



Office of Water Resources, Michael A. Bilandic Building, 160 N. LaSalle St., S-703, Chicago, IL 60601

Illinois Department of Natural Resources, Office of Water Resources
Public Notice

**Construction of Shore Protection Project, in Lake Michigan,
at 367 and 347 Bluffs Edge Drive, Lake Forest, Illinois 60045**

Tom Kapfer, 367 Bluffs Edge Drive, Lake Forest, Illinois 60045, and Jordan Kozer, Trustee, Thomas F Fuller Declaration of Trust, 347 Bluffs Edge Drive, Lake Forest, Illinois 60045 have applied for an Illinois Department of Natural Resources, Office of Water Resources permit for the construction of a shore protection project, in Lake Michigan, at 367 and 347 Bluffs Edge Drive, Lake Forest, Illinois 60045.

The existing shore protection at the site consists of a deteriorated, 89 ft long steel sheet pile groin with armor stone at the south property line; a 285 ft long armor stone revetment at the toe of bluff; and a 185 ft long armor stone groin north of the north property line. The applicant proposes to construct a shore parallel armor stone breakwater; rehabilitate the existing steel sheet pile groin with an attached armor stone breakwater on the lakeward end; and regrade the existing armor stone revetment. The proposed breakwater will be 120 ft long. The proposed breakwater will have a crest elevation of 586.5 and crest width of 10.5 ft. The proposed rehabilitated groin will consist of a new layer of armor stone, and an attached 92.4 ft long shore parallel section at the lakeward end. The proposed rehabilitated groin and attached breakwater will have a crest elevation of 586.5 and a crest width of 10.2-10.5 ft. The proposed regraded armor stone revetment will consist of salvaging displaced stone and replacing on the slope. Access will be provided over and across the proposed rehabilitated groin in the form of stone blocks and over and across the proposed regraded revetment in the form of stone blocks. At least 4,400 cubic yards of clean sand will be placed as pre-mitigational fill. All elevations are International Great Lakes Datum 1985-adjusted (IGLD-85). No structures will extend more than 125ft. lakeward of the existing toe-of-bluff. The proposed project will be reviewed using the Department's Part 3704 Rules. A location map and plans are attached to this notice.

No work is to start on this project unless and until such a time that the permit is issued.

Inquiries and comments regarding the proposed project can be directed to Eric Otto, Senior Water Resources Engineer, of the Chicago Office at IDNR/OWR, 160 N. LaSalle Street, Suite S-703, Chicago, Illinois 60601 or eric.otto@illinois.gov.

An expanded version of the public notice can be viewed at
<https://dnr.illinois.gov/waterresources/publicnotices.html>.

Comments will be accepted through **October 28, 2024**.



Known for excellence.
Built on trust.

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION
MANAGEMENT

915 Harger Road
Suite 330
Oak Brook, IL 60521
T: 630.684.9100
F: 630.684.9120
www.gza.com



September 17, 2024
File No. 20.0157480.50

Mr. Eric Otto, P.E., CPESC, CPSWQ, Senior Water Resources Engineer
Lake Michigan Programs-Illinois Department of Natural Resources
160 North LaSalle Street, Suite S-703
Chicago, Illinois 60601-31030

Re: IDNR/OWR Application-for-Permit **C20240017**
367 Bluffs Edge Drive
Lake Forest, Illinois

Dear Mr. Otto:

GZA GeoEnvironmental, Inc. (GZA) offers the following information and clarification statements in reply to your letter dated August 20, 2024, and our discussion during the site meeting on August 30, 2024. GZA's responses to your information requests are provided below.

The list of GZA preparers includes Dan Veriotti, P.E. and James Novak, PWS.

Dan Veriotti, P.E. | Principal Coastal Engineer

Mr. Veriotti has over 27 years of specialized Lake Michigan coastal experience. He served as Engineer of Record and Lead Engineer on numerous Great Lakes coastal projects. He leads GZA's Great Lakes practice area for services that include hazard vulnerability assessments and mitigation for Lake Michigan shoreline, bluff, and ravine projects from initial conceptual design to regulatory permitting and construction documents.

James Novak, PWS | Senior Scientist

Mr. Novak has over 37 years of specialized natural resources and wetlands experience. He has authored numerous technical reports in support of Environmental Impact Statements (EIS), Environmental Assessments (EA), and other related documents. He is a designated Environmental Lead, Ecology, Public Involvement and Technical Writing with the Illinois Department of Transportation (IDOT) and a professional Wetland Scientist.

1. *Effective January 15, 2014, the Office of Water Resources requires payment of an application review fee prior to the detailed review of an application for permit. Based on an initial review of your application and the type of work you propose, a fee of \$5,000 is required to continue review of your application.*

GZA's Response:

A check in the amount of \$5,000 was mailed by the property owner to your office address, but it was returned to him. This check was provided to you for forwarding to the appropriate department on August 30, 2024.

2. *One (1) hard copy of the application, including attachments.*

GZA's Response:

A printed permit application with attachments was provided to you during our August 30, 2024 meeting.



3. *One (1) separate PDF copy of the plans.*

GZA's Response:

A separate PDF copy of the plans was electronically provided to you on August 29, 2024.

4. *Revised plans that:*

- a. *Include and label all property lines. Please note that if work is proposed on adjacent property that is not owned by the applicant, the adjacent property owner must be a co-applicant.*

GZA's Response:

The property lines were as shown in the GZA plans per the official recorded and stamped Plat of Survey (by Peklay Surveying Co. Ltd.), dated November 11, 2022. This survey, along with the established survey controls, were verified in the field by GZA's surveys. The adjacent north property owner is now a co-applicant, in support of the project. Please see the revised permit application provided in **Attachment 1**.

- b. *Include and label pedestrian access over or around the south groin. Per the IDNR/OWR Guidelines, related to shore-perpendicular or offshore structures, "where possible, notably in areas where existing access along the lakeshore is available, the project should provide some type of reasonable access over or around [the structure(s)] on the landward side."*

GZA's Response:

A pedestrian access structure with stone steps was provided to cross the existing south groin. Please see the revised plans provided in **Attachment 2**.

5. *Revised Adjacent Property Owner List that includes both the adjacent property addresses and the owners' mailing addresses.*

GZA's Response:

The revised Adjacent Property Owner list is provided in **Attachment 3**. This includes the updated mailing addresses, as provided by the City of Lake Forest current GIS database.¹

6. *Documentation (i.e., calculations) to support the quantities of proposed sand to be provided to create two beach cells, including the 20% sand overfill.*

GZA's Response:

The calculations for the proposed sand quantity were performed in Autodesk Civil3D, using a Digital Elevation Model (DEM) created for the existing conditions (surface using the April 19, 2024 bathymetric survey points) and a DEM created for the proposed sand grades. A volumetric difference between these two surfaces provided the sand quantity, with an additional 20% sand over fill provided; see **Figure 1** below.

¹ City of Lake Forest current GIS database: <https://communitymapviewer.gisconsortium.org/LakeForestIL>.

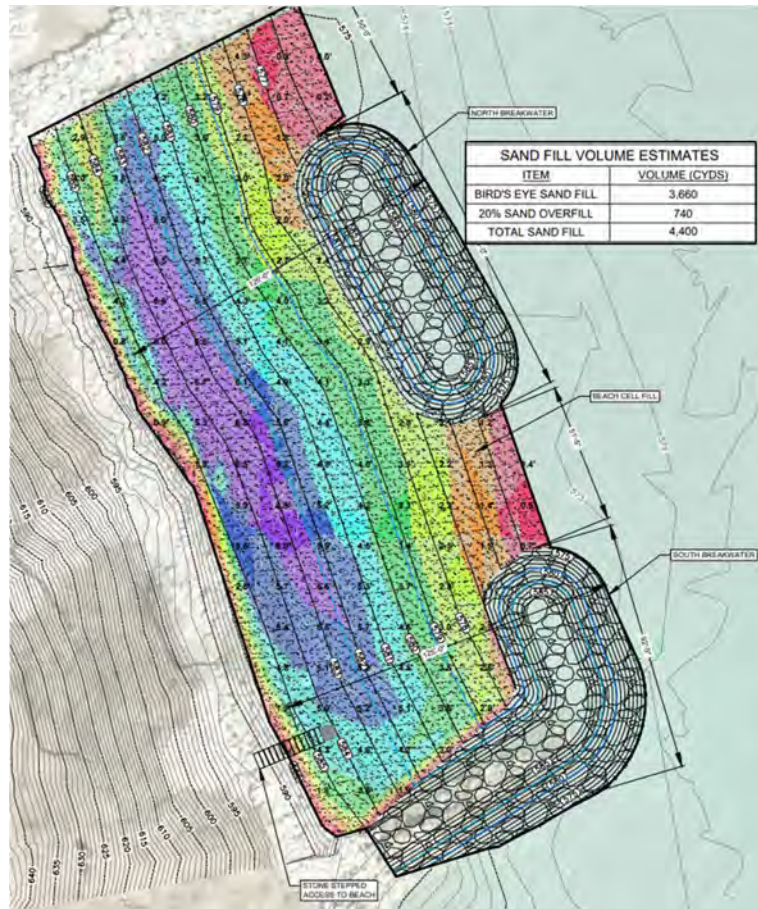


Figure 1. Volumetric Calculation for Sand Fill

7. *An evaluation of the benefits to the public interest in Lake Michigan which would result from the activity.*

GZA's Response:

The proposed permit activities have the following main goals:

- Shoreline stabilization;
- Create an improved coastal protection system for protecting the Lake Michigan bluff;
- Provide sand nourishment that can create and maintain a usable beach at various water levels; and
- The sand cover will protect against the open clay bottom being scoured (deepened) by the wave action. This process is irreversible if allowed to occur and referred to as lakebed downcutting. With the lake bottom deepening, larger waves attack the shoreline with increased energy.

The proposed project will greatly benefit the public interest on Lake Michigan, summarized as follows:

- A stepped stone structure will be provided to cross the south groin; currently, this is not possible given the existing steel sheet piling (SSP) groin configuration with armor stone;
- Creating and maintaining a sandy beach that works at various water levels will allow public access at or below the Ordinary Water Mark (OWM);
- A more stable beach system creates safer conditions for Lake Michigan swimmers;



- The stone structure fill provides fish habitat and creates recreational fishing opportunities;
- There will be no impacts to navigation, as the offshore extent of the stone structures (125 feet) will be significantly less than the north groin (approximately 189 feet). The proposed stone structures will be easily visible by the boaters, above the water.

8. *A discussion of the measures to be provided in the project design, construction, and operation which would minimize and/or mitigate any negative impacts.*

GZA's Response:

Design Phase

A coastal analysis was performed that selected a resilient set of design conditions (combination of water level and offshore wave), transform the waves to the near-shore area, and analyze the stone structure stability, side slope, required stone sizes, and crest elevation for reducing wave overtopping rates to acceptable levels.

The proposed project layout creates a controlled wave energy climate and allows the opportunity to provide and maintain a shoreline sandy beach, which protects against wave downcutting and the bluff toe.

Construction Phase

Project construction will be using water-based contractor means and methods. A marine barge will bring the clean stone materials and the work will be performed from the barge. The estimated project construction is during Winter 2024/early Spring 2025, without recreational boat traffic or water users being present.

The selected armor stone and sand fill will be from a pre-approved quarry, and clean, without impurities. The project will not have an impact on the Lake Michigan water quality during construction.

Operation and Maintenance

The project will be monitored by a Coastal Engineer over five years; this study will be able to proactively identify the need for stone structure maintenance and beach nourishment, as needed. The study will assure that the project works as intended after construction. A site topographic and hydrographic survey will be completed to document the as-built condition. Yearly surveys will be performed after the as-built condition survey is completed, for a monitoring duration of five years.

9. *An analysis of the extent and permanence of the activity's encroachment on Lake Michigan and of any impairment the activity would have on the rights, interests, or uses of the public in Lake Michigan and in the natural resources thereof. The analysis shall consider both the activity alone and the combined effects of similar activities which exist and/or could be lawfully undertaken in the locality. The analysis should be expressed in quantitative terms to the fullest extent practicable and should be performed by persons with expertise in such impact analysis.*

GZA's Response:

Public Uses Impact

The existing conditions do not currently allow public use. The south groin is constructed using an old SSP section with displaced armor stone, which is rapidly deteriorating and in need of immediate rehabilitation. Due to the combination of SSP and armor stone, crossing/accessing the south groin is not possible. The



proposed project will provide a stone-stepped structure on the south groin for public access. This is a net benefit to the public.

The existing lakefront was inspected several times during both high and low Lake Michigan water levels. No beach was documented, due to the absence of sediment in the shallow near-shore area (with exposed lake clay bottom). The proposed project will provide a sandy beach (above and below the Ordinary High Water Mark [OHWM]), which is another net benefit to the public. The beach will be protected by a stone breakwater (as an extension from the south groin) and a detached breakwater.

The existing north neighboring groin extends further offshore than the proposed project stone structures, therefore, the project will not have an impact on navigability/recreational boating.

Water Quality Impact

The proposed project will not impact the Lake Michigan water quality. Only clean quarry stone and sand fill will be provided, free of impurities. There will be no increase in water particle load or turbidity. The beach will act as a filtration media for any natural bluff groundwater discharges.

Natural Resources/Ecosystem Impact

The existing terrestrial habitat along the lakefront stone revetment is likely very limited. Along the lakefront, only the stone revetment exists, with no vegetation present. In the near-shore, exposed clay lake bottom was documented, which does not offer aquatic habitat. As the lake bottom downcutting continues, the clay layer can become a suspended plume, which is detrimental to marine life.

The proposed project will offer a sandy beach, sheltered by two stone breakwaters. The created beach will offer habitat for terrestrial animal and bird species, along with fish spawning in shallow water. As the project does not impact the existing bluff slope vegetation, the local terrestrial wildlife will continue to exist at this property. The sandy beach slope will be placed underwater, offering protection against lake downcutting into the clay layer.

The breakwater stones placed with voids will offer fish spawning, feeding, and sheltering opportunities for juvenile fish. The crest of the breakwater above the water can be used by birds for resting.

GZA initiated an Ecological Compliance Assessment Tool (EcoCAT) consultation to identify any known protected natural resources in or close to the project area. In addition, GZA researched the Historic and Architectural Resources Geographic Information System (HARGIS) for listed historic buildings, structures, sites, objects, and districts. There are no known resources and/or landmark properties in the immediate vicinity of the site, therefore, the project will not have any impact. The EcoCAT and HARGIS documents are provided in **Attachment 4**.

Littoral Sediment Transport Impact

The detached breakwater, south groin extension (as a breakwater), and beach fill create a beach cell that work together as a shore protection system. These two components work together for protecting the shoreline and providing a great habitat and recreational amenity. The armor stone breakwaters reduce the incoming wave energy and keep the sand stable within the project boundaries for long periods of time. The sandy beaches represent the majority of the shore protection function. The beaches are effective at dissipating wave energy while providing the public recreational component. It is noted that the breakwaters do not eliminate all of the incoming wave energy, as the waves transmitted through the structures and over the top are well tolerated by the beach system. It is expected that a portion of the sand fill will be lost as a positive source of sediment to the natural littoral system.



Based on our compiled practical experience from numerous implemented projects and our presentation, "Beach Fill Material Stability in Illinois," for the Illinois Coastal Zone Management and presented to the City of Lake Forest and other municipalities, there are important practical findings that were leveraged for the project site, including the Lake Forest Beach Cell 1 and Cell 2 nourishment design and monitoring, the Lake Forest Park Beach monitoring study, and other projects (Rosewood Beach in Highland Park, along with other numerous Lake Michigan coastal protection studies, design, and construction, including the Village of Kenilworth Lakefront design). We also performed numerous computer modeling studies for beach stability on open shoreline, with or without detached breakwaters.

The Illinois shoreline is considered to be "sediment starved." Bluff and lakebed erosion supply the sand needed in the littoral drift system. With the man-made armoring of the shoreline in Illinois and Wisconsin, the transport rates substantially decreased. The United States Army Corps of Engineers (USACE) conducted a study, *Sediment Budget for the North Illinois Shore from the Wisconsin Border to Wilmette Harbor* (2019). The study concluded that the net annual sediment transport rate varied between 60,000 to 90,000 cubic yards per year before 1986, with a significant reduction today (only 16,000 cubic yards per year) crossing in Illinois from Wisconsin.


The proposed project will supply a rate of sediment transport to the system by natural erosion processes and is expected to contribute from regular beach nourishment activities as a net benefit. In addition, the proposed cell fills are to the maximum holding capacity plus 20% overfill rate, allowing natural sediment transport processes to bypass the project area. No negative impacts will be recorded from the proposed project on the natural littoral drift processes.


At this time, we are aware of the City of Lake Forest beach nourishment for the Lake Forest Park Beach Cell 1 (completed 2022) and Cell 2 (2024), supplying a quantity of clean quarry sand to the northern park cells. There are no other current planned activities from the City of Lake Forest along the shoreline.

GZA appreciates the opportunity to be of assistance. Please feel free to contact Mr. Veriotti at (224) 275-2123 or via email at dan.veriotti@gza.com if you have questions.

Very truly yours,

GZA GeoEnvironmental, Inc.


Dan Veriotti, P.E.
Associate Principal/Vice President


James Novak, PWS
Associate Principal/Vice President

J:\157400to157499\157480 Lake Forest\50 Coastal Design\Work\Permit Application Response to Comments\FINAL 20.0157480.50 Permit App Responses_Lake Forest IL 9-17-24.docx

Attachments: Revised Permit Application
Revised Permit Plans
Revised List of Property Owners and Mailing Addresses
EcoCAT and HARGIS Documents

cc: Mr. James Casey, IDNR



ATTACHMENT 1

Revised Permit Application

**JOINT PERMIT APPLICATION FOR
Shoreline Improvements
367 Bluffs Edge Drive,
Lake Forest, IL 60045**

Prepared for

**U.S. Army Corps of Engineers – Chicago District
Illinois Department of Natural Resources, Office of
Water Resources
Illinois Environmental Protection Agency**

Prepared by



915 Harger Road, Suite 330
Oakbrook, IL 60523

TABLE OF CONTENTS

TAB 1	Joint Application Form
TAB 2	Introduction Project Description Existing Conditions Qualitative Habitat Assessment Mitigation Alternatives Assessment
TAB 3	Permit Plans
TAB 4	Adjacent Property Owner List
TAB 5	Ordinary High Water Mark Delineation

TAB 1

Joint Application Form

JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received
-----------------------	------------------

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name: Tom Kapfer Company Name (if any): Address: 367 Bluffs Edge Drive, Lake Forest, IL 60045 Email Address:	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant): Jordan Kozer Company Name (if any): Thomas F Fuller Declaration of Trust Address: 347 Bluffs Edge Drive, Lake Forest, IL 60045 Email Address:	4. Authorized Agent (an agent is not required): Dan Veriotti Company Name (if any): GZA GeoEnvironmental, Inc. Address: 915 Harger Road Suite 330 Oak Brook, IL 60523 Email Address:
Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, Dan Veriotti, PE to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Applicant's Signature

Date

7/13/2024

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a. See attached list		
b.		
c.		
d.		

6. PROJECT TITLE:

367 Bluffs Edge Drive Coastal Protection

7. PROJECT LOCATION:

367 Bluffs Edge Drive, Lake Forest, IL 60045

LATITUDE: 42.23290 °N LONGITUDE: 87.81325 °W	UTM's Northing: 4675955.49 Easting: 432894.50				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION 1 mile east of intersection of Sheridan Road and E Westleigh Road	LEGAL DESCRIPT	QUARTER NE	SECTION 3	TOWNSHIP NO. 43N	RANGE 12E
<input checked="" type="checkbox"/> IN OR <input type="checkbox"/> NEAR CITY OF TOWN (check appropriate box) Municipality Name City of Lake Forest		WATERWAY Lake Michigan		RIVER MILE (if applicable)	
COUNTY Lake	STATE IL	ZIP CODE 60045			

Revised 2010

☐ Corps of Engineers

☐ IL Dep't of Natural Resources

☐ IL Environmental Protection Agency

☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features):

The project involves rehabilitation of a steel sheet piling by adding armor stone and regrading the existing displaced stone, building a detached breakwater, and importing clean quarry sand to create two beach cells.

9. PURPOSE AND NEED OF PROJECT:

The purpose of the project is to create a better shoreline protection system that can protect from wave energy during storms and protect against lakebed downcutting.

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE:

The project involves placing armor stone to rehabilitate the south steel sheet piling and create a detached breakwater. Imported quarry sand will be placed for beach nourishment. Both design elements will help create a more resilient shoreline and help prevent continuing erosion.

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: Armor Stone, Core Stone, and Bird's Eye Sand, approximate gradations/tonnages shown on Drawing No. 2.

AMOUNT IN CUBIC YARDS:

Bird's Eye Sand: 3,650 CYDS, Armor Stone/Core Stone: 3,760 Tons placed below the OHWM (as shown on the attached plans)

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

0.782 Acres under the OHWM of 582.3' IGLD85.

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

Due to the nature of the project and the minimal environmental impacts, compensatory migration is not planned.

14. Date activity is proposed to commence
10/1/24

Date activity is expected to be completed
10/30/2024

15. Is any portion of the activity for which authorization is sought now complete?
Month and Year the activity was completed

Yes

☐

No

☒

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section.
Indicate the existing work on drawings.

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency

Type of Approval

Identification No.

Date of Application

Date of Approval

Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED.

Yes

☒

No

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent

Date

Signature of Applicant or Authorized Agent

Date

Signature of Applicant or Authorized Agent

Date

☐ Corps of Engineers
Revised 2010

☐ IL Dep't of Natural Resources

☐ IL Environmental Protection
Agency

☐ Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

See attached plan set as part of application materials.

Revised 2010

☐ Corps of Engineers

☐ IL Dep't of Natural Resources

☐ IL Environmental Protection
Agency

☐ Applicant's Copy

PLAN VIEW

See attached plan set as part of application materials.

FOR AGENCY USE ONLY

Revised 2010

☐ Corps of Engineers

☐ IL Dep't of Natural Resources

☐ IL Environmental Protection
Agency

☐ Applicant's Copy

TAB 2

Introduction

Project Description

Existing Conditions

Qualitative Habitat Assessment

Mitigation

Alternatives Assessment

TAB 2

Project Description

The Owner of 367 Bluffs Edge in Lake Forest, IL is proposing to improve the Coastal protection for the Site. The project location is on the Lake Michigan shoreline in Lake Forest, as shown in the attached project plans.

The proposed work consists of the following items:

- Rehabilitation of the Steel Sheet Piling (SSP) south groin by adding armor stone and regrading the existing displaced stone material;
- Regrading of the existing armor stone revetment;
- Build a detached armor stone breakwater;
- Provide imported quarry sand to create two beach cells.

The purpose of the project is to create a better shoreline protection system, that can mitigate the significant wave energy during storms, and protect against lakebed downcutting. The proposed work is shown in the permit plans included in Tab 3.

Existing Conditions

A GZA Coastal Engineer performed a site inspection on April 15, 2024. The Lake Michigan water level was 579.4 feet International Great Lakes Datum 1985 (IGLD85). The existing site has the following characteristics.

- 1. South groin

The south groin is a combination of steel sheet piling (SSP) and armor stone (up to approximately 2 tons) and is 89 feet long. The armor stone is undersized and not interlocking well. The end of the structure has a low crest, allowing significant wave overtopping rates. The SSP is very deteriorated, with a variable crest elevation (586.3 feet to 583.7 feet) and does not extend to the full end of the structure. The offshore structure end has a low crest with displaced armor stone. See **Figures 1 and 2**.



Figure 1. SSP South Groin

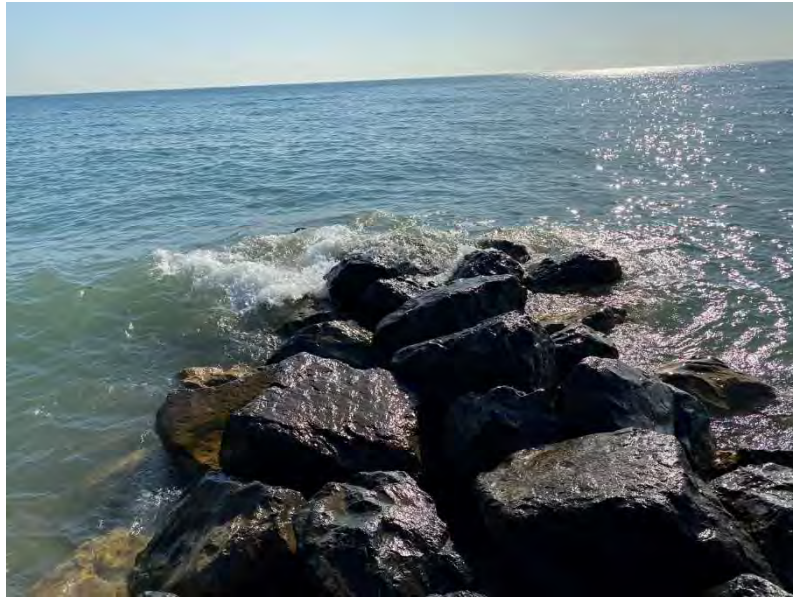


Figure 2. SSP South Groin-Offshore End

- 2. Backshore Protection. The backshore protection is an approximately 285-foot long armor stone revetment placed along the toe of the bluff. Some of the stone was displaced from the combined wave action and ice loading, along with the deepening of the near-shore area (“downcutting”). See **Figure 3**. The revetment is critical for providing bluff toe protection.

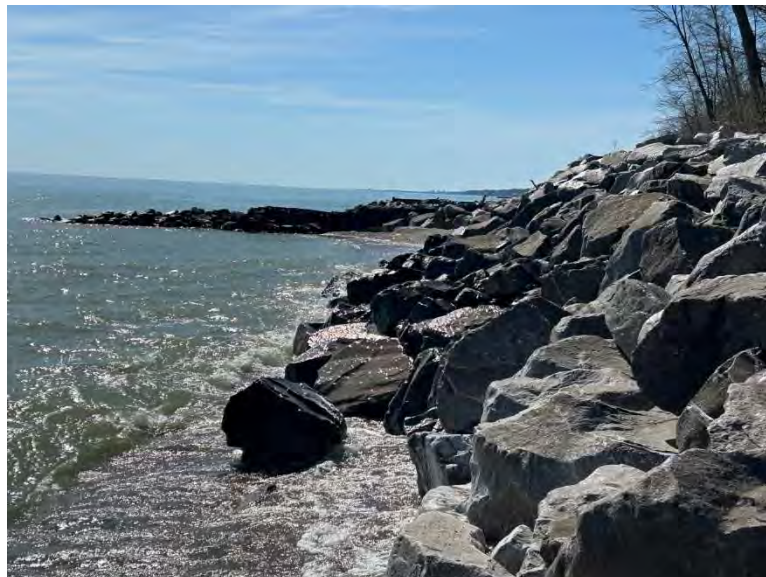


Figure 3. Stone Revetment with Displaced Stone

- 3. North Groin. The north groin is comprised of armor stone and is approximately 185 feet long. It is located entirely along and on the north neighboring property. The structure is in very good condition. See **Figure 4**.



Figure 4. North Groin

Site Survey and Ordinary High Water Mark

GZA performed a site bathymetric survey on April 19, 2024 and a field delineation of the Ordinary High Water Mark (OHWM). There are no visible field indicators for the delineation on site, as there is no permanent beach. During periods of lower water levels, a very narrow beach with gravels and cobbles was documented-see Figure 5.



Figure 5. Coarse Gravels and Cobbles

In the absence of shoreline indicators on site (as there is no beach), the following were surveyed:

- The south vertical SSP groin, with the delineated OHWM of 582.25 feet IGLD85;
- Neighboring north beach at 347 Bluffs Edge. Due to the significant length of the south groin, this shoreline area has a permanent beach, which was surveyed. The average OHWM elevation is 582.3 feet IGLD85,

which was adopted for this project. It is noted that this elevation is in agreement with the surveyed line on the SSP wall. This application includes the attached field delineation report.

A significant project concern is the absence of sediment material in the near-shore area. This condition allows the breaking wave energy to scour the bottom, which results in deepening of the water depths (process known as downcutting). With time, this will result in increased wave heights and shoreline erosion.



Figure 6. No Near-Shore Sediment

Development of Shoreline Protection Alternatives

Various alternatives were formulated and evaluated, as summarized below.

Alternative 1: No Action. If the existing coastal protection system is not improved, the stone revetment will continue to deteriorate, with more stone being displaced. Future bluff damages are likely. The south groin will fail, and further destabilize the stone revetment. The no-action alternative is not feasible for this site.

Alternative 2: Revetment and South Groin Repairs. This alternative includes salvaging the displaced revetment stone and placing back on the slope and re-grading the structure. A quantity of new armor stone will be supplied as needed. For the south groin, the displaced stone will also be salvaged and regraded, with a new layer of armor stone added to reinforce the structure and raise the crest elevation. This alternative does not address the near-shore downcutting and it is anticipated that frequent maintenance and high construction costs will be required, therefore it was dismissed.

Alternative 3: Revetment and South Groin Repairs with Beach Nourishment. This alternative adds sand nourishment to Alternative 2 (Revetment and South Groin Repairs). All the project goals will be met, except for the fact that the rehabilitated south groin does not have the capability to keep the sand nourishment stable. By direct comparison, the south groin is 89 feet long, while the neighboring north groin (retaining stable sediment) is 185 feet long. It is anticipated that maintenance sand nourishment will have to be provided frequently, for a significant cost. This alternative was dismissed.

Alternative 4: Beach Cells (Preferred Alternative). This alternative rehabilitates the existing revetment and the south groin. A "T" angled extension will be provided at the end of the rehabilitated south groin. A stone detached breakwater with sand fill will create two beach cells. The detached breakwater and south groin extension will work together with the beach cells to reduce the incoming wave energy. This alternative will have a superior performance achieving the project goals with reduced maintenance and was selected for the project.

Sediment Transport Overview

The net movement of sediment in the project area is from the north to the south. Longshore sediment transport (LST) is the transport of sediment in the littoral zone parallel to the shoreline as a result of obliquely approaching waves and induced currents. Storm waves can move significant annual volumes of sediment along the shoreline. The coastal structures (groins, jetties, detached breakwaters) help by retaining the beach fill and protect the shoreline.

The cross-shore sediment transport (CST), is perpendicular to the shoreline. The intensity of the LST and CST increases with larger waves (more intense storms). In an ideal situation, the sediment budget is in balance (the beach profile is stable) and there is a balance of sediment volumes in and out of the project area. This is rarely the case and the sediment budget imbalance will result in beach and bluff erosion.

The LST annual rates vary as a result of variable water levels and a reduction in the sediment supply. In recent years, man-made armoring of the shoreline and bluffs resulted in a significant reduction of the eroded material that was a positive source of sediment to the LST.

As reported by the United States Army Corps of Engineers (USACE), at the downstream end (border between Wisconsin and Illinois), approximately 60,000 to 80,000 cubic yards per year was the calculated range of the LST net rate before 1986. The most recent calculation based on monitoring results is only 16,000 cubic yards per year. Therefore, the LST significantly reduced due to the decrease in natural sediment supply.

The stability of a beach fill is directly dependent on the sediment sizes. In recent years, coarse Bird's Eye was used as beach fill for many recreational public Illinois beaches and performs well. The sand fill is used with armor stone structures in beach cells. This project is proposing creating two beach cells with armor stone structures, using coarse Bird's Eye sand fill.

Coastal Analysis and Basis of Design

GZA performed a Coastal analysis, including water levels, offshore waves, wave transformations, calculation of armor stone stable sizes, side slopes and crest elevations for safe wave overtopping rates using standard desktop models and approved methodology by USACE. A combination of (50, 20) or a 50-Year water level was selected with a 20-Year offshore wave as basis of design. For reference, a 50-Year event has a 2% annual occurrence chance, while a 20-Year event has a 5% annual chance.

The detached breakwater and the south groin improvements were designed based on the results of the Coastal analysis.

Qualitative Habitat Assessment

Very little habitat (if any) is present in the proposed work areas due to the presence of historic shoreline erosion, stabilization and bluff slope armoring. The lake substrate appears to be a combination of cobbles and exposed clay (no upper sediment layer). There is no visible aquatic vegetation or a beach present within the proposed work area. Also, there is no terrestrial vegetation on the stone revetment or south groin.

The nearest tributary, the Waukegan River, is approximately 7 miles north of the project area. Fort Sheridan Forest Preserve with upland ravines and other aquatic resources is approximately 1.8 miles south of the project area.

There are no known reef/shoal or other habitat features within 1 mile of the project area.

The project plans in Tab 3 show the existing conditions, including the GZA survey on April 19, 2024.

Mitigation

The proposed work will minimize impacts to Waters of the US to the maximum extent practicable. The work is anticipated to be conducted from the water (working barge) and will be conducted in a manner that limits the potential for environmental impacts, therefore, compensatory mitigation is not planned. The sand and armor

stone materials will be transported to the site and placed with water-based construction equipment from an anchored barge.

Selected Alternative

Alternative 4 (Beach Cells) was selected for implementation. This includes the following design elements, and detailed in the attached plans:

- One detached armor stone breakwater constructed 125 feet offshore from the existing stone revetment;
- Rehabilitated south groin with regrading and a new layer of armor stone placed on its north side;
- A south groin angled extension, constructed 125 feet from the existing stone revetment;
- Regraded stone revetment by salvaging the displaced stone and re-placing on the slope;
- The proposed armor stones have been sized to withstand the selected design condition (water level and offshore wave);
- Coarse sand fill be provided to create two beach cells, including a 20% sand overfill quantity.

Impact Assessment

Stone and Sand Fill

A total of 4,890 tons of stone fill (armor stone and core) will be placed. The stone fill will includes placing 3,760 tons of armor/core stone below the OHWM of 582.3 feet IGLD85. The stone materials will be clean, quarried stone. Similarly, clean quarry sand will be placed on the lake bottom. A total of 4,400 cubic yards of sand will be provided, which includes 3,650 cubic yards below the OHWM.

The primary impact on the substrate will be placing stone and sand on the exposed lakebed (currently estimated to be exposed clay).

We do not anticipate an increase in suspended load and turbidity, as the quarry stone materials are clean and free of impurities and fines.

TAB 3

Permit Plans



ATTACHMENT 2

Revised Permit Plans

COASTAL PROTECTION DESIGN

367 BLUFFS EDGE DRIVE
LAKE FOREST, ILLINOIS 60045
SEPTEMBER, 2024

ISSUED FOR REGULATORY PERMITTING

PREPARED FOR:

MR. TOM KAPFER
367 BLUFFS EDGE DRIVE
LAKE FOREST, ILLINOIS 60045

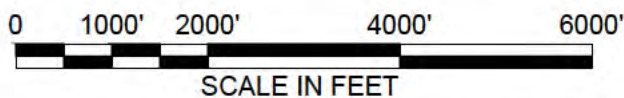
DESIGNED BY:



GZA GEOENVIRONMENTAL, INC.
915 HARGER ROAD
OAK BROOK, IL 60523
(630)-323-3905



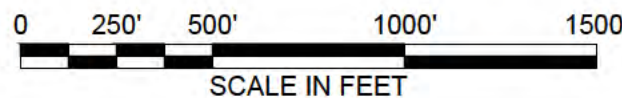
PROJECT LOCUS MAP



SOURCE: BASE MAP FROM THE FOLLOWING USGS QUADRANGLE MAP:
HIGHLAND PARK, IL
DIGITAL TOPOGRAPHIC MAPS PROVIDED BY USGSSTORE.GOV.



PROJECT VICINITY MAP



AERIAL BASE MAP DEVELOPED FROM AN ELECTRONIC
IMAGE FILE PROVIDED BY MICROSOFT CORPORATION /
DIGITAL GLOBE / CNES DISTRIBUTION AIRBUS DC IN 2024.

TABLE OF CONTENTS

DRAWING NO.	DRAWING TITLE
1	COVER SHEET
2	NOTES AND SPECIFICATIONS
3	SITE PHOTOGRAPHS
4	EXISTING CONDITIONS
5	SITE PLAN
6	CROSS SECTIONS (1 OF 2)
7	CROSS SECTIONS (2 OF 2)

DATED: 09/17/2024



ISSUED FOR REGULATORY
PERMITTING

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.			
COASTAL PROTECTION DESIGN 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045			
COVER SHEET			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: MR. TOM KAPFER 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045	
PROJ MGR: DV	REVIEWED BY:	CHECKED BY:	DRAWING NO.
DESIGNED BY: DV	DRAWN BY: CJB	SCALE: AS NOTED	1
DATE: SEPTEMBER, 2024	PROJECT NO.: 20.0157480.50	REVISION NO.:	DRAWING NO. 1 OF 7

© 2024— GZA GeoEnvironmental, Inc. GZA—\1746070157460 LAK FOREST\00 COASTAL DESIGN\DESIGNS\CAV\PRODUCTION DRAWINGS\GZA_20.0157460_00_COASTAL_V7.DWG NOTES AND SPECIFICATIONS SEPTEMBER 17, 2024 8:37 AM COLIN BYRON

GENERAL NOTES

- NEARSHORE AND BATHYMETRIC DATA COLLECTED BY GZA ON APRIL 19, 2024 .
- HORIZONTAL DATUM IS IN REFERENCE TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), ILLINOIS STATE PLANES, EAST ZONE, US FOOT.
- VERTICAL DATUM IS IN REFERENCE TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85).
- WATER LEVEL ON APRIL 19, 2024 = 579.2 FEET IGLD85.
- AERIAL MAP UNDERLAY DEVELOPED FROM ESRI 2023 ONLINE AERIAL IMAGERY.
- THE USE OF AERIAL PHOTOGRAPHY CAN OFTEN MAKE BUILDINGS AND OTHER SITE FEATURES APPEAR TO BE OVERLAPPING AND DISTORTED WHEN OVERLAID WITH ACTUAL SITE FEATURES.
- NORTH PARCEL LINE OBTAINED FROM PDF COPY OF DRAWING TITLED "PLAT OF SURVEY" PERFORMED BY PEKLAY SURVEY CO., LTD. ON NOVEMBER 23, 2022, FILE NO. 22-451.
- UTILITY LOCATES SHOULD BE COMPLETED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
- THIS PLAN DOES NOT GUARANTEE THE EXISTENCE/NON-EXISTENCE, SIZE, TYPE, OR LOCATION OF UNDERGROUND UTILITIES. UTILITIES SHOWN ARE BASED ON ABOVEGROUND UTILITY STRUCTURES AND AVAILABLE UTILITY PLANS.
- CONTRACTOR SHALL COORDINATE WORK OF REQUIRED TRADES, VERIFY FIELD CONDITIONS, AND VERIFY QUANTITIES/DIMENSIONS PRIOR TO THE COMMENCEMENT OF WORK ON-SITE. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD.
- WHERE POSSIBLE, CONTRACTOR SHALL SEPARATE AND USE EXISTING ON-SITE MATERIALS IN APPROPRIATE SPECIFIED MATERIALS.
- UNLESS NOTED AS "EXISTING" WORK SHOWN ON THESE DRAWINGS SHALL BE CONSIDERED AS PART OF AND PROVIDED FOR UNDER THIS CONTRACT.
- STRUCTURES LABELED AS EXISTING SHALL REMAIN UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL TAKE MEASURES TO PROTECT EXISTING STRUCTURES, UTILITIES, AND/OR DRAIN TILES WITHIN SITE BOUNDARIES.
- ANY DAMAGE TO EXISTING UTILITIES, AND/OR DRAIN TILES SHALL BE REPAIRED OR REPLACED TO MATCH THE ORIGINAL CONDITION AS APPROVED BY THE ENGINEER OF RECORD.
- CONTRACTOR IS RESPONSIBLE FOR THE COST TO REPLACE DAMAGED UTILITIES.
- CONTRACTOR SHALL GRADE TRANSITIONS BETWEEN NEW AND EXISTING SURFACES TO BE SMOOTH AND GRADUAL WITH NO ABRUPT CHANGES.
- NO LAND DISTURBANCE SHALL TAKE PLACE.
- THE SELECTED CONTRACTOR TO USE ONLY WATER-BASED CONSTRUCTION MEANS AND METHODS (WORK FROM BARGE).

COASTAL CONSTRUCTION BEST MANAGEMENT PRACTICES:

- CONTRACTOR SHALL COORDINATE WORK OF REQUIRED TRADES, VERIFY FIELD CONDITIONS, AND VERIFY QUANTITIES/DIMENSIONS PRIOR TO THE COMMENCEMENT OF WORK ON-SITE. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD.
- CONTRACTOR SHALL USE MATERIALS THAT CONFORM TO THE SPECIFICATIONS SECTIONS. DEVIATIONS FROM THE SPECIFIED MATERIALS SHOULD BE APPROVED BY THE ENGINEER OF RECORD.
- UNLESS NOTED AS "EXISTING" WORK SHOWN ON THESE DRAWINGS SHALL BE CONSIDERED AS PART OF AND PROVIDED FOR UNDER THIS CONTRACT.
- STRUCTURES LABELED AS EXISTING SHALL REMAIN UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL TAKE MEASURES TO PROTECT EXISTING STRUCTURES, UTILITIES, AND/OR DRAIN TILES WITHIN SITE BOUNDARIES.
- ANY DAMAGE TO EXISTING UTILITIES, AND/OR DRAIN TILES SHALL BE REPAIRED OR REPLACED TO MATCH THE ORIGINAL CONDITION AS APPROVED BY THE ENGINEER OF RECORD.
- CONTRACTOR IS RESPONSIBLE FOR THE COST TO REPLACE DAMAGED UTILITIES.
- CONTRACTOR SHALL GRADE TRANSITIONS BETWEEN NEW AND EXISTING SURFACES TO BE SMOOTH AND GRADUAL WITH NO ABRUPT CHANGES.
- HAZARDOUS MATERIALS SHALL NOT BE USED OR STORED ON-SITE.

ASSUMED VALUES AND MATERIAL PROPERTIES

LENGTH OF SHORELINE:	250 FEET
MIN. STONE MATERIAL SPECIFIC GRAVITY:	2.65 (165 PCF)
POROSITY OF STONE STRUCTURE MATERIAL:	20%-25%
BIRD'S EYE D50:	3.5mm +/-10%

MATERIAL QUANTITY ESTIMATES

MATERIAL	QUANTITY	UNITS
TOTAL ARMOR STONE FILL:	3,830	TONS
UNDER OHWM ARMOR STONE FILL:	2,700	TONS
TOTAL FILTER STONE FILL:	1,060	TONS
UNDER OHWM FILTER STONE FILL:	1,060	TONS
*TOTAL BIRDS EYE SAND FILL:	4,400	CYDS
*UNDER OHWM BIRDS EYE SAND FILL:	3,650	CYDS
TOTAL GRADING SURFACE AREA:	38,005	SQ. FT.
TOTAL GRADING SURFACE AREA:	0.872	ACRES
UNDER OHWM GRADING AREA:	34,048	SQ. FT.
UNDER OHWM GRADING AREA:	0.782	ACRES

*INCLUDES 20% OVERFILL *

CUT AND GENERAL FILL VOLUMES BASED ON SURFACE CREATED FROM GROUND SURFACE AND LAKE BOTTOM DATA COLLECTED BY GZA GEOENVIRONMENTAL, LLC. ON APRIL 19, 2024. CHANGES IN GROUND/LAKE BOTTOM SURFACE ELEVATION SINCE THE DATA WAS COLLECTED MAY SIGNIFICANTLY ALTER THE GEOMETRY, THUS CHANGING FILL VOLUMES REQUIRED

MATERIAL DEFINITION AND SPECIFICATIONS:

ARMOR STONE:	USED TO CONSTRUCT ARMOR STONE GROINS. ARMOR STONE SHALL BE WITHIN TO 2.5 TO 4.5-TONS.
FILTER STONE:	USED AS ARMOR STONE GROIN BASE/CORE. FILTER STONE SHALL BE WITHIN 300 TO 900 LBS.
GEOTEXTILE:	MIRAFI FW403 OR ENGINEER APPROVED EQUAL. USED FOR STEPPED ACCESS CONSTRUCTION.
BIRDS EYE SAND:	USED TO CONSTRUCT BEACH AREA. BIRDS EYE SAND SHALL MEET THE FOLLOWING GRADATION OR ENGINEER APPROVED EQUAL.

SIEVE	PERCENT FINER BY WEIGHT
3/8-INCH	100%
1/4-INCH	95-100%
NO. 4	75-80%
NO. 8	10-15%
NO. 40	1-2%
NO. 200	0-1%

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION SOIL EROSION AND SEDIMENT CONTROL CONSTRUCTION NOTES (SMC – 2013 revision)

* PROVIDED FOR REFERENCE ONLY, NOT APPLICABLE *

- SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF HYDROLOGIC DISTURBANCE OF UPLAND AREAS.
- FOR THOSE DEVELOPMENTS THAT REQUIRE A DESIGNATED EROSION CONTROL INSPECTOR (DECI), INSPECTIONS AND DOCUMENTATION SHALL BE PERFORMED, AT A MINIMUM:
 - UPON COMPLETION OF SEDIMENT AND RUNOFF CONTROL MEASURES (INCLUDING PERIMETER CONTROLS AND DIVERSIONS), PRIOR TO PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING.
 - AFTER EVERY SEVEN (7) CALENDAR DAYS OR STORM EVENT WITH GREATER THAN 0.5 INCH OF RAINFALL OR LIQUID EQUIVALENT PRECIPITATION.
- SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION; IF STRIPPING, CLEARING, GRADING, OR LANDSCAPING ARE TO BE DONE IN PHASES, THE PERMITTEE SHALL PLAN FOR APPROPRIATE SOIL EROSION AND SEDIMENT CONTROL MEASURES.
- A STABILIZED MAT OF CRUSHED STONE MEETING IDOT GRADATION CA-1 UNDERLAIN WITH FILTER FABRIC AND IN ACCORDANCE WITH THE ILLINOIS URBAN MANUAL, OR OTHER APPROPRIATE MEASURE(S) AS APPROVED BY THE ENFORCEMENT OFFICER, SHALL BE INSTALLED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE. SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT-OF-WAY, STREET, ALLEY OR PARKING AREA SHALL BE REMOVED BY SCRAPING OR STREET CLEANING AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.
- TEMPORARY DIVERSIONS SHALL BE CONSTRUCTED AS NECESSARY TO DIRECT ALL RUNOFF FROM HYDROLOGICALLY DISTURBED AREAS TO AN APPROPRIATE SEDIMENT TRAP OR BASIN.
- DISTURBED AREAS SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT MEASURES WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE END OF ACTIVE HYDROLOGIC DISTURBANCE OR REDISTURBANCE.
- ALL STOCKPILES SHALL HAVE APPROPRIATE MEASURES TO PREVENT EROSION. STOCKPILES SHALL NOT BE PLACED IN FLOOD PRONE AREAS OR WETLANDS AND DESIGNATED BUFFERS.
- SLOPES STEEPER THAN 3H:1V SHALL BE STABILIZED WITH APPROPRIATE MEASURES AS APPROVED BY THE ENFORCEMENT OFFICER.
- APPROPRIATE EROSION CONTROL BLANKET SHALL BE INSTALLED ON ALL INTERIOR DETENTION BASIN SIDE SLOPES BETWEEN THE NORMAL WATER LEVEL AND HIGH WATER LEVEL.
- STORM SEWERS THAT ARE OR WILL BE FUNCTIONING DURING CONSTRUCTION SHALL BE PROTECTED BY AN APPROPRIATE SEDIMENT CONTROL MEASURE.
- IF DEWATERING SERVICES ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. DISCHARGES SHALL BE ROUTED THROUGH AN APPROVED ANIONIC POLYMER DEWATERING SYSTEM OR A SIMILAR MEASURE AS APPROVED BY THE ENFORCEMENT OFFICER. DEWATERING SYSTEMS SHOULD BE INSPECTED DAILY DURING OPERATIONAL PERIODS. THE ENFORCEMENT OFFICER, OR APPROVED REPRESENTATIVE, MUST BE PRESENT AT THE COMMENCEMENT OF DEWATERING ACTIVITIES.
- IF INSTALLED SOIL EROSION AND SEDIMENT CONTROL MEASURES DO NOT MINIMIZE SEDIMENT LEAVING THE DEVELOPMENT SITE, ADDITIONAL MEASURES SUCH AS ANIONIC POLYMERS OR FILTRATION SYSTEMS MAY BE REQUIRED BY THE ENFORCEMENT OFFICER.
- ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES MUST BE MAINTAINED AND REPAIRED AS NEEDED. THE PROPERTY OWNER SHALL BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE AND REPAIR.
- ALL TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED.
- THE EROSION CONTROL MEASURES INDICATED ON THE PLANS ARE THE MINIMUM REQUIREMENTS. ADDITIONAL MEASURES MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER, ENFORCEMENT OFFICER, OR OTHER GOVERNING AGENCY.

LAKE COUNTY DIVISION OF TRANSPORTATION SOIL EROSION AND SEDIMENT CONTROL GENERAL NOTES (LCDOT – 2/4/15 revision)

- AREAS OR EMBANKMENTS WITH 2:1 SLOPES OR STEEPER SHALL BE STABILIZED WITH SOD OR EROSION CONTROL BLANKET (SPECIAL) IN COMBINATION WITH SEEDING.
- ANY SEDIMENT OR SOIL TRACKED OFF THE SITE SHALL BE REMOVED BY SCRAPING OR STREET SWEEPING AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. THIS WORK WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE CONTRACT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RETURNING ALL EXISTING AREAS (TO REMAIN) AFFECTED BY CONSTRUCTION ACTIVITIES, EQUIPMENT, OR LABORERS TO THE ORIGINAL UNDISTURBED CONDITIONS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PROTECTING ALL NEW WORK UNTIL THE COMPLETION OF THE CONTRACT.
- PERIMETER EROSION BARRIER SHALL BE INSTALLED AT LOCATIONS SPECIFIED IN THE PLANS AT 1 FOOT OUTSIDE THE TOE OF SLOPE OR INSIDE THE RIGHT-OF-WAY WHICHEVER IS CLOSER TO THE CENTERLINE, OR AS DIRECTED BY THE ENGINEER PRIOR TO THE START OF ANY EARTHWORK, CULVERT, OR STORM SEWER CONSTRUCTION.
- THE PERIMETER EROSION BARRIER SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED WITH VEGETATION. AT THIS TIME, THE PERIMETER EROSION BARRIER SHALL BE REMOVED AND AREAS DAMAGED BY THE PERIMETER EROSION BARRIER REMOVAL SHALL BE RESTORED. THE RESTORATION OF THE AREA DISTURBED BY THE PERIMETER EROSION BARRIER REMOVAL SHALL BE INCLUDED IN THE PAY ITEM OF PERIMETER EROSION BARRIER.
- THE INSTALLATION & REMOVAL OF PERIMETER EROSION BARRIER SHALL BE PAID FOR UNDER THE ITEM OF PERIMETER EROSION BARRIER. MAINTENANCE OF PERIMETER EROSION BARRIER SHALL BE PAID FOR UNDER THE ITEM OF MAINTENANCE OF TEMPORARY EROSION CONTROL SYSTEMS.
- TEMPORARY DITCH CHECKS SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD DETAIL SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE DITCH CHECKS SHALL BE INSTALLED AS GRADING PROGRESSES THROUGH THE PROJECT.
- ALL SEEDED AREAS SHALL BE COVERED WITH EROSION CONTROL BLANKET.


NO.	ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE. FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING, THE DRAWING SHALL NOT BE TRANSFERRED, REVISED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.			
COASTAL PROTECTION DESIGN 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045			
NOTES AND SPECIFICATIONS			
PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: MR. TOM KAPFER 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045	
PROJ MGR:	DV	REVIEWED BY:	CHECKED BY:
DESIGNED BY:	DV	DRAWN BY:	SCALE:
DATE:	SEPTEMBER, 2024	PROJECT NO:	REVISION NO.
			DRAWING NO.
			2
			DRAWING NO. 2 OF 7



PHOTO 1: LOOKING NORTHEAST AT NEIGHBORING NORTH ARMOR STONE GROIN.



PHOTO 2: LOOKING SOUTHEAST AT DISPLACED REVETMENT ARMOR STONE.

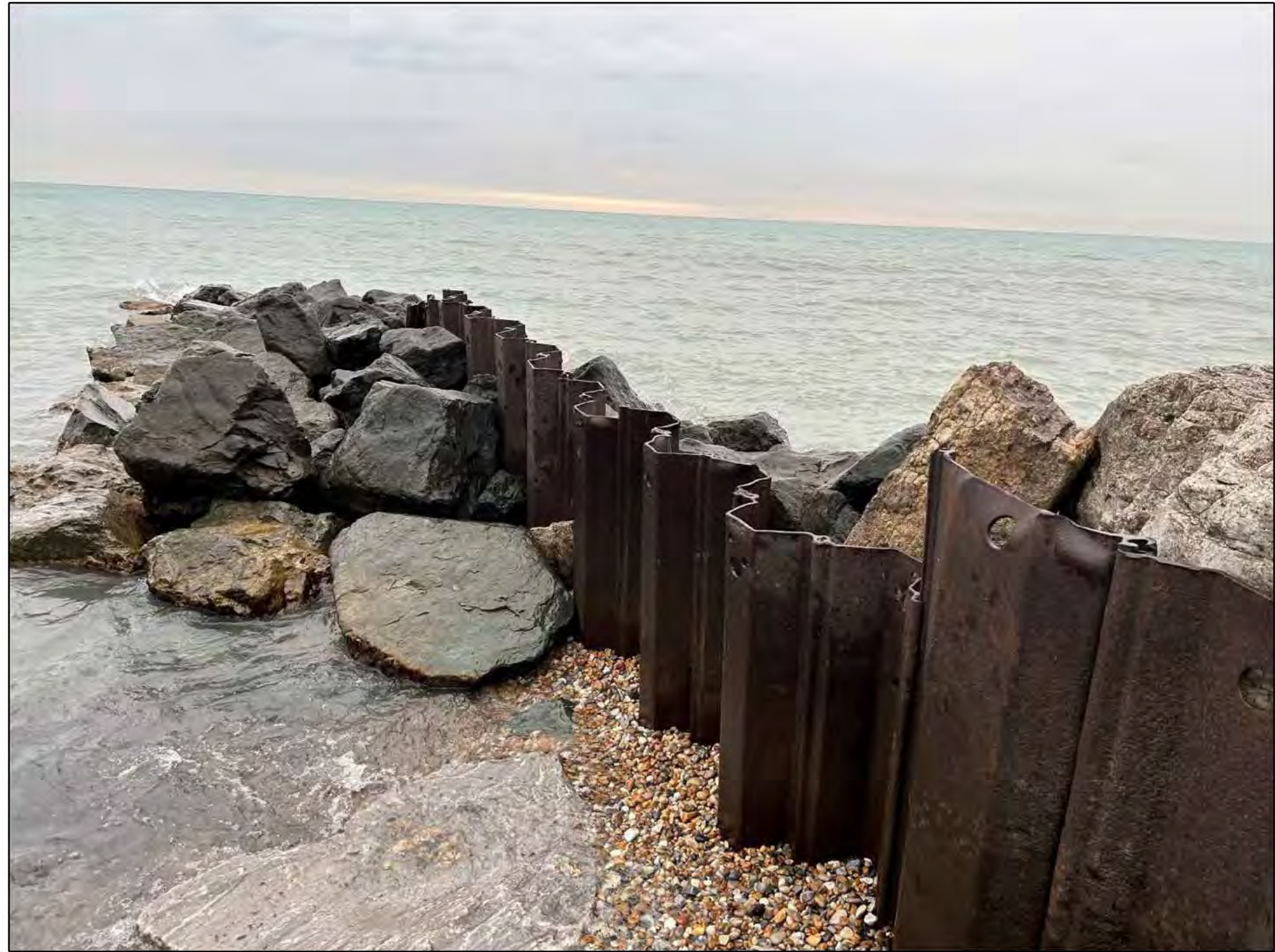


PHOTO 3: LOOKING EAST AT EXISTING STEEL SHEET PILE AND ARMOR STONE GROIN.



PHOTO 4: LOOKING AT NEAR-SHORE EXPOSED LAKE BOTTOM.



PHOTO LOCATION MAP
0 50' 100' 200' 300'
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.			
COASTAL PROTECTION DESIGN 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045			
SITE PHOTOGRAPHS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: MR. TOM KAPFER 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045	
PROJ MGR: DV	REVIEWED BY:	CHECKED BY:	DRAWING NO.
DESIGNED BY: DV	DRAWN BY: CJB	SCALE: AS NOTED	3
DATE: SEPTEMBER, 2024	PROJECT NO. 20.0157480.50	REVISION NO.	
			DRAWING NO. 3 OF 7

© 2024 - GZA GeoEnvironmental, Inc. GZA-15746070157460 LAK FOREST_V0 COASTAL DESIGN FIGURES.CAD/PRODUCTION DRAWINGS/GZA 20.0157460.50_COASTAL_V7.DWG EXISTING CONDITIONS SEPTEMBER 17, 2024 8:38 AM CQUIN BYRON

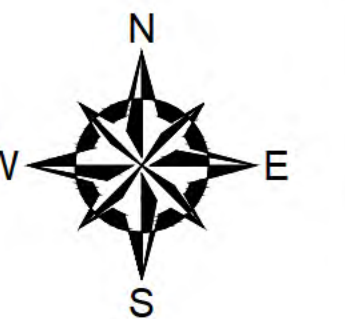


LEGEND

- 750--- EXISTING MAJOR TOPOGRAPHIC CONTOUR LINE
- 750--- EXISTING MINOR TOPOGRAPHIC CONTOUR LINE
- WATER LEVEL APRIL 19, 2024 = 579.2' (IGLD85)
- ORDINARY HIGH WATER MARK = 582.3' (IGLD85)
- EXISTING BUILDING
- PARCEL BOUNDARY

NOTES

- SEE DRAWING NO. 2 FOR GENERAL NOTES.
- ALL ELEVATIONS REFERENCE IGLD85.



0 10' 20' 40' 60'
SCALE IN FEET

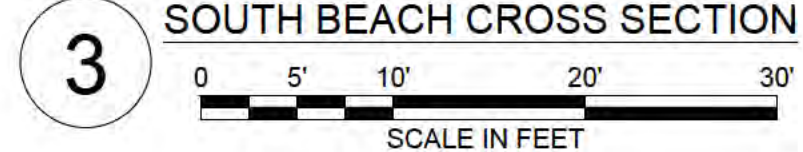
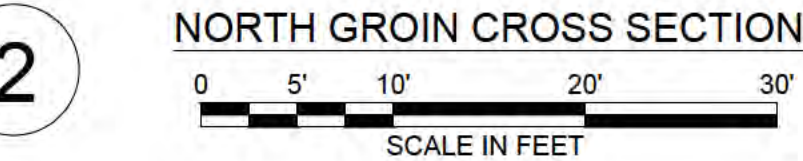
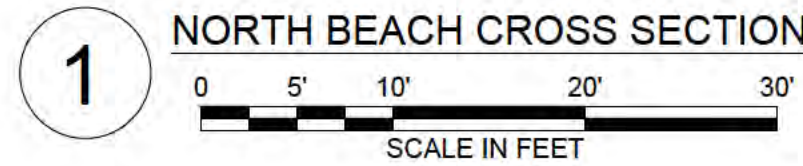
NO.	ISSUE/DESCRIPTION	BY	DATE








UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.


COASTAL PROTECTION DESIGN
367 BLUFFS EDGE DRIVE
LAKE FOREST, ILLINOIS 60045

EXISTING CONDITIONS

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: MR. TOM KAPFER 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045	
PROJ MGR: DV	REVIEWED BY: CJB	CHECKED BY: AS NOTED	DRAWING NO. 4
DESIGNED BY: DV	DRAWN BY: CJB	SCALE: REVISION NO.	
DATE: SEPTEMBER, 2024	PROJECT NO. 20.0157460.50		DRAWING NO. 4 OF 7



	EXISTING GRADE
	PROPOSED GRADE
	WATER LEVEL APRIL 19, 2024 = 579.2' (IGLD85)
	ORDINARY HIGH WATER MARK = 582.3' (IGLD85)
	PROPOSED ARMOR STONE
	PROPOSED FILTER STONE
	PROPOSED BIRDS EYE SAND

NO.				ISSUE/DESCRIPTION			BY		DATE
<p>UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOTECHNICAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.</p>									
<p>COASTAL PROTECTION DESIGN 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045</p>									
<p>CROSS SECTIONS (1 OF 2)</p>									
<p>PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>					<p>PREPARED FOR: MR. TOM KAPFER 367 BLUFFS EDGE DRIVE LAKE FOREST, ILLINOIS 60045</p>				
<p>PROJ MGR: DV</p>		<p>REVIEWED BY:</p>		<p>CHECKED BY:</p>		<p>DRAWING NO. <div style="font-size: 2em; font-weight: bold; text-align: center;">6</div> <p>DRAWING NO. 6 OF 7</p></p>			
<p>DESIGNED BY: DV</p>		<p>DRAWN BY: CJB</p>		<p>SCALE: AS NOTED</p>					
<p>DATE: SEPTEMBER, 2024</p>		<p>PROJECT NO: 20.0157480.50</p>		<p>REVISION NO.</p>					



ATTACHMENT 3

Revised List of Adjacent Property Owners and Mailing Addresses

Tom Kapfer
367 Bluffs Edge Drive Coastal Protection
USACE Permit Application # LRC-2024-XXX

South Property Owners – Mailing Address

Property Address: [REDACTED]
[REDACTED]

Property Owner: Mandan Farahati TTEE
UTD

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Thomas P Madsen,
Trustee

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Terry M Rozdolsky TR UD

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Tim & Heather Richmond

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Robert J & Darlene Bobb
TTEES

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Lake Forest Open Lands
Association

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Lake County Forest
Preserve

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Lake County Forest
Preserve

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Chicago Title Land Trust
Co., TTEE

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Shari E Coe TTEE UTD

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: 6 Cliff LLC

Mailing Address: [REDACTED]
[REDACTED]

North Property Owners – Mailing Address

Property Address: [REDACTED]
[REDACTED]

Property Owner: Thomas F Fuller, Trustee

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: ATG Trust Company

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Chicago Title Land Trust Co

Mailing Address: [REDACTED]
[REDACTED]

Property Address: [REDACTED]
[REDACTED]

Property Owner: Ethan Meister

Mailing Address: [REDACTED]
[REDACTED]



ATTACHMENT 4

EcoCAT and HARGIS Documents

Applicant: Lake Michigan Programs IDNR
Contact: Piper Siblik
Address: 160 N. LaSalle St., S-703
Chicago, IL 60601

Project: Bluffs Edge Coastal Protection
Address: 367 Bluffs Edge Drive, Lake Forest

IDNR Project Number: 2503486
Date: 09/09/2024

Description: Stabilization of the Lake Michigan shoreline through the creation of an improved coastal protection system to protecting the Lake Michigan bluffs.

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under Part 1075.

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Fort Sheridan Site INAI Site
McCormick Ravine INAI Site
Buffaloberry (*Shepherdia canadensis*)
Butternut (*Juglans cinerea*)
False Bugbane (*Actaea racemosa*)
Ground Juniper (*Juniperus communis*)
Purple-Flowering Raspberry (*Rubus odoratus*)
Sea Rocket (*Cakile edentula* var. *lacustris*)

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Lake

Township, Range, Section:
43N, 12E, 3



IL Department of Natural Resources Contact

Impact Assessment Section
217-785-5500
Division of Ecosystems & Environment

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

Security

EcoCAT operates on a state of Illinois computer system. We may use software to monitor traffic and to identify unauthorized attempts to upload, download, or change information, to cause harm or otherwise to damage this site. Unauthorized attempts to upload, download, or change information on this server is strictly prohibited by law.

Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.



EcoCAT Receipt

Project Code 2503486

APPLICANT

DATE

Lake Michigan Programs IDNR
Piper Siblik
160 N. LaSalle St., S-703
Chicago, IL 60601

9/9/2024

DESCRIPTION

FEE

CONVENIENCE FEE

TOTAL PAID

EcoCAT Consultation

\$ 25.00

\$ 1.00

\$ 26.00

TOTAL PAID

\$ 26.00

Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
217-785-5500
dnr.ecocat@illinois.gov

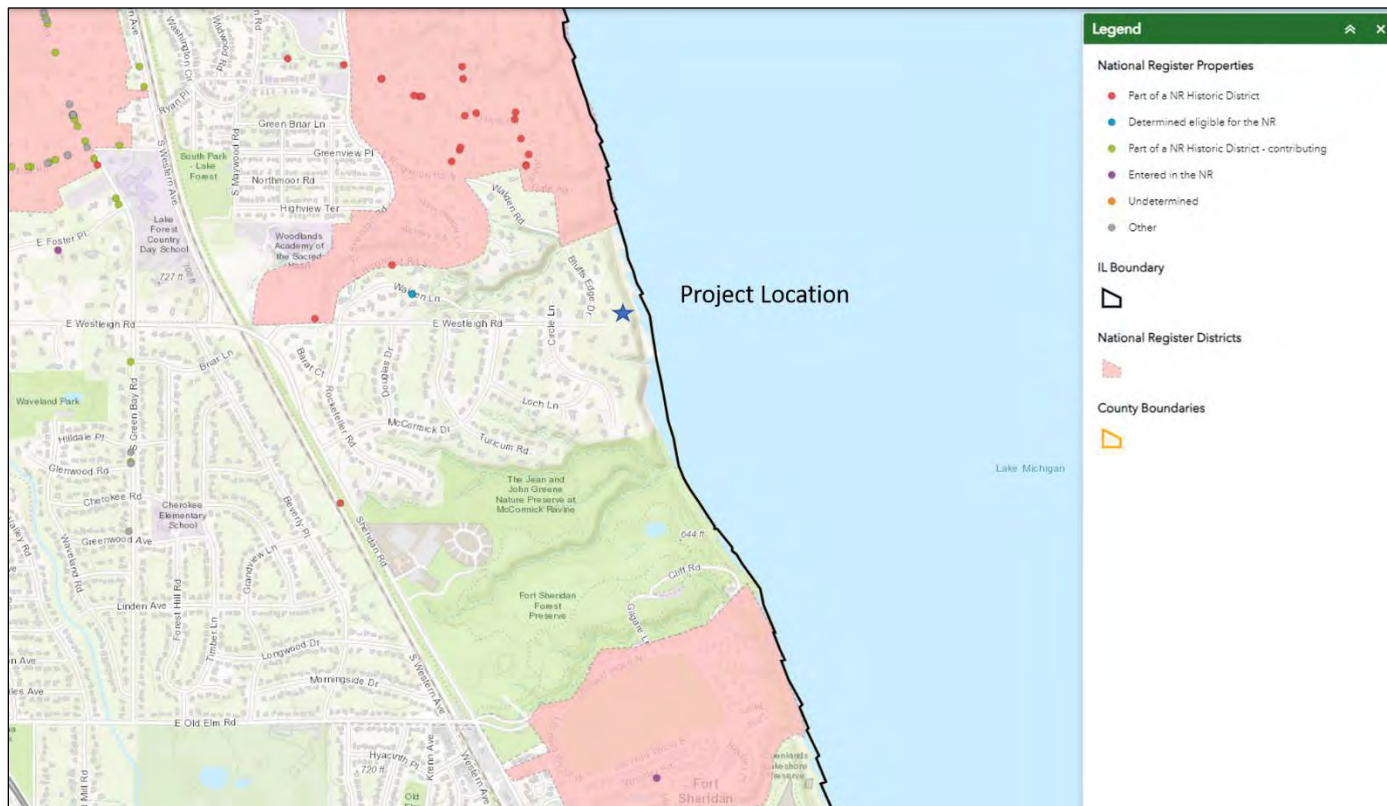


Figure. 367 Bluffs Edge Lake Forest HARGIS Database

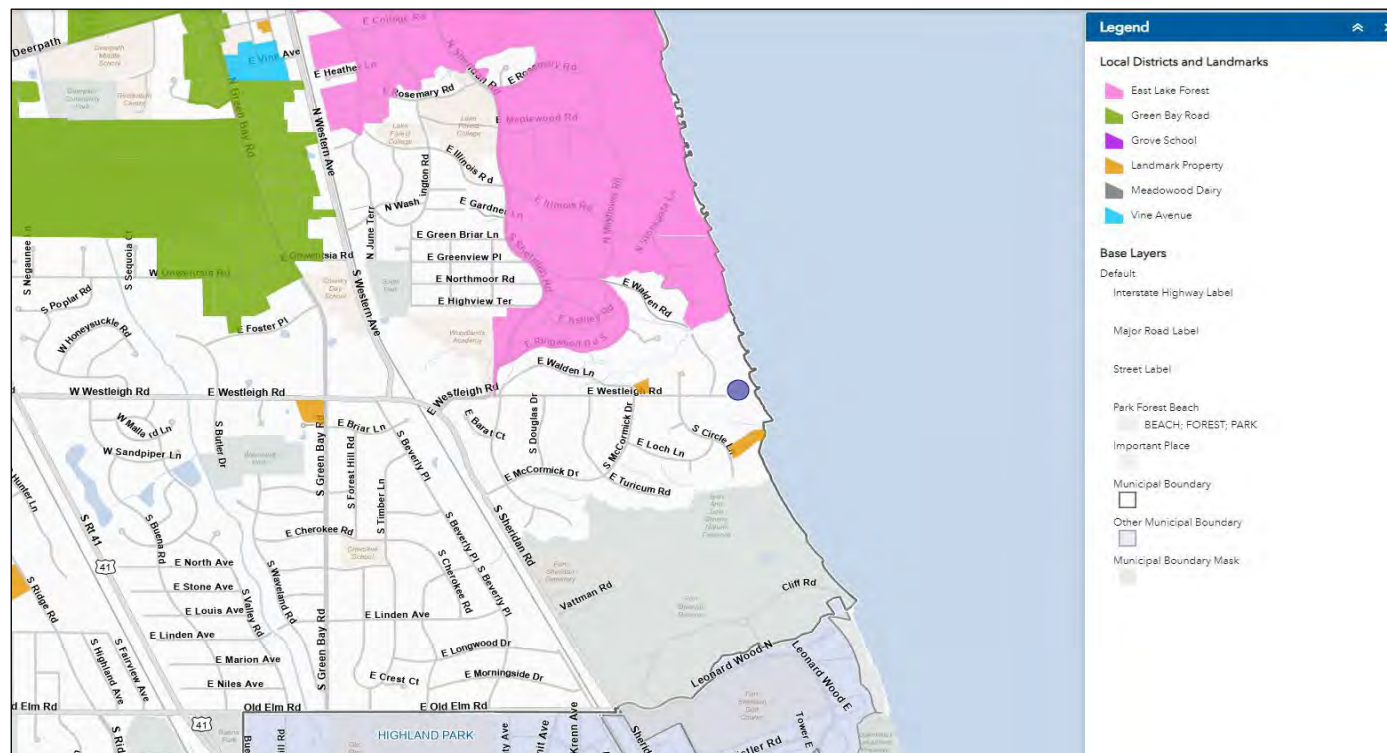


Figure. 367 Bluffs Edge Lake Forest Historic Sites Map