

Beach Erosion Containment

Memo from the Beach Committee and Martha Laughna ~ President CPA

January 2018

In my recent letter to members of Castle Park Association I included a brief mention of a project that lake front owners are pursuing to protect their shoreline. This project potentially has significant implications for the Castle Park Association because the CPA is also responsible for some lakefront property, and Castle Parkers love the lake! I would like to provide some history about this project, details of the current situation, the current recommendation of the Beach Committee and how this project could affect CPA.

Lake Michigan has long been a central focus of Castle Park. Whether you are a beachgoer, sunset watcher, dune climber, swimmer, or boater, the lake plays a central role in our existence at Castle Park. Unfortunately, high lake levels have forced erosion to the forefront of our minds. Preserving our lakefront access and surrounding property as much as possible is important to the fabric of Castle Park. This memo is intended for informational use. As more details become available, CPA members will be updated. No proposals are being considered by the board at this point in time.

Background

The Lake Michigan shoreline along Castle Park has been steadily eroding for hundreds of years. The lakeshore today lies more than 250-300 feet east of where it was in the early 1900's. There is no reason to think this erosion will stop. We have recently been lulled into a bit of a false sense of complacency, as up until about five years ago the lake water levels were low and we had a great beach. In fact, when looking at historical Lake Michigan water levels, the levels we experienced from 2003-2013 were some of the lowest water levels of the past 100 years. Due to several factors, the water level in Lake Michigan has risen consistently over the past few years; snow melt and wet weather along with the fact that the US Army Corps of Engineers (USACE) is not taking aggressive action in dumping water out of Lakes Ontario and Erie, have contributed to the rising waters. Last summer it became apparent that emergency action may be required in order to protect the bank in front of all of the cottages from Thier up to the John/Katie Palmer cottage. These lakefront owners formed an LLC to facilitate installation of Geotubes (very large tubes filled with sand and water) along the lake shore to dissipate the energy of the waves before they slammed against the shoreline. The Beach Committee, at that time, recommended that the CPA also join the LLC and the Geotube project in order to protect the bank at Castle Beach. The CPA Board of Trustees voted unanimously in favor of installing the Geotubes on Castle Beach because it was a relatively inexpensive stopgap measure to curb the immediate erosion problem. November is notorious for major wind and wave action and the hope was that these tubes could be installed during the fall to remediate the danger during November. As mentioned in the President's Letter to the membership, several factors prevented this project from coming to fruition.

Private Shoreline Owner Efforts

As part of the study which brought forth the Geotube project, several cottage owners continued to pursue alternative long term measures to prevent further erosion along the lake shore in front of their cottages. A corps of homeowners invited several engineering firms who are very knowledgeable and experienced in lakefront erosion containment to evaluate their needs and provide guidance regarding erosion containment. After careful consideration, John Palmer, who led the charge in this effort, recommended that these cottage owners hire Abonmarche to further develop, engineer and communicate a long-term solution to control the erosion from the Thier cottage north to the new Palmer property (aka Crow's Nest). In the middle of that line of cottages lies the Ridge Rd. easement, a 24 foot stretch commonly referred to as North Beach.

Early in December Abonmarche conducted two conference calls accompanied by a powerpoint presentation to educate interested lake front cottage owners about the potential options available and the benefits of each. After these owners evaluated several options, Abonmarche gathered feedback from these cottage owners and recommended a solution which incorporates the desires of all owners. The private lake shore owners abandoned the Geotube project in favor of pursuing a more permanent long term solution. All these cottage owners have preliminarily committed to installing the armor stone revetment recommended by Abonmarche. Abonmarche will soon apply for a permit to construct the most

aggressive solution so that owners have flexibility in how aggressive they want to be in their protection system (owners can build less than the permit allows but cannot build more).

Beach Area Zones (provided by Dick Shepard, Beach Committee Chair)

Castle Park has four different zones when it comes to the issue of beach protection. Two involve private property and two would require the involvement of the Castle Park Association.

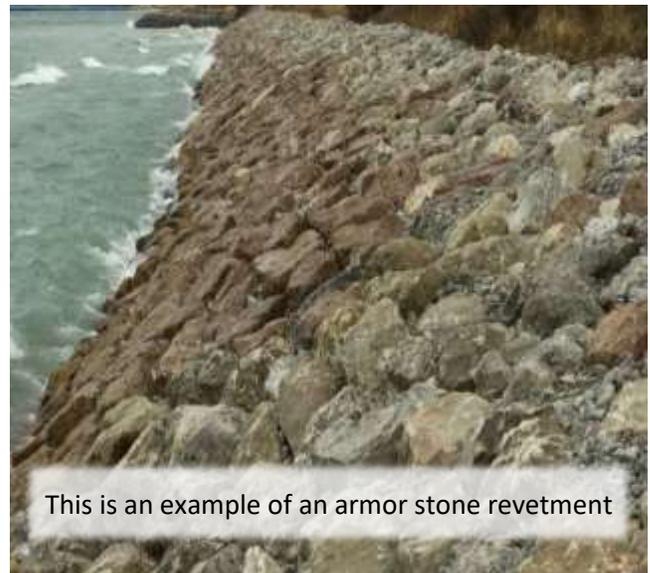
The most straightforward zone lies at the north and south ends of the Castle Park shoreline. Because the cottages are set back at a safe distance from the shore, the Muzzy property and South Dune Assoc. will most likely take no protective action. This is good news since all protection methods delay the return of sand beach.

The second zone consists of the cottages along Lovers Ln. up to the John/Katie Palmer cottage, Crow's Nest, most of which have protection from 20 years ago that is failing. As mentioned above, these owners plan to invest in limestone revetments¹ that are currently being designed and permitted by Abonmarche. Hopefully installation will occur this spring, especially if water levels continue to rise. This would be a huge investment on the part of these cottage owners: over \$2 million in total would be funded by the lakefront owners to protect their property.

Castle Park Association Beaches

The last two zones would be the responsibility of the Castle Park Association. One piece is the Castle Beach property and the other is a public easement at the end of Ridge Rd. (the 24 ft. road easement known as North Beach). Castle Beach and North Beach have absorbed most of the beach activity for well over 50 years and are considered to be Castle Park beaches.

Castle Beach ~ Castle Beach is critical to many Castle Parkers who rely on the beach for swimming all day and that end of the day dip. It is also the most complicated solution. Once the Geotube project for fall 2017 fell through, at the recommendation of the beach committee, Castle Beach went into a "wait and see" mode based on the hope that the Army Corps of Engineers (USACE) would take aggressive action to drop the water levels. While this beach was considered for the Geotube project, installing the armor stone revetments is more complicated. The easiest solution would be to bridge the gap between the "riprap" in front of the dance dune and the Thompson stone revetment. The distance is only about 70 feet and would be straightforward, however taking this approach would significantly delay the return of the beach. The "cove" design that Mother Nature has cut out (once again) is a much better design for maintaining a small beach even in high water conditions.



Recent forecasts published by USACE indicate that the lake level is likely to continue to rise. To protect Castle Beach from eroding further in very high water years, the beach committee now recommends that the limestone revetments being used elsewhere be placed on all three sides of the cove. Instead of 70 feet of direct line protection, now we are talking 160+ feet of limestone... 50+ feet in on both sides and about 60 feet along the East edge. The result would be a long term "pocket" of sand and the protection of the existing Dance Dune on the north side of the cove. The beach committee currently recommends that the CPA apply for a permit now but if water levels allow, delay construction until financing can be procured and to wait and see if the construction prices go down when contractors are more available.

¹ a retaining wall or facing of masonry or other material, supporting or protecting a rampart, wall, etc. The revetments on our beaches will have a slope of 2:1 or better.

North Beach ~ North Beach is simply a 24-foot road easement at the west end of Ridge. It is technically owned by the county road commission however the CPA and adjacent owners have a history of maintaining this area, and the west end of the road is essentially abandoned. The CPA has financially supported its proportionate share of the preliminary engineering work. This area has been pursued aggressively by the beach committee because there are cost efficiencies to joining in with surrounding private property owners, the situation is dire, and protection involves significantly less money than Castle Beach due to the short distance. In addition, and perhaps most important, leaving a gap in the beach protection is likely to cause even worse erosion in the area of the North Beach steps. Being that the easement is not privately owned and that this area has been available for decades for use by all members of the association, the beach committee recommends that the CPA be responsible for this portion of the shoreline. Seeking public funding is not recommended as it would open the beach to the public. The North Beach portion of the project must be completed along with the surrounding properties, or not at all, due to the permitting process and the logistics of the construction.

Where we stand now...

The CPA has not formally entered into any agreement to complete these projects. Currently Abonmarche is preparing to apply for a permit and will establish a firm proposal for installation of the armor stone revetment on the private property along the lake as well as the short section at North Beach. The beach committee will begin to evaluate options for Castle Beach now that it has recommended that we add that to the erosion containment project. The current cost estimate to install an armor stone revetment for both Castle Beach and North Beach is approximately \$2000/linear foot. Once Abonmarche delivers a formal proposal for construction, the beach committee will construct a proposal for the CPA board to consider.

How does this affect the CPA going forward?

The board will discuss the design and procedures for this project but will not vote on anything until we have an actual proposal from Abonmarche and the selected contractor. While Abonmarche has been able to give of some idea of the costs associated with construction, we will not be able to firm up the cost until we have a proposal from the construction contractor. The beach committee, and especially Dick Shepard, will remain intimately involved in evaluating options with respect to recommendations made by Abonmarche.

Project participation: The board will evaluate the anticipated proposal to install armor stone revetments at North Beach likely during spring or fall of 2018. In addition, the Beach Committee recommends that the CPA apply for a permit to construct the revetment but delay construction until financing can be arranged. Permits generally are valid for five years.

Staging area: Regardless of the position that the CPA takes on this project, the private owners will be seeking permission from the CPA to use some areas for staging. Likely the area at the top of the North Beach steps and the field to the east of the north tennis courts will be recommended. Reparations to the North Beach steps and the field are a likely added expense. The recommendations for Castle Beach are not finalized as, due to the newly available USACE report, this is a new addition to the Beach Committee's recommendation.

Financing: The Board of Trustees will be evaluating financing options in order to be prepared in the event that the board approves either of these projects. The expected cost is beyond the capacity of our current capital fund however depending on the timing, it is possible that the North Beach portion could be done without additional financing. Updates on the project will be sent regularly.

In Summary...

The Beach Committee recommends building the revetment at North Beach this spring or fall, (whenever the private properties get done) because it is "Now or Never". They also recommend that Castle Beach have the revetment installed but the timing is more in our hands since it is not integral to the private wall being built.