



6TH ANNUAL
CAPE COASTAL CONFERENCE
DECEMBER 4-5, 2018

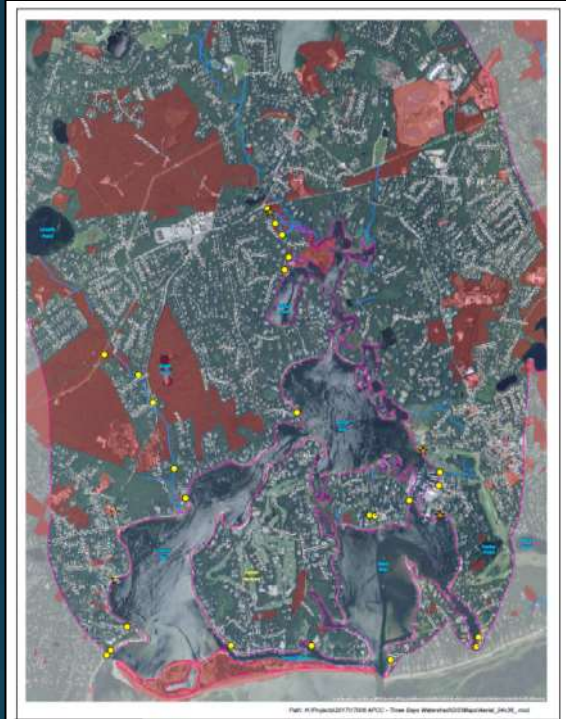


Design and Construction of Stormwater BMPs in Three Bays

Michelle West, Horsley Witten
Group, Inc.

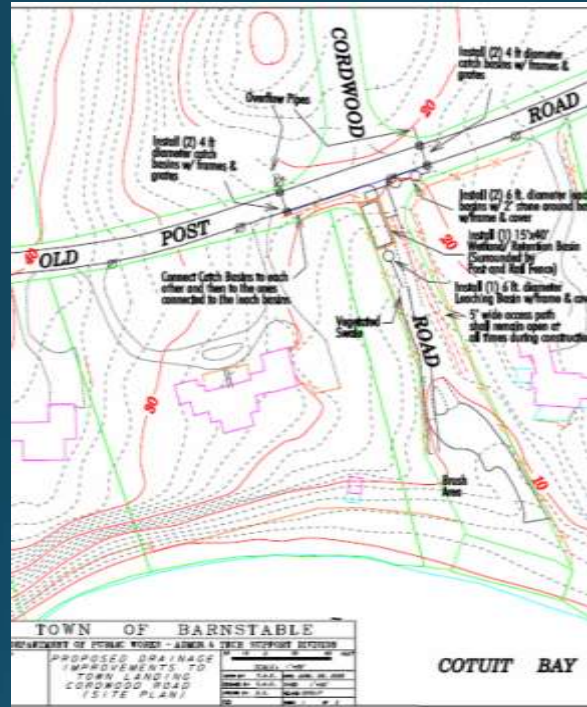


Approach



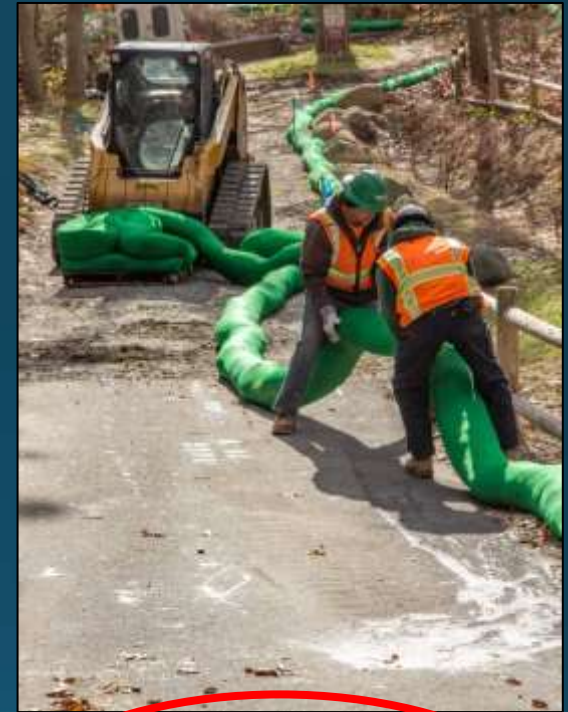
Assessment and Prioritization

Phase 1: March – August 2017



Design and Permitting

Phase 1: 2017 – 2018



Installation

Phase 1: October 2018 – January 2019

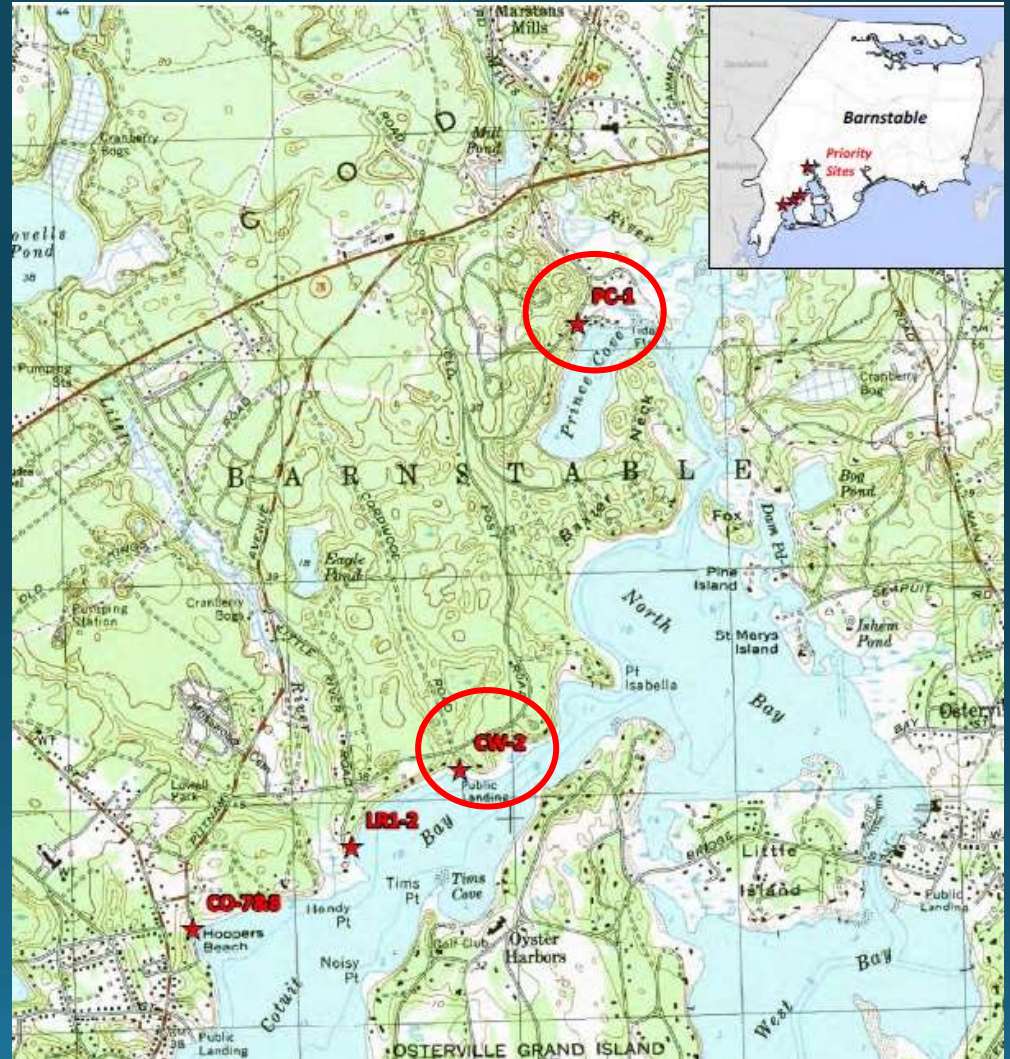
Priority Sites for Design and Permitting

COTUIT

- Ropes Beach (2 BMPs)
- Little River Landing
- Cordwood Landing

MARSTONS MILLS

- Prince Cove Marina



Specific Design Goals

- **Green Infrastructure = Nature-based Designs**
 - Bioretention
 - Sand Filter
- **Enhanced Pollutant Removal**
- **Coastal Resiliency**
- **Operation and Maintenance**
- **Public Access**





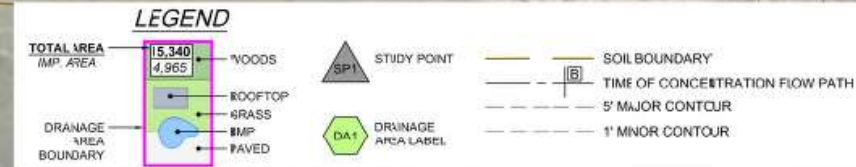
CW-2: Cordwood Landing



Design:

- Bioretention and Retrofit of Existing BMP
- 0.4-acre Drainage Area
- 55% Nitrogen Removal
- 70% Bacteria Removal

- Invasive Species Removal/ Buffer Restoration
- Improve Parking Lot
- Stabilized Water Access



SOIL TYPES

252C	CARVER COARSE SAND 8-15% SLOPE (HSG 'A')
259B	CARVER DAMY SAND 3-8% SLOPE (HSG 'A')
607	WATER, SALINE

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508-832-3750 fax

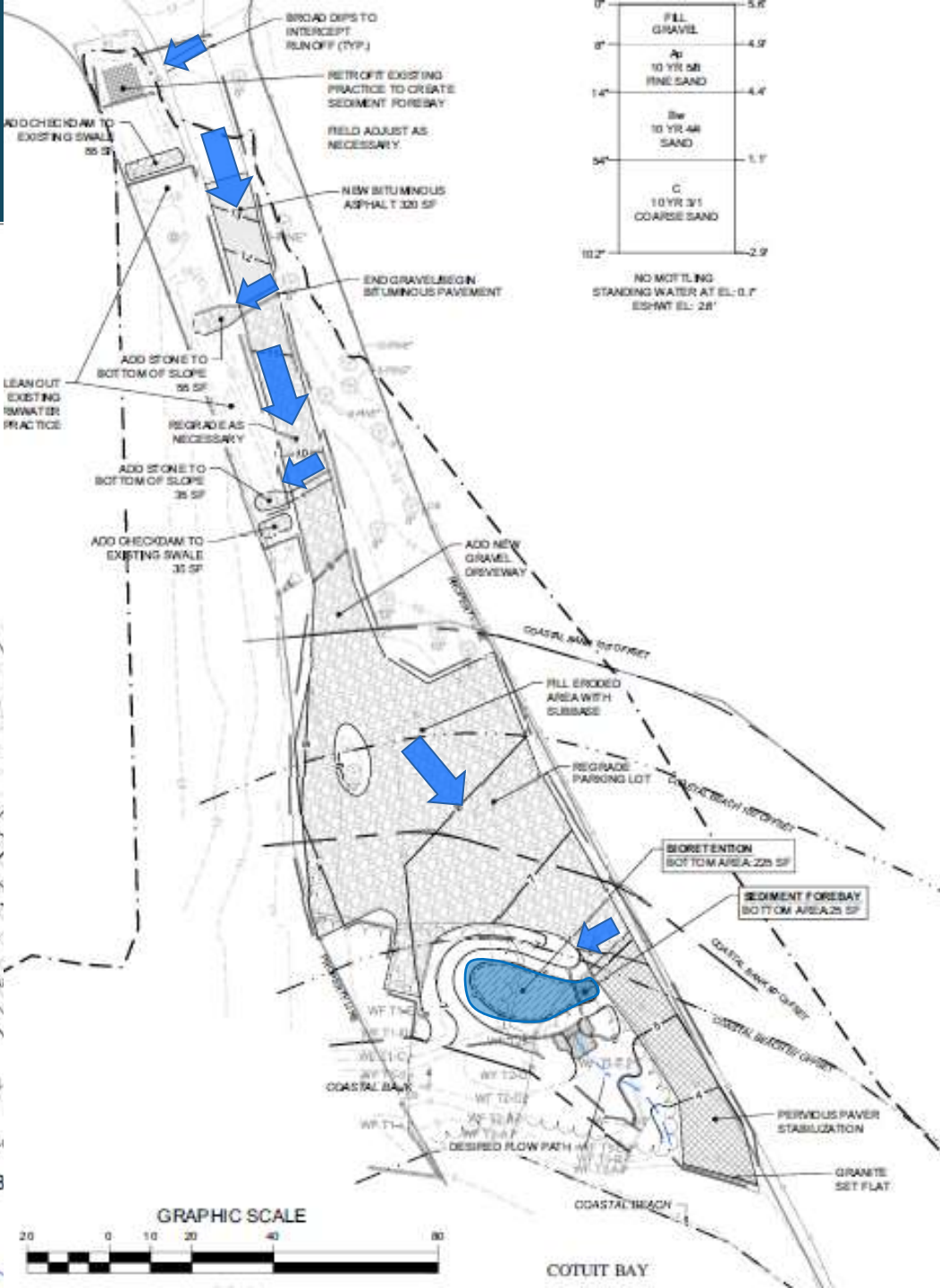
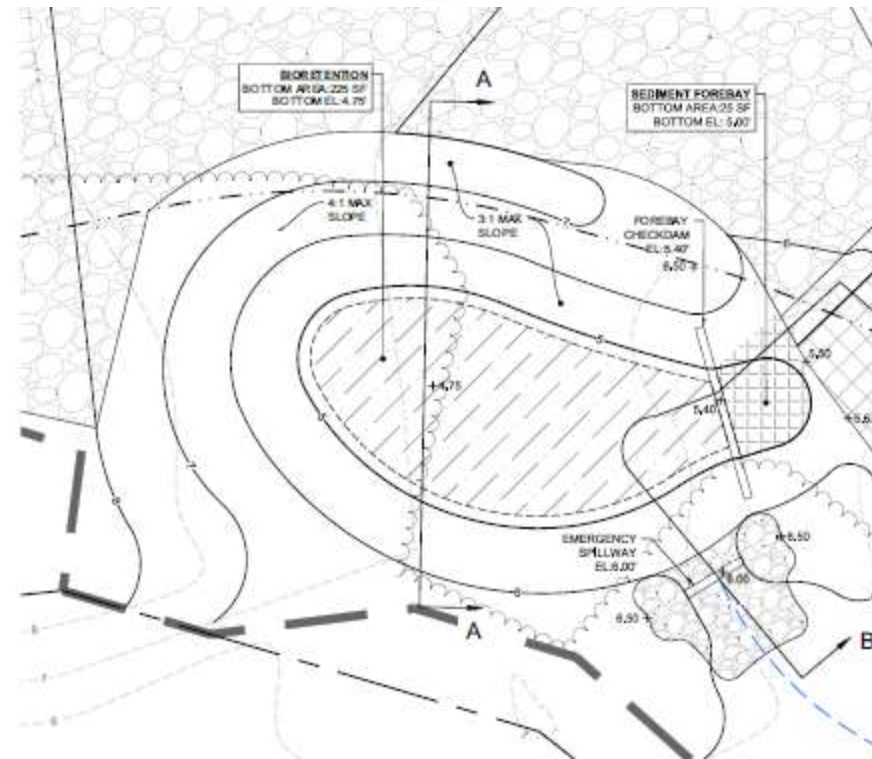
Project No. 17006
Date 12/13

THREE BAYS STORMWATER RETROFITS
PERMITTING PLANS
COTUIT, MASSACHUSETTS
17006 CORDWOOD DR POST

Project No. 17006
Date 12/13

Sheet No. 1
of 1

CW-2



Resiliency



March 2018
Nor'easter





Open
Main
Cons



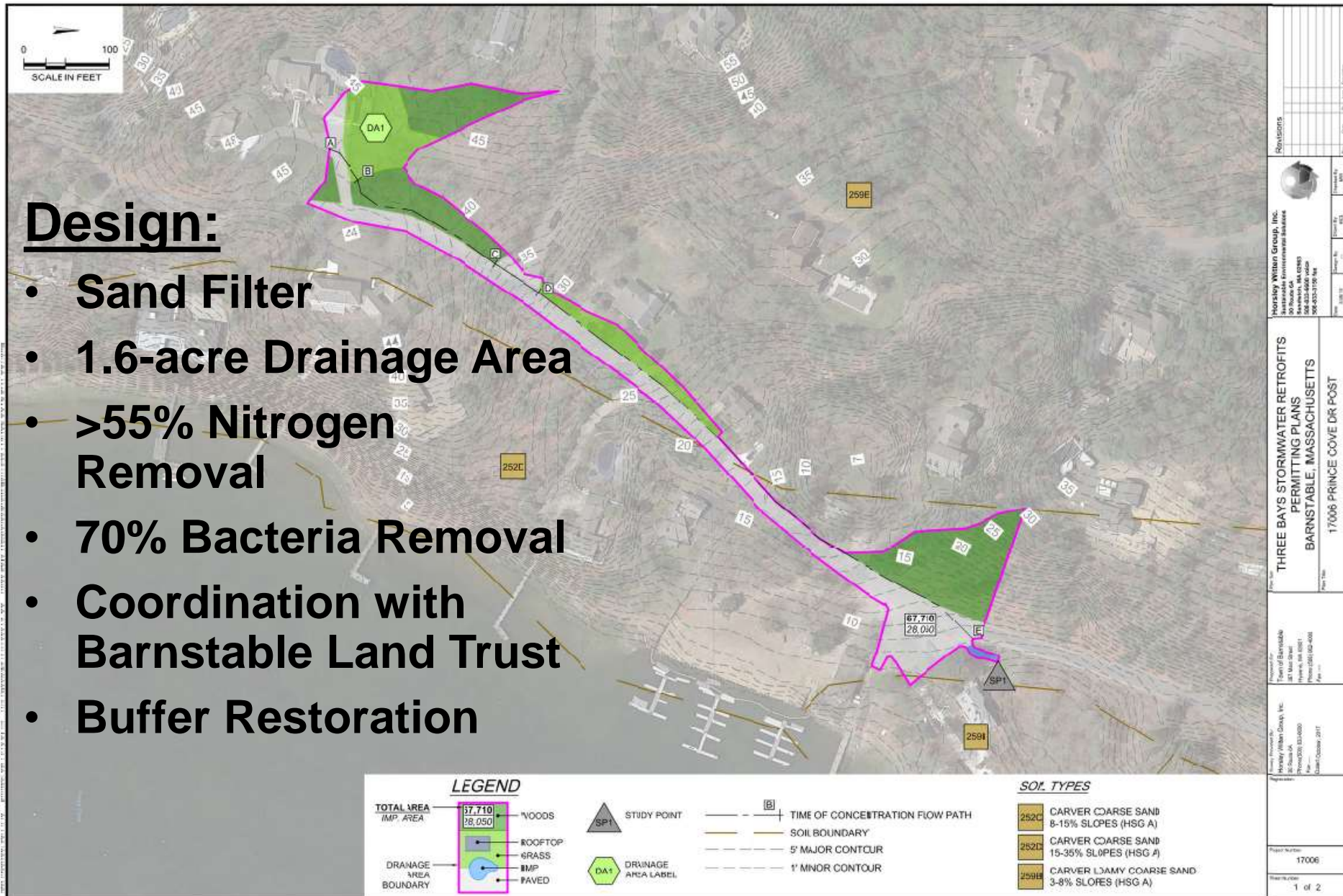
Hardened Forebays



PC-1: Prince Cove Marina

Design:

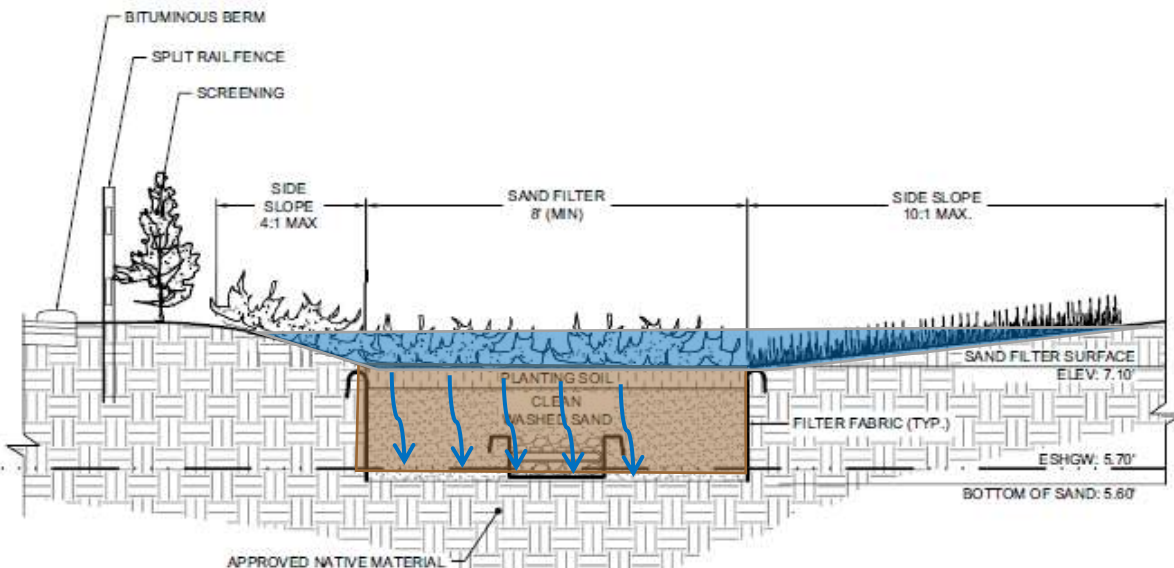
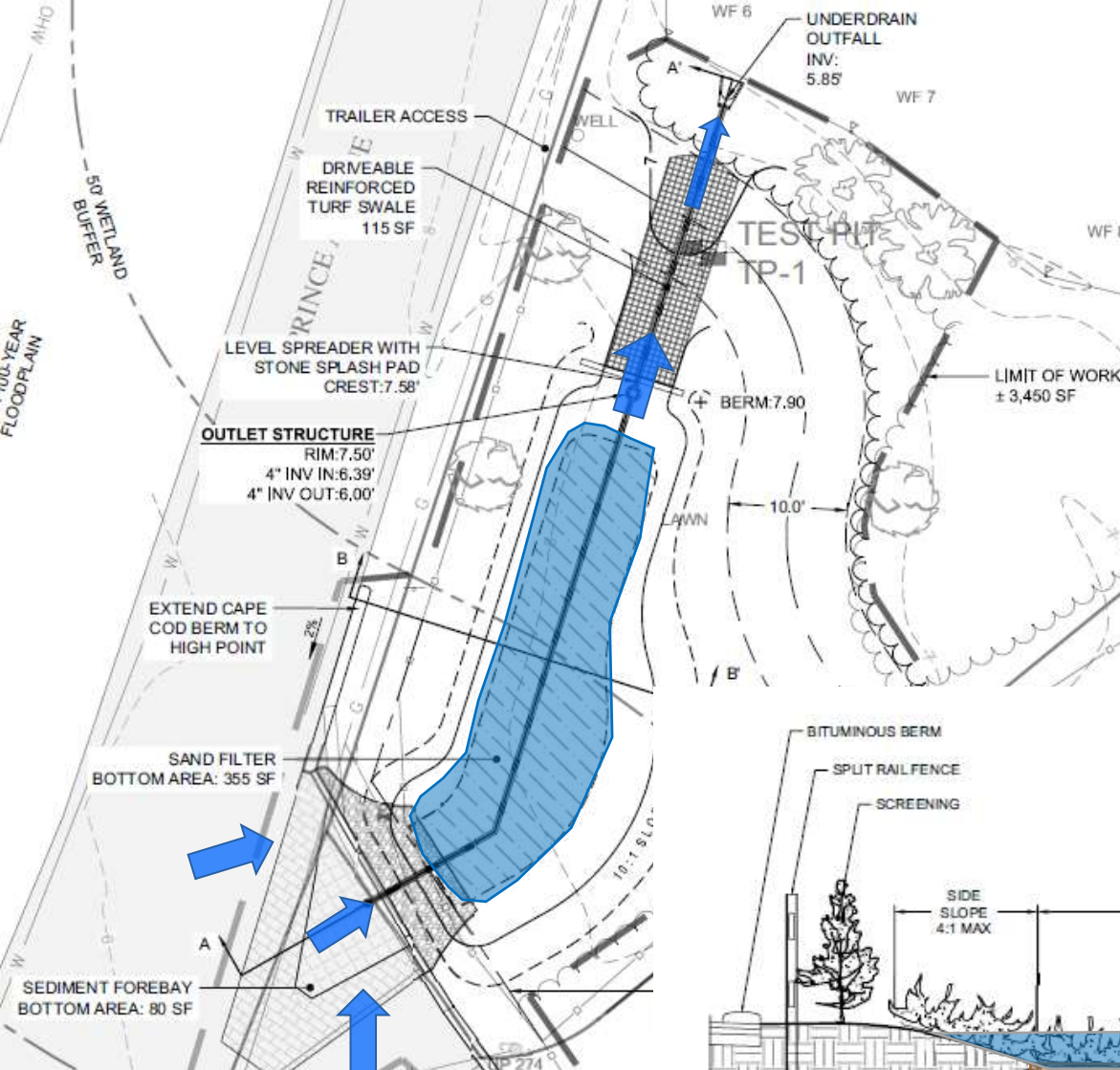
- Sand Filter
- 1.6-acre Drainage Area
- >55% Nitrogen Removal
- 70% Bacteria Removal
- Coordination with Barnstable Land Trust
- Buffer Restoration



PC-1: Prince Cove Marina

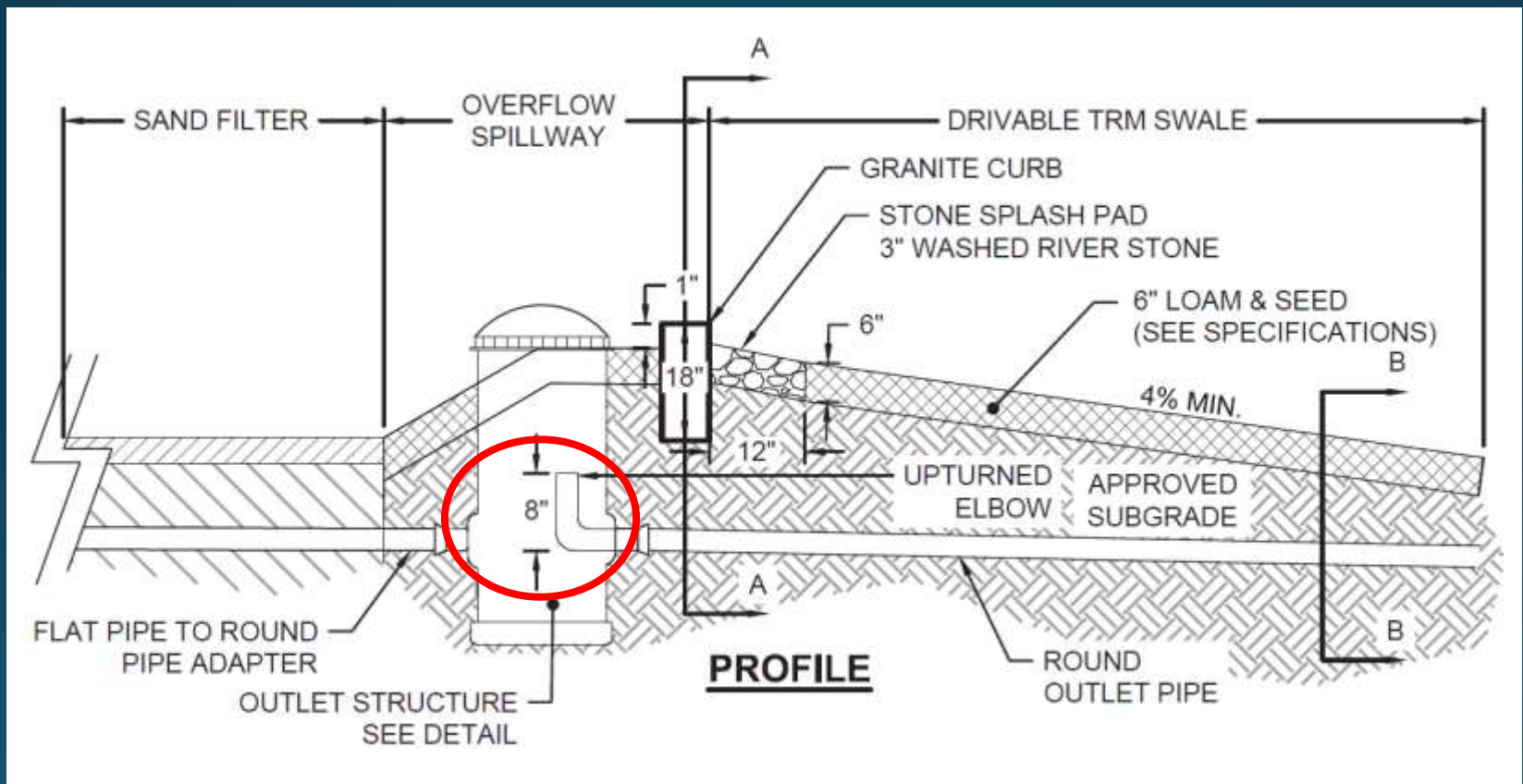


PC-1



SAND FILTER SECTION B-B'
NOT TO SCALE

Enhanced Pollutant Removal & Resiliency



Internal Water Storage

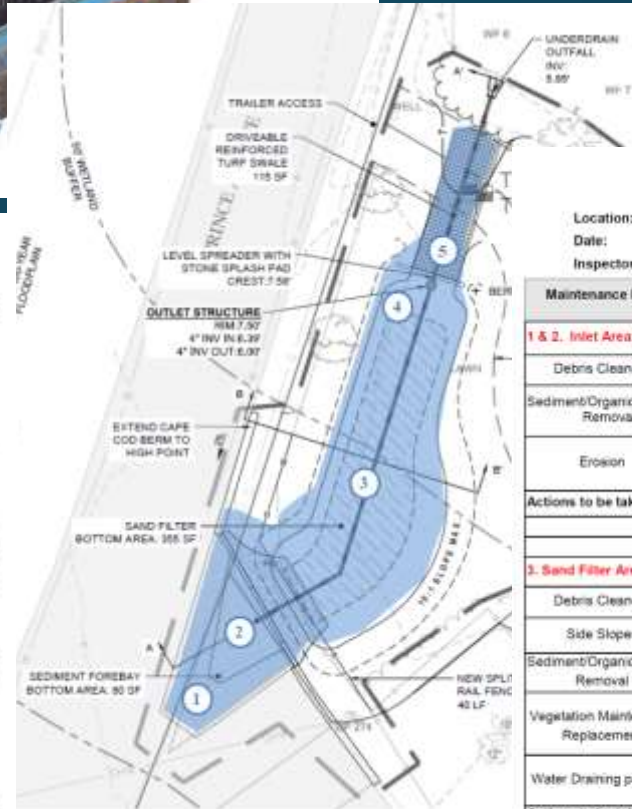
Operation & Maintenance Considerations



3.1 Landscape Areas



- Mowed Lawn Areas
- Low Mow Areas
- Natural Buffers



SAND FILTER AREA INSPECTION REPORT

Location:
Date:
Inspector:

Maintenance Item	Description	Maintenance (Y/N)
1 & 2. Inlet Area: Includes: Sediment Forebay		
Debris Cleanout	Remove all trash and debris from the forebay.	
Sediment/Organic Debris Removal	Remove and properly dispose of when build-up is greater than or equal to 3 inches.* Remove any vegetation that sprouts through voids in stone, pavement, or pavers.	
Erosion	Check for areas of erosion in the forebay, particularly along side slopes and perimeter. Repair as necessary.	
Actions to be taken:		
3. Sand Filter Area:		
Debris Cleanout	Remove trash and debris from the surface.	
Side Slopes	Signs of erosion gullies, animal burrowing, overtopping or slumping are observed. Repair as necessary.	
Sediment/Organic Debris Removal	Remove sediment accumulation and properly dispose when accumulation is greater than or equal to 3 inches.*	
Vegetation Maintenance	Mow vegetation at least twice per year but not more than four times per year.	
Replacement	Remove and replace vegetation as necessary using the appropriate species as designated on plans (see Appendix B).	
Water Draining properly	If standing water is observed for more than 48 hours after a storm event, rototill or aerate the bottom 6 inches to breakup any hard-packed sediment.*	
Actions to be taken:		
4. Overflow Structures/Spillways: Includes: Sand filter outlet structures and level spreaders/overflow spillways		
Emergency Spillways	Check for settling, gully, erosion damage, & clogging. Repair as necessary and return to design grades.	

Landscape Maintenance Considerations



THREE BAYS STORMWATER RETROFITS CONSTRUCTION PLANS BARNSTABLE, MASSACHUSETTS AUGUST 2018



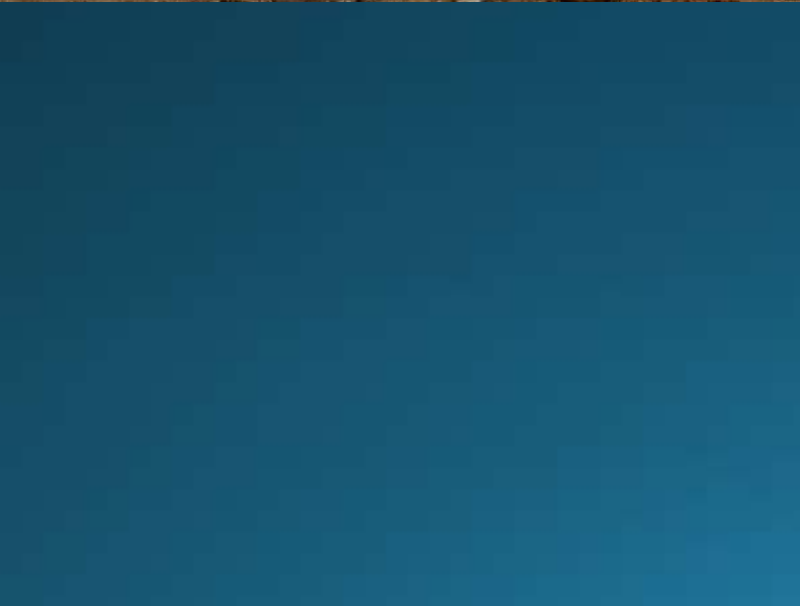
Sheet Number	Sheet Title
1	TOP SHEET
2	GENERAL NOTES
3	DEMOLITION AND SITE PREP PLANS
4	DEMOLITION AND SITE PREP PLANS
5	DEMOLITION AND SITE PREP PLANS
6	DEMOLITION AND SITE PREP PLANS
7	DEMOLITION AND SITE PREP PLANS
8	DEMOLITION AND SITE PREP PLANS
9	DEMOLITION AND SITE PREP PLANS
10	DEMOLITION AND SITE PREP PLANS
11	DEMOLITION AND SITE PREP PLANS
12	DEMOLITION AND SITE PREP PLANS

THREE BAYS STORMWATER RETROFITS
CONSTRUCTION PLANS
BARNSTABLE, MASSACHUSETTS

Construction



Contractor: SumCo Eco-Contracting



Prince Cove Construction – to be continued...



Questions?