

1940.



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PAPER

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Clerk of the Senate.*

SENATE

29 MAY 1940

R E P O R T

of the

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

Relating to the proposed repairs and improvements to the

W H A R F

a t

P O R T A U G U S T A , S O U T H A U S T R A L I A .

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Ninth Committee.)

The Honourable Josiah Francis, M.P., Chairman.

Senate.		House of Representatives.
Senator Charles Henry Brand.	.	Thomas Joseph Collins, Esq., M.P.
Senator Gordon Brown.	.	Charles William Frost, Esq., M.P.
Senator Walter Jackson Cooper	.	The Hon. Edward James Holloway, M.P.
	.	Walter Maxwell Nairn, Esq., M.P.
	.	John Lloyd Price, Esq., M.P.

EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES, No. 5,
DATED 23rd. APRIL, 1940.

4. Public Works Committee - Reference of Work - Repairs and Improvements to Wharf, Port Augusta - Mr. Nock (Minister representing the Minister for the Interior) moved, by leave, That, in accordance with the provisions of the Commonwealth Public Works Committee Act 1913-1936, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for investigation and report:- Repairs and Improvements to wharf at Port Augusta, South Australia.
Question - put and passed.

LIST OF WITNESSES.

- Artlett, W.L., Chief Traffic Manager & Comptroller of Stores,
Commonwealth Railways, Port Augusta. S.A.
- Beerworth, J.M., Business Manager, and Member of the Legislative Council
for the Northern Districts, South Australia.
- Debenham, A.J., Chief Engineer, Maritime Services Board of N.S.W.
- Gahan, G.A., Commissioner of Commonwealth Railways, Melbourne. Vic.
- Green, E.O.K., Assistant Principal Engineer, Harbours & Rivers,
Department of Works & Local Government, N.S.W.
- Hannaberry, P.J., Engineer of Ways and Works, Commonwealth Railways,
Port Augusta. S.A.
- Hosking, J.B.O. Chief Engineer, Melbourne Harbour Trust, Melbourne. Vic.
- Hutton, E.M.S., Manager Adelaide Stevedoring Company, Port Augusta. S.A.
- Mehaffey, M.W., Assistant Director-General of Works, Department of
Interior, Canberra. A.C.T.
- Riches, L.G., Printer, Mayor of Port Augusta and Member of the House
of Assembly for the District of Stuart, S.A.
- Simms, E., Secretary Commonwealth Railways, Melbourne. Vic.

REPAIRS AND IMPROVEMENTS TO THE WHARF AT PORT AUGUSTA.

R E P O R T .

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report, the question of effecting repairs and improvements to the Wharf at Port Augusta, South Australia, has the honour to report as follows:-

I N T R O D U C T I O N .

1. The wharf was originally built by the South Australian Government in 1835 at a cost of £37,931, and under the Northern Territory Surrender Act 1908 was handed over to the Commonwealth Government on 1 January 1914.

2. Under the provisions of the Commonwealth Railways Act 1917-1936 the Commonwealth Railways Commissioner is required to maintain the wharf in a state of efficiency.

3. In April 1939, it was proposed to carry out certain maintenance work and a thorough examination was made of the whole structure. As a result it was decided that very heavy renewals &c. were necessary and the present proposal was the result.

P R E S E N T P R O P O S A L .

4. The scheme now submitted provides for the renewal of approximately 310 piles, the renewal of timber above and below water, the widening of the wharf by about 4 feet to protect the toe of the stone-pitched bank and the strengthening of the design of the wharf to enable it to carry a load of approximately 500 lbs to the square foot.

E S T I M A T E D C O S T .

5. The estimated cost as submitted to Parliament was set down at £34,700, and the time fixed for completion 12 months from the date of commencement. During the taking of evidence it was explained that an additional amount was later included for labour costs which brought the estimate up to £36,500.

C O M M I T T E E ' S I N V E S T I G A T I O N S .

6. The Committee visited Port Augusta and inspected the existing wharf, took evidence from the Commonwealth Railway's Commissioner, the Commonwealth Engineer of Ways and Works, the Assistant Director-General of Commonwealth Works and various local witnesses at Port Augusta.

Through the courtesy of the respective State Authorities, evidence was also obtained from the Engineer-in-Chief, Maritime Services Board of New South Wales, the Assistant Principal Engineer, Harbours and Rivers, Department of Works and Local Government New South Wales and from the Chief Engineer, Melbourne Harbour Trust.

Members of the Committee also inspected various forms of wharf construction in Port Jackson and Whyalla, South Australia, perused reports, scrutinized plans and generally sought to inform themselves fully in regard to the project under consideration.

Amount already spent on Wharf.

7. It was ascertained in evidence that in addition to the original cost to the State of South Australia of	£37,931
the Commonwealth Railways spent on	
improvements up to 30 June 1939	£34,180
and on repairs " " " "	£21,911
while interest charges have amounted to	<u>£72,037</u>
a total of	£166,059

Revenue.

8. The gross revenue for wharfage and tonnage dues received by the Commonwealth Railways from date of taking over to 30 June 1939 was £134,593, and for the 6 years ended 30 June 1939 receipts from wharfage and tonnage dues have averaged £5,180 per annum and future revenue is expected to approximate the same figure.

Various proposals considered.

9. It was reported to the Committee that when the examination made in April 1939 indicated that the expenditure likely to be incurred was considerable, it was decided to seek the best expert advice available and the Chairman of the Melbourne Harbour Trust placed at the disposal of the Commonwealth the services of their Chief Engineer, Mr. J. B. O. Hosking, who visited Port Augusta and examined the wharf.

10. Mr. Hosking conferred with the Commonwealth Railway's Engineer of Ways and Works at Port Augusta and together they investigated 5 various proposals. These were:-

(a) Repairing Existing Structure.

This included cutting off rear piles at mud line and replacing tops of piles with stumps spliced to lower ends of existing piles through cast steel sleeves;

tying back rear of wharf behind each bollard with two 1 1/2" diameter tie rods;
restoring front profile of the rubble mound, and generally renewing decking and strengthening the structure to its original capacity. Estimated Cost £12,500.

If thus repaired the wharf could still carry only light shunting locomotives and a light distributed load of only 2 cwts per square foot, both of which loadings were represented to be too small for modern cargo handling requirements.

(b) Repairing and Widening Existing Wharf.

The existing timber wharf is of insufficient width to cover the toe of the rubble mound, which is therefore in danger of being damaged during dredging operations, and prevents vessels of maximum draft lying alongside the wharf at all states of the tide. To overcome this difficulty it was proposed, in addition, to repairs mentioned in (a) to widen the wharf 7 feet.

The existing wharf is not provided with fendering and if this were added the estimated cost of this proposal was given as £23,500. Without fendering the estimate was £21,000.

Under this alternative, although the wharf widening would be stronger than the balance of the structure, it could be considered safe only for the loadings referred to in (a) viz:

"D" class shunting locomotives or alternatively a distributed load of 2 cwts per square foot.

(c) Renewal of Wharf with steel sheet piling and rubble filling.

This would provide a first class structure capable of carrying KA locomotives and a distributed load of 500 lbs per square foot. Estimated Cost £75,000.

(d) Construction of new Wharf approximately 36 feet in width with face of wharf 25 feet in front of existing wharf face.

Under this alternative 3 turpentine piles would be driven in front of each existing face pile, and the existing wharf demolished and new superstructure erected, and the face of the structure protected with fendering.

Rubble would then be dumped on the face of the existing rubble mound until the top of the front face was in a suitable position for the re-erection of the hand packed rubble wall in a convenient position to support the rear edge of the wharf platform. The hand packed rubble mound would then be re-erected and back filled with rubble and good dry filling.

This structure would carry KA locomotives and a distributed load of 500 lbs per square foot. Estimated Cost £50,000.

(e) Construction of new Wharf approximately 30 feet in width with face of wharf approximately 4 feet in front of existing wharf face.

This structure would be erected on timber piles driven through existing rubble mound. Estimated Cost approximately £36,500.

The estimated life of each of these alternatives was given as (a) and (b) ten years, subject to proper maintenance, (c) fifty years and (d) and (e) 35 years.

It was urged that the results obtained under (a) and (b) would give doubtful service and the comparative costs of (c) with (d) and (e) suggested that alternative (e) would be the best proposition provided that the piles could be satisfactorily driven through the rubble mound. It was recommended that if this were not possible,

alternative (d) would be the best proposition.

Necessity for Repairs.

11. All the evidence tendered indicated that the maximum amount of service has been obtained from this wharf over the lengthy period it has been in use, and definite statements were made that it would be unsafe to try and maintain the structure in working order for a further period of even 12 months. The inspection by the Committee of the piles and timber work uncovered at low tide showed plainly the weakening of the structure which had taken place through the depredations of marine organisms during the last 55 years. There are 101 rear piles in the wharf at Port Augusta. Of that number 24 are completely eaten away, nothing being left of the pile over a distance of 3 feet 6 inches between high and low water. Of the remainder of the rear piles which were originally of a diameter tapering from 24 inches at the top to 14 inches at the toe, some have been eaten to a diameter of as little as 3 inches.

The 12 inch by 12 inch rear beam just in front of the stone wall is affected by dry rot for a depth of approximately 2 inches on the side adjacent to the filling and white ant is prevalent in various sections of the structure. Of the 15 inch by 7 inch longitudinal beams in the upper portion of the wharf 15 per cent have been found to be affected by dry rot and white ant. A number of the more recently driven piles and some of the existing decking however, are in good condition, and could be utilized in any reconstruction work undertaken but in view of what its own inspection revealed, and after consideration of the expert evidence received the Committee is satisfied that repairs are urgently necessary and should be put in hand without delay.

Scheme Recommended.

12. The Committee examined the various proposals which had been put forward, and gave careful attention to the economical aspects of each. Witnesses were unanimous that it would be false economy to undertake any expenditure which would not increase the strength of the existing structure beyond its present carrying capacity of 2 cwts to the square foot and which might be expected to prolong the life of the wharf only 10 years. Steel sheet piling construction which would give a life of 50 years while eminently desirable in places and under certain circumstances, was not considered justified in the present instance in view of the cost of £75,000 involved. Taking all facts into consideration it was decided to recommend

the scheme providing for the renewal of the structure and the widening of the wharf by 4 feet at a cost of approximately £36,500.

13. At the outset there was some hesitancy in recommending this proposal because of the fact that to carry out the work as planned it would be necessary to drive piles through the rubble mound which was placed in position under the wharf in the original construction. Expert witnesses examined in Sydney and Melbourne however stated that that class of work was frequently carried out by their respective organizations, and tests carried out in Port Augusta assured the Committee that any difficulty associated with this project could be satisfactorily overcome.

Timber versus Concrete.

14. In view of the fact that little if any suitable timber for wharf construction purposes is available in South Australia evidence was taken as to the advisability of using concrete piles or concrete decking. It was stated that concrete piles incurred some danger in being driven through rubble and presented difficulties in squaring off to take the decking. Moreover, the price of concrete piles was considerably in excess of timber piles.

15. For these reasons, and because timber piles previously used in the wharf indicated that they had a reasonably long life in these waters, the Committee agreed with the proposal that timber piles be used, and concur with the decision to invite tenders for piles of Ironbark, Turpentine or Jarrah. The question of sheathing the piles with copper was discussed, but as unsheathed piles had proved so satisfactory, the extra expense involved in this process was not considered warranted. The price quoted for timber piles up to the present was not considered satisfactory and the matter is being further investigated. If reasonable reduction in price can be obtained a substantial lowering of the cost of that work may be expected.

Decking.

16. Evidence was taken as to the relative advantages of timber and concrete for the decking of the wharf as it was stated that many modern wharfs are being constructed with concrete decking. In the case of Port Augusta however, it was explained that the same horses are used in the railway yards as for shunting purposes on the wharf and they would experience difficulty in working on a concrete wharf unless wooden battens were installed to provide a foothold.

The expense of the acquisition of motor vehicles for the wharf was not considered justified as horses would still have to be used in the railway yards. Moreover, there are railway lines of gauges 3 feet 6 inches and 4 feet 8½ inches on the wharf and if at any time the position of any of these lines had to be altered or if the decking had to be removed for the purpose of strengthening the under-structure, considerable expense would be involved. The Committee was convinced therefore that a timber decking at Port Augusta would meet all requirements.

Durability of Timber.

17. The original wharf was constructed of Karri and Jarrah, and repairs have been carried out in Turpentine and Ironbark. It says much for the durability of Australian hardwoods that although there have been renewals from time to time, some of the timber is in sufficiently sound condition that it will be utilized in the new work now proposed. To provide as wide a choice as possible, and give various States an opportunity of supplying requirements, tenders are being called for the following structural timbers, viz:-

Brush Box, Grey Box, Red Box, Yellow Box, Red Gum, Grey Gum, Iron Bark, Jarrah, Karri, White Mahogany, Tallow Wood, Turpentine, Wandoo.

Marine Organisms.

18. Inquiries were made by the Committee as to the presence of destructive marine organisms in the waters of Port Augusta, and the information obtained was reassuring. Of the more common forms such as Chelura, Sphaeroma, Limnoria and Teređo only the two latter have had any noticeable effect on the timbers of the wharf in question. The Limnoria Terebrans is a crustacean of crablike appearance and about one sixth of an inch in length. Timber between low and high water is its main objective; it attacks from the outside and works its way in slowly, eventually perforating the timber, reducing its diameter, making it spongy and providing openings through which the teredo can more readily attack. The Teređo Navalis on the other hand is a mollusc which bores right in immediately and carries on its attack from the inside, eating out long channels until the pile is nothing more than a shell.

In tropical waters it averages a foot or more in length and is about half an inch thick, but the specimens seen at Port Augusta were only about 4 inches long.

The damage wrought by these insects on some of the underwater timbers of the wharf has been fairly extensive, but not unduly so considering that those timbers have been in position for a period of 55 years.

Fendering.

19. The Committee made inquiries as to the fenders proposed to be provided in the new structure. It was originally intended to include vertical fenders and three rows of horizontal fenders, but it was subsequently decided to restrict the number of horizontal fenders to two. The Port Augusta Wharf is in comparatively sheltered water at the head of Spencer's Gulf and no fenders were used in the present structure which has stood for 55 years, and from the Committee's inquiries and inspection no serious disability has resulted from the lack of fenders. An economy of approximately £1,850 would be effected by omitting fendering, and in view of the circumstances the Committee thinks that omission would be justified and recommends accordingly.

Contract versus Day Labour.

20. Discussion took place on the question whether this work should be carried out by contract or day labour. It was explained in evidence that this is what is called an open job because while construction is in progress the usual business of the wharf will be proceeding at the same time.

This may at times lead to a temporary cessation of construction work which would compel contractors in tendering to insure against loss, and might leave the way open later for claims for extras. Moreover, the Railway Department prefers to carry out all its own work in connection with railway approaches and tracks and the Commissioner is confident that the whole of the proposed work could be done as cheaply if not more cheaply by day labour than by contract. For these reasons the Committee agrees that the work be carried out by day labour as proposed.

Dredging.

21. The berth at the wharf face was originally dredged to a depth of 22 feet at low water, but during the last 50 years some silting has taken place.

The toe of the rubble mound below the wharf extends a few feet beyond the face of the wharf and presents some danger if dredging operations are carried out so close to it as to interfere with its angle of repose. With the extension of the face of the wharf a further 4 feet this danger would be obviated.

Negotiations carried out between the Commissioner of Commonwealth Railways and the South Australian Authorities have resulted in an undertaking by the State Authorities to dredge along the face of the wharf and to a distance of 80 feet seaward to a depth of 22 feet, to dredge the channel of approach, and to attend to the removal of a rocky bar in the Gulf to provide a minimum depth over it of 18 feet at low water. To meet portion of the cost of this work, the Commonwealth has agreed, as a matter of grace, to incur a maximum liability of £1,500, and the State Authorities have promised to put this work in hand at an early date. It is anticipated that this will provide ample depth of water for the ships likely to be using the wharf for many years to come.

Length of Wharf.

22. The Committee queried the necessity for a wharf at Port Augusta approximately 1,200 feet long, and explored the possibility of effecting some economy by reducing that length. Evidence tendered, however, showed that ships using the wharf are of a length up to 425 feet and frequently two and occasionally three ships are at the wharf at the same time. In addition, provision has to be made for stacking various commodities to preclude the wheeling of loads for excessive distances and space is required for shunting and other railway purposes.

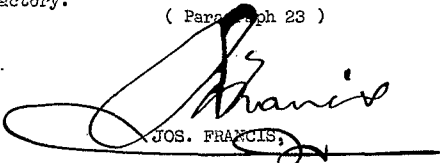
After hearing the views expressed by the Railway Authorities and the users of the wharf the Committee is satisfied that no good purpose would be served or material economy effected by any shortening of the length of the wharf.

Wharfage Facilities.

23. After hearing the views of a representative of a shipping Company and taking evidence from the Mayor of Port Augusta and a representative of the stevedoring company, the Committee is satisfied that the wharf is conveniently situated and with the work now proposed to be undertaken will provide all essential facilities and may be generally regarded as being quite satisfactory.

SUMMARY OF RECOMMENDATIONS.

24. Briefly summarized the recommendations of the Committee are:-
- (a) That repairs are urgently necessary and should be put in hand without delay; (Paragraph 11)
 - (b) That the most satisfactory scheme is that providing for the renewal of the structure and the widening of the wharf by 4 feet; (Paragraph 12)
 - (c) That timber piles be used; (Paragraph 15)
 - (d) That timber decking will meet all requirements; (Paragraph 16)
 - (e) That fendering be omitted; (Paragraph 19)
 - (f) That the work to be undertaken be carried out by day labour; (Paragraph 20)
 - (g) That the dredging to be undertaken by the South Australian Authorities will provide ample depth of water for ships likely to be using the wharf; (Paragraph 21)
 - (h) That no good purpose would be served or material economy effected by any shortening of the length of the present wharf; (Paragraph 22)
 - (i) That the wharf is conveniently situated and with the work now proposed to be undertaken will provide all essential facilities and may be generally regarded as being quite satisfactory. (Paragraph 23)



JOS. FRANCIS,

CHAIRMAN.

Office of the Parliamentary Standing Committee on Public Works,
Parliament House,
Canberra, 23th. May, 1940.