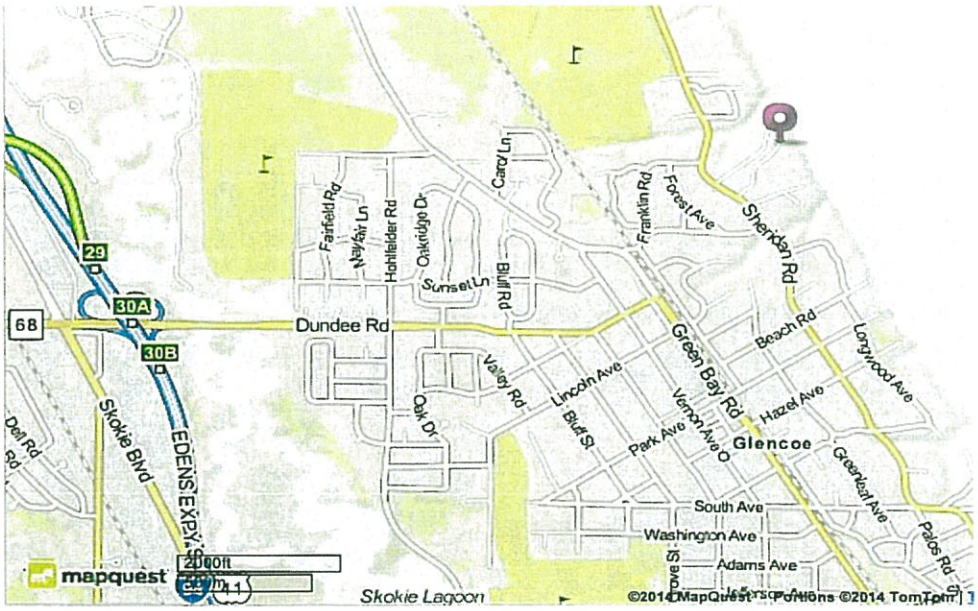
Shabica & Associates, Inc.
WE BUILD BEACHES

Federal Consistency Coordinator
Illinois Coastal Management Program
Illinois Department of Natural Resources
160 N. LaSalle Street, Suite 700
Chicago, IL 60601

To Whom It May Concern: October 20, 2014

In compliance with the Illinois Coastal Management Federal Consistency Review Procedures, we provide the following information for a proposed breakwater-protected beach system for the property located at 50 Glade Road, Glencoe, Illinois 60022, owned by 50 Glade LLC.

Location of Project
The proposed breakwater-protected beach system will be built on the lakefront of the property located at 50 Glade Road, Glencoe, Illinois 60022, owned by 50 Glade LLC.



550 Frontage Road • Suite 3735 • Northfield, Illinois 60093 • Tel 847.446.1436 • Fax 847.716.2007
www.shabica.com

Project Start Date and Duration
Work will not begin until all necessary permits have been received. It is anticipated that the project can begin by June 1, 2015. This work will require approximately 12 weeks to complete.

Extent of Work to be Conducted

A quarrystone breakwater will be built over the existing steel groin near the south property line, beginning approximately 10' north of the property line. The breakwater will extend east and north from the existing seawall at the bluff toe. The breakwater will extend east and north from the existing seawall at the bluff toe. The breakwater will have a crest elevation of 590' at the west end tapering to 582' (IGLD 1985) at the landward end with a slope of 1v:1.5h. There will be an island breakwater beginning 20' south of the existing steel groin at the toe extending 64' to the south. This island breakwater will have a crest of 582' with a slope of 1v:1.5h. The lakeward toes of both breakwaters will extend 125' east of the existing seawall. Mitigational sand will be placed in a quantity of 4200 tons in the system. A steel boat launch ramp will be installed 20.5' south of the north property line. The steel ramp will be 65' long and 12' wide with a 3'wide stair adjacent to it. The steel ramp will have a slope of 1h:4.5v and will extend from the crest of the seawall down to clay, estimated at 576'. The steel ramp will have a 10' wide approach immediately east of the seawall prior to the slope to the lake for safer access to the boathouse. The steel boat launch ramp will be installed on piles driven into the lakebed.

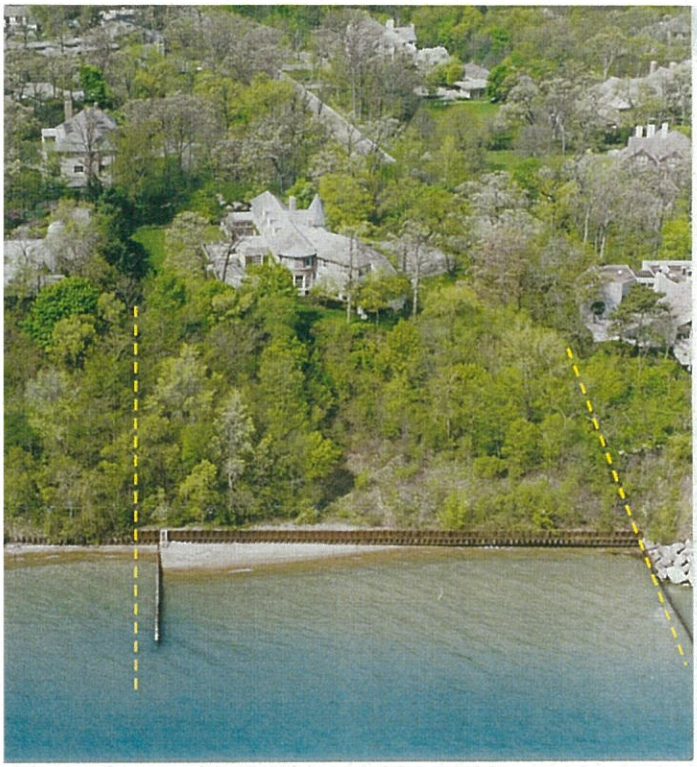
Contact Information
All questions pertaining to this project can be submitted to:

Jon Shabica
Shabica & Associates, Inc.
550 Frontage Road, Suite 3735
Northfield, IL 60093
jon@shabica.com
847-446-1436 Tel
847-716-2007 Fax

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

Sincerely,

Jon Shabica
Vice President



1997 Aerial Photo Approximate Property Lines in Yellow

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Ms. Kathy Chernich
East Section Chief, Regulatory Branch
Chicago District
U.S. Army Corps of Engineers
231 S. LaSalle Street, Suite 1500
Chicago, IL 60604

Dear Ms. Chernich:

October 20, 2014

Please find enclosed a permit application for shore protection for the property located at 50 Glade Road, Glencoe, Illinois, 60022, owned by 50 Glade LLC. Proposed work includes construction of two quarrystone breakwaters, sandfill, as required, and a steel boat launch ramp.

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. A separate letter has been submitted to the ICMP office.

Project Purpose Statement
The property owner has retained Shabica & Associates (SA) to design and engineer a shore protection system for this property. This project will be constructed on the lakefront of 50 Glade Road, Glencoe, where the new homeowner wants to increase the level of shore protection by reducing lakebed downcutting with a proper layer of sand cover over the lakebed to reduce the risk of failure of the existing seawall. The sandy beach at this site has deflated over the years. During higher lake levels, the beach trend is to be narrow allowing waves to impact the seawall during lake storms. This wave action causes scour at the smooth vertical face of the seawall.

The bluff at this site has a vegetated slope face that terminates at a steel seawall. Lakeward of the seawall is a sandy beach that varies in width, is typically narrower at the north end of the beach cell and is narrow enough at times to allow wave action on the seawall. Approximately 30' north of the south property line, there is a +/-95' long steel groin. This structure helps to hold the beach that exists on the property. There also is a steel groin at the north property line.

A quarrystone breakwater will be built over the existing steel groin near the south property line, beginning approximately 10 ' north of the property line. The breakwater will extend east and north from the existing seawall at the bluff toe. The breakwater will have a crest elevation of 590' at the west end tapering to 582' (IGLD 1985) at the landward end with a slope of 1v:1.5h. There will be an island breakwater beginning 30' south of the existing steel groin at the toe extending 64' to the south. This island breakwater will have a crest of 582' with a slope of 1v:1.5h. The lakeward toes of both breakwaters will extend 125' east of the existing seawall. Mitigational sand will be placed in a quantity of 4200 tons in the system. A steel boat launch ramp will be installed 20.5' south of the north steel groin. The steel ramp will be 65' long and 12' wide with a 3'wide stair adjacent to it. The steel ramp will

have a slope of 1h:4.5v and will extend from the crest of the seawall down to clay, estimated at 576'. The steel ramp will have a 10' wide approach apron immediately east of the seawall prior to the slope to the lake for safer access to the boathouse. The steel boat launch ramp will be installed on piles driven into the lakebed.

This section of coastline has historically lost sand due to large municipal structures, as well as lakebed downcutting especially during prolonged periods of low lake levels. Nearshore sand deposits vary from non-existent to nominal here (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.

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 2004-07). Large quantities of sand have been trapped or diverted offshore by municipal structures that extend 900 feet or more 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 shallow lakebed (where downcutting is most active), as well as to protect the revetment and bluff toe, SA has designed a breakwater beach system to hold sand, as necessary, to protect the lakebed and 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."

Design Options

The site at 50 Glade Road, Glencoe has been inspected and options for shore protection were determined using desktop coastal engineering, site conditions from the 2014 bathymetric survey, studying local prototypes, and several years of observations of the shoreline conditions 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. These four design options were considered:

OPTION 1

Do Nothing –

The first option of "Do Nothing" results in leaving the currently eroding beach in its existing state. This will allow lakebed erosion to continue allowing larger stormwaves to impact the coastline. Over time, the beaches along Illinois' North Shore coastline have continued to narrow due to being in a sand starved system. At this site, the beach continues to narrow even with lower lake levels. Now with the water level rising, Lake Michigan waves are impacting the seawall.

OPTION 2

Construct a Revetment –

The second option considered is to construct a quarrystone revetment. This option provides enhanced stormwater protection at the cost of the following:

1. Continued erosion of the lakebed, which will ultimately destabilize the revetment toe
2. The beach will erode over time, as there is less sand in the system.

OPTION 3

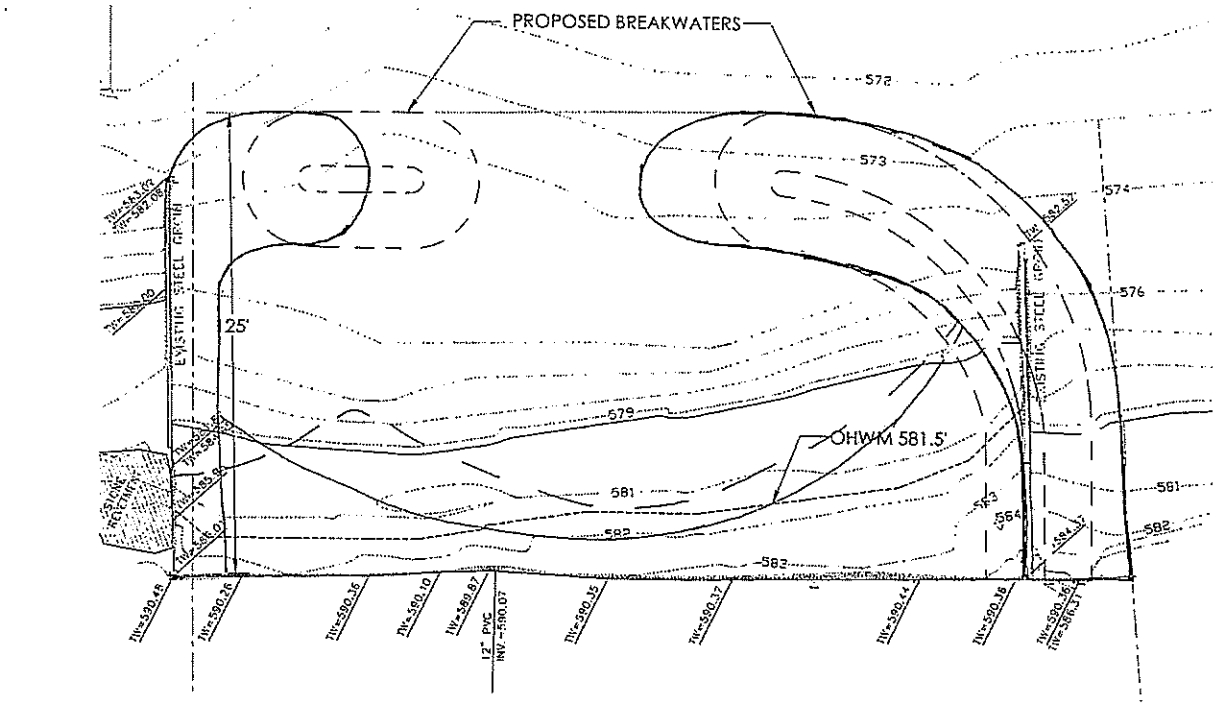
Preferred Option: Design a Two Breakwater System (Shore Connected and an Island) (125 ft offshore) –

The preferred option is to protect the property with a beach breakwater system. This design keeps the breakwater structures within the 125-foot distance offshore in accordance with the IDNR guidelines. The proposed breakwater will extend east from the seawall approximately 125 feet. This plan also includes a boat launch ramp for access to the new boat house. The proposed plan will help protect the glacial clay lakebed, as well as the beach and bluff, while allowing safe access to Lake Michigan. This option will not negatively impact the adjacent beaches the modification to the south steel groin is to encapsulate it in stone which will reduce wave energy in the immediate area. With proper maintenance, a structure like this could be expected to continue functioning for 30 plus years.

OPTION 4

Encapsulate the North Existing Steel Groin in Quarrystone and Build South Breakwater Arm –

This option would help to hold sand in the beach cell and is preferred by the client. However, the north groin is on the property to the north and accessing the owner has been unsuccessful. This option was dismissed as permission to build on the north property was not obtained. The conceptual drawing below reflects option4 with the preferred option 3 shown with dotted lines.



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 proposed project will have positive impact on the property immediately downdrift of the subject property. By relocating the shore protection structure to the property line as well as changing it from a reflective steel groin to a quarrystone breakwater that will help reduce wave energy in the immediate area increasing the quantity of sand retained south of the proposed breakwater.

Impact to Littoral Drift System

The proposed plan for this site includes the construction of two quarrystone breakwaters, placement of sandfill as required for permit, and a steel boat launch ramp.

The section of Lake Michigan shoreline north and south of 50 Glade Road, Glencoe is fully engineered with steel groins, piers, seawalls, and quarrrystone breakwaters. Based on our experience, as the proposed structures have been designed to allow sediment transport around the system and will be prefilled with mitigational sand, it will not negatively impact the littoral system after the sandfill is placed (anticipated quantity plus 20% overfill). According to the 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 new 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 new 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 be provided over the proposed breakwater in the form of stone steps. No work will be done on the north steel groin. The beach will 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. Additionally, navigation of water craft will not be impacted, as the proposed construction will not extend further east than the existing structure.

Impact on Natural Resources
Quarrystone structures in the nearshore waters of Lake Michigan and sandy beaches improve native species habitat. The Land Owner 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 individual permit.

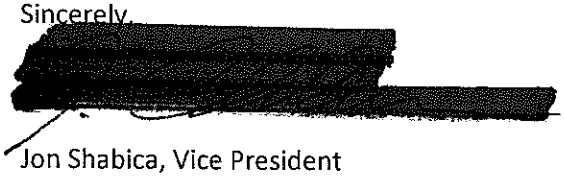
Description and Schedule of Proposed Activity
All of the proposed work will be completed via marine access. A barge will deliver a backhoe to work on land to place the materials. All materials will be delivered by barge to the site. Work will not begin until all necessary permits have been received. This work will require approximately 12 weeks to complete.

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 2800 tons of new, clean quarried stone will be placed to construct the revetment and breakwater. Approximately 4200 tons of clean sand will be placed on the existing beach. Acreage of stone placed on the lakebed east of the OHWM is 0.118 acres. All material removed from the lakebed for installation of the breakwater toe will be placed on the barge and removed from the site, then disposed of properly.

Summary
All of the above described activities and plans will follow IPP 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 and the Illinois Historic Preservation Association 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 (Casey)
IEPA (Heacock)
U.S. Fish & Wildlife Service
Illinois Historic Preservation Agency (Haaker)
Pat Bernal, 50 Glade LLC

DESIGN OF SHORELINE EROSION PROTECTION

Introduction

The following report summarizes assumptions and design criteria for two quarrystone breakwaters, sandfill mitigation and a steel boat launch ramp to help reduce erosion and protect the property located at 50 Glade Road, Glencoe IL, 60022. The design is based on the drawings included in the permit application to the U.S. Army Corps of Engineers dated October 2, 2014.

The site lies within a fully engineered section of urban lakeshore that is typically protected with revetments, seawalls, impermeable piers, steel sheetpile groins and breakwater protected beaches. There are no naturally eroding bluffs in the area.

This section of coast is sand-starved due to municipal structures (littoral barriers) constructed over the past 100 years that extend lakeward beyond the littoral zone and reduce sand bypass. Although there is currently an exposed sandy beach due to extreme low lake levels, the beach width varies greatly due to the vulnerability of this location. 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 two quarrystone breakwaters, sandfill mitigation and a steel boat launch ramp 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:	582 ft
Toe of Structure:	573 ft (average)
Crest Width:	6 ft
Armor Size:	2-6 tons
"B" Stone:	400 lbs to 1200 lbs
Slope:	1:1.5
Tons/linear feet:	15.5 tons

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 (assumes 1 ft of sand)
• 20-yr lakebed erosion at toe of breakwater:	3 ft**
• Design wave height (Hs):	9.45 ft

Assumptions (continued)

- Nearshore Slope: ± 1:30
- Design Wave Period (T): 9.9 s ***
- Depth at Structure Toe DHW (Ds): 9'
- 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
** 2.5 ft sand and gravel (thickness varies) plus 2 ft clay till, Nairn, 1997
*** Resio & Vincent, 1976

Stone Breakwater Stability, Armorstone

The proposed quarrystone breakwater has two layers of 2 – 6 ton armorstone built on a 1:1.5. Overtopping of the structure is expected during storms and higher water levels. Design conditions include:

* Lakeward breakwater crest elevation at DHW, 4.5 ft above DLW
* Depth-limited breaking waves will break on the stone breakwater and sand beach
* Depth at the toe of the structure is 9.0 ft (573.0) at design high water
* Incident wave directions: NE, E and SE
* Wave period for DHW T = 9.9 seconds
* Wave period for average conditions T = 6 seconds

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 coefficient (K_d) varies primarily with the shape of armor units, roughness of armor unit surface, sharpness of edges and degree of interlocking obtained in placement.

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

$$W = (W_r * H_s^3)/(K_d([W_r/W_w]-1)^3 * \cot(\beta))$$

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. As the lakeward face of the breakwater will be built random placement, an armorstone of 4.6 tons is predicted for random placement stonework based on the design conditions. The landward face of the breakwater will be built with special placement stone. Hudson's formula predicts 1.9 ton armorstone for special placement.

Bathymetry

Bathymetric profiling was performed on 7/31/2014. Five transects were completed in the project area. The profiles extend up to 450 ft east of the existing seawall. Survey work was completed by Terra Technology Land Surveying, Inc.

Water Levels

The following table summarizes water level data representing daily highest extremes measured at Calumet Harbor, Illinois, approximately 27 miles to the south of Glencoe. 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. Rod and transit 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 overlain on the proposed shore protection system. 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 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 Glencoe lakeshore is considered sediment-starved. Sand deposits were measured near this site (Ravine Drive, Highland Park) from the backshore to a depth of 6.1 m (20 ft). Sand deposits were thin to non-existent to a distance of 250 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 (see Figure 1) showing loss of lakebed sand from 1975 to 1991. According to Robert Nairn (Baird), 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 50 Glade Road, Glencoe 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 assure that they continue to meet design specifications.

References

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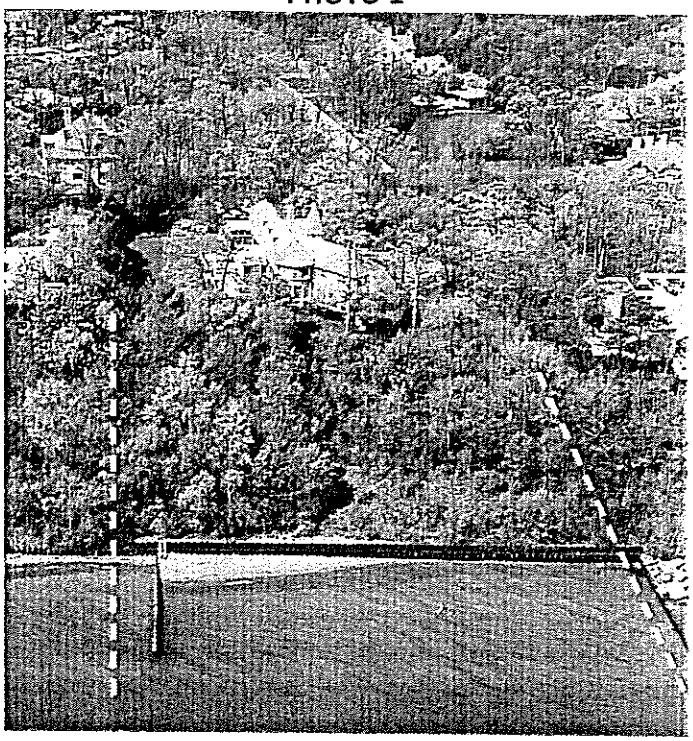
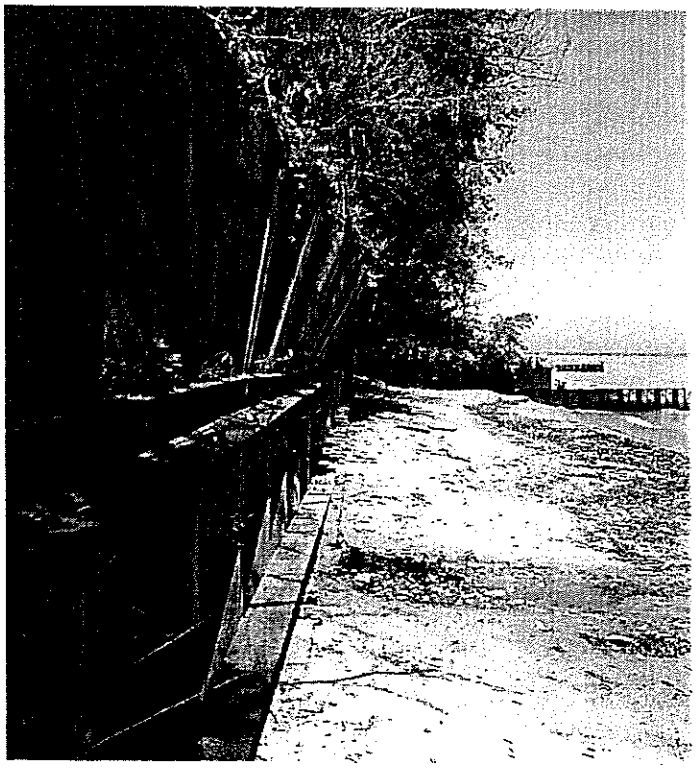
PHOTO 1



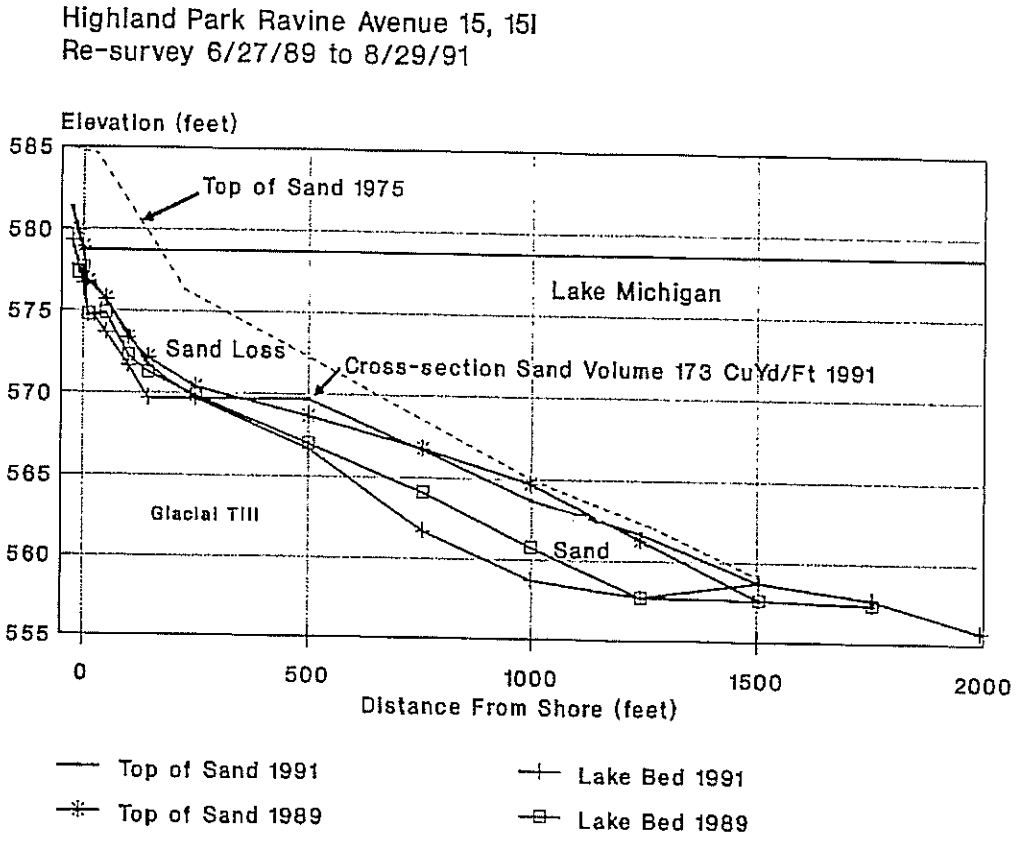
1997 Aerial Photo Approximate Property Lines in Yellow

PHOTO 2



2014 Photo, showing tipped section of seawall at bluff toe and narrow beach at north end of the cell

FIGURE 1


Highland Park Ravine Avenue 15, 151
Re-survey 6/27/89 to 8/29/91
Elevation (feet)
585
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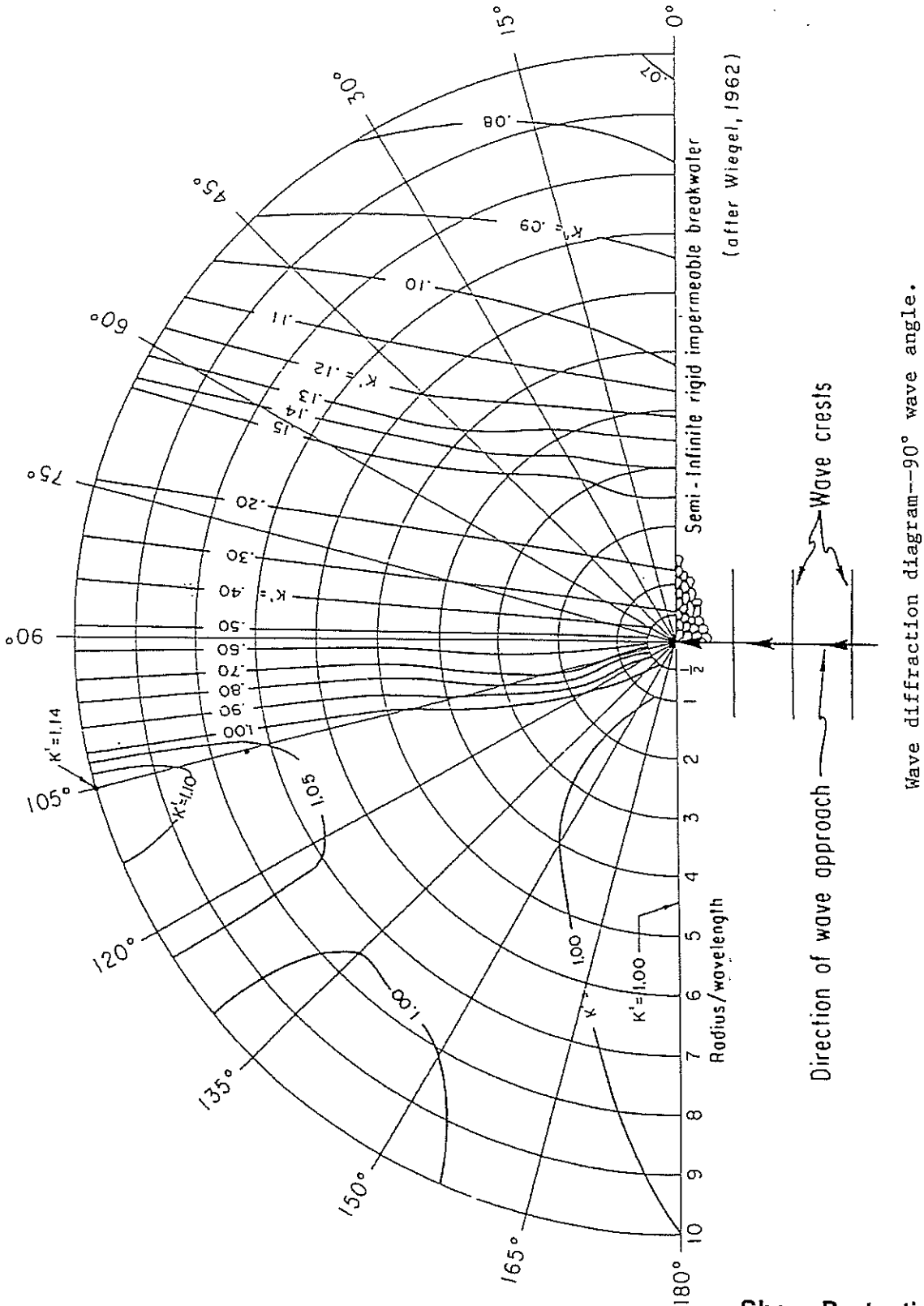
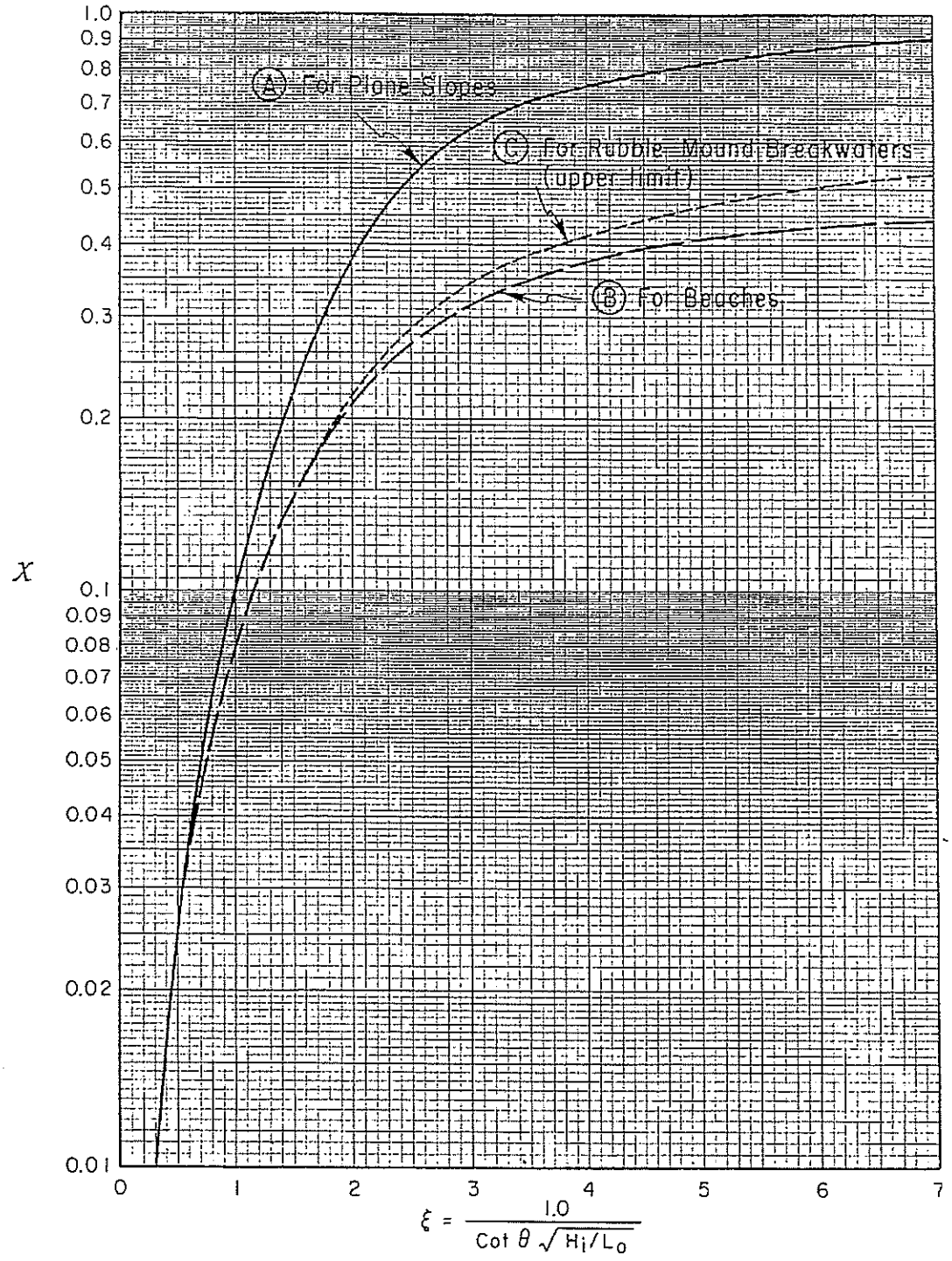
Top of Sand 1975
Lake Michigan
Sand Loss
Cross-section Sand Volume 173 CuYd/Ft 1991
Glacial Till
Sand
0
500
1000
1500
2000
Distance From Shore (feet)
Top of Sand 1991
Top of Sand 1989
Lake Bed 1991
Lake Bed 1989

FIGURE 2



Shore Protection Manual
USACE

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):
Patricia Bernal		Jon Shabica
Company Name (if any) : 50 Glade LLC	Company Name (if any):	Company Name (if any): Shabica & Associates, Inc.
Address: 1001 Greenbay Road #311 Winnetka, IL 60093	Address:	Address: 550 Frontage Road Suite 3735 Northfield, IL 60093
Email Address: [redacted]	Email Address:	Email Address: jon@shabica.com
Applicant's Phone Nos. w/area code	Applicant's Phone Nos. w/area code	Agent's Phone Nos. w/area code
Business: [redacted]	Business:	Business: 847-446-1436
Residence:	Residence:	Residence:
Cell:	Cell:	Cell:
Fax:	Fax:	Fax: 847-716-2007

STATEMENT OF AUTHORIZATION

I [redacted] Shabica & Associates, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon re[redacted]upport of this permit application.

[redacted]
Applicant's Signature

10/2/14
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 vicinity map		
b.		
c.		
d.		

6. PROJECT TITLE:
Breakwater-Protected Beach and Boat Launch Ramp

7. PROJECT LOCATION:
50 Glade Road, Glencoe, IL 60022

LATITUDE: 42.14508 °N LONGITUDE: -87.75463 °W	UTMs Northing: 4666185.30m Easting: 437684.12m				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE
50 Glade Street, Glencoe, IL		NW	6	42N	13E

☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box)

Municipality Name			WATERWAY	RIVER MILE (If applicable)
Glencoe			Lake Michigan	
COUNTY	STATE	ZIP CODE		
Cook	IL	60022		

Revised 2010

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

8. PROJECT DESCRIPTION (Include all features):

A quarrystone breakwater will be built over the existing steel groin near the south property line, beginning approximately 10 ' north of the property line. The breakwater will extend east and north from the existing seawall at the bluff toe. The breakwater will have a crest elevation of 590' at the west end tapering to 582' (IGLD 1985) at the landward end with a slope of 1v:1.5h. There will be an island breakwater beginning 30' south of the existing steel groin at the toe extending 64' to the south. This island breakwater will have a crest of 582' with a slope of 1v:1.5h. The lakeward toes of both breakwaters will extend 125' east of the existing seawall. Mitigational sand will be placed in a quantity of 4200 tons in the system. A steel boat launch ramp will be installed 20.5' south of the north steel groin. The steel ramp will be 65' long and 12' wide with a 3'wide stair adjacent to it. The steel ramp will have a slope of 1h:4.5v and will extend from the crest of the seawall down to clay, estimated at 576'. The steel ramp will have a 10' wide approach immediately east of the seawall prior to the slope to the lake for safer access to the boathouse. The steel boat launch ramp will be installed on piles driven into the lakebed.

9. PURPOSE AND NEED OF PROJECT:

To stabilize the site as well as reduce deepening of the lakebed caused by lakebed erosion.

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

10. REASON(S) FOR DISCHARGE:

Shore protection in the form of a breakwater-protected beach.

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:

Sand: 3343 cu. yds Stone: 1200 cu. yds

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

0.118 acres

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

The project is designed taking into account the existing structures on the site. The groin near the south property line will be encapsulated. As the north groin is on the neighboring property, an island breakwater will be built, in lieu of connecting to the seawall which would create a better aesthetic for the site.

14. Date activity is proposed to commence: June 1, 2015

Date activity is expected to be completed: August 31, 2015

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 kn[redacted]ief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

[redacted] — Signature of Applicant or Authorized Agent — Date: 10/21/2014

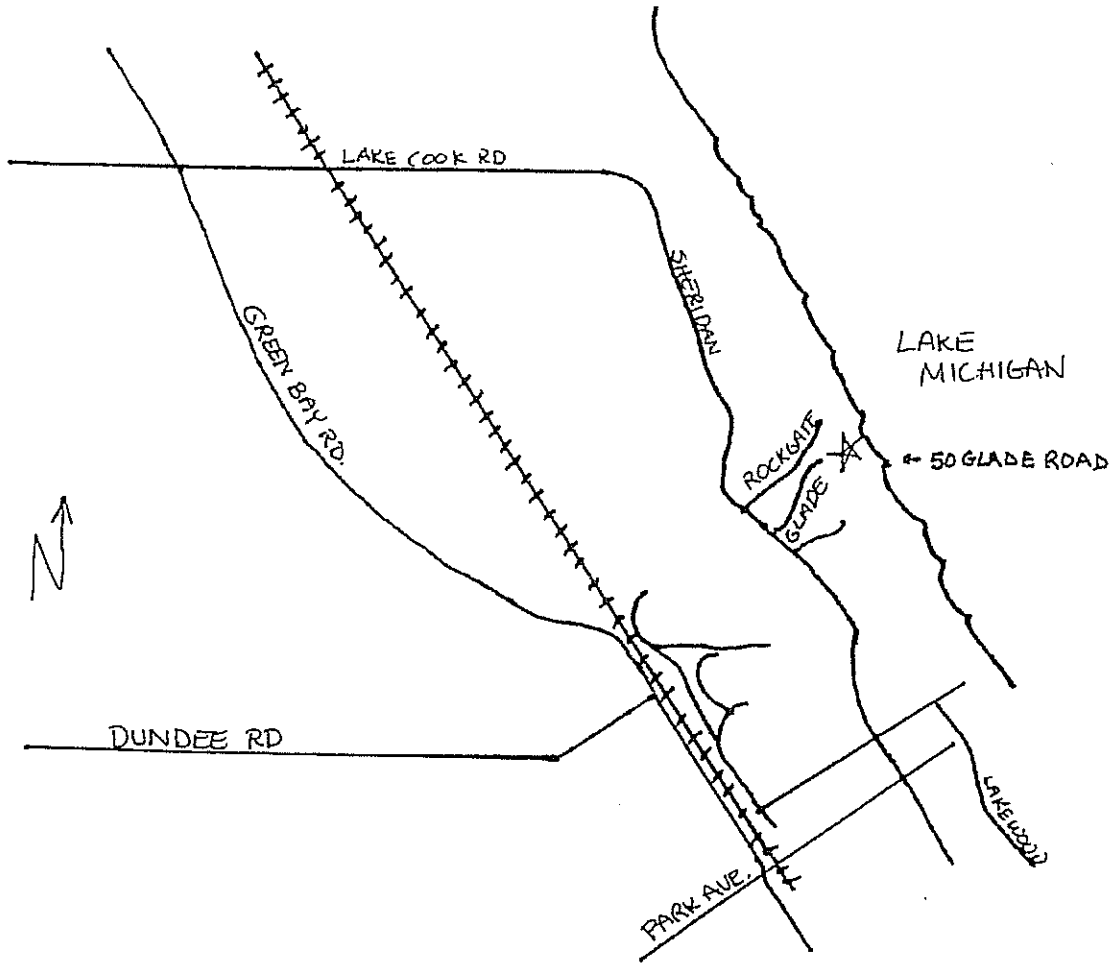
Signature of Applicant or Authorized Agent — Date

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

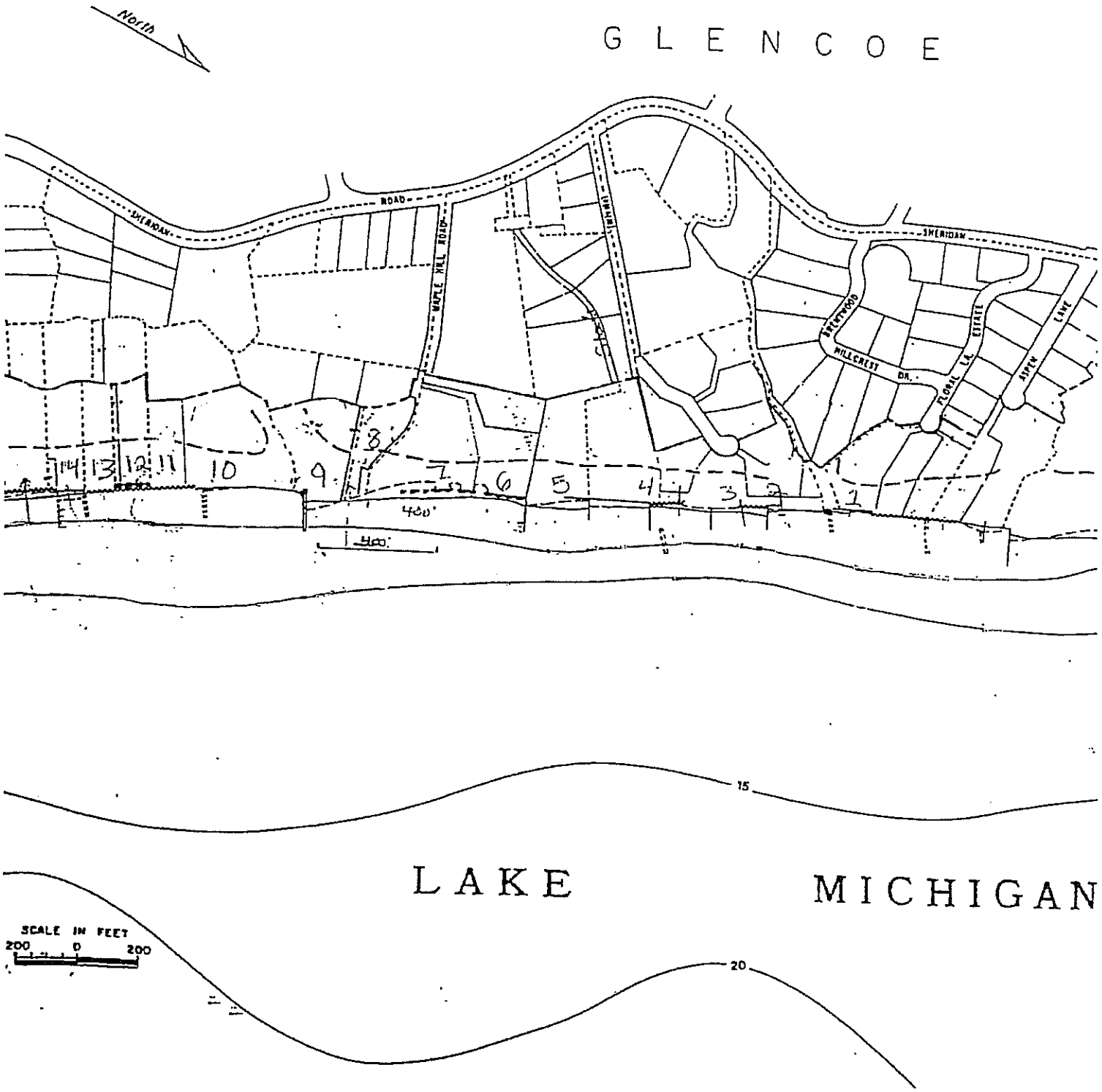
SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

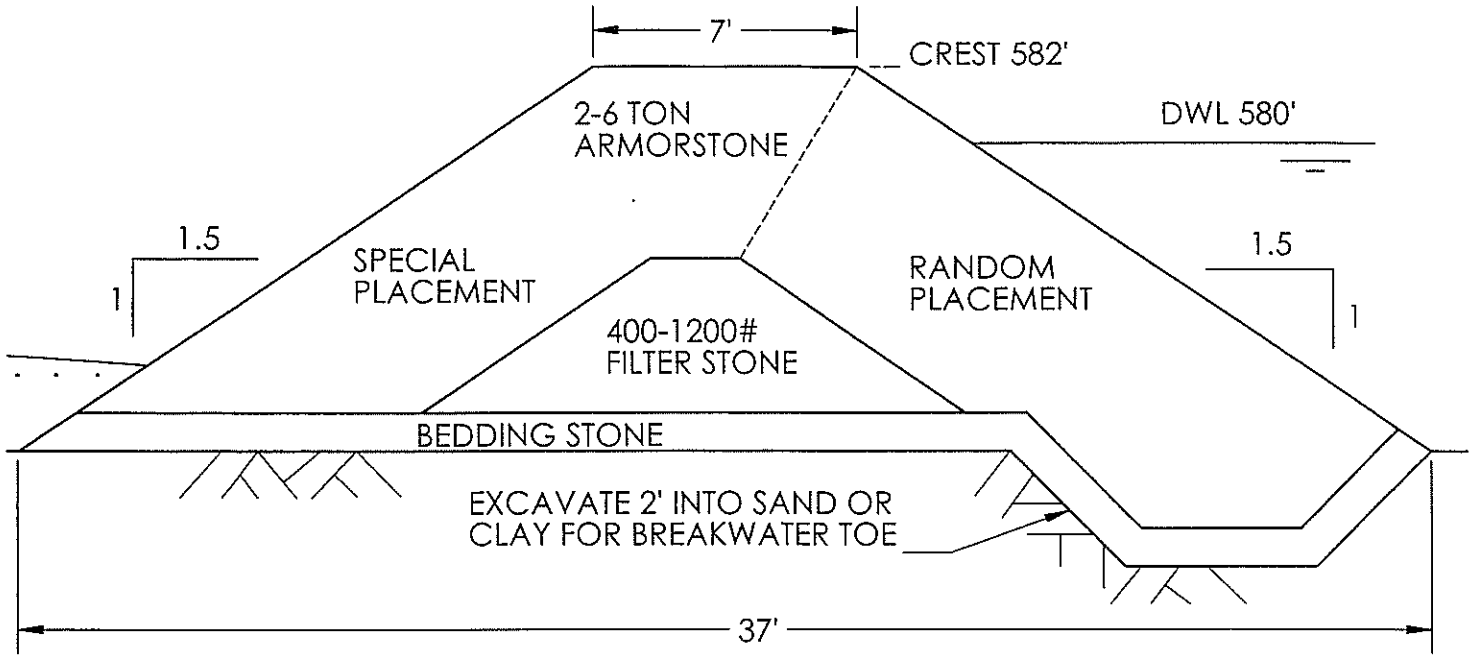


Revised 2010

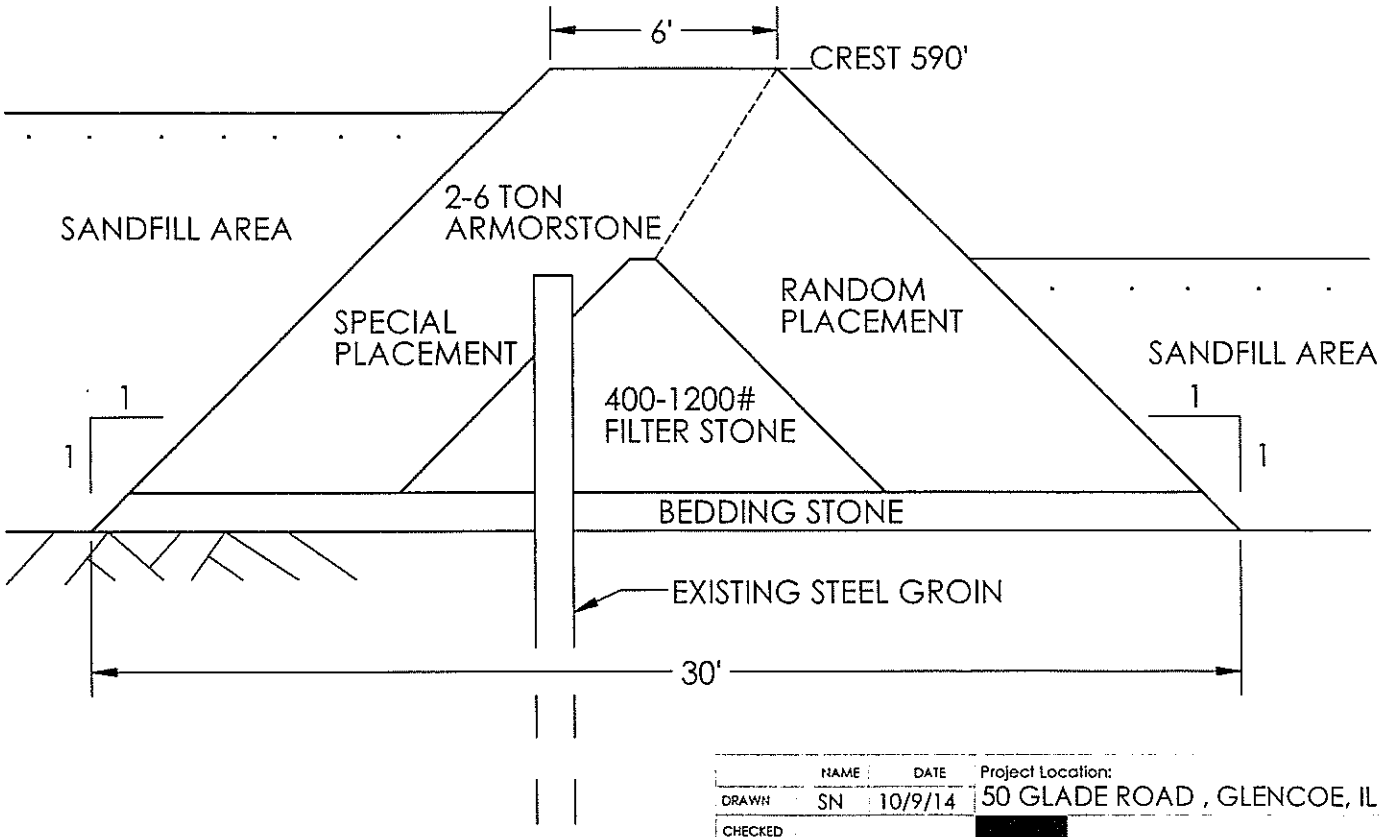
☐ Corps of Engineers ☐ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy


North
GLENCOE
SHERIDAN ROAD
MAPLE HILL ROAD
SHERIDAN
BRENTWOOD
HILLCREST DR.
FLORAL LA.
ESTATES
ASPEN LANE
14 13 12 11 10 9 8 7 6 5 4 3 2 1
400'
400'
15
LAKE
MICHIGAN
SCALE IN FEET
200 0 200
20

BREAKWATER CROSS SECTION A-A



BREAKWATER CROSS SECTION B-B



5'

SCALE

	NAME	DATE
DRAWN	SN	10/9/14
CHECKED		

COMMENTS:

DIMENSIONS ARE IN FEET
TOLERANCES: +.5', -1'
ALL ELEVATIONS IN
IGLD 1985

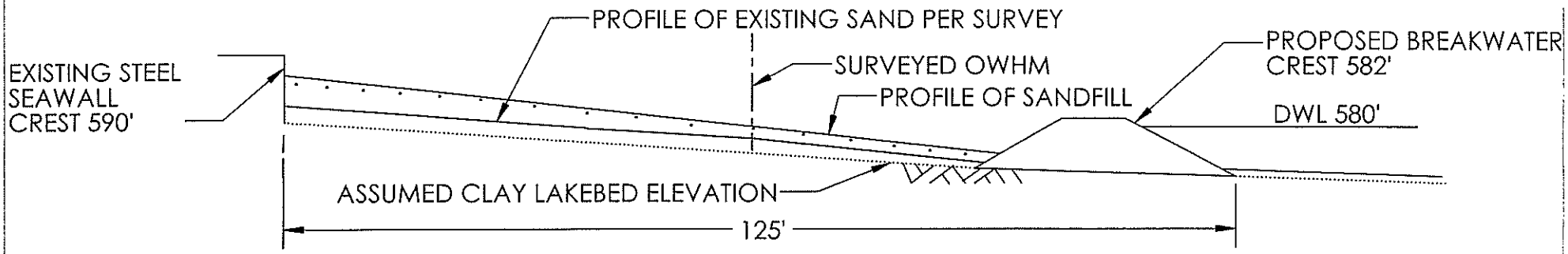
Project Location:
50 GLADE ROAD , GLENCOE, IL

Shabica & Associates, Inc.
550 Frontage Rd., Suite 3735
Northfield, Illinois 60093
847-446-1436
www.shabica.com

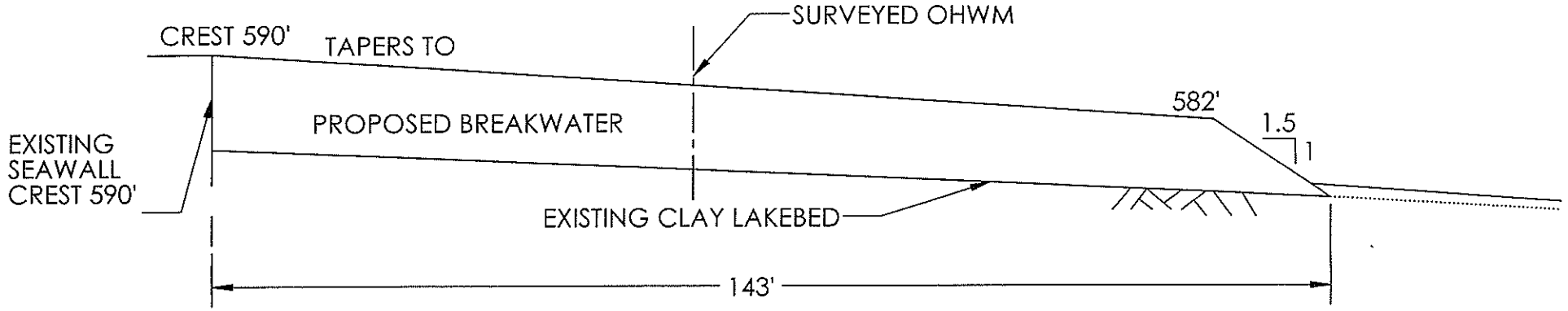
SIZE A | CROSS SECTIONS A-A & B-B | REV.

SCALE 1"=5'

PROFILE C-C



PROFILE THROUGH BREAKWATER D-D



20'

SCALE

	NAME	DATE
DRAWN	SN	10/9/14
REVISED		

COMMENTS:

DIMENSIONS ARE IN INCHES
TOLERANCES: +.5', -1.0'
ALL ELEVATIONS IN IGLD1985

Project Location:
50 GLADE ROAD, GLENCOE, IL

Shabica & Associates, Inc.
550 Frontage Rd., Suite 3735
Northfield, Illinois 60093
www.shabica.com

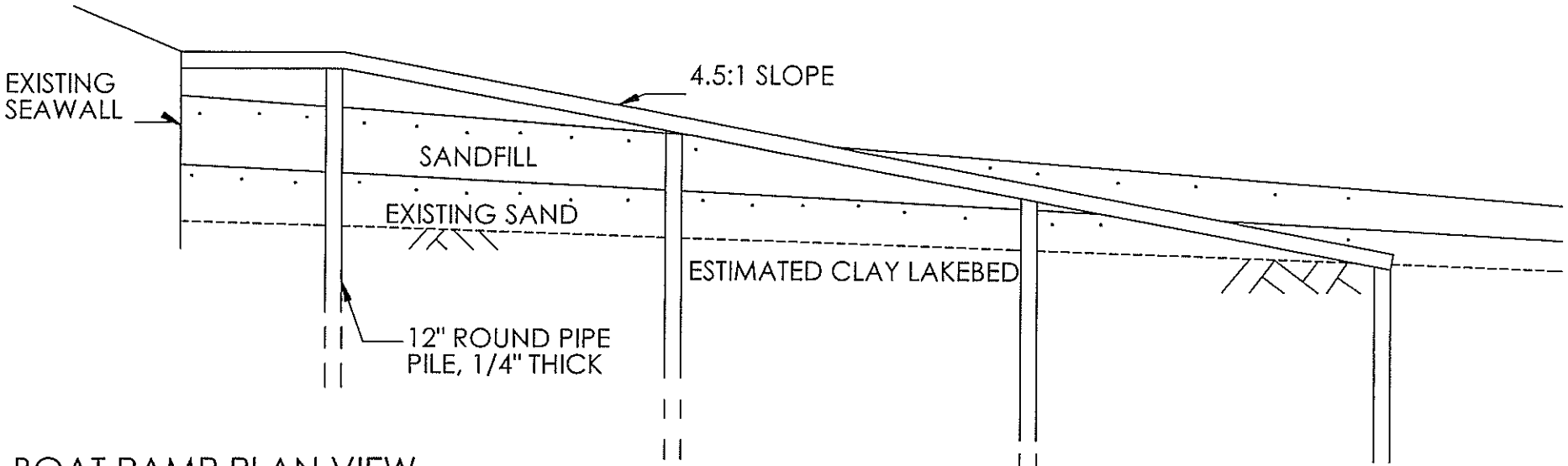
SIZE A | REV

CROSS SECTIONS C-C & D-D

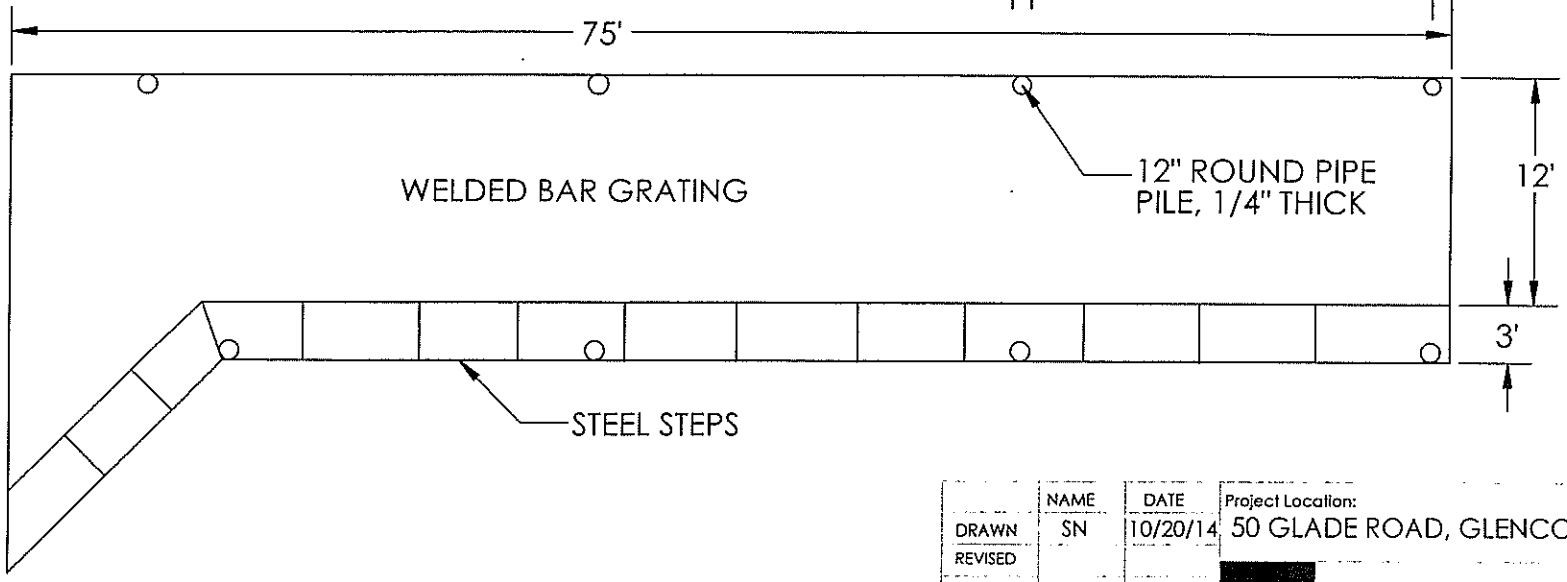
SCALE: 1:240 | SHEET 3 OF 6

5 4 3 2 1

BOAT RAMP TYPICAL CROSS SECTION



BOAT RAMP PLAN VIEW



10'
SCALE

	NAME	DATE
DRAWN	SN	10/20/14
REVISED		

COMMENTS:

DIMENSIONS ARE IN INCHES
TOLERANCES: +.5', -1.0'
ALL ELEVATIONS IN IGLD1985

Project Location:
50 GLADE ROAD, GLENCOE, ILLINOIS

Shabica & Associates, Inc.
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Northfield, Illinois 60093
www.shabica.com

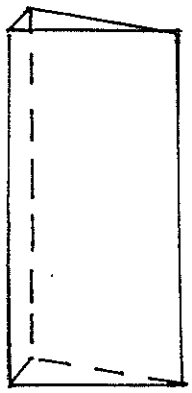
SIZE A | BOAT RAMP DRAWINGS | REV

SCALE: 1:120 | SHEET 4 OF 6

5 4 3 2 1

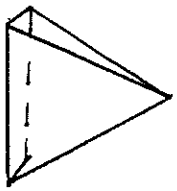
SAND CALCULATIONS

A



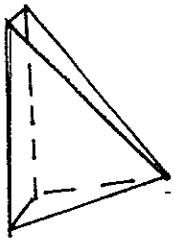
$$\frac{75\text{YDS} \times 33\text{YDS} \times 1.5\text{ YDS}}{2} = 1856 \text{ CUBIC YDS}$$

B



$$\frac{33\text{ YDS} \times 33\text{ YDS} \times 1\text{ YD}}{3} = 363 \text{ CUBIC YDS}$$

C

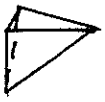


$$\frac{33\text{ YDS} \times 40\text{ YDS} \times 1\text{ YD}}{3} = 440 \text{ CUBIC YDS}$$

D

$$\frac{33\text{ YDS} \times 7\text{ YDS} \times 1\text{ YD}}{3} = 77 \text{ CUBIC YDS}$$

E



$$\frac{20\text{ YDS} \times 15\text{ YDS} \times 1\text{ YD}}{6} = 50 \text{ CUBIC YDS}$$

1856 + 363 + 440 + 77 + 50 = 2786 CUBIC YDS
2786 CUBIC YDS X 20% = 557 CUBIC YDS
2786 CUBIC YDS + 557 CUBIC YDS = 3343 CUBIC YDS
3343 CUBIC YARDS X 1.25 YDS/TON = 4178 TONS

PLACE 4200 TONS OF CLEAN SAND FOR MITIGATION

	NAME	DATE
DRAWN	SN	10/16/14
CHECKED	PK	10/16/14

COMMENTS:

DIMENSIONS ARE IN FEET
TOLERANCES: +.5', -1'
ALL ELEVATIONS IN
tGLD 1985

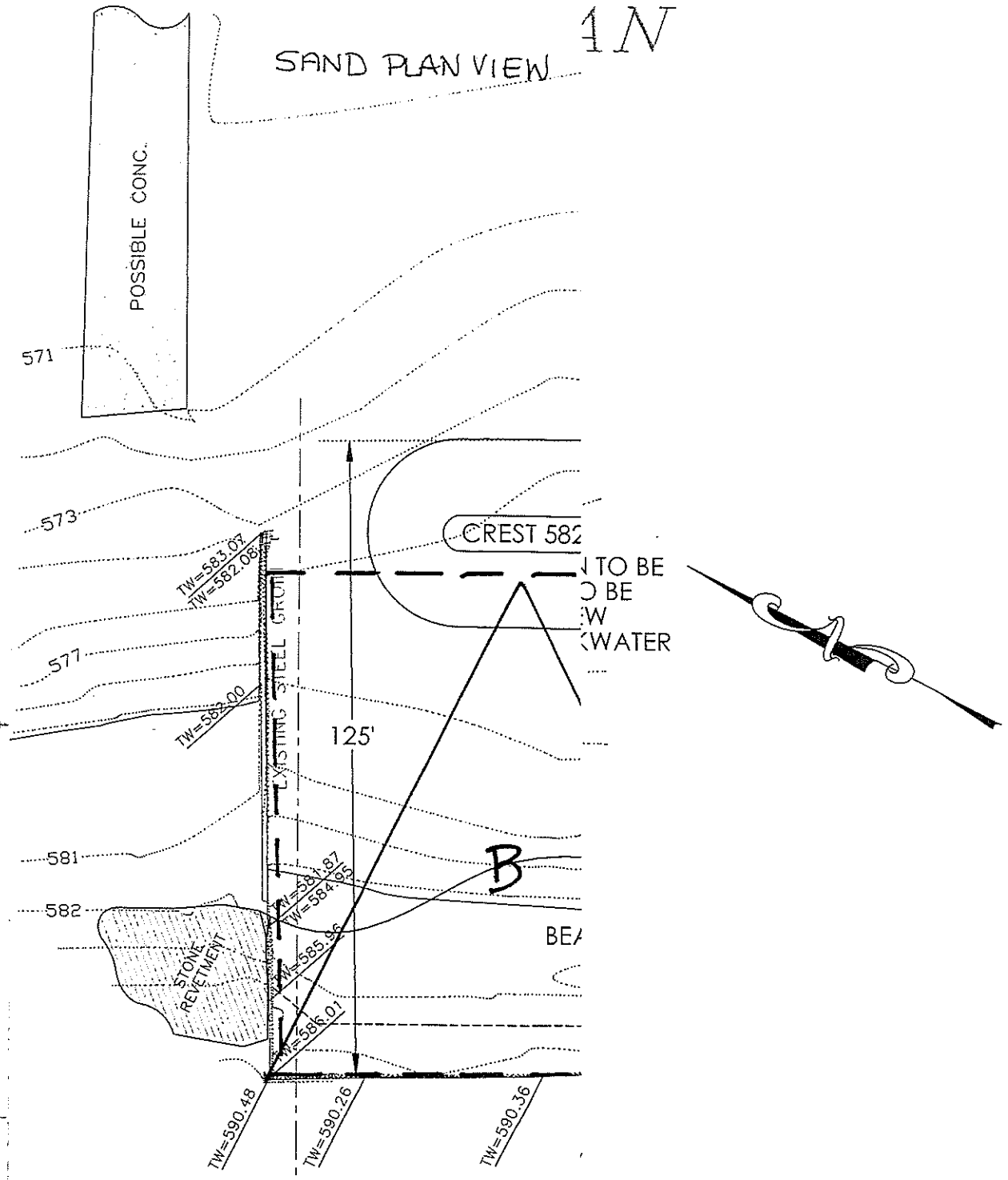
Project Location:
50 GLADE ROAD, GLENCOE, ILLINOIS

Shabica & Associates, Inc.
550 Frontage Rd., Suite 3735
Northfield, Illinois 60093
847-446-1436
www.shabica.com

SIZE A | SAND CALCULATIONS | REV.

SCALE 1"=5'

SAND PLAN VIEW 1N



6 ROCKGATE

NAME	DATE
SN	10/9/14

Project Location:
50 GLADE ROAD, GLENCOE, ILLINOIS

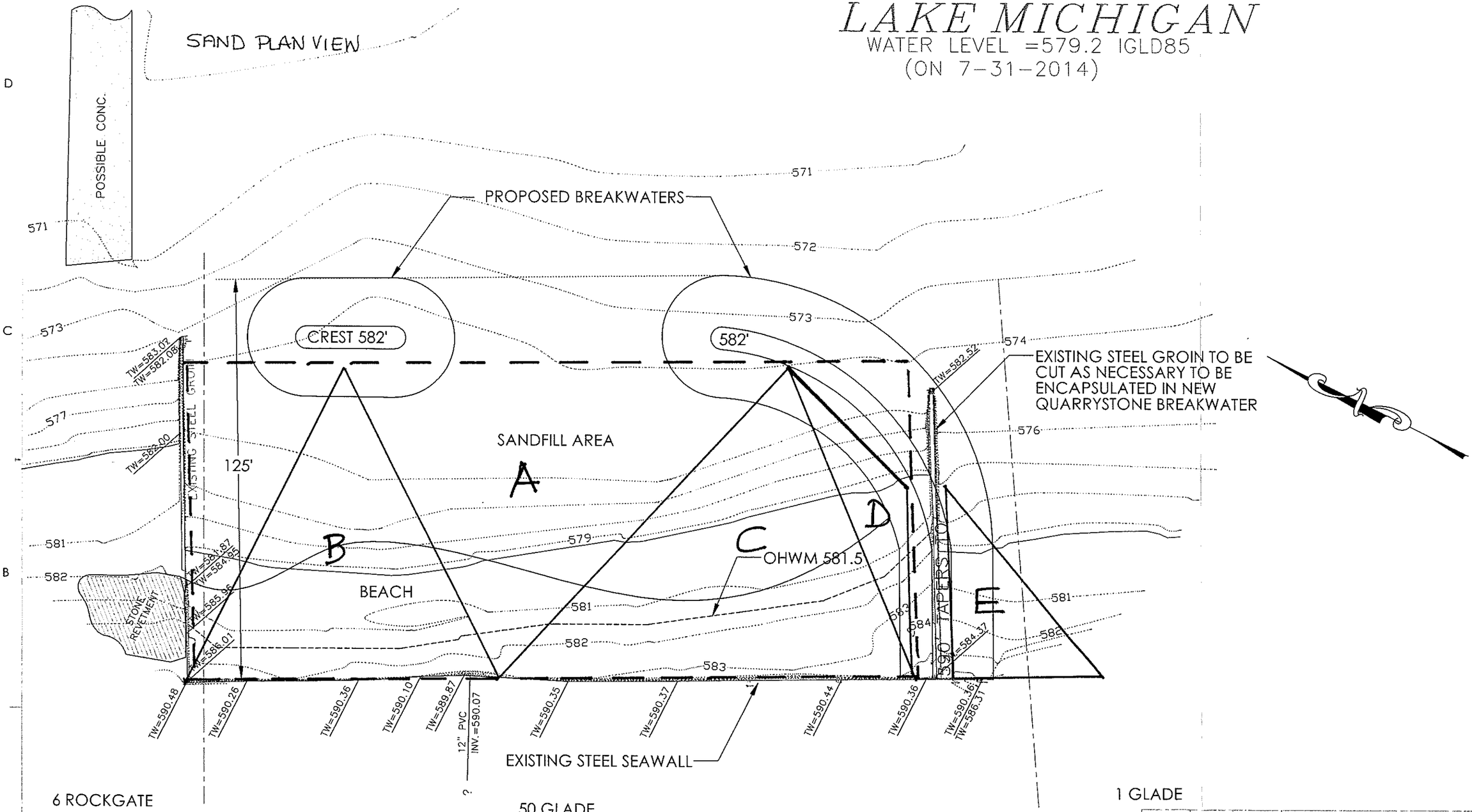
Shabica & Associates, Inc.
550 Frontage Rd., Suite 3735
Northfield, Illinois 60093
www.shabica.com

SIZE A | SAND PLAN VIEW | REV

SHEET 5 OF 6

SAND PLAN VIEW

LAKE MICHIGAN
WATER LEVEL =579.2 IGLD85
(ON 7-31-2014)



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

	NAME	DATE
DRAWN	SN	10/9/14
REVISED		

COMMENTS:

Project Location:
50 GLADE ROAD, GLENCOE, ILLINOIS

Shabica & Associates, Inc.
550 Frontage Rd., Suite 3735
Northfield, Illinois 60093
www.shabica.com

SIZE A | SAND PLAN VIEW | REV

PLAN VIEW

LAKE MICHIGAN
WATER LEVEL =579.2 IGLD85
(ON 7-31-2014)

SURFACE AREA OF WETLANDS FILLED BY QUARRYSTONE EAST OF THE OHWM (581.5') = 0.118 ACRES

POSSIBLE CONC.

PROPOSED BREAKWATER

CREST 582'

PROPOSED BREAKWATER LANDWARD CREST 590' TAPERS DOWN TO LAKEWARD CREST 582'

EXISTING STEEL GROIN TO BE CUT AS NECESSARY TO BE ENCAPSULATED IN NEW QUARRYSTONE BREAKWATER

BREAKWATER SLOPE 1:1.5 LAKEWARD SECTION A-A

BREAKWATER SLOPE 1:1 LANDWARD SECTION B-B

APPROXIMATE ACCESS LOCATION

SANDFILL AREA

125'

12'

3

20.5'

75'

EXISTING STEEL GROIN

Proposed Boat Launch Ramp with Stairs on South

BEACH

OHWM 581.5'

STONE REVETMENT

12" PVC INV.=590.07

EXISTING STEEL SEAWALL

TW=583.07
TW=582.08
TW=582.52
TW=562.00
TW=581.87
TW=584.95
TW=585.86
TW=586.01
TW=590.48
TW=590.26
TW=590.36
TW=590.10
TW=589.87
TW=590.35
TW=590.37
TW=590.44
TW=590.36
TW=590.36
TW=586.31
TW=584.37

6 ROCKGATE

50 GLADE

1 GLADE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

	NAME	DATE
DRAWN	SN	10/9/14
REVISED	SN	10/21/14

COMMENTS:

Project Location:
50 GLADE ROAD, GLENCOE, ILLINOIS

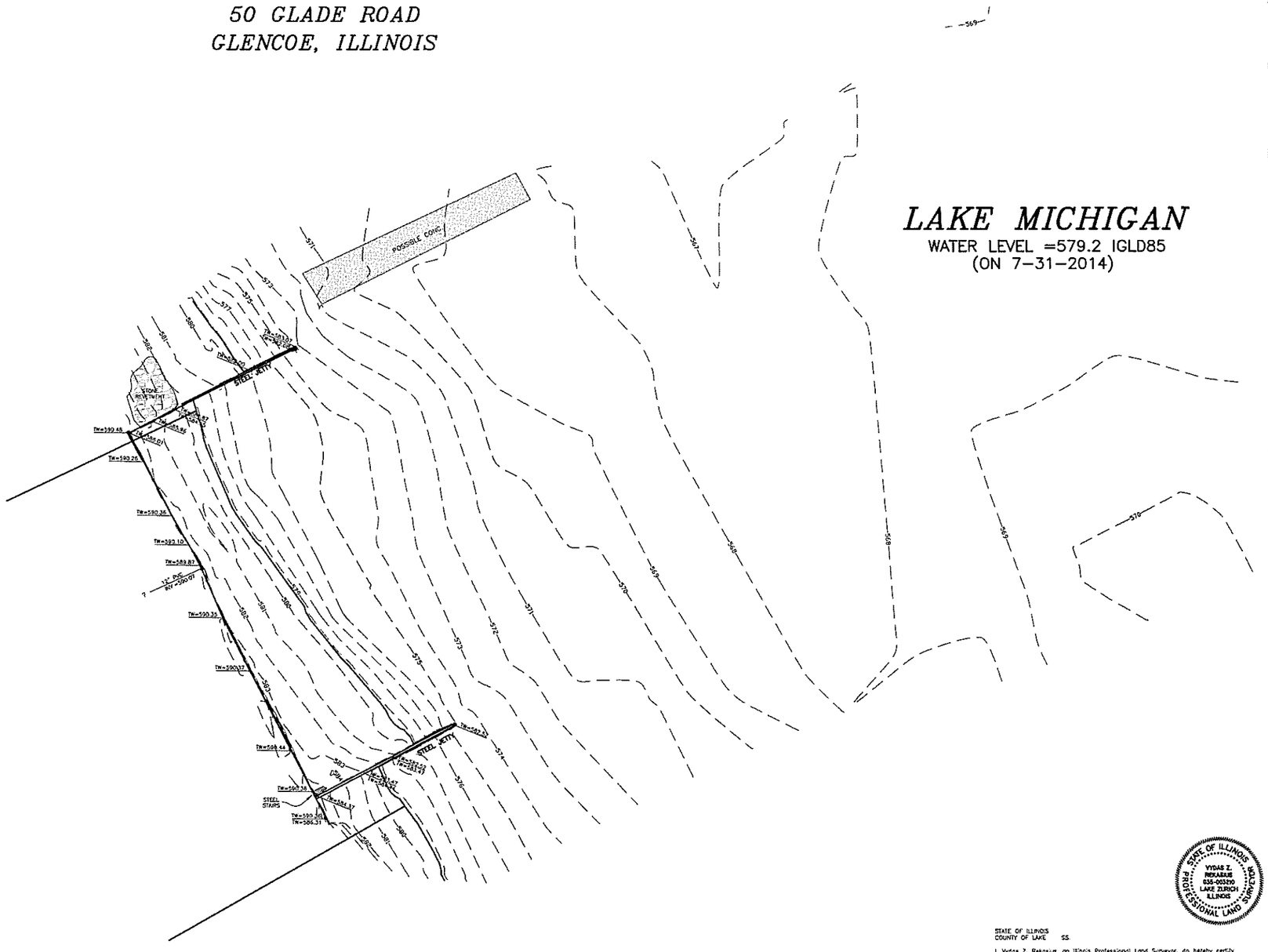
Shabica & Associates, Inc.
550 Frontage Rd., Suite 3735
Northfield, Illinois 60093
www.shabica.com

SIZE A | PLAN VIEW | REV

SHEET 1 OF 6

TOPOGRAPHIC / BATHYMETRIC SURVEY

50 GLADE ROAD
GLENCOE, ILLINOIS



NOTE:

1. Please check Legal Description with Deed and report any discrepancy immediately.
2. Compare all points before building by same and report any discrepancies at once.
3. Building lines, if any, shown hereon are building lines shown on the recorded subdivision plat or stated but in the title report
4. Consult local authorities for building lines established by local ordinances.
5. This professional service does not conform to the current Illinois minimum standards for a boundary survey.

STATE OF ILLINOIS
COUNTY OF LAKE SS.

I, Vydas Z. Rekasius, an Illinois Professional Land Surveyor, do hereby certify that I have surveyed the property described above and that the plat shown hereon is a correct representation of said survey.

DATED THIS 17th DAY OF AUGUST, A.D. 2014.

BY:_____

Illinois Professional Land Surveyor No. 3210
License Renewal Date : 11/30/2014
DESIGN FIRM NO. 184-004538 RENEWAL DATE: 4/30/2015

STATE OF ILLINOIS
VYDAS Z. REKASIUS
035-003210
LAKE ZURICH
ILLINOIS
PROFESSIONAL LAND SURVEYOR

TERRA TECHNOLOGY
LAND SURVEYING, INC.
24198 ROSE AVE. LAKE ZURICH, ILLINOIS 60047
PHONE: (847) 540-8606 E-MAIL: TTLS1@SBCGLOBAL.NET

JOB NO. : 14-0039 SURVEY DATE : 7/31/2014
DRAWING FILE : DATA/14/0039/SITE.DWG