



LIGHTHOUSES & SHIPWRECKS

Lighthouse Design & Construction Fact Sheet

Lighthouse buildings illustrate various designs adapted to the particular environments in which they were built - some of are the most rugged and remote coasts of Australia. Lighthouses and their associated quarters and landings are a reminder of the difficulties faced by both the builders and the lighthouse keepers and their families.

(Source SA Lighthouses)

Lighthouse structures in colonial Australia were unique in that many of them were architect designed until engineers took over the design. In New South Wales, many lighthouses were designed by James Johnstone Barnet, the Colonial Architect of NSW, from 1865 (after acting in the position for two years) until his departure in 1890.

Building materials varied from locally quarried granite, sandstone and limestone, as well as concrete, in addition to pre-fabricated iron lattice work, timber, concrete materials and galvanised iron where local materials were unsuitable.

After the Commonwealth took over the care and control of all Australian lighthouses in the first decades of the 20th century, lighthouse design became more standardised. More recently, with the advent of automatic lights and satellite navigation systems, many lighthouses have been de-manned, the care taken over by volunteers.

EARLY NEW SOUTH WALES LIGHTHOUSES DESIGNED BY THE COLONIAL ARCHITECT

Many of the early New South Wales lighthouses have a common appearance, and are easily recognisable as being designed by James Barnet, NSW Colonial Architect from 1865 to 1890,

<http://www.adb.online.anu.edu.au/biogs/A030097b.htm>

or his successor, Charles Harding, who designed lights such as [Cape Byron Lighthouse](#). Barnet was renowned for his towers having large ornate crowns and are easily distinguished.

The *Montague Island Tower*, constructed from granite, with tapering walls, an outward curving platform and a curved balustrade is considered a well proportioned structure. It is one of only two offshore island lighthouses along the NSW coast. <http://www.aussieheritage.com.au/listings/nsw/Narooma/MontagueIslandLighthouse/5930>

Green Cape Lighthouse, built in 1883 was the largest mass concrete structure in New South Wales and it is the tallest of the three concrete lighthouses designed by Barnet. It is a break from the traditional circular towers as it has a square base merging into an octagonal form. It was part of Barnet's vision was to create a highway of lights along the coastline from Melbourne to Sydney.

<http://www.lighthouse.net.au/lights/Bulletin/0408/Bulletin%20Aug%2004.htm#lamps>

The *Smoky Cape Lighthouse* has an unusual octagonal tower, and was one of the last lighthouses to be designed for architectural excellence, by Barnet. Smoky Cape was named on 13 May 1770 by [Captain Cook](#): the name arising from the great amount of smoke from Aboriginal burn-off fires on the headland.

<http://www.aussieheritage.com.au/listings/nsw/South%20West%20Rocks/SmokeyCapeLighthouseGroup/7107>

PRE-FABRICATED STRUCTURES

Iron lattice towers at Currie Harbour and Macrae

The construction and technology of the iron lattice towers at King Island and Port Phillip Bay show the absence of suitable building materials.

The Currie Harbour (1880), registered on the National Estate, and the Macrae lighthouses are rare examples of 'screw pile prefabricated iron lattice' towers.

<http://www.aussieheritage.com.au/listings/tas/Currie/CurrieHarbourLighthouseandBuildings/12678>

It was originally intended to construct the tower from stone, but when no suitable local material could be found the Public Works Department engaged leading British manufacturers Chance Brothers of Birmingham to design and prefabricate an iron structure. Construction was completed between 1877-79 and the light was first exhibited in March 1880.

Gabo Island wood lighthouse

The earliest attempt to erect a lighthouse on Gabo Island (Victoria) was abandoned in 1846 after excavations to the depth of 66 feet (20 metres) to find bedrock upon which foundations could be laid had used all the allocated funding. It was not until 1853 that a lighthouse was eventually established in. It was a wooden tower pre-assembled in Sydney, then dismantled and re-erected on the island.

North Reef Lighthouse

The *North Reef Lighthouse*, Queensland was completed in 1878. The structure sits on a small sandbank on a coral reef which can form into an island, disappear and reappear. The reef is only accessible by boat and the building of the lighthouse was a challenge.

The tower, 15 metres high and 12 metres across, was constructed of timber sheathed in galvanised iron.

QUOTE

....It was anchored to solid coral reef bed with a hollow base of cast concrete thus giving it resistance to the shifting nature of the sand bar...The sandbar came and went around the North Reef Lighthouse. Over the years the reef has stabilised into an island

Cape Don's reinforced concrete tower

When work began on the *Cape Don (Coburg Peninsular, Northern Territory) lighthouse* tower in May 1915, the tropical heat of the north was considered too excessive to use iron for the construction, and the local ironstone rock was not suitable for the formation of concrete, so the lighthouse was built from reinforced concrete using materials shipped from Melbourne.

QUOTE

Due to outlying reefs and mangroves, materials could not be landed directly at the site, so a jetty was constructed three miles to the east, a tramway was laid, and materials were transported on trucks drawn by horses. Due to the climate and the grade, only two round trips could be made each day, and construction could only be carried out during the dry season, taking three years.

LIGHTHOUSES BUILT FROM LOCALLY QUARRIED MATERIALS

The Wadjemup lighthouse of limestone

Wadjemup Lighthouse was Western Australia's first lighthouse.

QUOTE

The first lighthouse tower on the island was completed in 1849 using Aboriginal convict labour. Though it was 20 metres tall, it was still 3 metres shorter than originally planned and had taken 9 years to build due to poor skills and the penal environment.

The new tower, also built of limestone, completed in 1896, was designed by W T Douglass, in London, who was also responsible for the [Cape Leeuwin](#) light. Construction was under the supervision of the colony's Engineer-in-Chief, [C Y O'Connor](#).

Gabo Island's red granite tower

At Gabo Island, off the Gippsland coast, Victoria, conditions for keepers attending the first light were hard with poor shelter and irregular supplies. The current lighthouse was completed in 1862 using red granite quarried on the island. Keepers quarters were improved at this time and again in 1888.

<http://www.lighthouse.net.au/lights/VIC/Gabo%20Island/Gabo%20Island.htm#History>

Althorpe Island Lighthouse Station – limestone, sandstone and slate

Althorpe Island Lighthouse Station (**South Australia**) was constructed between 1877 and 1879 with a combination of limestone and hard sandstone, for hard wearing areas, quarried and cut on the island. The spiral staircase is made of solid blocks of sandstone, treads faced with Mintaro slate. The lighthouse was designed by R P Hickson, Engineer-in-Chief for South Australian harbours and jetties. The three Keepers' Cottages were constructed with rendered limestone rubble and hard sandstone for hard wearing areas.

<http://www.lighthouse.net.au/lights/SA/Althorpe%20Island/Althorpe%20Island.htm#History>

QUOTE

Construction was not without incident, including the loss of the attendant cutter, 'Young St George', industrial disputation and the strange death of the foreman, killed by a falling rock while sleeping.

The North Reef Lighthouse - timber sheathed in galvanised iron Lights

In Australia, the first lights were oil lamps, which only travelled a few miles. In 1797, coal from Newcastle replaced wood as the fuel source for the beacon which continued to guide vessels to Sydney Heads until Macquarie Light was built in 1818. In 1841, a new lens using prisms, invented Frenchman, Augustin Fresnel in 1822, was installed for the first time in Australian lighthouse.

The technology of the lights themselves was generally based on lamps and mechanisms imported from England. An exception to this was the Wadjemup Lighthouse on Rottnest Island, Western Australia which was lit in 1851 .

QUOTE

The machinery for the revolving catoptric light was designed and made in [Fremantle](#). This enabled the light to be opened a year earlier than waiting for a apparatus to arrive from England... The first light flashed for 5 seconds in the minute and was visible for 18 nautical miles. The light consumed some 3 gallons of coconut oil per week, although later kerosene was used as a fuel.

The second and current Wadjemup Lighthouse, is Australia's first ever rotating beam lighthouse. More recently, with the advent of automatic lights and satellite navigation systems, many lighthouses have been de-manned, the care taken over by volunteers.

The new tower completed in 1896, was designed by W T Douglass, in London, who was also responsible for the [Cape Leeuwin](#) light. Construction was under the supervision of the colony's Engineer-in-Chief, [C Y O'Connor](#). The new lighthouse, like the first lighthouse, was also built of limestone from Nancy Cove. This time the stone was transported to Wadjemup Hill along a short railway line.

Cape Don lighthouse, Coburg Peninsular, Northern Territory

When work began on the tower in May 1915, the tropical heat of the north was considered too excessive to use iron for the construction, and the local ironstone rock was not suitable for the formation of concrete, so the lighthouse was built from reinforced concrete using materials shipped from Melbourne.

QUOTE

Due to outlying reefs and mangroves, materials could not be landed directly at the site, so a jetty was constructed three miles to the east, a tramway was laid, and materials were transported on trucks drawn by horses. Due to the climate and the grade, only two round trips could be made each day, and construction could only be carried out during the dry season, taking three years

A replacement light, a 22m steel lattice tower, was built on nearby Fraser Island, a sandy islet just offshore from Point Cloates, in 1936. However, in 1966, a storm blew away the islet and the tower collapsed. A replacement GRP cabinet was built about 1 kilometre south of the original sandstone tower, and its name reverted back to Point Cloates.

The North Reef Lighthouse, Queensland

The North Reef Lighthouse was completed in 1878. The structure sits on a small sandbank on a coral reef which can form into an island, disappear and reappear. The reef is only accessible by boat and the building of the lighthouse was a challenge.

The tower and dwellings, a cylinder 12 metres across and 15 metres high, were constructed of timber sheathed in galvanised iron. The hollow base also served as a tank for fresh rainwater that was caught from the roof.

QUOTE

It was anchored to solid coral reef bed with a hollow base of cast concrete thus giving it resistance to the shifting nature of the sand bar...The sandbar came and went around the North Reef Lighthouse. Over the years the reef has stabilised into an island

The Moreton Bay Pile Light

Relocated after a new channel was cut, struck by a barge in 1945, the Moreton Bay Pile Light came to its end when the British tanker Wave Protector crashed through the light in 1949.

Moreton Pile light at the mouth of Brisbane River was built in 1882. The river, obstructed by a shoal before, became open when a channel was dredged through the bar.

The lighthouse fulfilled two functions. The first was to mark the seaward entrance to the port of Brisbane through the newly dredged Francis Channel. The channel was also marked by two other lighthouses on Fisherman Islands, by beacons along its whole length and by a light boat at its port end. The lighthouses were manned by keepers who lived in adjacent living quarters.

When the bar became blocked once again, a new cutting was opened in 1912 and the pile light had to be moved to a new position. The original platform was left where it stood with a new small light attached to it. It was eventually destroyed in the 1960s. The 4th order light was moved with the lighthouse and continued to signal the state of the tides; red during ebb and flashing during flood tides.

I am currently looking for some information on an American bomber that crashed near the pile light on 3.9. 1944 and have gathered some info on its location.

<http://www.lighthouse.net.au/lights/Bulletin/0302/Bulletin%20Feb%2003.htm#Destruction>

On 3 March 1945, the pile light was severely damaged when a US refrigerated barge in tow of a tug collided heavily with the pile. Though some damage remained on the steel structure, the lighthouse was soon repaired and returned to service. Its end came about four years later on 17 October 1949. The 15,000 ton British tanker Wave Protector failed to stop and crashed through the lighthouse. Its three inhabitants were thrown into the sea but escaped drowning when they were saved by the tanker's crew. The damaged structure remained at its place until 1966/67, when it was removed by a barge Hammerhead.