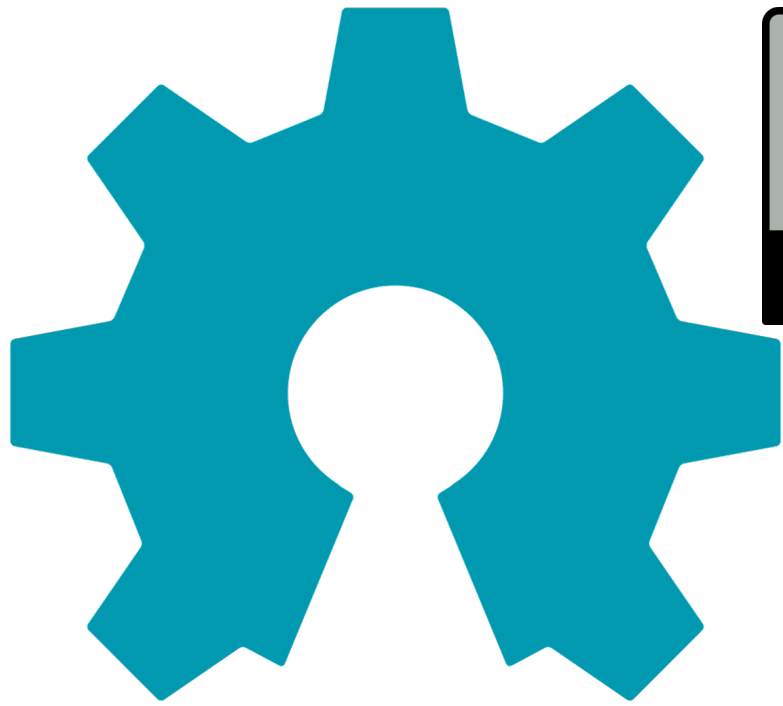


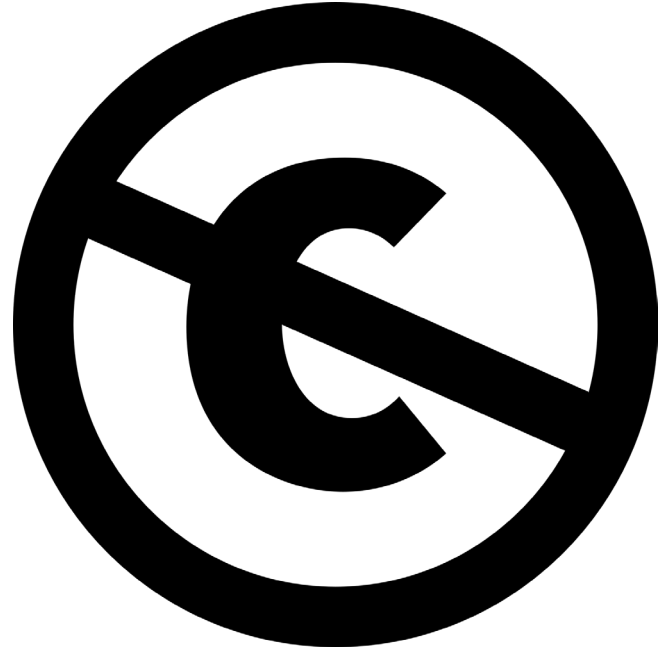


A Service-Pattern Sail Freighter: The Need For A Scalable Open-Source Sail Freighter Design.

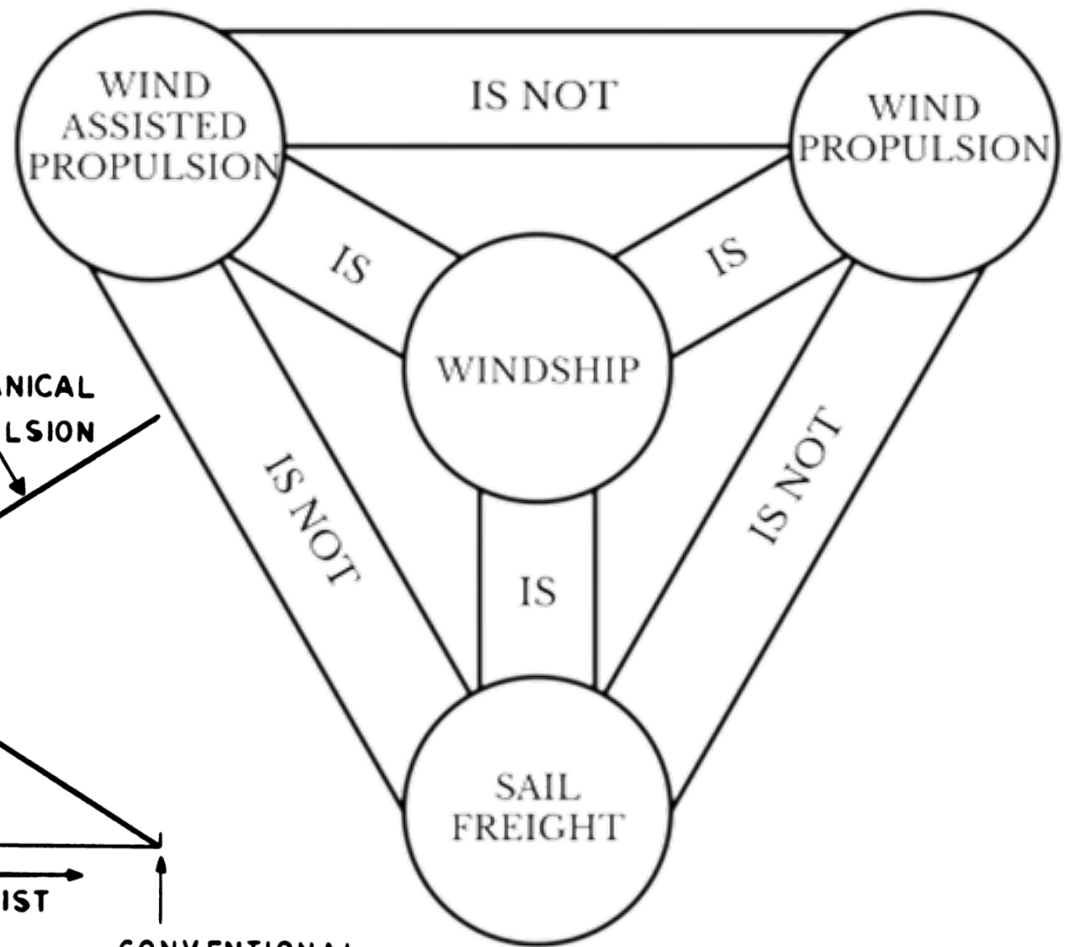
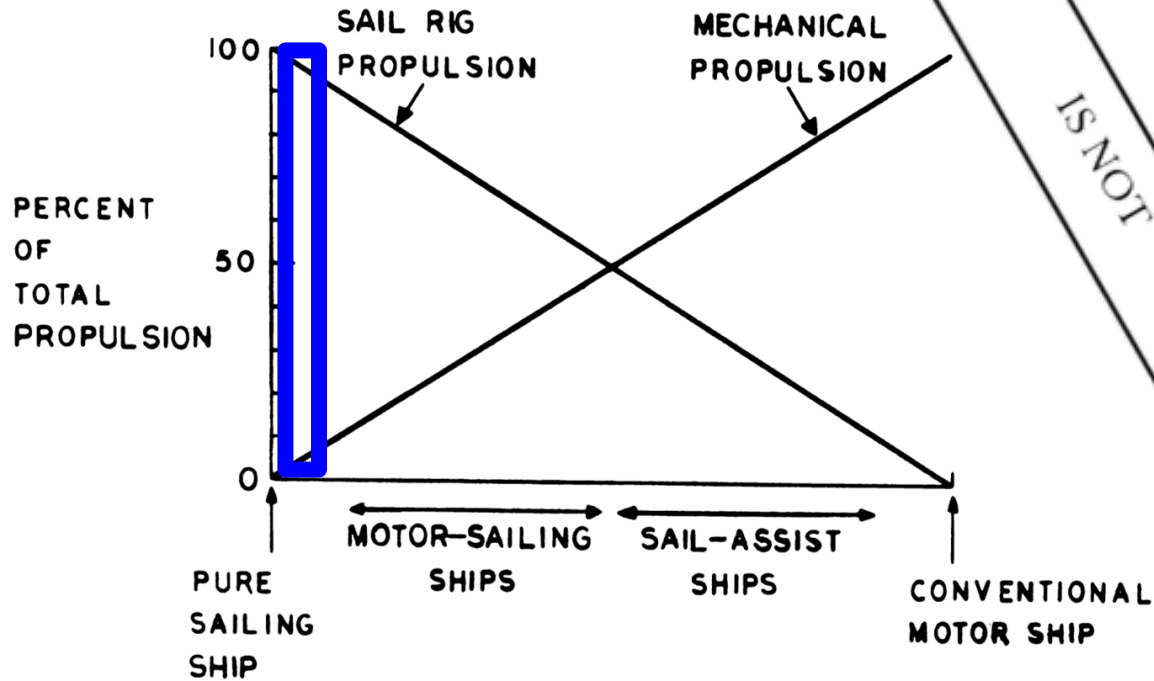
Steven
Woods



open source
hardware



Defining Sail Freight



Limited Stock Of Existing Vessels:

- ▣ Commercially Produced Recreational Vessels (Low Capital/Low Capacity).
- ▣ Restorable Historic Vessels (*Apollonia, De Gallant, Avontuur*, Etc.)
- ▣ New-Build Sail Freighters (*Grain de Sail, T W O T, Ceiba*, Etc)

Drawbacks Of Existing Designs

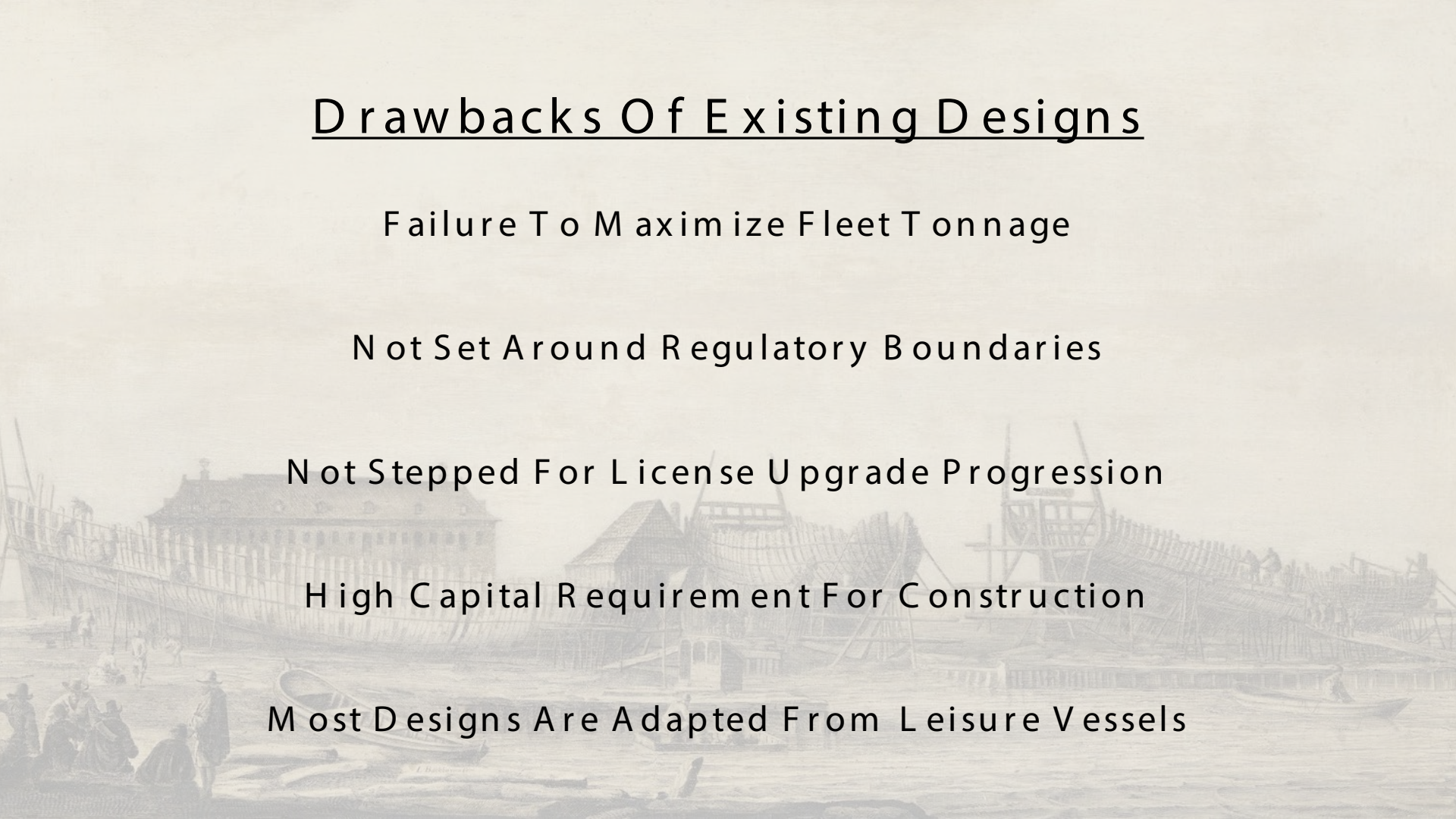
Failure To Maximize Fleet Tonnage

Not Set Around Regulatory Boundaries

Not Stepped For License Upgrade Progression

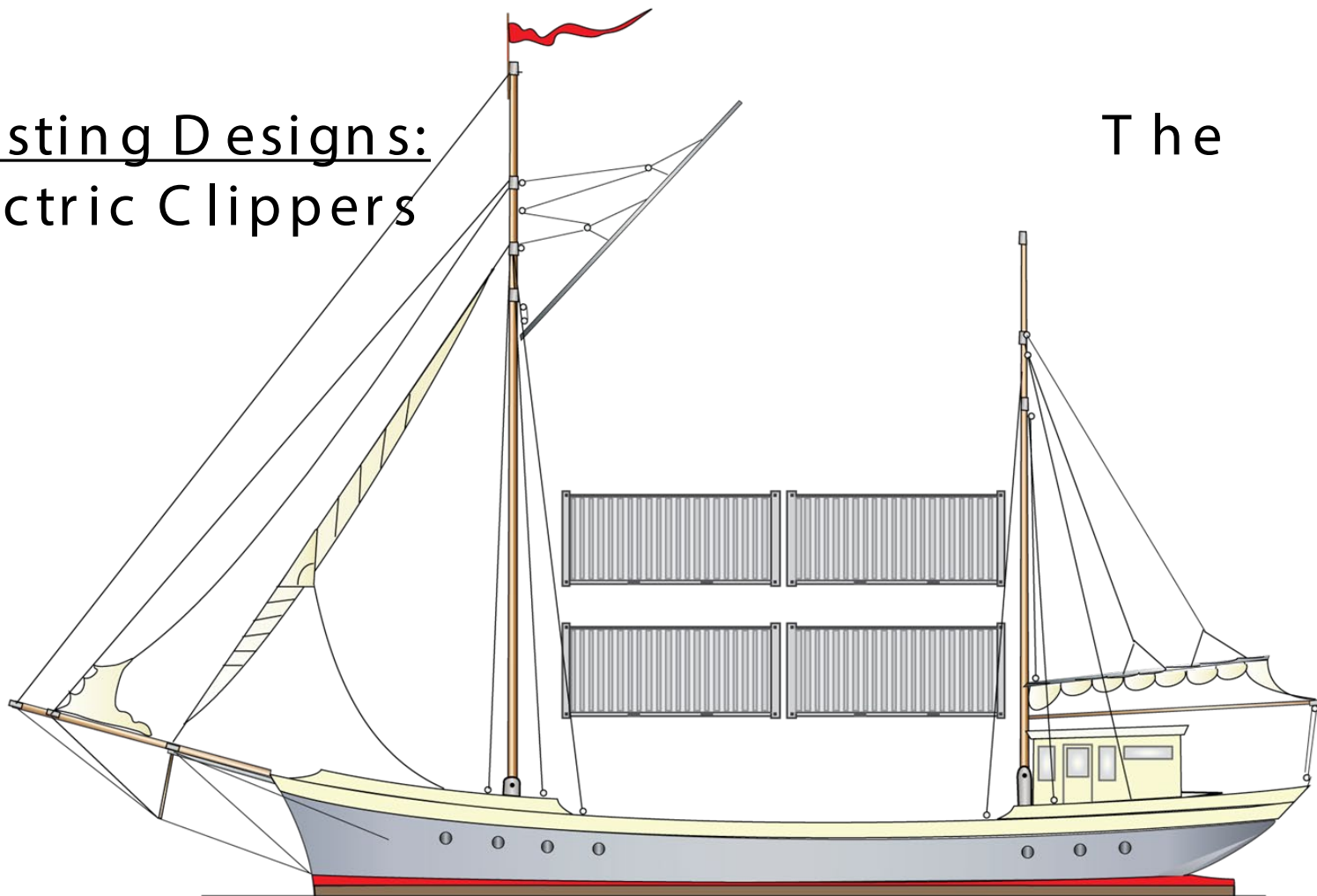
High Capital Requirement For Construction

Most Designs Are Adapted From Leisure Vessels



Existing Designs: Electric Clippers

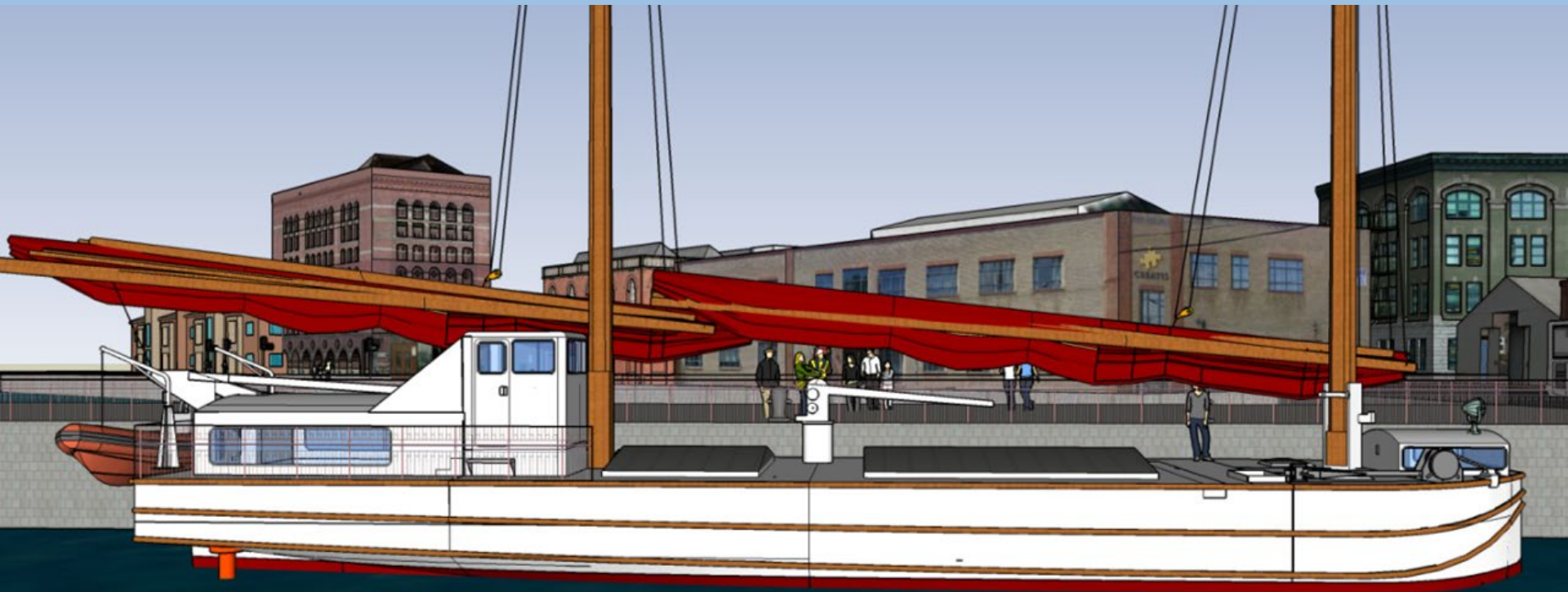
The



Tad Roberts Designs



ERIEMAX RSS-80



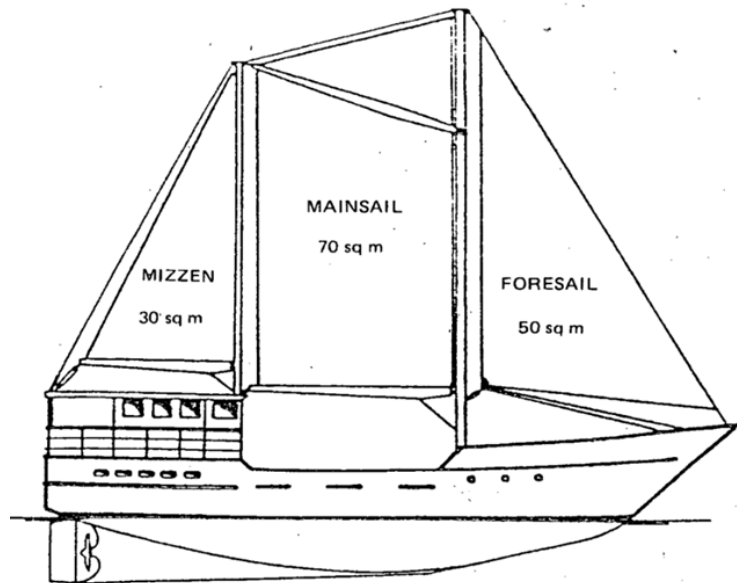
Greenheart Vessel



A blue and white sailboat with two large white sails is sailing on a large body of water. The sky is clear and blue. The text "CERES of VSFP" is overlaid on the right side of the image.

CERES of VSFP

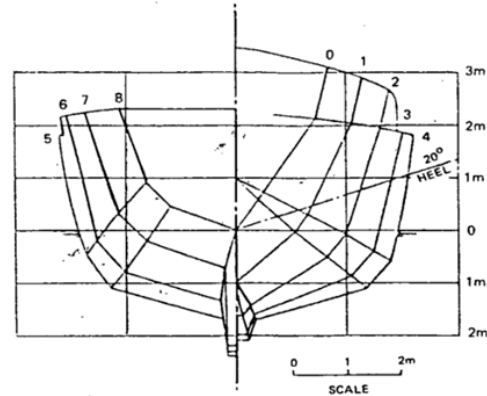
Oil Crisis Era Designs



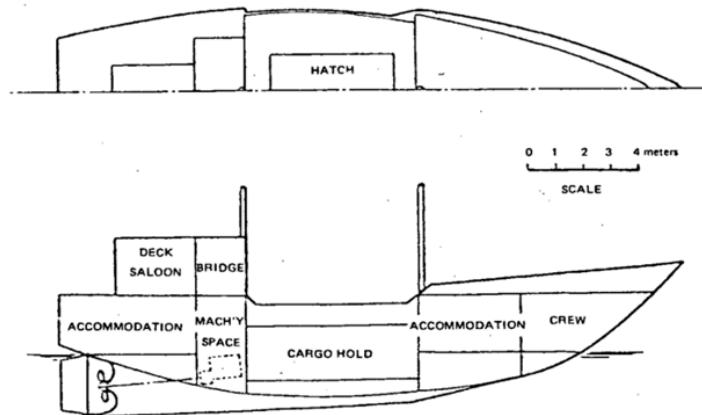
INTRALAND TRADING VESSEL FOR HA'APAI GROUP, TONGA

Principal Particulars

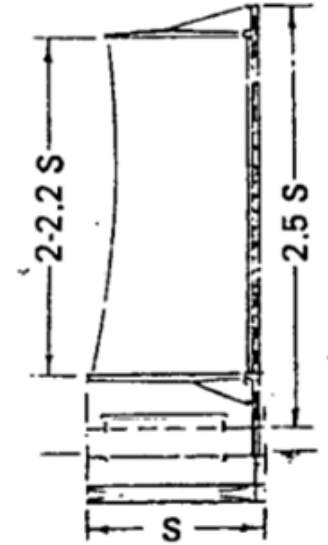
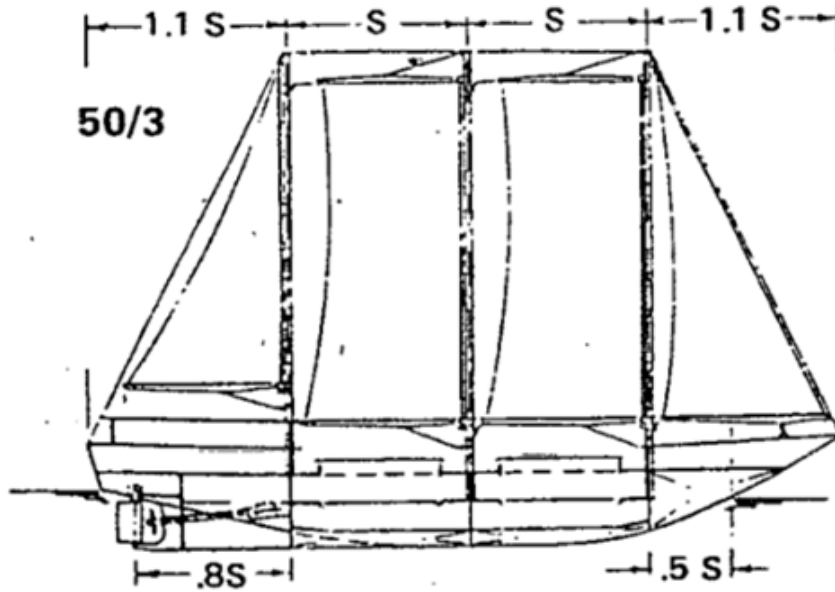
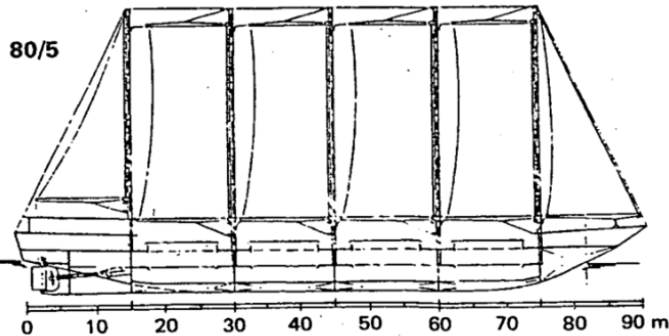
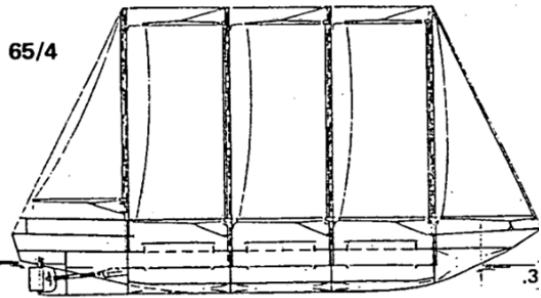
Length, Overall	22.5m	Lightship displacement	65 tons
Length, Water Line	18.0m	Ballast	10 tons
Beam	6.4m	Cargo Deadweight	20 tons
Depth	2.8m	Passenger Capacity	50 passengers
Draft	2.4m	Working Sail Area	150 sq m
		Engine Power	40 kw



(b) Internal Layout Schematic Plan



POTENTIAL MODULAR DESIGNS



From 1985 INDOSAIL design, described in
ADB Conference Proceedings.

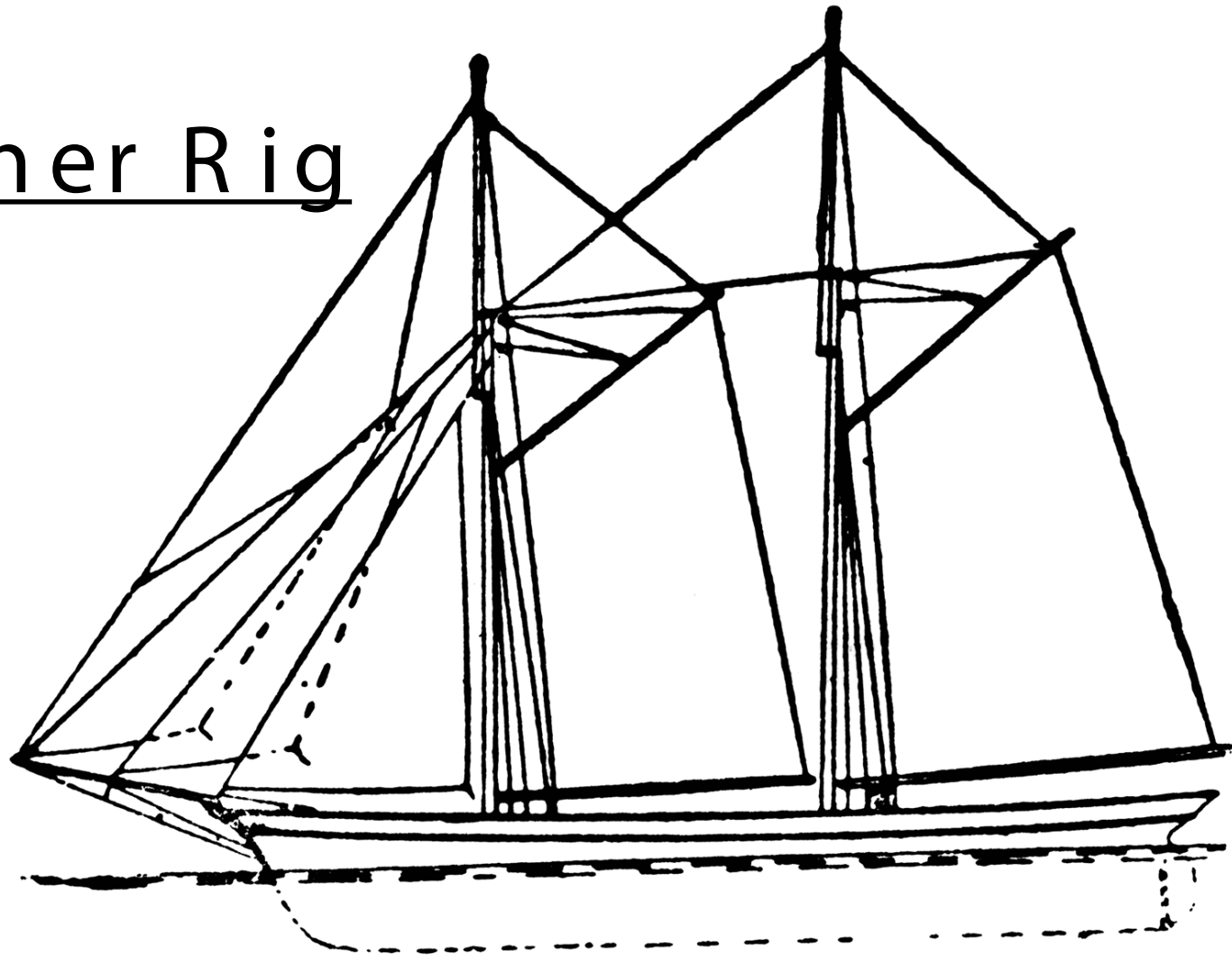
What Is The Ideal To Maximize Fleet Capacity?

- ▣ Openly Available Free Plans For Rapid Diffusion.
 - ▣ Designed For Rapid, Simple Construction.
- ▣ Maximize Possible Cargo Capacity For Every Crew And Ship.
- ▣ Design For Improvement: Start With Simple Outfit, Improve Over Time.
- ▣ Economy Of Individual Design Effort Per Person Through Open Source.

Service-Pattern Schooner Requirements:

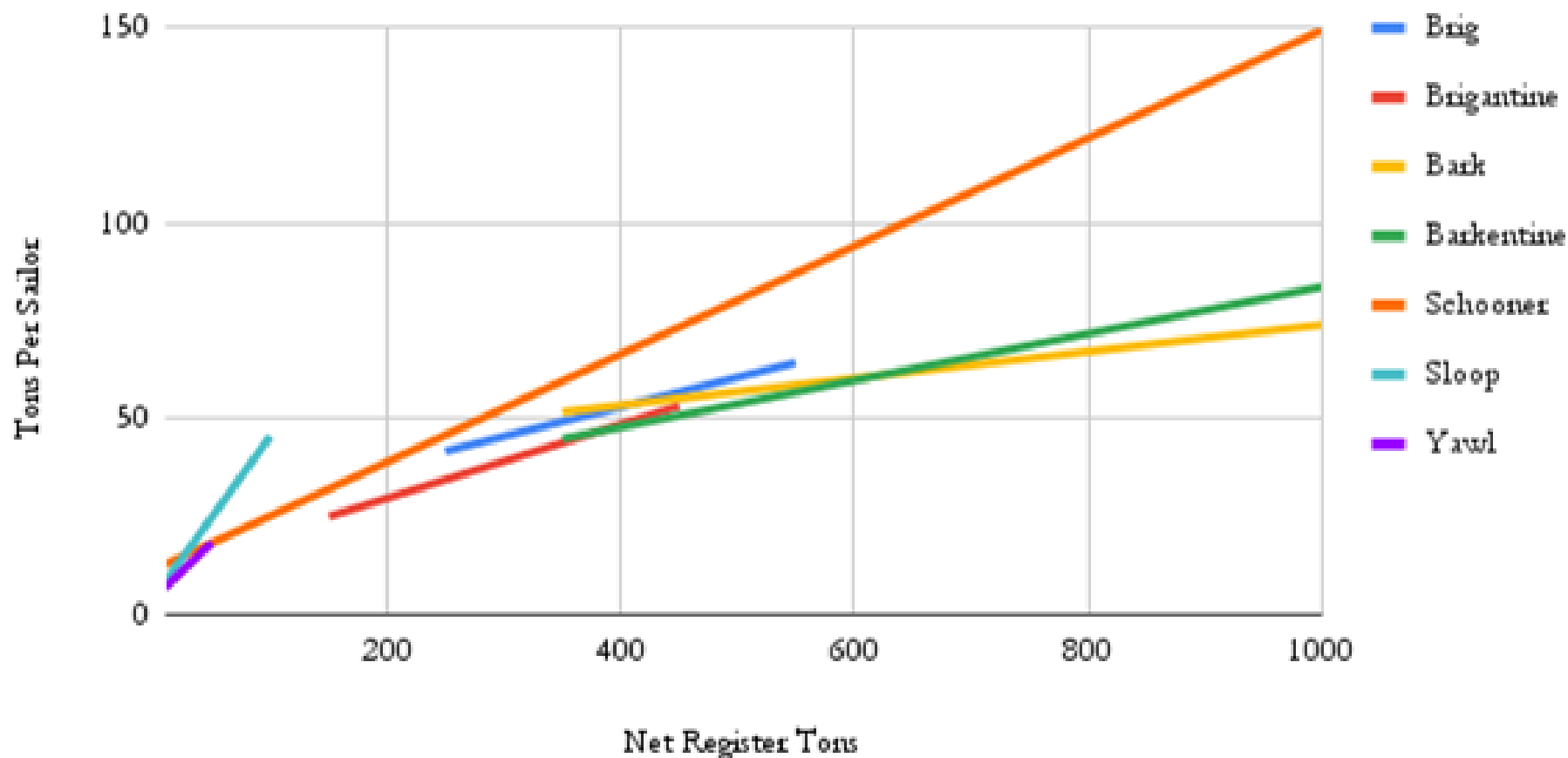
- ▣ 4 Hull variants: 15GRT / 25GRT / 50GRT / 100GRT
- ▣ 2 Rig variants: Schooner (Marconi and Gaff).
- ▣ ≤ 9 foot loaded draft.
- ▣ C D W T of at least 7.5/15/35/70 tonnes at Stowage Factor of 2.6 m³/tonne.
- ▣ Simplified, inexpensive, rapid construction in steel.
- ▣ 15/25 GRT model should include scantlings for plywood Home Build.
- ▣ Under 65 feet L O A where practicable (T-Boat Regulations).
- ▣ Sufficient motor power for docking and emergency use.
- ▣ Small enough fuel or energy storage to prevent reliance on motoring.
- ▣ Optimized for breakbulk/palletized (non-containerized) cargo.
- ▣ Sufficient ship's gear to handle drafts to and from the dock.
- ▣ Use of roller furling, winches, etc. to reduce crew requirements.

Schooner Rig



Tons Per Sailor in US Sailing Fleet, 1906

All vessels of 10 NRT or more, with clear outliers removed.



Open Source Canal Wherry

Same Requirements As Other Vessels In Tonnage

Sail And Solar Propulsion With Counterweighted Mast

Modularly Designed: Various Center Segments For Each Tonnage

Beam And Depth Remain The Same Across Models

THE NORFOLK WHERRY "GLENER"
SAIL PLAN

NOTES

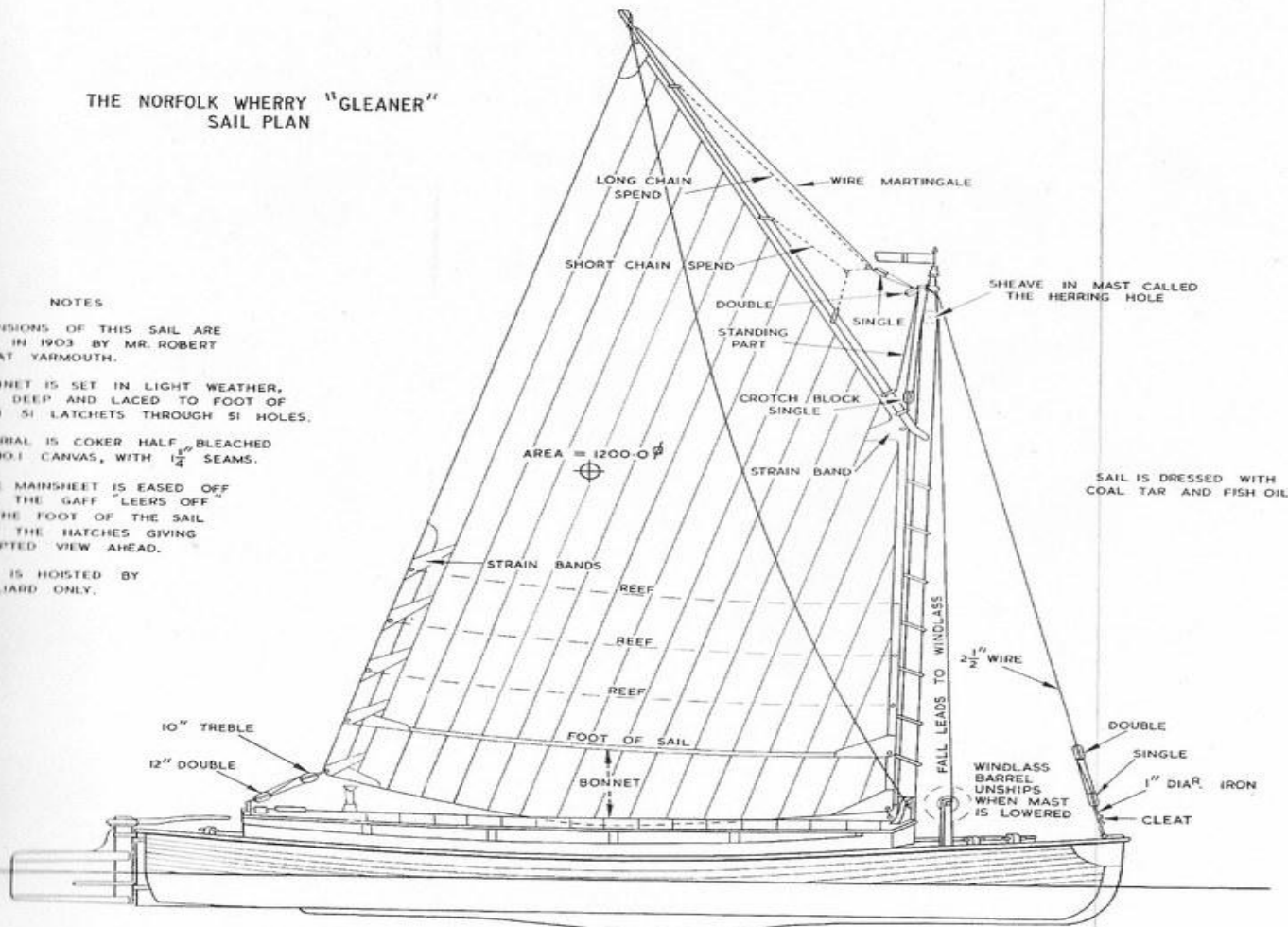
THE DIMENSIONS OF THIS SAIL ARE AS MADE IN 1903 BY MR. ROBERT FINE GREAT YARMOUTH.

THE BONNET IS SET IN LIGHT WEATHER, IS 4'-0" DEEP AND LACED TO FOOT OF SAIL WITH 51 LATCHETS THROUGH 51 HOLES.

THE MATERIAL IS COKE HALF BLEACHED DOUBLE HULL CANVAS, WITH 1/4" SEAMS.

WHEN THE MAINSHEET IS EASED OFF A LITTLE THE GAFF "LEERS OFF" LIFTING THE FOOT OF THE SAIL CLEAR OF THE HATCHES GIVING UNINTERRUPTED VIEW AHEAD.

THE SAIL IS HOISTED BY THE HALLIARD ONLY.



MAST = ~~22~~
= 4 7/16"

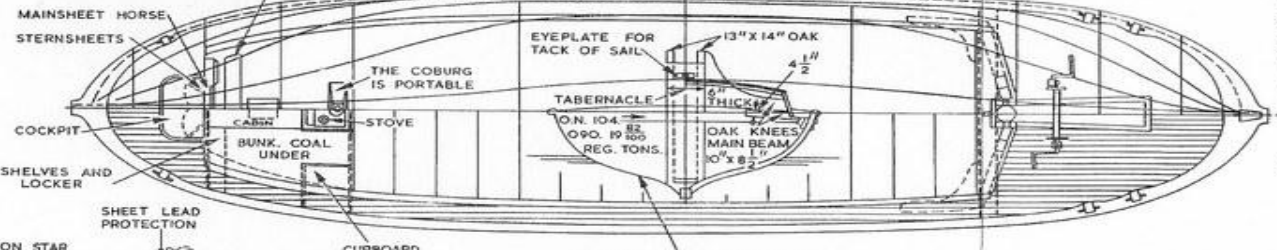
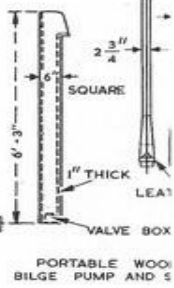
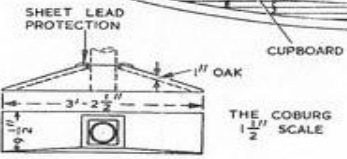
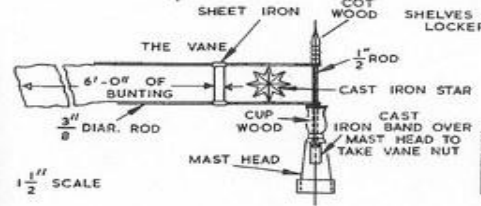
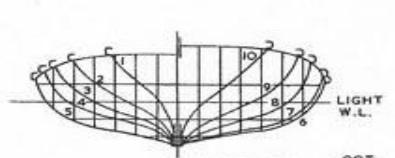
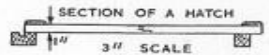
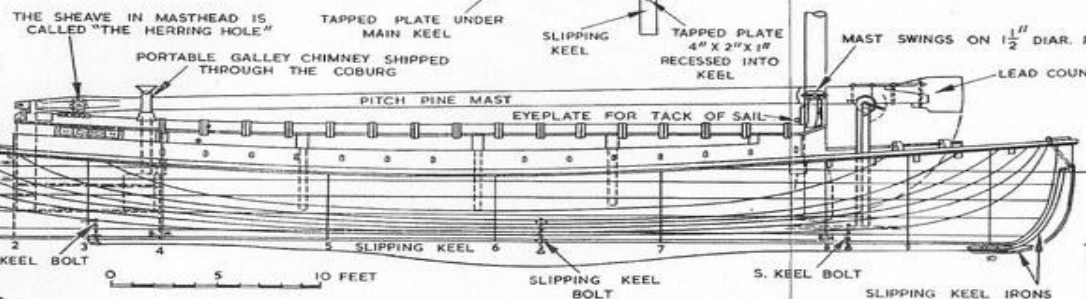
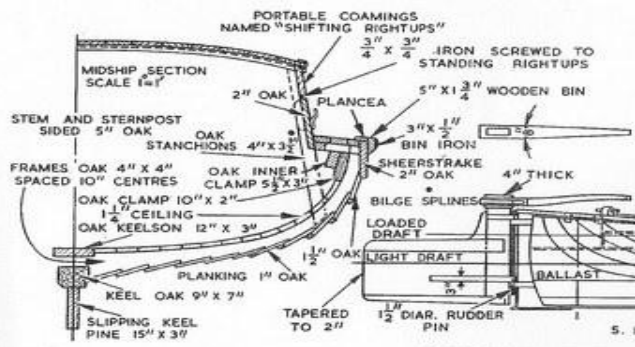
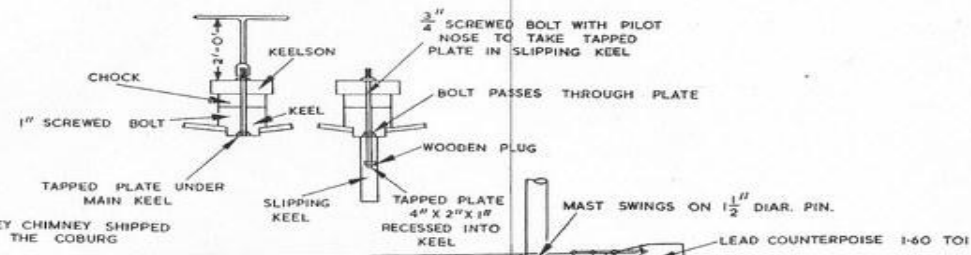
SAIL IS DRESSED WITH COAL TAR AND FISH OIL



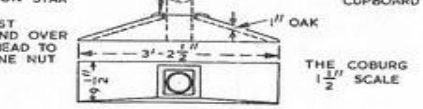
Scale = 1" = 8ft
= 1:96

THE NORFOLK WHERRY "CLEANER."
57'-0" x 14'-0" x 4'-0" MLD.

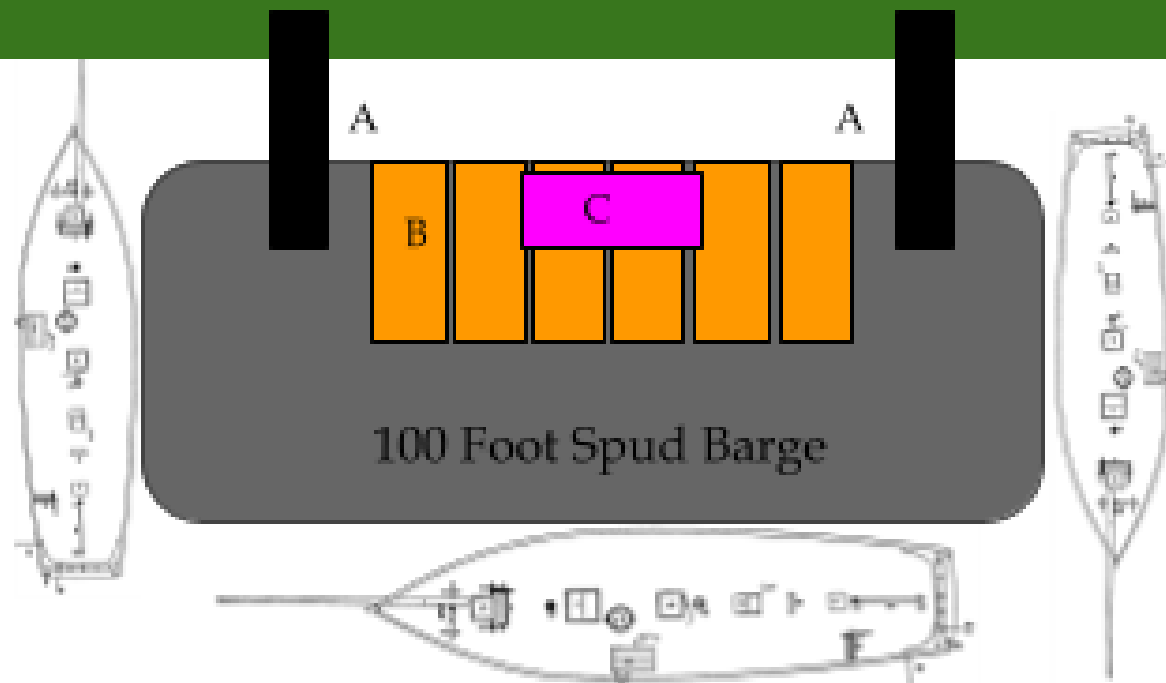
SECTIONS SHOWING METHOD OF WORKING SLIPPING KEEL
1-2 SCALE



SECTION AT NO. 8 SHOWING TABERNACLE CONSTRUCTION LOOKING FORWARD



Land Access

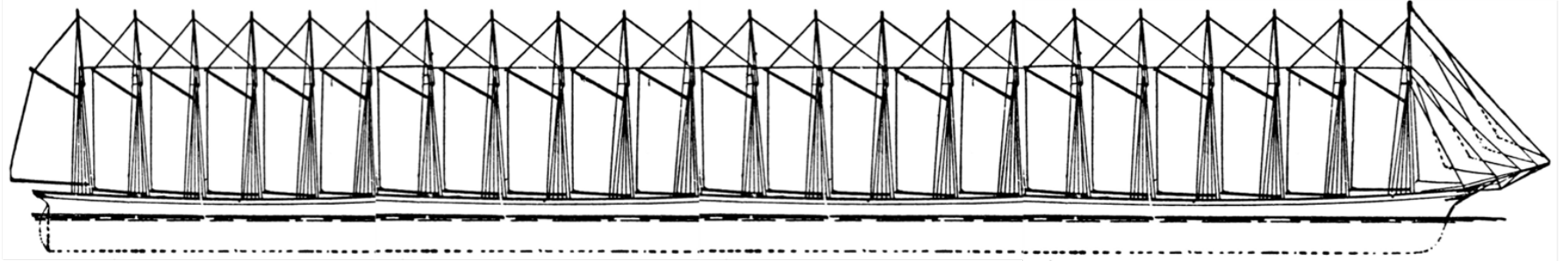


Proposed Layout Of 100 ft. Spud Barge Depot

A. Ramps to shore.

B. 20 ft Containers welded to deck.

C. 20 ft Office Container welded on deck above other containers.



Questions?