PUBLIC NOTICE

In accordance with the Statutes of the State of Illinois and the Ordinances of the City of Highland Park, the next meeting of the Natural Resources Commission of the City of Highland Park is scheduled to be held at the hour of 6:30 p.m. on Wednesday, May 13, 2015 at the City of Highland Park City Hall, 1707 St. Johns Avenue, Highland Park, Illinois, during which it is anticipated there will be a discussion of the following:

CITY OF HIGHLAND PARK
NATURAL RESOURCES COMMISSION
WEDNESDAY, MAY 13, 2015
HIGHLAND PARK CITY HALL
1707 ST. JOHNS AVENUE
HIGHLAND PARK, ILLINOIS
6:30 P.M.

MEETING AGENDA

I. Call to Order

II. Roll Call

III. Approval of Minutes: March 11, 2015 and April 8, 2015

IV. Business from the Public

V. New Business

A. 55-57 Deere Park Drive – Consideration of a Beach Structure Permit for Regulated Activities in the Lake Michigan Protection Zone

B. Consideration of a Code Amendment to Chapter 150, Article VII of the City Code Amending Section 703.1(E)(5) "Procedure and Notice" for Beach Structure Permit Applications

C. Consideration of Amending the Leaf Blower Ban Dates

D. Recognition of Active Transportation Family Friendly Bikeways Partnership

VI. Old Business

A. Discussion on Participation in the Beach Clean-Up September Event

B. Status Report on Sustainability Code Review

VII. Other Business

A. Commissioner Comments
   a. Recycling Center Update

B. Administrative Items

VIII. Adjournment

Posted in City Hall on May 7, 2015

MINUTES OF A REGULAR MEETING OF
THE NATURAL RESOURCES COMMISSION OF THE CITY OF HIGHLAND PARK, ILLINOIS

MEETING DATE: March 11, 2015

MEETING LOCATION: Presession Conference Room, Highland Park City Hall, 1707 St. Johns Avenue, Highland Park, Illinois

CALL TO ORDER

At 6:31 p.m., Chairwoman Coyle called the meeting to order and the Staff Liaison called the roll.

ROLL CALL

Members Present: Coyle, Pagoria, Matthews, Hannick, Wagenius, Ross, Stone, Dotson, and Grill

Members Absent: Rheinstrom, Lewittes, and Theodosakis

The Chairwoman declared that there was a quorum of the Commission present.

Staff Present: Staff Liaison Karen Berardi

MINUTES

A. Regular Meeting of the Natural Resources Commission—December 10, 2014

Commissioner Matthews moved to approve the minutes of a regular meeting held on January 14, 2015. Commissioner Wagenius seconded the motion. On a voice vote, Chairwoman Coyle declared that the motion passed unanimously (6-0).

BUSINESS FROM THE PUBLIC

Joel Cahn, 26 Lakeview Terrace, objected to the January 14, 2015 meeting minutes as approved because he believes the minutes do not accurately report what occurred at the meeting. Mr. Cahn read a statement into the record. Chair Coyle noted that Mr. Cahn's statement will be attached to the meeting minutes.

NEW BUSINESS

A. Ravine Drive Beach Rock Garden Installation Project Overview
Park District Representative and Natural Areas Manager Rebecca Grill presented on the rock garden installation to be constructed at Ravine Drive Beach as designed by John Dalton and donated by Highland Park resident Marjie Ettlinger. The pebble harp that will be constructed as part of the project was also demonstrated. Chair

Coyle thanked the Ettlingers, Dalton and the Boy Scout Troop for their contributions.

B. Status Report on Sustainability Code Review

Grace Rink, the City's Sustainability Consultant, provided an update on the code review initiative that she and Primera are undertaking as part of the 2015 Sustainability Work Plan. The code review entails an evaluation of whether sustainable practices are either enabled or prohibited, specifically regarding alternative power, green infrastructure, bird-safe design and light pollution.

Rink stated that many of these practices are allowable by code and that this may provide an opportunity for educating City staff. Chair Coyle and Councilwoman Stone stated that City staff have been resistant to allowing rain barrels and other alternative methods of managing storm water and indicated there may be a misinterpretation of the code. Rink clarified that the code does indicate that any additional storm water overflow must be directed into a storm sewer, but that it does not prohibit rain barrels. Commissioner Hannick noted that the code should still be changed to address reevaluation of drainage after changes have been made to homes, regardless of whether there is a change to their footprints. Commissioner Pagoria and Councilwoman Stone concurred that the code should be clarified. Rink will take the feedback received to evaluate what changes can be made to clarify the code.

Rink confirmed the commission's interest in amending the building code to regulate bird friendly designs on multi-family and commercial buildings. Rink will provide recommended code amendments as a next step.

Rink stated that she will continue to look at wind turbines and solar panel installations and ensure these forms of alternative energy sources are permitted within the code. Rink also noted that the City's tree protection ordinances may limit the installation of some wind turbines or solar panels.

In regards to light pollution, Rink will begin recommending code amendments and will work with City staff to move recommendations forward. Vice Chair Ross stated that with a written directive to ComEd they could begin to replace street lights with LEDs and change one street or neighborhood at a time. Berardi will follow up with the ComEd Representative and report back to the commission.

C. Discussion on Electricity Aggregation 100% Green Power Program

Staff Liaison Berardi provided an overview of the City's Electricity Aggregation Program and provided an update on the current contract recommendation with Integrys. Berardi noted that an update was presented to City Council on March 9, 2015 and discussion led to renewable energy credits (RECs) and whether or not to include 100% RECs in the volume energy mix. Councilwoman Stone provided an overview of the Council discussion pertaining to the Green Power Program and the 100% REC consideration. Councilwoman Stone sought commission direction on providing a recommendation to Council regarding the 100% REC.

Commissioner Wagenius left the meeting at 7:45 p.m.

Chair Coyle stated that Highland Park brands itself as a leader in sustainability and supported sending a recommendation to City Council.

Commissioner Matthews moved to direct the Chair to write a letter on behalf of the commission in support of 100% RECs with a provision that residents can opt out. Vice Chair Ross seconded the motion. On a voice vote, Chairwoman Coyle declared that the motion passed unanimously (5-0).

OLD BUSINESS

A. Status Report on Environmental Movie Screenings

Councilwoman Stone presented on the City's Bike Month activities and suggested that the commission co-sponsor a series of short films on biking in conjunction with the Highland Park Bike Fair on May 16, 2015. The commission was supportive of showing a series of short films on biking in conjunction of the fair. It was noted that the Library Auditorium is available on May 17 from 2:00 p.m. – 4:00 p.m. but the commission supported the idea of coordinating the screening on the same day and time as the bike fair.

Additional future films were discussed including *Food Patriots* and *Wild Things*. Commissioner Hannick suggested coordination with the Come Alive Outside campaign for a *Wild Things* screening. Chair Coyle suggested that a spring 2016 showing of *Wild Things* should be coordinated.

Councilwoman Stone also suggested bringing a Great Lakes exhibit to the Highland Park Library. Park District Representative Grill suggested the exhibit could be done in conjunction with Beach Clean-up in September.

OTHER BUSINESS

A. Commissioner Comments

Vice Chair Ross stated that he has an interest in bringing in outside coastal engineers to provide education on coastal management in addition to staff. Commissioner Hannick and Chair Coyle agreed. Commissioner Matthews suggested the City retain an unbiased coastal engineer to review applications and provide their recommendations to staff and to the commission as part of the review process. Staff Liaison Berardi noted that professional services agreements may have to be bid and the fee resolution would have to be amended.

Commissioner Matthews left the meeting at 8:45 p.m.

The commission directed staff to invite an unbiased coastal engineer to the April 8th, 2015 meeting for education on hard coastal structures and erosion. City staff will still provide an overview of City code and the application process.

Staff Liaison Berardi reported on the fourth quarter clothing and textile results, and provided an update on the City's waste hauling agreements.

B. Administrative Items

There were no administrative items this evening.

ADJOURNMENT

Commissioner Hannick motioned to adjourn the meeting. Vice Chair Ross seconded the motion. Chairwoman Coyle adjourned the meeting at 8:56 p.m.

Respectfully Submitted,

Karen Berardi, Assistant to the City Manager

MINUTES APPROVED BY THE NATURAL RESOURCES COMMISSION ON _____

- WITH NO CORRECTIONS _____
- WITH CORRECTIONS _____
  (SEE MINUTES OF [_____] MEETING FOR CORRECTIONS

MINUTES OF A REGULAR MEETING OF
THE NATURAL RESOURCES COMMISSION OF THE CITY OF HIGHLAND PARK, ILLINOIS

MEETING DATE: April 8, 2015

MEETING LOCATION: Presession Conference Room, Highland Park City Hall, 1707 St. Johns Avenue, Highland Park, Illinois

CALL TO ORDER

At 6:31 p.m., Chairwoman Coyle called the meeting to order and the Staff Liaison called the roll.

ROLL CALL

Members Present: Coyle, Rheinstrom, Hannick, Wagenius, Pagoria (6:40 p.m.), Ross (7:10 p.m.), Stone, Lewittes, Dotson, and Theodosakis

Members Absent: Pagoria, Ross and Matthews

The Chairwoman declared that there was a quorum of the Commission present.

Staff Present: Staff Liaison Karen Berardi, City Planner Eric Olson

MINUTES

A. Regular Meeting of the Natural Resources Commission—March 11, 2015

Commissioner Wagenius abstained from the vote due to his absence at the March 11, 2015 meeting. Due to lack of quorum, Chair Coyle moved approval of the regular meeting minutes to the May 13, 2015 regular agenda.

BUSINESS FROM THE PUBLIC

There was no business from the public.

NEW BUSINESS

A. Presentation on the City's Steep Slope Zone and Lake Michigan Zone Regulations
City Planner Eric Olson provided an overview of the Steep Slope Zone and Lake Michigan Protection Zone regulations and provided an overview on the commission's role as a regulatory and recommending body.

Commissioner Pagoria joined the meeting at 6:40 p.m. via conference call.

Chair Coyle inquired on where the City's jurisdiction ends in the lake. Staff Liaison Berardi will confirm with Corporation Counsel.

City Planner Olson noted that the codes are grandfathered in the sense that residents who constructed in one of the zones prior to the ordinances' passage are not required to reconstruct on their property unless a new permit application is submitted.

Staff Liaison Berardi noted she will send the presentation to the commission electronically following the meeting.

B. 55-57 Deere Park Drive – Consideration of a Beach Structure Permit for Regulated Activities in the Lake Michigan Protection Zone

Staff Liaison Berardi provided an overview of the project. Commissioner Rheinstrom inquired what documents were necessary for commission approval. Berardi noted that the commission cannot approve Findings of Fact until all permits have been issued, including the one missing in this case from the Army Corps of Engineers. Councilwoman Stone noted that Findings of Fact can be drafted but held until the permit is issued from the Army Corps of Engineers.

Shabica Associate Stefanie Nagelbach presented on the project scope and provided an overview of beach structure and beach restoration standards. Nagelbach noted that there have been multiple opportunities for public comment which is required as part of the permitting process with state and federal regulators.

Vice Chair Ross joined the meeting at 7:10 p.m. via conference call.

Commissioner Hannick inquired how the sand for sandfill is being transported to the site. Nagelbach noted that the sand will be trucked to Waukegan, moved to a barge and then transported to the site.

Commissioner Hannick stated that she prefers more natural looking stones than the formed rock island shown in the drawings. Nagelbach noted that they do not have the ability to change the shape of the structures, but could change whether the stones would be flat or the stone type as long as the type is approved by the Army Corps. Shabica cannot change size or shape as governed by the permits approved with state and federal regulators. Nagelbach recommended that commission input could be given to applicants prior to permit submission to state and federal regulators.

Commissioner Hannick stated that if the project came to a pre-meeting, they could consider aesthetic changes in the design. Commissioner Rheinstrom noted his support of that idea going forward.

The Commission discussed the proposed improvements in light of the Beach Structure Permit Application standards and noted that the two projects would be beneficial to the area and met all of the standards except the final standard: that the Applicant has properly obtained any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure.

The Commission directed staff to draft Findings of Fact recommending City Council approval of the project, noting that the Findings of Fact will not be approved until all state and federal permits have been obtained by staff.

Staff Liaison Berardi noted that the staff-drafted Findings of Fact would be prepared for approval by the Commission at its next regular meeting following the submission of the Applicant's Army Corps of Engineers permit.

C. Discussion on Earth Day Activities

The Commission discussed the commission's role in potential Earth Day activities. Chair Coyle stated that the commission chose to take public education out of its purview in the 2015 work plan. Commissioner Rheinstrom agreed that the commission discussed this last year as part of the 2015 work plan.

Staff Liaison Berardi noted that the City will release several educational messages surrounding Earth Day through the City's communication channels. The commission supported the City's communication plan to focus on environmental messages in the month of April.

Commissioner Rheinstrom left the meeting at 8:15 p.m.

D. Discussion on Highland Park Community Gardens

The commission discussed the possibility of creating a community garden in Highland Park. Commissioner Pagoria volunteered to look into the idea and report back to the commission. The commission was in support of Commissioner Pagoria's initiative.

OLD BUSINESS

A. Status Report on Electricity Aggregation

Staff Liaison Berardi provided an update on the electricity aggregation rate lock process and announced that the City Council had approved an agreement with Integrys Energy Services with a rate including 100% renewable energy credits.

OTHER BUSINESS

A. Commissioner Comments

Vice Chair Ross recommended that a pre-consultation with the commission be mandatory as part of the beach structure application process, and amend the code accordingly. Ross noted that the code should define long-term maintenance plan as more than five years. He recommended that the project be added to next year's work plan.

Chair Coyle recommended that the historical non-conforming aspect of the code should also be examined. Vice Chair Ross suggested to add to next year's work plan.

Commissioner Wagenius stated that he is beginning to work with staff on the waste hauling agreement and negotiations. He suggested that the commissioners assigned to projects with staff should be included earlier in the process and as the Request for

Proposals is developed.

Student Representative Lewittes raised a question regarding liability of damage as of a result of natural occurrences on any beach structure or steep slope application. The commission agreed that the question should be raised with the applicant at the June 10, 2015 meeting. Commissioner Hannick suggested that the applicant provide a bond to the City to cover liability. Councilwoman Stone recommended that liability be considered when examining the application code as part of the 2015 work plan.

Councilwoman Stone announced the Community Bike Fair that is scheduled for May 16 from 10:00 a.m. to 12:00 p.m. as well as the Go Green Highland Park event on May 2 at the City's Recycling Center.

Staff Liaison Berardi reported on the coastal engineer workshop which will be scheduled for the June 10 commission meeting.

Chair Coyle requested that an update on the Recycling Center be provided at the next meeting.

B. Administrative Items

There were no administrative items this evening.

ADJOURNMENT

Commissioner Wagenius motioned to adjourn the meeting. Vice Chair Ross seconded the motion. Chairwoman Coyle adjourned the meeting at 8:56 p.m.

Respectfully Submitted,

Karen Berardi, Assistant to the City Manager

MINUTES APPROVED BY THE NATURAL RESOURCES COMMISSION ON _____

- WITH NO CORRECTIONS _____
- WITH CORRECTIONS _____
  (SEE MINUTES OF [_____] MEETING FOR CORRECTIONS

Memorandum

To: Members of the Natural Resources Commission

From: Karen Berardi, Assistant to the City Manager

Date: May 8, 2015

Re: Agenda Items for the May 13th Meeting of the Natural Resources Commission

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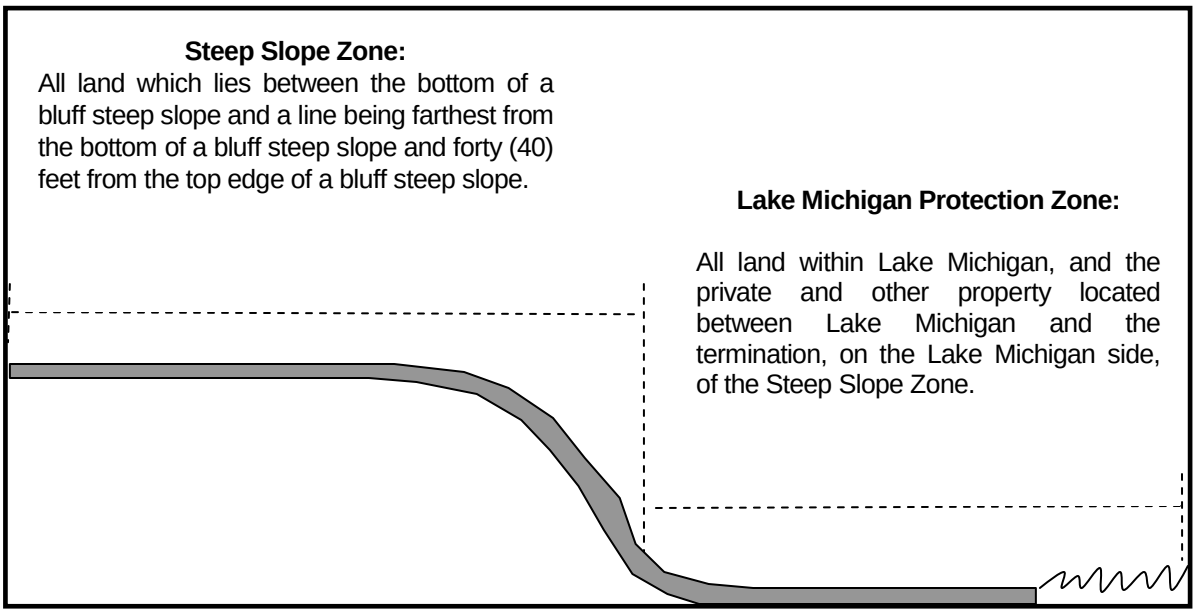
NEW BUSINESS:

A. 55 – 57 Deere Park Drive – Consideration of a Beach Structure Permit for Regulated Activities in the Lake Michigan Protection Zone

The applicants, Jerry Senser and Mark Gerstein, are requesting a Beach Structure Permit for regulated activities within the City's designated "Lake Michigan Protection Zone" at 55-57 S. Deere Park Drive. A diagram illustrating this zone designation follows on the next page.

The proposed activities on 55 S. Deere Park Drive consist of the construction of a 30' long quarrystone breakwater spur and sandfill. The proposed activities on 57 S. Deere Park Drive consist of the construction of a 60' long quarrystone breakwater spur, quarrystone breakwater toe protection, short breakwater spur near the north property line and sandfill. This proposed improvement will augment the existing breakwater previously permitted and constructed in 2009. According to the applicants, "the proposed project is designed to reduce the gap between breakwater helping sand to stay in the bay beach system, reducing lakebed downcutting and wave impacts on the revetment." On April 24, 2015, the applicant notified the City of a modification to the original plan for 57 S. Deere Park and provided additional documentation for this modification. The modification adds a cross section for a revetment on 57 S. Deere Park Drive.



Required Agency Reviews

The applicant has submitted permit applications required from the U.S. Army Corps of Engineers, the Illinois Environmental Protection Agency, and the Illinois Department of Natural Resources, as required by the Beach Structure Application regulations. The IDNR has previously issued their permit, whereas the IEPA and U.S. Army Corps of Engineers are still nearing their approval for the proposed work. However, due to the modification of the project submitted April 24, 2015, the agencies have been notified and an amended permit will be issued from all respective agencies. As of May 8, 2015, none of these amended permits have been issued to the applicants.

Engineering Division Review

The Engineering Division reviewed the original application materials and submitted the attached memorandum, dated March 31, 2015, and found that the report should be revised so that each statement in response to the required information is supported with a detailed explanation. The applicant, in turn, provided a response dated April 6, 2015. Following notice of the project modification, the Engineering Division reviewed the modified plan and submitted the attached memorandum, dated May 5, 2015. Upon completion of the project, the applicant's consultant will be responsible for certifying that all of the work has been completed in accordance with the approved plan and project specifications.

Forestry Division Review

The City Forester has not reviewed the application materials. A tree survey was not prepared or submitted by the applicant as the bluff and tableland will not be impacted by the construction. All materials and equipment will be delivered to and removed from the site via barge on Lake Michigan.

Beach Structure Ordinance Policy & Standards

The Beach Structure Ordinance regulates and requires permits for all activity in the City's "Lake Michigan Protection Zone," an area comprised of all land between Lake Michigan and the toe of the bluff. Per Section 150.703.1(E)(5(a), **the Commission is being asked to consider the proposed Beach Structure Permit under the following standards as well as the modified project plan and consider a draft Findings of Fact for future Commission approval and City Council determination.** Please note that within the attached cover memo, the applicant addresses these standards.

Standards:

No permit for a Regulated Activity in the Lake Michigan Protection Zone shall be approved unless all of the following standards have been met or satisfied:

(a) The proposed Regulated Activity and/or Structure shall not unreasonably impede access to or pedestrian movement along the beach or to Lake Michigan;

(b) The proposed Regulated Activity and/or Structure shall not unnecessarily impede navigability within Lake Michigan;

(c) The proposed Regulated Activity and/or Structure shall not unreasonably impact the Subject Property or the Adjacent Properties;

(d) The Applicant has proposed appropriate long-term maintenance requirements and plans, as necessary, for the proposed Regulated Activity and/or Structure;

(e) The proposed means and methods of undertaking the Regulated Activity and/or Structure are consistent with appropriate design and aesthetics principles;

(f) The proposed Regulated Activity and/or Structure shall not create new nor amplify existing erosion problems on the Subject Property and on Adjacent Properties;

(g) The proposed Regulated Activity and/or Structure shall be for the purposes of erosion control, water gathering, and/or public access only;

(h) There will not be an unnecessary adverse environmental or ecological impact on the Subject Property or on any of the Adjacent Properties as a result of the proposed Structure and/or the Regulated Activity;

(i) The proposed Structure and/or the Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose of the Structure; and

(j) The Applicant has properly obtained any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure.

Feel free to contact Karen Berardi for any questions regarding this matter, or to further discuss the Beach Structure Ordinance prior to the meeting. Per the Commission's direction, a brief presentation will be prepared summarizing the proposed project. The above list of Beach Structure Ordinance standards will also be available on the table for the Commission's reference and discussion.

B. Consideration of a Code Amendment to Chapter 150, Article VII of the City Code Amending Section 703.1(E)(5) "Procedure and Notice" for Beach Structure Permit Applications

At its April meeting, the commission expressed interest in amending Chapter 150, Article VII of the City Code in order to modify the procedure for applicants. Staff Liaison Berardi will present on what changes will be necessary in order to amend the procedure. Below are recommended code edits to Section 703.1(E)(5) "Procedure and Notice".

"(5) Procedure and Notice

(a) Pre-Application Meeting.

(i) Prior to submission of a Permit Application pursuant to Subsection (E)(4) of this Section, the Applicant shall request, in writing to the Chairman of the Commission and to the Director of Public Works, a Pre-Application Meeting, and shall submit payment of a Pre-Application Review fee, in the amount set forth in the City's Annual Fee Resolution. The Pre-Application Review shall/may take place prior to submission of any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure. (Ord. 28-10, J. 36, p. 105-109, passed 3/22/10)

(ii) Within 45 days following receipt of the written request of the Pre-Application Meeting, the Commission shall hold a Pre-Application Meeting with the Applicant, at which time the Commission may make any recommendations or requests for additional documentation and information to be included in the Permit Application."

These changes will allow applicants who must seek federal and state permitting approval to come before the Natural Resources Commission first as a pre-application meeting to present on the proposed plan. This would allow the commission to recommend adjustments to the plan before the applicants submit applications with state and federal regulators.

C. Consideration of Amending the Gas Leaf Blower Ban Dates

It has been brought to the City Council's and City Manager's attention that the City's gas leaf blower ban may not coincide appropriately with seasonal plant trends and that the ban length

should be shortened. As the Natural Resources Commission (formerly Environmental Commission) has done in the past, the City Manager's Office has directed this matter to the Natural Resources Commission for their recommendation to City Council.

Background:
In 1992, the City Council directed the Environmental Commission (EC), which has since merged with the Lakefront Commission to form the Natural Resources Commission (NRC), to develop a recommendation on banning gas leaf blowers. The EC vetted the issue and recommended that City Council ban the use of backpack-mounted leaf blowers from June 15 through October 1. The ordinance, as recommended, was approved on July 13, 1992.

In 1999, the City Council directed the EC to yet again make a recommendation on an amendment to the existing ordinance which amended the ban dates to May 15 to October 1. After consideration, the EC recommended that the ban dates be expanded from May 15 to October 1. On July 26, 1999, the City Council approved the EC's recommendation and the leaf blower ban was approved for the duration of May 15 to October 1.

The City's leaf blower ordinance is found in Chapter 95 "Nuisances" in Section 95.001 to which is states: "It is hereby declared to be a public nuisance for any person, firm, corporation or association to do, suffer or permit, any of the following: …(9) Any leaf blower type of machine other than one that is electrically powered used between May 15 and October 1 of each year, except that this restriction shall not apply to golf course maintenance operations and backpack-mounted or hand-held other than electrically-powered leaf blower type of machines used during roof gutter and downspout cleaning operations between October 1 and the following June 15. (Ord. 21-92, J. 19, p. 080-082, passed 7/13/92; Ord. 50-99, J. 25, pp. 129-133, passed 5/10/99; Ord. 70-99, J. 25, p. 310, passed 7/26/99 effective January 1, 2000)."

Under Penalty, the following is included in the City Code: "(B) Whoever suffers or permits a nuisance as specified in Subsection (O)(9) of Section 95.001, regarding the operation of gasoline powered leaf blower type of machines, to exist or continue upon property owned or occupied by him within the City shall be fined not less than $200 nor more than $500 for each offense. (Ord. 218, J. 4, p. 218, passed 8/28/44; Ord. 2C-64, J. 5, p. 809, passed 1/27/64; Ord. 21-92, J. 19, p. 080-082, passed 7/13/92; Ord. 32-97, J. 24, p. , passed 6/9/97; Ord. 25-10, J. 36, p. 052-058, passed 3/8/10)"

Neighboring Communities:
There are three nearby communities with similar bans on the use of backpack-mounted leaf blowers: Winnetka, Wilmette and Evanston. Their ban dates are listed below:

Municipality	**Dates of Ban**
Winnetka	June 1 – October 1
Wilmette	May 15 – September 30
Evanston	December 15 – March 30 & May 15 – September 30
Highland Park	May 15 – October 1

Based on the comparisons above, Highland Park falls somewhat in the middle: equal to Wilmette, more restrictive than Winnetka and less restrictive than Evanston.

Recommendation
It has been brought to the Council's attention that the ban dates may not coincide with seasonal plant trends and that the leaf blower ban dates should be shortened to June 15 – October 1 from its current dates of May 15 – October 1. It is recommended that the Natural Resources Commission consider the matter and further, make a recommendation to the City Council for their consideration.

D. Recognition of Active Transportation Family Friendly Bikeways Partnership

On April 27, 2015 Active Transportation published a blog article on its website (http://activetrans.org/blog/highland-park-first-family-friendly-bikeways-community) highlighting Highland Park as the first community to collaborate with Active Transportation Alliance on their campaign to build networks of bikeways that are comfortable places for all ages and abilities.

OLD BUSINESS:

A. Discussion on Participation in the Beach Clean-Up September Event

Chair Coyle will lead a discussion on the commission's participation in the September Beach Clean-Up Event. More information on the Alliance for Great Lakes' Adopt-A-Beach can be found here: www.greatlakes.org/adoptabeach.

B. Status Update on Sustainability Code Review

Staff Liaison Berardi will provide an update on the sustainability code review, specifically in regards to light pollution and bird friendly building design.

ATTACHMENTS:

- 55 S. Deere Park Drive Beach Structure Application
- 57 S. Deere Park Drive Beach Structure Application
- 57 S. Deere Park Drive Modification
- 55-57 S. Deere Park Drive Engineering Division Memorandums

Shoreline Stabilization at
55 S. Deere Park Drive
Highland Park

Submittal to
Community Development Department
March 4, 2015

Prepared By:

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We Build Beaches
550 Frontage Road, Suite 3735
Northfield, Illinois 60093
Tel. 847-446-1436
Fax 847-716-200

Shabica & Associates, Inc.
WE BUILD BEACHES

Eric Olson
City of Highland Park
Community Development Department
1150 Half Day Road
Highland Park, Illinois 60035

Dear Mr. Olson: March 4, 2015

Attached please find a submittal to the City of Highland Park's Community Development Department for a Shoreline Stabilization project at the property of Jerrold and Naomi Senser at 55 S. Deere Park Drive, Highland Park. Proposed work includes construction of a short quarrystone breakwater spur and sandfill as required for this work. This submittal includes required documents for review and approval by the Natural Resources Commission and City Council.

This project was submitted to the state and federal regulators in October 2014 and is under final review. All Federal and State permits have gone through the public notice stage. The IDNR has issued the permit. The IEPA and US Army Corps of Engineers are nearing approval for the proposed work (see Appendix).

The property at 55 S. Deere Park Drive has existing shore protection in the form of a breakwater protected beach at the south end of the property with a quarrystone revetment at the north end. This shore protection was the first beach system to be permitted by the IDNR after the 2 ½ year moratorium on structures extending on the bed of Lake Michigan lifted January 2008. As this was the first project reviewed, the scope was kept at a minimum, see article entitled, *Beach project a model in many ways*. The sand at the north end of the property has eroded over the years and with the lake level rising after a long period of low lake levels, the lakebed has been downcut causing deeper water and larger waves impacting the revetment. The proposed project is designed to reduce the gap between breakwaters, helping sand to stay in the bay beach system, reducing lakebed downcutting and wave impacts on the revetment.

The City's Standards for Review, as outlined in the "Lake Michigan Protection Regulations" from Section 150.703.1 *Special Regulations for the LFOZ Lakefront Density and Character Overlay Zone*, are outlined below with our responses following:

a. The proposed Regulated Activity and/or Structure shall not unreasonably impede access to or pedestrian movement along the beach or to Lake Michigan.

This project will not impede pedestrian access or movement along the beach or to Lake Michigan.

b. The proposed Regulated Activity and/or Structure shall not unnecessarily impede navigability within Lake Michigan

As the breakwaters will not extend further east than other existing structures, the proposed project will not have any impact on the navigability of Lake Michigan.

c. The proposed Regulated Activity and/or Structure shall not unreasonably impact the Subject Property or the Adjacent Properties

The project will protect the Subject Property from shoreline erosion, and the sandfill, as required by the IDNR will assure that the project will not negatively impact the adjacent properties.

d. The Applicant has proposed appropriate long-term maintenance requirements and plans, as necessary, for the proposed Regulated Activity and/or Structure

The project has a long-term maintenance plan. Monitoring of the project is also required for 5 years post construction by the IDNR.

e. The proposed means and methods of undertaking the Regulated Activity and/or Structure are consistent with appropriate design and aesthetics principles

The means and methods of construction are consistent with design and aesthetics; all work will be completed via marine mobilization. A similar structure has been constructed on the south side of the property.

f. The proposed Regulated Activity and/or Structure shall not create new nor amplify existing erosion problems on the Subject Property and on Adjacent Properties

The project will prevent future bluff erosion on the subject property, and will not affect adjacent properties. As the construction will be completed via marine access, the bluff will not be disturbed.

g. The proposed Regulated Activity and/or Structure shall be for the purposes of erosion control, water gathering, and/or public access only

The proposed shore protection will reduce and/or prevent future sand loss and bluff erosion on the subject property and allow access to the beach from the tableland.

h. There will not be an unnecessary adverse environmental or ecological impact on the Subject Property or on any of the Adjacent Properties as a result of the proposed Structure and/or the Regulated Activity

The proposed structure will not cause unnecessary adverse environmental or ecological impact. The quarrystone breakwater provides improved habitat for fish. Sand acts as a natural filter for stormwater runoff.

i. The proposed Structure and/or Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose of the Structure

The proposed system is a viable, environmentally-correct means of achieving the stated purpose.

j. The Applicant has properly obtained any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure

All Federal, State and County permits are under review and nearing issuance. The state and federal permit application is attached. All permits will be issued prior to any work commencing.

A Permit Application has been filed with the Department of Public Works for the proposed project. In conformance to the City's Application Guidelines, the following documents and information are included:

i. A statement of the purpose and planning objectives to be achieved by the proposed Regulated Activity

The proposed breakwater-protected pocket beach system will help protect the north half of the property during average to high lake levels. The proposed system will move the locus of wave action further offshore where lakebed downcutting will be reduced.

ii. A plat of survey of the Subject Property

A Plat of Survey is attached as well as a recent hydrographic survey showing the entire work area. A tree survey has not been prepared as the bluff and tableland will not be impacted by the construction. All access will be via barge on Lake Michigan.

iii. A conceptual plan showing the Subject Property and the Adjacent Properties, including any and all existing Structures in the portion of the Lake Michigan Protection Zone abutting those properties

A Plan View is attached.

iv. Development and site plans showing the proposed Structure, if applicable

Same as Conceptual Plan in Item iii

v. A demolition plan, if applicable

N/A

vi. An elevation plan, which shall include sectional views of the proposed Structure, if applicable

Cross-sectional drawings are attached.

vii. Copies of any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure

Federal and State permits are attached.

viii. Engineering details of the proposed Structure and/or the Regulated Activity, which shall include, if applicable:

A. Structure height: N/A, see Coastal Engineering Report in the cover letter to the state and federal regulators and plans in the Appendix
Structure Length: System extends about 112' lakeward from the seawall
Structure Width: N/A, see plans

B. The spacing between the proposed Structure and other Structures in the Lake Michigan Protection Zone abutting any of the Adjacent Properties

No spacing is applicable.

C. The materials of which the proposed Structure will be composed

The breakwater will be quarried quartzite. Sand will be placed as required by the IDNR as beach fill.

ix. A geo-technical investigation report of the site

As there will be no major earthmoving or structures built on the bluff slope, this project does not require a geotechnical investigation.

x. A statement outlining structure success in various water levels

The breakwater is designed to function during varying lake levels.

xi. A statement describing the long-term maintenance requirements and plan for the proposed Structure

The proposed structure has a 20-year design-life, and the stone that will be used will last thousands of years. Periodic maintenance is recommended as necessary based on biannual visual inspections. Typically, at the time of recommended maintenance, additional stone will be brought in and placed over the existing revetment to bring it back to the original specification.

xii. A written description of the proposed means and methods of undertaking the Regulated Activity

All materials and equipment will be delivered to and removed from the site via barge on Lake Michigan. The beach work will be completed using a backhoe and crane as needed.

xiii. An explanation, in narrative form, of the following:

A. Any and all erosion problems on the Subject Property for which the Structure and/or Regulated Activity is designed to correct or remedy

This system is designed to protect the Subject Property from future sand loss, lakebed downcutting and bluff erosion due to stormwave damage.

B. The environmental and ecological impact on the Property and the Adjacent Properties that are expected to result from the Structure and/or Regulated Activity

The environmental impact of this project is that the stormwater will be filtered by the beach. This will reduce sediment and non-point source pollution from flowing into Lake Michigan.

C. How the proposed Structure and/or Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose

The design of this system is minimally intrusive to the environment. The project design mimics mother nature by creating a rocky headland to create a calm bay where wave energy is reduced and sand can remain to provide shore protection.

D. The nature and composition of existing protections, including existing Structures, of the shoreline in that portion of the Lake Michigan Protection Zone abutting either the Subject Property or the Adjacent Properties, and the impact and effectiveness of those protections on the shoreline, the lakebed, and on erosion of the Subject Property and Adjacent Properties

The existing form of shore protection at the Subject Property is a quarrystone breakwater at the south property line and a steel groin at the north property line. A quarrystone revetment has been placed along the existing bluff toe. Sand has eroded severely from the north half of the current system due to increased lake water levels and extreme storms.

xiv. A non-refundable application fee, in the amount set forth in the City's Annual Fee Resolution

The application fee is attached.

An Appendix of attachments is included with this letter.

This information addresses the application requirements for submission. Please let us know if you require any further information.

Sincerely,

Jon Shabica
Vice President

Appendix

A PIONEER PRESS PUBLICATION • HP www.pioneerlocal.com news I 5

FIRST TO BE OK'D BY LAKEFRONT COMMISSOIN

Beach project a model in many ways

By CHARLES BERMAN
cberman@pioneerlocal.com

An exciting scene stretched deep over the Lake Michigan shoreline Nov. 20 as crews put the final touches on the gold standard of beach-restoration projects.

Cranes reached over the side of a barge and dropped tons of sand and stone onto a newly constructed private, residential beach on the southeast corner of Highland Park.

Shabica and Associates, a Northfield-based shoreline protection firm, designed the project to correct years of damage caused by erosion and to withstand years of natural destruction.

Jon Shabica, the firm's vice president, said what once was up to 50-feet of sandy beach was reduced to less than half its previous size during the last two years.

"There was very little natural sand left and the beaches were deteriorating to just cobble and lakebed clay," Shabica said.

Shabica said once sand disappears and lake-bed clay begins to erode, the natural process is unable to repair itself, resulting in larger waves and additional destruction to the bluffs and beaches.

So quarry stone breakwater stones were installed, a concrete pier was removed, a new curbstone groin was constructed with steps built into it, which extended into the lake. A limestone revetment was added, new sand was deposited, the beach was regraded and a dune grass system was installed.

That type of complete restoration project can cost between $400,000 and $1 million depending on finishes, the size of the property and the level of damage, Shabica said.

"My guess is that like the ravines, the amount of (property) loss we've seen has come more toward the end of the season and we typically see healthier beaches before winter," Shabica said. "So we might see some panicked people in the spring.

"We want to prevent any negative impact from the construction onto neighbors. The lake is constantly moving and shifting sand; we want to make sure nothing impedes its flow."

Barbara Cates

"This really hasn't been a good summer weather wise," he continued. "We think it has to do with the rising lake. It's up 1 foot, 3 inches since January."

The project also proved noteworthy because it was the first to go through the Highland Park Lakefront Commission's new process and the first state project to be completed since the Illinois Department of Natural Resources put a moratorium on all private coastal engineering projects.

"The city recognizes that the lakefront is a defining element of the city's character," said Barbara Cates, city planner and staff liaison to the Lakefront Commission. "We want to promote activities on the beach in the most ecological manner possible, so we established a process of approvals at the Lakefront Commission.

"There are a lot of natural processes going on at the lakefront."

Cates said the most important aspect of the city's new guidelines is the requirement for a resident to obtain all necessary state and county permits before the commission would make a recommendation to the city council.

"The (homeowners) were required to get six approvals before we considered this," Cates said. "We want to prevent any negative impact from the construction onto neighbors. The lake is constantly moving and shifting sand; we want to make sure nothing impedes its flow."

City Engineer John Welch said the work on South Deere Park Drive was a model project.

"We aren't saying people have to do this system," he said. "This is the Bentley of improvements that can be done on the lake shore. Their situation was probably worse than (most other situations) to begin with."

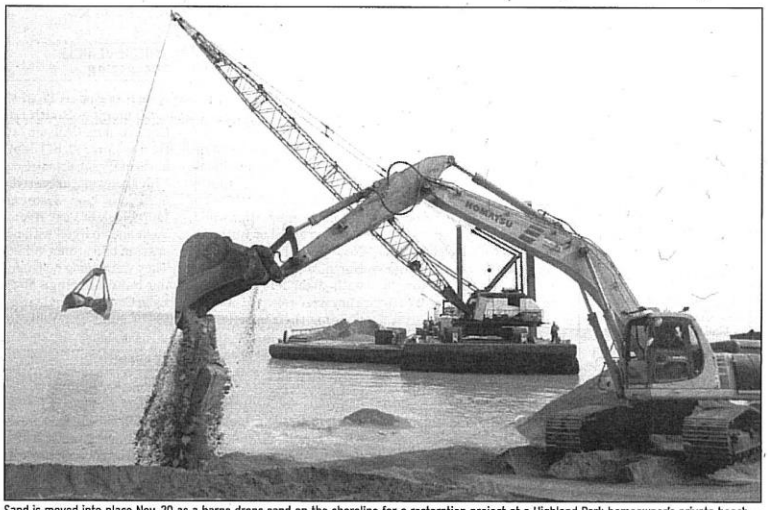
Welch recommends that residents employ a shoreline expert and take preventative measures to maintain their property, as it is cheaper to repair problems that are found earlier.

Cates said the Lakefront Commission found that this project will retain sand, prevent erosion and ultimately protect the shoreline in that area. The commission is also using this project as an education tool.

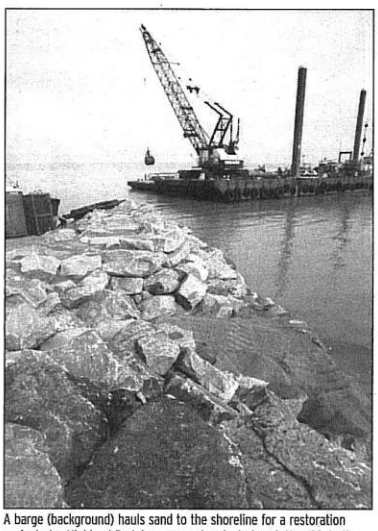
In the city's conditional approval, the homeowners were required to provide updated reviews of the improvements at its one-year and five-year anniversaries. The site was also extensively photographed before, during and after project was completed. Ongoing inspections and supervision of the project was required as well.

"It's a good learning process for the commission," Cates said. "We were making sure what they proposed, in the end, is what is being installed."

"These were vast improvements," Cates continued. "It's striking how much has changed. It looks very natural.

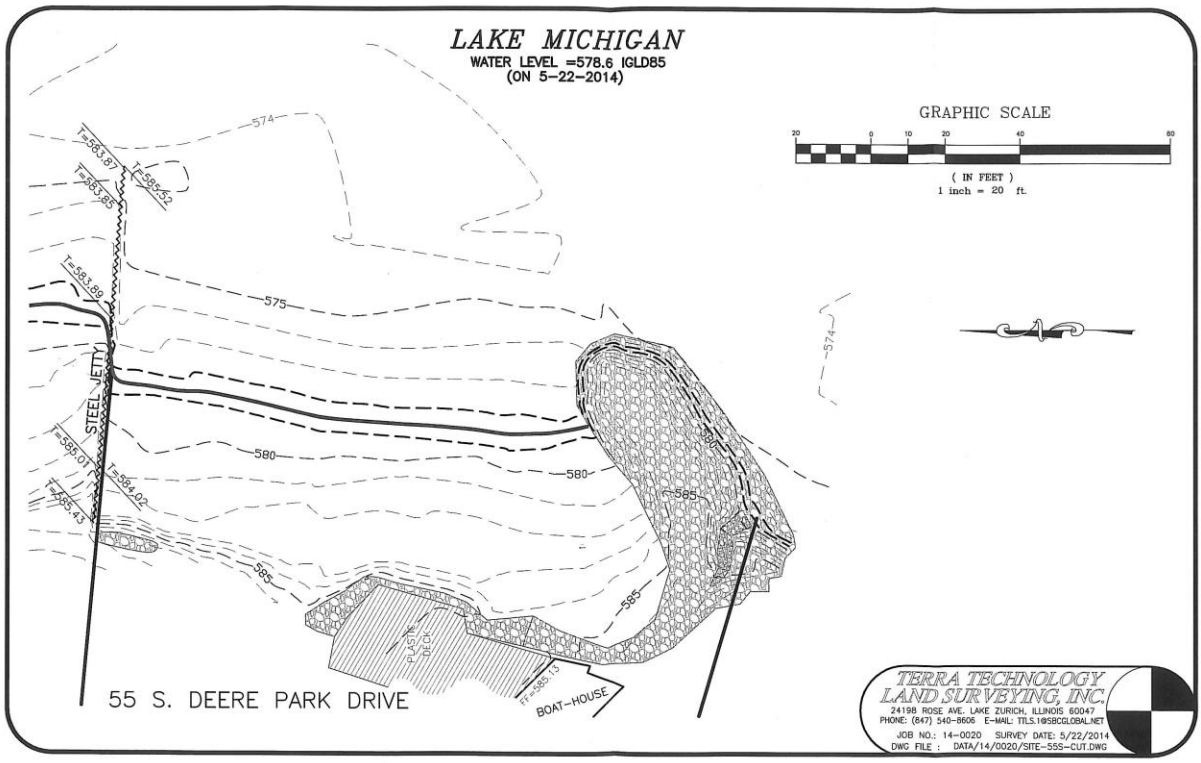


Sand is moved into place Nov. 20 as a barge drops sand on the shoreline for a restoration project at a Highland Park homeowner's private beach. The barge was dropping off tons of sand to replenish the sand bank of the beach, which has been deteriorating because of higher lake-water levels. (Buzz Orr/Staff Photographer)

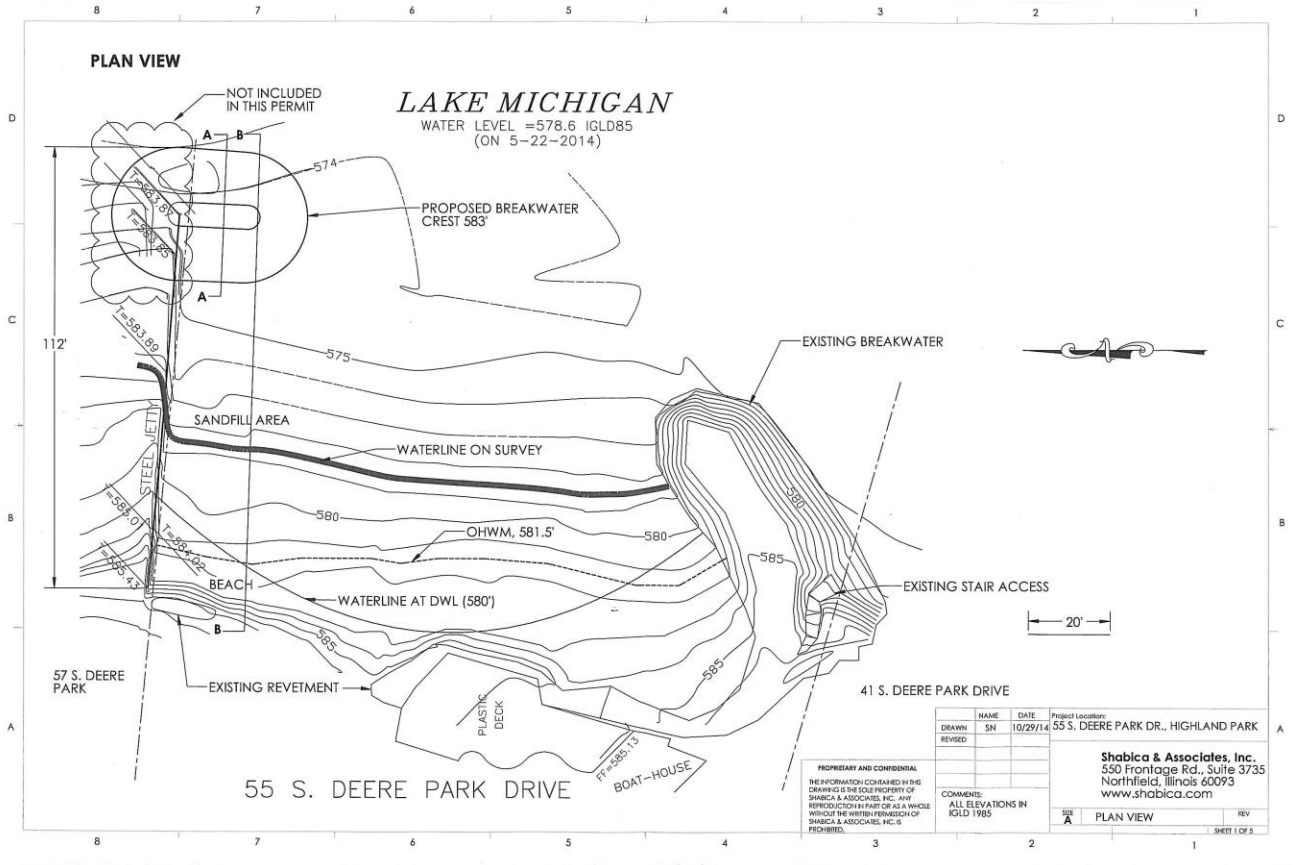


A barge (background) hauls sand to the shoreline for a restoration project at a Highland Park homeowner's private beach Nov. 20. In the foreground is a human-made stone breakwater that acts as an arm for an engineered beach. (Buzz Orr/Staff Photographer)

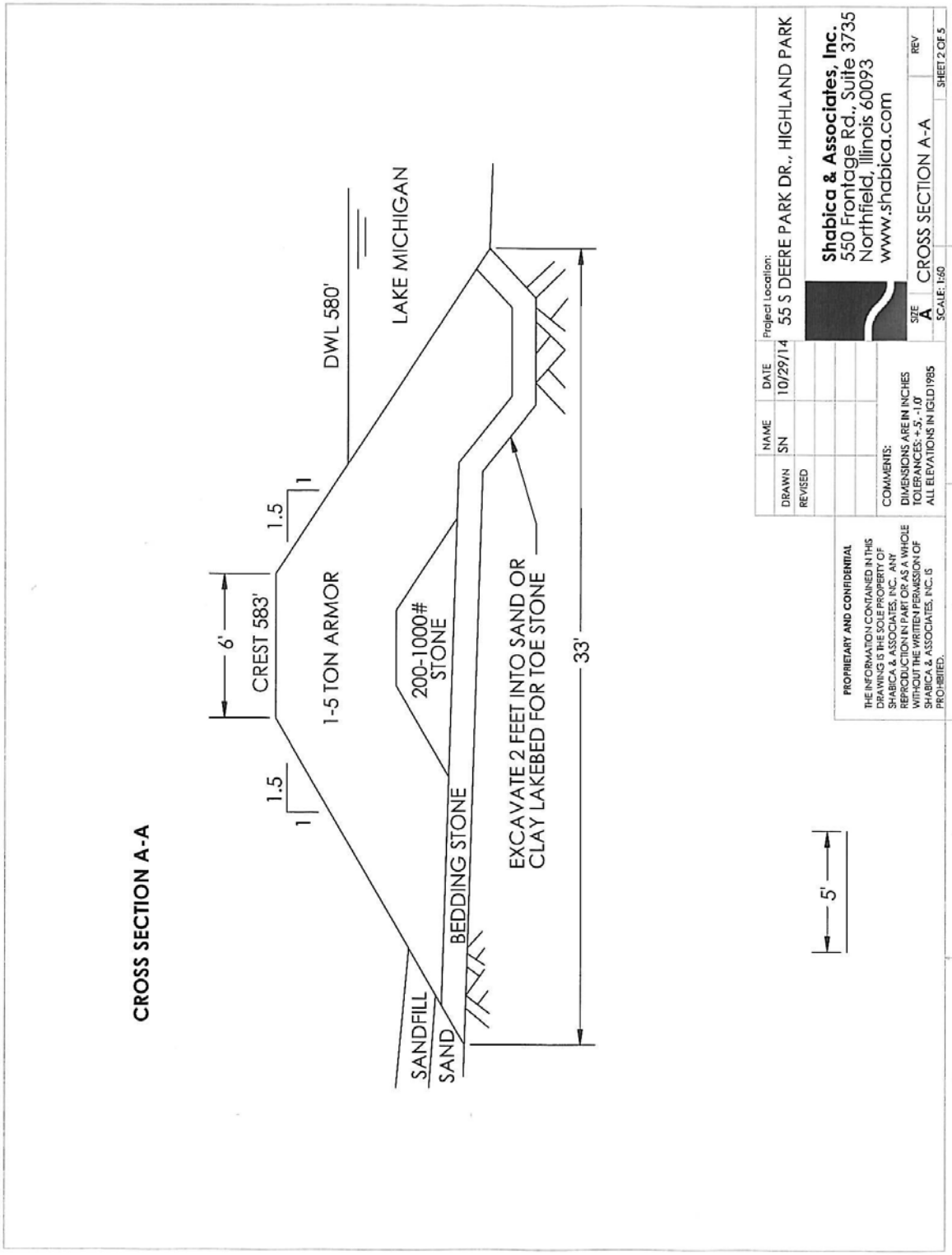
Hydrographic Survey



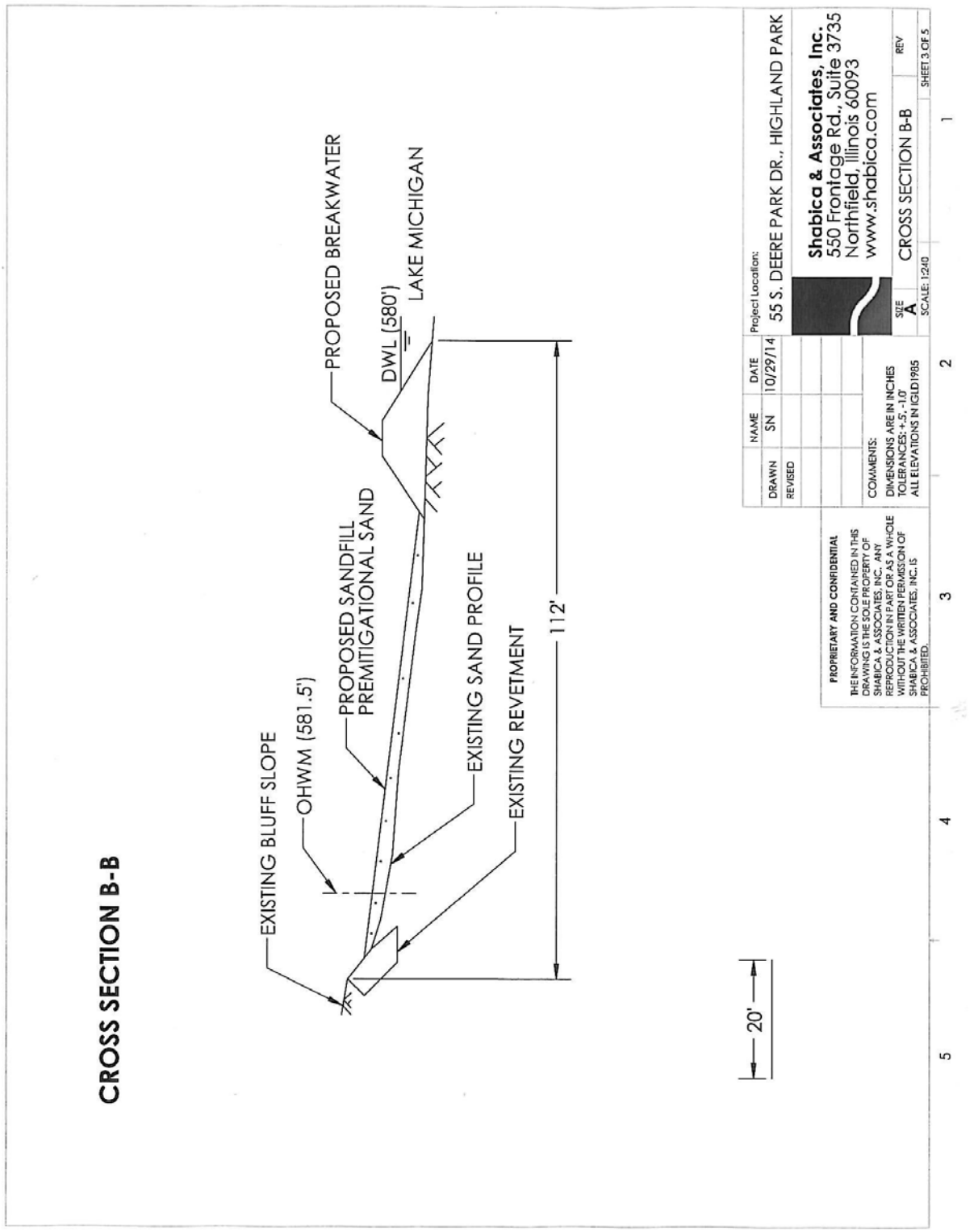
Permit Drawings



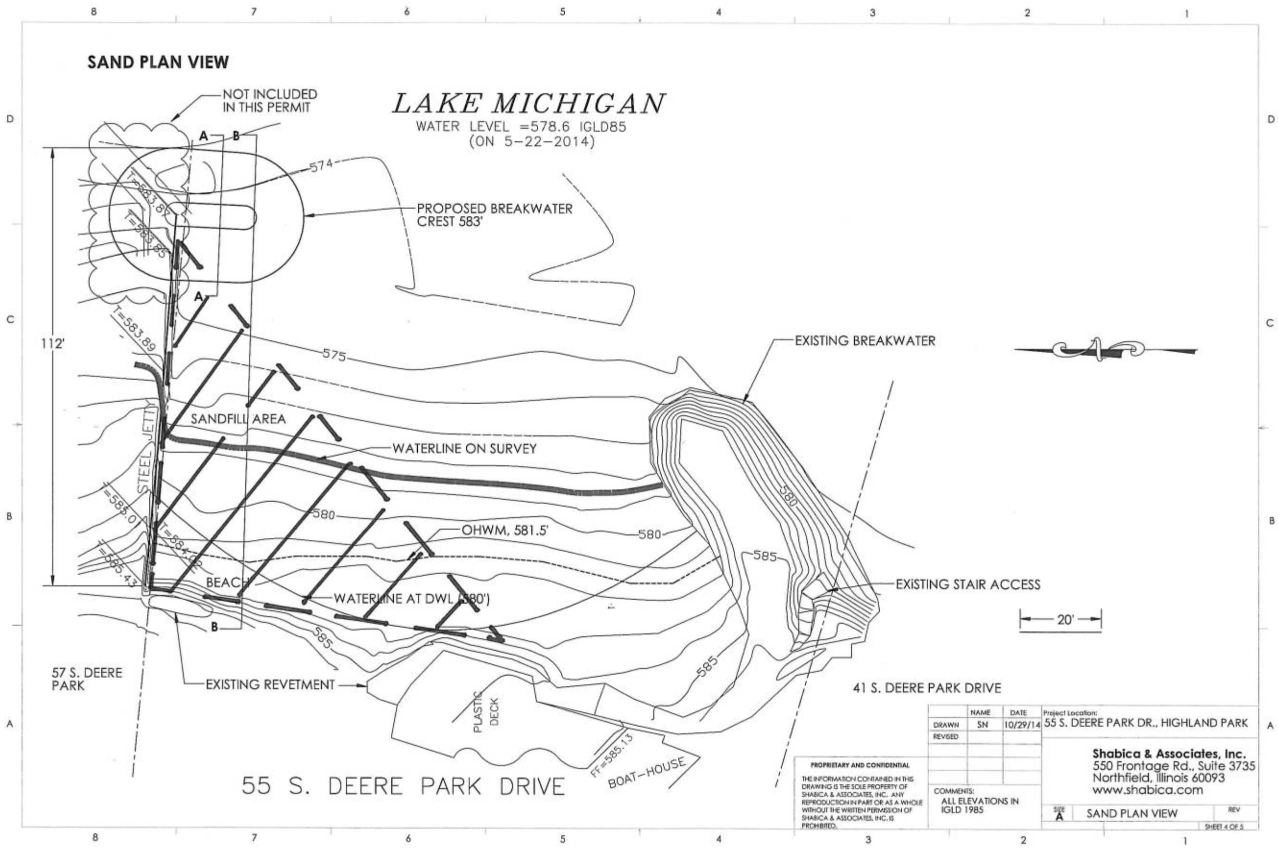
Permit Drawings (cont.)



Permit Drawings (cont.)



Permit Drawings (cont.)


SAND PLAN VIEW
LAKE MICHIGAN
WATER LEVEL =578.6 IGLD85
(ON 5-22-2014)
NOT INCLUDED IN THIS PERMIT
PROPOSED BREAKWATER CREST 583'
EXISTING BREAKWATER
SANDFILL AREA
WATERLINE ON SURVEY
STEEL JETTY
OHWM, 581.5'
WATERLINE AT DWL (580')
BEACH
EXISTING STAIR ACCESS
20'
112'
57 S. DEERE PARK
EXISTING REVETMENT
41 S. DEERE PARK DRIVE
PLASTIC DECK
BOAT-HOUSE
FF=585.13
55 S. DEERE PARK DRIVE
DRAWN SN 10/29/14
55 S. DEERE PARK DR., HIGHLAND PARK
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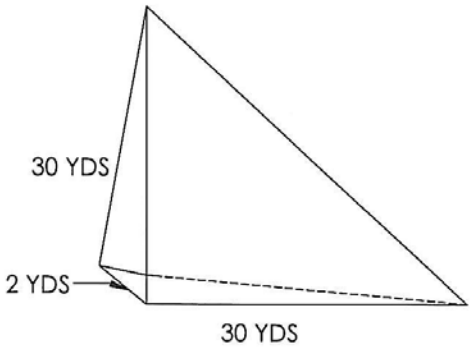
Northfield, Illinois 60093
www.shabica.com
PROPRIETARY AND CONFIDENTIAL
ALL ELEVATIONS IN IGLD 1985
SAND PLAN VIEW

Permit Drawings (cont.)

SAND CALCULATIONS



$$\frac{30 \text{ YDS} \times 30 \text{ YDS} \times 2 \text{ YDS}}{6} = 300 \text{ CUBIC YDS}$$

300 CUBIC YDS X 20% = 60 CUBIC YDS
300 CUBIC YDS + 60 CUBIC YDS = 360 CUBIC YDS
360 CUBIC YARDS X 1.25 YDS/TON = 450 TONS

PLACE 450 TONS OF CLEAN SAND FOR MITIGATION

	NAME	DATE
DRAWN	SN	10/29/14
CHECKED		

Project Location: 55 S DEERE PARK DR., HIGHLAND PARK

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

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' | SHEET 5 OF 5

State and Federal Permit Application

Shabica & Associates, Inc.
WE BUILD BEACHES

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 31, 2014

Please find enclosed a permit application for shore protection for the property located at 55 South Deere Park Drive, Highland Park, Illinois, 60035, owned by Mr. and Mrs. Jerrold Senser. Proposed work includes construction of a short quarrystone spur breakwater and sandfill, as required. A letter of support is attached from the adjacent north property owner, Mr. Mark Gerstein, who has submitted a permit application for work to be completed in conjunction with this project on the north property.

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 enhancement to the shore protection system for his property. Shortly after the moratorium on lakefront structures was lifted in 2008, the homeowner permitted and built a breakwater protected pocket beach on his property. The proposed work was originally recommended at that time in 2008, but the north neighbor did not want to participate in the project or sign off on any work attached to his property, because he was in the process of selling his residence. As this was one of the first projects to be reviewed after the moratorium, a minimal design was recommended to help protect the property. The original project has been monitored for the past 5 years. . This system is still not holding a stable beach profile. During the recent low lake levels, the property has continued to experience beach erosion. Waves impact the north half of the revetment that was designed to be a last line of defense; not a full line of defense. Now after monitoring the system's performance for 5 years, the homeowner is working in conjunction with his north neighbor, Mr. Mark Gerstein of 57 South Deere Park Drive, to install his own shore protection system. The north neighbor, Mr. Gerstein, is simultaneously moving forward with his own shore protection system that shares one common structure with this property, the breakwater that crosses the steel sheetpile groin at the property line.

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The homeowner would like to have peace of mind that his property is stable and secure from the lake by constructing a 33-foot long quarrystone breakwater spur extending south from the lakeward end of the existing steel groin to the north on his lakefront at 55 South Deere Park Drive, Highland Park. This would help break waves in the north section of the beach cell and help to retain the sand cover over the lakebed as well as the beach. The homeowner wants to provide additional shore protection and reduce lakebed downcutting that will eventually destabilize the bluff and steel groin.

A 33-foot long quarrystone spur breakwater (groin to toe) is proposed extending south from the breakwater along the north property line. The lakeward toe of the structure will extend to about 112 feet east of the toe of the bluff and the breakwater will have a crest elevation of 583' (IGLD 1985). The slope of the breakwater will be 1v:1.5h. This quarrystone spur breakwater will be placed at the lakeward end of the existing steel sheetpile groin to help reduce scour in this area to reduce wave energy in the north end of the beach system. Mitigational sand will be placed in a quantity of 450 tons in the system.

This section of coastline has historically lost sand due to lakebed downcutting especially during prolonged periods of low water. Sand deposits are thin here (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. This has resulted in bluff toe erosion especially during average to high lake levels. While a narrow beach has been present at this site during higher lake levels, stormwaves have scoured the glacial clay till at the bluff toe. If ignored, this will lead to destabilization of the bluff face causing loss of tableland and infrastructure.

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 an open 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 55 South Deere Park Drive, Highland Park has been inspected and options for shore protection were studied based on monitoring the previous work completed on this property using desktop coastal engineering, site conditions from the 2014 bathymetric survey, and studying local prototypes. 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 a system that will anticipate greater lakebed downcutting, higher amounts of beach erosion, more extreme storm events with larger waves, and potential loss of land. These three options were considered:

OPTION 1
Do Nothing –

The first option of "Do Nothing" results in leaving the currently eroding shoreline and exposed revetment in its existing state. This will allow lakebed erosion to continue allowing larger stormwaves to impact the lakebed and revetment. 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 than average lake levels. Now with the water level rising, Lake Michigan waves are impacting the seawall.

OPTION 2
Encapsulate the North Groin in Quarrystone–

This option would help to hold sand in the beach cell at a much reduced rate than the preferred option. This property is located at the north end of a groin field. The beach is narrow at the north end and with the deflation seen recently, the bluff toe would remain at risk. Additionally, the cost of encapsulating the existing structures in stone and adding sand is almost as expensive as constructing a more sustainable coastline.

OPTION 3
Preferred Option: Design a 33-foot Long Spur Breakwater –

The preferred option is to reduce the breakwater gap with a 33-foot breakwater spur extending south from the existing groin to the north in conjunction with the north neighbor's shore protection project. The proposed breakwater will extend east from the bluff toe approximately 112 feet. This plan will help to break wave energy during high lake levels as well as help the system to retain sand. The proposed plan will help protect the glacial clay lakebed, as well as the beach and bluff, while allowing safe access to Lake Michigan. With proper maintenance, a structure like this could be expected to continue functioning for 30 plus years.

OPTION 4
Larger Breakwater Protected Beach –

Options were discussed with the homeowner for larger breakwaters. The homeowner did not entertain larger options as the south end of the property already has a small breakwater that was constructed in 2009.

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.

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Impacts to Downdrift Properties
The proposed project will have minimal impact on the property immediately downdrift of the subject property. The adjacent property to the south has a quarrystone revetment immediately south of the subject property. Additionally, there is already a quarrystone breakwater at the south end of this property.

Impact to Littoral Drift System
The proposed plan for this site includes the construction of a short quarrystone spur breakwater and placement of sandfill as required for permit.

The section of Lake Michigan shoreline north and south of 55 South Deere Park Drive, Highland Park is fully engineered with steel groins, revetments, seawalls, and quarrrystone breakwaters. Based on our experience, as the proposed structure is immediately north of a quarrystone breakwater and extends minimally lakeward, 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 not be impacted by the modifications to the existing system. No additional public access structures will be built as part of this project, however, public access should be improved by the engineered beach system retaining more sand and holding a higher beach profile during all lake levels. 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 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 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 stone will be delivered by barge to the site. Sand will be delivered by truck. Work will not begin until all necessary permits have been received. This work will require approximately 3 weeks to complete.

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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 300 tons of new, clean quarried stone will be placed to construct the revetment and breakwater. Approximately 450 tons of clean sand will be placed on the existing beach. All clay displaced from the lakebed for installation of the breakwater toe stone will be placed on the barge and removed from the site and disposed of properly. Acreage of stone placed on the lakebed east of the OHWM is less than 0.02 acres.

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)
Jerrold and Naomi Senser

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DESIGN OF SHORELINE EROSION PROTECTION

Introduction

The following report summarizes assumptions and design criteria for a quarrystone breakwater and sandfill mitigation to help reduce erosion and protect the property located at 57 South Deere Park Drive, Highland Park. The design is based on the drawings included in the permit application to the U.S. Army Corps of Engineers dated October 29, 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 that may hold narrow beaches.

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 as well as due to lakebed downcutting causing a steeper lakebed profile leading to increased sand loss. 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 a short quarrystone spur breakwater 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:	583 ft
Toe of Structure:	573 ft (average)
Crest Width:	6 ft
Average Armor Size:	2.5 tons
"B" Stone	200 lbs to 1000 lbs
Slope:	1:1.5
Tons/linear feet:	11.5 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
• 20-yr lakebed erosion at toe of breakwater:	3 ft**
• Design wave height (Hs):	9.36 ft

Assumptions (continued)

- Nearshore Slope: 1:30 – 1:40
- 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 1 – 5 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 is 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 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 5 tons. Hudson's formula was used to estimate armorstone size. An armorstone of 1.83 tons is predicted for special placement stone based on the design conditions. As the lakeward face of the breakwater will be built random placement, 1 – 5 ton quartzite will be utilized for the construction of this project.

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Bathymetry
Bathymetric profiling was performed on 5/21/2014. 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.

Water Levels
The following table summarizes water level data representing daily highest extremes measured at Calumet Harbor, Illinois, approximately 31 miles to the south of Highland Park. 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.

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Lakebed Erosion

Lakebed erosion, active in water depths of 10 ft or less, is a design component of this plan. This section of Highland Park 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 cross-section (see, Figure 1) showing loss of lakebed sand from 1975 to 1989. 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 55 South Deere Park Drive in Highland Park 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.

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References

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APPENDIX 11
55 South Deere Park Drive, Highland Park • October 31, 2014

PHOTO 1

1997 Aerial Photo Approximate Property Lines in Yellow

PHOTO 2

2010 Google Earth Photo shows the breakwater constructed in 2009

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PHOTO 3

Spring 2014 photo depicts the conditions as the lake was beginning to rise from low lake levels. Note revetment is becoming exposed at the north end of the property.

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FIGURE 1

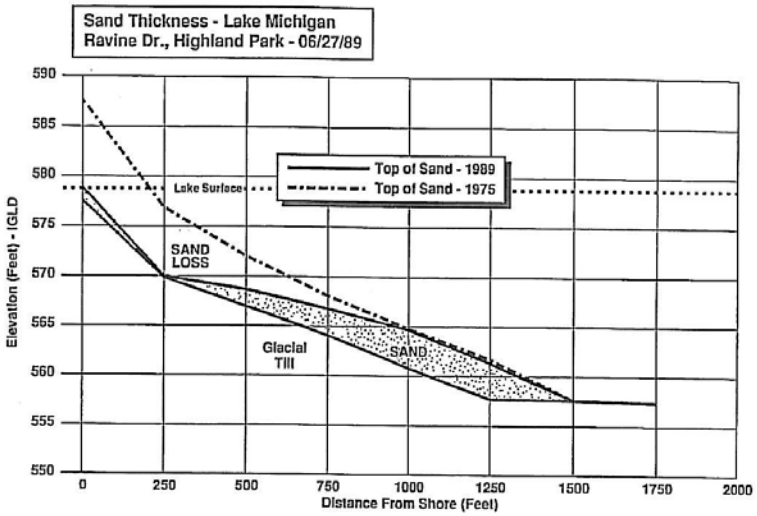

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FIGURE 2

Shore Protection Manual
USACE

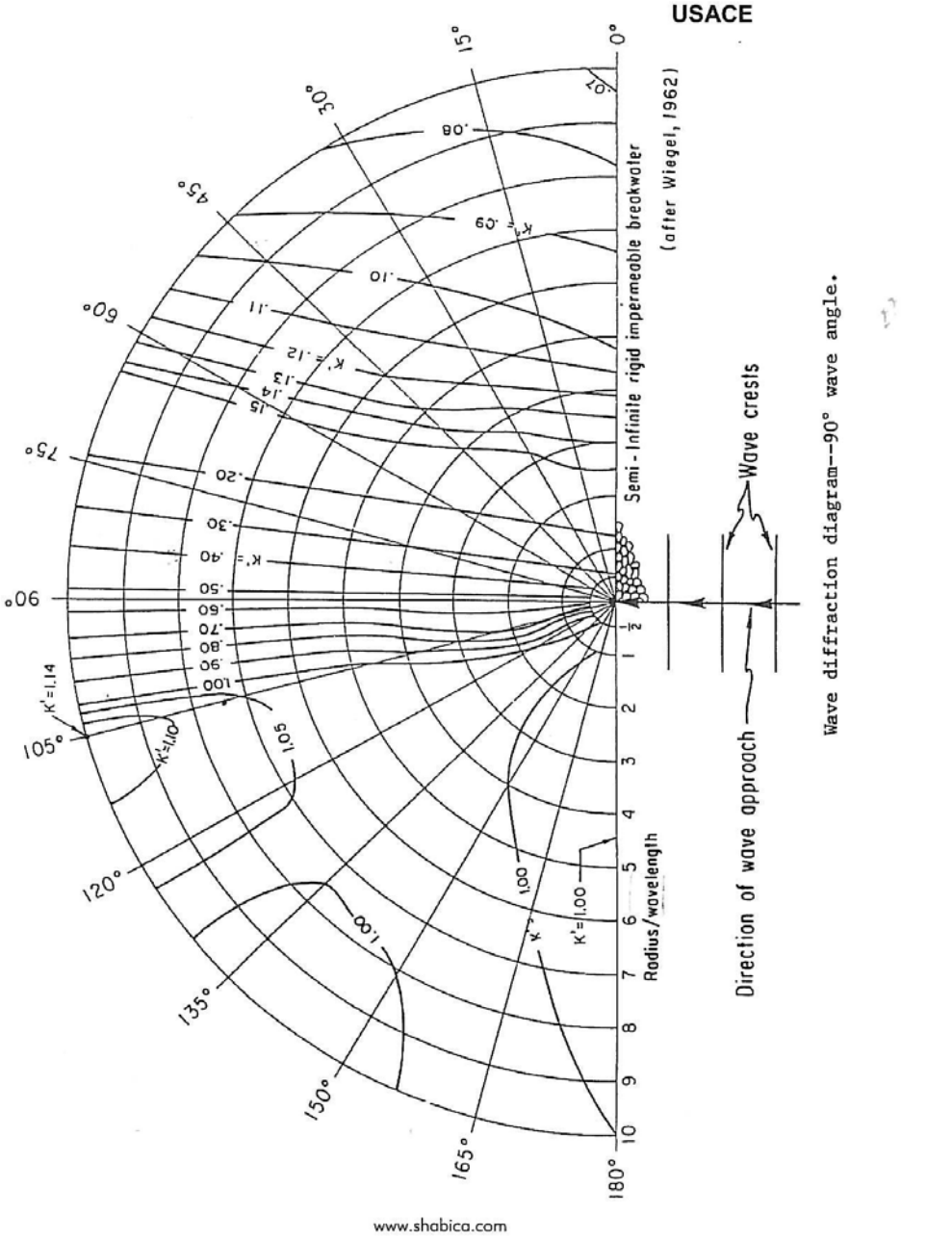

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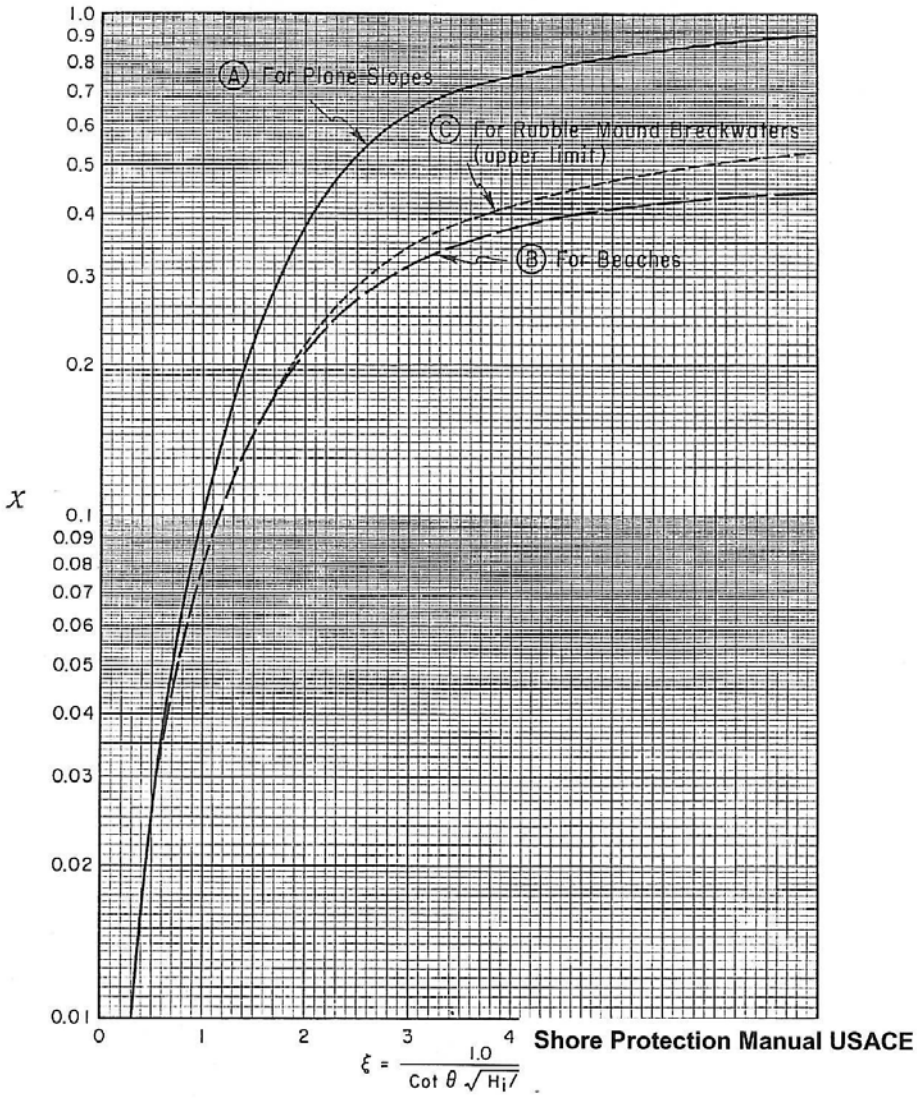
FIGURE 3



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

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):
Jerrold and Naomi Senser		Jon Shabica
Company Name (if any) :	Company Name (if any):	Company Name (if any): Shabica & Associates, Inc.
Address: 55 S. Deere Park Drive Highland Park, IL 60035	Address:	Address: 550 Frontage Road Suite 3735 Northfield, IL 60093
Email Address: jsenser@icapusa.com	Email Address:	Email Address: jon@shabica.com
Applicant's Phone Nos. w/area code Business: 312-424-9157 Residence: 847-266-0622 Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: 847-446-1436 Residence: Cell: Fax: 847-716-2007

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 _____

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

7. PROJECT LOCATION:
57 S. Deere Park Drive, Highland Park, IL

LATITUDE: 42.15336 °N LONGITUDE: -87.75982 °W	UTMs Northing: 4667082.16m Easting: 437221.26m				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION 55 S. Deere Park Drive	LEGAL DESCRIPT	QUARTER SE	SECTION 31	TOWNSHIP NO. 43N	RANGE 13E
☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box) Municipality Name Highland Park	WATERWAY Lake Michigan			RIVER MILE (if applicable)	
COUNTY Lake	STATE IL	ZIP CODE 60035			

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 33-foot long quarrystone spur breakwater (groin to toe) will be built extending south from the breakwater along the north property line. The lakeward toe of the structure will extend to about 112 feet east of the toe of the bluff and the breakwater will have a crest elevation of 583' (IGLD 1985). The slope of the breakwater will be 1v:1.5h. This quarrystone spur breakwater will be placed at the lakeward end of the existing steel sheetpile groin to help reduce scour in this area to reduce wave energy in the north end of the beach system. Mitigational sand will be placed in a quantity of 450 tons in the system.

9. PURPOSE AND NEED OF PROJECT:

To stabilize the north end of 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: 360 cu. yds Stone:122 cu. yds.

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

0.02 acres

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

By designing smaller structures, the footprints will be minimized on the lakebed.

14. Date activity is proposed to commence: July 10, 2015
Date activity is expected to be completed: July 31, 2015

15. Is any portion of the activity for which authorization is sought now complete? Yes [ ] No [X]
Month and Year the activity was completed
NOTE: If answer is "YES" give reasons in the Project Description and Remarks section. Indicate the existing work on drawings.

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

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED. Yes 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: 10/29/14

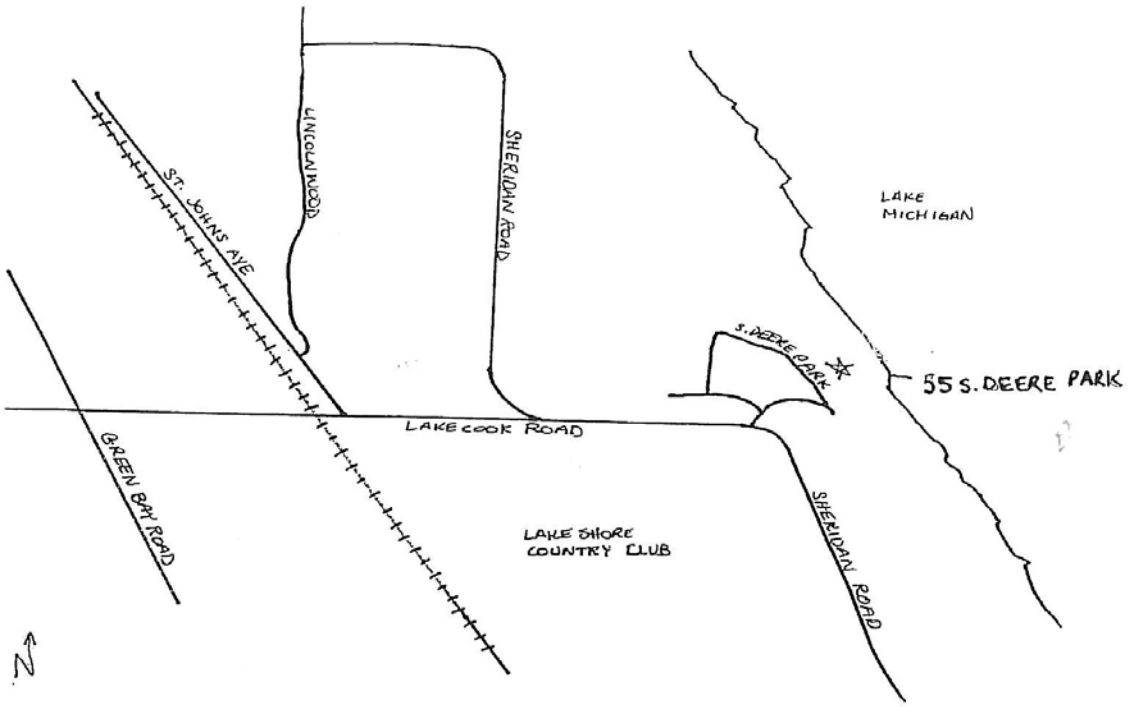
Signature of Applicant or Authorized Agent — Date: 10/29/14

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

55 S. Deere Park Drive
Highland Park, IL 60035

Shabica & Associates, Inc.
WE BUILD BEACHES

Location of Project: 55 Deere Park Drive, Highland Park, Illinois 60035

List of property owners (from North to South):

1. Andrew S. and Laura C. Hochberg, 77 S. Deere Park Drive, Highland Park, IL 60035
2. Cynthia B. Hirsch Trust, 65 S. Deere Park Drive, Highland Park, IL 60035
3. Mark and Julia Gerstein, 57 S. Deere Park Drive, Highland Park, IL 60035
4. Subject Property: Jerrold and Naomi Senser, 55 S. Deere Park Drive, Highland Park, IL 60035
5. Michael and Janet Krasny, 41 S. Deere Park Drive, Highland Park, IL 60035
6. Lake Shore Country Club, 1255 Sheridan Road, Glencoe, IL 60022
7. Village of Northbrook, Public Works Department, 655 Huehl Road, Northbrook, IL 60062
8. North Shore Congregation Israel, 1195 Sheridan Road, Glencoe, IL 60022
9. Milton Vainer, 35 Aspen Lane, Glencoe, IL 60022
   (mailing: 191 Apple Tree Road, Winnetka, IL 60093)
10. Nena Addis, 25 Aspen Lane, Glencoe, IL 60022
11. David Muslin, 35 Estate Drive, Glencoe, IL 60022
12. Robert Price, 30 Estate Drive, Glencoe, IL 60022
13. Shayle P. Fox, 1 Rockgate Lane, Glencoe, IL 60022
14. Property Owner, 6 Rockgate Lane, Glencoe, IL 60022

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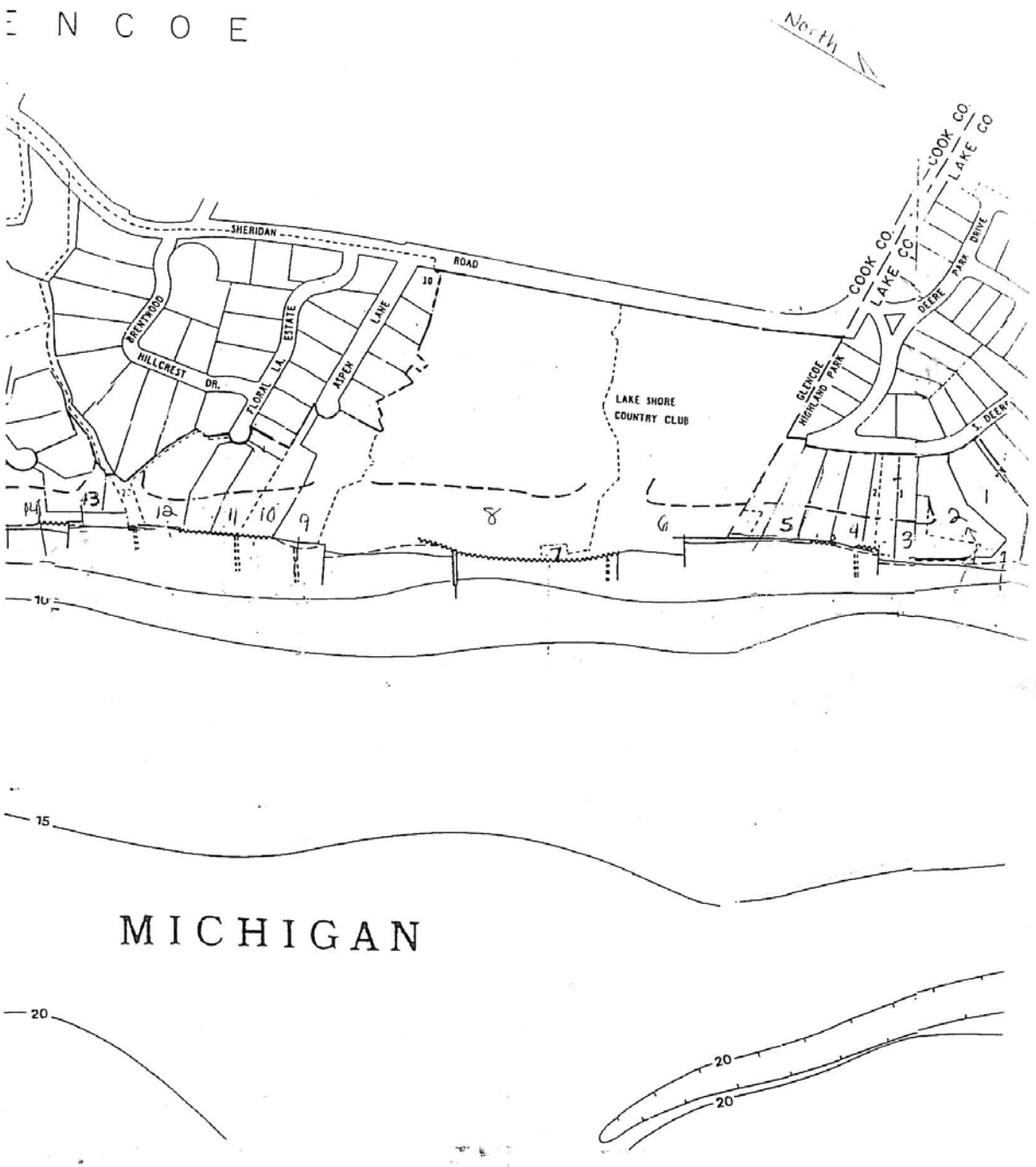

E N C O E
North
SHERIDAN
ROAD
BRENTWOOD
HILLCREST DR.
FLORAL LA. ESTATE
ASPEN LANE
LAKE SHORE
COUNTRY CLUB
GLENCOE
HIGHLAND PARK
COOK CO.
LAKE CO.
DEERE PARK DRIVE
MICHIGAN
15
20
20
20

Mark Gerstein
57 South Deere Park Drive
Highland Park, Illinois 60035

Construction Operations Div. Regulatory Branch
Corps of Engineers, Chicago District
111 N. Canal Street
Chicago, IL 60606-7206

September 25, 2014

Dear Sir or Madam,

I hereby request that Shabica & Associates, Inc. be authorized to act in my behalf in filing a permit application for shore protection work at the Senser property, 55 South Deere Park Drive, Highland Park, Illinois. I understand that the lakeward end of the steel groin on my property will be encapsulated with stone. I convey permission for representatives of Shabica & Associates, Inc. to enter my property for consulting purposes.

If additional information is required, please contact me at the above address.

Sincerely,

Mark Gerstein
Owner

cc: Illinois Department of Natural Resources
Illinois Environmental Protection Agency
Shabica & Associates, Inc.
Jerry Senser

Shoreline Stabilization at
57 S. Deere Park Drive
Highland Park

Submittal to
Community Development Department
March 4, 2015

Prepared By:

Shabica & Associates, Inc.
We Build Beaches
550 Frontage Road, Suite 3735
Northfield, Illinois 60093
Tel. 847-446-1436
Fax 847-716-200

Shabica & Associates, Inc.
We Build Beaches

Eric Olson
City of Highland Park
Community Development Department
1150 Half Day Road
Highland Park, Illinois 60035

Dear Mr. Olson: March 4, 2015

Attached please find a submittal to the City of Highland Park's Community Development Department for a Shoreline Stabilization project at the property of Mark and Julia Gerstein at 57 S. Deere Park Drive, Highland Park. Proposed work includes construction of a breakwater protected beach system with sandfill as required for this work. All Federal and State permits have gone through the public notice stage and are nearing approval for the proposed work (see Appendix).

This project was submitted to the state and federal regulators in October 2014 and is under final review. All Federal and State permits have gone through the public notice stage. The IEPA and IDNR have issued permits, see Appendix The US Army Corps of Engineers are nearing approval for the proposed work (see Appendix).

The shoreline at this site has been losing sand at a fast rate due to the lake level rising and higher intensity lake storms. As the sand level is lowering, the bluff toe has become vulnerable to erosion and the base of the stair access to the beach has been compromised.

The City's Standards for Review, as outlined in the "Lake Michigan Protection Regulations" from Section 150.703.1 *Special Regulations for the LFOZ Lakefront Density and Character Overlay Zone*, are outlined below with our responses following:

a. *The proposed Regulated Activity and/or Structure shall not unreasonably impede access to or pedestrian movement along the beach or to Lake Michigan.*
   This project will not impede pedestrian access or movement along the beach or to Lake Michigan.

b. *The proposed Regulated Activity and/or Structure shall not unnecessarily impede navigability within Lake Michigan*
   As the breakwaters will not extend further east than other existing structures, the proposed project will not have any impact on the navigability of Lake Michigan.

c. *The proposed Regulated Activity and/or Structure shall not unreasonably impact the Subject Property or the Adjacent Properties*

The project will protect the Subject Property from shoreline erosion, and the sandfill, as required by the IDNR will assure that the project will not negatively impact the adjacent properties.

d. *The Applicant has proposed appropriate long-term maintenance requirements and plans, as necessary, for the proposed Regulated Activity and/or Structure*

The project has a long-term maintenance plan. Monitoring of the project is also required for 5 years post construction by the IDNR.

e. *The proposed means and methods of undertaking the Regulated Activity and/or Structure are consistent with appropriate design and aesthetics principles*

The means and methods of construction are consistent with design and aesthetics; all work will be completed via marine mobilization. A similar structure has been constructed on the south side of the property.

f. *The proposed Regulated Activity and/or Structure shall not create new nor amplify existing erosion problems on the Subject Property and on Adjacent Properties*

The project will prevent future bluff erosion on the subject property, and will not affect adjacent properties. As the construction will be completed via marine access, the bluff will not be disturbed. As the construction will be completed via marine access, the bluff will not be disturbed except the location where the north spur breakwater is placed abutting the toe of the bluff.

g. *The proposed Regulated Activity and/or Structure shall be for the purposes of erosion control, water gathering, and/or public access only*

The proposed shore protection will reduce and/or prevent future sand loss and bluff erosion on the subject property and allow access to the beach from the tableland.

h. *There will not be an unnecessary adverse environmental or ecological impact on the Subject Property or on any of the Adjacent Properties as a result of the proposed Structure and/or the Regulated Activity*

The proposed structure will not cause unnecessary adverse environmental or ecological impact. The quarrystone breakwater provides improved habitat for fish. Sand acts as a natural filter for stormwater runoff.

i. *The proposed Structure and/or Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose of the Structure*

The proposed system is a viable, environmentally-correct means of achieving the stated purpose.

j. *The Applicant has properly obtained any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure*

All Federal, State and County permits are under review and nearing issuance. The state and federal permit application is attached. All permits will be issued prior to any work commencing.

A Permit Application has been filed with the Department of Public Works for the proposed project. In conformance to the City's Application Guidelines, the following documents and information are included:

i. A statement of the purpose and planning objectives to be achieved by the proposed Regulated Activity

The proposed breakwater-protected pocket beach system will help protect the bluff from erosion during all lake levels. The proposed system will move the locus of wave action further offshore where lakebed downcutting will be reduced.

ii. A plat of survey of the Subject Property

A Plat of Survey is attached as well as a recent hydrographic survey showing the entire work area. A tree survey has not been prepared as the bluff and tableland will not be impacted by the construction. All access will be via barge on Lake Michigan.

iii. A conceptual plan showing the Subject Property and the Adjacent Properties, including any and all existing Structures in the portion of the Lake Michigan Protection Zone abutting those properties

A Plan View is attached.

iv. Development and site plans showing the proposed Structure, if applicable

Same as Conceptual Plan in Item iii

v. A demolition plan, if applicable

N/A

vi. An elevation plan, which shall include sectional views of the proposed Structure, if applicable

Cross-sectional drawings are attached.

vii. Copies of any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure

Federal and State permits are attached.

viii. Engineering details of the proposed Structure and/or the Regulated Activity, which shall include, if applicable:

A. Structure height: N/A, see Coastal Engineering Report in the cover letter to the state and federal regulators and plans in the Appendix
Structure Length: System extends about 116' lakeward from the bluff toe
Structure Width: N/A, see plans

B. The spacing between the proposed Structure and other Structures in the Lake Michigan Protection Zone abutting any of the Adjacent Properties

No spacing is applicable.

C. The materials of which the proposed Structure will be composed

The breakwater will be quarried quartzite. Sand will be placed as required by the IDNR as beach fill.

ix. A geo-technical investigation report of the site

As there will be no major earthmoving or structures built on the bluff slope, this project does not require a geotechnical investigation.

x. A statement outlining structure success in various water levels

The breakwater is designed to function during varying lake levels.

xi. A statement describing the long-term maintenance requirements and plan for the proposed Structure

The proposed structure has a 20-year design-life, and the stone that will be used will last thousands of years. Periodic maintenance is recommended as necessary based on biannual visual inspections. Typically, at the time of recommended maintenance, additional stone will be brought in and placed over the existing revetment to bring it back to the original specification.

xii. A written description of the proposed means and methods of undertaking the Regulated Activity

All materials and equipment will be delivered to and removed from the site via barge on Lake Michigan. The beach work will be completed using a backhoe and crane as needed.

xiii. An explanation, in narrative form, of the following:

A. Any and all erosion problems on the Subject Property for which the Structure and/or Regulated Activity is designed to correct or remedy

This system is designed to protect the Subject Property from future sand loss, lakebed downcutting and bluff erosion due to stormwave damage.

B. The environmental and ecological impact on the Property and the Adjacent Properties that are expected to result from the Structure and/or Regulated Activity

The environmental impact of this project is that the stormwater will be filtered by the beach. This will reduce sediment and non-point source pollution from flowing into Lake Michigan.

C. How the proposed Structure and/or Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose

The design of this system is minimally intrusive to the environment. The project design mimics mother nature by creating a rocky headland to create a calm bay where wave energy is reduced and sand can remain to provide shore protection.

D. The nature and composition of existing protections, including existing Structures, of the shoreline in that portion of the Lake Michigan Protection Zone abutting either the Subject Property or the Adjacent Properties, and the impact and effectiveness of those protections on the shoreline, the lakebed, and on erosion of the Subject Property and Adjacent Properties

The existing form of shore protection at the Subject Property is a steel groin along the south property line to helps to hold a narrowing sandy beach. There is no engineered protection at the base of the bluff. Sand has eroded severely from the current system.

xiv. A non-refundable application fee, in the amount set forth in the City's Annual Fee Resolution
The application fee is attached.

An Appendix of attachments is included with this letter.

This information addresses the application requirements for submission. Please let us know if you require any further information.

Sincerely,

Jon Shabica
Vice President

Appendix

A PIONEER PRESS PUBLICATION • HP www.pioneerlocal.com news I 5

FIRST TO BE OK'D BY LAKEFRONT COMMISSOIN

Beach project a model in many ways

By CHARLES BERMAN
cberman@pioneerlocal.com

An exciting scene stretched deep over the Lake Michigan shoreline Nov. 20 as crews put the final touches on the gold standard of beach-restoration projects.

Cranes reached over the side of a barge and dropped tons of sand and stone onto a newly constructed private, residential beach on the southeast corner of Highland Park.

Shabica and Associates, a Northfield-based shoreline protection firm, designed the project to correct years of damage caused by erosion and to withstand years of natural destruction.

Jon Shabica, the firm's vice president, said what once was up to 50-feet of sandy beach was reduced to less than half its previous size during the last two years.

"There was very little natural sand left and the beaches were deteriorating to just cobble and lakebed clay," Shabica said.

Shabica said once sand disappears and lake-bed clay begins to erode, the natural process is unable to repair itself, resulting in larger waves and additional destruction to the bluffs and beaches.

So quarry stone breakwater stones were installed, a concrete pier was removed, a new curbstone groin was constructed with steps built into it, which extended into the lake. A limestone revetment was added, new sand was deposited, the beach was regraded and a dune grass system was installed.

That type of complete restoration project can cost between $400,000 and $1 million depending on finishes, the size of the property and the level of damage, Shabica said.

"My guess is that like the ravines, the amount of (property) loss we've seen has come more toward the end of the season and we typically see healthier beaches before winter," Shabica said. "So we might see some panicked people in the spring.

"We want to prevent any negative impact from the construction onto neighbors. The lake is constantly moving and shifting sand; we want to make sure nothing impedes its flow."

Barbara Cates

"This really hasn't been a good summer weather wise," he continued. "We think it has to do with the rising lake. It's up 1 foot, 3 inches since January."

The project also proved noteworthy because it was the first to go through the Highland Park Lakefront Commission's new process and the first state project to be completed since the Illinois Department of Natural Resources put a moratorium on all private coastal engineering projects.

"The city recognizes that the lakefront is a defining element of the city's character," said Barbara Cates, city planner and staff liaison to the Lakefront Commission. "We want to promote activities on the beach in the most ecological manner possible, so we established a process of approvals at the Lakefront Commission.

"There are a lot of natural processes going on at the lakefront."

Cates said the most important aspect of the city's new guidelines is the requirement for a resident to obtain all necessary state and county permits before the commission would make a recommendation to the city council.

"The (homeowners) were required to get six approvals before we considered this," Cates said. "We want to prevent any negative impact from the construction onto neighbors. The lake is constantly moving and shifting sand; we want to make sure nothing impedes its flow."

City Engineer John Welch said the work on South Deere Park Drive was a model project.

"We aren't saying people have to do this system," he said. "This is the Bentley of improvements that can be done on the lake shore. Their situation was probably worse than (most other situations) to begin with."

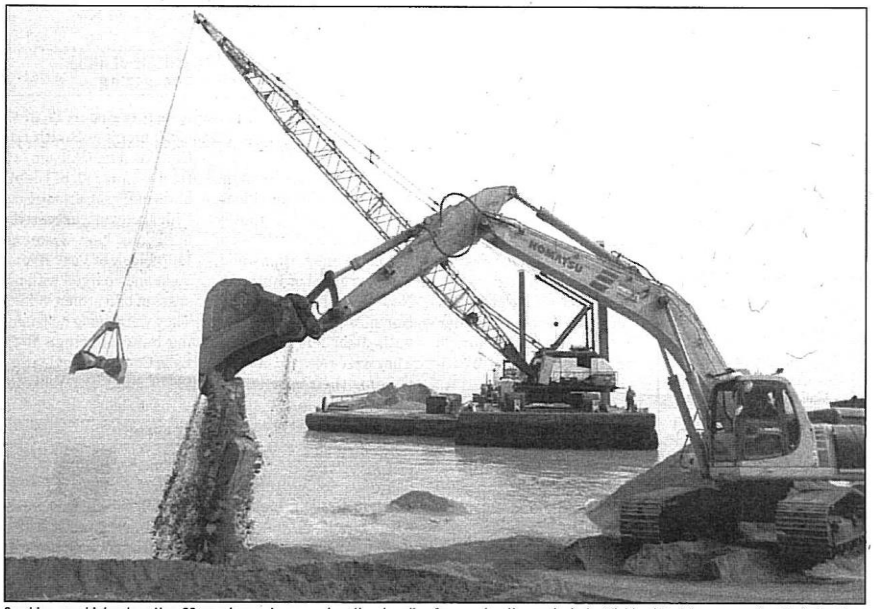
Welch recommends that residents employ a shoreline expert and take preventative measures to maintain their property, as it is cheaper to repair problems that are found earlier.

Cates said the Lakefront Commission found that this project will retain sand, prevent erosion and ultimately protect the shoreline in that area. The commission is also using this project as an education tool.

In the city's conditional approval, the homeowners were required to provide updated reviews of the improvements at its one-year and five-year anniversaries. The site was also extensively photographed before, during and after project was completed. Ongoing inspections and supervision of the project was required as well.

"It's a good learning process for the commission," Cates said. "We were making sure what they proposed, in the end, is what is being installed."

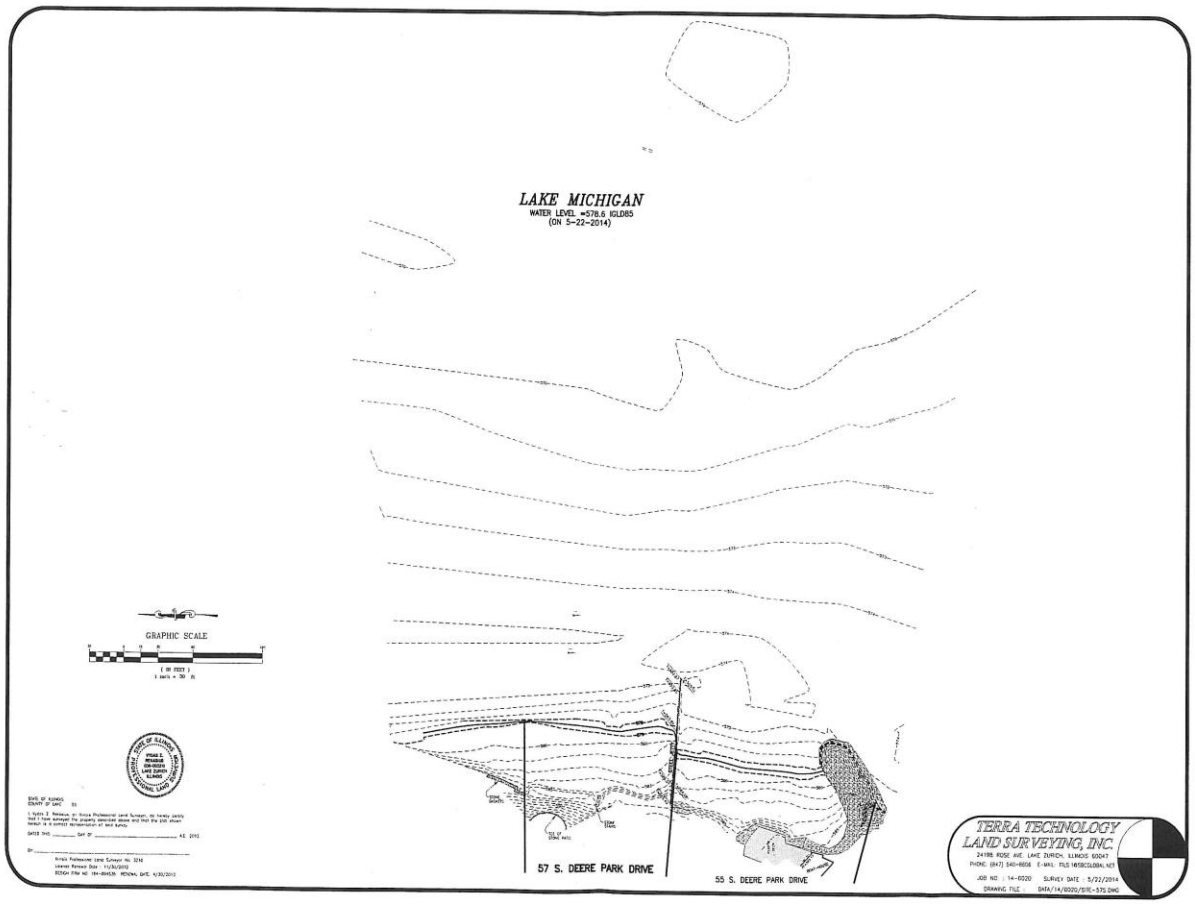
"These were vast improvements," Cates continued. "It's striking how much has changed. It looks very natural.



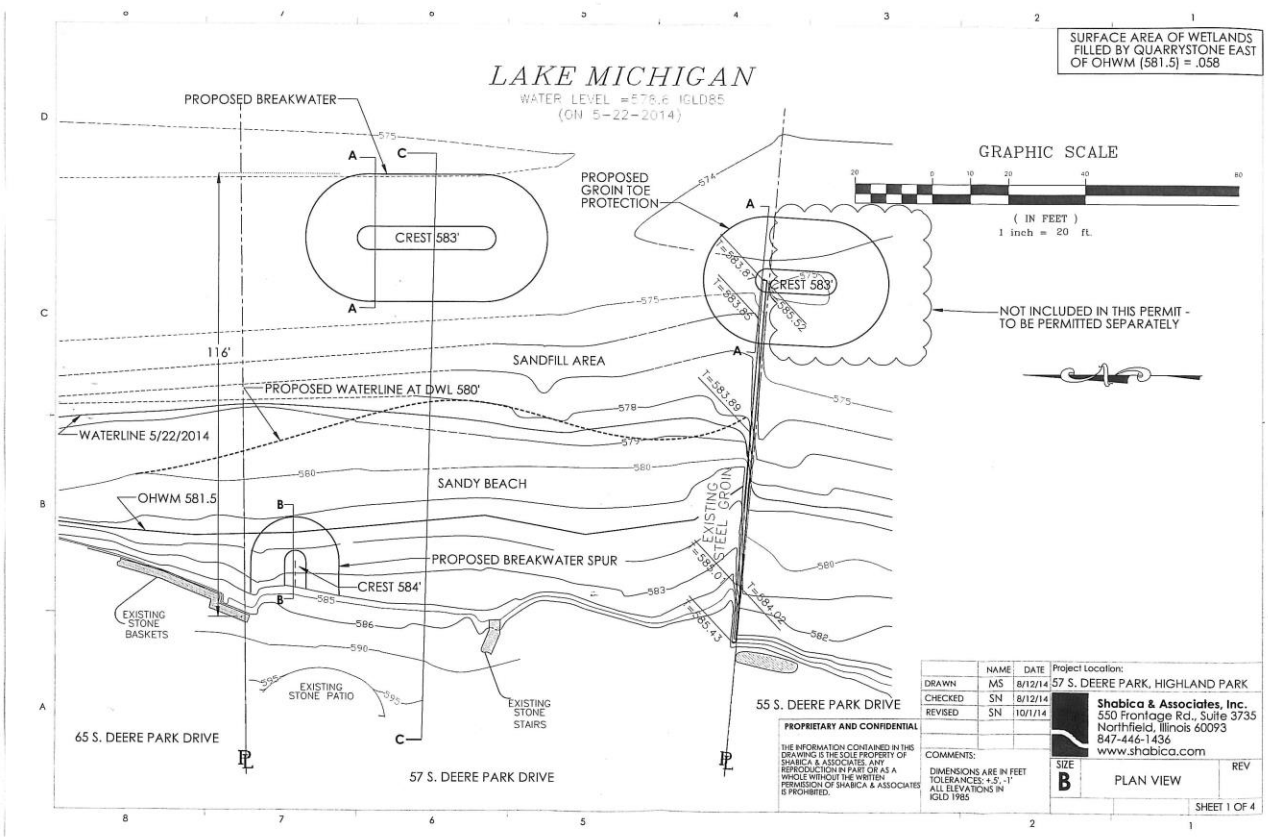
Sand is moved into place Nov. 20 as a barge drops sand on the shoreline for a restoration project at a Highland Park homeowner's private beach. The barge was dropping off tons of sand to replenish the sand bank of the beach, which has been deteriorating because of higher lake-water levels. (Buzz Orr/Staff Photographer)

A barge (background) hauls sand to the shoreline for a restoration project at a Highland Park homeowner's private beach Nov. 20. In the foreground is a human-made stone breakwater that acts as an arm for an engineered beach. (Buzz Orr/Staff Photographer)

Hydrographic Survey

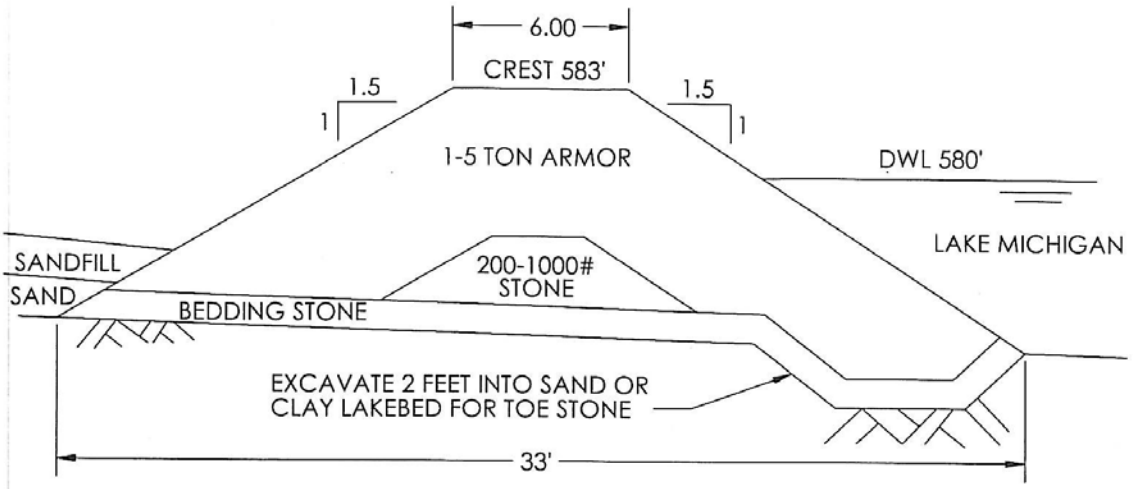


Permit Drawings

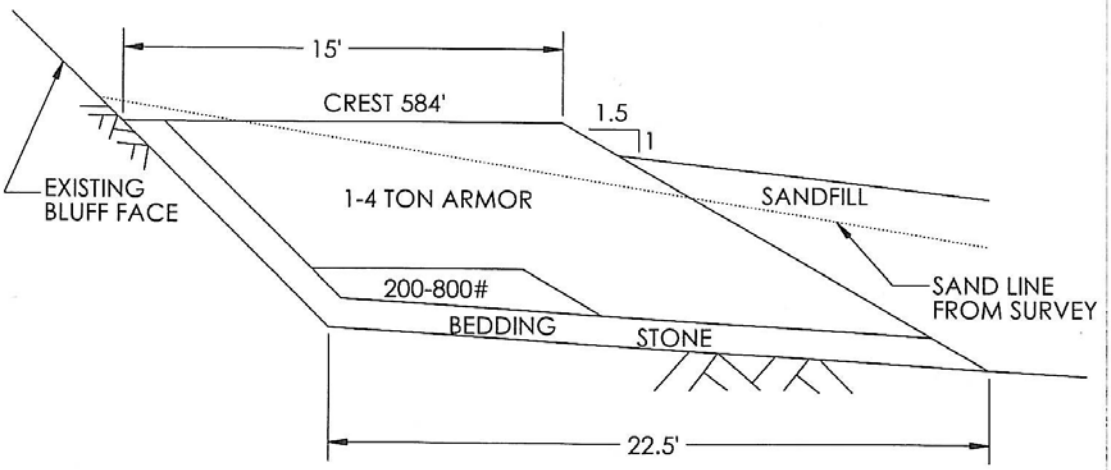


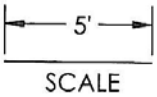
Permit Drawings (cont.)

CROS SECTION A-A



CROSS SECTION B-B





	NAME	DATE
DRAWN	SN	9/29/2014
CHECKED		

Project Location:
57 S. Deere Park Dr, Highland Park

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

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Northfield, Illinois 60093
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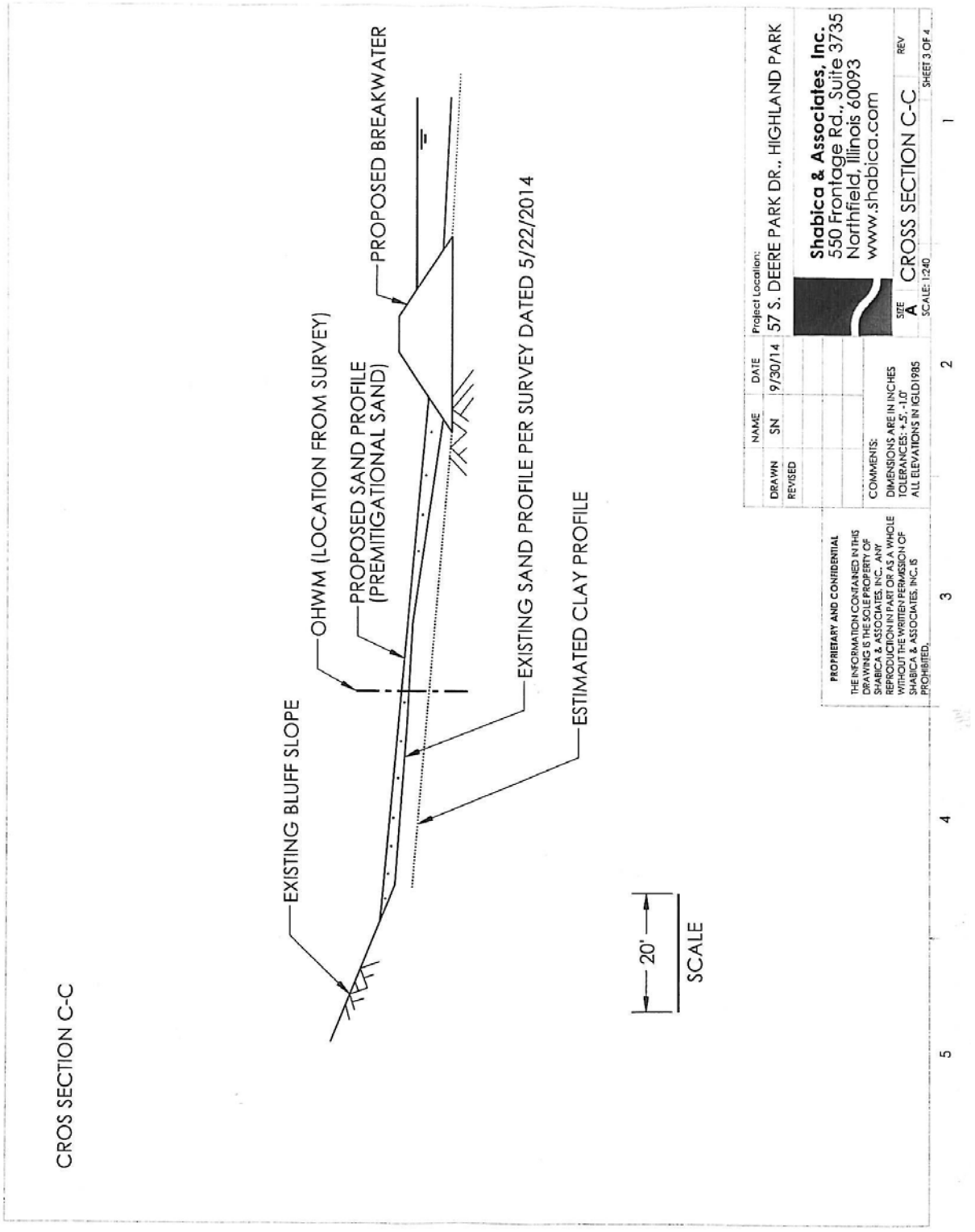
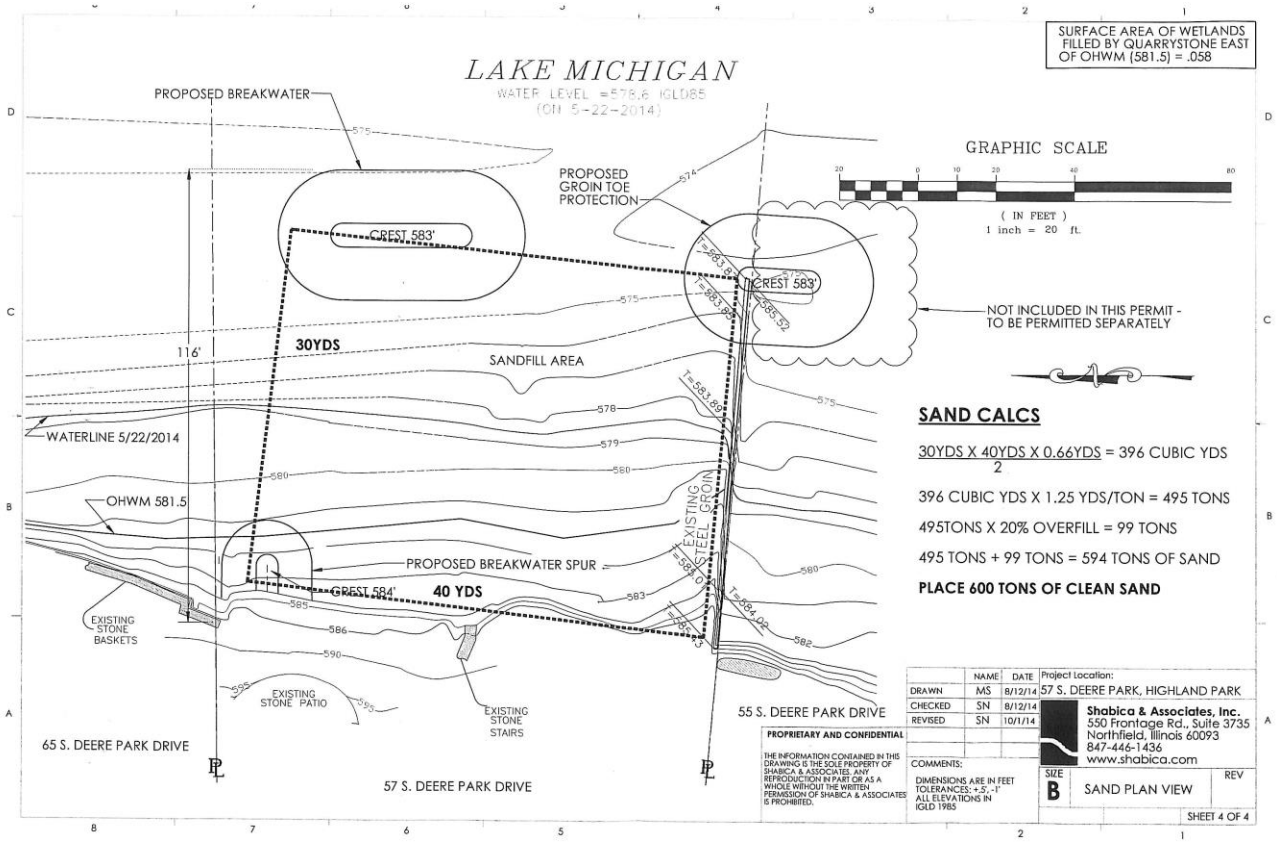
SIZE A | REV.
SCALE 1"=5' | SHEET 2 OF 4

Permit Drawings (cont.)



Permit Drawings (cont.)



State and Federal Permit Application

Shabica & Associates, Inc.
WE BUILD BEACHES

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 9, 2014

Please find enclosed a permit application for shore protection for the property located at 57 South Deere Park Drive, Highland Park, Illinois, 60035, owned by Mr. Mark Gerstein. Proposed work includes construction of a shore disconnected quarrystone breakwater, quarrystone toe protection for the lakeward end of the existing steel groin, a short quarrystone spur adjacent to the north property line and sandfill, as required. A letter of support is attached from the adjacent south property owner, Mr. Jerry Senser, who will be submitting a permit application for work to be completed in conjunction with this project on the south property.

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 his property. This project will be constructed on the lakefront of 57 South Deere Park Drive, Highland Park, where the homeowner wants to provide additional shore protection and reduce lakebed downcutting that will eventually destabilize the bluff and existing steel groin. The sandy beach at this site has deflated over the years. Even with recent low lake levels, the beach is narrower during all lake levels with stormwaves impacting the bluff toe and showing signs of eroding the bluff landward.

The bluff at this site has a vegetated slope face leading down to the beach and shoreline. The beach as this site has deflated an average of 3' in elevation as evidenced by the scarp at the back of the beach. This scarp has retreated west over time during storms and now, at the north end of the property, waves impact the bluff toe. Additionally, during a site visit in 2011, there was exposed lakebed clay near the waterline. This indicates that there is only a thin veneer of sand in this area increasing the amount of lakebed downcutting. At the south property line, there is an existing steel sheetpile groin that helps to hold the sand that does stay on the beach.

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A 60-foot long shore disconnected quarrystone breakwater (toe to toe) will be built approximately 50 feet north of the existing steel groin. The lakeward toe of the structure will extend to 116 feet east of the toe of the bluff and the breakwater will have a crest elevation of 583' (IGLD 1985). The slope of the breakwater will be 1v:1.5h. Quarrystone breakwater toe stone will be placed at the lakeward end of the existing steel sheetpile groin to help reduce scour in this area to improve the longevity of the groin. The crest elevation of the toe stone will be 583'. A short quarrystone spur breakwater will extend approximately 28 feet east of the bluff toe at the north end of the property. The crest elevation will be 584' with a slope of 1:1. This structure will help reduce loss of sand from the beach as well as break waves impacting the bluff toe during high lake levels. Mitigational sand will be placed in a quantity of 600 tons in the system.

This section of coastline has historically lost sand due to lakebed downcutting especially during prolonged periods of low water. Sand deposits are thin here (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. This has resulted in bluff toe erosion especially during average to high lake levels. While a narrow beach has been present at this site during higher lake levels, stormwaves have scoured the glacial clay till at the bluff toe. If ignored, this will lead to destabilization of the bluff face causing loss of tableland and infrastructure.

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 an open 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 57 South Deere Park Drive, Highland Park 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 deteriorating 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:

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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 than average 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 an Open Breakwater Beach System –

The preferred option is to protect the property with a pocket beach breakwater system. Based on research of prototypes along the Illinois North Shore, structures that extend less than around 125 feet offshore with a wide gap opening between structures, do not dissipate enough wave energy to hold a stable beach with fluctuating lake levels. This system is less than 125 feet offshore and due to its design will greatly enhance the level of shore protection at this property. The proposed breakwater will extend east from the bluff toe approximately 116 feet. This plan also includes quarrystone toe protection for the lakeward end of the existing steel sheetpile groin and a short breakwater spur near the north property line that will help to break wave energy during high lake levels as well as help the system to retain sand. 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 help stabilize the sand on the adjacent beaches by reducing 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 Groin in Quarrystone –

This option would help to hold sand in the beach cell at a much reduced rate than the preferred option. This property is located at the north end of a groin field. The beach is narrow at the north end and with the deflation seen recently, the bluff toe would remain at risk. Additionally, the cost of encapsulating the existing structures in stone and adding sand is almost as expensive as constructing a more sustainable coastline.

OPTION 5
Larger Bay Beach System-

Options for a larger bay beach were studied but were cost preventative for the client.

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:

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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 minimal impact on the property immediately downdrift of the subject property. The adjacent property to the south has a breakwater protected beach and is currently applying for a permit to install a short breakwater spur on the existing steel groin that separates the properties.

Impact to Littoral Drift System
The proposed plan for this site includes the construction of a shore-disconnected quarrystone breakwater, groin toe protection, a short quarrystone spur at the bluff toe and placement of sandfill as required for permit.

The section of Lake Michigan shoreline north and south of 57 South Deere Park Drive, Highland Park is fully engineered with steel groins, revetments, seawalls, and quarrrystone breakwaters. Based on our experience, as the proposed structure is immediately north of a steel sheetpile groin and extends minimally lakeward, 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 not be impacted by the modifications to the existing system. No additional public access structures will be built as part of this project, however, public access should be improved by the engineered beach system retaining more sand and holding a higher beach profile during all lake levels. Although the spur will extend 28' lakeward from the bluff toe, the modified sand elevation will accommodate for pedestrian access. During high lake levels, the beaches to the north tend to be submerged cutting off access for beach walkers. 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 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 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 stone will be delivered by barge to the site. Sand will be delivered by truck. 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 material will be clean and from inland quarries. Approximately 850 tons of new, clean quarried stone will be placed to construct the revetment and breakwater. Approximately 600 tons of clean sand will be placed on the existing beach. All clay displaced from the lakebed for installation of the breakwater toe stone will be placed on the barge and removed from the site and disposed of properly. Acreage of stone placed on the lakebed east of the OHWM is less than 0.058 acres.

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)
Mark Gerstein

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DESIGN OF SHORELINE EROSION PROTECTION

Introduction

The following report summarizes assumptions and design criteria for a quarrystone breakwater and sandfill mitigation to help reduce erosion and protect the property located at 57 South Deere Park Drive, Highland Park. The design is based on the drawings included in the permit application to the U.S. Army Corps of Engineers dated September 25, 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 that may hold narrow beaches.

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 as well as due to lakebed downcutting causing a steeper lakebed profile leading to increased sand loss. 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 a shore disconnnected quarrystone breakwater, groin toe protection, a quarrystone spur at the bluff toe 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:	583 ft
Toe of Structure:	573 ft (average)
Crest Width:	6 ft
Average Armor Size:	2.5 tons
"B" Stone	200 lbs to 1000 lbs
Slope:	1:1.5
Tons/linear feet:	11.5 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
• 20-yr lakebed erosion at toe of breakwater:	3 ft**
• Design wave height (Hs):	9.36 ft

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Assumptions (continued)

- Nearshore Slope: 1:30 – 1:40
- 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 1 – 5 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 is 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 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 5 tons. Hudson's formula was used to estimate armorstone size. An armorstone of 1.83 tons is predicted for special placement stone based on the design conditions. As the lakeward face of the breakwater will be built random placement, 1 – 5 ton quartzite will be utilized for the construction of this project.

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Bathymetry
Bathymetric profiling was performed on 5/21/2014. 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.

Water Levels
The following table summarizes water level data representing daily highest extremes measured at Calumet Harbor, Illinois, approximately 31 miles to the south of Highland Park. 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.

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Lakebed Erosion

Lakebed erosion, active in water depths of 10 ft or less, is a design component of this plan. This section of Highland Park 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 cross-section (see, Figure 1) showing loss of lakebed sand from 1975 to 1989. 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 57 South Deere Park Drive in Highland Park 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.

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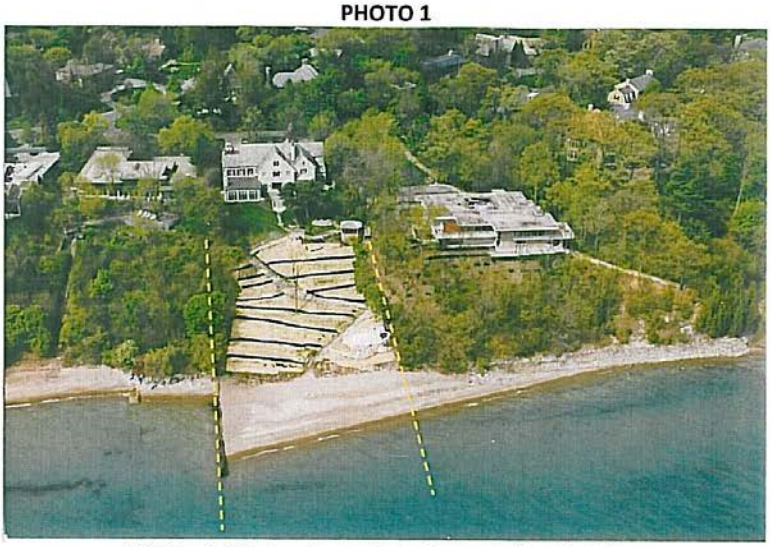
APPENDIX 11
57 South Deere Park Drive, Highland Park • October 9, 2014

PHOTO 1



1997 Aerial Photo Approximate Property Lines in Yellow

PHOTO 2

2013 Photo, note the extent of wave run-up on the sand and narrow beach

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FIGURE 1

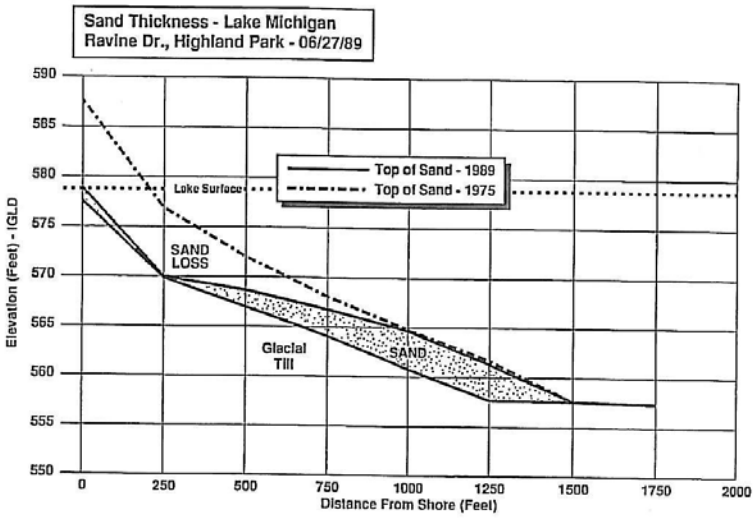

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FIGURE 2

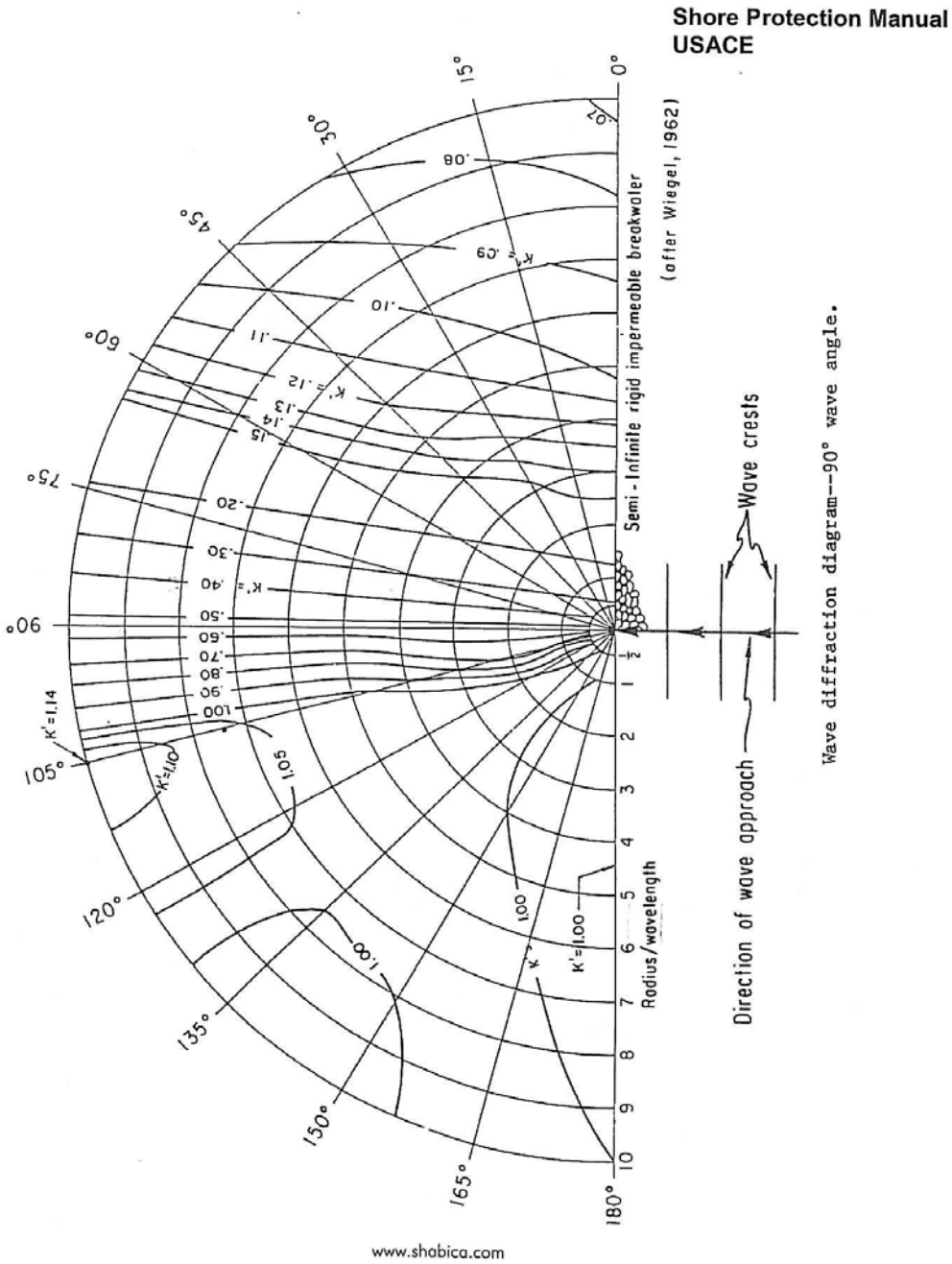

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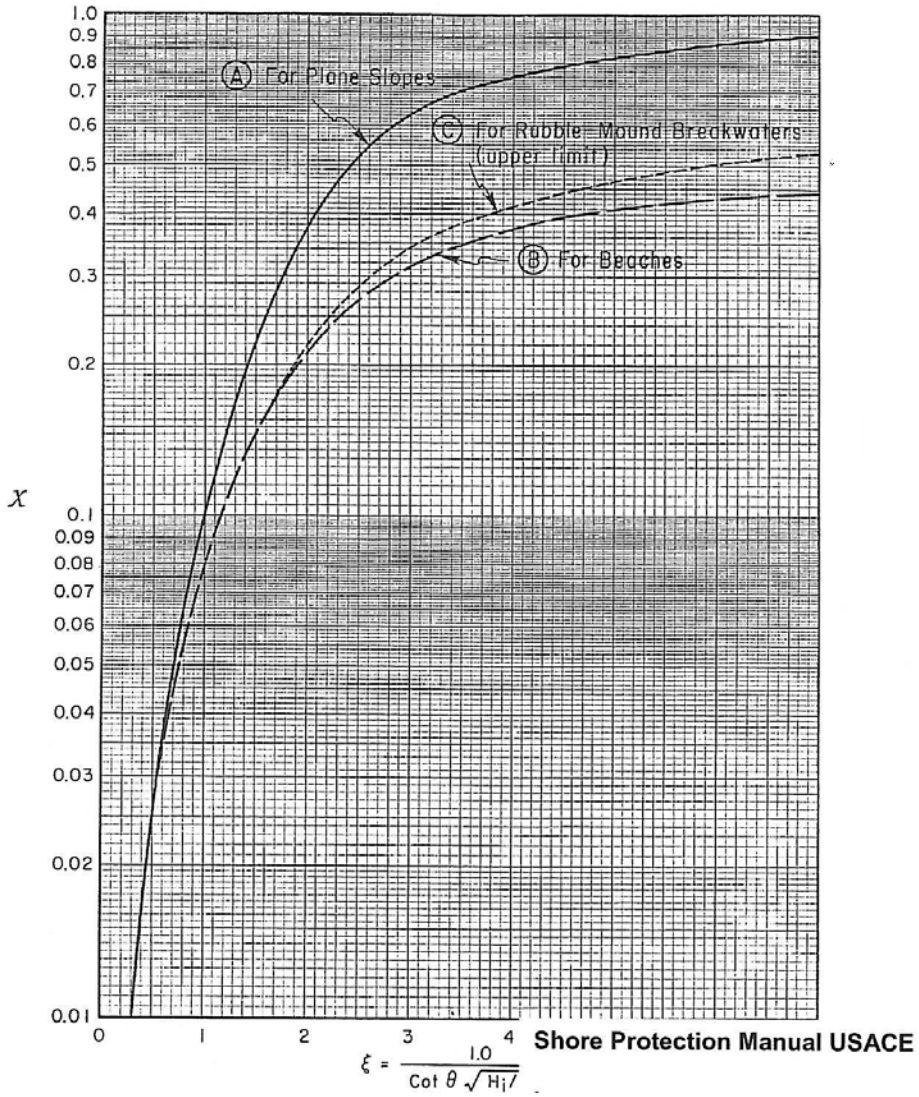
FIGURE 3



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

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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):
Mark Gerstein		Jon Shabica
Company Name (if any) :	Company Name (if any):	Company Name (if any): Shabica & Associates, Inc.
Address: 57 S. Deere Park Drive Highland Park, IL 60035	Address:	Address: 550 Frontage Road Suite 3735 Northfield, IL 60093
Email Address: mark.gerstein@lw.com	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: 312-876-7666	Business:	Business: 847-446-1436
Residence: 847-926-0226	Residence:	Residence:
Cell:	Cell:	Cell:
Fax:	Fax:	Fax: 847-716-2007

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: 9/25/14

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

7. PROJECT LOCATION:
57 S. Deere Park Drive, Highland Park, IL

LATITUDE: 42.15359 °N
LONGITUDE: -87.75995 °W

UTMs
Northing: 4667107.66m
Easting: 437212.53m

STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE
57 S. Deere Park Drive		SE	31	43N	13E

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

WATERWAY: Lake Michigan

RIVER MILE (if applicable):

COUNTY	STATE	ZIP CODE
Lake	IL	60035

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 60-foot long shore disconnected quarrystone breakwater (toe to toe) will be built approximately 50 feet north of the existing steel groin. The lakeward toe of the structure will extend to 116 feet east of the toe of the bluff and the breakwater will have a crest elevation of 583' (IGLD 1985). The slope of the breakwater will be 1v:1.5h. Quarrystone breakwater toe stone will be placed at the lakeward end of the existing steel sheetpile groin to help reduce scour in this area to improve the longevity of the groin. The crest elevation of the toe stone will be 583'. A short quarrystone spur breakwater will extend approximately 28 feet east of the bluff toe at the north end of the property. The crest elevation will be 584' with a slope of 1:1. This structure will help reduce loss of sand from the beach as well as break waves impacting the bluff toe during high lake levels. Mitigational sand will be placed in a quantity of 600 tons in the system.

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: 480 cu. yds Stone: 400 cu. yds

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

0.058 acres

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

By designing smaller structures, the footprints will be minimized on the lakebed.

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

Date activity is expected to be completed: October 15, 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 knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

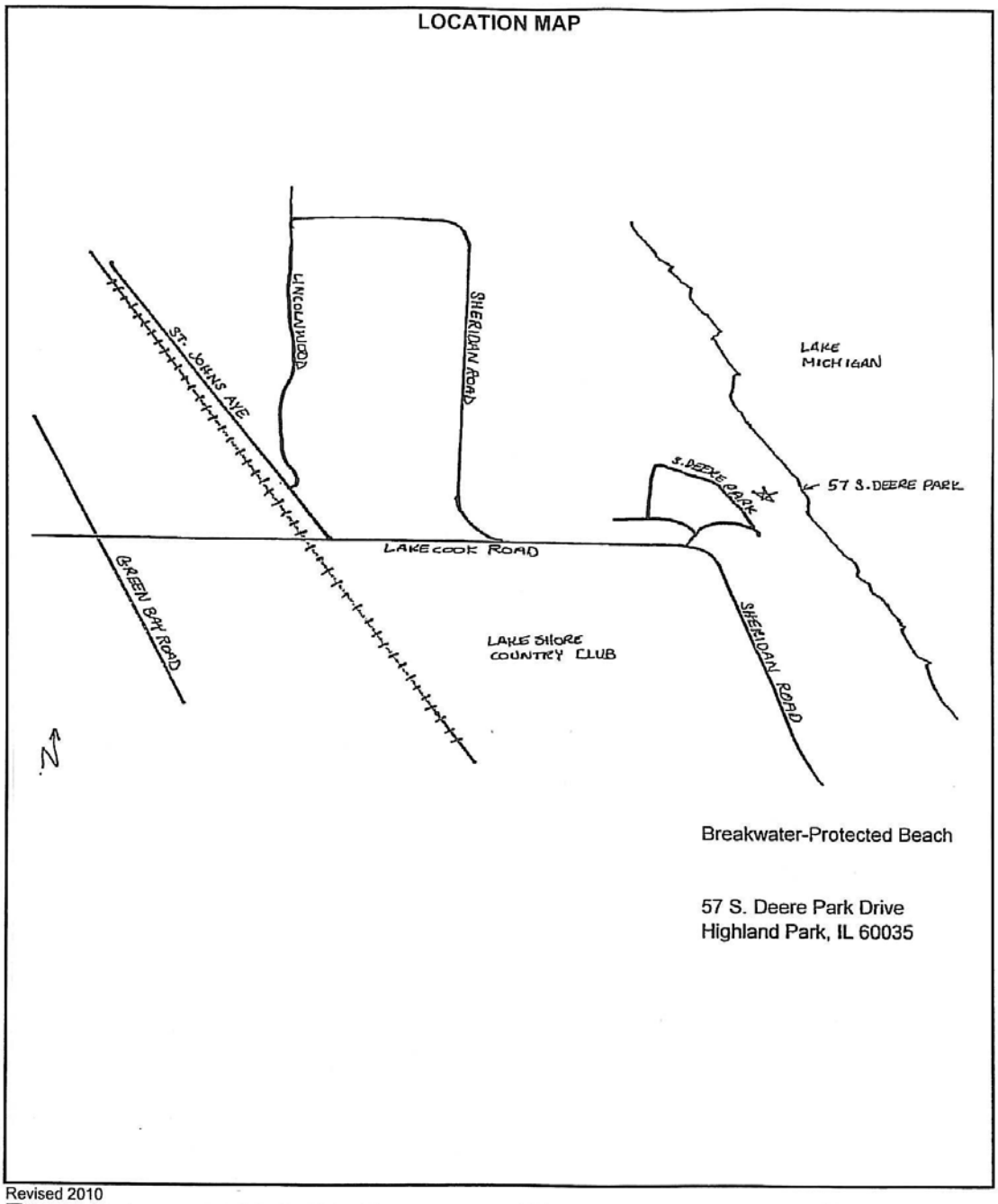
Signature of Applicant or Authorized Agent _____ Date _____

Signature of Applicant or Authorized Agent _____ Date _____

Signature of Applicant or Authorized Agent _____ Date _____

☐ Corps of Engineers Revised 2010 ☐ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS



Revised 2010

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

Shabica & Associates, Inc.
WE BUILD BEACHES

Location of Project: 57 Deere Park Drive, Highland Park, Illinois 60035

List of property owners (from North to South):

1. Deere Park Neighborhood Association, c/o Rob Rubin 336 N. Deere Park Drive, Highland Park, IL 60035
2. Andrew S. and Laura C. Hochberg, 77 S. Deere Park Drive, Highland Park, IL 60035
3. Cynthia B. Hirsch Trust, 65 S. Deere Park Drive, Highland Park, IL 60035
4. Subject Property: Mark and Julia Gerstein, 57 S. Deere Park Drive, Highland Park, IL 60035
5. Jerrold and Naomi Senser, 55 S. Deere Park Drive, Highland Park, IL 60035
6. Michael and Janet Krasny, 41 S. Deere Park Drive, Highland Park, IL 60035
7. Lake Shore Country Club, 1255 Sheridan Road, Glencoe, IL 60022
8. Village of Northbrook, Public Works Department, 655 Huehl Road, Northbrook, IL 60062
9. North Shore Congregation Israel, 1195 Sheridan Road, Glencoe, IL 60022
10. Milton Vainer, 35 Aspen Lane, Glencoe, IL 60022
    (mailing: 191 Apple Tree Road, Winnetka, IL 60093)
11. Nena Addis, 25 Aspen Lane, Glencoe, IL 60022
12. David Muslin, 35 Estate Drive, Glencoe, IL 60022
13. Robert Price, 30 Estate Drive, Glencoe, IL 60022
14. Shayle P. Fox, 1 Rockgate Lane, Glencoe, IL 60022

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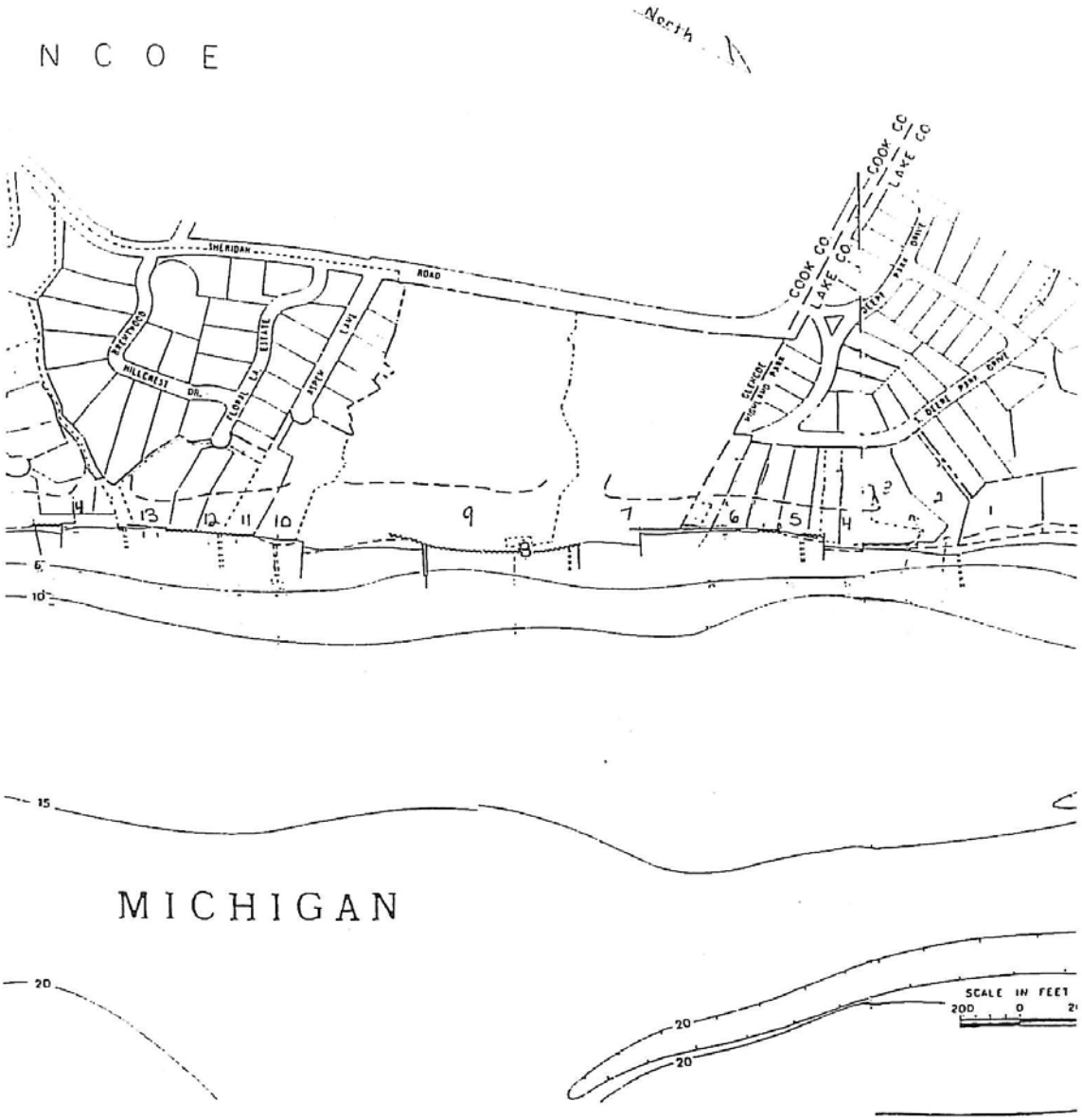

North
N C O E
SHERIDAN ROAD
COOK CO
LAKE CO
MICHIGAN
SCALE IN FEET
200 0
20
15
10
5

Jerry Senser
55 South Deere Park Drive
Highland Park, Illinois 60035

Construction Operations Div. Regulatory Branch
Corps of Engineers, Chicago District
111 N. Canal Street
Chicago, IL 60606-7206

October 2, 2014

Dear Sir or Madam,

I hereby request that Shabica & Associates, Inc. be authorized to act in my behalf in filing a permit application for shore protection work at my property as well as the Gerstein's property immediately to my north at 57 South Deere Park Drive, Highland Park, Illinois. I support the plan proposed by Shabica & Associates for the work to be completed on the Gerstein's property. I convey permission for representatives of Shabica & Associates, Inc. to access the beach for consulting purposes.

If additional information is required, please contact me at the above address.

Sincerely,

Jerry Senser
Owner

cc: Illinois Department of Natural Resources
Illinois Environmental Protection Agency
Shabica & Associates, Inc.
Mark Gerstein

State of Illinois Department of Natural Resources, Office of Water Resources and Illinois Environmental Protection Agency – Permit

PERMIT NO. LM2015002
DATE: February 6, 2015

State of Illinois
Department of Natural Resources, Office of Water Resources
and
Illinois Environmental Protection Agency

Permission is hereby granted to: **Mark Gerstein**
57 S. Deere Park Drive
Highland Park, IL 60035

To construct two quarrystone breakwaters, a shore attached quarrystone spur and sand fill in Lake Michigan at 57 S. Deere Park Drive, Highland Park, Illinois 60035. The project is located in the Southeast Quarter of Section 31, Township 43 North, Range 13 East, of the 3rd Principal Meridian in Lake County.

In accordance with an application dated **September 25, 2014**, and the plans and specifications entitled:

UNTITLED LOCATION MAP, ONE SHEET, UNDATED, RECEIVED OCTOBER 15, 2014.

57 S. DEERE PARK, HIGHLAND PARK, SHEET 1 OF 4, DATED AUGUST 12, 2014, REVISED OCTOBER 1, 2014; SHEET 2 0F 4, DATED SEPTEMBER 29, 2014; SHEET 3 OF 4, DATED SEPTEMBER 30, 2014; SHEET 4 OF 4, DATED AUGUST 12, 2014, REVISED OCTOBER 1, 2014, ALL SHEETS RECEIVED OCTOBER 15, 2014.

Examined and Recommended:

Daniel Injerd, Chief
Lake Michigan Management Section

Approval Recommended:

Loren A. Wobig, Acting Director
Office of Water Resources

Approved:

Wayne A. Rosenthal, Acting Director
Department of Natural Resources

This PERMIT is subject to the terms and special conditions contained herein and in the attached NOTICE OF FINAL DETERMINATION of the Illinois Environmental Protection Agency. This PERMIT is not valid unless a NOTICE OF FINAL DETERMINATION of the Illinois Environmental Protection Agency as required by Section 39(a) of the Environmental Protection Act is attached.

PUBLIC WORKS MEMORANDUM

DATE: March 31, 2015

TO: Karen Berardi, Natural Resources Commission Liaison

FROM: Joe Pasquesi, Civil Engineer

SUBJECT: 55 South Deere Park Drive, Shoreline Stabilization

I have reviewed the packet for the proposed work within the Lake Michigan Protection Zone at 55 South Deere Park Drive as detailed in the Shabica & Associates submittal dated March 4, 2015. The proposed improvement consists of additional stone breakwater constructed in Lake Michigan with sand fill augmenting the existing breakwater previously permitted and constructed in 2009. Construction of structures within the Great Lakes is under jurisdiction of the U.S. Army Corps of Engineers and the Illinois Department of Natural Resources. Permit applications for this project are being reviewed by those authorities.

The proposed work is within the "Lake Michigan Protection Zone" as defined by municipal Code Section 150.703(E)(1). Comments pertaining to the submittal are as follow:

The submittal addresses each of the standards of Section 150.703.1. However, each of the comments submitted by Shabica & Associates should be supported by a detailed explanation justifying the comment being made. The submittal generally lacks adequate information supporting and explaining the statements regarding Code compliance.

The following are responses to the requirements specified in Section 15-0.703(1):

d. *The Applicant has proposed appropriate long-term maintenance requirements and plans, as necessary, for the proposed Regulated Activity and/or Structure*

The project has a long-term maintenance plan. Monitoring of the project is also required for 5 years post construction by the IDNR.

(Provide specific details of the long-term maintenance plan. Describe the required monitoring and how it is to be accomplished.)

g. *The proposed Regulated Activity and/or Structure shall be for the purposes of erosion control, water gathering, and/or public access only*

The proposed shore protection will reduce and/or prevent future sand loss and bluff erosion on the subject property and allow access to the beach from the tableland.

(Explain how future sand loss will be prevented; especially during high lake levels or extreme storms. How will the proposed shore protection reduce or prevent bluff erosion?)

h. *There will not be an unnecessary adverse environmental or ecological impact on the Subject Property or on any of the Adjacent Properties as a result of the proposed Structure and/or the Regulated Activity*

The proposed structure will not cause unnecessary adverse environmental or ecological impact. The quarrystone breakwater provides improved habitat for fish. Sand acts as a natural filter for stormwater runoff.

(Explain how the breakwater will not create an adverse environmental or ecological impact.)

i. *The proposed Structure and/or Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose of the Structure*

The proposed system is a viable, environmentally-correct means of achieving the stated purpose.

(How is the proposed system a viable, environmentally-correct means of achieving the stated purpose?)

j. *The Applicant has properly obtained any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure*

All Federal, State and County permits are under review and nearing issuance. The state and federal permit application is attached. All permits will be issued prior to any work commencing.

(Federal and State permits have not been issued as of March 31, 2015; or provide copies if they have.)

vii. *Copies of any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure*

Federal and State permits are attached.

(Permits are not attached.)

xiii. *An explanation, in narrative form, of the following:*

A. *Any and all erosion problems on the Subject Property for which the Structure and/or Regulated Activity is designed to correct or remedy*

This system is designed to protect the Subject Property from future sand loss, lakebed downcutting and bluff erosion due to stormwave damage.

(This statement does not provide a satisfactory explanation.)

The report should be revised so that each statement in response to the required information in Section 150.703(1) is supported with a detailed explanation.

Upon completion of the project, a written statement from Shabica & Associates certifying that all of the work has been successfully completed in accordance with the approved plan and project specifications is required.

It is my opinion that the Shabica & Associated submittal for the proposed breakwater at 55 South Deere Park Drive meets the intent of Article VII of the Zoning Code, and I do not object to the construction of another breakwater at 55 South Deere Park Drive as long as the necessary Federal and State permits are issued. The report should be revised to include more supporting information and address the issues in this memo.

Please contact me with any comments regarding this memo.

Shabica & Associates, Inc.
WE BUILD BEACHES

Mr. Joe Pasquesi, Civil Engineer
Public Works Department, City of Highland Park
1150 Half Day Road
Highland Park, Illinois 60035

Dear Mr. Pasquesi: April 6, 2015

Thank you for your review comments on the submittal for proposed shoreline stabilization at 55 S. Deere Park Drive. I have reviewed your comments and my written rebuttals have been copied into this letter after each of your comments.

d. The Applicant has proposed appropriate long-term maintenance requirements and plans, as necessary, for the proposed Regulated Activity and/or Structure

The project has a long-term maintenance plan. Monitoring of the project is also required for 5 years post construction by the IDNR.

(Provide specific details of the long-term maintenance plan. Describe the required monitoring and how it is to be accomplished.)

SA Response: The IDNR requires that all breakwater projects be monitored for sand gain/loss and any other impacts from the work. This monitoring includes 4 topographic and hydrographic surveys at intervals between 25ô and 50ô (pending the width of the property) extending to the distance of 300ô lakeward of the system. The surveys are completed on land; as well, as with divers or a boat in the water and appropriate data collection devices (i.e. total station, single beam bathymetric transducer, etc.) The 4 surveys are preconstruction, immediately post-construction, and at 1-year and 5-years post-construction. After the 5-year post-construction survey, a summary of the impacts must be submitted to the IDNR addressing impacts, if anysed. At that time, the IDNR has the option to request modification to the system or placement of additional mitigational sand. In addition to the required monitoring by the IDNR, SA personnel inspect the site annually during the 5-year monitoring period to examine the breakwater construction and how the system is functioning. The previous project at 55 S. Deere Park Drive shows a net loss of 93 cubic yards of mitigational sand from the project area.

g. The proposed Regulated Activity and/or Structure shall be for the purposes of erosion control, water gathering, and/or public access only

The proposed shore protection will reduce and/or prevent future sand loss and bluff erosion on the subject property and allow access to the beach from the tableland.

(Explain how future sand loss will be prevented; especially during high lake levels or extreme storms. How will the proposed shore protection reduce or prevent bluff erosion?)

SA Response: The design of the system reduces the breakwater gap that allows for reduction of energy in the water. This promotes reduction of erosion in the bay. Additionally, the 30ô breakwater spur will

prevent waves from directly impacting the vertical steel groin that will again reduce wave energy, wave scour and sand loss. The breakwater will also prevent waves from impacting the north end of the revetment/bluff toe as waves will break on the breakwater spur prior to impacting beach and revetment. During extreme storms all beaches will lose sand and then recover to some extent. Beaches with quarrystone breakwaters typically have less erosion and quicker recovery than open beaches.

h. *There will not be an unnecessary adverse environmental or ecological impact on the Subject Property or on any of the Adjacent Properties as a result of the proposed Structure and/or the Regulated Activity*

The proposed structure will not cause unnecessary adverse environmental or ecological impact. The quarrystone breakwater provides improved habitat for fish. Sand acts as a natural filter for stormwater runoff.

(Explain how the breakwater will not create an adverse environmental or ecological impact.)

SA Response: Quarrystone breakwaters are a statewide BMP to help improve lake habitat over the devoid open expanse of lakebed. By holding sand, breakwaters reduce lakebed downcutting which is an irreversible phenomenon that creates deeper water closer to shore, and therefore allows larger waves to impact the shoreline. Additionally, when the clay lakebed is exposed due to sand loss; eroding clay increases water pollution by allowing colloidal material into the water column. And, as previously stated, a sandy beach acts as a natural filter for stormwater runoff.

i. *The proposed Structure and/or Regulated Activity is the least environmentally and ecologically intrusive means of achieving the stated purpose of the Structure*

The proposed system is a viable, environmentally-correct means of achieving the stated purpose.

(How is the proposed system a viable, environmentally-correct means of achieving the stated purpose?)

SA Response: See response above. Breaking waves offshore, holding a sandy beach for waves to break on and reducing water pollution is a viable, environmentally correct means to help stabilize the property.

j. *The Applicant has properly obtained any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure*

All Federal, State and County permits are under review and nearing issuance. The state and federal permit application is attached. All permits will be issued prior to any work commencing.

(Federal and State permits have not been issued as of March 31, 2015; or provide copies if they have.)

SA Response: State permits are attached. The USACE permit is in its final review and will be submitted upon issuance.

vii. *Copies of any and all permits required by the federal, state, and county governments for the Regulated Activity and/or the Structure*

Federal and State permits are attached.

(Permits are not attached.)

SA Response: See above.

xiii. *An explanation, in narrative form, of the following:*

A. *Any and all erosion problems on the Subject Property for which the Structure and/or Regulated Activity is designed to correct or remedy*

This system is designed to protect the Subject Property from future sand loss, lakebed downcutting and bluff erosion due to stormwave damage.

(This statement does not provide a satisfactory explanation.)

SA Repsonse: There has been substantial erosion at the north portion of the shoreline at 55 S. Deere Park Drive. Currently the revetment is protecting the bluff but fluctuating sand quantities can lead to lakebed erosion. The north spur was in the original design from 2008, but never implemented; as the previous owner of the property to the north had his property for sale, and didnôt want to have a pending state and federal permit tied to his property, as the steel groin is on his property. At this time, the new owner of the north property is preparing to do shoreline stabilization work and has authorized this work.

The report should be revised so that each statement in response to the required information in Section 150.703(1) is supported with a detailed explanation.

Upon completion of the project, a written statement from Shabica & Associates certifying that all of the work has been successfully completed in accordance with the approved plan and project specifications is required.

SA Response: SA will provide a written statement to the city stating that all work was successfully completed in accordance with the approved plans and specifications.

Please let us know if you have any further questions about this project. We are happy to discuss the project with you.

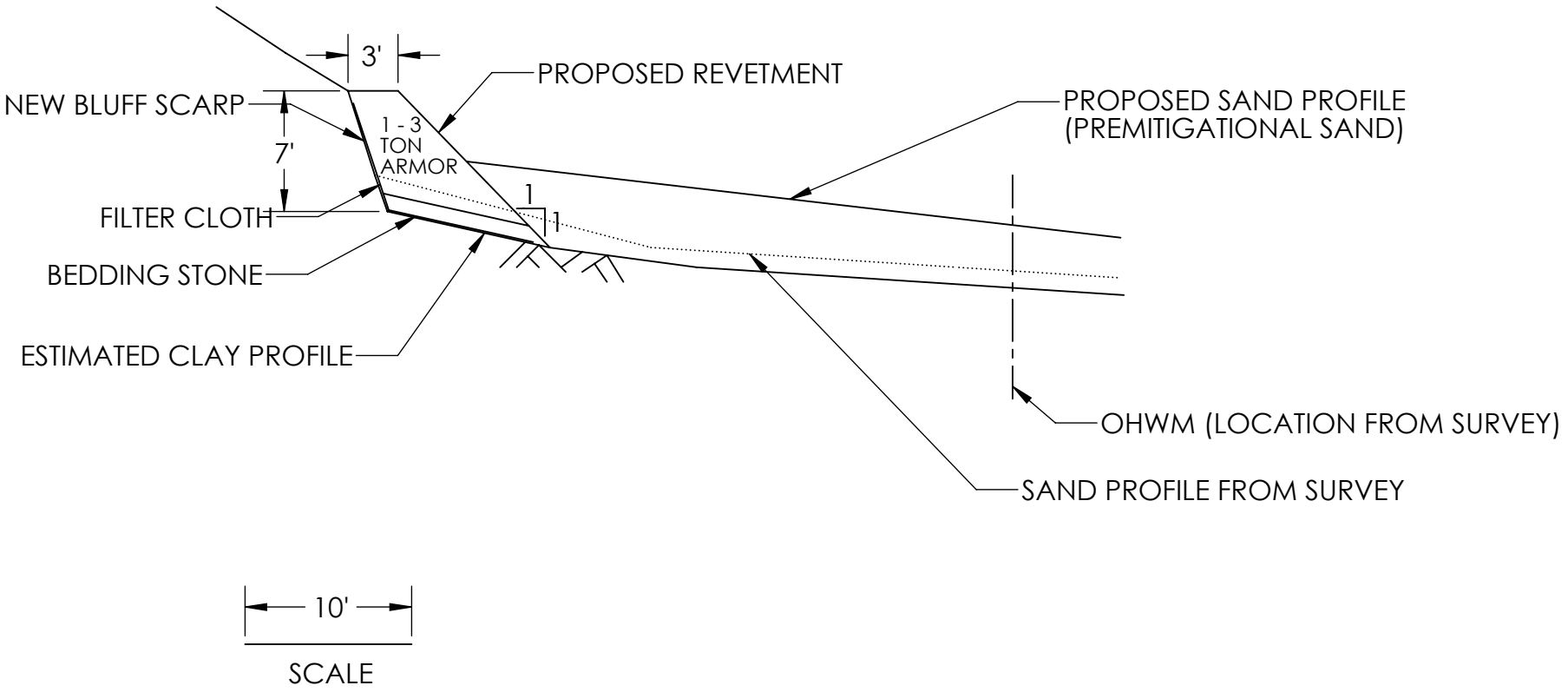
Sincerely,

Stefanie Nagelbach

Stefanie Nagelbach, CPESC

C: Karen Berardi, Assistant to the City Manager

CROSS SECTION D-D



	NAME	DATE
DRAWN	SN	4/24/15
REVISED		

Project Location:
57 S. DEERE PARK DR., HIGHLAND PARK

COMMENTS:

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

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

SIZE A | CROSS SECTION D-D | REV

SCALE: 1:120

5 4 3 2 1

SURFACE AREA OF WETLANDS FILLED BY QUARRYSTONE EAST OF OHWM (581.5) = .05

LAKE MICHIGAN

WATER LEVEL =578.6 IGLD85
(ON 5-22-2014)

PROPOSED BREAKWATER

PROPOSED GROIN TOE PROTECTION

CREST 583'

CREST 582'

CREST 584'

116'

575

574

578

579

580

583

585

586

590

595

T=583.87

T=583.85

T=585.52

T=583.89

T=585.01

T=584.02

T=585.43

OHWM 581.5

PROPOSED BREAKWATER SPUR

EXISTING STEEL GROIN

EXISTING STONE BASKETS

NEW STONE STAIRS IN SIMILAR LOCATION TO EXISTING

EXISTING STONE STAIRS

TOE OF EXISTING STONE PATIO

PROPOSED REVETMENT

55 S. DEERE PARK DRIVE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

57 S. DEERE PARK DRIVE HIGHLAND PARK, IL.

	NAME	DATE
DRAWN	MS	8/12
CHECKED	SN	8/15
MODIFIED	SN	4/24/15

COMMENTS:

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

MODIFIED

Project Location:
57 S. DEERE PARK, HIGHLAND PARK

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

SIZE B

PLAN VIEW

REV

SHEET 1 OF 1

PUBLIC WORKS MEMORANDUM

DATE: May 5, 2015

TO: Karen Berardi, Natural Resources Commission Liaison

FROM: Joe Pasquesi, Civil Engineer

SUBJECT: 57 South Deere Park Drive Revetment

I do not have any objections to the construction of the proposed stone revetment at 57 South Deere Park Drive; subject to the permits required by the Army Corps of Engineers and Illinois Department of Natural Resources. The proposed revetment is allowed by the Zoning Code and is intended to protect the toe of the Lake Michigan bluff (Steep Slope Zone) from wave action and beach erosion. The plan for the revetment should be signed and sealed by a licensed professional engineer. Upon completion of the revetment, a licensed professional engineer must certify that the revetment was constructed in accordance with the approved plan and specifications.

Please contact me with any comments regarding this memo.