Mooring Fields – From Concept to Construction

A Presentation for the

Proposed Manatee Pocket Mooring Field Workshop

(a project of the Martin County Board of County Commissioners)

Thursday, November 30th

Stuart Corinthian Yacht Club, Port Salerno

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ATM | DESIGN ENGINEERING CONSULTING

APPLIED TECHNOLOGY & MANAGEMENT, INC.





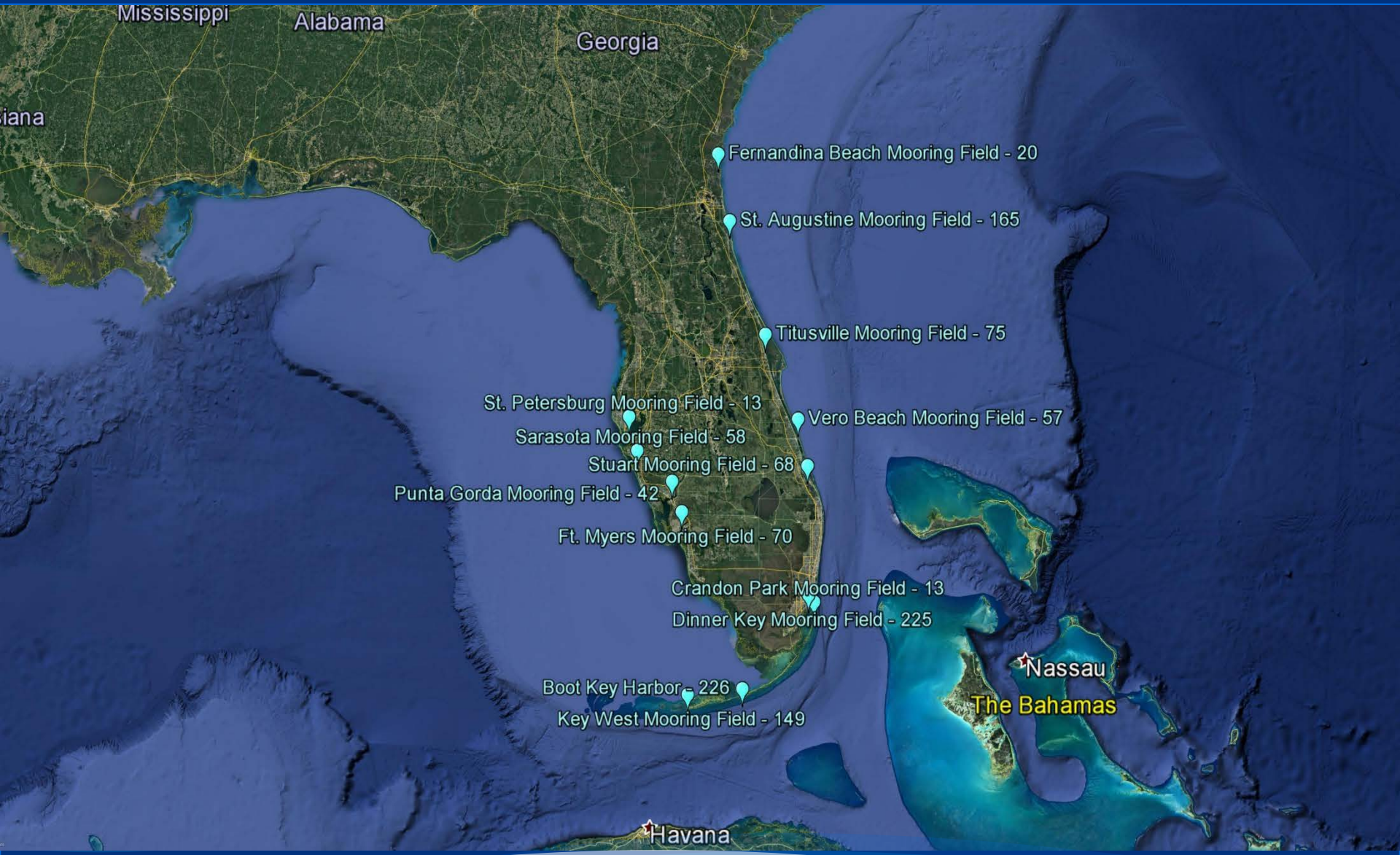
Presentation Outline

- Reasons for Considering Managed Mooring Fields
- Process for Establishing a Managed Mooring Field
- Planning, Design, and Construction of Mooring Fields
- Lessons Learned from Earlier Mooring Field Projects

Problems with Unmanaged and Unregulated Mooring Areas

- Vessels typically anchor in high traffic areas which could lead to navigational hazards
- Potential for illegal discharges
- Damage to seagrass, bottom, etc., from dragging anchor
- Damage to property and vessel from breakaway vessels
- Incorrect mooring radii
- Abandonment of unwanted vessels

Existing Mooring Fields in Florida



Problems with Unmanaged and Unregulated Mooring Areas

Problems with Unmanaged and Unregulated Mooring Areas

Solutions and Advantages of Managed Mooring Fields

- More affordable public access
- Improved navigation
- Properly designed mooring anchors
- Prevent damage to environment and local property
- Easy to manage
- Lower maintenance costs than a typical marina
- Cost effective ($2,500-$3,500 per mooring)
- Promotes tourism, thereby increasing income for waterfront communities
- Better able to manage illegal sewage discharges

Properly Managed Mooring Field

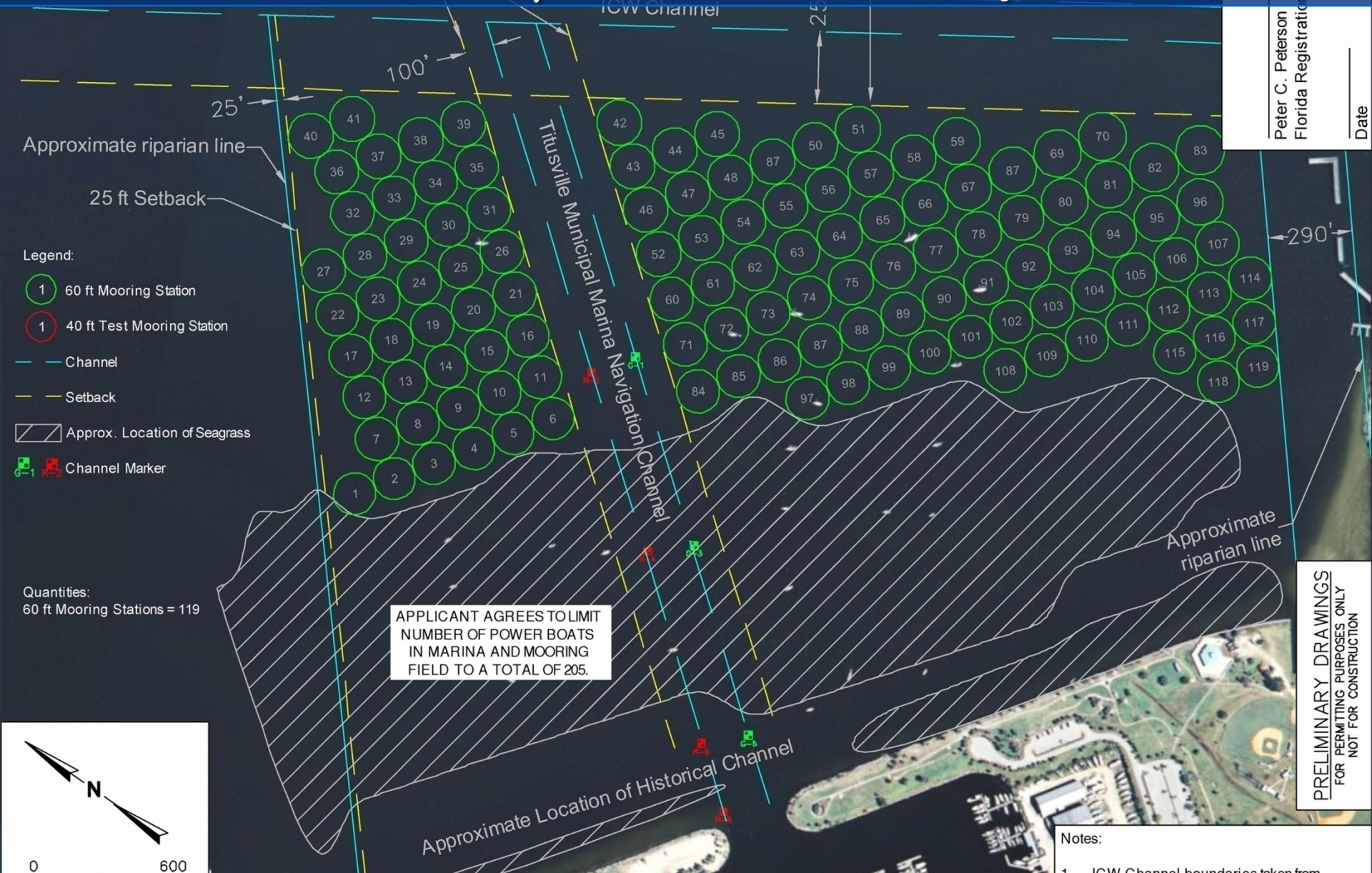
From Concept to Construction

1. Determine Market and Size of Vessels Anticipated
2. Identify Limitations (geotech, exposure, environmental)
3. Bathymetric Surveys, Ecological Resource Surveys, Geotechnical Investigation, and Archeological Investigations
4. Develop Concept Layout. Include Upland Facilities.
5. Start Permitting, Pre-Application Meeting (seagrass, manatees, **shellfish**, management plan, other benthic resources, etc.)
6. Establish Design Criteria (vessel size, depths, wind/wave exposure)
7. Mooring Design including Maintenance Considerations
8. Construct Mooring Field

Proper Layout and Planning

Detailed Layout Planning

Titusville Municipal Marina and Mooring Field



Permitting Considerations in Florida

- ***New* Noticed General Permit**
  - 62-330.420 General Permit to Local Governments for Public Mooring Fields
- **Seagrass**
  - Require adequate depths and flushing currents
  - Damage from random anchoring vs. single-point
- **Submerged Lands Ownership**
  - St. Augustine – Owns and controls submerged lands
  - Martin County – Standard SSL – no control outside of SSL
- **Upland facilities**
  - Showers, restrooms, garbage collection, sewage pump-out, dinghy docks/tender vessel services, etc.

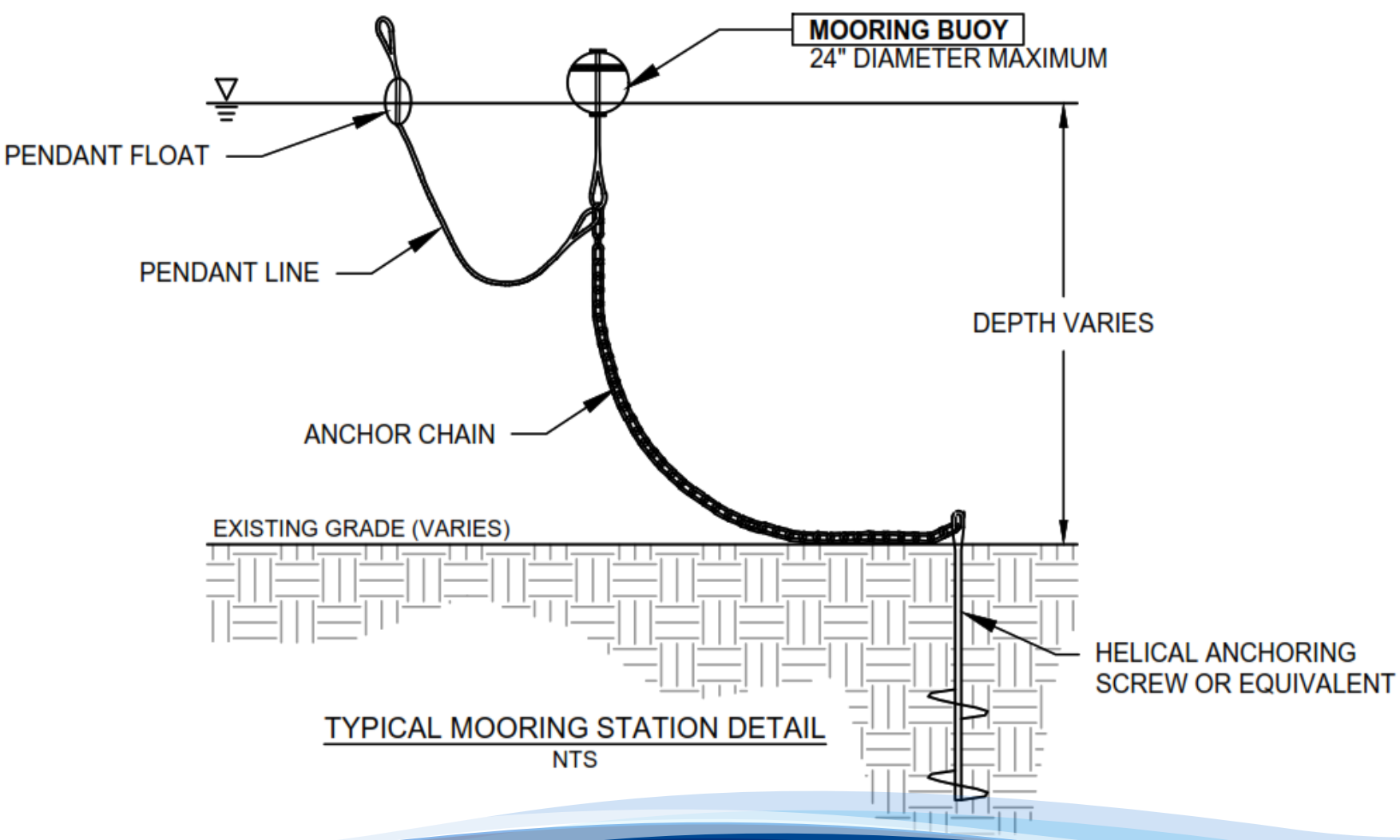
Florida Noticed General Permit

- **62-330.420 General Permit to Local Governments for Public Mooring Fields**
  - Mooring Field Management Plan
  - Details on the anchoring systems proposed for mooring vessels, any docks, pumpout facilities, kiosks, and in-water navigational signs and markers proposed
  - A scaled bathymetry plan
  - A benthic resource inventory
  - Survey for Submerged Lands Lease
  - Still requires a separate Section 10 Permit from Corps
  - Waterway Marker Permit

Proper Engineering is Key

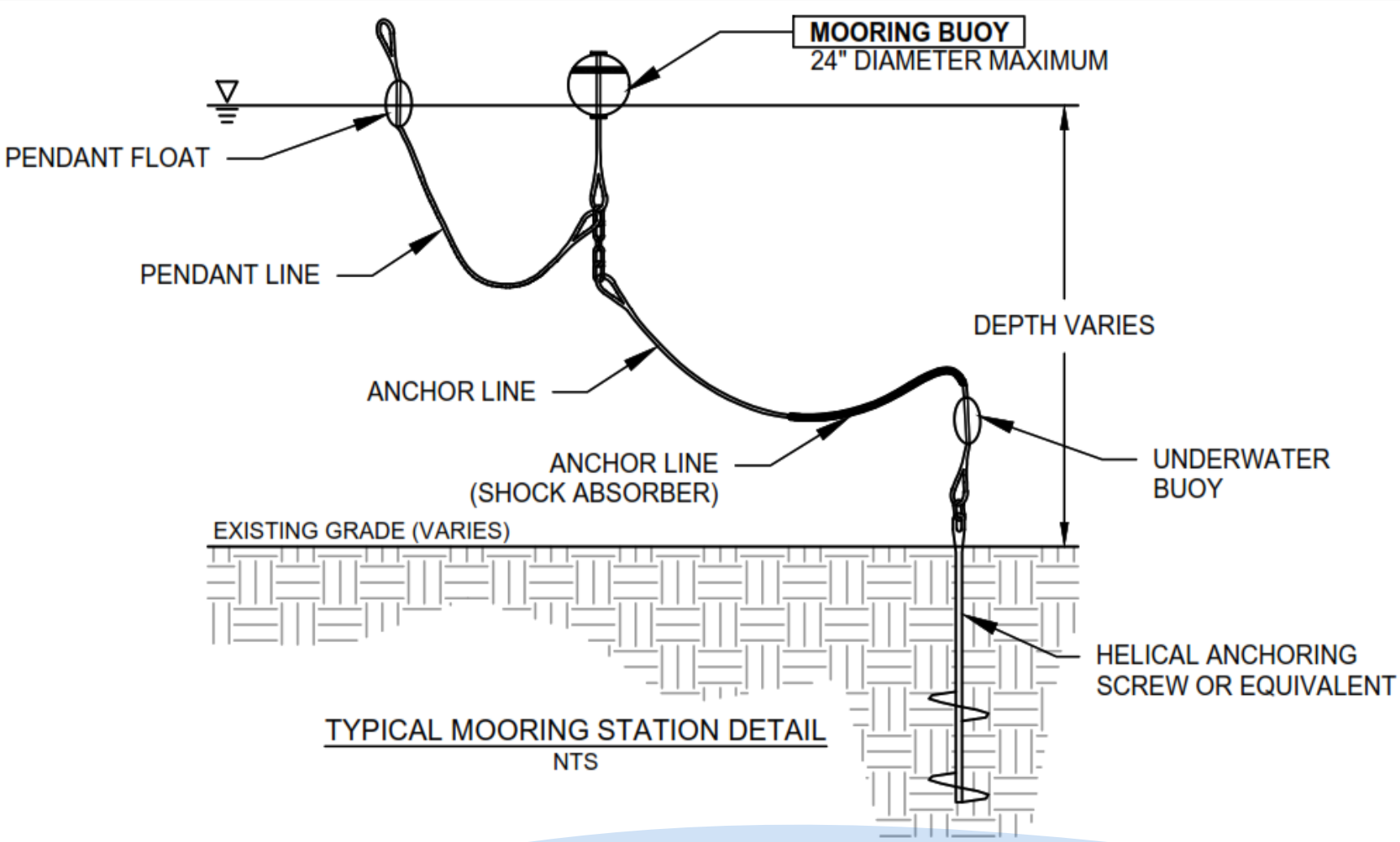
- Exposure
- Geotechnical Considerations
- Navigation Hazards
- Functionality of Mooring Considerations
- Design Load and Limitations
- Swing Radii
- Vessel Types

Mooring Technology: Old

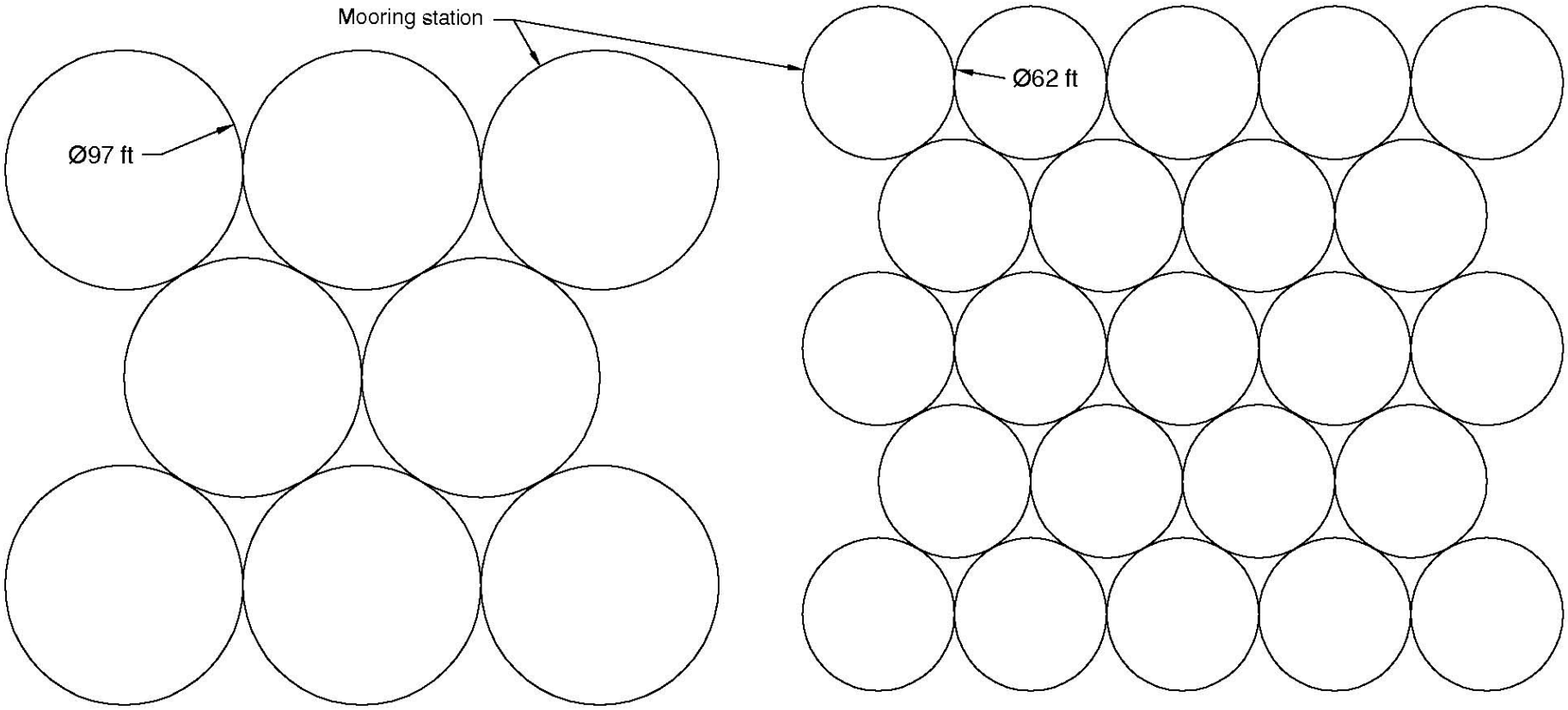


TYPICAL MOORING STATION DETAIL
NTS

Mooring Technology: New



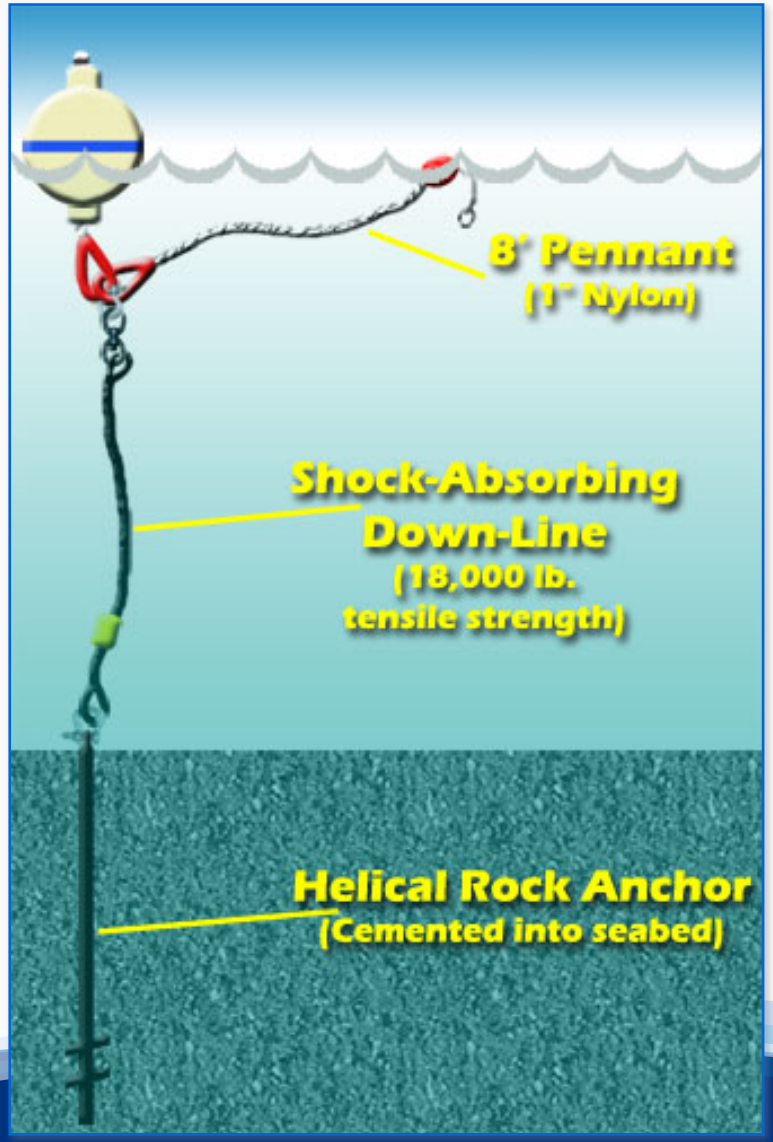
Increasing Efficiency



Note:

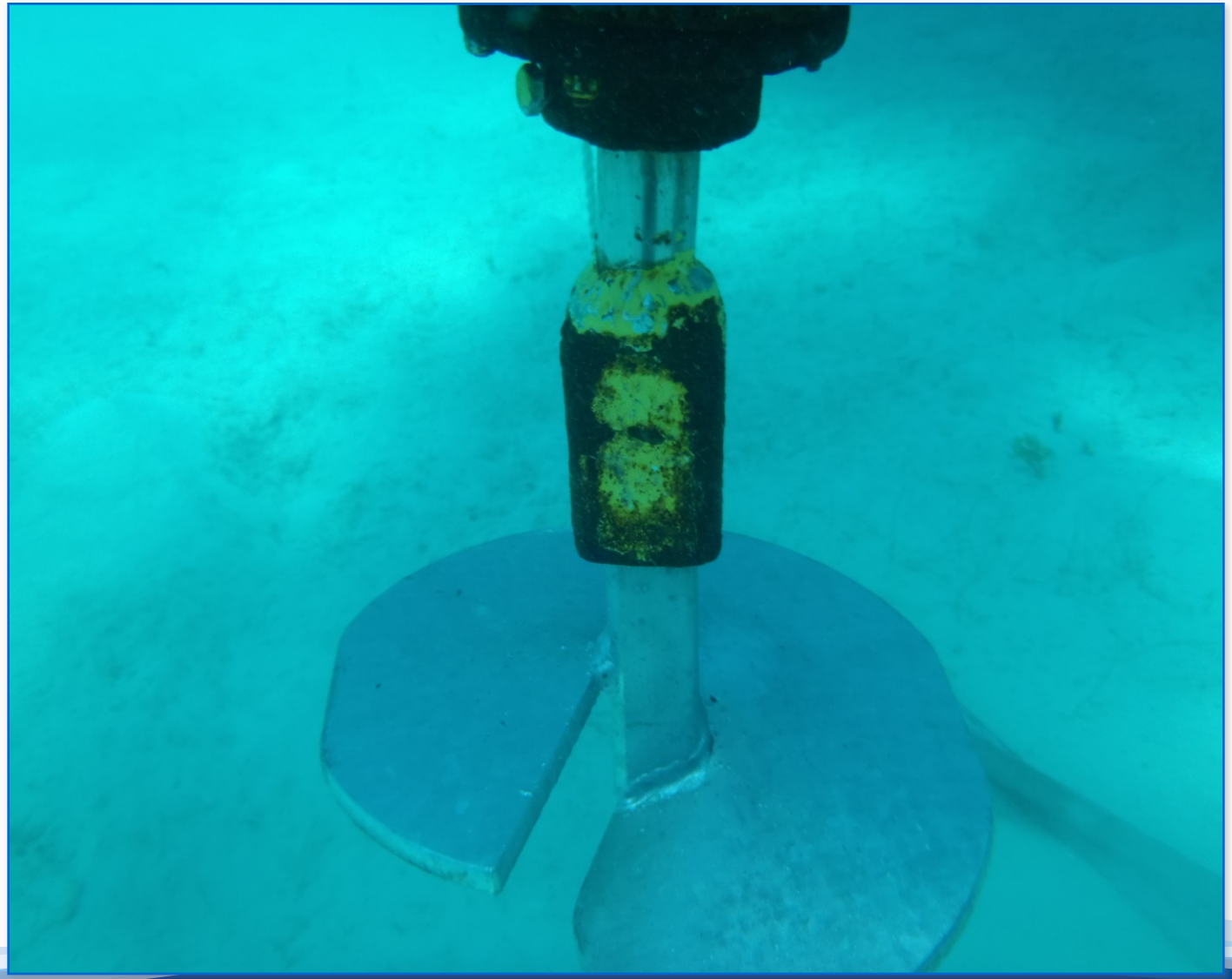
Mooring station diameters are shown for an area with a small tide range, water depth of 6 ft, and 40 ft length vessel. Each location is site specific.

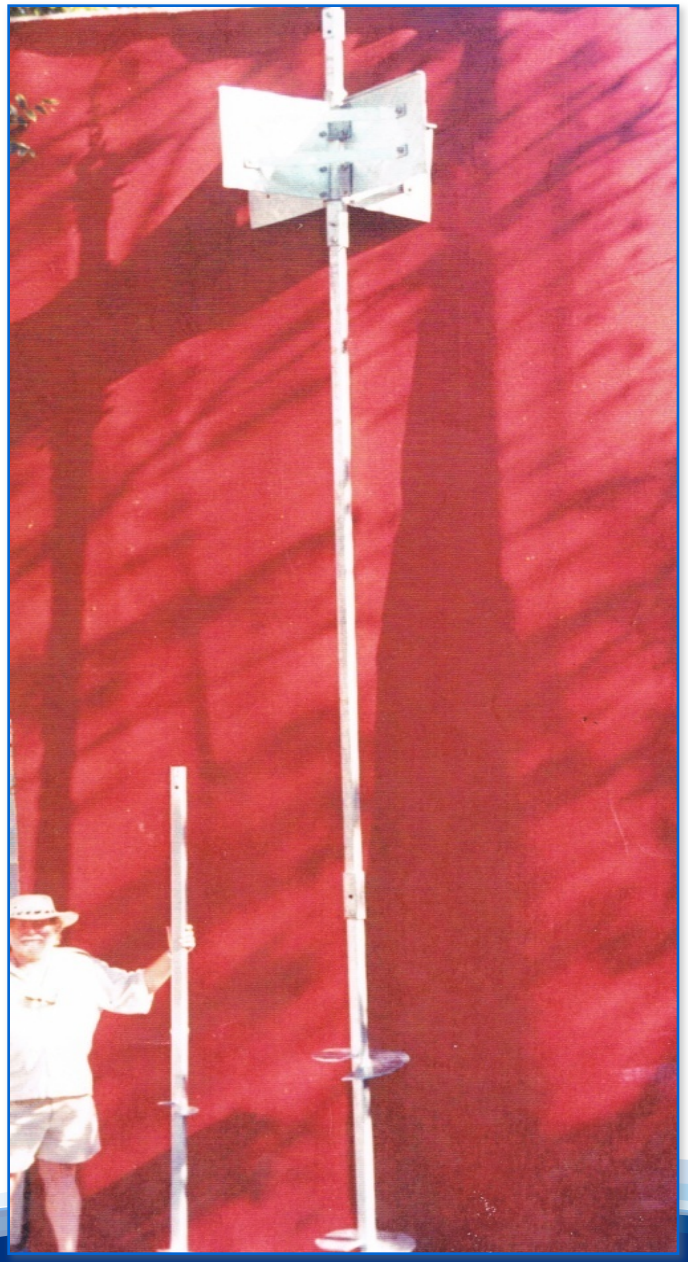
Typical Mooring Point



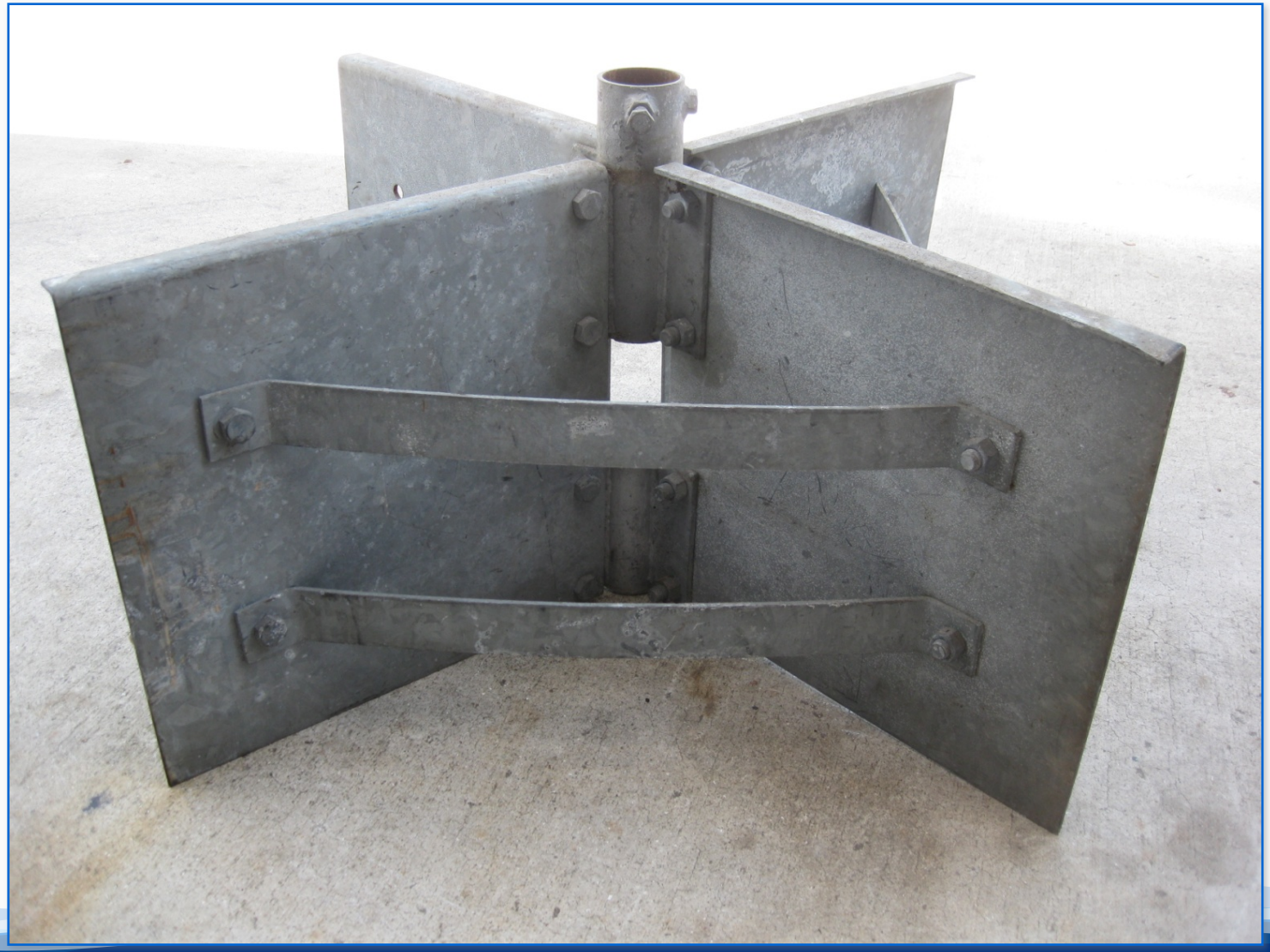
Installation of Anchor

Installation

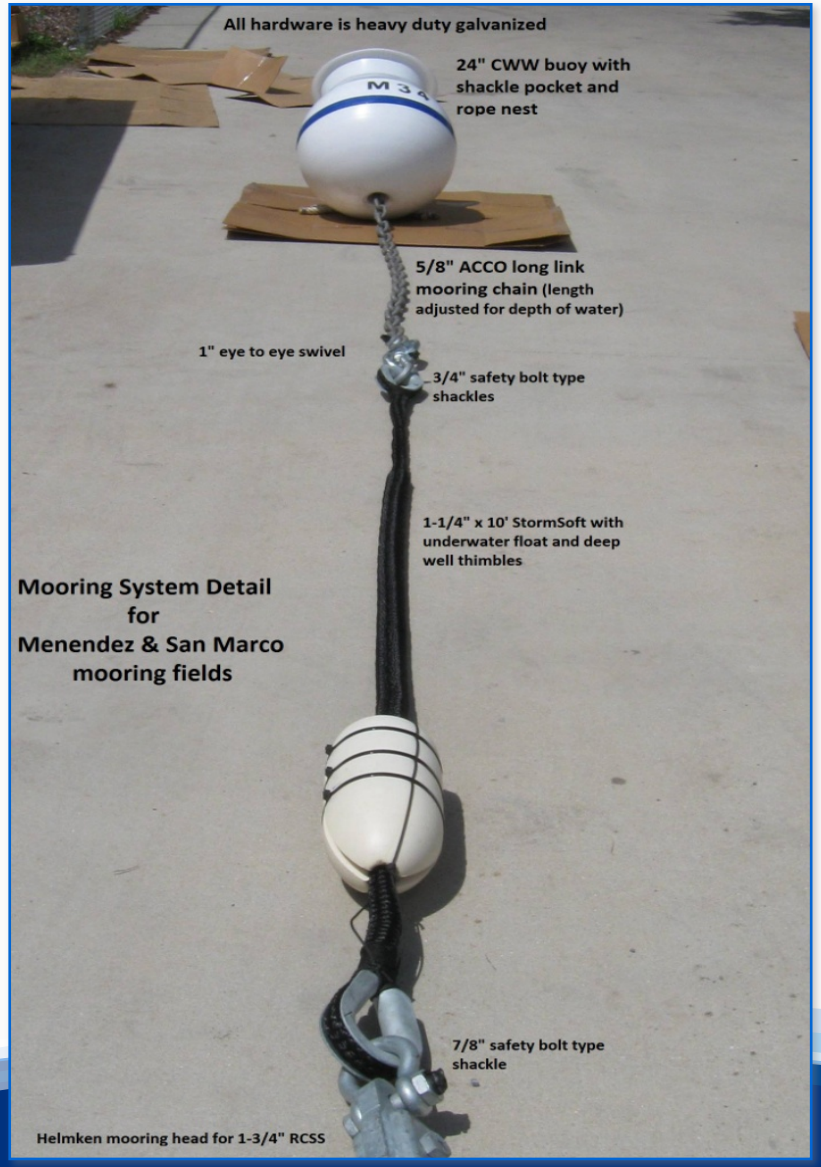




Stabilizer



Through Buoy Design




PERMIT NO. 09-006

Attached Pennant Design

Pennant Connection

Punta Gorda Buoy Design

Titusville Buoy Design

St. Augustine Buoy Design

Opposing Wind and Current

New HPDE Thimbles

New Soft Sided Buoy with Rope Nest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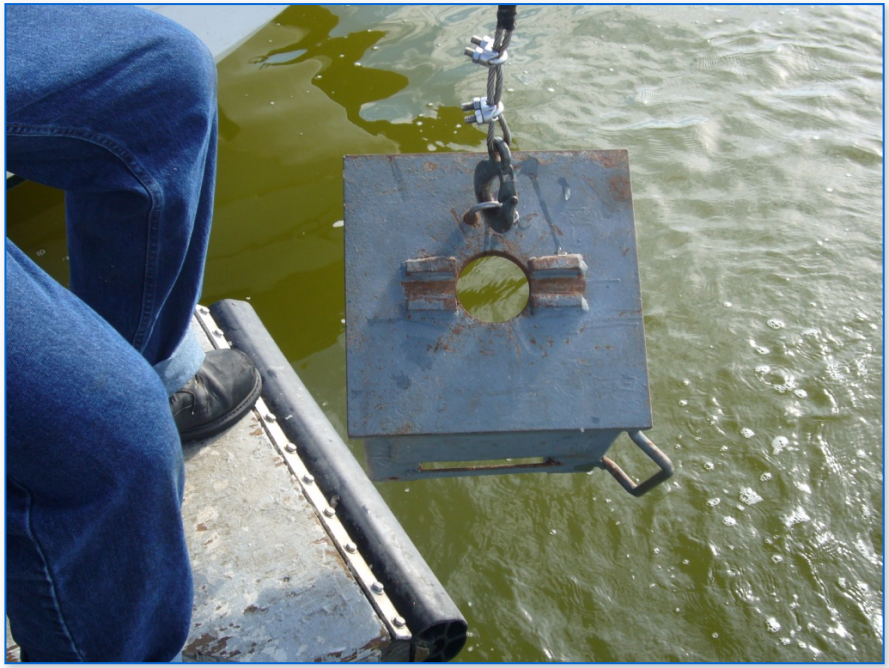
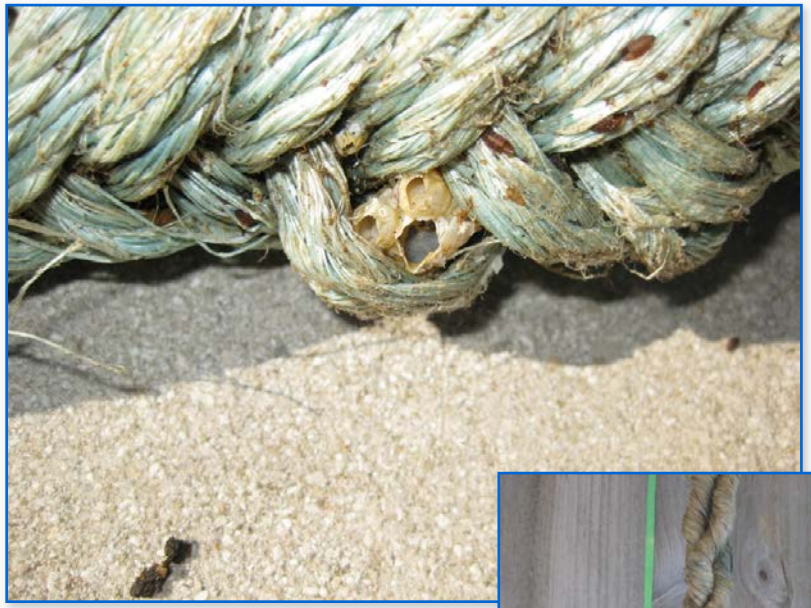
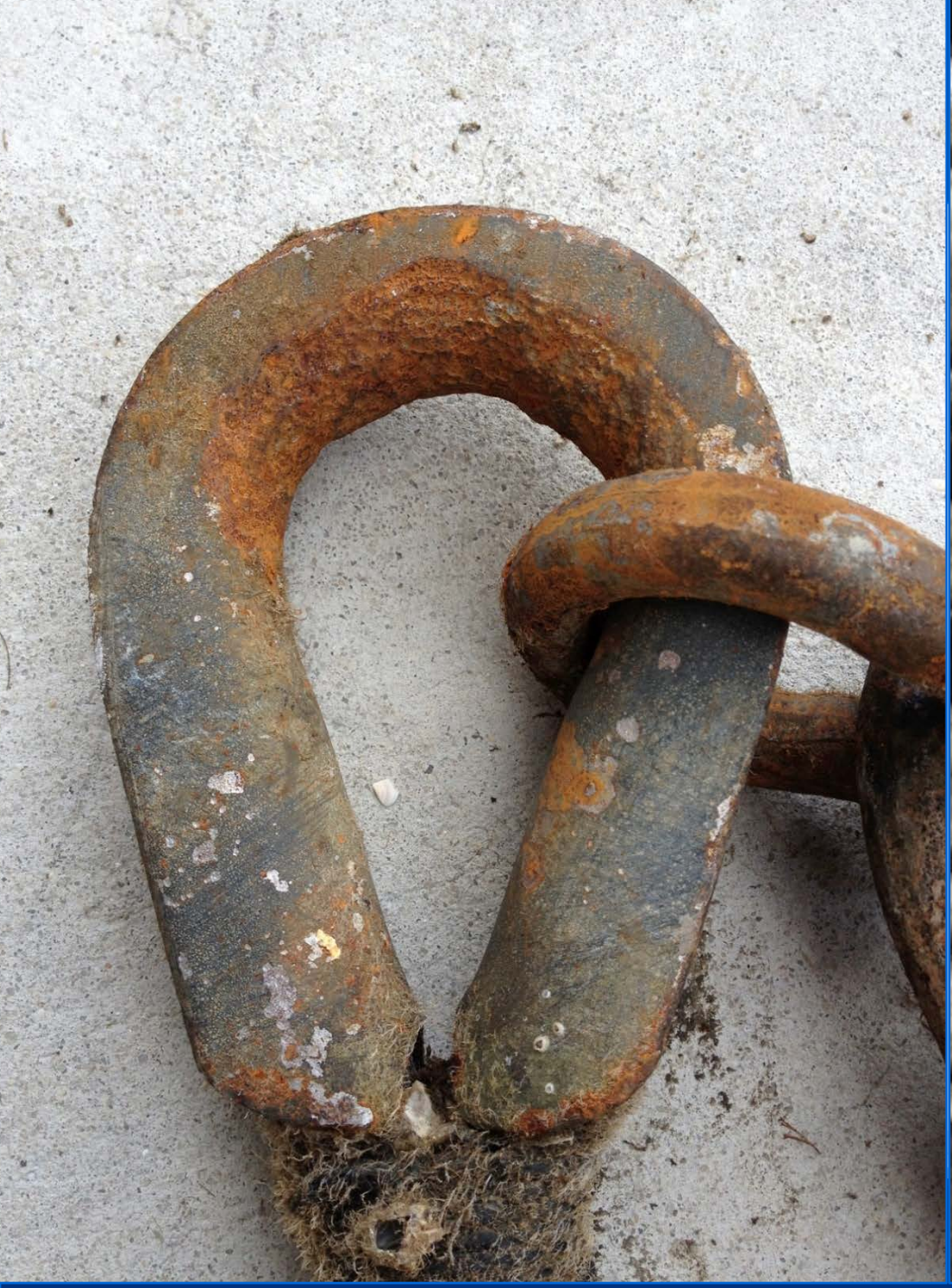
Load Testing Mooring Point

Load Testing Mooring Point



Maintenance Is Imperative





Summary

- Mooring fields are a cost-effective way to provide affordable in-water vessel storage
- Good for the environment – regulated
- Necessary public access amenity for transient vessels
- Proper design is critical
- Maintenance is imperative

Questions?