



RE:BEACH Oceanside CMANC

→ May 14, 2026

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RE:BEACH

Oceanside, CA

- Founded in 1888
- Population ~175,000 → 3rd largest city in San Diego County
- 42 sq. miles | 3.75 miles of beaches
- Iconic coastal landmarks: 1,942-ft wooden pier & harbor village
- World-class surf — official USA Surfing training site
- 5 million unique beach visitors annually
- Major regional transit hub
- Home to Caity Simmers, first CA surfing world champ (WCT) in 34 years

*A classic Southern California beach town,
located between San Diego and Los Angeles*



Site Conditions



Credit and Thanks to Save Oceanside Sand (SOS)

April 2026



**Boat Basin and
Harbor**



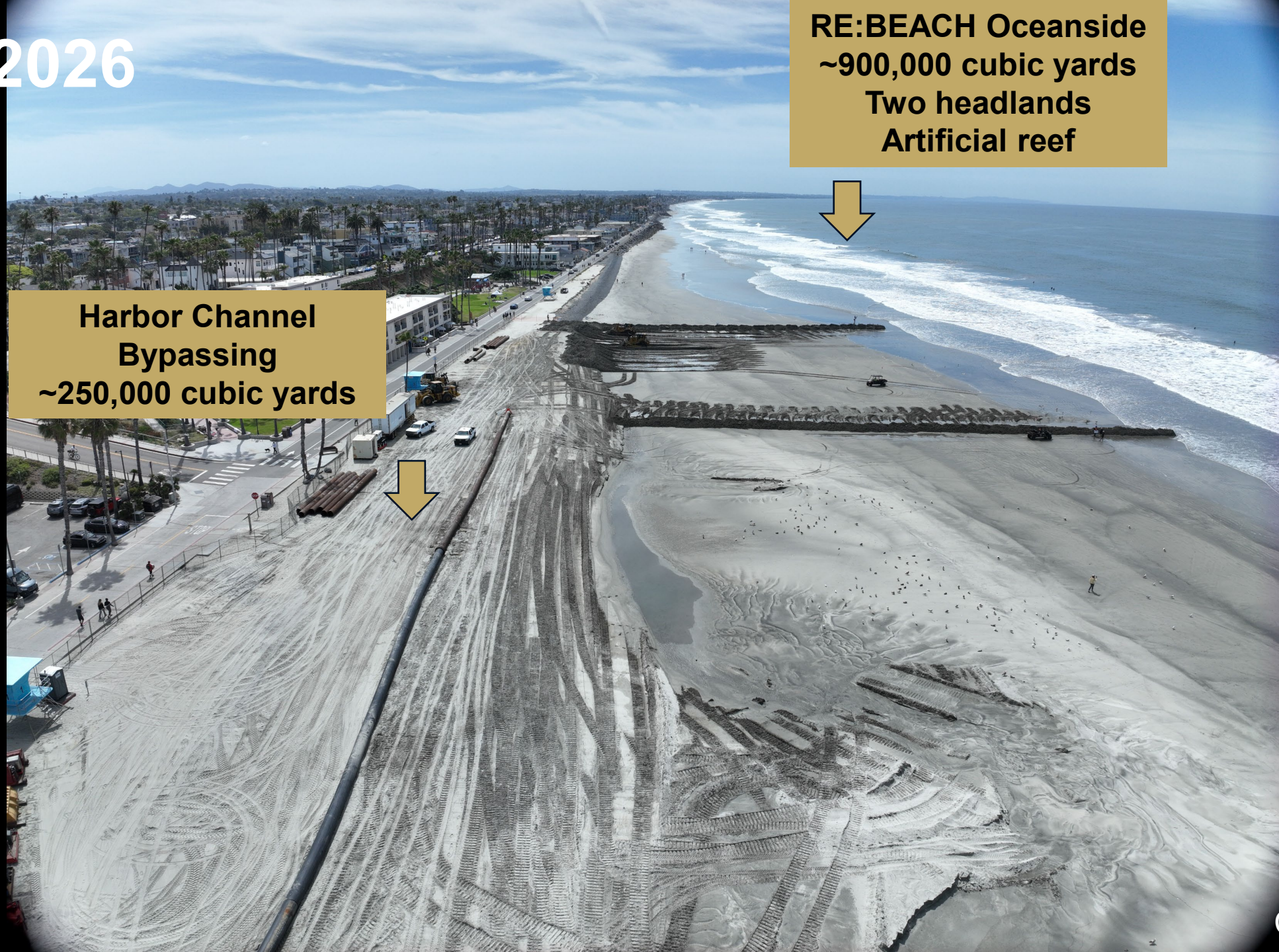
**Harbor Channel
Bypassing
~250,000 cubic yards**



**SCOUP Project
(2025)
~2200 cubic yards**



April 2026



**Harbor Channel
Bypassing
~250,000 cubic yards**

**RE:BEACH Oceanside
~900,000 cubic yards
Two headlands
Artificial reef**

RE:BEACH Background

Beach Sand Feasibility Study (2020 – 2021)

Preliminary Engineering Evaluation recommendations:

- Beach nourishment program
- Sand retention strategy

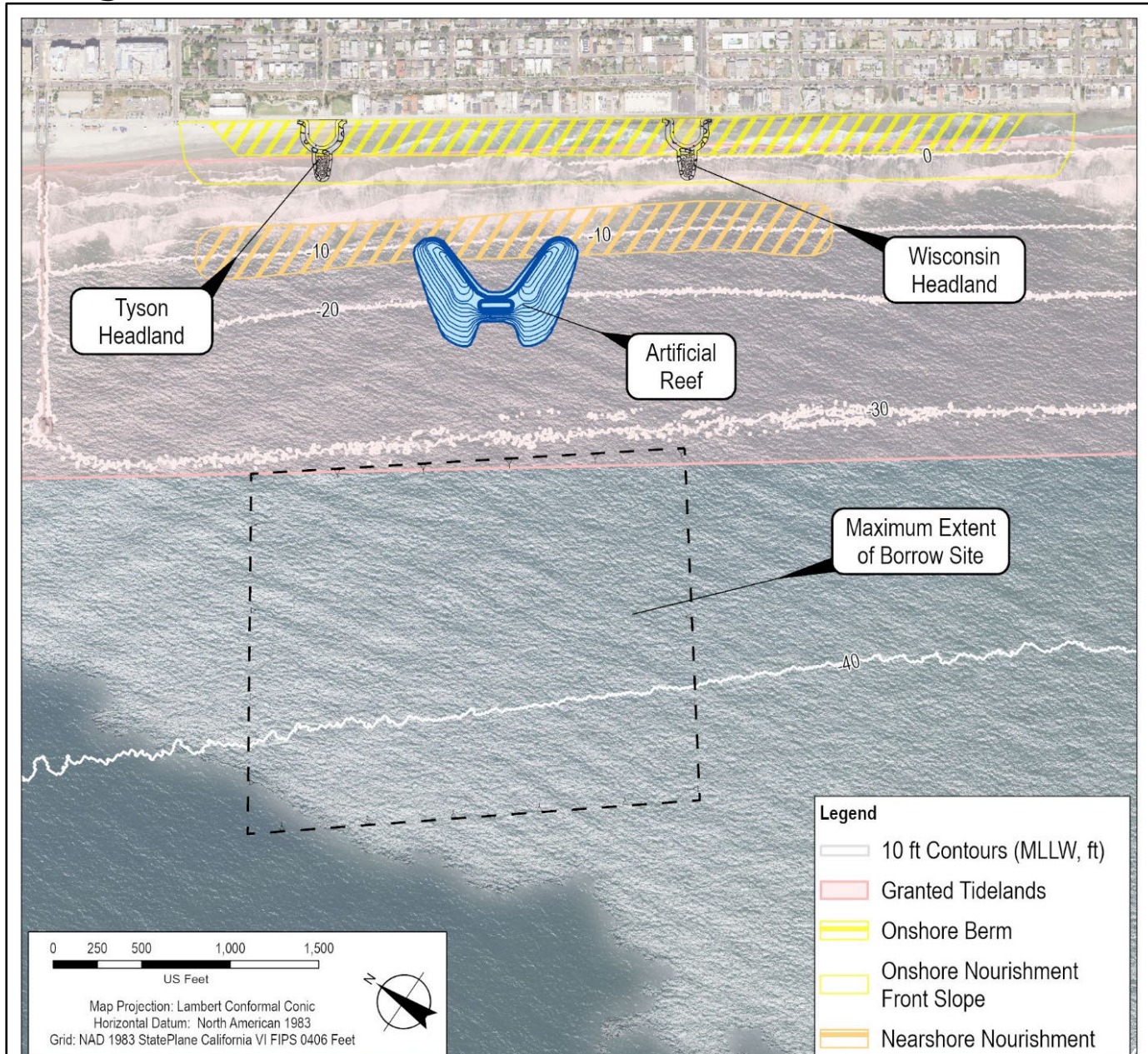
Sand Nourishment and Retention Pilot Project

RE:BEACH (2023-2027)

- Community and Stakeholder Engagement
 - Design Competition (2023)
 - Siting Study (2024)
- Offshore Investigation (2024)
- Baseline Monitoring (2025 – 2027)
- Engineering, Analysis and Design (2024-2026)
- Environmental Compliance and Permitting (2025-2027)



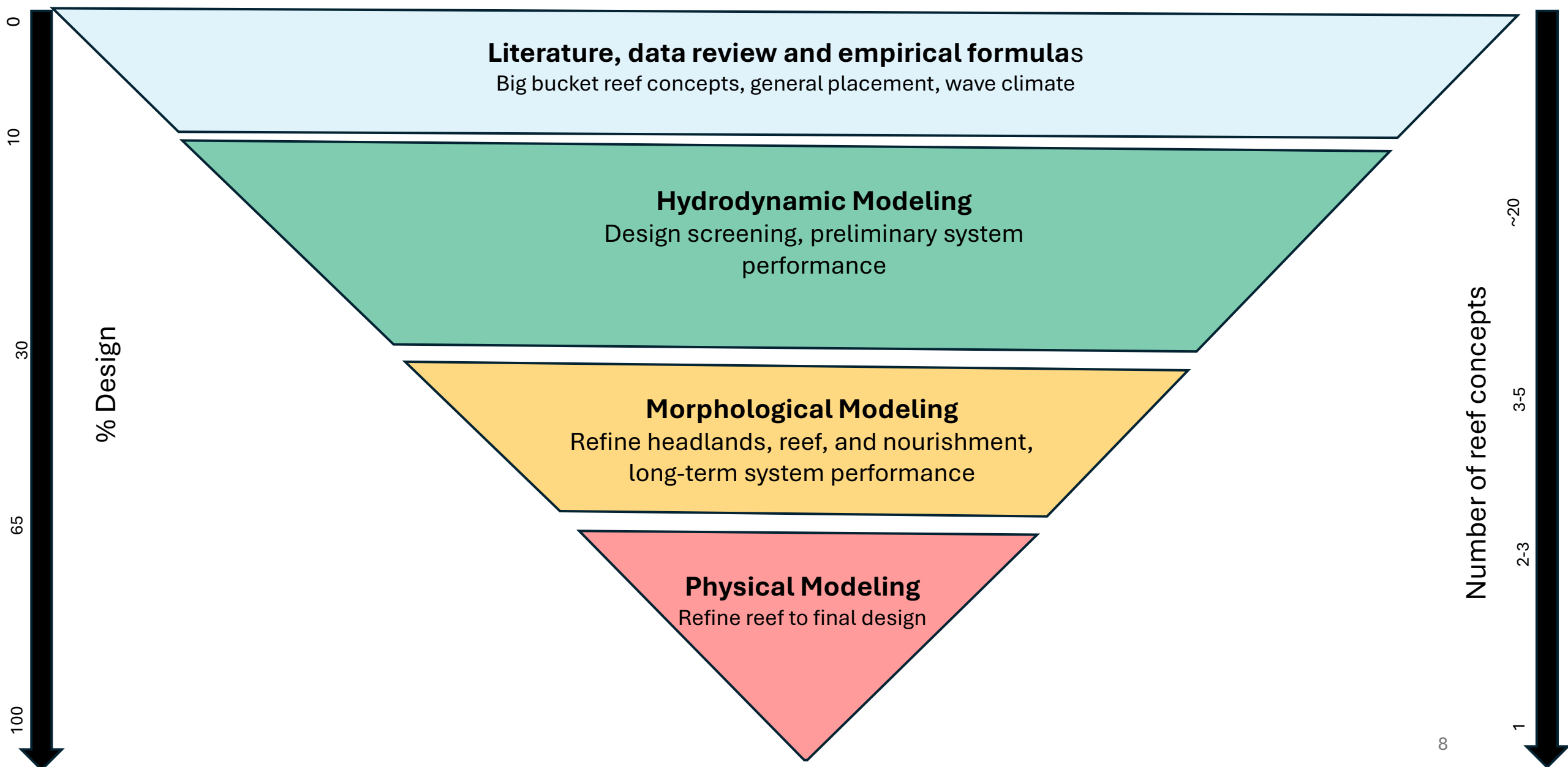
Project Overview



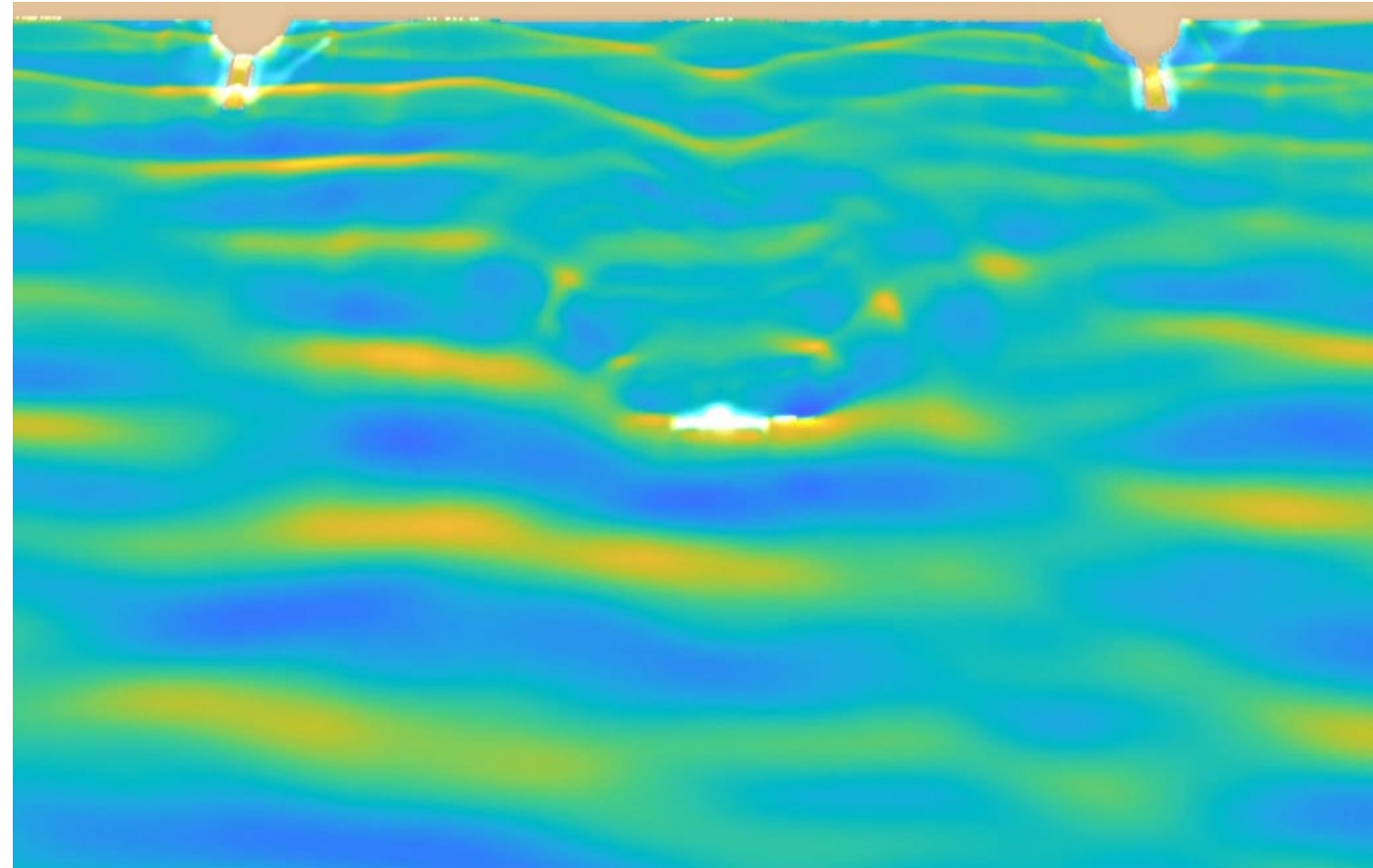
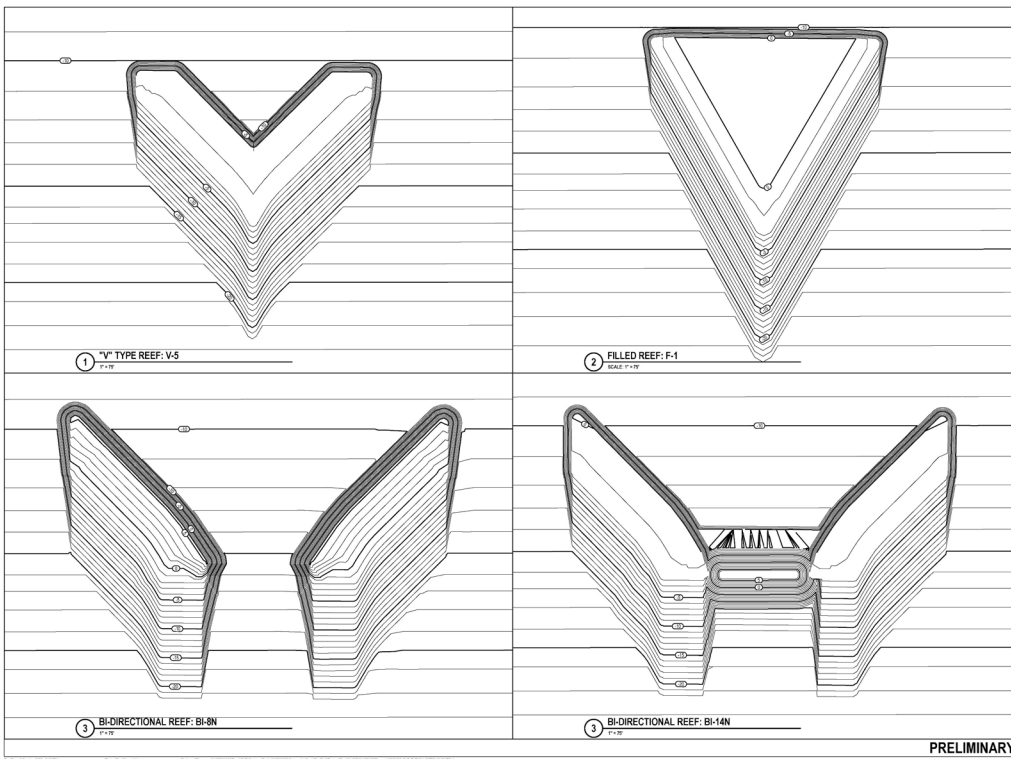
Pilot Project Elements

- Bidirectional artificial reef (160k Tons Rock)
- Two artificial headlands (Rock)
- Onshore and nearshore nourishment (900k CY)
- Local borrow site

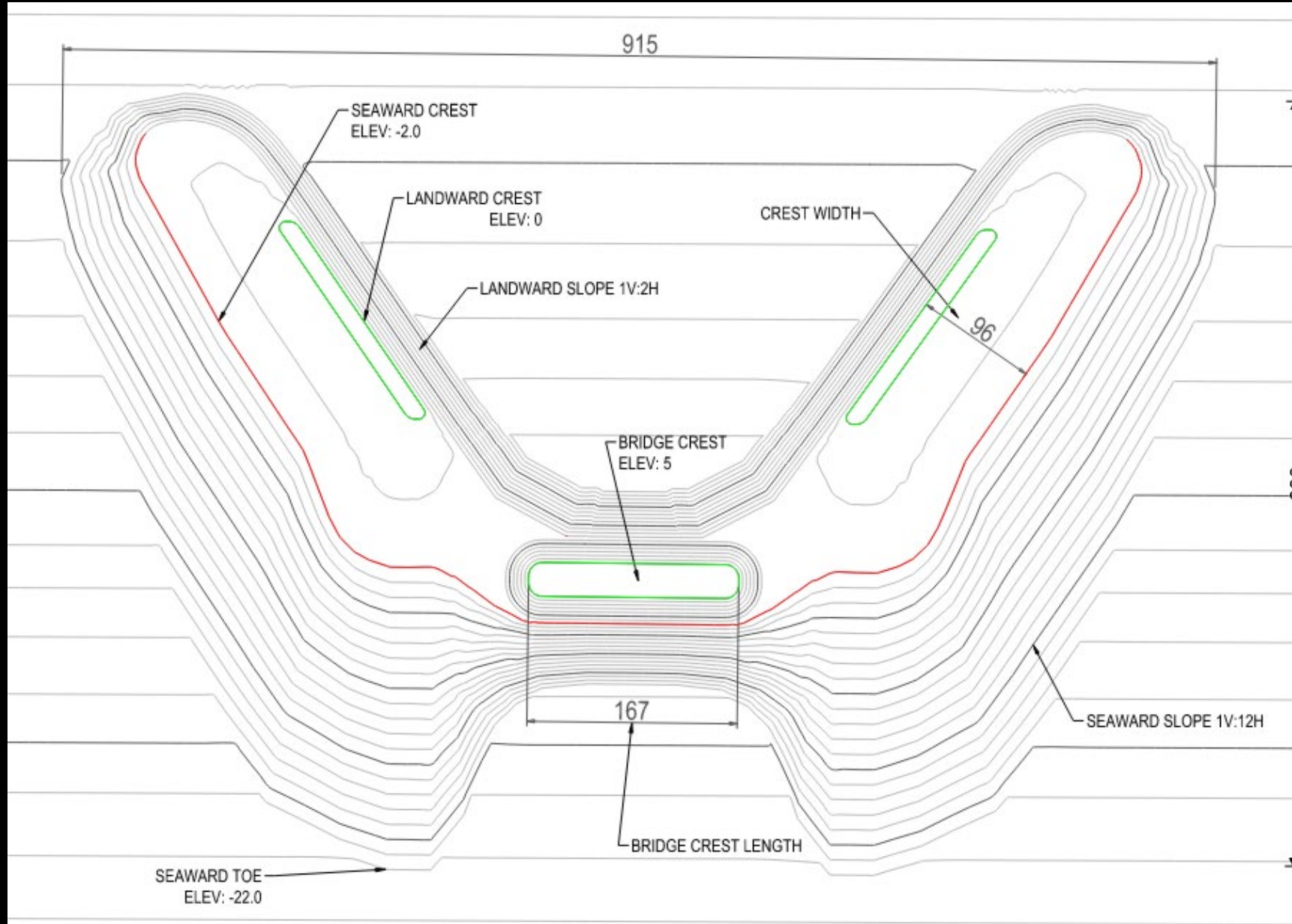
Final Engineering - Design Development



Numerical Modeling - Celeris



Artificial Reef – Parent Design Concept



Why Physical Modeling

Closest Tool to Reality

- Utilize most technical tools to create best design.

Evaluation of Performance Metrics

- All key parameters can be assessed in the physical model.

Novel Strategy

- As an innovative concept, a physical model builds confidence that the design can be constructed and meet project goals.



RE:BEACH Physical Model Tests

Test 1: Crest Height Sensitivity Testing

- Assess trade-offs in reef performance due to changing bridge crest height
- Observe dynamics occurring around reef: current velocities, wave breaking, wave transmission



Test 2: Stability Testing

- Find stable rock sizing under extreme conditions
- Measure rock movement under progressive loading



Test 3: Sediment Transport Patterns

- Place material in basin and observe moveable bed trends and potential sand movement



Test 4: Value Engineering

- Measure performance with reduced crest width on arms

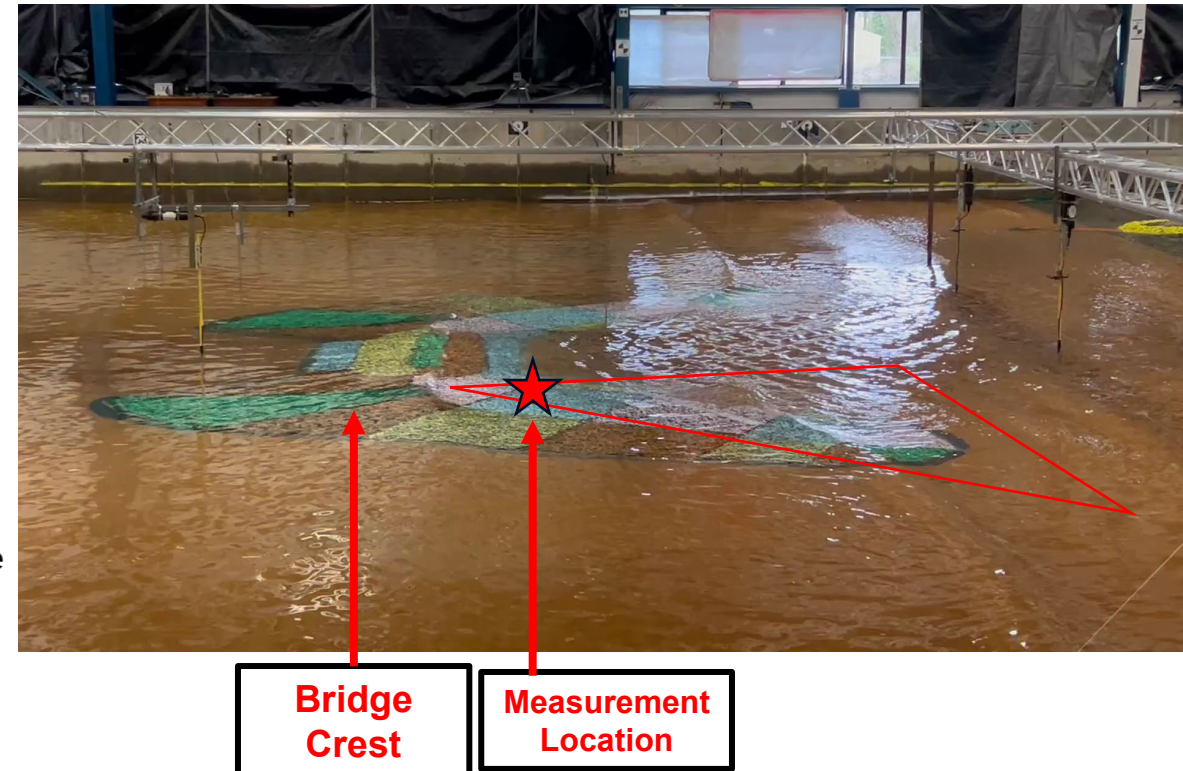
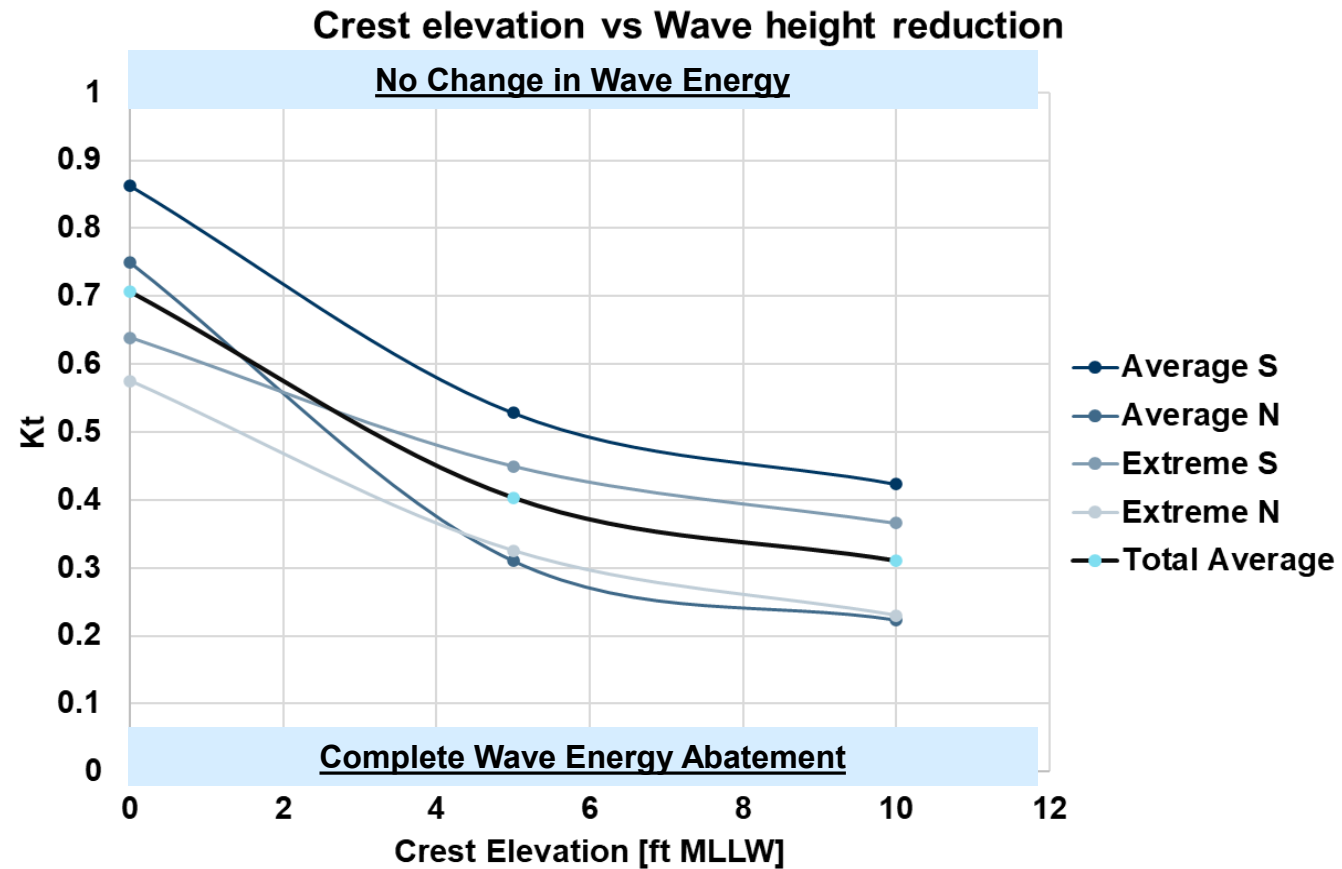
Test 5: Surfability

- Assess trade-offs in wave breaking from modified arm angle and shoulder geometry



Test 1: Wave Transmission

How does changing crest height effect reef performance?

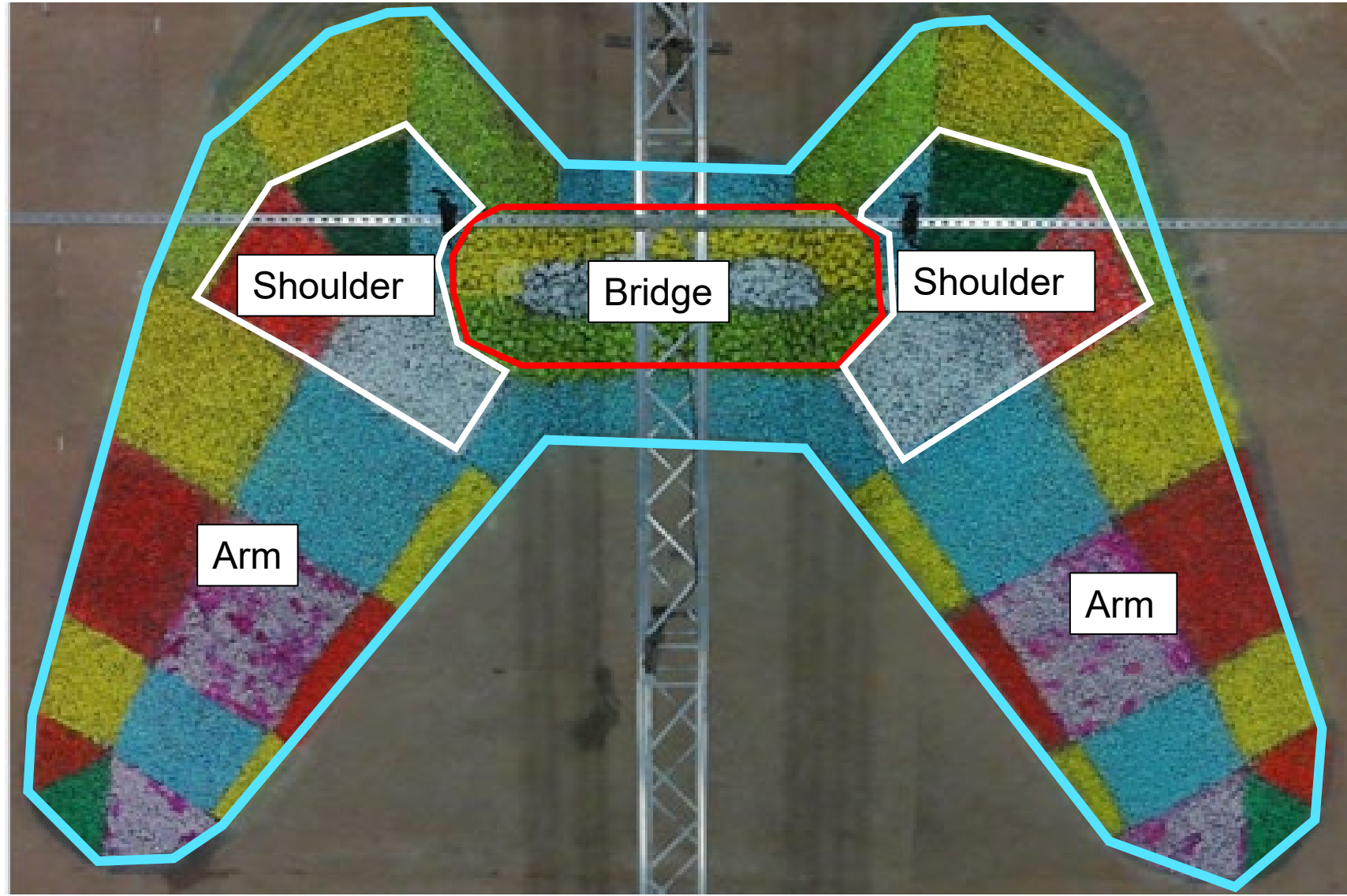


Test 2: Rock Stability Testing

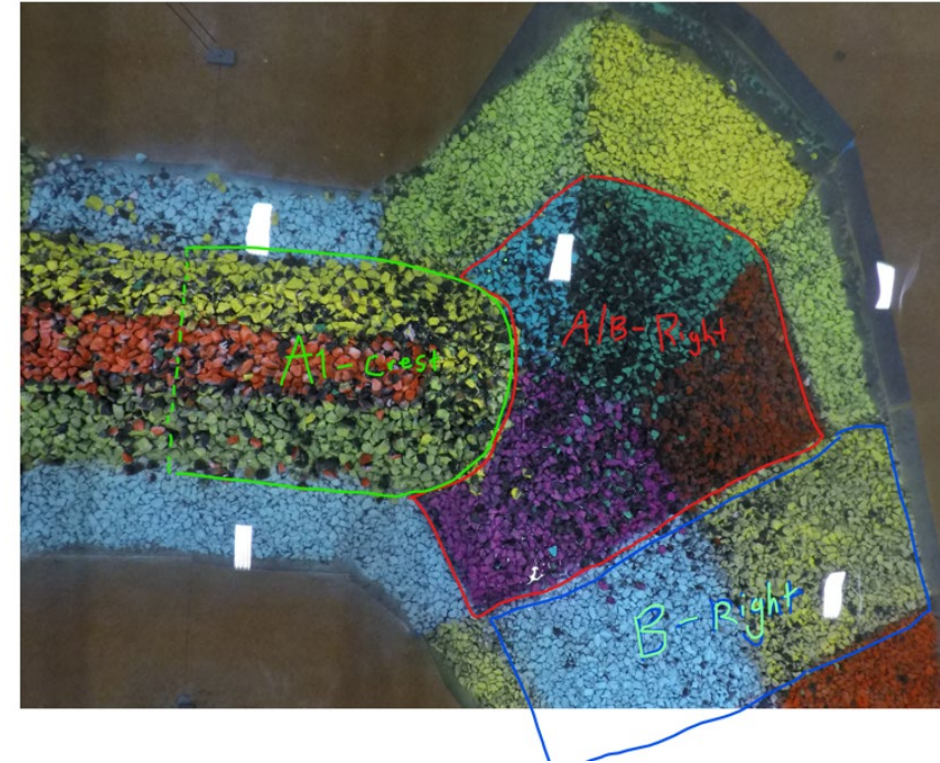
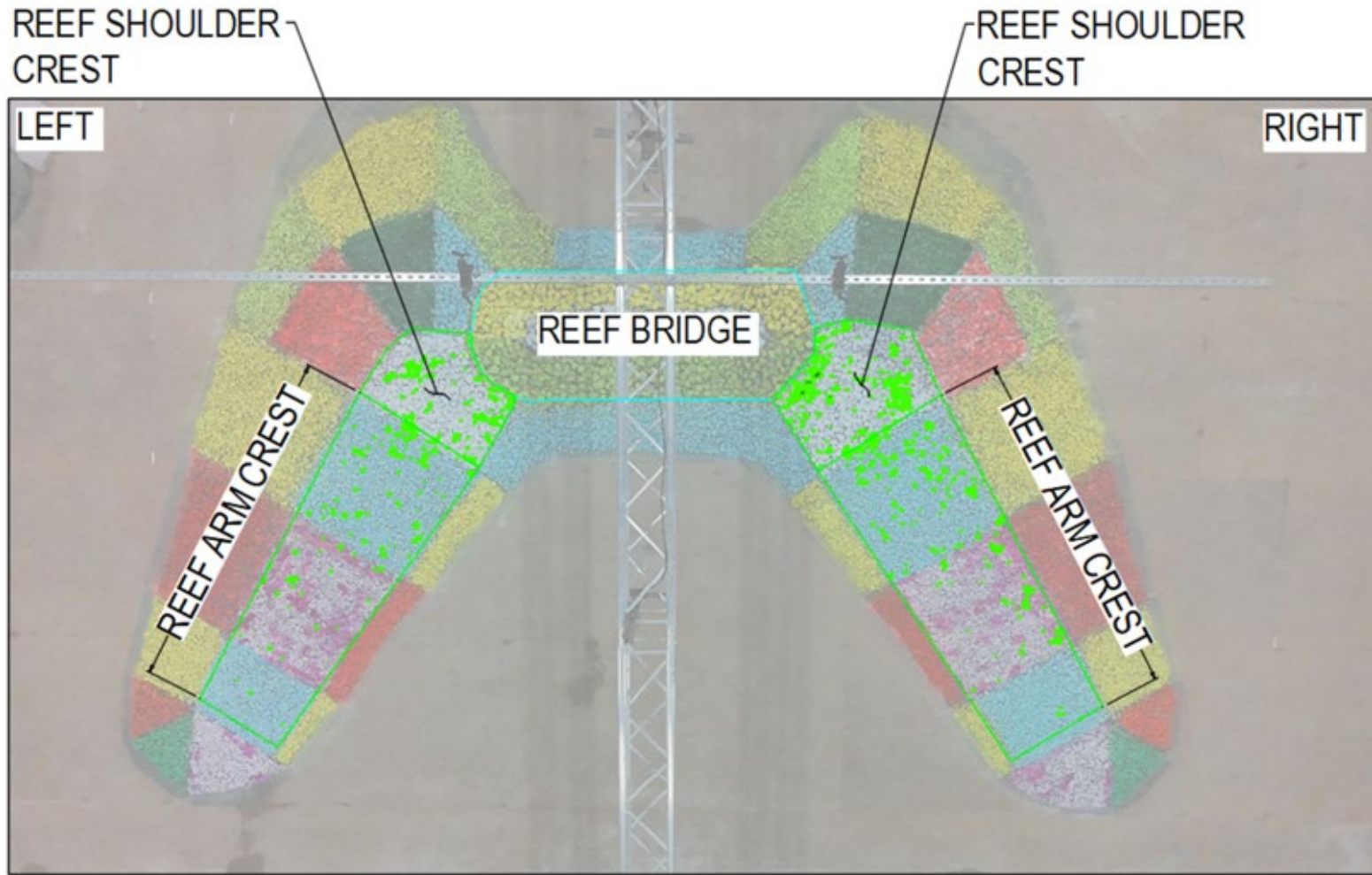
What is the minimum stable rock size?

Goal: Find stable rock sizing under extreme conditions.

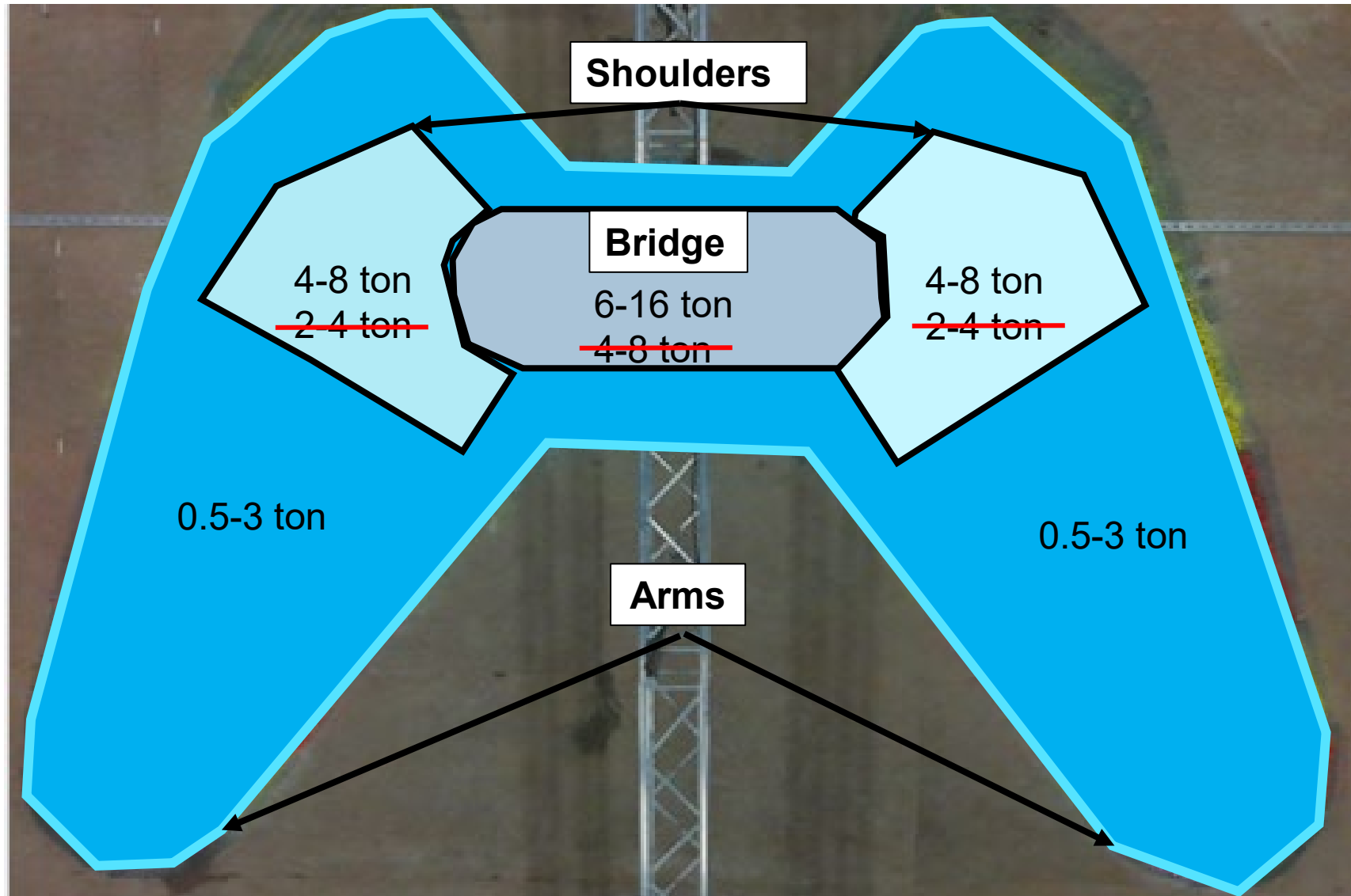
Test: Measure rock movement under progressive loading.



Test 2 Rock Stability

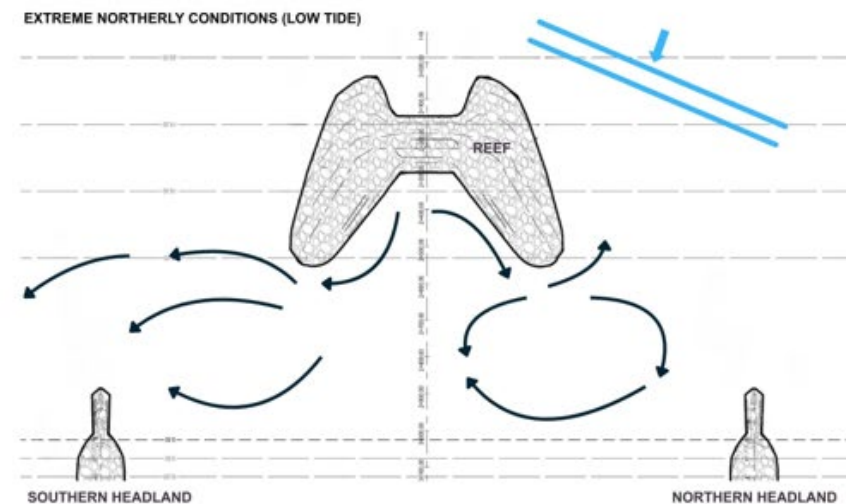
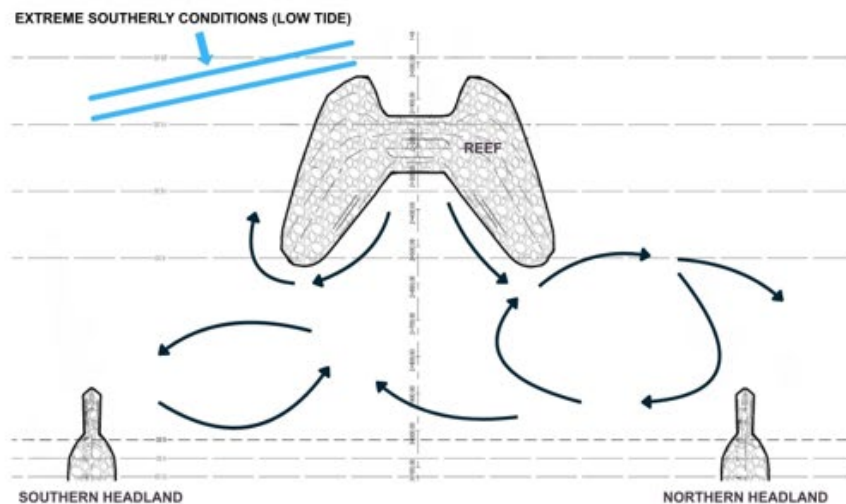
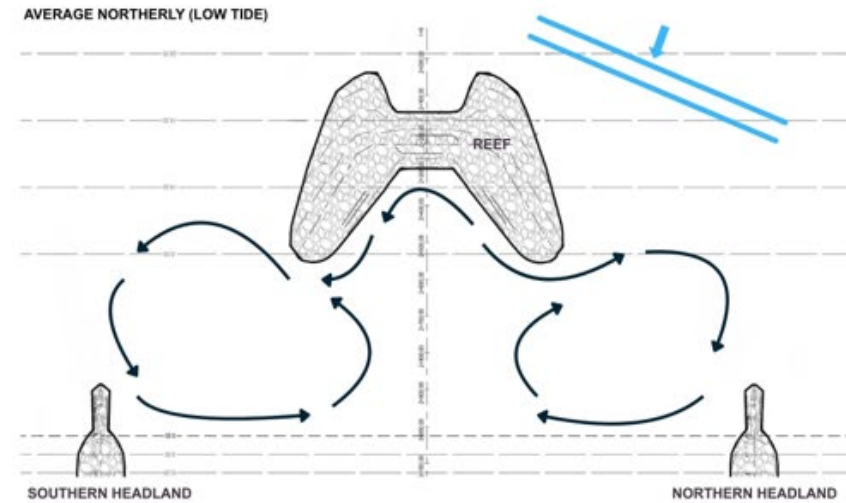
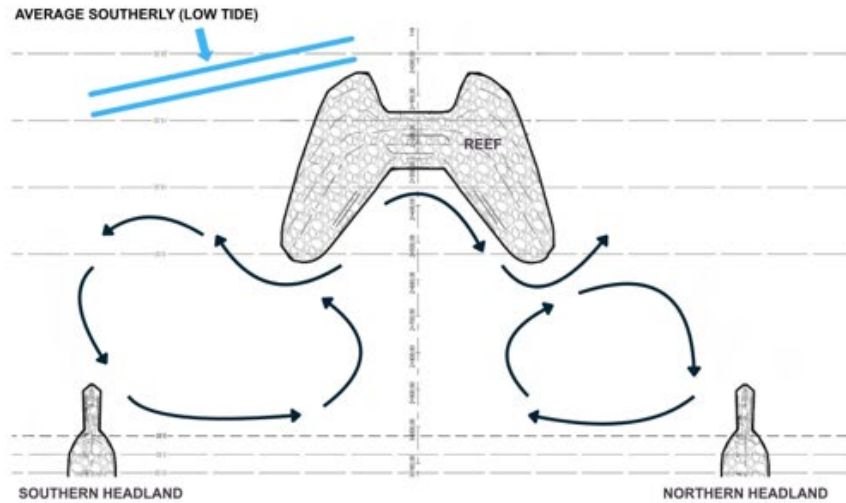


Test 2 Rock Stability: Findings



Test 3: Sediment Transport Analysis

Is observed sediment transport consistent with predictions?



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Crushed Walnut
Shells

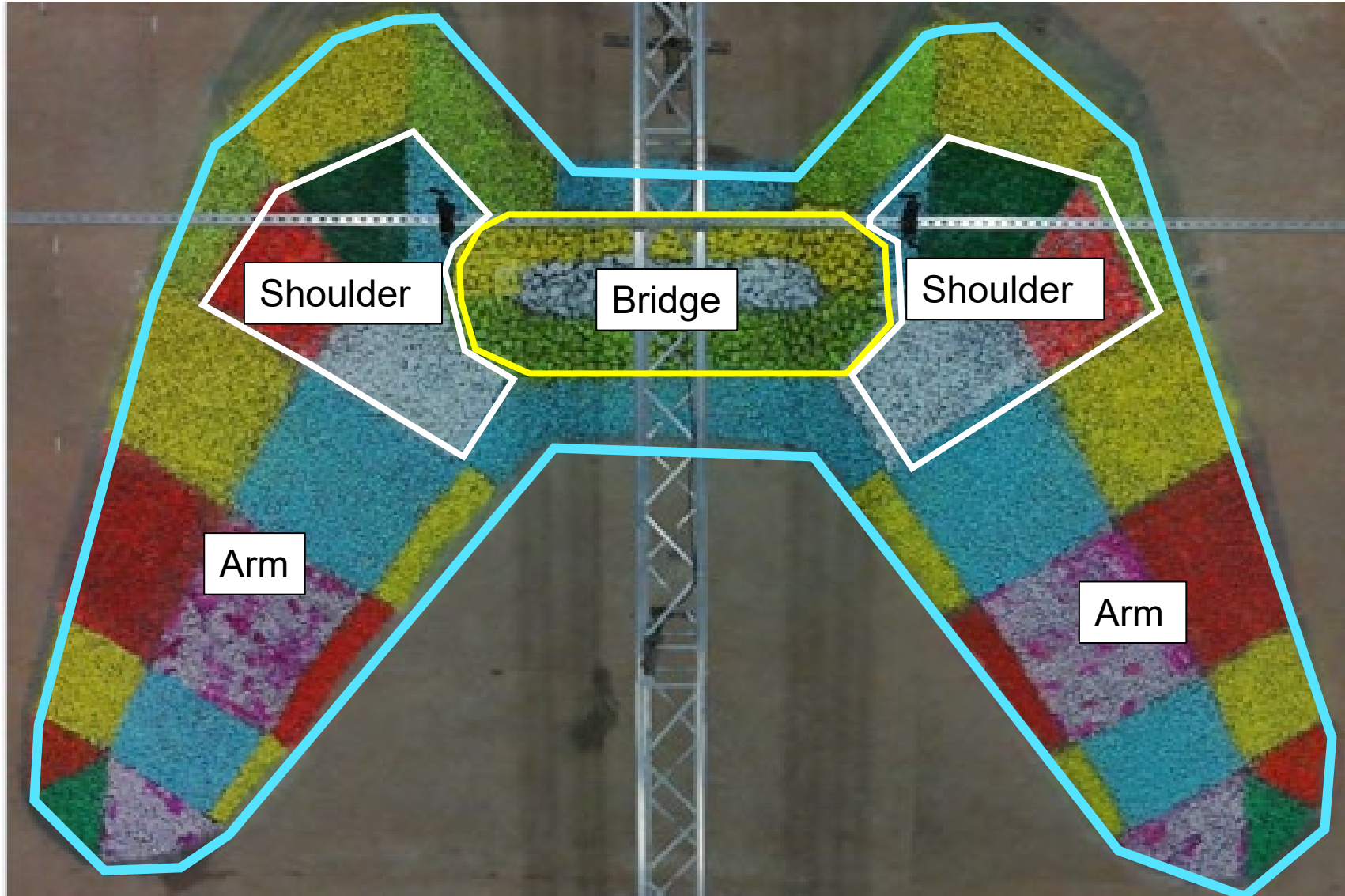
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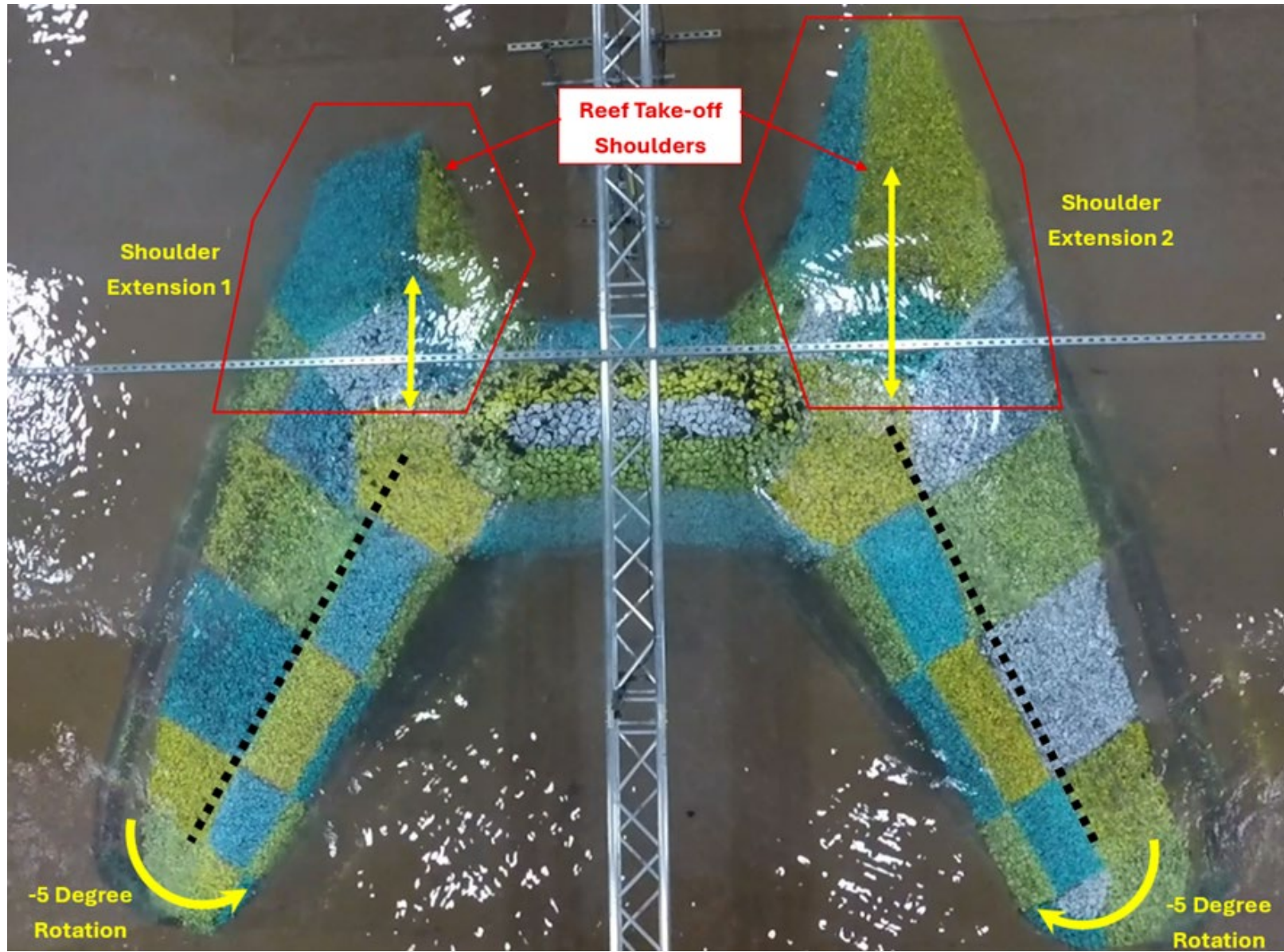
Test 4: Value Engineering

Can we achieve the same performance with less rock/money?



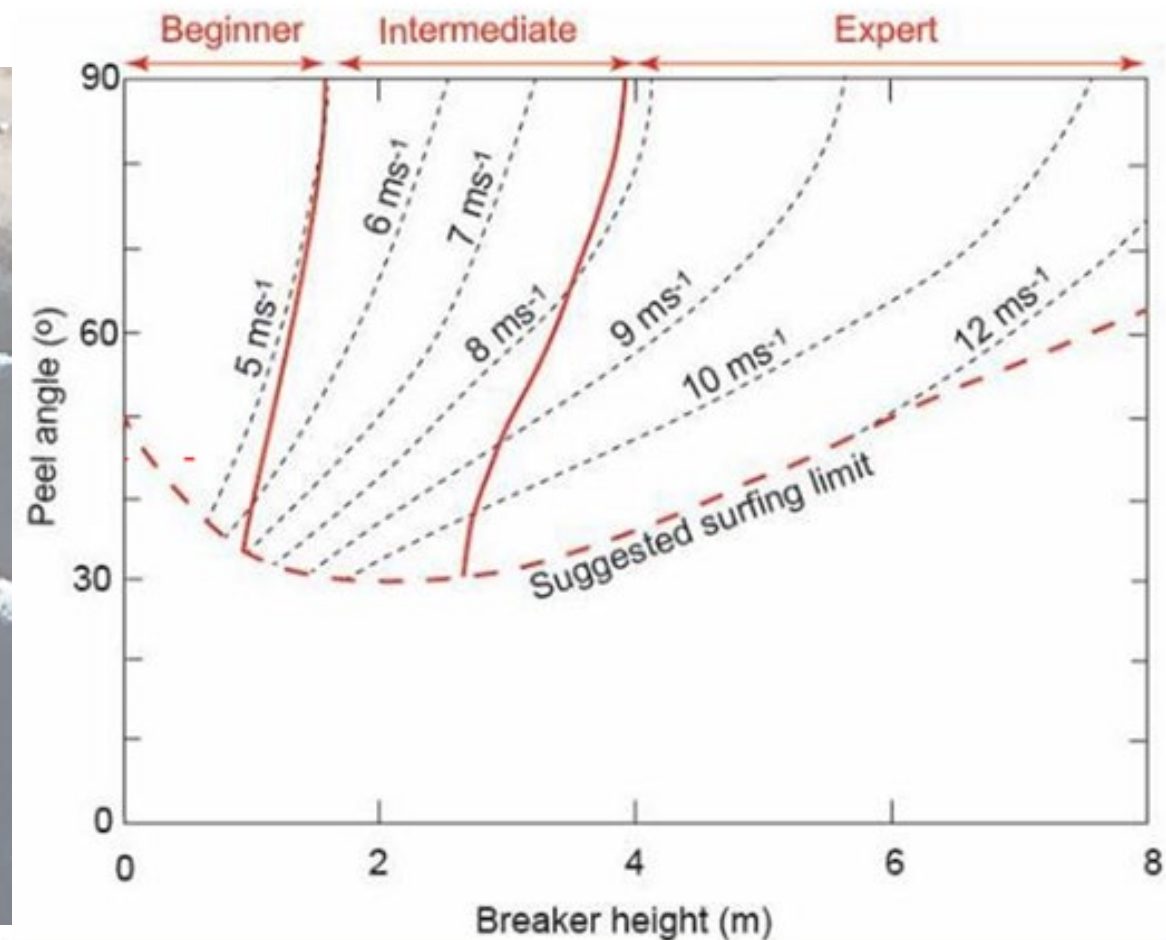
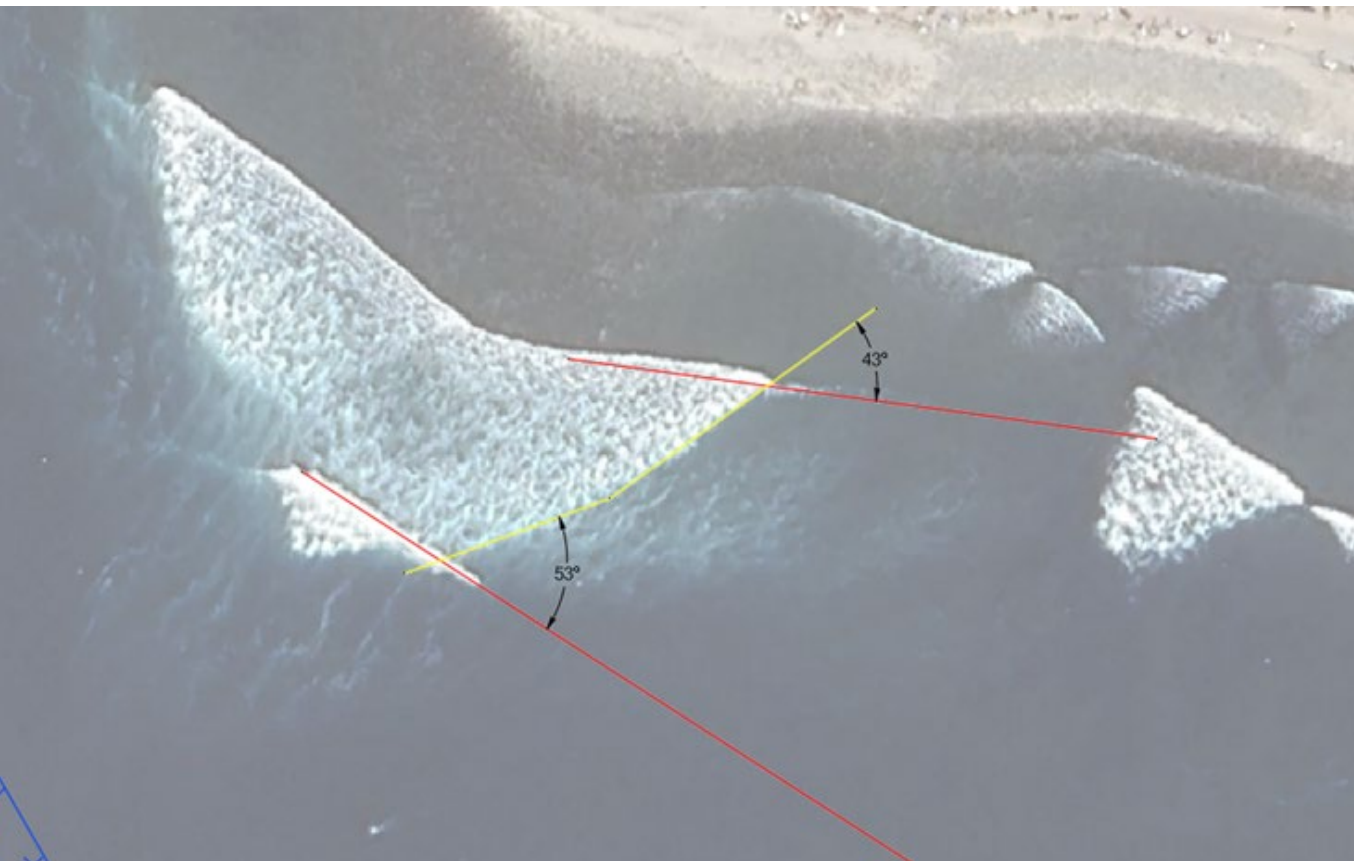
Test 5: Surfability

How does modifications to reef geometry affect wave breaking?



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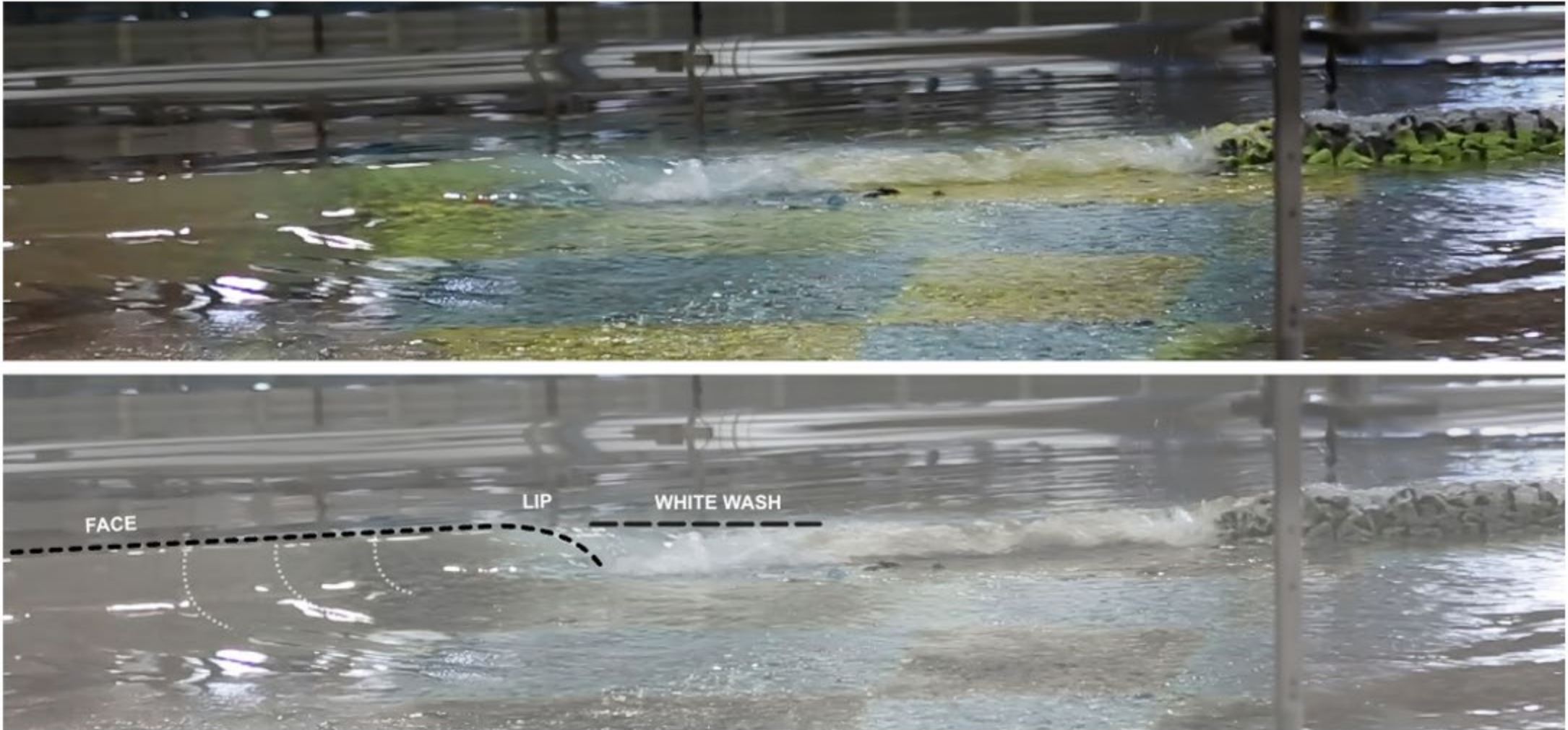


Figure 14 Typical example of 16s period, plunging type wave breaking over reef.

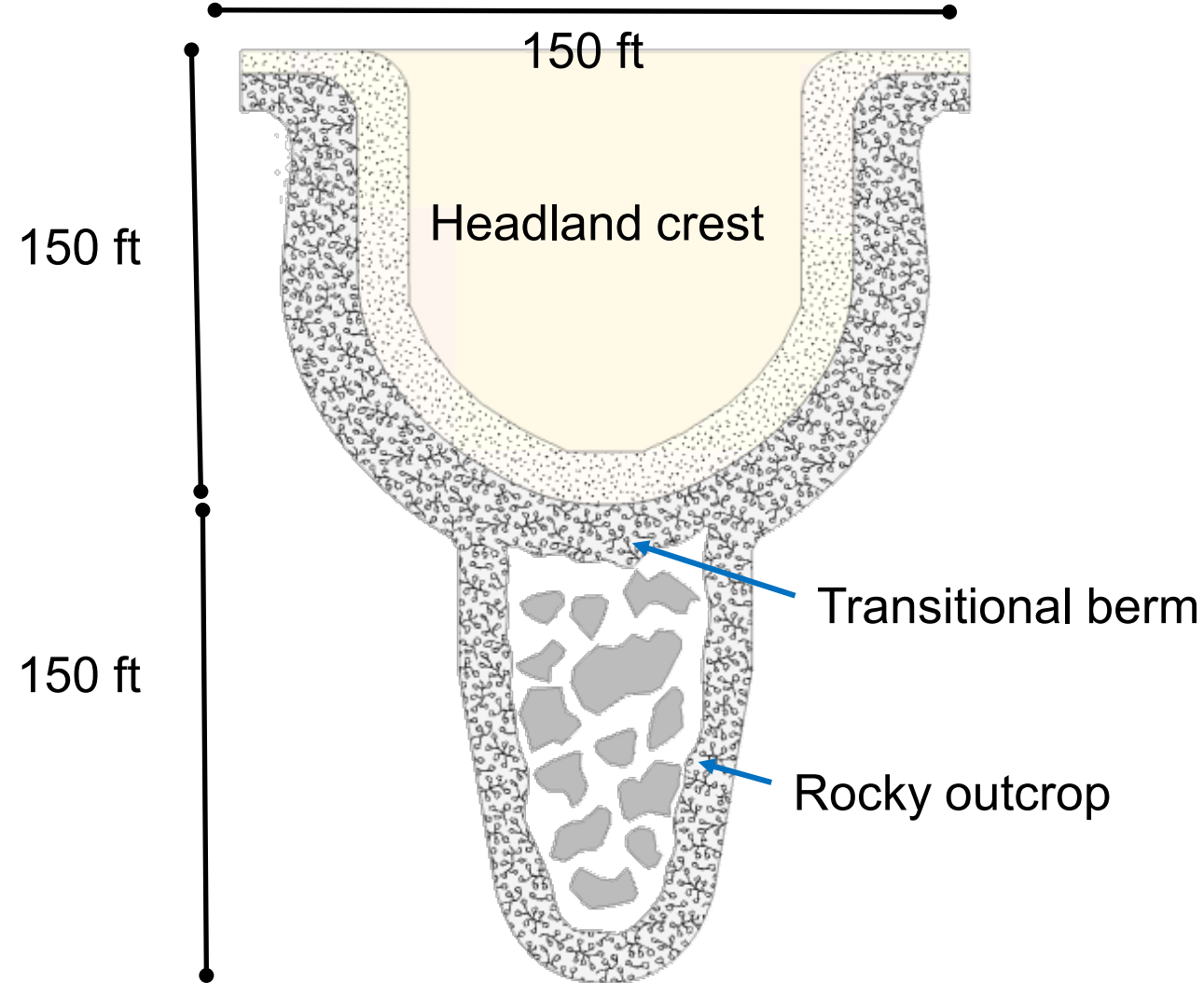
Recommended Pilot Project: Headlands

Primary function:

- Slow longshore transport
- Maintain minimum dry beach width

Dimensions:

- 300 ft x 150 ft (LxW)
- ~2,000 feet apart



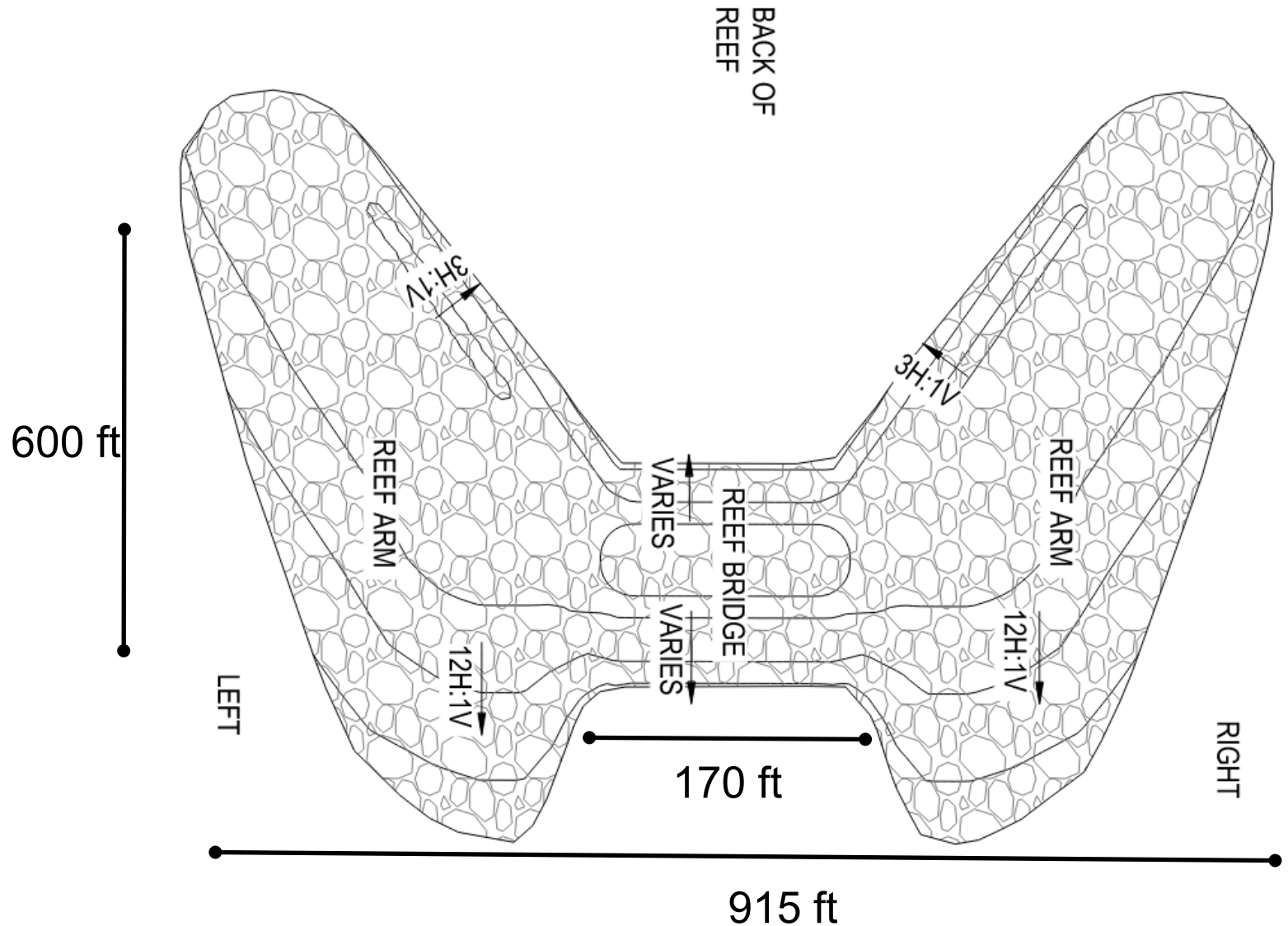
Recommended Pilot Project: Reef

Primary function:

- Slow cross-shore transport
- Stabilize beach in lee

Dimensions:

- 915 ft x 600 ft (LxW)
- -10 to -20 MLLW
- 900 feet offshore



Recommended Pilot Project: Beach Nourishment

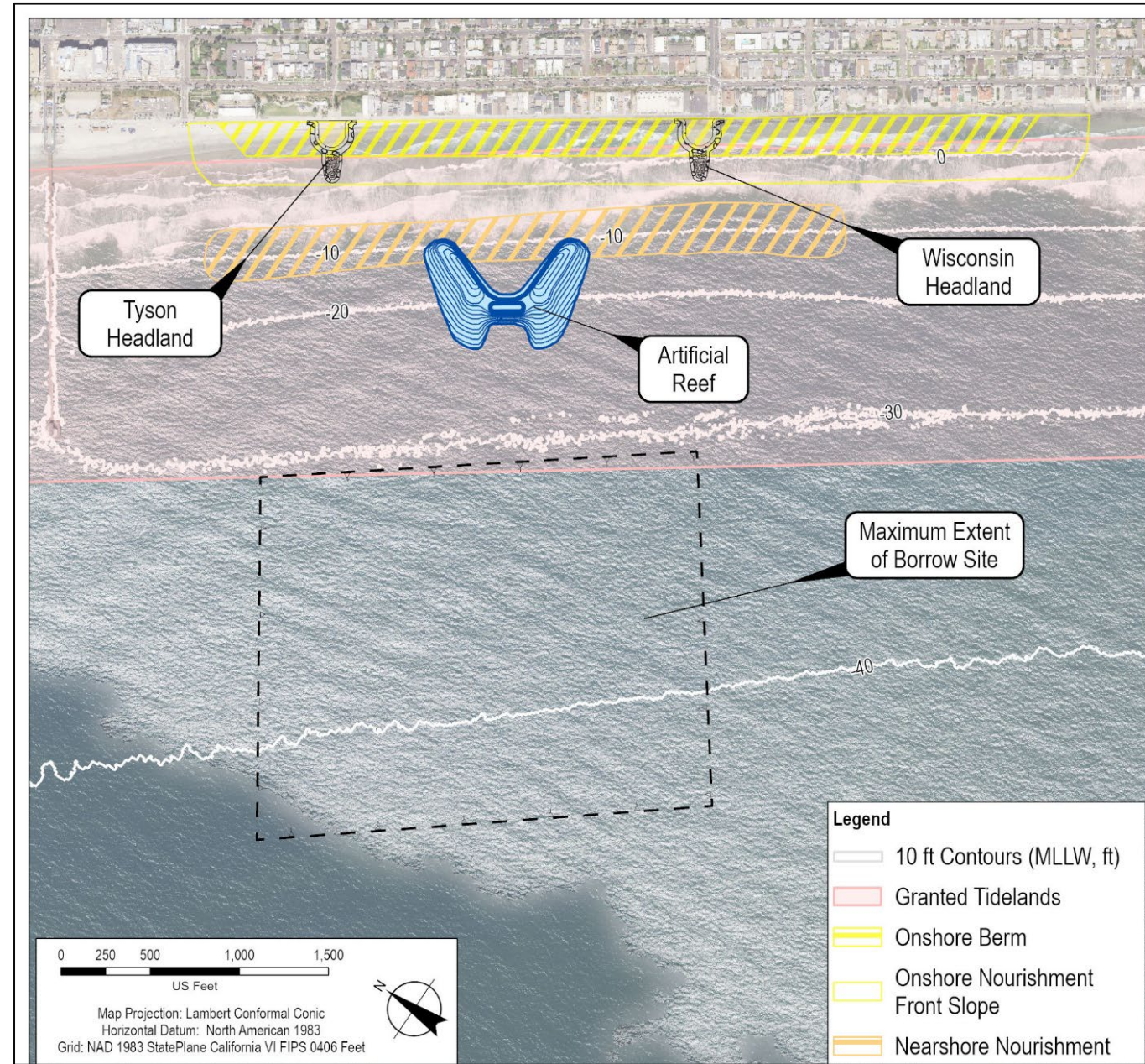
Primary function:

- Restore sandy beach

Dimensions:

- Nearshore Placement: 500k CY
- Onshore Placement: 400k CY

Total = 900k CY



Project Next Steps

	2024			2025				2026			2027				
	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Engineering, Analysis & Design	Pilot Siting Analysis														
	Offshore Sand Source Investigation														
				Design & Engineering											
				Sand Distribution Feasibility Study											
				Numerical Modeling											
								Physical Modeling							
						Advisory Groups									
								Adaptive Management Plan							
Environmental Compliance & Permitting	Regional and Resource Agency Coordination														
					Programmatic Environmental Document										
Monitoring	Study Area Baseline Monitoring														
						Enhanced Baseline Monitoring									

Thank you!

RE:BEACH

