

# Town of Yarmouth

## Riverwalk Park and Boardwalk

### Feasibility/Concept Design Study Report

Number: 17-2-CD

August 2018





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## EXECUTIVE SUMMARY

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### **Summary:**

The Town of Yarmouth conducted a Feasibility/Concept Design Study for the town-owned former drive-in property at 669 Route 28 to vet recommendations made by the Drive-In Site Utilization Committee (DISUC) to create a Riverwalk park along the Parkers River, a Boardwalk extending over the marsh to Seagull Beach, and use of the site for interim uses such as concerts and festivals. The Committee felt these recommendations would help to create a year-round destination location for visitors and Yarmouth residents alike and would encourage private development through this public investment.

The DISUC Committee, Town Staff, and consultant BETA, worked for over a year to identify constraints, evaluate alternatives, identify amenities and materials, outline permitting requirements and develop project costs (including design, permitting, construction and maintenance costs). A robust public participation process was included in the study to garner stakeholder input. Various modifications and compromises were made to the design concepts to help mitigate concerns.

Through this process, the DISUC developed the following recommendations and preferred concepts that were ultimately approved by the Board of Selectmen.

- Retain the entire Drive-In property for Recreational Uses
- Establish Festivals and Special Events as a permanent use on the site
- Move forward with the Preferred Riverwalk Park Concept Plan (see below)
- Move forward with Option 1C for a Looped Boardwalk (see below)
- Permit and design the Riverwalk Park and Boardwalk together and proceed with construction as funding and resources permit.

### **Riverwalk Park:**

Through the Feasibility/Concept Design Study, the DISUC evaluated 3 layouts for the Riverwalk Park, including identifying low maintenance building materials and public outreach meetings, to reach the preferred concept plan. The park includes a variety of amenities shown on the attached Riverwalk Amenities plan. These amenities are included in the Preferred Riverwalk Park Concept Plan and were utilized in preparing the construction cost estimate for the park.

EXECUTIVE SUMMARY – Preferred Riverwalk Park Concept Plan

# Riverwalk Park Concept Plan



# EXECUTIVE SUMMARY – Riverwalk Park Amenities

## Riverwalk Park Amenities

**Entrance Sign**

**Landscape Restoration & Butterfly Garden**

**Educational Opportunities**

**Events & Activities**

**Elevated Walkway in Parking Lot**

**Pedestrian Beacon At Route 28**

**Decorative Lighting**

**Interpretive Signage**

**Interactive Natural Playscapes**

**Seating Options**

**Pervious Pavement & Curb Stops in Parking Lot**

**Shade Sails**

**Permeable pavement trails**

**Bigbelly solar trash/recycling**

**Portable Toilet Enclosure (Dennis Pond)**

**Traditional Restrooms (Bass Hole)**

**Kayak Launch, Storage & Vendor Trailer**

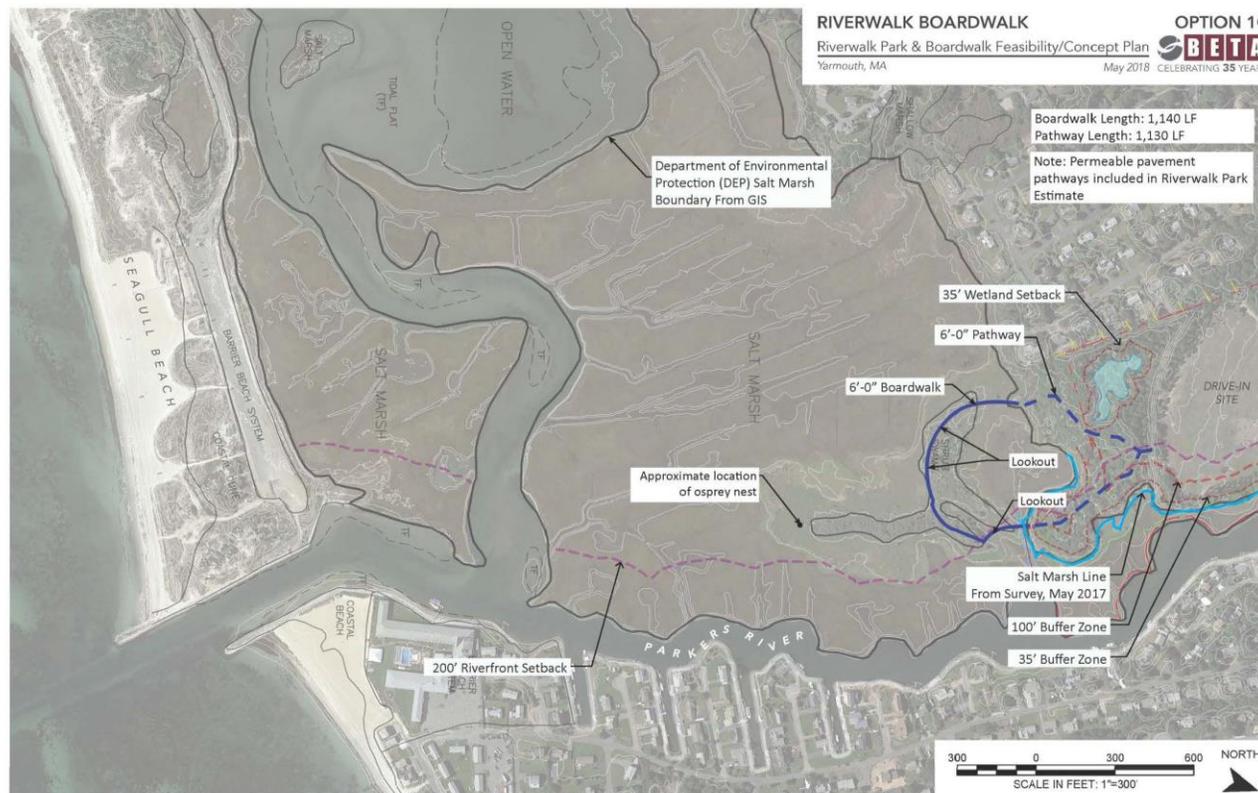
**Public Art Displays**

## EXECUTIVE SUMMARY – Preferred Looped Boardwalk Concept Plan

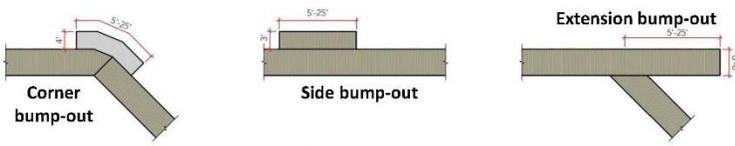
### Looped Boardwalk:

A similar process was undertaken for the Boardwalk with 3 concept layouts, two that crossed the full marsh and one that included a loop with a short spur. Ultimately the Board of Selectmen chose to pursue the Boardwalk Loop at this time. The preferred Boardwalk design incorporates an elevated 6' wide boardwalk made of Brazilian hardwood with wooden railings flared out on the sides. The boardwalk will include a number of outlooks with grating and interpretive signage. The boardwalk would have a helical anchor foundation. Refer to the Boardwalk Loop Concept Plan and Boardwalk Amenities plan below.

## Boardwalk Loop Concept Plan



# EXECUTIVE SUMMARY – Looped Boardwalk Amenities



**Corner bump-out**

**Side bump-out**

**Extension bump-out**

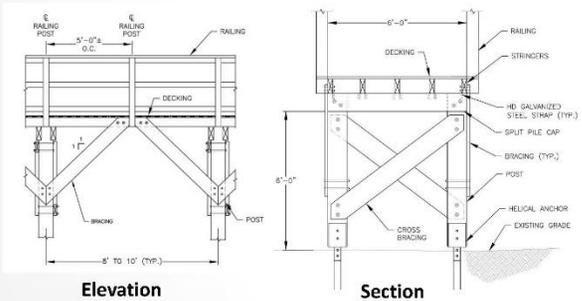


**Side bump-out**



**Extension bump-out**

**Boardwalk Overlooks**



**Elevation**

**Section**



**Raised Boardwalk**

## Boardwalk Amenities





**Boardwalk Decking Materials**

**Grating at a corner bump-out**

**IPE – Brazilian Hardwood**

**Donation naming**



**Angled Wooden Railing**




**Boardwalk Overlook Interpretation**

## EXECUTIVE SUMMARY – Cost Information

### Development & Construction Costs:

Cost estimates were developed by BETA for the preferred Riverwalk Park Concept Plan and Looped Boardwalk Option 1C, using the materials and amenities chosen for the project. Development costs were estimated at \$696,000 for site investigations, design, permitting and 20% contingency. Construction costs were estimated at approximately \$4.4 million for the access road and Riverwalk Park and approximately \$1.6 million for the Boardwalk Loop. These costs include state wage rates, a 25% contingency and 5% escalation.

### Maintenance Costs:

Utilizing knowledge of maintenance requirements at other Town facilities, Town Staff developed an estimate of average annual maintenance costs for the Riverwalk Park of approximately \$31,000 per year. These maintenance costs could be partially offset with potential revenue sources such as leasing to a kayak vendor, rentals for kayak storage, special event fees at the Riverwalk Park, pay and display parking, adopt a park program and naming rights/sponsorships.

Maintenance costs for the Boardwalk Loop were estimated at \$5 per linear foot, or \$6,000 annual for periodic replacement of decking planks, railings and grating. These maintenance costs could be partially offset with the sale of engraved boardwalk planks. Based on current sales of planks at Bass Hole, plank sales could net approximately \$100 per plank.

TABLE 1 SUMMARY OF TOTAL PROJECT COSTS RIVERWALK PARK AND BOARDWALK LOOP		
DESCRIPTION	SUBTOTALS	TOTALS
<b>DEVELOPMENT COSTS (site investigations, design, permitting, bidding &amp; construction administration):</b>		
Riverwalk Park	\$ 270,000	
Access Road & Utilities	\$ 70,000	
Boardwalk Loop	\$ 240,000	
20% Development Contingency	\$ 116,000	
<b>TOTAL Riverwalk Park &amp; Boardwalk Loop Development Costs:</b>		<b>\$ 696,000</b>
<b>CONSTRUCTION COSTS:</b>		
<b>Access Road &amp; Utilities</b>		
Access Road & Utilities	\$ 877,150	
25% Contingency	\$ 219,288	
5% Escalation Contingency	\$ 43,858	
<b>Access Road &amp; Utilities Construction Costs Subtotal:</b>	<b>\$ 1,140,295</b>	
<b>Riverwalk Park</b>		
Park & Woodland Paths	\$ 2,508,255	
25% Contingency	\$ 627,064	
5% Escalation Contingency	\$ 125,413	
<b>Riverwalk Park Construction Costs Subtotal:</b>	<b>\$ 3,260,732</b>	
<b>TOTAL Riverwalk Park &amp; Access Road Construction Costs</b>		<b>\$ 4,401,027</b>
<b>Boardwalk Loop:</b>		
Boardwalk & Overlooks	\$ 1,146,000	
Mobilization and Staging Area Prep	\$ 100,000	
25% Contingency	\$ 311,500	
5% Escalation Contingency	\$ 77,875	
<b>TOTAL Boardwalk Loop Construction Costs:</b>	<b>\$ 1,635,375</b>	
<b>TOTAL ESTIMATED CONSTRUCTION RIVERWALK PARK &amp; BOARDWALK LOOP:</b>		<b>\$ 6,036,402</b>
<b>TOTAL ESTIMATED DEVELOPMENT AND CONSTRUCTION:</b>		<b>\$ 6,732,402</b>

#### Notes:

- 20-25% contingency added due to conceptual nature of the design. Estimates developed by BETA.
- 5% escalation contingency added for construction in 2-3 years.
- This table is a summary, refer to Appendix for more details.

## EXECUTIVE SUMMARY – Next Steps

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The Next Steps for the DISUC Committee and Town Staff will continue to move this important project forward with input from the Board of Selectmen as outlined below:

### **Events/Festival Space:**

- Conduct short term improvements at the drive-in area to promote interim uses in 2018 including mowing, brush/small tree removal, relocation of stones and removal of glass and refuse.
- Obtain supplemental input from the August 18, 2018 concert event organizer to identify issues.
- Evaluate and implement the removal of the existing pile of organic matter/wood chips which is impacting the ability to utilize the full area for events/festivals. Work with the Department of Public Works to complete this work.
- Move forward with develop of a Concept Plan for the Event Area to define improvements to utilize the site permanently for events/festivals, coordinating with the preferred Riverwalk Park layout. Meet with a range of event organizers to garner input on needed amenities. Develop cost estimates and identify/obtain funding for construction of these improvements.

### **Riverwalk Park & Boardwalk:**

- Move forward with a Community Preservation Act (CPA) grant application in the fall of 2018 for design and permitting and partial construction funding. Seek out and apply for other supplemental grant opportunities utilizing the CPA fund as matching funds.
- Engage a consultant to design and permit the preferred Riverwalk Park and Boardwalk concept plans and move towards construction

## INTRODUCTION

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The Town has owned the 22 acre former drive-in property at 669 Route 28 since 1985 when it was taken for recreational purposes. For many years the Town planned to develop the property as a public/private marina. However, a subsequent feasibility analysis indicated that a stand-alone marina would no longer be financially viable and the Board of Selectmen (Board) formed the **Drive-In Site Utilization Committee (DISUC)** in 2015 to investigate other uses for the property.

Ultimately the Committee recommended a phased approach to the site with the first phase being the Riverwalk Park along the Parkers River and a Boardwalk over the marsh to Seagull Beach, with the remainder of the property for interim uses such as concerts and other community events.

To investigate this proposal further, the Town undertook a Feasibility/ Concept Design Study beginning in March 2017. The DISUC, along with the Department of Community Development and other Town Staff, worked with a hired Consultant, BETA, to complete a 16 month long Charge to vet the original concepts and prepared findings and recommendations for the future utilization of the former drive-in property and the town owned marshland to the south.

The DISUC Committee was made up of seven members, including Jim Saben (Chairman), Tom Roche (Vice Chairman), Jack McCormack, Rich Bilski, David Reid, Gerry Manning, and Peter Slovak. Alternate non-voting members are Bud Nugent and Dave Helberg.

Consultant hired by the Town -

- **The BETA Group, Inc.** for Landscape Architecture/Graphics, Visioning/Planning, Civil/Stormwater and Environmental Permitting

Subconsultants

- **Wetland Strategies, Inc.** for Wetland Delineation and Wetland Strategies
- **Alpha Survey Group, LLC**, for surveying
- **GEI Consultants, Inc.** for Boardwalk Engineering

Throughout 2017 and 2018, there were a total of 20 public meetings, including 3 formal public outreach meetings where community stakeholders reviewed the presented information and offered input to assist the DISUC in forming five recommendations reflecting the Town’s priorities and values.

### Community Stakeholders

Board of Selectmen	Town Staff	DISUC
Community Development	Building	Police
Conservation Commission	Health	DPW
Parks and Recreation	Abutters	General Public
Planning Department	Consultants	

## INTRODUCTION – Location Map



**LOCATION MAP**

The site is comprised of three distinct areas --

- *“Drive-In Area” cleared and graveled area from the original drive-in.*
- *“River Walk Area” to the east of the Drive-In Area and extends along the Parkers River*
- *“Marsh Land Area” south of the Drive-In Site extending to Sea Gull Beach.*

## DISUC & BOARD APPROVED RECOMMENDATIONS

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1. Retain the Drive-In Site for its originally intended use for Recreation and do not pursue Article 97 disposal of any portion of the property.
2. Establish a permanent use of the Drive-In Area for festivals and special events. Determine minimum improvements, costs and funding needed for the Drive-In Area to facilitate events and festivals at the site, while retaining compatibility with future construction of the Riverwalk Park.
3. Move forward with the DISUC Preferred Riverwalk Park Concept Plan, dated January 2018. Understanding funding limitations, development of the Riverwalk Park may need to be phased with priority assigned as follows: construction of the driveway access, parking, restrooms, kayak launch, picnic areas, vegetation restoration, nature walks and signage. The remaining amenities can be incorporated over time as additional funds or grants are obtained.
4. Move forward with the Looped Boardwalk Option 1C. The Committee unanimously agreed that some form of a boardwalk is central to the success of the project and the concept of creating a year-round, daily draw to the site and the area. **To that end and understanding that a boardwalk is an important component for creating a destination location in conjunction with the Riverwalk Park, the Committee was unanimously in favor of the inclusion of a Boardwalk “loop”** (see Boardwalk Option 1C below). Three of five members present at the April 11th meeting, also voted to pursue Boardwalk Option 2 (see Boardwalk Option 2 below) which includes the loop and travels across the marsh to Seagull Beach. Subsequently, the Board of Selectmen (Board) chose to move forward at this time with the Looped Boardwalk Option 1C.
5. Design and permit the Riverwalk Park and Boardwalk at the same time and move forward with development of each as funding permits.

*“Construction of the park is estimated to cost \$4.8 million ... the town could use several grant programs and take a phased approach to development to control costs. There’s ways that you can do a lot of this incrementally and still achieve the final goal of achieving a beautiful park and river walk area. Annual maintenance is estimated at #31,000, but could be offset by user fees from festivals held at the site or kayak rentals”*

*– Jim Saben, DISUC Committee Chairman, Article by Kristin Young, [Cape Cod Times](#)*

## RECOMMENDED NEXT STEPS

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**As the Board of Selectmen (Board) has chosen to pursue the Committee's recommendations based on their May 22 and July 24, 2018 meetings, the next steps are:**

1. Finalize the design of short-term site improvements needed to promote use of the Drive-In Area for events and festivals, develop cost estimates, identify and obtain funding for these improvements, and construct these improvements. Work with the Department of Public Works and other Town Departments to determine if some work items can be completed by Town Staff.
2. Move forward with Boardwalk Option 1C: The Board reviewed the two Boardwalk options (Option 1C - Northern Loop and Option 2 which travels across the marsh) in more detail at their July 24, 2018 meeting including a discussion on stakeholder input and the need for borings and geotechnical information for Option 2 (across the marsh and creek) to determine the actual depth to peat. The peat depth is critical to the foundation design and is needed to ensure an accurate construction cost estimate. Ultimately the Board decided to move forward with the Looped Boardwalk Option 1C at this time.
3. With the Boardwalk decision finalized, move forward with obtaining funding for design, permitting and updated cost estimates for the Riverwalk Park and chosen Boardwalk option.
4. Pursue funding opportunities for the Riverwalk Park and Boardwalk.

## FINDINGS RECREATION USE

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*“The Town of Yarmouth has a diamond that we’re sitting on, and we should polish it off”*

James Saben, DISUC Committee Chairman, said when referring to the construction of the Riverwalk & Boardwalk.

Article by Kristin Young, [Cape Cod Times](#)

- Although the Committee considered revisiting the possibility of a Marina in conjunction with mixed use development, **the Committee ultimately voted 5-0 to preserve the Recreational nature of the entire site and NOT to pursue any Article 97 disposition to sell or dispose of any portion of the property for private or commercial uses.**
- This vote was based on the original 1985 Town Meeting vote, the need for centrally located activities for residents and visitors, and the unique opportunity that this property presents for the Town.
- The Committee also acknowledged that the site was too small to accommodate a mixed-use development in conjunction with a private marina.
- The Committee further clarified that their vision for “Recreational Uses” on the property was primarily for events and festivals.
- This use will benefit the Town by creating economic opportunities that complement the Town’s character and which will also foster community pride by establishing a popular destination.
- The ramifications of this vote are significant in that the likely funding sources for the Riverwalk Park and Boardwalk would place permanent restrictions on the use of the site, and could require payback should those restrictions be removed.
- The decision to retain the entire site for Recreational use also precludes the need for a subdivision. The subdivision component of the feasibility study had been intended to divide the parcel so that Community Preservation Act funds could be directed to the Riverwalk Park without placing a recreation restriction on the remainder of the land.

## FINDINGS RECREATIONAL USE

The DISUC determined that by (1) finding interim uses for the Drive-In Area outside the Riverwalk Park area, and (2) by making minimal improvements to the property, the town can start using this long vacant property and help to revitalize the area in the short term.

During March, 2018, a pilot test was conducted by using the property for an Irish Festival. The event was successful and brought additional traffic to local area businesses.

Working with the event organizers, Staff identified a number of improvements that would be desirable to event sponsors, including:

- grading and greening of the site
- creating an informal parking area
- upgrading electrical and water service
- potential for adding Wi-Fi capacity to the site for vendors

These initial improvements do not include restroom facilities, but the Committee recognizes that these might be added at some point in the future.

The next step will be to develop cost estimates for these improvements and to identify possible funding sources including, but not limited to, Tourism Revenue Preservation and Community Preservation Act Funds.

The Committee's recommendation for the interim use of the site for events/festivals ultimately became their recommendation for a permanent use for the site



## FINDINGS RIVERWALK PARK — Concept Plan Options

An initial sketch was developed as part of the DISUC’s original recommendations to the Board of Selectmen in September 2015. In 2017 this sketch was refined into three Concept Sketches that were presented at two public outreach meetings to garner public input (Riverwalk Park Concept Options A, B & C, dated May 2017, shown below). This process resulted in the attached Riverwalk Park – DISUC Preferred Concept Plan, dated January 2018. This Preferred Concept Plan was also presented to the public at an April 2, 2018 public meeting.



# FINDINGS RIVERWALK PARK – Preferred Concept



## FINDINGS RIVERWALK PARK — Elements

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Preferred materials for use at the park that would minimize maintenance costs were considered and selected by the Committee. These material choices were then used in the development of cost estimates. Refer to the list of Amenities, Graphics and Riverwalk Park and Boardwalk Materials List found below. Please note that although composting toilets were presented and discussed at the public meetings, traditional restrooms and a porta john enclosure near the kayak launch were ultimately chosen.

### Amenities proposed include:

- access road with utilities
- pedestrian beacon across Route 28
- 82 parking spaces (pervious pavement)
- Pervious walking paths and woodland trails
- solar trash compactors
- decorative lighting
- landscaping with native vegetation
- groomed lawn area with fabric
- sail shade structures for events
- a variety of seating options
- interactive and natural playscapes
- kayak launch with vendor trailer and location for leased storage
- traditional restrooms along with a porta john enclosure near the kayak launch
- space for future artist tents or shanties
- interpretive signage
- kiosks including educational component at the existing shellfish upweller and boating safety at the kayak launch
- Prominent wayfinding signage and kiosks to inform and direct visitors and residents
- Space for future artist tents/shanties and public art

## FINDINGS RIVERWALK PARK — Elements

### Kayak Rental Options

Vendor Trailer



Kayak rental locker



Lease storage space



Yarmouth Riverfront Park & Boardwalk

### Artist Shanty, Rental Huts



Yarmouth Riverfront Park & Boardwalk

### Food Trucks/Seating Areas



Yarmouth Riverfront Park & Boardwalk

### Public Art Displays



Yarmouth Riverfront Park & Boardwalk

# FINDINGS RIVERWALK PARK — Elements

### Educational Opportunities

Existing Shellfish Upweller

Yarmouth Riverfront Park & Boardwalk

### Interpretive Signage

The Anatomy of the Scallop

MARTIN MILLWELL

LAKE ECOLOGY

Yarmouth Riverfront Park & Boardwalk

### Interactive & Natural Playscapes

Yarmouth Riverfront Park & Boardwalk

### Events/Activities

Outdoor Exercise Classes

Weddings or reunions

Small theatre productions

Concerts in the Park series

Yarmouth Riverfront Park & Boardwalk

# FINDINGS RIVERWALK PARK — Elements

### Pavilion and Shade Structures/Seating

Yarmouth Riverfront Park & Boardwalk

### Restrooms - Composting Toilets

**Pre-fabricated/Composting restrooms**

- Self-contained waste treatment systems
- Emit no pollution
- Site disturbance minimized to the footprint of the buildings
- Traditional looking buildings.

Yarmouth Riverfront Park & Boardwalk

### Portable Toilets Enclosure – Dennis Pond

Yarmouth Riverfront Park & Boardwalk

### Traditional Restrooms

Yarmouth Riverfront Park & Boardwalk

# FINDINGS RIVERWALK PARK — Elements



## FINDINGS RIVERWALK PARK —Materials List 1

<b>RIVERWALK PARK AND BOARDWALK                      MATERIALS LIST                      Updated September 20, 2017</b>		
Element	Materials	Comments
<b>RIVERWALK PARK:</b>		
Entrance Roadway	<ul style="list-style-type: none"> <li>Traditional bituminous pavement with drainage system to meet WPA for treatment, recharge, peak attenuation, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Traditional pavement chosen over impervious pavement due to potential for traffic from Lot 2 and durability for turning movements.</li> <li>All new utilities to come through entrance road and be buried.</li> </ul>
Pedestrian Crossings	<ul style="list-style-type: none"> <li>Push-button pedestrian flashing beacon and crosswalk at Route 28 for safety.</li> <li>Elevated walkways periodically throughout the parking lot to access Lot 2 and slow traffic.</li> </ul>	
Parking Lot	<ul style="list-style-type: none"> <li>Permeable Pavement.</li> </ul>	<ul style="list-style-type: none"> <li>Permeable pavement chosen to meet environmental regulations and eliminate the need for constructed drainage systems.</li> </ul>
Pathways	<ul style="list-style-type: none"> <li>Permeable Pavement.</li> </ul>	<ul style="list-style-type: none"> <li>Permeable pavement chosen to meet environmental regulations, for durability, easy handicap accessibility and no drainage required.</li> <li>Pathway widths should be minimum of 6' wide, with 8' preferable wherever permissible.</li> </ul>
Curbing/curb stops	<ul style="list-style-type: none"> <li>Curb stops in parking areas next to pathways.</li> </ul>	<ul style="list-style-type: none"> <li>Curb stops to protect pedestrian pathway next to the parking areas from vehicles and overhanging bumpers.</li> <li>No proposed curbing, keep it more natural/less formal.</li> </ul>
Restrooms	<ul style="list-style-type: none"> <li>Traditional Restroom/info center designed for floodplain near entrance.</li> <li>Portable toilet enclosure with roof near Kayak launch.</li> <li>Include automatic timed locks for restrooms to close from dusk to dawn.</li> </ul>	<ul style="list-style-type: none"> <li>Restrooms to be locked at night using automatic system (similar to other public restrooms in Town).</li> </ul>

## FINDINGS RIVERWALK PARK —Materials List 2

<b>RIVERWALK PARK AND BOARDWALK                      MATERIALS LIST                      Updated September 20, 2017</b>		
Element	Materials	Comments
Trash Cans/Recycling	<ul style="list-style-type: none"> <li>• Bigbelly Solar Trash Compactor/Recycling Containers.</li> </ul>	<ul style="list-style-type: none"> <li>• Locate 3 trash/recycling containers throughout the park where accessible by the trash truck.</li> </ul>
Lighting 	<ul style="list-style-type: none"> <li>• Decorative Lighting – nautical theme, LED, max. 15’ high poles.</li> <li>• Lighting should be able to accommodate security cameras.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider use of solar powered lighting if the design moves forward, but price buried electrical lines for cost estimate.</li> <li>• Include 3 security cameras in the parking area attached to light posts.</li> </ul>
Gate at Entrance to Park	<ul style="list-style-type: none"> <li>• Decorative style (not a utilitarian barrier gate, but not elaborate).</li> </ul>	<ul style="list-style-type: none"> <li>• May not be locked at all times.</li> </ul>
Landscaping	<ul style="list-style-type: none"> <li>• Include a variety of native species to reduce maintenance, to restore resource buffer areas, and foster butterfly and pollination areas. Consider edible gardens.</li> <li>• Retain one large grass area for events, but reduce other areas requiring mowing. Lawn event area to be irrigated.</li> <li>• Include water spigots around the park for watering and for drinking fountains.</li> <li>• Retain vistas from southern parking areas with low plantings.</li> <li>• Reduce number of trees that impact river views, increase visibility for security and reduce maintenance costs.</li> <li>• Use low lying shrubs to ensure lines of sight for security (&lt;3’).</li> <li>• Use shrub species to deter access to unwanted areas (thorny or thick shrubs).</li> </ul>	<ul style="list-style-type: none"> <li>• Low maintenance landscaping to meet the ecological restoration goals, maintain visibility of water views and for passive surveillance, include diverse plantings to foster butterfly/pollination areas and edible gardens.</li> </ul>
Pavilion at Lawn Area	<ul style="list-style-type: none"> <li>• Use fabric sails over permeable pavement pad (rather than structured pavilion).</li> <li>• Estimated area covered 20’x30’.</li> </ul>	

## FINDINGS RIVERWALK PARK —Materials List 3

<b>RIVERWALK PARK AND BOARDWALK                      MATERIALS LIST                      Updated September 20, 2017</b>		
Element	Materials	Comments
Seating Options	<ul style="list-style-type: none"> <li>• Benches (locate some trees for shade near benches).</li> <li>• Casual seating such as boulders.</li> <li>• A few picnic tables near the lawn area.</li> </ul>	<ul style="list-style-type: none"> <li>• Seating should be vandal-resistant and designed to prevent people from lying down (center handrail).</li> </ul>
Interactive/natural playscapes	<ul style="list-style-type: none"> <li>• Natural Materials for four (4) play-scape areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Include handicap accessibility</li> </ul>
Kayaks Vendor Trailer Leased Storage Space	<ul style="list-style-type: none"> <li>• Pervious Pavement Pad Area for private vendor.</li> <li>• Corral Area and Low Racks for leasing.</li> </ul>	<ul style="list-style-type: none"> <li>• No rental locker proposed at this time.</li> </ul>
Interpretive Signage & Kiosks	<ul style="list-style-type: none"> <li>• Signage at the entrance to identify park rules/hours.</li> <li>• General tourist information board at restrooms.</li> <li>• Kayak safety education kiosk.</li> <li>• Interpretive signage at the Upweller, pollinating/butterfly areas, edible garden and along the river.</li> </ul>	<ul style="list-style-type: none"> <li>• Consultant to determine materials and sizes for estimating purposes (include 8-10).</li> </ul>
Educational Elements	<ul style="list-style-type: none"> <li>• Included in interpretive signage above.</li> </ul>	
Artist Shanties/Tents	<ul style="list-style-type: none"> <li>• None initially budgeted.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide area for tents for now and future shanties at a later date.</li> </ul>
Public Art	<ul style="list-style-type: none"> <li>• None initially budgeted.</li> </ul>	<ul style="list-style-type: none"> <li>• Have separate source of funding for public art.</li> </ul>
Food Trucks	<ul style="list-style-type: none"> <li>• Utilize portion of parking lot – no special area.</li> </ul>	<ul style="list-style-type: none"> <li>• Food Trucks for special events only can use a closed off section of the parking lot.</li> </ul>

## FINDINGS FOR RIVERWALK PARK — Wetland Resources & Permitting Needs

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The Drive-In Site is already partially developed/disturbed, lessening some of the permitting requirements when being redeveloped. Resource areas were taken into consideration during the design of the park and the project includes landscaping restoration within the riverfront area to help protect the salt marsh and river resources.

**There are no significant regulatory or site constraints that would preclude the redevelopment of the site as a Riverwalk Park.**

The full Letter Report on the Wetland Resource Area Delineation is included in Appendix A, and the Memo outlining Issues, Site Constraints and Environment/Regulated Resources is included in Appendix B. These wetland resources were mapped onto the surveyed Base Map included in Appendix C.

Protected natural resources on the site include:

- Salt Marsh
- Coastal Dune
- Isolated Wetlands
- 200' Riverfront Area Adjacent To Parkers River
- Floodplain And River Bank

Key permitting programs for the Riverwalk Park include:

- Massachusetts Environmental Policy Act (MEPA)
- Wetlands Protection Act & Yarmouth Wetlands By-Law
- Cape Cod Commission – Development of Regional Impact (DRI) (if required through the MEPA process)
- Chapter 91 License & Army Corp of Engineers
- MA Programmatic General Permit for the kayak dock

## FINDINGS FOR RIVERWALK PARK — Costs

<b>SUMMARY OF PROJECT COSTS RIVERWALK PARK AND ACCESS ROAD</b>		
<b>DESCRIPTION</b>	<b>SUBTOTALS</b>	<b>TOTALS</b>
<b>CONSTRUCTION COSTS:</b>		
Access Road - Opinion of Probable Const. Costs		
Access Road & Utilities	\$ 877,150	
25% Contingency	\$ 219,288	
5% Escalation Contingency	\$ 43,858	
<b>Access Road &amp; Utilities Construction Costs:</b>		<b>\$ 1,140,295</b>
Opinion of Probable Construction Costs - Riverwalk Park		
Riverwalk Park & Woodland Paths	\$ 2,508,255	
25% Contingency	\$ 627,064	
5% Escalation Contingency	\$ 125,413	
<b>Riverwalk Park Construction Costs</b>		<b>\$ 3,260,732</b>
<b>DEVELOPMENT COSTS (design, permitting, bidding &amp; construction administration):</b>		
Access Road	\$ 55,000	
Subdivision Permitting (existing contract – not recommended)	\$ 15,624	
Riverwalk Park	\$ 270,000	
20% Development Contingency	\$ 68,125	
<b>TOTAL ESTIMATED FOR DEVELOPMENTS COSTS:</b>		<b>\$ 408,749</b>
<b>TOTAL ESTIMATED RIVERWALK DEVELOPMENT &amp; CONSTRUCTION:</b>		<b>\$ 4,809,775</b>

The table above summarizes the costs associated with utilizing the preferred Concept Plan and Material List. BETA developed opinions of probable construction costs and soft costs for the project. The construction costs are broken into separate estimates for the access road and the Riverwalk Park to maximize alternative funding sources. As the project is in the concept stage, a healthy 25% contingency has been included, as well as a 5% escalation contingency for future construction. As with any project, delays in the project timeline could have serious impacts to the overall project costs. Being a Town project, consideration for state wage rates have been included in the construction estimates.

## FINDINGS FOR RIVERWALK PARK — Costs (Continued)

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Also shown in the Summary of Project Costs table are development costs which include preliminary design, final design, permitting, bidding services and construction administration. A 20% contingency has been added to these soft costs.

For a more detailed breakdown of construction cost, see the following additional information in Appendix D:

- BETA cost estimates dated January 17, 2018 for the “Subdivision Entrance Drive” and the “Riverwalk Park (Preferred Concept)” for a more detailed breakdown of construction costs.
- BETA “Riverwalk Park (Preferred Concept) Soft Costs Estimate” for more detailed information.

## FINDINGS FOR RIVERWALK PARK — Maintenance Costs

<b>RIVERWALK PARK</b> <b>ESTIMATED AVERAGE ANNUAL MAINTENANCE COSTS</b> <b>January 16, 2018</b>		
Description	Average Annual Maintenance Costs	Remarks
Bathroom Cleaning	\$5,250	1.5 hrs./day, 7 days per week, for 20 weeks @ \$25/hr (3 stalls each side)
Porta-john Cleaning	\$3,960	\$165/month for 6 Months for 4 Porta-Johns
Porta-john Rentals	\$2,800	\$700 per season per Porta-John for 4 Porta-Johns (2 handicapped)
Bathroom Supplies - weekly	\$2,400	\$120 per week for 20 week season
Stock & Repair Materials	\$1,000	General Stock and repair parts per season
Mowing and trimming	\$2,600	3 hours per week for 26 weeks @ \$25/hr plus 26 hrs/season for irrigation
Fertilizing	\$500	Lump sum per season for law areas only
Watering as needed (spigots)	\$1,000	2 hours/week for 20 weeks at \$25/hr.
Trash Removal	\$1,500	3 hours/week for 20 weeks at \$25/hr.
Lighting & Electrical Maintenance	\$2,400	Estimated costs - LED lights
Line Striping	\$500	line striping once every 3 years
Stormwater - Basin Cleaning	\$1,000	Cleaning of Subdivision drainage structures and infiltration structures
Stormwater - Pervious Pavement	\$1,200	Sweeping of Parking twice per year
Pathway Maintenance	\$800	Periodic sweeping/sweeping
Septic Pumping	\$600	Pumping every other year
Structure Maintenance	\$2,000	Painting and repairs of park structures
Plowing & Salting	\$1,500	\$150 per event, estimated at 10 events per season
<b>Total:</b>	<b>\$31,010</b>	<b>Estimated <i>average</i> annual Riverwalk Park Maintenance Costs</b>

Utilizing knowledge of maintenance requirements at other Town facilities, Town Staff developed an estimate of average annual maintenance costs for the Riverwalk Park as outlined above. At approximately \$31,000 per year, these maintenance costs could be partially offset with potential revenue sources such as leasing to a kayak vendor, rentals for kayak storage, special event fees at the Riverwalk Park, pay and display parking, adopt a park program and naming rights/sponsorships.

## FINDINGS FOR RIVERWALK PARK — Potential Funding Sources

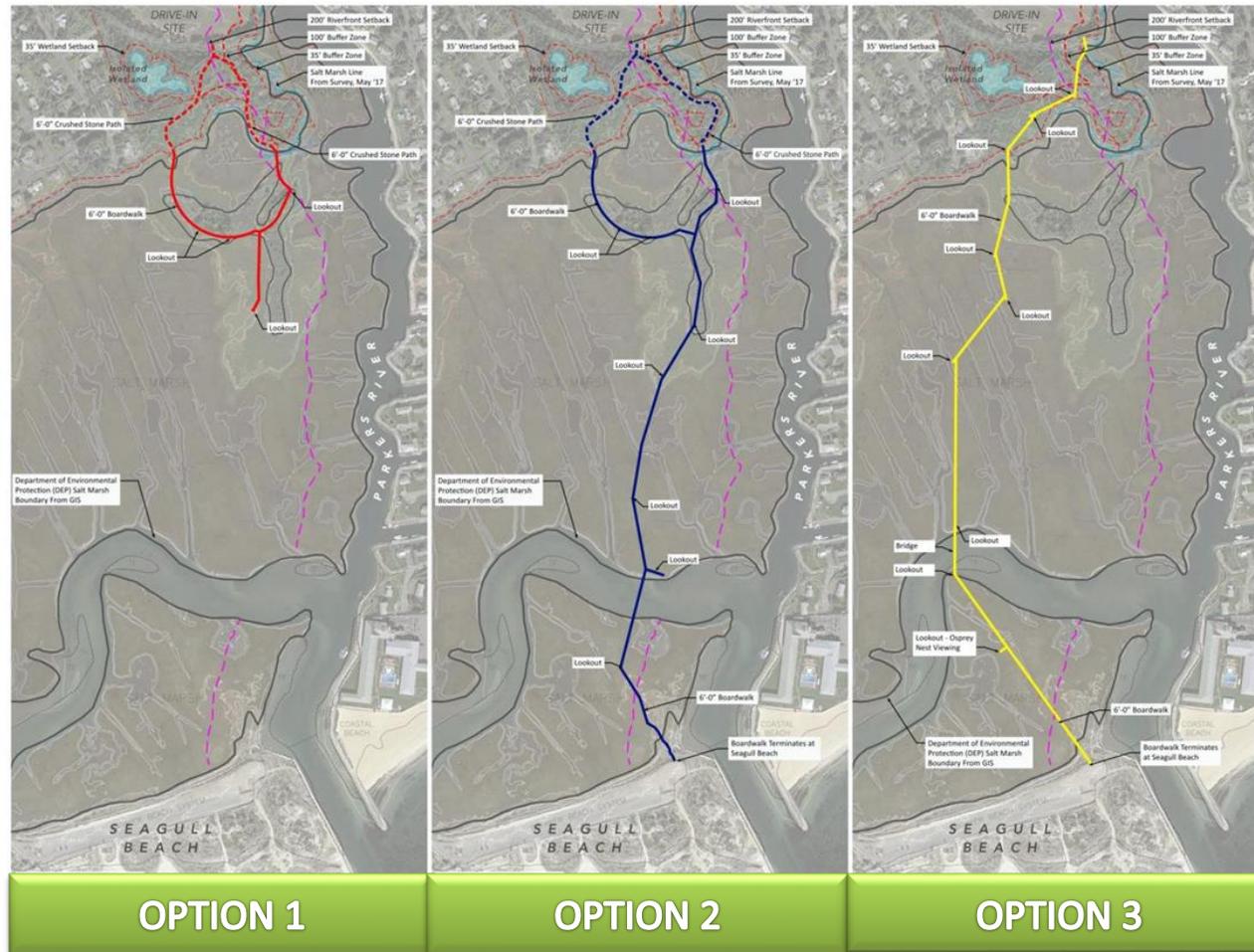
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There are a variety of funding sources and grant opportunities for the park that will be investigated should the project move forward, including but not limited to the following:

- Community Preservation Act (CPA) funds (often provides a source of matching funds required by other grant programs)
- Tourism Revenue Preservation Funds
- State Recreation Funds through the Division of Conservation Services
- Seaport Grants
- Transportation Funds
- Parkland Acquisitions and Renovations for Communities (PARC) Grant Program
- MassDevelopment

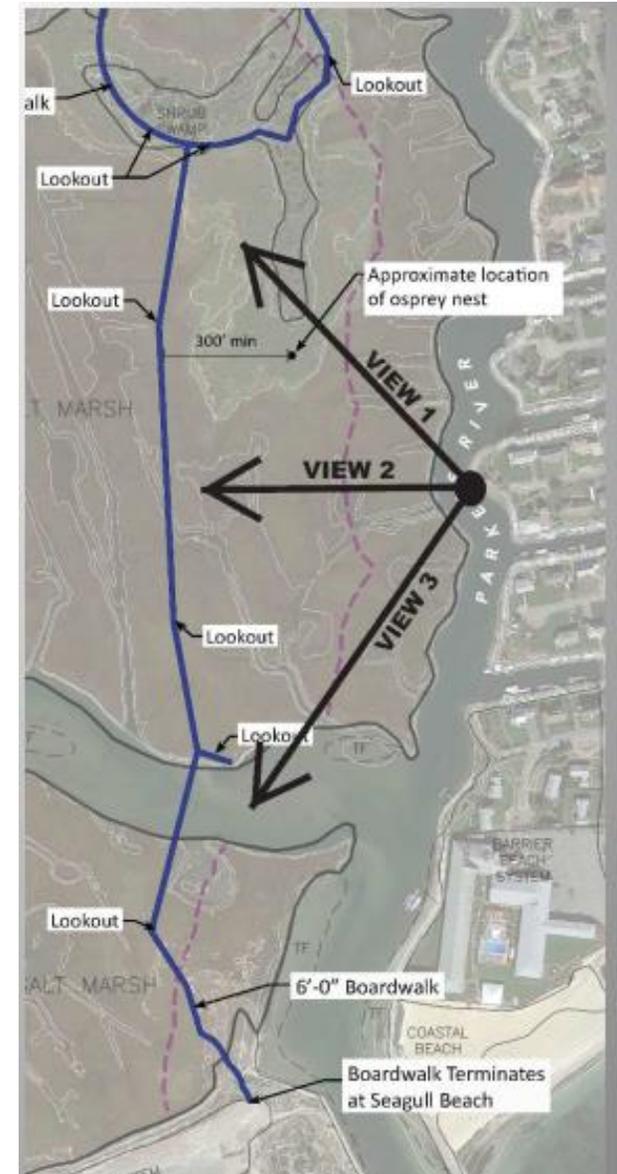
## FINDINGS FOR BOARDWALK — Layout Options

As was done with the Riverwalk Park, three Boardwalk alignment options were developed and presented to the public at two public outreach meetings. The concepts included two options that traversed over the marsh to reach Seagull Beach and one that was a loop and short spur from the southern end of the Drive-In property that would not extend over the marsh (refer to the Boardwalk Concept Sketches Options 1, 2 & 3, dated May 2017, shown below).



## FINDINGS FOR BOARDWALK — Photo-Visualization Locations

The public meetings resulted in a number of concerns being raised related to the visual impacts of the boardwalk on the nearby Gateway Isles neighborhood located across Parkers River. To better understand the potential visual impacts, a photo representation was prepared showing what the three Boardwalk Options would look like from the end of Cape Isle Drive. Photo visualizations from three different Views were prepared.



## FINDINGS FOR BOARDWALK — Photo-Visualizations View 1, 2 & 3

The Photo Representations below show the 3 Boardwalk Options for each of the 3 Views from the Gateway Isles Neighborhood. A panoramic view of the photo representation was presented at the April 2, 2018 public input meeting.

### View 1



Riverwalk Park & Boardwalk - Boardwalk Visualization View 2  
Tremouth, MA  
SOOQ  
October 2017

### View 2



Riverwalk Park & Boardwalk - Boardwalk Visualization View 1  
Tremouth, MA  
SOOQ  
October 2017

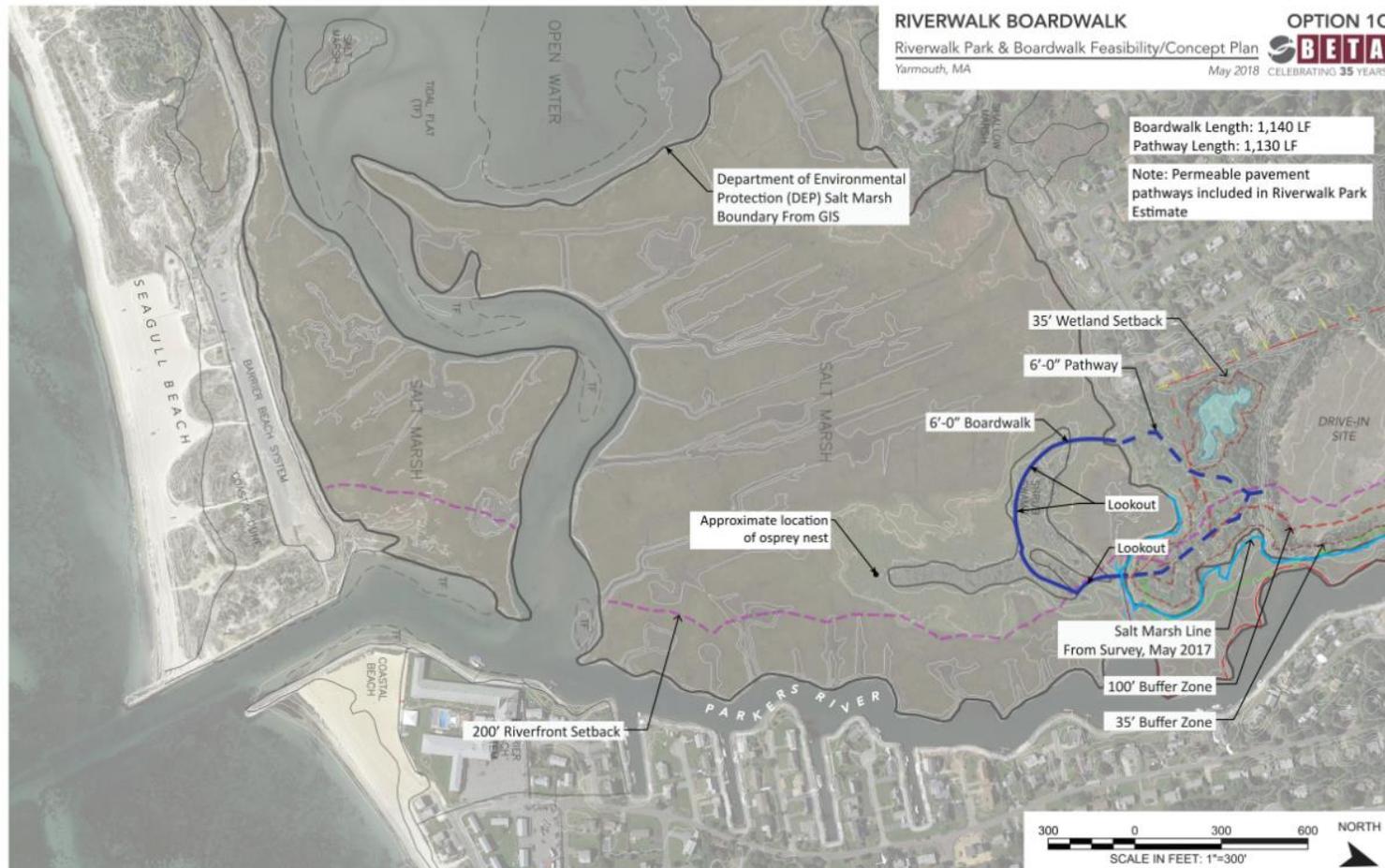
### View 3



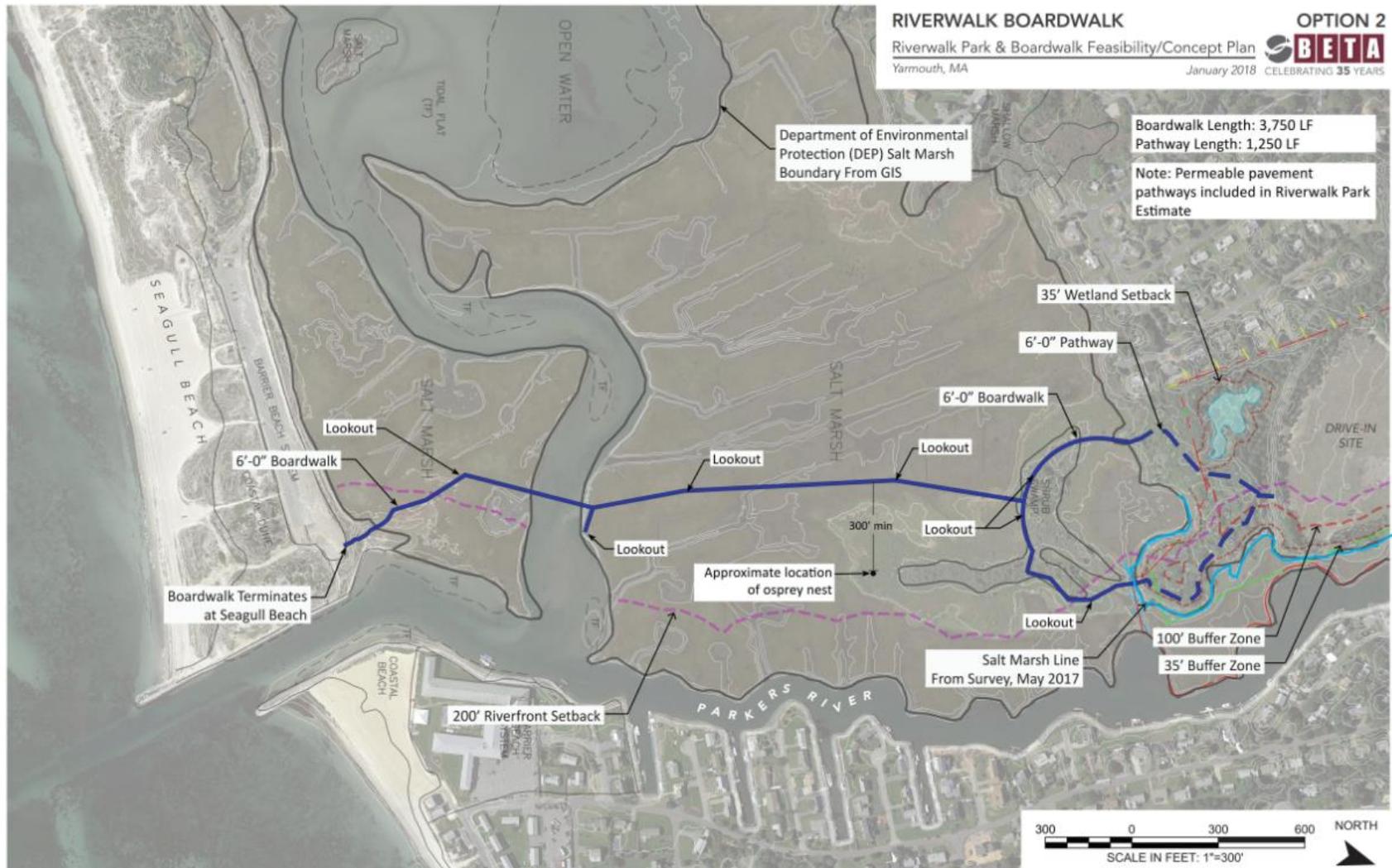
Riverwalk Park & Boardwalk - Boardwalk Visualization View 3  
Tremouth, MA  
SOOQ  
October 2017

## FINDINGS FOR BOARDWALK – Preferred Concepts

The Committee was unanimous in their recommendation to move forward with some form of a Boardwalk as they felt it was central to the success of the project and the concept of creating a year-round, daily draw to the site and the area. However, the Committee did not reach unanimous consensus on the preferred alignment for the Boardwalk and presented two alternatives to the Board of Selectmen at their May 22, 2018 meeting (refer to the attached Boardwalk Option 1C and Option 2). Option 1C created a Boardwalk Loop, while Option 2 traveled across the marsh to Seagull Beach. Although the Board of Selectmen ultimately chose to move forward with Boardwalk Option 1C at their July 24, 2018 meeting, the following incorporates information for both Option 1C and Option 2.



## FINDINGS FOR BOARDWALK – Preferred Concepts

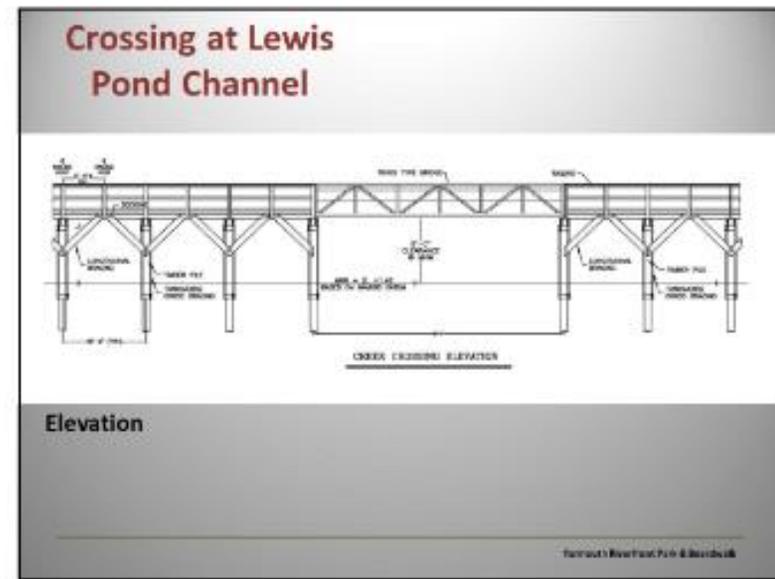
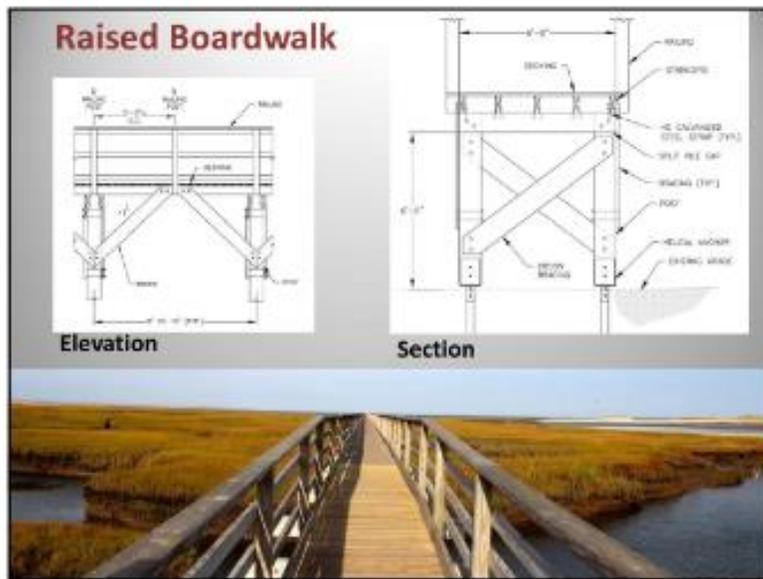


Option 2 was modified from the original Concept Sketch Option 2 to provide a minimum of 300' from a noted osprey nest

## FINDINGS FOR BOARDWALK – Materials

The preferred Boardwalk design incorporates a 6' wide boardwalk made of Brazilian hardwood with wooden railings flared out on the sides. The boardwalk will include a number of outlooks with grating and interpretive signage. The boardwalk over the marsh would have a helical anchor foundation with the boardwalk located 6' above the marsh to prevent shading. The raised boardwalk over the creek crossing (Option 2) would have an 8' clearance from the high water level to allow for the limited boat access and would be constructed on pilings. The entire boardwalk would be handicapped accessible.

As with the Riverwalk Park, preferred materials and amenities for the Boardwalk were developed as noted in the Graphics and Riverwalk Park and Boardwalk Materials List found below. Please note that cable railing was presented and discussed at the public meetings, but wooden railing was ultimately chosen.



# FINDINGS FOR BOARDWALK – Materials

### Wood Boardwalk and Railing

Vertical Railing

Yarmouth, MA

Angled Railing can give the impression of more room

Cape Cod National Seashore

Yarmouth Riverwalk Park & Boardwalk

### Cable Railing

Wood post and top rail

Stainless steel or aluminum post and top rail

### Boardwalk Decking Materials

Grating at a corner bump-out

Donation naming

Yarmouth Riverwalk Park & Boardwalk

### Boardwalk Overlooks- Configurations

Corner bump-out

Side bump-out

Extension bump-out

Side bump-out

Yarmouth Riverwalk Park & Boardwalk

## FINDINGS FOR BOARDWALK – Materials List

<b>RIVERWALK PARK AND BOARDWALK                      MATERIALS LIST                      Updated September 20, 2017</b>		
Element	Materials	Comments
<b>BOARDWALK AND WOOD TRAILS:</b>		
Boardwalk Deck	<ul style="list-style-type: none"> <li>• IPE ( Brazilian Hardwood) – sustainably harvested.</li> <li>• Southern Yellow Pine as an alternate.</li> <li>• Aluminum Grating at bump outs.</li> </ul>	<ul style="list-style-type: none"> <li>• Cost estimate should include IPE, with an alternate for southern yellow pine.</li> <li>• IPE must be sustainably harvested.</li> </ul>
Railings	<ul style="list-style-type: none"> <li>• Wood posts and railings that flare out on the sides.</li> </ul>	<ul style="list-style-type: none"> <li>• No Chromated Copper Arsenate (CCA) pressure treated wood. Alkaline Copper Quaternary (ACQ) is a less damaging pressure treated wood.</li> <li>• SS cable not used due to comments from public on noise from the wind whistling through the cables.</li> </ul>
Pathways through Woods	<ul style="list-style-type: none"> <li>• Permeable pavement.</li> </ul>	<ul style="list-style-type: none"> <li>• Permeable pavement chosen to meet environmental regulations, for durability, easy handicap accessibility and no drainage required.</li> </ul>
Interpretive Signage	<ul style="list-style-type: none"> <li>• Signage at all entrances to boardwalk identifying use rules.</li> <li>• Signage along the boardwalk noting wildlife, osprey nests, plants, marsh ecosystem, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Assume 8-10 interpretive signs along the Boardwalk.</li> <li>• Consultant to determine materials and sizes for estimating purposes.</li> </ul>
Trash Cans	<ul style="list-style-type: none"> <li>• One (1) Bigbelly Solar Trash Compactor</li> </ul>	<ul style="list-style-type: none"> <li>• Locate a trash compactor at the entrance to the boardwalk at Seagull Beach</li> </ul>

## FINDINGS FOR BOARDWALK – Permitting Needs

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A proposed boardwalk would traverse over multiple protected natural resources including the tidal creek to Lewis Pond for Option 2 and potential rare wetland wildlife and priority habitats for rare species.

Although there are multiple environmental permits required for the project, boardwalks are allowed over such resource areas if properly designed.

Permitting for the Boardwalk (especially the options traversing over the marsh and creek) would be more involved than for the Riverwalk Park.

**BETA concluded that there are no significant regulatory or site constraints that would preclude the development of a raised Boardwalk.**

Permitting for Option 1C may be more palatable to abutting neighbors, making it easier to permit. However, Option 2 traversing the marsh provides more of a destination draw and could foster more year-round use of the area. Ultimately the Board of Selectmen chose to move forward with Option 1C.

Key permitting programs for the Riverwalk Park include:

- Massachusetts Environmental Policy Act (MEPA)
- Wetlands Protection Act & Yarmouth Wetlands By-Law
- Cape Cod Commission – Development of Regional Impact (DRI) (if required through the MEPA process)
- Chapter 91 License for the creek crossing (Option 2)
- Army Corp of Engineers for the boardwalk and navigation

## FINDINGS BOARDWALK – Costs

BETA developed opinions of probable construction costs and soft costs for the three Boardwalk options, including three variations of Option 1. A healthy 25% contingency and 5% escalation contingency for future construction were included as outlined in the Table below.

SUMMARY OF PROJECT COSTS BOARDWALK OPTIONS - Updated May 2018					
DESCRIPTION	OPTION 1 North Side Loop; North & South Spurs	OPTION 1b North Side Loop & Spur	OPTION 1c North Side Loop Only	OPTION 2	OPTION 3
	Boardwalk: 1860' Channel: 0' Overlooks: 5	Boardwalk: 1490' Channel: 0' Overlooks: 4	Boardwalk: 1140' Channel: 0' Overlooks: 3	Boardwalk: 3575' Channel: 175' Overlooks: 7	Boardwalk: 3460' Channel: 200' Overlooks: 7
Plank Materials:	Hardwood	Hardwood	Hardwood	Hardwood	Hardwood
<b>CONSTRUCTION COSTS:</b>					
Boardwalk (6' wide, 20' helicals/5' embed)	\$ 1,377,400	\$ 1,103,100	\$ 846,600	\$ 2,637,750	\$ 2,551,400
Creek Crossing (6' wide, 40' pilings/20' embed)	\$ -	\$ -	\$ -	\$ 257,250	\$ 294,000
Railings (wood)	\$ 446,400	\$ 357,600	\$ 273,600	\$ 900,000	\$ 878,400
Overlooks (grating and wood railings)	\$ 43,000	\$ 34,400	\$ 25,800	\$ 60,200	\$ 60,200
Mobilization and Staging Area Prep	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
25% Contingency	\$ 491,700	\$ 398,775	\$ 311,500	\$ 988,800	\$ 971,000
5% Escalation Contingency	\$ 122,925	\$ 99,694	\$ 77,875	\$ 247,200	\$ 242,750
Subtotal for Construction:	\$ 2,581,425	\$ 2,093,569	\$ 1,635,375	\$ 5,191,200	\$ 5,097,750
<b>DEVELOPMENT COSTS (design, permitting, bidding &amp; construction administration):</b>					
	\$ 275,000	\$ 275,000	\$ 275,000	\$ 315,000	\$ 315,000
20% Development Contingency	\$ 55,000	\$ 55,000	\$ 55,000	\$ 63,000	\$ 63,000
Subtotal for Soft Costs:	\$ 330,000	\$ 330,000	\$ 330,000	\$ 378,000	\$ 378,000
<b>TOTAL REVISED ESTIMATED BOARDWALK DEVELOPMENT &amp; CONSTRUCTION:</b>	<b>\$ 2,911,425</b>	<b>\$ 2,423,569</b>	<b>\$ 1,965,375</b>	<b>\$ 5,569,200</b>	<b>\$ 5,475,750</b>

**Notes:**

1. Summary Table includes 6' wide boardwalk and assumes 15' of peat across marsh (20' helical foundation with 5' embedment) and 40' pilings with 20' embedment for the creek crossing.
2. Development Costs include Site Investigation, Survey, Borings, Preliminary Design, Final Design, Advertising and Bidding, Permitting and Cc
3. Permits anticipated include MEPA, Wetlands NOI, Chapter 91 and Army Corp (excludes EIR, special studies).

## FINDINGS BOARDWALK – Costs (Continued)

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The Committee decided to have BETA proceed with cost estimating assuming an average peat depth of 15' for the boardwalk and 20' deep for the channel crossing (Option 2). Borings would need to be done in the future for the boardwalk portion of the project to move forward with a final design.

Also shown in the Summary of Project Costs table above are development costs which include preliminary design, final design, permitting, bidding services and construction administration. A 20% contingency has been added to these soft costs.

Being a Town project, state wage rates have been included in the construction estimates. One of the unknowns at this stage of the project is the depth of peat across the marsh which will impact the depth of the foundations. Proposals were obtained from BETA to conduct six borings across the marsh, but the cost was in excess of available funding. Limited information was obtained from two manual test probes conducted on the south side of the marsh. The first test probe showed the peat approximately 5' deep and the second test probe (closer to the channel) was closer to 12'. There may be some locations where the depth to peat is greater in the center of the marsh with less along the edges.

## FINDINGS BOARDWALK – Maintenance Costs

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<b>Estimated Annual Maintenance Costs Boardwalk Options</b>		
<b>Boardwalk Option</b>	<b>Length (feet)</b>	<b>Estimates</b>
Option 1– North Side Loop; North & South Spurs	1,860	\$9,300
Option 1b – North Side Loop & Spur	1,490	\$7,450
Option 1c – North Side Loop Only	1,140	\$5,700
Option 2	3,750	\$18,750
Option 3	3,660	\$18,300

Working with Town Staff and BETA, an estimate of average annual maintenance costs for the Boardwalk Options were developed. General maintenance items could include periodic replacement of decking planks, railings and grating, as they age, split or warp. They do not include major repairs associated with storm damage.

For budgetary purposes, an estimated average maintenance cost of \$5 per linear foot of boardwalk is being used as outlined in the table above.

It should be noted that these general maintenance costs could be partially offset with the sale of engraved boardwalk planks. Based on current sales of planks at Bass Hole, plank sales could net approximately \$100 per plank.

## FINDINGS FOR BOARDWALK – Potential Funding Sources

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As with the Boardwalk, there are a variety of funding sources and grant opportunities for the Boardwalk that will be investigated should the project move forward including, but not limited to the following:

- Community Preservation Act (CPA) Funds - good source of local match for other grants
- Tourism Revenue Preservation Funds
- State Recreation Funds through the Division of Conservation Services (DCR)
- Seaport Grants
- Parkland Acquisitions and Renovations for Communities (PARC) Grant Program

It should be noted that the Boardwalk is located within a Coastal Barrier Resources System (CBRS) and federal funding cannot be utilized towards construction of structures within a CBRS. Careful consideration will need to be given to State Grant Programs as they may be receiving their funds from the federal government.

## MEETINGS AND NOTED CONCERNS - Schedule

Public input and transparency is a vital component of any Feasibility Study. The Committee met extensively in open public meetings throughout the Study including 3 public input meetings and multiple meetings with the Board of Selectmen, as outlined in the Meeting Schedule below.

### Riverwalk Park & Boardwalk Feasibility and Conceptual Design Study

#### MEETING SCHEDULE: Updated August 2018

#	Description	Attendance/Invitees	Purpose	Date*
1	Kick-off Meeting & Site Visit	Town Staff & DISUC & BETA	Kick-off Meeting with BETA to review purpose/process for study, discuss issues/concerns; ideas/amenities for concept designs; and conduct Site Visit	3/24
2	Three Preliminary Concept Sketches	Town Staff & DISUC & BETA	Review Preliminary Concept Sketches and provide input to BETA to further refine into Concept Sketches for stakeholder input. Discuss potential second survey.	5/2
3	Preparation and Organization Meeting	Town Staff & DISUC	Preparation for Public Information Meetings and selection of new Chairman/Vice Chairman	5/25
4	Public Input Meetings - Three Concept Sketches for Stakeholder Input	Conservation Commission Planning Board General Public/Neighbors Town Staff, DISUC & BETA	Public Presentations to garner public and stakeholder input on Concept Sketches and amenities.	5/30
5				6/7
6	Public Input Review	Town Staff & DISUC	Review public input comments and provide input to Staff regarding preferred Riverwalk Park alternative.	6/19
7	Concept Sketch of Preferred Riverwalk Park Sketch and Boardwalk Discussion	Town Staff & DISUC	Update on Riverwalk Park Preferred Alternative for costing purposes and preliminary discussion on Boardwalk Options.	7/10
8	Site Visits and Discussion on Visualizations for Boardwalk Options	Town Staff & DISUC	Site Visit to Drive-In Site and Cape Isle Drive. Discussion on photo-visualizations for the Boardwalk options.	7/31
9	Preferred Riverwalk Park Concept, Boardwalk Alignments and Materials	Town Staff & DISUC	Finalize Review of Preferred Riverwalk Park Concept and review Materials List for costing. Finalize Revised Boardwalk Alignments and Materials to be used in Visualizations.	8/23
10	Meeting Preparation & Interim Uses	Town Staff & DISUC	Preparation for Meeting with BOS and discussion on Interim Uses.	9/18
11	BOS Meeting	Board of Selectmen Town Staff & DISUC	Discuss status of DISUC work to date, outline next steps and garner BOS input.	9/26

\*Dates and Meeting Topics in Italics are Tentative  
\*\* All meetings are open to the Public

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### Riverwalk Park & Boardwalk Feasibility and Conceptual Design Study

#### MEETING SCHEDULE: Updated August 2018

#	Description	Attendance/Invitees**	Purpose	Date*
12	Boardwalk Visualizations, Preferred Alignment and Supplemental Info	Town Staff & DISUC	Review Boardwalk Visualizations, discuss Preferred Alignment, discuss supplemental information required to accurately cost the Boardwalk, and Article 97 issues on Drive-In property.	12/7
13	Riverwalk Costs and Interim Uses	Town Staff & DISUC	Review cost information for the preferred Riverwalk Layout. Discuss Interim Uses. Boardwalk boring update.	1/24
14	Boardwalk Costs and Interim Uses	Town Staff & DISUC & BETA	Review cost information for the Boardwalk Options. Discuss schedule and public input meeting. Discuss Interim Uses.	2/13
15	Public Meeting (rescheduled from 3/13 due to weather)	Conservation Commission Planning Board General Public/Neighbors Town Staff, DISUC & BETA	Presentation of study information compiled to date to garner public input.	4/2
16	Discuss findings and recommendations for BOS	Town Staff & DISUC	DISUC discussion on public input and recommendations for presentation to BOS.	4/11
17	Discuss findings and recommendations for BOS (continued)	Town Staff & DISUC	Continue DISUC discussion on findings and recommendations, and prepare for presentation to BOS.	4/25
18	Presentation to BOS	Board of Selectmen Stakeholders Town Staff & DISUC BETA	Review study process to date, Preferred Alternatives, cost estimates and other information with the BOS along with DISUC findings and recommendations.	5/22
19	Review of BOS Input	Town Staff & DISUC	Review BOS input and outline Next Steps for future discussions with the BOS	7/10
20	Meeting with BOS on Next Steps	Town Staff & DISUC	Discussed Next Steps including Revised Charge, short term improvements for events, choosing the preferred Boardwalk Option and moving forward with funding applications.	7/24

Additional meetings may be held as needed. Some topics may take multiple meetings.

\*Dates and Meeting Topics in Italics are Tentative  
\*\* All meetings are open to the Public

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## MEETINGS AND NOTED CONCERNS – Public Comments

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The Committee took the valuable input from a variety of stakeholders and, wherever feasibility, incorporated them into various project components or mitigation measures to address these concerns as further outlined below.

### **Boardwalk Summary:**

The majority of public comments received on the project were related to the Boardwalk. As with the Riverwalk Park, the Committee attempted to address these concerns in a myriad of ways. Refer to the attached Riverwalk Park and Boardwalk Noted Concerns, updated April 6, 2018, which identifies the issues and proposed mitigation measures.

A site visit and visualizations were prepared to help envision how the boardwalk options would look from the Gateway Isles neighborhood. The location of the boardwalk alignments were moved further away from the river and neighborhood to accommodate an osprey nest and neighborhood concerns. Environmental concerns will be adequately handled through the stringent environmental permitting process required for such projects.

As noted previously, boardwalks are typically allowed if properly designed to mitigate environmental issues. The boardwalk height over the creek (Option 2) will also be addressed in permitting along with input from the Harbor Master. The wooden railing style was chosen in deference to abutter concerns about noise associated with wire cable railings. Trash receptacles will be located at both ends of the Boardwalk and the Boardwalk will be designed to allow for ATV and stretcher access for emergency personnel, as well as for handicapped

### **Park Summary:**

Although most of the public comments garnered throughout the feasibility and conceptual design study process were related to the Boardwalk, there were some related to the Riverwalk Park. The Committee utilized this input to modify the park design to the extent possible to help mitigate these concerns as noted below. More detailed information is shown on the Noted Concerns on the next pages.

#### **Park related issues included:**

- Traffic And Pedestrian Safety
- Security And Crime Prevention
- Safety Of Kayak Usage On The Parkers River
- Cost Versus Benefit Of The Park

#### **Some design components that address these issues include:**

- A Flashing Pedestrian Beacon at Route 28
- Elevated Crosswalks Within the Parking Area
- Inclusion of Right & Left Turning Lanes at the Exit
- Security Measures Such as a Lighting
- Ability to Patrol the Park from a Police Vehicle
- Landscaping Design to Promote Visibility
- Promoting Kayak Safety with an Educational Kiosk

## PUBLIC COMMENTS — 1

**RIVERWALK PARK AND BOARDWALK  
NOTED CONCERNS  
September 19, 2017 – Updated April 6, 2018**

NOTED CONCERNS	MITIGATION MEASURES/RESPONSES
<p><b><u>Impacts to Quality of Life for Abutters to the Marsh:</u></b></p> <ul style="list-style-type: none"> <li>• Impacts to Privacy and views.</li> <li>• Location in close proximity to neighborhoods.</li> <li>• Possible Reduction in Property Values.</li> <li>• Noise from use of the Boardwalk.</li> </ul>	<ul style="list-style-type: none"> <li>• Boardwalk across the marsh has been moved to 700 feet away from abutters along the Parkers River to minimize impacts.</li> <li>• Consultant prepared a photo-visualization of the three Boardwalk options from the end of Cape Isle Drive in the Gateway Isles community to get a better understanding of visual impacts.</li> <li>• Boardwalk would be closed from dusk to dawn with no lighting.</li> <li>• Property Value impacts are unknown, current Town Assessed Values based on water access and water views, which would remain.</li> </ul>
<p><b><u>Impacts to Marsh and Wildlife:</u></b></p> <ul style="list-style-type: none"> <li>• Impacts to the salt marsh and the environment.</li> <li>• Impacts to wildlife.</li> <li>• Trash in Marsh.</li> <li>• Environmental Concerns outlined in C. Erickson Memo.</li> </ul>	<ul style="list-style-type: none"> <li>• Outreach to DNR and Conservation.</li> <li>• Environmental Regulations allow for construction of Boardwalks through resource areas subject to appropriate design measures (i.e. height, decking materials, foundation, etc).</li> <li>• Boardwalk located to minimize disturbance of osprey poles/nests.</li> <li>• Nitrogen from septic systems greatest threat to the health of the marsh.</li> <li>• Trash receptacles to be located at both ends of Boardwalk (solar powered trash compactors).</li> </ul>
<p><b><u>Boardwalk Bridge over Channel to Lewis Pond:</u></b></p> <ul style="list-style-type: none"> <li>• Abutters note that sailboats have been known to use the channel to access Lewis Pond, which would be impacted by the Boardwalk Bridge.</li> </ul>	<ul style="list-style-type: none"> <li>• Sailboat usage is limited along this channel due to shallow depths and narrowness.</li> <li>• Only one dock on Lewis Pond for which sailboats are prohibited.</li> <li>• Bridge height determined during the environmental permitting process and will be a function of frequency of sailboat usage, shallow depth of the pond and channel, the close proximity of Nantucket Sound for sailing, input from the Harbor Master, and whether the boardwalk provides a greater public benefit. Public comment will be considered by the various permitting agencies.</li> <li>• Bridge height will need to accommodate DNR skiff for shellfish propagation within Lewis Pond. Located to minimize crossing. Bridge design required to meet handicapped accessibility regulations.</li> </ul>

## PUBLIC COMMENTS — 2

**RIVERWALK PARK AND BOARDWALK  
NOTED CONCERNS  
September 19, 2017 – Updated April 6, 2018**

NOTED CONCERNS	MITIGATION MEASURES/RESPONSES
<p><b><u>Bicycle Traffic:</u></b></p> <ul style="list-style-type: none"> <li>Bicycle use on the Boardwalk may be dangerous.</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle usage on the Boardwalk should be prohibited due to the proposed 6' width. Provide bike racks at either end of Boardwalk.</li> </ul>
<p><b><u>Vehicular Traffic:</u></b></p> <ul style="list-style-type: none"> <li>Negative traffic impacts from the project to an already congested Route 28.</li> <li>Access in/out of the Riverwalk Park would be difficult, consider right turn only exiting the Park.</li> </ul>	<ul style="list-style-type: none"> <li>Entrance is lined up with parking entrance across Route 28.</li> <li>Right &amp; Left turning lanes exiting the Park are proposed.</li> <li>Traffic study to evaluate volume and potential improvements to Route 28 in this area will be required if the project moves forward.</li> </ul>
<p><b><u>Pedestrian Safety:</u></b></p> <ul style="list-style-type: none"> <li>Unsafe for pedestrians to cross Route 28.</li> <li>Speeding within the parking lot.</li> </ul>	<ul style="list-style-type: none"> <li>Include Flashing Beacon pedestrian crosswalk across Route 28.</li> <li>Include elevated walkways throughout the Riverwalk parking lot to slow traffic and provide safe access to Lot 2.</li> </ul>
<p><b><u>Security and Crime and Emergency Access:</u></b></p> <ul style="list-style-type: none"> <li>Riverwalk Park and Boardwalk may be a location where people congregate at night for parties, drug abuse, underage drinking or criminal activity.</li> <li><a href="#">Provisions for Emergency Access.</a></li> </ul>	<ul style="list-style-type: none"> <li>Riverwalk Park has been designed to allow for police to patrol the area from their vehicles.</li> <li>Riverwalk parking area will have security lighting.</li> <li>Landscaping to be designed to promote visibility.</li> <li>Signage for Park Rules and limit hours of operation from dawn to dusk (similar to beaches).</li> <li>Consider using security cameras.</li> <li><a href="#">Police Chief met with Mr. Larry Fennelly to discuss security issues.</a></li> <li><a href="#">Boardwalk accessible from Seagull Beach and Riverwalk Park. Width and alignment across marsh to be designed for stretcher access.</a></li> </ul>
<p><b><u>Kayak Usage:</u></b></p> <ul style="list-style-type: none"> <li>Boat traffic on Parkers River is busy now and may have safety concerns for added Kayak traffic due to the narrowness and shallow depth of the River.</li> <li>Already a private kayak rental firm operating out of Skippy's Marina.</li> </ul>	<ul style="list-style-type: none"> <li>Promote Kayak safety on River through an educational kiosk on paddle safety. Possible further education through on-site kayak rentals. Provide guidelines and rules of the river for those rental on-site kayak storage.</li> <li>Provide landscaping to prevent access to the River through the saltmarsh.</li> <li>Skippy's is a private marina and there is no public access for kayak launching.</li> </ul>

**RIVERWALK PARK AND BOARDWALK  
NOTED CONCERNS  
September 19, 2017 – Updated April 6, 2018**

NOTED CONCERNS	MITIGATION MEASURES/RESPONSES
<p><b><u>Purpose of the Project and Benefits:</u></b></p> <ul style="list-style-type: none"> <li>• Project would cost the Town money to construct and maintain and would not be self-sustaining, burdening taxpayers.</li> <li>• Drive-In site would be better used as a revenue generator for the Town.</li> <li>• <a href="#">Already have multiple boardwalks in Town.</a></li> <li>• <a href="#">Project needs to be part of a larger plan for Route 28.</a></li> </ul>	<ul style="list-style-type: none"> <li>• The concept is to create a destination location to energize Route 28 and use public investment to promote private investment in the area.</li> <li>• More visitors means more people using local businesses.</li> <li>• Article 97 issues may come into play for non-recreational use of the Drive-In property requiring legislative relief. <a href="#">Further investigations are needed into the applicability of Article 97 to the Drive-In property which may impact the option for other non-recreational uses on the property.</a></li> <li>• <a href="#">Riverwalk Park/Boardwalk in conjunction with Special Events would be a draw for this area (as shown by recent success of the Irish Festival).</a></li> <li>• <a href="#">Project would bolster economic development in the Village Center Overlay District (VCOD) passed in 2012 as a vision for what the Town wanted along this section of Route 28. Project would serve as a focal point and boost for an area already seeing improvements with the Parkers River Bridge and the Whydah Pirate Museum. Could also be the impetus for future improvements such as connection with the rail trail and improvements to the Great Island Block by private developers.</a></li> <li>• <a href="#">Popularity of Bass Hole Boardwalk shows that boardwalks can be a draw to residents and tourists. Drawing people to our commercial corridor along Route 28 is important to the economic health of our tourism driven economy.</a></li> <li>• <a href="#">Create community pride.</a></li> </ul>

**PUBLIC COMMENTS — 4**

**RIVERWALK PARK AND BOARDWALK  
NOTED CONCERNS  
September 19, 2017 – Updated April 6, 2018**

NOTED CONCERNS	MITIGATION MEASURES/RESPONSES
<p><b><u>Cost of the Project to Build &amp; Maintain:</u></b></p> <ul style="list-style-type: none"> <li>• Increases to Property Taxes.</li> <li>• Potential high costs to construct, maintain and repairs from storm damage to Boardwalk.</li> <li>• Town has other larger projects that need be funded (school buildings/wastewater/DPW Building/etc).</li> <li>• Cost Estimates are low.</li> </ul>	<ul style="list-style-type: none"> <li>• Feasibility Study includes cost estimating for development costs, construction and maintenance.</li> <li>• CPA funding could be used as matching funds for other grants. CPA can only be used for Recreation, Affordable Housing, Open Space and Historic Preservation. CPA Funds cannot be used for other Town projects outside these four categories (such as wastewater, schools, DPW Building or general budget). CPA Funds are a good source of matching funds for other grant opportunities and shows the Town is invested in the project.</li> <li>• Potential for grants for construction (PARC, Seaport Grant).</li> <li>• Opportunities for revenue generation (plank sales, kayak rentals, events), will help to offset maintenance costs.</li> <li>• Lot 2 also provides opportunities for revenue generation through interim uses or long-term uses for the site.</li> <li>• If Lot 2 is disposed of for commercial/residential purposes, maintenance of the Park could be included as part of the transaction.</li> <li>• Materials and landscaping chosen to be low maintenance.</li> <li>• Cost estimates are conservative with a 20% contingency on soft costs and a 25% contingency on construction costs, along with a 5% escalation. Excessive delays in decision making will negatively impact the costs associated with this project.</li> </ul>

Notes:

1. These are concerns expressed at DISUC meetings as well as the two public input meetings and written comments received through April 6, 2018. Please note that this table does not contain all comments/input from stakeholders. Many comments were readily incorporated into the design and not documented here, although they are noted in the meeting minutes.

## APPENDIX

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- A. Wetland Resource Delineation Letter Report
- B. Permitting Memorandum -- BETA
- C. Survey - Existing Conditions Plan
- D. Cost Estimates for Entrance Drive & Riverwalk Park

## APPENDIX A – Wetland Resource Delineation Letter Report

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# *Wetland Strategies, Inc.*

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5 Main Street Ext., Suite 303  
Plymouth, MA 02360

Phone: 508.747.4266  
FAX: 781.723.0406

May 23, 2017

Mr. Joseph Freeman, Associate  
BETA Group, Inc.  
315 Norwood Park South  
Norwood, MA 02062

RE: Wetland Resource Area Delineation  
669 Route 28 (Main Street)  
Yarmouth, MA

Dear Mr. Freeman:

Wetland Strategies, Inc. (WSI) is pleased to present this report on the wetland resource areas located at 669 Route 28 in Yarmouth, MA (the "site"). During March of 2017, this office conducted a site inspection and flagged several different wetland resource areas on the site. These wetland resource areas are described in more detail in the following paragraphs.

WSI's initial site evaluation revealed that the site is located to the west of Parkers River, in Yarmouth, MA which is a coastal river. Route 28 forms the northern boundary of the site and single family residential lands occur further west of the site. To the south of the site is an extensive vegetated salt marsh associated with Parker's River. In its most recent condition, the site housed an outdoor drive-in venue. Remnant paving, roadways, and the parking lot still exist on the site. Topography is relatively flat throughout the site with minor changes in slope observed adjacent to the wetland resource areas. During the inspection, WSI identified and flagged two (2) isolated vegetated wetlands and a salt marsh along Parker's River. Other wetland resource areas are also present on the site including Land Subject to Coastal Storm Flowage, a Coastal Dune and a Riverfront Area.

## **Salt Marsh**

The salt marsh at the site was flagged with blue flagging tape labeled SM 1 through SM 78. The flags were located at the upper edge of coastal wetland plants including a predominance of high tide bush (*Iva frutescens*). Spike grass (*Distichlis spicata*) was also in abundance throughout the salt marsh. Up-gradient of the salt marsh, WSI noted scrub pine, pitch pine and scrub oak trees and shrubs. WSI flagged the predominance of salt marsh vegetation without regard to the extent of the highest spring tide of the year, which is part of the regulatory definition of a salt marsh found at 310 CMR 10.32 and the town of Yarmouth's Wetland Protection regulations at Section 2.06. WSI expects that plans for the site will show the limit of the highest spring tide, which will then be used to correctly identify the salt marsh boundary per the regulatory definition.

## **Isolated Vegetated Wetlands**

During the site evaluation, WSI also observed and flagged two (2) separate isolated wet areas. Neither area appears to have an outlet and thus are separate and isolated from the salt marsh. The smaller of the two is located near Route 28 and occurs on the property line separating the site from the parcel to the east which is occupied by the Lobster Boat Restaurant. This area appears to be an anthropomorphic relic of prior site disturbances or possibly associated with the restaurant's drainage and/or runoff collection areas. WSI flagged this isolated wetland with sixteen (16) blue flags, labeled IVW1 through IVW16. Wetland vegetation observed with the isolated area included *Phragmites*, wool grass (*Scirpus cyperinus*), red maple (*Acer rubrum*), and bay berry shrubs (*Myrica penslyvanica*). Upland vegetation included scrub oaks and pine. This isolated area is protected by the Town of Yarmouth's wetland regulations as a Vegetated Wetland at Section 3.02. This area is too small to meet the regulatory definition of an Isolated Land Subject to Flooding (ILSF) as the area encompasses only 4,648 square feet. (See 310 CMR 10.57 (2)).

The other isolated wetland is in the southwest portion of the site and it was flagged with pink/black wetland flags labeled A1 through A40. Typical wetland vegetation noted in the isolated area included blueberry (*Vaccinium corymbosum*) and sheep laurel (*Kalmia latifolia*). Hydric soils were also noted within the wetland and the pit/mound topography is typical for naturally occurring wetland areas. This area encompasses 19,342 square feet and thus it is likely to meet the definition of an ILSF under the MA regulations. It is also protected by the Town of Yarmouth's wetland regulations as a Freshwater Wetland (Section 3.02). ILSF areas do not have a buffer zone under the Massachusetts regulations but the town regulations impose a 100-foot buffer zone.

## **Coastal Dune**

A coastal dune occurs adjacent to the site, and it is located just to the south of the Lobster Boat Restaurant. Coastal dunes are defined as a natural hill, mound or ridge of sediment located landward of a coastal beach deposited by wind or wave action (Ref. 310 CMR 10.28). In addition, the definition allows for dunes to be deposited by artificial means under the MA regulations. Although the coastal dune is not wholly within the site, the 100-foot buffer zone extends onto the site and is within the jurisdiction of the Yarmouth Conservation Commission.

## **Riverfront Area**

Parker's River is located immediately east of the site. It is a coastal river based on the halophytes bordering on the river and its tidal regime. Parker's River is perennial and thus has an associated Riverfront Area which is a wetland resource area protected by both state and local wetlands regulations. Per the definition of a riverfront area, a riverfront area is the area between mean high water (for coastal rivers) and a parallel line 200 feet away. Plans for the site show the location of MHW and the extent of riverfront on the site. A riverfront area may overlap other resource areas and their buffer zone. A riverfront area does not have an associated buffer zone.

## **Land Subject to Coastal Storm Flowage**

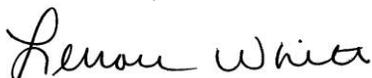
Land Subject to Coastal Storm Flowage (LSCSF) is a resource area identified in the MA regulations at 310 CMR 10.21. In the local regulations, the town provides the following definition for LSCSF, which states in part, "Said boundary shall be the relevant 100-year storm elevation referenced within the latest available Flood Insurance Rate Maps provided by the Federal Emergency Management Agency." WSI has prepared the enclosed map showing the location and general extent of LSCSF on the site, which is conterminous with the 100- year flood plain elevation (Zone AE, elev. 13).

## **GIS Research**

As part of its review, WSI researched the publicly available site information. WSI finds that the Natural Heritage and Endangered Species Program has NOT identified any rare or endangered species habitat on the site. Parker's River provides for anadromous fish migration between Nantucket Sound and Seine Pond. The 100-year flood zone extends over much of the site as shown on the enclosed FEMA map.

In sum, the site contains several wetland resource areas including a salt marsh, isolated vegetated wetlands, a flood zone, a coastal dune and a riverfront area. WSI expects the site plans will show the extent of all the above wetland resource areas. Should you wish to have the boundaries of said areas confirmed by the Yarmouth Conservation Commission, WSI is able to assist you in that confirmation.

Sincerely,  
Lenore White, PWS

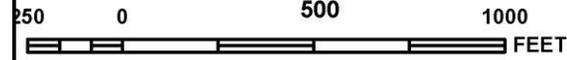


Principal

Enclosure



MAP SCALE 1" = 500'



NFP  
 NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0588J

**FIRM**  
 FLOOD INSURANCE RATE MAP  
 BARNSTABLE COUNTY,  
 MASSACHUSETTS  
 (ALL JURISDICTIONS)

**PANEL 588 OF 875**  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
YARMOUTH, TOWN OF	250015	0588	J

-NOTE-  
 THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



**MAP NUMBER**  
 25001C0588J  
**EFFECTIVE DATE**  
 JULY 16, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

**APPENDIX B – Permitting Memorandum**

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Date: September 29, 2017 Job No.: 5562  
To: Kathy Williams, Yarmouth Town Planner  
Cc: Kelly Carr, Associate  
From: Joseph Freeman, Associate  
Subject: **Yarmouth Riverwalk Park and Boardwalk – Issues, Site Constraints and Environmental/Regulated Resources**

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This memo summarizes our initial thoughts on the redevelopment of the former drive-in parcel and the construction of a boardwalk across the abutting salt marsh to the south, connecting the Riverwalk Park site to Seagull Beach on Nantucket Sound.

We have reviewed information received from the Town of Yarmouth, our field reconnaissance activities, and the updated wetland delineation and topographic survey. We have attend two (2) public meetings in Yarmouth (May 30 and June 7) with the Drive-In Site Utilization Committee at which public input on concept plans for the Riverwalk and the Boardwalk has been obtained. A listing of the information reviewed is attached to this memo.

Our conclusion is that there are no significant regulatory or site constraints that would preclude the redevelopment of the drive-in site as a Riverwalk Park and the construction of an elevated Boardwalk across the parcel to the south of the drive-in site to Seagull Beach. The several issues outlined below can be addressed through proper site, building and structure design and evaluated in the permitting process for the project.

Constraints on redevelopment of the former drive-in site are those associated with the presence of jurisdictional (under federal, state and local law) wetland resources, potential impacts to navigation in the Parkers River and the tidal creek to Lewis Pond, the flood zone designation of the property, site access from Route 28 and/or abutting residential streets to the west, potential limitations on disposal of septic effluent on site, and the presence of mapped Priority Habitat of Rare Species and Estimated Habitat of Rare Wetlands Wildlife on the site.

#### ***Jurisdictional Wetland Resources***

Almost the entire drive-in site is mapped as jurisdictional wetland resources. A detailed description of the existing wetlands on the drive-in site are included in the Wetlands Resource Area Delineation letter report prepared by Wetland Strategies, Inc. (May 23, 2017). The limits of the jurisdictional wetland resources are indicated on the Existing Conditions survey plan prepared by Alpha Surveying (May 16, 2017).

The wetlands on the site are largely unchanged since the last wetlands delineation performed for the previous marina project in 2006. One exception is an area formerly delineated as Coastal Beach, located on the northeastern portion of the drive in site adjacent to the Parkers River. The recent wetlands delineation completed by Wetland Strategies, Inc. has identified this as a Coastal Dune due to changes in the vegetation in the resource area.

#### **Massachusetts Wetlands Protection Act (WPA)**

The drive-in site includes the following wetland resource areas under the WPA:

- Salt Marsh – bordering the site along the Parkers River;

- Coastal Dune – northeast corner of the site immediately south of the Lobster Boat Restaurant;
- Isolated Vegetated Wetlands – two areas, one located in the northern portion of the site immediately south of Route 28 and a larger area located in the southwestern portion of the site;
- Riverfront Area – extends inland 200-feet from the Mean High Water elevation of the Parkers River; and
- Land Subject to Coastal Storm Flowage – includes all areas of the site at or below the 1% Annual Chance (100-year) Floodplain elevation.
- Banks of or Land Under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run (Fish Run) - although not identified in the wetlands delineation letter report the Parkers River is a Fish Run and the banks of the River lie within the boundaries of this resource area.

The Boardwalk parcel to the south was not surveyed and a delineation of jurisdictional wetlands was not performed. Based on Massachusetts Geographic Information Systems (MassGIS) mapping, the parcel is comprised largely of Salt Marsh with an irregularly shaped area identified as “Shrub Swamp” near the northern boundary of the Boardwalk parcel adjacent to the Riverwalk Park parcel. This area is likely to be Bordering Vegetated Wetland (BVW) under the WPA and appears to correspond to the area of densely vegetated upland within the larger area of salt marsh.

Areas of the resource area Tidal Flat are mapped within Lewis Pond and adjacent to the tidal creek into the pond from the Parkers River. Land below the Mean Low Water elevation in the tidal creek into the pond is classified as Land Under the Ocean.

Under the WPA, a 100-foot Buffer Zone extends upland from the limits of the Salt Marsh, Riverfront Area Coastal Dune, Fish Run and Tidal Flat resource areas.

#### Yarmouth Wetlands By-Law

The local by-law parallels the Massachusetts Wetlands Protection Act and Massachusetts Wetlands Regulations in large part with additional buffer zones and “no disturb” areas offset from the boundaries of most wetland Resource Areas. These include 50-foot and 35-foot no structure zones and a 35-foot vegetative buffer zone.

Under section 1.09(4)(c)(1) of the Yarmouth Wetland Regulations, no new non-water dependent structures are allowed within 50-feet of Coastal Dunes, Salt Marshes, Vegetated Wetlands, and Rivers (among other resource areas). Under section 1.09(4)(c)(2), “minor structures” may be allowed within 50-feet, but no closer than 35-feet, to a resource area. Section 1.09(4)(c)(3) requires that a 35-foot undisturbed vegetative buffer be maintained upland of Resource Areas.

In addition to the jurisdictional wetland resources listed above, the following additional resource areas are protected under the Yarmouth Wetlands Bylaw and the Yarmouth Wetlands Regulations.

- Land Within 300-feet of a Major Estuary (includes the Parkers River) – this Resource Area is protected under the Performance Standards for Land Subject to Coastal Storm Flowage contained at section 2.10(3) of the Yarmouth Wetlands Regulations.

#### Wetland constraints

In our opinion, the key wetland constraints on redevelopment of the drive-in site for the Riverwalk Park are associated with the Riverfront Area performance standards and the restrictions on location of buildings and structures imposed by the By-Law buffer zone requirements. For the construction of the Boardwalk, the key

issue is the potential impact of shading from the Boardwalk structure on the salt marsh vegetation and immediately adjacent to the structure.

#### *Riverfront Area*

Ordinarily, the Riverfront Area performance standards at 310 CMR 10.58(4)(d) include prohibitions on alteration of more than 10% of the total Riverfront Area on the lot and require that a 100-foot wide area of undisturbed vegetation from the river bank is preserved; that stormwater is managed in accordance with the Stormwater Performance Standards (although structural stormwater management measures are allowed if there is not practicable alternative location); the wildlife habitat capacity of the Riverfront Area is preserved; and groundwater or surface water quality is not impaired. A wildlife habitat evaluation in accordance with the requirements at 310 CMR 10.60 may be required by the Conservation Commission.

The concept plans for the Riverwalk Park largely respect the 100-foot undisturbed vegetative buffer with the exception of portions of walking trails and the construction of the access to the canoe/kayak dock on the Parkers River. In our experience, activities such as public access to the riverfront are generally allowed by a Conservation Commission as long as they fall within the 10% alteration threshold specified in the regulations and there is no alternative location outside of the Riverfront Area.

A more likely alternative approach under the Riverfront Area performance standards involves redevelopment of “previously developed” sites. Under this alternative approach we would clarify which areas on the Riverwalk parcel are disturbed and previously developed in consultation with the Conservation Commission. Clearly much of the site has been extensively altered from its natural state by the past use as a drive-in theater and the site could be considered as a “Previously Developed Riverfront Area” under the provisions of 310 CMR 10.58(5). The Conservation Commission “...may allow work to redevelop a previously developed riverfront area, provided the proposed work improves existing conditions.” (emphasis added) Under this section of the performance standards, alteration of the undeveloped portions of the Riverfront Area on the drive-in site would be limited to the 10% standard while work within the degraded (previously developed) areas would be allowed beyond the 10% limitation as long as it improves existing conditions.

It is clear that there are opportunities to provide substantial areas of restoration within the Riverfront Area on the site by providing areas of native plantings within the park design. Structural stormwater management measures can likely be accommodated outside the Riverfront Area and there will be opportunity to incorporate “green design” and Low Impact Design stormwater management measures such as permeable pavement, vegetated swales and vegetated buffers into the park design which would improve the existing conditions on the site.

#### *Salt Marsh*

The usual standard for construction in or within 100 feet of a Salt Marsh is that the activity shall not destroy any portion of the marsh or have an adverse effect on the productivity of the salt marsh. However, the construction of the Boardwalk through the Salt Marsh is an allowable activity under both the Massachusetts Wetlands Regulations (310 CMR 10.32(4) and Yarmouth Wetlands Protection Regulations (section 2.06(3)(b)) as long as there are no adverse effects other than “blocking sunlight from the underlying vegetation for a portion of each day.”

As noted below, the Army Corps of Engineers permit requirements require that structures located in or over tidal waters be constructed with a 1:1 height to width ratio. There is no current height to width ratio standard in the Massachusetts Wetlands Regulations or the Yarmouth Wetlands Protection Regulations which impose a similar requirement. A recent study on the shading impacts of small docks and piers on salt

marsh vegetation completed by the Massachusetts Division of Marine Fisheries Massachusetts Bay Program<sup>1</sup> monitored the shading impacts on salt marsh vegetation of structures at various heights and found that the structures constructed in compliance with the 1:1 ratio standard and with a deck spacing of  $\frac{3}{4}$ " resulted in "no detectable signs of reduced aboveground production (biomass) relative to unshaded areas." Structures monitored were on a north-south orientation (which would be the general orientation of the proposed Boardwalk) which maximized sunlight penetration under the structures. Division of Marine Fisheries environmental review program staff have recently been commenting on permit applications for structures over salt marsh and requesting that the 1:1 height to width ratio requirement be included in the permits.

We believe that the 1:1 height to width ratio requirement would be included in any Army Corps permit issued for the project and is likely to be a requirement of the wetlands Order of Conditions to be issued by the Yarmouth Conservation Commission.

The Corps' *General Permits for Massachusetts* (March 2015) requires that structures such as the proposed boardwalk which span more than 100 feet over salt marsh are not eligible for authorization as a Self-Verification activity under General Permit 3 (Pile Supported Structures, Floats and Lifts). The Corps requires a 1:1 height to width ratio for such structures over tidal waters (footnote 9, page 8).

### **Navigation Issues**

During the two public meetings, Yarmouth residents and nearby abutters raised the issue of impacts to existing navigation within the Parkers River that may result from the addition of a public kayak/canoe launch associated with the Riverwalk Park. The river is relatively narrow at this point and the speakers repeatedly raised the issue of interference from the kayak/canoe launch, particularly during low tide.

Impacts on navigation in the Parkers River and the tidal creek to Lewis Pond will be evaluated under Massachusetts General Laws, Chapter 91, the Public Waterways Act (Chapter 91), the Massachusetts Waterways Regulations (310 CMR 9.00) and the Army Corps of Engineers permit program.

Under the Army Corps permit program piers, docks and similar structures are not allowed to encroach on federal navigation projects (navigation channels) or extend beyond designated harbor lines. The Parkers River is not a federal navigation project and there are no designated federal harbor lines in the river.

The Corps has published guidelines for placement of structures in navigable waters.<sup>2</sup> In relevant part, the guidelines require that structures in "linear waterways" a "reasonable use of public water should be maintained" and those structures should not extend "more than 25% of the waterway width at mean low water."

Under Chapter 91, navigation issues are addressed through the licensing process and standards are established within the Waterways Regulations at 310 CMR 9.35: Standards to Preserve Water-Related Public Rights. Under the regulations, a project may not "significantly interfere with public rights of navigation." DEP will not issue a license for any project which: extends beyond any state harbor line; which extends into or beyond any existing channel such as to impede free passage; impairs any line of sight required for navigation; requires alteration of established course for vessels; extends beyond the length necessary to achieve safe berthing; would generate water-borne traffic that would "substantially interfere with other

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<sup>1</sup> Massachusetts Bays Program, Draft Final Report, "Shading Impacts of Small Docks and Piers on Salt Marsh Vegetation in Massachusetts Estuaries," January 2014

<sup>2</sup> *Guidelines for the placement of fixed and floating structures in navigable waters of the United States by the Regulatory Program of the New England District, Army Corps of Engineers, July 1996*

water-borne traffic in the area at present, or in the future;” or impair the ability of the public to pass freely upon the waterways.

There are no state navigation channels in the Parkers River and there are no designated state harbor lines in the river. In our opinion, the publicly perceived constraint in the width of the river at low tide which is available for safe navigation of all vessels will be a key issue in the Chapter 91 licensing process for the Riverwalk Park. The opinion of the Yarmouth Harbormaster and the Department of Natural Resources will be important in demonstrating to DEP the likely implications of a kayak/canoe launch with respect to navigation in the Parkers River.

Another navigation issue is the construction of the boardwalk across the tidal creek to Lewis Pond and the height of that structure above the Mean High Water elevation. Our understanding is that navigation in the tidal creek between the pond and the river is limited by the shallow depths and that small craft are the only vessels that routinely navigate the tidal creek, particularly at higher tidal conditions. A single dock is located on the western shore of the pond at the end of Lacker Road. In our opinion, DEP would likely defer to the opinion of the harbormaster as to the controlling height of the vessels which navigate the tidal creek and would require that the height of the structure to accommodate that height. We believe that the Army Corps of Engineers would defer to the requirements imposed in the state permitting process as there is no federal navigation project in the tidal creek. We do not foresee any significant issue in permitting the boardwalk crossing of the tidal creek as long as the structure does not interfere with existing navigation.

#### ***Flood Zone – FEMA Special Flood Hazard Areas***

The entire Riverwalk Park and Boardwalk sites are located within the 1% Annual Chance (100-year) Floodplain as mapped by the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map<sup>3</sup> for the area. The drive-in site is located within an AE Zone with a Base Flood Elevation (BFE) of 13 feet, North American Vertical Datum of 1988 (NAVD88). The Boardwalk parcel is located within an AE Zone with a BFE of 12 feet NAVD88. AE Zones are described by FEMA as areas where the flood elevation includes wave heights of less than 3 feet. Both the Riverwalk Park and Boardwalk parcels are mapped as within an area known as the Limit of Moderate Wave Action (LiMWA). According to FEMA the inland limit of the LiMWA zone is where 1.5 foot or greater breaking waves may be expected during the 1% Annual Chance flood event.

In addition, the majority of the Boardwalk parcel is located within a mapped Coastal Barrier Resource System area. Within these areas flood insurance for new structures is not available.

Construction of new buildings within the flood plain are controlled by the requirements of the Massachusetts Building Code, particularly 780 CMR 120.G.501 (Flood Hazard Zones). All new buildings constructed on the site must be elevated such that the “lowest floor is located at or above” the BFE. Any enclosed building spaces below the BFE cannot be used for human habitation and must be designed to equalize automatically the hydrostatic forces of flood events by allowing for the entry and exit of floodwaters. Structures must be designed such that they are anchored to resist flotation, collapse or lateral movement during flooding.

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<sup>3</sup> Flood Insurance Rate Map panel 25001C0588J, July 16, 2014

Implications for development of the Riverfront Park and Boardwalk are limited with respect to the flood zone designations. Any building structures can be designed to meet the requirements of the Building Code with respect to elevation above the BFE although these structures would be noticeably elevated above the surrounding ground, site elevations range from 4 feet to 9 feet over much of the developable portion of the Riverwalk Park site. The concept plans for the Riverwalk Park include only limited structures including a welcome center, public toilets and potential artist shanties.

The Riverwalk Park concept plans envision composting toilets as an option for the public toilets on the site. The composting toilets are an accepted method and have recently been installed in several coastal waterfront public parks in New England including Cranes Beach in Salisbury, Horseneck Beach in Dartmouth, Misquamicut Beach in Westerly, RI and Spectacle Island in Boston Harbor.<sup>4</sup>

Use of the composting toilets would minimize water use on the site, eliminate additional nitrogen loading into the groundwater at the site, and provide grey water for irrigation of park plantings.

#### *Site Access*

The issues associated with site access are related to the location along heavily travelled Route 28, the limited frontage, and constrained right-of-way width along Route 28 in the area of the drive-in parcel.

Route 28 is maintained by the Massachusetts Department of Transportation as a principal arterial highway with two travel lanes and limited shoulder width. Sidewalks are located along both sides of the roadway at the site entrance. Access to the drive-in parcel will require an Access Permit from MassDOT under the provisions of 720 CMR 13.00 (Approval of Access to State Highways). The specific form of access permit (Minor or Major) is dependent on the intensity of the final Riverwalk Park concept and is tied to the transportation thresholds of the Massachusetts Environmental Policy Act (MEPA) Regulations at 301 CMR 11.03(6).

Options for location of the site access drive are limited and we anticipate that MassDOT would require that the access drive be aligned with one of the access drives into the parking lot of Captain Parker's Pub on the north side of Route 28. The area available on the drive-in parcel frontage will allow for the construction of a three lane cross section on the access drive, allowing for a separate left turn exit lane and a through/right turn lane. Given the existing heavy seasonal traffic volumes on Route 28 this layout would result in the most efficient operating conditions for vehicles exiting the Riverwalk Park.

Options for construction of a left turn "pocket" on Route 28 to accommodate vehicles turning into the park parcel are limited by the narrow width of the Route 28 right-of-way, the proximity of abutting businesses and existing driveways and would need to be explored in detail during final design of the Riverwalk Park and the MassDOT access permit process.

#### **Rare Species**

Areas of the site are mapped as Estimated Habitat of Rare Wetlands Wildlife (EH 756) and Priority Habitats of Rare Species (PH 945) on the site. The Natural Heritage and Endangered Species Program (NHESP) recently revised the Estimated Habitat and Rare Species Habitat mapping (effective August 2017). The

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<sup>4</sup> <http://www.clivusne.com>

boundaries of the two mapped habitat areas encompass the entire salt marsh (boardwalk) parcel, overlap and extend well into Nantucket Sound both east and west from the site. It is not clear whether the mapped habitat areas extend into the drive-in parcel, this would need to be determined during the design phase of the project and would likely be based on the presence of specific vegetation or other habitat characteristics specific to the species associated with the habitat.

Potential impacts to the Estimated Habitat of Rare Wetlands Wildlife are addressed through the Wetlands Protection Act permitting process with the Conservation Commission with a copy of the Notice of Intent application provided to the NHEPS at the time of the filing. Briefly, the standard is that the project not adversely affect the habitat and/or habitat value of the site as specified in various performance standards associated with particular jurisdictional wetland resource areas.

Impacts to the Priority Habitat of Rare Species are addressed through a filing with the NHESP under the Massachusetts Endangered Species Act (MESA). Briefly, NHESP reviews the project and determines if it would result in a “take” of the rare species associated with the mapped habitat area. If it is determined that a take would result, an additional MESA permit would be required and potential mitigation for the take would be negotiated with NHESP. Typically, NHESP focuses on impacts relative to the amount of land clearing and changes to native vegetation in making their determination.

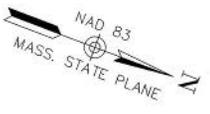
In the case of the proposed boardwalk, the footprint of the proposed boardwalk represents an extremely small percentage of total size of the mapped habitat area and would be unlikely to result in a “take” of the rare species. Additionally, the potential to include restoration of native vegetation in the design of the park could further mitigate any negligible impacts to the mapped habitat by providing additional suitable habitat and should be explored further in the design phase of the park.

### List of Material Reviewed

1. Federal Emergency Management Agency, National Flood Insurance Program, Flood Insurance Rate Map panel 25001C0588J, July 16, 2014
2. <http://www.clivusne.com>, accessed June 30, 2017
3. Massachusetts Bays Program, Draft Final Report, *"Shading Impacts of Small Docks and Piers on Salt Marsh Vegetation in Massachusetts Estuaries,"* January 2014
4. Massachusetts Wetlands Regulations, 310 Code of Massachusetts Regulations 10.00, October 24, 2014
5. Massachusetts Waterways Regulations, 310 Code of Massachusetts Regulations 9.00, May 23, 2014
6. Massachusetts Building Code, 780 Code of Massachusetts Regulations 120.G, Flood-Resistant Construction and Construction in Coastal Dunes, August 2008
7. Tetra Tech, Inc., *Expanded Environmental Notification Form, Parkers River Marine Park, West Yarmouth, Massachusetts*, October 2006
8. Town of Yarmouth By-Laws, Chapter 143, Wetlands, October 14, 2016
9. Town of Yarmouth, Conservation Commission, Wetland Regulations, December, 2016
10. United States Army Corps of Engineers, New England Division, General Permits for Massachusetts, March 2015
11. United States Army Corps of Engineers, New England Division, *"Guidelines for the placement of fixed and floating structures in navigable waters of the United States by the Regulatory Program of the New England District,"* July 1996
12. [http://maps.massgis.state.ma.us/map\\_ol/oliver.php](http://maps.massgis.state.ma.us/map_ol/oliver.php); MassGIS Data - NHESP Priority Habitats of Rare Species Datalayer, effective August 1, 2017, viewed 8/29/17
13. [http://maps.massgis.state.ma.us/map\\_ol/oliver.php](http://maps.massgis.state.ma.us/map_ol/oliver.php); MassGIS Data - NHESP Estimated Habitats of Rare Wildlife, effective August 1, 2017, viewed 8/29/17

**APPENDIX C – Survey – Existing Conditions Plans**

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**NOTES:**

- 1) THE INFORMATION SHOWN HEREON IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED BY ALPHA SURVEY GROUP, LLC BETWEEN MARCH 7 & APRIL 3, 2017.
- 2) THIS PROJECT IS HORIZONTALLY REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), CORRS ADJUSTMENT (NA2011/GEOD 12a) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS MADE ON MARCH 7, 2017 UTILIZING KEYSSTONE PRECISION INSTRUMENTS' KEYNET GPS VIRTUAL REFERENCE SYSTEM (VRS) NETWORK.
- 3) THIS PROJECT IS VERTICALLY REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON THE FOLLOWING BENCHMARKS: MASSDOT BM #0149 BRASS RIVET IN PARKER RIVER BRIDGE WITH A PUBLISHED ELEVATION OF 6.11 FT.; CB/TOWN OF YARMOUTH DISK STATION No 8 Elev=5.20 ft (N=2698656.57, E=1004794.63), CHISELED SQUARE ON N.E. CORNER OF PARKER RIVER CONC. BRIDGE WALL ELEV.=6.18 FT. (LOUIS BERGER DRAINAGE & UTILITY PLAN 75% DESIGN SHEET 6 OF 20 YARMOUTH MAIN STREET (RTE. 28) PROJECT). ALPHA PERFORMED A CLOSED LEVEL LOOP BETWEEN THE THREE BENCHMARKS AND FOUND THEM TO AGREE WITHIN ACCEPTABLE SURVEY ACCURACY. ALPHA WAS PROVIDED THE PRELIMINARY DESIGN FOR THE YARMOUTH MAIN STREET (ROUTE 28) PROJECT AND FOUND DISCREPANCIES IN THE ELEVATIONS RANGING FROM 0.1 TO 0.2 FEET. ALPHA HELD THE ELEVATIONS BASED ON THE THREE BENCHMARKS LISTED ABOVE.
- 4) THE WETLAND DELINEATION WAS PERFORMED BY WETLAND STRATEGIES DURING MARCH 13-17, 2017.
- 5) THE 2" WATERLINE SHOWN HEREON IS BASED ON A VERBAL DESCRIPTION PROVIDED BY THE TOWN OF YARMOUTH WATER DEPARTMENT UTILIZING A VISIBLE FEATURE ON GOOGLE MAPS.
- 6) THE LIDAR GENERATED CONTOURS SHOWN HEREON WERE TAKEN FROM AN AUTOCAD FILE ENTITLED "1 FT CONTOURS FROM LIDAR MA83F NAVD88\_CLIP.dwg" THE META-DATA (i.e. SOURCE, DATE, ETC.) WAS NOT PROVIDED AND ALPHA SURVEY GROUP, LLC ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.
- 7) THE M.H.W. EL.=2.05 AND M.L.W. EL.=0.7 PER PLAN REFERENCE #5.
- 8) AS DETERMINED BY GRAPHIC PLOTTING, THE SUBJECT PREMISES LIE WITHIN ZONE AE, AN AREA INSIDE A SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD WITH A SFE=11, BFE=12 AND A SFE = 13; A LIMIT OF MODERATE WAVE ACTION COINCIDENT WITH ZONE BREAK, ALL AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A.) FLOOD INSURANCE RATE MAP (F.I.R.M.) FOR BARNSTABLE COUNTY, MASSACHUSETTS (ALL JURISDICTIONS) MAP NUMBER 25001C0588J WITH AN EFFECTIVE DATE OF JULY 16, 2014. A PORTION OF THE PREMISES ALSO LIES WITHIN A COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREA (ESTABLISHED 11/15/1990).
- 9) BASED ON A DETERMINATION BY WETLAND STRATEGIES MADE ON APRIL 21, 2017, WETLAND RESOURCE AREAS ASSOCIATED WITH THE SUBJECT PREMISES INCLUDE SALT MARSH, ISOLATED AREAS SUBJECT TO FLOODING, AND COASTAL DUNE. THE COASTAL DUNE AS SHOWN HEREON WAS GRAPHICALLY COMPILED FROM MASSGIS DATA. THE 200 FOOT RIVERFRONT BUFFER SHOWN HEREON IS DERIVED FROM THE MEAN HIGH WATER (MHW) ELEVATION=2.05' PER THE REGULATORY DEFINITION.

**PLAN REFERENCES:**

- 1) "PLAN OF LAND IN YARMOUTH, MA PREPARED FOR THE TOWN OF YARMOUTH" BY THE BSC GROUP DATED JAN. 10, 1988 DWG. NO. 1060 RECORDED IN THE BARNSTABLE COUNTY REGISTRY OF DEEDS AS PLAN 413-36.
- 2) "PLAN OF LAND IN WEST YARMOUTH, MA ROUTE 28, FOR THE LOBSTER BOAT RESTAURANT" BY ELLIS & THULIN, Inc. DATED 10/14/1992 AND RECORDED AS PLAN 491-92.
- 3) "PLAN OF LAND IN WEST YARMOUTH, MASS PROPERTY OF GEO. V. PAYNTER", DATED MAY 1949 AND RECORDED IN PLAN BOOK 87 PAGE 133.
- 4) "PLAN OF LAND IN SOUTH YARMOUTH MASS CONVEYED BY JOHN E. HINKLEY TO JOHN E. & KEZJAC BURFIELD" DATED JAN. 1928 AND RECORDED IN PLAN BOOK 50 PAGE 59.
- 5) MASSDOT PLAN SET ENTITLED MAIN STREET (ROUTE 28) (BRIDGE NO. Y-01-002) 75% HIGHWAY SUBMISSION PREPARED BY THE LOUIS BERGER GROUP.
- 6) AUTOCAD FILE ENTITLED "1ft Contours from LIDAR MA83F NAVD88\_CLIP.dwg" PROVIDED BY BETA GROUP.

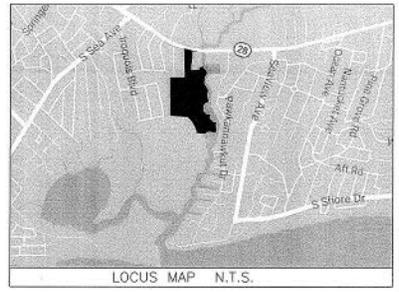
**UTILITY NOTE:**

ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY AND WERE COMPILED ACCORDING TO AVAILABLE RECORD PLANS FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD. BEFORE DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACK FILLING, GRADING, PAVEMENT RESTORATION OR REPAIRING, ALL UTILITY COMPANIES, PUBLIC & PRIVATE, MUST BE NOTIFIED INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN. SEE CHAPTER 370, ACTS OF 1965, MASSACHUSETTS. ALPHA SURVEY GROUP, LLC ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCUATELY SHOWN, BEFORE FUTURE CONNECTIONS, THE APPROPRIATE UTILITY ENGINEERING DEPARTMENTS MUST BE CONSULTED. CALL "DIG SAFE" AT 811.

**OWNER OF RECORD:**

TOWN OF YARMOUTH  
DB 4935 PG 181  
DB 5395 PG 20

TOTAL PARCEL AREA 1,011,050± S.F. = 23.2± ACRES  
UPLAND AREA 829,982± S.F. = 19.0± ACRES  
WETLAND AREA "A" 58014 S.F. = 1.3± ACRES  
WETLAND AREA "W" 34514 S.F. = 0.8± ACRES  
WETLAND AREA "SW" 156,466± S.F. = 3.6± ACRES  
WETLAND "COASTAL DUNE" 15,350± S.F. = 0.3± ACRES



PREPARED FOR  
BETA GROUP  
315 Norwood Park South  
Norwood, MA 02062

DATE: 4/27/2017  
SCALE: 1" = 80'  
SHEET NO.: 1 OF 9

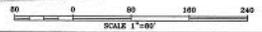
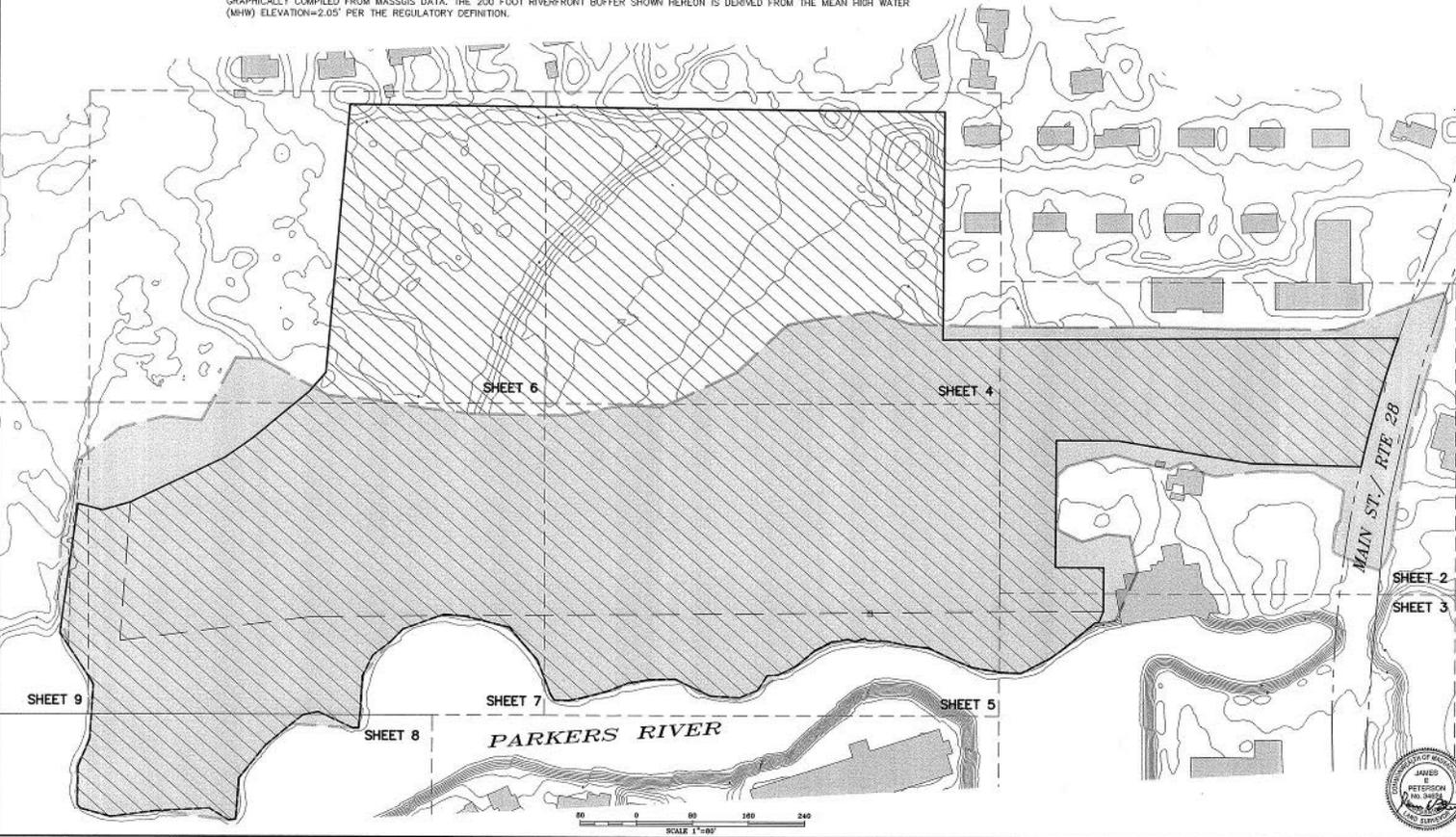
EXISTING CONDITIONS SURVEY  
FORMER DRIVE-IN PROPERTY  
669 MAIN ST. (ROUTE 28)  
YARMOUTH, MA. 02673

**ALPHA**  
SURVEY GROUP LLC

DATE: 5-10-17  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]  
DATE: 5-10-17

**SYMBOL LEGEND**

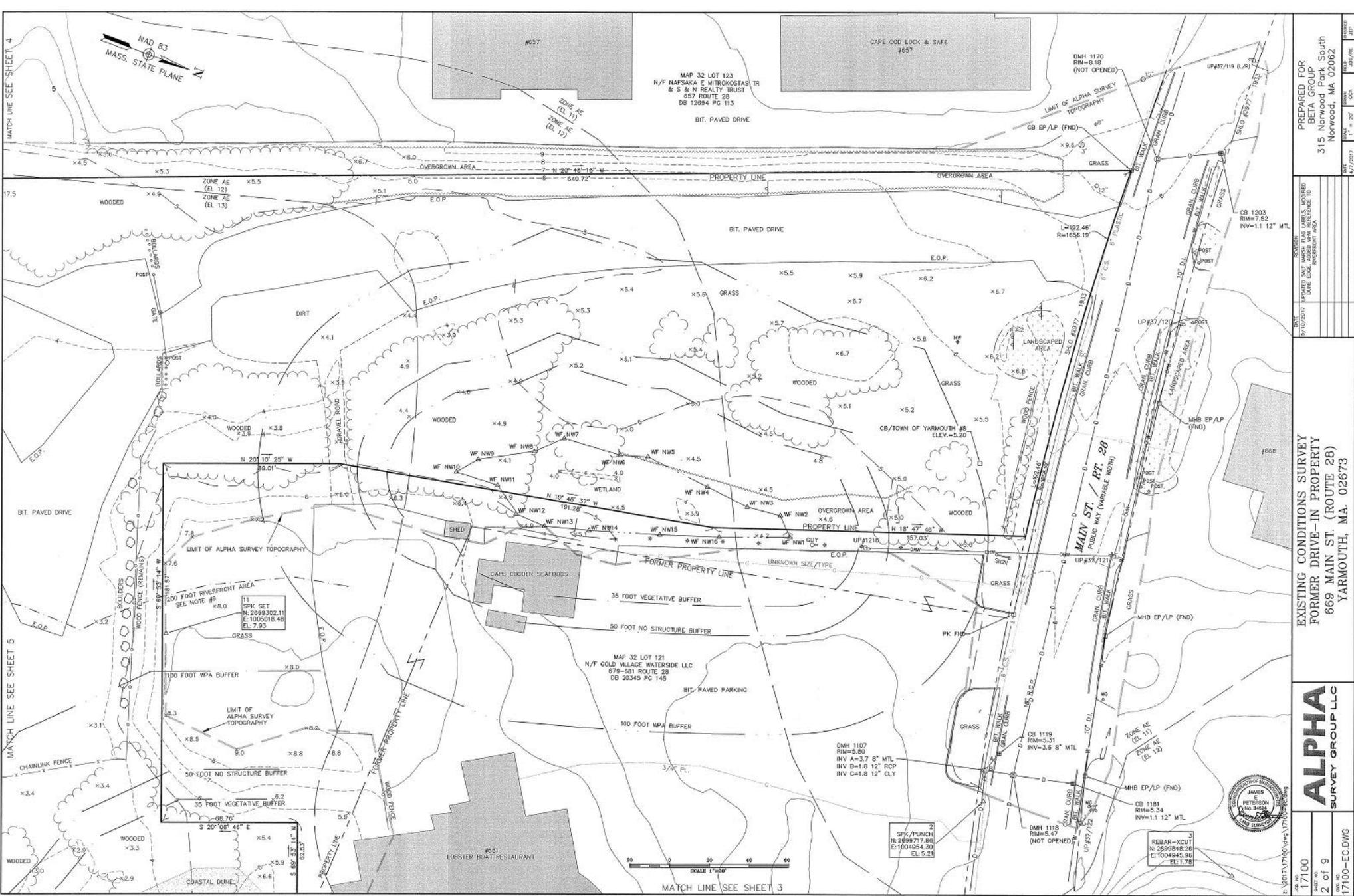
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- WATER GATE
- WATER METER
- FIRE HYDRANT
- UTILITY POLE
- UTILITY POLE WITH LIGHT
- UTILITY POLE WITH TRANSFORMER
- UTILITY POLE WITH RISER
- GUY WIRE ANCHOR
- DRAIN MANHOLE
- TELECOM MANHOLE
- CATCH BASIN
- LIGHT POLE
- TREE (SIZE INCHES)
- SHrub
- BUSH (SIZE FEET)
- MONITORING WELL
- WETLAND FLAG
- GAS LINE
- TELEPHONE LINE
- DRAIN LINE
- SEWER LINE
- ELECTRIC LINE
- CLAY
- PL
- METAL
- OVERHEAD ELECTRIC WIRE
- CHAIN LINK FENCE
- TREELINE
- WETLAND
- CONCRETE
- BITUMINOUS
- SPOT GRADE:
- FOUND
- STONE BOUND
- CONCRETE BOUND
- DRILL HOLE
- IRON PIPE
- IRON ROD
- PARKER-KALON NAIL
- MAG NAIL
- SPIKE
- BENCHMARK
- TRAVERSE (CONTROL) POINT
- LIMIT OF ALPHA SURVEY TOPOGRAPHY
- PROPERTY BOUNDARY
- MASS HIGHWAY BOUND ESCUTCHEON PIN MHB EP/LP
- GRANITE BOUND ESCUTCHEON PIN GB EP/LP
- 30' VEGETATIVE BUFFER
- 50' NO STRUCTURE BUFFER
- 100' WPA BUFFER
- 200' RIVERFRONT BUFFER
- 100 YEAR FLOODPLAIN ZONES



2:2017\17100.dwg 17100-ec.dwg

MATCH LINE SEE SHEET 4

MATCH LINE SEE SHEET 5



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SPK/PUNCH  
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E: 1004954.50  
EL: 5.21

3  
REBAR-XCUT  
N: 2699046.28  
E: 1004945.96  
EL: 1.78



PREPARED FOR  
BETA GROUP  
315 Norwood Park South  
Norwood, MA 02062

DATE: 5/12/2017  
SECTION: EXISTING CONDITIONS SURVEY  
SCALE: 1" = 20'  
DATE OF FIELD WORK: 5/12/2017  
DATE OF DRAWING: 5/12/2017

EXISTING CONDITIONS SURVEY  
FORMER DRIVE-IN PROPERTY  
669 MAIN ST. (ROUTE 28)  
YARMOUTH, MA. 02673

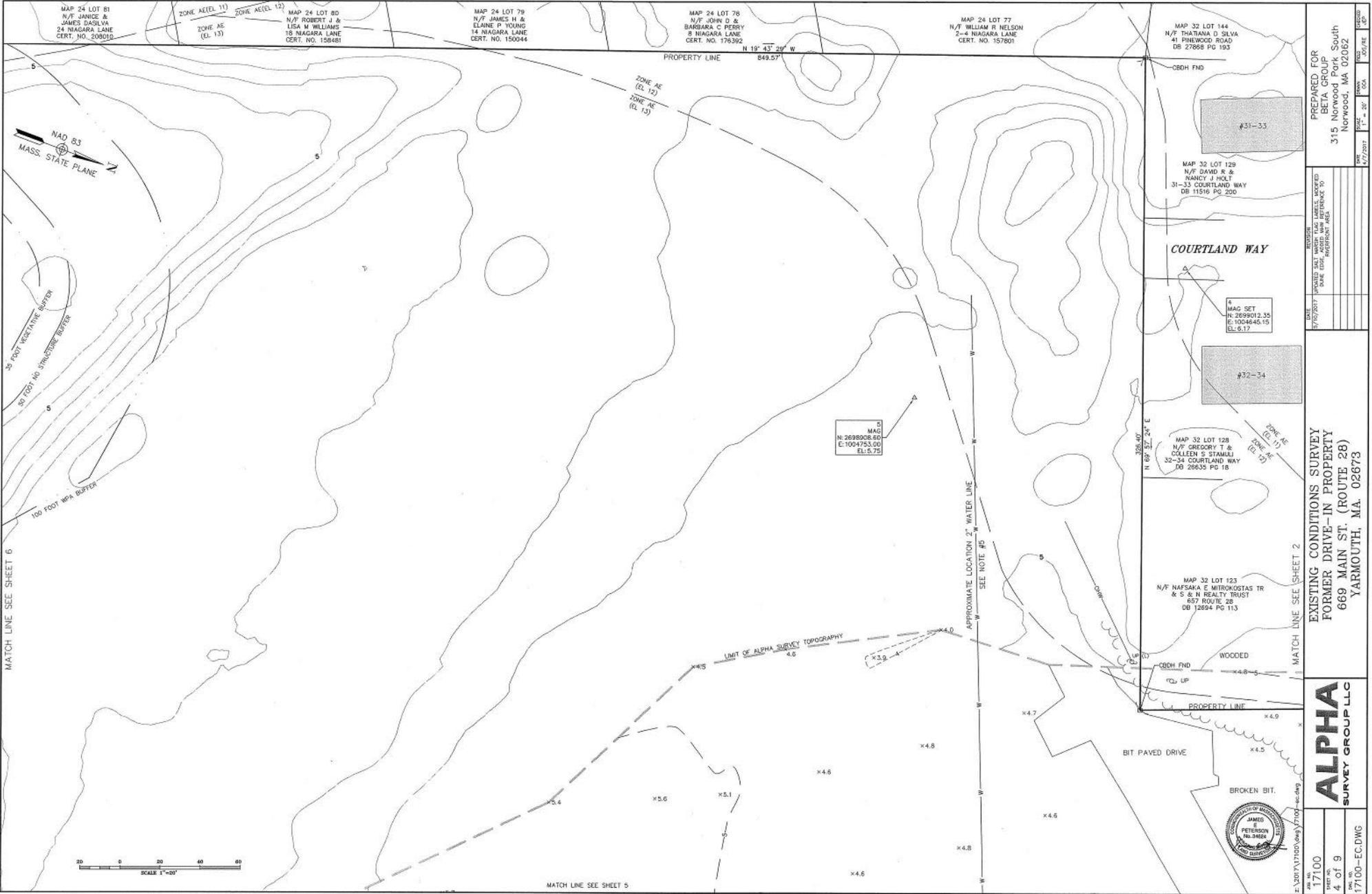
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SURVEY GROUP LLC

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17100-EC.DWG



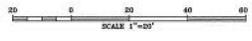
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FILE NO. 17100-EC.DWG	
DATE 11-2-20	DRAWN JCA
CHECKED JCP	PLOTTED JCP





MATCH LINE SEE SHEET 6

MATCH LINE SEE SHEET 5



PREPARED FOR  
**BETA GROUP**  
 315 Norwood Park South  
 Norwood, MA 02062

DATE	11/27/2017
SCALE	1" = 20'
DRAWN	COA
CHECKED	COA
DATE	11/27/2017
BY	COA

EXISTING CONDITIONS SURVEY  
 FORMER DRIVE-IN PROPERTY  
 669 MAIN ST. (ROUTE 28)  
 YARMOUTH, MA. 02673

**ALPHA**  
 SURVEY GROUP LLC

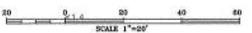
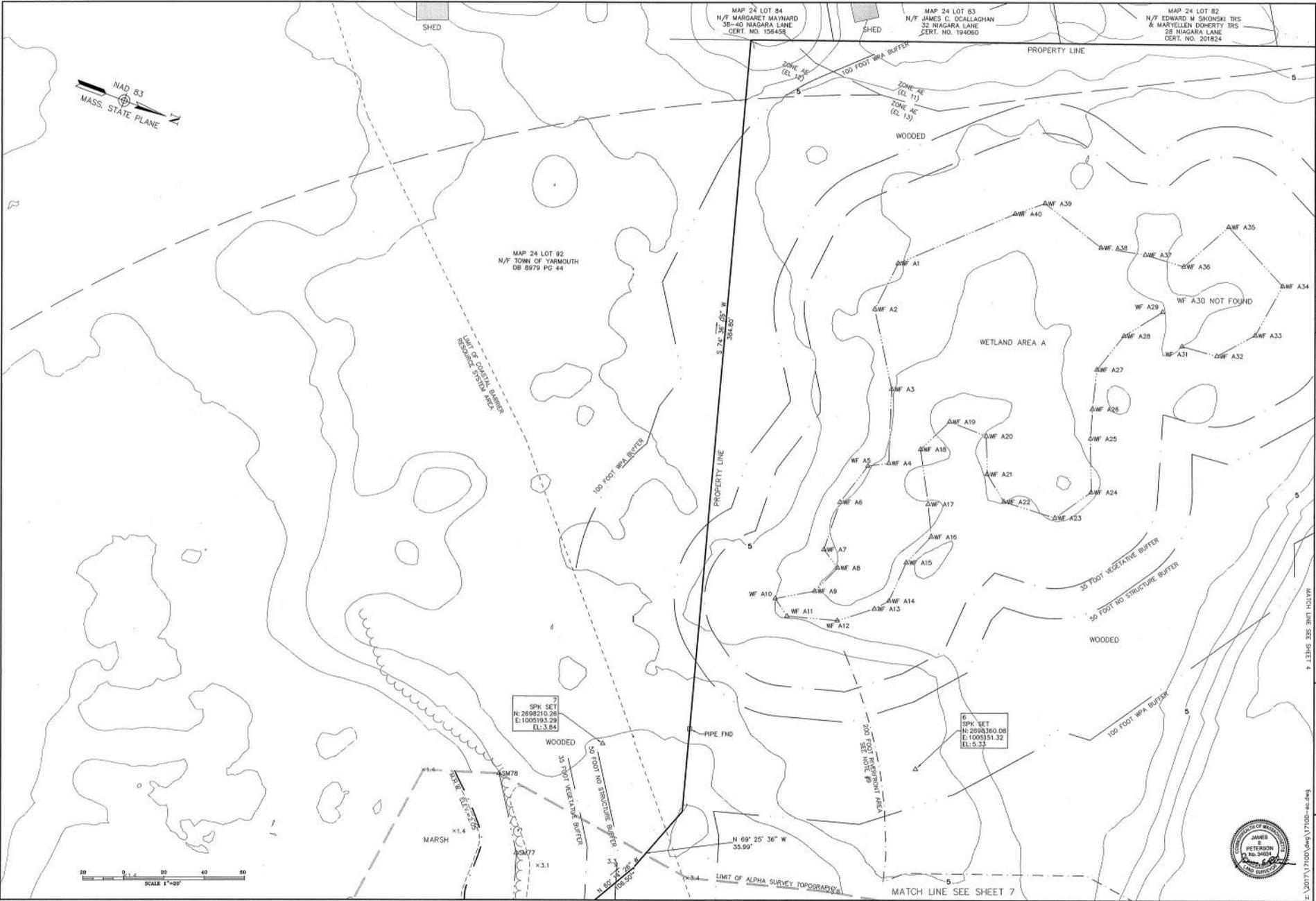
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 4 of 9  
 17100-EC.DWG



MATCH LINE SEE SHEET 2

DATE PLOTTED: 11/27/2017 11:00 AM





PREPARED FOR  
 BETA GROUP  
 315 Norwood Park South  
 Norwood, MA 02062

DATE	8/17/2017
PROJECT	EXISTING SURVEY TOPOGRAPHY
SCALE	1" = 20'
DRAWN	JAMES PETERSON
CHECKED	JAMES PETERSON
DATE	8/17/2017

EXISTING CONDITIONS SURVEY  
 FORMER DRIVE-IN PROPERTY  
 669 MAIN ST. (ROUTE 28)  
 YARMOUTH, MA. 02673

**ALPHA**  
 SURVEY GROUP LLC



DATE: 8/17/2017  
 SHEET OF: 9  
 FILE: 17100-EC.DWG

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X1.4

MARSH

X1.4

X0.9

X1.2

X1.1

MARSH

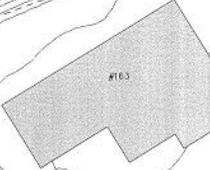
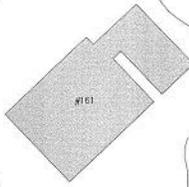
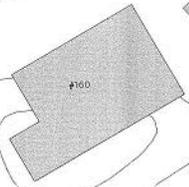
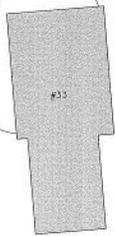
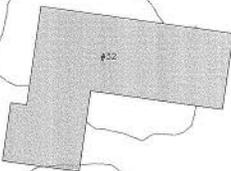
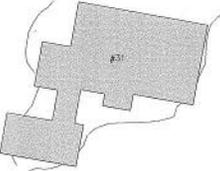
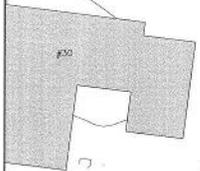
M.L.W. ELEV. = -0.7'

M.L.W. ELEV. = -0.7'

BOTTOM OF BANK & PROPERTY LINE BY PARKERS RIVER 989' & MARCH 15, 2017  
LIMIT OF ALPHA SURVEY TOPOGRAPHY

PARKERS RIVER  
E66  
FLOOD

LIMIT OF COASTAL BARRIER RESOURCE SYSTEM AREA



DATE: 4/2/2017		DRAWN BY: JWP	
DATE: 11-18-16		CHECKED BY: JWP	
PREPARED FOR BETA GROUP 315 Norwood Park South Norwood, MA 02062			
EXISTING CONDITIONS SURVEY FORMER DRIVE-IN PROPERTY 669 MAIN ST. (ROUTE 28) YARMOUTH, MA 02673			
<b>ALPHA</b> SURVEY GROUP LLC			
NO.:	17100	DATE:	4/2/2017
REV. NO.:	8 of 9	SCALE:	1"=20'
FILE NO.:	17100-EC.DWG		



SPK SET  
N: 2897867.94  
E: 1005448.42  
EL: 2.54

ZONE 16  
(EL. 11)  
ZONE 15  
(EL. 12)

MAP 24 LOT 92  
N/F TOWN OF YARMOUTH  
DB 8979 PG 44

M.H.W. ELEV. - 2.05'

S 5° 47' 26" E  
36.16'

N 77° 32' 54" E  
109.34'

N 77° 32' 54" E  
80.76'



PARKERS RIVER  
EBB  
FLOOD



PREPARED FOR  
BETA GROUP  
315 Norwood Park South  
Norwood, MA 02062

DATE: 4/7/2017  
SCALE: 1" = 20'  
DRAWN: JEP

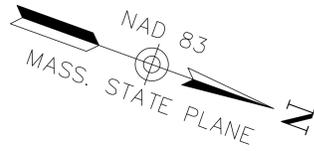
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FORMER DRIVE-IN PROPERTY  
669 MAIN ST. (ROUTE 28)  
YARMOUTH, MA. 02873

**ALPHA**  
SURVEY GROUP LLC

DATE: 4/7/2017  
SCALE: 1" = 20'  
DRAWN: JEP

17100-EC.DWG  
9 of 9  
21.00



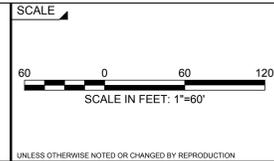


**RECORD DRAWINGS**  
 These Record Documents have been prepared by BETA GROUP, Inc. based on information received and/or obtained during construction, and pertain solely to those facilities installed by others under the referenced Contract. All other information provided and/or otherwise shown on these Record Documents are for informational purposes only and have not been verified for accuracy and/or completeness and are therefore not guaranteed.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: \_\_\_\_\_  
 DESIGNED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_

REGISTERED PROFESSIONAL \_\_\_\_\_  
 PREPARED BY \_\_\_\_\_  
 SUBCONSULTANT \_\_\_\_\_



TITLE

**EXISTING CONDITIONS SURVEY  
 FORMER DRIVE-IN PROPERTY  
 669 MAIN ST. (ROUTE 28)  
 YARMOUTH, MA. 02673**

BETA JOB NO. #####  
 ISSUE DATE 6/26/2017 12:23 PM  
 SHEET NO. 1 of 1

6/26/2017 12:23 PM O:\56005\5662 - YARMOUTH RIVERWALK PARKDRAWING FILES\SURVEY\5662 SURVEY\_COPY.DWG

**APPENDIX D – Cost Estimates for Entrance Drive & Riverwalk Park**

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**SUBDIVISION ENTRANCE DRIVE  
ORDER OF MAGNITUDE ESTIMATE  
Riverwalk Park and Boardwalk Project, Yarmouth, MA**

Quantity	Unit	Item Description	Unit Price	Amount	Amount
<b>SITE PREPARATION AND EXCAVATION</b>					<b>\$170,725</b>
1	LS	SITE PREPARATION	\$10,000	\$10,000	
500	LF	TEMP TREE PROTECTION FENCE	\$8	\$4,000	
500	CY	UNCLASSIFIED EXCAVATION	\$35	\$17,500	
935	CY	GRAVEL BORROW	\$35	\$32,725	
9650	SY	FINE GRADING AND COMPACTING	\$10	\$96,500	
1	LS	UNSUITABLE SOILS	\$10,000	\$10,000	
<b>DRAINAGE AND UTILITY</b>					<b>\$167,250</b>
6	EA	CATCH BASIN	\$3,000	\$18,000	
6	EA	LEACHING BASIN	\$4,000	\$24,000	
150	LF	12-INCH RCP	\$75	\$11,250	
700	LF	WATER MAIN 8 INCH	\$120	\$84,000	
3	EA	GATE VALVE	\$5,000	\$15,000	
2	EA	HYDRANT	\$7,500	\$15,000	
<b>PAVING AND SITE WORK</b>					<b>\$171,725</b>
610	TON	HOT MIX ASPHALT PAVEMENT - 4" DEPTH	\$110	\$67,100	
1500	FT	HMA BERM - TYPE 2	\$10	\$15,000	
120	TON	HMA SIDEWALK (800' x 8' WIDE)	\$200	\$24,000	
8	EA	GRANITE BOUND	\$500	\$4,000	
1	LS	MOBILIZATION	\$25,000	\$25,000	
405	CY	LOAM BORROW	\$50	\$20,250	
1625	SY	COMPOST TOP SOIL	\$7	\$11,375	
1	LS	NPDES STORMWATER POLLUTION PREVENTION PLAN	\$5,000	\$5,000	
<b>PLANTING</b>					<b>\$84,700</b>
40	CY	AMENDED SOIL MIX FOR TREE PLANTING	\$100	\$4,000	
1900	SY	SEEDING LAWNS - AREAS G1	\$3	\$5,700	
1625	SY	NATIVE SEEDING - AREAS G2	\$4	\$6,500	
700	LF	COMPOST FILTER TUBES	\$15	\$10,500	
25	EA	EVERGREEN TREES (8-10 FOOT)	\$800	\$20,000	
25	EA	DECIDUOUS TREES (3 INCH CALIPER)	\$1,200	\$30,000	
100	EA	SHRUBS (3 GAL)	\$65	\$6,500	
50	EA	PERENNIALS AND ORNAMENTAL GRASSES (1-2 GAL)	\$30	\$1,500	
<b>ELECTRICAL</b>					<b>\$213,750</b>
700	LF	3 INCH CONDUIT (COMMUNICATIONS)	\$55	\$38,500	
3	EA	COMMUNICATIONS HANDHOLE	\$1,750	\$5,250	
700	LF	4 INCH CONDUIT (ELECTRIC)	\$60	\$42,000	
2	EA	ELECTRIC MANHOLE	\$8,000	\$16,000	
5	EA	ELECTRIC HANDHOLE	\$1,750	\$8,750	
11	EA	PULL BOX	\$750	\$8,250	
1	LS	LIGHTING LOAD CENTER	\$15,000	\$15,000	
8	EA	ORNAMENTAL LIGHT	\$10,000	\$80,000	
<b>SIGNAGE AND TRAFFIC</b>					<b>\$69,000</b>
4	LS	SIGNS	\$500	\$2,000	
3000	LF	PAVEMENT MARKINGS	\$2	\$6,000	
10	CY	4,000 PSI 3/4 INCH CONCRETE	\$1,000	\$10,000	
2	EA	PUSH BUTTON PEDESTRIAN FLASHING BEACON	\$20,000	\$40,000	
1	LS	CROSSWALK AND HANDICAP RAMPS @Route 28	\$5,000	\$5,000	
1	EA	ENTRANCE GATE	\$6,000	\$6,000	
<b>SUBTOTAL PAY ITEMS</b>				<b>\$877,150</b>	<b>\$877,150</b>
<b>25% CONTINGENCY</b>					<b>\$219,288</b>
<b>5% ESCALATION CONTINGENCY</b>					<b>\$43,858</b>
<b>TOTAL</b>					<b>\$1,140,295</b>



**RIVERWALK PARK (PREFERRED CONCEPT)**  
**ORDER OF MAGNITUDE ESTIMATE**  
**Riverwalk Park and Boardwalk Project, Yarmouth MA**

Quantity	Unit	Park + Parking Lot Item Description	Amount	Unit Price	Amount
<b>SITE PREPARATION AND EXCAVATION</b>			<b>\$334,750</b>		
1	LS	SITE PREPARATION		\$10,000	\$10,000
500	LF	TEMP TREE PROTECTION FENCE		\$8	\$4,000
250	CY	UNCLASSIFIED EXCAVATION		\$35	\$8,750
100	CY	GRAVEL BORROW (Park misc. 100 CY)		\$35	\$3,500
17850	SY	FINE GRADING AND COMPACTING		\$10	\$178,500
1	LS	UNSUITABLE SOILS		\$10,000	\$10,000
1	LS	NPDES STORMWATER POLLUTION PREVENTION PLAN		\$5,000	\$5,000
35	CY	4,000 PSI 3/4" - 610 CONCRETE		\$1,000	\$35,000
1	LS	MOBILIZATION		\$80,000	\$80,000
<b>DRAINAGE AND UTILITY</b>			<b>\$291,000</b>		
1	LS	SEPTIC SYSTEM		\$125,000	\$125,000
800	LF	WATER MAIN - 8 INCH		\$120	\$96,000
2	EA	GATE VALVE		\$5,000	\$10,000
2	EA	HYDRANT		\$7,500	\$15,000
2	EA	DRINKING FOUNTAINS		\$7,500	\$15,000
1	LS	IRRIGATION SYSTEM (LAWN AREAS ONLY)		\$30,000	\$30,000
<b>PAVING AND SITE WORK</b>			<b>\$890,125</b>		
2700	CY	EXCAVATION (PARKING LOT)		\$30	\$81,000
2700	CY	GRADED STONE - 24" DEPTH FOR PERVIOUS ASPHALT(PARKING LOT)		\$75	\$202,500
925	TON	HOT MIX ASPHALT PAVEMENT - PERVIOUS - 4" (PARKING LOT)		\$175	\$161,875
1600	CY	EXCAVATION (WALKWAYS)		\$30	\$48,000
1600	CY	GRADED STONE - 24" DEPTH FOR PERVIOUS ASPHALT (WALKWAYS)		\$75	\$120,000
340	TON	HOT MIX ASPHALT PAVEMENT - PERVIOUS - 2.5" (WALKWAYS)		\$175	\$59,500
900	CY	EXCAVATION (WOODLAND PATH)		\$30	\$27,000
900	CY	GRADED STONE - 24" DEPTH FOR PERVIOUS ASPHALT (WOODLAND PATH)		\$75	\$67,500
190	TON	HOT MIX ASPHALT PAVEMENT - PERVIOUS - 2.5" (WOODLAND PATH)		\$175	\$33,250
1600	LF	HMA BERM - TYPE 2		\$10	\$16,000
110	EA	WHEELSTOPS		\$300	\$33,000
3	EA	RAISED CROSSWALKS		\$10,000	\$30,000
6	LS	SIGNS		\$500	\$3,000
7500	LF	PAVEMENT MARKINGS		\$1	\$7,500
<b>SITE AMENITIES</b>			<b>\$162,500</b>		
5	EA	PICNIC TABLE		\$3,000	\$15,000
10	EA	BENCH		\$2,500	\$25,000
3	EA	SOLAR TRASH & RECYCLING		\$2,000	\$6,000
10	EA	BIKE RACK		\$1,250	\$12,500
1	EA	PLAYSCAPE		\$20,000	\$20,000
20	EA	GRANITE BLOCK SEAT (USE FROM SITE)		\$450	\$9,000
3	EA	INTERPRETIVE PANELS		\$4,000	\$12,000
1	EA	SAFETY KIOSK		\$8,000	\$8,000
1	LS	KAYAK LAUNCH		\$45,000	\$45,000
1	LS	KAYAK STORAGE RACKS AND FENCING (24 KAYAKS, 6/RACK)		\$10,000	\$10,000
<b>STRUCTURES</b>			<b>\$206,000</b>		
1	LS	WELCOME CENTER & RESTROOMS		\$100,000	\$100,000
1	LS	PORTABLE TOILET ENCLOSURE (INCLUDES PAD & FENCE))		\$40,000	\$40,000
1	LS	SHADE SAILS		\$25,000	\$25,000
1	EA	KAYAK VENDOR SHED		\$6,000	\$6,000
1	EA	MARINE INTERPRETIVE STRUCTURE WITH DISPLAY KIOSKS AT UPWELLER		\$35,000	\$35,000

**RIVERWALK PARK (PREFERRED CONCEPT)**  
**ORDER OF MAGNITUDE ESTIMATE**  
**Riverwalk Park and Boardwalk Project, Yarmouth MA**

<b>PLANTING</b>			<b>\$385,130</b>	
2205	CY	LOAM BORROW	\$50	\$110,250
4140	SY	COMPOST TOP SOIL	\$7	\$28,980
1	LS	NPDES STORMWATER POLLUTION PREVENTION PLAN	\$5,000	\$5,000
60	CY	AMENDED SOIL MIX FOR TREE PLANTING	\$100	\$6,000
1400	SY	SEEDING LAWNS - AREAS G1	\$3	\$4,200
7475	SY	NATIVE SEEDING - AREAS G2	\$4	\$29,900
6700	SY	NATIVE SEEDING - AREAS G3	\$4	\$26,800
800	LF	COMPOST FILTER TUBES	\$15	\$12,000
20	EA	EVERGREEN TREE (8-10 FOOT)	\$1,500	\$30,000
30	EA	DECIDUOUS TREE (3 INCH CALIPER)	\$2,000	\$60,000
900	EA	SHRUBS (3 GAL)	\$65	\$58,500
450	EA	PERENNIALS AND ORNAMENTAL GRASSES (1-2 GAL)	\$30	\$13,500
<b>ELECTRICAL</b>			<b>\$238,750</b>	
800	LF	3 INCH CONDUIT (Communications)	\$55	\$44,000
3	EA	COMMUNICATIONS HANDHOLE (Communications)	\$1,750	\$5,250
800	LF	3 INCH CONDUIT (electric)	\$55	\$44,000
1	EA	ELECTRIC MANHOLE (electric)	\$8,000	\$8,000
10	EA	ELECTRIC HANDHOLE (electric)	\$1,750	\$17,500
10	EA	PULL BOX	\$500	\$5,000
1	LS	LIGHTING LOAD CENTER	\$15,000	\$15,000
10	EA	ORNAMENTAL LIGHT	\$10,000	\$100,000
SUBTOTAL PAY ITEMS			<b>\$2,508,255</b>	\$2,508,255
25% CONTINGENCY			<b>\$627,064</b>	\$627,064
5% ESCALATION CONTINGENCY			<b>\$125,413</b>	\$125,413
TOTAL CONSTRUCTION			<b>\$3,260,732</b>	\$3,260,732