REBUILD BY DESIGN
MEADOWLANDS
PUBLIC MEETING
MARCH 11, 2020
WELCOME / INTRODUCTIONS

Chris Benosky, AECOM

- Welcome + Introduction
- Project History and Build Plan
- From Feasibility to Design
- Design Phase Infrastructure
- Design Phase Landscape + Public Realm
- Open House Breakout Session
INTRODUCTIONS

CHRISTOPHER BENOSKY, Project Executive, AECOM

DAVE BLAIR, Project Manager, AECOM

ANNA HOCHHALTER, Landscape Architect, AECOM

MICHAEL MURPHY, HDR Manager, HDR

STEVE BIUSO, Design Manager, AECOM

SUSAN BEMIS, Associate Principal, Landscape Architecture and Urban Design, AECOM

HOGAN EDELBERG, Landscape Architect, AECOM

CAITLIN CAVANAGH, Water Resources Engineer, AECOM
PROJECT HISTORY + BUILD PLAN

CHRIS BENOSKY, AECOM
• HUD awarded State of New Jersey $150M for Phase 1 Pilot Area only

• Project must be functional and completed by September 2022
Address flood risk

Increase resiliency of the communities and ecosystems

Reduce impacts to critical infrastructure, residences, businesses, and ecological resources
Protect life, public health, and property

Increase community resiliency

Enhance water quality and protect ecological resources

Address systemic inland flooding & coastal flooding from storm surges

Integrate flood hazard risk reduction strategies with civic, cultural, & recreational benefits
ALTERNATIVE 3 HYBRID - THE BUILD & FUTURE PLAN
PREFERRED ALTERNATIVE

Build Plan

The Build Plan represents a feasible project that can be **constructed by 2022**. Components include flood reduction strategies to address frequent rain flooding.

Future Plan

Components that were not selected for the Build Plan became elements of a Future Plan. These elements could be implemented by others over time as new funding sources become available.
SELECTED ALTERNATIVE - BUILD PLAN
DOCUMENTED IN RECORD OF DECISION
Proposed components for construction

1. Pump station + Channel Improvements + New Park
2. Green Infrastructure + New Park
3. Pump Station + Force Main + Public Facility Improvements
4. Green Infrastructure
5. Park Improvements + 1 New Park + Green Infrastructure

Stormwater Management Features

- East Riser: Channel Improvements + Enhanced Wetland Open Space
- Avanti Park: Street Green Infrastructure + Enhanced Open Space
- Losen Slote: Force Main + Public Facility Improvements
- Green Infrastructure + Enhanced Wetland Open Space
- GI Improvements to Willow Lake Park + 1 New Wetland / Open Space along Hackensack River
FROM FEASIBILITY TO DESIGN

ANNA HOCHHALTER, AECOM
DESIGNING FOR FREQUENT RAIN FLOODING
FLOOD RISK + EXISTING CONDITIONS CHALLENGES

Major Challenges

- Over-burdened infrastructure
- Lack of drainage capacity
- Low-lying elevations with minimal grade changes
- Densely developed area
- Stormwater runoff carries pollutants into waterways

WATERWAYS LACK SUFFICIENT CONVEYANCE

STORMWATER FLOWS UNTREATED INTO WATERWAYS

STORMWATER RUNS OFF QUICKLY

LANDSCAPE WITH LOW ECOLOGICAL BENEFIT

DRAINAGE INFRASTRUCTURE LACKS CAPACITY

DIAGRAMS NOT TO SCALE
PROJECT DESIGN APPROACH + GOALS
FLOOD RISK REDUCTION + CO-BENEFITS

+ INFRASTRUCTURE
Primary flood risk reduction achieved through grey infrastructure

+ LANDSCAPE + PUBLIC REALM IMPROVEMENTS
Landscape improvements to provide additional water quality + parks + open space improvements
PROJECT FEATURE TYPES
INFRASTRUCTURE + LANDSCAPE / PUBLIC REALM

+ INFRASTRUCTURE
1. East Riser Channel Improvements + Pump Station
2. Losen Slote Force Main + Pump Station

+ LANDSCAPE / PUBLIC REALM
3. Joseph St. Park
4. Memorial Middle School
5. Little Ferry Library + Municipal Bldg
6. New Riverfront Park
7. Streetside Green Infrastructure - Type Improvements

DIAGRAMS NOT TO SCALE
PROPOSED PROJECT FEATURES
PUMP STATIONS + STORMWATER FORCE MAIN + CHANNEL IMPROVEMENTS

Pump Stations
Provide additional force to stormwater conveyance

Stormwater Force Main
Increases capacity for conveyance

Channel Improvements
Dredging + widening to improve conveyance
PROPOSED PROJECT FEATURES
LANDSCAPE + PUBLIC REALM IMPROVEMENTS

Native Planting
Planting native species improves ecological biodiversity and improves rain water uptake

Green Infrastructure
Methods of filtering and slowing stormwater to improve water quality + reduce burden on drainage system

Improved or New Parks
Designing ecological, community + recreational benefits
PROJECT IMPROVEMENTS
DESIGN PHASE PROJECT FEATURES

+ INFRASTRUCTURE
1. East Riser Channel Improvements + Pump Station
2. Losen Slote Force Main + Pump Station

+ LANDSCAPE / PUBLIC REALM
3. Joseph St. Park
4. Memorial Middle School
5. Little Ferry Library + Municipal Bldg
6. New Riverfront Park
7. Streetside Green Infrastructure - Type Improvements

DIAGRAMS NOT TO SCALE
DESIGN DRIVERS
DESIGN PROCESS OVERVIEW

CONCEPTUAL DESIGN

TECHNICAL
- Soil + Groundwater Data
- Geotechnical Data
- Existing Topography
- Existing Utilities
- Stormwater Regulations
- Existing + Future O&M
- Budget
- Timeline

COMMUNITY
- Stakeholder Coordination
- Community Priorities
- Ecological Goals

FINAL DESIGN
DESIGN PHASE PROJECT IMPROVEMENTS
SHOWN WITHIN DRAINAGE AREAS

East Riser Ditch
1. Channel Improvements + Pump Station

Losen Slote
2. Force Main + Pump Station
3. Joseph St. Park
4. Memorial Middle School
5. Little Ferry Library + Municipal Building

Hackensack River
6. Riverfront Park

Multiple Drainage Areas
7. Streetside Green Infrastructure-Type Improvements
DESIGN PHASE INFRASTRUCTURE

MIKE MURPHY, HDR
DAVID BLAIR, AECOM
INFOWORKS ICM MODEL DESIGN
BUILDING + REFINING THE MODEL FOR PROJECT DESIGN

**Purpose**
- Comparing existing and proposed conditions WSEL for rainfall events of varying sizes (2-yr to 100-yr)
- Extensive network of stormwater drainage infrastructure
- Cross-basin flow during large flooding events

**EAST RISER DITCH PROJECT AREA**
- 6 drainage basins
- 4400 acres (6.8 sq mi) drainage area
- 69 miles of stormwater pipes with existing pump stations and tide gates
- 2 rain gauges
- 17 flow meters
- 6 water level sensors

**LOSEN SLOTE INFRASTRUCTURE PROJECT AREA**
EAST RISER DITCH
EAST RISER DITCH IMPROVEMENTS

Major Challenges
• Over-burdened infrastructure
• Lack of channel capacity
• Water flow regulated by tide gate
• Low-lying elevations with minimal grade changes
• Densely developed project area
• Flooding occurs frequently
EAST RISER DITCH FLOOD RISK REDUCTION
AREA OF IMPROVEMENTS

Proposed Flood Reduction
• Channel design improves conveyance and reduces flood risk
• Located between Moonachie Ave and Starke Road
EAST RISER DITCH FLOOD RISK REDUCTION
PUMP STATION + CHANNEL IMPROVEMENTS

**Pump Station**
- Mostly underground station with submersible pumps
- Activates and pumps water beyond tide gates

**Channel Improvements**
- Dredging and embankment stabilization
- Bridge culvert and railroad bridge upgrades
- O&M corridor
- Native planting

Diagrams not to scale
EAST RISER DITCH ECOLOGICAL BENEFITS
DESIGNED FOR ECOLOGICAL ENHANCEMENT

Integrated Channel Ecology
- Native planting
- Biodiversity and improved air quality
- Cooler micro-climate
- Stormwater filtration reduces sediment loads
- Riparian and wetland plantings
LOSEN SLOTE
FORCE MAIN + PUMP STATION
LOSEN SLOTE FLOOD RISK REDUCTION + BENEFITS
INFRASTRUCTURE IMPROVEMENTS

Major Challenges
- Losen Slote drainage bottleneck results in frequent flooding
- Limited capacity in existing channel + pipe network
- Densely developed area
Northern Pump Station
- Located near Lorena St. and Liberty St.

Force Main to improve flow capacity
- The Force Main runs ~2,900 feet
- Located within Liberty St., Eckel Rd. and Birch St.

Existing Abandoned Tide Gate
- Existing Abandoned Tide Gate to be removed
- Channel restored
Proposed Flood Reduction

- Pump Station capacity is 50 cfs
- Activates and pump into force main when water elevation in existing conduit pipe is ~75% of pipe diameter
Proposed Flood Reduction
- Force main inlet connected to pump station
- Large 36-in diameter pipeline
- Energy dissipation at outflow into Losen Slote
LOSEN SLOTE FORCE MAIN FLOOD RISK REDUCTION
PUMP STATION SITE PLAN

NEW PUMP STATION

PROPERTY LINE

SIDE SETBACK:
4.6 FEET

REAR SETBACK:
2.15 FEET

PROPERTY LINE

10" VENT GOOSENECK EXTENDED TO 3'-6" ABOVE GRADE

10" VENT

ACCESS HATCH (TYP.)

GUARD POST, TYP.

18" VENT GOOSENECK EXTENDED TO 3'-6" ABOVE GRADE

GATE ENCLOSURE (ABOVE GRADE)

LOCATION OF EXIST.
78" X 52" PIPE

REMOVABLE COVER (TYP.)

BELOW GRADE PUMPING STATION

GAS METER

DEWATERING CHAMBER

WATER SERVICE HOT BOX

NEW CHAIN LINK FENCE

NEW SHRUBS

CONC. SIDEWALK AND DEPRESSED CURB

NEW RETAINING PAVEMENT

CONNECTION OF NEW WATER AND GAS SERVICE LINES BY THE UTILITY COMPANIES

36" FORCE MAIN, SEE CFM DRAWINGS

6" WATER SERVICE

GAS SERVICE, SIZE TBD.

LOSEN SLOTE

NEW FORCE MAIN

GRAPHIC FOR ILLUSTRATIVE PURPOSES
LANDSCAPE + PUBLIC REALM
UNDER CONSIDERATION WITH FLOOD-RISK REDUCTION FEATURES

Losen Slote
1. Joseph St. Park
2. Memorial Middle School
3. Little Ferry Library + Municipal Building

Hackensack River
4. Riverfront Park

Multiple Drainage Areas
5. Streetside Green Infrastructure-Type Improvements

DIAGRAMS NOT TO SCALE
LOSEN SLOTE COMMUNITY + ECOLOGICAL BENEFITS
MEMORIAL MIDDLE SCHOOL
LOSEN SLOTE COMMUNITY + ECOLOGICAL BENEFITS
MEMORIAL MIDDLE SCHOOL CONCEPT

Existing Conditions
- School yard
- Memorial
- Existing trees
- Lawn

Proposed Project Improvements
- Existing trees and memorial to remain
- Native planting
- Learning gardens
- Green infrastructure-type improvements
LOSEN SLOTE COMMUNITY + ECOLOGICAL BENEFITS

LITTLE FERRY LIBRARY
LOSEN SLOTE COMMUNITY + ECOLOGICAL BENEFITS
LITTLE FERRY LIBRARY CONCEPT

Existing Site
- Public Library
- Asphalt parking
- Ornamental shrubs

Proposed Project Improvements
- Native planting
- Green infrastructure-type improvements
- Permeable paving
Existing Site
- Borough Hall and Police Department
- Asphalt parking
- Parking landscape islands

Proposed Project Improvements
- Native planting
- Green infrastructure-type improvements
- Permeable paving
LOSEN SLOTE COMMUNITY + ECOLOGICAL BENEFITS

JOSEPH ST. PARK
Existing Site
- Civic Center + Senior Center
- Sports courts
- Playground equipment
- Pavilion

Proposed Project Improvements
- Native planting
- Green infrastructure-type improvements
- Permeable paving
HACKENSACK RIVER COMMUNITY BENEFITS
COMMUNITY + ECOLOGICAL BENEFITS

RIVERFRONT PARK
HACKENSACK RIVER COMMUNITY BENEFITS
RIVERFRONT PARK CONCEPT

Existing Site
- Private waterfront
- Private boat access + storage
- Church development in-progress

Proposed Project Improvements
- New Park (park boundary currently under consideration)
- Ecological enhancement
- Public waterfront access
PROJECT-WIDE COMMUNITY + ECOLOGICAL BENEFITS
STREETSIDE GREEN INFRASTRUCTURE-TYPE IMPROVEMENTS

STREETSIDE GREEN FEATURES
PROJECT-WIDE COMMUNITY + ECOLOGICAL BENEFITS
AREAS OF STREETSIDE GREEN INFRASTRUCTURE-TYPE IMPROVEMENTS

Improvements being considered
• ~20 systems being assessed
• Filtering nearly roadway runoff
• Designed to capture stormwater and then slowly release into grey infrastructure, reducing peak flow in the storm sewer mains
• Located within public right-of-way
• Native soils have poor infiltration capacity and high groundwater limits application in some areas
Improvements being considered

- Treats smaller, more frequent storms
- 4 primary types:
  - Bioretention basins*
  - Bioretention planters*
  - Storage Trenches
  - Tree Trenches
- Some types include vegetation or trees, while others are below the surface.

*Alternative designs being considered where shallow groundwater is present. Final designs are not yet confirmed.
OPEN HOUSE BREAKOUT SESSION

ANNA HOCHHALTER, AECOM
OPEN HOUSE SESSION OVERVIEW

OVERALL PROJECT INFO

GREY INFRASTRUCTURE

RIGHT-OF-WAY GREEN INFRASTRUCTURE

OVERALL ECOLOGICAL DESIGN STRATEGY

MUNICIPAL SITES

RIVERFRONT PARK
REBUILD BY DESIGN MEADOWLANDS: OVERALL PROJECT
DESIGN PURPOSE + FEATURES

FLOOD RISK REDUCTION + CO-BENEFITS

REDUCE FLOOD RISK

CULTIVATE ECOLOGY

ENERGIZE COMMUNITY

DESIGN APPROACH

INFRASTRUCTURE + LANDSCAPE + PUBLIC REALM IMPROVEMENTS

IMPROVED CONVEYANCE WITH PUMP STATIONS AND CHANNEL IMPROVEMENTS
GREEN INFRASTRUCTURE IMPROVES WATER QUALITY
PUBLIC REALM FILTERS AND DIRECTS SURFACE FLOW
ECOLOGICAL ENHANCEMENTS + COMMUNITY RECREATION
INCREASED CAPACITY WITH FORCE MAIN + PUMP STATION

NOTE: FEATURES ARE CURRENTLY UNDER DESIGN AND ARE SUBJECT TO CHANGE

Diagrammatic: Not to scale

Northern Losen Slote Pump Station
1. Losen Slote Force Main
2. East Riser Channel Improvements
3. East Riser Pump Station
4. Riverfront Park
5. Little Ferry Library
6. Little Ferry Municipal Building
7. Memorial Middle School
8. Joseph St. Park
9. Streetside Features (multiple locations)
**REBUILD BY DESIGN**

**MEADOWLANDS**

**LOSEN SLOTE**

**FORCE MAIN**
- The Force Main runs ~2,900 feet
- Bypasses a bottleneck in the stormwater flow within Losen Slote drainage area
- Discharges into open channel at Birch St.

**NORTHERN LOSEN SLOTE PUMP STATION**
- Draws stormwater out of Losen Slote and into a new force main
- Bypasses majority of existing Losen Slote below-grade conduit

**EAST RISER**

**CHANNEL IMPROVEMENTS**
- Channel design improves water conveyance and reduces flood risk
- Dredging, widening and embankment stabilization
- Bridge culvert and railroad bridge replacements
- O&M corridor
- Native planting

**PUMP STATION**
- Submersible pumps
- Activates and pumps water beyond tide gates when water levels in East Riser Ditch reach 2’ EL.
GREEN INFRASTRUCTURE-TYPE IMPROVEMENTS

SYSTEM PERFORMANCE

- Numerous system locations throughout project area
- Filtering roadway runoff
- Designed to capture stormwater and then slowly release into existing grey infrastructure, reducing peak flow in the storm sewer mains
- Treating and diverting runoff from entering the sewer system at the peak of the storm

4 PRIMARY TYPES UNDER CONSIDERATION*

*Alternative designs being considered where shallow groundwater is present. Final designs are not yet confirmed.

- Located within public right-of-way
- Native soils have poor infiltration capacity and high groundwater limits application in some areas
- Treats smaller, more frequent storms
- Some types include vegetation or trees, while others are below the surface.
**OVERALL PROJECT INFO**

**GREY INFRASTRUCTURE**

**RIGHT-OF-WAY GREEN INFRASTRUCTURE**

**OVERALL ECOLOGICAL DESIGN STRATEGY**

**MUNICIPAL SITES**

**RIVERFRONT PARK**
LITTLE FERRY BOROUGH HALL
CONCEPTUAL DESIGN

SITE PERFORMANCE

EXISTING CONDITION

UNIVERSITY AVE.
ON-SITE OCCASIONAL FLOODING
UNTREATED RUN-OFF

FILTERS RUN-OFF FROM ROOF
FILTERS RUN-OFF FROM LAWN AND PARKING LOT

FILTERS RUN-OFF FROM PARKING LOT

SITE PERFORMANCE

CONCEPTUAL DESIGN

DESIGN STRATEGY

+ DOWNSPOUT PLANTERS

IMPROVES BIODIVERSITY
FILTERS RUN-OFF FROM PARKING LOT

+ PERMEABLE PAVERS

FILTERS RUN-OFF FROM PARKING LOT AND DRIVEWAY
FILTERS RUN-OFF FROM LAWN

+ REGRADING + NATIVE PLANTING

IMPROVES BIODIVERSITY
FILTERS RUN-OFF FROM LAWN

HOW DOES IT WORK ON SITE?

DOWNSPOUT PLANTER

FILTERS RUN-OFF FROM ROOF
FILTERS RUN-OFF FROM PARKING LOT

PERMEABLE PAVING WITHIN PARKING STALLS

REGRADING AND NATIVE PLANTING

IMPROVES BIODIVERSITY
FILTERS RUN-OFF FROM LAWN
SITE PERFORMANCE

EXISTING CONDITION

UNTREATED RUN-OFF

ON-SITE OCCASIONAL FLOODING

FILTERS RUN-OFF FROM PARKING LOT

FILTERS RUN-OFF FROM ROOF

SITE PERFORMANCE

CONCEPTUAL DESIGN

DESIGN STRATEGY

+ DOWNSPOUT PLANTERS

+ PERMEABLE PAVERS

HOW DOES IT WORK ON SITE?

FILTERS RUN-OFF FROM ROOF

FILTERS RUN-OFF FROM PARKING LOT AND DRIVEWAY

IMPROVES BIODIVERSITY

IMPROVES BIODIVERSITY

DOWNSPOUT PLANTER

PERMEABLE PAVING WITHIN PARKING STALLS
**SITE PERFORMANCE**

- **EXISTING CONDITION**
- **SITE PERFORMANCE**
- **CONCEPTUAL DESIGN**

**DESIGN STRATEGY**

- **BIORETENTION BASIN**
  - Improves biodiversity
  - Filters run-off from parking lot and driveway

- **REGRADING + NATIVE PLANTING**
  - Filters run-off from parking lot
  - Improves biodiversity
  - Filters run-off from lawn

**HOW DOES IT WORK ON SITE?**

- **BIORETENTION BASIN**
- **REGRADING AND NATIVE PLANTING**
**SITE PERFORMANCE**

- **EXISTING CONDITION**
  - Filters run-off from lawn and parking lot
  - Improves biodiversity
  - On-site occasional flooding

- **SITE PERFORMANCE**
  - Filters run-off from roof
  - Filters run-off from parking lot
  - Improves biodiversity

- **CONCEPTUAL DESIGN**
  - Filters run-off from lawn and parking lot
  - Improves biodiversity
  - Filters run-off from roof

**DESIGN STRATEGY**

- **DOWNSPOUT PLANTERS**
  - Filters run-off from roof
  - Filters run-off from parking lot
  - Arranges native planting

- **PERMEABLE PAVERS**
  - Filters run-off from roof
  - Filters run-off from parking lot
  - Improves biodiversity

- **REGRADING + NATIVE PLANTING**
  - Filters run-off from parking lot and driveway
  - Arranges native planting

**HOW DOES IT WORK ON SITE?**

- **DOWNSPOUT PLAN TER**
  - Filters run-off from roof

- **PERMEABLE PAVING WITHIN PARKING STALLS**
  - Filters run-off from roof

- **REGRADING AND NATIVE PLANTING**
  - Filters run-off from parking lot and driveway
RIVERFRONT PARK
CONCEPTUAL DESIGN

1. SOUTHERN COVE
   - HSA MARITIME EDUCATION + BOAT STORAGE

2. MARITIME PLAZA
   - FLEXIBLE SMALL GATHERING IN LUSH PLANTING

3. CENTRAL CORE
   - FLEXIBLE GROUP GATHERING

4. NORTHERN PROMENADE
   - TIDAL MARSH ENHANCEMENT WITH FLOATING KAYAK LAUNCH

FUTURE CHURCH + PARKING

RIVERSIDE AVE.
BERGEN TURNPIKE
WASHINGTON AVE.

DESIGN IN PROGRESS AND SUBJECT TO CHANGE. DIAGRAM NOT TO SCALE.
NEXT STEPS
CHRIS BENOSKY, AECOM
NEXT STEPS

- Detailed Design Development + Permitting
- On-going Engagement
- Citizen Advisory Group Meeting (Spring)
- Community Meeting (Summer)
CRITICAL PROJECT INFORMATION

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Question & Answer