Arc/Billow Street Drainage Improvements – Project Status
Town of Edisto Beach

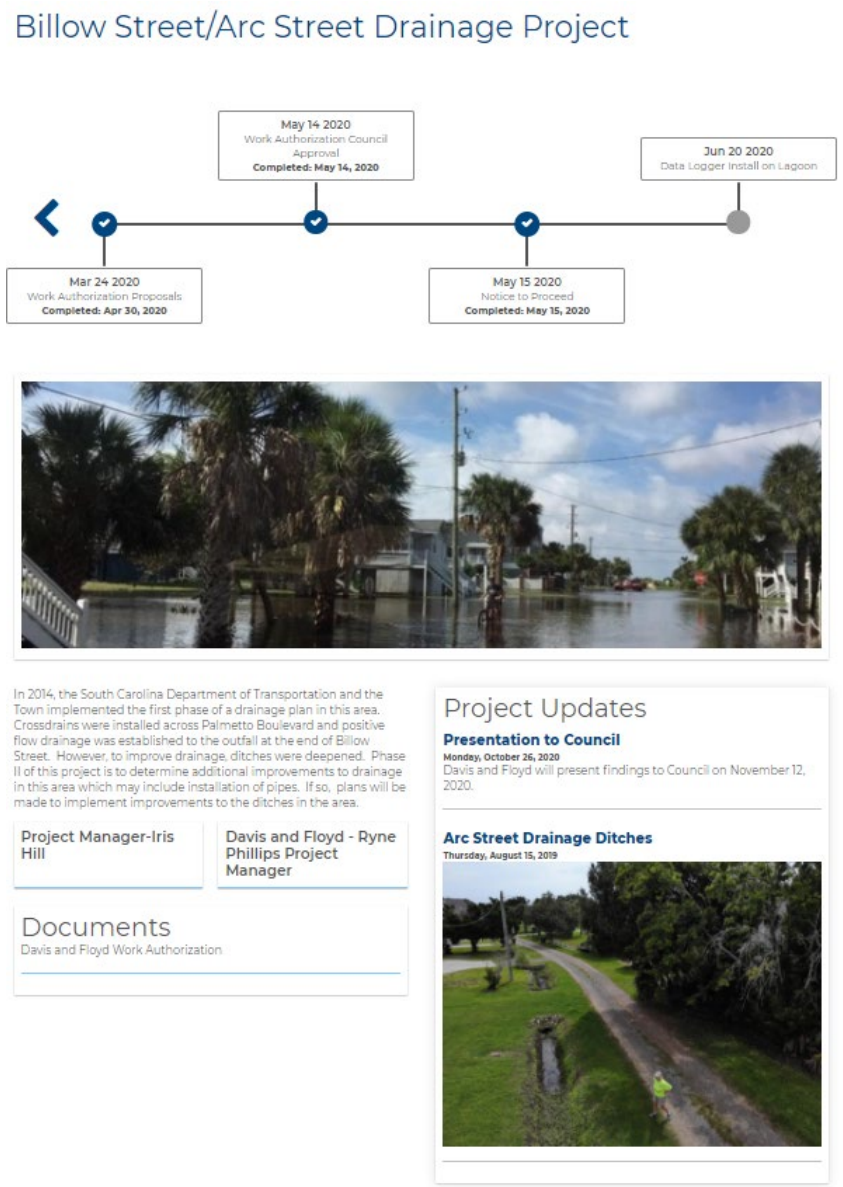
November 12, 2020, 6:00 PM
Town Council Meeting

Background


HIGHWAY 174
BILLOW ST
MYRTLE ST
NEPTUNE ST
POINT ST
Miles
0 0.0750.15 0.3 0.45 0.6
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Project Overview

- Data Collection and Field Investigations
- Drainage Study
- Recommendations for Improvements
- Engineering Design



Data Collection

- Hydrologic Data Gathering
  - Rain Gauge
  - Water Level Loggers (2)
- Field Investigations
  - Conditions Assessment
  - Pipe Inventory
  - Topographic Survey
- Record Drawings
  - Town As-Builts
  - SCDOT Roadway Plans

Drainage Study

- Identify Drainage Deficiencies
- Quantify Hydrologic/Hydraulic Conditions
  - 130-Acre Watershed
  - Contributing Drainage to Lagoon
- Develop Economic Solution

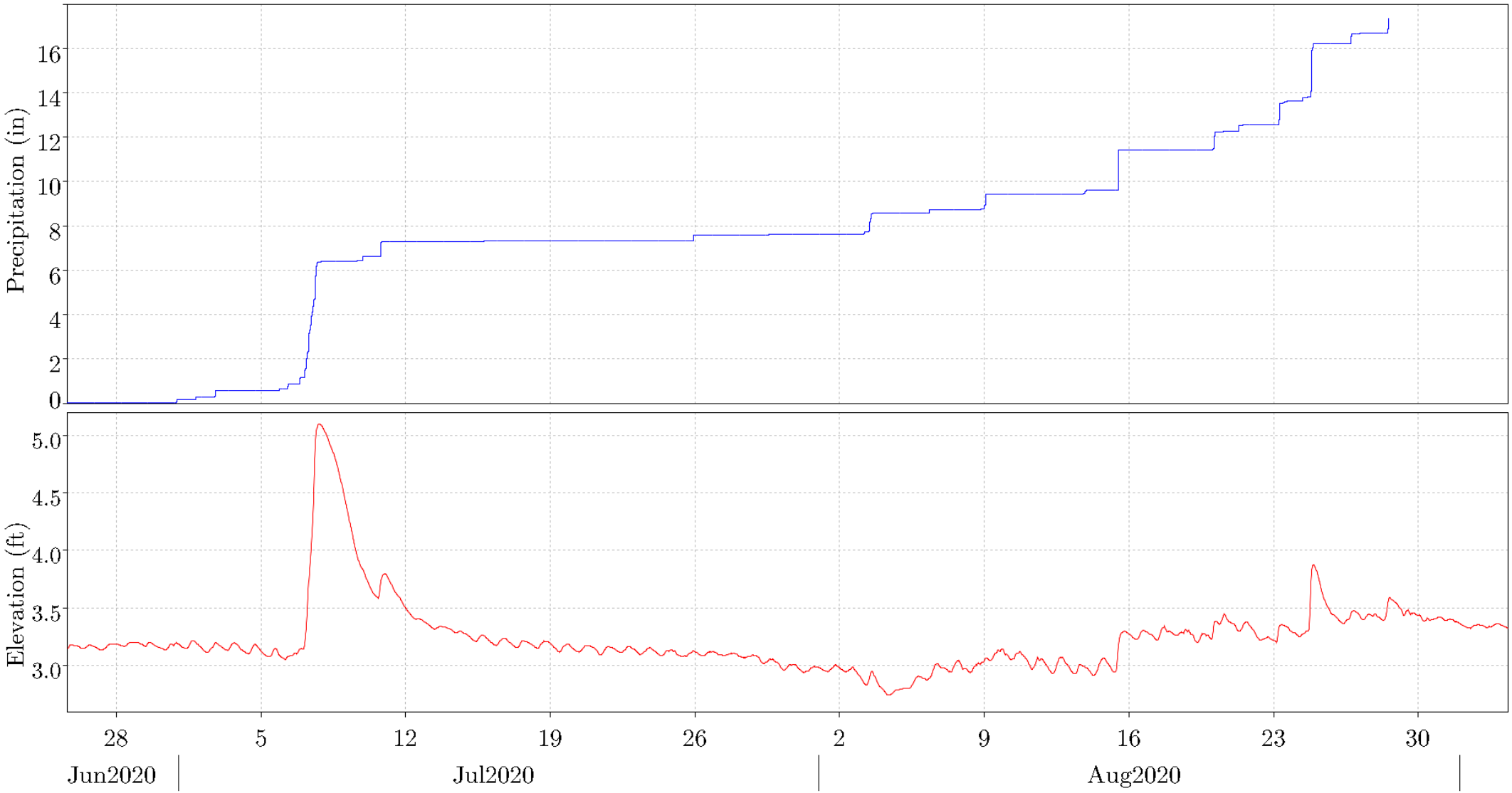
Conditions Assessment

Clogged Culvert (Myrtle St.)

Standing Water along Billow St.

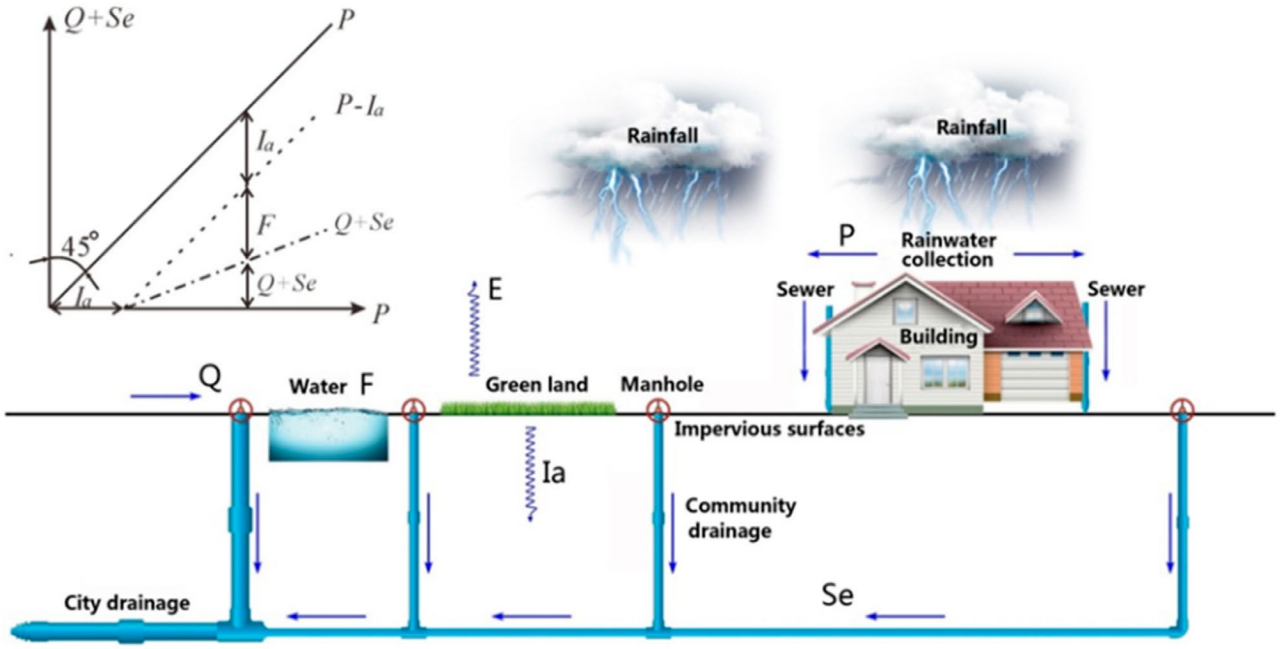
Inventory Overview (Desktop/Field)

Data Collection – Rainfall/Lagoon Monitoring



H&H Modeling

- Hydrologic Assessment
  - Watershed Identification
  - Rainfall-Runoff Process
    - Design Storms
    - Observed Storms
- Hydraulic Assessment
  - Pipe, Channel, and Overland Flow
  - Combined 1D/2D SWMM model
  - Identify/Evaluate Capacity
  - Lagoon Influence

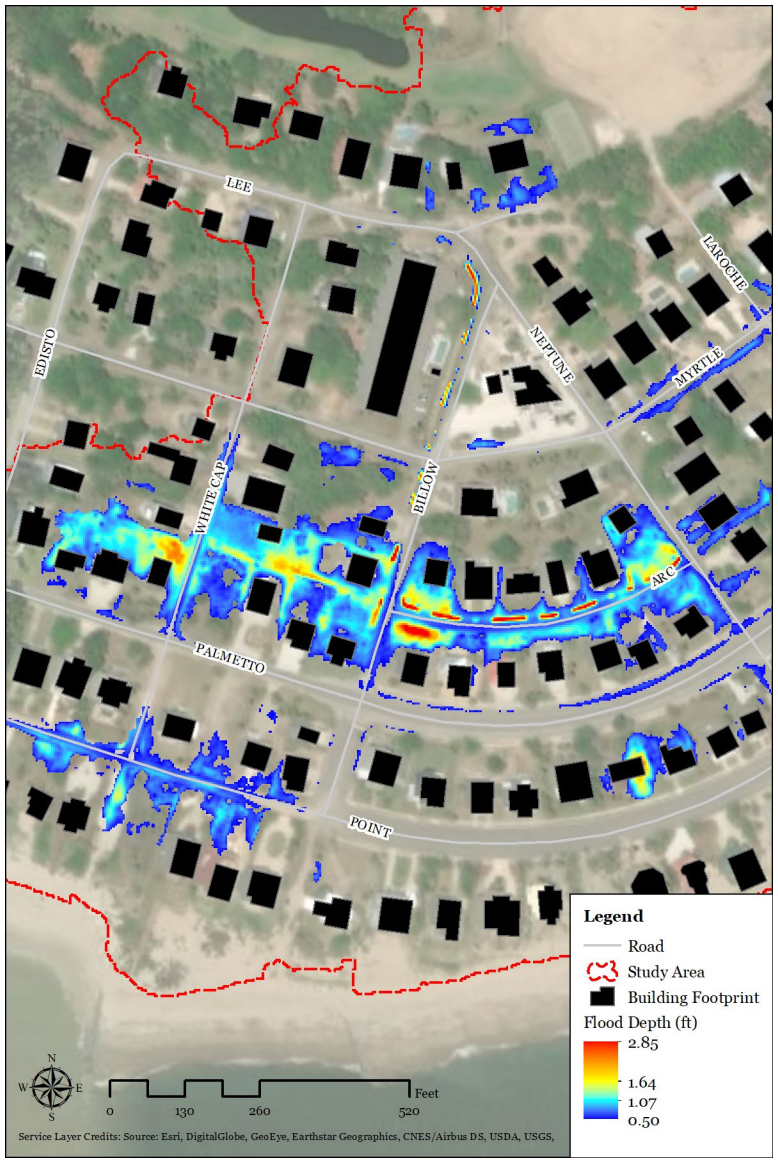


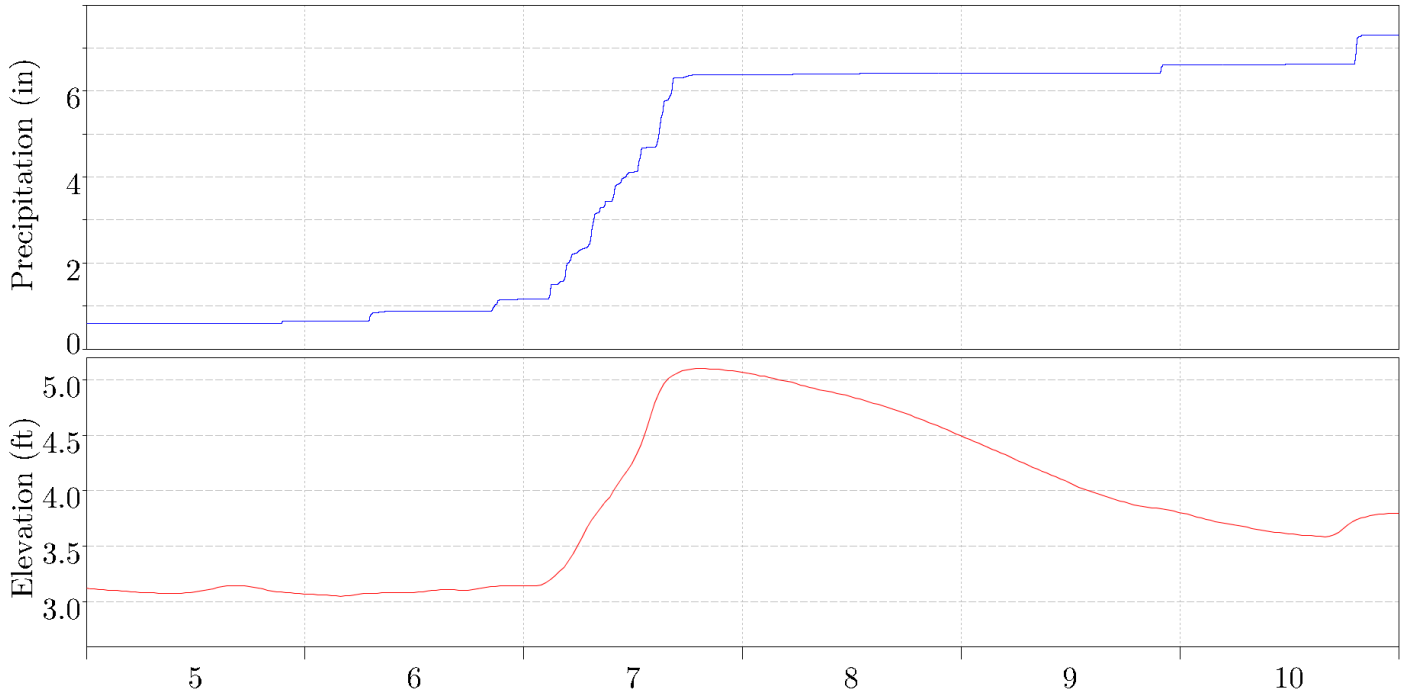
Urban hydrologic/hydraulic process (Meng et al., 2019).

H&H Modeling – Results

- 130-Acre Study Area
- 46 Watersheds
  - Average Area = 20 acres
  - Average Slope = 3.9 %
  - Average Curve Number (Runoff Potential) = 82

H&H Modeling – Results (Validation)



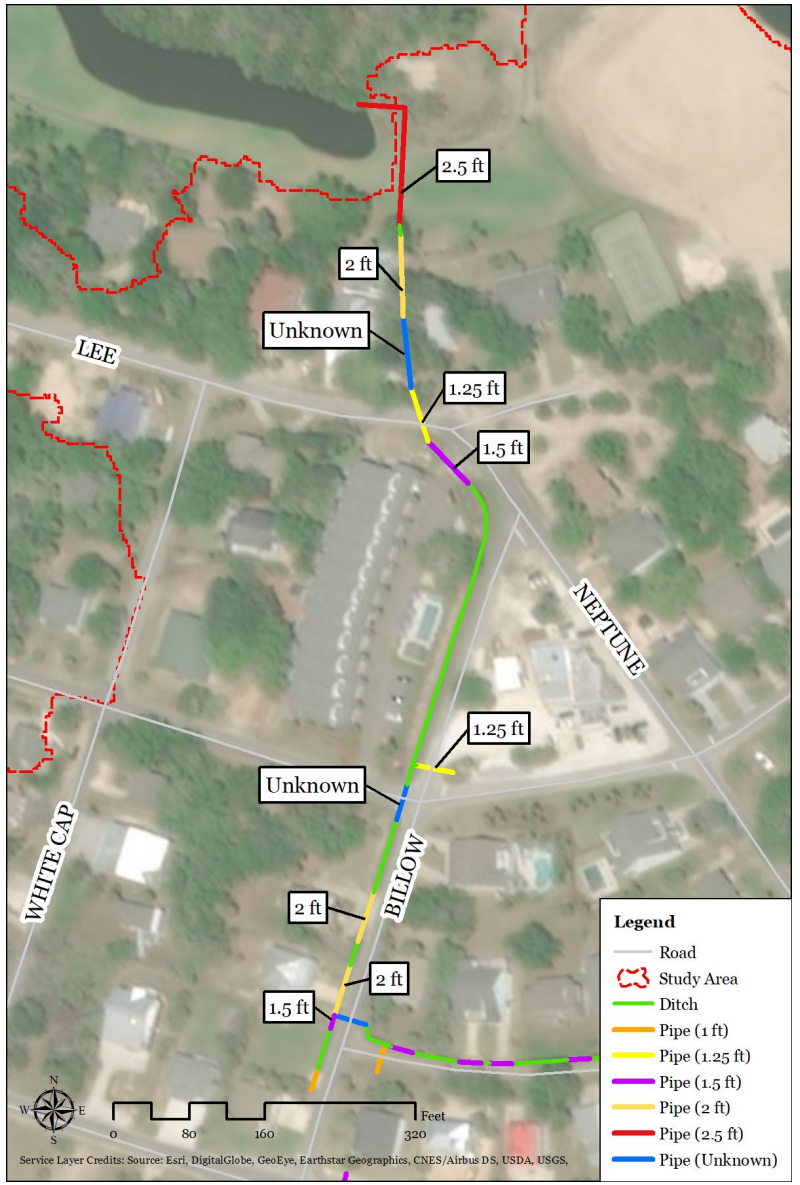


Cumulative precipitation (top) and downstream lagoon water level during July 7, 2020 storm event.

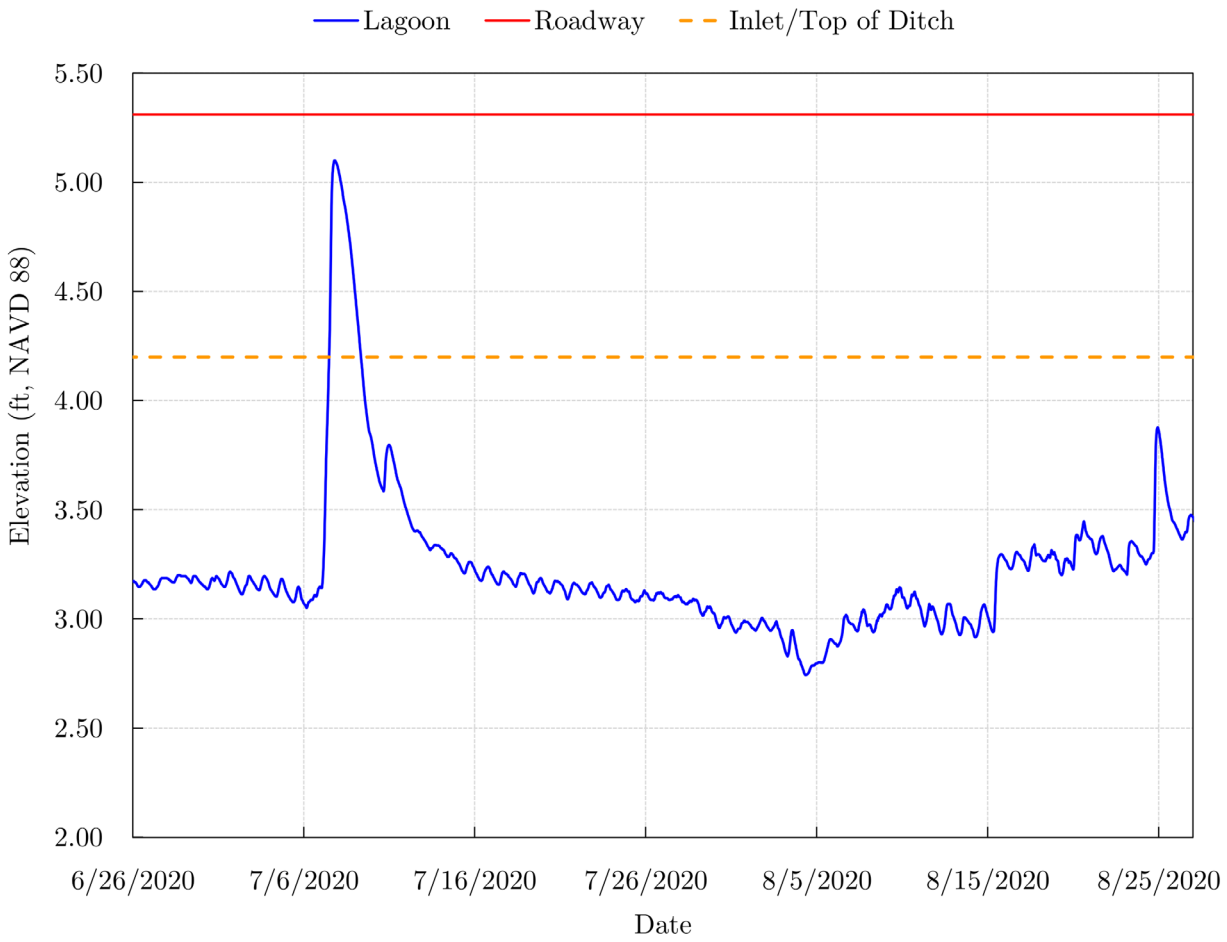
H&H Modeling – Results (Validation)

Structural Flood Contributors

- Clogged Culvert at Myrtle St.
- Constricted Outfall Piping
  - Billow St. Piping = 2-foot Diameter
  - Lee St. Piping = 1.25-foot Diameter
  - Golf Course Piping = 2.5-foot Diameter
- Reduced Pipe Grades
  - Golf Course Piping Higher than Upstream Piping



Hydrologic Flood Contributors



Elevation constraints at intersection of Arc and Billow.

- Lagoon System
  - Long Flow Path = Long Drain Time
  - Water Levels Maintained at or Above Pipe Inverts at Arc/Billow
- Large Contributing Drainage Area
- Low-Lying Area (Arc/Billow)
- High Water Table

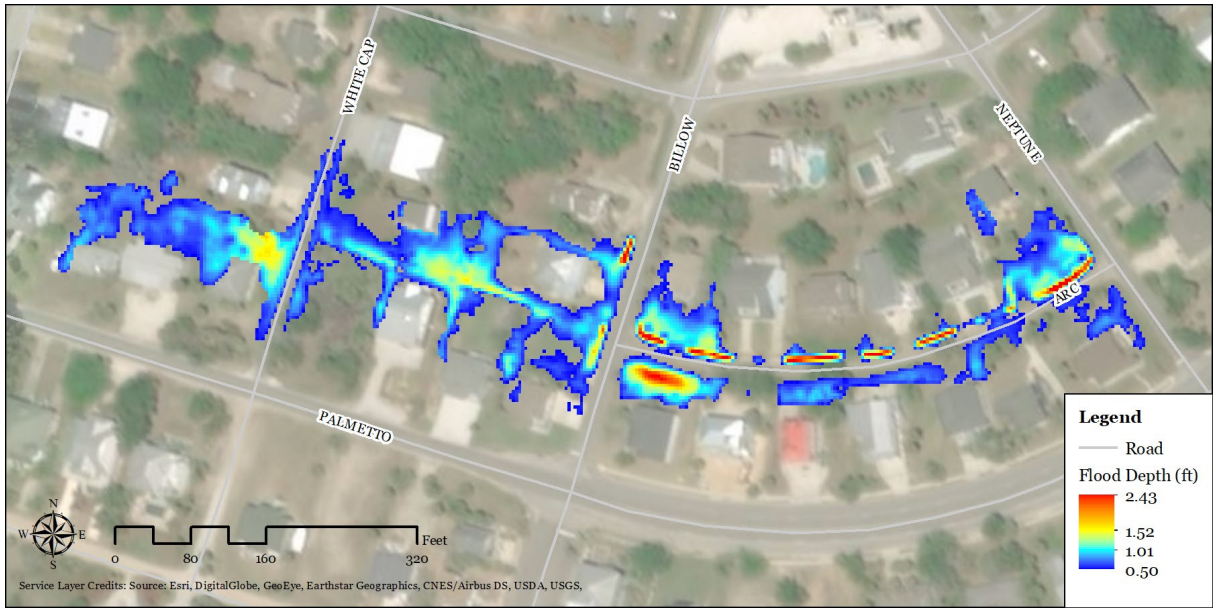
General Recommendations

- Culvert at Myrtle St.
  - Clean and “unplug” culvert
  - SCDOT has been contacted
- Maintenance
  - Routine pipeline cleaning
  - Town has purchased equipment

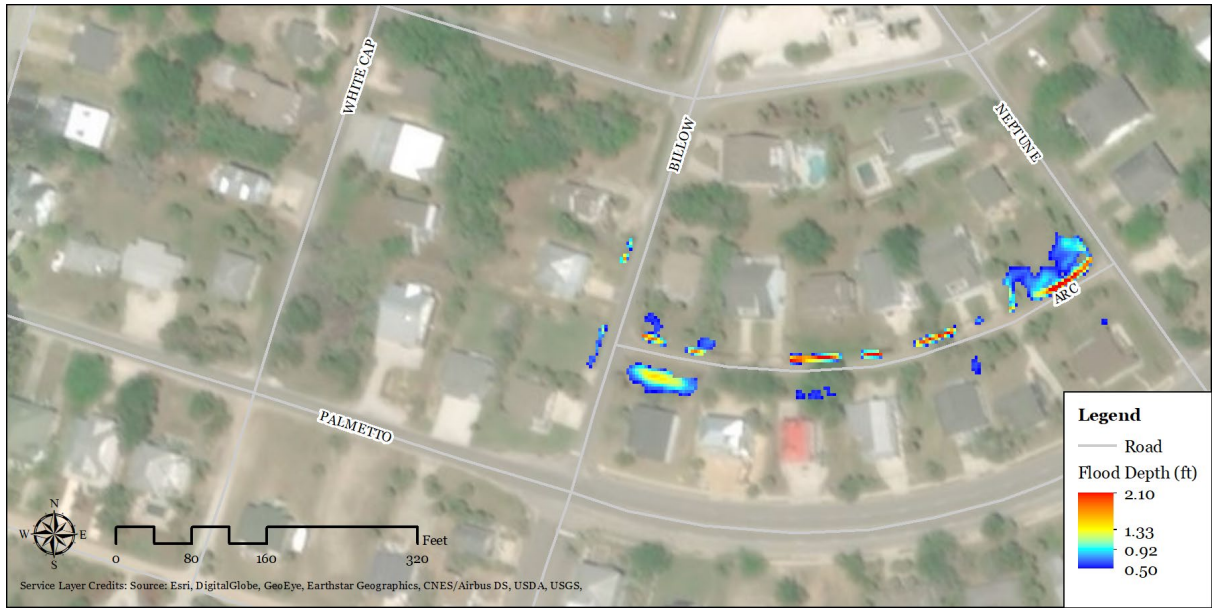
Clogged Culvert (Myrtle St.)

Immediate Construction Recommendation

Existing vs. Proposed



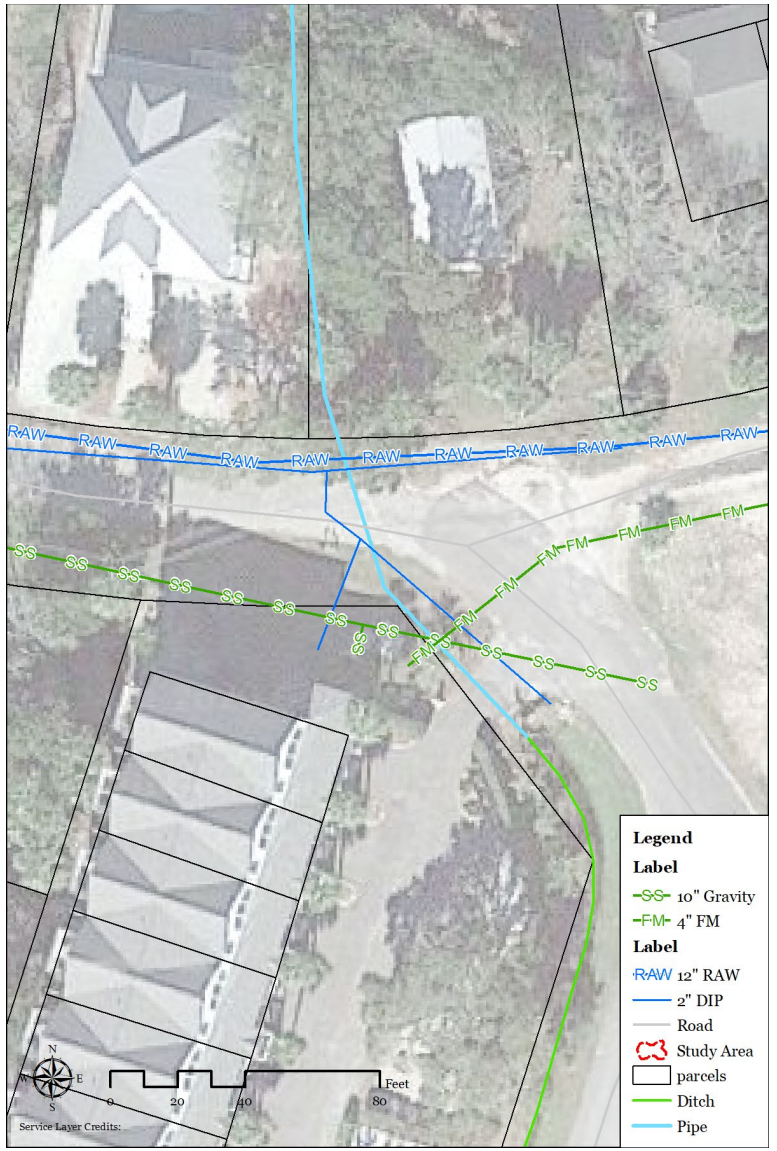
Existing Average Conditions



Proposed Average Conditions

Construction Constraints

- Utility Conflicts
  - Water
    - 12” Raw Water Line
    - 2” Water Service Lines
  - Sewer
    - 4” Force Main
    - 10” Gravity Line
- Tree Protection
- Water Table
  - Dewatering Requirements



Construction Estimate

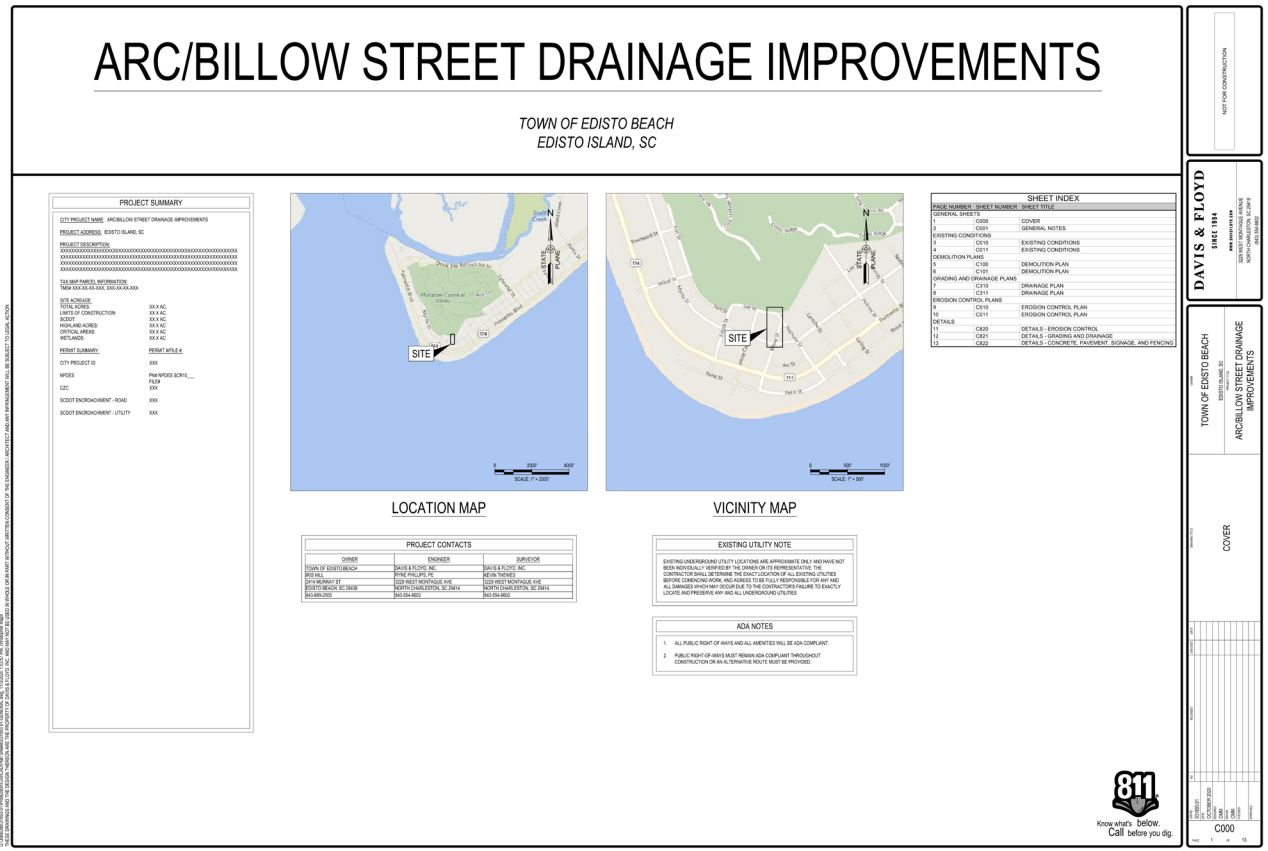
- ~$265,000
- Includes:
  - Utility Relocations (~25% of estimate)
  - Permitting
  - Construction Inspection Services
  - 25% Contingency
- Checks
  - MPW/CWS
  - SCDOT: Myrtle Street Drainage

Bid Form Cost Estimate

Item	Description	Qty.	Unit	Unit Price	Total Cost
GENERAL ITEMS					
1	*Mobilization*				
A.	Mobilization	1	LS	$10,000.00	$10,000.00
2	*General Items*				
A.	Surveying	1	LS	$10,000.00	$10,000.00
B.	As-Built Drawings / Project Closeout	1	LS	$10,000.00	$10,000.00
INCIDENTAL					
3	*Traffic Control and Temporary Signage*				
A.	Permanent Construction Signs (Ground Mounted)	2	SF	$10.00	$20.00
4	*Sediment and Erosion Control*				
A.	Drop-In Inlet Protection	4	EA	$880.00	$3,520.00
B.	Silt Fence, Sediment Tubes, and Construction Entrance	1	LS	$7,500.00	$7,500.00
STORMWATER					
5	*Demolition and Removal*				
A.	Removal and Disposal of Existing Stormwater Structures	3	EA	$750.00	$2,250.00
6	*Piping*				
A.	24" RCP	40	LF	$125.00	$5,000.00
B.	30" RCP	290	LF	$190.00	$55,100.00
7	*Structures*				
A.	24" x 36" Grate Inlet	2	EA	$2,750.00	$5,500.00
B.	JB (48" Diameter)	1	EA	$5,000.00	$5,000.00
B.	JB (48" Diameter) w/ Conflict	1	EA	$10,000.00	$10,000.00
8	*Management of Existing Stormwater System*				
A.	Cleaning & Inspection of Existing Storm Piping (<=36")	350	LF	$29.00	$10,150.00
ROADWAY					
9	*Demolition and Removal*				
A.	Removal and Disposal of Existing Pavement	96	SY	$25.00	$2,400.00
B.	Removal and Disposal of Existing Sidewalk and Concrete Curbing and Driveways	3	SY	$25.00	$75.00
10	*Pavement*				
A.	Liquid Asphalt Binder PG64-22	15	TON	$600.00	$9,000.00
B.	Hot Mix Asphalt Intermediate Course Type B	10	TON	$100.00	$1,000.00
C.	Hot Mix Asphalt Surface Course Type B	6	TON	$135.00	$810.00
WATER/SEWER INCIDENTAL ITEMS					
11	*Incidental Items*				
A.	Water Record Drawings and Closeout	1	LS	$5,000.00	$5,000.00
B.	Sewer Record Drawings and Closeout	1	LS	$5,000.00	$5,000.00
WATER DISTRIBUTION SYSTEM					
12	*Existing Utility Relocation*				
A.	12" RAW Water line Offset	1	LS	$12,000.00	$12,000.00
B.	2" Water Line Offset	2	EA	$2,500.00	$5,000.00
SANITARY SEWER					
13	*Existing Utility Relocation*				
A.	4" Force Main Offset	1	LS	$5,000.00	$5,000.00
B.	Bypass Pumping	1	LS	$15,000.00	$15,000.00
PERMITTING					
14	*Permitting*				
A.	Permitting	1	LS	$7,500.00	$7,500.00
CONSTRUCTION/INSPECTION					
15	*Construction/Inspection*				
A.	Construstion and Inspection	1	LS	$10,000.00	$10,000.00

Sub-Total Items 1-15 Inclusive	$211,825.00
25% Contingency	$52,956.25
Total	$264,781.25

Immediate Next Steps



ARC/BILLOW STREET DRAINAGE IMPROVEMENTS

TOWN OF EDISTO BEACH
EDISTO ISLAND, SC

PROJECT SUMMARY

LOCATION MAP

VICINITY MAP

SHEET INDEX

PAGE NUMBER	SHEET NUMBER	SHEET TITLE
GENERAL SHEETS		
1	C000	COVER
2	C001	GENERAL NOTES
EXISTING CONDITIONS		
3	C010	EXISTING CONDITIONS
4	C011	EXISTING CONDITIONS
DEMOLITION PLANS		
5	C100	DEMOLITION PLAN
6	C101	DEMOLITION PLAN
GRADING AND DRAINAGE PLANS		
7	C310	DRAINAGE PLAN
8	C311	DRAINAGE PLAN
EROSION CONTROL PLANS		
9	C510	EROSION CONTROL PLAN
10	C511	EROSION CONTROL PLAN
DETAILS		
11	C820	DETAILS - EROSION CONTROL
12	C821	DETAILS - GRADING AND DRAINAGE
13	C822	DETAILS - CONCRETE, PAVEMENT, SIGNAGE, AND FENCING

PROJECT CONTACTS

OWNER	ENGINEER	SURVEYOR
TOWN OF EDISTO BEACH	DAVIS & FLOYD, INC	DAVIS & FLOYD, INC
2414 MURRAY ST	WYNE PHILLIPS, PE	KEVIN THEMES
EDISTO BEACH, SC 29438	3229 WEST MONTAGUE AVE	3229 WEST MONTAGUE AVE
843-869-2505	NORTH CHARLESTON, SC 29414	NORTH CHARLESTON, SC 29414
	843-554-8802	843-554-8802

EXISTING UTILITY NOTE

EXISTING UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE ONLY AND HAVE NOT BEEN INDIVIDUALLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY OCCUR DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES

ADA NOTES

1. ALL PUBLIC RIGHT-OF-WAYS AND ALL AMENITIES WILL BE ADA COMPLIANT.
2. PUBLIC RIGHT-OF-WAYS MUST REMAIN ADA COMPLIANT THROUGHOUT CONSTRUCTION OR AN ALTERNATIVE ROUTE MUST BE PROVIDED.

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

DAVIS & FLOYD SINCE 1954

TOWN OF EDISTO BEACH
ARC/BILLOW STREET DRAINAGE IMPROVEMENTS

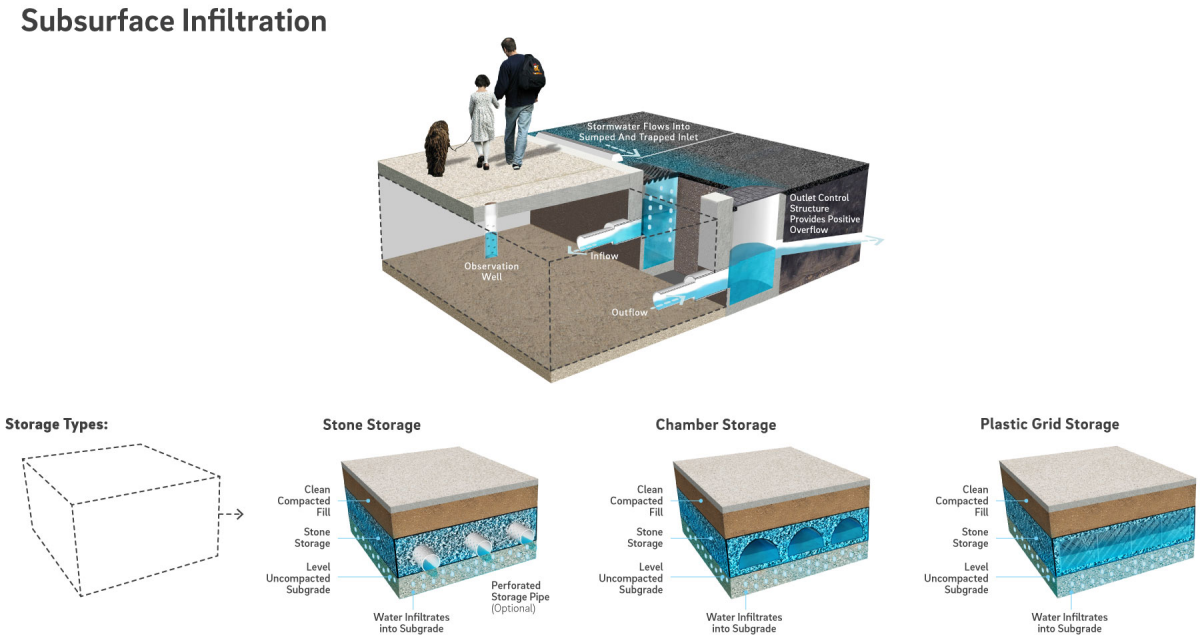
COVER

C000

- Finalize Design/Plans
- Prepare Bid Documents
- Permitting
- Construction

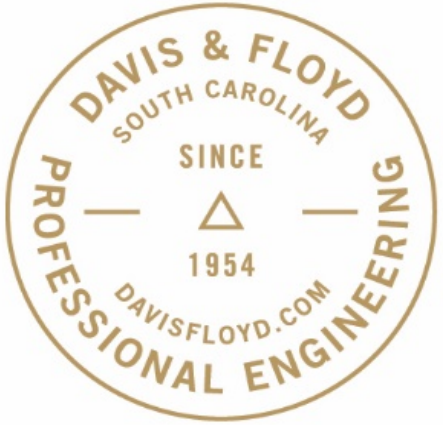
Additional/Future Considerations

- Infiltration Testing
  - Determine Adsorption Capacity of Arc St. Soils
  - Determine if Infiltration Technology is Feasible
- Comprehensive Lagoon Study/Master Plan
  - Ocean Ridge Drainage Network
  - Improvement Funding with FEMA BRIC Grants?



Sample subsurface infiltration technologies (Source: Philadelphia stormwater management guidance manual).

Questions?



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