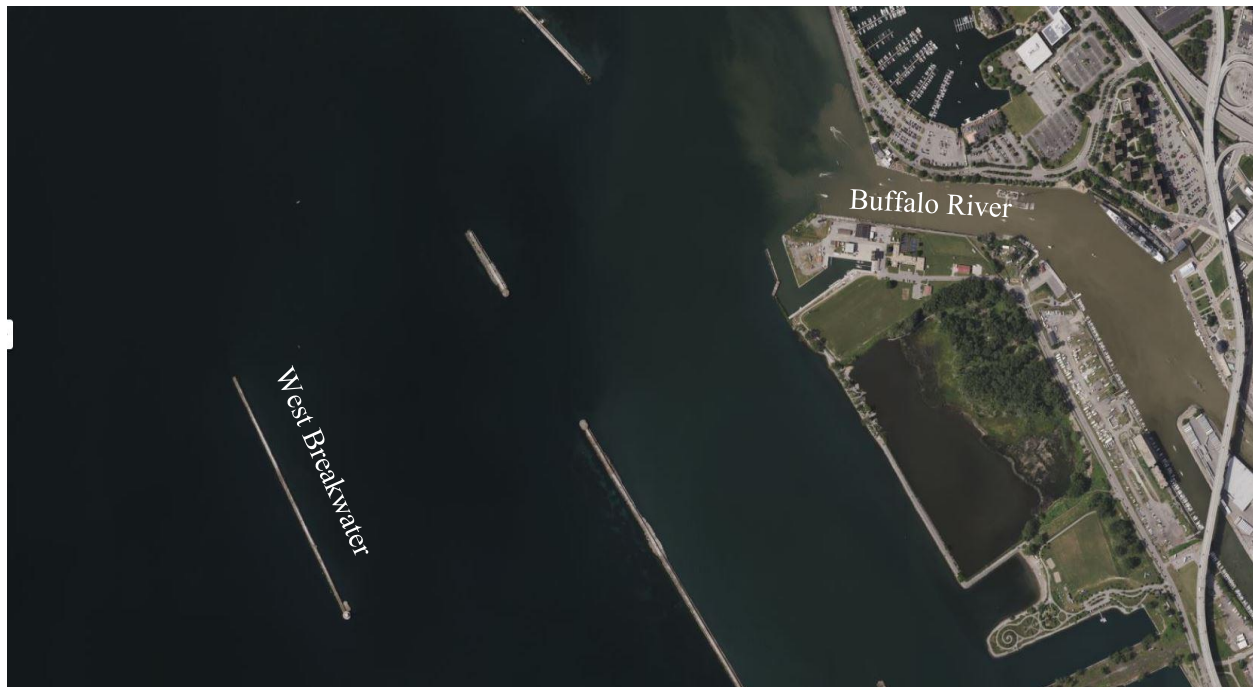




**US Army Corps
of Engineers®**
Buffalo District

SCOPING INFORMATION

Breakwater Repair Operations and Maintenance City of Buffalo, Erie County, New York



March 2024

**Buffalo District, U.S. Army Corps of Engineers
478 Main Street
Buffalo, New York 14202**

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1 INTRODUCTION

The National Environmental Policy Act (NEPA) directs federal agencies to initiate "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action." The Buffalo District - U.S. Army Corps of Engineers (USACE) has prepared this scoping information packet to elicit public and agency concerns, clearly define the environmental issues and alternatives that should be examined, and identify federal, state, and local requirements that may need to be addressed. The information in this scoping document has been prepared as part of the formal scoping process pursuant to NEPA and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1500 et seq.). This scoping document covers proposed project alternatives for the rehabilitation of a section of the Buffalo West Breakwater.

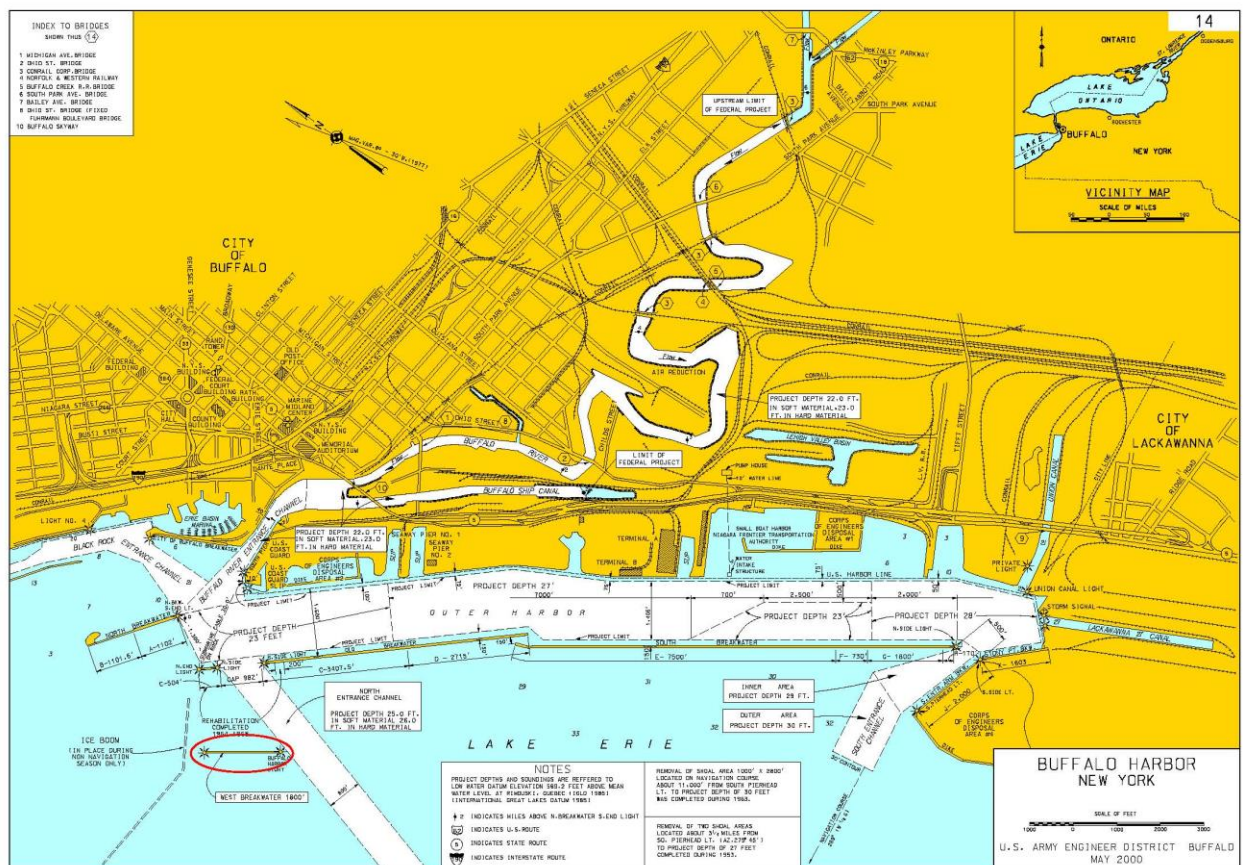


Figure 1: Buffalo Harbor Map, West Breakwater Circled in Red at Bottom Left

2 PURPOSE AND NEED FOR BREAKWATER REPAIR

2.1 Overview and Historical Background

The Buffalo West Breakwater is located near the eastern shore of Lake Erie at the Buffalo Harbor, City of Buffalo, Erie County, New York, and lies 2,475 feet west of the mouth of the Buffalo River (Figure 2). The 1,800-foot-long breakwater protects the Buffalo Harbor from the storm-driven waves originating from the west. This breakwater is exposed to deepwater wave and ice action.

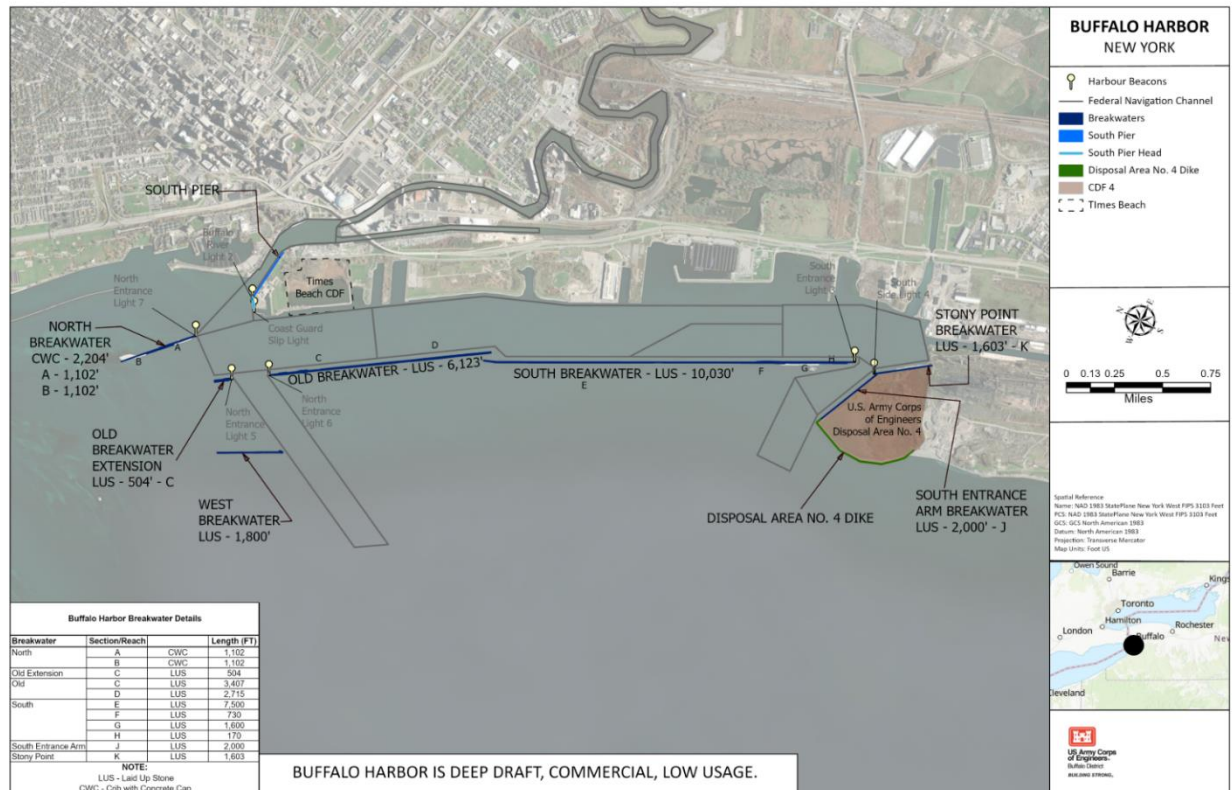


Figure 2: Buffalo Harbor Overall Structures Map

The West Breakwater is a rubble-mound structure with a crest width of 8 feet and a crest elevation of +12.2 feet LWD¹. Side slopes are 1V:1.3H and 1V:1.5H on the harbor and lake sides, respectively, and the armor stone used to construct the breakwater is 7 tons. There is a major light cell at the south end of the rubble-mound breakwater. The light cell is a circular steel sheet pile cell, 55.7 feet in diameter. It is constructed of S-28 piling to rock, which is at natural lake bottom. Top elevation of the cell is 20 feet above low water datum. The concrete foundation of the major light, inside the cell is independently supported on bearing piles toed into bedrock. A typical section of the detached West

¹ Low Water Datum (LWD) for Lake Erie is 569.2 feet above mean sea level at Rimouski, Quebec, Canada (International Great Lakes Datum 1985).

Breakwater is shown as (Figures 3 and 4). The structure, originally authorized by the Rivers and Harbors Act of 3 June 1896, was completed in 1899. Originally a three-tiered timber superstructure was constructed with stone filling placed as the timber work advanced. However, subsequent damage required restoration.

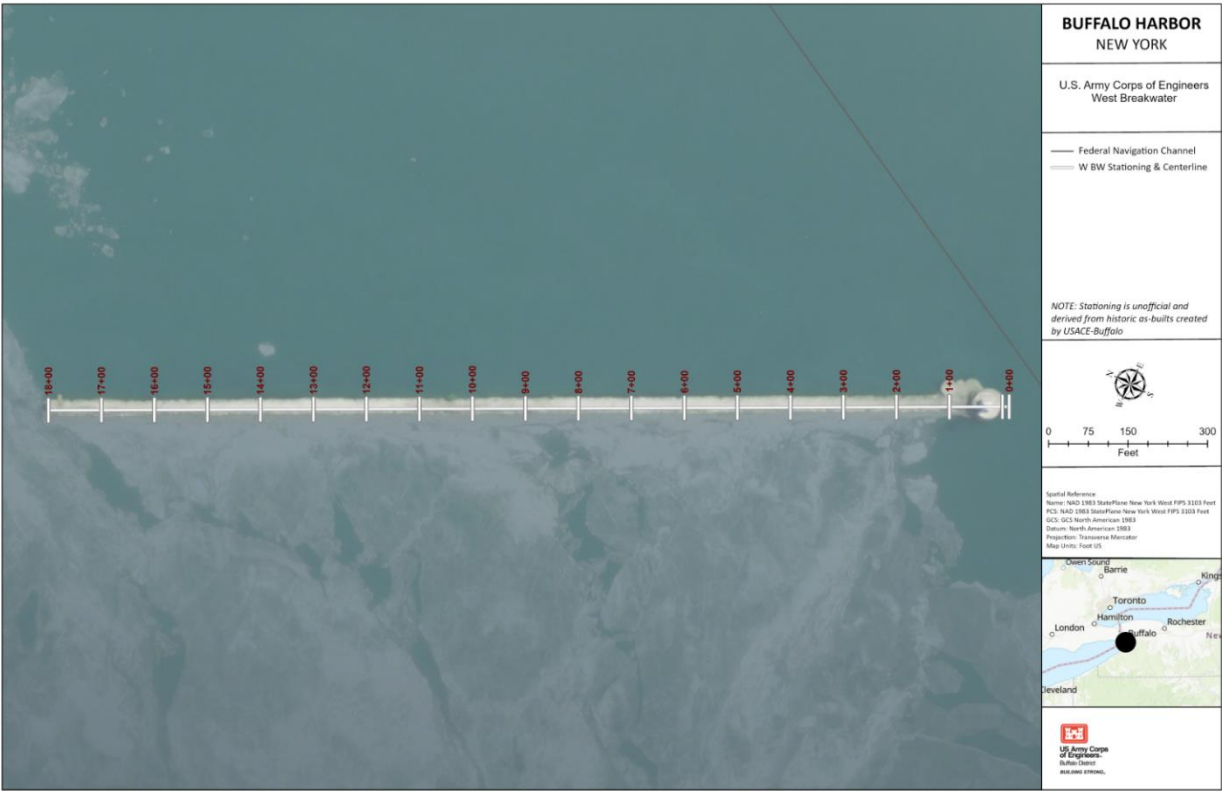


Figure 3: West Breakwater Map

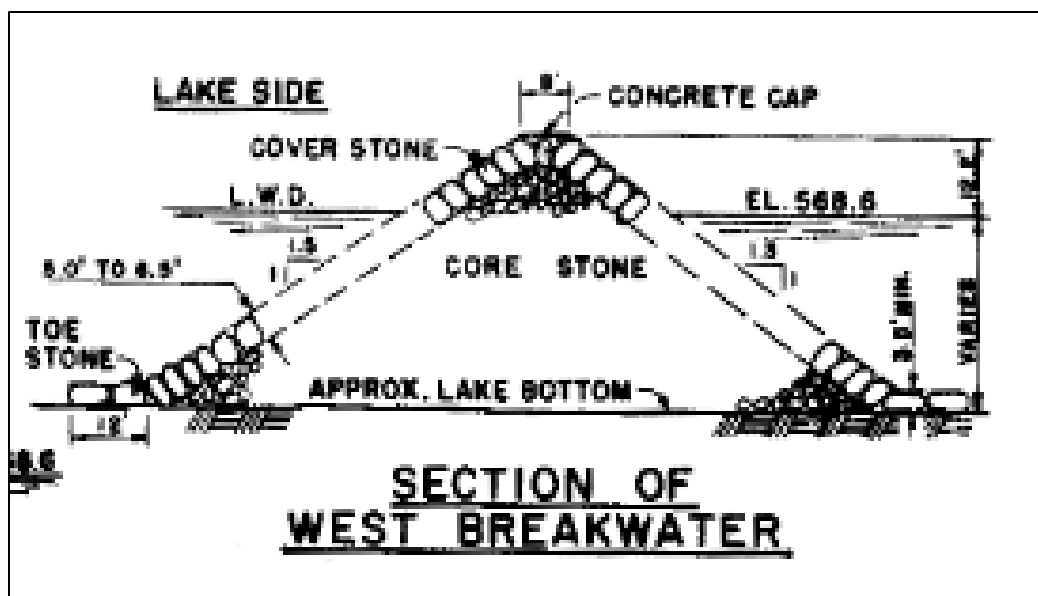


Figure 4: West Breakwater Typical Cross Section (As-Built)

2.1.1 Repair History

Records of previous repairs are incomplete. Historic records from 1939-1971 indicate numerous proposed repairs along the West Breakwater, primarily focused on the reach between 1,000 feet and 2,000 feet from the southern end, the present area of interest. In particular, the records show that the USACE worked in this area, and sometimes reworking previous repairs.

In 2008, USACE repaired a 65-foot-long section along the lakeside above water slope of the laid-up stone approximately 1,700 feet from the south end of the breakwater using precast concrete blocks and six-inch core stone. Subsequent movement of the toe blocks allowed the core stone to be lost out of the base. In August 2012, the section was rebuilt using larger core stone and with additional effort to key-in the toe blocks (Figure 5).



Figure 5: West Breakwater 2012 Repair with Precast Concrete Blocks, June 2016

On July 7, 2017, the USACE ran a remotely operated underwater vehicle (ROV) along a transect of the proposed repair area. The substrate lakeward of the structure was found to be a mix of gravel, cobbles, and boulders (Figure 6). In 2018, the USACE repaired approximately 1,000 feet of the Buffalo West Breakwater. This repair project also involved the construction of a stone stability berm along the lakeside of the repair area (Figure 7).



Figure 6: Station 166+00, typical substrate with boulders, cobbles, and gravel

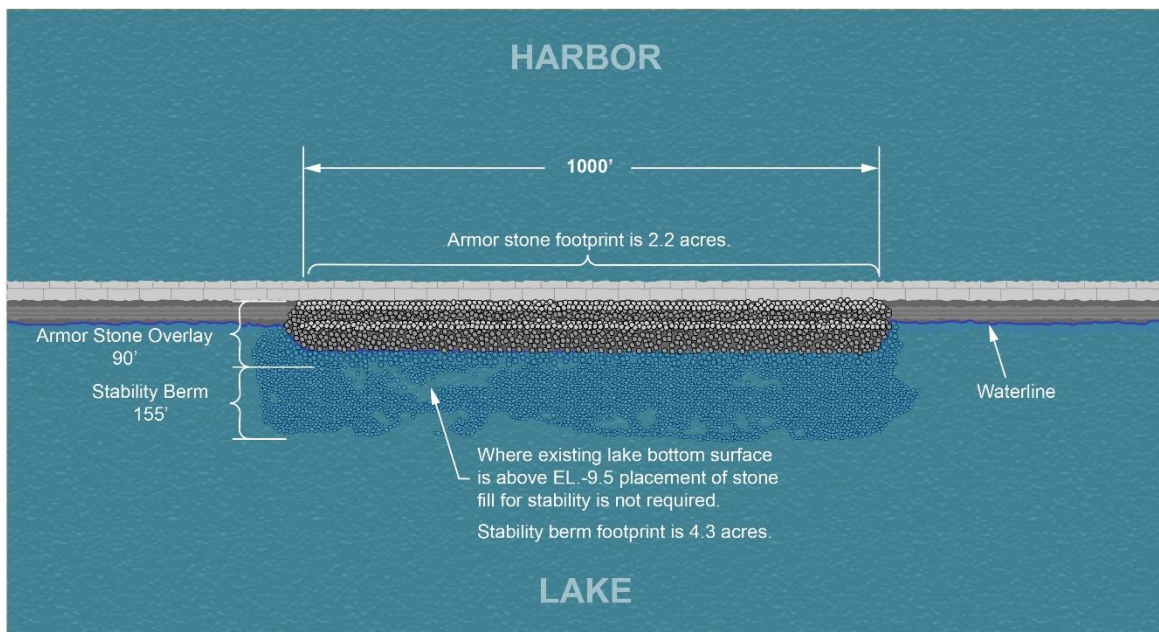


Figure 7: Conceptual rendering of 2018 repair including stone stability berm

2.1.2 Recent Inspections

On March 6, 2023, USACE visually observed and photographed the Buffalo West Breakwater. In general, the breakwater was in good condition. However, there is one 260-foot-long section that was damaged during winter storm Elliott in December 2022. This section appears to be the site of a previous repair, as the stone in that area is different in character than the rest of the structure (size, geometry, color).

2.2 Need for Action

Damage along approximately 260-feet of the 10,200-foot-long Buffalo West Breakwater is in need of repair. If this section is not repaired, this damage would spread laterally along the structure in either direction. The lakebed in the damaged area is comprised of a thick layer of clay with unknown strength, and therefore this repair would require a counterweight toe to ensure geotechnical stability.

2.3 Study Authority

The Buffalo West Breakwater was authorized or modified in several River and Harbors Acts between 1826 and 1962. A General Design Memorandum (September 1984) concluded that the most economically efficient plan for rehabilitating and/or maintaining the Buffalo West Breakwater consists of: (1) rehabilitating the structure between Station 191+00 to 218+00 and between Station 224+00 to 230+00, and (2) maintaining the entire Breakwater after the rehabilitation project. The previously approved rehabilitation was completed in 1986 and the repairs proposed in this 1984 report are a continuance of this prior maintenance plan.

2.4 Proposed Project

The March 2023 inspection identified the need to repair an approximately 260-foot-long section of the Buffalo West Breakwater. As previously indicated, the lakebed in the damaged area is comprised of a thick layer of clay. Repair work is necessary to restore design functionality. The project also involves correcting the problem of regular breakwall slumping, which is the instability of the soft clay later that underlies this portion of the breakwater.

3 PROPOSED REPAIR ALTERNATIVES

3.1 Alternatives Considered

It is USACE policy to consider all practicable and relevant alternative measures, including the no action alternative. Several alternatives were evaluated to achieve the purpose of repairing and stabilizing the Buffalo West Breakwater.

3.1.1 No Action

The USACE is required to consider the option of “No Action” as one of the alternatives to comply with the requirements of NEPA. The No Action alternative assumes that no

project would be implemented by the federal government to achieve the planning objectives. Under this alternative, it is assumed that no measures would be implemented to repair the damaged section of Buffalo West Breakwater. It is expected that damages and further degradation of the breakwater would continue, eventually allowing wave action to pass over the breakwater, thereby subjecting the Buffalo Harbor to damaging wind and storm-driven wave action.

3.1.2 Rubblemound Overlay

This alternative would consist of a leveling course of underlayer stone and covered with large armor placed at a slope of 1V:2H. The armor crest would be at +15 LWD and about 17-feet wide. The bottom armor berm would be placed at +4 feet LWD to ensure that it is usually visible by boaters.

3.1.3 Trench Excavation

This alternative involves excavating a trench near the toe of the existing breakwall and backfilling it with armor stone. This alternative limits the area of disturbance as well as fill volumes in Waters of the U.S., and also minimizes impacts to lake bottom habitat. This alternative was eliminated from further consideration because this measure would not provide enough shear strength to resist deformation of the subsurface layer. In addition, high excavation costs preclude this alternative from further consideration.

3.1.4 Rubblemound Overlay with Toe Berm (Preferred Alternative)

A rubblemound overlay alternative consists of a leveling course of underlayer stone covered with large armor placed at a slope of 1V:2H. The armor crest would be at +15 LWD and about 17-feet wide. The bottom armor berm would be placed at +4 LWD to ensure that it is usually visible to boaters. The stone overlay would measure 100 feet wide by 400 feet long (Figure 8).

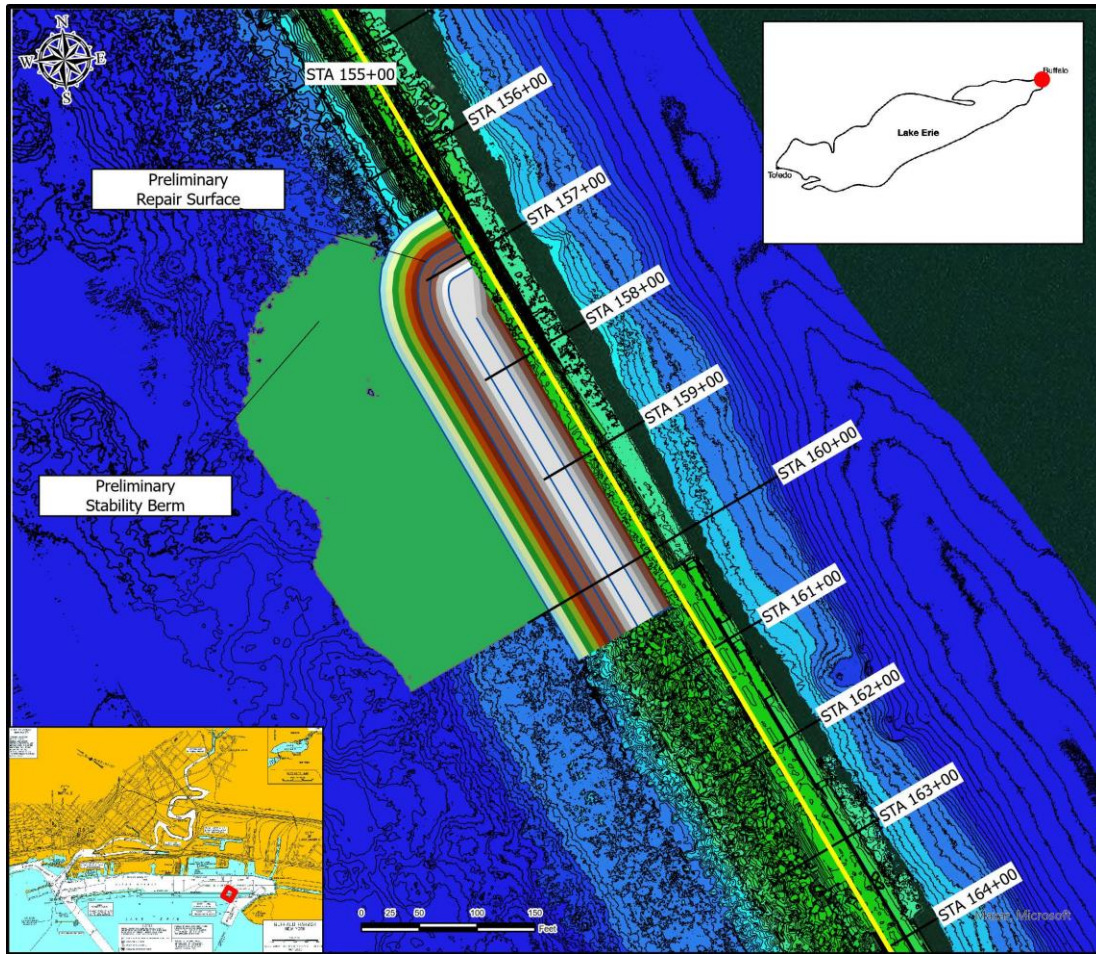


Figure 8: Conceptual repair footprint

A geotechnical analysis of the subsurface layers determined that a stability berm extending about 261 feet lakeward of the overlay would be required to counterbalance the additional weight of the armor overlay. The stone stability berm would measure 260 feet wide by 375 feet long (Figure 9).

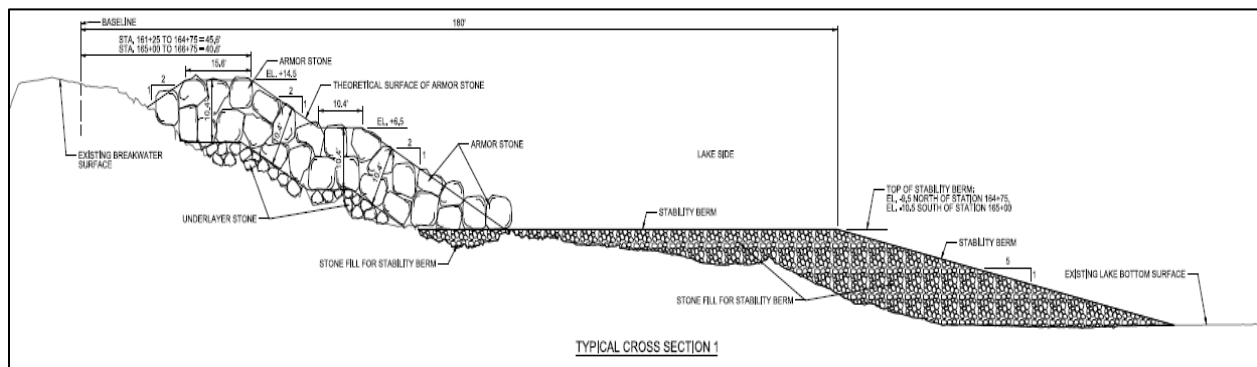


Figure 9: Typical cross section of proposed repair project and stability berm

3.1.5 Subsurface Soil Amendment

To improve the strength of the underlying clay, a soil amendment would be added. Soil strengthening may be accomplished in two ways:

1. Soil Mixing – Multiple cores would be drilled through the soil and cement mixed with the in-situ soil to create a series of columns to increase the bearing capacity.
2. Jet Grouting – This is a soil modification system used to create in situ, cemented formations of soil called soilcrete. It is an erosion-based system, wherein the erodibility plays a major role in predicting the geometry and production. Further investigation into applicability of this technique is required.

This alternative increases shear strength of the underlying soil layer. The existence of the 15-foot thick randomly placed rock layer above the clay would pose a challenge to drill through. The high installation cost and difficulty to implement given the site conditions is why this alternative was eliminated from further consideration.

3.1.6 Subsurface Excavation

This alternative involves excavating the entire subsurface clay layer and replacing it with high shear strength soil. This alternative increases the shear strength. The high costs associated with excavating and properly disposing of a large volume of underlayer clay eliminates this alternative from further consideration.

3.1.7 Steel Sheet Pile at Toe

The goal of this option is to allow the creation of a rubblemound overlay without the need to create an extensive stability berm. Instead, a row of steel sheet pile would be driven. This alternative creates a physical barrier to deformation of the subsurface clay layer. This alternative was eliminated from further consideration due to high installation costs requiring trenching through existing stone and deep pile installation. In addition, the potential risk of sheet pile failure at the bottom from the continuous pressure from the deformation of the underlayer prevents this alternative from being considered further.

4 PUBLIC PARTICIPATION AND INTERAGENCY COORDINATION

Throughout the scoping process, stakeholders and interested parties are invited to provide comment on the Buffalo West Breakwater Repair Project. Interested parties are welcome to contact USACE to discuss their views and recommendations regarding this project.

5 IMPACT ASSESSMENT

Future conditions with the No-Action alternative and potential impacts associated with the preferred alternative will be assessed in relation to several parameters including the following social, economic, and environmental categories:

- Fish and Wildlife Resources
- Water Quality
- Dredged Material Management
- Geology and Soils
- Contaminated Materials
- Air Quality
- Noise
- Recreation
- Historic Properties
- Property Values and Tax Revenues
- Employment
- Community Cohesion and Growth
- Transportation
- Public Facilities and Services
- Aesthetics
- Environmental Justice

6 COMPLIANCE WITH ENVIRONMENTAL PROTECTION STATUTES

Numerous environmental laws and executive orders influence and guide water resources planning, development, and management within the USACE civil works program. The list below presents a comprehensive list of environmental protection statutes, executive orders, etc. that are normally considered. Therefore, an additional goal of this scoping process is to consult with appropriate agencies and other interested parties pertaining to resources protected by these mandates. The dissemination of this scoping information initiates applicable coordination and consultation requirements required under their provisions.

Some important federal environmental protection statutes that will be assessed with respect to this proposed project include:

- *National Environmental Policy Act (NEPA)*. In accordance with 33 Code of Federal Regulations (CFR) 203 (Procedures for Implementing NEPA), USACE will assess the potential environmental effects of the project alternatives on the quality of the human environment. Using a systematic and interdisciplinary approach, an assessment will be made of the potential environmental impacts for each plan as determined by comparing the with- and without-project conditions. The impact assessment process will determine if an Environmental Impact Statement is required, or if an Environmental Assessment and Finding of No Significant Impact is appropriate.
- *Clean Water Act*. The recommended plan involves the placement of dredged or fill material into the waters of the United States. Therefore, the USACE will evaluate the discharge in accordance with the Clean Water Act Section 404(b)(1) Guidelines.

Water quality and related information used in this evaluation will provide documentation to demonstrate that the recommended plan complies with this Act. A Section 404(a) Public Notice would be circulated and an opportunity to request a public hearing afforded to all potentially affected parties. Section 401 Water Quality Certification for

the discharge would also be requested from the New York State Department of Environmental Conservation (NYSDEC).

- *Coastal Zone Management Act.* The Act requires that federal activities be consistent with the enforceable policies of the New York State Coastal Management Program. A federal consistency determination would be submitted to the New York Department of State (NYDOS) for their concurrence.
- *Endangered Species Act.* In accordance with Section 7 of this Act, the USACE is requesting information from the U.S. Fish and Wildlife Service (USFWS) on any listed or proposed species or designated or proposed critical habitat that may be present in the project area. If this consultation with USFWS identifies any such species or critical habitat, then the USACE would conduct a biological assessment to determine the proposed project's effect on these species or critical habitat.
- *Fish and Wildlife Coordination Act.* The USACE is coordinating this project with the USFWS. The USACE will collaborate with the USFWS to identify any potential fish and wildlife concerns, identify relevant information on the study area, obtain their views concerning the significance of fish and wildlife resources and anticipated project impacts, and identify those resources which need to be evaluated in the study. Full consideration will be given to their comments and recommendations resulting from this coordination.
- *National Historic Preservation Act.* Under Section 106 of this Act, this scoping process also initiates consultation with the National Park Service, State Historic Preservation Office, potentially interested Indian nations, local historic preservation organizations and others likely to have knowledge of, or concern with, historic properties that may be present within the study's Areas of Potential Effect (APE). The APE for each alternative is limited to the alternative's footprint within each project area as described in Section 4. It is believed unlikely there would be a need for cultural resources surveys due to the highly disturbed nature of the study area and the lack of historic structures in proximity. However, this decision would only be made after further coordination with applicable parties as a follow-up to this initial consultation and based on any information received. Initial review of the study areas has determined that there are no properties listed, or likely eligible for listing, on the National Register of Historic Properties or the New York State Register of Historic Properties within the APEs for this study.

7 POINT OF CONTACT

Interested parties are encouraged to contact the USACE with their comments and recommendations about the Buffalo Harbor West Breakwater repair project. Questions or requests for additional information may be directed to:

Buffalo District Environmental Analysis Team
E-mail: Buffalo.Breakwater@usace.army.mil

Please review the study information and present any comments in writing within thirty (30) days to the attention of the Buffalo District Environmental Analysis Team to the email address listed above or at the following address:

U.S. Army Corps of Engineers
Attn: Environmental Analysis Team
Buffalo District
478 Main Street
Buffalo, NY 14202

Thank you for your review of this project.

Other federal environmental protection laws, orders, and policies that may apply to this project include:

1. PUBLIC LAWS

- a. American Folklife Preservation Act, P.L. 94-201; 20 U.S.C. 2101, *et seq.*
- b. Anadromous Fish Conservation Act, P.L. 89-304; 16 U.S.C. 757, *et seq.*
- c. Antiquities Act of 1906, P.L. 59-209; 16 U.S.C. 431, *et seq.*
- d. Archaeological and Historic Preservation Act, P.L. 93-291; 16 U.S.C. 469, *et seq.* (Also known as the Reservoir Salvage Act of 1960, as amended; P.L. 93-291, as amended; the Moss-Bennett Act; and the Preservation of Historic and Archaeological Data Act of 1974.)
- e. Bald Eagle Protection Act; 16 U.S.C. 668.
- f. Clean Air Act, as amended; P.L. 91-604; 42 U.S.C. 1857h-7, *et seq.*
- g. Clean Water Act, P.L. 92-500; 33 U.S.C. 1251, *et seq.* (Also known as the Federal Water Pollution Control Act; and P.L. 92-500, as amended.)
- h. Coastal Zone Management Act of 1972, as amended, P.L. 92-583; 16 U.S.C. 1451, *et seq.*
- i. Endangered Species Act of 1973, as amended, P.L. 93-205; 16 U.S.C. 1531, *et seq.*
- j. Estuary Protection Act, P.L. 90-454; 16 U.S.C. 1221, *et seq.*
- k. Federal Environmental Pesticide Control Act, P.L. 92-516; 7 U.S.C. 136.
- l. Federal Water Project Recreation Act, as amended, P.L. 89-72; 16 U.S.C. 460-1(12), *et seq.*
- m. Fish and Wildlife Coordination Act of 1958, as amended, P.L. 85-624; 16 U.S.C. 661, *et seq.*
- n. Historic Sites Act of 1935, as amended, P.L. 74-292; 16 U.S.C. 461, *et seq.*
- o. Land and Water Conservation Fund Act, P.L. 88-578; 16 U.S.C. 460/-460/-11, *et seq.*
- p. Migratory Bird Conservation Act of 1928; 16 U.S.C. 715.
- q. Migratory Bird Treaty Act of 1918; 16 U.S.C. 703, *et seq.*
- r. National Environmental Policy Act of 1969, as amended, P.L. 91-190; 42 U.S.C. 4321, *et seq.*
- s. National Historic Preservation Act of 1966, as amended, P.L. 89-655; 16 U.S.C. 470a, *et seq.*
- t. Native American Religious Freedom Act, P.L. 95-341; 42 U.S.C. 1996, *et seq.*
- u. Resource Conservation and Recovery Act of 1976, P.L. 94-580; 7 U.S.C. 1010, *et seq.*
- v. River and Harbor Act of 1899, 33 U.S.C. 403, *et seq.* (also known as the Refuse Act of 1899)
- w. Toxic Substances Control Act, P.L. 94-469; 15 U.S.C. 2601, *et seq.*
- x. Watershed Protection and Flood Prevention Act, as amended, P.L. 83-566; 16 U.S.C. 1001, *et seq.*
- y. Wild and Scenic Rivers Act, as amended, P.L. 90-542; 16 U.S.C. 1271, *et seq.*

2. EXECUTIVE ORDERS

- a. Executive Order 11593, Protection and Enhancement of the Cultural Environment. May 13, 1979 (36 FR 8921; May 15, 1971)
- b. Executive Order 11988, Floodplain Management. May 24, 1977 (42 FR 26951; May 25, 1977)
- c. Executive Order 11990, Protection of Wetlands. May 24, 1977 (42 FR 26961; May 25, 1977)
- d. Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970, as amended by Executive Order, 11991, May 24, 1977
- e. Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978
- f. Executive Order 12372, Intergovernmental Review of Federal Programs, July 14, 1982
- g. Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, August 3, 1993
- h. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994
- i. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

3. OTHER FEDERAL POLICIES

- a. Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act
- b. Council on Environmental Quality Memorandum of August 10, 1980: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the National Inventory
- c. Migratory Bird Treaties and other international agreements listed in the Endangered Species Act of 1973, as amended, Section 2(a)(4)