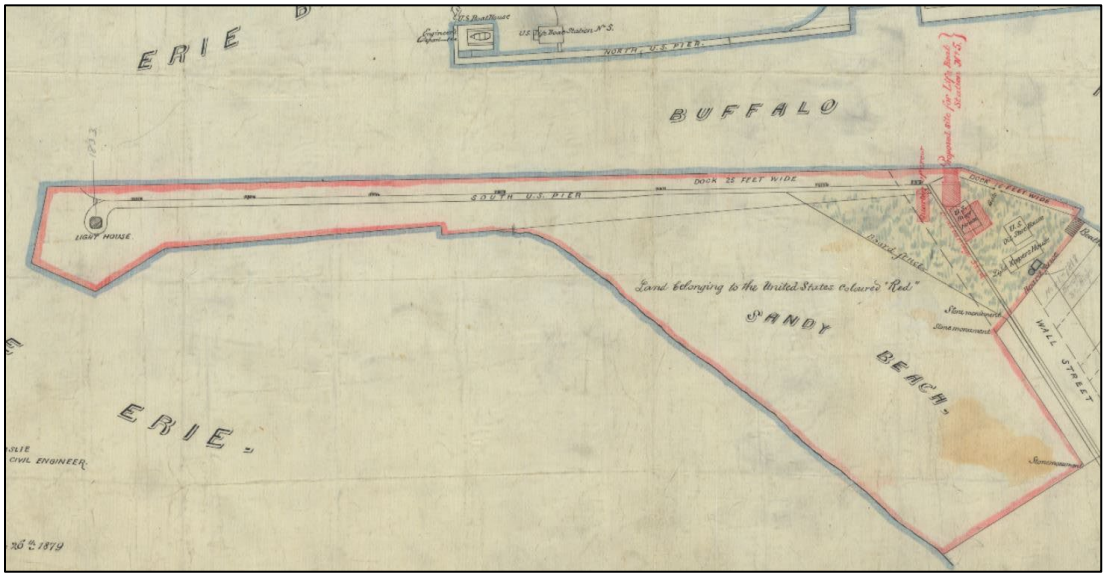


Figure 26. Detail of mole head showing lighthouse and stone stairs. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)

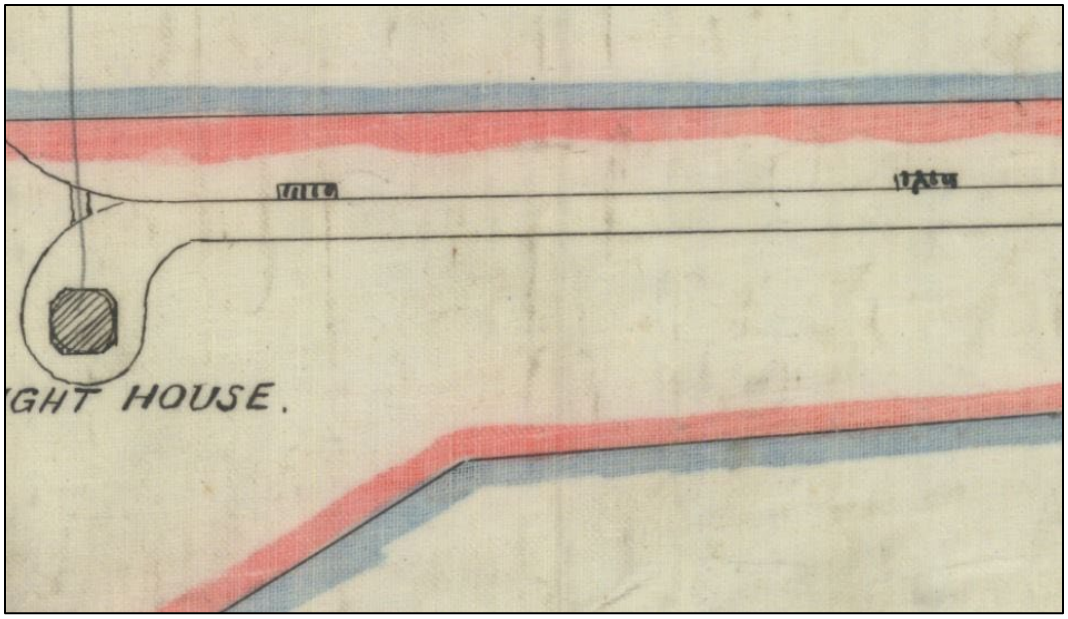
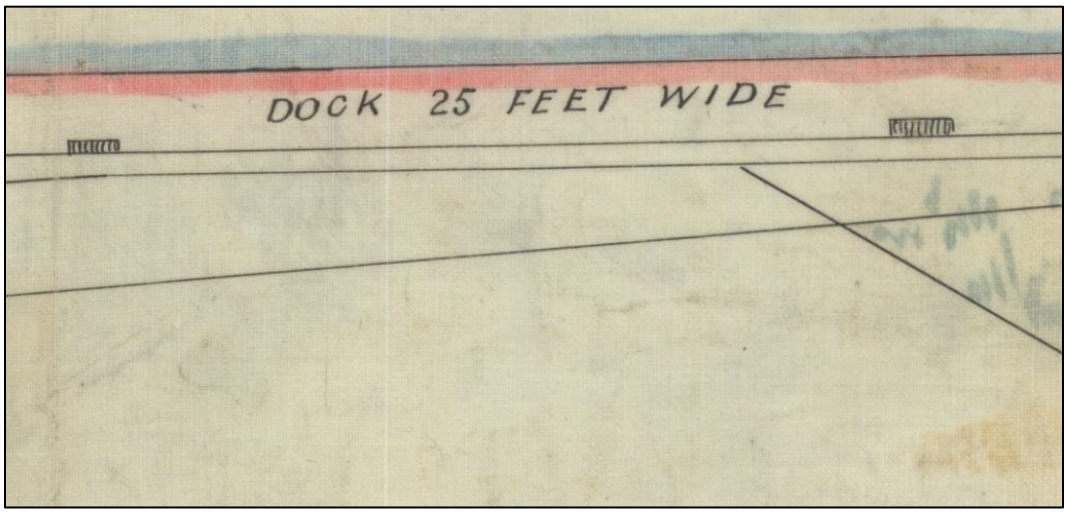
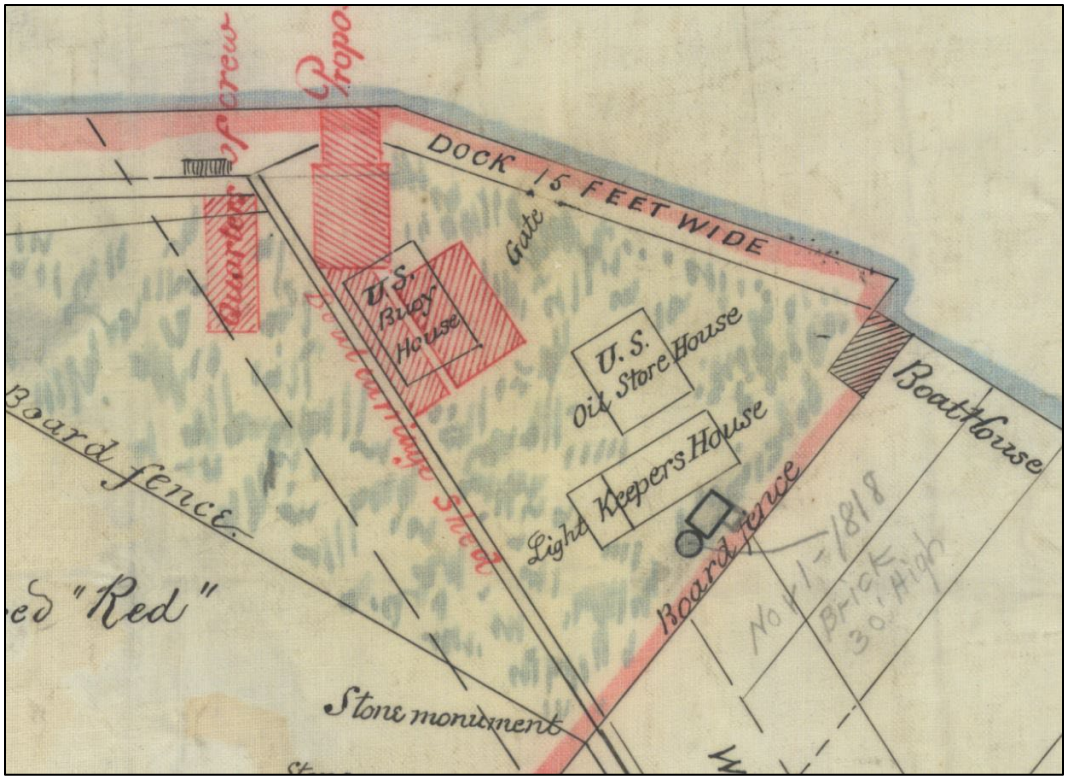


Figure 27. Detail of mole showing width of stone tow path, top of wall, and stone stairs, 1879. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



The drawing also shows the three buildings in the lighthouse area at the eastern end of the mole including the 1818 brick lighthouse marked in black outline. The other buildings outlined and hatched in red are proposed at this point. A new dock is noted as 15 feet wide extending east of the seawall (Figure 28). The 1879 Report of the Tenth Lighthouse District map depicts the new boathouse shown in hatched red and a lifeboat ramp that was constructed through the rough wall of the old pier and adjacent to the to the 1845 rebuilt section of the mole.

Figure 28. Detail of mole showing US lighthouse area (note 1818 lighthouse is extant and penciled in as brick), 1879. (Civil Works Map File, 1818–1947, RG 77-CWMF, NARA, College Park, MD. Public domain.)



A photograph from 1879, a drawing from 1880, and a lithograph from 1880 show very clearly how the mole was constructed out of stone and how vessels moored along the tow path (Figure 29 through Figure 31).

Figure 29. Looking down from the 1833 lighthouse showing stone incline plane, stone wall, and stone tow path, 1879. (Buffalo History Museum. Public domain.)

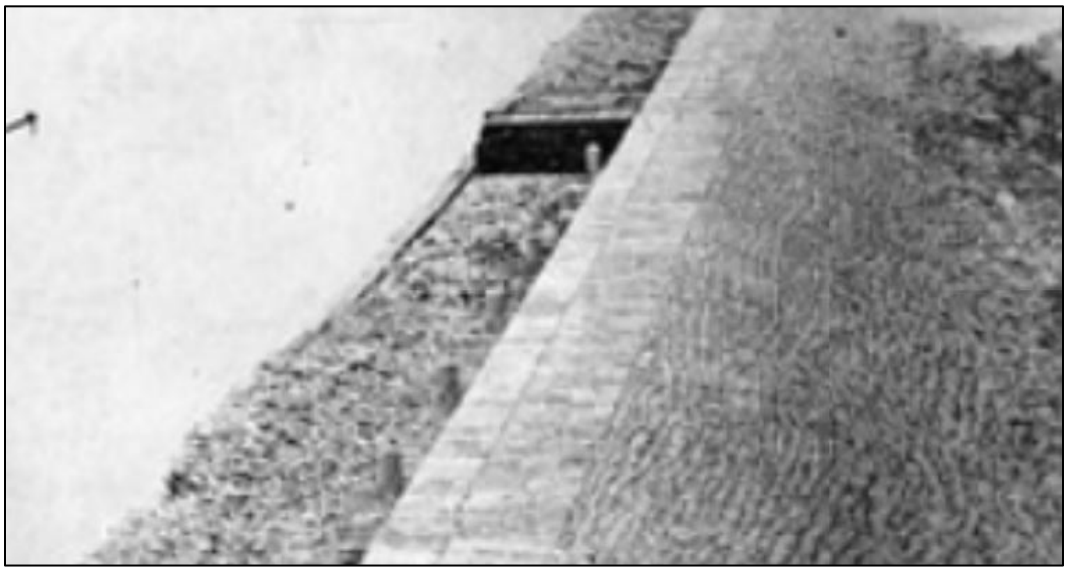


Figure 30. Drawing of the mole head and base of the lighthouse showing people walking along the top of the stone wall, the wood cribbing, stone cleat, and a boat docked along the tow path, 1880. (Buffalo History Museum. Public domain.)

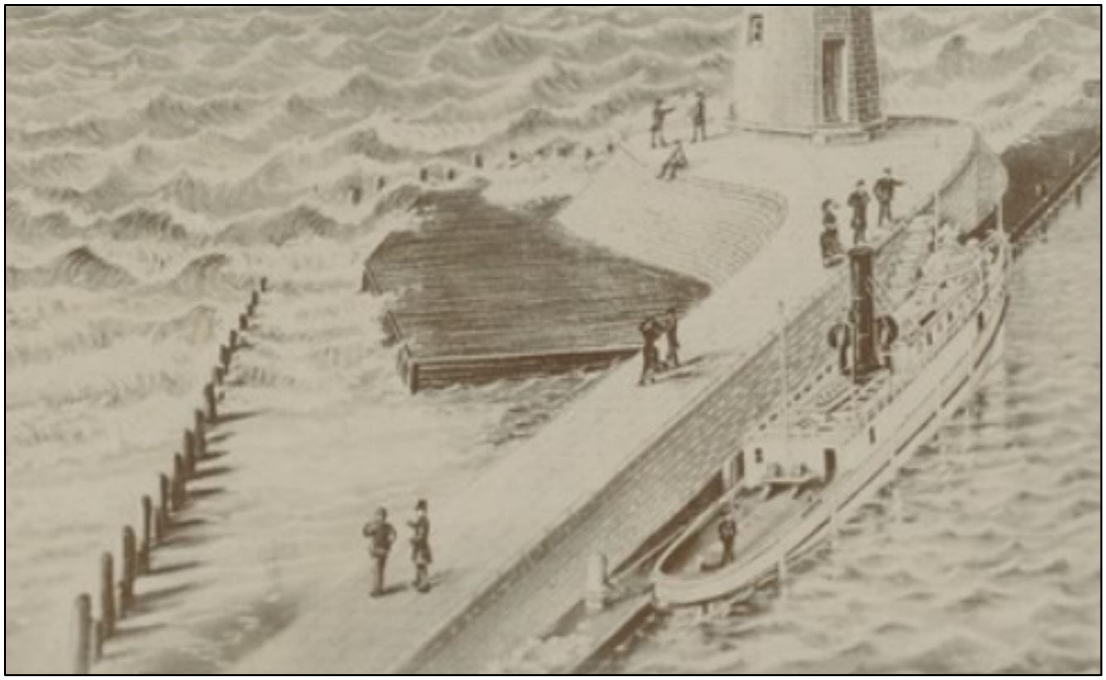
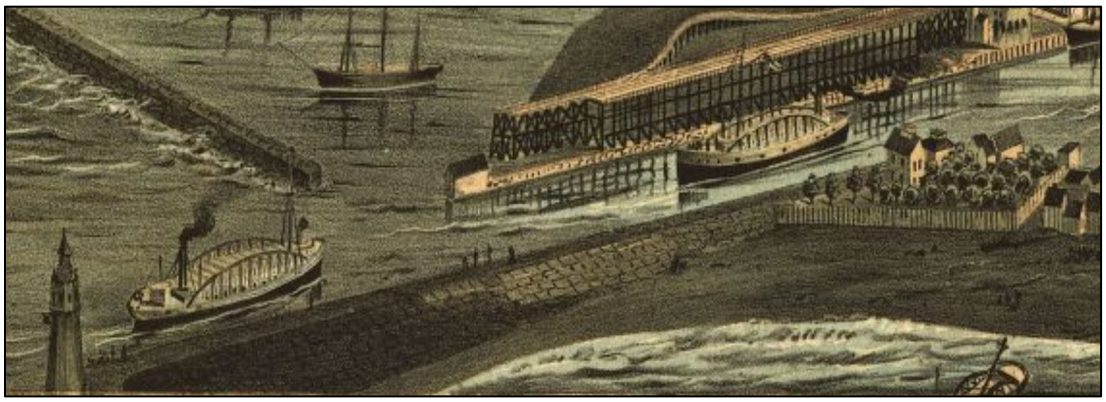


Figure 31. Portion of an 1880 lithograph showing the mole with its stone incline plane, lighthouse at the west end, and the US lighthouse area on the east end. (LC-USZ62-23771, Library of Congress. Public domain.)



An 1883 drawing does not show much change in the mole, although the extreme east end of the lighthouse area is marked for a new lighthouse tender docking slip (Figure 32). The 1883 drawing shows the stone stairs and stone incline plane (Figure 33). The drawing marks the site of the 1818 lighthouse (Figure 34) and the buildings of the US Life-Saving Service and the US Lighthouse Service.

Figure 32. Portion of an 1883 drawing showing the entire mole. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

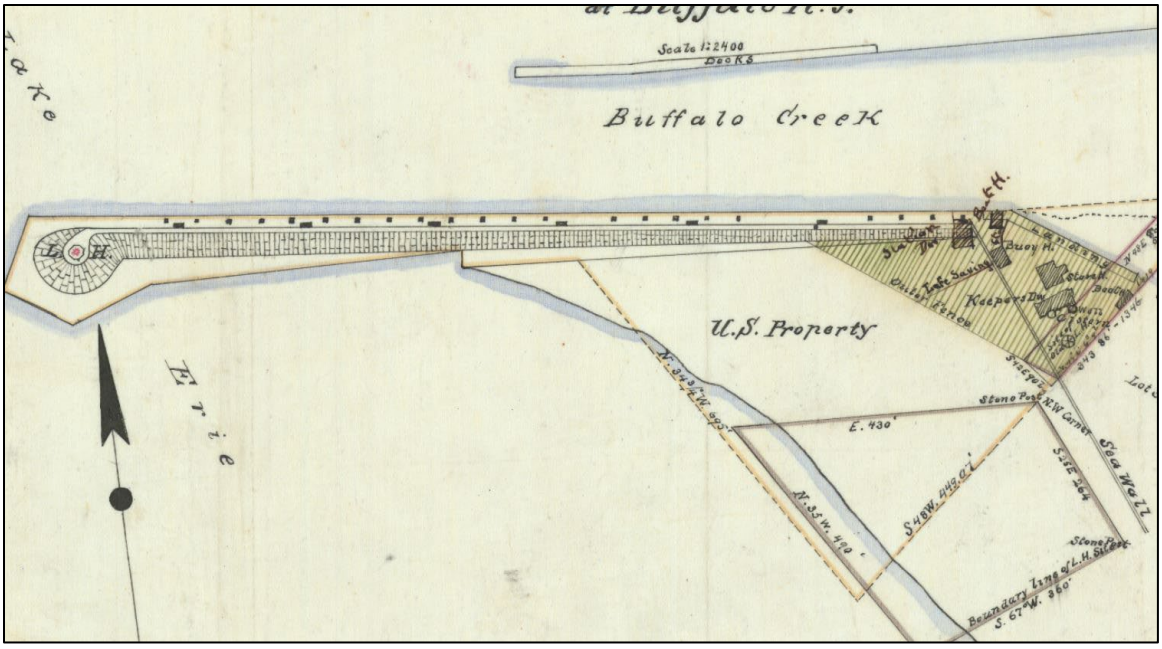


Figure 33. Detail of the mole head showing stone incline plane, path, and stairs leading down to the tow path, 1883. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

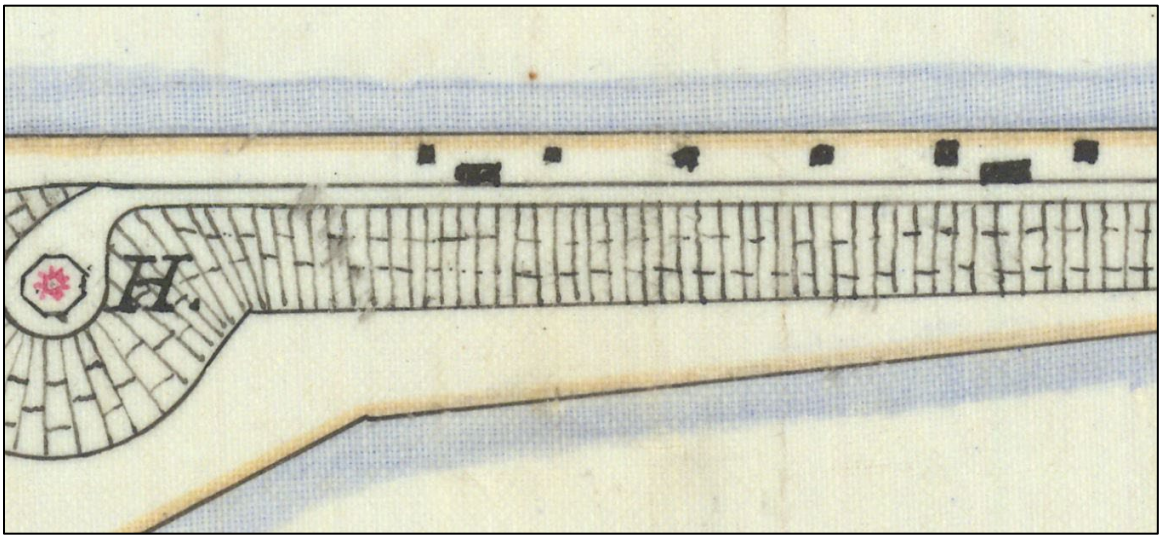
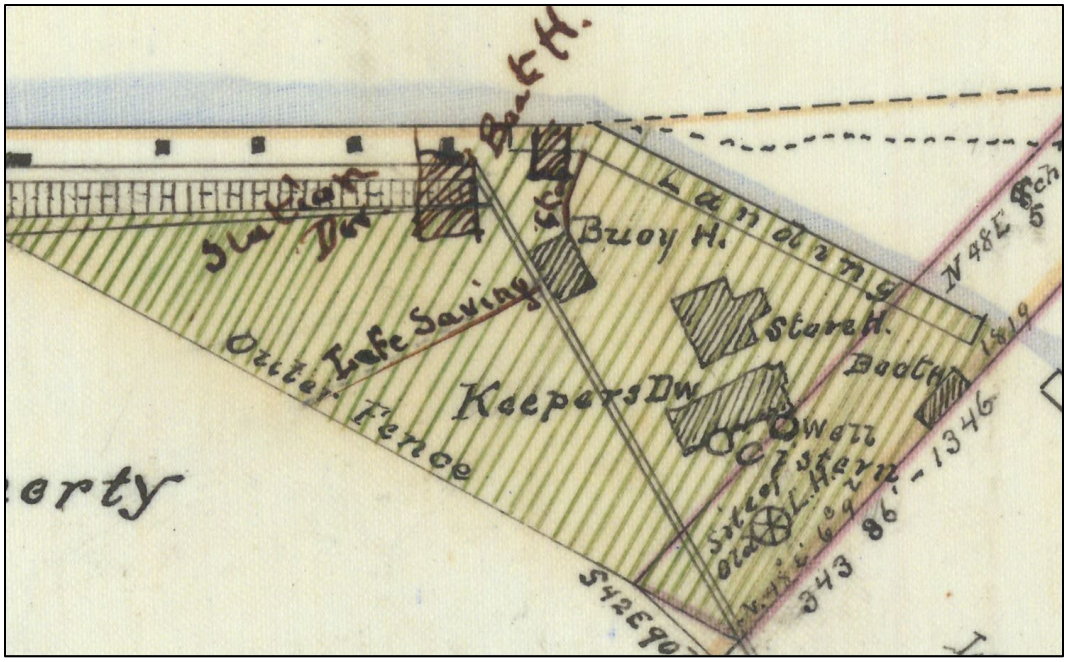


Figure 34. Detail of the east end of the mole showing location of buildings for the US Life-Saving Service and US Lighthouse, 1883. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)



An 1885 drawing is similar to the 1883 drawing (Figure 35 and Figure 36) except the lifeboat ramp at the end of the stone wall of the mole is complete. This ramp can be seen in an 1885 photograph (Figure 37 and Figure 38). This photograph shows that the brick and stone foundation storehouse (see Figure 21) is still extant and that the boathouse, lifeboat ramp, and lifesaving quarters have been erected. Notice that to the right of the lifeboat ramp and below the lifesaving quarters is a rough stone wall and stone stairs (Figure 38).

Figure 35. Detail of an 1885 drawing showing the extent of the entire mole (note that 1818 lighthouse is extant). (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

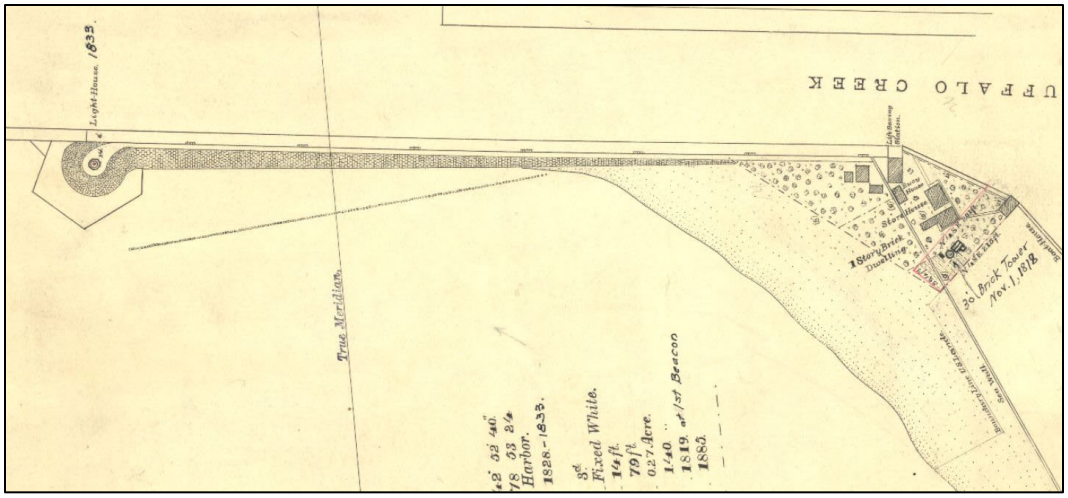


Figure 36. Detail of the mole showing stone incline plane, stairs, and tow path, 1885. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

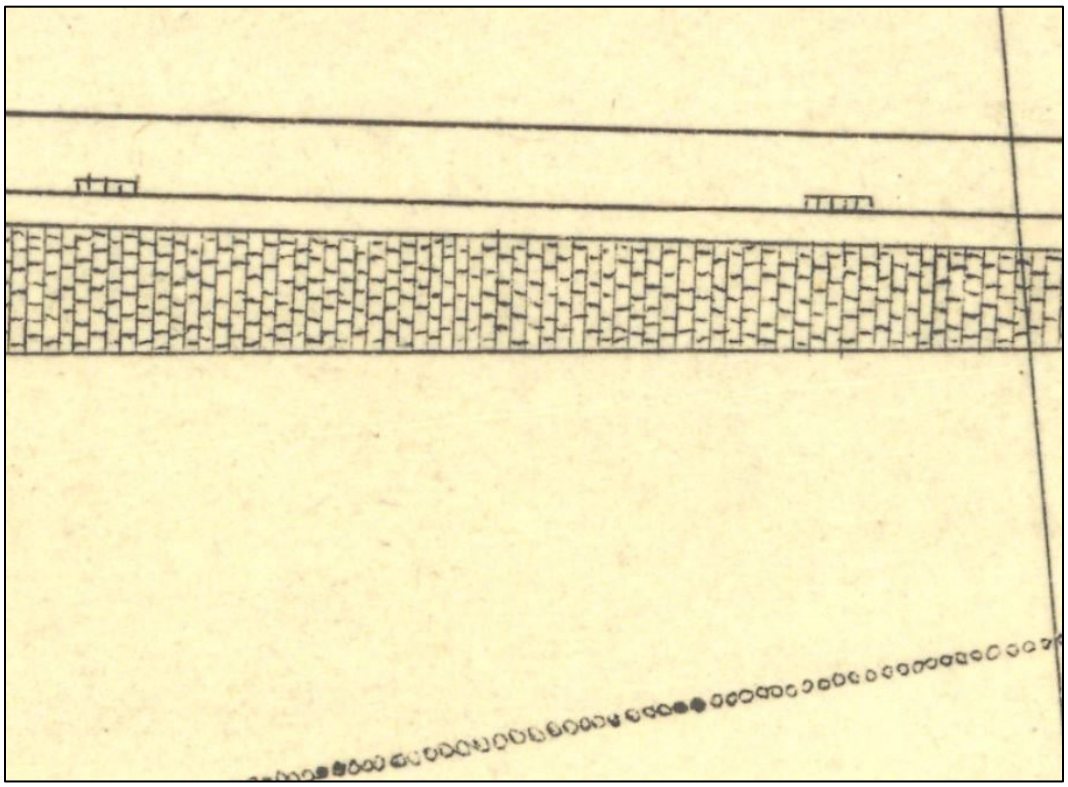


Figure 37. Looking south at the US Life-Saving Service buildings at the east end of the mole (note slip leading to boat house), 1885. (Buffalo Lighthouse Association. Public domain.)

Figure 38. Detail of stone wall, stone stairs, bench, and wood cribbing along tow path at the US Life-Saving Service buildings, 1885. (Buffalo Lighthouse Association. Public domain.)

The 1886 drawing shows the stone incline plane and the removal of the 1818 brick lighthouse (Figure 39 through Figure 41).

Figure 39. Detail of an 1886 drawing showing extent of mole. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

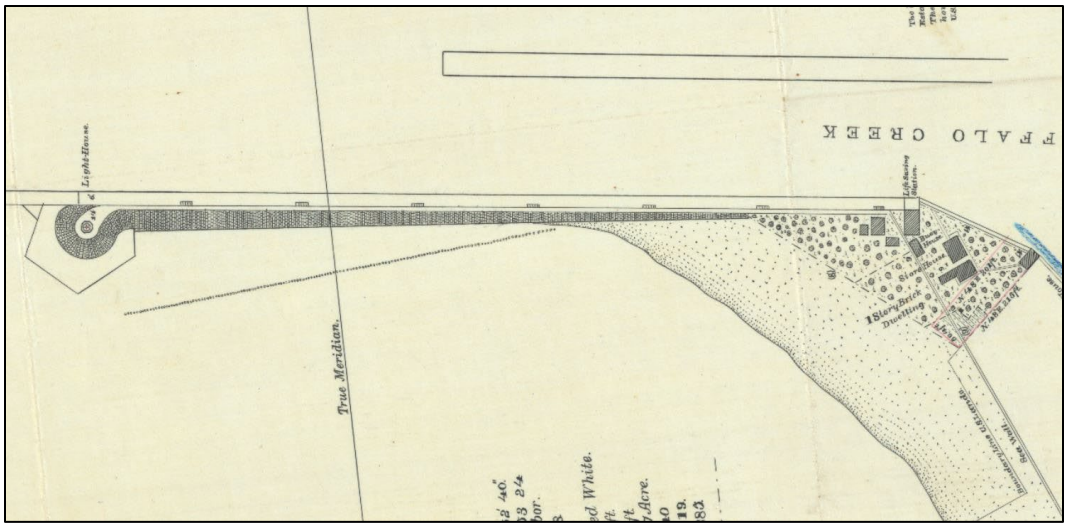


Figure 40. Detail of west end of mole showing stone talus, lighthouse, stone incline plane, top of wall, stairs, and tow path, 1886. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

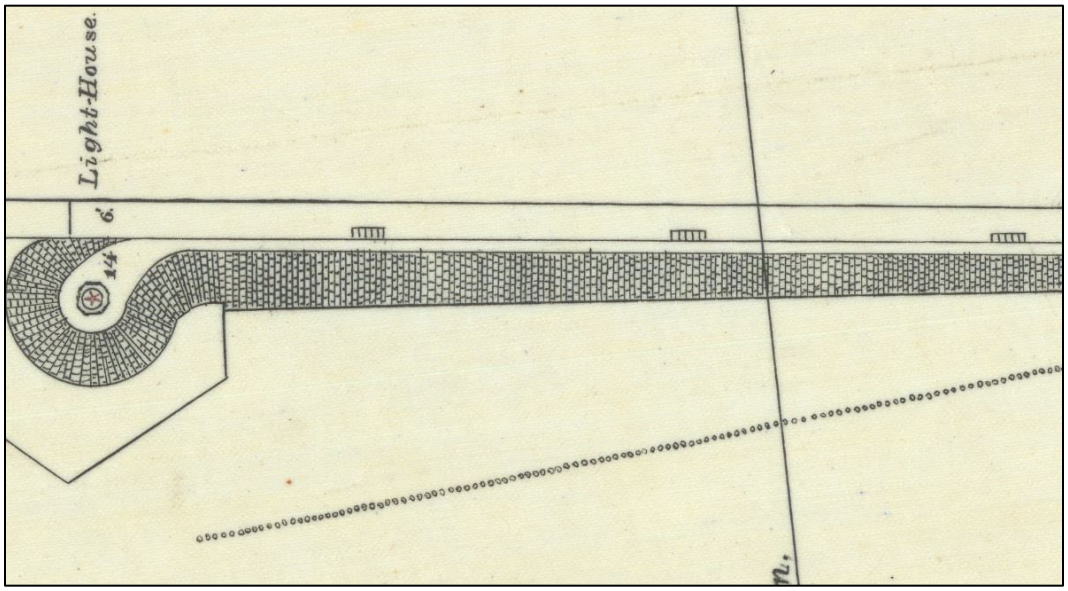
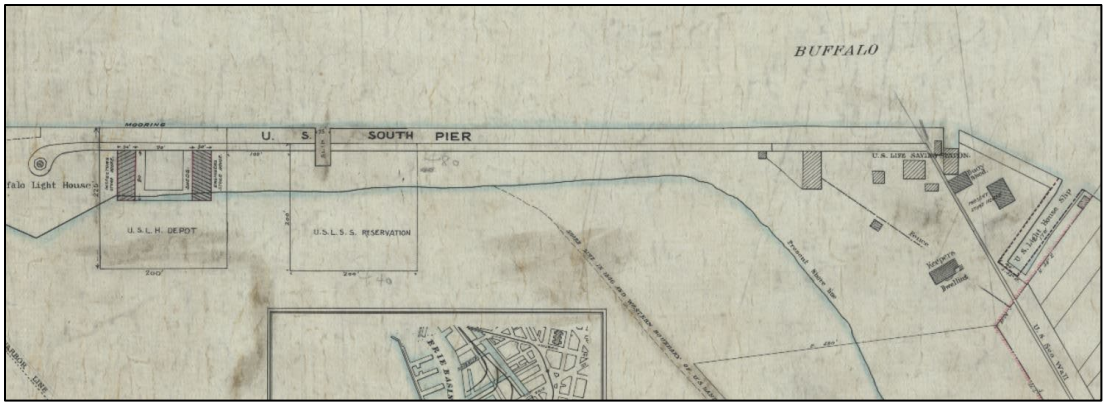


Figure 41. East end of mole showing the US Life-Saving Service and US Lighthouse Service buildings (note that the 1818 light house has been removed), 1886. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

A drawing from 1898 shows the lighthouse tender slip at the eastern end of the area (Figure 42) and the erection of US Life-Saving Service buildings on the western side of the mole east of the 1833 lighthouse. This drawing also confirms how sand and soil accreted against the stone incline plane.

Figure 42. Detail of an 1898 drawing of entire mole (note construction of lighthouse tender slip on the eastern end where the 1818 lighthouse stood). (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)



In 1900, the stone tow path began to be replaced with a concrete banquette (Figure 43). A photograph from 1900 confirms the removal of the stone tow path and its replacement with a concrete banquette (Figure 44).

Figure 43. Detail of a 1900 drawing showing stone tow path was replaced with concrete banquette. (Buffalo District files. Public domain.)

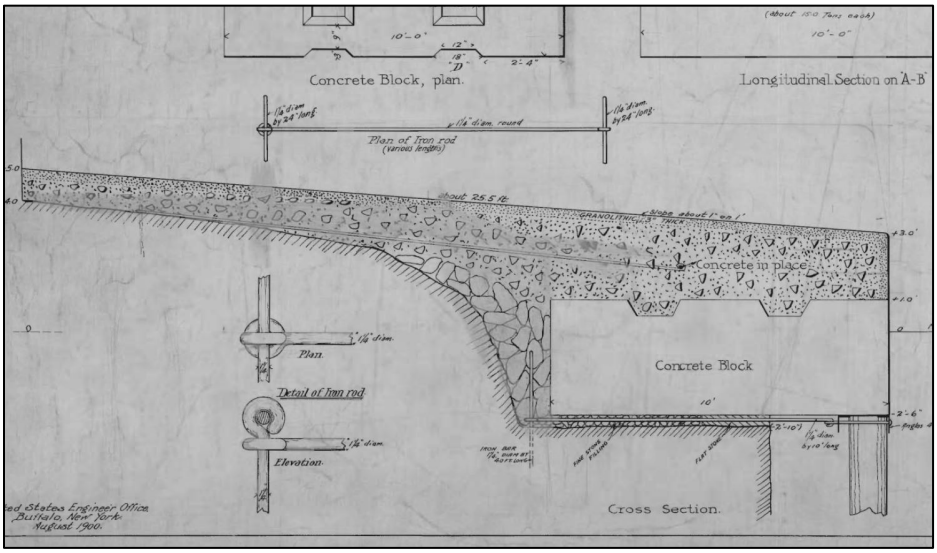


Figure 44. Looking west along top of stone wall with stone rubble in the location of the stone tow path (note stone stairs are extant), 1900. (Buffalo Lighthouse Association. Public domain.)

By 1903, drawings and photographs documented the construction of more US Life-Saving Service buildings on the west end of the mole (Figure 45 and Figure 47) and the removal of many US Life-Saving Service and US Lighthouse Service buildings on the eastern end. This new construction included a new lifeboat ramp east of the lighthouse (Figure 46).

Figure 45. Drawing of entire mole showing growth of the US Life-Saving Service station, 1903. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

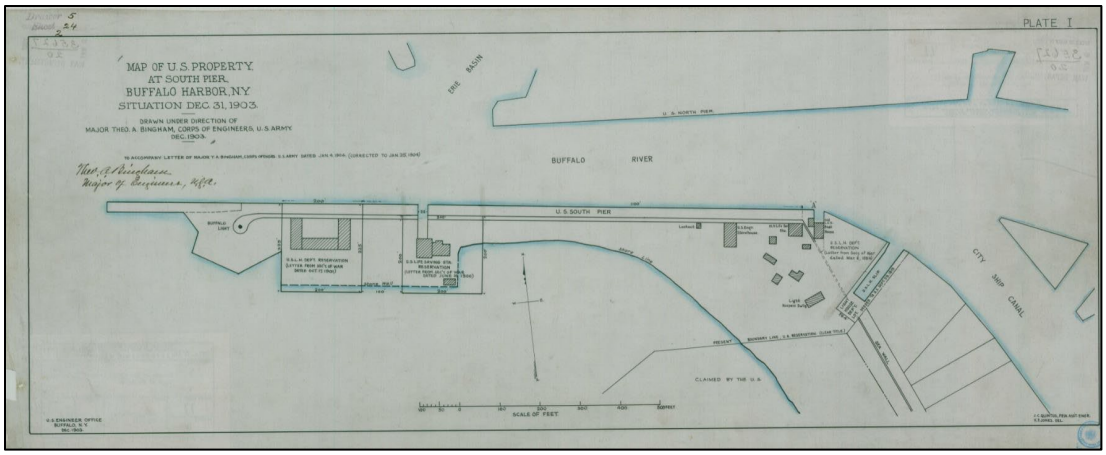


Figure 46. Detail of the west end of mole showing new US Lighthouse Service buildings, US Life-Saving Service station buildings, and the ramp cut through the mole wall, 1903. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

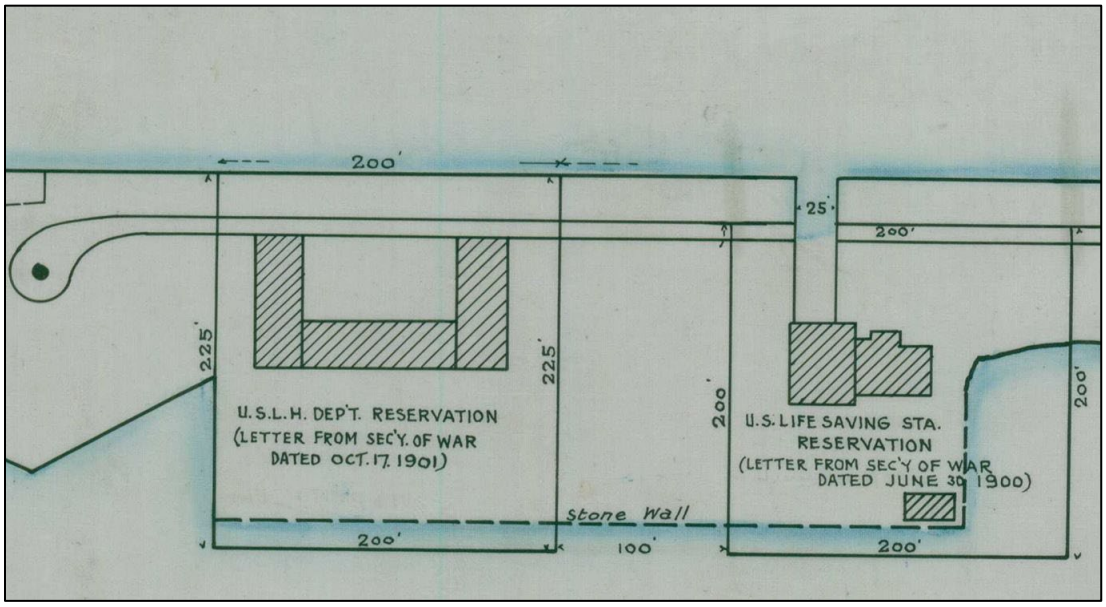


Figure 47. Looking west along the stone wall with the stone incline plane at the US Life-Saving Service station buildings under construction, 1903. (Buffalo Lighthouse Association. Public domain.)

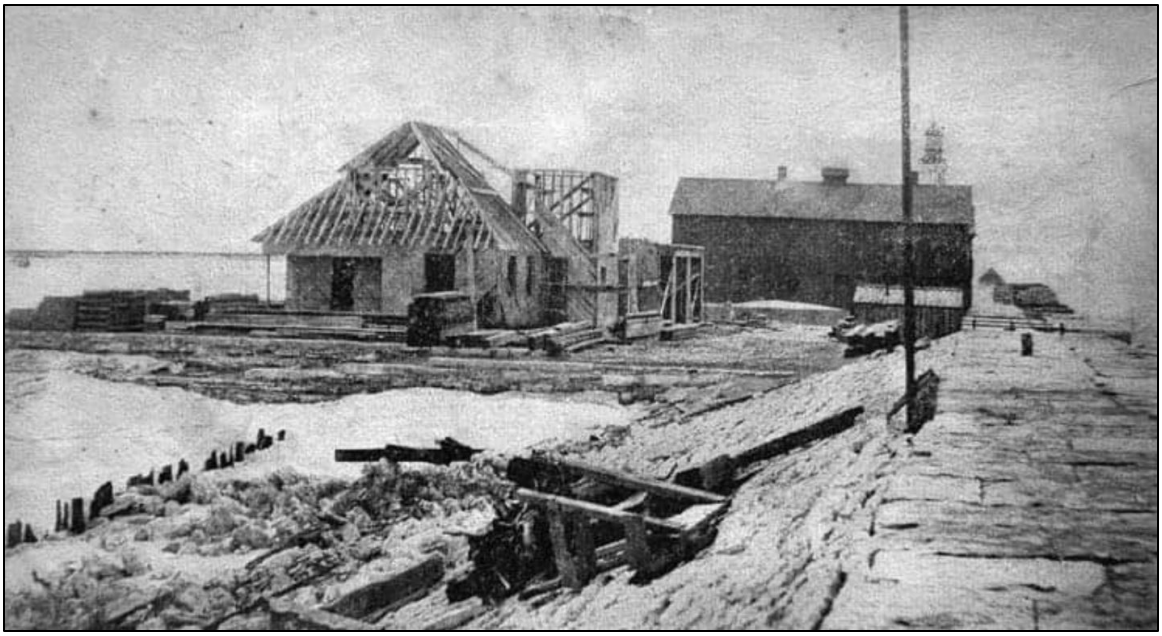
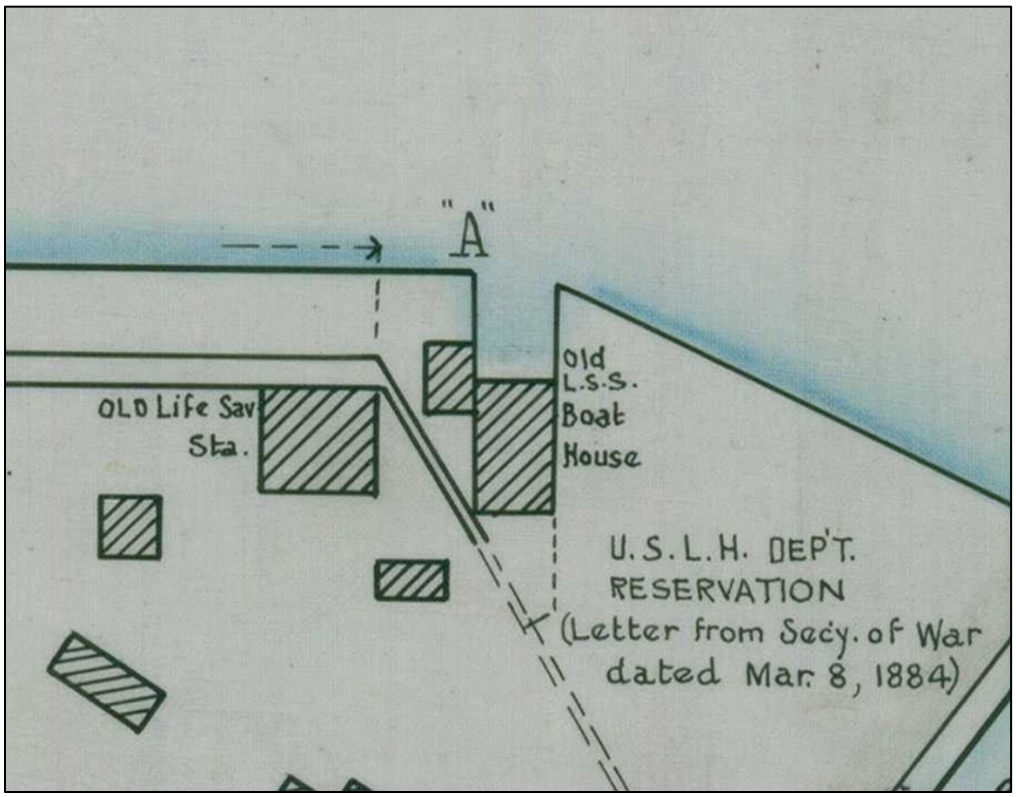


Figure 48. Detail of the east end of mole showing "old" US Life-Saving Service station buildings, 1903. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)



A drawing from 1924 shows additional buildings on the western end and eastern end of the mole, but it also confirms that the tow path is now concrete, and the stone wall is extant (Figure 49 through Figure 51). Figure 49 also shows how part of the stone wall was removed north of the buildings on the western end of the mole and a slip cut through the concrete banquette.

Figure 49. Drawing of entire mole showing growth of the US Life-Saving Service station, 1924. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

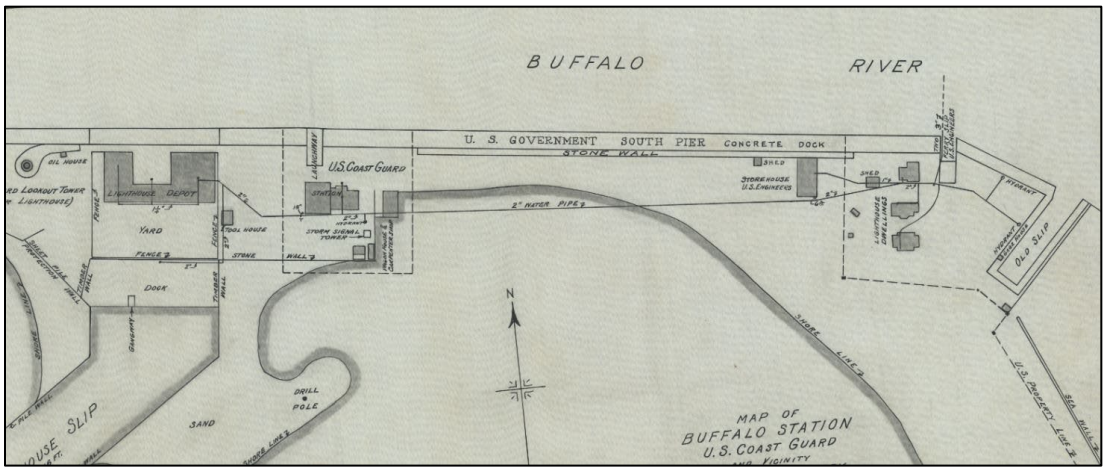


Figure 50. Detail of drawing showing that the stone wall is extant, and the tow path is now concrete, 1924. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

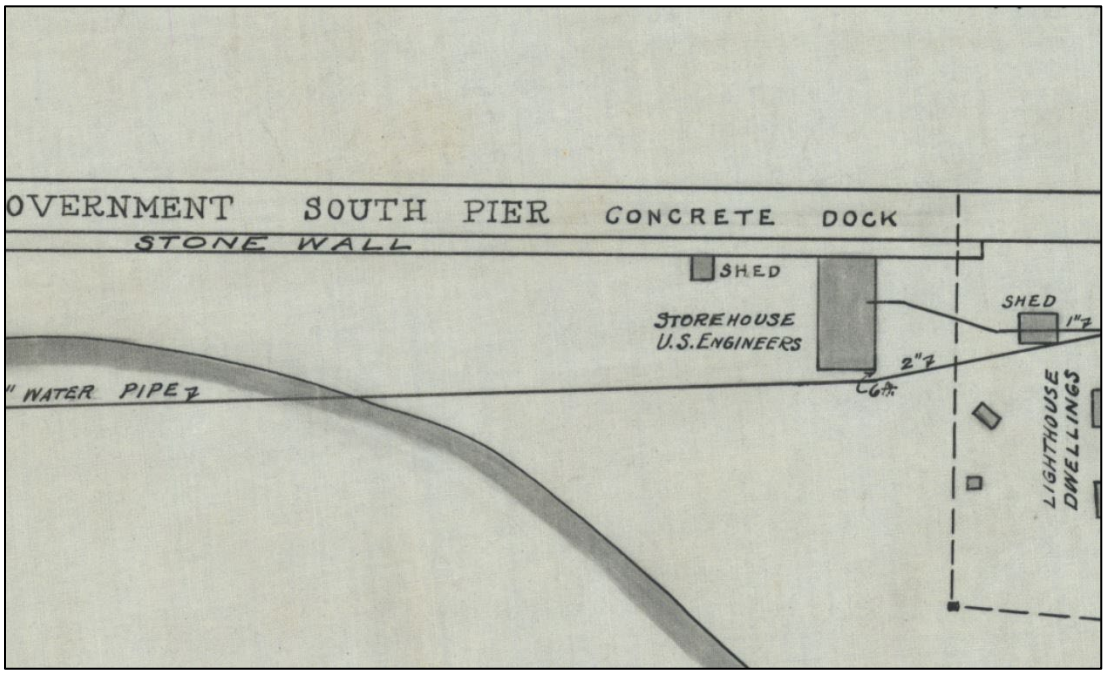
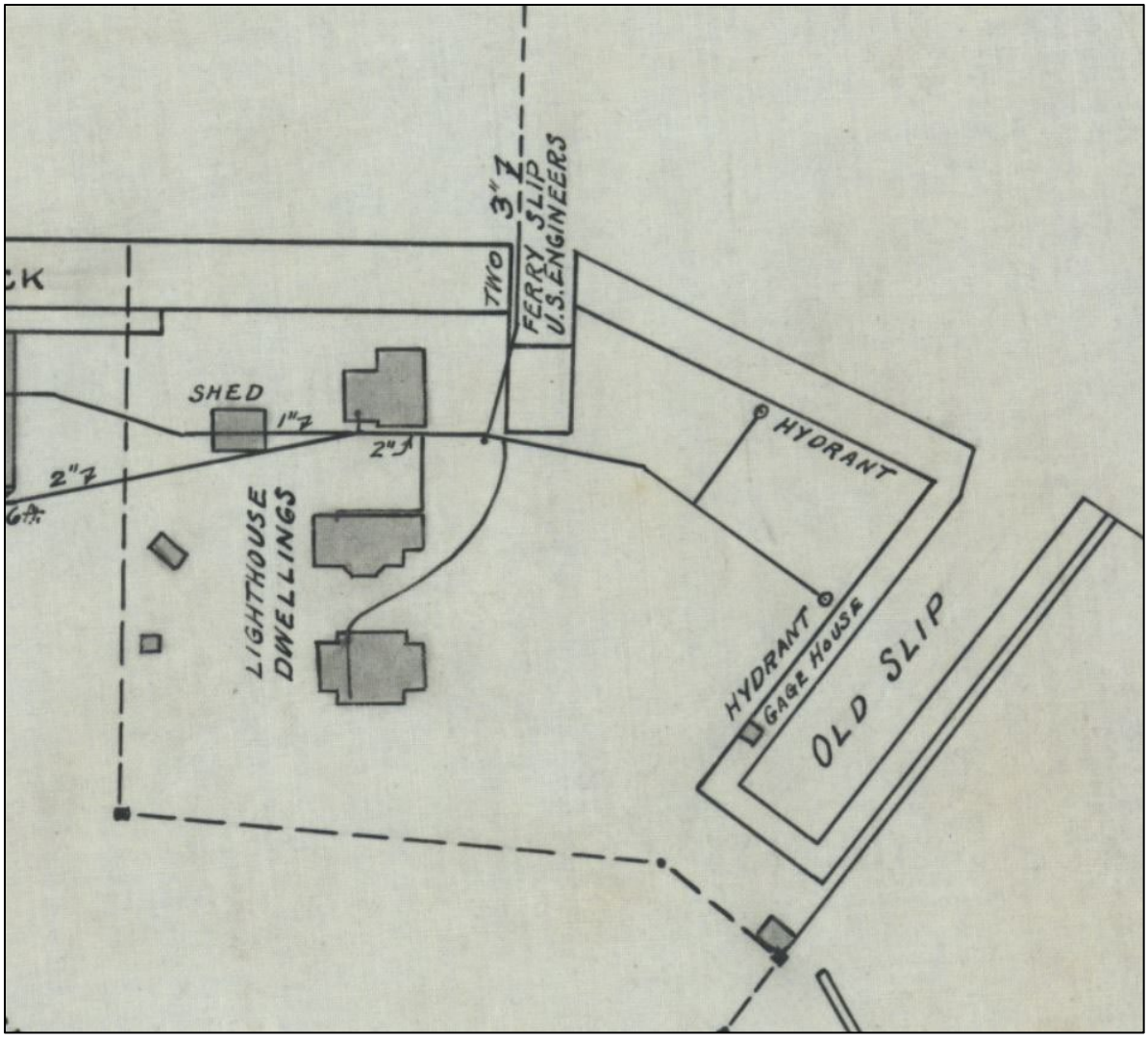


Figure 51. Detail of drawing showing the eastern end of the mole with new buildings and two slips, 1924. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)



Drawings from 1933 show radical changes to the current US Coast Guard area on the west end of the mole (Figure 52 and Figure 53). Soil and sand completely cover the stone incline plane. The concrete banquette has been repaired once again (Figure 54 and Figure 55).

Figure 52. Detail of entire mole area in 1933. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

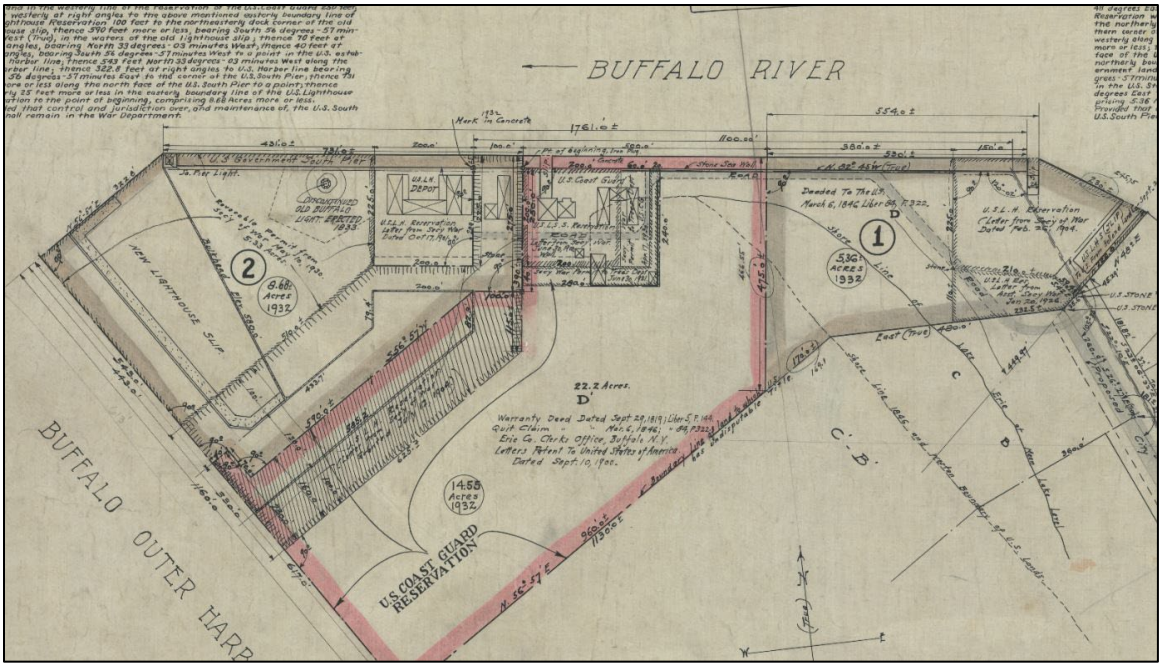


Figure 53. Detail of west end of mole with lighthouse and buildings for the US Life-Saving Service station, 1933. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

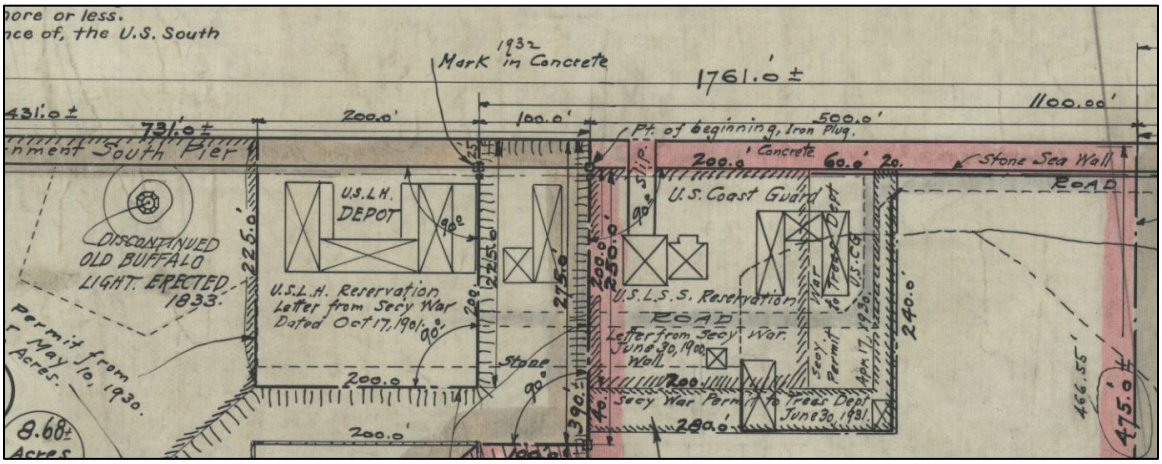


Figure 54. Detail section of the banquette being repaired with concrete, 1933. (Buffalo District files. Public domain.)

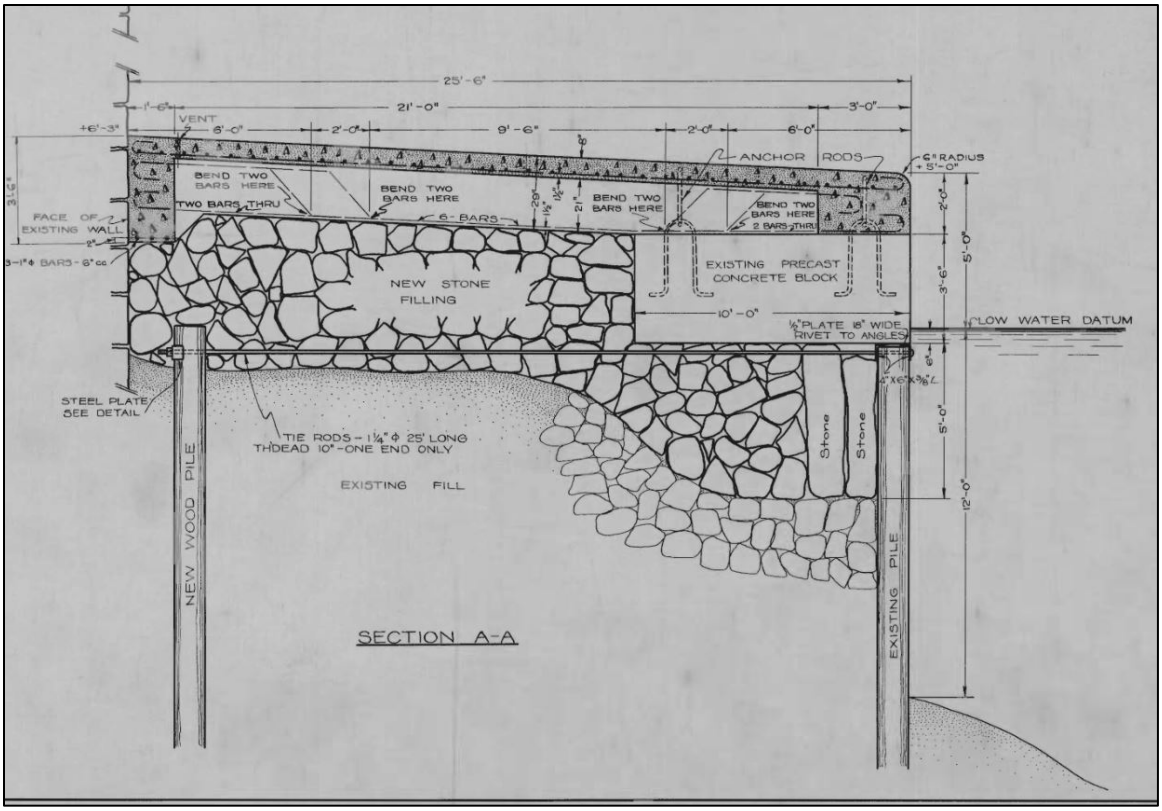
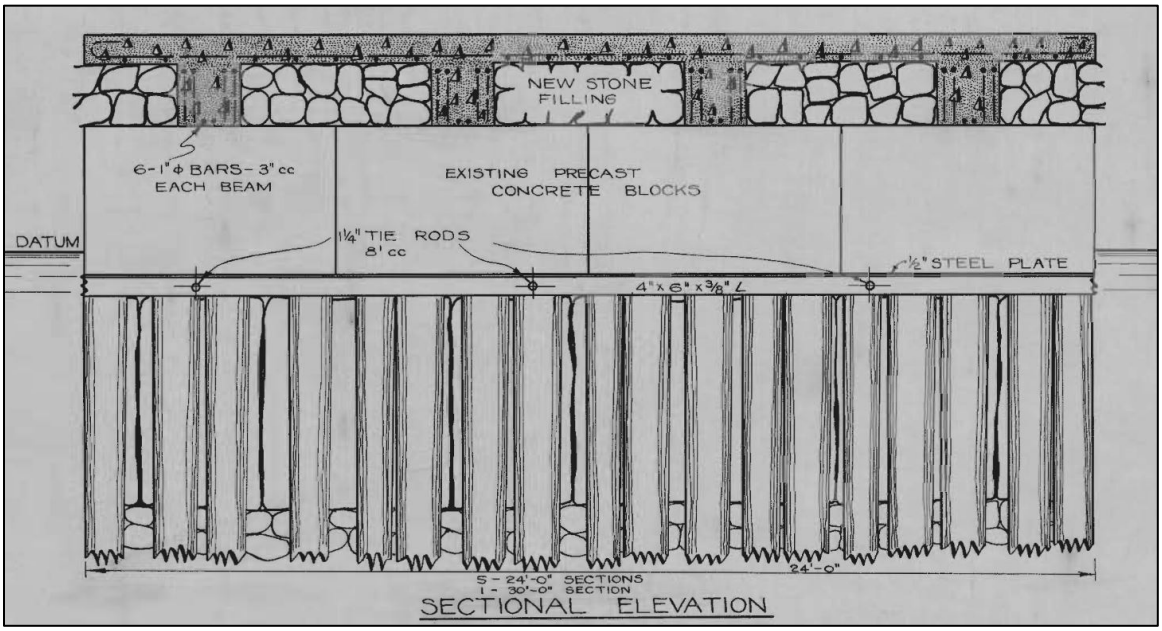


Figure 55. Detail elevation of the banquette being repaired with concrete, 1933. (Buffalo District files. Public domain.)



Drawings from 1944 do not show much change from 1933 but do reiterate that the banquette is concrete, the wall was shortened on the western end of the mole, and some buildings remain on the eastern end along with the two slips (Figure 56 through Figure 58). An aerial from 1951 shows much the same thing (Figure 59).

Figure 56. Detail of the entire mole structure, 1944. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

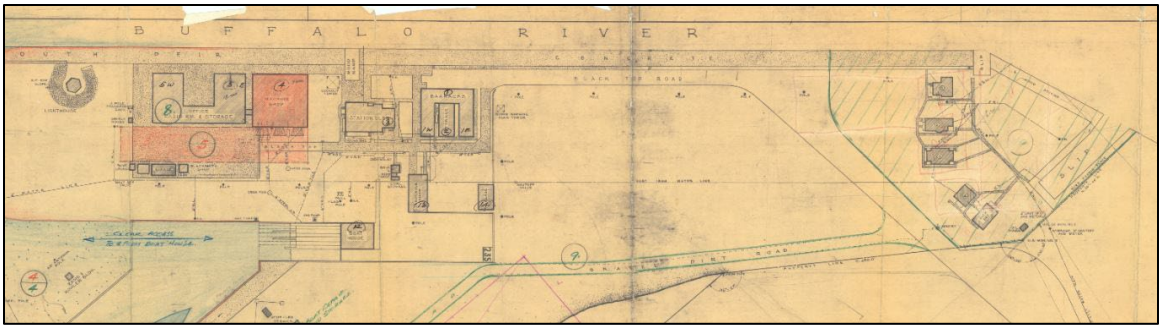


Figure 57. Detail of the mole showing that the tow path is concrete, there is a stone wall, and an asphalt road along the stone wall, 1944. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

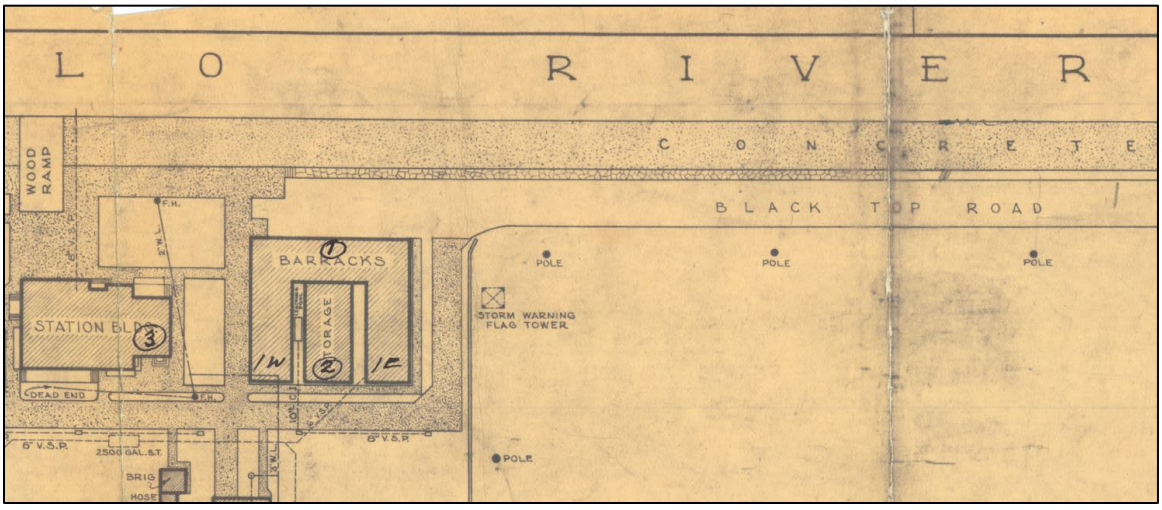


Figure 58. East end of the mole area showing location of buildings, 1944. (Department of Commerce. Bureau of Lighthouses. District 10. 1913–1939, RG26, NARA, College Park, MD. Public domain.)

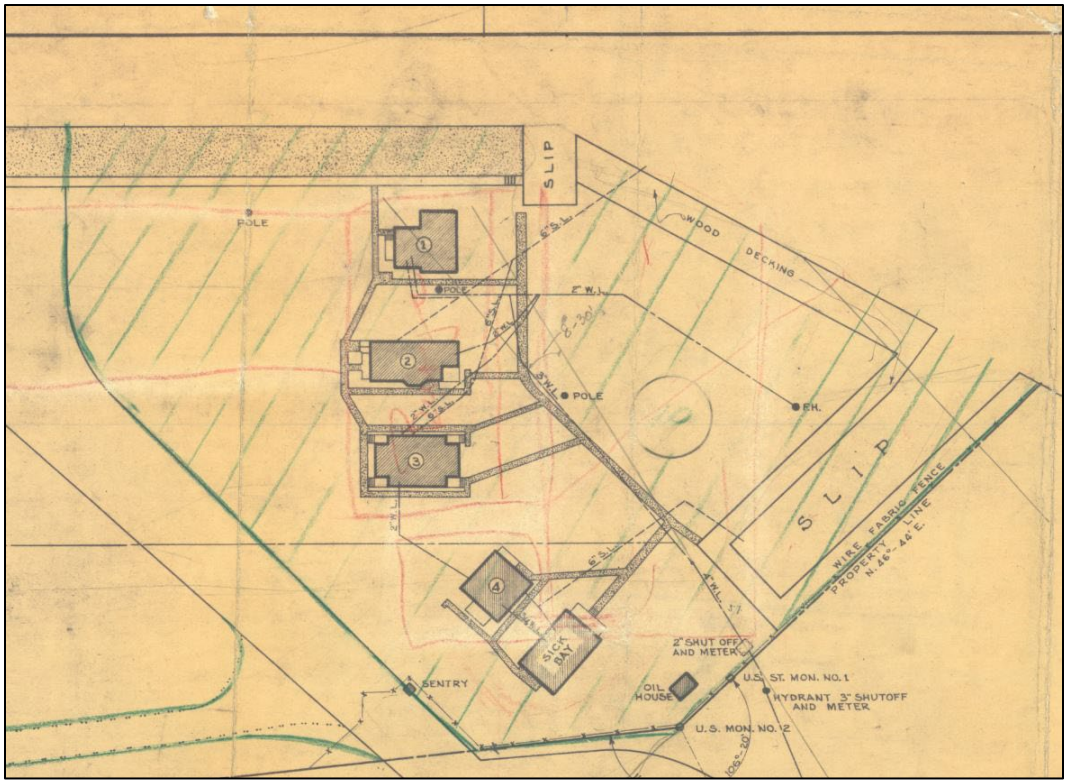


Figure 59. Detail from a 1951 aerial showing the entire area of the mole. (Erie County Aerials,[9] photo 51_2H116. Public domain.)

[9] Erie County aerial archives can be found at https://www3.erie.gov/aerial-photos/erie-county-aerial-photos-1951

By 1959, the far western portion of the site (technically past the talus) was fortified with a new steel bulkhead (Figure 60 and Figure 61). By 1962, the concrete banquette was removed and replaced with rubble from the now demolished 1900 era banquette (Figure 62).

Figure 60. Detail drawing of changes to the west end of the mole showing the installation of a steel bulkhead (note that US Life-Saving Service station slip will be filled in), 1959. (Buffalo District files. Public domain.)

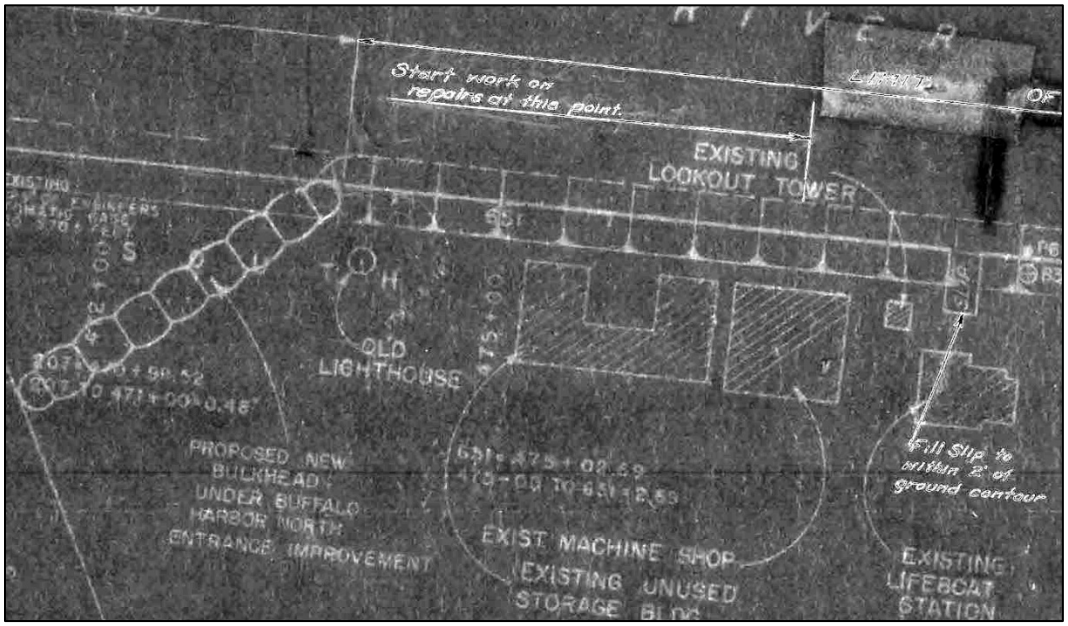


Figure 61. Measurements for the new steel bulkhead west of the lighthouse, 1959. (Buffalo District files. Public domain.)

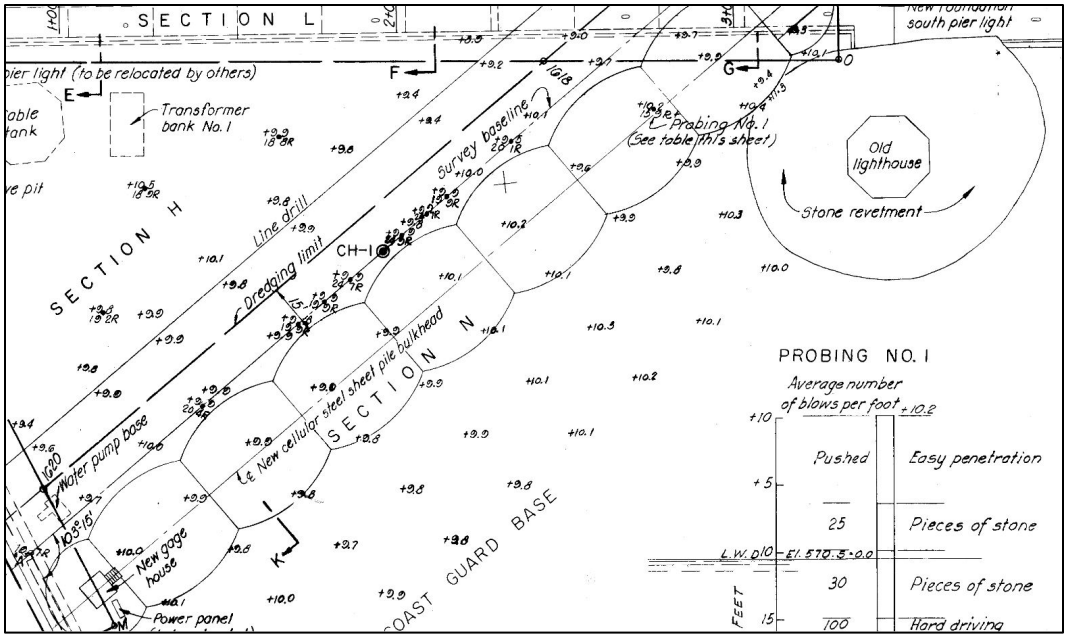


Figure 62. A 1962 aerial showing the removal of the concrete banquette and its replacement with rubble from the now demolished 1900-era banquette down the length of the mole. (US Coast Guard files. Public domain.)

3 Timeline

1818—brick lighthouse constructed

1820—mole constructed

1833—stone lighthouse constructed

1858—buildings added to the eastern end

1885—US Life-Saving Service slip on eastern end

1886—brick lighthouse demolished and replaced with large slip

1898—US Life-Saving Service buildings erected on the western end of mole

1898—stone wall lowered north of western US Life-Saving Service buildings

1900—stone tow path replaced with concrete banquette

1933—concrete banquette repaired and replaced

1959—steel bulkhead placed at far western portion of mole

1959–62—concrete banquette replaced with rubble from the demolition of the 1900 era banquette

2021—replacement armor stone at western end of mole

4 Present-Day Photos

Photographs (Figure 64 through Figure 85) showing the current condition of the mole and the surrounding buildings and landscape were taken during a site visit 19–20 July 2022. Locations and photo direction are shown in Figure 63. Additional photographs were taken from a boat on the Buffalo River. These photographs will document any features that remain from the original drawings, plans and photographs in Chapter 2.

Figure 63. Photograph location map. (Map data: Google, [2022], modified by ERDC-CERL.)

Figure 64. Looking southeast at the 1833 lighthouse and the 1959 steel bulkhead on the western end (photo by ERDC-CERL researchers, 2022).

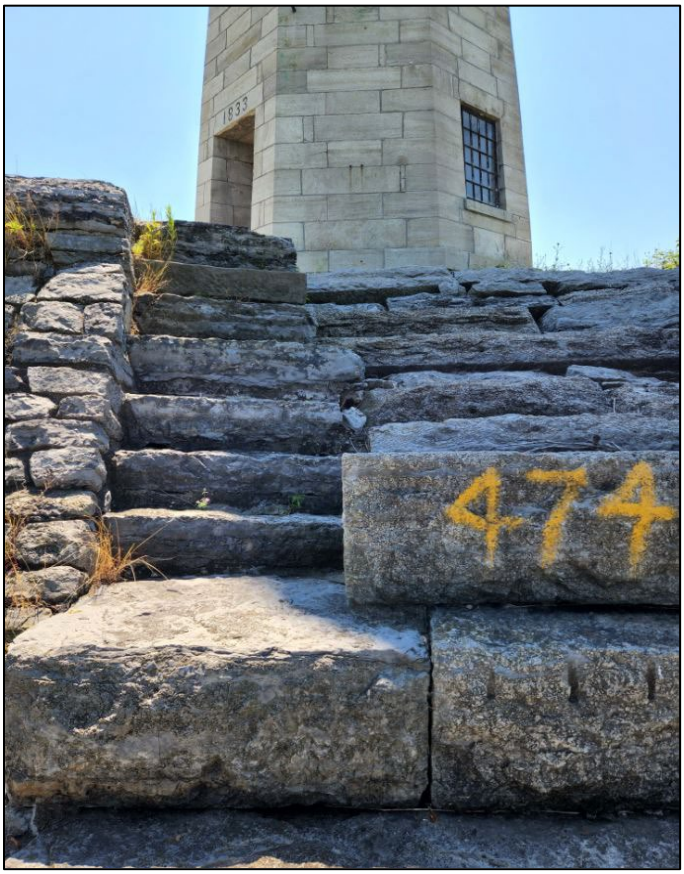
Figure 65. Detail of the 1959 steel bulkhead on the western end (photo by ERDC-CERL researchers, 2022).

Figure 66. The 1833 stone talus at the base of the 1833 lighthouse on the western end (photo by ERDC-CERL researchers, 2022).[10]

[10] The talus extends beneath the surface, and the presence of the wooden dock beneath the surface as suggested by MASW and GPR surveys performed by LRB in April 2020.

Figure 67. 1833 stone wall on the north side of the 1833 lighthouse, and note removal of stone wall on left side for the construction of the US Life-Saving Service buildings in the 1898–1903 period (photo by ERDC-CERL researchers, 2022).

Figure 68. 1833 stone stairs up from tow path to 1833 lighthouse (photo by ERDC-CERL researchers, 2022).[11]



[11] In accordance with congressional documents and period construction documents.

Figure 69. Western end of the 1820s stone wall showing how the wall was lowered in 1898 (photo by ERDC-CERL researchers, 2022).

Figure 70. Looking west along the 1820s stone wall (photo by ERDC-CERL researchers, 2022).

Figure 71. Middle of the 1820s stone wall showing how the wall was lowered in 1898 (photo by ERDC-CERL researchers, 2022).

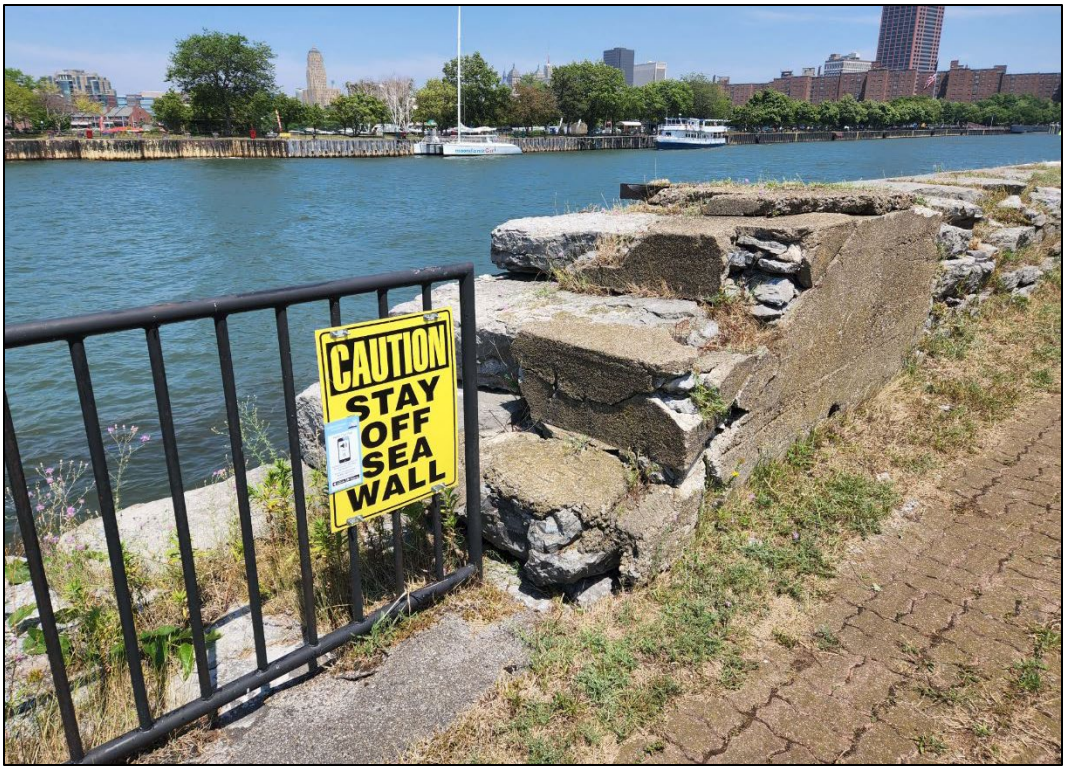


Figure 72. Looking south at the 1820s stone wall showing how it was lowered in the 1898–1903 period (photo by ERDC-CERL researchers, 2022).

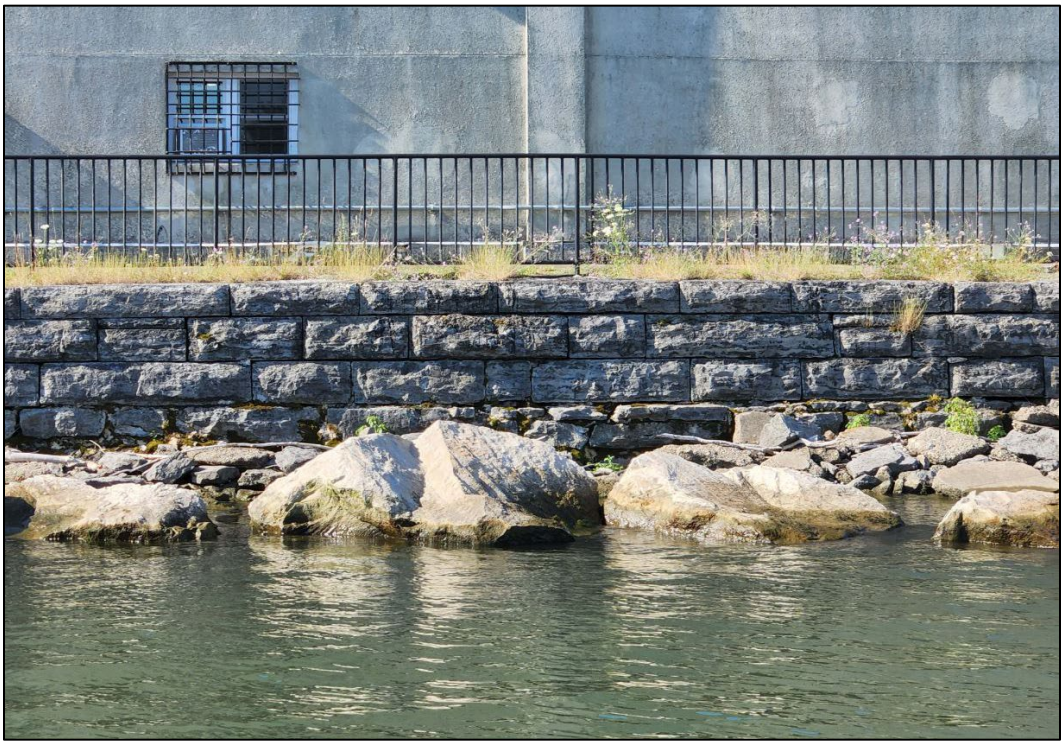


Figure 73. Looking south at the 1820s stone wall showing how this portion is at its original 1820s height (photo by ERDC-CERL researchers, 2022).

Figure 74. Looking south at the 1820s stone wall with 1820s stone stairs leading to a remnant of the 1933 concrete banquette (photo by ERDC-CERL researchers, 2022).

Figure 75. Looking down at the original 1820s stone stairs (photo by ERDC-CERL researchers, 2022).

Figure 76. Looking down at the original 1820s stone stairs (photo by ERDC-CERL researchers, 2022).

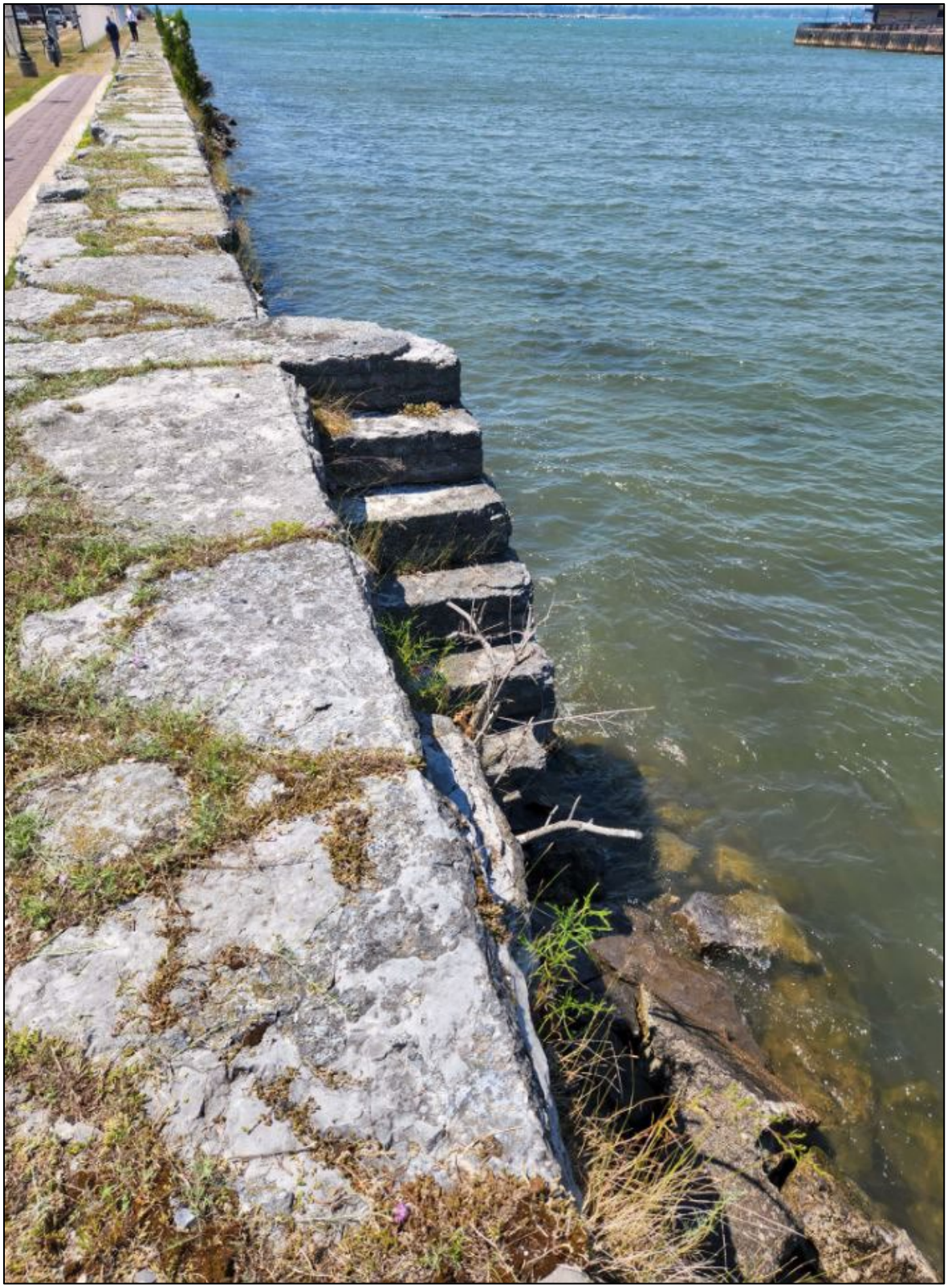


Figure 77. Looking east along armor stone placed along 1820s stone wall in 2021 (photo by ERDC-CERL researchers, 2022).[12]

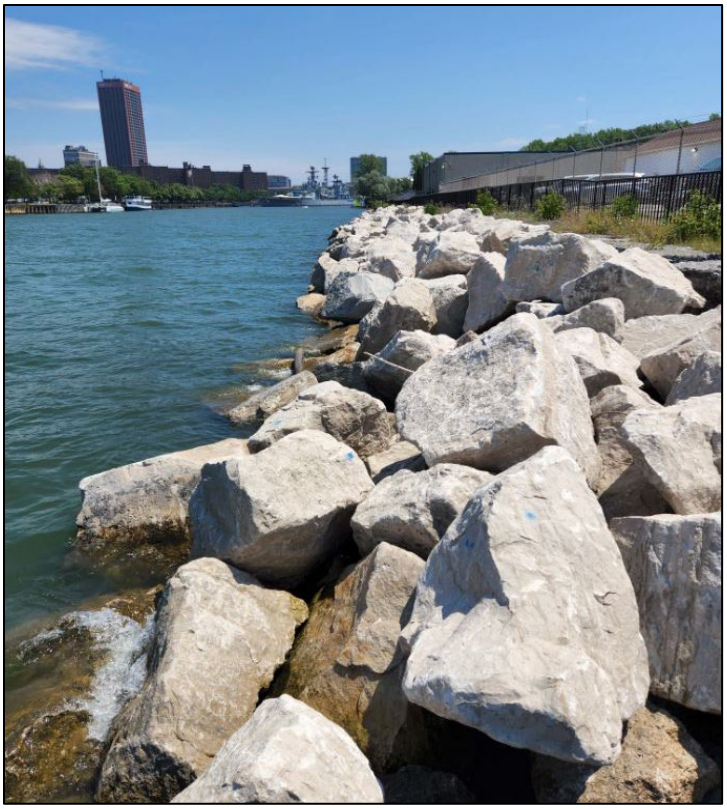


Figure 78. Looking south at the armor stone placed along 1820s stone wall in 2021 (photo by ERDC-CERL researchers, 2022).

[12] Note that although not shown in the photograph, there is shotcrete placed on the original stone wall behind the armor stone.

Figure 79. Looking east along concrete paver pathway placed here in 2021 and armor stone placed against 1820s stone wall in the same year (photo by ERDC-CERL researchers, 2022).

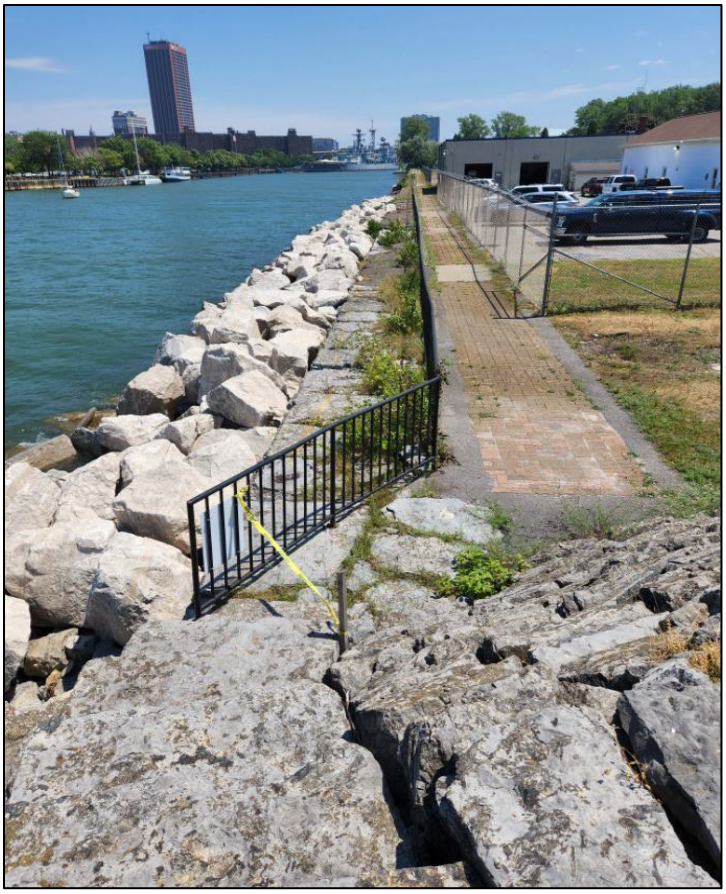


Figure 80. Looking west along concrete paver pathway placed here in 2021 (photo by ERDC-CERL researchers, 2022).

Figure 81. Looking east along asphalt placed on top of shortened 1820s wall and armor stone placed against 1820s stone wall in 2021 (photo by ERDC-CERL researchers, 2022).

Figure 82. Looking east at the 1833 stone wall at the eastern end of the mole, note that the old lifeboat saving slip would have been to the left of this wall (photo by ERDC-CERL researchers, 2022)

Figure 83. Sloping ground towards river on eastern side of the mole area (photo by ERDC-CERL researchers, 2022).

Figure 84. Looking southwest at the former lighthouse tender slip which is now used by the Sail Buffalo sailing school (photo by ERDC-CERL researchers, 2022).[13]

Figure 85. Foundation remnant, consistent with period georeferenced drawings, on the eastern side of the mole area (photo by ERDC-CERL researchers, 2022).

[13] Note that portion of slip pier is visible beneath crushed stone at right of sheet pile. Timber crib and slip infrastructure are visible at and below the water surface at time of inspection.

5 Character-Defining Features

Character refers to all those visual aspects and physical features that comprise the appearance of every historic building, structure, and landscape (site). Elements or features which show character include the overall shape of the building or structure, its materials, craftsmanship, decorative details, interior spaces, and features, as well as the various aspects of its site and environment.[14] These character-defining features are typically identified and listed when determinations of eligibility are made under Section 110 of the NRHP. This list is useful in the maintenance, management, and future planning of the building, structure, or site.

The list below (Figure 86 through Figure 93) is determined by the character-defining features of the Buffalo mole and site identified in Chapter 2 and what remains today (or potentially remain underground) as identified in Chapter 4.

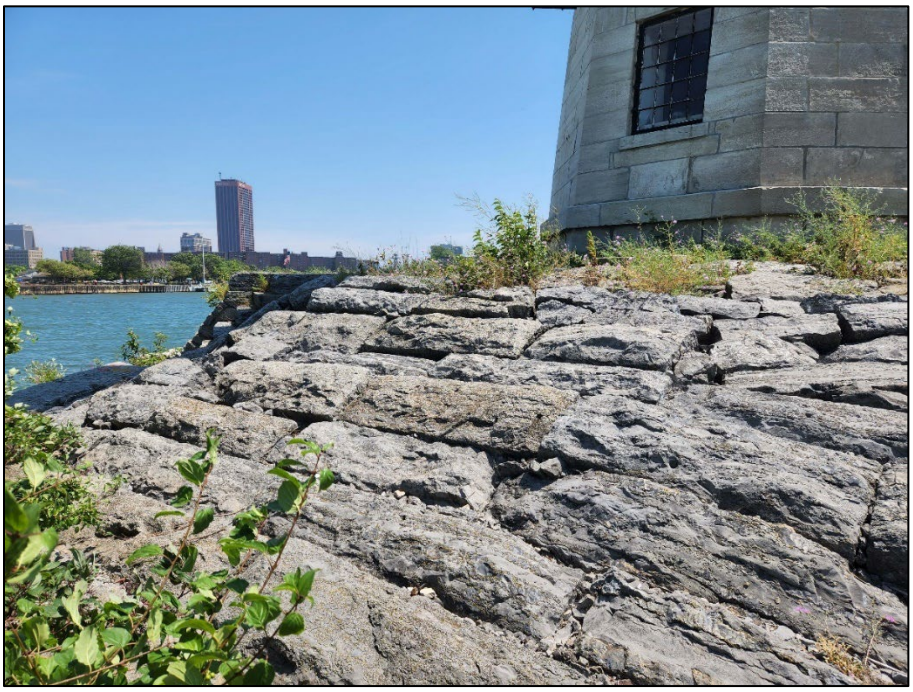
- 1833 stone lighthouse

Figure 86. Looking southwest at the 1833 lighthouse (photo by ERDC-CERL researchers, 2022).

[14] Nelson, Lee H. *National Park Service Preservation Brief 17: Architectural Character-Identifying the Visual Aspect of Historic Buildings as an Aid to Preserving their Character*. Washington, DC: US Department of the Interior, National Park Service. 1988. http://www.nps.gov/tps/how-to-preserve/briefs/17-architectural-character.htm.

- 1833 stone talus at base of 1833 lighthouse

Figure 87. Detail of the 1833 stone talus at the base of the 1833 lighthouse (photo by ERDC-CERL researchers, 2022).



- 1820s stone wall including stone stairs and type of stone

Figure 88. Looking west along the stone wall from the Buffalo River (photo by ERDC-CERL researchers, 2022).

Figure 89. Looking down at original stone stairs (photo by ERDC-CERL researchers, 2022).

Figure 90. Looking south at 1820s stone wall (photo by ERDC-CERL researchers, 2022).

Figure 91. Looking south at 1820s stone wall at former US Life-Saving Service portion of the site (photo by ERDC-CERL researchers, 2022).

- 1820s stone incline (presumed to be underground beneath the Coast Guard buildings, parking lots and grassy areas)
- Foundations of former US Lighthouse Service and US Life-Saving Service buildings on eastern end of the mole

Figure 92. Foundation remains on eastern portion of site (photo by ERDC-CERL researchers, 2022).

- Former lighthouse tender slip (and its associated underwater wood cribbing)

Figure 93. Looking southwest at former US Life-Saving Service slip now used by Sail Buffalo (photo by ERDC-CERL researchers, 2022).

6 Conclusions and Recommendations

The Buffalo mole was erected circa 1820s for the protection of the entrance to Buffalo River, for access to the 1833 lighthouse, and for the mooring of vessels. The mole and the area on top of and surrounding the mole, was modified through the years with the last major change in circa 1960 with the removal of a concrete banquette and its replacement with armor stone. Armor stone was placed at the western end of the mole in 2021.

6.1 Conclusions

The researchers recommend a period of significance of circa 1820 through 1972 (50 years) since the mole has continued its original use of keeping the entrance to the Buffalo River open for freight and recreational boating traffic through the present day. The character-defining features are listed in Chapter 5.

6.2 Recommendations

Modifications to the stone talus, stone wall, stone stairs, and underground stone incline should be consulted upon with the New York State Historic Preservation Office. It is recommended to avoid adverse effects and that future modifications to these character-defining features should be in keeping with the Secretary of Interior's Standards for Rehabilitation (the Standards).

6.3 Standards for Rehabilitation

The Standards (Department of Interior regulations, 36 CFR 67) [15] pertain to historic properties of all materials, construction types, sizes, and occupancy; encompass the exterior, interior, related landscape features, and the building's site and environment; as well as attached, adjacent, or related new construction. The Standards are to be applied to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility.

[15] For a full list of the standards, go to https://www.nps.gov/tps/standards/rehabilitation/rehab/stand.htm

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building, its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Bibliography

Kolber, Eric N., and Cedric T. F. Wrobel. 2021. *US South Mole, US Sea Wall, and Developments Thereon Historical Timeline*. Draft FOUO Report. Buffalo, NY: USACE.

Nelson, Lee H. 1988. *Architectural Character-Identifying the Visual Aspect of Historic Buildings as an Aid to Preserving their Character*. National Park Service Preservation Brief 17. Washington, DC: DOI-NPS. https://www.nps.gov/orgs/1739/upload/preservation-brief-17-architectural-character.pdf.

NHPA (National Historic Preservation Act) of 1966. Pub. L. No. 89-665. Amended by Pub. L. No. 96-515, Sections 110, 106. https://www.rd.usda.gov/sites/default/files/NationalHistoricPreservationAct.pdf.

NPS (National Park Service). 1997. *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin NRB 15. Washington, DC: DOI-NPS. https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf.

NPS (National Park Service). 1997. *How to Complete the National Register Registration Form*. National Register Bulletin NRB 16A. Washington, DC: DOI-NPS. https://www.nps.gov/subjects/nationalregister/upload/NRB16A-Complete.pdf.

NPS (National Park Service). 1999. *National Register Bulletin: How to Prepare National Historic Landmark Nominations*. Washington, DC: DOI-NPS. https://parkplanning.nps.gov/document.cfm?parkid=442&projectid=70917&documentid=78072.

NRHP (National Register of Historic Places). 2010. *Sylvan Hills Country Club Golf Course*. NR 8-6-10. Washington, DC: DOI-NPS. https://www.arkansasheritage.com/docs/default-source/national-registry/pu8500-pdf.pdf?sfvrsn=d280dec_0.

Weeks, Kay D., and Anne E. Grimmer. 2017 *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*. (1995 version revised by Anne E. Grimmer). Washington, DC: DOI-NPS-TPS. https://www.nps.gov/orgs/1739/upload/treatment-guidelines-2017-part1-preservation-rehabilitation.pdf.

Abbreviations

CERL	Construction Engineering Research Laboratory
ERDC	Engineer Research and Development Center
NARA	National Archives and Records Administration
NHPA	National Historic Preservation Act of 1966
NRHP	National Register of Historic Places
USACE	US Army Corp of Engineers

REPORT DOCUMENTATION PAGE

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED	
		START DATE	END DATE
April 2023	Final Technical Report (TR)	FY22	FY23

4. TITLE AND SUBTITLE

Character-Defining Features of the Buffalo South Mole (South Pier), NY

5a. CONTRACT NUMBER	5b. GRANT NUMBER	5c. PROGRAM ELEMENT
5d. PROJECT NUMBER	**5e. TASK NUMBER**	**5f. WORK UNIT NUMBER**

6. AUTHOR(S)

Adam D. Smith and Megan W. Tooker

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

US Army Engineer Research and Development Center (ERDC)
Construction Engineering Research Laboratory (CERL)
2902 Newmark Dr.
Champaign, IL 61824

8. PERFORMING ORGANIZATION REPORT NUMBER

ERDC/CERL TR-23-5

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)	11. SPONSOR/MONITOR'S REPORT NUMBER(S)
US Army Corps of Engineers Buffalo District Buffalo, NY 14207	USACE	

12. DISTRIBUTION/AVAILABILITY STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

13. SUPPLEMENTARY NOTES

Cross-Charge Labor Code 45D736

14. ABSTRACT

The US Congress codified the National Historic Preservation Act of 1966 (NHPA), the nation's most effective cultural resources legislation to date, mostly through establishing the National Register of Historic Places (NRHP). The NHPA requires federal agencies to address their cultural resources, which are defined as any prehistoric or historic district, site, building, structure, or object.

The precursor to the Corps of Engineers erected the mole (a.k.a., the south pier) in the early 1820s at the entrance to the Buffalo harbor. The area on top of and surrounding the mole was modified through the past two hundred years, many of the character-defining features remain including the stone retaining walls, talus, stairs, and lighthouse identified in plans and drawings from the period of construction. Notably lost is the stone tow path, or banquette, and the stone incline on the south side of the mole is no longer visible. The researchers recommend a period of significance of c. 1820 through 1972 (50 years) since the mole has continued its original use of keeping the entrance to the Buffalo River open for freight and recreational boating traffic through the present day.

15. SUBJECT TERMS

Buffalo NY--Historic buildings; Historic buildings--character-defining features; Historic preservation; Mole; Pier; Mole--stone; Harbor protection

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES
a. REPORT	b. ABSTRACT	C. THIS PAGE		
Unclassified	Unclassified	Unclassified	SAR	76

19a. NAME OF RESPONSIBLE PERSON	19b. TELEPHONE NUMBER (include area code)