Archaeological investigations of Tomoana Pā (T12/1) Tairua Forest, Whangamatā (HNZPT authority 2020/373): final report

report to
Heritage New Zealand Pouhere Taonga
and
Powerco

Brendan Kneebone, Arden Cruickshank, Danielle Trilford and Ella Ussher

CFG HERITAGE

CFG Heritage Ltd.
132 Symonds St
Eden Terrace
Auckland 1010
ph. (09) 309 2426
cfg@cfgheritage.com

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Prepared by: ....
Brendan Kneebone

Reviewed by: ....
Matthew Campbell

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CFG Heritage Ltd.
132 Symonds St
Eden Terrace
Auckland 1010
ph. (09) 309 2426
cfg@cfgheritage.com

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Powerco have replaced two H-Structures in Lot 2 DP 397533, a forestry block located beside the Wentworth River, Whangamatā (Figure 1) as part of a larger pole replacement project. The two structures (Poles 2 and 3) are located on Tomoana Pā, recorded as site T12/1 in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS). Powerco commissioned an archaeological assessment from CFG Heritage (Cruickshank 2019) during which a midden deposit was identified along the access road leading to T12/1, approximately 60 m northeast of a slash covered skid, and was recorded as T12/1446. A third midden/oven site, T12/48 had initially been recorded in 1975 as two discrete deposits of midden located 150 m apart at the intersection of Pa Road and the fire break which leads towards T12/1. This site has not been revisited since and this intersection has undoubtedly been modified in the intervening 40 years. Although the grid reference was clearly (located in a valley south of the T12/1 access track) this area as described in the site record form was

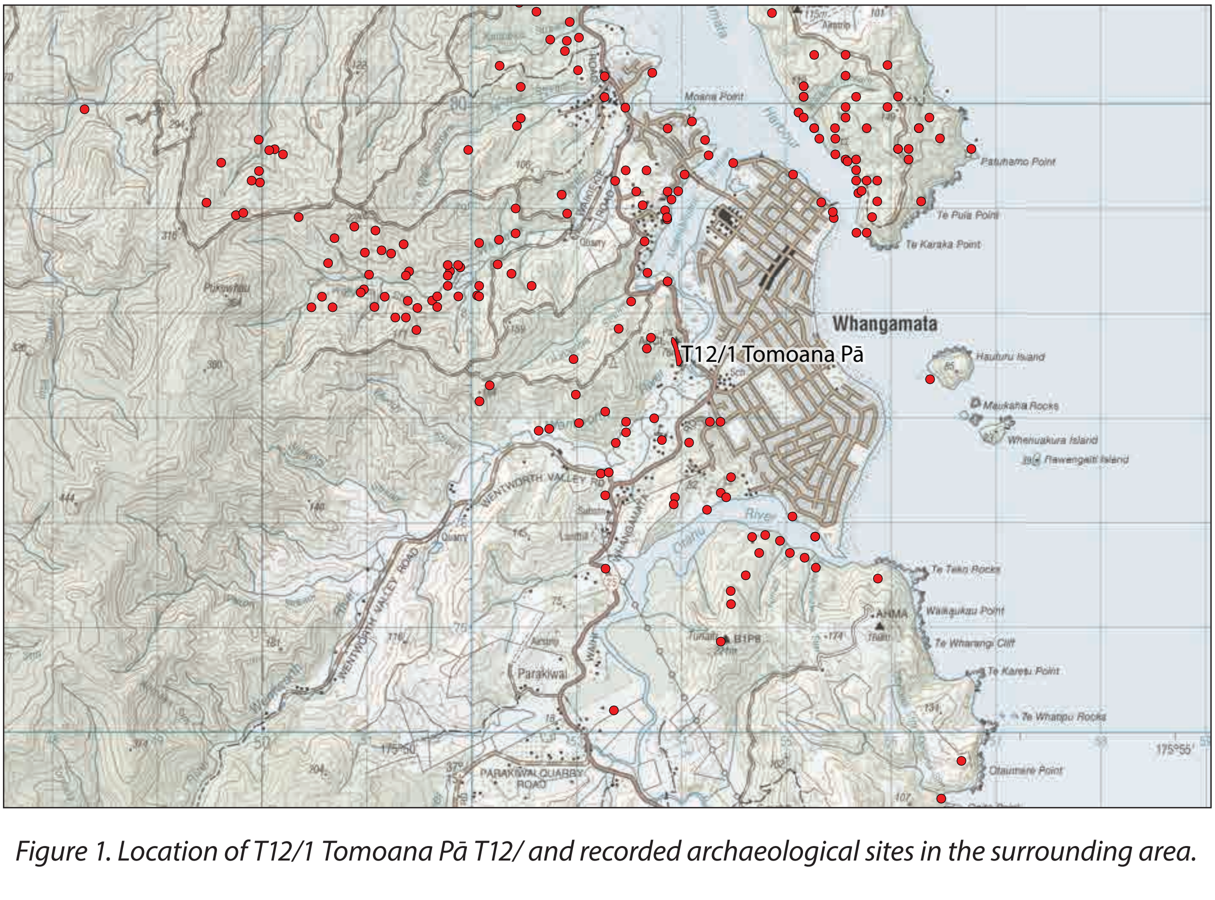

Figure 1. Location of T12/1 Tomoana Pā T12/ and recorded archaeological sites in the surrounding area.

closely inspected during the 2019 assessment, but no evidence of archaeological material was noted and the site is considered destroyed.

While Tomoana Pā has been affected by the establishment of the access track and instillation of Poles 2 and 3, there are still at least 20 intact features associated with the site which were identified during the 2019 assessment. Powerco subsequently applied to Heritage New Zealand Pouhere Taonga (HNZPT) for an archaeological authority to modify or destroy these sites and potential unrecorded archaeological deposits under section 44 of the Heritage New Zealand Pouhere Taonga Act 2014. Authority 2020/373 was granted on 19 December 2019. Archaeological monitoring of the access track clearance began on the 16 March 2020. The investigation of identified features was completed on 25 March 2020, and the final day of monitoring of earthworks associated with replacing Pole 3 took place on 7 December 2020.

Background

The forestry block is located west of Whangamatā, on the western edge of the Wentworth River. It is dominated by a northeast trending spur extending from the Coromandel Ranges between the Wentworth River and the Okaunga Stream. The soils in the vicinity of Whangamatā are derived largely from volcanic tephra erupted from Tūhua / Mayor Island and the Central Volcanic Zone (CVZ) over the past 40,000 years. In Whangamatā the most conspicuous tephra is a coarse pumice, classified as Tūhua tephra, which can be up to 600 mm thick and derives from volcanic activity on Tūhua / Mayor Island approximately 6200 years ago (Hogg and McCraw 1983: 163). The pumice lapilli are composed of dark reddish-brown particles up to 30 mm in diameter and the tephra has a weakly bonded structure. More recent tephras such as Kaharoa are not present as a distinct layer but have been mixed into the upper horizon through root and worm action (Harris and Hudson 2010). Other older tephras consist mainly of fine yellow-brown ash, which have developed into silty loam soil. The underlying geology is dominated by Minden rhyolites and is overlain with allophanic loam of the Poihipi family. These soils are well draining and suitable for Māori horticulture and storage.

Pre-European Māori background

Early settlement of the Coromandel Peninsula would have extended along the coastline and stream valleys where fresh water was available, and this is supported by archaeological evidence. Fish, shellfish and sea mammals would have been gathered from the foreshore or with the aid of canoes. Birds would have been snared and trapped in the surrounding bush clad hills. As population increased and coastal resources became scarcer, kūmara horticulture would have provided an additional food source (Mallows 2009). Whangamatā harbour was an important location for Māori, as it not only has its own obsidian source, but is the closest harbour to Tūhua / Mayor Island, the largest and most heavily exploited obsidian source in the country.

European settlement

Initial European settlement in the Whangamatā region was primarily focused on kauri logging, especially in the 1880s, in an area known as The Wires between the Wentworth and Maratoto Valleys. The name 'The Wires' was derived from the telegraph line between Auckland and Wellington, completed in 1872, which was diverted through the Colville Range to avoid the Waikato during the period of the Waikato Land Wars (Williamson 1988: 14–16).

Whangamatā was gazetted on 20 February 1873, consisted of 43 acres, divided into 20 lots, within what are now Harbourview Road, Beach Road and Port Road. A gum store was opened in Whangamatā in 1873, followed by a hotel in 1892 (Williamson 1988: 14–16).

Gold mining in the area commenced in 1887 on a ridge facing the Wairoa Stream. The claim later became known as the Goldwater Claim. It was worked spasmodically until 1909 but little gold was recovered. About 1897 quartz was discovered at Wentworth and two reefs were developed by the Hauraki Peninsula Exploration Company (London) and later by Mananu Goldmining Company (London). Operations ceased in 1905 (Williamson 1988: 16). Other mining operations in the district included the Luck At Last Mine (Mallows 2009).

Subsequent settlement was based around farming, with more recent subdivision and development of Whangamatā in the 20th century as a retirement and holiday destination that relies heavily on tourism.

Archaeology

Whangamatā has been subject to numerous archaeological surveys and investigations since the mid-20th century. Roger Green surveyed the Coromandel Coast in 1957, where he recorded two sites in Whangamatā: T12/1 Tomoana Pā and T12/2, and extensive coastal midden. Large scale surveys of the Coromandel were undertaken by the New Zealand Forestry service in the 1970s, which relocated previously recorded sites within the state forests, and identified further sites (Coster and Johnston 1975a, 1975b). A further coastal survey was conducted in 1981 by Sheridan Easdale and Chris Jacomb but this did not include Tomoana Pā. In the years since, there have been a multitude of smaller surveys in the area surrounding Whangamatā, mainly associated with forestry harvest, infrastructure works and residential / commercial development.

Unfortunately, due to urban development and access to private property obscuring any subsurface archaeological deposits, there are a lack of archaeological sites recorded within Whangamatā township. This is likely a false negative and distribution of sites within the township should be as dense as observed in the surrounding rural and forestry portions of the harbour.

The main focus of archaeological investigation in Whangamatā has been around the wharf, at sites T12/2 and T12/3. T12/3 appears to have been recorded at roughly the same time Roger Green recorded T12/1 and T12/2, as Bob Jolly, who recorded it, had assisted with Green's survey (1957). T12/2 was initially excavated by Jan Allo in 1969 who noted that the site is likely larger than first identified and may cover 2 or 3 acres.

T12/3 was first investigated by Wilfred Shawcross in 1963, and a Tahanga basalt working floor was identified. During their coastal survey in 1981 Easdale and Jacomb identified T12/2, T12/3 and T12/239 as being part of a continuous deposit along the harbour. T12/2 was later investigated by Caroline Phillips in 2015 for an extension for the Ocean Sports Club. As Easdale and Jacomb suggested, it would appear that this site and T12/3 are likely part of a larger site which has been truncated and bisected through 20th century development. Subsequent investigations by Gumbley in 2007 and 2016 at the Cabana Lodge identified an area of intensive food preparation, cooking and refuse disposal, along with stone tool manufacture (Gumbley 2014; Gumbley and Laumea 2019).

The closest archaeological investigation to the forestry block was T12/1243, at the wastewater plant directly north of Pole 1 by Opus International Consultants in 2007. This investigation uncovered a variety of archaeological evidence of land use from the mid-17th century through to the early 19th century, including Māori artefacts and midden and historic ceramics and butchered cattle remains (Mallows 2009).

T12/1 Tomoana Pā

The site was first recorded by Roger Green in 1957 and entered into the SRS in 1962. It was subsequently visited by Johnson and Coster in 1974. Green first noted the damage caused by the forestry road which runs down the western side of the pā, and Johnston and Coster noted further damage which was caused by the installation of the pole structures. During the 1974 site visit, Johnston and Coster also noted that the pā is much larger than initially mapped, with extensive terracing heading south, most likely right down to the road and river. A number of storage pits were also identified in the site, along with additional midden deposits.

During the most recent survey (Cruickshank 2019) the pā was remapped using a hand-held GPS with an accuracy of ± 4 m. Due to its size and extensive vegetation cover, it was not possible to map by tape and compass. Based on visible features, the pā is approximately 270 m in length (north–south) along the ridge, and at least 50 m wide with an indicative extent of 11,450 m^2. It is possible the southern terraces extended further, but there are houses on the lower slopes of the ridge which would be obscuring any archaeological evidence.

The pā had been noted in 2019 as having been extensively modified with the western access track, a bulldozed flattened area directly north of the Pole 3, and access track to Pole 2 on the top of the pā near the trig station. Attempts during recent felling to demarcate the pā with flagging tape had been somewhat successful, but additional damage and exposure of midden along the western access track has occurred.

A total of 11 terraces were identified on the pā by Cruickshank (2019), including the tihi with the trig station located on top of it. Ten midden deposits were also identified throughout the pā, consisting mainly of pipi or cockle, but some tuatua were observed in places. The main deposit of midden appears to be exposed along the western access track and looks to be a continuous lens 70 m long and up to 600 mm thick. It consists mainly of tuangi and pipi, with lesser numbers of tuatua and gastropods. This midden has been truncated by the construction of the track, as first noted by Green in 1962, and subsequent use of the track has undoubtedly further damaged it.

A single defensive ditch was identified at the northern end of the pā. This was recorded by Johnston and Coster in 1975 as 2 m deep and 4 m wide. It is probable that these measurements got mixed up, as the ditch is currently 2 m wide at the base and approximately 3.5 m deep. It appears to have been truncated to the west by the western access track, with only approximately 10 m of it remaining intact.

T12/1446 Midden/oven

A midden deposit was identified during the 2019 survey (Cruickshank 2019) on the access road that leads to T12/1, approximately 60 m northeast of a slash covered skid (Figure 1 and Figure 2). This site is considered different to T12/48 and appears to be redeposited. It may have been a small discrete midden within the extent of the road. The redeposited shell extends for 12 m along the road, and down the southern bank for approximately 20 m, which is likely the result of dozer push.

Summary

There were two previously recorded sites in the forestry block which had the potential to be impacted by the replacement of the poles. T12/1 has been affected by the creation of the western access track and installation of Poles 2 and 3, but still had more than 20 intact easily identifiable features. A new midden site (T12/1446) was identified in the bulldozed access road leading to T12/1, which may have associated features which could be affected by any track works that were required for access to Poles 2 and 3.

Methodology

Track widening works and topsoil stripping was undertaken using a hydraulic excavator under archaeological supervision. In total, approximately 730 m of track clearance and 355 m² of topsoil stripping was monitored. This resulted in two distinct areas of archaeological features identified (Figure 2). These areas were cleaned down by hand, and then investigated following standard archaeological procedures. Features uncovered in Area A were fully excavated and recorded.

In Area B, a datum line was established in a south–north direction which ran along the centre of the terrace. After all features that were present in Phases 2 and 3 were investigated, it was decided after consultation with HNZPT, Powerco and iwi that due to time restraints and in the interests of site preservation, everything to the east of the datum line in Phase 1 (pit storage phase) would be fully investigated to allow the creation of an access track, while features to the west of this line would be left in situ (Figure 8).

Following the investigation of the site, the excavated features were lined with Geotech cloth and backfilled, and the terrace covered with a layer of GAP20 gravel (Figure 26).

Samples were taken from the fill of ovens, fire features and postholes to extract shell and charcoal for analysis and radiocarbon dating, and all artefacts recovered were retained. All features were mapped and recorded and added to a digital database and the project GIS.

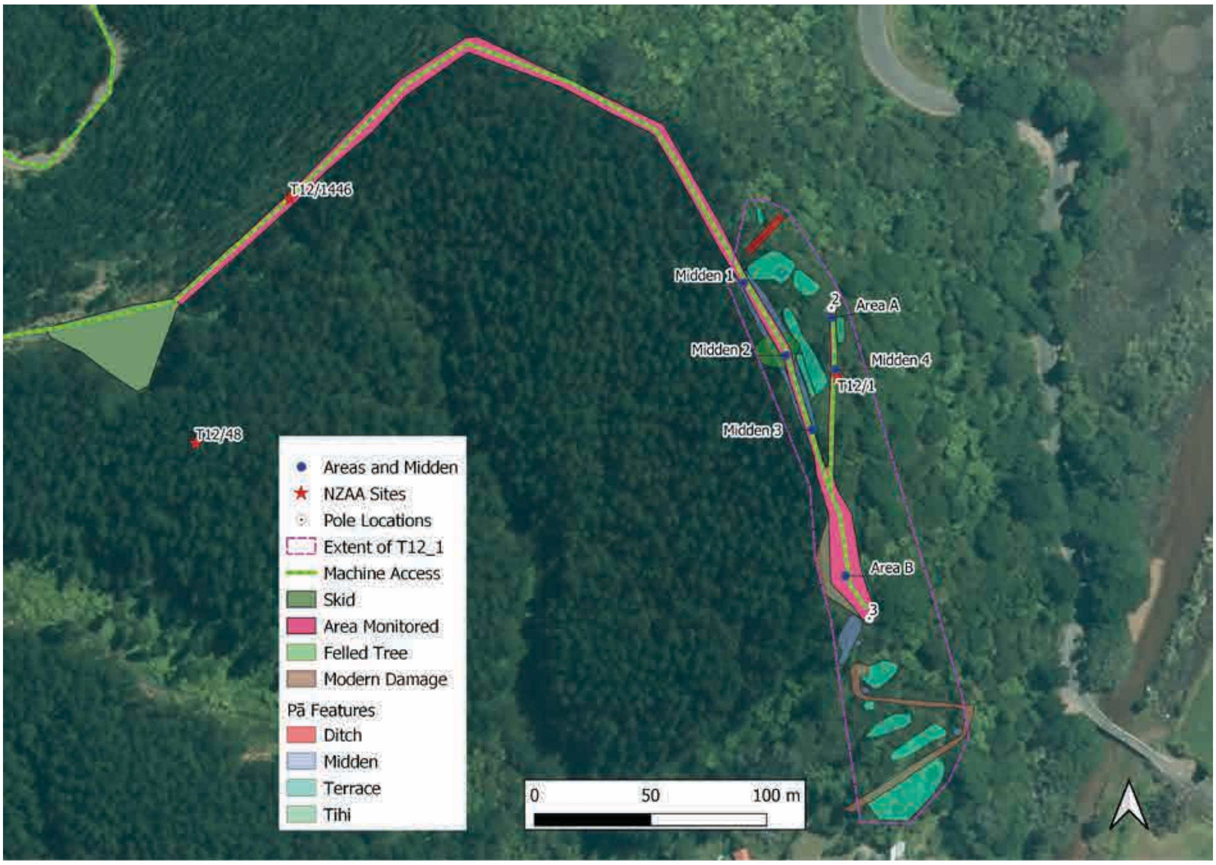

Figure 2. Map of pā and areas investigated.

Results

The redeposited midden located on the access track leading to Tomoana Pā remains predominantly a scatter extending 12 m along the track, and down the southern bank for approximately 20 m. The track works required through this section were minimal and had no further impact on this site. No in situ features or deposits were exposed and no further investigation was required (Figure 3).

Although the areas monitored at T12/1 Tomoana Pā had been modified through the establishment of the access track and the placement of the poles, as well as the southern terrace below Pole 3 used as a forestry skid, once the topsoil was removed a total of 132 archaeological features identified across two discrete areas, all associated with pre-European occupation. These included 11 fire features, two board slot trenches, 24 pit/storage features including one bin pit cut into the base of one of the larger pits and three bin pits, and 95 post and stake holes. These features were located on two terraces. Area A is a small terrace approximately 2 m below the tihi (topmost platform) on the western slopes of the pā (Pole 2 had been erected on the northern edge of this terrace); and Area B is a larger south facing terrace in the vicinity of Pole 3. In addition, four dense midden concentrations were noted and recorded once the access track had been cleared; three eroding out of the western bank of the pā above the track, and one eroding out of the track cut directly below the tihi. Nine artefacts were recovered from the investigation, all obsidian.

Area A

This area consists of a terrace approximately 15 x 7 m, on the west side of the pā located just below the old trig station which sits on top of the tihi. The original terrace has been mod-

Figure 3. Current state of T12/1446.

ified (widening and flattening) during bulldozing of the access track, and the initial installation of Pole 2 (Figure 4). Disturbed shell and midden from these activities can be seen pushed down the western slopes. Despite this, five in situ fire features were identified during topsoil stripping of an area approximately 45 m² (Appendix A).

Fire features

The largest and most substantial fire feature uncovered in Area A was Feature 1. The fill consisted of large pipi, tuatua and cockle shells in a dark, charcoal rich matrix (Figure 5) and measured ca. 600 mm long, 540 mm wide and 100 mm deep. It was oval in plan with sloping sides and a flat base. A 10 litre bulk sample was taken for analysis. Four other fire features were present in this area; however their current form and depth may indicate truncation by modern modification. Features 2 and 3 are smaller, intercutting fire scoops (Figure 6). Feature 4 is a small, isolated fire scoop, the base of which appears to have been damaged by bioturbation. The final feature, Feature 5, was exposed on the western edge of the stripped area, and extends into the baulk. Its size and shape indicate that this may have originally been a deeper, more substantial feature that has been truncated by subsequent activity or modern terrace modification.

Area B

Area B is located on a south facing terrace on which Pole 3 is located. There has been extensive modification from initial pole installation and subsequent forestry activity – the area has been used as a forestry skid for at least one rotation. Topsoil stripping of around 250 m²

Figure 4. Area A, looking north. Scale = 1m.

Figure 5. Large fire feature (F1) Area A. Scales = 1 m and 0.5 m.

Figure 6. Intercutting fire scoops (Features 1 and 2) in Area A. Scales = 1 m and 0.5 m.

revealed 128 in situ archaeological features (Figure 7 and Appendix A). At least three phases of occupation were identified, alongside examples of reuse within these phases. Twelve samples were taken from Area B for further analysis including dating, charcoal identification and midden analysis. Seven artefacts, all obsidian surface finds, were recovered.

Phase 1

The earliest phase of Area B is a storage pit complex containing a series of at least 21 storage pits and associated postholes as well as four bin pits and three fire features. The largest (F97) and the most complex (F71) pits are described in more detail below. The pits had varying dimensions (Appendix A), but all were generally rectangular in shape. The majority of the pits are intercutting, representing the possibility of multiple periods of occupation within this phase (Figure 8). The features present, aside from the three fire features, all had a similar fill consisting of a light mottled grey clay with inclusions of pumice and flecks of charcoal. The fill of the storage pits was heavily compacted, and a two-tonne excavator had difficulty removing it during the investigation. This is likely caused by heavy machinery associated with use of the terrace as a skid but it also served to aid in the preservation of the features associated with this phase. A particularly concentrated patch of charcoal was sampled from the base of pit F65 for further analysis. In general, the homogeneity of this material across the area indicates the pits had been filled during the occupation of the site, probably in a single event, before the occupation of Phase 2. The storage and posthole features in Phase 1 were well preserved, with generally sharp, well defined edges. The fire features contained a dark charcoal rich matrix, with one, F98, also containing some broken and fragmented shell. Generally, the pits appear to be aligned in two main directions: north to south and east to west.

Figure 7. Area B terrace after topsoil stripping

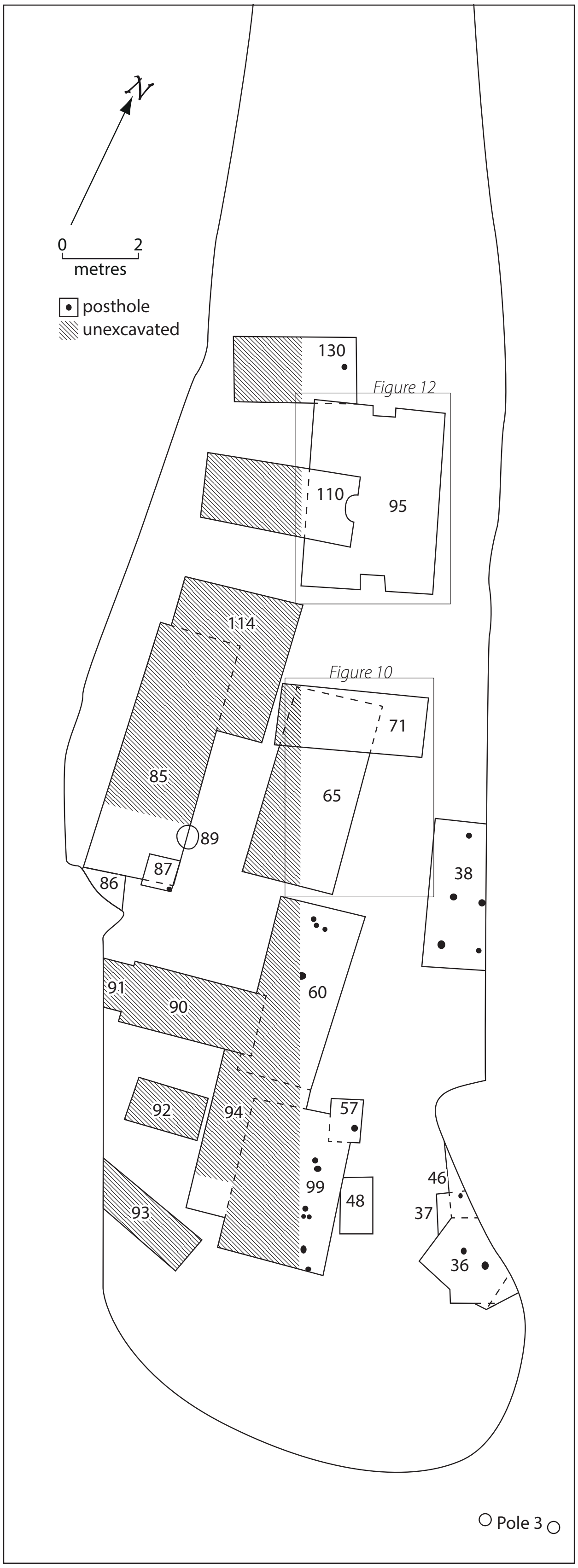

Figure 8. Plan of storage pits in Phase 1, Area B.

F71

Feature 71 was the most complex feature in this Phase. It was a rectangle pit measuring ca. 3900 x 1700 mm x 330 mm deep, with straight sides and a flat base which rises slightly at the eastern end. This edge of the pit appears to have been truncated and is likely the result of modification to the terrace through forestry activities or pole installation. The pit has two trenches in its base running at an angle of 90 degrees to each other. These trenches were potentially used as board slots (Figures 9 and 10). F71 appears to intercut pit F65, indicating it is a later feature in the sequence. A single central row of post holes is evident in the base of the excavated section. The fill was the same light mottled grey with pumice and charcoal inclusions as seen across the site.

F95

F95 is the largest pit investigated (Figures 11 and 12) on the site, measuring ca. 5000 x 3400 mm x 500 mm deep. It is rectangular with slightly sloping sides and a flat base. The very hard, compact fill was a light mottled grey, containing flecks of charcoal and inclusions of pumice. The northern wall has been cut by pit F130, and its western wall and part of its base is cut by pit F110, indicating that these two features were constructed later (Figure 13).

There are five parallel rows of postholes dug into the base of F95. One of these is a central row of larger postholes, presumably to support a central roof beam There are two narrow rows of generally smaller postholes either side of this (northern and southern end of the pit feature). Three fire features are also dug into the base most likely indicating a secondary use of the feature. 10 litre bulk samples were recovered from these fire features further analysis.

Figure 9. F71 with trenches, possibly used as board slots.

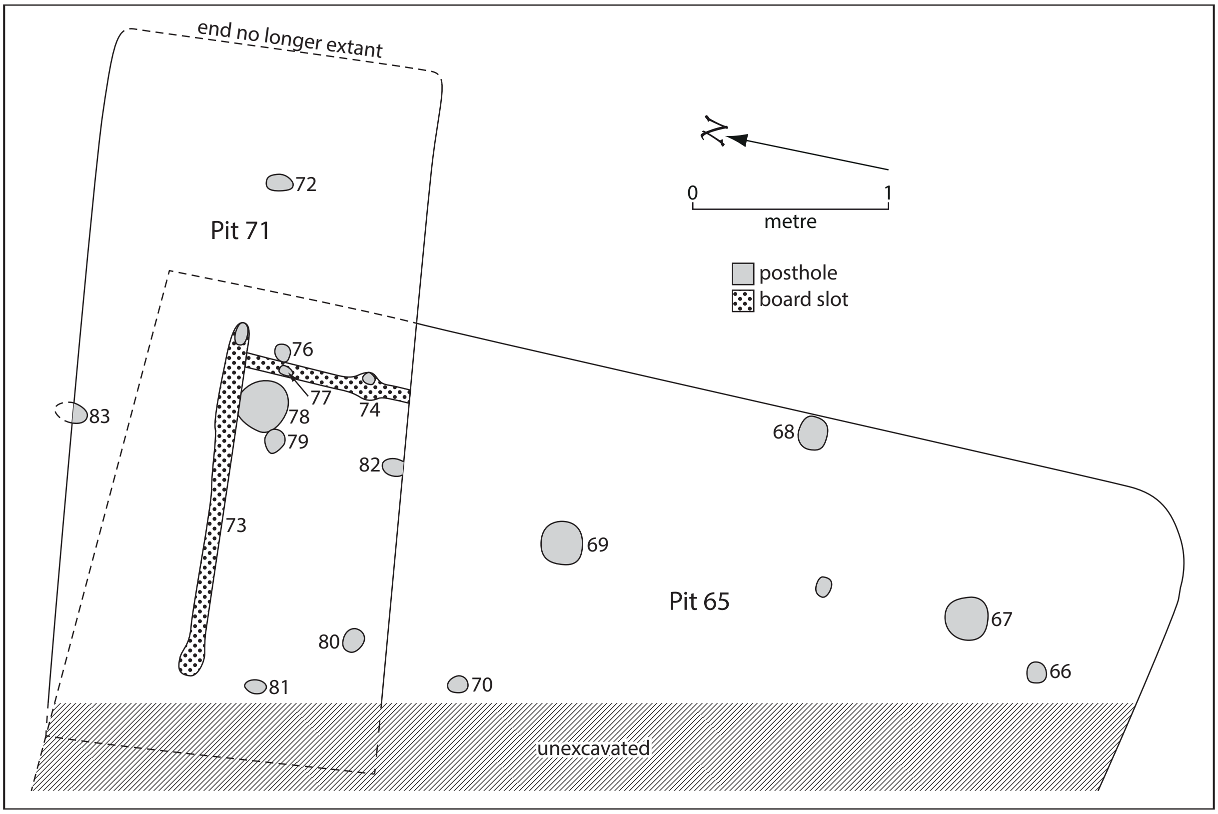

Figure 10. Plan drawing of F71 and F65.

Figure 11. F95 with intercutting pits, and posthole and fire features in base.

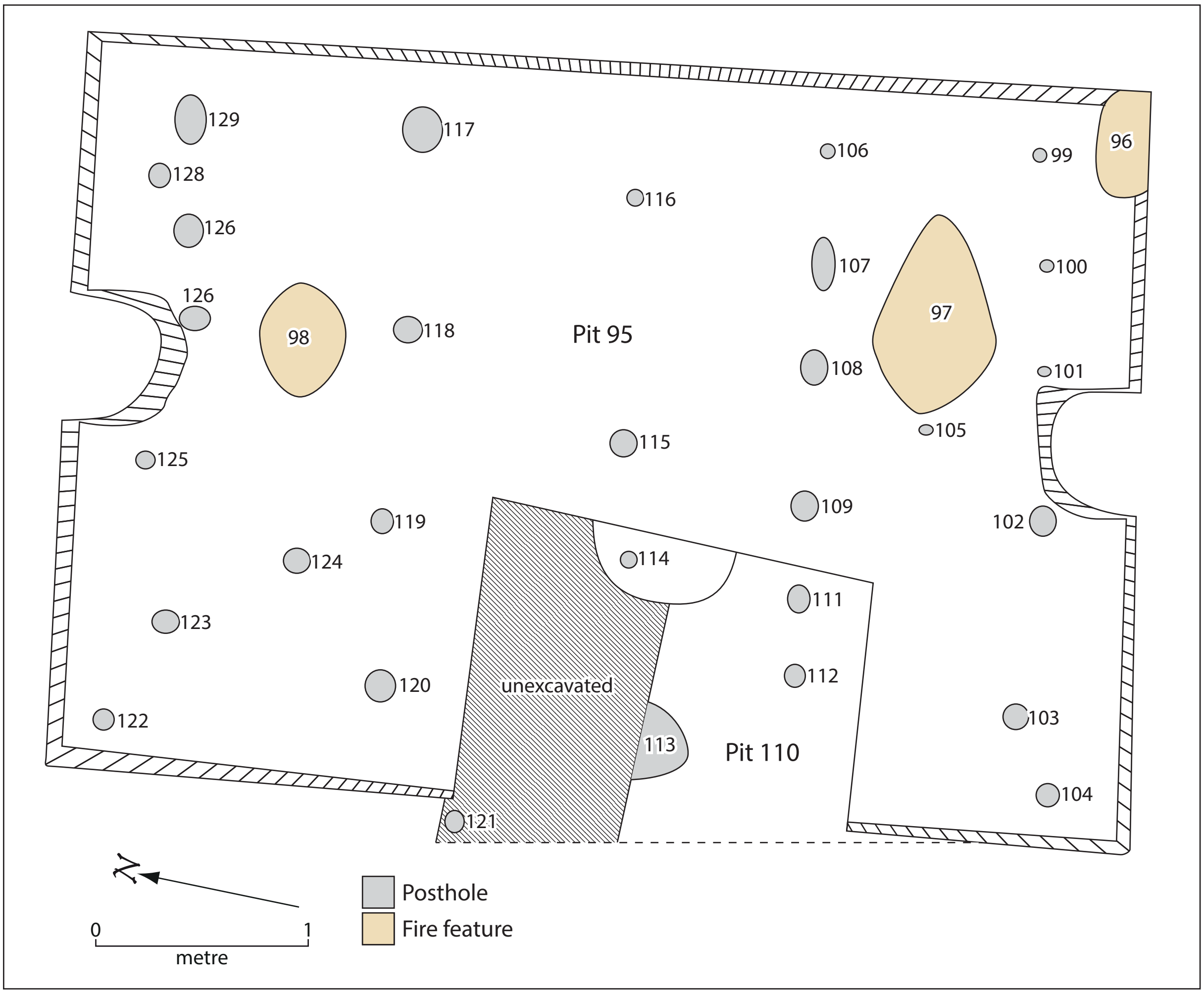

Figure 12. Plan drawing of F95.

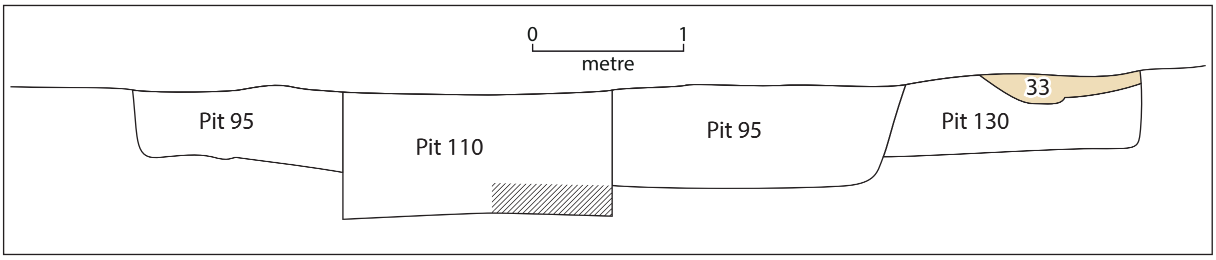

Figure 13. Profile of western baulk of storage pits F95, F110, F130 and fire feature F33.

Postholes

There were 69 postholes of varying sizes associated with this first phase of occupation. These were all dug into the base of the pits. The fill of F79, a posthole dug into one of the board slots in pit F71, and F115, a posthole dug into the base of Pit F95, both contained dense concentrations of charcoal and were sampled for further analysis.

Bin pits

There were four bin pits (F48, F57, F87 and F89) investigated in Area B (Figure 8). The definition of bin pits in this instance are taken from Lawlor (1983: 229), which describes bin pits as generally having length and width measurements less than 1 m with no postholes evident in the base to support roof structures. Although two of the pits (F48 and F57) were larger than 1 m, these were included in the category as they displayed no other features characteristic of a pit. F48 is the largest bin pit investigated measuring just under 2 m long and cuts the wall of pit F49. It is irregular and messy, which could be the result of bioturbation or modern damage but is generally rectangular in shape. It has two straight sides while the other two are sloped, with a flat base. There is also tree damage evident in its base.

F57 also cut Pit 49 in the northern wall of the feature. This bin pit is rectangular and has straight sides and a flat base. The base is deeper than that of Pit 49 indicating it may be a later feature in the sequence. A similar small bin pit (F87) is observed in the corner of Pit 85. The sequence of these two features could not be interpreted. The fill for all of these bin pits is the same compact, light mottled clay with pumice and some charcoal inclusions.

F89 was identified dug into the base of the western wall of pit F85 (Figure 8). This feature has circular, sloping sides and a flat base, and measures 430 x 600 mm at its entrance, and 340 x 400 mm at its end, and is 600 mm deep. The fill of which is the same light mottled grey clay with pumice and charcoal inclusions.

Phase 2

The middle phase of occupation (Phase 2) in Area B consists of a series of postholes, some of which form alignments, and three fire features which have been dug into the fill of the storage pits (Figure 16 and Appendix A). There were 26 post and stake holes identified and investigated in Phase 2, some of these appear to form alignments potentially for fences or wind breaks. The three fire features are concentrated towards the northern end of the terrace. The fill of three postholes (F10, F19 and F28) were total sampled for further analysis, and fire features F32 (Figure 14), F33 (Figure 15) and F34 were half sectioned and 10 litre bulk samples were taken from these for further analysis.

Phase 3

The third and last phase is a cooking phase which appears to have occurred prior to, or while, the posts from Phase 2 had been extracted, as the fill of these postholes range from sparse, fragmented shell mixed with charcoal, to dense whole shell in a dark, charcoal rich matrix. There was no obvious source for this darker fill, and it is probable that any features representing a later phase have been destroyed through the levelling for the installation of the poles and the use of the terrace as a skid. Midden material was evident mixed in with the topsoil and can be seen pushed down the western and southern slopes of the terrace. No fire scoops or other features were able to be associated with this phase therefore samples obtained from the fill of post holes F10, F19 and F28 (Phase 2) have been used to represent this third phase of occupation.

Figure 14. F32 half sectioned and sampled. Scales = 0.5m.

Figure 15. F33 half sectioned and sampled. Scales = 0.5m.

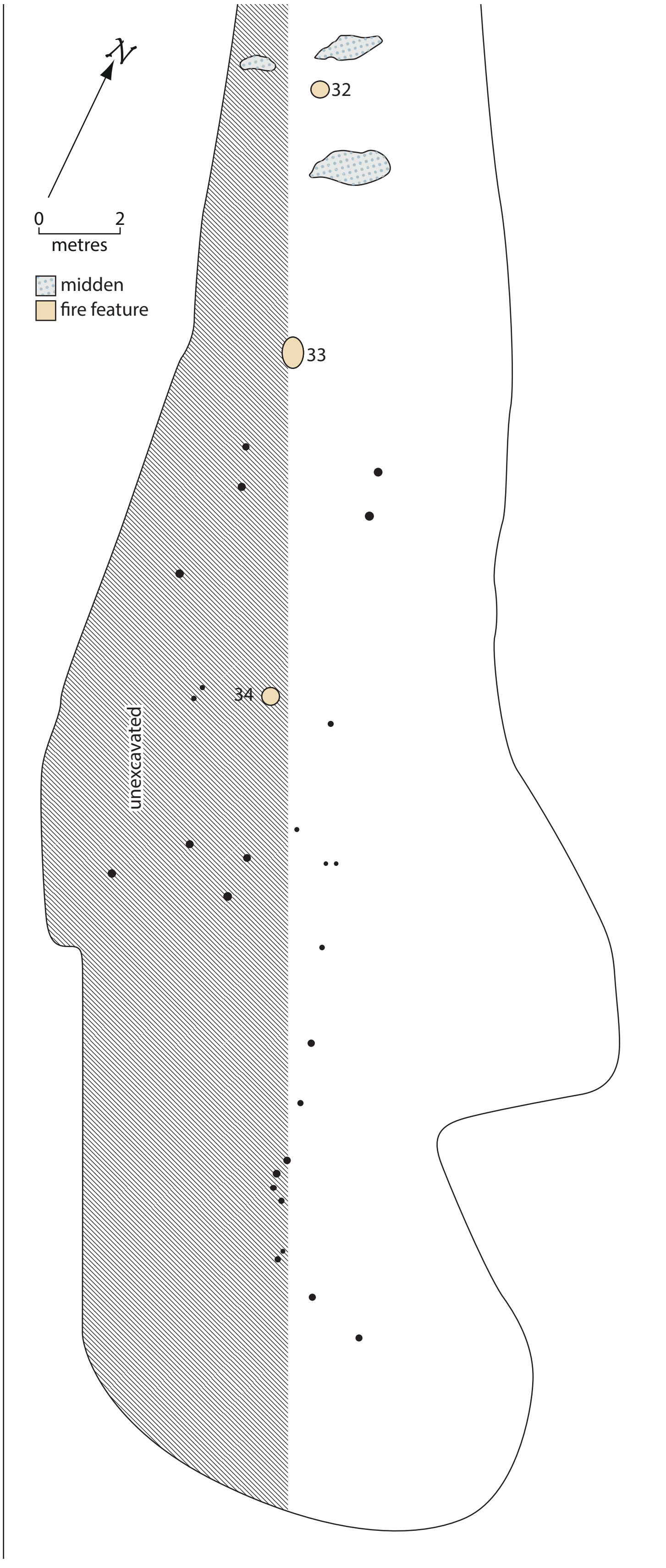

Figure 16. Plan drawing of Area B, Phase 2.

Figure 17. Area B post excavation.

Midden Deposits

While midden and shell scatter are prevalent in the topsoil both eroding from the cultural layers and terraces, as well as redistributed across the site from modern activity, four discrete in-situ concentrations were recorded once the access track was cleared (Figure 2). All four of these concentrations have been truncated by the creation of the track, and subsequent use of the track has undoubtably further damaged them. No sampling of these midden occurred as it was decided what remains of them were best left in-situ, they were not sampled and they could not be assigned to any phase of occupation.

Midden 1

Midden 1 is the northern most concentration eroding from the western bank above the access track. This midden is the same as that recorded during the archaeological survey (Cruickshank 2019) and extends at least 15 m east along the bank below a west facing terrace. The bottom third has slumped, but the intact portion measures at least 600 mm thick in most places. This midden contains whole shells of pipi and tuatua. Two obsidian artefacts were found on the track directly below after grass and vegetation was cleared which most likely originated from this layer.

Midden 2

Midden 2, approximately 5 m east of Midden 1 along the track, is a dense concentration of small (most less than 50 mm) whole and fragmented pipi shells eroding from a low terrace

Figure 18. Section of Midden 1 above slump. Scale = 0.5m.

Figure 19. Section of Midden 2 above track. Scale = 1 m.

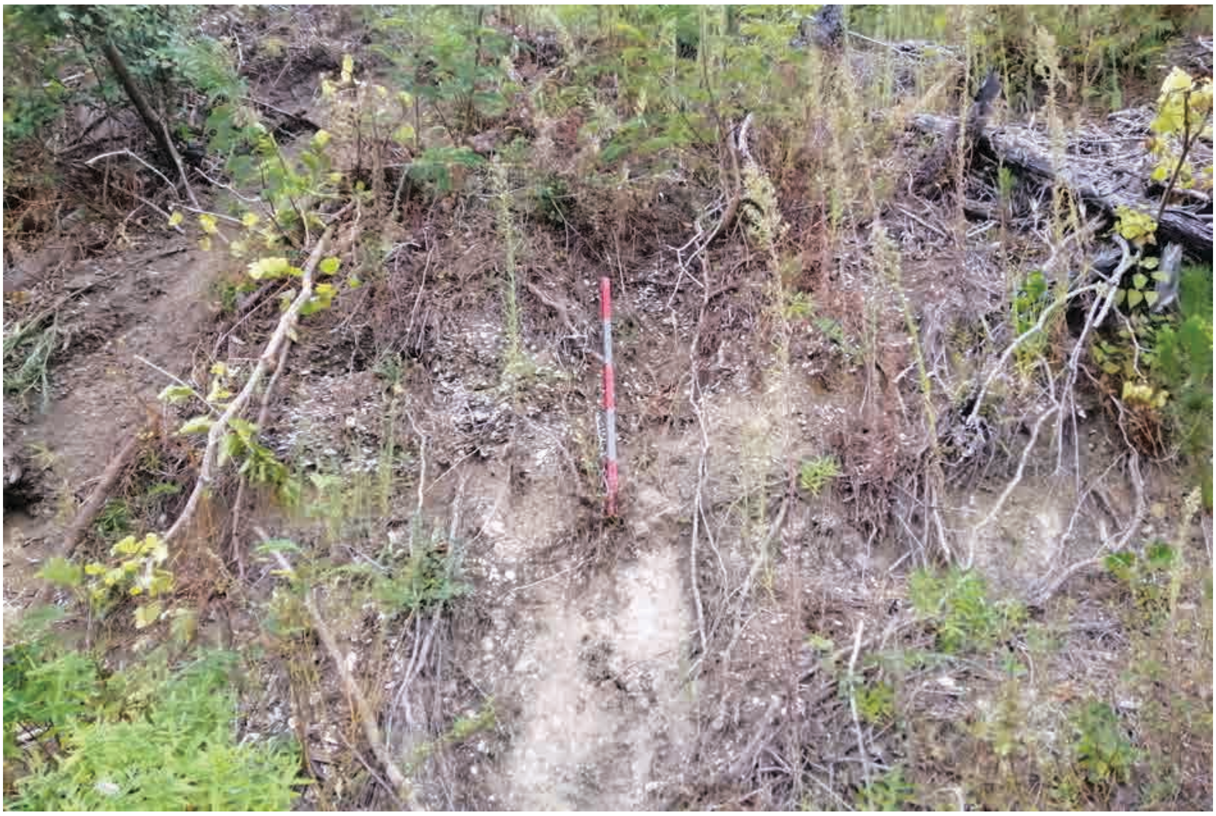

Figure 20. Section of Midden 3 towards the southern end of the access track. Scale = 1 m.

Figure 21. Midden eroding from track cut south of Pole 2 below tihi.

only 300 mm above the access track. The deposit is around 5 m long, and around 200 mm thick. The shell appears to be in a light grey mixed soil with probable charcoal which looks to be a distinct cultural layer.

Midden 3

Around 30 m east of Midden 2 towards the southern end of the access track is the third dense concentration of shell. Midden 3 is over 5 m long, and more than 1 m deep in places eroding from the bank below the pā. This midden has a condensed layer featuring large, complete pipi, tuangi and tuatua shells along with gastropods.

Midden 4

Midden 4 is a concentration of shell eroding from the track cut towards the top of the pa, south of Pole 2 just below the tihi. This midden is noticeably denser than the shell scatter covering most of the ground mixed in with the topsoil in this area and has complete pipi and tuatua shells in a charcoal-stained matrix.

Flaked stone

The only material culture recovered were stone artefacts, all of which were obsidian. Seven were recovered during initial monitoring of track works and the investigation, the remaining two were recovered during the final site inspection on the 7 December 2020. They are all surface finds so are lacking archaeological context, but all were found within the footprint of the pā. These were analysed following the methodology outlined in Andrefsky (2005), Holdaway and Stern (2004), Phillipps et al. (2016) and Turner and Bonica (1995). Dimensions for all artefacts were recorded, including the maximal length and width in millimetres, and the weight in grams. Where possible, the artefacts were analysed non-destructively using a Bruker Tracer III SD portable X-ray Fluorescence (XRF) to assign the samples to a geographical source to better understand the exchange and communication networks in place during the occupation of the site. The methods reported by McAlister (2019) were employed to calibrate the XRF data and assign the samples to a geographical source.

The obsidian assemblage consists of six flakes and three cores, including one complete flake and one complete core. None of the artefacts exhibit cortex on the dorsal surface. There was only one complete flake with both the striking platform and flake termination present,

Table 1. Obsidian artefact data.

A#	Type	Portion	Colour	pXRF Source	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
1	Flake	Complete	Green	Tūhua	32.86	24.5	8.44	4.32
2	Flake	Distal	Grey	Whangamatā	29.21	15.21	4.06	1.62
3	Core	Broken	Green	Tūhua	35.65	19.76	12.87	8.86
4	Core	Broken	Grey	Tūhua	33.09	12.25	9.94	5.24
5	Core	Complete	Grey	Tūhua	40.47	28.25	15.03	19.36
6	Flake	Proximal	Grey	Tūhua	39.89	16.64	8.49	4.72
7	Flake	Distal	Green	Tūhua	74.28	55.67	23.03	66.59
8	Flake	Broken	Green		30.51	42.82	4.48	5.80
9	Flake	Broken	Green		23.13	42.52	6.04	4.30
				Mean	37.68	28.62	10.26	13.42
				Std. Dev.	14.73	15.06	6.01	20.58

Figure 22. Obsidian artefacts recovered from Tomoana Pā.

however, there is nothing to indicate it has been used. There are two broken flakes displaying some evidence of use along at least one edge, while the remaining broken flakes show no evidence of use. One complete and two broken cores were also recovered from the investigation. The broken cores are green and grey respectively in transmitted light, while the complete core is grey. All display a general lack of inclusions and imperfections indicating good quality material for flaking. Radial flake scaring on all surfaces of all cores indicate an intensive reduction strategy (Figure 22).

While seven obsidian artefacts were recovered during initial monitoring of track works and the investigation, the remaining two were recovered during the final site inspection. These two have not undergone pXRF analysis, however, they are green in transmitted light and of good flaking quality indicating they most likely originated from Tūhua. Of the remaining seven artefacts, pXRF analysis assigned six artefacts to the Tūhua / Mayor Island source, while the seventh, the complete core, was assigned to Whangamatā (Table 1, Figures 23 and 24).

The small obsidian assemblage from T12/1 are all surface finds, therefore lacking secure context. However, radial flake scaring on the cores indicate an intensive reduction strategy was used to produce expedient implements with sharp edges. Some of the flakes show evidence of edge preparation and use, however the single complete flake shows no obvious signs of use or retouch. Six of the seven artefacts geochemically analysed were sourced to Tūhua / Mayor Island. This is the most exploited source of obsidian in New Zealand and has been identified in sites through the country, and as far afield as the Kermadec and Chatham Islands. The seventh artefact provenance comes from a local Whangamatā source, also known for its high flaking quality (Moore 1988).

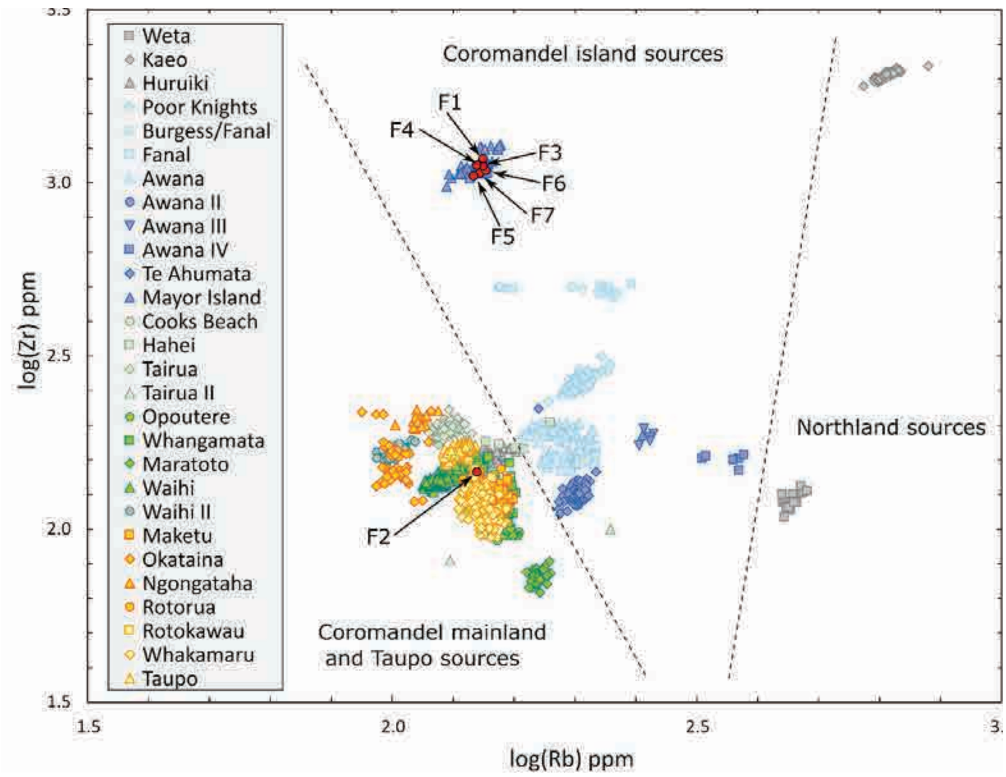

Figure 23. Scatterplot of Rb vs Zr on logarithmic axes showing the position of the artefacts F1 - F7 in relation to known obsidian sources. The dashed lines show the approximate extent of the Coromandel Volcanic Zone.

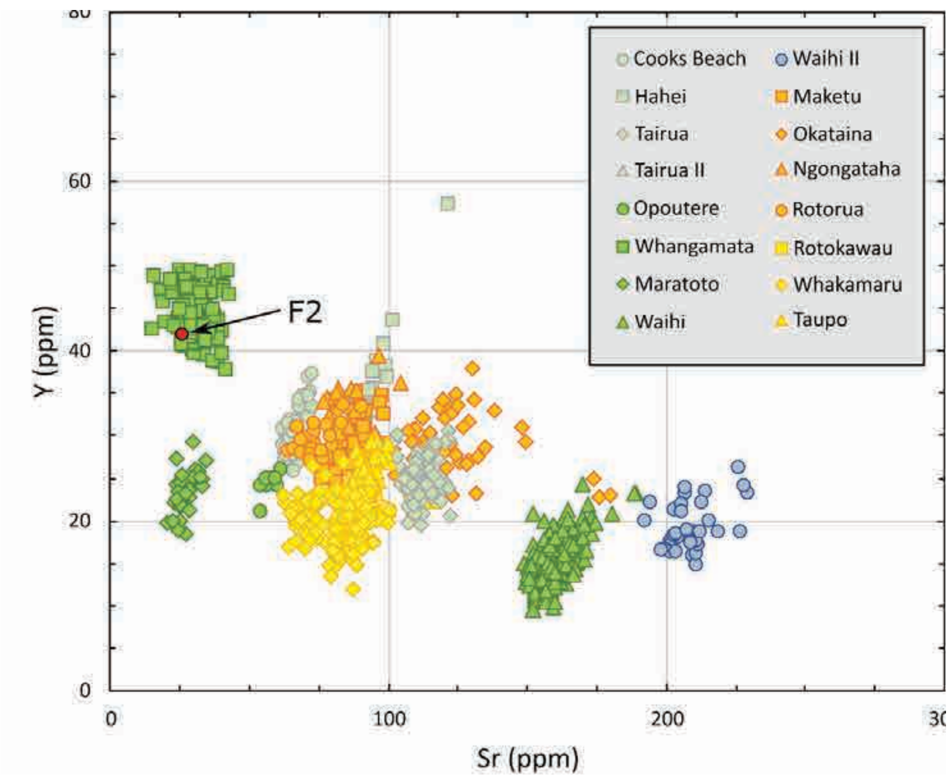

Figure 24. Scatterplot of Sr vs Y showing the Coromandel mainland and Taupo sources. Artefact F2 clusters unambiguously with the Whangamatā source samples.

Midden analysis

Midden samples were wet sieved through a 6 mm screen, dried and weighed. The charcoal was removed, and the remaining material was then sorted to class (shell, bone, stone) for specialist analysis. Shell that did not have any diagnostic portions was classified as residue.

Six samples were taken, representing midden and fire features. They were analysed using conventional methods. Species identification was based on Morley (2004).

Of the six samples, three were 10 litre bulk samples (Features 1, 33, and 98) while the others were total samples (Features 10, 19, 28). Only Feature 1 from Area A (a large fire scoop) had a sufficient minimum number of individuals (MNI) for a detailed analysis. Features 10, 19, 27, 28, and 98 from phases 2 and 1 are informative, but these are not as reliable as the findings of Feature 1 (Somerville et. al. 2017:219; Campbell 2017).

The Feature 1 assemblage was dominated by tuangi (*Austrovenus stutchburyi*) (Table 2). Tuangi is collected from soft shores like harbours and muddy sheltered areas. There is also a presence of pipi (*Paphies australis*) which is collected in a similar environment, although pipi can favour a slightly sandier shore than tuangi. Based on MNI, tuatua (*Paphies subtriangulata*) is almost a third of the sample. Tuatua are collected from open sandy shores, such as the open sandy shore at the mouth of the Whangamatā Harbour.

Based on MNI counts, there appears to be near equal representation of open sandy shore, soft shore, and soft/sandy shore (Figure 25). Observations during analysis note that the pipi were larger and less fractured than tuatua and tuangi within. This could suggest several scenarios, a combination of these could also be considered:

1 collection methods of pipi were selective;
2 collection of pipi simply taken from a patch which happened to have large species;
3 collection of tuatua and tuangi valves were using a non-selective collective method such as a type of dredging, where smaller species are part of the collection;
4 collection of tuatua and tuangi valves were simply taken from a patch which happen to have small species.

Interestingly, no rocky shore species are present. There are several rocky patches around Whangamatā which could have provided rocky shellfish species with no additional travel. Most of the remaining species identified in the hāngī are from soft shores, presumably within the Moanaanuanu Estuary and Whangamatā Harbour.

While the sample sizes from the remaining features (Area B, Phases 1 and 2) are too small to qualify for a detailed analysis (Somerville et. al. 2017: 219; Campbell 2017), they do indicate that people consumed both sandy shore and soft shore / harbour-caught shellfish (Table 2). Assuming people targeted the nearest environments, the Moanaanuanu Estuary, Whangamatā Harbour, and Whangamatā open sandy shore at the mouth of the harbour. Midden was exposed within post holes, a hāngī, and two fire-scoops. Only one of those had a large enough MNI count to provide a reliable and detailed analysis of the results (Feature 1,

Table 2. Summary of shellfish species recovered by MNI.

Species	Area A, Feature 1	Area B Phase 1	Area B Phase 2	Environment
tuangi (*Austrovenus stutchburyi*)	128	6	171	Soft/sandy shore
tuatua (*Paphies subtriangulata*)	112		37	Open sandy shore
tītiko / mudsnail (*Amphibola crenata*)	1		1	Soft shore
kawari / purple mouthed whelk (*Cominella glandiformis*)			1	Soft shore
kawari / speckled whelk (*Cominella adspersa*)			2	Soft shore
pipi (*Paphies australis*)	90	2	157	Soft shore
Total	331	8	262	

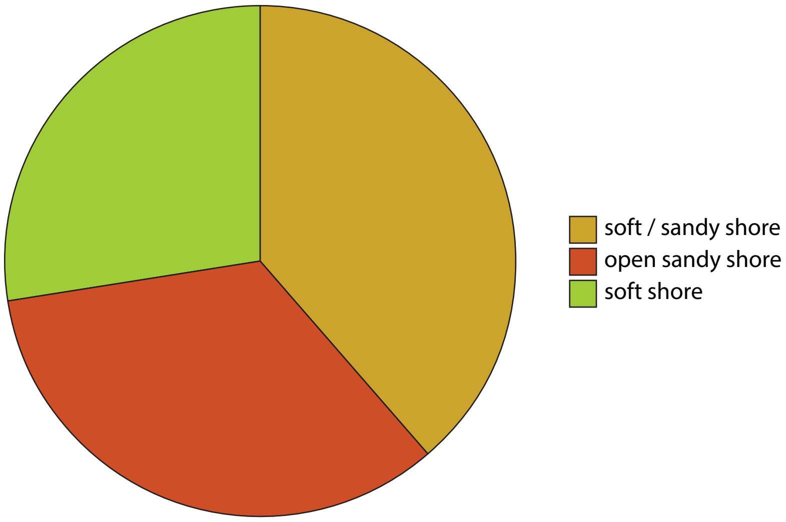

Figure 25. Pie chart showing the environments represented in Feature 1 by MNI.

hāngī) (Somerville *et. al.* 2017: 219; Campbell 2017). That sample indicated that people were collecting both tuatua and tuangi in mostly equal amounts, and a lesser number of pipi. The environments for all of these shellfish species can be found within 1.8km of the pā - namely Moanaanuanu Estuary, Whangamatā Harbour, and Whangamatā open beach.

Charcoal

Charcoal was analysed by Ella Ussher of CFG Heritage following the methodology outlined in Chabal et al. (1999), Théry-Parisot et al. (2010) and Dotte-Sarout et al. (2015), although the sample sizes were lower (20–50 fragments) than recommended (200–400 fragments). When combned by Phase the sample sizes were >100.

A range of features and contexts were sampled for charcoal analysis. These include five postholes (Features 10, 19, 28, 79 and 115), four fire-scoops or hearths (Features 1, 33, 97 and 98), one pit base (Feature 65). All the samples taken from post-holes, except that from Feature 79, contained three or more species, indicating that these are not the remnants of burned posts but instead are background environmental species that were included in the backfill.

Similarly, the three fire-scoops all contained three or more species, and all were large samples that derived from 10 litre bulk samples, from which 50 fragments of charcoal identified as a representative sample. These were taken from the flotation samples.

Firewood selection for these hearths was targeting mostly larger trees from the coastal forest, supplemented by some collection of easy burning shrubs such as manuka. It is interesting to note that according to Maori tradition, rewarewa is difficult to burn, but charcoal produced from the wood once ignited retains the heat for a long time and was used by canoe builders to help them hollow out the interior of logs (Best 1929: 266). It was also not usually used for cooking and its inclusion in Feature 97 is unusual.

A sample from the base of pit F65 contained only conifer charcoal and was very small and so could indicate that all fragments came from the same larger piece of charcoal or wood. Feature 1 a large fire scoop, contained seven species but was dominated by shrubs such as *Hebe* sp., *Coprosma* sp., and manuka, with only a small number of larger canopy species.

Table 3. Summary of species identified during charcoal analysis.

Species		Area A No.	%	Area B, Phase 1 No.	%	Area B, Phase 2 No.	%
Punga (*Alsophila dealbata*)	Ferns		0%	3	2%		0%
Manuka (*Leptospermum scoparium*)		4	80%	14	21%	106	83%
Kapuka (*Griselinia littoralis*)						5	
Tutu (*Coriaria arborea*)						2	
Hebe (*Hebe* sp.)	Small trees and shrubs	22				11	
Kowhai (*Sophora* sp.)				1			
Coprosma (*Coprosma* sp.)		14					
Five Finger (*Pseudopanax arboreus*)				7		4	
Orihou (*Pseudopanax colensoi*)				7			
cf. Mahoe (*Melicytus ramiflorus*)						2	
Kohekohe (*Dysoxylum spectabile*)		6	18%		13%		11%
Pohutukawa (*Metroideros excelsa*)	Broad-leaved canopy trees	2					
Titoki (*Alectryon excelsus*)		1					
Puriri (*Vitex lucens*)						1	
Rewarewa (*Knightia excelsa*)				18		17	
Conifer	Conifers	1	2%	88	64%	8	6%
Unidentified parenchyma	Unidentified		0%		0%	1	1%
Total		50		138		157	

Chronology

Four samples of charcoal were submitted to the Waikato University radiocarbon lab for dating. All four samples were processed as AMS dates.

F1, the large fire feature from Area A dug into the upper terrace, returned a date range much broader date than desirable. As shown in Table 4, this feature dates from the around the mid-17th to the mid-19th Century – later in the occupation sequence of the site. The dates returned for the features sampled in Phase 2 and 3 in Area B group around the mid-1700s to early 1800s. F98, the fire feature cut into the base of pit F98 also returned a broader date than desirable, however it is still the earliest date from the site and places T12/1 as being occupied around the time of the commencement of pā construction in New Zealand (Schmidt 1996; Davidson 1987). These dates support repeated occupation of the site from around the 1500s, and indicate the upper terrace (Area A) was most likely occupied later in the sequence, possibly contemporary with the latest phase of Area B.

Table 4. Results from Radiocarbon dating.

Lab No.	Feature	Area	Phase	CRA BP	cal AD 68.2%	cal AD 95%
Wk51624	F1	A		161 ± 23	1690–1730 (18.3%) 1800–1820 (2.4%) 1830–1890 (31.4%) 1920– (16.1%)	1670–1740 (21.1%) 1800– (68.4%)
Wk51626	F98	B	1	374 ± 24	1490–1520 (11.8%) 1540–1630 (56.4%)	1460–1640 (95.4%)
Wk51625	F33	B	2	226 ± 23	1660–1680 (7.2%) 1730–1800 (61.1%)	1650–1690 (19.9%) 1720–1810 (75.5%)
Wk51623	F28	B	3	237 ± 23	1660–1680 (9.7%) 1730–1800 (58.6%)	1650–1690 (22.6%) 1730–1810 (72.8%)

Discussion and conclusions

T12/1 Tomoana Pā is one of the first sites recorded in the Whangamatā area (Green 1954) and is a prime example of an extensive defended hilltop pā. Its current extent is around 11,450 m^2 and it is approximately 270 m in length (north–south) along the ridge, and at least 50 m wide. This site is also an example of how modern modification of the landscape through the access track establishment (bulldozing) and forestry activity can obscure sites, but not destroy them. Further, it is likely that compaction caused by heavy machinery operating on the southern terrace (Area B) aided in the preservation of the archaeological features below.

After topsoil stripping, the site proved to be relatively complex with at least one example of intercutting features in Area A and at least two phases, and probably three, of occupation present in Area B, although no material remains in situ material from the proposed Phase 3. At least 20 pit storage features were present which were not identified on the surface.

The small upper terrace just below the tihi (Area A) appears to solely have been used for cooking. Intercutting features here indicate a period of continued use. The radiocarbon date from a large fire scoop indicates this area may have been occupied around the same time as the cooking phase (Phase 3) from Area B on the terrace below.

The three occupation phases recorded in Area B, a south facing terrace, indicate separate uses for the same area over time. The earliest phase is a series of crop storage pits most likely used for kūmara. Their intercutting nature indicates multiple episodes of re-use within this occupation phase. Three fire features are cut into the base of the largest storage pit (F95) and may represent a way of drying or disinfecting the interior between uses, however given shell was present in one of the features (F98), it is more likely these represent a sheltered place to cook and therefore a secondary use of the feature.

The storage features appear to have been deliberately infilled with a homogenous clean fill and this surface then used for an unspecified occupation which involved some cooking features and several alignments of postholes. It is possible the alignments represent fences or windbreaks to compensate for the exposed nature of the terrace. These posthole features are filled with midden from what appears to be a later cooking phase which had been partly destroyed by modern damage to the site, with the remainder redeposited down the slopes.

Midden was found in post holes and fire scoops across the site, and a large fire scoop in Area A. A total of six features provided shell midden samples for analysis, but only one of these (Feature 1) had a large enough MNI count to provide a reliable and detailed analysis of the results. That sample indicated that people were collecting both tuatua and tuangi in mostly equal amounts, and a lesser number of pipi. While pipi were present in lesser amounts, they were the dominant species in terms of weight which indicates the species were larger and heavier than the tuatua and tuangi. The environments for all of these shellfish species, namely Moanaanuanu Estuary, Whangamatā Harbour, and the Whangamatā open beach are all within around 1.8 km of the pā.

It is interesting that very few artefacts were uncovered during the investigation, which probably relates to a separation of tasks across the site. The obsidian which was recovered indicates that intensive reduction was a strategy used to produce expedient implements with sharp edges, and some of the flakes show evidence of edge preparation and use. All of the obsidian was sourced to either Tūhua or the local Whangamatā area.

The charcoal identified most likely represents firewood selection and indicates the environment within which the site was occupied. The presence of conifers and some broad-leaved species suggest that primary forest stands likely remained in the vicinity, however the dominance of manuka and other small shrubs also points to at least some forest clearance. It is important to point out that these species do not present a comprehensive picture of all vegetation surrounding the pā, just those selected for use or were burned during forest clearance or cooking fires and survived as charcoal rather than turning to ash.

Most of the recorded sites in the Whangamatā area are concentrated on the peninsula on the north side of Whangamatā Harbour and in the hills and along the waterways on the island side of the Moananuanu Estuary. Closer to the harbour evidence has indicated earlier occupation with activities including kai moana processing and tool manufacture (e.g., T12/2, Gumbley and Hoffman 2008; Gumbley and Luamea 2019; T12/3, Phillipps 2015) and material culture being characterised by two-piece moa bone fishhook and what is considered early forms of tools (Gumbley and Luamea 2019). This is in contrast to occupation higher in the hills behind the Whangamatā township which is generally characterised by garden, storage, and terrace sites.

Storage pits are a common feature on terraced pā around both the Coromandel and the North Island of New Zealand as a whole, and the features present in the areas investigated are probably representative of features present on similar terraced platforms around T12/1. While T12/1 is a large pā with defensive earthworks, evidence from other pit and terrace sites in the Whangamatā area which date to around the same period (e.g., T12/1044 and T12/1084, Harris and Hudson 2010) suggest that the features investigated may be typical of the type of occupation prevalent during this time.

While investigations of T12/1 were restricted to two terraces, gardening would have been carried out in the nearby vicinity and the tephra soils around the lower slopes of the hills would have been ideal for kūmara cultivation as they are well drained and friable and would have warmed up rapidly in the spring. The amount of storage pits in Area B alone indicate that gardening and crop storage was important, as was collecting and eating shellfish. No evidence of fishing was identified on T12/1; however, this is not atypical as no other later sites in the area have fish remains been found (Harris and Hudson 2010).

Figure 26. Area B covered in GAP20 post investigation.

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Appendix A: Features from T12/1 Tomoana Pā

Feature	Type	Length(mm)	Width(mm)	Depth(mm)
Area A				
1	Fire feature	1300	700	200
2	Fire feature	600	540	100
3	Fire feature	870	610	200
4	Fire feature	440	330	200
5	Fire feature	1200	1000	80
Area B, Phase 1				
35	Posthole	240	240	300
36	Pit/Storage Structure	1700+	2500	475
37	Pit/Storage Structure	3200	500+	400
38	Pit/Storage Structure	3500	1800	450
39	Posthole	170	170	540
40	Posthole	90	90	120
41	Posthole	120	120	300
42	Posthole	120	120	480
43	Posthole	120	120	420
44	Posthole	170	170	250
45	Posthole	160	160	180
46	Pit/Storage Structure	2300+	63+	300
47	Posthole	170	170	60
48	Pit/bin pit	1900	700	390
49	Pit/Storage Structure	4000	2800	200
50	Posthole	140	140	180
51	Posthole	170	170	250
52	Posthole	160	160	260
53	Posthole	170	170	400
54	Posthole	200	200	200
55	Posthole	160	160	300
56	Posthole	170	170	200
57	Pit/bin pit	1170	970	280
58	Posthole	170	170	300
59	Posthole	120	120	120
60	Pit/Storage Structure	4300	2850	180
61	Posthole	180	180	390
62	Posthole	100	100	200
63	Posthole	200	200	400
64	Posthole	100	100	190
65	Pit/Storage Structure	4000+	2300	440
66	Posthole	140	140	300
67	Posthole	180	180	370
68	Posthole	170	170	210
69	Posthole	200	200	390
70	Posthole	170	170	280
71	Pit/Storage Structure	3900	1700	330
72	Posthole	170	170	490
73	Board Slot	1700	90	80
74	Board Slot	880	100	60
75	Posthole	100	100	130
76	Posthole	150	150	230
77	Posthole	100	100	80

Feature	Type	Length(mm)	Width(mm)	Depth(mm)
78	Posthole	220	220	400
79	Posthole	100	100	240
80	Posthole	130	130	280
81	Posthole	140	140	290
82	Posthole	80	80	90
83	Posthole	80	80	60
84	Pit/Storage Structure	3300	1800	
85	Pit/Storage Structure	3500+	1900	300
86	Pit/Storage Structure	1200+	900+	400+
87	Pit/bin pit	870	700	270
88	Posthole	100	100	120
89	Bell-shaped bin	430	600	600
90	Pit/Storage Structure	3170+	1600	
91	Pit/Storage Structure	700+	1180	
92	Pit/Storage Structure	2200	1150	
93	Pit/Storage Structure	2100+	1100	
94	Pit/Storage Structure	3500+	900+	200
95	Pit/Storage Structure	5000	3400	490
96	Fire Feature/Scoop	460	280	90
97	Fire Feature/Hearth	880	400	80
98	Fire Feature/Hearth	490	430	120
99	Posthole	100	100	200
100	Posthole	120	120	190
101	Posthole	130	130	470
102	Posthole	320	200	300
103	Posthole	200	200	400
104	Posthole	200	200	200
105	Posthole	100	100	130
106	Posthole	300	300	170
107	Posthole	260	160	350
108	Posthole	160-	160	300
109	Posthole	140-	140	200
110	Pit/Storage Structure	3400	1900	800
111	Posthole	14-0	140	100
112	Posthole	170	170	200
113	Posthole	400	200	460
114	Posthole	70	70	160
115	Posthole	160	160	300
116	Posthole	80	80	140
117	Posthole	200	200	460
118	Posthole	170	170	540
119	Posthole	140	140	530
120	Posthole	200	200	300
121	Posthole	180	180	200
122	Posthole	140	140	250
123	Posthole	200	200	360
124	Posthole	190	190	310
125	Posthole	190	190	400
126	Posthole	160	160	390
127	Posthole	170	110	300
128	Posthole	100	100	220
129	Posthole	200	100	280
130	Pit/Storage Structure	2800	1600	490

Feature	Type	Length(mm)	Width(mm)	Depth(mm)
131	Posthole	130	130	160
132	Pit/Storage Structure	2200		750
Area B, Phase 2				
6	Posthole	150	150	50
7	Stakehole	90	90	100
8	Posthole	170	170	240
9	Posthole	160	160	180
10	Posthole	120	120	120
11	Posthole	120	120	120
12	Posthole	120	120	120
13	Posthole	120	120	120
14	Posthole	130	130	40
15	Posthole	120	120	50
16	Posthole	80	80	30
17	Posthole	120	120	60
18	Posthole	120	120	90
19	Posthole	190	190	200
20	Post mould	300	300	200
21	Posthole	180	180	230
22	Posthole	160	160	170
23	Posthole	80	80	60
24	Posthole	150	150	210
25	Posthole	160	160	50
26	Posthole	160	160	50
27	Posthole	160	160	170
28	Posthole	180	180	100
29	Posthole	140	140	90
30	Posthole	160	160	140
31	Posthole	120	120	230
32	Firescoop	600	600	240
33	Firescoop	1130	900	230
34	Firescoop	630	670	100