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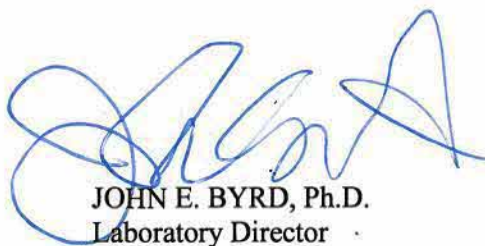
Date 16 January 2019

SUBJECT: Efficacy of DPAA Laboratory Casework

1. The purpose of this memo is to report that the SAR for CIL 2017-232 and CIL 2017-233 (submitted as a single SAR tracked under the number CIL 2017-232) written by (b)(6) and (b)(6) from DPAA external partner History Flight, presents results from casework that was not performed under DPAA Laboratory accreditation standards.

2. The casework does not meet DPAA Laboratory accreditation standards for the following reasons:

a. The casework cannot be verified to have been performed in accordance with the DPAA Laboratory Manual. Field documentation required for analytical peer review was only partially submitted. For some periods of activity, field documentation was submitted only in digital versions (no originals) while for other periods, no field documentation was submitted at all. History Flight provided only partial photo-documentation of their activities (i.e. scientific activities were reported but no photo-documentation was submitted to the Lab for verification). Finally, field mapping was lacking critical information, to include (but not limited to) the spatial data and provenience of evidence (including possible human remains) allegedly recovered during these activities and subsequently turned over to the DPAA. Because of these instances of non-compliance, the accuracy of their analytical work cannot be evaluated and verified. The DPAA-Lab requested these documents from History Flight and provided ample time for them to comply. History Flight subsequently indicated that these documents would not be provided. As such, the DPAA-Lab has adjudicated this SAR as unable to complete the DPAA-Lab's quality assurance process.


JOHN E. BYRD, Ph.D.
Laboratory Director

Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R, Excavation of Site Cemetery 33, Betio Island, Tarawa Atoll, Republic of Kiribati, 4 January–22 December 2017

History Flight, Inc.

7 January 2019

INTRODUCTION

Between January and December 2017, over the course of several field activities, History Flight, Inc. conducted excavations within the project area designated Cemetery 33 on the island of Betio, Tarawa Atoll, in the Republic of Kiribati (Figures 1 and 2). History Flight Recovery Teams (HFRTs) cleared to the soil surface and excavated a combined area of approximately 932.5 m² within the defined project area, and screened all vegetation, surface debris, and sub-surface matrix removed using 1/4-inch wire mesh. All areas were excavated to culturally sterile conditions. Archaeological units were excavated to a maximum depth of 250 centimeters below ground surface (cmbs), with the majority of excavation units reaching a depth of approximately 140 cmbs.

The HFRTs recovered both possible human remains (PHR) and possible material evidence (PME). The final Recovery Leader/Anthropologist (RL/A) suspended all remaining open excavation units within the Cemetery 33 project area at 0900 hours on 13 December 2017. All recovered remains and material evidence were curated and secured at the History Flight field laboratory located on Betio Island, Tarawa Atoll, in the Republic of Kiribati. Following a December 2017 DPAA Forensic Field Review, the remains and associated material evidence recovered from the Marine Burial Trench were assigned the DPAA designator: CIL 2017-232, and the remains and associated material evidence recovered from the individual burials were assigned the DPAA designator: CIL 2017-233.

BACKGROUND

Between 20–23 November 1943, U.S. Navy, U.S. Army Air Forces, and U.S. Marine Corps forces battled the Japanese Imperial Navy Forces for control of Betio Island, Tarawa Atoll, in what is now the Republic of Kiribati. This battle, and subsequent U.S. Army, Navy, and Marine Corps operations within the U.S.-occupied territory resulted in more than 1400 U.S. casualties, and over 4000 Japanese military and Korean laborer casualties. Several thousand Japanese and their Korean laborers, and an estimated more than 500 U.S. personnel remain unaccounted for on the island of Betio as a result of these hostilities (Figure 3). The U.S. servicemen killed in action were initially buried in both mass casualty trenches as well as in isolated individual burials, and the exact locations of these were lost due to poor record keeping, hasty construction, and changes in the landscape over time.

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Beginning in January 2017, History Flight, Inc. personnel intensified their long-term research, survey, and test excavation in the vicinity of the historic Cemetery 33. History Flight, Inc. conducted this work as a self-funded search and recovery operation, and this effort resulted in the identification of a portion of the historic Cemetery 33 location. History Flight Recovery Teams discovered and scientifically recovered remains from both disturbed and undisturbed archaeological contexts in direct association with possible U.S. material evidence. Following a joint History Flight, Inc.–Defense POW/MIA Accounting Agency (DPAA) collaboration at another location on Betio Island, DPAA modified the contract to support the History Flight, Inc. work in progress at the Cemetery 33 project area, having an effective date of 19 July 2017 and an end date of 22 December 2017.

RECOVERY SCENE LOCATION

The recovery scene is located in what is now the Republic of Kiribati, Tarawa Atoll, at a central location on Betio Island (Figure 4). The project area lies on the south side of what was the U.S. Hawkins Airfield during the war, and what is now immediately south of the southern leg of the “Ring Road” (which is nearly identical to the old border of the airfield) (Figure 5). By local landmarks, the Cemetery 33 project area is more specifically described as located across the road (south side) and slightly west of the Millennium Catholic Church, and south of the first residence fronting the road (Figure 6).

There are no surviving landmarks which would pinpoint the precise boundaries of Cemetery 33—either the initial mass-burial trenches, or the later added individual burials. Nor are there surface indicators of the subsequent “beautified” Cemetery 33, built after the U.S. occupation was well under way, as more of a memorial to those believed buried in the vicinity. Because of this, exploratory surface survey, sub-surface remote sensing, and many test excavations have been conducted by HFRTs in the vicinity for several years. One result of this work is the previously established project area sub-datum point, designated N100/E100, and defined as the southwest corner of the second residence south of the Ring Road, on the east side of Alley A (Figure 7). This site sub-datum is located at the MGRS grid coordinates: 59N QB 15359/49893 (+/- 3 m EPE), determined by a Garmin GPS Map 64st receiver, using the WGS-84 mapping datum, tracking 18 satellites. The geographic coordinates are North 1 degree, 21.321 minutes/East 172 degrees, 55.133 minutes.

DESCRIPTION OF RECOVERY SCENE

The recovery scene is located within a residential area which has been established over a portion of the former Cemetery 33 and surrounding environment. The project area considered by this report encompasses the northern portion of what is commonly referred to as “Alley A,” for a distance from the Ring Road of approximately 47 meters, and most of the land immediately east for a distance of approximately 42 meters. The project area defined here is bounded on the north by the Ring Road, and on the south, east, and west by residential neighborhoods. These residential lands are densely populated and include homes, outdoor kitchen areas, small gardens, pig pens, chicken roosts, hand-dug fresh water wells, sub-surface fresh water pipes, saltwater wastewater pipes, and numerous

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undocumented sub-surface power lines.

There are three solid-block construction housing units within the project area, and the landscape is flat and level, with numerous mature trees, including coconut palms and breadfruit trees, and many planted “decorative” smaller trees and bushes (Figure 8). The local residents have a tradition of burying their trash in the immediate vicinity of their homes, and because of this, the upper approximately 0-100 cmbs layer of coral sand/soil is heavily disturbed.

FIELD METHODS

In order to conduct field operations with this region of Betio Island, History Flight Inc. obtained all required governmental and individual permits and permissions necessary. The excavation in the Cemetery 33 vicinity during this project period expanded on previous HFRTs’ exploratory and recovery work and site sub-datum reference point that had already been established. Excavation units were normally designated with the southwest corner of the unit. A baseline was extended directly south from the reference sub-datum and an archaeological grid system was constructed using a SOKKIA optical transit and double right-angle optical prism. The grid system was expanded as the work progressed (Figure 9). Because there is a lot of human activity in the area, and the local population would sometimes remove boundary markers, the Recovery Leader/Anthropologist (RL/A) placed several grid reference points in the ground (fiberglass stakes) beyond the work in progress. The goal of the excavation activity described in this report was to excavate as much continuous area within the greater project area as possible to culturally sterile soil conditions (block excavation). The excavation activity sometimes included employing test excavations (*viz.*, trench excavation) to locate potential evidence locations and areas requiring broader excavation and recovery. When possible, block excavation would then be employed to complete areas suspected of possibly containing additional evidence.

Those units where archaeological evidence was found to be subjected to the effects of ground water required additional methodological procedures. In these types of units, most of the skeletal remains and material evidence went through two wet/drying cycles every day while buried, as they were just at or below the current water table. As the tide cycled throughout the day, that put hydrostatic pressure on the fresh water lens on the island, forcing it to raise and lower with the tide. In this way, water covered and drained from the burials twice every day. To enable excavation and recovery of these materials, the HFRT would have to use a sump pump to continually pump out water from a corner of an excavation unit while conducting recovery work.

Excavation proceeded using standard archaeological methods using hand picks, hand shovels, hand trowels, whisk brooms, and dust pans. Where deemed appropriate (helping to remove tree stumps, and backfilling completed excavation areas), a mechanical excavator was also used (Figure 10). Where more fragile remains and artifacts were encountered *in situ*, wood probes and fine brushes were used to expose and remove the evidence. The RL/A, who rotated every several weeks per History Flight Inc. standard protocols, monitored the removal of soils from each unit and directed excavation based on soil stratigraphy and content of a team comprised of History flight Inc. personnel, volunteers, and local laborers. RL/A’s during these periods were (b)(6) (b)(6) and (b)(6) All excavation units were excavated to

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culturally sterile soil. A metal detector survey was used to help determine the excavation depth needed to reach incident-sterile soil conditions, as bomb and shell fragments, and ferrous-metal containing “battle detritus” often reached depths below the trash pit level (Figure 11).

A constant concern while conducting search and recovery operations on the island of Betio was the possibility of encountering unexploded ordnance (UXO) during excavations. History Flight Inc. made a contingency plan with the Betio Police UXO Disposal Unit for any UXO encountered during excavations. An initial UXO survey was conducted by HFRT personnel of the project area using surface metal detection surveys. However, due to the extent of the disturbance of the soils by intentional trash pits, the surface metal detection was of extremely limited help. Therefore, UXO was almost exclusively discovered during excavation operations, and was handled following DPAA’s Standard Operating Procedure. When UXO was suspected or found during excavation, all operations ceased and personnel were evacuated from the immediate area until the Explosive Ordnance Disposal (EOD) technician could determine it safe to return to work. The discovery of UXO hand grenades fused to human remains occurred in several instances, and had to be segregated by the UXO technician before removing the human remains for transfer to the laboratory.

Soil was screened near the excavation unit in progress primarily using two-person handheld screens. When possible, a screening station was constructed near an excavation unit allowing one person to operate a single screen. All soils, both manually and mechanically removed, were passed through standard 1/4-inch wire mesh screens in order to recover all evidentiary material at the scene (Figure 12). Screened soils were stored in a back-dirt pile close to the excavation unit in progress. Excavation units were backfilled with soil from this pile promptly after unit closing, either manually with shovels or mechanically using an excavator (see Figure 10). After backfilling, the soils were compacted using a combination of water and a mechanical compactor (see Figure 7).

All evidence recovered was identified by unit designation and date, and retained in the custody of the RL/A. Throughout the workday, the RL/A would periodically clean and sort all material removed from the excavation and then check, bag, and record any material of interest recovered from the screens and photo-document the excavation progress. At the end of the workday, all evidentiary material would be transported by the RL/A to the History Flight, Inc. field laboratory, where it was further documented and securely stored. Decision making for the field strategy was coordinated through a unified History Flight team effort which included the (b)(6) (b)(6) as Senior Archaeologist (Scientific Recovery Expert), (b)(6) as Senior Recovery Leader/Anthropologist, (b)(6) as Historian, and (b)(6) as Remote Sensing Expert. Due to contractual hiatuses, rotation schedules for senior archaeological personnel (SRE) were not on a regular basis.

ARCHAEOLOGICAL FINDINGS

The natural soil stratigraphy within this project area is fairly consistent where undisturbed and is composed of numerous layers of loose sand and crushed coral laid down over a long period of time by wind and water action. However, as elsewhere on the island of Betio, most excavated units had some evidence of modern intrusive disturbance due to the local residents digging trash pits. Typically, these trash pits did not exceed 100 cmbs in depth (typically, about 75 cmbs), but they did

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show evidence of being secondary or tertiary disturbances of some recovered remains and associated material evidence. In addition, there were isolated areas of soil disturbance due to root infiltration (mostly near current live trees), fresh water pipes, salt water wastewater pipes, and buried electrical cables (Figure 13).

However, more subtle disturbances to the natural soil stratigraphy in this project area were observed as historic and archaeologic intrusions and backfill. As the matrix is mostly a sandy deposit, care, experience, and some degree of skill was required to recognize, expose, and read these. For example, in unit N90.7-104/E100-108 the soil profile shows several distinct strata (Figure 14). Soil Unit 3 (SU3) is described as the undisturbed naturally laid-down coral sand (bottom of soil unit not reached). Soil Unit 2b (SU2b) is the eastern limit of the original burial trench in which the recovered U.S. Marines killed in action (KIA) were laid to rest. This burial trench was likely originally excavated by a powered bulldozer or front-end loader. Soil Unit 2b represents the very end of the trench excavation which collapsed in on itself at the time of original excavation due to the soft sand conditions. Soil Unit 2a (SU2a) is the actual Marine Burial Trench which was open, and used to place the remains of the KIA Marines. This layer also includes the soils used to cover the remains of these Marines—the backfill. As this was accomplished relatively quickly, it is the same soil excavated from the trench. Sometime following this burial, decomposition, deflation, and natural compaction of the looser backfill caused a secondary depression. And, sometime following this as this area was later being developed, Soil Unit 1b (SU1b) was brought in from another location (much higher in organic content) to fill the depression and level the surface at this particular location. Ultimately, Soil Unit 1a (SU1a) filled in over the entire Cemetery 33 project area as an occupational strata due to the development of the area for residential housing. The Kiribati Housing Authority government-built solid block houses are on this surface. Soil Unit 4 (SU4) is an admixed conglomerate of all soil strata—backfill of an earlier, but recent, archaeological test trench. As the entire excavation unit N90.7-94/E100-108 was exposed to approximately 100 cmbs, the northern boundary of the Marine Burial Trench became clear, even before remains were exposed. This is the eastern end of what History Flight Inc. commonly refers to as “Cemetery 33 Burial, Row C” (Figure 15).

The only real exception to the soil stratigraphy discussed above involved the addition of a very hard, machine-compacted crushed coral layer laid down over the alleyway (“Alley A”) between the housing clusters in this area within the last two years. With the introduction to the island of more and more automobiles in recent years, the relatively unimproved alleyways became eroded and rutted, leaving large areas prone to flooding from rainfall, and subsequently contaminating fresh-water wells and leaving areas of stagnant water for mosquito larva. In 2015 and 2016, the government of Kiribati commissioned improvements, including building up a compacted layer of crushed coral over some of these avenues and poured concrete road bed over others. In the Cemetery 33 project area, Alley A is covered with an approximately 10-20 cm thick layer of this compacted crushed coral. The stratigraphy along Alley A within approximately 17 meters of the Ring Road (north) includes a top layer of this compressed crushed coral followed by a darker tar like layer, together reaching an average depth of approximately 50 cmbs. Excavation in these areas required the use of a large hand pick or mattock or a powered jackhammer to remove these recent strata (Figure 16).

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Throughout the entire project area, with the exception of one isolated location, the water table was encountered at approximately 120 cmbs, and in the majority of locations excavation was carried through to between 130-140 cmbs to ensure that incident-sterile soil and intrusion free conditions were met. The exception to this was excavation unit N113-115.5/E122-125, where an impermeable layer was encountered deeper, likely due to extreme heat and pressure compacting and fusing the sand matrix (possibly due to a bomb or artillery shell and fire). This unit was excavated to approximately 170 cmbs. In most cases where the water table level was apparently above the levels of archeological evidence, the protocols of pumping were employed as explained in the methodology section.

A detailed discussion of the significant archaeological findings from the greater project area are divided into contracted and non-contracted periods: Project 1, field activities conducted during a period of History Flight, Inc. self-funded operations; and Project 2, field activities conducted during the History Flight, Inc.–DPAA contract period of operations.

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Project 1: History Flight, Inc. Self-Funded Excavation Activities**

Beginning in early January 2017, a HFRT began exploratory excavations in the Cemetery 33 project area. This work was a continuation of excavations previously done by History Flight, Inc. where scattered and fragmentary remains of U.S. Marines were recovered from three distinct burial trench features in the vicinity, on the west side of Alley A. These mass burial features have been previously referred to as Cemetery 33, Row A, Row B, and Row C. Excavations of these features yielded partial remains and associated material evidence which were badly disturbed by the recovery efforts of the U.S. AGRS after the war. However, it was suspected that these recovery efforts were not complete, and both the partial as well as possibly complete remains of more individuals may have been left behind in the vicinity (Figures 17-19).

The HFRT exploratory excavations were completed in the areas of what are now the concrete pad behind (east) Residence #2 (N100-107/E107-113), and an area described as N94-99/E100.5-113. These excavations met with negative or undetermined results. The team then moved to excavate a test trench located at N90-91/E107.5-113 in increments, working towards the east (Figure 20). This test trench passed over a burial feature containing what was later recognized as Cemetery 33, History Flight Individual Burial #9, and as the excavation progressed east the team discovered some isolated, disarticulated partial human remains—what later became recognized as a portion of the north-south oriented Cemetery 33, Individual Burial #4 (Figure 21). The exploratory trench excavations continued east until encountering a recognized north-south oriented burial feature located at approximately N91-93/E113-114, at a depth of between approximately 110-120 cmbs. This feature contained both osseous remains and associated material evidence—to include badly degraded portions of a wooden coffin. These are the remains and associated material evidence designated Cemetery 33 Individual Burial #1 (Figure 22). Historic photographs depict U.S. military burials occurring after the Battle of Tarawa, including individuals buried in wooden coffins (Figure 23).

The HFRT recognized that the Individual Burial #1 wooden coffin was placed within a larger burial feature, with the soil disturbance extending into the south wall of the excavation. The team excavated further, following what turned out to be a trench containing a total of three individual burial coffins and their respective human remains, oriented in a north-south direction. The HFRT excavated an area including N86-94/E113-115. The two additional features were designated Cemetery 33 Individual Burial #2 and Cemetery 33 Individual Burial #3 (Figures 24-27).

Another HFRT continued the recovery efforts following the movement of the outside kitchen area to the south so that work could be expanded behind (east) the residence. This HFRT began by opening an excavation area encompassing N86-90/E106-113 (Figure 26). Faint soil staining defining additional burial features could be detected with careful excavation at approximately 80 cmbs. At this depth, a faint outline of the original burial excavation could be seen, and a darker stain of a burial coffin could be observed by skimming the soil very carefully with hand tools (Figure 27). As recovery operations continued, it became clear that there was a cluster of at least four individual burials in this vicinity. The features here included those for Cemetery 33 Individual Burials #5-#8. The entire 5-x-5-meter area was excavated as a unit, layer by layer (Figure 28). All four burial features were aligned nearly identically, oriented roughly north-south, and all were resting at approximately the same depth; between 120-130 cmbs. In addition, the burials lay in two excavation

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features, or burial trenches, also running north-south and aligned with the trench feature for Individual Burial coffins #1-#3. These observations led to the possibility that all of these individuals may have been interred at the same time, or, if subsequently disturbed, all reburied at the same time. As work progressed it became clear that these two trench features extended north, and the recovery of additional individual burials in the vicinity was possible (Figures 29-34).

As the HFRTs had to excavate an unstable media (sand), shoring of the walls had to be implemented to protect from wall collapse. Due to these conditions, several individual burial features required excavation in sections, as they spanned more than one excavation unit. Both Cemetery 33 Individual Burials #5 and #8 were recovered in this way, the southern majority recovered in the excavation of unit N85-90/E108-113 and the northern portions recovered with a one-meter expansion to the north. Due to the water-saturated conditions, Cemetery 33 Individual Burials #6 and #7 were removed as a block each, exposing the surrounding matrix below the level of the burial coffins, and then sliding a large metal sheet under to lift out the matrix and remains together for separation and cleaning in the History Flight laboratory. However, this did not produce an improved recovery, and the practice was abandoned.

As excavation operations expanded to include the northern portions of Cemetery 33 Individual Burials #6 and #8, evidence of another burial was discovered, designated Cemetery 33 Individual Burial #9. A darker soil stain consistent with those burial features previously described lay immediately north of Individual Burial #5, aligned similarly, and in the same burial trench feature. Also, it became clear that the original east-west exploratory recovery trench cut through this feature. In addition, as the remains now designated Cemetery 33 Individual Burial #4 were originally recovered to the east during the exploratory trench excavation, and a burial feature was not observed at that time, the HFRT expanded the entire excavation unit to N85-92/E108-113, to include overlapping the previous excavation activities (Figure 35). This recovery work showed that the original exploratory trench had not reached the same depth of the remains of Cemetery 33 Individual Burial #9. Cemetery 33 Individual Burial #4 turned out to be a severely disturbed burial. Subsequent to this individual being buried (or reburied, if subjected to AGRS activity), local habitation activity included excavation of a fresh-water well completely obliterating the southern portion of this burial. It likely also obscured much of the soil staining of the feature above the level of the remains. Regardless, block excavation of the entire area was the best way to ensure no remains or associated material evidence would be missed (Figures 36-37).

After unit N85-92/E108-113 was completed to sterile soil conditions, backfilling of the unit began, and at the same time a new excavation unit was opened to excavate the area between the completed work and Alley A to the west, along the north side of Residence #3 (Figures 38-39). The HFRT demolished and removed an old, no-longer used concrete former septic tank area now used as a planter and began excavations of unit N90.7-94/E100-108 in 20 cmbs arbitrary levels (Figures 40-41). The former planter was filled with a combination of sand and modern trash. All contents were removed and screened. This structure was lined with reinforced concrete, and a jackhammer and rotary metal-cutter had to be used to breakup and remove the walls and floor. The south wall of this structure was left in place, to act as shoring to retain the sand base supporting the residence foundation. Figure 42 shows excavation of unit N90.7-94/E100-108 to a depth of 60 cmbs, just below the reinforced concrete floor of the planter. At this level, suspicious intrusive soil staining patterns emerged, and excavation continued to further define these soil features.

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Between 60-80 cmbs, the soil disturbances became distinct, with well-defined edges and observed in wall profiles (Figure 43). At 80 cmbs, several features were defined. In Figure 43, the gold line defines several previous overlapping HFRT excavations, the red line defines what is believed to be a continuation of Cemetery 33, Row C, and the white line defines some highly organic soils imported as fill. Excavation continued to 95 cmbs, and only the suspected burial trench feature and the previous HFRT excavation features remained (Figure 44). At this point, the RL/A halted further excavation and decided the reinforced concrete cistern needed to be demolished and removed, as the suspected burial trench feature continued beneath it. Like the planter, the cistern was also filled with a combination of sand and modern trash, and all material was removed and screened. With the cistern removed, the entire floor of unit N90.7-94/E100-108 was excavated to a depth of 100 cmbs (Figure 45). At this level, it was known that the soil disturbances to the north within this unit were previous HFRT excavations, and the darker feature along the southern length of this excavation unit was suspected to be a continuation of the Cemetery 33, Row C, as it was aligned well with Row C portions excavated previously on the west side of Alley A.

As excavations continued, portions of two badly corroded U.S. helmets were exposed within the trench feature, immediately west of the E102 line, as the unit was being swept at 100 cmbs (Figure 46). At this point, the decision was made to very carefully hand-trowel excavate the trench feature, starting at the western end (Figure 47). It was soon discovered that these U.S. helmets were still protecting the crania of buried individuals, that the remains were still wrapped in U.S. poncho material, and that these individuals were positioned side by side. A total of three U.S. helmets covering poncho-wrapped crania, and one poncho-wrapped cranium without the protection of a helmet were exposed (Figure 48). Eventually, these would be determined to be Individuals #5-#8 of a total of twelve individuals recovered from this burial trench.

When excavation of the Cemetery 33 project area reached this stage, it became clear that this burial trench likely contained the remains of U.S. personnel, probably U.S. Marines, and that these remains were likely not disturbed by the AGRS recovery operations following the war. Furthermore, based on the soil stratigraphy and the angle of the trench and remains relative to the building structures above them, there were possibly more remains buried under the foundation of Residence #3 (Figure 49). Also, the stability of the remainder of the planter concrete wall was in question, and if this failed (or was removed) the stability of the northern portion of the residence foundation would also become compromised, jeopardizing the safety of the remains in this trench. Therefore, History Flight, Inc. decided that Residence #3 had to be demolished and removed.

History Flight, Inc. entered into negotiations with the Kiribati Housing Authority for the removal of the residence and the resettlement of the occupants. The HFRT stabilized the site with careful backfilling of this entire excavation unit. First, a ring of coral rock and concrete fragments were placed around the exposed feature at 120 cmbs. Then a layer of sand was carefully placed over the remains and buried with rock and concrete. A piece of blue tarp was placed on top of this, to provide a depth indicator for future recovery efforts following the removal of the residence. More sand was laid over this, with a cap of cement to deter anyone who may want to disturb the remains. Finally, another piece of blue tarp was laid on the dried cement, and the entire excavation area was covered with sand to the original occupation surface level (Figure 50).

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Residence #3 was demolished by History Flight, Inc., with private monies, to allow access to the archaeological evidence of further burials below the structure (Figure 51). Once the structure had been safely demolished and debris removed, the excavation of this area was completed. Following the completion of the excavations in December 2017 a new residence was constructed on the lot and provided to the family (Figure 52).

On May 16 2017 a new HFRT resumed work in the Cemetery 33 area. This HFRT's excavations focused on re-opening the area in which the previous fieldwork had uncovered a series of coffin burials and a series of *in-situ* helmets discovered during the last days of the prior field period.

A 1-x-8-m east-west trench was opened, the ~80 cmbs of backfill from the previously excavated units were removed, and a concrete and sand protective cap were exposed over the four *in situ* helmets discovered by the previous HFRT. The entire trench was then leveled off at approximately 100 cmbs (Figure 53).

A second 1-x-4-m north-south trench was manually excavated perpendicularly to the previous trench at the eastern end to a depth of 120 cmbs for the purposes of establishing two profiles of the main block to be systematically excavated. Evidence of a coffin burial was discovered in the southern edge of this trench at 120 cmbs.

Upon completion of the L-trench detailed above, a 2-x-3-m block (103.2-106.5E/90.7-87.7N) was marked off for excavation adjacent to the intersection of the two trenches. At approximately 60 cmbs a boot heel was discovered in the eastern center of the unit. Manual excavations then shifted from shovel shaving to trowel excavation, therein exposing a boot and intact poncho material. Excavation around the possible human remains (PHR) continued with trowel and brush, while the remaining portions of the block were shovel shaved. Trowel excavations to approximately 80 cmbs. Exposed legs and a pelvis of an individual which was designated as Marine Burial Trench Individual #1 (Figure 54).

Exposure of Individual #1 continued until Individual #1 was exposed as a fully articulated burial in an east-west position with feet towards the east and was in an excellent state of preservation. The exposed evidence was left in-situ and a 1-x-3-m unit [105.2-106.2E/90.7-87.7N] was opened to the west in an effort to determine if the entire individual was intact and therein expose the upper portions of the body. This unit revealed the upper portion of Individual #1 and evidence of a second individual along the western edge of the 1-x-3-m unit. The second individual, designated Individual #2, was in a north-south orientation, similar to the extrapolated position of the individuals associated with the previously discovered helmets in the same area (see Figures 54 and 55). The east-west position of Individual #1 appears to correlate to the sloping final edge of a bulldozer trench. This is evident in the sloping axis of the body for Individual #1 with the head to the west and the feet to the east. The burial trench stratigraphic differentiation was clearly visible in the southern edge of the excavation unit. Continued exposure of Individual #2 and the final cleaning of Individual #1 *in-situ* was carried out under the water table at approximately 120 cmbs Tidal differences variegated the actual depth of water in the unit based upon the time of day.

Exposed Individual #1 and the partial exposure of Individual #2 were photo-documented in-situ prior to the removal of Individual #1 and the continued excavation of Individual #2 beyond the

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opened units. The poncho was systematically removed from Individual #1. Once the poncho had been removed, the feet, legs and partial sections of the upper body were removed, tagged, and bagged for transfer to the History Flight, Inc. field laboratory. The removal of the upper torso and cranium were within the high tide water table and the decision was made to remove them as a block in the field, to be transferred to the laboratory wherein the final excavation and removal of the skeletal material could be completed under more stable conditions.

Excavations continued westward to further expose the remains of Individual #2. Root intrusions around Individual #2 were much more extensive than the conditions around Individual #1. Root intrusions invaded foramina and cavities in addition to adhesion to fleshed body areas (Figure 55).

Removal of Individual #2 was not viable due to the body position in relation to as yet unexcavated areas. To allow removal of this individual, the block unit was extended westward. The excavations continued westward following the archaeological evidence to complete a 3-x-3.7-m block unit [103.2-106.9E/90.7-87.7N].

Excavation of Individual #2 resulted in exposure of a nearly fully articulated burial in a north-south position with the feet to the south with associated identification media (Figure 56). There was no poncho covering this burial. Excavation of this burial also exposed six BAR magazines on the burial person which were removed and sent to the History Flight laboratory. An additional BAR magazine was fused to a hand grenade which was removed by the EOD technician and sent to the Kiribati Police depository. The cranium of Individual #2 was removed together with the helmet. The left and right arms of Individual #2 were left *in situ* since they extended into the 1-x-3-m unit to the west.

Excavation continued towards the west with the opening of a 1-x-3-m unit [102.2-103.2E/90.7-87.7N]. This unit was excavated to approximately 30 cmbs to be able to remove the cement-block wall of the previous residence on the site. The cement blocks were removed leaving only the wall foundation, the reinforced concrete foundation, and protective slab over the helmets. Continued excavation of this unit exposed Individuals #3, #4, and #5 (Figure 57). Individual #3 was completely removed to sterile substrata at 125 cmbs. The left and right arm and hands of Individual #2 were also removed from this excavation block. Excavation and removal of Individual #4 was completed with the exception of the innominates, sacrum, and left femur, which were taken out as a block for transportation to the History Flight, Inc. field laboratory to be exposed and recovered under more stable conditions (Figure 58).

The following unit, 1.5-x-3-m [100.7-102.2E/90.7-87.7N], to the west, followed the archaeological evidence and corresponded to the area where the helmets had been exposed by the previous HFRT. Excavations in this area exposed Individuals #5, #6 and #7, which were fully articulated burials all oriented north-south with feet to the south (Figures 59-60). All three individuals were buried covered with military ponchos and helmets. The three burials were totally exposed at 100 cmbs, which indicates the base of the original burial trench.

On 7 June 2017, the responsibility of the recovery was passed to another RL/A, and work continued with both the excavation of the Marine Burial Trench, as well as the surrounding area formerly under Residence #3. Partial backfilling of the completed midsection of the open trench

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excavation was conducted to protect against wall collapse, and this allowed expansion of the work in two directions simultaneously. Work continued following the Marine Burial Trench westward, and at the same time block excavation of a larger area formerly beneath Residence #3, to the south of the Marine Burial Trench. The continued excavation of this features resulted in the exposure and recovery of Individuals #7, #8, #9, and #10 which were a continuation of the previous contiguous burials in this part of the burial trench and were similarly articulated. A discussion of the context of these burials is discussed in the following paragraphs and visible in the associated photographs (Figures 61-72).

Excavation within the Marine Burial Trench was expanded west in sections as it encroached on Alley A to allow access for residents and their vehicles. The project area was resurveyed, and excavation proceeded with unit N88-91.5/E98-100, overlapping the previously closed unit (N87.7-91.2/E99.7-102.5) (Figures 73-74). A mass of folded U.S. poncho material was encountered at approximately 60 cmbs near the corner marked by N91.5/E98, but it was isolated at this level and not associated with any remains (Figure 75). At a depth of approximately 100 cmbs, U.S. poncho-wrapped remains of several individuals were encountered. Excavations proceeded to a depth of 120 cmbs to expose the margins of the remains and associated material evidence (Figure 76). Where several individuals were encountered during excavation of this archaeological unit, only a portion were completely exposed in order to preserve the evidence, taking care to minimize the possibility of commingling remains and associated material evidence.

The poncho material covering Marine Burial Trench Individual #10 was carefully removed to expose the remains and associated material evidence. All poncho material was retained and sent to the History Flight, Inc. field laboratory for curation and examination for any identifiers (e.g., adhering material evidence, or names or initials printed or written on the material). The soil matrix underneath was brushed away and the scene was photo-documented. While removing the matrix, a badly corroded identification tag was discovered at the same depth as the remains, but outside the poncho material covering Individual #10. This tag was in the space between Individual #10 and Individual #9, excavated by the previous RL/A. It is unclear which individual (if either) this tag belonged to, but it was retained as evidence with the remains of Individual #10 (Figures 77-78).

The recovery continued with the careful removal of the poncho material from Marine Burial Trench Individual #11. After the poncho was removed, the moist, adhering soils were brushed away to expose the skeletal remains and associated material evidence (Figure 79). When boot portions were encountered still encasing feet, the entire combination would be kept together for transport to the laboratory, where small bones and fragmentary remains could be cleaned and recovered in a more controlled environment. This followed the methodological protocol for mitigation of water table and tidal changes affecting the evidence. .

After the complete recovery of Marine Burial Trench Individual #11, the HFRT excavated the entire unit N88-91.5/E98-100 to 120 cmbs, exposing Marine Burial Trench Individual #12. This was the last individual recovered from this burial trench (Figure 80). Individual #12 required more care in recovery because a root from a nearby breadfruit tree had grown longitudinally through the length of the remains, up the spinal column, and through the cranium, fragmenting several cranial bones. In fact, the root had grown to engulf a couple of cranial fragments, and this section of root was cut out and included with the recovered remains (Figure 81). Two items of evidence were immediately

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noteworthy during the field recovery of this individual: (1) the recovery of a portion of a possible dental bridge (Figure 82), and (2) the recovery of a finger ring still around the digit of the hand *in situ* (Figure 83). This ring appeared to be originally wrapped in cloth tape, or perhaps a bandage.

The HFRT continued the excavation following the recovery of Cemetery 33 Marine Burial Trench Individual #12 across Alley A, expanding the excavation to 5 meters north-south to include the entire width of the trench feature. The team excavated an area designated N88-93/E92-100 to an average depth of 130 cmbs, identifying the limits of the burial trench as well as several previous History Flight, Inc. and possibly DPAA test excavations (Figures 84-85).

Although the original burial trench feature was excavated this distance into Alley A, there was no evidence of additional burials ever being placed here. However, when excavations reached unit N88-93/E90-92, more fragmentary remains and associated material evidence were recovered. Between 50-60 cmbs, some PME (789 gear) was identified, and by 70 cmbs portions of badly corroded U.S. steel and aluminum litter frames were exposed (Figure 86). The skeletal remains recovered in this unit were at the greatest depth (i.e., bottom) of the burial trench feature, but were isolated carpal, metacarpal, metatarsal, or phalanx portions, and a few examples of articulated bones of the feet associated with badly degraded boot portions (Figure 87). This pattern of individual bones either completely scattered and isolated or in articulated clusters of body parts mixed with 782 gear and burial artifacts (e.g., U.S. litters) is consistent with many other locations throughout the island of Betio where AGRS teams found burial trenches after the war and attempted recovery, badly disturbing the remains and leaving many portions behind.

Excavation continued, having to compress the unit north-south to work around the north side of the residence building on the west side of Alley A. The unit that began as N88-93/E89-90 had to become shortened on the south side to N89.5-93/E88-89.5 after reaching the building foundation. The HFRT again recovered isolated portions of remains consistent with the AGRS-disturbed Cemetery 33, Row C, including portions of a badly degraded U.S. boot with associated foot bones (Figure 88). As this unit was expanded west to the E88 line, the HFRT exposed the remnants of two previous HFRT recovery efforts. The northern border of this unit was composed of backfill from one recovery effort, and the central and southern portions contained the backfill and both battlefield and modern debris another team placed back into their completed units. The battlefield debris consisted of badly corroded litter frames, other metal fragments, some poncho material, and some small-arms ammunition. A modern nitrile blue glove was tied around one piece of metal litter frame, a likely attempt to mark their progress for later recovery teams (Figure 89). The HFRT completed unit N89.5-93/E88-89.5 to sterile soil conditions, removing all evidence from the ground (Figures 90 and 91), backfilled the excavation unit, and moved south to open excavation units along the east side of the residence row foundation.

The HFRT team continued excavation activities in and around where Residence #3 once stood, simultaneous with the recovery efforts in the Marine Burial Trench/Cemetery 33, Row C feature. Unit N84-88/E106-110 was opened and excavation proceeded in 20 cm levels. Two individual burial features began to emerge at approximately 80 cmbs in the southeast quadrant of this unit. Again, as described for previous individual burials recovered in this project area, these two features appeared to be within a single burial trench, leading to the conclusion that they may have been originally buried, or re-buried if subsequently disturbed, at the same time. Also, as described earlier in this

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report, these two individual burials were aligned identically north-south when compared to the burial arrangement of Cemetery 33 Individual Burials #1-#9 (Figure 92, see also Figure 74). These two individuals became designated Cemetery 33 Individual Burial #10 and Cemetery 33 Individual Burial #11 (Figures 93-95). Individual #10 was recovered in association with one identification tag in a remarkable state of preservation. Individual #11 was curiously buried in association with two helmets. Excavation revealed that these were likely used to contain fragmentary and disarticulated bone portions.

Excavation unit N84-88/E102-106 was opened simultaneously with the recovery of individual burials #10 and #11. As this unit was excavated in 20 cm levels, another individual burial feature was discovered, observed in the southwest quadrant of the unit, at approximately 80 cmbs (Figure 96). In each of the recovered Cemetery 33 individual burials, an inner, slightly darker stain left from the decomposition of the wooden coffin could be seen within a wider, less-dark stain caused by the actual burial cavity originally excavated (see Figure 96).

These burials were excavated by identifying these subtle features, and then carefully excavating downwards to the level immediately above the remains. In each case, all that was left of the wooden coffins was a stain from what was the wood material above the remains, and wet, fragmentary portions of the wood coffin around and directly under the skeletal remains. Once excavation reached the upper-most skeletal elements, the focus shifted to removing all the surrounding material outside the burial coffin down to a level defining the bottom of the burial. In this way, the anthropologists and archaeological technicians could then very carefully expose all of the remains *in situ*, enabling photo-documentation and forensic recovery of the remains and associated material evidence (Figures 97-98).

During the process of the excavation of Cemetery 33 Individual #12, unit N84-88/E102-106 was expanded to become N84-88/E100.5-106, to search for possible nearby burials and to create room to move around while excavating Individual #12. The result of this expansion led to the discovery of two large very badly degraded wooden planks, bolted together, and the southeast corner of another badly decomposing wooden coffin (Figure 99). Although the HFRT now knew there was at least one more burial location, with a good possibility for the recovery of intact remains, this burial, had to wait some time as it was beneath a very large breadfruit tree, and continued excavation in this area therefore had to await permission from the Kiribati offices of Lands and Quarantine to remove the tree. This burial was later recovered and designated Cemetery 33 Individual Burial #13. While waiting, the HFRT continued recovery efforts south, completing excavation activities in the area of unit N80-84/E99-110. These efforts yielded negative results. The HFRT then concentrated efforts to backfill the completed excavation units, gain the permits from the Kiribati government, and have the breadfruit tree safely removed (Figure 100).

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Project 2: History Flight, Inc.–DPAA Contract Excavation Activities

After securing the appropriate Kiribati government approval, the large breadfruit tree obstacle was cut down, and excavation activities resumed to recover Cemetery 33 Individual Burial #13 on 23 July 2017. Excavation unit N84-86/E96-100.75 was opened, and the burial feature was confirmed, again aligned north-south at the same orientation as the previous 12 individual burials outside the Marine Burial Trench. The HFRT encountered very wet weather and a rising groundwater table, but excavations continued and the 13th individual burial was exposed and recovered completely (Figures 101-102).

Recovery efforts continued and expanded with block excavation to search for additional evidence of both individual burials and mass-burial trenches. Excavations expanded as far south as the N77 line, west to fill unexcavated gaps to the E94 line, east as far as the E121.5 line, and as far north as the N99.5 line. In several cases, this fieldwork included overlapping previous excavations to ensure that recovery activities were complete, both vertically and horizontally (i.e., reaching sterile soil conditions) (Figure 103). However, these comprehensive efforts did not yield any additional burial features or associated material evidence.

The HFRT then added excavation units to continue the block excavation, wrapping around Residence #2. The team excavated successive 3-x-3-meter units along the east side of this residence, again overlapping previous work to the west, covering the area N92-107/E113-116. Evidence of several previous archaeological test pits and trenches, and several disturbance features from wastewater pipe, fresh water pipe, and electric wire emplacements were encountered, as well as numerous modern trash pits in this area (Figure 104). Only one unit bore evidence of buried human remains here, and it appeared to be a secondary deposit. Excavation unit N95-98/E113-116 contained a small concentration of the disarticulated skeletal remains of more than one individual. These were found in association with material evidence all consistent with typical gear of the WWII occupation by the Japanese Imperial Navy forces prior to and during the battle for control of Betio Island. These items included Japanese military helmets, leather items consistent with the tanning process found with Japanese gear of the period, Japanese sub-munitions, and a small lightweight metal canister with a label bearing Japanese writing (Figure 105). This area was expanded to include N94-98/E116-118 and N98-99/E116-117, which entailed the excavation around a modern concrete salt water wastewater junction (Figure 106). It appears that these remains and associated artifacts were encountered during the excavation for, and placement of this concrete junction, and the remains and artifacts were then simply replaced in the ground with the backfilling around the junction. The remains and associated artifacts here were concentrated in a small area and were recovered completely and transported to the History Flight, Inc. field laboratory for proper curation.

Excavation activities continued the length of the east side of the Residence #2 covered concrete pad (kitchen/dining area) with negative results. Once the team excavated to the N107 line, the RL/A extended the archaeological grid system to include the north side of the covered concrete pad and Residence #2 structure. The reinforced concrete cistern and former septic tank/planter attached to the north side of the residence were demolished and removed, with all contents screened (Figure 107). The team recovered only modern trash from these structures. The team then split into two elements, excavating an area defined by the outer boundaries N107-113/E99-118, generally divided into 3-x-3-meter units except where a fresh water well required some undisturbed margins. As the team reached

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east to unit N110-113/E111-116, at the extreme east of the Residence #2 property, a very distinct sub-surface disturbance was observed in the soil profile of the east wall (Figure 108). This feature had the possibility of being another burial trench, or possibly a defensive position. It appeared to be contemporary with the WWII era, both stratigraphically and morphologically. However, the team had to pause before excavating this further, required to get additional approval for excavation in this area and areas further east into the neighbor's property. No additional WWII features were encountered on the north side of Residence #2.

The team exposed the previously found what is believed to be Cemetery 33 Burial Row B, aligned east-west, which included disarticulated skeletal remains and associated material evidence (boot portions) at a depth of approximately 65 centimeters below the bottom of the house foundation (approximately 85 cmbs). This evidence was only approximately 20 cm west of the residence foundation, within excavation unit N102-106/E98-99.5 (Figure 109). After completing this unit, the team continued to follow the burial trench west, excavating unit N102-106/E96-98. This unit showed a well-defined burial trench feature continuing west, as well as several previous archaeological test excavations cutting through it. The HFRT recovered additional skeletal remains and associated material evidence, including cemetery wood cross portions and U.S. Marine 782 gear from this burial trench feature. The remains consisted of scattered, disarticulated skeletal elements, or partially articulated groups of skeletal elements (Figure 110). All recovered remains and their associated material evidence show a pattern of being right on, or very near, the bottom contour of these burial trenches—just as previously recovered from Cemetery 33, Row C, excavations. Interestingly, the remains and evidence recovered near the foundation of Residence #2 (N102-106/E98-99.5) were recovered at a depth of approximately 65 centimeters below the level of the bottom of the structure's foundation, or approximately 85 cmbs, while the remains and evidence recovered in unit N102-106/E96-98 to the west were recovered quite a bit deeper, at approximately 127 cmbs, both following the contour of the burial trench. Therefore, although it is likely the burial trench extends eastward, under the foundation of Residence #2, it probably terminates somewhere under this structure. Evidence to support this is found in the results of the excavations east of the residence structure, under what is now a concrete slab/covered outdoor kitchen/dining area added to the residence after HFRT excavations there. The results of that work indicated no evidence of a burial feature.

Excavation activities progressed further west, opening unit N102-106/E94-96. Again, the HFRT exposed a well-defined burial trench feature extending into the west wall. And again, the HFRT recovered skeletal remains and associated material evidence consistent with U.S. Marine 782 gear at the depths defining the bottom contour of the burial trench. These remains reflected a pattern observed throughout this burial trench feature, consisting of scattered, disarticulated skeletal elements, or partially articulated groups of skeletal elements (Figure 111). The team also identified more of the sections of the former beautified Cemetery 33 boundary metal railing within the backfill of this trench feature. Furthermore, consistent with other excavations crossing Alley A, the HFRT again noted evidence of more previous archaeological test excavations cutting through the burial trench feature, but not deep enough to reach the depths of the original burial trench. Evidence of test excavations from 2013 to find Cemetery 33 were encountered. The HFRT recovered evidence of this previous work in the backfill of those test trenches/pits, including colored engineer tape labeled "T4 SE" and "T7 SE" (i.e., Test Trench 4 and Test Trench 7 which were the checkerboard methodological units excavated by the HFG in 2013 which resulted in the discovery of Cemetery 33

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in 2013 and the recovery of Tarawa MIA Captain Richard Vincent) (Figures 112 and 113). Based on knowledge of previous History Flight, Inc. excavations on the west side of Alley A, and on the obvious path of the burial trench feature observed in this work, it is believed that the HFRT has exposed and recovered skeletal remains and associated material evidence from what has been historically referred to as Cemetery 33, Row B.

At the same time one element of the team was excavating across Alley A in the area of Cemetery 33, Row B, another team element continued excavations north within Alley A, including three 1.5-x-4-meter units and one 1.5-x-5-meter unit to the N123 line and the southern border of the Ring Road pavement (units N106-110/E94-95.5, N110-114/E94-95.5, N114-118/E92.5-94, and N118-123/E91-92.5; see Figure 103). These excavations met with negative results.

Between 7 November and 12 December 2017 another HFRT continued excavation along Alley A within the northwestern quadrant of the Cemetery 33 project area. The first unit was laid out as a westward expansion of prior excavations within the Cemetery 33 Row B disturbed burial trench. Unit N102-106/E93-94 was opened, and isolated, scattered skeletal portions and non-associated material evidence were recovered in close proximity to several cemetery stones and a series of three cemetery border markers located within the approximate center of the unit (Figure 114). Soil disturbance features, consistent with previous exploratory trench excavations were also noted within the unit. The unit was closed after reaching culturally sterile soil conditions at 130 cmbs.

Excavations progressed to the south in an effort to completely cover the area represented by the disturbed burial trench. These units (N98-102/E93-96 and N93-98/E94-95.5) continued to yield scattered and isolated skeletal fragments and scattered non-associated material evidence as excavation progressed southward, including a glass prism, poncho fragments, possible boot sole fragments, and Load Bearing Equipment (LBE) gear and uniform components. Soil disturbances consistent with recent excavations were also observed in these units, showing overlap with recent HFRT recovery efforts. A very small cluster of disarticulated skeletal remains in association with a uniform button was uncovered within the northern third, near the western border of excavation unit N93-98/E94-95.5 at 100 cmbs. Therefore, a .5-x-2-m westward extension was excavated to ensure complete recovery of the material (N96-98/E93.5-94). Additional remains, including hand elements and rib fragments, were recovered from within the extension along with a U.S. BAR-type magazine, U.S. poncho material, gas mask canister fragments, LBE gear components, and .30 caliber shell casings (Figure 115). These remains and associated material evidence were recovered on the border of a modern trash pit, and their context indicated they were likely moved after initial burial, at least once (secondary or tertiary disturbance of both the remains and the material evidence). Both the main unit and the extension were excavated to culturally sterile soil and closed at 135 cmbs. However, excavations did not proceed further west, to avoid encroachment beyond the permitted project area boundary.

Excavation activities also proceeded in a northern direction to fill in gaps of unexcavated areas between the Ring Road and the already completed units. Two excavation units were placed in Alley A parallel to Residence #2 (N106-110/E92.5-94 and N110-114/E92.5-94), and an additional unit was placed north-east, adjacent to a rectangular cement planter belonging to Residence #1 (N110-114/E95.5-99). With the exception of one cemetery rock and a small amount of battle trash, these units yielded only modern debris and faunal remains, and were excavated to culturally sterile soil

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and closed at depths of 130 to 135 cmbs.

Excavations then shifted to the northeast quadrant of the Cemetery 33 project area to pursue a possible trench feature noted in the east wall profile of a prior unit (see Figure 108). The area to be investigated followed an east-west oriented driveway bordered on the south by a local residence, and on the north by a fenced property line. After clearing the surface to ground level, a 3-x-3-m unit (N110-113/E116-119) was placed adjacent to the eastern wall of the unit in which the feature was originally noted. At 30 cmbs, a series of long narrow-gauge metal rails consistent with a Japanese ammunition track were uncovered. The rails spanned the length of the unit and extended to a depth of 155 cmbs. The rails were bent, twisted, and broken and appeared to have been damaged in a blast event (Figure 116). This unit also yielded a Japanese gas mask canister, a large, rectangular ferrous metal slab, and a U.S. mid-20th century Owens-Illinois bottle, but no remains.

Remnants of the Japanese rail system, including portions of a probable rail cart, continued to be exposed in subsequent units as excavation progressed to the north and east up to a small unpaved access road (Figure 117). An additional six units were placed within the area, with isolated skeletal remains portions and material evidence being recovered within two of the units. Unit N113-115/E119-122 yielded only scattered and isolated skeletal portions and non-associated poncho material. Unit N113-115.5/E122-125 began to yield U.S. poncho material and 782 gear components within the first 30 cmbs, in addition to generalized battle trash, faunal remains, and modern debris. This unit also yielded a quantity of early to mid-20th century bottles of Australian and New Zealand origin, 1940s U.S. Owens-Illinois and Coca-Cola bottles, and a blue and white U.S. Navy-type enamelware mess cup, as well as Japanese bottles and bottle fragments. Additional material evidence recovered from this unit includes possible boot sole fragments, strap buckles, possible uniform buttons, a folding belt buckle, a pocket knife, and a data plate dated 1941 from the Hazletine Corp. Isolated, possible human skeletal portions were also recovered from this area.

The two units placed furthest east and adjacent to the access road yielded only generalized battle trash, modern debris and faunal remains. In addition to several nose cones, a single corroded grenade of unknown type, and a 70 mm shell casing were recovered in proximity to the Japanese rail system. All units were excavated to culturally sterile soil at a depth of 160 to 170 cmbs, with the exception of one unit located adjacent to the access road in which sterile soil levels were reached at between 135 and 155 cmbs.

The final History Flight, Inc. Recovery Leader/Anthropologist (b)(6) suspended all excavation activities within the Cemetery 33 project area at 0900 hours on 13 December 2017 due to the holiday break and the impending expiration of the History Flight, Inc.-DPAA contract. All recovered remains and material evidence were curated and secured at the History Flight field laboratory located on Betio Island, Tarawa Atoll, in the Republic of Kiribati. Following a DPAA Forensic Field Review, the remains and associated material evidence recovered from the Marine Burial Trench were assigned the DPAA designator: CIL 2017-232, and the remains and associated material evidence recovered from the individual burials were assigned the DPAA designator: CIL 2017-233. A final plan view map showing the general distribution of this evidence is shown in Figure 111 and a list of the excavation units yielding PHR and PME during this field activity can be found below in Tables 1 and 2. Description of items in these tables represents field designations only, and the final probative value of these items as evidentiary is determined by DPAA through

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laboratory analysis.

CONCLUSIONS AND RECOMMENDATIONS

Between January and December 2017, over the course of several field activities, History Flight, Inc. conducted excavations within the project area designated Cemetery 33 on the island of Betio, Tarawa Atoll, in the Republic of Kiribati. History Flight Recovery Teams cleared to the soil surface and completely excavated a combined area of approximately 932.5 m² within the defined project area to sterile soil conditions. The final Recovery Leader/Anthropologist suspended excavation on 13 December 2017 due to the holiday season break and the termination of the History Flight, Inc.—DPAA contract. All recovered remains and material evidence were curated and secured at the History Flight field laboratory located on Betio Island, Tarawa Atoll, in the Republic of Kiribati.

Following a DPAA Forensic Field Review, the remains and associated material evidence recovered from the Marine Burial Trench were assigned the DPAA designator: CIL 2017-232, and the remains and associated material evidence recovered from the individual burials were assigned the DPAA designator: CIL 2017-233.

From 4 January-18 July 2017, HFRTs recovered twelve individually articulated sets of nearly complete skeletal remains from within an undisturbed portion of a burial trench feature, along with associated material evidence. The HFRTs also recovered twelve sets of nearly complete, and partially complete skeletal remains from individual burial features in the vicinity of, but outside the burial trench. The HFRTs also identified an additional individual burial feature, but had to delay recovery until the Kiribati government removed the breadfruit tree from the project area. Several of the individual burials contained associated U.S. material evidence, including identification media.

From 19 July-13 December 2017, the HFRTs completed the recovery of the thirteenth individual burial feature, and continued block-excavation of the Cemetery 33 project area. This excavation defined the eastern extent of what has been historically referred to as Cemetery 33, Row C, and Cemetery 33, Row B, and completed the excavation of Cemetery 33, Row C, from its eastern end, west to where it had been previously excavated—both by AGRS activity following the war, as well as subsequent History Flight, Inc. recovery efforts. The eastern extent of Cemetery 33, Row B, was defined within this project area, and areas excavated east of Residence #2 demonstrate that Row B did not continue beyond this structure. However, it is clear that Row B extends under, and terminates beneath, the foundation of Residence #2.

The twelve sets of remains and associated material evidence recovered from within Cemetery 33, Row C, referred to in this report as the “Marine Burial Trench,” were found undisturbed by any recovery efforts during or after the war. These individuals were recovered still wrapped in their ponchos and wearing some of their gear. The excavation westward across Alley A revealed that there was an approximately 9 meter gap between these remains and those of other U.S. Marines buried in this row west of Alley A, whose remains were badly disturbed by AGRS recovery efforts shortly after the war. The remains and associated material evidence recovered west of Alley A in Cemetery 33, Row C, were scattered, disarticulated, comingled, and fragmentary.

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The thirteen sets of remains recovered from the individual burial features were consistent with being “accretion” burials—individuals who were buried within Cemetery 33 after the original mass-burial trenches were covered. All likely died and were buried, or were moved and reburied there, sometime following the battle to secure the island. Evidence was recovered to support this hypothesis, including identification tags and U.S. service gear for U.S. Army Air Forces individuals killed during later events, including the loss of two U.S. B-24 aircraft which crashed shortly after takeoff and within minutes of each other on 21 January 1944. It is clear that many of the coffin burials found in the eastern side of Cemetery 33 were partially recovered by the AGRS. Also, the soil matrix of these burials shows several individual coffin burials within singular short trenches. This could be due simply to the individuals being interred at the same general time, and skeletal elements missing due to incomplete recovery at an aircraft crash scene, but the missing elements and positioning in several burials is inconsistent with this. There are other seemingly undisturbed and intact individual burials outside these short trenches which are nearly complete. Thorough laboratory analyses and records research will likely explain the inconsistencies, and provide additional opportunities for identifications.

Historical research indicates that there are many more remains associated with Cemetery 33 which are still unaccounted for. Cemetery 33, Row A, Row B, and Row C, have not been completely excavated, and Row D has still not been found. History Flight, Inc. recommends that permission be gained to complete these excavations across Alley A, and into adjacent property, possibly under residents’ house foundations (*viz*: Cemetery 33 project area Residence #1 and Residence #2, as well as the residences west of Alley A—especially noting that previous excavations may have been incomplete). Recommend also expanding the Cemetery 33 project area both north and south as there may be an additional undisturbed burial trench and/or additional accretion burials yet undiscovered: south including the Residence #4 property and Alley A area, and north to include more of Alley A as well as beneath the Ring Road. Excavation further east should also be considered, although at the current time this seems less of a priority.

(b)(6)

Senior Recovery Leader/Anthropologist

(b)(6)

Scientific Recovery Expert

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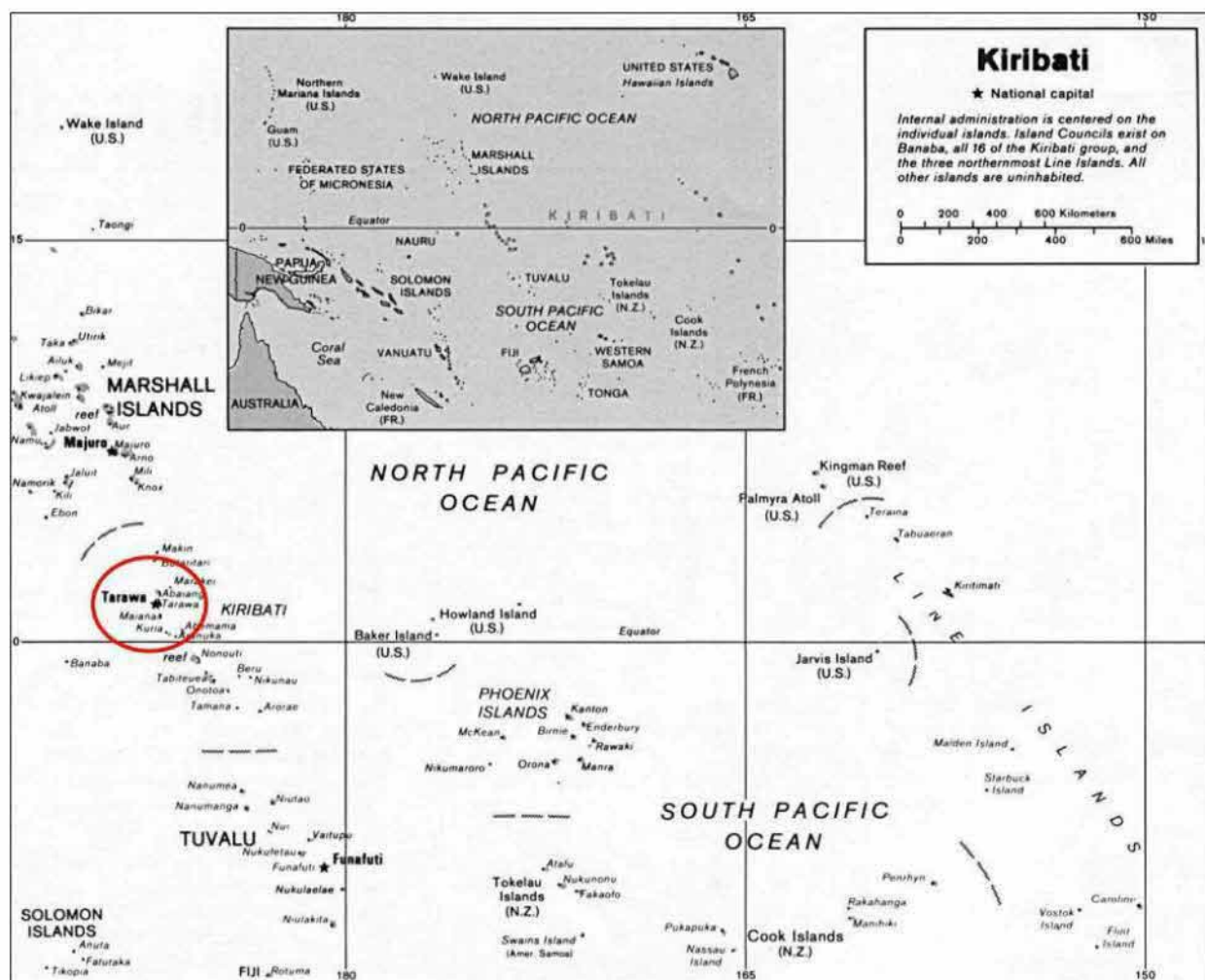


Figure 1. General location of Tarawa Atoll, Republic of Kiribati, in the North Pacific Ocean.



Figure 2. Location of Betio Island within Tarawa Atoll.

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Figure 3. U.S. Marine casualties on Betio Island, 21 November 1943.



Figure 4. Aerial view of Betio Island. Yellow pin shows general location of the Cemetery 33 project area.

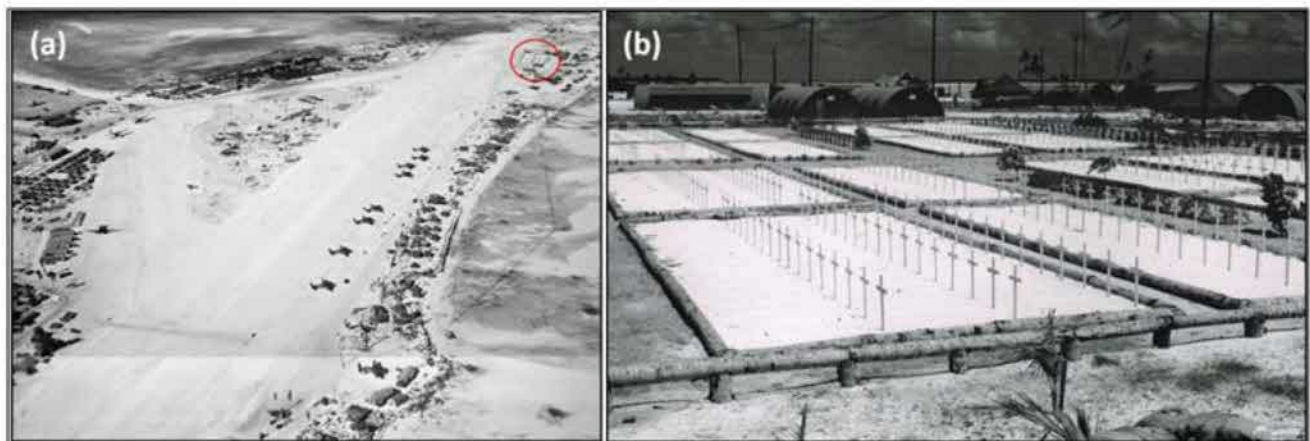


Figure 5. The "beautified" Memorial Cemetery 33 during U.S. military occupation on Betio Island; (a) general location in reference to Hawkins Airfield (red circle), and (b) close-up historic photograph.

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Figure 6. Current Cemetery 33 project area on the island of Betio.



Figure 7. Excavation activities within the Cemetery 33 project area. View is north. Red arrow indicates archaeological sub-datum (N100/E100).



Figure 8. Close-up aerial view showing the Cemetery 33 project area (red box). Yellow numbers designate the three resident structures built on top of this portion of the cemetery.



Figure 9. Cemetery 33 archaeological grid system set-up. Red arrow shows optical transit. Yellow arrow shows Schiebel MIMID metal detector. Red circle shows double right-angle prism.

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Figure 10. Excavator being used to expedite backfilling operations for land restoration.



Figure 11. Using metal detector to help define sterile conditions.

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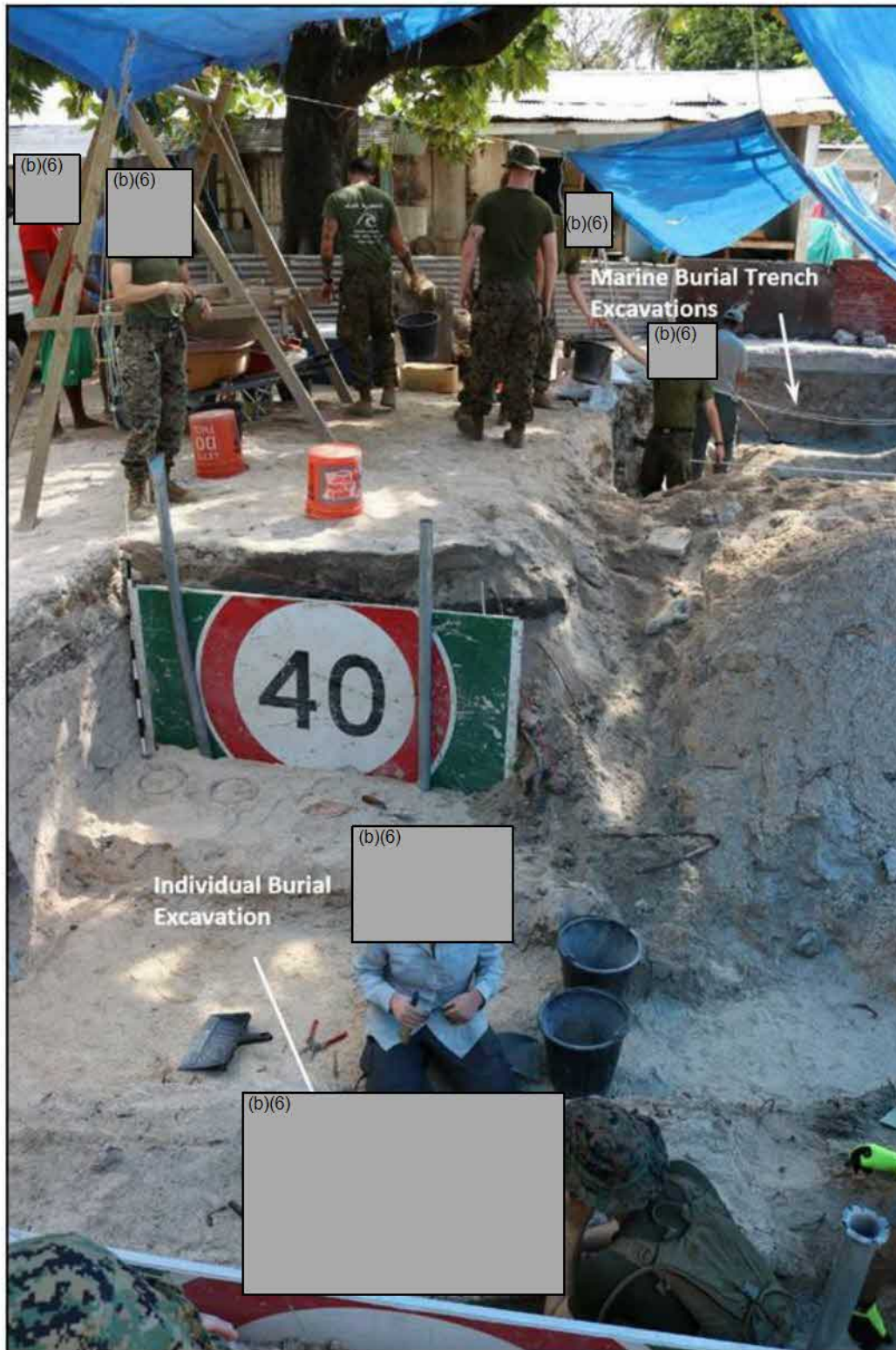


Figure 12. Excavations and screening operations in the Cemetery 33 project area. View is toward the west.

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Figure 13. Excavation unit showing various soil disturbances often encountered on Betio Island. Blue line defines salt water wastewater pipe intrusion. Red line indicates disturbance for old buried electrical line (removed). Orange line shows contour of trash pit. White line indicates fresh water line placement.



Figure 14. Soil profile showing soil disturbance features defining the eastern limit of “Cemetery 33 Row C”.

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Figure 15. Excavation unit N90.7-94/E100-108. The northern portion of the undisturbed Marine Burial Trench (eastern extent of "Row C") is clearly visible (orange line).



Figure 16. (a) Careful break-up and removal of the hard, compact coral layer in Alley A. (b) Excavation unit showing the soil strata in Alley A.

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Figure 17. Excavation in Alley A. Gold line is the Marine Burial Trench contour. Red lines are previous test excavations in the area.



Figure 18. Excavations in Alley A. Gold line is the Marine Burial Trench contour. Red line is a previous test excavation.

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Figure 19. Excavation in the Cemetery 33 project area exposing Marine Burial Trench Individual #12. Gold line is the burial trench contour. Red line is a previous excavation test pit.

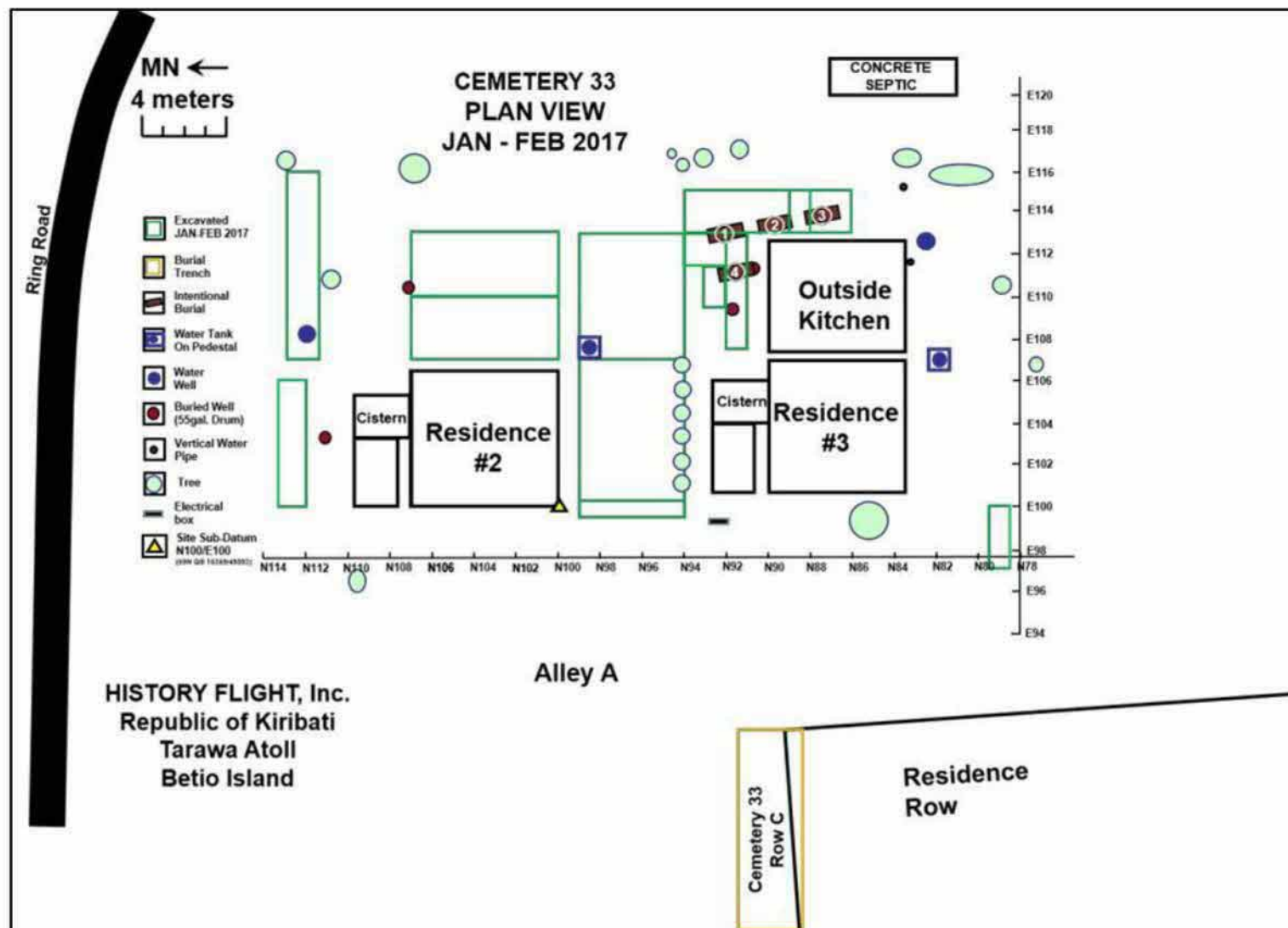


Figure 20. Cemetery 33 project area; January-February 2017.



Figure 21. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #4.

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Figure 22. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #1.



Figure 23. 1946 historic photograph of Lone Palm Cemetery grave concentration activities depicting a wooden coffin and remains for burial wrapped in a blanket on Betio Island.

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Figure 24. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #2.

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Figure 25. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #3.

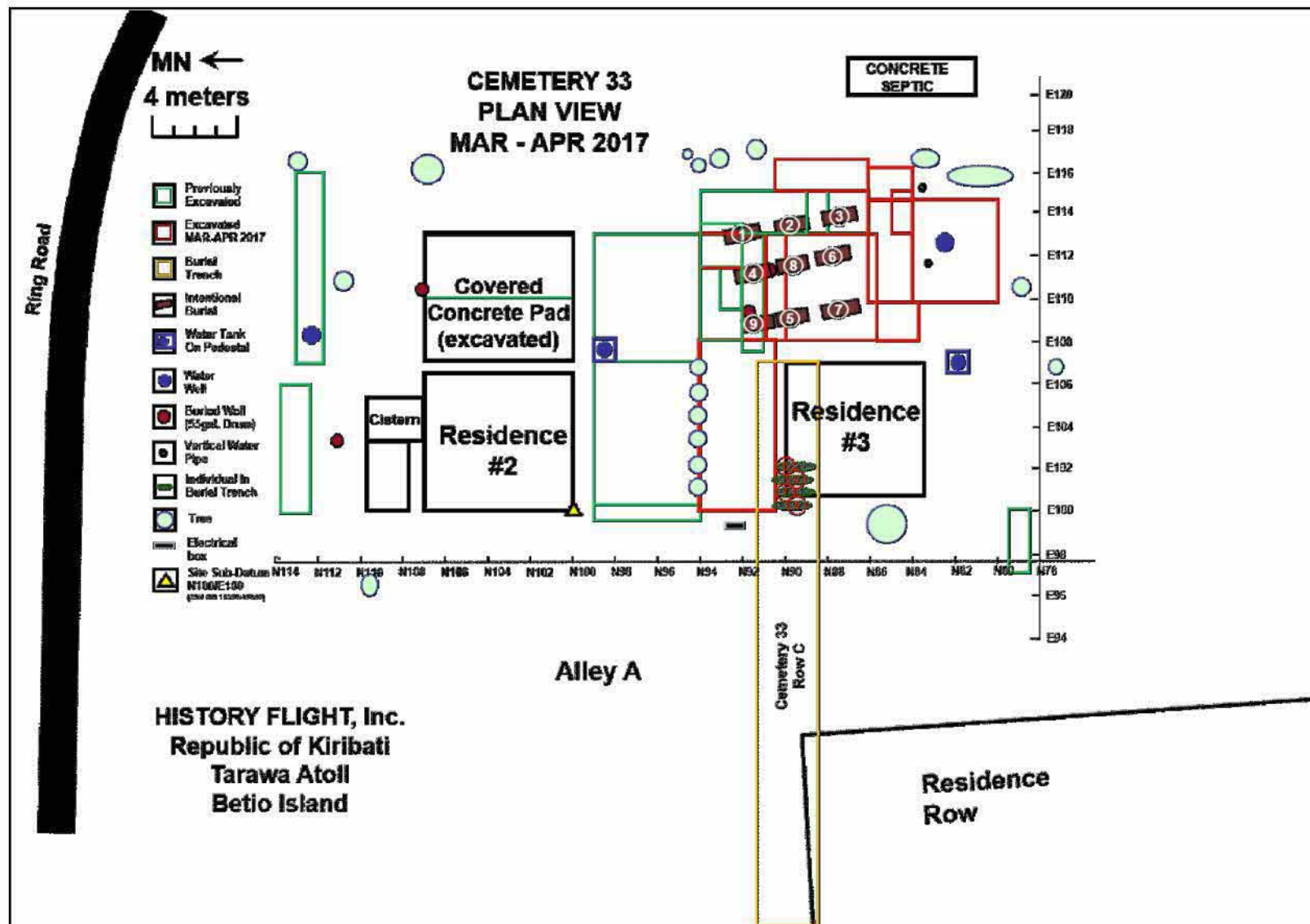


Figure 26. Cemetery 33 project area; March-April 2017.

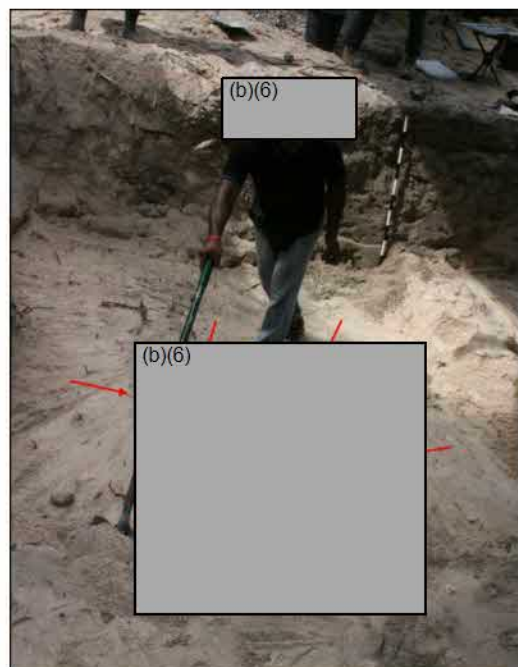


Figure 27. Careful shovel-skimming exposing an individual burial excavation (red arrows) and the stain of the wooden coffin (yellow arrows). Shown is Cemetery 33 Individual Burial #8.



Figure 28. Excavation of unit N85-90/E108-113, showing a cluster of four individual burials.

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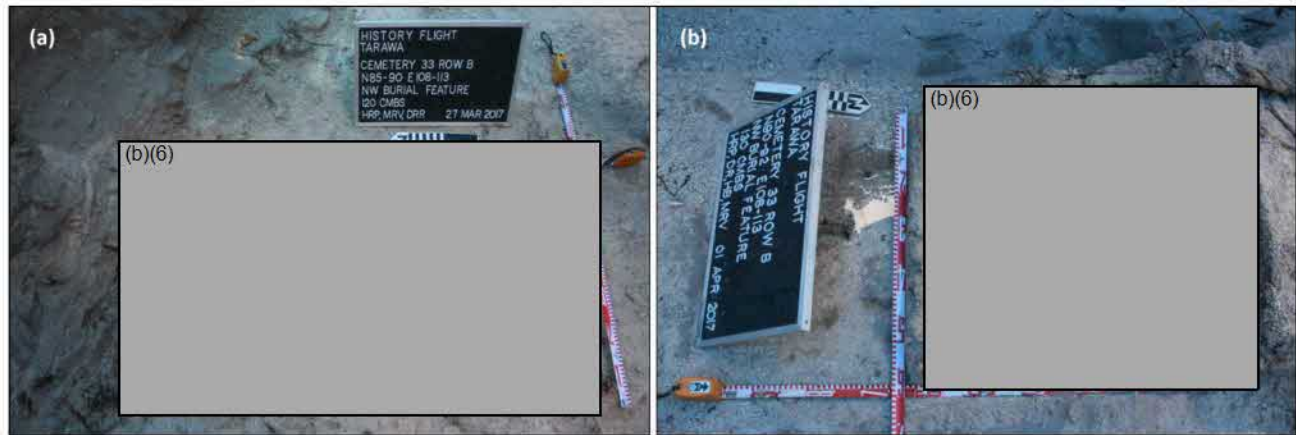


Figure 29. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #5; (a) is the southern portion, and (b) shows the northern extent.

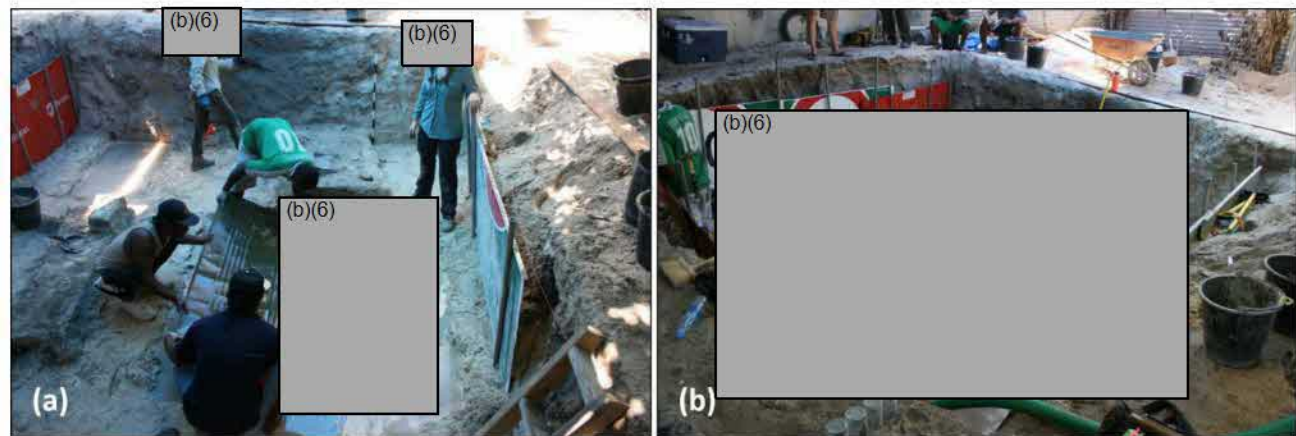


Figure 30. Field excavation photograph showing removal of the Cemetery 33 Individual Burial #6 as a block of matrix containing remains and associated material evidence; (a) sliding the metal sheet beneath the block, (b) the block ready to be removed from the excavation unit to the laboratory.



Figure 31. Field excavation photograph showing removal of the Cemetery 33 Individual Burial #7 as a block of matrix containing remains and associated material evidence; (a) the block excavated to expose the surface of remains and associated material evidence, (b) sliding the metal sheet beneath the block for removal from the excavation unit to the laboratory.

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Figure 32. Close-up photograph of Cemetery 33 Individual Burial #7, showing attached identification tag. An insulated wire was used to attach the tag to the cervical vertebrae.



Figure 33. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #8.

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Figure 34. Close-up photograph of Cemetery 33 Individual Burial #8, showing attached identification tag. An insulated wire was used to attach the tag to the left hand.

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Figure 35. Field excavation photograph showing the excavation to reach Cemetery 33 Individual Burial #9; (a) Red arrows indicate burial coffin stain and the yellow dotted line defines the southern border of the initial exploratory trench cutting across this feature. (b) Red arrows indicate the remnants of the bottom of the wood burial coffin, the yellow dotted line defines the southern border of the initial exploratory trench, and the white arrows show the borders of the exploratory trench – not reaching the depth of the individual’s remains.

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Figure 36. Photograph showing detailed excavation of Cemetery 33 Individual Burial #9.



Figure 37. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #9: (a) remains and remnants of the wooden coffin of the southern portion of the feature, and (b) the remains and remnants of the wooden coffin in the northern portion of the same burial.

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Figure 38. Backfilling excavation unit N80-92/E108-113.



Figure 39. Land restoration following excavation west of Residence #3.

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Figure 40. Cemetery 33 project area, north side of Residence #3 before excavation.



Figure 41. Excavation and screening operations in progress on the north side of Residence #3.

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Figure 42. Excavation on the north side of Residence #3 to a depth of 60 cmbs.



Figure 43. Excavation on the north side of Residence #3 to a depth of 80 cmbs. Orange line defines the southern boundary of previous History Flight, Inc. excavations, the white line defines an area of imported fill, and the red line defines the northern edge of the suspected burial trench.

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Figure 44. Excavation on the north side of Residence #3 to a depth of 95 cmbs. Only the soil disturbances from the previous History Flight, Inc. excavations and the suspected burial trench remain.



Figure 45. Excavation on the north side of Residence #3 to a depth of 100 cmbs. The cistern has been removed and the burial trench slopes upward toward the surface beneath it, defining the trench's eastern limit (see also Figures 14 and 15).

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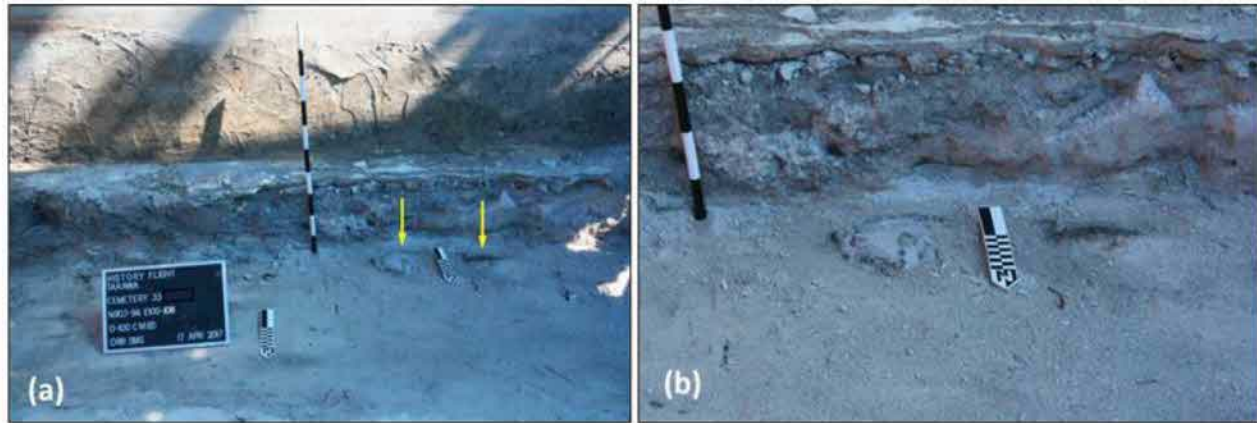


Figure 46. Discovery of two U.S. helmets within the suspected burial trench feature; (a) showing general location (note reference marks on concrete wall), and (b) close-up photograph.

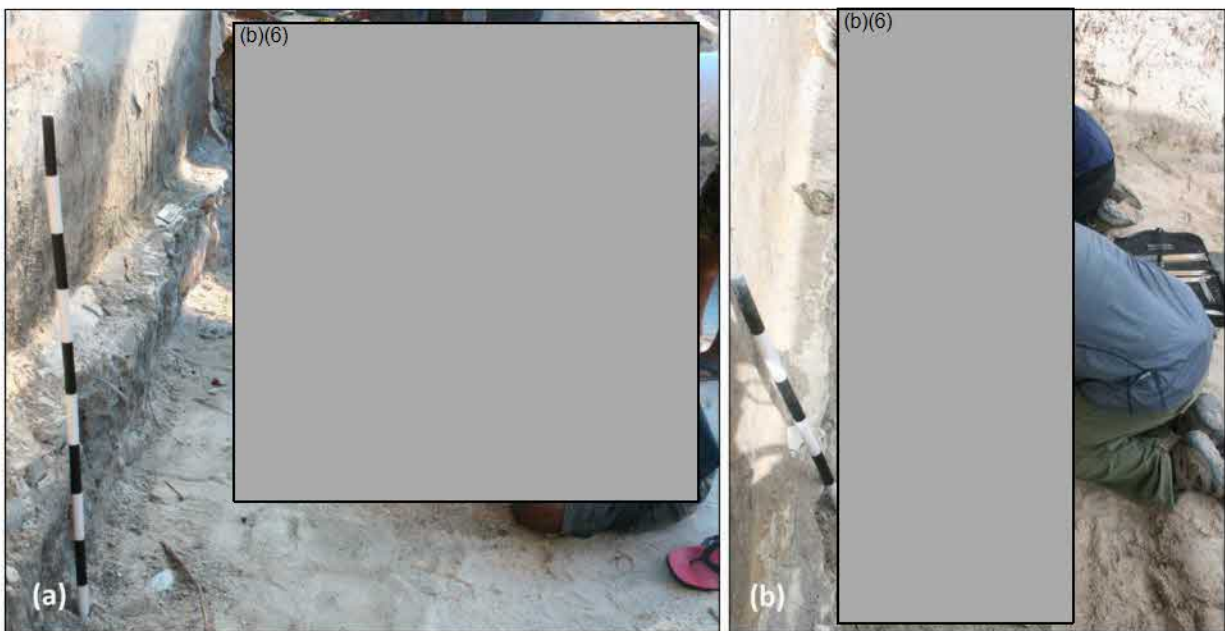


Figure 47. Hand-tool excavation of the burial trench feature; (a) excavation exposing three U.S. helmets and one poncho-wrapped cranium, and (b) detailed excavation to determine that each helmet protects U.S. poncho-wrapped crania.

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Figure 48. (a) Exposed U.S. helmets and U.S. poncho-wrapped remains in unit N90.7-94/E100-108; (b) detail photograph showing U.S. poncho-wrapped maxilla (white arrow) and dentition (yellow arrow) within the helmet at left, photograph (a).



Figure 49. Excavation of unit N90.7-94/E100-108 to 120 cmbs.

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Figure 50. Preservation of the Cemetery 33 Marine Burial Trench (east end “Row C”), clockwise from top left; (a) building up a ring of rock and base of sand with a piece of tarp marker, (b) a cap of cement, (c) a second piece of tarp as a marker and a top layer of sand, (d) the north side of Residence #3 after land restoration.

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Figure 51. Residence #3 located over evidence of Cemetery 33 which was demolished by History Flight.



Figure 52. Newly constructed replacement residence built over location of previously demolished Residence #3.



Figure 53. Opening of initial trench to relocated previous excavations and protective layers placed over in-situ helmets previously discovered.

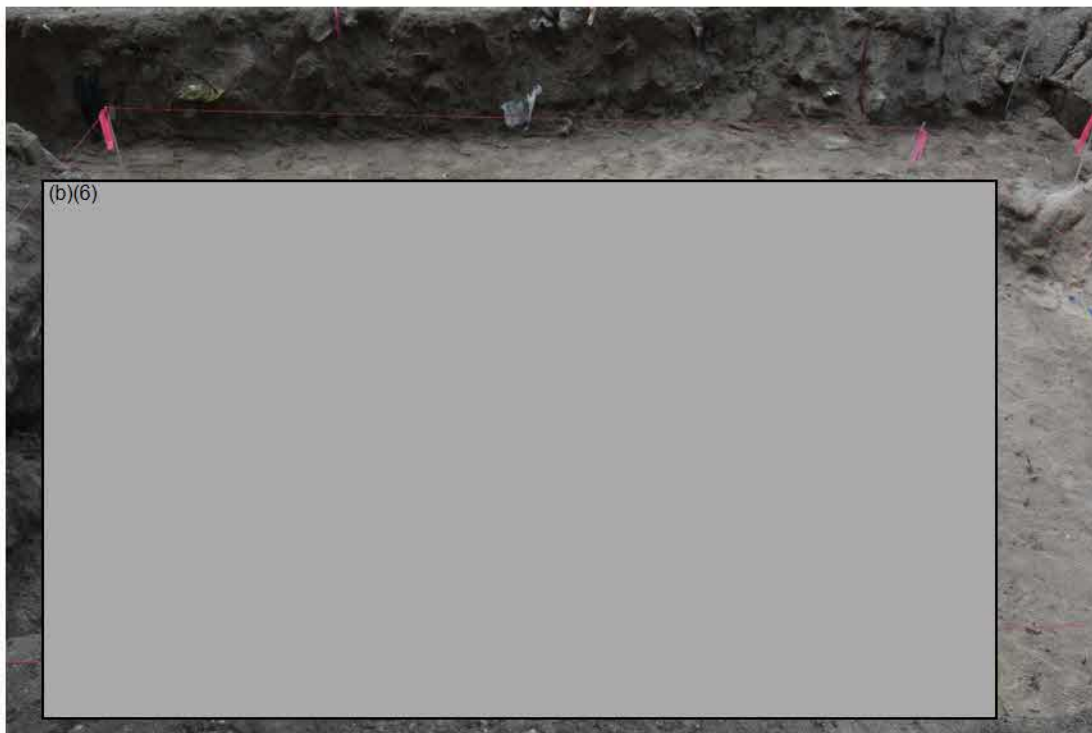


Figure 54. Exposure of Marine Trench Burial Individual#1 showing state of conservation with intact poncho, orientation, surrounding matrix and intrusion of tidal water table.

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Figure 55. North-south orientation of Marine Trench Burial Individual #2 showing state of conservation, articulation and surrounding matrix.

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Figure 56. Marine Trench Burial Individual #2 with in-situ identification media reading: "STRANGE, A 519497 P TYPE O T 4/43 USMC".

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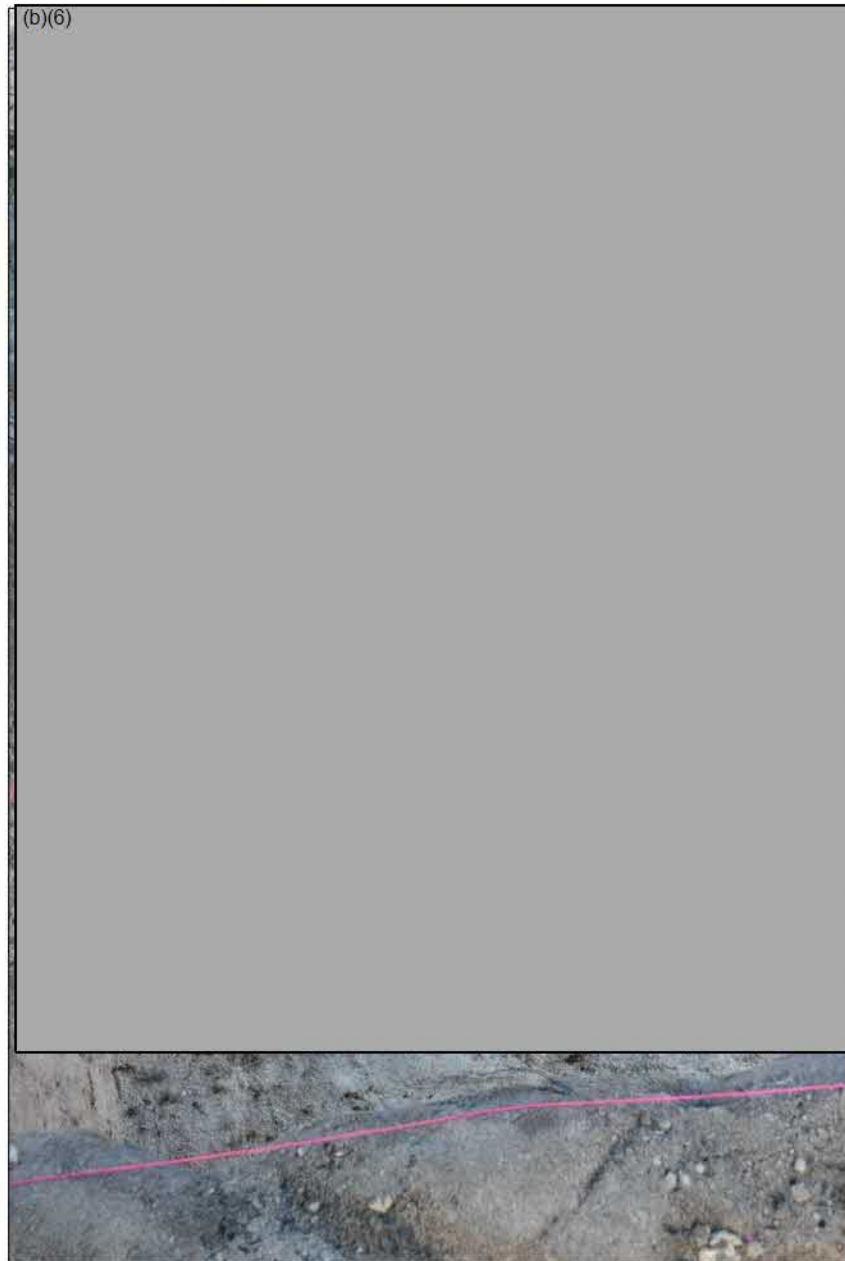


Figure 57. Marine Trench Burial Individuals #2, #3 #4, and #5 showing poncho shrouded burials in alternating north-south orientations. Note the arms of Individual #2 are on the upper right of the photograph.

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Figure 58. Marine Trench Burial Individual #4 showing degree of in-situ conservation.

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Figure 59. Marine Trench Burial Individuals #5, #6 and #7 showing degree of preservation with *in-situ* poncho shrouds, consistent north-south orientation and surrounding matrix conditions.

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Figure 60. Lateral view of Marine Trench Burial Individuals #5, #6 and #7.

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Figure 61. Marine Trench Burial Individuals #7, #8 and #9 showing degree of in-situ conservation, shrouded ponchos and burial orientation.

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Figure 62. Lateral view of Marine Trench Burial Individual #7 showing degree of in-situ conservation, body orientation and stratigraphic context.

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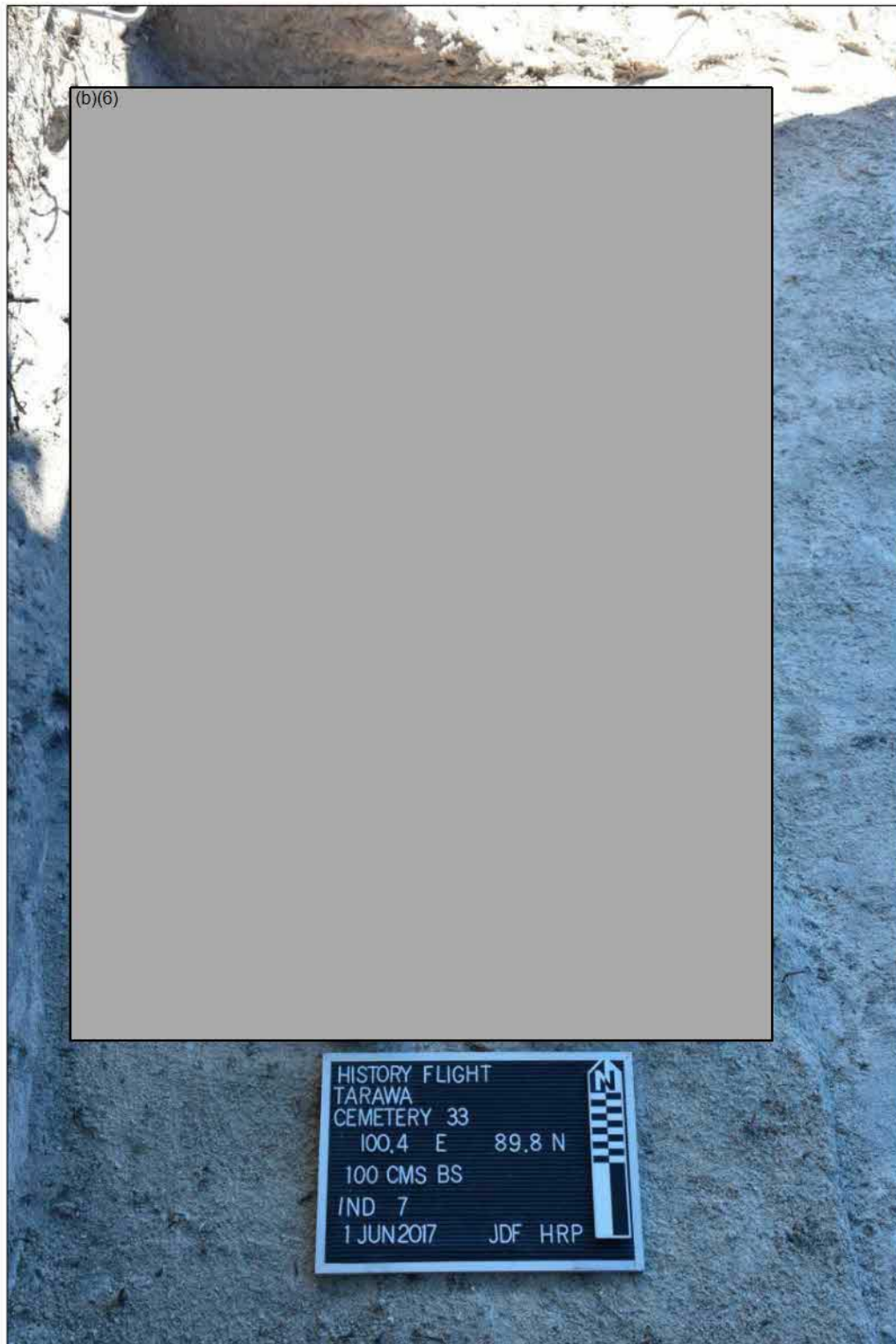


Figure 63. North-south view of Marine Trench Burial Individual #7 with poncho shroud removed showing degree of articulation and orientation.

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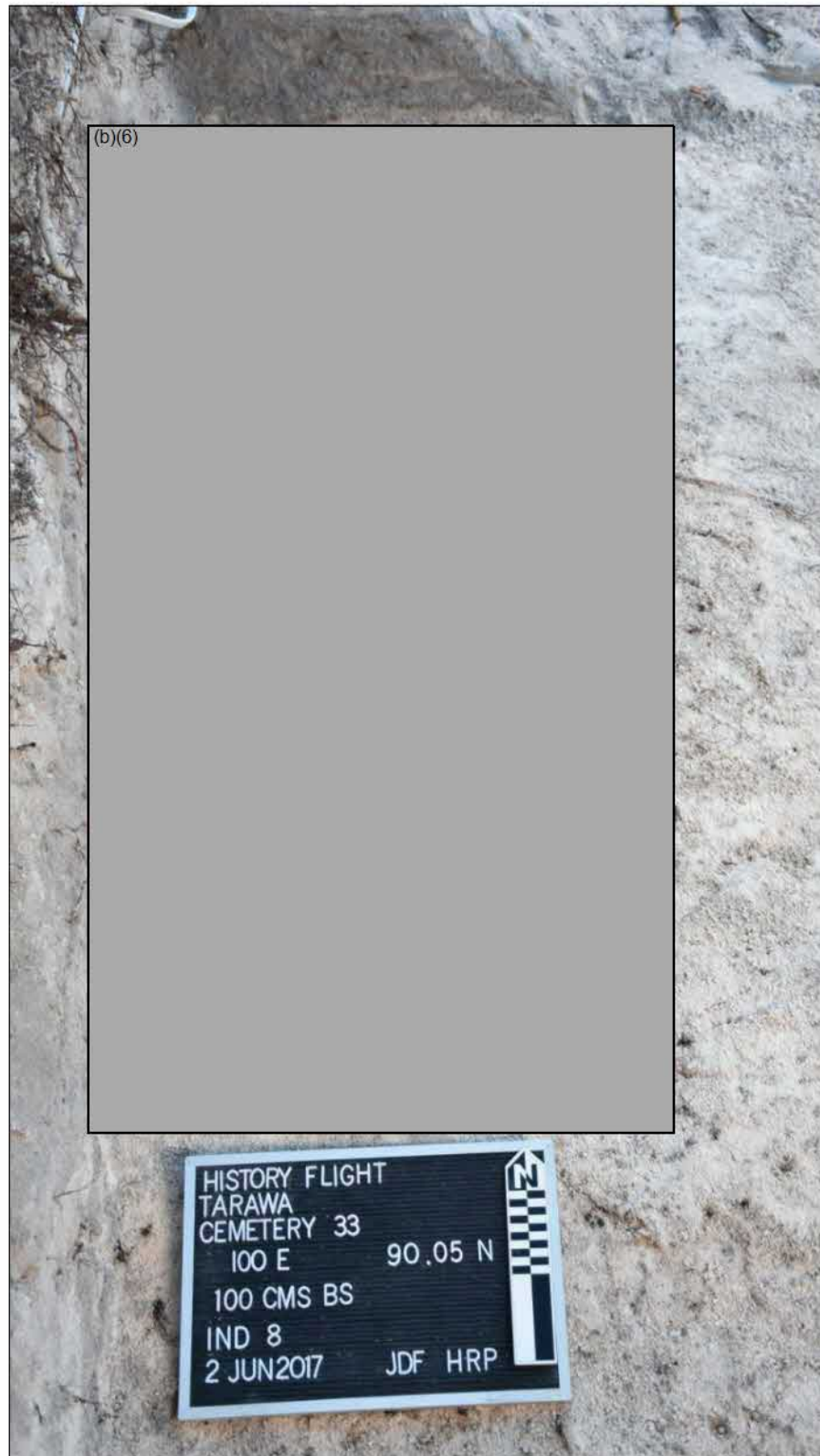


Figure 64. Marine Trench Burial Individual #8 showing degree of conservation once burial poncho shroud removed.

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Figure 65. Marine Trench Burial Individual #9 showing degree of conservation once poncho removed, orientation and stratigraphic matrix.

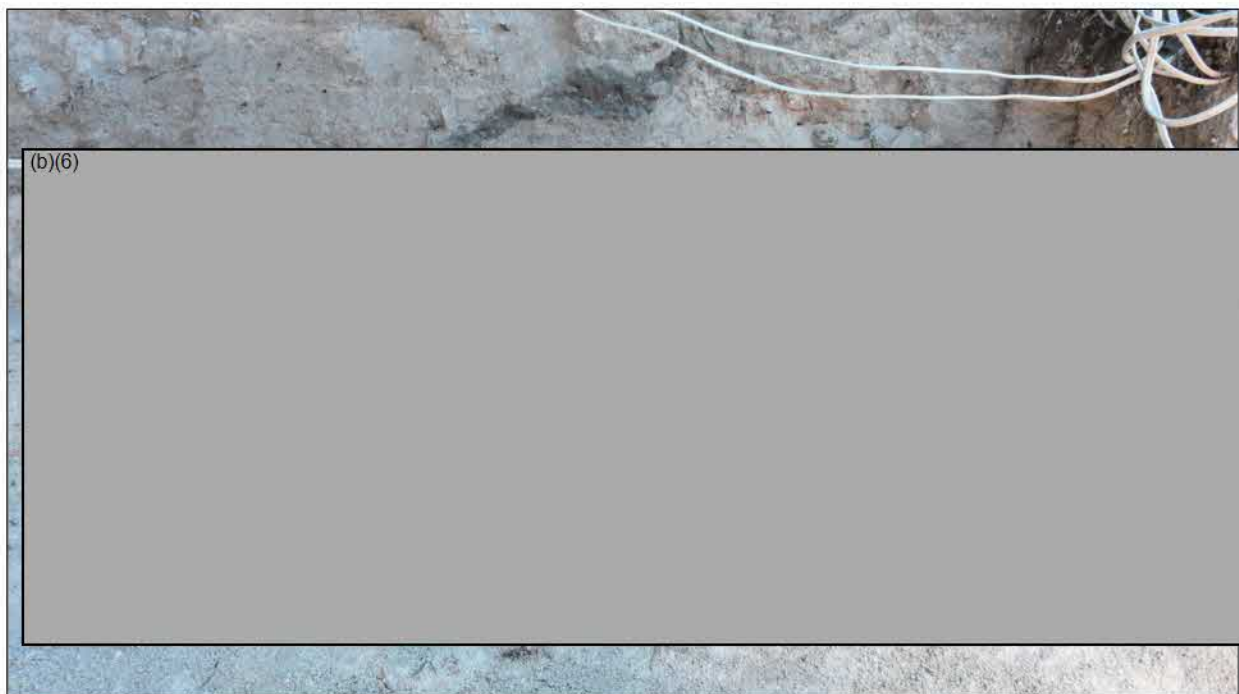


Figure 66. Lateral view of Marine Trench Burial Individuals #9 and #10 showing stratigraphic context.

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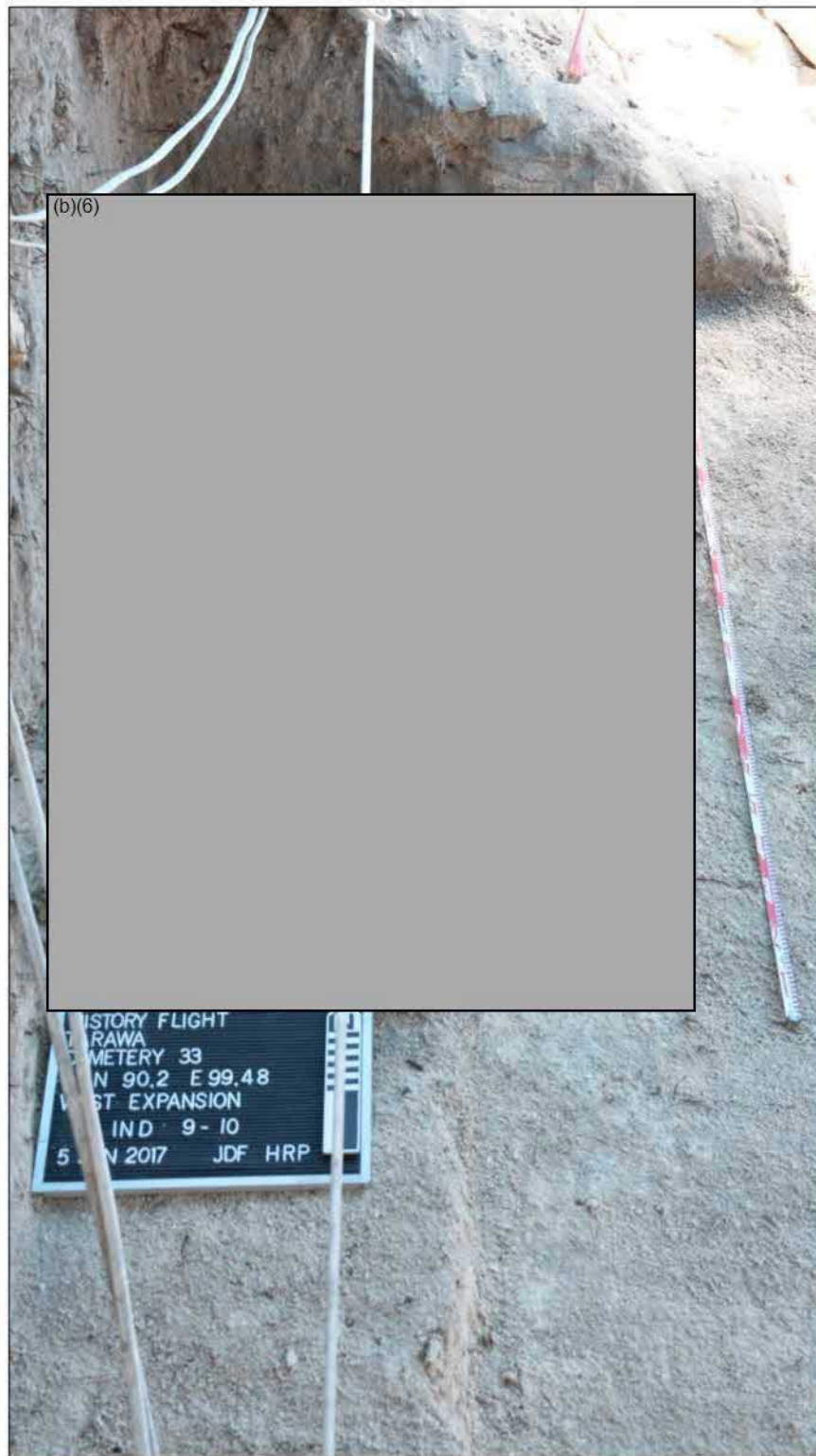


Figure 67. View of in-situ burials of Marine Trench Burial Individuals #9 and #10 showing burial orientations.

USMC Gear: Canteen, “782” gear



Figure 68. Representative compilation of the 12 burials and associated material evidence recovered from Cemetery 33. Scales are cm.

American USMC ‘Cord’ type boots



Figure 69. Representative compilation of the 12 burials and associated material evidence recovered from Cemetery 33. Scales are cm.

USMC "Cord" Type Boots, "782" Gear



Figure 70. Representative compilation of the 12 burials and associated material evidence recovered from Cemetery 33. Scales are cm.

USMC Gear: Gas Mask, Canteen, E-Tool, Boots



Figure 71. Representative compilation of the 12 burials and associated material evidence recovered from Cemetery 33. Scales are cm.

USMC Gear: “Cord” type boots, Bayonet scabbard, ammunition, nylon toothbrush



Figure 72. Representative compilation of the 12 burials and associated material evidence recovered from Cemetery 33. Scales are cm.

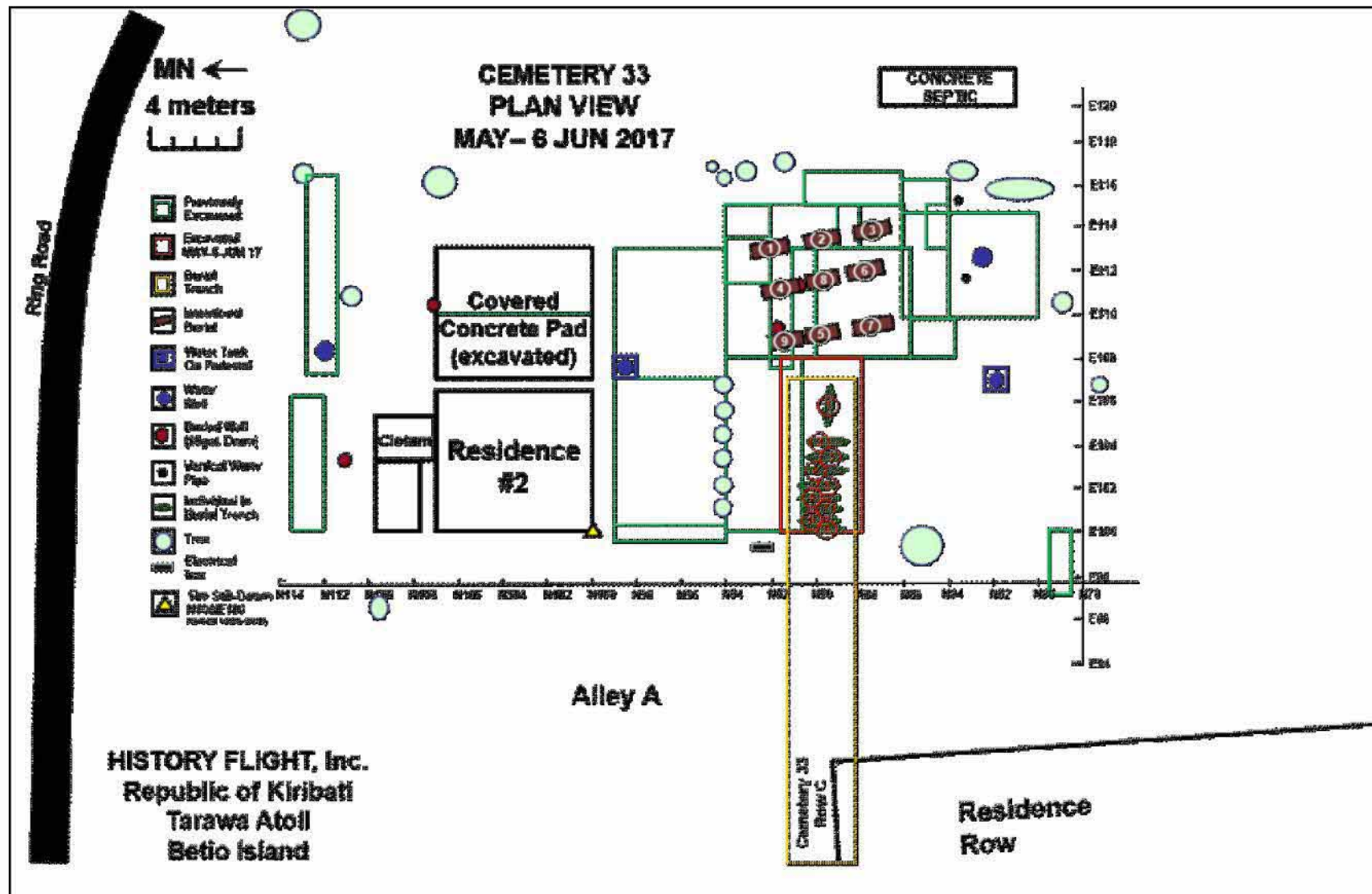


Figure 73. Cemetery 33 project area; May-6 June 2017.

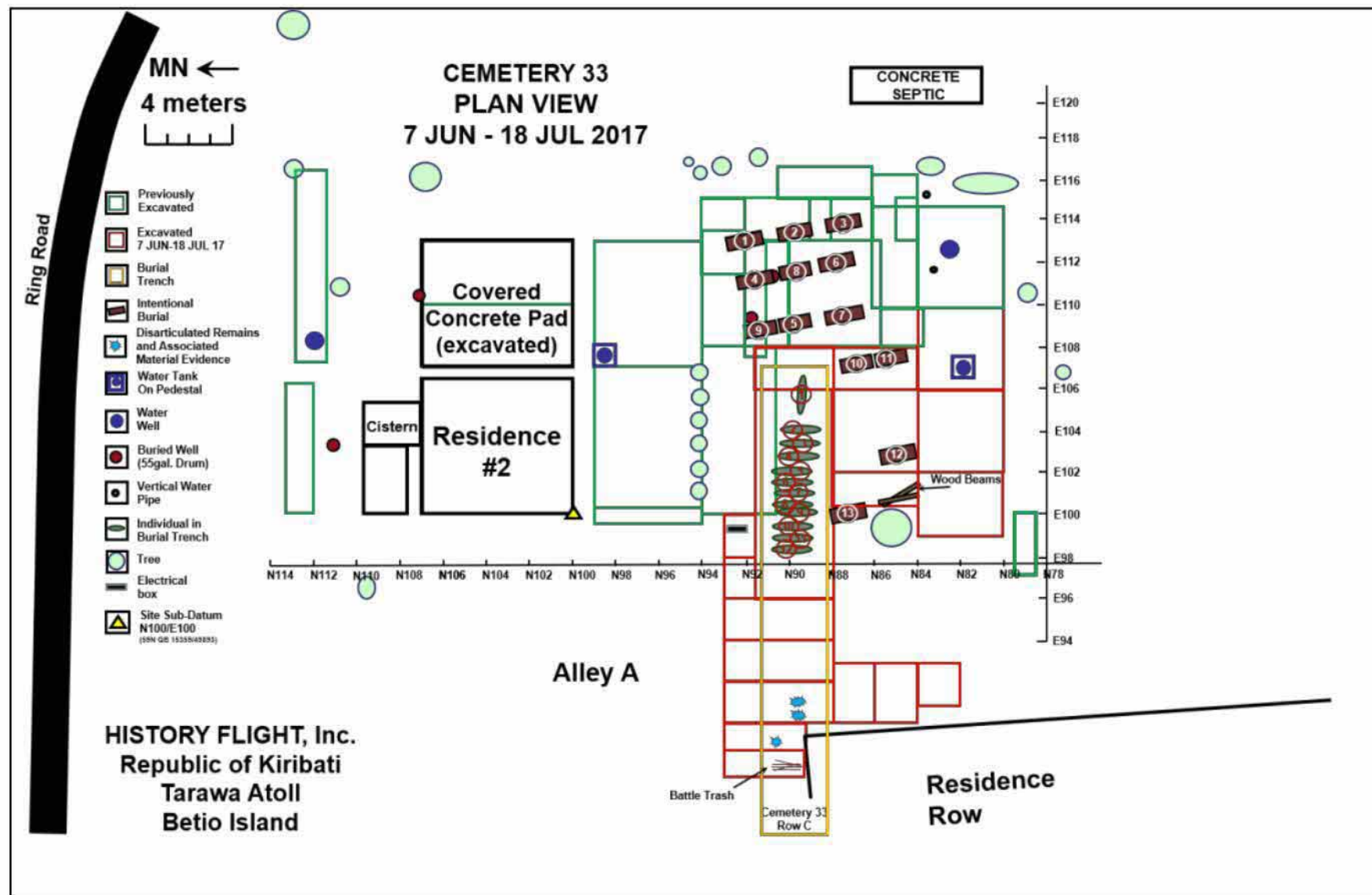


Figure 74. Cemetery 33 project area; 7 June-18 July 2017.

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Figure 75. Isolated U.S. poncho material in unit N88-91.5/E98-100.

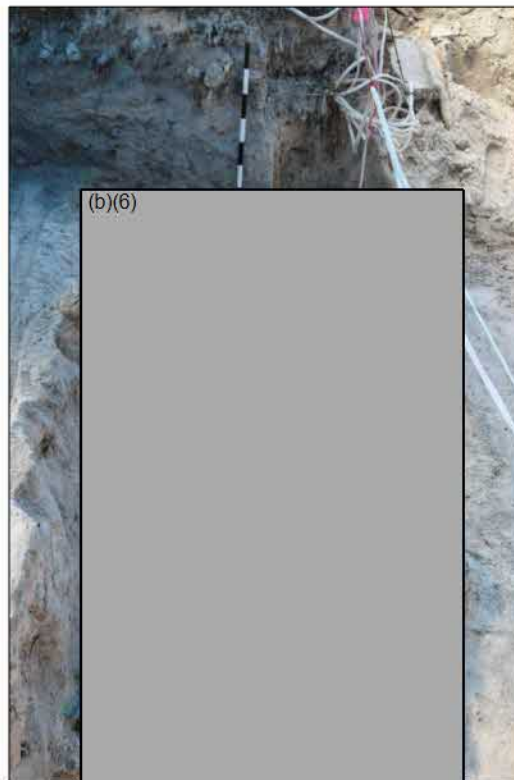


Figure 78. Exposed U.S. poncho-wrapped remains in unit N88-91.5/E98-100, between 100 and 120 cmbs. Two individuals and the legs of a third can be seen.

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Figure 77. Field excavation photograph showing exposure of the Cemetery 33 Marine Burial Trench Individual #10. Yellow arrow points to identification tag.

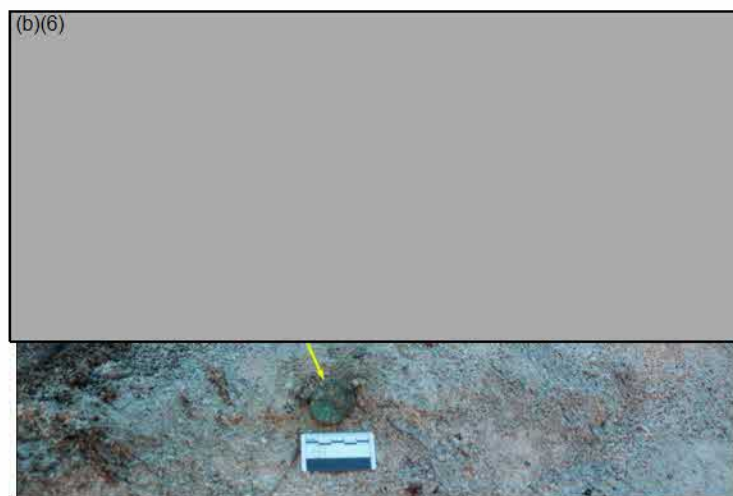


Figure 78. Close-up photograph showing identification tag in reference to the remains of Marine Burial Trench Individual #10.

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Figure 79. Field excavation photograph showing exposure of the Cemetery 33 Marine Burial Trench Individual #11.

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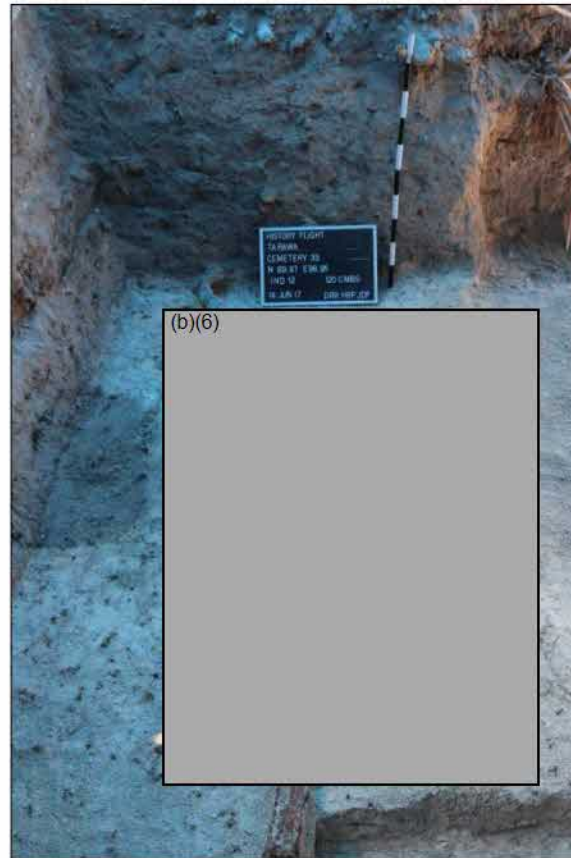


Figure 80. Field excavation photograph showing exposure of the Cemetery 33 Marine Burial Trench Individual #12.

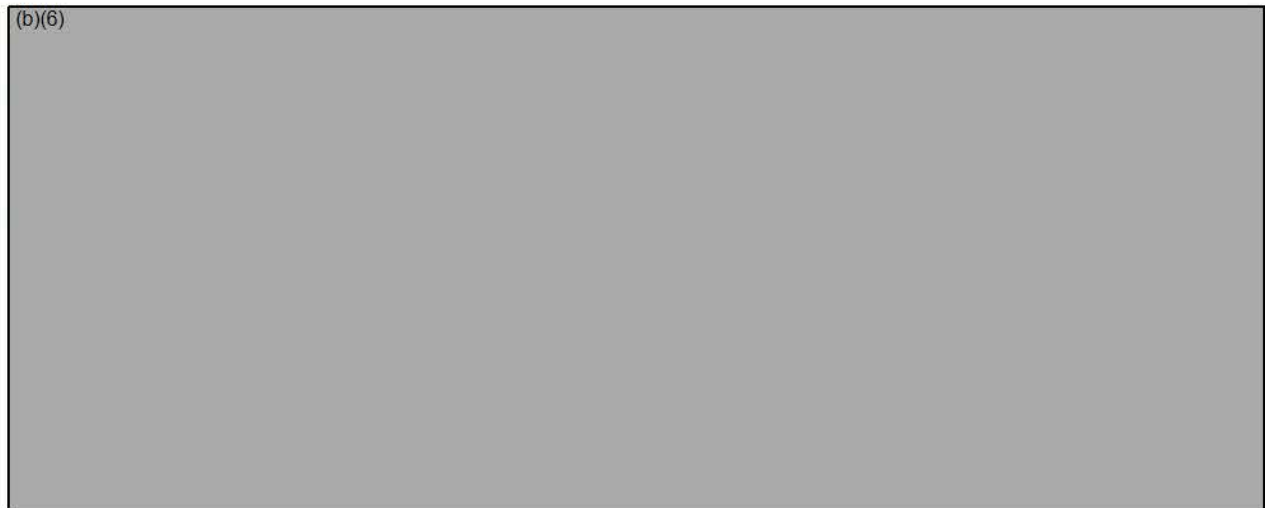


Figure 81. Close-up photograph showing tree root growing through the remains (a), and cranial fragments embedded in the root (b) associated with Cemetery 33 Marine Burial Trench Individual #12.

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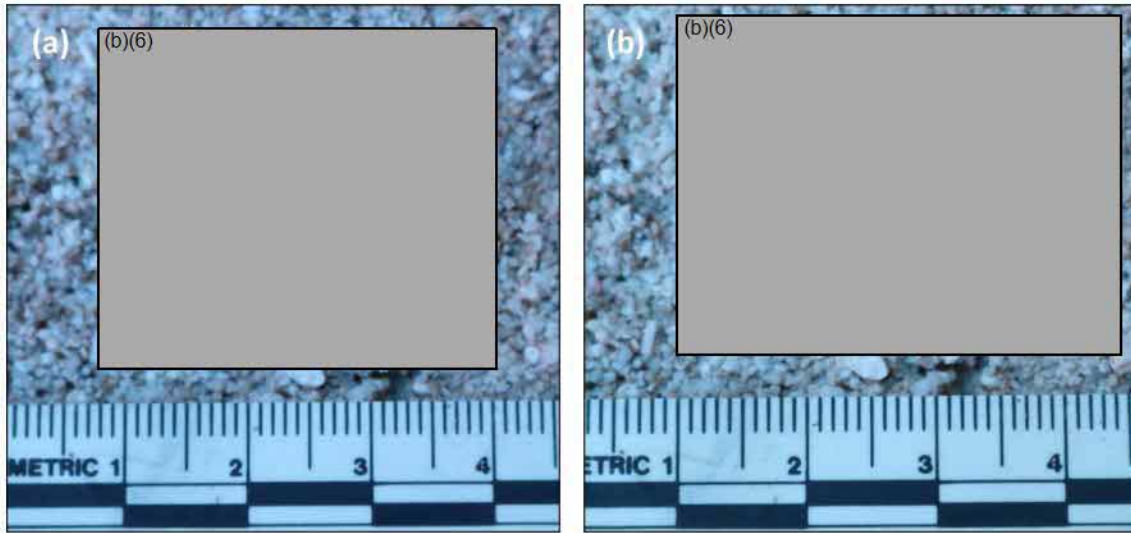


Figure 82. Dental remains associated with Cemetery 33 Marine Burial Trench Individual #12; (a) buccal surface, and (b) lingual surface.

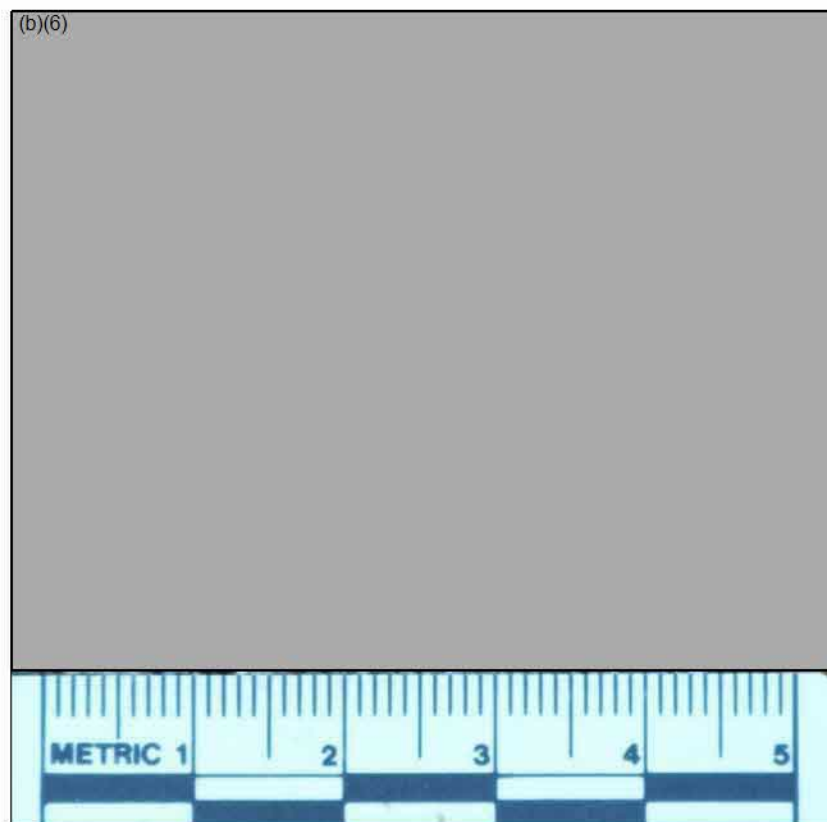


Figure 83. Finger ring associated with Cemetery 33 Marine Burial Trench Individual #12, *in situ*.

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Figure 84. Cemetery 33 project area completed excavation unit N88-91.5/E98-100. Orange line shows the contour of the burial trench in the west wall. Yellow line shows a previous, intrusive pit which missed Marine Burial Trench Individual #12 by approximately 20 cm.



Figure 85. Cemetery 33 project area excavations across Alley A. Example showing Marine Burial Trench (west wall profile) and several previous archaeological test excavations (pits) in the floor and south wall of the excavation unit.

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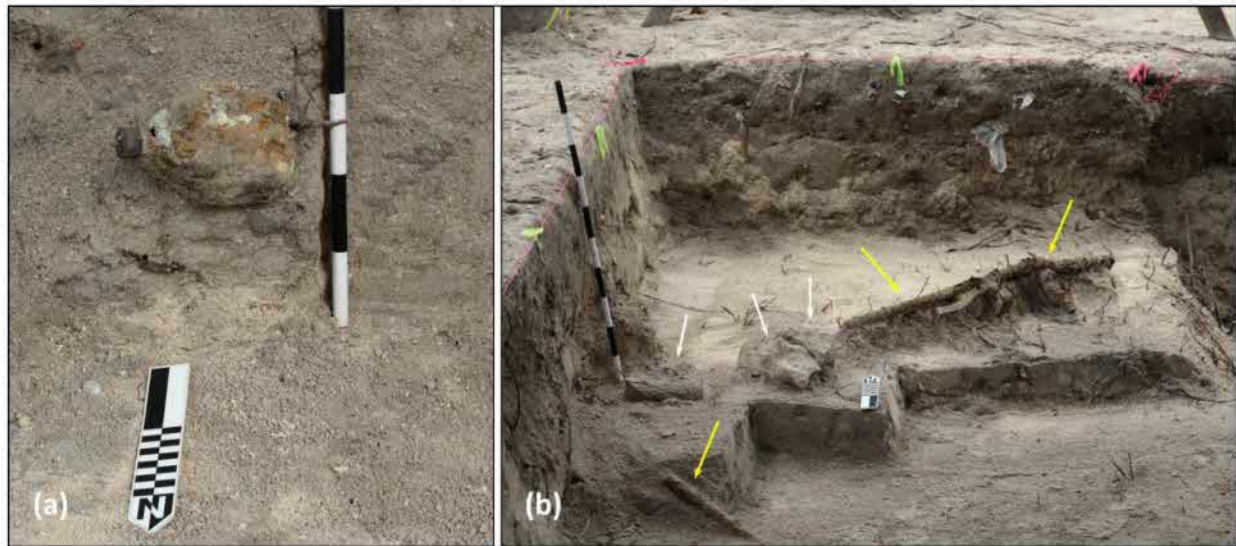


Figure 86. Excavation unit N88-93/E90-92; (a) U.S. style canteen (782 gear), and (b) cemetery marker stones (coral, white arrows) and corroded U.S. litter frames (yellow arrows).



Figure 87. Excavation unit N88-93/E90-92. Exposed burial artifacts and four U.S. boots with remains associated with each (red arrows).

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Figure 88. Excavation unit N88-93/E89-90. A badly degraded portion of U.S. boot associated with bones of one foot (yellow arrow).



Figure 89. Excavation unit N89.5-93/E88-89.5. Exposed burial artifacts and one U.S. boot with associated remains (yellow arrow). White lines define previous History Flight, Inc. excavation activities. Gold line shows remaining contour of the north side of the original burial trench (“Cemetery 33 Row C”). Red line indicates margins of a modern trash pit. Blue arrow points to blue nitrile glove placed by a previous HFRT.

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Figure 90. Excavation unit N89.5-93/E88-89.5, showing extent this HFRT pursued the Marine Burial Trench/Cemetery 33 Row C toward the west. Photograph shows sterile soil conditions in the floor at 120 cmbs.



Figure 91. Cemetery 33 project area excavations on the east side of residence row, N82-88. View is toward the southwest.

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Figure 92. Excavation unit N84-88/E106-110 showing partial exposure of Cemetery 33 Individual Burials #10 (yellow arrows) and #11 (red arrows). White dotted line defines the narrow separation of the two.



Figure 93. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #10. Yellow arrow indicates associated identification tag.

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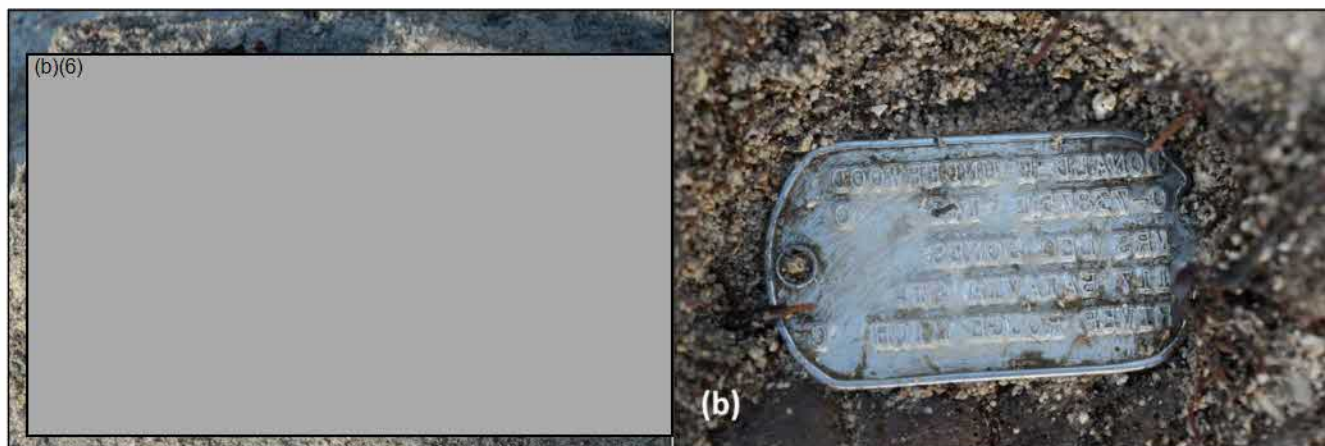


Figure 94. Field photographs showing the *in situ* identification tag associated with Cemetery 33 Individual Burial #10; (a) general location, (b) detailed close-up.



Figure 95. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #11.

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Figure 96. Excavation unit N84-88/E102-106 showing discovery of the Cemetery 33 Individual Burial #12 feature. The white arrows indicate the stain from the backfill of the actual burial cavity. The yellow arrows indicate the stain left by the decomposition of the burial coffin.



Figure 97. Field recovery of Cemetery 33 Individual Burial #12 in progress; (a) excavation of the soil matrix surrounding the remains, and (b) careful exposure of the skeletal remains themselves. Note the rise and fall of the groundwater table.

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Figure 98. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #12.



Figure 99. Cemetery 33 excavation of N84-88/E100.5-106. White dotted line indicates one of the short trenches for burying individuals outside the Marine Burial Trench feature. Red arrows show large wood planks *in situ*. Yellow arrow shows southeast corner of wood coffin for Cemetery 33 Individual Burial #13, located under a very large breadfruit tree.



Figure 100. Cemetery 33 project area. Backfilling and land- restoration activities while awaiting Kiribati government approval to remove the very large breadfruit tree (upper left). The view is toward the northwest.



Figure 101. Excavation unit N84-88/E96-100.75. The breadfruit tree on the upper right of the photograph is cut-down and recovery efforts for Cemetery 33 Individual #13 resumed.

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Figure 102. Field excavation photograph showing exposure of the Cemetery 33 Individual Burial #13.

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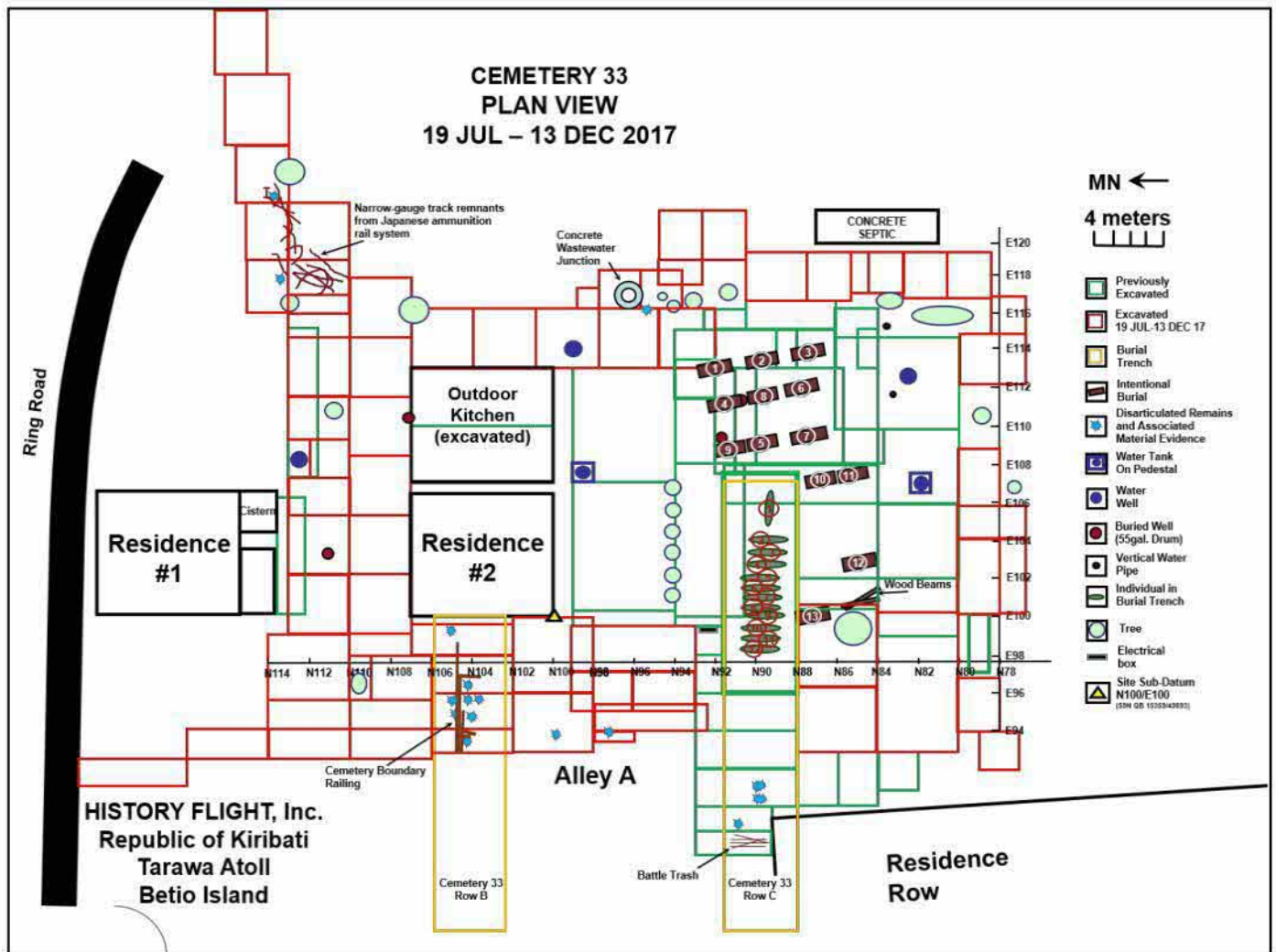


Figure 103. Cemetery 33 project area; 19 July-13 December 2017.

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Figure 104. Cemetery 33 project area excavation units N98-101/E113-116 and N101-104/E113-116 showing intrusive disturbances common to Betio Island. Yellow arrows show salt water wastewater pipes. Red arrow points to electric wire. Blue arrows point to fresh water line. Orange line indicates previous excavation test trenches. White line indicates modern trash pit, into which a trench for the fresh water line was excavated (blue line).

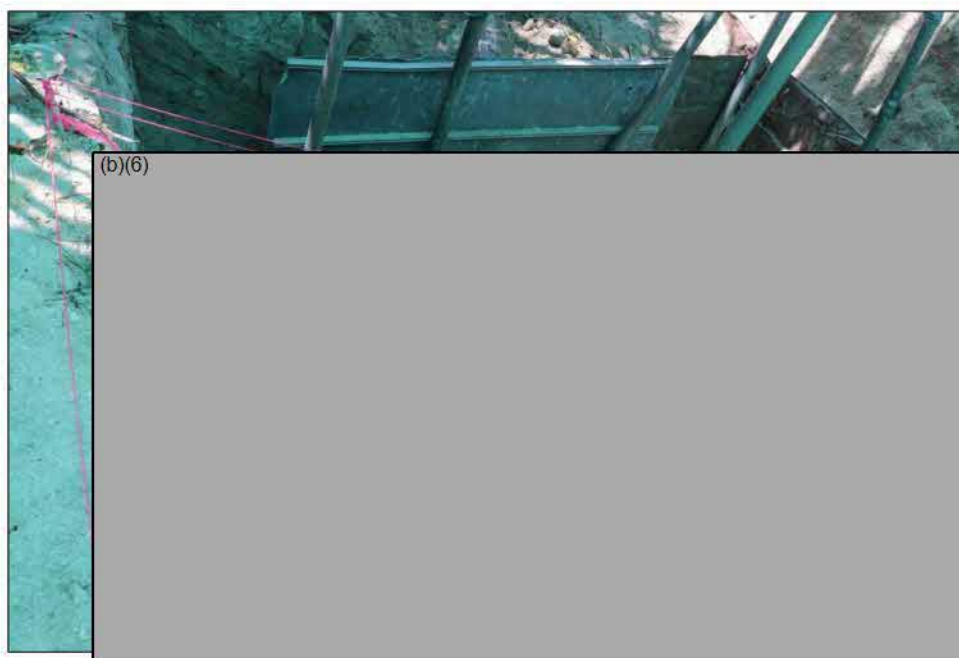


Figure 105. Cemetery 33 project area excavation of unit N95-98/E113-116, containing disarticulated skeletal remains and associated Japanese material evidence.

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Figure 106. Cemetery 33 project area excavation of concrete wastewater junction; N94-96/E116-118.



Figure 107. Cemetery 33 project area; demolition and removal of the cistern and planter on the north side of Residence #2.

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Figure 108. Cemetery 33 project area excavation unit N110-113/E111-116; yellow arrows indicate suspicious sub-surface disturbance feature.

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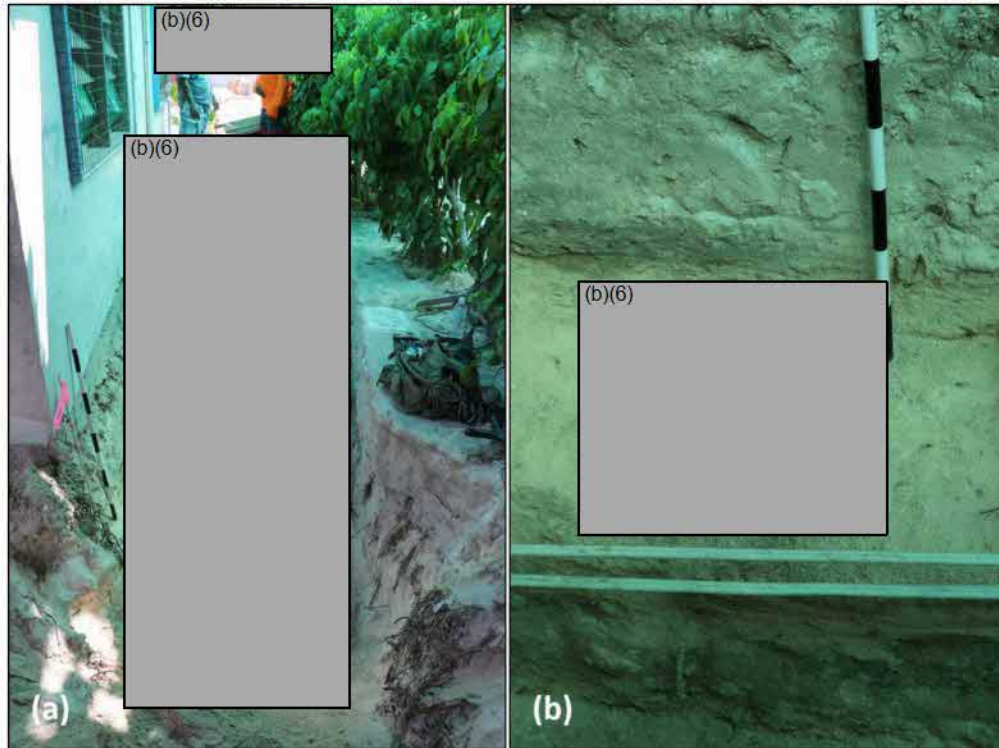


Figure 109. Cemetery 33 project area excavation unit N102-106/E98-99.5; (a) recovery of skeletal remains and associated boot portions (yellow arrow) within a burial trench feature, and (b) close-up photograph of the skeletal remains and boot portions. The white wires are live 240V electric lines.

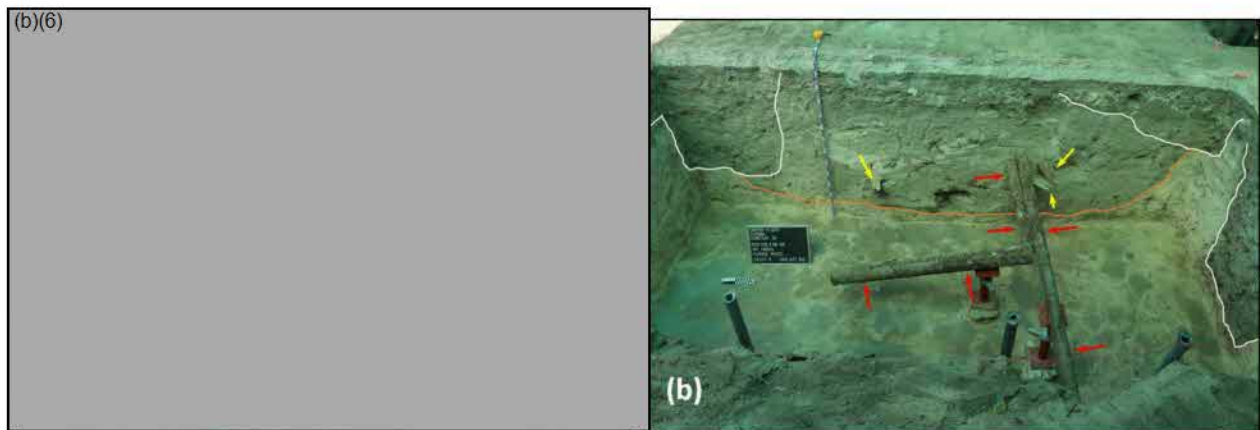


Figure 110. Cemetery 33 project area excavation unit N102-106/E96-98; (a) close-up photograph showing scattered, disarticulated skeletal remains near the bottom of the burial trench at approximately 127 cmbs, and (b) unit closing photograph at 140 cmbs with remains removed. The yellow arrows indicate portions of wood cemetery crosses. The red arrows designate former cemetery boundary metal railing. The orange line shows the burial trench contour. And the white lines show previous exploratory archaeological test trenches or pits.

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Figure 111. Cemetery 33 project area excavation unit N102-106/E94-96, skeletal remains and associated material evidence exposed at the bottom of the burial trench feature; (a) view is toward the south, and (b) view is directly downward. Red arrows indicate skeletal elements and groupings.



Figure 112. Cemetery 33 project area excavation unit N102-106/E94-96. Orange line indicates the contour of the burial trench feature. White line shows disturbances from previous archaeological test excavations. White dotted line defines track of a corner of a test trench cutting across the burial trench feature.



Figure 113. Evidence remaining after screening a portion of backfill from previous exploratory excavations cutting through the Cemetery 33, Row B burial trench feature.

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Figure 114. Excavation unit N102-106/E93-94, with exposed metal cemetery border railing (red arrows). Yellow lines define Cemetery 33 Row B burial trench contour. Yellow dotted-lines indicate burial trench margins in the excavation unit floor at this depth. White lines define previous exploratory test trenches/pits. View is toward the south.



Figure 115. Cemetery 33 unit N96-98/E93.5-94 showing scattered skeletal elements (red arrows) and one BAR-type magazine (yellow arrow) at approximately 100 cmbs.



Figure 116. Cemetery 33 unit N110-113/E116-119; probable destroyed Japanese ammunition rail system. View is to the north.

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Figure 117. Cemetery 33 project area excavation unit N113-115.5/E122-125; wheel assembly from a probable Japanese track cart.

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Table 1. Possible human remains recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.**

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
17 FEB 17	N91-92/E107.5-113	110-120	Individual Burial #4
18 FEB 17	N91-92/E107.5-113	110-120	Individual Burial #4
25 FEB 17	N92-94/E111.5-115	110-120	Individual Burial #1
25 FEB 17	N89-92/E113-115	110-120	Individual Burial#1
25 FEB 17	N91-92/E107.5-113	110-120	Individual Burial #1
2 MAR 17	N89-92/E113-115	110-120	Individual Burial #2
8 MAR 17	N86-89/E113-115	110-120	Individual Burial #3
9 MAR 17	N86-89/E113-115	110-120	Individual Burial #3
27 MAR 17	N85-90/E108-113	120-130	Individual Burial #5
1 APR 17	N90-92/E108-113	120-130	Individual Burial #5
27 MAR 17	N85-92/E108-113	110-120	Individual Burial #6
27 MAR 17	N85-92/E108-113	110-120	Individual Burial #7
31 MAR 17	N85-92/E108-113	120-130	Individual Burial #8
1 APR 17	N90-92/E108-113	120-130	Individual Burial #9
8 APR 17	N92-94/E108-113.5	120-130	Individual Burial #9
14 JUN 17	N84-88/E106-110	120-130	Individual Burial #10
17 JUN 17	N84-88/E106-110	120-130	Individual Burial #11
27 JUN 17	N84-88/E102-106	120-130	Individual Burial #12
28 JUL 17	N84-88/E96-100.75	130-140	Individual Burial #13
21 MAY 17	N90.7-87.7/E103.2-106.9	120	Marine Trench Burial #1
21 MAY 17	N90.7-87.7/E103.2-106.9	120	Marine Trench Burial #2
23 MAY 17	N90.7-87.7/E103.2-102.2	100	Marine Trench Burial #3
23 MAY 17	N90.7-87.7/E103.2-102.2	100	Marine Trench Burial #4
23 MAY 17	N90.7-87.7/E103.2-102.2	100	Marine Trench Burial #5
28 MAY 17	N90.7-87.7/E102-100	100	Marine Trench Burial #6
1 JUNE 17	N89.9/E100.4	100	Marine Trench Burial #7
2 JUNE 17	N90.05/E100	100	Marine Trench Burial #8
5 JUNE 17	N90.2/E99.48	100	Marine Trench Burial #9
12 JUN 17	N90.23/E99.72	110-120	Marine Trench Burial #10
13 JUN 17	N90.12/E99.35	110-120	Marine Trench Burial #11
14 JUN 17	N89.87/E98.95	110-120	Marine Trench Burial #12
24 MAR 17	N85-90/E108-113	25-40	Possible Human Remains
8 JUN 17	N88-92/E107-109	50-100	Possible Human Remains
9 JUN 17	N88-91.5/E98-100	100-110	Possible Human Remains
17 JUN 17	N88-91.5/E96-97	70-80	Possible Human Remains
27 JUN 17	N80-84/E102-106	45	Possible Human Remains

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Table 1. Possible human remains recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.**

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
6 JUL 17	N88-93/E90-92	70-100	Possible Human Remains
7 JUL 17	N88-93/E90-92	95-110	Possible Human Remains
8 JUL 17	N88-93/E89-90	50-110	Possible Human Remains
10 JUL 17	N89.5-93/E88-89	40	Possible Human Remains
13 JUL 17	N84-86.5/E115-116.5	80	Possible Human Remains
14 JUL 17	N84-86/E90-93	0-50	Possible Human Remains
30 SEP 17	N92-95/E113-116	80-120	Possible Human Remains
2 OCT 17	N95-98/E113-116	0-10	Possible Human Remains
3 OCT 17	N95-98/E113-116	20-100	Possible Human Remains
4 OCT 17	N95-98/E113-116	80-130	Possible Human Remains
6 OCT 17	N98-101/E113-116	40-60	Possible Human Remains
7 OCT 17	N98-101/E113-116	120-130	Possible Human Remains
9 OCT 17	N101-104/E113-116	120	Possible Human Remains
10 OCT 17	N101-104/E113-116	80-90	Possible Human Remains
11 OCT 17	N101-104/E113-116	120	Possible Human Remains
14 OCT 17	N94-96/E116-118	70-85	Possible Human Remains
16 OCT 17	N94-96/E116-118	85-110	Possible Human Remains
17 OCT 17	N96-98/E116-118	80-100	Possible Human Remains
18 OCT 17	N98-99/E116-117	80-90	Possible Human Remains
24 OCT 17	N102-106/E98-99	0-70	Possible Human Remains
25 OCT 17	N102-106/E98-99	70-100	Possible Human Remains
25 OCT 17	N102-106/E99-99.5	85-90	Possible Human Remains
26 OCT 17	N102-106/E96-98	0-60	Possible Human Remains
27 OCT 17	N102-106/E96-98	70-127	Possible Human Remains
28 OCT 17	N102-106/E96-98	125-135	Possible Human Remains
30 OCT 17	N98-102/E96-100	0-50	Possible Human Remains
31 OCT 17	N98-102/E96-100	65-100	Possible Human Remains
3 NOV 17	N106-110/E95.5-98	0-60	Possible Human Remains
3 NOV 17	N102-106/E94-96	20-60, 115-135	Possible Human Remains
4 NOV 17	N102-106/E94-96	115-135	Possible Human Remains
08 NOV 17	N102-106/E93-94	70	Possible Human Remains
08 NOV 17	N102-106/E93-94	120	Possible Human Remains
09 NOV 17	N102-106/E93-94	100	Possible Human Remains
09 NOV 17	N98-102/E93-96	25	Possible Human Remains
10 NOV 17	N98-102/E93-96	40-110	Possible Human Remains
14 NOV 17	N92.5-98/E94-95.5	60	Possible Human Remains

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Table 1. Possible human remains recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.**

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
15 NOV 17	N92.5-98/E94-95.5	65	Possible Human Remains
15 NOV 17	N92.5-98/E94-95.5	100	Possible Human Remains
15 NOV 17	N96-98/E93.5-94	100	Possible Human Remains
16 NOV 17	N92.5-98/E94-95.5	120	Possible Human Remains
27 NOV 17	N113-115.5/E122-125	80	Possible Human Remains
08 DEC 17	N113-115/E116-119	25-105	Possible Human Remains

Table 2. Possible material evidence recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
17 FEB 17	N91-92/E107.5-113	110-120	Possible Material Evidence
18 FEB 17	N91-92/E107.5-113	110-120	Possible Material Evidence
25 FEB 17	N92-94/E111.5-115	110-120	Possible Material Evidence
25 FEB 17	N89-92/E113-115	110-120	Possible Material Evidence
25 FEB 17	N91-92/E107.5-113	110-120	Possible Material Evidence
2 MAR 17	N89-92/E113-115	110-120	Possible Material Evidence
8 MAR 17	N86-89/E113-115	110-120	Possible Material Evidence
9 MAR 17	N86-89/E113-115	110-120	Possible Material Evidence
24 MAR 17	N85-90/E108-113	25-60	Possible Material Evidence
25 MAR 17	N85-90/E108-113	70-110	Possible Material Evidence
26 MAR 17	N85-90/E108-113	110-120	Possible Material Evidence
27 MAR 17	N85-90/E108-113	110-130	Possible Material Evidence
27 MAR 17	N85-92/E108-113	110-120	Possible Material Evidence
28 MAR 17	N90-92/E108-113	120	Possible Material Evidence
30 MAR 17	N90-92/E108-113	80-120	Possible Material Evidence
30 MAR 17	N85-92/E108-113	130	Possible Material Evidence
31 MAR 17	N85-92/E108-113	120-130	Possible Material Evidence
31 MAR 17	N90-92/E108-113	120-130	Possible Material Evidence
1 APR 17	N90-92/E108-113	120-130	Possible Material Evidence
7 APR 17	N92-94/E108-113.5	0-80	Possible Material Evidence
8 APR 17	N92-94/E108-113.5	120-130	Possible Material Evidence
10 APR 17	N92-94/E108-113.5	125-140	Possible Material Evidence
11 APR 17	N90.7-94/E100-108	0-30	Possible Material Evidence
12 APR 17	N90.7-94/E100-108	0-25	Possible Material Evidence
13 APR 17	N90.7-94/E100-108	0-55	Possible Material Evidence

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Table 2. Possible material evidence recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.**

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
14 APR 17	N90.7-94/E100-108	50-65	Possible Material Evidence
17 APR 17	N90.7-94/E100-108	0-95	Possible Material Evidence
8 JUN 17	N88-92/E107-109	50-100	Possible Material Evidence
9 JUN 17	N88-91.5/E98-100	60	Possible Material Evidence
10 JUN 17	N88-91.5/E98-100	120	Possible Material Evidence
12 JUN 17	N88-91.5/E98-100	120	Possible Material Evidence
13 JUN 17	N88-91.5/E98-100	120	Possible Material Evidence
14 JUN 17	N88-91.5/E98-100	110-120	Possible Material Evidence
14 JUN 17	N84-88/E106-110	120-130	Possible Material Evidence
16 JUN 17	N88-91.5/E98-100	60-70	Possible Material Evidence
17 JUN 17	N84-88/E106-110	120-130	Possible Material Evidence
19 JUN 17	N91.5-93/E96-98	50-100	Possible Material Evidence
20 JUN 17	N84-88/E106-110	30-60	Possible Material Evidence
21 JUN 17	N80-84/E106-110	60	Possible Material Evidence
22 JUN 17	N84-88/E106-110	0-50	Possible Material Evidence
26 JUN 17	N84-88/E100.5-102	80-120	Possible Material Evidence
27 JUN 17	N80-84/E102-106	45	Possible Material Evidence
27 JUN 17	N84-88/E102-106	120-130	Possible Material Evidence
27 JUN 17	N84-88/E106-110	95-125	Possible Material Evidence
30 JUN 17	N88-93/E94-96	50-80	Possible Material Evidence
1 JUL 17	N88-93/E94-96	80-100	Possible Material Evidence
3 JUL 17	N88-93/E92-94	0-50	Possible Material Evidence
4 JUL 17	N88-93/E92-94	50-100	Possible Material Evidence
5 JUL 17	N88-93/E92-94	100-130	Possible Material Evidence
5 JUL 17	N88-93/E90-92	0-60	Possible Material Evidence
6 JUL 17	N88-93/E92-94	60-100	Possible Material Evidence
7 JUL 17	N88-93/E90-92	95-125	Possible Material Evidence
8 JUL 17	N88-93/E89-90	0-110	Possible Material Evidence
10 JUL 17	N89.5-93/E88-89	0-50	Possible Material Evidence
11 JUL 17	N86-88/E90-93	0-20	Possible Material Evidence
13 JUL 17	N84-86.5/E115-116.5	80	Possible Material Evidence
13 JUL 17	N86-88/E90-93	0-30	Possible Material Evidence
14 JUL 17	N84-86/E90-93	30-50	Possible Material Evidence
14 JUL 17	N86-88/E90-93	95-120	Possible Material Evidence
15 JUL 17	N84-86/E90-93	50-100	Possible Material Evidence
17 JUL 17	N84-86/E90-93	100-135	Possible Material Evidence

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Table 2. Possible material evidence recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.**

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
28 JUL 17	N84-88/E96-100.75	130-140	Possible Material Evidence
29 SEP 17	N107-110/E105-108	0-100	Possible Material Evidence
29 SEP 17	N92-95/E113-116	0-60	Possible Material Evidence
30 SEP 17	N92-95/E113-116	103-120	Possible Material Evidence
2 OCT 17	N95-98/E113-116	0-10	Possible Material Evidence
3 OCT 17	N95-98/E113-116	40-100	Possible Material Evidence
4 OCT 17	N95-98/E113-116	80-130	Possible Material Evidence
5 OCT 17	N95-98/E113-116	100-145	Possible Material Evidence
6 OCT 17	N95-98/E113-116	60-90	Possible Material Evidence
6 OCT 17	N98-101/E113-116	0-50	Possible Material Evidence
7 OCT 17	N98-101/E113-116	120-130	Possible Material Evidence
7 OCT 17	N107-110/E114-117	0-60	Possible Material Evidence
9 OCT 17	N101-104/E113-116	0-30	Possible Material Evidence
9 OCT 17	N107-110/E114-117	0-90	Possible Material Evidence
10 OCT 17	N101-104/E113-116	60-90	Possible Material Evidence
10 OCT 17	N107-110/E114-117	90-120	Possible Material Evidence
12 OCT 17	N104-107/E113-116	30-60	Possible Material Evidence
12 OCT 17	N110-113/E111-114	0-50	Possible Material Evidence
14 OCT 17	N94-96/E116-118	60-110	Possible Material Evidence
16 OCT 17	N94-96/E116-118	90-120	Possible Material Evidence
16 OCT 17	N102-105/E107-110	0-30	Possible Material Evidence
17 OCT 17	N96-98/E116-118	120-130	Possible Material Evidence
17 OCT 17	N107-110/E102-105	60-90	Possible Material Evidence
19 OCT 17	N110-113/E99-102	0-90	Possible Material Evidence
19 OCT 17	N110-113/E105-107	90-120	Possible Material Evidence
21 OCT 17	N110-113/E102-105	30-60	Possible Material Evidence
23 OCT 17	N110-113/E102-105	100-130	Possible Material Evidence
23 OCT 17	N106-110/E98-99	30-80	Possible Material Evidence
24 OCT 17	N110-113/E109-111	0-90	Possible Material Evidence
24 OCT 17	N102-106/E98-99	0-70	Possible Material Evidence
25 OCT 17	N102-106/E98-99	70-100	Possible Material Evidence
25 OCT 17	N102-106/E99-99.5	60	Possible Material Evidence
26 OCT 17	N102-106/E96-98	0-60	Possible Material Evidence
27 OCT 17	N102-106/E96-98	100-127	Possible Material Evidence
27 OCT 17	N106-110/E94-95.5	70-100	Possible Material Evidence
28 OCT 17	N102-106/E96-98	125-135	Possible Material Evidence

*Interim Search and Recovery Report CIL 2017-232 and CIL 2017-233-R***Table 2. Possible material evidence recovered during History Flight, Inc. field operations within the Cemetery 33 Project Area.**

Date	Unit Coordinate	Depth (cmbs)	Evidence Description
30 OCT 17	N98-102/E96-100	0-50	Possible Material Evidence
1 NOV 17	N118-123/E91-92.5	0-60	Possible Material Evidence
2 OCT 17	N118-123/E91-92.5	120-135	Possible Material Evidence
3 OCT 17	N106-110/E95.5-98	0-60	Possible Material Evidence
3 OCT 17	N102-106/E94-96	20-135	Possible Material Evidence
4 OCT 17	N102-106/E94-96	115-135	Possible Material Evidence
7 NOV 17	N102-106/E93-94	0-60	Possible Material Evidence
8 NOV 17	N102-106/E93-94	40-120	Possible Material Evidence
9 NOV 17	N102-106/E93-94	100-120	Possible Material Evidence
9 NOV 17	N98-102/E93-96	20-40	Possible Material Evidence
10 NOV 17	N98-102/E93-96	40-110	Possible Material Evidence
11 NOV 17	N98-102/E93-96	80-110	Possible Material Evidence
14 NOV 17	N92.5-98/E94-95.5	20-65	Possible Material Evidence
15 NOV 17	N92.5-98/E94-95.5	60-100	Possible Material Evidence
15 NOV 17	N96-98/E93.5-94	100	Possible Material Evidence
16 NOV 17	N92.5-98/E94-95.5	100-120	Possible Material Evidence
16 NOV 17	N96-98/E93.5-94	100-120	Possible Material Evidence
23 NOV 17	N113-115.5/E122-125	0-30	Possible Material Evidence
25 NOV 17	N113-115.5/E122-125	30-70	Possible Material Evidence
27 NOV 17	N113-115.5/E122-125	70-160	Possible Material Evidence
9 DEC 17	N113-115/E116-119	50	Possible Material Evidence
11 DEC 17	N113-115/E116-119	150	Possible Material Evidence