



Parliamentary Standing Committee on Public Works

REPORT

relating to the

CONSTRUCTION OF A NEW WHARF AND SEAMANSHIP SCHOOL AT HMAS CERBERUS, CRIB POINT, VICTORIA

(Eleventh Report of 1986)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1986

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EXTRACT FROM THE
VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES
NO. 118 DATED MONDAY, 22 SEPTEMBER 1986

- 6 PUBLIC WORKS COMMITTEE - REFERENCE OF WORK - WHARF AND SEAMANSHIP SCHOOL, HMAS CERBERUS, CRIB POINT, VIC.:
Mr West (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 consideration and report:
Construction of a new wharf and seamanship school at HMAS Cerberus, Crib Point, Vic.

Mr West presented plans in connection with the proposed work.

Debate ensued.

Question - put and passed.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

CONSTRUCTION OF A NEW WHARF AND SEAMANSHIP SCHOOL AT
HMAS CERBERUS, CRIB POINT, VICTORIA

R E P O R T

By resolution on 22 September 1986 the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and report the proposed construction of a new wharf and seamanship school at HMAS Cerberus, Crib Point, Victoria.

The Committee is pleased to report as follows:

THE REFERENCE

1. The proposed work is to redevelop the existing waterfront at HMAS Cerberus to provide new maritime facilities and a seamanship training school. The new wharf and seamanship school are the first phase of a staged redevelopment of the facilities at HMAS Cerberus which is the principal training establishment for Royal Australian Navy personnel.

2. The proposed work comprises:

- provision of temporary accommodation for seamanship training;
- demolition of existing structures and buildings;
- dredging of Hann's Inlet and spoil disposal;
- construction of wharf, marina and boat ramp;
- repair and replacement of channel marker piles;
- construction of seamanship training school; and
- provision of associated engineering services.

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

BACKGROUND

10. Location and History The earliest date for naval training in Victoria is 1855 and until 1870 training of naval personnel was carried out on ships of the Victorian Naval Forces. In 1870 Williamstown Naval Depot, located within Port Phillip Bay, was established as a torpedo depot, a depot for Victorian ships and a general naval establishment.

11. After Federation and the formation of Commonwealth Forces, the Williamstown depot became too small and the Victorian State Government required it for local shipping.

12. In 1911 the Commonwealth Government received a report from Admiral Sir Reginald Henderson, R.N., on the general administration, organisation and location of naval forces of the Commonwealth. A 1500 hectare site at Hann's Inlet on Westernport Bay was acquired between 1911 and 1919 and construction of the Flinders Naval Base commenced in 1912. Hann's Inlet is a relatively shallow inlet ranging between 300 and 1,000 metres in width was selected because of its sheltered location. The inlet runs east/west and is about 3,000 metres in length. The base was originally developed as a destroyer and submarine base. At the time a destroyer had a displacement of 700 tonnes and submarines about 200 tonnes. Modern destroyers have a displacement of about 4,000 tonnes and submarines about 2,500 tonnes. During the 1920s its role was changed to training. The establishment opened as Flinders Naval Base in September 1920. In 1921 the name was changed to Flinders Naval Depot and the establishment was commissioned as HMAS Cerberus. (Illustration B-1, Appendix B, shows the location of HMAS Cerberus in relation to the City of Melbourne and Westernport Bay.)

THE NEED

17. Defence submitted there is a need to provide new facilities to support the seamanship, ship husbandry and survival at sea training functions and to provide for the navigational, berthing, operational and logistic support requirements of attached and visiting craft.

18. The wharf area and facilities used for training, operational and logistic support are located on the waterfront, in the south-east sector of the site.

19. Present Location Before describing in detail the reasons for and the extent of facilities required, it is worth addressing the advantages of seamanship training remaining at HMAS Cerberus. This matter was raised by the Committee at the public hearing. Defence advised that the question of remaining at HMAS Cerberus arises from time to time when major development proposals are under consideration. One of the main reasons against relocating elsewhere would be the cost involved. The RAN has developed the base over many years providing infrastructure and many buildings. A large number of these buildings do not require replacement and are considered satisfactory for the foreseeable future. The Committee was assured that there are no pressures to relocate as a result of urban encroachment and the base poses no major environmental problems.

20. Seamanship Training All seaman category recruits are required to complete a five week basic seamanship course after graduating from recruit school and prior to commencement of other specialist courses. Seamanship training covers theory and practical work in subjects such as anchorwork, cordage, boatwork, pilotage, replenishment at sea, rigging and other specialised drills. Class sizes are limited to eight students to allow maximum practical training time to be achieved.

25. Even if these costs were more comparable, there would still be a need for fundamental seamanship training to be undertaken ashore so that basic procedures and safety principles can be taught in a controlled and safer environment.

26. Defence pointed out that most navies of comparable size to the RAN undertake seamanship training ashore. Advanced training and consolidation are undertaken at sea.

27. Training Forecasts Defence advised that during 1985/86 322 personnel completed 40 seamanship courses with seven courses overlapping on occasions. It was emphasised by Defence that a higher training load is anticipated in the future as recruiting levels increase and stabilise.

28. Defence advised that the RAN has just under 16,000 personnel and the manpower wastage rate is about 12 per cent per annum. About 1500 sailor recruits are required each year to make up this loss. At present the RAN takes in about 150 new recruits every six weeks. It is planned to increase this level next year to 140 recruits every four weeks. All recruits are required to undergo survival at sea and ship husbandry training. Approximately 22 per cent of recruits are required to undergo seamanship training.

29. Need for Seamanship Training The Committee was advised that teaching personnel the basics of seamanship is essential despite technologically advanced ships entering service. There is less emphasis and less time spent on seamanship training than 20-30 years ago; courses are generally short, but intense nevertheless.

30. Existing Facilities A group of nine buildings, constructed of various materials such as brick, weatherboard, asbestos cement and galvanised iron are used for seamanship training. Existing classrooms and staff are located in four low grade buildings

35. Courses consist of classroom instruction plus practical demonstrations of survival equipment for classes of seven to thirty students at a time. Over 1,000 personnel completed this course in 1985/86.

36. Existing Facilities Under present arrangements training facilities are located in a former sail loft built in 1922. Defence advised that the demonstration area is small and is shared with workshop space. The building lacks the environmental control necessary to prevent safety equipment from deteriorating.

37. Requirement Defence submitted there is a requirement for a classroom for thirty students, a covered demonstration area, office, access to changerooms and access to water for life raft drills.

38. Ship Husbandry All recruits are required to complete a two-day course in ship husbandry on completion of their basic training course. The course provides instruction in procedures for the cleaning and preservation of ship fittings and equipment and seven to thirty trainees are instructed at a time. Refresher training for other personnel of all ranks is also programmed. More than 1,000 personnel completed the ship husbandry course in 1985-86.

39. Existing Facilities The current training area is located in a former service station built in 1943 which has insufficient space and lacks sound attenuation.

40. Requirement Defence submitted there is a need for a classroom for 30 students, and indoors and outdoors practical demonstration areas. A tool issue store, flammable store and paint store are also required. Air driven descaling equipment is used in some demonstrations and sound attenuated areas are required for this.

47. Any new wharf should be able to provide the full range of alongside services including fuel, telephone connections, sewage disposal, water and power.

48. Defence also maintain that any new wharf should be capable of supporting a mobile crane lifting a 10-tonne load. This would enable a patrol boat engine to be changed if necessary or for cargo to be unloaded.

49. In addition to wharfage for operational and training craft, it is also considered necessary to provide a separate section of wharf for seamanship training. Defence submitted such a wharf should be 30 metres long which gives the overall requirement for a new wharf of 140 metres.

50. Support and Sail Training Craft Defence advised that about 10 motorised craft, ranging in length from four to 14 metres are located at HMAS Cerberus. The larger boats are used for moving yachts and towing targets.

51. In 1984/85 the RAN acquired five 11-metre sail training craft and three were allocated to HMAS Cerberus. They are used for sail training and formal instruction in ocean sailing.

52. In addition to support and sail training craft, there are also 18 sailing dinghies and three small utility boats which are used for sail and seamanship training.

53. Existing Facilities The motorised support craft and the sail training craft are too large or heavy to be removed from the water when not in use. They are currently moored to buoys in the turning basin adjacent to the wharf or secured to pontoons alongside the wharf. These arrangements obstruct the turning basin or are constrained by a lack of landing steps.

59. Requirement When berthed, patrol boats require electric power, telephone connections, water and an on-shore facility for pumping sewage and oily bilge water.

60. Defence submitted there is a need to provide a patrol boat operations room and office for the following functions:

- storing and displaying charts;
- planning and controlling local boat operations;
- training RAN Reserve personnel; and
- assisting local authorities with communications in the event of a local disaster.

61. There is also a requirement for a patrol boat office for patrol boat personnel to plan maintenance.

62. Diving Store Defence advised that Navy diving teams visit the area for diving exercises or for carrying out underwater inspections on operational craft.

63. The existing diving store is housed in a low grade building, constructed in 1928 adjacent to the wharf area and is considered unsuitable for retention.

64. Turning Basin The turning basin contiguous with the wharf is too small to allow craft to manoeuvre at low tide. The patrol boat assigned to HMAS Cerberus is a standby search and rescue vessel and it is considered there is a need to rectify deficiencies within the turning basin and the channel into Hann's Inlet. Dredging of the turning basin has not been carried out for at least 15 years and Defence consider it now to be essential for dredging to be carried out to overcome the limitation.

65. Channel Marker Piles The location of the approach channel to HMAS Cerberus is delineated by a number of channel marker piles, some of which require repairs or replacement.

- wharf, marina and boat ramp;
- dredging of the turning basin and channel and spoil disposal; and
- provision of associated engineering services.

71. In order to provide these facilities and works it will be necessary to demolish existing buildings and structures on the site used by the seamanship school, small craft and support craft and to provide temporary accommodation for seamanship training.

72. The location of the proposed work is in accordance with the zone plan developed to identify functional zones for future planning. The following paragraphs describe the general design and functions of the various components of the proposed work, the location and extent of which are shown in Illustration B-2, Appendix B.

73. Seamanship School This will comprise the construction of a new building and the conversion of the sail loft and will contain the following functional areas:

- administration and support facilities;
- instructional section;
- covered demonstration area;
- ship husbandry section; and
- boat shed section.

74. The main axis of the building will run parallel to the main wharf area. The boat shed section, comprising dinghy stowage, utility boat storage area and sail drying area, will be located in the northern half, adjacent to a new boat ramp. The ship husbandry section will be located in the southern half of the building. A classroom, outdoor work area, demonstration and practical area, paint store and tool issue and utility store will be provided in this section.

for a desk and filing cabinet. The Committee believes the amount of space proposed would not provide an environment where instructors could concentrate on work. Therefore, the Committee believes that the space allocation should be reviewed against needs for space for additional furniture such as drafting tables, map cabinets and requirements for additional staff. It should be noted here that to meet additional recruit training targets there may be a need to increase instructor and support staff. No allowance is made for any increases staff.

80. The first floor will contain a lecture room, operations room and crew quarters for the duty boat.

81. The adjacent former sail loft will be refurbished to provide a sail training craft facility and will contain a classroom and workshop/store at ground level and a first floor sail loft.

82. Plans and elevations of the proposed building are at Illustrations B-3 to B-5, Appendix B.

83. Design DHC advised that the design of the building aims to reflect the architectural character, form and materials of the majority of existing buildings at HMAS Cerberus. It has been designed to provide a flexible layout to meet both current and future training and operational needs. Future expansion of the building could be to the north and the south.

84. Structure and Materials The single-storey section of the building will be a steel portal framed industrial type structure. Upper levels of two-storey construction will be supported on concrete columns and brickwork.

85. DHC advised that materials proposed for the building have been selected for their economy, function, low maintenance and compatibility with existing buildings at HMAS Cerberus.

These materials are face brick and corrugated pre-coated wall panelling, concrete floors, corrugated metal roofing, plasterboard ceilings and polyester coated aluminium window frames.

86. The materials proposed for the sail training craft facility will be timber, plasterboard and weatherboard.

87. Building Services Offices and classroom areas will be air conditioned to provide comfort conditions. Mechanical exhaust ventilation will be provided to other areas including the covered demonstration area, ship husbandry demonstration and practical area. Hot water floor slab heating will be provided to the covered demonstration area, the ship husbandry demonstration and practical area, rigging shed, boat shed workshop and the patrol and support craft workshop.

88. The ship husbandry demonstration and practical area and the support craft workshop will be served with a reticulated system of compressed air.

89. Temporary Facilities Prior to the demolition of existing facilities the seamanship school functions will be temporarily relocated to buildings adjacent to the site to enable training to continue during construction. Two vacant buildings will be used for this purpose; one will be adapted to provide classrooms, offices and instructor's studies, the other will be adapted to house the rigging shed and bosun's store, support craft and survival at sea facilities. Temporary toilet and shower buildings will also be provided.

90. Wharf A new wharf, 140 metres long by 10 metres wide is proposed to replace the existing wharf. It will consist of reinforced concrete deck supported on tubular steel piles. DHC maintained that this type of construction is a proven and cost-effective solution.

97. Reinforced Earth Pty Ltd The Committee received a written submission and took evidence from a representative of Reinforced Earth Pty Ltd, a company which has provided a range of vertical retaining walls, bridge abutments and storage bunkers for the construction industry.

98. The submission suggested the reinforced earth technique could be used as a cheaper design solution to the more traditional piles and deck concept proposed for the wharf by DHC. Reinforced earth is a patented system of interlocking concrete facing panels connected to a composite material of earth and buried strip reinforcements. It has been used extensively in retaining walls and bridge abutment and recently in wharf construction at Honiara in the Solomon Islands. The Committee was advised that an explosives magazine has recently been constructed for the Commonwealth at Point Wilson, Victoria, using the reinforced earth method. DHC indicated that whilst the concept has been generally proven as cost-effective in a wide range of terrestrial applications, its use in maritime works is unproven overall and its capital cost may be higher than claimed by the Company. The Committee understands that the reinforced earth concept was considered in the examination of design alternatives for the proposed Fleet Base wharves at Garden Island, N.S.W., carried out by a firm of consulting engineers. Alternatives considered and costed for Garden Island ranged from a gravity wall wharf (\$20 million) to a suspended deck on piles (\$10 million). The estimated cost of a reinforced earth wharf was \$15 million. The reasons for the relatively high cost of the latter were:

- a large quantity of dredging;
- difficulties in establishing a level base underwater;
- a large amount of fill required; and
- dependance on extensive use of divers.

106. External Works and Services The existing site is generally flat and it will be necessary for site works involving clearing trees, buildings, structures and below ground services to be carried out.

107. Access to the seamanship school building, wharf marina and boat ramp will be provided by extending the existing road system. A new car park will be provided while existing car parks in the vicinity of the building will be extended.

108. The existing water supply system has sufficient capacity to provide water for domestic and fire fighting purposes for the new facilities.

109. Pumps located in the boat shed section of the seamanship school will provide pressurised saltwater to distillation plant located nearby.

110. Stormwater from the building and surrounding surfaces will be connected to a drainage system and discharged into Hann's Inlet.

111. Sewage from the building and wharf will be discharged into the existing reticulation system for treatment by the on-base treatment works.

112. Power will be provided by underground cable from the overhead supply on base.

113. Fire Protection An automatic fire detection system of thermal detectors and manual break-glass alarm points will be generally installed throughout the seamanship school building. Beam detectors will be used in the covered demonstration area and both systems will be connected to the base alarm system.

The extent and design of the main wharf, training wharf, marina and associated dredging will enable assigned and visiting vessels to effectively operate and training and support craft to be adequately moored and maintained.

ENVIRONMENTAL CONSIDERATIONS

121. Defence believe the proposal involving the construction of the seamanship school building will have no significant impact on the environment. Some existing trees on the site will need to be removed to allow construction of the building.

122. The Committee received a letter from the Australian Heritage Commission concerning the proposed building. In the letter the Commission congratulates Defence and DHC for proposing a design which is in sympathy with the existing buildings at HMAS Cerberus.

123. Dredging DHC advised that an environmental study of the proposed dredging determined that the most cost-effective solution, consistent with minimal and acceptable impact on the environment of Hann's Inlet, would be a dredging operation with disposal of dredged material into a containment area.

124. Notice of Intention A Notice of Intention on the dredging proposal was submitted to the Department of Arts, Heritage and Environment who sought comments from the Victorian Ministry of Planning and Environment. The Victorian Ministry supported the proposed method of containing dredged material within a bunded area and provided comments on some parts of the operation. These comments were incorporated in a supplement to the Notice of Intention and the Department of Arts, Heritage and Environment subsequently determined that the object of the Environment Protection (Impact of Proposals) Act 1974 has been achieved and that an environmental impact statement would not be required.

E. Coli. At the public hearing DHC advised that these levels had been traced to a fault in the system which had been rectified. Beginning in November 1985 test results of discharge have revealed levels which are within parameters acceptable to the EPA.

FUTURE WORK

129. Defence foreshadowed a number of additional major works identified in the current Five Year Defence Programme. These are:

- a new communications school;
- new recruit school, training and recreation facilities;
- upgrading of accommodation blocks for all ranks;
- upgrading of galleys, junior sailors cafeteria and cookery school.

CONSULTATIONS

130. Defence advised that local, state and Commonwealth authorities and departments were consulted about the proposal and have indicated their agreement with it.

PROGRAM AND COSTS

131. DHC advised that subject to the necessary approvals, it is proposed to call initial tenders in April 1987 with progressive completion and occupation by late 1989.

132. The Limit of Cost Estimate for the proposal is \$14.0 million at October 1986 prices which includes the following components:

136. The Committee asked DHC if any areas of risk or uncertainty had been identified in the proposal which could cause the cost to escalate. DHC advised that given approvals within the context envisaged in workplans, all the works proposed can be completed for the limit of cost, subject to normal escalation due to rising prices.

137. External Works and Services The Committee also questioned DHC about the relatively large component of costs attributed to external works and services for the seamanship school and maritime facilities.

138. External works and services to the seamanship school include the following:

- demolition, site preparation;
- upgrading of the sail loft;
- provision of temporary accommodation;
- water, gas and power supply;
- stormwater and sewer drainage;
- roads, footpaths and landscaping.

139. For the maritime facilities the external works and services include:

- demolition and site works;
- fuel storage and reticulation;
- compressed air;
- saltwater fire main;
- lighting, power, cathodic protection and fire protection;
- sewer, water supply;
- pavements;
- oily water facility.

RECOMMENDATIONS AND CONCLUSIONS

142. The recommendations and conclusions of the Committee and the paragraph in the report to which each refers are set out below:

	<u>Paragraph</u>
1. THERE IS A NEED FOR THE SEAMANSHIP SCHOOL TO BE PROVIDED WITH MODERN PURPOSE-DESIGNED FACILITIES AND FOR A NEW WHARF AND IMPROVED FACILITIES FOR MOORING, STORING AND MAINTAINING TRAINING AND SUPPORT CRAFT.	69
2. THE TURNING BASIN NEEDS TO BE ENLARGED AND DREDGING OF THE CHANNEL NEEDS TO BE CARRIED OUT.	69
3. THE EXTENT AND DESIGN OF THE SEAMANSHIP SCHOOL BUILDING WILL MEET THE FUNCTIONAL REQUIREMENTS FOR ON-SHORE TRAINING IN SEAMANSHIP, SURVIVAL AT SEA, SHIP HUSBANDRY AND WILL PROVIDE SPACE FOR OTHER SUPPORT FACILITIES.	120
4. THE EXTENT AND DESIGN OF THE MAIN WHARF, TRAINING WHARF, MARINA AND ASSOCIATED DREDGING WILL ENABLE ASSIGNED AND VISITING VESSELS TO EFFECTIVELY OPERATE AND TRAINING AND SUPPORT CRAFT TO BE ADEQUATELY MOORED AND MAINTAINED.	120
5. THE LIMIT OF COST ESTIMATE FOR THE PROPOSAL IS \$14.0 MILLION AT OCTOBER 1986 PRICES.	132

LIST OF WITNESSES

Ainsworth, Mr P.H., Councillor, Municipal Offices, Hastings,
Victoria

Carwardine, Commodore A.M., Commanding Officer, HMAS Cerberus,
Department of Defence, Russell Offices, Canberra,
Australian Capital Territory

Colebrook, Mr W.J., Associate Director, Projects Division,
Victoria/Tasmania Region, Department of Housing and
Construction, Melbourne, Victoria

Devlin, Mr R.J., Acting Project Manager, Projects Division for
Air and Navy, Victoria/Tasmania Region, Department of
Housing and Construction, Melbourne, Victoria

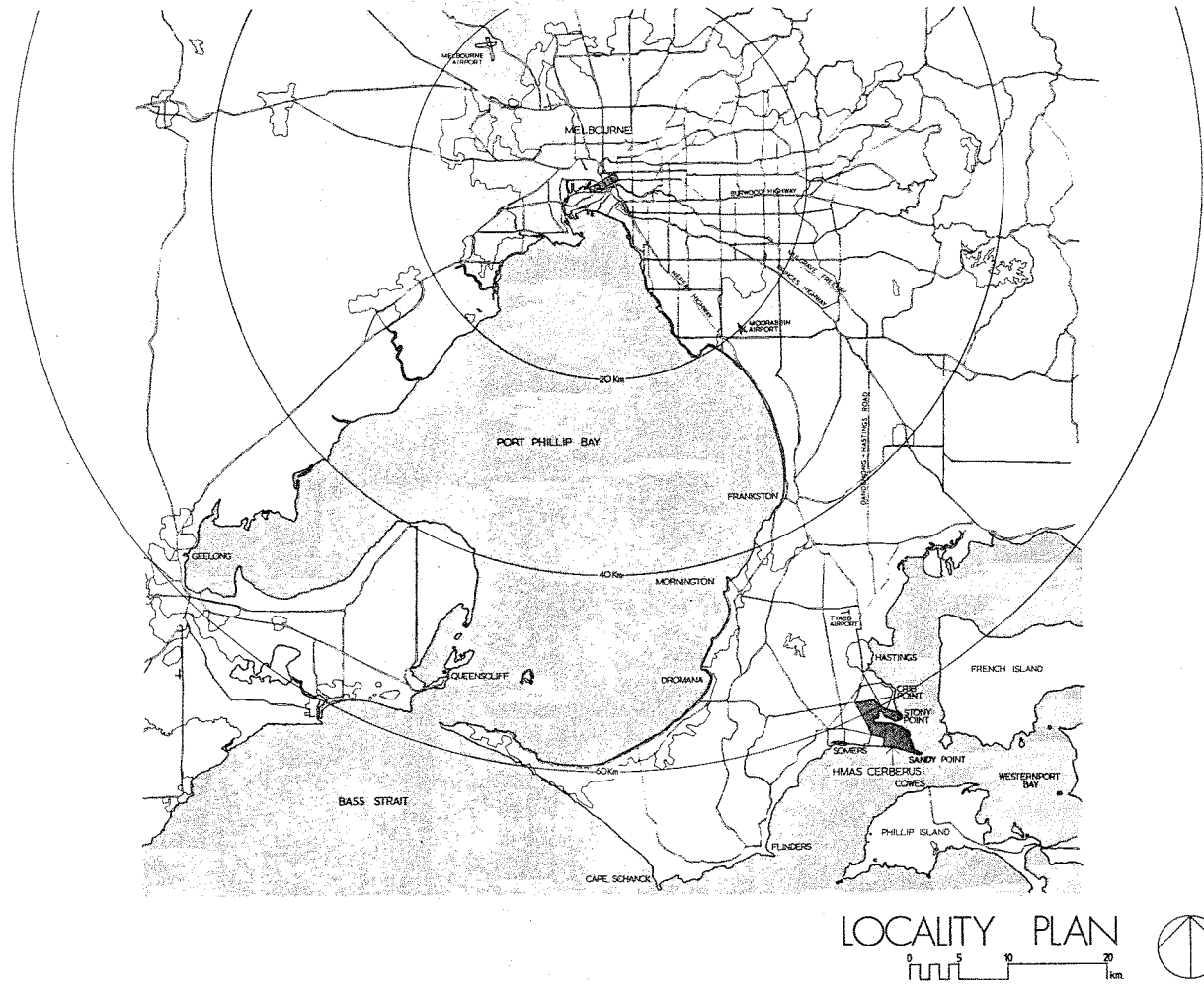
Featherston, Mr W.R., Shire Secretary, Municipal Offices,
Hastings, Victoria

Moore, Captain M.J., Acting Director-General, Facilities - Navy,
Department of Defence, Russell Offices, Canberra,
Australian Capital Territory

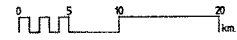
Parker, Mr J.L., Regional Manager, Reinforced Earth Pty Ltd,
16 Princes Street, Kew, Victoria

Phelan, Mr L.J., Shire President, Municipal Offices, Hastings,
Victoria

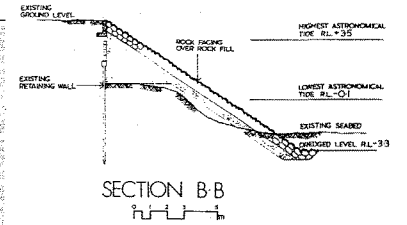
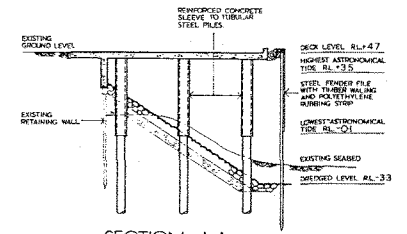
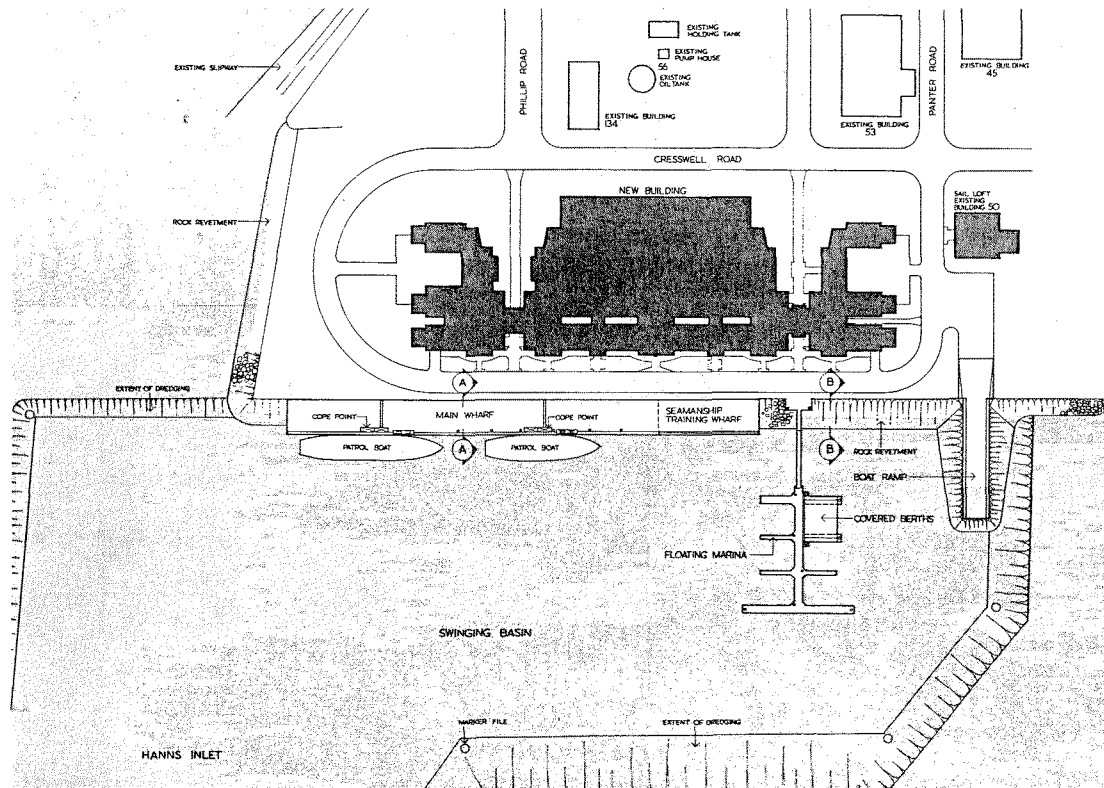
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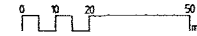
LOCALITY PLAN

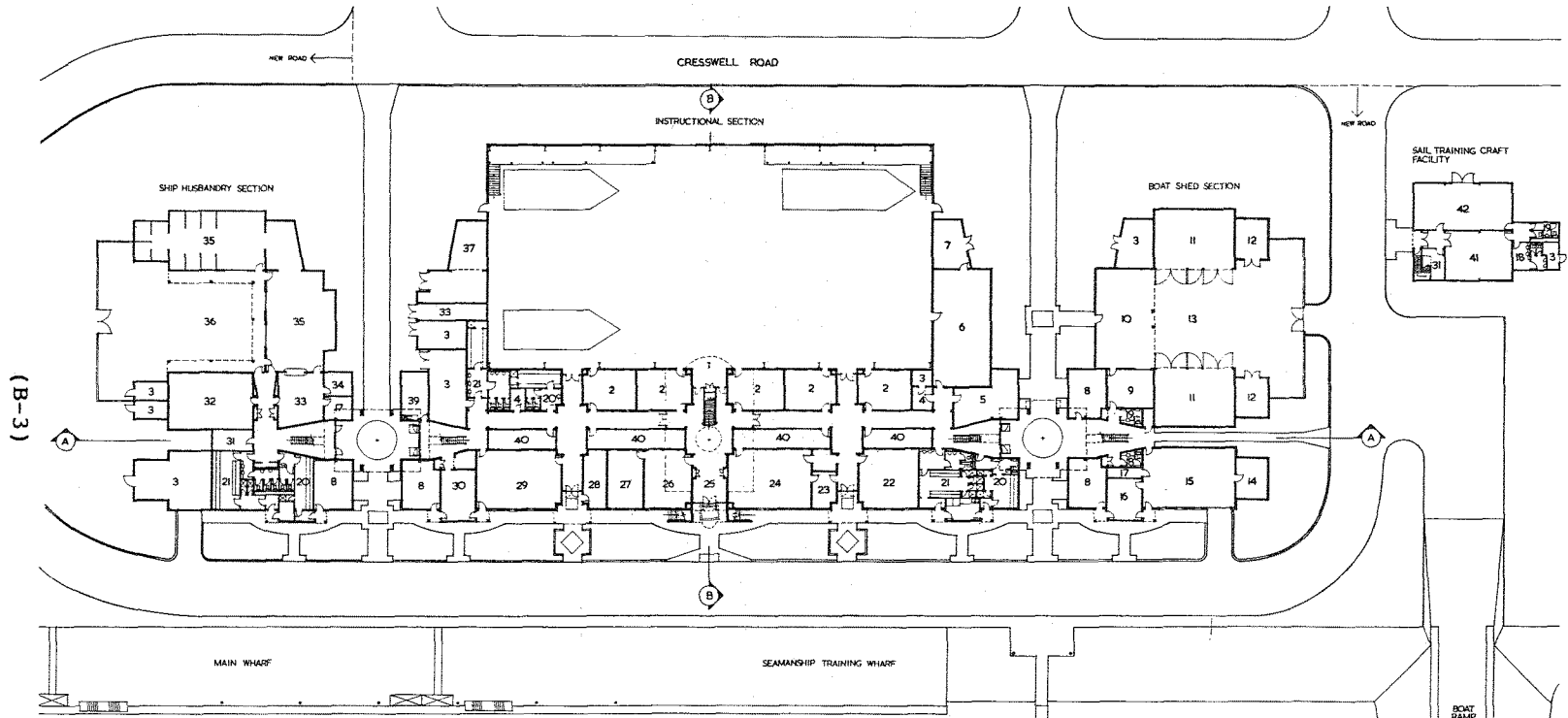


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WHARF, MARINA AND BOAT RAMP

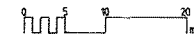




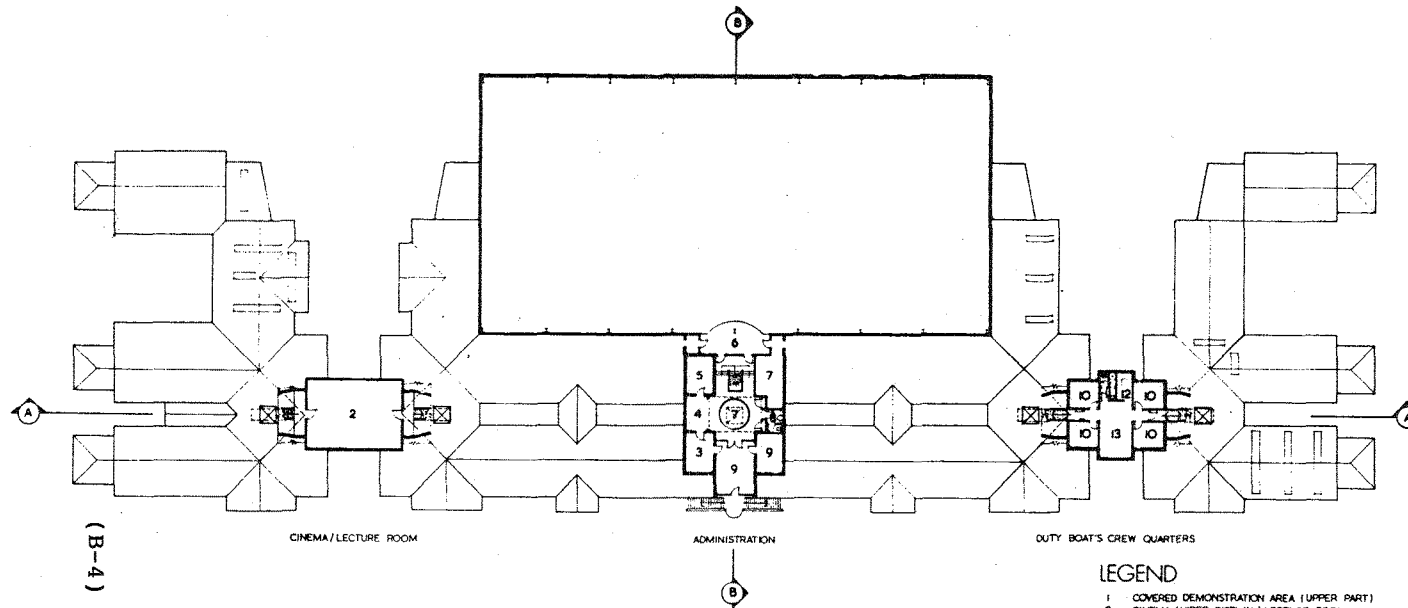
LEGEND

- | | | |
|------------------------------|--|-------------------------------------|
| 1 COVERED DEMONSTRATION AREA | 15 PATROL AND SUPPORT CRAFT WORKSHOP | 29 INSTRUCTORS' STUDY |
| 2 SEAMANSHIP CLASSROOM | 16 SUPPORT CRAFT MAINTENANCE OFFICE | 30 PATROL BOAT SUPPORT OFFICE |
| 3 PLANT ROOM | 17 FLAMMABLE STORE | 31 OFFICE |
| 4 CLEANSER | 18 MALE TOILET | 32 SHIP HUSBANDRY CLASSROOM |
| 5 SEAMANSHIP EQUIPMENT STORE | 19 FEMALE TOILET | 33 TOOL ISSUE AND UTILITY STORE |
| 6 RIGGING SHED | 20 FEMALE CHANGE ROOM / TOILET | 34 PAINT STORE |
| 7 BOSUN'S STORE | 21 MALE CHANGE ROOM / TOILET | 35 DEMONSTRATION AND PRACTICAL AREA |
| 8 LAY-APART STORE | 22 SAILMAKER'S WORKSHOP | 36 OUTDOOR WORK AREA |
| 9 WORKSHOP | 23 SURVIVAL-AT-SEA SECTION OFFICE | 37 SUBSTATION |
| 10 UTILITY BOAT STORAGE AREA | 24 SURVIVAL-AT-SEA CLASSROOM | 38 SWITCHROOM |
| 11 DINGHY STORAGE AREA | 25 POYER | 39 TEA ROOM |
| 12 SAIL DRYING AREA | 26 C/O, O/C, AND T/O OFFICE | 40 COURTYARD |
| 13 OUTDOOR RIGGING AREA | 27 LIBRARY / MODULE ISSUE / STATIONARY STORE | 41 SAIL TRAINING CRAFT CLASSROOM |
| 14 EQUIPMENT AND TOOL STORE | 28 DIVING STORE | 42 WORKSHOP / STORE |

**SEAMANSHIP SCHOOL
GROUND FLOOR PLAN**



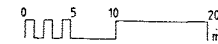
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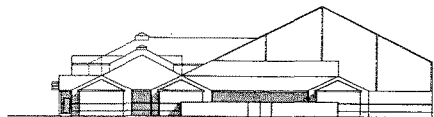


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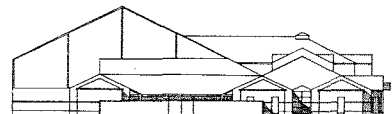
- 1 COVERED DEMONSTRATION AREA (UPPER PART)
- 2 CINEMA / VIDEO DISPLAY / LECTURE ROOM
- 3 DIC'S OFFICE
- 4 FOYER
- 5 ASO'S OFFICE
- 6 LANDING
- 7 VOID
- 8 TOILET
- 9 OPERATIONS ROOM
- 10 BEDROOM
- 11 BATHROOM
- 12 TEA ROOM
- 13 COMMON ROOM
- 14 SAIL LOFT

SEAMANSHIP SCHOOL
FIRST FLOOR PLAN



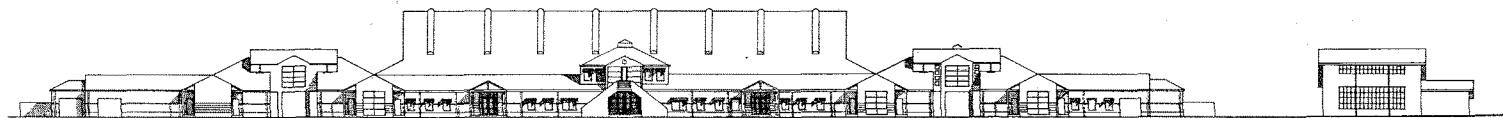


NORTH ELEVATION

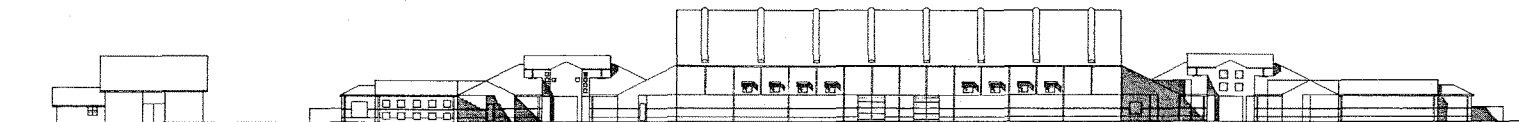


SOUTH ELEVATION

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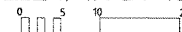


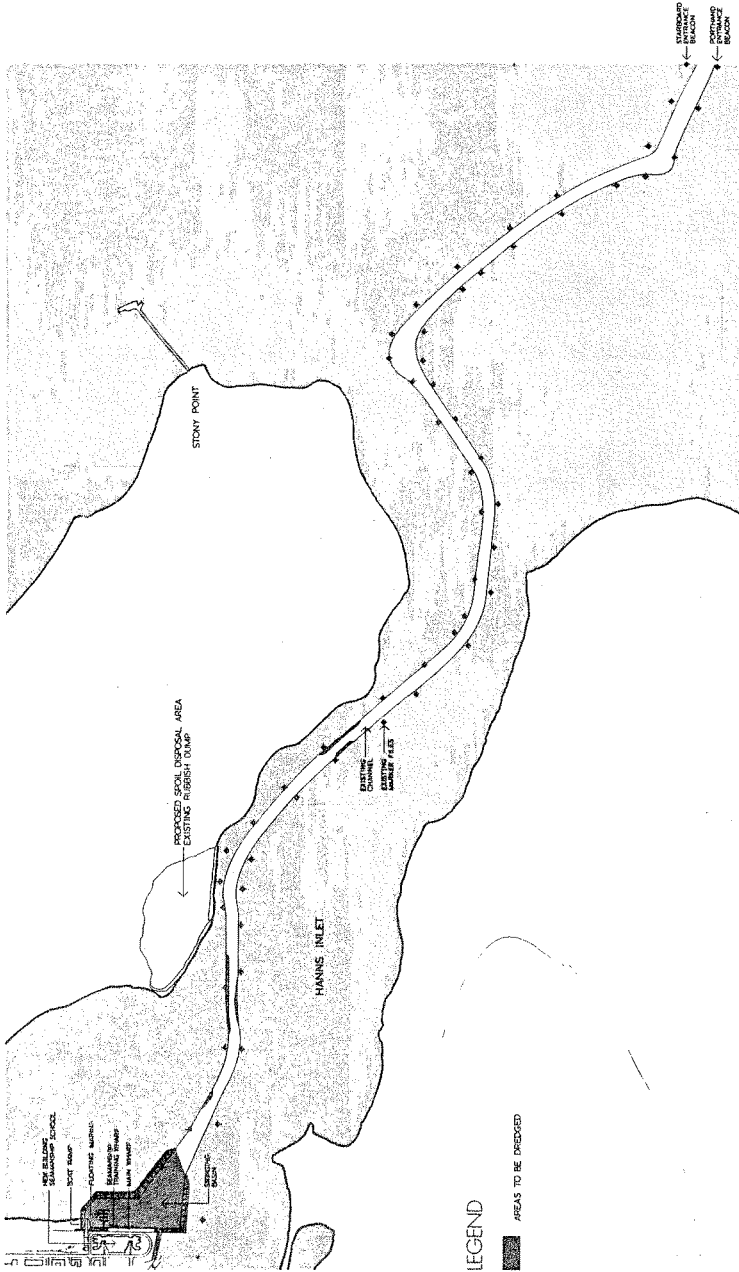
EAST ELEVATION



WEST ELEVATION

SEAMANSHIP SCHOOL
ELEVATIONS





DREDGING PLAN

(B-6)