

# SOLANUS MISSION BEACH CITY OF PETOSKEY, MICHIGAN

20-CHHC-001

FEASIBILITY PLAN

January 29, 2021

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*Financial assistance for this project was provided, in part, by the Coastal Management Program, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, under the National Coastal Zone Management Program, through a grant from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.*

*VIEW DISCLAIMER: The statements, findings, conclusions, and recommendation in this (report/video) are those of the (Grantee) and do not necessarily reflect the views of the Michigan Department of Environment, Great Lakes, and Energy or the National Oceanic and Atmospheric Administration.*



## I. Project Summary

In winter of 2019, the City of Petoskey and its consultant, Beckett & Raeder, Inc. (BRI) began conceptual design for a waterfront portion of public property within Petoskey's Bayfront Marina referred to as Solanus Mission Beach. The original objective was to provide pedestrian accessibility into Solanus Mission Beach, which is one of the few remaining areas of natural great lakes shoreline in the vicinity. Subsequent to preparation of a conceptual plan, the Coastal Management Program / NOAA planning grant funding opportunity (GFO) was announced, after which the City decided to pursue the opportunity in order to more comprehensively plan the project. The City and BRI completed an application for the GFO which was approved and for which the commencement date was January 1, 2020. Initial drone data collection by Baird Engineering for Solanus Mission Beach was performed during December as a larger effort to gather data for the Little Traverse Bay shoreline before seasonal conditions were prohibitive; however, Coastal Zone Management grant funds were not applied toward any work occurring before the beginning of the grant period.

Weather, snow cover and the State of Michigan stay-at-home executive order limited work during the first quarter to preliminary analysis by Baird Engineering and initial inventory by Beckett & Raeder, Inc. During the second quarter, the topographic survey, and site inventory and analysis was conducted by consultants and stakeholders/in-kind contributors. Final reports regarding site inventory, analysis and recommendations were completed during the third quarter. Progress updates on the effort were provided during Parks and Recreation Commission meetings during the third quarter.

During fall of 2020, The City of Petoskey was also in the process of completing a 5-year Parks and Recreation Master Plan amendment, intended to address resiliency and sustainability. The opportunity was taken to conduct public input regarding the Solanus Mission Beach Feasibility Plan during the required public input session for the master plan amendment on October 12, 2020, which was advertised during the Parks and Recreation Commission meeting on September 14<sup>th</sup>, and during the City Council meeting on October 5, 2020. The original conceptual plan, inventory and analysis findings were presented to the commission during the online meeting, which was attended by members of the public. Meeting attendees were presented a series of questions in live poll format, and asked to provide responses based on their knowledge of the park and the information provided. A link to the poll opportunity was provided on the City website along with the opportunity to participate in the master plan update. The polls were concluded and outcomes presented during the November 9<sup>th</sup> Parks and Recreation Commission meeting.

## II. Inventory and Analysis: Consultant and Stakeholders/In-Kind Contributors

Following are summaries of inventory and analysis performed and recommendations provided by project consultants, stakeholders and in-kind contributors:

- Baird Engineering, Inc.  
During winter and spring of 2020, Baird Engineering performed a city-wide analysis of the Little Traverse Bay shoreline to assess recent storm damage and propose conceptual level solutions to minimize subsequent damage. Per City request, Baird Engineering considered solutions promoting preservation of natural shoreline conditions in the section of their report addressing the Solanus Mission Beach shoreline. Baird's preferred solution facilitates preservation and controlled public access for Solanus Mission Beach.
- Mackinac Environmental Technology (MET)  
During spring and summer of 2020, MET visited the site on a number of occasions to assess environmental conditions, and to inspect the site for presence of Threatened and Endangered Species included on State and Federal inventories. MET also performed a report on State and Federal Regulations and Compliance Interpretation. Finally, MET provided a background report on an EPA redevelopment site adjacent east to Solanus Mission Beach.
- Tip of the Mitt Watershed Center (ToMWC)  
During spring and summer of 2020, ToMWC made a number of site visits to assess Environmental Conditions, inventory Threatened and Endangered Species, conduct invasive species identification, and recommendations for construction standards and post-construction invasive species control. ToMWC has thorough past knowledge of the project site from it's efforts to control and eradicate shoreline invasive species.
- Little Traverse Bay Band Of Odawa Indians (LTTBOI)  
During fall and winter 2020, Beckett & Raeder, Inc. conducted email interviews with Lauren Dey, Water Quality Biologist from the Little Traverse Bay Band of Odawa Indians Odawa Indians, to gain input on the current environmental conditions. The Little Traverse Bay Band of Odawa Indians Native Plants Initiative (2009), prepared by LTTBOI Wetland Specialist Jacqueline Pilette, was consulted and is referenced on the proposed interpretive signage regarding existing native plant species and their cultural significances.  
The LTTBOI and Little Traverse Bay Historical Society was also consulted for information regarding St. Francis Solanus Indian Mission Church.

Inventory and analysis, recommendations and relevant documents can be found in Appendix A.

### **III. Public Input Summary**

BRI is simultaneously working with the City of Petoskey to amend their 5-Year Parks and Recreation Plan to incorporate objectives related to environmental resilience. Public input was solicited during the October 2020 City of Petoskey Parks and Recreation meeting during which the Parks and Recreation Master Plan amendment was discussed, which provided an ideal introduction to present the proposed improvements at Solanus Mission Beach for public input. BRI presented the original concept plan, inventory and analysis findings, and an initial conceptual cost estimate during the meeting and asked attendees to respond to a short number of poll questions regarding development of Solanus Beach. The poll was also posted on the City of Petoskey website until the November meeting in order to provide community members unable to attend the meeting with an opportunity to provide input.

See Appendix B for poll results.

#### IV. Schematic Plan

The schematic plan was developed based on the original intent of providing pedestrian access to Solanus Mission Beach and improving the existing environmental quality, and informed and influenced by the inventory and analysis provided by consultants and stakeholders/in-kind contributors, described in greater detail below.

The shoreline stability study performed by Baird Engineering for the Solanus Mission Beach shoreline found sufficient stability to recommend carefully developed public access to the space. Elements of the plan consistent with the inventory findings and analysis described in consultants and in-kind contributors include:

- Minimal Development Footprint (MET report and site history; LTBBOI and ToTMWC recommendations; public input poll)
- Eradication and Control of Invasive Species (LTBBOI and ToTMWC recommendations)
- Preservation and Promotion of Native Plant Palette (LTBBOI and ToTMWC recommendations)
- Boardwalk Path with Minimal Construction Disturbance (ToTMWC recommendations; public input poll)
- Boardwalk Path Allowing Natural Movement of Wind-Swept Surface Materials (ToTMWC recommendations)

Additional considerations include:

- Boardwalk location beyond initial crest on beachfront, in order to minimize damage to boardwalk materials.
- Low-profile, modular, and/or repositionable boardwalk, to allow for natural wind-driven surface materials movement (ToTMWC recommendations)
- Universal accessibility throughout the boardwalk path to meet or exceed ADAAG.
- Seasonal access mat to water's edge to meet or exceed ADAAG.
- Interpretive signage describing the significance of the project site, and the effort to realize the project.
- Site furnishings to include trash and recycling receptacles and bike racks for users of the Little Traverse Wheelway. The only furnishings proposed within the beach area would be benches, at the entrance from the Wheelway.

Anticipated development permits include:

City of Petoskey Soil Erosion and Sedimentation Control Plan

Emmet County Building Permit

MEGLE General Permit (boardwalk walking surface)

In addition to construction codes, construction requirements are to include:

- All construction equipment to use approved biodegradable lubricants.
- All construction equipment and associated materials must be thoroughly cleaned prior to entering the site, in order to avoid introduction of additional invasive plant species.
- All native materials to remain on-site
- No imported fill to be used on project.

Finally, because of the importance of monitoring construction impacts, the need to monitor for invasive species, and the dynamic natural condition, the following post-construction requirements must be met:

- Revisit site immediately and regularly post-construction to identify and eradicate invasive species
- Assess site at the end of the Fall season in order to identify any impacts of increased use. Assess the proximity of modular / repositionable boardwalk. Relocate as necessary to ensure protection.
- Assess site bi-annually to identify and eradicate invasive species.



Boardwalk Options



Site-Built Repositionable Boardwalk



Roll-Out Boardwalk



Entry Ramp

**V. Opinion of Preliminary Construction Cost**

The following Opinion of Preliminary Construction Cost applies the most recent available construction cost information from related projects, assigns a small factor to account for cost inflation, and includes contingencies for final design and engineering, construction, and construction contract general conditions.



DESCRIPTION	QTY.	UNIT	UNIT COST	SUBTOTAL	TOTAL
<b>SITE PREPARATION and DEMOLITION</b>					
Clearing & Grubbing Vegetation	475	sy	\$7.50	\$3,562.50	
Tree Removal, 6" - 24"	2	ea	\$500.00	\$1,000.00	
Strip Lawn and Topsoil, Stockpile Topsoil	225	sy	\$3.50	\$787.50	
Remove Asphalt Trail	80	sy	\$12.00	\$960.00	
Filter Fabric Fence	250	lf	\$5.00	\$1,250.00	
Stabilized Construction Entrance	1	ea	\$1,500.00	\$1,500.00	
				Subtotal	\$9,060.00
<b>EARTHWORK</b>					
Earthwork	40	cy	\$20.00	\$800.00	
				Subtotal	\$800.00
<b>SITE IMPROVEMENTS</b>					
Concrete Pavement, 5" over 4"	1725	sf	\$6.00	\$10,350.00	
Boardwalk Ramp with Guardrails	980	sf	\$40.00	\$39,200.00	
At Grade Boardwalk	2215	sf	\$27.00	\$59,805.00	
				Subtotal	\$109,355.00
<b>SITE FURNISHINGS</b>					
Accessible (Backless) Benches	4	ea	\$2,100.00	\$8,400.00	
Trash and Recycling Receptacles	2	ea	\$900.00	\$1,800.00	
Interpretive Signs	2	ea	\$750.00	\$1,500.00	
Bike Loops	10	ea	\$750.00	\$7,500.00	
				Subtotal	\$19,200.00
<b>LANDSCAPING AND SITE RESTORATION</b>					
Spread 2" Topsoil	75	cy	\$25.00	\$1,875.00	
Shrub Planting, 18"	350	ea	\$40.00	\$14,000.00	
Perennials, 18" O.C. Typ.	370	ea	\$25.00	\$9,250.00	
Lawn Seeding and Irrigation Modifications	1	ls	\$2,500.00	\$2,500.00	
				Subtotal	\$27,625.00
<b>SUBTOTAL</b>					<b>\$166,040.00</b>
General Conditions (5%)					\$8,302.00
Design Contingency (10%)					\$17,434.20
<b>TOTAL ANTICIPATED BID</b>					<b>\$191,776.20</b>
Construction Contingency (10%)					\$19,177.62
<b>A. TOTAL ANTICIPATED PROJECT COST:</b>					<b>\$210,953.82</b>
Permitting					
MDEQ/USACE Joint Permit				\$50.00	

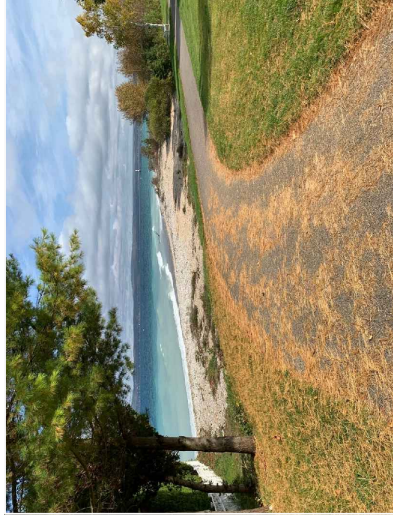
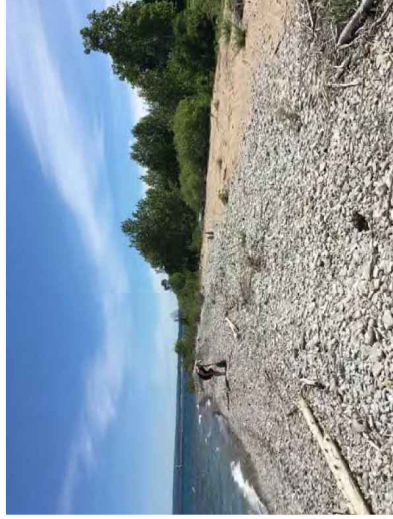
## **VI. Interpretive Signage**

Following is the proposed interpretive signage proposed for the project.

# Solanus Beach

## City of Petoskey

In 2019, the City of Petoskey received funding from the Michigan Department of Environment, Great Lakes and Energy, and the National Oceanic and Atmospheric Administration for planning of sensitive shoreline locations. The purpose of the funding opportunity and planning exercise was to examine the site to determine the feasibility of improved public access, balanced with preservation of the natural environment. This included an analysis of existing natural conditions, identification of cultural and historical issues related to the site, and an assessment of future resiliency or stability. The improvements that are present today are a result of that comprehensive planning process. Images below show Solanus Mission Beach prior to completion of this project.



This area of Bayfront Park, referred to as Solanus Beach, includes one of the few remaining natural great lakes shoreline within the park and city limits. This project attempts to formalize universal pedestrian access that allows visitors to experience the setting in a somewhat controlled manner, in order to best preserve that condition. Preserving unique natural spaces while allowing for limited visitor access can increase awareness regarding the importance of these spaces.

Solanus Mission Beach takes its name from St. Francis Solanus Indian Mission Church, which was settled in 1855 by Father Frederic Baraga and is the oldest building standing in Petoskey today. Solanus Mission Church still serves a community role to the church and to the Little Traverse Bay Band of Odawa Indians, who help maintain the building and participate in the annual Mass.



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MICHIGAN DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY



# Solanus Beach

## City of Petoskey

Solanus Beach includes many native plants typical to the great lakes natural shoreline habitat. Many of these native plants also carry cultural significance to the indigenous peoples of the area: Wormwood was used in medicine and smudge; Red Twig Dogwood was commonly used in crafting and also served medicinal purposes.

Due to the dynamic shifting topography and proximity to developed landscapes, the area is also prone to invasive species establishment. Preservation of the native habitat is maintained by control of invasive species through inspections and eradication measures, combined with establishment and promotion of native species.



SWALLOW WORT

INVASIVE SPECIES  
PREVIOUSLY FOUND IN  
SOLANUS BEACH



SPOTTED KNAPWEED



GRAY WILLOW



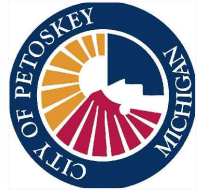
AMERICAN BEACH GRASS



DOGWOOD

NATIVE SPECIES FOUND IN SOLANUS BEACH

Please clean your shoes on the brush provided before entering this sensitive environmental space, in order to reduce the risk of invasive species spread.



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Appendix A: Inventory, Analysis and Recommendations

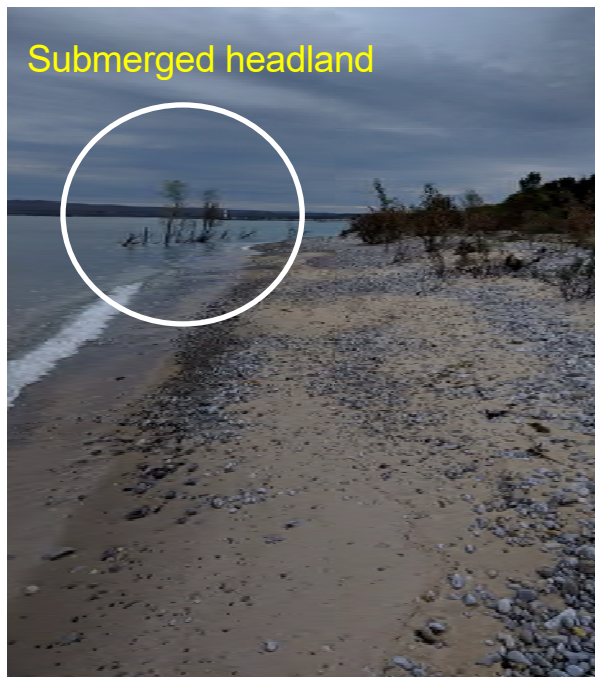
## 2.4 Solanus Mission Beach

The Solanus Mission Beach (SMB) area consists of approximately 1,000 LF of shoreline, abutting private shoreline properties (condominiums to the east and a private residence to the west). A native sandy/ cobble beach makes up the western portion of the area (~400 LF of shoreline). A natural headland (lakeward undulation of the shoreline) near the eastern end of the beach appears to have helped form this stable beach area. A naturalized stormwater drainage channel exists immediately east of the natural headland. The eastern portion of this shoreline area (~500 LF) consists of a degrading stone revetment structure affronting a large open public green space. A description of each area is provided below.

This site is named after the St. Francis Solanus Mission church (the oldest building in Petoskey), which is located landward of the native beach area. Fortunately, the historic church is located a safe distance from coastal hazards.

### 2.4.1 Area 1: Native Beach Area

The SMB native beach appears stable and is not in immediate need of repair; however, there is an existing headland that is currently underwater and likely eroding due to the current high lake levels, which could impact the long-term stability of the beach area - as shown below in Figure 2.15 (left image). The existing trail way that traverses along the back of the native beach area is located at a safe distance from the shoreline, so it is not currently impacted by coastal hazards (i.e. waves, flooding, ice, erosion, etc.). As previously noted, a MCMP grant was recently awarded to the City for this area of shoreline. Beckett & Raeder, Inc. developed an initial plan to improve this section of shoreline through the addition of a public boardwalk and native shoreline habitat restoration, as shown in Figure 2.16, which will be incorporated into the schematic design alternatives for this site.



**Figure 2.15: Existing Beach Area: Looking East (left image), Looking West (right image)**



Figure 2.16: Solanus Mission Beach Concept (Beckett & Raeder, Inc., 5 February 2019)

## 2.4.2 Area 2: Shoreline Revetment

This area of the SMB site consists of a severely damaged shoreline revetment, which has become a continual maintenance issue for the City. The large armor stones have become displaced by coastal processes. The cause of the failure appears to be inadequate revetment design (i.e. low crest elevation, undersized filter stone); however, the exact cause is difficult to identify due to the severe degradation of the structure. Wave energy also scatters smaller cobble stone into the existing lawn area, as shown below in Figure 2.17. No underlying geotextile fabric associated with the stone revetment was observed. Placing geotextile between the filter material and landward soil helps stabilize the revetment structure by preventing erosion of soil material through the revetment structure. Said issues will likely become more prevalent during significant storm events coupled with recent high lake levels. Additional issues, such as subsidence and landside erosion may lead to loss of lawn area/ public park space if no long-term solution is implemented in the near future.



Figure 2.17: Damaged Shoreline Revetment Structure (Baird, 15 October 2019)

### 2.4.3 Solanus Mission Beach Field Data Collection

A series of oblique aerial images of the site (spanning from west to east) collected by Baird via drone on December 22, 2019 are shown in Figure 2.19 through Figure 2.22.

Lakebed sediment along the shoreline for this area generally consisted of cobble and stone material, with a maximum jet probe depth to refusal of < 6 inches, similar to the BPE and BPC sites (see Figure 2.18). The native beach area primarily consisted of rounded cobble stone (0.5" to 6" diameter) with areas of finer grained beach sand. Test pits revealed that the depth of sand in the nearshore beach area was relatively shallow (approximately 6" to 12") atop of typical cobble beach stone. Refer to Figure 2.23 for photos of typical nearshore sand and cobble. Petoskey stone (fossilized rugose coral) was quite prevalent throughout the SMB area.

The existing armor stone (from the damaged revetment) was measured for possible reuse. The following is a summary of the approximate size range and quantity of existing armor stone available for reuse:

- Approximate armor stone size: 1280 to 5120 lbs (from as-built drawings)
- Approximate quantity of armor stone available for potential reuse: 1,044 Tons

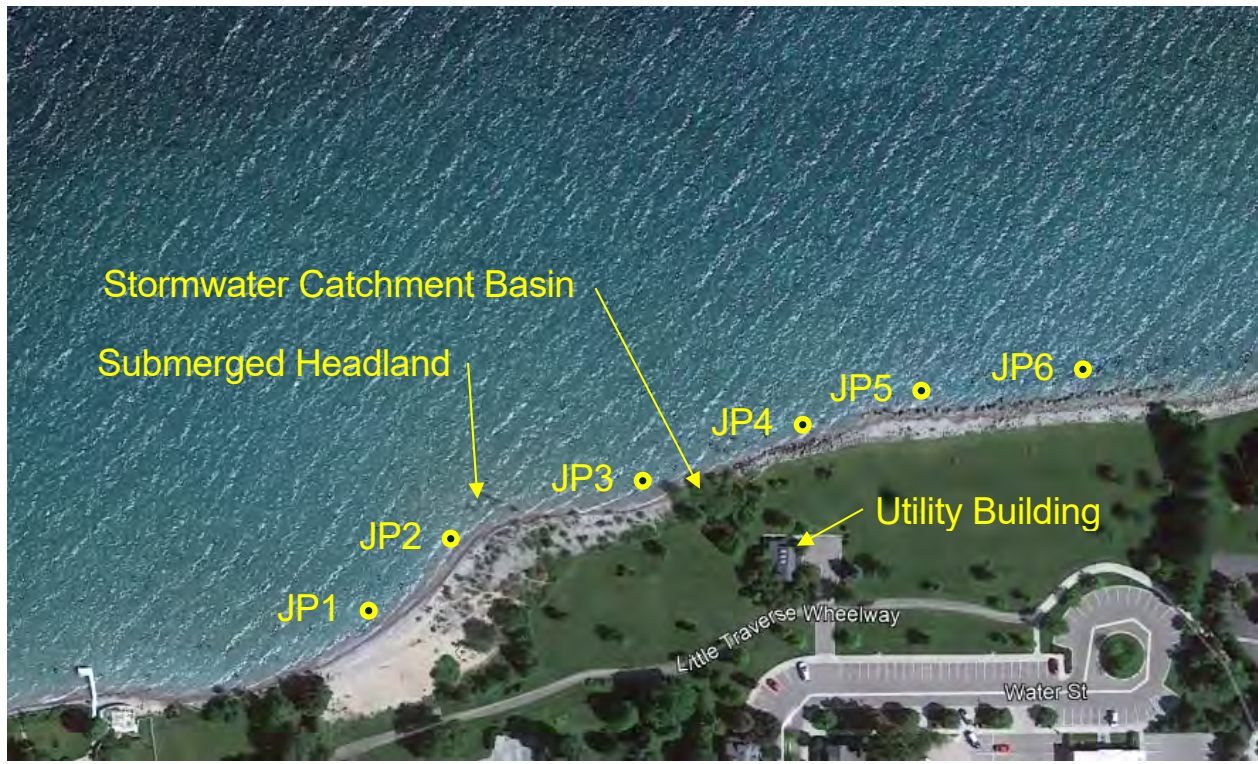


Figure 2.18: Jet Probe Map



Figure 2.19: Existing Solanus Mission Beach Shoreline – Photo 1 of 4 (Baird, 22 December 2019)



Figure 2.20: Existing Solanus Mission Beach Shoreline – Photo 2 of 4 (Baird, 22 December 2019)



Figure 2.21: Existing Solanus Mission Beach Shoreline – Photo 3 of 4 (Baird, 22 December 2019)



Figure 2.22: Existing Solanus Mission Beach Shoreline – Photo 4 of 4 (Baird, 22 December 2019)



Figure 2.23: Solanus Mission Beach Lakebed Sediment (Baird, 22 December 2019)

#### 4.4 Solanus Mission Beach

Initial Solanus Mission Beach design alternatives are shown in Figure 4.12, Figure 4.13, and Figure 4.14.

Table 4.5 provides a summary of the initial design alternatives developed for this site.

**Table 4.5: Bayfront Park Central**

Concept	Description
SMB (A)	Revetment along Bayfront Park West (BPW) tied into the Beckett Raeder Plan for Solanus Mission area.
SMB (B)	Relocated shelter with a combination of revetment and cobble beach along BPW. Solanus Mission area per Beckett Raeder Plan. Concept includes placing a submerged offshore reef to reduce wave action and stabilize beach area.
SMB (C)	Expanded native/ cobble beach restoration along entire project area. Solanus Mission area per Beckett Raeder Plan. Concept includes placing a submerged offshore reef to reduce wave action and stabilize beach area.

City Review Comments:

Of these options the city would like to focus on only refining SMB (C), with the following input:

- This concept will create a continuous natural beach restoration across the entire project area limits. City prefers excavating into green park space to expand beach area landward, versus expanding lakeward.
- City noted that maintaining protection of the existing City utility building and stormwater catchment basin from the coastal processes is crucial – meaning that if land is excavated between the building and lake to place a beach, additional protection (i.e. buried revetment or offshore stone reef) should be incorporated as needed.
- City emphasized that the cobble beach design must be completed to ensure that it remains not only functional, but aesthetic during periods of low and high lake levels.
- City requested that no additional shoreline path be provided along the back of the proposed cobble beach area.

Refined consensus plan, labeled SMB (1), is shown in Figure 4.15. Table 4.6 provides a description of the consensus plan.

**Table 4.6: Solanus Mission Beach – Consensus Plans**

Consensus Plan	Description
SMB (1)	This concept replaces the existing failing revetment along the Bayfront Park West shoreline with a cobble beach fronting a native shoreline buffer between the existing lawn area and the shoreline. This will create a continuous beach experience across the entire shoreline reach. An offshore submerged reef oriented to align with the dominate incoming wave direction and sized to reduce wave action along the shoreline is designed to help stabilize the proposed cobble beach area. The reef structure crest elevation is 577.5' IGLD85 to ensure that it remains submerged during periods of lower lake levels but remains effective for wave dissipation at high lake levels. This feature will consist of two layers of armor stone, much of which will consist of salvage revetment stone. This will also serve as a habitat improvement for native fish communities. The

**Consensus Plan**      **Description**

existing storm water catchment basin will remain in-place and functional with this proposed solution and the expanded beach area location (adjacent to the City Utility building) will provide additional protection to said building from coastal processes. B&R’s plan to improve shoreline access and native habitat along the western portion of this site, including the development of a new park shelter is included in this design.

A complete preliminary drawing set and an Engineer’s Opinion of Probable Construction Costs for Solanus Mission Beach is provided in Appendix C.



**Figure 4.12: Initial Schematic Design – SMB (A)**



Figure 4.13: Initial Schematic Design – SMB (B)



Figure 4.14: Initial Schematic Design – SMB (C)

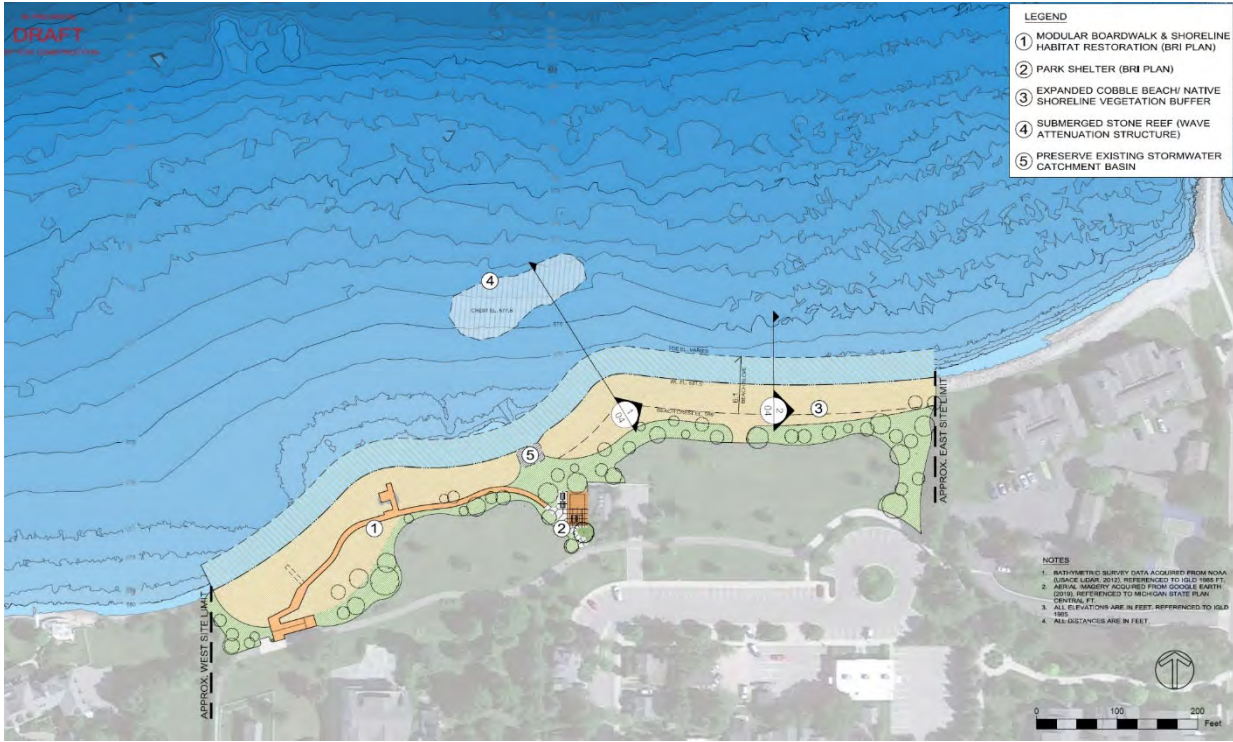


Figure 4.15: Consensus Plan – SMB (1)

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PHOTO 1  
EXISTING SHORELINE



PHOTO 2  
FAILING REVETMENT

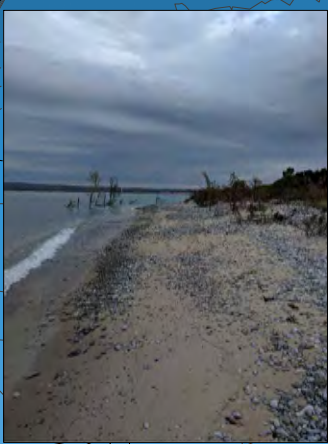
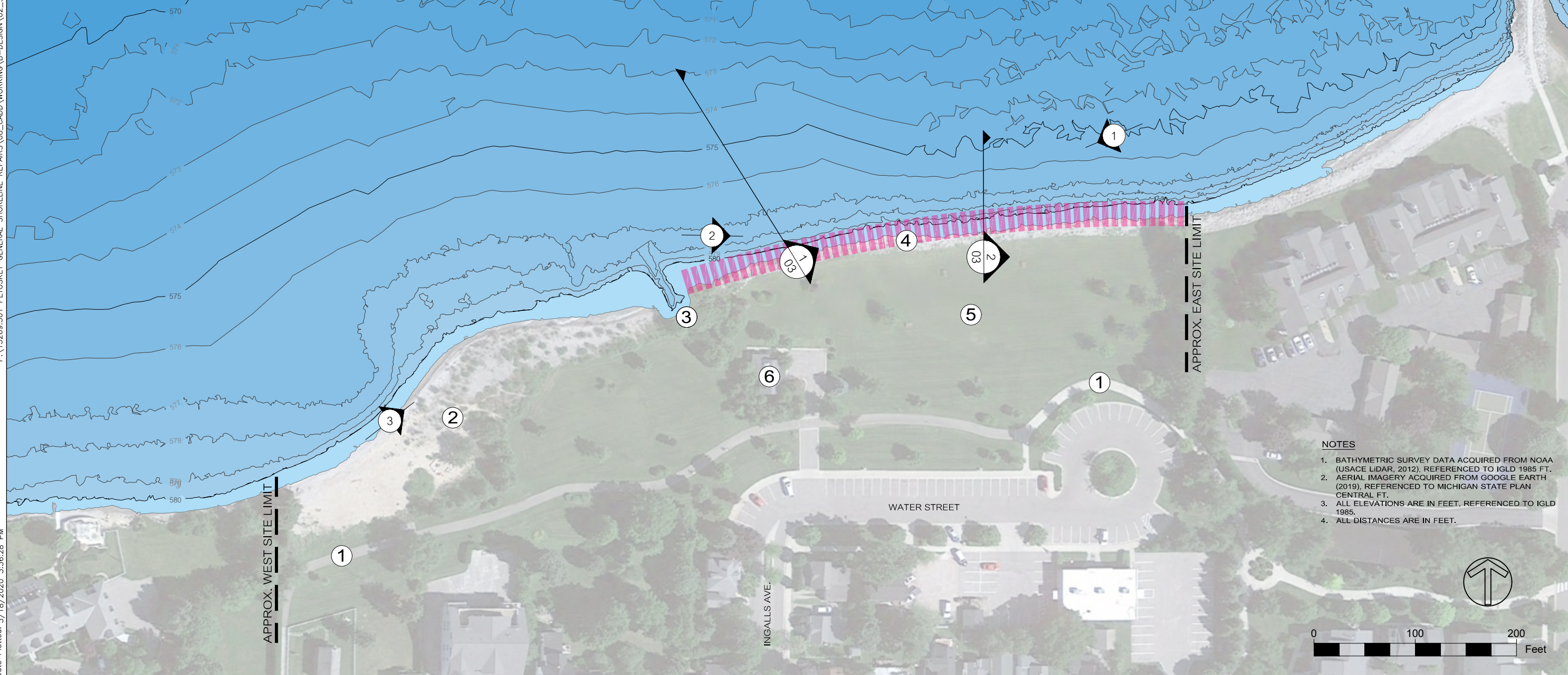


PHOTO 3  
EXISTING SOLANUS MISSION BEACH

LEGEND	
①	LITTLE TRAVERSE WHEELWAY
②	NATIVE BEACH AREA
③	EXISTING STORMWATER CATCHMENT BASIN
④	EXISTING/ FAILING SHORELINE REVETMENT (500 LF)
⑤	PUBLIC GREEN SPACE
⑥	EXISTING PUMP STATION



- NOTES**
- BATHYMETRIC SURVEY DATA ACQUIRED FROM NOAA (USACE LIDAR, 2012), REFERENCED TO IGLD 1985 FT.
  - AERIAL IMAGERY ACQUIRED FROM GOOGLE EARTH (2019), REFERENCED TO MICHIGAN STATE PLAN CENTRAL FT.
  - ALL ELEVATIONS ARE IN FEET, REFERENCED TO IGLD 1985.
  - ALL DISTANCES ARE IN FEET.

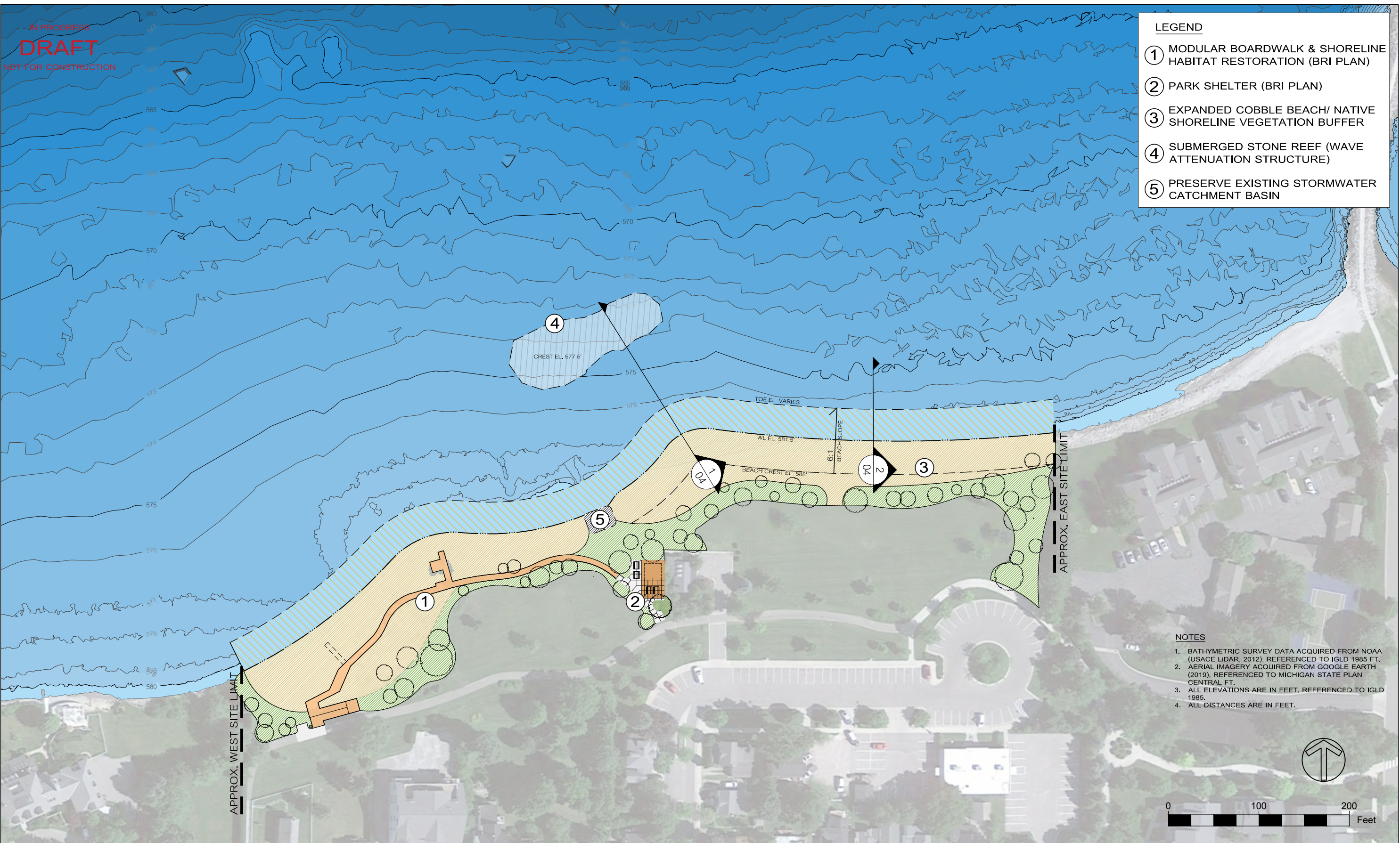
# SOLANUS MISSION BEACH - EXISTING

PETOSKEY SHORELINE IMPROVEMENTS

Project Number: 13269.301-SKT-01  
 Date: 2020-03-17



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**LEGEND**

- ① MODULAR BOARDWALK & SHORELINE HABITAT RESTORATION (BRI PLAN)
- ② PARK SHELTER (BRI PLAN)
- ③ EXPANDED COBBLE BEACH/ NATIVE SHORELINE VEGETATION BUFFER
- ④ SUBMERGED STONE REEF (WAVE ATTENUATION STRUCTURE)
- ⑤ PRESERVE EXISTING STORMWATER CATCHMENT BASIN

- NOTES**
- 1. BATHYMETRIC SURVEY DATA ACQUIRED FROM NOAA (USACE LIDAR, 2012), REFERENCED TO IGLD 1985 FT.
  - 2. AERIAL IMAGERY ACQUIRED FROM GOOGLE EARTH (2019), REFERENCED TO MICHIGAN STATE PLAN CENTRAL FT.
  - 3. ALL ELEVATIONS ARE IN FEET, REFERENCED TO IGLD 1985.
  - 4. ALL DISTANCES ARE IN FEET.

# SOLANUS MISSION BEACH - OPTION 1

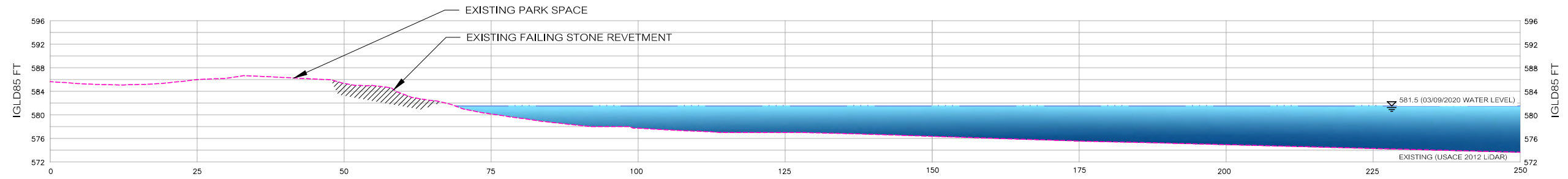
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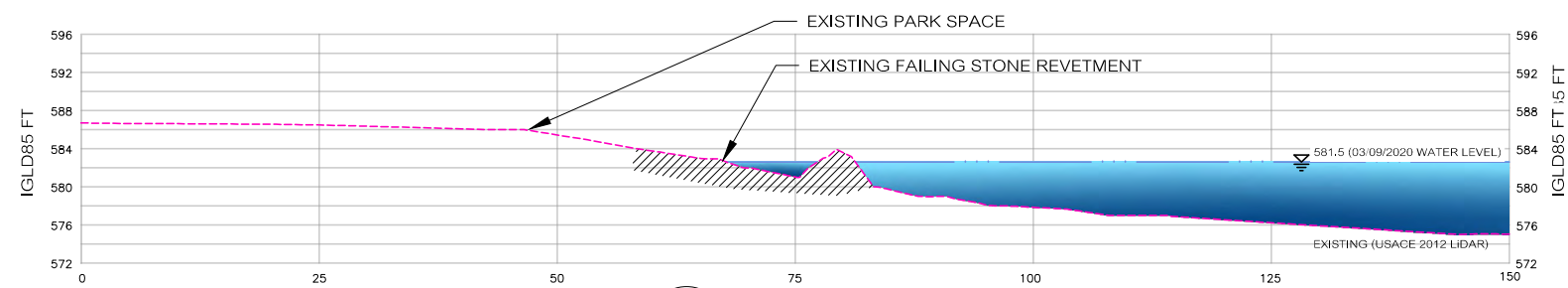


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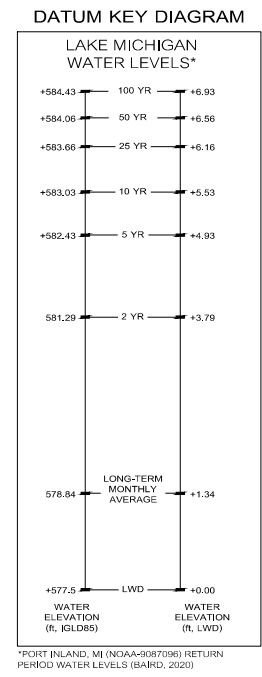
IN PROGRESS  
**DRAFT**  
NOT FOR CONSTRUCTION



1  
03 PROFILE: EXISTING FAILING STONE REVETMENT



2  
03 PROFILE: EXISTING FAILING STONE REVETMENT



NOTES:  
1. ALL ELEVATIONS ARE REFERENCE TO FT. IGLD85  
2. ALL DISTANCES ARE IN FEET.



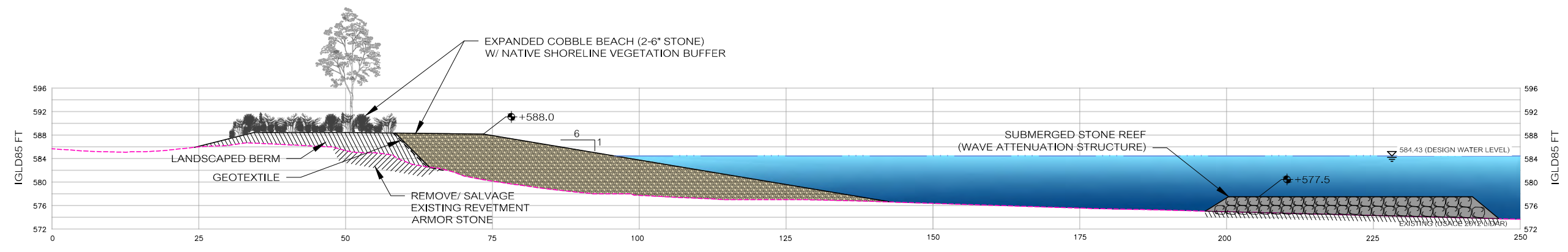
# SOLANUS MISSION BEACH - EXISTING PROFILES

PETOSKEY SHORELINE IMPROVEMENTS

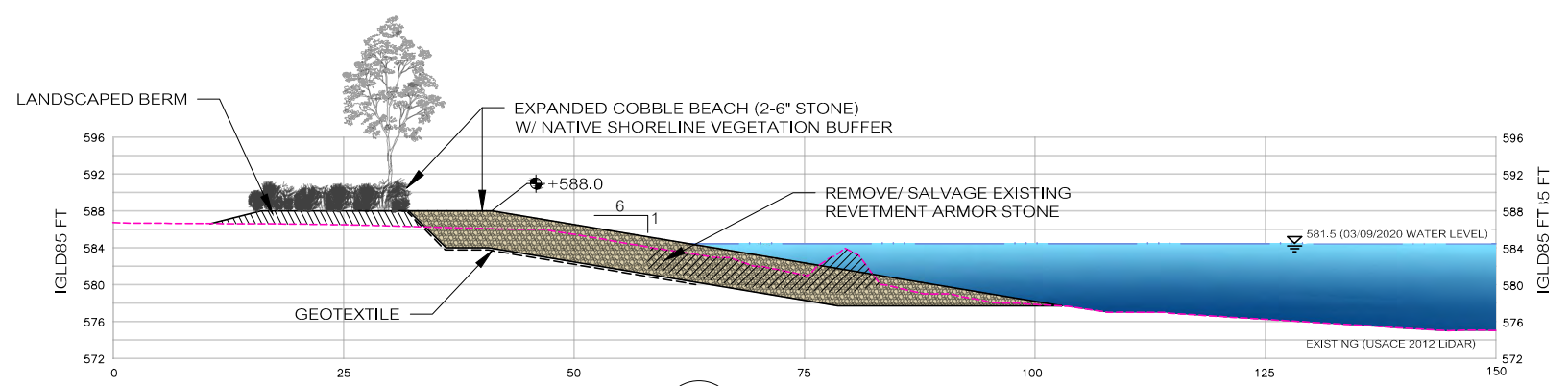


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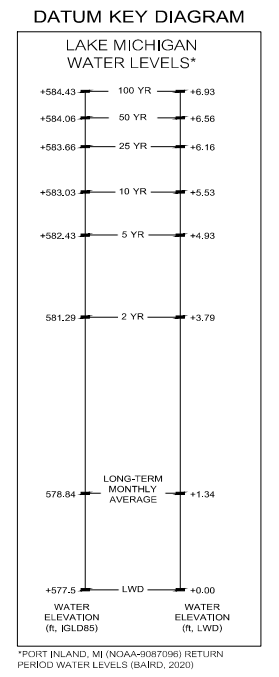
IN PROGRESS  
**DRAFT**  
NOT FOR CONSTRUCTION



1  
04 PROFILE: PROPOSED COBBLE BEACH



2  
04 PROFILE: PROPOSED COBBLE BEACH



NOTES:  
1. ALL ELEVATIONS ARE REFERENCE TO FT. IGLD85  
2. ALL DISTANCES ARE IN FEET.



# SOLANUS MISSION BEACH - PROPOSED PROFILES (OPTION 1)

PETOSKEY SHORELINE IMPROVEMENTS

Project Number: 13269.301-SKT-04  
Date: 2020-03-17





# MACKINAC ENVIRONMENTAL TECHNOLOGY, INC.

*Environmental Consulting and Contracting Since 1990*

**RE:** Endangered/Threatened Species Survey & Environmental Review

Tim:

I was able to complete the endangered and threatened species survey and plant classification on July 25, 2020. The assessment focused on species identified by the U.S. Fish & Wildlife Service (USFWS) for Emmet County and also assess the property for potential habitat utilized by the listed species. Five data collection points were established between the beach front and the lawn area to the north. Photographs depicting current Site conditions are attached along with an Aerial Map showing assessment locations. The following is a summary of the plant species observed on the Site (all points):

Common Name	Scientific Name	R3 Indicator	Status
Red-osier Dogwood	<i>Cornus stolonifera</i>	FACW	Native
Balsam Poplar	<i>Populus balsamifera</i>	FACW	Native
White Spruce	<i>Picea glauca</i>	FACU	Native
Black Ash	<i>Fraxinus nigra</i>	FACW+	Native
Bebb Willow	<i>Salix bebbiana</i>	FACW+	Native
Choke Cherry	<i>Prunus virginiana</i>	FAC-	Native
Queen Anne's Lace	<i>Daucus carota</i>	FACU	Native
Common Mullein	<i>Verbascum blattaria</i>	FACU-	Native
Bladder Champion	<i>Silene vulgaris</i>	FACU	Native
Poison Ivy	<i>Toxicodendron radicans</i>	FAC	Native
White Clover	<i>Trifolium repens</i>	FACU+	Native
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	FACU	Native
Canada Goldenrod	<i>Solidago canadensis</i>	FACU	Native
Wormwood	<i>Artemisia Annu</i>	FACU	Native

No threatened or endangered species were identified on the Site at the time of the assessment. A majority of the Site consists of manicured lawn with a paved recreational path along the north side. Most native vegetation on the Site is located between the lawn area and the rock shoreline. There was very little plant growth on the beachfront.

The topography of the Site exhibits a northerly slope toward the lake. A stormwater drainageway is located on the west side of the property and discharges directly to the lake. Vegetation identified in the table above is located along the banks of the drainageway.

In addition to the survey, MET completed a preliminary review of current federal and state environmental compliance requirements outlined in National Environmental Policy Act (NEPA). General comments are as follows:

***Summary of State and Federal Regulations and Compliance Interpretation***

<b>Air Quality</b> [Clean Air Act, Sections 176 (c) and (d), and 40 CFR 6, 51, 93]	COMPLIANT: The project property is not located within a “non-attainment” or “maintenance” area identified in the air quality State Implementation Plan (SIP).
<b>Endangered Species Act</b> [50 CFR 402]	COMPLIANT: The project is not in violation of the Endangered Species Act. The Site consists of lawn space followed by a narrow band of vegetation, then beach front (rock/cobble) with little to no vegetation. See attached photos.
<b>Coastal Zone Management Act</b> [Sections 307(c),(d)]	The proposed project is located within a Coastal Zone Management Area.  Ref: Michigan Department of Natural Resources and Environment Coastal Management Program – Coastal Zone Management Boundary/Coastal Zone Management Area Map.
<b>Wild and Scenic Rivers Act</b> [Sections 7 (b), (c)]	COMPLIANT: The project property is not located within one mile of a wild or scenic river.
<b>Historic Preservation</b> [36 CFR 800]	N/A - A State Historic Preservation Office (SHPO) request was not submitted.
<b>Wetlands Protection</b> [Executive Order 11990]	COMPLIANT Based on available documentation, the Site is not located in a regulated wetland area. Established uplands extend from the paved recreational path on the north side of the Site to the Ordinary High Water Mark located at the beach front.
<b>Farmland Protection Policy Act</b> [7 CFR 658]	N/A
<b>Sole Source Aquifers</b> [40 CFR 149]	COMPLIANT: The Site is not located over a sole source aquifer.
<b>State Environmental Policy Act</b>	N/A at this time
<b>Executive Order 12372,</b> “Intergovernmental Review of Federal Programs”.	N/A - Given the minor project scope.
<b>Environmental Concerns: Phase 1 ESA</b>	A Phase 1 Environmental Site Assessment (ESA) was not conducted during the preliminary evaluation. However, Michigan Department of Environment, Great Lakes & Energy (EGLE) databases that identify contaminated properties was reviewed. The closest area of environmental contamination was located just west of the Site. Note; A monitor well, associated with past investigations, was observed on the east edge of the Site. Information associated with these investigations and development of the adjacent properties to the west is attached.

**PHOTO SUMMARY: SOLANUS BEACH - PETOSKEY**  
**Photographs by P. Kreski – 07/09/2020**



1. Looking west across the Site.



2. Looking north along the east edge of the Site. In general, vegetation on the Site consists of lawn space transitioning to a narrow vegetative zone followed by beach area (rock/cobble).



3. View of the transition area – looking east.

**PHOTO SUMMARY: SOLANUS BEACH - PETOSKEY**  
**Photographs by P. Kreski – 07/09/2020**



4. A monitor well was observed on the east edge of the Site. The well is associated with environmental investigation conducted just east of the Site. No other monitor wells were noted.



5. Looking south from the beach. MET established five (5) assessment locations for vegetation identification.



6. Looking west along the beach front (east end).

**PHOTO SUMMARY: SOLANUS BEACH - PETOSKEY**  
**Photographs by P. Kreski – 07/09/2020**



7. Looking east along the beach front (west end).



8. Red-osier Dogwood and Balsam Poplar were the dominant shrub/trees species between the lawn area and beach front.



9. Looking south along the west side of the Site.

# Solanus Park

Write a description for your map.

Legend



= ASSESSMENT POINT



#1

DRAINAGEWAY

MONITOR WELL



#3



#5

Little Traverse

Google Earth

© 2020 Google



100 ft

# Success Story

## PMC Groundwater Superfund Site



PMC Groundwater Superfund Site  
Petoskey, Michigan  
October 2010  
FINAL

U.S. EPA Region 5

## **Table of Contents**

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*Developed for EPA Region 5 by E<sup>2</sup> Inc.*

## Executive Summary

The Petoskey Manufacturing Company (PMC) in Petoskey, Michigan was located in an industrial area on the shores of Lake Michigan’s Little Traverse Bay. PMC improperly disposed of solvents used in die casting at the plant, contaminating ground water and the town’s municipal well. This case study highlights how the U.S. Environmental Protection Agency (EPA), the Michigan Department of Natural Resources and the Environment (MDNRE), the City of Petoskey and local developers collaborated on the cleanup and redevelopment of the PMC Site and surrounding waterfront area. This collaboration and persistence, combined with the city’s visionary planning efforts and creative financing strategies, transformed the former contaminated industrial zone into a vital recreational waterfront.

EPA and MDNRE made it a priority to work with the City of Petoskey to design cleanup activities to be compatible with the future vision for the community while still achieving the objectives of the cleanup. While discussions continue regarding potential improvement to the PMC Site, the cleanup and redevelopment of the Site helped to revitalize the community in many ways. The number of visitors that come to enjoy Petoskey’s lakefront scenery and recreational amenities has significantly increased in recent years, and the taxable value of the PMC Site has multiplied 15 times from when the PMC facility was in operation in the 1960s.



## Introduction

Located on the shores of Lake Michigan’s Little Traverse Bay, the City of Petoskey, Michigan is a vibrant community and popular resort surrounded by natural beauty and year-round recreation. The community is recognized nationally as a “best small town” and a “best place to retire”. The town has a well-established full-time population of about 6,000, but draws thousands of visitors every year to enjoy the lakefront scenery, festivals, recreation and the century-old buildings downtown. The city’s waterfront area has undergone a major transformation over the last twenty years from an industrial corridor to a welcoming public space, which has helped to boost the number of visitors that come to enjoy Petoskey. Part of this transformation was the cleanup and redevelopment of the PMC Groundwater Superfund Site (PMC Site or Site).



Figure 1: Site vicinity map

This case study explores the partnerships and key factors that led to the cleanup and reuse of the PMC Site. In particular, the case study discusses the evolution of remediation and redevelopment efforts, and ongoing reuse activities at the Site. The report outlines lessons learned identified by the local, state and federal representatives involved in the project. While discussion continues regarding potential remedial improvements to the Site, the reuse of the PMC Site has resulted in regional economic revitalization due in part to collaboration on cleanup and redevelopment activities.

## Site Description

The PMC Site is located within the City of Petoskey, Emmet County, Michigan. The Site consists of several units, including the former Petoskey Manufacturing Company (PMC) property, the City of Petoskey's former Ingalls Municipal Well and the portion of the city's Bayfront Park West that surrounds a contaminated ground water plume. The Site boundary shown in Figure 1 is approximate and not meant to indicate the extent of contaminated ground water.

The former PMC facility was located at 200 West Lake Street in what is currently a residential area of the City of Petoskey. The former PMC facility is bordered to the north by the Sunset Shores condominium complex, to the east and south by several residences and to the west by a 100-foot wide access easement to Bayfront Park West and the Fraternal Order of Eagles (FOE) parking lot. Little Traverse Bay of Lake Michigan is approximately 500 feet north of the PMC property. Bear Creek, which drains into Little Traverse Bay, is located approximately 500 feet east of the PMC property.

## Site History

The land between the former PMC facility and Little Traverse Bay was once occupied by a large industrial rail yard, which included oil, coal and propane storage facilities, and a rail turntable. A manufactured gas plant was located to the northeast in an area formerly known as the Petrolane Site. This area is now a public park called Festival Place. Figure 2 shows an aerial photo of the site thought to have been taken in the 1940s. Land use at the site today is entirely residential and recreational.

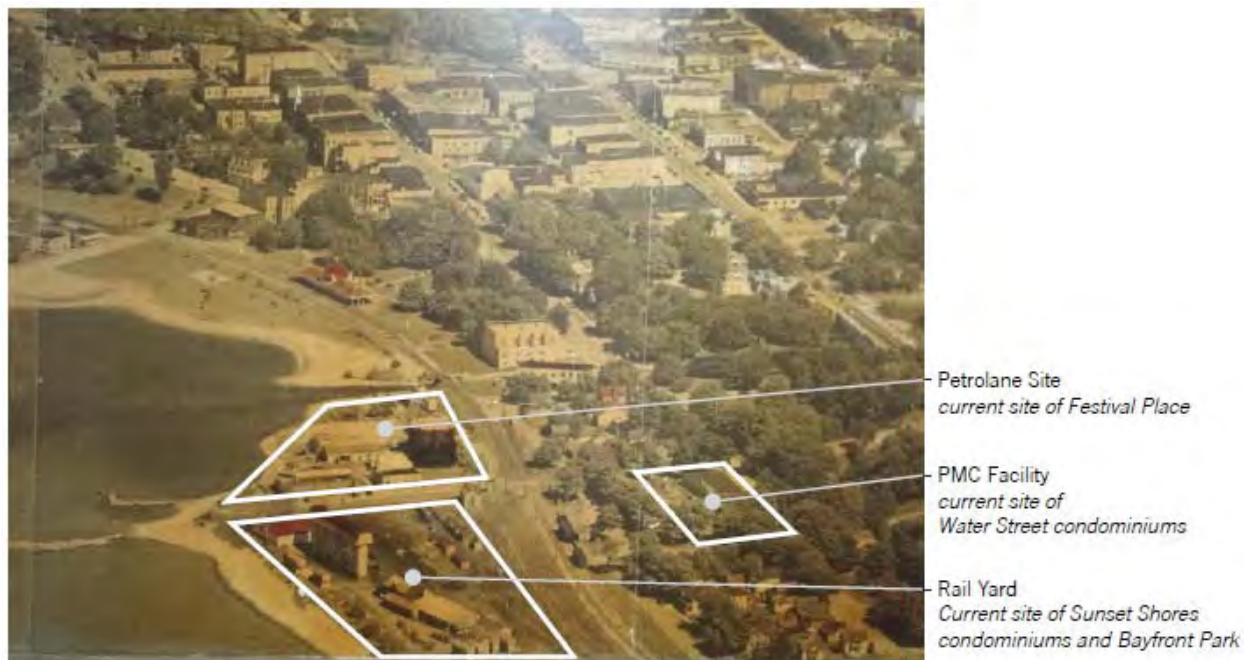


Figure 2: Aerial photo thought to be from the 1940s showing the former PMC building and the Petrolane manufactured gas plant. A rail yard and coal storage sit on the current location of the Sunset Shores condominiums and Bayfront Park West. Today, Water Street and the new bike path run along the easement of the former main rail line. (Source: City of Petoskey)

## Planning for Redevelopment

A proposal from a private developer provided the catalyst to initiate the first cleanup and redevelopment activities in the area. The developer saw residential potential in the former propane storage property, but was not willing to invest so long as the Petrolane manufactured gas plant remained in place across Wachtel Ave. The city submitted an offer to the Petrolane Company to move their facility. The offer consisted of a new 4-acre site south of town, construction of a new rail



The former Petrolane Site is now a public park called Festival Place.

siting and the \$280,000 reserved in the city's Beach Fund. As soon as the city demonstrated their commitment to restoring the Petrolane property, the developer moved forward with construction of the Sunset Shores condominiums. The Michigan Department of Natural Resources and the Environment (MDNRE) funded three phases of remediation on the Petrolane Site to enable the area to be used for public recreation.

### Petoskey Manufacturing Company

PMC was established in 1946 as a small fabricating and painting operation. The company performed a die casting of zinc parts for the automotive industry from the late 1960's up to fall 2000 when the business closed. The primary product line included door handles, hood ornaments and emblems. Molten zinc was cast into parts and then trimmed, polished, buffed and painted as necessary. Trichloroethylene (TCE) was used as a solvent to clean paint masks. Xylene was used as paint thinner and solvent.

The successful cleanup and redevelopment of the Petrolane Site opened the city's eyes to the possibilities of redeveloping other areas of the waterfront. City staff and officials realized that redevelopment of the waterfront for recreational and residential use could encourage more private investment and raise real estate values. In 1981, the city established an official Waterfront Redevelopment Plan to guide the redevelopment efforts in the waterfront district.

### History of Remediation

Contamination at the PMC Site was first discovered in September 1981 when drinking water samples from the Ingalls Municipal Well revealed high levels of volatile organic compounds (VOCs) and inorganic contaminants. The City of Petoskey requested assistance from MDNRE in identifying responsible parties and in finding the source of the contamination. MDNRE conducted soil sampling at the PMC facility in 1982 and found high levels of several chemical

contaminants. Small amounts of TCE breakdown products were also found in monitoring wells near the former PMC property.

MDNRE determined that in its operations, PMC had disposed of spent solvents directly to the ground surface surrounding the plant. For this reason, EPA and MDNRE identified PMC as the source of the city's ground water contamination.

In 1982, under the direction of the MDNRE, PMC performed a Time Critical Removal of contaminated soils from a portion of the Site. EPA evaluated the PMC Site and added it to the National Priorities List (NPL) on September 8, 1983. Following the removal of the contaminated soil, TCE concentrations in the Ingalls Well decreased significantly from 50 part per billion (ppb) to approximately 4.0 ppb. TCE concentrations remained relatively stable in the 1 to 3 ppb range until monitoring ended.

In 1987, PMC signed an Administrative Order by Consent (AOC) with EPA agreeing to conduct a full Remedial Investigation and Feasibility Study (RI/FS). After several delays due to PMC's financial limitations, EPA relieved PMC of conducting the RI/FS work in 1990 and entered into a State Cooperative Agreement with the MDNRE to perform the RI with funding provided by EPA.

Concurrently with the state-led RI, EPA began a Focused FS to examine the impact of site-related contamination on the Ingalls Well. In 1995, EPA signed an Interim Record of Decision (ROD) for providing on-line treatment of ground water at the Ingalls Well. The State of Michigan requested that construction of a new drinking water source be considered instead of the selected remedy due to the likelihood that water from the Ingalls Well would need additional treatment. EPA agreed to forgo the selected remedy and contribute the capital costs to the city to partially defray the cost of replacing the Ingalls Well. The State of Michigan contributed \$500,000 in grants for the development of the alternative water supply. In late 1995, the City of Petoskey completed the construction of its replacement municipal wells and use of the Ingalls Well ceased.

## Remedial Timeline

1981: PMC identified as a PRP by EPA and MDNRE

1982: Time Critical Removal of contaminated soil from the west side of the PMC building

1983: Site listed on EPA's National Priorities List

1995: First Record of Decision (ROD) signed for providing on-line treatment of ground water

1996: City completed construction of replacement municipal water source and use of Ingalls Well ceased

1998: MDNRE completed the Remedial Investigation; EPA completed the Feasibility Study

1998: Second ROD signed for the soil and final ground water remedies

1999: PMC filed for bankruptcy and closed

1999: On-site construction starts

2000: Preliminary Close-out Report signed

2005: Restrictive Covenant for former PMC property approved by MDNRE and filed with Emmet County

2006: Ingalls Well demolished by City

2007: Replacement monitoring wells installed and EPA declares PMC Groundwater as Site Wide Ready for Anticipated Use (SWRAU)

In September 1998, EPA issued another ROD to select the remedies for soil and ground water at the Site. The remedies included:

- Excavation and off-site disposal of the contaminated soil that exceed MDNRE’s residential direct contact criteria and Ground Water/Surface Water Interface (GSI) protection criteria for protection of surface water used as a drinking water source.
- The installation and operation of a Soil Vapor Extraction (SVE) system to remove volatile organic compounds (VOCs) from subsurface soils.
- Monitored natural attenuation (MNA) of the ground water, which included the development of a Ground Water Monitoring Plan (GWMP), followed by installation of a monitoring well network, an initial three year period of quarterly monitoring, and then ten years of long-term monitoring.
- Establishment and maintenance of Institutional Controls (ICs) to prohibit future use of the ground water on the former PMC Property. ICs consist of a Restrictive Covenant prohibiting contact with soils or use of ground water on the former PMC property and a municipal ordinance prohibiting the construction of wells or use of ground water in the area that exceeds ground water cleanup standards.
- Development of a plan for a contingency remedy, and development of a monitoring well abandonment plan.

With the known PMC soils having been addressed by SVE and excavation, EPA expected the residual contaminated ground water to naturally attenuate. A Preliminary Close-Out report was signed on February 18, 2000 indicating the remedial construction activities were complete at the Site. With construction complete and ICs in place, EPA declared the PMC Groundwater Site as Site Wide Ready for Anticipated Reuse (SWRAU) on December 17, 2007.



A flush mounted monitoring well located in Bayfront Park

## Remedial Considerations

While the remedy currently remains protective of human health and the environment, TCE concentrations continue to exceed MCLs and there is no clear indication that contaminant concentrations in the ground water plume are declining. MDNRE and EPA continue to discuss additional remedial implementation, including revisions to the monitoring plan and monitoring well network, potential contingency remedies and ICs, investigation into remaining contamination, including zinc, and long-term maintenance options.

## Agency Collaboration and Support

MDNRE and EPA made innovative efforts to best utilize funds and speed up the cleanup (both during Remedial Design and during field work). For example, EPA and MDNRE agreed that preparation of a Quality Assurance Project Plan (QAPP) and the implementation of verification sampling would not be necessary if areas that exceeded direct contact criteria were over-excavated. By drawing the excavation boundaries with sufficient conservatism, the agencies could feel assured that these areas had been sufficiently remediated.

MDNRE and EPA also worked together to modify cleanup standards to allow for the greatest flexibility in future reuse of the Site. Considerations of future use are an integral part of EPA's Superfund program to ensure that contamination is not a barrier to reuse of a property. Despite the fact the PMC property was zoned for industrial reuse, EPA agreed to MDNRE's request to modify cleanup standards from industrial to residential reuse criteria since the Site was surrounded by existing residences and the city anticipated future residential redevelopment of the property.

Finally, EPA consented with MNDRE's recommendation to purchase and develop an alternative municipal water supply for the City of Petoskey.

### Developing an Alternative Water Supply

Contamination was discovered in the Ingalls Well in 1981. After 10 to 12 years of searching for an alternative water source, the City was about to go forward with the development of a surface water plant when another option emerged. The developer of a proposed golf resort and conference center needed water supply sooner than the expected surface water treatment plant and invested in a search for ground water closer to the proposed development site. To everyone's surprise, he found ground water of adequate quality and quantity.

The City worked out an arrangement to purchase the two wells that had been installed from the Bay Harbor Company for \$2,885,000. The City updated the wells to municipal standards, developed a third well, upgraded the distribution system, installed 5 miles of pipeline, created a wet well that accepted the water from Bay Harbor, and then renovated the pumping system to redistribute water throughout the City. The State of Michigan contributed \$500,000 in grants towards the construction of the alternative water supply. The project, which took a total of \$7 million, was completed in 1996. The alternative plan, the construction of a lake water treatment plant, would have cost closer to \$15 million with higher annual expenses for operation and maintenance.

George Korthauer, the City Manager at the time, remembers that "the Bay Harbor option emerged at a crucial time for the City. It was no secret that the City needed water, and Bay Harbor had the City in the perfect spot to sell water to the City, but we were able to get it worked out to the City's advantage".

## Brownfield Redevelopment Authorities

In the State of Michigan, a local governing body may establish one or more Brownfield Redevelopment Authorities and create and implement a brownfield plan that identifies the properties from which taxes will be captured and where eligible activities will be conducted. BRAs may only exercise powers on eligible property within the jurisdiction and may only capture taxes from approved brownfield sites that the municipality authorizes. States may require state approval of the brownfield plan and approved brownfield projects are also eligible for other incentive programs.

*(Source: Citizens Research Council of Michigan, Survey of Economic Development Programs in Michigan, June 2007)*

## History of Redevelopment

In 1984, the city came up with a method to finance their redevelopment plans for the waterfront district. The city established a tax increment finance authority (TIFA) and a tax increment financing (TIF) district to capture of property tax levies above and beyond the year in which the TIFA was established. The city used the initial revenue to recover costs from the cleanup and redevelopment of the former Petrolane Site, beyond the remediation funded by MDNRE in the early 1990s. The subsequent increment generated by the Sunset Shores condominiums, which was significant, was used to fund further waterfront improvements.

In 2000, the state awarded the City of Petoskey a Clean Michigan Initiative Waterfront Redevelopment Grant. This provided approximately \$500,000 for demolition and \$100,000 for acquisition of the PMC Site. The grant posed one particular challenge; it was specifically designed for industrial or commercial brownfield redevelopment, which no longer matched the city's

zoning or desires for the property. After the city successfully made the case that resort tourism was the most valuable industry in the area, the state agreed to a predominantly residential brownfield redevelopment plan with a small commercial component. The city rezoned the property as a Planned Unit Development (PUD) in order to incorporate the small commercial component needed to meet the state's grant program requirement.

After resources available from the state and EPA for cleanup were exhausted, and monitoring wells were all that remained on the Site, the city formed a local Brownfield Redevelopment Authority (BRA) to



The former PMC facility (Source: City of Petoskey)



The Water Street condominiums with improved road (Wachtel Ave) and integrated utilities

help develop a plan for the Site's redevelopment. A BRA allows a local government to use TIF revenue for environmental remediation of brownfield sites, which can provide an added incentive to private entities for redeveloping a site.

In April 2003, the former PMC facility was sold through Chapter 7 Bankruptcy Trustee to Perazza Products, LLC, a Michigan developer. In July 2004, the developer demolished the existing building, including its foundation and removed contaminated soils. The construction of the new residential condominium buildings, called the Water Street Condominiums, started in September 2004 and continued until 2008. Ten of the 16 condos were completed before the property went into foreclosure in the fall of 2009.

Financial assistance was an important driver for the developer. The developer relied on approximately \$150,000 in compensation from the BRA to offset \$350,000 in cleanup expenses. The developer also depended on a Small Business Tax Credit from the Michigan Economic Development Corporation for construction of the condominiums.

### *Redevelopment of the Surrounding Waterfront District*

During the time the city was searching for another water source, the Water Department purchased the land west of the Sunset Shore condominiums and east of the Ingalls Well pump house for use as a reservoir. The city considered development of a water intake from the lake or a water treatment plant on this property before reaching an agreement to purchase the new wells installed by the Bay Harbor Company.



The City of Petoskey has invested considerable resources in planning and designing recreational improvements along the waterfront. The City's latest effort involves recreational improvements along the Bear River which extends south from Bayfront Park. The Bear River Valley is characterized by natural forests and open space areas that are rich in plant species and local history.

In 2005, the City of Petoskey began a two-year project to rebuild and re-landscape streets, utilities and additional waterfront parkland. The work included street rerouting and repaving, and relocation of electric and cable utilities underground. Since the lakefront property west of Sunset Shores was no longer needed for a reservoir or water treatment plant, the city converted the property to what is now the popular Bayfront Park West. The park area was significantly re-graded and a new storm drainage and underground sprinkler system was installed.



Bayfront Park

The city's waterfront redevelopment activities also resulted in the conversion of a public street to a bicycle and pedestrian right of way. The bicycle / pedestrian path created a connector between two portions of the Little Traverse Wheelway, a 26-mile trail that stretches along Little Traverse Bay from Harbor Springs through Petoskey and down to Charlevoix. The trail is part of the North County Trail, a National Park Service designated scenic trail which extends from Pennsylvania to South Dakota. The Michigan Department of Transportation (MDOT) financed the majority of the trail construction in Petoskey, from Bay Harbor to Bayview, with the city completing a half-mile segment.

## Waterfront Redevelopment History

1981: Waterfront Redevelopment Plan created

1985: Tax Increment Financing District established

1999: Emmet County Brownfield Redevelopment Authority (BRA) established

2000: First PMC Brownfield Plan approved; made site eligible for Tax Increment Financing (TIF)

2000: MDNRE granted the City a \$597,500 Clean Michigan Initiative Waterfront Redevelopment Grant (WRG) (\$497,500 for demolition; \$100,000 for property acquisition)

2002: MDNRE agrees to City's request to remove WRG requirement for a Prospective Purchaser Agreement (PPA) with EPA

2003: Developer submitted a revised Brownfield Redevelopment Plan; Developer Agreement approved by the BRA

2003: Developer requests property rezoning from I-1 Light Industrial to a Planned Unit Development (PUD); City Council unanimously approves

2003: Developer submits a Baseline Environmental Assessment and Due Care Compliance Analysis for the former PMC property to MDNRE

2004: Developer demolished building, removed contaminated soils and started construction; City starts construction of Bayfront Park and surrounding infrastructure improvements

2007: Construction of 10 of the 16 residential units and one commercial space complete; Reconstruction of Bayfront park and city improvements complete

2010: Developer reimbursed by BRA for eligible cleanup expense of PMC site

Although some components were modified, the Waterfront Redevelopment Plan is currently in place as it was originally intended 25 years ago.



Water Street right-of-way before redevelopment. (Source: City of Petoskey)



Water Street right-of-way redeveloped as a bicycle / pedestrian path called the Little Traverse Wheelway.

## Overcoming Challenges to Redevelopment

The redevelopment of the PMC Site and waterfront district was not without local controversy. The city had difficulty getting community buy-in and support from older generations who considered the waterfront district an area that should be redeveloped to support the city's industrial future. The city was blamed at one point for causing the PMC to go out of business. George Korthauer, the former City Manager, remembered that the City Council decision to acquire the Petrolane Company Site came down to a 3 – 2 vote: "If that vote had fallen the other way, the area would not be improved as it is today. The city having the ability to get that industrial use out of the waterfront is what enabled the area to turn the corner in terms of redevelopment".

The previous name of the Site caused concern in the community and created a number of public relations problems for the city. When the Site was placed on the NPL, the site name was changed from the *Petoskey Manufacturing Company Superfund Site* to the *Petoskey Municipal Well Field*. In 2007, EPA recognized the name unfairly stigmatized the City of Petoskey, which was never a potentially responsible party, and changed the site name to *PMC Groundwater*.

The city acknowledges that coordinating infrastructure improvements with the condominium construction was often a challenge, especially due to frequent turnover of the developer's onsite project management staff. The city, however, kept constant pressure on the developer to complete the slabs and foundations so the city could finish construction of public improvements on the Site's perimeter. If it were not for the city's need to coordinate activities, the Site may not be in the finished state it is today. While the city anticipates the vacant building pads on the PMC site will remain vacant until economic conditions improve, the city, state and EPA are assured that the soil caps are in place and the infrastructure is installed and ready for the economy to rebound.

## Components of Success

Participants involved in the PMC Groundwater Superfund Site agree that a combination of factors contributed to the Site's cleanup and successful redevelopment.

- The city had a strong vision for residential and recreational use of the waterfront district in place, which helped to guide cleanup standards and reuse activities. Amy Tweeten, the current City Planner remarked that, “the city stuck to the Plan, and despite challenges from potential funding sources and the volatility of developer investments in the area, the city stuck to it and kept chipping away at it.”
- The city had visionary and persistent leadership from city staff and elected officials. The main designer of the Waterfront Plan was involved since the inception of the plan, providing institutional knowledge and continuity throughout the project.
- The local government put together a variety of funding mechanisms to support redevelopment of the waterfront district over the years, including the creation of a BRA and TIF, the Small Business Tax Credits from the Michigan Economic Development Corporation, the Waterfront Redevelopment Grant from the Clean Michigan Initiative and trail funding from the MDOT.
- The Site is located in an area that is well suited for residential and recreational use, and the market responded positively to improvements made in the area.
- EPA and MDNRE selected and implemented a remedy for the Site that would be consistent with the property's reasonability anticipated future use.
- The State of Michigan worked extensively with the city and the developer to provide state grant funding and coordinate redevelopment efforts with remediation efforts.



Vacant building pads serve as soil caps, an essential component of the site remedy

## Conclusion

The redevelopment of the PMC Groundwater Site illustrates how community visioning, dedicated leadership, state and federal funding opportunities, collaborative partnerships with EPA and MDNRE, and flexible long-term planning can result in local economic redevelopment and community

revitalization. The city recognized that the cleanup represented an opportunity to revitalize the downtown area in a way that was aligned with their long-term vision for the waterfront district. The city, in partnership with EPA and MDNRE, has realized their vision for restoring the natural setting along the lakefront, enhancing outdoor activities and bolstering the recreational culture of the area. Public and private investment in the area has significantly increased the number of visitors every summer that come to enjoy Petoskey's lakefront scenery and recreational amenities. Today, the financial rewards of this investment are great. The taxable value of the PMC Site is now almost \$1.5 million, compared to \$97,000 when the PMC facility was in operation.



A visitor walking through Bayfront Park on the Little Traverse Wheelway

Tip of the Mitt Watershed Council

For City of Petoskey and Beckett and Raeder

Environmental conditions at Solanus Mission Beach

October 2020

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Tip of the Mitt Watershed Council staff have walked the site numerous times throughout the summer and fall to assess environmental conditions that may influence the proposed site development as prepared by Beckett and Raeder.

Although ever changing, the shoreline conditions are considered stable as the dynamic processes associated with wind and waves are unimpeded. Nearshore erosion and deposition of sand and other materials is continually changing the configuration of the shoreline, however, this is to be expected. It is strongly encouraged that no actions to attempt to fortify the shoreline be pursued as this will likely interrupt these critical processes. Although somewhat barren (devoid of vegetation), this is common along Great Lakes shorelines. Several native plant species are present, however, and should be allowed to continue to colonize the area as they provide a degree of stability and habitat. They include willows (*Salix spp.*) and red-osier dogwoods (*Cornus sericea*) (Figure 1 and 2). Other native plants noted on site include beach grass (*Ammophila breviligulata*) (Figure 3), Virginia creeper (*Parthenocissus quinquefolia*), maple saplings (*Acer rubrum*), among other species.

Invasive plants noted include spotted knapweed (*Centaurea stoebe*) (Figure 4) and what is believed to be a residual patch of black swallow-wort (*Cynanchum louiseae*) (Figure 5). Previous treatment for invasive species at this location appear to have been largely successful. However, the potential patch of black swallow-wort must be monitored and treated, once confirmed. Prior to treatment, garlic mustard was noted on site. Seeds from the infestation are likely still on site, therefore, monitoring for a reemergence of this species should be conducted.

The proposed plans to install a boardwalk is not likely to compromise the environmental conditions of the site provided the following:

- The construction of the boardwalk is either elevated or constructed in a way that minimizes soil disturbance and allows for movement of the predominately sand, wind-swept topography. Concrete or other paved surfaces should not be considered in this application. On-grade walkways may be considered if they are not permanent, but rather can be repositioned to allow for adequate access and to respond to the changing site conditions that invariably will occur over time given the dynamic influences on the site.
- All construction equipment and associated materials are thoroughly cleaned prior to entering the site to avoid introduction of additional invasive plant species, which invariably accompanies any construction equipment.
- Monitoring for invasive species immediately follows construction for a period of several years to be sure any introduction or expansion of existing invasive plants are contained immediately.
- The overall footprint of the site improvements is kept to a minimum. A simple boardwalk and overlook will not increase surface runoff.

No threatened, endangered or species of concern were noted on site.



*Figure 1 Willow*



*Figure 2 Dogwood and willow*



*Figure 3 Beach grass*



*Figure 4 Spotted knapweed*



*Figure 5 suspected swallow-wort*



Appendix B: Public Input Poll Results

# City of Petoskey Parks and Recreation

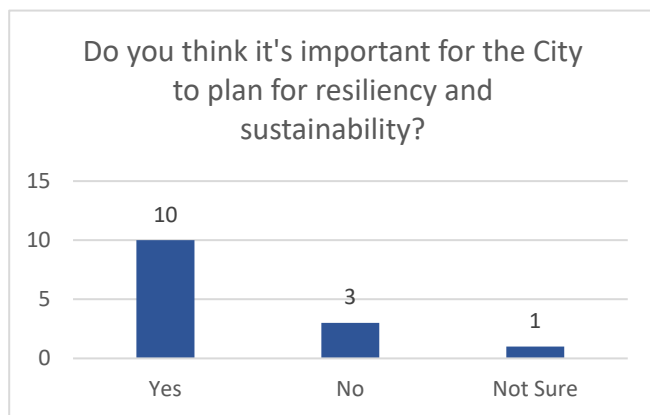
## Public Input Meeting, October 12, 2020

### Summary of Public Input

A public input session for the Parks and Recreation Plan amendment was held on Monday, October 12, 2020 at 7:00pm. The meeting was held to gather feedback regarding resiliency and sustainability planning. The City has also been working on a plan for Solanus Mission Beach and took this opportunity to ask the public what they would like to see for the future of this beach area. The meeting was provided via zoom with real time voting options. A total of 28 people attending the meeting. A presentation was given, and a variety of questions were asked of the audience.

The general impression was that people feel that it is important to plan for resiliency and sustainability. The following graphs and tables highlight the public opinion.

**Q1** The majority of people think it is important for the City to plan for resiliency and sustainability. The overall support shows that the City should invest in opportunities to plan for a sustainable park system.



**Q2** The items in Table 1 were ranked in order of importance. A majority of people rated shoreline improvements as the top priority. The item that was rated second was sustainable facility design which goes hand in hand with how to develop shoreline improvements.

Table 1

Items	1	2	3	4	5
Shoreline Improvements	10	2	0	2	2
Sustainable Facility Design	4	2	5	0	1
Recycling	2	2	4	1	3
Invasive Species Management	0	4	1	4	3
Forestry	0	2	2	5	3

**Q3** The items listed in Table 2 were rated in order of importance. The top two items were riverbank stabilization and landscaping best management practices. Stabilizing the riverbanks is important during the planning process. Using landscaping BMPs can ensure resiliency pertaining to landscape plant materials.

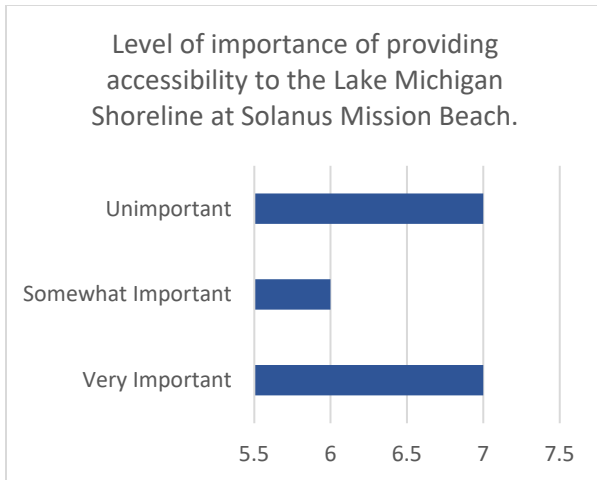
Table 2

Items	1	2	3	4
Riverbank Stabilization	5	3	4	1
Landscaping Best Management Practices	5	2	1	5
Alternative Energy Sources	4	3	3	2
Stormwater Management	1	4	4	4

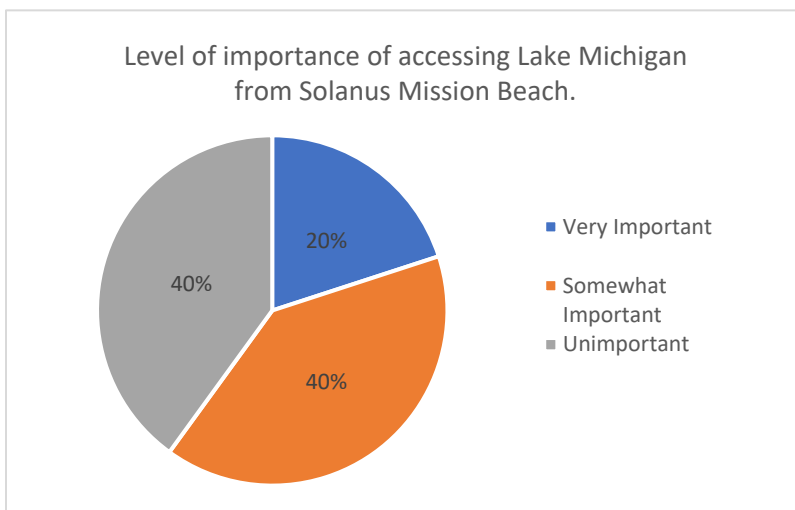
**Q4** People were asked to list the most important aspect of planning for a sustainable park system. Shoreline improvements and alternative energy sources ranked the highest. Below is a list of answers that were provided by the public.

- The most important aspect is the shoreline improvements.
- Alternative energy sources.
- Sustainable energy.
- Using recycled materials and sustainable energy.
- High water impacts.
- Stormwater management.
- Best practices in land and water management focused on sustainability.
- Shoreline improvements.
- Alternative energy sources.
- Shoreline/highwater stabilization. Landscaping best management and forestry.
- Eco friendly.

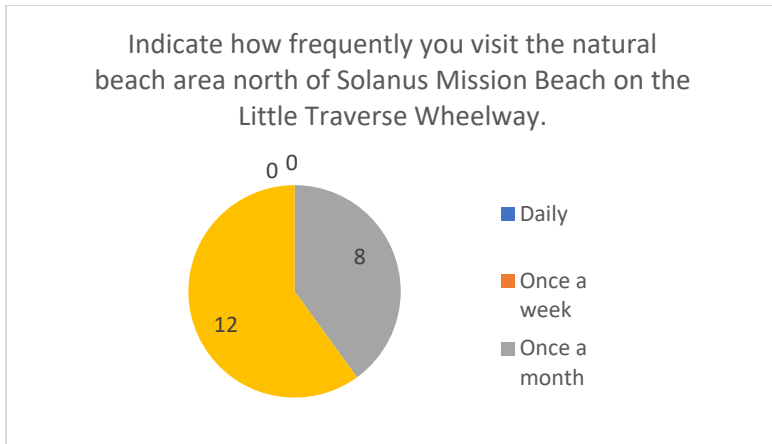
**Q5** The audience was asked to rate the importance of providing accessibility to the Lake Michigan Shoreline at Solanus Mission Beach. More people felt that it was important rather than unimportant. The option of getting people to the water regardless of mobility would be an equal opportunity for the community to participate in recreation activities.



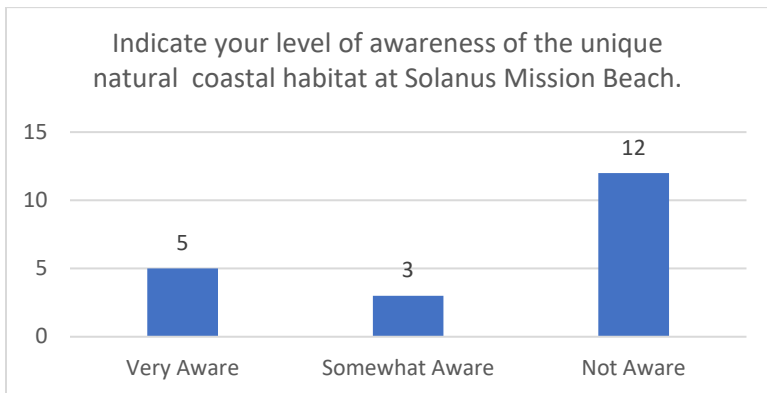
**Q6** People were asked to rank the importance of directly accessing Lake Michigan from Solanus Mission Beach. 60% of people rated access to the lake as very important or somewhat important. Access to the space and shoreline would provide the opportunity to visit one of the last remaining natural great lakes shorelines within the City limits.



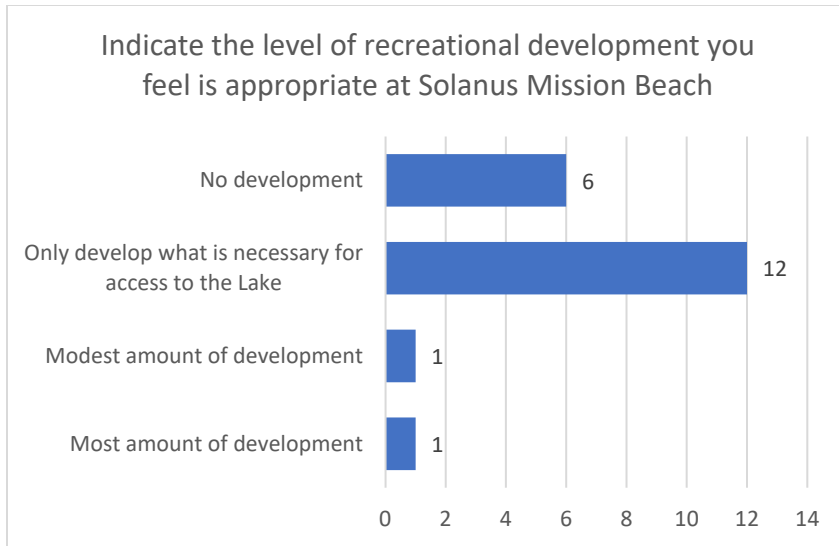
**Q7** The people that attended the meeting recorded that they never visit the Solanus Mission Beach or only visit once a month. Planning for Solanus Mission Beach



**Q8** The audience was asked how aware they are of the natural coastal habitat at Solanus Mission Beach. A majority of the people were not aware of the natural coastal habitat. It is important for the City to educate the public about what steps they are taking to incorporate sustainable best practices. Public engagement is key to creating good communication with the people of the community.



**Q9** The audience was asked to indicate the level of development they felt was appropriate for Solanus Mission Beach. The majority only wanted development that is necessary for access to the lake. Since the beach area is a natural coastal habitat, the development will be precise in how it is implemented to not disturb the natural environment.

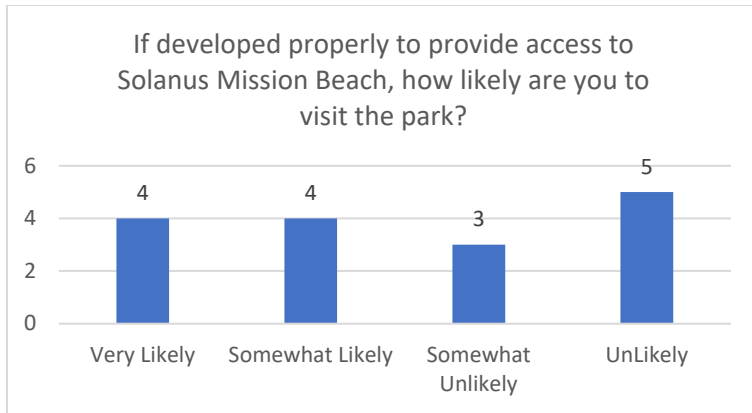


**Q10** Table 3 describes how people prioritized the list of items. Eradicating invasive species was rated as a top priority, followed by boardwalk access to the beach from the wheelway and natural habitat restoration. It is evident that by getting rid of invasive species would help restore the natural habitat. Creating access to the beach from the wheelway would allow people of all abilities to enjoy the waterfront.

Table 3

Items	1	2	3	4	5	6	7
Invasive Species Eradication	5	3	4	2	2	0	3
Boardwalk Access to Beach from Wheelway	4	4	2	2	2	3	1
Natural Habitat Restoration	4	2	4	4	3	1	0
Overlook of Beach at Wheelway	2	4	3	2	1	3	3
Boardwalk Access to Waterline	2	4	3	1	6	2	1
Stormwater Improvements	2	1	1	5	1	7	1
Built Facilities (Picnic Shelter and Restrooms)	0	1	1	2	3	2	9

**Q11** People were asked if they would visit Solanus Mission Beach if it were developed properly. The vote was split evenly. Providing access to the waterfront for people of all abilities would most likely attract people to the area.



**Q12** During the uncertain time of COVID-19, municipalities are cautious with how projects are prioritized. The audience was asked how the City should prioritize the budget with fewer resources. The list below highlights the comments made by the public.

- Natural habitat restoration.
- Funding sources.
- Sustainable resources.
- Invasive special control in already developed parks.
- Clean bathrooms.
- Eradication of invasive species.

**Q13** The list below describes some topics for goals the City should implement to improve the sustainability for the Parks and Recreation Department.

- Tree management.
- Public bathrooms.
- Natural habitat restoration.
- Funding sources.
- Fixing bike path.
- Using the city budget responsibly.