



**CITY OF SOUTHPORT
BOARD OF ALDERMEN
SPECIAL PUBLIC INFORMATION SESSION**
223 E. BAY STREET
February 27, 2023
3:00 PM

Agenda

Please turn off all cell phones

Meetings are open to the public. Face masks and social distancing may be used at the discretion of each individual. The Board of Aldermen reserve the right to make changes to this policy, as needed to help prevent the spread of the Coronavirus.

If you are not able to attend the Board of Aldermen meetings in person, the meeting will be available for you to watch via live-stream on the City of Southport website (<https://cityofsouthport.com/board-of-aldermen-meetings/>), Facebook page, and YouTube channel.

ETHICS STATEMENT:

"If any members know of any conflict of interest or the appearance of a conflict of interest concerning matters on the agenda, please so state at this time."

- A. Call to Order**
- B. Invocation**
- C. Pledge of Allegiance**
- D. Approval of Agenda**
- E. Agenda**
 - 1. Shoreline Stabilization Project (Chris Creed, Olsen Associates)
 - 2. Public Questions/Comments on Shoreline Stabilization Project
 - 3. Mulberry Branch Wastewater Treatment Plant Expansion (Carter Hubard, WK Dickson Engineering)
 - 4. Utility Merger Feasibility Study (Walter Gross, Wooten Engineering)
 - 5. USDA Sewer Replacement (Walter Gross, Wooten Engineering)
 - 6. City-Wide Sewer Rehabilitation (Carter Hubard, WK Dickson)
 - 7. Sewer Lift Station Rehabilitation (Carter Hubard, WK Dickson)
 - 8. Public Questions/Comments on Wastewater Projects
- F. Board Comments and Questions**
- G. Adjourn**

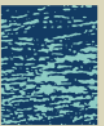
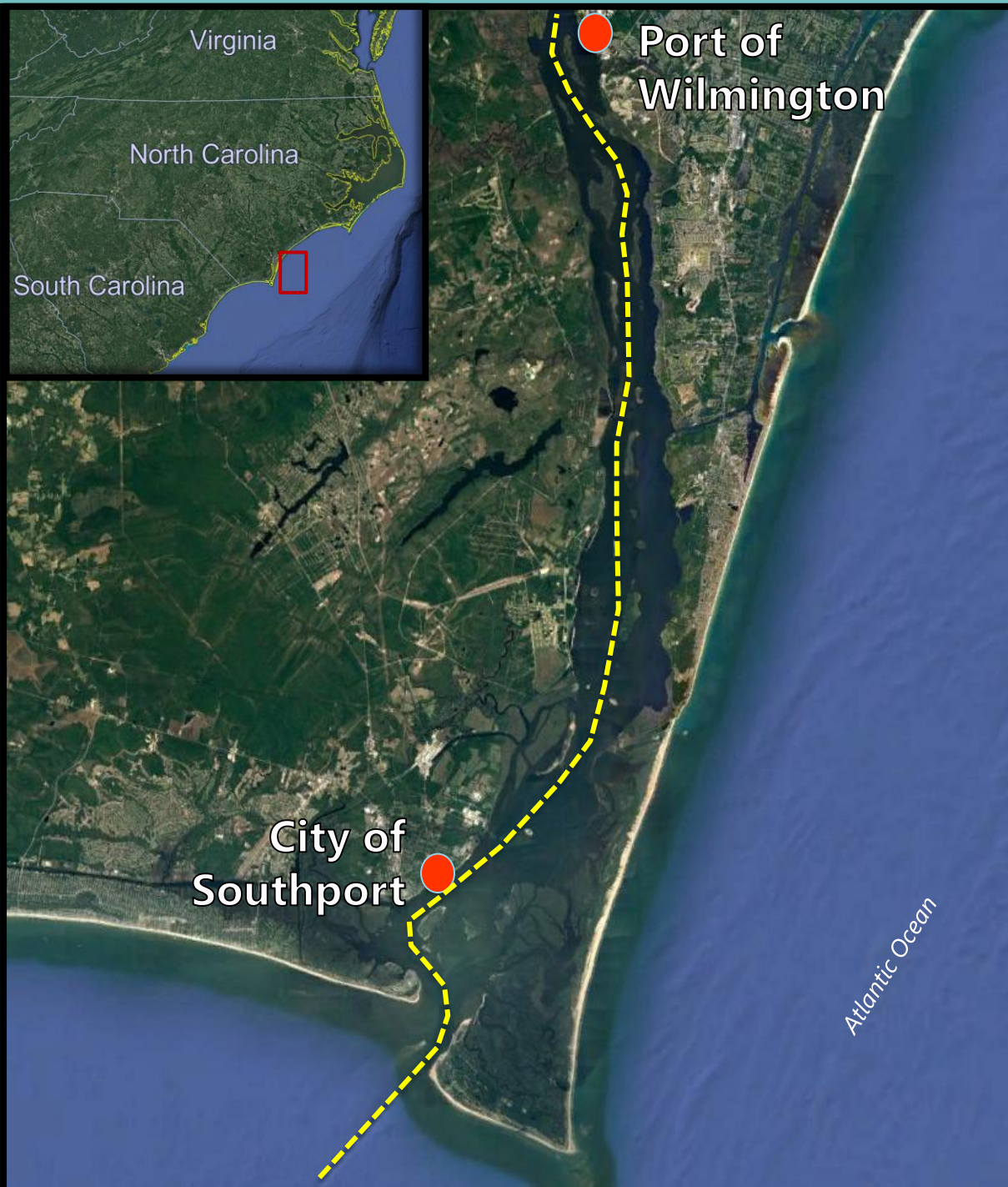


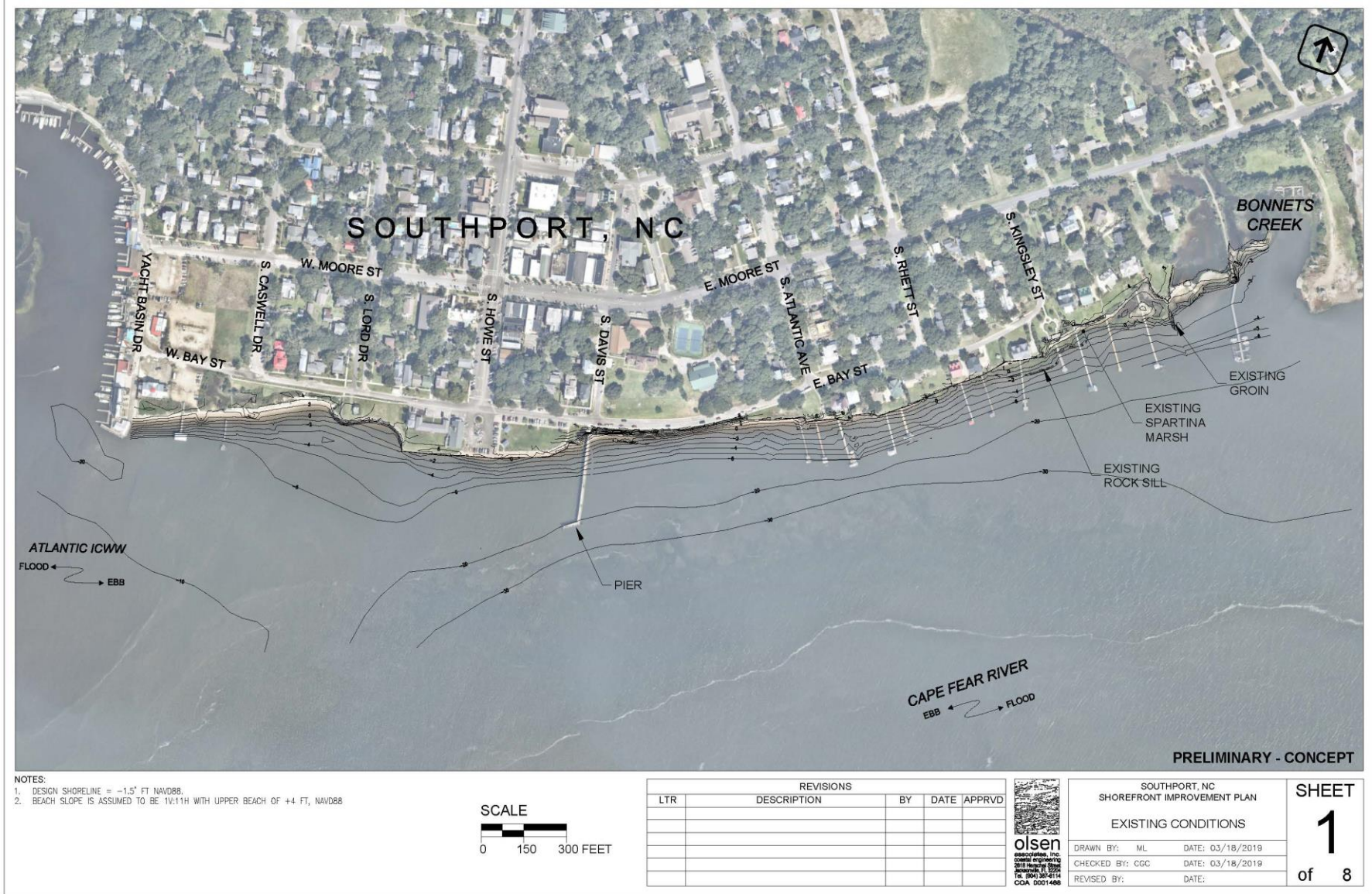
City of Southport
Board of Alderman Workshop
February 27, 2023



SHORELINE IMPROVEMENT PROJECT

Chris Creed, P.E.
olsen associates, inc.
ccreed@olsen-associates.com

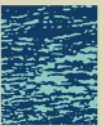


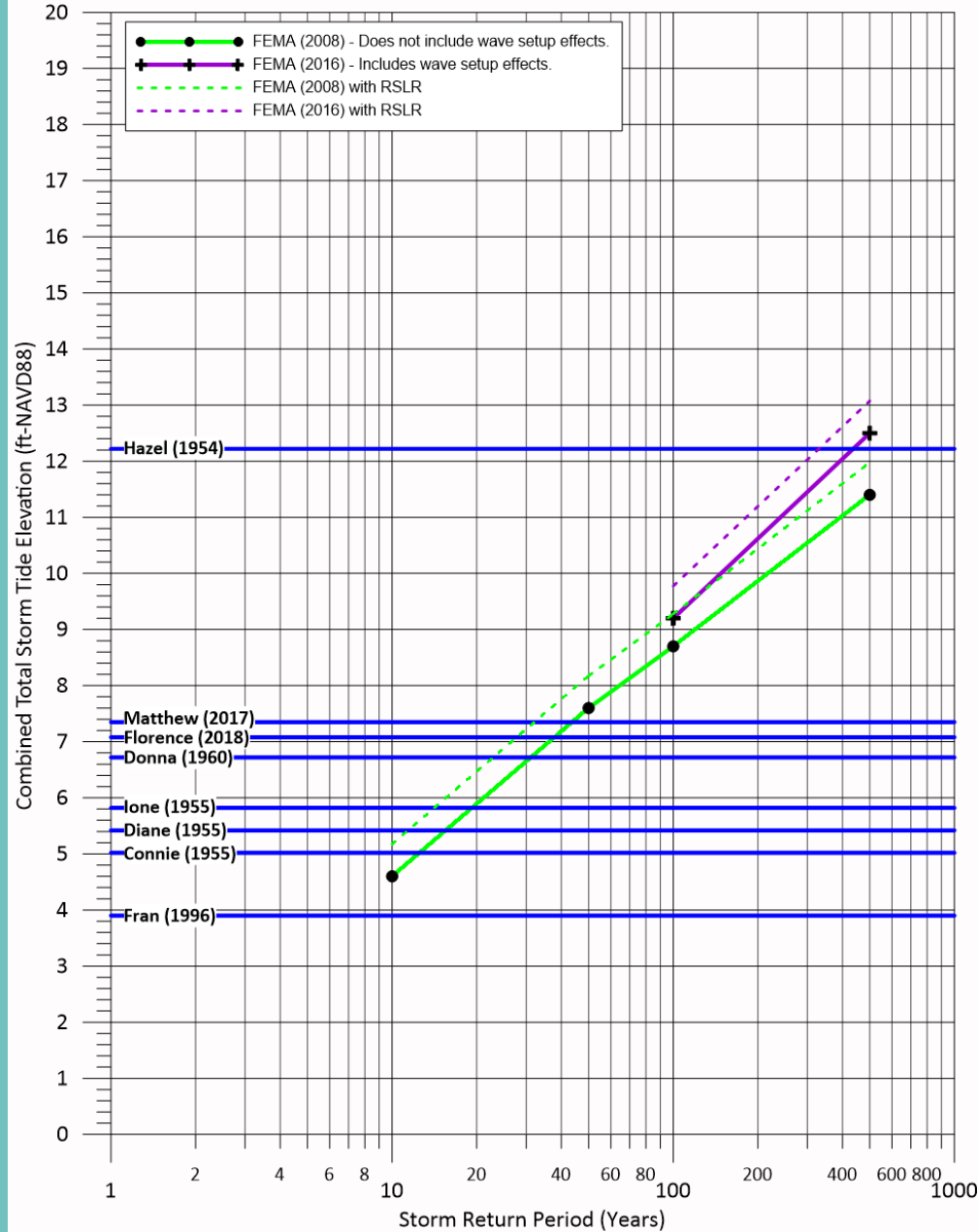


Existing Conditions

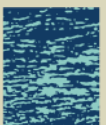
Site Conditions / Considerations

- Highly Eroded Shoreline (4,000 ft +/-) (widespread armoring)
- High Erosional Stress
 - Storm surge
 - Wind waves
 - Ship/boat generated waves
- Future Port of Wilmington Expansion
 - Channel deepening
 - Increase in ship size and frequency
- Sea Level Rise (SLR)



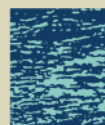


Storm Surge Predictions





Dominant Wind Wave Fetches



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Table 9. Relative sea level rise by 2045 considering potential increased rates of sea level rise (RCP 2.6 which is the lowest greenhouse gas emission scenario, combined with vertical land movement at each tide gauge).*

Station	RCP 2.6 + VLM			
	RSLR in 30 years, inches			
	Mean	Low	High	95% CI
Duck	7.1	4.8	9.4	2.3
Oregon Inlet	6.3	3.9	8.7	2.4
Beaufort	6.5	4.2	8.7	2.3
Wilmington	5.8	3.5	8.0	2.3
Southport	5.9	3.7	8.2	2.3

**Note: Projections were rounded to the nearest tenth of an inch.*

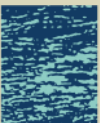
Table 10. Relative sea level rise by 2045 considering potential increased rates of sea level rise (RCP 8.5 which is the highest greenhouse gas emission scenario, combined with vertical land movement at each tide gauge).

Station	RCP 8.5 + VLM			
	RSLR in 30 years, inches			
	Mean	Low	High	95% CI
Duck	8.1	5.5	10.6	2.5
Oregon Inlet	7.3	4.7	9.9	2.6
Beaufort	7.5	5.0	10.0	2.5
Wilmington	6.8	4.3	9.3	2.5
Southport	6.9	4.4	9.4	2.5

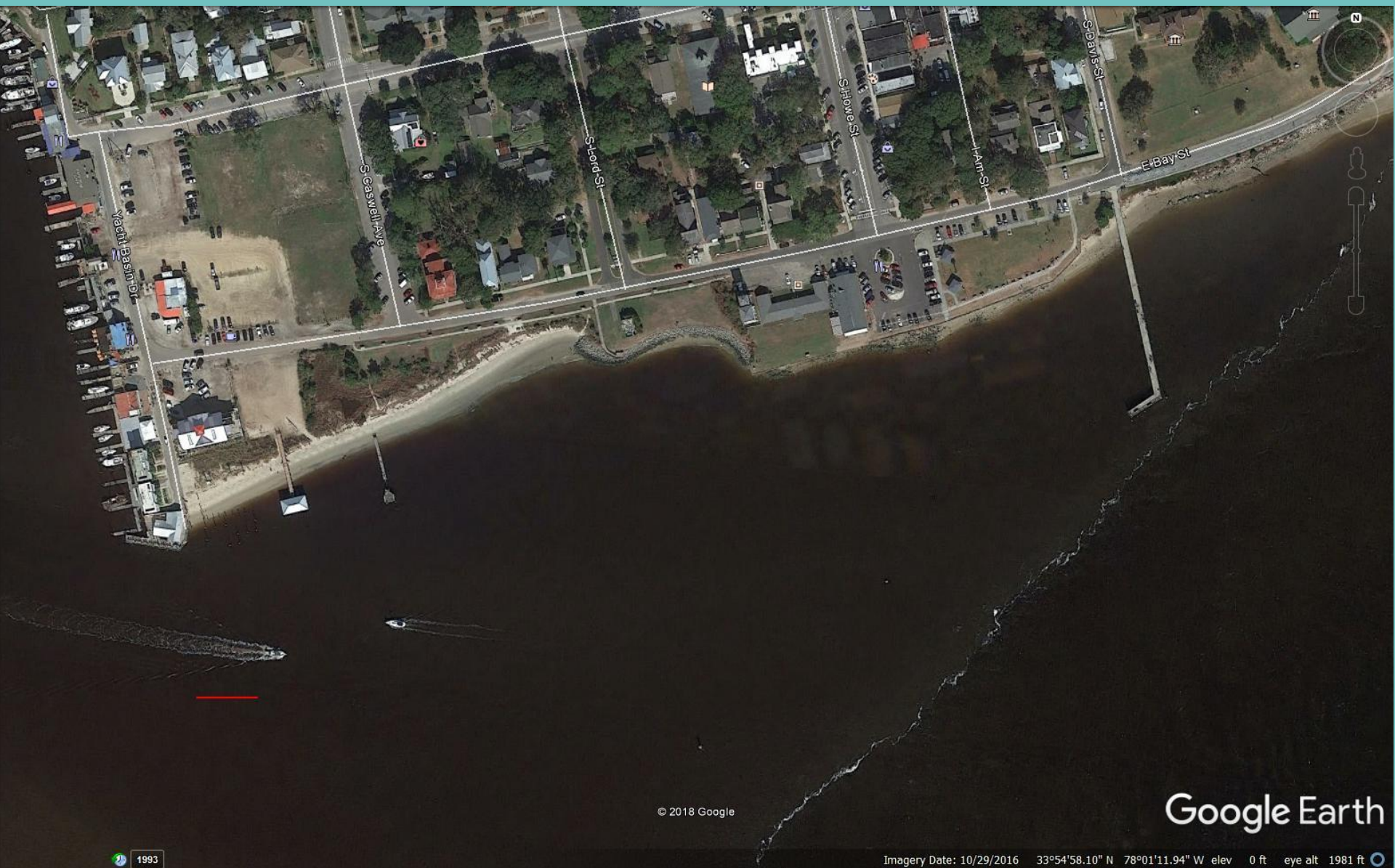
**Note: Projections were rounded to the nearest tenth of an inch.*



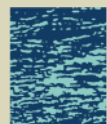
Sea Level Rise







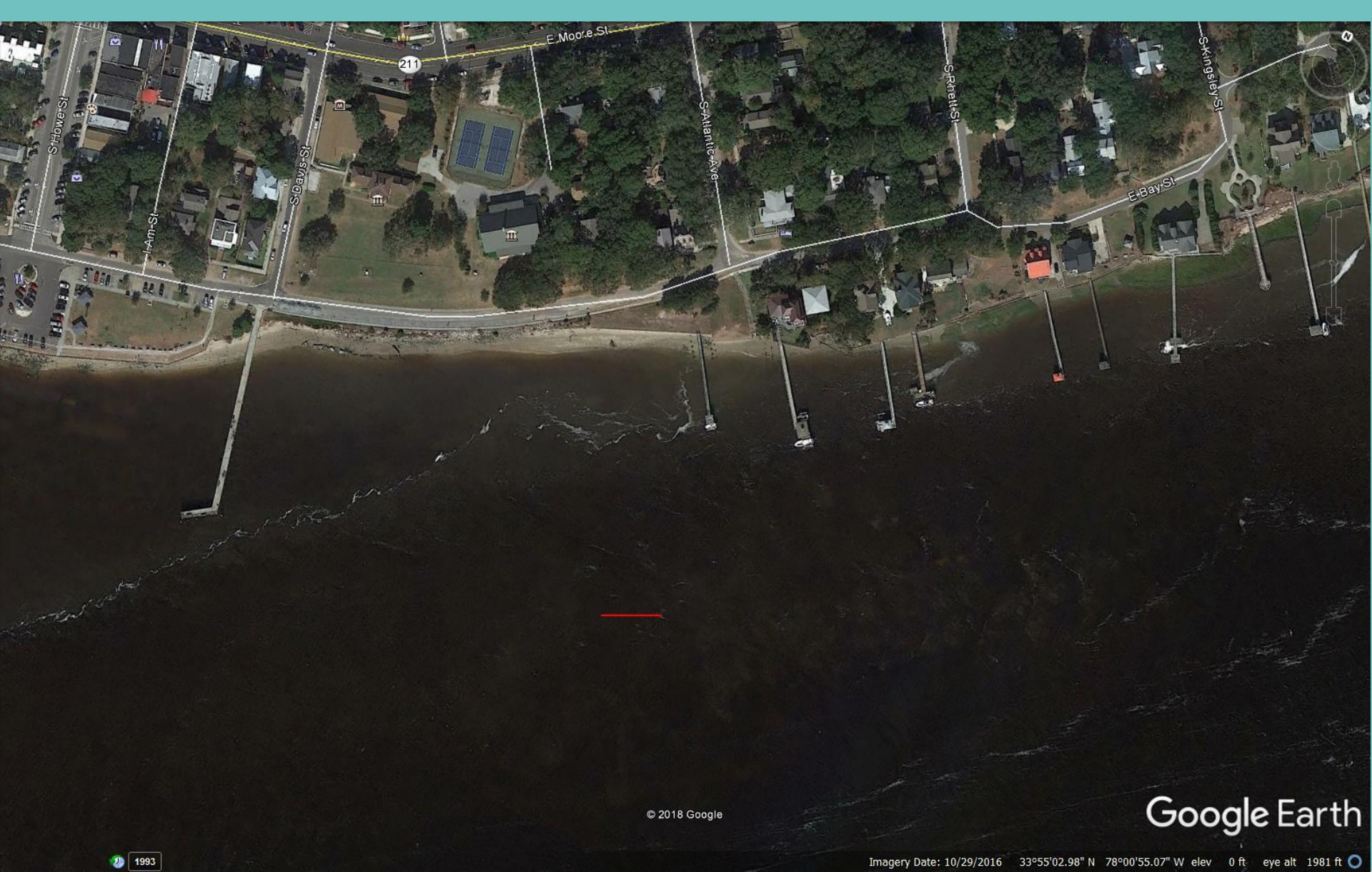
Sections 1, 2 and 3



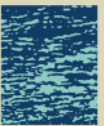


Section 2



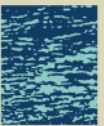


Sections 4 and 5





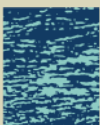
Section 4



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Coastal Engineering

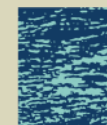


Section 5



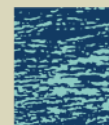


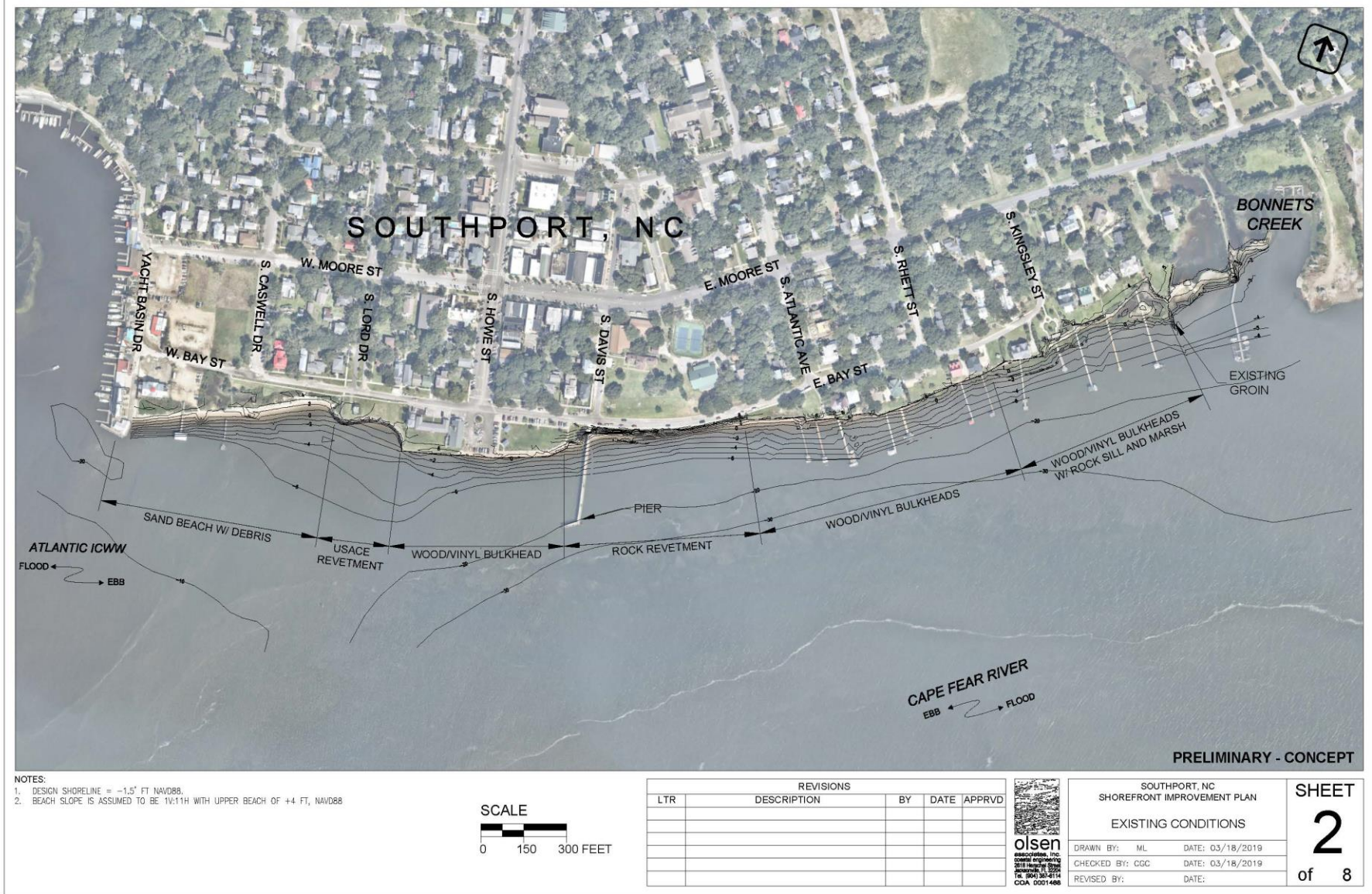
Sections 5 and 6





Section 6





Shoreline Sections



Southport, NC

Atlantic Intracoastal Waterway

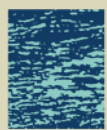
Lower Cape Fear River

Wilmington Harbor Federal Channel

~1,000 feet

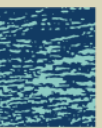


Federal Navigation Channels



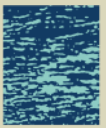
Project Goals

- Comprehensive shoreline stabilization
- Protect shoreline and upland from...
 - Continued erosion and loss of land
 - Ship generated waves (existing and future)
 - Sea level rise (SLR) and increase frequency and magnitude of flooding
- Enhance and protect environmental resources of the area
- Increase the recreational value (access and use)
- Improve and expand 'living shoreline' features



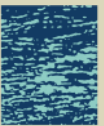
Project Approach

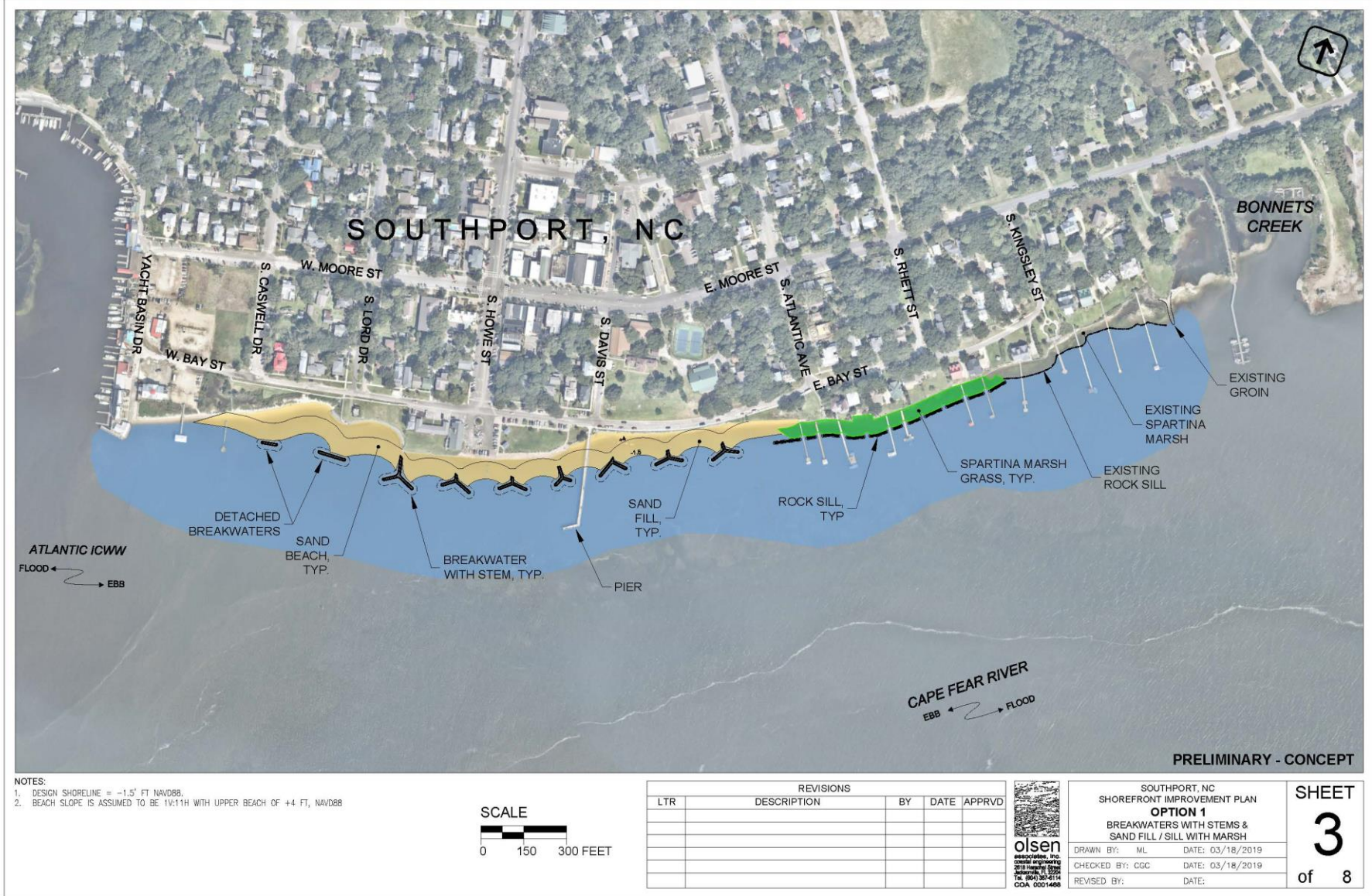
- Develop Project Scope for Current Conditions
- Develop Alternatives based on City constraints
 - Funding limitations from Port of Wilmington grant
 - Spectrum of 'Green to Gray' Solutions
- Incorporate existing shoreline protection
 - USACE constructed revetment
 - Living shoreline protection adjacent to private homes



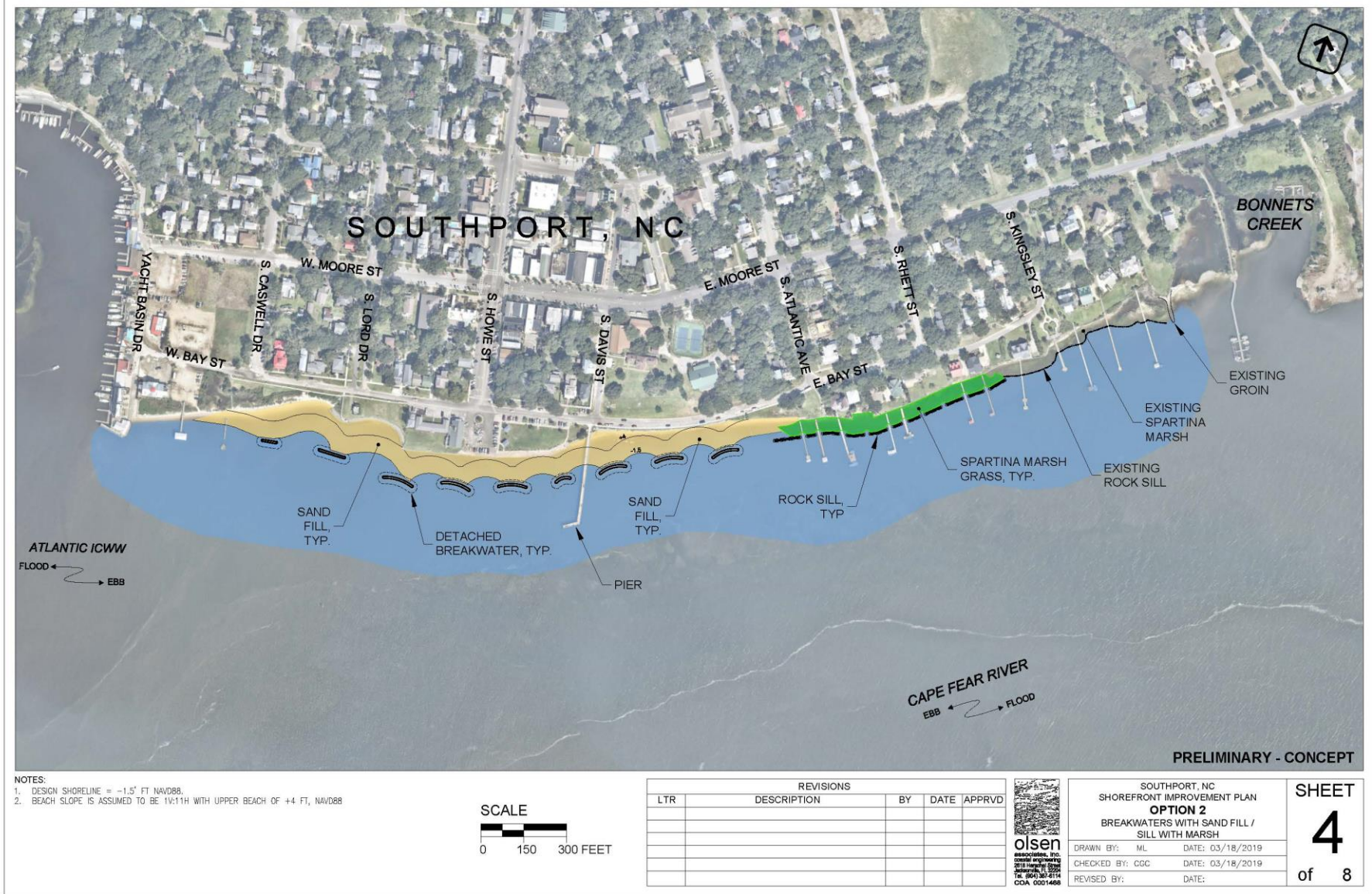
Previously Proposed Alternatives

- No Action
- Option 1: T-groins / Sand Beach/ Living Shoreline
- Option 2: Breakwaters / Sand Beach / Living Shoreline
- Option 3: Revetment / Living Shoreline

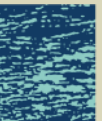


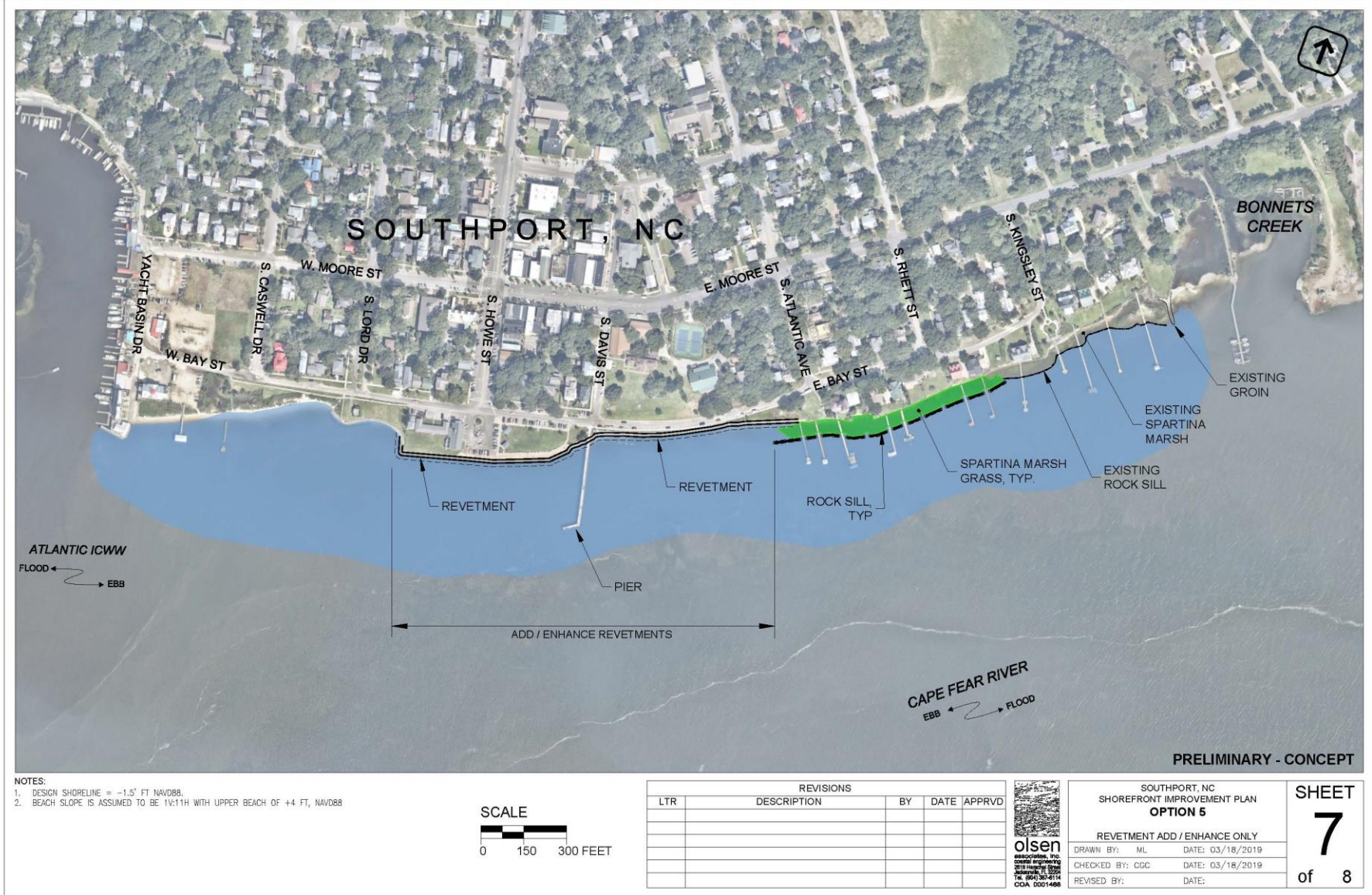


Option 1

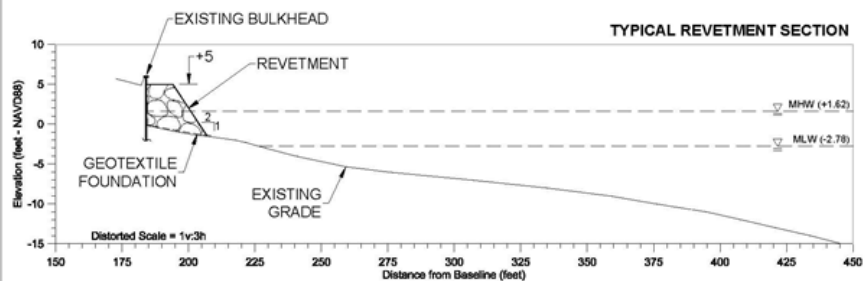
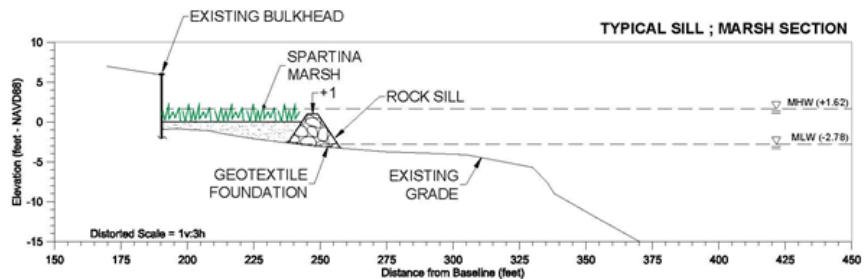
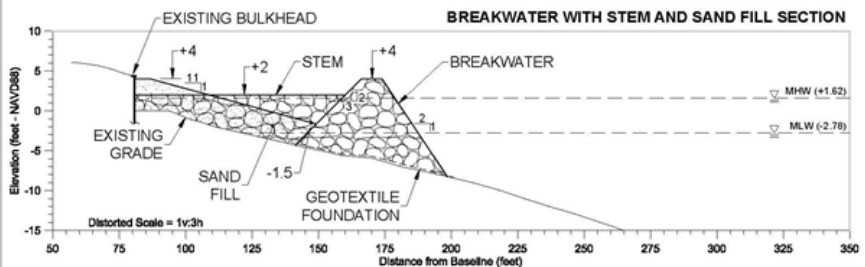
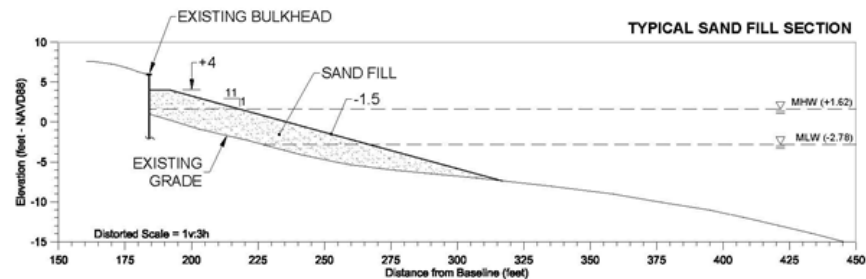
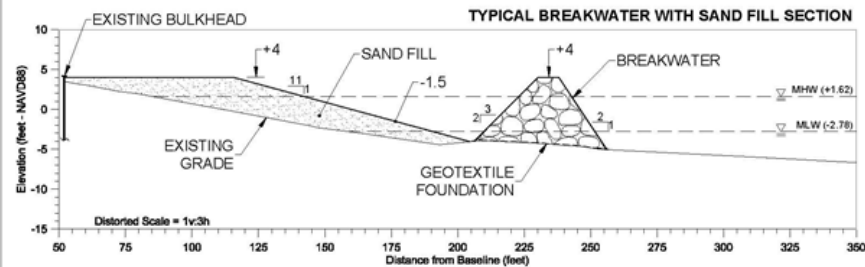


Option 2



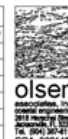


Option 3



- NOTES:
1. DESIGN SHORELINE = -1.5' FT NAVD88.
 2. BEACH SLOPE IS ASSUMED TO BE 1V:11H WITH UPPER BEACH OF +4 FT, NAVD88

REVISIONS				
LTR	DESCRIPTION	BY	DATE	APPRVD



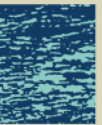
SOUTHPORT, NC SHOREFRONT IMPROVEMENT PLAN		SHEET 8 of 8
TYPICAL SECTIONS		
DRAWN BY: ML	DATE: 03/18/2019	
CHECKED BY: CGC	DATE: 03/18/2019	
REVISED BY:	DATE:	



Typical Section Views

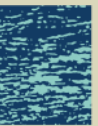
Next Steps

- Preferred approach confirmation
- Schematic level design update
- Regulatory agency pre-application briefing
- Permit application and agency coordination
- Final design and plans and specification development
- Bid advertisement
- Contractor selection
- Construction
- Post-construction reporting and monitoring



Considerations

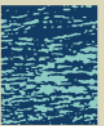
- Water Depths Seaward of Project
- Available Funding
- Riparian Ownership
- Cultural Resources
- Future SLR



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Current Activities

- Updated detailed topographic and hydrographic survey
- Cultural resource survey and investigation



Wastewater Treatment

- November 2022 Bids Rejected
- Plan to Rebid in March 2023
- Bid Form and documents repackaged

Public Information Meeting Project Status Updates

Walter Gross, PE • The Wooten Company

City of Southport, North Carolina
February 27, 2023

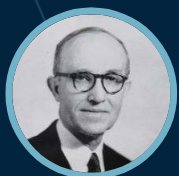


Firm Overview



1894

L.E. Wooten Born
in Eastern NC



1936

Wooten Founds
Firm in Raleigh



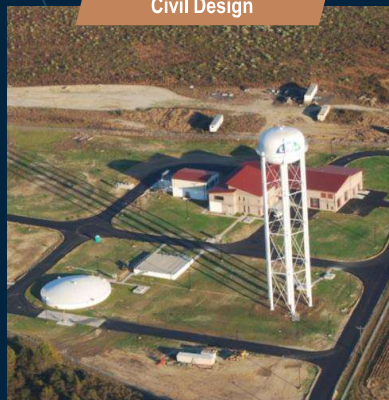
2021

Wilmington
Office Opens

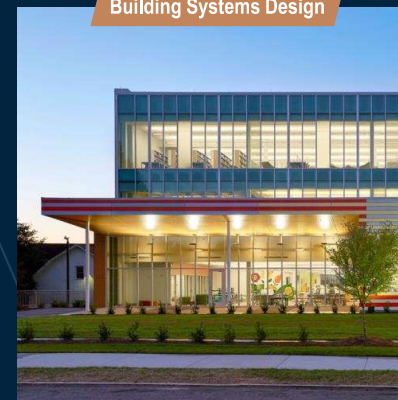


90+
Employees

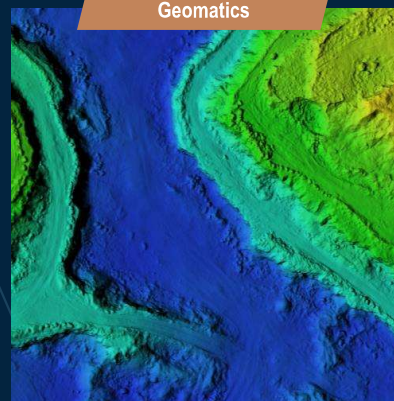
Civil Design



Building Systems Design



Geomatics



Funding Strategies

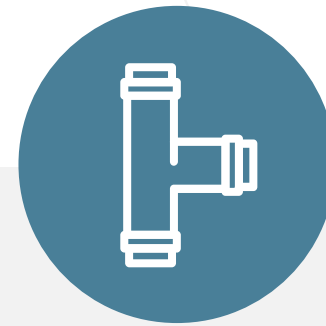




Current Capital Projects for the City of Southport



***Merger-Regionalization
Feasibility (MRF) Study***



***USDA Sewer
Replacement Project***



Merger-Regionalization Feasibility (MRF) Study



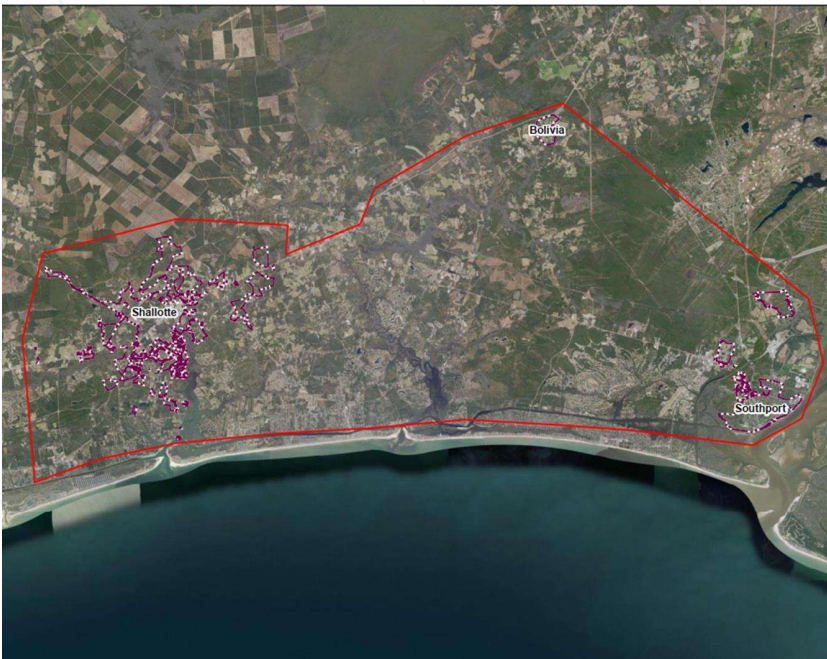
The City received funding from the NC Division of Water Infrastructure to perform Merger-Regionalization Feasibility (MRF) Studies for water and wastewater service.



MRF Studies primarily investigate a regional/merged approach to wastewater conveyance and disposal in response to local needs, with Brunswick County as the primary stakeholder.



Merger-Regionalization Feasibility (MRF) Study



The County provided Wooten with significant GIS data, enabling our team to proceed with the Water and Wastewater merger studies.



Wooten will focus first on Wastewater study first.



Merger-Regionalization Feasibility (MRF) Study



Additional Data Received Included



Record drawings for Water/Wastewater (W/WW) infrastructure near the City



For assets on systems near the City, W/WW records including:

- Daily flows for the past two years
- Number and type of customers (residential, commercial, and industrial)
- Sewer rate information
- Pump station run time data



W/WW system mapping



Recent reporting and analyses of W/WW systems



Merger-Regionalization Feasibility (MRF) Study



MRF Study Goals



Task 1: Assess the Age, Condition, and Vulnerability of Existing Asset Inventory



Task 2: Develop Estimated Costs Associated with Assuming Responsibility for Southport Water and Sewer Utilities



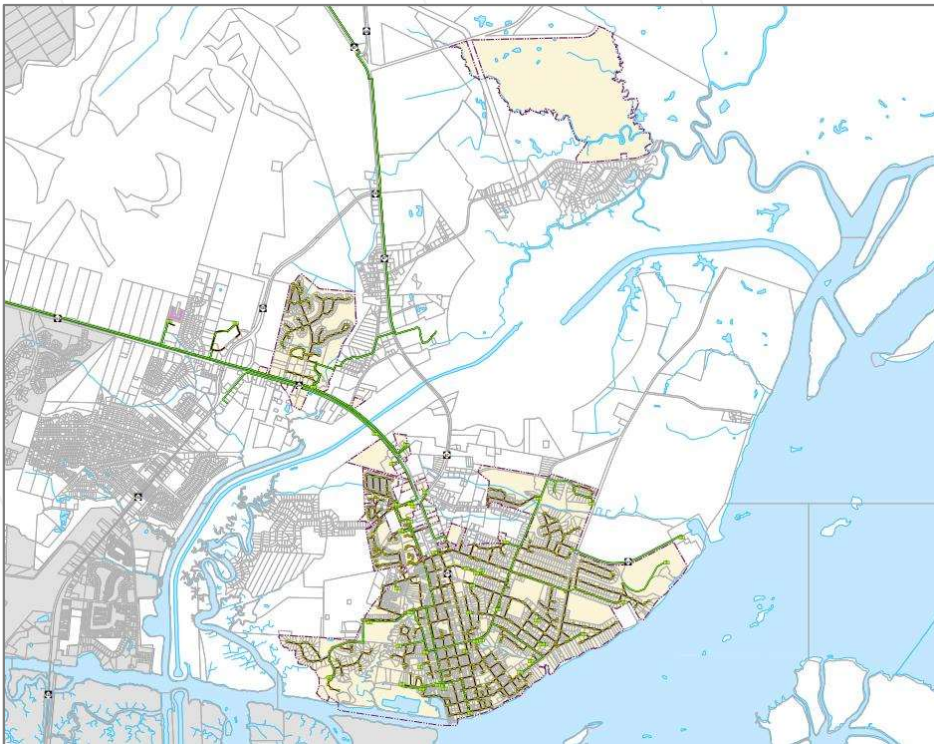
Task 3: Conduct Limited Financial Analysis



Task 4: Prepare Technical Report



Merger-Regionalization Feasibility (MRF) Study



- Have begun compiling overall maps and are fully informed of what the City is doing to improve their wastewater system.
- Must confirm what would need to be done on the County's end to take over Southport's utilities. Have information from the wastewater treatment plant project.
- As these studies are very involved, we typically budget 1 year, start-to-finish, based on the number of people involved with gathering of data and its review.



Merger-Regionalization Feasibility (MRF) Study

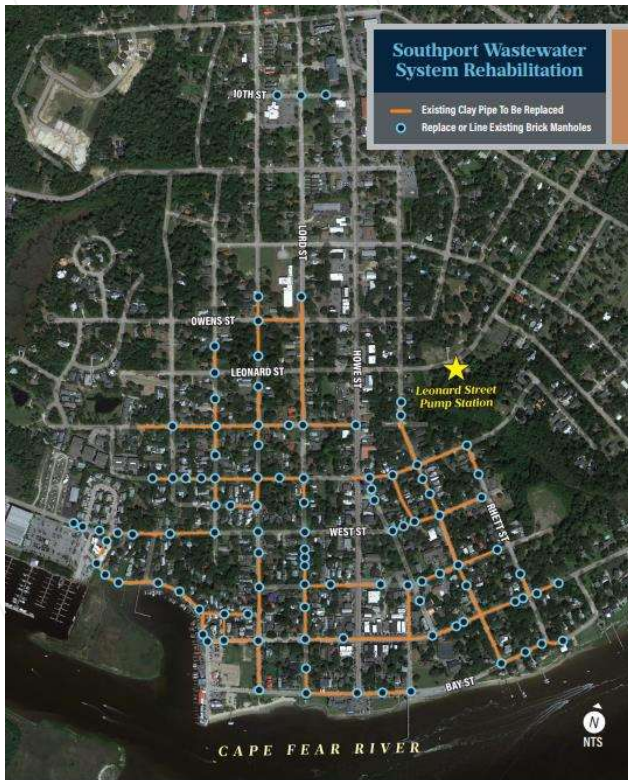


Sample Financial Analysis

	Inside City Limits			Outside City Limits		
	Base Charge (+1 kGal)	Volumetric Charge (\$/1 kGal)	Charge at 5,000 Gallons	Base Charge (+ 1 kGal)	Volumetric Charge (\$/1 kGal)	Charge at 5,000 Gallons
Water	\$25.00	\$5.00	\$45.00	\$27.00	\$6.00	\$51.00
Sewer	\$37.50	\$5.00	\$57.50	\$40.50	\$6.00	\$64.50
	Inside City Limits (Residential)			Outside City Limits (Residential)		
	Base Charge	Volumetric Charge (\$/1 kGal)	Charge at 5,000 Gallons	Base Charge	Volumetric Charge (\$/1 kGal)	Charge at 5,000 Gallons
Water	\$20.00	\$4.90	\$44.50	\$33.00	\$8.35	\$74.75
Sewer	150% of Water Bill		\$66.75	150% of Water Bill		\$112.13



USDA Sewer Replacement Project



The Project Involves



Replacement of approximately 18,097 linear feet gravity sewer lines



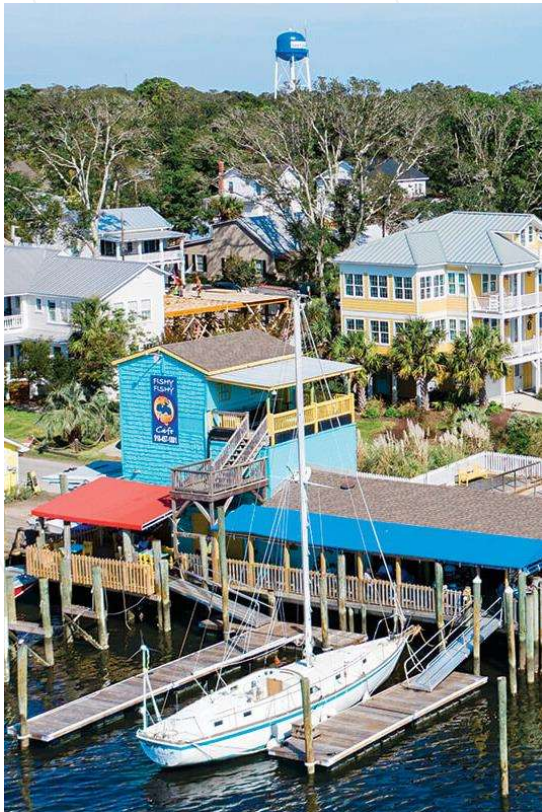
Construction or rehabilitation of 111 sewer manholes



Installation of a new sewer pump station to replace the existing Leonard Street pump station



USDA Sewer Replacement Project



Wastewater System Assessment

- In 2022, Wooten compiled a Wastewater System Asset Management Plan (AMP) and Capital Improvement Plan (CIP) for the City of Southport.
- Sewer system was installed in early-mid 1900's.
- Determined that most sewer lines downtown are vitrified 8" diameter clay lines, with 1 sewer pump station requiring replacement.
- Estimated inflow & infiltration into the system is approx. 134,000 GPD.
- Majority of the City's force mains are in good working condition.
- Force mains associated with Southport's oldest pumping stations, installed in 1974, are reaching the end of their useful life and need to be replaced.



USDA Sewer Replacement Project



Task 1: Existing Information Review



- Began review of all existing information in late 2022.
- Replacement sewer lines sizing to be same as existing 8" dia. pipe, which will meet all present and future needs.
- All work to be performed within existing street Rights-of-Way or on City-owned land.
- Wetlands and floodplain areas will not be impacted.



USDA Sewer Replacement Project



Task 1: Existing Information Review



- The Leonard St. pump station will be designed to meet the existing permitted flows (no new flow increase will occur).
- Current operational range is approx. 49,000 GPD on average, with estimated peaks of 76,000 GPD.
- The new pump station will be of similar capacity.



USDA Sewer Replacement Project

Task 2: Survey



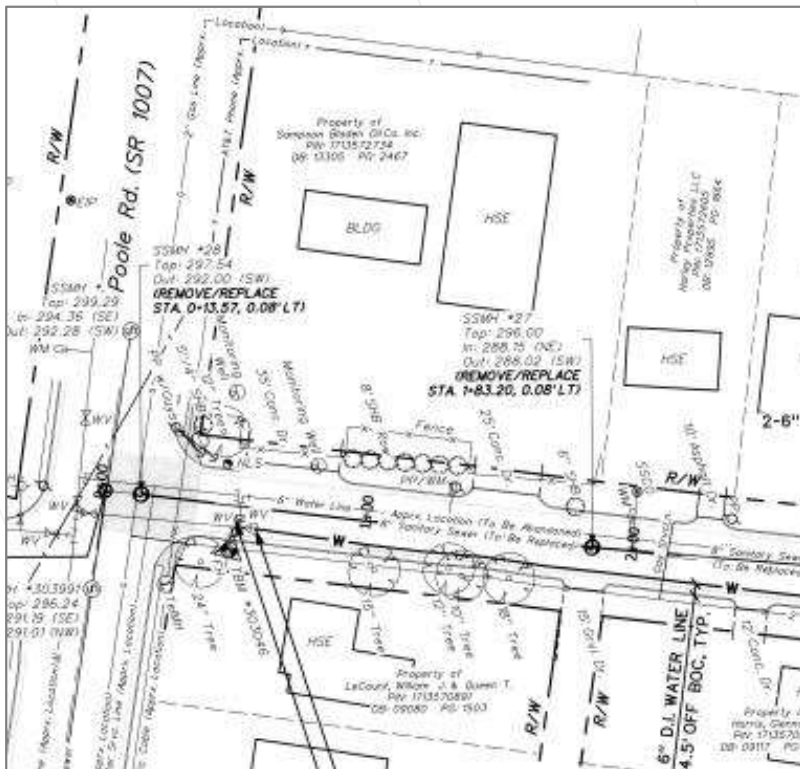
- While confirming scope and project needs, Wooten engaged our in-house Geomatics practice to begin surveying efforts.
- Survey crew was immediately sent out upon approved ESA in January.
- To meet identified schedule requirements, delivery of survey data to our design team is likely the most critical part of the project schedule.



USDA Sewer Replacement Project



Task 3: Preliminary Design

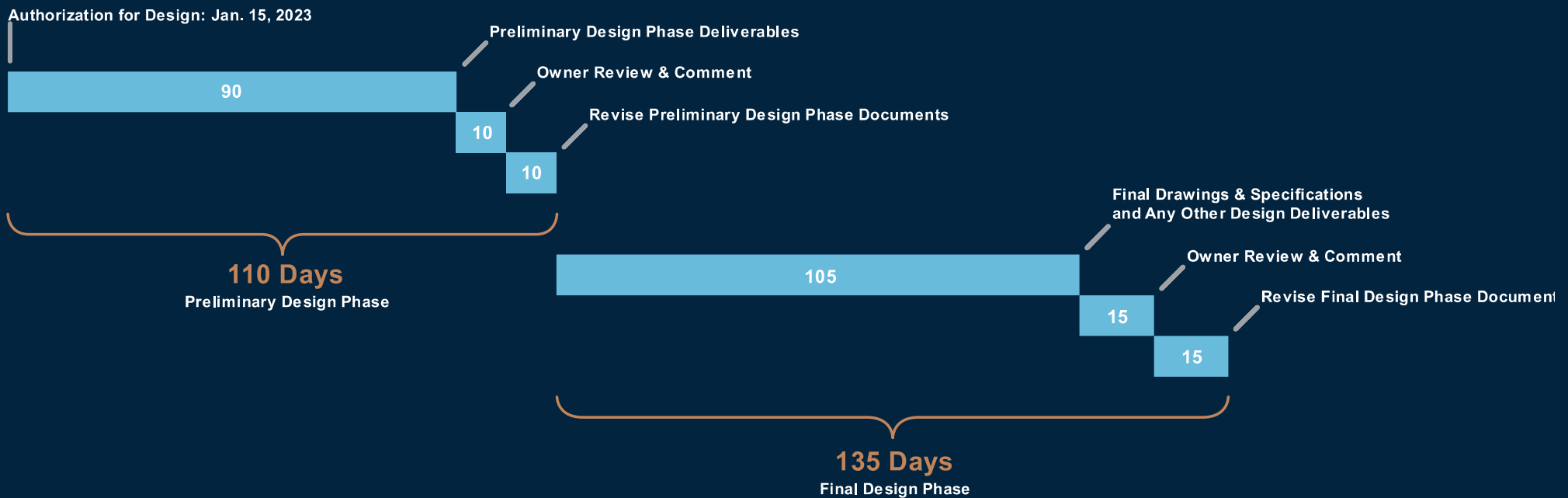


- To start after survey has been completed.
- Preliminary layout will be created identifying all existing conditions, together with a plan schematic of the proposed pump station and gravity sewer alignments.
- Submittal will include updated opinion of probable construction cost to keep the City apprised of any cost implications or fluctuations in the bidding market.



USDA Sewer Replacement Project

Phased Design Schedule

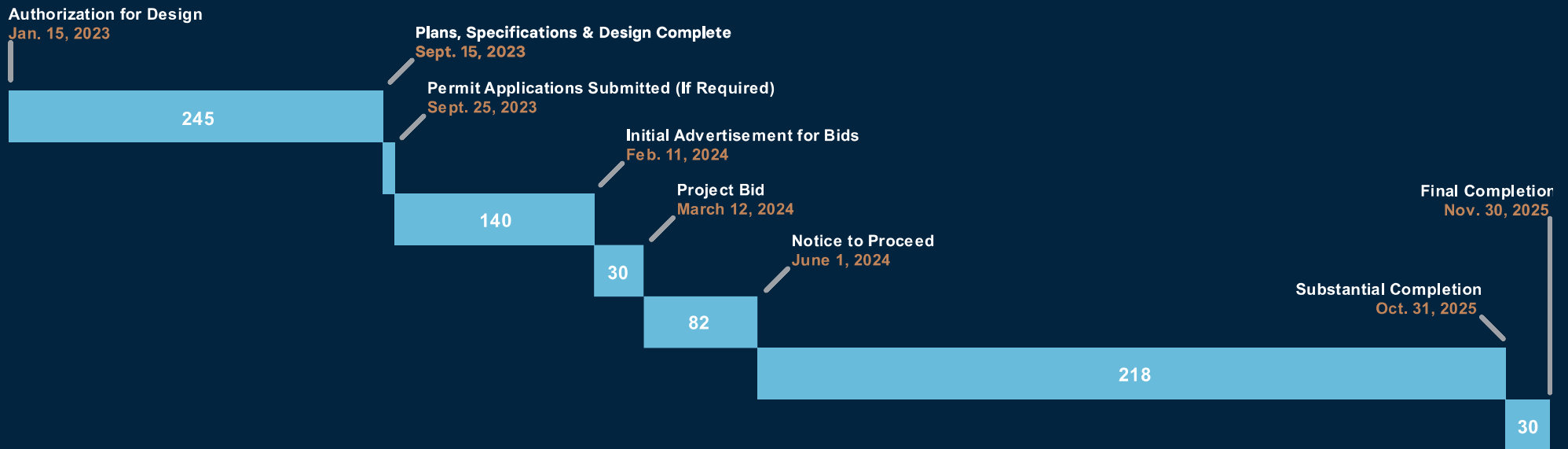


Engineering Design Total Duration: **245 days** (8.2 months) = January – September 2023



USDA Sewer Replacement Project

Overall Project Schedule

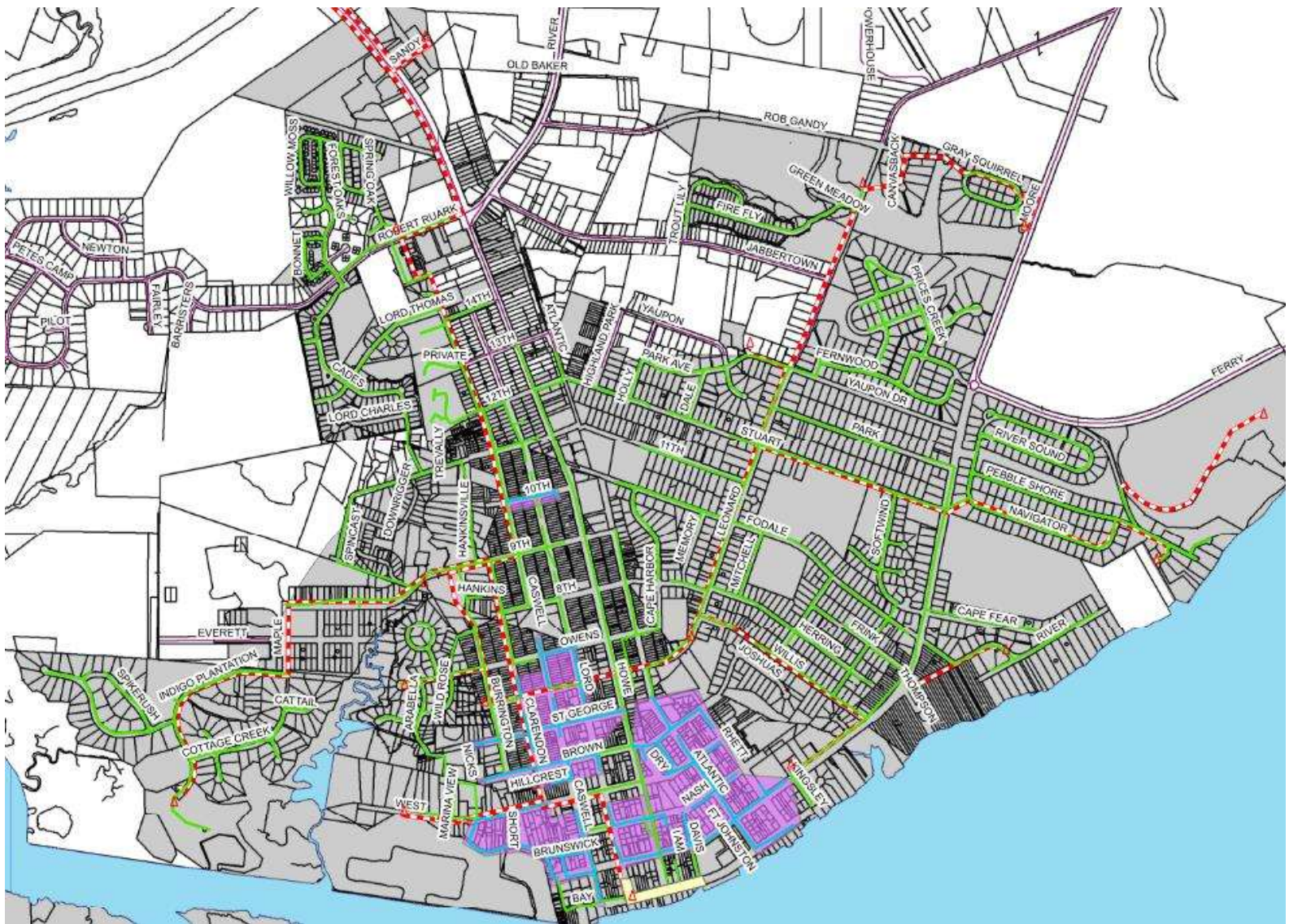


Wooten

A tradition of DESIGNING THE FUTURE ►

Sewer Rehabilitation City Wide

- Inflow and Infiltration, Rehabilitation and Replacement
- Funding applied for
 - Study \$400,000
 - Find It Fix It \$9,835,000



Lift Station Rehabilitation – Funded \$2,800,000

Progress

- Field assessment and draw down testing
- Development requests
- DOT force main replacement
- Evaluating scenarios of force main improvements
- Design in 2023
- Construction 2024



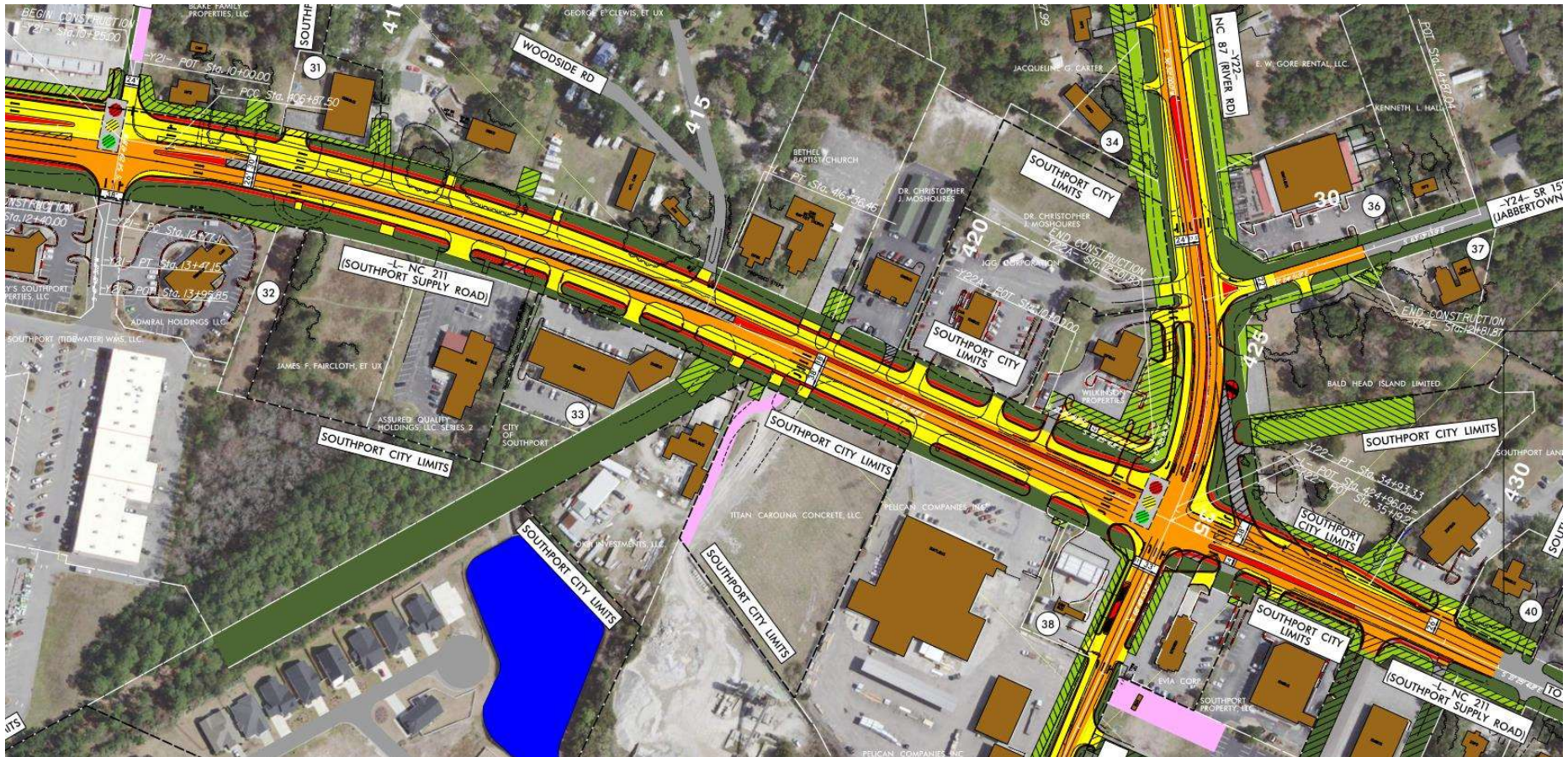
Lift Station Rehabilitation- Field Testing

- Park
- Leonard
- Moore
- Ninth
- Central
- Forest Oaks

Lift Station Rehabilitation- Development Requests

- 9th Street
- Prices Creek
- Indigo
- East Moore and Ferry Road

Lift Station Rehabilitation – DOT Force Main Replacement



Lift Station Rehabilitation – Evaluating Improvements

- Existing Conditions
- Peak Capacity
- Pump improvements
- Force Main Improvements

