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 a Shore Protection Project, in Lake Michigan,
at 1055 Sheridan Road, Winnetka, IL 6093

Michael Fitzgerald, 1055 Sheridan Road, Winnetka, IL 60093, has 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 1055 Sheridan Road, Winnetka, IL 60093.

The existing shore protection at the site consists of a concrete seawall and stone revetment. The applicant proposes to construct a shore perpendicular steel sheet pile groin, quarrystone headland and quarrystone revetment. The proposed groin will be located along the north property line. The proposed groin will consist of a 90ft. long shore perpendicular section with a 30ft. long section angled to the southeast on the lakeward end. The proposed groin will have a crest of elevation of 587ft. on the landward end tapering to 585ft. on the lakeward end. A 60ft. long quarrystone headland will be constructed around the 30ft. long angled section of groin. The headland will have a crest elevation of 585ft. and a crest width of 10ft. A quarrystone revetment will be constructed along the south face of the shore perpendicular section of the proposed groin. The revetment will have the same crest elevation as the proposed groin with a crest width of 4ft. Access will be provided over and across the proposed groin in the form of steel stairs on the north side and stone stairs on the south side. At least 1,020 tons 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 James Casey of the Chicago Office at IDNR/OWR, 160 N. LaSalle Street, Suite S-703, Chicago, Illinois 60601 or james.casey@illinois.gov. An expanded version of the public notice can be viewed at http://www.dnr.illinois.gov/WaterResources/Pages/PublicNotices.aspx. Comments will be accepted through **July 23, 2024**.

Shabica & Associates, Inc.

Teralyn Pompeii, PE
Chief, Regulatory Branch
U.S. Army Corps of Engineers, Chicago District
231 S. LaSalle Street, Suite 1500
Chicago, IL 60604

Dear Ms. Pompeii: March 4, 2024

Please find enclosed a permit application for shore protection for the property located at 1055 Sheridan Road, Winnetka, Illinois, 60093, owned by Michael Fitzgerald. Proposed work includes construction of a steel groin with a small headland of stone at the lakeward end and required sand fill.

A *Design of Shoreline Erosion Protection* report has been attached to this cover letter as the coastal design specifications component of this permit. All references, photographs and figures referred to in the cover letter and the following report can be found in the Appendix.

The proposed activity complies with the approved Illinois Coastal Management Program (ICMP) and will be conducted in a manner consistent with such policies.

Project Purpose Statement
The property owner has retained Shabica & Associates (SA) to design and engineer an enhanced shore protection system for his property. The homeowner wants to provide a higher level of shore protection for the property as well as reduce the erosional impact from the adjacent municipal stormwater outfall pipe on the beach. Increased stream flow due to climate change causes periodic washout of the municipal street end as well as the adjacent beach including deposition of debris, leaves, garbage, etc. at high flow events.

Project Description
This application is for a steel sheetpile groin to be installed extending 90' lakeward from the existing concrete seawall and quarrystone revetment, with an additional 30' feet angling southeast. A quarrystone headland will be constructed around the angled extension with the toe stone 60' southeast from the shore parallel steel groin. A stone revetment will be constructed on the south side of the steel groin to an elevation matching the steel and a slope of 1:1. Steel (N) and stone (S) stairs will be constructed over the steel groin for beach walkers to traverse the structure. Clean mitigational sandfill will be placed north and south of the groin as required by the IDNR.

Coastal Geology
This section of coastline has historically lost sand due to lakebed downcutting, especially during prolonged periods of low lake levels. Sand deposits are thin to non-existent here with the exception of thin sand deposits in a portion of the nearshore (Figures 1, Appendix) and scientists estimate that the rate of lakebed erosion averages 6 inches per year (Nairn, 1997). The net result is similar to the effects of global warming and rising sea level on marine coasts. This includes deeper water nearshore, larger stormwaves and progressively narrower beaches as the nearshore lakebed continues to erode. This has resulted in wave impact at the bluff toe along the deflated limestone revetment. During the record low lake level in 2013, this site had a wide beach. The loss of sand since then left the property more vulnerable to stormwaves. The homeowner just completed revetment maintenance to

address the first line of defense from stormwaves. No beach was present lakeward of the revetment during the recent high-water levels in 2019.

The Illinois Lake Michigan shoreline is considered "sediment starved" by coastal scientists. This is in contrast to East Coast and Gulf Coast open ocean shores where tens of thousands of tons of sand are found in the nearshore system that provide a primary line of defense against stormwaves. On most Great Lakes shores including southern Lake Michigan, natural sand beaches are not able to protect the lakeshore (exceptions may be during very low lake levels like 1964 or 2013). Large quantities of sand have been trapped or diverted offshore by municipal structures that extend over 1,000 feet into the lake. Today, the main sand supply is wave erosion of the nearshore glacial clay lakebed that contains only about 10% sand (Shabica and Pranschke, 1994). The result is that groins are losing their effectiveness at holding a sandy beach during average to high lake levels. To help retain a sand covering of the nearshore lakebed (where downcutting is most active), as well as to protect the revetment and bluff toe, SA has designed a single groin system with a low stone headland to help prevent additional beach and lakebed scour from stormwater and waves during higher lake levels and storms.

If beach and nearshore sand is lost, degradation of the nearshore ecosystem will result. Meadows et al., (2005) reports an increase in zebra mussels *Dreissena polymorpha*, and a decrease in native zooplankton in waters where the lakebed is eroding clay and rocks. In comparison, a nearshore area with 100% sand cover supports a species-rich community. The report concludes, "it [is] nonetheless clear that sand-based areas were characterized by sufficient shallow water fish CPUE and species richness to suggest that these are important habitats within the context of the Great Lakes Basin and not simply 'wet deserts' as they are often considered."

Coastal Climate

One of the largest factors in determining the scope of a project is analyzing current lake levels and climatic conditions. Over the past several years, larger-than-normal stormwaves have impacted the shoreline of Lake Michigan. The shoreline at 1055 Sheridan Road has been impacted by the recent extreme increase in water level evidenced by waves overtopping and infiltrating the existing revetment and the deflation of the sand. These stormwaves, in combination with a severe rebound in Lake Michigan water levels, have exacerbated the nearshore erosion along the lakefront. Changes in weather patterns and lake levels affect the intensity of storms. Unfortunately, it is not possible to predict future Lake Michigan lake levels and how the changing levels will impact the shoreline.

The **Illinois State Water Survey, Prairie Research Institute** report on *Potential Impacts of Climate Change on Water Availability* (http://www.isws.illinois.edu/iswsdocs/wsp/climate_impacts_012808.pdf) states that:

> *"Scientists cannot predict future Illinois climatic conditions with confidence. The historical climate and hydrological records since the nineteenth century show that climate has changed significantly in the past and, even without human interference, could change significantly in the future."*

The Illinois State Water Survey goes on to graph future precipitation models, illustrating conditions that are wetter or drier than previous historic extremes. Either scenario is likely to cause loss of property due to stormwave erosion from either lakebed downcutting and/or larger stormwaves.

Design Options

The site at 1055 Sheridan Road, Winnetka has been inspected and options for shore protection were determined using desktop coastal engineering, site conditions from the current 2023 bathymetric survey, studying local prototypes, and several years of observations of the deteriorating shoreline conditions at this site. Given the sand loss over the last several years including during extreme high lake levels, as well as the uncertainty of future lake levels, it is prudent to engineer and design systems that will anticipate greater lakebed downcutting, higher amounts of beach erosion, more extreme storm events with larger waves, and potential loss of land.

Do Nothing Option: The option of "Do Nothing" results in leaving the beach and bluff in its existing state. Lakebed erosion will continue and allow larger stormwaves to impact the coastline further lowering the lakebed and eventually causing destabilization of the revetment. The existing newly maintained revetment is still functional to help reduce wave overtopping during low to average lake levels but not high lake levels when the sand erodes from the site (2019 high water levels). The site will also continue to have washout from the adjacent stormwater outlet.

At this site, a steel groin with a relatively short quarrystone headland will help to maintain sand cover helping to reduce lakebed erosion, reduce wave energy on the property as well as reduce impacts from the municipal stormwater outfall. The Village of Winnetka has reviewed and preliminarily approved the proposed design.

Public Benefits of Sandy Beaches

The Great Lakes represent the most important natural resource in the United States. Sandy beaches play an important role in keeping the lakes clean and safely accessible. Furthermore, a sandy beach makes a better ecotone (transitional environment) for flora and fauna than seawalls and revetments. Summary arguments supporting a sandy beach system include:

1) Beaches are filters for non-point source runoff.
2) Beaches reduce lakebed downcutting, a source of fine clay pollutants.
3) Beaches support endangered species such as sea rocket, marram grass, and seaside spurge.
4) Beaches make better wildlife habitat than actively eroding bluffs or seawalls.
5) Stone headlands make better fish habitat than eroding lakebed clay.
6) Beaches protect the lakebed from erosion that causes larger stormwaves to impact the shore.
7) Beaches are far safer for swimmers and boaters than a coast lined with seawalls or revetments, especially in an emergency.
8) Beaches, unlike most steel or concrete seawalls, are not visual pollution.

Impacts to Downdrift Properties

The downdrift section of coastline is protected by quarrystone revetments and steel groins with beaches that get wider further south due to the lakeward projection of the Tower Road Water Plant facilities. There should be no negative impact on the downdrift properties.

Impact to Littoral Drift System

The proposed plan for this site includes the construction of a steel groin with quarrystone headland and placement of sandfill as required for permit. As the system will be closer to shore than the existing quarrystone breakwater to the north and will be filled to 20% over its sand holding capacity and monitored for 5 years, sand will not be stolen from the littoral drift system.

The existing section of Lake Michigan shoreline at 1055 Sheridan Road, Winnetka is fully engineered with quarrystone breakwaters, revetments, and steel groins. The nearest structure to the north is 1077 Sheridan Road's 170' quarrystone breakwater approximately 100' north of the property line. The property to the south has a newly constructed quarrystone revetment. Based on our experience, the proposed breakwater will have a positive impact on the surrounding shoreline by breaking wave energy near the shoreline. It will not negatively impact the littoral system after the sandfill is placed (anticipated quantity plus 20% overfill). According to the former Illinois State Coastal Geologist (Chrzastowski, 2005), "the design to contain placed sand is becoming necessary because of reduced volume of littoral sand in transport." He further states, "beach-cell systems may represent the future for beaches along much of the Illinois bluff coast from Waukegan south to Evanston."

The beach system will be nourished with sand including a 20% overfill placed north and south of the system. The IDNR regulations for structures that will retain sand require pre- and post-construction surveys, as well as surveys at the one and five-year intervals. This requirement will help assure that a sand equilibrium is met and that the new project is gaining and losing sand at a similar rate to neighboring properties.

Impact on Public Uses
Public access will not be negatively by the project. This section of shoreline is heavily used by beach walkers and a set a steel stairs will provide access over the steel groin for safe and easy access. Fishing will not be impacted negatively, as the underwater area of the quarrystone protection will create an improved fish habitat. Navigation of water craft will not be impacted as the proposed breakwater will not extend as far as the existing structure to the north.

Impact on Natural Resources
Quarrystone structures in the nearshore waters of Lake Michigan and sandy beaches improve native species habitat. The LandOwner Resource Centre with support from the Canadian Wildlife Service and the Ontario Ministry of Natural Resources states that, "unstable shorelines can release silt that can choke nearby aquatic habitats." Additionally, underwater structures such as artificial reefs constructed of large boulders and clean riprap material "in large water bodies, such as the Great Lakes . . . are often the best method of creating habitat." As stated above, according to Meadows, et al., 2005, "a nearshore area with 100% sand cover support[s] a species rich community." As the design does not impact the bluff and vegetation, the local terrestrial wildlife will continue to inhabit this property.

Type of Permit
The scope of this project requires an LMRGP.

Description and Schedule of Proposed Activity
All of the proposed work will be completed via marine access. A barge will deliver materials and machinery to the site. Pending the water depth at the time of construction, some of the work will be completed from the barge and some will be completed by a backhoe working from land. All stone and sand will be delivered by barge to the site. Work will not begin until all necessary permits have been received. This work will require approximately 6 weeks weather permitting.

Type and Quantity of Fill/Measures Taken to Avoid Impact/Erosion and Sediment Control Plan
All material will be clean and from inland quarries. Approximately 675 tons of quarried quartzite will be placed in the structures. Approximately 1,020 tons of clean sand will be placed. Acreage of stone placed on the lakebed east of the OHWM is approximately 0.06 acres.

Summary
All of the above-described activities and plans follow LMRGP terms and conditions. All of the proposed work adheres to the guidelines prescribed by the Illinois Environmental Protection Agency and its Anti-Degradation Assessment. U.S. Fish & Wildlife Service will be updated on all relevant correspondence.

If you have any questions, please feel free to call me at the phone number below.

Sincerely.

Jon Shabica
Vice President

C: IDNR/OWR (Casey)
IEPA, Bureau of Water, Permit Section
U.S. Fish & Wildlife Service
Michael Fitzgerald

DESIGN OF SHORELINE EROSION PROTECTION

Introduction

The following report summarizes assumptions and design criteria for a quarrystone breakwater system and sandfill mitigation to help reduce erosion and protect the property located at 1055 Sheridan Road in Winnetka, Illinois 60093. The design is based on the drawings included in the permit application to the U.S. Army Corps of Engineers.

The site lies within a nearly completely engineered section of suburban lakeshore that is typically protected with breakwaters, revetments, and steel sheetpile groins.

This section of coast is sand-starved due to municipal and military structures (littoral barriers) constructed over the past 100 years that extend lakeward beyond the littoral zone and reduce sand bypass. According to the Illinois State Geological Survey, there is almost no sand moving along this section of coast. All structures in the area have been steadily losing their effectiveness at holding beach sand. This problem is exacerbated by lakebed erosion. In many cases where all the sand has been lost, the adjacent bluffs have begun to erode. To provide adequate protection for the upland property, solutions have typically been of two types: breakwater- or groin-anchored beaches to protect the bluffs, or large quarrystone revetments placed against the toe of the bluff that prevent stormwave erosion but at the expense of the beach.

Project Description

Construction of a steel sheetpile groin with quarrystone headland and sandfill mitigation are proposed that fulfill the design requirements of 20-year stormwave erosion protection. The proposed system is designed for all lake level conditions.

Summary Specifications

Using the Army Corps of Engineers Shore Protection Manual (1984), performance of nearby prototypes and other sources, the following specifications were developed for this site (elevations are based on IGLD 1985):

Stone Breakwater Specifications	
Lakeward Crest Elevation:	585 ft
Toe of Structure:	575 ft (average)
Crest Width:	10 ft
Average Armor Size:	3.5 tons
"B" Stone	400 lbs to 1000 lbs
Slope:	1:1.5

Assumptions	
• Design High Water (DHW):	582.0 ft *
• Design Water Level:	580.0 ft
• Design Low Water (DLW):	577.5 ft *
• Existing clay till elevation at breakwater toe:	573.0 ft
• 20-yr lakebed erosion at toe of breakwater:	3 ft**
• Design wave height (Hs):	7.5 ft
• Nearshore Slope:	± 1:40
• Design Wave Period (T):	9.9 s **
• Depth at Structure Toe DHW (Ds):	7'
• Design Deepwater Wave (Ho):	18.0'
• Design Wave Length (Lo):	501.8'
• Structure Porosity:	37%

* DHW includes 2 ft storm setup; DLW is equivalent to Low Water Datum

** Resio & Vincent, 1976

Stone Breakwater Stability, Armorstone

The proposed steel and quarrystone breakwater will be constructed with an armor layer of 2 - 5 ton armorstone built on a 1:1.5. The lakeward face will be 2-layer random placement and the landward face will be special placement. Overtopping of the structure is expected during storms and higher water levels.

For a quarrystone breakwater, structural integrity may depend on the ability of the foundation to resist the erosive scour by the highest waves. Therefore, it is suggested that the selected design wave height H_s for such structures be based on the design wave height H being the average height of the top 10 percent of waves expected during an extreme event. Based on the deepwater significant wave height H_s corrected for refraction and shoaling.

The stability number (K_d) is primarily affected by the depth of the stone foundation and toe protection below the still water level and the depth of the structure.

The equation below is Hudson's formula and is used to determine the armor stone weight needed to support a particular structure.

$W = (W_r * H_s^3) / ((K_d[W_r/W_w]-1) * \cot(\beta))$
W = weight of individual armor units in lbs
W_r = Unit weight of armor units
W_w = unit weight of water
H_s = the design wave height for the structure
K_d = the design stability coefficient for rubble and toe protection
β = the angle of incline of the structure

Quartzite armorstone is recommended as it is highly durable and is locally available in most gradations under 6 tons. Hudson's formula was used to estimate armorstone size. An armorstone of 2.6 tons is predicted for random stone based on the design conditions.

Shoreline / Bathymetry

Bathymetric surveying was performed on October 3, 2023. Survey notes: Lake conditions at the time of survey were waves of 1 foot or less. Bathymetric survey was performed using a Trimble R10 GPS Receiver along with a Hydrolite-TM Single Beam Echosounder. Survey was performed tied to Trimble's VRS Now Network, data points were collected in NAV88 datum and converted to IGLD 1985.

Water Levels

The following table summarizes water level data representing daily highest extremes measured at Calumet Harbor, Illinois, approximately 30 miles to the south of Winnetka. Note: Low water datum = 577.5 ft (IGLD 1985).

Lake Level	LWD	IGLD 1985
Record High	+5.5	583.0
Record Low	-1.4	576.1

Project Supporting Data

To help facilitate project review, SA offers the following supporting data based on standard coastal engineering practices:

1. **Sediment Transport Around Structure** The structure is designed to lie within the surf zone (zone of breaking waves), therefore allowing sediment transport around the structure. The range of breaking wave heights is from 7.4 ft based on a 6-second wave with a wave length of 184 ft (using 1/25 Lo) to 18 ft based on a 9.9-second wave with a wave length of 501.8 ft (Resio and Vincent, 1976). The commonly accepted zone of sediment transport is to 18 ft (depth of closure) in this section of Lake Michigan, which is a function of the design wave parameters. Based on this data, once the structure has been filled with sand, it will continue to bypass littoral drift sand. Survey monitoring will be conducted, as required by the IDNR, to assure that the system performs as designed.

   The IDNR requires sand fill in areas where sediment will be trapped by the new system. Sand volume quantities have been calculated as shown in the permit drawings. As required by the IDNR, a 20% overfill will be added to the calculated volume. Additionally, the new pre- and post-construction monitoring will be performed and submitted to the IDNR to verify the impacts to the system.

2. **Effect on Adjacent Shorelines** A wave diffraction diagram (Figure 2, Appendix) has been attached. Using a refracted incident wave angle of 90 degrees (USACE, Shore Protection Manual), with average and design waves, there will be a decrease in wave energy on adjacent properties. The wave diffraction pattern shows that the coefficient of diffraction (K) reduces the wave energy to a distance of about ½ the wave length downdrift and does not have an impact further downdrift. For the average 6-second wave, that distance of reduced wave energy is about 90 ft and for the design wave, the protected distance is about 250 ft. This protected area close to the structure has diminished wave energy that will in turn help reduce erosion in the area.

3. **Wave Reduction in Rubble-Mound Structures** The Iribarren number (ξ), or surf similarity number, is used to determine the wave reflection coefficient. For rubble-mound structures, wave reflection (and wave energy) is reduced by one half or more (0.2 to 0.53) (Figure 5, Appendix). For example, a wave reflection of 0.25 means that the wave energy is reduced by 75%. The range of wave reflection for beaches peaks at about 0.44. The range for plane slopes, however, quickly rises to 0.5 and peaks at .91. This illustrates that rubble-mound structures reduce wave energy almost as well as beaches.

Lakebed Erosion

Lakebed erosion, active in water depths of 10 ft or less, is a design component of this plan. This section of the Winnetka lakeshore is considered sediment starved. Sand deposits were measured near this site (60 Harbor Street, Glencoe) from the backshore to a depth of 6.3 m (21 ft). Sand deposits were thin to non-existent to a distance of 150 ft from shore (Shabica & Pranschke, 1994). Also, the site is underlain by highly-erodable, cohesive glacial clay-till. See Shabica survey data and cross-section showing loss of lakebed sand from 1975 to 1989. Calculated sand deposits at this site are 81.2 cubic meters per meter of lakeshore to a depth of 4 meters. According to Robert Nairn, approximately 200 m^3 of sand cover per meter of lakeshore (out to a depth of 4 m) is necessary to protect the underlying cohesive profile from lakebed erosion under most conditions. Sand and coarser sediments represent typically less than 15% of the material eroding from the lakebed and bluffs.

Using the historic rate of lakebed downcutting of 0.15 ft/yr (Nairn, 1997), an irreversible lowering of the nearshore lakebed clay of approximately 3.0 ft over a 20-year period is predicted in unprotected areas. With the stone breakwater, revetment and sandfill installed, the lakebed erosion will be reduced.

Project Monitoring

As the performance of shore protection structures cannot be predicted with absolute certainty, the shore protection system for 1055 Sheridan Road, Winnetka will be inspected as required by IDNR guidelines. This includes topographic and hydrographic surveys beginning at an elevation of 581.5 ft (IGLD 1985) and progressing to 300 ft lakeward of the lakeward end of the project, within the north and south property lines for the Fisher Lane public ROW and 1055 Sheridan Road. Additionally, all structures should be inspected to assure that they continue to meet design specifications.

References

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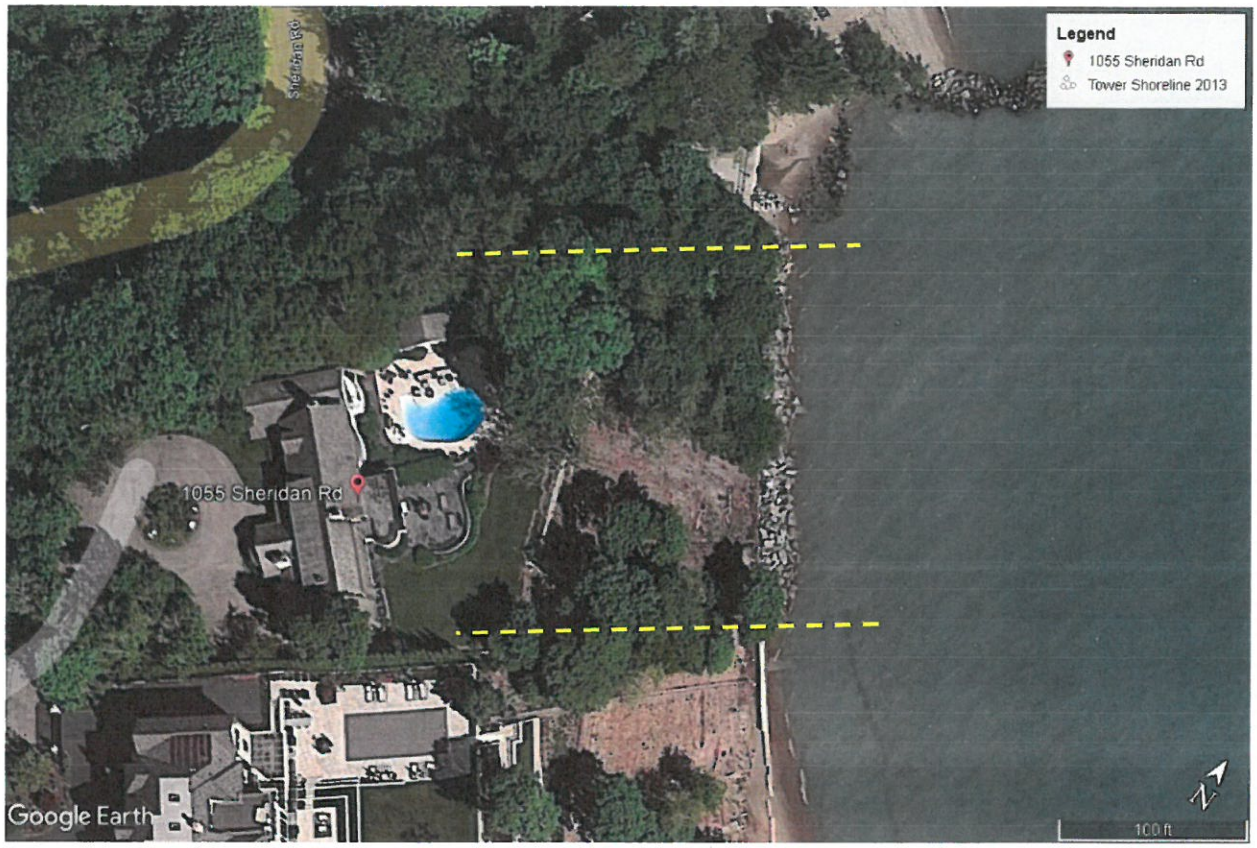
APPENDIX
1055 Sheridan Road, Winnetka • March 4, 2024



2020 Google Earth Image (Approximate Property Lines in Yellow)

2015 Google Earth Image shows ravine stream moving south across on 1055 Property

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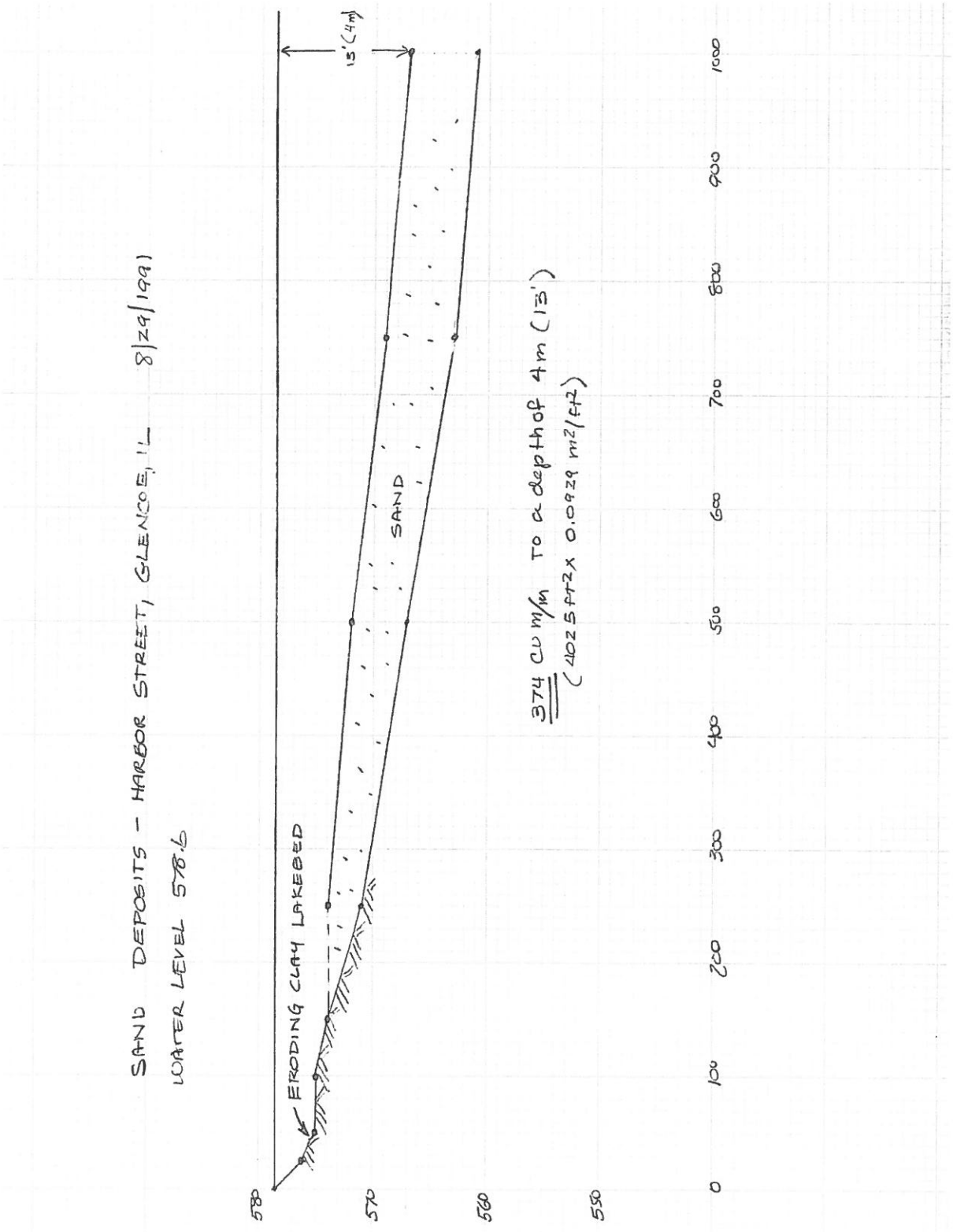
www.shabica.com

APPENDIX
1055 Sheridan Road, Winnetka • March 4, 2024

2008 SA Photo showing the Fisher Lane stormwater outfall and washout to the beach

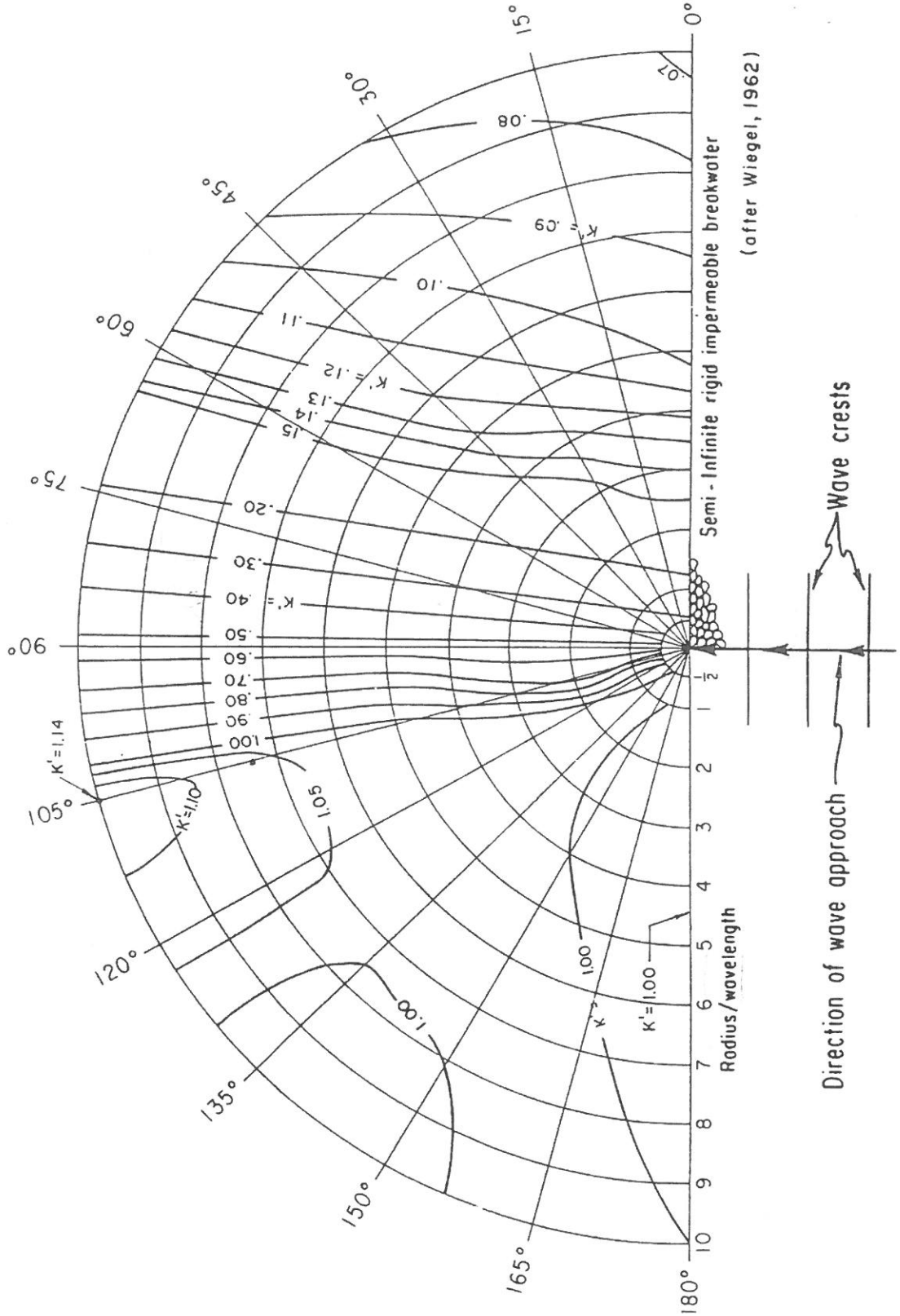
2023 SA Photo looking south shows narrow beach

FIGURE 1


SAND DEPOSITS - HARBOR STREET, GLENCOE, IL 8/29/1991
WATER LEVEL 578.6
13' (4m)
ERODING CLAY LAKEBED
SAND
374 CU M/M TO A DEPTH OF 4m (13')
(4025 FT2 X 0.0929 m2/ft2)
580
570
560
550
0
100
200
300
400
500
600
700
800
900
1000

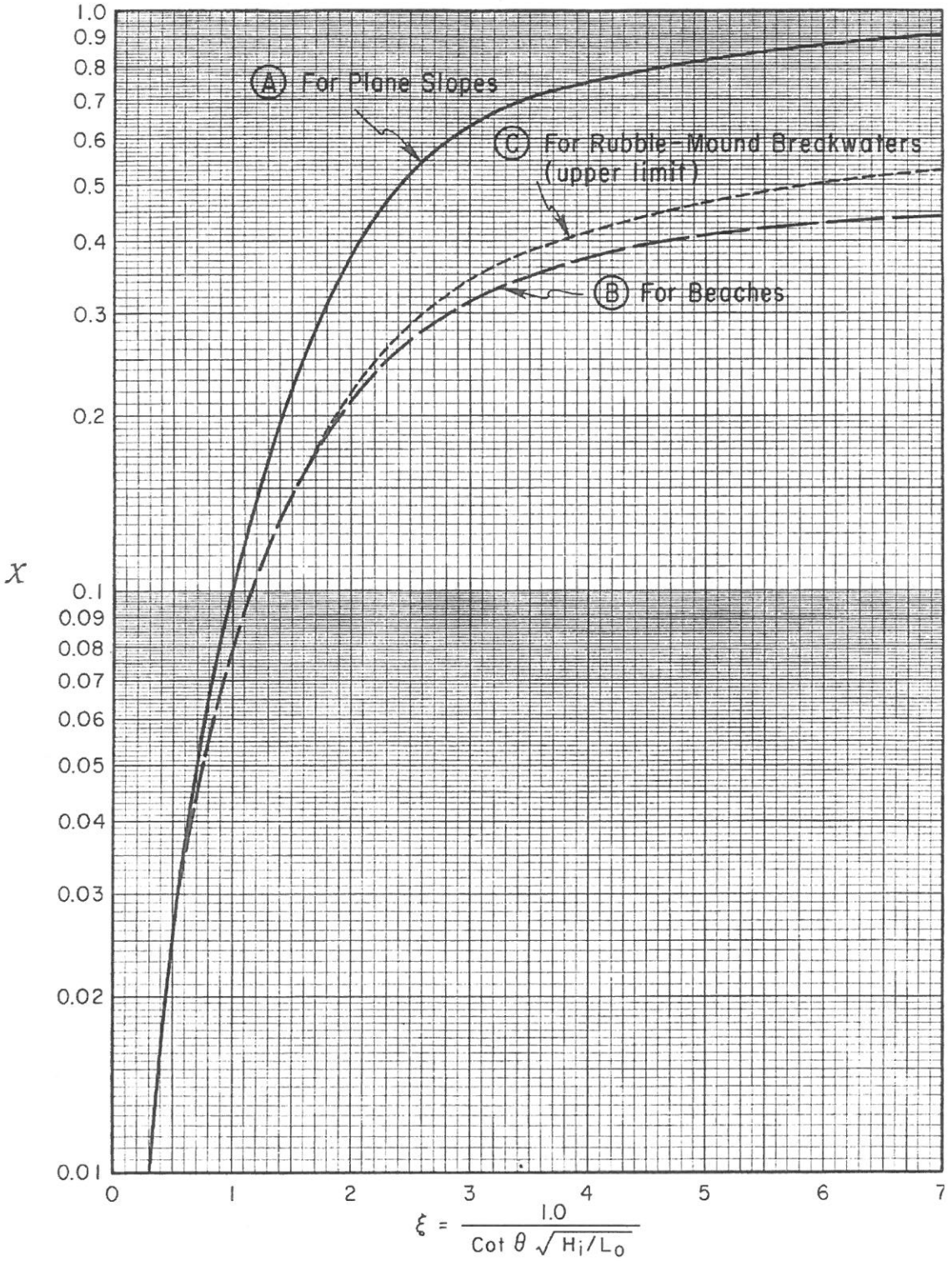
APPENDIX
1055 Sheridan Road, Winnetka • March 4, 2024

FIGURE 2



APPENDIX
1055 Sheridan Road, Winnetka • March 4, 2024

FIGURE3



Wave reflection coefficients for slopes, beaches, and rubble-mound breakwaters as a function of the surf similarity parameter ξ .

Shore Protection Manual USACE

LAKE MICHIGAN REGIONAL GENERAL PERMIT (LMRGP)
Property Address: 1055 Sheridan Road, Winnetka, Illinois
Project: Steel Groin with Quarrystone Headland

AUTHORIZED ACTIVITY: The following activities are covered under this permit:	
1. Installation, repair, and modification of permanent and seasonal piers/docks, boat ramps, boat hoists, and lifts	N/A
2. Navigational and mooring aids	N/A
3. Temporary recreational structures	N/A
4. Installation, repair, and modification of shore protection	Steel Groin with Quarrystone Headland
5. Beach nourishment	Yes
6. Maintenance of existing public harbors, public access facilities, and navigational features required for maintaining existing function	N/A
7. In-water discharge of dredged material, including beneficial use of dredged material for beach nourishment, shore protection or ecosystem restoration	N/A
8. Temporary structures and minor discharges of dredged or fill material necessary for the removal of vessels (wrecked, abandoned, or disabled) or for the removal of constructed obstructions to navigation.	N/A
1. A completed application form signed by the applicant or agent. The application form is available at Https://www.lrc.usace.army.mil/Missions/Regulatory/Illinois/. If the applicant does not sign the application form, notification must include a signed, written statement from the applicant designating the agent as their representative.	Completed application is attached.
2. Location map identifying the project site.	Location map is attached.
3. A detailed project description. Include the amount of fill in cubic yards and acres to be placed below the OHWM.	This application is for a steel sheetpile groin to be installed extending 90' lakeward from the existing concrete seawall and quarrystone revetment, with an additional 30' feet angling southeast. A quarrystone headland will be constructed around the angled extension with the toe stone 60' southeast from the shore parallel steel groin. A stone revetment will be constructed on the south side of the steel groin to an elevation matching the steel and a slope of 1:1. Steel (N) and stone (S) stairs will be constructed over the steel groin for beach walkers to traverse the structure. Clean mitigational sandfill will be placed north and south of the groin as required by the IDNR. Approximately 370 cubic yards of clean fill will be placed below the OWHM. Coverage of the lakebed will be 0.06 acres.
4. Project plans and any construction drawings depicting all proposed work. The plans must include the following: a. A plan view identifying the dimensions of all existing structures and prior fills, as well as dimensions of all proposed structures and fill; b. A cross-sectional plan that identifies the water level measured at the OHWM as it relates to the proposed activity(ies) and/or structures; and c. The OHWM clearly depicted on the plans	Plans as described are included in the permit submittal.

5. Description of existing site conditions: a. On-site constructed structures such as piers, revetments, breakwaters, etc.; b. Proximate structures potentially influencing site conditions or project design both on- and off-site; c. Assessment of shoreline morphology including shoreline orientation, condition and description of shoreline (ex. beach, bluff, maintained turf lawn, recent erosion, existing vegetation), and any other relevant features; d. Applicable project history such as past permits, recent changes in site conditions or water levels, etc. Describe any significant recent storm events that may have influenced site conditions and the date that the qualitative assessment (item 6 below) was completed; and e. Recent photographs of the shoreline and project area.	A. The property has a newly maintained revetment at the toe of the bluff that encapsulates an old concrete seawall. The beach width varies gratly pending lake level and wave conditions. B. Two properties to the north (100') is a 170' stone breakwater. Approximately 2000' to the south is the Tower Road Water Plant facility that projects into the lake and hold a large fillet of sand to the north. The property immediately to the south has a newer revetment. C. The shoreline oriented to the northeast. Sand has eroded due to the high lake level. The bluff is steep and metastable. The north side of he property is a ravine wiht municipal stormwater outfall. D. The revetment was just maintained. Varying water levels cause a change in beach width. E. Photos are attached in the cover letter.
6. Qualitative assessment of the habitat near the project area (excluding authorized activities 2 and 3 defined above): a. Describe substrate composition, basic description of aquatic and terrestrial vegetation, and any other habitat features observed or known/documented; b. Distance from, and location of, nearest tributary, ravine, or other aquatic resource; c. Distance from, and location of, nearest known reef/shoal or other habitat feature; and d. Bathymetric survey conducted within the last 12 months.	A. The substrate composition of the lakebed is a thin veneer of native lake sand over cohesive glacial clay till. There is no visible aquatic vegetation. There is no terrestrial vegetation in the property location due to continued wave energy here. B. The nearest ravine outlet is located immdeiately to the north. C. The Glencoe Shoal is approximately 2.35 miles north of this site. D. Recent bathymetric survey is included.
STATEMENT ON MITIGATION: Mitigation includes actions which may avoid, minimize, rectify, reduce, or compensate for adverse environmental effects or activities which may otherwise be contrary to the public interest. The notification request must include a statement describing how compensatory mitigation requirements will be satisfied, or an explanation why compensatory mitigation should not be required for proposed losses to WOUS. Project proponents may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the project proponent must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of the current Corps policies, guidelines, and 33 CFR 332 (the Mitigation Rule).	There will not be any known adverse effects to aquatic resources. The littoral drift system will maintain an equilibrium once the system is constructed and filled with premitigational sand. Monitoring will be completed in accordance with the approved monitoring plan of the IDNR. There should be no increased erosion or noticeable loss of sand downdrift of this system based on the coastal engineering and the study of similar projects in the region. The proposed quarrystone structures will increase the aquatic and terrestrial habitat. Coverage on the lakebed below the OHWM is 0.06 acres.
Special Conditions:	
a. Acceptable materials to be used include poured (formed) concrete, clean quarried stone, fabric-formed concrete, gabions, steel (piling), and clean recycled concrete chunks with the reinforcement steel removed. Rubble, asphalt, pavement, debris, and other waste products may not be used for shore protection;	Construction material is steel sheet pile and clean quarried stone and sand.
b. Shoreline structures must be designed to withstand the expected wave forces of the lake. Steepening of stone structure faces that include a stone toe design may be allowed by this office on a case-by-case basis;	The quarrystone headland are designed with a 1:1.5 slope. The toe of the structure will be dug into lakebed clay to address future lakebed erosion and scour.
c. For shoreline protection structures consisting of steel, the addition of stone may be required to reduce erosion of adjacent shorelines from reflected waves or induced eddies at the end of structures	N/A
d. A construction sequence describing how access to the site will be accomplished. Water-based access is limited to the use of barges for the transport of heavy equipment and construction materials;	This project will be constructed via marine access on Lake Michigan to deliver machinery and materials to the site. A backhoe will work from the beach or lakebed to place the stone and sand in accordance with the drawings.
e. A contingency plan for temporary "dig-in" and sidecasting of lake substrate for access to the work area by barge. If temporary "dig-in" is needed, you must provide notification to this office of the change prior to sidecasting and relocating the substrate;	In the unlikely event that the water is too shallow due to sandbars, sand will be sidecast downdrift. The bucket will remain under the water surface. No clay will be excavated for access.

f. Revetments must be the minimum width below the OHWM necessary for completing the work and for structural integrity of the proposed design;	N/A
g. Groins and breakwaters must be situated within 125 feet of the toe of the bluff, as determined by this office. A variance in the maximum offshore distance of a structure may be granted for public facilities. All variances must be approved by this office on a case-by-case basis;	This project does not extend more than 125' offshore.
h. Pre-fill sand at a volume of 120% of the calculated capture volume of the proposed structure(s) must be provided in conjunction with the construction of the structure. A pre-construction bathymetric survey must be completed within one (1) month of the start of construction to recalculate the pre-fill sand volume to account for changes in site conditions since the original survey. Surveys more than one (1) month old will be considered if the start of construction is delayed due to weather conditions. A copy of the survey and final pre-fill sand volume must be provided to this office prior to the start of construction activities;	This project will abide by the state and federal requirements for sand quantities and monitoring.
i. Structures must provide reasonable accommodations, as determined by this office, to maintain public access to the shoreline.	This project will not prevent access to Lake Michigan.
5. Beach nourishment: a. Clean sand material from an upland source or suitable dredged material that complies with the 401 WQC in Appendix 1 may be used; b. Placement may not occur within or be associated with activities occurring in wetlands as defined in Title 33 CFR Part 320.	Sand nourishment will be clean and from an inland quarry.
6. Maintenance of existing public harbor, public access facilities, and navigational features required for maintaining existing function:	N/A
7. In-water discharge of dredged material, including beneficial use of dredged material for beach nourishment, shore protection, or ecosystem restoration: a. In-water discharge of dredged material includes placement of clean dredged sediment in less than 18 feet of water depth and on beaches below the OHWM; b. Materials may be placed for any purpose including disposal of excess materials, shoreline/beach nourishment, habitat creation, or other approved purpose; c. Placement may not occur within, or be associated with, activities occurring in wetlands as defined in Title 33 CFR Part 320 unless specifically approved by this office.	N/A
8. Temporary structures and minor discharges of dredged or fill material necessary for the removal of vessels (wrecked, abandoned, or disabled) or for the removal of constructed obstructions to navigation:	N/A

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:	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant):	4. Authorized Agent (an agent is not required):
Michael Fitzgerald		Shabica & Associates, Inc.
Company Name (if any) :	Company Name (if any):	Company Name (If any): Shabica & Associates, Inc.
Address: 1055 Sheridan Road Winnetka, IL 60093	Address:	Address: 550 Frontage Road Suite 3735 Northfield, IL 60093
Email Address:	Email Address:	Email Address:
Applicant's Phone Nos. w/area code	**Applicant's Phone Nos. w/area code**	**Agent's Phone Nos. w/area code**
Business:	Business:	Business:
Residence:	Residence:	Residence:
Cell:	Cell:	Cell:
Fax:	Fax:	Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, Shabica & Associates, Inc. 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.

2/20/24
Date

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:
Groin with Quarrystone Headland

7. PROJECT LOCATION:
Lakefront at 1055 Sheridan Road, Winnetka, IL

LATITUDE: 42.12048 °N
LONGITUDE: -87.73565 °W

UTMs
Northing: 4663413.22 m
Easting: 16T 439186.30 m

STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE
1055 Sheridan Road		NE	17	42N	13E

☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box)
Municipality Name: Winnetka

COUNTY	STATE	ZIP CODE
Cook	IL	60093

WATERWAY: Lake Michigan

RIVER MILE (if applicable):

Revised 2010

☐ Corps of Engineers ☐ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features):

This application is for a steel sheetpile groin to be installed extending 90' lakeward from the existing concrete seawall and quarrystone revetment, with an additional 30' feet angling southeast. A quarrystone headland will be constructed around the angled extension with the toe stone 60' southeast from the shore parallel steel groin. A stone revetment will be constructed on the south side of the steel groin to an elevation matching the steel and a slope of 1:1. Steel (N) and stone (S) stairs will be constructed over the steel groin for beach walkers to traverse the structure.Clean mitigational sandfill will be placed north and south of the groin as required by the IDNR.

9. PURPOSE AND NEED OF PROJECT:

To help reduce beach washout and to help protect the clay lakebed and bluff toe.

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

10. REASON(S) FOR DISCHARGE:

To provide adequate shore protection on a sediment starved section of lakeshore.

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

TYPE: Stone and sand

AMOUNT IN CUBIC YARDS:

Stone: 370 cu. yds; Sand: 675 cu. yds.

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

Stone will cover +/- 0.06 acres

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

There will not be any known adverse effects to aquatic or terrestrial resources. The littoral drift system will maintain an equilibrium once the system is constructed and filled with premitigational sand.

14. Date activity is proposed to commence: September 10, 2024

Date activity is expected to be completed: 6 weeks

15. Is any portion of the activity for which authorization is sought now complete? Yes [ ] No [X]

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

Month and Year the activity was completed

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 X 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 [illegible] nd accurate. I further certify that I possess the authority to undertake the proposed activ

3/4/2024
Date

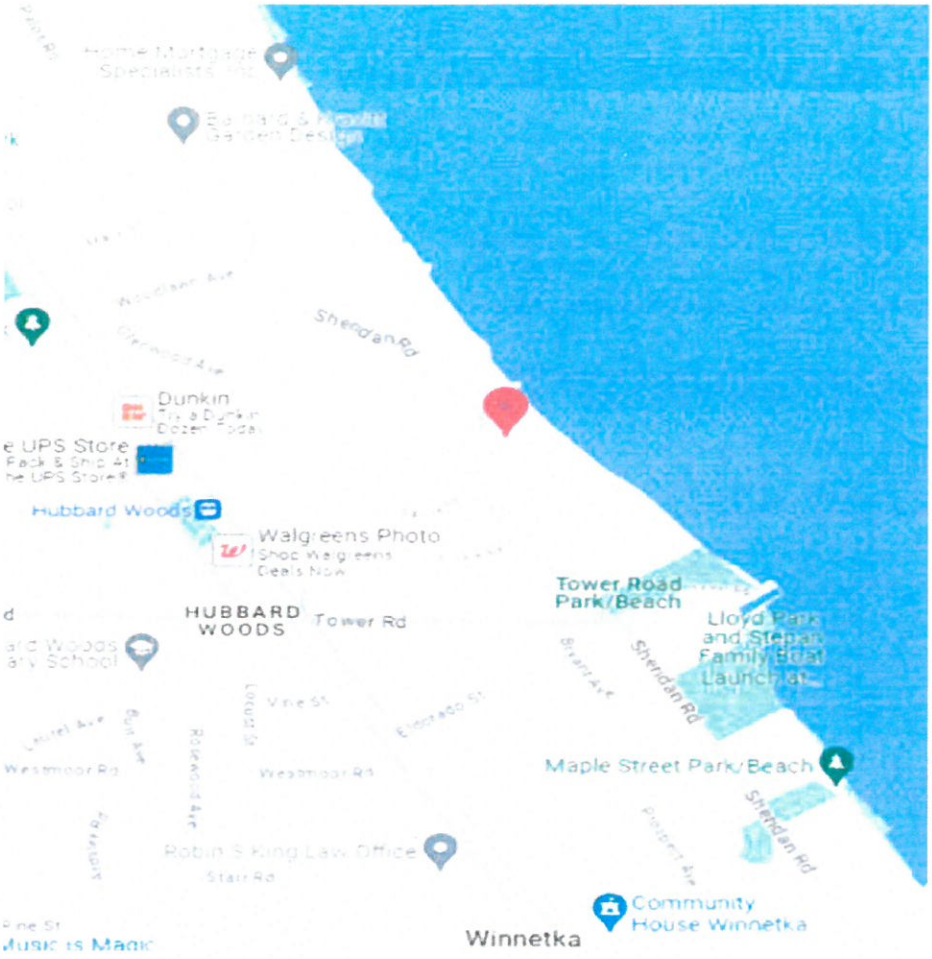
Signature of Applicant or Authorized Agent — Date

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

Vicinity Map



Groin with Quarrystone Headland

1055 Sheridan Road
Winnetka, IL 60093

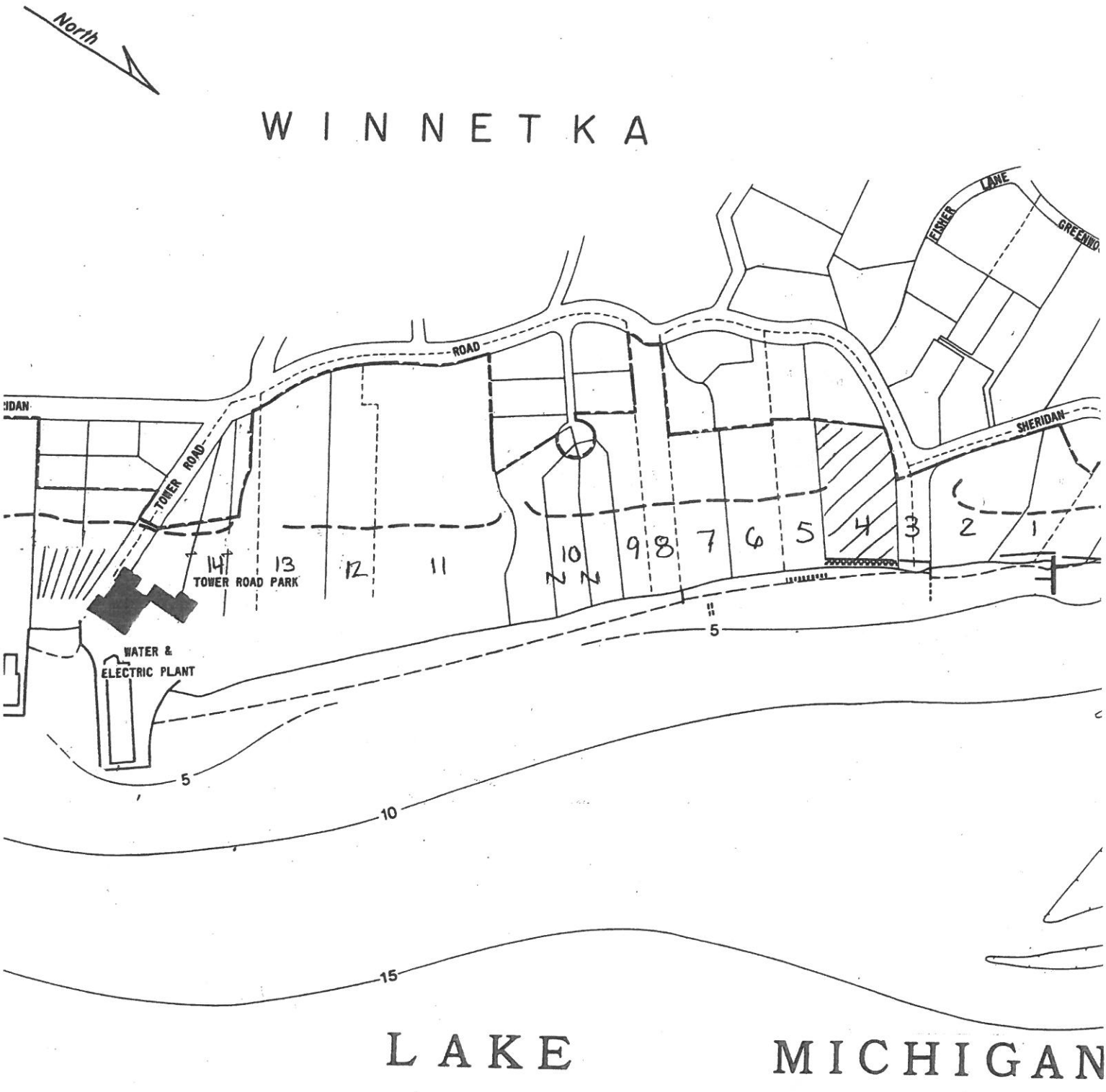
Shabica & Associates, Inc.

Location of Project: 1055 Sheridan Road, Winnetka, IL 60093

List of property owners (from North to South):

1. Eileen Hovey,
2. Matt Hulsizer,
3. Village of Winnetka,
4. Subject Property: Michael Fitzgerald
5. Stephen Fussell,
6. Jack Levin,
7. 979 Sheridan Road LLC,
8. CTLTC 008002375625,
9. Howard Garoon,
10. Ralph Peters,
11. Terry McKay,
12. Elaine Jaharis,
13. Winnetka Park District,
14. Winnetka Park District,

550 Frontage Road • Suite 3735 • Northfield, Illinois 60093 • Tel 847.446.1436 • info@shabica.com
www.shabica.com



LOCATION MAP

TOPOGRAPHIC/BATHYMETRIC SURVEY

LAKE MICHIGAN

LAKE LEVEL=579.6 IGLD85
(10-3-2023)

STONE BREAK
WATER

575
576
577
578
580
581
582
583
584
585

REVETMENT TOE UNDER SAND

EXISTING
REVETMENT

CONC.

PROPERTY LINE

EASEMENT LINE

PROPERTY LINE

1055 SHERIDAN ROAD
WINNETKA, ILLINOIS

SCALE: 1" = 30'

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

LAKE MICHIGAN

LAKE LEVEL=579.6 IGLD85
(10-3-2023)

STONE BREAK WATER

575

576

577

578

580

581

582

583

584

585

546

125'

PROPOSED BREAKWATER

CREST 585'

STEEL GROIN TAPERS FROM 587'-585'

BEACH

SAND FILL AREA

STONE STAIRS

STEEL STAIRS

REVETMENT TOE

VISUAL OHWM

EST. BLUFFTOE

EXISTING REVETMENT

CONC.

FISHER LANE STREET END PUBLIC ROW.

PROPERTY LINE

EASEMENT LINE

PROPERTY LINE

1055 SHERIDAN ROAD
WINNETKA, ILLINOIS

PLAN VIEW

Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
JAN. 29, 2024
REV. MARCH 5, 2024

1035 SHERIDAN RD.

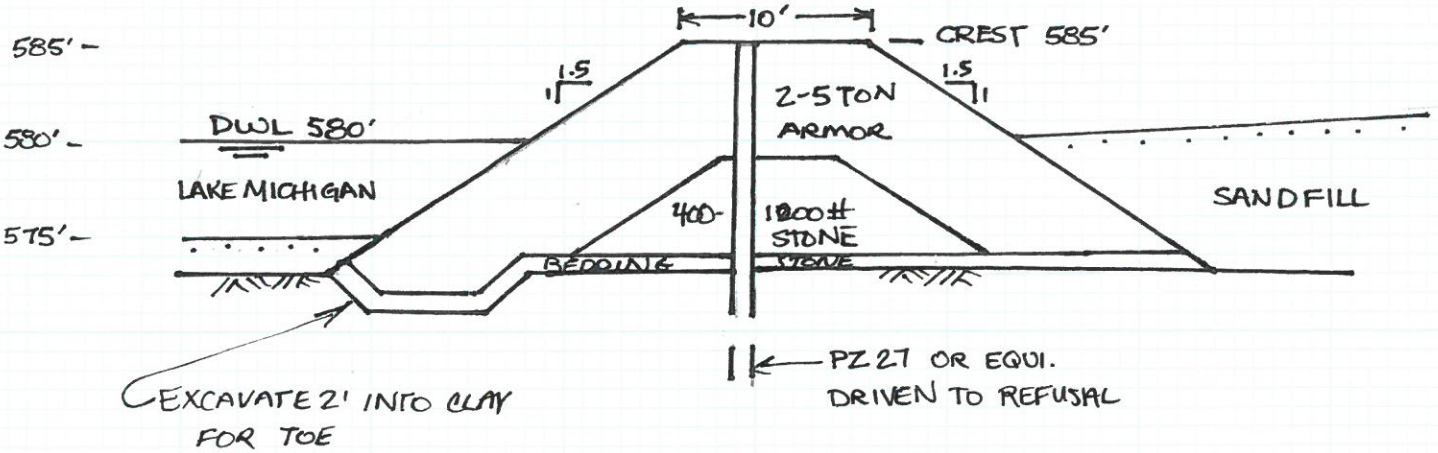
SCALE: 1" = 30'

GRAPHIC SCALE

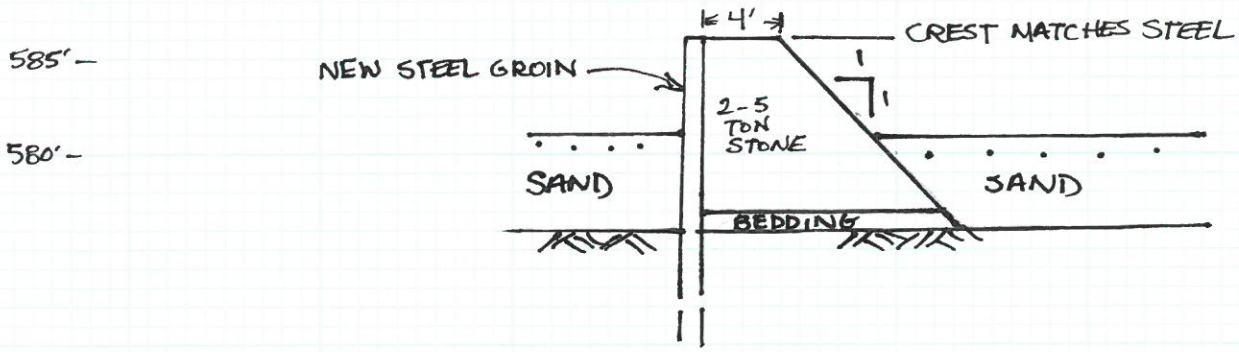
30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

BREAKWATER CROSS SECTION



REVETMENT ALONG GROIN CROSS SECTION · TYPICAL



0 FEET 10

SCALE

DATUM: IGLD 1985

TOLERANCE: ±1'

CROSS SECTIONS

1055 SHERIDAN, WINNETKA
Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
MARCH 4, 2024

SAND

LAKE MICHIGAN

LAKE LEVEL=579.6 IGLD85
(10-3-2023)

STONE BREAK WATER

575 576 577 578 580 581 582 583 584 585

A B C

EXISTING REVETMENT

CONC.

FISHER LANE
STREET END
PUBLIC ROW.

PROPERTY LINE

EASEMENT LINE

PROPERTY LINE

1055 SHERIDAN ROAD
WINNETKA, ILLINOIS

A $\frac{33 \times 33 \times .33}{2}$ = 180 cu.yds.

B 15 x 25 x 1 = 375 cu.yds.

C $\frac{27 \times 27 \times 1}{6}$ = 121 cu.yds

180 + 375 + 121 = 676 cu. yds
676 cu.yds. x 1.25 yds/TON = 845 TONS
845 TONS x 20% OVERFILL = 169 TONS
845 + 169 = 1014 TONS
PLACE 1020 TONS CLEAN SAND

SAND PLANVIEW & CALCS

Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
JAN. 29, 2024

1035 SHERIDAN RD.

SCALE: 1" = 30'

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.