



Department of  
Design and  
Construction

INFRASTRUCTURE DIVISION



# East 6th Road Flooding Study

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## Community Board Update

**MAY 20, 2026**

Paul A. Ochoa  
Commissioner

Eric C Macfarlane, P.E., M.ASCE, NAC, ENV-SP  
First Deputy Commissioner

Thomas Wynne, P.E.  
Deputy Commissioner, Infrastructure

## Flooding Study of East 6th Road

At the request of the community, DDC coordinated a targeted planning study to better understand recurring flooding conditions along East 6th Road in Broad Channel and identify potential improvement considerations.

The study evaluated:

- Existing roadway elevations
- Existing drainage system
- Historical tidal conditions and rainfall conditions
- Projected sea level rise and increased precipitation
- Finished floor elevations and private property constraints
- Wetland and overland flooding conditions
- Potential improvement concepts and their limitations

This is an important planning step. The findings help identify what may be feasible in the near term and what would require broader coordination, additional evaluation, funding, and future community discussion.

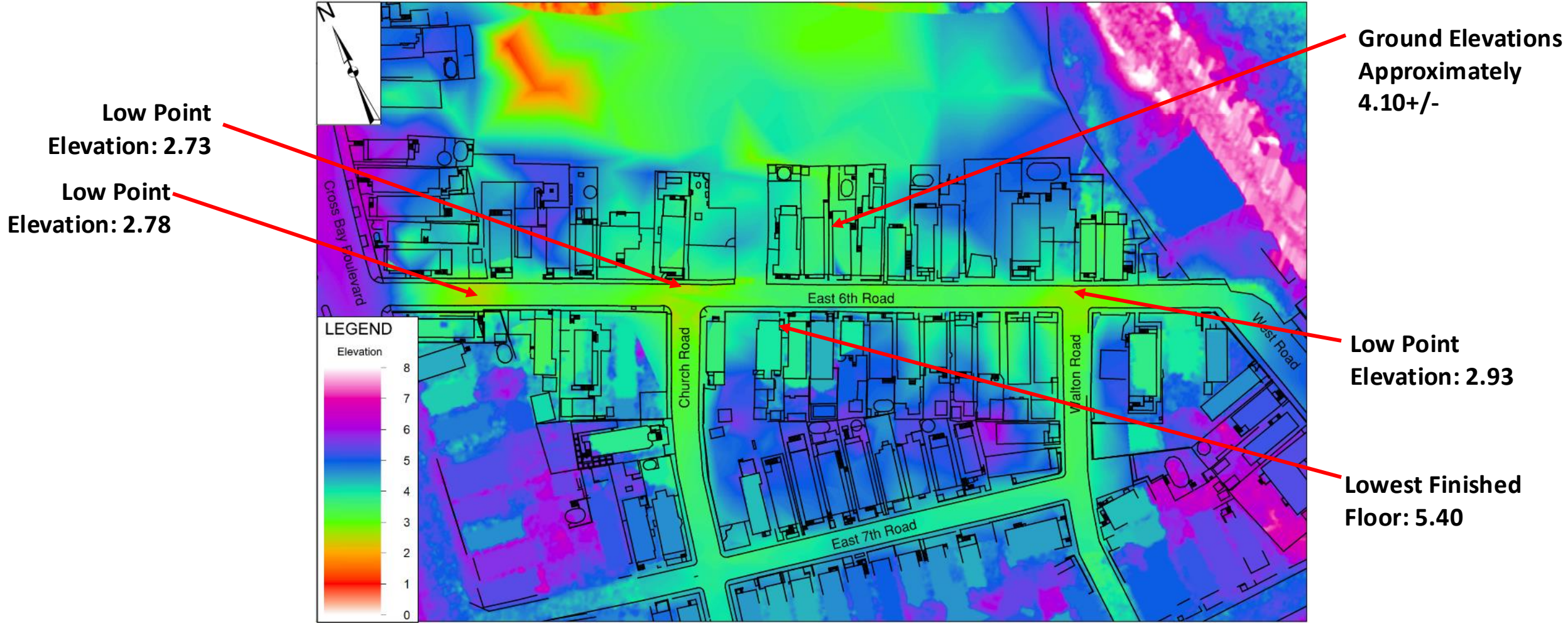
# Introduction

## East 6th Rd Study



# Existing Topography

East 6th Rd Study



# Existing Flood Conditions

East 6th Rd Study

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## **Three types of flooding to address:**

1. Tidal Surcharging of the existing drainage system due to High Tide in Jamaica Bay
2. Overland Flooding from the National Parks Service Wetlands
3. Runoff from Rainfall

# Existing Flood Conditions

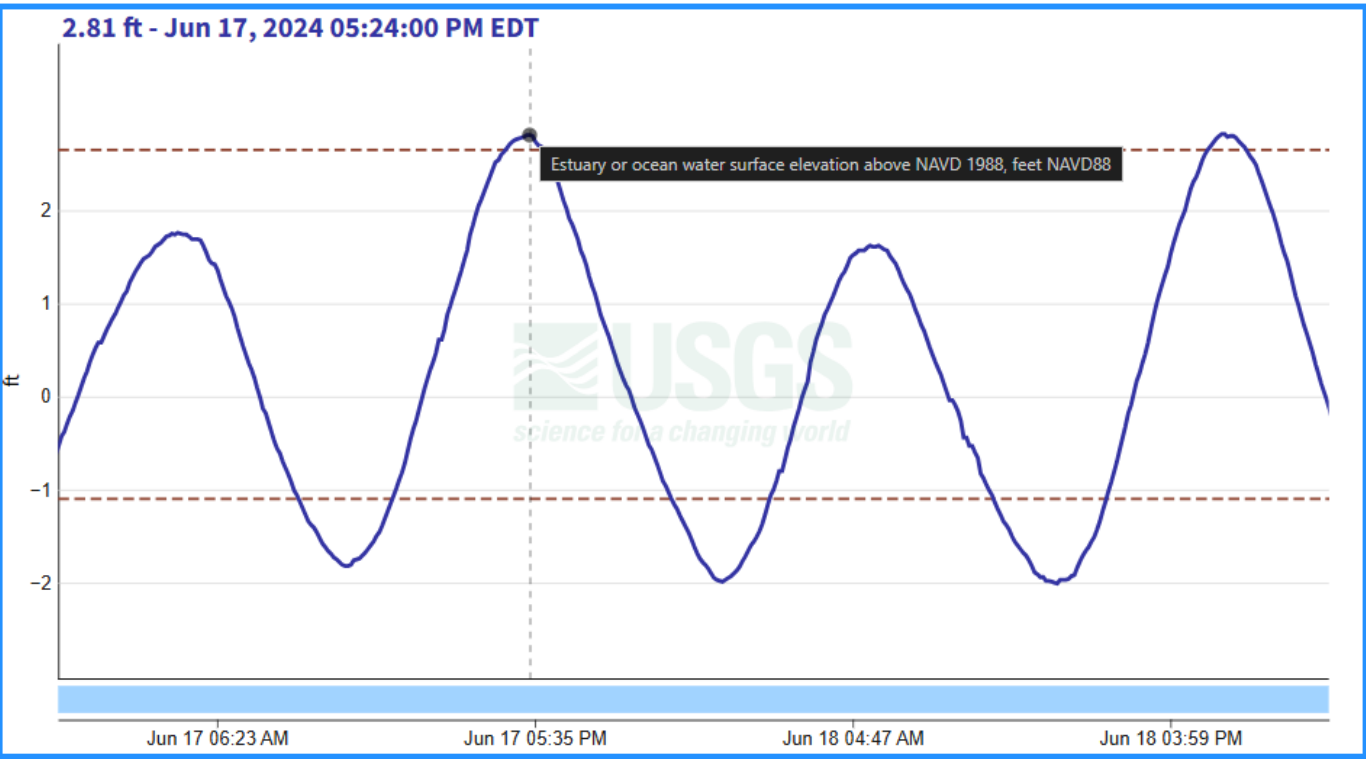
East 6th Rd Study

Rockaway Inlet Near Floyd Bennett Field NY - 01311875

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- using custom time span -  
- using graph zoom -  
June 17, 2024 - June 18, 2024

Estuary or ocean water surface elevation above NAVD 1988, feet NAVD88



Data Source: U.S. Geological Survey Monitoring Location  
USGS-01311875 – Rockaway Inlet Near Floyd Bennett Field

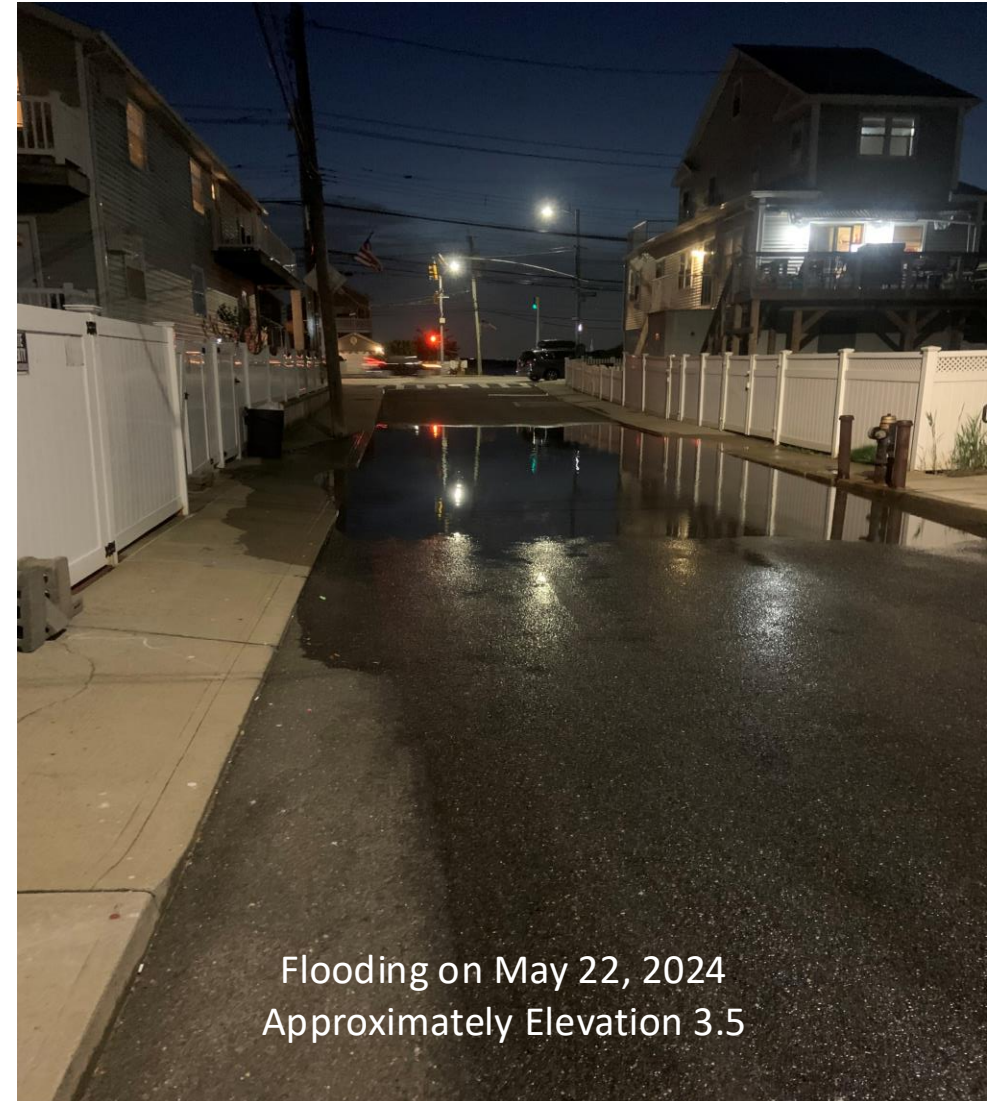
- Performed analysis of surrounding tide data
- Generally E 6<sup>th</sup> Rd would have water surface elevations 3-4” below what was observed at Bennett Field
- Mean Higher High Water (MHHW) – Average height of the higher of the two high tides each day
- Published MHHW is based on measurements from 1982-2001
- MHHW: El. 2.70
- Current MHHW adds 0.44’ to account for sea level rise from 2001 to the present
- Adjusted Current MHHW: El. 3.14
- Existing Inlet elevation at E 6<sup>th</sup> Rd and Church Rd is at El. 2.73

# Existing Flood Conditions

East 6th Rd Study

## 1) Tidal surcharge from Jamaica Bay:

- Minimum overflows at tidal elevations above El. 2.73
  - USGS monitoring data suggests 230 occurrences on average a year
  - Current MHHW of El. 3.14
- Field observation of flooding at tide elevation of approximately elevation El. 3.5
  - USGS monitoring data suggests 92 occurrences on average a year



Flooding on May 22, 2024  
Approximately Elevation 3.5

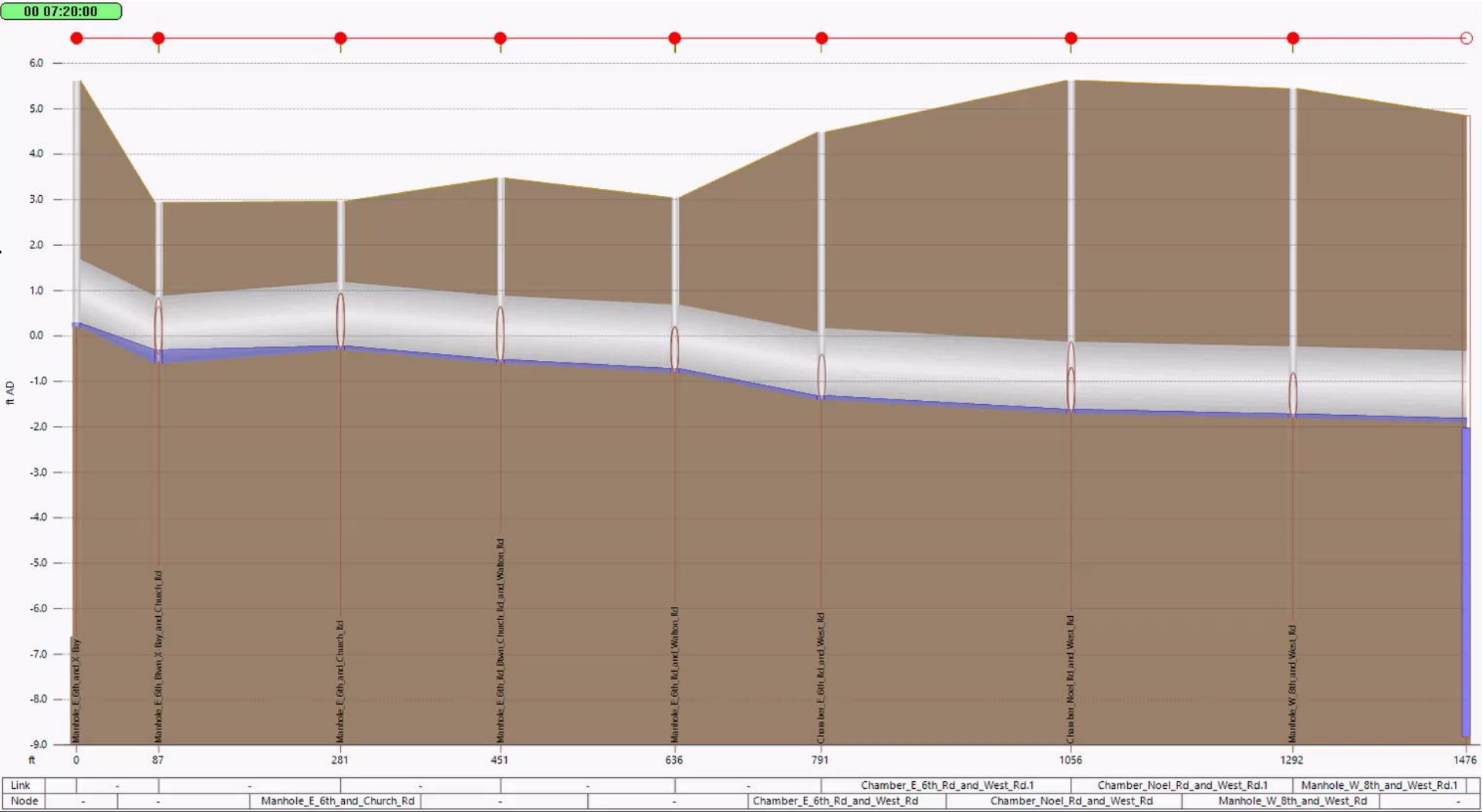
# Existing Flood Conditions – Tidal Surcharge

East 6th Rd Study

Tidal Surcharge on E 6<sup>th</sup> Road between Cross Bay Blvd and West Rd for flooding observed in field

Stormwater  
Manhole at  
Cross Bay Blvd.  
and E 6<sup>th</sup> Rd.

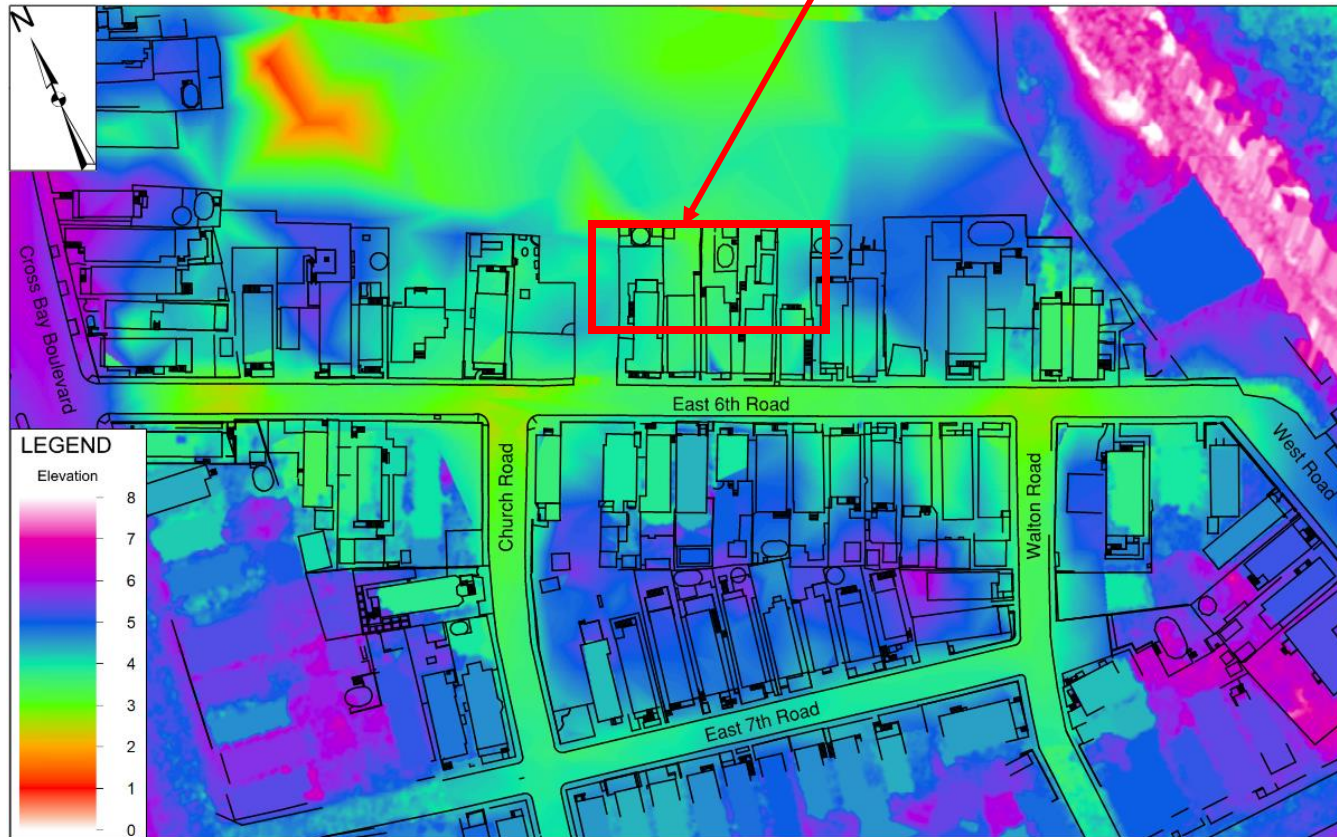
Outfall at end  
of West Rd



# Existing Flood Conditions – Overland Flooding

East 6th Rd Study

Area where overland flood begins first

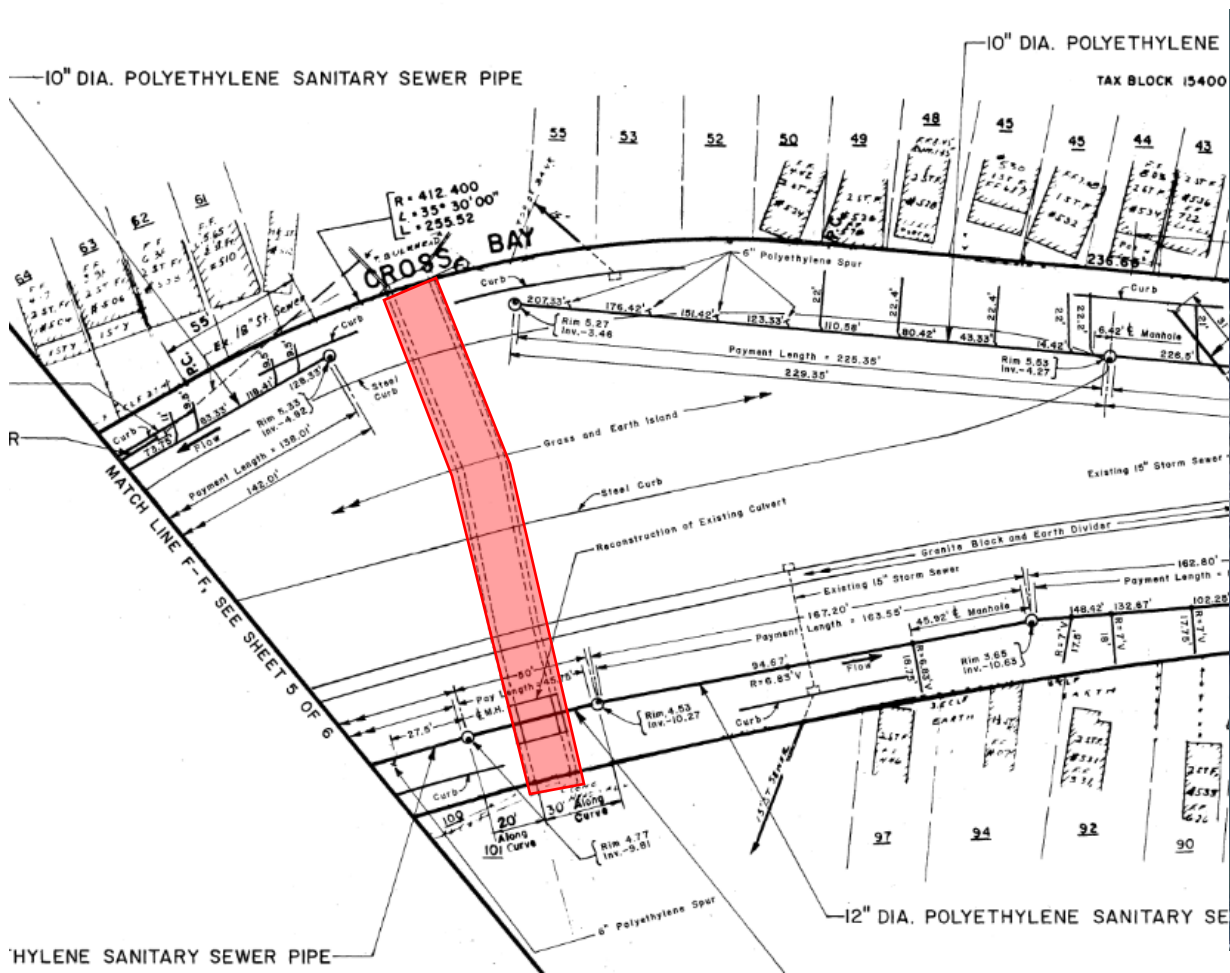


## 2) Overland flooding from the wetlands:

- Overland flood events occur locally above El. 4.1, when water comes over the wetland
  - USGS monitoring data suggests 20 occurrences a year
- More widespread at El. 4.5
  - USGS monitoring data suggests 11 occurrences a year

# Cross Bay Boulevard Culvert Assessment

East 6th Rd Study



# Existing Flood Conditions

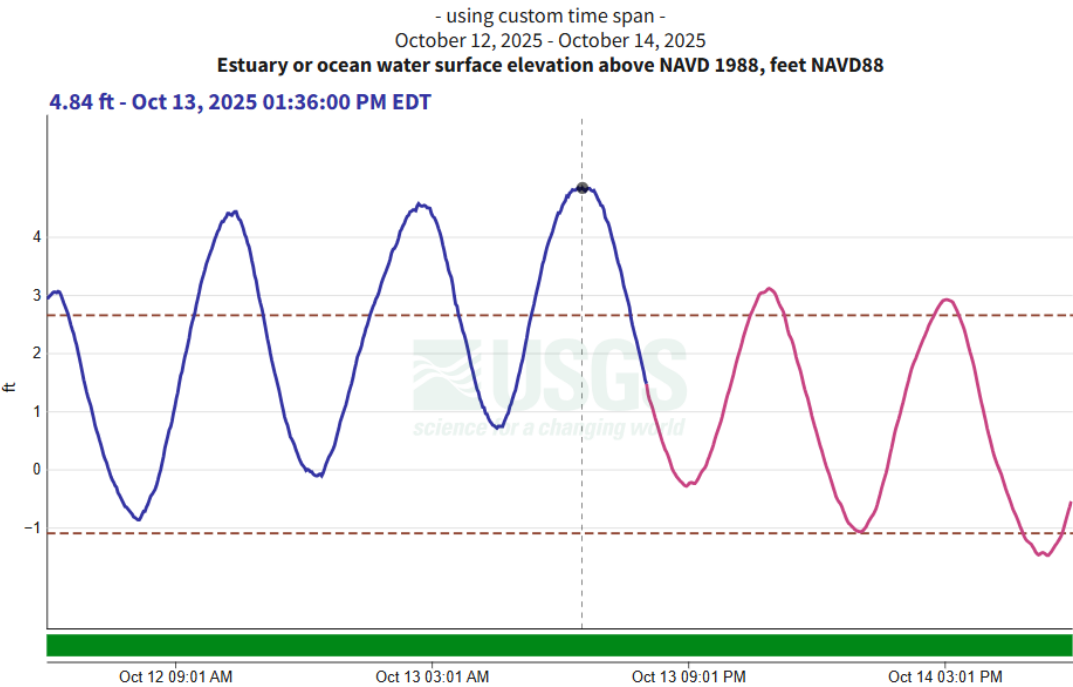
East 6th Rd Study



October 13, 2025  
Nor'easter

Rockaway Inlet Near Floyd Bennett Field NY - USGS-01311875

[Subscribe to WaterAlert](#)



Data Source: U.S. Geological Survey Monitoring Location  
USGS-01311875 – Rockaway Inlet Near Floyd Bennett Field

Bennett Field Measured Elevation 4.84

Field Measurements on E 6<sup>th</sup> Road Estimated  
High Water at Elevation 4.50

# Existing Flood Conditions – Runoff From Rainfall

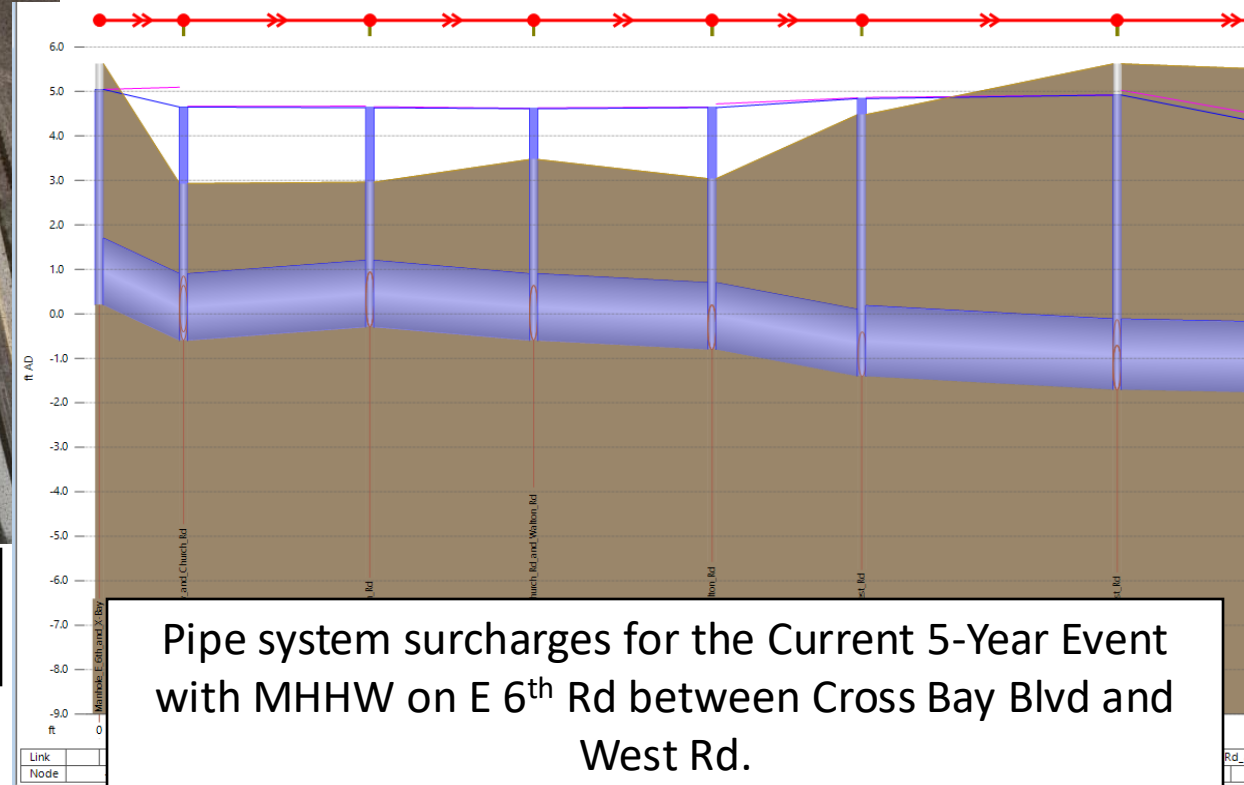
## East 6th Rd Study

### 3) Runoff from rainfall:

- Typical 5-Year rainfall event, one with a 20% chance of occurring in any given year, coinciding with the tide at MHHW, results in flooding of the roadway.
- Flooding also occurs with the tide at MLLW, which means the flooding will not recede until the rain slows down.



Extents of surface flooding for 5-Year Event with MHHW on E 6<sup>th</sup> Rd between Cross Bay Blvd and West Rd.



Pipe system surcharges for the Current 5-Year Event with MHHW on E 6<sup>th</sup> Rd between Cross Bay Blvd and West Rd.

# Prior Projects – West Side Street Raising

East 6th Rd Study

- Elsewhere in Broad Channel, streets were raised to El. 5.4 (4.9 for W 14<sup>th</sup> Rd) to mitigate flooding
- W 14<sup>th</sup> Street was raised 1.4' from 3.5
- W 15<sup>th</sup> Street was raised 1.6' from 3.8
- W 16<sup>th</sup> Street was raised 1.2' from 4.2
- W 17<sup>th</sup> Street was raised 1.5' from 3.9



# Why Flooding Is Difficult to Address Here

East 6th Rd Study

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**East 6th Road has limited elevation difference between the roadway, tide levels, drainage infrastructure, adjacent properties, and nearby wetlands.**

## **Key constraints:**

- Existing low roadway and inlet elevations create areas of ponding
- Surcharge of existing drainage system during certain tide and rainfall conditions.
- Adjacent homes, driveways, and finished floor elevations limit how much the roadway can be raised.
- Wetlands and surrounding low-lying areas contribute overland flooding.
- Drainage systems that serve other areas (i.e. Cross Bay Blvd, Noel Road, etc.)
- Drainage improvements alone may not address all existing and future flooding conditions.
- Multiple Intersections and adjacent streets

**These conditions shaped the improvement concepts explored and identified.**

# Potential Concepts

East 6th Rd Study

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- **Concept 1 – Near Term Street Regrading**
- **Concept 2 – Higher Impact Roadway and Drainage Reconstruction**
- **Concept 3 – Long-Term Resiliency**

## Concept #1

### Near Term Street Regrading

# Concept 1 - Description

East 6th Rd Study

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- Established a 0.5% positive pitch from high points along East 6th Road's property rear yard toward the proposed roadway .
- Uses existing rear yard and wetland drainage high points to direct runoff toward East 6th Road.
- Avoids low points and eliminates the need for drainage infrastructure on private property.
- No storm sewer upgrades included beyond inlets at new low points.
- Reduces tidal flooding to approximately 167 events annually under historical conditions.
- Vulnerability to future sea level rise and rainfall projections remains.

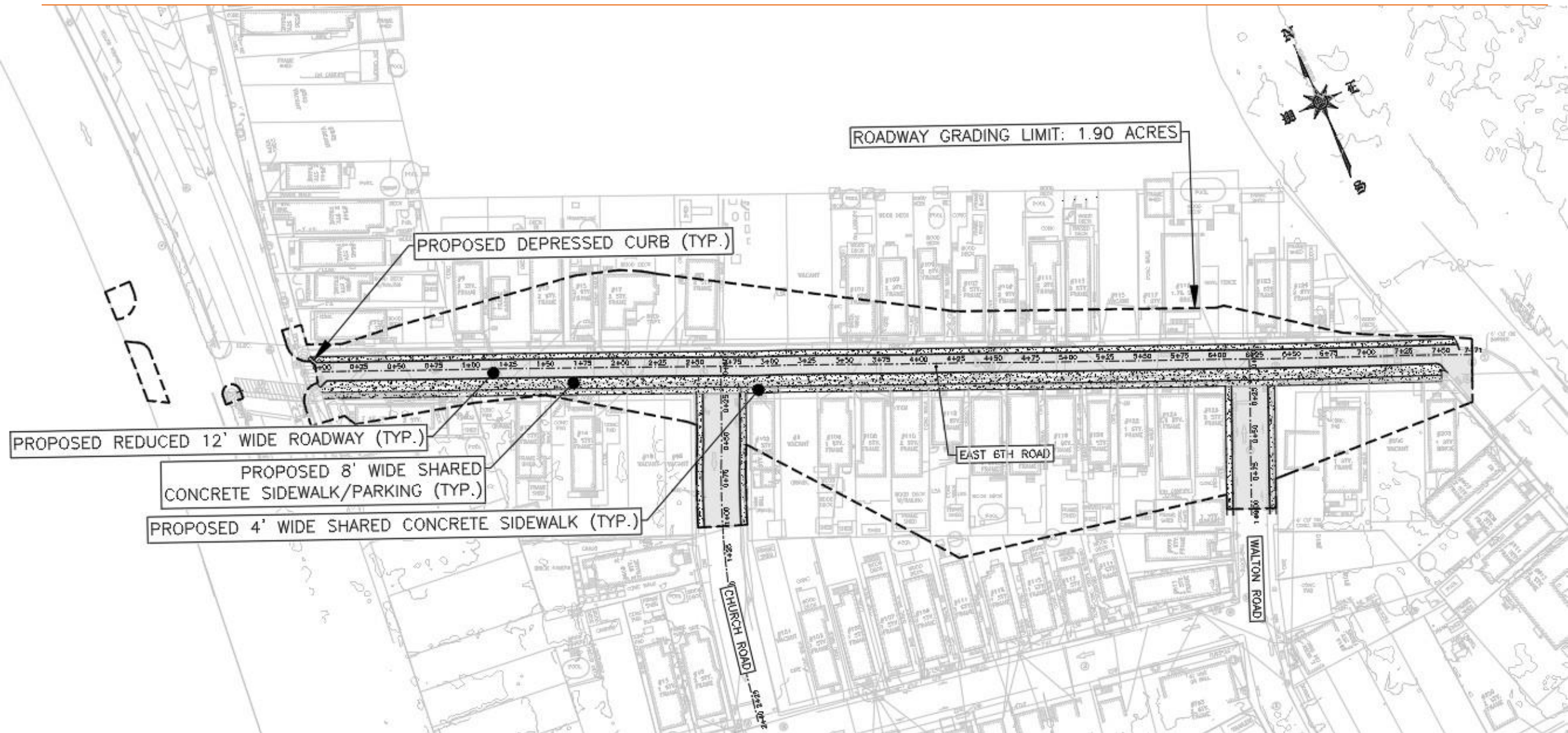
# Concept 1 – Benefits & Challenges

East 6th Rd Study

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| <div><div><u>KEY BENEFITS</u></div><div><ul style="list-style-type: none"><li>• Promotes positive drainage from both sides of East 6<sup>th</sup> Rd.</li><li>• Eliminates reliance on drainage infrastructure on private properties</li><li>• Lowest construction cost and duration</li><li>• Limited utility relocations (poles only)</li></ul></div></div>                             | <div><div><u>CHALLENGES</u></div><div><ul style="list-style-type: none"><li>• Does not mitigate overland flooding</li><li>• Approx. 70% of properties require regrading along foundations</li><li>• Regrading will extend to rear of some properties</li></ul></div></div> |
| <div><div><u>Flood Improvements</u></div><div><ul style="list-style-type: none"><li>• Reduces frequency of tidal flooding from a current average of over 230 times per year to projected 167</li><li>• Reduces depth of flooding from 2.0’ to 1.8’ for current 5-Year Design Event</li><li>• Reduces drawdown time after 5-Year Storm Event from 4 hours to 3 hours</li></ul></div></div> |                                                                                                                                                                                                                                                                            |

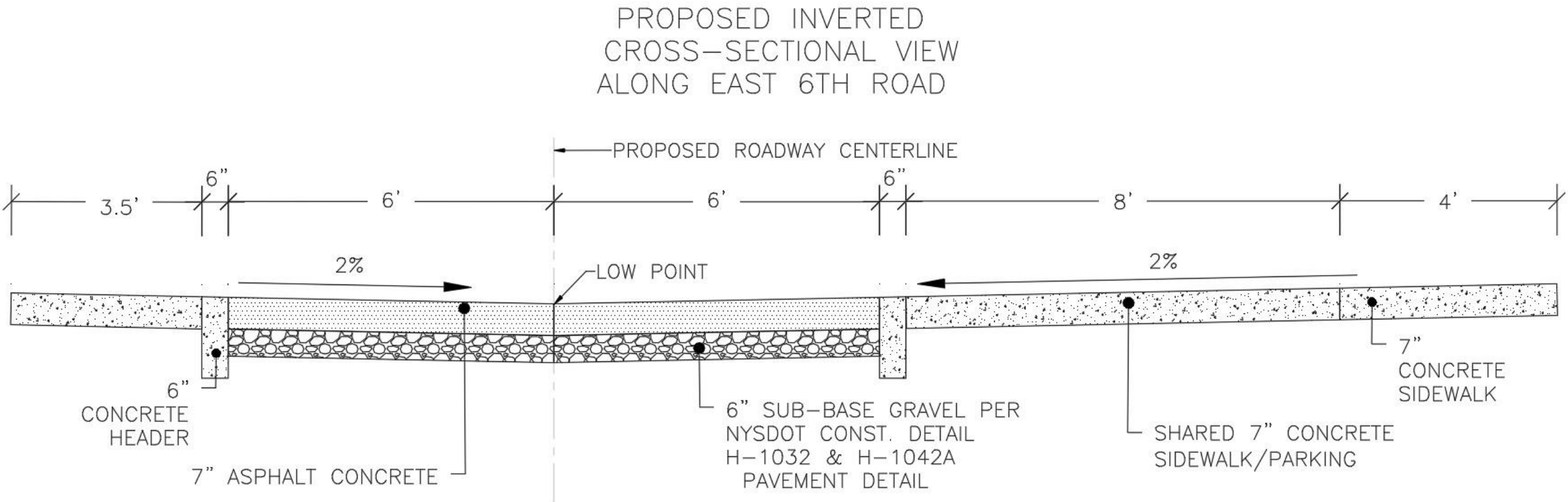
# Concept 1 – Roadway Layout Plan

East 6th Rd Study



# Concept 1 – Proposed Cross-Section

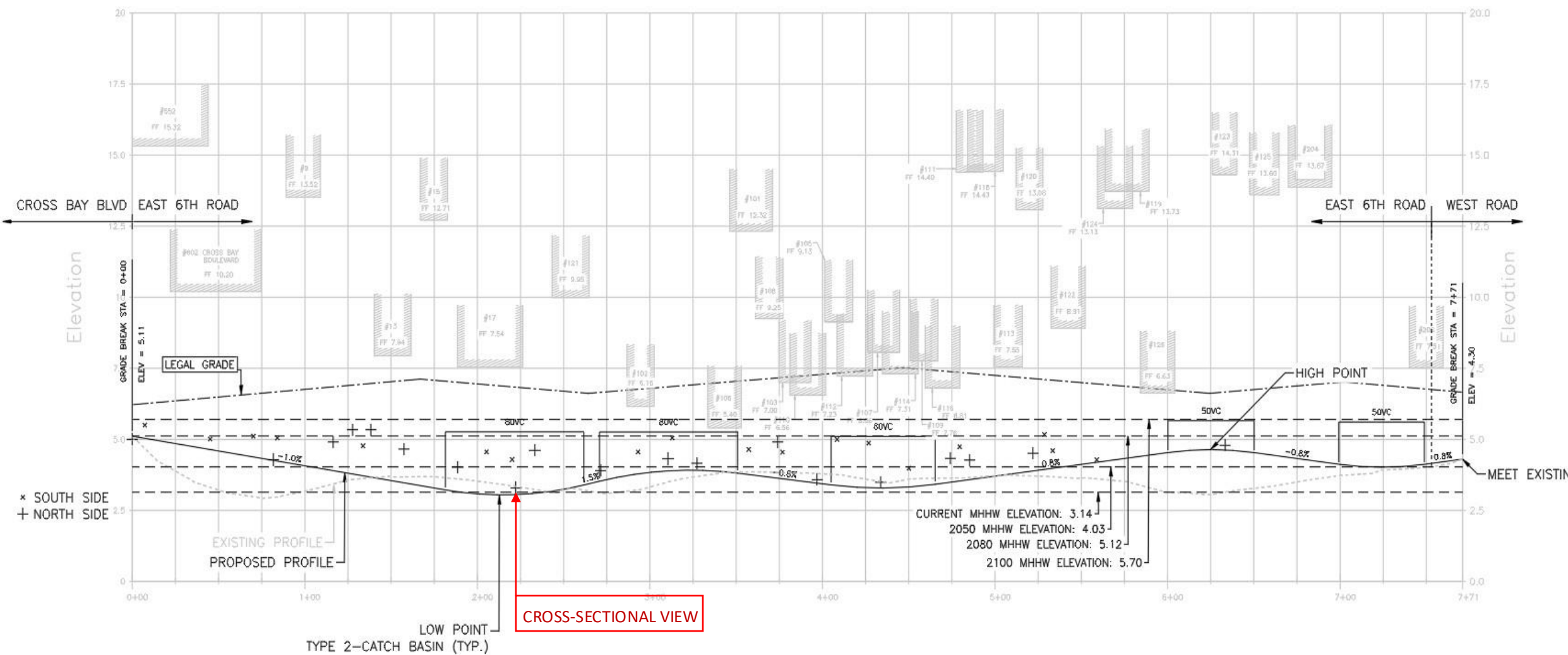
East 6th Rd Study



# Concept 1 – Road Profile

East 6th Rd Study

PROPOSED ROAD CENTERLINE PROFILE – EAST 6TH STREET



## Concept 2

# Higher Impact Roadway and Drainage Reconstruction

# Concept 2 – Description

East 6th Rd Study

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- Establishes a minimum 2% slope away from the lowest existing finished floor elevations along East 6th Road, 5.40 feet.
- Southern properties graded at 2% slope; northern side at 5% slope to avoid impacts to federal wetlands.
- Includes sewer reconstruction along East 6th Road and soil replacement.
- Reduces tidal flooding to approximately 4 events per year.
- Performs above 2050 sea level rise projections but remains vulnerable to extreme rainfall events.

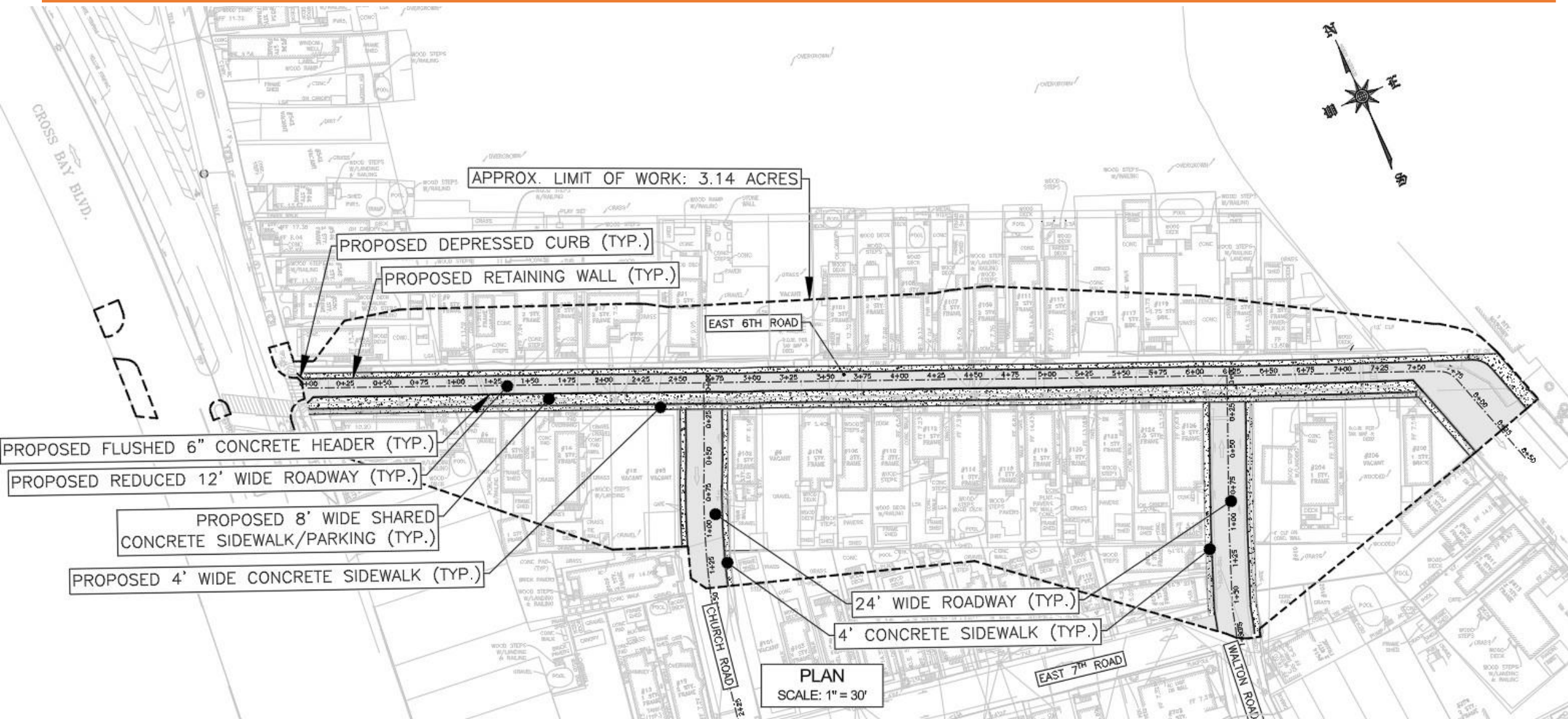
# Concept 2 – Benefits & Challenges

East 6th Rd Study

|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div><div><u>KEY BENEFITS</u></div><div><ul style="list-style-type: none"><li>• Flooding reduction</li><li>• Raises lowest point of road by 2.12'</li><li>• No federal wetland disturbance</li></ul></div></div></div>                                                                                                                                                                 | <div><div><div><u>CHALLENGES</u></div><div><ul style="list-style-type: none"><li>• Higher limit of disturbance than Alternative # 1 by 1.24 Acres</li><li>• Proposed elevations abutting properties will increase from existing conditions</li><li>• Requires extensive drainage infrastructure</li><li>• Requires consent agreements for private property improvements</li><li>• Considerable utility relocation</li><li>• Geotechnical Concerns</li><li>• Second highest construction cost</li></ul></div></div></div> |
| <div><div><div><u>FLOOD IMPROVEMENTS</u></div><div><ul style="list-style-type: none"><li>• Reduces frequency of tidal flooding from average of over 230 times per year to projected 4</li><li>• Reduces depth of flooding from 2.0' to 0.9' for current 5-Year Design Event</li><li>• Reduces drawdown time after 5-Year Storm Event from 4 hours to 40 minutes</li></ul></div></div></div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

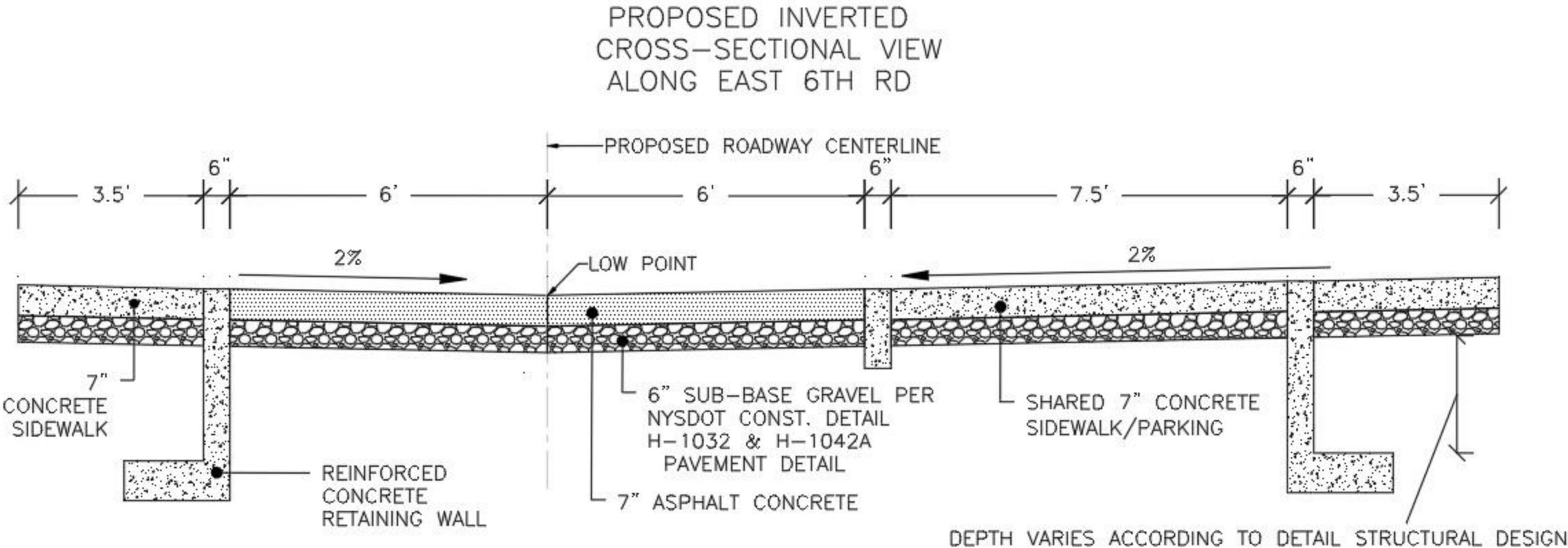
# Concept 2 – Roadway Layout Plan

East 6th Rd Study



# Concept 2 – Proposed Cross-Section

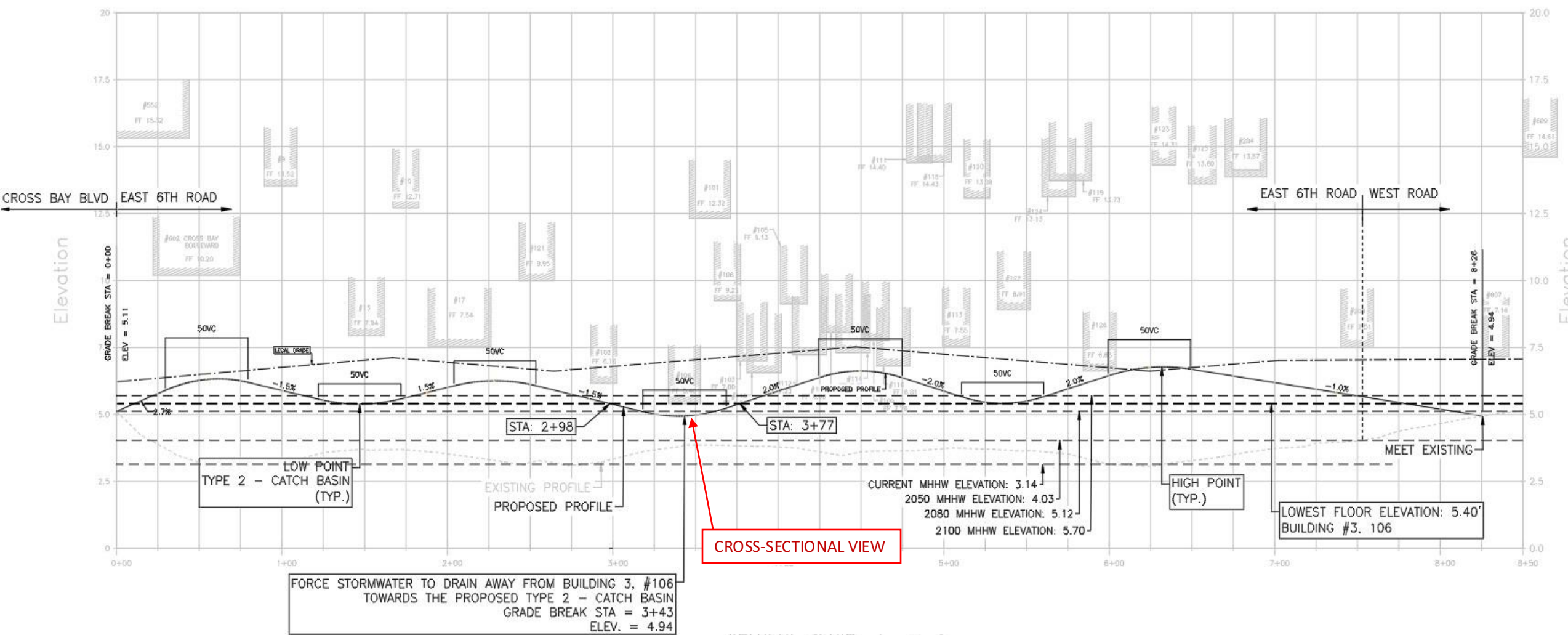
East 6th Rd Study



# Concept 2 – Road Profile

East 6th Rd Study

PROPOSED ROAD CENTER LINE PROFILE ALONG EAST 6TH STREET



# Higher-Impact Roadway and Drainage Concepts

East 6th Rd Study

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The study also screened more intensive roadway and drainage reconstruction concepts.

These concepts showed potential flood reduction benefits under certain modeled conditions, but also raised significant challenges:

- Larger property impacts
- Utility relocation and constructability concerns
- Additional drainage infrastructure needs
- Higher cost and longer implementation timeframe
- Continued vulnerability under future rainfall and sea level rise conditions

These concepts would require additional interagency planning, permitting, funding, and community coordination before any capital scope could be considered.

## Concept 3

### Long-Term Resiliency

# Concept 3 – Description

East 6th Rd Study

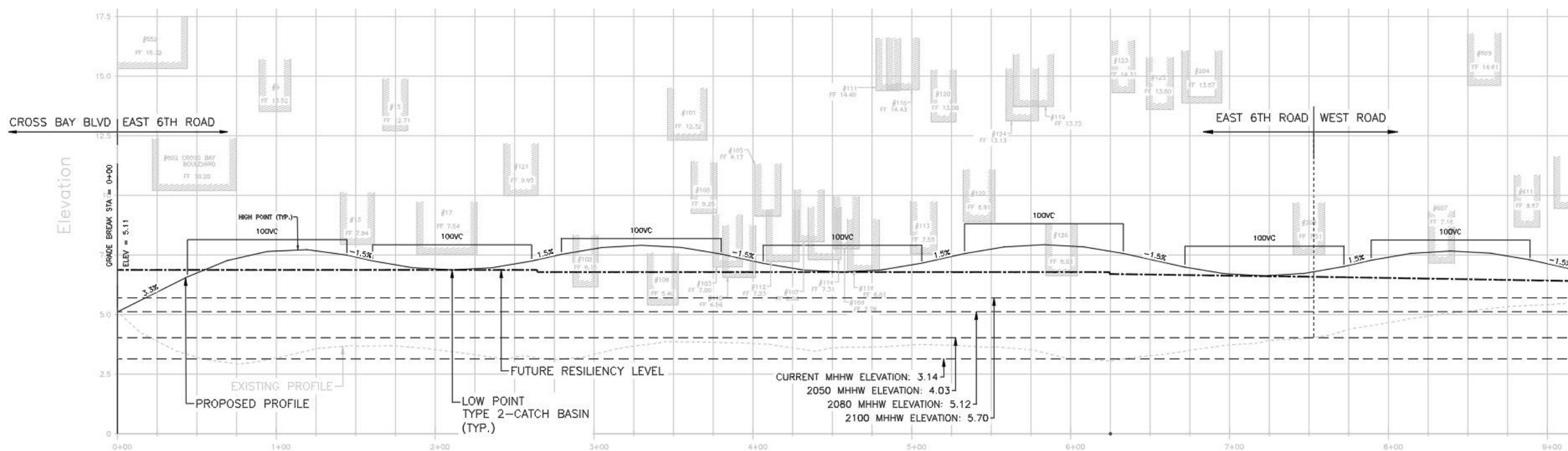
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- The study also considered what a longer-term resiliency approach would need to address if the goal is to perform under future sea level rise and rainfall conditions.
- May integrate flood wall, pump station, and/or significant property impacts.
- Requires significant capital investment and major infrastructure improvements.
- Impacts extend neighborhood-wide, including intersections, utilities, and building elevations.
- Would require coordination across multiple agencies.
- Broader study area needed to evaluate and implement coastal flood protection measures.

# Concept 3 – Road Profile

East 6th Rd Study

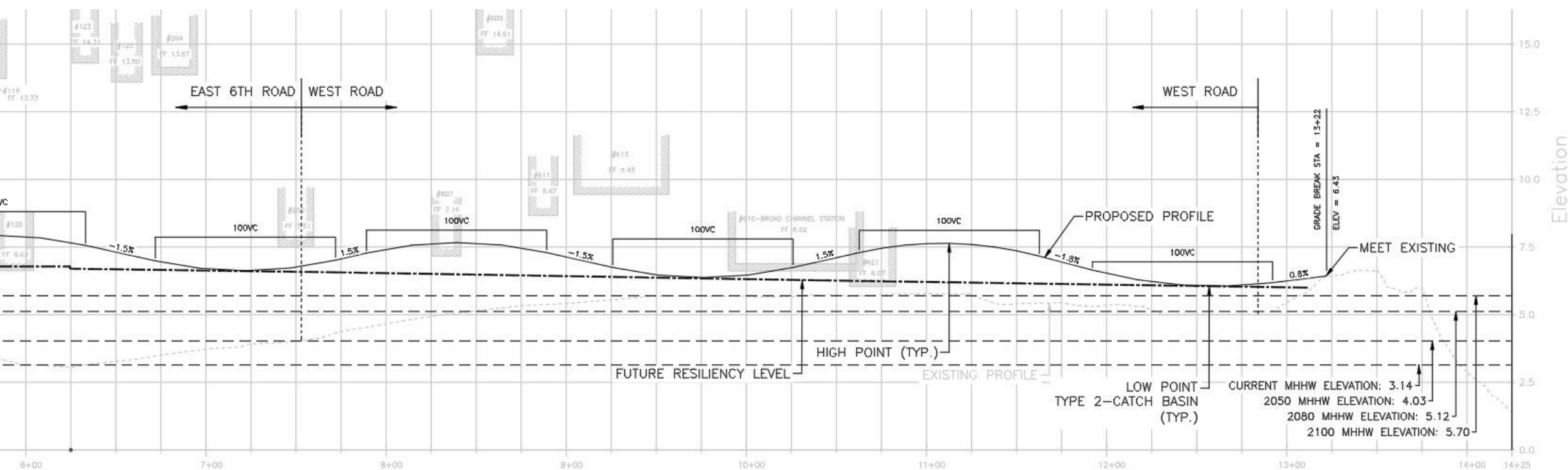
## PROPOSED ROAD PROFILE ALONG EAST 6TH ROAD AND WEST ROAD



# Concept 3 – Road Profile (cont'd)

East 6th Rd Study

## PROPOSED ROAD PROFILE ALONG EAST 6TH ROAD AND WEST ROAD



## Conclusions

- The study illustrated that flooding is caused by multiple overlapping conditions with complex engineering constraints.
- Concept 1 presents near-term roadway/drainage improvements that could reduce recurring flooding.
- Long-term resiliency (Concept 3) requires broader neighborhood wide planning which this study will inform.

## Next Steps

- Presentation to OMB
- Report to Inform Next Steps to DOT