2020 Annual Conference

CONNECTICUT
Association of Flood Managers

Bayview Beach Flood Mitigation

Presented by

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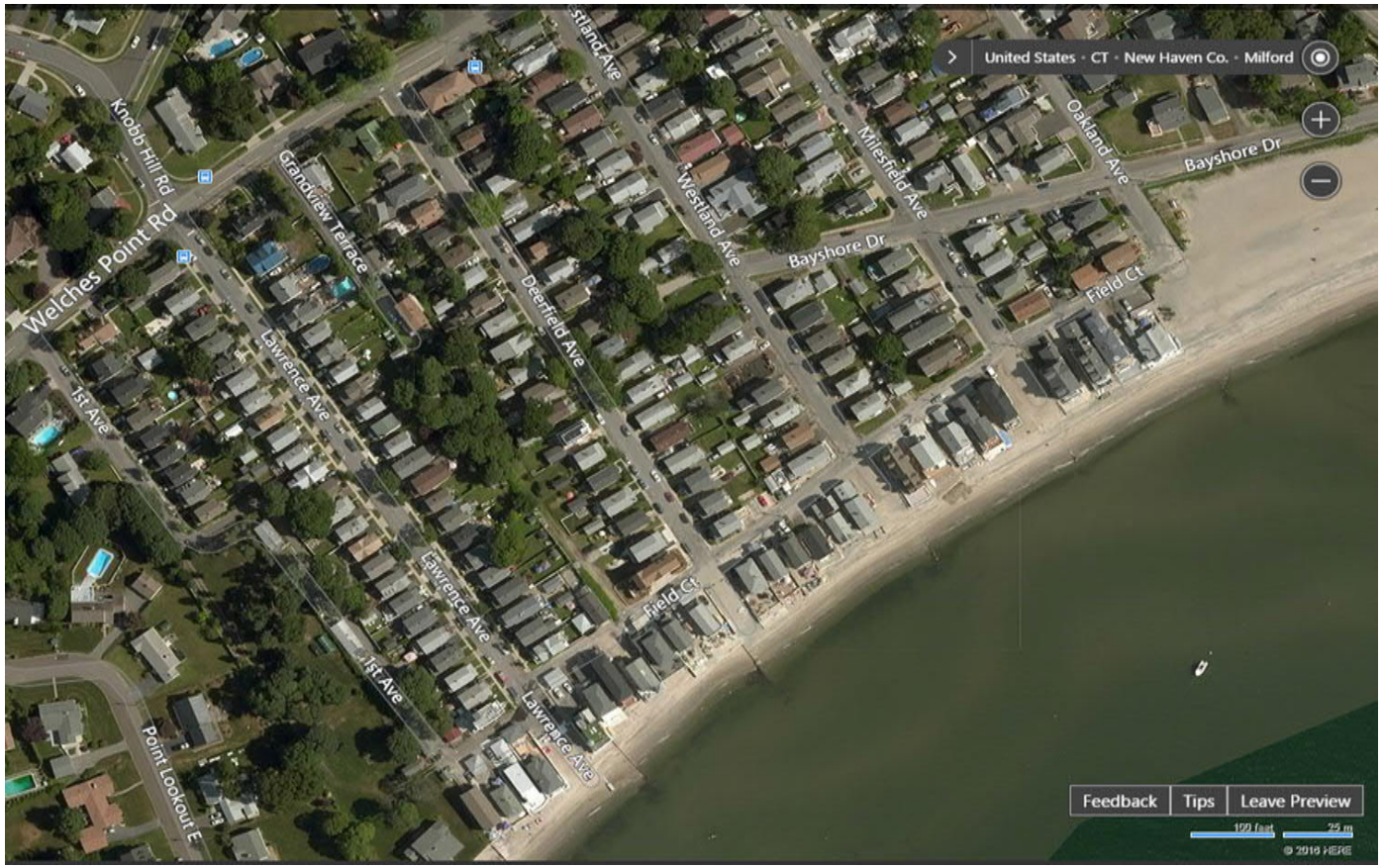
FUSS & O'NEILL

Outline

- Overview
- Existing Conditions
- Design
- Construction
- Results



Overview

Overview - Issues

- Frequency of dune overtopping is increasing
- Frequency sand washed into Field Court and into catch basins is increasing
- Dune is unprotected and erodes easily
- Shoaling clogs discharge pipes with sand
- Deteriorating pipes and tide gates aggravate street flooding
- Low-lying streets and storm pipe systems mean flood waters can't drain easily

Overview – Key Goals

- Replace 1986 storm water drainage pipes and tide gates. Increase storage.
- Minimize tidal flooding from catch basins.
- Elevate road portions.
- Design ability to pump flood waters.
- Improve dune resiliency.

Existing Conditions

Deteriorated and Inadequate Infrastructure

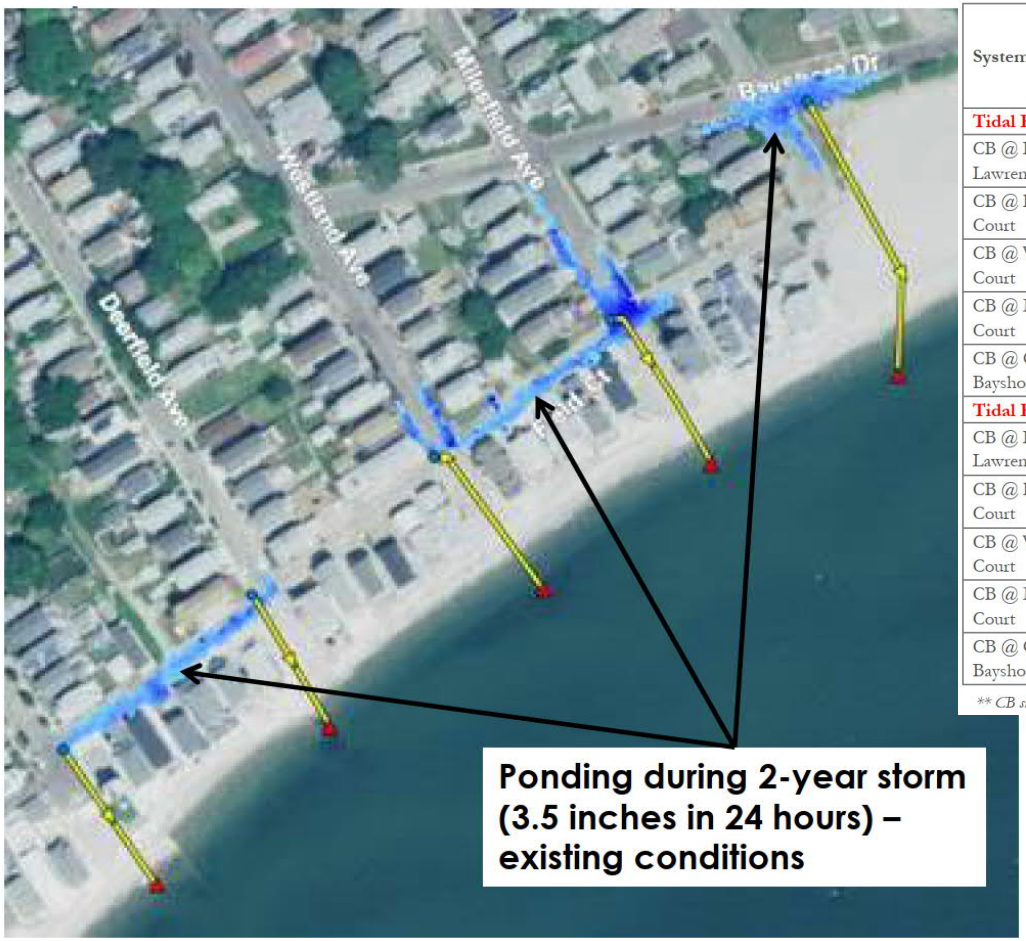
Daily Tidal Flooding – Resident Headache

Extreme Weather Events – Lasting Impacts

Design

Design

- How much increased storage? - SWMM Flood Modeling performed



System Location	Modeled Surcharge Depth (Feet Above Rim) / Time of Surcharge (min)					
	1-Inch Storm	1-Year Storm	2-Year Storm	5-Year Storm	10-Year Storm	25-Year Storm
Tidal Elevation at MHW (2.9 Feet NAVD88)						
CB @ Lawrence Avenue & Lawrence Court	0 / 0	0 / 0	0 / 0	0 / 6	0.1 / 6	0.1 / 8
CB @ Deerfield Avenue & Field Court	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
CB @ Westland Avenue & Field Court	0 / 0	0.4 / 32	0.6 / 46	0.8 / 62	0.9 / 80	1.1 / 106
CB @ Milesfield Avenue & Field Court	0 / 0	0.1 / 12	0.2 / 16	0.2 / 20	0.3 / 22	0.3 / 30
CB @ Oakland Avenue & Bayshore Drive	0 / 0	0.3 / 18	0.4 / 28	0.5 / 40	0.5 / 50	0.6 / 66
Tidal Elevation at HTL (4.7 Feet NAVD88)						
CB @ Lawrence Avenue & Lawrence Court	0 / 0	0 / 2	0 / 4	0.1 / 8	0.1 / 8	0.1 / 12
CB @ Deerfield Avenue & Field Court	1.1 / **	1.2 / **	1.2 / **	1.2 / **	1.2 / **	1.2 / **
CB @ Westland Avenue & Field Court	1.2 / **	1.4 / **	1.5 / **	1.6 / **	1.6 / **	1.7 / **
CB @ Milesfield Avenue & Field Court	0.1 / 22	0.2 / 90	0.3 / 124	0.4 / 166	0.5 / 212	0.5 / 266
CB @ Oakland Avenue & Bayshore Drive	0.8 / **	1 / **	1 / **	1.1 / **	1.1 / **	1.1 / **

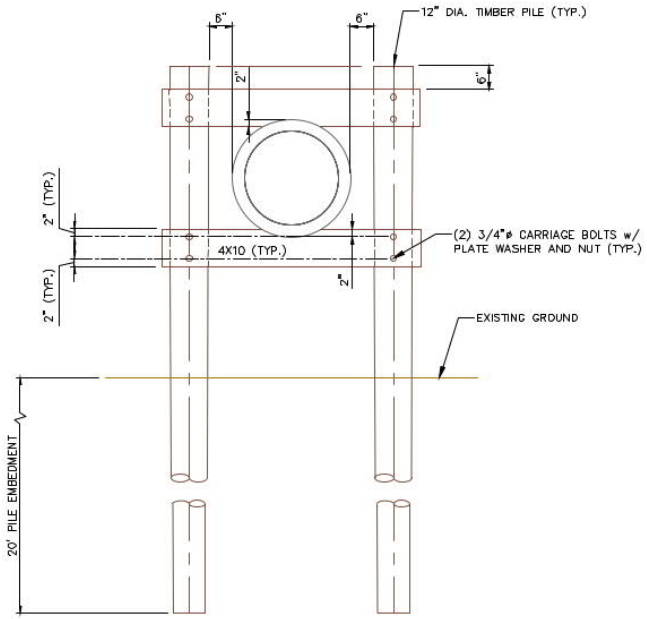
*** CB surcharges for the entire simulation period since the rim elevation is below the HTL.*

Projected sea level rise for Bayview Beach over a 50-year time horizon between 2017 and 2067

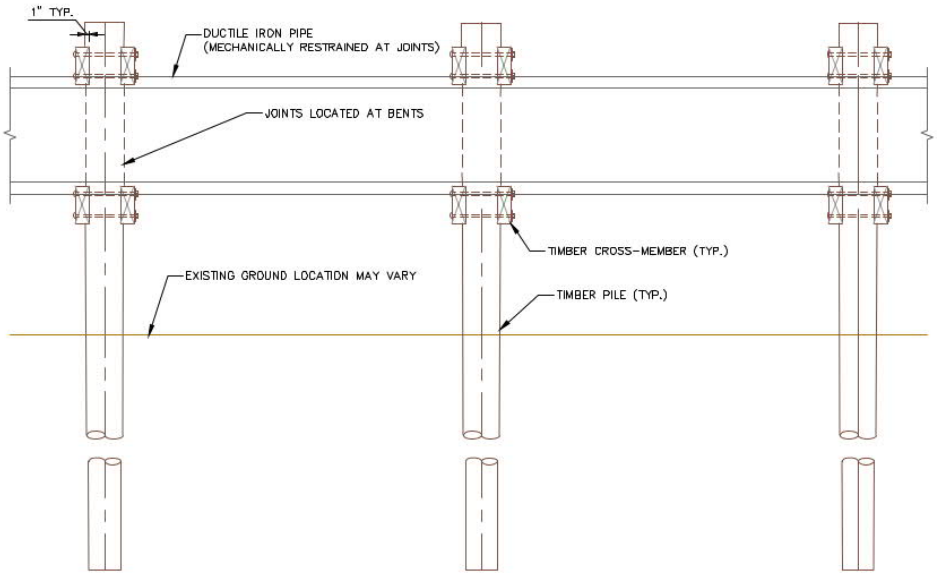
Sea Level Rise Rate	Sea Level Increase (ft)
Low	0.42
Intermediate	0.82
High	2.13

Design

- Army Corps of Engineer Timber Pipe Support Structure Design
  - Greenheart Timber
  - TR-Flex Ductile Iron Pipe



TYPICAL UNIT SECTION

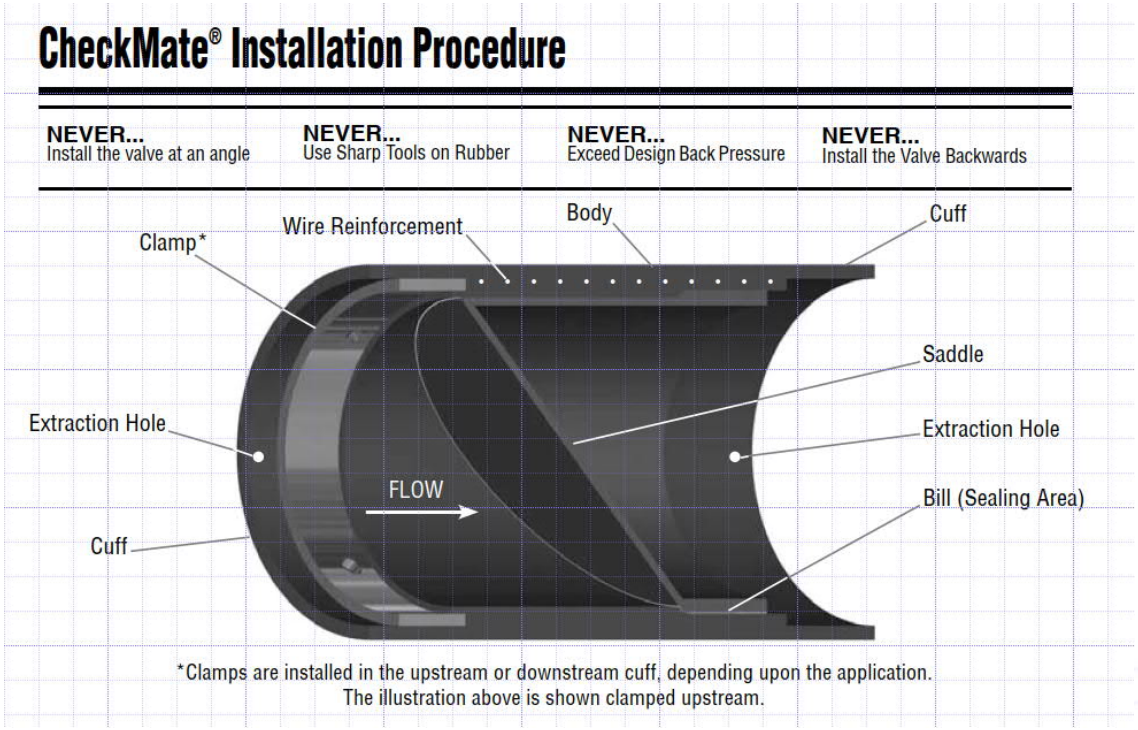


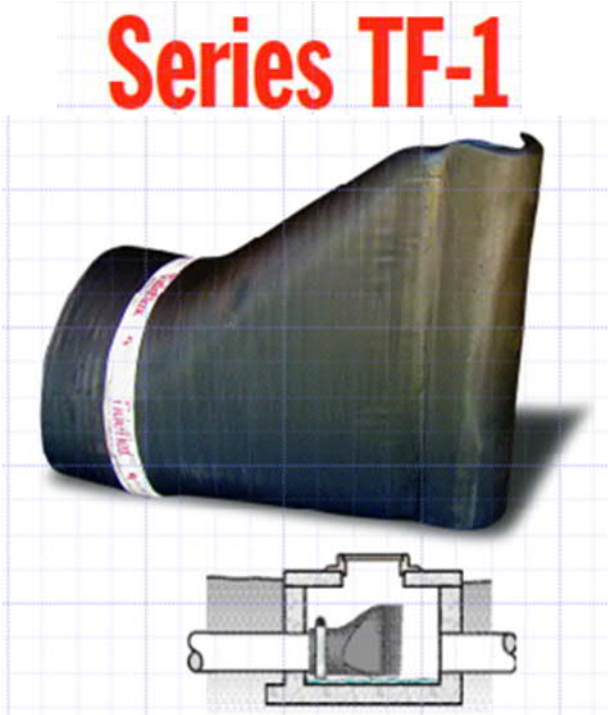
PARTIAL ELEVATION

OUTFALL NOTES:
1. TIMBER SHALL BE GREENHEART WOOD OR BETTER.
2. ALL HARDWARE SHALL BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL.
3. ELEVATION OF PIPE SUPPORT STRUCTURE VARIES WITH PIPE INVERT ELEVATION. SEE PLAN FOR DETAILS.

Design

- Advanced Technology Check Valves





- Ideal for manhole installations
- Minimal bottom clearance required
- Lightweight, all-elastomer design
- Seals around small solids
- Available in slip-on or flanged design

Materials of Construction
Neoprene, Hypalon®, Buna-N, EPDM, Vito

Mounting Bands
304 or 316 Stainless steel.

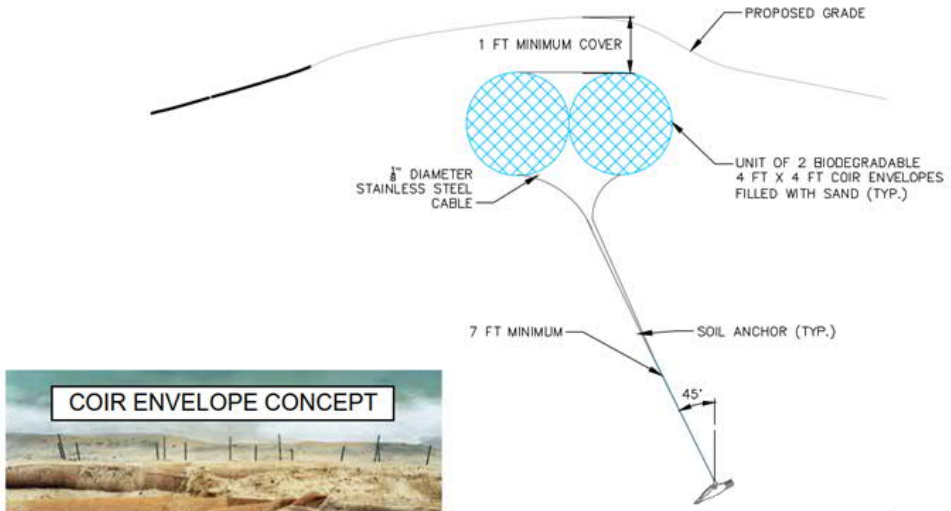
The TF-1 is designed for installation in existing structures such as interceptors, manholes and vaults where the invert of the pipe is close to the floor. The flat-bottom and offset-bill design of the TF-1 allows it to be installed without any modifications to the structure.

The TF-1 offers low cracking pressure to reduce the potential for standing water and very low headloss which is not affected by rust, corrosion or lack of lubrication.

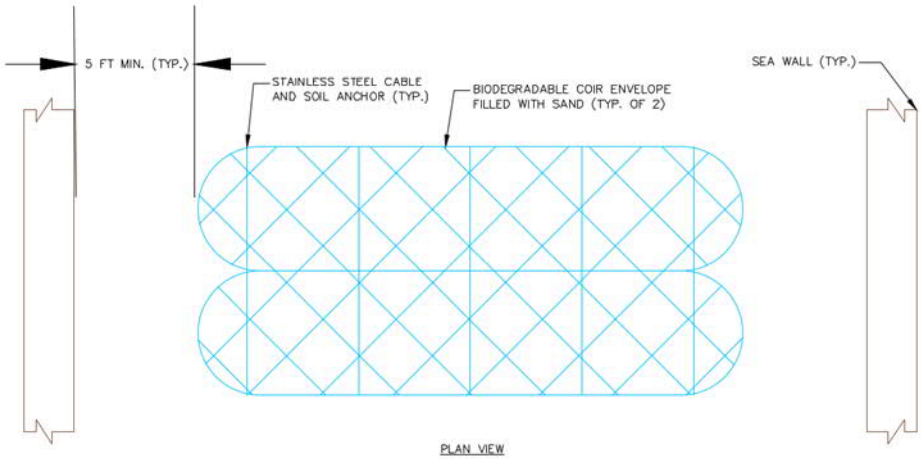
The TF-1 is ideal for sewer systems because it will seal around small debris. The TF-1 design is available with a slip-on or flanged pipe connection. Tideflex® TF-1 valves are constructed with a curved bill as standard.

Design

- Dune Resiliency - Coir Envelope



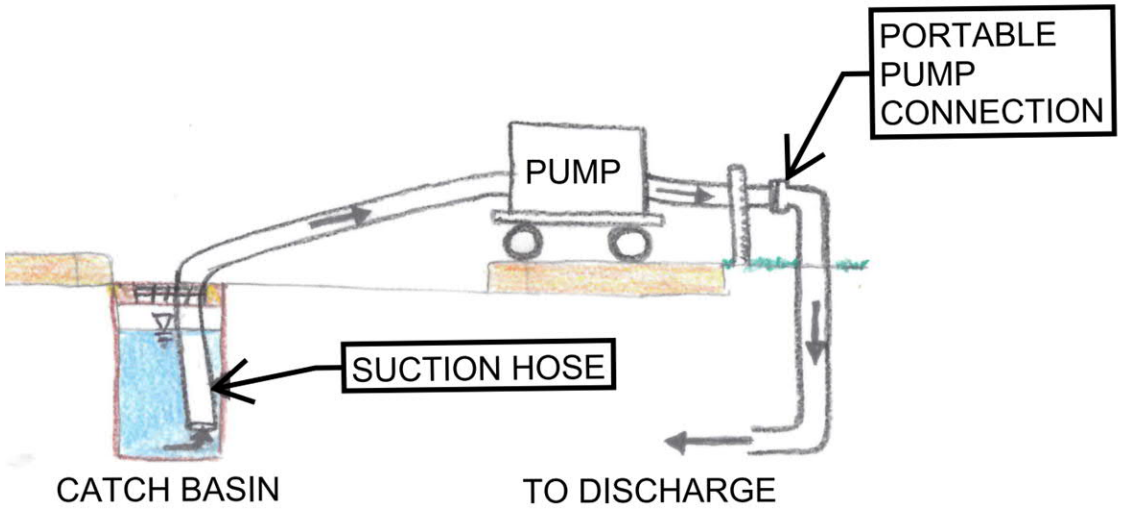
PROFILE VIEW

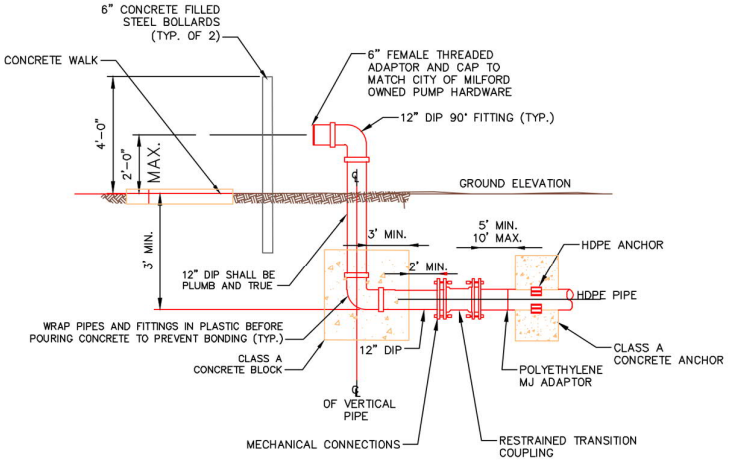


PLAN VIEW

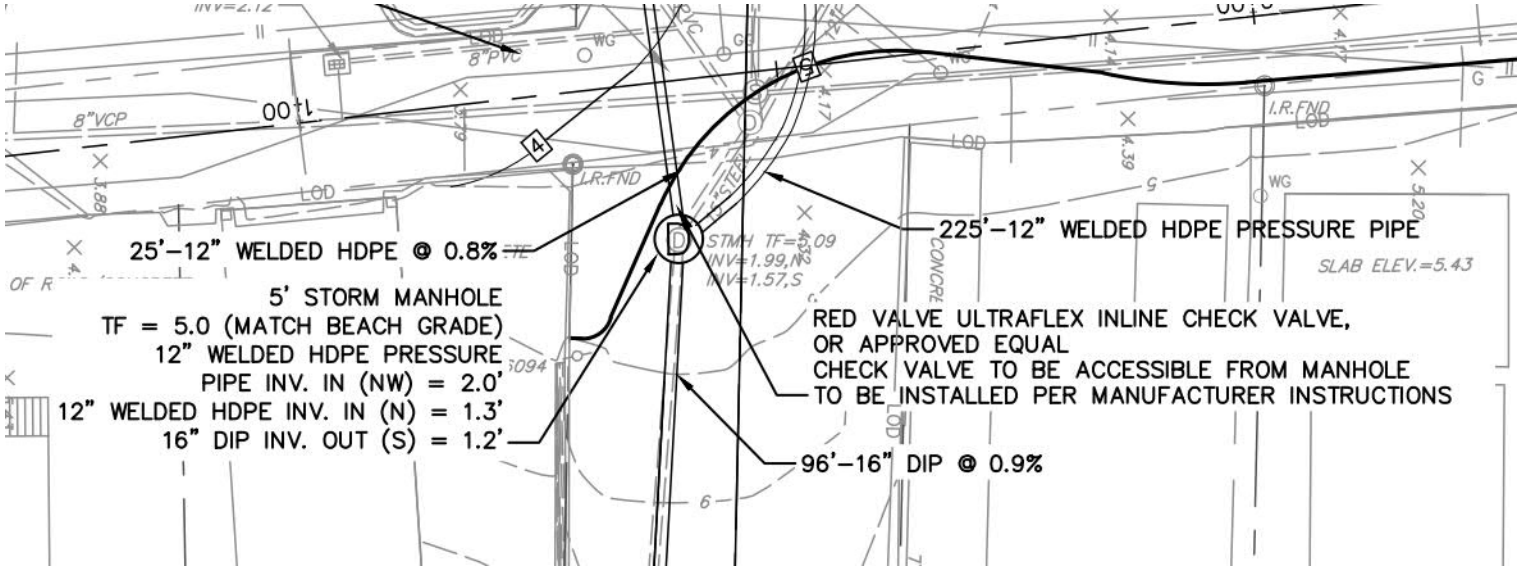
Design

- Pump Station Alternative - Portable Pump Connection





NOTE: IN-LINE PIPE ANCHORS REQUIRED AT ALL D.I. TO HDPE PIPE TRANSITIONS.



Construction

Construction

- Pile Driving

Construction

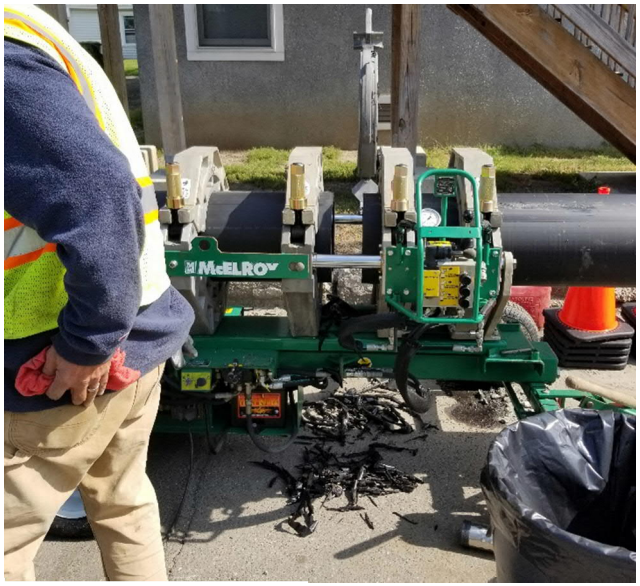
- Timber Pipe Support System Construction and Pipe Installation

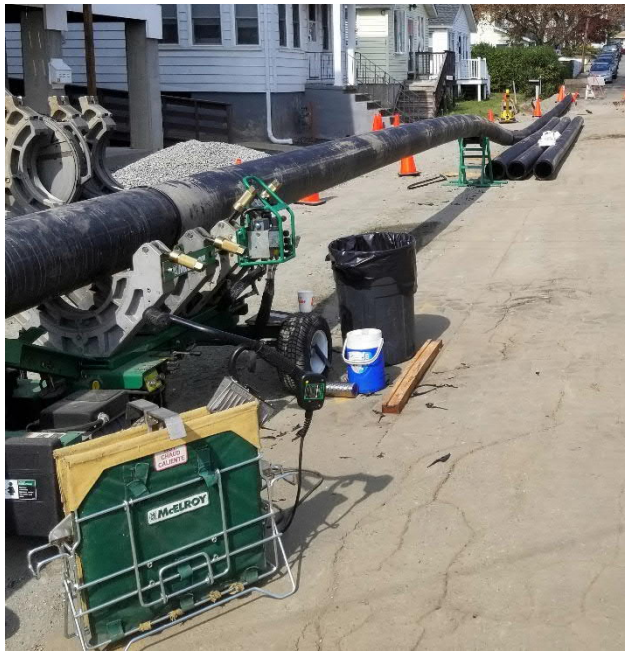
Construction

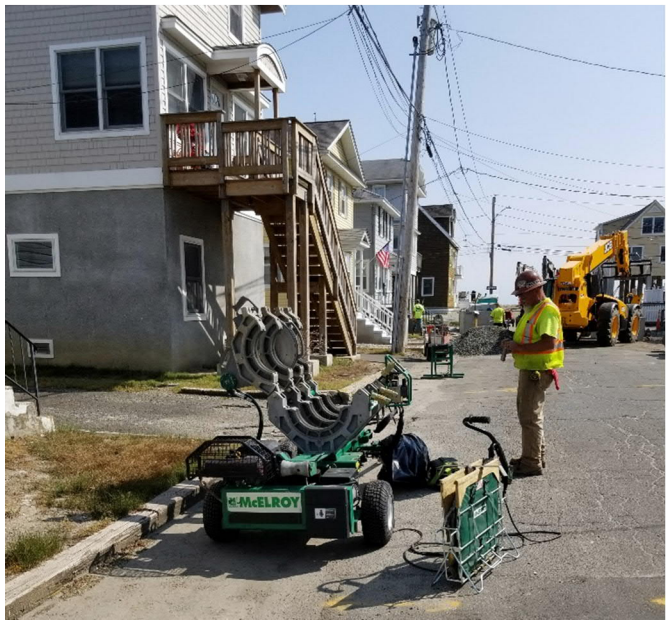
- Check Valve Installation

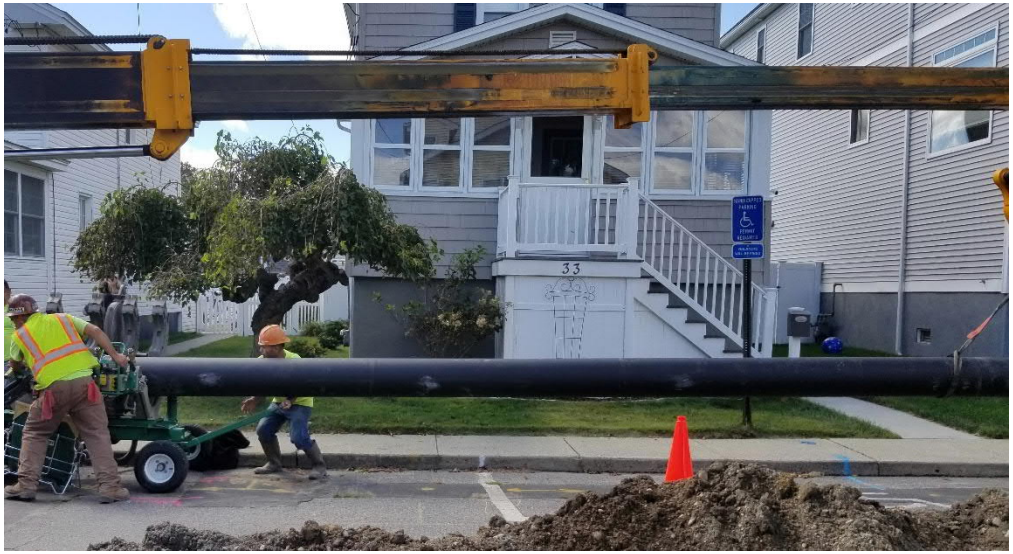
Construction

- Welded HDPE







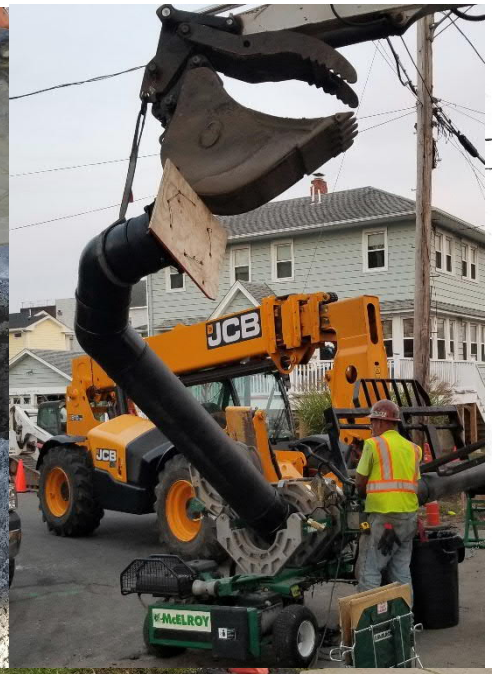


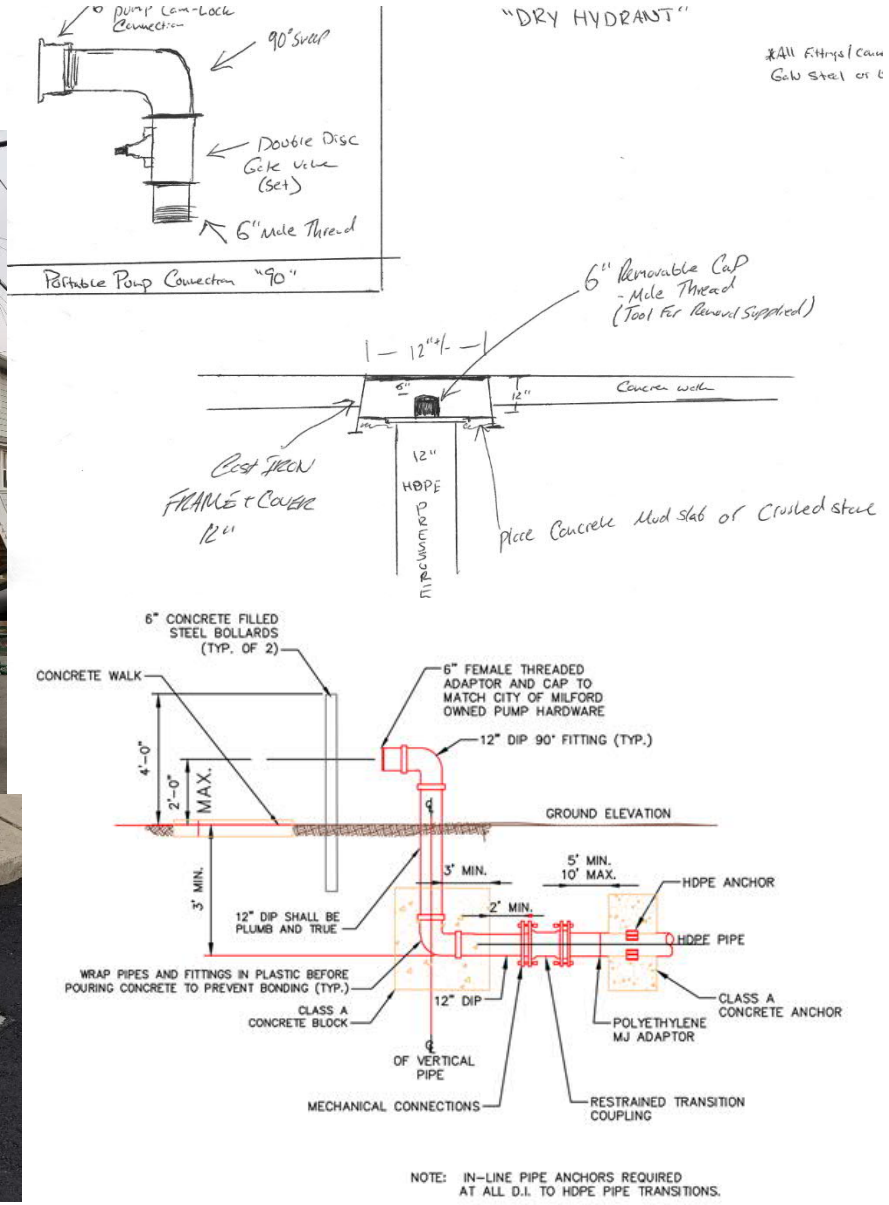
Construction

- Increased Street Storage and Welded HDPE Installation

Construction

- Portable Pump Connection Changes



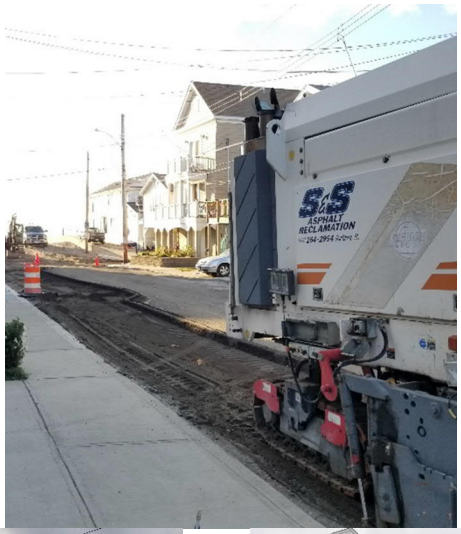


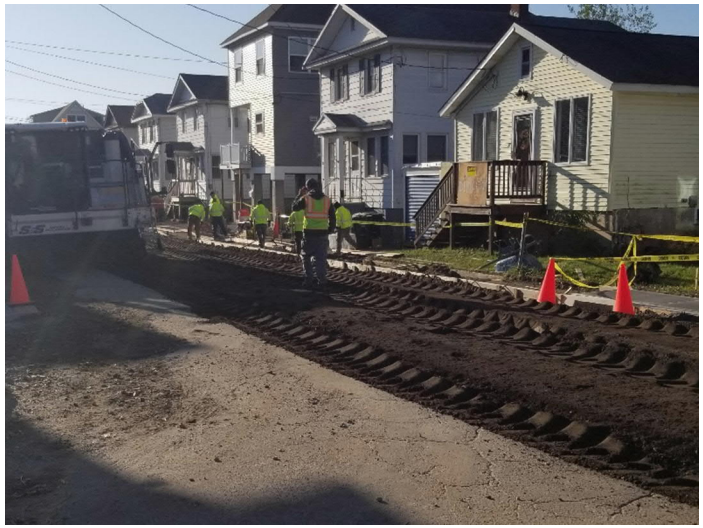
Construction

- Coir Envelope

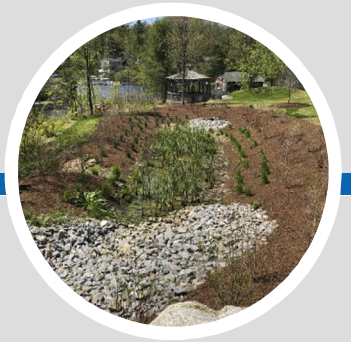
Construction

- Sidewalks, Reclaim, Milling, Paving



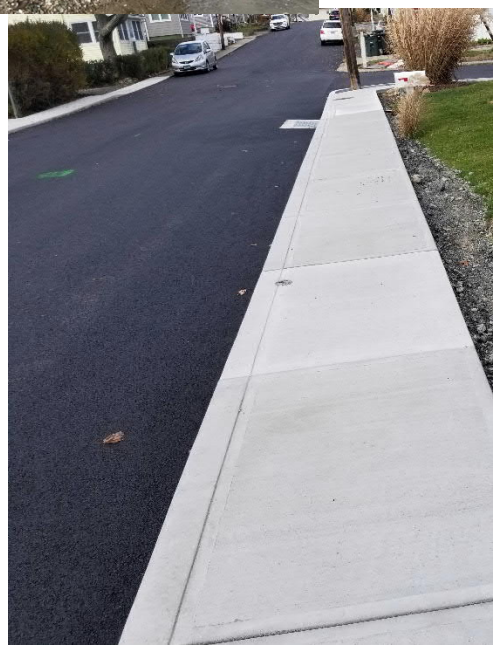




Results

Results



Questions?

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