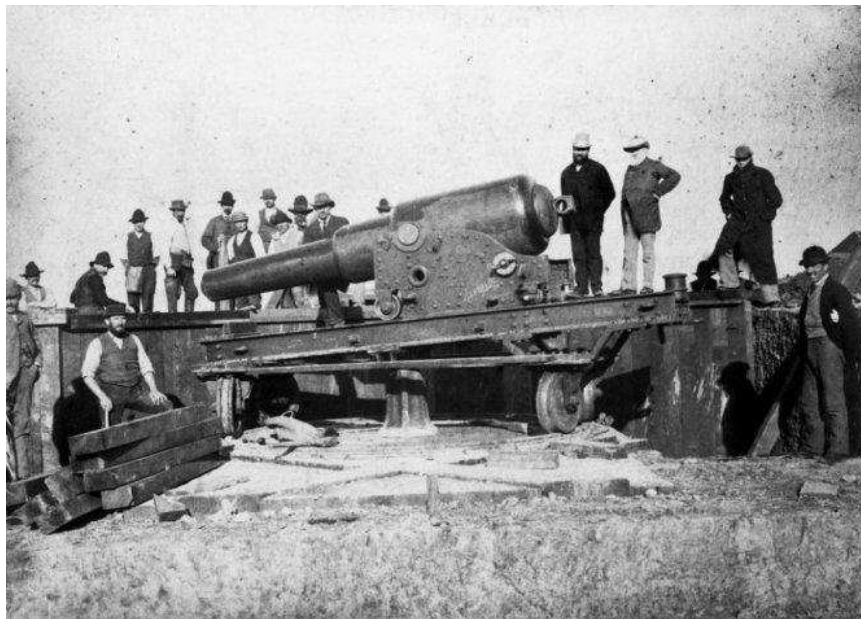


**DEFENDING DUNEDIN:
THE ARCHAEOLOGY OF DUNEDIN'S COASTAL
FORTIFICATIONS
1885- 1945**

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Abstract

This dissertation is an archaeological analysis of Dunedin's coastal military fortifications in the period from the 1880s, when the country was threatened with Russian invasion, through until the end of the Second World War. This investigation examines the nature and extent of these fortifications, and was conducted through both field survey and mapping, and historical research. With very little previous work conducted on these types of site, this research provides valuable insight into fortification construction methods and temporal change throughout this period. This investigation also examines the mindset of a young nation, and their reaction when facing for the first time a serious external threat to their way of life.

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CONTENTS

ABSTRACT	II
ACKNOWLEDGEMENTS.....	III
CONTENTS.....	IV
LIST OF FIGURES	VI
1. INTRODUCTION	1
1.1. PURPOSE OF THE STUDY	2
1.2. CHAPTER OVERVIEW	2
2. BACKGROUND TO THE STUDY	4
2.1. LITERATURE REVIEW	4
2.2. HISTORICAL BACKGROUND	10
3. METHODS	16
4. RESULTS	18
4.1. FORT TAIAROA	18
LIGHTHOUSE BATTERY	21
HOWLETT POINT BATTERY.....	24
CHANNEL BATTERY.....	25
SADDLE BATTERY	26
ASSOCIATED FEATURES	28
4.2. HARINGTON POINT BATTERY.....	32
ROADBLOCK.....	34
UPPER LEVEL.....	34

LOWER LEVEL	41
4.3. TOMAHAWK BATTERY	48
4.4. REREWAHINE BATTERY	52
4.5. LAWYER'S HEAD BATTERY, ST. CLAIR BATTERY, AND CENTRAL BATTERY	55
5. DISCUSSION	60
5.1. CONDITION	60
5.2. VARIATION AND TEMPORAL CHANGE	62
5.3. SITE DISTRIBUTION AND DEFENSIVE STRATEGY	64
5.4. COMPARISON	65
6. CONCLUSION	69
6.1. LIMITATIONS	69
6.2. CONTRIBUTIONS TO THE FIELD	71
6.3. FUTURE RESEARCH	72
REFERENCES	74
APPENDICES	80

LIST OF FIGURES

Figure 1. Satellite image of Dunedin showing the location of Dunedin's coastal military defences. Location 45°50'07.60" S and 170°37'13.36" E (Google Earth July 12 2013).	18
Figure 2. Map of Fort Taiaroa showing both archaeological and modern features (courtesy of Hamel 1994).	20
Figure 3. Photograph of L. Battery Volunteers on hill just south of Fort Taiaroa, with the Fort to the north in the background, c. 1889 (De Maus Gallery, Port Chalmers Museum).	21
Figure 4. Armstrong Disappearing Gun while underground (Photo courtesy of Royal Albatross Centre).....	23
Figure 5. Photograph of L. Battery Volunteers practicing with 7-inch RML gun at Saddle Battery, c. 1889. (De Maus Gallery, Port Chalmers Museum).....	27
Figure 6. Stone jetty showing basalt blocks, and fur seal in foreground (Photo courtesy of Jill Hamel).	28
Figure 7. Water tanks and foundations of water pump house. Fort Taiaroa (Photo courtesy of Jill Hamel).	30
Figure 8. World War II Map of Fort Taiaroa also showing Harington Point Battery and Rerewahine Battery. From Fort Record Book (courtesy of Laurie Stewart, Otago Peninsula Trust).	31
Figure 9. Map of Harington Point. Scahill 2013.	33
Figure 10. World War II Engine Room at Harington Point, complete with budding archaeologist.	36
Figure 11. 1890s 7-inch RML Gun Emplacement at Harington Point.....	37
Figure 12. 1890s Engine Room. Facade has partially deteriorated, revealing concrete construction underneath.....	39
Figure 13. 1906 Searchlight Post at Harington Point.	43
Figure 14. 1906 Searchlight Post communications instructions partially legible on wall.....	44
Figure 15. World War II Searchlight Post at Harington Point.....	45

Figure 16. Harington Point lower level. Northern QF gun emplacement is visible in background, while corner of southern QF emplacement is visible in bottom left corner of photo. The war shelter is visible in between the two QF emplacements.	47
Figure 17. World War II plan of Tomahawk Battery. Fort Taiaroa Record Book (courtesy of Laurie Stewart, Otago Peninsula Trust).	49
Figure 18. Tomahawk 6-inch Gun Emplacement. Minimal deterioration can be seen in upper left section of canopy with metal reinforcement revealed from within the concrete.	50
Figure 19. Partially exposed roof of Observation Post at Tomahawk Battery. The two 6-inch emplacements are visible in the top centre of photo.....	52
Figure 20. 6-inch gun emplacement at Rerewahine Battery. Second emplacement is visible in background. c. 1985. Condition of structures now is reportedly poor (Photo courtesy of Laurie Stewart, Otago Peninsula Trust).	54
Figure 21. Coast defense gun known as Keep-'em-off, Lawyer's Head, Dunedin. c. 1885. Field family: Field and Hodgkins family photographs. Ref: 1/2-105940-F. Alexander Turnbull Library, Wellington, New Zealand. http://natlib.govt.nz/records/23056557	56
Figure 22. Proposed plan for St. Clair Battery. Ultimately the battery was never fitted with the proposed 8-inch Disappearing gun.	57
Figure 23. Coast defense gun known as Pop-'em-off, St. Clair, Dunedin. c. 1885. Field family: Field and Hodgkins family photographs. Ref: 1/2-105939-F. Alexander Turnbull Library, Wellington, New Zealand. http://natlib.govt.nz/records/23199061	58

1. INTRODUCTION

While historic period archaeology in New Zealand is becoming increasingly well researched, some facets have had significantly less attention directed at them than others. The archaeology of New Zealand's coastal military defences is one such facet. This is not totally unsurprising given the nature of this infrastructure. While New Zealand has had several serious external security threats since European colonisation, the country's fears were never realised and the weapons mounted at these defences were only ever used during test firing (Cooke 2000: 1- 7). As a result they can be perceived as having a somewhat less distinguished history with less emotional attachment when compared with overseas sites that were actually used in combat (Schofield 2009: 21- 26). Contributing to this perception is the notion that these structures, particularly those constructed during the Second World War, occupy such a recent past that they are not necessarily considered to be 'archaeological' sites. As a result, very little archaeological work has been conducted at these types of site, locally, nationally, and internationally. The majority of the work that has been undertaken has generally been conducted for development purposes as opposed to academic inquiry. However, as Schofield (2009: 21) notes, the recent past is beginning to be considered "as much a part of our heritage as are more distant periods". Indeed, while New Zealand's defences may never have seen action, they are an important part of New Zealand's history, as the events which necessitated the construction of a defensive system were momentous and devastating events which drastically changed the shape of the modern world (*ibid*: 22). The coastal military fortifications in Dunedin were occupied and developed over a period of approximately sixty years, and have the potential to provide valuable insight into the nature and development of late-19th century to mid-20th century military defence construction in New Zealand, providing a basis for both national and international comparison.

1.1. PURPOSE OF THE STUDY

This study was undertaken for several reasons. Firstly, as Dunedin's coastal fortifications have been largely ignored archaeologically, this project aims to create a record of these sites, so that they can become recognised for their archaeological merits, and receive the appropriate heritage treatment. The second purpose of this investigation is to examine the nature of construction of late-19th to mid-20th century coastal military fortifications; that is, the way in which they were constructed, what materials were utilised, and the way in which construction methods changed over time. Lastly, this study aims place these archaeological remains into a social context, to address issues within society at the time in which these sites were constructed, and to examine what actually necessitated the construction of these defences.

1.2. CHAPTER OVERVIEW

Chapter Two presents a background to the current study, and is separated into two sections. The first section provides an overview of the literature pertaining to previous work in the archaeology of coastal military fortifications. As the current study is dealing primarily with built structures, a brief overview is also provided pertaining to buildings archaeology. The second section discusses the political and social situation leading up to and during the period with which the current study is concerned. This provides insight into why construction of the defence sites were necessary to New Zealand's security.

Chapter Three outlines the methods employed during the current study, and discusses why different approaches were required for each of the study sites.

Chapter Four presents the results of the investigation. The results are divided by site, starting with the sites for which the most information has been recorded and ending with the sites which are least well known. For each site, historical and archaeological information has been melded where necessary to provide as thorough coverage as possible. Maps and photographs have been utilised where appropriate.

The discussion in Chapter Five examines the study sites, concerning both the archaeological and historical record, and evaluates the aims that this project sought to address. While addressing the sites, this discussion also attempts to demonstrate that these sites are a reflection of the social fears and insecurities of a nation and its people, coping for the first time with serious threats to their livelihoods.

Chapter Six concludes the study, reflecting on the extent to which the goals established for this study were achieved, the strengths and limitations of the methods used, contributions made by the study, and directions for further research.

2. BACKGROUND TO THE STUDY

2.1. LITERATURE REVIEW

The difficulty in locating archaeological literature associated with nineteenth and twentieth century coastal military fortifications is indicative of the fact that these types of sites have been largely ignored by archaeologists, both within New Zealand and internationally. When examining archaeological research which has been carried out on these sites, it becomes clear that there is no established or defined approach to the way in which they have been investigated, but rather a variety of methods have been employed ranging from simple site survey to the use of ground penetrating technologies.

As Carter (2011: 165) notes, with the exception of being recorded in the New Zealand Archaeological Association (NZAA) recording scheme, ArchSite, little has been done in the way of archaeological investigation of these sites.. Archaeological work has focussed solely on the Fort Taiaroa site (J44/151), located on the northern tip of the Otago Peninsula at the entrance to the Otago Harbour. The sites use by Māori as a pa prior to the European occupation of the area has meant that most archaeological work has yielded evidence of both Māori and European settlement. This work has been primarily of a development nature, helmed by either the New Zealand Historic Places Trust (NZHPT) or the Department of Conservation (DOC). The only academic archaeological research at Fort Taiaroa pertains primarily to the Māori occupation of the site with only brief mention of European activities (Leach & Hamel 1978). More recent research of an inquisitive nature carried out by Mark Jurisich (n.d), examining a 17th century Māori ditch and bank defence on Pukekura currently remains unpublished. A subsurface geophysical survey was conducted by Hans Dieter-bader (2006), examining possible burials at the southern end of the site behind the current

visitor's centre. Interestingly, with the exception of Jurisich and Dieter-bader's work, and the collaboration of Leach and Hamel (1978), all archaeological investigation at Fort Taiaroa has been completed solely by Jill Hamel. The lack of archaeological inquiry at the site can be explained by the present use of the headland area as a reserve for the breeding and study of Northern Royal Albatross. Due to this, access to the site is understandably restricted. All archaeological investigation carried out at the Fort Taiaroa site has primarily involved development to facilities at, or associated with, the Royal Albatross Centre, and has taken the form of both surface level survey (Hamel 1994; 2012) and subsurface excavation (Leach & Hamel 1978; Hamel 1992; 2005; 2009; 2010).

Surface level survey has examined two main types of remains; existing building structures (Hamel 1994), and other surface evidence of human activities such as Hamel's (2012) report discussing surface evidence of a tramline and storm water drainage. A report produced by Hamel (1994) presented a rough outline for the current state of defence features at the site. The report consisted of sketch maps and plans for the existing defence structures that comprise Fort Taiaroa, with brief descriptions corresponding to the various batteries and other features. Hamel notes that these are no substitute for measured drawings (1994: 1), but due to limited access to the site it was not possible to produce more detailed maps. This survey was also completed prior to GPS technologies becoming readily available. The absence of anything other than historical maps prior to this report means that this research still provides a good basis for comparison with historical records and the relationship between archaeological features and modern additions such as buildings or tracks.

Minimal subsurface excavations have been conducted at the Taiaroa Head site, though as the present investigation is focussed primarily on standing structures, the information gleaned from excavation is of little relevance to this study. Consequently, with archaeological investigation only having occurred at the Fort Taiaroa site, the NZAA site record forms for the other Dunedin sites are at best patchy.

The lack of a coordinated approach to examining coastal military fortifications is a pattern which extends throughout New Zealand, again with most inquiry conducted as NZHPT or DOC reports. The nature of these types of report tend to be primarily brief overviews of the site in question rather than in depth investigations and discussions of sites. A good example of this is Kelly's (1998) report, which provides short accounts of all historic coastal defence sites in New Zealand, compiling information on historical, physical, and cultural significance into no more than a few hundred words on each site. The purpose of these types of report is primarily to address any issues of preservation or maintenance.

The most comprehensive archaeological work on coastal military defences in New Zealand has been conducted at North Head, Auckland. Veart (1990) provides a thorough investigation of the North Head complex, comprehensively evaluating historical literature and the archaeological nature of the site. Primarily concerned with the changing nature of the site, Veart evaluates the various components of the site, both gun emplacements and associated structures such as searchlights and engine rooms, discussing them in reference to their original plan or construction, and how they exist in the present day. A second comprehensive investigation was carried out by Treadwell (1992), conducted by evaluating official military records and archival documents. This was conducted by Treadwell for the Department of Conservation as a direct response to public concern in relation to claims that there were a number of hidden underground structures at the site, as well as unknown quantities of ammunition. With that focus, the investigation specifically examined documentation pertaining to underground structures and the handling of ordnance and ammunition. While providing the most comprehensive accounts of any of New Zealand's historic coastal fortifications, as with research in Dunedin, these reports were conducted as a foundation upon which to base plans for present day use of the site, ie. public access to the site, measures to deal with vandalism, and the potential for archaeological investigation. Further work by Veart (1994; 1998; 2000; 2003; 2011) at North Head pertains primarily to preservation or development concerns, such as concrete repair work on damaged structures, and upgrades to car parking facilities at the site. While providing a

much less comprehensive account, Walton (1990) used the same basic method in his essay on Wellington's defence structures, though only alluding briefly to the significance of the sites.

Taking a radically different approach, work by Young (1992) used resistivity methods to investigate subsurface remains of defences at Point Resolution, Auckland. Using electrical currents, resistivity techniques showed variations in the electrical conductivity of groundwater, indicating a number of structures were present beneath the soil. This technique was used to determine appropriate areas for excavation, ultimately leading to the discovery of several structures which could then be compared to historic plans for the site.

Internationally, there is also a lack of archaeological research associated with historic military defences, and a similar variety of methods have been utilised across various studies. As with New Zealand sites, much work has been conducted in order to investigate issues of preservation and site maintenance. However, as Schofield (2009) notes, opinion is split as to whether many recent military sites should even be preserved. One issue in this debate concerns the loss of life, and the appropriateness of preserving sites which are associated with horrific tragedy and painful memories. However, this issue pertains primarily to sites which were actively involved in combat, and as Cooke (2000) states, no attacks in New Zealand were ever recorded during the 117 year period his research covers, meaning that in New Zealand this is much less of an issue. While covering sites dating right back to the Roman period, Bromhead and Ibsen (2006) review and discuss the impact of landslides and coastal erosion on historic fortifications in England. Nineteenth and twentieth century fortifications are reviewed briefly in this context, giving brief examples of several sites which are affected by changes in the landscape. Rapidly advancing technologies are also being used at coastal military sites for purposes of heritage management. The site of Point du Hoc at Normandy, France is one of the most important, and arguably the most well known military site of World War II. Using three-dimensional resistivity techniques, archaeologists have recently been surveying the site to assess erosion, with the intent of applying appropriate preservation measures to safeguard the site (Udphuay et al. 2011). The nature of the sites and the structures is not discussed. Survey of Second

World War Japanese military bases on the Marshall Islands was also conducted primarily for heritage purposes (Christiansen 2002). As discussed, features constructed of concrete are generally well preserved, while those made of steel and iron are in far worse shape and deteriorate rapidly in the local climate (*ibid*: 62- 63).

Stichelbaut (2006) was able to use aerial photographs from the First World War to identify military sites such as gun emplacements and trenches. Comparison of photographs taken at different stages of the war made it possible to identify a pattern of change as new structures were developed. Using GIS it was possible to pinpoint the precise location of the structures from over 90 percent of the 1100+ photographs used. While this investigation was not focussed on coastal sites, this method has the potential to be successfully applied to a coastal environment.

As part of a BBC TV series *Two Men in a Trench*, Pollard and Banks (2008) carried out a survey and excavation of military sites on Inchkeith Island, in the Firth of Forth, Scotland. This site has a long history of military occupation, with the first fort being built on the island by the English in the mid-16th century. Since that time, fortifications were also developed by the French and Scots, with military use of the site continuing right through until World War II. The excavations carried out examined both Victorian and World War II defences, as well as a 16th century midden, revealing a number military related trenches, and providing evidence of various constructional developments from different periods of occupation.

One of the most comprehensive archaeological investigations of recent military sites is the *Defence of Britain Project*. This project encompassed all 20th century military sites, both coastal or otherwise. Administered by the Council for British Archaeology, the focus of this scheme was to record and detail all 20th century military sites in Britain, primarily to inform agencies and councils tasked with heritage preservation. The result of this project was the creation of a database of all sites from both field and documentary research, available to agencies at both a local and national level (Archaeology Data Service 2006).

Without a clearly established approach to the archaeology of historic period coastal military fortifications, methods for the current investigation were chosen based on the nature of the sites in question, that is, built structures. Thus, this investigation follows a buildings archaeology approach. At a fundamental level buildings archaeology is as its name suggests, the archaeological study of buildings. In essence, this involves the archaeological study of building remains, whether they are fully or partially standing buildings or whether all that remains are foundations or remains of structures within the ground. At this level, buildings archaeology can be used to investigate architectural traditions, construction techniques and processes, or the use of various materials for the construction of buildings (Morris 2000: 8). This can also be used to assess changes to a structure or site over time (Mrozowski 2008). As Orser (2004: 53) states, buildings are of significant importance to archaeologists as they are “active objects that helped create, structure, and maintain life.” While buildings archaeology can be used to investigate aspects of social life such as gender, class and ethnicity (Deagan 1996), in its fundamental form buildings archaeology is simply concerned with structural remains.

Richard Morris (2000: 14) describes buildings archaeology in its most basic form as consisting of three elements, what he calls “the three ‘Fs’: fabric, form, and function.” These elements are all seen as linked and while the relationships between these elements may not always be immediately apparent, they are equally important. The first element, fabric, is the materials used in the construction of the building, whether it is stone, wood or steel. Form is the physical manifestation of the structure, the shape, size and layout. The third element, function, is one which can be quite apparent in some structures, while difficult to ascertain in others. Function describes the manner of use for which the structure was meant. As Reynolds (2009: 345- 347) discusses in relation to fabric and form, archaeologists can learn different things by investigating both standing structures and buried remains. Standing structures are useful for understanding the preferred architectural traditions at a particular point in time. The pitfall of this is that many structures will have undergone significant transformations over time so as to no longer provide information about

the function of the structure or activities that took place within the structure during its earliest periods of use or occupation. It is also possible that due to the standing nature of the structure, excavation of any buried remains from earlier occupations may not be possible. However, the buried remnants of demolished structures often also preserve archaeological material from early periods of use, which can be investigated through excavation. The function of a building can be rather deceptive. In the case of the current investigation, a gun emplacement, the function is immediately apparent, while in structures such as a military barracks complex, various rooms or areas may have had differing functions, which could be difficult to evaluate from a purely fundamental buildings archaeology approach.

2.2. HISTORICAL BACKGROUND

In order to fully appreciate the archaeology of New Zealand's coastal defence landscape it is imperative to place the archaeological material into historical context, examining the potential threats to the nation which necessitated the construction of these fortifications, beginning with the threat of invasion at the hands of the Russian empire and culminating with the Second World War.

Prior to the 1880s, the fixed coastal defence landscape of New Zealand was non-existent. However, by the 1870s the threat of invasion from external powers, primarily from the Russian empire and to a lesser extent the French (Barratt 1981: 15- 17), was significant enough to warrant serious discussion (Cooke 2000; Veart 2011b; Jurisich n.d.). Until the early 1870s, colonists had been preoccupied with the conflict of the New Zealand land wars, which were considered a greater threat to colonists than those from outside the country (Veart 1990; Veart 2011b).

The Russian threat which resulted in the construction of the nations' first coastal defences in the 1880s was nothing new. Even as early as the 1830s Britain viewed the Russian empire as a leading foreign power, and articles expressing anti-Russian hysteria were regular features in the media across the British empire from Edinburgh to Sydney (Barratt 1981: 7- 17), a phenomenon

Barratt refers to as "*Russophobia terribilis*". In New Zealand, media speculation about the perceived threat of invasion by Russia began to take off following the Crimean War of 1854-1856 (Barratt 1981; Veart 1990: 10- 12; Veart 2011b: 220; Jurisich n.d.: 3). As Veart (2011b: 220) notes, by this time the majority of internal conflict had also subsided, presenting the opportunity to examine the security of the country from a wider vantage point. One media publication in particular, printed by the *Daily Southern Cross* in mid-February 1873 caused widespread panic amongst the public and concern reached an all time high as it was realised the nation had no way of defending itself. The article in question, known as the '*Kaskowski* hoax,' described an attack on Auckland city by an armoured Russian warship, the latest in modern military technology (Veart 1990: 10; 2011b: 220). The initiative was simple, yet highly effective, much of the panic stemming from the public not realising the article was a hoax, believing they were genuinely under attack. Barratt (1981: 52) describes the author of the hoax, David Luckie as having "played with virtuosity on all the strings of public nervousness". Headlines such as "*Russian Atrocities*", "*Russia in the Pacific*", and "*The Ambition and Falsity of Russia*" served to keep tensions high (Barratt 1981: 51). Throughout the 1870s 'sightings' of Russian ships off New Zealand's coasts became frequent, causing emotions to flare up periodically throughout the decade (*ibid*: 57) Once again, David Luckie was the culprit behind much of this hype. Some citizens, unhappy with official security protocol, went as far as to establish volunteer artillery units like the Otago Harbour 'L' Battery, which began training in 1879 with two 32- pound Armstrong guns (Church 1994: 74).

With alarms being raised it became clear that a reliance on the British Fleet for colonial protection was not viable in such an isolated locale like New Zealand (Carter 2011: 171), with Defence Minister John Sheehan reporting the "Defence of New Zealand by sea, impracticable" (Cooke 2000: 39). As Walton (1990: 89) notes, the British government were unsympathetic. With their own financial concerns, they insisted that as a self-governing colony, New Zealand was responsible for financing and installing its own coastal defence fortifications. As a result of increasing concern, official preparations began in earnest in the late 1870s, beginning with the purchase of 22

Rifled Muzzle Loader (RML) guns in 1878 (Jurisich n.d.: 3). Following the recommendation of Colonel Scratchley in 1880 that defences be constructed at each of New Zealand's major ports: Auckland; Wellington; Lyttelton; and Dunedin, official plans were pushed forward, especially with the appointment of Sir William Drummond Jervois as New Zealand's governor in 1882 (Cooke 2000: 34; Veart 2011b: 220; Jurisich n.d.: 3). Jervois, with his experience in planning defences in Britain, Australia and other parts of the British empire, recognised New Zealand's vulnerability to external attack and he sought the appointment of a professional military engineers (Veart 2011b: 220). Finally in 1885, with conflicts between British and Russian troops in Afghanistan causing security concerns to reach boiling point, the New Zealand government began construction of its coastal defence network (Veart 2011b: 220; Jurisich n.d.: 3). To accompany the already purchased RML guns (which upon arriving in New Zealand had subsequently been placed in storage), in 1888 orders were placed for 23 Armstrong Disappearing Guns, the latest and most up to date ordnance available at the time (Heyward 1999:13; Veart 2011b: 220) with a range of 8000 metres (Stark 1965: 4- 5; Sorrell 1999: 695).

Once installed the guns were very much a calming presence, with the echoing booms of test-firing around the country reportedly comforting and satisfying colonists (Barratt 1981: 88). In Dunedin, locals went so far as to affectionately name two of their guns "Keep-'em-off" and "Pop-'em-off", the latter an amusing reference to Rear-Admiral A. Popov, a key figure in the modernisation of the Russian naval fleet (Stark 1965: 6; Barratt 1981: 32- 33), yet the monikers also served as a daily reminder of the persisting Russian threat.

Throughout the 1890s and into the beginning of the 20th century, emotions concerning the Russians were in a constant state of flux. As Barratt (1981: 119) notes, the dying down of anti-Russian propaganda was in no way indicative of public sentiment, but simply due to a lack of international incident and little in the way of inflammatory remarks from European leaders.

The end of the Russian threat came in 1905 with Japanese triumphs over the Russian fleet at Mukden, and final victory in the Straits of Tsushima (Lissington 1972: 1). The British Government had been looking to Japan as an ally as early as 1898, aware that the Japanese were well equipped and drilled (Barratt 1981: 128), with an Anglo-Japanese defensive pact being signed in 1902. Unsurprisingly, with tensions between Russia and Japan becoming increasingly strained throughout 1903, media attention pertaining to these relations saw a dramatic increase in frequency throughout New Zealand. As Barratt (*ibid*: 129) notes, "Among New Zealanders. there was never any doubt that Russian victory would be a bleak conclusion to an Eastern war". War broke out in February 1904 and until peace was met in August 1905, the New Zealand media thoroughly and efficiently covered the action, with public interest increasing with every passing week (Lissington 1972: 7; Barratt 1981: 139). With the Japanese victory, *Russophobia* was quashed overnight, the Japanese now the dominant military power in the Pacific (Lissington 1972: 1- 7; Cooke 2000: 1- 7). With this, New Zealand's alliance with the Japanese was deemed essential with Japan now Australasia's "real and only danger from an enemy" (Trotter 1999: 70).

Until World War I Japan remained an important ally, providing New Zealand and Australia with what the First Lord of the Admiralty, Winston Churchill described as the only "true and effective protection" (Lissington 1972: 23; Trotter 1999: 73). Even so, with over 100,000 New Zealanders (approximately 10% of New Zealand's population at the time) serving overseas, homeland defence again became a serious concern (Carter 2011: 173). During this period the largest threat to the country was from German Cruisers and Armed Merchant Cruisers (Trotter 1999: 73; Cooke 2000: 246). Yet despite potential threats little was done in the way of upgrading coastal defences. Exemplified in Dunedin, during the First World War the city received no modern ordnance (Cooke 2000: 249), with the government instead choosing to concentrate efforts offshore, sending New Zealand troops to occupy German Samoa, while Australian troops were sent to New Guinea, Yap, and Rabaul (Trotter 1999: 73).

Following the First World War tensions eased and homeland defence became less of a concern, with hopes of peace becoming more reliant on treaties and "gentlemen's agreements" (*ibid*: 79). As Trotter (*ibid*: 82) notes, while the Japanese had become the dominant force in the Pacific, during times of peace there was little reason for the population to be concerned. During the 1930s, pacifist Labour Councils in many areas made conscious efforts to remove war and insecurity from the minds of the population. In Dunedin the Council conducted an anti-military sweep of the city, removing any military relic "which might encourage a spirit of war in the younger generation." (Stark 1965: 3- 6). This endeavour involved the removal of many of the city's guns, with the 7-inch RML gun "Pop-'em-off" from St. Clair Battery, and a 64-pounder even receiving "military funerals", being buried in Queen's Gardens (*ibid*: 6). Part of this was the view that the British naval base in Singapore was a major part of New Zealand's defence plan, with the New Zealand government contributing £100,000 per annum to the construction of this base, leaving much less money for homeland defence improvements (Veart 1990: 19).

With another outbreak of war in Europe security issues in New Zealand again became a growing concern. In a 1939 broadcast, New Zealand Prime Minister Savage stated the nations unequivocal support for the British empire, saying "we range ourselves without fear behind Britain. Where she goes, we go" (McIntyre 1999: 98). The period from 1940- 1941 were incredibly anxious years for the country, with serious consideration again given to the defence of New Zealand's shores (Cooke 2000: 246- 251). In New Zealand, as late as November 1941 citizens were unaware of how extremely close they were to war with Japan (Lissington 1972: 170). Deliberate and calculated simultaneous attacks on Pearl Harbour, Malaya, and the Philippines on the 7th and 8th of December 1941 left little doubt that adequate defence of New Zealand's shores was imperative (McIntyre 1999: 97- 99). At 11 a.m. on the 8th of December 1941 came the official announcement "in command from His Majesty the King", New Zealand was at war with Japan (Lissington 1972: 187). Upon declaring war against Japan, New Zealand began the second major phase of homeland defence building, both constructing new batteries across the country and upgrading and re-manning those constructed

during the Russian scare. In Dunedin, Rerewahine Battery was begun the day after the attack on Pearl Harbour (Cooke 2000: 495- 496) with Tomahawk Battery following five months later, while Harington Point and Fort Taiaroa both received additional and upgraded weapons (*ibid*: 84; 116-119). Fortunately, the threat of Japanese attack on New Zealand was significantly diminished following American naval victories in 1942 in the Battles for the Coral Sea and Midway (Carter 2011: 174), and following Japan's formal surrender on September 2nd 1945 New Zealand's coastal defences became redundant (Bayler 1945: 2- 5; Carter 2011: 174).

3. METHODS

Methodology for this research was carried out through two main avenues: field survey, and through documentary research. Field survey comprised of site mapping, using both a Trimble Geotech 3000 handheld GPS and dumpy level, and site description through primary observation. Maps were digitised using Adobe Illustrator. Sources for documentary research included existing New Zealand Archaeological Association site record forms, academic research, reports to agencies such as the New Zealand Historic Places Trust and the Department of Conservation, and archival research. Archival research was carried out primarily through the help of Laurie Stewart and his colleagues at the Otago Peninsula Trust and Fort Taiaroa Education and Resource Centre. The information gleaned from these two methods has been combined to provide a thorough account of historic era coastal fortifications within the Dunedin area.

Seven sites were chosen for inclusion within this investigation. Fort Taiaroa, Harrington Point Battery, Rerewahine Battery, Tomahawk Battery are sites which still exist today. Lawyers Head Battery, Central Battery, and St. Clair Battery are documented sites for which no surviving remains are known. These have been included in the discussion based solely on information taken from historical sources, in order to provide a complete depiction of the whole area.

Fort Taiaroa was not visited for survey during the course of this investigation. Its location within the boundaries of the operational Royal Albatross Centre facilities and albatross breeding grounds means that access to the site is tightly restricted. For the purpose of this investigation, details pertaining to the archaeology of the sites at Fort Taiaroa come from existing archaeological site record forms (J44/151; J44/148; J44/71), as well as work carried out by Jill Hamel, primarily in relation to earthworks and development associated with the Royal Albatross Centre. This work has

been published almost exclusively as reports to the Department of Conservation and the New Zealand Historic Places Trust.

The site at Harrington Point was assessed using the archaeological site record forms (J44/155), and through methods of site survey. While on privately owned land, the Harrington Point site is publically accessible and is routinely used by fishermen, divers, and sightseers. As this investigation did not utilise invasive or destructive survey methods such as excavation, and with public accessibility, landowners were not approached for permission. Field survey of Harrington Point consisted of a thorough site walkthrough and written site description, and mapping of the site using a GPS and dumpy level. Underground structures were not mapped or measured due to GPS inability, and partial flooding. As the Harrington Point site is considerably larger than the other sites surveyed, field survey at this location was completed over a period of six days.

The Tomahawk Battery site is situated on both publicly and privately owned land. At this site three structures; the two gun emplacements, and the Battery observation post, were surveyed visually to produce site descriptions. Landowners were approached for permission before accessing the area of the site located on privately owned land. The Rerewahine Battery, also situated on privately owned land was not visited during the course of this investigation. Safety concerns regarding the present physical condition of the structures meant that access was not possible. All details pertaining to this site are taken from historical sources. As the remaining sites discussed are no longer present archaeologically, all details pertaining to these sites were also taken exclusively from the historical record.

4. RESULTS

The seven sites investigated for this project are situated either on or near the headland on the Otago Peninsula, or near the beaches on Dunedin's south coast (Figure 1.).



Figure 1. Satellite image of Dunedin showing the location of Dunedin's coastal military defences. Location 45°50'07.60" S and 170°37'13.36" E (Google Earth July 12 2013).

4.1. FORT TAIAROA

Archaeological work at Fort Taiaroa (site J44/151) has been conducted almost exclusively by Jill Hamel. The archaeological evidence for the military structures at Fort Taiaroa comes primarily from her reports, as well as NZAA site record forms, and is supplemented by historical research and documents.

Fort Taiaroa is located at Taiaroa Head on the Otago Peninsula, at the very entrance to the Otago Harbour. Prior to its use for 19th and 20th century coastal fortification the Heads had been occupied and used by Māori as a pa site called Pukekura, established around 1650 A.D. (Leach and Hamel 1978: 244). Following European arrival a small village was established at the site in 1860, and by the 1890s around 100 people resided in the community. However, by 1913 the village had been almost entirely abandoned (Hamel 2009: 1).

Military occupation of the site began during the Russian scare of the 1880s with the placement of a number of guns on the headland (*ibid*) with the first construction beginning in 1885 (Cooke 2000: 116). The fort was permanently manned by both professional and volunteer soldiers to counter any potential threat (McLean 1985: 97). World War II fort records show that the placement of a defensive landscape at the Heads served two main purposes: to protect the Harbour from offshore bombardment, and to deny hostile vessels of entry to the Harbour (Fort Record Book n.d.: 7). There are four primary batteries situated at the Fort: Howlett Point Battery, Channel Battery, Saddle Battery, and Lighthouse Battery (Carter 2011: 172). A number of other features comprise the military installations at the site. These include searchlight posts, a 300 foot rubble wharf, a tramline, parapets, and observation posts (Figure 2. and 3.). The site is now occupied by the Royal Albatross Centre, the only mainland breeding ground for albatross anywhere in the world (Royal Albatross Centre 2013). While tours of the site can be taken, access to the site is strictly controlled by the Otago Peninsula Trust (Cooke 2000: 119).

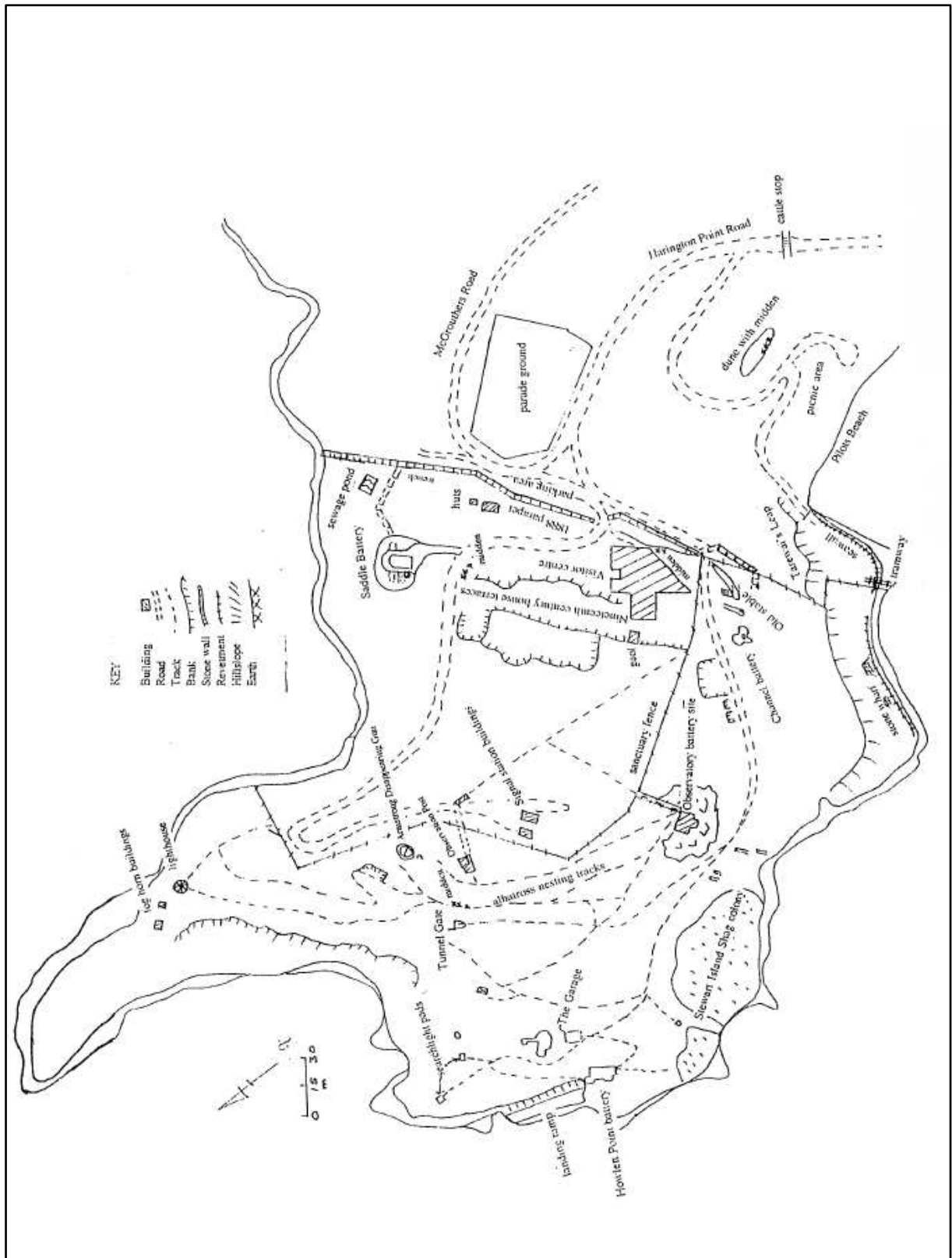


Figure 2. Map of Fort Taiaroa showing both archaeological and modern features (courtesy of Hamel 1994).

Fort Taiaroa is reached by Harington Point Road, from Dunedin, after passing Harington Point Battery approximately one kilometre to the south. When reaching the site from the south there is a

large gravel car park area just south of the site perimeter. During military occupation of the site, this large, flat area was used as a parade ground (Figure 2. and 3.). At the northern end of the car park, a high stone defensive parapet runs from the cliffs on the west, just inside the harbour entrance at a spot known as Tarewai's Leap, across to the high cliffs on the eastern edge of the site. While there are several archaeological features associated with the Fort south of this wall, the wall demarcates the southern extent of the fortifications and defence structures.

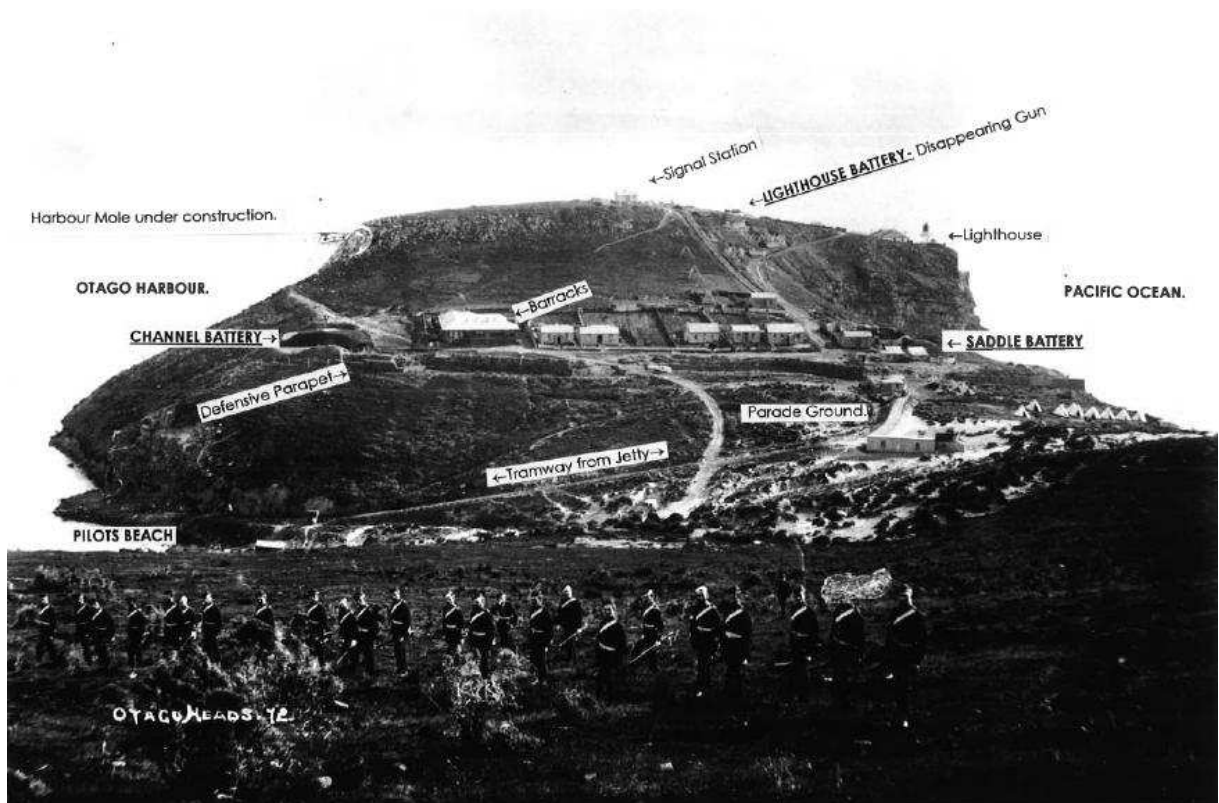


Figure 3. Photograph of L. Battery Volunteers on hill just south of Fort Taiaroa, with the Fort to the north in the background, c. 1889 (De Maus Gallery, Port Chalmers Museum).

LIGHTHOUSE BATTERY

Located north of this wall are the majority of the military sites, as well as the Royal Albatross Centre. The four batteries are situated at various strategic locations within the site. Lighthouse Battery is located near the northern extremity of the site, south of the lighthouse (which blocked part of the guns firing arc) (Cooke 2000: 117). Near the highest point on the Heads, in approximately the centre of the site, is the pit for the 6-inch 5-ton Armstrong Disappearing gun, observation post, and signal station buildings. As Hamel (1994: 4) notes, the Armstrong Disappearing gun is the major

installation on the headland (Figure 4.). Installed in 1889, the Armstrong Disappearing gun was operational until 1920, and then again from 1941 to 1943. During the Second World War, the fifty year old gun was reconditioned, but by then was obsolete and only useful to protect against enemy landing, as its range was too limited to be useful against offshore bombardment (Cooke 2000: 250). At this point, due to its age, there were doubts as to the guns reliability, and tales tell of an anxious gun-crew diving for cover during test firing of the weapon (Stark 1965: 6). The intimidating nature of this gun echoes through to its after its restoration, reflected in the words of Morrie Hammond who, in a 1987 letter, refers to the gun affectionately as "Bertha" while stating "This monster frightened me." (Hammond 1987: 1- 4). The gun was only ever fired once in anger, during the Second World War when a fishing boat entering the harbour failed to observe proper protocols (Sorrell 1999: 695). Now restored, it is the only working example of this type of gun in the world (Historic Fort Taiaroa 2008) as all New Zealand's other examples were either dumped in Cook Strait or melted down to avoid being captured by the enemy in the event of an invasion (Heyward 1999: 13; Cooke 2000: 119). This gun was operated from an underground pit. It would be aimed while in the pit, then raised on its hydro-pneumatic mounting and fired. The recoil from firing would then push the gun back underground for reloading (Historic Fort Taiaroa 2008). Being underground, except when firing, such guns were virtually impregnable (Knight 1979: 30). Designed by W. G. Armstrong in England, the Disappearing guns each weighed 18.5 tonnes and cost a £14,000 each to install, a great expense considering 23 were ordered for New Zealand's various defences (Heyward 1999: 13).



Figure 4. Armstrong Disappearing Gun while underground (Photo courtesy of Royal Albatross Centre).

Hamel (1994: 4) notes that this battery has been constructed differently to the others. While the other batteries are constructed mostly of concrete, the Disappearing Gun emplacement has been built of carefully trimmed and mortared bluestone, with some sections of wall made of old bricks and with concrete floors. The bluestone construction extends through a downhill passageway 25 metres to the west and exiting through Tunnel Gate, a bluestone wall "elegantly finished with small posts and bolstered top stones" and an iron gate. Hamel states that the Tunnel Gate feature is one of the most attractive features at the site. The observation post associated with the Disappearing gun is made of concrete with a tin roof, while a hatch and ladder provided internal access to the gun (*ibid*). A new tunnel was also built in 1986 replicating the original construction, in order to maintain ease of access to the emplacement without disturbing the albatross (Cooke 2000: 119). Summit Battery, which was often viewed as a detached section of the Lighthouse Battery has now been removed and the area is now occupied by a bird viewing observatory (*ibid*). Active from 1888 until 1906, the battery was mounted with a 6-pound Nordenfelt Quick Firing Gun (J44/151).

HOWLETT POINT BATTERY

To the west of Lighthouse Battery, covering the inside of the harbour entrance is Howlett Point Battery (Figure 2.). Hamel (1994: 3) describes this battery as a 'massive concrete work' with pipe railings and six cupboard like spaces which were likely used to store ammunition. The dimensions of these, each 1.25m wide, 0.75m high and 0.75m deep, are very similar to the boxes built into the Quick Firing Gun emplacements and the engine room beside the 7-inch gun emplacement at Harington Point. The positioning of these is discussed below. There are two west-facing hexagonal gun platforms, one of which still has the metal gun mounting in place. Both of these platforms are covered by 1.40m high parapets, with two ammunition boxes built into the concrete apron at the front of the installation, accessible from a sheltered area which runs between the two gun platforms. The four remaining ammunition boxes are positioned with two each built into the wall behind each of the two gun platforms. At these two emplacements were mounted 12-pounder Quick Firing Guns (Cooke 2000: 116)

Behind the gun platforms is a set of stairs beginning at the southern end of the battery and descending north into a series of three or four small underground rooms. The concrete partitioning wall dividing two of the rooms has partly fallen (Hamel 1994: 3). There are several pieces of graffiti on the walls in these rooms reading: "13th Heavy Regiment, 18th Heavy Battery, 1941 1942 82nd Heavy Battery, Gnr E M Dags 12th April 1943, Gnr E Perry WAAC Taiaroa Head 25/9/43" as well as numerous 1930s dates (*ibid*). Immediately north of the battery is a ramp which has been cut into the cliffs and descends down towards the sea. Hamel (*ibid*) argues that while this may have been to improve line of sight for the guns, a suggestion which is congruent with Cooke's observations (2000: 117), the flat nature of the ramp suggests that supplies were likely hoisted from a boat below the ramp and then pulled up the ramp on a sledge. The top end of the ramp has been disturbed by the battery, suggesting that the ramp was constructed at an earlier date.

Defence maps of Fort Taiaroa, drawn in 1917 show an absence of Howlett Point Battery at that date (Hamel 1994: 1). This however contradicts Cooke's (2000: 116- 117) account, which

describes the battery as having been built in 1885, with further installations added in 1914. It is likely that the earlier emplacement referred to by Cooke is actually the Garage Battery described by Hamel (1994: 1- 4) as being slightly to the east of Howlett Point Battery, situated at a higher altitude. This would be supported by Cooke's (2000: 116) descriptions, which detail the 1885 emplacement as being 134ft above sea level (ASL), while the 1914 additions were located 104ft ASL. However, this still doesn't explain the absence of any part of the Howlett Point Battery from 1917 defence maps. It is possible that field survey for the 1917 defence plans was conducted prior to 1914, explaining the absence of this battery from the plans. Directly north of the Howlett Point Battery emplacements are two concrete pads 7m by 8m, and 3m by 4m. While Hamel (1994: 4) suggests these were both searchlight posts, Cooke's (2000: 117) research shows that one of these was a searchlight post (the only searchlight placed at Taiaroa Head), while the second pad was an engine room built to power the light. These were constructed in 1944, explaining their absence from the 1917 defence plans (*ibid*).

The structure described by Hamel (1994: 4) as the Garage Battery (named because of its garage-like doors) is likely the 1885 stage of construction Cooke (2000: 116- 117) refers to as being part of Howlett Point Battery (Figure 2.). It features a large underground room, possibly used as a stable for horses, as well as a gun emplacement, possibly the 64-pound RML gun referred to by Cooke (*ibid*). Hamel (1994: 4) describes the emplacement as being 'sunken' and thus not requiring a parapet. A long, concrete passage descends east into an underground room 3.7m by 5.8m, from which concrete steps lead up to an observation post and parapet. This also has a small ammunition box which suggests that this also doubled as a machine gun post (*ibid*).

CHANNEL BATTERY

Just inside the western end of the large stone parapet demarcating the southern extent of the fortifications, is the Channel Battery, and old stable (Figure 2. and 3.). These structures are the most susceptible to deterioration, having been badly damaged by bulldozing and deliberate demolition with explosives by the Army in the 1950s (Hamel 1994: 2; Cooke 2000: 117). The Channel

Battery was constructed hurriedly during the 1885 scare in order to cover the inner harbour-mouth channel (Cooke 2000: 117). As Cooke describes, two 64-pound RML guns were mounted 84ft apart with a magazine complex constructed between the two emplacements, while a brick structure was added at a later date providing accommodation for fifteen men (*ibid*). Presently, as Hamel (1994: 2) notes, damage has made comparison with earlier plans problematic. A doorway to Channel Battery's underground room has the date 1895 above the door. The underground rooms are still relatively intact. The walls of these rooms are constructed of wooden beams with plastered concrete panels in between, while the roofs, with the exception of one wooden roof, are made of the same materials as the walls. One brick partition wall is still in place internally, and a shaft drops from above ground into the central passage underground. This would have been used either for moving ammunition or for communication (*ibid*). Located by Channel Battery, the old stable is a concrete structure 26m long, with two side rooms measuring 5.5m by 4.0m, and 6.4m by 4.0m. A passage on the western side consists of a room measuring 6.5m by 4.0m and a passage 1.2m wide and 4.0m long (*ibid*).

Approximately 50m north of Channel Battery is an observation post built to cover this battery. As with the Howlett Point Battery, an ammunition niche, covered with two metal doors suggests this feature was also used as a machine gun post (Hamel 1994: 2). The post is covered to the west by a 0.46m thick parapet which is 1.16m high. Interestingly, Hamel notes the presence of a curved trough in the floor, 1.3m long and 0.70m deep which extends around the edge facing the harbour, although she appears unsure as to the function of this trough. This has a 9m passageway leading into it from the east (*ibid*). Ceramic piping is placed to prevent water build up behind the parapet.

SADDLE BATTERY

Saddle Battery is located at the south-eastern end of the site, and covers the site from north to east (Figure 2. and 3.). The battery features a central gun emplacement mounted on a raised concrete platform approximately 5.75m long by 5m wide (Hamel 1994: 12). Three concrete stairs

lead up to the platform from the rear. Here a 7-inch 7-ton RML gun was mounted at 121ft ASL (Cooke 2000: 118; Figure 5.).

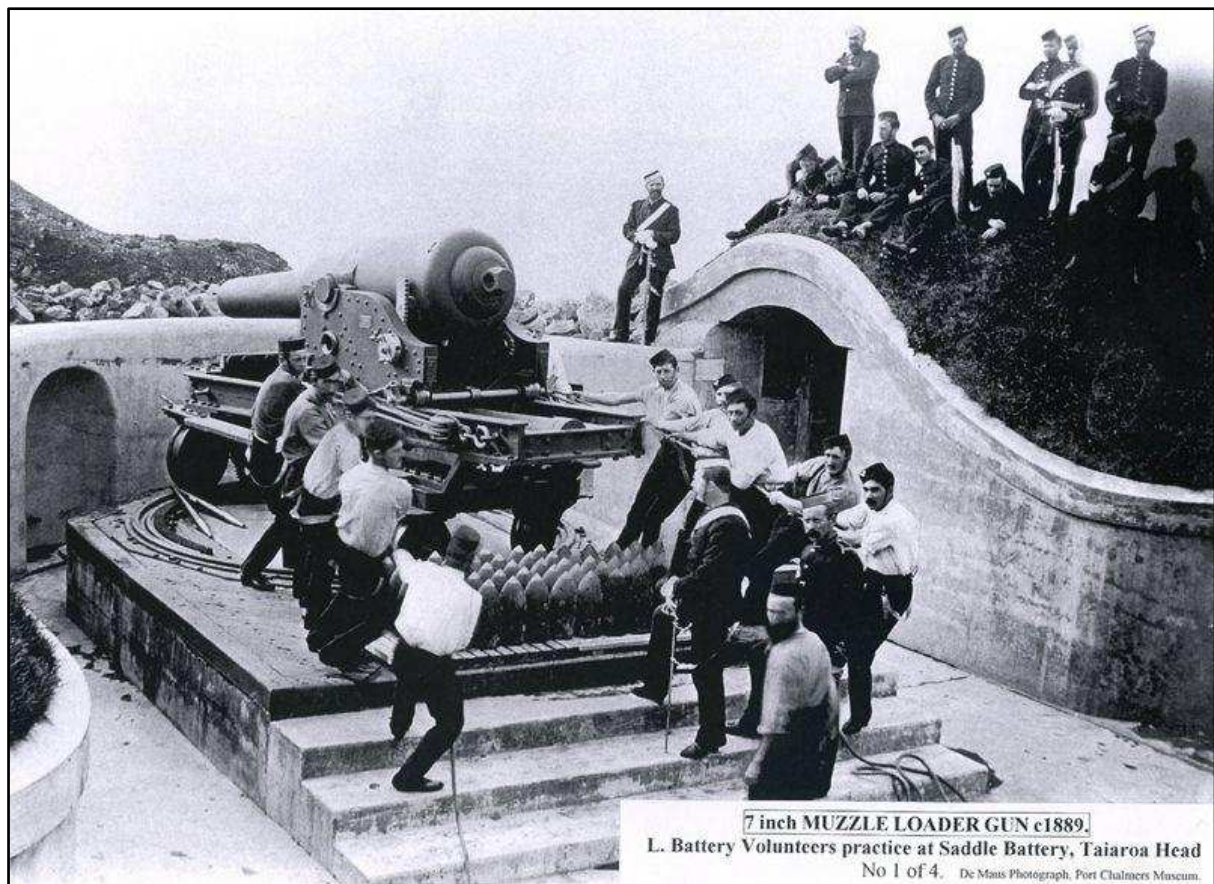


Figure 5. Photograph of L. Battery Volunteers practicing with 7-inch RML gun at Saddle Battery, c. 1889. (De Maus Gallery, Port Chalmers Museum).

A concrete parapet approximately 9m in length covered the front of the emplacement. A doorway directly to the east of the emplacement leads into an ammunition room measuring approximately 5m by 2m. To the west of the emplacement a passage leads into a series of small rooms, two of which were further ammunition rooms. This series of rooms had a tramway track and an overhead rail for carrying ammunition (Hamel 1994: 12; Cooke 2000: 118). An observation post was located above this gallery and was accessible via a ladder from underground. A trench runs south-east from the battery to the southern stone parapet, allowing for soldiers to move between Saddle and Channel Batteries under cover. Established in 1888, by 1891 officials considered this battery to be ill-placed and serving "no effective purpose" (Cooke 2000: 118), although the gun remained mounted and operational until 1910.

ASSOCIATED FEATURES

While not part of the fortified landscape of the site, there are several more archaeological features associated with 19th and 20th century military occupation at Taiaroa Head. In 1896, a 300 foot rubble jetty (J44/148) was built using prison labour in Pilots Bay, at the south-western end of the site, with an 1880s tramline (J44/71) used to bring supplies from the jetty uphill to Fort Taiaroa (Bell 1888a: 1- 13; Hamel 2012: 1). A report by Resident Defence Engineer Arthur Bell discusses the use of approximately 8 prisoners for labour during construction of the landing place at Pilots Beach (Bell 1888a: 1- 13). The jetty is built of well cut and trimmed basalt blocks (Figure 6.).



Figure 6. Stone jetty showing basalt blocks, and fur seal in foreground (Photo courtesy of Jill Hamel).

The stones are graded with the larger stones at the bottom (Hamel 1994: 2). The wall is about 2 metres high in most sections. Originally the jetty was paved with large stone slabs, although many of the slabs have now moved or been damaged due to forces placed upon them from waves and the tidal movement of the harbour (J44/148), with the most severe damage occurring at the

western end of the jetty, furthest from Pilots Bay. At the western end of the jetty is a round structure one metre high and 2.5 metres across. It has an unusual pattern of bolts set in it. A square concrete pad with sides of two metres sits near the round structure (Hamel 1994: 2). Research by Hamel (2012) examined the tramline in further detail, also detailing World War II era storm water drains and pumps. Archaeologically, much of the tramline is still evident in the form of a trench running from Pilots Bay uphill towards the fort. Remains above Harington Point road, as well as a ditch and wire at the bottom of the hill indicate the tramline ran uphill at a slope of 11° (*ibid*: 1). As Hamel (*ibid*: 12) discusses, the tramline is largely absent from historic reports and dating the installation of the line can only be estimated from the dates of other structures. With the earliest guns in place by 1885, Hamel surmises that the tramline was likely in place by at least 1884, and that the first item winched up (by hand) would have been the steam engine installed on the tramline for hauling goods uphill (*ibid*).

A larger trench, visible in a photograph taken around 1900 shows that storm water exited the fort through a hole in the parapet wall, running downhill parallel with the tramline for approximately 50m before entering a culvert angled towards the sea (*ibid*: 5- 7), while effluent was dealt with in a similar manner after passing through septic tanks (Fort Taiaroa Archive FT00/207 n.d.: 511- 512). In the 1880s water was supplied via wells which were drilled 4.5m underground on the slopes above Pilots Bay (*ibid*: 7), although these were difficult to maintain (New Zealand Defence Department 1888). However, by the Second World War water was being pumped to Fort Taiaroa from four springs at Harington Point, on the hill above the roadblock with a 4750 gallon tank in place at this location, and from two springs near the Rerewahine Battery, along with several other springs (Hamel 2012: 7). In addition to this, saltwater was pumped up to Fort Taiaroa from Pilots Bay for use in the latrines, ablution blocks and for fire fighting (*ibid*). Evidence for this still remains in the form of three large water tanks located on the slope about half-way along the tramline, along with the foundations of the pumping station beside them (Figure 7.), while two tanks remain within the confines of the

Royal Albatross Centre facilities, one behind the current visitor centre marked 3750 gallons, and the other a much larger 35000 gallon reservoir further north.



Figure 7. Water tanks and foundations of water pump house. Fort Taiaroa (Photo courtesy of Jill Hamel).

At the southern end of the site, directly north of the large stone parapet is the current visitor centre. Directly north of this are a series of 19th century house terraces (Hamel 1994; 2009). Excavations carried out in 2009 behind the visitor centre revealed areas of 19th century paving, as well as ceramic fragments dating to the same period (Hamel 2009: 1-3). Hamel compared the evidence against historic photographs, showing that the materials came from areas occupied by both the 19th century village and Defence housing (*ibid*). A barracks building once stood on the area where the visitor centre now resides, though it is unknown whether there are subsurface archaeological remains beneath the visitor centre (Hamel 1994: 23). A camp was established in 1941 on the flat area above the shoreline in Pilots Bay, occupied by the 82nd Heavy Battery of the New Zealand Army (Fort Record Book n.d.: 45). While no remains of this camp are left above the surface, it is unclear whether subsurface archaeological remains are present. Power for electric lighting and heating was supplied to Fort Taiaroa, Harington Point Battery and Rerewahine Battery from a small power station situated roughly halfway between Fort Taiaroa and Rerewahine Battery.

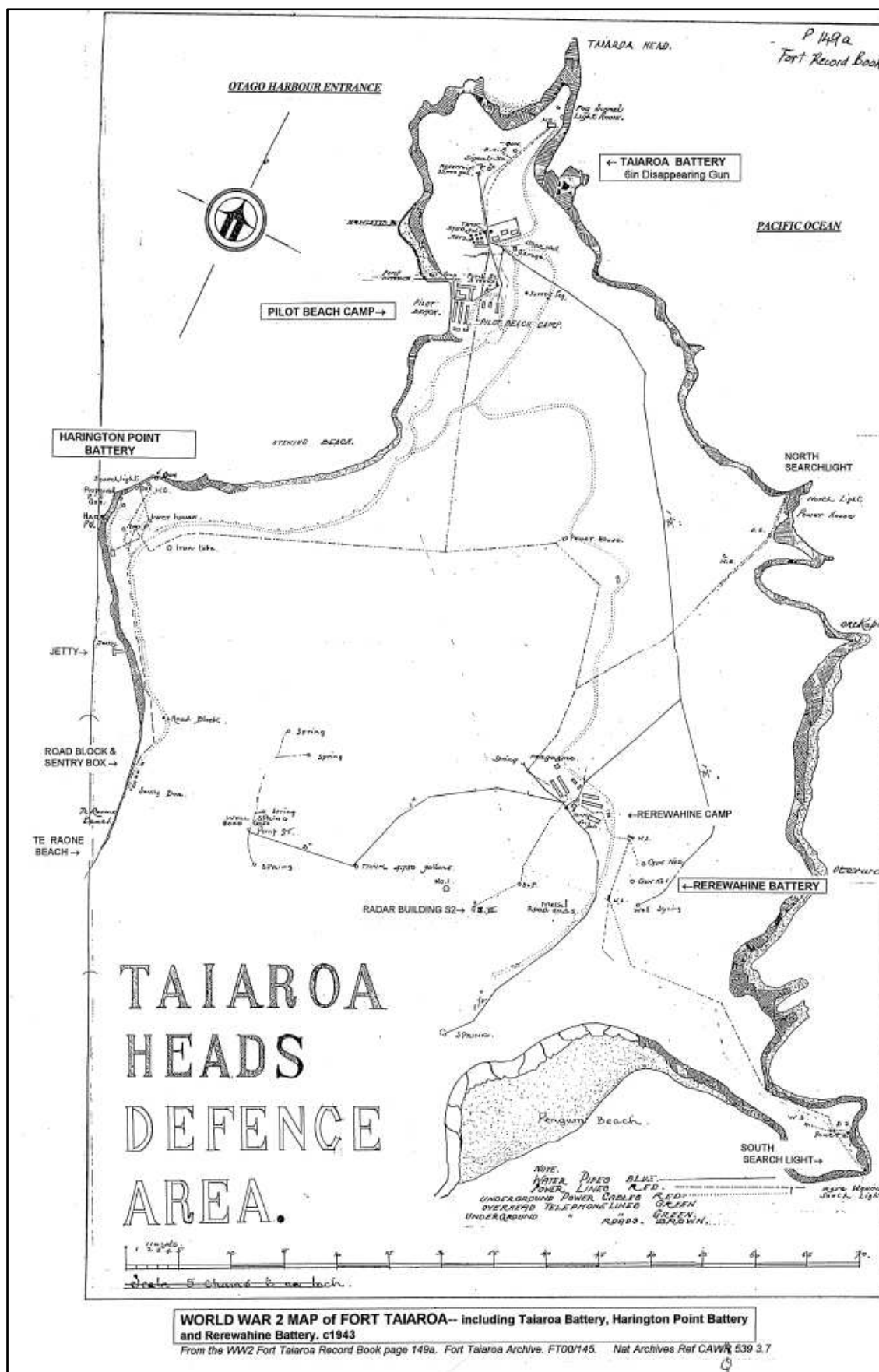


Figure 8. World War II Map of Fort Tairaroa also showing Harington Point Battery and Rerewahine Battery. From Fort Record Book (courtesy of Laurie Stewart, Otago Peninsula Trust).

4.2. HARINGTON POINT BATTERY

Harington Point Battery (J44/155), named after the secretary of the New Zealand Company, T. C. Harington, is located on the Otago Peninsula, just inside the entrance to the Otago Harbour (McCluskey 1995: 144). Fort Taiaroa is directly to the north, Rerewahine Battery is approximately 1km east, while on the opposite side of the harbour to the west is the Aramoana mole (Figure 8.). Its location provides 180° coverage north to the harbour entrance (also covered by Fort Taiaroa), across to Aramoana and south up the harbour channel. The natural landscape of the peninsula on the eastern side of the harbour, combined with both the Aramoana mole, a manmade spit, and the natural dunes at Aramoana on the western side of the harbour create a funnelled harbour entrance. The defences at both Fort Taiaroa and Harington Point are therefore well placed strategically and would have provided thorough coverage of the whole harbour entrance. While consisting of only a small number of structures, the military complex located at the site is distributed across quite a large land area. The distribution of archaeological remains are divided into two primary levels, one situated on the hillside, just below Harington Point Road, while the other level is situated at the foot of the hill, just above the high tide level of the harbour. The terrain coverage is primarily grass and tussock, while there is extensive gorse coverage over much of the site. Remains at the site were constructed over a period of time, beginning in 1891, with additional installations in the first decade of the twentieth century (Cooke 2000: 84). The final military developments at Harington Point took place during World War II. Graffiti is widespread across the concrete structures at the site.

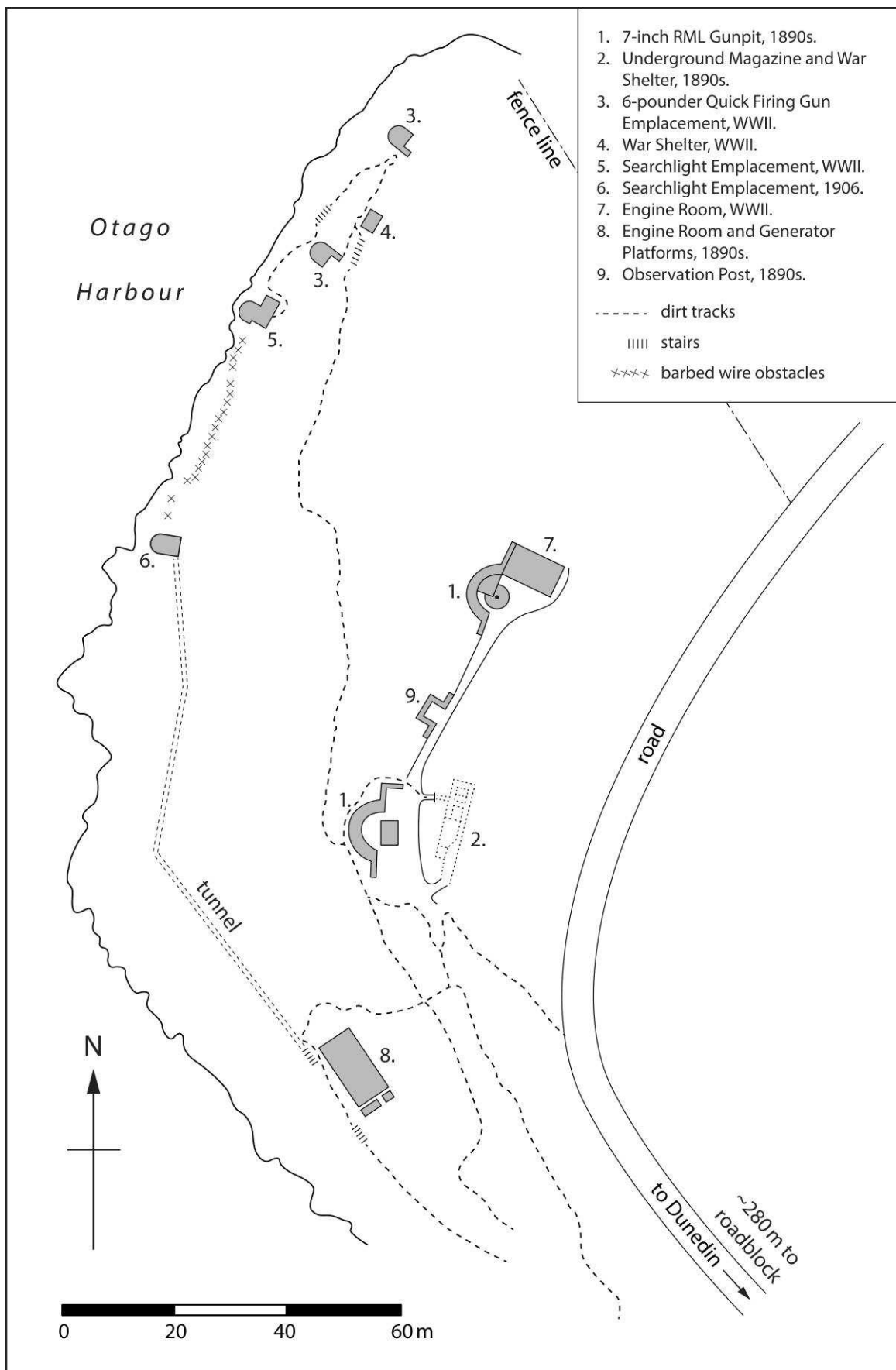


Figure 9. Map of Harington Point. Scahill 2013.

ROADBLOCK

Before reaching Harington Point there is an associated roadblock several hundred metres down the Harington Point Road, towards Dunedin. The roadblock is comprised of two large rectangular concrete blocks, one on either side of the road, and two large cylindrical concrete blocks. These cylindrical blocks are located on the hillside edge of the road, and in the event of use would have been rolled across the road to block off the road between the two rectangular blocks. With steep cliffs on both sides of the road, this roadblock would have provided a solid obstacle for any opposing forces, requiring opposition to alternatively come up over the steep hill, or traverse a much longer and more open route along the hilltops. These alternatives would be much less effective strategically for the enemy, and as such, the roadblock would have been highly effective.

UPPER LEVEL

The upper level of the site consists of two 7-inch gun emplacements, two engine rooms (of which the original has a tunnel leading down to the lower level), an observation post, along with a magazine and war shelter. All these structures, with the exception of the northern engine room structure which is World War II era, date to the 1890s (Stewart 2008) (Figure 9.). With the exception of the magazine and war shelter, which have been built into the hillside, the buildings on this level are all above the ground surface. All structures on the upper level are situated at the same height above sea level except for the southernmost structure, the original engine room, which is located approximately 10 - 15 metres down the hillside. The remaining structures, while not all connected to each other, are all situated in a trench which has been dug into the hillside. There are several sections of concrete walling along the trench, although these extend only from the concrete structures and do not continue the entire length of the trench. Presently, the trench is almost entirely overgrown with gorse, with the only gorse-free areas around the concrete structures, and the dirt path which leads down from the road, used by fishermen and divers to access the shoreline.

The northernmost structure at this level is an engine room. This is a large rectangular concrete structure measuring 9.5m long by 5.5m wide (Figure 10.). Located inside the trench which

runs the length of the structures, only the top one metre of the building is above the natural surface level of the hillside. The building has been constructed using cement mixed with an aggregate of small stones approximately 0.5- 2cm in size. Horizontal seams varying from 10- 20cm apart indicate that construction was completed by pouring each concrete layer once the previous layer had set. On the roof of the structure there are three vents, set at equal distances apart running down the centreline of the roof. Two of these have square concrete boxes about fifty centimetres high, with small holes on each side for ventilation. The cement in these boxes has been mixed with a much coarser aggregate with stones between 2- 5cm. Portions of the concrete on these boxes has broken away, and small metal chimneys are visible underneath the concrete. The third vent has had the concrete box removed and is now just a square hole in the roof. On the northern wall of the structure there are also three ventilation units near the top of the wall. On the southern facing wall in the centre is a large doorway 2.15m high and 1.90m wide. The wooden doorway frame is still in place. To the left of this, when facing into the building are two window frames 1.10m high and 0.75m wide. These begin at the ceiling and extend down. To the right of the doorway are four window frames, each measuring 0.55m high and 0.90m wide. Two of these are at ground level, while the other two are directly above at ceiling level. The wooden frames on all but one of the windows are still in place. Beside the door and all the windows, metal hinges and latches indicate where the door and window covers were once attached.



Figure 10. World War II Engine Room at Harington Point, complete with budding archaeologist.

The inside of the engine room has a concrete floor, with five raised concrete platforms ranging in size from 2.15m by 0.80m, to 1.15m by 0.60m. Each one of these raised platforms has metal bolts in each corner, which would have been used for securing generators and machinery to the floor. The northern and western interior walls both have large cubic units built into the wall, presumably for storage of ammunition. These both measure 1.2m high by 1.2m wide by 1.2m deep. At the entrance they have wooden frames. The box on the western wall still has door hinges screwed into the wooden frame, while marks in the wooden frame of the other box show where the hinges used to be. Inside each box there are three holes on each side of the wall with metal bolts in each hole, indicating some sort of shelving system was once in place. The roof of the box in the western wall has broken away to reveal three metal beams embedded into the concrete, used as a strengthening mechanism.

Directly beside the northern engine room are the structural remains of a 7-inch Rifled Muzzle Loader (RML) gun emplacement. This consists of a rounded concrete wall, and half-hemisphere shaped building 2.9m long by 4.0m wide. The building is a single room and has several small boxes built into the wall at ground level. Approximately 1m above ground level there are boxes built into the wall 0.3m high and 0.15m wide, and spaced approximately 1.5m apart. As the rounded wall continues past the building these boxes continue in the exterior wall. Each of these small boxes has a single large chain link fixed into the concrete. These were likely used as additional braces for the emplaced gun. On the exterior of the building on the eastern side is a circular raised concrete platform approximately one metre high. This has pieces of railway iron protruding from the broken edges, evidence of strengthening. In the centre of this raised platform is a large circular metal platform 0.50m wide and 0.60m high. This is the base of where the 7-inch gun would have been placed (Figure 11.). Across the western side of both the engine room and the gun emplacement at surface level runs a flat concrete lip, which connects the two structures.



Figure 11. 1890s 7-inch RML Gun Emplacement at Harington Point.

To the south of this northern emplacement is a small observation post. This is simply a rectangular concrete 'pit', built into the side of the dugout trench. It measures 2.8m long by 3.6m wide. In each of the four corners, metal rods protrude from the concrete wall. It is likely that these rods were used to support some sort of non-permanent roofing structure.

Directly south of the observation post is the entrance to the magazine and war shelter, and the second 7-inch gun emplacement. The second gun emplacement consists of a large semi-circular concrete wall with a diameter of 6.10m. From inside the trench the wall is approximately 1.3m high, while the exterior is at surface level. Similarly to the northern emplacement, a flat concrete lip runs the length of the wall. Within the trench behind the circular wall is a rectangular concrete pad, which has largely been broken away. The platform is 4.10m wide, but due to deterioration the length is indeterminate. This would have been the platform upon which the gun was installed. Broken pieces of the concrete in this emplacement wall reveal that the construction material here is concrete mixed a larger aggregate of stones 5- 10cm in size. The surface of the concrete work here, and also the concrete lip at the northern 7-inch emplacement, and the magazine entrance appears much smoother. While the core of the concrete structures has been made using a mix of stones and cement, the cores have been covered with an external layer of much finer concrete, most likely using cement with no stone inclusions. This appears to have simply been an aesthetic measure to give the buildings a smoother, finished look.

The magazine and war shelter has two entrances, one directly behind the gun emplacement, and one on the southern facing hillside. The entrance behind the emplacement consists of a concrete frame, which extends around and into a concrete wall along the trench wall. Heading inside the entrance is a long, narrow corridor leading under the hillside. At the end of this, an opening on the left-hand side leads into a short corridor, off which three small equal-sized rooms are situated. Halfway up the entrance corridor on the right-hand side is another short corridor which leads into a single small room, similar in size to the three on the left. At the far end of the entrance corridor to the right the corridor opens into a larger, wide corridor which heads south to the southern magazine

entrance. When facing south down this corridor there is a large room to the right. This room has doorways at both the northern and southern end of this corridor. Unlike all the previous rooms which are built on a single level, this large room is built slightly lower, with a single step leading down into the room. This underground structure served as a magazine for storage of ammunition, accommodation and living quarters for up to twenty soldiers, as well as a war shelter for during times of conflict (Cooke 2000: 84).



Figure 12. 1890s Engine Room. Facade has partially deteriorated, revealing concrete construction underneath.

Located on the southern facing part of the hillside, built slightly below the other structures is the original engine room (Figure 12.). This has been built against the hillside, with the facade of the building facing south. The building is 12.9 long by 6.5m wide. It has been constructed in largely the same fashion as the other structures at the top level. Made of concrete with a coarse aggregate 5-10cm in size mixed with cement. As with the other buildings horizontal seams indicate that the building was constructed in small levels. The southern facing wall of the building contains two doors,

one measuring 1.90m high by 1.10m wide placed at the western end of the wall, while the other is placed in the centre of the wall and measures 2.4m high by 2.0m wide. There are also three windows in the wall measuring 1.80m high by 0.90m wide. The windows and doors all have wooden frames. Unlike any of the other structures at the site however, the facade of this building has been concreted over with a thin layer of cement which has been scored horizontally and vertically at regular intervals, giving the impression that the building has been constructed of large stone blocks rather than concrete. Much of this layer has broken away, revealing the true nature of construction underneath (Figure 12.). Also visible from the exterior of the facade is the division between the top of the structure walls, and the roof, between which is a layer of asphalt. On top of the roof is a large cylindrical container, perhaps once used for water storage.

Inside the structure, the ceiling is concrete, with metal beams roughly 5cm wide running the from north to south. These beams are spaced roughly 30cm apart and continue the whole length of the building. It is likely that the roofing concrete was poured into sections with the metal beams before being placed on top of the walls and secured using the asphalt layer. Inside the engine room the floor is concrete, but in places has broken away, revealing a second layer of concrete with wooden panels. In the centre of the room is a raised concrete platform 2.50m long by 1.10m wide with metal bolts in each corner. Similarly to the northern engine room, there are three ventilation holes in the ceiling at regular intervals. The internal walls at the western end of the building have decayed a lot, revealing the coarse aggregate underneath the smooth concrete exterior. Not visible where the smooth exterior still remains, in this decayed section there are the exposed ends of wooden beams in the walls, spaced roughly 40- 50cm apart horizontally. The top row of these is just below roof level, and there are further rows directly underneath at intervals of roughly one metre. Interestingly, this same end of the building is where the concrete floors have broken away to reveal the wooden panels underneath. From the way the southern facade is open, the western end of the building would be more exposed to harsh southerly weather conditions, possibly explaining the greater deterioration seen in the western end of the building. In the centre of the eastern wall at

roof height, there is a large pipe coming in from the exterior, which extends toward the centre of the room, stopping and curving downward above the eastern end of the raised concrete platform in the floor. It is likely that this pipe was associated with the generator or machinery which was situated on the platform. Also situated in the roof above the raised platform are four large single chain links, probably used as addition points to secure the machinery in place below.

Outside the building beside the eastern wall there are two more large raised platforms about 0.60m high, one of which is roughly 1.50m by 1.50m while the other is roughly 1.50m by 2.50m. Following the trench eastward from the facade of the building there is a small set of nine stairs leading upward before the trench continues eastward. At the western end of the building the trench descends down a set of fifteen stairs, leading into a tunnel. The tunnel leads from this level down to the 1890s searchlight post just above sea level. Above the tunnel entrance are several small holes, above which the date '1906' has been written on the wall using plaster. The first two holes are square, with approximately 10cm sides and are about 10cm deep. The third hole is similar in size, but circular, and this hole extends through to the inside of the tunnel, where it connects with the wooden wiring housing leading down the tunnel. This wiring housing is the same style as that used in the other buildings, and runs down the tunnel ceiling. The entrance way to the tunnel has a wooden frame, and etched into the woodwork is graffiti reading 'R. Powley 1906'. The tunnel walls are constructed of concrete, and similarly to elsewhere appear to use a coarse aggregate covered by a smoother exterior layer.

LOWER LEVEL

The lower level of the Harington Point complex is situated on the shoreline, just above the high tide mark. This level comprises five building structures, two sets of stairs, and some concrete walls. These structures consist of two searchlight posts, a war shelter, and two 6-pounder Quick Firing Guns, as well as an observation post built into the concrete wall opposite the war shelter (Figure 9.). The southern searchlight building, which is connected via the tunnel to the southern upper level engine room, dates to the 1890s, while all remaining structures at the lower level are

World War II era (Cooke 2000: 84; Stewart 2008). The Second World War structures were constructed with the use of both prison labour and by staff from the Public Works Department (Bell 1888: 1- 13; Fort Tairaroa Archive FT00/207 n.d.: 511- 512).

The oldest structure at this level is the southernmost searchlight post, completed in 1906 (Fort Record Book n.d.: 17). In 1941, searchlight emplacement was installed with three railway locomotive headlights, which were powered by six volt batteries (Fort Record Book n.d.: 17). However these were not installed long before being upgraded in 1942 to Coastal Artillery Lamps with 90cm 3° dispersal projectors, powered by a Ford V8 engine coupled with a Holmes D.C. generator (*ibid*). This structure is located on the rocky cliffs overlooking the shoreline (Figure 13.). As with the other structures at the complex this searchlight post, measuring 5.8m long by 4.1m wide, is constructed from concrete with a coarse aggregate 5- 10cm in size, covered in a smoother exterior layer. Much of the exterior layer has broken away, exposing the core aggregate material. The floor of this structure is concrete, but is now covered with a thick layer of mud washed downhill through the tunnel. Externally, the roof has been covered with a layer of asphalt about 2cm thick. Unlike the engine room which had this material as a layer between the roof and walls, the searchlight structure has the layer spread across the rooftop. Near the western end of the building there is a small ventilation hole. On the north-eastern corner of the building the concrete has been broken away in several places, creating several small holes which pass through the entire thickness of the wall.



Figure 13. 1906 Searchlight Post at Harington Point.

Internally the walls of this structure exhibit the same horizontal seams evident on the northern engine room and gun emplacement at the upper level. The ceiling is strengthened differently from the other buildings at the site. Like the 1880s engine room, the concrete in the ceiling of this searchlight post is strengthened by using metal beams roughly 5cm wide. In the eastern half of the building these beams are spaced similarly to the engine room, approximately 30cm apart, running widthways across the structure. However, on the western half of the structure there is a much higher incidence of these beams, with a divide of only 3 - 4cm, and the beams run perpendicular to those on the eastern half of the structure. Near the western end of the structure there are also two thick railway sleepers concreted in to support the roof. On the northern wall, near the western end there are the partially legible remains of some original communications instructions painted on the wall, though graffiti has meant the sign cannot be fully read (Figure 14.). Beside this is a small box built into the wall, presumably some sort of storage. At the south-eastern end of the

structure the tunnel branches off to the south, heading uphill toward the engine room. A wooden frame with hinges still present indicates the tunnel was once sealable with a door.



Figure 14. 1906 Searchlight Post communications instructions partially legible on wall.

The second searchlight post, the next most southern structure on the lower level is considerably different to the older searchlight, likely due to the 37 year gap in construction, with this emplacement built in 1943 (Fort Record Book n.d.: 17) (Figure 15.). The two searchlight posts are separated by a short length of rocky cliff above the shoreline. Coils of rusted barbed wire are also spread between the two posts. Facing west toward the harbour, this structure is made of similar

materials to the other structures at the site. The building measures 6.15m long, at the front is 4.15m wide, and at the rear is 5.15m wide. This extra width accounts for the entry room discussed below. At the western end of this searchlight post, the roof concrete overhangs slightly to create a sort of lip. Inside of this there is a semi-circular concrete wall roughly 1m high with a metal rim. There is a corresponding metal rim attached to the ceiling with what appears to be a metal track. At each end of this, where the semi-circle wall joins with the rectangular building, attached to the wall are the remnants of large metal shutters on hinges. It is likely that at the time of use these metal shutters would have extended around the semi-circle to close in the building, with the shutter able to slide open along the metal tracks installed in the ceiling. Running from the rear of the room (eastern end) to the front down the centre is a track cut onto the concrete, possibly used to slide the searchlight back and forth. There is a smaller square room built at the north eastern end of the structure, and entry to the building is via the rear end. The roof of this structure appears to have been made in a single large slab, with no evident seams like those exhibited in other structures.



Figure 15. World War II Searchlight Post at Harington Point.

There are two Quick Firing Gun emplacements on the lower level (Cooke 2000: 84). In February 1941 these were mounted with two 15-pound Quick Firing guns (Fort Record Book n.d.: 45). Deemed obsolete, the placement of these guns was short-lived and after a matter of only about nine months these were removed and replaced with two 6-pound Nordenfelt Quick Firing guns (*ibid*; Cooke 2000: 84), while the 15-pounders were sent to Central Battery (Fort Record Book n.d.: 33). These emplacements were built in order to provide counter-attack against small hostile vessels moving through the narrow harbour entrance (*ibid*.: 7), and covered a range from 210° extreme left to 010° right (*ibid*: 16). The right side of the arc faced directly towards Fort Taiaroa. These two structures have been made like the other structures at the site, with coarse aggregated concrete. The difference between these two buildings and the others lies in the roof construction. The roofs of these two structures are comprised of six concrete panels 0.60m wide running east to west. Each of the panels has a large metal bolt protruding at both the western and eastern end. Both the walls and roofs of these structures have been strengthened by using 1cm thick metal rods, which have been set in a woven fashion inside the concrete, and are only visible now due to decay. The two Quick Firing emplacements both have small boxes built into their rear walls. These measure 1.05m wide, 0.90m high, and 0.90m deep, and closely resemble the two square boxes found in the northern World War II era engine room in the upper level. These recesses were used for the storage of ammunition (Fort Taiaroa Archive FT00/207 n.d.: 511- 512). Hamel (1994: 3) describes similar features within Howlett Point Battery at Fort Taiaroa, and also speculates that those were likely for the storage of ammunition. The two buildings are similar in size. Both structures measure 3.5m long by 3.65m wide. However, the northern structure has a small entry way at the rear in the southern corner, while the southern structure has its entrance in the rear in the northern corner.



Figure 16. Harington Point lower level. Northern QF gun emplacement is visible in background, while corner of southern QF emplacement is visible in bottom left corner of photo. The war shelter is visible in between the two QF emplacements.

Between the two Quick Firing emplacements are the remaining structures (Figure 16.). Just south of the northern Quick Firing emplacement is a set of 10 stairs, which descend to the shoreline rocks, and enable access to the northernmost searchlight post. There is a trench built between the two Quick Firing emplacements. The western wall of this has been built into a concrete wall, with a small rectangular observation post built into the wall. Opposite the observation post is the last structure at the site, a small, single roomed structure built as a war shelter. This structure is very basic, measuring 3.95m long and 2.7m wide, with a small southern facing window, and roof complete with a small ventilation hole. Directly to the north of this there is a set of 17 stairs ascending to the south. At the top of these stairs a poorly defined dirt track continues up the hill towards the upper level, and further on up to Harington Point Road. This track is now used by fishermen and divers accessing the shoreline. It is unclear whether this same track was used during the military occupation

of the site, although the stairs ascending from the lower level indicate that there was some connection leading from here to the upper level.

4.3. TOMAHAWK BATTERY

Tomahawk Battery, also known as St. Kilda Battery, is located near the base of the Otago Peninsula on Dunedin's south coast. The two emplacements, which once housed two 6-inch Mark VII guns, are placed on a small rocky outcrop separating Tomahawk Beach on the west and Smaills Beach on the east (Fort Record Book n.d.), while the observation post, magazine, and battery camp were located slightly to the north-east (Figure 17.). The Southern Military Command (SMC) and Public Works Department (PWD) began construction on the emplacements in May 1942 in order to cover Dunedin's docks from offshore bombardment from the south (Joyce 1995: 1; Cooke 2000: 498), and were completed during September that year. The guns were mounted in October, but Cooke (2000: 498) notes that the battery never became fully operational. One gun was fully mounted and test fired, though according to the records, incomplete equipment meant the second gun was never tested (Joyce 1995: 4). The second, incomplete gun was removed soon after and replaced with a similar gun which was transferred to Tomahawk from Bluff (Cooke 2000: 498). The guns covered a range from 095° and 258° right (Joyce 1995: 2). Camouflaging was carried out by the PWD, with the western emplacement camouflaged to look like a beach cottage, while the eastern emplacement was made to look like a shed. Both emplacements were fitted with false fronts, through which the gun barrels protruded (Fort Record Book n.d.: 9; Joyce 1995: 1- 2; Cooke 2000: 498).

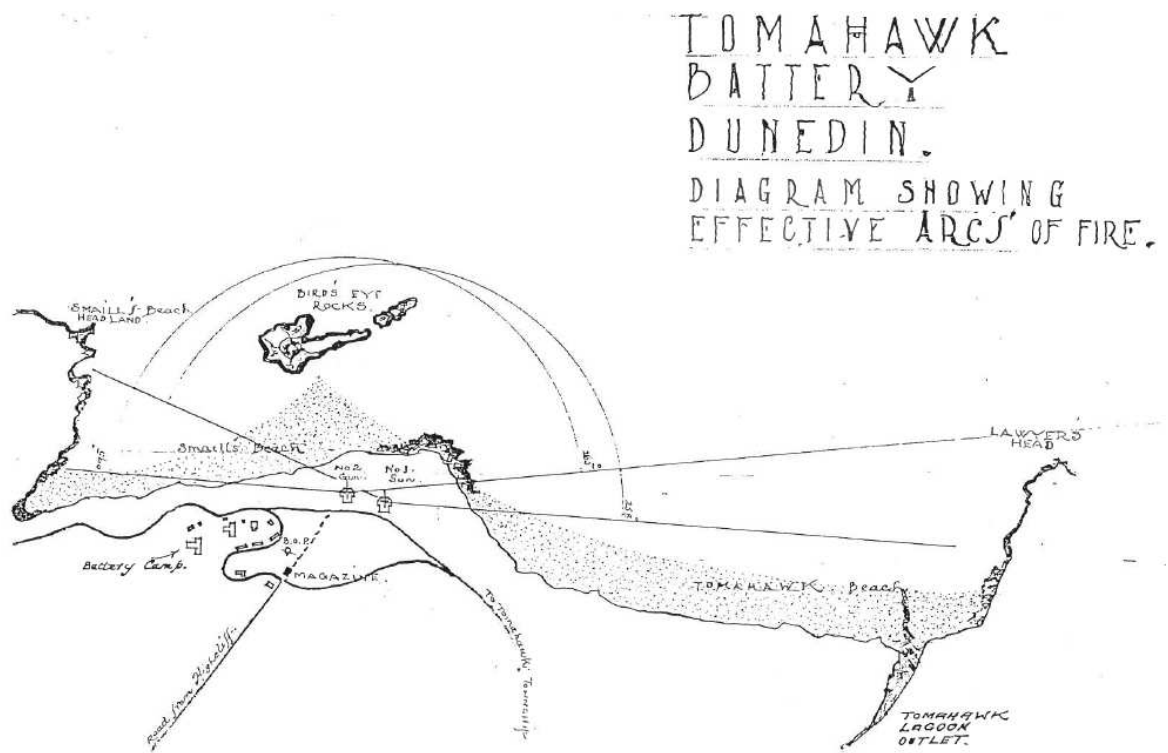


Figure 17. World War II plan of Tomahawk Battery. Fort Taiaroa Record Book (courtesy of Laurie Stewart, Otago Peninsula Trust).

The emplacements were of the Colchester pattern, complete with overhead covers and internal magazines (Fort Record Book n.d.: 9; Joyce 1995: 1- 2; Cooke 2000: 498). The two emplacements are southern facing, and measure approximately twelve metres in length from front to back. At the front end of the emplacement the structures are about ten metres wide, while they are narrower at the rear, measuring roughly eight metres in width. The front, wider half of the structures are where the guns were mounted, while the narrower rear sections house internal rooms and magazines. The wider sections are open at the front, with a large concrete canopy covering the gun mounting platform (Figure 18.). These canopies are made of thick slabs of concrete, and have each have two concrete support beams approximately 30 - 40cm thick running from the back to the front. Small areas of concrete in the canopy have deteriorated, revealing metal bars set into the concrete for strengthening. The eastern structure has a concrete floor, with the gun platform centrally placed, while the second structure is the same with the exception of a large gravel build up on the concrete floor surrounding the mounting platform. The mounting platforms are slightly raised circular concrete platforms with a diameter of 1.60m. On top of these are set two round metal

mountings 1.05m in diameter, set into the concrete. In the rear section of the structures were internal magazines, accessible through a wide doorway at the rear of the canopied area. The doorways into these rooms have large metal doors. In July 1945 both guns were removed from their mountings, the magazines were emptied, and the internal rooms of the emplacements were permanently sealed (Joyce 1995: 3; Cooke 2000: 498).



Figure 18. Tomahawk 6-inch Gun Emplacement. Minimal deterioration can be seen in upper left section of canopy with metal reinforcement revealed from within the concrete.

The Battery observation post is located approximately 120m north-east of the two 6-inch emplacements. Located above the emplacements, the observation post has been partially buried within the hill (Figure 19.). Entering from the north a 1.2m wide passageway leads 18m into the hillside, with a slight bend to the east 15m down the passageway. At the end of the passageway, a door on the right-hand side leads into a small 1.45m by 1.45m opening, before opening into the main observation room. The main room faces south and measures 4.6m wide by 3.05m long. At

approximately eye level, there is a long narrow window for observation. This opening extends the entire 4.6m width of the front of the room, and extends 1.7m down both sides of the room, giving a wider viewing range. This window has no glass and is open to the air, and is covered with sections of wire, to prevent people climbing into or out of the room through this opening. The length of this opening has a wooden frame, onto which the wire has been attached. Along the front section is a flat, wooden 'windowsill' which has been broken and now covers only half the length of the sill. The floor is made of concrete. As discussed in the site description from Harington Point, horizontal seams in the walls of the observation post indicate that the walls were created in levels. On the exterior, most of the structure has been built into the hillside, and is now overgrown with vegetation. Overgrown vegetation now disguise the entrance into the observation post, though it would not have been like this at the time of occupation. Only a small section of the concrete roof is visible from the exterior. This would have been camouflaged in some capacity by the PWD (Fort Record Book n.d.: 9).



Figure 19. Partially exposed roof of Observation Post at Tomahawk Battery. The two 6-inch emplacements are visible in the top centre of photo.

Initially the battery camp consisted of five cottages for accommodation, two owned by the SMC and the others rented (Joyce 1995: 1; Cooke 2000: 498), although a number of additional buildings had to be built shortly after to accommodate additional staff stationed at the battery (Joyce 1995: 1). Facilities included a mess block, latrines, men's and women's showers and laundry, a recreation room, food and fuel stores, and even a hairdressing salon (Fort Record Book n.d.; Joyce 1995: 1). Additionally, the installation of water supplies and construction of roads were necessary to ensure full functionality of the site (Joyce 1995: 1).

4.4. REREWAHINE BATTERY

Rerewahine Battery is located just seaward of the highest point at the eastern end of the Otago Peninsula, just over 1km directly east of Harrington Point (Figure 8.). Construction began on

the 8th of Decemeber 1941, the day after the United States naval base at Pearl Harbour, Hawaii was attacked (Willmott et al. 2001: 12). The guns were mounted by Captain R. Kerr of the Royal New Zealand Army between January 18th and 20th 1942, and first tested the following month (Fort Record Book n.d.: 45; 57; Cooke 2000: 495). Mounted at 506ft ASL with two 6-inch Mark VII guns, the battery covered a range from 314° to the left, which was directly in line with Fort Taiaroa, and east to 075° seaward (Fort Record Book n.d.: 13) (Figure 20.). The Fort Record Book lists the role of this battery as being defence against both offshore bombardment and against close enemy vessels (*ibid*: 7). In addition to the two emplacements, Rerewahine Battery was fitted with two searchlight posts, one approximately 750m north of the emplacements, and the second approximately 650m south-east of the emplacements. The northern light is reported as serving three functions: as a sentry beam, an observation light, and as a fighting light for the battery. The southern light was installed as a fighting light to cover Pipikaretu Beach in the event of an attempted enemy landing (Fort Record Book n.d.: 17; Cooke 2000: 496). These and their accompanying engine rooms were built from reinforced concrete in September and December 1942 respectively (Fort Record Book n.d.: 17). On the hilltop to the west of the emplacements a radar building was constructed, with an observation post about 30m away controlling the radar (*ibid*: 45; 149). Four reinforced concrete war shelters were constructed, one corresponding with each of the two emplacements and the two searchlight posts (*ibid*: 149).



Figure 20. 6-inch gun emplacement at Rerewahine Battery. Second emplacement is visible in background. c. 1985. Condition of structures now is reportedly poor (Photo courtesy of Laurie Stewart, Otago Peninsula Trust).

To accommodate the 82nd Heavy Battery and 11th Heavy Battery soldiers manning the battery a camp was constructed about 30m east of the emplacements. The camp consisted of three barracks buildings, two for men and one for the Women's Army Auxiliary Service (W.A.A.C.), along with officers quarters, mess block, lavatories and ablution block, and a Young Man's Christian Association (Y.M.C.A.) building. The battery magazine was constructed beside the men's barracks. After being manned for a little over eighteen months, responsibilities for the battery were transferred to Care and Maintenance on the 22nd of September 1943, although the battery remained fully operational until March 1944 (Fort Record Book n.d.: 31; 46).

Archaeologically, all concrete structures still remain in place, though these are in varying conditions. The site is on privately owned land, and the battery magazine has been modified in some capacity by the landowner (Cooke 2000: 496), while other structures have been utilised for the owners present business ventures (Stewart, L.: pers. comm.). Only one of the wooden barrack blocks is still standing (Cooke 2000: 496). Reportedly, many of the remaining concrete structures are in poor

condition, with the concrete deteriorating to such an extent as to make many of the structures unstable (Stewart, L.: pers. comm.). Due to the instability of the site and the resulting safety concerns, this site was inaccessible for survey as part of this project.

4.5. LAWYER'S HEAD BATTERY, ST. CLAIR BATTERY, AND CENTRAL BATTERY

Lawyer's Head Battery, Central Battery (also known as Ocean Beach Battery) and St. Clair Battery (also known as Forbury Battery) were three batteries constructed along Dunedin's south coast between 1885 and 1889, at the same time of Fort Taiaroa's initial period of construction (Stark 1965: 4- 6; Cooke 2000: 96- 113) (Figure 1.). Central Battery was located along the beach front sand hills at where St. Clair Beach meets St. Kilda Beach, with Lawyer's Head Battery located east at the headland between St. Kilda Beach and Ocean Grove Beach, and St. Clair Battery west of Central Battery on the headland at the western end of St. Clair Beach (Stark 1965: 4). Central Battery was constructed primarily to counter offshore bombardment with its two 6-inch 5-ton Disappearing guns, while the two batteries either side were primarily designed to counter against possible beach landings (*ibid*: 4- 6).

Constructed in 1885, Lawyer's Head Battery was mounted with a 7-inch 7-ton RML gun (Cooke 2000: 96) (Figure 21.). Official recommendation argued for the additional mounting of an 8-inch gun, but upon its arrival at the battery it was placed in storage and never mounted. The gun spent sixteen years in storage at the site before finally being removed and shipped to Wellington (*ibid*). The Lawyer's Head 7-inch gun, while covering beach landings at St. Kilda and St. Clair to the west, could also be pivoted to cover both offshore bombardment, and Ocean Grove and Tomahawk Beaches to the east (Stark 1965:5). The gun was removed twelve years after installation in 1897 (Cooke 2000: 96). The battery itself was of timber and earthwork construction (*ibid*).



Figure 21. Coast defense gun known as Keep-'em-off, Lawyer's Head, Dunedin. c. 1885. Field family: Field and Hodgkins family photographs. Ref: 1/2-105940-F. Alexander Turnbull Library, Wellington, New Zealand. <http://natlib.govt.nz/records/23056557>

St. Clair Battery was constructed at the same time as Lawyer's Head Battery, with its purpose also to cover possible enemy landings on St. Clair and St. Kilda Beach. Similarly of timber and earthwork construction, this battery was mounted with the same type of 7-inch 7-ton RML gun as Lawyer's Head, but with the addition of a 6-pound Nordenfelt Quick Firing Gun in 1888 (Cooke 2000: 110). The initial plans for the site also included an emplacement for an 8-inch Disappearing Gun, although this emplacement was never constructed, likely due to financial constraints (Figure 22. and 23.). By 1893 the timber magazine, along with other timber construction were rotting through and were unserviceable (*ibid*). The Quick Firing Gun was removed this year, although the 7-inch gun remained mounted until 1911 before being gifted to the Dunedin City Council (*ibid*). In a near disaster during a test firing incident in 1905, the St. Clair Battery (although reported by some sources to be the Central Battery) mistakenly aimed the 7-inch gun with the wrong coordinates and narrowly missed hitting the trawler *Express*, with the round shooting between the funnel and the mast, hitting

the water within 60 or 70 yards (approximately sixty metres) of the boat (Ryffel 1905: 7; Cooke 2000: 110).

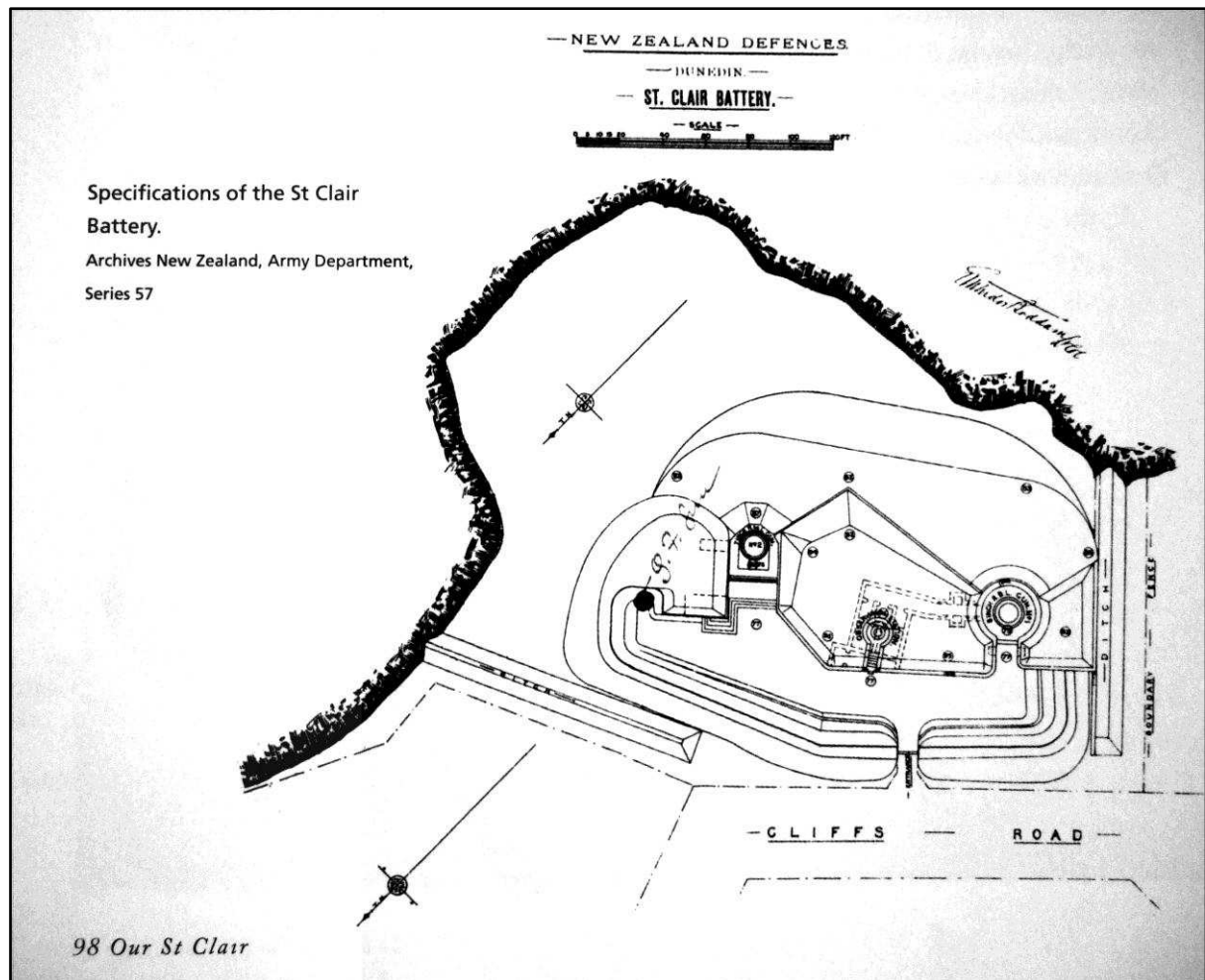


Figure 22. Proposed plan for St. Clair Battery. Ultimately the battery was never fitted with the proposed 8-inch Disappearing gun.

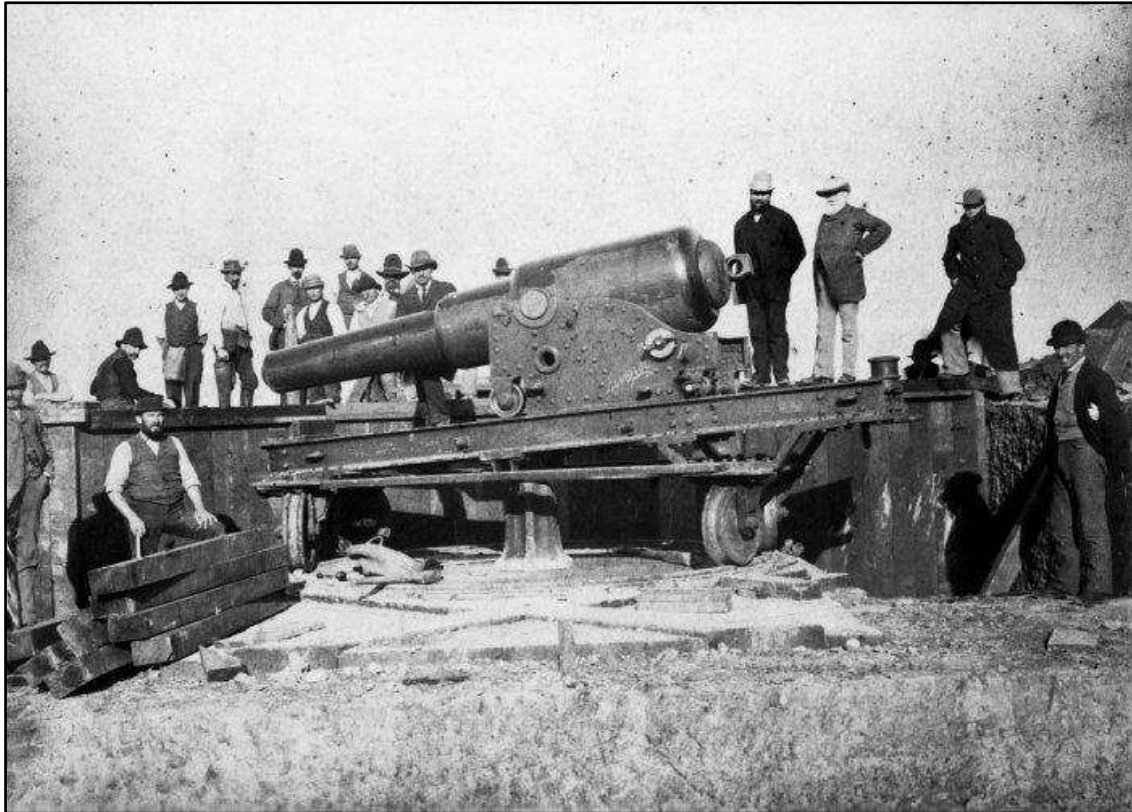


Figure 23. Coast defense gun known as Pop-'em-off, St. Clair, Dunedin. c. 1885. Field family: Field and Hodgkins family photographs. Ref: 1/2-105939-F. Alexander Turnbull Library, Wellington, New Zealand. <http://natlib.govt.nz/records/23199061>

Construction began on Central Battery in 1886, with the battery becoming operational by 1889. The battery consisted of two 6-inch Elswick Disappearing guns on the forward flanks, a gallery running between the two emplacements, and a 200-round magazine and artillery store positioned behind the gallery. (Stark 1965: 4; Cooke 2000: 104). A tramway constructed of steel ran the length of the gallery, and was used to transport shells from the store to the guns. With everything running smoothly, these guns could maintain a rate of fire of about one round per minute (*Star* 1955). Behind this area were the living quarters, complete with barracks to house 25 men, lavatories, kitchen facilities, living room, and women's quarters (*ibid*). Construction was predominately concrete, with some timber lining and wooden floors (Skilton 2008: 16- 17). This battery had a number of technical issues and difficulties. In 1889 a memorandum from Defence Engineer Arthur Bell to the Minister for Defence discussed the battery as suffering considerable leakage through the roof. The remedy for this was to cover the roof with a layer of asphalt, no more than an inch thick (Bell 1889b). Due to its

positioning on the sand hills, the battery quickly became inundated with sand, and it became increasingly difficult to keep the gears and fittings of guns in working order (*ibid*). Reports from before the battery had even become operational stated that sand was becoming an issue, and covers for the guns and pumps had already been requested (Douglas 1888). By 1893, the battery had been almost entirely covered by sand, considered by some to be a problem, while others such as Arthur Bell believed the coverage provided more reliable camouflaging and masked the site (Cooke 2000: 104). Once covered over the sand hills covering the battery were described as a "rabbit warren of concrete-lined tunnels and various rooms" (Skilton 2008: 16- 17). The battery remained operational until 1920, although the guns were last fired as a salute to mark the end of the First World War (*Star* 1955). During the Second World War the site was declared a Prohibited Place under Defence Emergency Regulations (Cooke 2000: 105). According to Fort Record Books, upon being removed from Harington Point, two 15-pound Quick Firing Guns were relocated to Central Battery in November 1943 while the battery was under the responsibility of Care and Maintenance (n.d.: 33). The site was subsequently demolished in the 1950s by the Royal New Zealand Army (Cooke 2000: 105).

Lawyer's Head Battery, St. Clair Battery, and Central Battery were all demolished at various points and archaeologically are no longer visible today (Cooke 2000: 96; 105; 111). However, it is likely that subsurface remains of these sites are still present, buried beneath the sand hills and headlands (Stewart, L.: pers. comm.). Within the scope of this project, examination of subsurface remains was not possible. Information on these sites from historical sources has been included to give a complete picture of the nature and extent of Dunedin's coastal defence landscape.

5. DISCUSSION

Given the nature of the sites investigated for this research it is unsurprising that the vast majority of the archaeological remains survive today in relatively good condition. Their very nature requires them to be structurally sound and resilient when faced with extreme forces. In the event of enemy invasion, the lives of many New Zealanders, both the soldiers stationed at the fortifications and the citizens they were protecting, would have depended on these structures to withstand and hold off enemy attack. Even recoil and vibrations from firing the enormous weapons mounted at these emplacements would have put considerable strain on the structures and their foundations. As such, almost all structures included within the scope of this investigation have been constructed of reinforced concrete. Thick, strengthened walls served to protect soldiers from enemy attack, while also bearing the immense weight created by thick concrete roofs. The original plans for New Zealand's fortifications by Major Henry Cautley in 1883 were designed using traditional British methods and specifications (Veart 2011b: 220- 221). Intended to use large, heavy stone bricks, these plans were deemed elegant, but too expensive to build. Instead, Captain Edmund Tudor Boddam proposed the substitution of traditional methods for the use of concrete and old metal rails from surplus railway supplies (*ibid*). This proved to be much cheaper as it required no skilled bricklayers or expensive materials, while concrete could be easily mixed and poured by unskilled labour, at the time primarily prison labour (*ibid*). The only skilled labourers required were carpenters to build the framework into which the cement was poured, and a blacksmith to make the metal fittings.

5.1. CONDITION

As resilient as these structures may be, their exposed locations, and the complete abandonment of the majority, has inevitably led to some level of deterioration. Environmental conditions bear some part in this. As discussed in the site description of Harington Point Battery, the

1880s engine room bears significantly more deterioration in the concrete of the internal walls at the western end of the structure, which is more exposed to the harsh conditions of a southerly weather front than the eastern end of the walls. Underground structures at the site, such as the tunnel and magazine complex, being protected from weather, exhibit minimal signs of deterioration. As access to Rerewahine was not possible due to safety concerns, the condition of structures was not witnessed firsthand, but levels of deterioration are reportedly quite extreme at this site, significant enough to compromise the structural integrity of the buildings (Stewart, L.: pers. comm.). Without surveying the site, and with a lack of official reports pertaining to the site, it is difficult to attribute particular causes to the high level of deterioration at this site. However, considering the good condition that the majority of the other sites are in, it is highly likely that human factors have contributed to the increased rate of decay seen here. The only other site reported to be highly susceptible to deterioration is the Channel Battery and old stable at Fort Taiaroa, which was severely damaged by intentional demolition attempts and by a bulldozer, compromising the integrity of the archaeological remains (Hamel 1994: 2- 3).

There is a stark contrast in the amount of graffiti present at the two sites visited for this research. At Harington Point Battery every concrete structure at the site is covered in large amounts of graffiti, while at Tomahawk Battery graffiti is virtually nonexistent. Part of the absence of graffiti at Tomahawk Battery can be explained by the observation post being on private land, limiting access to those with legal access or permission. The two emplacements at Tomahawk are regularly visited by members of the public as they are located in a beautiful scenic location. The Dunedin City Council have placed park benches here overlooking the beaches and Pacific Ocean, as well as maintaining a planting program to provide an aesthetically pleasant location to visit. As part of this endeavour, any graffiti is likely cleaned off by the council, or as the emplacements are painted, graffiti may simply be painted over. In contrast, the more secluded location of Harington Point Battery means that graffiti artists have plenty of time to tag the structures without interruption, while the majority of people visiting the site are there to go fishing or diving, as opposed to visiting for scenic purposes.

5.2. VARIATION AND TEMPORAL CHANGE

One of the aims that this research intended to address was the issue of whether temporal change was evident in construction methods and patterns. The most drastic markers of temporal change are no longer present, but are discussed in the historical literature. In the earliest period of defence building, many defences, exemplified in records pertaining to Lawyer's Head Battery and St. Clair Battery, were earthworks and timber constructions, which were replaced by the more permanent concrete structures, many of which survive to this day. While this was extremely difficult when examining concrete structures there are several characteristics present in the structures which indicate a change in construction methods over time. Structurally, it was noted during field survey at Harington Point that several buildings had layers of asphalt on the roofs. The 1880s engine room had a layer between the roof and top of the walls, while the 1906 searchlight emplacement had a layer about 2cm thick on top of the roof. While never mentioned in records pertaining to Harington Point, in numerous reports Defence Engineer Arthur Bell makes reference to asphalt being used at other batteries as a mechanism to prevent water leakage (Bell 1888b: 4; Bell 1889a; Bell 1889b). This technique is not apparent in any of the World War II era structures at Harington Point or Tomahawk Beach, and all documentary references to the use of asphalt for waterproofing occur in records from the 1880s.

The way in which metal is used to reinforce the concrete structures also changes from the 1880s to the Second World War. In the earlier structures, as noted in the site description of Harington Point, the roofs of the older structures all employ the use of long, flat metal panels approximately 5cm wide and 1cm thick which run the length of the roofs on the internal side of the roofs. These are clearly visible when standing inside the rooms and looking at the ceilings. These are likely the flat bottoms of the rails used in Boddam's designs. The only visible use of this technique in the World War II era structures are in the two small ammunition boxes in the northern engine room at Harington Point, but the roof of this structure exhibits no evidence of the use of these beams. In

the Second World War structural evidence of reinforcement is only visible in areas of the structures that have suffered from deterioration, where the surface of the concrete has broken away and revealed the core of the walls and roofs. In these areas thin metal rods are visible within the core of the structures. It is possible that this method was also utilised in the structures built during the Russian scare although metal rods are not visible within any of the deteriorated patches of these older buildings.

As noted in the site descriptions of both the Harington Point structures and the observation post at Tomahawk Battery, horizontal seams running along the walls of the structures indicate that the buildings were made in layers, with sections of the wall laid on top of each other. It was noted that at Harington Point, these seams appeared more superficial on some structures than on others, meaning that on some structures the seams appear within the walls, while on some structures the seams appear to be confined to the surface of the structure. As discussed in the site descriptions, the buildings are made of concrete with a coarse aggregate of large stones in the core, and smoother, finer concrete on the surface. It is possible, although unclear, that the difference in nature of the horizontal seams relates to differing construction techniques between the earlier and later structures. It is more likely however, that the older structures have simply been subject to more weathering, revealing that the seams continue right through the structures, while the more recent buildings have not yet eroded enough to show this.

While the ordnance installed during the Russian scare was sufficient, "as the capability of military equipment increased, it became necessary to upgrade these defensive sites accordingly" (Carter 2011: 179). As a result of this, obsolete weapons were removed from many sites and replaced with more contemporary guns. It was hypothesised that one of the more visible elements of temporal change would be evident in places where structures had been modified in order to allow for the upgrade of ordnance. However, no evidence for this was found. Upgraded weapons must have either been fitted into existing mountings, or in order to upgrade mountings old surfaces were demolished and new mountings were set into fresh concrete foundations.

Interestingly, the engine room constructed during the 1890s at Harington Point is the only building at the site to exhibit any evidence that methods of an aesthetic nature were used during construction. This building was constructed of concrete, as for all the other structures at the site. However, the front facade of this building has been concreted over with a thin layer of cement which has been scored both horizontally and vertically at regular intervals, giving the impression that the building was actually constructed of large stone blocks. Erosion of this layer in places now reveals the genuine construction underneath. The aesthetic facade which adorns the 1890s engine room at Harington Point is likely an attempt to make it appear as if traditional construction methods were being utilised in these fortifications, and was potentially a measure to placate government officials such as Major Cautley, who had prepared the original plans for the defences following traditional methods. There is no evidence that this technique was used on other structures built during the same era, although it is possible that any other facades similar to this have simply eroded away.

5.3. SITE DISTRIBUTION AND DEFENSIVE STRATEGY

Throughout history, people have been actively interacting with the landscape. Carter asserts that "the physical world shapes, and is itself shaped, by human society and culture" (2011: 1), and this idea is clearly exemplified in the positioning and selection of coastal military sites in Dunedin. While the natural landscape is partly responsible for the vulnerabilities which placed the city at risk, people were able to use the landscape to their defensive advantage, constructing their defences at specifically selected locations to give a strategic advantage defensively, and using the natural form of the land to camouflage fortifications. The distribution of Dunedin's coastal fortifications is confined to two specific areas of the city. Fort Taiaroa, Harington Point Battery, and Rerewahine Battery are all located on the headland of the Otago Peninsula, while Tomahawk Battery, Lawyer's Head Battery, Central Battery and St. Clair Battery are all confined to the south coast of Dunedin. This is indicative of the purpose for which these defences were developed; that is, to defend against hostile entry into the Otago Harbour and against attack on the city of Dunedin. Dunedin was described by officials in

1871 as being "the most important town in New Zealand, and at the same time it is the most expensive to defend from open sea." (Cooke 2000: 33). This was because Dunedin was vulnerable to attack from two directions, both from offshore bombardment on the south coast, and at the harbour entrance which provided access to the Port of Dunedin and the deepwater Port Chalmers (*ibid*: 43; Carter 2011: 1). The distribution of sites is therefore indicative of a strategic plan to protect the city from all possible threats. As Carter (2011: 177) notes, defences were typically built in elevated positions from which soldiers would be able to see any enemy approaching and react to the threat accordingly. The placement of fortifications at Taiaroa Head is not the first time this location has been strategically utilised for defensive purposes, with a Māori pa constructed at the site in the mid-17th century (Leach and Hamel 1978: 244).

Of similar importance strategically, camouflages of various natures were employed at different sites to disguise the position of defences from enemy observation. At Tomahawk Battery, the emplacements were camouflaged with false fronts to look like a beach cottage and a shed (Cooke 2000: 498), while the observation post was built into the hillside with only a small portion of the roof visible from above. At Central Battery, while some officials viewed the build up of sand around the battery as problematic for weapon maintenance, Defence Engineer Arthur Bell found the accumulation of sand beneficial for purposes of camouflage (*ibid*: 104). At Fort Taiaroa, reports discuss the use of excess soil from excavation of gun emplacements to be placed around emplacements "to create fairly neat slopes, removing defined angles as these are recognisable." (Bell 1888b).

5.4. COMPARISON

Given that the various coastal fortifications erected across New Zealand were all constructed during the same periods, and for the same purposes, these sites are all very similar in reference to construction materials and methods used, while variations in layout are a result of defences being

strategically tailored to suit the local landscape. However, with such little work done on these types of sites, comparison is difficult.

Walton's (1990) survey of Wellington's fortifications, as well as Treadwell (1992) and Veart's (1990; 1994; 1998; 2000; 2003; 2011a; 2011b; 2011c) work at North Head in Auckland, and Kelly's (1998) overview of various sites around the country, indicate that unsurprisingly, these sites have been constructed in the same manner as those in Dunedin. While Walton only provides a basic overview, Wellington's fortified sites were also of concrete construction, and housed the same type of weapons as Dunedin's batteries (1990).

The same can be seen at the sites in Auckland. Veart (2000: 121) states that, as in Dunedin, most early defences were of earthwork and timber construction, before being quickly replaced by reinforced concrete batteries. In Auckland, while most structures were resultantly concrete, a small number of brick and stone structures were built before Captain Boddam's designs had been completed. At North Head in 1885, several magazines and underground stores were constructed of brick and rough stone five feet thick, although by 1888 all descriptions refer to concrete construction methods (Treadwell 1992: 4- 10). Similarly to Lawyer's Head Battery and St. Clair Battery, within five to ten years of their construction, the earlier earthwork and timber constructions were severely rotting, while concrete foundations were beginning to crack and needed replacement (*ibid*: 6). Construction at Auckland sites used a method whereby layers of concrete were used to build up structures (Veart 2011c: 224). This is consistent with evidence at Harington Point Battery and Tomahawk Battery, where horizontal seams in the structures indicate that a system of layering was used in construction. By the 1940s, this method was standard in fortification construction across various regions of the British empire (*ibid*). Resistivity survey and excavation at Point Resolution in Auckland, a battery built between 1885 and 1887, showed that this early site was constructed using a mix of concrete and brick construction (Young 1992: 109- 120). As with the Russian scare period sites in Dunedin, at North Head, batteries in the 1880s and 1890s were waterproofed using asphalt and coal tar, with 2000 gallons arriving from the Auckland Gas Company in March 1891 (Veart 2000: 123).

As at Fort Taiaroa, engineers also employed a tramline and winch system at North Head in the 1880s to hoist equipment uphill to the emplacements (*ibid*). The sites across New Zealand were also mounted with the same types of weapons (Kelly 1998; Cooke 2000).

Internationally, the pervading lack of research on coastal military fortifications makes it difficult to place Dunedin's defences into a broader context. Christiansen (2002: 61-63) discusses the preservation of Japanese bases in the Pacific during the Second World War, which were also of concrete construction, although specific details concerning construction are not discussed. However, as these sites were involved in active combat, many concrete structures are riddled with traces of war such as bullet holes and bomb craters (*ibid*). With the Japanese abandonment of these sites following the war, metal structures such as aeroplanes, vehicles and guns were left behind and now form part of the archaeological landscape, although these are much more at risk of deterioration and pillaging than concrete structures. This is an aspect of conflict archaeology not seen in New Zealand sites.

As construction of New Zealand's defences differed from those of traditional British design, comparison with other British sites could provide particularly interesting insight into changing fortification structures. While traditional construction methods were still in mainstream use by the British at the time New Zealand adopted their novel approach (Veart 2011b: 220-221), Pollard and Banks' (2008) study has shown that the British were experimenting with similar methods elsewhere at the same time, learning from their own experiences in battle. The British had noted upon bombarding artillery defences at Alexandria, Egypt in 1882, that concrete fortifications with carefully sloped earth mounds were highly effective against bombardment, with the earth slopes often causing shells to ricochet over their targets (*ibid*: 113). As a result, at the same time New Zealand was installing her first homeland defences, Britain was experimenting with similar construction methods at Inchkeith Island on the Firth of Forth, constructing a series of concrete, earth covered fortifications, similar to those at Harington Point Battery and Fort Taiaroa, and subsequently subjecting them to heavy bombardment during a well-publicised experiment (*ibid*). The study also

showed that this site, with a fortification history dating to the mid-16th century, also had a series of stone block fortifications constructed between the 1860s and 1880s which conformed more to the traditional British method of defence construction (*ibid*: 118). The Second World War structures at the site appear to conform to the designs used during that period in New Zealand. For more substantial comparisons to be made, these types of sites need to be the focus of more serious archaeological investigation, both in New Zealand and abroad.

6. CONCLUSION

The purpose of this dissertation was to examine the nature and extent of Dunedin's coastal military defences in order to gain more of an understanding of late-19th to mid-20th century defence construction methods and their role in the community of both Dunedin and New Zealand. It also set out to record for posterity a group of sites that have largely been ignored until now. When New Zealand was first faced with external security threats in the 1880s, the youthful, isolated, and still developing nation had to react as best they could. At the time financial constraints, the isolated location of the country, and a lack of skilled labourers meant the traditional British fortification designs were not feasible, and the country had to adapt accordingly. Despite these limitations, resourceful plans were made to substitute the traditional construction of stone block fortifications for reinforced concrete structures that were substantially cheaper and easier to construct (Veart 2011b: 221- 222). The remains of Dunedin's coastal defences are reminders of the astute adaptive measures taken by New Zealand's military engineers in the 1880s, as well as providing insight into changing defence construction over the following sixty years, evidenced in construction variations between the defences built in the 1880s and those of the Second World War.

6.1. LIMITATIONS

The nature of the archaeological remains are highly suited to the type of methods utilised in this investigation. Surface features are easily surveyed, and combined with historical documentation allow for reasonable interpretations to be made. There were however, a number of factors which impacted on the direction of this research, and the nature of the evidence which was used during this investigation, both archaeologically and documentary. One of the main barriers during this investigation was access to archaeological evidence. As noted in the discussion of methods employed for this study, Harington Point Battery and Tomahawk Battery were both visited and surveyed.

Current use of the land at Fort Taiaroa for the breeding and conservation of Northern Royal Albatross means that access to the site is strictly controlled (Cooke 2000: 119; Royal Albatross Centre 2013). A number of archaeological reports on the land at Taiaroa Head have been published, pertaining to both the Māori pa and European occupation of the site. Archaeological work at Taiaroa Head has been conducted primarily as reports for the Department of Conservation and New Zealand Historic Places Trust. With access to this site controlled, archaeological data for this site comes from the previous work of others, primarily that of Jill Hamel. No previous archaeological work had been conducted at any of the other sites investigated in this study. Safety concerns regarding the Rerewahine Battery site meant that access to this site was not possible. Information regarding the condition of this site was obtained from personal communications with Laurie Stewart of the Otago Peninsula Trust and Fort Taiaroa Education and Resource Centre, while all other information was of a documentary nature. The final three sites; Lawyer's Head Battery, Central Battery, and St. Clair Battery have all been demolished and no surface archaeological evidence remains. As invasive survey methods such as excavation were not possible within the scope of this investigation, all information pertaining to these sites is documentary in nature. However, personal communications with Laurie Stewart into the nature of the demolition of these sites indicates that there are likely subsurface archaeological remains of the foundations still present at these sites.

When carrying out documentary research, it became apparent that the vast majority of documentary evidence is limited to the sites constructed during the Second World War and to the areas of the earlier sites which received additional construction or modification during this period. With the exception of Cooke's *Defending New Zealand: Ramparts on the Sea 1840- 1950s* (2000), which covers the entire period encompassed by this study, resources pertaining to the Russian scare period of defence construction are scarce. Skilton (2008: 16- 17) also notes this in his paper on Central Battery. Even the archive at the Fort Taiaroa Education and Resource Centre is comprised primarily of material concerning the later period of development. This made it particularly difficult to

clearly and comprehensively discuss the three sites which no longer exist, all of which were built during the initial period of fortification construction in the 1880s.

6.2. CONTRIBUTIONS TO THE FIELD

This study provides valuable insight into the archaeology of Dunedin's defensive landscape. As little archaeological work has been undertaken at these types of sites, both locally and further afield, simply recording the existence of these sites is important for heritage and preservation. Only the Fort Taiaroa and Harington Point Battery sites had previously been recorded in the New Zealand Archaeological Association recording scheme, ArchSite. From this investigation, records for Tomahawk Battery (I44/591), Rerewahine Battery (J44/161), and Lawyer's Head Battery (I44/590) were added into the scheme, while the Harington Point Battery record was updated. These records, along with the three associated with Fort Taiaroa (J44/151, J44/71, J44/148) which were not altered, have been included as Appendices 1- 7. The exact positioning of the Central Battery and St. Clair Battery sites is unclear, and as such these sites were not added into the ArchSite database. However, this study delves deeper than simply recording sites, and provides important information into the changing nature of military defence technologies from the late-19th century into the mid-20th century. As discussed, temporal changes in the sites were visible in a number of constructional characteristics, exemplified in the changing nature of concrete reinforcement, changing in waterproofing methods and the aesthetic nature of some structures, while basic methods of construction were also investigated. Even more drastic temporal changes, no longer visible archaeologically, were discussed in the historical literature with changes from the earlier earthwork and timber batteries like those at Lawyer's Head and St. Clair to more permanent concrete structures.

This study also gives insight into the mindset of a nation developing during its early years, and becoming increasingly independent of its colonial homeland. The archaeological remains

investigated during this research are physical manifestations of New Zealand's fears and anxieties, as well as clear evidence of a deep-rooted patriotism for a country which had only been theirs for several decades. Traditionally, protection of British colonies was the responsibility of the British naval fleet. However, citizens were aware that in such an isolated location, in the event of an invasion the country could not rely on the British navy to arrive in time to provide protection (Cooke 2000: 39; Carter 2011: 171). With plans to build fortifications at a number of locations, the British government were sent repeated requests for financial assistance, only to be repeatedly declined (Barratt 1981: 13- 26; Cooke 2000: 25). It is thus unsurprising that with the absence of official protection that citizens took matters into their own hands, forming volunteer artillery units (Church 1994: 74). The public hysteria that developed in the 1870s was a direct result of the widespread public awareness of the total vulnerability of the country. With such widespread concern and the British governments lack of willingness to assist, New Zealand had no choice but to independently protect itself from external threats. While the country's fears of invasion never became a reality, the archaeological remains of the fortifications built during these periods of insecurity are remnants of these uncertain times and reminders of the measures citizens were willing to take to ensure the security and freedom of their new nation.

6.3. FUTURE RESEARCH

There is still plenty of scope for further archaeological investigation into the coastal military fortifications of Dunedin. Although site access is a limiting factor, the poor condition and rapidly deteriorating nature of Rerewahine Battery make it imperative that this site be recorded before it becomes entirely ruinous. As the only maps of this site were made during the Second World War, it is important that this site be accurately GPS mapped while it is still in existence. Likewise, while still providing a valuable base, Hamel's (1994) site map of Fort Taiaroa was constructed by site survey and subsequently using aerial photographs to place the features in their relative positions. This site would also benefit from accurate mapping using contemporary GPS technology. Many historic maps of the

site are incomplete, exemplified by the 1917 Defence plans discussed by Hamel (1994: 1). Subsurface excavations could potentially provide valuable insight into the sites at Lawyer's Head Battery, Central Battery, and St. Clair Battery, which have no archaeological information recorded and little in the way of supporting documentary information. The approach used in this investigation would also be easily applied to other fortified coastal sites, both within New Zealand and abroad, allowing for a greater understanding of regional and temporal changes in coastal fortification construction methods. In places such as the Central Pacific, abandonment of many sites following the Second World War means that there are a wealth of untouched sites with a huge potential for archaeological research of the type conducted in this study (Christiansen 2002: 63- 64). Of particular interest for future research would be comparisons between Second World War Allied and Axis defence construction. As little archaeological research has been conducted pertaining to coastal military fortifications both in New Zealand and worldwide, it is hoped that the future will see many more contributions made in this field.

REFERENCES

- Archaeology Data Service. 2006. *Defence of Britain Archive*, Council for British Archaeology.
<http://archaeologydataservice.ac.uk/archives/view/dob/> (Accessed 30 September 2013).
- Barratt, G. 1981. *Russophobia in New Zealand 1839-1908*. Palmerston North: The Dunmore Press.
- Bayler, W. L. J. 1945. Wake Surrender. *Marine Corps Gazette*, 29 November: 2- 5.
- Bell, A. 1888a. Handwritten report by Arthur Bell pertaining to 6-inch gun at Fort Taiaroa. Fort Taiaroa Archive. FT00/046. Copies from Stewart, L., Otago Peninsula Trust.
- Bell, A. 1888b. New Zealand Defences Six Inch Gun, Taiaroa Head Works, November 1888. Fort Taiaroa Archive. FT00/047. Copies from Stewart, L., Otago Peninsula Trust.
- Bell, A. 1889a. Notes from Mr. Bell, Saddle Battery, 4 June 1889. Fort Taiaroa Archive. FT00/505.
Copies from Stewart, L., Otago Peninsula Trust.
- Bell, A. 1889b. Memorandum from Arthur Bell to the Minister for Defence. 1 May 1889. Fort Taiaroa Archive. FT00/139. Copies from Stewart, L., Otago Peninsula Trust.
- Bromhead, E. N., and Ibsen, M. L. A Review of Landsliding and Coastal Erosion Damage to Historical Fortifications in South East England. *Landslides*, 3: 341- 347.
- Carter, M. J. 2011. *People, Place, and Space: The Maritime Cultural Landscape of Otago Harbour*. Unpublished Masters Thesis: University of Otago Anthropology and Archaeology Department.
- Central Battery Ocean Beach. 1955. City Losing Aged Guns of Coastal Defence Unit. *Star*, September 15. Fort Taiaroa Archive. FT00/021.

- Christiansen, H. 2002. Forgotten and refound military structures in the Central Pacific: examples from the Marshall Islands. *In*: Schofield, J., Johnson, W. G., and Beck, C. M. (eds.) *Matériel Culture: The Archaeology of twentieth century conflict*, pp 58- 64. London: Routledge.
- Church, I. 1994. *Port Chalmers and its People*. Dunedin: Otago Heritage Books.
- Cooke, P. 2000. *Defending New Zealand: Ramparts on the Sea 1840- 1950s*. Wellington: Defence of New Zealand Study Group.
- Deagan, J. A. 2008. An Archaeology of Modernity in Colonial Jamaica. *Archaeologies* 4: 87- 109.
- Dieter-bader, H. 2006. Letter to Graeme Hall, Dunedin City Council, describing geophysical survey on Taiaroa Head.
- Douglas, Maj. A. P. 1888. Battery Report, May 1888. Fort Taiaroa Archives. FT00/021. Copies from Stewart, L., Otago Peninsula Trust.
- Fort Taiaroa Record Book. Fort Taiaroa Archive. FT00/145. National Archives Ref CAWR539 3.7. Copies from Stewart, L., Otago Peninsula Trust.
- Hamel, J. 1992. Fish bones to plastic at Pukekura Pa. Wellington: New Zealand Historic Places Trust.
- Hamel, J. 1994. Map of archaeological sites on Pukekura Pa. *Conservation Advisory Science Notes No. 57*. Wellington: Department of Conservation.
- Hamel, J. 2005. Fish bones and birds at Pukekura Pa. Wellington: New Zealand Historic Places Trust.
- Hamel, J. 2009. The site of the nineteenth century village at Taiaroa Head/Pukekura. Wellington: New Zealand Historic Places Trust.
- Hamel, J. 2010. Archaeology of fencing and nest boxes at Pilots Beach, Pukekura. Wellington: New Zealand Historic Places Trust.

- Hamel, J. 2012. A Tramline and storm water at Pilots Beach, Pukekura. Wellington: New Zealand Historic Places Trust.
- Hammond, M. 1987. Letter to Miss P. Graham, 22.05.87. Fort Taiaroa Archives. FT00/511. Copies from Stewart, L., Otago Peninsula Trust.
- Heyward, C. 1999. Disappearing gun that came back to life. *Sunday Star Times*, 27 June: 13.
- Historic Fort Taiaroa, Dunedin. 2008. *History Revisited: Historic Fort Taiaroa, Dunedin*. Fort Taiaroa Tourist Pamphlet: Dunedin.
- Joyce, J. L. 1995. *Tomahawk Battery*. Fort Taiaroa Archive. FT00/185. Copies from Stewart, L., Otago Peninsula Trust.
- Jurisich, M. n.d.. Ditch and bank defence of Pukekura pa, Otago Peninsula (J44/4). Unpublished manuscript in possession of Jill Hamel.
- Kelly, M. 1998. Historic Coastal Defence Structures of New Zealand, 1885- 1945. Wellington: Department of Conservation.
- Knight, H. 1979. *Otago Peninsula*. Dunedin: Allied Press Limited.
- Leach, H. M., and Hamel, J. 1978. The place of Taiaroa Head and other Classic Māori sites in the prehistory of East Otago. *Journal of the Royal Society of New Zealand* 8: 239- 251.
- Lissington, M. P. 1972. *New Zealand and Japan 1900- 1941*. Wellington: A. R. Shearer, Govt. Printer.
- McCluskey, F. H. *Down the Bay: the history of the ferries on Otago Harbour*. Wellington: New Zealand Ship and Maritime Society and Wellington Maritime Museum and Gallery.
- McIntyre, W. D. 1999. New Zealand, Japan, and the Twenty-Year Last Contest of Empires, 1931- 1951. In: Peren, R. (ed.) *Japan and New Zealand: 150 Years*, pp 65- 84. Palmerston North: New Zealand Centre for Japanese Studies, Massey University.

- McLean, G. 1985. *Otago Harbour: Currents of Controversy*. Dunedin: Otago Harbour Board.
- Morriss, R. K. 2000. *The Archaeology of Buildings*. Gloucestershire: Tempus Publishing.
- Mrozowski, S. A. 2008. The Archaeology of Seventeenth and Eighteenth Century Northern Plantations. In: McManamon, F.P., Cordell, L.S., Lightfoot, K.G., and Milner, G.R. (eds.) *Archaeology in America: An Encyclopedia, Vol. 1: Northeast and Southeast*, pp 140- 142. Connecticut: Greenwood Press.
- New Zealand Defence Department, Dunedin. 1888. Progress reports of work done at Taiaroa Head October to Decemeber 1888. Copies from Stewart, L., Otago Peninsula Trust.
- Official War History of the Public Works Department, Volume 3. n.d.. Fort Taiaroa Archive. FT00/207.
- Orser, C. E. 2004. A Brief History of Historical Archaeology. In: Orser, C.E. (ed.) *Historical Archaeology*, pp 28- 55. New Jersey: Pearson Prentice Hall.
- Pollard, T., and Banks, I. 2008. Archaeological Investigation of Military Sites on Inchkeith Island. In: Pollard, T., and Banks, I. (eds.) *Bastions and Barbed Wire: Studies in the Archaeology of Conflict*, pp 109- 136. Leiden: Brill.
- Reynolds, A. 2009. The Archaeology of Buildings: Introduction. *World Archaeology* 41: 345- 347.
- Royal Albatross Centre. 2013. www.albatross.org.nz (accessed 30 September 2013).
- Ryffel, Cpt. 1905. The Battery Practice Incident. *Wanganui Chronicle*, 20 January: 7.
- Schofield, J. 2009. *Aftermath: Readings in the Archaeology of Recent Conflict*. New York: Springer.
- Skilton, T. 2008. Central Battery. *Forts and Works* 23: 16- 17.
- Sorrell, P. (ed.). *The Cyclopedia of Otago and Southland, Volume 2*. Dunedin: Dunedin City Council.
- Stark, J. F. G. 1965. *Dunedin Was Prepared For Russian Invasion*. Dunedin: Otago Festival Annual 1965- 1966.

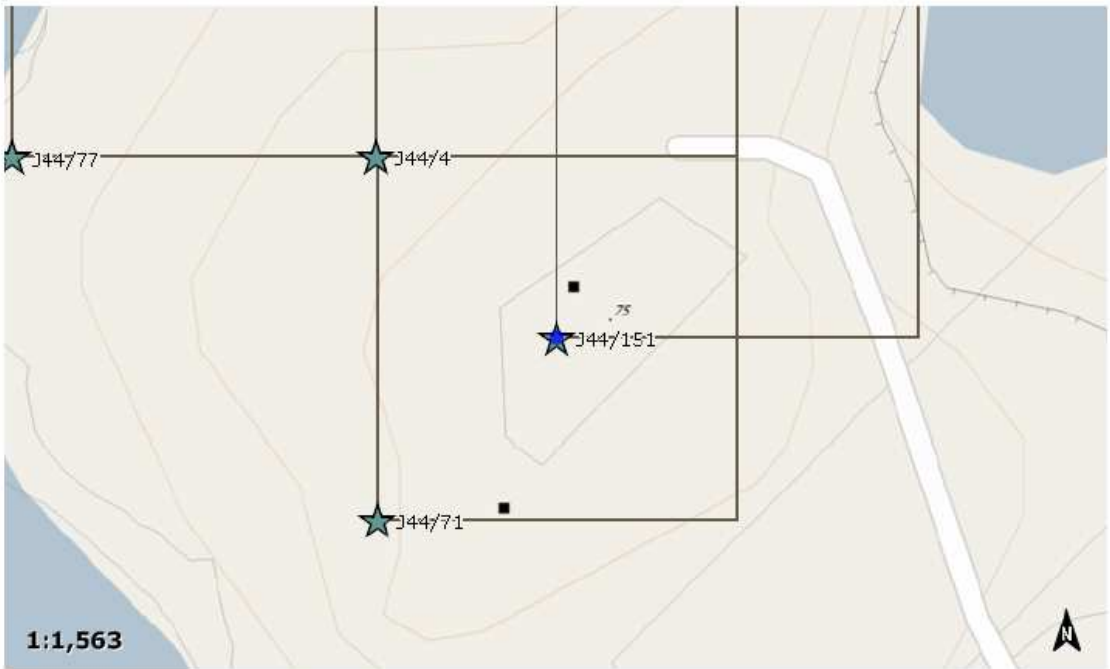
- Stewart, L. 2008. Fort Taiaroa Harington Point Fortifications. Fort Taiaroa Archive. FT00/068. Copies from Stewart, L., Otago Peninsula Trust.
- Stitchelbaut, B. 2006. The Application of First World War Aerial Photography to Archaeology: The Belgian Images. *Antiquity* 80: 161- 172.
- Treadwell, J. L. 1992. North Head Investigation, 1992 Interim Research Report. *Auckland Conservancy Historic Resource Series No. 5*. Auckland: Department of Conservation.
- Trotter, A. 1999. Friend or Foe? New Zealand and Japan, 1900- 1937. In: Peren, R. (ed.) *Japan and New Zealand: 150 Years*, pp 65- 84. Palmerston North: New Zealand Centre for Japanese Studies, Massey University.
- Udphuay, S., Günther, T., Everett, M. E., Warden, R. R., and Briaud, J-L. 2011. Three-dimensional resistivity tomography in extreme coastal terrain amidst dense cultural signals: application of cliff stability assessment at the historic D-Day site. *Geophysical Journal International* 185: 201- 220.
- Veart, D. 1990. North Head: The Development of a Fort. Auckland: Department of Conservation.
- Veart, D. 1994. Propping up the Past, Concrete Repair Work at the North Head Historic Reserve. First Australasian Conference on Engineering Heritage.
- Veart, D. 1998. North Head Tunnels Excavation Report. *Auckland Conservancy Historic Resource Series No. 5*. Auckland: Department of Conservation.
- Veart, D. 2000. Mr. Frankham Builds a Fort. Second Australasian Conference on Engineering Heritage.
- Veart, D. 2003. The Excavation of a Roof and Two Stairwells, Site R11/1723, Fort Takapuna. Auckland: Department of Conservation.
- Veart, D. 2011a. North Head Historic Reserve Carpark Upgrade Report. Auckland: Department of Conservation.

- Veart, D. 2011b. North Head: Engineering Auckland's Victorian Defences. *In: La Roche, J. (ed.) An Evolving City, Auckland's Engineering Heritage*, pp 220- 222. Auckland: Wily Publications.
- Veart, D. 2011c. Stony Batter: Auckland's Last Fortress. *In: La Roche, J. (ed.) An Evolving City, Auckland's Engineering Heritage*, pp 223- 226. Auckland: Wily Publications.
- Walton, T. 1990. Wellington's defences: a reconnaissance survey of the fortifications of 1884- 1945. *Archaeology in New Zealand* 33: 87- 99.
- Willmott, H. P., Haruo, T., and Johnson, S. 2001. *Pearl Harbour*. London: Cassell.
- Young, J. 1992. Pinpointing a buried fort on Point Resolution, Auckland. *Archaeology in New Zealand* 35: 109- 120.

APPENDICES

Appendix 1: J44/151 Fort Taiaroa ArchSite record.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 Site Record Form	NZAA SITE NUMBER: J44/151 SITE TYPE: Military (non-Maori) SITE NAME(s): Fort Taiaroa DATE RECORDED:
SITE COORDINATES (NZTM) Easting: 1423341 Northing: 4928425 Source: CINZAS	
IMPERIAL SITE NUMBER: METRIC SITE NUMBER: J44/151	
	
Finding aids to the location of the site On Taiaroa Head at entrance to Otago Harbour. Fort occupies the area of Pa site (J44/4) but is much more extensive. Land is a complex mix of nature reserve, local purpose reserve and recreation reserve administered by DCC, DoC and Ngai Tahu. O. Pen.Trust.	
Brief description The fort was a multi-battery establishment in service from 1885 to WWI and in WWII. The 6-in Armstrong gun is the only working example in the world. Category I Historic Place, Register No. 369.	
Recorded features Gun battery	
Other sites associated with this site	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: J44/151
Site description Condition of the site Howlett Point sites are in reasonable condition while channel battery emplacement is in poor condition as a result of attempted demolition in past. Access to most areas is strictly controlled. Statement of condition Current land use: Threats:	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY			NZAA SITE NUMBER: J44/151
Observations about this site made in			
Author	Year	Title	Publication Details
Cooke, P	2000	Defending New Zealand. Ramparts on the sea 1840-1950s.	Wellington, Defence of New Zealand Study Group
Hamel, J.	1994	Map of archaeological sites on Pukekura Pa.	Conservation Advisory Science Notes 57, DOC
Supporting documentation held in ArchSite			

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

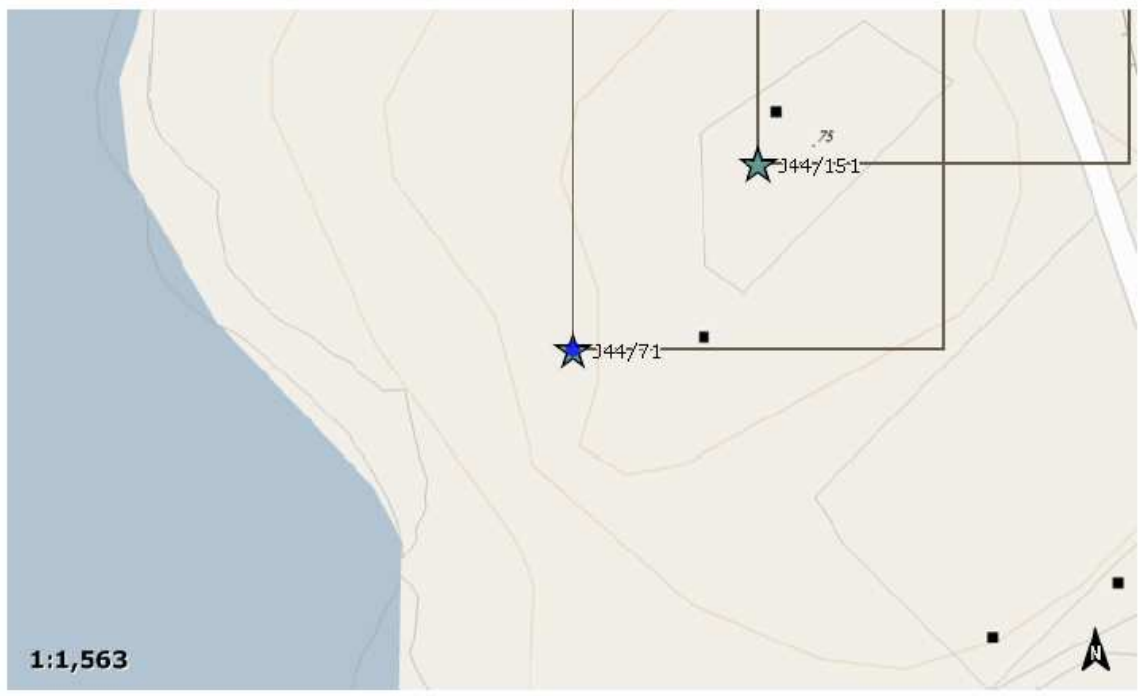
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (METRIC)		NZAA METRIC SITE NUMBER J44/151 DATE VISITED 1992 SITE TYPE Fortifications SITE NAME: MAORI Taiaoroa Head OTHER 5164						
Metric map number J44 Metric map name Dunedin Metric map edition 2000								
Grid Reference Easting <u>213 332 010</u>		Northing <u>514 900 010</u>						
1. Aids to relocation of site (attach a sketch map) The fortifications are at the northern end of Harington Point Road on Pukekura Pa, known as Taiaoroa Head when the fortification was established. The structures are located mostly within the albatross sanctuary but some are to the east of the visitors centre building and on Pilots Beach.								
2. State of site and possible future damage Mostly well protected as part of the wildlife sanctuary. Some degree of threat from requirements of the albatross colony and the tourism operation.								
3. Description of site (Supply full details, history, local environment, references, sketches etc. If extra sheets are attached, include a summary here) See Map of Archaeological Sites on Pukekura Pa, Jill Hamel. 1994. Conservation Advisory Science Notes, No.87.								
4. Owner Address Crown, Dunedin City Council, Ngaitahu and local runanga		Tenant/Manager Address						
5. Nature of information (hearsay, brief or extended visit, etc) Many visits Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site)								
6. Reported by Address Jill Hamel, 42 Ann Street, Dunedin.		Filekeeper Date <i>J. Hamel</i> 1/10/92						
7. New Zealand Historic Places Trust (for office use)								
<table border="1"> <tr><td>HA</td></tr> <tr><td></td></tr> <tr><td>AG</td></tr> </table>	HA		AG	Type of Site Local environment today Land classification	<table border="1"> <tr><td>AB</td></tr> <tr><td>JK</td></tr> </table>	AB	JK	Present condition and future danger of destruction Local body
HA								
AG								
AB								
JK								

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM NZMS260 map number J44 NZMS260 map name DUNEDIN NZMS260 map edition		NZAA METRIC SITE NUMBER J44/151 DATE VISITED 1991, 1992 (Hamel) SITE TYPE Fortification SITE NAME: MAORI Pukekura OTHER Fort Taiaoroa		
Grid Reference	Easting	23 3 3 1 54	Northing	54 9 0 0 58
1. Aids to relocation of site (attach a sketch map) On Taiaoroa Head at entrance to Otago Harbour. Fort occupies the area of Pukekura pa (J44/4) but is much more extensive. Land is mostly a mix of Nature Reserve, Local Purpose Reserve, and Recreation Reserve administered by Dunedin City, Department of Conservation, and Ngai Tahu. Otago Peninsula Trust has a lease on part of the land. Above grid reference is for geodetic mark A230 which is centrally placed within the fort.				
2. State of site and possible future damage Various. Howlett Point sites are in reasonable condition while channel battery emplacement is in poor condition as a result of attempted demolition in past: see Hamel (1994). Access to most areas is strictly controlled. The 6-in Armstrong gun is the only working example in world.				
3. Description of site (Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here) The fort was a multi-battery establishment in service from 1885 to WWI and again in WWII. For history and detail of military changes over time see Cooke (2000: 116-119). For listing and description of features see Hamel (1994). Batteries within the perimeter of the fort were: 1. Howlett Point 1885-1904 (1 x 64-pr RML). Two 12-pr QF guns were later emplaced nearby 1914-1922. [NB: Hamel's "Garage Battery" is the original 64-pr site; her "Howlett Point Battery" is the later 12-pr site.] 2. Channel Battery 1885-1904 (2 x 64-pr RML). 3. Lighthouse Battery (Signal Station Battery) 1889-1925 (1 x 6-in Armstrong BL or disappearing gun). 4. Summit Battery 1888-1906 (1 x 6-pr Nordenfolt QF). (Often considered a detached part of 3.) 5. Saddle Battery 1888-1910 (1 x 7-in RML). For the location and descriptions of various features see Hamel (1994: Fig 1). The landward side of the fort was defended by a parapet and a stone wall. There were barracks and stores buildings etc. A 300ft rubble jetty (J44/148) was built in Pilots Bay in 1896 to service the fort. References: Cooke, P. 2000. <i>Defending New Zealand. Ramparts on the sea 1840-1950s</i> . Wellington, Defence of New Zealand Study Group. Hamel, J. 1994. Map of archaeological sites on Pukekura Pa. Conservation Advisory Science Notes 57, DOC.				
4. Owner Various. Mostly reserve land. Dunedin Address City, DOC, Ngai Tahu.		Tenant/Manager Address		
5. Nature of information (hearsay, brief or extended visit, etc.) Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site)		Published sources only - -		
6. Reported by A. Walton Address Wellington 5 May 2005		Filekeeper Date		
7. Central File (for office use)				
☐ Type of site ☐ Land classification		☐ Condition/threat ☐ Local body		

Appendix 2: J44/71 Tramway at Fort Taiaroa ArchSite record.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 ARCH SITE archaeological site recording scheme Site Record Form	NZAA SITE NUMBER: J44/71 SITE TYPE: Transport/ communication SITE NAME(s): DATE RECORDED:
SITE COORDINATES (NZTM) Easting: 1423291 Northing: 4928375 Source: CINZAS	
IMPERIAL SITE NUMBER: S164/150 METRIC SITE NUMBER: J44/71	
 1:1,563	
Finding aids to the location of the site	
Brief description TRAMWAY	
Recorded features	
Other sites associated with this site	

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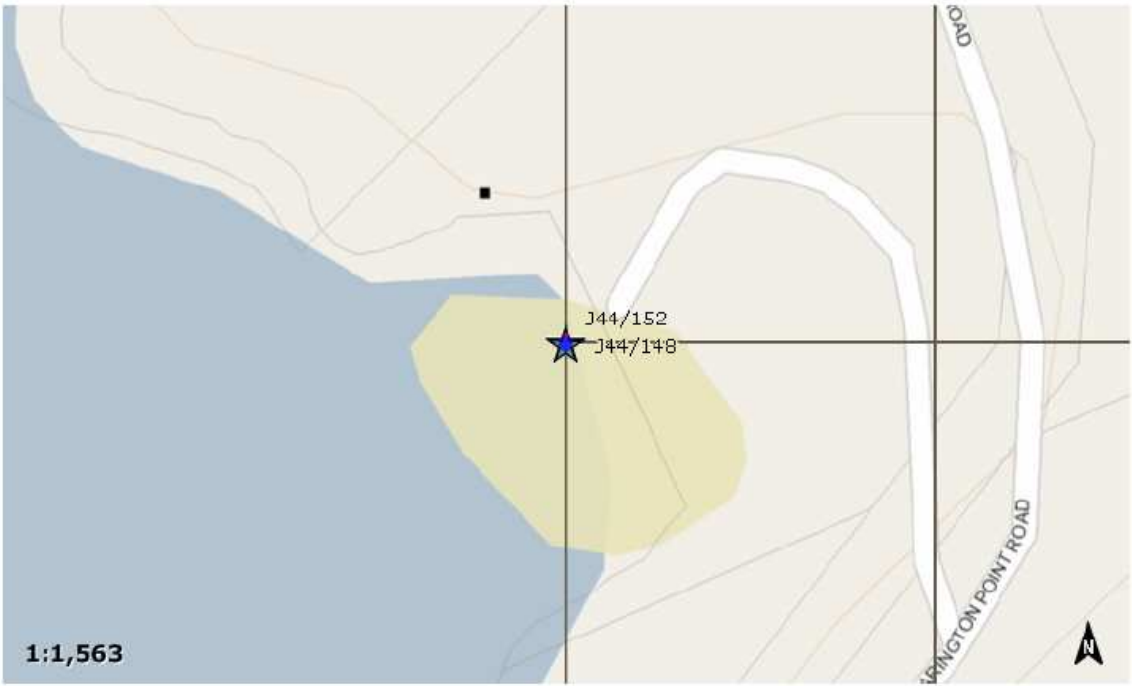
02/11/2012

SITE RECORD HISTORY	NZAA SITE NUMBER: J44/71
Site description Condition of the site Statement of condition Current land use: Threats:	
Empty space for detailed notes	

SITE RECORD INVENTORY		NZAA SITE NUMBER: J44/71	
Observations about this site made in			
Author	Year	Title	Publication Details
Supporting documentation held in ArchSite			
SITE REFERENCE FORM Mon number S.164 Map name Dunedin Grid reference 343837 E 434300 N 283700		BBBE-----AABF SITE NUMBER S.164/150 SITE TYPE Tramway	
1. Aids to relocation of site		0' -50' a.s.l.	
2. State of site; possibility of damage or destruction			
3. Owner		Tenant	
Address		Address	
Attitude		Attitude	
4. Name of site			
Source of name			
5. Date recorded		Details of investigation; method	
6. Aerial photograph numbers			
7. Reported by H.Knight, Public Hospital Dunedin.		Filekeeper S.Park, Otago Museum, Dunedin.	
Date		Date 26.8.68.	

Appendix 3: J44/148 Pilot's Beach Sea Wall ArchSite record.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 ARCHSITE archaeological site recording scheme Site Record Form	NZAA SITE NUMBER: J44/148 SITE TYPE: Transport/ communication SITE NAME(s): DATE RECORDED:
SITE COORDINATES (NZTM) Easting: 1423392 Northing: 4928175 Source: CINZAS	
IMPERIAL SITE NUMBER: METRIC SITE NUMBER: J44/148	
	
Finding aids to the location of the site Take the road to Pilots Beach, off Harington Point Road. The sea wall is at the north end of the beach and used to extend around through the fence of the albatross reserve to the stone wharf inside the reserve.	
Brief description Sea wall built of very well cut and trimmed basalt blocks, laid so that they are brought to course. Originally there were massive stone slabs forming the paving of the wharf. Built in the 1890s. Tramline alignment.	
Recorded features Stone wall, Tank, Tramway, Trench, Wharf/ jetty	
Other sites associated with this site J44/151	

Printed by: Smith I

02/11/2012

SITE RECORD HISTORY	NZAA SITE NUMBER: J44/148
Site description Updated: 02/03/2010, Visited: 01/10/2009 - NZTM E1423392 / N4928175 (CINZAS). An extra revetment feature was located on the west side of the main bend of the road, under a clump of ngaio bushes. This is a short length of revetment on the sandy slope west of the road. It is 2-3 m long, less than 1 m high at the best, and built of rounded and slabby basalt rocks. It would have provided a small stable platform immediately above on the slope. It is just to the east of the main trench running downhill for the rails that ran up from Pilots Beach, and may have been associated with it. Refer to attached site record form. Inspected by: Hamel, Jill. Updated: 30/01/2012, Visited: 21/12/2011 - NZTM E1423392 / N4928175 (CINZAS). Research in 2011 showed that the trenches on the line of the tramway (see previous form) were all later work, mostly for drainage of storm water from the houses behind the parapet. A track and boardwalk built in 2011 from the upper carpark down past the tanks for viewing blue penguins runs beside and over the old tramline. No traces of sleepers or ballast were found during the earthworks for the walkway. The alignment of the tramline was clear from the notch above Harington Pt Road and the outer edge of the stone wharf on Pilots Beach. A length of heavy wire hawser still lies in the lower part of the formation. The WWI structures were also briefly researched - see report Hamel, Jill. 2012. A tramline and storm water at Pilots Beach. Report to N Z Historic Places Trust. No measurements are available for the stone wharf which is inside the Albatross Sanctuary fence. Photographs taken from the sea are lodged with this form and reproduced in Hamel, Jill. Pukekura, the Headland J44/148. Inspected by: Hamel, Jill. Condition of the site The wharf has been badly damaged by wave action (2004). Updated: 02/03/2010, Visited: 01/10/2009 - This was always a poorly built revetment and the ngaio over it are both sheltering and slightly displacing it. Updated: 30/01/2012, Visited: 21/12/2011 - The formation of the 1880s tramline has been almost entirely destroyed by later military activities, but the mark on the hillside is still clear. Statement of condition Updated: 02/03/2010, Visited: 01/10/2009 - Poor - Visible features are incomplete, unclear and/or the majority have been damaged in some way Current land use: Updated: 02/03/2010, Visited: 01/10/2009 - Reserve/ recreation, Conservation land Threats:	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY			NZAA SITE NUMBER: J44/148																
Observations about this site made in																			
Author	Year	Title	Publication Details																
Supporting documentation held in ArchSite																			
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (METRIC) Metric map number J44 Metric map name Dunedin Metric map edition 2002			NZAA METRIC SITE NUMBER J44/148 DATE VISITED May 2004 SITE TYPE Sea wall/wharf SITE NAME: MAORI OTHER 5164																
Grid Reference Easting <u>2 3 3 2 0 0</u> Northing <u>5 4 8 9 0 0</u>																			
1. Aids to relocation of site (attach a sketch map) Take the road down to Pilots Beach off Harington Point Road. The sea wall is at the north end of the beach and used to extend round through the fence of the albatross reserve to the stone wharf inside the reserve.																			
2. State of site and possible future damage Badly damaged by wave action.																			
3. Description of site (Supply full details, history, local environment, references, sketches etc. If extra sheets are attached, include a summary here) The sea wall is built of very well cut and trimmed basalt blocks laid so that they are brought to course. The wharf area is now covered with debris but 20 years ago there were massive stone slabs forming the paving of the wharf. Both would have been used in the 1890s by prison labour when the Taiaoroa fortress was being erected. They would have been used to land the guns and other materials that had to be hauled up the tramline from the north end of Pilots Beach to the flat ground on the Heads.																			
4. Owner Address Dunedin City and Department of Conservation Tenant/Manager Address																			
5. Nature of information (hearsay, brief or extended visit, etc) Several visits Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site)																			
6. Reported by Jill Hamel, Address 42 Ann Street, Dunedin. Filekeeper Date <i>J Hamel</i> 6/04																			
7. New Zealand Historic Places Trust (for office use)																			
<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>H</td><td>A</td></tr> <tr><td> </td><td> </td></tr> <tr><td>A</td><td>G</td></tr> </table> Type of Site		H	A			A	G	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>B</td><td>B</td></tr> <tr><td>T</td><td>L</td></tr> </table> Present condition and future danger of destruction		B	B	T	L	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table> Local environment today					
H	A																		
A	G																		
B	B																		
T	L																		
<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table> Local body																			

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02/11/2012

J44-148. Tarewai Point wharf from the sea with the quarry at far right. Note: fur seals (Jill Hamel, 2011).



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J44-148. Tarewai Point wharf close in - a fur seal bull has woken up (Jill Hamel, 2011).



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J44-148. Far right of Tarewai Point wharf where the sanctuary fence crosses it. The hand built walling has broken up at left but is still partially complete as it runs towards Pilots Beach (Jill Hamel, 2011).



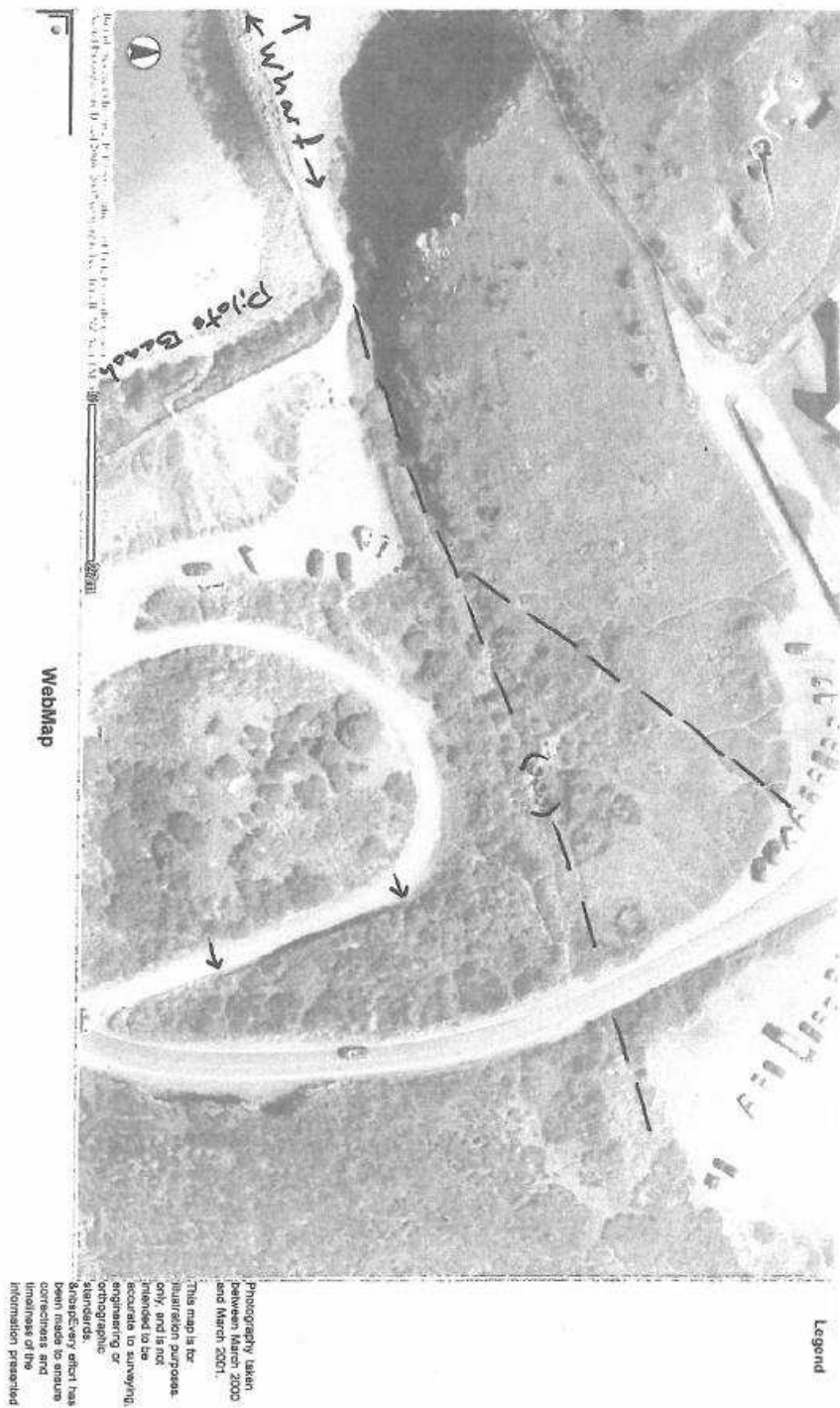
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

J44-148. Continuation of walling from the wharf into Pilots Beach. The tram line for hauling the guns ran just behind the track at the top of the photo (Jill Hamel, 2011).



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION		NZAA METRIC SITE NUMBER J44/148	
SITE RECORD FORM (NZMS260)		DATE VISITED October 2009	
NZMS 260 map number J44		SITE TYPE Seawall/wharf system	
NZMS 260 map name Dunedin		SITE NAME MAORI	
NZMS 260 map edition 2002		OTHER	
Grid References Easting <u>2 3 3 3 2 0.0</u> , Northing <u>5 4 8 9 8 0.0</u>			
1. Aids to relocation of site (attach a sketch map) Take the road down to Pilots Beach off Harington Point Road. The extra feature described on this form is on the west side of the main bend of the road, under a clump of ngaio bushes. The only way to find it is to climb up under the bushes.			
2. State of site and possible future damage This was always a poorly built revetment and the ngaio over it are both sheltering and slightly displacing it.			
3. Description of site (Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here) This is a short length of revetment on the sandy slope west of the road. It is 2-3 m long, less than 1 m high at the best, and built of rounded and slabby basalt rocks. It would have provided a small stable platform immediately above on the slope. It is just to the east of the main trench running downhill for the rails that ran up from Pilots Beach, and may have been associated with it.			
			
4. Owner Address Dunedin City Council		Tenant/Manager Address	
5. Nature of information (hearsay, brief or extended visit, etc.) Brief visit Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site)			
6. Reported by Jill Hamel, Address 42 Ann Street, Dunedin.		Filekeeper Date	
7. Key words			
8. New Zealand Register of Archaeological Sites (for office use) NZHPT Site Field Code			
Latitude S		Longitude E	
Type of site		Present condition & future danger of destruction	
Local environment today		Security code	
Land classification		Local body	

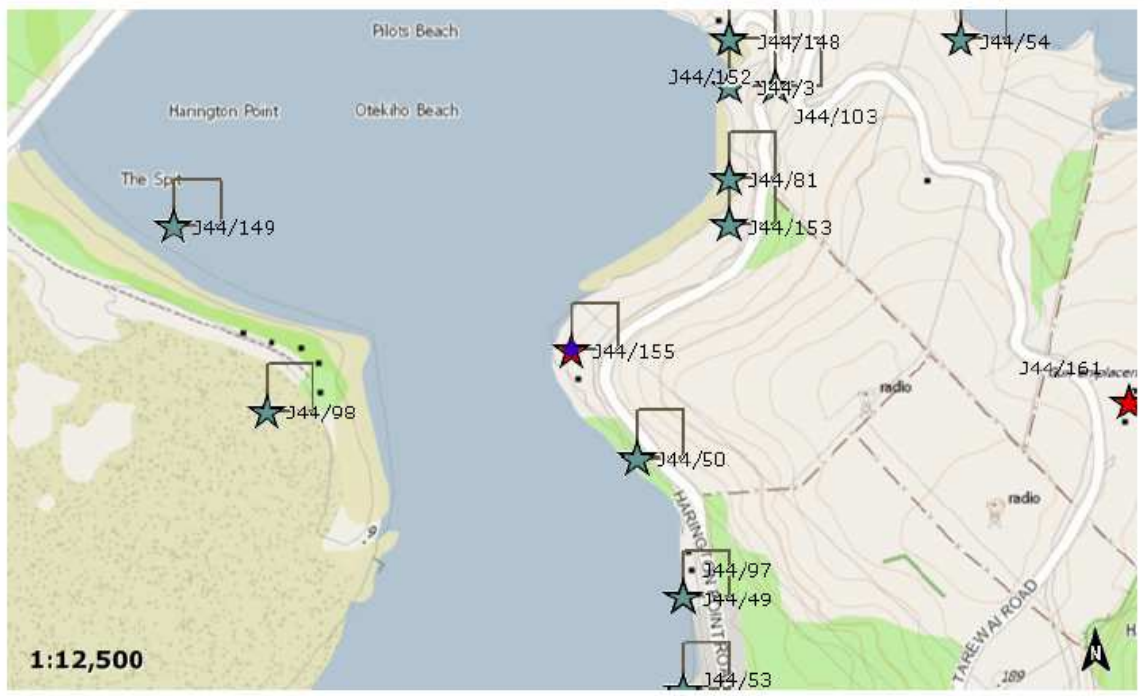
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION		NZAA METRIC SITE NUMBER J44/148	
SITE RECORD FORM (NZMS260)		DATE VISITED October 2009	
NZMS 260 map number J44		SITE TYPE Seawall/wharf system	
NZMS 260 map name Dunedin		SITE NAME: MAORI	
NZMS 260 map edition 2002		OTHER	
Grid References Easting 2 3 3 3 2 0.0. Northing 5 4 8 9 8 0.0			
1. Aids to relocation of site (<i>attach a sketch map</i>) Take the road down to Pilots Beach off Harington Point Road. The extra features described on this form are on the upper side of this small side road.			
2. State of site and possible future damage The trenches are heavily over grown and one has later military installations built on it.			
3. Description of site (<i>Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here</i>) There are two trenches running uphill from the end of the stone wharf recorded in 2004, within which there were railway lines for the system by which the guns and materials were hauled from the beach up to the flat area now occupied by the carpark in the 1890s and afterwards. The deeper trench is perfectly aligned with the wharf at the north end of Pilots Beach, which is however at right angles to the main wharf shown in enclosed photographs. (The wharf area was L-shaped.) The second trench, which is much less well defined, is at an angle to the main trench (see enclosed aerial photograph). Old photographs show a winch shed at the top of the main trench. A feature which is also almost certainly part of the 1890s military works is a wall, 35 m long and mostly 1.5 m high, cut into solid breccia on the upper side of the road down to Pilots Beach (see arrows on aerial). It creates an unnaturally straight edge to the road as it runs down through the sand dunes. The cut breccia is moderately weathered, compared to the banks of the older main road. Two thirds of the way up the deeper of the two trenches there are the remains of two concrete water tanks and other concrete structures which almost certainly belong to the WWII military period.			
4. Owner Address Dunedin City Council		Tenant/Manager Address	
5. Nature of information (<i>hearsay, brief or extended visit, etc.</i>) Brief visit Photographs (<i>reference numbers and where they are held</i>) Aerial photographs (<i>reference numbers and clarity of site</i>)			
6. Reported by Jill Hamel, Address 42 Ann Street, Dunedin.		Filekeeper Date <i>J Hamel</i> <i>10/09</i>	
7. Key words			
8. New Zealand Register of Archaeological Sites (<i>for office use</i>) NZHPT Site Field Code			
Latitude S		Longitude E	
☐ Type of site		☐ Present condition & future danger of destruction	
☐ Local environment today		☐ Security code	
☐ Land classification		☐ Local body	



841/445

Appendix 4: J44/155 Harrington Point Battery ArchSite record.

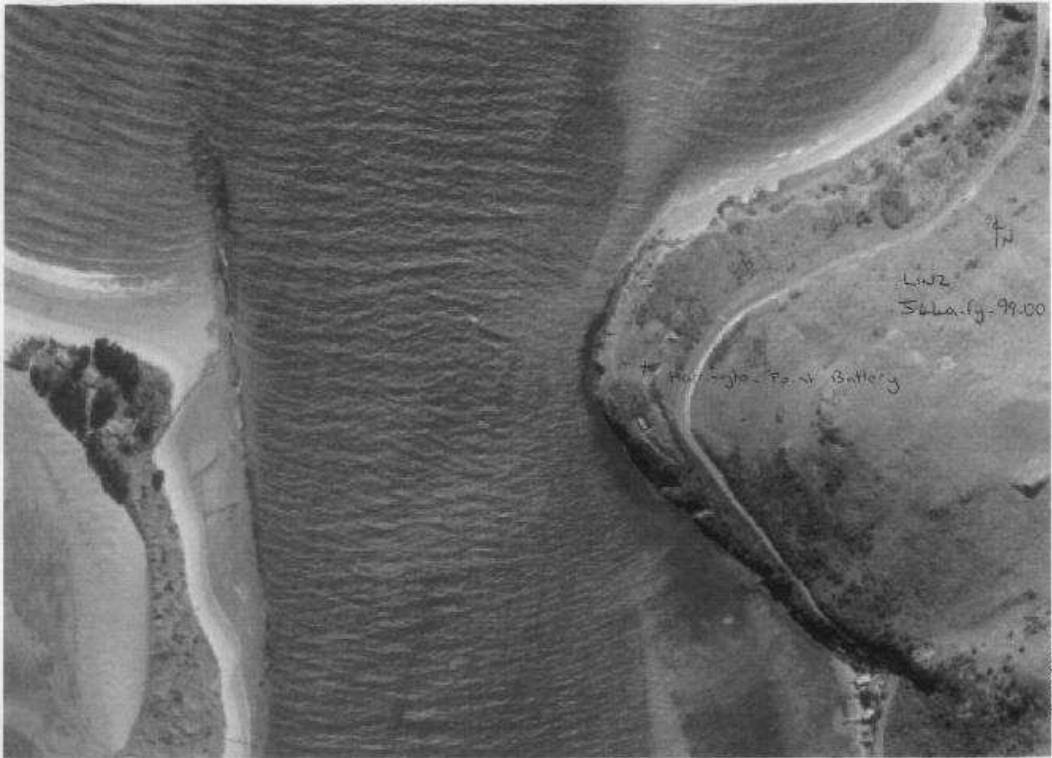
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 ARCH SITE archaeological site recording scheme Site Record Form	NZAA SITE NUMBER: J44/155 SITE TYPE: Military (non-Maori) SITE NAME(s): Harrington Point DATE RECORDED:
SITE COORDINATES (NZTM) Easting: 1423053 Northing: 4927505 Source: CINZAS	
IMPERIAL SITE NUMBER: METRIC SITE NUMBER: J44/155	
	
Finding aids to the location of the site The site is located on Harrington Point, below Harrington Point Road.	
Brief description Fortification. Work began in 1890 as a minefield control work and QF Battery. The site consists of two 7-inch RML pits, Quick Firing gun emplacements, searchlight and observation posts, magazines and associated infrastructure.	
Recorded features Building, Gun battery, Tunnel - pedestrian	
Other sites associated with this site	

Printed by: Smith I

09/10/2013

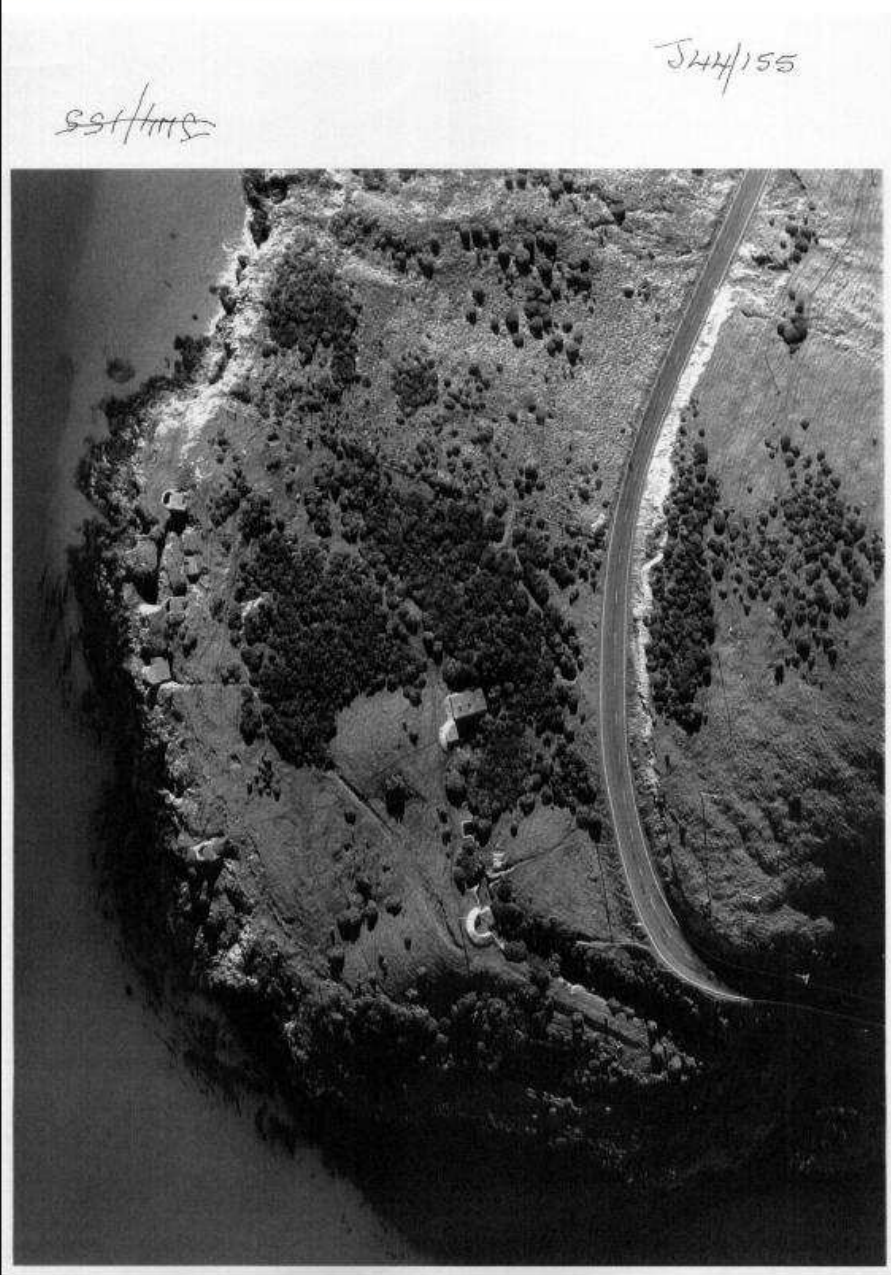
SITE RECORD HISTORY	NZAA SITE NUMBER: J44/155
Site description Updated: 09/10/2013, Visited: 09/10/2013 - The Battery at Harington Point is divided across two levels. The upper level, on the hill just below Harington Point Road) consists of two engine rooms, two 7-inch RML gun emplacements, an observation post, and underground magazine and war shelter. All structures, with the exception of the northern engine room which is WWII era, were constructed in the 1890's. The lower level, situated just above the high tide mark of the Harbour consists of two searchlight posts, two 6-pdr QF gun emplacements, and a war shelter. With the exception of the southern searchlight post, on which construction was completed in 1906, all structures at this level are WWII era. The 1906 searchlight post has a tunnel which extends uphill to the original engine room on the upper level. For detailed historical information see Cooke (2000). For detailed site descriptions and archaeological data see Scahill, A. 2013. Defending Dunedin: The Archaeology of Dunedin's Coastal Military Fortifications 1885- 1945. Unpublished Honours Dissertation, University of Otago Anthropology and Archaeology Dept. Condition of the site In reasonable condition. All concrete structures remain. No known threats. (Updated 2005). Refer also to Cooke, P. 2000. Defending NZ. Ramparts on the sea 1840-1950's. Wellington, Defence of NZ Study Group. Statement of condition Current land use: Threats:	

SITE RECORD INVENTORY			NZAA SITE NUMBER: J44/155	
Observations about this site made in				
Author	Year	Title	Publication Details	
Supporting documentation held in ArchSite				
				



Harrington Point Battery in WW2
Refer: Locke 2000, p8

55/470



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM NZMS260 map number J44 NZMS260 map name DUNEDIN NZMS260 map edition		NZAA METRIC SITE NUMBER J44/155 DATE VISITED Not visited - published sources only SITE TYPE Fortification SITE NAME: MAORI OTHER Harrington Point								
Grid Reference	Easting 23 3 2 8 6	Northing 54 8 9 1 3								
1. Aids to relocation of site (attach a sketch map) Inside Taiaoroa Head, Otago Harbour. On Harrington Point below Harrington Point Road. Above grid reference derived from approximating the position of visible remains on aerial photos on Terraview map.										
2. State of site and possible future damage Reasonable. All concrete structures remain. No known threats.										
3. Description of site (Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here) For history of the place see Cooke (2000: 84). Copy attached along with copies of three photos from his photo section (A24, A25). Work began in 1890 as a minefield control work and QF Battery. Work was stopped soon after but resumed in 1892. Work consists of two 7-in RML pits - the 2 nd added as late as 1903 when the 7-in RML was already obsolete. In 1941 structures were built in one 7-in emplacement to support QF and searchlight batteries. The QF guns were initially 2 obsolete 15-pr guns later replaced by two 6-pr Nordenfolt QF guns. There is also an engine room and a long tunnel (built c.1906) which leads down to the searchlight emplacement below. References: Cooke, P. 2000. <i>Defending New Zealand. Ramparts on the sea 1840-1950s</i> . Wellington, Defence of New Zealand Study Group.										
4. Owner	Sec 75 Blk II Portobello SD	Tenant/Manager								
Address	Wiremu POTIKI	Address								
5. Nature of information (hearsay, brief or extended visit, etc.) Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site)		Published sources, aerial photos only LINZ Orthophoto J44a_fy_99_00 - shows badly								
6. Reported by	A. Walton	Filekeeper								
Address	Wellington	Date								
	5 May 2005	9/05								
7. Central File (for office use) <table border="0"> <tr> <td>☐</td> <td>Type of site</td> <td>☐</td> <td>Condition/threat</td> </tr> <tr> <td>☐</td> <td>Land classification</td> <td>☐</td> <td>Local body</td> </tr> </table>			☐	Type of site	☐	Condition/threat	☐	Land classification	☐	Local body
☐	Type of site	☐	Condition/threat							
☐	Land classification	☐	Local body							

K Jones
22/7/99
Harington Pt
J44/





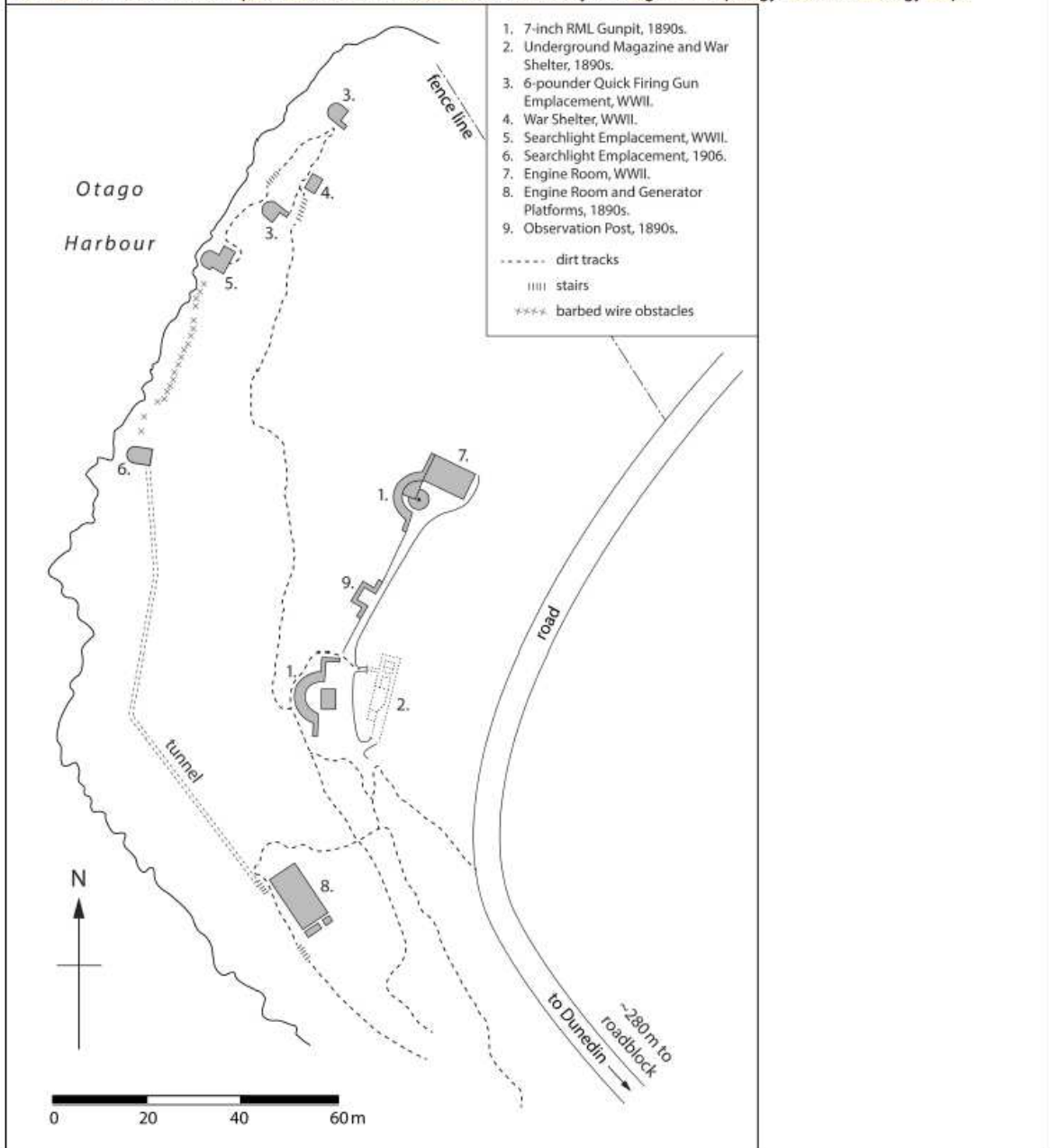
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

1890s Engine room. Deteriorated front facade reveals concrete construction underneath, disguised to appear as if constructed of large stone blocks.



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

Map of Harington Point Battery. From Scahill, A. 2013. Defending Dunedin: The Archaeology of Dunedin's Coastal Military Fortifications 1885-1945. Unpublished Honours Dissertation. University of Otago Anthropology and Archaeology Dept.



Appendix 5: I44/591 Tomahawk Battery ArchSite record.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 ARCHSITE archaeological site recording scheme Site Record Form	NZAA SITE NUMBER: I44/591 SITE TYPE: Military (non-Maori) SITE NAME(s): Tomahawk Battery St. Kilda Battery DATE RECORDED: 09/10/2013
SITE COORDINATES (NZTM) Easting: 1410278 Northing: 4913331 Source: On Screen	
IMPERIAL SITE NUMBER: METRIC SITE NUMBER:	
	
Finding aids to the location of the site Site is located on Dunedin's south coast, at the point where Tomahawk Road meets Centre Road.	
Brief description Tomahawk Battery is WWII constructed in 1942. The two emplacements are placed on a small rocky outcrop separating Tomahawk Beach and Smail's beach, while an observation post exists to the north-east. All concrete structures remain.	
Recorded features Gun emplacement, Observation post, Unclassified	
Other sites associated with this site	

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09/10/2013

SITE RECORD HISTORY	NZAA SITE NUMBER: I44/591
Site description	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

Updated: 09/10/2013, Visited: 09/10/2013 - Tomahawk Battery, also known as St. Kilda Battery, is located near the base of the Otago Peninsula on Dunedin's south coast. The two emplacements, which once housed two 6-inch Mark VII guns, are placed on a small rocky outcrop separating Tomahawk Beach on the west and Smailly Beach on the east (Fort Record Book n.d.); while the observation post, magazine, and battery camp were located slightly to the north-east. The Southern Military Command (SMC) and Public Works Department (PWD) began construction on the emplacements in May 1942 in order to cover Dunedin's docks from offshore bombardment from the south (Joyce 1995: 1; Cooke 2000: 498), and were completed during September that year. The guns were mounted in October, but Cooke (2000: 498) notes that the battery never became fully operational. One gun was fully mounted and test fired, though according to the records, incomplete equipment meant the second gun was never tested (Joyce 1995: 4). The second, incomplete gun was soon after removed and replaced with a similar gun which was transferred to Tomahawk from Bluff (Cooke 2000: 498). The guns covered a range from 095° and 258° right (Joyce 1995: 2). Camouflaging was carried out by the PWD, with the western emplacement camouflaged to look like a beach cottage, while the eastern emplacement was made to look like a shed. Both emplacements were fitted with false fronts, through which the gun barrels poked out (Fort Record Book n.d.: 9; Joyce 1995: 1-2; Cooke 2000: 498).

The emplacements were of the Colchester pattern, complete with overhead covers and internal magazines (Fort Record Book n.d.: 9; Joyce 1995: 1-2; Cooke 2000: 498). The two emplacements are southern facing, and measure approximately twelve metres in length from front to back. At the front end of the emplacement the structures are about ten metres wide, while they are narrower at the rear, measuring roughly eight metres in width. The front, wider half of the structures are where the guns were mounted, while the narrower rear sections are internal rooms and magazines. The wider sections are open at the front, with a large concrete canopy covering the gun mounting platform. These canopies are made of thick slabs of concrete, and have each have two concrete support beams approximately 30-40cm thick running from the back to the front. Small areas of concrete in the canopy have deteriorated, revealing metal bars set into the concrete for strengthening. The eastern structure has a concrete floor, with the gun platform centrally placed, while the second structure is the same with the exception of a large gravel build up on the concrete floor surrounding the mounting platform. The mounting platforms are slightly raised circular concrete platforms with a diameter of 1.60m. On top of these are set two round metal mountings 1.05m in diameter, set into the concrete. In the rear section of the structures were internal magazines, accessible through a wide doorway at the rear of the canopied area. The doorways into these rooms have large metal doors. In July 1945 both guns were removed from their mountings, the magazines were emptied, and the internal rooms of the emplacements were permanently sealed (Joyce 1995: 3; Cooke 2000: 498).

The Battery observation post is located approximately 120m north-east of the two 6-inch emplacements. Located above the emplacements, the observation post has been partially buried within the hill. Entering from the north a 1.2m wide passageway leads 18m into the hillside, with a slight bend to the east 15m down the passageway. At the end of the passageway, a door on the right-hand side leads into a small 1.45m by 1.45m room, before opening into the main observation room. The main room faces south and measures 4.6m wide by 3.05m long. At approximately eye level, there is a window type opening for observation. This opening extends the entire 4.6m width of the front of the room, and extends 1.7m down both sides of the room, giving a wider viewing range. This window opening has no glass but is open to the air, covered with sections of wire, to prevent people climbing into or out of the room through this opening. The length of this opening has a wooden frame, onto which the wire has been attached. Along the front section is a flat, wooden 'windowsill' which has been broken and now covers only half the length of the sill. The floor is made of concrete. As discussed in the site description from Harington Point, horizontal seams in the walls of the observation post indicate that the walls were created in levels. On the exterior, most of the structure has been built into the hillside, and is now overgrown with plants. Overgrown plants now disguise the entrance into the observation post, but would not have been like this at the time of occupation. Only a small section of the concrete roof is visible from the exterior.

Initially the battery camp consisted of five cottages for accommodation, two owned by the SMC and the others rented (Joyce 1995: 1; Cooke 2000: 498), although a number of additional buildings had to be built shortly after (Joyce 1995: 1). Facilities included a mess block, latrines, men's and women's showers and laundry, a recreation room, food and fuel stores, and even a hairdressing salon (Fort Record Book n.d.; Joyce 1995: 1). Additionally, the installation of water supplies and construction of roads were necessary to ensure full functionality of the site (Joyce 1995: 1).

References: Cooke, P. 2000. *Defending New Zealand: Ramparts on the Sea 1840- 1950s*. Wellington: Defence of New Zealand Study Group.

Fort Taiaroa Record Book, Fort Taiaroa Archive. FT00/145. National Archives Ref CAWR539 3.7. Copies from Stewart, L., Otago Peninsula Trust.

Joyce, J. L. 1995. Tomahawk Battery. Fort Taiaroa Archive. FT00/185. Copies from Stewart, L., Otago Peninsula Trust.

Condition of the site

Updated: 09/10/2013, Visited: 09/10/2013 - All concrete structures remain, with only minimal deterioration.

Statement of condition

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

Current land use:

Updated: 09/10/2013, Visited: 09/10/2013 - Urban residential, Reserve/ recreation

Threats:

SITE RECORD INVENTORY			NZAA SITE NUMBER: I44/591	
Observations about this site made in				
Author	Year	Title	Publication Details	
Supporting documentation held in ArchSite				
Inside of Observation Post at Tomahawk Battery				



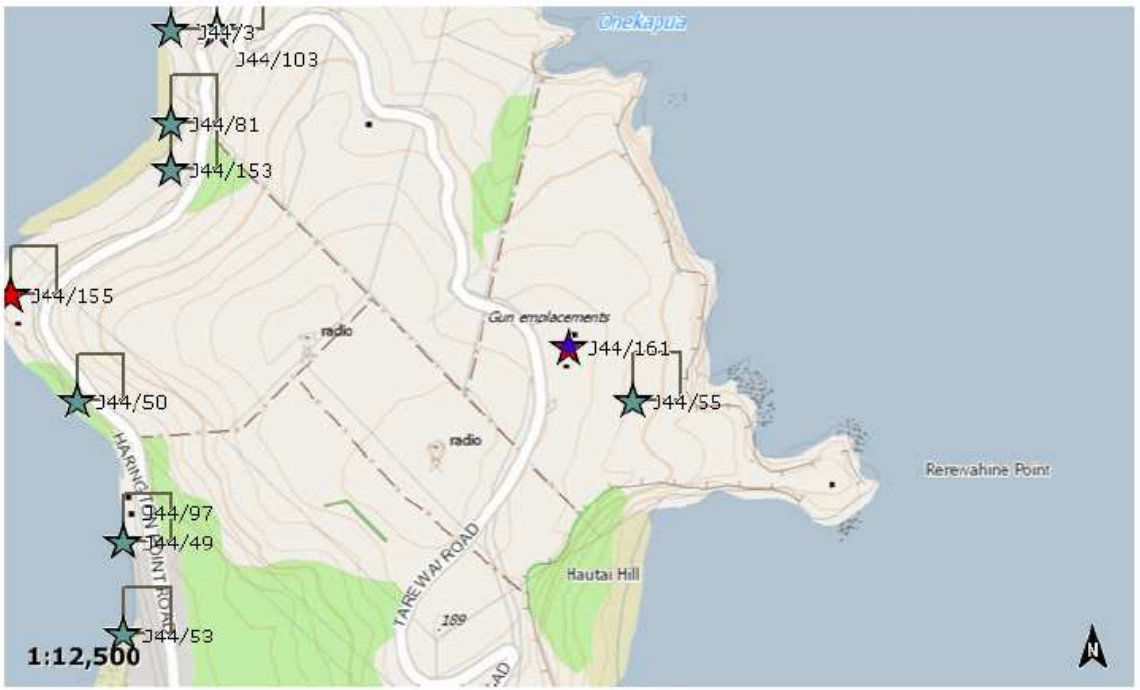
View south from roof of observation post. Gun emplacements are visible in foreground.





Appendix 6: J44/161 Rerewahine Battery ArchSite record.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 Site Record Form archaeological site recording scheme	NZAA SITE NUMBER: J44/161 SITE TYPE: Military (non-Maori) SITE NAME(s): Rerewahine Battery DATE RECORDED: 09/10/2013
SITE COORDINATES (NZTM) Easting: 1424254 Northing: 4927391 Source: CINZAS	
IMPERIAL SITE NUMBER: METRIC SITE NUMBER:	
	
Finding aids to the location of the site Go to Taiaroa Head, then head south 2km down east coast along Tarewai Road.	
Brief description Constructed in 1941- 1942, Rerewahine Battery was built to defend the Otago Harbour entrance and peninsula beaches from hostile invasion and offshore bombardment.	
Recorded features Building, Gun battery, Gun emplacement, Observation post	
Other sites associated with this site	

Printed by: Smith I

09/10/2013

SITE RECORD HISTORY	NZAA SITE NUMBER: J44/161
Site description Updated: 09/10/2013 - The site consists of two gun emplacements, which were mounted with 6-inch BL guns, magazine, barracks, radars station, engine rooms, searchlights and war shelters. One of the original barracks buildings remain, while most concrete structures are still in place, though conditions are reportedly poor. For detailed historical descriptions see Cooke, P. 2000. Defending New Zealand: Ramparts on the Sea. Wellington: Defence of New Zealand Study Group. and Scahill, A. 2013. Defending Dunedin: The Archaeology of Dunedin's Coastal Military Fortifications 1885-1945. Unpublished Honours Dissertation, University of Otago Anthropology and Archaeology Dept. Condition of the site Updated: 09/10/2013 - Located on private land, site access is limited due to the reportedly poor condition of the sites concrete structures creating safety concerns. Consultation with Laurie Stewart of the Otago Peninsula Trust and Fort Tairaroa Education and Resource Centre indicates that structures at the site are badly deteriorating, to the point where the structural integrity of the structures has been compromised. Some structures have been modified in various ways by the current landowner. Statement of condition Current land use: Threats: Updated: 09/10/2013 - Erosion, Property development	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY			NZAA SITE NUMBER: J44/161	
Observations about this site made in				
Author	Year	Title	Publication Details	
Supporting documentation held in ArchSite				
Gun emplacement at Rerewahine, c. 1985. Condition of emplacements now is reportedly very poor. Photo provided by Laurie Stewart of the Otago Peninsula Trust and Fort Tairaroa Education and Resource Centre.				



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

Gun emplacement at Rerewahine, c. 1985. Condition of emplacements now is reportedly very poor. Photo provided by Laurie Stewart of the Otago Peninsula Trust and Fort Tairaroa Education and Resource Centre.



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

Gun emplacement at Rerewahine, c. 1985. Condition of emplacements now is reportedly very poor. Photo provided by Laurie Stewart of the Otago Peninsula Trust and Fort Taiaroa Education and Resource Centre.



Appendix 7: I44/590 Lawyer's Head Battery ArchSite record.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 ARCH SITE archaeological site recording scheme Site Record Form	NZAA SITE NUMBER: I44/590 SITE TYPE: Military (non-Maori) SITE NAME(s): Lawyer's Head Battery DATE RECORDED: 09/10/2013
SITE COORDINATES (NZTM) Easting: 1408862 Northing: 4913118 Source: On Screen	
IMPERIAL SITE NUMBER: METRIC SITE NUMBER:	
	
Finding aids to the location of the site Located at the end of John Wilson Ocean Drive on the headland. No surface trace remains, but believed to have been at the site of the memorial on the headland.	
Brief description Constructed in 1885, the 7-inch RML gun mounted here protected the city from offshore bombardment, and against enemy landings on the beaches. No surface traces remain, but subsurface remains are likely (Cooke 2000: 96).	
Recorded features Unclassified	

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: I44/590
Site description Updated: 09/10/2013 - Constructed in 1885, Lawyer's Head Battery was mounted with a 7-inch 7-ton RML gun (Cooke 2000: 96). Official recommendation argued for the additional mounting of an 8-inch gun, but upon its arrival at the battery it was placed in storage and never mounted. The gun spent sixteen years in storage at the site before finally being removed and shipped to Wellington (ibid). The Lawyer's Head 7-inch gun, while covering beach landings at St. Kilda and St. Clair to the west, could also be swung around to cover both offshore bombardment, and Ocean Grove and Tomahawk Beaches to the east. The gun was removed twelve years after installation in 1897 (Cooke 2000: 96). The battery itself was of timber and earthwork construction (ibid). While no surface trace remains, consultation with Laurie Stewart of the Otago Peninsula Trust and Fort Taiaroa Education and Resource Centre indicates that subsurface remains are likely. As no real archaeological remains are known, this site is recorded simply as a point spot for historical reference. For further reference see Cooke 2000. Defending New Zealand: Ramparts on the Sea 1840s-1950s. Condition of the site Updated: 09/10/2013 - No surface trace remains. Statement of condition Current land use: Updated: 09/10/2013 - Reserve/ recreation, Road reserve Threats:	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY			NZAA SITE NUMBER: I44/590	
Observations about this site made in				
Author	Year	Title	Publication Details	
Supporting documentation held in ArchSite				