The Chicago Shoreline Storm Damage Reduction Project

Andrew Benziger, Chicago District

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Wood piling or wood bulkhead deterioration, breakage and loss provides lakeward exposure of the revetment rock fill.
Revetment Rock fill is dispersed onto the toe protection by wave surge as well as gravity. Revetment capstones tilt, slide and fall as they lose their underlying support.
Failed Timber Crib
Federal Plan (NED)

Rubble mound revetment
Local Sponsor Requirements

- Provide safe access to the water’s edge
- Provide and preserve an unobstructed view of Lake Michigan
- Provide universal access to all levels of the revetment
- Closely replicate original structure but use modern construction materials
Locally Preferred Proposal - Step Stone Revetment
Design Analysis for Locally Preferred Plan

- 2-D Models for 18 different cross sections to quantify overtopping volume
- Optimize design crest elevation and overall structure width
- Developed an equation to predict overtopping rates for use in preliminary design efforts
Revetment Design Elements
Wave Pressures

Wave Crest Load

1500 to 2000 psf

Wave Trough Load

300 to 400 psf
Gang Forms
Typical Toe Berm Section
Toe Berm at 33rd to 37th Street
Drainage Gap in the I-55 to 30th Street Revetment

Photo by: V. Jurca
I-55 to 30th Street Drainage Gap
View of 37th Street Drainage Gap
Completed Projects
Pre-Project Conditions at Entrance to Belmont Harbor
Post Construction Entrance at Belmont Harbor
I-55 to 30th Street Revetment
Recreational Enhancements

- New Permanent Bike Path
- Proposed Section
- Existing Section (dashed)
- Existing Water Edge
- High Water
- Average

Tree and recreational enhancements diagram.
Conceptual Design of Universal Access System
Universal Access Constructed on the Montrose Peninsula
37th to 40th Street

3180 ft. Revetment and Land Expansion Creating Approximately 15 Additional Acres of Parkland
Construction and Land Expansion at 37th to 40th Street
31st Street Beach

Before

After
Pre-Project Conditions at 40th to 41st Street
Conceptual Beach Design for 40th to 41st Street

- Lake Michigan
- Submerged Breakwater
- Navigation light
- Safety Cable typ.
- Fishing station, typ.
- Concrete seat wall
- Beach
- Limestone blocks
- Universal access
- Walk

Previous Beach Design
Morgan Shoals
Conceptual Beach Design for Morgan Shoals
Preserving the Historical Nature of the Chicago Shoreline
Step Relief Detail for Test
Section Form Liners
REVETMENT RESTORATION AND STEP STONE REPLACEMENT USING SHPO APPROVED FORM LINERS

Belmont to Diversey Harbor
Fill Voids with Low Pressure/High Viscosity Grout

REVETMENT RESTORATION

Raise Elevation of Toe Stone

Reset Lowest Step
PROMONTORY POINT

- Controversial Rehab Project
- Construction begins in 1920’s with fill operations and shore protection consisting of stone filled bulkheads covered with capstones
- Revetment steps added in 1930’s as part of WPA program
- Park landscaped by Alfred Caldwell
RESIDENTS OPPOSE CONCRETE SEA WALL

“City plan for Point called far too pricey”
Chicago Sun-Times

“Promontory Point talks progressing”
Chicago Tribune

“Promontory Point panel formed Alderman aims at rehab dispute”
Chicago Tribune

“Report boosts opponents of concrete lakefront wall”
Chicago Tribune

“Point talks collapse …”
Hyde Park Herald

“55th Street promontory project halted”
Chicago Sun-Times

“POINT REHAB WINS HOUSE SUPPORT”
Hyde Park Herald

“Between rock, hard place, parks seek a compromise Point's top steps may be limestone”
Chicago Tribune

“Promontory compromise floated”-Chicago Tribune
Questions ?