
**NEW JERSEY INSTITUTE OF TECHNOLOGY
HAZARD MITIGATION WORKSHOP**

“Getting to the top of the LTCP Mountain – One self-operable step at a time” -

**A Presentation on Effective Flood Mitigation and
Long Term Control Plan (LTCP) Implementation**

By Christine M. Vaccaro, PE

INTRODUCTION TO THE PRESENTER



Christine M. Vaccaro, PE

Senior Project Manager

Suburban Consulting Engineers, Inc.

OUTLINE OF TOPICS

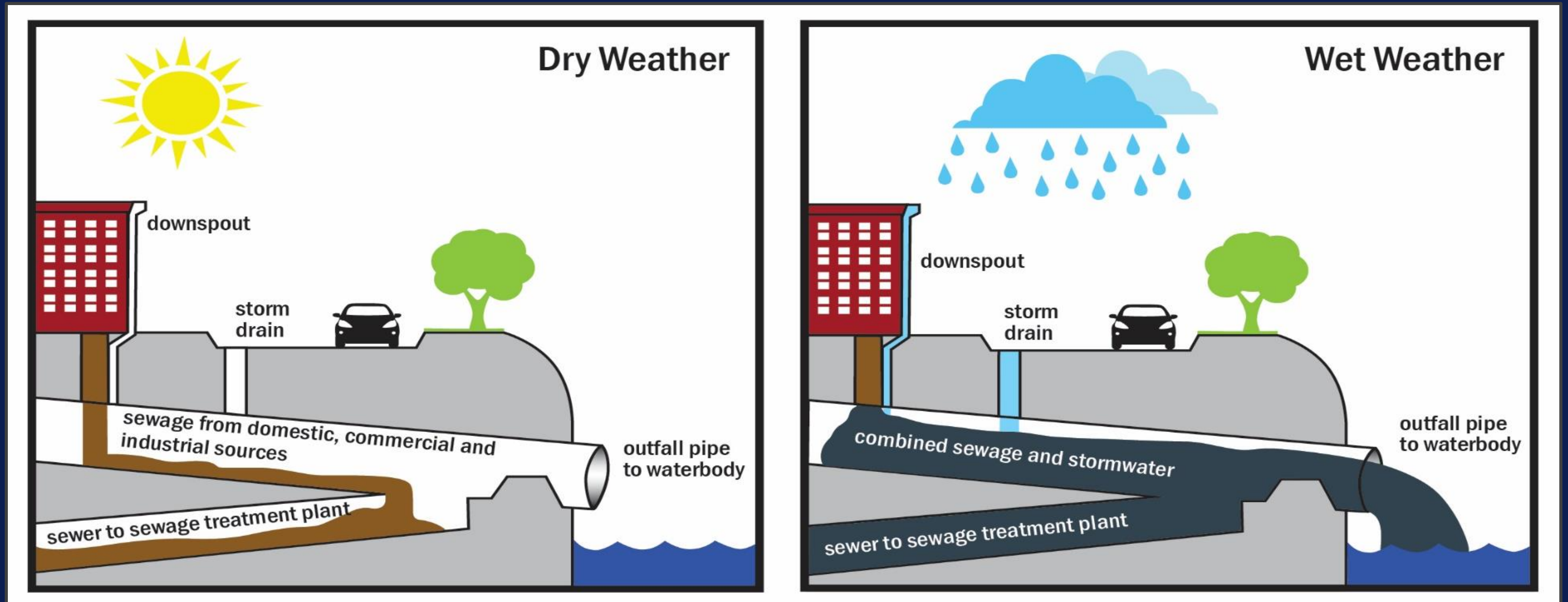
WHAT WE'LL DISCUSS

- NJDEP Combined Sewer Overflow Program Overview
- The City of Hackensack's LTCP and Flooding Overview
- Implementation and Flood Mitigation Projects and Funding
- The Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) Application Process Through the New Jersey Office of Emergency Management (NJOEM)

NJDEP COMBINED SEWER OVERFLOW PROGRAM OVERVIEW



COMBINED SEWER SYSTEM OPERATION



WHERE ARE NJ CSOs?

WARNING

POSSIBLE SEWAGE OVERFLOWS
DURING AND FOLLOWING WET WEATHER
CONTACT WITH WATER MAY ALSO CAUSE
ILLNESS



AVISO

POSIBLES DESBORDAMIENTOS DE AGUAS NEGRAS
DURANTE Y DESPUÉS DE EVENTOS DE LLUVIA
EL CONTACTO CON ESTA AGUA PUEDE CAUSAR
ENFERMEDADES

- REPORT DRY WEATHER DISCHARGE TO NJDEP HOTLINE AT:
1 (877) 927-6337 (WARN-DEP)

- REPORT FOUL ODORS OR UNUSUAL DISCOLORATION TO
NJDEP HOTLINE OR PERMITTEE AT: (555) 555-5555

- NJPDES PERMIT NUMBER: NJ0#####

- DISCHARGE SERIAL NO. 001A

WWW.STATE.NJ.US/DEP/DWQ/CSO.HTM



THE CITY OF HACKENSACK'S LTCP AND FLOODING OVERVIEW

MULTI-YEAR CAPITAL IMPROVEMENTS

PROJECT IDENTIFICATION

LTCP GOAL

Mitigate and reduce CSO occurrences.



Maximize removal of stormwater discharge from the CSS.

CITY OBLIGATION

Alleviate CSS surcharging.



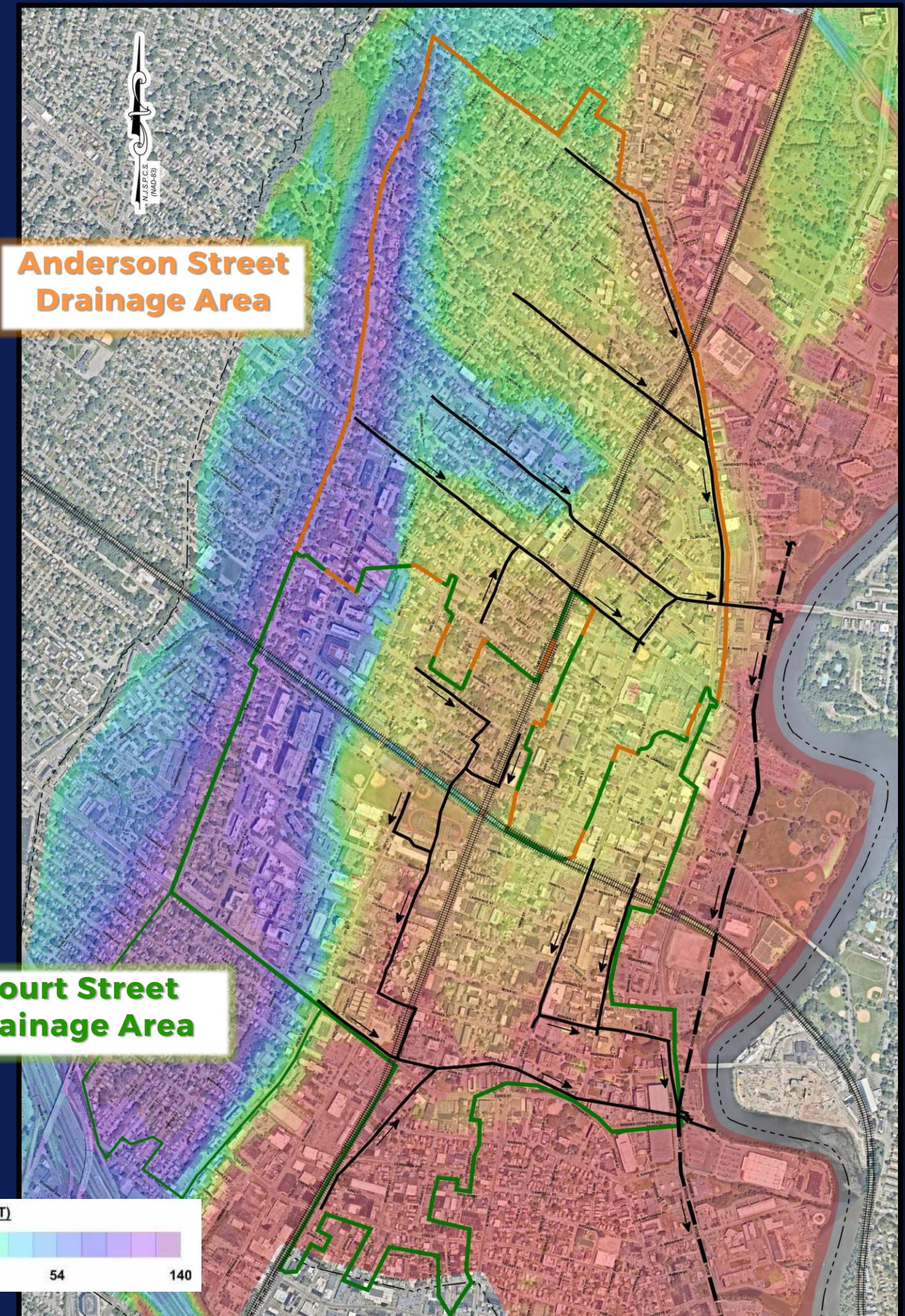
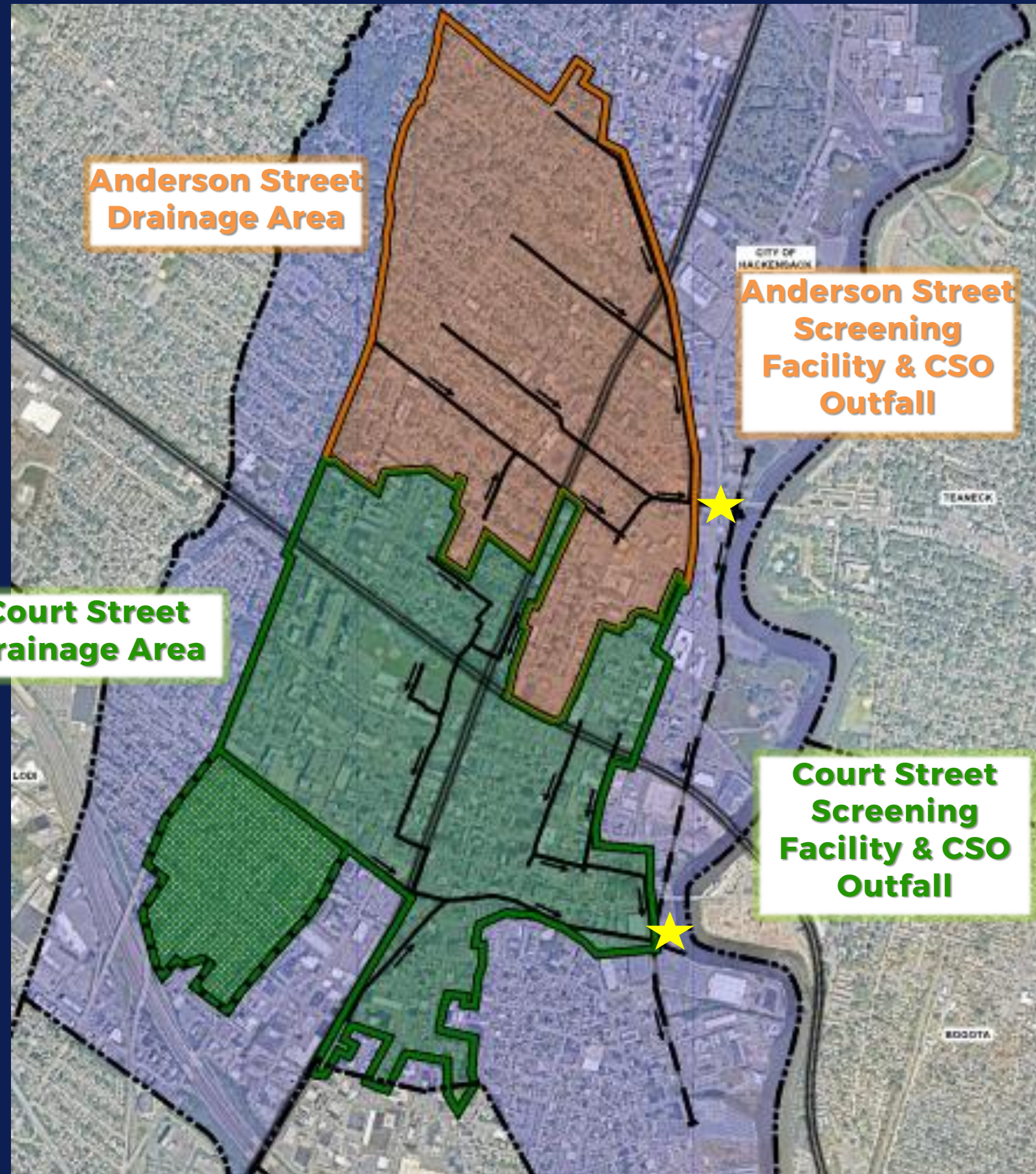
Identify critical areas in the City to mitigate CSS surcharges and localized flooding.

LIMITATIONS

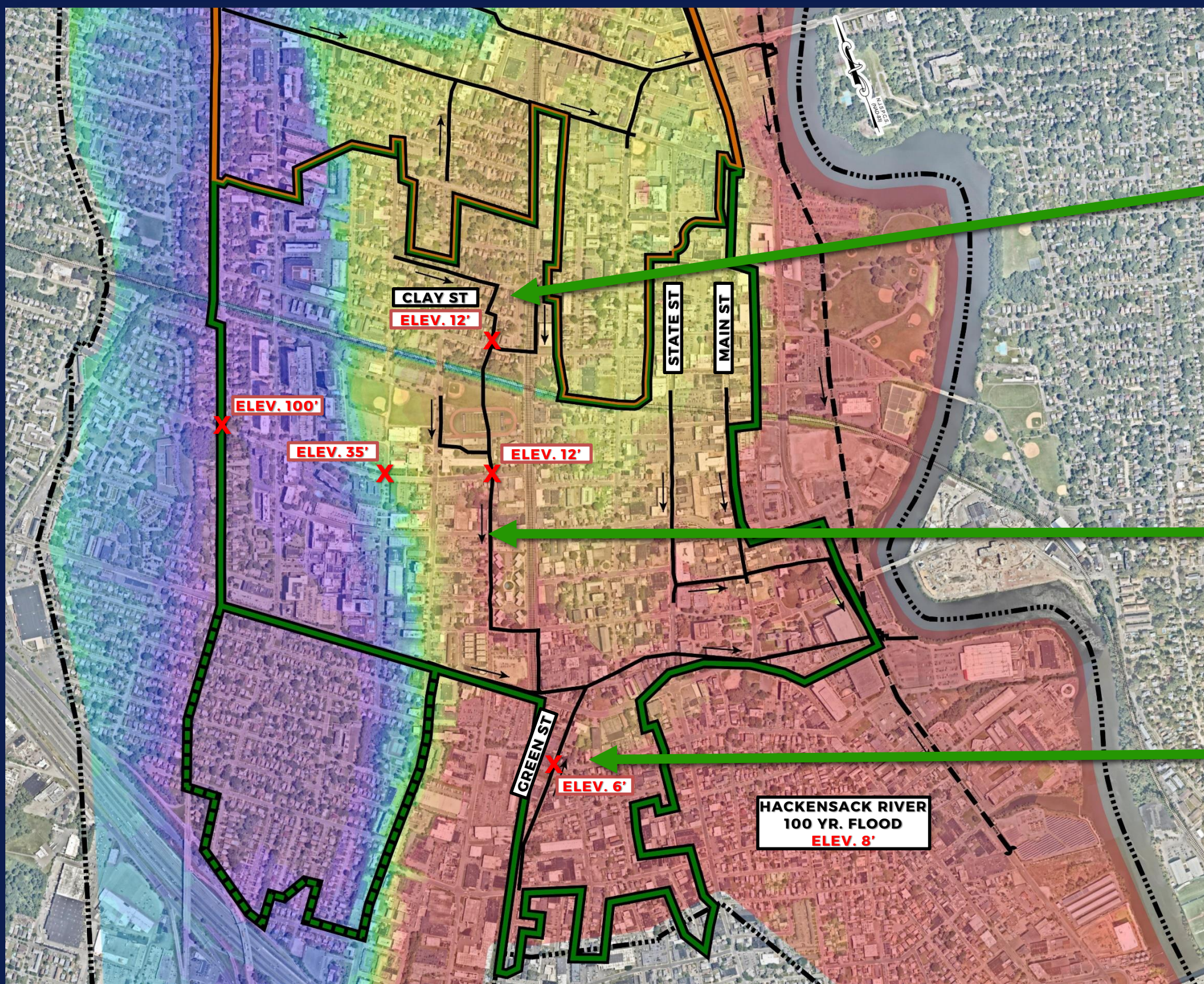
- Tidal Influence.
- Conrail Railroad.
- NJ Transit Railroad.
- Interior low-lying areas
- Minimal routes to Hackensack River.
- Unidentified CSS assets.



INFRASTRUCTURE AND TOPOGRAPHY



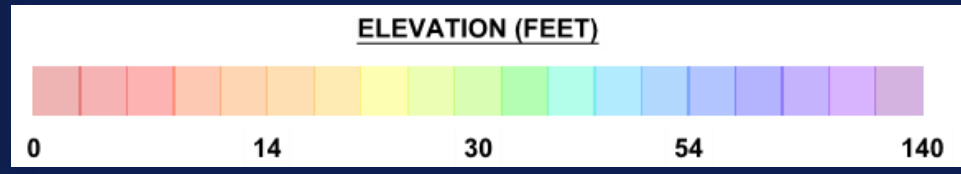
COURT STREET DRAINAGE AREA



Low lying area of Clay Street.

Path of current Combined Sewer through Court Street.

Low lying area of Green Street.





THE CITY OF HACKENSACK'S IMPLEMENTATION OF FLOOD MITIGATION PROJECTS AND FUNDING

SOURCES OF FUNDING

CLEAN WATER STATE REVOLVING FUND (CWSRF)

Principal Forgiveness Grants & Low Interest Loans

SENATE APPROPRIATIONS

Discretionary funding to eligible projects.

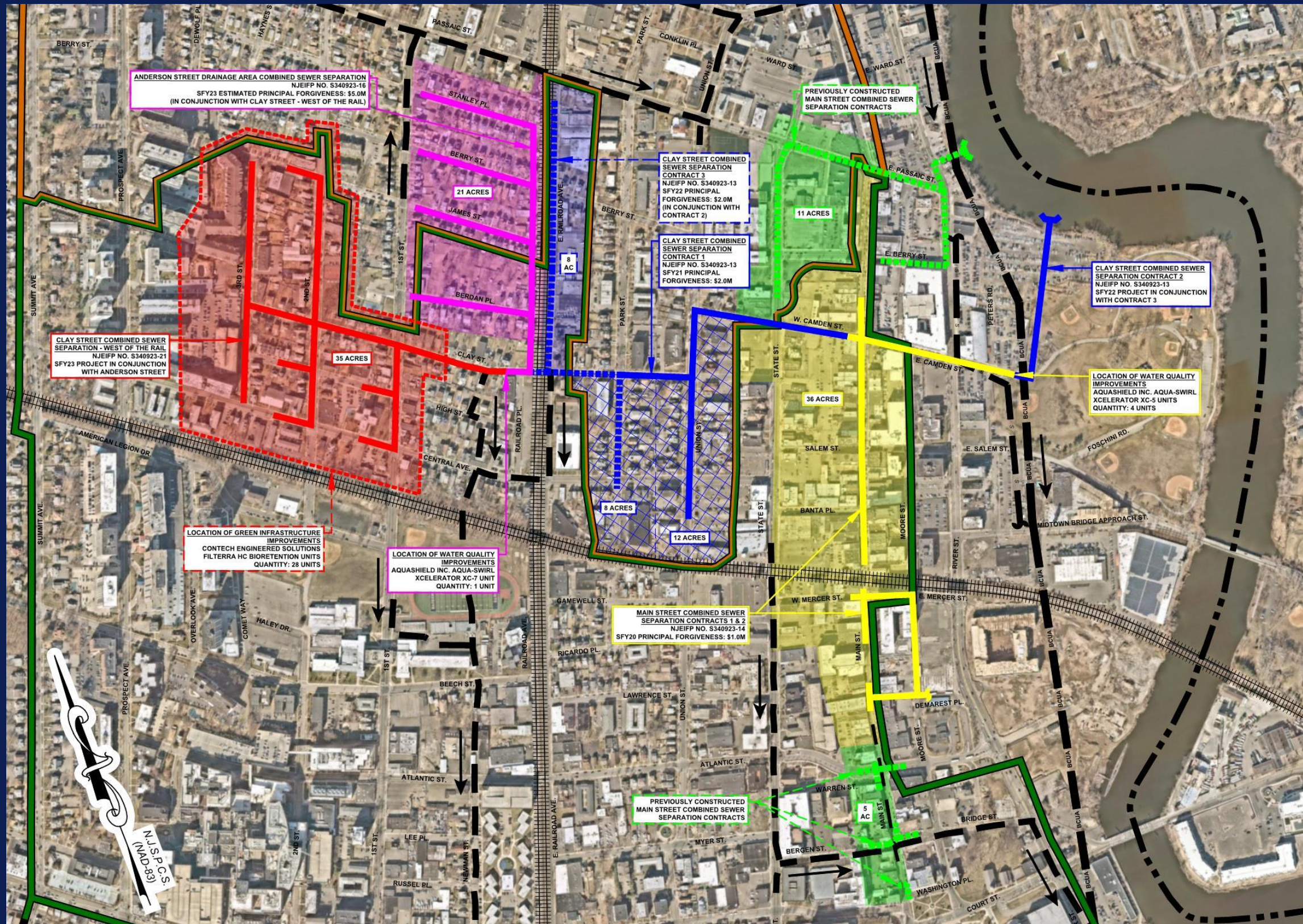
FEDERAL EMERGENCY MANAGEMENT AGENCY HAZARD MITIGATION GRANT PROGRAM (FEMA HMGP)

Disaster Relief Grants through New Jersey Office

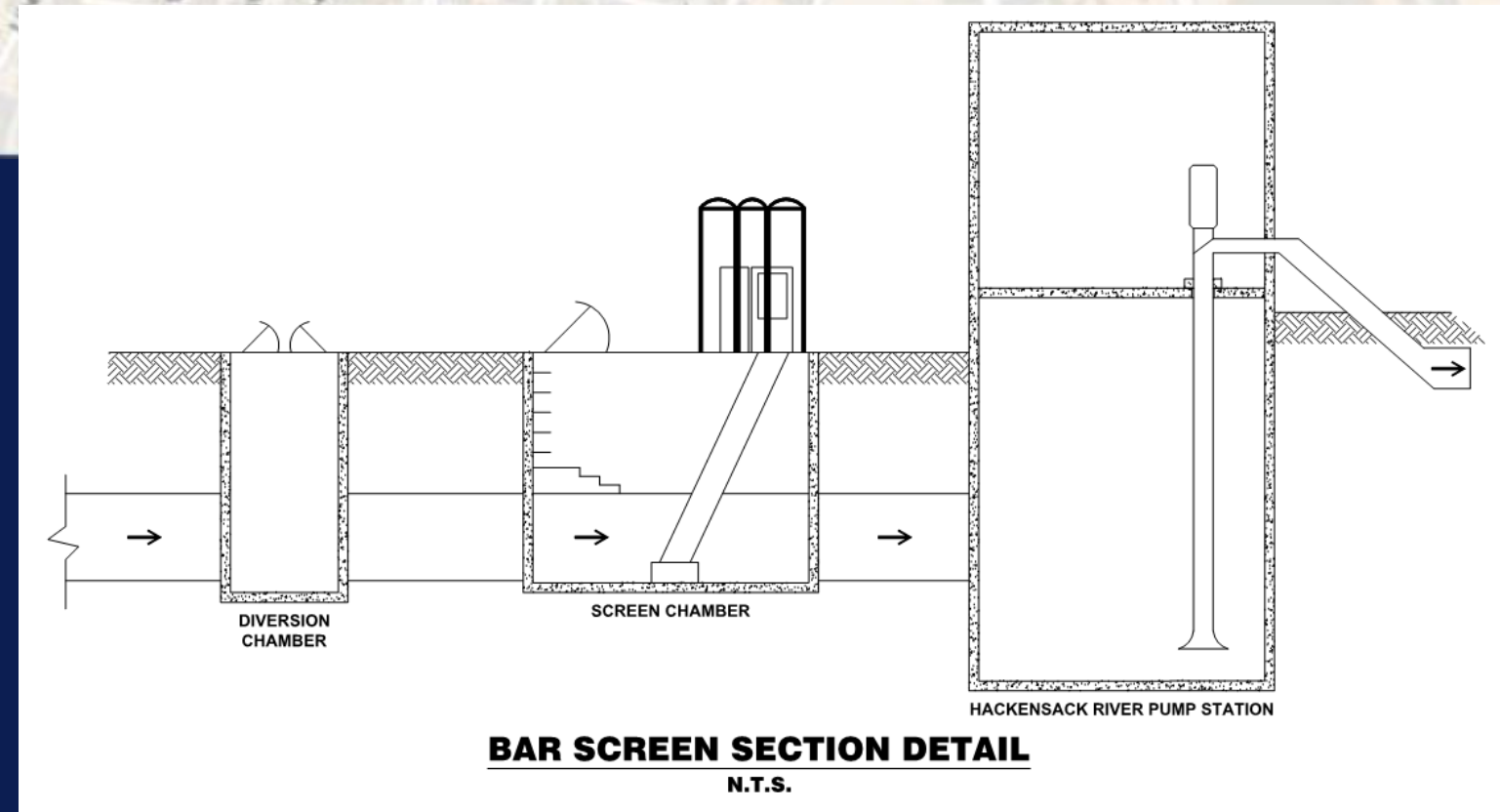
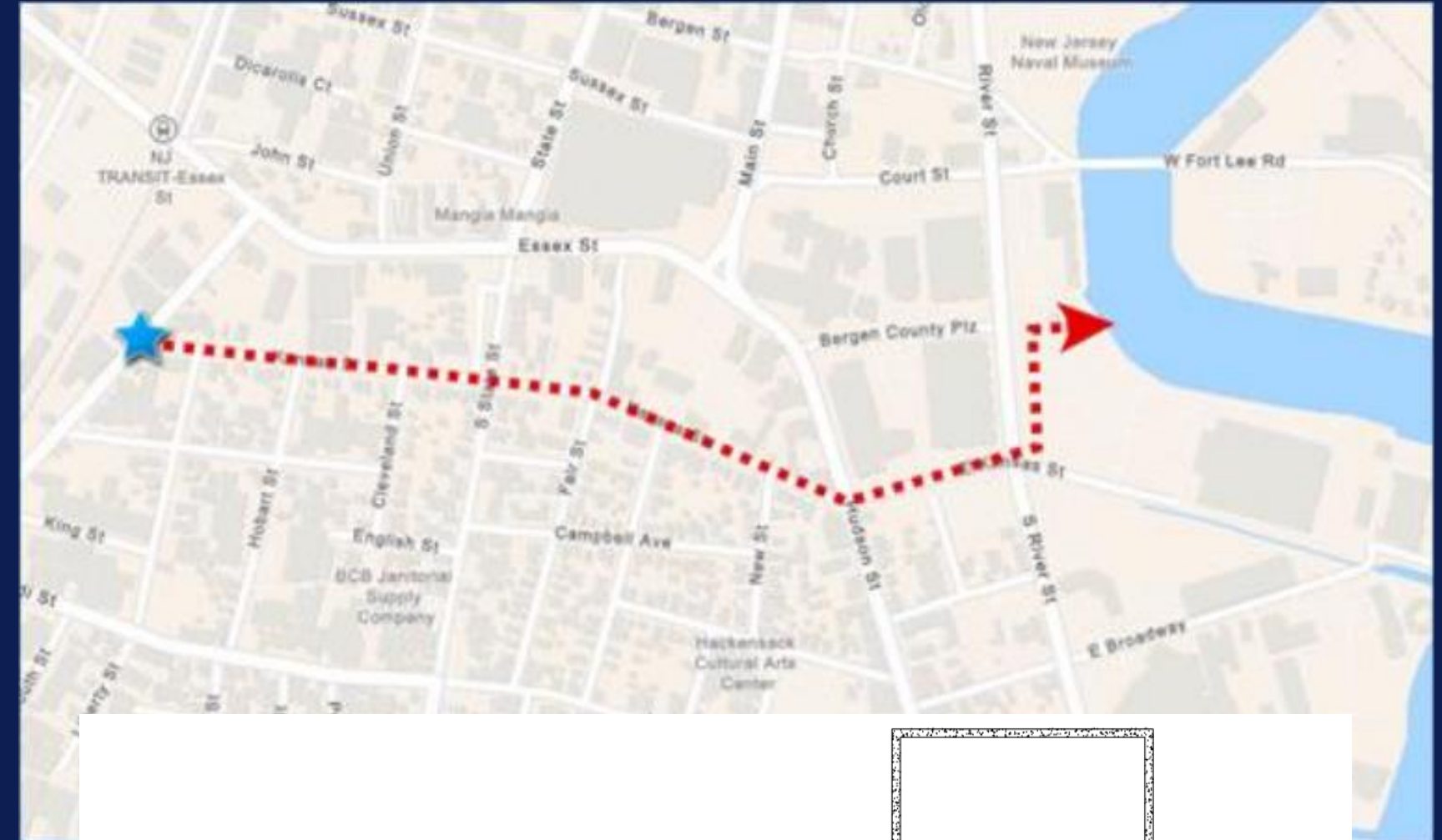
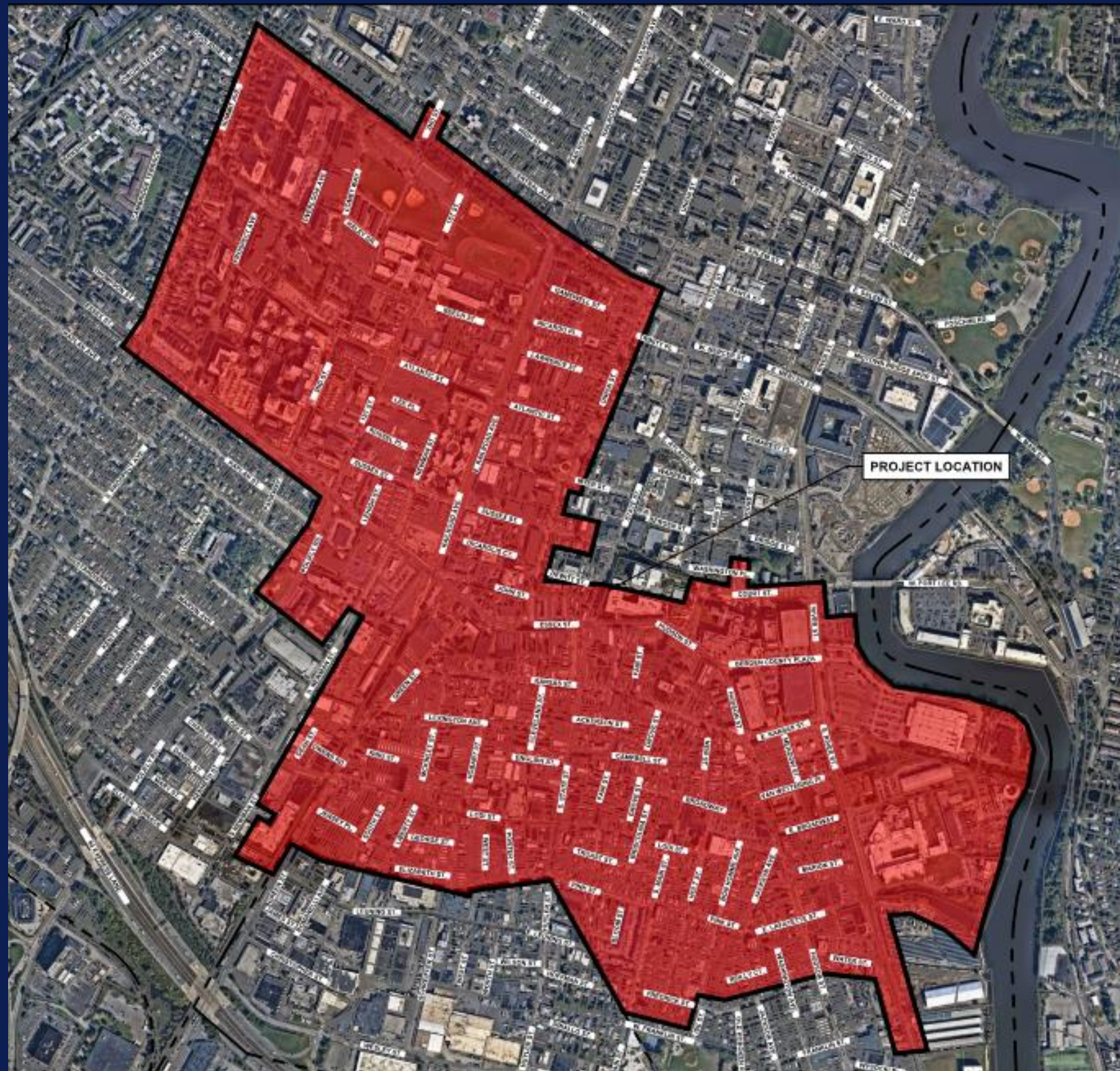


MAXIMIZE GRANT FUNDING

SPLITTING A LARGE INFRASTRUCTURE PROJECT INTO OPERABLE SEGMENTS



MAXIMIZE GRANT FUNDING DIVERSIFY SOURCES OF FUNDING



FEMA HMGP PROGRESS TOWARD PROJECT AWARD

PROJECT ELIBIGILITY

Discuss project eligibility with NJOEM.

BENEFIT COST ANAYLIS (BCA)

Prepare benefit cost analysis with NJOEM team and consultant.

SUBMISSION TO FEMA

Prepare project report and application for submission to FEMA as sub applicant to NJOEM.

RESPOND TO FEMA RFIs

Prepare plans, project documents, and responses to FEMA Requests for Information (RFI)s

PROPERTY ACQUISTION

Advance property acquisition discussions for stormwater pump station property in order to submit NJDEP Land Use Permits

ADVANCE PERMITTING

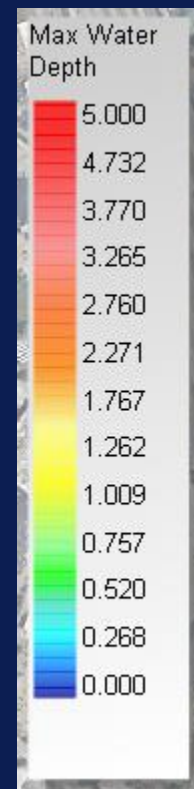
Advance design and make critical permit submissions.

- NJDEP Land Use
- NJDEP Tidelands
- United States Army Corps. Of Engineers (USACE) Nationwide

BENEFIT-COST ANALYSIS (BCA)



EXISTING



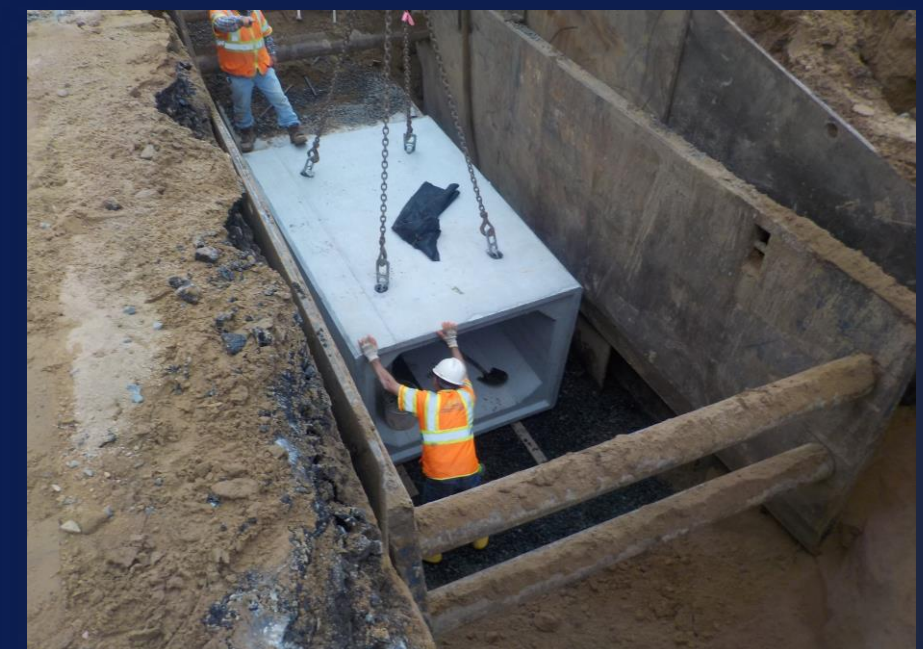
PROPOSED

Benefits-Costs Summary	
Drainage Improvement @ 222 2nd St, Hackensack, New Jersey, 07601	
Total Standard Mitigation Benefits:	\$128,179,123
Total Social Benefits:	\$0
Total Mitigation Project Benefits:	\$128,179,123
Total Mitigation Project Cost:	\$41,424,433
Benefit Cost Ratio - Standard:	3.09
Benefit Cost Ratio - Standard + Social:	3.09

CONSTRUCTION COSTS

<u>Project</u>	<u>CWSRF Number</u>	<u>Total Project Costs</u>	<u>Anticipated Relief</u>	<u>Anticipated Relief Funding Source</u>
Main Street Contracts A & B	S340923-14	\$5.7M	\$1M	SRF SFY20 PF
Clay Street Contract 1	S340923-13	\$6M	\$2M	SRF SFY21 PF
Clay Street Contract 2	S340923-13*	\$2.9M	\$2M	SRF SFY22PF
Clay Street Contract 3	S340923-13*	\$6.1M		
Anderson Street Drainage Area	S340923-16*	\$11.25M	\$9M	SRF ARPA 80% PF
Clay Street West of Rail	S340923-21*	\$13.6M	\$10.1M	SRF ARPA 80% PF
			\$3.5M	Senate Appropriation FFY23
Carver Park	S340923-21*	\$1.4M	\$0.4M	SRF ARPA 80% PF
			\$1M	Senate Appropriation FFY22
FEMA HMGP	N/A*	\$40M	\$32M	FEMA HMGP
		\$87M	\$61M	

*Projects are still ongoing - costs are estimated





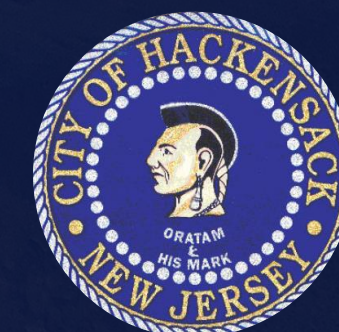
SUBURBAN
CONSULTING
ENGINEERS Inc.

THANK YOU

QUESTIONS?

SPECIAL THANKS TO
ALL INVOLVED

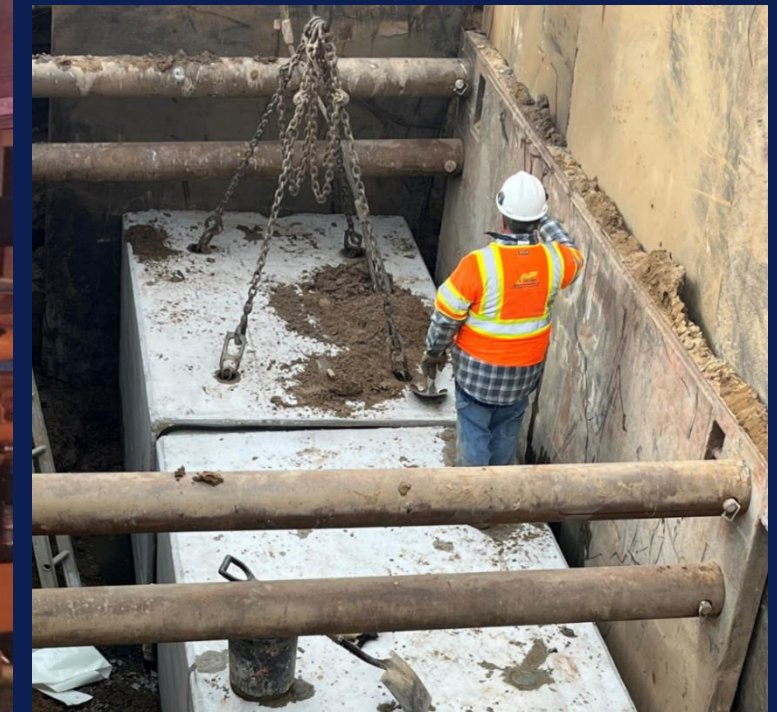
www.suburbanconsulting.com



MAJOR DESIGN COMPONENTS

LINEAR STORAGE & CIPP LINING

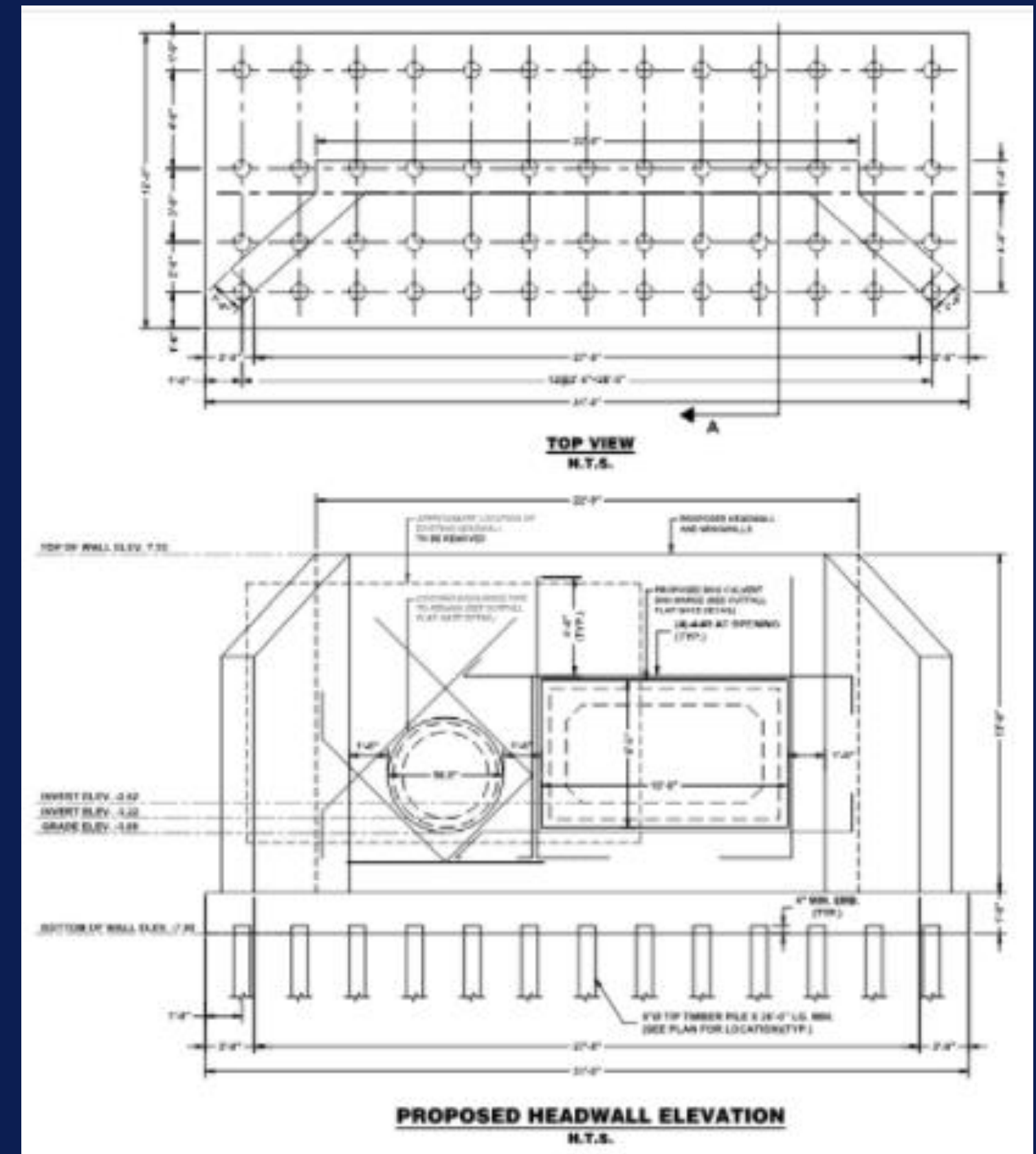
- Maintain and line existing CSS infrastructure with Cured In Place Pipe (CIPP) lining.
- 4'X5' and 4'X8' boxed culvert at minimal slopes for linear storage.



MAJOR DESIGN COMPONENTS

OUTFALL CAPACITY

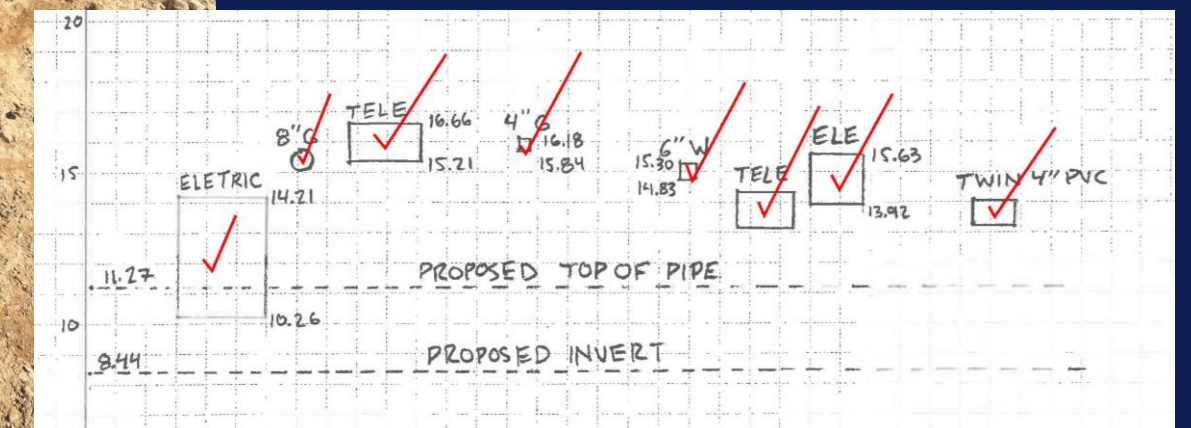
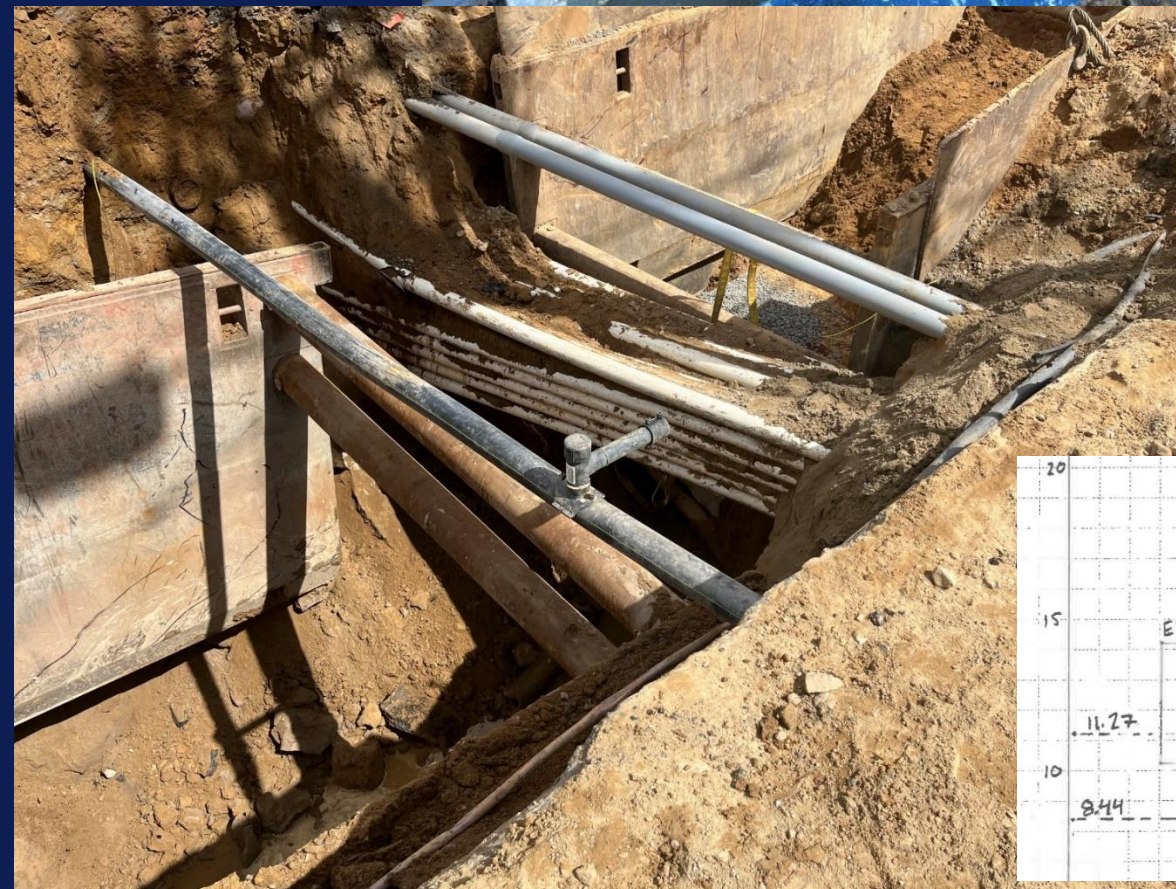
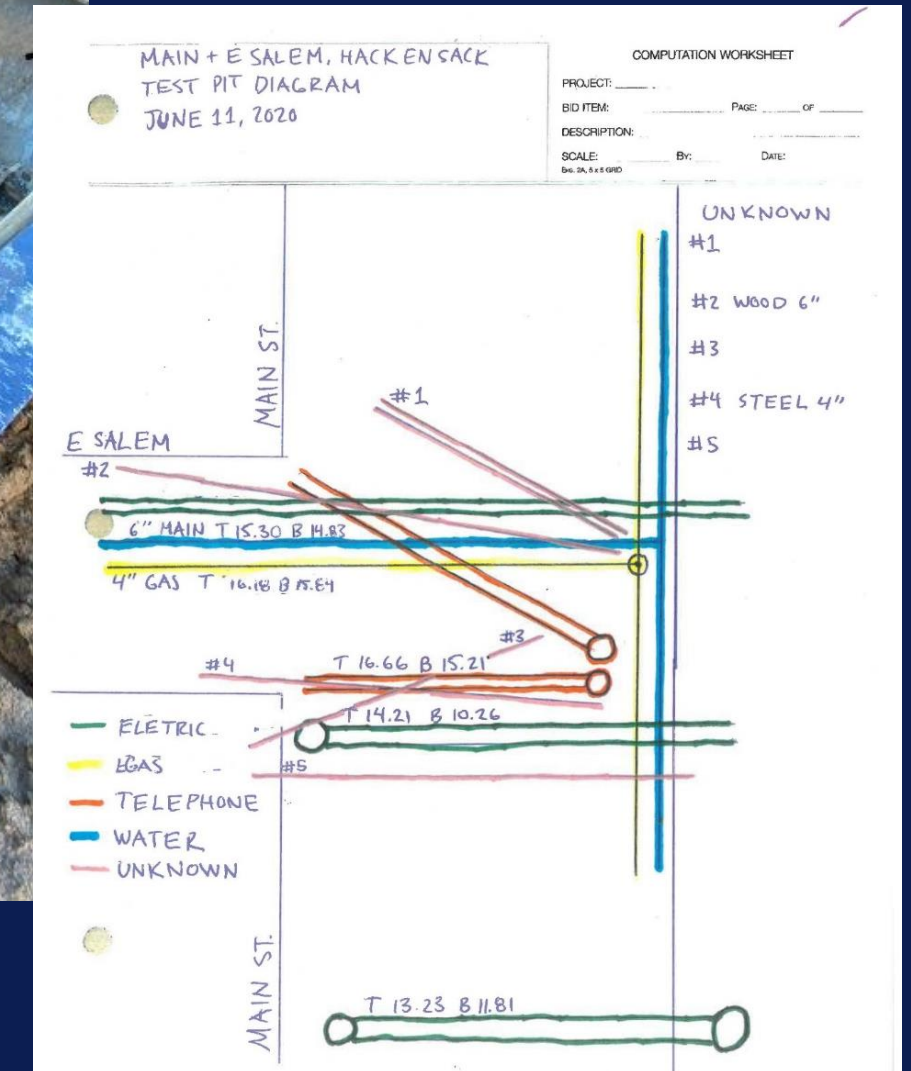
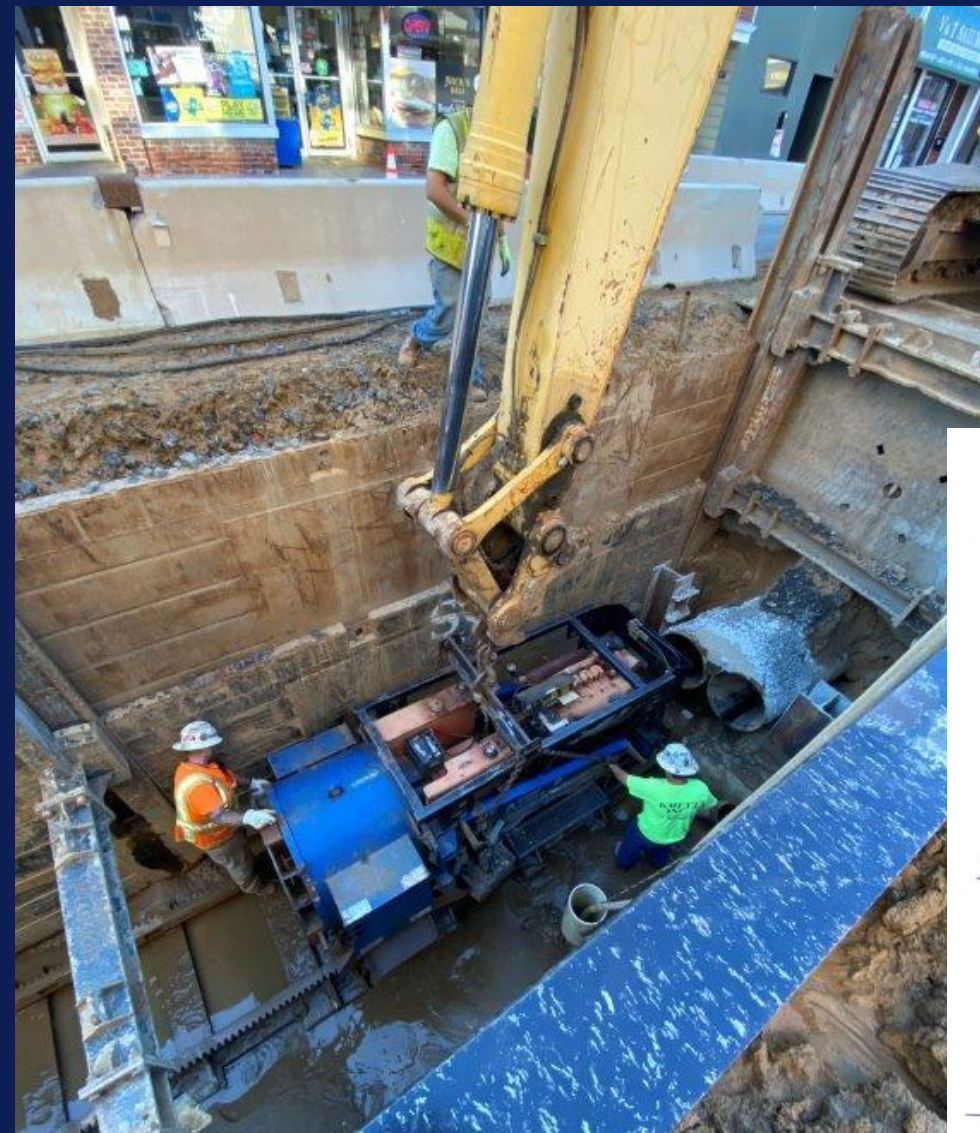
- Increase the size of existing outfall near Foschini Park.
- Hydraulically separate park drainage from culvert receiving upstream flows.
- NJDEP Flood Hazard Area (FHA), Waterfront Development (WFD), and Tidelands Utility License.



MAJOR DESIGN COMPONENTS

MAJOR R.O.W. CROSSINGS

- Jack and bore under NJT Railroad and 20" water transmission line within NJT R.O.W.
- Install receiving pit without impacting CSS trunk line.
- Deep excavation adjacent to NJT Rail.
- Crossing major utility corridors with large proposed storm sewer.



HACKENSACK'S LONG TERM CONTROL PLAN (LTCP)

DEFINITION

LTCP is a system wide evaluation of the sewage infrastructure and the hydraulic relationship between the sewers, precipitation, treatment capacity, and overflows.

PURPOSE

Reduce combined sewerage overflows to obtain permit compliance.

- Reduce the number of overflows to four (4) per year or
- Capture 85% of the volume of combined sewerage overflows.

REQUIREMENTS

- Permittees must evaluate alternatives that will reduce or eliminate the discharges and develop a plan and implementation schedule to achieve those goals.
- NJDEP required Hackensack to Evaluate:
 - Green Infrastructure.
 - Sewer separation.
 - Infiltration/inflow control.
 - End of pipe treatment.
 - Storage - tanks or tunnel.

IMPROVEMENTS

- Court Street Stormwater Project.
- Localized partial sewer separation projects.
- Green Infrastructure.
- Anderson Street Storage Tank (as needed).

CSO PROGRAM OBJECTIVE

- ✓ Reduce or eliminate CSO discharges through study, design, and implementation of the Long-Term Control Plan (LTCP).
- ✓ New Jersey Pollutant Discharge Elimination System (NJPDES) permits are not construction permits but rather focus on discharge quality.
- ✓ All New Jersey facilities have selected a minimum of 85% wet weather capture under the Presumption Approach (i.e., reducing CSO discharges through CSO control measures) consistent with the Federal CSO Control Policy.

$$\text{Percent Capture} = \frac{(\text{Total System Wet Weather Inflow} - \text{Total CSO Volume})}{(\text{Total System Wet Weather Inflow})}$$

TYPES OF PROJECTS

7 CSO CONTROL STRATEGIES

1. Sewage Treatment Plant Expansion.
2. Increased Storage Capacity in the Collection System.
3. Sewage Treatment Plant Bypass.
4. I/I Reduction.
5. Sewer Separation.
6. Treatment at the CSO Discharge.
7. Green Infrastructure.

