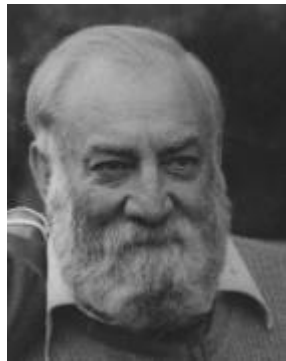


BRIAN DONOVAN

A Portfolio of Designs

in

Ferrocement



Compiled by G C Kenyon

This rough draft is the first stage in what is hoped might lead to a small glossy publication commemorating Brian Donovan and his ferrocement designs.

It is hoped that by circulating this as a starting point, among the many friends and clients of Brian Donovan, that more photographs, text and drawings will be forthcoming.

If there is sufficient response, I will approach the members of the Donovan family, and the Auckland maritime Museum, for permission to uplift the remaining surviving original drawings of Brian's.

With the assistance of a competent editor, high quality drawings and enhanced photographs and artwork, I believe it might be possible to produce something worthy of Brian's memory, which people might enjoy.

Please send written material, stories, anecdotes, scanned photographs and drawings to graemekenyon@hotmail.com
Please also add further information to what you see here, including correction of errors.

Thank you for your response

Graeme Kenyon
April 2015

In my opinion one of the most important people active with ferrocement in New Zealand is Brian Donovan. He never sold as many boat plans as Richard Hartley but he was accessible and helpful. He also produced a rich variety of designs in ferrocement. At Span Farm alone a 76 foot (the largest) and a 19 foot (the smallest) sailboat were being built to his plans. He was a friend to many, many people and his pre-plastering inspections saved a lot of trouble for builders. He would point out places where reinforcing was lacking or where some other defect in the structure existed. One thing NZFCMA did do was provide an inspection certificate with Brian as one of the inspectors and this proved to be a valuable service.

When I first met Brian he was living in a house in Devonport on the north shore in Auckland. He had a car crate for an office in the back yard. I remember sitting with Brian over a drawing board one hot day working out an accommodation plan for my boat. His dog, Sam, was on the floor and a line of ants crossed the papers and walked up the wall. There were water stained papers all about and dozens of messages, postcards and notes pinned up. Brian lived very modestly and this car crate office would move with him after he sold his house. It has been said that Brian never sent a bill out. Naturally, he kept very busy. This lack of business sense actually hurt Brian in some ways. He would offer some advice but because it was not on a business basis there might not be a follow-up and hard feelings could arise.

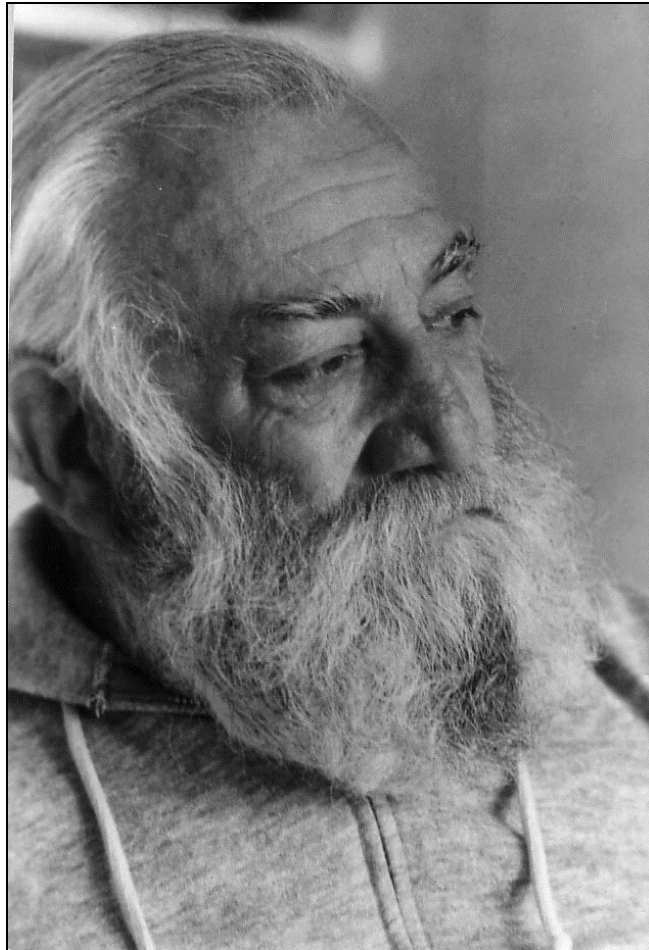
Brian was the ultimate scrounger and could show you every trick imaginable to build a boat without money if you only had the time. I once tried to get John Fyson interested in sponsoring a UN-FAO publication by Brian on improvised boat building but was unsuccessful. Brian taught many people to work with metal and wood. I received my first forging lesson from Brian and we made an anchor to his design. Later it would hold my boat securely through gales, storms and a hurricane.

Brian has had many new and clever ideas for using ferrocement. He had supervised sheathing projects over both wood and steel boats well before the technique received attention in American yachting magazines. To my knowledge his wooden scow designs are still the only new construction ever conceived with a ferrocement sheath. I helped him build his hull and it very much impressed me as a construction technique. It has been this fertile imagination and energy that have kept Brian young and made most of his friends a generation younger.

Brian's personal life has always been a worry to his friends. His artistic temperament could make him explosive at times and his affairs of the heart never seemed to end in happiness. He would often suffer from depression and work long exhausting hours. He was usually by himself and neglected his nutrition. A friend who might stop by to talk boats or ferrocement always gave Brian a real lift. There are postcards on his walls from all of the sailors he once helped.

I remember one instance when Brian really helped me. It was one of those situations where my building program was at a junction and the wrong turn could be disastrous. The situation can (and usually does occur) during the final stages of the meshing process. As the mesh gets tighter during twitching, lacing or jogging it will tend to distort the fairness of the armature rod. In my case the mesh had become too tight and pushed the rods in towards the hull. I had seen the dreaded "starved dog" look in boats before but could not see how I was going to save the situation. Brian had said on a number of occasions that it would not be a problem and not to worry about it.

The next day was plastering day and I was feeling frantic. Brian arrived in late afternoon and we started the fairing process with a sledgehammer! It worked perfectly and Brian took much pleasure in seeing how fair my boat turned out.



photograph by Eurico Charraz

Bñau Daurau falechu eue 24/2/1993



EASTER 1992
CHARRAZ

Introduction

These designs are a selection from a large number drawn up over several years work with ferrocement. This introduction outlines the design philosophy which I have followed in the planning of these vessels and describes in general terms the construction methods employed.

Design considerations

Pleasure craft. As with all types of boat, yachts and launches must be carefully planned for their intended purpose. A vessel may be intended for coastal work or to cross oceans, as a weekender or for life afloat. These and other differences in basic function, as modified by the experience of the client and architect, will result in entirely different craft.

Cruising yachts are among the most interesting commissions. A compromise must always be established between their functions as a mode of transport and as a home. Although long ocean passages (for example) have been undertaken in all types of craft, many boats which have been successful in the ocean crossing have at the same time fallen down in other respects. The boat may not have had suitable plumbing arrangements. Complicated equipment may have failed. Perhaps the berth arrangements did not give sufficient privacy. Although a cruiser should not be slow and cumbersome, then, neither should she fatigue her crew, and she should supply comfort when the stress of weather is against it.

There is a tendency to short-rig a cruiser, although I do not know why. There should be the ability to reduce sail rapidly and with the least effort. Since there is not generally a lot of manpower available, the gear should be designed with this in mind and simplicity may not always be the answer. She should be able to work to windward under reduced sail and be able to handle the draft limits of her cruising waters. She should not draw a large quarter wave and should have buoyant ends.

How suitable is ferrocement as a building material? At present it is very heavy, and a 20mm ($\frac{3}{4}$ ") thick panel will weigh about 50 kg/m² (10lb/ft²) without any allowance. for the weight of keel, floors, frames and so on. It is very difficult to get below 20mm and impossible on larger vessels, although hulls of 13mm ($\frac{1}{2}$ ") and even slightly less have been built successfully. Some would say that this is an unanswerable argument against the material, but the influence of increased displacement on the performance of yachts is not necessarily bad.

The primary requirement for speed in displacement craft is not light weight but low wetted surface and low windage, with sufficient lateral plane to combat leeway

(assuming that sail area is sufficient, and efficient). A heavy yacht is steadier in her motion, but she will be wetter when driven hard. She will sail at a much less angle of heel, but will be harder on her gear. She will not give to puffs of wind or shoot ahead as a light yacht will, but she will have much more room, and can carry more of everything, including stores, while at the same time allowing more variety in the layout of the accommodation compared with a light craft of the same linear dimensions.

Launches. There has been comparatively little interest in the use of ferrocement in launches. Two are illustrated in this catalogue, of very different types. *Timu* is a light, fast, 9.1m (30') Sport Fisherman, while *Tamure* is a traditional displacement cruising launch of slightly lower overall length. It is a mystery why more of the latter type of craft are not designed and built in ferrocement, since the material is probably better suited to this type than to any other kind of pleasure boat.

Commercial vessels. Commercial designs do not lend themselves so easily to presentation as stock plans since they are usually custom designed, or at least modifications from a basic design to suit the needs of a particular client. The small selection here are all relatively small craft capable of meeting a variety of needs and circumstances. Some of them are of types no longer often seen in the "Western" world, but which still play a vital role in the economies of the developing nations. *Karere*, for example, is a 12.2m (40') auxiliary ketch designed for the carriage of small cargoes and a few passengers between islands or on coastal trade. She is capable of quick, economical construction, is of heavy displacement for cargo-carrying and has a simple sail plan to assist the engine in passage-making. The *Indonesian* 12.5m (41') fishing boat is designed to meet the need for an economical vessel in developing countries. She has a very easily driven hull, requiring very little power to drive it, and only minimal accommodation.

Paruparu, in contrast, is a modern type of small fishing boat suitable for pelagic trawling or long-lining, with accommodation in Western style for a crew or owner-operators who expect reasonable comfort. *Ellimek* is a small general-purpose launch which could also be fitted out for one-man fishing if desired.

Ferrocement is a material well-suited to commercial vessels provided there is proper attention to design detail to enable the vessel to stand up to the rigours of hard use.

Construction methods

All hulls are designed to be built upright over temporary wood moulds. Although often used quite satisfactorily, frames are not a necessity in ferrocement boats since the shell acts as a stressed membrane which carries within itself the elements necessary to absorb loads from internal or externally-applied forces. In these designs frames are used (if at all) as grounds for the fitting of bulkheads etc.

All the hulls are designed to be built on an integral steel keel shoe which supports the frames and armature during construction and protects the keel in service. The shells are reinforced with both longitudinal and transverse steel and all integral structures such as frames and engine beds are fabricated on starter rods which form a mechanical tie into the hull. Extra steel is incorporated in high stress areas such as at the sheer, around openings and in the bilges. The stern tube and rudder tube are of mild steel welded into the stern bars.

All vessels require floors, but in almost all these boats the cabin sole also is a structural member. In combination with the keel and the floors (which act as spacers) this whole structure forms a large girder through the bottom of the vessel which acts to resist longitudinal distortion. At rest in calm water the weight of ballast, fuel, water and so on puts the sole in compression and the keel in tension, while the reverse occurs when the vessel is slipped or grounded. In rough water the condition will alternate as hogging and sagging occurs.

The structural sole reduces the need for floors and the large spaces formed can be used as tanks for fuel, water and waste. (The tanks must be sealed to protect the hull from contact with the stored liquids.) The system of integral tanks also acts as a double bottom to prevent flooding in the event of the hull being holed in the under-sole area. The maximum tank space is obtained and the great weight of fuel and water is kept low in the keel where it has a beneficial effect on stability. In all these designs the keel is kept reasonably wide. Besides providing space for fuel and water, and enabling low placement of the engine, this greatly facilitates construction of the keel, since laying up and tying the armature is much speeded if both sides of the shell are accessible. Plastering is also made easier.

Two-shot plastering is favoured strongly over the one-shot method. This means that the outer surface of the hull is plastered and cured before stripping the mould and applying mortar to the inside. This minimises

the crisis aspect of plastering which results from the enormous amount of work which has to be done to one-shot plaster a hull in one day. It therefore makes a sound, workman-like job much easier to attain.

The various building methods developed for on-off amateur construction are described and analysed in detail in *"The Ferrocement Yacht: An Introduction"* available from this company.

Costs. Undoubtedly there is more wishful thinking in the field of cost estimation than in any other aspect of amateur boatbuilding. There is no substitute, of course, for realistic assessments of material, labour and equipment costs, but there can still be an enormous difference between what a boat can cost if you let it and what it need cost.

Over recent years the aesthetics of yacht design has been over-whelmed by the power of advertising. It is true that there is a type of boat that does not look right without all the shiny "bolt-on" gear which we see in the magazines, but the true beauty of any boat is in its basic form, in the sweep of the sheer, the proportions of the cabin trunk or deck-house, the position of deadlights, the visual effect of beltings and so on, as well as the efficiency with which the boat and its gear perform the function for which they were intended.

There is much room for economising in the proper choice of materials and in the design and selection of fittings and equipment. As one example the vessels in this catalogue make wide use of mild steel fittings which can be manufactured by any competent machine shop. Stern tube and rudder gland come into this category, as do many deck fittings such as the stem roller, pulpits, stanchions and winch bases. The reader should price these fittings in bronze or stainless steel for the vessel he is considering and note the opportunity for saving! Properly protected these fittings will give no maintenance trouble, and be more reliable than the often mis-applied stainless steel. Mild steel has the added advantage of being very close to the hull reinforcing on the galvanic scale.

Quality.

The ability of a vessel to stand up to the long years of hard work which should be expected of her depends on the construction detail which goes into her building. Unsuitable structural systems, improper selection of materials and equipment, poor attachment details, incorrect wiring, substandard painting, inadequate beltings and cappings can all rob a ferrocement hull of years of service.

Brian Donovan's design philosophy for ferrocement, extracted from
Stock Designs, New Zealand Ferrocement Services Ltd. circa 1980

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Arataki	60'	ketch

Scows designed for Ferrocement Sheathing

28' scow

33' scow

Launches

Tamure	28'	cruising launch
Timu	30'	sport fisherman
Ellimek	30'	cruising launch

Working Boats

Paruparu	36'	commercial fishing boat
Karere	40'	cargo ketch
Indonesion	41'	fishing boat
Truk Project No.2	60'	passenger/fishing/cargo vessel

Sailboat Designs

Nulgarra 19' sloop

L.O.A.	19'	(5.791m)
L.W.L.	14'	(4.267m)
Beam	6'9"	(2.057m)
Draft	3'3"	(1.016m)
Displ.	7943 lb	(3.6029 tonnes)
Sail Area	206 sq. ft.	(19.1 m ²)
Prism. Coeff.	0.5169	



This is *Roc* built by Roger Taylor in Hamilton.
In 1974 Roger and *Roc* entered and completed the first Trans-Tasman Single-Handed Race from New Plymouth, New Zealand to Moolooaba, Australia.

A number of these little vessels have been built and owners have always commented favourably on them.

An unusual feature for such a small yacht is full standing headroom below.

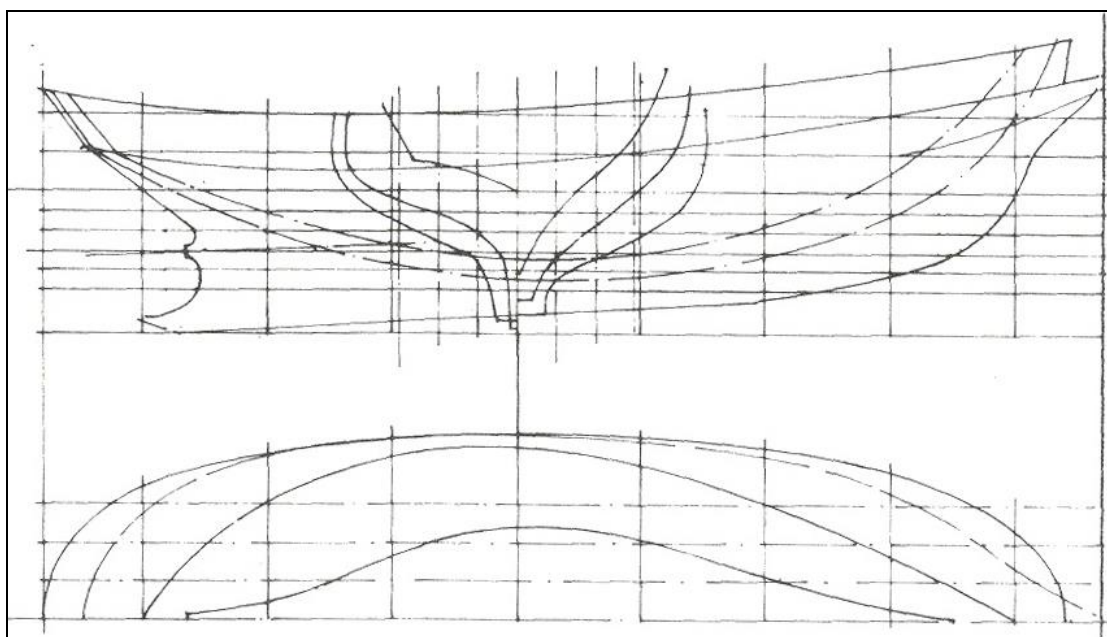
(This is the same Roger Taylor whose *Mingming* and *Minming 2* voyages are well known, and documented in his series of books.)

JRA members will be interested to know that Marcus Ramon was one of the later owners of *Roc*.

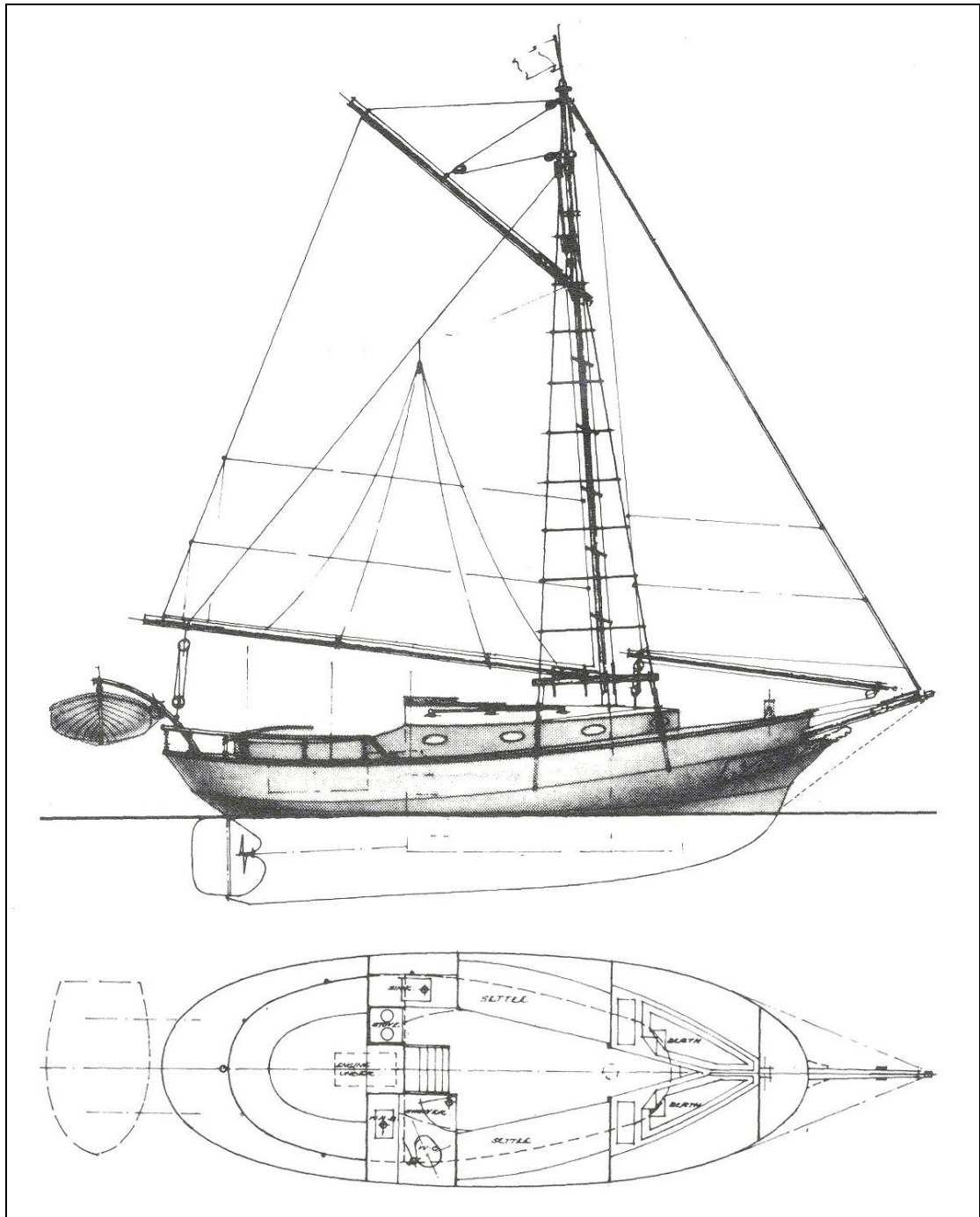
Kapowhai 27' gaff-rigged sloop

L.O.A.	27'	(8.230m)
L.W.L.	22'4"	(6.807m)
Beam	9'6"	(2.896m)
Draft	3'7"	(1.092m)
Displ.	12,920 lb	(5.8605 tonnes)
Sail Area	410 sq. ft.	(38.1 m ²)
Prism. Coeff.	0.5597	

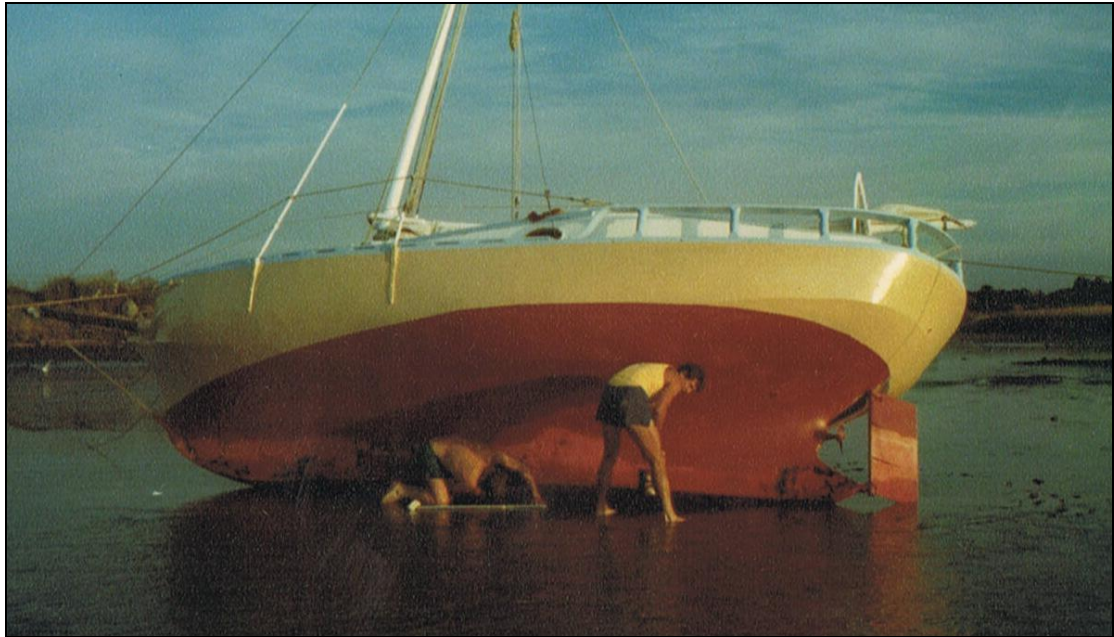
Kerry Dwyer built this little sloop in New Plymouth the 1970's, while still in his teens, and still owned her until a few years ago. She did many trips into the Tasman Sea, and occasional voyages between Kawhia and Marlborough Sounds.



For most of her life she has been owned by Kerry, and moored alongside the Waitara River near New Plymouth, as seen in the two photographs above. (Opposite) she is lying at her new home on the Henderson Creek in West Auckland.





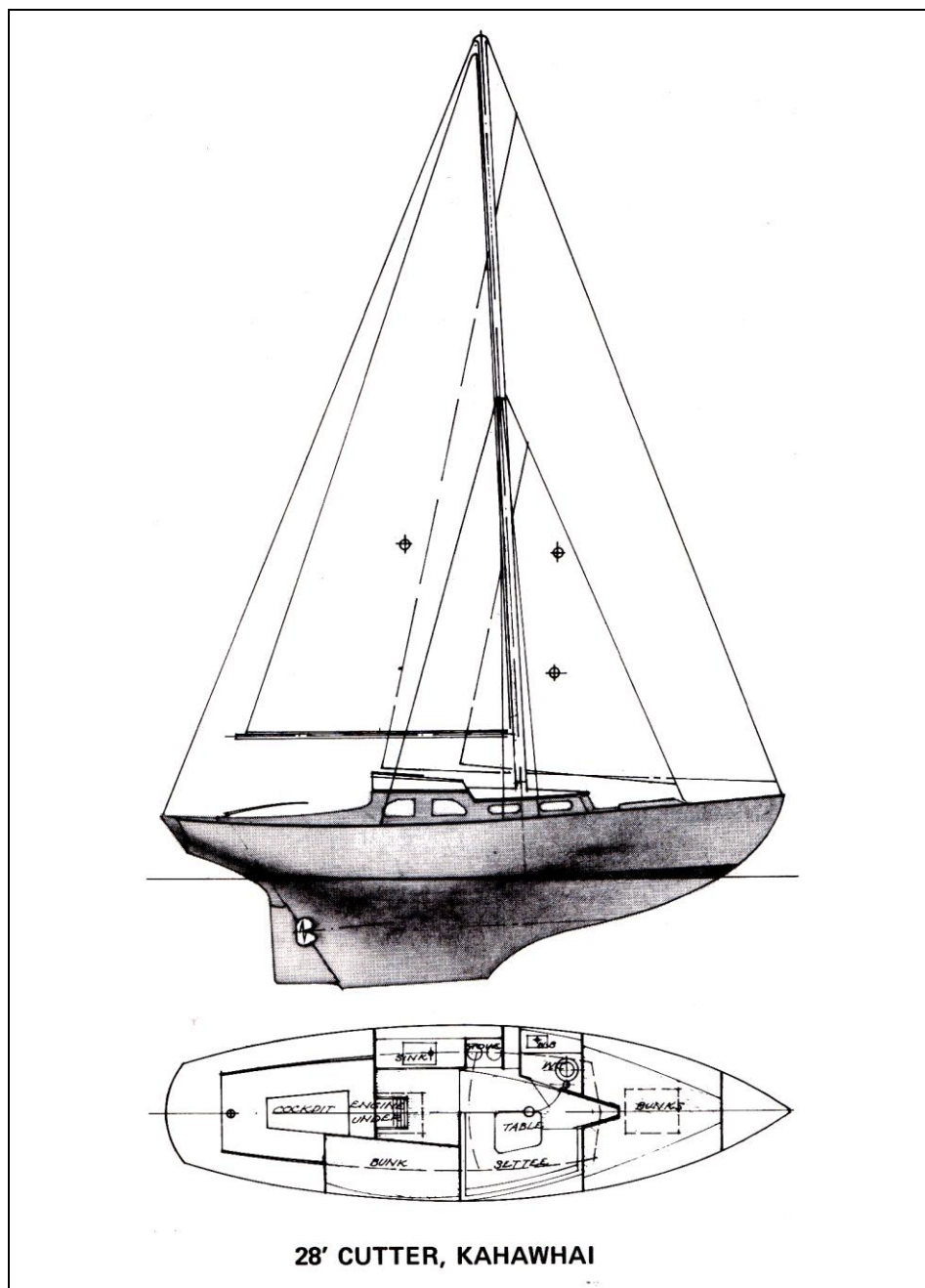


In the early days, careening at Waitara, showing her well-rounded hull form and elliptical stern.

Kahawai 28' cutter

L.O.A.	28'0"	(8.534m)
L.W.L.	21'0"	(6.401m)
Beam	8'0"	(2.438m)
Draft	4'9"	(1.448m)
Displ.	11,870 lb	(5.4296 tonnes)
Sail Area	550 sq. ft.	(51.1 m ²)
Prism. Coeff.	0.4930	

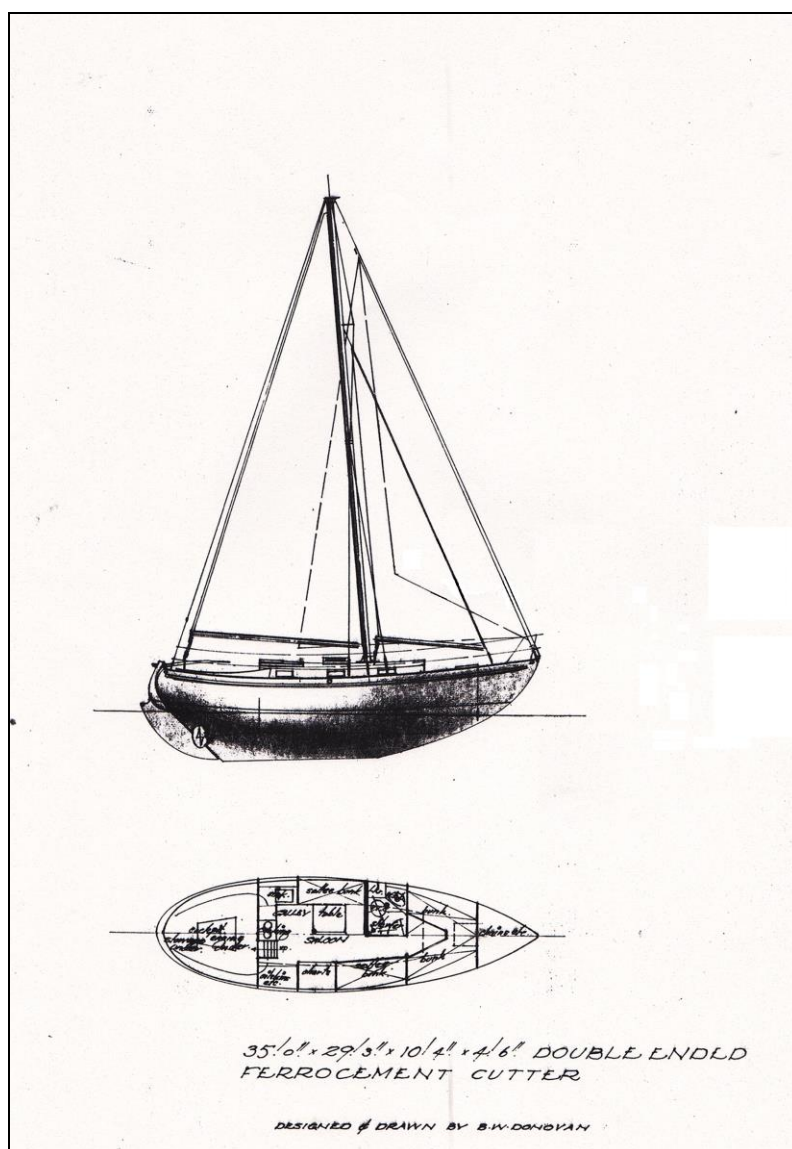
One of these was built in Tasmania.



Kareela 35' cutter

L.O.A.	35'0"	(10.668m)
L.W.L.	29'3"	(8.915m)
Beam	10'4"	(3.150m)
Draft	4'6"	(1.372m)
Displ.	23,040 lb	(10.4509 tonnes)
Sail Area	588.5 sq. ft.	(54.7 m ²)
Prism. Coeff.	0.53870	

This little cutter was designed for Bernard Bunn of Glendene, Auckland.

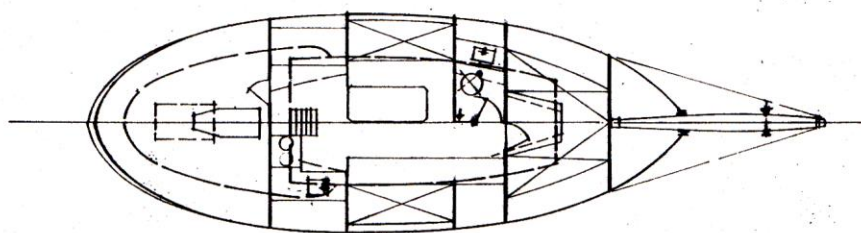
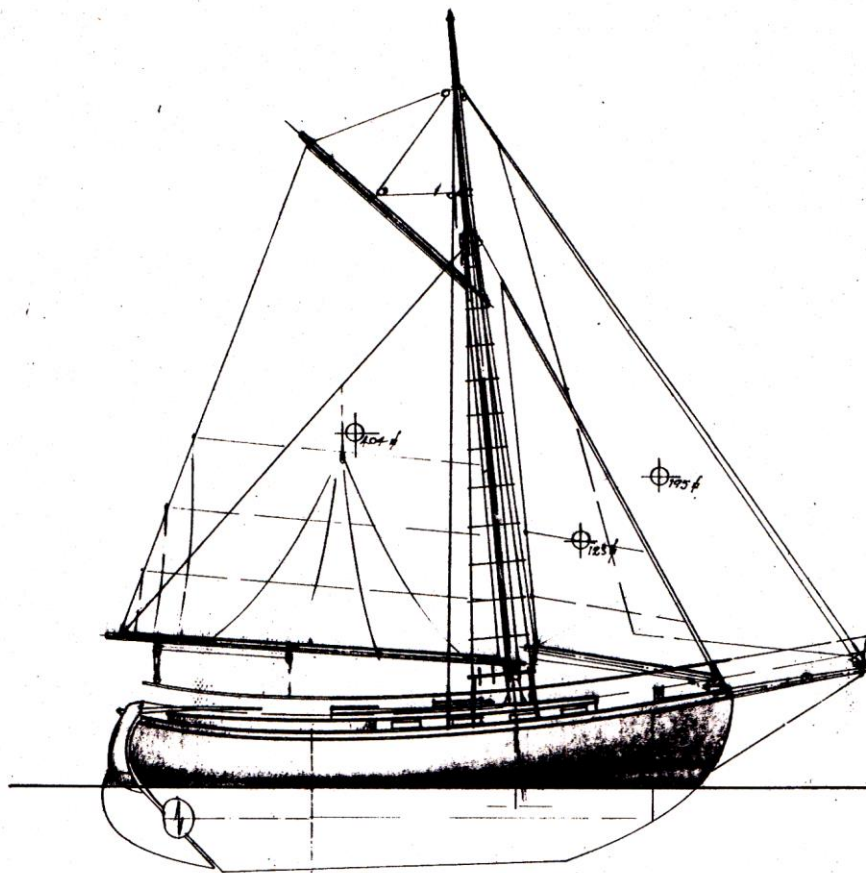


Colin Archer type 36' cutter

L.O.A.	36'0"	(10.973m)
L.W.L.	33'0"	(10.058m)
Beam	12'11"	(3.937m)
Draft	5'0"	(1.524m)
Displ.	31,660 lb	(14.4610 tonnes)
Sail Area	720 sq. ft.	(66.9 m ²)
Prism. Coeff.	0.5338	

Ian and Heather Baugh built the hull of this at their property in Glen Eden.
She was later finished to a high standard by another owner, and launched as *Halcyon*.
At one time *Halcyon* was owned by Doug Hamilton.





36'6" x 12'10" x 5'6" FERROCEMENT
"COLIN ARCHER" TYPE

DESIGNED & DRAWN BY B.W. DONOVAN 1 TAKARUNGA RD. AUCK. 9

Waimarie 36' centreboard yawl

Unfortunately the tracings for this design do not appear to have survived.

At least two of these extreme shallow draft vessels were built.

The one shown here was built by Graeme Wyatt. He and his family sailed her around the world.

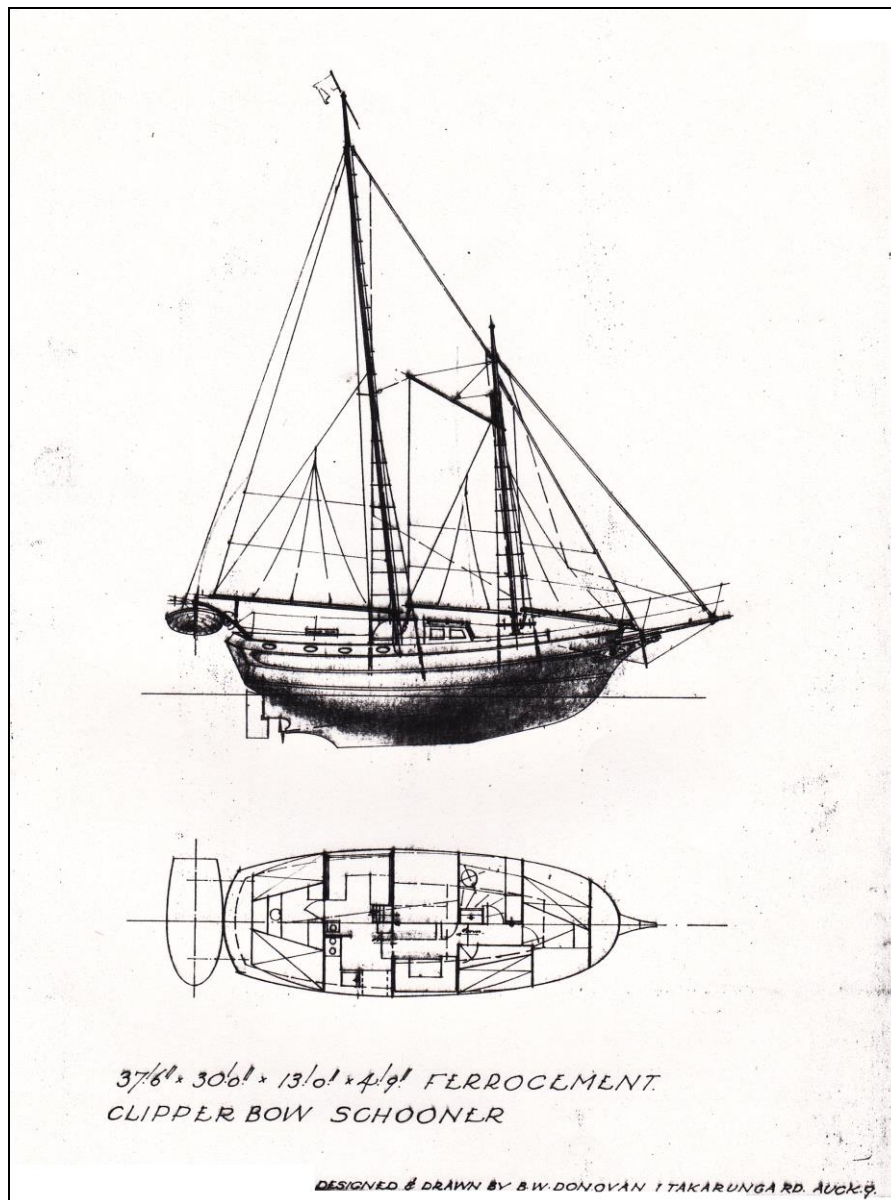




Katea 37'6" schooner

Ballast approx 100%	Main	320
	Fore	150
	Stay Sail	85
	Jib	94
	Fulcrum	242
		892

There are study prints also. Notes state one was built in Australia.



Amiri 40' ketch

L.O.A.	40'0"	(12.192m)
L.W.L.	32'8"	(9.855m)
Beam	11'6"	(3.505m)
Draft	6'0"	(1.829m)
Displ.	30,720 lb	(13.9345 tonnes)
Sail Area	636 sq. ft.	(59.1 m ²)
Prism. Coeff.	0.4734	

This vessel was built by Dennis and Nancy Broad at Span Farm, and launched as "*Tikitere*".

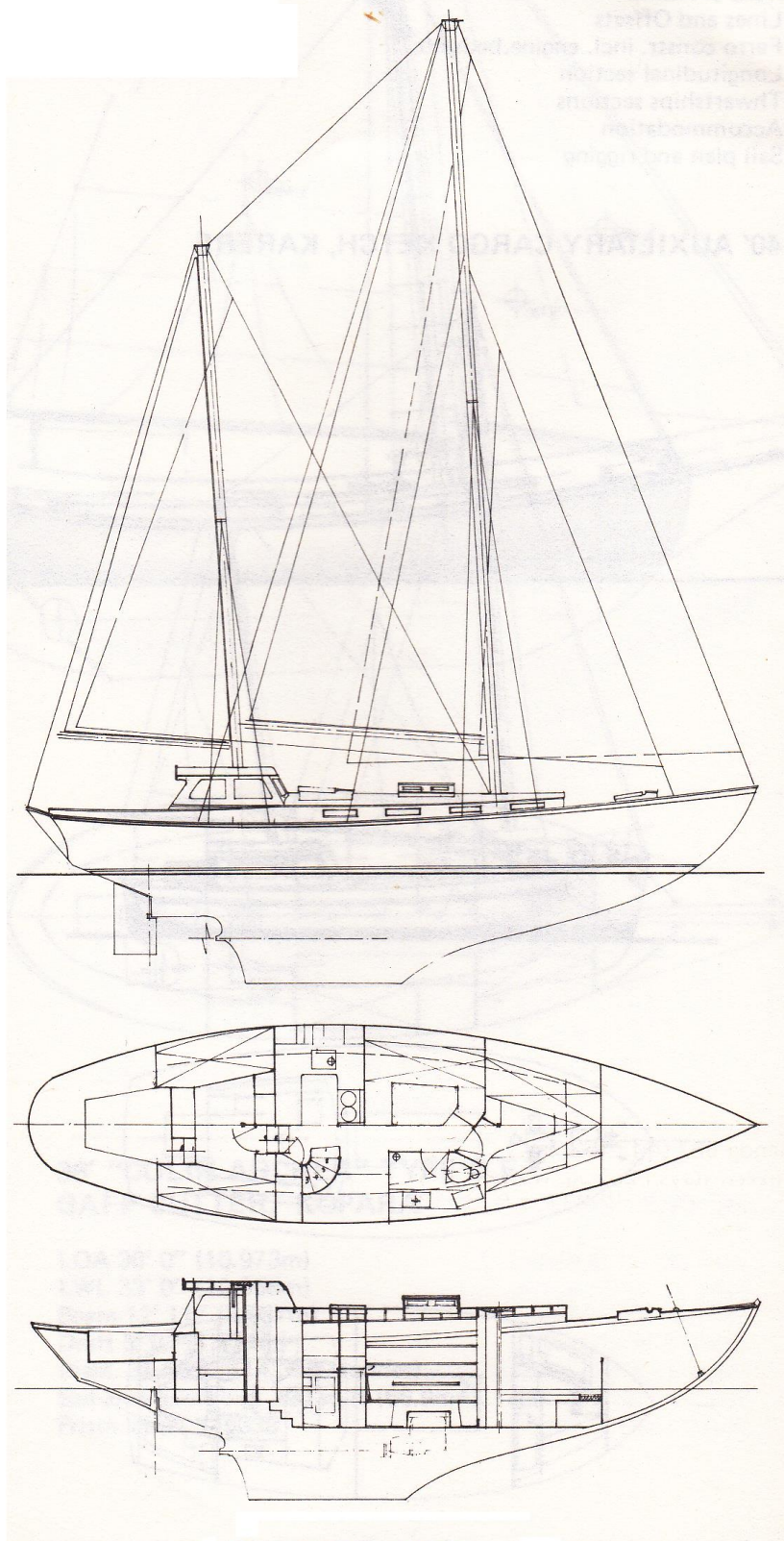
Completed to a high standard, she proved to be an able Pacific Island cruiser.



Dennis and Nancy (left) and crew, departing the Admiralty Steps bound for Tonga. (thats me on the right)



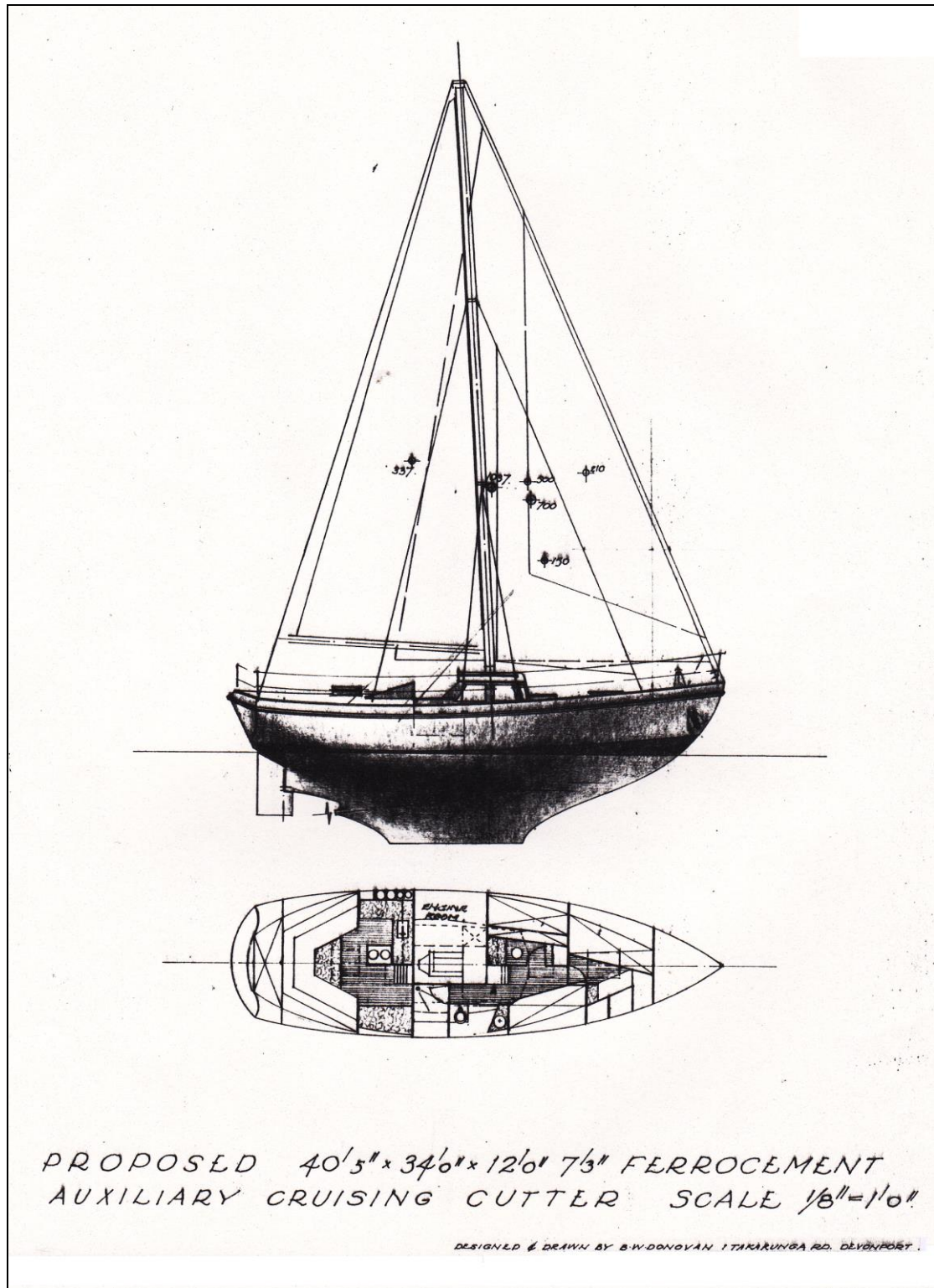
Brian Donovan
at the helm of
Tikitere



40' KETCH, AMIRI

Amokura 40' 5" cutter

Barry Woods built and sailed to USA



Hinemoana 45' ketch

L.O.A.	46'0"	(14.021m)
L.W.L.	41'6"	(12.650m)
Beam	13'0"	(3.962m)
Draft	5'9"	(1.753m)
Displ.	45,570 lb	(30.6704 tonnes)
Sail Area	845 sq. ft.	(78.5 m ²)
Prism. Coeff.	0.4709	

Built by the brothers of Wakeling Ave, West Auckland.

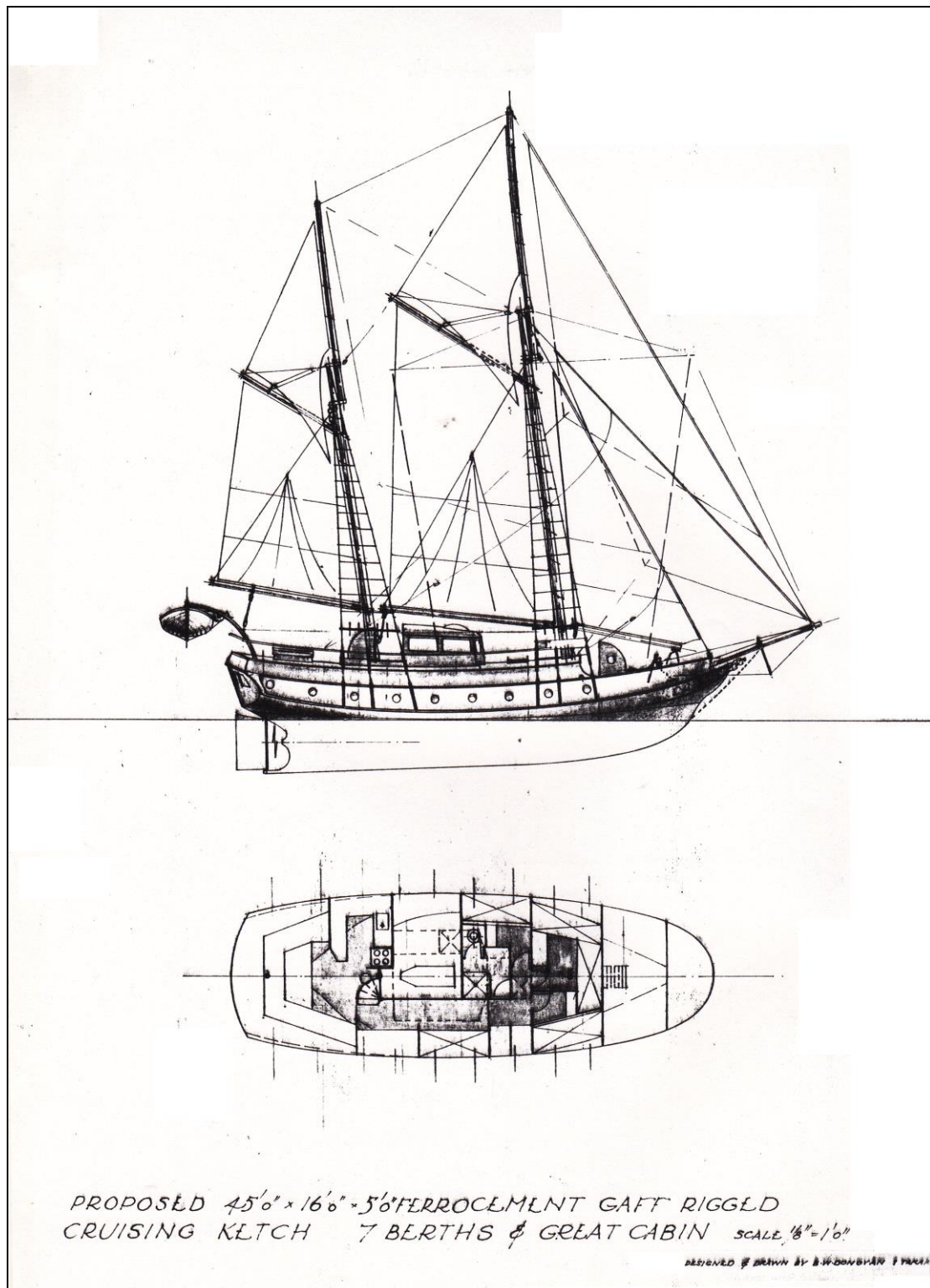
Cruised the Pacific.

Currently moored at Westpark Marina.



Tirimoana 45' ketch

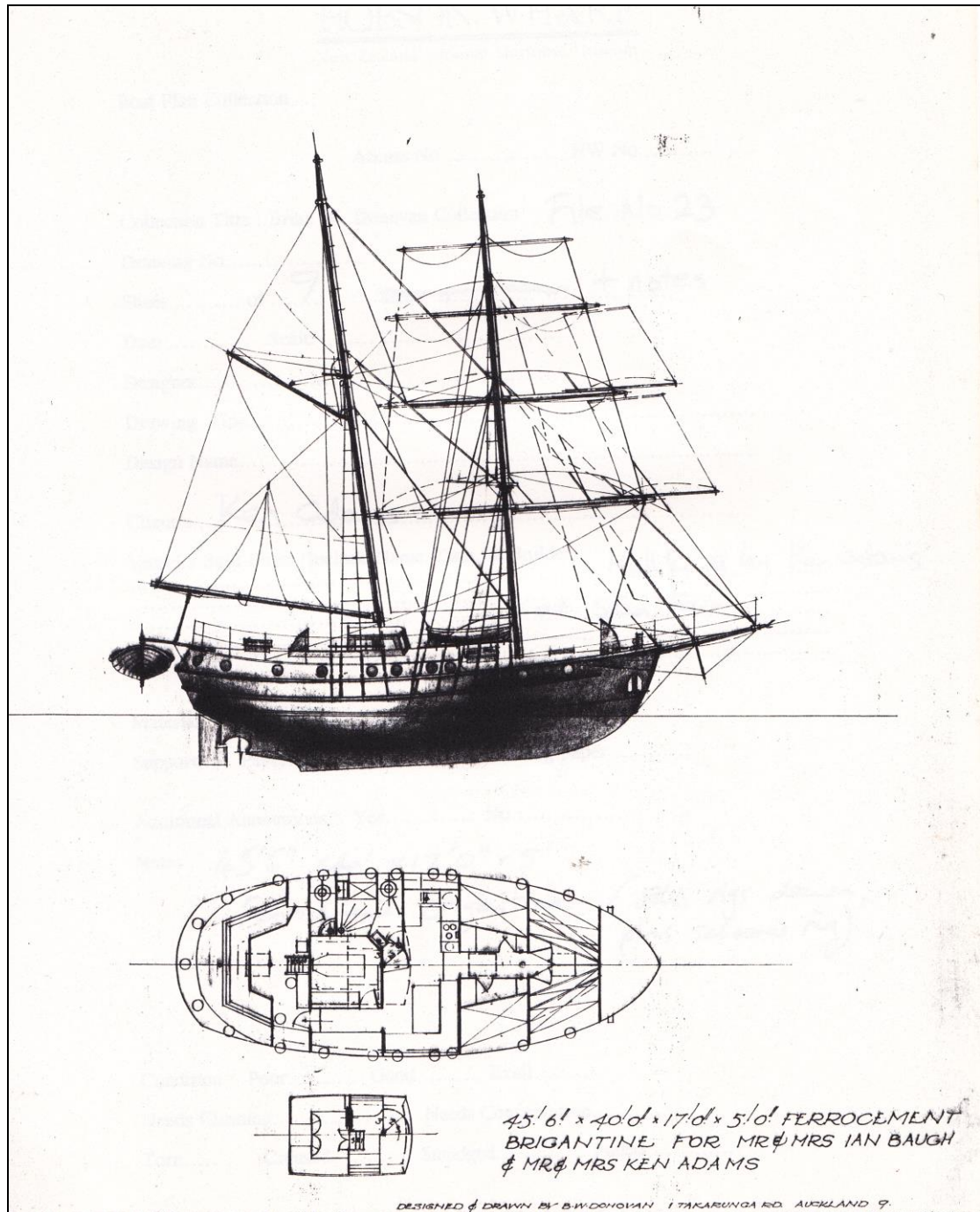
Built by Norm Kearns and family, and sailed around the world.



un-named 45' Brigantine

Designed for two families, the hull was built at Span Farm by Ken Adams and Ian Baugh and their families.

This large vessel went through some changes of ownership before finally completed.



Donovan designed Brigantine built by Ernie Johnson and Jim Sands



Photographs taken at Riverhead, by Eurico Charraz.

This vessel has since been rebuilt and re-fitted to a high standard and is currently moored at Westpark Marina. It is named “*Black Hawk*”





Donovan designed Schooner *Lady Teresa*

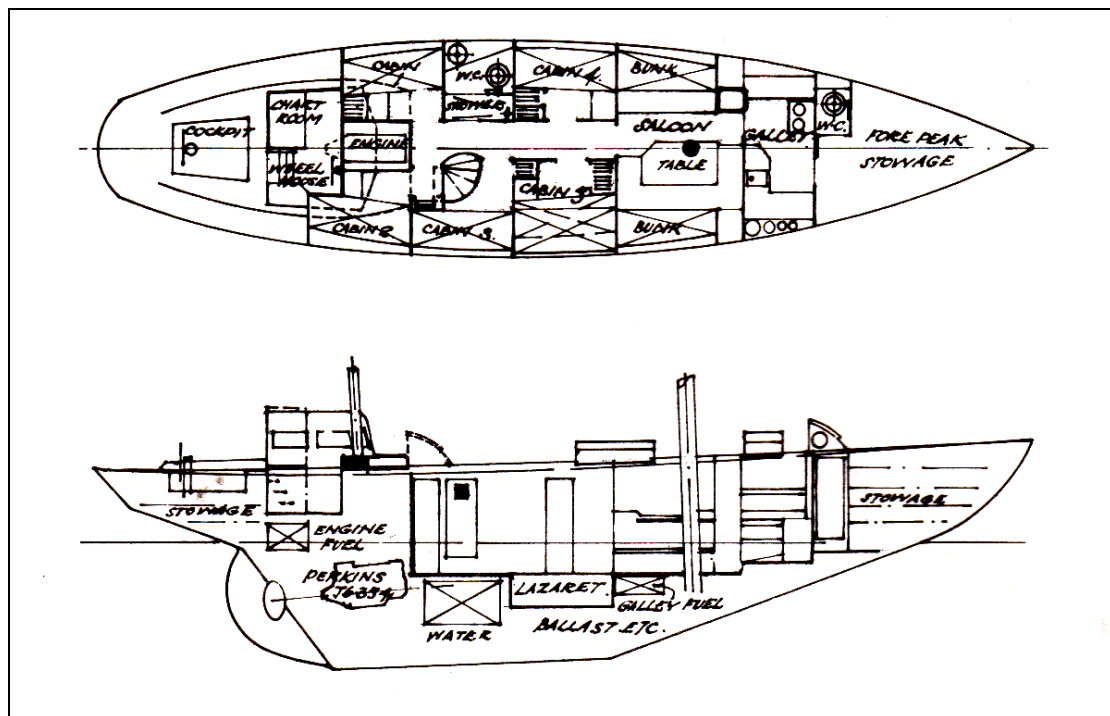


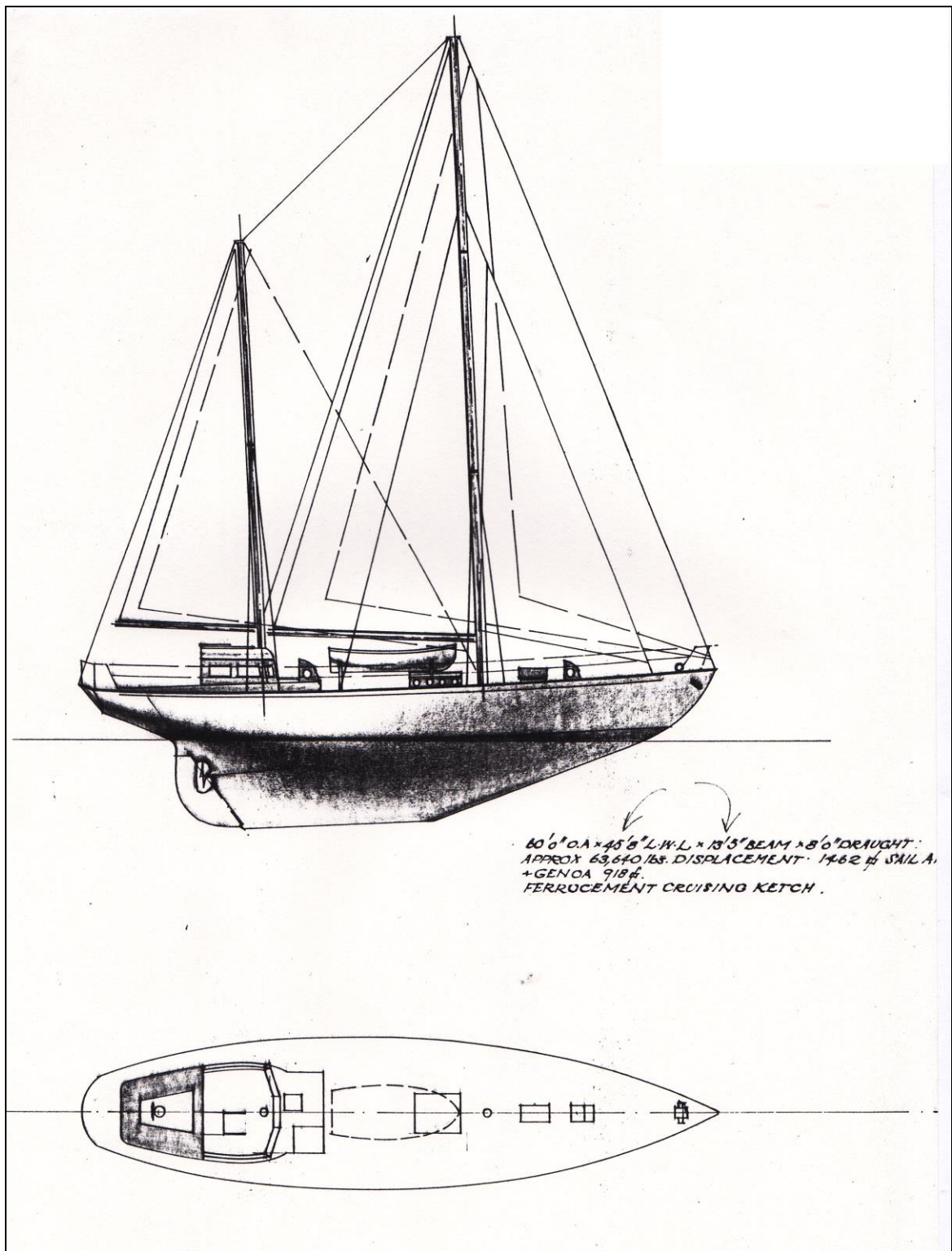
viewed in Whangarei I can not identify the design or who built it I believe now this is the vessel which was designed as a brigantine and built at Span Farm by Adams and Baugh families.

Arataki 60' ketch

L.O.A.	60'0"	(18.288m)
L.W.L.	46'0"	(14.021m)
Beam	13'6"	(4.115m)
Draft	8'0"	(2.438m)
Displ.	63,640 lb	(28.8669 tonnes)
Sail Area	1462 sq. ft.	(135.8 m ²)
Prism. Coeff.	0.5896	

Is this the one currently still being built at Span Farm?





Scows

designed for

Ferrocement Sheathing

The earliest scows in New Zealand were transom-bowed, flat bottomed sailing barges, the idea having been imported from the Great Lakes of Canada. Very soon a sharp bow was developed, unique to New Zealand. Lee boards gave way to centreboards, and the type developed over the 19th century, providing coastal transport for the North East Coast and beyond. Larger scows traded across the Tasman Sea. By the end of the 19th century road and rail infrastructure began to come available, leading eventually to the demise of this useful working vessel.

The two scows here are models of the original New Zealand scow, approximately to 1/3 scale.

The ferrocement on plywood sheathing was an inspiration of Brian's. Unfortunately the materials specified for the 28' scow (car case plywood) was inadequate. Tanalised pine timber and plywood would have been more suitable. Layers of bird netting all over, and 8 gauge wire at points of stress, all stapled to the plywood, makes an adequate layup.

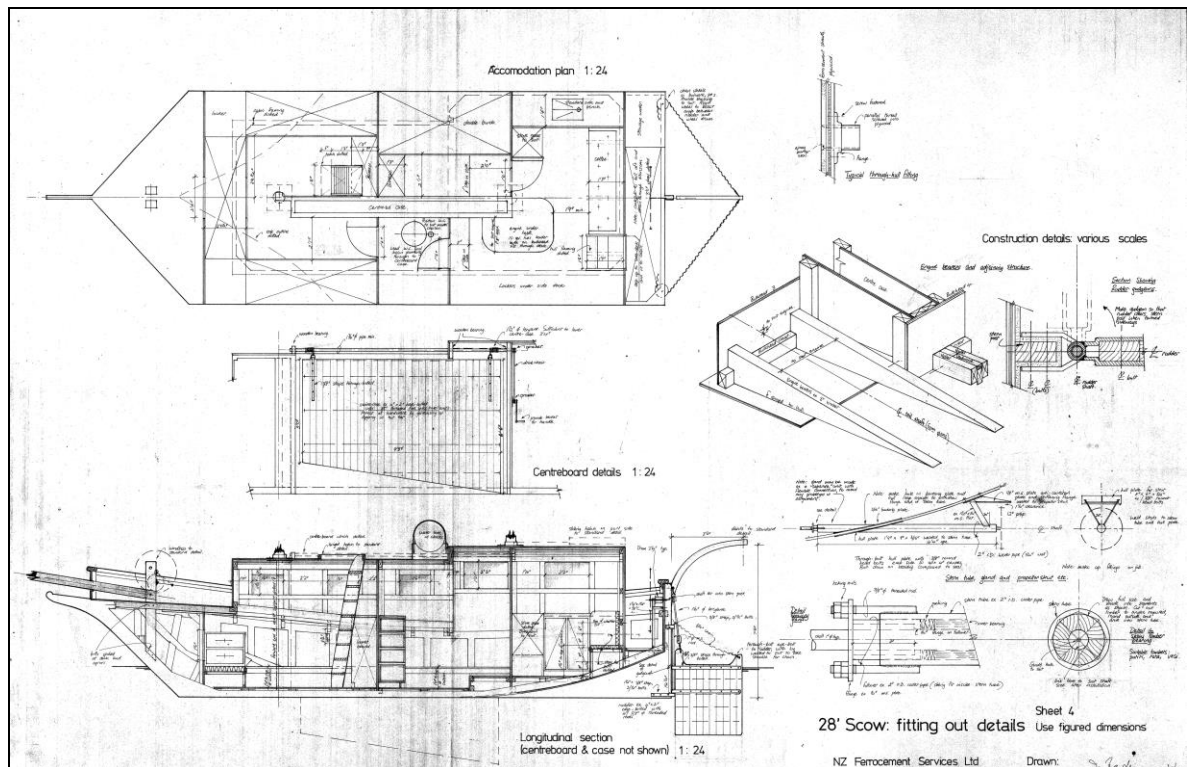
The 33' scow was built of two layers of 3/4" macrocarpa planking, laid diagonally, then sheathed (including the inside of the centre case) with a 3/8" thick ferrocement layup comprising a single layer of Watson mesh, with 8 gauge rods at stress points. (Watson mesh is a high quality 3-dimensional mesh designed for ferrocement.) The mesh and steel was closely fastened with galvanised fencing staples, the solid timber and planking clenched with galvanised nails. After nearly 50 years of minimal maintenance the hull remains sound. This is probably the first scow which never leaked and never had a toredo worm in the centreboard case.

The 33' scow has been a live-aboard for much of its life. The hull was built upside down on the edge of the Henderson Creek. After the hull was rolled over, building was taken over by Brian Giles who completed the topsides, engineering and rig. She remained for many years in Whangaroa Harbour and is currently back in West Auckland, sitting on a mudbank just a few metres from where she was originally built.

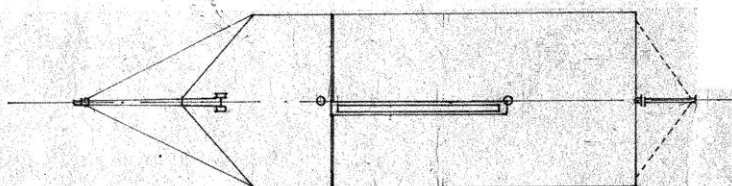
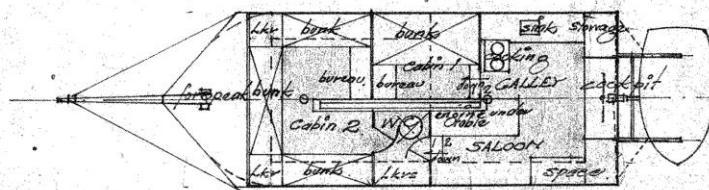
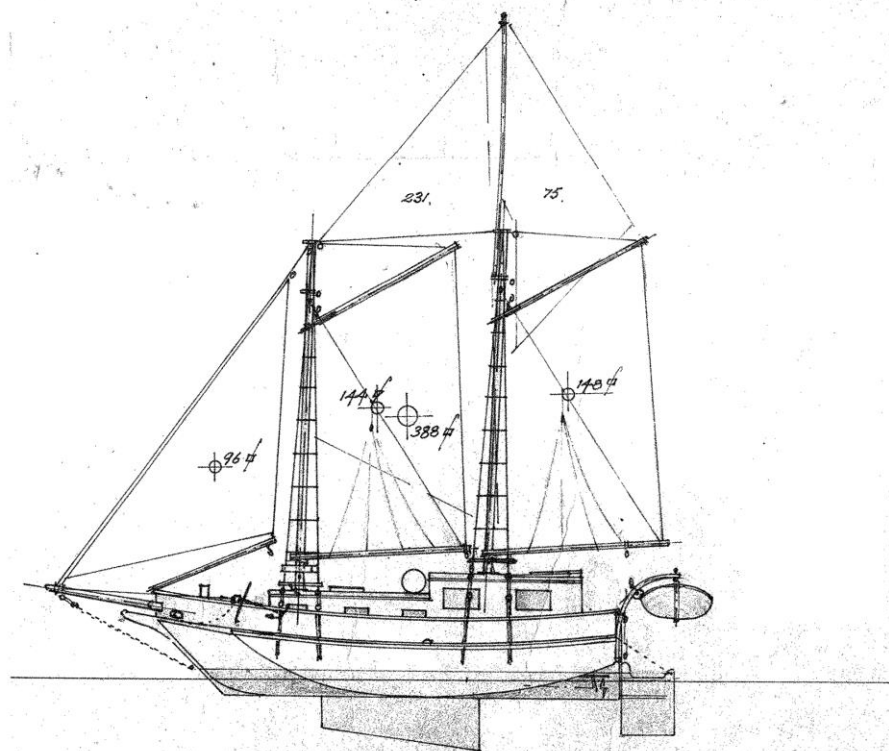
Ownership recently passed to Marcus Ramon who has re-named her *Havoc* and is currently living aboard and restoring her. He plans on eventually giving her a junk rig.

28' scow

designed for ferrocement sheath over plywood



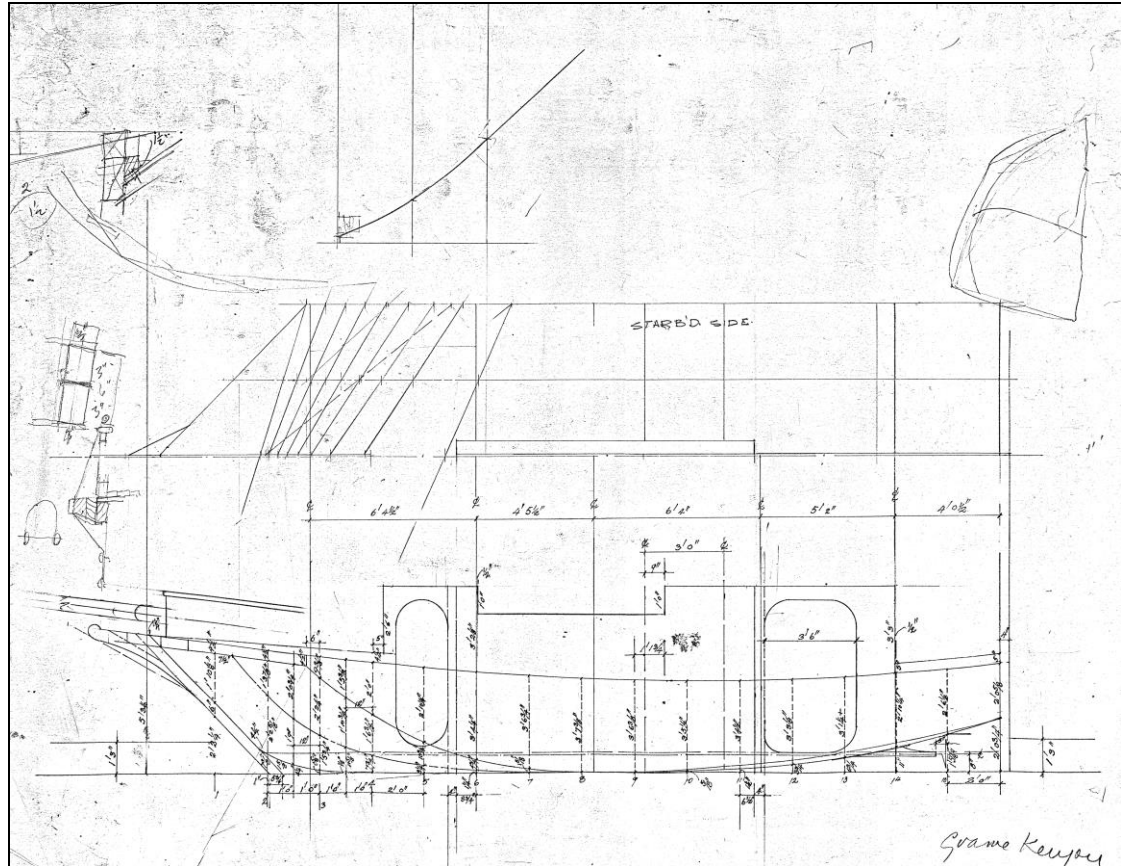
fitting out details drawn by Ian Baugh



28' O.A. x 10' 6" BLAM SCOW SCHOONER
CRUISING YACHT

33' scow

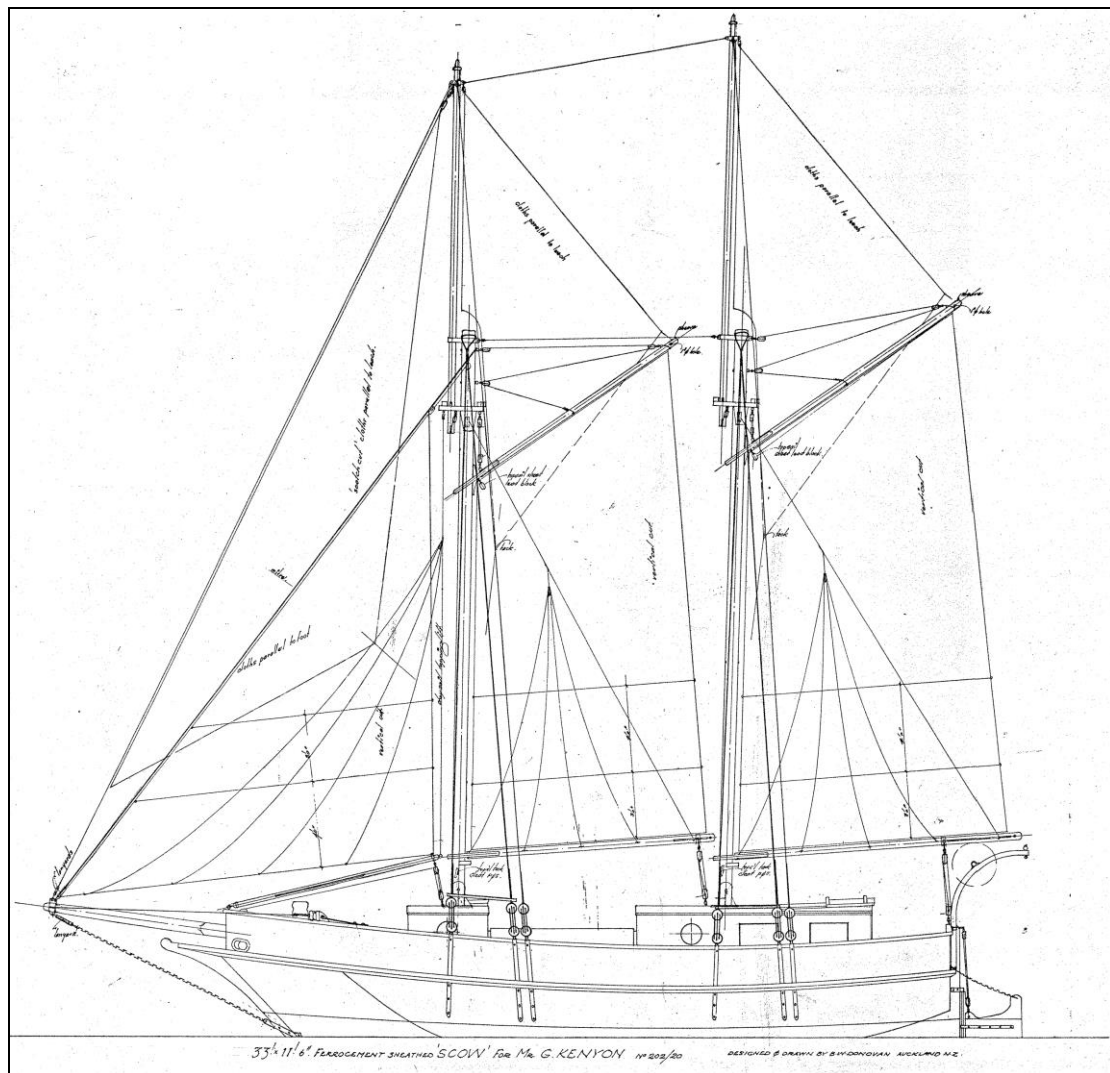
Built of Watson-mesh reinforced ferrocement over double diagonal macrocarpa timber planking



Offsets, and an explanation of the developed bow section.



Afloat on a spring tide, Henderson Creek



Building the 33' scow on the edge of the Henderson Creek



Sitting on a mudbank a few metres from where she was built over 40 years ago.



Spent many years of her life as a live-aboard



At Motuihe Island. (Maritime Museum scow *Ted Ashby* in the background.)

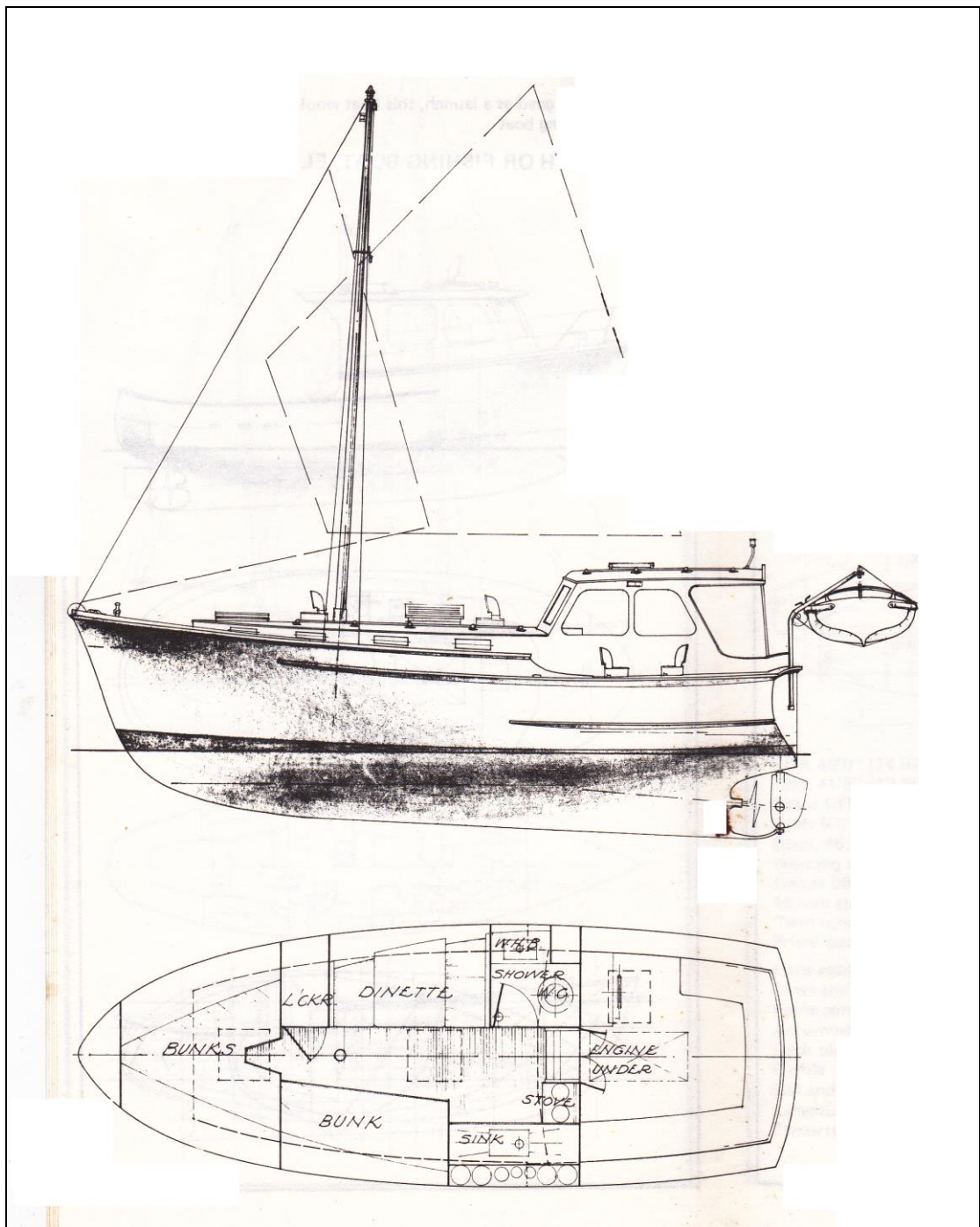
Launches

Tamure 28' cruising launch

L.O.A.	28'0"	(8.534m)
L.W.L.	26'0"	(7.925m)
Beam	10'0"	(3.048m)
Draft	3'3"	(1.016m)
Displ.	12,640 lb	(5.7335 tonnes)
Engine	30hp@900rp	23"x18" propeller
Prism. Coeff.	0.5991	

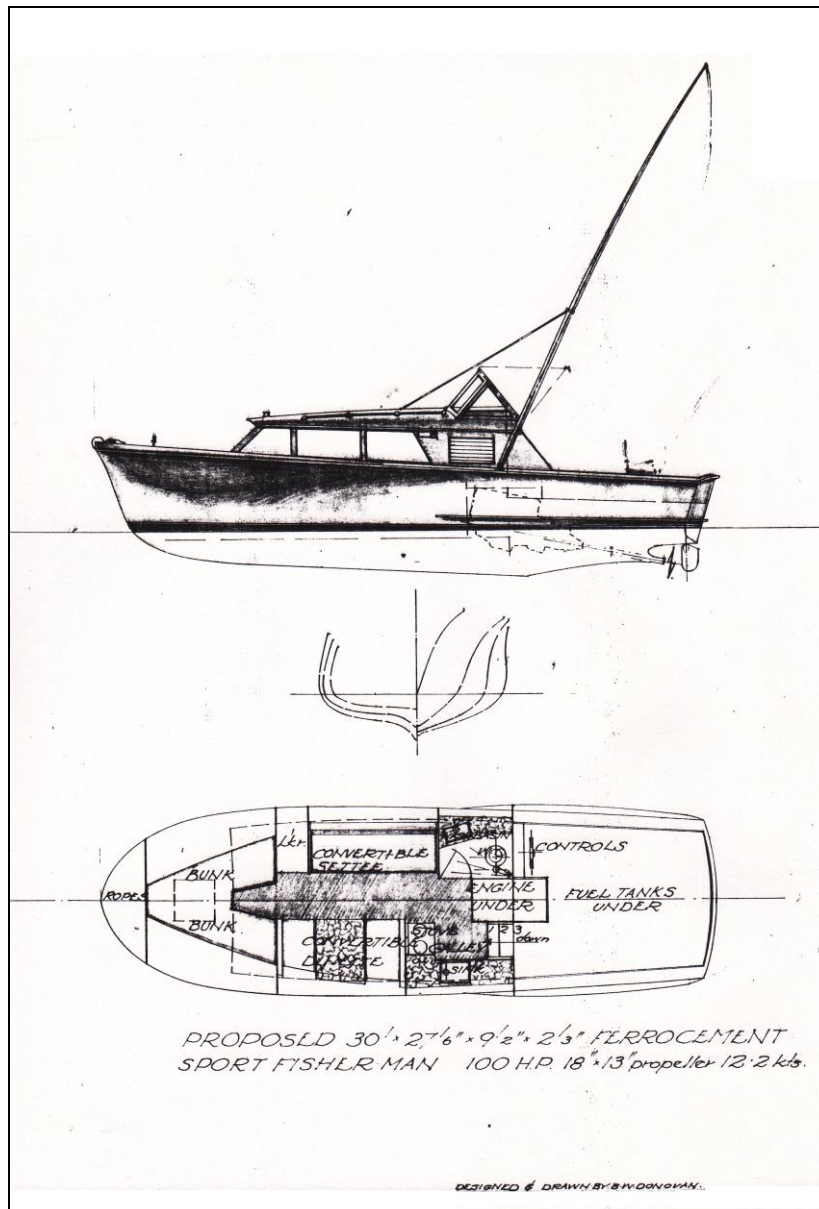
Joe Buckton built this pretty little launch. A later owner lengthened her.





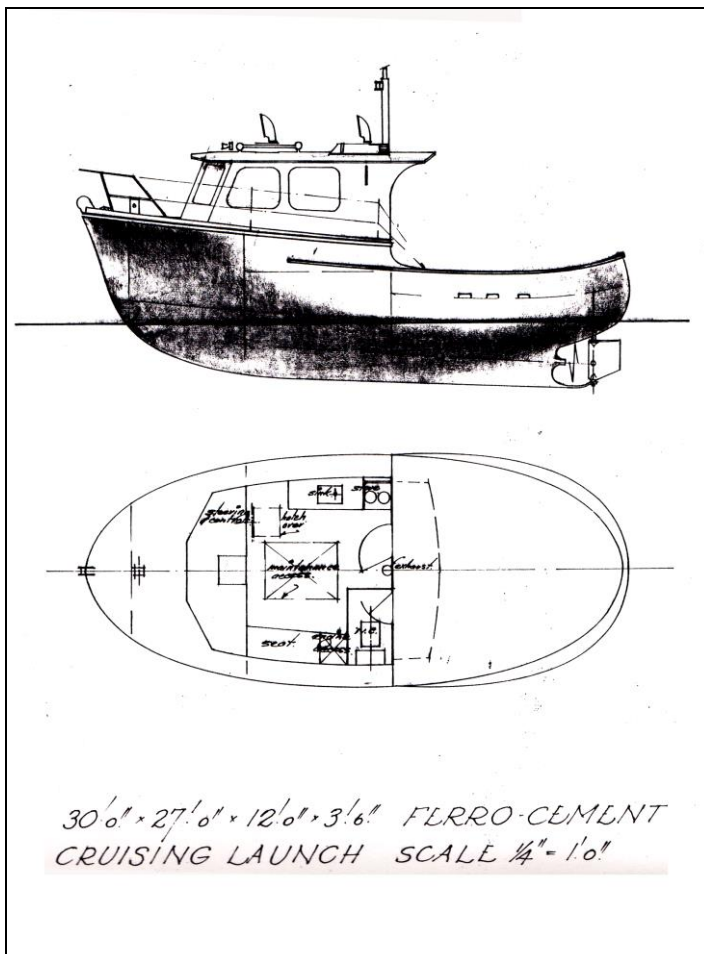
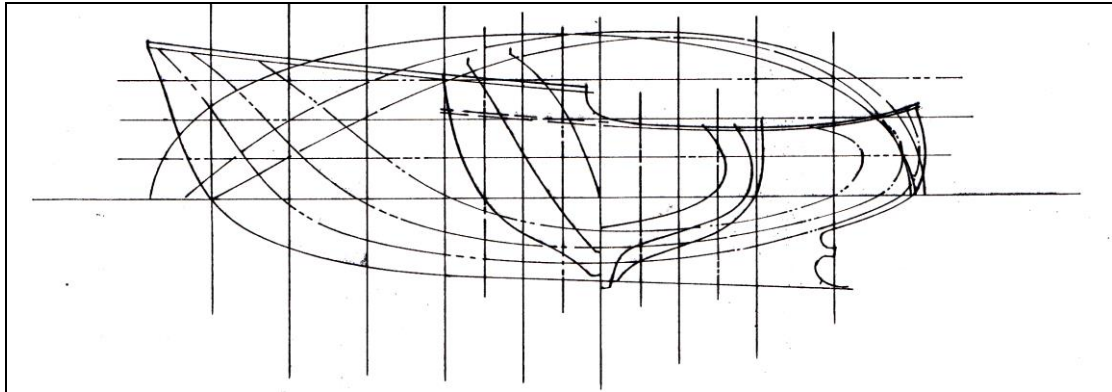
Timu 30' sport fisherman

L.O.A.	30'0"	(9.144m)
L.W.L.	27'6"	(8.382m)
Beam	9'2"	(2.794m)
Draft	2'3"	(0.685m)
Displ.	10,770 lb	(4.8852 tonnes)
Engine	100hp@2200rpm	1.5:1 reduction 18"x13" propeller
Prism. Coeff.	0.6363	



Ellimek 30' cruising launch

L.O.A.	30'0"	(9.144m)
L.W.L.	27'0"	(8.230m)
Beam	12'0"	(3.658m)
Draft	3'6"	(1.067m)
Displ.	24,040 lb	(10.9045 tonnes)
Prism. Coeff.	0.5746	

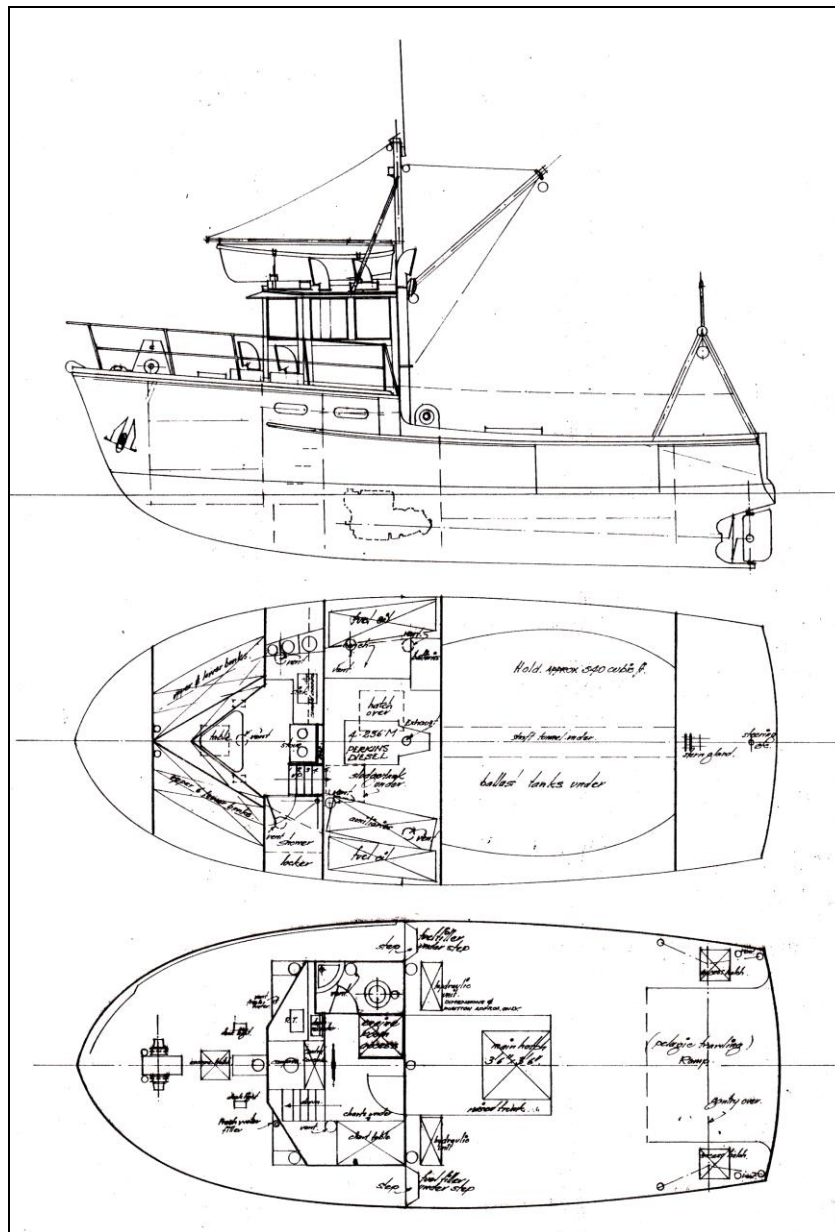


Working Boats

Paruparu 36' commercial fishing boat

L.O.A.	36'2"	(11.024m)
L.W.L.	33'6"	(10.211m)
Beam	14'6"	(4.420m)
Draft	3'10"	(1.168m)
Displ.	36,390 lb	(16.5064 tonnes)
Hold	540 cu ft	(15.3m ³)
Engine	50hp@650rpm 28"x21" propeller	
Prism. Coeff.	0.6101	

This was built at Span Farm

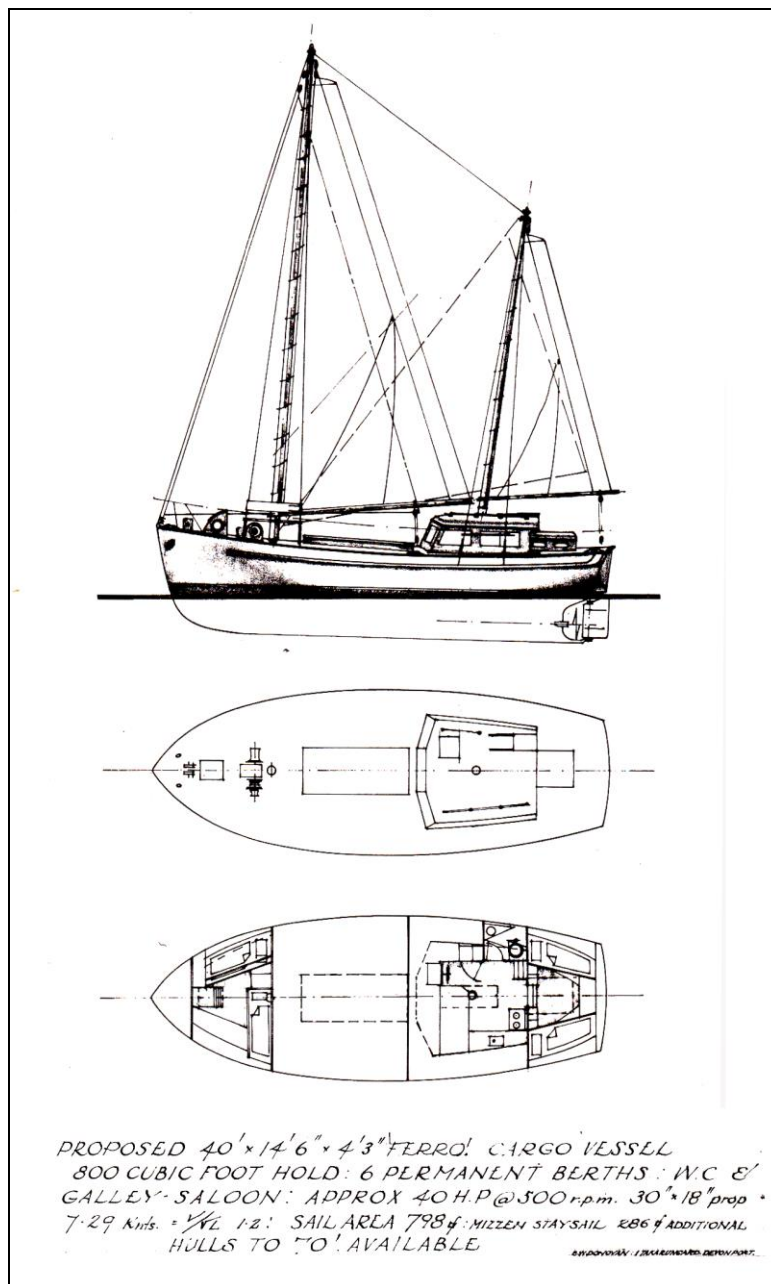


Karere

40' cargo ketch

L.O.A.	40'0"	(12.192m)
Beam	14'6"	(4.420m)
Draft	4'3"	(1.295m)
Displ.	53,930 lb	(24.4265 tonnes)
Sail Area	798 sq ft	(74.13m ²)
Hold	800 cu ft	(22.7m ³)
Engine	40hp@500rpm 30"x18" propeller	
Prism. Coeff.	0.5765	

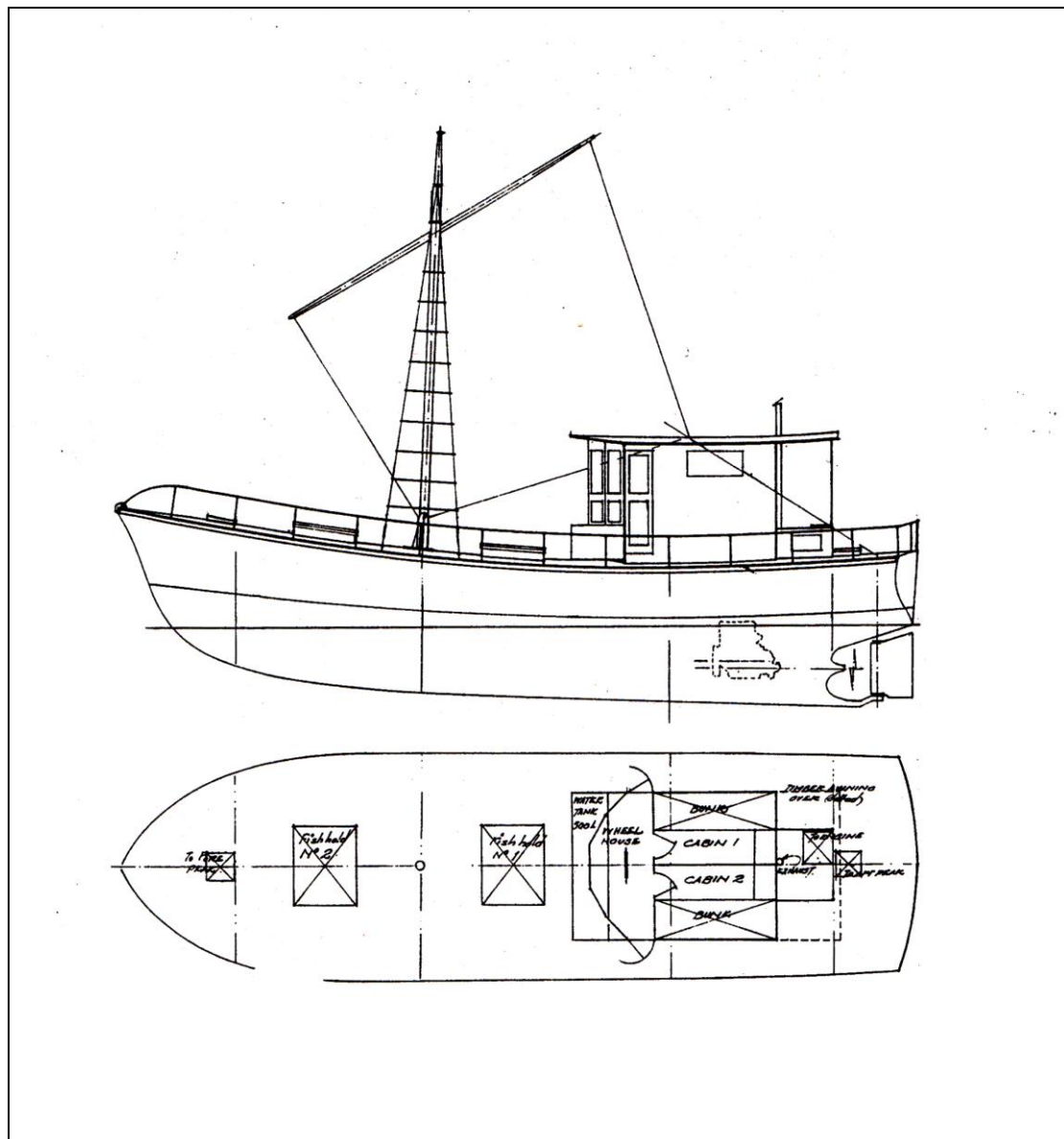
Designed for island trading, with large hold, six permanent berths, saloon, galley and w.c.



Indonesian 41' fishing boat

L.O.A. 41'0" (12.5m)
Beam 11.8' (3.6m)
Displ. 39,870 lb (18.6944 tonnes)
Engine 16 – 25 hp@
Prism. Coeff. 0.5614

This vessel was drawn to meet the particular requirements of an economical vessel for developing countries: an easily driven hull requiring minimum power; simple construction; minimum accommodation.



Truk Project No. 2 60' passenger/fishing/cargo vessel

For Catholic Social Action Centre, Truk, Caroline Islands

