

DEPARTMENT OF THE SENATE  
PAPER No. 200  
DATE PRESENTED 28 FEB 1960  
*W. E. ...*  
Clerk of the Senate

**REPORT**

relating to the proposal for the

**REPLACEMENT OF CRANES**

at

**Port Phillip Island Dockyard,  
New South Wales**

**(FIRST REPORT OF 1960)**

1980  
THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

*Parliamentary Standing Committee on Public Works*

## REPORT

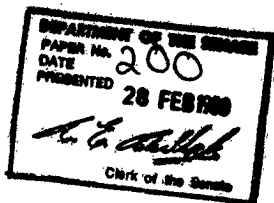
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# REPLACEMENT OF CRANES

at

**Cockatoo Island Dockyard,  
New South Wales**

(FIRST REPORT OF 1980)



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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA  
PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

R E P O R T

relating to the proposal for the

REPLACEMENT OF CRANES

at

Cockatoo Island Dockyard,  
New South Wales

(First Report of 1980)

Australian Government Publishing Service  
Canberra 1980

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Albert William James, Esq., M.P.

Murray Evan Sainsbury, Esq., M.P.

EXTRACT FROM

THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES  
NO. 122 DATED 20 SEPTEMBER 1979

- 12 PUBLIC WORKS COMMITTEE - REFERENCE OF WORK - COCKATOO ISLAND DOCKYARD, SYDNEY, N.S.W. - REPLACEMENT OF CRANES: Mr. Groom (Minister for Housing and Construction), pursuant to notice, moved - That, in accordance with the provisions of the Public Works Committee Act 1969, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for investigation and report: Replacement of cranes at Cockatoo Island dockyard, Sydney, N.S.W.

Mr. Groom presented plans in connection with the proposed work.

Question - put and passed.

WITNESSES

Humbley, R.R.W., Esq., Managing Director, Vickers  
Cockatoo Dockyard Pty Ltd, Cockatoo  
Island, Sydney, New South Wales

Hunt, P., Esq., Assistant Secretary, Policy and  
Development Branch, Defence Facilities  
Division, Department of Defence,  
Russell Offices, Canberra, Australian  
Capital Territory

Jeremy, J.C., Esq., Technical Director, Vickers  
Cockatoo Dockyard Pty Ltd, Cockatoo  
Island, Sydney, New South Wales

Jobson, Captain J.L., RAN, Director of Naval Weapons  
Design, Department of Defence,  
Campbell Park Offices, Canberra,  
Australian Capital Territory

Roxburgh, R.D., Esq., Associate Director,  
Department of Housing and Construction,  
NSW Region, Tower Building, Australia  
Square, Sydney, New South Wales

Schmidt, P.C., Esq., Managing Director, Schmidt and  
Muller (Sales) Pty Ltd, 13 Lachlan  
Street, Waterloo, New South Wales

Silva, M.E., Esq., Project Manager, Department of  
Housing and Construction, NSW Region,  
Tower Building, Australia Square,  
Sydney, New South Wales

Wood, D.D., Esq., Assistant Secretary, Industry  
Policy and Planning Branch,  
Department of Defence, Russell  
Offices, Canberra, Australian Capital  
Territory

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPLACEMENT OF CRANES,  
COCKATOO ISLAND DOCKYARD

R E P O R T

By resolution on 20 September 1979 the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report to Parliament the proposal for the replacement of cranes at Cockatoo Island Dockyard, New South Wales.

The Committee has the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for the replacement of three existing cranes at Sutherland Dock, Cockatoo Island, so as to retain and enhance that Dock's capabilities to support the full range of RAN fleet units.
2. The work will also include associated crane rails and beams on the north and south sides of the dock, building alterations, new pavement around the dock and electrical and civil engineering services.
3. The estimated cost of the proposed works at July 1979 prices is \$4.2 million.

THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and drawings from the Department of Defence and the Department of Housing and Construction and took evidence from their representatives at a public hearing in Sydney on 3 and 4 December 1979. The Committee

also received written submissions from Vickers Cockatoo Dockyard Pty Limited and Schmidt & Muller (Sales) Pty Limited and took evidence from their representatives. A written submission was received from the Federated Ship Painters' and Dockers' Union of Australia and a letter from the Returned Services League of Australia endorsing the proposal was also received. Three responses from crane manufacturers were noted and referred to the Department of Housing and Construction.

5. A Sectional Committee was formed for this inquiry and prior to the public hearing inspected the existing facilities at the Sutherland Dock on Cockatoo Island including the location for the new cranes, the proposed alterations and extensions to adjacent buildings and other works.

6. The Sectional Committee's proceedings will be printed as Minutes of Evidence.

#### COCKATOO ISLAND DOCKYARD

7. Cockatoo Island, about 10.5 hectares in area, is the largest of eight islands in Sydney Harbour and is located west of the Harbour Bridge. It is approximately 4 kms north-west of the Central Business District of Sydney. The dockyard's primary role is repair and refit of submarines and construction of naval ships. Its secondary role is the repair and refit of naval surface ships. Its history as a dockyard dates back to the days of the early settlers and a place where a convict settlement was formed. Among the facilities constructed over a century ago and still in use are the Sutherland and Fitzroy Docks.

8. Cockatoo Island Dockyard is a Commonwealth asset and was acquired in 1919. A lease of the dockyard was granted initially in 1933 to Cockatoo Docks and Engineering Co. Pty Ltd. This company became a subsidiary of the Vickers Group in 1947. The current Trading Agreement and Lease was signed on 14 January 1972 and remains valid to 1993. The company may undertake ship repair, construction and engineering work for commercial interests and Government Authorities but under the terms of the Agreement the lessee is obliged to give priority to naval work. During the public hearing the Committee was

informed that approximately 70% of the work undertaken by Vickers Cockatoo Dockyard (VCD) is for the Navy and the remaining 30% of work related to commercial activity. The Agreement allows for the provision of new and replacement buildings, works and services by either the Commonwealth or the lessee. Where a need for replacement arises from a naval requirement, it is funded by the Commonwealth.

#### THE NEED

9. Existing Facilities Sutherland Dock is currently served by three cranes, two of which are steam driven, installed in 1890, the other, electrically driven, was installed in 1924. These cranes are inefficient and lack a number of modern safety features. They have inadequate reach, lift capacity and degree of control for present requirements.

10. The two steam cranes are of totally obsolete design, their control depending on the physical condition and skill of the driver. The electrical crane (capacity 10 tonnes) has inadequate reach and capacity for it to fulfil its role as the main crane servicing the dock. The Committee was informed that the continued use of these cranes has only been tolerated under strictest supervision with consequent manpower inefficiencies additional to operating inadequacies of the cranes themselves.

11. During its inspection, the Sectional Committee observed one of the operating inadequacies. The 10-tonne crane had a faulty winding drum and because of this the electric cable was lying loose and needed the constant attention of an electrician to keep the cable clear of the crane tracks whilst the crane was operating. At the public hearing, the Committee expressed dissatisfaction with this situation particularly as it had existed for some years. The Department of Defence undertook to have the matter examined as a matter of urgency to determine whether a low cost repair type solution was possible.

12. The inherent limitations of the cranes restrict the range of commercial work that can be undertaken, thus increasing the overhead burden on that Navy work which is carried out on a cost-plus basis of payment. With the provision of modern cranes



the dock will be able to handle a wider range of tasks more effectively, with reductions in operating costs and consequent reductions in the cost of RAM work.

13. Committee's Conclusion The existing cranes at Sutherland Dock, Cockatoo Island are obsolete, do not comply with current safety standards and should be replaced.

14. Requirement for the Three Cranes Sutherland Dock is the larger of the two docks at Cockatoo Island and is used in the program for repair and refit of submarines and for work on surface ships when the workload at Williamstown and Garden Island dockyards precludes the use of the docks in those yards. It is the only Navy dock other than Captain Cook Dock which is capable of handling the larger RAN ships and, therefore, in addition to routine dockings, has a role as an emergency docking facility. Its proximity to Garden Island is important in the case of a future emergency docking of a PFG frigate.

15. The need for three cranes has been examined and confirmed by the Department of Defence having regard to the length of the dock, the frequency of lifting requirements, the process of moving ships into and out of the dock, and the limitations on the capacity and reach of a crane on the north side due to the proximity of a cliff face adjacent to the dock.

16. During the hearing, the Committee was provided with further details as to the need for three cranes. It was explained that initially two smaller cranes, one on either side of the dock, were needed so that ships may be towed into and out of the dock. These cranes were then required to handle shores, scaffolding, and by working in parallel, would considerably reduce the time taken for this operation. The cranes would then be engaged in servicing the work of cleaning and painting the hull of a ship as well as assisting with other such items as propellers and rudders etc. and any inboard equipment on the ship. It was also pointed out that because the internal structure of the dock is stepped, (see Plan C) it was necessary to do most of the work suspended from the cranes.

4.

17. A crane with a larger lift capacity for heavier items was also needed primarily for lifting the 23 tonne propeller of the PFG and a forklift truck of 26 tonnes for handling dock blocks on the floor of the dock.

18. Committee's Conclusion To maintain capability to repair and refit RAN ships, it is essential that the dock be equipped with three adequate cranes.

#### THE PROPOSAL

19. It is proposed to provide two new cranes on the south side and one new crane on the north side of Sutherland Dock. All cranes are to be electrically driven, with precise load control and adequate reach capabilities.

20. One 30-tonne Portal Crane This crane will be on the south side of the dock and will have a capacity of 30 tonnes with working loads as follows:

- 30 tonnes at 18m radius;
- 20 tonnes at 24m radius;
- 14 tonnes at 27m radius;
- 5 tonnes at 32m radius.

21. One 5-tonne Portal Crane Because of the length of the dock (213 metres), and the total range and number of lifts involved, the 30-tonne capacity crane will need to be supplemented with lighter cranes exhibiting fast lift and travel characteristics on both sides of the dock.

22. It is proposed to replace the 4-tonne at 7.6m crane on the south side of the dock with a crane having a working load of 5 tonnes at 32m. These characteristics permit high lifts over the centre line of the dock, thus allowing craneage requirements on the north side to be met by a small 3-tonne crane. The 5-tonne crane will be used for a variety of other tasks including the removal of dock pit covers, the handling of shores, staging and scaffolding, and, in co-operation with the 3-tonne crane on the north side, the towing of ships into and out of the dock.

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5.

23. One 3-tonne Portal Crane A crane with the characteristics as described in paragraph 24, above, on the south side will allow the 3.7 tonne at 7.6m crane on the north side of the dock to be replaced with a crane having a working load of 3 tonnes at 13.7m. This will be the only crane on the north side and its size is constrained by the proximity of the cliff face. It will have a variety of tasks including the placing of staging and scaffolding and, in co-operation with the 5-tonne crane, the towing of ships into and out of the dock.

24. Crane Rails and Associated Work It is proposed to replace the present worn, uneven and misaligned rails to cater for the heavier cranes and reposition the bollards on the dockside abutments to provide clearance for the larger cranes. It is also proposed to resurface the dockside and provide service ducts for electricity, air, water and other services for ships in the dock. The Committee was told that the provision of these ducts now, is intended to avoid later costly excavation beneath the new rails as future requirements for services arise. Additionally, on the north side some local removal of cliff overhand and re-routing of services is required to give clearance for the new crane.

25. Alterations to Buildings The clearance required for the two new cranes on the south side will involve the partial demolition of four buildings, two of which contain amenities and other facilities. Allowance has been made in the project to replace those facilities affected in the two amenities buildings. An electrical substation will also be affected. In rebuilding this, it is proposed to expand it in size to ensure compatibility with future upgrading of electrical reticulation to the island planned by the Electrical Supply Authority.

#### CONSTRUCTION

26. The proposed work is as follows:

- replace Crane No. 1 of 3.7-tonne capacity on the north side of the Sutherland Dock with a 3-tonne crane;

6.

- replace Crane No. 2 of 4-tonne capacity on the south side of the dock with a 5-tonne crane;
- replace Crane No. 115 of 10-tonne capacity on the south side of the dock with a 30-tonne capacity travelling crane.

27. The extent of the work also comprises:

- crane rails and beams on the north and south sides of the dock;
- trimming a cliff face and partial demolition of an historic building;
- partial demolition and additions to two buildings;
- demolition of one building and partial demolition of another building;
- relocation of a substation;
- electrical power supply to cranes;
- relocation and rearrangement of main power cables;
- paving of area surrounding the dock.

28. All three cranes will be of a specialised type used for operating on a wharf and will be capable of longitudinal travel along the dock. They are to be jib-type, a jib being a projecting beam or strut rotating about a fulcrum located above the cabin and fully balanced so as to improve stability and operational capability. The cranes will also be capable of rotating around a vertical axis and will be level luffing, a facility which allows the hook's path to travel horizontally during lowering or raising the jib. The cranes will be of portal design, whereby the cabin is raised above ground level on frame-work to allow access under the crane. The cranes will be fitted with controls which will give the precision considered necessary for the type of operation envisaged.

29. The cranes will be specifically built for the purpose and it will be necessary for crane manufacturers to modify standard designs to meet the specific requirements of this installation which include the requirements for ship towing capability.

7.

30. Replacement of Cranes on Southern Side of Sutherland Dock The 10-tonne capacity DC electrically powered crane will be replaced with a 30-tonne capacity crane, supplied with AC electrical power through a trailing cable and cable reeling attachment on the crane.

31. Due to the increased reach and load capacity of this crane, compared with the present crane, it is not practicable for it to operate on the existing 20 ft gauge track. The crane will therefore be designed to operate on a new track of 9.1m gauge (30 ft) which will allow the crane to have a satisfactory stability.

32. The existing 4-tonne steam driven crane will be replaced by a 5-tonne electrically powered crane having similar reach as the 30-tonne crane and operating on the same tracks.

33. Replacement of Crane on Northern Side of Sutherland Dock The existing 3.7-tonne steam driven crane will be replaced with an electrically powered crane having a capacity of 3 tonnes with an outreach of 7.6m. It will operate on a track gauge of 2.7m, similar to that of the existing crane. The working area for this crane is extremely restricted, due to the adjacent cliff face. It is necessary, therefore, for the crane to travel frequently to and from the head of the dock, where there is sufficient working space and storage area. For this reason, the crane will have to be fitted with a special long travel drive, which will provide much higher than normal travel speeds, thus minimising the time lost in this operation.

34. Details of the performance capability of the proposed cranes are included in the Minutes of Evidence.

35. Ship Towing The 3-tonne and 5-tonne capacity portal wharf cranes will be designed and equipped to enable them to tow ships into and out of the dock in conjunction with harbour tugs. The cranes may be required to operate separately or in unison during towing operations.

36. Crane Rails and Foundations The rails for the new cranes will be supported on a new reinforced concrete pier and beam system. The piers will be founded on rock to cater for the heavier wheel loads associated with the new cranes on the southern side and to prevent uneven settlement of the rails. On the northern side the crane beam will be supported directly on rock, except at the western end where some piers will be required.

37. Alterations to Buildings Buildings 78, 79 and 81 which comprise a combination of amenities, stores and workshops, will be partially demolished to make way for the proposed southern-most crane track. The loss of space associated with these buildings will be compensated by additions to the ground and first floors which will be of brick construction with rendered and painted internal finishes to match the existing buildings.

38. During the public hearing, the Committee was informed that it was also intended to upgrade the existing buildings at the same time. Having noted the conditions of these buildings, the Sectional Committee fully supports this proposal and strongly recommends that funds be made available at the appropriate time to ensure that the proposed upgrading will be carried out.

39. Building 66, a disused shed, will be demolished, unless required by VCD. Substation 'A' will be relocated.

40. Alterations to Services The existing electrical services along the northern cliff face will be relocated in new service ducts in the dockside pavement. The other services, compressed air, water and high pressure water, will be relocated along the cliff face to provide sufficient clearance for the crane.

41. Some of the hydraulic services on the south side of the dock will require replacement and relocation due to the construction of the crane tracks, beams and piles. A service particularly affected is fresh water, where an existing 250mm main is on the alignment of the southern crane beam. Also affected are compressed air and stormwater lines where these cross the track alignment at various places.

42. Electrical Power Supply The existing substation 'L' on the south side of the dock will be upgraded to handle the increased load associated with the 30-tonne and 5-tonne cranes. This substation will also be connected into the ring main system to provide alternate power sources.

43. The power supply for the other 3-tonne crane will be from the existing power house on the north side of the dock.

44. Associated with the relocation of substation 'A' and the necessary relocation of cables at present on the cliff face, a rearrangement of cabling between this substation and the power house will be undertaken to ensure that the new work will be compatible with future upgrading of the HV reticulation on the island. This upgrading is occasioned partly by an anticipated increase in power consumption on the island and partly because of the intention of the Sydney County Council to change the supply to the island from 6.6 kV to 11 kV, as the Balmain power house, which supplies the present power, is due to close. The work to be undertaken will be co-ordinated with the Sydney County Council.

45. Pavement Around the Dock As the construction of the crane beams will largely destroy the existing standard paving, a new concrete pavement will be provided around the dock to ensure satisfactory operating conditions. The pavement will be regularly jointed to prevent cracking.

46. Ducts will be provided for existing and proposed new services to permit future work on the services to be carried out without damaging the new pavement. Stub mains for salt water reticulation to cope points on the southern side of the dock will be provided to the edge of the pavement for connection to future reticulation.

47. Cliff Trimming and Associated Historic Building To satisfy the clearance requirements of the proposed 3-tonne crane on the north side of the dock, the cliff face must be trimmed back. As an old guard house is located on top of the cliff, part of it, a kitchen annex, must be demolished.

48. The kitchen annex has been classified as an historic building and is listed in the Registrar of National Estates compiled by the Australian Heritage Commission. Approval for the partial demolition of this building has been given by the Australian Heritage Commission and the National Trust of Australia (NSW) subject to certain conditions, which have been incorporated in the proposed work. In particular, only the southern corner of the kitchen annex will be demolished. A wall, using stone salvaged from the demolished section, will be constructed parallel to the cliff face, joining the ends of the remaining walls.

49. Committee's Recommendation The design of the proposed cranes appears satisfactory for the type of operations envisaged. The Committee recommends the construction of the work in this reference.

#### ESTIMATE OF COST

50. The estimate of cost for the work when referred to the Committee was \$4.2 million at July 1979 prices.

This estimate is made up as follows:

	\$
Building works	370 000
Construction of sufficient track to assemble the cranes	80 000
Provision of the cranes	2 350 000
Other associated works	1 400 000
	<u>4 200 000</u>

#### PROGRAM

51. The project is included in the 1979/80 Works Program. With the Committee's approval, design and documentation has commenced. It is expected that tenders will be called in March 1980 for the building works and for sufficient crane rails to erect the cranes, with acceptance before June. Tenders for the cranes will be called in June 1980 and acceptance expected by December. Construction of the cranes is expected to be completed by June 1982.

52. Closure of the dock for essential repairs on the drainage system and caisson roller supports is proposed between January and June 1982, with the remainder of the crane rails and associated works also being constructed during that period. During the public hearing, the Sectional Committee was supplied with full details of the proposed repairs to the dock. It was also informed the program of submarine refitting was such that the dock would not be needed between January and June in 1982.

#### ENVIRONMENTAL ASPECTS

53. The former Department of the Environment, Housing and Community Development determined that the impact of the proposal under consideration will not require an Environmental Impact Statement provided the following conditions are observed:

- Any wastes that are produced to be disposed of in accordance with the requirements of local authorities.
- The trimming of the cliff face to be done mechanically rather than by blasting.
- All work to be carried out where practicable during normal working hours.
- The Old Guard House kitchen annex wall affected by removal of cliff overhand to be rebuilt to a new alignment and a plaque erected to record its original position and the reason for re-alignment.

54. The Department of Science and the Environment confirmed the above determination and the Departments of Defence and Housing and Construction will ensure the conditions are observed.

#### GENERAL OBSERVATIONS

55. Master Plan During the public hearing, the Committee sought information as to whether an assessment had been made on future requirements at Cockatoo Island. It was informed that a study had been done in 1967 by consultants for Vickers and later the Department of Housing and Construction commissioned consultants and provided a feasibility and cost analysis of cranes and dock facilities at Cockatoo Island for the Royal Australian

Navy. Since then the reports have been used by both VCD and the Department of Defence to select individual items of works which have been governed by the needs of the Navy, replacements due to age and the availability of funds. The Sectional Committee concluded that as there appears to be no master plan as such, a review would be timely. The Committee is of the opinion that a master plan should be prepared and endorsed as was done in the case of the naval dockyards at Garden Island, Sydney and Williamstown.

56. Management From a general observation during its visit to Cockatoo Island Dockyard and noting the responses given to enquiries on the state of the existing electrical crane at Sutherland Dock, the long delay in the disposal of some obsolete cranes and divided opinions given during the public hearing, the Sectional Committee formed the view that the present control and management appears cumbersome and requests an examination by the Department of Defence on this aspect with a view to more centralised control on the island and more responsibility being given to naval personnel.

57. Relationship with Unions The Department of Defence evidence indicated that discussions were taking place between the lessee company's management and their employee union representatives regarding this proposal. There had been general agreement and discussions would continue with a view to ensuring that union requirements were taken into consideration.

58. During the hearing, the Managing Director of Vickers Cockatoo Dockyard, Mr. R. Humbley referred to the current Port of Sydney Ship Building and Ship Repair Industry Agreement which allows for procedures for dealing with grievances and complaints etc. through a Joint Industry Committee. Mr. Humbley believed that because of this agreement, industrial affairs had improved over recent years to a satisfactory standard. As to the Painters' and Dockers' Union of Australia letter to the Committee, Vickers Cockatoo Dockyard Pty Ltd would be having further consultations with them on the matters raised. The representatives of the Department of Housing and Construction told the Committee that when tenders are called, action would

be taken in regard to the... that appropriate... disputes.

59. Sutherland Dock... of this company, which represents... manufacturers... for Sutherland Dock... mobile radio control... including provision of... savings in cabin construction... The Department of Housing and Construction... proposition put forward by...

RECOMMENDATIONS AND CONCLUSIONS

60. The summary of recommendations and conclusions of the Committee is set out below. Paragraph alongside each is shown the paragraph in the report to which it refers.

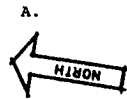
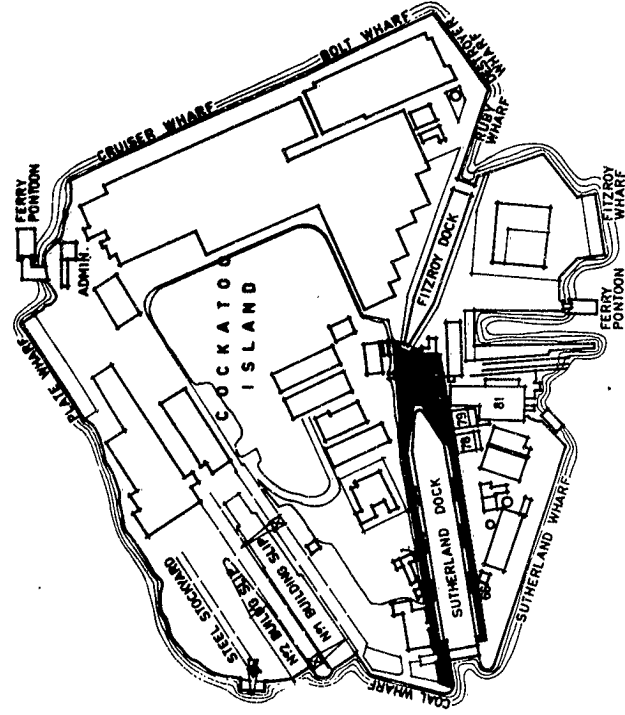
- 1. THE EXISTING CRANES AT SUTHERLAND DOCK, COCKATOO ISLAND ARE OBSOLETE, DO NOT COMPLY WITH CURRENT SAFETY STANDARDS AND SHOULD BE REPLACED. 13
- 2. TO MAINTAIN CAPABILITY TO REPAIR AND REFIT SHIPS, IT IS ESSENTIAL THAT THE DOCK BE EQUIPPED WITH THREE ADEQUATE CRANES. 18
- 3. THE DESIGN OF THE PROPOSED CRANES APPEARS SATISFACTORY FOR THE TYPE OF OPERATION ENVISAGED. 49
- 4. THE COMMITTEE RECOMMENDS THE CONSTRUCTION OF THE WORK IN THIS REFERENCE. 49

- 5. THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$4.2 MILLION AT JUNE 1979 PRICES.

*M.B.*  
(M.B. BUNGEY)  
Chairman

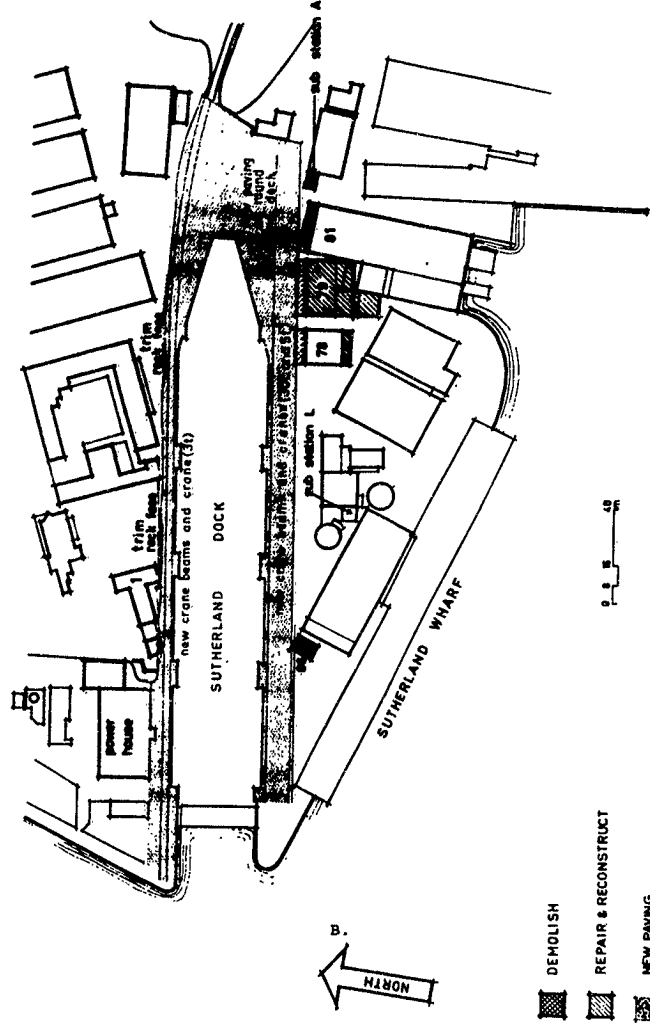
Parliamentary Standing Committee on Public Works,  
Parliament House,  
CANBERRA, A.C.T.



21 February 1980.



# LOCATION PLAN



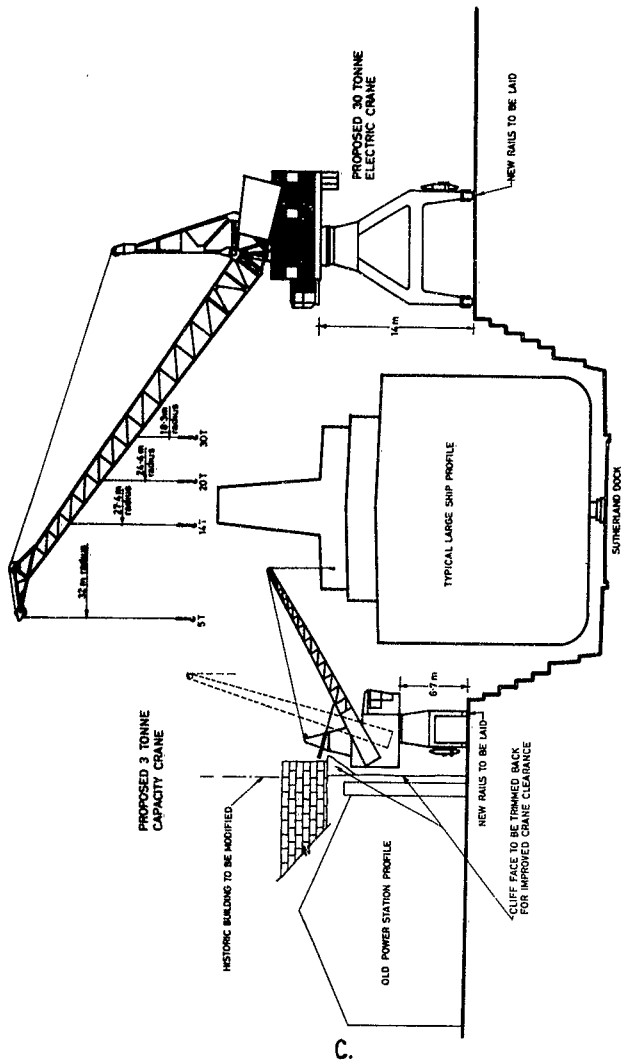


-  DEMOLISH
-  REPAIR & RECONSTRUCT
-  NEW PAVING



# SITE PLAN





COCKATOO ISLAND DOCKYARD SECTION THROUGH SUTHERLAND DOCK SHOWING PROPOSED 3 TONNE & 30 TONNE CRANES