Illinois Department of Natural Resources
JB Pritzker, Governor • Natalie Phelps Finnie, Director
One Natural Resources Way • Springfield, Illinois 62702-1271
www.dnr.illinois.gov

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

December 1, 2025

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

Construction of a breakwater-protected beach, in Lake Michigan, at 501 Sheridan Road, Kenilworth, IL 60043

501 Sheridan LLC, 1741 Harding Road, Northfield, IL 60093, has applied for an Illinois Department of Natural Resources, Office of Water Resources permit for the construction of a breakwater-protected beach, in Lake Michigan, at 501 Sheridan Road, Kenilworth, IL 60043.

The proposed breakwater-protected beach will consist of a capped, shore-perpendicular steel sheetpile groin, an attached, offshore quarrystone breakwater, and a rebuilt, shore-parrallel revetment. The groin will be 98 feet long, including an 80-foot, shore-prependicular section extending to the northeast, and an 18-foot section angled to the north from the lakeward end. The groin will be 10 feet north of the south property line, with a crest elevation tapering from 588 feet landward to 585 feet lakeward. The breakwater will have a nominal length of 95 feet, and angle to the north from the lakeward end of the groin. The breakwater will have a crest elevation of 585 feet, a crest width of 11 feet, and side slopes of 1V:1.5H. The existing revetment will be rebuilt, along the face of the existing seawall, with a crest elevation of 590 feet and a face slope of 1V:1H. All offshore structures will be within 125 feet of the existing seawall. The project includes stairs to provide pedestrian access over the landward end of the groin. 1,520 tons of clean, quarried sand will be placed as pre-mitigational fill for the project. All elevations are International Great Lakes Datum 1985-adjusted (IGLD-85). 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.htm.

The signatures, email addresses, and phone numbers of the applicant, co-applicant (if any), and authorized agent (if any) are redacted from this public notice. The mailing addresses and phone numbers of adjoining and adjacent property owners are redacted from this public notice.

Comments will be accepted through **January 9, 2026**.

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: November 17, 2025

Please find enclosed a permit application for modification to a shore protection system for the property located at 501 Sheridan Road in Kenilworth, Illinois, 60043, owned by 501 Sheridan LLC. Proposed work includes construction of a breakwater protected beach, revetment maintenance and necessary sandfill.

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 a breakwater protected beach for shore protection system for the property. This project will be constructed on the lakefront of 501 Sheridan Road, Kenilworth, where the homeowner wants to provide a higher level of shore protection for the property, help address the effects of lakebed downcutting, and help retain sand with fluctuating lake levels.

Project Description
Construct a new 98' long steel sheetpile groin that angles to the northeast 80' out at 10' north of the south property line tapering from 588' landward to 585' lakeward, with a 95' (nominal length) quarrystone breakwater extending to the north. The breakwater crest will be 585', 11' feet wide with structure slopes of 1v:1.5h. The revetment will be rebuilt with a crest elevation of 590' and a slope of 1:1. All work will be within 125' of the existing seawall. Mitigational sandfill will be placed as dictated by desktop coastal engineering with 20% overfill.

The proposed system is designed to help retain a sandy beach, move the locus of wave energy further offshore, help reduce lakebed downcutting, reduce erosion of the bluff toe landward of the seawall, and help provide safe access for pedestrians and swimmers to and from Lake Michigan. At most Lake Michigan water levels, there is no access for shore walking north or south of the project site.

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 (Figure 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. During the record low lake level in 2013, this site had a sandy beach, but there have been little to no beach at all other times in the past 20 years.

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 retain a sand covering of the nearshore lakebed (where downcutting is most active), as well as to protect the revetment and infrastructure at the bluff toe, SA has redesigned the breakwater island to a pocket beach system to hold sand, as necessary, to protect the lakebed and related infrastructure bluff during higher lake levels.

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 501 Sheridan Road has been impacted by the recent extreme increase in water level evidenced by waves overtopping and infiltrating the existing breakwater and 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 lake 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 501 Sheridan Road, Kenilworth has been inspected and options to improve shore protection were determined using desktop coastal engineering, site conditions from the 2025 bathymetric survey, studying local prototypes, and several years of observations at this site. Given the sand loss over the last several years including during extreme low 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 deteriorating revetment as is. The limestone is deteriorating, and the stones have splayed and moved around from heavy wave action leaving the structure extremely erratic. The limestone will continue to breakdown and lose its ability to break wave energy.

Enhancing the revetment by rebuilding it with quartzite is an option. As there is typically no beach in this stretch of shoreline, over time the revetment toe will fail as the lakebed clay at the toe erodes. Additionally, the revetment would help protect the property but would not reduce lakebed downcutting in the nearshore.

Construction of a breakwater island was explored. This option was not selected due to the variable sand retention. Studying a local prototype and seeing its function over time, this option was not selected.

The selected option is a shore connected breakwater that will help stabilize the shoreline and lakebed lakeward of the property.

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 help 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 are far safer for swimmers and boaters than a coast lined with seawalls or revetments, especially in an emergency.

Impacts to Downdrift Properties
The downdrift section of coastline is protected by seawalls, quarrystone revetments and steel groins with minimal, exposed, ephemeral beaches (sand and cobble). 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 connecting to a quarrystone breakwater and placement of sandfill as required for permit. The breakwater will not extend beyond the 125' offshore guideline from the LMRGP and IDNR guidelines which is similarly in line with the systems to the north and the Kenilworth public beach a few properties to the south which extends approximately 140' east of the seawall at the old Kenilworth water plant. Sandbars easily move around these structures with the shallow water. Once the mitigational sandfill is placed (20% over its sand holding capacity and monitored for 5 years).

The proposed structure 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 within the property boundary. 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 impacted by the project. Stairs will be installed over the landward end of the steel groin. There are no beaches adjacent to this site due to the sand starved condition and lack of breakwater protection in the area. During average to high lake levels (and even low water levels other than the record low), there were no sandy beaches at the north ends of the beach cells. The proposed beach will help provide a safe place for boaters and swimmers in distress. Fishing will not be impacted negatively, as the underwater area of the quarrystone protection will create an improved fish habitat. Navigation of watercraft will not be impacted as the proposed project will not extend beyond the existing breakwater island.

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 the proposed work will be completed via marine access. A barge will deliver materials and machinery to the site. The water depth at the time of construction should allow for the majority, if not all work, to be completed from a backhoe working landward of the existing breakwater. All stone, steel, 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 10 weeks to complete.

Type and Quantity of Fill/Measures Taken to Avoid Impact/Erosion and Sediment Control Plan
All materials will be clean and from inland quarries. 2,150 tons of quarried quartzite will be placed in the structures. 1,520 tons of clean sand will be placed. Total coverage with stone is 0.11 acres.

Summary
All the above-described activities and plans will follow LMRGP terms and conditions. All 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 (Otto)
IEPA (Gove)
U.S. Fish & Wildlife Service
501 Sheridan LLC

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 501 Sheridan Road in Kenilworth, Illinois 60043. 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 seawalls, revetments and steel sheetpile groins that may hold narrow beaches pending lake levels.

This section of the 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 minimal sand moving along this section of the 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 help prevent stormwave erosion, but at the expense of the beach.

Project Description

Construction of a quarrystone breakwater system, revetment 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 Arm Specifications	
Lakeward Crest Elevation:	585 ft
Toe of Structure:	574 ft (average)
Crest Width:	11 ft
Average Armor Size:	4 tons
"B" Stone	400 lbs to 1200 lbs
Slope:	1:1.5
Tons/linear feet:	23 tons

Assumptions	
• Design High Water (DHW):	583.2 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):	8.7 ft
• Nearshore Slope:	± 1:40
• Design Wave Period (T):	9.9 s **
• Depth at Structure Toe DHW (Ds):	9.2'
• Design Deepwater Wave (Ho):	17.0' (Angle Class 3)
• 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 quarrystone breakwater will be constructed with an armor layer of 2-6 ton armorstone built on a 1:1.5. The lakeward face will be 2-layer random 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 3.4 tons is predicted for special placement stone based on the design conditions.

Shoreline / Bathymetry

Bathymetric surveying was performed on September 23, 2025. 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 34 miles to the south of Kenilworth. Note: Low water datum = 577.5 ft (IGLD 1985).

Lake Level	LWD	IGLD 1985
Record High	+5.5	583
Record Low	-1.5	576

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 from the USACE Shore Protection manual (Figure 2, Appendix) shows how wave energy is broken down around quarrystone structures and in breakwater bays. Using a refracted incident wave angle of 90, 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 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 3, 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 Kenilworth lakeshore is considered sediment starved. Sand deposits were measured at Kenilworth Waterworks from the backshore to a depth of 6.7 m (22 ft). Nearshore sand deposits averaged zero to three feet thick from shore to 243 feet offshore where there was the thickest section of sand at 4.5 feet thick. Moving lakeward from there, the sand thickness ranges from zero to three feet thick for the majority of the transect (Shabica & Pranschke, 1994). Also, the site is underlain by highly-erodible, cohesive glacial clay-till. See Shabica survey data and cross-section showing loss of lakebed sand from 1975 to 1990. Calculated sand deposits at this site are 121 cubic meters/meter of lakeshore to a depth of 6 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 501 Sheridan Road, Kenilworth 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. Additionally, all structures should be inspected to help assure that they continue to meet design specifications.

References

Anglin, C.D., and K. J. Macintosh, *Southport Marina, Kenosha, Wisconsin: Design and Construction of Breakwaters, in Coastal Engineering for the Great Lakes*, a short course, University of Wisconsin, March 11-13, 1991.

W.F Baird & Associates and Warzyn Engineering, 1986, *Shoreline Development at Forest Park, Lake Forest, Illinois, Model Studies*, Unpublished Final Report to the City of Lake Forest.

Chrzastowski, M.J. and C.B. Trask, 1995, Illinois State Geological Survey, Open File Series, 1996-7, 57 p. plus eight appendices.

Chrzastowski, M.J. and C.B. Trask, 1996, *Review of the City of Lake Forest Final Report for the 1995 beach and nearshore monitoring program, Forest Park Beach, Lake Forest, Illinois*: Illinois State Geological Survey, Open File Series, 1996-6, 57 p. plus eight appendices.

Chrzastowski, M.J., 2005, *Chicagoland Geology and the Making of a Metropolis*, Illinois State Geological Survey Open File Series OFS 2005-9.

Johnson, Charles, 1997, USACE, Chicago, personal communication.

LandOwner Resource Centre, Canadian Wildlife Service, Ontario Ministry of Natural Resources, 1999, *Improving Fish Habitat,* Extension Notes: Ontario, LRC 45.

Meadows, Guy; Mackay, S.; Goforth, R.; Mickelson, D.; Edil, T.; Fuller, J.; Guy, D.; Meadows, L.; Brown, E.; Carman, S.; Liebenthal, D.; 2005, *Cumulative Habitat Impacts of Nearshore Engineering,* Journal of Great Lakes Research; vol.31, Supplement 1, 2005, pp.90-112.

Nairn, Robert B. 1997, *Cohesive Shores,* Shore & Beach Vol. 65 No. 2: 17-21.

Resio, Donald T. and Charles L. Vincent, 1976, *Design Wave Information For The Great Lakes: Technical Report 3, Lake Michigan*.

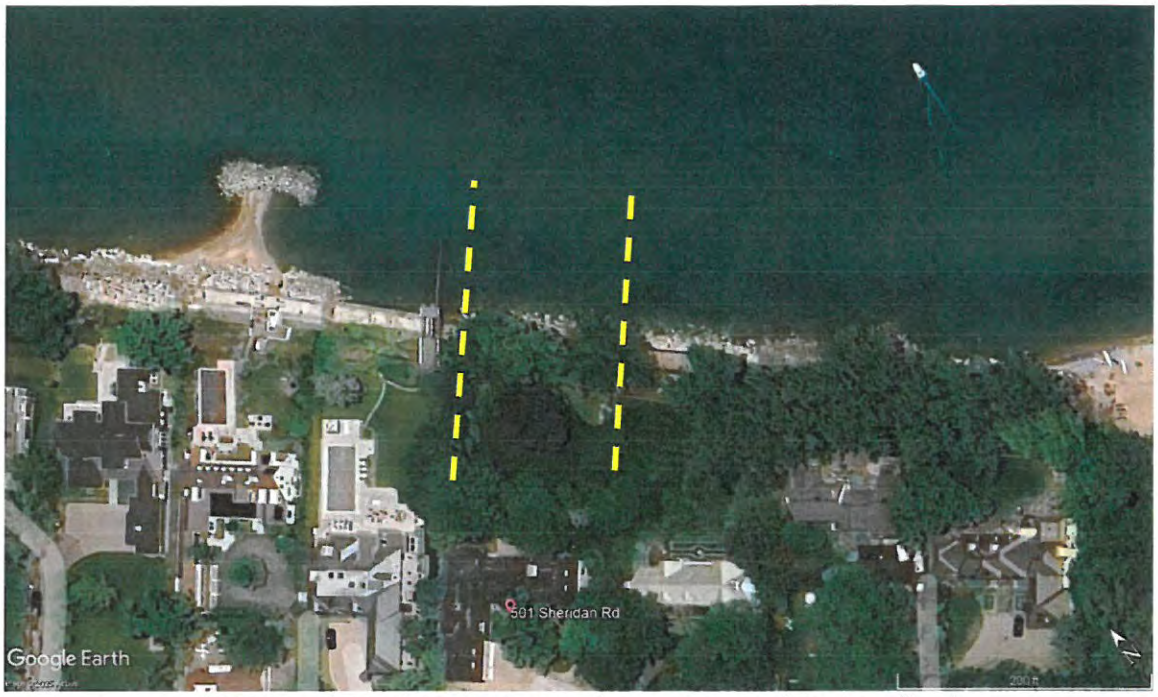
Shabica, C.W., F. Pranschke and M. Chrzastowski. 1991, *Survey of Littoral Drift Sand deposits Along the Illinois Shore of Michigan from Fort Sheridan to Evanston*, Illinois/Indiana Sea Grant Program, IL-IN-SG-R-91-3.

Shabica, C.W., F. Pranschke, 1994, *Survey of Littoral Drift Sand Deposits Along the Illinois and Indiana Shores of Lake Michigan*, U.S. Geological Survey Symposium Volume, Journal of Great Lakes Research, vol. 20, no.1, pp 61-72.

Shabica, Charles and Assoc., 1997, *Lake Bluff Beach Monitoring and Mitigation Report 5*, US Army Corps of Engineers, Chicago District.

US Army Corps of Engineers, 1984, *Shore Protection Manual*, Coastal Engineering Research Center, Vicksburg, Mississippi.

APPENDIX
501 Sheridan Road, Kenilworth • November 17, 2025



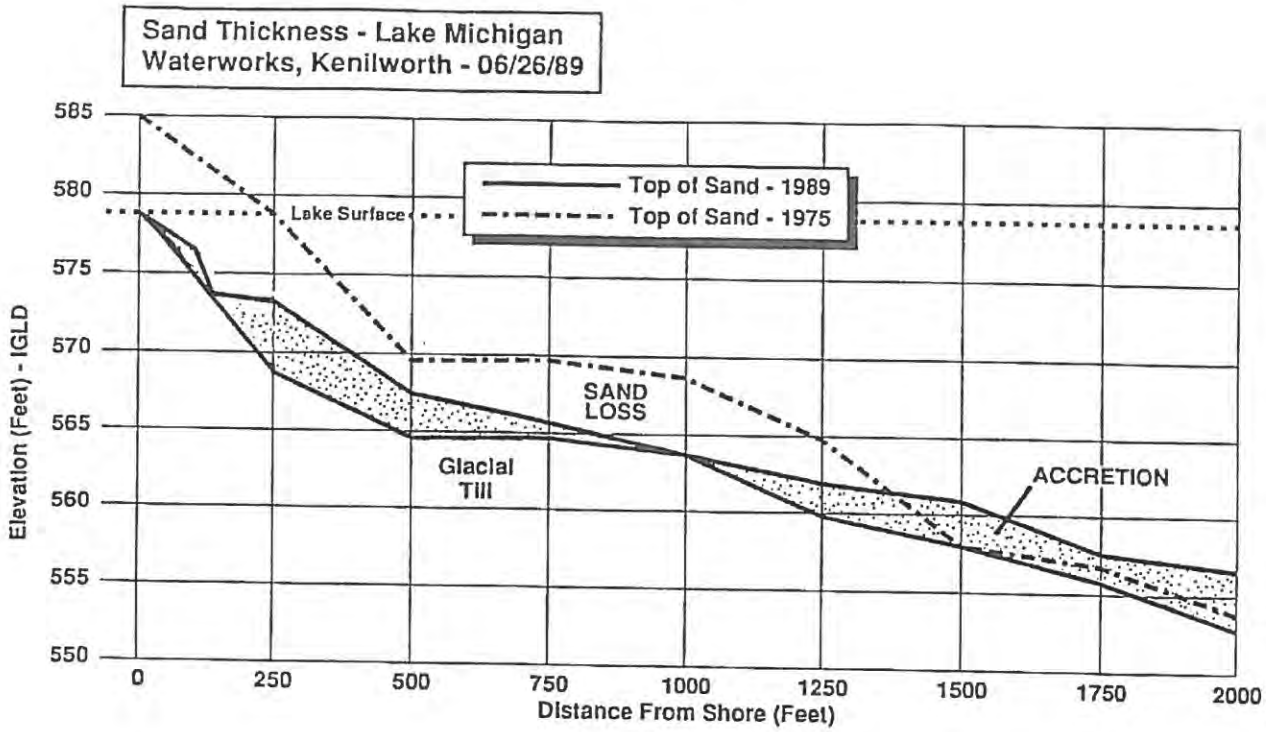
2025 Google Earth Image (approximate property lines in yellow)

2022 SA Photo looking south shows existing limestone revetment a steel seawall cap

APPENDIX
501 Sheridan Road, Kenilworth • November 17, 2025

2025 SA Photo looking north along the existing revetment to the adjacent steel groin (yellow arrow)

FIGURE 1


Sand Thickness - Lake Michigan Waterworks, Kenilworth - 06/26/89
Top of Sand - 1989
Top of Sand - 1975
Lake Surface
SAND LOSS
Glacial Till
ACCRETION
Elevation (Feet) - IGLD
585
580
575
570
565
560
555
550
0
250
500
750
1000
1250
1500
1750
2000
Distance From Shore (Feet)

APPENDIX
501 Sheridan Road, Kenilworth • November 17, 2025

FIGURE 2

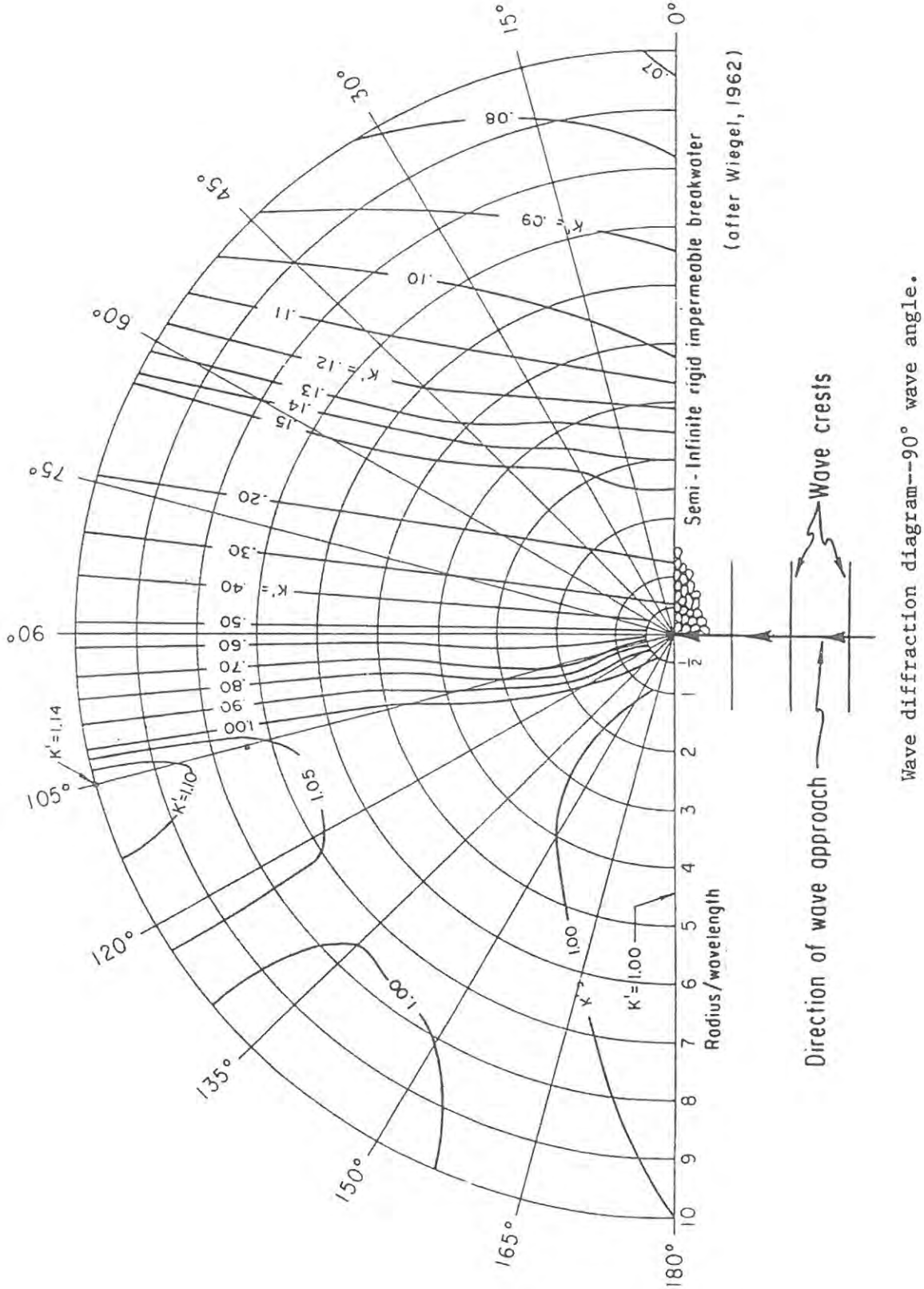
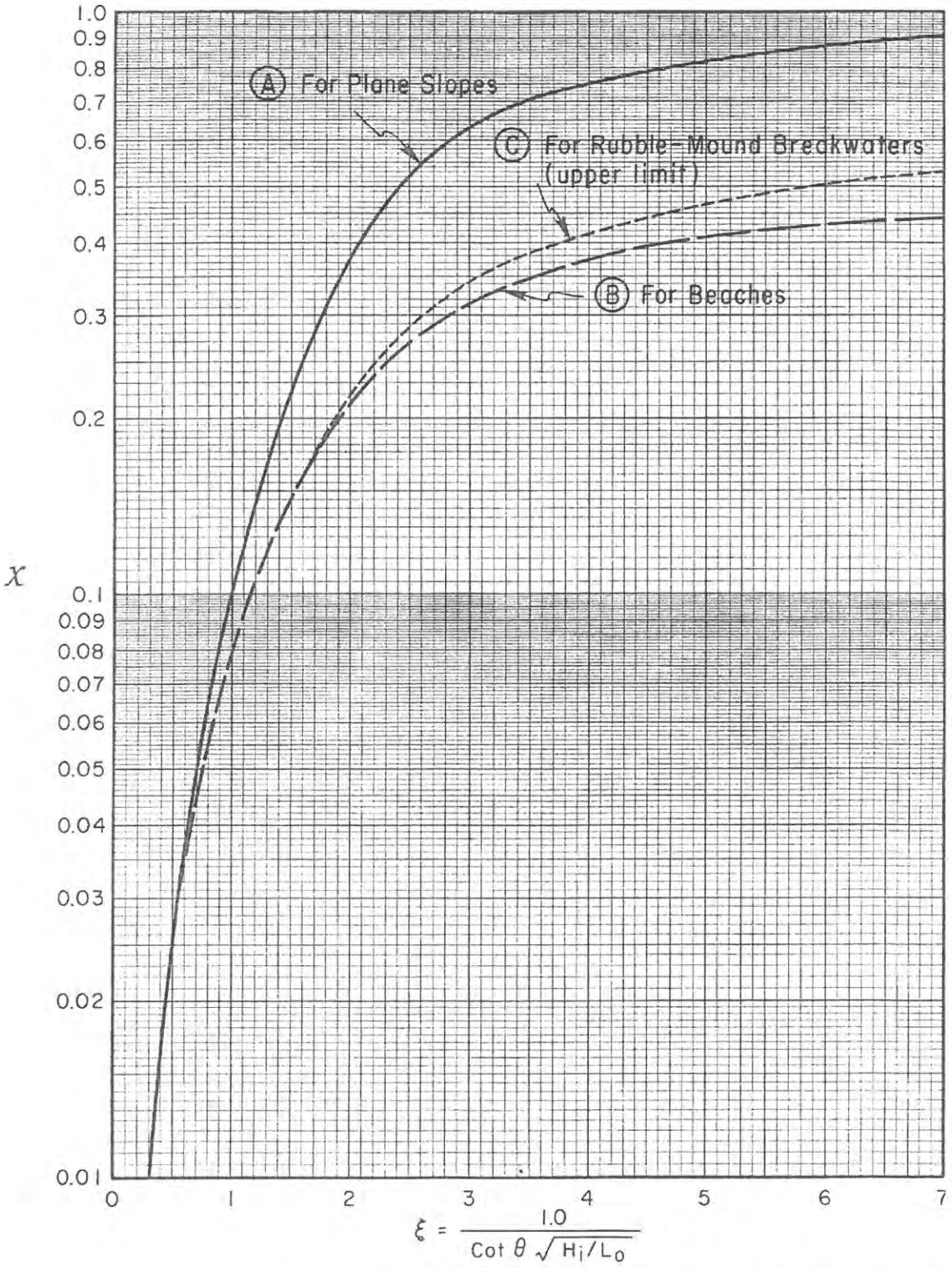


FIGURE 3



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

Shore Protection Manual USACE

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):
Leo Birov		Shabica & Associates, Inc.
Company Name (if any): 501 Sheridan LLC	Company Name (if any):	Company Name (if any): Shabica & Associates, Inc.
Address: 1741 Harding Road Northfield, 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 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, 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.

Applicant's Signature — Date: Sept 11, 2025

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:
Breakwater-Protected Beach

7. PROJECT LOCATION:
Lakefront at 501 Sheridan Road, Kenilworth, Illinois 60043

LATITUDE	LONGITUDE	UTMs
42.09507 °N	-87.71003 °W	Northing 4660574.39 m Easting 16T441286.12 m

STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE
Lakefront at 501 Sheridan Road		SW	22	42N	13E

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

WATERWAY: Lake Michigan

RIVER MILE (if applicable):

COUNTY	STATE	ZIP CODE
Cook	IL	60043

Revised 2010

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

8. PROJECT DESCRIPTION (Include all features):

Construct a new 98' long steel sheetpile groin that angles to the northeast 80' out at 10' north of the south property line tapering from 588' landward to 585' lakeward, with a 95' (nominal length) quarrystone breakwater extending to the north. The breakwater crest will be 585', 11' feet wide with structure slopes of 1v:1.5h. The revetment will be rebuilt with a crest elevation of 590' and a slope of 1:1. All work will be within 125' of the existing seawall. Mitigational sandfill will be placed as dictated by desktop coastal engineering with 20% overfill.

9. PURPOSE AND NEED OF PROJECT:

To maintain a stable beach and protect the clay lakebed and toe of the bluff

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: 890 cu. yds; Sand: 1215 cu. yds.

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

Stone will cover +/- 0.11 acres

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

This site has a very chaotic wave state adjacent to the revetment. The aquatic and terrestrial flora and fauna will not be negatively impacted. The project will have a positive impact on the environment and water quality.

14. Date activity is proposed to commence: October 1, 2026

Date activity is expected to be completed: December 10, 2026

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)

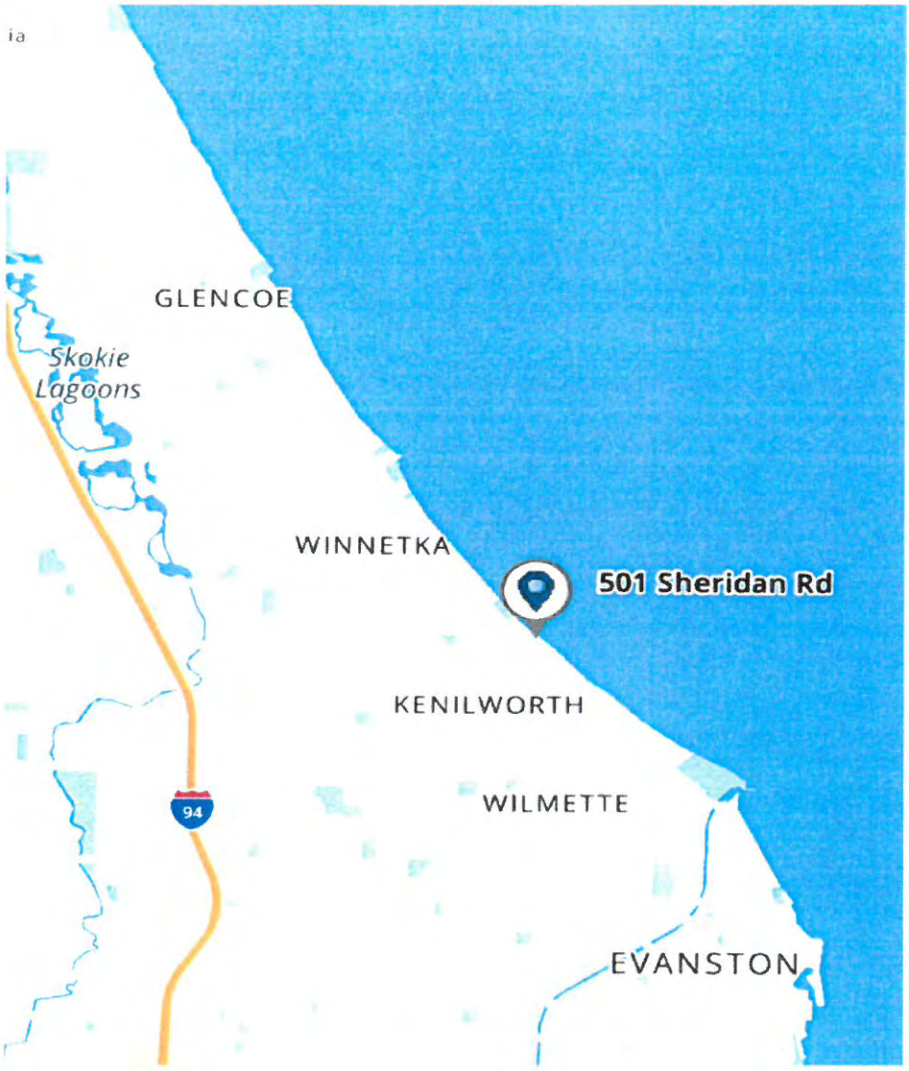
Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake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

Signature of Applicant or Authorized Agent	Date
	11-14-2025
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



Breakwater-Protected Beach
501 Sheridan Road
Kenilworth, IL 60043

Shabica & Associates, Inc.

Location of Project: 501 Sheridan Road, Kenilworth, IL 60043

List of property owners (from North to South):

1. Mike Bonds,
2. Joachim Weidemanis,
3. 513 Sheridan LLC,

4. Subject Property: 501 Sheridan LLC, 501 Sheridan Road, Kenilworth, IL 60043

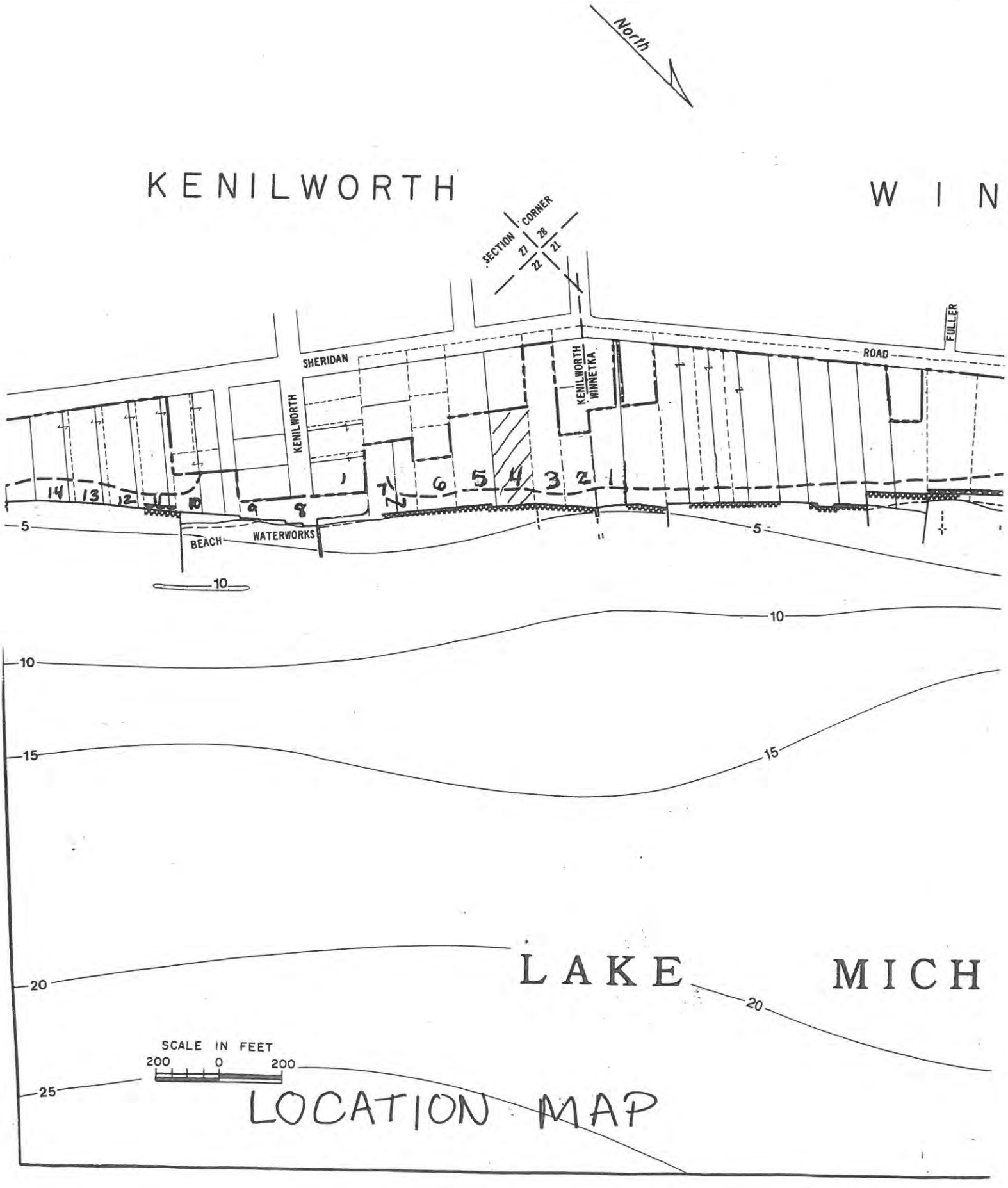
5. Sheridan 439 LLC,

6. Richard Illgen,
7. Mary C Belton,
8. Village of Kenilworth Beach,

9. Kenilworth Water Department,

10. Julie Halbower,
11. Debra Gill,

12. Nydia W. Hohf,
13. Karen A. Tappendorf.
14. Debra A. Cafaro as Trustee,


North
KENILWORTH
WIN
SECTION
CORNER
28
27
22
21
SHERIDAN
ROAD
FULLER
KENILWORTH
KENILWORTH
WINNETKA
14
13
12
11
10
9
8
7
6
5
4
3
2
1
5
BEACH
WATERWORKS
5
10
10
10
15
15
LAKE
MICH
20
20
SCALE IN FEET
200
0
200
25
LOCATION MAP

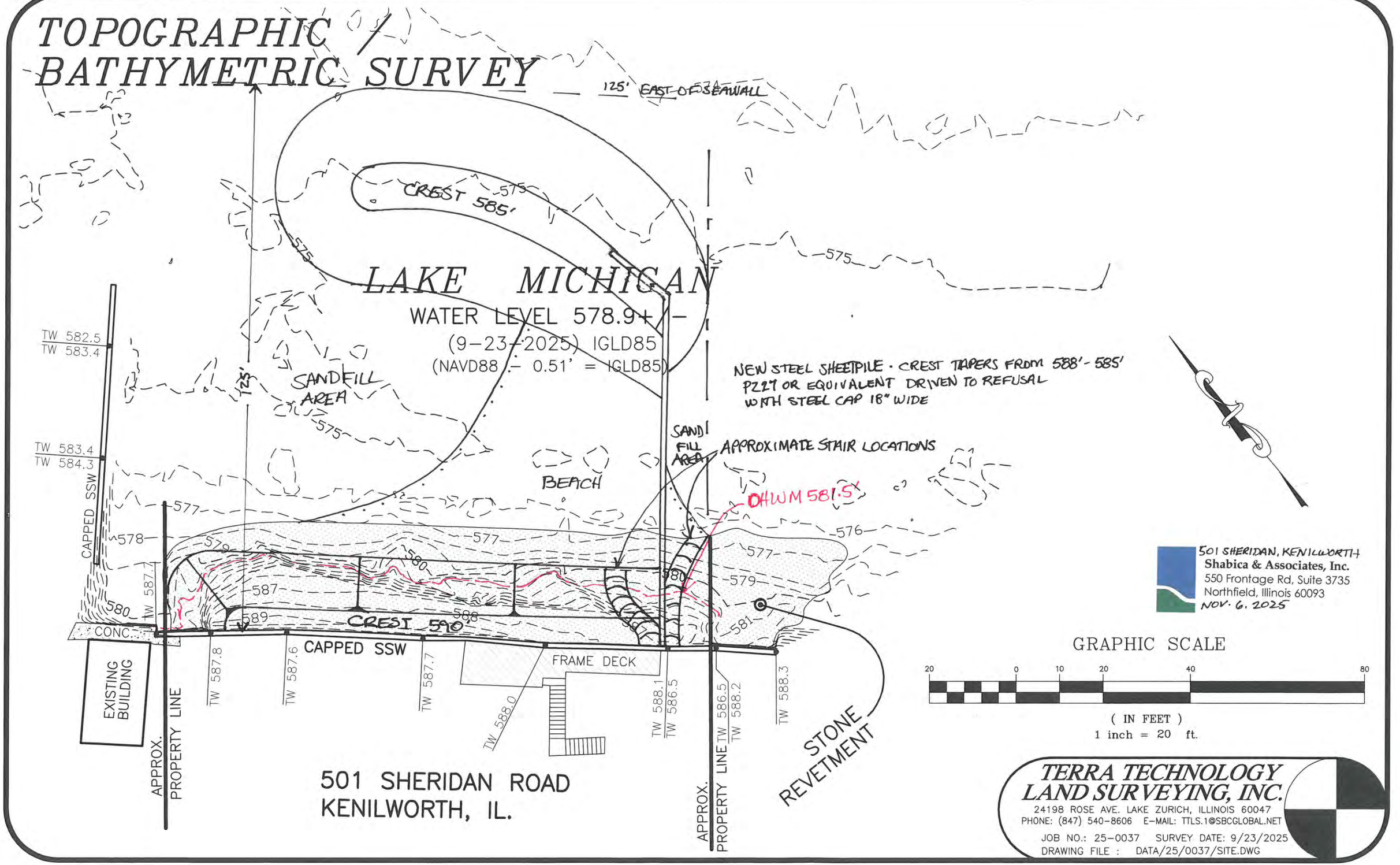
Shabica & Associates, Inc.

Title:	Breakwater-Protected Beach 501 Sheridan Road Kenilworth, Illinois 60043
Submittal Date:	November 17, 2025
Plan Sheets:	2025.11.6, 501 Sheridan, Kenilworth_Plan View Over Topographic/Bathymetric Survey – Sheet 1 of 4 2025.11.6, 501 Sheridan, Kenilworth_Breakwater Cross Section - Typical, Revetment Cross Section - Typical – Sheet 2 of 4 2025.11.6, 501 Sheridan, Kenilworth_Sand Plan View Over Topographic/Bathymetric Survey – Sheet 3 of 4 2025.11.6 501 Sheridan, Kenilworth_Sand Plan Calculations – Sheet 4 of 4

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

PLAN VIEW

TOPOGRAPHIC / BATHYMETRIC SURVEY



501 SHERIDAN ROAD
KENILWORTH, IL.

501 SHERIDAN, KENILWORTH
Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
NOV. 6, 2025

GRAPHIC SCALE

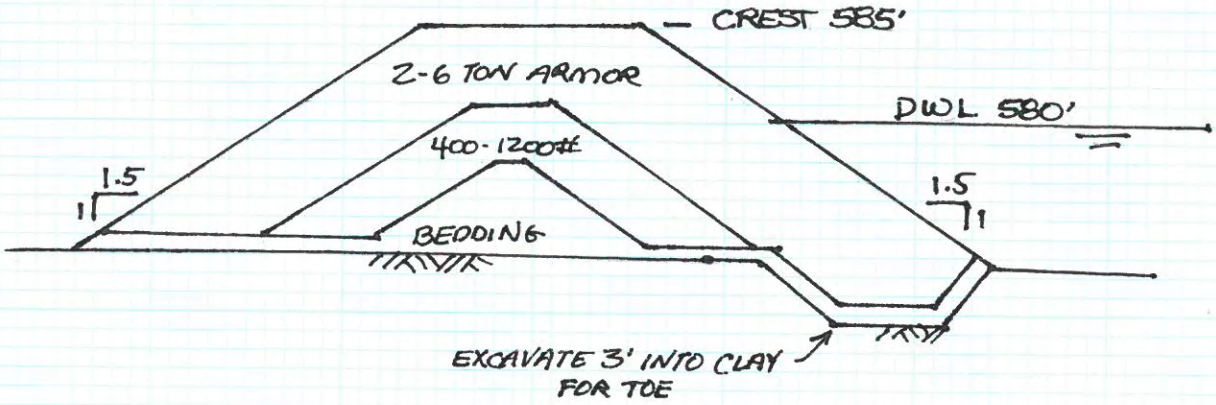
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

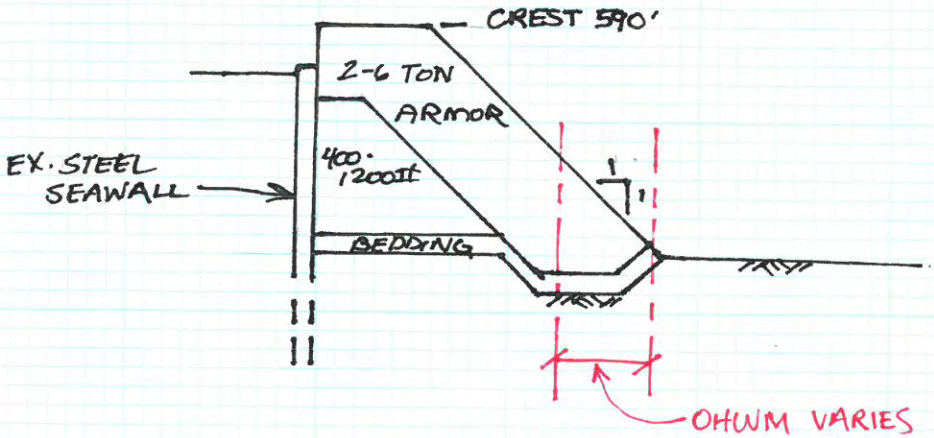
TERRA TECHNOLOGY LAND SURVEYING, INC.
24198 ROSE AVE. LAKE ZURICH, ILLINOIS 60047
PHONE: (847) 540-8606 E-MAIL: TTLS.1@SBCGLOBAL.NET

JOB NO.: 25-0037 SURVEY DATE: 9/23/2025
DRAWING FILE : DATA/25/0037/SITE.DWG

BREAKWATER CROSS SECTION · TYPICAL



REVETMENT CROSS SECTION · TYPICAL



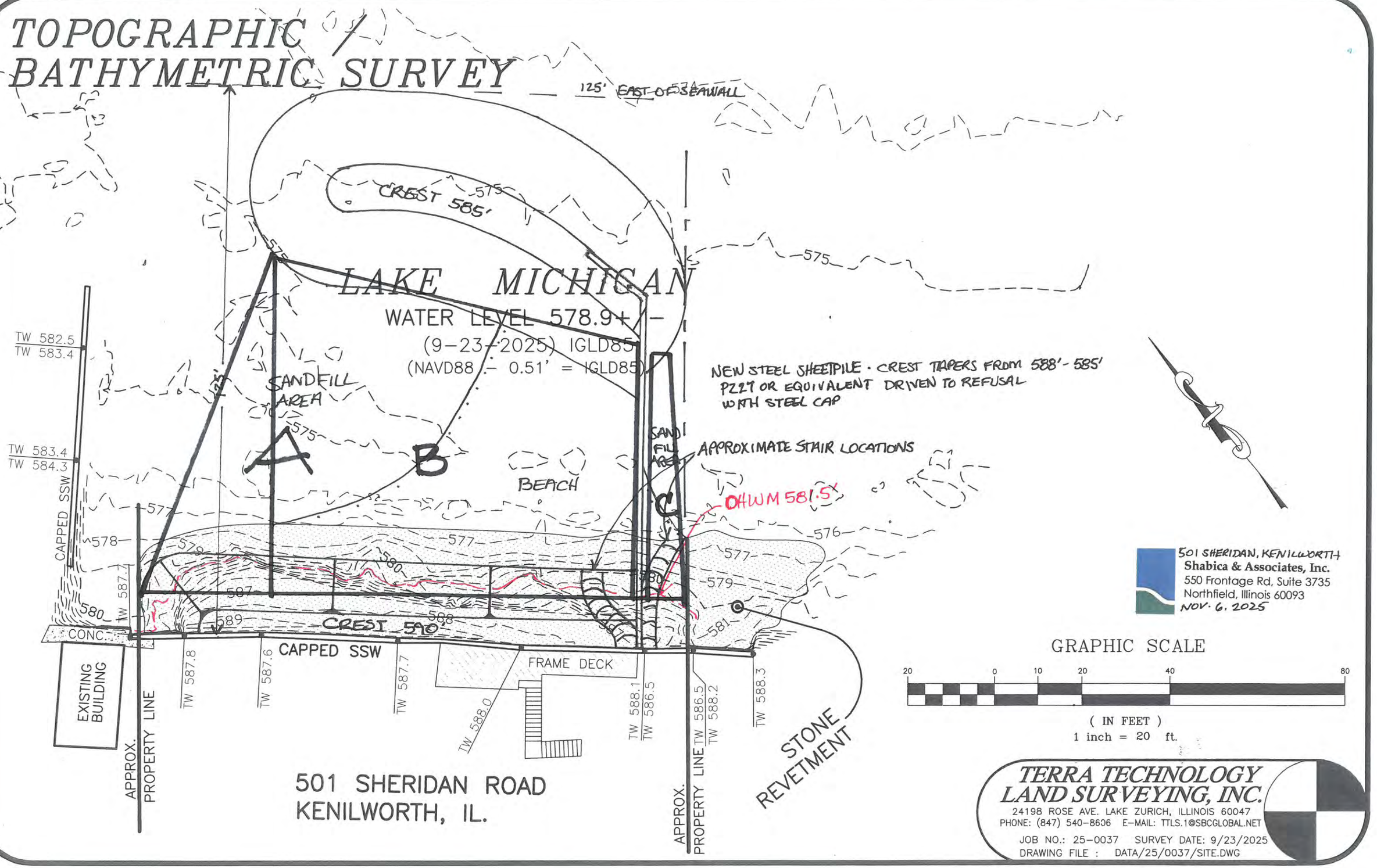
0 FEET 10
SCALE

DATUM: IGLD 1985

501 SHERIDAN, KENILWORTH
Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
NOV. 6. 2025

SAND PLAN VIEW

TOPOGRAPHIC / BATHYMETRIC SURVEY



NEW STEEL SHEETPILE - CREST TAPERS FROM 588'-585'
PZ27 OR EQUIVALENT DRIVEN TO REFUSAL
WITH STEEL CAP

501 SHERIDAN ROAD
KENILWORTH, IL.

501 SHERIDAN, KENILWORTH
Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
NOV. 6, 2025

GRAPHIC SCALE

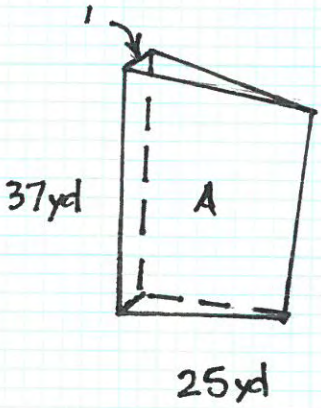
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

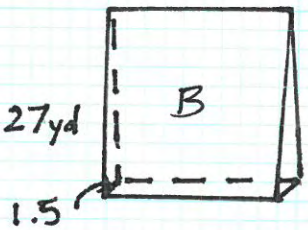
TERRA TECHNOLOGY LAND SURVEYING, INC.
24198 ROSE AVE. LAKE ZURICH, ILLINOIS 60047
PHONE: (847) 540-8606 E-MAIL: TTLS.1@SBCGLOBAL.NET

JOB NO.: 25-0037 SURVEY DATE: 9/23/2025
DRAWING FILE : DATA/25/0037/SITE.DWG

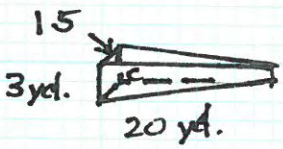
SAND CALCULATIONS



$$\frac{25\text{ yd} \times 37\text{ yds} \times 1}{2} = 462.5 \text{ cu. yds}$$



$$\frac{25 \text{ yds} \times 27 \text{ yds} \times 1.5}{2} = 506 \text{ cu. yds.}$$



$$\frac{3 \text{ yds} \times 20 \text{ yds} \times 1.5}{2} = 45 \text{ cu. yds}$$

1013.5 cu.yds. X 1.25 cu.yds/ton = 1267 tons

1267 tons x 20% OVERFILL = 253 tons

1267 tons + 253 tons = 1520 tons

PLACE 1520 TONS CLEAN SAND FILL

501 SHERIDAN, KENILWORTH
Shabica & Associates, Inc.
550 Frontage Rd, Suite 3735
Northfield, Illinois 60093
NOV. 6, 2025