

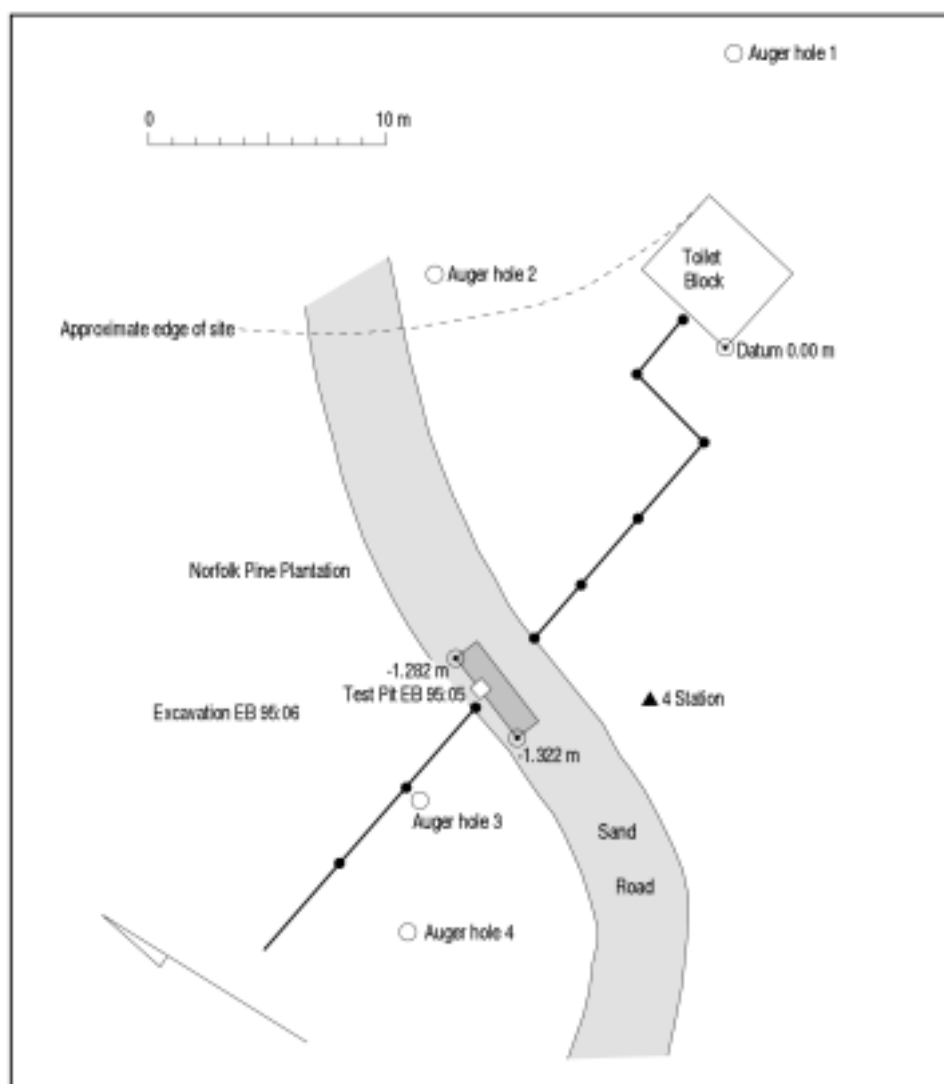


Figure 8. Location of auger holes (labelled 95/1–4 in Fig. 13) and Trenches EB95:05 and EB95:06.

SB96:04, the density of rubble prevented the back hoe from reaching below 1.4 m, and it was not possible to operate the auger. Sections were cleaned down by trowel and the stratigraphy measured and drawn (Fig. 11).

Test Trenches SB96:03–06. No significant cultural remains were revealed, either in structures or artefacts, and no charcoal-enriched levels were recorded. No structures of placed rock or other indications of settlement features of pre-European provenance were observed, except in SB96:06, and possibly SB96:05.

In SB96:03, a broken basalt cobble was found immediately below the brown sandy clay and rock layer, and a small, struck basalt flake, picked out of the sand scoop, seems to have been associated with it. It is possible that both are of historical age and caused incidentally in the course of activities other than adze manufacture. However, it is also possible that the yellow medium calcareous sand and rock unit in which these occurred, along with some pieces of marine gastropod shell and coral is, in fact, the prehistoric settlement level in Slaughter Bay. There was nothing beneath that level of archaeological interest all the way down to the water table at 3.0 m.

Trench SB96:04 was on the top of the ridge near the road. Below a series of thin sand layers of differing

characteristics, and a brown, sandy, clay was yellow calcareous sand which, as the trench deepened, proved to contain increasing quantities of calcarenite rubble. This was of all sizes and shapes, in pieces up to 0.8 m long, with sand between. It has the appearance of a storm beach layer and may lie immediately above solid calcarenite bedrock.

Trench SB96:05 disclosed a thin layer of partly burnt packed calcarenite rubble lying above a thicker layer of calcarenite rubble and sand. Since the trench was dug beyond the known boundary of the convict road, it is assumed that these features may be discarded material from the nearby lime kilns.

In SB96:06, at 2.3 m depth near the base of the back hoe excavation, we encountered a thin, brown, sandy-clay layer which contained damp, rotted sandstone, some charcoal smears and cut pieces of cattle bone (identified by Ian Smith, a specialist in mammal bone). This find indicates that the overlying calcareous sands, and the layer of brown sandy-clay, are of historical age and have been blown and pushed over levels at which there was discard of European rubbish.

It is difficult to interpret the Slaughter Bay sedimentary sequence and determine the level or levels within it at which prehistoric remains could occur. At the sea wall in the extreme eastern corner of the beach, fish and bird bone

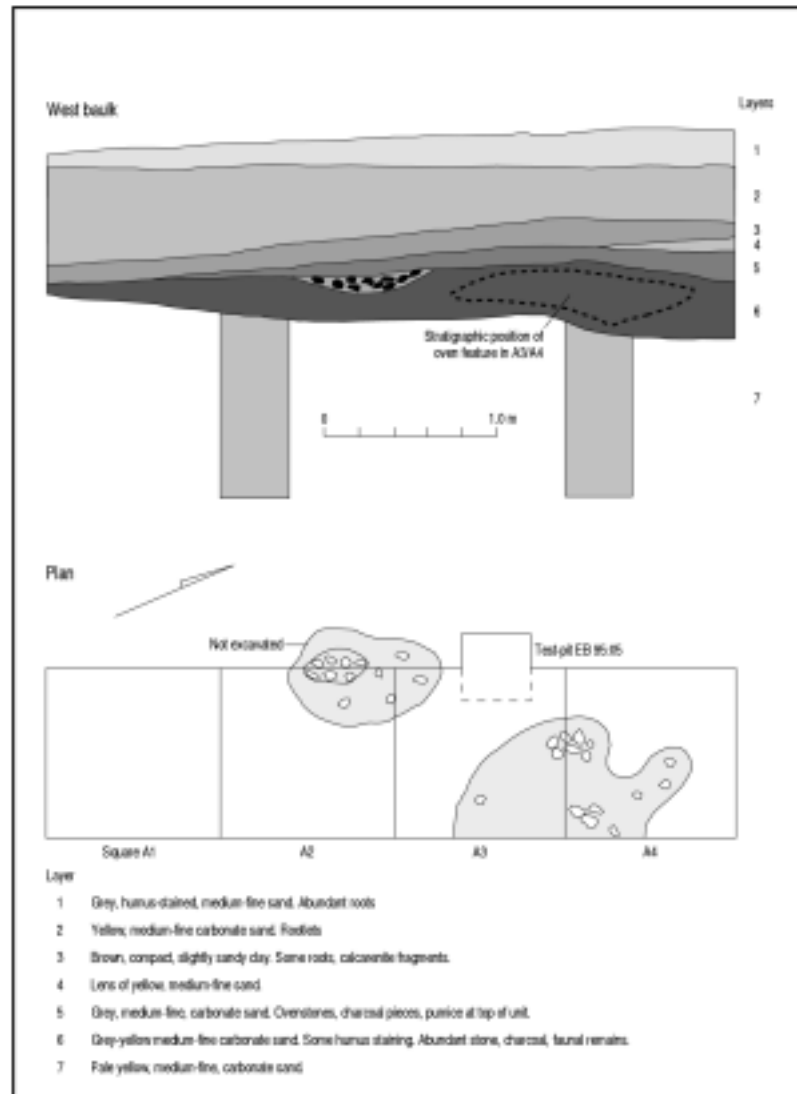


Figure 9. Stratigraphy and plan of Trench EB95:06.

together with an adze were recovered by Bevan Nicolai (above). There is no further sign of occupational debris there, and it seems that what remained was probably destroyed by the recent construction of the sea wall.

Where any depth of deposit is encountered in the eastern end of Slaughter Bay, the common sequence is: modern turf, calcareous sand (usually yellow, but also buff or containing humus-stained lenses), a layer of brown, sandy or silty clay which is compact and tough to penetrate, going down on to yellow calcareous sand beneath. The possible indication of prehistoric remains in SB96:03 occurred at the top of the last unit.

Since these sands would be highly mobile when exposed, it is quite possible that they were blown inland during the European era over the margins of the swamp, into which some butchery remains had been discarded previously (SB96:06). However, the brown clay is not mobile and it is difficult to see what could have shifted it over the dunes between the road and the swamp other than labour or machine. It is known that substantial dumps of “fill” (mostly clay and stone) were deposited and spread immediately to the west of the clump of pines in recent times and it seems

very likely that this practice also occurred further east. If that was the case, then the stratigraphy above the yellow medium sand and rock is all comparatively recent and no prehistoric material will be encountered within it, at any rate *in situ*.

While these initial investigations suggest that prehistoric remains are not abundant in eastern Slaughter Bay—and the absence of charcoal-stained layers is particularly indicative of low density or absence—it will still be necessary to continue looking. Several test trenches closer to the base of the calcarenite massif, and further augering in the central and western parts of the bay may be warranted. There is, however, nothing to show that the Emily Bay site continued into Slaughter Bay. The area between has been heavily disturbed by public works over the last two centuries which might have destroyed some of the evidence, but the stratigraphy on the western side of the Emily Bay site indicates that it did not reach the present drainage ditch. Consequently, it seems almost certain there was a pre-European settlement site in Slaughter Bay, the erosion of which has left numerous adzes and basalt flakes along the eastern part of the beach.

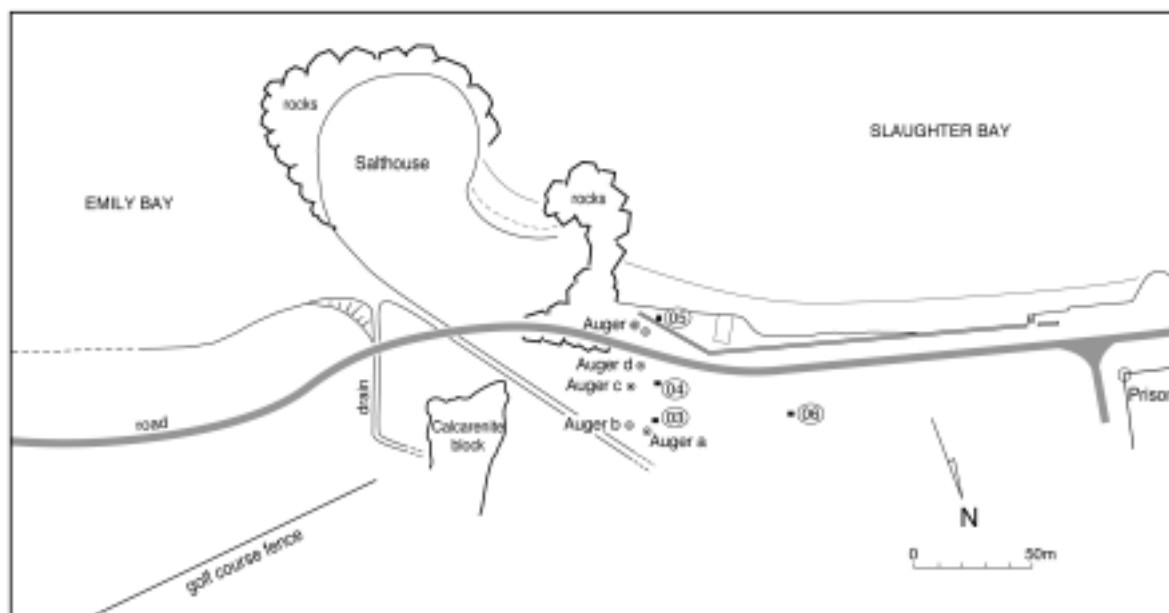


Figure 10. Auger holes and trenches in Slaughter Bay. SB96:03 incorporates SB96:01 and SB96:05 incorporates SB96:02.

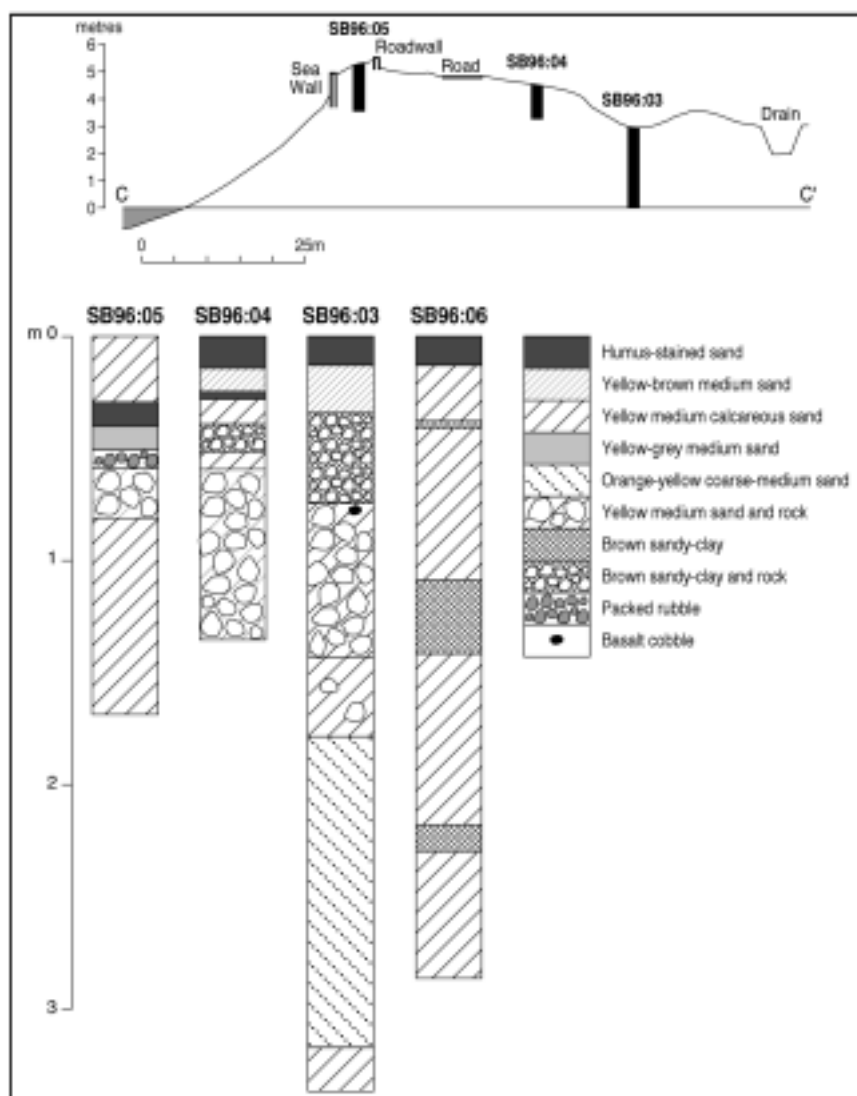


Figure 11. Stratigraphy of trenches in Slaughter Bay.

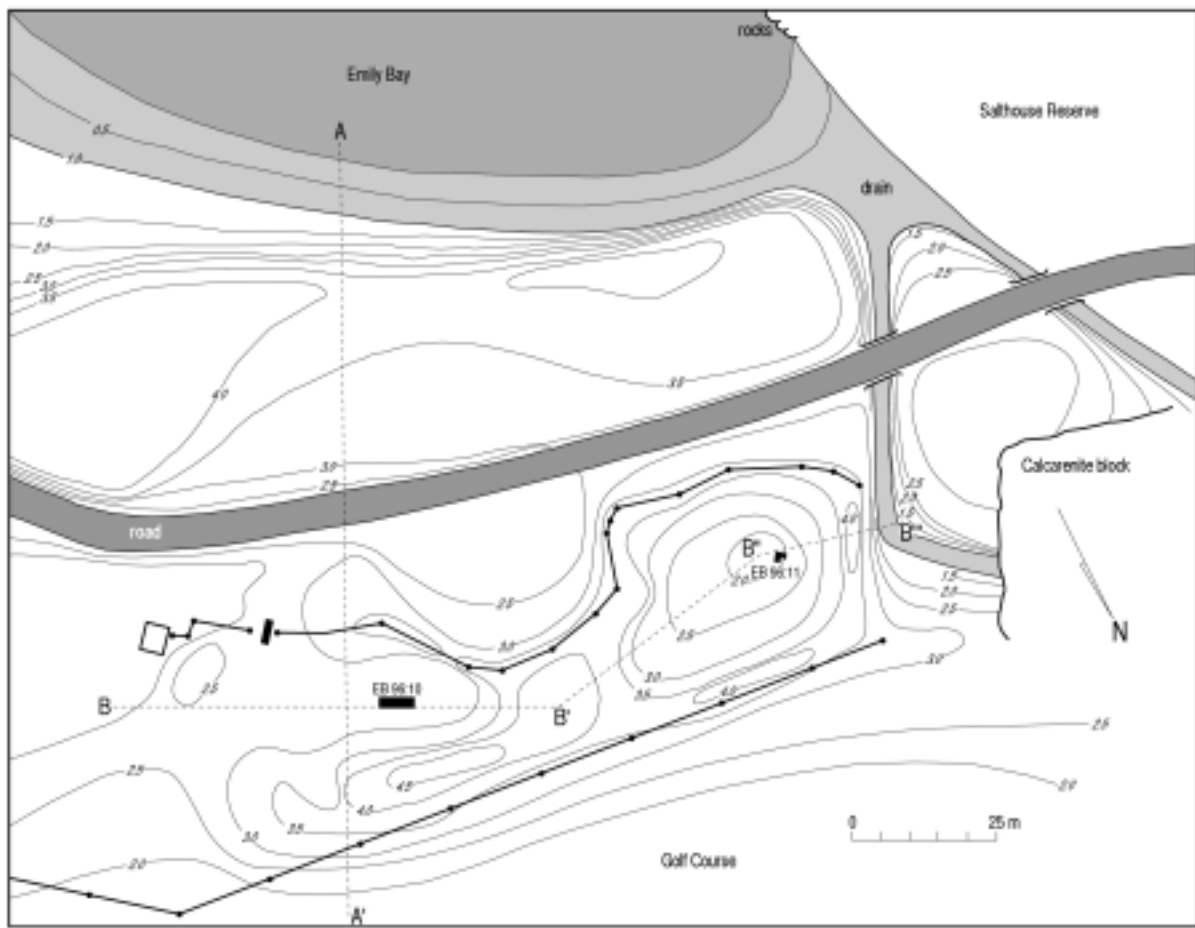


Figure 12. Location of trenches at Emily Bay in 1996, showing transect lines for stratigraphic analysis (Figs. 14, 15).

Emily Bay. The tasks at Emily Bay were to continue defining the extent of the site—areally and stratigraphically—and to expand the very small sample of it which was exposed in December 1995. The site was mapped and a contour plan drawn of the present land surface. Excavations were undertaken in each of the two main swales in which the site occurs (Fig. 12).

Extent of site. Thirty-six auger holes were drilled in order to define the boundaries of the site and its main stratigraphic pattern (Fig. 13). The details of each hole were recorded and then selected holes used to draw the stratigraphy along two axes of the site (Figs. 14, 15). As can be seen from these, the site is laid on a level to slightly undulating surface, but there are more substantial dunes deposited above it. These comprise a sinuous line along which runs the seaward fence of the pine plantation, and a second line inside the golf course fence. There are cross-dunes at the drain and through the centre of the site area. The effect of these is to create two large swales in which the archaeological remains are more accessible than elsewhere. It is in these swales that excavations have occurred: in the large eastern swale and its run-out area in December (Trenches EB95:05, EB95:06) and April (EB96:10), and in the smaller western swale in December (EB95:04) and April (EB96:11).

The auger holes showed that the site extends north–south for approximately the width of the plantation. It is possible that this coincidence results from protection of remains under the dunes, while former parts of the site were deflated or destroyed by earthmoving. However, the stratigraphy,

indicating a thinning of the cultural layer at each extremity, suggests that the current site boundaries might define the original extent along this axis. Along the east–west axis, there appear to be gaps in the distribution. The main part of the site lies under the eastern swale, but does not extend further east than the sand road. The prehistoric cultural layer thins towards the central cross-dune and does not appear immediately on the western side of it. In the western swale, there is a discontinuous distribution of cultural stratigraphy.

Trench EB96:10. Auger holes showed that in this area the stratigraphy was very similar to that encountered in EB95:05 and EB95:06, but that the cultural layer was blacker in colour, indicating a cooking area, or possibly domestic hearths. The backhoe was used to scrape the overlying sand off an area 6.3×1.7 m, down to the brown clay. This was then chipped off by hand and an excavation area of 6.0×1.5 m was set out (Fig. 16).

Excavation disclosed a single cultural layer, varying in thickness from 0.15 m to 0.40 m (Fig. 17). It was directly overlain by the brown clay and underlain by medium-fine, yellow calcareous sand. The cultural layer was excavated in 0.10 m spits. It appeared as a compact grey-brown sand, grading to dark grey and black at the eastern end of the excavation. In that area, were numerous ovenstones and the pits of three scoop ovens, one apparent in spit 1 and the others in spit 2. Other possible structural features were investigated in spits 2–3. Several appeared, initially, to be post-holes, but all proved upon further excavation to be the remains of root holes. In spit 2, extending into spit 3, at the

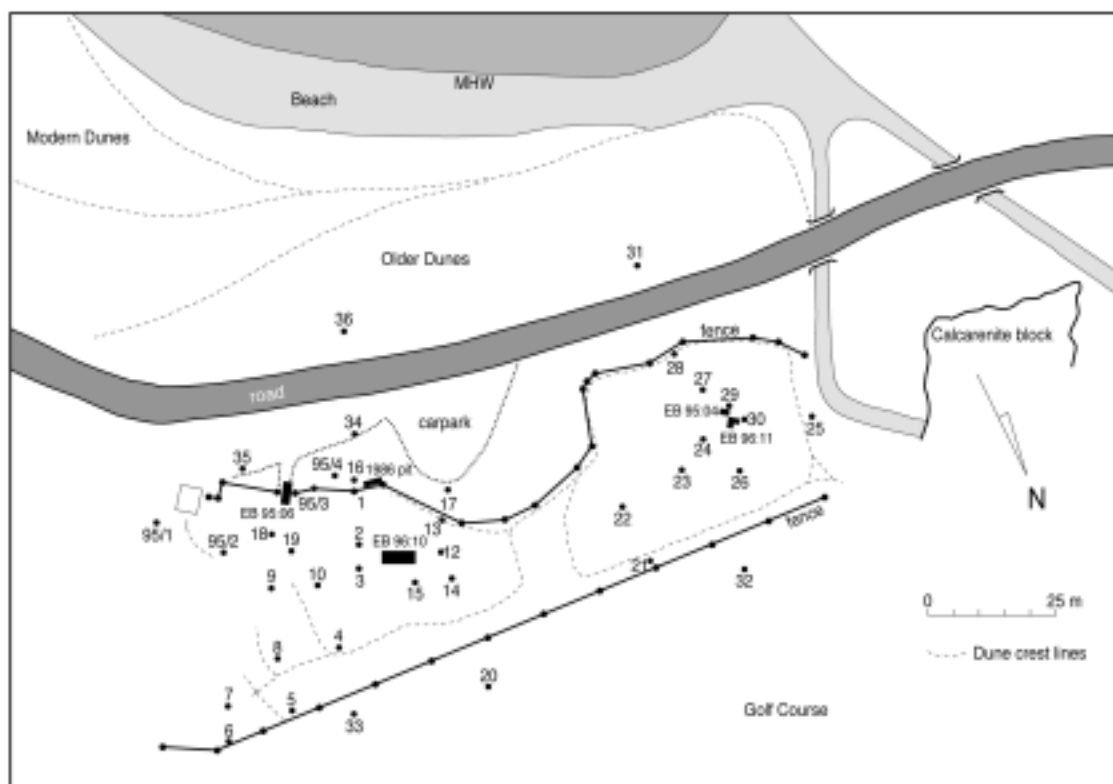


Figure 13. Location of auger holes excavated in 1996 at Emily Bay.

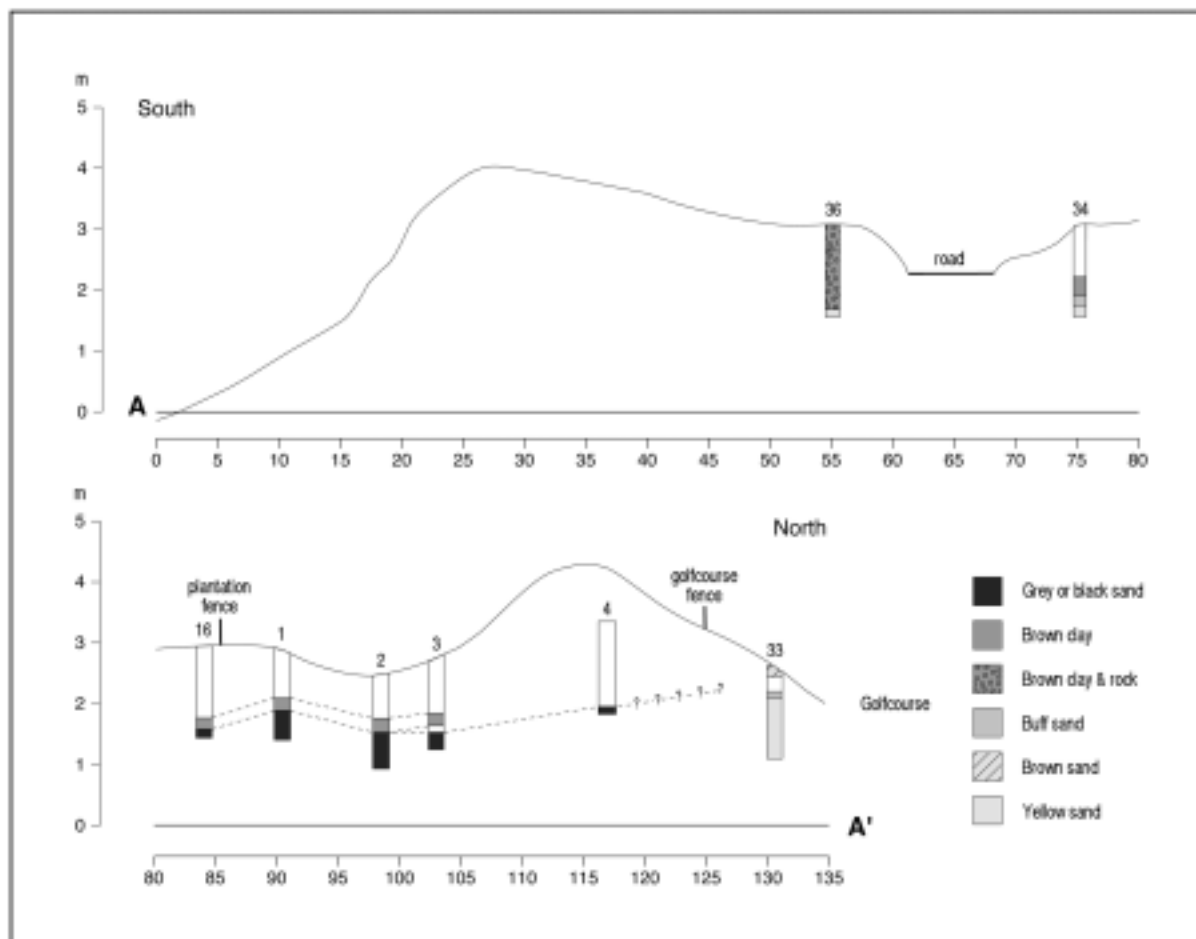


Figure 14. Stratigraphy in A transect at Emily Bay.

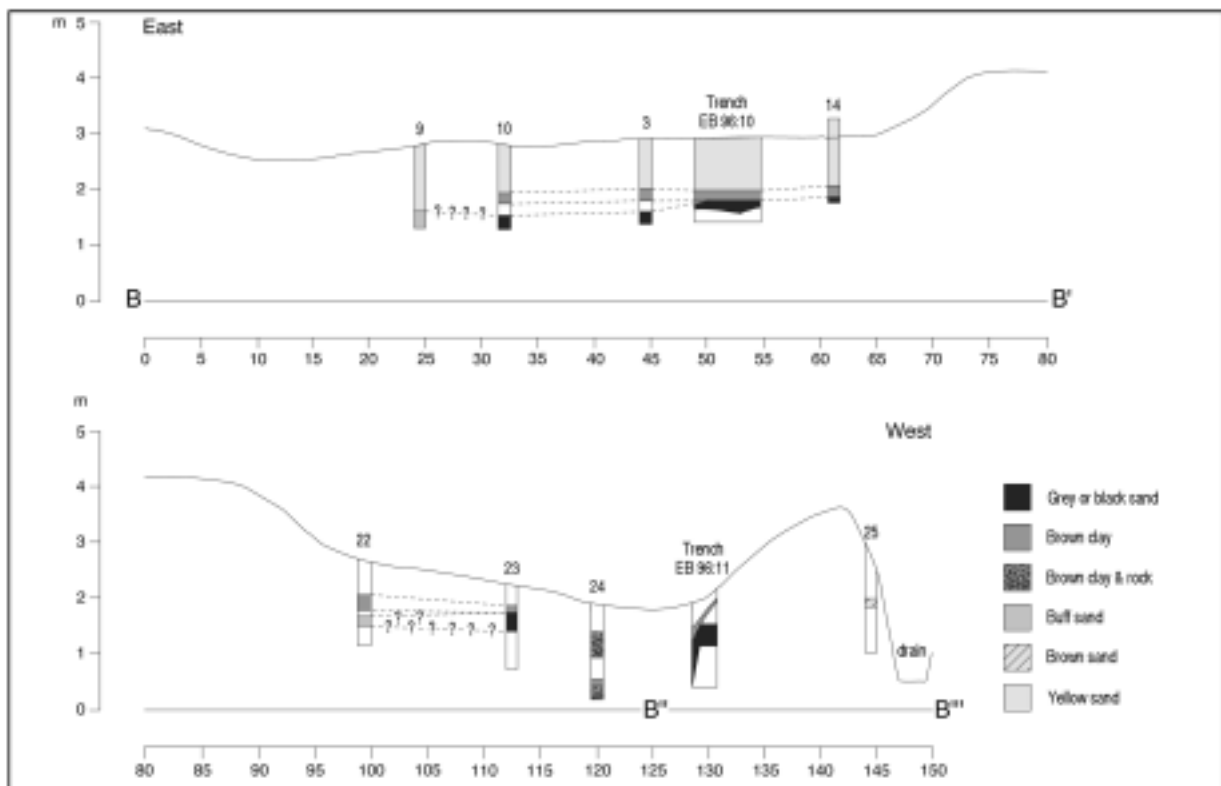


Figure 15. Stratigraphy in B transect at Emily Bay.

western end of the excavation was a rubbish pit, filled with fish and bird bone (Fig. 18). Midden remains were otherwise less abundant than in Trench EB95:06, but there were some different materials, including turtle bone (most of a scapula in one place) and the worked pieces of a large pelecypod. Basalt flakes from adze manufacture were fairly common, but no other lithics were discovered. In this excavation and also in EB96:11, all material was sieved through 4 mm mesh and the residue retained for laboratory analysis.

Trench EB96:11. A 3 m² excavation was opened in the western swale. The undamaged stratigraphy proved to be much as it is elsewhere in the site, with a cultural layer evidenced by 0.4 m of black sand grading down to 0.3 m of grey sand (at a total of 0.7 m, the thickest part of the cultural layer in the site), overlain by a brown clay—separated from it by some yellow sand in places—and underlain by yellow sand (Fig. 19).

In the eastern part of the excavation, the even deposition of layers terminates in ragged, slumped lenses. Some agency has cut away the site and left a steep edge, down which lenses of the various stratigraphic units—black sand, grey sand, yellow sand and brown clay—have tumbled and interleaved (Fig. 19). The damage extends through the area of Trench EB95:04. Further east, in the centre of the western swale, there is no evidence of the site, and it can be assumed that the same event or events were responsible for removal of it. The most probable explanation is that we have uncovered the edge of a cutting through which ran a road. The auger hole (Fig. 15, Auger hole 24) which was then expanded into a small pit in the centre of the swale disclosed two levels of hard-packed brown clay and rock which could only be penetrated with a crowbar. These are probably surfaces of a road in this area (apparently of Second Settlement age) which began at the junction of Bligh Street



Figure 16. Excavation of Trench EB96:10, showing hearth pits. Kirsten Anderson and Rosanne Anderson excavating.

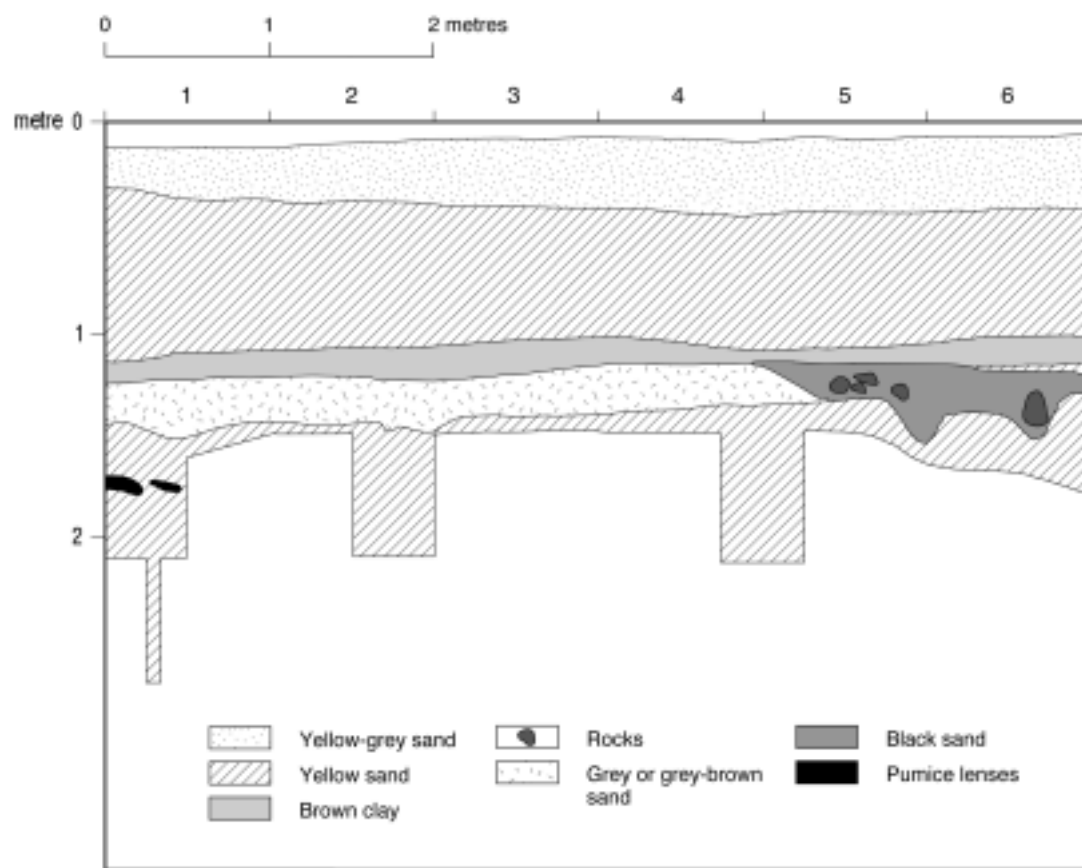


Figure 17. Stratigraphy of northern baulk of Trench EB96:10.

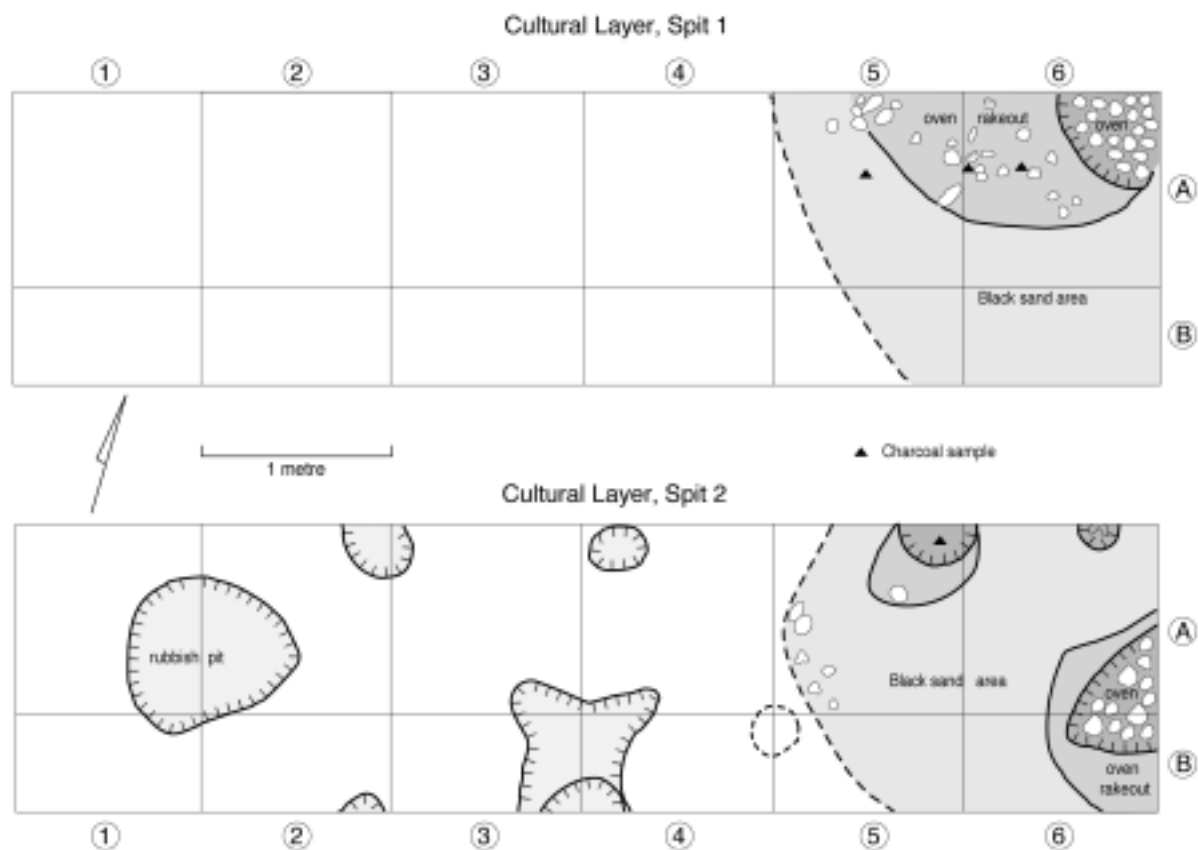


Figure 18. Plan of Trench EB96:10.

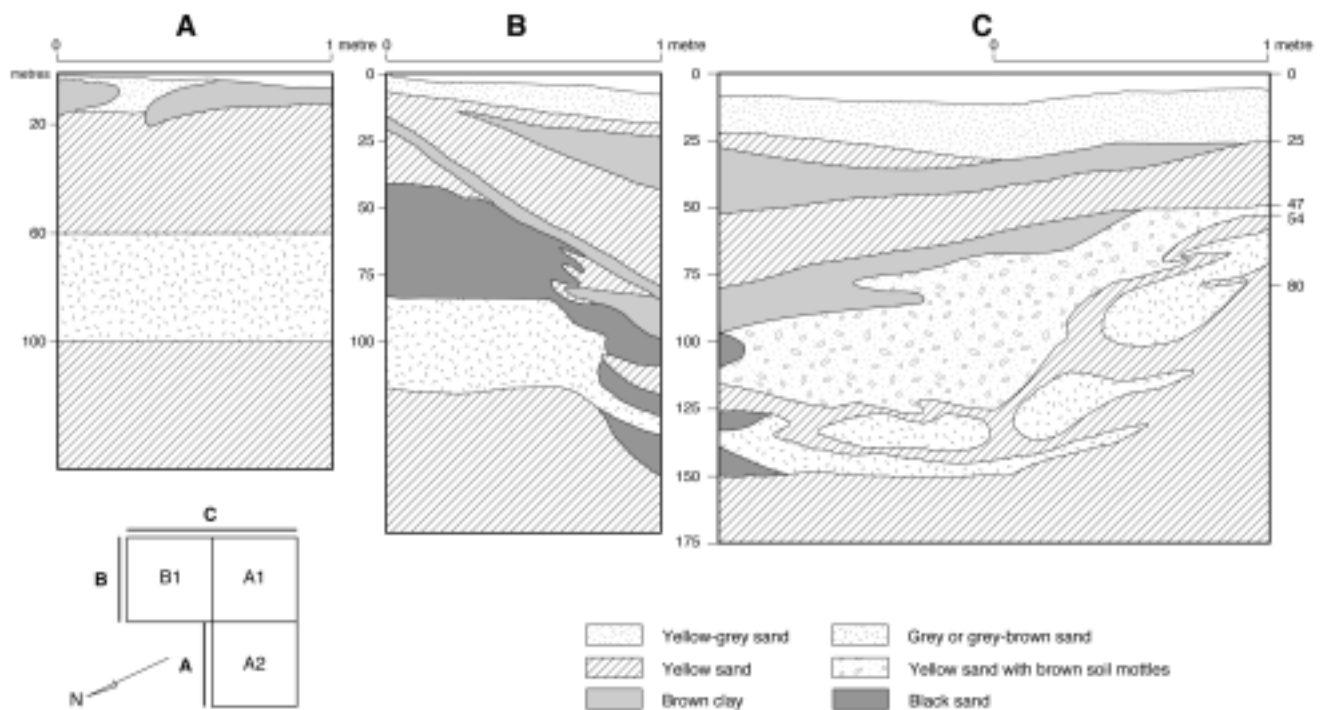


Figure 19. Stratigraphy of Trench EB96:11.

and Bay Street, ran across the drain, curved through the area of the western swale and terminated in a limestone quarry east of Government House.

The material recovered from this excavation was rather different from that obtained in the trenches in the eastern swale. A broken head of a rotating harpoon made from turtle bone and a blade of obsidian were found. There were numerous basalt flakes, some of which had come from polished adzes, a large, unifacially-retouched basalt blade and the butt of a trilaterally-flaked adze preform. This material looks like the debris that might be expected in a domestic area, compared to that which was recovered in the eastern area. Midden remains mainly comprised fish bone, with much less bird bone than was apparent in earlier excavations. A burnt and broken dog carnassial tooth was recovered and also a shark tooth.

These discoveries, including the evidence of greater diversity than previously documented in the archaeological materials, and most particularly the obsidian blade with its promise of sourcing the origin of the prehistoric settlers, encouraged planning for a third field season.

Fieldwork in 1997

Emily Bay. The nature of the evidence in 1996 indicated that a substantial open-area excavation in the western swale would repay the effort. The area had to be selected quite carefully because an original request to the Australian Heritage Commission for permission to excavate up to 150 m² was negotiated down to a total excavation area of 45 m², about 3% of the area of the swale. In the event, the discovery of stone paving required a special application from the field to KAVHA and the AHC for additional excavation area, resulting in permission for a further 10 m². The 1997 excavation areas are shown in Fig. 20. All excavated material was sieved to at least 4 or 5 mm mesh

size (it became necessary to borrow an older sieve with 5 mm mesh from the Norfolk Island Museum). Where small stone flakes or faunal remains occurred, the excavated material was washed through 2 mm sieves. The residue was bagged and later sundried and sorted into major components (shell, bone, stone, charcoal etc.), re-bagged and retained for laboratory analysis. Whole samples of approximately two litres each were also taken from each square, sundried, sieved to remove sand and re-bagged for laboratory analysis.

In planning the main areas to open up, the information of the 1996 auger holes and EB95:04 and EB96:11 excavations was supplemented by two test-pits (Fig. 21).

Trench EB97:21. An excavation of 1.5 m², on the western slope of the swale, cut through yellow carbonate sand containing a sloping layer of brown clay mixed with sand and calcarenite, to reach the level surface of the cultural layer at 0.83 m (Fig. 22). This proved to be 20 cm thick, with one small, deeper depression in it. At 5 cm below its surface in square Z1 there was a fine example of a basalt adze preform, triangular in cross-section (Turner, Anderson and Fullagar, this vol.).

Trench EB97:22. A 1 m² excavation on the eastern slope of the swale encountered a similar stratigraphy to EB97:21, with the surface of the cultural layer reached at 0.7 m depth. In it, at 5–10 cm, there was a number of calcarenite slabs, laid flat, and in the northeast corner, at 10 cm depth, a small group of upright stones set above a hammerstone (Anderson and Green, this vol.). Burnt, broken cobbles were found in the southern part of the square. In due course, this excavation became incorporated into EB97:24 as square Z5.

Trenches EB97:23, EB97:24. These were the major excavations at Emily Bay. As such they constitute the subject of most of the chapters in this volume, and are described only briefly here. Both excavations were situated in the western swale, although the topography was different at the time of site occupancy. It is apparent that the Emily

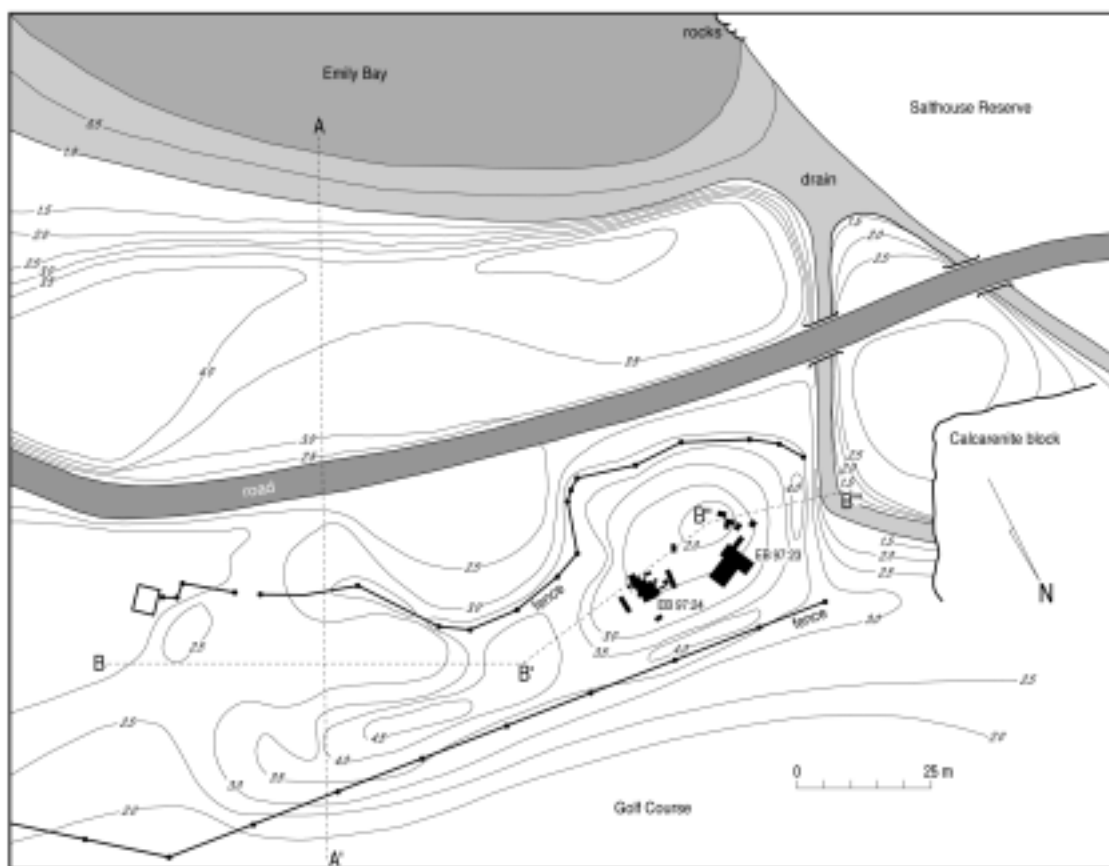


Figure 20. Location of trenches at Emily Bay in 1997.

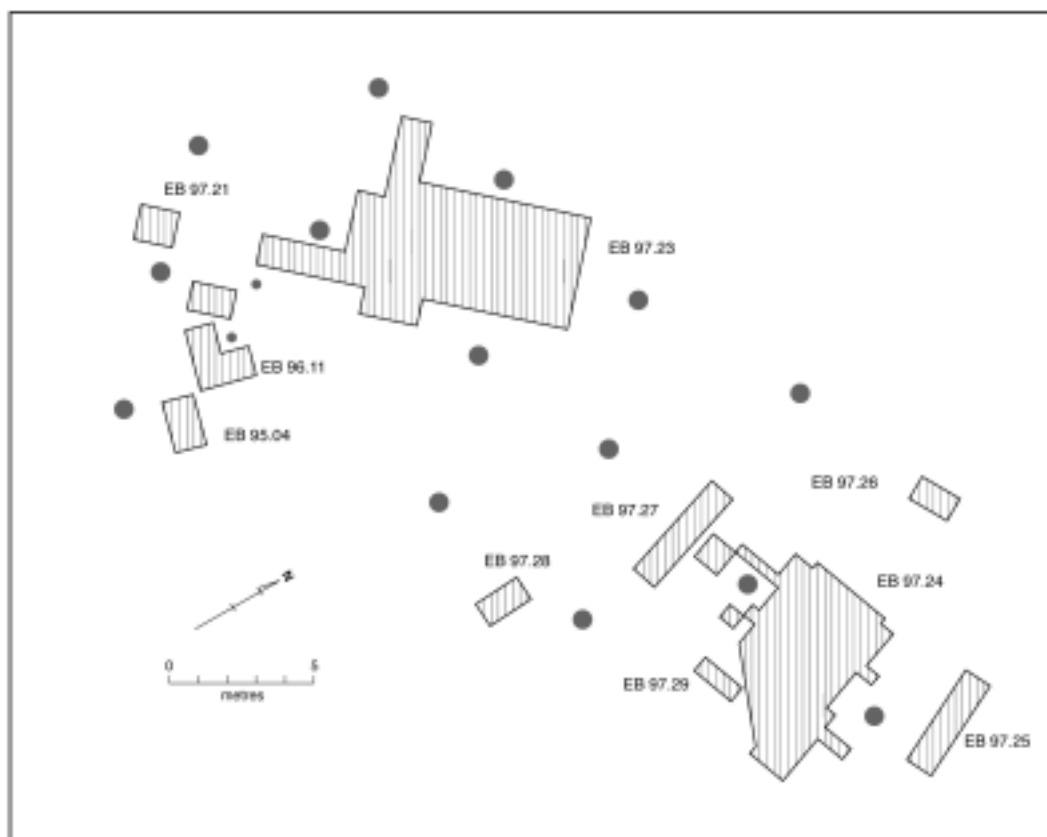


Figure 21. Plan of excavated and cleared areas at Emily Bay, 1997—shaded circles indicate tree boles. Note that EB97:23 includes adjacent unlabelled small trench to the south.

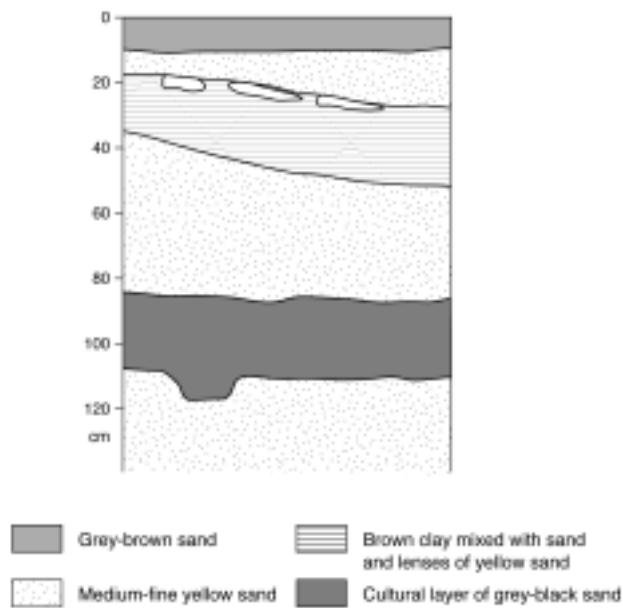


Figure 22. Stratigraphy of northern baulk of Trench EB97:21.



Figure 23. Excavation of EB97:23, seen from north. Note the heavily disturbed central squares of the excavation inside the postholes. Penny Crook and John Anderson excavating.

Bay site in general was located initially upon a surface which, while not flat, did not have the topography of the modern dunes. There is carbonate sand for 0.7–1.2 m under the cultural layer in the eastern swale, but beneath it in the western swale is mixed sand and water-rolled gravel and cobbles; material which has the appearance of a former beach or wind deflation area. It is possible that there were no active dunes in Emily Bay at the time of initial pre-European colonization and that the settlement was placed upon a more or less flat surface situated about 1.0 m above the high tide level (our survey indicated that the base of the cultural layer, where it was undisturbed, was about 1.3 m above high tide level in the eastern swale and 1.0 m above in the western swale).

On the basis of the test-pits, a 39 m² excavation (Figs. 23, 24) was undertaken in the northwest quadrant of the swale (EB97:23). The stratigraphy is generally straightforward. Under the pine duff is a layer of pale yellow carbonate sand of varying thickness and, running through it, following a former dune surface, is a thin (8–15 cm) band of brown soil, a fairly recent palaeosol. Beneath is a thick layer (0.6–1.0 m) of the same pale yellow sand which, over most of the excavation, covers the almost level surface of the cultural layer, observed as a grey-brown sand with black patches in it. In squares A–B 6–8, and E–F 6–8, lenses of stiff brown clay lay directly upon the cultural layer (below).

The cultural layer in EB97:23 is generally about 0.3 m thick and grey-brown in colour, and we excavated about 11.7 m³ of it. Except in small patches, mostly near the postholes, and within and around the large oven in A–B 7, charcoal is scarce. Similarly, there was very little shell midden, and it consisted only of small patches of *Nerita* sp. (Campbell and Schmidt, this vol.). Bird bone was much more common. Most of it is broken, and some burnt, which is characteristic of midden, but some will also be from mutton birds which died naturally on the site (Holdaway and Anderson, this vol.). Fish remains (Walter and Anderson, this vol.) were sparsely scattered, and there were several pieces of turtle and mammal bone (Smith, Clark and White, this vol.). Basalt flakes were distributed about the site, in no apparent pattern and one flake of translucent obsidian was recovered from square E12, spit 4 (Turner, Anderson and Fullagar, this vol.).

The excavation of Trench EB97:22 had located some flat slabs which appeared to be paving. Additional excavation in this area (Fig. 25) uncovered a paving structure, discussed by Anderson and Green (this vol.). Nineteen square metres of this were excavated as Trench EB97:24. This part of the site was covered by up to 0.6 m of medium-fine yellow carbonate sand above a 10–15 cm thick layer of brown clay enriched with sand and fragments of calcarenite. Beneath was 5–10 cm of yellow carbonate sand overlying the cultural layer (Fig. 26). The latter, 15–25 cm thick, with slabs embedded within it, lay upon coarse brown sand containing abundant water-rolled gravel, which also occurred in the interstices between the paving. The brown clay layer dips steeply along the southwest edge of the paving to flatten out at about 1.2 m below the paving level, indicating that the loss of a paving edge along that side occurred prior to the formation of the brown clay, although the latter is almost certainly a European feature (see later).

It was not possible to excavate out to the limits of paving

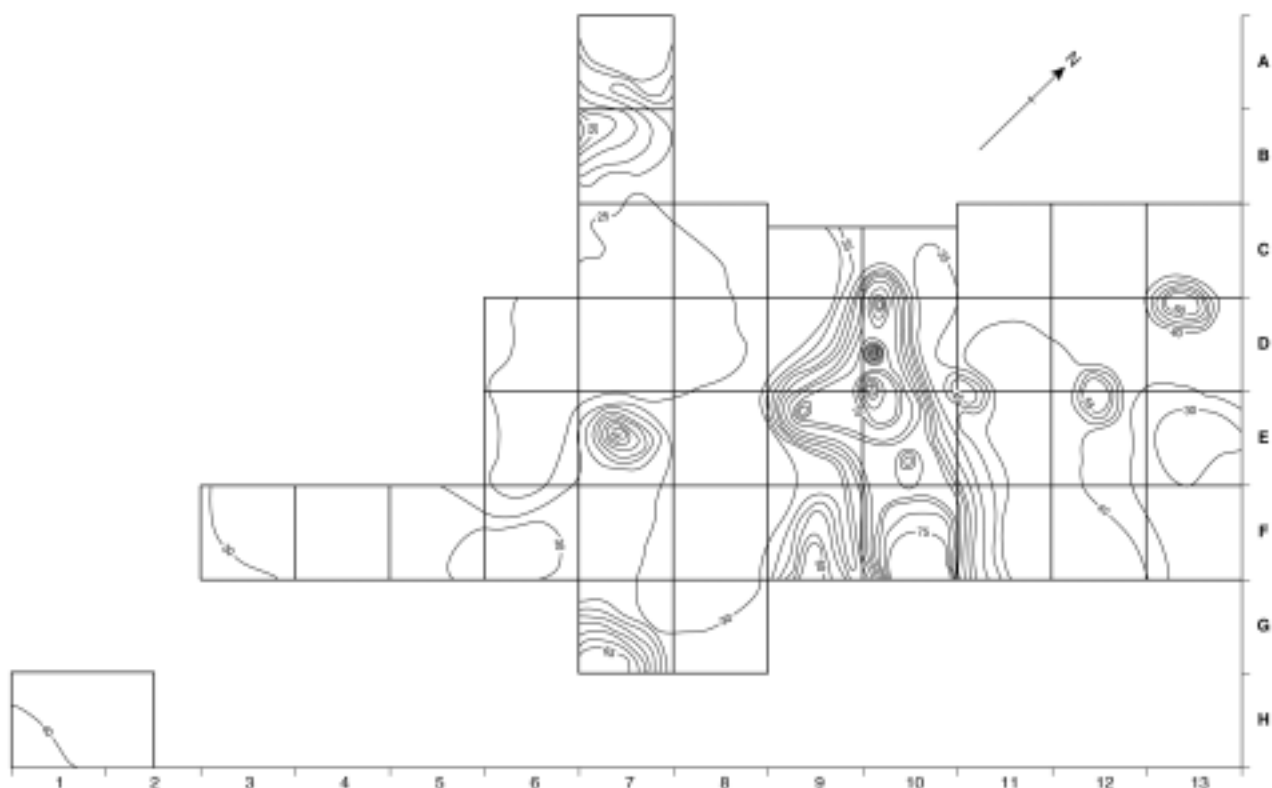


Figure 24. Contour plan of the depth of the cultural layer in Trench EB97:23.

stones along the west side, because of restrictions on permitted excavation area, and it would have been desirable to excavate further to the east as well. However, extensive probing in these areas, and a series of trenches (EB97:25, 26, 27, 28, 29) cleared down to the surface of the cultural layer, which was not excavated, showed that the exposed paving constituted the full feature, as it presently survives. The paved area is discussed at length by Anderson and Green (this vol.). These trenches also indicated that the disturbed deposit at the southwest edge of EB97:24 continued through the southern half of EB97:27 and that EB97:28 exhibited brown, rubble-filled clay in the northern half of the square, perhaps a further indication of the historical roadworking which runs through the centre of the western swale. Mention of that feature raises the more general question of the degree to which the Emily Bay site has been exposed to post-depositional disturbances of any kind.

Site Taphonomy. The Emily Bay site appeared initially to have been protected from post-depositional disturbance in the areas excavated in 1995 and 1996 in the eastern swale area by the tough brown clay layer over it. However, this layer is discontinuous at best in the western swale and there is evidence of at least four agencies of site disturbance there. First, within the historical era a roadway had been constructed through the centre of the western swale, and that seems to be evidenced in several auger holes. Further signs of historical disturbance reaching to the prehistoric cultural layer are evident in Trench EB97:23, squares A–B, 6–8 (the 6 and 8 rows in A–B were cleaned down to the top of the cultural horizon but only row 7 was excavated). A large oven feature containing many basalt cobbles was situated within the cultural layer and, almost immediately

above it like a mirror image, was a low mound of calcarenite slabs (Fig. 27). The mound was sitting upon a thin layer of stiff brown clay packed with clasts of basalt and calcarenite which, in turn, lay directly upon the surface of the cultural layer. A piece of European china in the brown clay indicates that it, and the mound, are of European age, so the situation of these features together can only be coincidental.

Second, either as a result of a road cutting, or by natural agencies, the site is badly slumped along the eastern edge of excavation EB96:11. That at least some of this is probably natural (wave damage is suspected), is indicated by similar ragged slumping of the edge of the site in a curved “bite” along the SW edge of excavation EB97:24 which had caused that edge of the paved feature to collapse. Since the site is quite close to high tide level (below), and was probably closer to the shore before the formation of the modern dunes south of the road, it was vulnerable to storm damage. In both Emily and Slaughter Bay, in fact, there is a history of wave erosion which has uncovered burials and washed out numerous adzes, basalt flakes and other material (Specht, 1984). The current seaward boundary of the site is therefore probably an artefact of natural processes.

Third, in a process which is continuing today in the western swale, muttonbird burrowing into and through the cultural layer is redistributing material from above the archaeological horizon, into and below it. There is some evidence of this in the distribution of landsnails (Neuweeger, White and Ponder, this vol.). The burrowing, which is most apparent as a deep disturbance across the centre of the EB97:23 excavation (Figs. 24, 28), has carried material to 0.9 m below the cultural surface.

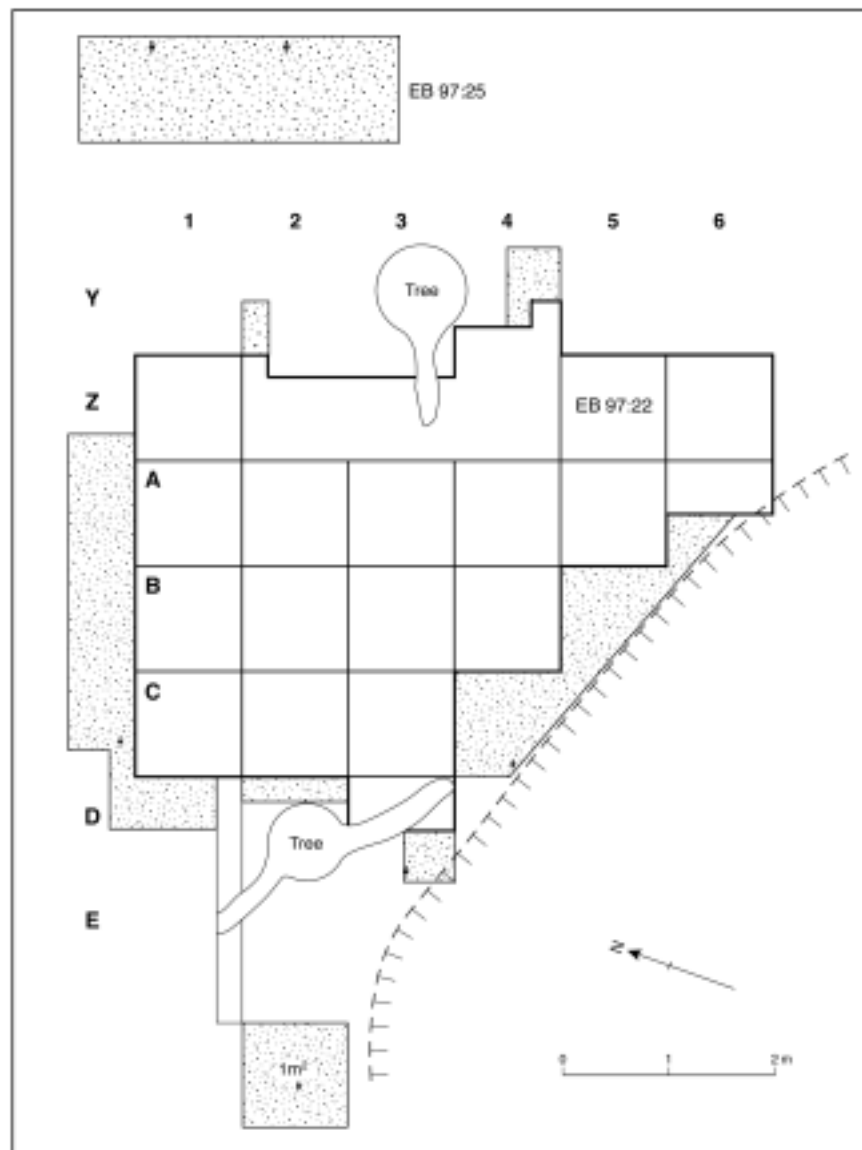


Figure 25. Plan of the excavated area of Trench EB97:24. Stippled areas were cleared of sand but the cultural layer was not excavated.

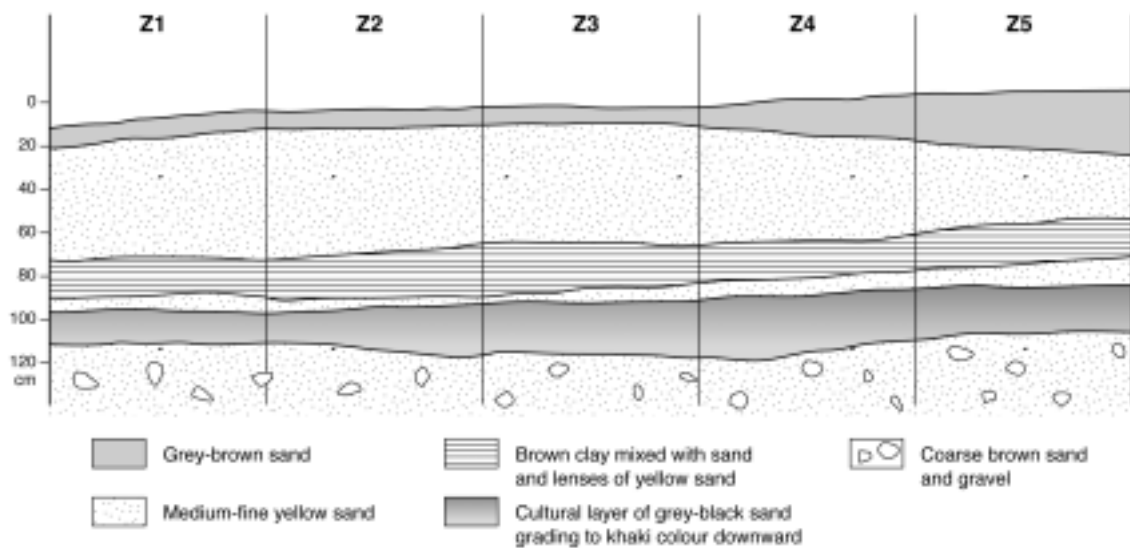


Figure 26. Stratigraphy of the east baulk of row Z in Trench EB97:24.

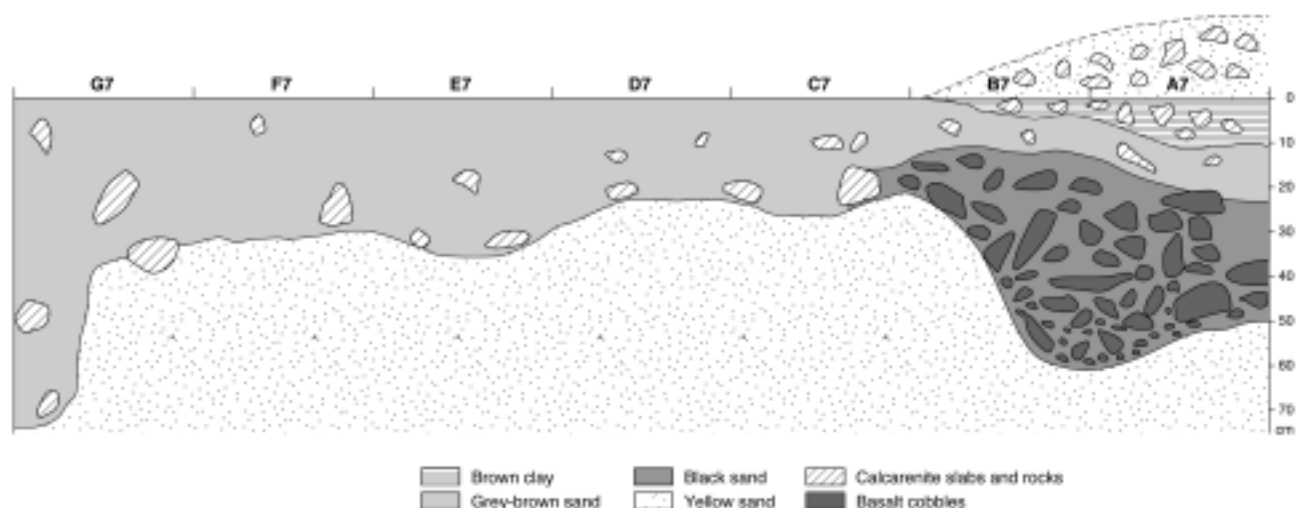


Figure 27. Stratigraphy of the west baulk of row 7 in Trench EB97:23.

Fourth, the virtually level surface of the cultural layer, everywhere that it is encountered, suggests not only that it is in that respect quite typical of a living surface, but perhaps also that it has undergone some natural planation. The remarks in McCarthy (1934: 268) that Mr Rabone found at Emily Bay, "a number of small adzes in process of being fashioned. With them were several hundred flakes that had been chipped off in the shaping of the adzes," suggest that some part of the site was open at that time. Since the Emily Bay dunes were largely unvegetated prior to the establishment of the current plantation, as shown in numerous photos taken from the 1930s onward (S. Quintal collection), it is very probable that wind deflation had periodically exposed parts of the site and planed the surface. It is probably this process which allowed a piece of European ceramic to almost reach the surface of the cultural layer in EB97:24 (square Z2), and which enabled a piece of modern pig mandible to reach the top of the cultural stratigraphy in EB97:23 (see also Anderson, Higham and Wallace, this vol.).

Fieldwork in 1999

During the 1997 fieldwork we observed considerable numbers of landsnails in all levels of the trenches. Grab samples were taken from the sands above and below the grey sandy cultural level and appeared to show considerable

changes. In an attempt to analyse the human impact on the local environment, further samples were taken by 10cm sand auger in February 1999. Two sets, each of four samples, were taken adjacent to Trench EB97:23 and another set near EB96:10 (Figs. 13, 20). Two other sets were begun but encountered European disturbance and were abandoned. Two sets of two samples each were taken at Cemetery Bay, one inside and one adjacent to the new quarry. A comparative sample of the modern landsnail fauna was collected from six environmental zones by Dr Winston Ponder, Australian Museum. The analysis of this material is described by Neuweger, White and Ponder, (this vol.).

Additional investigations

The existence of prehistoric archaeological remains at Kingston, and the recovery of various artefacts, mostly adzes, from elsewhere on Norfolk Island, encourages the view that there may be additional prehistoric sites to be found. Some initial explorations were conducted during the 1997 fieldwork season.

Bomboras Bay. Two small test-pits (0.3×0.3 m) were dug 20 m and 30 m respectively to the north of the creek mouth on a small shelf of fairly level land about 2 m back from the high tide mark. The first disclosed only 0.5 m of stiff

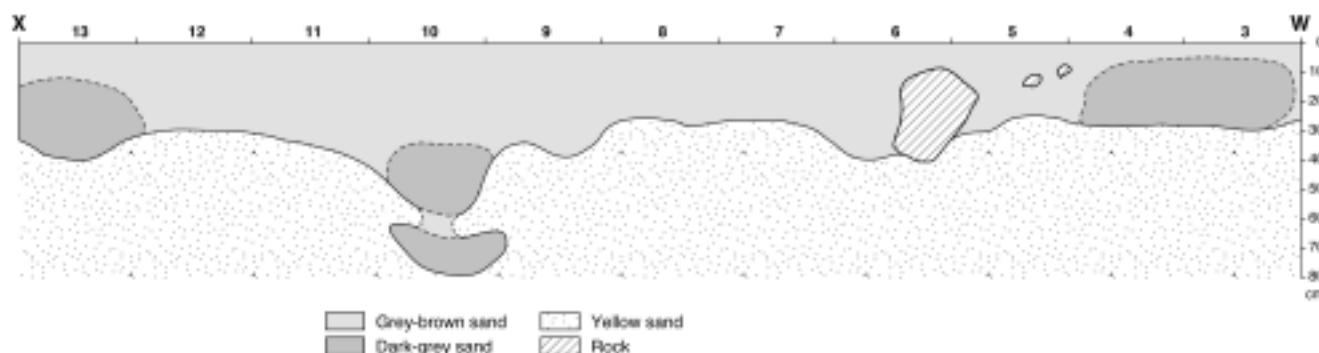


Figure 28. Stratigraphy of the south baulk of row F in Trench EB97:23. Transect WX shown in Anderson and Green (this vol., their fig. 2).

brown clay above bedrock. The second had 0.3 m of the same clay above 0.3 m of orange-yellow calcareous sand resting upon water-rolled boulders. No cultural material was observed.

Ball Bay. There are hearsay accounts of adzes being found at Ball Bay, notably along the eastern side of the bay near the “Melky” trees (Nicolai, pers. comm.). At the main patch of these, located around the coast about 210 m SE of the oil depot, a test-pit (0.3×0.3 m) disclosed 0.45 m of brown, hard-packed clay lying upon basalt bedrock. A second test-pit, a further 22 m to the east, cut through 0.55 m of hard-packed clay and clasts of weathered basalt, especially towards the bottom, to encounter 0.37 m of stone-free, brown clay-loam (probably an old soil horizon) resting upon heavily-weathered basalt boulders. The area on which this test-pit was located is a gently-sloping shelf of ground about 30×10 m lying immediately behind the boulder beach. The existence of this deeply buried horizon of good soil suitable for settlement should encourage more extensive investigation in future, despite the absence of cultural material in our excavations.

Phillip and Nepean Island. A brief surface inspection of the deeply-eroded surface of Phillip Island produced nothing

of archaeological interest. Nepean Island, heavily wooded at European contact, is now under deep grass with occasional wind-sheared white oaks. The ground has been extensively disturbed by muttonbird burrowing. A test-pit (0.3×0.3 m) was dug on the saddle of the island. It found 0.5 m of friable, sandy loam resting on calcarenite bedrock. Muttonbird bones occurred, but nothing of cultural origin. A second test-pit was dug on a natural terrace about 15 m above sea level in the large cove and sand-beach on the NW coast of the island, a reasonably sheltered position. There was 0.6 m of yellow carbonate sand above calcarenite. Occasional bird and lizard bone appeared natural and there was one small cowrie shell, but nothing which appeared to be of cultural origin.

Conclusions

The fieldwork of the NIPP has located an extensive prehistoric site in Emily Bay, and shown that, so far at least, this is the only such site of any significance remaining on Norfolk Island. Excavations during 1995–1999 (Fig. 29) show that the Emily Bay site has a single cultural layer containing various features, notably a paved structure, and numerous ovens, with associated midden remains and quantities of flaked basalt.

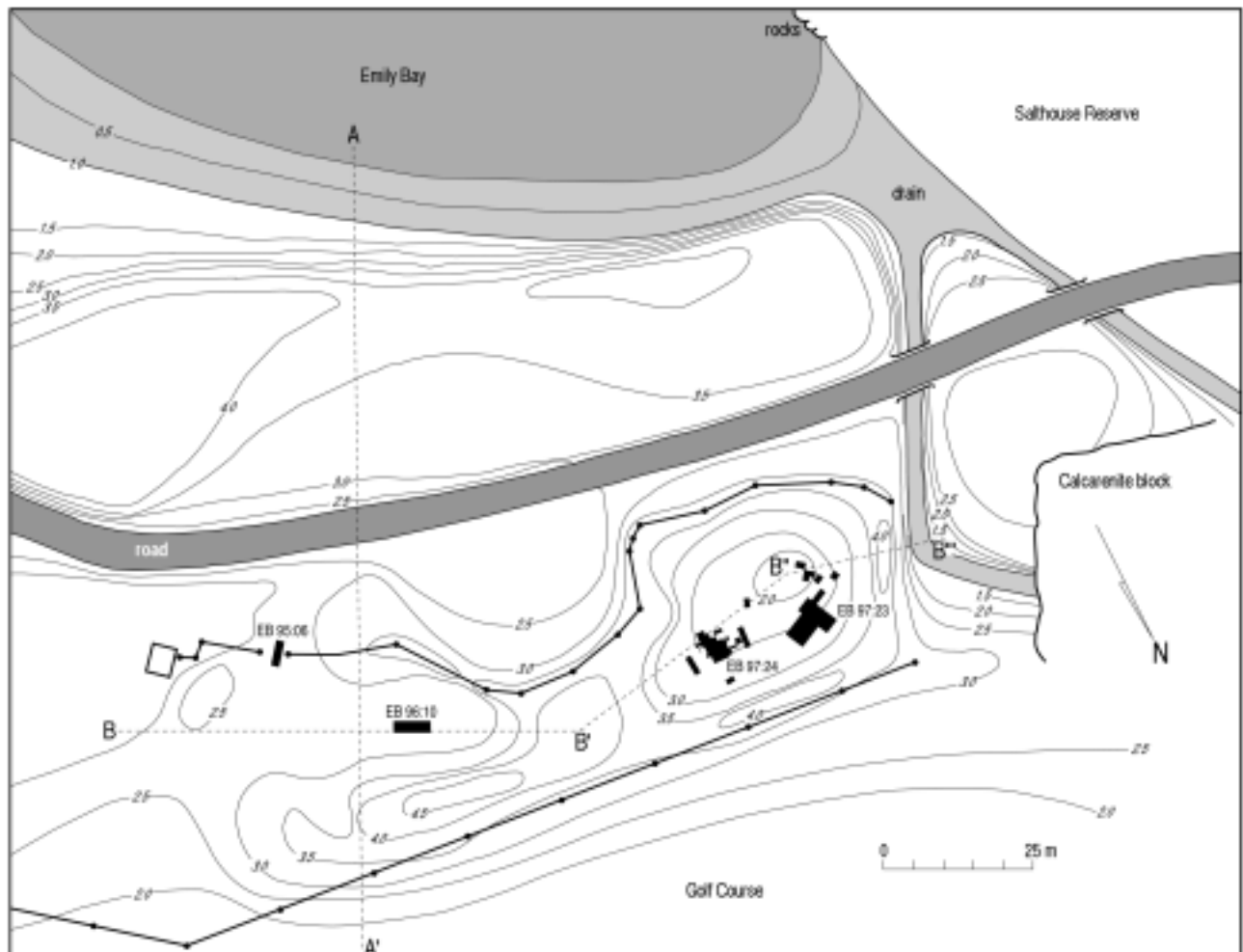


Figure 29. Map of all NIPP excavations at Emily Bay.

The site is approximately 100 m long and 30 m wide on average (3000 m²), but it is now almost certainly rather smaller than it was originally, having been eroded along the seaward side and quite probably also to the east where the dunes are much younger and appear to have filled an area which had been heavily eroded by wind and water. Various agencies of post-depositional disturbance have also compromised the integrity of the cultural layer in many areas. Nevertheless, enough of the site remains in sufficiently original condition to obtain a clear view of the nature of the occupation that it represents.

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<http://dx.doi.org/10.3853/j.0812-7387.27.2001.1334>

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<http://dx.doi.org/10.3853/j.0812-7387.27.2001.1348>

Appendix F – 2020 community warning from NIRC regarding Emily Bay swimming

PUBLIC HEALTH WARNING - VERY POOR WATER QUALITY IN EMILY BAY OUTLET

The public are advised to keep away from any freshwater in the KAVHA Catchment and avoid swimming in Emily Bay until water quality in the area improves to an acceptable standard.

The sand plug at Emily Bay that holds stormwater in Watermill creek burst its bank at about midday on Friday the 31st of July and water started flowing into Emily Bay.

The stormwater in this catchment is of extremely poor quality and causes significant water quality issues in streams and in Emily Bay after heavy rainfall and runoff.

According to the Guidelines for Managing Risks in Recreational Water, limits for primary contact recreation - where the body can be fully immersed and there is the potential to swallow water, and you are in direct contact with the water (eg. surfing, water skiing, diving and swimming) are **150 CFU/100ml** for Thermotolerant Coliforms and **35 CFU/100ml** for Enterococci.

The stormwater was analysed on Monday morning for faecal indicators to assess the level of contamination and, according to the results of the independent tests, the count for Thermotolerant Coliforms was greater than **1,000,000 CFU/100mL** and Enterococci was greater than **900,000 CFU/100mL**.

Further water quality testing by Biotec on Wednesday showed some improvement in water quality, with Enterococci at **17,200 CFU/100ml** in the freshwater outlet and **4,800 CFU/100mL** in Emily Bay.

This water still poses a significant threat to public health. The community members at most risk are young children, elderly people and persons with compromised immune systems. Symptoms can include ear and throat infections, gastroenteritis or diarrhea. If these symptoms occur Council advise that you should seek medical assistance as soon as practicable.

Council acknowledges that swimming in the freshwater outlet has been an old past time for Norfolk Island residents. The water quality however is getting increasingly worse because many of the septic system soakage trenches are beyond their service life and cattle have unrestricted access to waterways. This accumulative impact has meant that the risk of contracting water borne illness from the swimming in the creeks in KAHVA has dramatically increased in recent times.

To limit the contamination of surface water and ground water it is extremely important to appropriately maintain household septic systems by pumping them out at least once a year. It is also recommended that soakage trenches be renewed every 7 to 10 years.

A business case has been developed by Balmoral Group Australia Pty. Ltd. for the upgrade of the current wastewater treatment plant, and Council is currently developing project proposals and will continue to explore funding options to connect more houses to the Water Assurance Scheme and reduce the number of properties using septic tanks.

Cattle exclusion fencing has recently been erected in the KAVHA area and plans are underway for more fencing, alternative water for stock and revegetation with native plants. In time the completion of these projects will result in improved water quality on Norfolk Island.

If you have any questions or concerns please contact Customer Care via email customercare@nirc.gov.nf or by telephone on local free call 0100.



Jim Castles

Manager Planning & Environment

3 August 2020

Appendix H:

Wacker Neuson Operator Manual

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**WACKER
NEUSON**
all it takes!

Operator's Manual

Rammer

BS



Machine Type
Material Number
Version
Date
Language

BS65-4, BS72-4
5100061347
2
03/2021
[au]



5 1 0 0 0 6 1 3 4 7

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Original operator's manual

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The machine on the cover is for illustration purposes only and may therefore have special equipment (options).

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EC Declaration of Conformity**Manufacturer**

Wacker Neuson Produktion GmbH & Co. KG, Wackerstraße 6, D-85084 Reichertshofen
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product	BS65-4
Product type	Vibratory rammer
Function of product	Soil compaction
Material number	5100061307
Net installed power	2,7 kW
Measured sound power level	105 dB(A)
Guaranteed sound power level	108 dB(A)

Conformity assessment procedure

2000/14/EC, Annex VIII

Notified body

TÜV Rheinland LGA Products GmbH, Tillystr. 2, D-90431 Nürnberg (NB 0197)

Guidelines and standards

We hereby declare that this product complies with the relevant provisions and requirements of the following directives and standards:

2006/42/EC, 2000/14/EC, 2014/30/EU, EN 500-1:2006 + A1:2009, EN 500-4:2011, EN ISO 13766-1:2018, EN ISO 13766-2:2018

Person responsible for technical documents

Wacker Neuson Produktion GmbH & Co. KG, Wackerstraße 6, D-85084 Reichertshofen

Reichertshofen, 17.02.2021



Helmut Bauer
Managing Director

EC Declaration of Conformity**Manufacturer**

Wacker Neuson Produktion GmbH & Co. KG, Wackerstraße 6, D-85084 Reichertshofen
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product	BS72-4
Product type	Vibratory rammer
Function of product	Soil compaction
Material number	5100061309
Net installed power	2,7 kW
Measured sound power level	105 dB(A)
Guaranteed sound power level	108 dB(A)

Conformity assessment procedure

2000/14/EC, Annex VIII

Notified body

TÜV Rheinland LGA Products GmbH, Tillystr. 2, D-90431 Nürnberg (NB 0197)

Guidelines and standards

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Person responsible for technical documents

Wacker Neuson Produktion GmbH & Co. KG, Wackerstraße 6, D-85084 Reichertshofen

Reichertshofen, 17.02.2021



Helmut Bauer
Managing Director

2 Foreword

2.1 Introduction

This operator's manual contains important information and procedures for the safe, proper and economical operation of this machine. Careful reading, understanding and observing it helps to avoid hazards, reduce repair costs and downtimes and thus increase the availability and service life of the machine.

This operator's manual is not a manual for extensive maintenance or repair work. Such work must be carried out by the service partner or by technically trained personnel. The machine must be operated and maintained in accordance with the instructions in this operator's manual. Improper operation or maintenance can cause hazards.

Defective machine parts must be replaced immediately!

The manufacturer is always available to answer questions on operation or maintenance.

2.2 Storage Location of the Operator's Manual

This operator's manual must be kept in the immediate vicinity of the machine and accessible to personnel at all times.

If this operator's manual is lost or you require a new copy, there are two ways of obtaining a replacement:

- You can download it from the Internet - <http://www.wackerneuson.com>
- Contact the manufacturer.

2.2.1 Understanding These Instructions

This section helps to understand the operator's manual and the illustrations used therein.

Target group

People working with this machine must be regularly trained with regard to the dangers and risks occurring when using this machine.

This operator's manual is aimed at:

- Operating personnel:
 - These people have been instructed in working with the machine and about possible dangers and risks arising due to improper behavior.
- Technically trained personnel:
 - These people have a professional training as well as additional knowledge and experience. They are capable of assessing the tasks assigned to them and recognizing any possible risks and dangers.

Explanation of symbols

Symbol	Explanation
1., 2., 3...	Indicates an activity. The sequence of the steps must be observed.
⇒	Indicates a result or an intermediate result of an action.
✓	Indicates prerequisites that must be established for the activity.
•	Indicates a list, e.g. if several components are named one after the other.
-	Indicates a sub-list, e.g. if components consist of further components
	Identifies a position, usually a component or control element, in a graphic. The numbering may be sequential or in Roman numerals.
1; A	Indicates the naming of components in explanatory texts. It is identical with the adjacent positions in the illustrations.
 	Indicates a direction of movement or different positions for switches.
▶	Indicates the avoidance of hazards in warning notices.
[▶52]	Indicates a cross-reference in tables. Here e.g. reference to page 52

2.2.1.1 Explanation of symbols

The symbols used in the operator's manual are explained below. The symbols are used exclusively in warning or environmental instructions or information. Warnings must always be observed to protect the operator and third parties from personal injury and damage to property.



Symbol for warning notices

This symbol marks general warnings. It is used to alert you of possible hazards, e.g. risks of injury or accidents.



Symbol for indications of technical damage

This symbol is a warning symbol that indicates a danger of technical damage. It is used to indicate situations where damage to the machine or third-party property may occur.



Symbol for environmental information

This symbol indicates environmental information. It is used to warn of possible environmental hazards.



Symbol for information

This symbol indicates information. This information can include tips on operation, for example. It helps to better understand and use the machine.

2.3 Accident Prevention Regulations

In addition to the notes and safety instructions in this operator's manual, the local accident prevention regulations and the national industrial safety regulations apply.

2.4 Contact person

Depending on the country, the contact person is a service partner, a subsidiary or a dealer.

On the Internet at - <http://www.wackerneuson.com>.

2.5 Limitation of liability

In the event of the following infringements, the manufacturer disclaims any liability for personal injury and damage to property:

- Actions contrary to this operator's manual.
- Non-designated use
- Deployment of untrained personnel.
- Use non-approved spare parts and accessories.
- Improper handling.
- Structural changes of any kind.
- Non-observance of the General Terms and Conditions (GTC).

2.6 Use of the operator's manual

This operator's manual:

- must be regarded as an integral part of the machine and must be kept in a safe place throughout its service life.
- must be passed on to each subsequent owner or operator of this machine.
- applies to various machine types from one product range. For this reason, some illustrations may differ from the appearance of the purchased machine. Variant-dependent components that are not included in the scope of delivery can also be described.

The manufacturer reserves the right to change the information in this operator's manual without notice.

It must be ensured that any changes or additions made by the manufacturer are immediately incorporated into this operator's manual.

Group - Type	Material number (Mat. no.)
BS65-4As 11in SAM	5100061307
BS72-4As 11in SAM	5100061309



3 Usage

3.1 Designated use

Designated use also includes observing all notes and safety instructions in this operator's manual and observing the prescribed care and maintenance instructions.

Any other use or use that goes beyond this is considered improper use. The manufacturer shall not be liable or liable for any damage resulting therefrom. The risk is borne solely by the operator.

The machine is used for:

- Compaction of cohesive, mixed and granular soils.
- Soil compaction in trenches.
- Backfilling of structures.
- Use in civil engineering, gardening and landscaping.
- Asphalt compaction.

3.2 Unintended use

The manufacturer is not liable for personal injury or damage to property resulting from unintended use. The following activities, among others, are not intended:

- Connecting non-permitted components.
- Operating the machine outside the performance data.
- Compaction of strongly cohesive soils.
- Compaction of frozen soils.
- Compaction of hard, non-compactable soils.
- Compaction of non-load-bearing soils.
- Shaking in cobblestones.

4 Safety

4.1 Safety symbols and signal words

The following symbol identifies safety instructions. It is used for warning against potential personal risk or danger.



⚠ DANGER

DANGER identifies a situation causing death or serious injury if it is not avoided.

Consequences in case of non-observance.

- Avoidance of injury or death.



⚠ WARNING

WARNING identifies a situation that can cause death or serious injury if it is not avoided.

Consequences in case of non-observance.

- Avoidance of injury or death.



⚠ CAUTION

CAUTION identifies a situation that can cause injury if it is not avoided.

Consequences in case of non-observance.

- Avoidance of injury.



NOTICE

INFORMATION identifies a situation that causes damage if it is not observed.

Consequences in case of non-observance

- Avoidance of damage to property.

4.2 Principle

The machine has been designed and built in accordance with latest state-of-the-art standards and the recognized safety regulations. Nevertheless, improper use may result in danger to life and limb of the operator, third parties or damage to the machine and other material property.

Read and observe the notes and safety instructions in this operator's manual. Failure to follow these instructions may result in electric shock, fire and/or serious injury, and damage to the machine and/or other objects.

Keep safety instructions and information for the future.



4.3 Structural changes

Structural modifications may not be made without the written consent of the manufacturer. Unauthorized structural changes may result in hazards to the operator and/or third parties as well as damage to the machine.

The manufacturer's liability and warranty are also void in the event of unauthorized structural alterations.

In particular, a structural change shall be deemed to have occurred:

- When opening of the machine and permanent removal of components.
- Installation of spare parts that do not come from the manufacturer or are not equivalent in design and quality to the original parts.
- Attachment of accessories of any kind that do not originate from the manufacturer.

Spare parts or accessories from the manufacturer can be installed or removed safely. Further information is available on the Internet at - <http://www.wackerneuson.com>.

4.4 Responsibility of the operator

The operator is the person who operates this machine himself for commercial or economic purposes or who leaves it to a third party for use/application and bears the legal product responsibility for the protection of personnel or third parties during operation.

The operator must make the operator's manual accessible to the personnel at all times and ensure that the operator has read and understood the operator's manual.

The operator's manual must be kept ready to hand at the machine or at the place of use.

The operator must hand over the operator to any other operator or subsequent owner of the machine.

The country-specific regulations, standards and directives on accident prevention and environmental protection must also be observed. The operator's manual must be supplemented by further instructions for compliance with operational, official, national or generally applicable safety guidelines.

4.5 Obligations of the operator

- Know and implement applicable health and safety regulations.
- In a risk assessment, identify hazards arising from working conditions at the place of use.
- Create operating instructions for the operation of this machine.
- Regularly check whether the operating instructions correspond to the current status of the regulations.
- Clearly regulate and define responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- Train personnel at regular intervals and inform them about possible dangers.
- Refresh instruction at regular intervals.
- Keep records of the training received and make them available to the competent authority on request.
- Provide personnel with the necessary protective equipment.

4.6 Qualification of staff

This machine may only be put into operation and operated by trained personnel.

In the event of misuse, abuse or operation by untrained personnel, there is a danger to the health of the operators and/or third parties, as well as damage or total failure of the machine.

In addition, the following requirements apply to the operator:

- Physical and mental suitability.
- Minimum age 18 years.
- No influence on reactivity by drugs, alcohol or medication.
- Familiarity with the safety instructions in this operator's manual.
- Familiarity with the intended use of this machine.
- Instructed in the independent operation of the machine.

4.7 General safety instructions

The safety instructions in this chapter contain the "General safety instructions", which must be listed in the operator's manual in accordance with the applicable standards. It may contain instructions which are not relevant for this machine.

4.7.1 Workplace

- Before starting work, familiarize yourself with the working environment, e.g. load-bearing capacity of the floor or obstacles in the environment.
- Secure work area to public transport area.
- Necessary protection of walls and ceilings, e.g. in trenches.
- Keep unauthorized persons and children away when working with this machine. Distraction may result in loss of control of the machine, work must be carried out carefully.
- Always secure the machine against tipping, rolling, slipping and falling. Risk of injury!
- Keep work area tidy. Disorder or unlit work areas can lead to accidents.
- Observe the changing ground conditions, especially on uneven and soft ground or on slopes. Secure the machine against slipping!
- When working near pits, ditches or plateaus, exercise caution! The load-bearing capacity of the ground must safely carry the weight of the machine and the operator.

4.7.2 Personal safety

- Working under the influence of drugs, alcohol or medication can lead to serious injuries.
- Suitable protective equipment must be worn for all work. Personal protective equipment considerably reduces the risk of injury.
- Keep wide or loose clothing, protective gloves, jewellery and long hair away from moving machine parts. Danger of being drawn in!
- Always ensure that you are standing in a stable position, always stand with both feet on the ground.
- During prolonged work with this machine, long-term vibration-related damage cannot be ruled out completely. Vibration load, [see Technical Data on page 46](#).
- Ensure that there are no other persons in the danger zone!

Personal protective equipment



⚠ WARNING

Risk of hearing damage if the country-specific noise limit is exceeded!

Working with the machine without hearing protection can lead to hearing damage in the long-term.

- ▶ Wear ear protectors.
- ▶ Work attentively and cautiously when using hearing protection.

4.7.3 Handling and use

- Handle machines with care. Do not operate machines whose components or control elements are defective. Have defective components or control elements replaced immediately. Machines with defective components or control elements entail a high risk of injury!
- Do not lock, manipulate or alter the machine operating elements in an inadmissible manner.
- Secure unused machines against unauthorized putting into operation. The machine may only be operated by authorized personnel.
- Handle machine with care. Have defective parts replaced immediately before this machine is commissioned. Defective machines entail a high risk of injury.
- Use the machine, accessories, tools etc. in accordance with these instructions.
- After operation, store the machine in a locked, clean, frost-protected, and dry location that is inaccessible to other persons and children.

4

4.8 Specific rammer-related safety instructions

4.8.1 External influences



⚠ WARNING

Fire and explosion hazard!

The use of machines in potentially explosive environments or near open flames may result in an explosion or a fire.

- ▶ Do not operate the machine in a potentially explosive environment.
- ▶ Do not operate the machine in the vicinity of open flames.
- ▶ Do not operate the machine in oilfield environments - methane gas leaks from the ground.
- ▶ Do not operate the machine in dry, highly flammable vegetation.

4.8.2 Operational safety



⚠ CAUTION

Risk of collapse and spillage!

There is a risk of injury from falling or spilling when working on fracture, pit, dump and embankment edges, on trench edges and heels.

- ▶ Pay attention to side walls and their stability.
- ▶ Ensure stability.

- When operating the machine, make sure that no gas, water or electrical lines or pipes are damaged.
- Exercise the utmost degree of caution near abysses or slopes.
- Never let the machine run unattended.
- Keep work area clear and keep unauthorized persons away.
- Make sure that persons located in the work area maintain a minimum distance of 2 meters from the running machine.

4.8.2.1 Safety distances

Compaction work in the vicinity of buildings can lead to building damage. Therefore, any possible effects and vibrations on surrounding buildings must be checked in advance.

The relevant regulations and codes of practice for measuring, assessing and reducing vibration immissions must be observed, in particular DIN 4150-3.

The manufacturer shall not be liable for any damage to buildings.

4.8.3 Conduct

If this machine is operated for a longer period of time, vibration-induced circulatory disorders may occur in fingers, hands or wrists.

Symptoms:

- Numbness of the mentioned body parts, tingling, pain, stinging and changes in skin color.
- In the case of a personal predisposition to poor blood circulation, the working time can be reduced despite protective gloves and regular breaks from work.
- If these symptoms are detected, consult a doctor immediately.

4.9 Safety features

Safety features protect the operator of this machine from being exposed to the existing hazards. These are barriers (separating protective devices) or other technical measures that serve to avert or reduce hazards.



⚠ WARNING

Hot exhaust!

Contact may cause burns.

- ▶ Only operate the machine if the safety features are correctly fitted.
- ▶ Do not change or remove safety devices.



Burn protection 1 protects the operator from contact with hot surface.

4

4.10 Maintenance

- The machine must not be serviced, repaired, adjusted or cleaned when switched on.
- Observe maintenance intervals according to maintenance plan. Have work that is not listed performed by a service partner.
- Replace worn or damaged machine parts immediately. Only use spare parts from the manufacturer.
- Keep the machine clean.
- Replace any missing, damaged or illegible safety labels immediately. Safety and information labels contain important information for the protection of the operator.
- Carry out maintenance work in a clean and dry environment (e.g. workshop).

4.10.1 Service

- Only have the machine repaired or serviced by technically trained personnel.
- Only use original spare parts and accessories. The operational safety of the machine is thus maintained.

4.10.1.1 Threaded fittings

All threaded fittings must comply with the specified specifications and be firmly bolted together. Observe the tightening torques! Screws and nuts must not be damaged, bent or deformed.

Particular attention should be paid to the following:

- Self-locking nuts and micro-encapsulated screws must not be reused after loosening. The fastening effect is lost.
- Threaded fittings with adhesive protection/liquid adhesives (e.g. Loctite) must be cleaned after loosening and provided with new adhesive.

**Information**

Observe the instructions of the liquid adhesive manufacturer.

4.10.2 Vehicle fluids

- Always wear protective goggles and gloves when handling vehicle fluids. Seek medical advice immediately if, for example, hydraulic oil, fuel, oil or coolant gets into the eyes.
- Avoid direct skin contact with vehicle fluids. Wash skin immediately with soap and water.
- Do not eat or drink while working with vehicle fluids.
- Contaminated vehicle fluid (e.g. with dirt, water) can lead to premature wear or failure of the machine.
- Dispose of discharged or spilled vehicle fuel in accordance with applicable environmental regulations.
- If vehicle fluids leak from the machine, stop operating the machine and have it repaired immediately by a service partner.

4.10.3 Combustion engine



⚠ WARNING

Danger of poisoning!

Inhalation of exhaust fumes can lead to death in a few minutes. Exhaust gases contain carbon monoxide.

- ▶ Do not operate the machine in a closed area, e.g. a tunnel.
- ▶ Unless there is adequate ventilation through exhaust fans or hoses.

- Before starting work, check the engine for leaks and cracks in the fuel line, tank and filler cap.
- Do not start the defective motor. Replace damaged parts immediately.
- The preset engine speed must not be adjusted. This could lead to engine damage.
- Ensure that the exhaust system of the engine is free of flammable materials. Fire hazard!
- Before refueling, switch off the engine and let it cool down.
- Use the correct type of fuel. Observe the prescribed mixing ratios.
- Use clean filling aids for refueling. Do not spill fuel, wipe up spilled fuel immediately.
- Do not start the engine near spilled fuel. Explosion hazard!
- When operating in partially enclosed rooms, sufficient ventilation must be provided. Do not inhale exhaust gas. Danger of poisoning!
- The engine surface and exhaust system can become very hot after only a short time. Risk of burns!
- Do not use jump start sprays. These can cause misfiring and engine damage. Fire hazard!
- Smoking prohibited!

5 Description of the Machine

5.1 Type plates and labels

5.1.1 Type label

A type label is permanently attached to the machine.

Other type labels

Furthermore, the following components of the machine are provided with their own type label:

- the combustion engine

Symbols on the type label

Various symbols and markings for national and international approvals may be shown on the type label.

5.1.1.1 Labeling on the machine

Type label data

The type label contains information that uniquely identifies this machine. This information is required for ordering spare parts and for technical queries.

Enter the data on the machine in the following table:

Designation	Your details
Group - Type	
Material number (Mat. no.)	
Machine version (version)	
Machine number (machine no.)	
Year of construction	

5.1.2 Safety and information labels



⚠ WARNING

Injury hazard due to missing or damaged labels and signs!

Safety labels contain important information to protect the operator.

- Keep all safety, warning and operating instructions on the machine in a clearly legible condition.
- Replace missing or damaged labels and signs immediately.



Activate choke.



Danger of suffocation!

- Engines emit carbon monoxide.
- Do not operate the machine in closed rooms.
- No sparks, flames or burning objects are permitted near the machine.
- Stop the machine before filling up with fuel.

Warning!

- Wear ear protectors.
- Read the operator's manual.
- Start - Stop quick guide.
- For optimal control, performance and minimum hand and arm vibration, hold the guide bracket on the left and right.



Throttle lever positions

- Turtle = Idle / low engine speed.
- Rabbit = High / fast engine speed.

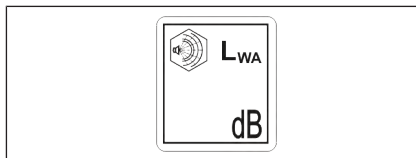


- Only use suitable and tested lifting gear and slings (safety hooks) with sufficient lifting capacity.
- Do not lift the machine with an excavator bucket or forklift truck on the central suspension.

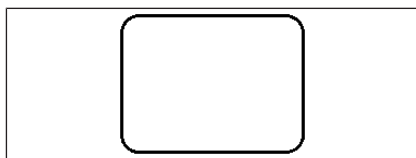


Warning!

Release the cover slowly so that the spring does not pop out.
Read the repair instructions.



Guaranteed sound power level.



Type label.

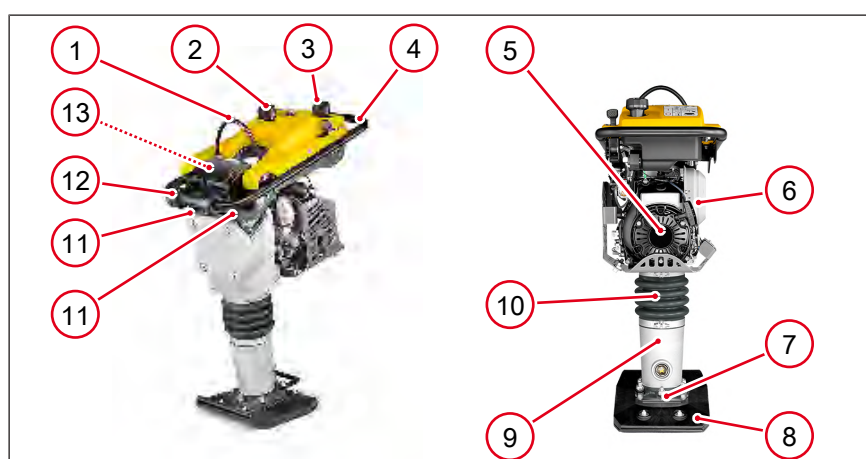


Warning of hot surface.



Display low oil protection.

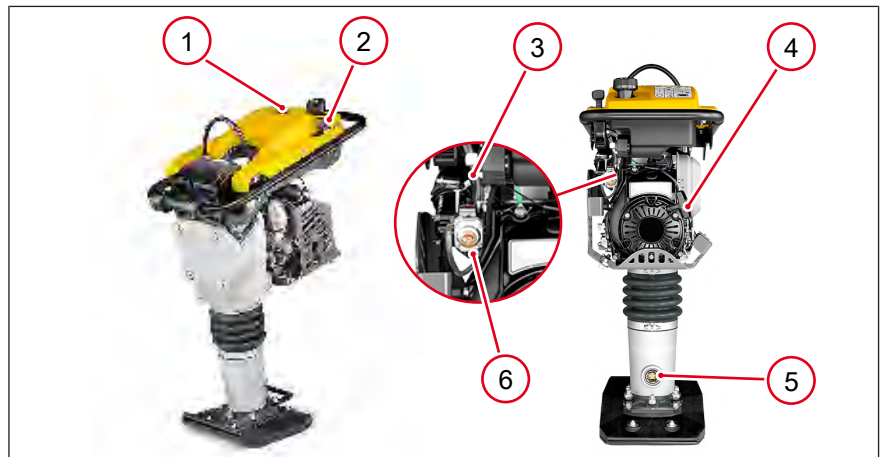
5.2 Components



- 1 Central suspension
- 2 Oil tank (optional)
- 3 Fuel tank
- 4 Guide bracket
- 5 Drive motor
- 6 Air filter
- 7 Spark plug
- 8 Base plate
- 9 Drive shaft
- 10 Drive pulley
- 11 Drive belt
- 12 Drive pulley
- 13 Drive belt

- 6 Exhaust
- 7 Handle
- 8 Ramming plate
- 9 Ramming system
- 10 Bellows
- 11 Rubber buffer
- 12 Transport roller
- 13 Air filter system

5.3 Control elements



- 1 Operating hour meter / speed display (optional)
- 2 Throttle lever
- 3 Choke lever
- 4 Starter handle
- 5 Oil sight glass
- 6 Purger

6 Transportation

6.1 Safety instructions for transport



⚠ WARNING

Fire hazard due to fuel!

Leaking fuel can catch fire and cause severe burns.

- ▶ Empty the fuel tank before transport.
- ▶ Lift the machine upright and transport it.

6.2 Prerequisites and preparations



Information

Fuel leakage!

During transport, fuel may escape through the pressure relief valve.

- ▶ Drain the fuel system before transport.
- ▶ Observe the dangerous goods regulations of the means of transport and the national safety guidelines.

- Switch off the engine and let it cool down.
- Drain fuel, [see Maintenance on page 32](#).
- Lean the machine upright against a solid object and secure against tipping over. The manufacturer recommends placing the machine on the transport trolley.

6.3 Lifting the machine



⚠ WARNING

Risk of crushing!

Crushing of hands and feet possible.

- ▶ Work cautiously.



NOTICE

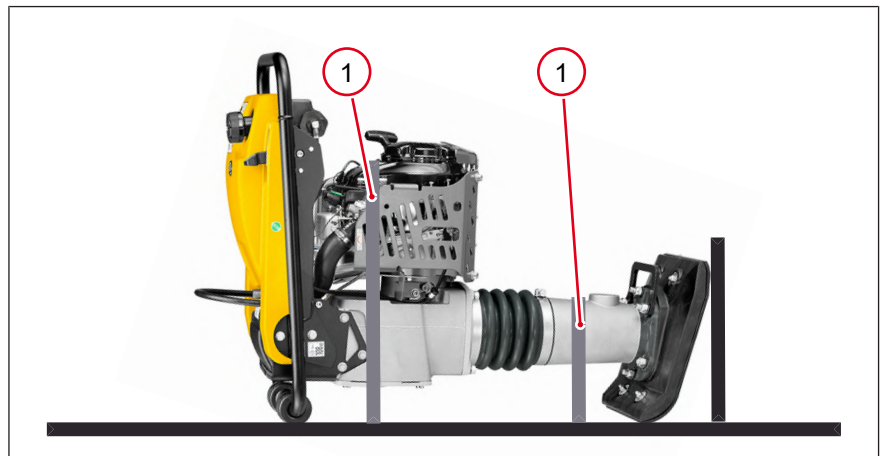
Note on the lifting procedure!

- ▶ Designate a competent instructor for a safe lifting procedure.



1. Attach suitable sling to central suspension **1**.
2. Load the machine into or onto the transport vehicle.
3. Transfer the machine to the front onto the transport roller **2**.

6.4 Lashing the machine



1. Lash the machine to the transport vehicle as shown.
2. Attach the tension belts **1** over the machine and tighten them.
⇒ The machine is secured against unrolling, slipping and tipping over.

7 Commissioning

7.1 Safety instructions for operation



⚠ WARNING

Tipping hazard!

Risk of serious injury from slipping or overturning machine.

- ▶ Ensure sufficient stability.
- ▶ Always secure the machine against tipping over.
- ▶ Park the machine on a level surface with firm ground.



⚠ WARNING

Risk of crushing!

Crushing of hands and feet possible.

- ▶ Work cautiously.



⚠ WARNING

Injuries caused by uncontrolled machine operation.

- ▶ Always hold the machine with both hands and take a firm stand.



⚠ CAUTION

Health hazard due to vibrations!

Physical impairments due to vibration.

- ▶ Take regular breaks.



⚠ CAUTION

Risk of injury and material damage due to recoil!

On firm, hard or unyielding floors, injuries and material damage may result from strong rebounds.

- ▶ Avoid hard or unyielding floors.



⚠ CAUTION

Risk of collapse and spillage!

There is a risk of injury from falling or spilling when working on fracture, pit, dump and embankment edges, on trench edges and heels.

- ▶ Pay attention to side walls and their stability.
- ▶ Ensure stability.



NOTICE

Information on operation at temperatures < 0°C!

The cold grease in the percussion mechanism can increase the resistance to such an extent that the centrifugal clutch slips.

- ▶ Warm up the machine at low speed (do not press the throttle grip), otherwise the centrifugal clutch will wear out within a very short time.

7.2 Tests before commissioning



Information

Further information and detailed descriptions, [see Maintenance on page 32](#).

Perform the following checks:

- Check machine and components for damage.
 - Do not put the damaged machine into operation. Damages and defects must be repaired immediately.
- Check fuel level.
- Check engine oil level.
- Check to ensure the screw connections are firmly seated.
- Check control elements for functionality.
- Check the air intake area for dirt.

7

7.3 Putting into operation



⚠ WARNING

Hot exhaust!

Contact may cause burns.

- ▶ Only operate the machine if the safety features are correctly fitted.
- ▶ Do not change or remove safety devices.



⚠ CAUTION

Risk of injury when starting!

Improper handling during starting can lead to minor injuries.

- ▶ Do not pull the starter cable until there is sufficient space and no persons in the immediate vicinity.



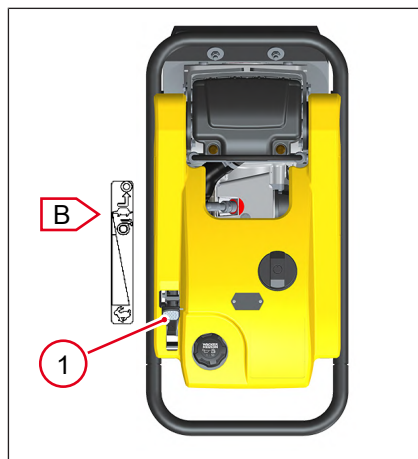
NOTICE

Improper handling can lead to damage to the machine.

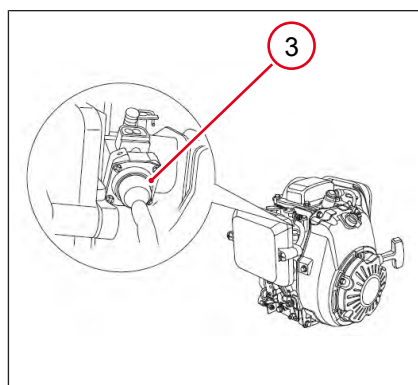
- ▶ Do not pull out the starter cable as far as it will go.
- ▶ Let the starter cable roll in slowly.

7.3.1 Starting the machine

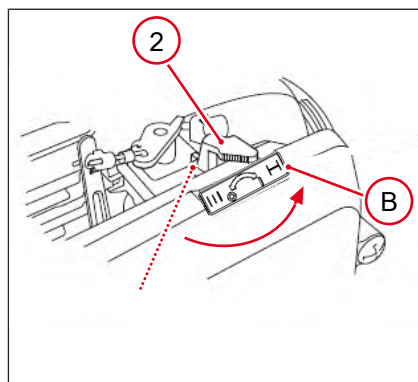
- ✓ The machine is on a level surface.



1. Move the throttle lever **1** to position **B**.
 ⇒ Fuel tap opens automatically.



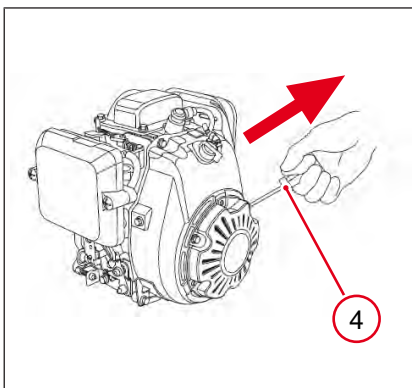
2. Press Purger **3** repeatedly until it is completely filled with fuel.



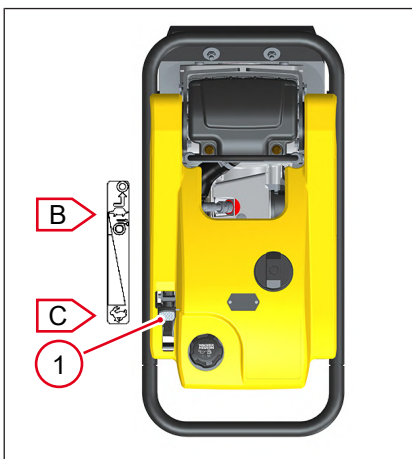
3. With cold engine, move choke lever **2** to position **B**.
 ⇒ Choke is activated.



4. Pull starter handle **4** of reversing starter lightly until resistance is felt.



5. Pull starter handle **4** firmly in the direction of the arrow.
6. Slowly move starter handle back.
⇒ Engine runs.



7. Move throttle lever **1** slightly above position **B**.
⇒ Choke jumps back automatically.
8. Allow engine to warm up briefly.
9. Move throttle lever to position **C**.
⇒ Vibration begins when moved forward.

8 Operation

8.1 Operating the machine



⚠ WARNING

Injuries caused by uncontrolled machine operation.

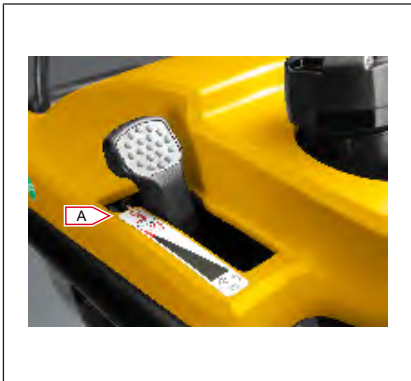
- ▶ Always hold the machine with both hands and take a firm stand.



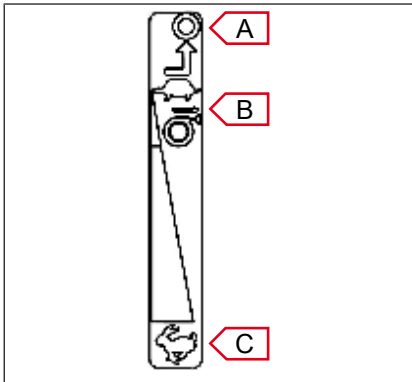
- The operator's designated location is behind the machine.
- Guide and steer the machine using the guide bracket.
- Let the machine move forward on its own. Do not use your muscles to push it forward or pull it back.
- For optimal control, performance and minimum hand and arm vibration, hold the guide bracket on the left and right.
- To avoid damage to the machine, do not move the machine when it is running.
- Exercise caution with rough material. To avoid extreme wear and tear to the ramming plate, ensure that it is always parallel to the ground being compacted.

8.1.1 Compacting material

1. Guide the machine with both hands at the guide bracket.
2. Operate the throttle lever until the desired speed is reached.
3. When the material has been compacted, move the throttle lever to position **A**.
⇒ The machine stops.
4. Lift and transfer the machine.



8.2 Select speed



Position A: Stop, machine stands still.

Position B: Idle, slow speed.

Position C: Full speed, fast speed.

8.3 Taking the machine out of operation



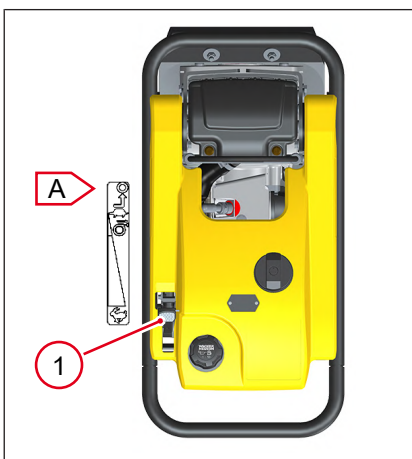
⚠ CAUTION

Danger of burns due to hot surfaces!

The machine, engine and exhaust can heat up quickly after a short time; that can lead to severe burns in case of contact with skin.

- ▶ Always allow the machine, engine and exhaust to cool down after use.
- ▶ Use heat-resistant protective gloves if the cooling phase cannot be maintained (e.g. due to an emergency).

8



✓ The machine is on a level surface.

1. Move the throttle lever **1** into position **A**.
⇒ Fuel tap closes automatically.
⇒ The machine stops.
2. Allow the machine to come to a complete stop.
3. Let the machine and engine to cool down.
⇒ The machine is out of operation.



9 Maintenance

9.1 Safety instructions for maintenance



⚠ WARNING

Improper handling may result in injury or serious material damage.

- ▶ Please read and follow all safety instructions in this operator's manual.



⚠ WARNING

Hazard of poisoning from exhaust fumes!

Exhaust fumes contain poisonous carbon monoxide, which can lead to unconsciousness or to death.

- ▶ Only perform maintenance work with the engine switched off and the machine decommissioned.



⚠ WARNING

Fire and explosion hazard due to fuel and fuel vapors!

Fuel and fuel vapors can ignite or catch fire and cause serious burns.

- ▶ Do not smoke.
- ▶ Do not refuel near open fire.
- ▶ Switch off the engine and allow it to cool before refueling.



⚠ WARNING

Risk of injury due to missing or non-functioning safety devices!

- ▶ Only operate the machine if the safety devices are correctly installed and functioning.
- ▶ Do not change or remove safety devices.



⚠ CAUTION

Health risk from fuel, lubricants and coolants!

- ▶ Do not inhale vapors.
- ▶ Avoid skin and eye contact.



NOTICE

Damage by penetrating water!

Penetrating water can damage electrical operating elements or machine components.

Penetrating moisture can lead to total failure.

- ▶ Do not clean the machine with high pressure or steam cleaners!
- ▶ Use a cloth to remove water that has entered (e.g. due to rain) the housing and then let the machine dry.
- ▶ Only use dry and clean cloths.



NOTICE

If the engine is operated without an air filter, there is a risk of faster engine wear!

- ▶ Do not operate the engine without an air filter or air filter cover.



Environment

Soil contamination due to oil leaking or overflowing.

- ▶ Line work surface with impermeable foil.
- ▶ Use collecting container for used oil.
- ▶ Dispose of used oil in an environmentally friendly manner in accordance with statutory regulations.

9.2 Maintenance plan

Activity	Daily	Weekly 25 h	Once a month 100 h	3 Monthly 300 h	Once a year
Clean the machine. Visual check for completeness. Visual check for damage.	•				
Clean the air filter. Change if necessary.	•				
Check oil level. Top up as required: • Ramming system	•				
Check oil level. Top up as required: • Four-stroke engine	•				
Check fuel lines and connections for cracks and leaks. Change if necessary.	•				
Check screw connections of the ramming plate. Retighten if necessary.		•			
Clean engine cooling fins.		•			
Clean spark plug and check gap.		•			

Activity	Daily	Weekly 25 h	Once a month 100 h	3 Monthly 300 h	Once a year
Oil change • Four-stroke engine			•		
Oil change • Ramming system				• ¹	
Check central suspension for wear, damage or misuse.				•	
Replace spark plug.					•
Clean fuel filter. Have replaced if necessary.*					•
¹ Change oil after first 50 hrs.					
* Have this work carried out by a service partner.					

9.3 Maintenance work

9.3.1 Carrying out preparations

1. Place the machine on a level surface.
2. Decommissioning the machine.
3. Let the machine cool down.

9.3.2 Cleaning the machine

1. Clean machine and components after each use.
2. The manufacturer recommends cleaning with compressed air.
3. Wipe the housing with a damp and clean cloth.
4. After cleaning, check cables and wires for damage.
5. Check screws and bolts to see if they are loose.
6. Remedy any deficiencies noted immediately.

9.3.3 Add fuel



1. Remove dirt.
2. Open filler cap **1** slowly.
⇒ Any excess pressure can thus slowly escape.
3. Refill fuel to maximum lower edge of filler neck.
⇒ Fuel specification, [see Technical Data on page 46](#).
⇒ Fuel mixing table, [see Technical Data on page 46](#).
4. Close filler cap tightly.

9.3.4 Emptying the fuel system

1. Remove dirt.
2. Open filler cap.
3. Pump fuel into a suitable container or tank, e.g. with a suction lift pump.
4. Close filler cap tightly.
5. Start the engine and let it run at idle until the fuel in the carburetor is used up and the engine stops.

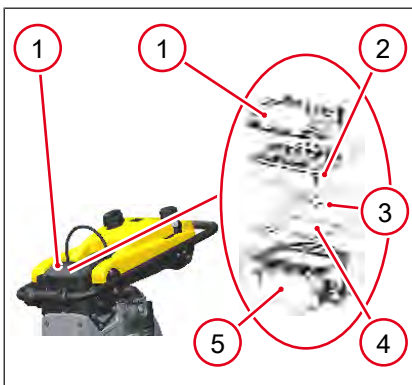
9.3.5 Cleaning and replacing the air filter



NOTICE

Possible engine damage!

- Do not allow dirt to enter the engine intake duct when cleaning.



1. Remove air filter lid **1**.
2. Remove air filter element **2** and separate filter elements.
⇒ Pre-filter **3** and foam filter insert **4**.
3. Check both air filter elements for cracks and holes, replace if damaged.

Cleaning the air filter insert

1. Knock out air filter insert on a hard surface.
2. Blow with compressed air from the inside through the filter insert.

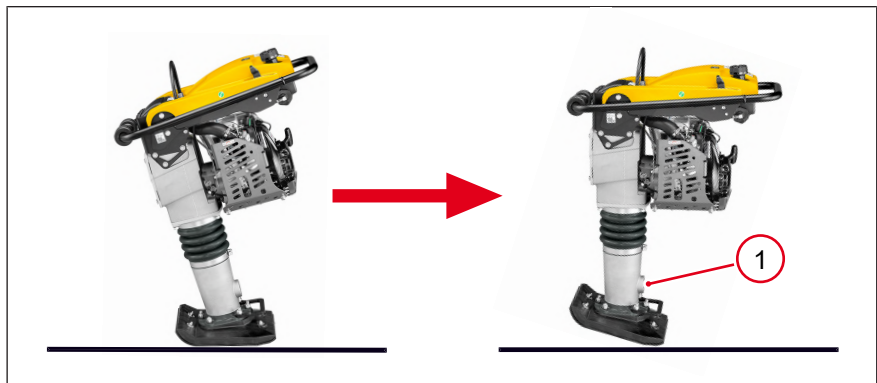
Cleaning the foam filter insert

1. Wash out foam filter insert in soapy water.
2. Rinse thoroughly with warm water.
3. Rinse with clean water.
4. Leave to dry.

Cleaning the filter housing

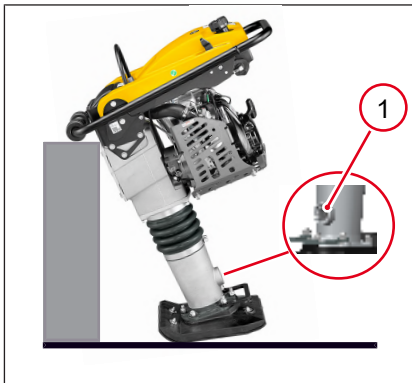
1. Wipe out filter housing **4** with a cloth.
2. Do not use compressed air!
3. Clean the dirt discharge slot of the prefilter.
4. Insert both filter elements into the filter housing.
5. Screw on air filter cover.

9.3.6 Checking and refilling the ramming system oil level



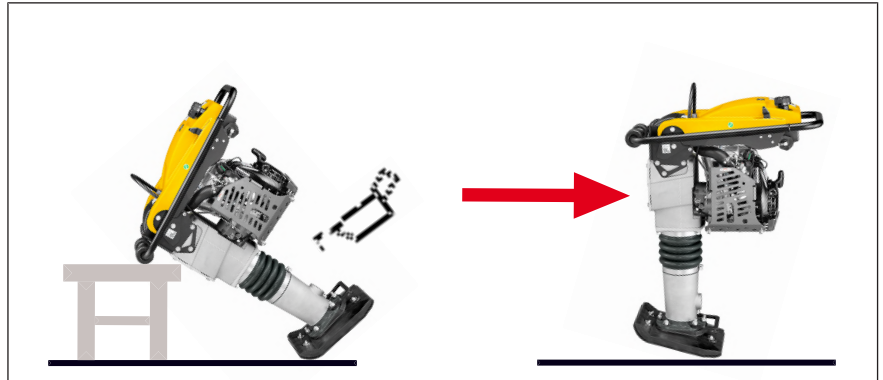
✓ Let machine stand in upright position for at least 15 minutes.

1. Remove dirt in the area of the oil sight glass 1.
2. Place the machine in a horizontal position.
3. Check the oil level by using the oil sight glass.
⇒ Oil level must be between $\frac{1}{2}$ and $\frac{3}{4}$.
4. If necessary, refill the oil, [see Technical data on page 46](#).



Refilling the oil level of the ramming system

1. Tilt the machine forward to access the oil sight glass 1.
2. Secure the machine in this position.
3. Unscrew the oil sight glass.
4. Clean the thread on the oil sight glass.



5. Pour oil into the housing through the opening in the oil sight glass.
6. Tighten the oil sight glass.
7. Place the machine in upright position to check the oil level.
8. If necessary, top up oil until the oil sight glass $\frac{1}{2}$ to $\frac{3}{4}$ is filled.
9. Tighten the oil sight glass again. Tightening torque 9 Nm.
10. Wipe the area of the oil sight glass with a clean cloth.

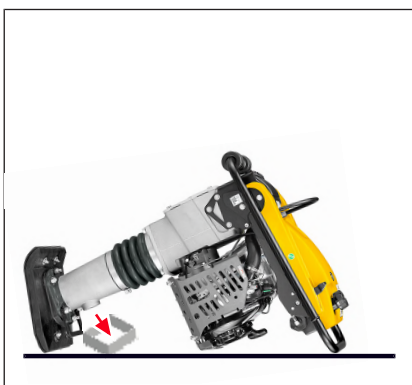
9.3.7 Changing oil



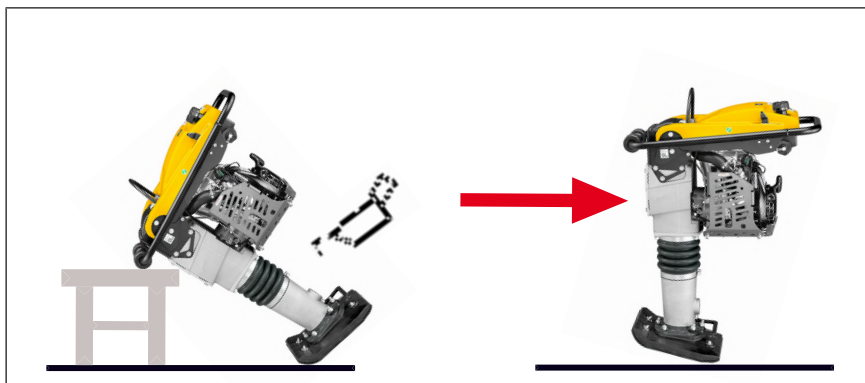
Environment

Soil contamination due to oil leaking or overflowing.

- ▶ Line work surface with impermeable foil.
- ▶ Use collecting container for used oil.
- ▶ Dispose of used oil in an environmentally friendly manner in accordance with statutory regulations.



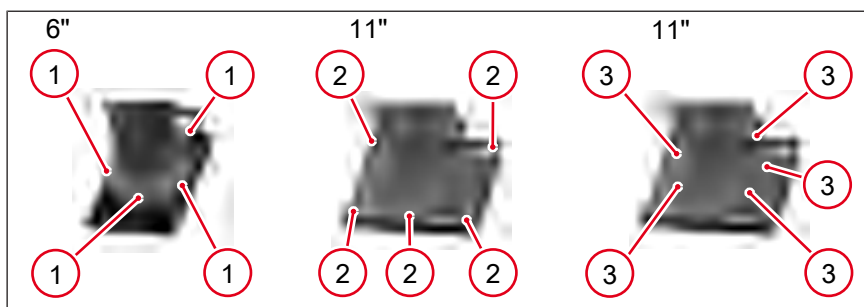
1. Remove dirt.
2. Provide a suitable container for draining the used oil.
3. Unscrew the oil sight glass.
4. Clean the thread on the oil sight glass.
5. Tilt the machine backwards until it is resting on the guide bracket.
6. Allow the used oil to drain completely.



7. Tilt the machine forward and secure it in this position.
8. Fill oil into the housing through the opening in the oil sight glass, [see Technical data on page 46](#).
9. Tighten the oil sight glass.
10. Place the machine in upright position to check the oil level.
11. If necessary, top up oil until the oil sight glass $\frac{1}{2}$ to $\frac{3}{4}$ is filled.
12. Tighten the oil sight glass again. Tightening torque 9 Nm.
13. Wipe the area of the oil sight glass with a clean cloth.

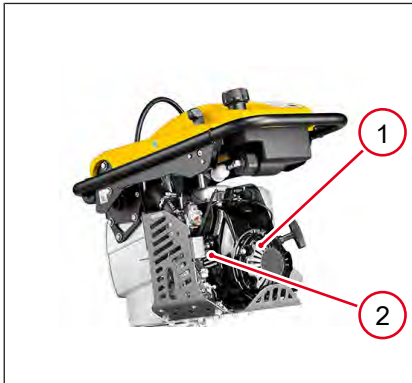
9.3.8 Check screw connections of the ramming plate

1. Check all screw connections for tightness at regular intervals.
2. Tighten loose screw connections.



	Tightening torque in Nm (ft-lbs.)
1	86 (63)
2	19 (14)
3	79 (58)

9.3.9 Cleaning the cooling fins



- Clean cooling fins on reversing starter **1** and on engine **2** with compressed air to remove dirt and residues.

9.3.10 Checking and changing the spark plug



⚠ CAUTION

Risk of burns!

Contact with hot spark plug can cause burns.

- ▶ Only unscrew the spark plug when the engine has cooled down.
- ▶ Use protective gloves.



NOTICE

Danger of engine damage!

An incorrect spark plug can cause engine damage, [see Technical Data on page 46](#).

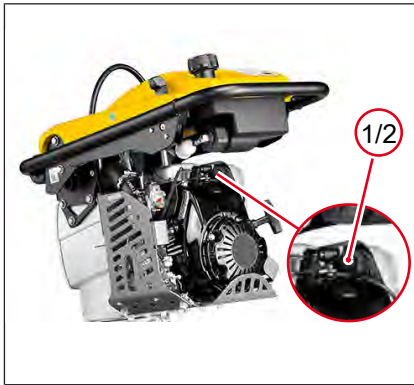
- ▶ Correct electrode spacing.
- ▶ Free of deposits.



NOTICE

- ▶ Do not pull the spark plug connector from the spark plug by the ignition cable.

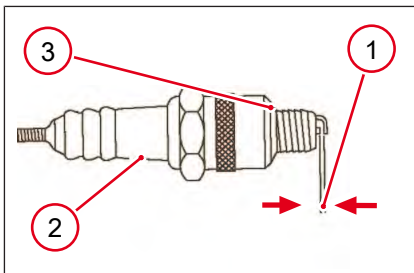
Remove spark plug



- ✓ The engine is switched off.
- ✓ The machine has cooled down.

1. Pull out spark plug connector **1**
2. Remove dirt in spark plug area **2**.
3. Unscrew spark plug and check.

Checking and cleaning the spark plug



1. Check the isolator **2**.
2. Replace if damaged or heavily soiled.
3. Clean the electrode with a wire brush.
4. Measure electrode spacing **1**, [see Technical Data on page 46](#)
 ⇒ Correct the distance between the electrodes by bending it.
5. Spark plug and electrode gap **1** Technical data.
6. Check spark plug sealing ring **3**.
7. Replace if damaged.

Install spark plug.



NOTICE

Hazard of engine damage!

Too loose or too tightly screwed in spark plug can lead to engine damage.

- Tighten the spark plugs to the prescribed tightening torque.

1. Tighten spark plug, tightening torque 22 Nm.
2. Plug the spark plug connector onto the spark plug.

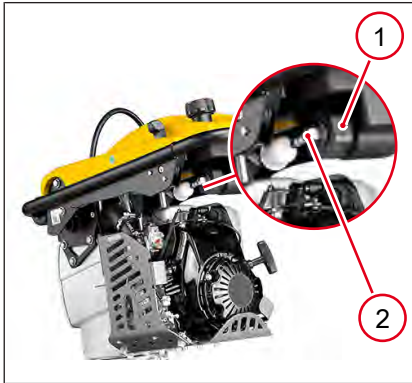
9.3.11 Cleaning and replacing the fuel filter



NOTICE

Connect fuel line correctly!

- To ensure a safe connection, cut off approx. 10 mm (3/8") from the end of the fuel line and connect to the fuel filter.



1. Disconnect fuel line **2** and remove from fuel filter.
2. Unscrew and remove fuel filter **1**.
3. Wipe visible debris and dirt particles from outside of fuel filter screen with a clean, dry, lint-free cloth.
4. Check fuel filter screen for cracks, damage and dirt particles, replace if damaged or soiled.
5. Reinstall the fuel filter.
6. Before restarting the machine, check fuel system for leaks.



10 Troubleshooting

10.1 Troubleshooting

Fault	Possible cause	Remedy
Engine does not start.	Fuel cock is closed.	Set throttle lever to idle.
	Choke lever is deactivated.	Set throttle lever to idle and activate choke.
	Purger not pressed.	Press purger repeatedly.
	Fuel tank is empty.	Refill with fuel.
	Fuel filter is soiled.	Change filter.
	Soiled air filter.	Clean filter, replace if necessary.
	Spark plug is defective.	Replace spark plug.
	Spark plug soiled or wet.	Clean spark plug, replace if necessary.
	The electrode gap of the spark plug is set incorrectly.	Adjust the electrode gap.
Engine runs, but machine does not ram.	Centrifugal clutch is defective.	Replace the centrifugal clutch.*
Idling speed too high or too low.	Idling speed adjusting screw incorrectly positioned.	Correct screw position.
Engine power too low.	The air filter is soiled.	Clean filter, replace if necessary.
	Fuel filter is soiled.	Change filter.
Machines with oil injection		
Engine starts and stops after approx. 30 seconds.	Not enough oil in oil tank.	Refill with oil.
	Cable connection on engine loose or slack.	Check connection and correct if necessary.
	Oil sensor in oil tank defective.	Replace oil sensor.*
* Have this work carried out by a service partner.		

11 Shutdown

11.1 Temporary decommissioning



Information

Further information and detailed descriptions, [see Maintenance on page 32](#).

Storage requirements

- Store dust-free and dry.
- Do not store outdoors.
- Protect from direct sunlight.
- Observe the storage temperature, [see Technical Data on page 46](#).
- Store in a locked place that is not accessible to children.

If the machine is stationary for more than 1 month, perform the following measures:

Entire machine	• Clean thoroughly. • Check for leaks, rectify any defects if necessary.
Fuel tank	Drain fuel completely.
Engine	• Check engine oil level, top up engine oil, if necessary. • Check and clean air filter. • Clean fuel filter.

If the machine is shut down for more than 6 months, contact a service partner.

11.2 Final shutdown

If the machine is no longer in use and is shut down for good, all operating fluids must be drained.

Have the machine professionally dismantled and disposed of by a state-approved recycling company.

Professional disposal of this machine avoids negative effects on human health and the environment, helps with the targeted treatment of pollutants and makes it possible to recycle valuable raw materials.

12 Accessories

12.1 Accessories



⚠ CAUTION

Risk of injury and possible machine damage!

Using non-original accessories or spare parts can lead to injuries or machine damage.

- ▶ Use only original parts.
- ▶ In case of disregard, no liability will be accepted.



⚠ CAUTION

Stability of the machine with wheel set!

Tipping over or rolling away of the machine can lead to injuries or material damage.

- ▶ Park the machine safely.
- ▶ Secure the wheel set against rolling away or fold it up.



Lockable oil tank cap

Lockable oil tank cap prevents misfueling.



Ramming plate

Ramming plates are available in different widths. This allows the working width of the machine to be increased or decreased.



Wheel set

For easier transport on the construction site.



Transport trolley

For easier transport on the construction site.

13 Technical Data

13.1 General instructions



Information

For system technical reasons, empty columns can be displayed in the technical data, and numbers and letters that written in superscript or subscript may be displayed incorrectly, e.g:

- ▶ Sound power level LWA instead of L_{WA}
- ▶ Sound pressure level LpA instead of L_{pA}
- ▶ Vibration total value ahv instead of a_{hv}
- ▶ Carbon dioxide CO₂ instead of CO₂
- ▶ Unit m/s2 instead of m/s^2

13.2 Noise and vibration data

The noise and vibration data listed have been determined in accordance with the following guidelines for the typical machine operating conditions / special test conditions and using harmonized standards:

- Machinery Directive 2006/42/EC
- Noise Emission Directive 2000/14/EC

During operational use, values may differ depending on the prevailing operating conditions.

Sound pressure level at operator station

- L_{pA} was determined according to EN ISO 11201 and EN 500-4.

Guaranteed sound power level

- L_{WA} was determined according to EN ISO 3744 and EN ISO -4.

Weighted vibration total value hand-arm vibration

- a_{hv} was determined according to EN ISO 20643 and EN 500-4.

13.3 BS

Type	BS65-4As 11in SAM	BS72-4As 11in SAM
Material number machine	5100061307	5100061309
Material number engine	5100058517	5100058517
Number of strokes [1/min]	656	656
Impact force [kN]	16	18
Forward travel [m/min]	7,1	8,8
Length [mm]	673	673
Width [mm]	343	343
Height [mm]	940	965
Length (Ramming shoe) [mm]	340	340

Type	BS65-4As 11in SAM	BS72-4As 11in SAM
Material number machine	5100061307	5100061309
Width (Ramming shoe) [mm]	280	280
Operating weight [kg]	65	72
Rated output [kW]	2,7	2,7
Rated speed [1/min]	4200	4200
Oil specifications (Ramming system)	SAE 10W-40	SAE 10W-40
Oil volume (Ramming system) [l]	0,7	0,9
Operating temperature range [°C]	-10 – +40	-10 – +40
Storage temperature range [°C]	-30 – +50	-30 – +50
Sound pressure level LpA [dB(A)]	93	92
Sound power level LWa measured [dB(A)]	105	105
Sound power level LWa guaranteed [dB(A)]	108	108
Vibration total value ahv [m/s ²]	11	9,5
Measurement uncertainty of the total vibration value ahv [m/s ²]	1,9	1
* The actual operating speed depends on numerous operating parameters and may differ from the rated speed.		

13.4 Combustion engine

Engine manufacturer	Honda
Material number engine	5100058517
Engine type	GXR 120
Combustion processes	four-stroke
Cooling	Air
Cylinder	1
Cubic capacity [cm ³]	121
Inclined position max. [°]	-
Fuel type	Gasoline
Fuel consumption [l/h]	1,0
Tank volume [l]	2,9
Oil specification	SAE 10W-40
Oil filling max. [l]	0,3
Output max. [kW]	-
RPM [1/min]	3600
Standard	SAE J1349
Exhaust-emission level	EU Stage V, US Stage 3, China Stage II
CO ₂ emission* [g/kWh]	674
Exhaust gas aftertreatment	-
Spark plug type	CR5HSB / U16FSR-UB
Electrode gap [mm]	0,6 - 0,7
* Determined value of the CO ₂ emission during engine certification without consideration of the applications on the machine.	



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Material Number: 5100061347
Language: [au]

Appendix I:

Waste Sorting Guide

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THE NORFOLK WAVE RECYCLING CENTRE HOUSEHOLD BIN GUIDE



FOOD & ORGANICS FOR COMPOSTING



THIS BIN MIGHT BE BEST
PLACED IN YOUR KITCHEN

GLASS PROCESSED INTO SAND



THIS BIN MIGHT BE BEST
PLACED OUTSIDE

RECYCLAPOD ANYTHING THAT CAN'T GO IN THE OTHER BINS



WILL BE HAND SORTED

THIS BIN MIGHT BE BEST
PLACED IN YOUR KITCHEN

HAZARDOUS HARMFUL ELEMENTS



THIS BIN MIGHT BE BEST PLACED
IN THE LAUNDRY

HAZARDOUS

NIRC HAZARDOUS WASTE AREA



SANITARY

UNPLEASANT FOR HAND SORTING



THIS BIN MIGHT BE BEST
PLACED IN YOUR BATHROOM

PLEASE REMOVE
ALL LIDS
& RINSE OFF
ORGANIC MATTER

Follow us on
'THE NORFOLK WAVE'



visit us here!
WWW.THENORFOLKWAVE.COM/RECYCLING-CENTRE
Contact us here!
PHONE - 24090
EMAIL - HELLO@REVOLVEYOURWORLD.ORG

Opening Hours

MONDAY - WEDNESDAY 7:00AM - 3:00PM
THURSDAY CLOSED
FRIDAY - SATURDAY 7:00AM - 3:00PM
SUNDAY CLOSED

NIRC
Opening Hours here...
CONTACT NUMBER - 22244

