



Future Trends in Marina Construction & Design

Bryce Fisher | Manager of Project Development



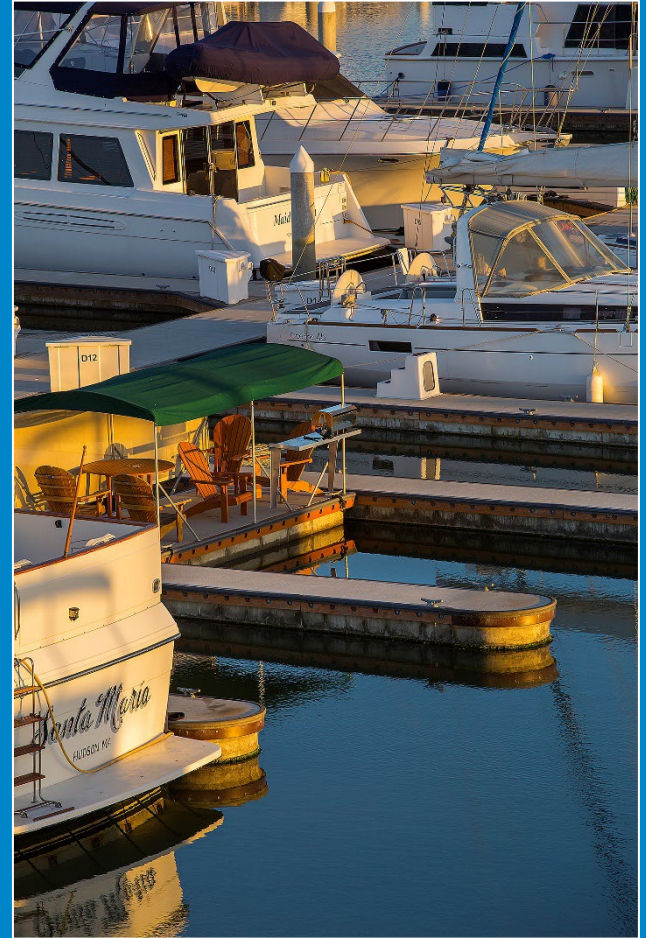
ACTIVATING THE WATERFRONT

Create an Experience





GATHERING SPACES







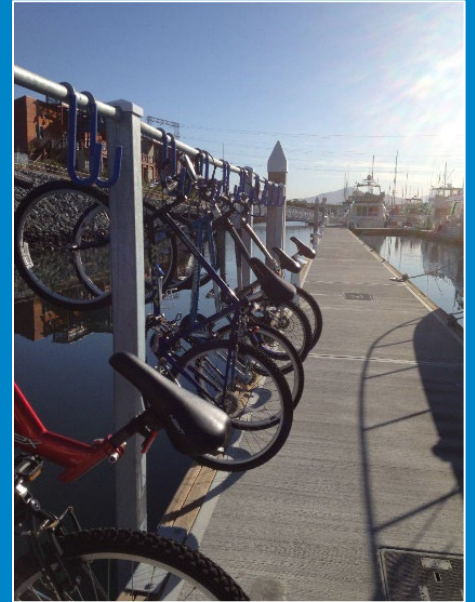
ADDITIONAL AMENITIES AND DESIGN FEATURES

Tenant Conveniences

- Tenant Storage (Dock Boxes or Landside Units)
- Fish Cleaning Stations
- Shade Structures
- Restrooms
- Showers
- Gathering Areas
- Laundry

ACCESS AND ACCESSIBILITY

- Kayak and Paddle Board Racks
- Bike Racks
- ADA Access
- Parking



ACCESSIBILITY & AMENITIES



ADA ACCESSIBILITY









FLOATING PLATFORM POSSIBILITIES



- Swimming Pool
- Fuel Station
- Restroom Facility





OTHER DESIGN CONSIDERATIONS

Electrical System

- Local Building Code Requirements
- Receptacle Size and Quantity
- Pedestal or Power Center
- Remote Utility Monitoring / Shutoff



OTHER DESIGN CONSIDERATIONS

Fire System

- Local Fire Marshall Requirements
- Dry Standpipe and Hose Cabinets
- Combined System (Fire and Potable)



OTHER DESIGN CONSIDERATIONS

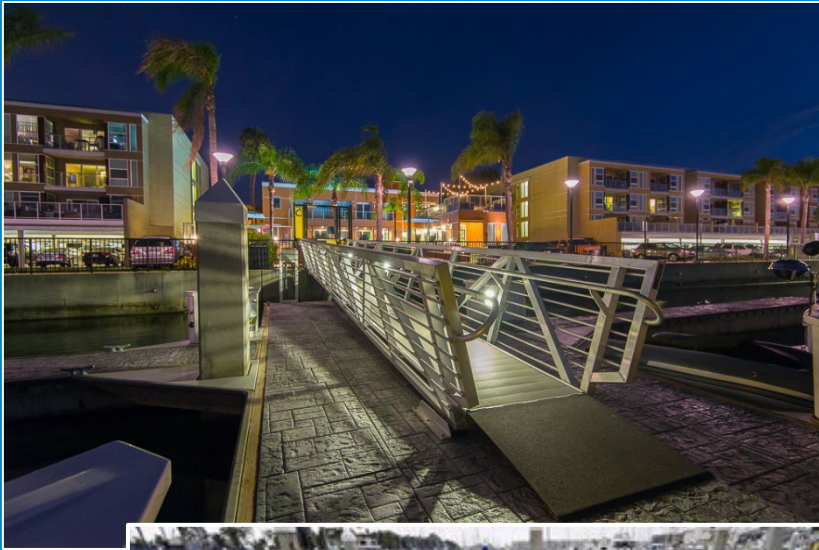
Potable Water & Sewer System

- Material type HDPE vs PVC
- Remote Monitoring / Shutoff
- Sewer Pump Out System (Central Location, In-Slip, Pump- out Vessel)
- Ionized water



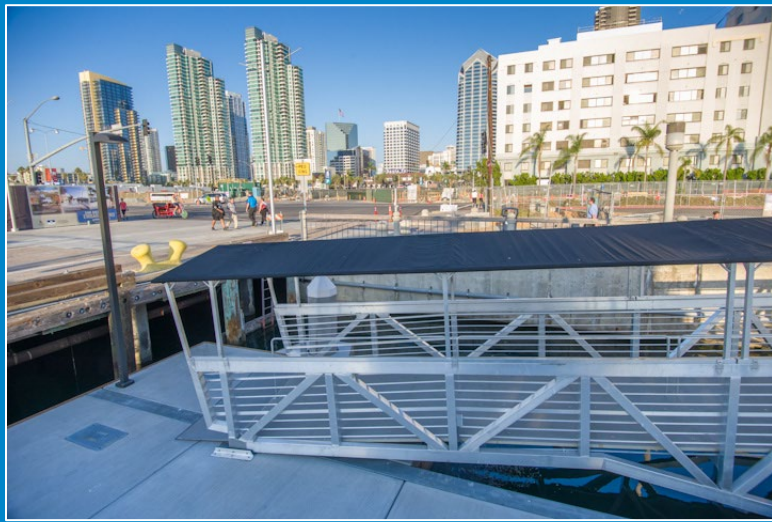
ADDITIONAL AMENITIES AND DESIGN FEATURES

- Stamped or Colored Deck Surface Treatments
- Decking Overlays
- Lighting (Post, Bollard, deck or underwater)
- Security Gates, Gangways and Access
- High-speed WiFi











CONSIDERATIONS FOR FUTURE MARINA DESIGN

What to keep in mind when rebuilding your marina

- Regulatory permitting (Re-configure or Replace in Kind)
- Engineering (Structural, geotechnical, electrical and mechanical)
- Site Criteria (Wind and Wave exposure, Vessel Sizes)
- Civil (ADA Access, Parking, Facility Accessibility)

DESIGNING FOR THE FUTURE

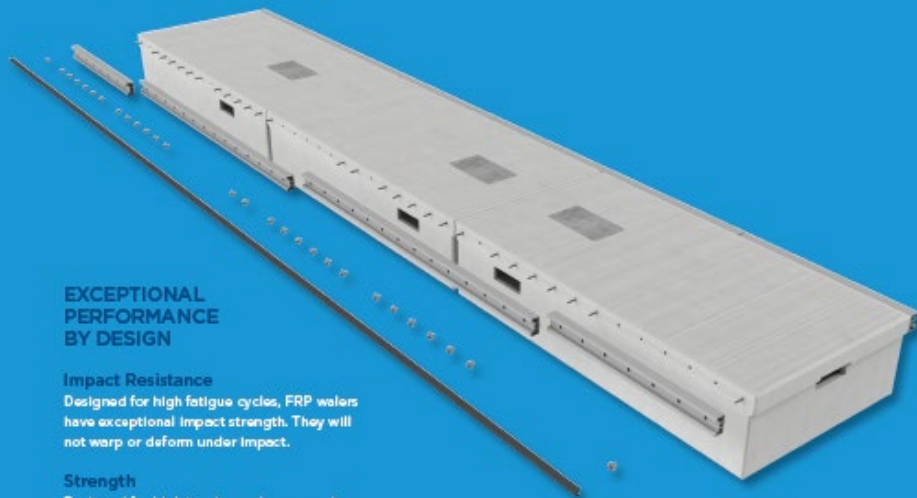
Choosing materials that last



FIBERGLASS REINFORCED POLYMERIC (FRP) WALER SYSTEM

Unifloat® FRP Walers

Fiber reinforced polymer (FRP) walers are everything you want - long lasting, modern styling and preservative free.



EXCEPTIONAL PERFORMANCE BY DESIGN

Impact Resistance

Designed for high fatigue cycles, FRP walers have exceptional impact strength. They will not warp or deform under impact.

Strength

Designed for high tension and compression strength, pound for pound, FRP in tension is stronger than steel, aluminum, and wood.

Preservative Free

FRP products are 100% safe for use in the most sensitive marine environments.

Rot Resistant

Unaffected by moisture or immersion in water, FRP walers will not rot or decay.

PRODUCT SPECIFICATIONS

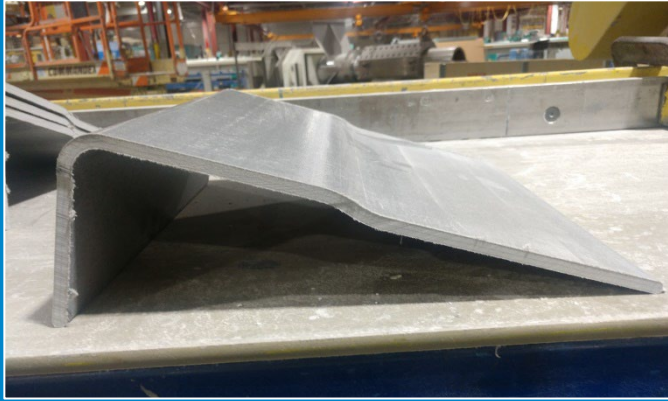
Structural, Walkway Walers

Compression Strength (Lengthwise) per ASTM D6641- 60,000 psi
In-Plane Shear Strength (Lengthwise) per ASTM D5379 - 7,500 psi
Bearing Strength (Lengthwise) per ASTM D953 with a 3/4" pin - 21,000 psi
Modulus of Elasticity (Full Section) - 4.5E6 psi

Semi-Structural, Finger Walers

Compression Strength (Lengthwise) per ASTM D6641- 40,000 psi
In-Plane Shear Strength (Lengthwise) per ASTM D5379 - 6,000 psi
Bearing Strength (Lengthwise) per ASTM D953 with a 3/4" pin - 21,000 psi
Modulus of Elasticity (Full Section) - 4.0E6 psi

FRP Walers



STRENGTH

Designed for high tension and compression strength, pound for pound, FRP in tension is stronger than steel, aluminum and wood.

STIFFNESS

FRP Walers are extremely rigid. Testing shows the FRP waler exceeds stiffness requirements for dock construction by nearly three times

CHEMICAL FREE

FRP Walers are 100% safe for use in the most sensitive marine environments.

ROT RESISTANT

Unaffected by moisture or immersion in water, FRP walers will not rot or decay.

CORROSION RESISTANT

REDUCED MAINTENANCE

HIGH STRENGTH

PREDICTED 75+ YEAR SERVICE LIFE

IMPACT RESISTANT

Designed for high fatigue cycles, FRP Walers have exceptional impact strength. Will not warp or deform under impact.

WALER PRODUCT SPECIFICATIONS

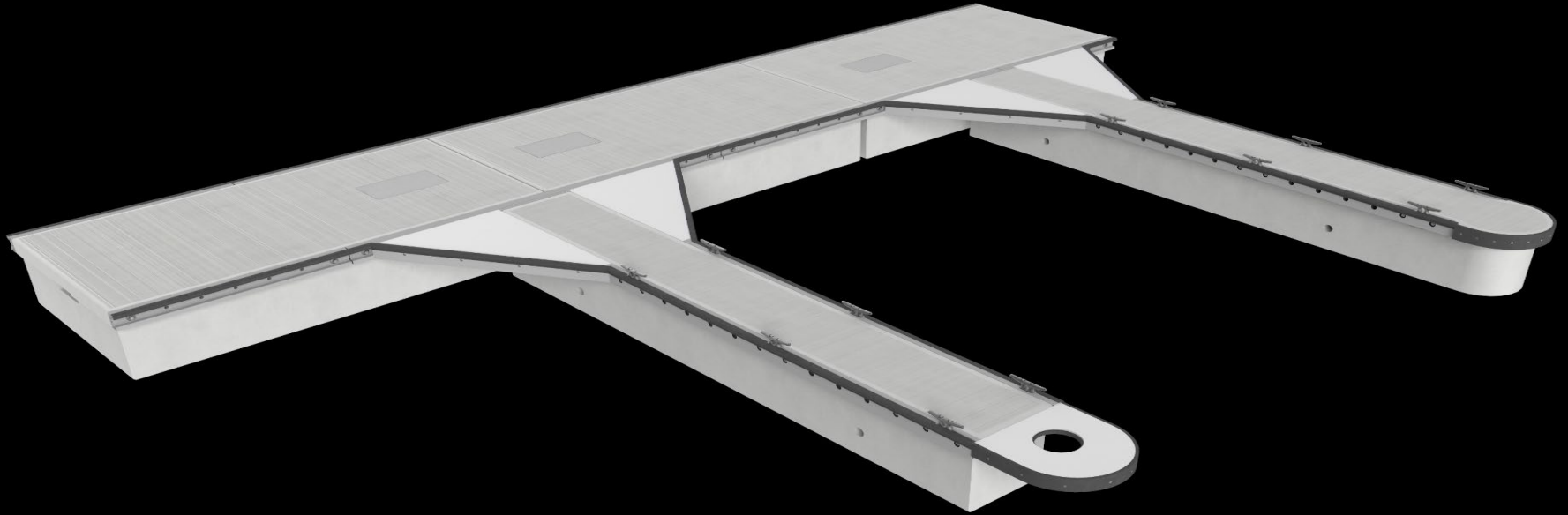
Shear Strength > 7,500 psi

Compression Strength > 60,000 psi

Bearing Strength > 26,200 psi

Bending Strength > 45,000 psi

FRP Walers by Bellingham Marine



FRP Wales – Visual Appearance



Walkway- Visual Appearance



FRP Wales (Utility Skirts) - Visual Appearance



Utility Skirts



FRP Wales – Visual Appearance



FRP Walkers/Match-Cast Platform – Visual Appearance



FRP Match-Cast Platform – Visual Appearance



FRP THRU-ROD SYSTEM



Unifloat® FRP Thru-Rods

For owners who appreciate a low maintenance, long lasting dock system.

Unifloat FRP thru-rods with nylon nuts provide better longevity, greater shear strength, and less maintenance than galvanized or stainless steel rods.

Corrosion Resistant

Rust free, these FRP rods are formulated for maximum corrosion resistance, providing marina owners with better longevity than stainless steel, especially in environments with high salinity and elevated temperatures.

Reduced Maintenance

With superior stretch characteristics, the FRP thru-rod system holds tension better than steel, so end nuts stay tight.

High Strength

Twice the tensile strength of stainless steel and excellent flexural fatigue resistance, FRP thru-rods are appropriate for use on floating wave attenuators, superyacht berths and floating platforms.

Retrofit Existing Docks

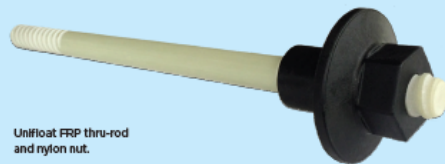
Convert your Unifloat docks to FRP thru-rods from steel. The retrofit process is straightforward. Ask us about upgrading your thru-rods to FRP.

3/4" ROD AND NUT PRODUCT SPECIFICATIONS

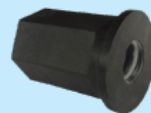
Shear Strength > 14,600 pounds

Nut Strength > 18,000 pounds

Clamping Force 4,850 pounds



Unifloat FRP thru-rod and nylon nut.



The nylon nuts come in two styles. A standard water nut (bottom) and a weldment nut (top).



Our FRP thru-rods last longer, are corrosion free and require less maintenance than conventional metal thru-rods.

Corrosion Resistant

Reduced Maintenance

High Strength

Retrofit Existing pontoons

FRP Components



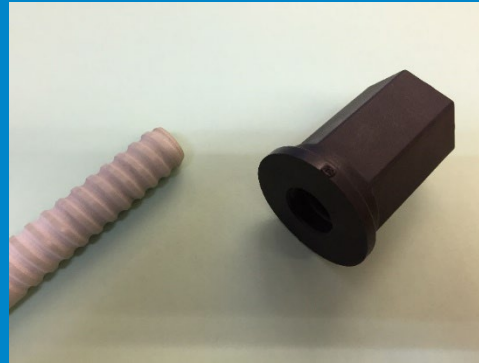
Walkway Waler (Structural)



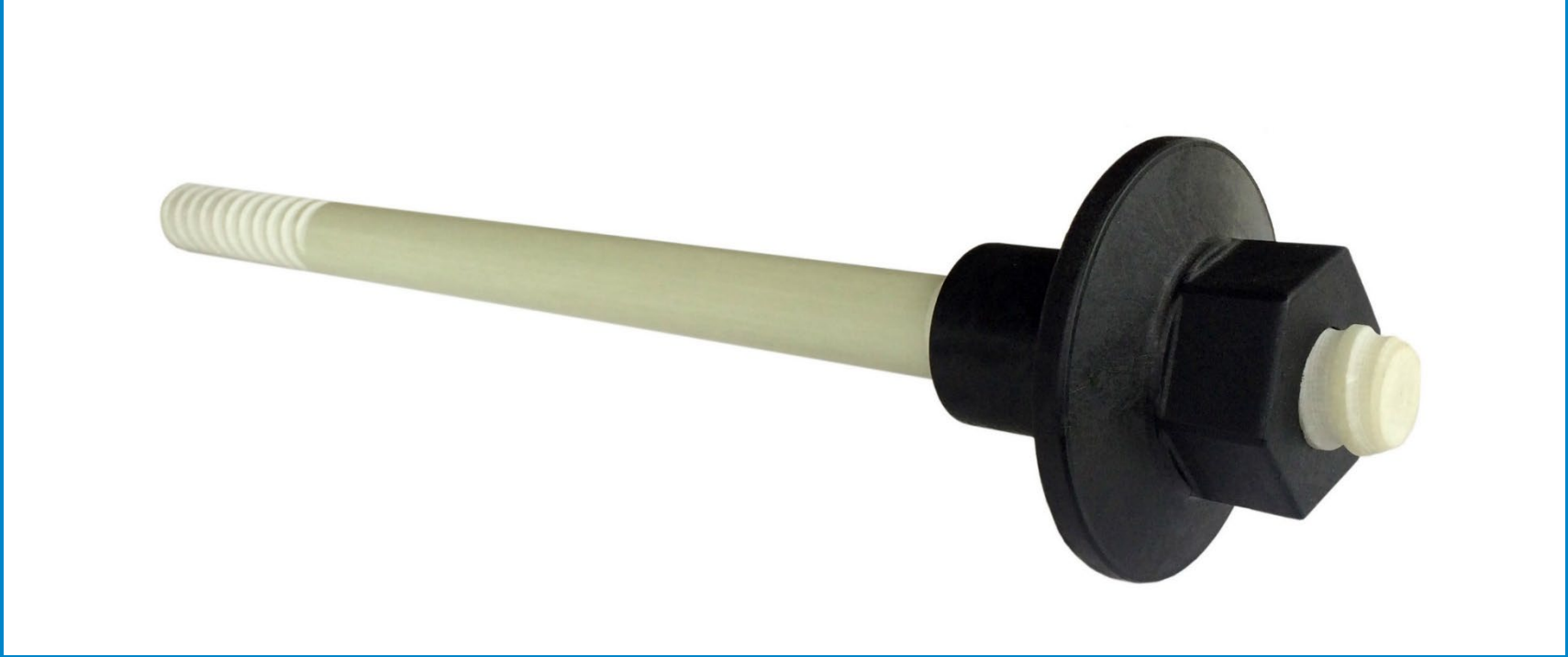
FRP Rod and Waler Nut



Finger Waler (Non-Structural)

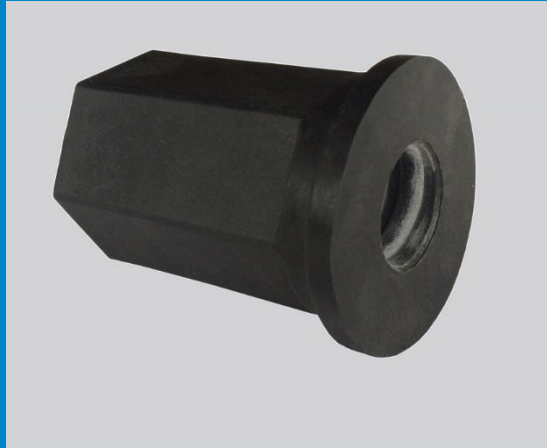


FRP Rod and Triangle Frame Nut



Specifically designed for the Unifloat® pontoon system, FRP thru-rods and nylon nuts provide better longevity, greater shear strength, and less maintenance than galvanized or stainless steel counterparts.

The Nylon Nuts Come in Two Styles



weldment nut



standard water nut

ROD AND NUT PRODUCT SPECIFICATIONS

Shear Strength > 14,600 pounds

Nut Strength > 18,000 pounds

Clamping Force 4,850 pounds

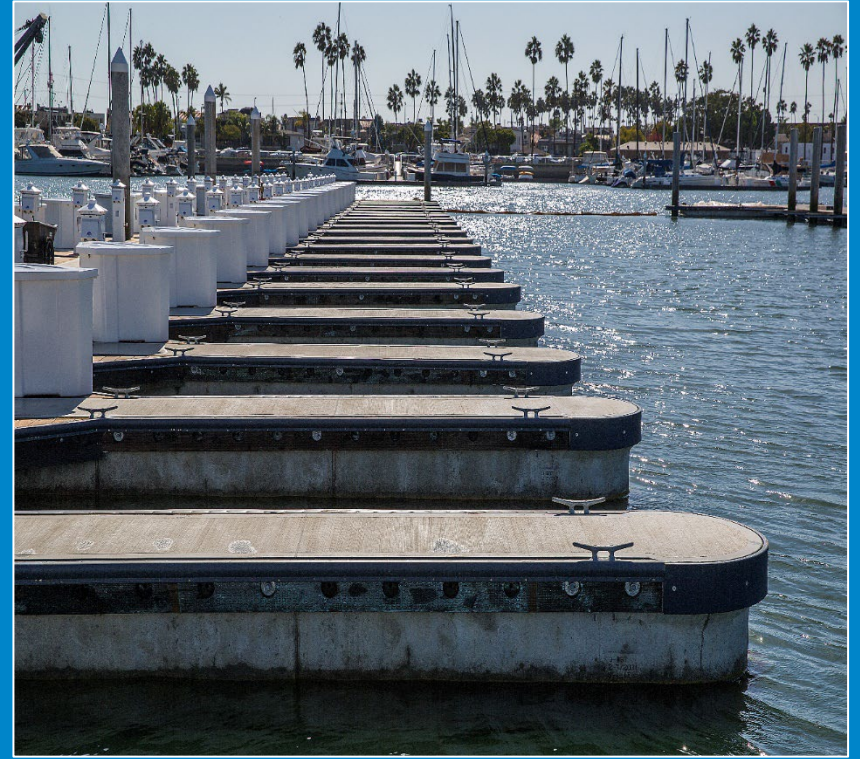
Finger Waler- Single FRP Rub Board (Non-Structural)



Finger Walers (Single Cast Cantilevered Finger)

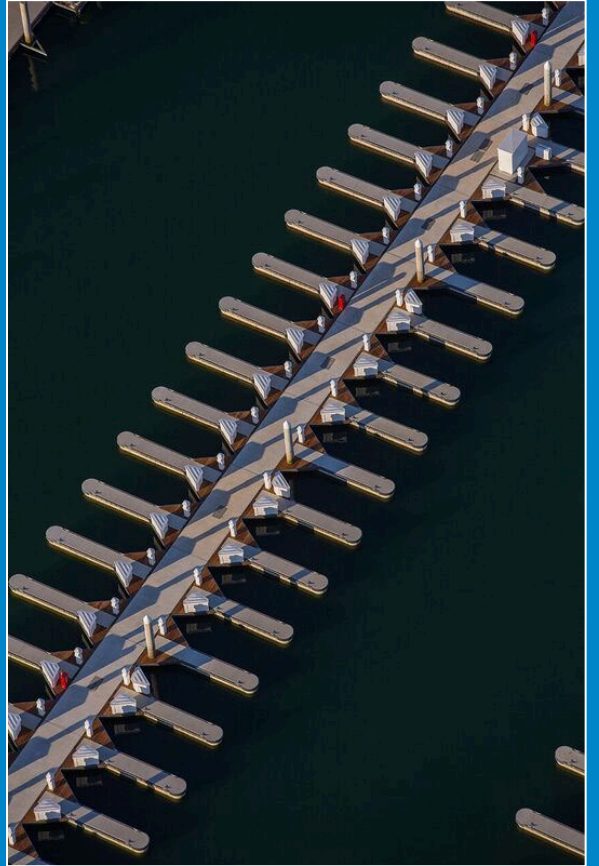


Finger Walers (Single Cast Cantilevered Finger)



Boater-Friendly Rounded End Fingers









Walkway- Visual Appearance



WHAT'S COMING NEXT?

- Quick-Charging Stations
- Higher Power Requirements at Slips
- Electric Boats



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