Te Onewa Pa upgrade:
a methodological case study in minimising effects on archaeological sites

report to
Heritage New Zealand Pouhere Taonga
and
The New Zealand Transport Agency

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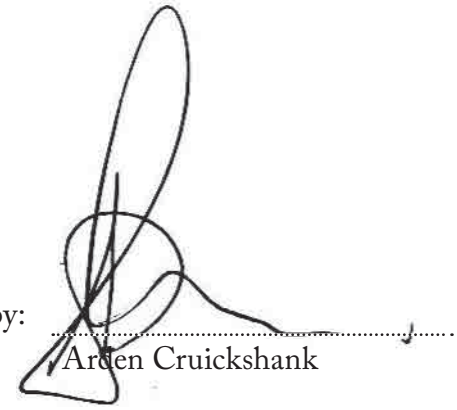
Prepared by: 
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Cover image. Flagpole at the opening of the Northcote Domain in 1908, flying the ensign donated by local Maori. Photo William A. Price, Alexander Turnbull Library 1/2-000344-G

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Te Onewa Pa upgrade: a methodological case study in minimising effects on archaeological sites

Arden Cruickshank

The New Zealand Transport Agency – Waka Kotahi (NZTA) has undertaken a programme of landscaping and amenity enhancements at Stokes Reserve beneath the northern section of the Auckland Harbour Bridge. The land is gazetted as a recreation reserve (Northcote Domain) under the Reserves Management Act 1977 and its legal description is Pt Allotment 68, Town of Woodside. An archaeological site, Te Onewa Pa, recorded as R11/54 in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS) is located on the southern point of the reserve. NZTA commissioned an assessment of archaeological effects from CFG Heritage (Campbell 2015) and subsequently applied to Heritage New Zealand Pouhere Taonga (HNZPT) for an archaeological authority to modify the pa under section 44 of the Heritage New Zealand Pouhere Taonga Act 2014. Authority 2016/651 was granted on 11 February 2016. The project utilised several methods to minimise ground disturbance and protect the remnants of the pa, which will help improve the amenity, condition and information values of the site. Although no in situ archaeological material was identified during works, this is likely the result of the methodology employed, which ensured ground disturbance in areas which had not been previously modified was kept to a minimum.

Background

Te Onewa / Stokes Point is at the end of a prominent peninsula which extends south from the Northshore into the Waitemata Harbour, separating Little Shoal Bay to the west from Shoal Bay to the east. It has steep sandstone cliffs on the western, eastern and southern faces and extends north into the rolling landscape of Northcote. Although it has been extensively modified since the arrival of humans, the area would have naturally supported podocarp–broadleaf forests.

Pre-European Maori background

The Waitemata Harbour has been a focus of Maori occupation since the first settlement of Aotearoa. The rich fish and shellfish resources of the harbour would have complemented the volcanic gardening soils and made Tamaki a very attractive place to live. This wealth required defending – the volcanic cone pa of Tamaki are the best known expression of this but many headlands on the Waitemata was also fortified. These small headland pa offered good views up and down the harbour and often overlooked valuable fishing grounds. Te Onewa is a good example of one of these headland pa, with commanding views and formidable defences.

Te Onewa is the name associated with the surrounding area, with the point itself known to Maori as Totaratahi. The area would have supported a large population utilising the wetlands to the north, the shark fisheries of the Waitemata and large tracts of horticulture throughout the surrounding area (Auckland Council 2011). Eventually, unrest led to the construction of a pa at Totaratahi, with a large defensive ditch separating the peninsula from the mainland. The area

Figure 1. Map of area showing the extent of the pa and nearby archaeological sites.

was occupied by Maori until the mid-19th century and following the Mahurangi Purchase many Maori moved out of the area, with the remainder relocating to the Awataha Mission (Harlow, 2010).

Historic Settlement

Following the Mahurangi Purchase in 1841, Europeans began to settle in Northcote. One of the earliest families in the area were the Callans, who lived at Northcote point from around 1843, with their deed formalised in 1851, once the Mahurangi purchase was approved. The New Zealand Company purchased a large portion of what is now greater Northcote in 1844, with the intention of setting up a colonial settlement. When this settlement failed to attract adequate interest, they began to sell off blocks of their land. The Catholic church purchased 40 acres in 1848, and St Marys school was built. The church added to its property the purchase of a further 376 acres of New Zealand Company land, and this area became the Awataha Mission and school (Auckland Council 2011).

The main factor encouraging settlement in Northcote was the introduction of regular ferry services between Queen Street and Stokes Point in the 1850s. These were first run by James Reed from 1854 and were subsidised by the Auckland Provincial Government. In 1856 the Auckland Provincial Government took a strip of the Callans land to form a road down to the tip of the point, providing for a wharf in much the same position as the existing one. The

first ferry service began in May 1860 but was closed by October the same year. By 1864 the Waitemata Steam Ferry Company was running regular ferry crossings. By 1877 the Auckland and North Shore Steam Ferry Company was operating seven steamers, but in 1881 they were bought out by the Devonport Steam Ferry Company and the services to Northcote were discontinued. The original wharf was taken down in 1880 and a new cutting was made to allow bigger steamers easier access. In 1882 the Northcote and Ponsonby Ferry Company was formed to take up the lapsed service. In 1892 the Devonport Steam Ferry Company began running services to Northcote, which continued until the harbour bridge was opened (Murray 2005)

Stokes Point was gazetted as two separate reserves in 1884, and later combined into one in 1888, referred to as Northcote Point (Murray 2005). In 1908, Northcote became a borough, and Northcote Point was declared a domain. Local iwi purchased an ensign and contributed to the erection of a flagpole within the reserve (Figure 2), of which the stays are still visible.

The Harbour Bridge

Discussions of a harbour crossing had been around since the mid-19th century, when plans for barges, telescopic bridges and drawbridges with viaducts were floated as possible options. Although plans were made, nothing came to fruition, and the idea remained on the backburner.

Figure 2. Maori carrying the ensign over the bridge across the ditch, 1908. Photo William A. Price, Alexander Turnbull Library 1/2-001716-G.

In 1920 the Auckland Canals and Waterways commission explored the feasibility of a harbour crossing, although it decided to not invest in the project. A royal commission in 1929 reached the same conclusion and although there were attempts in the 1930s to raise private funds for the harbour bridge, the economic depression caused banks to be wary of such a project.

The project moved forward in the 1940s when it was touted as a good employment venture for returning servicemen. Eventually in 1951, the government passed the Auckland Harbour Bridge Act which established the Auckland Harbour Bridge Authority.

The bridge was designed by British firm Freeman Fox and Partners, who had initially designed it as a five-lane bridge, with two six-foot-wide footpaths on either side. Due to austerity measures, this was reduced to four lanes and no footpaths.

The bridge opened in 1959, and its popularity exceeded expectations. It was anticipated as early as 1963 that the bridge would reach peak capacity by 1970, so four additional lanes (known colloquially as the Nippon Clip-ons) were attached and opened in 1969 (Auckland Council 2011).

Effect of the Harbour Bridge on Te Onewa Pa

The construction of the harbour bridge meant inevitable modification to Stokes Point. Records of the earthworks show that the defensive bank was to be removed, along with most of the surface, to a depth of approximately 8 feet (Figure 3). Although these plans have been sub-

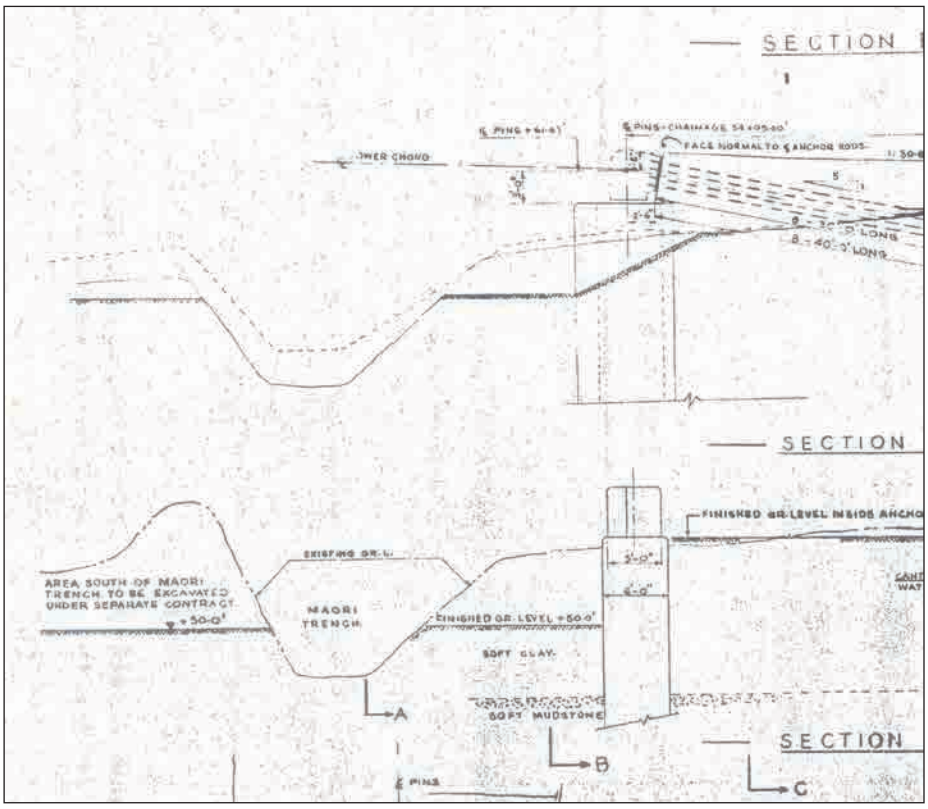

Figure 3. Detail of Drawing No. 125/1-51F by Freeman, Fox and Partners, London showing proposed cut of the pa.

Figure 4. People crossing the footbridge over the ditch at the opening of the Northcote Domain in 1908. Photo William A. Price, Alexander Turnbull Library 1/2-000734-G.

Figure 5. Flagpole at the opening of the Northcote Domain in 1908. Photo William A. Price, Alexander Turnbull Library 1/2-000347-G

Figure 6. Stay from the 1908 flagpole still in situ.

Figure 7. Detail of aerial photograph from Whites Aviation dated to 1956 showing tree felling and initial site set up. Note that the flagpole is still standing.

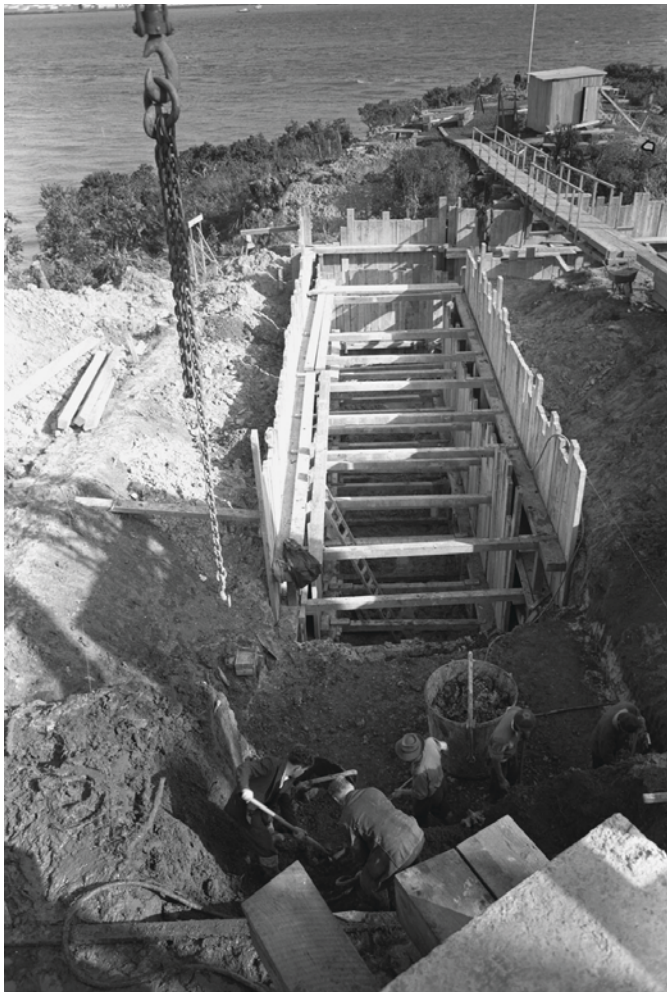

Figure 8 (above). Photo probably dated to 1957 showing the installation of a tramway along the western side of the pa. Note the pier which is being used for support, along with the stays which can be seen presumedly attached to anchors to the left of frame. Sir George Grey Special Collections, Auckland Library 459-15.

Figure 9 (left). Photo probably dated to 1957 showing construction of northern anchorage. note the surface height, and flagpole still in place. Sir George Grey Special Collections, Auckland Library 314-A16365.

mitted as part of the engineering packet at the time, it is more likely that the modification to the pa was much more limited than that.

Photos from 1908 do not show a defensive bank as such (Figure 4) although there appears to be a gentle slope from the inside of the ditch to the south (Figure 5). Two of the flagpole stays are still in situ at ground level (Figure 6) indicating that the ground south of the ditch has not been substantially cut down. Photos from the early stages of bridge construction (Figure 7 to Figure 9) show that the undisturbed ground inside the ditch remained level and only disturbed at specific points. These pits in are most likely related to the pier visible in Figure 8, used during the construction phase. Likewise, a photo which has been tentatively dated to 1957 shows the cut for the northern abutment, in which the defensive ditch and flagpole can be seen (Figure 9).

Based on the photographic evidence and the existence of the flagpole stays still on the ground surface (Figure 6), it appears that the ground surface was not cut down as much as concluded by Harlow (2010), and although there was clearly evidence for ground disturbance it is possible that much of the pa inside the ditch was only subject to minimal disturbance.

Not only did the construction of the Auckland Harbour Bridge physically modify the ground on which it sits, it has made a significant change to the once open nature of the headland that projects into the harbour. The site is now visually dominated by the underside of the Harbour Bridge deck, the abutment and the piers on which it sits.

After the construction of the Harbour Bridge, Te Onewa Reserve was effectively cut off from the rest of Stokes Reserve and the surrounding area. Although there was pedestrian access, it was uninviting, and the ground surface of the pa was constantly in shade from the Harbour Bridge. This led to it becoming a location of less desirable behaviour with the consumption of alcohol and other illicit activities becoming the main attraction of the pa.

Unfortunately, this isolation was not limited to antisocial behaviour. In 1998, the North Shore City Council were informed of illegal earthworks which were being undertaken on the southern tip of the pa, which were initially thought to have been undertaken by The Department of Anthropology, University of Auckland. After considerable investigation, no perpetrator was able to be identified, and it is thought those responsible tried to pass themselves off as being associated with the department to alleviate any suspicion (Packington-Hall 2001).

Establishment of Management Plans

In 1999, Geometria undertook a resistivity survey to see if any areas could be defined as containing sub-surface archaeological features, to aid in the long-term management of the pa. Several clearly defined areas indicated that there may be sub-surface archaeological features, including an area approximately 6 x 6 m, 3 m northwest of the memorial plaque which appeared to show either a pit cluster or a large pit (Bader and Gibb 1999).

It is possible that this anomaly is related to the Harbour Bridge construction, as there were at least three large holes (estimated to be 4 x 4 m) dug into the pa during construction. One of these holes roughly lines up with the anomaly (Figure 8), but it should be noted that the other large hole in front of the flagpole was not picked up by the resistivity survey.

The pa was subsequently damaged when a slip was caused by regular water blasting being undertaken on the Harbour Bridge. This was reported on by Packington-Hall (2001) where regular site monitoring was recommended to ensure any issues were dealt with before they caused long term damage to the pa. Transit New Zealand accepted responsibility for the damage and proposed a cantilevered walkway to replace the slip damaged track. At its meeting of 12 March

2002 the Birkenhead / Northcote Community Board granted landowner consent for the walkway and associated planting to be undertaken. One of the Community Board's conditions to its agreement was that written approval for the proposed works be obtained from Iwi. In July 2002 Transit New Zealand lodged a resource consent application to construct the walkway. Ngati Paoa withdrew its support for the project due to concerns about the level of access being provided to Te Onewa Pa. Transit New Zealand did not continue to pursue the consent application at that time. Remedial works were eventually undertaken by Transit New Zealand, but a formalised track was still not constructed (Murray, 2005).

In 2005, a Reserve Management Plan was written for Te Onewa (Murray, 2005). This was followed with a conservation plan in 2010 (Harlow) outlining the basis of future works to be undertaken on Te Onewa to ensure the damage is minimised through regular weeding, and maintenance. Harlow (2010) cites a Tonkin and Taylor report which suggests constructing an independently supported track which will be less susceptible to ground disturbance.

Boffa Miskell were commissioned by the AHB Alliance to design a formalised walking track on Te Onewa. They presented four design options which Matthews and Matthews Architects Ltd and CFG Heritage assessed 2014 to provide advice on the options that would have the least effect on the heritage of Te Onewa pa and the Auckland Harbour Bridge. Following this, Lucy Tukua of Ngati Paoa in conjunction with Boffa Miskell provided further refinement of the design concepts, incorporating Auckland Council's Te Aranga design principles, with concepts of arriving and gathering highlighted. The design was further refined by Boffa Miskell, retaining the intent of the Ngati Paoa design, and engineering plans have been prepared by Opus International Consultants, amalgamating ICOMOS and Te Aranga principles. The aim of the concept was to protect and celebrate Maori and European history and values and to restore the mauri, wairua and ecological values to Te Onewa while providing safe access and enhance the experience of the headland.

To achieve the positive urban design outcomes, the improvements were designed in a manner that minimised physical intrusion to the headland pa and reserve (Matthews and Matthews, 2015). In keeping with the concept of protecting the values of Te Onewa, the project was designed in such a way as to minimise ground disturbance, both during works and after completion by keeping visitors restricted to specific demarcated areas.

Methodology

This project consisted of three main tasks: the replacement of the perimeter fence around the edge of the pa; construction of a boardwalk (and replacement foot bridge) to minimise ground disturbance caused by foot traffic, and; suitable stabilisation planting. Each task required ad hoc methodology to ensure minimum ground disturbance and these are discussed below separately.

Perimeter fence design

The existing perimeter fence consisted of 73 timber posts with a top rail and wire balustrade. There were no balusters and it was inadequate for containing visitors and not code-compliant. A new fence was required to, firstly keep visitors safe and away from the steep bank, and secondly prevent interference with the vegetation outside the fence that could lead to further erosion of the pa. It was determined that the existing timber post and wire fence around the

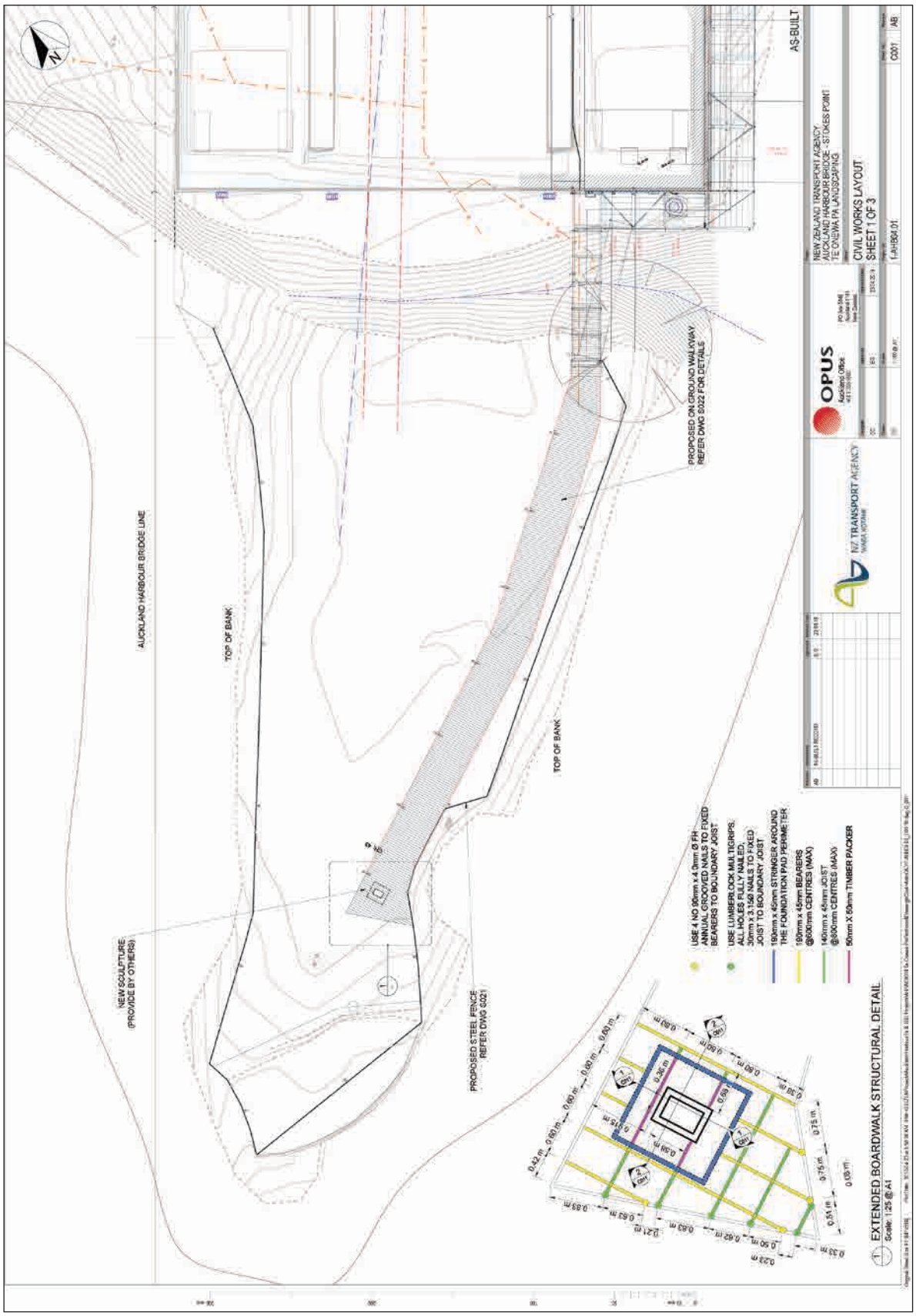

Figure 10. Final design of the boardwalk and refurbishment of Te Onewa.

Figure 11. Previous perimeter fence.

cliff edge was to be replaced with a new steel fence, compliant with current Building Code requirements.

Extracting each post and footing as a single unit would cause a significant ground disturbance to the pa, affecting not only any potential archaeological features below the surface but also the bank stability. To ensure the works were in keeping with the concept of minimal disturbance, a methodology was devised to reutilise the current concrete footings by using a concrete coring auger to remove the existing posts and creating a hole for the new steel post and concrete to be poured into.

Boardwalk and foot bridge design

A safe accessible timber walkway was designed to connect Te Onewa to the existing asphalt-surfaced area along the eastern side of the Harbour Bridge abutment. The walkway incorporates both level and ramped sections providing mobility access to the pa, along with new security gates to close off the pa if required. This walkway provides protection to the ground surface by restricting visitors to the boardwalk, using subtle planting along the edge.

The construction of the boardwalk did not use piles, but rather relied on joists resting on the surface. The surface was evened out where necessary using GAP40 basecourse.

A new foot bridge was designed to replace the existing timber foot bridge over the ditch. The re-use of the existing timber foot bridge substructure was investigated, however unsuitable foundation conditions raised concerns about installing new structural components. The existing abutment was left in situ and a new abutment installed immediately to the south, which required the removal of 1910 x 400 x 600 mm of soil.

Stabilisation planting

There has been an ongoing issue with encouraging vegetation growth on Te Onewa, due to the restriction of rain and sunlight from the Harbour Bridge deck. Previous attempts of restoration planting have failed, and plants and methodology need to be selected to meet the difficult growing conditions. On the flat areas, native grasses and ground covering shrubs were used which did not require as much light or maintenance, and in the ditch, a method incorporating ponga logs to create and encourage growing areas was used.

The ponga logs were anchored using a biodegradable keeper system supplied by Brilliant Little Planet Ltd. These anchors are made of biodegradable plant starch, which are driven into the ground using a 12 mm diameter rod. A biodegradable rope is attached to the anchors which is then used to bind the ponga logs. The anchors and the rope will eventually biodegrade, in which time the plants which were planted behind the ponga logs will have established with the help of the decomposing logs providing nutrients.

Shade friendly plants and the biodegradable anchors were used on this project to see if they will be successful, in which case the methodology can be adopted and adapted for similar uses elsewhere.

Works methodology

All ground disturbance was monitored by an archaeologist. On the western side of the bridge abutment, geotechnical cloth was laid, and basecourse was placed over the surface so that the high vehicle traffic did not adversely impact the ground surface. All machinery movement within the extent of the pa was undertaken on top of 17 mm ply sheets to ensure no ground disturbance was caused by vehicle tracks or wheels.

All unnecessary soil (such as that removed from the perimeter fence coring and augering and the foot bridge abutment) was removed from site and disposed of as contaminated soil, due to the levels of heavy metals present in the soil (George et al. 2016).

Results and discussion

Perimeter fence

Starting from the eastern side and working clockwise about the reserve, the existing fence posts were cut down leaving approximately 250 mm exposed above the ground. The topsoil was then removed around the post to expose the concrete footing. A bolt was placed at the centre of the post and a guide jig was used to align the 310 mm coring auger. The post was then cored and lifted out. The hole was inspected and extended using a 280 mm auger to a final depth of 1300 mm to accommodate the new post.

The first 18 holes that were drilled exposed a sandy topsoil that was generally 800 mm deep, overlying a sterile clay. In holes 12, 13, and 14, a concrete slab was encountered at 850 mm. The extent of the slab is unknown, but it is at least 2 m in length, and 500 mm thick. It is probably related to bridge construction. Between holes 53 and 57, redeposited midden and construction steel elements probably had a similar origin. This appears to be evidence of the modification to the pa from the construction of the Harbour Bridge, as they appear to line up with two of the

Figure 12. Plywood sheeting being used to mitigate ground disturbance by heavy machinery.

Figure 13. Extracted post and concrete with coring auger.

Figure 14. Hole 53 showing 800 mm of mixed topsoil with redeposited shell midden.

Figure 15. View south of new fence post footings being augured.

excavated areas in Figure 7. Elsewhere, the topsoil was between 150–200 mm deep, overlying sterile clay.

There were an additional seven holes drilled with the 280 mm auger to bring the perimeter fence further back from the point. The new augured holes were within the area of illegal excavation form 1998 and did not hit clay, or any archaeological deposits. It is likely that the area was heavily modified, either during the Harbour Bridge construction, or during this illegal excavation.

Boardwalk and foot bridge

Works related to the installation of the boardwalk were minimal since most of it did not require ground disturbance. The foot bridge abutment was dug by hand and monitored by an archaeologist. There was fragmented redeposited undiagnostic shell exposed during the cut, but no sample was taken. This material was removed from site along with the soil following the contamination protocols outlined above.

Stabilization planting

The ponga were installed within the eastern portion of the ditch to assist and encourage the stabilisation plants to grow. Due to the nature of the anchoring system, no archaeological material was encountered, and any impact on the ditch itself was minimal.

Figure 16. New fence post in place.

Figure 17. Ponga held in place in ditch prior to replacement foot bridge being installed.

Figure 18. View of vertical ponga underneath foot bridge.

Ponga were also placed vertically beneath the foot bridge to prevent people from entering into the ponga stabilization area. This has also removed the last place were pedestrians could easily get to the cliffs on the eastern side of the pa both improving safety and allowing the stabilisation planting to grow unaffected by human interference.

Along with stabilization planting within the ditch and outside the perimeter fence, some low-level grasses were planted alongside the walkway and within the illegal excavation area to the south. This should discourage people from stepping off the path, and over the next 5-10 years will provide valuable information about low light plants and planting options in sensitive areas.

Conclusion

These works were required to reverse the ongoing issues with stabilisation and ground disturbance that has been occurring at Te Onewa pa for over 50 years since the construction of the Auckland Harbour Bridge. Any works of this nature are going to require ground disturbance, but this work was done in a way which minimised construction disturbance to cover 1.57 m^2 for the entire project. The planting programme will provide stabilisation and ground cover; and will assist in future planting programmes for areas of unnatural shade on other sensitive archaeological landscapes.

Due to the multi-discipline design process, which incorporated engineers, ecologists, mana whenua, heritage and landscape architects and archaeologists, this project was able to produce an outcome which not only created minimal ground disturbance, but will help enhance the mauri and wairua of Te Onewa as well as its heritage and ecological values.

Figure 19. View down boardwalk showing new planting.

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