SACRED FALLS, OAHU SECTION 227 DEMONSTRATION PROJECT

cosponsored by:
US Army Corps of Engineers
Honolulu District

and:
State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands

US Army Corps of Engineers®

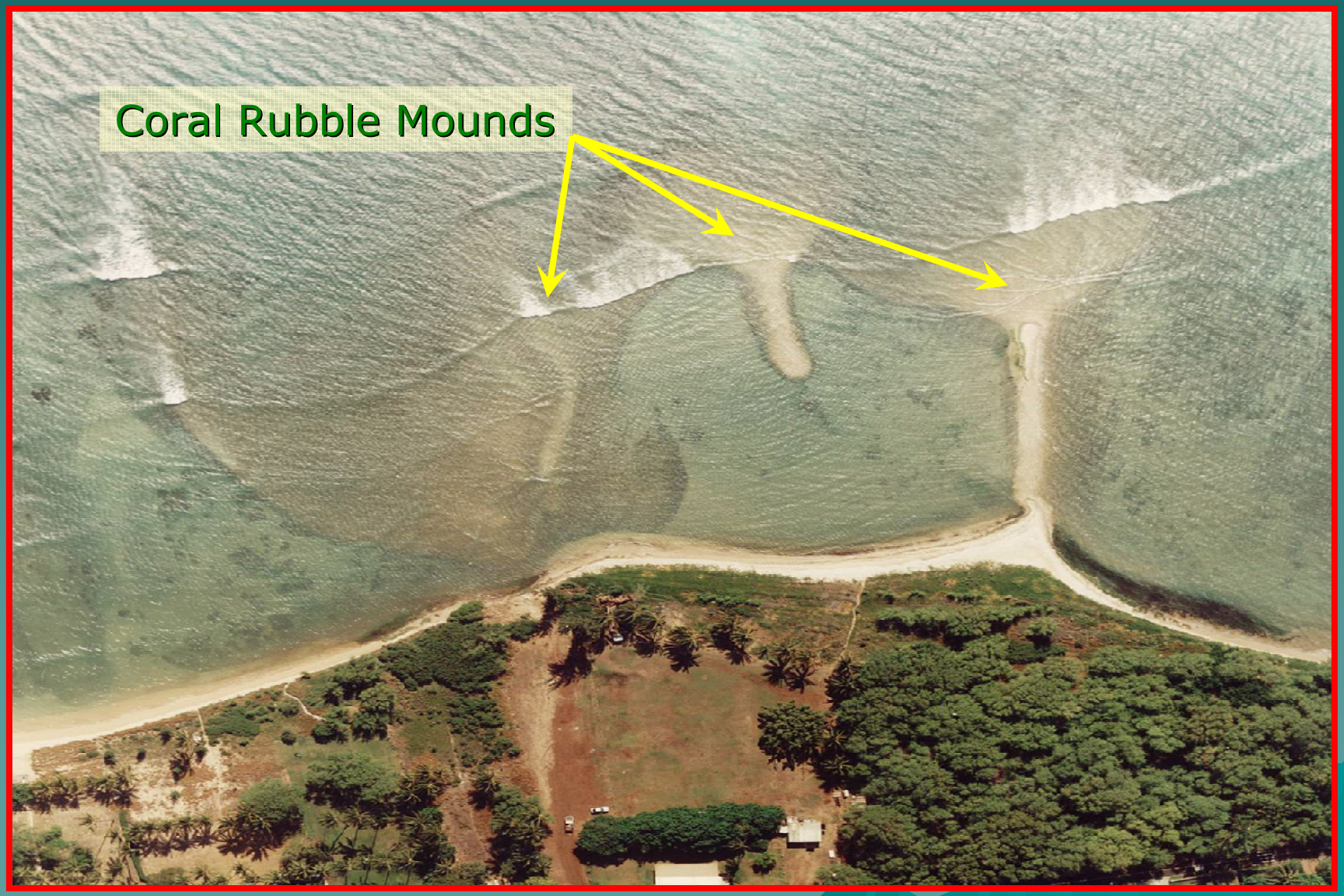
Program Workshop
St. Louis, MO
4 August 2005

TOPICS

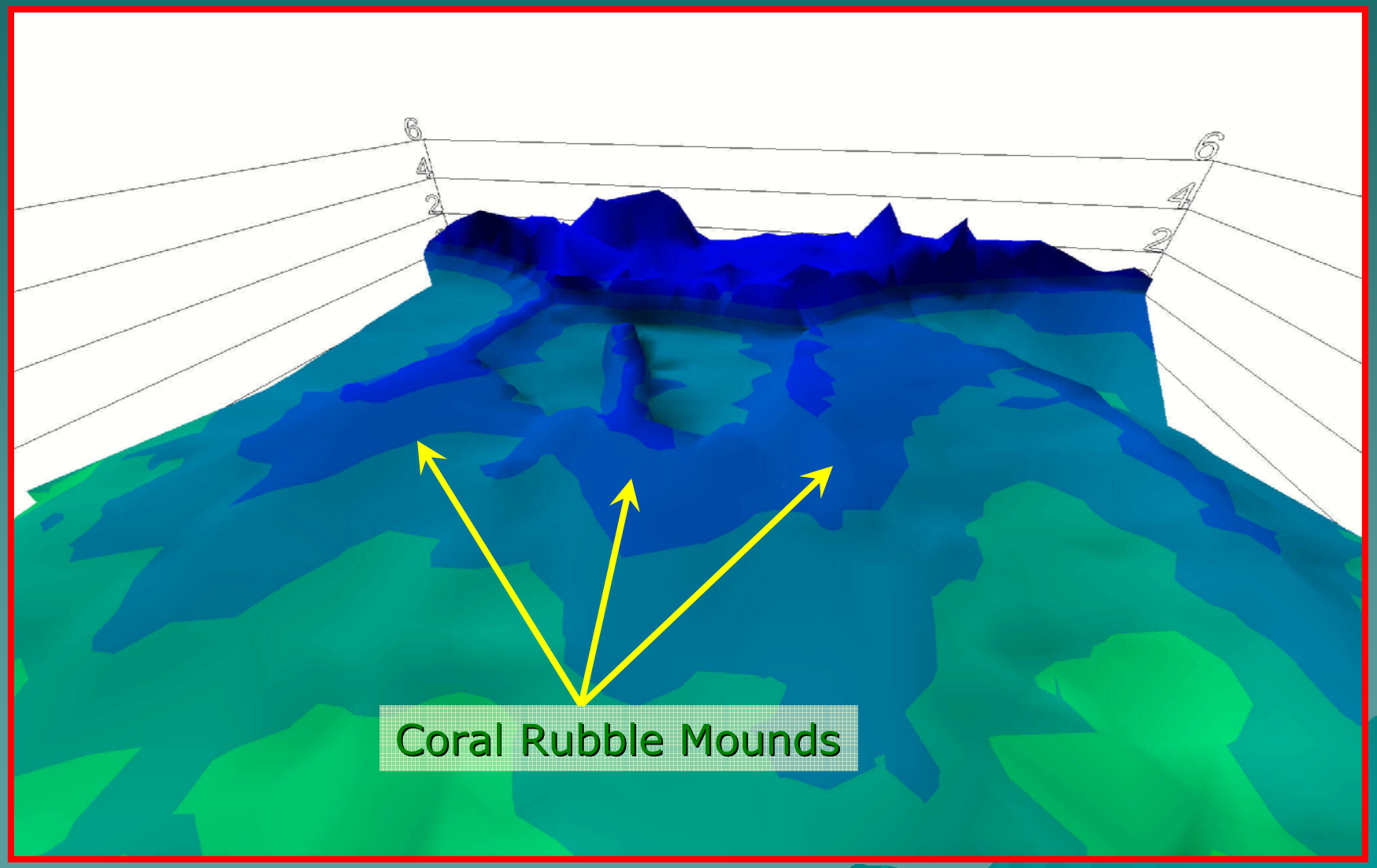
- Site Characterization
  - Kihei, Maui
  - Sacred Falls, Oahu
- Numerical Modeling
- Physical Model
  - Shape Evaluation
  - Shape Performance
  - Modular Design
- Next Steps

SITE CHARACTERIZATION

PROTOTYPE SITE: Kihei, Maui



PROTOTYPE SITE: Bathymetry

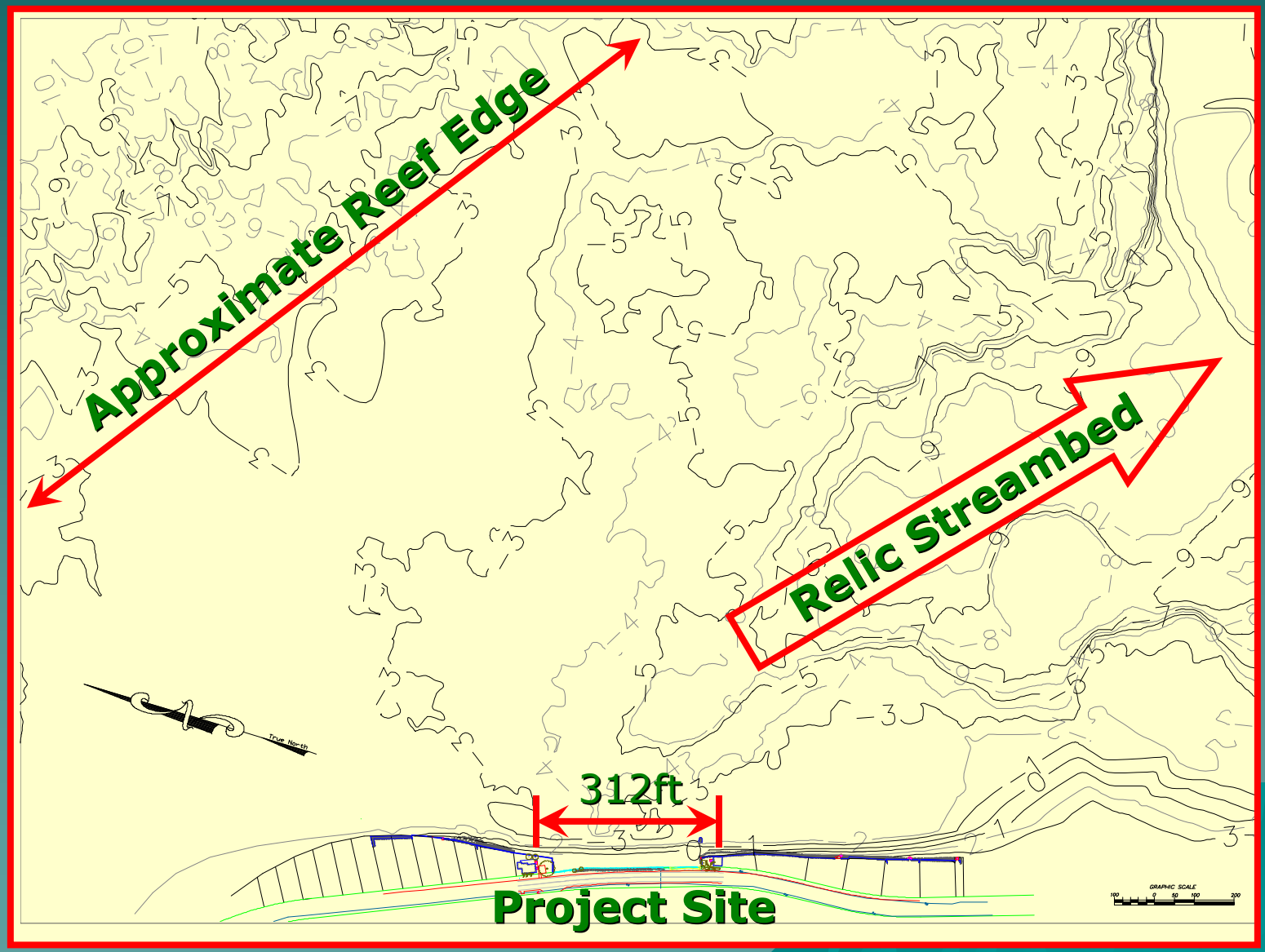


SACRED FALLS, OAHU

PROJECT SITE: Looking North

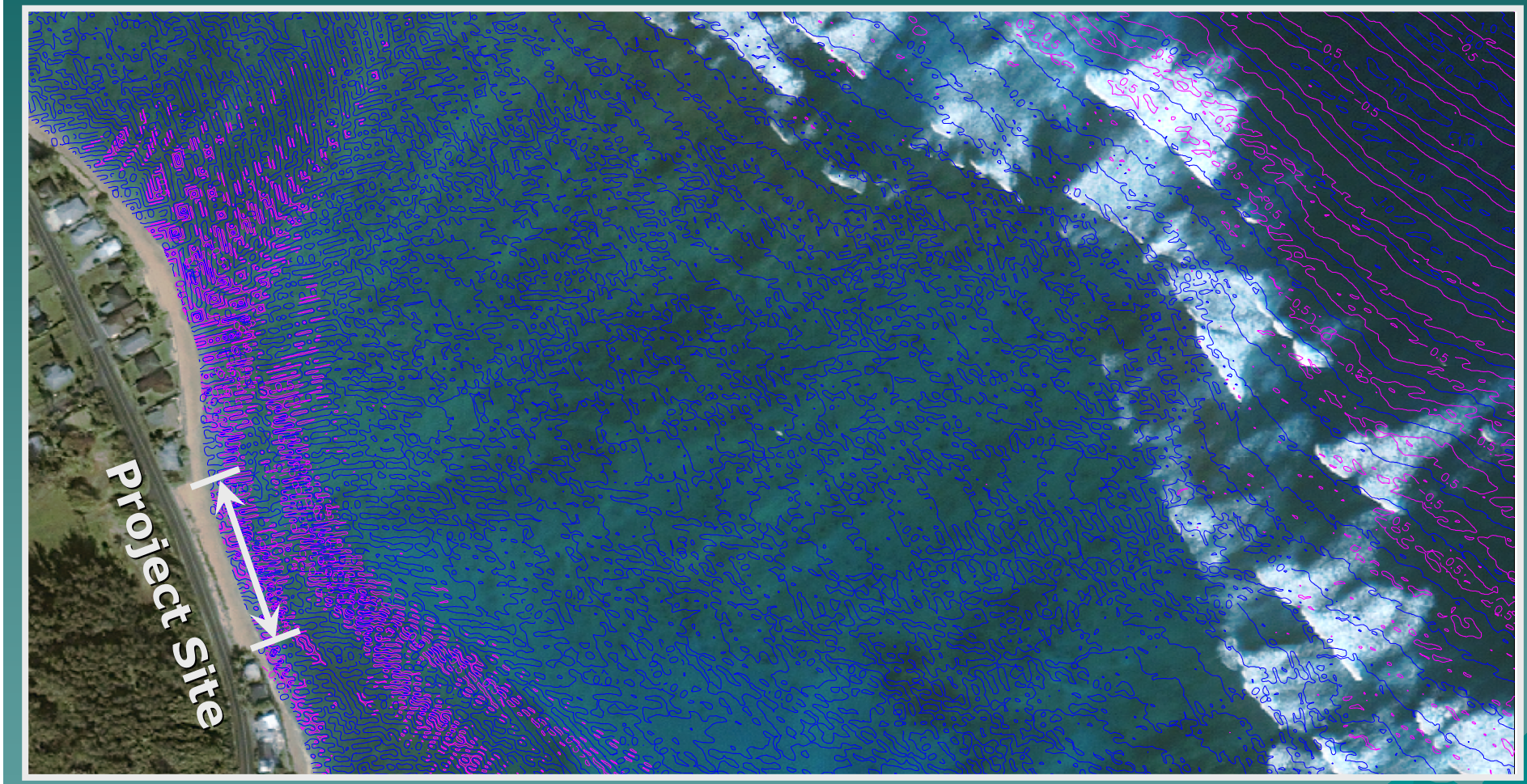
PROJECT SITE: Looking South

SACRED FALLS: Bathymetry



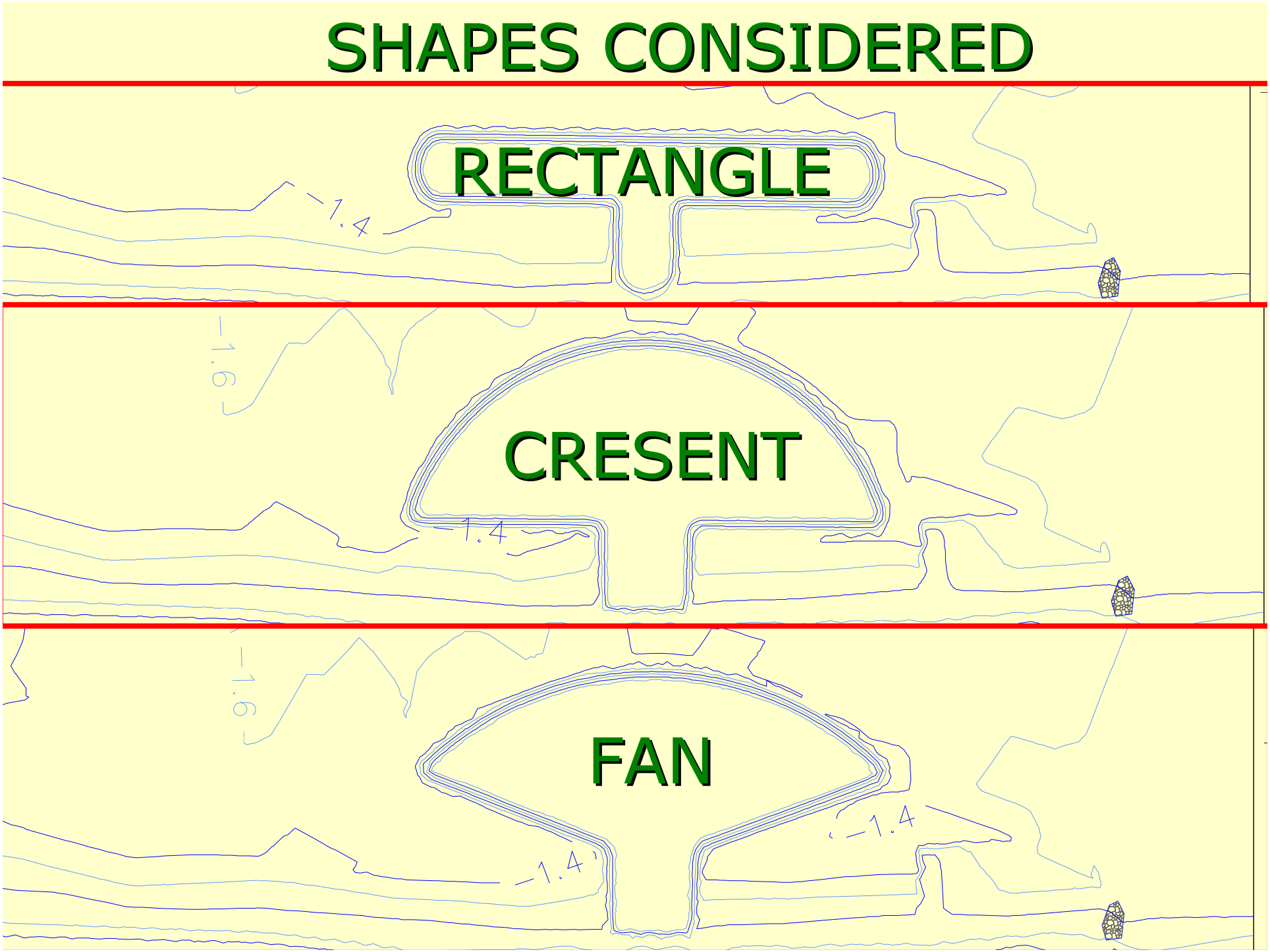
NUMERICAL MODELING

WAVE TRANSFORMATION

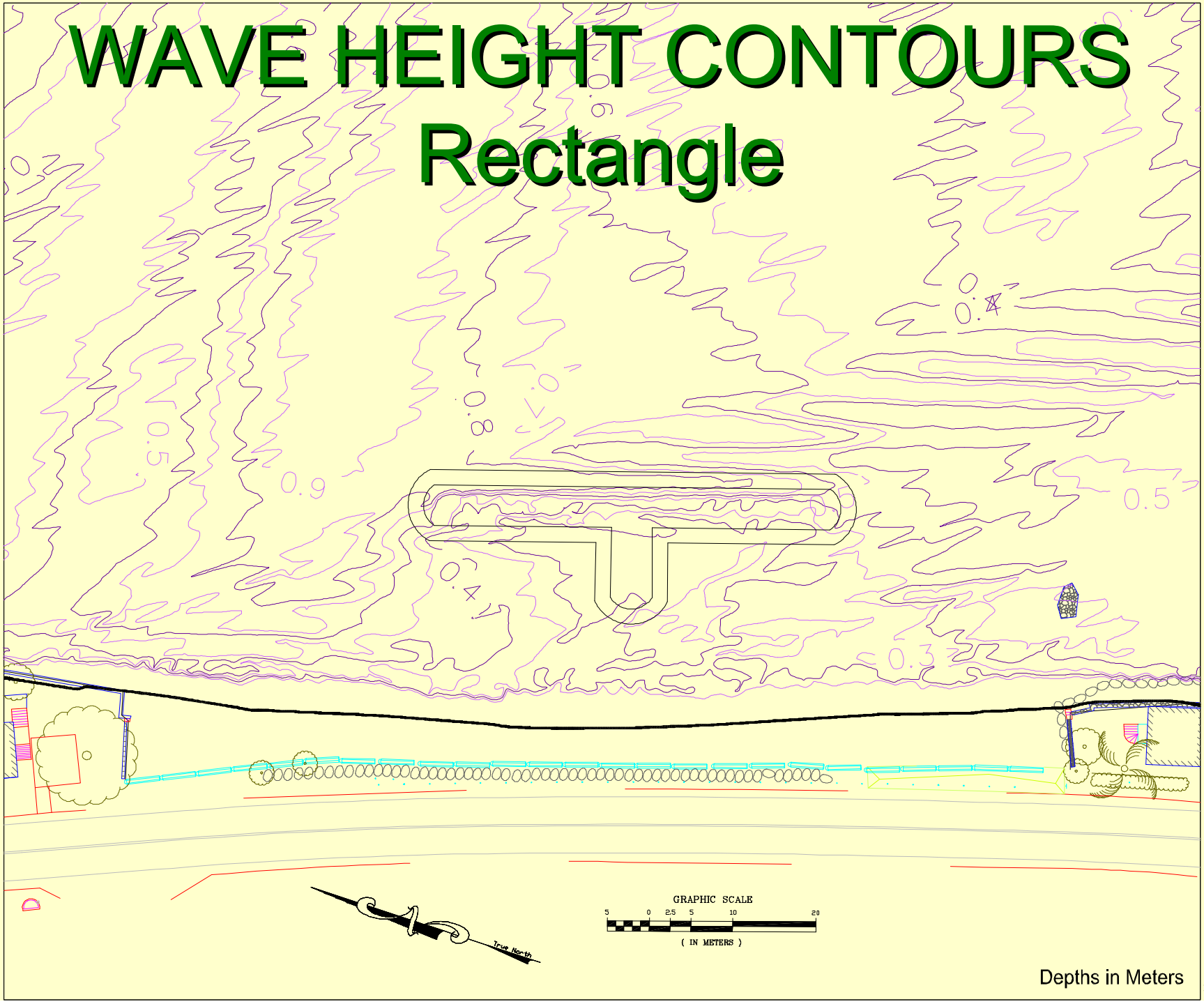


RefDif model results overlaid on IKONOS imagery.

SHAPES CONSIDERED



WAVE HEIGHT CONTOURS
Rectangle



Depths in Meters

Sea Engineering, Inc.
MAKAI RESEARCH PIER
WAIMANALO, HI 96795
(808) 259-7966/FAX (808) 259-8143

KEYNOTES

1. Datum is MHW.
2. Depth accuracy ±x.x m or better.
3. Soundings collected at discrete intervals. Bottom conditions may vary between soundings.
4. Horizontal Control
Station:
Hawaii State Plane - Zone #
Description:
X
Y
5. Vertical Control
Station Name:
Elevation:
6. Survey Date:

04-18 Section 227
Ref/Dif Results: Heights
Block 24, MHW Tide
September 7, 2004

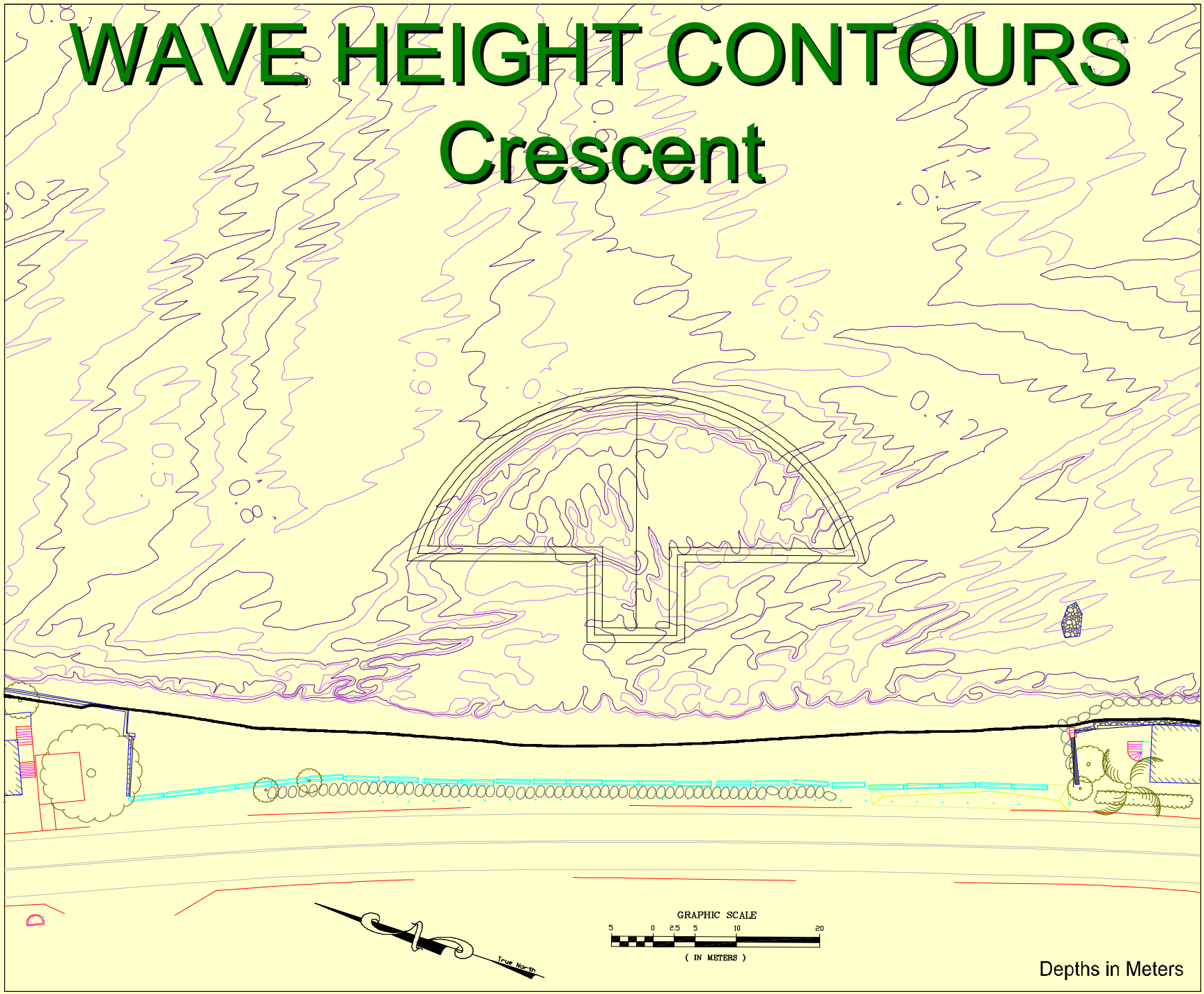
REVISIONS

NO.	DATE	REVISION

XXX
XXX

PROJECT NUMBER XXX
PROJECT ENGINEER XXX
DRAWN BY XXX CHECKED BY XXX
SCALE XXX DATE XXX
FILE
XXX

WAVE HEIGHT CONTOURS
Crescent



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Description:
X
Y
5. Vertical Control
Station Name:
Elevation:
6. Survey Date:

04-18 Section 227
Ref/Dif Results: Heights
Block 20, MHW Tide
September 7, 2004

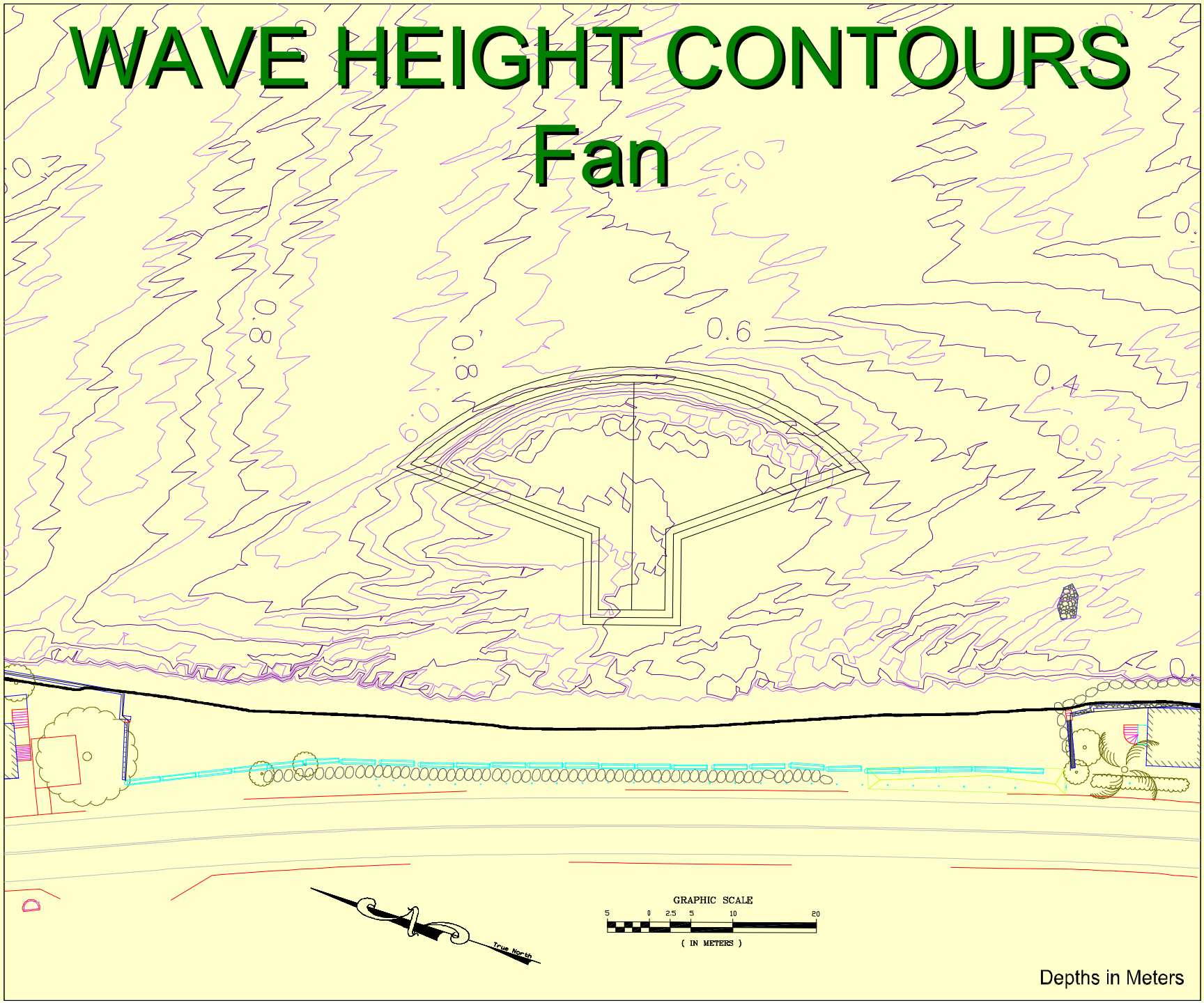
REVISIONS

NO.	DATE	REVISION

XXX
XXX

PROJECT NUMBER XXX
PROJECT ENGINEER XXX
DRAWN BY XXX CHECKED BY XXX
SCALE XXX DATE XXX
FILE
XXX

WAVE HEIGHT CONTOURS
Fan



Depths in Meters

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Station:
Hawaii State Plane - Zone #
Description:
X
Y
5. Vertical Control
Station Name:
Elevation:
6. Survey Date:

04-18 Section 227
Ref/Dif Results: Heights
Block 22, MHW Tide
September 7, 2004

REVISIONS

NO.	DATE	REVISION

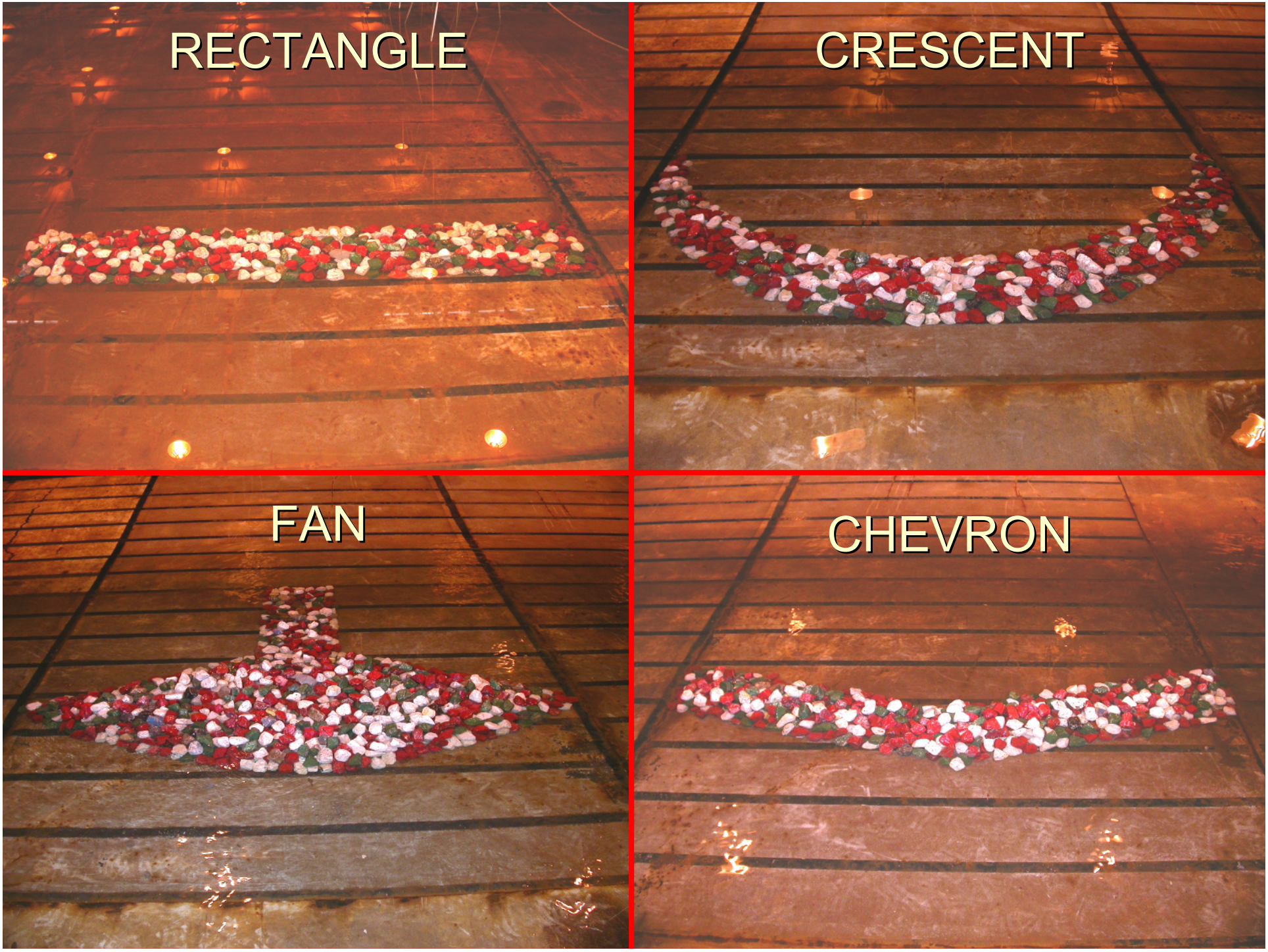
XXX
XXX

PROJECT NUMBER XXX
PROJECT ENGINEER XXX
DRAWN BY XXX CHECKED BY XXX
SCALE XXX DATE XXX
FILE
XXX

PHYSICAL MODEL
Shape Evaluation

PHYSICAL MODEL

- Flume: 56ft long X 32ft wide
- Scale: 1/16
- Wave Parameters:
  - Height: Depth Limited over Reef
  - Period: 9 and 16 second
  - Direction: -7 degrees
- Longshore Current
- Sediment Transport


RECTANGLE
CRESCENT
FAN
CHEVRON

PHYSICAL MODEL

Shape Performance

RECTANGLE: Dye Study (1)

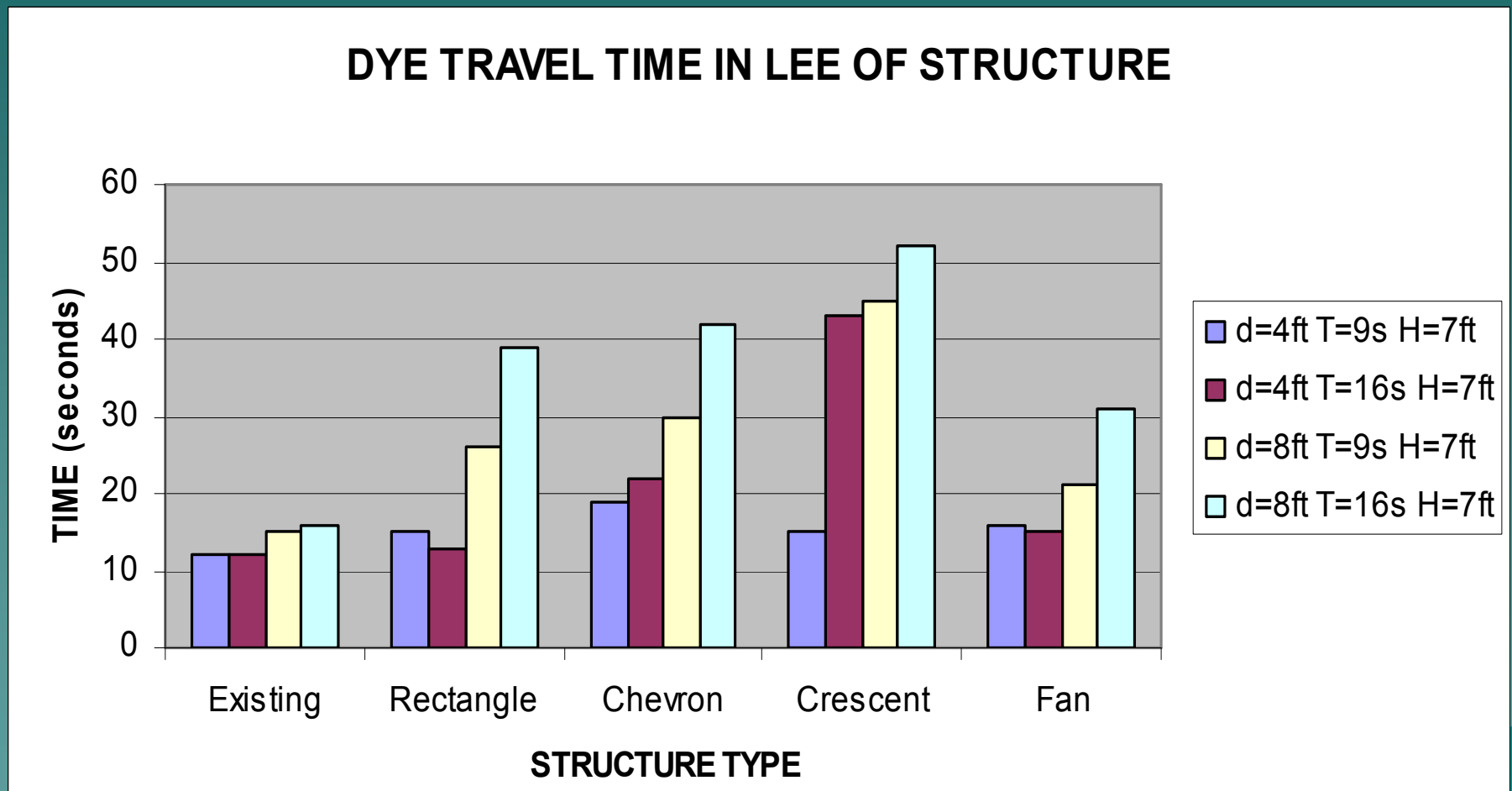
RECTANGLE: Dye Study (2)

RECTANGLE: Dye Study (3)

RECTANGLE: Dye Study (4)

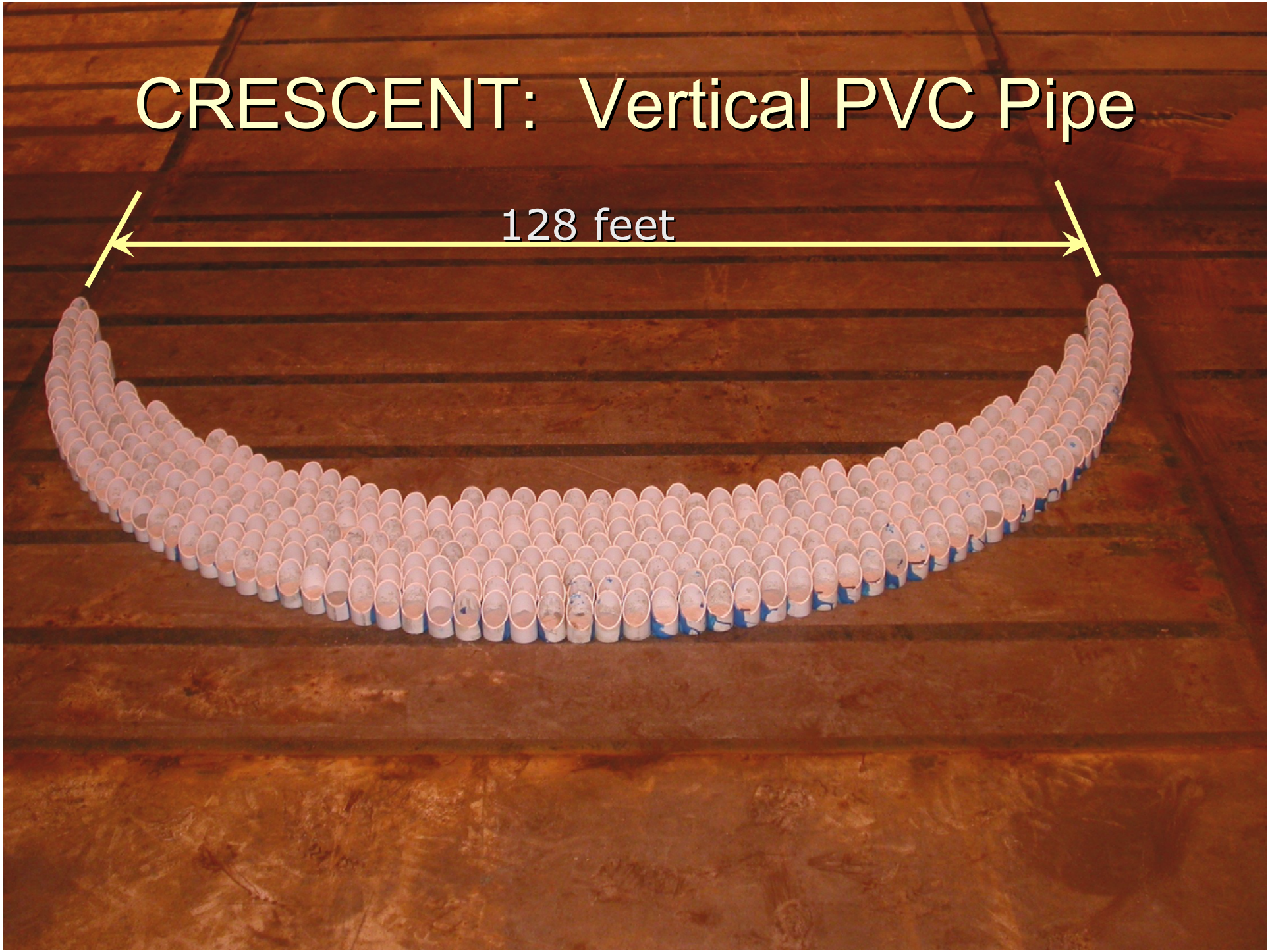
RECTANGLE: Dye Study (5)

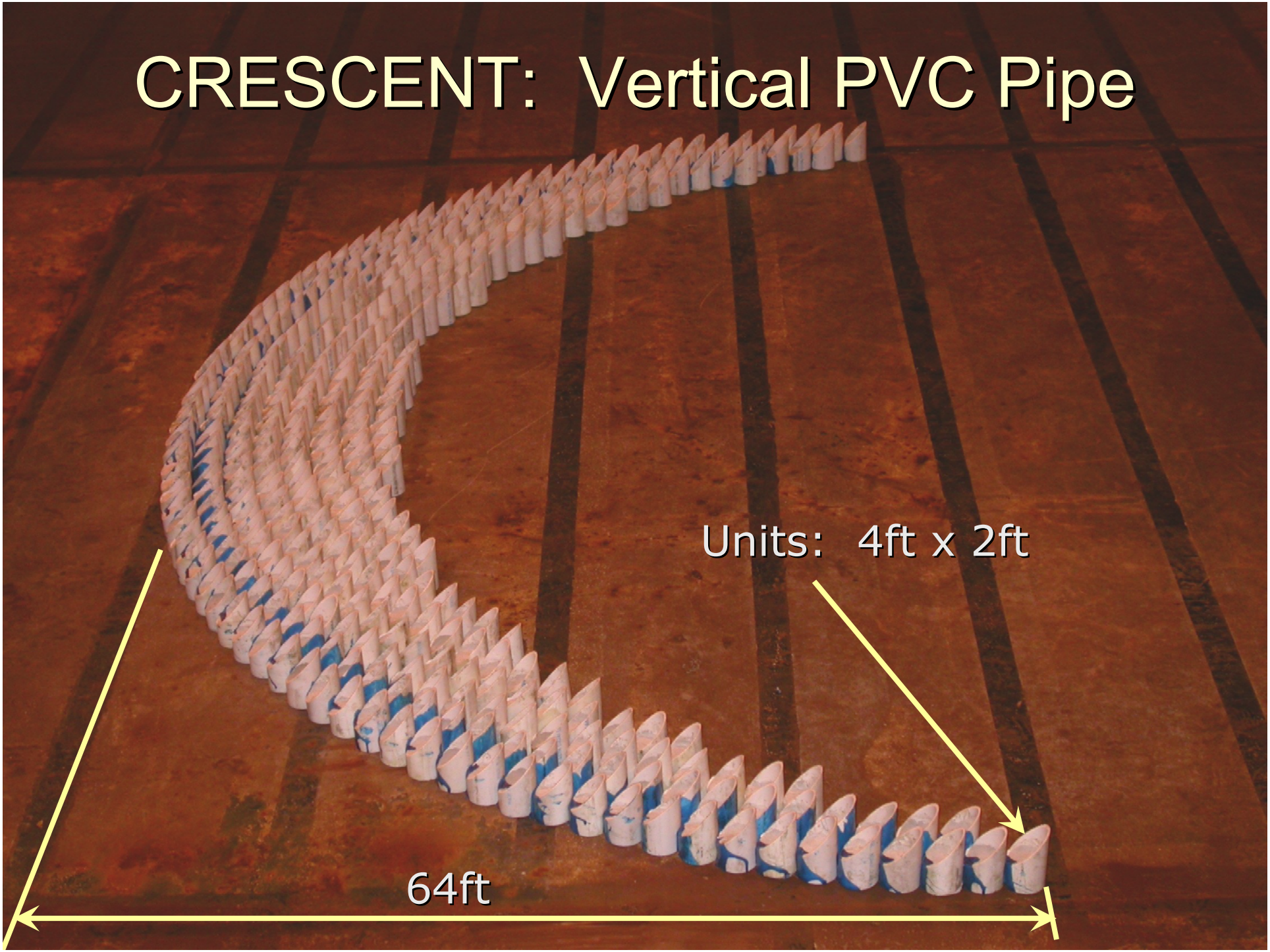
SHAPE PERFORMANCE



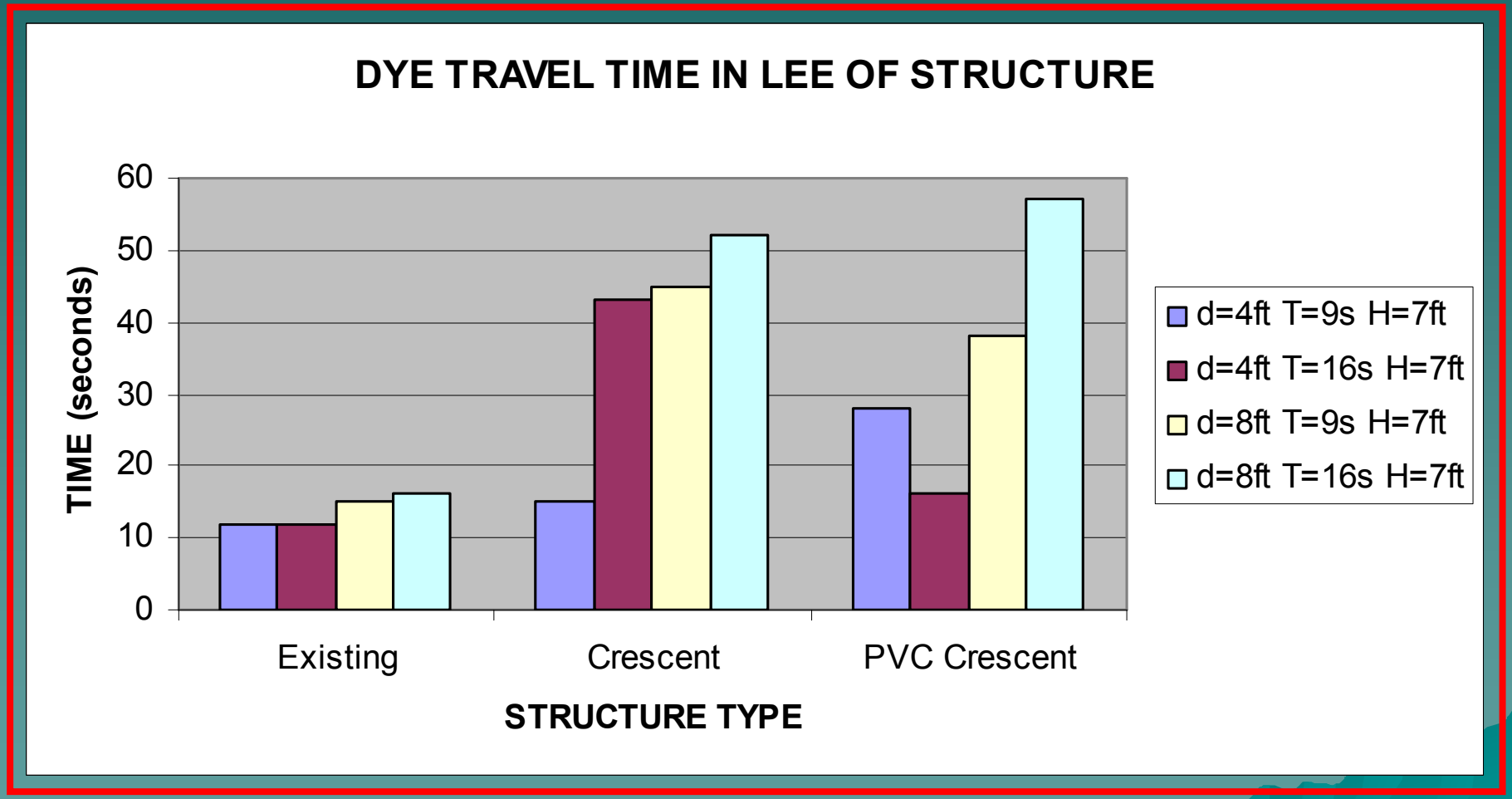
PHYSICAL MODEL
Modular Design

- PVC Pipes
- Plastic Traffic Barriers
- Cylindrical Storage Tanks
- Hawaiian Fish Pond Wall


CRESCENT: Vertical PVC Pipe
128 feet


CRESCENT: Vertical PVC Pipe
Units: 4ft x 2ft
64ft

MODULAR PERFORMANCE



NEXT STEPS

- Detailed Design (FY05)
- Sand Source Investigations (FY05)
- Environmental Coordination (FY05/06):
- Construction (FY06)
- Monitoring and Evaluation (FY07->)

THANK YOU