NORTH HEAD PROJECT

INTERIM REPORT MAY 1994

1. The origins of the Project

The North Head project was undertaken by the Department of Conservation in response to public disquiet about the possibility of the existence of decaying ammunition in disused and hidden tunnels beneath the Fort at North Head Auckland.

These stories had been circulating for some years but appear to have intensified as the result of a taped telephone conversation between John Earnshaw and former Minister of Defence, Tizard. In the tape Mr Tizard intimated that he had received advice that ammunition may still be present. An opposing point of view was presented by Major R Nutsford, the Officer responsible for closing down the Fort. He maintained strongly that he had cleared the Fort of all ammunition by the time it was handed over to the Devonport Borough Council.

In a series of public meetings held in Devonport the Department of Conservation outlined and had approved a plan for an orderly and controlled investigation of the mystery.

2. The Project

The North Head Project was then subdivided into a number of stages.

The first stage was a re-examination of all archival material and an assessment of the witness information to the existence of now hidden tunnels. The excavation project was initially designed using this information.

3. Archival Research

The archival research was undertaken by Mr J Treadwell, a Conservation Architect who had previous experience in researching the history of other major government works projects.

Archival material was sourced from National Archives in Wellington and Auckland, the Alexander Turnbull Library, Works Consultancy archives, the Auckland Public and Museum libraries, Department of Conservation files, Defence Department files, and material supplied by the Navy Museum, Devonport.

Also checked were the libraries at the Army Museum, Waiouru and the Museum of Transport and Technology.

This material was all collated and presented as a referenced chronology.

There was little in this material to suggest the existence of any other major tunnel system. The pattern that was discernable in this material was of two major phases

of construction on North Head. The first period extended from 1885 until the First World War. During this time the fort was constructed intensively from 1885 until 1893, after which the work levels decreased with only the 12pr guns and 6" MkVII guns installed after this date.

The second period extended from 1937 until the end of the Second World War.

Almost all the structures visible today were accounted for in the chronology.

Also examined were any gaps in the archival record. These did exist especially in the period 1900 - 1910 and for some periods during the Second World War.

It was felt that any major supplementary earthworks carried out during World War II would have been noted and remembered by residents and the people involved in the construction.

No-one came forward with any information relating to this period. Therefore it was more likely that if these other major tunnel systems had been built and the records lost it was probable that it was from the earlier period, 1900 - 1910.

4. Witness accounts

A number of people had approached either Mr Earnshaw or the Department with accounts of other tunnels they claimed to have seen. Also Mr Earnshaw supplied a volume of the accounts he had collected. This information was collated and a number of sites were selected initially on this basis.

5. Gas Testing

In two areas of North Head, the Summit Battery and the old Engine Room there was a distinct smell of naphtha or mothballs. It was suggested that this smell may have been coming from decaying ammunition somewhere in the complex. For this reason the company "Groundsearch" was employed to test the gases in these areas before any other work was attempted. A series of holes were drilled in the walls and floors of both areas and the gases extracted and analysed. The areas of concentration were then plotted onto the maps. A number of volatile hydrocarbons were identified some of which were similar to those present in explosives. However at the time of the drilling a black tar like substance smelling strongly of naphtha was found coating the outside of the tunnel walls. Further archival research then discovered 19th century records of over 2000 gallons of coal tar being ordered for waterproofing the tunnels at North Head. This substance contains most of the volatile hydrocarbons present in explosives. It seemed most probable that the gases detected came from coal tar rather than from ammunition.

6. Engineering Consultants

Much of the proposed work involved problems not usually encountered in archaeological projects. Specialised machinery was needed and care had to be taken

not to damage the 19th century structures in which we were working. For this reason a firm of consulting engineers, Riley Consultants were engaged. They have provided advice on methods, machinery and contractors and have supervised some of the specialised work.

7. Army Liaison

Before any work was started army explosives experts were consulted as to method and procedures. All work was checked by the army and personnel were on standby at all times work was being carried out.

8. The sites based on Witness Evidence

Site I: The Water Tank

This was sited on the summit of North Head. It had originally been an 8" gunpit.

In 1960 the gunpit had been sealed with a concrete floor and wall liner and converted into a watertank. A number of witness described going from this gunpit into a passage and thence to other levels below the present fort. Also an army drilling team in 1988 had drilled the wall and reported loose fill and a GSCB radar scan suggested the presence of a cavity in the gunpit wall.

Both the water tank walls and floor were core drilled and then removed revealing an intact 1880s gunpit. There were no additional entrances in either the walls or floor of this structure.

Site II: The 7" RML Gunpit

This structure was known but had been filled with earth for at least 30 years. This structure was excavated by machine and cleaned. It has been left open, and the tunnel and gates leading to the rest of the underground complex cleared.

No extra tunnels or entrances were found although a number of features uncovered agree with eyewitness accounts of the other 8" gunpit, (the old water tank), suggesting some confusion between the two.

Site III: The structure on the Western slope

This structure was visible on old photographs although its function was unknown. A machine was used to dig a number of trenches across the slope. These revealed an old rubbish tip containing bottles, tins, and some broken concrete.

The trenches were dug down to the subsoil over a large area. No sign of any tunnel or other structures were found.

Site IV: The Old Tramway

This was visible in a number of old photographs and there was the possibility that a tunnel entrance was visible in one of these.

The area was dug out by machine revealing a large iron idler pulley originally part of the tramway. This structure was left open and the wheel cleaned. Bottles and a 1914 calendar found under the pulley wheel indicated a successive backfilling of this site from about 1914 until 1940.

No tunnel entrance was found.

9. The Photosurvey Map and Magnetometer Survey

At the conclusion of phase I it was clear that more information was needed before any further work could be undertaken.

This information was obtained in two ways.

Firstly a firm of professional cartographers, Photosurvey, were approached and they suggested mapping using the stereo pair aerial photographs of North Head which were available for 1940, 1950, 1960 and 1970. These photographs allowed a map to be produced showing any changes to ground surface or buildings during this period. Both John Earnshaw and myself worked with Photosurvey indicating areas of interest when the photographs were viewed on the stereoscope. Five further sites were located from this map. Photosurvey then surveyed and pegged these sites on the ground.

The cartographers also located an old drawing of an engine room held by John Earnshaw onto the map.

The other technique used was a magnetometer survey. This was undertaken by P Vidanovich, a geological surveyor. Most of the tunnelling on North Head is of the "cut and cover" type where the tunnel is dug as a trench, roofed and then backfilled. The tunnel roofs are reinforced with old railway line, which can be detected by magnetometer. Three areas were surveyed, the road terrace by the toilet block, the old tennis court/parade ground and the area where the old plan indicated another engine room may exist.

The sites identified from the photosurvey map and the magnetometer survey were then investigated. The investigation used three techniques. Where the sites were identified as possible entrances a machine was used to dig the area. Where the sites were deep and localised a drilling rig was used and in two areas inaccessible by machine, hand excavation was used.

10. Site V

This was located on the bank below the public toilet block on the south western side of North Head.

This site was located using the Photosurvey map. This showed a possible entrance in the 1950 aerial photographs. It was also in the area where an 1885 photograph showed a large trench on the hillside. The area was checked by probe indicating an area of looser fill, and the magnetometer survey gave a positive result.

The site was located on the ground and pegged by Photosurvey.

The machine dug in this area to a depth of 3 metres, indicating fill for approximately 2 metres, with the original ground surface and natural soil layers below this depth. A large sash weight was excavated at approximately 1.5m depth. It was probably this object that had been shown on the magnetometer survey. There was no sign of any structures in this area and no concrete or brick, broken concrete or concrete dust as would be expected if a tunnel or tunnel entrance had ever existed in this area.

Site VI: On slope below Main Magazine.

This site was located using the magnetometer. It was also in the area where it had been suggested that the large trench photographed in 1885 may have existed.

This site was excavated to a depth of 3m. The cross-sections indicated a number of fill layers. A buried topsoil layer was excavated at a depth of 2.1m with natural undisturbed soil under it. A 40cm length of railway line, presumably an offcut from the tunnel roof reinforcing was found. This is probably the material located by the magnetometer. As with site V, no sign of tunnels, tunnelling or any other structure was located.

Site VII: Saluting gun Base on the old Tennis Court.

These structures were recorded as bases for a battery of saluting guns located here in the 1930s.

This area was checked as there had been some argument as to what these concrete structures were and whether they were the cause of the magnetometer anomalies in this area. When dug it was apparent that the reinforced concrete slab sat on top of a natural rock and soil base and were probably the origin of the magnetometer anomaly.

Site VIII: At base of the bank below North Battery.

This site had been located by Photosurvey in the 1940 and 1950 aerial photographs. It appeared to be a raised rectangular object that may have been a ventilator or an object, possibly a chimney, visible in a Whites Aviation photo from the late 1930s. This site was located and pegged and then excavated.

It was a rubbish pit with a number of stratified fires. A large number of bottles, tins, bones and other refuse was recovered. The bottles recovered indicate use between about 1900 and 1960. It is possible the 'raised objects' may have been containers used for rubbish or perhaps an incinerator.

Site IX: Area of Possible Engine Room.

This site was excavated on the basis of two pieces of evidence. Firstly a 19th century drawing in the possession of John Earnshaw shows another engine room in this area. Also the magnetometer survey indicated some anomaly.

A 12.5m long trench was excavated across the area where the drawing indicated a tunnel may exist. This was excavated to a depth of 2m. The drawing showed a soil cover above the tunnel roof of 4 feet. The trench was dug to the subsoil. In one area a band of soft tuff (consolidated volcanic ash) was encountered. There was no evidence of tunnels, concrete or deep cultural material. There was no indication of what had caused the magnetometer anomaly, although it is possible that this was located in an area too steep for the machine to work.

The old drawing was then located by Photosurvey onto their map and two holes were drilled, one over where the tunnel was indicated and one over the engine room.

Possible Tunnel site: Drilled to 6.25m through natural soil and scoria.

Possible Engine Room site: Drilled to 7m through soil and scoria.

No traces of concrete or any cultural material was discovered. It seems certain that this engine room was never built.

Sites on Terrace by Public Toilets

These sites were drilled to test locations indicated by the magnetometer survey.

Site X:

Hole 1: Drilled to 8.75m. This site was cored, indicating scoria and soil.

Hole 2: Drilled to 8.75, indicating scoria, soil.

No tunnels or cultural material were found.

Site XI

On the magnetometer survey this site showed as a linear pattern, therefore 2 holes were drilled.

Hole 1: Drilled to 9.25m, indicated soil and small pebbles.

Hole 2: Drilled to 7.5m, indicated a tuff layer .5m thick at 3m, with soil beneath this.

Again, no tunnels, concrete or cultural material were found.

Site XII

This site was drilled above an area where a possible entrance was indicated on the Photosurvey site map. While not directly on the entrance, which was shown on the slope below, it was felt that if a tunnel existed here it would have to go directly into the hill below the area drilled.

Drilled to 7.5m, indicating soil and small pebbles.

No tunnel, concrete or cultural material was encountered.

Site XIII

This site was drilled on the road above the public toilets to test information that a tunnel existed behind the modern Toilet Block. This was drilled to 7.25m and indicated scoria boulders and soil. No tunnel, airspace, concrete or cultural material was found.

Tennis Court Magnetometer Sites

Site XIV

These possible sites had been located as a result of the magnetometer survey and were tested with the drilling rig. The first site tested had shown a very strong magnetic anomaly.

It was drilled to 7; Non-ferrous metal filings were encountered at 1.2m.

This site was then excavated by spade and mattock. The natural tuff layers were encountered at approximately .6m. The rock was smashed out with a mattock. At 1.2m a band of very dense tuff was discovered. No metal or other cultural material was found. Peter Riley, a consulting engineer, suggested to me that one possible scenario was that the drill when it struck the hard tuff layer started to vibrate bringing the metal down from a higher level.

It is certain however that this area is undisturbed natural tuff.

Site XV

This was another site located during the magnetometer survey. It was drilled to 5.25m through undisturbed tuff.

Site XVI

Tennis Court Extra Work

Throughout this job Mr Phillip Molineux, who as a Naval Officer had done some of the earlier investigation at North Head, has suggested the use of divining rods as a research tool. He had shown me on a number of occasions how he used these things. One area where he thought the divining rods showed a definite response was on the Tennis Court. I got him to show me where the rods gave a strong response and a hole was drilled to 7.5m showing undisturbed tuff.

Southern Tennis Court Bank Site.

Site XVII

This had been identified as a possible entrance on the Photosurvey map. They had surveyed and pegged the location. The peg was relocated and an auger was used to do initial testing and then a test trench was spaded out.

This indicated a layer of redeposited fill between 1.3 and 1.5m deep containing glass, broken concrete and sheets of some non-ferrous metal possibly zinc or alloy. The trench was dug to the original ground surface. No structural evidence was apparent.

Site XVIII

Northern Tennis Court Bank Site. This was also initiated with an auger prior to the excavation of a test trench. Here the original ground surface was covered with a 1.5m deep layer of redeposited fill. No cultural material was found.

Site XIX

This possible site was identified by a member of the public in a low cave on the NE coastline. He reported seeing a concrete plug at the back. The cave was partially cleared of sand. The cave floor was only 30-40cm below the sand and the only access was by crawling. The back of the cave was partially dug out. The reported concrete appeared to be a natural whitish concretion forming on the tuff.

11. Conclusion

Two types of site have so far been investigated; sites where a known structure existed and sites identified by aerial photographs or magnetometer. The three known sites, the water tank, the 7" gunpit and the tramway all revealed new information but no unknown tunnel entrances or structures. In all the other sites there have been no new structures uncovered. At this point all possible entrance sites identified by aerial photograph have been excavated. The only unchecked information is some of the "witness evidence". The problem with almost all of this is its vagueness. There are no definite locations from which to work. A majority of these stories relate to the known structures, for example North and South Batteries. Without a definite entry

point a large amount of damage to historic structures would be necessary to investigate these stories. The archival evidence for North, South and the summit batteries is a very good description of what can now be seen. We have obtained from National Archives the weekly and monthly reports of the man who supervised the construction of these three batteries between 1887 and 1893. In these is a very detailed description of the structures as they now stand. There is no record if any other tunnelling work being done in these areas. There is however a description left by Naval assessors looking for magazine storage in the 1920s. Their description of the North Head magazines is of dark, damp, cramped spaces that fit the dimensions and types we know today.

The other area where eyewitnesses describe an entrance is at Torpedo Bay. This area has been inspected closely and the area described is a natural cliff of banded tuff.

It would seem that no entrance has or could ever have been located in this area.

The work undertaken to date is sufficient to assure the public that no hidden tunnels or underground structures containing ammunition exist on North Head. The only proviso would be that if any further definitive evidence in the form of photographs or drawings showing clearly an unknown entrance or structure are made available then these will be investigated.

Dave Veart

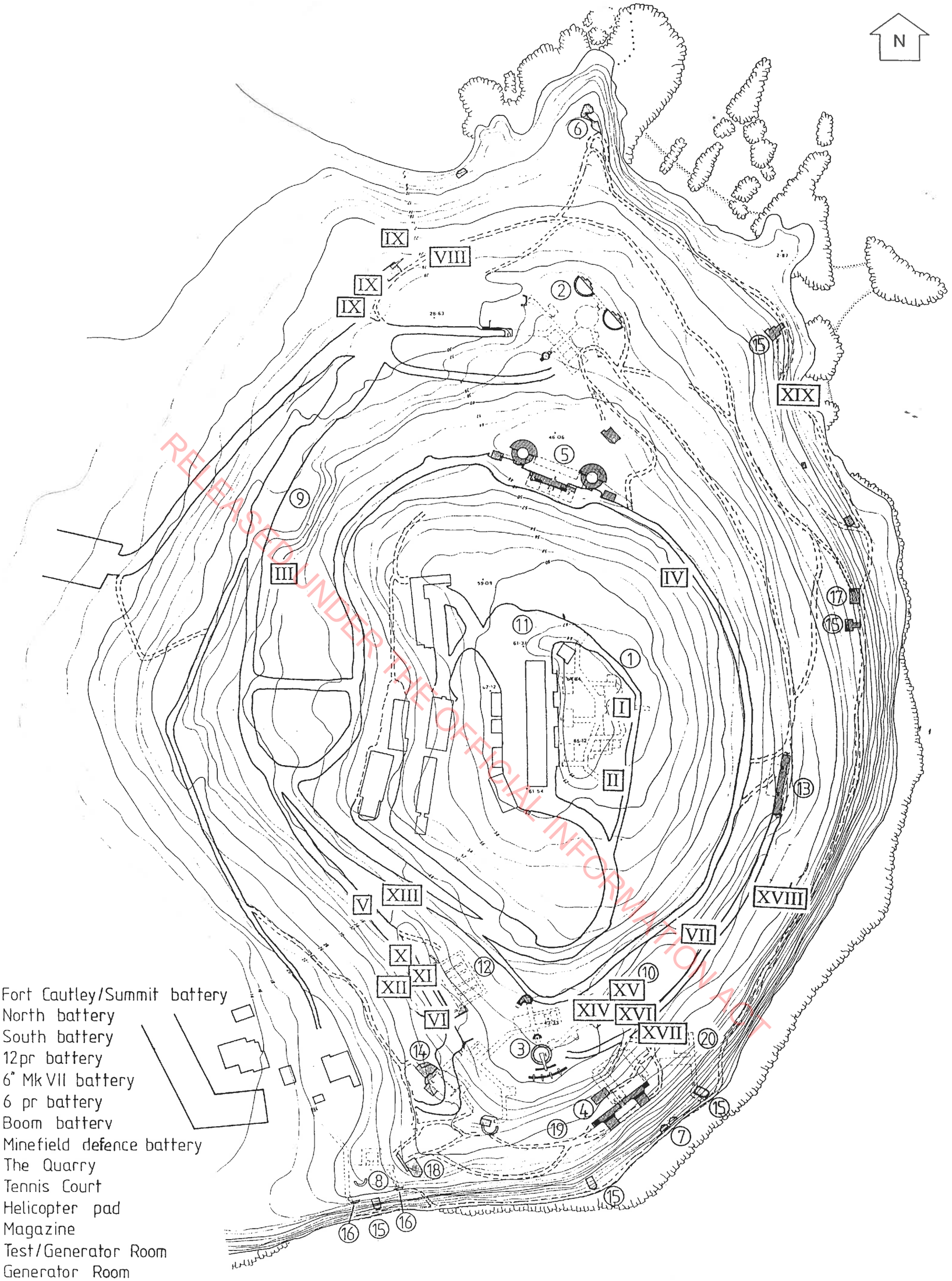

Figure 5: North Head, location of major installations.