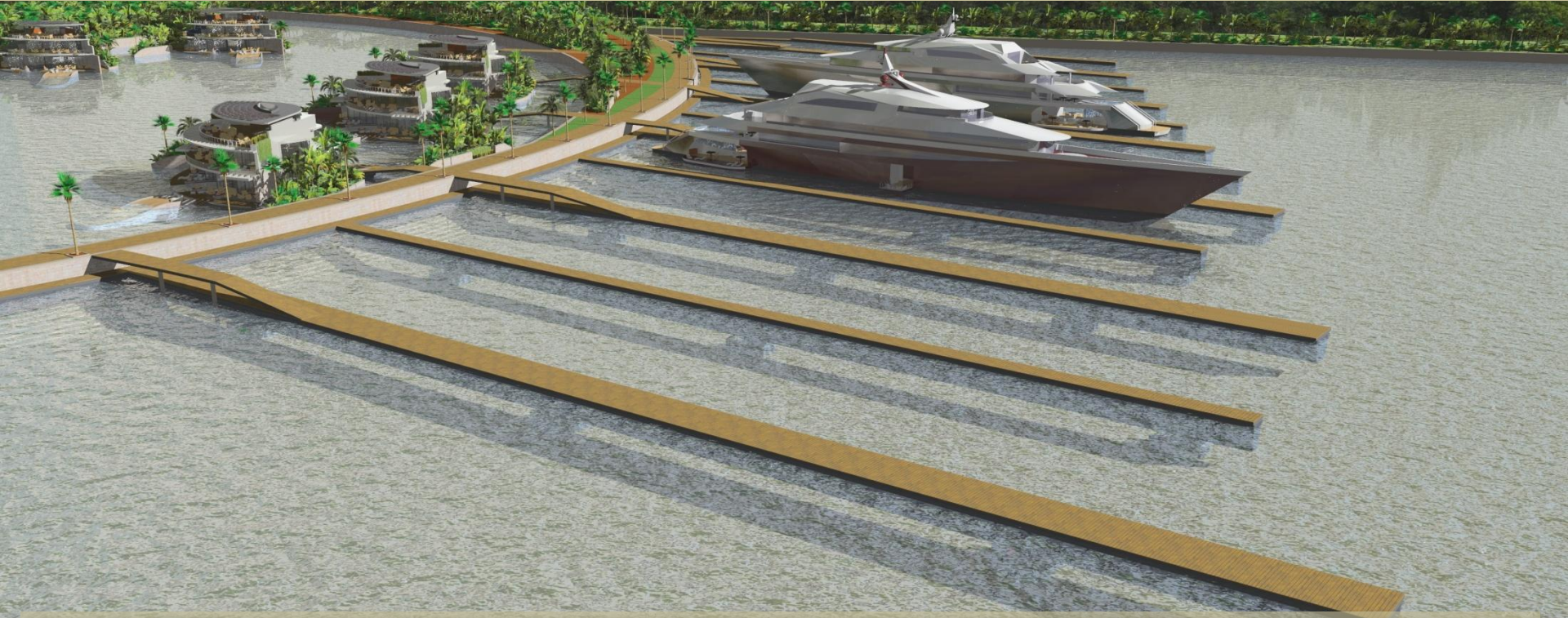


Onwater™ Floating Foundation Applications

System will support, lift and protect any type or size building, structure or vessel



Onwater™ Lift Docks, Lift Piers, Dry Dock Lifts

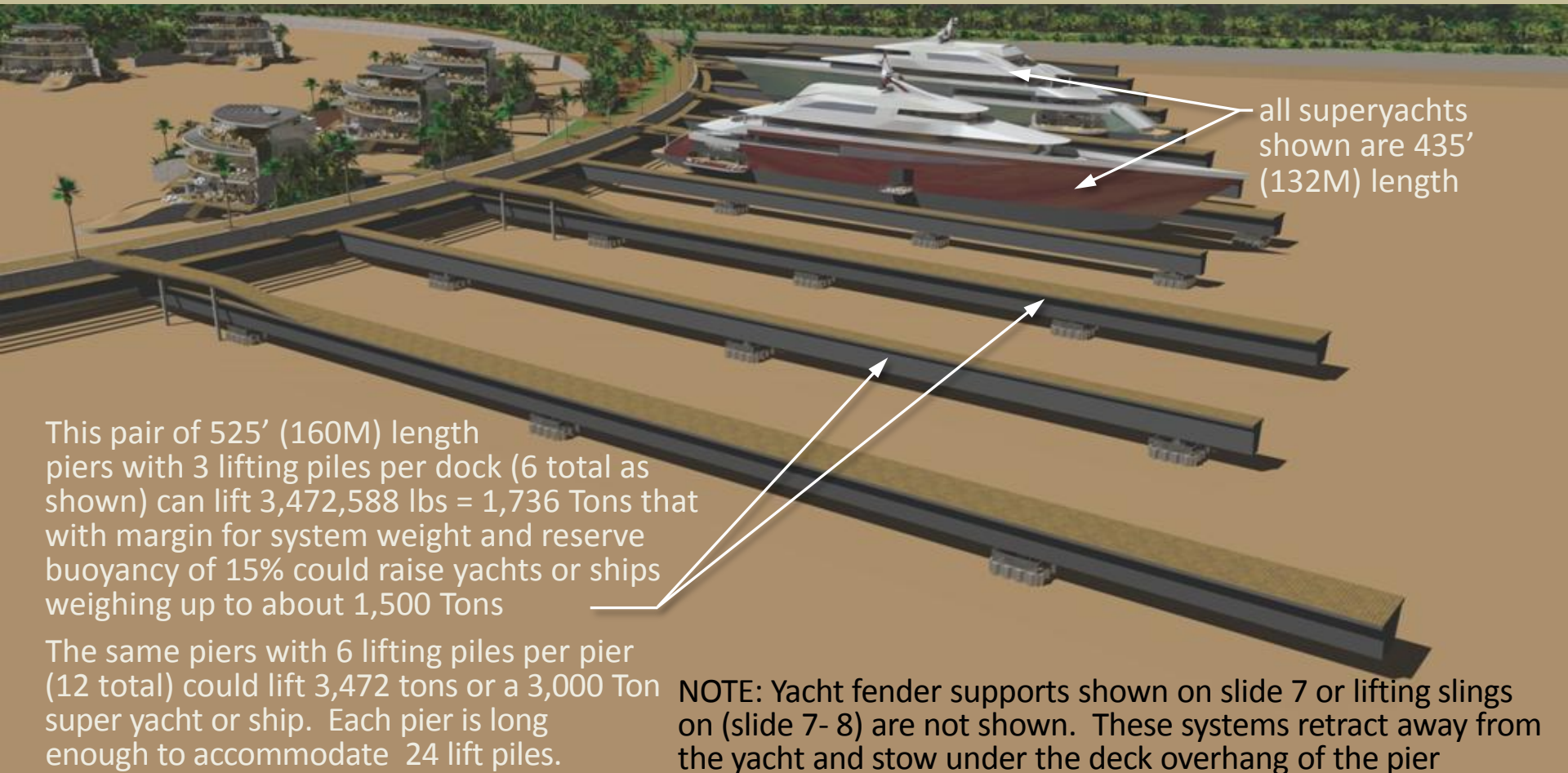


Onwater™

Proprietary & Competition Sensitive

Onwater™ Floating Foundation Applications

With water removed; 3 or more lifting piles that support each dock are visible



all superyachts shown are 435' (132M) length

This pair of 525' (160M) length piers with 3 lifting piles per dock (6 total as shown) can lift 3,472,588 lbs = 1,736 Tons that with margin for system weight and reserve buoyancy of 15% could raise yachts or ships weighing up to about 1,500 Tons

The same piers with 6 lifting piles per pier (12 total) could lift 3,472 tons or a 3,000 Ton super yacht or ship. Each pier is long enough to accommodate 24 lift piles.

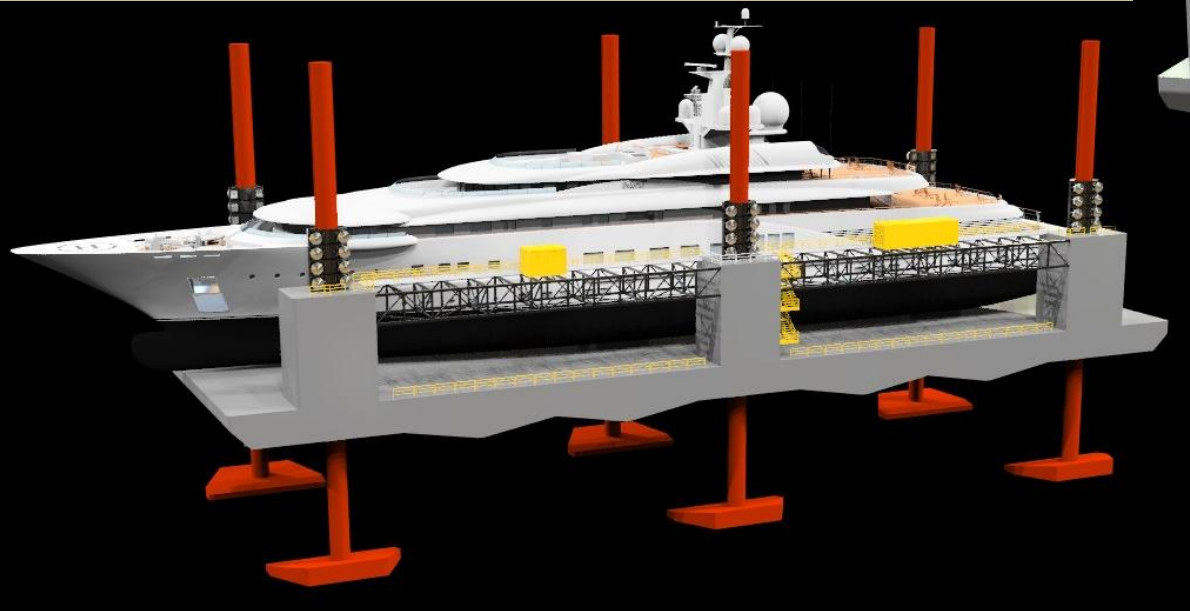
NOTE: Yacht fender supports shown on slide 7 or lifting slings on (slide 7- 8) are not shown. These systems retract away from the yacht and stow under the deck overhang of the pier



Proprietary & Competition Sensitive

Onwater™ Floating Foundation Applications

Superyacht & ship lifts to service, store and provide protection from catastrophes



Images on this slide and the next slide are a jack-up barge lift system by [PENUMBRA MARINE LOGISTICS](#) Onwater pilings and a deck instead of a jack-up barge create a higher performing dry dock lift.

Onwater™ Floating Foundation Applications

Superyacht & ship lifts to service, store and provide protection from catastrophes



Onwater™

Proprietary & Competition Sensitive

Lift and Dry Dock for Submersibles, Watercraft, Yachts & Ships

A flat deck w/ fixed docks at the waterline on 3 sides & 4 retracting fender cradles

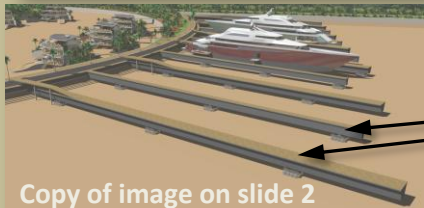


Onwater lift pier systems shown on slides 1-2 can be used to raise and lower flat decks of any size to create the same functionality as the yacht lift system on the previous slide or as Float-On / Float-Off (FLO/FLO) Semi-Submersible Heavy Lift Ships shown on the next slide.



Lift and Dry Dock for Submersibles, Watercraft, Yachts & Ships

Flo/Flo barge only requires 2 fender towers per side and griping to secure ships



Articulating fenders like the ones stabilizing this ship can be installed just below the deck on the vertical face of the dock structure to stabilize and secure boats, yachts and ships when they are lifted out of the water

A flat deck structure similar to the barge deck on slides 3-4 can be suspended from the underside of the proposed dock system to create a deck surface with space for a cradle and for workers to set staging on for ship repair similar to this barge system.

Lift and Dry Dock for Submersibles, Watercraft, Yachts & Ships

Strategically placed slings can replace the deck platform noted in the previous slide



Lift and Dry Dock for Submersibles, Watercraft, Yachts & Ships

Travel lifts use slings suspended from superstructures similar to Onwater lifts

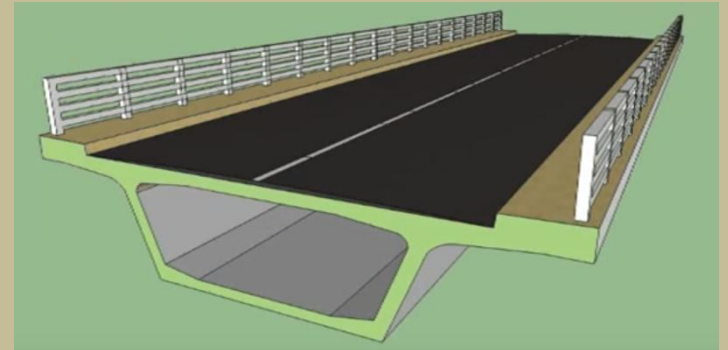
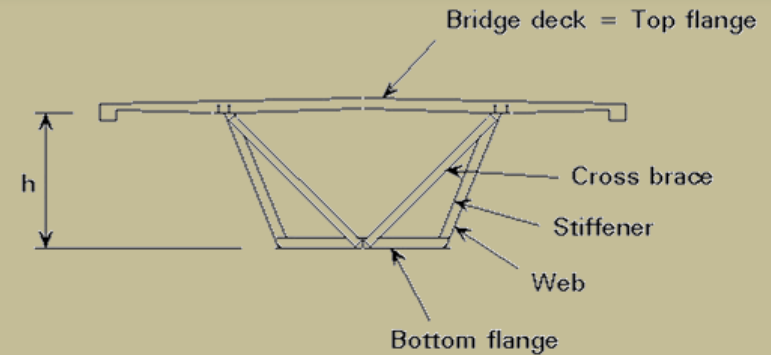


Piers, Docks and Dry Docks with Adjustable Floating Foundations

Docks can be constructed in the same way as open trapezoidal box girder bridges

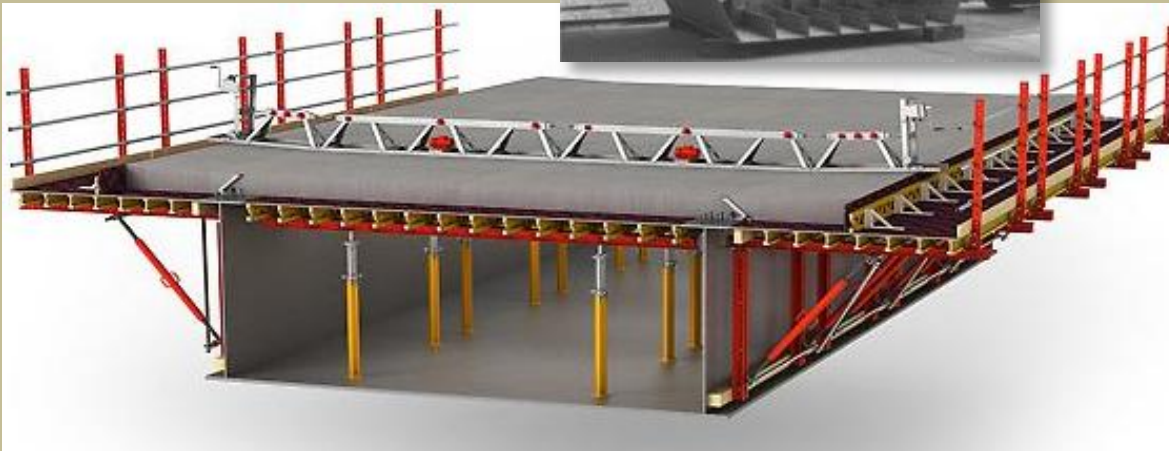
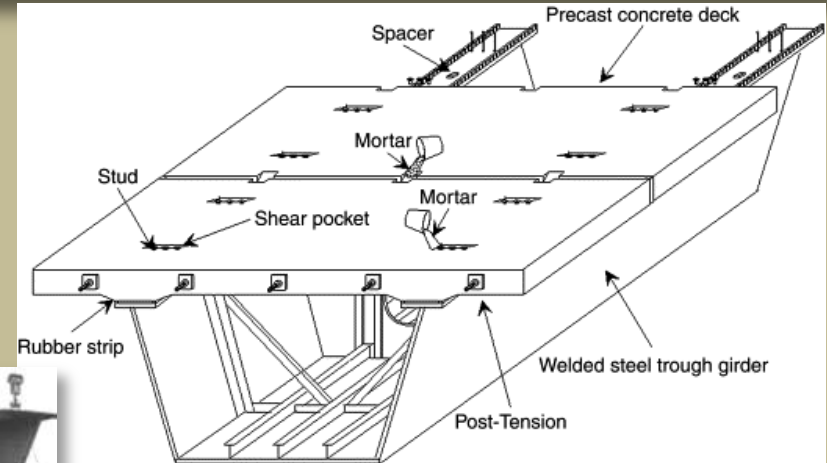
These bridges are constructed several ways but the two most common methods are:

1. **Open trapezoidal composite steel box girder:** The bottom flange and webs are steel plate and the deck which serves as the top plate is constructed with cast in place concrete that is reinforced with steel rebar and/or tensioned steel cables as shown in upper left.
2. **Open trapezoidal prestressed concrete box girder:** The entire cross-section is concrete cast in a single pour in segments or entire spans as shown below.



Piers, Docks and Dry Docks with Adjustable Floating Foundations

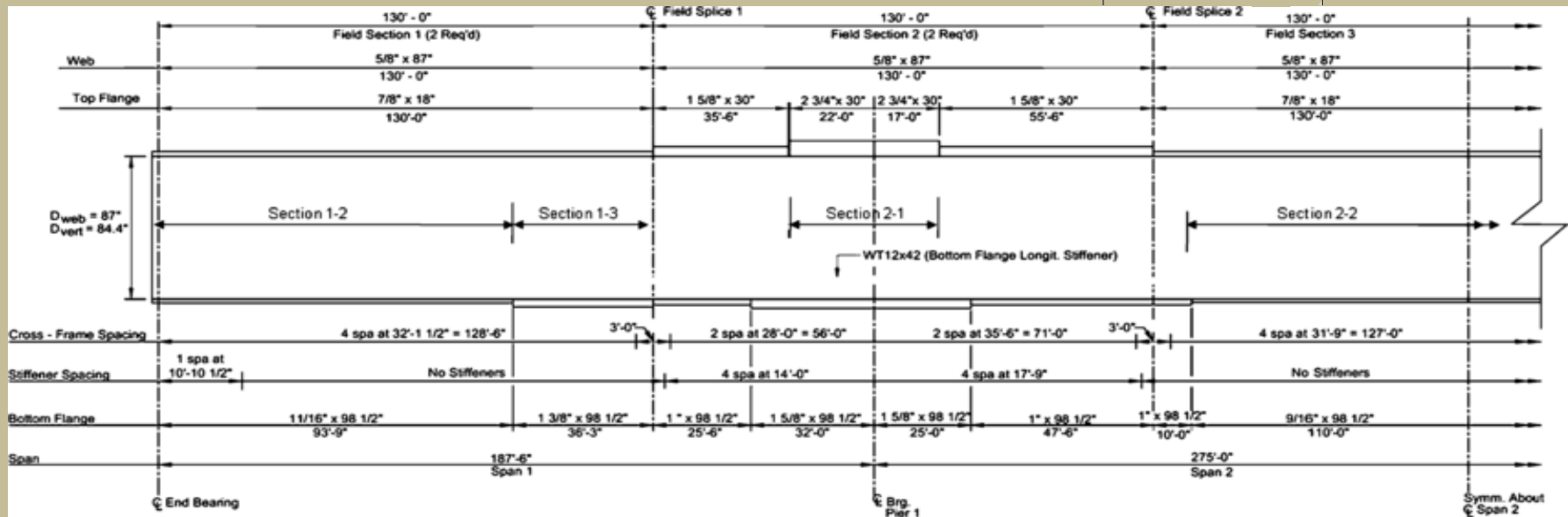
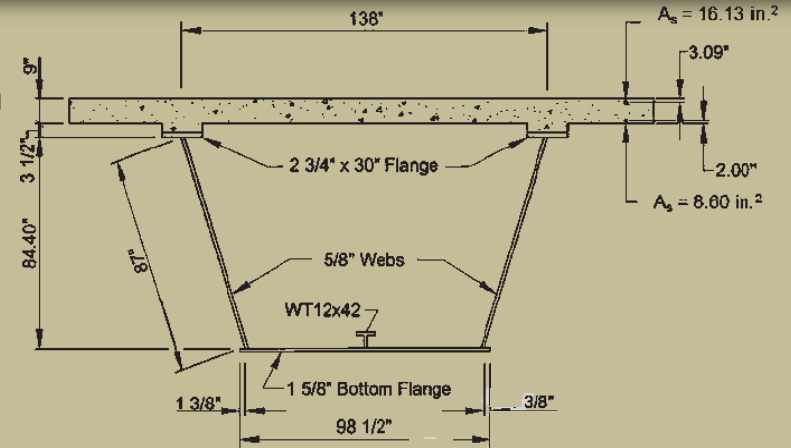
Box girder docks can be welded steel plate trough girders with concrete decks



Piers, Docks and Dry Docks with Adjustable Floating Foundations

Yacht and superyacht piers can be built in the same way as highway bridge spans

Open trapezoidal composite steel plate box girder bridges are very simple structures. The adjacent drawings are for a typical 198 meter (650') length highway bridge with two symmetrical interior piers. The two outer spans each measure 57 M (187') and the middle span is 84M (275') in length. The elevation view of the bridge shows transverse web stiffeners and indicates the plate thickness along the entire bridge span.



Piers, Docks and Dry Docks with Adjustable Floating Foundations

Entire structure can be precast concrete using ferrocement or traditional mixes

Open trapezoidal prestressed concrete box girder:

- Using ferrocement, the monolithic piers will be inherently watertight and last 100+ years
- can achieve an ideal buoyancy weight



Piers, Docks and Dry Docks with Adjustable Floating Foundations

Advantages of steel and/or concrete trapezoidal box girder construction

Yacht and ship piers constructed with either steel or concrete open box girders offer the following :

- The box girder shape creates a watertight hull to float the pier from the yard where it is fabricated to the location where it is installed. They can be floated over the lifting piers at high tide to eliminate the need for cranes or heavy equipment of any kind to transport or install the piers.
- With access hatches, lifts, ship ladders or stair wells added, the cross-sectional profile of the box girder structure has adequate volume and full headroom height to be used to house:
 - Office, meeting space, break room and restrooms for staff/crew, receiving and materials handling
 - Storage rooms for loose/unsecured deck furnishings on the pier or yacht (that can blow away during storms) and to store covers that protect equipment and furnishings aboard ship and toy storage
 - Provisions, linen and table setting storage including refrigeration, dry goods and food preparation
 - Commercial laundry facilities for clothes, bedding, linens, cleaning and wash equipment for the yacht
 - Vessel maintenance and repair shop space and storage space for tools equipment and spare parts
 - Crew quarters including galley, bunk rooms and living spaces that are larger than those aboard the yacht and have more space for crew members personal items, reducing wear and tear on the yacht
 - Emergency shelter space for yacht owner and passengers to ride out any disaster
 - Hotel and emergency power generation, fuel storage and water/sewer processing and storage
- The construction of the pier system is relatively simple, easy to fabricate, affordable and has a long system life while performing a wide variety of functions.
- Can be a universal modular system that accommodates any size watercraft
- Canopies with PV solar panels can be added onto the deck to charge battery arrays below deck that power the electric pumps in the lifting piers. Solar panels make the entire system net zero for energy consumption and allow the system to be installed where no utilities are available.

