

KIAWAH ISLAND  
COMMUNITY  
ASSOCIATION

# Kiawah's Ponds and Drainage System

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# Kiawah Island



- KICA maintains 122 ponds
- 352 acres of water surface
- 49.8 miles of pond shoreline
- Drainage infrastructure
- 30+ miles pipe



# Drainage Basins



- Group ponds into 15 basins: 7 major, 8 minor
- 2 drain 70% of Kiawah Island
- 10 have weir structures



# Beachwalker System Zoomed In



Sanders Bros, inlet inspection, pipe repairs, spot dredging, multiple connections



# Weirs



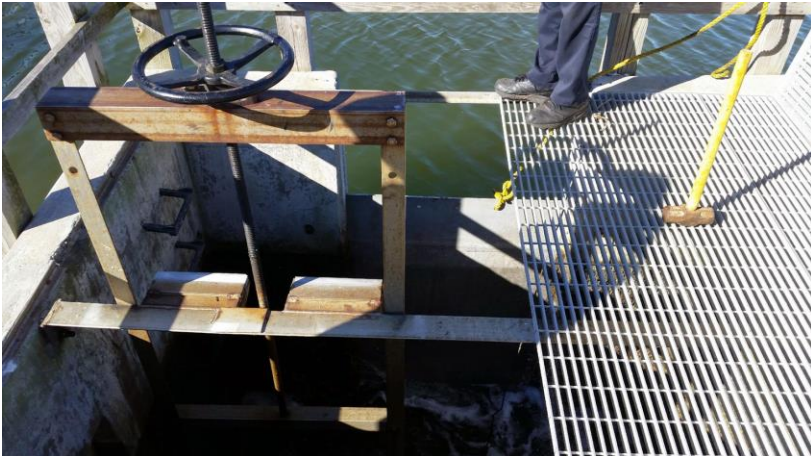
Engineered concrete structure that allows us to manage the flow of water in and out of Kiawah's ponds system





# Weir Operation

- Steel frame w/ cast iron components
- Turn wheels to raise/lower
  - Threaded rod and nut
- Directional flap gates
- Timing of drainage is tide dependent
- 4 hrs/tide to get whole island



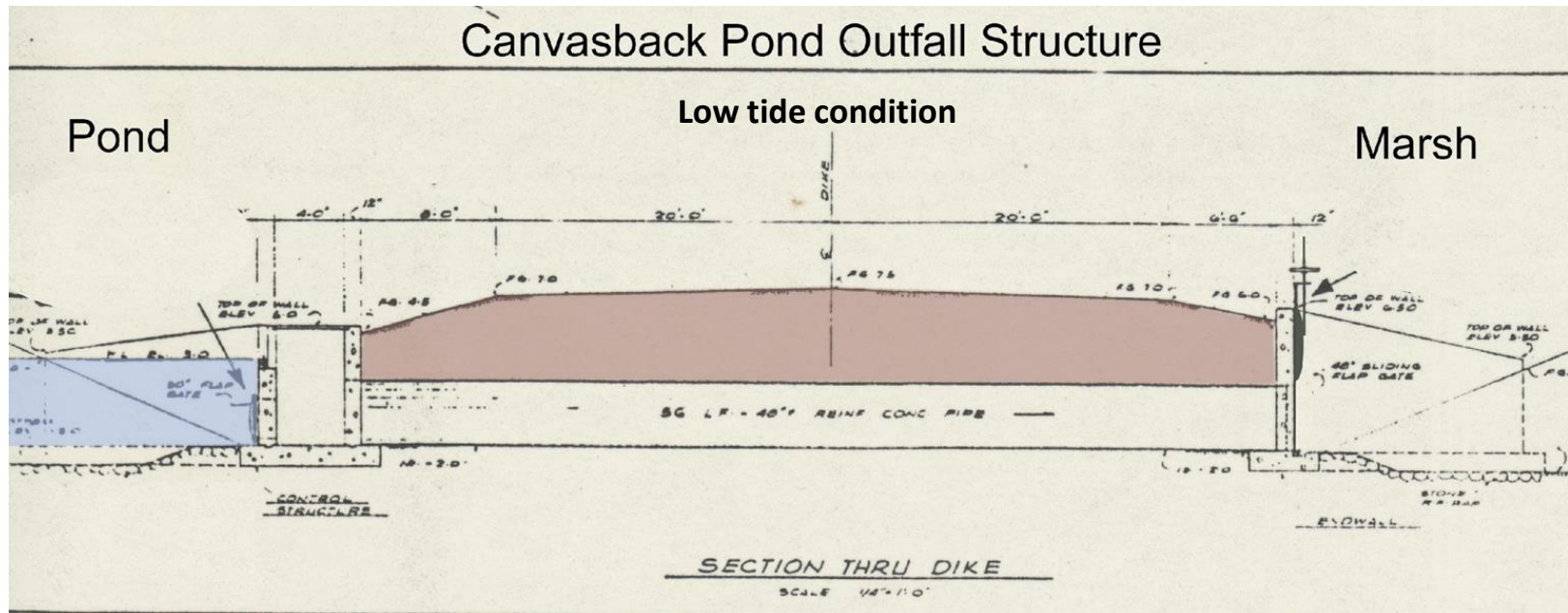
# Automatic Gates

- New! 2022 & 2023
- Allows control remotely
- Computer/internet based
- Backed by generator power
- Preset times/dates for predicted extreme tides
- Minimal man power and time



# Daily Operation

- Marsh side gates left open to allow water transfer at high tide
  - Helps pond health and water quality
- 6.1 ft flows into pond system
  - Higher than avg. high tide

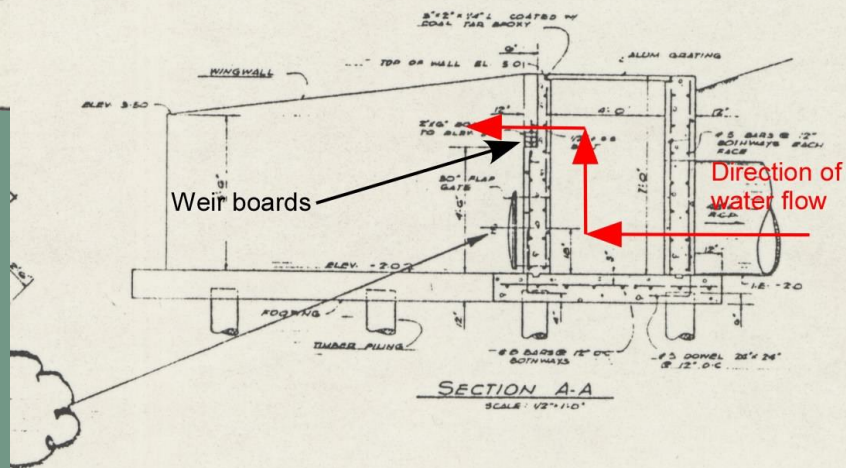
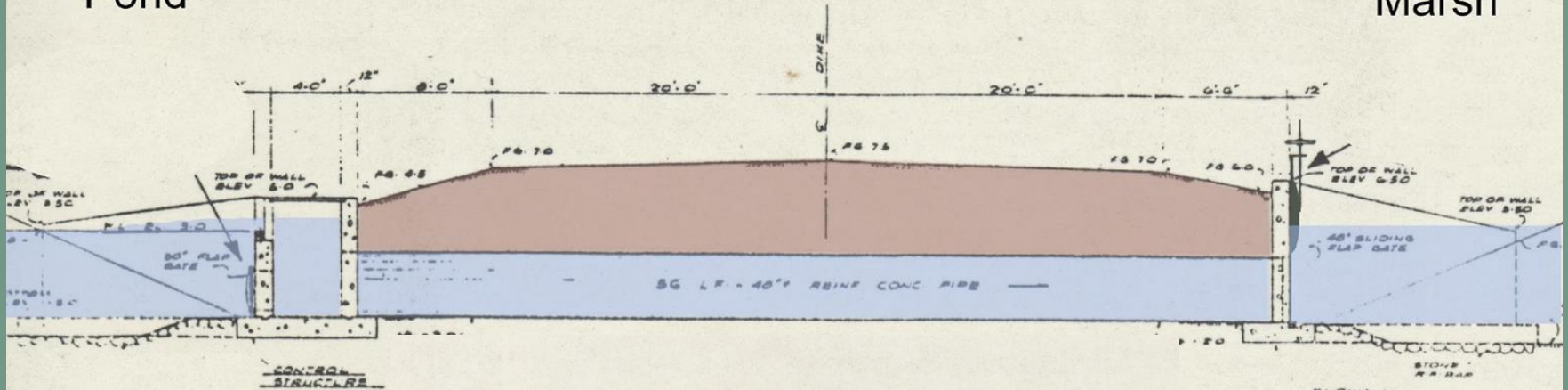


# Daily Operation - High Tide

## Canvasback Pond Outfall Structure

Pond

Marsh





# What can we handle?

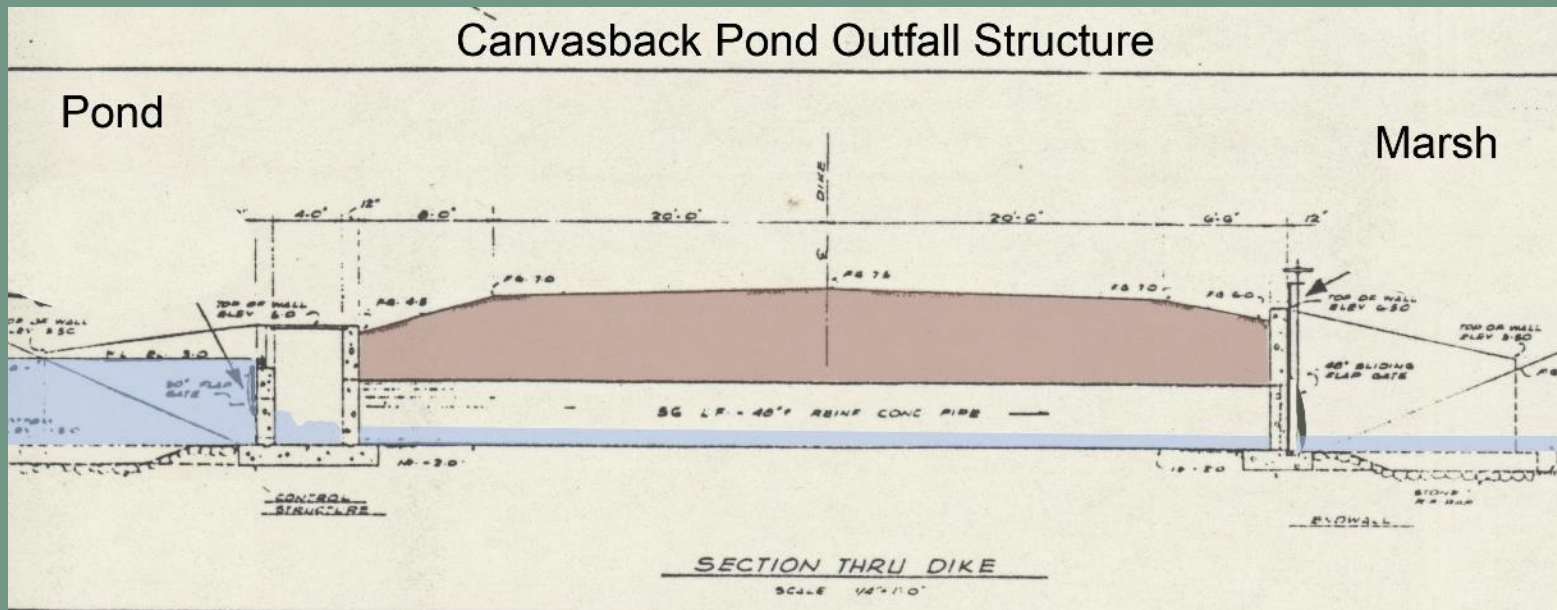
- Hydrologic study
- Individual storms are unique
- Rainfall
  - Storm water can be captured up to pond capacity
  - Stored in pond until tide falls
  - No appreciable drainage at high tide
- Surge
  - Cannot push water “uphill”
  - Pumping is futile at high tide





# Tropical System

- Timing, tide, rainfall, surge, intensity, location
- Prep begins days in advance
  - 4 hrs, drain at low
  - moving target, adapt
- Recovery



# What Does it Take to Lower Water?

- 2-3 days for significant capacity
- Manpower: initial setup, constant monitoring
- Limited by tides
- Early prep for big storms
- Changes with the forecast



# Sunny Day Flooding

- Extreme high tides
- 7.4 ft puts water on roads
- 8.75 ft breaches roads and earthen dikes

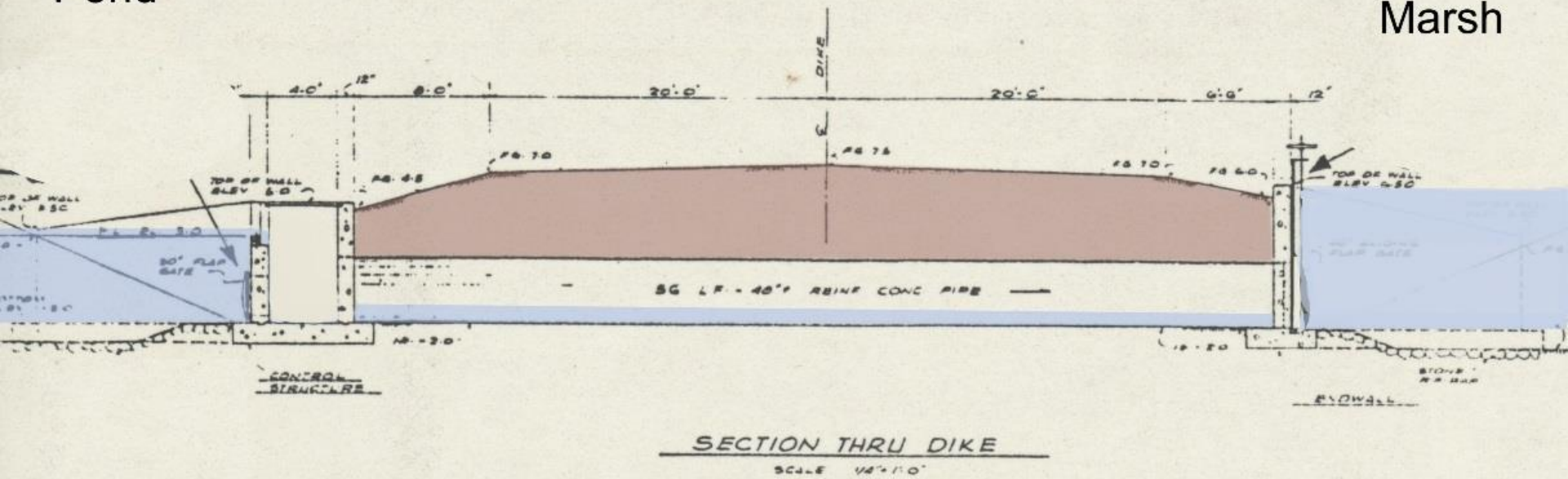


# Extreme High Tide

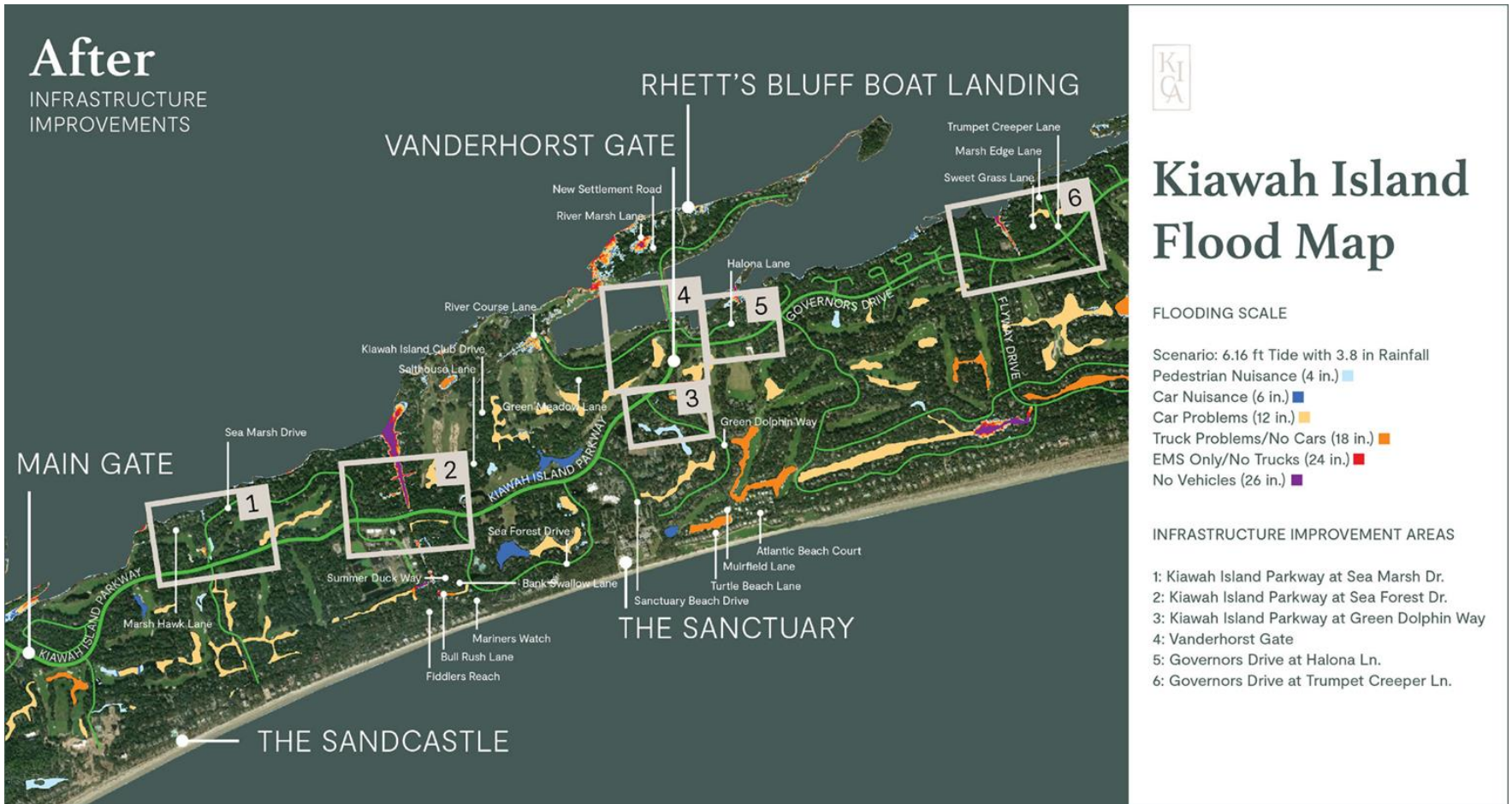
## Canvasback Pond Outfall Structure

Pond

Marsh



# Water Management Projects



# Takeaways

- Robust system
  - capacity
- Dynamic environment
- Regulated by tides
- Not cut and dry
  - Similar storms, different external conditions

