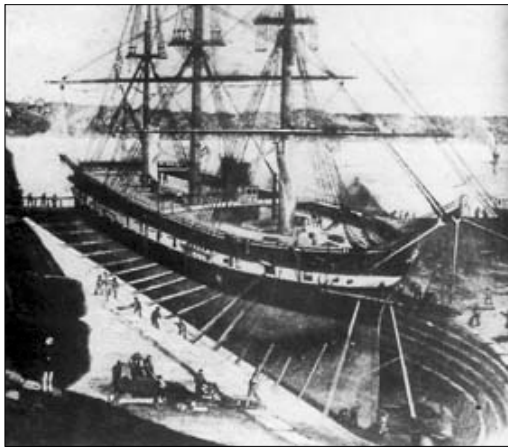


Engineering and Industry on Three Sydney Harbour Islands

There are regular guided tours to three of the harbour islands—Fort Denison, Cockatoo and Goat Islands. Each of them is worth visiting for its engineering heritage. This brochure outlines the engineering and industrial history of these islands supplementing the information provided on the guided tours.



HMS Galatea in Fitzroy Dock 1868

Guided Tours of Fort Denison, Cockatoo and Goat Islands



The Institution of Engineers, Australia Sydney Division
Engineering Heritage Committee

Fort Denison

Within a month of the arrival of the First Fleet, Governor Phillip was using the island for marooning offenders, and called it Rock Island. It soon became known as Pinchgut. When George Barney arrived in Sydney in 1835 as Commanding Royal Engineer he suggested it should become an important part of the fortifications for the harbour. In 1836 he drew up an overall plan and ordered 46 x 24 pounders, which resulted in 16 of these cannon being delivered from England in 1840. By then there was growing concern about the lack of harbour defences, especially as four American men-of-war had turned up unexpectedly off Sydney Cove in November 1839. Barney started work on Pinchgut in 1840 with teams of convicts using explosives and had the island ready to receive its guns by 1842.



Pinchgut late 18th century

Barney was replaced as Commanding Royal Engineer in 1843 by Lieutenant Colonel Gordon, who drew up a comprehensive plan for fortifications including a martello tower on Pinchgut. Barney returned to England. In 1849 he was back in Sydney again, though no longer with the Royal Engineers. With the arrival of Governor Denison in 1855 he had the opportunity to implement Gordon's plan.

The fortifications, almost as they stand today, were completed in 1862. The largest guns installed were twelve 32 pounders, three located in the casemate (vaulted chamber) of the martello tower. They had a range of about 1700 metres.

Fort Denison, as it was named in 1857, was handed over in 1869 to the Volunteer Naval Brigade that practised there, firing shells into a target in Rose Bay on Saturday afternoons.

Martello tower

In 1794 a small garrison in a lightly armed tower on Mortella Point in Corsica repulsed two British warships, HMS Fortitude (74 guns) and HMS Juno (32 guns). The event inspired military engineers to build over two hundred of these fortified towers for coastal or waterway defence over the next seventy years, most of them on the coasts of England and Ireland. They became known as martello towers. The one on Pinchgut was one of the last to be built.

In 1901 control of the island was passed to the Sydney Harbour Trust, which was succeeded in 1936 by the Maritime Services Board. During World War II it was fortified with a 3 inch gun for use against ships and aircraft, with an officer and thirty men stationed there. In 1992 Fort Denison became part of the Sydney Harbour National Park.

Since 1858 there has been a navigation light on the island. From 1906 a gun has been fired there at 1 pm each day, except from 1942 to 1986 and for part of 1999.

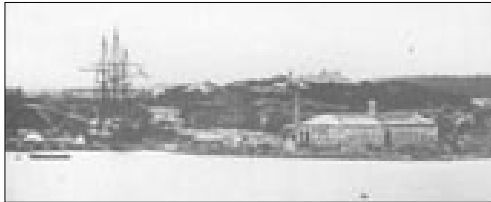
National Parks and Wildlife Service provides three hour guided tours of the island, commencing from Cadman's Cottage, 110 George Street, The Rocks. For bookings phone (02) 9247 5033. For more information visit the website www.npws.nsw.gov.au



Fort Denison late 19th century

Cockatoo Island

There was a convict settlement on Cockatoo Island from 1839, with buildings being constructed under the supervision of Captain George Barney. He also excavated 17 silos in the rock for storing surplus grain to be used in times of shortage in the colony. More silos were planned but in 1841 the Imperial Government put a stop to the project because it would interfere with market forces. The silos were then used to store water. They still exist.



Cockatoo Island 1869

In 1847 the Commanding Royal Engineer Lieutenant Colonel James Gordon was instructed to commence work on a graving dock, which was designed by the Sydney civil engineer, Captain Gother Mann. Mann was then stationed on the island to supervise construction using convict labour. The dock, called Fitzroy Dock, was constructed between 1851 and 1857. On completion the dockyard was handed over to the Department of Lands and Public Works and was managed from 1859 to 1904 by the Department of Public Works. It then became a government trading enterprise under a Superintendent, A E Cutler, formerly an officer of the Department of Public Works. In 1913 the whole island was taken over by the Commonwealth.

The dockyard facilities had been gradually expanded, being used mainly for Royal Navy and other government work. Building of small ships began about 1870. The Sutherland Dock was commenced in 1882, designed by J B McKenzie under the direction of E O Moriarty, Engineer-in-Chief for Harbours and Rivers. When completed in 1890 it was the



Main workshop around 1880

largest dock in the world and would accommodate any ship in service (though not the Great Eastern which was by then laid up).

The dockyard became the Commonwealth Naval Dockyard in 1913, and in 1914 John King Salter, an experienced shipbuilder and one of the principal officers at the Chatham Dockyard became General Manager. By 1919 there were 4000 employees. During World War I the dockyard built three destroyers and a cruiser, including the boilers and turbines, an impressive achievement. Immediately after the war the dockyard completed another cruiser and a program of refits, and built several merchant ships. The two dry docks were busy.



Cockatoo Island 1930s

Control of the dockyard passed in 1921 to the Commonwealth Shipbuilding Board of Control. Over the next few years, as the shipbuilding program came to an end, there was increasing difficulty in finding sufficient work, largely because the dockyard was not permitted to compete against commercial firms for engineering work. In 1933 the government leased the dockyard to an Australian company, the Cockatoo Docks and Engineering Company, and the restrictions on competing were largely removed. The British company Vickers Limited acquired a majority of the shares in 1947.

During World War II the dockyard was busy with shipbuilding, and became the major ship repair facility in the Western Pacific. It also built machinery and at one point was delivering boilers for naval ships at the rate of two per week. The work force reached 3000 in 1942. After the war the building of naval vessels continued steadily until the early 1960s, by which time the dockyard was looking for other work. One of its projects in the 1960s was the 12,000 ton Empress of Australia, launched in 1964. In 1984 the last ship, HMAS Success, an 18,000 ton naval supply ship, was launched. The workshops continued to have a steady flow of heavy engineering work for industry, including repairs to turbines and other rotating machinery.

George Barney (1792–1862)



Captain Barney arrived in Sydney in December 1835 with his wife and three children, after service in the Peninsular war and the West Indies, to command the Royal Engineers in Sydney. Soon after he was also appointed Colonial Engineer by Governor Bourke. In addition to his military duties

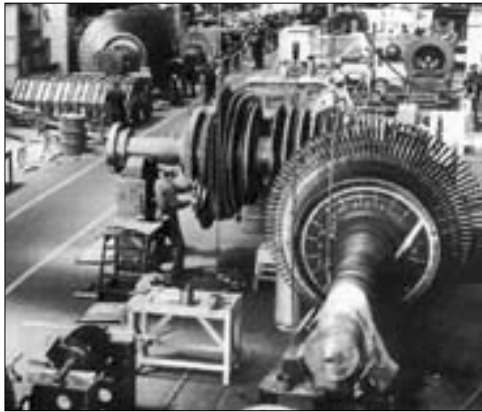
which included building fortifications at Pinchgut and elsewhere and building the Victoria Barracks, he undertook civil works for the government, including Semi-circular Quay, a breakwater at Newcastle, harbour works at Wollongong, roads, bridges and convict barracks. He was Chairman of the Australian Gas-Light Company from 1837 to 1843. He returned to England in 1844, retiring from the military as a Lieutenant Colonel. He returned to Australia in 1846 having been commissioned as superintendent of a new convict colony to be established at Port Curtis in north-east Australia, near the present site of Gladstone, Queensland. It was unsuccessful, and he returned to Sydney where he was appointed Chief Commissioner of Crown Lands in 1849 and Surveyor General in 1855, succeeding Sir Thomas Mitchell. He was briefly a member of the Legislative Assembly.

Gother Kerr Mann (1809–1899)



Mann was born in Athlone, Ireland. After military service in India he settled in Sydney and practised as a consulting engineer. In 1847 he designed the Fitzroy Dock at Cockatoo Island and then supervised its construction. From 1855 to 1857 he was Chief Commissioner of Railways. In

1857 he was appointed Engineer-in-Chief for Civil Engineering, Dry Docks and Fitzroy Dock in the newly formed Department of Lands and Public Works. He retired in 1870.



Turbine shop 1980s

In 1971 the dockyard commenced its most technically complex program, refitting the Oberon Class submarines. On completion of its last submarine refit in 1991, the dockyard closed.

In late 1991 most of the equipment was sold at auction, and subsequently most of the buildings were demolished. The two docks were flooded. The power house building and its contents are intact, but there is little remaining evidence of the scope and scale of the industrial activities that once filled the island.

Sydney Harbour Federation Trust, custodians of Cockatoo Island, conduct regular guided tours of the island. There is no public access to the island except on these tours. Details of tours and booking arrangements are at www.harbourtrust.gov.au.



Cockatoo Island 1999



Empress of Australia launch 1964



HMAS Success 1987

Goat Island

Goats brought by the First Fleet from South Africa probably gave the island its name. In 1831 sandstone was being quarried there on a large scale, but in 1832 Governor Bourke put a stop to this, for fear it might damage the island's potential as a defence site. In 1833 there were 200 convicts working on the island quarrying stone to prepare a site for an explosive magazine. The Queen's Magazine and the cooperage for making explosives barrels were completed in 1837 and the officers' barracks in 1838, all under the direction of Captain George Barney the Commanding Royal Engineer. The buildings are intact and an impressive example of colonial sandstone masonry. In 1837 the Water Police were moved from Longnose Point to new buildings on the north-eastern corner of the island, from which they had an excellent view of the harbour. At Barney's suggestion, a ditch was cut to create two separate islands, a small one for the water police controlled by the Colonial Government and a larger one for the Ordnance, which was under the control of the British Secretary of State for War.

By 1846 most of the colony's explosives, privately as well as government owned, were being stored on the island, and it was decided to build a separate merchants' magazine, completed in 1853. By 1861 there were more than 7,000 barrels (about 500 tons) stored there, and the Colonial Secretary was advised this was 'quite enough to send half of Sydney to the other world'. During the 1860s the facilities on Goat Island were extended and improved, but the major new developments in explosives storage from 1860 on were at Spectacle Island, Newington and later at Bantry Bay.

In 1866 there was a huge nitro-glycerine explosion in Bridge Street in the centre of Sydney, which resulted in the storage of all commercial explosives being concentrated on Goat Island. In 1875 engineer Gother Kerr Mann as chairman of a Board of Enquiry expressed concern about the danger of accidental explosion so close to the centre of Sydney. But it was not till 1900 that all explosives were finally moved off the island, mostly to Bantry Bay. The object was to allow the Health Department to set up an emergency bacteriological station on

the island to deal with the outbreak of plague in the port area of Sydney. In 1901 the plague abated and with the establishment of the Sydney Harbour Trust, Goat Island became its headquarters.

A fine residence was built for the Sydney Harbourmaster and a large tug, the *Pluvius*, equipped also for fire-fighting, was purchased and based with its crew on the island. The Trust's shipyard for the repair of its vessels was established in 1925. At this time the Colonial Magazine was drastically modified to become the shipwrights' shop. By the 1930s the Trust had 170 vessels including tugs, hopper barges, dredges and pilot ships based on the island, and 120 people resident there.

In 1936 the activities of the Trust were taken over by the Maritime Services Board. Work on the island expanded from the 1940s to the 1960s with the building of new facilities. Wooden ships were built in the yard, among them three 500 ton pilot ships built in 1959 and 1960, at which time there were 500 men working on the island. After this the board's activities on the island gradually declined or were moved elsewhere and had virtually ceased by 1990. In 1994 the National Parks and Wildlife Service assumed sole control of the island.

The former Fire Brigade Barracks at the north-east of the island became the site for filming a TV series, 'Water Rats', in 1995. Since then the shipwright's shop and shipyard have been leased for commercial work.



Goat Island shipwrights building pilot vessel 1950s

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