

Creating Resilient Infrastructure & Watersheds Conference

Coastal Resiliency Challenges and Planning in Fairfield, Connecticut

July 12, 2017

Presentation Team

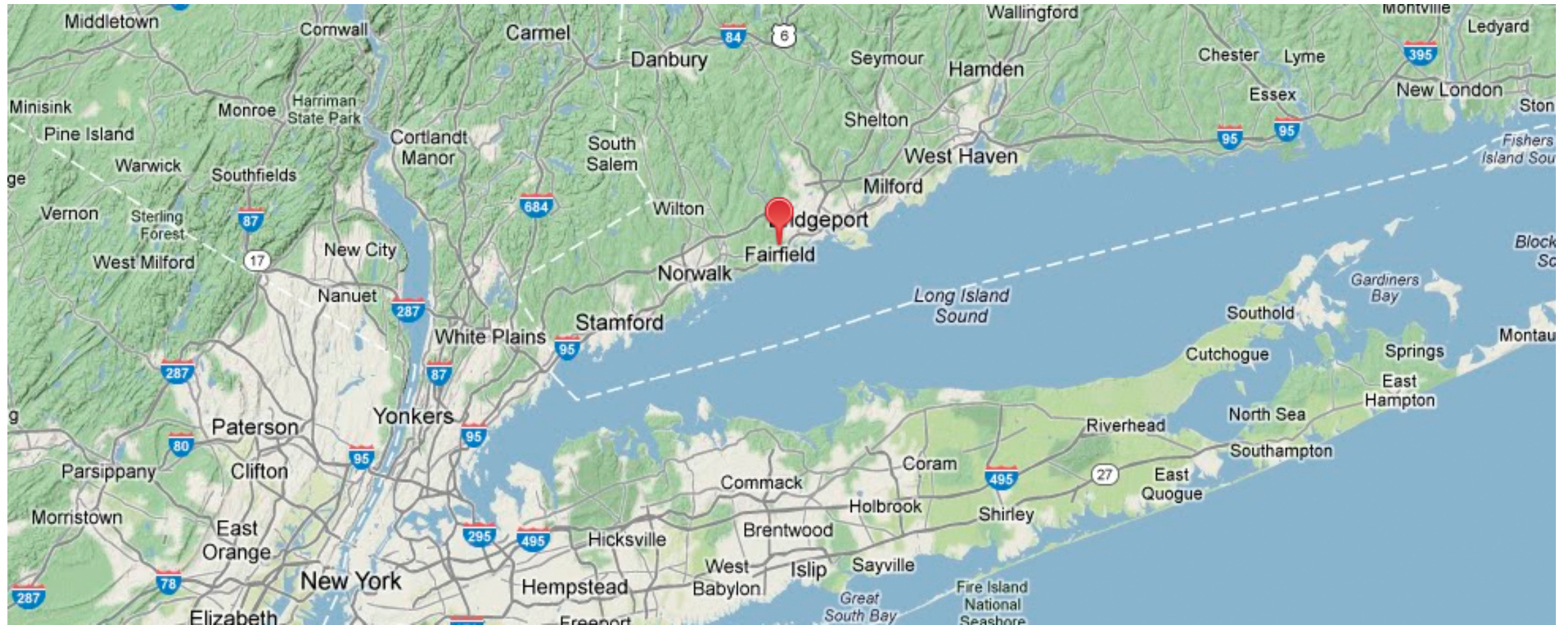
Joseph Michelangelo, P.E., Director of Public Works,
Town of Fairfield

Dana Huff, P.E., Vice President, Tighe & Bond

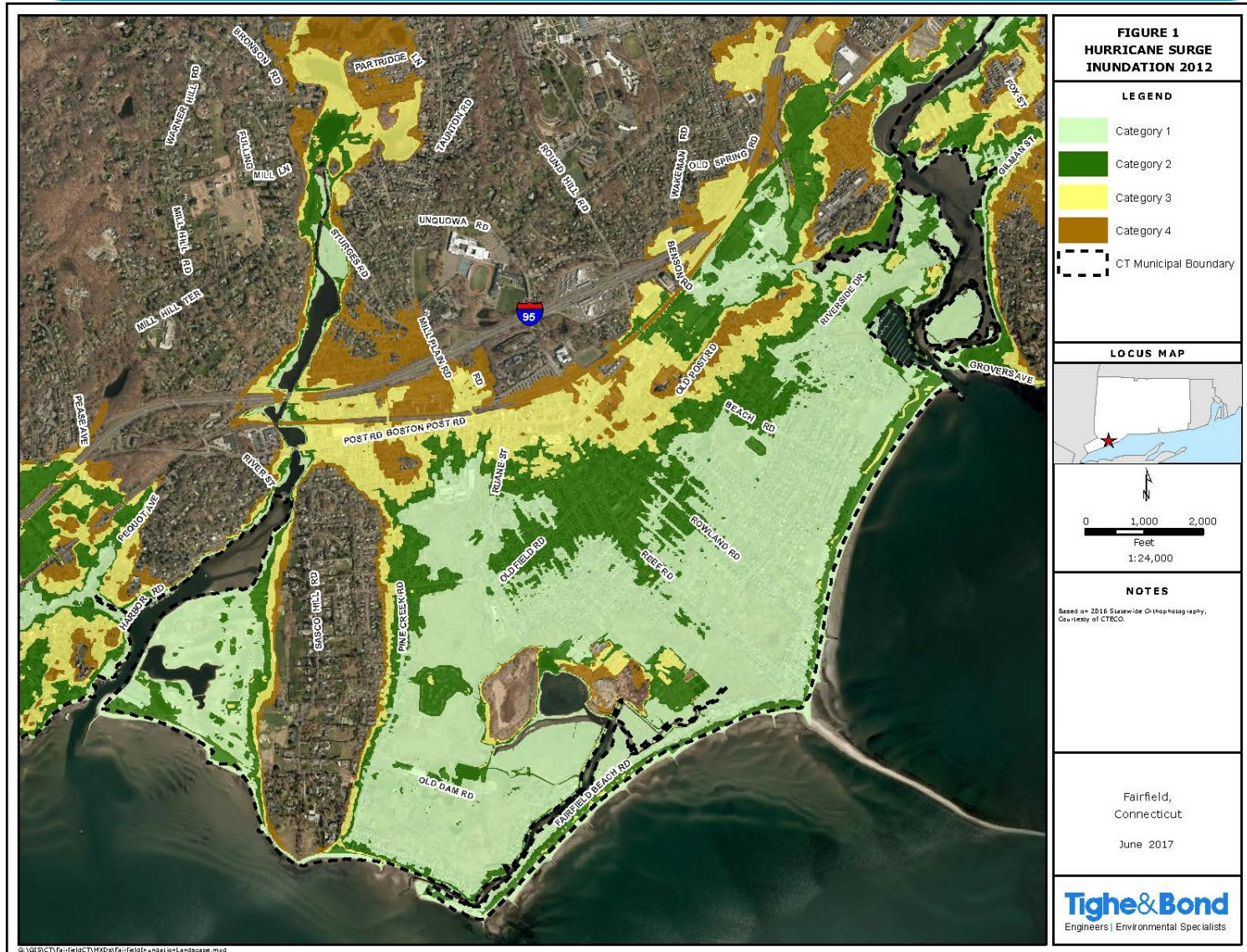
Outline

- **Background**
- **Hurricane Sandy**
- **Repair & Recovery**
- **Planning for the Future**
- **Questions**

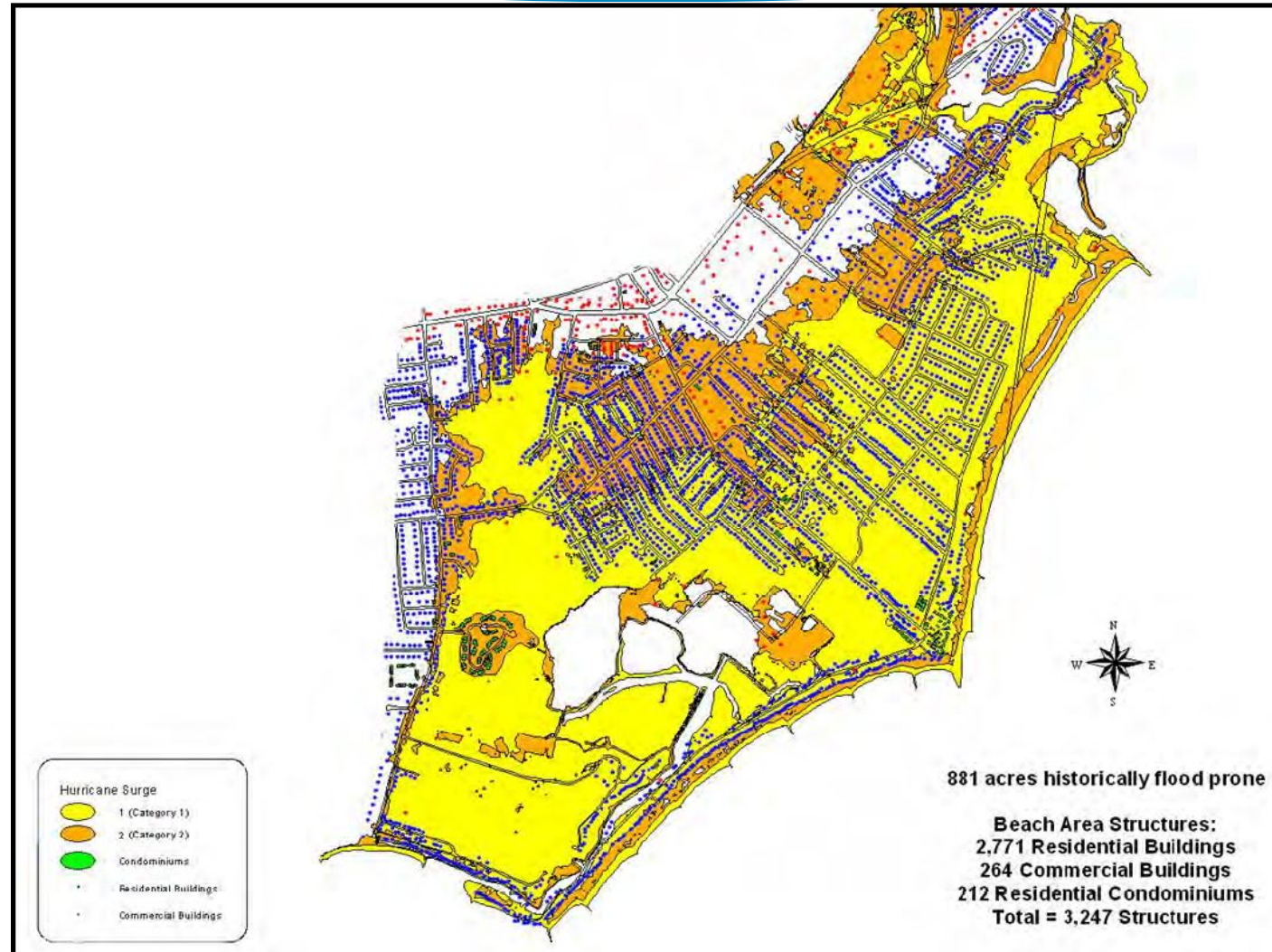
Background



Background

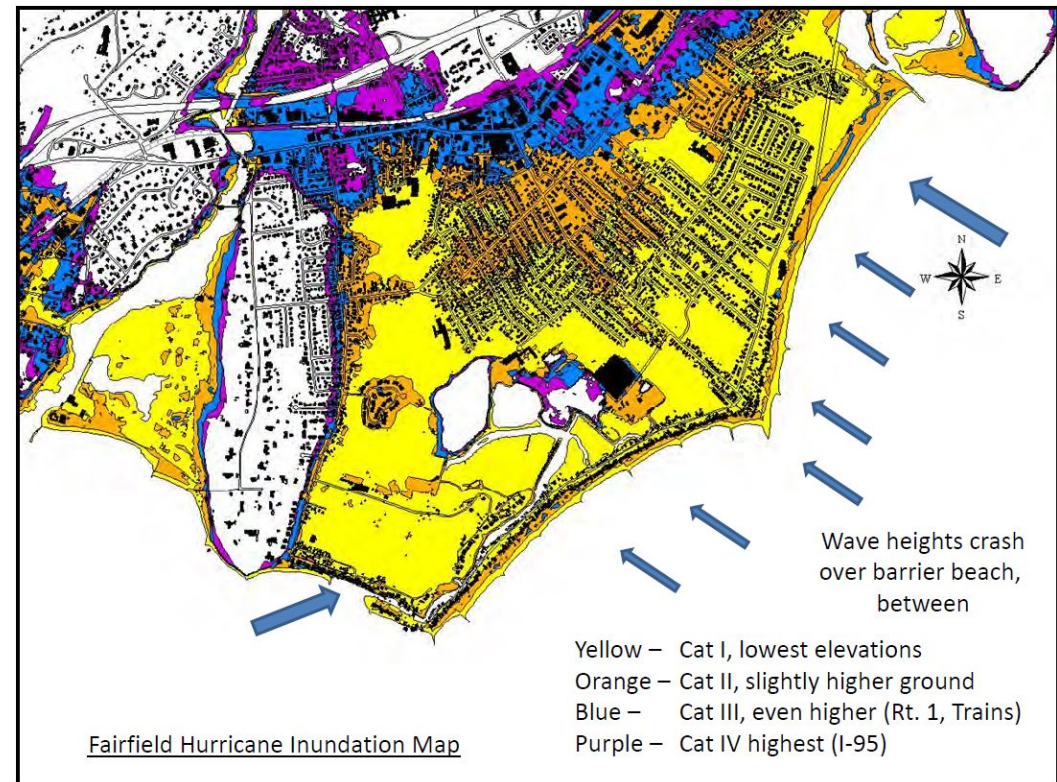
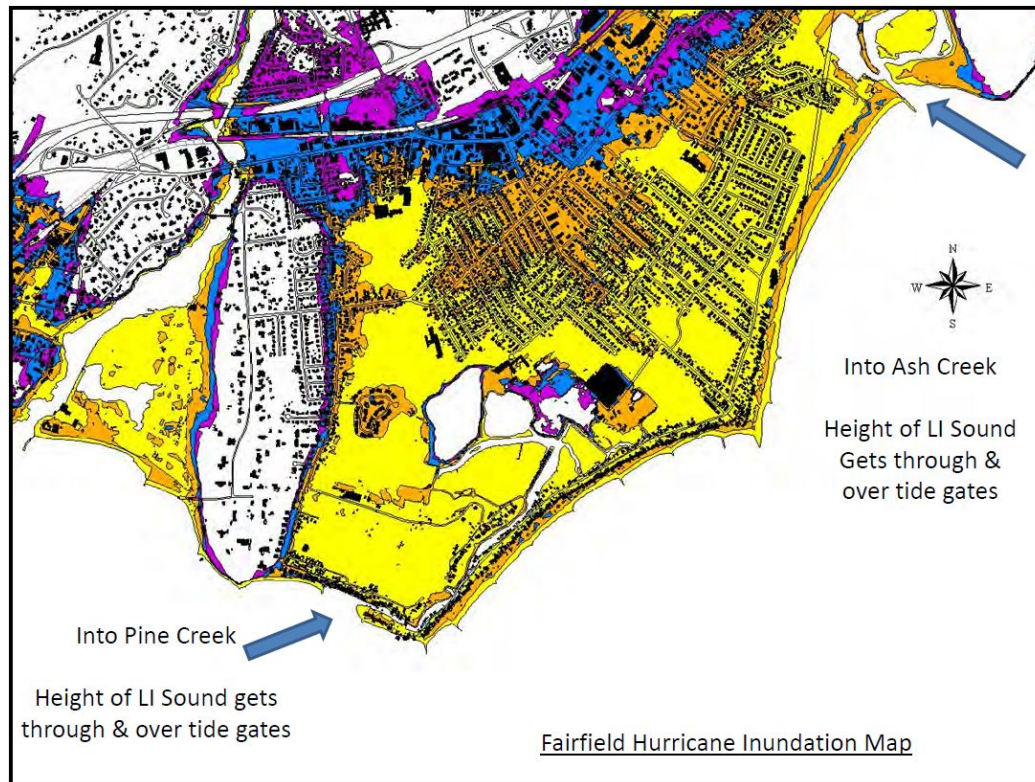


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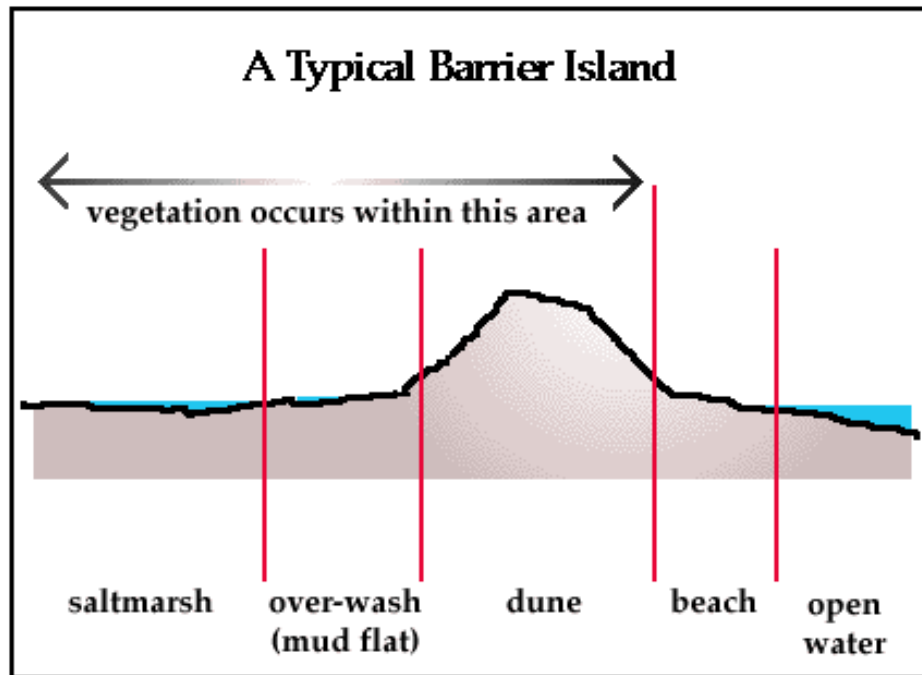
■ How does Fairfield flood?



Town of Fairfield Flood and Erosion Control Board

Background

■ How does Fairfield flood?



Hurricane Sandy



Hurricane Sandy



McAndrews, Michael. Aerial Views of Sandy Storm Damage in Connecticut. *Hartford Courant*

Hurricane Sandy



McAndrews, Michael. Aerial Views of Sandy Storm Damage in Connecticut. *Hartford Courant*

Repair & Recovery

■ FEMA Grants Secured for Immediate Repair Projects

- Penfield Pavilion
- South Benson Marina Fishing Pier
- Southport Beach Seawall/Breakers
- Pine Creek Navigational Channel Re-Establishment
- Fairfield Beach Road Seawall & Timber Bulkhead
- Pine Creek Dike
- Southport Beach Concession Foundation
- Sasco Beach Concession Foundation
- Ye Yacht Yard Restroom/Storage Building Foundation
- Pequot Avenue Bridge Scour Protection



Planning for the Future

■ HUD/CT DOH CDBG-DR Construction Grants

- Pine Creek Dike Culvert Repair
- Wastewater Treatment Plant (WWTP) Outfall Repair
- WWTP Hardening Project
- WWTP Microgrid Project
- Penfield Pavilion Repairs
- Shoreline Resiliency at Penfield Beach



Planning for the Future

■ Pine Creek Dike Culvert

- 48-inch CMP culvert
- 310-Acre watershed
- Culvert partially collapsed during Hurricane Sandy
- Vastly undersized for drainage area
- Contributing area was flooded for more than a week even with emergency pumping
- 36" main outfall from Fairfield WWTP approximately 12" below existing culverts



Planning for the Future

■ Pine Creek Dike Culvert

- Solution was two 48-inch culverts, two 60-inch “emergency” culverts
- Self-Regulating Tide Gates on 48-inch culverts
- Manual sluice gates on emergency culverts
- Triple Wall Polypropylene pipe for corrosion protection



Planning for the Future

■ But First...

- HUD Environmental Permitting
 - NEPA Checklist
 - 8 Step Process for Work in Floodplain
 - Environmental Assessment
 - Several rounds of notices
- CTDEEP OLISP Structures, Dredging & Fill, Tidal Wetlands & 401 Water Quality Certificate
- ACOE General Permit
- CTDEEP IWRD Flood Management Certification



Planning for the Future

■ WWTP Hardening Project

- 9.0 MGD WWTP
- Adjacent critical facilities include Fairfield County Fire Training School, Conservation Building and Animal Control
- Plant was partially inundated during Hurricane Sandy, nearly catastrophic
- Entire Town affected if plant incapacitated



Planning for the Future

■ WWTP Hardening Project

- 2,300 LF of sheet pile wall, 600 LF of earthen berm proposed
- Two pump stations sized for 100-Year storm
- Flood barrier at 500-Year flood elevation (more than 3' above 100-Year)
- Microgrid will allow facilities to operate in “island mode”
- Application being reviewed for CTDEEP Dam Safety Permit



Planning for the Future

■ HUD/CT DOH CDBG-DR Planning Grants

- South Benson Pump Station Study
- Riverside Drive Flood Mitigation Study
- Downtown Flooding and Drainage Study
- Engineered Beaches
- Pine Creek Dike Elevation Study



Planning for the Future

■ South Benson Pump Station Study

- 170-Acre watershed
- Existing storm drainage system very flat
- Surcharges in rainfall events greater than 1-Year Storm
- Lacks capacity to discharge storm surge flooding



Planning for the Future

■ South Benson Pump Station Study

- 80 MGD Pump Station
- Discharge two feet of storm surge flooding in 24 hours
- (2) 60 HP pumps for smaller storms, (4) 200 HP major pumps for 25-Year storm and storm surge
- Relay approx. 2 Miles of storm main to 0.5% slope
- New outfall to Ash Creek



Planning for the Future

- **FEMA – Pre-Disaster Mitigation Grant Program**
 - WWTP Generator Replacement
 - Mill River Pump Station Generator Replacement



Planning for the Future

■ Flood Prevention Master Plan

- New dikes and flood walls, raising of existing dikes
- Estimated project cost of \$27M
- Creates continuous physical barrier against 100-Year storm



Questions?

Dana Huff, P.E.
Vice President
Tighe & Bond, Inc.
1000 Bridgeport Avenue
Shelton, CT 06484
dchuff@tighebond.com

Joseph Michelangelo, P.E.
Director of Public Works
Town of Fairfield
725 Old Post Road
Fairfield, CT 06824
jmichelangelo@fairfieldct.org