North Beach Infrastructure

Council Presentation
October 29, 2019

Overview

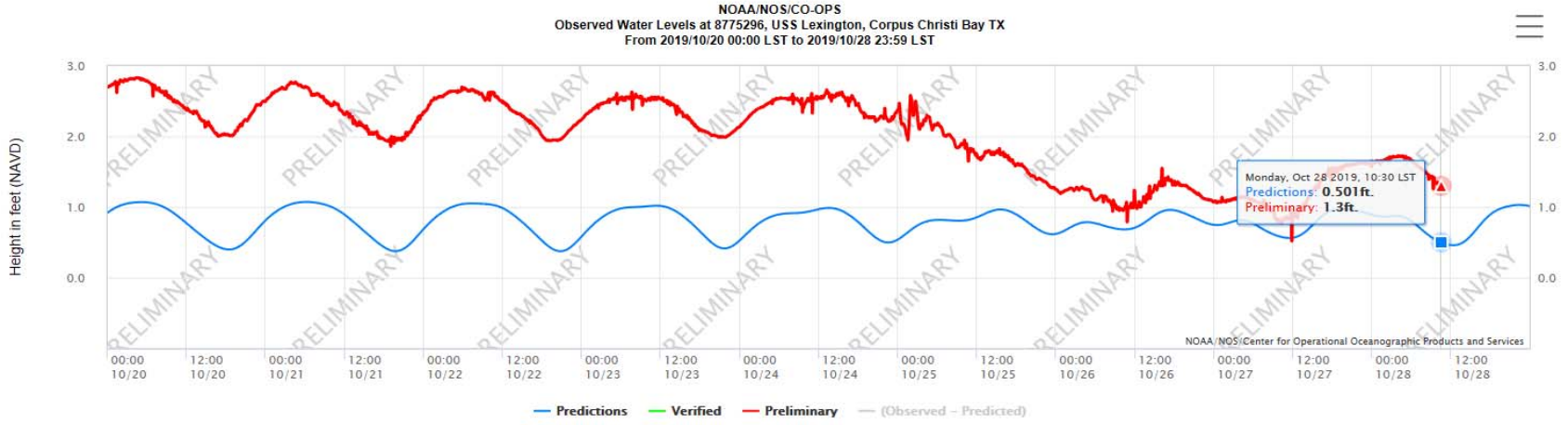
- North Beach Drainage issue is an Elevation issue
- Drainage problems can be solved by elevating roads and private property
- Tidal Flooding vs. Storm Water Flooding

Cost of Initial Solutions	
Navigable Ditch	$41 Million
Raise Streets	$35 Million

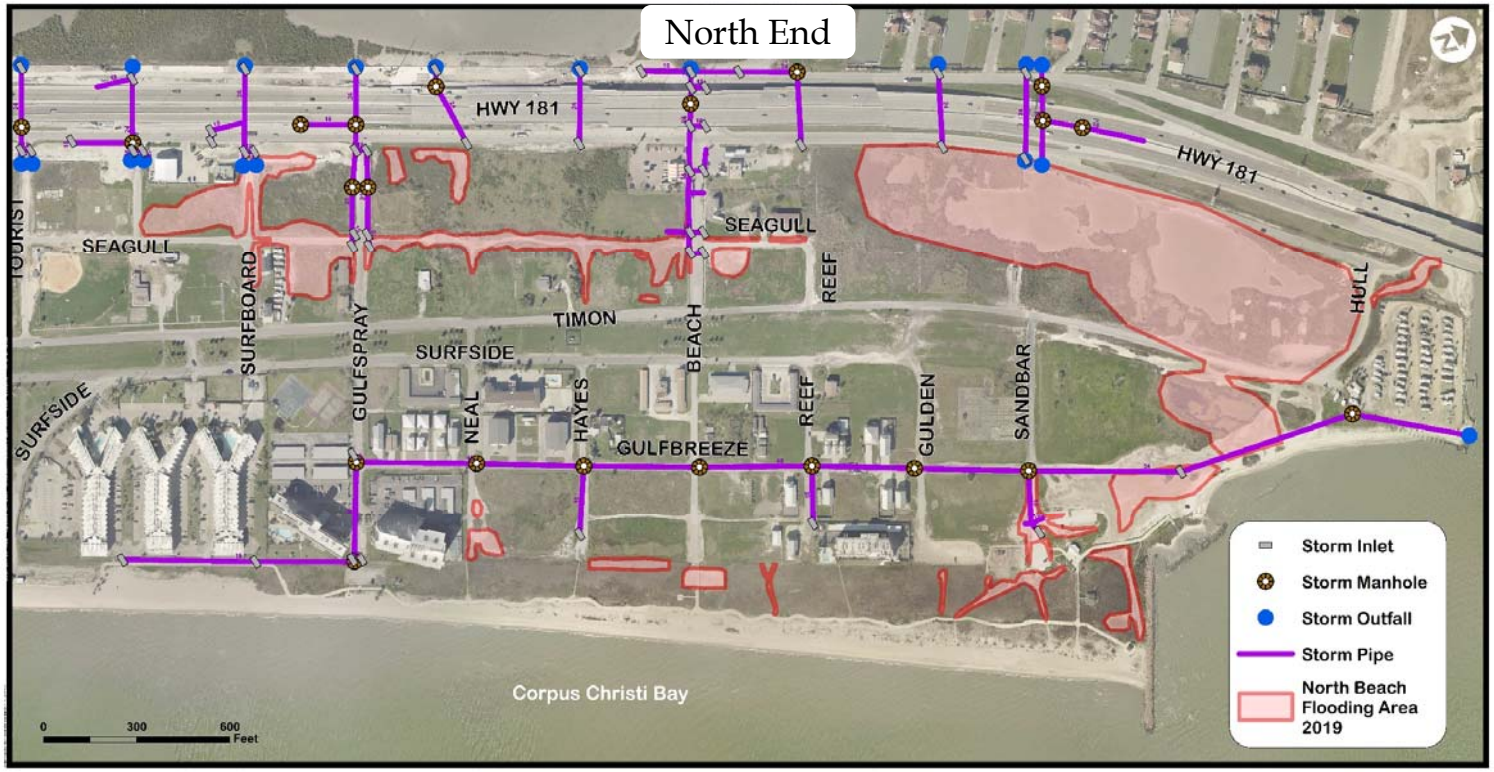
Tidal Flooding


10/20 = 2.59’ and 10/28 = 1.3 ft

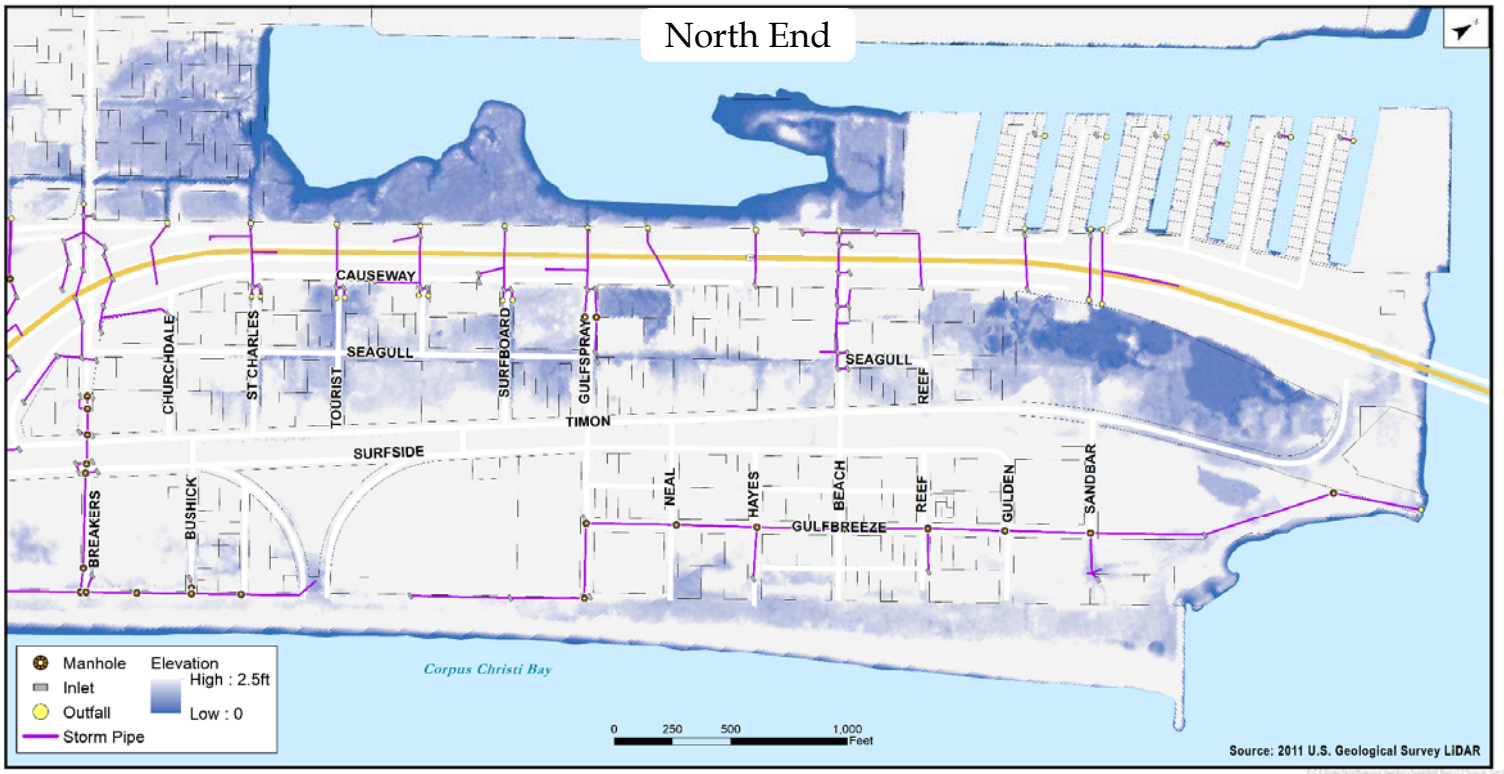

10/20 = 2.59’ and 10/28 = 1.3 ft



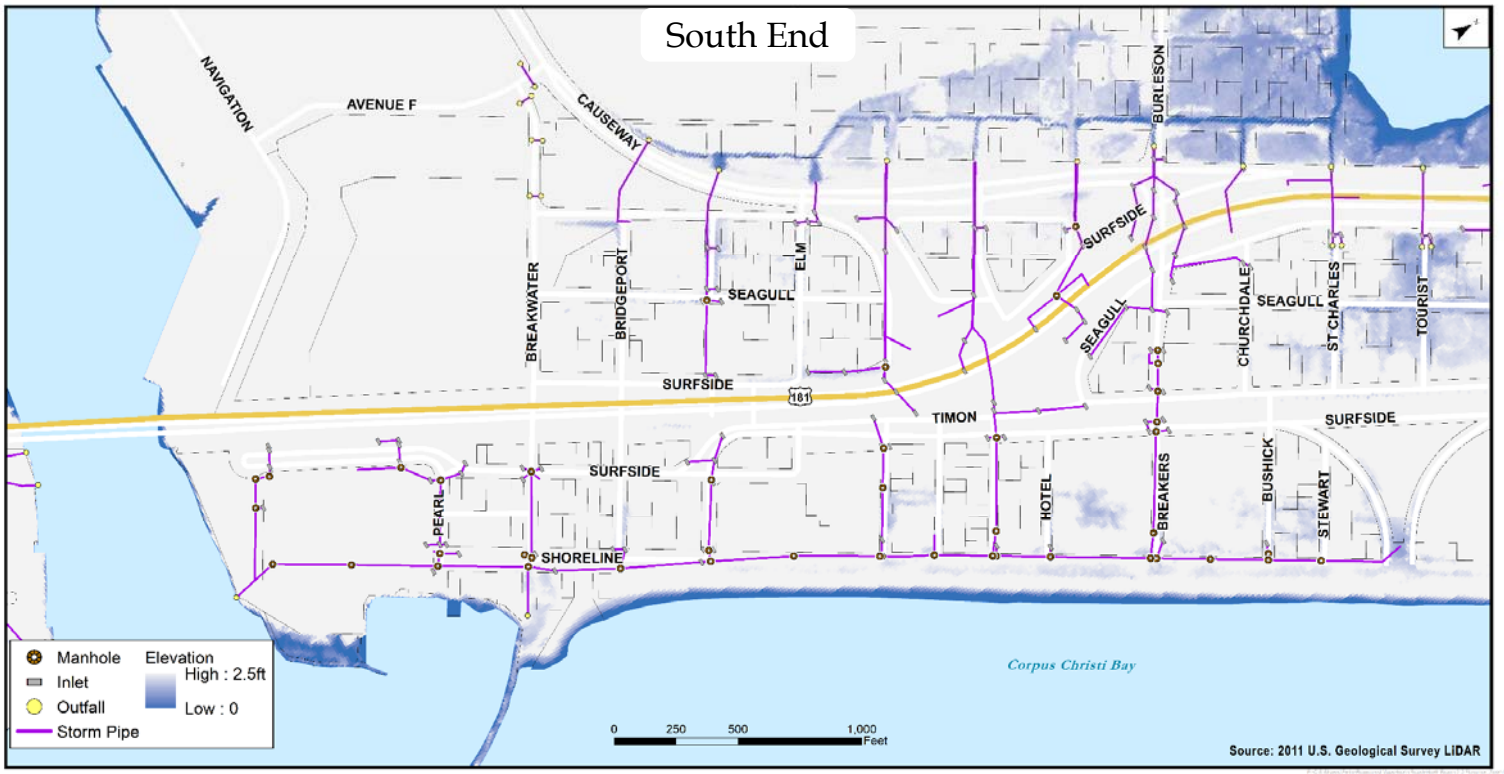
Observed Tidal Flooding Oct 18, 2019



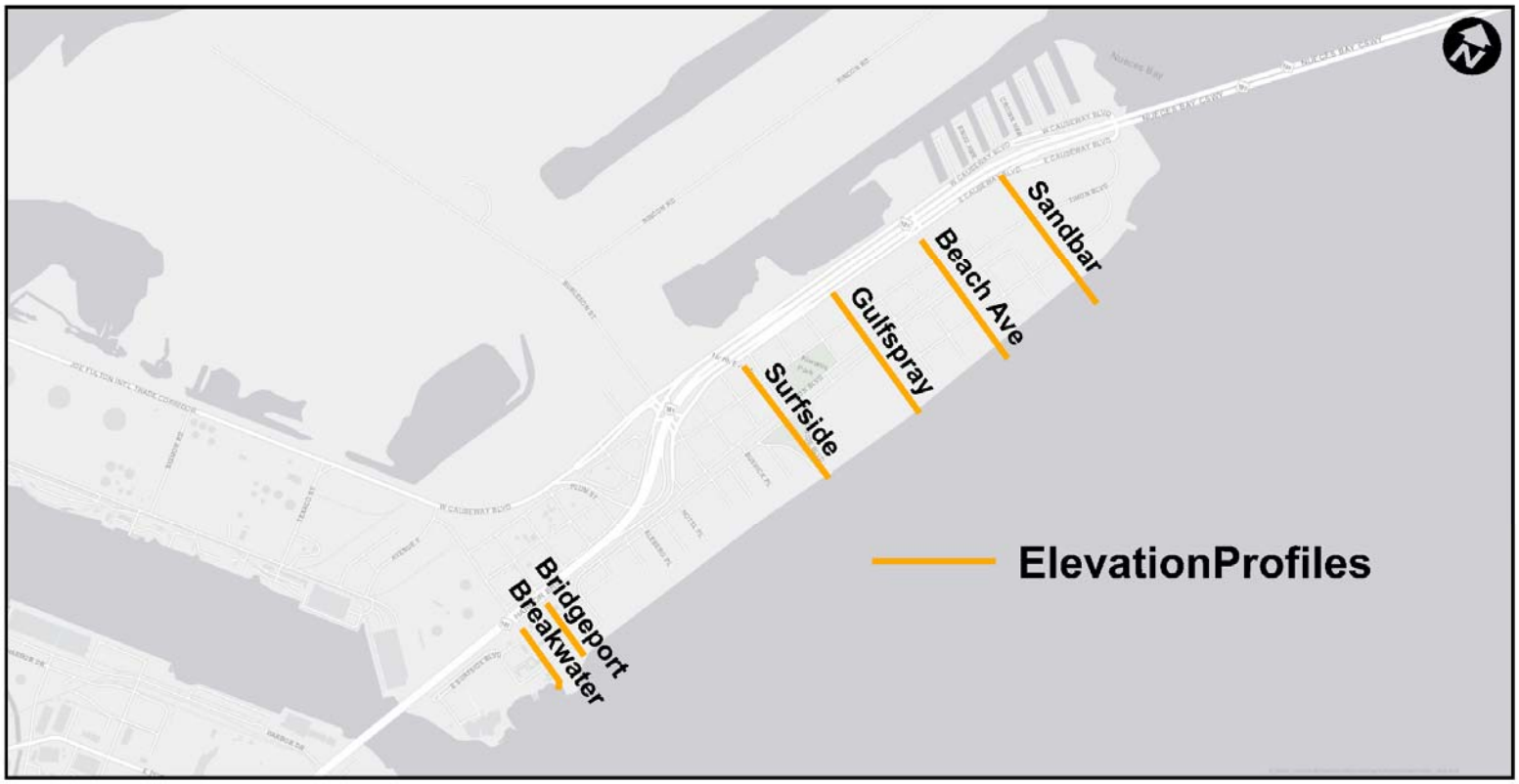
Elevations 2.5ft and Below



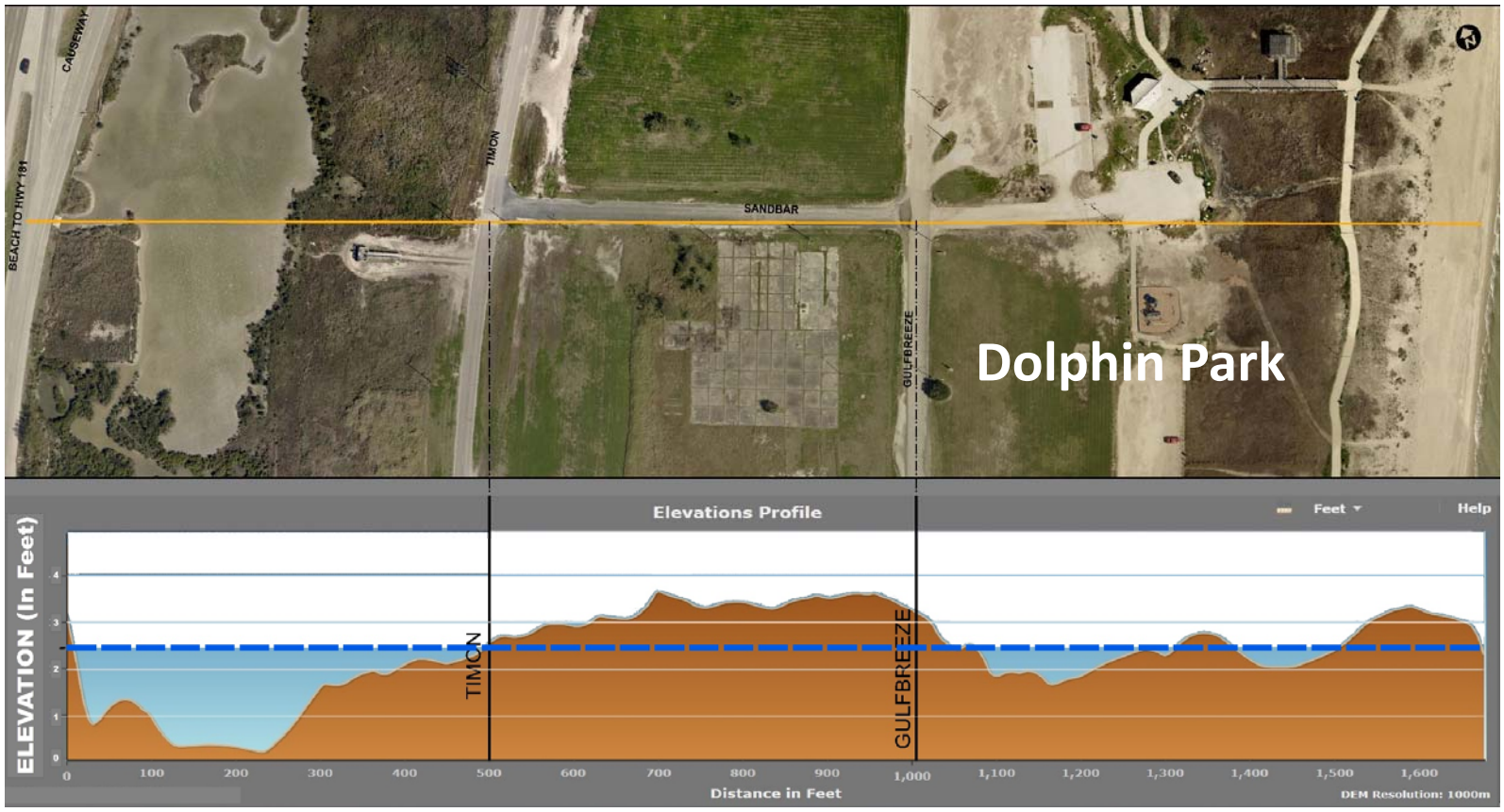
Elevations 2.5ft and Below



Elevation Profiles

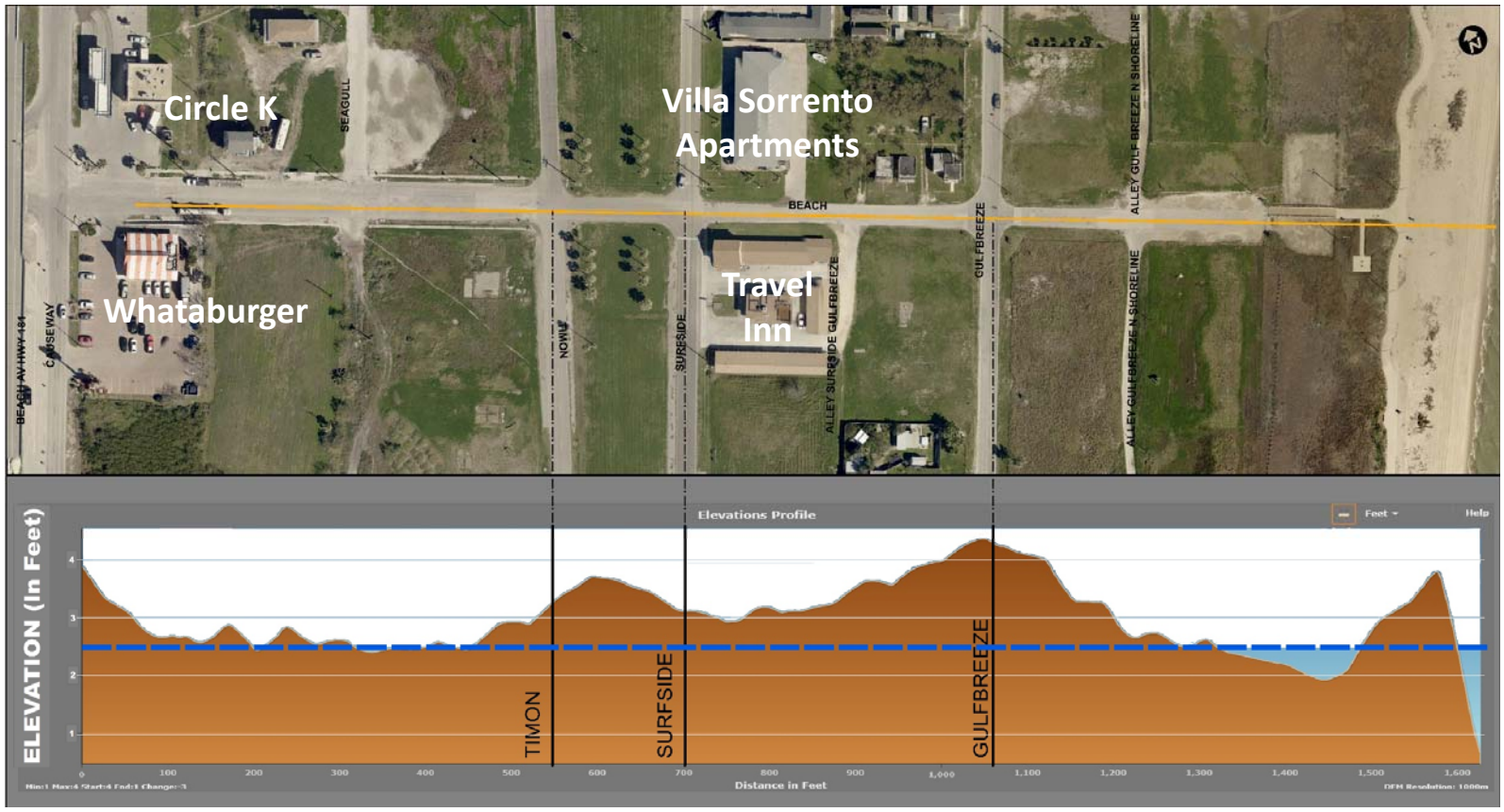


Sandbar Ave Elevation



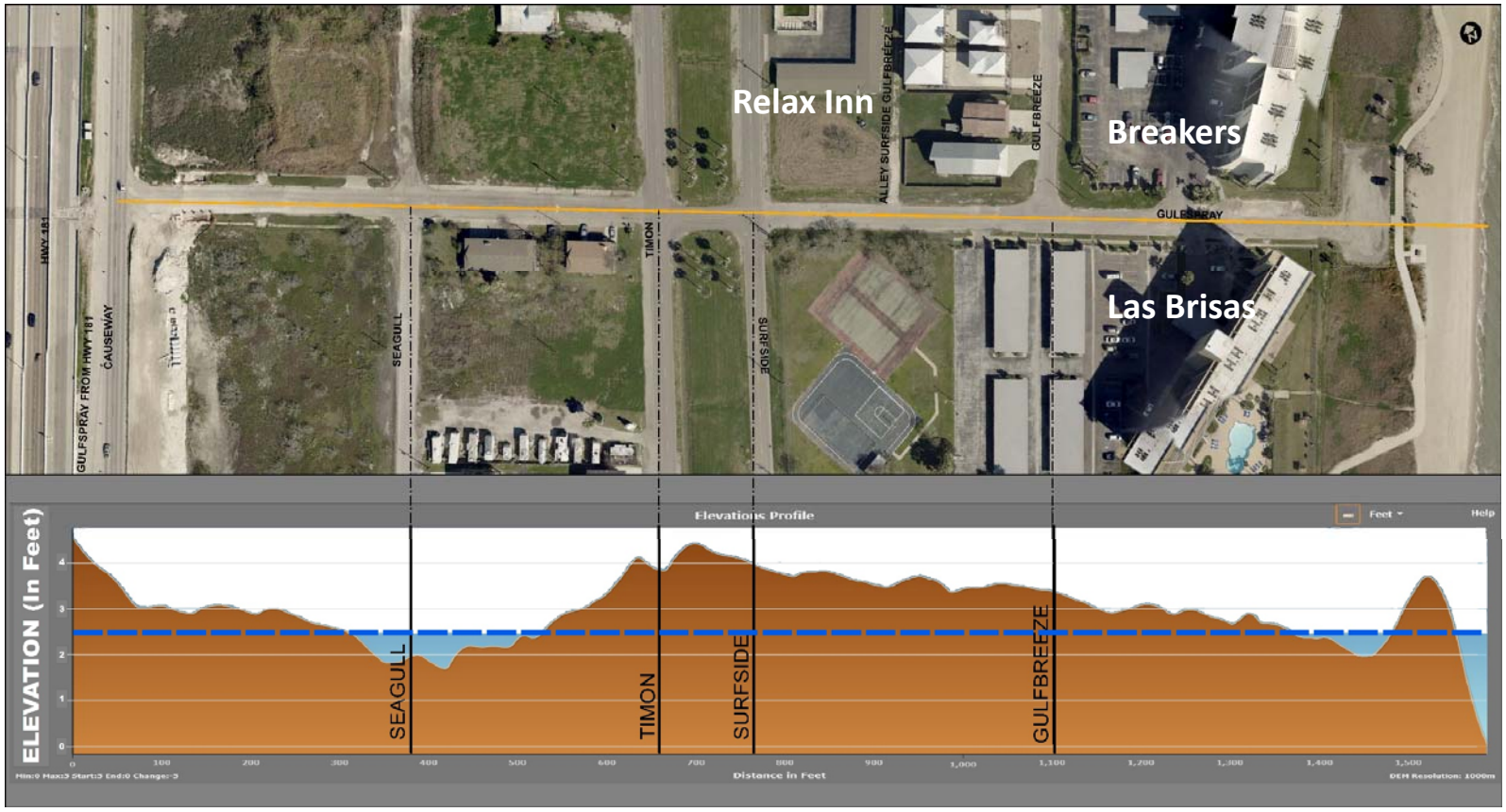
Sandbar Ave Elevation

Beach Ave Elevation



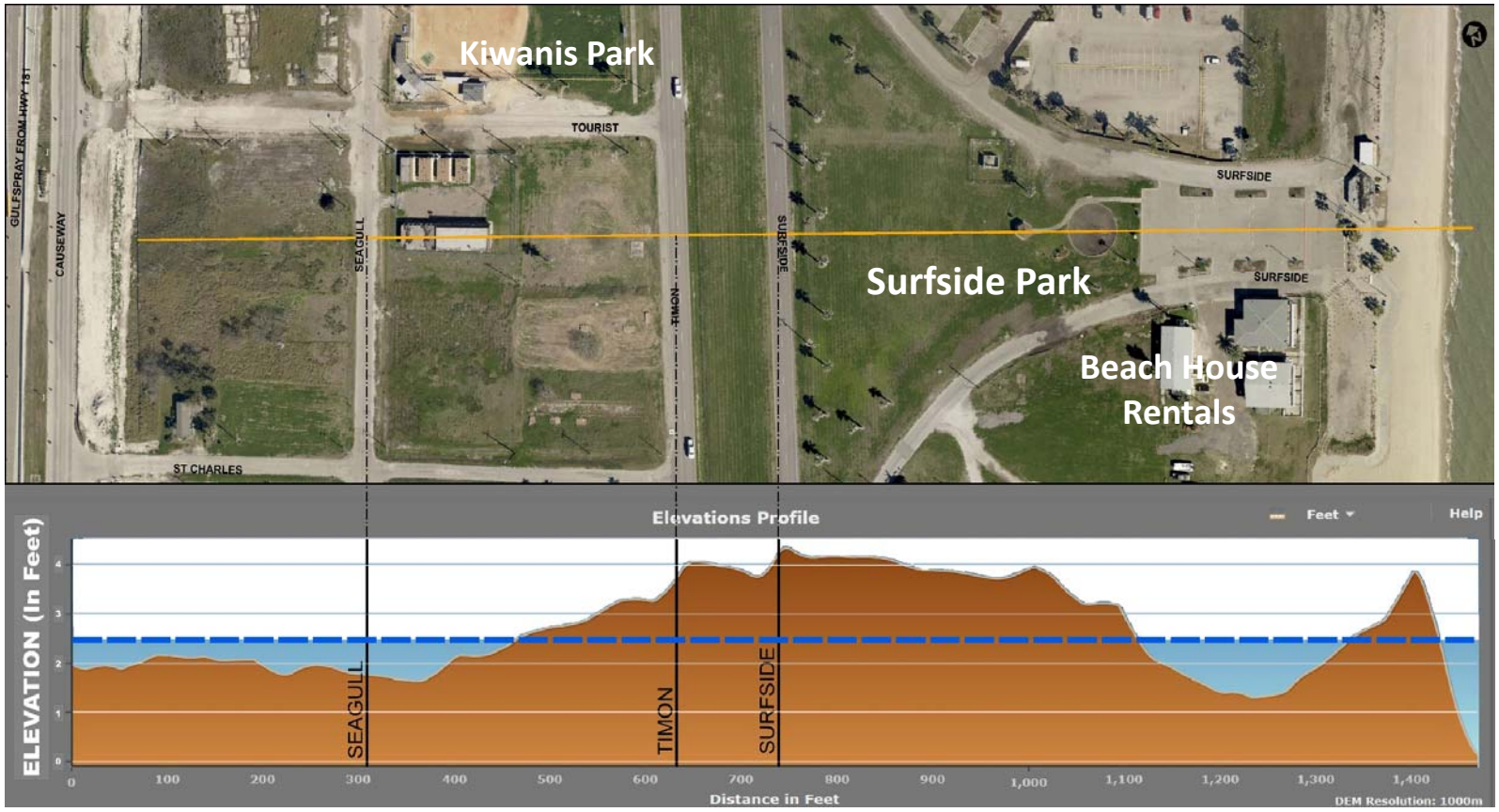
Beach Ave Elevation

Gulfspray Ave Elevation



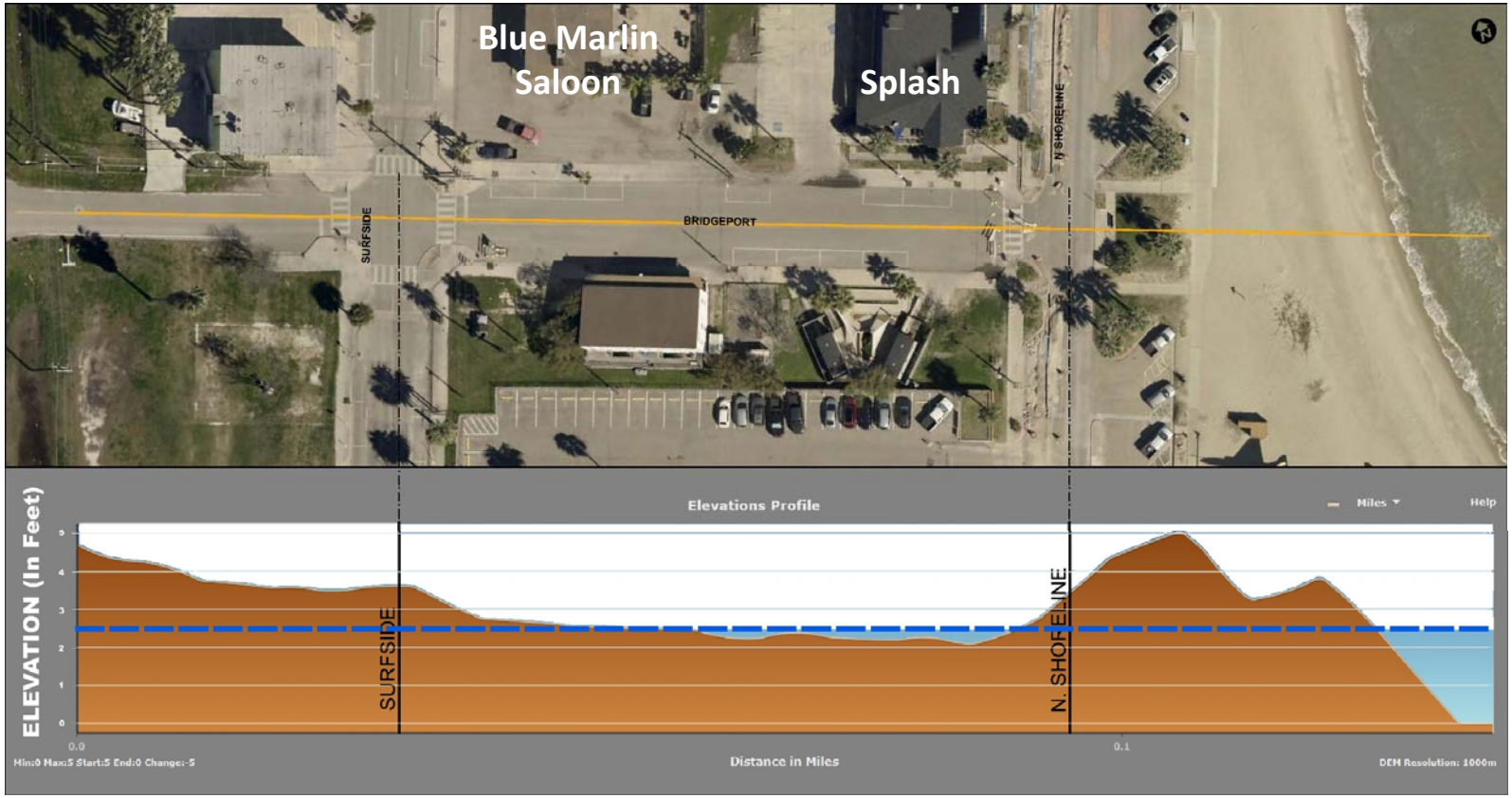
Gulfspray Ave Elevation

Surfside Park Elevation



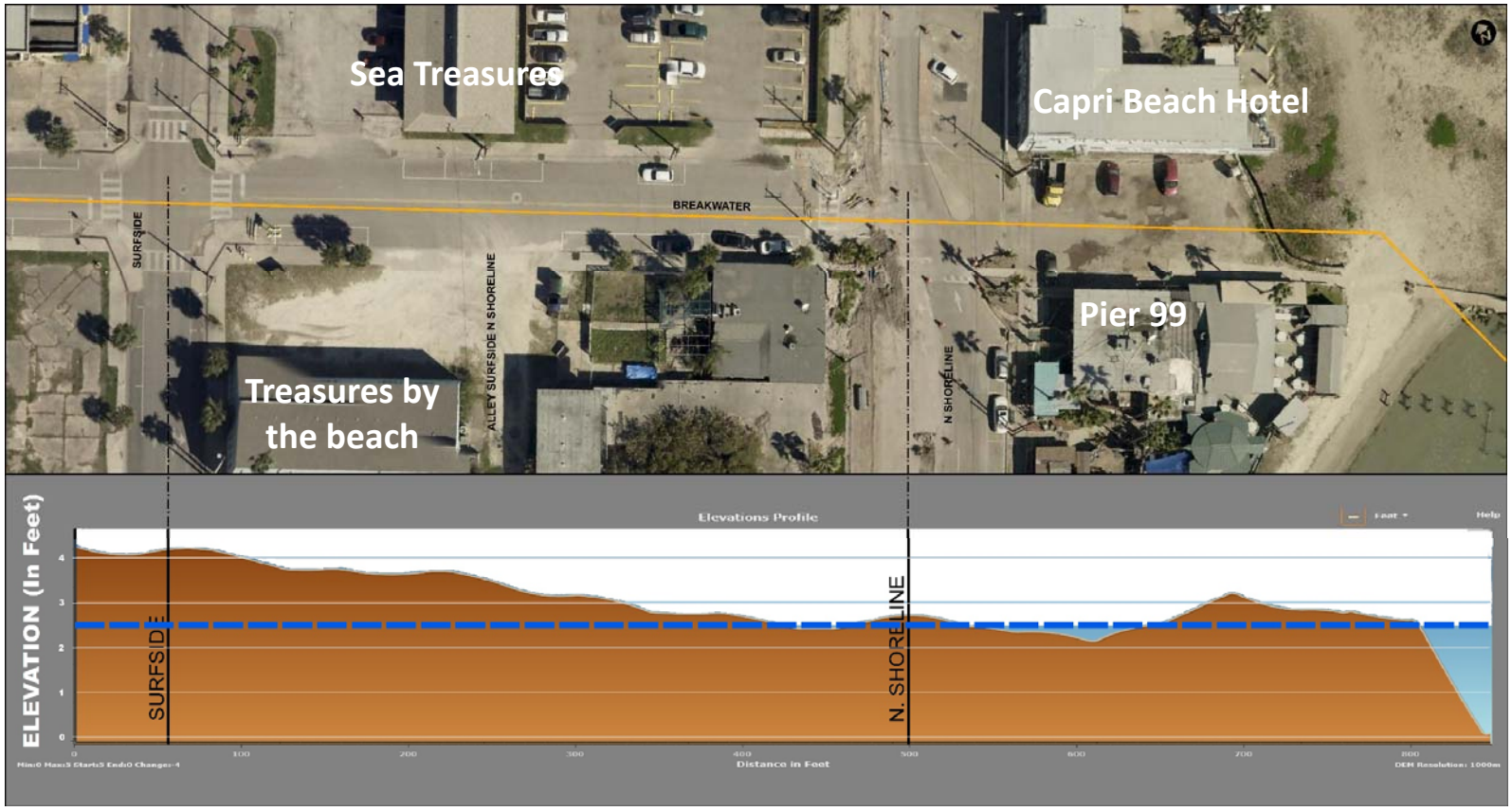
Surfside Park Elevation

Bridgeport Ave Elevation



Bridgeport Ave Elevation

Breakwater Ave Elevation

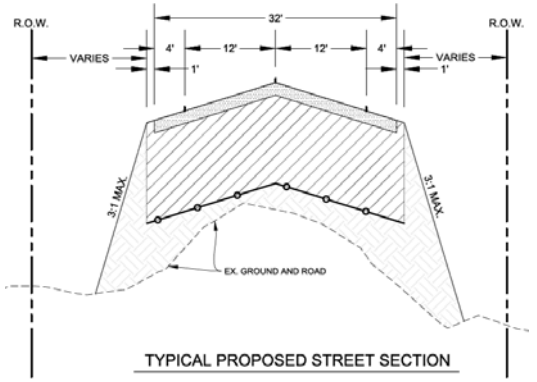


Street Improvements Needed

- The preliminary estimate to raise the is approximately **$ 35 M**.

- Listed below are our assumptions:

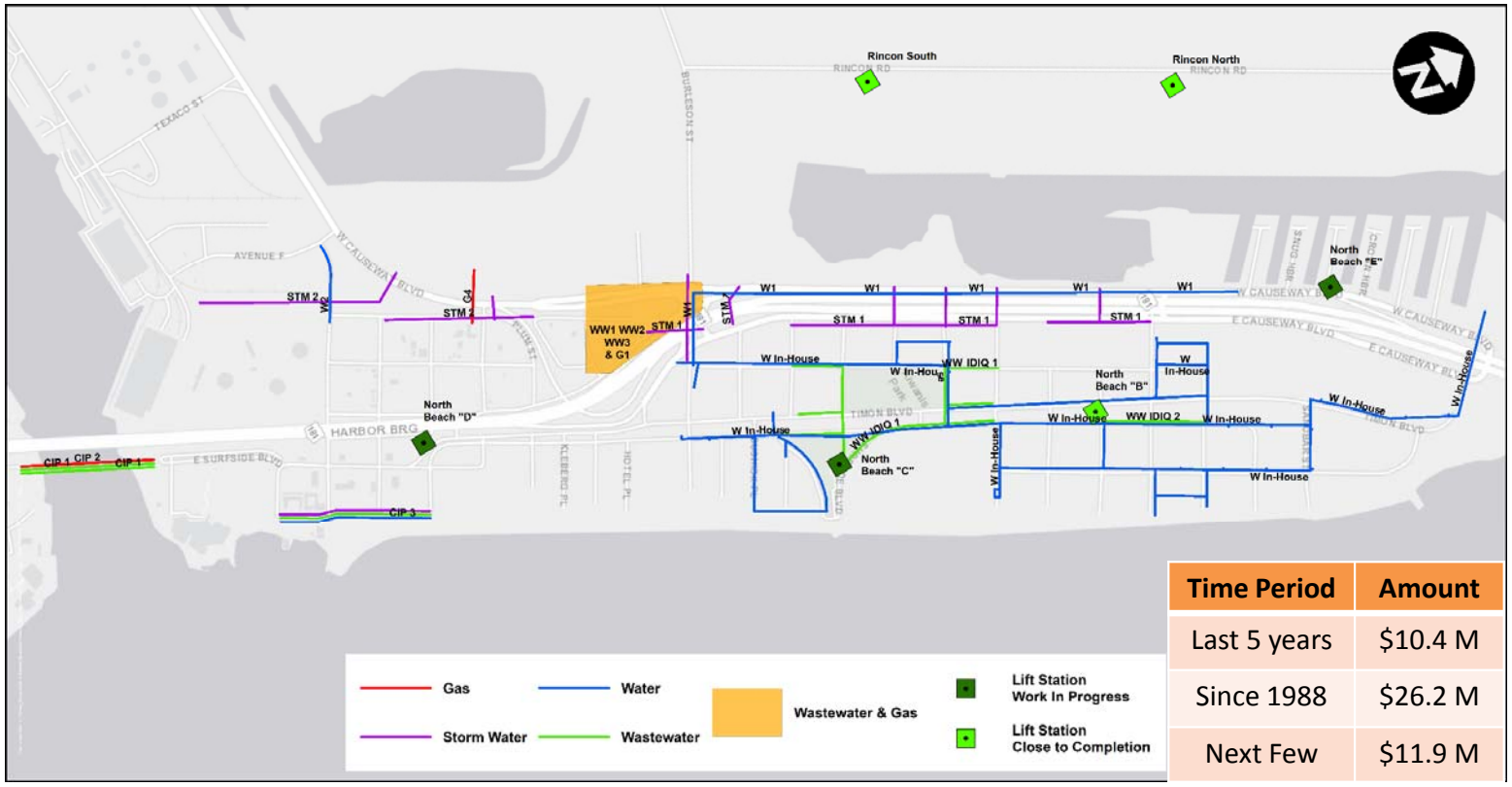
  - Approximate length of street to be raised is 25,000 lf.
  - Used Laguna Shores street typical x-section (one 12’ lane in each direction and a 4’ shoulder in each direction with no curb and gutter (C&G). Total Paved width is 32’)
  - Unit cost per lf of street is around $ 1000.00.
  - Added 40% contingency for engineering, survey, design etc.



TYPICAL PROPOSED STREET SECTION

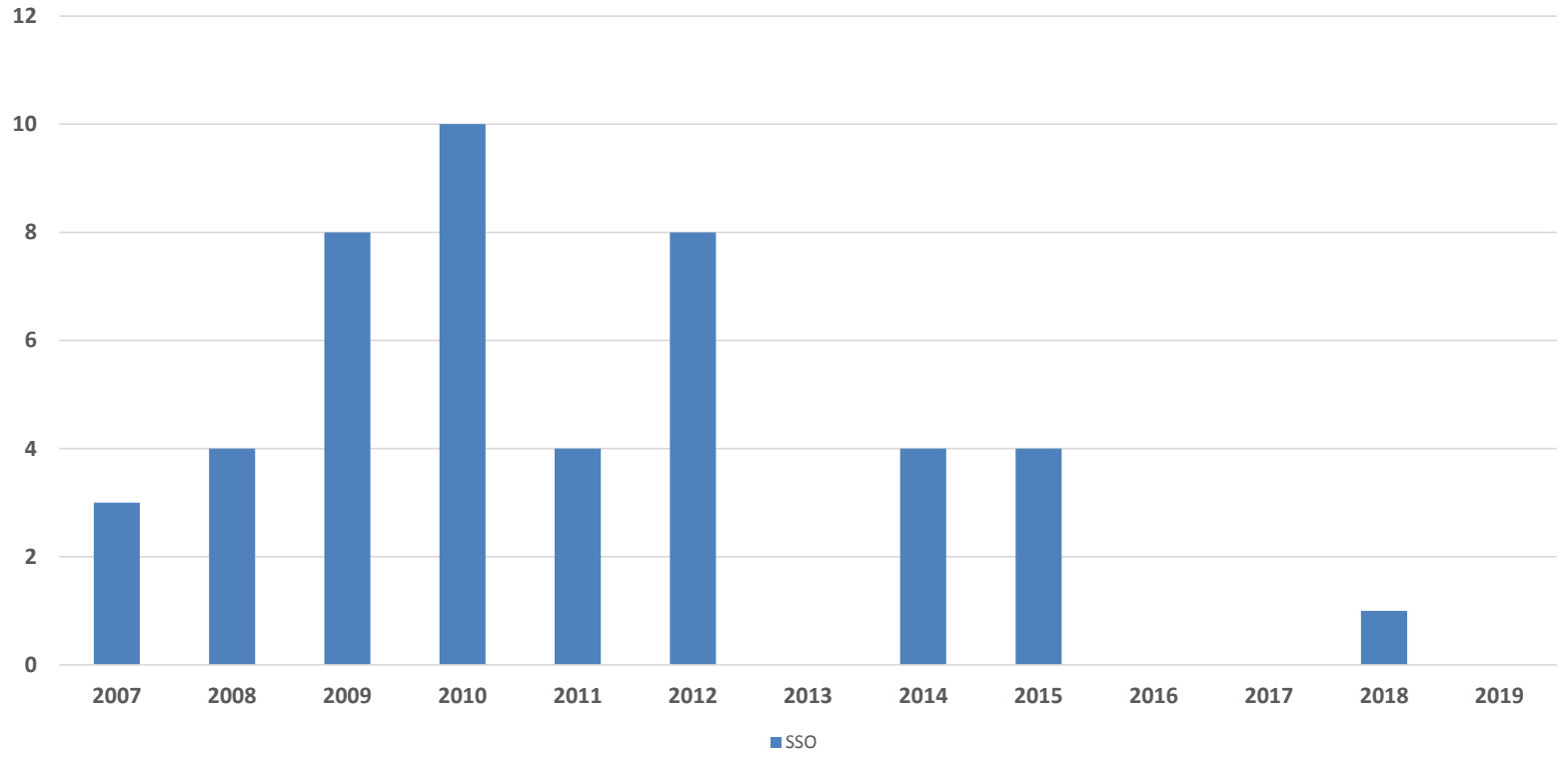
SPECIFICATIONS:
1. 2" HOT MIX ASPHALTIC COURSE, HOT LAID ASPHALTIC CONCRETE (TYPE D)
2. 14" FLEXIBLE BASE (TYPE A, GR 1-2) PLACED IN MAX. 8" LIFTS AND COMPACTED TO 98% MODIFIED PROCTOR DENSITY AT OR MAX. 2% ABOVE OPTIMUM MOISTURE CONTENT
3. GEOGRID TX-5
4. SELECT FILL EMBANKMENT. FILL SHALL BE PLACED IN NO GREATER THAN 8" LIFTS AND COMPACTED TO A MIN. OF 95% STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT. VARIES IN DEPTH.

North Beach Utility Projects
2007 - 2019



Time Period	Amount
Last 5 years	$10.4 M
Since 1988	$26.2 M
Next Few	$11.9 M

Decrease in Sanitary Sewer Overflows in North Beach



Stormwater Infrastructure

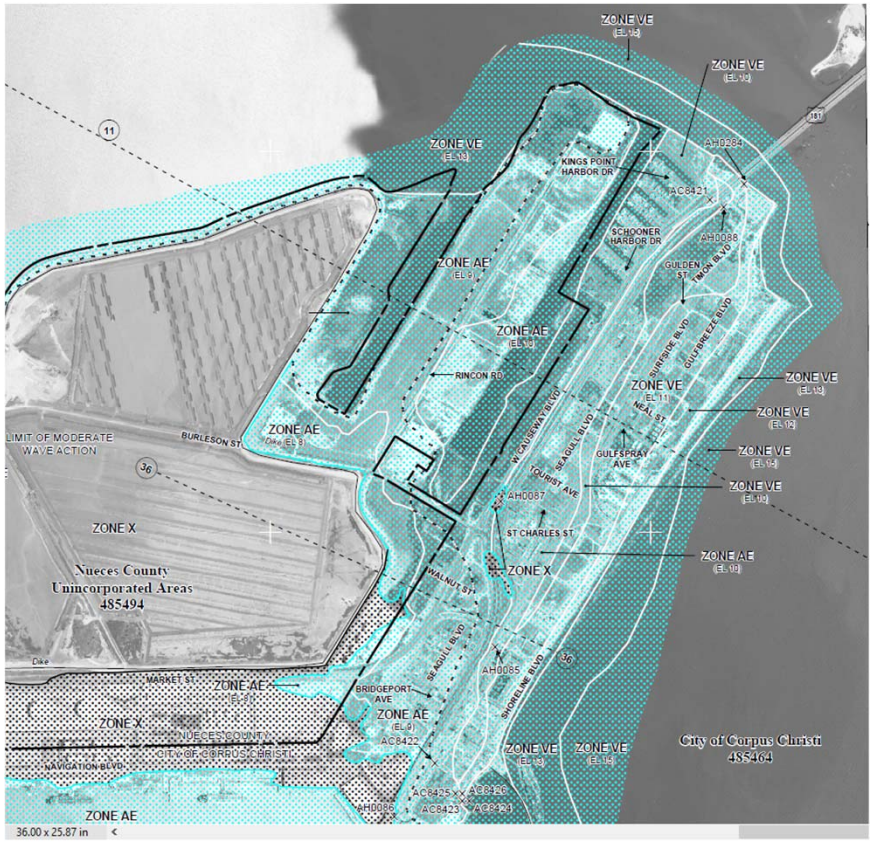
- Storm water trunk lines size 24 in. to 54 in.
- 110 total storm water inlets
  - 5 full of sand or debris (Still drained)
  - 6 restricted flow
- 59 manholes
- Inspected and cleaned inlets 4 separate occasions in past 24 months

Fund Sources

- General Obligation Bonds
- Type B Funding
- Revenue Bonds
- TIRZ
- Pay-As-You Go

Total Buildings = 200; Elevated = 107

Flood Insurance Rate Map



North Beach Drainage Analysis

Council Presentation
October 29, 2019

Introduction

- Urban Engineering was given a Small A/E Contract to study options to solve the drainage issues on North Beach

- The study started in July and a Final Draft was provided to staff early last week

- The report provides
  - Review of the existing conditions
  - Three proposed options
  - Cost estimates of the options
  - Conclusions and Recommendations

Study Area

- It includes approximately 195 acres between the beach and HWY 181

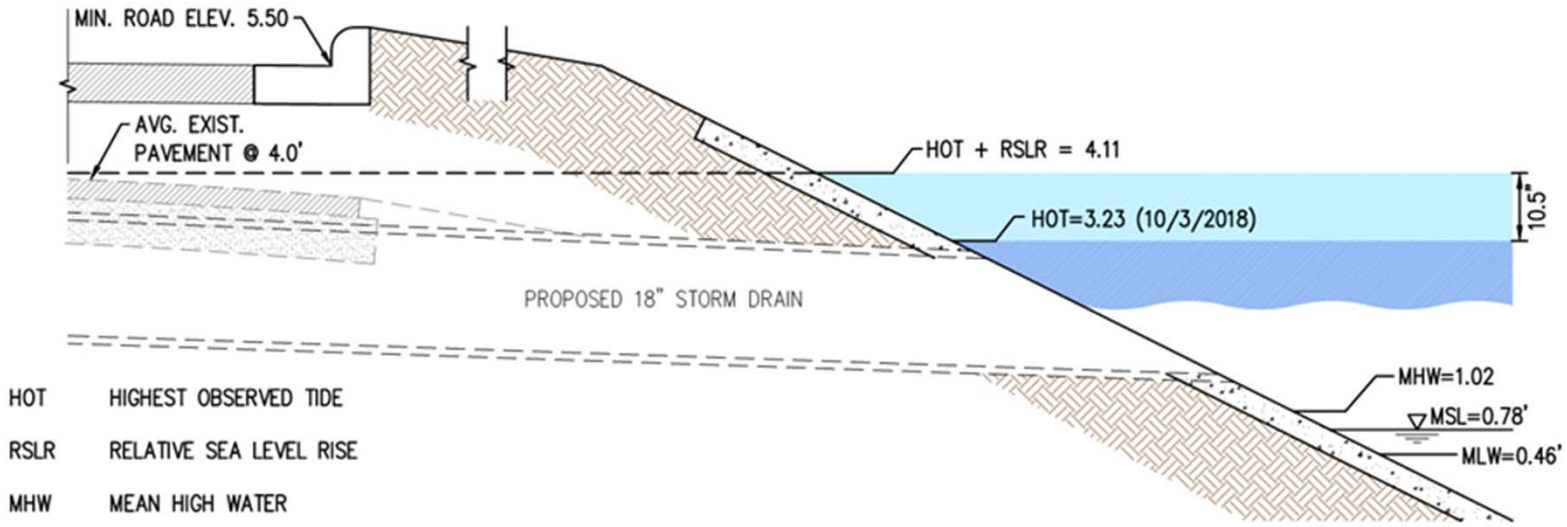
- It did not include HWY 181
  - HWY 181 design is complete
  - Construction of drainage improvements are nearly complete

Existing Conditions

North Beach struggles with drainage for the following reasons

- Low Elevation
  - Areas from 0’ to 6’ above sea level
  - Streets from 2’ to 5’ above sea level
  - Some property is lower than the adjacent street
- Rising Sea Level of 5.4 mm/yr (.21 in/yr) = 10.5” over the next 50 years
- Undersized storm system that requires regular maintenance

Relative Sea Level Rise



HOT HIGHEST OBSERVED TIDE

RSLR RELATIVE SEA LEVEL RISE

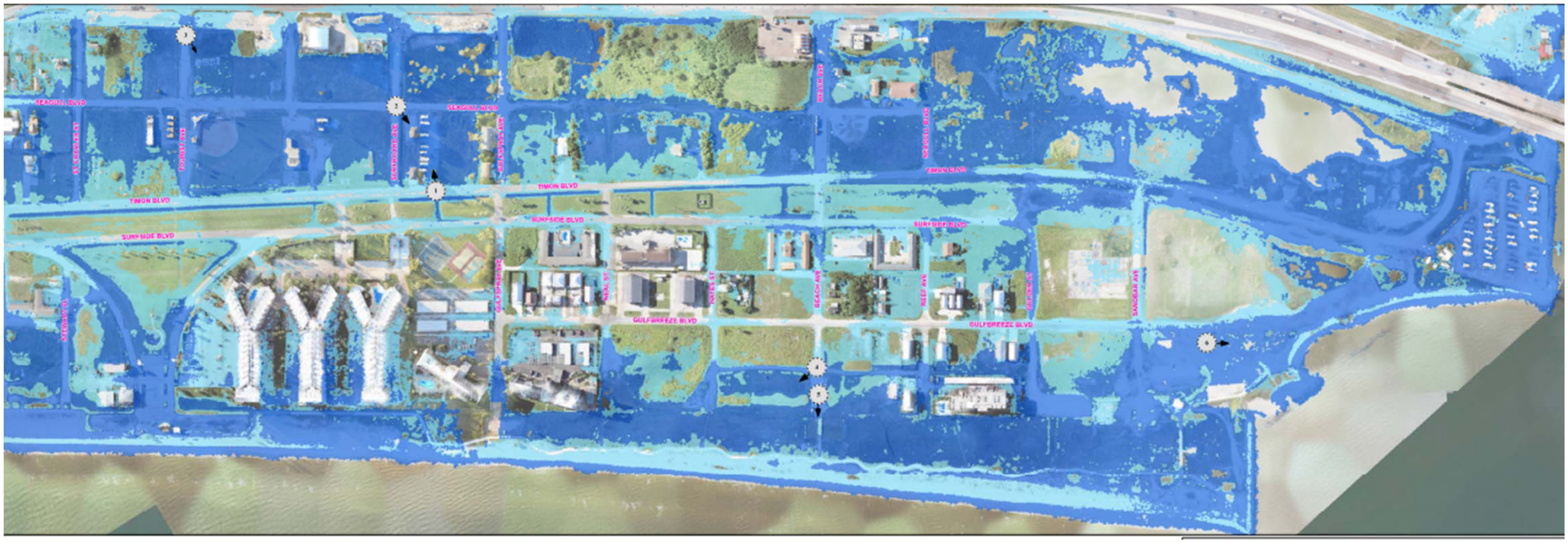
MHW MEAN HIGH WATER

MSL MEAN SEA LEVEL

MLW MEAN LOW WATER

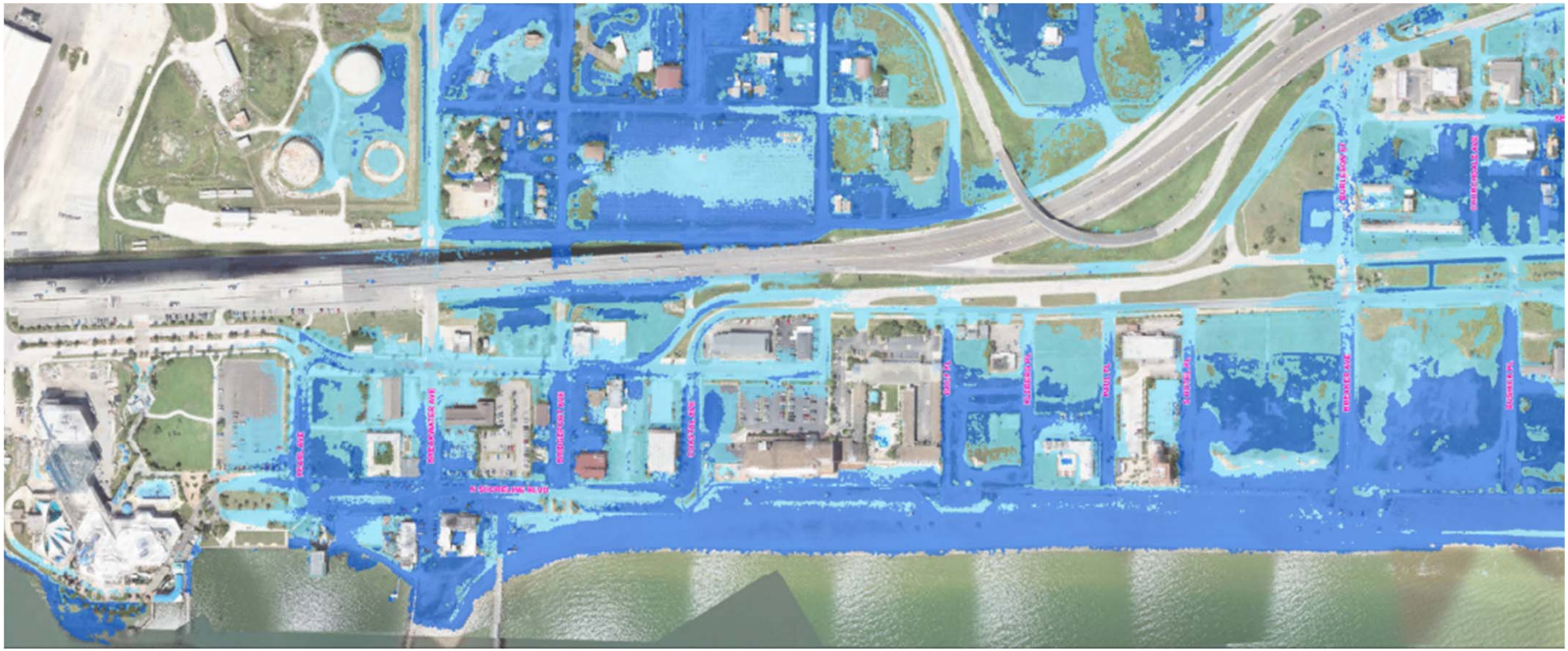
* HIGHEST WATER NOT AFFECTED BY A TROPICAL STORM OR HURRICANE

Tidal Inundation (North End)



Dark Blue = 3.25’ and below Light Blue = 4.11’ and below

Tidal Inundation (South End)



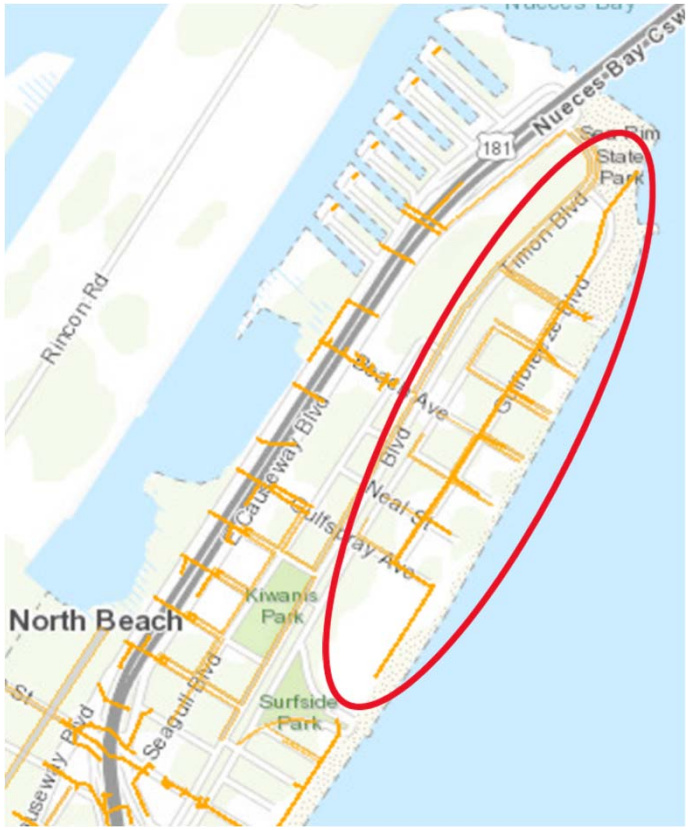
Dark Blue = 3.25’ and below Light Blue = 4.11’ and below

Tidal Inundation (Continued)






Existing Drainage



Existing Drainage (Continued)

- Inlets accumulate sand and need regular maintenance
- System is undersized per 2018 HDR Report
- Long submerged lines with almost no slope

Two Part Solution

1: Provide a Better Way for Storm Water to Get Out

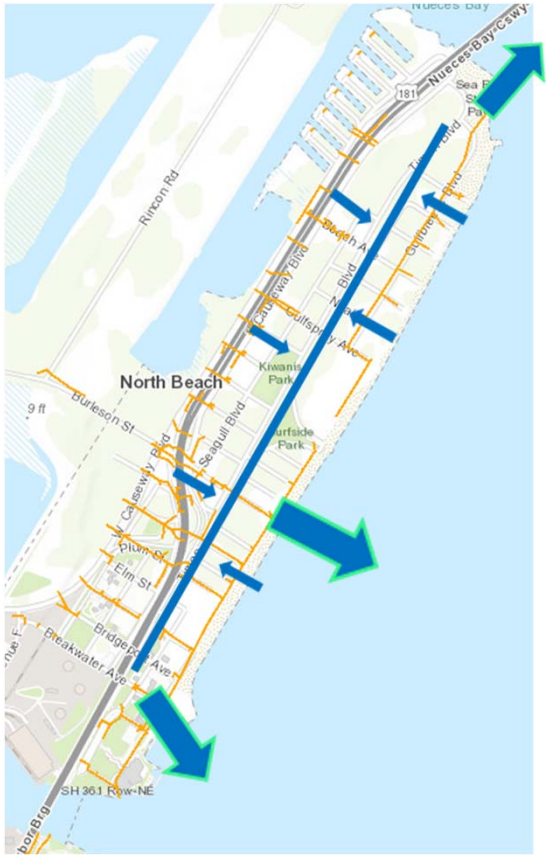
- More Capacity (New System)
- Shorter Lines with More Slope
- Don’t Submerge Storm Lines Where Possible
- Clean & Reshape Street Ditches on East/West Streets

2: Raise Property

- Raise the Streets – City
- Raise Individual Properties – Property Owners

Drainage Concept

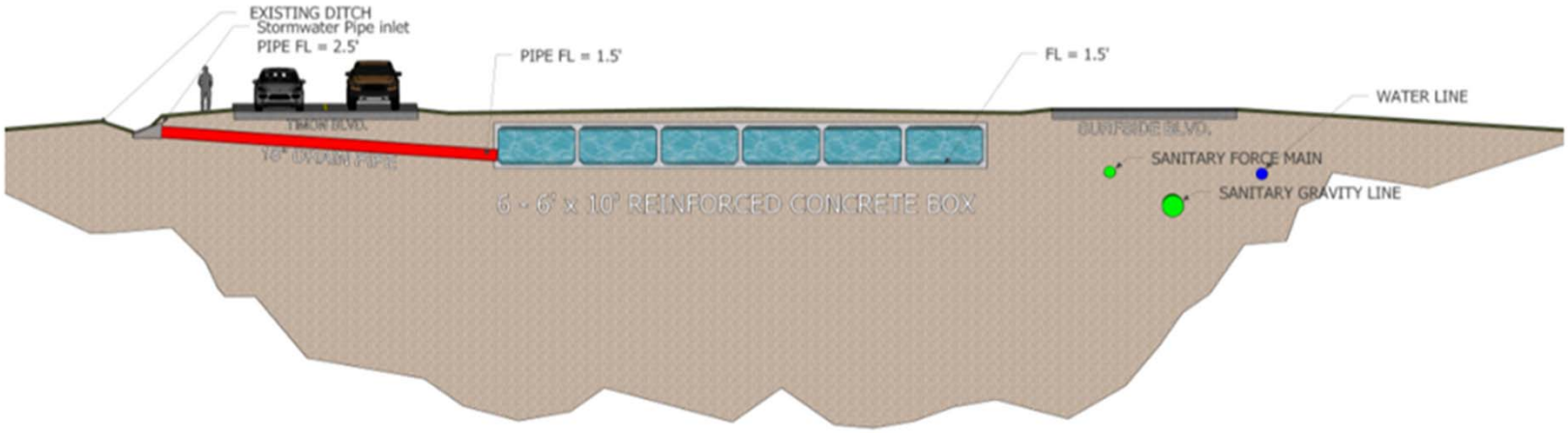
- Provide a centrally located trunk line that is within 2 blocks of any property
- Recommend open system to allow for easier maintenance such as a ditch or channel
- Provide larger outfalls to the bay (possible navigable connection)
- Raise streets above high tide and slope towards Timon & Surfside Blvd



Drainage Options

Option 1: Closed Conduit System

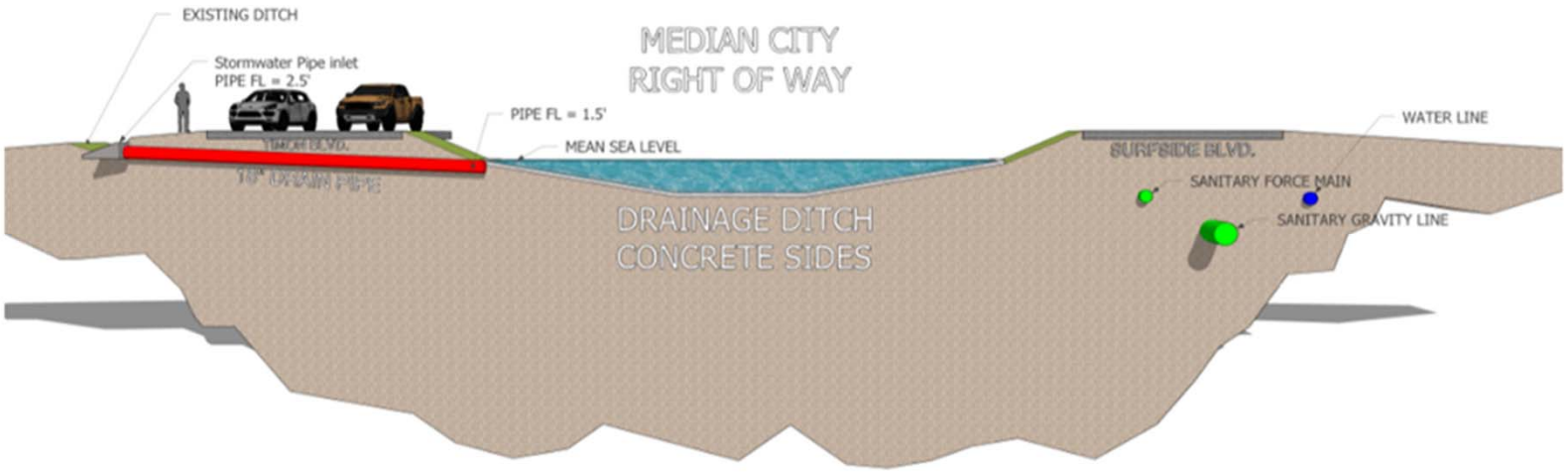
- Expensive
- Difficult to maintain
- Least beneficial hydraulic improvement



Drainage Options (Continued)

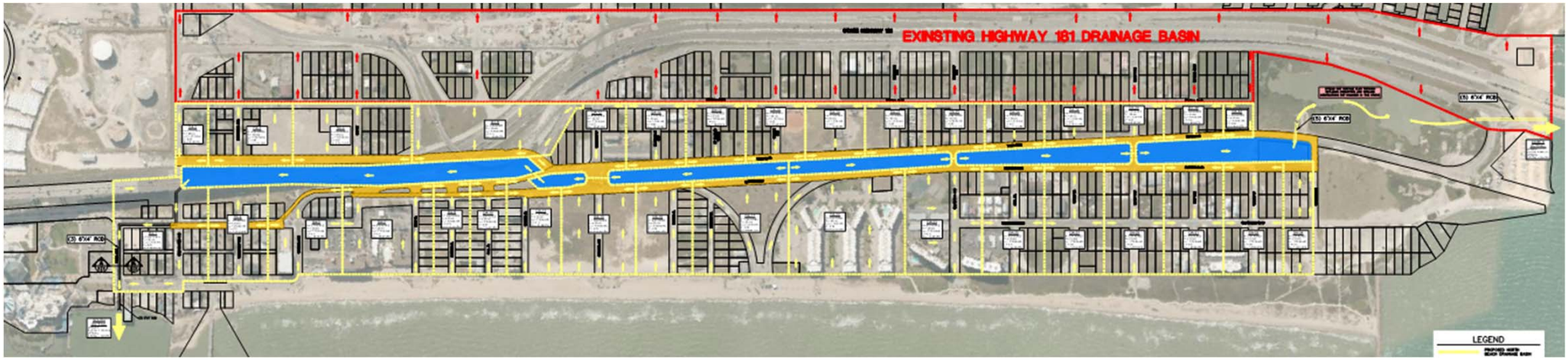
Option 2: Open Ditch

- Most Cost Effective
- Easy to Maintain
- Good hydraulic improvement



Drainage Options

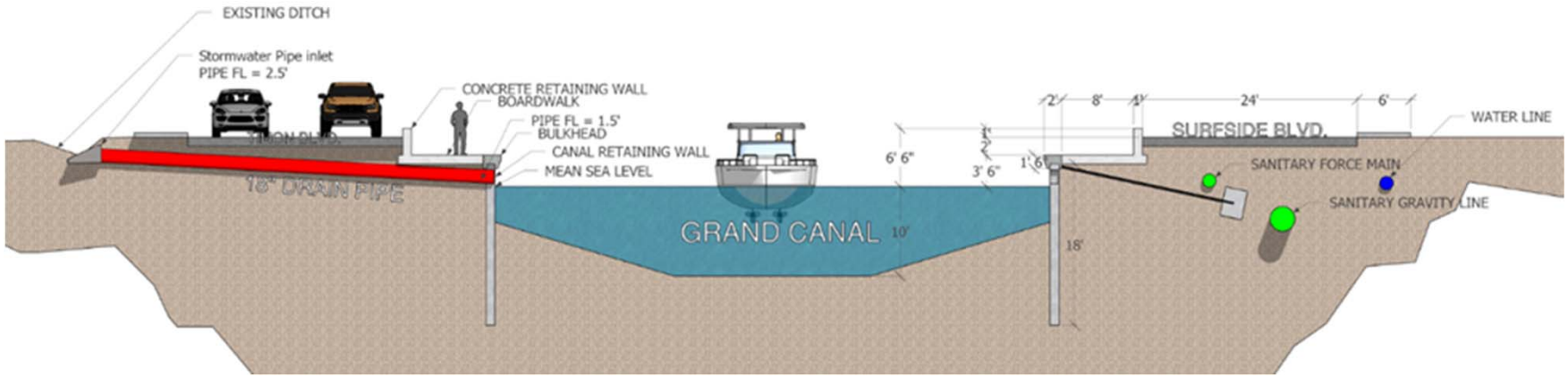
Options 1 & 2: Layout



Drainage Options (Continued)

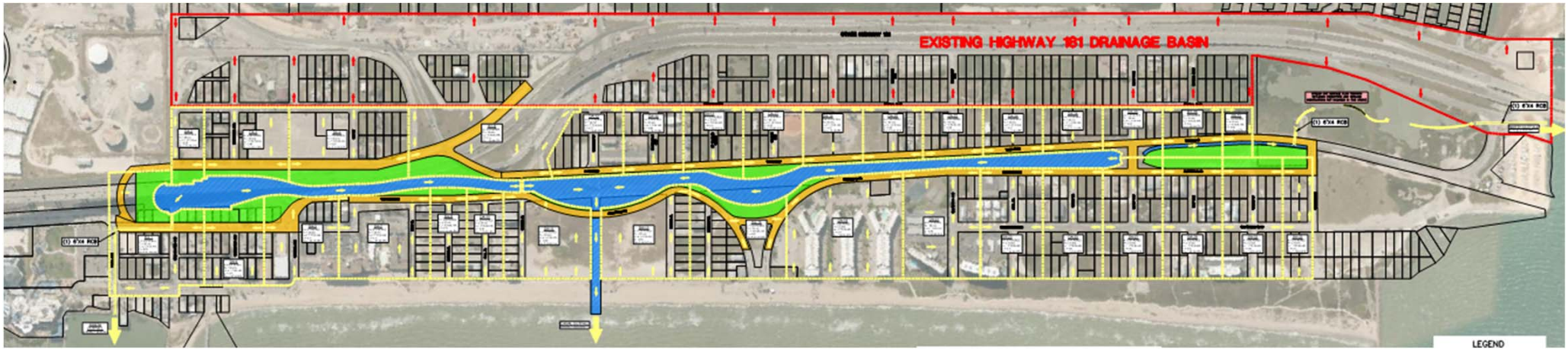
Option 3: Navigable Channel

- Cost more than ditch
- Easy to Maintain
- Best hydraulic improvement



Drainage Options

Option 3: Layout



Utilities

All three options will require replacing or relocating some existing utilities

- Water, Sewer and Gas lines crossing east to west will need to be lowered under the Box, Ditch or Channel
- Most utilities with in Timon & Surfside Blvd will need to be relocated to make way for the Box, Ditch or Channel

Cost Estimates

Option 1: Closed Conduit System	**$82,635,608**
Option 2: Open Ditch System	**$36,119,137**
Option 3: Navigable Channel	**$41,242,560**

<u>Added to All Options</u>

Raise Streets	**$32,000,000**

Conclusions

- The permanent drainage solution for North Beach needs to include significant additional drainage improvements
- Raising all streets on North Beach needs to be part of the solution. This needs to be programmed over multiple years.
- North Beach needs fill dirt as much as it needs more drainage infrastructure. Securing sources of fill material beyond the ditch/channel would be beneficial.

Recommendations

- Raising all streets on North Beach needs to be considered as part of the long-range cost of fixing North Beach
- Pursue Options 2 or 3 as viable options to solve the drainage issues for North Beach

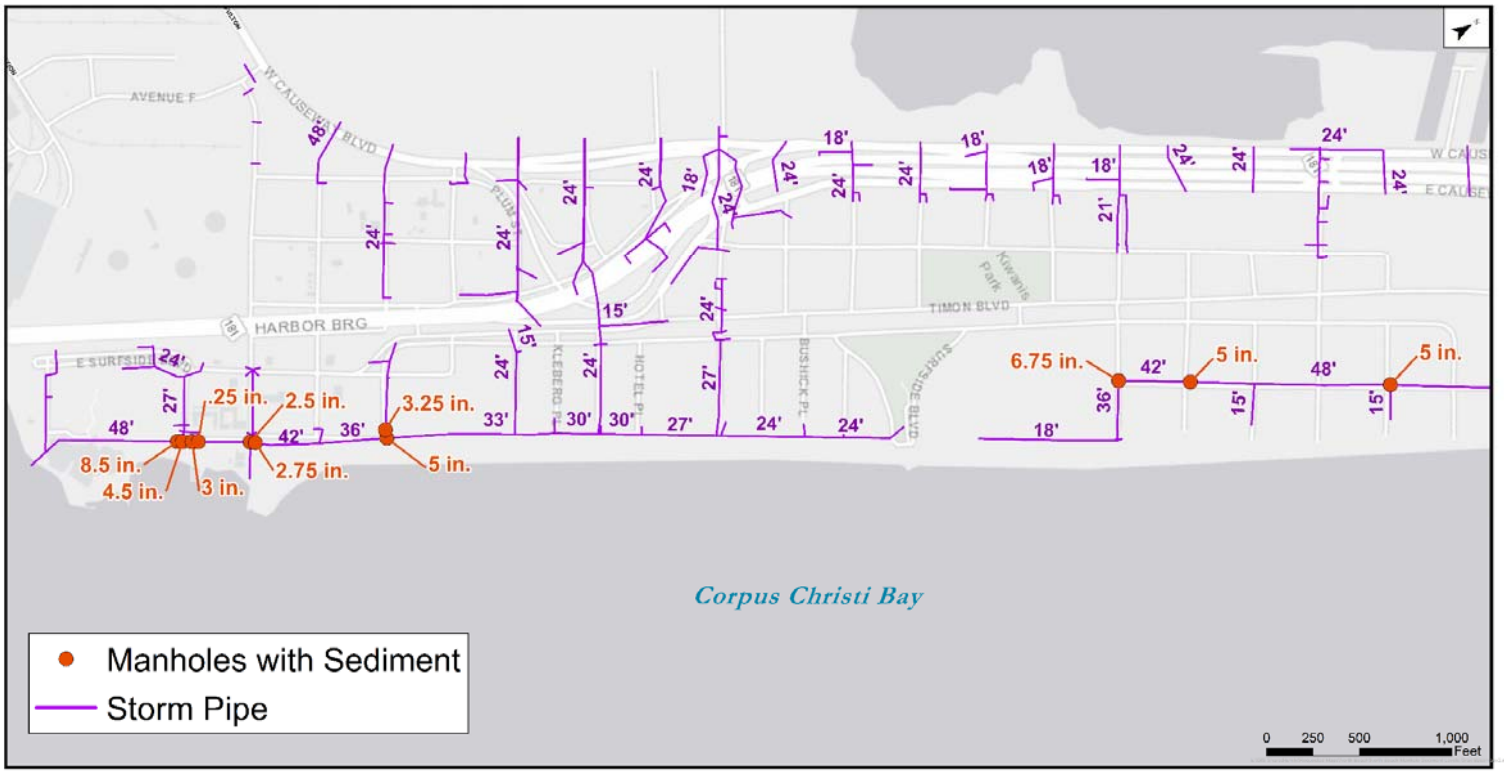
QUESTIONS

Backup Slides

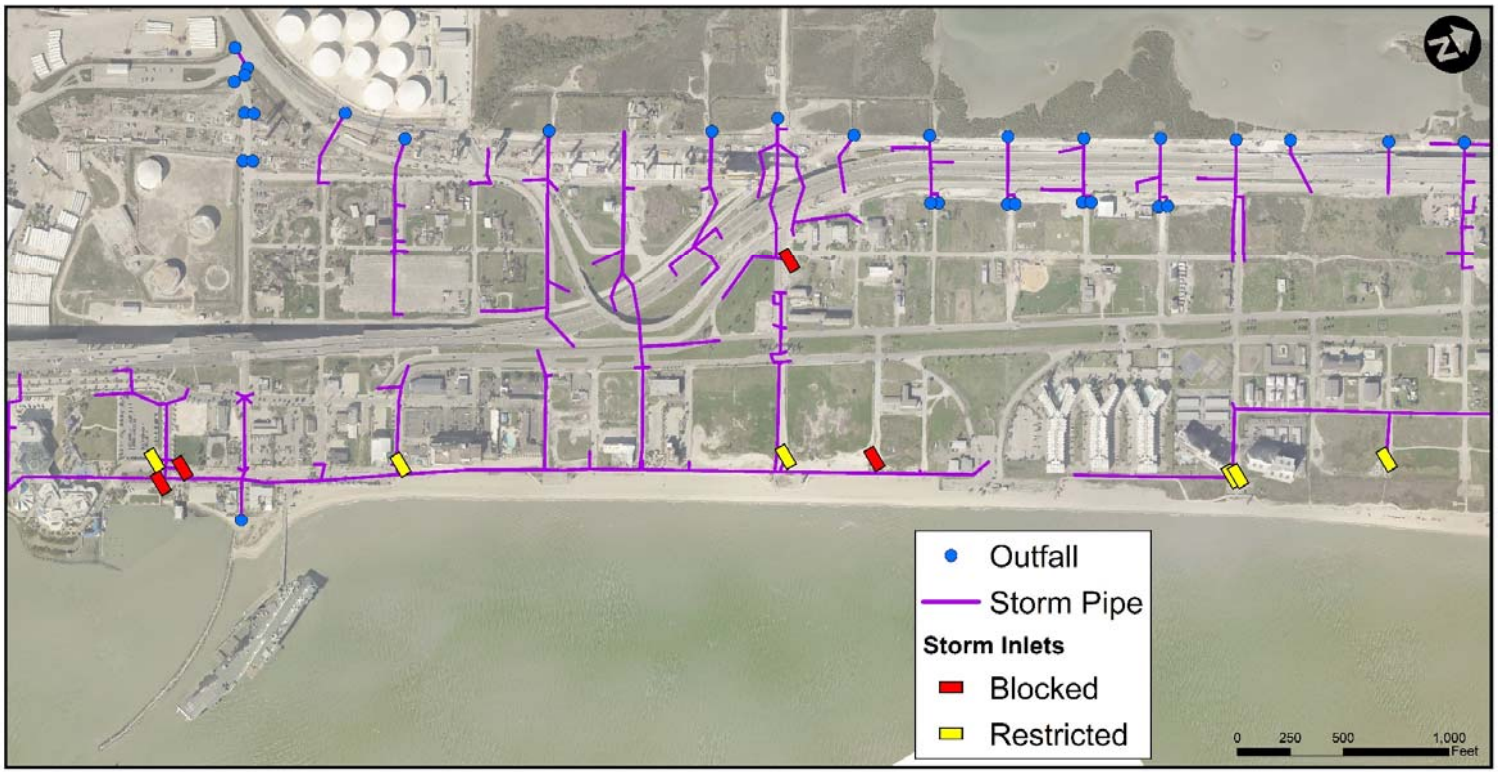
Stormwater Funded Capital Improvements

Funding Source	Numbers	Amount ($)
Stormwater CIP 2019-2020	6	$10,600,000
Stormwater Funding from Street/Bond 2018	98	$32,208,404
Stormwater Funding from Street/Bond 2016	1	$350,000
	Total	$43,158,404

Manhole Sediment Levels

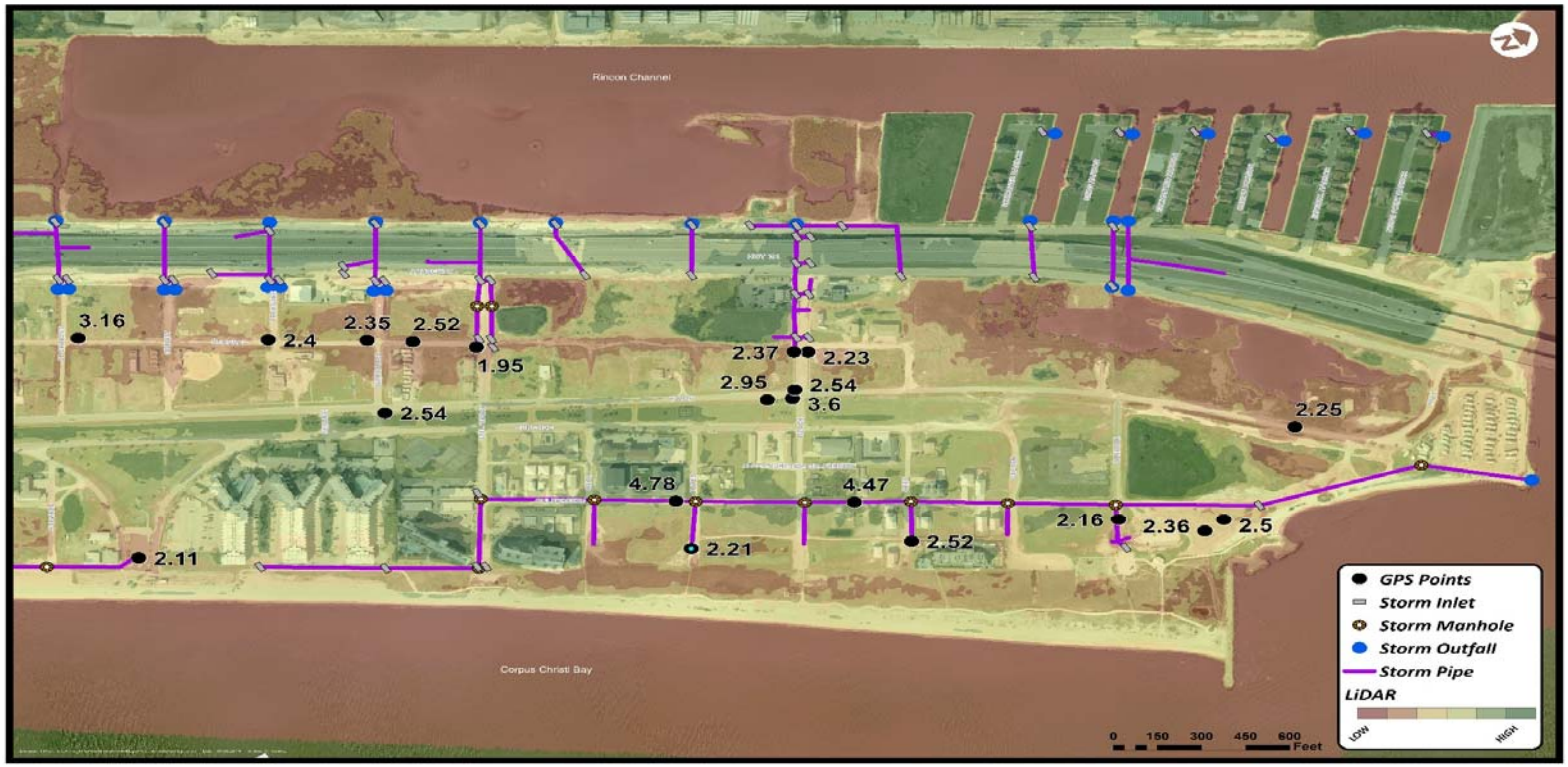


Inlet Blockages

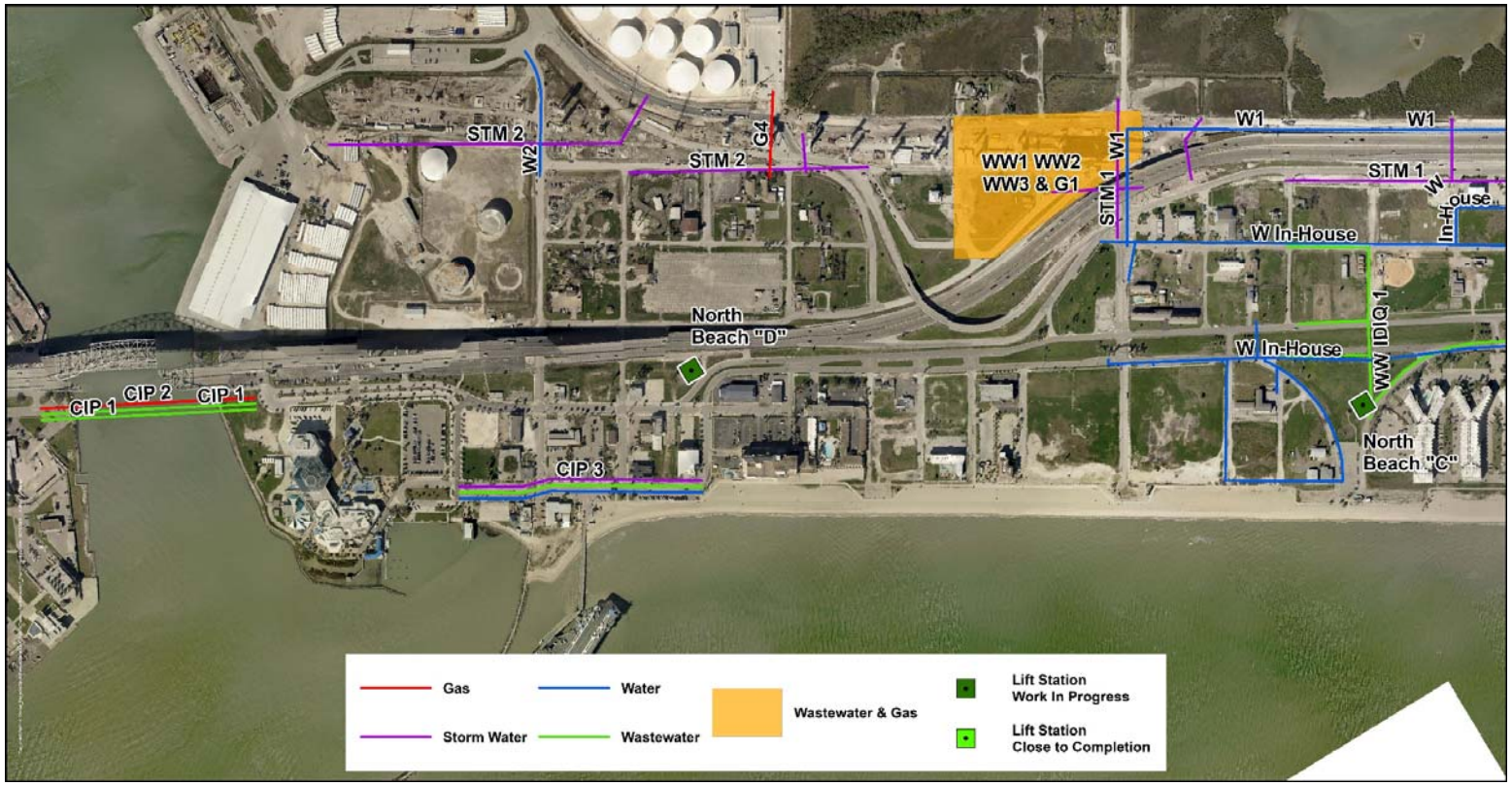


Total Buildings = 200

North Beach Drainage



North Beach Utility Projects
2007 - 2019



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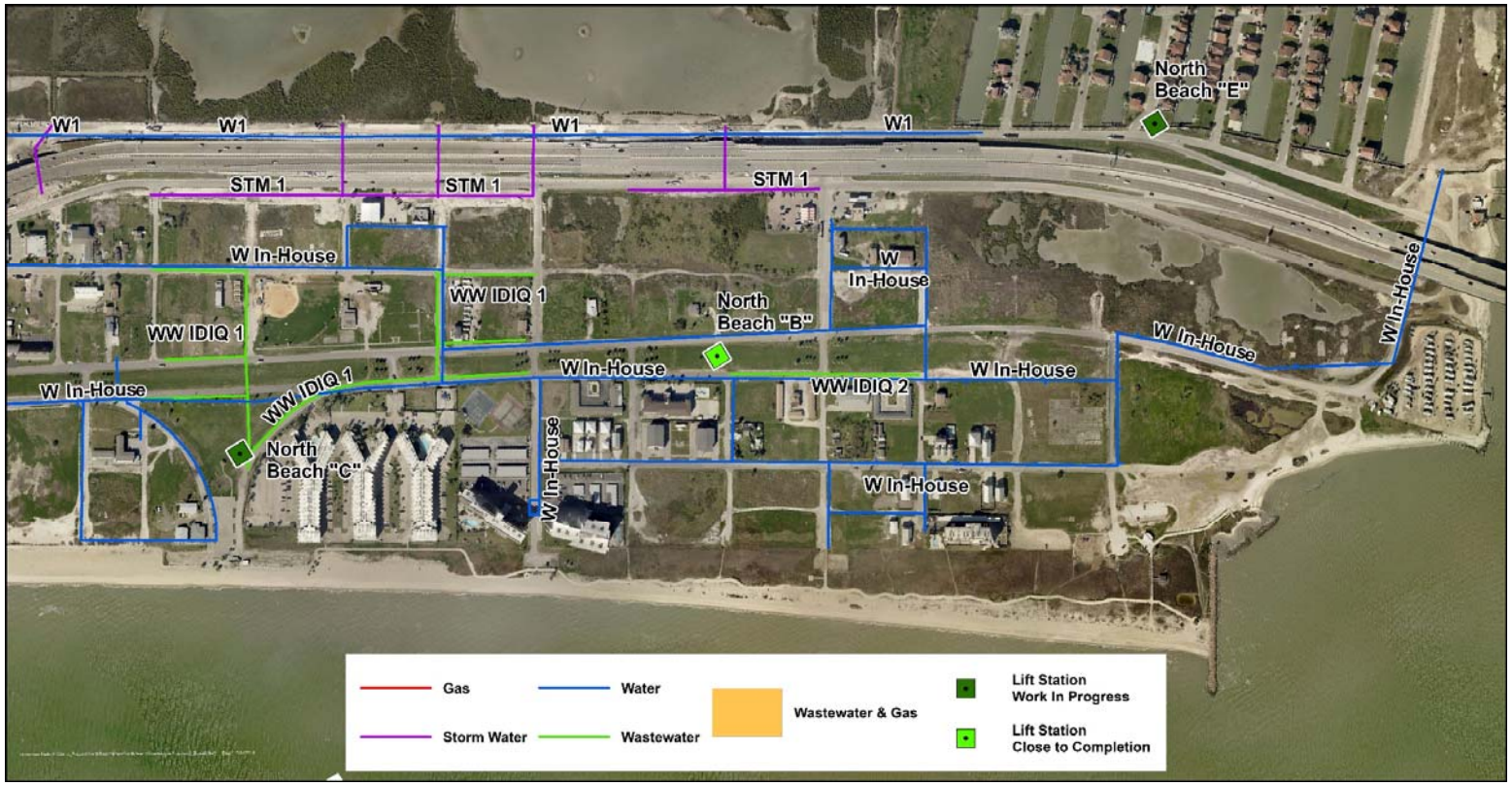

Industrial Canal Crossing

North Beach Lift Station Improvements

- Construction contract awarded to Associated Construction Partners, LTD. to Implement Lift Station Repairs Citywide in May 2018
  - Repairs to Rincon North, Rincon South, and North Beach B Lift Stations with a total amount of $272,000
- Condition Assessment of 20 Lift Stations including the remaining three lift stations in North Beach began in 2019 and is anticipated to be completed in February 2020

Decrease in Inflow & Infiltration