

Nomination Document
for
Engineering Heritage Recognition
by
Engineers Australia Engineering Heritage Committee
of

BARQUE SV *JAMES CRAIG*



Restored SV James Craig in full sail - post 2000



SV James Craig abandoned hull Recherché Bay 1972

by Douglas Boleyn

Sydney Engineering Heritage Committee
October 2015

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1. Introduction.

As an island continent, Australia since 1788 has been a nation heavily reliant on shipping to maintain its links with the rest of the world and to access ports around its extensive coastline. The commercial success of its industry and movement of people - in particular immigrants, would not have happened without effective maritime services.

The perfection of sailing ships and steamships occurred more or less simultaneously, beginning well before the mid-19th century, when the Tonnage Law of 1836 revised the measurement system to eliminate tax advantages for full-bodied ships. The bluff shaped bows of these vessels that were the first type of vessel to engage in the Australia trade gave way to vessels with sharper bows, streamlined hulls and the yards were constructed so they would brace around more with sails filled and allow closer sailing to the wind.

It was at this time, in 1873 that Thomas Dunlop a Glasgow merchant and ship owner commissioned the construction of one such vessel - the *SV [sailing vessel] James Craig* which was destined to be one of the many "workhorses" that criss-crossed the seven seas to service the commercial needs of the British Empire.

Over the 43 years she plied the trade routes of the world carrying general cargo she rounded Cape Horn 23 times, completed the round trip across the Tasman Sea 35 times and traversed Bass Strait many more times.

The *James Craig's* design and construction were not out of the ordinary nor was she a significant vessel in any way. But as an outcome of the application of functional design and current technology of the day she is representative of quality construction of similar vessels built in the shipyards of Britain, Germany and the United States.

By the 1880s steam-ships had depressed sailing ship freights permanently. This left to sailing vessels the transport of bulk cargoes to and from ports that had limited facilities and where rapid turn round was not important. In turn this led to the steady decline in numbers of sailing vessels. During World War 1 German submarines dispatched all but a few relics of the already diminished fleet leaving only a few sailing ships to serve out-of-the-way ports such as the South Australian York Peninsular and its grain trade.

The *James Craig* is now the only 19th century vessel of its type in survey left in the southern hemisphere and is one of only four operational 19th century barques left in the world. [*World Ship Review No.25 September 2001*]

The service life and history of the *James Craig* paralleled that of many similar vessels as noted in **Basic History** section and Appendix 6.

What is significant in the life of the *James Craig*, unlike many of its companion sailing vessels of that era, is that it is a survivor only because of the dedication of philanthropists and members of the Sydney Maritime Museum Limited - better known as the Sydney Heritage Fleet (SHF). The SHF rescued the hull from its 'graveyard' in Tasmania and worked unceasingly over three decades to restore the vessel – always in accordance with the highest standards of workmanship and heritage philosophy [Appendix 9 and Ref 10 and 11] That in itself is a story worthy of recognition.

Ships are expensive and complicated to conserve, and when they are obsolete, difficult to re-engineer for other roles without significant destruction of historic fabric. The SHF successfully avoided the latter possibility.

The *James Craig's* restoration involved substantial replacement of her hull components, design and manufacture of above deck components that were missing and equipping her with safety measures required by maritime safety authorities - the latter being necessary so she could be registered as a commercial sea-going vessel. Her restoration philosophy was always driven by the goals of maximum preservation of the remaining fabric and adherence to researched authenticity.

Through its intervention to restore the vessel as close as practical to its merchant sailing days, the SHF sought to sustain the inspiration that this vessel represented

Poet Laureate John Masefield writing about the *tall-ships* era in his poem *Ships*, ends with the stanza that wistfully states ...

They mark our passage as a race of men
Earth will not see such ships again

This statement is not entirely correct in respect of the restored *James Craig*; *the vessel* allows those who sail in her to gaze into a tracery of rigging, spars and a vast press of sail, and to experience a tangible link with the age of sail and Australia's maritime history

The restoration of the *James Craig* was recognised by the World Ship Trust [WST] with the vessel being awarded the World Ship Trust Medal; a level of recognition that is only accorded to iconic vessels.

Only four ships that have been accorded this level of recognition are in survey. Appendix 6. She is the only ship of the four that regularly goes to sea.

Recommended Level of Recognition

Following its assessment against the prescribed heritage criteria it is considered that the restored SV *James Craig* is of outstanding engineering heritage significance to the nation. Accordingly, it is recommended that it be recognised as an **Engineering Heritage National Marker**.

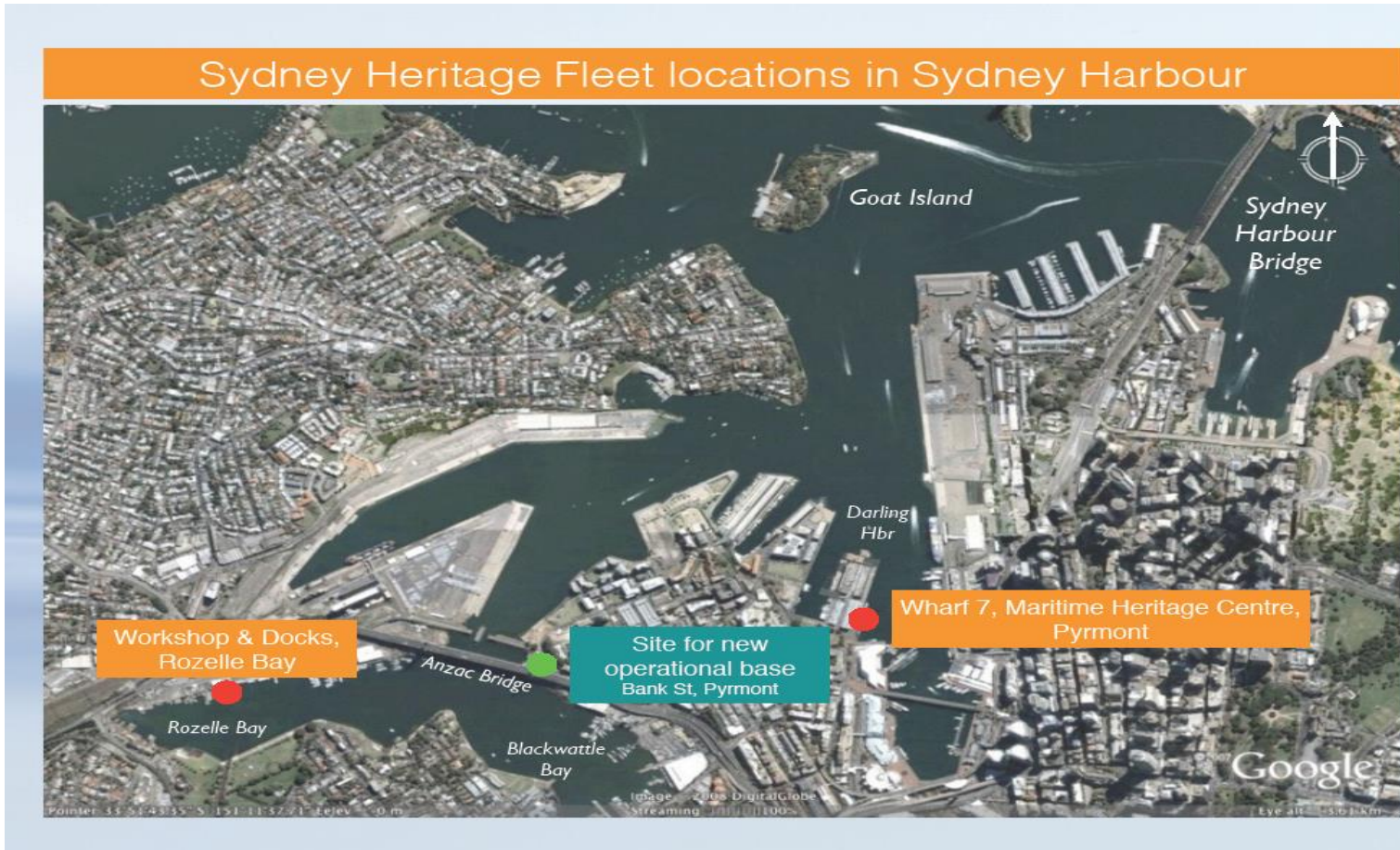
Note:

* The organisation that is currently known as the Sydney Heritage Fleet and is legally registered as Sydney Marine Museum Ltd trading as Sydney Heritage Fleet. It was incorporated as *Lady Hopeton* and Port Jackson Steam Maritime Museum Limited on 3 December, 1965. The organization went through a number of name changes - The Sydney Cove Waterfront Museum Limited [1973] then Sydney Cove Waterfront Museum Ltd. in 1977 and finally in April 1985 to its present name.

A trust - The Sydney Maritime Museum Custodian Limited owns the SV *James Craig*. This trust is legally bound to the Sydney Maritime Museum by way of a *Memorandum of Understanding*. It was this trust that had the responsibility for the restoration of the *James Craig*. For the sake of simplicity, generally the author has used the term SHF for all these entities throughout this document.

2. Location of *James Craig*

When not at sea or in another port, the *SV James Craig*, unless she is undergoing repairs at the SHF work site, is moored at Wharf 7 Darling Harbour, Sydney Harbour.



Note:

The SHF Dock and Workshops - where repair and restoration work is carried out on the SHF vessels is currently situated in Rozelle Bay Sydney Harbour. In the next few years the base will be relocated to Bank St Pyrmont - under the Anzac Bridge

3. Basic History*for more detail refer Appendix 2 History Time-Line of James Craig*

SV [Sailing Vessel] *James Craig* was constructed as an iron sailing ship by Bartram, Haswell and Company shipbuilders of Sunderland ¹ England at their yard, to the order of Glasgow grain merchant and shipowner Thomas Dunlop for a cost of £11,375. She is a barque – square rigged to main and fore masts with a spanker on her mizzen mast - one of many such vessels constructed around this time to take advantage of the flourishing maritime trading opportunities of the day. The order for her construction was placed some time in 1873, with the ship launched on 18 February 1874 as the *Clan Macleod* ².

She was assigned British Registration Number 68086, given Signal Flag Hoist MRJV and was granted a Lloyds 100 A1 classification ³.

The shell plating method used in her construction was the 'sunken and raised' system' with the outer iron strake plates horizontally overlapping the inner plates. Each plate is riveted to the frames and stringers - the outer plates having a liner inserted between the frame and the plate. Vertical plate ends were butted flush and riveted with internal butt straps, thus providing a streamlined hull. Watertightness is achieved by 'caulking' the edges of the plates by hammering their edges to seal any gaps.

The reverse angle irons on floors and frames extended across the middle line to the hold beam stringers and gunwale alternately. There was provision for a boarded 'tween deck and a lower floor at keelson level. Access to the hold was by one of 3 hatches: main, fore and quarter.

She had only one bulkhead reaching from the floors to the upper deck and secured between double frames. This collision bulkhead divided the forepart of the hold from the forepeak and was designed to contain in-rushing seas in the event of a bow collision.

She was the first of what became Thomas Dunlop & Sons'- later Queen shipping line, and was the first of his iron ⁴ ships constructed. She was designed ⁵ for world-wide tramping - contracting to take on board cargoes of any nature and to transport them to any nominated port.

The Sunderland Times of 20 February, 1874 said of her - "*she was fitted with all the latest improvements in the trade*".

From April 1874 she was owned by a syndicate of eight holding 64 shares with Tomas Dunlop retaining 16 shares.

The *Clan Macleod* commenced her maiden voyage on 6 April 1874 carrying English coal around Cape Horn to Callao, Peru and then sailed further up the west coast of the Americas to Portland, Oregon from where she returned home around the Horn without incident to Britain loaded with flour and wheat, arriving on 10 July 1875.

She sailed to Karachi, India two months later with a load of coal to trade for grain and seed.

On her third voyage the *Clan Macleod* sailed into Australasian waters on her way to Otago, New Zealand with a general cargo. It was a voyage plagued by disaster: with a cargo of wheat, on her return voyage via the Horn the ship's rudder became loose and she lost her long boat and some spars. This plus burst hatches and the fire hazard of an overheating grain cargo, necessitated a stop at Rio de Janeiro Brazil in what would be the beginning of a lifetime of maintenance and repair.

1. Sunderland was at the time among the biggest shipbuilding ports in the world with 65 shipyards on the River Wear in the 1840s. By 1851 over 1000 vessels called the port of Sunderland home. *Ref 17*
2. She was named in honour of Dunlop's late pastor Norman Macleod DD *Ref 17*
3. According to Survey Report 12470 – of iron plating, 'well wrought [although a little rough] the workmanship is generally sound'. *Ref 17*
4. After 1877 steel as opposed to wrought iron [iron] was used for ship hulls, but when the *Clan Macleod* was built in 1874 iron plating still prevailed. The ½ inch thick steel plates were riveted onto iron frames and stringers, as they would be until the 1940s when welding replaced riveted construction. *Ref 17*
5. The *Clan Macleod* while similar in appearance to the earlier clipper ships was designed as a workhorse to be strong, reliable and suitable for a wide range of cargoes. *Ref 17*

Clan Macleod's fourth voyage saw her carrying general cargo around the Cape of Good Hope to the Dutch East Indies [Indonesia] and returning to Queenstown [Cobh], Ireland with a cargo of sugar taking the same route.

It was her fifth voyage that finally brought the *Clan Macleod* to an Australian port when she docked in Brisbane on 10 August 1879. [Details of her cargo are given in Ref 2.]

The *Clan Macleod* was a busy ship and did her job well; two of her most notable passages being 113 days from Portland, Oregon to Queenstown, Ireland in 1879, and 28 days from Kobe, Japan to Portland, Oregon USA.

She was away from her home port Glasgow for nearly two years from 1884 to 1886 on a voyage that took her twice around the Horn with stops in Oregon, USA, South America and Rangoon, Burma.

During her time under ownership of Thomas Dunlop & Sons she made 11 voyages between 1874 and 1887 rounding the Horn 15 times.

Comment: the SHF website for the James Craig provides details of all her voyages showing the route taken, cargo and ports visited for the times she was owned by Thomas Dunlop, Roderick Cameron, Joseph Craig, and Henry Jones.

In 1888 Thomas Dunlop & Sons' *Queen Line* was in the process of replacing its older sailing vessels, with the more profitable steam ships⁶ and sailing vessels four times the size of the *Clan Macleod*. The *James Craig* was sold to Russell and Co ship builders of Glasgow in part payment for a larger sailing ship that they were building. Russell later sold her on to Sir Roderick Cameron and she sailed to New York to join his Australian Pioneer Line, remaining in registration at her original home port to meet her new Canadian owner. As part of his Australian Pioneer Line of sailing ships she traded between the east coast of the United States and Australia and New Zealand with the occasional voyage to Britain, regularly circling the globe via the Cape of Good Hope and back around Cape Horn to Boston, Massachusetts, USA, for a further 11 years.

The *Clan Macleod* docked in Brisbane a second time in 1892, and made her first visit to Melbourne to take on a cargo of wool. She was back in Brisbane again in 1895 for her last load of Australian wool. Otherwise, her usual antipodean trade was with New Zealand, calling in at Wellington, Auckland or Lyttlelton, often with a load of kerosene to exchange for kauri gum and flax. In 1891 she made a notable passage of just 75 days between Wellington and Boston USA.

By 1899 the *Clan Macleod* had sailed around the Horn 23 times.

Ownership of the *Clan Macleod* changed on 15 August 1899 to Joseph James Craig an Auckland, New Zealand shipowner and timber merchant and sailed under the J and J House flag. *Clan Macleod* arrived in Auckland, her new home port, on 23 February 1900 having sailed from New York via Newcastle, NSW and entered the trans-Tasman trade; her Horn rounding days were over.

Over the next 11 years she plied across the Tasman Sea no less than 35 times, typically with coal from Newcastle and bringing timber back from New Zealand. Her first visit to Sydney was in 1902; her first to Adelaide was in 1904.

On 14 December 1905 she was re-named *James Craig*, after the owner's son.

Once again in her life, sail gave way to steam and the *James Craig* was sold to the British New Guinea Development Company for £2,000 registered in Sydney on 19 June 1911 and arrived in Port Moresby on 30 July, 1911. There she was de-rigged and stripped of her jib boom, top gallant masts and all but her main yards and for the next seven and a half years, she served as a storage hulk for copra.

But for World War 1 her story would have ended here. During World War 1, there were significant losses to the merchant marine from enemy action, resulting in a sharp decline in available shipping tonnages – both steam and particularly the slower sail that was an easy target. Because of the acute shortage of shipping after the war, she was again brought back into service and in August 1918 was sold to Henry Jones and Company of Hobart. She was delivered to Sydney to be re-rigged in her original configuration at Mort's

6. World-wide steamship tonnage exceeded sailing ship tonnage by about 1887. From a peak of about 9 million tons in 1892, the total tonnage of sailing ships worldwide steadily declined to almost nothing over the next 40 years. Ref 17

Dock for service as a trading ship for Henry Jones IXL the well known jam manufacturer and ship owner of Hobart . In her IXL days she made numerous runs across Bass Strait to Melbourne, Sydney and other mainland ports and Auckland. Her registered port was now Sydney.

During this time the later well respected sailing ship captain and prolific maritime author Alan Villiers, crewed on the *James Craig* and noted in his book *By Way of Cape Horn* that as 'a lovely little vessel 180 feet long and 671 gross tons' she is a 'lively, lovely and highly responsive *thoroughbred of a ship*' and '*she tacked like a yacht and ran like a greyhound*. [Appendix 10]

In 1918 on her return from New Guinea she had to put into Gladstone for repairs and then proceeded to Sydney for an extensive overhaul and recommissioning. However, this work had been badly done and in 1920 she had to be towed to Sydney for extensive repairs and refitting because of storm damage which opened up her topside seams - *the uppermost plates of her hull*.

By 1922 the world's steamship stock had recovered from its wartime depletion and the older steamships engaged to carry cargoes that were once the province of sailing vessels. That left the remaining sailing ships to carry cargoes available at ports with limited facilities and where time of delivery was of little consequence.

In 1921 following an inspection by a Lloyds surveyor in Melbourne, the *James Craig* was condemned and she was taken to Hobart and there she was partially rigged down.

As a result, the retirement of the *James Craig* from active sea-going service was inevitable and became permanent when the coal cargo she had come to Recherche Bay [on the remote south-east coast of Tasmania] to collect failed to show up. The Catamaran Coal Mining Company purchased the *James Craig* in late 1925. Her last trip was under tow to Hobart to be converted once again to a hulk⁷, and then returned to Recherche Bay to serve as a bunker for the coal brought to the wharf from the mine. Within two years the vessel was found to be unsuitable for this function, so she was towed up to Coal Pit Bay and anchored near the French anchorage of 1792. *There is a photo of her in her partially de-rigged state in Appendix 3*

It was the intention of the Catamaran Coal Mining Company - a subsidiary of Henry Jones, that she now be used as a dumb barge being towed to Hobart when filled coal from the Catamaran Mine. Unfortunately this never happened. When the Catamaran Mine closed in the early 1930s the vessel being of no more use was left anchored in the bay. During a severe storm she broke her anchor line and being considered a danger to shipping, she was towed to a shallow part of the bay and scuttled by blowing a hole in her stern to make sure she settled in the mud⁸. There she remained - abandoned, forgotten until 1972.

Circa 1933, a Hobart scrap metal dealer bought the Catamaran mine which to his surprise included the stranded *James Craig*.

Over the next 40 years she was vandalised by locals including fishermen who looked on her as a resource for plate and obtained this by using explosives leaving more and bigger holes in her hull. During this time, the deck and other timbers were destroyed either by decay or by fire. Her hold was full of coal and coal sludge.

In January 1966, the *Lady Hopetoun and Port Jackson Marine Steam Museum* [now the Sydney Maritime Museum - now known as the Sydney Heritage Fleet [SHF] bought the NSW Maritime Services Board *Lady Hopetoun* - a retired Vice-Regal steam launch for \$600, and hoped to acquire a 'tall ship' to complement this and other vessels in the fleet it owned at the time. The SHF was later to acquire the 1902 steam tug *Waratah*, the 1927 steam ship *John Oxley* and ex 1912 Sydney Harbour ferry *Kanagra*. This was to form a collection for the Museum to be located at Campbell's Wharf in Sydney Harbour. After a world-wide search the Museum was advised that the hull of the *James Craig* was lying abandoned and derelict in Recherche Bay.

7. By the late twenties, there were over 120 former sailing ships serving as lighters in Australia. *Ref 2*

8. This prevented her from becoming a floating hazard to other ships, but it also meant that much of the iron hull was protected from the corrosive effect of salt air by the quiet water in which she was now submerged. In this it was serendipitous as, unlike the *James Craig*, a sister ship of the Craig Line the *Jessie Craig* was sunk as a harbour breakwater and was destroyed by wind and waves in only a few weeks.

In January 1972 the *James Craig* was inspected by Alan Edenborough a member of the now SHF and later in the year by a ship surveyor who reported to the Museum Board that in his opinion she could be salvaged. He then negotiated the purchase of the *James Craig* on behalf of the SHF from John Hood for an undisclosed price which was only to be disclosed on the death of Alan and John.

A resourceful and determined salvage crew went to Recherche Bay and with the help of locals did what no one was sure could be done in such a remote location only accessible by sea. Following considerable effort to make the hull seaworthy the ship was refloated on 24 October, 1972 - a significant engineering task in itself.

On 18 January 1973 she was towed to Hobart to the Powder Wharf with the intention of slipping her but this did not happen. There the ship languished for nearly 10 years with minimal inappropriate work being carried out. Because of the difficulties experienced in carrying out the restoration work in Hobart with the project being managed from Sydney a decision was made to take the ship to Sydney after completing necessary repairs to make her seaworthy for the tow. She arrived in Sydney Harbour on 18 January 1981 where she was berthed at the Museum's new premises - the former Dunlop Works Birkenhead Point.

There restoration commenced work on the hull. An inspection of the hull showed many of the plates - mainly those making up the strakes above the wind and water line, would have to be replaced. This work was accelerated in 1985 when the hull was placed on the SHF Fleet's new purpose-built pontoon slave dock. Over the ensuing years hull and topside work continued at various sites on the Sydney waterfront with the ship finally floated off the slave dock in 1997. The lower main and fore masts were manufactured using the original iron lower masts as patterns. New yards, upper masts, mizzen mast and other spars were also made at this time.

The restored hull was relaunched in February 1997.

With the new standing rigging complete, the lower masts were stepped in 1998.

Engines, shafts, gearboxes and propellers were fitted during 1998 at the Garden Island Naval Dockyard.

On completion of the fitting out she commenced sailing trials in 2000.

A Class 1C - in commercial survey, certificate was issued by the Waterways Authority on 22 June 2001 which meant the *James Craig* was now able, observing certain conditions, to take paying passengers to sea

Comment: An excellent diary of the recovery and restoration journey is given in Ref 17 and commentary in Refs 8, 9 - a copies of which are included in Appendix 10

Following the recovery of the *James Craig* and its coming to Sydney Harbour there were the inevitable internal arguments about how the SHF should proceed with her restoration. One school argued that the *James Craig* should be restored authentically to its 1874 configuration, and become a floating museum exhibit like the *Polly Woodside* in Melbourne and other similar vessels around the world. The counter argument that prevailed was that the *James Craig* would be restored to sea-going condition and so attract paying customers. This meant that she would have to be in-survey and as a consequence would have all the safety equipment of the modern age on board; but it would be done in a sympathetic manner. Fortunately the latter argument prevailed.

A Board of Governors was set up to operate independently of the Museum and the restoration project was guided by a Memorandum of Understanding drawn up between the Sydney Maritime Museum Ltd and a new entity The Sydney Maritime Museum Custodian Limited charged with the responsibility of restoring the *James Craig*.

The word *restoration* rolls lightly off the tongue but the undertaking presented many problems, whichever option was adopted, foremost :

- There were no specific standards or guidelines extant in Australia to control the restoration of historic vessel.

The search for appropriate standards identified a series of standards and associated guidelines for the restoration of historic ships in the United States - *The US Department of the Interior Standards for Historic Vessel Preservation Projects - with Guidelines for Applying the*

Standards. [Appendix 9 gives an overview of the standard]. Published in 1990, they were recent, comprehensive and reflected the body of knowledge existing in the US, a country that had more historic vessels in preservation than the next country by a factor of 10. This document was adopted by the Restoration Project Team as the "bible" for determining what had to be or could be done and to what standard.

- The vessel was in a poor state and no extant drawings were available. Also the vessel had had a number of unrecorded changes over its lifetime; so the question was to what configuration was the vessel to be restored.

From the outset it was agreed by the SHF Project Team that all restoration work would be based on verifiable historical and physical evidence, where available [Article 9 Ref 10]. Using this approach, it was decided to restore the vessel to a known configuration because such information was readily accessible. The period selected was the last decade of the 19th century where fine photographic images were available of the *Clan Macleod* in New York harbour in sea-going condition.

As an iron sailing ship, the defining characteristics of the *James Craig* arise from a range of its features; the slender clipper-bowed riveted hull, the soaring masts and spars and the intricate web of its rigging. In 1972 apart from the hull the only parts of the ship that remained were the lower main and fore masts and some equipment such as windlass and bilge pumps. Much of the hull was severely weakened by corrosion. All these elements have been reconstructed to the known earlier configuration - often scaled off photographs, while retaining a significant proportion of historic fabric, using appropriate materials. While no conjectural or architectural elements have been added, certain generic items have been replaced. Where items were absent or deemed non-repairable, they were replaced by either by items salvaged elsewhere or items manufactured to the type, pattern and size appropriate for the period. The level of conjecture has been limited to the use of standard configuration for generic missing components such as the windlass - which needed reconstruction, and the use of a ship's wheel from a sister ship.

In short, the requirements of Items 6 and 7 of Ref 10 *refer Appendix 9* have been complied with.

- No ready workforce was available that had the necessary trade skills to accurately replicate the vessel's 19th century construction.

The SHF already had a number of volunteers who were skilled in the restoration of vessels it owned but the work needed a much greater workforce. Initially the replating work was carried out by a small gang of paid tradesmen. Then more people volunteered their time and others came from a wide range of backgrounds and skill sets including the Australian Army which provided men to lay and caulk the main deck, and day-release prisoners who were involved in riveting.

Because the restoration work necessitated the utilisation of traditional skills such as riveting, caulking, sail making and rigging, it was vital, if the work was to proceed to completion in an acceptable time frame, that the numbers in the potential skilled workforce would have to be trained. "Apprentices" were trained formally and by the old apprentice system whereby skilled operatives lead the apprentices until they could work independently or as part of a dedicated team.

The skills acquired by the new volunteer workforce are now being applied for the restoration of other SHF vessels.

- To complete restoration of the *James Craig* to a working in-survey vessel rather than a static exhibit. [as had been the fate of many others of her kind]

The ship as restored demonstrates some concessions to the 21st century and the need to provide a financial return. To obtain the necessary statutory approvals to have paying passengers aboard to go to sea or even cruise the harbour the vessel had to be in survey. To this end a number of modern safety appliances and treatments have been installed to comply

with regulations for fire protection, auxiliary propulsion, watertight integrity, electrical and communication systems and buoyant apparatus. eg.

- suitable fire extinguishers are displayed overtly .
- watertight aluminium hatches have been let in to the hatch covers for access purposes.
- navigation lights, radios and radar have been unobtrusively installed
- climbing safety systems were installed and crew required to be fitted with harnesses to ensure safe access aloft.
- 3 inflatable life rafts

- The envisaged level of restoration would take money - lots of it.

A fundraising arm of the Restoration Committee was set up. Activities such as numerous fundraising dinners, auctions, lotteries and the like followed. Many arms were twisted to extract money and personal and business contacts approached to assist in often nominated ways. Many corporations and high profile people with maritime connections were cold-called. A number of the people made significant loans but realizing they would never be repaid turned them into donations.

While a significant amount of money was raised by this approach many firms, such as Transfield, offered to carry out work with their workforce facilities and expertise or to supply needed items and tools at cost. Many firms also elected to donate money to the cause.

As the SHF was a registered charity donors could claim tax deductions. So it could be said that the wider taxpaying public also contributed to the restoration cost.

To ensure the James Craig remains in survey a best practice preventative maintenance program has been drawn up by the SHF based on successful maintenance programs for other operational vessels in the fleet.. Income from her activities is used to meet the costs associated with this program.

At the suggestion of SHF the Australian Maritime Safety Authority [AMSA] agreed to include a new recognition classification - heritage vessels.

A Class1C survey certificate was issued on 22 June 2001; the James Craig was now *in commercial survey*.

As to be expected, there were certain restrictions attached to the survey certificate:

- sailing in daylight hours restricted the compliment to 120 persons and to remain within 30 km of the coast or port of safety
- special permission was required to cross Bass Strait

The current uses of the James Craig comprising alongside inspection, and harbour and ocean cruising are compatible with her historic qualities and appearance.

4. Nomination

The Administrator
Engineering Heritage Australia
Engineers Australia
Engineering House
11 National Circuit
BARTON ACT 2600

Nominated Item: **Barque SV *James Craig***

Nominated For: **recognition under EA Engineering Heritage Recognition Program**
- the level of recognition to be determined

Location: *when not at sea or at another port :*
Maritime Heritage Centre Wharf 7 Darling Harbour, Pyrmont, NSW

Owner: **Sydney Maritime Museum Custodian Limited**

The Owner has been advised of this nomination, and a consenting letter of agreement is attached - Appendix 1

Access to Site: *Land* **off Pirrama Road Pyrmont**
Water **Darling Harbour seaward of the Pyrmont Bridge**

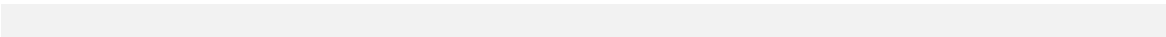
*Note: Wharf 7 Darling Harbour is accessible to the public.
When the vessel is wharfside, it is open for inspection at notified times*

Nominating Body: **Engineers Australia, Sydney Engineering Heritage Committee**

Glenn Rigden

Chair Engineering Heritage Committee Sydney

Date



5. NOMINATION SUPPORT INFORMATION
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5.1 Basic Data

Item Name: Barque *James Craig*

Former Names: *Clan Macleod*

Location: The ship is an item of moveable heritage

Address: When not at sea or visiting other ports, the ship is moored at Sydney Harbour Maritime Heritage Centre, Wharf 7 Darling Harbour - off *Pirrama Road*, Pyrmont, Sydney, NSW

Local Government Area: Unincorporated waterway Sydney Harbour

Owner: Sydney Maritime Museum Custodian Limited

Current Use: Museum ship - part of Sydney's Maritime Heritage Precinct.
Working ship focusing on the maritime heritage of the "tall ship" era of the late 19th C
Provision of an historically accurate and evocative sea-going "tall ship" sailing experience for the paying public

Former Use: Commercial cargo vessel and storage hulk.

Designer: Bartram, Haswell and Company, Sunderland, England

Builder: Bartram, Haswell and Company, Sunderland, England

Year Started: March? 1873

Year Completed: *launched* 18 February 1874

Physical Description:

The *James Craig* is a flush-decked iron hulled [*now after restoration approximately 25% iron and 75% steel*] sailing ship of riveted construction. It has a raised quarterdeck, a clipper bow with a bowsprit and counter stern. An unbalanced iron rudder is fitted which is controlled by manual steering gear mounted on the quarterdeck. Rigged as a barque, the ship has three stepped masts - fore, main and mizzen. The fore and main lower masts are of riveted steel construction and the upper masts and mizzen mast of timber. Likewise, the lower yards are of riveted steel construction and the upper yards are of timber. All other spars are timber. The ship is rigged in its 1890s configuration, with a suite of 21 sails including split topsails, 3 jibs and 6 staysails. A timber deckhouse for crew accommodation, mess and galley is located immediately abaft the foremast with a drum type windlass fitted to the forecastle. The master's accommodation is aft including a bedroom, saloon and bathroom. The ship retains her 'tween deck, accessed by companionways from the aft and fore hatches, two small ones fore and aft and a large hatchway midships. The 'tween deck floor could be removed to access the floor below to allow cargo to completely fill the hold from the floor to the underside of the deck.

A new neo-classic figurehead – a three quarter length woman - is fitted along with decorative trailboards. The hull is painted black overall with grey anti-fouling, red boot topping and draft marks in white-painted Roman numerals.

Her statistics are	gross tonnage*	671 tons 0 cwt	
	hull length*	179 feet 5 ins	[54.8m]
	hull beam*	31 ft .3 ins	[9.5m]
	draft laden	17.5 feet	[5.3m]
	sail area - all 21 sails set	11,840 sq ft	[1100sq m]
	mainmast height above deck	108 feet 3 inches	[33.0m]

**These figures are taken from the Bartram, Haswell & Co Register. This register also names the suppliers of materials used in her construction*

Further statistics regarding the ship as constructed and in its current state are given in Appendix 5

5.2 Physical Condition:

As a result of her meticulous restoration and the ongoing commitment to a high standard of maintenance by the SHF artisans and the volunteer crew, the condition of the hull, masts, spars, standing and running rigging and appurtenances are all in excellent condition; this is a requirement of the NSW Roads and Maritime Services for the ship to be Class1C survey

5.3 Modifications:

Because of aggressive marine conditions, the service life of vessels such as the *James Craig* was only of the order of 20 to 30 years [cheaper and faster competition also played a role in their demise] Over her working life of 60-plus years nearly everything above-deck would have been rebuilt or replaced, particularly during voyages that took her along the '*Roaring Forties*' and around the Horn where there was every prospect of sails, masts, spars, rigging, accommodation, ships boats and the like being damaged or swept away

No major modifications have been recorded other than the removal of the standing rigging to convert the vessel to a hulk. However, it is likely that the *James Craig* had a number minor practical changes during her lifetime - for example, the incorporation of new labour-efficient technology to allow the reduction of manning levels, modifications to accommodate different cargo needs and to accommodate changing mandatory safety requirements.

From what we know, none of these changes altered the main body of the vessel – its shape, proportions and structure of its hull.

There are no extant construction drawings for the *James Craig* and all that remained from the hulk raised at Recherche Bay was a damaged holed hull and lower masts. She has been restored to a configuration based on photographs taken by Alice Austen in New York harbour in the 1890s.

The restoration of the *James Craig* involved the repair of the fabric - where this was possible and the replacement of missing components. At all times the decision as to what was to be repaired and how the missing items were manufactured was guided by the commitment to ensure authenticity in compliance with the *Standards for Historic Vessel Restoration Projects* issued by the US Secretary of the Interior. [Ref 5]

No conjectural features or architectural elements have been added and where elements were absent, they have been manufactured based on the type, pattern and size that was appropriate for the period. Wherever possible and practical, original materials have been sourced and used.

The following changes have been made to make the ship suitable for its current use as a sea-going passenger-carrying vessel.:

Repair/ Refurbishment:

- Refurbishment of steering system including rudder, rudderpost, tiller and rudderhead
- Repair of the lower masts and addition of sundry missing fittings

Renewal/ Replace missing items originally on the Ship:

- Renewal of most of the hull plating above A, B, C, and D [lower] strakes - i.e. from the wind and waterline up, with mild steel plate
- Renewal of 50% of main frames, 100% of reverse frames, 100% of stringers with steel sections
- Renewal of keelson
- Partial renewal of collision bulkhead
- Replacement of several deck support pillars
- Sandblasting and painting of all metal both exterior and interior
- Renewal of the lower and upper main and fore masts
- Renewal of all yards and components
- Renewal of the bowsprit including the dolphin
- Installation of new mizzen mast and spars and sundry fittings
- Design and installation of new standing rigging
- Design and installation of new running rigging, including blocks
- Laying and caulking new wooden decks
- Reconstruction of crew, officers and captain accommodation
- Reconstruction of aft companionways to comply with safety regulations

- Installation of new deck beams, hatch combings and covers
- Carving and installation of a new figurehead
- Provision of new steering wheel *ex sister ship Jessie Craig*
- Capstan
- Mooring bollards

Modification

To comply with the requirements of Australian Maritime Safety Authority and NSW Waterways Authority to meet 21st century safety requirements, the following additions have been made sensitively and without detracting from the heritage value or operational needs of the ship;

- Installation of a modern diesel propulsion system
- Installation of modern navigation and communication systems
- Provision of 3 inflatable life rafts and an inflatable rescue seaboat with outboard motor
- Construction and installation of 2 replica ships boats
- Installation of a fire suppression system
- Installation of an electrical system - alternator, emergency power supply, access lighting, navigation lights
- installation of an electric winch and stockless anchor
- Installation of modern amenities in the fore hold area
- Automatic bilge alarm and pumps
- Cathodic protection
- Modern heads
- Catering facilities

Refer to Basic History section of this nomination and Appendices 2 and 5 and Ref 17 .

Comment [Ref 8]

"The nature of the restoration work that has been carried out since 1980s can be categorised as 'conservation by a combination of restoration and maintenance". Where practical and possible, restoration of the James Craig has been carried out in accordance with The [US] Secretary of the Interior's Standard for Historic Vessel Preservation Projects and the Barcelona – European Charter for the Conservation and Restoration of Traditional Ships in Operation. The SHF focus has always been driven by the goal of authenticity.

5.4 Historical Notes: *Refer to Basic History section and Appendix 2 of this nomination document for dates and details.*

5.5 Heritage Listings:

Name :	World Ships Trust's International Maritime Heritage Medal for authentic restoration
Title:	Barque <i>James Craig</i>
Number:	Award 23
Date	7 March 2003

[Nomination for inclusion of the James Craig on the NSW State Heritage Register is in preparation.]

6. ASSESSMENT OF SIGNIFICANCE

6.1 Historic Phase:

The *James Craig* is historically significant because :

- She is the most significant "tall ship" of the 19th century remaining in the southern hemisphere and is the oldest ship in Australia capable of being sailed offshore.
- She represents the type of vessel engaged in world-wide commercial tramp trading activities in the latter part of the 19th century.
- She is associated with coastal and Trans-Tasman trading at the time of Federation and earlier.
- she was Thomas Dunlop's first iron sailing ship and the first to have the prefix "Clan", a tradition lasting over a century.
- She eventually came into the ownership of a long-lived Australian enterprise - Henry Jones and Company - and was used for the maritime carriage of their produce.
- She demonstrates the end and ultimate expression of an era in transport technology – the fine-lined late Victorian square-rigged sailing ships.
- She was associated with the first a major sea-going sailing vessel in Australia to be preserved by voluntary effort.

6.2 Historic Individuals or Association:

The *James Craig* is significant because:

- She is associated with a number of important ship owners of the Victorian era - Thomas Dunlop owner of the Queen Line, Russell & Co ship builders and brokers, Sir Roderick Cameron owner of the Australian Pioneer Line, extensive fleet owner J J Craig, British New Guinea Company, and Henry Jones and Company.
- She is a memorial to the many nameless people who 'went down to the sea in ships' – a tribute to the ships and men of the merchant marine of the world in the days of sail.
- Over its life as a sailing vessel, it visited a number of Australian ports, in particular in its Trans-Tasman trading days and spent the latter part of its working life in Australian waters.
- She is inspiring evidence of the dedication of those volunteers who have worked over the past fifty years to bring the Sydney Heritage Fleet to its present-day stature; a dedicated organisation of volunteers who have worked to save and preserve many magnificent heritage vessels that make up its fleet for the benefit of future generations.

6.3 Creative or Technical Achievement:

The *James Craig* is significant because:

- As a remarkable survivor, it demonstrates the design, materials and technical development of the iron sailing ship in the late Victorian period.
- Research and practical experiment carried out for its restoration has produced a store of knowledge and local insight into 19th century maritime skills that had all but disappeared. Such measures have produced an artisan resource well versed in these hitherto forgotten arts and now provides a workforce capable of using these acquired skills on other vessels in the fleet that need this level of intervention.
- The vessel has been reconstructed to a known former configuration. Although a large amount of new material has been introduced, the project is generally in compliance with

the *Standards for Historic Vessel Restoration Projects* issued by the US. Secretary for the Interior.

6.4 Research Potential:

The *James Craig* has high research potential by demonstrating:

- The design, materials and technology used to construct late 19th century iron sailing vessels.
- The re-rigged vessel is a technical record of materials and technology that was being used in the latter part of 19th century for iron hulled bulk carriers.
- The cargo carrying and handling technology and practice of the last period of commercial sailing ships that serviced the ports of the world.
- The revival and perpetuation in the modern era, of traditional maritime skills such as riveting, caulking, rigging, boatbuilding and sailmaking.
- Traditional sailing, seamanship and marine workmanship that are no longer part of regular maritime activity that at one time was essential to the development of Australia and NSW in particular.
- The conditions under which seamen in the late 19th C and early 20th C worked and lived on an ocean-going merchant sailing vessels.
- The cargo carrying and handling technology and practice of the last period of commercial sailing ships.

6.5 Social:

The *James Craig* is significant from a social perspective because:

- The restored vessel reveals the aesthetic, functional and historic value of ships that were once the only way goods were transported to and from the Australian colonies and around the world in the second half of the 19th century.
- She is a focal point of interest for people with a love of things maritime, especially the 'tall ship' era.
- She is of great significance to a large number of people who sought her recovery and worked on her, who have crewed on her voyages and supported her financially.
- She is called on to participate in community events such as Australia Day celebrations on Sydney Harbour.
- Along with the National Maritime Museum's vessels that make up the maritime heritage precinct of Darling Harbour, she is a significant tourist attraction and has captured the imagination of the thousands of people who have gone on board to learn her stories .
- The funding of the restoration work is associated with a level of philanthropy from individuals hitherto unseen in Australia for an item of moveable heritage. In the dollars of today, over \$20 million in money and kind has been spent on her restoration.
- She is associated with the development of industrial heritage preservation as a voluntary leisure pursuit among Australians.
- The training of volunteer artisans and crew and the very accomplishment of the lengthy restoration project has resulted in the re-learning of traditional skills.
- Willing participants can live their dream of crewing a sailing ship and assist with the crew in the management of the running rigging and other duties when at sea.
- The sight of the *James Craig* sailing on the harbour and out to sea has captured the public's imagination and has enhanced enthusiasm and interest in maritime heritage conservation.

- She demonstrates the conditions under which seamen of the late Victorian era lived and worked.

6.6 Aesthetic

The *James Craig* is of aesthetic significance because:

- Under her lofty billowing full press of sail, the graceful vessel, with her projecting clipper bow, streamlined hull and counter stern she perpetuates the 'landlubbers' nostalgic and romantic vision of the age of sail.
- Her reconstruction and re-rigging is in conformity with her original design, that being a classic small iron sailing ship of English late Victorian appearance.
- She represents an era of sail that is portrayed as glamorous and romantic, filled with hardship and courage, and inspires the skills of those who would see themselves as mariners.
- Her current use - alongside inspection, harbour and ocean cruising - are compatible with her historic qualities and appearance.

6.7 Representativeness:

The *James Craig* is of representative significance because:

- she is one of the very few examples remaining in commercial survey of the once prolific work-horses of late Victorian era iron-hulled sailing ships criss-cross the world's oceans in the late 19th and early 20th century.
- with her long low hull with clipper bow and rounded counter stern, she is a classic example of the ultimate - in both beauty and line - of the tall ships that were the last of the commercial cargo carrying sailing vessels.

6.8 Integrity/ Intactness:

The *James Craig* is of significance because:

- Over 25% of her original iron hull survives.
The condition of the restored hull and the standing rigging is in excellent condition – a requirement of the ship being in commercial survey
- The restoration of the derelict hulk and replacement of her lost features does not detract from the interpretation of its construction, the operational function of the ship or its visual attractiveness.

Note:

1. *By its very nature – a life in a harsh marine environment, the ship is a living structure and maintenance and replacement of items that are beyond their service life are an ongoing necessity.*
2. *Structural replacements have been made in mild steel as materials once commonplace such as [wrought] iron plate and iron wire are no longer available.*

6.9 Rarity:

The *James Craig* has rarity value because:

- She is one of the only four sea-going, 19th century barques remaining in the world in commercial survey and the only one in the southern hemisphere. [Ref 18] All other remaining vessels of the type are either unsalvageable wrecks or static exhibits which do not go to sea. refer Appendix 10
- She is a now rare example of a once common ocean-going merchant vessel that traversed the oceans of the world.

- She is one of three similar-sized, or larger sailing vessels in the world recognised by the World Ship Trust [Ref 13] ⁹ and is one of the few vessels of its type that are now largely only represented by literature, photos and painting; a touchstone of another era [Refs 12,14].

6.10 Other Points of Significance:

Other facts relative to the level of recognition for the *James Craig* are:

- *James Craig* is one of 29 vessels that have been awarded the World Ship Trust Medal for supreme achievement in the preservation of maritime heritage.
- The heritage significance of the *James Craig* has been recognised by government, industry and the Australian public through the donation of money, labour and goods in kind to a value in excess of \$20,000,000 for her restoration and conservation.
- *James Craig* is significant to NSW, not only because it visited a number of Australian east-coast ports, but because some of her in-service refitting, the planning for her restoration and the majority of the restoration work was carried out in Sydney, and Sydney Harbour is where she now resides.

6.11 Statement of Significance:

The barque *James Craig* is significant because :

- She is one of only four similar 19th century "iron" ships in the world still sailing, and the only one remaining in the southern hemisphere.
- She is associated with a number of important ship owners of the Victorian era - Thomas Dunlop owner of the Queen and Clan Lines, Russell & Co ship builders and brokers, Sir Roderick Cameron owner of the Australian Pioneer Line, extensive fleet owner J J Craig, British New Guinea Company, and Henry Jones and Company.
- She demonstrates and is representative of the technical development of the iron sailing bulk carriers of the Victorian period.
- She represents the type of vessel engaged in worldwide trade in the late 19th century that was essential to the settlement and development of Australia.
- She is inspiring evidence of the dedication of heritage volunteers generally and of the large group of volunteers who established the Sydney Heritage Fleet and whose work has saved and preserved many heritage vessels.
- Research and practical experiment during its restoration has re-discovered, revived and recorded 19th century maritime techniques and skills that will be of value in future maritime restorations and conservation work.
- The training of volunteer artisans and crew and the accomplishment of the lengthy restoration project has resulted in the re-learning of traditional skills.
- Her restoration has engendered pride in the wider Sydney community and in members of the Heritage Fleet.
- She perpetuates the 'landlubbers' nostalgic and romantic vision of the age of sail.
- She is associated with coastal and trans-Tasman trading at the time of Federation, eventually coming into the ownership of a long lived Australian enterprise, Henry Jones and Company for the carriage of its produce.
- She demonstrates the increasing awareness in the community of maritime heritage and a commitment to undertaking challenging heritage projects and acquire vanishing skills, as a leisure pursuit.

6.12 Comparisons:

There are only four operational barques from the 19thC still capable of sailing - the *Star of India* in San Diego, California [launched 1863], *James Craig* in Sydney [launched 1874], *Elissa* in Galveston, Texas launched in 1877], and *Belem* in Nantes, France [launched in 1896]. Of these , *James Craig* is the only one in the southern hemisphere, and is the only one of the four which regularly carries members of the general public to sea. [Ref 10 and Appendix 6].

A similar ship the *Polly Woodside* [Rona] 1885 of 648 tons, is marooned on the Yarra River, Melbourne and at the present time is in need of urgent maintenance to preserve its fabric.

In 2015 the gifted wooden hulled clipper *City of Adelaide* [launched 1864] arrived in Adelaide. It is a parlous condition and without significant funding is likely to remain in this state.

In 2003 the *James Craig* joined a handful of restored ships that have been awarded the World Ship Trust Medal joining other iconic vessels such as *Mary Rose* [UK 1510], *Vasa* [Sweden 1627], *USS Constitution* [USA 1797], *Great Britain* [UK 1843] and *Cutty Sark* [UK 1869] and square-rigged ships *USS Constitution* and *Charles W Morgan*.

She is a true restoration not a replica . Other Australian tall ships are either replicas such as the Bark *Endeavour*, ships built in the 20th century such as *Southern Swan* [previously *Our Svanen*], *Saren Larsen* and *One and All*, static museum exhibits such as *Polly Woodside* in Melbourne and *City of Adelaide* in Adelaide or abandoned unsalvageable wrecks such as the *Santiago* in Adelaide.

6.13 Recommended Category of Award: Engineering Heritage National Marker

7. Interpretation Plan

7.1 General Approach

A date for a recognition ceremony has not been finalised with the SHF..
The ceremony will be held on board the *James Craig*

In determining the information to be included on an interpretation panel it should be remembered when visitors are on board the *James Craig* there are always experienced and knowledgeable SHF volunteer guides who can tell them the story of the *James Craig* and answer technical questions - this is considered to be far better information source than any interpretive panel can provide.

However, it is acknowledged that it is important that when visitors are on board the ship they need to be aware that her engineering heritage has been recognised by organizations such as the World Ship Trust and Engineers Australia.

From conversations with the SHF President, it is unlikely that the SHF would be amenable to having more than the standard EA - EHA plaque installed on the ship but if they do agree to the installation of an interpretation panel, this is the suggested presentation [which would have to be signed off by the SHF].

7.2 General Attributes of the Interpretation Panel

1. Title **"Barque *James Craig*"**
2. Sub title **"Last surviving sea-going barque in the Southern Hemisphere"**
3. Logos of Engineers Australia and Sydney Heritage Fleet would be incorporated
4. 300mm diameter representation of the EHA marker plate would be included
5. Date and other details of the recognition ceremony would be included
6. Text to be 24 point Arial Bold or as suggested by a graphic artist.

7.3 The Interpretation Panel

1. Size to be nominally 350 mm wide x 400-500mm high
2. The panel to be manufactured vinyl film on aluminium with mounting holes
3. The panel to be placed on the *James Craig* in a prominent position such as the 'tween deck area

7.3 Suggested Panel Wording *154 words*

**Barque *James Craig*
The last surviving sea-going barque in the southern hemisphere"**

The barque *James Craig* launched in Sunderland England in 1874 enjoyed a long life moving cargo around the globe. She rounded Cape Horn 23 times and is the only remaining sea-going iron 'tall ship' in Australia – an epitome of the great age of sail. She is a rare example of the once common merchant marine trading vessels that plied the world's oceans to populate and provide the new and old worlds. Restored by volunteers of the Sydney Heritage Fleet and the generosity of firms and nameless people, The *James Craig* demonstrates the design, materials and technology used to construct late 19th century iron sailing vessels.

Her restoration is associated with the revival of traditional maritime skills and a level of philanthropy from individuals hitherto unseen in Australia for an item of moveable heritage.

**The Institution of Engineers Australia,
Sydney Heritage Fleet 2016**

8. References & Acknowledgements:

This submission used information from the following documents:

	Author	Title	Publisher	Repository/ location	Year
1	Jeff Toghil	The <i>James Craig</i> Story ISBN 0-9750227-0-7	Sydney Maritime Museum Ltd	Web site of Sydney Heritage Fleet	2003
2	Jeff Toghil	The <i>James Craig</i> – her history and recovery ISBN 0-589-50059-7	Sydney Maritime Museum Ltd	Sydney Heritage Fleet	1978
3	B. Lubbock	The Last of the Windjammers – Vol 1		Sydney Heritage Fleet library	1963
4	Steve Adams Australian National Maritime Museum	An Assessment of <i>James Craig</i> as a Restoration Project		Sydney Heritage Fleet library	2001
5	D Hill, M Flappan et al	<i>James Craig</i> Restoration – Survey 1986		Sydney Heritage Fleet library	1986
7	NSW Department of Planning Heritage Branch	State Heritage Inventory		NSW Heritage Branch website	Feb 2009
8	Sydney Heritage Fleet DVD	<i>James Craig</i> Sails Again – the Story of a Restoration		Sydney Heritage Fleet	
9	Sydney Heritage Fleet DVD	Narration Alan Edenborough Recovery of <i>James Craig</i>		Sydney Heritage Fleet	
10	U.S. Department of the Interior National Park Service	The Secretary of the Interior's Standard for Historic Vessel Preservation Projects		Website http://hnsa.org/standa.htm	1990
11	European Maritime Heritage	Barcelona Charter		Web site	2003
12		Preserved Square-rigged Ships		www.bruzelis.info/Nautica/ships/Preserved-Square-rigged-ships	
13	World Ship Trust	International Awards World Ship Trust		www.worldshiptrust.org/awards	
14	Wikipedia	Table of Largest Sailing Vessels by LOA		www	
15	Charles H Brown	Nicholls's Seamanship and Nautical Knowledge for Second Mates', Mates' and Masters' Examinations	Nautical Press Brown Son & Ferguson Glasgow	Personal copy	1940
16	Michael York	All Hands on Deck The Restoration of the <i>James Craig</i> ISBN 0 9751023 7 0	Citrus Press		2006
17		World Ship Review No 25 September 2001			2001
18		The James Craig Her history, recovery and restoration	AH & AW Reed	Sydney Heritage Fleet	1978
19	Sydney Maritime Museum	Feasibility Study for Restoration of the <i>James Craig</i>		Sydney Heritage Fleet	1986
20	David Hill	The James Craig Restoration: Rebuilding a 19th Century Square-Rigger in the 20th Century		Newcastle Maritime Museum	1988

Acknowledgements:

My research on the James Craig has benefited from the extensive experience of members of the Sydney Heritage Fleet, in particular Alan Edenborough - Project Director and Specialist Consultant, to whom I owe a great debt of thanks.

Again I am again indebted to Michael Clarke who has the gift of perspicacity and the ability to make my documents all the more readable.

I also thank fellow Sydney Engineering Heritage Committee member John Gibson for suggesting the idea of recognising the *James Craig* for its engineering heritage significance.

I have also drawn on the knowledge and wording of Steve Adams report - *Ref 4*, Michael York's fine book and Sydney Heritage Fleet's website. This material has been incorporated into many sections of this document.

| [All photographs are from the collections of Sydney Heritage Fleet and Alan Edenborough](#)



Engineers Australia - Sydney Division
Engineering Heritage Committee - Sydney

Attn: Doug Boleyn
10 Noel Street,
NORTH WOLLONGONG, NSW 2500

1 October 2015

Dear Doug,

Engineering Heritage Recognition of Barque James Craig

I refer to your letter dated 9 July 2014 and advise that the Sydney Maritime Museum Ltd (trading as Sydney Heritage Fleet), together with the owner of *James Craig*, Sydney Maritime Museum Custodian Limited, consents to the barque being formally recognised by Engineers Australia under its Engineering Heritage Recognition Program for its significant engineering heritage value and international importance.

Such recognition would be an honour that will increase public awareness of the heritage significance of the vessel and the important role that engineering has played in her restoration.

Sydney Heritage Fleet looks forward to the nomination being successful.

In agreeing to the recognition, the SHF acknowledges that it will be responsible for organising the recognition ceremony.

The SHF contact person in this matter is Alan Edenborough whom you are already working with.

Yours sincerely,



Tony Hunt
Rear Admiral Tony Hunt AO RAN (retd)
President

Appendix 2 History Time Line of James Craig

Date	Occurrence	Comment
March? 1873	Construction commenced at Sunderland shipyard of Bartram, Haswell and Company to the order of Glasgow merchant and ship owner Thomas Dunlop for the cost of £ 11,375	An identical sister ship Cumbria had been built previously
18 Feb 1874	Hull No 75 launched as <i>Clan Macleod</i> and assigned British Registration No 68086	
18 March 1874	Ship passed final survey by Lloyds of London classified <i>Lloyds 100 A1</i>	
6 April 1874	Embarks on maiden voyage to Callao Peru via Cape Horn cargo coal	Outward cargo coal Master William Alexander
29 Nov 1874	Captain's wife gives birth on-board William Macleod Alexander	
10 July 1875	Returns safely to England - R. Humber, 171 days passage	Return cargo flour and wheat from Portland USA Note After the first voyage, each voyage to the Pacific Ocean entailed a world circumnavigation. ie the outward voyage was via the Cape of Good Hope and return voyage via Cape Horn
1 Sept 1875	2 nd voyage Sunderland England to Karachi, India	Outward cargo coal. Return cargo seed and grain
Jan 1877	3 rd Voyage First passage into Australian waters - destination Otago NZ Arrived Liverpool 29 10 1877	Mate William Morris washed overboard and drowned. Outward cargo ?? Return cargo - grain to Rio de J then general Heavy damage rounding the Horn
?	4 th voyage Liverpool to Surabaya Indonesia return to Greenock Scotland [13 02 1879]	Outward cargo - general return cargo sugar
7 April 1879	5th voyage departs Glasgow for Brisbane [20 09 1879] return Hull England	Outward cargo-general return cargo??
30 June 1880	6th voyage departs Antwerp Belgium for Kobe Japan [16 04 1881] to Portland Oregon [16 04 1881] to South Shields to collect cargo [to Sunderland [20 05 1881]	Outward cargo - pig iron return cargo from Portland, Oregon wheat, cola from South Shields
4 Feb 1882	7th voyage Valparaiso Chile to Iniquie, Chile to Hamburg, Germany [24 08 1882] to Penarth, Wales [25 09 1882]	Outward cargo nitrate next cargo coal to Valparaiso?
1 Jan 1883	8th voyage Valparaiso Chile to Talcahuano to load [22 03 1883] to Shields	Outward cargo - nitrate, next cargo - coal to Valparaiso?
16 Nov 1883	9th voyage Valparaiso to Coquimbo [24 11 1883] Pisagua Chile [15 01 1884] to Falmouth for orders	Outward cargo - nitrate
July 1884	10th voyage to Burma Rangoon [19 02 1885] to Rio de Jan [17 07 1885] to Portland Oregon [4 12 1885] to Deal England [8 06 1886]	Return cargo - rice from Portland - wheat to Middlesborough to collect coal
Aug 1886		
	Note: details of all of the James Craig's voyages including dates, ports of call and cargoes can be found on the SHF website for the James Craig	
1888	Clan Macleod sold to Russell & Co ship builders in part payment for a new larger sailing ship that was being built in their yard	
1888	Sold to Canadian Sir Roderick Cameron	Placed on New York – New Zealand trade Outward cargoes mainly general variety including paper, crockery, glassware, machines, tobacco etc Return cargo – wool, flax, kauri gum

23 May 1892	Next visit to Australia Brisbane?	
14 Aug 1893	Next visit to Brisbane to collect a cargo of wool	
end Sept 1899	12 th and last voyage from New York to Wellington NZ rounding the Horn for the 23rd time.	Outward cargo 531 tons inc 80,000 cases of kerosene
15 August 1900	<i>Clan MacLeod</i> sold to Mr J J Craig ship owner Auckland NZ	Returned to New York via Newcastle NSW Remained in port as a result of coal miners strike
Jan 1901	Loaded coal at Newcastle NSW for new home port Auckland	Return cargo - coal
25 Feb 1901	First visit to new home port of Auckland under the J J Craig flag	She now entered the trans –Tasman trade carrying mostly timber to Australia and coal from Newcastle on the return passage. For the next 7 years the barque sailed to and fro across the Tasman Sea from NZ – Thames, Kaipara, Whangarei to Australia – Sydney and Melbourne. Her return passage was almost invariably from Newcastle on the coal run. Normal passage time 14 to 20 days
17 May 1901	Visits Melbourne	
2 Oct 1901	Visits Newcastle for a cargo of coal	
5 Dec 1901	Visits Melbourne	
9 March 1902	Visits Melbourne	
5 April 1902	Visits Newcastle	
17 July 1902	M	
21 Aug 1902	First visit to Sydney	
2 Sept 1902	Visits Newcastle	
03 Nov 1902	Visits Melbourne	
29 Nov 1902	Visits Newcastle	
18 Feb 1903	Visits Melbourne	
15 March 1903	Visits Newcastle	
4 June 1903	Visits Sydney	
28 June 1903	Visits Newcastle	
12 Oct 1903	her fastest passage from NZ 10 days	
31 Oct 1903	Visits Newcastle	
12 Jan 1904	First visit to Adelaide	
2 Feb 1904	Visits Edinburgh SA	
14 May 1904	Visits Sydney	
7 June 1904	Visits Newcastle	
12 SEpt 1904	Visits Melbourne	
7 Oct 1904	Visits Newcastle	
6 Dec 1904	Visits Melbourne	
29 Dec 1904	Visits Newcastle	
28 Feb 1905	Visits Melbourne	

24 March 1905	Visits Newcastle	
10 June 1905	Visits Sydney	
30 June 1905	Visits Newcastle	
23 Sept 1905	Visits Sydney	
14 Oct 1905	Visits Newcastle	
14 Dec 1905	<i>Clan Macleod renamed James Craig</i>	
9 Jan 1906	Visits Melbourne	
7 Feb 1906	Visits Newcastle	
9 May 1906	Visits Sydney	
26 May 1906	Visits Newcastle	
12 Sept 1906	Visits Port Adelaide	
11 Oct 1906	Visits Edenborough SA	
30 Dec 1906	Visits Melbourne	
24 Jan 1907	Visits Newcastle	
17 April 1907	Visits Sydney	
17 May 1907	Visits Newcastle	
31 July 1907	Visits Sydney	
20 Aug 1907	Visits Newcastle	
28 Nov 1907	Visits Sydney	
17 Dec 1907	Visits Newcastle	
17 March 1908	Visits Sydney	
3 April 1908	Visits Newcastle	
8 July 1908	Visits Sydney	
27 July 1908	Visits Newcastle	
7 Oct 1908	<i>Visits Sydney</i>	
23 Oct 1908	Visits Newcastle	
9 Jan 1909	Visits Melbourne	
12 May 1909	Visits Sydney	
27 May 1909	Visits Newcastle	
22 July 1909	<i>Visits Sydney</i>	
9 Aug 1909	Visits Newcastle	
30 Sept 1909	<i>Visits Sydney</i>	
19 Oct 1909	Visits Newcastle	
12 Dec 1909	Visits Sydney	
4 Jan 1910	Visits Newcastle	
3 July 1910	Visits Melbourne	
21 Oct 1910	<i>Visits Sydney</i>	
8 Oct 1910	Visits Newcastle	

13 Jan 1911	Visits Melbourne	
10 Feb 1911	Visits Geelong	Visit to Sydney
15 May 1911		
6 July 1911	Visit Newcastle	
30 July 1911	<i>James Craig</i> sold to British New Guinea Development Company and registered in Sydney	
	<i>James Craig</i> converted to a storage hulk in Port Moresby Harbour for copra - stayed that way for the next 7 1/2 years until	Top gallant masts, yards [with the exception of the main], and jib boom were removed
19 Aug 1918	She was bought by H Jones and Company	To replace tonnage that had been sunk by German submarines
	Put into Gladstone for several weeks in Gladstone as a result of storm damage coming down from Port Moresby	
20 Aug 1918	Visited Newcastle	
August 1919	Brought down to Sydney arrived 30 August 1919 for refitting and re-rigging at Morts Dock Sydney and brought back into commission 7 months	Underwent extensive overhaul in which a number of plates in the hull were replaced as well as the decks and all standing and running rigging. By the time she was refitted there was little which had not been replaced with new gear.
May ?1920	Alan Villiers joined her for this refit and sailed on her on the Hobart run	
6 May 1920	Visited Newcastle	Cargo of coal and bone dust
22 May 1920	Struck bad weather off Gabo Is and towed to Sydney by the Fenwick tug Hero	Damaged by heavy seas, topside seams opened and leaking
6 July 1920	Visited Hobart	Cargo timber
25 July 1920	Visited Port Huon	Cargo timber
13 Aug 1920	Visited Port Pirie	Cargo
31 Aug 1920	Visited Adelaide	Cargo superphosphate
10 Dec 1920	Visited Melbourne	General cargo
30 Jan 1921	Visited Hobart	
14 Feb 1921	Visited Port Huon	Hardwood timber
8 July 1921	Visited Melbourne	
10 Oct 1921	Visited Hobart	
18 Oct 1921	First visit to Recherche Bay	Cargo timber
24 Nov 1921	Visited Adelaide	Cargo calcines for ER&S Risdon Tasmania
8 Jan 1922	Visited Hobart	
28 Jan 1925	Sailed to Recherche Bay Tasmania to await cargo that never came	
Nov 1925	Sold to Catamaran Coal Mining Company	
4 June 1926	Stripped down and converted to a coal storage hulk	
1933	Mr John Hood scrap metal dealer of Hobart purchased the Catamaran mine for scrap	to his surprise the sale included the abandoned <i>James Craig</i>
1930s	Abandoned and scuttled	
Jan 1972	Inspected by Sydney Heritage Fleet volunteer Alan Edenborough	
24 Oct 1972	Refloated by SHF volunteers	
28 May 1973	Towed to Hobart and berthed at the Powder Wharf for initial repairs	There she remained for 7 years
18 Jan 1981	Arrived in Sydney after a 16 day tow, berthed at SHF museum wharfside Birkenhead Point for restoration	
1985	Placed on SHF Sea Heritage Dock for plate replacement	60m floating pontoon

1997	Floated off SHF Sea Heritage Dock	
1998	Engines, shafts and propellers fitted at Garden Island Naval Dockyard, lower masts stepped	
1999	Re-rigged and fitted out	
2000	Commenced sailing trials	
22 June 2001	Issued with Class1C Survey Certificate by NSW Waterways Authority	

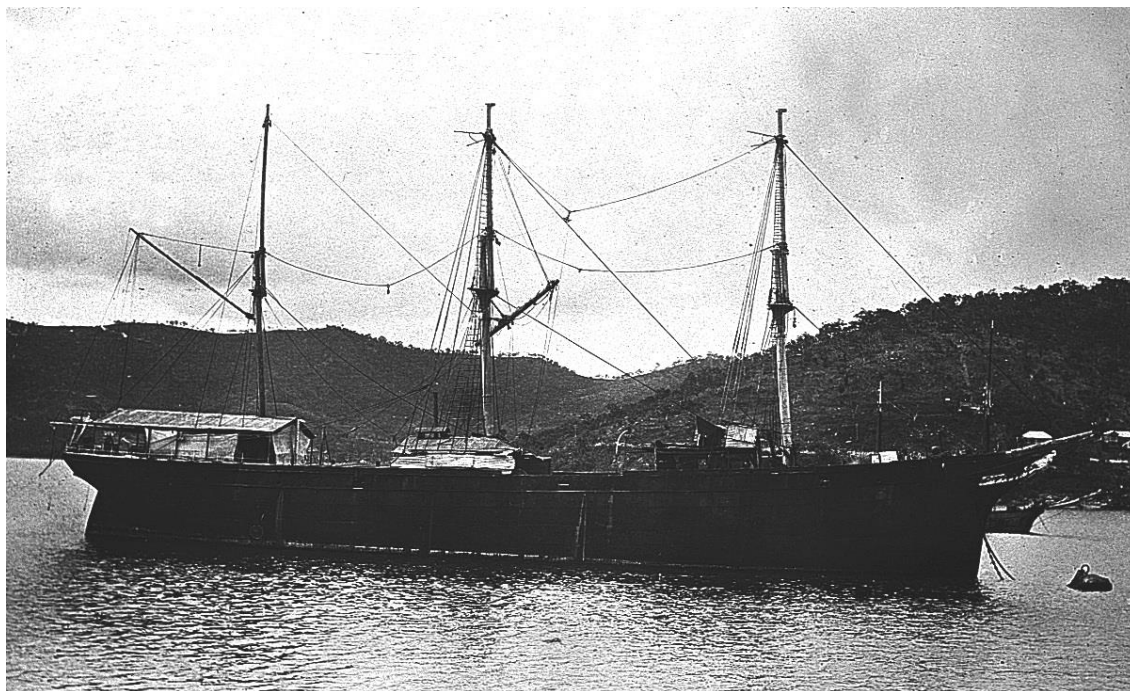
Appendix 3 Photos of *James Craig*



James Craig in New York Harbour 1890s [Alice Austin]



James Craig in New York Harbour [Alice Austin]



James Craig Down-rigged Port Moresby, New Guinea circa



James Craig Adelaide - Timber Wharf 1921



James Craig off Melbourne 1920s



THE IRON BARQUE 'JAMES CRAIG' RIGGED DOWN TO A COAL HULK



James Craig abandoned in Recherche Bay



James Craig Geoff cleaning out the sludge



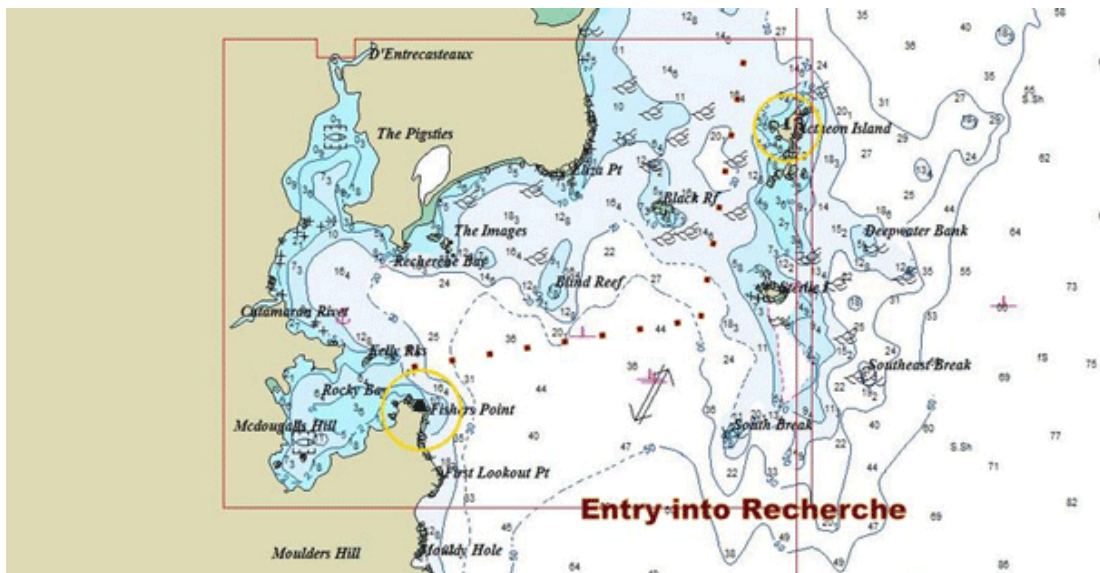
James Craig on Sea Heritage Dock - Plates Removed



James Craig on Sea Heritage Dock - Cockle Bay



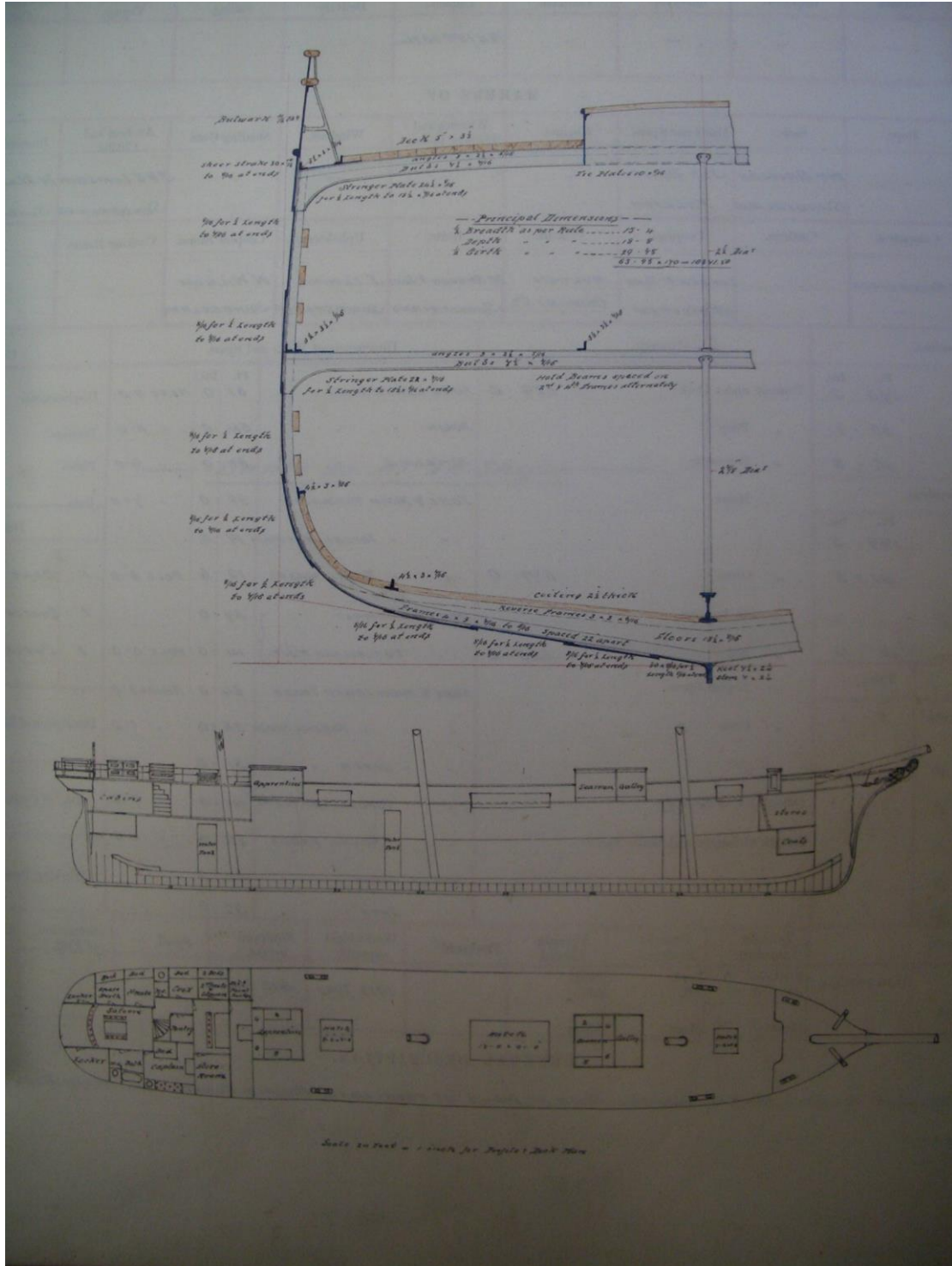
James Craig Preparing to Rivet her Stem



Hydrographic Chart Recherche Bay
The *James Craig* was aground just south of the Piglets

Appendix 4 Drawings of *James Craig* held by Sydney Heritage Fleet

Only the one extant drawings of the *James Craig* is known.



However, an extensive suite of drawings has been drawn to plan and record the work that has been carried out over the restoration of the *James Craig*.

Appendix 5 James Craig Statistics

Comment:

1. *Because there are no working drawings, where it could not be measured or available from historical records or recollections, the information regarding her original construction details the information was scaled off the 1890s photographs taken in New York Harbour*
2. *Where available, some of this information has been taken from the Bartram, Haswell & Co Register. This register also names the suppliers of materials used in her construction*

Detail	As Constructed	As Restored
Vessel Registration and Survey Details		
Name	<i>Clan Macleod</i> Three-masted iron hull barque with a clipper bow and rounded counter-stern	<i>James Craig</i> name changed 1905
Launched	18 February 1874 by Mrs Mary McCullum of Glasgow	23 February 1997 – by Hon Bob Carr MP Premier of NSW
Registration Number	British RN68086	RN68086
Signal Flag Hoist	MRJV	VJMR
Survey Classification	Lloyds 100 A1	RMS Class 1C
Tonnage		
Gross tonnage	671 tons?	
Deadweight tonnage		
Net tonnage	646 tons	
Displacement tonnage	approx 1500 tons loaded,	646 tons
Vessel Dimensions		
Length of Hull	179 ft 6 in [54.7m] <i>between perpendiculars</i>	179 ft 6 in [54.7m] <i>between perpendiculars</i>
Overall length	229 ft 7 in [70m] <i>from flying jib boom to mizzen boom</i>	229 ft 7 in [70m] <i>from flying jib boom to mizzen boom</i>
Beam	31 ft 4 in [9.54m]	31 ft 4 in [9.54m]
Draft - unladen	12 ft 3 in [3.7m] load waterline	12 ft 3 in [3.7m] load waterline
- laden	17 ft 6 in [5.33m] to load waterline	17 ft 6 in [5.33m] to load waterline
Coefficient of fineness		????
Hull		
Hull plates/ shell plating inc - Garboard strakes - Sheer strakes Bulkhead 1 Floor plates	424 iron plates ½ inch thick riveted [¾ in diam] clinker built – lapped strakes onto iron frames and stringers <i>The hull plate carbon content as determined by later spectrographic analysis was 0.01%</i> <i>Plates 175 tons Stockton Iron Co Bars 100 tons</i>	Mix of original iron plates – A, B, C and D strakes and 75 % of the original plates above the water line replaced with steel plates 424 Iron plates ½ inch thick riveted [¾ in diam] clinker built – lapped strakes onto iron frames and stringers
Number of rivets	~50,000 ~14 tons	
Main frames	iron	
Reverse frames	Iron 3ins x 3 ins x 6/16 ins	
Number of frames	92 vertically spaced 22 ins apart	92 100% reverse frames replaced in steel 50% main frames replaced in steel
Bilge Stringers	4 1/2ins x 3 ins x 7/16 ins	???? 100% replaced
Bow	Iron bowsprit, timber jib boom,	Steel bowsprit, timber jib boom,
Keelson	12 1/4 ins x 10/16 ins	replaced
Keel	Bar keel 7.5 ins x 2.25ins	
Hull protection	Paint Cathodic protection was not in use at this time	Epoxy paint and sacrificial zinc anode blocks
Bulkheads	1 forward collision bulkhead running from the hull bottom to the upper deck	1 forward collision bulkhead running from the hull bottom to the upper deck
Steering Gear		
	Manual steering gear mounted on deck	????

Rudderpost, tiller and rudderhead	Forged iron [6 tons 15cwt forgings]	Original forged iron restored
Deck Construction		
Main Deck		
Deck beams		
Deck	Main deck 5in x 31/2in yellow pine planking laid over deck beams 'tween deck coitering 2 1/2in thick????	Main deck 10cm wide white beech planking 'tween deck ???
Length of deck planking	1000m	1,000m
Deck Caulking	oakum	oakum
Tween Deck		
	If needed this deck could be raised and stored if cargo storage needs required	
Floor		
	Baltic fir betwixt decks 2 ins	
	Upper deck 3 1/2 Yellow pine	
	Baltic fir 2 1/2 ins in hold	
Holds		
Number	3	
Dimensions of hatches	Main hatch 14 ft x 9 ft x 12 ins high Fore hatch 5.5 ft x 5.3 ft x 12 ins high Quarter hatch 7 ft x 7 ft x 14 ins high	Unchanged but with aluminium covers for easy handling
Depth of hold	18 ft 10 ins from main deck to keel ??? main deck to 'tween deck	
Comings	12 ins [0.3m]	0.6m
Access to holds	2 companion ways	
Masts		
Height of masts	Main mast 33.0m above deck Mizzen mast ft above deck Fore mast ft above deck	Main mast 33.0m above deck Mizzen mast m above deck Fore mast mabove deck
Main		
Lower mast	Iron riveted construction length 64ft [18.6m] stepped on keel Parcelled Timber - ???	Steel riveted construction Length ???m Laminated timber - oregon
Top mast	Length 38ft Timber - ???	Length xxxm Diam xxxcm Laminated timber - oregon
Top gallant mast	Length x19ft 6ins Diam xxx cm	Length xxxm Diam xxx cm
Royal Mast	12ft 6ins	
Foremast		
Lower mast	Iron riveted construction Length 61ft	Steel riveted construction Height xx ft xxins diam stepped on keel
Top mast	Diam xx cm stepped on keel Timber	Laminated timber - oregon Height xxxm
Top gallant mast	Length 19ft 6ins Diam xxxicm Timber - ???	Laminated timber - oregon Length xxxm Diam xxxcm
Royal Mast	Length 12ft 6ins Diam xxins Timber	
Mizzen		
Lower mast	Timber - pine Length 61ft Diam xx cm stepped on keel	Timber - laminated oregon Length xxxm Diam xxxcm
Top mast??	Timber - ????	Timber -laminated oregon
Mizzen boom	Length 37ft Diam xxxcm Timber - ??	Length xxxm Diam xxxcm Timber - oregon
Mizzen Gaff	Length 42ft Diam xxxcm	Length xxxm Diam xxxcm
Jib boom	Timber - ??? Length xxxm	Timber - oregon? Length xxxm

Yards			
Main Mast:			
Lower yard	64ft 0ins	Pole 3ft	19.2m mass 1.4 tonne 50.8cm diam tapering down to 17.8cm diam ????????????????
Lower topsail yard	56ft 0ins	Pole 1ft	
Upper topsail yard	51ft 0ins	Pole 2ft 6ins	
Topgallant yard	41ft 0ins	Pole 2ft	
Royal yard	32ft 0ins	Pole 1ft 6ins	
Foremast:			
Lower yard	64ft 0ins	Pole 3ft	????????????????
Lower topsail yard	56ft 0ins	Pole 1ft	
Upper topsail yard	51ft 0ins	Pole 2ft 6ins	
Topgallant yard	41ft 0ins	Pole 2ft	
Royal yard	32ft 0ins	Pole 1ft 6ins	
Mizzen Mast:			
Boom	42ft		???
Gaff	32ft		?????
Course yards	Iron <i>riveted construction</i>		Steel <i>riveted construction</i>
Upper yards	Timber		Timber
Booms and Gaff	Timber		Timber
Ballast	Cargo when fully loaded Stones if no or partial cargo		500 tonne of precast concrete 1 ½ tonne blocks on lower deck
Rigging			
Rigged as	Square-rigged barque with spanker on mizzen mast		Square-rigged barque with spanker on mizzen mast
Length of standing rigging	5,000m iron wire rope		5,000m steel wire rope
Length of running rigging	13,890m flexible iron wire and hemp rope		13,890m flexible steel and synthetic rope
Sail Suite			
Number of sails	21 <i>in full sail</i>		21 <i>in full sail</i>
Number of sets	1 light set and 1 heavy set + spares		1
Total sail area	11,500 sq. ft. [1,066sq m] <i>in full sail</i>		11,840 sq ft [1,100 sq. m] <i>in full sail</i>
Mainmast Sails	Main course Lower and upper topsail Top gallant Royal		Main course Lower and upper topsail Top gallant Royal
Foremast Sails	Main course Lower and upper topsail Top gallant Royal		Main course Lower and upper topsail Top gallant Royal
Mizzenmast sails	Spanker Gaff topsail		Spanker Gaff topsail
Jib sails	Inner jib Outer jib Flying jib		Inner jib Outer jib Flying jib
Staysails 6	Fore topmast staysail 3 between mizzen and main mast 2 between main and fore mast		Fore topmast staysail 3 between mizzen and main mast 2 between main and fore mast
Mooring			
Anchors	bower 3 21:1:21 Stream 2 9:1:7 kedge 1		1 Admiralty pattern + 1 stockless anchor
Cables	240 fathoms of anchor cable hemp		
Bollards			
Winch	Up-and down manual		electric
Boats			
	1 long boat - 20ft 2 others		2 double-ended life boats ft inflatable life raft

Ballast		
	Ship's cargo tonne concrete blocks
Figurehead	three quarter length woman beneath the bowsprit timber	Replaced three quarter length woman beneath the bowsprit ?? timber
Crew		
Original compliment	Master+ wife + 16 crew inc 3 apprentices	10 officers + 30 crew
Later compliment	Master + 12 crew	
Accommodation	Captain Officers House on poop deck including bedroom, salon, bathroom and heads Crew House abaft the foremast	??????
Propulsion		
	3-masted barque-rig sails	3-masted barque-rig plus 2 x 400 hp MTU diesel marine engines and ZF Marine model IRM 350 gearboxes with a reduction ratio 6:1
Hull Corrosion Prevention		
	Inside Portland cement to upper turn of bilges and paint above Outside 3 coats of paint	
Sailing History		
Years in sailing service	1874 – 1911 [37 years] 1918 – 1922 [4 years]	2000 -
Cape Horn Roundings	23	
Trans Tasman Crossings	35 round voyages	
Bass Strait Crossings		????????????????

The Clan Macleod had a sister ship *Cumbria* constructed previously at the Bartram & Haswell yard

Alan Edenborough is obtaining the missing information

6. Preserved Square Rigged Sailing Ships and World Ships Trust Medal List

Award No	Vessel awarded to , Nationality Date of launch	Vessel Type	Date of Award
1	Ghosts of Cape Horn	film	09 11 1980
2	Vasa Sweden 10 08 1628	Warship	24 04 1982
3	Mary Rose England 1510	Carrack type warship	12 10 1982
4	Jylland Denmark 15 05 1862	Screw propelled steam frigate	03 04 1985
5	USS Constitution USA 21 10 1797	3 masted wooden hulled heavy frigate	17 12 1987
6	HMS Warrior Great Britain 01 08 1861	Steam frigate	24 03 1988
7	Polly Woodside Belfast 1885	3 masted barque	17 10 1988
8	Suphanna-Hong Thailand	Royal barge	04 06 1992
9	Mikasa Japan 08 11 1900	Pre-dreadnought battleship	08 06 1992
10	Buffel Holland 1868	Monitor	08 09 1995
11	Huascar Peru/ Chile 1865	Single screw sea-going monitor	15 11 1995
12	Great Britain Great Britain 1843	First steam screw , iron hulled commercial ship in the world	15 10 1996
13	Bergantim Real Portugal 1778	Royal barge	20 11 1997
14	Argonaute France 1950s	Submarine	16 12 1999
15	Dom Fernando II e Gloria Portugal 1843	1843 Teak hulled frigate	11 03 1999
16	Star of India/ Euterpe USA 1863	Fully rigged ship, iron hull	28 04 1999
17	Cutty Sark Great Britain 1869	Tea clipper	09 05 2000
18	Charles W Morgan USA 1841	Whaling barque	23 09 2000
19	HMS Tricomale Great Britain 1817	Frigate	29 11 2001
20	Hans Cogge Germany 1380	Cog	06 12 2001
21	Cap San Diego USA 1962	Modern cargo ship	06 12 2001
22	May Queen Australia 1867	Timber ketch	05 03 2003
23	James Craig Sunderland UK 1874	Iron hulled barque	07 03 2003
24	SS Jeremiah O'Brien USA 19 06 1943	Liberty ship	17 03 2003
25	SS John W Brown USA 07 09 1942	Cargo ship	17 05 2003
26	Aurora Russia 1903	Cruiser	27 06 2003
27	Pommeran/ Mneme Germany/ Finland 1903	4 masted steel hull barque	01 11 2004
28	HMS Victory Great Britain 1765	1 st rate Warship	11 03 2005
29	ORP Blyskawica Poland 1936	Grom Class destroyer	25 11 2008

SPECIAL AWARDS

1	Balclutha/ Pacific Queen USA 1886	Steel hulled fully rigged ship	06 04 2002
2	Edmund Gardner Great Britain 1953	Pilot vessel	10 04 2002
3	Bombay Castle/ INS Angre India 1554	Indian Naval Barracks HQ Western Naval Command	04 11 2004
4	HQS Wellington Great Britain 1934	Escort sloop warship	10 03 2004
5	SS Lane Victory USA 1945	Cargo vessel successor to Liberty ships	09 10 2007

Appendix 6 Other Preserved Square-rigged Vessels

Full-rigged ships, barques, barquentines, brigs and brigantines preserved as museum ships or in active duty.

LEGEND Column 2

- S** sailing today
F floating , permanently moored not sailing
D drydocked or equivalent, permanently
H Historic ship that no longer exists

Year of Launch	S	Vessel Name	Type	Current Location	LOA	Hull Material	Sail Area	Original Service
1628	D	<i>Wasa</i>	3-mast full-rig 64-gun ship	Stockholm, Sweden.				warship
1765	D	<i>HMS Victory</i>	Full-rig 100-gun ship	Portsmouth, Great Britain	69.3m	Wood - oak	5440 sq m	warship
1797	F	<i>USS Constitution</i>	3-mast frigate	Boston, MA, USA.	62m	Wood,		Warship, training ship
1817	F	<i>HMS Trincomalee</i>	3-mast frigate	West Hartlepool , Great Britain	46.2m	wood		warship
1824	F	<i>HMS Unicorn</i>	3-mast frigate	Dundee, Great Britain	46.2	wood		Depot ship
1841	S	<i>Charles W Morgan</i>	3-mast frigate/carvel	Mystic Harbour, CT, USA.	34.4m	wood	1028 sq m	Whaling ship
1843	F	<i>Dom Fernando II e Gloria</i>	3-mast frigate	Almada, Portugal	87m	wood	2052 sq m	warship
1853	D	<i>Edwin Fox</i>	full-rigged ship	Picton, New Zealand	48m	Wood - teak		cargo
1855	F	<i>USS Constellation</i>	3-mast sloop-of-war	Baltimore, MD, USA.	55m	wood		warship
1860	D	<i>Jylland</i>	3-mast steam frigate	Ebeltoft, Denmark.		wood		Steam warship
1860	F	<i>HMS Warrior</i>	steam 3-mast frigate	Portsmouth, Great Britain	127m	iron		warship
1863	S	<i>Star of India ex Euterpe</i>	3-mast full-rigged ship	San Diego, CA, USA.	84.8m	iron		Cargo, passengers
1864	D	<i>City of Adelaide ex Carrick</i>	3-mast barque /clipper	Adelaide, South Australia	74.4m	Iron/wood		Cargo. passenger
1869	D	<i>Cutty Sark</i>	3-mast tea-clipper	Greenwich, Great Britain	85.4m	Wood iron frame		Tea clipper
1874	S	<i>James Craig ex Clan MacLeod</i>	3-mast barque	Sydney, Australia.	54.7m	Iron/ steel	1100 sq m	cargo
1877	S	<i>Elissa ex Dido</i>	3-mast barque	Galveston, TX, USA.	43m	iron		cargo
1878	F	<i>Falls of Clyde</i>	4-mast ship	Honolulu, HI, USA	85.3m	iron	?	Cargo, tanker
1879	F	<i>Lady Elizabeth</i>	3-mast barque	Whalebone Cove Falkland Is	70m	iron		Cargo ship
1882	F	<i>Joseph Conrad ex Georg Stage</i>	full-rigged ship	Mystic, CT, USA	36m	iron		Training ship
1885	F	<i>Polly Woodside</i>	3-mast barque	Melbourne, Australia	70m	iron		cargo
1885	F	<i>Wavertree ex Southgate</i>	3-mast full-rigged ship	Seaport Museum New York, USA	89.5m	iron		cargo
1886	F	<i>Balclutha ex Pacific Queen</i>	3-mast full-rigged ship	San Francisco, USA	92m	steel		Cargo
1887	F	<i>Sigyn</i>	3-mast barque	Turku, Finland	57.5m	wood		cargo

1888	F	<i>af Chapman ex Dunboyne</i>	3-mast full-rigged ship	Stockholm, Sweden	youth hostel	88.4m	steel		cargo
1896	S	<i>Belem ex Fantom</i>	3-mast barque	Nantes, France	training ship	58m	iron/steel	1000 sq m	cargo
1896	F	<i>Glenlee</i>	barque	Glasgow, Scotland	museum ship	61m	steel		Cargo
1896	F	<i>Rickmer Rickmers</i>	3-m barque	Hamburg, Germany		97m	steel	3500 sq m	cargo
1897	F	<i>Najaden</i>	3-mast full-rigged ship	Halmstad, Sweden	museum ship	43.2m	wood/steel		warship
1897	F	<i>Presidente Sarmiento</i>	3-mast full-rigged ship	Buenos Ayres, Argentina	museum ship	81m	steel		Sail training ship
1899	F	<i>Jarramas</i>	full-rigged ship	Karlskrona, Sweden	naval museum ship	49m	steel?	1002 sq m	Sail training ship
1901	F	<i>Discovery</i>	3-mast barque	Dundee, Scotland	museum ship	52m	wood		Antarctic expedition
1901	F	<i>Duchesse Anne ex Grossherzogin Elizabeth</i>	3-mast full-rigged ship	Dunkerque, France	museum ship	92m	steel	2060 sq m	cargo
1901	F	<i>Gazela of Philadelphia</i>	3-mast barquentine	Philadelphia, USA	museum ship	54m	wood	828 sq m	mother ship fishing
1902	F	<i>Suomen Joutsen ex Laënnec</i>	3-steel mast full-rigged ship	Turku, Finland	museum ship	96m	steel	2807 sq m	cargo
1903	F	<i>Pommern ex Mneme</i>	4-mast barque windjammer	Mariehamn, Finland	museum ship	95m	steel	3240 sq m	cargo
1904	F	<i>Moshulu ex Kurt</i>	4-mast barque	Penns Landing Philadelphia, USA	floating restaurant	121m	steel	4180 sq m	cargo
1906	S	<i>Alexander von Humbolt</i>	3-mast barque	Bremmerhaven, Germany	sail training ship	62.6m	steel	1035 sq m	lightship
1907	F	<i>Viking</i>	4-mast barque	Göteborg, Sweden	floating hotel	118m	steel	3690 sq m	cargo
1909	F	<i>Dar Pomorza ex Prinzess Eitel Friedrich</i>	3-mast full-rigged ship	Gdynia, Poland	museum ship	80m	steel	1900 sq m	Sail training ship
1909	F	<i>Unyo Maru</i>	3-mast barque	Tokyo, Japan	museum ship	45.9m	steel		applied research
1911	F	<i>Passat</i>	4-mast barque	Travemünde, Germany	youth hostel	115m	steel	4600 sq m	nitrate carrier
1911	F	<i>Peking</i>	4-mast barque	Seaport Museum New York, USA	museum ship	115.1m	steel	4100 sq m	Nitrate carrier
1914	S	<i>Staatsraad Lehmkühl ex Grossherzog Friedrich August</i>	3-mast barque	Norway	training ship	98.0m	steel	2026 sq m 22 sails	Cargo gross tonnage 1516t
1919	F	<i>Seute Deern ex Elizabeth Bandi</i>	barque	Bremerhaven, Germany	museum ship	75.5m	steel	1486 sq m	cargo
1921		<i>Ebe</i>	brigantine	Milan, Italy		54.6m			
1921	S	<i>Sedov ex Magdalene Vinnen</i>	4-mast barque	Murmansk, Russia	training ship	117.5m	steel	4195 sq m	cargo
1926	S	<i>Krusenstern ex Padua</i>	4-mast barque	Kaliningrad, Russia.	training, tourist ship	114.4m	steel	3400 sq m	
1927	S	<i>Creol Vira</i>	3-mast schooner	Mallorca	cruising yacht	65.3m	wood	1640 sq m	pleasure craft
1927	F	<i>Schulschiff Deutschland</i>	3-mast full-rigged ship	Bremen, Germany	museum ship	86m	steel	1950 sq m	Sail training ship
1927	S	<i>Sørlandet</i>	3-mast full-rigged ship	Oslo Norway	sail training	64.2m	steel		Sail training ship
1927	S	<i>Juan Sebastian Elcano</i>	4-mast barquentine	Ferrol, Spain	sail training	113m	steel	2467 sq m	Sail training ship
1930	F	<i>Kaiwo Maru 1</i>	4-mast barque	Tokyo, Japan	museum ship	110.1m	steel		Sail training ship
1930	F	<i>Nippon Maru</i>	4-mast barque	Yokphama, Japan	museum ship	97m	steel		Sail training ship
1931	S	<i>Amerigo Vespucci</i>	3-mast full-rigged ship	La Spezia, Italy	sail training ship	101m	steel	2824 sq m	Sail training ship
1931	S	<i>Sea Cloud of Cayman ex Hussar</i>	4-mast full rig ship	Valetta?, Malta	cruise ship	109.5m	steel	3000 sq m	Private yacht
1932	S	<i>Danmark</i>	3-mast full-rigged ship	Denmark	sail training ship	77.1m	steel	1632 sq m	Sail training ship

1932	F	<i>Mercator</i>	barquentine	Oostende, Belgium	museum ship	78.5m	steel	1600 sq m	Sail training ship
1933	F	<i>Gorch Fock ex Tovaritsch</i>	3-mast full-rigged ship	Stralsund, Germany	museum ship	82.1m	steel	1753 sq m	Navy sail training
1934	S	<i>Palinuro ex Commandant Louis Richard</i>	3-mast barquentine	Italy	sail training ship	69m	iron		Navy sail training
1935		<i>Georg Stage / Joseph Conrad</i>	full-rigged ship	Mystic Seaport Connecticut USA	museum ship	36m	iron		Navy sail training
1936	S	<i>USCGC Eagle ex Horst Vessel</i>	3-mast barque	USA	sail training ship	89.7m	steel	1983 sq m	
1937		<i>Christian Radich</i>	full-rigged ship	Norway					
1937	S	<i>Sagres ex Albert Leo Schlageter</i>	3-mast barque	Portugal	sail training ship	89.0m	steel	1950 sq m	
1938	S	<i>Mircea</i>	3-mast barque	Romania	sail training ship	82.1	steel	1748	
1951		<i>Grief ex Wilhelm Piek</i>	brigantine	Germany					
1952		<i>Esmeralda</i>	4-mast schooner	Chile	sail training ship	113m	steel	2467 sq m	
1953		<i>Dewaruci</i>	3-mast barquentine	Indonesia					
1956	S	<i>Libertad</i>	3-mast ship	Rio Santiago Argentina	sail training ship	104m	steel	2652 sq m	
1958	S	<i>Gorch Fock</i>	3-mast barque	Germany	sail training ship	89.4m	steel	2037 sq m	
1959	S	<i>Legacy France II</i>	4-mast barquentine	France	cruise, research ship	89.6m			
1968		<i>Gloria</i>	3-mast barque	Colombia					
1976	S	<i>Phocea</i>	4-mast ship			75.1m	steel		
1979		<i>Simon Bolivar</i>	3-mast barque	Venezuela					
1981	S	<i>Dar Mlodziezy</i>	full-rigged ship	Poland	sail training ship	110.6	steel	3015 sq m	
1982		<i>Cuauhtemoc</i>	barque	Mexico					
1984		<i>Nippon Maru</i>	4-mast barque	Japan					
1987		<i>Druzhba</i>	full-rigged ship	Ukraine					
1988		<i>Mir</i>	full-rigged ship	Russia					
1989	S	<i>Kaiwo Maru</i>	4-mast barque	Japan	sail training ship	110.1m	steel	2760 sq m	
1989		<i>Khersones</i>	full-rigged ship	Ukraine					
1989		<i>Pallada</i>	full-rigged ship	Russia					
1991		<i>Nadezhda</i>	full-rigged ship	Russia					

This list was compiled using: records of World Ships Trust
www.bruzelius.info/Nautica/Ships/Preserved_Square rigged_Ships

Appendix 7

Glossary

SHF	Sydney Heritage Fleet
RMS	NSW Roads and Maritime Services [previously Waterways Authority]
AMSA	Australian Maritime Safety Authority

Terms

Barque	<p>Up to the end of 18th century the British Royal Navy used the term bark for a nondescript vessel which did not fit any of its usual categories. From that time, the term barque came to refer to any vessel with a particular type of rig. This comprised three [or more] masts – fore-and-aft sails on the aftermost mast – mizzen, and square sails on all other masts.</p> <p>The advantage of the barque rig was that these vessels could get by with a smaller [and cheaper] crew than was required by either a full-rigged vessel or a brig rigged vessel and is easier to handle and better to rise to the wind than full-rigged or brig-rigged vessels.</p>
Beams	The top ends of the port and starboard frames are tied together by means of a beam, the beam being efficiently connected to the frames by a <i>knee</i> . The beams are slightly rounded upwards, thus forming a “ <i>camber</i> ” to shed water off the deck.
Boot topping	The part of a ship's hull that is between the load line and the water line when the ship is not loaded .
Brace	On a square-rigged ship is a rope (<i>line</i>) used to rotate a yard around the mast, to allow the ship to sail at different angles to the wind. Braces are always used in pairs, one at each end of a yard.
Bulkhead	The vertical partition arranged transversely or longitudinally to divide the ship into convenient sections. Watertight bulkheads are part of the main structure of the vessel, their principal function being to impart strength and to make a self-contained water tight compartment.
Compass point	11 1/4 degrees
Coefficient of Fineness	The ratio between the actual volume of the under-water shape and the volume of a rectangular block having the same extreme length, breadth and depth
Counter stern	Counter" (or "cutaway") sterns is a stern that extends well beyond a ship's after waterline, were widely used in the construction of 19 th century sailing ships.
Courses	Mainsails.
Draught	The distance from the lowest part of the keel to the load waterline.
Framing	<p>The longitudinal framing of a vessel consists principally of keel, stem and stern posts, keelsons, bottom longitudinals, margin plates, stringers</p> <p>The transverse framing consists of floors, frames and sometimes reversed frames, tank side brackets, beams</p>
Frames	Frames extend from the upper deck to the keel and, in earlier types of ships such as the <i>James Craig</i> a “reversed” frame was riveted to the [main] frame so that the two angles when riveted back-to-back formed a very rigid rib.
Floors	The vertical plates extending from bilge to bilge between the inner and outer bottoms. Sailing ships had no inner bottom plating riveted to the top of the floors, just planks laid fore and aft, some of them portable so that the spaces between the floors, named <i>limbers</i> could be cleaned and dried up – a very important operation prior to loading cargo

Forepeak	The area in front of the collision bulkhead.
Halyard	Line (rope) that is used to hoist a sail, or a yard.
in survey	Certification by a recognised ship-classifier, such as Lloyds that the vessel complies with its standards for construction, maintenance and safety provisions
Iron	Wrought iron
Keelson	A longitudinal structure running above and fastened to the keel of a ship in order to stiffen and strengthen its framework.
Lloyds Classification	World's first and largest ship-classification society, begun in 1760 as a registry for ships likely to be insured by marine insurance underwriters. It is concerned with the establishment of construction and maintenance standards for merchant ships and the provision of a technical service to assist owners in maintaining such standards.
Load Waterline	The waterline corresponding to the maximum draft to which a vessel is permitted to load, either by the freeboard regulations, the conditions of classification or conditions of service.
Reverse angles	<i>see frames</i>
Rigged down	All the yards are sent down, the top gallant masts and topmasts struck and the jib boom sent in.
Rigging	Rigging is the mechanical sailing apparatus attached to the hull in order to move the boat as a whole. This includes cordage (ropes attached to the spars and sails in order to manipulate their position and shape), sails (aerofoils, usually made of fabric, used to catch the wind), and spars (masts and other solid objects sails are attached to)
• standing	the system of ropes/ wires used to secure the masts and the bowsprit -shrouds, stays,
• running	a system of sheets and halyards used to raise, lower, turn the yards - braces, lifts; raise and lower the sails - halyards, sheets, tacks, downhauls, clew lines, buntlines and furl the sails - gaskets, furling lines.
Shroud	Standing rigging which hold the mast up from side to side. There is frequently more than one shroud on each side of the boat. Usually a shroud will connect at the top of the mast, and additional shrouds might connect partway down the mast, depending on the design of the boat. Shrouds terminate at their bottom ends at the chain plates, which are tied into the hull.
Signal Flag Hoist	Alphabetical combination of 4 signal flags that are unique to a vessel that identify the vessel to other observers
Spanker	A fore-and-aft sail on the aftermost lower mast of a sailing vessel having three or more masts.
Spar	Any ship's mast, boom, gaff or yard
Split top sails	On a square rigged vessel, a <i>topsail</i> is a square sail rigged above the <i>course sail</i> and below the <i>topgallant sail</i> where carried. A full rigged ship has either single or double [<i>"split"</i> upper and lower] topsails on all masts, the single or lower topsail being the second sail above the deck and the upper topsail where so rigged being the third.
Square rigged	Sailing vessel whose sails are square to the midline of the hull. The <i>square sail</i> is the oldest type of sail. It is rectangular and is held up by a horizontal spar called the <i>yard</i> , that is attached to the mast in a fashion that allows the yard to be turned both in the vertical and the horizontal plane.
Strake	The part of the shell or hull of the ship. It is a continuous line of plates forming the side of a vessel.
sheer, garboard,	the topmost plate line. the two strakes next to, and on each side of the keel they provide the only connection between the keel and the hull.
Stay	ropes, wires, or rods on sailing vessels that run fore-and-aft along the centreline from the masts to the hull, deck, bowsprit, or to other masts which serve to stabilize the masts. Stays that run aft are called backstays and stays that run forward are

called forestays. Along with shrouds, they form the primary stabilization for the standing rigging.

Stringers Keelsons	Longitudinal structural members attached to the frames [termed keelsons when attached to the floors]. They have similar functions, both contribute longitudinal strength, and help to stiffen the shell plating by keeping the frames and floors in their correct relative position so that they all act together.
Tonnage: <i>Gross tonnage</i>	The total of all the enclosed spaces of a vessel in cubic feet divided by 100
<i>Net tonnage</i>	The gross tonnage less the space taken for engines, bunkers, lockers, stores, crew accommodation. spaces, have been deducted from the gross tonnage. Because it is a good indicator of a ship's earning power, mooring and harbour fees are based on this tonnage.
<i>Displacement Tonnage</i>	The actual weight of the ship and its equipment.
<i>Deadweight Tonnage</i>	The number of tons [of 2240lbs] of cargo, stores, etc., that a vessel is capable of carrying at her load draft.
Tonnage deck	The upper deck in a vessel with only two decks. The second deck above the inner bottom in a vessel with more than two decks.
Trailboards	A pair of boards that may be found at the <i>bow</i> of certain sailing vessels, where they run from the <i>figurehead</i> back to or towards the <i>hawsepole</i> . They are in the main decorative, though they often bear the name of the ship; they may be more or less elaborately carved and painted.
Tramping	A cargo vessel that carries goods among many different ports rather than sailing a fixed route was known as a tramp steamer. Tramp ships are, in accordance with the demand, contractually put at the disposal of charters to carry, for one or more voyages, a quantity of goods between named harbours [in voyage charter] or to carry a number of transport assignments in a certain period of time [time charter]. The cargo generally consisted of unpackaged bulk goods – coal, grain, phosphates, ore, timber etc.
Unbalanced rudder	This type of rudder is typically hung on the sternpost or transom. The whole of the rudder is behind the stock (the "pole" the rudder blade is fitted to). The steering gear (and the helmsperson) has to withstand the full steering forces.
Windjammer	Originally a derisory term used by steamship crew to describe competing sailing vessels.
Yards	Horizontal spars.

Imperial Units used in this document and conversions

feet	1 foot = 0.3048 metres
inches	1 inch = 25.4mm
nautical mile	1 nm = 1.852 km
knots	1 knot= 1.852 km/ hour

Appendix 8 Background History of Merchant Sailing Vessels and Sail Plans

Over the centuries as nations sought to extend their political and commercial influence offshore and obtain resources they did not have in their area of control, the only way open to facilitate the movement of people and commodities to and from these sources was by sea.

To achieve this, it was necessary for these nations to encourage merchants and entrepreneurs to develop a reliable and efficient deep-water merchant marine. Often, in parallel with this development, each nation developed a sovereign navy to protect its interest overseas and its established trade routes.

Economic growth led by consumer demand at home and trade with colonies scattered around the globe demanded faster and cheaper voyages to which end science and technology played a significant part in achieving this.

Originally vessels were propelled by manpower – rowing and poling. Only later did craft adopt the use of sails to harness the energy of the wind.

Construction of vessels evolved from primitive construction using readily available materials, where man sought to construct the simplest water-borne transport to all timber construction with a framed hull with planking until in the mid 19th century the shipbuilding technology began to be based on [wrought] iron and steel rather than wood.

For most of the second millennium, the deep sea-going vessels – both merchant and warships, tended to be very full bodied and apple-bowed and broad in relation to their length; designed for capacity rather than speed. The nett result was, they were particularly slow. Of wooden construction throughout, the timbers used in their frame were massive, sheathed inside and out with thick planking and wales. Heavy beams bound the structure together and were braced to the sides and to each other by vertical and horizontal knees. An immense amount of timber - a second rate navy vessel required more than 2000 oak trees for its construction, was needed to build a hull which would resist the strains of hogging or sagging under heavy cargo or from working in heavy seas.

The perfection of sailing ships and steamships occurred more or less simultaneously, beginning well before mid-19th century, when the Tonnage Law of 1836 revised the measurement system to eliminate tax advantages for the full-bodied, ships. The bluff shaped bows of these vessels gave way to vessels with sharper bows, streamlined hulls and yards that would brace around more and allow closer sailing to the wind.

For the sailing ship, the repeal of the protectionist Navigation Acts in 1849 allowed ships flying foreign flags to carry cargoes to British ports. The 'golden age' of shipping had arrived spurred on by the development of the extremely fast clippers of the 1850s and 1860s.

At this time sail power was predominant but steam power was rapidly increasing its presence and provided active competition.

Solving the problem of the marine condenser in the 1860s allowed working steam pressures to rise and this as much as anything else was to lead the sailing ship to eventual extinction.

The availability and use of iron in the construction of iron ships resulted in superior strength, greater safety, thinner and lighter hulls with greater capacity for stowage, economy of construction, less damaging when aground, cheaper to repair, a longer in-service life. The Industrial Age made sure the necessary materials were readily available..

In 1850 10% of new tonnage added to the British Register was of iron, in 1860 it was 30% and by 1870, 60% with steam the percentage was much higher, being 26% in 1850 and 80% in 1860.

In 1850 British registered sailing ships numbered 24,797, but by 1885 the figure had dropped to 17,018, while at the same period the number of steamers had risen dramatically from 1,187 to 6,644

The introduction of iron frames, riveted plates, steel spars and wire rigging during the 1860s and 1870s permitted the building of larger ships which could take the battering of heavy seas

without working their hulls open and could stand the strain of heavier masts and yards needed to drive larger hulls at a reasonable speed.

Even when the Suez Canal was opened in 1869 and well into the latter part of 19th century, sailing ships proved more economical for bulk trades such as coal, grain, wool, cotton, timber, guano.

The merchant sailing ship which held on to a decreasing portion of sea commerce in the last decades of the 19th century was not simply a refined or improved clipper. The most important single change was a marked increase in size: the average tonnage of registered sailing ships rose from approximately 1,200 tons in 1860s to 1,500 tons in 1870s, 1,800 tons in 1880 and 2,000 tons in 1890.

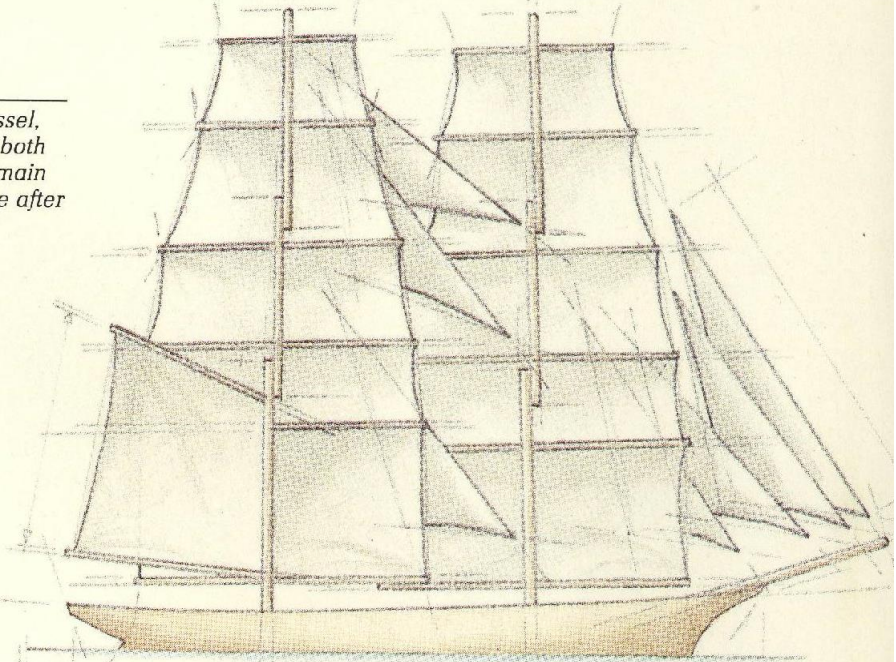
The new merchant sailing ship of the 1870s and 1880s, although not unlike their sister "clippers" specifically built for the China tea and passenger trade, were designed for cargo capacity rather than speed, had greater length, less beam, less freeboard and a fuller bottom but were none the less comparatively fast compared to their predecessors.

By the 1890s the era of the sailing ship was drawing to an end. The introduction of steam-powered vessels in the late 1840s, and the later development of the triple expansion engine, brought about a revolution in ship-building and design. The smaller iron-hulled sailing ships of the 60s and 70s lacked the speed and capacity to compete with the larger, faster and more reliable steam-driven ships that were not as reliant on wind and weather as the sailing vessels they replaced.

Also of significance of the impetus for the change from sail to stem was that crewing in the 19th century sailing ships, to keep costs to a minimum so they could compete with steam ships, was at a bare minimum with scanty poor quality food and living conditions that were crowded and uncomfortable. Life aboard these vessels was often hard and dangerous with crew expected to go aloft or work on deck whatever the weather. It comes as no surprise that the better seamen moved over to crew the steam ships for better pay and an easier life leaving the less skilled and inexperienced seaman to crew the sailing ships.

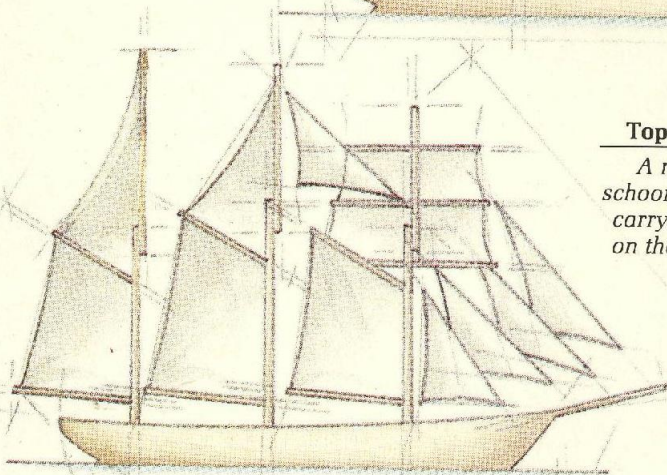
Brig

A two-masted vessel, square-rigged on both masts with a gaff main sail (spanker) on the after mast.



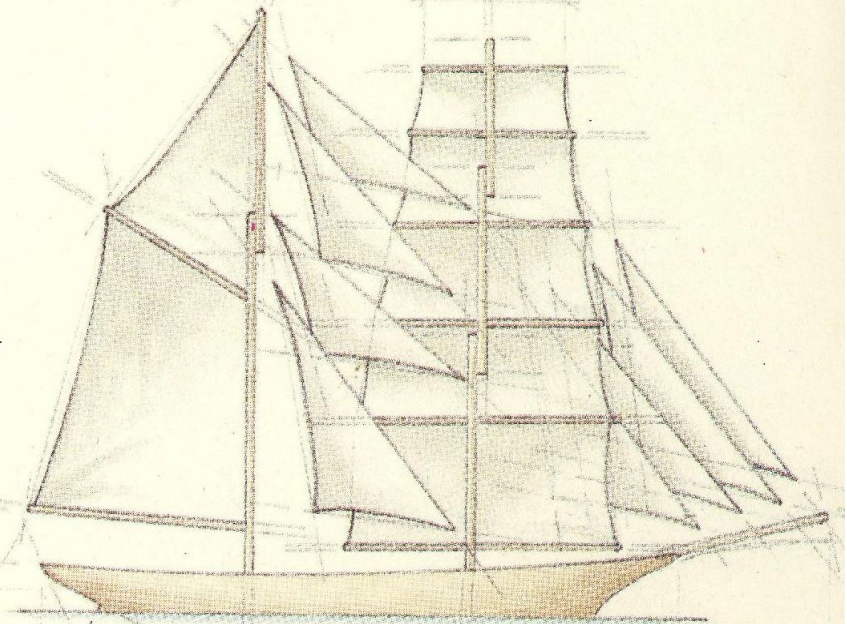
Topsail Schooner

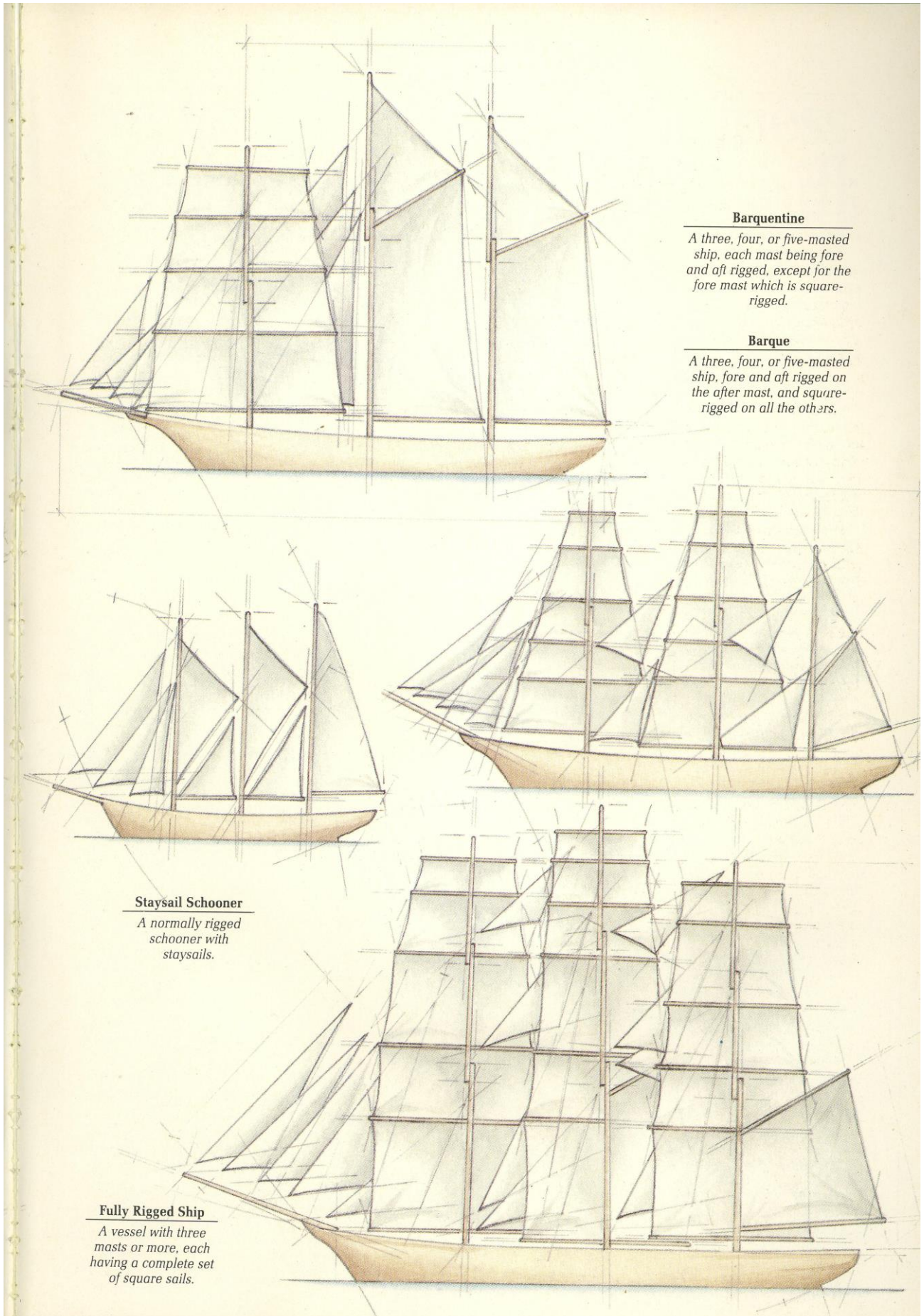
A normal rigged schooner (fore and aft) carrying square sails on the top of the fore mast.

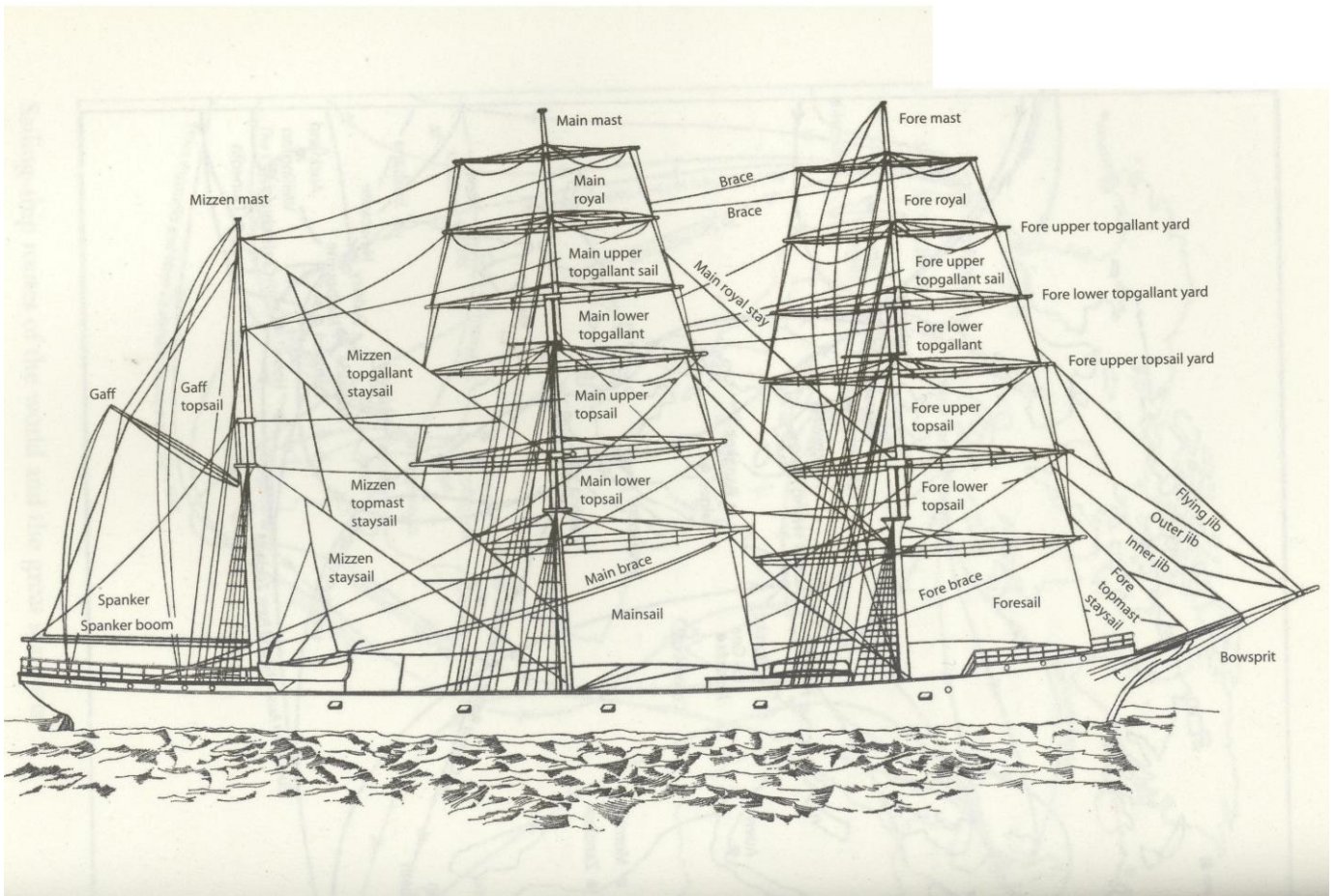


Brigantine

A two-masted vessel with the fore mast being square-rigged, and the after mast fore and aft rigged.







This Sail Plan is very much like that for the James Craig except the James Craig's topsails are not split

Appendix 9 The US Secretary of the Interior's Standards for Historic Vessel Preservation

The Standard used to evaluate the *James Craig* as a restoration project were The Secretary of the Interior's Standards for Historic Vessel Preservation Projects - with Guidelines for Applying the Standards. Published in 1990, they are relatively recent, comprehensive and reflect the body of knowledge existing in the US. a country which has more historic vessels in preservation than the next country by a factor of 10. These standards have been used to evaluate the *James Craig* as a restoration project.. The scope of the standards is very broad, yet general in their application.

Ref 4 gives a commentary / response to each of the Sections of the Standards describing how the Project dealt with the matter. They are of necessity brief but are the result of the crystallisation of a large amount of written material that arose during the project.

1. *A historic vessel shall be put to a use - either continuing or new, that requires minimal change to its historic qualities and appearance.*
2. *The defining characteristic of a vessel shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterise a vessel shall be avoided.*
3. *Each vessel shall be recognised as a physical record of time , place and use. Changes that create a false sense of historical development such as adding conjectural features and/ or architectural elements from other vessels shall not be undertaken.*
4. *Most vessels change over time; those changes that have acquired historical significance in their own right shall be retained and preserved.*
5. *Distinctive features, finishes and construction techniques or examples of craftsmanship that characterise a vessel shall be preserved.*
6. *All vessels shall be subject to a program of preservative maintenance. Deteriorated historic features and their materials shall be repaired rather than replaced. Where the severity of deterioration requires removal of a distinctive feature, the replacement shall match in design, colour, tenure and other visual qualities; and, where possible, material. Replacement of missing features shall be substantiated by historical, physical or pictorial evidence.*
7. *Every reasonable effort shall be made to protect and preserve physical evidence of features previously removed, replaced, altered, or otherwise affected in the course of the vessel's history.*
8. *Chemical or physical treatments, such as sandblasting that cause damage to historic materials shall not be used. The surface cleaning of vessels, if appropriate, shall be undertaken by the gentlest means possible.*
9. *Restoration work shall be based on verifiable historical, pictorial or physical evidence rather than on conjecture.*
10. *Restoration decisions shall be made only after careful consideration has been given to the availability of substantial historical information about the form and configuration of the vessel at the time to be represented by the restoration; the historical, cultural and technological significance of the vessel in the period selected; and the degree to which the historic fabric will be affected by restoration to a particular period.*

Appendix 10 Biographies of Companies and People Associated with the *James Craig*

Alan Villiers

Captain **Alan John Villiers** (23 September 1903 – 3 March 1982) was an author, adventurer, photographer and Master Mariner.

Born in Melbourne, Australia, Villiers first went to sea at age 15 and sailed all the world's oceans on board traditionally rigged vessels, including the full-rigged ship *Joseph Conrad*. He commanded square-rigged ships for films, including *Moby Dick* and *Billy Budd*. He also commanded the *Mayflower II* on its voyage from the United Kingdom to the United States.^[1]

Villiers wrote 25 books, and served as the Chairman of the Society for Nautical Research, a Trustee of the National Maritime Museum, and Governor of the Cutty Sark Preservation Society. He was awarded the British Distinguished Service Cross as a Commander in the Royal Naval Reserve during World War II.

Thomas Dunlop & Sons / Queen Line

Founded by Thomas Dunlop [1831 - 1893] in 1851, it was to become an important commercial and marine enterprise. The business traded in foreign grain and flour merchants, They were shipowners and brokers and had a share in a biscuit factory. The firm owned two fleets which imported and traded in grain and flour. They were ship owners of both the Queen Line of steamers and the Clan Line of sailing ship There were also marine insurance brokers and Lloyds agents.

Thomas bought his first ship in 1868 and eventually owned 14 sailing ships and 35 steamships. In 1883 he purchased his first steamship.

Confusion with the ships of Cayzer, Irvine's Clan Line caused Dunlop to change his naming system from Clan to Queen from 1878.

The Glasgow West Address book of 1888 stated:

"Messers. Dunlop & Sons are owners of the two valuable fleets of merchant vessels comprised in the "Clan Line" of sailing ships, and the Queen Line of steamers. These rank among the most successful vessels in the British Merchant Marine; they sail for trading purposes to every quarter of the globe, conveying freight and cargoes of all descriptions, and their crews aggregate a force of three hundred men. Messers. Dunlop & Sons control a great volume of trade in the entirety of their operations, the business connections maintained extending throughout the world, and as earnest of their representative stans in matters mercantile and maritime is afforded in the circumstance that they hold the important post of agents to Lloyd's for the port of Glasgow."

Russell and Company

The Company was established by Joseph Russell and his partners Anderson Rodger and William Lithgow who leased the Bay Yard in Port Glasgow from Cunliffe & Dunlop and started trading as **Russell & Co.** in 1874.

In 1879 they purchased the Cartsydyke Mid Yard from J.E. Scott and in 1881 they acquired the Kingston Shipyard from Henry Murray. The partnership was dissolved in 1891: Russell retired, Rodger took the Bay Yard and Lithgow the Kingston and Cartsydyke Yards.

In 1900 The Cartsydyke Yard was sold to Greenock Dockyard.

Then in 1908 brothers William Lithgow's sons, James and Henry, assumed control; they bought the Bay yard in 1911.

The Company then entered a period of expansion by acquisition, buying the Port Glasgow East Yard from *Robert Duncan & Co* in 1915 and Glasgow marine engine-builders *David Rowan & Company* in 1917.^[1]

In 1918 *Russell & Company* was renamed *Lithgows Ltd.*^[1]

Further acquisitions included the Inch Yard of *Dunlop, Bremner* in 1919 (although it continued to trade under its own name until 1926), the Glen Yard of William Hamilton and Company also in 1919[!] (although it continued to trade under its own name until 1963), steel stockholders *James Dunlop & Company* in 1920, the closed yard of *Murdoch & Murray* in 1923 (giving them complete ownership of the entire Port Glasgow waterfront from Bay to Inch), the Greenock engine-builder *Rankin & Blackmore Ltd* also in 1923 and the Irvine based shipbuilder *Ayrshire Dockyard Ltd* in 1928.

In 1933 the Inch shipyard was sold to National Shipbuilders Security and 'sterilised' for 40 years. Then in 1935 Lithgows took control of the Fairfield Shipbuilding & Engineering Company in Govan although it continued trading as a separate entity.

Closures followed: the Bay shipyard was closed and demolished in 1935. The Robert Duncan East Shipyard which had closed in 1931 was reopened under Lithgows name in 1937.

By 1950 it was the largest private shipbuilding company in the world.

Sir Roderick Cameron

Sir Roderick Cameron was the head of the well-known shipping firm of R W Cameron & Co. of New York, London and Australia. He went to the United States in his youth and built up a considerable shipping and general business.

In 1852 when the Australian gold-rush was exciting the North American public he chartered a ship to take passengers and supplies from New York to Australia. He followed this up with 17 other ships in a period of 26 months, consolidating his activities in a shipping company known as the Australian Pioneer Line.

Concentrating on trade between New York and Australia, with links to New Zealand and England, the firm R W Cameron & Company, also traded in Asia and elsewhere

After its early years, the company purchased ships as well as chartering them, but gave up ship-owning about the end of the 19th century.

Cameron served as a representative of New South Wales at the Philadelphia exhibition [1876] and at the Paris exposition [1878]. He was honorary commissioner from Canada in Australia for the Sydney exhibition [1879-80] and the Melbourne exhibition [1880-81]

Joseph James J Craig



Hanna, photo.
MR. J. J. CRAIG.

Joseph James Craig was a business man. His many interests included acting as a shipping and forwarding agent and general carrier, coal merchant and coal mine owner; lime merchant and lime manufacturer; brick, tile and pottery manufacturer; ship-owner, Quarry owner etc.

The Cyclopedia of New Zealand states

Mr J. J. Craig's business was probably for variety, colossal proportions and industrial enterprise, the champion concern of the Colony of New Zealand. His extensive fleet of over 20 sea-going vessels includes a four-masted barque [1], other three-masted barques [7], [barquentines [2], schooners [2], cutters [3], and ketches [2] not to mention shares in vessels and a chartered fleet of over 2000 tons vessels. The carrying business, the nucleus of the vast concern which includes a most complete plant was established by his father in 1866.

Joseph showed from an early time in the company a rare degree the faculty for managing large concerns and acceded to his present position on the death of his father in 1885.

He held a number of prestigious public offices in his lifetime, company directorships and consulted on business matters.

British New Guinea Development Company

The British New Guinea Development Company was a company that was registered in London on 11 February 1910. The company was formed to acquire and turn to account lands, rights or options in New Guinea and surrounding islands. The company went into voluntary liquidation to form a new company in 1922.

In its prospectus its aim was states as to promote the cultivation of tropical plantations (rubber, cotton, tobacco, sugar, coconut and cocoa) as well as carrying on financial and mercantile trading.

Henry Jones and Company

Henry Jones was an employee of George Peacock who just before 1895 transferred his jam making interests to him. H Jones & Company was established in 1891 in Hobart.

An article published in 1922 attributed much of the company's success to the self-contained nature of the company as everything required by the company was produced by it, from the timber for the packing cases to the equipment necessary to manufacture the specialist machinery used in the factory and shipping to move his produce and bring in supplies.

Jones became a leading Australian financier and one of the early advisors of the Commonwealth Bank.

Throughout most of the twentieth century Henry Jones IXL thrived as a food processing company with IXL as a leading brand.

The 1911 Henry Jones IXL Building that replaced earlier buildings, was among the first reinforced concrete structures in Australia;

Catamaran Coal Mining Company

There is very little on record about this Company. It has been suggested that the Catamaran Coal Mining Company [CCMC] was a subsidiary of H Jones & Co

The exploitation of the Catamaran Coal Field was spasmodic with the first mining attempts in the area were carried out in 1900. The CCMC produced coal until 1906 but was plagued by water problems, [which was to be a problem for later mining ventures]when its capital ran out.

Tasmanian Government Geologist in 1915 in his report stated that Catamaran coal was suitable for 'an extensive bunker trade.

Between 1907 and 1920 abortive and costly attempts were made to mine the coal boosted by a cursory but grandiose report in 1912 which predicted over 2 million tons of coal could be profitably won from the lease. A wharf and large coal bins were constructed only to be later destroyed by fire and over 2 kilometres of steel tramway was laid from the mine to the wharf over an old wooden tramway route.

Work commenced in 1914 to sink a 40 metre shaft to access a 3 metre thick coal seam. Funding ran out as usual

The main shaft was pumped out in 1923 when mining commenced and major works became possible in 1925 through new investment. A narrow gauge railway over 3 kilometres long was constructed to deep water at Evorall Point, where facilities for storage of 1200 tons and rapid loading by conveyor were provided. The James Craig was purchased for use as a coal hulk, to be towed to Hobart when filled. This time production appeared to justify the expenditure when, 9950 tons of coal were produced in 1926 and output in 1927 was on course for a greater tonnage. The mine flooded, they ran into a fault and there was a labour dispute - the mine closed. Reopening in 1928, it closed two years later when the company became bankrupt.

Sydney Heritage Fleet

"The *Lady Hopetoun* and Port Jackson Marine Steam Museum", the forerunner of the Sydney Heritage Fleet, was founded in 1965 by a group of public-spirited individuals to preserve Sydney's 1902 VIP steam yacht *Lady Hopetoun*. The organisation later became known as the Sydney Maritime Museum Ltd. In 1998 the museum adopted the trading name Sydney Heritage Fleet. The Fleet now comprises 10 historical vessels which is amongst the largest such collection in Australia.

The SHF's website states:

A community-based non-profit organisation, the Fleet's mission is;

To build and maintain an internationally recognised centre of excellence in maritime heritage for the benefit of all Australians by presenting through research, acquisition, conservation, restoration, education and operation, our continuing maritime history.

The Fleet is funded through donations, membership subscriptions and income from vessel charters and tours.

The Fleet's 1200 strong membership and 450 dedicated volunteer workers restore, operate and maintain the fleet of vintage vessels. In the process they preserve traditional technical methods and skills.

The Fleet's oldest vessel, the 1874 iron barque *James Craig*, has been fully restored and regularly puts to sea under full sail. The Fleet also operates three of the most historically significant vessels on Sydney Harbour: the 1902 steam tug *Waratah*, the 1902 VIP steam launch *Lady Hopetoun* and the 1903 schooner *Boomerang*.

Other operational vessels include: *Protex*, the 1908 inner-harbour motor launch; *Harman*, the c.1943 ex-RAN harbour workboat / passenger motor boat; *Berrima*, the 1954 general Botany Bay workboat / passenger motor boat.

Under restoration are the 1912 steam-powered ferry *Kanangra*, the 1950s wooden speed boat *Kookaburra II* and the 1927 steam-powered pilot vessel *John Oxley*.

Two ex- RAN tugs - Brozewing and Currawong bring the SHF total number of vessels to 12.

The Fleet also has 55 small heritage boats and one of the largest collections of marine engines in Australia which are being restored and conserved. The Fleet's collection includes over fifty model ships, including models of some of the Fleet's own vessels.

The Fleet's Maritime Records and Research Centre maintains a comprehensive research library and archive which includes photographs, ships' plans, diaries, logs and journals.

The Sydney Heritage Fleet made significant contributions towards the establishment of the Australian National Maritime Museum which opened at Darling Harbour in 1991. Whilst the two organisations differ, they do play complementary roles, the Sydney Heritage Fleet is placing an emphasis on preservation, restoration and operation of heritage vessels.

**Appendix 11 Author's Assessment of Engineering Heritage Significance of Barque *James Craig*
Assessment of Category of Award**

Historical Significance	Indicate 'Agree' or leave blank	
	National or State heritage significant	Other than National or State heritage significant
<i>Guidelines for inclusion</i>		
Shows evidence of a significant human activity.	Agree	
Is associated with a significant activity or historical phase.	Agree	
Maintains or shows the continuity of a historical process or activity.	Agree	
<i>Guidelines for exclusion</i>		
Has incidental or unsubstantiated connections with historically important activities or processes.		
Provides evidence of activities or processes that are of dubious importance.		
Has been so altered that it can no longer provide evidence of a particular association		
Historic Individuals or Association		
<i>Guidelines for inclusion</i>		
Shows evidence of a significant human occupation.	Agree	
Is associated with a significant event, person, or group of persons.	Agree	
<i>Guidelines for exclusion</i>		
Has incidental or unsubstantiated connections with historically important people or events.		
Provides evidence of people or events that are of dubious historical importance		
Has been so altered that it can no longer provide evidence of particular association.		
Creative or Technical Achievement		
<i>Guidelines for inclusion</i>		
Shows or is associated with, creative or technical innovation or achievement.	Agree	
Is aesthetically distinctive.	Agree	
Has landmark qualities.	Agree	
Exemplifies a particular taste, style, or technology.	Agree	
<i>Guidelines for exclusion</i>		
Is not a major work by an important designer or artist.		
Has lost its design or technical integrity.		
Its visual or sensory appeal or landmark qualities have been more than temporarily downgraded.		
Has only a loose association with a creative or technical achievement.		

Research Potential	Indicate 'Agree' or leave blank	
	National or State heritage significant	Other than National or State heritage significant
Guidelines for inclusion		
Has the potential to yield new or further substantial scientific and/or archaeological information.		
Is an important benchmark or reference site or type.	Agree	
Provides evidence of past human cultures that is unavailable.		
Guidelines for exclusion		
Has little archaeological or research potential.		
Only contains information that is readily available from other resources or archaeological sites.		
The knowledge gained would be irrelevant to research, human history, or culture.		
Social		
Guidelines for inclusion		
Is important for its association with an identifiable group.	Agree	
Is important to a community's sense of place.	Agree	
Guidelines for exclusion		
Is only important to the community for amenity reasons.		
Rarity		
Guidelines for inclusion		
Provides evidence of a defunct custom, way of life or process.	Agree	
Demonstrates a process, custom, or other human activity that is in danger of being lost.	Agree	
Shows unusually accurate evidence of a significant human activity.	Agree	
Is the only example of its type.		
Demonstrates designs or techniques of exceptional interest.	Agree	
Shows rare evidence of a significant human activity important.	Agree	
Guidelines for exclusion		
Is not rare.		
Is numerous but under threat.		

I cannot tell their wonder nor make known
 Magic that once thrilled through me to the bone;
 But all men praise some beauty, tell some tale,
 Vent a high mood which makes the rest seem pale,
 Pour their heart's blood to flourish one green leaf,
 Follow some Helen for her gift of grief,
 And fail in what they mean, whate'er they do:
 You should have seen, man cannot tell to you
 The beauty of the ships of that my city.

That beauty now is spoiled by the sea's pity;
 For one may haunt the pier a score of times,
 Hearing St. Nicholas bells ring out the chimes,
 Yet never see those proud ones swaying home
 With mainyards backed and bows a cream of foam,
 Those bows so lovely-curving, cut so fine,
 Those coulters of the many-bubbled brine,
 As once, long since, when all the docks were filled
 With that sea-beauty man has ceased to build.

Yet, though their splendour may have ceased to be
 Each played her sovereign part in making me;
 Now I return my thanks with heart and lips
 For the great queenliness of all those ships.

And first the first bright memory, still so clear,
 An autumn evening in a golden year,
 When in the last lit moments before dark
 The *Chepica*, a steel-grey lovely barque,
 Came to an anchor near us on the flood,
 Her trucks aloft in sun-glow red as blood.

Then come so many ships that I could fill
 Three docks with their fair hulls remembered still,
 Each with her special memory's special grace,
 Riding the sea, making the waves give place
 To delicate high beauty; man's best strength,
 Noble in every line in all their length.
Ailsa, *Genista*, ships, with long jibbooms,
 The *Wanderer* with great beauty and strange dooms,
Liverpool (mightiest then) superb, sublime,
 The *California* huge, as slow as time.
 The *Copley* swift, the perfect *J. T. North*,
 The loveliest barque my city has sent forth,
 Dainty *John Lockell* well remembered yet,
 The splendid *Argus* with her skysail set,
 Stalwart *Drumcliff*, white-blocked, majestic *Sierras*,
 Divine bright ships, the water's standard-bearers;
Melpomene, *Euphrosyne*, and their sweet
 Sea-troubling sisters of the Fernie fleet;
Corunna (in whom my friend died) and the old
 Long since loved *Esmeralda* long since sold.
Centurion passed in Rio, *Glaucus* spoken,
Aladdin burnt, the *Bidston* water-broken,
Yola, in whom my friend sailed, *Dawpool* trim,
 Fierce-bowed *Egeria* plunging to the swim,
Stanmore wide-sterned, sweet *Cupica*, tall *Bard*,
 Queen in all harbours with her moon-sail yard.

Though I tell many, there must still be others,
 McVickar Marshall's ships and Fernie Brothers',
Lochs, *Counties*, *Shires*, *Drums*, the countless lines
 Whose house-flags all were once familiar signs

At high main-trucks on Mersey's windy ways
 When sunlight made the wind-white water blaze.
 Their names bring back old mornings, when the docks
 Shone with their house-flags and their painted blocks,
 Their raking masts below the Custom House
 And all the marvellous beauty of their bows.

Familiar steamers, too, majestic steamers,
 Shearing Atlantic roller-tops to streamers,
Umbria, *Etruria*, noble, still at sea,
 The grandest, then, that man had brought to be.
Majestic, *City of Paris*, *City of Rome*,
 Forever jealous racers, out and home.

The *Alfred Holt's* blue smoke-stacks down the stream,
 The fair *Loanda* with her bows a-cream.
 Booth liners, Anchor liners, Red Star liners,
 The marks and styles of countless ship-designers,
 The *Magdalena*, *Puno*, *Potosi*,
 Lost *Cotopaxi*, all well known to me.

These splendid ships, each with her grace, her glory,
 Her memory of old song or comrade's story,
 Still in my mind the image of life's need,
 Beauty in hardest action, beauty indeed.
 "They built great ships and sailed them," sounds most
 brave,

Whatever arts we have or fail to have.
 I touch my country's mind, I come to grips
 With half her purpose, thinking of these ships:
 That art untouched by softness, all that line
 Drawn ringing hard to stand the test of brine;
 That nobleness and grandeur, all that beauty
 Born of a manly life and bitter duty;
 That splendour of fine bows which yet could stand
 The shock of rollers never checked by land;
 That art of masts, sail-crowded, fit to break,
 Yet stayed to strength and back-stayed into rake;
 The life demanded by that art, the keen
 Eye-puckered, hard-case seamen, silent, lean.
 They are grander things than all the art of towns;
 Their tests are tempests and the sea that drowns.
 They are my country's line, her great art done
 By strong brains labouring on the thought unwon.
**They mark our passage as a race of men—
 Earth will not see such ships as those again.**

Ships John Masefield