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Incorporating AHMS and Futurepast

Cairns Shipping Development Project – Concrete Wharves 1-6

Heritage Impact Statement

Prepared for Flanagan Consulting Group

18 December 2017



Built & Urban Heritage | Aboriginal Heritage | Archaeology | Interpretation | Intangible Cultural Heritage | World Heritage

EXTENT HERITAGE PTY LTD

ABN 24 608 666 306 ACN 608 666 306

info@extent.com.au

extent.com.au

SYDNEY

3/73 Union Street

Pyrmont

P 02 9555 4000

MELBOURNE

13/240 Sydney Road

Coburg

P 03 9388 0622

BRISBANE

Level 7, 757 Ann Street

Fortitude Valley

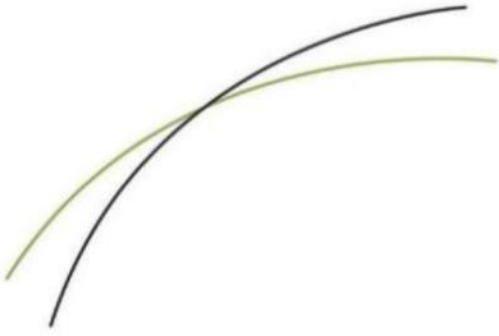
P 07 3667 8881

PERTH

312 Onslow Road

Shenton Park

P 08 9381 5206



Document Control Page

CLIENT: Flanagan Consulting Group

PROJECT: Cairns Shipping Development – Concrete Wharves 1-6 – Heritage Impact Statement

EXTENT PTY LTD INTERNAL REVIEW/SIGN OFF				
WRITTEN BY	DATE	VERSION	REVIEWED	APPROVED
Tony Brassil / Andrew Sneddon	15/12/2017	DRAFT	Tony Brassil	15/12/2017
Tony Brassil / Andrew Sneddon	18/12/2017	DRAFT_Rev1	Tony Brassil	18/12/2017
Tony Brassil / Andrew Sneddon	18/12/2017	FINAL	Tony Brassil	18/12/2017

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1 INTRODUCTION

1.1 Project Background

EXTENT Heritage Pty Ltd ('Extent') has been engaged by Flanagan Consulting Group to prepare a Heritage Impact Statement (HIS) for the historic concrete wharves at Cairns Harbour in Queensland (Wharves 1-6). The wharves are listed on the Queensland Heritage Register (QHR) as a State significant heritage item (QHR No: 601790). The Cairns Shipping Development Project (CSDP) is a broad-scale development project which aims to improve the berthing facilities for large cruise ships in the Port of Cairns. The CSDP proposes works that will impact Wharves 1-6 to varying degrees.

The expansion of cruise ship facilities in Cairns is an important step in developing increased tourism opportunities in North Queensland and is likely to produce considerable benefits to the local economy and to the tourism industry generally in Far North Queensland. The key requirements, to enhance cruise ship visit numbers, are the dredging of a broader and deeper entrance channel to allow port access for larger cruise ships and the upgrade of berth infrastructure within Trinity Inlet.

The CSDP forms part of an ongoing program of facility upgrades and improvements at the wharf complex in the last decade, which has seen the reinvigoration of the complex as a hub for community activity and the conservation of a range of heritage features.

Section 4 below provides full details of the proposed CSDP works.

Section 6 identifies a number of adverse heritage impacts to the Wharf Complex arising out of the CSDP works. However, this Heritage Impact Statement concludes that the works are necessary and appropriate having regard to:

-) The physical condition of the wharves, especially the badly deteriorated Wharf 6.
-) The contemporary demands made of port facilities for large cruise ships and the importance of maintaining the maritime use of the wharf complex.
-) The absence of prudent or feasible alternatives.

1.2 Approach and Methodology

This HIS assesses the potential adverse heritage impacts of the CSDP on the physical structure of Wharves 1-6. We understand that a separate report addresses other potential heritage impacts at the wharf complex, including Aboriginal heritage and maritime archaeology.

This HIS identifies historic heritage values affected by the proposed works, demonstrates measures taken to avoid/minimise/mitigate impacts, identifies conservation outcomes, and considers relevant government policies. It has regard to (among other documents):

-) *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (ICOMOS 2013) (hereafter The Burra Charter).
-) The Queensland government guideline document entitled 'Preparing a Heritage Impact Statement' (dated October 2015).
-) The Queensland government guideline document entitled 'State Development Assessment Provisions. State Code 14: Queensland heritage'.

Of particular relevance to this report's assessment of impacts on Wharf 6 is Performance Outcome 4 of the 'State Development Assessment Provisions. State Code 14: Queensland heritage'. Specifically, this HIS has reference to:

- J PO4.1(a) – Extraordinary economic cost – If Wharves 1-5 are not upgraded to accommodate modern large cruise ships then the economic model underpinning the CSDP will be entirely undermined.
- J PO4.1(d) – Risk to Public Health or Safety – Wharve 6 is in such poor condition that it poses a risk to public health and safety.

In making the assessment of heritage impacts in this report, the authors had regard to the following relevant considerations:

- J The wharf complex has been a defining feature of the city of Cairns for over a century, and central to its significance to the city has been its ongoing and active *use* as a maritime facility. If this use is to be maintained then some physical changes to its fabric will be necessary from time to time. Therefore, physical intervention will be appropriate in some circumstances provided the principles of the Burra Charter are observed e.g. ‘do as much as necessary and as little as possible’.
- J Wharf 6 was constructed in haste during World War II and is an example of ‘war-time expediency’ (to quote the QHR citation). Wharf 6 was always intended to have a limited use-life. Condition assessments by specialists have demonstrated that it has reached the end of that use-life. In fact, Wharf 6’s deteriorated condition is such that it poses a threat to public health.
- J There are no prudent or feasible alternatives to the demolition of Wharf 6, or to the limited physical intervention proposed for Wharves 1-5 in order to maintain them in use.

In making the above observation in relation to Wharf 6, this HIS is cognisant of the Practice Note prepared as an adjunct to the Burra Charter by Australia ICOMOS entitled ‘Understanding and assessing cultural significance’. That Practice Note states:

The physical condition of a place does not generally influence its significance, but will often be a factor in determining policy for the place. Guidance: A place may be in ruinous condition, yet still be significant if its values can be clearly understood. In this case the condition does not influence significance, but will have a bearing on the development of policy for the place.

Therefore, this HIS concludes that Wharf 6 remains highly significant despite its poor condition but policy (especially health and safety requirements) dictates that it should be demolished.

The assessments in this HIS also appreciate that the fabric of a heritage place may be only part of its significance. Article 1.2 of the Burra Charter states:

Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

Conservation of the heritage values embodied in the wharf complex is dependent on an understanding of, assessment of, and response to the ‘setting’. Therefore, this HIS includes observations in relation to potential impacts of the proposed works on a visual appreciation of the physical and historical context of the wharf complex.

The impacts identified in this Heritage Impact Statement measure the proposed works against the heritage values identified in the QHR citation, augmented by additional research undertaken by Extent and presented in a preliminary report dated August 2016. This HIS reproduces large parts of the earlier Extent report which expanded on the QHR citation.

1.3 Existing Heritage Management Policies

The Wharf Complex has been the subject of previous heritage studies, including a report entitled *Cairns Cityport Wharf Area: A Conservation and Management Plan for Cairns Port Authority*¹. This document includes 19 management policies for the Wharf Area².

The CSDP has had reference to the conservation policies contained in the 2000 Conservation and Management Plan. Those that are relevant to the proposed development are presented in Table 1, including a statement on how the CSDP proposal is consistent with those policies.

Table 1 – Management policies from the Allom Lovell (2000) CMP for the Cairns Wharf Area.

Policy #	Policy	CSDP Response
1	<i>Action informed by significance:</i> The more significant a theme, of fabric or relationship, should inform proposals that may affect the place – the object being to ensure that the work will not reduce, and may reinforce the identified significance.	Efforts made to retain significant structures and fabric in situ. Efforts made to minimise physical intervention in Wharves 1-5 (impacted original fabric limited to 3-5% of the deck surface).
2	<i>An ongoing life:</i> The wharves should remain in their present form, location and scale. They should be maintained at a standard required to attract the berthing of large vessels whilst still maintaining other significant elements.	Location and scale of the wharves not impacted. The physical intervention proposed for Wharves 1-5 is essential to maintaining modern port facilities, and to attracting berthing of large vessels, while maintaining other significant elements.
3	<i>Responsibility for the vision:</i> The control of any changes to the wharves needs to be the responsibility of one entity.	The proposed works form part of a vision for the ongoing redevelopment and use of the port, including conservation and interpretation. This unified vision has won heritage and architecture awards.
4	<i>Burra Charter:</i> All work at the Cairns Wharves, whether planning or capital works should be carried out in accordance with accepted standards and procedures for the conservation and management of cultural material.	Policy met. See Sections 6.
11	<i>Site and Setting:</i> The wharves should be integrated back into the activity of the city.	The proposed works are designed to achieve this goal. The works proposed for Wharves 1-5 are essential if the complex is to be reintegrated with the city as a functioning port.

¹ Allom Lovell Architects Pty Ltd (2000) Report prepared for Cairns Port Authority.

² Ibid. pp 37-45.

Policy #	Policy	CSDP Response
12	<i>Vistas:</i> The significant vistas of the wharves, sheds and clock tower from the water should be retained.	Significant vistas retained.
13	<i>Vistas:</i> The Clock Tower should remain visible from Abbott and Lake Streets	Significant vistas retained.
14	<i>Vistas:</i> The vista from the front gates through the covered area between Sheds 2 and 3 should be maintained.	Significant vistas retained.
15	<i>Curtilage:</i> The area of the Cairns wharves should be maintained in its current form as one parcel.	Curtilage retained.
17	<i>Adaptation and reuse:</i> The adaption and re use of the site and buildings should be informed by the level of significance identified in this report.	Historical use retained. Physical adaptation limited to what is necessary to ensure continuity of historical use.
18	<i>New developments:</i> Any new development within the present site should be located outside of the significant view corridors.	Minimal 'new development' limited to addition of unobtrusive fenders and piles at Wharves 1-5. Demolition of Wharf 6 dictated by health and safety considerations.
19	<i>New developments:</i> The design of any new development within the site should create a cohesive and easily identifiable group.	Minimal 'new development' limited to addition of unobtrusive fenders and piles at Wharves 1-5.

1.4 Site Description

The Cairns Concrete Wharves which are the subject of this report are known as the Trinity Wharves 1 – 6, located on the waterfront of Trinity Bay and accessed from Wharf Street, Cairns.

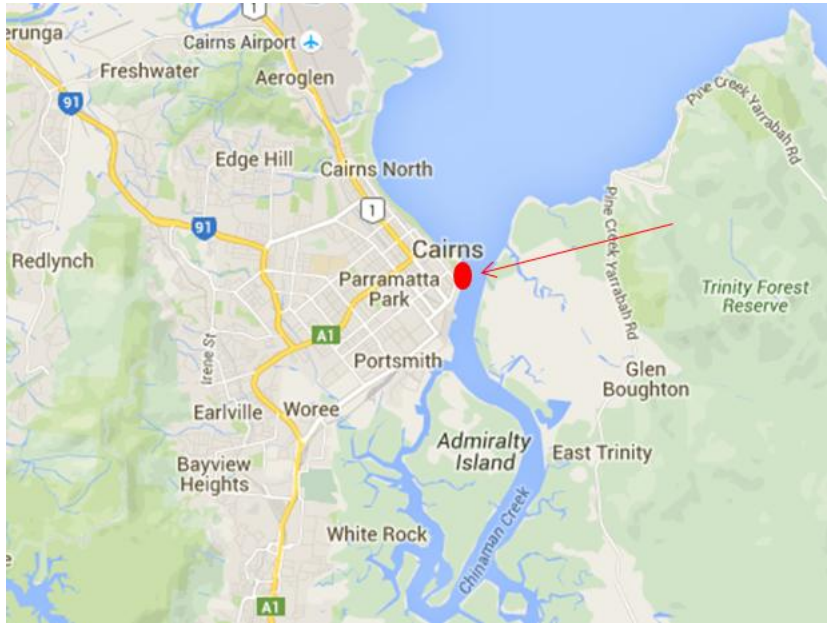


Figure 1. Map showing the location of the Trinity Wharves in relation to the Cairns region (Source: Google Maps)

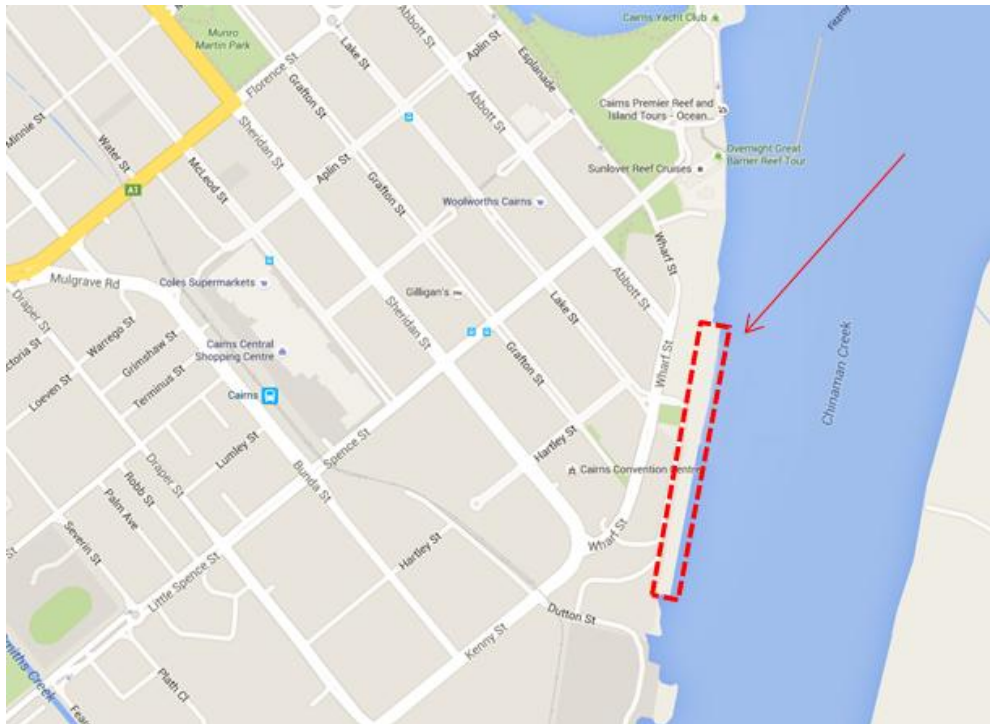
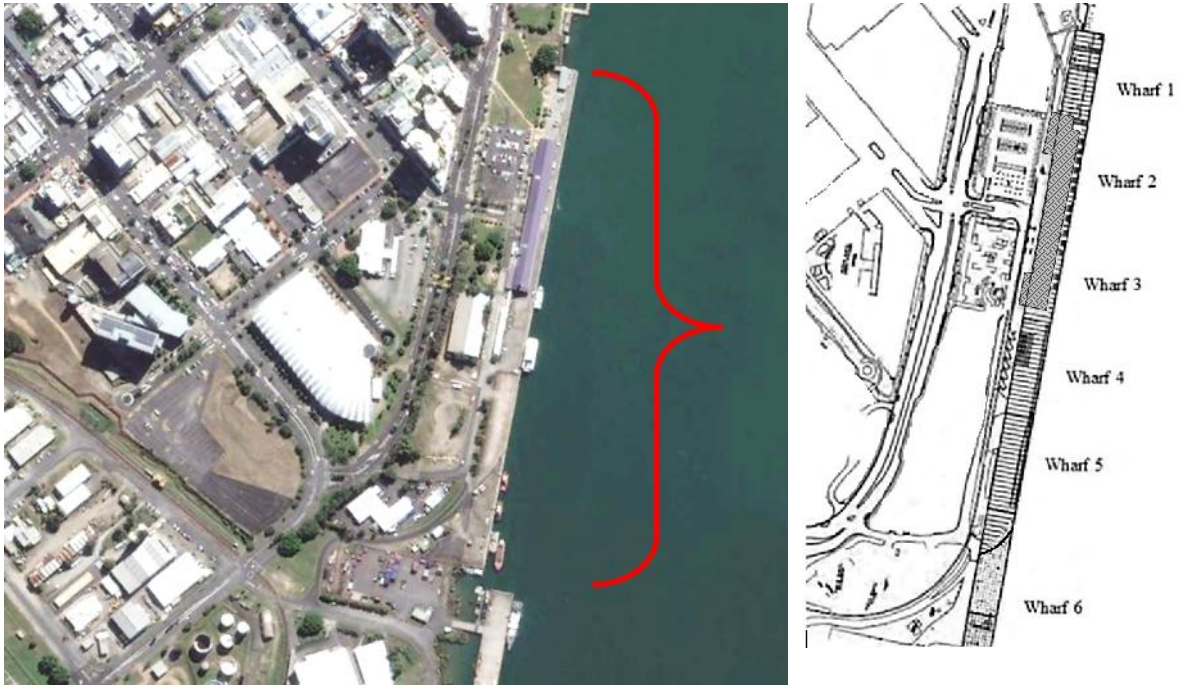


Figure 2. Map showing the location of the Trinity Wharves within Cairns (Source: Google Maps)



Figures 3 and 4 Aerial view of the site of the Trinity Wharves (Source: Google Earth) and Layout of berths at the Trinity Wharves (Source: CSDP EIS)

1.5 Statutory Heritage Listings

1.5.1 1.5.1 Environment Protection and Biodiversity Conservation Act 1999

The Trinity Wharves are not included on either the National Heritage List or Commonwealth Heritage List under the *Environment Protection and Biodiversity Conservation Act 1999*.

1.5.2 Queensland Heritage Act 1992

The Trinity Wharves are included on the QHR as *Cairns Wharf Complex* (QHR No: 601790). The boundary of the listed area is shown in the statutory map attached to the listing report presented as Appendix A (Figure 5 below).

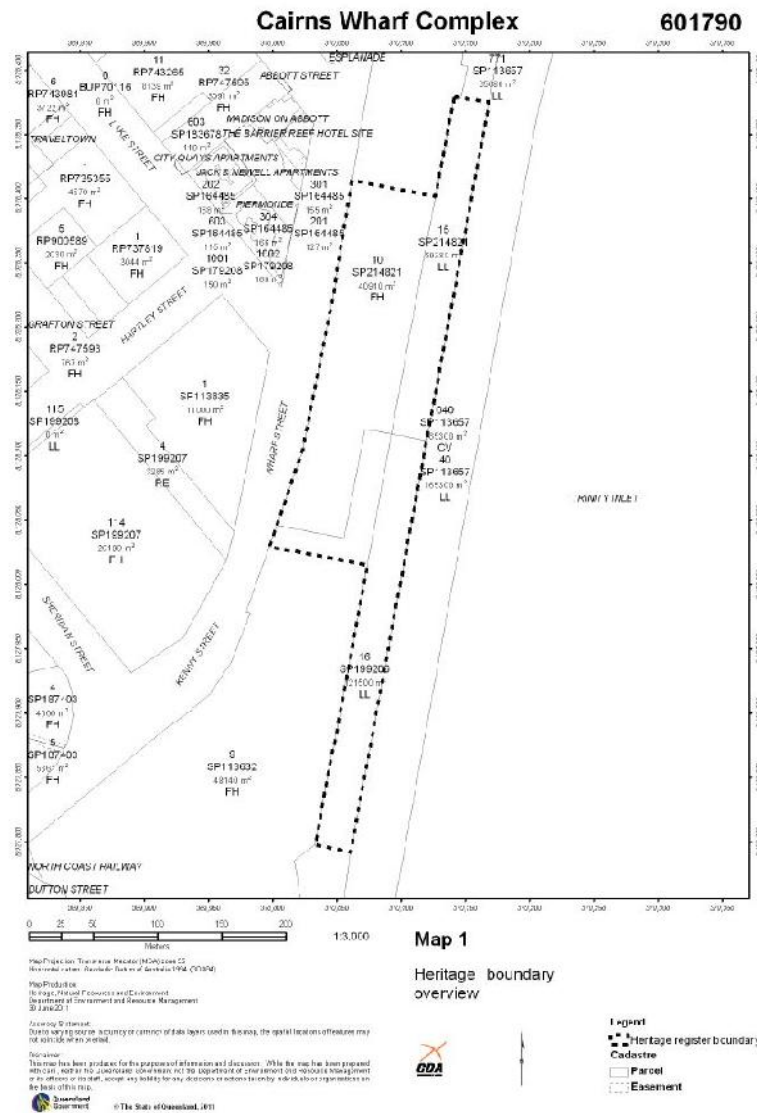


Figure 5 Map from the Queensland Heritage Register showing the Cairns Wharf Complex statutory listing boundary (Source: Queensland Office of Environment and Heritage Protection)

1.5.3 Local Heritage Register

The *CairnsPlan 2009*, which incorporates the Ports North Land Use Plan, is the current planning scheme for the Cairns Regional Council Area. It contains the Local Heritage Register, including places and precincts. QHR places are automatically included on the Local Heritage Register.

1.5.4 Heritage Items in the Vicinity

There are three heritage items located in the vicinity of the *Cairns Wharf Complex* that are listed in the QHR. No sites in addition to those located on the QHR are identified in the Cairns Regional Council Local Heritage Register.

The three sites are:

QHR Number	Site Name	Address
601608	Barrier Reef Hotel.	Abbott St, Cairns.
601610	Jack and Newell Building (former).	29 Wharf St, Cairns.
600377	Cairns Custom House (former).	6A – 8A Abbott St.

Their locations are illustrated in Figure 6 below. None of these places would be impacted by the proposed CSDP works.

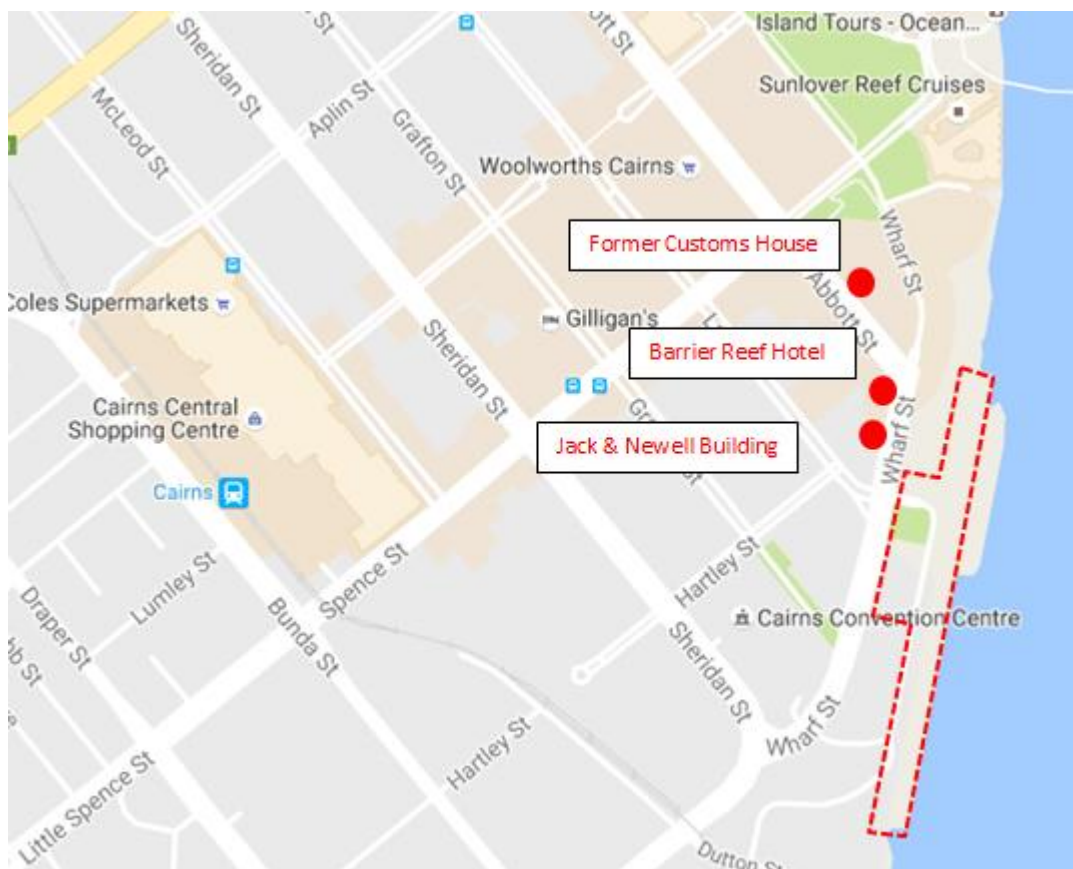


Figure 6 Street map of Cairns, showing the proximity to Cairns Wharf Complex of the other items listed in the QHR. (Google Earth)

1.6 Limitations

No community consultation was carried out in the preparation of this report. However, comment is sometimes made on the potential 'social significance' (criterion [d]) of places, having regard to the QHR citation.

The Cairns Wharves 1-6 were inspected externally and photographed on 20 July, 2016. The inspection was undertaken as a visual study only. All photographs are by the author unless otherwise indicated.

The historical overview below provides sufficient historical background to provide an understanding of the place in order to assess the significance and provide relevant recommendations, however, it is not intended as an exhaustive history of the site.

1.7 Authorship

This report was prepared by Tony Brassil and Andrew Sneddon of Extent, with additional input from Mac North and Matthew Harris.

1.8 Terminology

The terminology in this report follows definitions presented in The Burra Charter. Article 1 provides the following definitions:

Place means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.

Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

Places may have a range of values for different individuals or groups.

Fabric means all the physical material of the place including components, fixtures, contents, and objects.

Conservation means all the processes of looking after a *place* so to retain its *cultural significance*.

Maintenance means the continuous protective care of the *fabric* and *setting* of a *place*, and is to be distinguished from repair. Repair involves restoration or reconstruction.

Preservation means maintaining the *fabric* of a *place* in its existing state and retarding deterioration.

Restoration means returning the existing *fabric* of a *place* to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction means returning the *place* to a known earlier state and is distinguished from *restoration* by the introduction of new material into the *fabric*.

Adaptation means modifying a *place* to suit the existing use or a proposed use.

Use means the functions of a place, as well as the activities and practices that may occur at the place.

Compatible use means a use that respects the *cultural significance* of a *place*. Such a use involves no, or minimal, impact on cultural significance.

Setting means the area around a *place*, which may include the visual catchment.

Related place means a place that contributes to the *cultural significance* of another place.

2 HISTORICAL BACKGROUND

2.1 Development of Cairns

In the 1870s, the discovery of the Palmer River goldfields attracted both Europeans and Chinese to far north Queensland and Cooktown was established as a port in 1873 to service this goldfield. Gold was subsequently found on the Hodgkinson River, some 300 kilometres to the south, in 1876. The colonial government, keen to collect customs revenue from the gold trade, sent the Government Surveyor to establish a town and port at Trinity Bay in late 1876. Government officials and passengers landed at Trinity Inlet, at the southern end of Trinity Bay, on 3 October 1876 and the inlet was subsequently declared a port of entry and clearance on 1 November that year.

The township of Cairns was surveyed in late 1876 and rudimentary port facilities were constructed soon after. Better facilities were later constructed by shipping and trading companies and the town, including shops, hotels, warehouses, banks, the customs house and other government offices, developed around the port area.

In 1884, Cairns was selected as the rail terminus for the Herberton tin fields and construction of the rail line was begun. A timber railway wharf was built in 1886, connecting the wharf directly to the rail line into the hinterland. As these developments progressed, increasing numbers of arriving settlers received land and established agriculture both around Cairns and on the Atherton tablelands, with sugar cane dominating on the lowlands and fruit and dairy produce on the tablelands. The other northern ports of Cooktown and Port Douglas dwindled as a result of Cairns' railway connection.

Trinity Inlet offered a deep but sheltered anchorage close to the open sea, with low-water depths of up to 5.5 metres within the channel, but a bar at the entrance prevented large vessels from entering. The first cuts to the bar, deepening it to 4 metres, were made in 1890 but, over time, it reformed and clearance was a mere 3.1 metres in 1896, when it was again dredged to 4 metres. By 1900, it was reduced to 3.2 metres³.



Figure 7. View of the Cairns Wharves taken from the harbour, ca. 1907. (Source: SLQ #99872)

During these early years, the port of Cairns comprised a series of small wharves constructed of timber on timber piles, set perpendicular to the shore line out over the mudflats. They were built and owned

³ Cairns Cityport Wharf Area Conservation Management Plan; Allom Lovell Pty Ltd, Report for Cairns Port Authority; 2000

by shipping and trading companies such as Howard Smith, Adelaide Steamship, Burns Philp and the Australian United Steam Navigation Company.

2.2 The Cairns Harbour Board

Until the 1890s, Queensland ports were administered from Brisbane by the Department of Harbours and Rivers. The Harbour Boards Act was introduced to the Parliament in 1893, to endorse local control of ports and to encourage local financing of harbour improvements. It was not until 1896 that the first boards were established, in Rockhampton and Townsville (the two largest ports outside of Brisbane). They had wide-ranging powers over port improvements and foreshore leases and were empowered to charge fees for harbour improvements, which went to the Boards' coffers. They were also given authority to borrow money for necessary works.

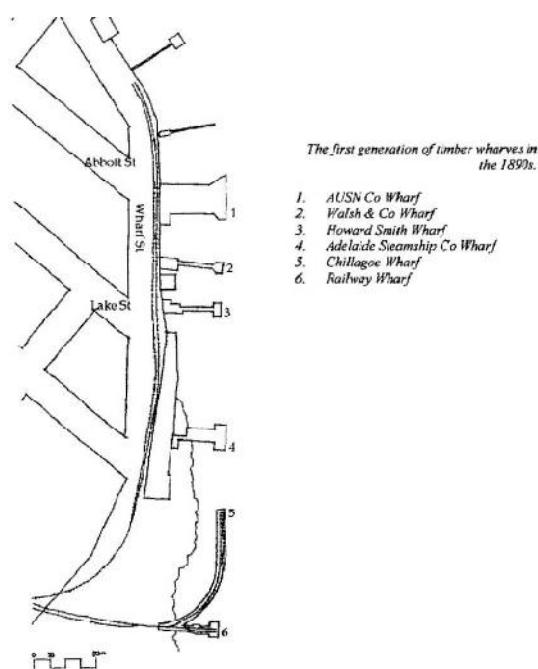


Figure 8. Plan of the private wharves at Cairns Harbour. (Allom Lovell, 2000)

Cairns established a provisional Harbour Board in 1899 but, owing to a degree of local opposition, progress was slow. The Harbour Board at Cairns was formally constituted by an Act of the Queensland Parliament in 1906 and its main tasks were to maintain the entrance channel and to develop and maintain the facilities of the port. An overdraft of £500 was arranged with the Board's bank and a bucket dredge, the "Willunga", was provided by the Queensland government⁴. Permanent staff were appointed, with Mr. T R Hall as Secretary and Mr E G Waters as Engineer. By the end of 1907, the board had acquired most of the private wharves and began collecting the fees for their use.

The Cairns Harbour Board immediately began investigations into the improvement of the Cairns harbour wharfage. In October, 1907, the NSW firm of Gummow Forrest & Co were invited, on the recommendation of W E Adams of the Sydney Harbour Trust, to provide a report on the new form of reinforced concrete wharves, which were, at that time, considered to be the latest development in wharf technology. Experience with the effects of the toredo worm on marine timbers in the tropical climate had already proved that wharves constructed of timber had little more than ten years effective

⁴ Allom Lovell op cit

life before major replacements were required. Gummow Forrest & Co replied in November that, for a fee of £250, they would send an Engineer to investigate and provide any necessary report⁵.

2.3 The Arrival of Reinforced Concrete in Australia

Reinforced concrete was developed in Europe during the latter half of the nineteenth century. From a range of crudely reinforced structures, it was soon realised that the combination of the two materials provided benefits beyond the capabilities of either and the details of its arrangement and composition were closely studied. Joseph Monier patented his first reinforcement system for horticultural troughs in France in 1867 and, over the next decade, took out further patents for concrete pipes and basins (1868); concrete panels for building façades (1869); concrete bridges (1873) and reinforced concrete beams (1878). In 1875, Monier designed and built the first reinforced concrete bridge at the Castle of Chazelet⁶.

Monier had exhibited his work at the Paris Exposition in 1867 and countryman François Hennélique was one of those who saw the potential of the material. He established his own firm and carried out many experiments to determine the nature and extent of its possibilities. In 1892, he patented a complete building system based upon his own design of reinforcement and, in 1897, appointed Gustave Louis Mouchel his representative in the UK. Mouchel later took out patents for Australia and New Zealand.

In 1886, German engineer Gustav Adolf Wayss bought Monier's patent. He established the firm of Wayss & Freytag and conducted further research in the use of reinforced concrete as a building material, particularly by applying scientific analysis and mathematical calculation to the operation of forces and stresses. He published this research in 1887 in the book 'Das System Monier' and eventually gained control of the Monier patents throughout Germany and Austria⁷.

The Monier system was brought to Australia by William Julius Baltzer, who had received an engineering education in Germany and emigrated in 1884. He moved to NSW to work for the Sewerage Construction Branch of the NSW Public Works Department as a draughtsman/engineer in 1885. In 1890, owing to the economic depression, he took the opportunity to return to Germany, where he contacted Wayss & Co and studied theory and applications of reinforced concrete. He returned to Australia and persuaded a group of Sydney businessmen and contractors, particularly respected engineer Frank Moorhouse Gummow, to take out Monier patents in the Australian colonies. Trading as Carter Gummow & Co (later Gummow Forrest & Co), with Baltzer acting as Carter Gummow's technical specialist, they prevailed upon his former colleagues in the Sewerage Construction Branch to test the Monier system through the construction of two sewerage aqueducts at Annandale in Sydney in 1897. Despite many initial doubters and critics, the construction was successful and the aqueducts remain in service in 2016. Gummow Forrest & Co went on to carry out many constructions and was generally regarded as the leading exponent of the technology. They commenced manufacturing Monier concrete pipes at Alexandria in 1897 and, in an interesting aside, these pipes were used in 1899 by PWD engineer Ernest De Burgh as sheaths on timber piles to protect bridge piers from toredo worms⁸. In 1915, Gummow Forrest & Co was purchased outright by the NSW Government, which continued to operate the works as the State Monier Pipe and Reinforced Concrete Company for the next twenty years.

In 1897, Carter Gummow had approached the Victorian Government to offer a Monier arch bridge to carry Anderson Street over the Yarra River and, to promote the Monier system, they organised an exhibition at the University of Melbourne. Notable local engineer, Joshua Thomas Noble Anderson,

⁵ Cairns Morning Post; "The Wharf Scheme" 11/11/1907; via Trove.

⁶ Structurae – 'Joseph Monier'.

⁷ Archinform; Gustav Adolf Wayss

⁸ Lewis, Miles; *200 Years of Concrete in Australia*; Concrete Institute of Australia; 1988

who had from 1894 been in partnership with his younger colleague, John Monash, took the opportunity to make contact and persuaded Gummow to appoint Monash & Anderson as their representatives in Victoria. In 1898, Monash visited Sydney and was coached in the theory and practice of reinforced concrete by William Julius Baltzer, who continued to check designs emanating from Monash's office until about 1910⁹. Monash & Anderson went on to build several Monier concrete arch bridges and a range of tanks, culverts and silos. In 1901, they established the Monier Pipe Co. Pty. Ltd. of Victoria. In 1905, the Monash and Anderson partnership was dissolved and a new company, the Reinforced Concrete & Monier Pipe Construction Co. Pty. Ltd was established. This was followed by the South Australian Reinforced Concrete Co. Ltd in 1907. Both companies were successful well into the twentieth century.

The third corporate proponent of reinforced concrete in Australia at this time was the Australian representative of the Hennélique system. Gustav Mouchel, the UK agent, traded the patents for Australia and New Zealand to the Ferro-Concrete Company of Australasia, under the management of William Arthur Robertson, in 1902. Their first major contract was the construction of the Kings Wharf in Auckland Harbour between 1904 and 1907 (the Harbour Engineer, W H Hamer, had previously worked with Mouchel in England) and this was followed by a second contract in 1907 for the Queens Wharf, Auckland. In 1907, they also were awarded the contract for the construction of the Grafton Bridge in Auckland. This latter project, on a difficult site and with payments withheld until the work could be tested, ultimately sent this company bankrupt in March, 1909 (although they did manage to complete the Queens Wharf before they were finally wound up)¹⁰.

2.4 Reinforced Concrete for Wharves

Reinforced concrete, in the first decade of the twentieth century, was considered to be a very innovative but largely untested technology. All proponents undertook educational and promotional tours and lectures and gave extensive interviews to the press. In 1903, William Robertson visited Devonport in Tasmania to sell 'ferro-concrete' to the local marine authority and spoke at length to the local press. Although it does not appear that the Devonport marine authority commissioned any works as a result of Robertson's visit, Roberson states that, at that time:

*'It is largely used at Southampton in the construction of docks and wharves; also at Portsmouth, Plymouth, Liverpool, London, Hull and other harbours in England. At Liverpool, not only is ferro-concrete the material of the wharf but, at the cattle landing stage, even the posts, flooring and beams are all built of ferro-concrete... Coming-nearer home Mr Robertson states that at the important port of Singapore a contract is under way for two miles of ferro-concrete wharf, which will be 65ft in width and piles will be 60ft in length.'*¹¹

Locally, the earliest wharfage of reinforced concrete by an Australian company was built in Auckland, New Zealand. As mentioned above, the Ferro-Concrete Company of Australasia commenced work on the Kings Wharf in Auckland Harbour in 1904 (completed in 1907), followed by a second contract in 1907 for the nearby Queens Wharf (completed in 1909).

In Australia, reinforced concrete began to be used for bridges and buildings after 1897. In NSW, the Department of Public Works were quietly experimenting with reinforced concrete, particularly in relation to sewage works (no doubt influenced by their former colleague, W J Baltzer). In addition to the commissioning of the Annandale aqueducts from Carter Gummow & Co in 1895, during the late 1890s, Sewerage Construction Branch engineer, Edward G Stone, designed the underground structures of the low-level sewage pumping stations in reinforced concrete. He went on to undertake

⁹ structurae.net/persons/wilhelm-julius-baltzer

¹⁰ *Heritage Assessment - Queens Wharf Auckland*; Matthew and Matthew Architects; for Auckland City and Auckland Regional Councils, 2009

¹¹ "Davenport Harbor Improvements"; North-Western Advocate and Emu Bay Times; 07/08/1903

some significant works for the Sydney Harbour Trust and, in private practice as Stone and Siddeley after 1908, using the Considère reinforcement system.

Another engineer working for the Sydney Harbour Trust, W E Adams, developed a system of rat-proof seawalling using pre-cast Monier plates carried on L-shaped pre-cast trestles and this was being installed from 1902 at Darling Harbour and Millers Point. The Sydney Harbour Trust also commissioned Carter Gummow & Co in 1903/4 to design and construct a reinforced concrete lighthouse for Bradleys Head (followed by a second at Cremorne Point). However, despite the extensive wharf building programme pursued by the Sydney Harbour Trust between 1901 and the 1920s, it was not until the 1920s that a full wharf structure of reinforced concrete was erected in NSW.

The earliest contract for a reinforced concrete wharf in Australia appears to have been issued in 1906, when the CSR Company decided to replace their wharf at Glanville in Port Adelaide and invited designs in reinforced concrete. John Monash and the RCMCP provided a design which was eventually accepted and worked commenced in late 1906. Completed in November 1909, it incorporated a concrete truss on concrete piles carrying a concrete slab deck¹². This wharf survived until the 1970s, when a burst water main caused its collapse¹³.

The Adelaide wharf may have been commissioned earlier but the first completed operational reinforced concrete wharf in Australia appears to have been that erected at Gladstone in Queensland. In January 1907, the Queensland Premier, William Kidston, visited New Zealand and inspected the construction of the concrete wharves at Auckland. He was reported as suggesting that:

‘Similar material will be used in the construction of a new jetty at Gladstone, Queensland, which will probably be the only one of its kind in Australia. He hopes that the new jetty will be an object lesson for the Harbour Boards and also for the Government in the future’¹⁴

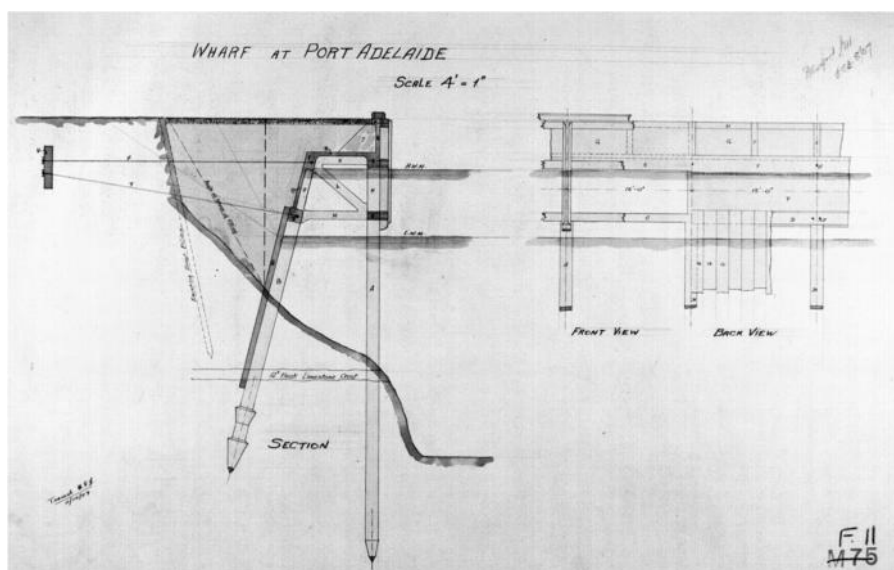


Figure 9. Original proposal prepared by John Monash for the CSR Glanville Wharf, in 1906. (Source: J Thomas Collection; in Holgate, A; Sir John Monash and The South Australian Reinforced Concrete Co; published in Transactions of the Inaugural South Australian Engineering Heritage Conference, 3 May 2012; Engineering Heritage Australia)

¹² Holgate, A; *Sir John Monash and The South Australian Reinforced Concrete Co*; published in Transactions of the Inaugural South Australian Engineering Heritage Conference, 3 May 2012; Engineering Heritage Australia.

¹³ Lewis, M; op cit

¹⁴ 'Concrete Wharf at Gladstone'; The Brisbane Courier; 25/01/1907; via Trove.

The contract for the Gladstone jetty (co-incidentally, at 'Auckland' Point, Gladstone) was awarded to the Ferro-Concrete Company of Australasia early in 1907 and, in the first week of October 1908, the Queensland Government's Engineer for Harbours and River, E A Cullen, formally received the first stage of the completed wharf from its builders.¹⁵ This wharf was commissioned by the Harbours and Rivers Department, as the Gladstone Harbour Board wasn't formed until 1914. It is unclear whether this wharf, the foreshore around which has subsequently been extensively reclaimed, remains as part of the current Auckland Point Wharf but it appears that the original site is now occupied by the present bulk grain terminal.



Figure 10. Auckland Point Jetty circa 1908, prior to its extension in concrete (left) (Source: Gladstone Regional Art Gallery and Museum) and (right) in the 1920s after its extension (note the railway connection).(Source: QSL)

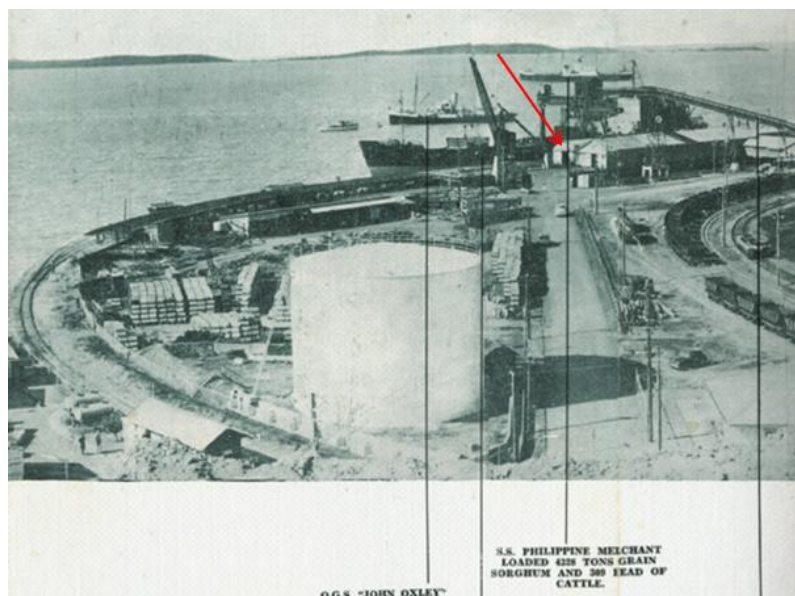


Figure 11. Auckland Point Wharf in 1955, showing original wharf now met by land reclamation (note railway line on left). The red arrow shows the original wharf shed. (Source: A Pictorial History of the Port of Gladstone; Gladstone Ports Corporation; 2009)

¹⁵ 'Gladstone'; The Capricornian; 10/10/1908

A second reinforced concrete wharf was commissioned by the Harbours and Rivers Department for Pinkenba on the Brisbane River in 1909, with construction commencing in September, 1909. This work was overseen by Engineer Mr C N Boulton, formerly employed by the (now bankrupt) Ferro-Concrete Company of Australasia.¹⁶ (It is not clear whether Boulton had been involved in the construction of the Gladstone Wharf, however, one later report indicates that he "*had experience at Gladstone and Pinkenba in ferro-concrete wharf construction*"¹⁷.) For the Pinkenba project, Boulton was directly employed by the Queensland Railways Department, for whom the wharf was being erected. The new concrete wharf was put into use, prior to its final completion, in May 1910. The survival of this early concrete wharf at Pinkenba is also unclear, although it appears likely that it was the concrete wharf that was demolished in 2007.

Other early reinforced concrete wharves were built by Stone and Siddeley at Thevenard, South Australia (completed in 1920) and at Stansbury on Yorke Peninsula (commissioned in 1918 and completed 1920/21). Both of these wharves appear to be still in use. Apart from the Glanville wharf, John Monash and the RCMCP did not build any other concrete wharves until the 1920s¹⁸.

2.5 The Development of the Cairns Wharves

In 1907, the Cairns Harbour Board began investigating options for improving the wharfage in the Port of Cairns and sought advice from a variety of sources. W E Adams of the Sydney Harbour Trust recommended they approach the NSW firm of Gummow Forrest & Co but, in November, 1907, when that firm requested a payment of £250 to send an engineer to report, the Board declined. In October, 1908, the Board received a briefing from Mr Gifford-Lodder, Senior Engineer (in New Zealand) for the Ferro-Concrete Company of Australasia¹⁹ and, in February 1909, E A Cullen, the Queensland Government's Engineer for Harbours and Rivers, visited Cairns and supplied a detailed report regarding the advantages of ferro-concrete wharfage²⁰. He also reviewed the wharfage scheme drawn up by Cairns Harbour Engineer, E G Waters, and, in most respects, approved the scheme²¹. He provided detailed plans, specifications and cost estimates for the Board to consider²² (see also Figure 12). In May 1909, W J Baltzer of Gummow Forrest & Co visited Cairns and presented to the Harbour Board (the question of payment was not mentioned at this time)²³.

By the end of 1909, a decision to proceed had been agreed but, by this time, the preferred contractor, the Ferro-Concrete Company of Australasia, was in liquidation. However, their Engineer, Mr C N Boulton, had been engaged in works in Queensland and had been subsequently engaged to oversee construction of the Pinkenba Wharf. In early 1910, the Pinkenba Wharf was approaching completion and E A Cullen recommended that they approach Mr Boulton in relation to works at Cairns; Boulton indicated that he would be willing to take on the position at £600 per annum²⁴.

The Queensland Government approved a loan of £14,000 to the Cairns Harbour Board in March²⁵ and Boulton was engaged by April, 1910, when he made an inspection of the site²⁶. He also inspected the quarries and foundries that would supply local materials. By September, he was reporting to the Board that: "*The concrete piles are all complete ... The driving and cutting down remain to be done*"²⁷.

¹⁶ '*Disappearing Island*' The Telegraph, Brisbane 02/01/1907; via Trove.

¹⁷ '*Notices of Motion*'; Cairns Post 12/07/1910; via Trove.

¹⁸ Lewis op cit; Holgate op cit.

¹⁹ '*Wood or Concrete*' Cairns Morning Post 26/08/1908; via Trove.

²⁰ '*Permanent Wharf Scheme*' Cairns Morning Post; 24/03/1909; via Trove.

²¹ '*Cairns Harbour Board - Concrete Wharf Scheme*' Cairns Post; 28/01/1910; via Trove.

²² '*The Cairns Wharves Ferro-Concrete Scheme - The Specification*'; Cairns Post; 01/02/1910; via Trove.

²³ '*Wharf Construction*' Cairns Morning Post 28/05/1909; via Trove.

²⁴ '*The Cairns Harbour Board*' Cairns Post 12/01/1910

²⁵ '*Concrete wharf at Cairns*' Brisbane Courier; 17/03/1910; via Trove.

²⁶ '*Cairns Harbour Board Engineers Report*' Cairns Post 26/09/1910; via Trove.

²⁷ '*Ferro-Concrete Wharf*'; Cairns Post 21/09/1910; via Trove.



Figure 12. Photograph of the Concrete Piles for the Cairns Harbour Board, published in 'The Week', Friday, 30 December, 1910. (Source: Trove)

Construction of wharves proceeded steadily over the ensuing months. The second section of wharf construction was approved in September 1911, while construction of the first section was approaching completion. The first vessel to dock at the new concrete wharf was the *Perthshire*, carrying immigrants from England via the Torres Straits, arriving on the 21 November, 1912. Around this time, the Cairns Harbour Board published a brochure for shipping companies, in which the port's characteristics and facilities are described. In relation to the wharfage, it states:

'There are three deep water wharves at present: No. 4 Wharf 272 feet frontage, 20 feet low water; No. 3 Wharf (new Ferro-concrete), 300 feet frontage, 22 feet at low water: Chillagoe Wharf (privately owned, with railway on wharf), 236 feet frontage, 20 feet at low water. The Harbour Board are carrying out a scheme whereby the new concrete wharf No 3 will have 900 feet frontage and 22 feet at low water.... The railway, indirect communication with the back country, runs at the rear of all the wharves. Shed accommodation is on all the wharves except the Chillagoe Company's Wharf. Bonded stores on No. 5 and the new concrete wharf'²⁸

A large storage shed, 73 metres by 17 metres (240 feet by 60 feet), was constructed on the wharf shortly after. Immediately, preparations were made for the construction of the next 92 metre (300 feet) section to the north of the first section (ie No.2 wharf). In September 1913, the No.2 wharf was completed, measuring 92 metres by 25 metres (300 feet by 80 feet) with a storage shed measuring 73 metres by 18 metres (240 feet by 58 feet).

The construction of the wharves continued during 1913. At that time, the concrete piles for the retaining wall for Nos. 4 and 5 wharves were made, the old No. 4 wharf demolished and construction of the new No. 4 wharf commenced. Temporary sheds were erected for the accommodation of cargo and a 10 ton travelling gantry crane was erected between Nos. 2 and 3 wharves. Roads were constructed behind the wharves and railway tracks were laid along the full length of the wharves.

²⁸ 'Cairns Harbour'; Daily Mercury 12/10/1912; via Trove

Cairns Post Tuesday 1st February, 1910

The Cairns Wharves
FERRO-CONCRETE SCHEME
THE SPECIFICATION

In the Post of Saturday there appeared a report from Mr. E. A. Cullen, Engineer Harbours & Rivers Department, in connection with the proposed ferro-concrete wharves to be erected for the Cairns Harbour Board. The following are some details for the specification for reinforcement.

The cement shall be according to the specification of the Railway Department, the sand shall be clean, sharp and coarse, free from any vegetable or clayey matter. The gravel shall be absolutely clean and the stone is to be broken basalt, granite, or other rock of similar hardness. For making piles, it must be made to pass a one-inch ring and must be freed from the dust made in crushing. The steel shall consist of round bars of mild steel. The reinforcement steel shall have an ultimate strength of 28 tons per square inch and shall elongate 25 per cent on an eight-inch test before fracture. The steel must be free from all scales or rust and must be put in accurately to drawings.

The concrete shall be composed as follows: For piles: 1 of cement, 1 ¼ sand, and 2 ½ broken metal to pass a 1 inch ring; For superstructure: 1 of cement, 2 ½ sand and 3 ½ broken metal or gravel to pass a 2 inch ring; For retaining walls and anchorages: 1 of cement, 2 ½ sand and 4 ½ gravel or broken metal. Displacers of clean hard spalls may be freely used in this portion of the work, care being taken not to displace the reinforcement. The concrete shall be mixed wet enough to readily flow round the reinforcement but not so wet that the mortar can flow from the broken metal or sand. Moulds shall be made rigid and true to dimensions shown on the drawings. All re-entrant angles must be cut out as per sketch. All corners must be chamfered one inch. Great care must be used in stripping the falseworks after the concrete has set, so as not to damage the corners. The whole of the work except the top surface shall be coated with a coat of cement grout, applied while the concrete is still green. All reinforcement must be made into rigid frames and securely lashed into place before concreting is commenced.

The piles shall be 15 in by 15 in square and shall be reinforced with 1 ½ in diameter steel rods as shown, so that the minimum covering of concrete over the wires shall be 1 ½ in. The main reinforcement 1 ½ in diameter must be welded so that the welds break joint -welds may, however, come opposite each other diagonally. The wiring shall be put on tight and free from bends and kinks. No. 8 galvanised steel wire shall be used and must be of stiff quality. Driving bars and shoes shall be moulded as shown. They.. [illegible] signs of tension cracks, preferably by the tipping table, and must be driven to the required set with a wooden dolly and sawdust or other suitable cushion. When driven, they must be pulled and fastened in line and the concrete broken away from the bars down to the level of the deep transverse bracing beams. The longitudinal shall be 26 inch deep, from the top of the deck 32in, and the girders at haunches shall 15 inch wide. The reinforcement shall consist of six 1 in diameter bars, four of which are turned up and overlapped as shown and two run straight. Stirrups 1/4 in steel must be placed as shown on plans.

The transverse shall be 28 in deep and 15 in wide. The reinforcement shall consist of six ¾ in diameter rods which must be welded into one length throughout. Welds must be spaced so that, in the bent rods, they come approximately ¾ span from the centre of the longitudinal girders and straight rods shall have welds approximately at the centre of the longitudinal girders. The welds must break joint, not more the half the welds being at one place. The deep bracing beams shall be six feet deep and 15 in wide. They shall be reinforced with two 1 ¼ in diameter rods welded into single lengths, the welds in any beam breaking joints. The ends shall be turned up as shown.

The decking shall be 8 in thick except where the rails are laid - where two rail beds each 6 feet wide by 12 in deep shall be put in. There shall be two troughs for rails as shown, the troughs to be filled in with concrete on brown paper jointing until it is required to lay rails. The decking will be reinforced in two directions: (1) longitudinal bars which shall be 18 feet long. They shall be bent up over the transverse beams as shown and shall overlap every 7ft. 6in. These bars must be arranged so that the overlap shall take place alternately over the transverse beams and deep bracing transverse beam. (2) Transverse bars shall run over these longitudinal bars except where the latter are bent up. They shall not be bent up over the longitudinal girders. The upper ½ in of the deck shall consist of one of ¼ in metal chips, 1 of sand and 1 of cement and is to be laid with the rest of the decking. Provision is to be made in this surfacing for a slope of one-half inch away from the sheds. One inch drainage holes through the decking shall be provided behind front kerb, spaced 7ft. 6in.

A retaining wall shall be constructed as shown. The reinforcement shall consist of four 1 in diameter rods at top, two 1 in diameter rods at bottom, twelve 3/8 in diameter rods front and back. The specification for fender piles states that they shall be driven along the face of the wharf and hardwood longitudinals, 12 in by 6 in, shall be bolted to the front of the wharf.

Figure 13. The transcribed text of an article printed in the Cairns Post 1st February, 1910 providing the specification for the construction of the concrete wharves. (Source: Cairns Post, via Trove)

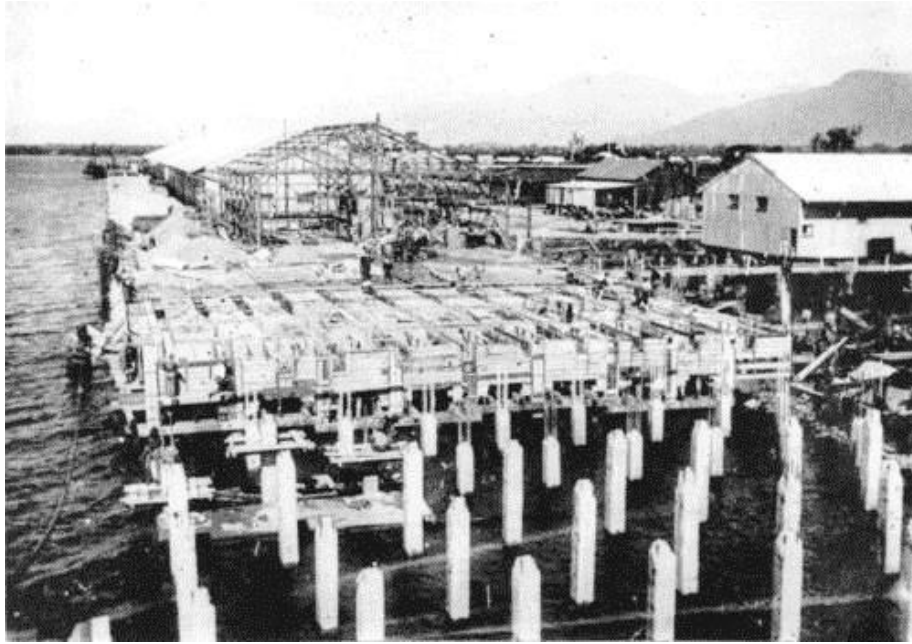


Figure 14. Construction of wharves at Cairns, 1915. (Source: SLQ #201219)

By 1915, an unbroken series of 369 metres (1,200 feet) of concrete wharf was complete and available at the port. The Chillagoe Wharves were acquired by the Harbour Board in early 1916²⁹ and another 92 metre (300 foot) section of concrete wharf was constructed in its place. More loans were taken out in the early 1920s and the wharves were extended further with the construction of the No.5 wharf in 1923. With the completion of this wharf, the port could boast a continuous 492 metres (1600 feet) of concrete wharfage, providing five berths of approximately 98.5 metres (320 feet) each (Berths 1 - 5).

2.6 Subsequent Works

In 1925, a storage shed was constructed on No.1 wharf, adjoining the existing sheds. It was 60 metres (195 feet) long and 17.8 metres (58 feet) wide. In this year also, the wharf sheds were connected to one another at roof level to form a continuous line of roofing along the wharves. In 1929, another 123 metres (400 feet) of concrete wharf was completed south of Lily Creek. Initially referred to as the No.6 wharf, it was later renamed as the overseas wharf³⁰.

The Port of Cairns wharves remained in this form until early in World War 2, when the existing wharf was extended with the construction of Wharf No. 6, on the south side of wharf No. 5. This section of wharf was built by the Allied Works Council and was constructed with a reinforced concrete deck poured on permanent corrugated-iron formwork carried on timber piles, with a shed on the wharf.

Post-war, the clock tower on top of the shed roof at wharf No.3 was added in 1948. The clock itself was manufactured in Sydney at a cost of £900.

²⁹ 'Chillagoe Wharves' The Telegraph, Brisbane, 08/01/1916

³⁰ Allom Lovell op cit



Figure 15. *New section of reinforced concrete wharf (Wharf 5) under construction at Cairns, circa 1923. (Source: SLQ #199171)*



Figure 16. *Construction of Wharf 5 at Cairns, circa 1920s. The rail tracks are set into the deck of the wharf and the future site of Wharf 6 is on the right. (Source: SLQ #186298)*

In 1984, the shed at No 1 wharf was demolished and the new terminal building erected for the development of 'Trinity Wharf' as a cruise liner terminal. Later, the sheds at wharves Nos. 4, 5 and 6 were also demolished, leaving only those at wharves Nos. 2 and 3.

In the late 1990s and early 2000s, Cairns Port Authority and Cairns Regional Council developed the Cairns Cityport Masterplan, including a heritage precinct centred on Wharves 2 - 5. In late 2007, the (new) shed at No. 1 wharf was demolished and the sheds at No's 2 and 3 Wharves were adapted to house the new Cruise Liner Terminal. These sheds were then progressively renovated between 2008 and 2012. This work was integrated with the redevelopment of the Cairns waterfront for tourism uses and, in late 2012, a new café building was erected on No. 1 Wharf.



Figure 17. Aerial view of Cairns Wharf, Queensland, 1937. Wharf 6 has yet to be constructed. (SLQ # 105056)

3 PHYSICAL CONTEXT

3.1 General

The following description of the Cairns Wharves Complex summarises the QHR citation and the descriptions provided in the Allom Lovell Conservation and Management Plan (2000), as well as on-site observations. It does not provide a detailed investigation of all fabric but an overview of the elements of the place.

At present, Wharf Shed No. 3 is fitted out as the present Cruise Ship Terminal, with offices and facilities for Port administration purposes. Wharf Shed No. 2 has been renovated and, whilst currently vacant, is to be leased to a café/restaurant/tourism occupant. Wharf No 1 is a largely public open space area, with a small café/restaurant and public amenities building on its northern end. Wharves 4 and 5 are clear open wharf aprons. The timber substructure of Wharf 6 is in poor physical condition. Consequently, Wharf 6 is partially fenced to separate it from the other wharves and to ensure that vehicles do not cross onto the wharf deck which has been severely load-limited. All wharves are in use for general shipping and fishing fleet mooring; Wharf 3 currently serves as the primary Cruise Liner berth.

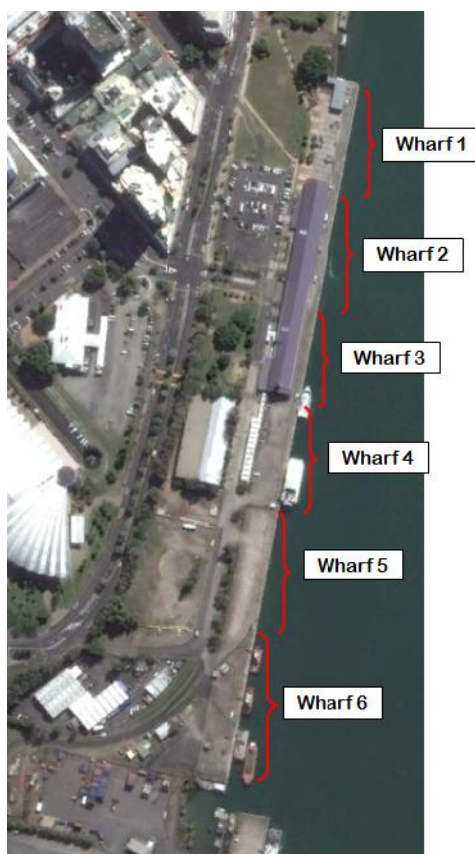


Figure 18. *Layout of Wharves at Cairns (GoogleEarth).*

3.2 Wharf Structures

The six wharves comprise six individual structures, although recent works have joined the structures of Wharves 1 - 5 into a continuous structural unit. Wharves 1 - 5 are constructed entirely from reinforced concrete, whilst No.6 has a reinforced concrete deck carried on a timber substructure. The total length of wharf is approximately 590 metres, with 480 metres of reinforced concrete wharf and 110 metres of timber wharf.

The concrete wharves are all of a similar design and construction. Wharves 2 - 5 are each approximately 100m long by 27.5 m wide, though No 5 curves at its southern end. Wharf 1 is approximately 80 metres length. Each wharf consists of a concrete slab on a grid of reinforced beams on concrete piles, all poured in situ with visible formwork imprints. Piles are laid in a grid approximately 4.6 metres (15 feet) by 3.1 metres (10 feet).

Tapering concrete beams 1.7 metres deep span between the piles, perpendicular to the land. Set into these beams at approximately 2 metre spacings are transverse concrete beams, 600mm deep by 410mm wide. Wharf No 1 differs from the others by having a deep concrete beam along the outer edge and the northern-eastern corner of the wharf is chamfered. A reinforced concrete seawall extends the full length of wharves on the inland side.

The seaward edge of the concrete deck has a discontinuous concrete kerb and new steel bollards alongside original 'rams-horn' bollards. The deck shows evidence of many minor penetrations and repairs. Timber fender piles bearing against rubber cone compression units are spaced at approximately 4 metre intervals along the entire wharf frontage.

Wharf 6 is approximately 110 metres long and curved on its northern end to match the equivalent south end of Wharf 5. It comprises timber piles (laid in a similar grid to the concrete wharves) with timber headstocks and transoms carrying a concrete deck poured in situ on permanent corrugated-steel sheet formwork. Timber piles are generally sheathed in concrete, with many showing damage to the sheathing and notable degradation of the timber pile within the tidal zone. The concrete deck is continuous with the adjoining wharves and contains a similar arrangement of bollards and kerbing. Three large new concrete piers have been inserted through the deck of the wharf within the last decade. These formed the footings for a tripod crane installed on the wharf in the late 1990s and removed in 2012. Owing to the poor condition of the substructure, the wharf has a restrictive load limit applied to its deck (with one area from which vehicles are specifically excluded) and has been fenced off from general access.



Figure 19. View northwards of wharves 5 and 4, with the Wharf 3 Shed in the background.



Figure 20. *The reinforced concrete structure is apparent at the north end of Wharf 1.*



Figure 21. *View northwards of wharves 3 and 2, with the Wharf 3 Shed on the left.*



Figure 22. *The timber substructure of Wharf 6 is in poor condition.*



Figure 23. *The wharf edge, showing concrete kerbing blocks and cone-mounted fender piles.*

3.3 Wharf Sheds

The two wharf sheds are simple rectangular structures with gable roofs built directly onto the concrete wharf deck. The sheds run parallel to the wharf and are approximately 16.5 m by 80 m, with an 8 metre wide roadway between the shed and the wharf edge. The roof is continuous between the two buildings, creating a covered area between the sheds. The roof frame is comprised of twenty-one Howe trusses supported on single timber posts at the ends and mid span. The top chord of each truss extends approximately 1.5 m beyond the wall framing as rafters to provide overhanging eaves. The bottom chord is a double member and trusses are jointed with metal plates. The central posts are strutted to the bottom chord and the end posts are strutted at irregular intervals to give clearance to the large timber sliding doors. Single purlins run between the trusses and are bolted through the top chord.

The walls are simply framed with timber posts and beams on a continuous bottom plate with diagonal bracing between posts. The walls are clad externally with painted corrugated iron. The iron is in small sheets, uneven and is dented from use. The exterior openings are top-hung timber sliding doors and high level ventilation openings sheeted with wire mesh.

Both sheds have been substantially renovated and upgraded. Much of the roof sheeting and some cladding has been replaced with Colourbond™ sheeting, although much original cladding has been retained and sheeted over. Shed 3 is largely open on the ground floor, providing a flexible space used for storage, functions and for customs clearance when a Cruise Ship is in port. The northern wall has been replaced with glazed panels. The southern end has a two-storey section which contains offices on the upper level. A rectangular skillion roof insertion on the western side of the roof is the remains of the former conveyor connection from the sugar shed (White's Shed). Shed 2 is a single-storey open space, with glazed wall panels inserted on the northern end. It is currently vacant.

On the southern end of Shed 3 is a clock tower. The clock tower is a square shaft clad with flat metal sheeting, capped with a pyramid roof of corrugated iron with broad timber-lined eaves surmounted by a decorative steel weather van. Stabilising wires radiate out to the main shed roof. The clock presents a 2 metre diameter face to each side.

There is a 10 ton capacity hand-operated cargo crane conserved on the western side of Shed 2.



Figure 24. *The wharf apron and seaward frontage of the Wharf 3 Shed, now the Cairns Cruise Liner Terminal.*



Figure 25. *The Wharf street frontage of the Wharf 3 Shed; note the skillion section in the roofline which is a remnant of the former conveyor connection from White's Shed.*



Figure 26. *The redeveloped north end of Wharf Shed 2, with glazed wall panels and timber screen.*



Figure 27. *The interior of Wharf Shed 2, showing the clear space awaiting a new tenant.*



Figure 28. *The hand-operated 10ton capacity cargo crane has been conserved outside Wharf Shed 2.*

3.4 Condition Including Recent Alterations and Additions

Wharves 1-5 are in acceptable physical condition. They would be retained under the CSDP proposal.

However, Wharf 6 is in very poor structural condition. A condition assessment conducted by Flanagan Consulting Group³¹ concluded that:

Wharf 6 is currently in very poor structural condition due to the severe deterioration of the timber piles, headstocks, timber girders and concrete deck. Testing of these key structural components has confirmed that significant loss of strength and durability has occurred and is continuing to occur at an increasing rate. The failure of any of these structural elements could result in catastrophic collapse of the deck and could endanger users and equipment.

Wharf 6 does not comply with current Australian Standards and is not fit for purpose.

Other parts of the wharf complex have been subject to major development works carried out to the Cairns waterfront between 2008 and 2014. These included the upgrade and redevelopment of the wharves, wharf buildings and surrounding areas:

-) Wharf 1 and a large section of the surrounding site was landscaped and adapted for public open space, with parkland, boardwalk areas, cultural and heritage interpretation and tourism-focussed commercial developments.
-) No. 2 Wharf Shed was renovated and prepared for adaptive reuse.
-) No. 3 Wharf Shed was renovated and upgraded as the Cairns Cruise Liner Terminal and Wharf administration building.

These works have received a number of commendations and awards.

The work to Wharf Shed 3 was awarded:

-) 2011 National Trust of Queensland – John Herbert Award for most outstanding nomination across all award categories;
-) 2011 National Trust of Queensland – Gold Queensland Heritage Council Award for achievement in the conservation of places on the Queensland Heritage Register;
-) 2011 Australian Institute of Architects National Lachlan Macquarie Award for Heritage Architecture;
-) 2011 Australian Institute of Architects Queensland Don Roderick Award for Heritage Architecture; and
-) 2011 Australian Institute of Architects Far North Queensland Eddie Oribin Award for Building of the Year

The Cairns Foreshore Development project, with particular emphasis upon the conservation and adaptation works to Wharf Shed 2, was the recipient of two major design awards:

-) 2013 Australian Institute of Architects Queensland Don Roderick Award for Heritage Architecture; and
-) 2013 Australian Institute for Architects Far North Queensland Edit Oribin Award for Building of the Year.

In addition to these works, Ports North has undertaken an extensive maintenance and repair programme for the reinforced concrete wharves. This has involved detailed investigations into the current condition of structural elements, innovative corrosion remediation techniques and the

³¹ Flanagan Consulting Group 2017, *Condition Assessment Report: Wharf 6, Wharf Street, Cairns*.

development of low-impact infrastructure upgrades such as the installation of rubber-cone mounted fender piles along the front of the wharf.



Figure 29. Image of the deteriorating piles and structure at Wharf 6 (from Appendix AE Condition Assessment).

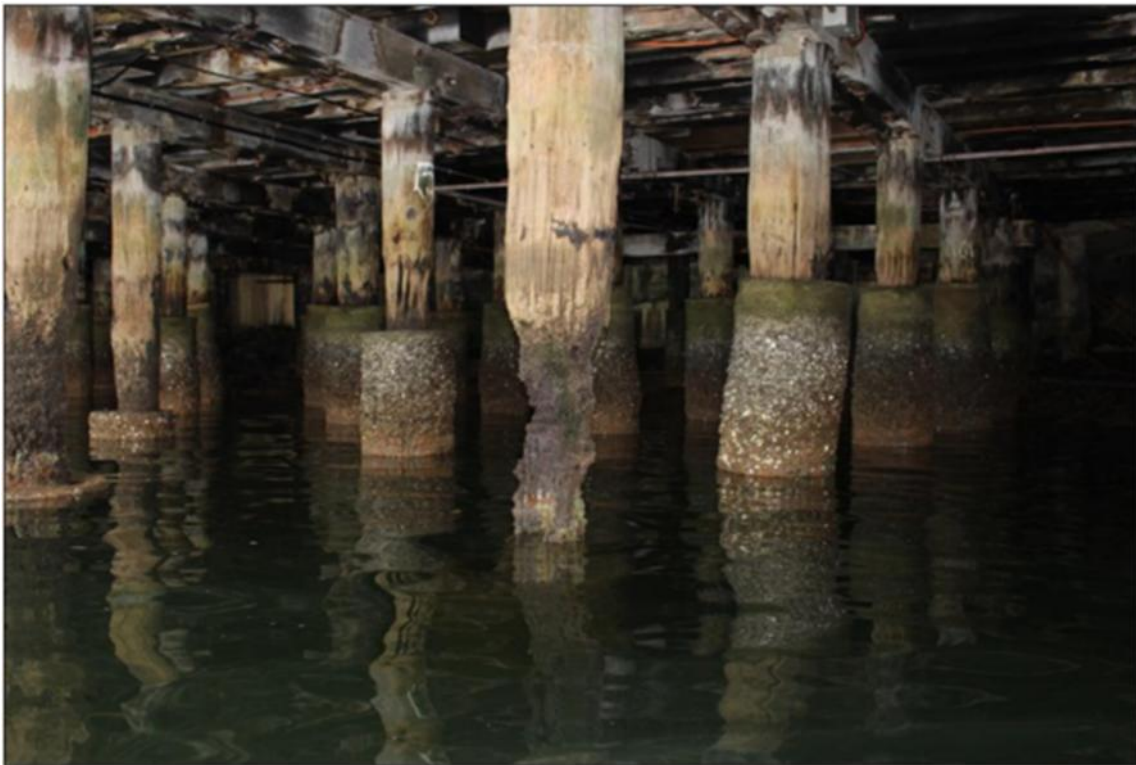


Figure 30. Image of the deteriorating piles and structure at Wharf 6 (from Appendix AE Condition Assessment).

4 CSDP PROPOSED WORKS

The Cairns Shipping Development Project is a broad-scale development project which aims to improve the berthing facilities for large cruise ships in the Port of Cairns. The expansion of cruise ship facilities in Cairns is an important step in developing increased tourism opportunities in North Queensland and is likely to produce considerable benefits to the local economy and to the tourism industry generally in Far North Queensland. The key requirements, to enhance cruise ship visit numbers, are the dredging of a broader and deeper entrance channel to allow port access for larger cruise ships and the upgrade of berth infrastructure within Trinity Inlet.

While the existing wharf facilities are of sufficient length for the intended purpose, the structure of the existing wharves is not capable of safely berthing ships of the size and weight of modern cruise liners. Therefore, CSDP proposes the following (see Figures 31-18 below):

-) Existing Wharf 6 is in extremely poor condition and would be demolished.³² Wharf 6 is different to Wharves 1 - 5, in that it has a concrete deck supported by a timber substructure (timber piles, timber headstock and timber bearers) and it was constructed in the 1940's. Wharves 1 - 5 are fully reinforced concrete in construction and were built in the 1920's and earlier.
-) Removal of Wharf 6 would leave a taper on the end of Wharf 5. Therefore, Wharf 5 would be 'infilled' to provide a usable quay line for cruise ships. The infill would be similar to the existing concrete construction of Wharf 5 in form, fabric and appearance.
-) Berthing / mooring dolphins would be inserted into penetrations in the existing concrete Wharves 1 - 5 at 23m centres, with the top of the concrete dolphin to match the top of the existing concrete wharf. The dolphins would be based upon their own steel pile system and would take the berthing load via large rubber cone fenders.
-) Twenty-three dolphins would be required, located at every fifth bent or panel along the wharves.
-) Each Berthing Dolphin would require a section of the present concrete deck to be removed and replaced with new concrete to support the dolphin (concrete removed in this operation would be replaced with concrete).
-) In addition to the berthing / mooring dolphins, it would be necessary to provide a number of mooring only dolphins, separated from the main wharf. Their construction would be similar to the berthing / mooring dolphins. Access to these dolphins would be via lightweight aluminium walkways.

³² Flanagan Consulting Group 2017, *Condition Assessment Report: Wharf 6, Wharf Street, Cairns*.

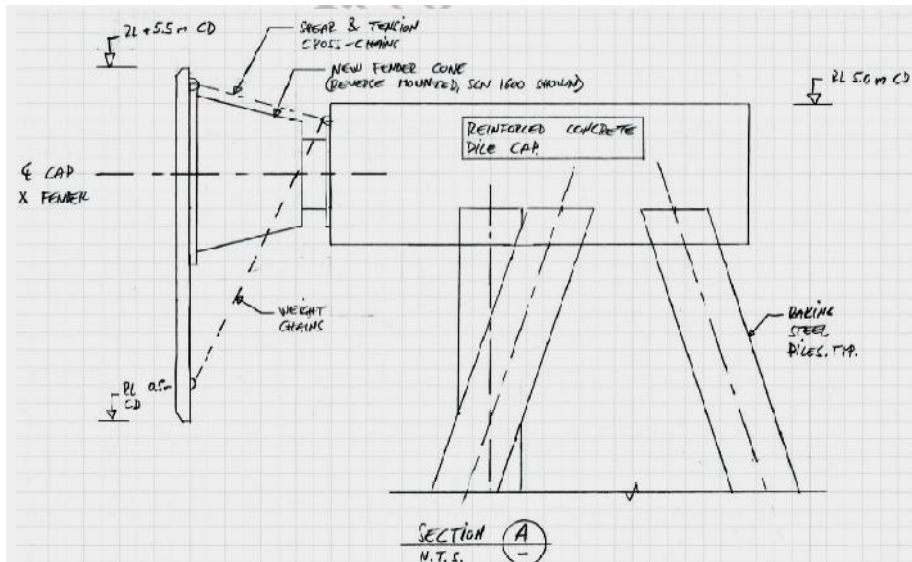


Figure 31. Elevation sketch of the proposed new berthing dolphins at Cairns (Source: Arup).



Figure 32. Generated image of the proposed new berthing dolphins inserted into the wharf deck, visible as white/black patches along the front of the wharf. Note: The white and black in the image is to assist the reader only. The actual finish would be grey concrete similar in appearance to the historic fabric. (Source: Ports North)



Figure 33. *Indicative view of an installation of ‘Super-Cone Fenders’ (at Bahrain) (Source: Ports North).*

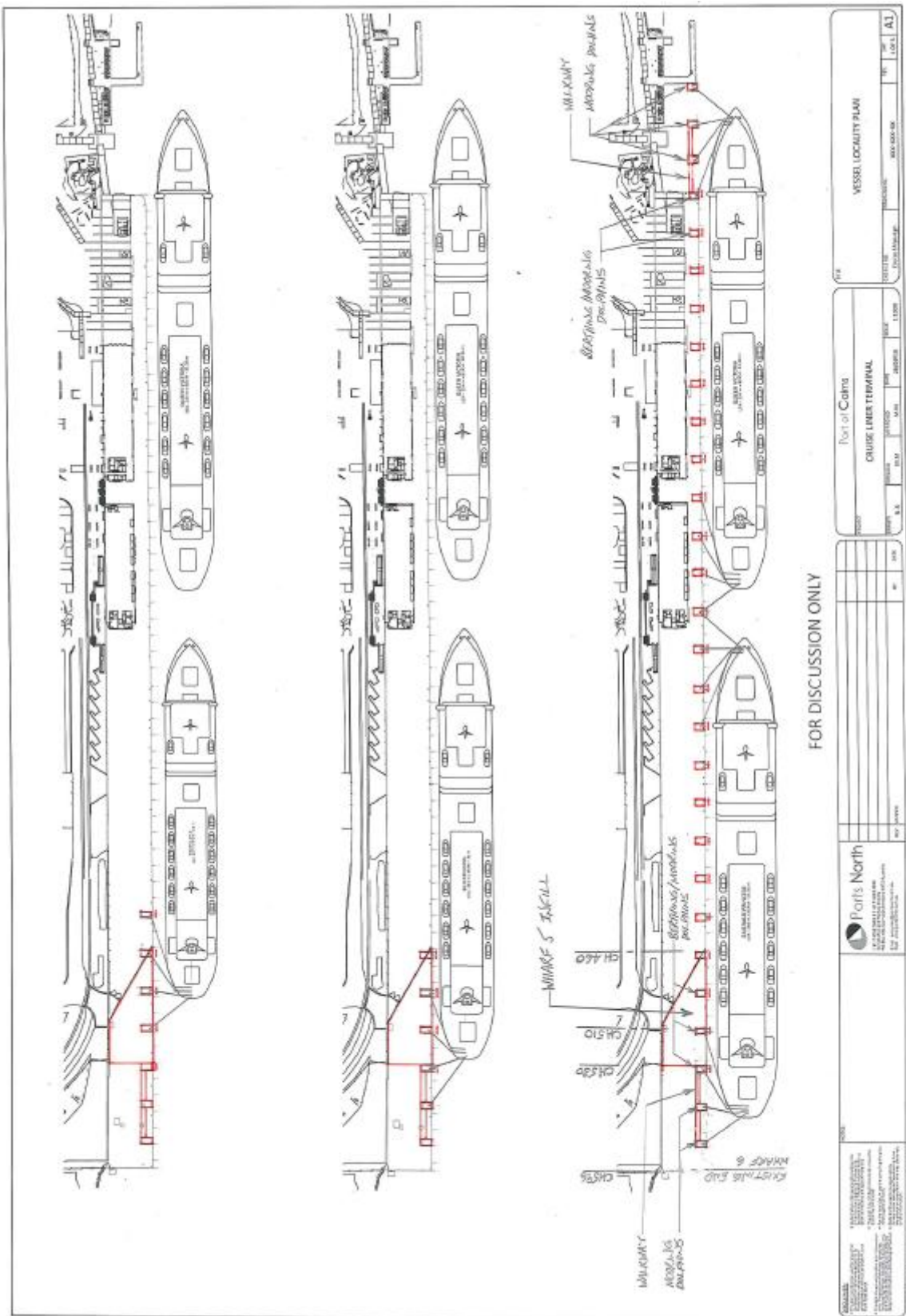


Figure 34. Indicative layout of the proposed installation of Berthing Dolphins at Cairns wharf (Ports North).

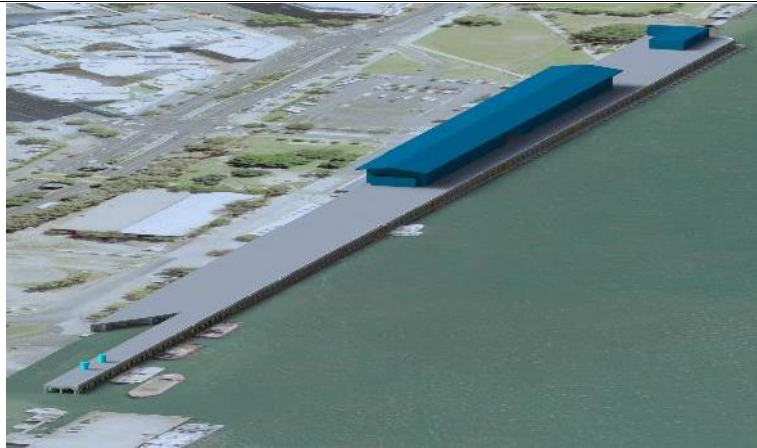


Figure 35. Option 1 – Proposed treatment of the demolition of Wharf 6 and addition of extension to Wharf 5 at Cairns wharf (Ports North).



Figure 36. Option 1 – Detail of Wharf 5 & 6 interface area - Proposed treatment of the demolition of Wharf 6 and addition of extension to Wharf 5 at Cairns wharf (Ports North).

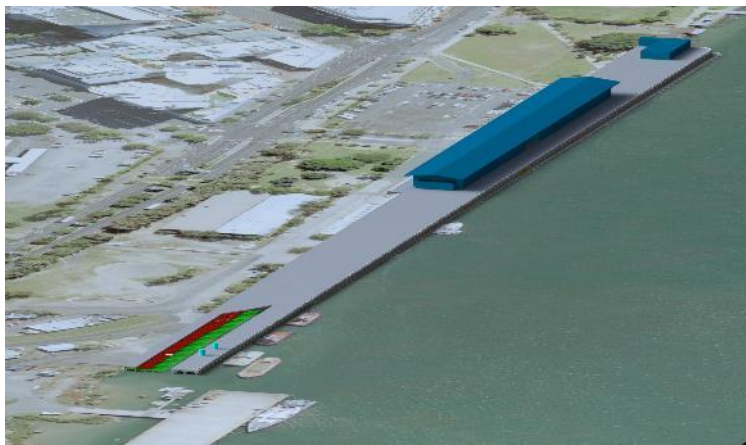


Figure 37. Option 2 – Proposed treatment of the demolition of Wharf 6 and addition of extension to Wharf 5 at Cairns wharf (Ports North) – showing a small section of Wharf 6 retained along the foreshore, with exposed piles in the waterway between.



Figure 38. Option 2 – Detail of Wharf 5 & 6 interface area - Proposed treatment of the demolition of Wharf 6 and addition of extension to Wharf 5 at Cairns wharf (Ports North) – showing a small section of Wharf 6 retained along the foreshore, with exposed piles in the waterway between.

5 HERITAGE SIGNIFICANCE

5.1 Preamble

'Heritage significance' and 'cultural significance' are terms used to define and describe an item's value or importance to our society. Cultural significance is defined in the Australia ICOMOS 'Charter for Places of Cultural Significance (The Burra Charter)' as:

Aesthetic, historic, scientific, social or spiritual value for past, present and future generations.

These values may be contained in the fabric of the item, its setting and relationship to other items, the response that the item stimulates in those who value it or the meaning of that item to contemporary society.

Clearly stating the different aspects of the cultural significance of a place assists us to identify the potential adverse impacts of proposed activities at or near that place.

5.2 Criteria for Assessing Queensland Heritage Places

The *Queensland Heritage Act 1992* sets out the basis for an assessment of heritage significance of an item or place, expressed as a number of assessment criteria.

The eight criteria are:

Criterion A: The place is important in demonstrating the evolution or pattern of Queensland's history.

Criterion B: The place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage.

Criterion C: The place has potential to yield information that will contribute to an understanding of Queensland's history.

Criterion D: The place is important in demonstrating the principal characteristics of a particular class of cultural places.

Criterion E: The place is important because of its aesthetic significance.

Criterion F: The place is important in demonstrating a high degree of creative or technical achievement at a particular period.

Criterion G: The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

Criterion H: The place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

A heritage place may be entered in the QHR if it satisfies any one or more of the above criteria. A place is not to be excluded from the QHR on the grounds that places with similar characteristics have already been entered in the Register.

The Cairns wharf precinct has been included on the QHR for satisfying all eight of the above assessment criteria.

5.3 The QHR Assessment of Significance

The Trinity Wharves at Cairns are included on the QHR as *Cairns Wharf Complex* (QHR No: 601790). The following Statement of Significance is quoted from the Queensland Heritage Register listing report for *Cairns Wharf Complex*.³³

Criterion A: The place is important in demonstrating the evolution or pattern of Queensland's history.

The Cairns Wharf Complex is of importance in demonstrating the evolution of Queensland's history as it represents an important stage of development of Queensland and Australian wharf facilities dating from 1909 to 1942. The wharves are among the earliest Australian attempts to introduce the medium of reinforced concrete into wharf construction. The construction of number 6 wharf in 1942 demonstrates the importance of Cairns as a centre for Pacific forces during World War II, and its timber and reinforced concrete construction reflects war-time expediency. The wharf-side cargo sheds, numbers 2 and 3, are the most visible surviving remnant of the Cairns waterfront development in the early 1900s. The cargo crane is the last remaining crane from the earliest period of the wharf's history in the 1910s, and helps to convey a sense of the industrial maritime history of the wharves. White's (Sugar) Shed is a place which demonstrates an evolutionary stage of the North Queensland sugar industry and wharf practices dating to the 1920s through 1950s. The closure of the shed to sugar handling in the early 1960s was the result of the opening of Cairns bulk sugar terminal at Portsmouth in 1964. The opening of the bulk terminals reduced significantly the wharf labour force required for the handling of sugar. The railway lines demonstrate the importance of rail links in establishing Cairns as the dominant regional port in far North Queensland, and consequently, as a viable town. The railway lines are also integral to an understanding of the operation of the wharves, with wharf shed platforms that aligned to the height of the rail cars.

Criterion B: The place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage.

The Cairns wharf sheds, numbers 2 and 3 and White's (Sugar) Shed, demonstrate rare aspects of Queensland's cultural heritage as surviving wharf sheds are becoming increasingly rare throughout Australia as coastal cities revitalise their waterfront areas. White's shed, with its remnant bag-stacking machinery, is the only known example of this type of structure existing in Queensland and Australia, and as such also demonstrates rare aspects of Queensland's cultural heritage.

Criterion C: The place has potential to yield information that will contribute to an understanding of Queensland's history.

The remnant bag-stacking machinery located in White's shed has the potential to yield information that will contribute to an understanding of Queensland's history. Since records of the sugar bag conveyance apparatus have disappeared in the years since abandonment of the system, the intact features along the roof of the structure's interior offer insights which are only available through study of this physical feature.

³³ Queensland Department of Environment and Heritage Protection; Queensland Heritage Register listing sheet for *Cairns Wharf Complex*.

Criterion D: The place is important in demonstrating the principal characteristics of a particular class of cultural places.

The number 2 and 3 wharf sheds are important in demonstrating the principle characteristics of a wharf-side cargo handling structure.

Criterion E: The place is important because of its aesthetic significance.

The Cairns wharves site is important because of its aesthetic significance as the wharves, number 2 gate, White's shed and wharf sheds numbers 2 and 3, including the clock tower, contribute to the streetscape of inner-city Cairns. The wharves run at right angles to the main city streets of Cairns, terminating the long views down Abbott, Lake and Grafton streets south. These views are framed by the mountains and mangroves behind and across Trinity Inlet. The clock tower is particularly of aesthetic significance as a local landmark.

Criterion F: The place is important in demonstrating a high degree of creative or technical achievement at a particular period.

The concrete wharves are important in demonstrating a high degree of technical achievement in the early twentieth century. The use of reinforced concrete for wharf construction represents one of the earliest Australian attempts to introduce this material for wharf construction.

Criterion G: The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

The Cairns wharves, sheds 2 and 3 and White's (Sugar) Shed, number 2 gate and clock tower have a special association with the Cairns community as physical evidence of the city's history and sense of identity. The clock tower affixed to the roof of the number 3 wharf shed has provided a focus for this identity, and has functioned as the city's and wharf's timepiece since 1948.

Criterion H: The place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

The place has a special association with the work of the early Cairns Harbour Board. The wharves and sheds offer a physical reminder of the importance of the Board in establishing the maritime focus of the city and the development of the region.

The Heritage Significance of the Cairns Wharves was also assessed in detail in the Conservation and Management Plan prepared by Allom Lovell in 2000. The Summary Statement of Significance from that report concludes:

The primary significance of the Cairns wharfs lies in its ongoing maritime use. The City of Cairns developed around the wharfs and they are arguably the only remaining major still functioning wharfs in their original inner city location.

The concrete wharfs are some of the earliest reinforced concrete wharfs, indeed reinforced concrete structures, in Australia.

Of secondary significance, the broader site, including Sheds 2 & 3 and Whites' Shed, contain evidence of the site's continued use as a port for nearly one hundred years.

This HIS agrees with the above assessments. In particular, it agrees with the Allom Lovell report's conclusion that the facility's ongoing maritime use is of 'primary significance', and notes that the works proposed by the CSDP are aimed at continuing that use.

5.4 Additional Aspects of Significance

Additional aspects of significance have been identified through the research undertaken in the preparation of this report. These are:

-) The earliest part of the Cairns reinforced concrete wharves (Wharf 3) was the fourth reinforced concrete wharf structure (comprising an integrated deck on piles) to be completed in Australia, after wharves completed at Gladstone Queensland, Glanville South Australia and Pinkenba, Queensland.
-) The Cairns reinforced concrete wharves (Wharves 1 – 5) are now the oldest surviving reinforced concrete wharves in Australia, following the demolition of the Gladstone, Glanville and Pinkenba wharves. The Kings and Queens Wharves in Auckland are the only reinforced concrete wharves outside of Europe known to be older than the Cairns Wharves.
-) The Cairns reinforced concrete wharves are a rare surviving example of the work and techniques of the Ferro-Concrete Company of Australasia, the only Australasian proponent of the patented Hennébique system of reinforcement and the only local entity associated with Louis Gustave Mouchel, who was widely associated with the early use of reinforced concrete in Britain and Europe.
-) The reinforced concrete wharves at Cairns demonstrate that many cutting-edge technologies and advancements in engineering were adopted (or were located) in regional Australia well before they appeared in the major population centres (which tended to be conservative in this respect). The recognition that regional Australia was well-informed and up-to-date regarding significant world developments is important in understanding the course of Australia's historic and economic development.

In relation to Wharf 6 this report also notes that:

-) The Queensland Heritage Register citation makes it clear that 'The construction of number 6 wharf in 1942 demonstrates the importance of Cairns as a centre for Pacific forces during World War II and its timber and reinforced concrete construction reflects war-time expediency'. In other words, Wharf 6 was constructed in haste and did not use the best fabric (timber instead of concrete piles). It was always intended to have a limited use-life.
-) Wharf 6 is a later addition to the original set of five wharves (which were completed between 1912 and 1923) being built in 1942 by the Allied Works Council. It differs from the rest of the wharf complex in its structure, having a concrete deck carried on a timber substructure, and the concrete deck is not built to the original reinforced concrete specification using the Hennebique reinforcing system. The timber substructure is in poor condition, with many degraded timber piles, and a large proportion of the headstocks and transoms suffering end rot and borer infestation.
-) There is nothing technologically advanced or sophisticated about the timber wharf substructure. It is a simple post-and-beam structure relying on traditional materials, technologies and skills and wharves of this type have existed from Roman times. The timber substructure is typical of a wide variety of timber wharf structures and has little technical or rarity significance. The placement of the reinforced concrete deck on corrugated metal sheeting as permanent formwork is remarkable only for having occurred as late as 1942, where this approach was more typical of the early twentieth century.

6 ASSESSMENT OF HERITAGE IMPACTS

6.1 Consideration of Options and Impacts of Preferred Option

The proposed work, in relation to the Cairns Wharf Complex, has two major elements:

-) the installation of Berthing and Mooring Dolphins within and adjacent to the existing wharf structures (Wharves 1-5).
-) the demolition of Wharf 6 and its partial replacement.

These are discussed separately below.

6.2 Wharves 1-5 – Installation of Berthing and Mooring Dolphins

The ‘installation of Mooring and Berthing Dolphins’ may be separated into the two components, as each has differing physical requirements and impacts. The options analysis for the installation of Mooring and Berthing Dolphins is set out in the report entitled *Cairns Cruise Shipping Development Strategy – Land Based Infrastructure – Wharf Structure/01*, prepared by ARUP Pty Ltd, 23/02/2012 (forming part of the CSDP EIS).

6.2.1 Scenario - Do Nothing

Without the installation of the Mooring and Berthing Dolphins, Wharves 1-5 would not be suitable berthing locations for modern large cruise ships. In other words, the redeveloped port facilities would be unfit for their intended purpose. Noting that the ongoing maritime use of the wharves is a primary part of their cultural significance, the introduction of the mooring dolphins would constitute a positive heritage impact, insofar as this would ensure their ongoing maritime use.

6.2.2 Mooring Dolphins

The installation of Mooring-only Dolphins relates to the fore and aft mooring lines of the ships and mooring points are required ahead and behind the ships, as well as alongside. For this reason (and to maximise effective use of the existing wharf frontage), mooring-only dolphins would be installed in line with the wharf but up to 50 – 80 metres beyond the extremities of Wharf 1 (northwards) and Wharf 5 (southwards). The northern mooring dolphins would be located in the waterway in front of a foreshore currently unused for maritime purposes. The southern mooring dolphins would be located in the waterway area currently occupied by Wharf 6. These would be accessed from the decks of Wharf 1 and Wharf 5 via lightweight aluminium walkways on lightweight piles. In both instances, there would be little, if any, physical impact upon the fabric of the significant wharf structures and, as maritime structures in a waterfront context, there will be no adverse aesthetic visual impact upon the setting of the significant wharves.

6.2.3 Berthing Dolphins

The installation of Berthing Dolphins (some of which will be additionally utilised as mooring dolphins) would have a physical impact upon the fabric of Wharves 1–5 in discrete locations. Sections of the original wharf deck would be cut and removed in 20 panels to allow the installation of the new dolphins. These sections would be rectangular in shape, measuring 5.87 x 3.5m. This would amount to c411m². out of a total wharf surface area of c13, 0000m². In other words, no more than 3-5% of the original wharf deck would be removed.

The removal of the panels of reinforced deck and the associated concrete beams would be a significant interference with the original fabric and would have an adverse impact upon the historic integrity of the wharves.

Current engineering advice is that the works would have no impact on the structural integrity of the wharves.

The Berthing Dolphins would be only slightly visible from viewpoints on and above the wharf, as the concrete tops of the new dolphins would be integrated into the current concrete deck via flexible joints. The new concrete would be apparent in contrast to the existing concrete deck but, owing to a long history of use and repair to the pavement, the existing concrete is already variable in colour and texture and this contrast would not be highly prominent. The new work would be more easily discerned from the waterside but would appear as functional maritime structures and the individual dolphins would be largely subsumed in the overall vista of wharf and sheds, with the city behind.

A range of alternative approaches were considered by ARUP in determining the preferred option. These included:

-) Strengthening of the existing wharf structure – not prudent or feasible due to its overall impact upon the original concrete structure.
-) Adding a new line of wharf in front of the existing – not prudent or feasible due to its high cost and poor functional outcomes.
-) Addition of mooring bollards on the landward side of the wharf – not prudent or feasible due to the undesirable complications associated with mooring lines crossing the wharf deck.
-) The addition of a new row of fender piles outside of the existing line of wharf – not prudent or feasible due to its impact upon non-cruise ship users of the wharf.

A central consideration in evaluation of the alternative options was the long-term effect upon the historic wharf structure. The wharf is in good condition at present, owing to a sustained and sophisticated repair and maintenance program undertaken by Ports North over the last decade. This program has been economically justified by the importance of the wharf to the local economy as an item of infrastructure. Relegation of the wharf to a lower level of use would likely lead to a lower level of investment in maintaining its condition, which could be interpreted as a long-term threat to its survival. The Cruise Ship industry, whilst making demands upon the wharf, has also been the agent of its conservation and, for the foreseeable future, the future of the wharf and the Cruise Ship industry in Cairns are interdependent.

All things considered, the removal of sections of deck to allow the installation of independent mooring dolphins, while not ideal in heritage terms, may be the least-worst option available for the future conservation of Wharves 1 - 5. The wharves are fundamentally utilitarian items of infrastructure that must serve their purpose (there are few, if any, practical opportunities for repurposing the wharf in the Cairns context) and their continued use for their designed purpose is the most preferable outcome in heritage terms. It is not unusual for any item of infrastructure to be modified and/or upgraded to maintain its utility and, in this case, the opportunity exists for the wharf, if modified, to continue to serve a significant economic role for at least several decades into the future. The options analysis undertaken by ARUP has established that if Wharves 1 – 5 are to serve as the cruise ship berths for Cairns, this is the least interference required to achieve the attendant level of operation.

6.2.4 Summary

In summary, the proposed works for the installation of Mooring and Berthing Dolphins will have an adverse impact upon the fabric and historic integrity of the Cairns Wharves 1 – 5. This impact, however, represents a necessary modification to the wharves to enable their continued use for economic maritime purposes and this continued use will itself consequently ensure the ongoing

maintenance and repair of the wharves for the foreseeable future. For this reason, the impacts upon integrity are considered to be an acceptable compromise to ensure the long-term viability of the use of the wharves. The proposed works will not substantially reduce the cultural heritage significance of the Cairns Wharf Complex.

This outcome is consistent with the Burra Charter which provides:

-) Article 3.1 – Conservation is based on a respect for the existing fabric, use, associations and meanings. It requires a cautious approach of changing as much as necessary but as little as possible – the CSDP proposed works would have some impact on original fabric but would maintain the ongoing maritime uses, associations and meanings of the wharf complex.
-) Article 4.2 – Traditional techniques and materials are preferred for the conservation of significant fabric. In some circumstances modern techniques and materials which offer substantial conservation benefits may be appropriate – the CSDP proposed works would introduce modern concrete to the places where original concrete has been removed. This is appropriate given the necessity for modern fabric in a functioning mooring/berthing location.
-) Article 7.1 – Where the use of a place is of cultural significance it should be retained – the CSDP proposed works would ensure the ongoing maritime use of Wharves 1-5.
-) Article 8 – Conservation requires the retention of an appropriate setting ... New construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are not appropriate – The CSDP proposed works would not adversely impact the setting of the wharves.
-) Article 15.3 – Demolition of significant fabric of a place is generally not acceptable. However, in some cases minor demolition may be appropriate as part of conservation. Removed significant fabric should be reinstated when circumstances permit – The proposed CSDP works require the removal of a small proportion of the original fabric of the wharves, but not demolition. Reinstatement of the removed concrete is not appropriate in engineering terms.
-) Article 22 – New work such as additions or other changes to the place may be acceptable where it respects and does not distort or obscure the cultural significance of the place, or detract from its interpretation and appreciation. New work should be readily identifiable as such, but must respect and have minimal impact on the cultural significance of the place – the proposed CSDP works would maintain a historic use and would not distort or obscure the place’s cultural significance. New fabric would be sympathetic and unobtrusive.

6.2.5 Economic Considerations

As noted above, State Code 14 of the State Development Assessment Provisions (Performance Outcome 4) provides that where works may result in ‘substantially reducing the cultural heritage significance of a State Heritage Place’ it may be appropriate where it is demonstrated that ‘there is no prudent or feasible alternative to carrying out the development due to ... an extraordinary economic cost to the state, all or part of a community, or an individual ...’

As noted above, the physical impact of the proposed mooring/berthing dolphins would amount to only approximately 3-5% of the wharves’ total surface area. It is arguable that this does not constitute a substantial reduction in the cultural significance of the place. However, adopting a highly cautious approach, this HIS has applied PO4 (a higher standard than PO1). This HIS concludes that the proposed works are appropriate having regard to the extraordinary economic cost of not undertaking the works.

The economic dimensions of the development of the Cairns Port facility are presented in Chapter B9 of the EIS being a report entitled ‘Socio-Economic’. Among a range of local economic goals that a redeveloped Cairns port facility would help to achieve, the authors have identified the following State and regional socio-economic goals directly relevant to the CSDP proposed works at Wharves 1-5 (page 11-21, quoting the report):

- J) The *Far North Queensland 2009-2031 Regional Plan* (FNQRP) remains the current Queensland Government strategic planning document for Far North Queensland. It is noted that the Queensland Government is in the process of updating the state's regional plans. The FNQRP highlights the Port of Cairns as a key node for the development of tourism in the region.
- J) *Advancing Tourism Plan 2016-2020* - Advancing Tourism is the Queensland Government's plan to attract more visitors to the state. It identifies a number of key competitive advantages of Queensland including: diversity in products and experiences; iconic natural assets that offer unique experiences; accessibility through strong transport connections, safe, clean and green environment; and close proximity to Asia. The Great Barrier Reef is identified as a natural asset that can support new and refreshed ecotourism and nature-based tourism products and experiences. Indigenous and cultural tourism products, events and experiences are also identified as an area for growth. Encouraging private sector investment in key cruise ship ports is identified as an action to improve access to tourism transport and infrastructure. Also related to the cruise ship market is an action to undertake a study to investigate opportunities around superyachts and investigating the economic contribution that base porting in Queensland could provide.
- J) *Draft Queensland Tourism and Transport Strategy 2016* – The cruise ship market is identified as one of the fastest growing sectors of the tourism industry in the strategy, and aviation and cruise infrastructure are therefore considered priorities in the strategy. The Port of Cairns is identified as a key cruise port in Queensland supporting the cruise market which is one of the fastest growing travel sectors. As well as actions on improving visitor information, transport services, and ticketing and products, the strategy identifies actions on planning and investment to encourage long term tourism growth which include actions related to the cruise ship market. The actions include: (a) supporting the development of the cruise shipping ports by continuing to encourage private sector investment in the industry and developing a prioritised list of opportunities to optimise long-term growth, (b) capitalising on cruise industry market opportunities by studying potential economic impacts of superyachts, highlighting economic contribution of base porting, and providing a coordinated approach to cruise shipping across Queensland Government.
- J) The *Tropical North Queensland Tourism Opportunity Plan* (TTNQ n.d.) provides direction on the sustainable development of tourism in the TNQ region. It lists the upgrade of the Cairns Cruise Liner Terminal (CCLT), which was completed in 2010, and the upgrade of the shipping channel, as key opportunities to grow cruise tourism.
- J) *Advance Cairns' Tropical North Queensland Regional Economic Plan 2011-2031* (TNQREP) (Advance Cairns 2010) outlines a 20-year economic vision for the region built through consultation with key economic stakeholders in Far North Queensland. It sets out a vision to become 'The World's Leading Sustainable Tropical Region'. The CSDP project is listed in the TNQREP as an activity to strengthen and diversify the region's tourism industry and destination appeal.
- J) *Regional Development Australia (RDA n.d.) Far North Queensland and Torres Strait Roadmap 2013 – 2016* (FNQTSRM) sets out a number of regional focus areas. The upgrade of the shipping channel and associated port infrastructure is identified as a key infrastructure asset needed for social and economic development and future sustainability of the region.
- J) *Tropical North Queensland Destination Tourism Plan 2014* – Tourism Tropical North Queensland developed a tourism plan for the area to assist in achieving an increase in regional tourism expenditure by \$2 billion per year from 2012 to 2020 (TTNQ 2014). The CSD Project is identified as a major tourism-related infrastructure project for the region creating future opportunities. Actions are identified to 'Grow a portfolio of Cruise Liner port visitation schedules and Cairns home porting' and 'Grow superyacht visitation'.

As noted above, without the relatively minor changes proposed to the fabric of Wharves 1-5 those wharves would not function adequately as berths for large modern cruise liners. This would clearly have a significant economic impact on the local, regional and State economy out of all proportion to the relatively low identified adverse heritage impacts.

6.3 Wharf 6

6.3.1 Preamble

A number of options for the retention and conservation of Wharf 6 have been considered by Ports North and its predecessors over a period of several years, both in the wharf's own right and in the context of the approved adaptive re-use of Wharves 1-5 and Sheds 2-3. Ports North has sought to optimise Wharf 6's use but has also considered options that do not involve its ongoing use as an operational wharf.

Detailed evaluation of a range of options was undertaken (discussed in Sections 6.3.2-6.3.5 below) before Ports North settled on the option presented in Figure 35 of Appendix U of the RD-EIS; namely, Option 2. Option 2 involves the partial demolition of Wharf 6 with the retention of the rear of the wharf for its visual appreciation. This option is preferred because it balances engineering and safety requirements against heritage conservation requirements. Importantly, Option 2 ensures the ongoing use of the location of Wharf 6 for wharf purposes, including the mooring of large vessels and the loading/unloading of passengers and freight.

6.3.2 Option: Do Nothing or Ongoing Reactive Maintenance Only

The poor condition of Wharf 6 is described in Section 3.4 above. It is presently fenced off and excluded from primary port purposes due to its unsafe condition.

If a 'do nothing' approach were adopted Wharf 6 would become progressively more dilapidated until there is a catastrophic structural failure. In the interim, this part of the port facility would be sterilised of its primary purpose - the loading and unloading of passengers and freight, which is a primary part of its significance. This would be an adverse heritage impact.

To avoid this scenario Ports North and its predecessors have implemented ongoing maintenance activities under a range of maintenance protocols and exemption certificates. Since 2000 these have been undertaken in a manner consistent with a Conservation and Management Plan. The objective has been to extend the structure's life-span, recalling that its use-life was not envisaged to extend far beyond the close of World War II. However, the structure's condition has now deteriorated to a point where ongoing reactive maintenance is insufficient to ensure its structural integrity in a safe condition. For example, the badly deteriorated sub-structure can no longer be maintained without significantly impacting the wharf's deck as well (see Section 6.3.3 below).

6.3.3 Refurbishment of Wharf 6 to Make it Similar Standard Wharf

The existing sub-structure of Wharf 6 is particularly badly deteriorated with numerous failed timber piles and related infrastructure. The 'repair' of this sub-structure would require the wholesale replacement of most of the original fabric.

Furthermore, because Wharf 6 was built in haste, and because it was never intended to have a lengthy use-life, the timber sub-structure was designed to be inaccessible. This makes repair/refurbishment of the sub-structure impossible without penetrating the existing poured-in-situ concrete deck in numerous locations (e.g. for insertion of new piles). Puncturing the deck to gain access to the substructure (to the degree necessary) would seriously compromise the structural integrity of the deck, probably requiring its replacement as well.

In other words, the refurbishment option would result in new piles and other critical elements of the sub-structure, and a new deck. The wharf would be almost entirely replaced with new fabric. This would so compromise the wharf's heritage values that its continued inclusion on the QHR would not be warranted.

6.3.4 Partial or Total Demolition

As noted above, Wharf 6 was constructed as an ad-hoc structure during WWII, and has been subject to substantial physical degradation since its construction. The heritage values of Wharf 6 have been substantially impacted by this dilapidation, including limiting the continued use of Wharf 6. This continued use is 'at the heart of the [heritage] value of the wharves to the City'.³⁴

Evidence of 'wartime expediency' (quoting the QHR citation) is evidence of an intention to minimise time, costs and difficulty and, in this context, there was no ambition that the structures should last any longer than the wartime conditions persisted. Placement of a unitary concrete slab over a timber substructure is itself evidence of the expedient nature of this wharf as, with no in-built provision for repairs or maintenance to be undertaken economically through the deck, there was never any real prospect of it surviving beyond the lifespan of the first generation of timber elements. Wharf 6 is a 'temporary' or 'ad hoc' structure that has remained in use for a long time but the condition of its components has reached the point where replacement of the majority of its fabric is necessary for its continued survival. Retention of the wharf into the future would require substantive, if not total, reconstruction.

It is inevitable that Wharf 6 will be demolished at some time, as the timber substructure will continue to degrade and the poured-in-situ concrete deck makes the replacement of timber fabric extremely difficult. Puncturing the deck to gain access to the substructure (to the degree necessary) would seriously compromise the structural integrity of the deck, probably requiring its replacement in any case. Consequently, it is reasonable to contemplate alternative approaches to the retention of the significance of the wharf, as retention in its current state is neither prudent nor feasible.

However, the wharf represents physical evidence of the role of Cairns in WW2 and its demolition will remove this historical connection. It may be noted, however, that the timber substructure has only ever been visible from the seaward side and, as there is no apparent difference between Wharf 6 and the other five wharves, this aspect of its significance has not been apparent to most observers. Nonetheless, there is no other primary evidence of the impact of WW2 upon the waterfront at Cairns associated with the Trinity Wharves, although there may be evidence in other locations within Cairns.

Options have been considered and, amongst other possibilities, the partial retention of a section of wharf deck along the foreshore, with several rows of remnant piles projecting from the tidal zone (i.e. Option 2 in Figure 35 of Appendix U of the RD-EIS), remains an achievable outcome subject to health and safety considerations. This approach would retain fabric, expose the relevant characteristics relating to the heritage significance of the wharf (the timber substructure), and facilitate interpretation of the wharf's heritage values by providing a conserved 'heritage element'. It is consistent with the retention of remnant piles within the tidal zone that has occurred on the northern side of Wharves 1 – 5 as part of the Cairns Foreshore Development project. This approach is illustrated as Option 2 in Figures 35 and 36 above. (Option 1 in Appendix U of the RD-EIS is for the complete removal of Wharf 6 and clearly provides a lower value outcome in cultural heritage terms than Option 2).

³⁴ Allom Lovell (2000), pp.37

6.3.5 Adaptive Reuse of Elements in another location

In addition to Option 2 there is scope for the re-use of elements of Wharf 6 in heritage interpretation within the port precinct, consistent with interpretation and public art measures undertaken in recent years. This is reflected in the recommendations contained in this HIS.

For example, elements of solid timber, and cross-sections of concrete and corrugated iron, would capture the industrial maritime flavour of the wharf and may be selectively removed before or during the demolition process for recycling elsewhere. Recycling of the failed wharf timbers (especially the piles) in other structures within the wharf precinct would also be desirable as an interpretation device.

6.3.6 Health and Safety Considerations

As noted above, State Code 14 of the State Development Assessment Provisions (Performance Outcome 4) provides that where works may result in 'substantially reducing the cultural heritage significance of a State Heritage Place' it may be appropriate where it is demonstrated that without the proposed works there is a 'risk to public health or safety'. PO4 goes on to say that regard must be had to:

structural instability where it can be demonstrated that it is not technically feasible to make the building serviceable, or the cost of doing so is exorbitant. Supporting material will include assessments by a qualified structural engineer, evidence that the structures have been adequately maintained, and safety risk assessments

Appendix AE of the Cairns Shipping EIS contains a detailed condition assessment report for Wharf 6. It concludes:

Wharf 6 is currently in very poor structural condition due to the severe deterioration of the timber piles, headstocks, timber girders and concrete deck. Testing of these key structural components has confirmed that significant loss of strength and durability has occurred and is continuing to occur at an increasing rate. The failure of any of these structural elements could result in catastrophic collapse of the deck and could endanger users and equipment.

Wharf 6 does not comply with current Australian Standards and is not fit for purpose.

The demolition of Wharf 6 would constitute an adverse heritage impact, however it would be appropriate having regard to health and safety issues. It is neither prudent nor feasible to retain the wharf.

It may be feasible to retain *elements* of the wharf in situ but this would entail:

-) Replacement of the original failed timber piles.
-) Repair (usually replacement) of numerous failed headstocks and timber girders.
-) Repair of parts of the deck.

On completion of such repairs comparatively little original fabric would remain and the wharf's authenticity and integrity so compromised that its inclusion in the QHR would not be warranted.

The total demolition of Wharf 6 is prudent on health and safety grounds. Additionally, if Wharf 6 were 'repaired' its authenticity/integrity would be so compromised that it would no longer meet the threshold for listing on the QHR. The adverse heritage impact demolition would cause would be mitigated by observing the recommendations presented below.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The proposed works would have an adverse impact upon the heritage values of the Cairns Wharf Complex because they would alter Wharves 1 – 5 through the removal of some original fabric from the wharf decks, and demolish Wharf 6.

The removal of sections of the existing deck of Wharves 1-5 to allow the installation of berthing/mooring dolphins is a minimalist alteration to the wharves to allow their ongoing use for economic maritime purposes. Only a small fraction (c3-5%) of the wharves' surface area would be removed, with the bulk of their original fabric being retained unaffected. While the removal of original fabric would compromise the historic integrity of the wharves to a degree, it would conversely ensure their ongoing use (an important dimension of their significance), conservation and interpretation as important elements in the history of the development of Cairns and Far North Queensland.

Furthermore, failure to undertake the proposed works at Wharves 1-5 would render them unfit for service as berthing/mooring facilities for large modern cruise liners. This would have an extraordinary economic impact on the local, regional and State economy out of all proportion to the relatively low identified adverse heritage impacts.

The demolition of Wharf 6 is unavoidable in the long term and timely in relation to its current condition. Retention of the wharf cannot be achieved without a significant interference in its heritage values, particularly in relation to its demonstration of 'wartime exigencies'. Remnant elements of the wharf can be retained and interpreted to continue to express the significance of Wharf 6, both as a relic of the role of Cairns in WW2 and as a demonstration of wartime construction techniques and approaches.

Furthermore, the demolition of Wharf 6 is warranted on health and safety grounds. In its present condition it poses a risk to the public. Its retention is neither prudent nor feasible.

Also, the demolition of Wharf 6 is appropriate having regard to the compromised authenticity/integrity of Wharf 6 should it be 'repaired' to make it safe. Such repair would effectively amount to an almost total replacement of original fabric.

7.2 Recommendations

Based upon the analysis and conclusions carried out above, it is recommended that:

-) The Option to retain deck fabric and pile elements of Wharf 6 should be adopted and pursued and these remnants should be interpreted to the public to explain their heritage significance. If it is not possible to retain those elements in situ it would be appropriate for them, and the interpretation measures, to be located elsewhere within the wharf complex (or nearby).
-) The Option to install berthing/mooring dolphins within the existing deck of the Wharves represents the least adverse impact upon the fabric of the wharves, if they are to be used for berthing large cruise ships. This work should be undertaken with an extraordinary level of attention to the treatment of exposed steelwork and stabilisation of existing materials.
-) If possible, sample sections of removed deck, particularly where they demonstrate evidence of their internal steel reinforcement, should be retained and interpreted within the context of the wharf. Ideally, each section should be excised intact and, if not selected for direct interpretation, then they should be reused (for example, as pavement elements) as part of the general historic fabric and interpretation of the Cairns Wharf Complex.

-) Prior to the demolition of Wharf 6 a photographic archival record of the feature should be made, consistent with the requirements of the Queensland government guideline entitled 'Archival Recording of Heritage Places'. Digital photographic recording (as opposed to, for example, measured drawings) would be sufficient.

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