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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed

MODERNISATION OF H.M.A. NAVAL DOCKYARD (STAGE 1)

Williamstown, Victoria

(THIRD REPORT OF 1973)

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

MODERNISATION OF H.M.A. NAVAL DOCKYARD
(STAGE 1), WILLIAMSTOWN, VICTORIA

REPORT

By resolution on 12 April 1973, the Senate referred to the Parliamentary Standing Committee on Public Works for investigation and report, the proposal for the modernisation of H.M.A. Naval Dockyard, Williamstown, Victoria.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is the first stage of a three stage plan to modernise H.M.A. Naval Dockyard, Williamstown and will provide facilities for new hull construction including

- a steel stockyard;
- parts making shop;
- parts marshalling area;
- panel prefabricating and jobbing shop;
- unit assembly shop; and
- two building slips with a new 150 ft high crane.

The work will involve some reconstruction of existing structures, demolition to provide sites and new building construction. Extensions and alterations to associated engineering services which include a new power house will also be provided.

2. The cost of the work in this reference is estimated at $7.6 million.

THE COMMITTEE'S INVESTIGATION

3. The Committee received written submissions and drawings from the Departments of the Navy and Works and took evidence at a public hearing in Melbourne from representatives of these departments. The Committee also received written submissions and took evidence from representatives of the City of Williamstown Municipal Council and the Combined Union Shop Committee, Williamstown Naval Dockyard. We inspected the site of the proposed work in March 1973.

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

WILLIAMSTOWN NAVAL DOCKYARD

5. Location The Naval Dockyard at Williamstown is situated on twenty-six acres bounded by Port Phillip Bay and is on a peninsula, the headland of which is known as Point Gellibrand. It has landward boundaries with the Melbourne Harbor Trust, except for some 700 ft fronting Nelson Place, a public thoroughfare of the City of Williamstown.

6. History A patent slip was set up on the site in 1818 and the Alfred Graving Dock was completed in 1873. The shipbuilding yard opened in 1913 when No. 1 and No. 2 building slips were completed. No. 3 and No. 4 building slips were completed during 1940-1941.

7. The Department of the Navy officially took over the dockyard on 28 October 1942, since when the yard has been engaged in building and refitting a wide range of naval ships. In recent years the yard has produced type 12 destroyer escorts and the hydrographic ship H.M.A.S. Flinders. The destroyers Vampire and Vendetta have also been extensively modernised at the dockyard recently.

8. Existing Facilities Facilities at the dockyard include Dockyard and Nelson Piers, Alfred Graving Dock, four building slips, some seventy separate administration, workshop and stores buildings, an oil fuel installation and appropriate engineering services. No. 3 and No. 4 building slips are unsuitable for ship construction of the destroyer escort size and are disused because the launching area is masked by Gellibrand Pier to the east. No. 1 and No. 2 slips are productive and ships up to 2,700 tons are built at these slips. The administration offices and stores are in dispersed buildings of temporary construction, outdated design and, in many instances sited adjacent to the dock and building slips which must be freed for dockside activities. Nelson Pier, a temporary construction, has reached the end of its economic life. Approximately 2,000 people are employed at the dockyard.

9. Functions The main functions of Williamstown Dockyard are that of a specialist yard for construction, major conversion and modernisation of combatant ships of the destroyer type, including refitting for the smaller size R.A.N. destroyers, currently River Class ships. It is an operating and maintenance base for patrol boats in Victoria and also facilitates refitting and repair of specialised naval equipment of Victorian shore establishments. The dockyard refits all support craft in the Victorian area and provides stores facilities for the associated functions, including fuelling and defuelling.

10. Future Development The Committee were told of the Navy's overall ship replacement programme and expansion policy on which future planning for naval shipbuilding has been based. The policy includes that production of major combatant ships of the destroyer type should be performed at Williamstown which should be developed to be capable of

maximum output of one destroyer every fifteen months. Government approval was given to plan the modernisation of Williamstown after due consideration had been given to the economical development of all Navy operated dockyards. Some main advantages of Williamstown include direct rail and road access and availability of manpower.

11. In accordance with current plans, construction of a destroyer of about 5,000 tons is to commence at Williamstown in 1975. It is not envisaged that any change in type of destroyer to be built would alter this starting date. The first of the new destroyers is to complete early in 1980 and subsequent ships to complete at about two yearly intervals.

12. To effectively implement this shipbuilding programme and also continue the current functions of the dockyard in future years, the Navy proposes modernising facilities at the dockyard in three stages as follows:

Stage 1 - New hull construction facilities;

Stage 2 - Rebuild Nelson Pier and outfitting shops and facilities, dockyard offices, dockyard store, training buildings;

and in the longer term

Stage 3 - Weapons/electronics workshop.

At each stage, upgrading of engineering services as appropriate will be included.

THE NEED

13. The existing shipbuilding facilities are inefficient by today's standards and not suited to prefabrication of units and the unit construction method, which is now universally accepted practice.

Continued use of the outmoded facilities in carrying out the present functions of the dockyard would be uneconomical, wasteful of man hours, and would require far greater construction time than would apply with modernised facilities.

14. The Committee were told that the present facilities are not capable of providing ship production as required in the Navy's proposed programme. The initial requirement is for three destroyers and the subsequent requirement for the replacement of existing destroyers calls for provision of facilities to build ships up to 5,000 tons. This will require about 1,500 tons of steel per annum, two stream building on slipways and two stream fitting out alongside piers. Added to the ships construction requirement is the need to provide modern facilities for refitting the River and Daring Class destroyers which have operating cycles of three years between refits with refit periods of twenty-two weeks plus mid-cycle dockings. This refitting work will provide a workload approximating to 1½ refits per year.

15. The future demand placed on the dockyard by the two major roles of shipbuilding and refitting along with other functions outlined in paragraph 9, necessitates that the dockyard's productivity be increased. The need will be even more critical if it becomes necessary to expand the Fleet.

16. Committee's Conclusion The Committee agree that, accepting that the Navy's shipbuilding programme is soundly based, there is a need for modernising shipbuilding facilities at Williamstown and that staged construction would cause least disruption to normal dockyard activities.

THE PROPOSED WORKS

17. Master Plan All facilities to be constructed at the dockyard will be sited and designed according to a master plan. This plan has been developed to provide separation of new ship construction and refitting activities. It also provides a logical flow of material through the various hull making processes. The plan is designed to create an attractive working environment.

18. The Site Siting of individual structures will be in accordance with the master plan. The area is relatively flat yet it is well protected from the effects of prevailing weather in the bay and is unlikely to be exposed to waves greater than 4 ft in height. The tidal range is approximately 3 ft as a maximum and averages 2 ft.

19. The Committee believe that the sites selected for the proposed new facilities are suitable.

20. Foundation Conditions Site investigations indicate the area to be on the edge of a lava flow which has left basalt in various stages of decomposition. Rubble fill has been dumped over much of the area on the decomposed basalt. The soil strata at the seaward edge consists of layers of rubble, marine silts and clays.

21. The work proposed in Stage 1 of the modernisation programme will provide facilities for hull construction and refitting work on ships and comprise the following.

22. Steel Stockyard The steel stockyard will be an area for stowage of 1,100 tons of steel plates and sections and be served by a six ton travelling magnetic gantry crane. On the north side of the stockyard the preparation line is proposed. This will consist of a

conveyor line, straightening rolls, a shot blast machine and an automatic paint spray and drying oven. The facility will be located in the north-east corner of the site adjacent to the Foster Street boundary.

23. The stockyard area will be graded, drained and covered with a 12 in crushed rock pavement and bounded by concrete kerbs. Prestressed concrete sleepers are to be laid over the area and adjacent areas paved with concrete slabs. A sub-drainage system will be constructed.

24. The crane will have a 180 ft by 108 ft reach and travel on rail tracks founded on piles driven to basalt. Buildings housing equipment on the plate preparation line will be founded on reinforced concrete, steel framed, roofed and sheeted with protective metal sheeting with some panels removable.

25. Parts Making Shop The parts making shop will be provided by rearrangement in the existing shop (known as Thompson Building). The plate conveyor line will terminate at the north end of this shop which will contain the 1/10 scale lofting equipment and the optical profile burner. It also contains an existing plate bending machine and a new 100 ton bumper press.

26. Facilities for lofting will be provided on a timber floored mezzanine to be constructed in the south-eastern corner of the building while an amenities area, offices, a control room and a substation will be housed in a single storey annexe to be constructed on the western side of the building.

27. Special purpose floors and concrete subfloors will be laid in the south-east corner of the building. Sections of the existing concrete floor will be demolished and new reinforced concrete foundations will be constructed for a new 100 ton bumper press, smaller machines and relocated machines. Two new five ton overhead travelling cranes will be provided on the existing crane rails. The control room for the 1/10 scale automatic optical profile machine will be air conditioned.

28. Parts Marshalling Area A concrete paved parts marshalling area serviced by an overhead crane will take up the area between the parts making shop and the panel fabrication shop.

29. The new ten ton overhead travelling electric crane will be provided on a new system of columns and beams. Existing service lines will be relocated and the road surfacing removed. The area will be regraded and a new 12" in thick concrete pavement provided with a suitable drainage system.

30. Panel Prefabrication and Jobbing Shop This shop will be provided by the conversion of the existing No. 2 Boiler Shop and will contain equipment for fabricating individual parts into components such as deck panels, side panels, superstructure units and bulkheads. The southern end of this building will be an area used for small sub-assembly welding and jobbing for the fabrication of a wide variety of smaller items. A two storey annexe will be built on the south wall of the existing shop to house amenities and offices. One five ton electrically operated overhead travelling crane will be provided additional to the three existing cranes and a 2,000 KVA distribution switchboard and transformers will be installed to serve welding points.

31. Structural alterations will be made to permit insertion of new large steel roller shutter doors in the east and west walls, clear access through the building and construction of the annexe. Sections of the existing concrete floor will be demolished and new reinforced concrete foundations constructed to permit the relocation of machines within the building.

32. Unit Assembly Building Site preparation for this facility involves demolition of the existing Boiler Shop No. 1 and subsequent staged demolition of an adjacent amenities block. The new building will be approximately 300 ft by 65 ft by 75 ft high and will accommodate facilities and equipment to prefabricate and lift structural units of up to 40 tons in weight. Office amenities and ready use stores will be accommodated in a two storey annexe to be constructed in stages and timed to coincide with the staged demolition of the existing amenities building.

33. The new building will have cranes provided at two levels; two 20-ton capacity overhead travelling electric cranes at the upper level and one ten-ton capacity crane at a lower level allowing a minimum of 35 ft clearance to its hook. The building will be supplied with five electrically operated sliding doors, two will have 50 ft high by 45 ft wide clear openings and three will have 30 ft high by 49 ft wide openings. Panels of translucent plastic sheeting will be included in walls to provide adequate internal illumination and the roof will be fitted with a ridge ventilator. A 12 in thick concrete floor slab with a monolithic finish will be provided. The two-storey annexe will be of brick and concrete construction.

34. Building Slips and Shipbuilding Crane This work will involve reconstructing the existing No. 1 and No. 2 slipways including lengthening

and strengthening them, provision of watertight gates at the seaward end and provision of a large new travelling crane to serve both slips. This is designed to enable parallel construction of two destroyers of up to 5,000 tons full displacement having launch weights up to 2,600 tons.

35. The existing slipways are to be reconstructed to a steeper slope and will enable vessels up to 475 ft long and 50 ft beam to be constructed. The area will be extended seawards by reclamation and new construction and landwards by filling within a new surrounding retaining wall after partial demolition of an existing building.

36. A mass concrete floor of a thickness varying from 17 ft 6 in to 9 ft over a distance of 140 ft from the seaward end will be constructed together with reinforced concrete retaining walls on either side containing service ducts. Keel and launchway slabs will be of concrete construction on steel pile foundations. Generally the rest of the area will be graded and filled with selected non-plastic filling to the required slope and paved with 12 in thick reinforced concrete slabs. At the seaward end, the building berths will have removable gates of steel fabrication protected against corrosion and fitted with peripheral rubber seals to ensure them being watertight. Sluice valves will be provided to permit flooding of the lower portion of the berth area prior to a launching. Dewatering the berths in 24 hours will be facilitated by provision of an 800 gallons per minute electrically driven pump. Stormwater will be discharged by an automatically controlled 250 gallons per minute pump.

37. The shipbuilding crane to be installed on the western edge of the building berths has a maximum capacity of 40 tons at 135 ft radius and dimensions to clear a height of 84 ft while standing some 150 ft high.

It will be radio controlled and fitted out for night operations. Tracks of the existing ten ton cranes on either side of the berth area and the existing railway crane will be reinstated.

38. A reinforced concrete structure to carry the rail loadings of the new travelling crane will be provided together with grated drains for stormwater, and a cable slot for the trailing cable power supply. Any disturbed areas will be refilled, graded and covered with 12 in thick concrete paving slabs.

39. Materials and Finishes Steel sheeting panels will provide contrast to external walls finished in face brickwork and balance the design of particular elevations. Solid timber doors will be provided for stores and secure areas and steel roller shutters to areas of industrial activity. Internal brickwork walls will be painted and lunch rooms and offices will have hard plaster or plasterboard finishes. Showers, washrooms, toilets and similar areas will have ceramic tile and hard plaster surfaces.

40. Floors generally will be monolithically finished concrete slabs. Amenities areas and offices will have vinyl sheet covering with ceramic tiles in wet areas.

41. Ceilings generally will be plasterboard. Insulation will be provided under roofs generally and roofs over industrial activity areas will have reinforced aluminium foil sheeting as sarking.

42. Environment. The proposed modernisation can be achieved wholly within the area of the existing dockyard. The areas surrounding the dockyard are zoned industrial, public purpose and transportation.

43. The Committee were told that there will be no increase in air or water pollution and no change in noise level from the proposed development. The only major impact on the environment will be the visual effect produced by the dominating height of the shipbuilding crane.

44. Parking Facilities The Committee noted the various observations that had been made in respect of the problem of providing parking facilities within the precincts of the dockyard for the very large number of privately owned vehicles. The Committee draw the Government's attention to the need to resolve this matter particularly when the next stages of the modernisation programme are being examined in detail.

ENGINEERING SERVICES

45. Rearrangement, updating and augmentation of engineering services will be carried out. Telephone services will be extended to the offices in the parts making, panel fabrication and unit assembly buildings.

46. Power House A new power house will be built on the site of the existing non-ferrous metal store and will allow demolition of the old inadequate power house. This building will be mechanically ventilated and heated, provided with amenities for operators and contain electrical switchgear, conversion equipment, air compressors and will be serviced with a six ton overhead travelling crane. The structure will be steel framed and contain a main machine room 55 ft by 120 ft and will receive adequate natural lighting through the southern openings. A steel framed annexe will be attached to the south wall of the machine room and contain switch rooms, a transformer compound and an office and toilet facilities on a mezzanine floor.

47. Service Tunnel A service tunnel of 6 ft diameter concrete pipes will be constructed underneath the building berths and adjoining crane tracks, and will extend to the western building line of the unit assembly building. Services inside the tunnel will be carried on steel racks fixed to the tunnel walls and have outlets along the centre and either side of the berth area.

48. Roads Existing hardstandings and roads will be extended. Roads will generally have 32 ft width of pavement and will be kerbed and guttered and provided with adequate vehicle and access crossings. Hardstanding areas and roads will have 12 in thick concrete paving on a bed of 6 in of crushed rock and adequate underground stormwater drainage will be provided.

49. Water, Sewerage and Drainage Water will be supplied from the Melbourne and Metropolitan Board of Works' mains through two tappings for domestic consumption and one for fire fighting purposes. Ring mains will be constructed inside the dockyard to reticulate supplies. Water for fire fighting will be stored in two 100,000 gallon tanks and automatic pumping by diesel and electric pumps will be provided.

50. It will be necessary to extend sewerage and drainage services. Two sewage inlets will be provided in the centre of the berthing area for connection to temporary toilets used during hull construction. Sewage will be pumped into the dockyard sewerage system.

51. Electricity Dual 22,000 volts supply lines from the Williamstown City Council system will be connected to the power station with automatic changeover facilities to maintain power in the event of

failure of one supply. The power will be transformed to 11,000 volts which is used to operate air compressors and supply frequency changers throughout the dockyard and will be distributed through underground ring mains to the various substations. Frequency changers for 50 Hz to 60 Hz will also be located in the power house to supply ships requirements.

52. Electric light and power will be extended to open areas and the new buildings from substations located nearby. Security lighting will be mounted on buildings and 33 ft high towers.

53. Compressed Air Compressed air at 100 pounds per square inch (p.s.i.), for operating air driven equipment, will be provided by relocating the existing compressors and installing a new air compressor in the proposed power house. This air will be distributed to the machines by extending new service lines to various points in the dockyard including the new facilities and to the eastern side of the building berths via the services tunnel.

54. Gas Natural gas for cutting steel, drying material and heating the new buildings will be supplied through new lines from a point on Nelson Place to required areas within the dockyard.

55. Acetylene for gas welding and cutting steel on the building berths will be distributed from a centrally located sixty cylinder capacity storage installation and portable bottles in other locations.

56. Liquid oxygen, used jointly with natural gas or acetylene for cutting and welding and stored adjacent to the water storage tanks, will be reticulated at 100 p.s.i. in a gasified form to the various outlet points.

57. Fire Protection Buildings and associated areas will be provided with fire protection facilities including hand fire extinguishers, hose reels, automatic sprinkler systems, automatic electric fire detection and alarm systems.

58. Committee's Recommendation The Committee recommend the construction of the work in this reference.

ESTIMATE OF COST

59. The estimated cost of the work when referred to the Committee was $7.6 million made up as follows:

	$
Alterations and additions to existing buildings	1,300,000
New unit assembly building (including demolition work)	1,000,000
Two slipways, crane tracks and a berth crane	3,200,000
Engineering site services and power house	2,100,000
	7,600,000

PROGRAMME

60. The Committee, noted with concern the fact that the approval of Stage 1 virtually anticipates the Committee's endorsement of Stage 2. However the Committee accepted the proposition by the Department of the Navy's representatives, who

were conscious of the Committee's prerogative on the matter, that there was no alternative in view of the approval of the Government for an approach to the Committee being limited to Stage 1 at this time.

61. The Committee are also critical of the circumstances leading to the necessity of the Department of Works to seek, and obtain ministerial permission to proceed with detailed documentation of the proposed Stage 1 works in advance of the enquiry, in anticipation of the Committee's approval. Some members of the Committee expressed the view that as the planning was so far advanced when the proposal was referred to the Committee, there appeared little time in which it was possible to have changes incorporated in the design of certain aspects of the dockyard should such have been necessary.

62. Planning envisages the progressive completion and handover of the facilities commencing with the plate storage area in December 1974, the various shops and unit assembly building together with the shipbuilding berths in June 1975. This envisages completion of Stage 1 in November 1975.

RECOMMENDATIONS AND CONCLUSIONS

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

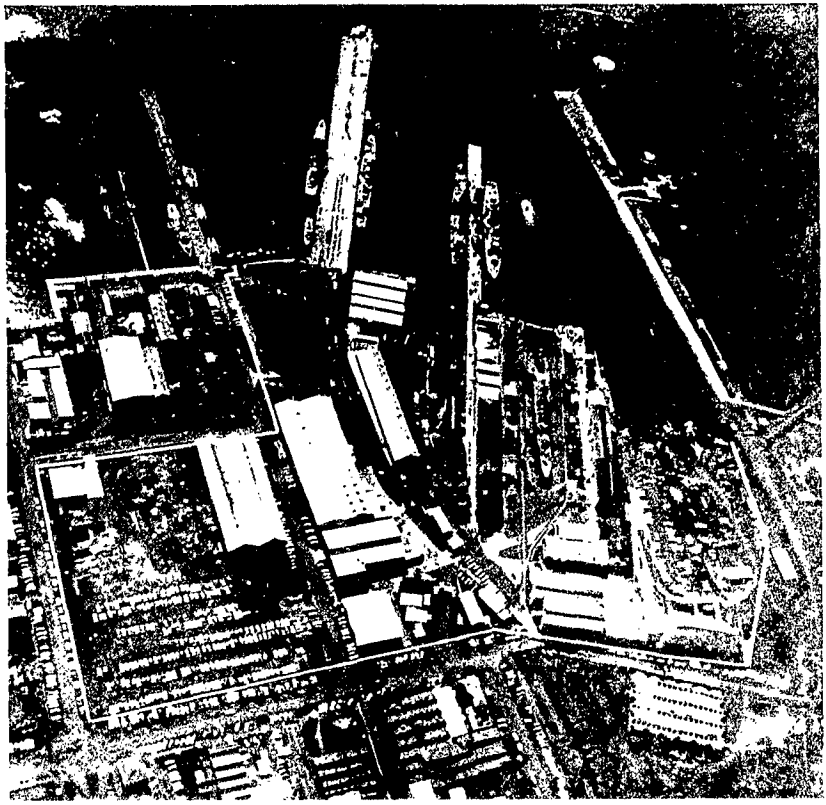
		Paragraph
1.	THE FUTURE DEMAND PLACED ON THE DOCKYARD BY THE TWO MAJOR ROLES OF SHIPBUILDING AND REFITTING NECESSITATES THAT THE DOCKYARD'S PRODUCTIVITY BE INCREASED.	15

		Programme
2.	THERE IS A NEED FOR MODERNISING SHIPBUILDING FACILITIES AT WILLIAMSTOWN DOCKYARD.	16
3.	THE SITES SELECTED FOR THE PROPOSED NEW FACILITIES ARE SUITABLE.	19
4.	THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	58
5.	THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS $7.6 MILLION.	59
6.	THE COMMITTEE ARE CRITICAL OF STAGE 1 APPROVAL VIRTUALLY ANTICIPATING AN ENDORSEMENT OF STAGE 2 OF THE PROGRAMME.	60

(W.J. FULTON)
Chairman.

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

22 May 1973.



H.M.A. NAVAL DOCKYARD WILLIAMSTOWN