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**Sydney Harbour Federation Trust**

**Management Plan - Mosman No. 2**  
Chowder Bay

24<sup>th</sup> NOVEMBER 2003



**Australian Government**  
**Sydney Harbour Federation Trust**

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## Introduction

The Trust's Comprehensive Plan sets out its vision for the harbour sites under its control and includes a process for the preparation of more detailed management plans for specific precincts, places or buildings.

The Comprehensive Plan proposes the creation of a Headland Park that integrates Middle Head, Georges Heights and Chowder Bay.

The vision for the park is a place where the area's rich natural and cultural heritage, including its early aboriginal and military occupation will be protected and interpreted and where access will be provided to areas that have long been inaccessible to most people.

The Trust has identified the creation of the Headland Park as one of its highest priorities. Its goals are to ensure that:

- The natural and cultural assets of Middle Head, Georges Heights and Chowder Bay are conserved;
- The bushland area is increased in size;
- A network of walking tracks is created that links the various former military precincts and other places of interest; and
- Existing facilities and buildings are adaptively re-used for appropriate educational, community, recreational and commercial uses.

Chowder Bay is an historic precinct within the park and the Trust has decided that this precinct should be developed at an early stage.

The purpose of this Management Plan is to guide this work.

## Commencement Date

This plan was adopted by the Trust on 24 November 2003 and came into force on that date.

## Land to which the Management Plan Applies

The land covered by this Management Plan is shown by broken black edging on the plan at *Figure 1*. All of the land is included within Lot 202 DP 1022020. Lot 202 extends to mean high water mark.

The Chowder Bay wharf and the Naval refueling wharf extend beyond mean high water mark and are leased by the Commonwealth from the NSW Waterways Authority. The Authority is the consent authority for development related to these wharves.





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## Aims of this Plan

The aim of this plan is to:

- Conserve and interpret Chowder Bay as an historic precinct within the Headland Park;

In doing this it aims to:

- Create opportunities for leisure, recreation and education at Chowder Bay;
- Conserve, enhance and interpret the site's natural and cultural heritage;
- Enhance the amenity of the surrounding parkland;
- Provide visitor facilities and amenities including picnic areas, walking tracks, toilets and parking;
- Expand the foreshore bushland to screen the existing barrack buildings;
- Modify the external appearance of the barrack and mess buildings to ameliorate their visual prominence;
- Create a sense of arrival and make Chowder Bay Road and the existing parking areas less visually dominant;
- Protect the cultural landscape of the area surrounding the heritage buildings;
- Reinststate the parade ground and enhance the setting of the existing memorial;
- Assist the conservation of heritage structures by ensuring that they are occupied and used;
- Provide for the adaptive reuse of heritage structures;
- Adaptively re-use the Sergeant Major's Quarters and Submarine Miners' Depot for uses that either contribute to the public enjoyment of this harbourside location or for maritime oriented uses;
- Adaptively re-use the barrack and mess buildings for functions, short term accommodation, educational facilities or similar uses;
- Foster opportunities for marine research;
- Use the existing Chowder Bay wharf for visitor arrival by small ferries and charter vessels;
- Provide opportunities for access by bus;
- Control the quality and quantity of stormwater run off;
- Protect the surrounding bushland from the spread of *Phytophthora cinnamomi*;
- Remediate site contamination and hazardous materials;
- Retain the existing fuel tanks and refueling facilities for use by the Navy.

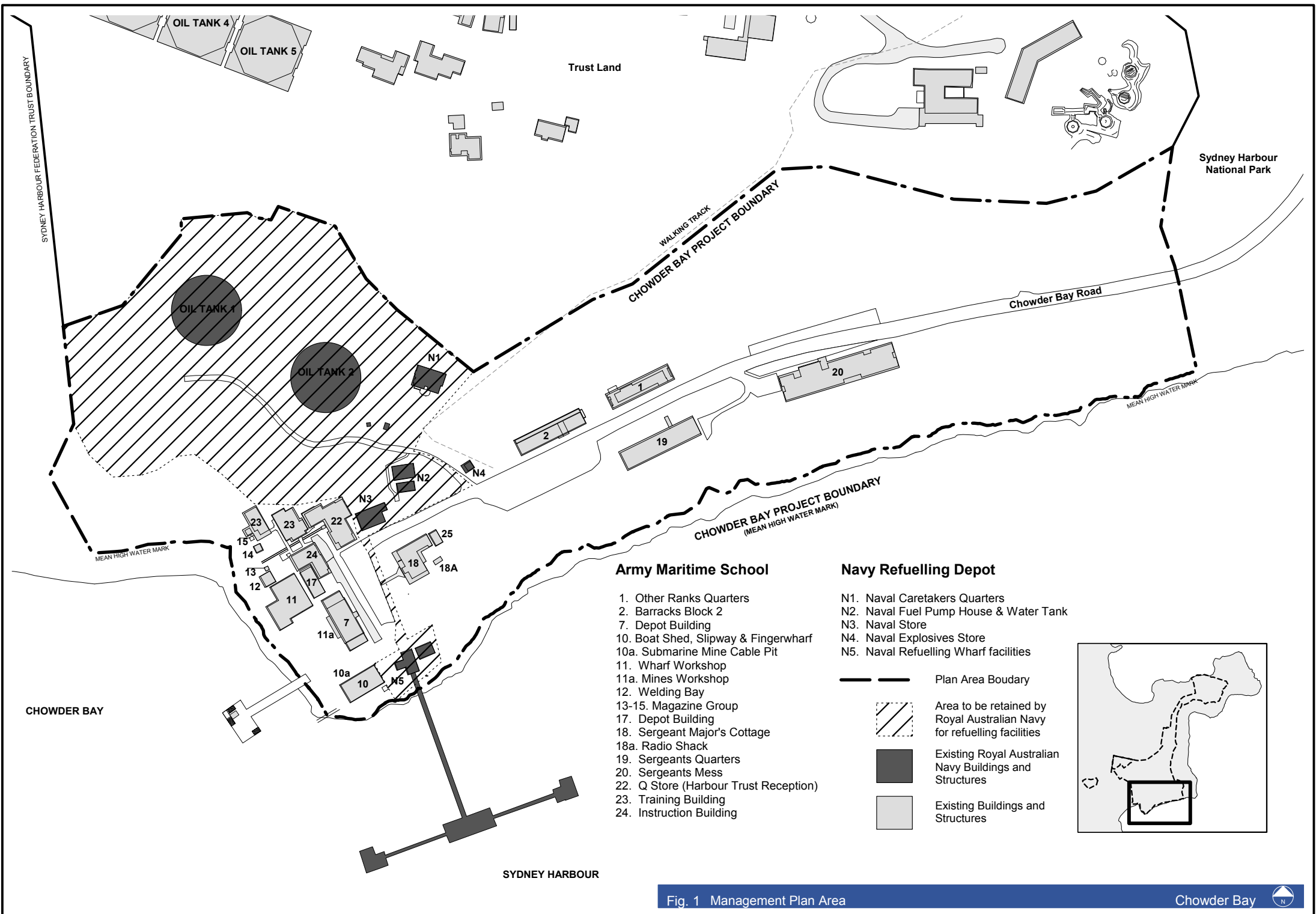
## Relationship with the Trust's Comprehensive Plan

This Management Plan is the middle level of a three tiered comprehensive planning system developed to guide the future of the Trust's lands.

The other levels are:

- The Trust's Comprehensive Plan - this is an overarching plan that was prepared in accordance with the *SHFT Act* and provides the strategic direction and planning context for all of the management plans; and
- Specific projects or *actions* - *actions* are defined in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* and are similar to the concept of *development* in the NSW planning legislation. Part





**Army Maritime School**

- 1. Other Ranks Quarters
- 2. Barracks Block 2
- 7. Depot Building
- 10. Boat Shed, Slipway & Fingerwharf
- 10a. Submarine Mine Cable Pit
- 11. Wharf Workshop
- 11a. Mines Workshop
- 12. Welding Bay
- 13-15. Magazine Group
- 17. Depot Building
- 18. Sergeant Major's Cottage
- 18a. Radio Shack
- 19. Sergeants Quarters
- 20. Sergeants Mess
- 22. Q Store (Harbour Trust Reception)
- 23. Training Building
- 24. Instruction Building

**Navy Refuelling Depot**

- N1. Naval Caretakers Quarters
- N2. Naval Fuel Pump House & Water Tank
- N3. Naval Store
- N4. Naval Explosives Store
- N5. Naval Refuelling Wharf facilities

- Plan Area Boundary
- ▨ Area to be retained by Royal Australian Navy for refuelling facilities
- Existing Royal Australian Navy Buildings and Structures
- Existing Buildings and Structures

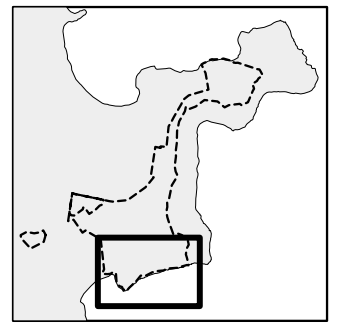


Fig. 1 Management Plan Area

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11 of the Trust's Plan requires a Management Plan to be in place before an *action* is determined by the Trust.

This Management Plan describes specific outcomes for the Chowder Bay Precinct. It interprets the Trust's Comprehensive Plan and guides its implementation by providing more explicit detail about the way the precinct is developed, adaptively reused or conserved.

The Management Plan must be consistent with the Trust's Comprehensive Plan. In particular it must be consistent with the *Outcomes* identified in *Part 7* of the Trust's Plan and must address the *Objectives and Policies* in *Part 3*.

The *Outcomes* identified in *Part 7* of the Trust's Comprehensive Plan for Middle Head, Georges Heights and Chowder Bay are reproduced at *Figure 2*.

The *Objectives and Policies* that are most relevant to this Management plan are those relating to the conservation of the natural environment, the conservation of cultural and aboriginal heritage, transport management, storm water management and catchment protection, bushfire management, access and the adaptive reuse of buildings. These *Objectives and Policies* were addressed during the assessment of the site and are discussed in more detail in the relevant sections of this plan.

## Relationship with other Trust Management Plans

This Management Plan is the second to be prepared by the Trust for land within the Mosman local government area. Others will be prepared as subsequent stages of the park are developed - gradually building up the mosaic until the park is completed. All of the Management Plans must be consistent with each other as well as any plans for neighbouring lands.

## Related Policies and Guidelines

In addition to this Management Plan there are a number of overarching Policies and Guidelines that will guide the development of the Chowder Bay Precinct. However, at this stage only a few have been prepared. As others are prepared they will also apply. Current policies include:

- The Threat Abatement Plan for *Phytophthora cinnamomi* prepared by the Department of Environment and Heritage, 2002;
- The Trust's draft Phytophthora Root-rot Management Strategy and Best Practice Procedures for Bush Regeneration Activities; and
- The Trust's draft Leasing policy;

This Management Plan has to be interpreted having regard for these policies.

## Relationship with the Headland Park Design Framework

The transformation of the former Defence bases into a unified area of parkland requires consideration of all of the elements that make up the public domain in a holistic manner and in a way that:



- 
- Fulfils expectations about gaining access and enjoyment of the site; and
  - Enables their integration with the harbour, the foreshore and the local neighbourhood.

The development of the design framework and the design treatment of each of its elements must be drawn from the heritage values and characteristics of the lands, rather than imposing an arbitrary new “design statement”.

The design framework for the Headland Park is shown at *Figure 3*. It identifies all of the elements that make up the public domain - how they need to work together as a network of spaces and the principles that will guide their detailed design development within each of the Management Plan areas.

The elements of the public domain comprise:

- Precincts – areas with distinct characteristics by virtue of land uses or physical factors such as topography, building scale and form;
- Streets and Paths – the network of routes that provide access to and through the site for all modes – walking, cycling, public transport and private motor vehicles;
- Entries - to a precinct or significant public places;
- Significant Public Places – the destinations, the spaces used for gatherings, relaxation, ceremony or cultural or sporting activity;
- Landmarks – places, structures or natural features of public interest;
- Edges – the boundaries between precincts, the borders to parks and gardens, dramatic level changes, the interfaces between buildings and the public domain.

### Precincts

The terrain and its relationship to the harbour is the first and most fundamental consideration for all of these. It is the terrain that has given rise to the historic uses and it is its relationship to the harbour that makes these lands special.

The early fortifications located at the escarpment and the associated defence facilities on the knolls form identifiable precincts. These precincts include –

- The cluster of buildings on the rock ledges at Chowder Bay;
- The former barracks and fortifications at Georges Head;
- The former World War I Hospital precinct on the highest knoll at Georges Heights:
- The fortifications, sheds and barrack buildings at the spur terminating the Georges Heights plateau; and
- The Middle Head barracks.

Generally, these precincts have an institutional - parkland character, with the buildings forming small scale, civic spaces.

The open spaces on the saddles of the undulating plateau and the steep slopes also create distinct precincts. These include:

- The steep, wooded slopes below the escarpment;
- The plateau which is generally characterised by coastal heath and exposed rock ledges; and the
- Institutional parkland areas of the former bases.



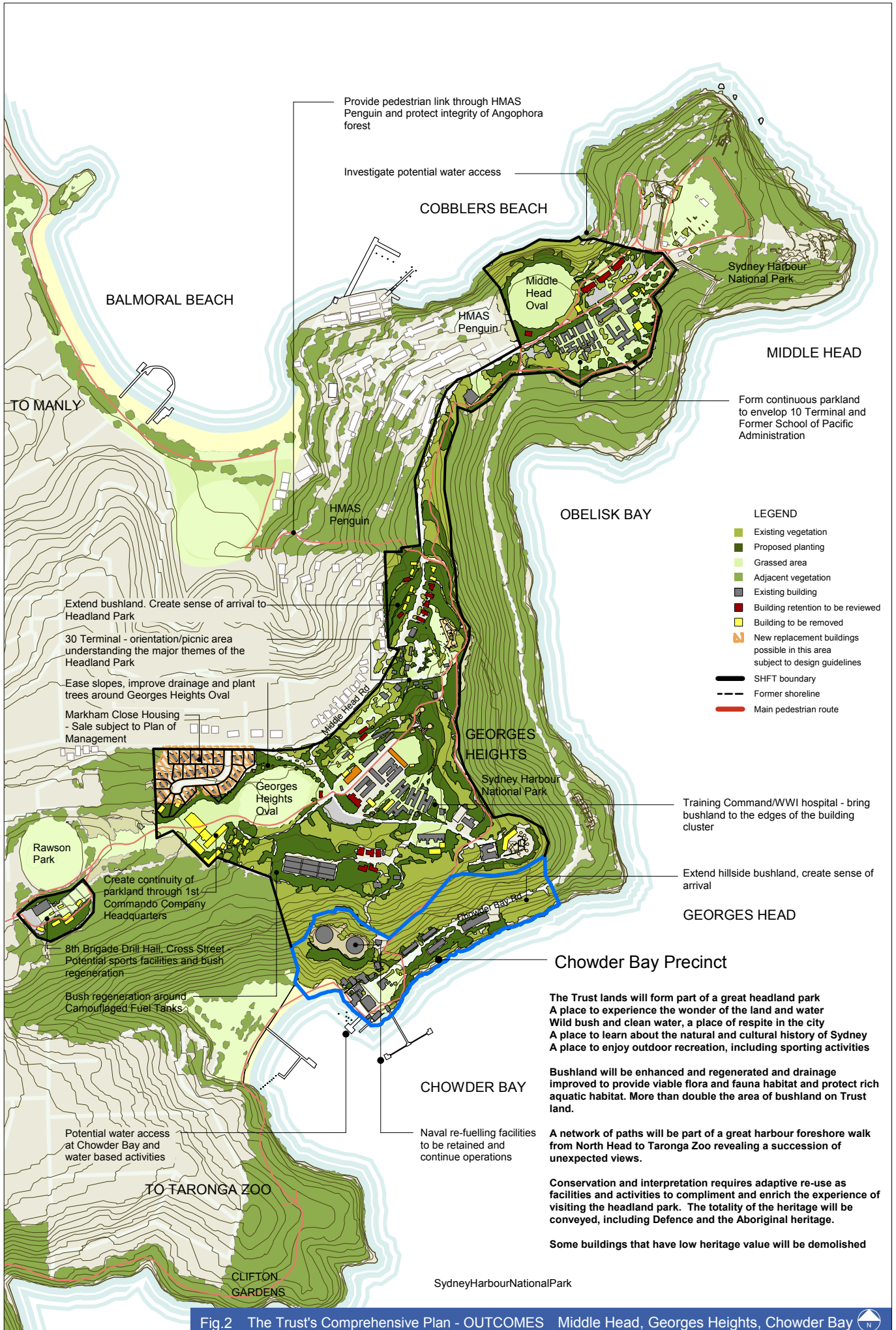


Fig.2 The Trust's Comprehensive Plan - OUTCOMES Middle Head, Georges Heights, Chowder Bay



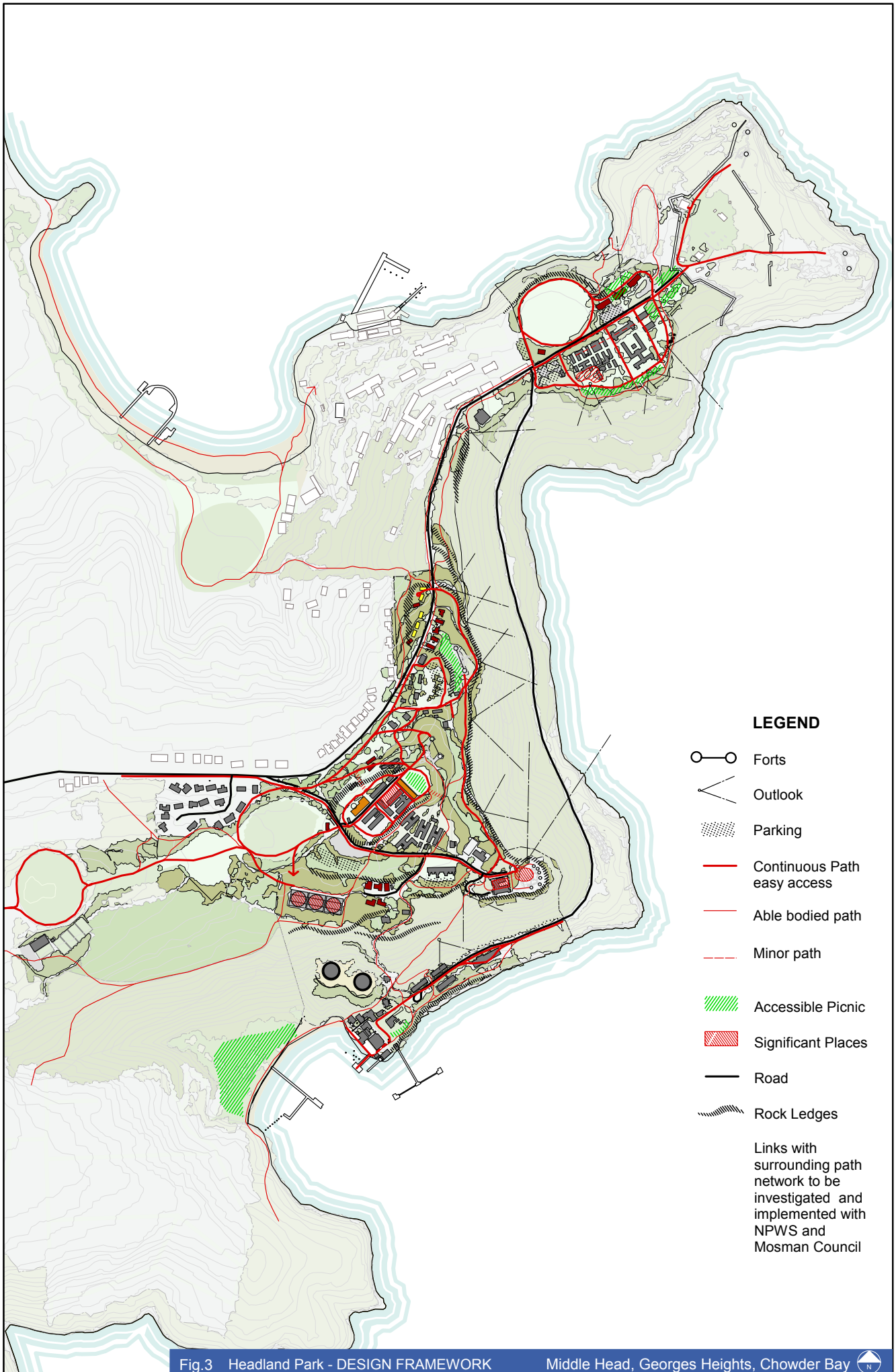


Fig.3 Headland Park - DESIGN FRAMEWORK



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The Headland Park will form a succession of spaces from hill tops with a sense of openness and height above all the surrounding land – such as the former Training Command HQ, through to more enclosed areas in the saddles and valleys and to places along escarpment edges. As the plateau narrows and winds towards the headland, these spatial experiences will vary – as the views into Middle Harbour unfold and gain equal prominence to the views to the outer harbour and the ocean.

The former Submarine Miners' Depot is located on a rock platform at Chowder Bay and has similarity to the other precincts on rocky knolls. However, the tight cluster of buildings benched into the cut rock faces, stepping from the knoll to a paved waterfront court, is a smaller scale version of a pattern more typical in industrial waterfronts up the harbour.

### Streets and Paths

The access network needs to provide clear and convenient access to and through the Headland Park. Each of the elements of the network will be designed to reflect its role and function, and the desire to create an unfolding sequence of experiences in response to the environment it passes through. The network consists of the following elements, as shown in *Figure 3*:

- The approach roads adjoining and leading into the park – Middle Head Road, Chowder Bay Road and Suakin Drive;
- Internal streets and laneways within each precinct (within the former bases);
- A major pathway circuit that provides access for people with all levels of mobility and that links the significant public places, features and landmarks, the entry roads, car parks and local neighbourhood;
- A minor pathway network providing more variety, intimacy and seclusion, and access for able-bodied walkers to limited areas within the bushland; and
- The car parks and bus set down areas.

As a general principle cycling should not take place on pedestrian pathways.

At Chowder Bay, the roadway entry will be landscaped to reinforce the sense of traveling through bushland culminating at the park-clearing with sweeping views of the harbour. Links will be provided with the pathway up to the Georges Heights escarpment, Clifton Gardens and along the cliff edge to the National Park.

### Entries

It is proposed that there will be numerous “*entry points*” so that access opportunities are maximised and dispersed. This will accommodate people arriving from many different directions and by different modes of travel and will avoid concentrations of visitors.

Entries in the public domain will not usually be built structures. However, they need to provide a sense of arrival. This can be achieved by the use of elements that provide a sense of transition, such as the widened end of the wharf, the wharf shed and crane at Chowder Bay. They can also facilitate an appreciation of the former Defence uses while also achieving site security - for example, access through a single entry, possibly flanked by an existing gatehouse, or, as at Chowder Bay, by a gate. They do not necessarily need to be given undue emphasis, especially as one of the Trust's objectives is to



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maximise public access and weave these formerly isolated sites into the life of the community.

### Significant Public Places

The Headland Park will have a range of public spaces offering a diversity of activities. These will include:

- Passive recreational areas for picnics and relaxation such as the clearing around the Sergeant Major's cottage at Chowder Bay;
- Areas for community sporting activities;
- Places of contemplation within a bushland setting or on the escarpment with spectacular views; and
- Small civic spaces defined by former defence buildings for community gatherings or simply watching the passersby - the waterfront apron at Chowder Bay is a fine example, and is the only one at Middle Head providing a sheltered courtyard by the water's edge.

They will form a series of experiences connected by the main pathway network. All of these spaces are located and chosen to enhance an understanding and appreciation of the natural environment and the succession of historical uses.

### Landmarks

Within each of the precincts, there are significant features that relate to the history or the natural beauty of the place. They are often beautiful or unusual structures, buildings or natural features that provide the focus in public places or points of interest along the way. The setting of these features will be designed to assist in a greater understanding and appreciation of their significance and the Headland Park as a whole.

### Edges

The most dramatic edges are along the escarpment. Here the primary consideration is the protection and enhancement of the bushland on the slopes by effective stormwater management and bush regeneration.

Where environmental conditions are suitable, public access will be provided. This will be in locations related to the fortifications and scenic lookouts. One such cliff edge walk will be along the shoreline at Chowder Bay.

Some of the edges currently include untidy service areas, sheds and paved areas of low heritage value. In these cases intrusive elements will be removed and landscaped to reveal the natural terrain and to clearly identify the precincts.

## **Plans Prepared for Neighbouring Lands**

In addition to the Trust's policies there are plans and policies prepared by neighbouring land managers that provide a context for this Management Plan. Most of these plans are identified in *Section 7* of the Trust Plan. However, the following are particularly relevant to the Chowder Bay Precinct:





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### Sydney Harbour National Park Management Plan

Chowder Bay immediately adjoins Sydney Harbour National Park. The National Parks and Wildlife Service has prepared a Management Plan that applies to the whole of the Sydney Harbour National Park including Middle Head and Georges Head.

The Management Plan outlines general and specific objectives for the National Park with the overall strategy for the park being the protection of its natural vegetation and the maintenance and adaptive reuse of important historic places. The park is divided into precincts with emphasis to be given to the following strategies in the Middle Head Georges Heights Precinct:

- Interpretation of fortifications and defence history; and
- Rehabilitation of the natural vegetation.

High priority projects, that are relevant to the Trust's Headland Park, include the preparation of a weed control program, feral animal management and the preparation of a fire management plan.

The plan proposes that the Middle Head and Georges Head fortifications will continue to be used for historic tours and passive recreation. It also proposes that no additional facilities will be provided until improved access and parking can be provided.

The NPWS has also prepared a draft amendment to the Plan of Management that facilitates the adaptive reuse of historic buildings and structures in the park. The historic buildings and structures identified in the amendment do not include any at Middle Head.

### Mosman Bicycle Plan

Bicycle planning in the Mosman Municipality is currently directed by a regional plan prepared by Loder and Bayly-Stapleton in 1982 and an Integrated Land and Water Access Plan released by the State Government in February 2003.

Recommendations contained in the Loder and Bayly-Stapleton plan for implementation in and around the Headland Park include the marking of 3 metre centre lanes along Middle Head Road to facilitate the creation of kerb lanes for car parking and cycling and the provision of an on-road cycle route along Chowder Bay Road to the Chowder Bay Precinct.

Mosman Council has also resolved to prepare a Bicycle Plan that will replace the regional plan.

The Trust will collaborate with the Council in the development of this plan and will give careful thought to the identification of Trust areas where cycling will be permitted so that there is no conflict with walkers.

### Sharing Sydney Harbour – Integrated Land and Water Access Plan

In February 2003 the State government released a draft plan that proposes to increase the amount of accessible foreshore around the harbour through the provision of new walking and cycle tracks and improved public open space, landscaping and picnic areas.



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The plan proposes a “*Major On- and Off-Road Cycleway*” through the Chowder Bay Precinct linking Clifton Gardens to Chowder Bay Road. The implementation of this cycleway will require very careful consideration having regard for the steepness of the terrain in the vicinity of the former Submarine Miners’ Depot.

The plan also proposes “*new and improvements*” to wharves and pontoons in Chowder Bay.

#### Plans made under the Rural Fires Act 1997

There are two sub-plans of the NSW State Bush Fire Plan made under the Rural Fires Act 1997 that apply to the Mosman local government area, including the Harbour Trust’s land and the adjoining Sydney Harbour National Park. The Manly – Mosman District Bush Fire Management Plan 2000 deals with strategies to minimise bush fire risk such as hazard reduction. The Manly – Mosman Draft Bush Fire Operations Plan 2003 deals with the operational and management issues. Evacuation routes are determined under Local Emergency Disaster Plans.

There is also a Bush Fire Prone land map prepared under Section 146(2) of the *Environmental Planning and Assessment Act 1979* the was approved by the NSW Rural Fire Service in 2003. This map identifies areas of bush fire prone vegetation and vegetation buffer areas around the Chowder Bay Precinct. Particular developments proposed on bush fire prone lands can trigger the need to conform to the requirements of *Planning for Bushfire Protection 2001* guidelines under the Environmental Planning and Assessment Act 1979.

The Trust has completed an assessment of bushfire risk for its sites at Middle Head, Georges Heights and Chowder Bay and this assessment informed the preparation of this management plan.

#### Clifton Gardens Reserve

In 2002 Mosman Council commissioned Pittendrigh Shinkfield Bruce Pty Limited to prepare a Management Framework, Landscape Masterplan and Implementation Plan for Clifton Gardens Reserve. The Management Framework provides a consistent approach and future direction for the management of the reserve and includes a series of principles for its future management.

The Landscape Masterplan recognises the importance of retaining and enhancing the character of the reserve, as a significant site in its own right and within a sequence of open spaces along the foreshore. The Landscape Masterplan also aims to interpret the site’s historical elements including the former hotel, baths and pavilion.

The Landscape Masterplan will be implemented through a number of proposed Actions. The most important for the Chowder Bay Precinct is Action 1 – the construction of a foreshore walkway link. The purpose of the proposed link is to join the existing walking track from Taronga Zoo to the Chowder Bay Precinct.

The proposed link is consistent with the outcomes identified for Chowder Bay in the Trust’s Plan. However, the exact location and nature of the connection with Chowder



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Bay have not been resolved. This connection is considered to be an important matter to be resolved as part of the implementation of this Management Plan.

### Draft Environmental Management Plan for the Naval Fuel Tanks

In 2001 the Department of Defence engaged consultants URS to prepare an Environmental Strategy and Environmental Management Plan for the Chowder Bay Fuel Installation. This plan deals with issues such as fire prevention, emergency response to fuel spills, environmental monitoring, stormwater management and similar matters that are relevant to the management of the Trust's land. The refueling facilities will remain operational and in the ownership of the Department of Defence. Accordingly it will be important for ongoing cooperation to ensure an integrated approach to the management of the refueling facility and the Chowder Bay Precinct.

## **Site Description**

The site is located on Middle Head Peninsula below Georges Heights. It has a long frontage to the harbour and Chowder Bay and is surrounded on the other three sides by bushland. To the east it is bounded by Sydney Harbour National Park and to the west by Clifton Gardens Reserve.

The only vehicular access to the site is through the National Park via Chowder Bay Road. Chowder Bay Road also acts as a central spine for the precinct. The site has its own wharf and has the potential for ferry and charter boat access.

Clustered above Chowder Bay is a group of historic buildings known as the Submarine Miners' Depot. This was established in the 1890s and operated until 1922 when the Submarine Mining Corps was disbanded. Chowder Bay then became a depot and barracks for Army engineers. It was used for the Army's Maritime Transport Wing from the 1940s and in the 1970s became the Army Maritime School. The School closed in 1997.

Moving up Chowder Bay Road towards the National Park there is a group of more recent buildings - the barrack and mess buildings that hug the road between the shoreline and the base of the escarpment.

Natural bushland occurs along the water's edge and slopes leading to Georges Heights. These areas are important in providing a backdrop for the buildings and in reinforcing the impression of a green entry to the harbour. However, land clearing, landfill and altered drainage patterns have adversely affected much of the natural environment at Chowder Bay.

There are two above ground fuel storage tanks, pump house, pipelines, offices, refueling wharf and caretaker's residence at Chowder Bay. These facilities supply the Royal Australian Navy and are to be retained and operated by the RAN and do not form part of the Trust's site.

Similarly there is an area designated as *Naval Waters* located off Chowder Bay surrounding the Naval Refueling wharf. These waters come under the jurisdiction of the Commanding Officer of HMAS Kuttabul (Superintendent of Naval Waters) with delegated



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authority being given to the Port Services Manager. This is discussed in more detail in the section of the plan dealing with site analysis.

## **Relationship to Surrounding Lands**

Chowder Bay is strategically located to form an important link in the currently disjointed open space network of Sydney Harbour. The site is surrounded by two significant areas of open space, Clifton Gardens Reserve and the Sydney Harbour National Park – both of which are linked by walking tracks to other areas of open space, including Taronga Zoo and Balmoral Beach.

Much of the bushland around the edges of Chowder Bay is affected by weed infestation, poor drainage and die back. A series of informal paths have been forged through the bushland connecting various parts of Georges Heights to Chowder Bay and Clifton Gardens. The formalisation of some of these paths to link Chowder Bay with the National Park and Clifton Gardens is identified as an outcome in this Management Plan. Investigation of the most appropriate access tracks will need to be carried out in more detail through consultation with Mosman Council and the National Parks and Wildlife Service.

### Sydney Harbour National Park

The only vehicular access to Chowder Bay is through the bushland of Sydney Harbour National Park. This contributes to Chowder Bay's special character and sense of isolation. It also imposes specific management responsibilities on the Trust in the way it manages the site.

The section of the National Park that adjoins the site is dissected by Chowder Bay Road and includes a number of small road side car parking areas. It is important that vehicular access to Chowder Bay is managed collaboratively with the National Parks and Wildlife Service and having regard for the impact on the National Park and the competing demands of visitors to the park.

A number of important historical features including the Beehive Casemate (from 1872) and the more recent Armoured Casemate Battery are also located in the National Park close to the entry of Chowder Bay. One of the objectives and policies of the Trust's Comprehensive Plan is the interpretation of the heritage of the Trust's sites in context of the whole harbour. The interpretation of the military history of the National Park and the Trust sites will be an important component of achieving this.

### Clifton Gardens reserve, beach and wharf

At present access to the Chowder Bay precinct from Clifton Gardens is via a small board walk connecting the lower deck of the Submarine Miners' Depot across the sandy beach of Chowder Bay. One of the aims of both this Management Plan and Mosman Council's Management Framework for the Clifton Gardens Reserve is to upgrade the link between these two sites. This will provide pedestrian access to public transport and existing foreshore pathways.

Clifton Gardens Reserve, beach and wharf are accessible via Morella Road - by bus, private motor vehicle, cycle and pedestrian. Pedestrians can also access the site by a



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walking track that links Taronga Zoo ferry wharf to the reserve through Sydney Harbour National Park. Charter boats, ferries and private vessels also provide access to both the wharf and bay.

## Site Analysis

### Heritage Conservation – Archaeology, Buildings, Places and Plantings

The Chowder Bay Barracks group of buildings is listed on the Register of the National Estate – see *Australian Heritage Commission Database Number 2876*. This is in recognition of its historical significance as one of the locations of major defence works for Sydney Harbour during the 19<sup>th</sup> and 20<sup>th</sup> centuries as well as subsequent military occupation of the site.

The precinct's initial development and operation by the Submarine Miners' Corps was a major defence undertaking of the late nineteenth century. It represents the most advanced military technology available at that time and one of the earliest uses of electric technology in a military situation.

The Submarine Miners' Depot is believed to be the most intact in the world and to be the sole surviving mine laboratory in Australia.

The four phases of military development and building use represented at Chowder Bay are:

- Phase 1 - 1892 to 1922. The establishment of the Submarine Miners' Depot in 1892 to maintain an electronically triggered minefield within Sydney Harbour as a defence against enemy ships.

This phase included the construction of the stone masonry mine stores, workshops, Sergeants Major's cottage, small brick explosive magazines, cable pond and boatshed. The majority of this development is intact and is set on various terraced levels leading down to the waterfront.

- Phase 2 - 1922 to 1974. During this phase the Depot was occupied by various groups of the Royal Australian Engineers – the Fortress Engineers, the Transport Service and the Australian Water Transport.

From the middle to the end of this phase new barrack and mess buildings were constructed along the eastern section of the entry road. These buildings were constructed for both short and long term accommodation for base personnel and training course attendees.

It was also during this time that the Naval refueling facilities were established. This included the two tanks located above the Depot, refueling wharf, pipe line and buildings to accommodate pumps etc.

- Phase 3 - 1974 to 1997. This was the final phase of military occupation. During this time the site was used as the Army Maritime School. The school trained personnel in water transport.



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In the late 1980's several buildings from the earlier phases were demolished to provide new accommodation for the school.

- Phase 4 - 1998 to present. During this phase management of the site was transferred to the Sydney Harbour Federation Trust and the Trust has located its offices in three of the former school buildings - buildings 22, 23 and 24.

The buildings and structures remaining from these phases of occupation are shown in *Figure 4*

In July 2003 the Trust engaged architects, Brian McDonald & Associates, to prepare a Conservation Management Plan (CMP) for the Chowder Bay precinct.

This study assessed all of the built items including buildings, workshops, barracks and has provided a statement of significance and recommendations for each building.

The study recommended that all existing buildings and structures under Trust control be maintained. It recommended that buildings 7, 10, 11, 11a, 13, 14, 15, 17, 18, 18a, the dry cotton store and their associated infrastructure should be conserved and that buildings 1, 2, 12, 19, 20, 22, 23, 24 & 25 could be modified. The recommendations suggest a range of modifications for different buildings for example, adaptive re-use of buildings 22, 23 and 24, and external appearance changes to buildings 1,2,19 and 20 if creating a more harmonious relationship with the harbour-side setting.

The study also noted that buildings N2, N3 & N4 (the pump house and associated buildings) are aesthetically intrusive and recommended that if possible they should be removed. However, buildings N2 and N3 are under the control of the Department of Defence and are essential to the functioning of the Navy fuelling depot. Building N4 is not an essential part of this of this complex and it is proposed that it and the surrounding crib wall are removed.

The study noted that in preparing the Management Plan for the site it should be borne in mind that the primary significance of the place depends on its development as part of the defence network for Sydney Harbour. Therefore, any interpretation should include an interpretation of the support buildings that no longer exist.

### Aboriginal Heritage

The language group of indigenous people is thought to be part of the *Guringai* and the clan group the *Borogegal*, with Chowder Bay being recorded as "*Koree*" and the stretch of water between Chowder Bay and Obelisk Beach recorded as "*Taliangy*".

There are two recorded Aboriginal sites located on Trust land at Chowder Bay. Both sites are registered with the NSW National Parks and Wildlife Service. Site 45 – 6- 2331 is a shelter site with midden while Site 45-6-2327 is an open midden. The Trust will ensure that any future development will not impact on these sites.

In June 2003, the Trust commissioned the Australian Museum Business Services (AMBS) to carry out an Aboriginal Heritage Survey of the Trust lands at Middle Head Georges Heights and Chowder Bay. Stage one of the survey included a survey of



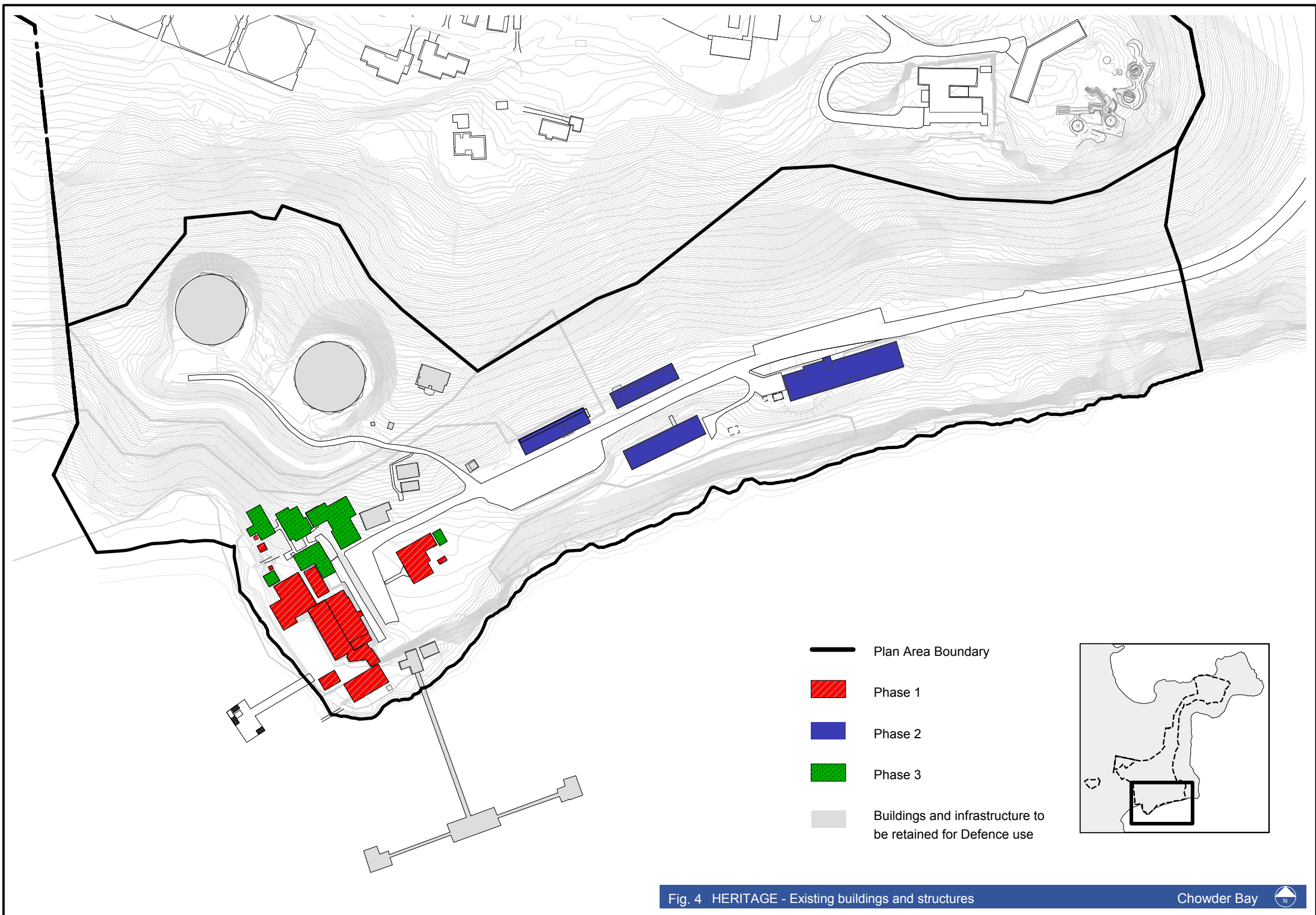


Fig. 4 HERITAGE - Existing buildings and structures



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Chowder Bay. AMBS found no additional Aboriginal archaeological sites. However, it concluded that all of the areas surveyed have a moderate archaeological sensitivity and recommended that a qualified archaeologist undertake a monitoring program during any subsurface exposure.

### Bushland and Natural Values

The vegetation type is Sydney Sandstone Complex and its formation was and still is generally that of an Open Forest. Local variations range from the treed canopy on the upper slopes, to part scrub fringing the harbour foreshore. The floristic content of the harbour foreshore is characteristic of coastal headlands, which indicates the influence of the marine environment.

In 2003, Conacher Travers Pty Ltd prepared a flora survey for all of the Trust's land at Middle Head and Georges Heights including the Chowder Bay Precinct. The study found that in general all the communities identified on the site are common and widespread on coastal headlands and in the Hawkesbury Sandstone region of the Sydney Basin.

It noted that much of the Chowder Bay Precinct has been altered from its natural state and there remains little remnant bushland. Open forested areas can still be found around the naval refueling tanks and along Chowder Bay Road. Common species include *Eucalyptus botryoides* (Bangalay), *Angophora costa* (Sydney Red Gum), *Allocasuarina littoralis* (Black She-oak) and *Acacia longifolia* (Sydney Golden Wattle). Disturbances to these communities include informal and formal walking tracks and weed incursions.

Although the endangered species *Acacia terminalis* ssp. *terminalis* has been identified in other Trust precincts, this species was not detected within the Chowder Bay precinct.

Conacher Travers also undertook a comprehensive fauna survey of Middle Head, Georges Heights and Chowder Bay. The majority of species identified are considered to be relatively common. However, some local populations, such as the Tawny Frogmouth, Boobook Owl, Diamond Python and the White-striped Mastiff Bat are considered to be vulnerable to a variety of ecological threats.

NPWS has advised that although not identified in the Conacher Travers survey, vulnerable species such as the *Arctocephalus pusillus doriferus* (Australian Fur Seal), *Ptilinopus superbis* (Superb Fruit Dove) and the *Miniopterus schreibersii* (Common Bent-Wing bat) have previously been recorded in the Georges Head and Middle Head areas. Trust lands provide potential haul out sites for the seals and potential foraging habitat for the Fruit Dove and Bent-Wing Bats.

Vegetation communities on-site were also assessed for the presence and quality of fauna habitat including the presence of tree hollows, rock shelves, overhangs, boulders, caves, creeks, drainage lines, ponds and fruiting trees and shrubs.

A number of management recommendations were put forward to assist in maintaining and enhancing the habitat. These include the:

- Investigation of an appropriate fire regime for the area with an inter-fire interval of 6-7 years;





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- Management of hydrology to reduce the amount of disturbance and pollution of drainage lines;
  - Minimising disturbances to vegetation areas such as trampling by walkers and rubbish dumping;
  - Provision of nest boxes;
  - Regeneration of native bush; and
  - Investigation exclusion and trapping programs for feral animals.

Studies of the intertidal zone have also been undertaken. In 1995 The Ecology Lab Pty Ltd completed a study of Middle Head including Chowder Bay and in 2000 the Centre for Research on Ecological Impacts of Coastal Cities (EICC) completed a survey of Intertidal and Shallow Subtidal Habitats in Chowder Bay.

From the beach to the wharf at Chowder Bay there are small areas of sea grasses where there is exposed sandy seabed. Several species of fish commonly targeted by anglers and a number of invertebrates are prevalent - making this area an interesting place to SCUBA-dive or snorkel.

Near the Navy refueling wharf and in front of the existing car parking the inter-tidal area is particularly narrow and more sheltered than the shoreline further round Middle Head. Just beyond this area there are small stands of sea grasses.

Near the barrack and mess buildings and the beaches in the National Park there are a greater diversity and abundance of animals and plants - typical of a shore to which access has been limited. There is also a greater range of habitats such as rock pools and crevices and associated animals, including a relatively large abundance of sea snails.

#### Phytophthora cinnamomi

Dieback related to the root-rot fungus *Phytophthora cinnamomi* has been listed as a key threatening process under the *Environment Protection and Biodiversity Conservation Act, 1999*. In response to this the Department of Environment and Heritage has prepared a Threat Abatement Plan to guide actions by Commonwealth agencies to prevent the spread of this disease and to limit its affects on vulnerable or endangered native species.

In August 2003 the Trust engaged ERM – consultants, to collect soil samples within the Chowder Bay precinct to determine whether *Phytophthora cinnamomi* is present. This is part of an ongoing sampling programme being undertaken by the Trust to inform its planning decisions.

Samples were collected from the lawn area next to the Sergeant Major's cottage and the area down slope of the adjacent carpark. These samples were all negative. Samples were also collected along the drainage lines dissecting the existing Chowder Bay to Middle Head Road walking track, behind the 1952 timber barracks. These samples were positive. However, samples taken in the grassed area immediately behind the barracks were negative.



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The Royal Botanic Gardens has advised that existing vectors for the introduction of *Phytophthora cinnamomi* included stormwater and nutrient laden run-off. It recommended that the Trust improve these conditions in order to reduce the risk of the spread of the disease. The key components of the Trust's strategy for dealing with this issue are set out in the Outcomes section of this plan.

### An Evolving Landscape

The Trust engaged Craig Burton of CAB Consulting – Architect and Landscape Architect to advise on the natural and cultural landscape qualities of Chowder Bay.

This work concluded that the precinct has undergone ten different periods of landscape development. Each identified period represents a change to the overall landscape composition of the place.

The ten periods identified are:

- Aboriginal Occupation;
- Bungaree's Village and Farm 1815 –1822;
- Land Subdivision and Reserve 1823 –1853;
- Military Occupation 1854 –1890;
- Submarine Miners' Corps 1890 –1922;
- Military and Municipal Use 1923 –1940;
- Military Expansion 1941 -1960;
- Operation New Broom 1961 – 1979;
- Military Occupation (ending 1997) and National Parks (1979 – present); and
- Sydney Harbour Federation Trust 1998 – present.

These phases of landscape development are summarised in the diagrams at *Appendices 1 to 5*.

- **Aboriginal Occupation**

The indigenous landscape in the period of Aboriginal occupation was recorded at the time of contact with Europeans. It has been suggested that the indigenous vegetated slopes may have been burnt by Aboriginal groups as a method of managing the land, resulting in the suppression of the Open Forest vegetation structure evident today and the promotion of more open shrub layers. Those parts of the foreshore exposed to onshore winds and marine wave action were eroded to cliff lines, and in the more protected areas large sandstone rocks have collapsed down slope creating a distinctive estuarine edge.

- **Bungaree's Village and Farm 1815 -1822**

During this period Governor Macquarie established an Aboriginal settlement at Georges Heights for a group of displaced *Borogegal* families from the Pittwater area. He placed King Bungaree in charge of the village and farm, which was located immediately above the Chowder Bay precinct. Later a '*romantic road*' was constructed to connect the village to a harbourside landing. The course of the road is assumed to have taken the alignment of the existing path running between Chowder Bay and the sandstone outcrop on the plateau edge above Georges Head. Although the scheme failed, Aboriginal people remained in the area until the 1870s.



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- Land Subdivision and Reserve 1823 –1853

Following the demise of the formal aboriginal settlement the land was subdivided and street plans were laid out on paper, with some of these new alignments being subsequently used as corridors for services. By 1841 land reservations had been made which included land at Georges Head and the prominent sandstone outcrop associated with the aboriginal settlement. With the exception of the road to the former village the landscape remained in its indigenous state.

- Military occupation 1854 -1890

A Reserve for military purposes was declared and barracks and fortifications were built at George's Head. The road to the former aboriginal settlement continued to be used for access to the beach at Chowder Bay.

The most significant impact of this development on the landscape was the creation of a scree slope below the escarpment. This resulted from stone spoil from the construction of the barracks and fortifications.

During this period a private pleasure ground was established at Chowder Bay and later the *Clifton Hotel* was also opened.

- Submarine Miners' Corps 1890 -1922

The development of facilities for the Submarine Miners' Corps led to further dramatic changes affecting the existing indigenous setting. Chowder Bay Road was constructed, creating a benched landform which terminated at the northern headland of Chowder Bay in a series of terraced levels, buildings and jetties with a residential complex sited at the upper level adjacent to a parade ground. A link road was established from the middle terrace level to gain access to the older Georges Heights to Chowder Bay Road.

The grounds were cleared of indigenous vegetation in the core of the development and a single Norfolk Island pine planted at the eastern end of the parade ground.

The residential precinct appears to have been enclosed by a picket fence while the larger depot was also fenced to secure it.

A new walking track was established from the depot to Georges Head to access the barracks located there.

- Military and Municipal use 1923 -1940

During the inter-war years some areas of the Military lands such as a stretch of land along Chowder Bay Road to the Mosman Golf Club were made accessible to the public.

Fuel tanks were erected on the upper mid-slopes above Chowder Bay, obstructing the path of the former road and walking track as well as the parade ground. A new jetty extending east into the harbour was constructed to service ships. New buildings were added to service the site's refuelling functions, including a caretaker's cottage adjacent to the tanks. Chowder Bay Road was realigned to arrive directly at the paved parade ground.



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- **Military Expansion 1941-1960**

In this period more buildings were added to the Chowder Bay complex, with the most notable being the barrack buildings. Modifications were made to the jetty structures and a path system was established to formalise access to the fuel tanks.

- **Operation New Broom 1961 - 1979**

Additional barracks were constructed on either side of a newly realigned Chowder Bay Road with works including associated paved parking areas and a sealed road linking the refuelling tanks with Chowder Bay Road.

Ornamental planting was added along the road alignment and in association with the new building development. This consisted of a mixed assortment of mostly Australian plants set in parkland settings. The removal of the clutter of buildings and fences around the former residential buildings allowed for an extension of a grassed surface and its use for more recreational activities. Following the loss of the Norfolk Island Pine tree two Canary Island Palms were planted.

- **Military occupation (ending 1997) and National Parks (1979 – present)**

Further plantings were made in this period together with the extensive rebuilding. Courtyard plantings of indigenous trees and shrubs were made as well as a line of casuarina trees in an attempt to reduce the visual impact of some of the buildings when viewed from the harbour.

Adjoining land was handed over to the State government to form part of Sydney Harbour National Park.

- **Sydney Harbour Federation Trust 1998 – present**

Recent changes include the regeneration of bushland and its extension into the formerly grassed margins of Chowder Bay Road, the adaption of the early road alignment as a walking track with a new section linking to Chowder Bay Road and the addition of stone edging and hedge planting along the northern edge of the former parade ground. Some buildings have been conserved and some adapted to the requirements of the Trust.

### Visual Qualities and Views

Chowder Bay still has the characteristic of a tight, village-like grouping of small buildings stepping down to the water's edge and enveloped by the bushland. However, this quality has been eroded away by the changes brought in the second half of the 20<sup>th</sup> Century. The barrack and mess buildings along Chowder Bay Road, the cleared areas, the land fill which has resulted in steep embankments and contrasting plantings, and the fuel tanks are visible from the harbour and its southern shores. The steep, south facing slope of the site renders most of these elements into shade. The light coloured roofs, the end walls that catch the morning or afternoon sun and the steep grassed embankments are the most visible. The utilitarian night lighting gives the impression of a more intensively developed area and does not convey the same, strong identity as the day-time appearance of the precinct.

The un-shaded road area and car park, the barrack buildings, crib retaining walls, the fence along the edge of the landfill over the escarpment and the service areas



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associated with the fuelling facility diminish the otherwise magnificent views of the harbour and appreciation of the Sergeant Major's cottage and the other Submarine Miners' Depot buildings. The varied microclimates along the north side of the road are isolated and obscured from view.

Landscaping and minor building modifications can readily address these issues.

### Bushfire Risk

In 2002 the Trust commissioned Geospatial Integrity to undertake an interim review of bushfire risks at Middle Head, including the Chowder Bay precinct and to identify mitigation works for the 2002-2003 bushfire season.

The study recommended the creation of an Asset Protection Zone (APZ) around the Naval refueling tanks. The APZ required the reduction of available fuel loadings in vegetated areas from the north-west to north east of the tanks by either slashing of vegetation to 15cm stubble or selective removal of 60% vegetation where mesophyllic (rainforest) species predominate. The objective of the fuel reduction treatment would be to promote the establishment of native herb/forb cover in these areas.

The study also recommends the creation of a Strategic Wildfire Control Zone (SWCZ), which involves a cyclic pattern of brushcutting to remove 40% of shrub and herb vegetation in the SWCZ prior to the fire season. It is also proposed that native mesophyllic plant species such as *Pittosporum undulatum* be retained and promoted, with the selective removal of woodland species such as *Banksia* and *Allocasurina*. Native mesophyllic plant species would not significantly contribute to fuel loadings and may retard fire activities in low intensity fires.

All of the area identified for the APZ and the majority of the area identified as the SWCZ are within the land to be retained by Defence. The Trust will continue to work with Defence, Mosman Council and NPWS to ensure fire risk in the area is appropriately managed.

Construction or upgrade of buildings in the Chowder Bay precinct should also consider *Australian Standard 3959 – 1999 (incorporating amendments Nos. 1 and 2) Construction of Buildings in Bushfire-prone Areas (AS3959-1999)*. Under this standard, the category of bushfire risk to buildings would be based on the type of vegetation, the distance between the building and predominant vegetation and the slope of the land on which the vegetation is located. The classification of bushfire risk determines the level of construction.

### Stormwater Quantity and Quality

The Chowder Bay precinct is part of a sub-catchment that includes HQ Training Command, the residential areas in Imperial Place and Commonwealth Avenue, Gunshot Alley and the Officers' Mess. The Chowder Bay Precinct is at the low point of this sub-catchment and all stormwater passes through it before draining to the harbour.

There is minimal formal collection of stormwater in the areas above Chowder Bay. Drainage from HQ Training Command is discharged overland via natural and formed watercourses to the Chowder Bay Precinct. Apart from open channels behind the



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barracks (buildings 1 and 2), this stormwater is intercepted at Chowder Bay Road. Road and building drainage within the precinct is then collected in drainage pits and pipes and discharged to the harbour

Due to the large sub-catchment area, high volumes discharge from these points. However, no pollution control, retention, or energy dissipation devices have been installed.

The Trust has commenced preparation of a catchment investigation incorporating the Chowder Bay Precinct. This investigation will be used to develop a detailed design of stormwater upgrades to achieve the water quality objectives set by the NSW Government for Sydney Harbour.

### Contamination and Hazardous Materials

In 2001, the Department of Defence commissioned PPK Environment and Infrastructure Pty Ltd to undertake contamination investigations at Chowder Bay. These investigations were undertaken in accordance the NSW EPA Guidelines and the National Environment Protection Measure on Contaminated Land Management. The sampling design and results were also reviewed and endorsed by an independent NSW EPA accredited auditor.

The study concluded that while a number of areas of contamination were identified in the Chowder Bay precinct, the areas of contamination tend to be shallow and can be readily remediated or managed to mitigate any potential risks to human health and the environment. All remediation works will be undertaken in accordance with an Environmental Management Plan.

In 2002, the Trust engaged HLA – Enviroscience Pty Ltd to undertake a hazardous materials survey of selected buildings and structures at Chowder Bay. This study was undertaken to meet the Trust's obligations under the *NSW Occupational Health and Safety Regulation 2001*.

For the purposes of this study hazardous materials were defined as those containing asbestos, synthetic mineral fibre (SMF) and polychlorinated biphenyl (PCB).

The study found that all the potentially hazardous materials used in the buildings are in a stable condition and that no remedial work is required at the current time.

An Environmental Management System will be prepared for the management of hazardous materials during implementation of this Management Plan.

### Services

In 2002 PPK Consulting undertook a detailed survey in order to establish the extent and condition of site services. The study looked at electricity, telephone, water, fire, sewerage and stormwater services. It found that the services are generally sound. However, it made a number of recommendations to rationalise and upgrade them.



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### Compliance with the Building Code of Australia

In 2000, Trevor R Howse and Associates were engaged to assess both the buildings and site at Chowder Bay to determine the level of compliance with the Building Code of Australia (BCA) and the nature of works required to remedy any deficiencies. The assessment took into consideration the heritage values of both the buildings and the site and assessed each building in the context of its former or existing use class as-well-as its proposed use.

Assessment was made in respect of:

- Fire Compartmentation;
- Fire Resistance;
- Protection of Openings;
- Occupant Egress;
- Access for People with a Disability;
- Fire Safety Protection Services;
- Sanitary Facilities.

In summary the study found that:

- The installation of fire doors, fire walls, sprinklers, smoke detectors and ventilation will be required to ensure adequate fire protection is in place;
- A number of buildings will require further detailed inspection to determine the level of fire-resistance offered by walls, and, if necessary, these should be upgraded to achieve the specified fire-rating before reoccupation takes place;
- Stairways will need to be modified;
- Existing buildings do not comply with the BCA in terms of providing access for people with a disability, while the installation of a ramp or lift is recommended to provide full disabled access to all levels of the site; and
- Provision of sanitary facilities is inadequate and will need to be upgraded.

Although a number of these recommendations have since been implemented, many buildings will require further detailed inspections prior to reoccupation occurring. This will be carried out once building uses are identified.

### Accessibility

In 2003 the Trust engaged SCI Access Australia to prepare a Disability Access Evaluation for Chowder Bay. The report highlights the key access issues for both the general public and Harbour Trust staff. It identifies maintenance, operational and policy changes concerning the future design and use of sites and buildings within the context of the *Disability Discrimination Act (DDA)*. The report provides a summary of the site and building access requirements and prioritises these requirements.

### Transport Management

In 2003 the Trust commissioned Maunsell Australia Pty Ltd to prepare a Transport Management Plan (TMP) for Middle Head, Georges Heights and Chowder Bay.

The TMP identified measures to minimise reliance on access by private motor vehicles and to maximise the use of public transport, walking and cycling. The TMP also



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considered the cumulative impacts of the use of Trust lands and HMAS Penguin, Sydney Harbour National Park and local sporting facilities.

General recommendations relevant to Chowder Bay include the:

- Preparation of a submission to the State Transit Authority regarding the subsidisation of additional bus services to the Trust sites;
- Installation of bicycle facilities including bicycle storage;
- Installation of consistent public transport directional signage and timetable information; and
- Provision of consistent pedestrian directional signage and information similar to signs currently provided by the Trust.

Specific recommendations relevant to the Chowder Bay precinct include:

- Parking
  - Conversion of the parking area adjacent to the timber barracks building into a bus pick-up and set-down area;
  - Formalising the public parking area close to the entrance of the Chowder Bay Precinct as parking available to those accessing the precinct; and
  - The continued use of Georges Heights Oval as a public parking facility for large special events.
- Public Transport
  - Provision of bus pick-up and set-down facilities, including an adequate turning circle, bus shelter, and supporting timetable and passenger information;
  - Investigation of the use of charter ferry services to Chowder Bay for events etc. during peak season.
- Cycling
  - Installation of bicycle parking facilities.
- Pedestrians
  - Upgrading of pedestrian access way between Clifton Gardens and Chowder Bay to improve public transport accessibility to the Precinct; and
  - Continued implementation of the off-road recreation walkways identified in the Trust's Comprehensive Plan
- Travel Demand Management and Marketing
  - Development of workplace travel plans for new and existing organisations - as part of leasing approval process;
  - Installation of consistent public transport directional signage and timetable information, especially at the proposed Chowder Bay bus-stop.

These recommendations have been incorporated in to the overall design concept for the site.

### Ferry Access

In 2003 the Trust engaged Patterson Britton and Partners to undertake a preliminary feasibility study into the size of ferries that could access the existing Chowder Bay wharf and to identify potential impacts on the physical environment resulting from this.





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The preliminary feasibility study indicates that the wharf has the capacity to berth vessels with a length overall (LOA) of up to 30 metres. Vessels of this size could have a maximum carrying capacity of 200-300 persons.

The capacity of the wharf is limited by the depth of water required to turn a vessel and the restrictions placed on navigation within the adjoining *Naval Waters*.

The study also found that the use of the wharf by ferries would cause minor disturbance of sediments on the seabed during maneuvering. The possible environmental impact of these disturbances would need to be assessed in further detail. However, disturbance of sediment was a feature of the operation of the wharf between 1942 and 1995.

### Naval Waters

Activities within the Naval Waters are controlled by the *Control of Naval Waters Act, 1918 (amended)* and a *Draft Environmental Management Plan for Chowder Bay Naval Fuel Installation* prepared by the Department of Defence.

The Naval Waters cover a rectangle area approximately 345 m by 190 m but do not extend as far as the timber wharf managed by the Trust. However, access to and from this wharf would require vessels to navigate through the Naval Waters. Under the current security classification given to the refueling facility, vessels navigating through the Naval Waters would be required to pass to the south or west of the white mooring buoy located to the west of the refueling wharf. These restrictions would likely alter with a change in security classification for the facility.

Any other activity that encroaches on the Naval Waters as defined on chart AUS 201 should give due consideration to existing controls and seek authority from the Port Services Manager, HMAS Kuttabul. Under the Naval Waters Act 1918 a Superintendent of Naval Waters has the power to give directions to the master of a vessel within Naval Waters as to the mooring, anchoring, placing, unmooring or removal of the vessel.

Adjacent uses that may impact on Naval Waters through spills or migratory contaminants should have appropriate environmental management measures in place. Under the Act the Minister of Defence may prohibit the construction of any wharf, jetty, building or structure in or on the foreshore of any naval waters and any factory or store for explosives, oil or other flammable material within five miles of the limit of a dockyard or within two miles of the limits of any naval waters.

The proposed outcomes for Chowder Bay do not encroach on the Naval Waters or any of the controls as defined by the *Control of Naval Waters Act, 1918*

## **Summary Statement of Cultural Significance**

The former Submarine Miners Depot at Chowder Bay is remarkably intact and serves as a record of the central role played by submarine mining in the defence of Sydney in the late nineteenth and early twentieth century.

The depot and workshop buildings, built during the early 1890s with the additions in the early 1900s, are probably the only examples of their type in Australia and are of national



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significance. They represent a most advanced defence technology at that time about which little is known due to the secrecy of its operations. The building complex presents the ability to interpret the processes and activities undertaken by the Submarine Miners with the aid of further research and the display of the two mines, now part of the Australian Army Maritime Memorial, and the timber hand drawn trolley that are rare surviving artifacts.

The Depot represents the implementation of a major component of the defence strategy devised for Sydney by the British military experts Sir William Jervis and Lieutenant Colonel Peter Scratchley and the early buildings were among the first designed and supervised by Colonel F.R.de Wolski in charge of the new Military Works Branch that had taken away that role from the Colonial Architect, James Barnet.

The main three level Depot and Mines Workshop building is of considerable architectural merit and exhibits fine detailing and workmanship in the stonework, wrought iron railings and timber joinery.

The group of 1890s buildings, railings, jetty and slipway form an aesthetically pleasing composition and landmark that can be appreciated from the harbour, Clifton Gardens and the adjoining Reserve. Such an harmonious building group, complemented in scale and form by the late 1980s additions, right at the harbour's edge is rare. The setting is enhanced by the backdrop of the slopes of Georges Heights.

The cutting away of the sandstone cliff to form levels to which the buildings relate and the use of the spoil to create the lower level apron reflects the similar formation of other defence and industrial sites around the harbour. The two excavated water cisterns are evidence of the isolated nature of the site and the iron railings of the secret and dangerous nature of submarine mining.

The expanding activities of the former Army Maritime School are reflected in the barrack buildings constructed in 1950 and 1962-3 and the purpose built training facilities of the late 1980s along Chowder Bay Road. This road was cut in at the base of the Georges Heights cliff formation to access the Depot from Middle Head Road.

## **Outcomes**

### Park Design Concept

Unlike Lower Georges Heights, where a whole new park precinct is to be created from a former Army Transport base, at Chowder Bay the changes proposed to achieve significant improvements are relatively minor. See *Figure 5*.

The proposal is to extend the bushland down to the cliff top, improve the sense of arrival and orientation and improve the picnic area by the provision of public amenities and landscape works that enable people to better appreciate the view and understand the historic evolution of the site.

The terrain and the early settlement pattern defines three distinct areas:

- The hillside and the sequence of rock ledges connected by the entry road;



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- The clearing and Sergeant Major's cottage and surrounding areas that terminate this sequence and overlook the harbour and Chowder Bay; and
  - The buildings and paved terraces of the former Submarine Miners' Depot that are benched into the rock ledges, concealed from vessels coming into the harbour and sheltered from the elements.

#### **The Hillside and the Entry Road**

It is proposed to extend the bushland down the slope to envelop the road and buildings and to heighten the contrast between the historic Submarine Miners' Depot and its bushland setting. See *Figure 6*.

The roadway entry into Chowder Bay will be landscaped to:

- Reinforce the sense of traveling through a bushland park;
- Lessen the visual impact of the barrack buildings;
- Minimise the visual dominance of the roadway; and
- Improve the experience and safety for pedestrians.

The landscape treatment is designed to retain the number of car parking spaces. However, the location and layout of the parking is redistributed to allow for a bus lay over and turning circle.

The roadway provides the opportunity for a sequence of glimpses to the harbour and into the different microclimate environments along the hillside. Rather than consistent tree planting like that often found along an urban avenue, it is proposed to plant a mix of trees and shrubs that are indigenous to the area. This will provide varied canopy shapes and textures.

Although the barrack buildings along the road have very little heritage significance, they provide an opportunity for this harbour side location to be appreciated in a manner that would otherwise not be available – uses such as basic visitor accommodation, functions and in-the-field training facilities would be appropriate. The buildings have the potential to be integrated with the landscape by planting to partially screen the buildings and by opening up the entries and the end walls to frame views of the harbour as part of the progression of views. These landscape treatments could be complimented with treatment of building exteriors to ensure their visual impact is lessened.

#### **The Sergeant Major's cottage**

The amenity and appearance of this area will be improved as a park for passive recreation - such as picnics, and to enable an appreciation of the historical setting of the cottage. See *Figure 7*. Changes in ground level are proposed to enhance views over the fence to the harbour. Views to the western headland at Nielsen Park will facilitate interpretation of the cables and mines laid across the harbour from the depot to that point. The level changes and landscaping will also be used to convey an appreciation of the former cottage gardens while avoiding fragmentation of the space. Low walls or embankments will be used in a manner that makes the area more comfortable and inviting to use.

The former parade ground located in front of the cottage will be upgraded so that it forms an attractive part of the public park and a befitting setting for the existing Army Maritime



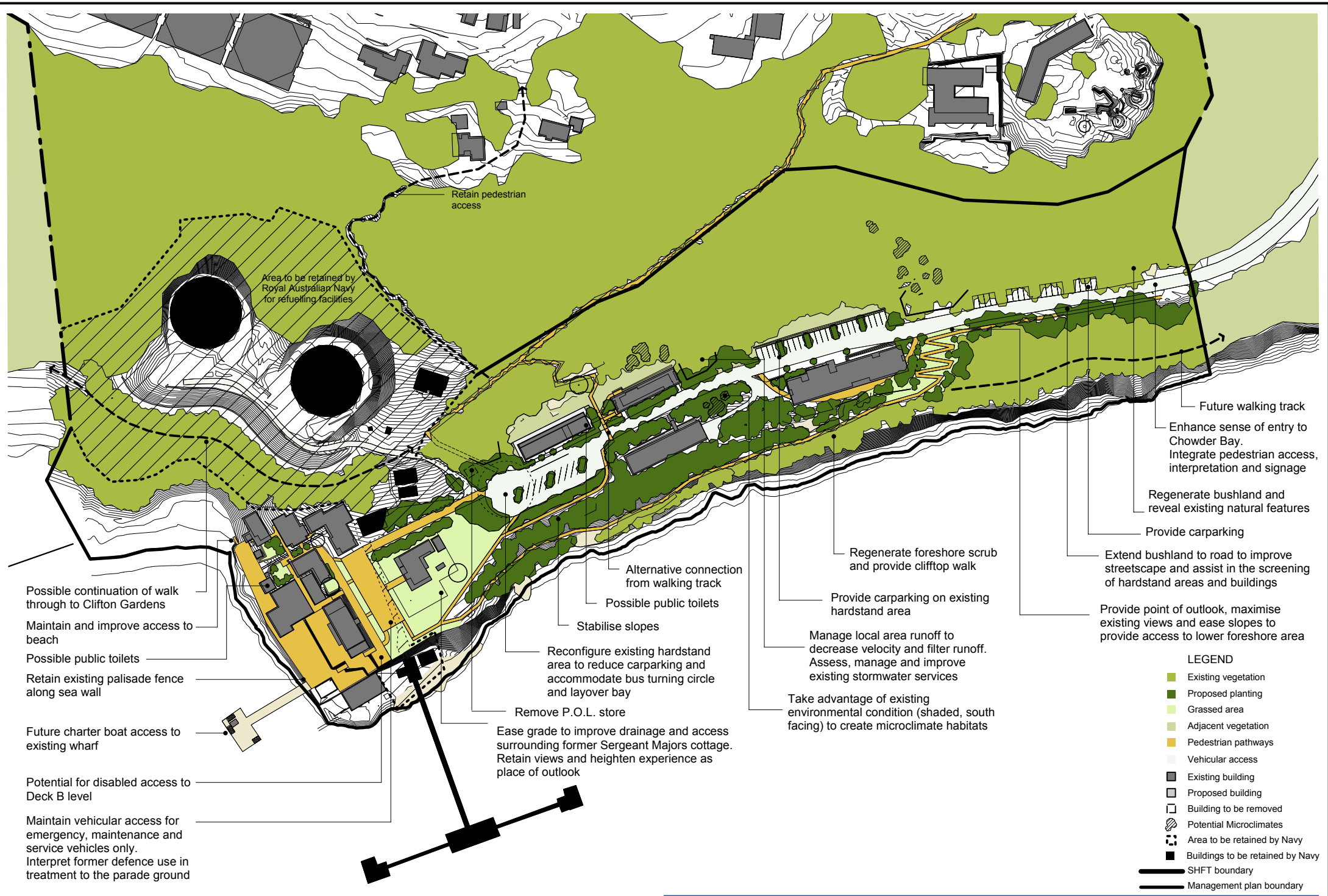


Fig. 5 Outcomes



Visually intrusive buildings, particularly their ends

Visually dominant roadway

Visually intrusive retaining wall and grassed areas

EXISTING



Opportunity to improve building entry

Trees and shadows diminish visual dominance of roadway and buildings

PROPOSED

Fig. 6

ACCESS ROAD INTO CHOWDER BAY

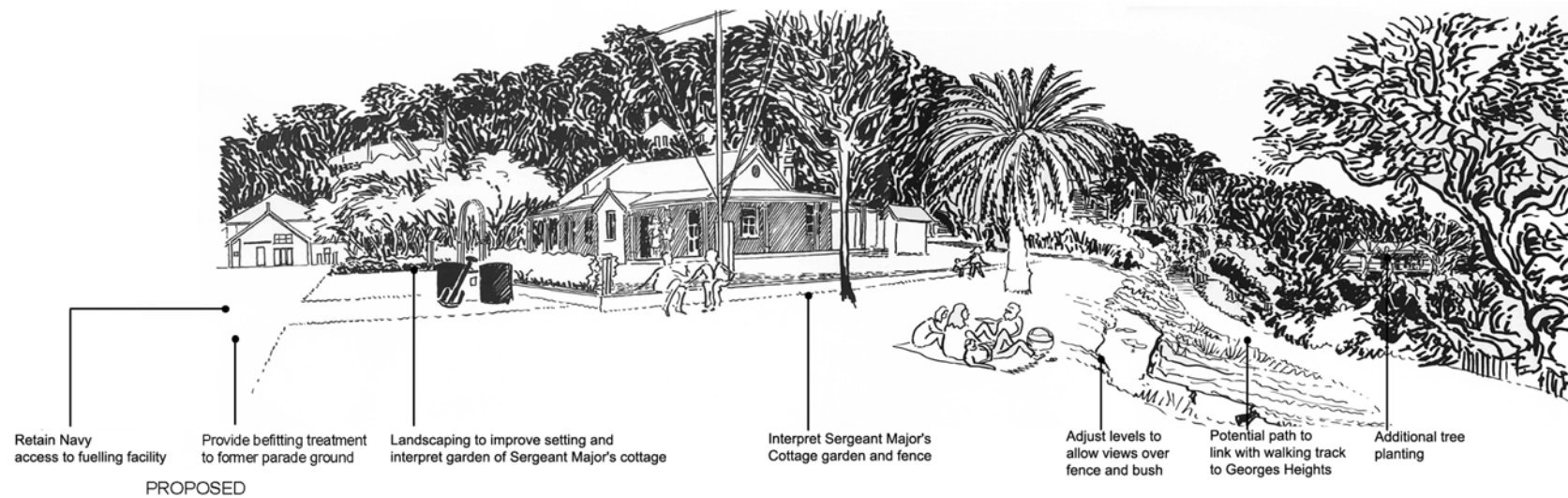
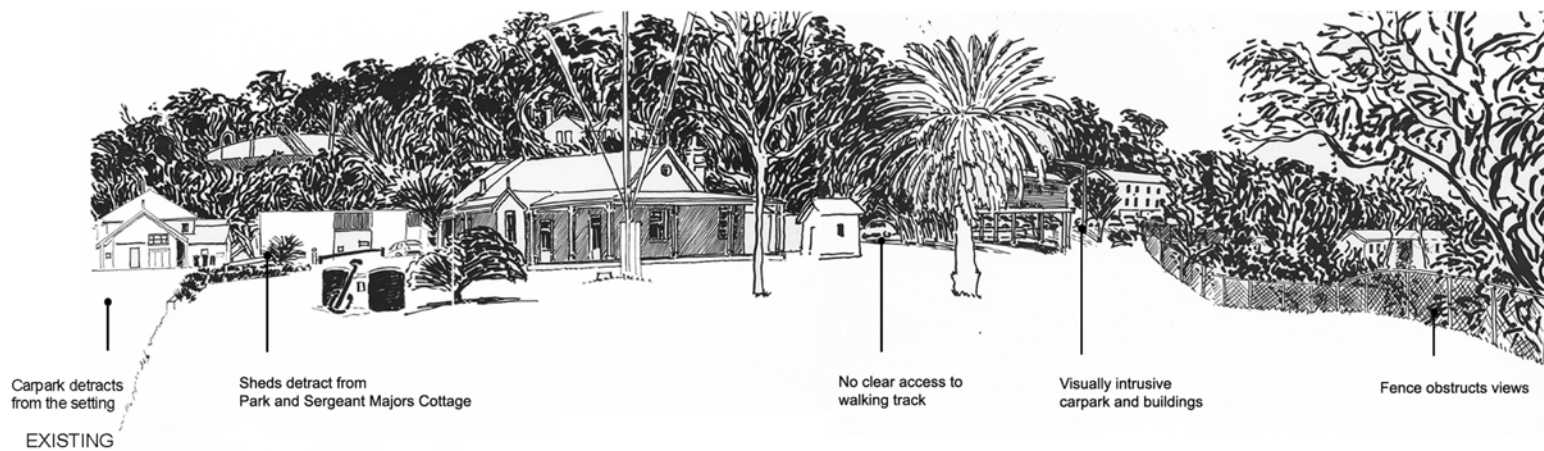


Fig. 7

PARK AT SERGEANT MAJOR'S QUARTERS

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Memorial. It will be necessary to continue to provide access through this area to the Navy fuelling facilities. However, it is intended that it does not look like a car park.

Public toilets that are accessible from the road, car park and the pathway network will be provided in the weatherboard barracks.

#### **The buildings and paved terraces of the Submarine Miners' Depot**

The minimal changes proposed are for the purpose of:

- Improving public access;
- Interpretation of the history of the former depot; and
- The adaptive re-use of the depot in accordance with the Conservation Management Plan.

Any paving improvements will include interpretation of the trolley tracks used to wheel the mines to the wharf.

The sea wall, fence, and wharf are important heritage elements that will be retained and therefore limit land-water access to uses that can operate with these constraints such as snorkeling and diving, or kayaks or other small boats that can be carried.

Public lighting improvements will be used to minimise light spillage from the precinct, highlight the special qualities of the building and satisfy public safety and security considerations.

Public toilets are proposed to be provided in the former welding bay building on the lower level.

Any works to be carried out that may 'harm the marine vegetation' will be forwarded to NSW Fisheries for assessment and comment.

#### **The Pathway Network**

A clearly visible and inviting access to the existing Chowder Bay to Georges Heights walking track is required. At present the track arrives at the widest part of the car park and access road. It is proposed to provide a safe and inviting connection to the path by either relocating the lower section of the track to the space between the weatherboard and brick barrack buildings or by modifying the existing track entrance. See *Figure 8*. Any track alterations will be designed to limit the potential for the spread of *Phytophthora* by walkers.

It is proposed that the pathway would be extended across the road, down the steep embankment and along a lowered pathway on the southern edge of the car park to the picnic area around the Sergeant Major's cottage. The carpark bank would be re-modeled and revegetated to provide a pleasant walking environment that is separated from the carpark.

Additional tracks also proposed:

- Along the cliff top connecting to the National Park;
- Below the Navy fuel tanks to Clifton Gardens. This connection will depend on the requirements of the Navy fuelling facilities being satisfied: and



- 
- Connecting the existing Chowder Bay to Georges Heights track to Commonwealth Avenue.

Access for mobility impaired people will be provided to all significant features but not with a continuous path due to significant natural topographic features and heritage buildings and structures. The picnic area and Sergeant Major's cottage, and the upper level of the Submarine Miners' Depot building will be accessible from the roadway and car park. The waterfront apron and the stone mine store of the Submarine Miners' Depot building will be available by assisted access from the wharf, and possible future lift or inclinator associated with the buildings.

As a general principle, cycling will not be permitted on the walking track.

### Criteria for the Adaptive Re-Use of Buildings

The Trust is responsible for an extensive array of built and natural assets. On-going conservation of these assets and public access to them requires their adaptive re-use and occupation. The primary objectives for the adaptive re-use of the buildings in the Headland Park are set out in *Section 7* of the Trust's Comprehensive Plan.

Future uses will need to satisfy criteria such as public benefit, heritage conservation requirements, traffic generation, parking requirements and transport needs, environmental impact, service and infrastructure constraints, BCA requirements and the *Objectives and Policies* set out in *Section 3* of the Trust's Comprehensive Plan.

The general principles that underlie the selection of uses are:

- The need for a diverse range of uses to provide variety and as a means of managing transport demand;
- Selection of uses that best respond to the place and provide a positive contribution to the enjoyment and understanding of the place and its heritage; and
- Uses that are compatible with the heritage / environmental / transport and amenity requirements such as noise and light spillage.

The Chowder Bay precinct is characterised by a number of elements that will be important determinants in the identification of future building uses. One of the most important is the limited amount of parking and restricted access by public transport. The Trust's priority is to improve accessibility without encouraging increased private motor vehicle use. This can be achieved by the:

- Identification of uses that do not generate a large number of vehicle trips or which generate trips during non-peak times;
- Facilitation of public transport by the inclusion of a bus turning circle and set down area; and
- Limiting the amount of available parking spaces.

Chowder Bay precinct contains four main groups of buildings:

- The barrack and mess buildings located along Chowder Bay Road (Buildings 20, 1, 19 and 2);
- The more recent buildings, used previously for Army administration and training and currently used as the Harbour Trust offices (Buildings 22, 23 and 24);







Ends of buildings are most visible from water

Dominating road and parking areas

Access to building is concealed

EXISTING



Open up building-ends to reduce their visual dominance and improve connection

Planting reduces visual dominance of roadway

Provide a lower pathway that is separated from the carpark

PROPOSED

Fig. 8

POSSIBLE NEW LINK TO GEORGES HEIGHTS WALKING TRACK

- 
- The submarine miners' depot and workshop buildings on the eastern slope of Chowder Bay and the Sergeant Major's Cottage; and
  - The buildings associated with the operation and management of the naval refueling depot (Buildings N1, N2, N3, and N5).

### **Barrack and Mess Buildings**

The barrack and mess buildings are structurally sound and are in good condition. The building services and fittings are of a good standard and accommodation includes individual bedrooms, bathrooms and laundry facilities. Building 20 also includes substantial commercial kitchen facilities.

These buildings have very low heritage value and many in the community regard them as visually intrusive. However, the facilities that they offer and their location provide an opportunity for people to access and experience the site in a manner that would otherwise not be possible.

To inform this Management Plan, the Trust commissioned a feasibility study into the possible use of these buildings as overnight accommodation. The study concluded that they were suitable for lower cost, group style accommodation. This could include accommodation for school, sport and recreation groups or other non-profit type organisations.

To facilitate this outcome, work would need to be carried out to ensure compliance with current health and safety requirements and relevant building standards. Other alterations that may be necessary include the provision of facilities for kitchens, a bus turning area and drop off and pick up points and communal facilities such as lounge and dining areas, TV room or meeting rooms etc.

A range of other possible uses including educational or administrative uses, offices, conference and function facilities could also be accommodated in these buildings. The primary determining factor will be the restricted nature of access to the site by private motor vehicle and parking constraints.

### **Harbour Trust Office Buildings**

The buildings currently used as the Trust's offices were built in the 1980's as administration and office accommodation, training and teaching rooms and storage areas. It is proposed that similar uses could continue in these buildings. However, to avoid having an adverse impact on the public's accessibility to the surrounding parklands and traffic generation through the neighbouring urban areas, implementation of strict parking schemes and incentive schemes for the use of public transport will be required.

### **Submarine Miners' Depot and the Sergeant Majors Cottage**

The national heritage significance of this group of buildings and the limited potential to modify the fabric of the buildings without diminishing their heritage value will be the major determining factors in the identification of appropriate future uses. Any development will have to comply with the Conservation Management Plan prepared for the buildings.



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In addition to compliance with the Conservation Management Plan and BCA requirements the re-use of these buildings will also be determined having regard for the traffic and parking constraints of the site.

Priority will be given to uses that provide public interest. The upper levels of the depot building and the Sergeant Major's Cottage will be considered for a range of uses such as a function space, gallery, restaurant, studio or office accommodation. While the bottom level of the depot is considered more suitable for water related activities such as diving, kayaking or educational or research uses.

#### **Naval Refueling Facility**

The buildings associated with the Naval Refueling facility include a caretaker's residence, offices and a number of purpose built structures used to house equipment and machinery. All of these buildings will continue to be used by the Navy.

#### **Water Sensitive Urban Design**

The principles of Water Sensitive Urban Design (WSUD) are to be incorporated into the redevelopment of the Chowder Bay Precinct to achieve water quality, water conservation and ecological objectives. Effective integration of these objectives will require the application of concepts on a catchment wide basis. The key concepts to be applied are:

- *Source controls* – removal or mitigation of the pollutant source, and on-site rainwater use;
- *Conveyance controls* – applied during the conveyance of stormwater to bushland, streets or channels;
- *Discharge controls* – applied at the point where water leaves the site or the catchment;
- *Natural systems planning* – applied to the entire area. Natural systems planning recognises essential hydrological and ecological functions of watercourses, wetlands and native vegetation.

A number of measures are available to achieve the stormwater management objectives by applying these concepts in the redevelopment of the Chowder Bay precinct. These are:



<b>Concept</b>	<b>Issue</b>	<b>Application at Chowder Bay</b>
Source controls	Sewer overflows and discharges	The identification, repair or removal of the causes of sewer overflows particularly for up-gradient areas (Training Command). At Chowder Bay blockages restrict flow and result in overflows upstream. Significant upgrade works including survey, relining and re-laying of pipes and repair and replacing connections and junctions will be undertaken.
	Underground storage tanks	Two small (4500 l) underground storage tanks located at Chowder Bay will be removed or decommissioned.
	Street sweeping and landscaped maintenance	Roads and organic matter are a source of many pollutants. Sweeping and maintenance will be part of the on-going management of the site.
	Rainwater tanks	The use of rainwater for toilet flushing, irrigation etc will reduce water use and stormwater flow peaks.
	Rainwater detention gardens	Applied particularly in the up-gradient areas (Training Command), to intercept sheet and concentrated flows. This will reduce flows and reduce scouring and erosion in bushland areas. It will also improve stormwater quality.
	Navy Fuel Installation	Risk of leaks or spills from storage tanks or associated structures to be adequately addressed by Defence.
Conveyance controls	Gross pollutant traps	To be installed at the inlet to the piped system along the road and car-park areas to capture leaf litter and coarse solids.
	Water sensitive road design	The installation or improvement of buffer strips and bioretention swales, particularly along up-gradient edges of the road and car-park areas. These measures will reduce run-off velocities and reduce contaminant transport to receiving waters.
Discharge controls	Energy dissipaters at pipe outlets	The installation of energy dissipaters at pipe outlets, particularly along the foreshore to reduce discharge velocities.
Natural systems planning	Control of pest species	Rabbit warrens to be removed and damaged ground revegetated. This is particularly important for foreshore areas below the road.
	Weed removal and revegetation with native species	This will improve water retention and site amenity.



Concept	Issue	Application at Chowder Bay
	<i>Phytophthora cinnamomi</i>	Reduce nutrient impact to bushland areas. Reduce ponding and concentrated stormwater flows.
	Dieback areas	Regenerate to reduce erosion, water retention and amenity. To be carried out in parallel with a strategy for controlling <i>Phytophthora cinnamomi</i> .

### Phytophthora cinnamomi

The Trust is developing and implementing a Phytophthora Management Strategy in cooperation with neighbouring managers, as part of an inter-agency Phytophthora Working Group.

Key components of the Trust's strategy include:

Risk of spread or introduction by -	Management Strategy
Bush regeneration activities	Implementation of best practice hygiene procedures for bush regeneration or related activities;  Soil and plant materials to be sourced from appropriately certified suppliers.
Water flows, and increased surface water nutrients	Introduce stormwater measures so that flows are remediated to approach the natural condition in bushland areas, or direct flows away from bushland;  Reduce nutrient impact to bushland areas, by remediating nutrient and contaminant sources or nutrient removal.
Walkers	Introduction of a phytophthora community education program;  Walking track design that limits the potential for spread by walkers, including: <ul style="list-style-type: none"> <li>- Integrated drainage controls;</li> <li>- Clean crushed sandstone capping;</li> <li>- Mulched edges;</li> </ul> Confine walkers to tracks in bushland areas.
Construction/ earthworks/ landscaping activities	Implement hygiene protocols for personnel, machinery and tools;  Soil and plant materials to be sourced from Phytophthora-free certified suppliers, or low risk sources;  Use only well composted soil free mulch.



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## Implementation

The development of Chowder Bay precinct is considered to be one of the highest priorities for the Trust given its rich cultural history and visual prominence on the harbour. Chowder Bay also provides a strategic linkage in a foreshore walk from Taronga Zoo to Middle Head / Georges Heights, and with the possibility of a future extension to Balmoral.

It is envisaged that the implementation of the Chowder Bay Management Plan will provide significant benefits including:

- Conservation and interpretation of heritage buildings and landscapes;
- Provision of improved access to the site via adjoining foreshore open space and the harbour, and provision of a significant link in a regional walkway;
- Creation of opportunities for leisure, recreation and education, marine research and interpretation of the natural and cultural values of the site;
- Improving the existing natural environment through remediation of contaminated areas and removal of hazardous materials, improvements to stormwater quality and expansion of bushland areas;
- Improving the visual quality of the site through making parking areas and buildings less dominant through screen planting and landscaping; and
- Improving visitor experiences and understanding of the place through provision of public facilities and interpretive material, and conservation of buildings to allow for their adaptive re-use.

The site's visual prominence and improved accessibility will ensure that the community can experience the area and gain a greater understanding of the place.

As identified in the Trust's Comprehensive Plan, the implementation of this Management Plan will take place over a number of years and the Trust has discretion as to when and what work is carried out. Priorities for implementation have been determined in a manner consistent with those identified in the Comprehensive Plan. In particular the project benefits of improved public access and public domain, improved environmental conditions and provision of public facilities will be the highest priority.

The following table summarises the outcomes to be achieved through the implementation of the Chowder Bay Management Plan. The table identifies individual elements and prioritises those elements in a manner consistent with those priorities identified in the Comprehensive Plan. The relevant sections of the Management Plan and supporting studies which detail each element are also included in the table as a quick reference point.



## Implementation and Action Plan

	Outcomes	Elements	Priority	Relevant Management Plan or Supporting Study (in addition to the Park Design Concept)
Access and Arrival (from Chowder Bay Road)	Develop entry precinct, establishing a sense of arrival	<ul style="list-style-type: none"> <li>▪ Enhance sense of entry to Chowder Bay through integration of pedestrian access, interpretation and signage</li> <li>▪ Treatment of building exteriors to lessen their visual impact</li> <li>▪ Provide point of lookout and heighten existing views</li> <li>▪ Extend bushland to road to improve streetscape and assist in screening of buildings and hardstand areas</li> </ul>	High	<ul style="list-style-type: none"> <li>▪ Cultural Landscape Assessment</li> </ul>
	Improve public access and develop access links	<ul style="list-style-type: none"> <li>▪ Ease slopes to provide access to lower foreshore area</li> <li>▪ Provision of safe pedestrian and cyclist (where appropriate) access and links to National Park area</li> <li>▪ Reconfigure existing hardstand area to accommodate carparking and possible bus turning circle and layover bay</li> </ul>	High High High	<ul style="list-style-type: none"> <li>▪ Sydney Harbour National Park Management Plan</li> <li>▪ Transport Management Plan</li> <li>▪ Traffic Management Plan</li> </ul>
	Improved environmental conditions	<ul style="list-style-type: none"> <li>▪ Remediate bushland on slopes and reveal existing natural features</li> <li>▪ Remediate foreshore scrub</li> <li>▪ Stabilise slopes below carpark</li> <li>▪ Improve stormwater management</li> </ul>	Medium Medium High High	
	Works to enable use / leasing of buildings	<ul style="list-style-type: none"> <li>▪ Improve existing carparking on hardstand areas</li> <li>▪ Provide additional carparking areas</li> <li>▪ Provision of maintenance / service vehicle access to Chowder Bay Buildings and navy facilities</li> </ul>	High Low High	<ul style="list-style-type: none"> <li>▪ Draft EMP for Chowder Bay Naval Fuel Installation</li> </ul>



	Outcomes	Elements	Priority	Relevant Management Plan or Supporting Study (in addition to the Park Design Concept)
Access and Arrival (from Clifton Gardens and Chowder Bay)	Improve public access and develop access links	<ul style="list-style-type: none"> <li>▪ Improve access to wharf for charter boats and private vessels</li> <li>▪ Improve access to Building 7 and clarify public domain</li> <li>▪ Maintain and improve public access to beach</li> <li>▪ Investigate possible linkages of Trust land through Clifton Gardens reserve</li> <li>▪ Provision of interpretive material in public areas</li> <li>▪ Provision of public toilet facilities</li> </ul>	High Medium High Medium	<ul style="list-style-type: none"> <li>▪ Chowder Bay Feasibility Assessment for Ferry Access</li> <li>▪ Conservation Management Plan</li> <li>▪ Accessibility Audit</li> <li>▪ Cultural Landscape Assessment</li> <li>▪ Management Framework – Clifton Gardens Reserve</li> <li>▪ Management Framework – Clifton Gardens Reserve</li> </ul>
Public Domain	Works to enable use / leasing of buildings  Improved public amenity and provision of parkland	<ul style="list-style-type: none"> <li>▪ Provision and / or upgrade of on site services</li> <li>▪ Restoration of Heritage buildings</li> <li>▪ Retain extraordinary views and heighten as a place of outlook</li> <li>▪ Clarify landscape surrounding former Sergeant Majors cottage – ease grade and improve access</li> <li>▪ Provision of accessible public toilet facilities, disabled parking, lighting, picnic areas</li> </ul>	High High High High Medium / Low High	<ul style="list-style-type: none"> <li>▪ Site services survey</li> <li>▪ BCA report</li> <li>▪ Conservation Management Plan</li> <li>▪ Cultural Landscape Assessment</li> <li>▪ Accessibility Audit</li> </ul>





	<b>Outcomes</b>	<b>Elements</b>	<b>Priority</b>	<b>Relevant Management Plan or Supporting Study (in addition to the Park Design Concept)</b>
Public Domain continued...	<p>Improved public amenity and provision of parkland continued...</p> <p>Improved access to public domain – pedestrian links, facilities for cyclists, disabled access, limited parking</p> <p>Improved environmental conditions</p>	<ul style="list-style-type: none"> <li>▪ Provision and / or upgrade of on site services for public domain areas</li> <li>▪ Removal of building N4</li> <li>▪ Remediate bushland to provide screening of buildings</li> <li>▪ Investigate alternative connection from walking track</li>   <li>▪ Provide screen planting for buildings along Chowder Bay Road</li> <li>▪ Take advantage of existing environmental conditions in the creation of microclimate habitats</li> <li>▪ Implement Phytophthora Management Strategy</li> <li>▪ Manage local area run-off</li> <li>▪ Assess and manage existing stormwater services</li> <li>▪ Remediation of contaminated areas and hazardous materials in public areas</li> </ul>	<p>High</p> <p>High Medium</p> <p>Medium</p> <p>High</p> <p>Low</p> <p>High</p> <p>High High</p> <p>High</p>	<ul style="list-style-type: none"> <li>▪ Site Services Survey</li>   <li>▪ Conservation Management Plan</li>   <li>▪ Phytophthora Management Strategy</li> <li>▪ Site Services Survey</li> <li>▪ Contamination Assessment</li> <li>▪ Hazardous Materials Survey</li> </ul>



	<b>Outcomes</b>	<b>Elements</b>	<b>Priority</b>	<b>Relevant Management Plan or Supporting Study (in addition to the Park Design Concept)</b>
Conservation and interpretation of Heritage buildings	Improved interpretation of sites natural and cultural heritage	<ul style="list-style-type: none"> <li>▪ Preparation and presentation of interpretive material and signage in public domain areas including picnic areas and car park</li> <li>▪ Landscape improvements that respond to and convey the sites natural and cultural heritage</li> <li>▪ Conservation and adaptive reuse of heritage structures</li> </ul>	<p>High</p> <p>Medium</p> <p>High</p>	<ul style="list-style-type: none"> <li>▪ Cultural Landscape Assessment</li> <li>▪ Conservation Management Plan</li> <li>▪ Cultural Landscape Assessment</li> <li>▪ Conservation Management Plan</li> <li>▪ Cultural Landscape Assessment</li> <li>▪ Conservation Management Plan</li> </ul>



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## Related Studies

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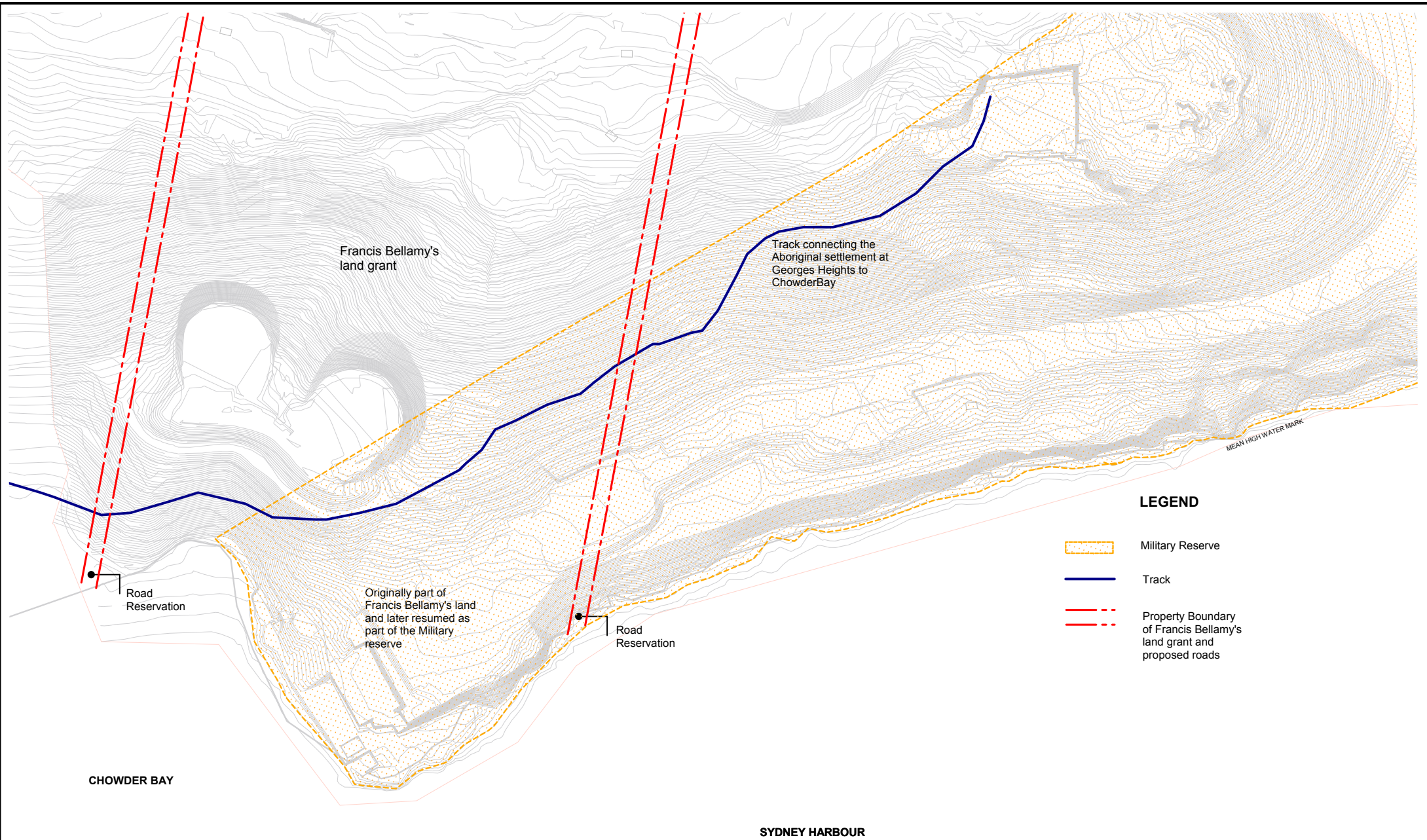
Trevor R Howse & Associates Pty Ltd, 2000, BCA Building & Fire Safety Audit Report regarding the former Army Maritime School - Chowder Bay, Mosman.

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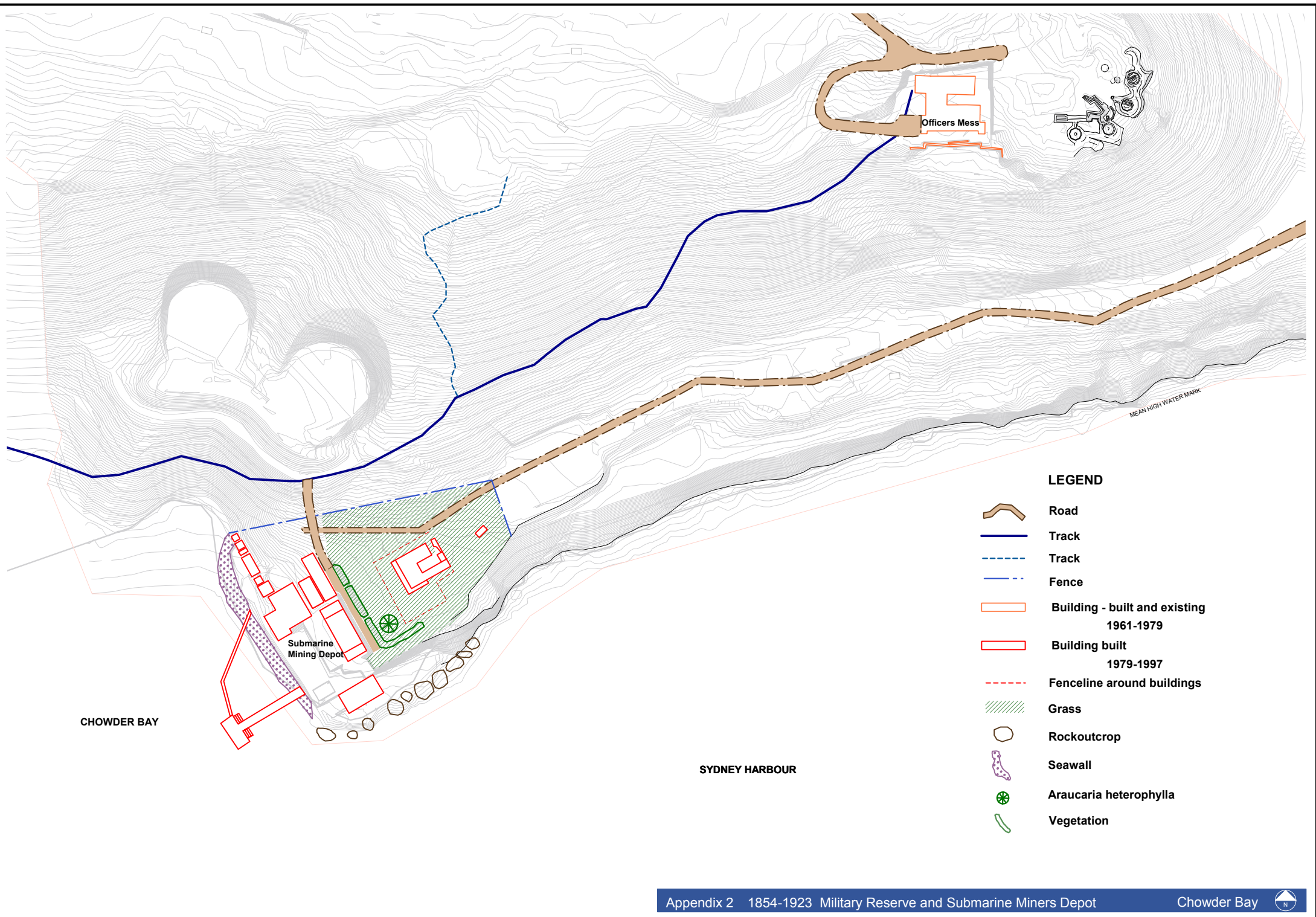
## APPENDICES



**LEGEND**

-  Military Reserve
-  Track
-  Property Boundary of Francis Bellamy's land grant and proposed roads





Officers Mess













Submarine Mining Depot

CHOWDER BAY

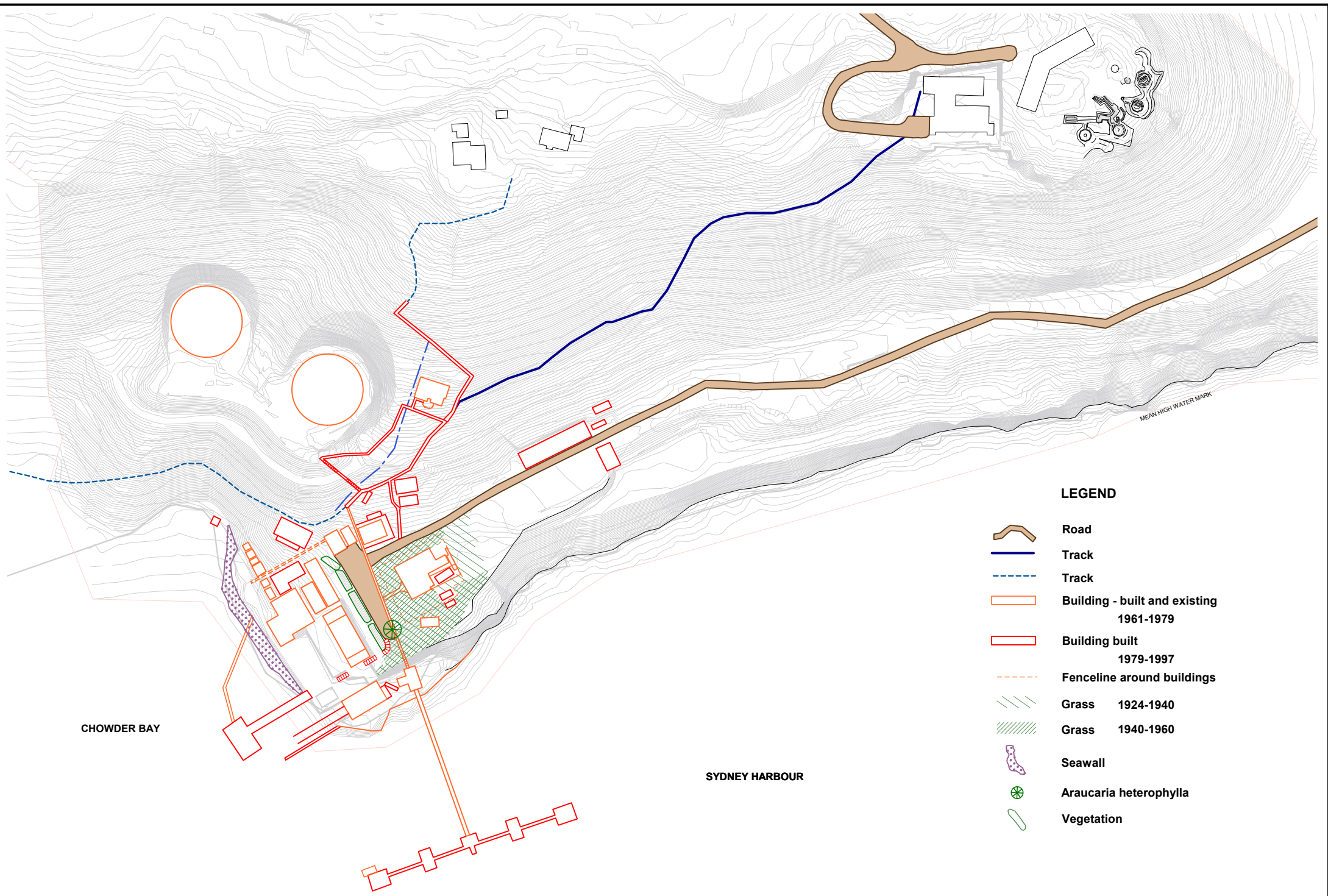
SYDNEY HARBOUR

MEAN HIGH WATER MARK












**LEGEND**

-  Road
-  Track
-  Track
-  Fence
-  Building - built and existing 1961-1979
-  Building built 1979-1997
-  Fenceline around buildings
-  Grass
-  Rockoutcrop
-  Seawall
-  Araucaria heterophylla
-  Vegetation





**LEGEND**

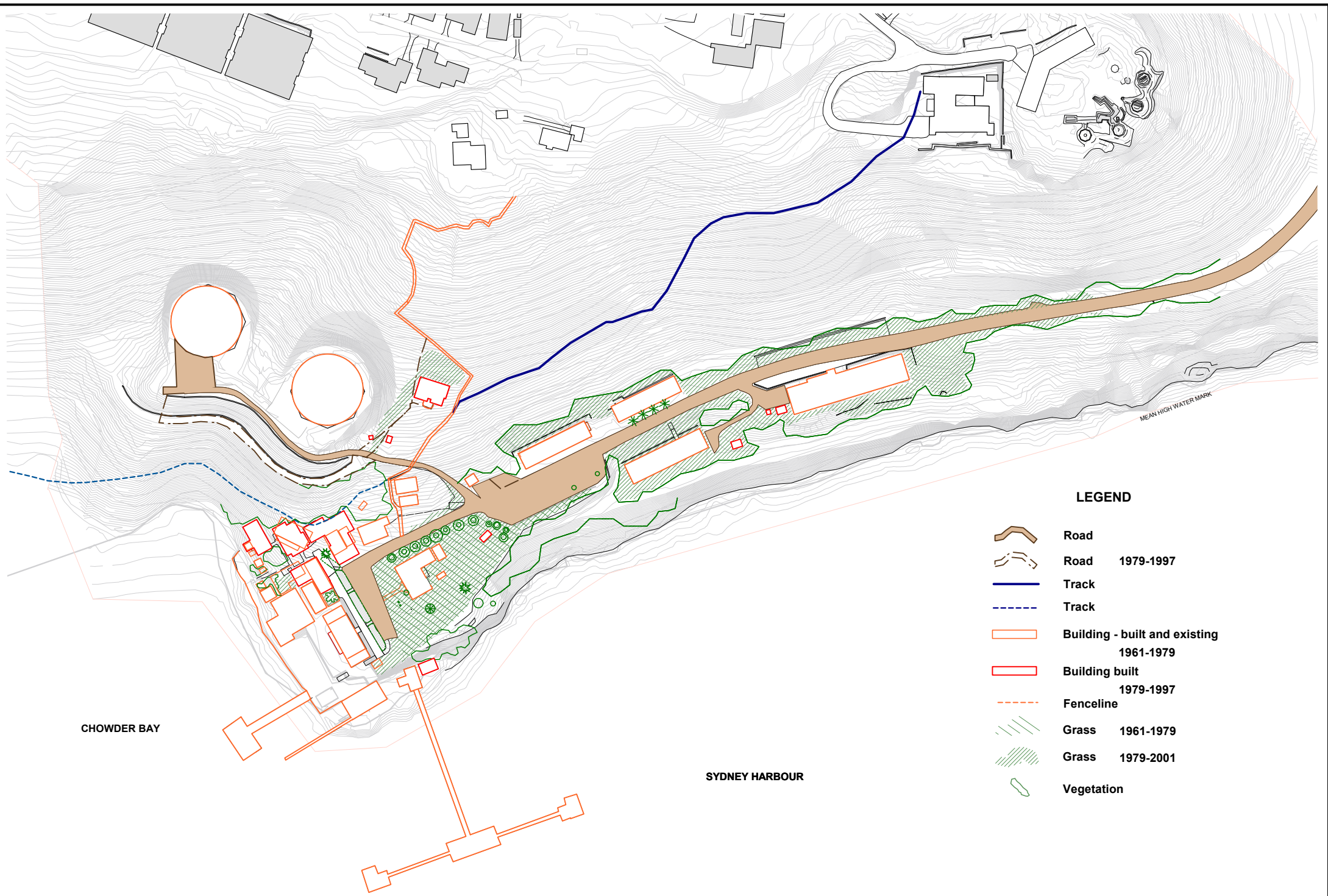
-  Road
-  Track
-  Track
-  Building - built and existing 1961-1979
-  Building built 1979-1997
-  Fenceline around buildings
-  Grass 1924-1940
-  Grass 1940-1960
-  Seawall
-  Araucaria heterophylla
-  Vegetation

CHOWDER BAY











SYDNEY HARBOUR

MEAN HIGH WATER MARK





**LEGEND**

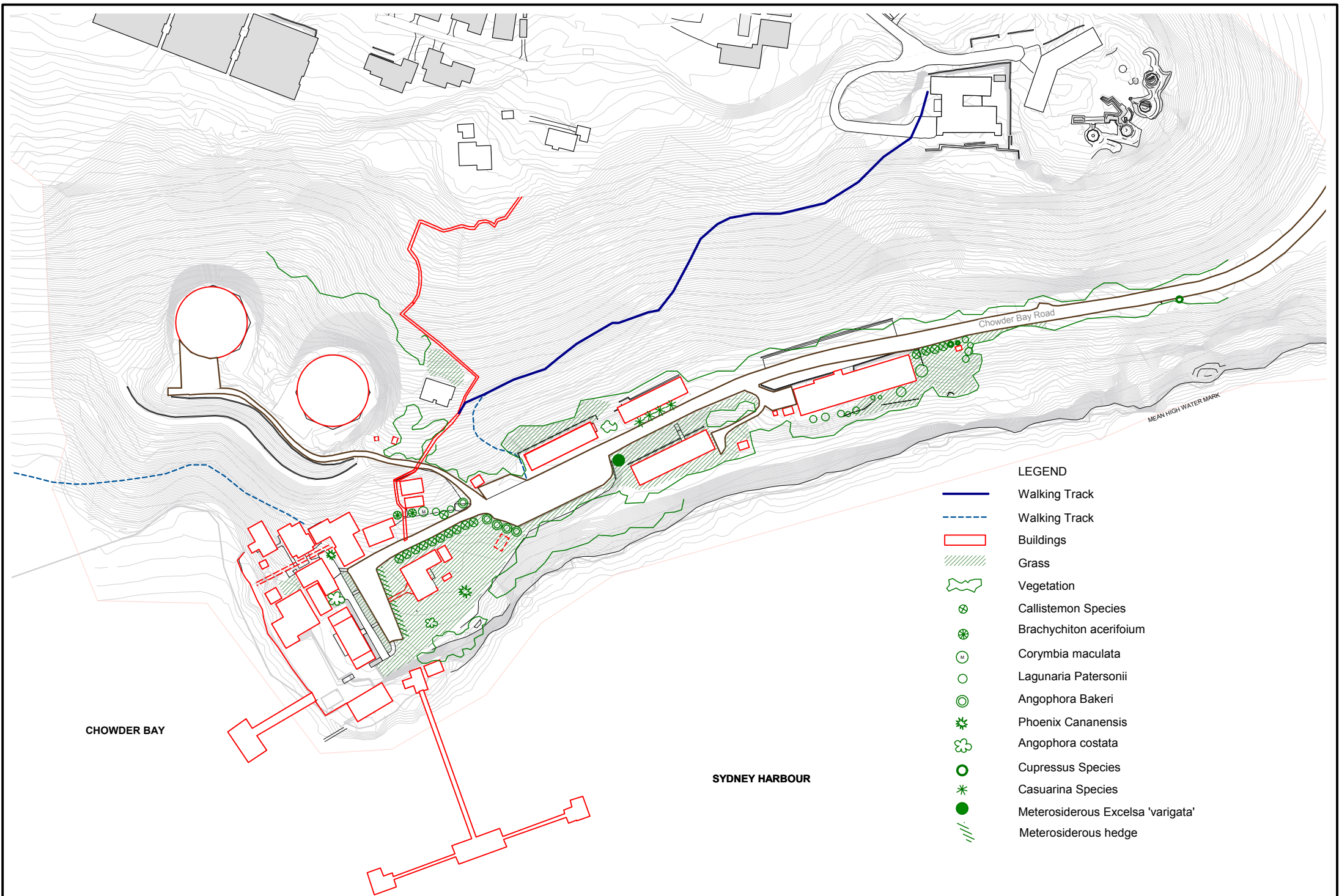
-  Road
-  Road 1979-1997
-  Track
-  Track
-  Building - built and existing 1961-1979
-  Building built 1979-1997
-  Fenceline
-  Grass 1961-1979
-  Grass 1979-2001
-  Vegetation

CHOWDER BAY

SYDNEY HARBOUR

MEAN HIGH WATER MARK





**LEGEND**

- Walking Track
- Walking Track
- Buildings
- Grass
- Vegetation
- Callistemon Species
- Brachychiton acerifoium
- Corymbia maculata
- Lagunaria Patersonii
- Angophora Bakeri
- Phoenix Cananensis
- Angophora costata
- Cupressus Species
- Casuarina Species
- Meterosiderous Excelsa 'varigata'
- Meterosiderous hedge