National Shoreline Erosion Control Demonstration and Development Program

SECTION 227

Miami Beach

63rd St "Hotspot"

by

Donald Ward

Engineering Research and Development Center

And

Jonas White

Jacksonville District

Miami Beach, FL

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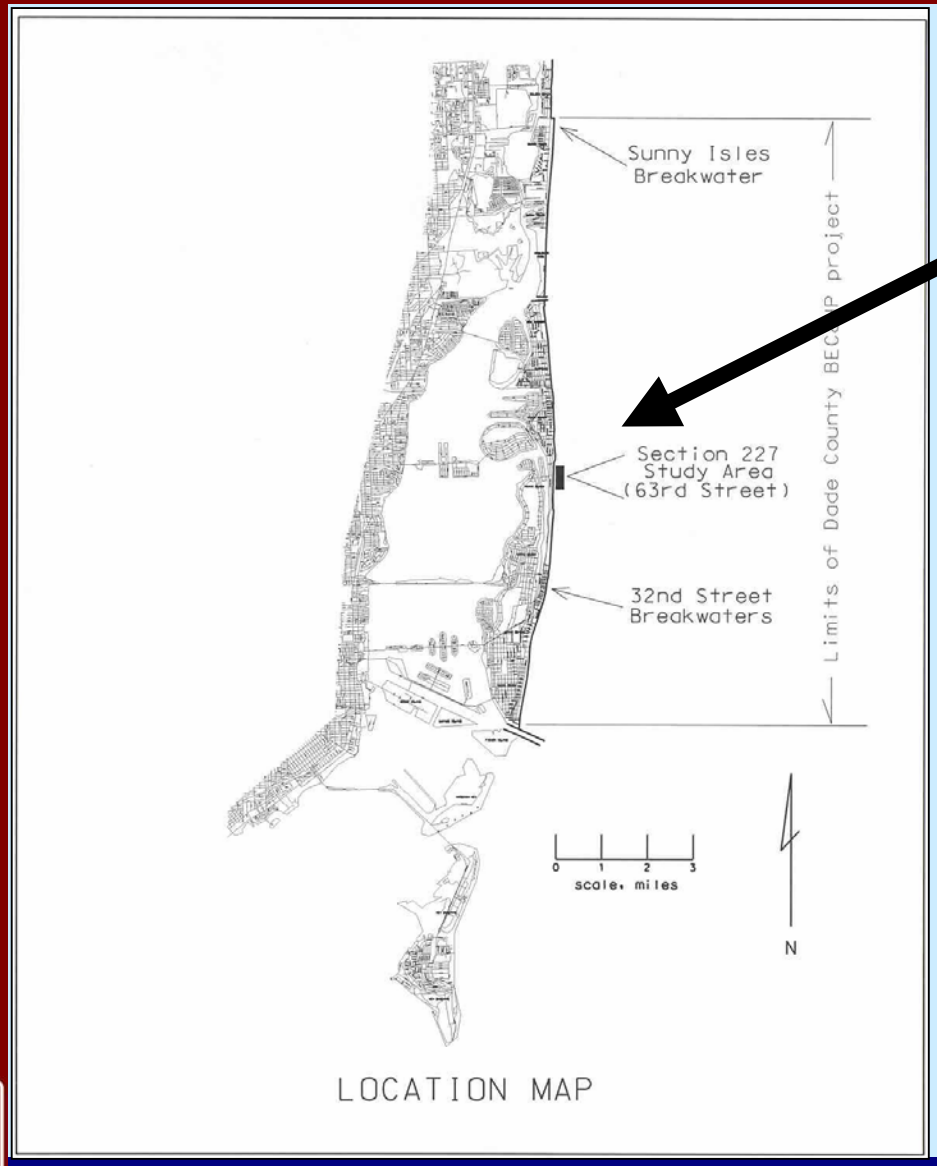
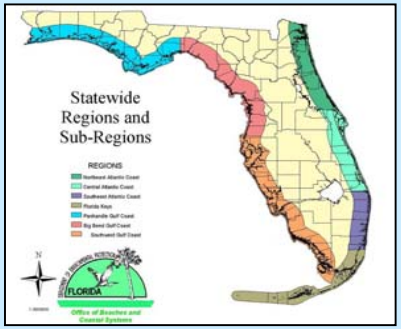
SECTION 227

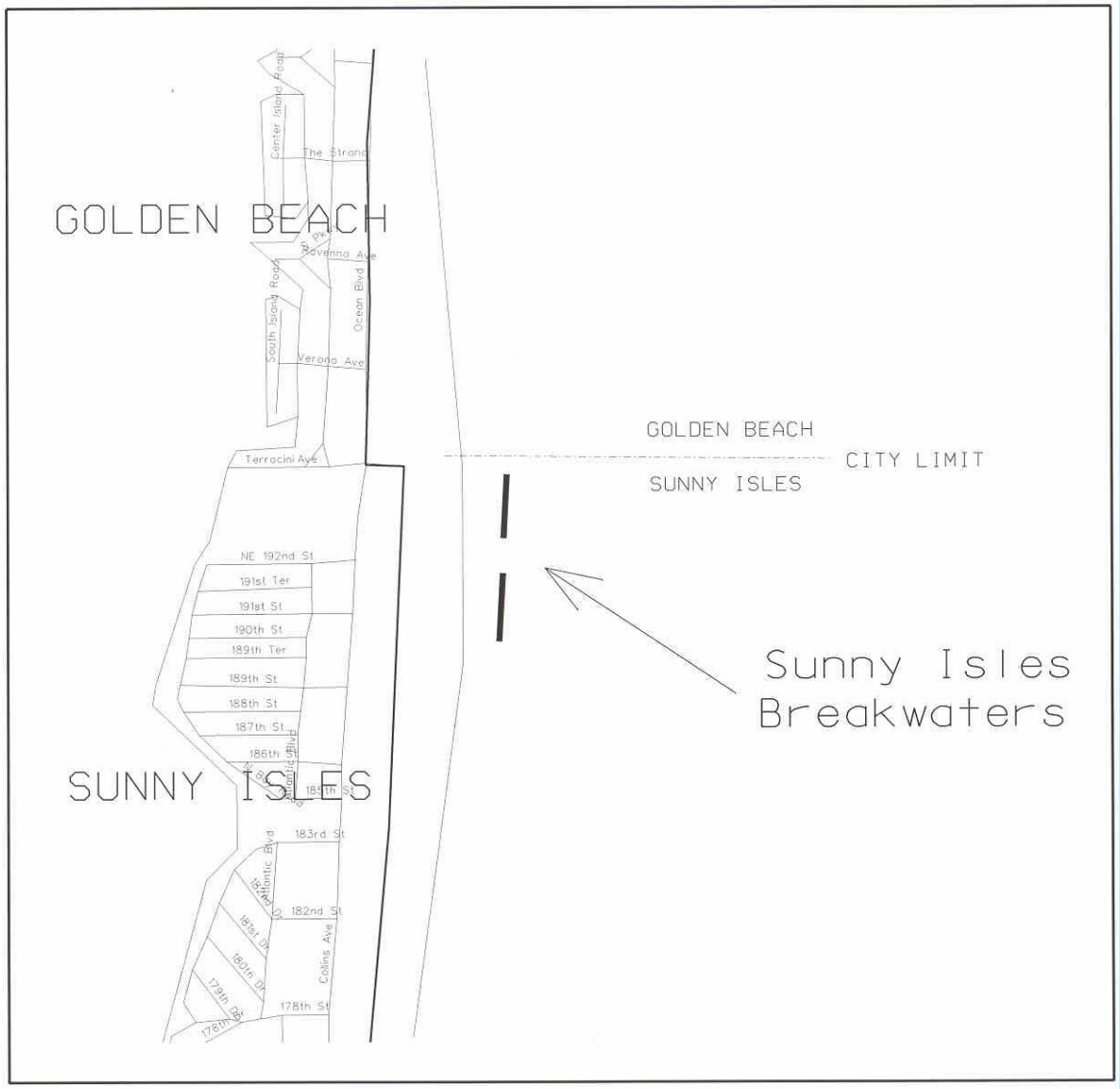
63rd St
Hot-Spot

SECTION 227

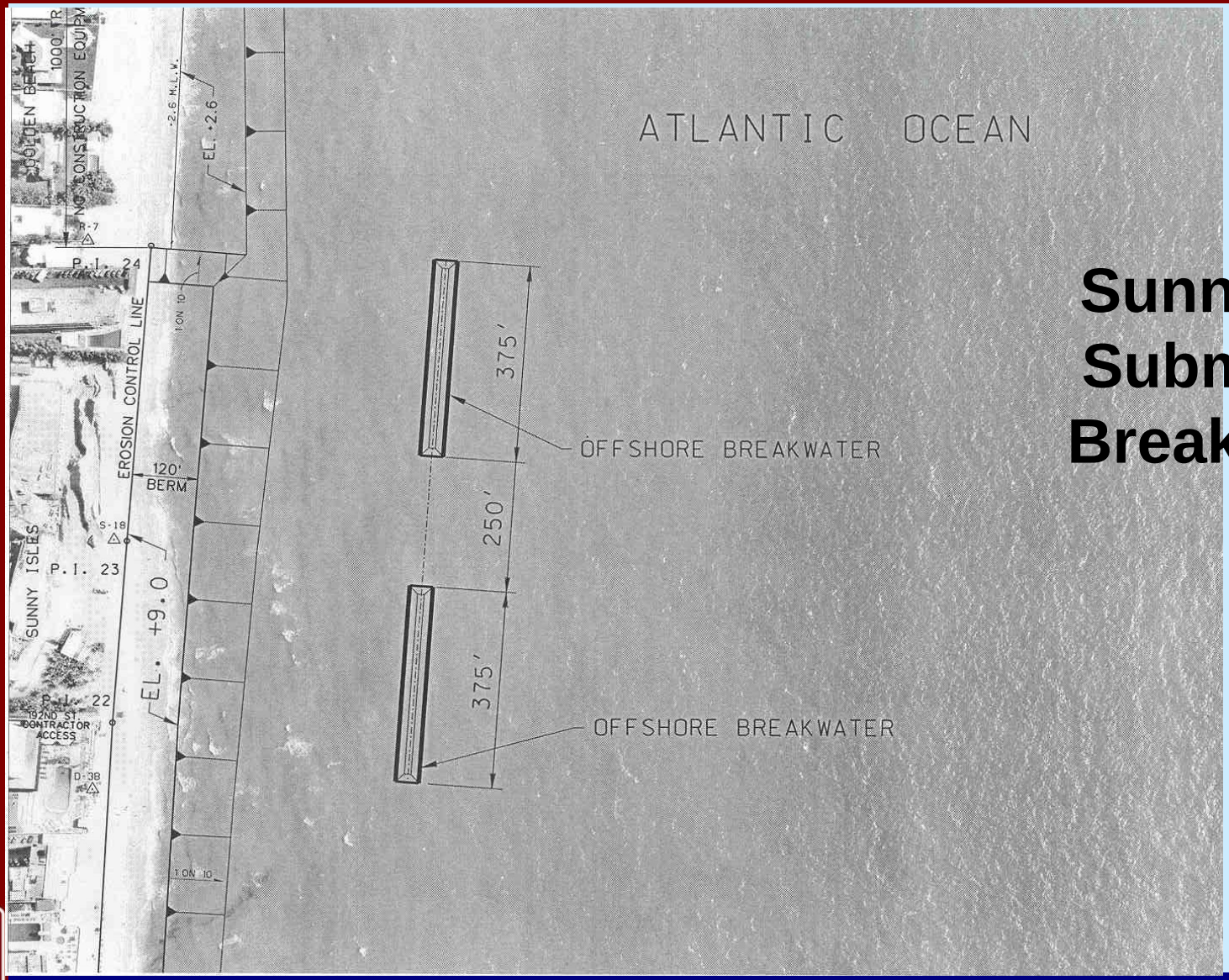




Dade County Beach Erosion Control Projects

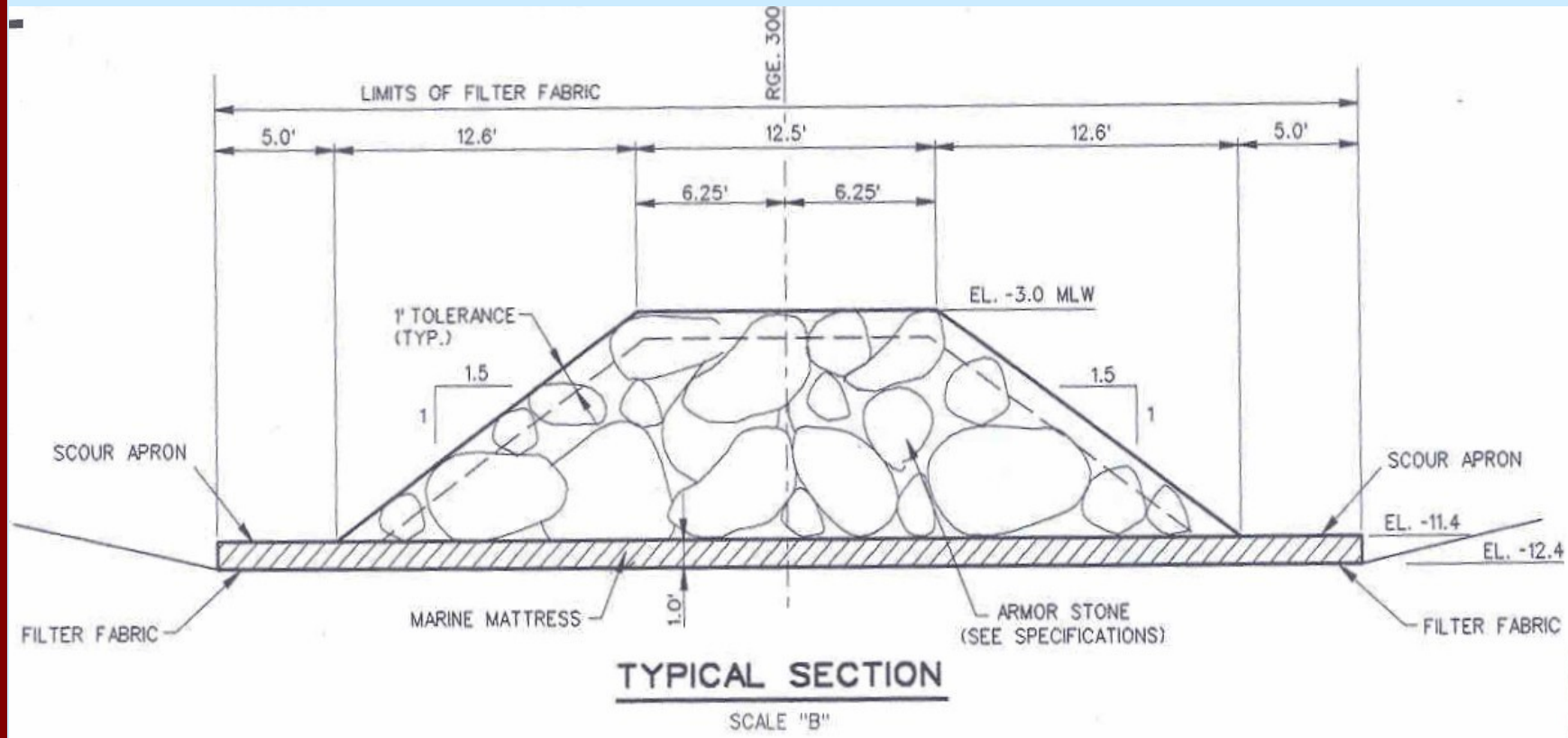


Sunny Isles Submerged Breakwaters



Sunny Isles Submerged Breakwaters

Sunny Isles Breakwaters



TYPICAL SECTION

SCALE "B"

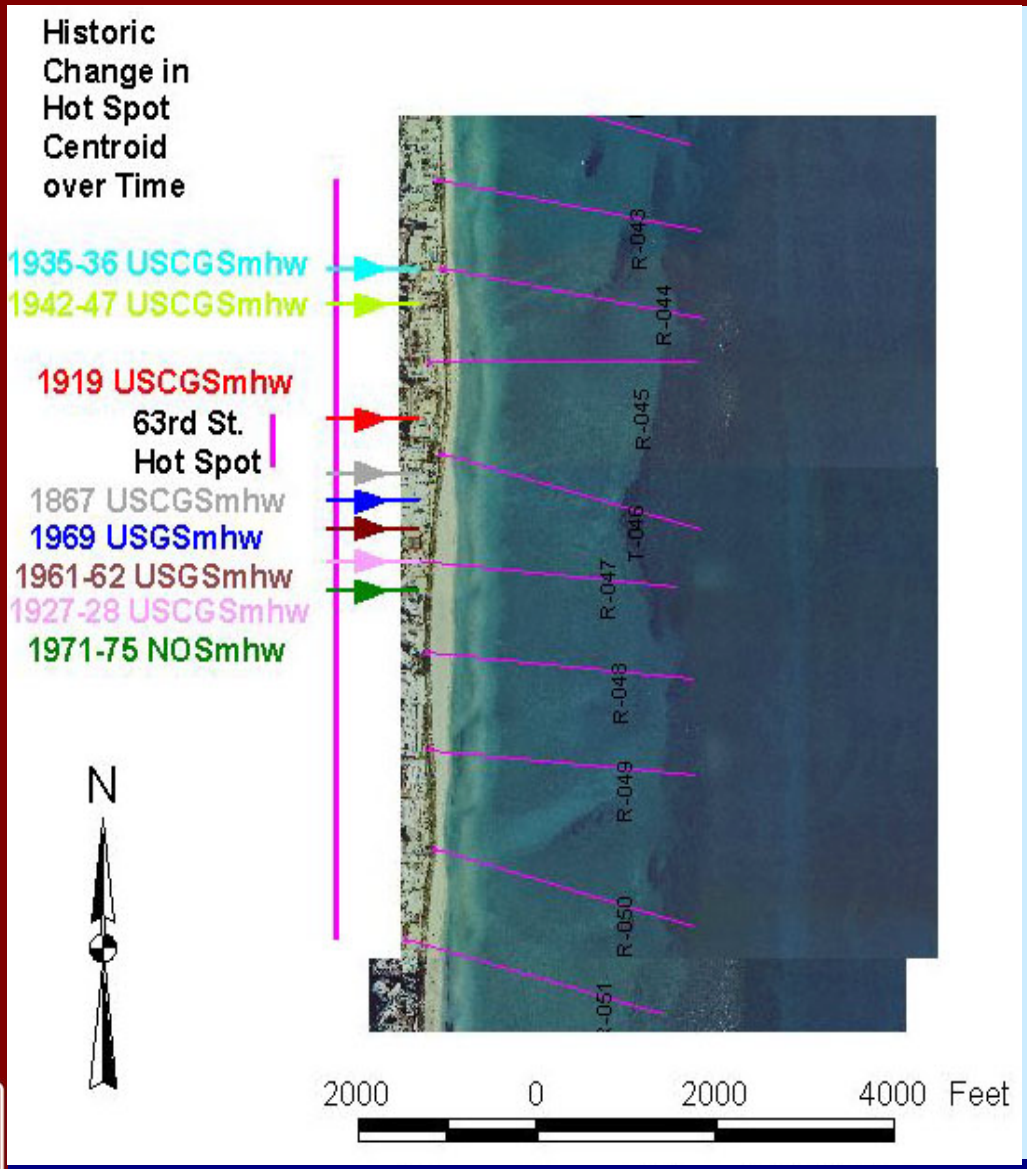
SECTION 227

32nd Street Headland Breakwaters

32nd Street
Headland
Breakwaters

63rd Street

- Problem: erosional “hot” spot
- Purpose: to stabilize shoreline while contributing to the environment
- Conducted in partnership among the Engineering Research and Development Center (ERDC), Jacksonville District Corps of Engineers, and the Miami-Dade Department of Resources Management (DERM)
- Design/Build Contract

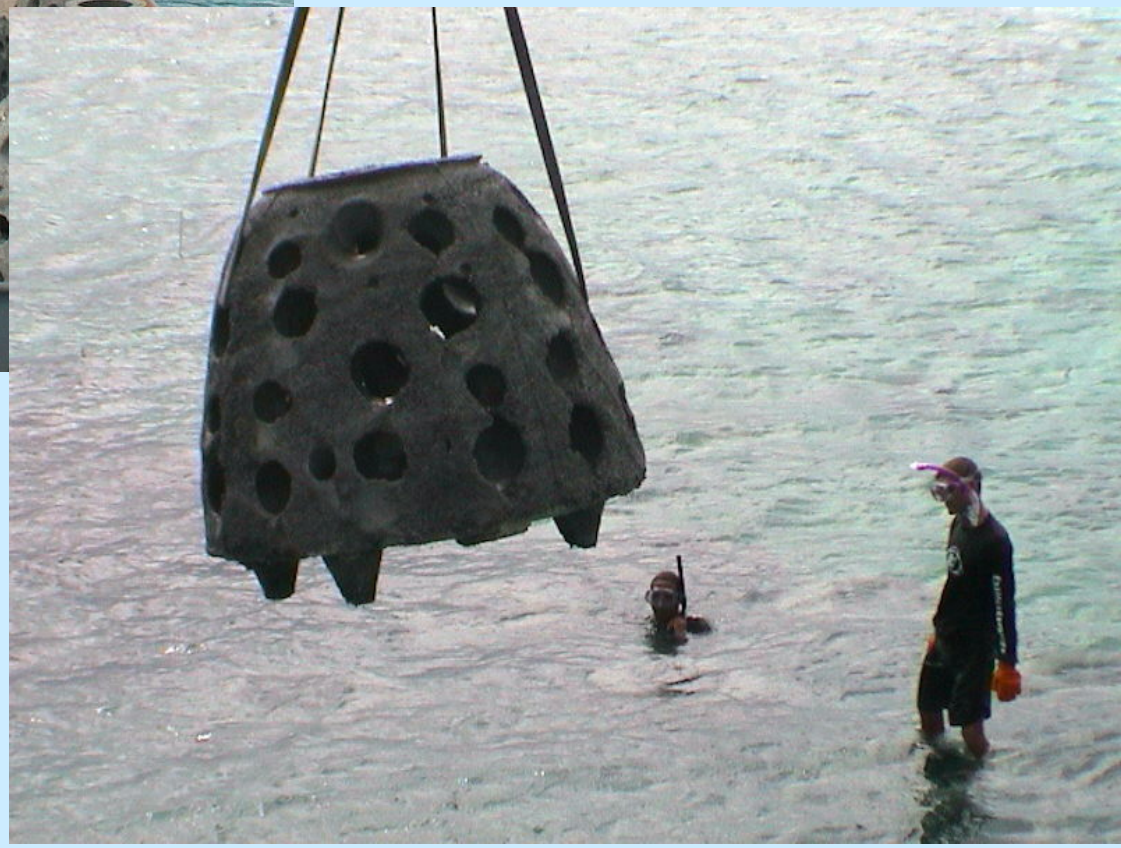


Miami Beach, FL

Considered Designs

- Pre-cast concrete units
- Offshore submerged reefs of geotextile units
- Offshore submerged reef of Reef Balls
- Reefs and groins combination
- Cement filled geotextile tubes
- Suspended shore normal nets

Typical Reef Balls



Reefball Casting Yard

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Reefball Mold

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Pouring a Reefball

SECTION 227

Typical Reef Balls

SECTION

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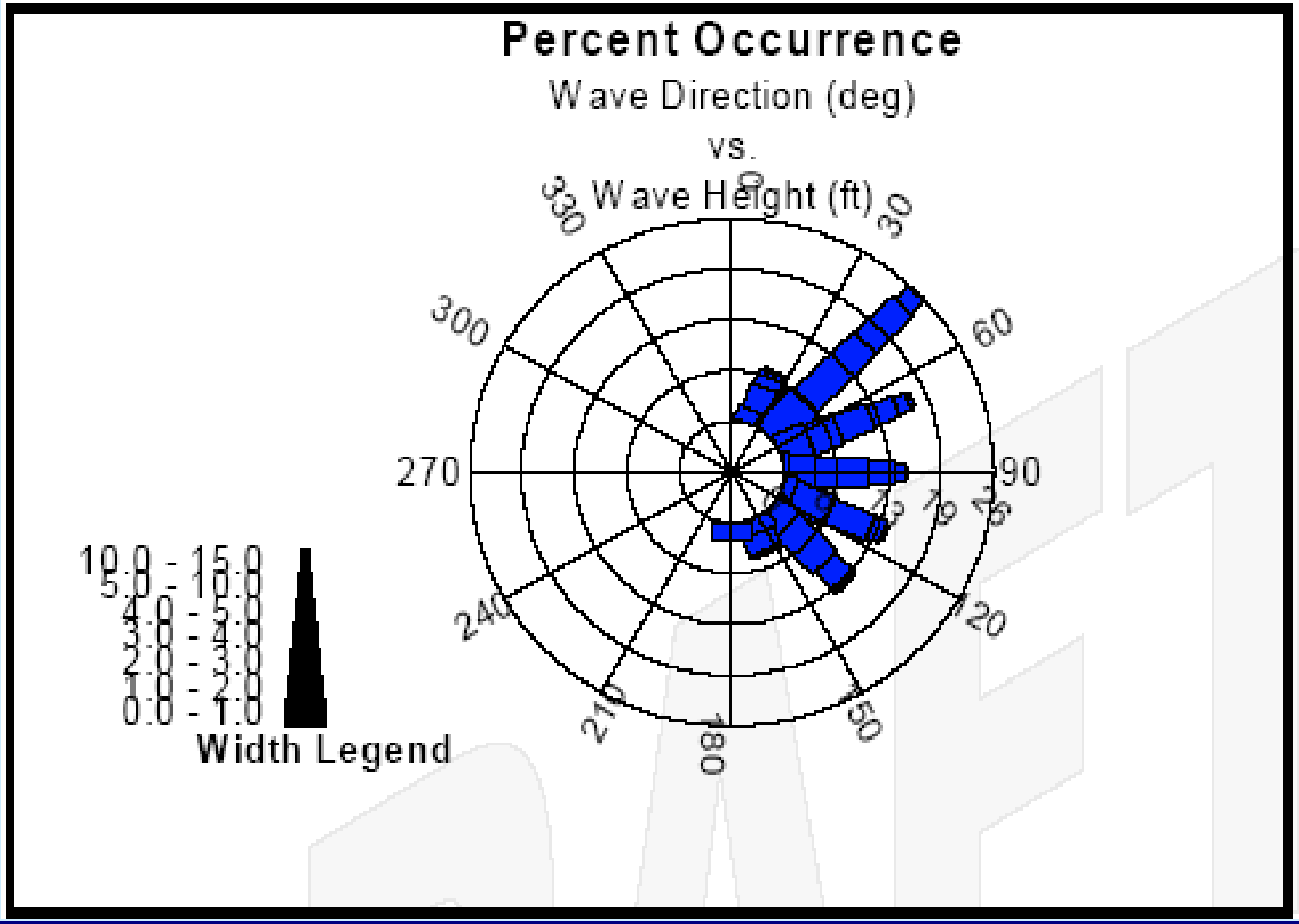
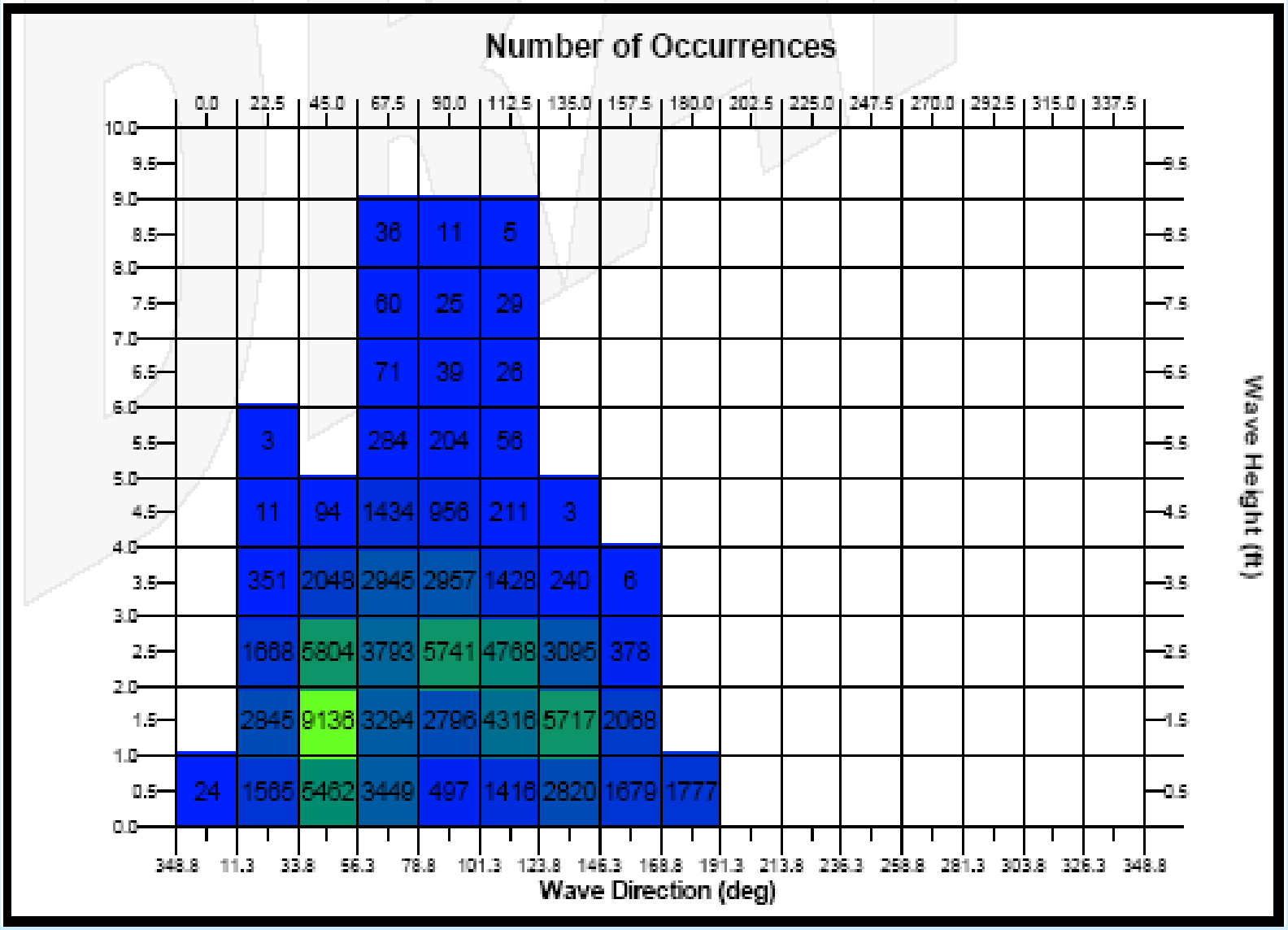
Maiden Island, Antigua

Wave Rose


Percent Occurrence
Wave Direction (deg)
vs.
Wave Height (ft)
0
30
60
90
120
150
180
210
240
270
300
330
10.0 - 15.0
5.0 - 10.0
4.0 - 5.0
3.0 - 4.0
2.0 - 3.0
1.0 - 2.0
0.0 - 1.0
Width Legend

Wave Height and Direction



Wave Energy Dissipation Study

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Physical Model Study

Wave Energy Dissipation Study

Reefball Layout

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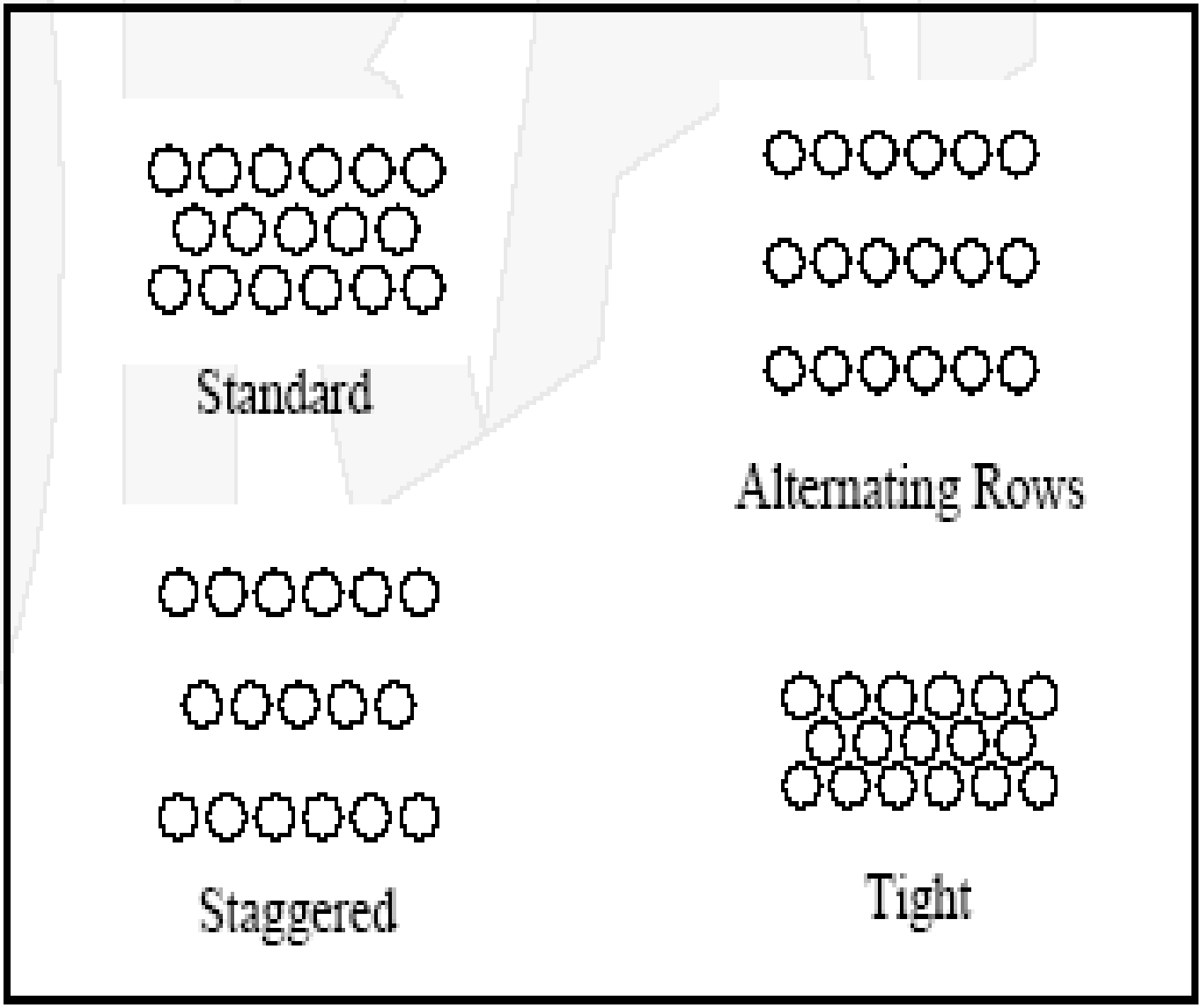

Typical Reefball Installation

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Concrete Articulated Mat

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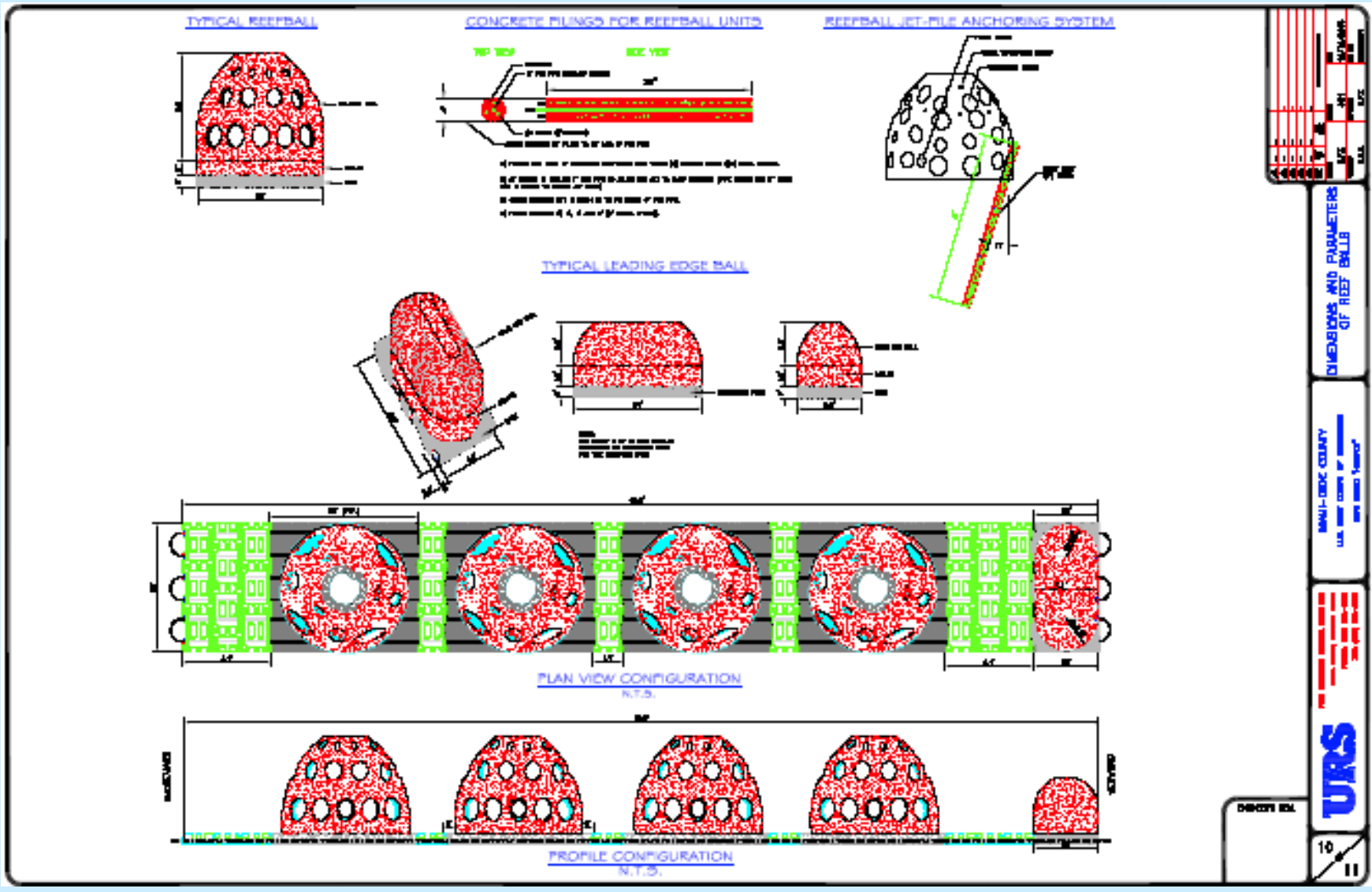
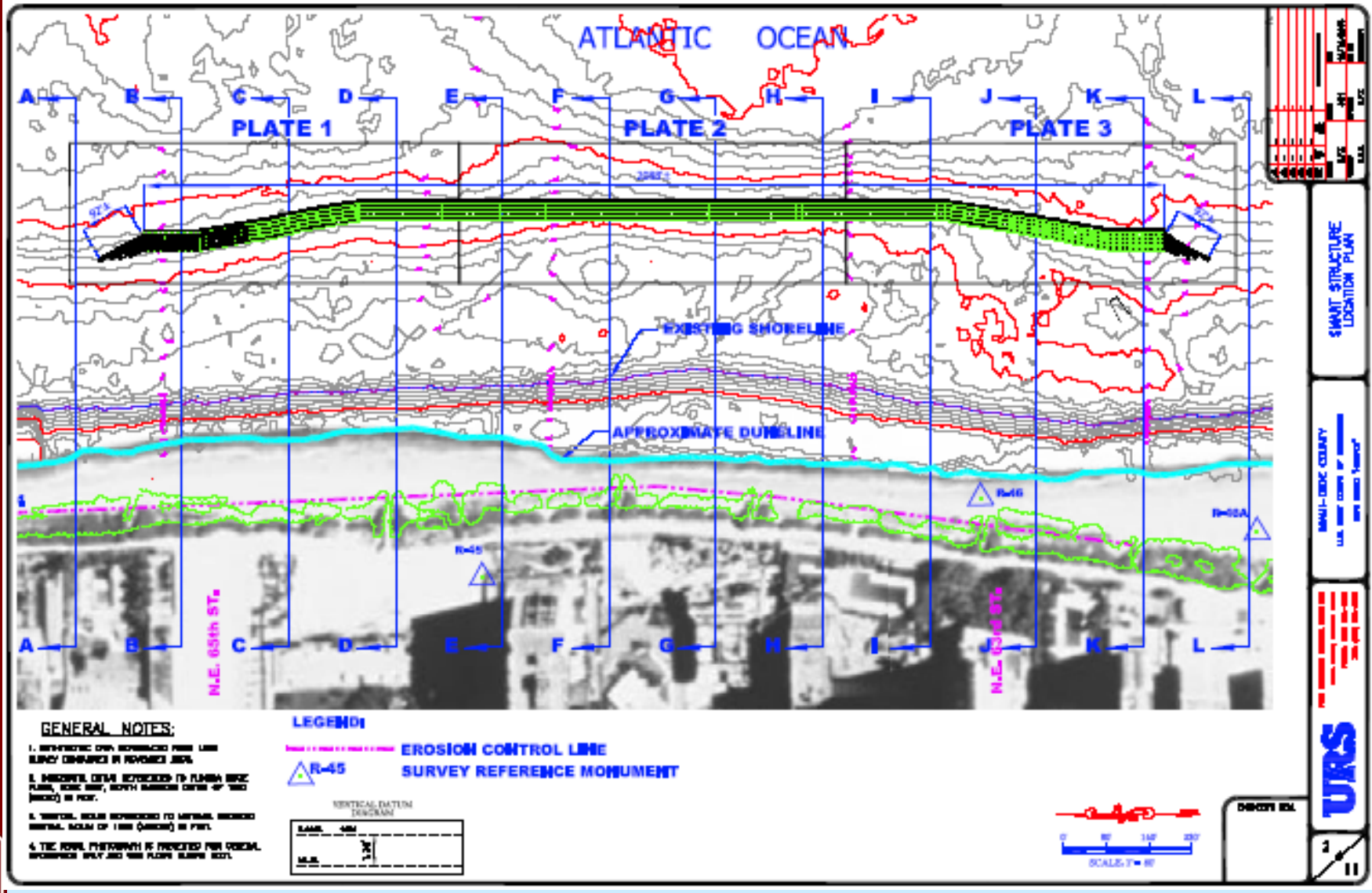

TYPICAL REEFBALL
CONCRETE PILINGS FOR REEFBALL UNITS
REEFBALL JET-PILE ANCHORING SYSTEM
TYPICAL LEADING EDGE BALL
PLAN VIEW CONFIGURATION
N.T.S.
PROFILE CONFIGURATION
N.T.S.
URS
10
11

63rd St. Hot Spot



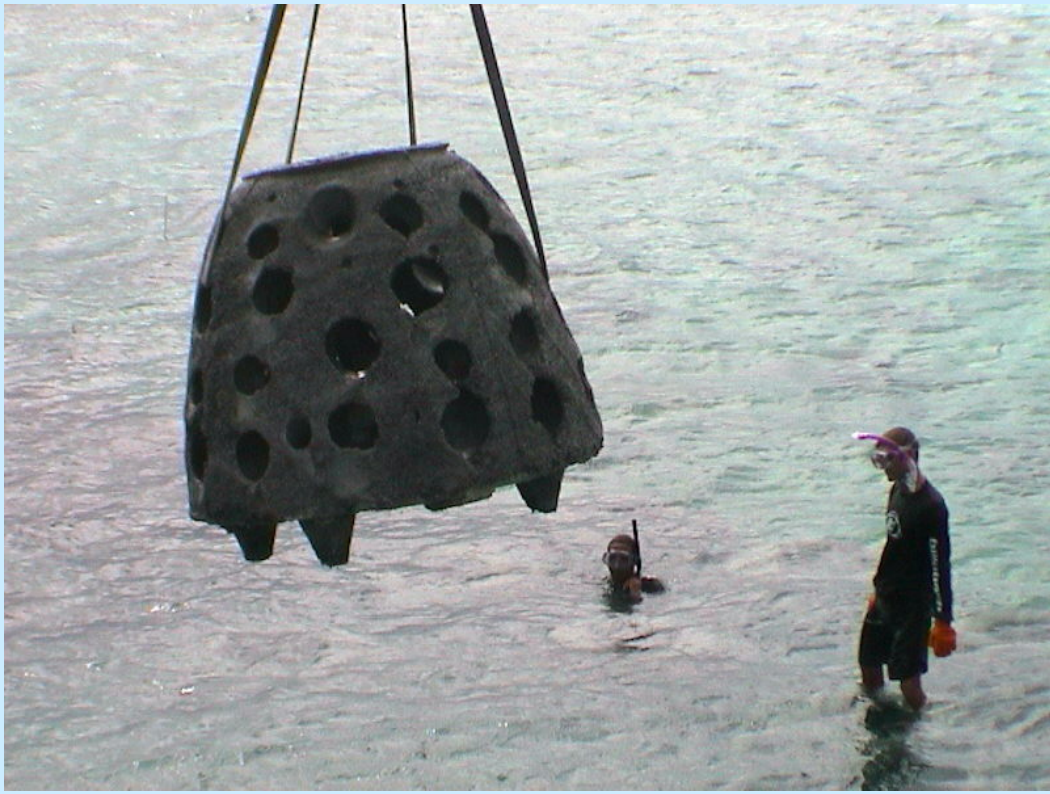
Benefits

SECTION 227

- Stabilize the Beach!
- Provide excellent aquatic habitat
- Provide a rich and scenic snorkeling area
- Develop design guidance for Reefballs

Areas of Applicability

- Almost any wave environment
- Fresh- or saltwater
- Areas with shallow nearshore shelf
- Areas not subject to icing and ice floes



THANK
YOU