CITIZEN ADVISORY GROUP (CAG) MEETING #6

ALTERNATIVE 1: STRUCTURAL FLOOD REDUCTION CONCEPT DEVELOPMENT
Welcome & Opening Remarks
Project Status Update and Schedule
Alternative 1: Structural Flood Reduction Concept Development
  - Flood Conditions
  - Flood Reduction Alignment Options
  - Developing the “Kit of Parts”
- Developed working draft Concept Screening Criteria
- Completed and published to Project Website:
  - Meeting Minutes from CAG Meeting #5
  - November 2016 Newsletter
- Developing Alignment Options
ALTERNATIVE 1:
STRUCTURAL FLOOD REDUCTION
CHRIS BENOSKY, AECOM
NEARLY ALL THE PROJECT AREA IS WITHIN THE 100-YEAR FLOODPLAIN.

**Legend**
- Municipality
- 100-Year Floodplain
- Properties Within 100-Year Floodplain
- Properties Not Within 100-Year Floodplain
SEA LEVEL RISE BY 2050

- SEA LEVEL IS ESTIMATED TO RISE BETWEEN 0.5 – 1.1 FEET

Data Sources: NOAA Int-High, NOAA Int-Low/USACE Intermediate (Modified NRC Curve II, Sea Level Rise (SLR) Inundation Data, NOAA Coastal Services Center (2015))
SEA LEVEL RISE BY 2075

- **SEA LEVEL IS ESTIMATED TO RISE BETWEEN 1.2 – 2.4 FEET**

Legend

- Municipality
- Direction of Water
- Water
- 0’ Sea Level Rise
- 1’ Sea Level Rise
- 2’ Sea Level Rise
- 3’ Sea Level Rise
- 4’ Sea Level Rise
- 5’ Sea Level Rise
- 6’ Sea Level Rise

Data Sources: NOAA Int-High, NOAA Int-Low/USACE Intermediate (Modified NRC Curve II, Sea Level Rise (SLR) Inundation Data, NOAA Coastal Services Center (2015))
AVERAGE WATER LEVELS

- 5': EXAMPLE GROUND ELEVATION (NAVD 88)
- 3.08': MEAN HIGHER HIGH WATER (NAVD 88)
- 2.75': MEAN WATER LEVEL (NAVD 88)
- -3.55': MEAN LOWER LOW WATER (NAVD 88)

- AVERAGE WATER LEVELS OF THE HACKENSACK RIVER RELATIVE TO A 5' GROUND ELEVATION
THERE IS A 10% CHANCE THIS STORM COULD OCCUR EACH YEAR
There is a 2% chance this storm could occur each year.
100-YEAR STORM

- THERE IS A 1% CHANCE THIS STORM COULD OCCUR EACH YEAR
STARTING AT A 7’ ELEVATION

- 7’ NAVD88 is approximately 8’ NGVD29
- Using the 7’ elevation as a study baseline
- 7’ elevation maintains existing level of protection with Sea Level Rise through 2050
- Other elevation heights are being considered and will be included as costs and feasibility inputs are identified
- Currently investigating tie-in options and footprint locations
NORTHEAST EDGE

7' FLOOD ELEVATION (NAVD 88)

(5') EXAMPLE GROUND ELEVATION

1-3' FLOOD STRUCTURE

5' EXAMPLE GROUND ELEVATION

REBUILD BY DESIGN MEADOWLANDS

CAG Meeting #6 // December 6, 2016
SOUTHEAST / SOUTHEAST EDGES

FLOOD STRUCTURE AS HIGH AS 4'

7' FLOOD ELEVATION (NAVD 88)

4' EXAMPLE GROUND ELEVATION
7’ ELEVATION - FILLING IN THE GAPS

- **EXISTING GROUND CONDITIONS**
  - IN THE PROJECT AREA MAY BE AT OR ABOVE A 7’ ELEVATION

- **FOR STUDY PURPOSES, THIS ALIGNMENT CONSIDERS 7’ ELEVATION TO BE HIGH GROUND**

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7’ ELEVATION

HIGH GROUND

UNDER 7 ELEVATION
7' ELEVATION - FILLING IN THE GAPS

- A FLOOD REDUCTION STRATEGY WILL BE PROPOSED IN AREAS WHERE GROUND ELEVATION IS BELOW 7'

UNDER 7' ELEVATION

MEETING 7' ELEVATION
HOW TIE-INS WORK

- STRUCTURAL FLOOD REDUCTION CONNECTS EXISTING HIGH GROUND (7’ ELEVATION)
HARD & SOFT EDGES

- THE COLORS ON THE FOLLOWING ALIGNMENT MAPS REPRESENT POTENTIAL LOCATION OF WALLS AND BERMS
- **Overview of all alignment options at 7’ elevation**
- **Screening of options is ongoing**
- **Interactive maps available post-meeting**
PRELIMINARY

FLOOD REDUCTION ALIGNMENT OPTIONS

GARRETT AVERY, AECOM
ZONE KEY

- SIX AREAS WITH SEVERAL OPTIONS
- MIX OF WALLS AND BERMS PROVIDE FLOOD PROTECTION
- NEW TIDAL GATES AND PUMP STATIONS
- **OPTION 1:** TIE-IN WEST OF BERGEN TNPK. ROAD REGRADING OR A DEPLOYABLE WOULD BE REQUIRED.

- **OPTION 2:** TIE-IN NORTH OF PROJECT AREA. NO ROAD CROSSINGS OR REGRADING NEEDED.

- **OPTION 3:** TIE INTO HACKENSACK RIVERWALK NORTH OF PROJECT AREA. NO ROAD-CROSSING REQUIRED.
- **OPTION 4:** INTERIOR ALIGNMENT, TIE-IN AT 7’ CONTOUR AT INDIAN LAKE. WOULD REQUIRE ROAD REGRADING AND DEPLOYABLES.

- **OPTION 5:** INTERIOR ALIGNMENT, TIE-IN AT 7’ CONTOUR ON THE EAST SIDE OF BERGEN TNPK. WOULD REQUIRE ROAD REGRADING AND DEPLOYABLES.
**ALIGNMENT OPTION – ZONE 3**

- **ELEVATION 7’ ALIGNMENT CONTINUES ALONG THE EDGE.**
- **TYING INTO TO HIGHGROUND AND USING BERMS WHERE POSSIBLE.**
- **EXISTING RIVER ACCESS PRESERVED BY CLOSURE GATES.**
- Elevation 7' alignment composed of floodwall or berm as space allows.
- Surge gate to protect existing treatment plant outfalls.
- Reinforcement or replacement of existing berms being studied. Floodwall and berm being considered to limit potential wetland disturbance.
- **OPTION 1:** TIE-OFF ON NORTH SIDE OF COMMERCE BLVD. WOULD REQUIRE ROAD REGRADING AND CLOSURE GATES (CROSSES ACCESS POINTS).

- **OPTION 2:** TIE-OFF ON SOUTH SIDE OF COMMERCE BLVD. COULD BE A BERM OR A WALL. NO REGRADING OR STREET CROSSINGS.

- **OPTION 3:** TIE-OFF TO 7’ CONTOUR. FOLLOWS PATH OF EXISTING BERM TO LIMIT POTENTIAL WETLAND DISTURBANCE.
OPTION -1

- **SURGE BARRIER AT PATerson PLANK ROAD (SOUTH OF THE BRIDGE) WOULD PROTECT OVER 50% OF THE PROJECT AREA.**

- **(3) CLOSURE GATES, REGRADING, AND MINOR WALL TO TIE-OFF.**

- **NEW PUMP STATION TO CONTROL WATER LEVEL IN BERRY’S CREEK DUE TO RAINFALL.**
ALIGNMENT OPTION – ZONE 6

OPTION - 2

- INTERIOR ALIGNMENT ALONG THE EAST BANK OF BERRY’S CREEK.
- CONNECTS EXISTING TIDE GATES AND SURROUNDING POINTS AT 7’ GROUND ELEVATION.
- WOULD REQUIRE ADDITIONAL TIDE GATES AND NEW PUMP STATION.
ALIGNMENT OPTION – ZONE 6

OPTION - 3

• INTERIOR CONNECTIONS TYING OFF TO 7' CONTOURS.
DESIGN ELEMENTS

APPLYING THE “KIT OF PARTS”

SUSAN BEMIS, AECOM
MODULARIZING THE "KIT OF PARTS"

WHAT GOES WHERE?

- BASIC WALL
- BENCH
- PLANTER
- AMPHITHEATER
- CANOPY
- CANTILEVERED WALKWAY
- SHEET PILE
- WALLS

- BERM + PATH
- BASIC BERM

- BERMS

- FLIP DEPLOYABLE
- INFLATABLE DEPLOYABLE
- ROLLER DEPLOYABLE

- DEPLOYABLES
MODULARIZING THE “KIT OF PARTS”

WHAT GOES WHERE?

COMMERCIAL
BASIC WALL
BENCH
PLANTER
CANOPY
ROLLER DEPLOYABLE
FLIP DEPLOYABLE

RESIDENTIAL
BASIC WALL
BENCH
PLANTER
AMPHITHEATER
CANTILEVERED WALKWAY
BERM + PATH

INDUSTRIAL
BASIC WALL
SHEET PILE
BASIC BERM
FLIP DEPLOYABLE
INFLATABLE DEPLOYABLE
ROLLER DEPLOYABLE
EXISTING CONDITIONS

- BUILDING THE LINE OF PROTECTION
- RESPONDING TO THE EXISTING COMMERCIAL ENVIRONMENT
COMMERCIAL ZONE
BUILDING THE PROTECTION

- STARTING WITH THE BASIC WALL
- BUILDING THE SYSTEM WHERE APPROPRIATE
BUILDING THE PROTECTION

- MODULAR SYSTEM WORKS IN 30’ UNITS
- SYSTEM REDUCES COST AND TIME OF CONSTRUCTION
BUILDING THE PROTECTION

- **UNITS ARE INTERCHANGEABLE**
MODULAR SYSTEM EXAMPLE

- FLOOD PROTECTION + STREET AND PUBLIC BENEFITS
- INTERIOR CONDITION
RESIDENTIAL ZONE
EXISTING CONDITIONS

- RESPONDING TO THE RESIDENTIAL CONTEXT
- PROVIDE ACCESS AND VIEWS TO THE HACKENSACK RIVER
- POTENTIAL FOR RECREATION AND NEIGHBORHOOD CONNECTIONS
THE MODULAR SYSTEM PROVIDES PLACES TO SIT AND ENGAGE WITH THE HACKENSACK RIVER

RESIDENTIAL ZONE

REBUILD BY DESIGN MEADOWLANDS
IN AREAS THAT ALLOW FOR A GREATER FOOTPRINT, A SOFT BERM COULD BE INCORPORATED

OR THIS...
CANTILEVERED WALKWAY EXAMPLE

- CANTILEVERED WALKWAY IS STILL BEING CONSIDERED WHERE POSSIBLE
- PROVIDES RECREATION AND WATER ACCESS

OR THIS.
INDUSTRIAL ZONE
EXISTING CONDITIONS

- BLENDING INTO THE INDUSTRIAL ENVIRONMENT
- COST EFFICIENCY
MODULAR SYSTEM EXAMPLE

- SHEET PILE AND BASIC WALLS FOR AREAS WITH SMALL FOOTPRINTS
BASIC BERM EXAMPLE

- BASIC BERM WHEN LARGER FOOTPRINT CAN BE ACCOMMODATED

OR THIS.
INVESTIGATION: 1

- The design team is currently developing the modular system based on feedback from CAG #4 workshop.

- The following images reflect current system design studies.
INVESTIGATION: 2
INVESTIGATION: 3
INVESTIGATION: 4
INVESTIGATION: 5
NJDEP / AECOM UPCOMING ACTIVITIES

- Prepare Meeting Summary for CAG #6
- Continue developing:
  - Concepts and Alternatives
- CAG #7 in January
  - Alternative 3 - Hybrid
CAG: CALL TO ACTION

- Submit comments & worksheet from CAG #6 meeting on December 16, 2016
- Share information from this Meeting with friends and neighbors
- Continue to build interest in the Project
- Ensure the public knows about upcoming information (to be posted on Project website)
Critical Information

January 31, 2017
CAG Meeting #7: Alternative 3 (Hybrid)

Project Website
www.rbd-meadowlands.nj.gov

Project Email
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Question & Answer
THANK YOU!