WWII Battlefield Survey of Peleliu Island
Peleliu State, Republic of Palau

Final Report

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NOTE: Special Appendices I and II contain confidential site location information and are not intended for public distribution.

Part 1 Project Background

Introduction

The Peleliu battlefield was designated as a U.S. National Historic Landmark in February of 1985, one of less than 1,000 worldwide. In 1991 NPS evaluated the possibility of designating the battlefield as a National Historic Park, however the complexities of traditional land ownership systems on Peleliu stalled this effort. International interest in Peleliu continued to build and in December 2004 the United States Congress passed PL 108-479 which requests that the U.S. Department of Interior act to protect the National Historic Landmark and provide information to the public about the battle. In 2006 the National Park Service elevated the condition status of the battlefield to 'threatened' in its annual report to Congress.

The Peleliu War Historical Society (PWHS) is an American non-profit 501(c) 3 organization formed in 2005 for the purpose of preserving the WWII battlefield on Peleliu and fostering the public remembrance of what happened there. The PWHS was awarded a $44,000 grant in 2005 from the National Park Service American Battlefield Protection Program to develop a preservation plan for the battlefield on Peleliu (PWHS 2008). Among the recommendations of the historic preservation plan was an island-wide cultural resource inventory. Accordingly PWHS applied for and in 2008 was awarded a grant of $12,650 to do an archeological assessment of the Peleliu battlefield. Some contractors bid for the project but none were found that were willing to do the project under the terms of the grant. An agreement between PWHS and the Palau Bureau of Arts and Culture (BAC) was reached in which BAC would include the battlefield survey into their annual survey of traditional Palauan resources which typically focuses on a different Palauan state every year. The archeologist in charge at BAC was Rita Olsudong, the widely respected National Archeologist of Palau since 1997 and who sadly passed away in 2009. With Palau lacking an archeologist with the advanced academic degree required by NPS, the survey was delayed again.

In 2010, the senior author of this report, Rick Knecht, volunteered to lead the battlefield survey and the limited grant funds went toward his travel costs and those of Neil Price and Gavin Lindsay from the University of Aberdeen and Steve Cypra of PWHS. All of the off island archeologists, Knecht, Price and Lindsay on this survey had experience in WWII archeology and Knecht had served as a BAC Ethnographer on Palau for two years beginning in 2004. During the years that the project was delayed, a non-profit Demining team, Cleared Ground, had begun work clearing unexploded Ordnance (UXO) which is present in frightening quantity on Peleliu. The density of dangerous UXO was naturally highest in the areas of the battlefield where combat had been most intense. In response to this concern, supplemental funds were located by NPS for the Cleared Ground UXO experts to accompany the archeological survey team.

This report presents the results of a nine-day survey of the Peleliu battlefield that took place in December, 2010. On the average we were able to field a crew of about 20 for each of those days, including the UXO crew and Emergency Medical Technician, local guide and archeologists. We focused our efforts on areas previously documented by Denfeld in 1981 to see what sites still survived and on those areas thought most likely to have a high density of undiscovered sites. In all the survey documented we 285 WWII sites, 200 of which were

previously unrecorded by archeologists. The team members were continually amazed by the quantity and quality of the historic archeological record on Peleliu which easily deserves its reputation as the best preserved WWII battlefield remaining in the Pacific Theatre.

A number of historic and prehistoric sites were encountered in the survey that were not directly associated with WWII and these are being reported separately as part of the BAC annual survey of cultural sites made to the U.S. National Park Service. After a local review of the cultural sites, they will also be listed among the cultural and historic resources of Peleliu and will contribute to our understanding of the build-up and aftermath of the war on the community.

The Setting

The following basic geographic and historical background of Palau is described in the Peleliu Historic Preservation Plan (Farrell et. al 2008) and appears here by permission of the Peleliu War Historical Society. As the westernmost archipelago of the Caroline Islands, in western Micronesia, the Republic of Palau lies roughly 800 km equidistant from the Philippines to the west and Irian Jaya to the south. The islands of Yap and Guam lie approximately 400 km north and 800 km northeast (Figure 1.1). Eight main islands comprise the Palauan archipelago —Babeldaob, Koror, Ngerkebesang, Ngerukdabel, Mecherchar, Peleliu, Anguar, and Ngeruangl and several hundred smaller ones, totaling about 458 sq km (190 sq mi). The archipelago is 25 km across at its widest point and stretches over 160 km (100 mi.) in a north-east/south-west direction.

Babeldaob Island and portions of Koror and its immediate vicinity are volcanic in origin, with rich soils and ample water. All the other islands are limestone, uplifted coralline shelf and reef structures. With the exception of Anguar, all of the major island are enclosed within a single barrier reef nearly 100 miles long. Two atolls, Ngeruangl and Ngcheangl, lie to the north outside of the barrier reef. To the south are the small islands of Tobi and Merir, and Helen Reef, a small atoll. The boundaries of the country are "all of the islands of the Palauan archipelago, the internal waters..." and "the territorial waters extending out to 200 nautical miles." as defined by the Palau Constitution.

Located at about 7.5 degrees above the equator, Palau enjoys a warm climate all year round with an annual mean temperature of 82° F. (27° C.); the average relative humidity is 82%. The annual average rainfall is 150" (3800mm), with more frequent showers between June and October. Typhoons are possible, but rare. Most of the islands of Palau are covered by dense, heterogeneous tropical forests, except for extensive areas of savannah and grasslands on Babeldaob, that traditionally were maintained by fire. Mangrove forests are common along the coastlines of Babeldaob, Koror and Peleliu. Subsistence farming, principally of taro, tapioca (cassava), sweet potato, coconut, and banana is practiced on all the inhabited islands.

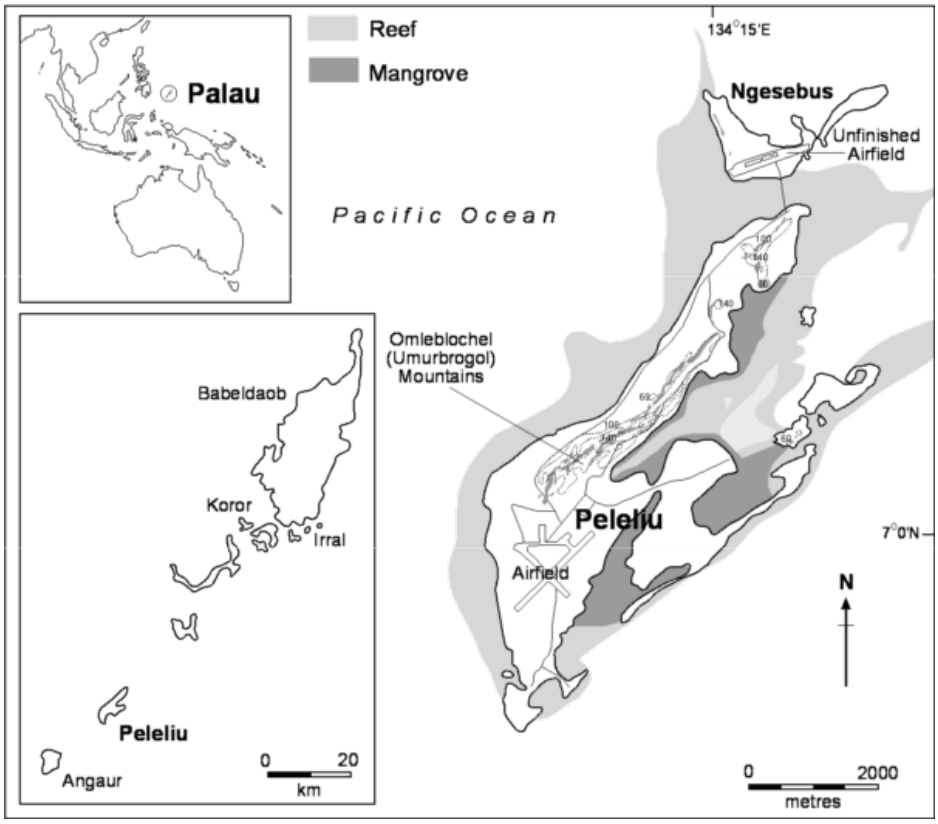

Figure 1.1 Location map of Palau and the study area in Peleliu.

The People

The earliest inhabitants of Palau came to the archipelago from Indonesia or the Philippines by at least 3500 and perhaps as long as 4500 years ago. Palauans had a complex matrilineal social system, wherein money and property were inherited and guarded by women, though regarded as communal property of the clan. By the 16th century the social system functioning at the time of Western contact was in place. Social and political organization was strongest at the village level. Each village was occupied by ranked clans (usually ten), with the chief usually a member of the most highly ranked clan. Public policy was entirely controlled by a chiefly council of 10 male chiefs and a parallel advisory staff of 10 female elders, each representing one of the ranking clans. The male council addressed matters primarily relating to the local economy, welfare, and law and order. The female council concerned itself mainly with matters of inheritance and inter-lineage or inter-clan peace. A pattern of chronic warfare existed among the polities. Villages formed alliances ruled by a paramount chief, who could organize military expeditions and extract tribute.

New Arrivals

The first sustained foreign contact was in 1783 when the English vessel Antelope, under the command of Captain Henry Wilson, was shipwrecked on a reef near Ulong, a Rock Island located between Koror and Peleliu. With the assistance of Koror's High Chief Ibedul, Wilson and his men stayed on the island for three months to rebuild his ship. George Keate's An Account of the Pelew Islands (1788), which recounted the friendship and adventure found in Palau, served to fuel the European myths of the noble savage and island paradise. Whaling and trade in trepang, pearl shell, turtle shell and copra attracted an increasing number of visitors in the 1800s, leaving beachcombers, firearms, and diseases behind.

Spain's claim to the Caroline Islands, including Palau, was upheld by Pope Leo XIII in 1885 and two Catholic churches were established. In 1899, Spain sold the Carolines and the Northern Marianas to Germany. During the period of German administration (1899-1914) there was some increased economic activity in the form of phosphate mining and the planting of coconut plantations for copra.

Japanese Administration and The War

Japanese forces occupied Palau in 1914 at the start of WWI. Following Germany's defeat, the islands were formally passed to the Japanese under the 1919 Treaty of Versailles. Under the Japanese administration, the economy of Palau shifted from a level of subsistence to a market economy and property ownership began to move from the clan to individuals. Koror became the administrative center for all Japanese possessions in their "South" Pacific, Nan`yo, in 1922. The Nan`yo was essentially closed to foreigners from the 1920s on. By 1940 the Japanese civilian population in Palau reached almost 26,000, and the 5,500 Palauans were a marginal minority by 1936. Japan began concentrating its efforts to develop military fortifications throughout the islands. During the final stages of WWII, Japanese installations across Palau became targets for Allied attacks, culminating in the invasion of Peleliu on September 15, 1944 and the 74-day battle that followed (See Appendix A). While the battle still raged, construction on the Peleliu naval base and naval air facilities began. The base was commissioned in January 1945 and at the height of activity had 7,000 to 10,000 men. Operations continued until 1946. The air facility was disestablished on 30 June 1947. U.S. Naval civil administration of Palau lasted until July 1951.

Trust Territory and a New Republic

The United States took control of Micronesia following Japan's defeat in the war. On 18 July 1947 the islands of Palau became part of the United Nations Trust Territory of the Pacific Islands administered by the United States. After three decades as part of the Trust Territory, this westernmost cluster of the Caroline Islands opted for independence in 1978 rather than join the Federated States of Micronesia. A constitution, originally ratified in the referendum of July 9, 1979, became effective on January 1, 1981. Palau held its first elections in November 1980. A Compact of Free Association with the U.S. was approved in 1986, but did not go into effect until 1994. The Compact provides for the Republic of Palau (ROP) to be fully self-governing, while retaining close ties with the United States. Importantly for this project, Palau is treated as a State or Territory in regard to receiving U.S. appropriations for historic preservation. The U. S. has provided economic assistance for a period of almost 15 years, in the form of block grants and program assistance, tax and trade benefits such as duty free treatment of goods.

The constitution of Palau provides for a bicameral legislature, Olbiil Era Kelulau, an executive branch, a judiciary and state governments. The president is the chief executive and is aided in an advisory capacity by a council of traditional chiefs, one from each of the states, on matters of traditional laws and customs. There are 16 states, originally loosely tied village clusters that became municipalities during the Trust Territory period: Aimeliik, Airai, Angaur, Hatohobei, Kayangel, Koror, Melekeok, Ngaraard, Ngarchelong, Ngardmau, Ngaremlengui, Ngatpang, Ngchesar, Ngiwal, Peleliu and Sonsorol. Each state has a governor, an elected legislature, and a major chief who heads the state council of chiefs. The national constitution incorporates mechanisms designed to protect traditional rights. In

case of a conflict between the traditional and national law, a statute prevails "only to the extent it is not in conflict with the underlying principles of the traditional law."

The present population of Palau is estimated to be about 20,000 residents; a great many Palauan citizens, perhaps as many as 25%, live abroad. Palau's principal economic sectors are government employment, tourism, fishing, agriculture and trade. Tourism has grown steadily since the advent of jet airline connections to the mainland US and Asia. Most tourism is related to diving and other water-related activities.

Babeldaob Island comprises more than 70 percent of the nation's land mass, with 330km (128.5 mi). The international airport is located at the southern end of this island. Most economic activity, however, takes place on Koror, a smaller island to the south, connected to Babeldaob by the K-B bridge. Koror was the capital until the construction of the new, permanent capital in Melekeok. Koror is the commercial, transportation, administrative, and educational center for Palau. It is also the most heavily developed area, with a commercial center, port, government facilities, and schools. Most wage-generating jobs are in the Koror area. The Compact of Free Association with the U.S. supplies much of Palau's budgetary resources for operations, capital improvement, and economic development. In addition to U.S. assistance, other countries —including Japan, Taiwan, Australia, and New Zealand— and international organizations provide aid on a smaller scale.

The Community of Peleliu State

The population of Peleliu in the 2000 census was 571 persons in 135 households. But twice this many chad ra Beliliou, persons of Peleliu, live in Koror, and worldwide there are probably 1,800 to 2,000 persons who consider themselves to come from the island. Each of these is a member of one of the five traditional villages through, primarily, matrilineal descent. These villages are Ngerdelolk, Ngesias, Ngerchol, Ngerkeyukl, and Teliu. Two of the villages, Teliu and Ngerkeyukl, were seized by the Japanese and demolished for the airfield in the late 1930s; the other three villages were destroyed in the war. The people would like to rebuild the villages but have not done so, for many complex reasons: the near total destruction and disappearance of the old villages, filling in and destruction of farmland, lack of capital, being forbidden at first by the U.S. to return to the old sites, and perhaps the underlying reason, uncertainty of land tenure. Palauan land courts are slowly unraveling competing claims. The 2010 survey recorded sites and features associated with these villages and the results are being reported in the BAC survey and inventory of Peleliu sites.

The Battle

Some of the most detailed histories of the battle were produced shortly after the end of WWII and include Hough 1950, Craven and Gate 1953, and Smith 1953. More recent studies include Gailey, 1983; Ross, 1991; Hallas, 1994; Gilliland, 1994; Moran and Rottman, 2002; Wright, 2002; Sloan, 2005 and Murray, 2006. Denfeld provided an excellent historical overview in his 1988 report and in recent decades the number of published histories and memoirs on Peleliu has grown exponentially. Autobiographies and memoirs include classics like Robert Leckie's *Helmet for my Pillow* (1957) and Eugene Sledge's *With the Old Breed* (1981) along with other vivid recollections in Hunt, 1958; Bronemann, 1982; Deen, 1984; Watkins, 1992; Woodard, 1994; Gayle, 1996 and Burgin, 2010.

Relatively new additions to Peleliu literature include unit histories like Blair and DeCioccio, 2011; and Camp, 2008. In addition, ever growing numbers of WWII archival documents and

photographs have been declassified and include unit histories, field reports and maps produced while the battle was in progress. These documents along with an excellent archival photographic record are available to the public at the National Archives and Records Administration (NARA). We are grateful to David McQuillen for providing us with access to NARA materials in his files. Other repositories of Peleliu material are maintained by the U.S. Marine Corps and the U.S. Army.

By late 1944, the Palauans had already been living under the rule of the Japanese for thirty years when they found themselves on the frontline of the Pacific War (Price and Knecht, 2012). The Solomons, Marshall Islands and the Marianas had all fallen to the Americans, who were now within bombing range of Japan itself. Their next target was the Philippines, and the US command considered the capture of the Japanese air base in Palau a necessary prerequisite for a successful invasion. The airfield was located on Peleliu, which was garrisoned by troops of the Imperial Japanese Army and Navy (IJA & IJN). Unknown to the Americans, in addition to the expected beach defenses the Japanese had adopted a new strategy and concentrated their resistance in an extensive network of more than 600 caves and tunnels within the Omleblochel mountains that extended the length of the island.

On 15th September 1944, Peleliu was invaded by a substantial American force from the 1st Marine Division, later reinforced by Soldiers of the 81st Infantry Divisio. Having relatively quickly taken the beaches and airfield, though with heavy losses, the Marines next encountered the elaborately prepared cave-based defenses of the Peleliu's ridge system. Their experiences in the seemingly endless ridges, caves and ravines of the Omleblochel, which became known to Americans as Bloody Nose Ridge, has largely defined the collective American memory of the war on Peleliu. Before the final destruction of the Japanese garrison there, the Americans were forced to fight one of the most dehumanizing and costly battles of the Pacific War.

The essential nature of the fighting can be conveyed more briefly in bleak statistics (Price and Knecht 2012) :

- from an original projected timetable of 3-4 days for the campaign, it took more than two months of continuous combat for the Americans to overcome the Japanese defenses
- fighting was exceptionally vicious, involving clearing each cave and bunker individually using explosives, flamethrowers, burning liquid fuel and hand-delivered napalm. In addition, many defended caves were sealed with machinery and explosives, entombing their occupants alive
- the Japanese garrison numbered just over 11,000 men, of whom 19 survived
- approximately 3,000 forced labourers, mostly Koreans and Okinawans, died alongside the Japanese
- the American losses were proportionately among their worst of the war, with more US fatalities on Peleliu than all the Allied dead of all five Normandy beaches combined
- one Marine regiment lost 71% dead and wounded, many were reduced by half, and overall the Marines and Infantry lost a third of their strength
- 48% of the surviving Marines were rotated home with psychological trauma, and many committed suicide after the battle

The public memory of the Peleliu campaign was neglected in the post-war decades, mostly due to a collective desire to gloss over its costly pointlessness in favor of more clear-cut battles elsewhere. Individual memories and family connections to the battle were made more painful by the relative historical obscurity to which one of the formative experiences of their lives was consigned. One result of this neglect was the battlefield's almost complete reclamation by jungle, which has preserved this historic landscape for us today. Thus we have been given another chance to assess what happened with our own eyes and draw what lessons we may and share them with new generations.

To some extent Peleliu was 'rediscovered' by the general public, especially in America, through the attention given to it in the 2010 TV mini-series *The Pacific* (Ambrose, 2010). The resulting increase in tourist interest is a potential threat the preservation of the sites, which were largely undocumented except for an excellent but necessarily limited survey more than twenty years ago (Denfeld, 1988). Coupled with the overwhelming presence of unexploded ordnance (UXO), this meant that a program of recording, assessment and heritage management planning was imperative.

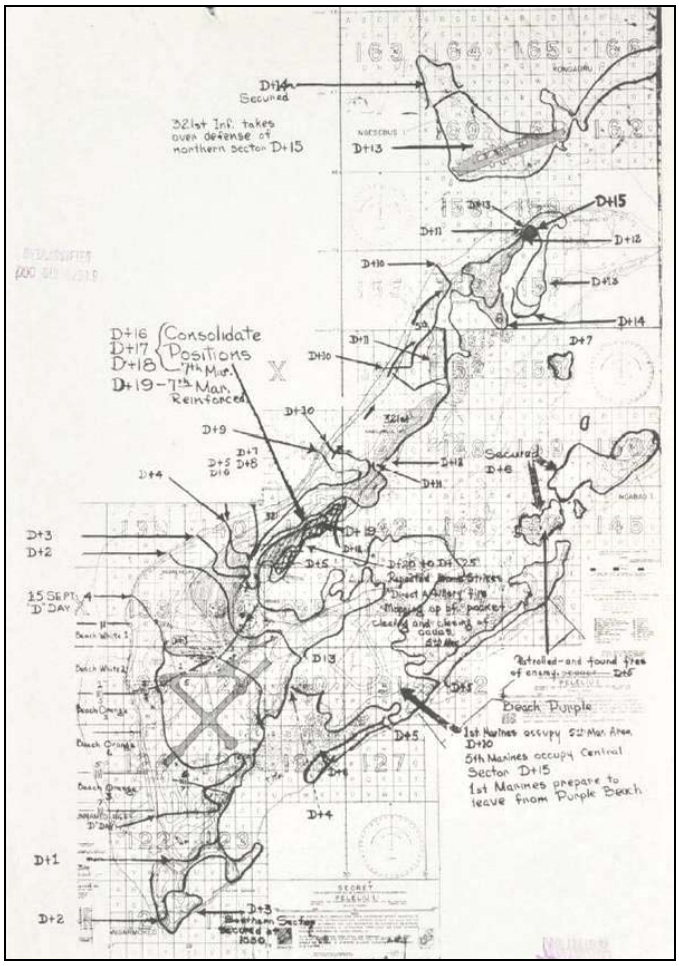

Figure 1.2 Situation map of Peleliu showing the progress of American Marines in securing the island in the days following D-day, September 15, 1944. By D+16, the fighting had become focused on the ridges of the Omleblochel.

Field Methods
The fieldwork for the battlefield survey component of the project consisted of pedestrian survey to locate sites. The team relied on a combination of local knowledge, Denfeld's 1988 report and the expertise of the UXO team leader (who had previously conducted extensive decommissioning examinations of the island) and long-time local guide Tangie Hesus. All sites were GPS-located, with written descriptions and measurements of each site were then made, with a photographic record. The likelihood of buried UXO precluded any subsurface testing and in any event subsurface testing proved unnecessary for the purposes of this survey.

UXO in the form of hand grenades, mortar rounds and other ordnance were present everywhere on the battlefield, and were far too numerous to record individually. Military gear is ubiquitous on the island, particularly within the 'Central Combat Zone' of the limestone ridge systems. Small arms, miscellaneous equipment and personal items were most common in cave interiors, where they were startlingly well preserved and numbering in the hundreds and thousands. Proper documentation of even a single cave might take several weeks per site and we were faced with more than one hundred caves. Thus given our time constraints we were only able to manage rough categorical inventories of the material culture we saw at the site. Similarly the large number of sites we encountered meant that only a fraction could be recorded in the form of sketch maps. Mapping cave interiors obviously requires special care and safety concerns were paramount. Unusual or otherwise noteworthy objects among the stray finds that we observed on the battlefield were recorded individually. We also noted the larger concentrations of fragmentary and unarticulated human remains, which were found in the majority of caves and among the detritus on the jungle floor

Figure 1.3 UXO expert Steve Ballinger checks the barrel of a Japanese field piece for unexploded rounds.

With the exception of UXO, no artifacts were collected or moved for the purposes of recording or photography. Piled objects were not disturbed in an effort to record artifacts underneath. We took the advice of our guides and UXO specialists not to touch any object

on the battlefield. No artifacts other than unexploded ordnance were collected or removed from the sites. Locations of articulated groups of human bones and concentrations of human remains were photographed and recorded but not otherwise disturbed. A separate GPS database was kept of UXO which was maintained by the Cleared Ground personnel as part of their standard operating procedure. In the field the archeological investigation of each site was preceded by a UXO check, after which team leader Steve Ballinger briefed the archeologists on the specific hazards present at each location. We were always accompanied inside the caves by one or more UXO team members who led the way and monitored our movements and recording activities inside.

Figure 1.4 More than 118 caves were among the 285 WWII sites documented on Peleliu in just nine days of fieldwork.

Serious UXO hazards were cordoned off using red specially-marked tape. Exceptionally dangerous sites were addressed immediately by the UXO team, such as booby-trapped caves. One cave contained 27 land mines each placed on a grenade, while another presented us with a carpet of 97 grenades with all the pins pulled. In less critical areas, the UXO was rendered safe or removed in the days and weeks following the survey.

A fully trained paramedic, David McQuillen, remained present during all fieldwork. As the project unfolded it became abundantly clear to us that no archeological field work should ever take place on Peleliu (and probably in many other areas of Palau as well) without the guidance of an onsite UXO team. Because of the sheer number and complexity of the sites we encountered, most were not measured and mapped in detail. Our main mission with the WWII material was to (a) see if the sites recorded in the 1981 survey were intact and that the battlefield retained the same integrity it had when it was made a National Historic Landmark and (b) to gauge the potential for undiscovered sites still remaining on Peleliu. Small isolated artifacts were seen by the thousand on the jungle floor and were not recorded unless they represented a lost aircraft or rare object.

Figure 1.5 A sample of the many thousands of battle related artifacts that remain on the jungle floor deep in the complex and difficult topography of the Omleblochel ridge system.

Part 2 KOCOA Analysis

KOCOA Analysis; *Key Terrain; Observation and Fields of Fire; Cover and Concealment; Obstacles; and Avenues of Approach and Retreat for the Assault on Peleliu: September 15- November 30, 1944.*

The National Park Service (NPS) employs a traditional military analysis of battlefields called the KOCOA approach to establish battlefield boundaries. In the case of Peleliu, the entire island comprised the battlefield, however some areas of the island were obviously the scenes of much longer and intense combat than others. It is hoped that this preliminary attempt at a KOCOA analysis may be useful together with the historic record, in identifying those areas on Peleliu with the greatest density of battle related remains. This in turn is naturally relevant to preservation planning as well as in locating areas that may contain high concentrations of UXO.

KOCOA analysis uses defining features—aspects of the landscape that are mentioned in historic accounts of the battle and can be located on the ground today. Defining features may be natural (streams or ridges) or cultural (buildings or roads) in origin. Defining features are categorized into Key Terrain; Observation and Fields of Fire; Cover and Concealment; Obstacles; and Avenues of Approach and Retreat as defined in the table below.

Table 2.1: Definitions of KOCOA Battlefield Evaluation System (after NPS)

Battlefield Element	Definition	Examples on Peleliu
Key Terrain	A portion of the battlefield, possession of which gives and advantage to the possessor.	Airstrips, roads, trails, beachheads, causeways, high ground.
Observation and Fields of Fire	Any point on the landscape that allows observation of the movements, deployments, and activity of the enemy that is not necessarily key terrain, offers opportunity to see over an area and acquire targets, and allows flat-trajectory weapons to be brought to bear on the enemy.	High ground, sloping approaches to entrenched positions.
Cover and Concealment	Landforms or landscape elements that provide protection from fire and hide troop positions from observation.	Walls, buildings, bunkers, caves, jungle, ravines, entrenchments, ditches
Obstacles	Landscape elements that hinder movement and affect the ultimate course of the battle.	Mangrove, swamp, streams, walls, dense vegetation, fortifications, ravines, tank ditches, wire, mines
Avenues of Approach	Corridors used to transfer troops between the core battle area and outer logistical areas.	Roads, paths, beaches, level ground.

Key Terrain

Securing Japanese airfields was the primary objective for the American 'Operation Stalemate', the neutralization of the Japanese forces on Palau and the invasion of Peleliu, because of its potential to threaten the plans for American counterattack and reoccupation of the Philippines. The major Japanese airfield was already operational and smaller airfield on Ngedbus and Anguar Islands were also high priority targets in the operation. An airstrip under construction near Airai was attacked from the air and by naval bombardment. Within days after being secured the Peleliu airfield was reconditioned and being used by American aircraft to attack Japanese positions barely a kilometer distant. Close air support by American aircraft, along with heavy bombardment from battleships standing offshore would prove decisive in destroying Japanese strong points in the days after the invasion, although was less successful in American attempts to attack the Japanese dug into the limestone caves of the central combat zone in the Omleblochel ridge system. When the airstrip on Ngedbus was taken it was found to be incomplete and unusable because the cleared runway area was still covered with soft sand. The airstrip on Anguar however was also used by American forces and new squadrons quickly arrived in the area to supplement ongoing operations by carrier-based aircraft.

Beaches are also key terrain features that were not only important for the assault but for landing crucial supporting troops and material. This was especially important on Peleliu, which lacked deep water docking facilities and was surrounded by shallow tidal flats that could not be approached except by small vessels. Amphibious tracked vehicles such as the LVTs were crucial not just in the assault, but in landing supplies in the weeks following the landings until the reconditioned Japanese airfield could support large scale cargo landings. The American DUKW amphibious transports were each capable of carrying 25 troops or 5,000 pounds of cargo (Falk 1974:57). The beaches figured prominently as combat areas only in the first hours of the battle on Peleliu. Three beaches on Peleliu had sandy approaches sufficient for large scale landings of tracked vehicles; these were code-named by American planners as White, Orange and Scarlet beaches. Scarlet beach was in a deeply inset fan-shaped lagoon with the shallows heavily protected by rows of obstacles installed by the Japanese. White and Orange beaches were much wider and bombardment and demolition teams removed most of the obstacles in the shallow water.

The natural terrain on Peleliu tended to channel the movement of ground combat from the beaches of the west side toward the level ground of the airfield. Mangroves and swampy taro patches on the east side of the island precluded landings there and were only lightly defended by the Japanese. Any American movements toward the airfield from Purple Beach, which would be approached overland, were funneled through a narrow area of dry ground that linked the east coast to the airfield. The strategic potential of these bottlenecks discounted Purple Beach and were never utilized in any real way by the Japanese, who had already moved most of their forces into prepared areas in the higher ground of steep limestone ridges of the Ombleblochel. That area along with some smaller ridges and isolated hills on the north end of Peleliu had been converted into a natural fortress by months of Japanese tunneling and conversion of natural caves into a defense system. The list of key terrain must include Ombleblochel, which blocked American advances for months and created the slow and costly war of attrition that came to define the experience of war on Peleliu.

Observation and Fields of Fire

Analysis of observation and fields of fire for the battle of Peleliu in terms of the historic landscape is complicated by use of aircraft by the Americans for both observation and attack as well as the presence of an substantial American offshore battle group of battleships and aircraft carriers. The battleships were capable of delivering 14 inch projectiles onto Japanese defenses with considerable accuracy, aided by ground based observers as well as observation planes. With control of the air, the Americans were also able to obtain a constantly updated series of aerial photographs which became even more useful as the jungle cover was gradually burned off during the fighting.

The Japanese advantages in holding the higher ground on Peleliu were offset by the Americans early control of the air. During the beach landings, historical accounts describes Japanese fields of fire from known and archeologically visible points on the northern and southern rocky edges of White and Orange Beach and on the southern end of Orange beach from an unnamed rocky island. These were overcome in the first few hours following the Marine landing. Highly complex and less defined fields of fire however were crucial in the hundreds, perhaps thousands of small scale fire fights for caves and hilltops that defined the bulk of the combat on Peleliu. Some of these may be amenable to analysis of the expended cartridge deposits that are abundant in the central combat zone. Mortars were heavily used by both sides in the conflict and while some mortar positions can be documented archeologically, the actual direction of fire from these positions may be impossible to determine unless a connection can be made through unit action reports.

Despite these difficulties, it seems obvious that the Ombleblochel ridge system and Radar Hill can be counted among the areas important for observation by the Japanese defenders, especially with the absence of jungle cover as it was removed by repeated bombing and napalm attacks. Remaining under cover in the caves and crevices of the central combat zone as the Americans massed for attack would confer an obvious advantage to the Japanese defenders and probably prolonged their ability to resist.

Cover and Concealment

Camouflage was employed with varying degrees of success by the Japanese on nearly all of their defensive installations on Peleliu. In some cases tide and wind removed thin coverings of palm fronds and sand over mines and tank traps in the days before the Americans landed. The flat roofs of major concrete buildings were often covered with a layer of soil which was in turn planted in an attempt to obscure their outlines from the air. Today the overgrown descendants of those plant communities endanger the structural integrity of the now historic buildings they were intended to hide. Painted camouflage was also used by the Japanese on the walls of some concrete structures. Many underground installations and shelters constructed by the Japanese still remain undiscovered today. On a larger scale the cover and concealment offered by the limestone ridge system of the Omleblochel and northern hills played a decisive role in shaping the battle.

During the assault the Americans made good use of Japanese tank ditches just inland from the landing beaches. To some extent the American forces initial approach toward the ridges of the island interior were shielded by the jungle vegetation. Sledge mentions instances where his mortar positions were well concealed by tree cover (1981:138). In

general however, the natural cover worked in favor of the Japanese, who were familiar with the terrain. The Americans were repeatedly frustrated by mangrove swamps and sinkholes that didn't appear on their maps. With the drastic reduction of the jungle cover continual bombardment, the Americans pressed their attacks under cover of smoke and in the case of the heavily contested ridge tops, even behind sandbags pushed forward with poles.

Obstacles

Natural obstacles to the American assault were abundant on Peleliu Island. Heavy growths of mangroves and salt water marshes along with large patches of swampy ground east of the airfield combined to protect the island's east coast. Two small sandy pocket beaches on the southeast end of the island were protected by the installation of lines of wire entanglements and vehicle obstacles in the shallows. On much of the west coast of Peleliu the beaches tend to be narrow and the beachheads protected by low but cliffy terraces of sharp limestone. The American lands were thus channeled to White and Orange Beaches where the Japanese had prepared lines of wire entanglements and offshore obstacles as well as long tank ditches. A line of limestone ridges riddled with caves, pockets and small box canyons existed a short distance beyond White Beach and beyond those the even more daunting heights of Palau's Omleblochel ridge system.

Orange beach provided the most ready access to the flat ground surrounding the Japanese airfield, the primary objective of the assault. The main obstacle here was the tank ditch which was bridged by the Marines in several places for their tracked vehicles while the ditch itself was used to shelter American command and control locations

The greatest natural obstacle for the American forces was the Omleblochel ridge system where the Japanese had made heavy investments in preparing cave defenses in the months before the invasion. By D plus 16 the Japanese defense on Peleliu had been reduced to what became known as the Central Combat Zone centered on the limestone ridge system, where it would remain until the final collapse of Japanese resistance near the end of November, 1944.

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Avenues of Approach

The major avenues of approach for American forces were the landing beaches on White and Orange Beach and through control of the airspace over Peleliu. Smaller beach areas like Scarlet and Purple Beach, were approached largely by overland movements that began on the larger landing beaches. After the airfield was taken it was quickly restored to a usable condition providing an invaluable platform for close air support. West Road and East Road, leading northward up the west and east coasts of Peleliu were important for the movement of armor and tracked vehicles to the north end of Peleliu for the assault on Ngedbus Island and securing of the small airfield there. The Japanese were able to offer little resistance to Americans moving up those roads other than harassing and sniper fire from the ridge system. Approaches to the Peleliu by sea were under American control from the beginning of the assault, however some Japanese reinforcements from the islands to the north were able to make a costly but partially successful landing on the northern tip of the island on at least one occasion.

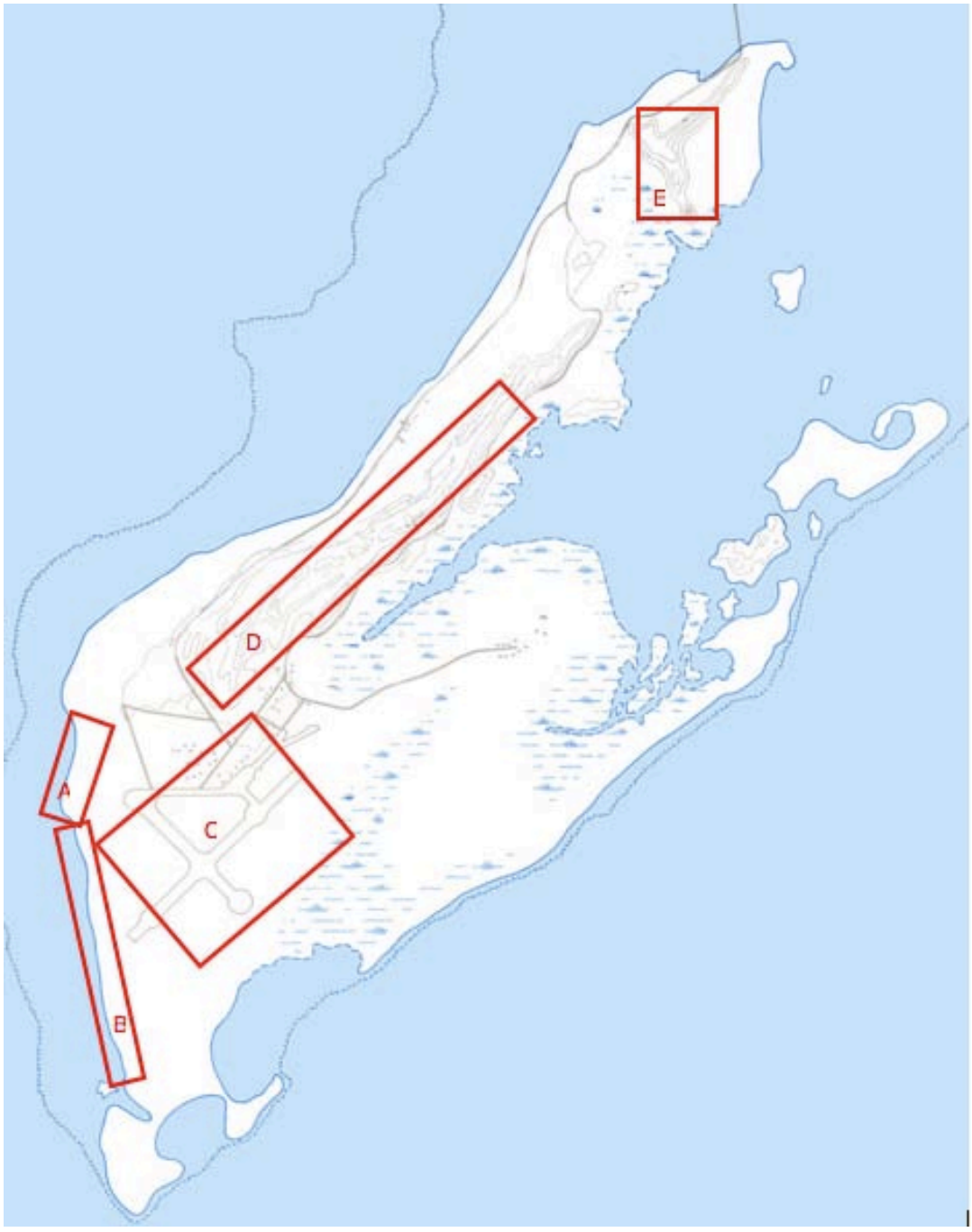

Figure 2.1 Key Terrain; Peleliu assault: September 15- November 30, 1944

A. White Beach
B. Orange Beach
C. Peleliu Airfield
D. Omleblochel/ Bloody Nose Ridge
E. Radar Hill and Northern Peleliu Hills

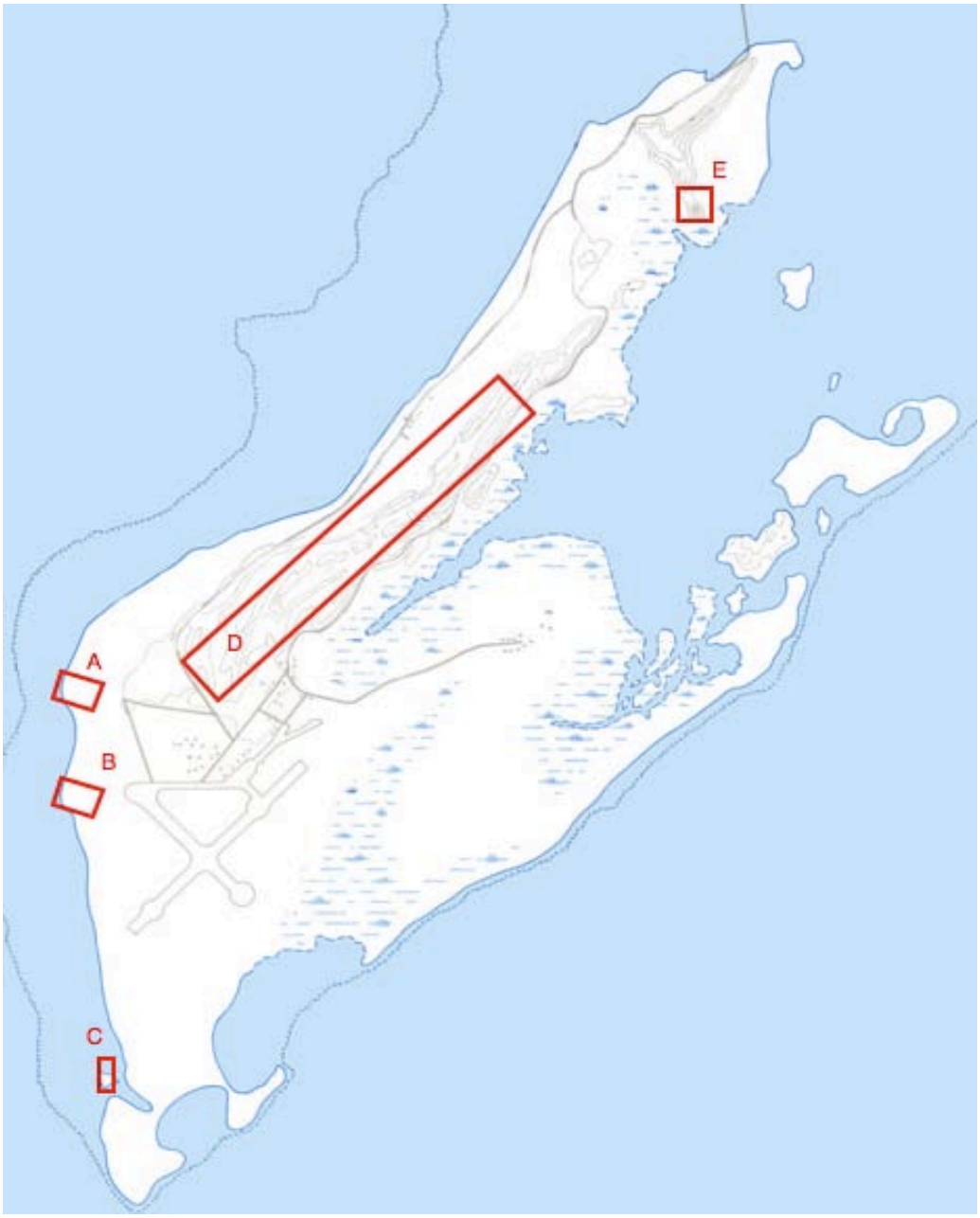

Figure 2.2 Observation and Fields of Fire; Peleliu assault: September 15- November 30, 1944

A. 'The Point' White Beach
B. Rocky Promontory White and Orange Beach
C. Unnamed Island, Orange Beach
D. Southern Ridge System/Omleblochel/ Bloody Nose Ridge
E. Radar Hill

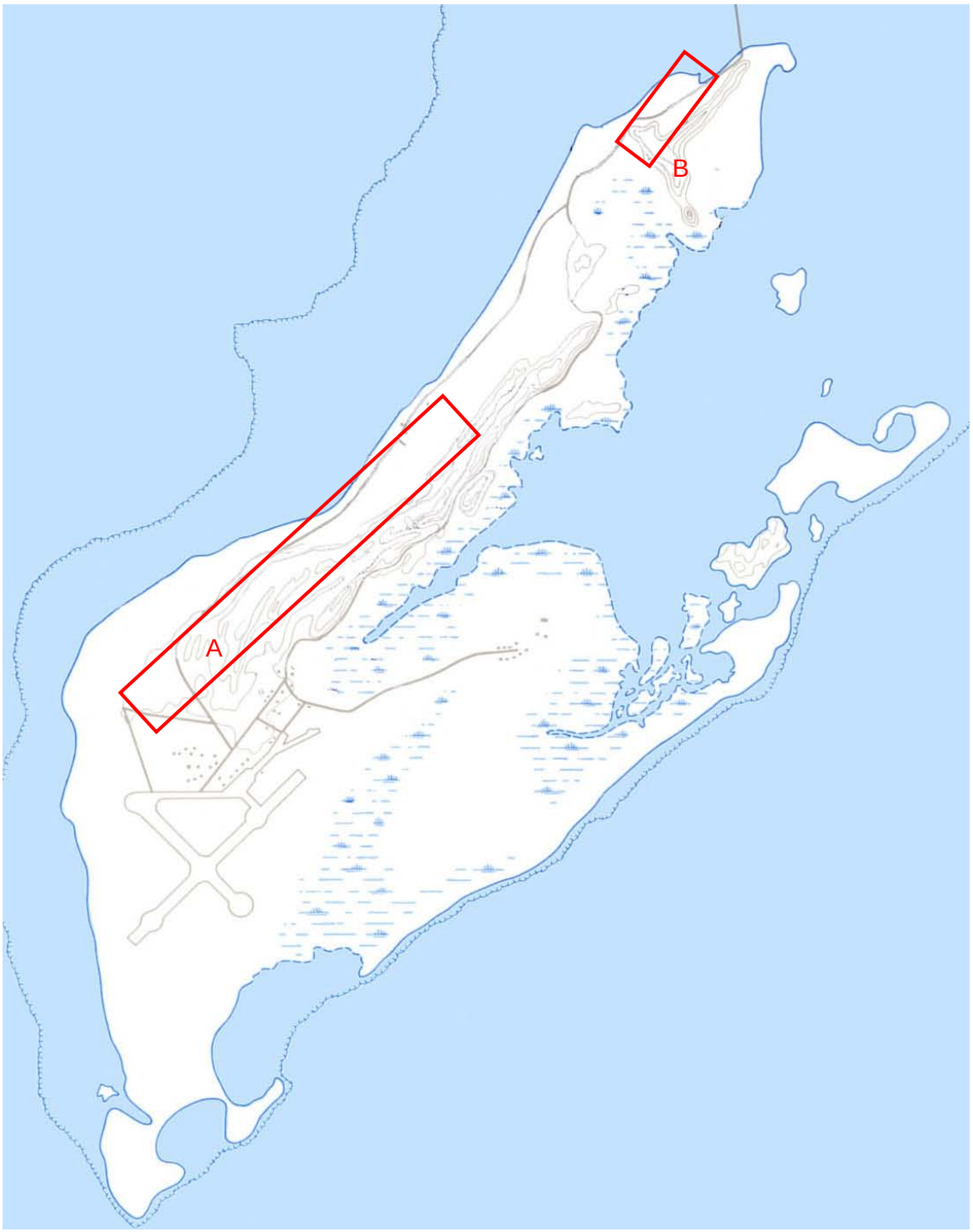

Figure 2.3 Cover and Concealment; Peleliu, September 15- November 30, 1944

A. Omleblochel/ Bloody Nose Ridge Caves
B. Thousand-Man Cave system

Figure 2.4 Obstacles; Peleliu, September 15- November 30, 1944

A. Mines and tank ditches, White Beach
B. Limestone ridges, White Beach
C. Mines and tank ditches, Orange Beach Beach
D. Southern Ridge System/Omleblochel/ Bloody Nose Ridge
E. Swampy ground
F. Barbed wire entanglements and beach obstacles

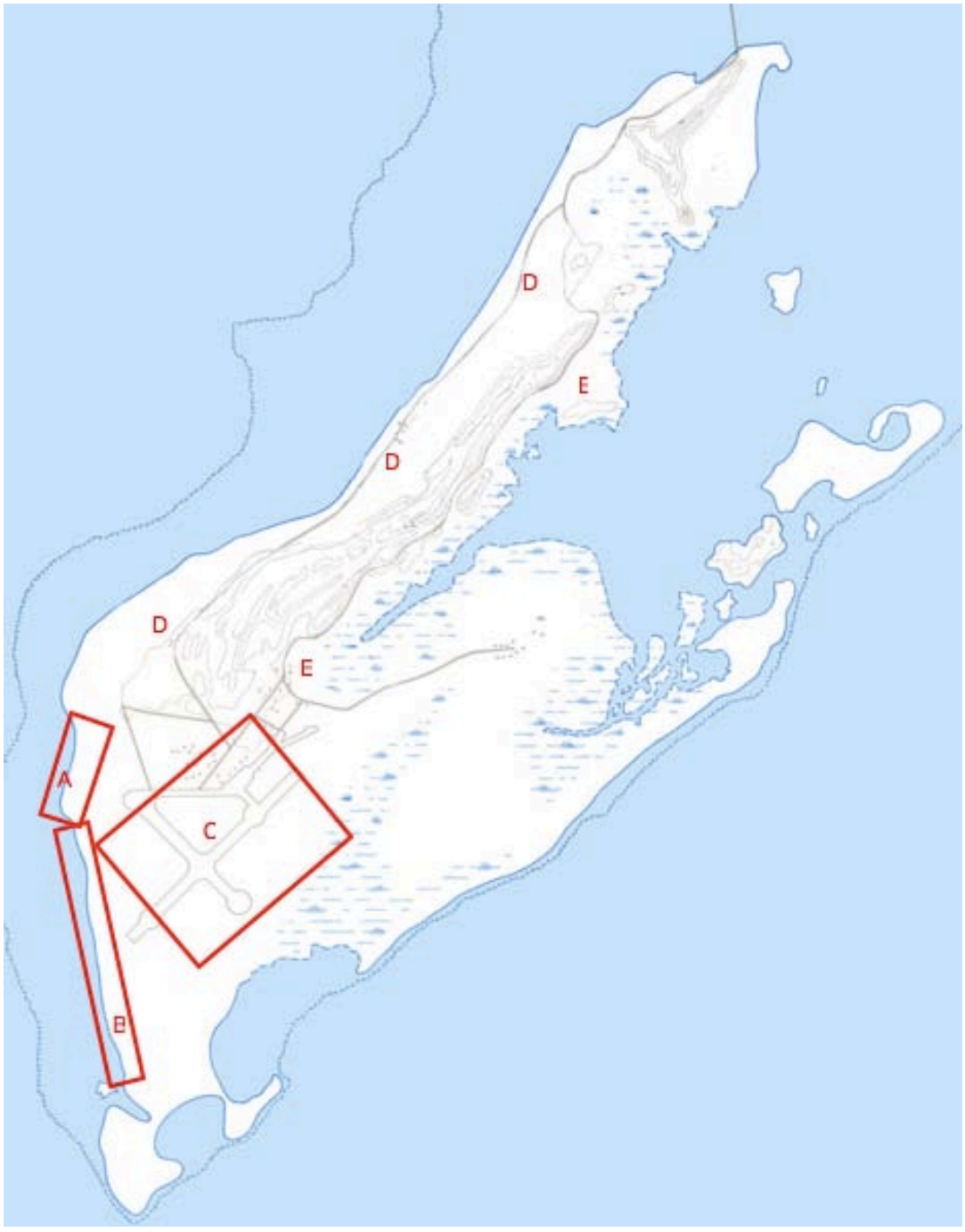

Figure 2.5 Avenues of Approach; Peleliu, September 15- November 30, 1944

A. White Beach
B. Orange Beach
C. Peleliu Airfield area
D. West Road
E. East Road

Part 3 White Beach

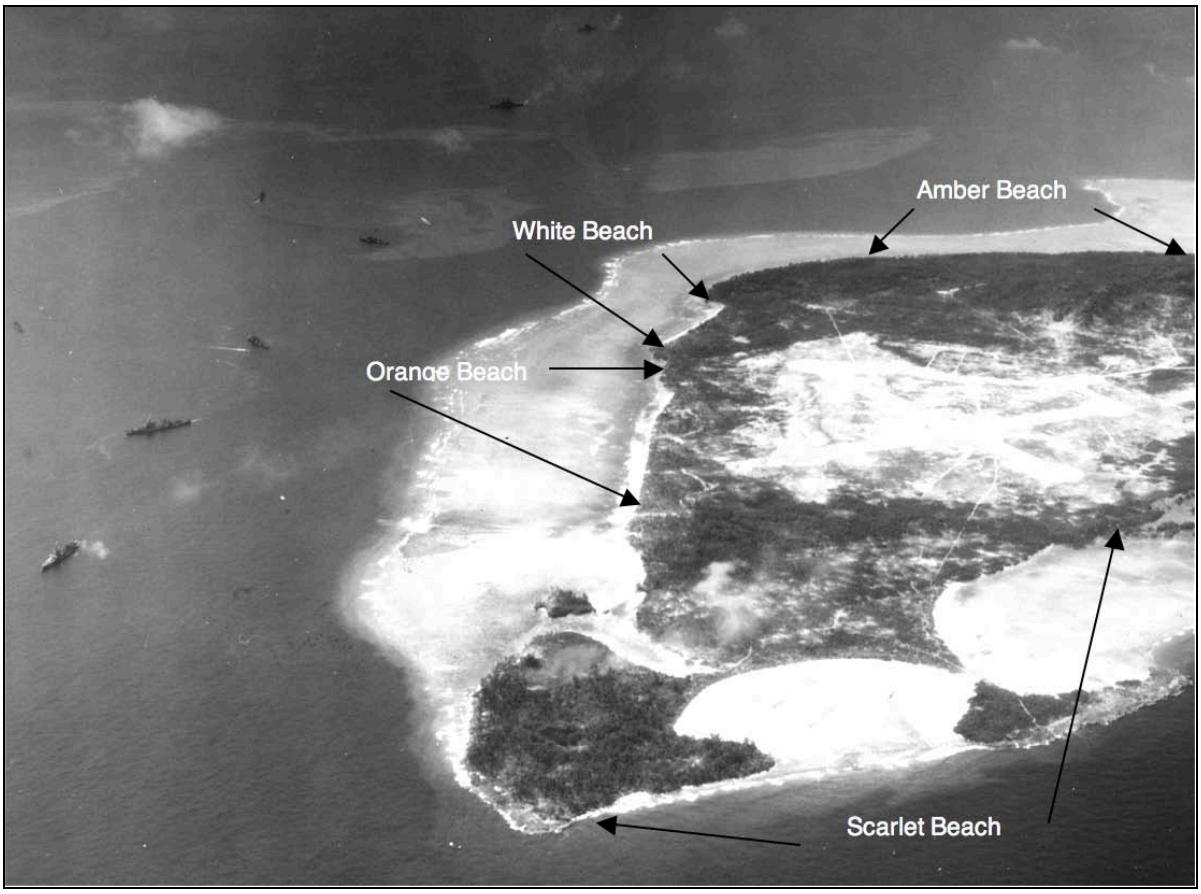

Figure 3.1 Pre-invasion aerial photo (labels added) of the code-named beaches. Purple Beach is not in view, but is on the east side of the island, a few hundred m north of Scarlet Beach. White and Orange Beach were chosen for the invasion landings. (NARA; RG 127)

The Landing Beaches on D-day

On the morning of D-day, September 15, 1944, the American landings on White and Orange beaches began under a curtain of heavy bombardment by U.S. ships and bombing by carrier based aircraft. To the troops on the LVTs approaching the beach, the shoreline appeared as "a continuous sheet of flame backed by a thick wall of smoke" (Sledge 1981:56). To Marine Captain George Hunt, the beach "was smothered in black vapor and flying spray and sand… it didn't seem possible that anybody could live under such a shelling" (Hunt 1946: 35, 39, quoted by Murray 2006).

The First Marines Special Action Report (1944) succinctly describes the landings:

> The weather on D-Day was ideal for our operations; it was moderately warm with visibility limited only by a few high clouds. The first wave consisted of LVT(A)s, touched the beach at 0832 and commenced immediate fire support for the following waves of infantry in LVTs. Initial enemy fire all along our landing are consisted of small arms, artillery, and heavy mortar fire. Only scattered Japanese infantry were met on the beach, but considerable

> resistance developed as our troops advanced inland. Heavy mortar and artillery fire knocked out many of our LVTs, LVT(a)s and DUKWs both on the reef and beach, especially at Orange 3 and White 1. Troops were able to penetrate 150 to 200 yards inland before encountering heavy small arms and machine gun fire. Our medium tanks landed without difficulty in about the fourth wave, immediately crossed the heavily mined beaches and moved up to support the infantry.

The experience of individual Marines landing on the beaches on D-Day is vividly recounted in a number of historical accounts and memoirs. Marine Colonel Lewis 'Chesty' Puller told his biographer about his memories of landing on White Beach:

> I went up and over the side as fast as I could scramble and ran like hell at least 25 yards before I hit the beach, flat down. When I looked back to the Amtrak I saw four or five shells hit it all at once. A few men were killed, getting out too slow, but most of them were saved because they got out before we stopped moving. We lost our communications officer, his leg was blown off and he couldn't be saved. I looked down the beach and saw a mess – every damn Amtrak in our wave had been destroyed in the water by the enemy, or shot to pieces the minute it landed. (Davis 1962:217, Denfeld 1988:15).

White Beach

White Beach or 'Beach White', is a sandy pocket beach about 500 m long and bounded between low rocky headlands on the north and the south. Each of the headlands were bitterly contested Japanese strong points during the landings, fortified with well camouflaged concrete pillboxes that held 20 mm cannon, 37 mm and 75 mm guns (Denfeld 1980:53). Deeply embedded into surrounding coral bedrock, the pillboxes survived the pre-invasion bombardment and their disciplined crews held their fire until the last moment as American LVTs approached the beach.

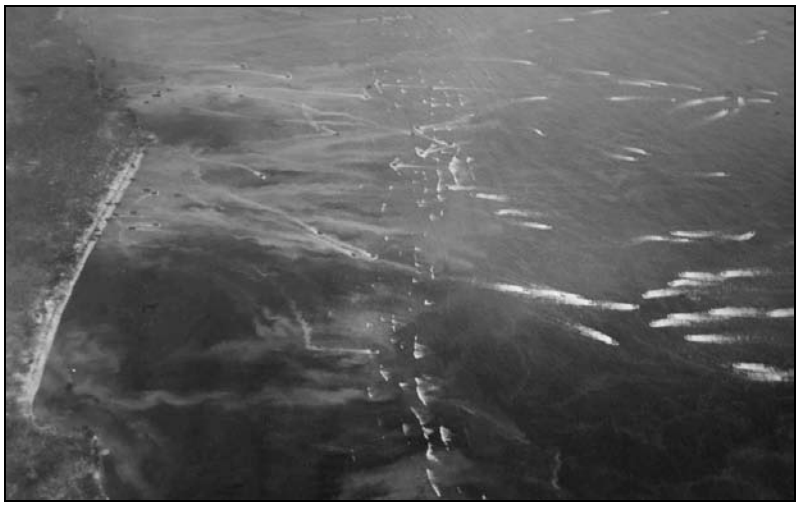

Figure 3.2 Aerial view looking south of D-day landings on White Beach, September 15, 1944; (NARA; RG 127)

Figure 3.3 D-Day Assault on Japanese positions on the rocky southern end of White Beach. The AB52 pillbox is just behind the white smoke in this combat photograph. (NARA; RG 127)

Figure 3.4 The same view of the south end of White Beach in 2012. (David McQuillen)

Figure 3.5 View north toward the Point on White Beach, September 1944. (NARA; RG 127)

Figure 3.6 Same view of White Beach in 2012. The exposed Japanese mine (circled) is live and was removed by the Cleared Ground UXO shortly after this photo was taken. (David McQuillen)

Figure 3.7 Close-up view of the exposed live landmine on White Beach in Figure 3.6. An additional mine was removed on the same day, along with more than 40 live American hand grenades in the adjacent tide flats, possibly dropped by Marine casualties as they came under heavy fire. (David McQuillen).

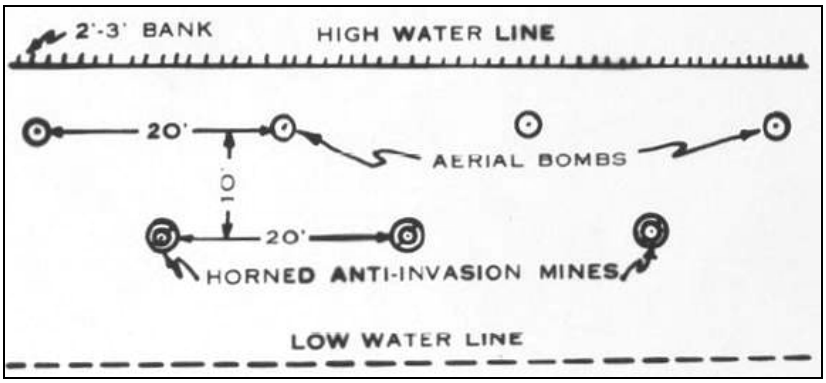

Figure 3.8 Diagram of mine layouts found by Marines on White and Orange Beaches (after First Marines 1944:)

Mines on the beaches included 50 kg. aerial bombs, buried upright with a pressure detonated fuse three inches above the ground, spaced about 20 feet apart in a line near the high tide line. These aerial bomb mines were present in several locations on Peleliu. Ten feet toward the sea from the line of aerial bombs was another line of similarly spaced 2-horned anti-invasion mines. Most of the horned mines were unarmed, however the aerial bombs were destructive. Four bulldozers and two cranes were later destroyed by mines on the beaches (USMC 1944).

Once the Marines got past the remains of the wire entanglements, mines and heavy cross fire, they had to contend with the sharp coral rock that was close to the surface in the beach areas and in many places prevented ‘digging in’ for protection in foxholes. Many Marines when caught by mortar and artillery fire could only huddle as best they could on the sharp coral.

Figure 3.9 The exposed coral rock just beyond the sands of White Beach includes the remains of the traditional Palauan village of Ngerkeyukl that was located here before the war.

> Around this place there's nothin' but sharp coral. I mean, you get down on your hands and knees, you're getting cut. And grenades are going off. And each time this coral is just shattering in small bits and it peppers you. I guess it would be as if somebody turned a sandblaster on you. It just stung you all over. (Marine quoted in Hallas 1994:70)

The unloading of supplies additional troops was made extremely difficult by the continued mortar and artillery fire on the beaches and the number of LVTs and knocked out began to create a shortage of vehicles. But despite everything progress was made and the First Marines were able to make this report by day’s end:

> By 1800 forces of this Division had gained a beachhead of 3000 yards in length and averaging 500 yards in depth. Artillery had one and a half battalions of 75 mm pack howitzers and one and a third battalions of 105 mm howitzers in position, registered and ready to furnish supporting fire. Our D-Day casualties were recorded at 92 KIA, 1140 WIA, 56 MIA; a total of 1298.

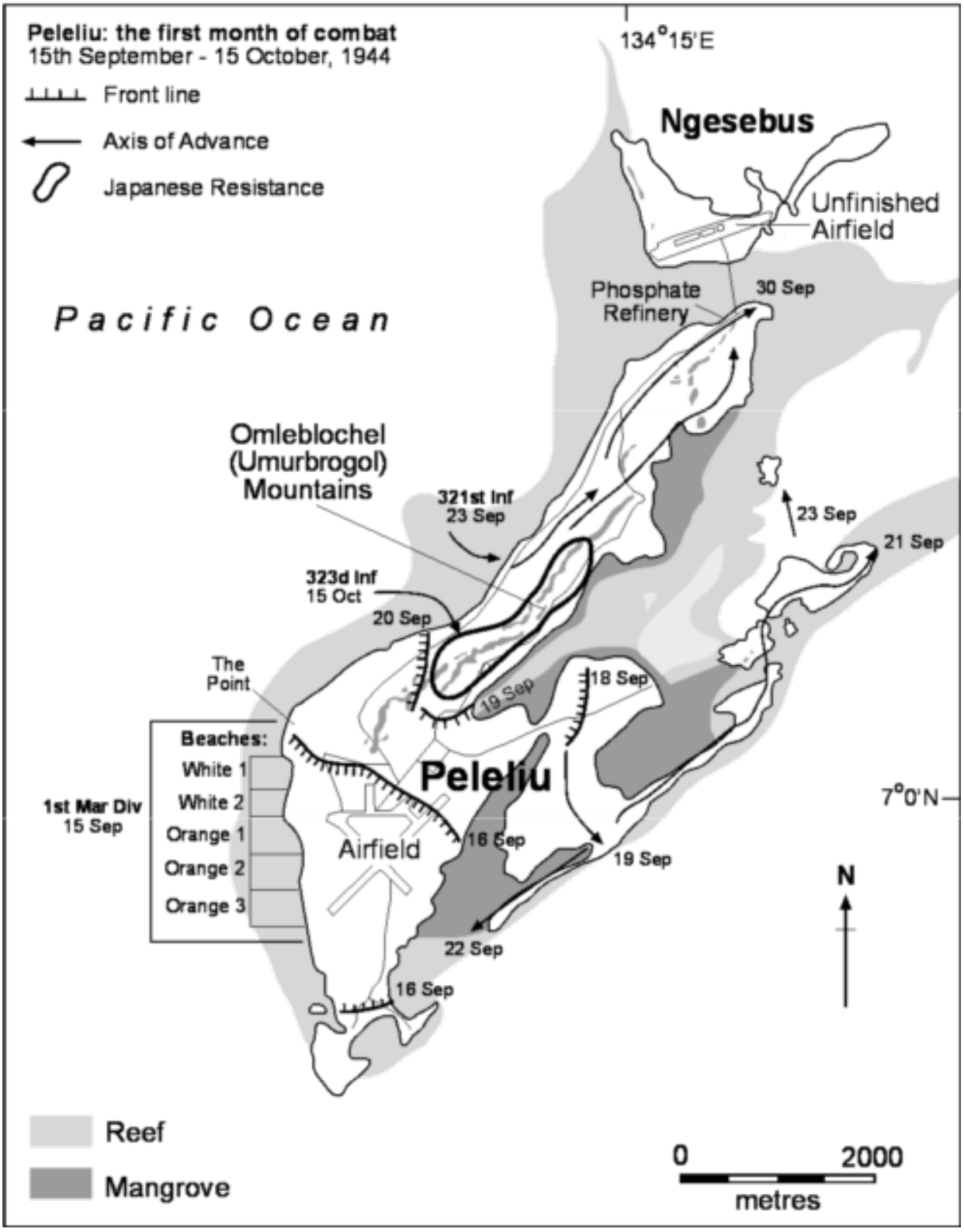

Figure 3.10 Movement of American forces into Peleliu following D-day, 1944. By mid-October the remaining Japanese defenders were contained in a small but highly defensible area in the central combat zone of the Omleblochel (Price and Knecht 2012)

Figure 3.11 General locations of sites in the White Beach area

Table 3.1 Sites Documented in the White Beach area in 2010

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB48	Site 1 Feature 13		American Quonset hut slab
AB49	Site 1 Feature 13		American Quonset hut slab
AB50	Site 1 Feature 12		Japanese Bunker/Casemate
AB51	Site 1 Feature 13		American Quonset hut slab
AB52	Site 1 Feature 1		Japanese Bunker w/gun
AB52.1	Site 1 Feature 1		Japanese Sealed Japanese Defensive Cave
AB53	Site 1 Feature 1		Japanese Defensive Cave
AB54	Site 1 Feature 3		Japanese Defensive Cave - collapsed
AB55	New site/feature		Japanese Defensive Cave
AB56	Site 1 Feature 14		American Officer's Club and Mess Foundations
AB56.1	Site 1 Feature 16		American Officer's Club Hussman Reefers
AB56.2	Site 1 Feature 15		American Officer's Club Japanese Rail Wheels
AB57	New site/feature		American Officers Housing Area Coral ramps
AB58	New site/feature		American Navy Officers Housing area
AB59	New site/feature		Japanese Rifle Pit
AB60	New site/feature		Japanese Pill Box
AB61	Site 14		Japanese Fuel Storage Bunker Foundation
AB62	Site 14		Japanese Fuel Storage Bunker Foundation
AB141	Site 2		Japanese Tank
AB147	New site/feature		Japanese Tank; buried
AB148	New site/feature		American Aircraft Wreckage, Merlin Engine
AB168	Site 14		Japanese Fuel Storage Bunker/ WWII Museum
AB169	New site/feature		Japanese Open Well (across from Museum)
AB279	Site 1 Feature 7		Japanese Fuel drum emplacement
AB280	Site 1 Feature 6		American LVT

Figure 3.12 AB50 pillbox facing south on White Beach. This position caused heavy casualties among the Marines on D-day and had to be taken by close ground assault.

AB50 Japanese Pillbox/Casemate

A Japanese bunker is embedded into the coral rock of the 'point' on White Beach and was constructed of reinforced concrete covered with a layer of coral rubble. It measures about 4 m square and has a firing aperture overlooking the sea measuring 2.4 m wide and .8 m high. The bunker has been heavily damaged by shellfire, especially from a large impact just east of the firing aperture. Japanese guns housed in this bunker and supporting installations caused significant American casualties and damage to landing vehicles on White Beach. According to the First Marines Special Action Report (1944), this casemate contained a 47 mm anti-boat/anti-tank gun which was defiladed from the sea and fired south along White beach while the similar gun on the north end of the beach (AB52) fired north. Many accounts of the battle mention these positions on White Beach and the disproportionate damage they did to American forces and armored vehicles during the landing.

A few m west of the bunker, mounted on a coral rock exposure is a memorial marker dedicated to Captain George P. Hunt, commander of an assault on the positions on the northern end of White Beach Point by K Company, First Marines. After a day and two nights of intense close combat, K Company had suffered more than 50% casualties, including 32 KIA. Japanese dead numbered about 500. Hunt survived the war to write a book about his experience on White Beach, *Coral Comes High* (1946) and later became managing editor of *Life* magazine. Hunt died in 1991. Denfeld recorded two other pillboxes on the White Beach Point area that were not revisited in 2010.

Figure 3.13 Concrete Quonset slab AB49, dating from the post-battle occupation of Peleliu by American forces.

AB48-49, AB51 American Quonset Hut Slabs

A number of rectangular concrete slabs probably accommodated US Quonset huts and are associated with the post-battle expansion of the former Japanese airfield in 1944 and 1945. AB49 measures 16 m by 5.30 m and AB51 consists of a pair of adjacent slabs aligned NW-SE and N-S, measuring about 18 m by 6.3 m. After Peleliu was secured and the American rebuilding program begun, White Beach was utilized as an officer's mess, housing area and support facilities for the US Navy Western Carolines Sub Area. The slabs match the description of the commanding officers quarters described by Denfeld (1980:53):

> At the tip of the Point, 15 m west of Feature 10, are the remains of the Quonset Huts used by Rear Admiral Elliott Buckmaster, Commander of the Western Carolines Sub Area, and his Chief-of-Staff, Captain Eugene T. Oates. Buckmaster's quarters had a small screened porch on the ocean side where the admiral placed a chair which he used to enjoy the cool breezes from the ocean about 20 m below. The concrete foundation slab of the Admiral's Quonset hut and some screening material are all that remain of his quarters…Twenty m north of Buckmaster's residence was Captain Oates quarters, which also consisted of a Quonset Hut. Oates, however, did not have a screened in porch. The area between the two huts had been landscaped by Palauan laborers when construction began in 1945. The landscaping was completed by the addition of a Japanese 75mm gun and an aircraft propeller, artifacts which have since disappeared.

With some exceptions, most of the surface debris we saw on pedestrian survey of the beach area between the headlands of White beach was associated with the post-battle occupation. Some of the larger objects may have been intentionally left as memorials to the battle or as Denfeld suggested, brought to the site as yard ornaments.

AB56 American Officer's Club and Mess Foundations

A T-shaped concrete pad 46 m long and 20 m across at the wide point of the 'T' was found with rusting but still identifiable features as recorded in Denfeld's 1981 survey, which he identified by referring to archival materials (1988:57):

> The largest extant foundation located on the northern promontory is from the Officers Club and Mess located 50 m north of Oates quarters (AB-51). The foundation was easily identified through archival photographs on the Command, Western Caroline Sub Area. The Officers Club and Mess was a T-shaped wooden frame structure which made extensive use of open screened walls and high roofs with canopies to create a cool interior. The two dining rooms were located at both ends of the top of the T. The kitchen and club lounge were located in the base of the T. Each of the dining areas was 6.3 m wide and 16.3 m to the center section. The center section or upright member of the T was 13 m wide and 13.8 m long. At the bottom of the center section was a screened patio lounge that added another 3 m to the center unit. The screened lounge was on the ocean side of the Mess and Club…The walls of the building were open with screens to within 65 cm of the floor. At the far ends of each dining area were oak-lined closets and serving stations for the mess stewards. The walls above the line cabinets were decorated with local mats. The dining tables were covered with white linen table cloths and china.

Figure 3.14 US Navy Post-1940 design Wardroom Officers dinnerware fragments found the surface on White Beach.

Figure 3.15 Frames and remains of Hussman refrigeration units behind the former American Navy Officers club.

AB56.1 American Hussman Reefer Frames

Two large square frames of angle iron were found standing a few m east of the American officer's club. They closely resemble similar but better preserved units we had recorded in the American garrison area of the airfield complex. These otherwise enigmatic structures were identified by Denfeld as American Hussman Reefer refrigeration units (1980:58). Nearly all of the refrigeration mechanisms are missing from these frames. Pieces of tubing, machinery and heavy cans of what may be refrigeration gas still remain in the immediate area. Although these materials were in much deteriorated condition in 2010, Denfeld thought these pieces worth preserving when he encountered then in the 1981 survey:

> One of the innovations of the Pacific war was the American mobile refrigeration unit, or reefer. These mobile units, capable of being transported aboard ships and quickly moved into position, dramatically improved the storage of perishable foodstuffs. Few of these units have survived intact in the Pacific area.

Figure 3.16 These narrow-gauge rail wheels were once used in Peleliu's phosphate mining operations, then by the Japanese military and finally as lawn décor by American garrison officers.

AB56.2 Japanese Rail Wheels

Denfeld found four sets of Japanese narrow gauge rail wheels in the area of the former US Navy officer's mess which were apparently taken from other locations and used as lawn decorations. In 2010 we located one set of these wheels still remaining on the site. Rails and rail wheels were found in several Japanese WWII installations during the survey and had been originally part of the prewar phosphate mining operation on Peleliu which had been started by civilian firms in 1934 and stopped in 1943 as the construction of military defenses became paramount (Murray 2006). Rail components were most often seen by in association with caves in Bloody Nose Ridge. Two matching pairs of narrow gauge rail wheels were also found in AB145, the Caisson Cave site

AB57 Coral Ramps

Two parallel ramps of coral rock lead in an E-W direction up the coral ridge and are a short distance from AB56, the American Officer's Club and Mess Foundations. They are 63.7 m long and 6.6 m wide and incline downward toward the west. They may have been installed as part of the US Navy base construction and are likely associated with a roadway to the front door of the Mess as described by Denfeld (1988:58)

AB58 Navy Officers Housing Area and Tennis Court

About 80 m north of the former Officer's Mess area is a large concrete platform with no evidence of an associated superstructure. It was identified by Denfeld as a tennis court and part of the U.S. Navy Base complex. It measures 34 m N-S and 28.2 m E-W. Officers housing was located nearby.

AB59 Japanese Rifle pit

Shelling and/or post-battle construction has eradicated most of the Japanese rifle pits and firing positions in the immediate vicinity of the beach, however several remnants exist among the rocky areas of the Point, including one rectangular pit which appears to be cut into the coral rock itself. It is nearly 2 m deep, 4 m long and 1.5 m wide. It is aligned in the N-S direction.

Figure 3.17 Interior of Japanese defensive cave near White Beach.

AB55 Japanese Defensive Cave

A low coral ridge east of the Point area of White Beach is about 20 m wide and was very effectively utilized by the Japanese as a defensive position. Denfeld (1988:59) noted the presence of firing positions, foxholes, small caves and equipment scatters in this area. On the east side of this coral ridge is a partially collapsed natural cave entrance 2 m wide by about 1 m high. It has a steep, nearly vertical entrance. Only a few square m of the original cave floor are still exposed and no artifacts were evident.

Figure 3.18 A possible gun emplacement constructed from Japanese fuel drums has been nearly buried by shifting sand in the years since it was first documented in 1981.

AB279 Japanese Fuel Drum Emplacement

A circular alignment about 6-7 m in diameter of what appears to be a single wall of Japanese fuel drums filled with coral rubble may represent the remains of a gun emplacement recorded by Denfeld in 1981 as Feature 7 of Site 1 (White Beach). Denfeld thought this feature large enough to accommodate a 120mm anti-aircraft or larger Japanese gun (1980:56). In 2010, only a few cm of the top of these drums were still visible above the sand.

Figure 3.19 The remains of an LVT at AB280 are slowly being destroyed by tree roots.

AB280 Buried American LVT

A heavily damaged and corroded but still recognizable frame of an American LVT lies just above the high tide line where a sizeable tree has grown in the middle of it. This is one of eight LVTs located during our survey and in the poorest condition. Denfeld identified it as an LVT4 (1988:56). It may represent the remains of one of the 26 LVTs that were knocked out by Japanese fire or landmines on D-Day (USMC 1944). A possible set of iron LVT tracks are located near the north end of White Beach but these were covered by high tide at the time of our visit.

Figure 3.20 The interior of the AB280 Japanese pillbox and partially buried 37mm gun.

Figure 3.21 Entrance to AB52 pillbox in September, 1944. About 1 meter of fill has since been deposited in this area, partially filling the pillbox. Human remains in the foreground may be those recorded in 1984 in the sealed cave just west of the pillbox. (NARA; RG 127)

AB52 Japanese Pillbox/bunker and 37mm gun

This gun position is located on the rocky headland, called *Iwamatsu* by the Japanese, located on the south end of White Beach. The gun was sited for enfilade fire in a northern direction complimenting Japanese gun positions on the far, or northern end of the beach and the crew withheld fire until the American vehicles had come in close to the beach. Like the gun on the Point, this position was responsible for substantial American casualties and damages to the landing vehicles. It was taken by frontal assault with heavy casualties. The reinforced concrete pillbox was disguised with thick walls and roof coverings of coral rock rubble. Denfeld described the shape and dimensions of this structure (1988:54):

> The pillbox is trapezoidal rather than the cube-like shape characteristic of Japanese 37mm positions…The embrasure wall is three m wide and it is 6.25 m from the front of the pillbox to its rear where the entrance is located. The rear wall is 6.25 m wide with the eastern wall angling in to the three m wide embrasure face…As was common to Japanese 37mm pill boxes, the firing port is wide, in this case measuring two m across and 65 cm high. The wall at the firing port is one m thick and the remaining walls are 50 cm thick.

The pillbox has been partially buried, inside and out by sand and coral rubble. Upright Japanese oil drums filled with coral rubble existed around the exterior of the pillbox, and are visible either side of the firing slot. The 37mm gun remains intact but mostly covered inside the bunker.

Figure 3.22 Archeologist Rita Olsudong in the 1985 trench that illegally opened the sealed cave at AB52.1. The cave opening is visible behind her and was resealed shortly after this photo was taken.

AB52.1 Sealed Japanese Defensive Cave

A sealed cave is located about 3 m west of the AB52 pillbox and was illegally opened in September 2004 by a Canadian film maker. The film crew was guided to the site by an American amateur historian and artifact collector and a three m deep, 10 m long trench exposing the cave was dug with a hired backhoe. The perpetrators were apprehended by local police just as they broke into the cave, however they refused to stop their activities when ordered and more police had to be called in from Koror. The film was seized and a large fine was levied. As part of the subsequent police investigation the cave interior was examined by one of the authors of this survey, Knecht, along with the late BAC archeologist Rita Olsudong. The cave contains Japanese equipment and semi-articulated human remains representing about a dozen individuals, possibly representing the gun crew from the adjacent 37mm pillbox. This is the first archeologically documented sealed cave on Peleliu and artifacts inside were in a better state of preservation than in the open caves; there was less rust and artifacts like gas mask filter cans retained their original surface paint. Traces of uniform cloth could be seen under rows of buttons. Remains of wood on bayonet and weapon handles were gone however, as in the open caves. Damage to the contents took place when the cave was initially broken into with shovels and a Japanese cranium and helmet were broken by falling rock. The cave was re-sealed with heavy equipment immediately after the damage was documented. As of 2011 there was no sign that the cave had been reopened, despite local rumors to the contrary.

AB53 Sealed Japanese Defensive Cave

At least two small sealed cave openings exist just west of the AB52 pillbox on the promontory which dominates the south end of White Beach. It is naturally difficult to determine the original

extent of a cave by looking at a sealed opening and it is possible that some of these may have been rock shelters or Japanese firing positions rather than substantial caves. AB53 is a south-facing entrance of what appears to be a small sealed cave and measures about 2 m wide and 1.5 m high. Partial slumping of a pile of coral rubble made it possible to get a glimpse of military equipment inside.

Figure 3.23 Partially sealed cave mouth AB54, on the south end of White Beach.

AB54 Sealed Japanese Defensive Cave

A collapsed cave entrance is located on the opposite side of a rock outcrop above AB53 and it is possible that both of these entrances may have accessed the same cave. The entrance faces north toward White Beach and is 2.5 m wide with a 50 cm gap which may lead deeper into the cave but was not entered by the survey team for safety reasons.

Figure 3.23 African-American Marines camped south east of the south promontory on White Beach, September 1944 (NARA; RG 127). Small Japanese caves were probably sealed about this time on the rocky point in the background.

Figure 3.24 Gun port of Japanese pillbox AB60 in 1944, view east (NARA; RG 127).

Figure 3.24 Same view of AB60 in 2010, showing partial damage to coral revetment, probably from visitor traffic.

AB60 Japanese Pillbox

This reinforced concrete pillbox lies just south of the southern end of the defensive coral ridge that runs parallel to White Beach. It has a large entrance on the east side, which faces away from the beach. A shorter wall of the pillbox is 2.5 m wide faces White Beach and is heavily pockmarked by shell and bullet holes. A 1 m wide firing aperture has been shell damaged and some pieces of iron rebar are exposed. Coral rock covered the sides and top of the pillbox although 1944 photographs show that this has been eroded somewhat. The pillbox is adjacent to a two track roadway that is used by visitors to access White Beach.

Figure 3.25 AB168, the southwest side of the heavily damaged sole survivor of four Japanese fuel storage bunkers on Peleliu, shortly after being secured by Marines in September 1944 (NARA; RG 127).

Figure 3.26 AB168 in 2010, now a locally maintained WWII museum. The holes left by the 14 inch shells of American battleships have been covered and used as windows.

AB168 Japanese Fuel Storage Bunker (WWII Museum)

This is the only surviving fuel storage bunker of four constructed by the Japanese on Peleliu; eighty m apart from one another with two on either side of a road near the north side of the airfield (Denfeld 1988:68). It is unclear, perhaps doubtful that any of these bunkers actually contained fuel. Two across the road north of AB168 (AB61 and AB62) were under construction at the time of the American invasion. After the bunker was secured by Marines only some unidentified machinery was found inside.

The bunker became a Japanese strong point that temporarily held up the advance of American Marines moving northward from White Beach toward the airfield. D-day plus two saw fierce combat at this location, with 35 Marines killed or wounded in preliminary assaults on the bunker with its bomb proof reinforced concrete walls proving impervious to 37mm and 75mm shells fired at close range (Wright 2002: 117, 214). Finally the Marines called for supporting fire from the Navy fleet anchored offshore. Wright (2002:215) quoted First Lt. NRK Stanford, a naval gunfire forward observer who was at the scene:

> 'I was lying in the coral rubble of a shattered bunker in front of the blockhouse with the Nambu fire going high to my left and the Jap mortars bursting in the ripped and twisted coconut grove behind me. I set up my SCR-284 (radio) nearly at the top of an abandoned bunker…'Ironsides (the call sign of the battleship USS Mississippi) this is Charlie Nine. Target at…reinforced concrete blockhouse…AP (armor piercing) one round. Main battery…commence firing'.. The 14-inch shell passed low over his head with a heart-stopping crack and landed beyond the target with a huge explosion. Stanford requested an adjustment 'Down 200, one salvo'. It rumbled overhead, smashing into the blockhouse. "I was numbed from the concussion and it took my eyes a few seconds to focus, but I could see that the camouflage had been stripped away and the shape of the blockhouse altered"

A Marine Battalion report (in Wright 2002:215) described the results: "The nearest body was fully 30 feet away …a severed Jap hand lay in the doorway…15 to 20 dead Japs lay inside, not a mark on them, killed by the terrific concussion." Two enormous navy shell holes still mark the bunker; one each on the west and south facing walls. The shell that struck the west wall penetrated the thick concrete walls on both entry and exit. After the bunker was secure it was cleaned out and used by the Marines as a forward aid station. As the battle moved on it was first used by the Seabees as an office and barracks and later on it served as a movie theatre for the 4th Marine Air Wing Squadron (Denfeld 1988:68). In 2003 a collection of battlefield artifacts that had been stored in the Peleliu village school was moved to the bunker and dedicated as a WWII museum and interpretive center for visitors on the 60th anniversary of the landings on September 15, 2004. Air conditioning and electricity were installed shortly afterward and improvements on both the facility and the exhibits are continuing as funds become available. In 2010 the museum had no regular operating hours or permanent staff but was looked after by volunteers and opened to visitors by appointment.

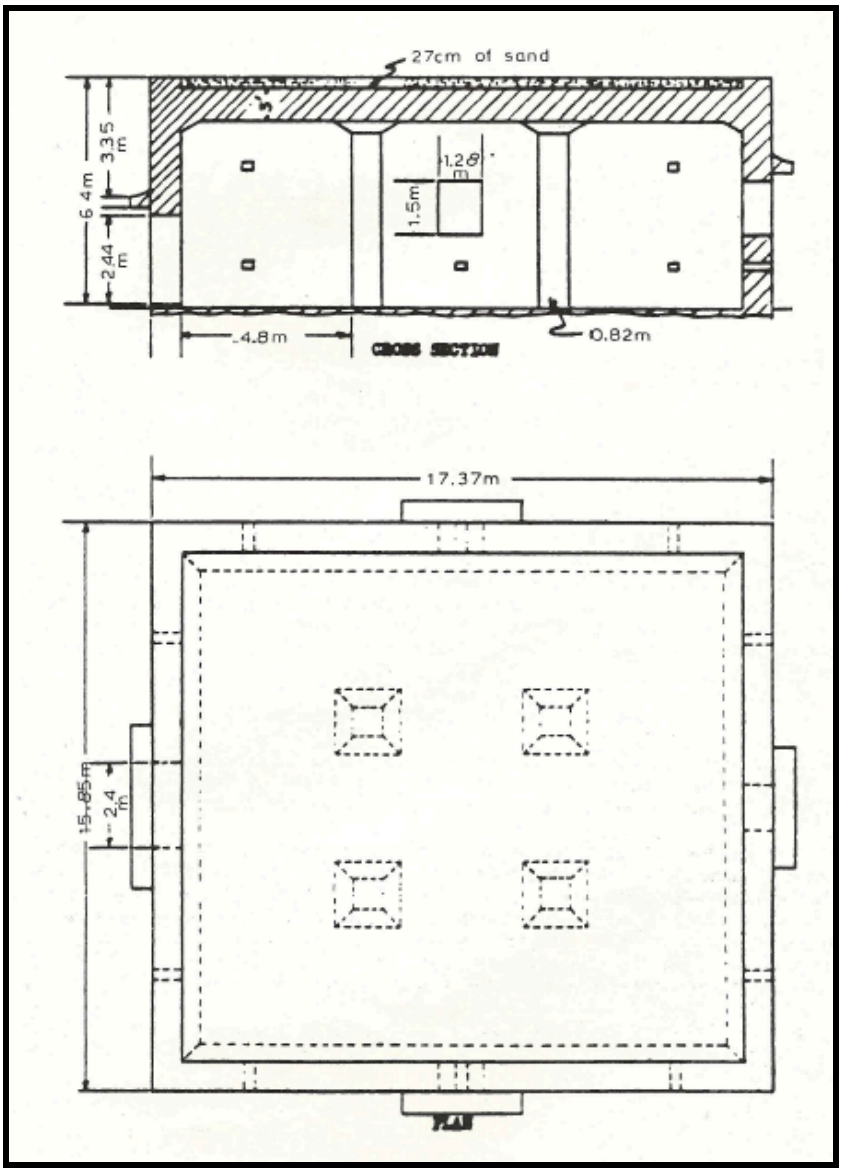

Figure 3.27 Plan of a concrete Japanese fuel bunker similar to AB168 (After Denfeld and Russell 1984). The AB168 building may have never held fuel and Marines found miscellaneous machinery inside when the building was secured.

Like other Japanese structures on Peleliu, the fuel bunkers followed a standard design used elsewhere in the Pacific theater. Denfeld (1988:67) described their features and construction:

> They measured 15 m wide and 17 m long and were constructed of reinforced concrete. Doors and windows were equipped with 'burster slabs', thick concrete protrusions directly above openings intended to deflect aerial bomb bursts. In addition to the burster slabs, doors and windows were protected by hinged steel shutters. The walls of the bunker are 80 cm thick and the roof thickness measures one meter. Soil was often placed on the roof to provide additional protection. Inside, four concrete support posts provide additional structural strength…

Figure 3.28 Marines rest in front line aid station inside of AB168. (NARA; RG 127)

Figure 3.29 Low aerial view south of White and Orange Beaches with AB68, AB61, and AB62 in the foreground in 1944. (NARA; RG 127)

AB61, AB62 Japanese Fuel Storage Bunker Foundations

The two unfinished bunkers AB61 and AB62, lie in the heavy jungle vegetation across the street from AB168. They are identical and consist of heavily constructed concrete platforms that stand about 1m high and measure 17.4 m by 15.8 m. Located 90 cm from the outside edge, on the top surface of the platforms is a shallow trough, probably a cable duct which encircles the platform. A similar cable duct is open and runs along on the inside wall of AB168. Wartime photos show lengths of rebar extending up from the walls of AB61 and AB62 in preparation for pouring the walls. The rebar is now missing, probably salvaged after the war. A 4th bunker foundation just west of AB168 was apparently in preparation but is now missing or buried.

Figure 3.30 Japanese tank AB141 shows the effects of American fire in the wake of the D-Day afternoon counterattack. It has probably been moved from its original position.

AB141, AB147 Japanese Tanks

On the late afternoon of D-Day the Japanese launched a counterattack on Marine units approaching the edge of the airfield, utilizing primarily Type 95 light tanks supported by infantry. The historical record is unclear about the numbers of tanks involved ranging from 12-13 (Denfeld 1988:16) to over 100 (Gayle 1996:18). Japanese records indicate that the 14th Tank Division under Captain Amano was on Peleliu with 17 tanks (Pacific Wrecks) and it seems likely that all 17 were involved in the counterattack. The Americans already knew that tank units were present on Peleliu and were arming themselves accordingly before attacking the airfield where the ground favored the movement of armored vehicles (Garand and Strobridge 1971).

The Japanese tank column moved down the runway and sped ahead of the Japanese infantry in support, attacking diagonally across the front line of the 2nd Marines. Some Japanese infantry were apparently riding atop the tanks as they approached. The 5th Marines saw the tank attack and moved out into the airstrip and began firing. The thinly armored Japanese tanks were fired on by hundreds of Marines with 37mm guns, heavy machine guns, bazookas, an artillery battery, multiple Sherman tanks, and even a Navy dive bomber that dropped a 500 pound bomb (Garand and Strobridge 1971:123-124). In the chaos two Marines were crushed to death by Japanese tanks, others wounded as Japanese tanks exploded. One Sherman had been hit three times by American bazookas. Most of the

Japanese counterattack disappeared in this firestorm but a few tanks went deep into American lines before they were stopped, one nearly making it to the beach.

Located near what was the northwest corner of the Japanese runway, AB141 is a Type 95 Light tank has long been kept free from vegetation and on static display for visitors. It has long been though that this tank remains *in situ* from the counterattack, but its position when placed on an overlay of the 1945 USGS map shows that it would have been in the middle of an active runway. It may have been a static display in a runway median and move at a later date. The turret of this tank was blown off but lies nearby. The tank is oriented in a SW-NE direction with its nose toward the SW. It is corroding but rubber on the guide wheels still survives. Denfeld detailed the history and characteristics of the Type 95 (1988:59):

> The prototype of the Type 95 tank was developed by Mitsubishi Jukogyo in 1934. It first saw service in Manchuria. Following this initial testing on the battlefield, it was accepted in 1935 and designated the Type 95 HA-GO. Mass production of this model began in 1936 and continued until 1942. The Type 95 was 4.3 m long, 2.07 m wide and 2.28 m high. Its engine was a six cylinder diesel with 120 horsepower giving it a top speed of 40 kilom per hour. It was armed with one 37mm cannon and two machine guns. A crew of three operated the tank.

This tank was long thought to be the only remaining Japanese tank on Peleliu, with the identifiable remains of the others taken by post-war scrap collectors. In the 2010 survey we documented an additional tank (AB147) 275 m northwest of the AB141 tank. The tank is buried on its side, exposing a set of wheels, partially missing track and the left side of the turret. Other than the missing track, no obvious battle damage is visible on the exposed parts other than some missing rubber from the guide wheels. A 1944 photograph taken by a veteran shows what appears to be the same tank lying upside down next to a large crater. At some point the tank was evidently shoved down into the crater and buried. If buried soon after the battle the tank may well still contain UXO and even the remains of its crew.

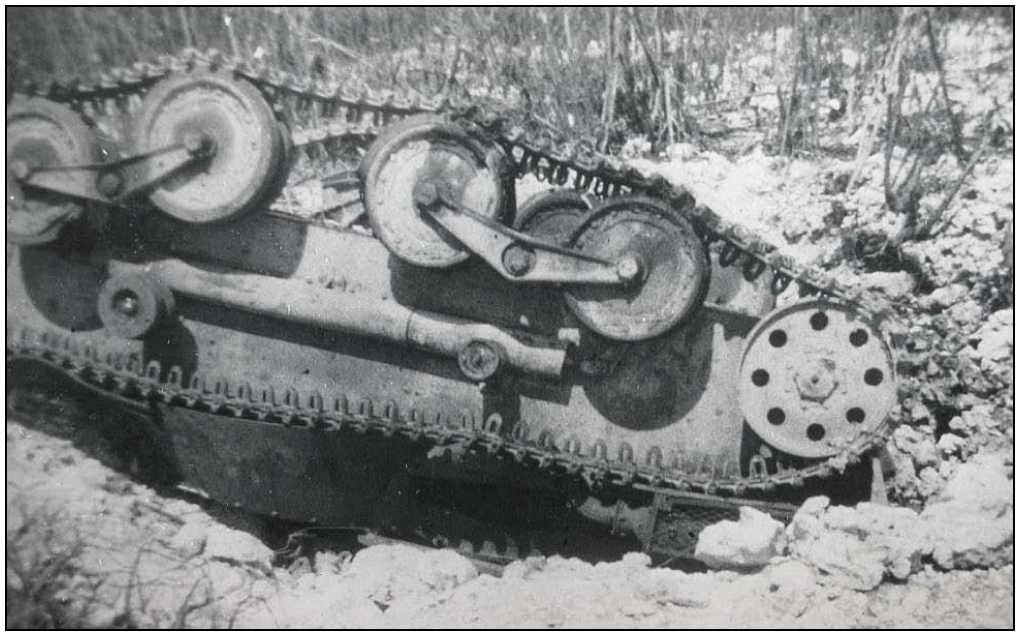

Figure 3.31 AB147, a Japanese Type 95 tank in 1944 adjacent to shell hole into which it was pushed and partially buried. (Edgar Mitchell collection, courtesy of Tangie Hesus).

Figure 3.32 AB147, the same tank in shown Figure 3.31 in 2010, now just partially exposed in a wooded area. This may be the best preserved of the two known Japanese tanks left on Peleliu.

Figure 3.32 Locations of the two known Japanese Type 95 tanks on Peleliu, superimposed on a 1945 USGS map. AB141 is the tank on static display near a roadway today. It may have been originally displayed in one of the airfield's triangular medians and moved later.

Part 4 Orange, Scarlet and Amber Beaches

Figure 4.1 Marines landing on Orange Beach on D-day, September 15, 1944. (NARA; RG 127)

Figure 4.2 Orange Beach in 2010. The beachheads beyond this point were heavily modified after the battle and little of the original historic landscape left by the events of D-day remains in this immediate area.

Post-Invasion Disturbance of the Landing Beaches

With the exception of the rocky headlands on the north and south, White Beach and particularly Orange beach were substantially modified by grading with heavy equipment during the construction of U.S. Navy facilities. The impressive scale of the 1945 construction is evident in the Department of the Navy's summary of its activity on Peleliu (1947:330-331). By January 1945, the Seabees had completed a tank farm, consisting of one 10,000-barrel tank, twenty 1,000-barrel tanks, and three 1,000-barrel tanks for diesel oil and aviation fuel. Hospitals constructed by the Seabees were the 17th Army Evacuation Hospital and Navy Base Hospital 20 which had a 440-bed capacity. An additional Naval hospital had six H-type Quonset-hut units, of 100 beds each, and a 320-bed annex to Base Hospital 20 was completed in March 1945. Naval dispensaries, with a total capacity of 161 beds, were also constructed. By the end of January 1945 a Japanese concrete-block pier had been rebuilt and the approach channel was dredged to a 10-foot low-water depth and an LCT landing beach prepared. A Marine railway and shops for small-boat repair were built along with a supply depot with 8 Quonset-type warehouses with concrete floors. For the aviation supply depot, the Seabees constructed another five Quonset style buildings. At the airfield, four 20 x 50 foot steel magazines were constructed. The spare parts depot consisted of four Quonset buildings, with concrete floors and unloading platforms, and several Quonset huts for offices. More than 16 miles of primary roads were built to serve these activities on Peleliu. Portable components of these installations were taken down when the base was demobilized and abandoned in 1946.

Figure 4.3 Orange Beach in July 1945, view north (NARA; RG 127). By this time many features relating to the beach landings had been destroyed by the American reconstruction and expansion of the airfield.

2010 Survey Results; Orange Beach

Figure 4.4 General location of sites in the Orange beach area

Table 4.1 Sites Documented on Orange Beach in the 2010 Survey

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB149	Site 4		Orange Beach Cemetery
AB149.1	Site 4 Feature 2		Orange Beach Cemetery Flagpole and Stand
AB150	Site 4 Feature 3		Orange Beach Cemetery Chapel Ruins
AB218	New site/feature		Post-war amphibious vehicle
AB219	Site 3 Feature 6		Aircraft part dump; 100 m long
AB220	Site 7		Japanese Defensive Caves (2)
AB221	Site 7		Japanese Defensive Cave
AB230	New site/feature		Aircraft cowling
AB268	New site/feature		Japanese Zero wreck

Figure 4.5 A September 1944 aerial view of Orange Beach shows intense activity on the beach and the complexity of foxholes and other features as the Americans dug in. The main road across the Japanese tank trap is visible as is the beginnings of the cemetery (circled) (NARA; RG 127).

Figure 4.6 Orange Beach Cemetery on July, 1945; looking north with the expanded airfield in the background (NARA; RG 127)

AB149 Orange Beach Cemetery

The former military cemetery and war memorials at Orange Beach are located about 400 m southwest off the end of today's Peleliu airstrip. It is one of the few locations on the island which is regularly maintained and visited by the US military in cooperation with the State of Peleliu. It is a fraction of its original size, with the remainder overgrown however a substantial area is still kept clear and landscaped with ornamental plants that spell out USA in letters large enough to be seen in aerial photographs of the island. The cemetery was emptied in 1947 and remains repatriated to the United States or to Hawaii depending on the wishes of next of kin. Today the cemetery is marked by two stone monuments with attached metal plaques honoring the units that fought on Peleliu, replaconcretes for earlier bronze plaques that were missing when Denfeld's 1981 visit. According to Denfeld (1988:63), the monuments were constructed by the 306th Engineer Battalion. Only the western monument appears in December1945 photographs of the site and it is not known when the identical monument about 30 m to the east was constructed. Also marking the cemetery is a concrete cross similar to the wooden white crosses which originally marked the American graves on the site. It is decorated with a USMC helmet which had its original camouflage cover in 2005 which has now rusted away. The cross is typically decorated with various found WWII artifacts left by visitors, which is also the case with other American and Japanese monuments across the island. A concrete plinth with steps on the north side is 8.3 m long and contains a flagpole which Denfeld reports is a replaconcrete for a much larger original which has since rusted away (1988:63). The cross, flagpole and chapel remains are aligned in a magnetic north orientation.

The location of the cemetery at Orange Beach was established early in the battle for Peleliu and neatly arranged lines of covered American dead can be seen in early aerial photographs of the beach head. The Unit history of the First Marines Peleliu campaign (1944:3) described procedures for burial of American and Japanese dead:

> As a large number of men were killed on the beaches, a cemetery had to be established near the beach. On D plus one, a site was selected about fifty yards inland from Beach Orange Two. This was the only place in the area that had been secured up to that time that was not occupied by tactical units, which could be cleared. The urgent need of all heavy engineering equipment for tactical purposes made clearing and the digging of graves very difficult. The Graves Registration Section collected bodies and transported them by hand, on stretchers, as no other transportation was available. Later, when two DUKW's that could not be water-borne became available, they were utilized… Enemy dead were buried at convenient locations as soon as conditions permitted. Working parties were obtained from service units for this work. On 20 October 1944 there were 10,695 enemy dead buried… there were 1,058 persons from all branches of the Service buried at the U.S. Armed Forces Cemetery Peleliu Number one.

Figure 4.7 Dedication ceremonies at the Orange Beach Cemetery, December 27, 1944 (NARA; RG 127)

Figure 4.8 Orange beach monument in 2010 along with the 1944 concrete plinth and the newer replaced concrete flagpole installed by the people of Peleliu.

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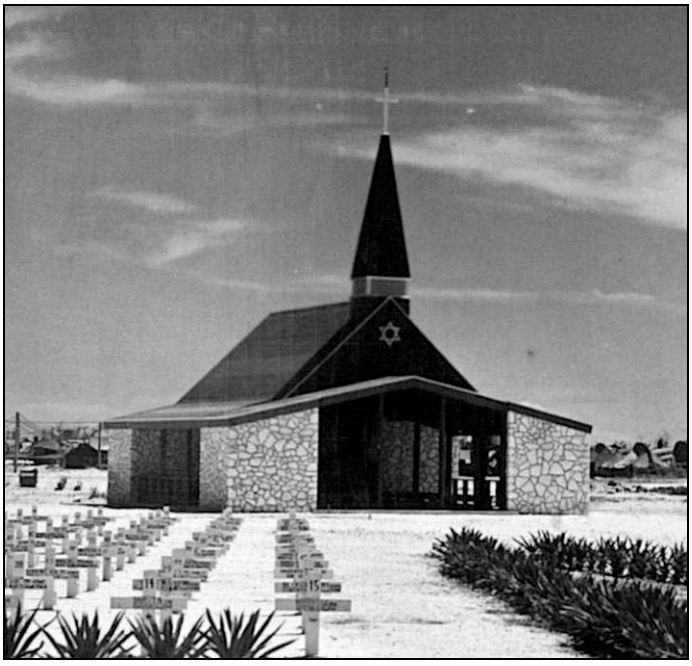

Figure 4.9 (A) The Orange Beach Cemetery Chapel in July 1945 (NARA; RG 127). (B) Left rear corner wall of former chapel.

AB150 Orange Beach Cemetery Chapel

A set of vine-covered coral and concrete walls surrounding a concrete slab is 30 m north of the flagpole in the Orange Beach cemetery area and represents the remains of a roofed open air chapel. The walls are cracked and portions of the wall tops have fallen away and the remains are being covered by jungle vegetation. (Denfeld 1980:62) provided measurements and a detailed description:

> The chapel had four large open windowless spaces, formed by four concrete corners which originally supported a peaked wooden frame roof. The chapel

was centered on the north side of the grounds…the stone faced corner walls are standing but the wooden roof has collapsed and rotted away. The chapel measures 9.8 m wide and 11.6 m from the entrance to the rear at the back of the pulpit. The two corner walls at the entrance are…2.3 m long on the entrance face and 2.5 m along the sides. The entrance portions were each 72 cm thick, while the wall on the side was 65 cm thick. The two front corners left an open entrance of 5.2 m. At the rear of the chapel on the north end, the …walls did not conform to the foundation outline but was placed toward the front creating small enclaves behind it. This was the area of the pulpit. The corner walls at the pulpit are 2.45 m on the sides and 3.5 m in front of the enclaves. These corners are 52 cm thick along the sides and 72 cm thick in front of the enclaves. The four corner walls slope to the center from 2.2m to 3.2 m to give the roof its pitch. The open distance between the front and rear corners provide 6.65 m of windowless space. The walls are placed on a concrete slab that is 10 cm thick.

Figure 4.10 View north at the Orange Beach Cemetery site in 2010 showing the alignment of the memorial cross, flagpole and former chapel. Plantings in the foreground spell out 'USA'.

Peleliu veteran Jim Johnston (in Wright 2002:153) made this observation:

> As we sailed away I watched until the battle blackened ridges and peaks of Peleliu were out of sight, and silently reaffirmed that I never wanted to see that place again…I have heard recently that someone later raised a monument to the boys and fought and died on Peleliu- I think that was a bad idea. If I were going to put up a monument, I would put it up on the lawn of the White House in Washington DC.

Figure 4.11 American and Japanese aircraft parts piled high at AB219, the largest of several aircraft part dumps on Peleliu.

AB219 Aircraft Part Dump

On the south end of Orange Beach, along the shoreline near Peleliu's south dock is 100m long and 10 m wide pile of mangled aluminum and parts from Japanese and American aircraft. We noted wing and cockpit sections of Corsairs, including .50 caliber machine guns and parts of Japanese twin engine bombers. Denfeld (1988:62) estimated that there were about 2700 cubic m of aircraft debris present at the site in 1981 and reported that the material was the remnants of 1950s scrap collecting from the airfield that had been gathered together but never shipped. This story is supported by the fact that it is located on an artificial harbor constructed by the American military in 1945. Today these aircraft parts have considerable historic and commercial value and there have already been attempts to remove these artifacts.

Figure 4.12 Interior of the U-shaped cave at AB220

AB220 Japanese Defensive Caves (2)

The landings at Orange Beach came under fire from an unnamed island on the south end of the landing area. In 1945 the island was connected to the larger island of Peleliu by construction of a large artificial harbor by Navy Seabees. Denfeld (1988:64) surveyed the island and located three caves which are probably the same ones revisited during the 2010 survey; AB220 and AB221. Three cave openings representing two adjacent caves are present at site AB220. One is a U-shaped cave with an east facing entrances measuring 2 m wide and 1 m high. It was not entered but did not appear to contain any artifacts. This may be the cave Denfeld thought most likely to have housed the Japanese gun. The other cave at this location is located a short distance south of AB220 L-shaped and is about 3 m wide and is about 14 m long. It contains Japanese mess kit parts, rice bowls and other artifacts.

Figure 4.13 Coral revetment wall and entrance to AB221, located on a former island.

AB221 Japanese Defensive Cave

Located south of AB220 is a small cave opening 1.5 m wide and 1 m high. It has an east facing entrance that has been partially protected by a low revetment wall of stacked coral rock. It contained no obvious surface artifacts, however some material may be present under leaves and dried vegetation that has accumulate on the cave floor.

Figure 4.14 Site AB268, Japanese Zero wreckage in 2010. This is located just off a road and is a popular visitor stop on Peleliu.

AB268 Japanese Zero Wreck

Located just off the road near South Dock are the remains of a heavily damaged but recognizable Japanese Zero aircraft. It is aligned SE-NW with the nose facing toward the SE. The wings extend only as far as the undercarriage legs and the fuselage runs from the engine bulkhead and ends just behind the cockpit canopy. There is a shell hole located just behind the right side in line with the radio behind the seat. Instruments and equipment for this aircraft are all missing, leaving behind the basic aluminum shell.

Figure 4.15 AB230 is a Curtis Commando C-46 engine cowling that seems likely to have been moved here from another location.

AB230 Aircraft Cowling

An engine chin cowl from a Curtis Commando C-46 transport plane is located on a former island on the southern extreme of Orange Beach that later connected to the island as part of
an artificial harbor constructed by the Navy Seabees. It may be associated with the post-invasion garrison phase of American occupation. No C-46 aircraft were lost on Peleliu during the combat phase of operations. These aircraft were used by both the Army Air Corps and the U.S. Navy/Marine Corps in moving people and cargo during WWII and afterward.

Scarlet Beach

Contrary to popular lore, Scarlet Beach was not named for its blood-stained sands following the American invasion; it was a military code name and was not among the beaches chosen for the D-Day assault. There was however heavy combat inland from this area and because it was less disturbed by later construction, many more battlefield remains are present here than on White or Orange beaches. Gayle (1996:23) described the fighting on Scarlet Beach:

> In the south, from D plus 1 through D plus 3, the 7th Marines were in vigorous assault against extensive fortifications in the rear of the Scarlet Beaches. These were defended by a full battalion, the elite 2d Battalion, 15th Regiment. Although isolated and surrounded by the Marines, this battalion demonstrated its skill and its understanding of Colonel Nakagawa's orders and mission: to sell Peleliu at the highest possible price. The 7th Marines attacked with 3/7 on the left and 1/7 on the right. They enjoyed the advantage of attacking the extensive and well prepared defenses from the rear, and they had both heavy fire support and the terrain for limited maneuver in their favor. Both sides fought bitterly, but by 1530 on 18 September (D plus 3), the battle was substantially over. The Marines had destroyed an elite Japanese reinforced infantry battalion well positioned in a heavily fortified stronghold.

The majority of the sites located in the 2010 survey were new to the inventory on Peleliu. There are likely many more sites in the dense undergrowth north of the cluster of sites around the 120mm Japanese gun positions, as well as in the northwest sections of the southern peninsula where the current Japanese memorial park is located. These areas should all be considered very high probability areas in that that more hitherto undiscovered WWII remains are probably located there.

2010 Survey Results; Scarlet Beach

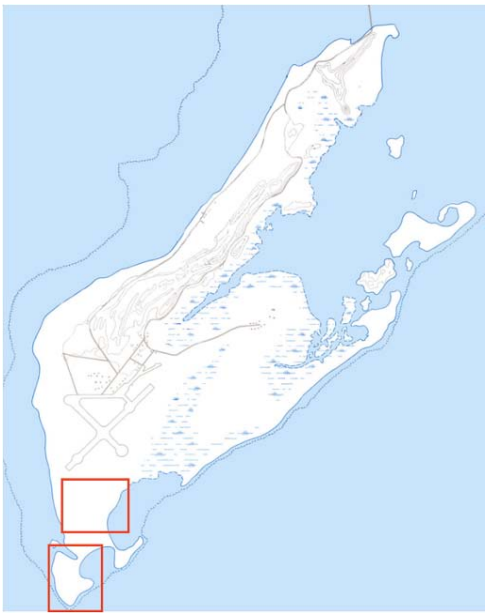

Figure 4.16 General location of sites in the Scarlet Beach area

Table 4.2 Sites Documented in the Scarlet Beach Area in 2010

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB142	Site 11		Japanese 'German' Blockhouse
AB143	New site/feature		Japanese 37 mm wheeled gun
AB144	New site/feature		Japanese Searchlight Power Bunker
AB173	Post 1981		Japanese Memorial Scarlet Beach
AB174	New site/feature		Japanese Mortar Pit
AB175	New site/feature		American pontoon barge
AB176	New site/feature		American Concrete gun mount
AB177	New site/feature		Japanese? Mooring Buoys
AB178	New site/feature		Japanese bunker w gun
AB179	New site/feature		American TNT cache (removed by UXO team)
AB180	Site 8 Feature 1?		Japanese Pillbox- collapsed
AB181	New site/feature		American Corsair Belly Tank, Napalm Canister
AB182	New site/feature		American LVT4
AB183	New site/feature		American Water Pumping Complex
AB184	New site/feature		Japanese dugout
AB185	New site/feature		Japanese 120 mm gun position (and gun?)
AB186	New site/feature		American 'Lady Luck' LVT
AB187	New site/feature		Japanese 120 mm gun position
AB188	New site/feature		Japanese Anti-Aircraft Gun pit
AB189	New site/feature		Japanese Anti-Aircraft Gun pit
AB190	New site/feature		Japanese 25 mm Anti-Aircraft gun
AB191	New site/feature		American Water tank
AB192	New site/feature		Japanese 25 mm Anti-Aircraft Gun mount
AB193	New site/feature		American Mortar pit
AB194	New site/feature		Japanese Defensive Cave

AB174 Japanese Mortar Pit

A pit aligned N-S with an entrance on the north side measures 2.5 m wide, 7 m long and is 1.75 m deep. It contained two damaged Japanese mess kits and miscellaneous other hardware fragments. The pit is partially covered with remnants of a roof made from plate metal and coral rock. It may originally have been one of the Japanese 'spider holes' that plagued the Marines in this area.

AB175 American Pontoon Barge Fragments

The badly rusted remains of a US pontoon barge in this location may have been abandoned or perhaps washed out from artificial harbors elsewhere on Scarlet/Orange beach by a storm. The barge remains are not associated with any coral rock walls or other materials that suggest there was a dock or other facility at this location.

Figure 4.17 AB176; a USMC concrete mount between coral rocks

AB176 USMC Concrete Mount

An unusual feature consisting of a roughly rectangular mass of concrete and coral rock is 1.5 m high and measures 1.25 m x 2 m. Coral rock encircles a U-shaped concrete pad which may have been anchored an installation, radio tower or even an artillery piece. This feature was not seen in any other location on Peleliu during the 2010 survey. Letters were crudely drawn into the concrete while it was still wet and are difficult to make out but it seems to read 'John Buhlar USMC'. An inscription by a Marine suggests that this feature was installed during the combat phase of the Peleliu operation in the fall of 1944. The only artifact associated with this feature was an unbroken vacuum tube or specialized light bulb of some kind.

Figure 4.17 AB177, One of two mooring buoys on Scarlet Beach

AB177 Mooring Buoys

Two cylindrical iron tanks probably represent the remains of navy mooring buoys a short distance apart are on the high tide line. They are about two m in diameter and flanges around the base may have accommodated rubber or wooden bumpers. It is not known with certainty whether these are related to the American or Japanese occupation of the island, however period photographs of Japanese harbor installations suggest that they are probably Japanese.

Figure 4.18 Entryway of AB178 pillbox overlooking Scarlet Beach

AB178 Japanese Pillbox and Gun
A trapezoidal pillbox overlooks Scarlet beach with a west facing gun aperture 1 m wide. The reinforced concrete walls are 1 m thick and the exterior was camouflaged on the sides and rooftop with coral rock boulders. The doorway is on the east side and is 2.8 m wide. The interior of the pillbox is 1.5 m high and 4 m long. The rusted and badly damaged remains of an unidentified Japanese wheeled field gun are located about 10 m east of the pillbox and consist of a mid-section of the gun barrel and the fragmentary remains of the wheel axle.

Figure 4.19 AB179 cache of American TNT in a rusted barrel. The molded charges of TNT will explode upon contact with an open flame or similar heat source.

AB179 American TNT Cache
One surface find that caught our attention was a metal oil drum base which was filled with about 120 pounds of live TNT demolition charges. The drum was located about 4 m in a mangrove swamp which had recently receded to expose the cache or explosives. The material was immediately removed by the UXO team and consisted of 67 individual molded charges of TNT. According to our UXO specialist this amount of TNT, if exploded would have left a crater roughly about 10 m wide and about 2 m deep. Rotted remains of wooden slats suggest that the TNT had originally been deposited in the barrel packed in a crate.

AB180 Collapsed Japanese Bunker
A square of collapsed reinforced concrete rubble measures about 6 m on a side and apparently had coral side walls. It may have had wooden components that are now missing. It appears to have faced north.

Figure 4.20 AB181, A belly tank probably used to deliver napalm as the Marines fought to secure the southern end of Peleliu.

AB181 Corsair Belly Tank/ Napalm Canister

A battered and dented aluminum underbelly tank, probably for a Corsair, is about 2 m long and identical to others found during the survey in the central combat zone on Bloody Nose Ridge and on static display in the area of the airfield complex. It is aligned NNE-SSW. The north end of the tank is damaged and the coupling is missing.

Figure 4.21 Two views of AB182, wreckage of an American LVT(A)4; the rear left corner of the vehicle (top) and the separated turret (bottom).

AB182 LVT4 Remains
A badly damaged LVT(A)4 survives in the tree line above the high tide line on Scarlet Beach. The body of the LVT remains intact and lacks a ramp. The turret faces to the rear and has a .50 cal machine gun ring. The guns and track are missing from this wreckage and it may have been dismantled by post-war metal salvagers.

AB183 Water Pumping Complex
Two rectangular concrete pads measures about 5m x 10m and lie parallel to other with an iron manhole cover between them, along with a narrow concrete slot that accommodated a large pipe and several concrete equipment mounts for which may have held pumps which are now missing. It is probably associated with the post-battle construction by the U.S. military.

AB184 Japanese Dugout
A rectangular dugout is aligned NE-SW with an entrance on the NE end. The dugout measures 5.35 m by 3.9 m and the entrance tunnel is 2.25 m by 1.1 m. It is 85 cm deep.

Figure 4.22 AB185, A Japanese 120mm gun position just after being taken by Marines in 1944 (NARA; RG 127)

Figure 4.23 AB185 Japanese 120mm gun position in 2010.

AB185 Japanese 120mm gun and revetment

A circular complex of at least small gun pits in coral rock is 12-15 m in diameter. In the center of these is a gun pit about 5 m in diameter and exposed on the surface is the top of the intact 120mm artillery piece which is apparently buried inside the collapsed revetment. A deeper pit on the southeast side of this complex may represent the buried entryway. This was one of a Japanese Navy 4-gun battery located in the Scarlet Beach area. The battery was protected by two twin mount and three single mount 25mm anti-aircraft guns and a 13 mm single mount gun. It also had a searchlight, and underground command post and two large ammunition shelters (First Division 1944: 90,91). One other battery of 120mm guns overlooking Orange and White Beaches was under construction at the time of the U.S. assault and never used. At least one other functioning 120mm gun fired on US troops from Radar Hill (Denfeld 1988:92). Another 120 mm battery existed on Ngedbus Island but was damaged by bombing and/or naval fire and was only able to fire a few rounds. At least one of those guns still remains intact (Gayle :33). The 120mm guns may have been largest actually used by the Japanese in defending Peleliu; A battery of three 127mm guns had not yet been delivered and three 200 mm guns had not been completely installed by the time of the American assault.

Figure 4.24 Front view of AB186, the 'Lady Luck' LVT(A)4 in 2010.

AB186 Lady Luck LVT(A)4

'Lady Luck' is the most historically significant LVT on the island, although not the most visited or accessible. The 1944 photographs and story about Lady Luck's predicament are well known among WWII buffs and the wreck is often a scheduled visit for battlefield tour groups. In 2011 a 1/72 scale plastic model kit of the Lady Luck was introduced by a hobby company. During the assault on these positions the Lady Luck broke through the roof of a covered 120mm gun revetment (AB187) and was not recovered. According to our Palauan crew members, the LVT(A)4 was towed off the revetment by post war salvagers who wanted to remove the gun. This story is supported by the evidence of 6-10 m of drag marks that still visible in the soils between the LVT and the position. Slump on the west side of the gun revetment still marks the location where the Lady Luck was stuck. Several Japanese defenders of the position were reportedly trapped beneath the vehicle at the time. The large number 'D-12', which refers to the landing sequence assigned to this vehicle, is rusting over but still legible on the turret, however smaller painted lettering of the name 'Lady Luck' is not longer visible. The tread belts are missing and corrosion has opened holes on the sides of the vehicle and weakened it. The gun barrel has been removed from the turret, probably by post-war metal salvagers.

Figure 4.25 The 'Lady Luck' LVT(A)4 in 1944, stuck after falling through the roof of AB187, a Japanese 120 mm gun position. (NARA; RG 127)

Figure 4.26 The same view of Japanese 120mm Gun Revetment AB187 in 2010.

AB187 Japanese 120mm Gun Revetment

This gun revetment has been partially filled and there is no evidence that the gun still remains in place. The depression is 7 m in diameter and has a south facing entrance ditch 2 m wide, which may represent the remains of an entry tunnel. This revetment is collapsed inward on its western side where the Lady Luck broke through. Interior details photographed after the position was secured show an elaborate installation with telephone communication and well-constructed ammunition storage alcoves (First Marines 1944).

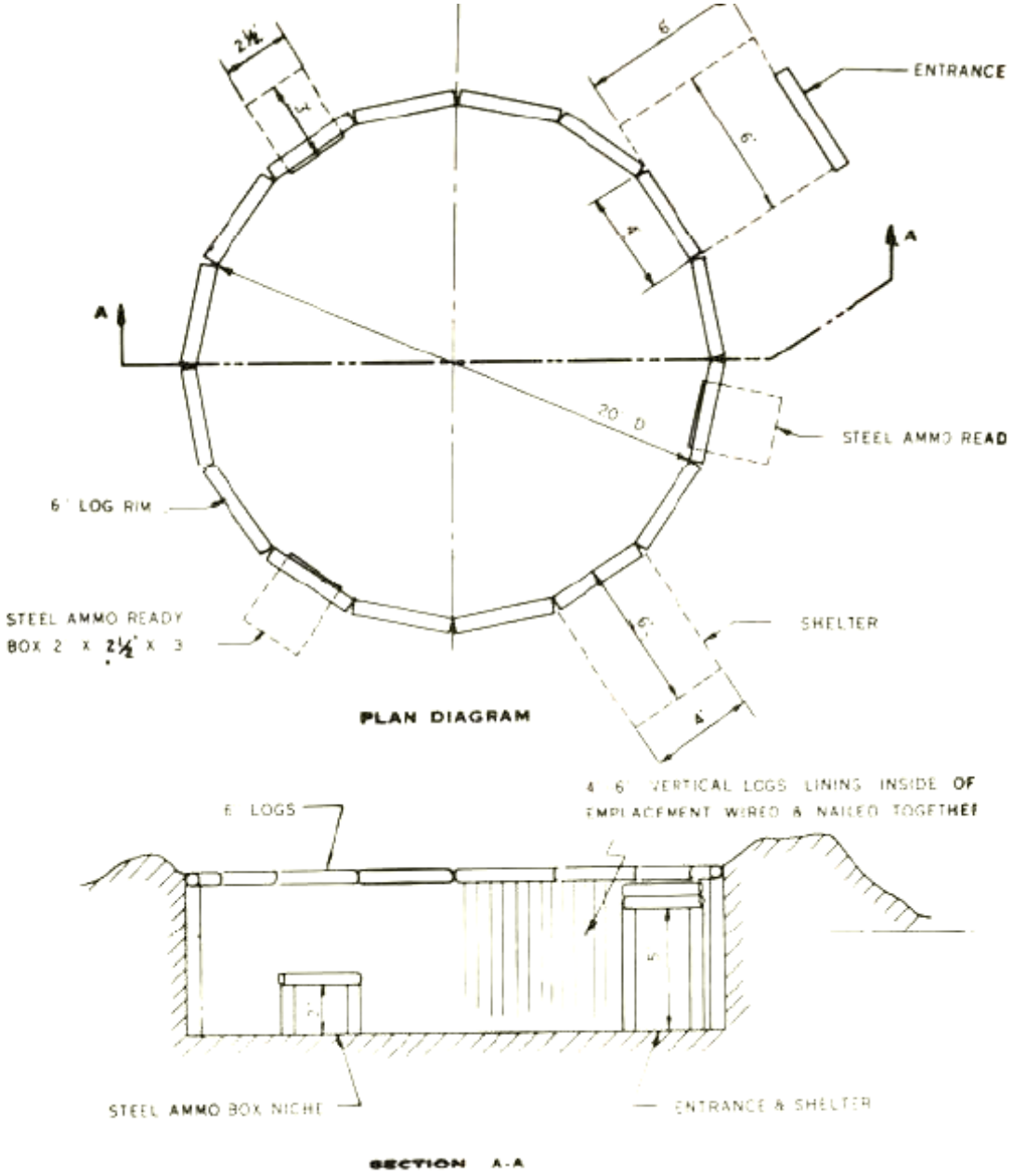

Figure 4.27 Plan diagram for the Japanese 120 mm gun emplacement at AB187 as it was documented in 1944 (First Marines 1944).


Figure 4.27 (left) The gun mount at AB188 shortly after the area was secured by U.S. Marines in 1944 (NARA; RG 127) and (right) the same gun mount, now damaged, in 2010.

AB188 Japanese Anti-Aircraft Gun Pit

A circular gun pit 2 m in diameter is 1 m deep and surrounded by a revetment of coral boulders. In the center of the pit is a shattered wooden post, which was bound with metal bands and used to support single anti-aircraft guns that defended the battery. The gun is missing from this position.

AB189 Japanese Anti-Aircraft Gun Pit

This pit is much like AB188, but is not as well preserved and lacks both a mount and any evidence of a gun. It has been partially filled and the outlines are not well defined.

Figure 4.28 25mm anti-aircraft guns like this one at AB190 are common elements of WWII Japanese installation sites in Palau.

AB190 Japanese 25mm Anti-Aircraft Gun

A roughly defined 5 m wide semi-circular depression in coral rock boulders contains a single 25mm type 96 gun. No mount is visible but 25 mm cartridge clips and heavily corroded iron fragments surround the gun.

AB191 American Water Tank

The collapsed remains of a cylindrical water tank about 9 m in diameter was contained within a coral revetment 17.2 m in diameter and 1 m high. Remains of metal ladders, valves and pipes are also present. American markings were seen on the hardware and it seems probable that this feature was built to support American garrison installations after Peleliu was secured.

Figure 4.29 (left) AB192 gun position and mount in 1944 (NARA; RG 127) and the same location in 2010.

AB192 Japanese 25mm Anti-Aircraft Gun Mount

An iron gun mount is in a partially filled 2m wide pit of coral rock. The mount was used in conjunction with one of the 25mm anti-aircraft guns that defended the 120 mm navy gun battery.

AB193 American Mortar Pit

A circular pit cut into the coral is 2 m in diameter and may be a Japanese pit that was utilized by an American mortar team. A large number of iron ‘clover leaf’ mortar round carriers are on the site. The distinctive clover leaf caps once covered long since deteriorated heavy cardboard tubes that protected the mortar rounds. The pit is about 50 cm deep. A roll of barbed wire, American jerry cans and a US plasma bottle are located on the west side of this position.

Figure 4.28 The entry to AB194 cave still bears the scorch marks from American flame-throwers.

AB194 Japanese Defensive Cave

A large natural cave mouth 5m in diameter drops nearly vertically for about 3 m before leveling off and leading to the north through an opening that is 2 m wide and 1 m high. The UXO team found live grenades in the cave and hadn't had a chance to investigate further so the cave was not accessed during the 2010 survey.

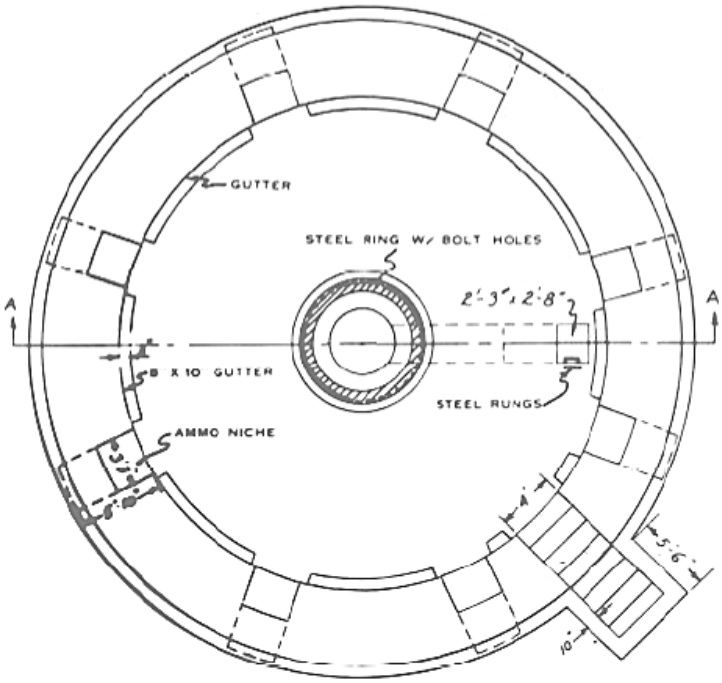

Figure 4.31 Plan diagram of Japanese 127 mm gun emplacement (First Marines 1944)

Figure 4.29 AB264, a Japanese 127mm gun emplacement being recorded by members of the 2010 survey team.

Figure 4.30 US Marines investigate one of three concrete Japanese 127mm gun emplacements in 1944. The guns were in transit at the time of the American invasion and the emplacements were never used against US troops. (NARA; RG 127)

AB264-266 127mm Japanese Gun Emplacements (3)

Among the unfinished Japanese defense installations at the time of the American invasion was a cluster of three identical 127mm gun emplacements, located about 150 m west of the Scarlet Beach shoreline. The emplacements are in the form of concrete bowls about 12 m in diameter and 2 m deep and are of the same design as examples documented in Japanese defenses at Pohnpei and Roi-Namur (Denfeld 1988:65). Archival photographs show that the circumferences of these emplacements were originally painted with numbers for compass bearings although these have now faded away. Concrete steps on the northwest side lead onto the floor of the emplacements. Distributed around the base of the bowls are 8 niches, place every 3.25 m, which accommodated ammunition magazines. The emplacements appear to have been completed and were awaiting delivery of the guns had not arrived by September of 1944. An iron ringed circle for the gun mount at the center of the emplacement is 2.75 m in diameter and 1.85 m deep.

Located inside the gun ring of AB265 is a grill and headlamps from a Japanese army 5 ton prime mover tractor. Also located between emplacements AB264 and AB264 is a fairly well preserved trailer for a Japanese army 90 cm searchlight.

Figure 4.31 Discarded Japanese military items near the 127mm gun emplacements (left) a tractor grill, (right) a searchlight trailer and mount.

Figure 4.32 AB142, Japanese ‘German’ Blockhouse after being secured by American Marines in 1944. (NARA; RG 127)

Figure 4.33 AB142 Japanese ‘German’ Blockhouse entrance in 2010.

AB 142 Japanese 'German' Blockhouse

A leading Japanese strong point among the defenses in the Scarlet Beach area was a reinforced cast concrete blockhouse, with walls further protected by a thick revetments made of coral rock and equipped with four gun ports. It was a formidable objective and Hough (1950:63) described how this position was finally taken:

> Early on the morning of 16 September (D-plus 1), tank support and heavy preparatory fire enabled Company I, attacking eastward, to seize the supporting positions to its front--three concrete dual-purpose gun positions and a barracks area--with no great difficulty, but the blockhouse itself proved to be a very tough nut indeed..This fortification was finally reduced by demolition teams working under the concealment of smoke placed to blanket all of its apertures.

After being secured the blockhouse was used by the Marines as a command post and after that the 321st used it as a message center (Denfeld 1988). The name originates with the Americans who noted its resemblance to similar fortifications used in Germany and 'German Bunker' is the local nickname for this site used by the residents of Peleliu. The building was well described by Denfeld (1988:65) who was familiar with this design from several other Japanese WWII sites elsewhere in Micronesia:

> This site has four pie-shaped compartments, each having a firing port equipped with a metal shield. At each gun port is a ring gun mount with gun socket equipped to accommodate a 13mm or 20 mm gun. The interior walls of the blockhouse were originally covered with rock wool insulation and wooden paneling for sound deadening. The blockhouse is 12 m in diameter and its walls are 1.20 m thick. On Peleliu, the Japanese added additional reinforcement by stacking rocks around the blockhouse walls, sometimes up to five m thick. In the center of the blockhouse is a circular concrete ammunition magazine. Above the magazine is a steel turret observation post.

Denfeld noted that the Peleliu exemplar of this building type was the best preserved of all those in Micronesia, where other buildings had been stripped or damaged by fire. The coral rock prevented shell damage and the metal port mechanisms and observation turret also remain intact. The rock wool and wooden paneling that were present in 1981 however, are all missing and apparently have been removed for reuse elsewhere on the island. Nevertheless this blockhouse retains surface features now lost in examples elsewhere in the Pacific (Denfeld, pers.comm. 2012).

The metal observation turret is corroding and will need stabilization soon if it is to last much longer. The iron gun ports remain in good condition. There has been some vandalism to the interior in the form of spray painted graffiti, some of it referencing the war with messages like 'God bless all the brave soldiers'.

Figure 4.34 Marines pause in front of one of the four firing ports in AB142 in September, 1944. (NARA; RG 127)

Figure 4.35 Firing ports and sliding iron blast doors remained in good condition at AB142 in 2010.

Figure 4.38 Interior view of the AB144 power bunker in 1944 (left- First Marines 1944) and 2010 (right).

AB144 Japanese Searchlight Power Bunker

About 100 m southeast of AB142 is another reinforced concrete structure with meter thick walls, buried underground and covered with a mound of coral rubble. Narrow doorways were installed at either end of a rectangular room inside, but only the door on the west side remains open while the other is almost entirely blocked by coral rubble, some of which is spilling down into the main room. Iron ventilation pipes lead to the outside from the main room which accommodated generators intended to power a searchlight attached to the Japanese blockhouse complex. Parts of the heavily constructed iron generator housing are still intact, but other equipment that appears in the 1944 photograph (Figure 4.3) is now missing and was presumably taken by post-war metal salvagers. Modern day rubbish has accumulated in this structure, however there was no outright vandalism observed as of 2010.

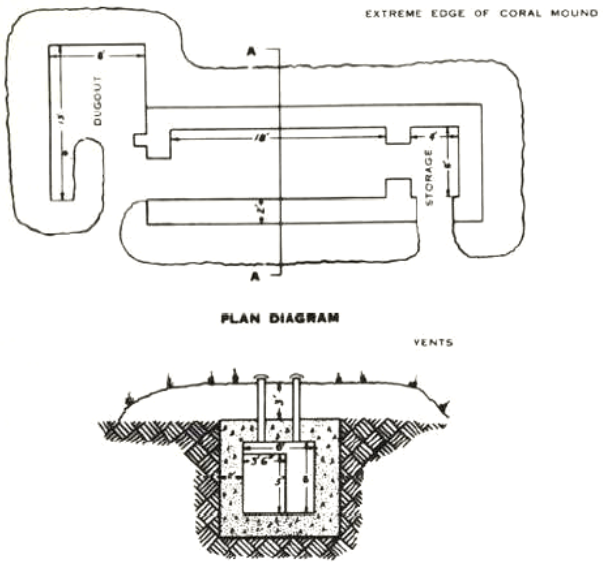

Figure 4.39 Plan views of AB144 (after First Marines:1944)

Figure 4.40 AB142, a Japanese 37 mm gun may have been intended as a static display and is probably not be in its original position.

AB143 Japanese 37mm Wheeled Gun

Located just west of the AB142 'German Bunker' is a corroded but remarkably intact example of a Japanese Type 96 Infantry rapid-fire wheeled gun. It rests on a bed of coral rubble and is free of any accumulated vegetation. That and the fact that the gun was not mentioned in Denfeld's description of AB142 suggests that the gun may have been brought here from elsewhere on the island for the sake of visitors to AB142.

Figure 4.40 Interior of AB217, an E-shaped Japanese artificial cave.

AB217 E-shaped Japanese Defensive cave

An artificial E-shaped cave has three southern facing entrances facing south and two machine gun positions that face north. Only the middle entrance is open, measuring about 2 m wide and 1 m high. A post strung with barbed wire exists at the west side of the entrance. Scattered on the cave floor are a large quantity of disarticulated human remains, including a scapula, pelvis fragments, vertebrae, and ribs. Remains of a uniform belt along with another broken bone scatter and a cranial fragment exist on the east end of the cave and may be associated with a single individual. Numerous artifacts exist in this cave including bottles, a metal teapot, leather boot fragments and Japanese mess kit parts.

Figure 4.40 Location of AB276, an area of more than 100,000 sq. m that is very heavily contaminated with WWII unexploded Ordnance.

Figure 4.40 American and Japanese unexploded Ordnance carpets the jungle floor for a substantial area at AB276. Mortar rounds, rifle grenades, artillery rounds and hand grenades are all abundant.

AB276 UXO Contaminated Area

The ground between Purple Beach and the Japanese positions at the airfield and beyond was swampy and unsuitable for a ground approach by invading American forces except for a narrow strip of dry ground. That strip could not be surveyed in 2010 because of an extraordinarily dense cover of Japanese and American UXO on the ground surface. According to our UXO team, this concentration measures at least 450 m wide and 250 m long, for a total area of 112,500 square m, or 27.79 acres. This material may represent rarely preserved *in-situ* deposit of battlefield detritus or a UXO dumping ground used by the American military or both. There are large numbers of empty small arms clips and grenade pins that suggest that at least part of these artifacts reflect combat operations. Regardless, this area is far too dangerous to enter and should be professionally cleared by a UXO team at the earliest opportunity, and until then should be marked with barricades and signage.

2010 Survey Results; Amber Beach

Figure 4.41 Location map of sites AB151 and AB152. The site has been marked for visitors by the State of Peleliu.

Table 4.2 Sites Documented in the Amber Beach Area in 2010

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB151	New site/feature		Japanese Holdout Cave
AB152	New site/feature		Japanese Rifle pits

AB151 Japanese Holdout Cave

Amber beach comprised the west coast of Peleliu north of White Beach and extending to the north end of the island. American planners judged the beachheads here too rocky to support large scale landings and defenses in this area were spared most of the heavy pre-invasion bombardment. Amber beach also escaped the post-invasion construction by the Americans and Denfeld found numerous Japanese gun positions here that had been placed in modified cracks and fissures in the limestone rock (1988:83).

The 2010 survey did not cover Amber Beach except for a historically significant cave where a group of Japanese managed to not only survive the battle for Peleliu, but hold out right under the noses of the American military for nearly three years afterward. The group of 34 Japanese included 22 army, 8 Navy and 4 members of civilian construction teams and were under the command of 2nd Lt. Ei Yamaguchi. The group had conducted small guerilla operations and had been subsisting largely on discarded foodstuffs left by the American garrison. As the American garrison began to shrink with the gradual dismantling of the base on Peleliu, was considering a strike in an effort to overwhelm the remaining US troops, but gradually yielded to pleas from the Americans and Japanese relatives and former officers that the war was over.

Figure 4.42 Entry to AB151, a cave where 34 Japanese holdouts lived for nearly 3 years.

Time Magazines coverage of the story (March 31, 1947) conveys the sense of genuine alarm that Lt. Yamaguchi's men triggered on the American base on Peleliu:

> One midnight last week two native boys finished work at Peleliu's naval compound, started home through the jungle. As they swung into the trail through the mangroves, prowlers jumped them. They dived for cover, with bullets zipping overhead. Next day they reported to the commander of Peleliu's tiny naval and Marine detachment that their attackers were Japanese guerrillas.
>
> For weeks the U.S. garrison had seen signs of resurgent Jap activity. A raft loaded with stolen Marine rations was discovered floating in Peleliu's lowland swamps. Then a Marine sentry fired on a band looting a warehouse of captured Japanese weapons, was answered with rifle and grenade fire. The Jap strength was estimated at 50, led by a lieutenant commander, with more coming in daily from nearby Babelthuap. Alarmed by the weakness of his small, lightly armed Marine garrison, worried for the safety of the 35 naval dependents, Peleliu's commander radioed for reinforcements.

> By this week 26 more Marines had flown in from Guam, with flame throwers and 60-mm. mortars, to join the hunt. By day they crawled cautiously up Peleliu's tortured Bloody Nose Ridge, where the 1st Marine Division had lost over 6,000 casualties just 30 months before. By night they established cossack posts to bushwhack guerrillas who sneaked out in search of food & clothing. There was one change from the first, historic assault landing on Peleliu. This time the Marine reinforcements jumped at the chance to move in "for experience and target practice."

On April 21, 1947 the group surrendered to U.S. troops in a ceremony that was the last formal surrender of WWII anywhere in the world.

The holdout cave is located about 100 m east of the West Road and is adjacent to a large mangrove swamp and marsh filled with standing water. The entrance to the natural cave faces west and is a narrow vertical slit 1.05 m long and 35 cm wide, small enough to be easily hidden under a few palm fronds during the day. Small arms rounds can be seen inside on the floor of the cave which is just over 1 m high. The cave location is marked on the roadside by a battered but still readable stainless steel sign written in both Japanese and English and the site is approached by a narrow trail.

AB152 Japanese Rifle Pits

At least 3 or 4 rifle pits are in the immediate vicinity of AB151, probably constructed by the Japanese holdouts for defense in event of discovery of their hiding place by American forces. The pits are located north and west of the cave entrance and fragments of American .30 cal ammunition boxes and American mess kit fragments can be seen on the surface.

Figure 4.43 The last formal surrender of WWII by Japanese survivors on April 21, 1947. (Peleliu WWII Museum collection)

Part 5 The Japanese Airfield Complex

Overview

As Murray (2006) points out, the selection of Peleliu by Japanese planners for the construction of the largest airfield on Palau had far reaching implications for the people of that island. Militarily, Peleliu was disadvantaged by its location 25 miles from Koror and a lack of deep water docking approaches, but it did have flat ground that could be modified by human labor and construction machinery was lacking in Micronesia. Construction began on the airfield under the direction of Imperial Japanese Navy (IJN) in 1938 and it was operational by 1940 with further improvements continuing through the first American air raids on the base in March of 1944 (Murray 2006:122). Several Japanese installations were found to be still under construction when the Americans secured the base in September of 1944 and an additional air strip on Ngedbus Island was not yet operational. Construction caves and installation of large guns and associated defensive structures on Peleliu did not begin until the war turned against the Japanese in 1944.

American reconnaissance aerial photographs of the Peleliu airfield and support structures show a substantial complex of neatly organized and landscaped buildings and roadways. According to Denfeld (1988:76), the Japanese garrison occupied 12 wood frame barracks, six latrines and baths, 21 concrete water tanks and 8 heavily reinforced concrete air raid shelters. Surviving concrete structures and pads were incorporated into the American occupation of the airfield complex that began immediately after it was secured from the retreating Japanese. Many buildings were removed during the subsequent enlargement of the airfield and construction by American forces. Jungle vegetation has reclaimed most of the airfield, except for roadways and a single length of the SW-NE runway, which is gravel covered and said to be 6,000 feet long and 40 feet wide (FAA 2010).

Air Raids and Bombardment

The airfield like other Japanese installations in Palau came under serious American attack for the first time during the carrier-based air raids of March 30-31, 1944. This was a large scale attack supported by 11 aircraft carriers, 6 battleships, 13 cruisers and 48 destroyers. American pilots counted 111 Japanese aircraft destroyed in the air and 46 more destroyed on the ground during this raid while American losses were relatively light (Denfeld 1988: 26). Peleliu was hit by a second carrier raid in July as well as attacks by land-based heavy bombers from June to September 6, when carrier-based aircraft and the American support fleet began the heavy pre-invasion bombardment of the island. Shelling from 4 battleships, 4 cruisers and 9 destroyers would last for two hours, followed by two hours of air attack by the carrier based planes; a pattern repeated for three days until Navy commanders declared that there were no more visible targets left to attack. Photos of the airfield complex show a ruined landscape of destroyed buildings and innumerable impact craters large and small. Seven of the eight heavily constructed air raid shelters and a few buried bunkers in the airfield complex survived the bombardment as well as the largest reinforced concrete buildings, although all of these were heavily damaged.

Figure 5.1 US Marines take refuge in a shell hole during the attack on the airfield by US Marines on September 16. View NW toward Bloody Nose Ridge (NARA; RG127).

Figure 5.2 The 5th Marines advance on the open ground of the airfield under heavy fire. Ruins of the Japanese Airfield Operations Building (AB263) can be seen in the background. (NARA:RG127)

Attack on the Airfield

The southern edge of the Japanese held airfield was only a few hundred meters from the main landing beaches at Orange Beach 1,2, and 3 and White Beach 1 and 2. On September 16, D-Day plus 2, the 5th Marines attacked the open airfield under heavy artillery and small arms fire which mostly came from the ridge system just north and west of the airfield, much of which had a commanding view of the area. The 2nd Battalion of the 1st Marines cleared the ruined concrete installations on the north edge of the airfield, also coming under heavy mortar fire as well as enduring "savage close-in fighting" (Hough :75). By the end of the day the Peleliu airfield, primary objective of the assault, was secure. Taking the remainder of the island would take the Americans another 70 days.

Rebuilding of the Airfield

By September 19, or D-Day plus 4, Seabees from the 33rd Construction Battalion began the clearing of UXO, landmines and debris from the airfield and construction equipment landed the following day began infilling shell holes (US Navy 1947:328). Within 72 hours the first three squadrons of American fighters were able to use the field for close combat support operations. Construction of a 6,000 foot bomber strip was begun on September 23 and despite being under mortar fire for the following six days, the bomber strip was operational in a week. Improvements and expansion of the airfield continued well past the end of combat on Peleliu. The bomber strip is the one used today by civilian aircraft, while the fighter strip measured 4,000 by 250 feet. By 1945 the airfield accommodated seven squadrons along with 100 cargo and transient planes (US Navy 1947:329).

At least two of the larger surviving concrete buildings in the airfield complex as well as the structures of the Radio Direction Finder (RDF) complex were utilized by the Americans as command posts. The Japanese Airfield Headquarters building and the main Power Plant just to the north were both used throughout the assault and were focal points for a large tent camp that grew on the cleared ruins of the airfield complex and was steadily improved through the end of the war.

Figure 5.3 The reconstructed Peleliu airfield being used by Americans on D plus 11. (NARA: RG127)

2010 Survey Results; The Japanese Airfield Complex

Figure 5.4 General locations of sites surveyed in the Airfield Complex. Area ‘A’ is where the major Japanese administration and support buildings were located, ‘B’ was a barracks and support area and ‘C’ is the Japanese Radio Direction Finder Administration complex.

Table 5.1 2010 Peleliu Battlefield Survey: Sites Located in the Airfield Complex

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB1	Site 31 Feature 1		Japanese RDF Administration Building
AB1.1	Site 31 Feature 3		Japanese RDF Water Tank
AB1.2	Site 31 Feature 4		Japanese RDF Power Plant Building
AB1.3	Site 31 Feature 5	B:BE-2:9	Japanese RDF Supply Building
AB2	New site/feature		Japanese RDF Bunker/Bomb Shelter
AB6	New site/feature		Japanese Dugout and Natural Defensive Cave
AB7	Site 6 Feature 4		American Hussman Reefer and Concrete Platform
AB8	Site 26 Feature 1		Japanese School Building Walls and Foundation
AB9	Site 26 Feature 3		Japanese Gate; 2 posts
AB10	New site/feature		Japanese Sea Plane Float: Jake or Aichi E13A
AB11	Site 23 Feature 1		Japanese Airfield Bomb Shelter
AB12	Site 23 Feature 1		Japanese Airfield Bomb Shelter
AB13	Site 23 Feature 2		Japanese Mess Hall Foundation
AB14	New site/feature		Oil Drum Platform and Can dump
AB15	Site 23 Feature 3		Japanese Water Tank
AB16	New site/feature		Japanese Gate; 4 posts
AB17	New site/feature		Japanese Barrack Foundation
AB18	New site/feature		Japanese Barrack Foundation
AB19	New site/feature		Japanese Barrack Foundation
AB20	New site/feature		Japanese Barrack Foundation
AB21	New site/feature		Japanese Barrack Foundation
AB22	New site/feature		Japanese Bath House Foundation
AB23	New site/feature		Japanese Bath House Water Tank
AB24	New site/feature		Japanese Bath House Water Tank
AB25	New site/feature		Japanese Underground Shelter
AB26	New site/feature		Japanese Bunker/Bomb Shelter
AB27	Site 26 Feature 5		Concrete Slab on Coral Foundation
AB28	Site 23 Feature 1		Japanese Airfield Bomb Shelter
AB29	New site/feature		Japanese Gun Position
AB30	New site/feature		Japanese Defensive Cave
AB31	New site/feature		Aircraft part dump; NE end
AB31	New site/feature		Aircraft part dump; SW end
AB32	Site 22 Feature 4		Japanese Power Plant 2
AB32.1	New site/feature		Japanese Power Plant 2 Water Tank
AB33	New site/feature		Collapsed Japanese Defensive Cave
AB34	New site/feature		Japanese Defensive Cave
AB35	New site/feature		Japanese Defensive Cave
AB36	Site 19 Feature 1		Japanese Power Plant 1
AB36.1	Site 19 Feature 4		Japanese Power Plant Pillbox
AB36.2	Site 19 Feature 3		Japanese Power Plant Water tank/slab
AB37	Site 19 Feature 2		Japanese Power Plant Diesel Storage Building
AB38	Site 20 Feature 1		Japanese Air Headquarters Building
AB38.1	Site 20 Feature 3		Japanese Air Headquarters Bomb Shelter
AB38.2	Site 20 Feature 4		American Quonset Shelters and Motor Pool
AB39	Site 23 Feature 1		Japanese Airfield Bomb Shelter
AB40	New site/feature		Concrete Pad for Radio Mast
AB41	New site/feature		American Hussman Reefer Units and Pad
AB138	Site 24		American LVT
AB138.1	Site 24		American LVT
AB139	Site 22 Feature 5		American LVT with ramp down
AB263	New site/feature		Japanese Air Operations Bomb Shelter
AB264	Site 9 Feature 1		Japanese 127mm gun emplacement #1
AB265	Site 9 Feature 2		Japanese 127mm gun emplacement #2
AB266	Site 9 Feature 3		Japanese 127mm gun emplacement #3

Figure 5.5, 5.6 (R) Pre-invasion 1944 aerial views of the Japanese airfield (L) superimposed on a Google Earth image of Peleliu. (NARA : RG127)

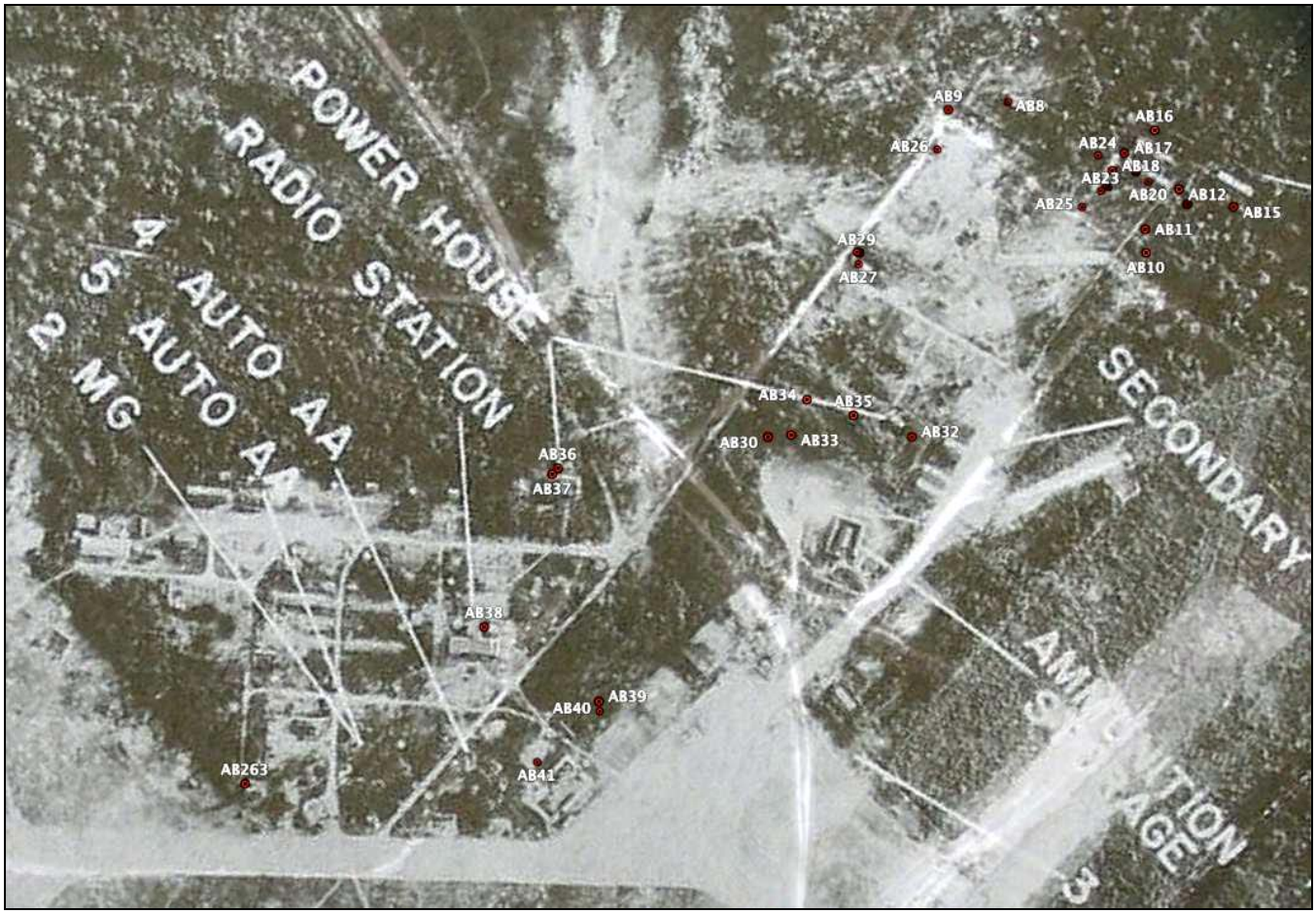

Figure 5.7 Detail of Figure 5.6 with the WWII contexts of surviving Japanese structural remains encountered during the 2010 survey.

Figure 5.8 American Marines and vehicles move west toward the central combat zone on Peleliu, September, 1944. The area surrounding the former Japanese airfield headquarters building was a focal point for rear echelon support for the American forces on Peleliu. (NARA:RG127)

Figure 5.9 The ruined Japanese Radio Direction Finder complex, located just north east of the main airfield, shortly after being secured by Marines. (NARA:RG127)

Japanese Radio Direction Finder (RDF) Complex

An air strike enabled the 2d Battalion of the 7th Marines to secure the Japanese Radio Direction Finder (RDF) complex on the morning of September 19 as part of an overall push by the 7th Marines on D-plus 3 to secure the remainder of the southern end of Peleliu. According to Hough (1951:75), "opposition was limited to a scattering of Japanese, evidently stragglers, who lurked among the demolished installations." By this point the majority of the Japanese defenders had withdrawn to the prepared caves and defenses of the island's ridge system.

All four concrete structures described and located by Denfeld in 1981 (1988:81) were found still intact; an administration and communications building, power plant building, supply building/warehouse, and a concrete water tank. The complex was heavily damaged in the 1944 bombing and bombardment, but enough remained of the administration building to be used during the battle by the USMC as an observation and command post. The smaller supply building was used as a residence at the time of the 1981 survey and in 2010 we found that some modern furniture and debris remained in the standing structures, all of which have been abandoned in recent years. A bulldozer, possibly from post-war military construction is also abandoned on site. Several smaller structures that appear in 1944 photographs of the site are no longer extant, probably removed during post-battle reconstruction of the airfield and surrounding areas.

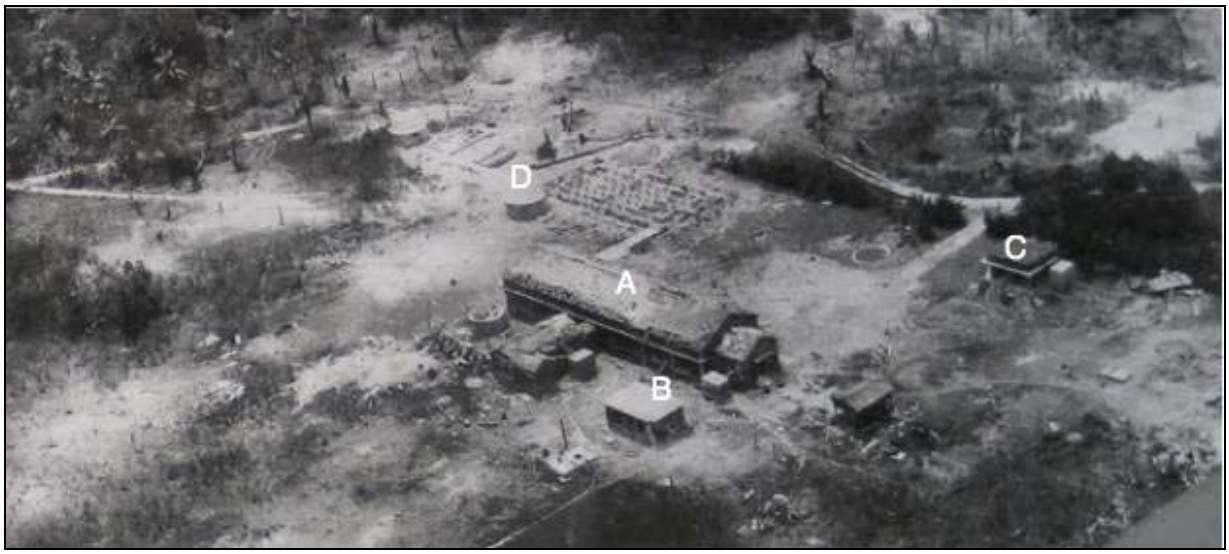

Figure 5.10 AB1. Aerial photograph facing SW of the Japanese Radio Direction Finder Complex, September 16, 1944 (NARA: RG 127). Structures surviving in 2010 include: (A) Administration Building (B) Power Plant,(C) Supply Room (D)Water tank. (NARA:RG127)

AB1 Japanese RDF Administration and Communications Building

The RDF Administration Building remains much as Denfeld (1988:81) described it:

> This one story concrete structure originally had a pitched wooden frame roof and an open veranda design similar to the headquarters building described earlier. The structure is 37.50 m long and 10.45 m wide. A covered passageway led from the building to a bathhouse and latrine at the rear. At the end of the building was a stick radio mast mounted on a steel tripod base. The radio masts and the covered passageway have disappeared.

Damage to this building from the 1944 bombardment has rendered its southern end unstable as iron rebar within the concrete is exposed and heavily corroded. Vertical and horizontal support pillars are broken in many places and exposed rebar is sagging and appears on the verge of the collapse. The northern portions of the building are enclosed and rooms and surrounding veranda areas are by contrast in fairly good condition. Portions of interior walls may even retain some of the original paint from the Japanese era. Paint outlines of original electronic equipment can also be seen on some walls. Miscellaneous kitchen items and furnishings, such as a US Navy graniteware pitcher remain were apparently left behind by the occupants of the property who abandoned it fairly recently, and may represent objects that were salvaged elsewhere on the island.

Figure 5.11 Damage to the Japanese RDF Administration and Communications building is clearly visible in this photograph taken shortly after the September landing by US forces. (NARA:RG127).

Figure 5.12 Weakened concrete supports on the west end of the Japanese RDF Administration and Communications building contrast with the well-preserved and enclosed eastern portion of the structure.

Figure 5.13 Surviving water tank near the Japanese RDF complex. An additional water tank that appears in 1944 aerial photographs of the site is now gone.

AB 1.1 Japanese RDF Complex Water Tank

One water tank remains of at least two water tanks that appear on wartime aerial photographs of the Japanese RDF complex. It is located 20 m SW of the RDF Administration Building and is constructed of reinforced concrete 30 cm thick. Two 45 cm square hatch openings exist in the roof of the tank, on either side of a central support column that is concrete and 25cm square. A door was cut into its east side of and it is unclear whether a single small length of pipe penetrating the wall was ever connected to anything. It is possible that this and other 'water tanks' were in fact a defensive bunkers either by intentional disguise or as opportunistic conversions of water tanks not yet connected to a water systems.

Numerous cylindrical concrete water tanks appear throughout the Japanese airfield complex in wartime aerial photographs. Most of them had been demolished by the time post-war expansion of the airfield was completed. The RDF water tank is typical of the plain cylindrical water tanks, where as others feature vertical concrete buttresses on the outside walls. Most water tanks encountered during the survey had been penetrated by a shell hole at ground level to create a ragged edged doorway. Other doorways seemed to have been cut or at least trimmed to form a neat rectangular opening. This appears to have been done by the Japanese, and it is clear many of the water tanks appear to have attracted heavy fire and bullet holes on interior walls indicate that at least some water tanks were the scene of firefights.

The east side of the Japanese RDF water tank was heavily scarred by different caliber rounds from small arms, .50 caliber and bazooka rounds with penetration into the concrete not exceeding 9 cm. The damage is concentrated on the northern half of the water tank, which faced the American advance on Purple Beach. The RDF Administration and Communication building is similarly bullet-scarred on the east facing side.

Figure 5.14 Water tank in the airfield complex with cut doorway being used as a U.S. Marine communication post September 23, 1944 (NARA: RG 127).

Figure 5.15 Japanese RDF power plant building in 2010. The shell hole visible in the 1944 photo above can be seen on the left wall of the building.

AB 1.2 Japanese RDF Power Plant Building

This concrete building is in good condition and lies about 20 m north of the RDF Administration. It is 8 m high, 5.2 m wide and 8.2 m long, and divided into two large rooms. Original interior paint is still intact and shows outlines of probable WWII era interior shelving and electrical fixtures. It has been used for storage in recent years but has been abandoned.

Figure 5.16 Marines gather in the shade of the damaged Japanese RDF Power Plant, September, 1944. The RDF Administration and Communication building is in the background (NARA: RG 127)

AB 1.3 Japanese RDF Supply Building

This concrete structure lies about 30 m south of the RDF Administration and Communications building and was being used as a private residence at the time of Denfeld's 1981 survey. It remains in usable condition but was no longer occupied at the time of our visit in 2010. It is a small structure, measuring about 3 m wide by 6 m long (Denfeld 1988:83) and has been modified slightly from its 1944 appearance with the doorways partially blocked. A new roof with a slightly different pitch was also added at some point. A rectangular concrete water tank on the southwestern side of the building appears in 1944 photos of the site and is apparently still functional.

The RDF Supply Room appears in several NARA: RG 127 photographs of the first religious services held for US troops after the landing, which were held in the open ground between the Supply Room and Administration buildings. Denfeld interviewed Navy Chaplain Charles M. Eggert in 1982 (Denfeld 1988:81) who recalled the event:

> By that time our regiment must have pushed onto the east side of the island to Purple Beach at the site of the RDF… it must have been D3. It appeared that the enemy had decided to hold out, not there but in the cliffs and caves west of that area, so we had a place where we could breathe a little easier. Thinking that it was Sunday and relatively free from enemy harassment, I asked Colonel Harris if he thought it would be OK for me to say Mass with as many men as we could get to attend. He gave his assent. There was an ox cart there that looked like it could serve as an altar. The heat was intense. The men tended to spread about in the shade of the landing vehicle to avoid the sun an also possible sniper fire. I recall too that the Protestant chaplain conducted a service later that day, telling me afterwards how gratified he was with his attendance, which included quite a few who did not usually frequent church services.

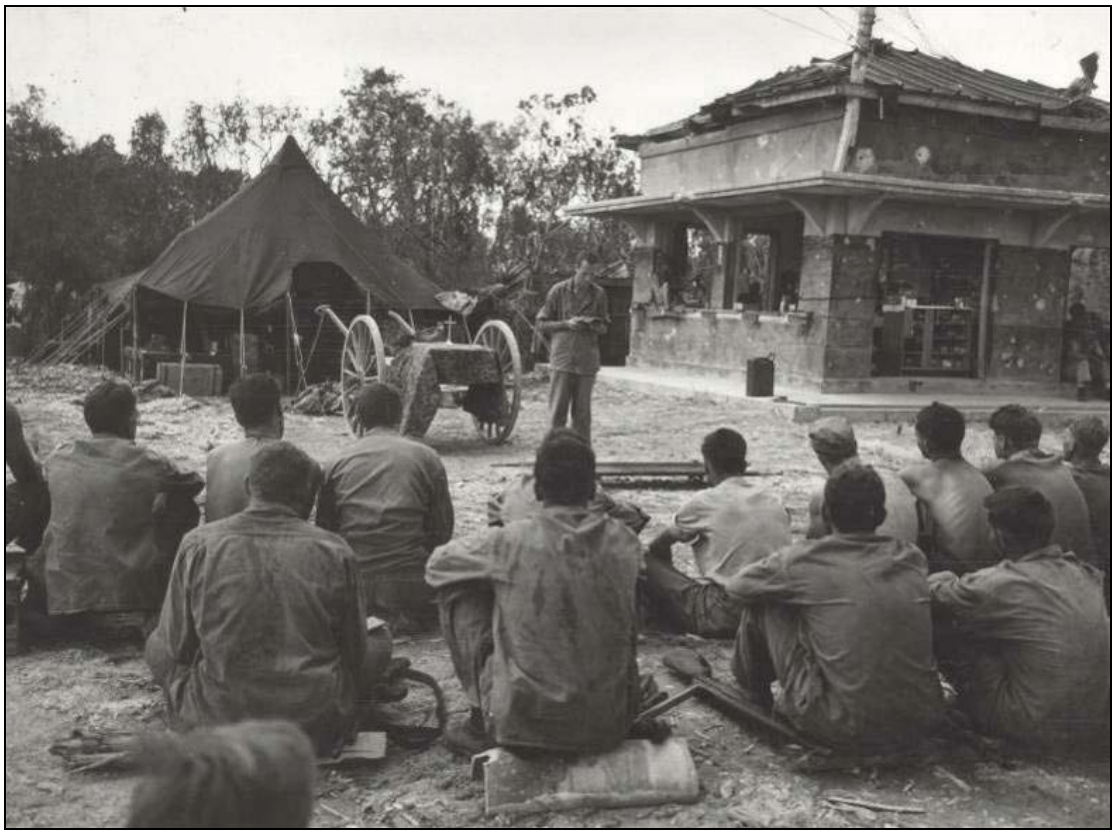

Figure 5.17 The first post-landing religious services in progress held near the Japanese RDF Supply Building on D-Day plus 3 (NARA: RG 127).

Figure 5.18 The Japanese RDF Supply Building has been used as residence in recent years. The rectangular water tank on the right also dates to 1944.

Figure 5.19 Entry to Japanese Bomb Shelter AB2. The bunker is buried beneath a heavily vegetated mound in the background and the doorways are the only visible surface sign of its existence.

AB2 Japanese Concrete Bunker/Bomb Shelter

A concrete semi-subterranean bunker lies buried in a mound 60 m in diameter, on the south edge of a maintained modern Palauan cemetery located just south of the Japanese Radio Direction Finder complex. It is almost entirely hidden except for a pair of entrances on the long ends of the bunker. It is very similar to other Japanese bomb shelters on the island except that there are only a single set of steps for both entrances.

Figure 5.20 Collapsed dugout and attached natural cave at AB6 (L) and *in situ* Japanese bayonet and scabbard.

AB6 Dugout and Natural cave

This Japanese defensive feature consists of a collapsed dugout that once had a wooden plank roof and a low coral rock revetment. The south end of the dugout adjoins a low natural cave no more than 1 -1.5 m high. Two narrow tunnels branch out from the far corners of the natural cave. These were deemed too unsafe to explore further. A 1.1 m entrance tunnel adjoined the dugout at a right angle. The dugout pit is 6.2 m long and 5.6 m wide. A Japanese bayonet still in a metal scabbard was found on the side wall of the dugout wedged in a tree root. It is rusted, but appears to have likely been pulled from the cave and left behind within the last few years. A thin scatter of artifacts can be seen on the natural cave floor and the dugout floor has accumulated plastic bottles and other refuse of recent origin.

Figure 5.20 American Hussman reefer unit at AB7.

AB7 American Platforms on Oil Drums

Two platforms in this location were formed by upright oil drums placed tightly together to form a square. Platform 'A' was obscured by heavy jungle vegetation but measures at least 25 m square. Platform 'B' included a concrete pad on top of the oil drums as well as a 15 cm high concrete plinth. Resting on top of the plinth are the remains of two motorized pieces of machinery, each inside square frames of angle iron which may have originally been enclosed by a plate metal covering. This machinery has been tentatively identified as the remains of refrigeration units known as Hussman Reefers, also seen in American garrison areas elsewhere in the Airfield Complex (AB41) and near the Navy Officers Mess area on the north end of White Beach (AB56.1). This location may be associated the American Quartermaster's supply depot where a similar oil drum platform foundation measuring 14m x 36m was described by Denfeld (1988:80).

AB8 Japanese School

A concrete building constructed as a school for Japanese children is mostly collapsed and some upright walls are covered with heavy vegetation. It measures 34m x 6.7 m and Denfeld (1988:80) reported that it originally had a pitched wooden roof and had offices in

the eastern end and a single classroom in the western end. Although heavily damaged in the battle, it saw some use during the American post-war occupation. Post-war Quonset hut foundations and associated remains noted by Denfeld in 1981 probably still exist under the heavy jungle vegetation cover on this site. A pair of concrete gate posts now standing at the entrance to the school complex in the modern village were reportedly removed from this site and placed near the roadside entrance and measure 1.75 m high and 40 cm square (Denfeld 1988:87).

Figure 5.21 Marines advance near the ruins of the Japanese School visible on the right side of the photo, September, 1944. (NARA: RG127)

Figure 5.22 The interior of the former Japanese school being used as a front line aid station by American Marines. (NARA: RG127)

AB9 Japanese Airfield Gate Posts

The entrances to the Japanese Airfield were marked by gateways comprised of sets of tall concrete columns with hinged, probably wooden gateways. One gateway to the road that once ran by the former Japanese school is still standing near a junction that leads toward the Horseshoe and Bloody Nose ridge. This pair of battered and pockmarked concrete columns is 5.75 m tall and 60 cm square (Denfeld 1988:80). There may have been a shorter set of columns here as well that are now missing. At least three different sets of gateposts appear in wartime photographs, however only this set and a set of four at AB16 are known to have survived.

Figure 5.23 One of two surviving sets of concrete gate posts that once marked entrances to the Japanese air base. The two inside posts are now gone.

Figure 5.24 The same location in 1944 (NARA:RG127)

AB10 Japanese Sea Plane Float

A fragment of a float tentatively identified as belonging to a Japanese Jake or Aichi E13A was found not far from one of the Japanese long bunkers, with no other aircraft parts nearby. There are reports that a Japanese Seaplane used as an observation plane being shot down by US forces in the days following the landings. Several sunken Aichi E13A wrecks exist in Palau and are popular with sport divers. The nose end of this float is badly damaged, suggesting possible crash impact. The remains measure 3.2 m long x 1.06 m wide x 65 cm deep. Some traces of paint remain.

Figure 5.24 Two views of an aluminum sea plane float, tentatively identified as Japanese.

Figure 5.25 One of eight heavily constructed concrete bomb shelters once part of the Japanese airbase complex.

AB11 & AB12 Japanese Airfield Bomb Shelters

Five of the eight Japanese bomb shelters reported by Denfeld in1988 were all found to be in good condition in 2010 except for some 1944 pock marks from shells and bomb fragments. These heavily constructed structures are about 20 m long and 3.25 m wide with concrete blast walls protecting the main doorways and heavy iron doors on smaller escape hatches on the ends. Firing ports also are present on the ends and dense scatters of metal machine gun belt links were found on the floor of one bunker, suggesting that it may have been defended during the battle for the airfield in the first days following the invasion.

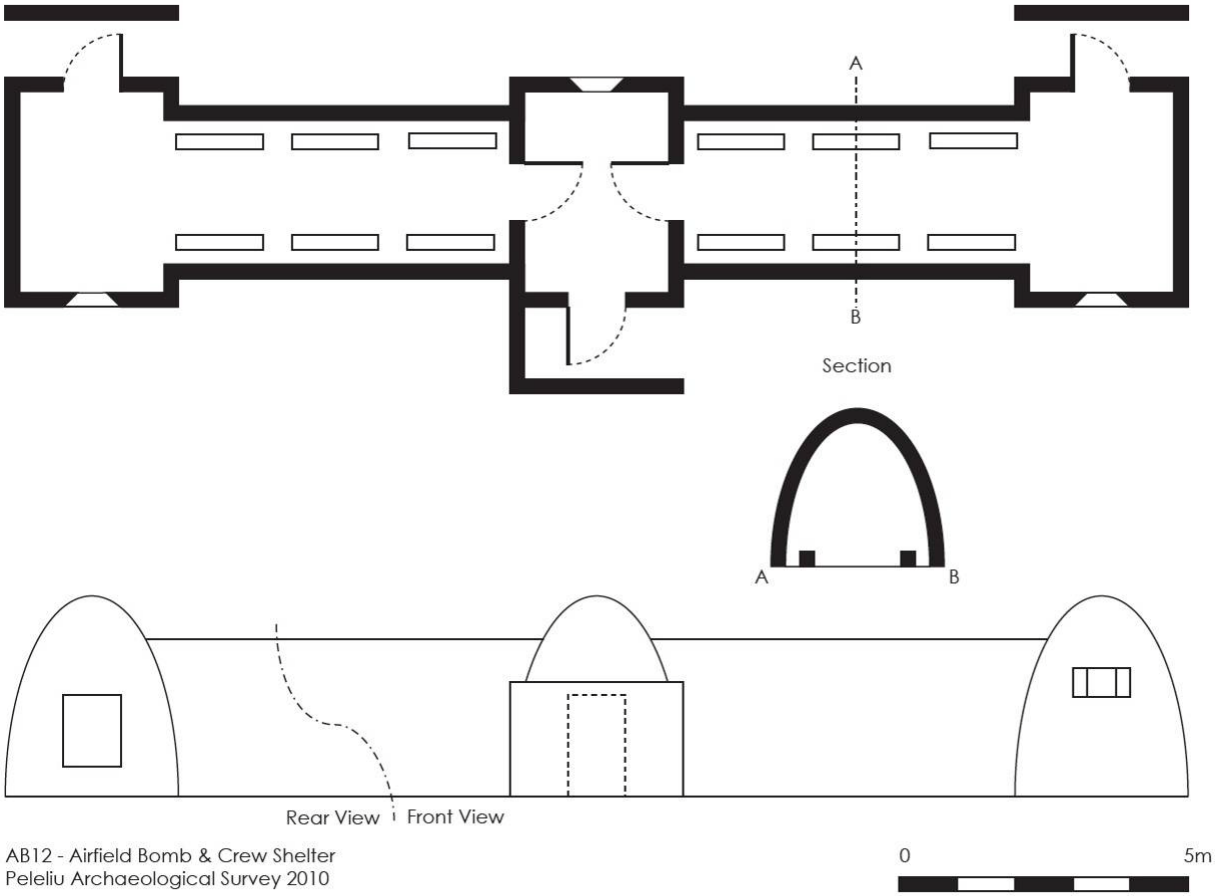

Figure 5.26 Plan view of the long concrete bomb shelters exemplified at AB12. (drawing by Gavin Lindsay)

Figure 5.27 (Left) Interior view of the bomb shelter at AB12.(R) Machine gun belt links on the bomb shelter floor may represent a last ditch defense by Japanese inside.

AB13; Japanese Building Foundation
This is a heavily overgrown but largely intact foundation measuring 25 m by 13.66 m and combining elements of poured concrete slab and concrete piers. Remains of a boiler and hot water tank, toilet and a brick oven/cooking area exist on the northeast corner of this foundation, suggesting that it may have served as a mess hall. A pair of round openings in the oven probably accommodated a pair of the large iron rice cookers common in Japanese installations. Large quantities of corroded oil drums litter the surrounding area.

Figure 5.28 A rusting platform of arranged oil drums at AB14

AB14; Oil Drum Platform and Can Dump
A rectangular platform has been formed from horizontally placed oil drums and is aligned in a NW-SE direction, measuring 15.7 m (19 drums) by 5.5m (6 drums). A large quantity of rusting iron cans, measuring 17 cm in diameter and 20 cm high, possibly oil cans, have been littered across the top of the platform in no particular order. The condition of this feature is very poor because of the corroded condition of its components.

AB15 Japanese Water tank w/shell hole
One of 16 similar water tanks originally located in the Airfield complex, this tank is about 6 m in diameter. Like three other water tanks located during the survey, this example also has an entryway installed by blasting and consists of a ragged 1 x 2 m hole on its SW side.

AB16 Japanese Airfield Gate; 4-column gate
This set of four large concrete upright posts was previously unknown even to our local guides. The largest two posts in the center are identical to a much better known set of two gate posts (AB9) adjacent to a local roadway that leads to the 'Horseshoe' and visitor destinations at the foot of Bloody Nose ridge. The four posts also represent one of the gateways into the Airfield Complex however the road in this location has disappeared and the immediate area is covered by thick second growth jungle. The four posts are aligned NW-SE and the largest gateposts are about 5 m apart with the remains of large iron hinges indicating that the gates swung inwards toward the west. The gates themselves are gone but would have been about 9 cm thick. There were also gates or screens between the smaller columns and the large center posts. It is clear from this gate as well as wartime photos that both gates originally had 4 columns and that the smaller pair is now missing from AB9 near the modern road. There are a few bullet and shell holes in the posts, but the tops are undamaged.

Figure 5.29 Figure 5.30 Concrete gate posts marking the former eastern entry into the Japanese airbase on Peleliu, now covered in dense jungle.

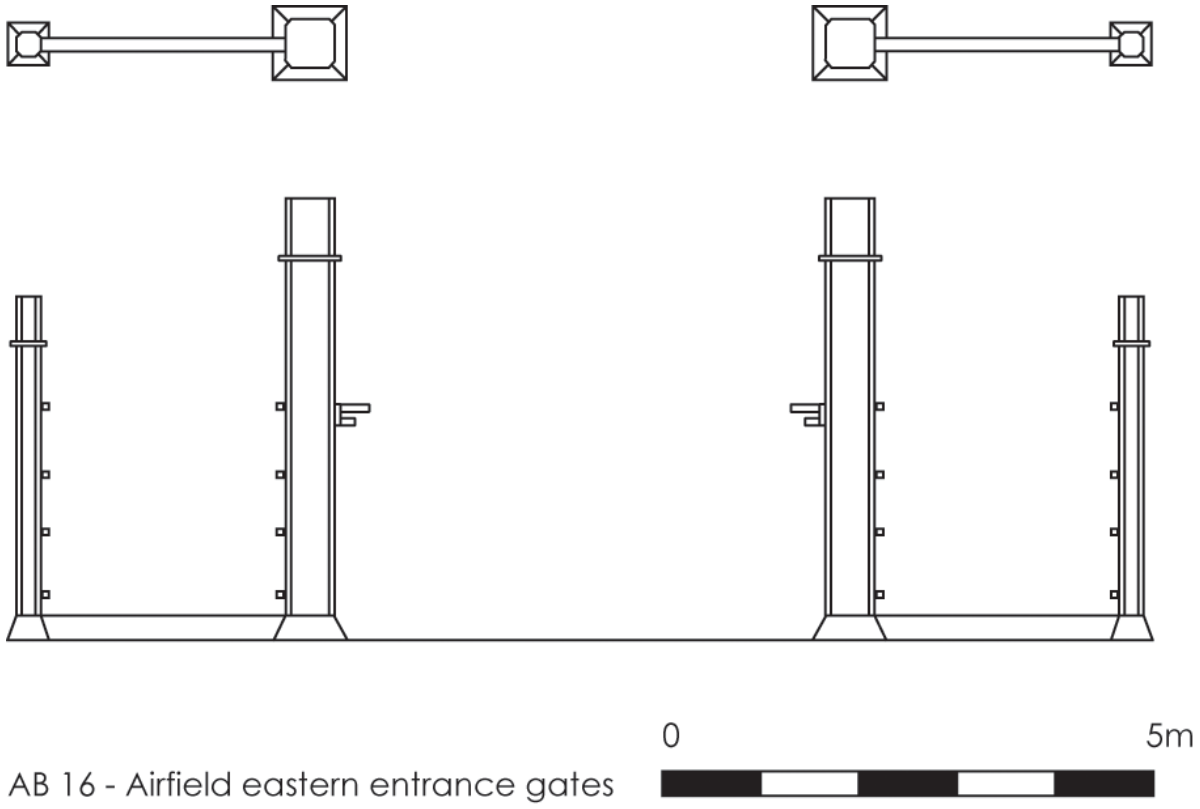

Figure 5.30 Plan view of concrete entrance gates at AB16. (drawing by Gavin Lindsay)

Figure 5.30 One of the few Japanese barracks left standing in the Japanese airfield complex in 1944. (NARA:RG127)

AB17-21 Japanese Barrack Foundations

Two long lines of concrete pier foundations and sets of concrete steps were found in the dense vegetation and represent the foundations of Japanese barracks like the one in Figure 5.30, which was photographed somewhere in the Japanese airfield complex. Wooden structural remains were entirely absent. No surface artifacts were noted in association with the barracks.

Figure 5.31 Water heater and hot tub in a foundation in the airfield complex.

AB22 Japanese Bath House Foundation

A rectangular concrete foundation measures 25 m long and 7.5 m wide. In the SE corner is a cylindrical metal boiler still plumbed into the foundation. Next to the boiler is a square concrete bathing tub with low concrete benches built into the walls. According to Denfeld

there were six latrine and bath facilities on the Japanese airfield before the American bombing raids of March 1944. The foundations of at least two of these still exist and more may be present in other areas of the airfield complex which is now covered with heavy undergrowth.

Figure 5.32 American Marines fire artillery over the ruins of a bathhouse in the former Japanese airfield complex, September, 1944. (NARA:RG127)

Figure 5.33 AB23, a concrete Japanese water cistern has a doorway blasted through one side.

Figure 5.34 AB24, one of two concrete water tanks that once served the bath house at AB22. Doorways may have installed to convert it into a defensive bunker.

AB23, AB24 Japanese Bath House Water Tanks

The AB22 Japanese bath house foundation lies only a few m from two cylindrical water tanks. A large number of these were present in the Japanese airfield complex, particularly in the areas where housing and support buildings were located. Some of these were destroyed in the pre-invasion bombing raids and bombardment, others were taken down to make room for American garrison areas and the expansion of the airfield. Many of the water tanks in the Japanese airfield complex have had doorways cut or blasted in their sides. Denfeld thought that at least some of these where postwar modifications by Peleliu residents reusing the structures, however archival evidence indicates that most of doorways were installed by the Japanese. Much of this work appears to have been hurriedly done, perhaps during the Spring and Summer of 1944, when the damaged airfield was partially abandoned in anticipation of the upcoming American assault. Bullet and shell holes on the exterior and interior of the water tanks as well as anecdotal information from veterans suggests that at least some of the water tanks were used as defensive positions.

The AB24 tank is about 4 m northwest of the bath house building and has a shell hole and/or blasted entryway on its east side. The surface around the entry is pockmarked with shell holes of mixed calibers. This water tank is associated with a story told by a Marine veteran to Tangie Hesus. According to the story, one or two Japanese defenders were inside the water tank when it was approached by Marines. As other Marines fired rifles into the tank to cover the doorway, another approached and tossed a hand grenade inside, killing the Japanese. This story is supported by the fact we found two sets of 7 bullet holes on the inside wall of the tank, opposite the doorway. An M1 rifle clip holds 7 rounds. One cluster of bullet holes was set low, another high. The size of the bullet holes suggests a fairly close range.

AB23 is about 5 m southeast of the bathhouse and also has a doorway blasted into its southern wall.

AB25 Japanese Underground Shelter

About 5 m south of the AB23 water tank are two small holes in the ground about 20 cm in diameter. On close inspection the holes were found to open up into an underground shelter of uncertain dimension, but seemed to be rectangular and at least 4 m wide and 8 m long and 2.5 m deep. Some rusting equipment could be seen on the floor. The roof of this structure is very unstable and the area unsafe. The holes seemed to have opened in the recent past and there was no accumulation of leaves or vegetation inside.

AB26 Japanese Bunker/Bomb Shelter

This heavily constructed concrete bomb shelter is similar to others recorded on the airbase complex in that it is rectangular, has two entrances and is deeply buried under a mound of coral rubble. Others bomb shelters similar to this were associated with major airfield installations like the RDF Administration Building (AB1.1), Air Headquarters Building (AB38.1), and the Air Operations Building (AB263). The entrances to the cramped interior of the shelter are 75 cm wide and the main room is 9.2 m long and 2 m wide. The ceiling is 1.75 m high.

AB27 Concrete Slab on Coral Foundation

A rectangular concrete slab measuring 11.9 m long and 10.1 m wide is aligned in an E-W direction and rests on a pad of coral rubble. It probably represents a hut base. The edges of the concrete are crumbling and the slab is heavily overgrown with vegetation. It seems likely, but not certain that this feature is associated with the post-battle American garrison construction.

AB28 Japanese Airfield Bomb Shelter

This long reinforced concrete bunker is identical to AB12 and is one of 8 in the Airfield Complex, all of which survived the war and the American base expansion. All the iron blast doors and hatches on the AB28 bomb shelter are intact and it is in fairly good condition.

AB29 Japanese Gun Position

A partially in-filled rectangular pit is located immediately NW of the AB28 Airfield Bomb shelter. The side walls have been lined with what appears to be the same type of corrugated tin used in some of the Japanese defensive caves. A machine gun in this position would have excellent coverage of the adjacent road to the NW. The pit is about 2 m long and 1 m wide with corrugated tin sheets surviving on the NW, S and E sides.

AB30 Japanese Defensive Cave

A low natural cave centrally located in the airfield complex contains miscellaneous Japanese military equipment and appears to have been used as a defensive position. The entrance of the cave is N facing, measuring about 2 m wide and 1 m high. It is set into a ridge running E-W and may be substantial in size. It was not entered by the survey crew because our UXO team had not yet arrived on scene. There is another possible sealed entrance to the cave located about 5 m away from the main doorway, where it overlooks the edge of an excavated bowl that contains the aircraft parts dump at site AB31.

Figure 5.35 Among the hundreds of artifacts at AB31 is this F4U or FG-1D Corsair Cockpit front canopy (L) and (R) a pair of iron gun shields.

AB31 Aircraft Parts Dump

An excavated quarry area south of the AB32 Power Plant 2 site is now covered by jungle vegetation but shows clearly in wartime aerial photos of the Japanese airfield. A set of narrow gauge tracks ran through this area and these may have been associated with the phosphate mining operation. The mining train cars may also have been used in construction of the airport by the Japanese after the phosphate plant was closed in 1943. A substantial number of aircraft were destroyed on the airfield, first by the American bombing raids in the spring of 1944 and later by the pre-invasion bombardment (Table 5.3). A number of wrecked Japanese aircraft were found about 300 m west of AB32 and it appears that the Americans moved them to the north side of the former quarry as part of the cleanup and rebuilding of the airfield. A similarly large pile of aircraft parts exists on the south end of Orange Beach, near Peleliu's South Dock, which was reportedly left behind by post-war metal salvagers.

Both American and Japanese aircraft are represented at AB31. The part-dump consists of a string of piles less than a meter high as opposed to the higher jumbles of debris at Orange Beach, and seems to have undergone some sorting suggesting that these materials were being salvaged or stored by military maintenance personnel at some juncture. The dump is about 80 m long and about 20 m wide and is stretched in a NE-SW direction along the side of the quarry area, below the embankment that leads up to the Power Plant 2 area.

Table 5.3 Aircraft found and documented on Peleliu Airfield by US Marines in 1944

Number of Aircraft	American Code Name	Japanese Aircraft Designation
61	Zeke	Mitsubishi A6M Zero - Navy Carrier Fighter
15	Judy	Yokosuka D4Y Navy Type 2 Dive Bomber
1	Kate	Nakajima B5N Navy Type 97-1 Torpedo and Dive Bomber
7	Irving	Nakajima J1N Navy Type 2 Land Recon Plane/Night Fighter
7	Frances	Yokosuka P1Y Navy Bomber
33	Betty	Mitsubishi G4M Navy Type 1 Land-based Attack Aircraft
3	Tess	Douglas DC-2

Figure 5.36 The hollowed out concrete shell of a Japanese power plant at AB32

AB32 Japanese Power Plant 2

This 2-story concrete structure was a power plant that served the Radio Direction Finder Complex and other installations on the north end of the Japanese airfield. It has the lightest construction and probably as a consequence is the most seriously shell damaged of the major Japanese buildings still standing on Peleliu. The local nickname for this building among the local WWII guides is 'the Temple of Doom'. It is comprised of a shell of the outer walls with only a remnant of roof and no signs of the second floor other than a set of window openings. The building is square and measures 15 m on a side and is about 10 m high. The north and east sides have double door sized entryways.

The south wall has an enormous shell hole that extends from a crater two m below the foundation well into the exterior wall of the second floor. This has weakened the wall and piano-sized pieces of concrete are suspended, hanging from pieces of 2 cm iron rebar. The generating equipment has been removed leaving only a few scraps and some concrete machinery mounts. The structure as it exists now would be a hazard to visitors. There is also an unmarked open well more than 7 m deep is located five m from the south west corner of the building. It is framed by a low concrete lined plinth and represents a significant safety hazard, although the site is in a heavily wooded area and seldom visited. An American canteen and other unidentifiable gear can be seen on the well's bottom which is filled with shallow clear water. A square cooling tank is 4 m from the SW corner of the building and is similar to those seen on the larger and more heavily constructed Power Plant 1 (AB36). The concrete tank is about 1.5 m deep, dry and is five m square.

Figure 5.37 Low aerial view of the ruined Japanese airfield complex after bombardment with the AB32 power plant visible near the center of the photo. (NARA:RG127)

Figure 5.38 Detail from figure 5.37. It appears that the second story floor of the building survived the assault but was lost later, probably as the wood decomposed.

Figure 5.39 (L) Interior view of AB32, now filled, and probably supported by a growth of thick jungle vines. (R) The heavily damaged south wall.

AB33 Collapsed Japanese Defensive Cave

This is primarily a natural cave which was used with little or no obvious modification. It is located about 5 m west of cave AB30. It has partially collapsed or been sealed, leaving a remaining entry that is 50 cm high and about 3 m wide. The entry runs parallel with the edge of the quarry edge south of the AB32 Power Plant 2 site. The survey crew did not attempt to enter this cave.

AB34 Japanese Defensive Cave

This unmodified cave is located north of cave AB33 and it is possible that both are entries into the same natural cave system below. One of our local guides said that two human skulls were found in this cave in May 2010, however they were missing by the time of our visit in December 2010. The entrance faces west toward the ridge.

AB35 Cave with Two Entrances

This is one of three natural caves on the limestone knoll just south of AB32 Power Plant 2, and is located on the downhill slope of the knoll. The cave has two low entrances. The smallest and more northerly entrance faces toward the west. In a low chamber just past the entrance is a scatter of disarticulate human long bones. The southern entrance faces east and is a steep, nearly vertical entrance to the cave and is partially collapsed. The extent of this cave is unknown.

Figure 5.40 Heavily damaged main power plant at AB36 in 1944, view NW. (NARA:RG127)

Figure 5.41 Same view of AB36 in 2010.

AB36 Japanese Power Plant 1

This power plant was the primary power facility for Peleliu, although energy dependent facilities such as the Radio Direction Finder (AB1), Naval Radio Station (AB278) and the Radar Installation on Radar Hill (AB164), and the 'German' blockhouse searchlight (AB144) all had backup generating capabilities. Like the Japanese Airfield Headquarters building, AB36 was a landmark structure for both the Japanese Airfield and for the subsequent American garrison area. During the battle it housed American administrative offices even as bitter fighting continued on the ridges of the Central Combat Zone only about 1 km to the NW. The Power Plant building remains much as Denfeld recorded it in 1981 (1988:72):

> This structure measures 14.65 m by 16.75 m by 6.3 m high. Its walls are 80 cm thick and the roof is one m thick. Windows and doors are shielded with heavy steel shutters and burster slabs. Within the power plant building are two oxygen tanks…

On a window sill of the building is a damaged American helmet, probably placed there by a visitor. Inside is an iron staircase and landing, the last remnant of the power generation equipment which was probably removed by post-war metal salvagers. Heavy shell damage from the pre-invasion bombardment is very apparent, including a large round hole in the south wall. The building housed the Marine Service Headquarters after the airfield was secured. A heavy growth of jungle vegetation including trees now caps the power plant building.

AB36.1 Japanese Power Plant Pillbox

A square reinforced concrete pillbox is about six m southwest of the powerhouse and according to Denfeld (1988:72) once held a 37mm gun. In 1944 and at least up until 1981, the bunker roof was protected by an additional 1 m thick layer of coral rock which is now gone. The doorway on the north side of the pillbox is barely visible at ground level, indicating that the bunker may have been entered through an adjoining trench. The pillbox measures 3.78 m by 3.33m and stands about 1.2 m high. The field of fire from this pillbox was directed at airfield.

AB36.2 Japanese Power Plant Water tank

A water tank a few m west of the power plant was used to circulate water and cool the diesel engines (Denfeld 1988). It measures 9.2 m by 11 m. Sometime after 1981 the tank was capped by a concrete slab and in 2011 there was a wood-frame chicken coop on top.

AB37 Japanese Power Plant Fuel Storage Building

Just north of the power plant building is another stoutly built concrete structure, relatively undamaged by shelling. Measuring about 5 m square, the structure was designed to provide bomb-proof protection for diesel fuel for the generator and seems to have suffered relatively little battle damage to its walls other than pock marks from multiple caliber weapons. At some point after 1944 there was damage to the roof. Heavy iron blast doors on the south wall and three heavy iron window shutters on the remaining walls are intact but rusted shut in some cases. Denfeld (1988:72) reported that it was used as an office by the Chaplain after Marines had removed the fuel tanks inside. Like the neighboring Power Plant Bilding, this structure has also acquired a luxuriant growth of tropical vegetation on its flat rooftop.

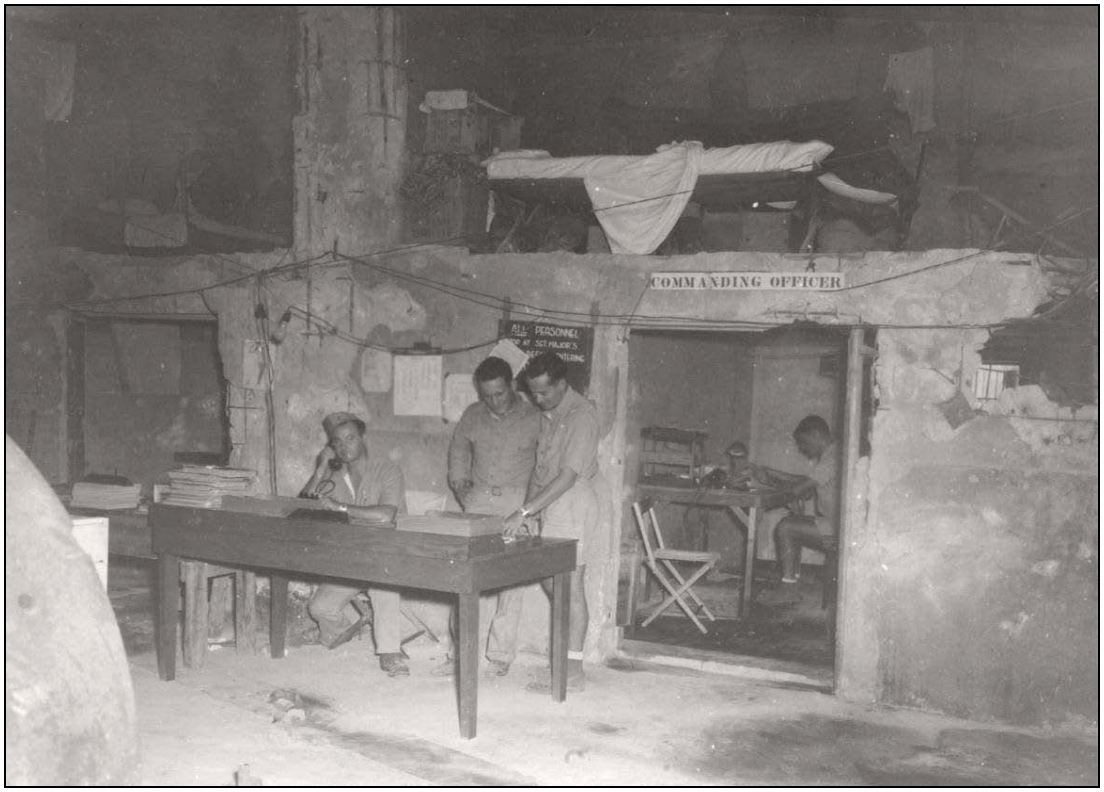

Figure 5.42 Interior of the main Japanese power plant building at AB36 in used as a Marine office, September 1944. (NARA:RG127)

Figure 5.43 Same view today. The interior of the building has remained remarkably as it was in 1944. (David McQuillen)

Figure 5.44 Japanese main power plant (AB36) and concrete fuel storage building (AB37) in 1944. Note the camouflage paint and the plantings on the roof. (NARA:RG127)

Figure 5.45 Same views of AB36 and AB37 in 2010

Figure 5.46 East side of the Japanese Air Headquarters building shortly after being taken by U.S. Marines and in the process of being cleaned out and converted into a division command post for the 1st Marine Division. (NARA: RG127)

Figure 5.47 Same view of the Japanese Air Headquarters building in 2010.

AB38 Japanese Air Headquarters Building

This structure is one of the most historically significant buildings on Peleliu and for that matter in Palau. It was as a command and control center for the airfield by the Japanese, a Japanese strong point during the American assault on the airfield, and was division command post for the 1st Marine Division and later for the Army's 81st Infantry Division. After Peleliu was secured, the building was centrally located as the airfield was garrisoned and rebuilt by American forces. The building features in numerous NARA: RG 127 photographs show the evolution of the building and its surrounding support structures before, during and after the attack on the airfield. Several archival stills and moving images show visits to the building by American commanders Major General William H. Rupertus and Admiral William F. Halsey.

Figure 5.48 Aerial of the Peleliu airfield, March 1944; detail shown on Figure 5.49 (NARA: RG 127)

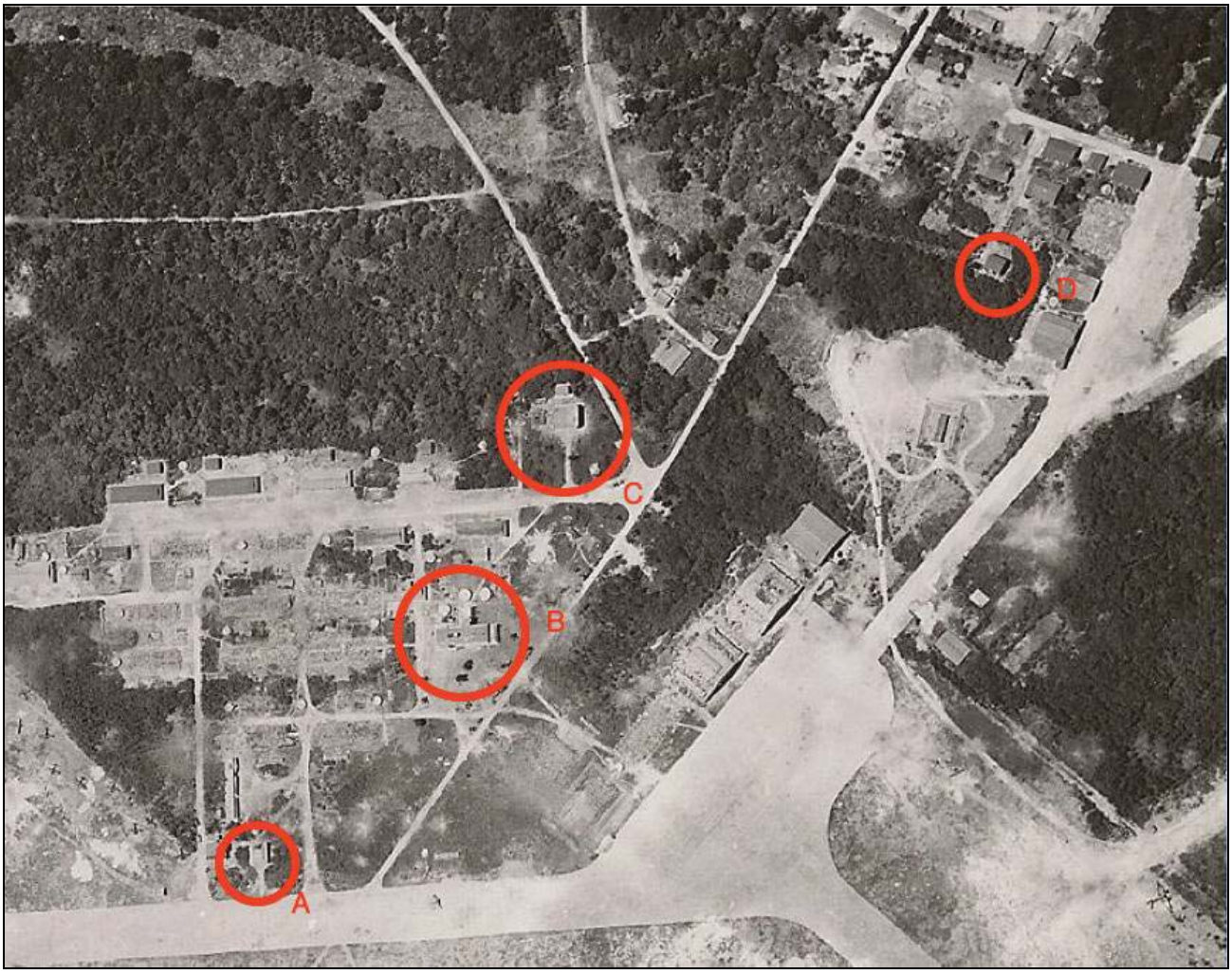

Figure 5.49 Detail of Peleliu airfield in March 1944, with the largest surviving Japanese structures circled: A; Air operations building (AB262), B; Air Headquarters building (AB38), C; Main power plant (AB36), D; Power plant 2 (AB32). (NARA: RG127)

The building was heavily damaged during the pre-invasion bombardment. One shell hole is 3-4 m in diameter, perforates both the roof and second floor of the reinforced concrete structure and remains open. Iron rebar that was exposed by the war damage has continued to corrode and portions of the building are in danger of collapse. Jungle vegetation has enveloped the structure to the point that the second floor has the feel of being in a large tree house. A recent effort by Peleliu state to clear the vegetation had to be abandoned when it became clear that larger tree roots were actually helping hold fractured walls of the structure together. Some concrete load-bearing columns were damaged to the point that the concrete is gone and the rebar cages remaining is bent and deformed by the enormous weight. Portions of the building can no longer be safely accessed, notably the second floor of the enclosed bunker-wall section of the building which held the transmitting and receiving room.

The headquarters building remains as it was described by Denfeld (1988:72-73):

> This structure follows a standardized design used at a number of Central Pacific bases such as Tinian and Truk. The building is 12.50 m wide and 43 m long. In addition to the main section, the building also contains a wing

which measures 9.75 m wide and 13.50 m long. The first floor contains a guard room, recreation room, hallway, workers room and an NCO room. Also contained on the first floor is a bunker like section with walls 60 cm thick. This room contains a transmitting material store room, a generator room and storage battery room. On the second floor above the open wall area was a transmitting command post, aircraft unit command post, and an officer's room. Within the second floor bunker area was a wireless telegraph room and receiving and transmitting room. The windows of the bunker are equipped with steel shutters.

Figure 5.50 Aerial view of the area around the Headquarters building after the 1944 bombardment (NARA: RG127)

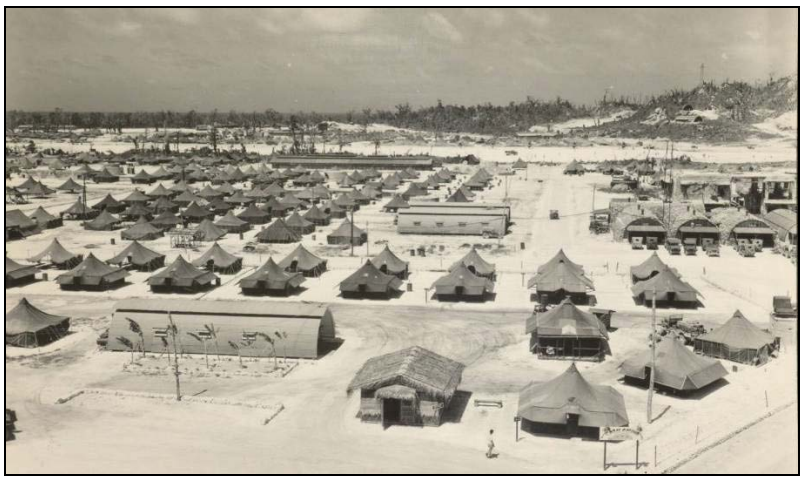

Figure 5.51 (L) American garrison around the Headquarters building on February 11, 1945. (R) General Rupertus and Col. Harold D. Harris, commander 5th Marines at AB38. (NARA: RG 127)

Figure 5.52 Battle damaged second floor of the Headquarters building in 1944. (NARA: RG127)

Figure 5.53 Second floor of the Headquarters building in 2010.

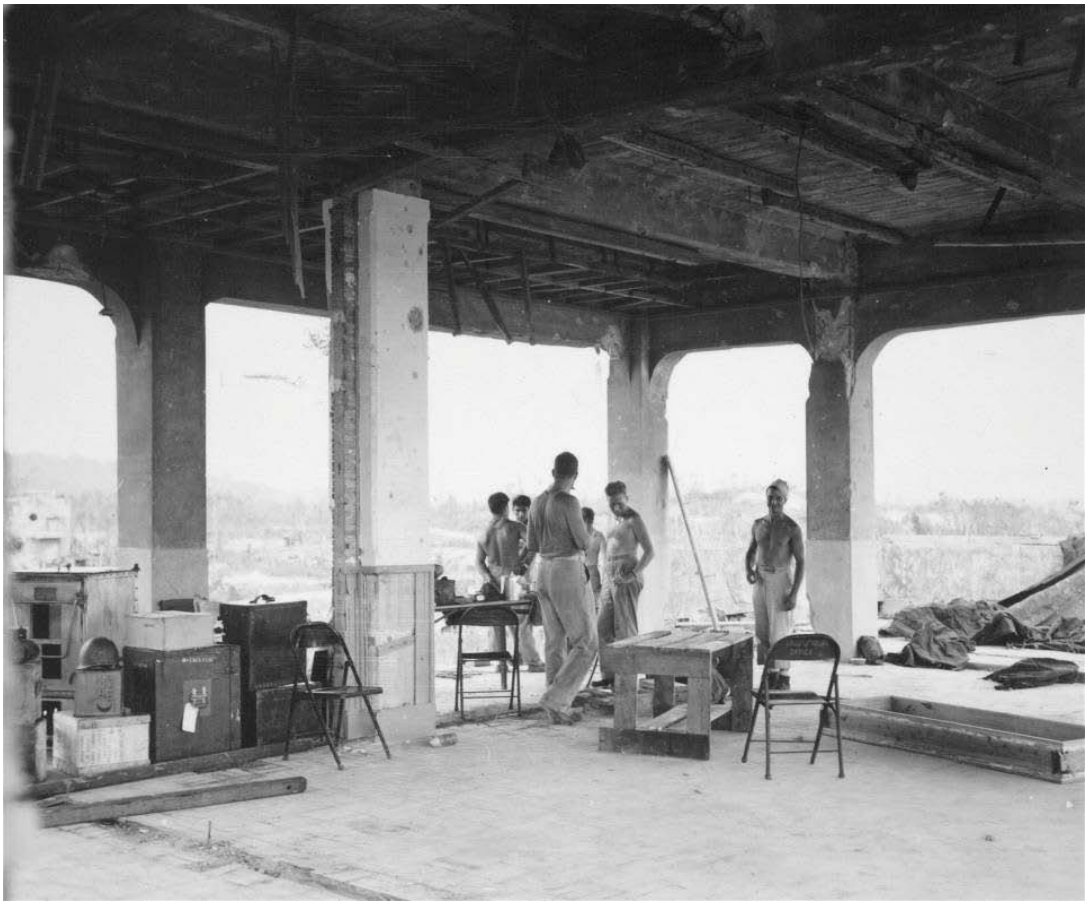

Figure 5.54 First floor of the Headquarters building in use by American Marines as a Division command center, 1944 (NARA: RG127)

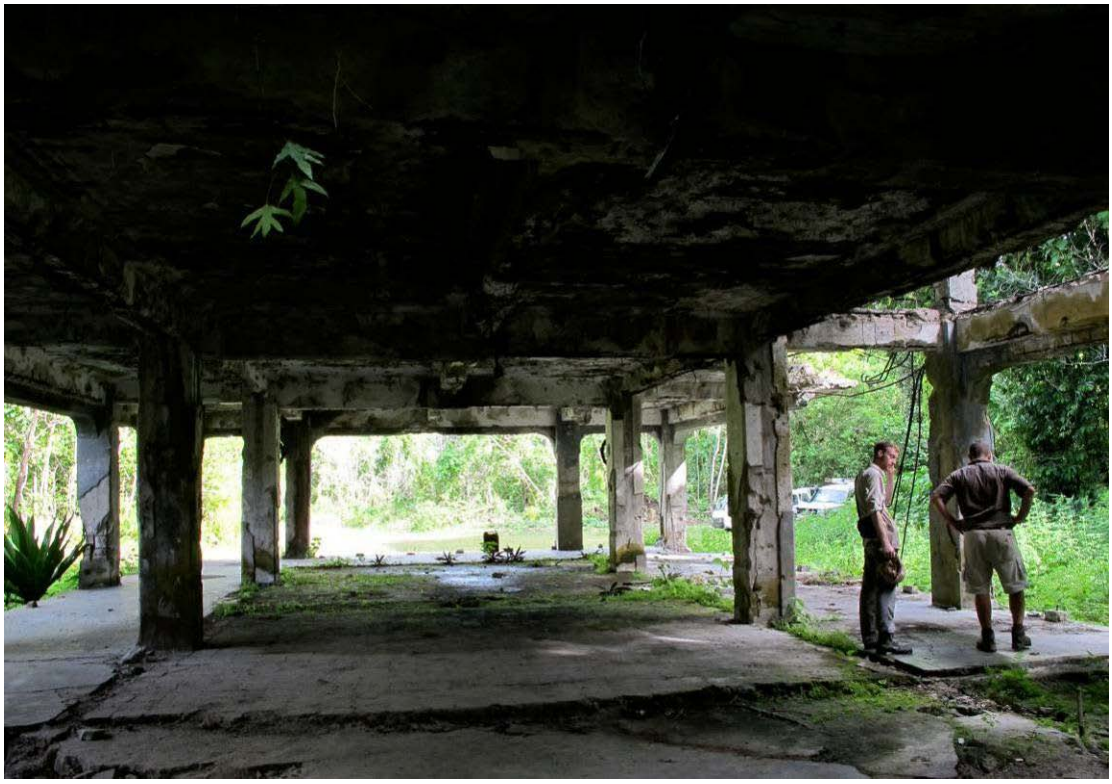

Figure 5.55 First floor of the Headquarters building in 2010

Figure 5.56 Exterior and entry to the Japanese Air Headquarters bomb shelter.

AB38.1 Japanese Air Headquarters Bomb Shelter

An underground bomb shelter is located about 25 m from the rear of the one story wing of the Japanese Air Headquarters building, which Denfeld was able to identify as a kitchen in 1981. The shelter is heavily constructed from reinforced concrete and is protected and camouflaged by a meter thick covering of coral rock. There are two pairs of steps at either end of the mound which lead through two steel doors to the shelter below which is six m long and 2 m wide (Denfeld1988:74).

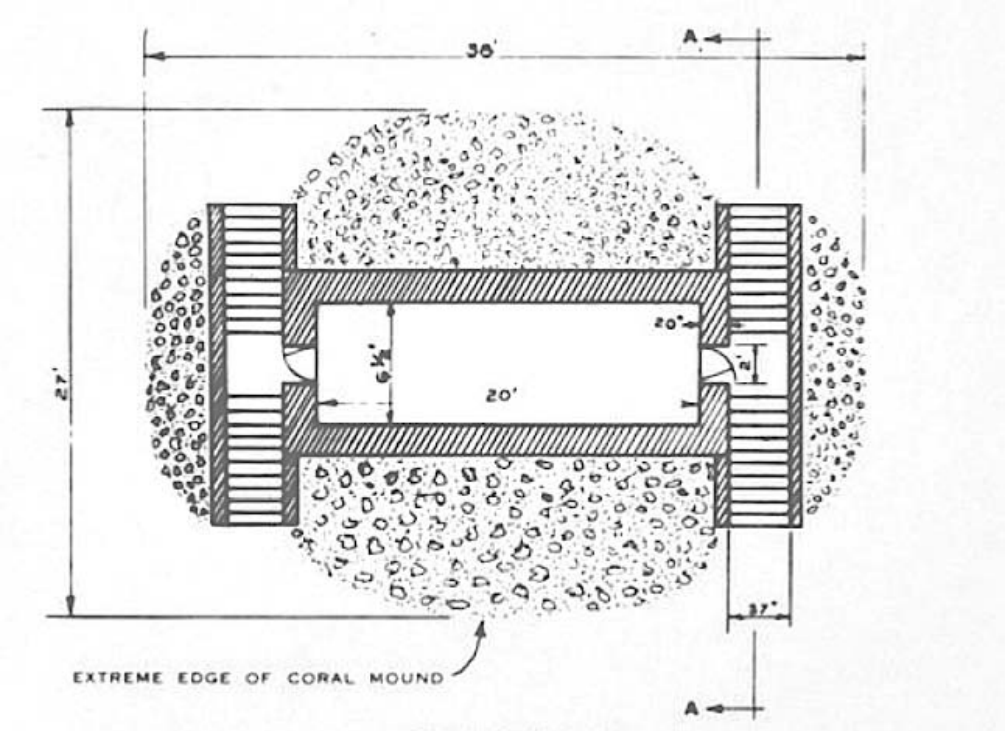

Figure 5.57 Plan view of the Japanese Headquarters bomb shelter (First Marines 1944)

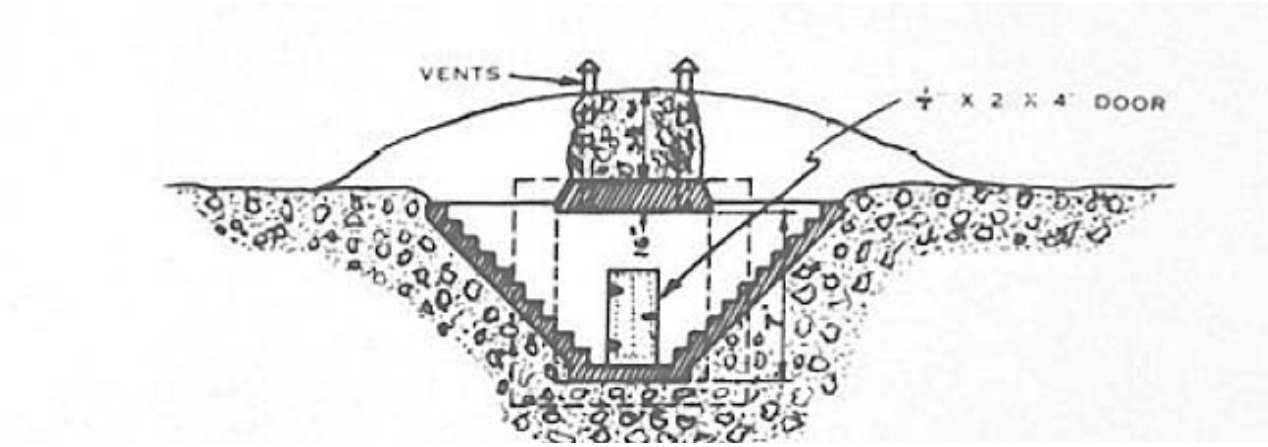

Figure 5.58 Cross-section of the Japanese Headquarters bomb shelter (First Marines 1944)

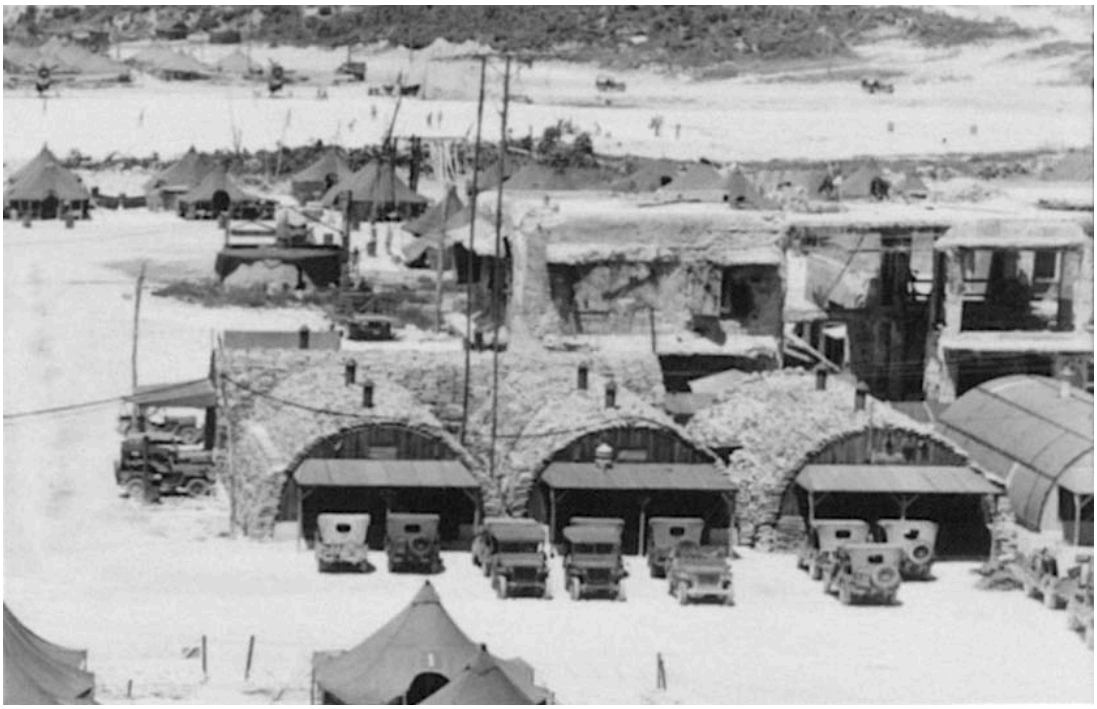

Figure 5.59 American motor pool site AB38.2 in 1944, view north. (NARA: RG127)

AB38.2 American Motor Pool Quonsets

By the summer of 1945 the American military had constructed a pitched wood framed roof onto the flat topped Japanese Air Headquarters Building which has long since disappeared. A row of heavy steel Quonset huts were built just south of the building which apparently served as a motor pool and repair facility for jeeps and other small vehicles. Of the original five Quonsets, Denfeld found two still standing in 1981 (1988:74):

> Five heavy steel huts, 15.5 m long and 6.3 m wide were erected in front of the headquarters structure by an American construction battalion. Three of the huts have collapsed leaving two standing. One of the standing structures contains a two-drawer filing cabinet with work order requests for vehicle repair.Also in the huts are nine engines, transmissions, transfer cases and axles, evidence that the huts were used for vehicle maintenance.

Twenty years following Denfeld's survey only one of the huts is still up but is rusted at the point where the steel is in contact with the concrete base and is in danger of collapse. Another hut is about half collapsed and still contains the vehicle parts. We did not see the filing cabinet, however it may still exist beneath one of the collapsed roof tops.

Figure 5.60 A single Quonset from the American motor pool remained standing at AB38.2 in 2010.

Figure 5.61 American military vehicle parts at the former motor pool site.

AB39 Japanese Airfield Bomb Shelter

This reinforced shelter is identical to the eight others reported to exist in the Japanese airfield complex and one of three encountered during the 2010 survey

AB40 Concrete Pad for Radio Mast

Located in the heavy brush north of the Japanese Air Headquarters Building is a concrete pad measuring about 6 m by 8 m. On the pad are several bent pieces of angle iron support and a hoop bracket that suggest the pad may have been for a radio mast or similar structure.

AB41 American Hussman Reefer Units and Pad

An iron frame of angle iron supports rusting but identifiable refrigeration equipment similar to Hussman reefer units recorded at AB7 and at White Beach. Ten m away from the refrigeration unit is a concrete base which may have supported the unit, measuring 5 m x 3 m, and 1 m high. It is probably associated with the post-battle American garrison.

Figure 5.62 This American Navy Avenger prop and engine is from one of two Avengers known to have been shot down in combat on Peleliu.

AB140 American Avenger Wreck (45676)

This is one of two carrier-based US Navy Avengers known to have crashed on Peleliu. The other avenger (16956) broke up in pieces as it came down over the northern end of Bloody Nose Ridge (AB209 and AB212). Both wrecks were extensively researched by BentProp (BentProp.org) with the wreck at AB140 discovered and reported in March of 2006. Records indicated that the plane was shot down on D-day, 15 September 1944. It was piloted by Francis Waters, with crew members Hyman Atun and Paul Bensman all of whom are MIA (BentProp.org). Waters and his crew were with squadron VT51, as was future U.S. President George Bush. (Bush had been shot down over Chichi Jima and did not fly in the combat phase of operations at Peleliu). The wreck is in pieces distributed within about a 25 m area and appears to have been gone though and piled. An investigation by JPAC in 2008 failed to locate any human remains on the site and disturbance of the wreck is probably a result of the JPAC work. At least one air-cooled .30 caliber US machine gun is present at the site in fair condition.

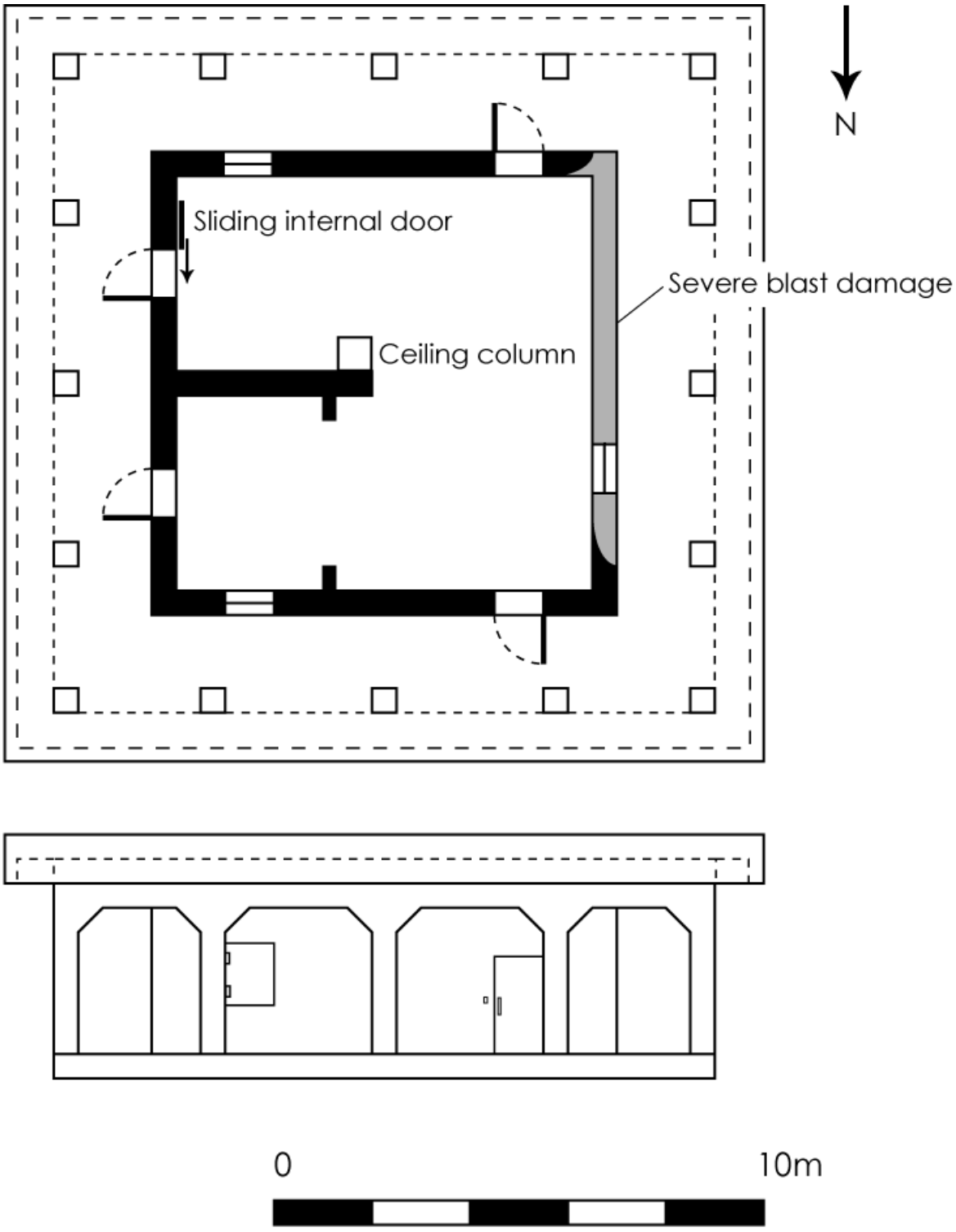

Figure 5.64 Plan view of the Japanese Airfield Operations Building, AB262. (Drawing by Gavin Lindsay)

Figure 5.65 The damaged Air Operations building shortly after being taken by Marines in September, 1944. (NARA : RG127)

Figure 5.66 The Air Operations building hidden by thick jungle in 2010.

Figure 5.67 American LVT(A)4 on static display at AB138.

Figure 5.68 American LVT2

AB138, AB138.1 American LVTs

A pair of American LVT's has been on static display next to the road at least since the time of Denfeld's 1981 visit (1988:77). Their tracks, hatches and other removable iron pieces are missing, probably taken by post-war metal salvagers. AB138 is an LVT(A)4 which had a 75 mm howitzer on a turret designed to destroy beach defenses. AB138.1 is the more commonly seen version of LVT2 designed to carry troops. Its machine gun shields are missing. Like other LVTs on Peleliu, both are badly in need of stabilization and/or conservation assessment.

Figure 5.69

AB139 American LVT4

Another American LVT4 is on static roadside display in the former airfield complex, this one with the loading ramp down. This LVT has suffered little battle damage and has only a few small caliber bullet holes in its sides. It has been cleared of brush cover since 1981, but is fast losing its structural integrity to corrosion and needs conservation assessment and stabilization if it is to last another decade. Like other LVTs on Peleliu, this example has also been stripped of its metal tracks by metal salvagers.

Part 6 Omleblochel; the Southern Ridges; Rois Ngedechelabed and Rois Kar

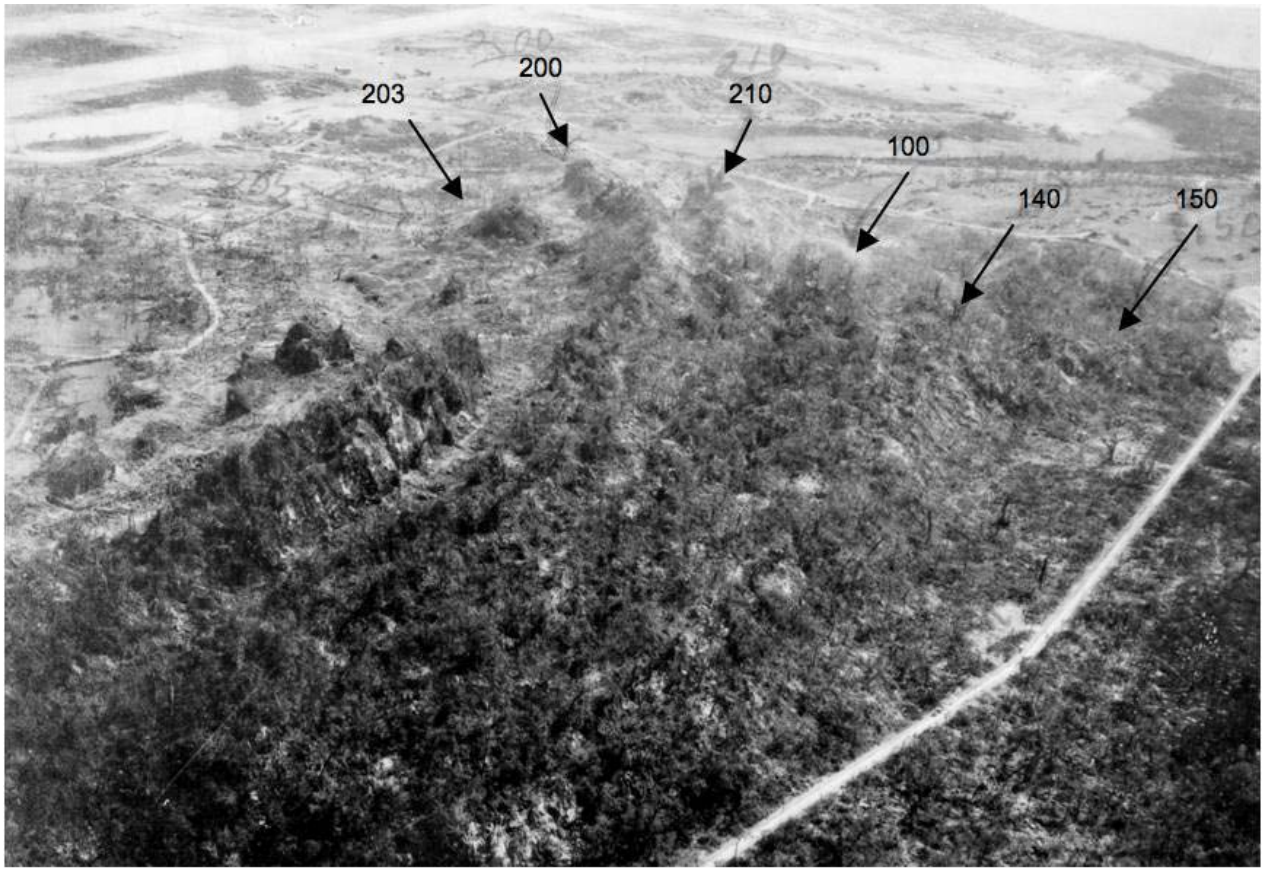

Figure 6.1 Aerial view looking south of the west road and the southern end of Peleliu's ridge system. Hill names shown here were designated by the American military after their altitude in feet; numbers and arrows on the original photo have been enhanced. (NARA:RG127)

Omleblochel

A limestone ridge system runs like a jagged spine down in the interior of Peleliu Island, rising in places nearly 200 m high, with 20 m cliffs leading to crest upon crest of jagged coral and limestone outcrops. Riddled with gorges and boulder-filled ravines, the uneven terrain is also punctured by concealed sinkholes up to 30 m deep. Pre-war phosphate mining on Peleliu added steep quarry pits and waste piles to an existing complex and jagged landscape. The Palauans called the southeastern portion of the limestone ridge system Omleblochel Mountain, while the Japanese called the whole system the Momiji Plateau. American military histories employ a version of the Palauan name, corrupting it as 'Umurbrogol', and erroneously apply it to the entire range (Price and Knecht 2012, Murray 2006:158f.) Using miners and forced labor, the Imperial Japanese Army and Navy turned Peleliu's ridge system into a fortress, honeycombed with caves — some natural, some augmented, some wholly artificial.

To the American Marines assaulting Peleliu, the central ridge system of Peleliu was known by a variety of place names that reflect a series of bitterly fought engagements over dozens of hilltops and valleys. Today those names have gradually fallen into disuse and the entire area is most often referred to as Bloody Nose Ridge. WWII era descriptions of the interior of Peleliu describe the complex topography that the Japanese defenders employed to their advantage. The maze of steep walled bowls and sinkholes are so complex that even today they defy our ability to map them. Some features represent rooms and passages remaining from an ancient collapsed cave systems and combat in this area was akin to fighting in an urban city, one that was virtually bombproof and that had to be taken room by room.

The Marines first encounter with the ridge system and its defenses took place on the southern end, where a series of hills were code-named by the Americans according to their relative elevation in feet. The stark change in the nature of combat here was described by veteran O.P. Smith (in Wright 2002:290):

> There were actually two Pelelius after the first two weeks of the battle. One Peleliu was the flat ground we had captured on the southern third of the island. There we went about the job, all but unmolested, we'd been sent to do-seize the airstrip, and bring in our men and planes so that the Japanese couldn't use the island to interfere with Macarthur's operations in the Philippines. The other Peleliu began at Bloody Nose Ridge…. This was a brutally different extra-inning ball game, one where the score was kept in the number of ridges taken and how many Marines were killed or wounded in the seemingly endless process.

Figure 6.2 Aerial view of Omleblochel and the Central Combat Zone after jungle cover had been burned away by repeated bombardment. (NARA:RG127)

The official USMC history (Garand and Strobridge 1971) summarized the historical consensus:

> Our language just does not contain words that can adequately describe the horrible inaccessibility of the central ridge line on Peleliu. It was a nightmare's nightmare if there ever was one. Nothing in our planning studies and subsequent development of plans led us to realize how terrible it was…The fact that the Marines and Army troops were able to capture the Umurbrogol Pocket at all is a tribute to sheer guts, tenacity, and unmatched bravery.

Figure 6.3 The ruined landscape of the Omleblochel was the image that American veterans took home with them and their memoirs reflect that with titles like 'The Devil's Anvil', 'Islands of the Damned, 'Forgotten Corner of Hell' and 'The Far Side of Hell'. (NARA:RG127)

> Old Marines talk of Bloody Nose Ridge as though it were one, but I remember it as a series of crags, ripped bare of all standing vegetation, peeled down to the rotted coral, rolling in smoke, crackling with heat and stinking of wounds and death. In my memory it was always dark up there…It must have been the color of the ridge that made me remember it as always dark- the coral was stained and black like bad teeth. Or perhaps it was because there was almost always smoke and dust and flying coral in the air. (Russell Davis in Camp; 2008: 241)

The jungle cover is thick here and the winding valleys and limestone pockets provide further shade so that darkness comes early to the lower reaches of the Bloody Nose Ridge. Photography becomes difficult by late afternoon. It is quiet and still and the effect is one of isolation and wilderness. This can create a false sense of first discovery in visitors, who feel that they are entitled to souvenirs. For Americans this springs from a vicarious sense of sharing in the sacrifice and victory. Some even don WWII fatigues or bits of military clothing

to symbolize this connection as they tour the battlefield. For Japanese, souvenir collecting is justified by a deep sense of memorial and respect for a sacrifice made by their troops. All collecting however, diminishes the quality of this remarkable and historic landscape that remains as the most powerful and profoundly evocative memorial to all who fought there.

To this day, the full extent of the complex topography in the ridge system remains uncharted. Military maps from the War era were made after the jungle cover had been blasted away from the largest valley floors and ridge tops, however the smaller features are a maze of sinkholes and sheer limestone walls that will continue to present a challenge to all but the most technically well equipped survey projects. Highly accurate GPS surveying systems cannot receive satellite signals through the dense jungle canopy. Garmin hand held units used in the 2010 survey were a huge improvement over compass and dead reckoning, however their accuracy in the heart of the valleys within the ridge system averaged about plus or minus 50 m.

Time constraints (it was a nine day survey) and safety concerns precluded the mapping of all but a few cave interiors. No artifacts were moved in any way in recording the photographs. Given the long history of souvenir hunting in the caves, which often began in the minutes after they were taken, a significant number of these objects are no longer in situ. The inventory of materials within the caves however still contain a great deal of important information that promises to shed new light on the experience of the combatants.

Figure 6.4 The survey crew working in the complex geology of Omleblochel.

Figure 6.5 American Marines detonate explosives in an attempt to seal Japanese defenders inside a cave on Peleliu (NARA:RG127)

Combat in the Ridge System

Except for those areas with the longest history of visitor traffic, the archeological record in most of the ridge systems is amazingly intact, despite a certain amount of small scale movement of objects by visitors since 1944. The nature of combat in these areas was a new experience for the attacking Americans and Japanese alike, one that would be repeated in other areas of the Pacific theatre and which arguably contributed to the eventual decision to employ atomic weapons against Japan in lieu of a bloody invasion.

(Garand and Strobridge 1971:262) described how new methods of close combat were developed on Peleliu:

> This organized cave defense presented a new and very formidable problem to our attacking forces. Bombing failed to demolish them and concussion had little effect on the deeply embedded personnel. Small arms fire merely covered the entrances and because positions were mutually supporting our troops could not close with the enemy. Flame throwers and demolition when brought within range were highly successful but because of heavy crossfire their uses were limited. Artillery firing point blank offered best results as many caves were knocked out in this fashion.
>
> As a means of reducing the last Japanese defenses on Peleliu, ingenious Soldiers set up fuel tanks in covered positions about 300 yards from the Japanese caves, then hooked up a hose to the tanks and poured oil into the most prominent enemy caves. This oil was ignited by white phosphorus hand grenades lobbed into the caves after the spraying. This method yielded good results and henceforth became an effective improvisation.

Figure 6.6 A flamethrower mounted on an LVT attacking a Japanese cave on Peleliu. The range was 75 yards with gasoline and oil mix, 150 yards with napalm. Duration of fire was 55 seconds for gasoline and oil, and 80 seconds for napalm. (Garand and Strobridge 1971: 271). (NARA:RG127)

This kind of fighting was psychologically scarring for the Americans and horrific for the Japanese. PFC Hank Chamberlain described one such attack (in Wright 2002: 156).

> I was cover for a flamethrower near a row of caves. A grenade came flying out towards us- we dived behind an outcrop of rocks and the grenade exploded harmlessly. As the flamethrower guy stumbled forward, my pal Bucky and I emptied our magazines into the cave entrance…to keep the occupants quiet for a while. The flamethrower was now alongside the cave entrance and sidestepped in front of it and let off a long blast. A single Jap came tearing out, he was a mass of fire from head to foot and his shrieks were indescribable. Both Buck and I had emptied our guns into the cave and we reloaded as fast as we could. The Jap was now writhing on the ground with his arms flailing the air; we put him out of his agony with enough bullets to kill a dozen men.

There are no Japanese memoirs of the battle for Peleliu, with the near total annihilation of the garrison there, but Sergeant Funasaka Hiroshi recalled his experience in the caves on nearby Anguar (1986: 59):

> After the Americans had penetrated through the canal, they began to lob incendiary bombs and grenades into the caves, and constantly used flamethrowers, as they set out to cook us to death, just like we were *tanuki ibushi* [raccoon dogs to be smoked out]. We were trapped inside the caves, jolted by terror and rage. The air became more and more bloody. The injured men's wounds festered, and filled the air with a sickening stench that assaulted our noses. Their features and forms, covered in the dust of battle, were transfigured in the gloom in an especially eerie way. Then in starvation and despair, everyone began to reveal their various instincts. Outside, the enemy attacked us heartlessly with flames, but inside, we were attacked by those powerful enemies – hunger, thirst and pain.

The Marines fought from one Japanese defended position to the next, each enfiladed from other strong points and hit with air attacks, artillery –sometimes fired point blank and with armor support. Caves, tunnels and bunkers were cleared individually (the Marines called it "processing" (Price and Knecht 2012 Cameron, 1994:181) with grenades, satchel charges and flamethrowers. This costly war of attrition was of course the result of a conscious strategic decision by Japanese military commanders with the goal to tie up as many Americans as possible and reduce the pressure on other fronts in the Pacific. It was certainly more effective, although ultimately every bit as costly in terms of Japanese lives, as the infamous Banzai attack. In general the ratio of Japanese dead to American KIAs was about 10:1. But casualties kept accumulating and as the Marine Corps units became ever more thinned in numbers, Army assistance from the 321st Regimental Combat Team was brought in, and after a month of fighting the Marines were finally relieved by nearly 11,000 men of the 81st Infantry Division, the 'Wildcats'.

Because of the nature of the topography even a surface survey of the Omleblochel, including all the valleys and ridge tops will take at least several long field seasons. Some areas of Bloody Nose Ridge are readily accessible and include memorials and static displays of vehicles and weapons that are popular among visitors to Peleliu. We documented those, but chose to focus most of our efforts on areas in the middle of the Central Combat Zone not commonly visited but known to have concentrations of Japanese defensive caves; Death Valley and China Wall, and Wildcat Bowl. We also surveyed the Hill 210 area and the north side of Bloody Nose Ridge. The survey results for each of these areas are described separately: Death Valley, including China Wall and Hell's Pocket, Wildcat Bowl, Hill 210, and Bloody Nose Ridge.

Figure 6.7 Scorched landscape between Hills 200 and 210 in 1944. (NARA RG:127)

Figure 6.8 General location of sites documented in the southern ridge system

Table 6.1 Sites Located on the Southern Ridges

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB63	New site/feature		Japanese Defensive Cave w/AA gun
AB64	New site/feature		Japanese Defensive Caves, (2) rifle pit
AB132	Site 18 Feature 3		American LVT with Stuart Turret
AB133	Site 18 Feature 1		200 MM Japanese Gun in Defensive Cave
AB134	New site/feature		Firing position, Japanese Defensive Cave
AB135	New site/feature		Japanese Defensive Cave, filled oil drum wall
AB136	New site/feature		Japanese Defensive Cave
AB137	New site/feature		Sealed Japanese Defensive Cave
AB145	Site 17		Japanese Storage Cave with Caissons
AB146	New site/feature		Japanese Navy Command Post Cave
AB223	Site 7		Japanese Defensive Cave and gun position
AB224	New site/feature		U shaped Japanese Defensive Cave
AB225	New site/feature		Japanese Defensive Cave
AB226	New site/feature		Japanese Defensive Cave
AB227	New site/feature		Y-shaped Japanese Defensive Cave
AB228	New site/feature		L-shaped Japanese Defensive Cave
AB229	Site 27		American NCB Caterpillar Bulldozer
AB231	New site/feature		Japanese Defensive Cave and firing positions
AB232	New site/feature		Concrete pad
AB233	New site/feature		Japanese Defensive Cave and 75mm field gun
AB234	New site/feature		American Standing water tower
AB235	New site/feature		Foxhole and trench
AB236	New site/feature		Japanese Large Coral Revetment
AB237	New site/feature		Japanese Defensive Cave and firing positions
AB238	New site/feature		C-shaped Japanese Defensive Cave
AB239	New site/feature		Japanese Defensive Cave with 75mm shells
AB240	New site/feature		Japanese Bunker with 75mm wheeled gun
AB241	New site/feature		Japanese Bunker with wooden doors
AB242	New site/feature		Japanese Defensive Cave with gun
AB243	New site/feature		Japanese Bunker
AB244	New site/feature		Japanese Defensive Cave/rock shelter
AB245	New site/feature		Japanese Defensive Cave complex
AB246	New site/feature		Japanese Defensive Cave
AB248	New site/feature		Japanese Defensive Cave
AB249	New site/feature		Human Remains
AB250	New site/feature		Three firing positions
AB251	New site/feature		Firing position, rock shelter
AB252	New site/feature		Japanese artillery ammo can dump and position
AB253	New site/feature		Small Japanese Defensive Caves
AB254	New site/feature		Small Japanese Defensive Cave
AB255	New site/feature		Small Japanese Defensive Cave
AB256	New site/feature		Small Japanese Defensive Cave
AB257	New site/feature		Japanese helmet and human remains
AB258	New site/feature		F shaped Japanese Defensive Cave
AB259	New site/feature		Rock platform
AB260	New site/feature		Japanese Defensive Caves (2)
AB261	New site/feature		L shaped Japanese Defensive Cave with gun
AB269	New site/feature		Aircraft part dump, wing US aircraft
AB270	New site/feature		American Sherman tank, memorial
AB271	New site/feature		Japanese Defensive Cave
AB272	New site/feature		L-shaped Japanese Defensive Cave
AB273	New site/feature		Japanese Navy Communication Cave
AB274	New site/feature		Japanese Defensive Cave/ rock shelter

Figure 6.9 AB63 Cave mouth and 25 mm gun parts

AB63 Japanese Defensive Cave with 25 mm AT/AA Gun

This cave is on the end of the newly constructed WWII interpretive trail and within the small area now cleared of UXO. It contains a Japanese Type 96 25 mm gun barrel and mount assembly as well as 17 empty 25 mm magazines, each of which held 15 rounds (Figures 4.1, 4.2). Fragments of the gun mount are also present in front of the cave mouth. The entrance to the cave is through a 4 m wide rock shelter, narrowing down to 2 m cave entrance where it turns to the north for another 6 m where it is blocked by fallen rubble. In September of 1944 this position had a clear field of fire over the Japanese airfield, and probably contributed to the heavy fire reported from the ridge area when the open airfield was crossed by Marines on D-plus 2. This cave lies near the southern end of Death Valley; an area reached by American forces by D-plus-4.

Figure 6.10 AB63. Seventeen empty 25 mm magazines were found in this cave which overlooks the former Japanese airfield.

Figure 6.11 AB64; Two mouths of a single U-shaped cave in Death Valley.

AB64, U-shaped Cave and Rifle pit Complex

A U-shaped cave in this location opens to the NW. Another small cave is located just to the north and contains remains of miscellaneous metal equipment and fragments of Japanese gas masks. Two firing positions, defined by small walls of coral rock overlook the ridge in the northeasterly direction and are located just above the cave. This cave is also included as a stop on the interpretive trail and has been cleared of UXO. Japanese boot soles and a small medicine bottle lie on one cave floor and are among the artifacts left in situ for the benefit of visitors.

Figure 6.12 Japanese tabi boot soles and a small medicine bottle on the cave floor of AB64.

Figure 6.13 American LVT(A) on static display for visitors on Peleliu, site AB132.

AB132 American LVT(A) with Stuart Turret

An LVT(A) is in the same static display as it was during Denfeld's 1981 visit (1988:70). It is located near the parking area and approach to the main tourist trail which leads up to the AB133 and the newly developed interpretive trail. Along with the nearby 200 mm gun it is one of the most widely photographed remains of WWII on Peleliu.

Armored LVTs were used to attack beach defenses and clear the way for troop-carrying LVTs (Denfeld 1988:71). This example was equipped with a 37 mm gun and a .30 cal machine gun. The condition of this LVT(A) has continued to deteriorate to the point that portions of the body are in danger of collapse and some conservation efforts are needed. The turret still contains the .30 cal Browning machine gun and the gearbox in the interior is full of crankshaft fragments.

Figure 6.14 Rear view of the LVT(A) at AB132.

AB133 Japanese 200 MM Gun and Caves

This spectacular gun is located at the entry to the tourist trail and although it has become a photographic icon, in fact represents only a footnote in the Japanese defense of Peleliu. According to a post-war intelligence assessment (First Marine Division 1944:179) four of these weapons, manned by a Japanese special detachment, were found on Peleliu. There were all located in the hills of the northern peninsula, emplaced for anti-shipping and coastal defense fire. These weapons had been hurriedly put into position; none had been fired. Two of the guns were in shallow open pits, 25 feet in diameter, one in a cave, and the fourth in a concrete casemate under construction at the time of the landing. All were mounted on a spider-like steel framework 23 feet in diameter. A small amount of ammunition was found along with the gun in the casemate.

The other three 200 mm guns along with their mountings are now missing and were probably removed, like nearly all the Japanese artillery pieces, by post-war civilian metal salvagers. Photographs taken in 1944 show that gun at AB133 was found pointing inward, perhaps to aid in concealment. By January of 1945 the gun was turned around to point to the southeast where it remains today. The gun and supports are covered with moss and the metal surfaces are corroding. A little known hazard in this popular visitor attraction is a live artillery round, smaller than that utilized in this gun, solidly wedged nose first between the breech mechanism and the gun frame. It presents a hazard and should be removed.

The gun cave is 7 m deep and 11 m wide (Denfeld 1988:70). Two passages were dug into the rear of the cave behind the gun platform. The northern passage is blocked by fallen rubble. The other is an 'I' shaped cave 11 m long that leads outside to an opening a few meters west of the main cave. It appears that the passage may have been intended to widen into a room but that the cave remained unfinished by the time of the American attack.

Figure 6.15 The 200 mm gun at AB133 as discovered by Marines in 1944. (NARA; RG127)

Figure 6.16 The corroding but intact 200mm gun at AB 133 in 2010. It is the only remaining example of four such guns on Peleliu.

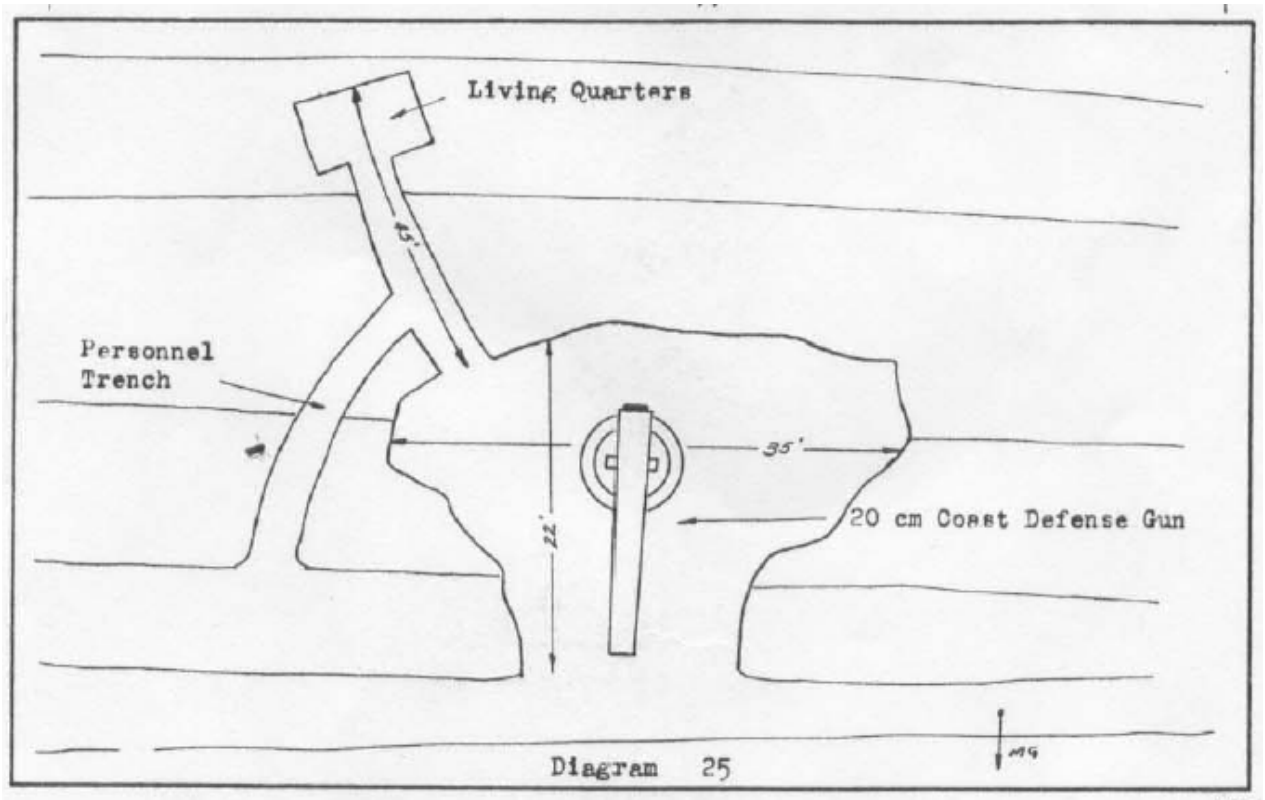

Figure 6.17 War era sketch of the gun emplacement at site AB133 (after Phelan 1944)

AB134 Japanese Defensive Cave and Firing Position

A pair of very small caves are 2 m apart with openings only about 1 meter square were likely used as firing positions facing southeast and southwest. The SE facing cave has an oil drum inside.

Figure 6.18 A wall of Japanese fuel drums still protects the entrance of AB135.

AB135 Japanese Defensive Cave with Filled Oil Drum Wall

A revetment is made of upright lines of oil drums two tiers high, each filled with limestone and coral rubble. There are 17 drums on the lower course, 10 on the upper, many bearing bullet holes from the battle. The drums are arranged in a semi-circle around the entrance of a cave that was deemed unsafe for further investigation. A 1944 photograph of this cave entrance shows a framework of heavy dimensional lumber around the doorway which has since disappeared. The original passage to the cave entrance has been partially blocked by the collapse of one of the drums that was still upright in the 1944 photograph (Figure 6.19). This site is adjacent to a popular visitor trail.

Figure 6.19 Entryway to cave AB135 in 1944 (NARA; RG127)

Figure 6.20 Same view of the cave entry in 2010.

AB136 Japanese Defensive Cave

A west facing L-shaped cave was dug into the reverse side of the same outcrop where the 200 mm gun emplacement AB133. The entrance to this cave has been obscured by a large rock fallen in from above, but it appears to be about 1.5 m high and 1 m wide.

AB137 Japanese Defensive Cave; Sealed

A sealed cave entrance exists about 7 m north of AB136. The entrance faced west, however the damage to the entrance was such that the size of the mouth of this cave could not be determined.

Figure 6.21 Interior of the concrete lined Japanese storage cave at site AB145.

AB145 Japanese Storage Cave with Caissons

This is among largest artificially constructed caves on Peleliu and one of two caves with a reinforced concrete entrance tunnel. The cave is entered through a short concrete lined tunnel 4.85 m long and 2.4 m wide and about 2.65 m high, which opens into a high vaulted rectangular room 25 m long and 9.5 m wide. Phelan's cave study (1945:14) described the construction details:

> This cave was hollowed out of the ridge and finished off with concrete walls, ceilings and floors. Its entrance portals were carved in rock 10 feet thick and its entrance and interior were built in tunnel fashion. A road ran up to its mouth and horse drawn caissons moved in and out of it easily. Two vents ran up through a hole in its roof providing ventilation. A system of dome type lights had been installed. It was used as a storage warehouse for large caliber shells and aerial bombs. At the approach of our forces Japs within it emplaced barrels filled with rocks at its entrance and defended it with small arms fire. It had no other defenses.

The cave was not designed for defense and was in fact a storage facility constructed by the Japanese Navy and attached to the airfield complex. According to Denfeld (1988:70): “Two large underground storage caves, lined with reinforced concrete, were constructed by the Japanese at Peleliu. One was used to store aerial bombs and the other for fuel. The tunnels were entered via a short tunnel equipped with heavy steel doors. By the time the Marines landed at Peleliu the supply of aerial bombs had been depleted. As a result the caves contained only a limited amount of artillery ammunition and other miscellaneous supplies.” Denfeld was only able to locate one cave and thought that the entrance to another had been sealed by US troops.

The cave was the scene of one of many firefights that took place as US troops encountered cave mouths and other defenses of the ridge system. Once inside the Marines found the cave filled with ammunition along with 75 mm gun horse drawn caissons. Guards were posted at the mouth of the cave until the ammunition was removed and to prevent the cave from being reoccupied by Japanese infiltrators. In 2010 we found that the caissons were rusted but retained substantial amounts of original paint and remained remarkably intact except for the wooden elements of the wheels which have disappeared completely. With the spokes gone, the iron wheel rims are leaning and have fallen next to the metal caissons which appear to be in their original parked configuration. We found at least 10 vehicles, mostly Japanese Type 13 caissons. Two pairs of rail wheels may represent a mine cart salvaged from the island’s pre-war phosphate mining operation. The stored ammunition has been removed, however flat black strips of low explosive propellant remain strewn about the floor along with a jumble of miscellaneous hardware. A nearly complete Japanese metal hand cart is missing it rubber tired wheels. A full archeological inventory of this cave’s contents and a conservation assessment is definitely in order here.

Figure 6.23 Firefight between U.S. Marines and Japanese defenders of the storage cave at site AB145. (NARA; RG127)

Figure 6.24 The entry to AB145 was protected by wooden barrels filled with rubble. These are now missing. (NARA; RG127)

Figure 6.25 Japanese Type 13 artillery caisson inside the cave at site AB145

Figure 6.26 Ammunition drawers inside of the artillery caissons at site AB145

Figure 6.27 Remains of one of the narrow gauge rail cars salvaged from the phosphate mines on Peleliu and reused by the Japanese military. Only the wooden elements are missing.

AB146 Japanese Navy Command Cave

This is one of the more historically significant caves on Peleliu in that it served as the first Japanese command post during the first days of the American assault. The command center was then moved to an H-shaped cave in the ridge on the west side of Wildcat Bowl (AB81) and again as the Japanese pulled back it was finally moved to the 'Last Command' post caves at AB68. This large natural cave was initially described in a Marine Intelligence report (First Marines 1944:161,162):

> This personnel cave was one of the most complex on the island. It quartered at least 200 men. Nine wooden decks were built on staggered levels with headspace between the decks a maximum of four feet. Wooden steps connected all decks. Stone steps had been cut down to an adjacent storage cave and a passageway led to the command post cave. A grenade launcher had been emplaced just below the entrance that looked out on a narrow ravine. The command post was located in a cave more than 30 feet below the entrance. It contained complete communications facilities, radio and electric lights. Decks were of wood and walls of sheet iron. Empty oil drums were used to collect water dripping from the stalactites. It was connected by a passageway to an adjacent personnel cave."

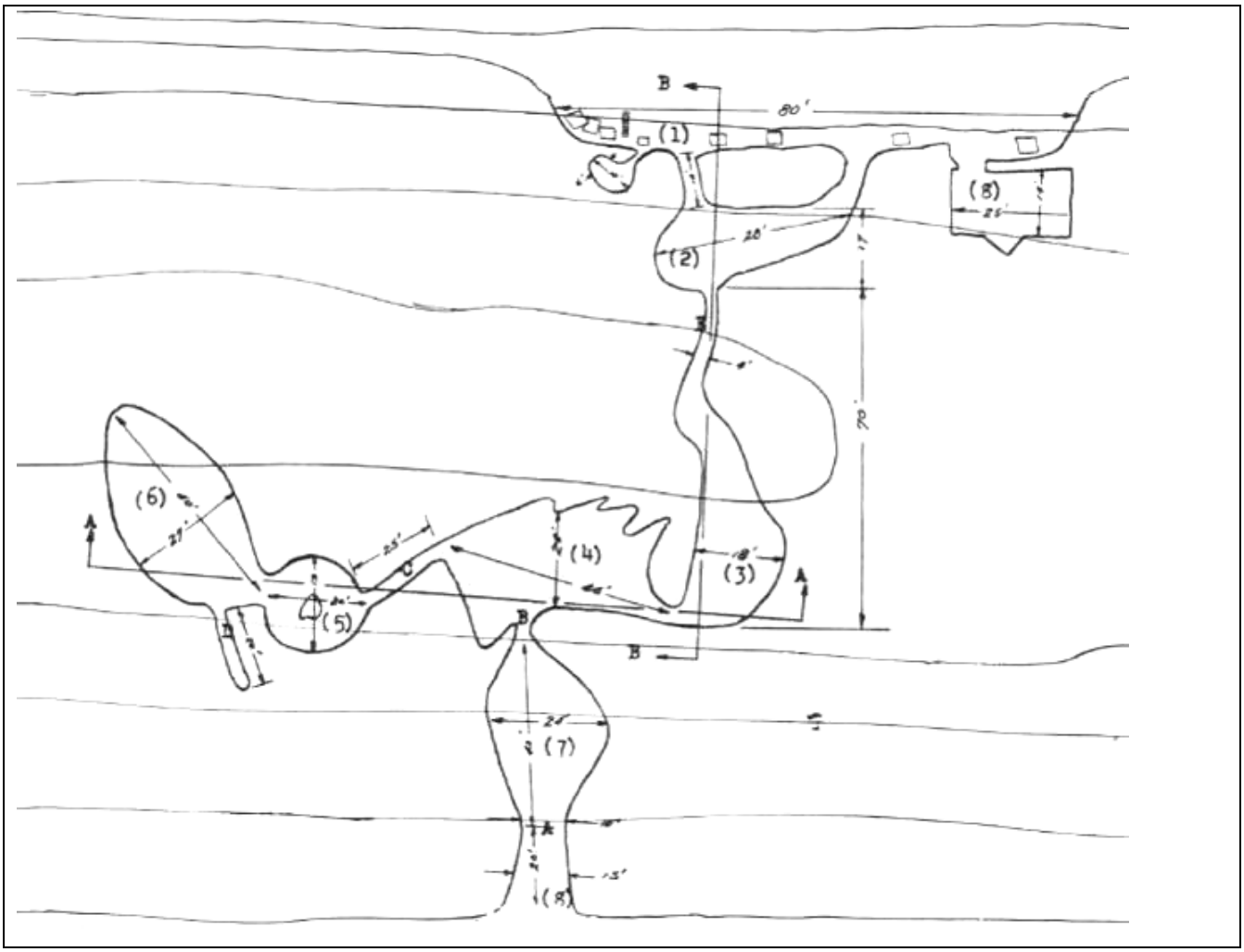

Figure 6.28 Map of the interior of the Japanese Navy Command Cave (after Phelan 1945:31).

Within the 'balcony' mouth numerous rooms had been installed as well as sand bag partitions and automatic weapons…Directly behind the mouth was a large natural room which had at one time been part of the mouth. The Japs had closed all but two small entrances to it and used it as a protected area of personnel functioning in the mouth. An OP (observation post) existed above the cave and interior lines of communication ran through the valley from it. From the lowest portion of the balcony area a tunnel ran down to a series of six large vertical cavities on various levels down and through the ridge. The last cavity (8) gave access to the eastern side of the ridge looking over the flat area of the island. In the mouth of this cavity a 75 mm gun was emplaced and a group of mortars was located nearby. Cavity 8 (diagram) is both the eastern entrance and the combat portion of the caves. Room 7 was an ammunition storage and refuge area for the gun crews. It was protected by a bottleneck tunnel (A). Room 4 served as a food storage compartment and mess hall, rooms 5 and 6 were enlisted men's quarters and tunnel 'D' was in the process of being constructed as a private entrance to the enlisted men's area and an alternate escape route. Room 3 was provided with floors, roof and furniture. It has wood-

partitioned rooms built one above the other. It served as the officers' quarters while area 1 was the administrative center. At the upper part of the balcony mouth an artificial room had been constructed with wooden floors and closets and tin walls and roof. It probably served as the living quarters of Col. Nakagawa, CO of the Japanese 2nd Regiment.

This deep and extensive cave complex withstood attacks by aerial and naval bombardment as well as ground attack with flamethrowers with the Japanese defenders protected by the sharp turns and thresholds inside the cave. The 75 mm gun was destroyed, but demolition charges on both ends of the cave only widened the cave mouths (Phelan: 33). In the end the cave was only given up because it was in an insecure location from a tactical point of view. The Japanese command post was moved back into the ridge system into an H-shaped cave (AB81) and finally to the 'last command post' site (AB68).

We located the 75 mm gun described by Phelan and found it upside down but in otherwise good condition in the southernmost room of the cave complex, Phelan's room 7 (Figure 6.36). Rooms 4, 5, and 6 are today a large and densely occupied bat colony and floors and artifacts in these rooms are covered with a layer of foul smelling bat guano more than 10 cm deep. The northern end of room six is flooded with an accumulation of water at least 30 cm deep and several oil drums are variously floating about or scuttled in this pool. Most of the interior structures described in wartime accounts have disappeared and are represented now corrugated metal siding and piled sections of iron scaffolding that may have been used in conjunction with wooden decks. Japanese artifacts are abundant and well preserved throughout this cave, particularly within the deeper sections which are difficult to access and probably rarely visited.

Figure 6.29 Enameled metal rice bowls with Japanese Navy markings and a light machine gun on the floor of the Japanese Navy Command cave, site AB146

Figure 6.30 Entry to the Japanese Navy Command Cave in 1944 (NARA; RG127)

Figure 6.31 Entry to the Japanese Navy Command Cave in 2010.

Figure 6.32 Steep passage down into the interior of the Japanese Navy Command Cave in 1944 (NARA; RG127)

Figure 6.33 The same passage in 2010. Note the movement of artifacts since 1944.

Figure 6.34 Japanese light machine gun tripods and beer bottles on the bat guano covered floor of the Japanese Navy Command Cave.

Figure 6.35 Japanese food cans in the Japanese Navy Command Cave. 1944 photos show stacked wooden crates in this area which have rotted away to expose the cans.

Figure 6.36 Japanese 75mm gun which protected the eastern mouth to the Japanese Navy Command cave, now upside down on the cave floor after being hit by American fire.

Figure 6.37 Entry to Japanese defensive cave at site AB223.

AB223 Japanese Defensive Cave and Gun Position

A narrow slit in a NNE facing slope 1.5 m wide and about 50 cm high, leads into a nearly vertical drop into a rectangular rock shelter. It is cut into a natural cave that faces east and is a probable Japanese defensive firing position. Located about 3 m to the west is a cave mouth 2 m wide an 3 m long that leads to a small room about 3 m in diameter. It contains some Japanese bottles and once contained some live American Bangalore torpedoes that have recently been removed by the UXO team.

Figure 6.38 Mix of American and Japanese military artifacts left by cave looters at outside the cave at site AB224.

AB224 Japanese Defensive U-shaped cave

The two mouths of a U-shaped cave face to the west and north. Artifacts are abundant in this location; near the west entrance is a sizeable concentration of equipment, dominated by American and Japanese canteens, 6.5 mm magazines, rocket rounds, live rifle grenades and batteries. There are signs of recent looting and movement of artifacts near the cave entrance and the artifact concentration probably represents a cave looters 'sort' pile. The west mouth of the cave is 3 m wide and 1.5 m high while the north mouth is blocked but measures 2 m wide and 1 m high.

Figure 6.39 Mouth of Japanese defensive cave at site AB225

AB225 Japanese Defensive Cave

A large cave mouth faces NW and measures 5 m wide and 2 m high. There is a mound of coral and limestone rubble at the mouth. Several Japanese mess kit parts were noted on the north side of the opening.

Figure 6.40 Japanese flame thrower and mortar rounds outside of cave at site AB226

AB226 Japanese Defensive Cave

This large cave faces NW and has a mouth 3 m wide and 2 m high fronted by a low coral revetment. A good example of a Japanese flamethrower in good condition other than a few bullet holes is present on the revetment, along with an 81 mm illuminating mortar round.

The cave floor is densely covered with artifacts including picks, chisels, sake bottles, rice bowls, many American M1 rifle clips and at least 16 live American and Japanese hand grenades on the surface with more probably existing under the accumulated sediment.

Figure 6.41 Pile of live American and Japanese hand grenades on the cave floor at site AB226.

AB227 Y-Shaped Japanese Defensive Cave

A probable Y-shaped cave is located about 5 m south of AB226. The cave mouth appears to be battered by explosives and a quantity of rubble lies in front of it. The mouth faces toward the NW and is about 5 m wide. The cave was not entered on the advice of the UXO specialist who found that the cave contained numerous live mines and booby traps.

AB228 L-shaped Japanese Defensive Cave

This L-shaped cave has a small entrance measuring 1 m wide and 60 cm high, facing SW and may have been sealed with coral rock at one time. The narrow entrance opens into a roughly L shaped room about 10 m long. This cave appears to have been rarely visited by looters and artifacts are abundant on the cave floor and indicate use by both the Japanese and American military. We documented this cave under close monitoring by the UXO specialist. At least 85 pieces of Ordnance are present on the surface including Japanese M2, and Type 91, 97 and 99 ammunition and clips as well as live US smoke and incendiary Mk2 hand grenades. At the far end of the cave is a pile of live Japanese type 97 hand grenades; we counted 70 of them on the surface. Six Japanese Mk 27 machine gun magazines are also in this area.

Two American helmets, one in very good, useable condition are present here, along with a USMC bayonet scabbard with a stenciled name of ‘S. Gomez, Jr.’. A record search showed that PFC Santiago Gomez Jr. joined the USMC on November 10, 1943, was wounded in action but survived and left the Marines on February 13,1946. This Marine died in 1959. American canteens and plasma bottles and remains of a stretcher are also present, suggesting that the cave may have functioned as a temporary aid station during the assault.

Figure 6.42 One of two American helmets on the cave floor at site AB228.

Figure 6.43 American phosphorus grenades, plasma bottle, medical kit and other artifacts on the cave floor of site AB228. This caves appears to have been largely undisturbed by looters.

Figure 6.44 Live Japanese hand grenades on the cave floor at site AB228.

Figure 6.45 AB228 cave interior with two live bazooka rounds, American canteens, canteen cup and mess kit pan.

Figure 6.46 American WWII era bulldozer at site AB229

AB229 American NCB Bulldozer

At the base of Pope's Ridge are the remains of what appears to be a WWII era Caterpillar D8 8R, which is missing the engine but is otherwise fairly complete. Bulldozers were used in the assault as well as by U.S. Navy Construction Battalions (Seabees) in construction of American facilities after the battle. The engine block has been removed.

AB231 Japanese Defensive Cave and Firing Positions

A small cave on the side of a steep hill has a mouth facing NE which is 1.5 cm high and 75 cm wide and drops nearly vertically to a small interior containing Japanese helmets and canteens. The east side of the cave entrances is protected by a curving wall of coral rubble and the entrance to the cave is partially blocked by a large collapse of rubble, possibly the remains of an additional section of wall.

AB232 Concrete pad, Hill 210

A concrete hut base measures about 6 x 10 m and is oriented N-S with slots and bolts for a superstructure either never installed or now missing. This may represent the remains of a post-war US military structure. A 4.5 inch barrage rocket lies nearby.

Figure 6.47 Japanese Type 41 wheeled 75mm field gun at AB233

AB233 Japanese Defensive Cave and 75mm Field Gun

A U-shaped cave on a NW facing slope has a large eastern entrance 2 m wide and 9 m high. The only artifacts noted on the floor of this cave were 27 pieces of live TNT, probably the contents of a US satchel charge. Down slope about 5 m from the cave mouth are the remains of a Japanese wheeled artillery piece, a Type 41 75 mm field gun which had apparently been destroyed by placing explosives placed in or near the muzzle. Some remains of electrical equipment are just east of the field gun, possibly the remains of a radio. Wooden components of the wheels are absent with the wheel rims collapsed in situ on either side of the gun.

AB234 Standing water tower (post war), Hill 210

A standing water tower is still extant on top of Hill 210 was part of the post-war construction. It is an open framework construction made from angle iron and appears to be about 20 m high.

AB235 Foxhole and trench, Hill 210

A complex of defensive features on the W slope of Hill 210 includes a foxhole, a shallow trench 7 m long, a coral revetment wall and a broken up concrete base of a small structure, possibly Japanese. The foxhole is 60 cm deep.

Figure 6.48 American Marines move up into the southern ridges past the revetment at site AB236 (NARA; RG127).

AB236 Large Japanese Revetment

A very large scale revetment of coral rock is located near the base of the southern ridge system and resembles similar structures that once existed in the airfield complex. The revetment is built against a steep hillside and a machine gun position is dug into the western corner near the hill. The revetment walls are about 10 m thick at the base, 5.8 m high and 2 m wide at the top. The interior of the revetment measures 19.6 m by 16.1 m across the enclosed level area. There is an opening in the middle of the revetment wall facing away from the hill that is 4.3 m wide. A large explosion of a fuel and/or ammunition dump was reported in accounts of the assault on Hill 210 and it is possible that it originated from this feature. A large metal speaker bullhorn was found on top of the revetment wall which may be American in origin. The site today is covered with dense jungle.

AB237 Rock shelter firing position

A rock shelter cut 50 cm into a vertical limestone face is facing SW. It was protected by a curving wall of coral rubble about 1 m high.

AB238 Japanese L-shaped defensive cave

An entrance to a small L shaped cave exists about 7 m north of AB237. The entrance faces west and is about 2 m wide and 1 m high.

Figure 6.49 Stacked Japanese artillery rounds on the cave floor at site AB239

AB239 Japanese Defensive Cave with 75mm Artillery Rounds

A west facing cave mouth 8 m wide, 3 m deep and 6 m high is heavily scarred by shell fire. It may have sheltered a Japanese artillery piece or been used to store ammunition. There are at least 37 pieces of Ordnance on the cave floor, primarily 75 mm projectiles for a Japanese type 94 gun. There is a substantial amount of limestone rubble at the entrance to this cave.

Figure 6.50 Entry to the bunker at site AB240

AB240 Japanese Bunker with 75mm wheeled gun

A trapezoidal concrete casemate is very similar to AB178 and several others that were documented by Marine intelligence teams on Peleliu after the battle at Orange and White Beaches (First Marines 1945). It contains a damaged 75 mm Japanese mountain gun partially covered by rubble that is unusual in that the wooden wheel spokes and carriage parts remain in good condition. The gun opening and gun barrel face NW. The casemate is constructed of reinforced concrete and is 1.6 m high, and had a 2 m wide entrance enclosed by a pair of double wooden doors with large iron hinges that resemble those seen on the airfield gate pillars. The casemate appears to have taken one or more direct hits on the front from large guns. Besides the damaged gun the casemate interior contains at least six 7m mm projectiles, three Japanese type 91 hand grenades and disarticulated human bone fragments.

Figure 6.51 Damaged Japanese 75 mm gun inside of the bunker at site AB240.

AB241 Japanese Bunker with Wooden doors

This small but heavily constructed concrete bunker near the top of Hill 210 was entered through a stout wooden door which was attached until 2007 and is now located a few m down slope. The entrance is partially obscured by rubble and consists of a 1 m square doorway on the SW side. The interior of the bunker is about 2 m square and about 2 m high. This bunker was among the Japanese defense systems investigated and documented by USMC intelligence shortly after the battle (USMC: 97) and was determined to be a

Japanese artillery command post that worked in conjunction with a nearby concrete observation post (AB243) located at the top of Hill 210.

Figure 6.52 Japanese observation post at site AB243/

AB243 Japanese Bunker and Observation Post, Hill 210

A concrete bunker was located on east side of the top of Hill 210 had observation ports facing the south and southwest and was used as a Japanese observation post to direct artillery fire and was associated with the AB241 command post. USMC investigators found it complete with plotting and communication equipment along with tables indicating that the guns had been pre-sighted on the landing beaches before the American assault began. The bunker is extremely well disguised in the way it is dug into existing topography and covered with coral boulders; approaching the site on the west side one sees only a pair of thin rectangular observation slots near ground level near the top of Hill 210. The reinforced concrete construction is heavy with the roof over 1 m thick. The entryway still retains a hinged wooden door with the same type of heavy iron hinges seen in AB241. Artifacts on the floor of the bunker include rice bowls and fragments of Japanese mess kits.

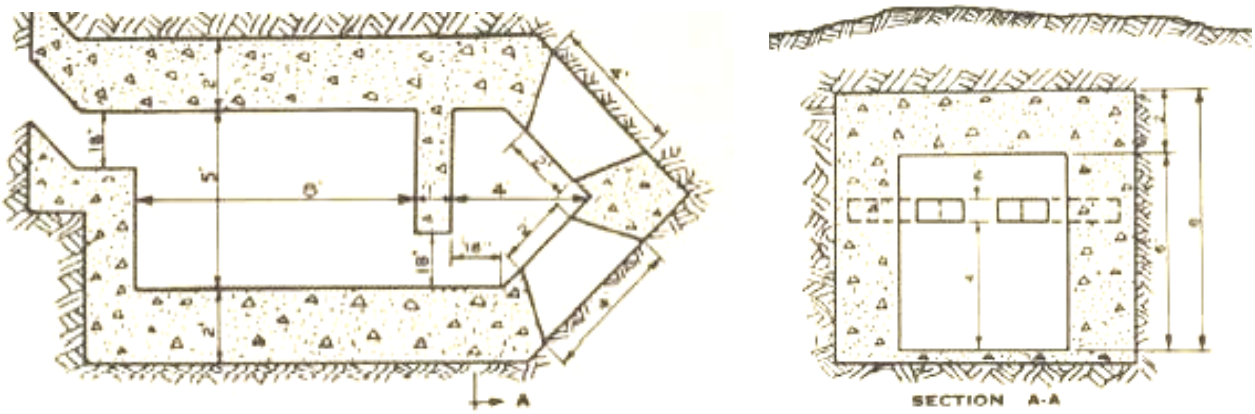

Figure 6.53 Plan view of the bunker at site AB243 (after First Marines 1944)

Figure 6.54 Wooden door and entry into the Japanese observation post at site AB243

Figure 6.55 Interior of the Japanese observation post with concrete mounts that held sighting equipment. This location directed Japanese fire onto the landing beaches on D-Day.

Figure 6.56 Interior of damaged Japanese casemate at site AB242.

AB242 Japanese Casemate with Gun

A heavily damaged reinforced concrete casemate may have been similar to that seen at AB240. A damaged Japanese artillery piece is buried under limestone and collapsed concrete from the ceiling and may be either a Japanese 75 mm or 37mm field gun, based on the shaped of the support leg. The entranceway is about 5 m wide and the interior is difficult to access because of an extensive amount of bent and damaged iron rebar.

AB244 Japanese Defensive Cave/rock shelter

A rock shelter faces east, surrounded by a curved wall of coral rock about 2 m high with a 1 m wide entrance gap. There is a 4 m by 6 m rectangular recess in the rock about 1 m deep that is in line with the entrance.

AB245 Japanese Defensive Caves (2)

A pair of heavily shell damaged caves face NE, one with a coral rubble revetment around the mouth, which is about 5 m wide, 4 m high and 3 m deep. A second cave was probably located just above but is damaged to the extent that it is only visible as a remnant.

AB246 Japanese Defensive Cave

A cave is located on the west base of the cliff edge surrounding a limestone bowl. There is a large mound of rubble in front of the mouth, but the portion of the mouth still above ground is 2 m high and 4 m wide. There is a near vertical drop into the cave which extends about 3-

4 m into the rock. The cave contains corroded metal boxes and containers. There is an entrance pathway on the north side of the mouth, supported by a coral rock revetment wall.

AB248 Japanese Defensive Cave

A cave with a SW facing mouth commands a field of fire across an entire limestone bowl. The mouth is about 3 m wide and 1.5 m high and extends just 2 m deep. There is a low coral revetment in front of the entrance. The cave floor has a small arms ammunition scatter as well as signs of a Palauan prehistoric midden.

Figure 6.57 Human remains on the ground surface at site AB249

AB249 Human Remains Concentration

A scatter of disarticulated human remains was found nestled on ground surface of a small bowl in the limestone on the north facing slope of Hill 210. There is a cranial fragment which is small but has fully knitted sutures, suggesting an adult individual. An irregularly shaped puncture on the forehead is rust stained. Laying several cm north of the cranial fragment are bundled, disarticulated long bones along with a fragmentary pelvis and maxillary bones. It is possible that all these bones represent the same individual and they represent a secondary deposit made by post war visitors to the site. A fragment of a small size Japanese tabi sole is also present.

AB250 Gun Positions, Hill 210

Three probable machine gun positions are located along the thin ridge top which extends north of AB249. The first overlooks the ridge on the SE side, the other two are about 5 m further north and face toward the west. They are about 4 m apart and are outlined by a single course of coral boulders. They are about 3 m x 2 m. The first position is V-shaped and the other two are rectangular.

AB251 Firing position and Rock Shelter

A south facing rock shelter is semi-circular and about 3 m across. The entrance is about 1 m wide and 1.5 m high. The floor slants up for about 5 m past the mouth. It has been cut into a coral rock knoll and may represent an unfinished cave that was used as a firing position. Artifacts associated with this cave include an American canteen, helmet and a mortar shell carry case.

Figure 6.58 Japanese ammunition cans at site AB252

AB252 Japanese Ammunition Can Dump and Firing Position

A valley bottom is littered with several hundred metal cases for ammunition used in a Japanese type 92 70mm Howitzer with the scatter measuring at least 20 m across. Most of the cans seem to be empty, but filled cans with live rounds inside are not unknown on Peleliu. Each originally can held 4 artillery rounds. Nearby is also a 5-10 m scatter of American jerry cans. A 1 x 2 m rectangular enclosure of coral rock stacked to a height of 50 cm is aligned E-W and may represent a firing position for a mortar. The remains of these short, highly portable weapons, ammunition cans and associated gear boxes are very common in the caves and on the valley floor of the ridge system. They were easily the single most common large Japanese gun encountered during the 2010 survey.

AB253-AB256 Japanese Defensive Caves

A series of closely spaced small natural caves run long the base of a limestone cliff running N-S which forms one edge of a limestone bowl, probably a weathered sink hole- which is located at the western foot of Hill 210. The bowl and the caves were heavily utilized by Palauans at one time, evidenced by dense middens of faunal material and earthenware in the bowl and in many of the caves.

AB253 Shallow Cave/ Rock Shelter
A shallow cave or rock shelter has an opening 2 m wide and 3 m high and extends only a meter or so into the limestone. Sitting on a limestone shelf inside is a very well preserved American helmet still in useable condition. A mortar shell carrying case lies nearby.

AB254 Small Cave
A shallow but wide cave mouth faces eastward into the bowl, measuring 4 m wide, 1.75 m high and only extending inward for 1.5 m. The only artifact present on the surface is a rusting oil drum.

AB255 Small Cave
A small cave facing eastward into the bowl features a curving revetment wall of coral rock. The cave is 1.1 m wide, 1.6 m high and extends into the rock for 3 m. No artifacts are present on the ground surface either inside or immediately surrounding this cave.

AB256 Small Cave
The last of the small caves surrounding this bowl is crescent shaped and contains only a rusted food tin. The mouth is 2 m high, 1.5 m wide and the cave extends to a depth of 3m.

AB257 Human Remains Concentration, Hill 210
An area of about 3 square m on a SW facing slope near the top of Hill 210 has a number of disarticulated human remains on the jungle ground surface. Two tibia shafts, a femur and remains of a stretcher are present. About 1 m west of the human remains is a Japanese helmet.

AB258 Japanese Defensive F- shaped cave
About 5 m NW of the human remains at AB257 is an F-shaped cave with a SW facing mouth about 1.2 m square. Past the mouth the cave opens into a higher cave, reaching a height of nearly 2 m. Artifacts are abundant on the floor of this cave, especially along the cave walls and include Japanese ammunition drum clips, strip magazines, canteens floor
Figure 6.59 Japanese artifacts on the cave floor at site AB260

AB259 Rock Platform
A rectangular rock platform of coral rock of is located along the side of a SW facing slope. It is about 10 m x 5 m and built about 50 cm high above the jungle floor. Its function is unclear, but it seems to be historic in origin.

Figure 6.59 Japanese artifacts on the cave floor at site AB260

AB260 Japanese Defensive Cave

A cave entrance 1.2 m high, 1.7 m wide faces SE and has a partial coral revetment in front of it. Inside the cave the space is configured in an irregular zigzag shape. Artifacts are abundant on the cave floor and include Japanese small arms ammunition, canteens, gas mask filter canisters, mess kit elements, metal equipment cases and the metal components of shovels.

Figure 6.60 Japanese 70mm gun parts on the cave floor of site AB261

AB261 Japanese Defensive L-shaped Cave and Gun

A few m from AB260 is another cave entrance 2.5 m wide and 1.5 m high. About 2 m from the entrance are the badly damaged barrel, carriage and metal wheels of a Japanese type 92 70mm Howitzer. Artifacts are thickly strewn on the floor of this cave and besides the damaged gun include metal and porcelain rice bowls, Japanese canteens, gas mask parts, mess kit parts, a chopstick case and many rounds and clips of both Japanese and American rifle ammunition.

Figure 6.61 Porcelain rice bowls, chopstick boxes and other artifacts on the cave floor at site AB267.

AB267 Japanese Defensive J-shaped Cave

This cave is the only WWII defensive cave on Bloody Nose Ridge previously documented in detail by archeologists (Blaiyok and Olsudong 1996) and one of the very few that has a Palauan site number; B:BE-1:124. The cave was found in April 1996 by Tangy Anastacio and reported to BAC archeologists.

The cave entrance 95 cm high and 2.3 m wide and inside the cave the ceiling rises to as high as 1.9 m. Live Ordnance and a human skeleton minus its cranium had been removed from this cave in the past year by Japanese bone recovery teams and the UXO specialist in a program approved by the Palauan authorities. The west entrance to the cave had been capped by reinforced concrete and the skeleton was removed from the overhanging tangle of rebar behind the shell-damaged concrete. Artifacts are abundant on the cave floor, many displaying evidence of flamethrower attack. According to Blaiyok and Olsudong, an unnamed American veteran attending the 50th anniversary observations on Peleliu in 1994 had participated in the attack on the cave which had been subjected to flamethrowers fired into both entrances. When the cave was first located, it was reported that the remains of three individuals were inside.

Leaning upright against the cave wall is a heavy shield plate from a Japanese 70mm mountain gun. Japanese canteens, mess kits and gas mask parts are present in quantity although often damaged by heat and shrapnel. A proximal fragment including the breech of a Japanese rifle barrel is also present. The physics and horror inherent in the flame thrower attacks on the caves on Peleliu are starkly evident in this cave. A stack of eight 48 rpm records have been melted together and a Japanese canteen lies exploded from the inside, probably when the water turned to steam in the heat. A partially melted eyepiece of a Japanese gas mask is fused to the ceiling of the cave where several shards of human long bones have been driven deep into the limestone by the combined forces of explosion and heat.

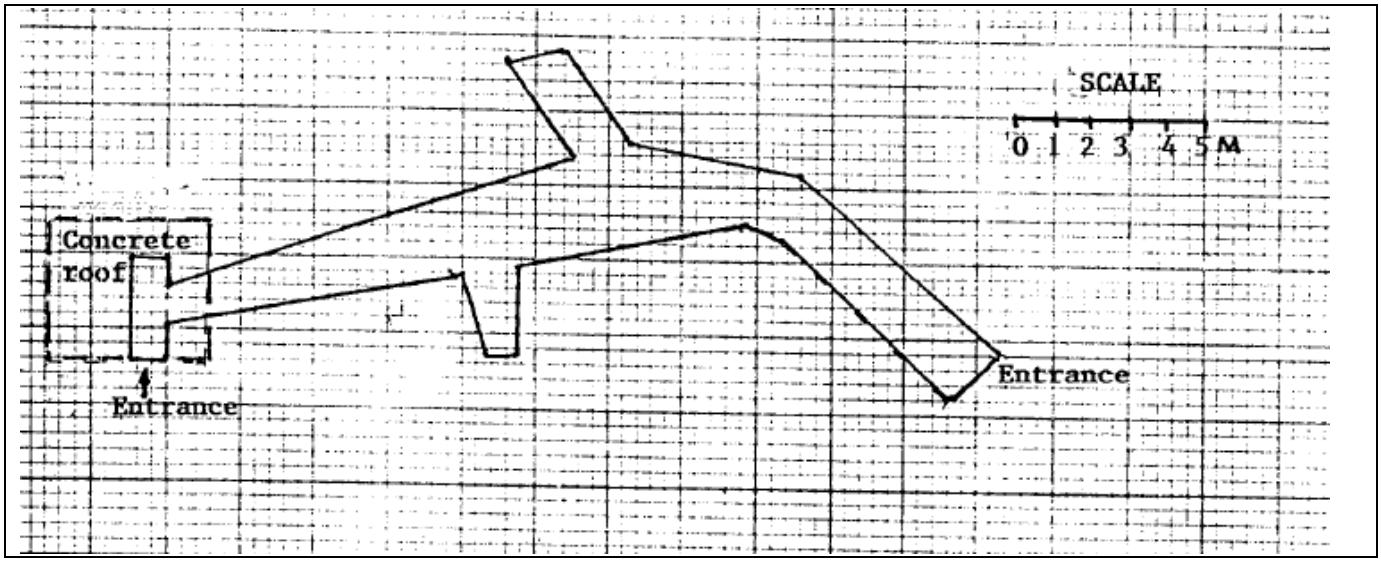

Figure 6.62 Sketch of AB267 (after Blaiyok and Olsudong Figure 2, 1996).

Figure 6.63 Stacked 78 rpm records melted by the heat of American flame throwers, site AB267.

Figure 6.64 Exploded Japanese canteen on the cave floor at site AB267

AB272 Japanese Defensive L-shaped cave

An entrance to an L-shaped cave is about 1 m wide and 1.7 m high and surrounded by a semi-circular wall of upright oil drums. Japanese mess kit parts are strewn about the interior.

Figure 6.65 American Sherman tank at site AB270.

AB270 American Sherman Tank

This tank, probably nicknamed by its crew 'Flying Home', is lying on its side missing its tracks. According to our local guide Tangie Hesus, the tank was originally in its upright position but was turned upon its side by metal salvagers so they could remove the tracks. The tank was assigned to A company of the 710th Tank Battalion and had been part of an earlier assault on Anguar island. On October 18, 1944 the tank was reportedly supporting Marines who were searching for two Navy airmen who had gotten lost while out hunting for souvenirs. The airmen were found and the tank was returning when it came under fire from Japanese caves in Bloody Nose ridge. The tank was in the process of moving into position to return fire, guided by Marine Captain Henry Will Jones, who was riding on top. The tank ran over one of the buried aerial bombs that the Japanese had placed as a mine and the explosion penetrated the relatively thin armor and killed Captain Jones and three tank crewmembers; T/4 Otto Hesselbarth, Cpl. Michael Valentino, Pfc.George Lopes. Crewmember Pfc. Howard Dahms later died of severe burns and tank commander John Prehm was blown clear of the tank and survived his injuries (Pacific Wrecks 2010). The tank burned for hours afterward, which is clear from the condition of the engine in the tank interior. A nearby memorial plaque to the dead was placed on the site by 710th Tank Battalion veterans in 1997. This is one of at least two Sherman tanks remaining from the assault, there are other examples on Ngedbus Island where at least one Sherman tank remains upright and relatively undamaged.

Figure 6.66 The bottom of the Sherman tank at AB270, showing damage from the buried Japanese bomb that it ran over.

AB272 Japanese Defensive L-shaped cave

An entrance to an L-shaped cave is about 1 m wide and 1.7 m high and surrounded by a semi-circular wall of upright oil drums. Japanese mess kit parts are strewn about the floor of the cave.

AB273 Japanese Navy Communication Cave

The Japanese Navy communication cave worked in conjunction with AB146, the Japanese Navy command cave located 160 m to the northeast of this site. The entry to the cave is partially blocked with a low wall of coral rock and is overhung with large stalactites. A pile of metal struts on the left hand side of the large open entry room (A) is probably the dismantled remains of scaffolding that supported multiple layers of bunks and living areas inside the cave. Iron bed frames are also present, along with generator parts and batteries. Four drum magazines for IJA Type 99 model 2 Mk3 20mm heavy machine guns along with a drum magazine for a 7.7mm Japanese Lewis gun are on the floor of the entry area. Both this and the Navy Command cave are large natural caves that completely penetrate the ridges in which they were formed. The west entrance is much smaller and just outside of it was the incomplete but recognizable remains of an American .30 caliber Browning machine gun and a Japanese army 20mm Type 99 heavy machine gun as well as two damaged aluminum teapots.

with kitchen equipment, steel cots and electricity and gave access to an interior valley with a protected line of communication…Cave 'B' gave access to the eastern flat of the island; 20 mm cannon were mounted in its mouth, and radio equipment and a telephone switchboard, connected to vital points by a system of steel cable laid on the ground, were located within it. When the Japs evacuated their primary command post there was no longer a necessity for a primary communications center in this area; they therefore abandoned this one simultaneously. They did not abandon it, however, without leisurely smashing the radio equipment and switchboard. They left a handful of men behind to man the 20 mm guns and hold us off by sniping. Thus the caves served alternately as a communications center and strong point.

Figure 6.68 Cave 'A' at the Japanese Navy Communication Cave in 1944 (NARA; RG127)

Figure 6.69 Same view of Cave 'A' in 2010.

Figure 6.70 Four drum magazines for Japanese heavy machine guns along and drum magazine for a 7.7mm Japanese Lewis gun among other artifacts on the cave floor, site AB273

Figure 6.71 Stacked scaffolding that once supported bunks in the Japanese Navy Communication Cave; site AB273.

Figure 6.72 Interior of room ‘B’ in the Japanese Navy Communication Cave, site AB273

Figure 6.73 Bed frames and bunk scaffolding inside room ‘B’ Japanese Navy Communication Cave; site AB273.

Figure 6.74 Eastern entrance to Japanese Navy Communication Cave, site AB273.

AB274 Japanese Defensive Cave/ rock shelter

Located about 6 m NW of the south facing entrance of the Communications Cave AB273 is another south facing entrance to a shallow cave or rock shelter that is 2 m deep, 3 m wide and 6 m high. No artifacts remain on the cave floor however two Japanese sake bottles are located several m down slope from the entrance.

AB275 Japanese Defensive Cave

A shallow cave facing east has two damaged Japanese fuel drums in the entrance. The mouth of the cave is 1.5 m high, 2.6 m wide and extends into the hill for about 6 m. Artifacts on the cave floor include corroded food cans and a Japanese sake bottle.

Part 7 Death Valley, Wildcat Bowl and Bloody Nose Ridge

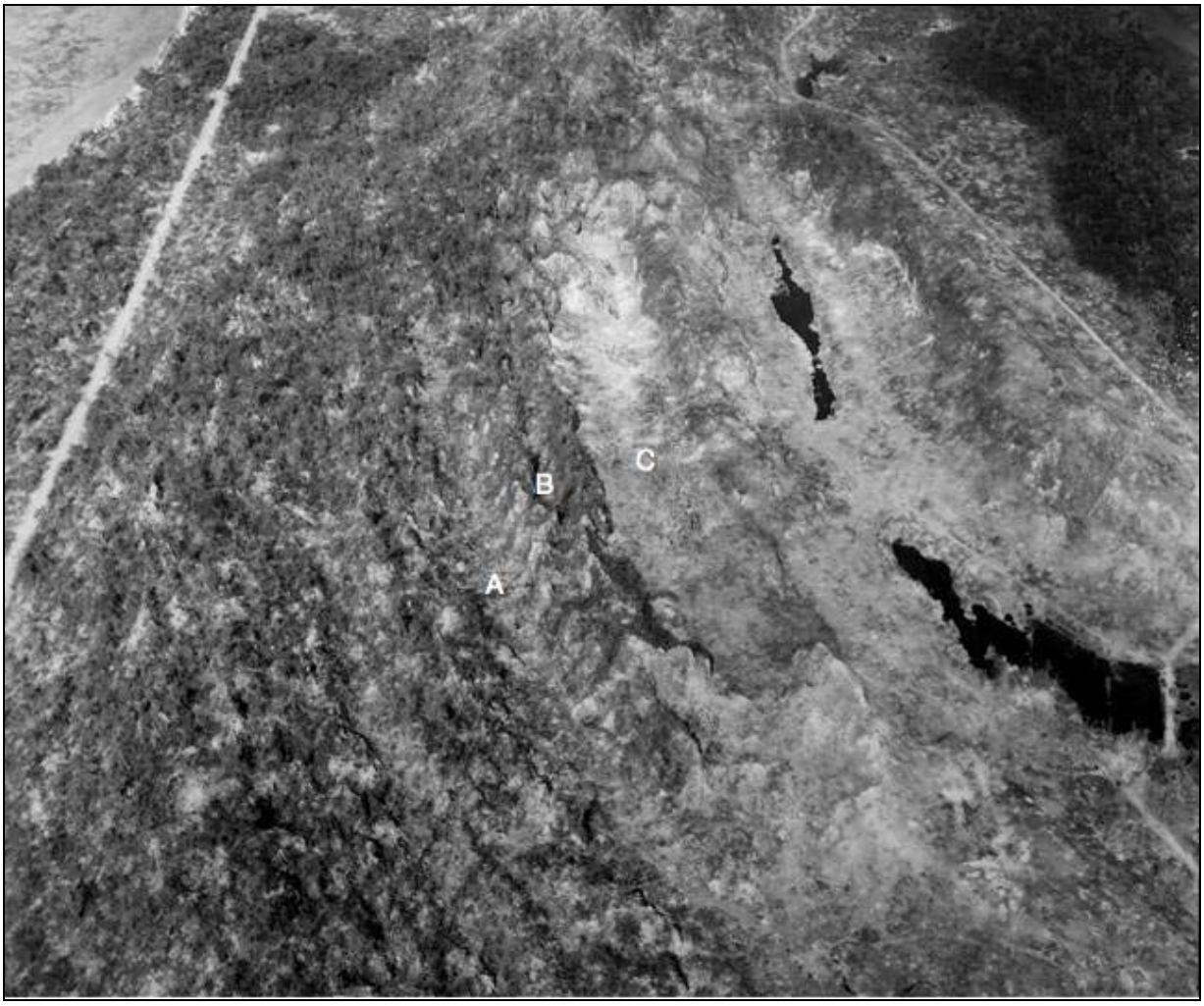

Figure 7.1 A 1944 Aerial view of the central combat zone in the Omleblochel ridge system after the jungle cover had been removed by months of fighting. A; Death Valley, B; Hell's Pocket and China Wall. C; Wildcat Bowl. (NARA; RG127)

Death Valley and Wildcat Bowl were the scenes for what was probably the most sustained fighting in the central combat zone, from the Marine's first encounter with the ridge system on D-plus 3 and lasting until the final collapse of the Japanese defense on November 24, 1944. Wildcat Bowl is named for the U.S. Army 81st Infantry Division, nicknamed the 'Wildcats' who relieved the First Marines in the final push into the central combat zone. It is a broad valley, bordered by steep limestone walls riddled with natural and artificial caves. Large areas of the floor of Wildcat Bowl are perforated by steep walled and narrow sinkholes that appear on the jungle floor without warning and are up to 30 m or more deep. The west side of Wildcat bowl is edged by a 25 m high wall of sheer limestone which the Americans dubbed 'China Wall'. A narrow slot in the middle of this wall, no wider than an alley was a deadly combat zone called 'Hells Pocket'. Death Valley also had incredibly difficult terrain, with sharp limestone boulders making passage up this narrow defile making this some of the hardest fought ground in the entire Pacific Theatre.

Figure 7.2 American troops in action in Death Valley (NARA; RG127)

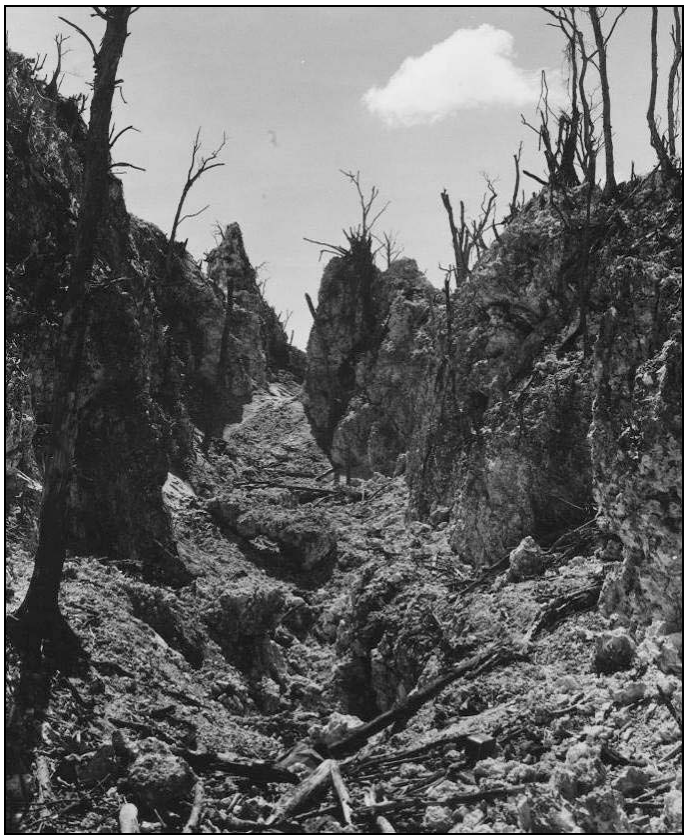

Figure 7.3 Hell's Pocket, a narrow valley in the middle of China Wall (NARA; RG127)

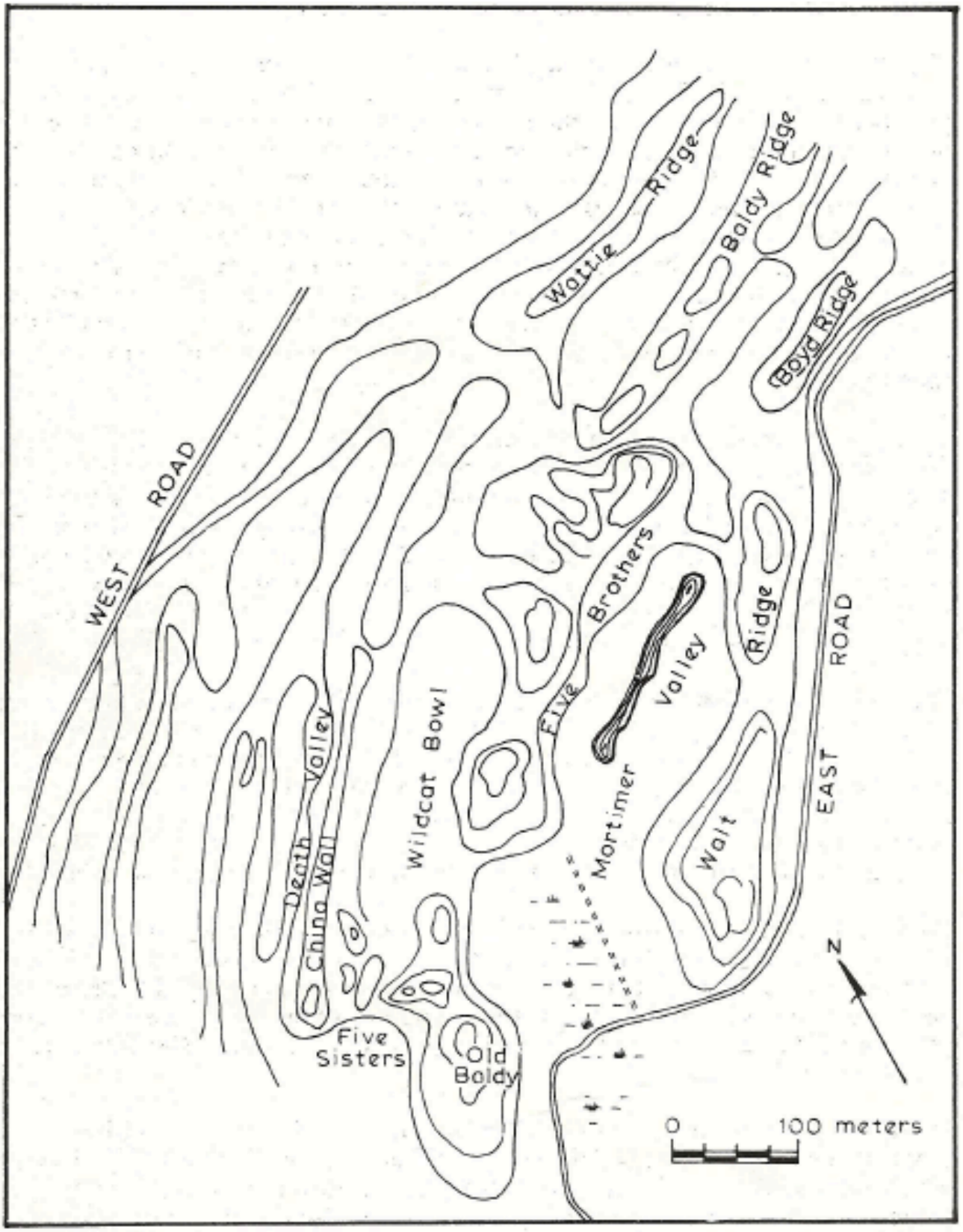

Figure 7.4 Place names used by American forces in the central combat zone (after Denfeld 1981: 32)

Figure 7.5 General Location of sites recorded in Death Valley and Wildcat Bowl during the 2010 survey.

Table 7.1 Sites Located in Death Valley

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB65	New site/feature		Japanese Defensive Caves, rifle pits
AB66	New site/feature		Japanese Field kitchen and Defensive Caves
AB67	New site/feature		Japanese Aircraft Pilot Seat
AB68	Site 29		Last Japanese Command Post (2 caves)
AB69	New site/feature		Hells Pocket
AB70	New site/feature		Japanese Defensive Caves (2)
AB71	New site/feature		Japanese Defensive Cave
AB72	New site/feature		Japanese Defensive Cave, human remains
AB73	New site/feature		Japanese Defensive Cave
AB74	New site/feature		Japanese Defensive Cave
AB75	New site/feature		Vertical Japanese Defensive Cave
AB76	New site/feature		Y-shaped Japanese Defensive Cave
AB77	New site/feature		Japanese Defensive Cave
AB117	New site/feature		Japanese bicycles

Table 7.2 Sites Located in Wildcat Bowl

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB78	New site/feature		Japanese Defensive Cave
AB79	New site/feature		U-shaped Japanese Defensive Cave
AB80	New site/feature		I-shaped Japanese Defensive Cave
AB81	New site/feature		H-shaped Japanese Defensive Cave
AB83	New site/feature		U-shaped Japanese Defensive Cave
AB84	New site/feature		I-shaped Japanese Defensive Cave
AB85	New site/feature		U-shaped Japanese Defensive Cave
AB86	New site/feature		Japanese Defensive Cave, hole in China wall
AB87	New site/feature		Japanese Defensive Cave mouth -buried
AB88	New site/feature		Japanese Defensive Cave
AB89	New site/feature		Japanese Defensive Cave
AB90	New site/feature		American Ramp from Wildcat Bowl up China Wall
AB92	New site/feature		Japanese Defensive Cave
AB93	New site/feature		Japanese Defensive Cave
AB94	New site/feature		U-shaped Japanese Defensive Cave
AB95	New site/feature		Japanese Defensive Cave
AB96	New site/feature		Y-shaped Japanese Defensive Cave
AB97	New site/feature		Y-shaped Japanese Defensive Cave
AB98	New site/feature		Y-shaped Japanese Defensive Cave
AB99	New site/feature		Japanese Defensive Cave mouth- sealed
AB100	New site/feature		Y-shaped Japanese Defensive Cave; collapsed
AB101	New site/feature		End pocket; rock shelter
AB102	New site/feature		Japanese Defensive Cave mouth
AB106	New site/feature		American Napalm Barrels
AB107	New site/feature		Japanese Defensive Cave
AB108	New site/feature		Shallow Japanese Defensive Cave
AB109	New site/feature		U-Shaped Japanese Defensive Cave
AB110	New site/feature		Japanese Defensive Cave
AB111	New site/feature		Sealed Japanese Defensive Cave
AB112	New site/feature		Sealed Japanese Defensive Cave
AB113	New site/feature		Sealed Japanese Defensive Cave
AB114	New site/feature		Y- Shaped Japanese Defensive Cave
AB115	New site/feature		American 1000 lb. Napalm bomb
AB116	New site/feature		Collapsed Japanese Defensive Cave
AB118	New site/feature		Sealed Japanese Defensive Cave
AB119	New site/feature		Sealed Japanese Defensive Cave
AB120	New site/feature		Japanese Defensive Cave
AB121	New site/feature		Japanese Defensive Cave
AB122	New site/feature		Japanese Defensive Cave
AB123	New site/feature		Japanese Bomb 100 Kg. Type 99
AB124	New site/feature		Japanese 100Kg. Bomb Cache (7)
AB125	New site/feature		Japanese Firing position/ Trench
AB126	New site/feature		Japanese 70 mm gun with carriage
AB127	New site/feature		Mortar or gun position pit
AB129	New site/feature		Collapsed Japanese Defensive Cave

AB65 Japanese Defensive Caves and Rifle Pits

Shallow caves, firing positions and a dense scatters of military equipment on the jungle floor exist in a bowl that is part of the complex limestone geology characterizing Death Valley. This high walled bowl is located on the W slope of Death Valley presented a naturally sheltered position for Japanese defenders augmented by low walls of coral boulders. Concentrations of bottles as well as numerous Japanese and American canteens suggest that water may have been stored here during the first days following the American landing. A small niche in the limestone displays a mix of artifacts common to the ridge system in that it contains both a large sherd of pre-contact Palauan earthenware as well as a live US 'pineapple' hand grenade.

Figure 7.6 American canteens on the bowl floor near AB65.

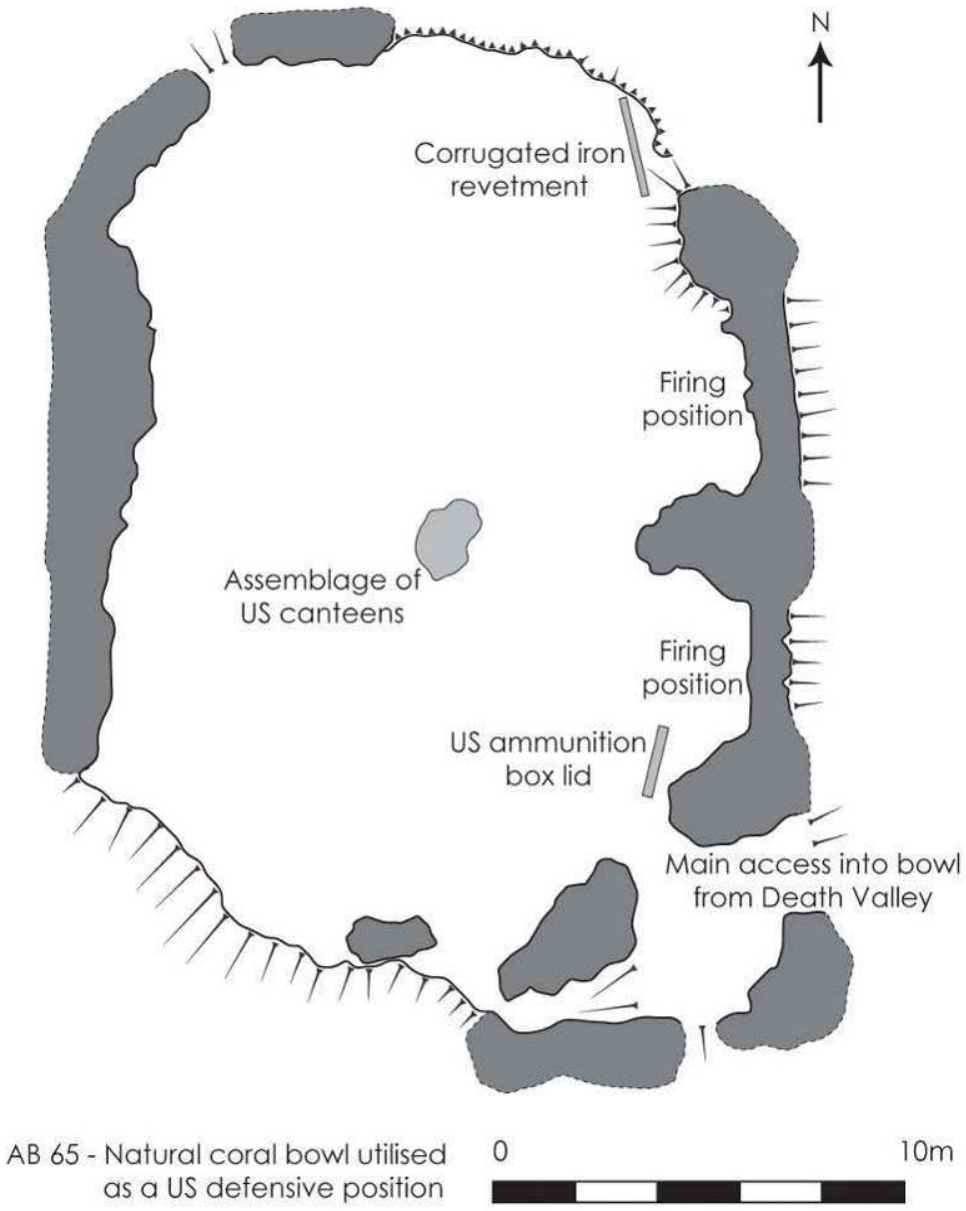

Figure 7.7 Site AB65 is typical of the many small bowls in the Karst topography of Peleliu that were utilized by Japanese and Americans alike. (Drawing by Gavin Lindsay)

AB66 Japanese Field Kitchen and Defensive Cave

A bullet-riddled stove and an iron rice cooker may represent the remains of a Japanese field kitchen. The stove is split and rusting and bullet holes exist in the front panel of the stove above the door. The rice cooking pot is 75 cm in diameter. While Japanese mess kits and aluminum food cooking and storage pots are common in the interior cave assemblages, this was the only exterior Japanese cooking area we recorded in the central combat zone.

Two m north of this location is a cave dug into a vertical cliff on west wall of Death Valley. It is about 7 m deep, 2 m high and 3 to 6 m wide and contains a Japanese Type 99 machine gun and the battered remains of a Japanese canteen.

Figure 7.8 AB66 Japanese rice cooker found in association with damaged stove.

Figure 7.9 AB66 cave entrance near Japanese field kitchen.

AB67 Japanese Pilot Seat

An aluminum aircraft seat was located as an isolated find on the floor of Death Valley and has been identified as originating in an Imperial Japanese Navy Yokosuka P1Y1 Navy bomber, code named 'Frances' by the American military. The wrecks of seven 'Frances' bombers were counted among the Japanese aircraft remains on the airfield after it was secured. The seat is in excellent condition; an indentation in the back of the seat accommodated a parachute. Of the 130 Japanese aircraft destroyed or captured on the

Peleliu airfield, seven were Japanese ‘Frances’ bombers, the first ever captured by American forces (1st Division SAR 1944:5) How the seat came to be at this location is a mystery; no other obvious aircraft parts were observed in the immediate area. It may have been salvaged from the wreck when the Japanese garrison began to move into the Bloody Nose Ridge area following the destruction of the airfield by air attack beginning in March of 1944.

Figure 7.10 Pilot seat for Japanese Navy P1Y1 'Francis' Navy bomber; site AB

AB68 Last Command Post End Death Valley

This site marks the command post for the final phase of Japanese resistance and where commanding officers Colonel Kunio Nakagawa and Major General Kenjiro Murai committed suicide shortly after the burning of the 15th Infantry Regimental colors on 24 November 1944. Although Murai was the senior officer, Nakagawa was in command of the army forces on Peleliu. The commander for Japanese Navy forces on the island is unknown but would have been under orders from Vice Admiral Yoshioka Ito, who was not on Peleliu and was present when Palau was surrendered to the Americans in April of 1945. According to post-war interviews with Lt. General Sadae Inoue, who was in overall command of Palau, Murai was sent to Peleliu to help cope with the low level of cooperation between the Japanese Army and the Navy which was utilizing the bulk of available labor in constructing defenses (Hough 19 200). We found the command post as described by Denfeld (1988:81). The site consists of three caves within a steep sinkhole at the northeast edge of Death Valley, the bowl to the west of the Wildcat Bowl. Denfeld measured the sinkhole and found that it was 12.20 m deep and 7.7 m wide at the bottom. One small cave in this location is less than 2 m long and 3 m tall and was referred to as cave ‘B’ Phelan study

(1944:41) served as a communications center. Another low Y-shaped natural cave is where the suicides of the Nakagawa and Murai occurred. The higher chamber, cave 'A' was the administrative center according to Phelan. This cave appears to be mostly natural in origin and there are few artifacts remaining that reflect its use during the battle; only a few Japanese canteens and gas mask filter canisters. At the time of our visit fresh flowers had been placed in this cave as a memorial. The last command post cave and approaches are littered with Ordnance such as mortar fragments as well as Japanese military gear including a helmet, metal rice bowls and gas mask parts.

Figure 7.11 Artifact scatter in front of the 'Last Command Cave'; AB68.

Figure 7.12 Caves ‘B’ and ‘A’ of the ‘Last Command Post’ at AB68.

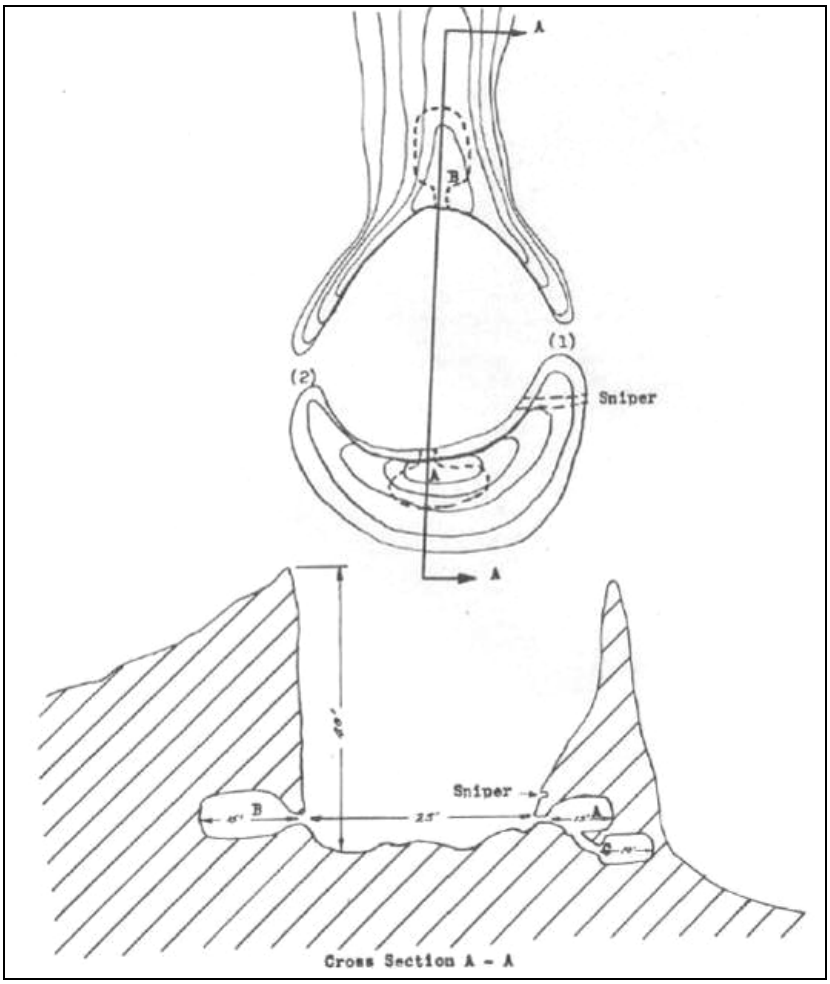

Figure 7.13 Sketch of AB69, the ‘Last Command Post’. (after Phelan 1944)

Figure 7.14 Entrance to excavated cave at site; AB70.

AB70 Japanese Defensive Cave

A rectangular, rock cut entrance to this cave, located on the E slope of China Wall, features a coral rock revetment on its southwest side. The doorway is 1.2 m wide and 1.8 m high. A second entrance to this cave exists 5.4m to the southwest of this doorway and is roughly D-shaped. This cave contains a large inventory of military artifacts including Japanese mess kits, a stove, cups and bottles. The cave extends deep into the hillside.

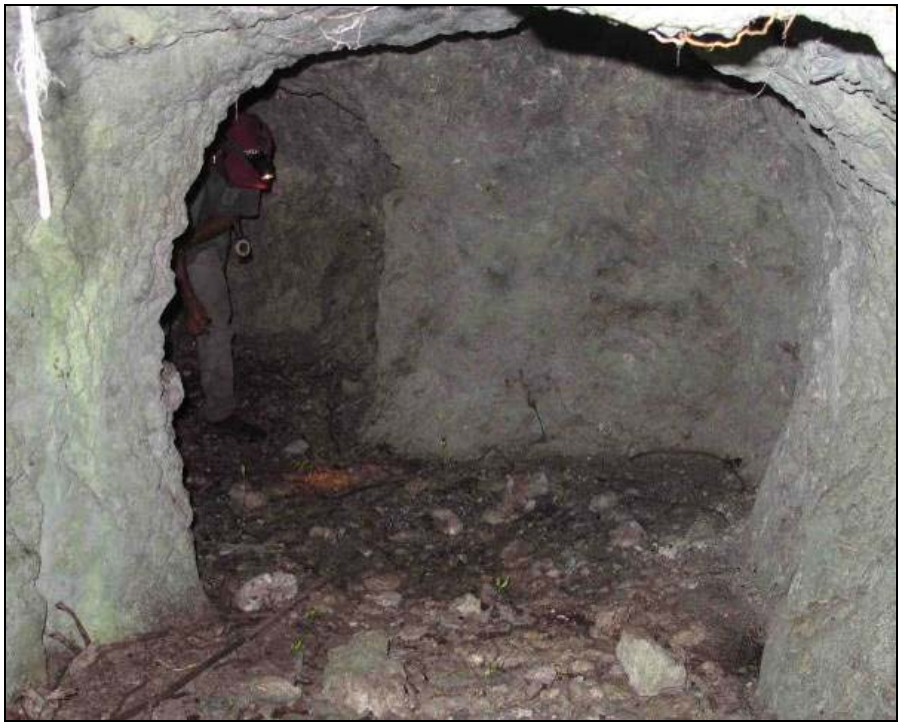

Figure 7.15 Cave interior; site AB71.

AB71 Japanese Defensive Cave

This cave is about 50 m south of AB70 and has a large rectangular entrance. It is on the east slope of valley behind China Wall. It overlooks a massive steep-walled sinkhole on the bottom of the valley. The cave is large and deep but does not contain many artifacts.

Figure 7.16 Battle-damaged Japanese helmet in AB72 cave interior.

AB72 Japanese Defensive Cave

Located about 10 m south of AB71 is a cave mouth elevated 5-6 m up the slope of the valley entrance, where it faces south. The cave dips down sharply and its mouth is partially concealed by a wall of five upright oil drums filled with coral rock. The cave contains disarticulated human remains, including vertebrae, tarsal and toe bones. Military artifacts are also present, notably an unexploded US incendiary hand grenade and a Japanese helmet.

Figure 7.17 AB73; Japanese military issue eyeglass frames on cave floor.

AB73 Japanese Defensive Cave

This small cave measures only about 2 sq m inside, with its mouth concealed by three upright oil drums. The cave opening is 2m wide by .7 m high and artifacts in the interior of the cave include a pair of round Japanese military issue spectacles (figure 4.15) Round eyeglass frames such as this were designed to be worn inside of a gas mask and were used by the Japanese and well as the German militaries during WWII. Also present is a pair of long iron chisels used in cave construction. It is possible that this represents an unfinished cave.

AB74 Japanese Defensive Cave Complex

Just inside the entrance of a large cave opening is a smaller passage leading to a shallow ground level cave, located about 3 m to the south. Directly above this is a natural cave with metal nails fixed in the ceiling, what may have been used to hang camouflage or communication wire. No artifacts were observed in this particular complex other than three Japanese oil drums lying on their sides, dented and heavily damaged by large caliber shell fire.

Figure 7.18 Vertical cave at the base of a 30 m deep sinkhole in the floor of Death Valley. The opening in the photograph is about 20 m wide.

AB75 Vertical Cave

A vertical cave, or sinkhole at this location is a spectacular example of Karst topography and extends downward at least 30 m where it appears to open up into a room. Oil drums and corrugated metal could be seen on the bottom. This and other steep walled sinkholes in the area clearly contain artifacts and probably human remains from the battle but remain inaccessible except with technical climbing equipment.

Figure 7.19 Interior of Japanese Y-shaped cave; site AB76.

AB76 Japanese Y-shaped Defensive Cave

This massive Y-shaped cave system was excavated into the corner of a nearly vertical east-facing slope, with a cave entrance about 2.1 m high. This cave contains a large and impressive assemblage of well-preserved military material, including fired and unfired rifle rounds, medical supplies, glass bottles and jars, canteens, personal items such as toothbrushes. Just inside the entrance is a 50 kg. aerial bomb which has been disarmed, and probably represents one of the Japanese booby traps dealt with by Army technicians in 1944. A pile of US .45 cal. shell casings was found the southern entrance, most likely from a Thomson machine gun.

Figure 7.20 Disarmed Japanese bomb on cave floor; site AB76.

AB77 Japanese Defensive Cave

A small cave is connected to the larger complex at AB76 by a coral rock walkway about 2 m wide by 1 m high. There is a live Japanese anti-personnel mine at the entrance of this cave and based on the recommendation of our UXO team we did not enter to investigate further.

Figure 7.21 Japanese votive figurine placed in cave by visitors; site AB78.

AB78 Japanese Defensive Cave

This cave is easily accessible to visitors and has been almost completely robbed of any WWII remains except for a gun mount near one entrance. The cave interior shows substantial charring from flame thrower attack. It is a U-shaped cave that now features a wooden carving of a Japanese deity set in an alcove a short distance in back of the gun mount. It is one of several similar shrines located in caves where Japanese visitors pay their respects to the dead. The cave faces northeast and is about 2.5 m wide and 1.5 m high.

AB79 U-shaped Japanese Defensive Cave

This U-shaped cave measures about 3 m wide on its southern entrance and has an opening about 1 m high. It is near a popular tourist trail and almost entirely devoid of artifacts.

AB80 Japanese I-shaped Defensive Cave

A rectangular opening to an I-shaped cave is about 1 m high and 3 m wide and partially obscured by a coral rock wall on its northern side. It contains no identifiable surface artifacts.

AB81 Japanese H-shaped Command Cave

A large entrance 3 m side by 2 m high is roughly triangular and leads deep into the hill to a large H-shaped cave. The walls and ceiling of this cave are blackened by soot and scorching from flame throwers. There are narrow gauge railway tracks on the floor of this cave, perhaps utilized either in the removal of rock in making of the cave or for moving an artillery piece. There is a partially blocked side room on this cave where unarticulated human remains can be seen on the cave floor along with live Japanese and American hand grenades and loaded rifle clips. Recent disturbance by looters has left these materials stacked and sorted against the sides of walls and chambers.

This cave was among those documented by the military as part of the post-battle study of the Japanese caves on Peleliu. At that time the cave penetrated the ridge between Death Valley and Wildcat Bowl, but those passages have since collapsed or been sealed. According to Phelan (1945:5) this cave is unusually significant in that it was used as the Japanese command center after a retreat from the Japanese Navy Command cave, a large natural cave in the southern ridges of the Omleblochel (site AB146):

> This cave depended mostly on the inaccessibility of its location for protection against direct assault and it was abandoned when our forces approached it. Originally it had timber shoring for its sides and a roof and wooden floors. Handcar tracks running into the cave indicate that it may have been part of the old phosphate mine. Radio installations had been provided, as well as water piped in from the next valley and electric light provided by a gasoline generator.

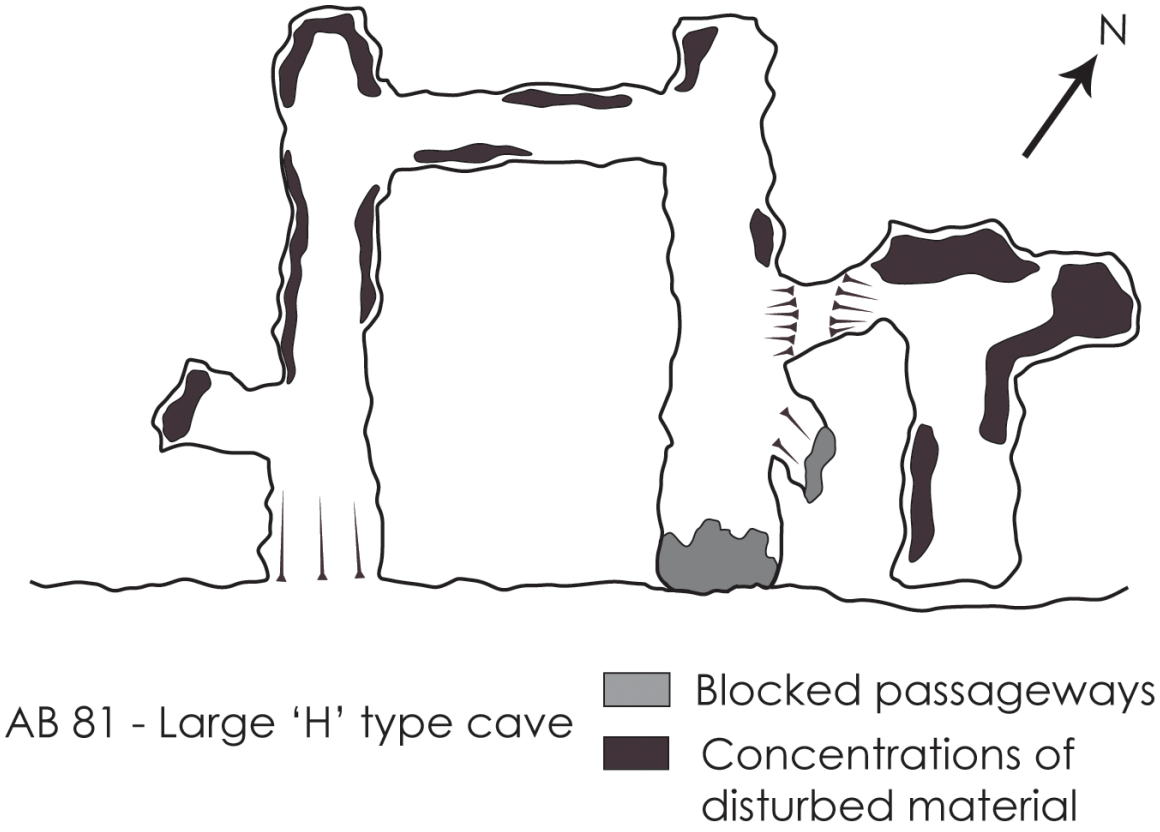

Figure 7.22 Plan view of AB81. (Drawing by Gavin Lindsay)

Figure 7.23 Artifacts on the floor of the Japanese Command Cave; site AB81.

Figure 7.24 Japanese leather bullet pouch on cave floor; site AB83.

AB83 Japanese Defensive U-shaped Cave,

A U-shaped cave on the west slope of Wildcat Bowl has a southern entrance 1 m wide by .5 m high. A larger entrance to the north is 1.15 m by .95 features a neat hole in the limestone to the top left of the cave mouth 2 m high from the ground level and 1.6 m from the entrance. This at first appeared to be a ventilation hole, but investigation with a flashlight revealed the back of a large unexploded artillery round embedded about 1 m into the limestone. Similar shell holes and unexploded rounds are likely to exist through the Karst topography of Bloody Nose Ridge, particularly around targeted areas such as cave mouths. This cave features many artifacts including a hairbrush, many Japanese leather boot and ammunition belt pouches and more under a deep accumulation of sediment on the cave floor. Disarticulated human remains were also observed in this cave, including burned phalanges and cranial fragments.

Figure 7.25 Small personal items on the cave floor; site AB83.

Figure 7.26 Japanese helmet filled with human remains and a live Japanese land mine on the cave floor; site AB84.

AB84 Japanese Defensive I-shaped Cave

An I-shaped cave is located about 10 m north of AB83, and has a wider entrance of 2 m with the remaining opening about 70 cm high. The rock surface above the cave mouth bears the scarring of heavy U.S. shell fire and the inside surfaces of the cave are charred from attack by flame throwers. There is a high quantity of UXO in this cave, including a live Japanese Type 93 land mine that has been placed on top of a quantity of small human bone fragments that in turn fill an upside-down Japanese helmet. There are also Japanese hand grenades, leather ammunition pouches, and canteens. A deep layer of sediment on the cave floor probably contains other artifacts.

Figure 7.27 Japanese mess kits, canteens and gas mask canisters on cave floor; site AB84 .

Figure 7.28 Entry to cave; site AB85.

AB85 Japanese Defensive U-shaped Cave

An L-shaped cave or possibly an unfinished U-shaped cave exists about 10 m north of AB84. Two unexploded blasting charges were observed at the entrance of this cave mouth which is 2 m wide and 75 cm high, with accumulated debris at the cave mouth of a height of about 1.5 m slanting downward into the interior of the cave. There is a large shell impact mark 2 m above the south edge of the cave mouth. The interior of this cave is also marked by soot and charring from flame thrower attack. There was no UXO observed on surface of the cave floor where there were fragments of Japanese gas masks and other artifacts.

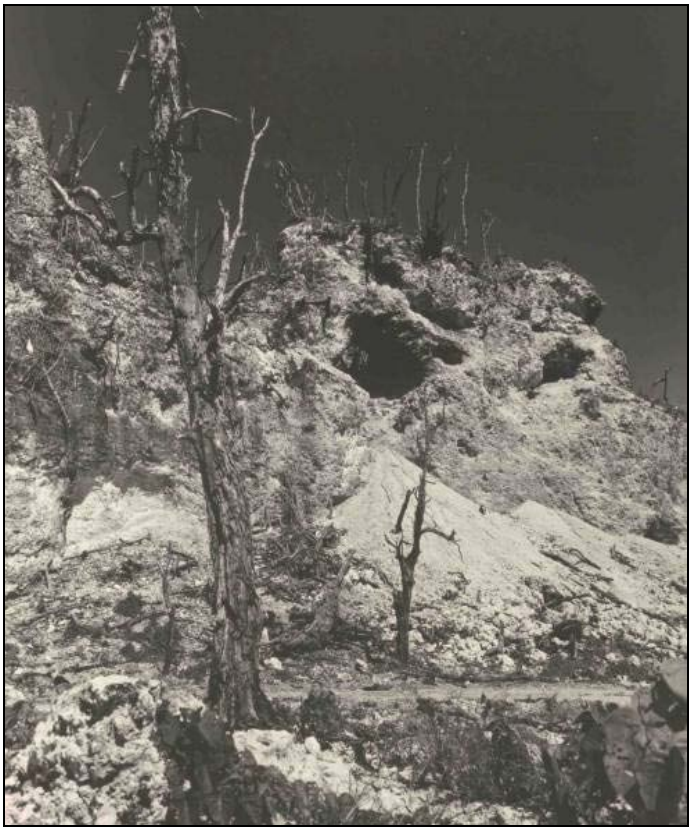

Figure 7.29 Cave through China Wall in 1944. (NARA; RG127)

Figure 7.30 Survey crew climbing though the cave through China Wall; site AB86.

AB86 Cave Through China Wall

A large naturally formed cave has a wide diameter but short length, forming what amounts to a large hole in the west face of China Wall facing westward toward the airfield. Coral rock piles around this location show use by the Japanese as a firing and observation position. This feature leads into a narrow pocket full of caves and geological features that remain complex even in the aftermath of heavy WWII era bombing and artillery fire. Most of the caves and rock shelters in the immediate area of this feature appear to be sterile of artifacts with the exception of occasional remains of M6A1 heat rockets and 75 mm projectile Ordnance.

Figure 7.31 Small cave entrance; site AB87

AB87 Small Japanese Defensive Cave

A very shallow and partially collapsed slit in the limestone is about 2 m wide and 50 cm high and contains no artifacts but may have been a firing or observation position. It appears to be a natural hole that was expanded by digging.

Figure 7.32 Cave entrance with sediment deposit; site AB88.

AB88 Japanese Defensive Cave
A cave entrance is located about 6.5 m north of AB87, measuring 2.2 m wide and 1.5 m high in a roughly rectangular shape. It is 6 m deep and has a substantial deposit of sediment on the floor with no artifacts visible on the surface.

AB89 Japanese Defensive Cave
A cave mouth 5 m north of AB88 measures 2.6 m wide and is 1.5 high with the surrounding limestone pock marked with shell holes. The cave is 8 m deep and contains a 75 mm projectile along with a heavy accumulation of sediment on the cave floor. The ceiling of this cave is heavily scorched from flame thrower attack.

Figure 7.33 Ramp constructed by American engineers up China Wall in 1944; site AB90. (NARA; RG127)

AB90 American Ramp on China Wall
This ramp was constructed in the last phases of the assault on the remaining pocket of Japanese defenders after the northern end of China Wall had been secured. It was completed by Company A of the 306th Engineer Battalion on the afternoon of November 25th, 1944, the day following the suicide of Japanese commanders Nakagawa and Murai (Hough: 177). The following morning tanks and an LVT equipped with a flame thrower went up the ramp to the ridge summit. Hough (1950:178) described how the assault on Bloody Nose Ridge ended on November 27:

> At 1030 elements of the 2d Battalion, moving northward along the China Wall, came face to face with their comrades of the 3d Battalion, working southward. Across the few yards intervening, they could see men of the 1st Battalion perched on the rim of Death Valley. For long moments the weary Wildcats looked at one another in an uncanny silence, trying to realize that this was all there was; there wasn't any more.

The remains of the ramp today are covered with dense jungle vegetation. The ramp is about 9-10 m wide, made from of piled limestone and coral rock and leads westward from the base of Wildcat bowl over and through its west slope. It stops suddenly after cutting through the west slope of Wildcat bowl, reflecting the fact that the ramp was constructed not as a roadway, but to create an elevated firing position for US tanks or armored attack vehicles. The entrance to the 'last command post' site is about 20 m northwest of this point, and the ramp was constructed in the last stages of the American assault on the central combat zone.

A series of caves are located on the small bowl that the ramp overlooks and two napalm canisters were found on the floor of the bowl, which has a narrow passage leading to Death Valley on its north end, a terminus called the 'Slot' by the US troops.

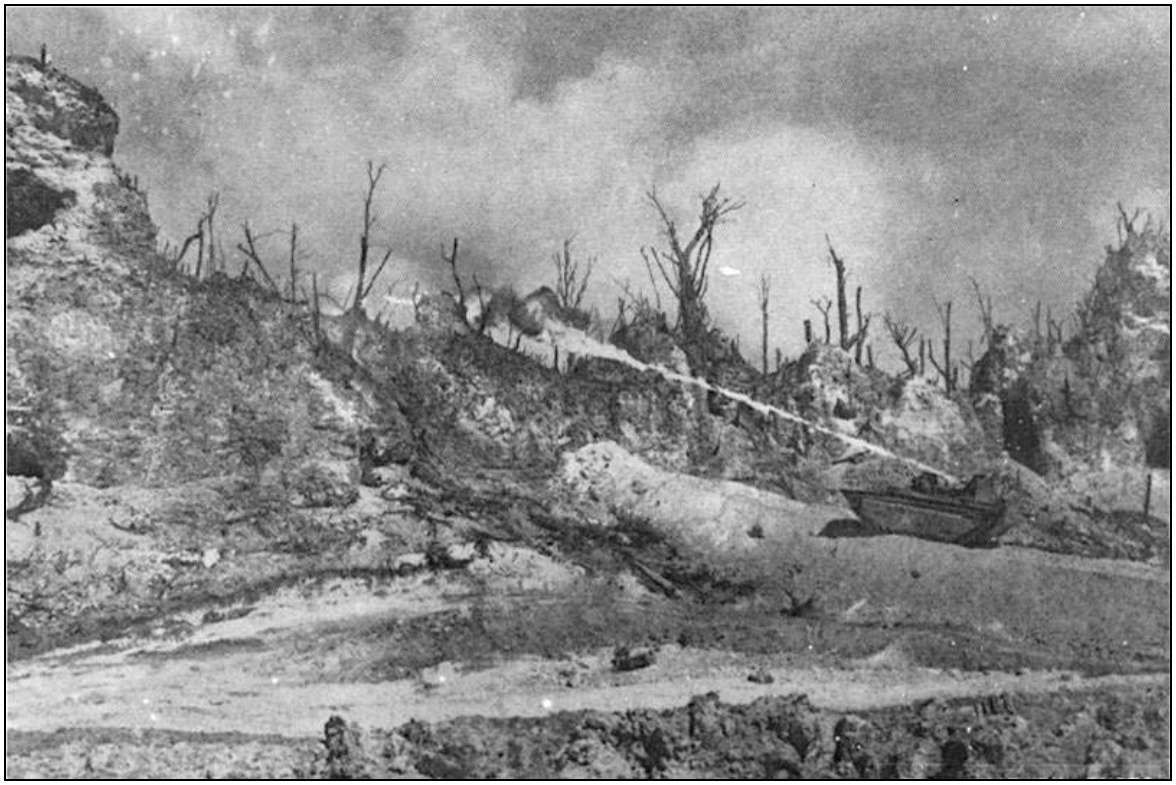

Figure 7.34 Ramp in use by an AVT equipped with a flamethrower. (NARA; RG127)

AB92 Japanese Defensive Cave

A cave mouth north of the end the AB90 ramp is 2 m wide and 2.1 m high. The cave faces west and extends straight back into the limestone for 3m, then turns northward for another six m before it narrows to a 90 cm aperture which extends further for an unknown distance. Artifacts observed in this cave include Japanese mess kits, food tins, and gas mask filter cans.

AB93 Japanese Defensive Cave

A 5 m wide cave mouth on the west slope of a ravine is unusual in that it has a central pillar of limestone supporting the roof in its interior. The cave ceiling is 2.5 m high inside and the entrance has been partially buried leaving an opening 50 cm high. It contains food tins and a Japanese canteen.

AB94 Japanese Defensive U-shaped Cave

A small cave a short distance north of AB93 may represent either another entry into AB93 or a separate cave. The entrance is 2 m wide and 1.5 m high, and extends back about 2.5 m before contracting into a 75 cm square crawlway in the southwest corner of the cave, bending around toward AB93. It was not explored further, but was clean, with no artifacts or accumulations of fallen sediment.

Figure 7.35 The barrel of an American M1 rifle protrudes from rubble in front of a Japanese cave; site AB95.

AB95 Japanese Defensive Cave

A shallow cave located fairly high up the west wall of Wildcat Bowl is 3 m wide, 2 m high and extends only about 1.5 m into the limestone. Extending from a pile of rock and sediment about 4 m down slope from the cave mouth is the distal end of a US M1 Garand rifle with the rest of the weapon presumably buried.

AB96 Japanese Defensive Y-shaped Cave

A Y-shaped cave has an uneven, nearly bi-level floor, with the main chamber on the lower level. It showed signs of recent looting with disturbance in and around the entrance. The walls of this cave are heavily sooted from flame thrower attack, especially 5 m south of the entrance. Several live hand grenades were observed in the loose rubble near the mouth of the cave which was 5 m wide but partially blocked by a boulder and is about 2.3 m high.

AB97 Japanese Defensive Y-shaped Cave

A large Y-shaped cave has a large fan of rubble extending down from its mouth, as well as signs of at least one large projectile strike in the limestone above. The cave mouth is 5.2 m wide and separates into two chambers 2 m from the entrance, 5 and 6.4 m long. The cave floor here is relatively clear of artifacts except for Japanese gas mask fragments.

AB98 Japanese Defensive Y-shaped Cave

A cave on the north slope of the bowl entrance faces south and dips steeply down from an entrance that is 3 m wide and 75 cm high. Inside the cave opens into a Y-shape. This cave contains abundant military artifacts, including large quantities of live Ordnance recently removed by the UXO team, chiefly Japanese landmines and grenades. There are a great deal of Japanese medical materials here, including used and unused morphine bottles and an ether canister that still contained gas. Large patches of bright yellow picric acid exist here and there on the cave floor from where it has leaked from live Ordnance. Japanese material; live small arms ammunition, helmets, bottles, leather ammunition pouches and other items lie in heaps against the side of this cave, partially as a result of recent disturbance. Disarticulated human remains including a human mandible and tarsal bones were found in association with the medical equipment. This cave contains many small portable artifacts and as such is at high risk of being looted.

Figure 7.36 Japanese artifacts piled against a cave wall by looters and/or bone collecting teams; site AB98.

Figure 7.37 Japanese gas grenade being inspected by the UXO specialist from Cleared Ground Demining; site AB98.

Figure 7.38 Japanese cookware and IJN and IJA gas mask canisters; site AB98

Figure 7.39 Japanese medical equipment stored in a niche in a cave wall; site AB98

AB99 Sealed Cave Mouth

A sealed cave entrance is 9 m high and 2 m wide with a large fan of rubble spreading downhill. It is located on the north slope facing south and appears to be the entrance of a fairly substantial cave.

AB100 Y-shaped Collapsed Cave

A possible Y-shaped cave in this location has been heavily damaged by shelling. Narrow gauge railway tracks survive on the floor, however the entire front section of the cave is a mass of rubble leaning toward the southeast, the same direction as the cave mouth once faced, suggesting that a portion of the cave's contents and possibly even its occupants may still lie under buried there. The southern wing of the cave extends some 10 m into the hill. It is possible that this is in fact the western entry to AB81, the Japanese command cave, which is the only other cave encountered in the survey with rail tracks on its floor. Phelan (1945) showed the cave linking Death Valley and Wildcat Bowl, however its midsection appears to have collapsed.

AB101 Japanese Defensive Cave

An extensive cave was dug into the base of a limestone stack where it faces south with a good firing position covering the end pocket of Wildcat Bowl. It contains an expended aluminum napalm tank and a live mortar shell. A hole in the cave wall allows a view and a line of fire to the north as well. A dense scatter of mostly small arms Ordnance exists at the rear of the cave as well as food tins, sheet metal and some Japanese gas mask filter canisters. The mouth of this cave is only 1 m wide and the interior height is 1.65 m.

Figure 7.40 Japanese cave mouth; site AB102

AB102 Japanese Defensive Cave
A south facing cave has an entrance measuring 1.6 m wide and 1.3 m high, with a large opening to the southwest which casts light into the cave. It contains a live American rifle grenade.

AB103 Japanese Defensive Cave
A cave in this location faces NE, overlooking an extensive area of impassable and dangerous sink holes in the floor of Wildcat Bowl. It is 3.5 m wide and 1.6 m wide and contains a scatter of artifacts such as Japanese canteen fragments as well as disarticulated human remains. Rubble and jungle growth on the floor of the cave likely conceal more remains.

AB104 Japanese Defensive Cave
A large natural cave can be entered through a nearly sheer walled vertical hole created by a 6-8 m deep collapse of its ceiling. Whether this hole represents the original entry or was created or expanded by bombardment during the battle is uncertain. The hole splits the original cave, which was at least 40 m long and 9 m wide, into two sections. Large stalagmites up to 40 cm or more thick exist between the ceiling and the floor of this cave, with smaller stalactites and flowstone broken and in fragments on the cave floor. The cave is full of Japanese equipment and ammunition as well as a large number of American jerry cans possibly tossed in during the battle to burn out the defenders. Some damaged American canteens are also present. Charring on the walls and on artifacts indicate an intense incendiary attack.

Figure 7.41 Steep entry to a natural cave used by the Japanese; site AB104.

Figure 7.42 Natural Cave interior showing charring left by flame thrower attack; site AB104.

Figure 7.43 Japanese and American artifacts on cave floor; site AB104.

AB105 Japanese Defensive Cave

A small cave faces north out of the steep ridge of limestone that overlooks AB104. It is about 2 m wide and 3-4 m high and extends into the ridge for about 3 m. It contains a Japanese gas mask filter canister.

Figure 7.44 Hand painted label on American napalm drum; site AB106.

AB106 Napalm Drums

Three drums at the head of Wildcat Bowl, one upright, the others horizontal, feature hand painted white lettering on the end caps that is still clearly legible, reading ’50 gal NAPALM 8/22’. The assault on Bloody Nose Ridge was one of the first uses of napalm, a jellied

gasoline. The drums may have been carried napalm intended for pumping into difficult caves near the final end of the battle. They are partially corroded but remarkably intact considering they have remained outdoors in a tropical environment. Napalm was sometimes stored in galvanized drums which may account for their good condition (Denfeld pers. comm., 2012) They represent very significant and rare artifacts in that Peleliu was one of the first places where napalm was used in combat and are worth some conservation measures.

AB107 Japanese U-shaped Defensive Cave

What appears to be an incompletely constructed U-shaped cave is on the north end of the southern side of Wildcat Bowl, Its entrance is 3 m wide and about 1 m high and faces to the northwest.

AB108 Partially Sealed Japanese Defensive Cave

A westward facing sealed cave entrance is 2.5 m wide, 1.5 m high and extends into the limestone for 3 m before it becomes impassable with rubble fill. It appears to have been collapsed with the use of an explosive charge.

AB109 Japanese Defensive H-Shaped Cave

An H-shaped cave on the east side of Wildcat Bowl has a north facing entrance 3 m wide and 1 m high. The top of the 'H' in this cave is disproportionately large to the extent that this cave could almost be considered U-shaped instead. Ammunition boxes, metal equipment fragments and other items are in small mounds of debris on the floor of this cave. Upright barrels appear to have used to protect the entrance. The interior of the cave is fairly commodious, measuring 2.5 m high and 3 m wide.

Figure 7.45 Interior of large H-shaped Japanese cave with abundant artifacts; AB109.

Figure 7.46 Gas mask parts and a Japanese pomade jar on cave floor; site AB110

Figure 7.47 Japanese 7.7mm machine gun, clip and leather ammunition pouch near cave entrance; site AB110.

Figure 7.48 Radio set on cave floor; site AB110.

AB110 Japanese Defensive U-shaped Cave

A roughly U-shaped cave on the east side of Wildcat bowl has a westward facing entrance that is about 4 m wide and 1.5 m high and another entrance 3 m wide and 2 m high. A clip for a Japanese 6.5 mm Type 96 machine gun is located on the right side of the cave entrance. Inside the cave are empty magazines and large quantities of clips as well as standard Japanese items of equipment such as gas mask parts, rice bowls, bottles and boot fragments. Some of the artifacts have been shoved against the wall, presumably by looters looking for small objects such as gold teeth.

A damaged radio set and partially melted drafting equipment suggest that this cave may have been a Japanese command and control center. Disarticulated human remains in the form of scattered small bone fragments were seen on the cave floor. A 7.7 mm Type 92 machine gun is in rusted but identifiable condition at the mouth of the south entrance. About 3 m down slope of the north entrance of the cave are a number of disarticulated human long bones and a Japanese mess kit. These remains are partially entangled and overgrown by thick jungle roots covering the rubble fan that leads down from the cave.

Figure 7.49 Drafting equipment on cave floor, partially melted by flamethrower attack; site AB110.

Figure 7.50 Tool box for Japanese 70 mm Navy Type 92 battalion gun; site 110.

Figure 7.51 Artifacts piled against cave wall by looters and/or bone collecting teams; site AB110.

AB111 Sealed Japanese Defensive Cave
A sealed cave entrance facing west on the east side of Wildcat Bowl is 3 m wide and 50 cm high and extends only about 1 m before it is sealed by rubble. The mouth of the cave contained a carrier for US 81 mm illuminating mortar rounds, suggesting that the cave may have been sealed by satchel charge while the battle was still in progress.

AB112 Sealed Japanese Defensive Cave
A north facing sealed cave entrance is 4-5 m wide and extends into the rock for about 2.5 m until it is rendered impassable by sediment and rubble.

AB113 Sealed Japanese Defensive Cave
A westward sealed cave mouth in this location is 6 m wide and 1.5 m high and only extends inward for about a meter before being sealed off by rubble.

AB114 Japanese Defensive Y-shaped Cave
A Y-shaped cave with a partially sealed entrance 1.6 m wide and 60 cm high faces north on the east slope of Wildcat Bowl. It differs somewhat from the standard Y-shape, having one straight passage of about 15 m with an 11 m passage angling off of it. There is also a small rectangular shaped passageway leading off the straight passage that goes 3 m east, 6 m south and then 3 m west to rejoin the main passage. Artifacts on the floor of this cave include small arms ammunition, 81 mm mortar fragments and pieces of disintegrating Japanese gas masks.

Figure 7.52 American Corsair Belly Tank on the floor of Wildcat Bowl was probably used to deliver napalm; site AB115.

AB115 American Corsair Belly Tank/ Napalm Bomb

A battered and empty iron Corsair belly tank was found on the floor of Wildcat Bowl, aligned north-south. It measures about 2 m long and about 50 cm wide. In the final stages of the assault, 165 gallon belly tanks loaded with napalm were attached to Marine Corsairs on the newly taken Peleliu airfield and dropped less than a mile away in what are famously considered the shortest bombing runs of WWII. By late October of 1944, Corsairs of VMF-114 made these attacks without even bothering to retract their landing gear and are shown dropping napalm on Bloody Nose ridge in that configuration.

The Soldiers on the ground requested unfused bombs for a drop over specifically designated areas of the pocket. The napalm was subsequently ignited by mortar shells. These tactics were successful, and machine gunners on the ground were able to destroy a good many Japanese trying to get away from the resulting inferno…. In the words of the Marine aviators: "We were using up a goodly supply of belly tanks, but everyone was being satisfied and Japs exterminated without commensurate losses to ourselves. (Garand and Strobridge 19 -256).

A caption on a NARA photo taken in October 1944 noted that by that time American Corsairs had already dropped 193 belly tanks of napalm on Bloody Nose Ridge.

Figure 7.53 American ground crews attach belly tanks full of napalm to Corsairs at Peleliu airfield in 1944. (NARA; RG127)

Figure 7.54 Entry to collapsed/sealed cave; site 116.

AB116 Collapsed Japanese Defensive Cave

A collapsed cave mouth 3 m wide and 1 m high extends into the limestone for about 1.75 m before being completely blocked by limestone rubble. Some metal fragments of metal protrude from the rubble.

AB118 Sealed Japanese Defensive Cave

A barely visible slot 2 m wide in a limestone wall is only 10 cm above the ground level and represents the mouth of a rubble filled cave. Many of these caves were sealed by U.S. troops using a combination of satchel charges often followed by sealing with bulldozers. In other cases artillery or tank rounds were fired at close range into or just above the opening of the cave in an effort to collapse the entrance.

Figure 7.55 Barrel stoves inside cave; site AB119.

AB119 Japanese Defensive Cave

A north facing cave has an entrance 3 m wide and 50 cm high. On the southwest side of the entrance is an overturned Japanese helmet filled with human bone fragments, including a human proximal femur. The cave extends about 6 m into the hillside and contains oil drums converted into cooking stoves, a Japanese helmet, porcelain dishes and a large diameter cleaning brush; possibly intended for maintaining an artillery piece.

AB120 Japanese Defensive Cave

This cave mouth faces to the northwest and is about 3 m wide and 1 m high. The cave contains an oil drum, Japanese gas mask filter cans, machine gun magazines and a gun mount.

AB121 Japanese Defensive L-Shaped Cave

An L-shaped cave with a mouth1.5 m wide and 1 m high has an interior that curves around to the south east. A hole 50 cm above the door may be a shell hole, possibly containing an unexploded round from the attempts of American attackers to seal the cave. It contains a scatter of Japanese artifacts including mess kit parts, canteens and gas mask fragments.

Figure 7.56 Shell damaged entry to cave; AB122.

AB122 Japanese Defensive Cave

Located just three m south of AB121, another L-shaped cave has a mouth 3.5 m wide and 1 m high, which forms a rectangular shape of 1.5 m by 75 cm about 1 m past the entrance. This cave still contains a US communications cable reel, a Japanese metal rice bowl, and many small arms rounds. At the entrance is a Japanese canteen and two strip clips for a Japanese type 92 7.7 mm heavy machine gun.

Figure 7.57 Defused Japanese bomb; site AB123.

AB123 Japanese 110 Kg. Bomb

A Japanese 110 kg type 99 aerial bomb is located south of the trail at this point on the ground surface. An additional buried bomb is represented by a nose cap protruding from the ground three m to the west. Aerial bombs were used in quantity by the Japanese in mining beaches and approaches to defensive positions. These bombs have been de-militarized, probably by UXO teams working in 1944, who dealt with these as they were discovered during the assault.

Figure 7.58 Cache of Japanese bombs, probably inert; site AB124.

AB124 Japanese Bomb Cache

A cache or dump of Japanese Type 99 aerial bombs is partially obscured by overgrowth and is located just south of the tourist trail. There are at least seven bombs in this pile, along with a metal Japanese wheelbarrow and two 81 mm US mortar canisters about 4 m to the south. The bombs all appear to have been rendered inert. It is unclear whether this represents an *in situ* Japanese supply dump or whether it is a secondary deposit left by subsequent clean up by US troops or post-war salvage companies.

AB125 Japanese Firing Position/ trench

A Japanese firing position and trench is aligned to the NE-SW and faces into the 'Horseshoe' lying below and to the east of the position. It is about 1 m deep and surrounded by a revetment about 1 m thick. Perhaps because limestone bedrock is so close to the surface throughout the Bloody Nose Ridge system, trenches and foxholes are relatively rare.

Figure 7.59 Japanese 70 mm Battalion gun; site AB126.

AB126 Japanese 70 mm Gun

A Japanese 70 mm Type 92 Battalion gun is complete with chassis, which has collapsed following decomposition of the wooden spokes and other elements in the wheel assembly. The metal wheel rims have collapsed outward to either side. The barrel points north and inside the barrel is a mid-section of a human long bone. A number of US 81 mm and 60 mm mortar shells are also present near the wheel rims of the battalion gun. About 3 m to the south is an empty US 81 mm mortar case. A water pipe crossing the path in this area runs from east to west and is riddled with bullets and therefore appears to be a Japanese feature.

AB127 Mortar or Gun Pit

A mortar or machine gun pit just east of the tourist trail is about 2.5 m in diameter and is 50 cm deep and roughly circular.

AB129 Collapsed Cave

A mouth of a sealed cave exists near the base of the stairway leading to the Wildcat Monument. It faces south and is 1 m wide and about 75 cm high and leads into the hillside for no more than 4 m before being blocked by rubble.

Northern Bloody Nose Ridge

Figure 7.58 General Location of sites on Northern Bloody Nose Ridge.

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB160			Japanese Storage Cave
AB195	New site/feature		Japanese Firing positions (2)
AB196	New site/feature		Japanese Type 92 machine gun
AB197	New site/feature		Japanese Defensive Cave/crack
AB199	New site/feature		Japanese Firing position
AB201	New site/feature		U-shaped Japanese Defensive Cave
AB202	New site/feature		Japanese Defensive Cave with wall
AB203	New site/feature		Japanese Defensive Cave
AB204	New site/feature		Rock shelter
AB205	New site/feature		U-shaped Japanese Defensive Cave
AB206	New site/feature		Natural Japanese Defensive Cave
AB207	New site/feature		Japanese Defensive Cave
AB208	New site/feature		Japanese Defensive Cave
AB209	New site/feature		American Aircraft wing
AB210	New site/feature		Japanese Sniper position
AB211	New site/feature		Human Remains
AB212	New site/feature		American Aircraft fragment; Avenger 16956
AB213	New site/feature		F-shaped Japanese Defensive Cave
AB214	New site/feature		Japanese Aircraft Parts
AB215	New site/feature		U shaped Japanese Defensive Cave
AB216	New site/feature		American LVT in modern dump
AB267	Recorded in 1996	B:BE-1:124	Japanese Defensive Cave; human remains

Figure 7.59 (L) Cave entry and shell hole in 1944 (NARA:RG127). (R) The entry in 2010; site AB160

AB160 Japanese Storage Cave

A Japanese storage cave was made by adding a concrete entry into a large natural cave. It is one of the WWII sites on Peleliu that also has traditional cultural significance for Palauans and is a cave that figures into local oral histories. The entrance is 2 m wide and constructed in the much same way as another large Japanese storage cave on Peleliu, AB145. This cave may well be the second such storage cave that Denfeld had heard about but was unable to locate (Denfeld 1981:70). The concrete lined entry faces west and has been sealed with rubble since 1944, however a large shell hole above the doorway now serves as a new entry. The first room past the entry has been made nearly square inside and measures 12.03 m wide and is 13.77 m long. On the east side of the room, on the wall opposite the entry, there is a 5 m wide break in the wall which drops about 3 m down into another passage. The cave contains scattered human remains, a Japanese 50 Kg. bomb, numerous clips of small arms rounds as well as individual bullets, a Japanese type 91 hand grenade, and numerous live Japanese land mines with three exposed on the floor and others probably hidden beneath the bat guano which is thick on the floor. The presence of UXO and the well known location and easy accessibility of this cave combine to make this a dangerous site until the UXO can be removed.

Figure 7.60 Interior of Japanese storage cave; site AB160.

Figure 7.61 The back passage of Japanese storage cave being inspected by UXO specialist. It was judged too dangerous for the survey crew to enter; site AB160.

Figure 7.62 Japanese machine gun and other artifacts at site AB196.

AB196 Japanese Type 92 Machine Gun

A Japanese Type 92 7.7 mm machine gun is on the edge of a crater about 8 m in diameter. The gun is complete with feeding strips and unfired rounds. Also present in the immediate area are 81 mm and 60 mm mortar rounds, a communications cable spool, the iron blades of two picks and a Japanese oil can. The gun appears to have been propped up and posed with its feeding strips and the other items also appear to have been added by visitors. This site is a few m from the AB197 cave, which may have been the original location of the machine gun.

Figure 7.63 Japanese helmet at cave mouth; site AB197

AB197 Japanese Defensive Cave

This cave opening appears inside of a north facing rock crevice, with the cave opening facing toward the west, measuring 2 m wide and 1 m high. There are surface artifacts in the area of the cave mouth, including a drum magazine from a 7.7 mm Japanese light machine gun, a Japanese helmet and a propellant charge for a 75 mm rifle grenade, all found in close association.

AB199 Firing position

A D-shaped wall made from two courses of stacked coral rock faces SW toward AB195 and probably represents the remains of a machine gun position. The coral structure is 50 cm high and about 2.5 m in diameter. A drum magazine for a Japanese machine gun is located nearby.

Figure 7.64 Cave mouth protected by rubble-filled oil drums; site AB201

AB201 Japanese U-shaped Defensive Cave

The two entrances to a U-shaped cave are about 6 m apart and face toward the south. The western entrance to this cave is 3 m wide and 1 m high and the eastern entrance is 2.25 m wide and only 45 cm in height. Four rubble-filled oil drums and a Japanese machine gun clip are present at the western entrance and a pair of narrow gauge railroad tracks, probably salvaged from Peleliu's pre-war phosphate mining operation. A fully loaded American M-1 Garand rifle clip was found on the surface just outsides this cave. Inside the cave artifacts are abundant and include Japanese gas mask parts, large quantities of live knee mortar rounds and full Japanese Arisaka rifle clips. Personal gear such as a tooth brush and Japanese uniform buckles are also present on the cave floor. A live 250 pound U.S. aerial bomb was located a short distance up the trail from this site and is scheduled for removal by the UXO team.

Figure 7.65 Cave floor with live Japanese knee mortar rounds and filter cans from Japanese Army and Navy gas masks; site AB201.

AB202 Japanese Defensive Cave with Walled Entrance

A cave entrance was found surrounded by a 2 m high wall of coral rock and blocked by remains of original support timbers on the wall were possibly associated with an entrance structure or closure. The cave was not entered to avoid damage to the entrance features.

Figure 7.66 Japanese and American artifacts on the ground surface; site AB203.

AB203 Japanese Defensive Cave

A NW facing cave mouth is protected by a wall of coral rock and rubble 2 m wide and 1.75 m high. The cave is L-shaped, leading straight in for about 3 m then curving toward the SW for another 6 m. Artifacts observed inside included Japanese helmet fragments, narrow gauge rail track, a Japanese style carpenter saw blade and a battle damaged US canteen near the entrance. Japanese gun oil cans were also noted.

AB204 Rock Shelter Firing Position

A D-shaped rock shelter faces SE across a narrow gorge. The shelter is about 3 m wide, 2 m high and 1.5 m deep. A Japanese canteen was seen at the entrance and 6 m down slope from the site is a scatter of artifacts including US .30 caliber ammunition boxes, US helmet fragments, a shell case and a basin.

AB205 Japanese Defensive U-shaped Cave

A U-shaped cave has entrances facing SE, located about 10 m apart and measuring 3 m wide and 1.5 m high. Four weeks before our survey the UXO team had noted at least 12 Japanese mess kits lying outside the cave mouth; by the time we arrived at the site in December of 2010, all had since been removed by persons unknown. An upright oil drum stands in one mouth of the cave and the interior contains abundant artifacts that showed signs of recent disturbance. Artifacts noted include blocks of US TNT explosive, Japanese knee mortar rounds, uniform buttons, and a toothbrush. Disarticulated human remains were also seen in this cave.

Figure 7.68 Interior of large natural cave with artifacts on cave floor; site AB206

AB206 Japanese Natural Defensive Cave

A partially collapsed natural cave faces toward the SE, where there is large pile of limestone rubble obscuring the cave mouth. The cave is about 5 m wide, 2 m high and 3 m deep. Artifacts on the cave floor were all of Japanese origin, including rice bowls, a bayonet, and mess kits. One mess kit tray contained a pile of rifle clips. Sediment accumulation is fairly deep on this cave floor and other WWII era remains may exist beneath the floor surface. A small cubby hole in the cave wall near the entrance of this cave contains a live Japanese hand grenade.

Figure 7.69 Enamel ware rice bowls with Japanese Navy makings; site AB206.

Figure 7.70 Japanese bayonet and scabbard; site AB206.

AB207 Japanese Defensive Cave

A small natural cave exists in the side of a narrow pass between the limestone cliffs and has been collapsed. According to our guides, this is the unmarked site where Captain Haldane was killed by a sniper as described by Eugene Sledge in the 'With the Old Breed' (1981) and dramatized in the recent HBO 'Pacific' series.

Figure 7.71 Entrance to cave at site AB208.

AB208 Japanese Defensive Cave

A cave entrance 3 m wide and 1.75 m high faces to the NW and extends back into the limestone for about 6 m. Near the entrance of the cave is a Japanese Type 92 machine gun and a debris field of artifacts down slope for about 5 m of the cave mouth may be a secondary deposit of material that was originally inside the cave. Artifacts on the debris slope include a heavily damaged radio set, Japanese mess kit and abundant rounds of small arms and rifle clips.

Figure 7.72 Bullet-riddled port wing of TBM Avenger 16956 which was shot down two days before the invasion with the loss of all 3 crew members.

AB209 TBM-1C Avenger Wing

The port wing of a US Navy Avenger lies on the valley side, aligned SE-NW, with the leading edge of the wing next to the ground. It is riddled with bullet holes, reflecting the fact it was on the surface throughout the entire battle for Peleliu. The wing is heavily damaged, but extends from the wing tip to the undercarriage and wheel well. Armament racks exist on the underside of the wing and there is a dive flap on the leading edge. A stenciled ID-number '16956' was found on a wing part of this wreckage, indicating that it is associated with an aircraft documented by the Bent Prop organization (Pacific Wrecks). The TBM-1C Avenger 16956 was assigned to the *USS Enterprise* and on September 13, 1944 left on a mission to bomb the Peleliu airfield.

The crew of three included Pilot Ensign Donald E. Baxter, Gunner ARM1c Arthur C. Miller, and Radioman AOM2c Wessly R. Stuart, who was flying in his first combat mission. While on a steep dive approaching the airfield, the aircraft was hit by anti-aircraft fire, exploded and crashed on Popes Ridge, leaving a debris field of parts, including this wing that extended for nearly a mile from the crash site. A US JPAC team excavated the soils surrounding the main crash site in 2005 in an effort recover human remains but were unable to locate remains of the aviators among a large number of Japanese and Palauan skeletal material on the site. Remains eventually identified with DNA testing as those of Miller were recovered shortly after the battle while remains of Baxter and Stuart remain missing.

Figure 7.73 TBM-1C Avenger 16956 and Crew in 1944: (L-R) Radioman AOM2c Wesley R. Stuart, Pilot Ensign Donald E. Baxter, and 'Corky' Courtman. Prior to takeoff Courtman was replaced by Gunner ARM1c Arthur C. Miller (BentProp.org)

AB210 Sniper Position
Located about 20 m north of AB209; the TBM-1C Avenger wing is a small rock shelter facing NE, measuring 2 m wide, 2 m deep and 60 cm high. Several spent rifle cartridges remain on the surface and it is a possible firing location for the sniper that killed Captain Haldane (site AB207) and may warrant further forensic investigation. A disarticulated human femur is located about 5 m down a fan of limestone rubble that extends from the rock shelter.

AB211 Human Remains Concentration
About 5 m east of AB209 on the south slope of the same bowl are a number of disarticulated human remains partially covered by an overgrowth of tree roots. Noted were human long bone mid-sections, pelvis fragments, a proximal fibulae, a small femur and a large femur; indicating that more than one individual is represented. The scatter of human remains extends about 6 m across the jungle floor.

Figure 7.74 Fragment of USN Avenger '16956'; site AB212.

AB212 U.S. Navy Avenger Fragment
An aluminum fragment of a vertical stabilizer from the tail of a US aircraft. includes the top of a white US star insignia as well as the number '16956', and 'NAVY' in barely legible blue stencil, indicating that it is another piece of the same TBM-1C avenger represented at site AB209, probably part of the tail. It is located 70 m southeast of the port wing from this same aircraft (AB 209). It is about 75 cm long. This and other fragments of this aircraft were recovered by the BentProp organization and the main wreckage on Pope's Ridge was excavated by a JPAC team and some fragmentary remains of the crew recovered.

AB213 F- Shaped Japanese Defensive Cave
A F-shaped cave has two entrances on a north facing slope. The west entrance is 2 m wide and partially blocked to a height of 50 cm but eventually opens to 1.75 m high. The east entrance is about 2 m wide and 1 m high and goes into the hill for 4 m before it turns east where it is blocked by fallen rubble. At least 60 pieces of unexploded ordnance were visible in the interior of this cave and our UXO team advised us that it was too dangerous to explore further.

Figure 7.75 Japanese aircraft parts on the jungle floor; AB214.

AB214 Japanese Aircraft Parts

A pair of heavy cast aluminum u-shaped parts were found on the jungle floor that have been tentatively identified as being from the landing gear of a Japanese aircraft. They are not associated with any other aircraft remains and seem likely to have been collected from elsewhere, either during the battle or by post-war metal salvagers.

AB215 Japanese U-shaped Defensive Cave

A U-shaped cave's two entrances face south, overlooking the roadway. The east entrance is 3 m wide and 2 m high and the west entrance is 2 m wide and 50 cm high. There is a small recess leading east off of the eastern entrance. The cave contains a rice bowl, small arms ammunition, knee mortar rounds, and a drum magazine from a Japanese machine gun. Disarticulated human remains are also present on the cave floor including a rib, vertebra, and several carpal bones.

AB216 American LVT4

Remains of an LVT (Landing Vehicle Tracked) can be seen amid a pile of modern automobile wreckage at the edge of a recently used refuse dump at the side of the road. The engine is located in the front and the open rear section and rear loading ramp indicate it is an LVT4, which along with the LVT2 was one of the two types of LVT used in the Peleliu assault. These vehicles were first used in the landings on Saipan in mid-1944 and 8,348 were built between 1943-45. The vehicle is partially covered by automobiles and overgrowth, but a detailed evaluation of this vehicle is in order to see if it is worth salvaging and incorporation into interpretive display.

Part 8 Northern Peleliu

Figure 8.1 General area of sites located in Northern Peleliu in the 2010 survey.

Table 8.1 Sites Located in Northern Peleliu

2010 Survey	Denfeld 1988 Survey Designation	Palau Site Number	Site Description
AB153	Site 39 Feature 2		Japanese Phosphate Pier Foundations
AB154	Site 38		1000 Man Japanese Defensive Cave: Entrance 3
AB155	Site 39 Feature 1		Japanese Phosphate Plant loading dock
AB156	Site 38 Feature 2		Japanese Pillbox
AB157	Site 38 Feature 4		Japanese Pillbox
AB158	Site 40 Feature 1		Japanese Ngedbus Causeway Foundations
AB159	Site 40 Feature 2		Japanese Pier (Peleliu North Dock)
AB161	New site/feature		120mm Japanese Gun
AB162	New site/feature		Japanese Defensive Cave
AB163	New site/feature		Rock Shelters
AB164	New site/feature		Japanese Generator Platform
AB165	New site/feature		Japanese Defensive Cave w/electrical gear
AB166	Site 46 Feature 1		U-Shaped Japanese Defensive Cave
AB167	Site 46 Feature 3		Radar Antenna Platform
AB222	Site 40 Feature 2		Peleliu North Dock
AB277	Site 34		Peleliu Cemetery, Japanese Memorials
AB278	Site 36 Feature 1		Japanese Naval Radio station building
AB278.1	Site 36 Feature 2		Japanese Naval Radio station fuel building

The Battle on Northern Peleliu

The American advance on the northern end of Peleliu began with a push up the west road that went past the north end of Bloody Nose ridge by September 25, 1944 (D+10). In the following five days American forces succeeded in securing the north end of Peleliu Island and in crossing the shallow water to Ngedbus Island and in securing the airstrip under construction there. The major Japanese defensive strong points on the north end of Peleliu as were in and around limestone ridges, particularly the Thousand Man Cave (AB154) and on Radar Hill. Another major object was the large concrete Japanese Navy Radio Building (AB278), the remains of which are in the middle of the modern village. Isolated groups of Japanese held out in some pockets, like the Thousand Man Cave where the last few survivors didn't surrender until early in 1945.

The survey was confined to a few high probability areas in northern Peleliu and time precluded several hill and ridge tops that were known to have Japanese cave and defensive installations. Several barge wrecks are visible just north of Peleliu during low tides and at least some of these are probably associated with the landing of Japanese reinforcements on D-plus 8 as described in this detailed account by Hough (1950:104):

> At dawn on 23 September, the disconcerting discovery was made that, despite all vigilance by naval patrols, the Japanese were reinforcing their Peleliu garrison from the strongly held islands to the north. Owing to darkness and distance, what actually happened is difficult to reconstruct. According to U.S. reports, several barges were detected approaching some distance north of Akarakoro point and promptly brought under fire by naval vessels and land based artillery, which claimed destruction of seven. At 0245 on the 24th another group was taken under fire; 8 were observed to explode, and 10 wrecks were observed on the reefs after daybreak. According to a captured survivor, the convoy included 13 barges and a motor sampan, all of which were believed destroyed. It was conceded that a few stragglers might have reached shore across the reef, though probably without equipment and certainly without supplies.
>
> The Japanese version, however, differs substantially. No mention is made of any losses during the first landing: "The advance detachment, part of the 2d Battalion, 15th Infantry Regiment, made a successful landing at 0520, under command of 1st Lieutenant Murahori." As for early morning, 24 September: "The main body of the garrison reinforcement left Palau on the night of the 23d. Nine barges arrived safely, but six were shelled and burned while taking the wrong landing route. Most of the personnel of these were able to land by walking through the shallows. So far as Colonel Nakagawa was concerned, the 2d Battalion, 15th Infantry, had arrived, accepting losses inevitable to such an operation; a fact partially borne out by subsequent intelligence which indicated that 300 to 600 men of that unit were fighting on Peleliu.

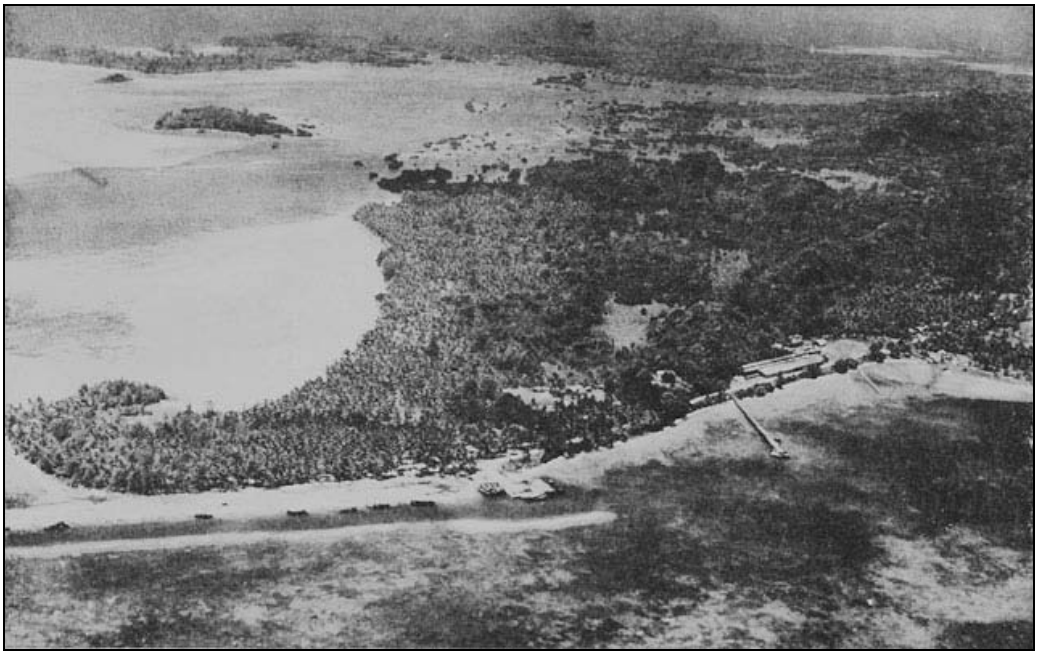

Figure 8.2 Prewar View of Northern Peleliu with phosphate dock, loading platform and other historic features visible. (NARA: RG127).

AB153 Phosphate Mine Pier

Phosphate mining operations on Palau were begun during the German occupation and continued by the Japanese when they assumed control of the islands in 1914. The largest phosphate mine was on Anguar Island just south of Peleliu however Tobi Island and Peleliu were also mined. Phosphate mining on Peleliu was a civilian run concern and operated from 1934 until 1943. Concrete supports for a loading pier extend NW from the shoreline of Peleliu, from a point midway between the former phosphate loading dock and the southern entrances of the 1000 man cave.

Figure 8.3 Concrete supports for the former wooden pier that was built as part of the pre-war Japanese phosphate mine on Peleliu.

AB155 Japanese Phosphate Plant Loading Platform

By D-plus 12 (27 September) the 2d Marine Battalion was dealing with a large antitank ditch which protected the approach the reinforced concrete loading platform of the former Japanese phosphate plant which had been converted into a blockhouse. A tank-dozer (i.e., a medium tank equipped with a bulldozer blade) had filled the trap about 0830 and tanks were able to cross to assault the strong point. Under the cover of tank and infantry fire, an LVT flame-thrower was able to close in and more than 60 Japanese dead were counted in the ruins (Hough 1950: 121).

The Japanese phosphate processing plant was located on top of the high limestone ridge called Amiangal mountain that runs parallel to the main road leading south to the village. On east side of the main road is the concrete loading platform built for the plant, probably in the mid-1930s. According to Denfeld (1988:90):

> The platform is 80m long and was converted by the Japanese military into a blockhouse. This was accomplished by cutting firing ports into the west walls of the 1.7m high platform. This provided interior fighting chambers that were 80 cm high. These firing positions were neutralized by flamethrowers and then sealed with soil and coral pushed into place by bulldozers. A few years ago, a bone collecting mission from Japan opened the structure and removed skeletal remains…

Figure 8.4 Marines using flamethrowers against Japanese defenders of the phosphate loading platform which had been hurriedly converted into a blockhouse. (NARA: RG127)

Figure 8.5 One of the fire ports that were cut into the former phosphate loading platform.

AB154 Thousand Man Cave

To the initial surprise of the Marines, northern Peleliu contained some of the more elaborate cave defenses on the island. Hough (1950:119), quotes the 5th Marines Regimental Narrative on a particularly tough and elaborate cave where defenders would plague the Americans for months: ". . . tank guns, firing point-blank directly into caves and tunnels, did not even temporarily cause the enemy therein to cease fire." Reacting to increasing casualties from this cave complex, the Marines withdrew from the ridge top overlooking the cave area and a 155 mm gun could be brought to the beach. Two of the gunners were killed and three more wounded as the gun was being set up. The range was extremely short and the crew had to take cover from their own bursts. One eyewitness described the scene:

> Nips could be seen trying to crawl out through the rubble knocked down by the shell bursts. One round set off a munitions cache inside the cave system which blew out through the principal cave mouth in three successive blasts, the last with a large smoke ring. (Hough 1950:128)

Marines cut down Japanese fleeing out of the cave mouths on the east and there was an attempt to seal the entrances, but incredibly some Japanese defenders inside managed to survive for more than four more months before finally surrendering.

According to Phelan (1944:6) this was a Japanese navy cave and was excavated by the 214th Naval Construction Battalion into the northern end of Amiangal mountain. This is by far the largest of the artificial caves documented on Peleliu, containing 284 M (933 feet) of tunnels with 33 alcove side rooms along the sides of six of the linked hallways (Figure 8.6). The cave is today a favorite attraction on Peleliu and is easily accessed just off the main road to the village and a short distance from the boat dock where most visitors disembark. The entry to tunnel three is kept free of vegetation and for the convenience of visitors a map of the cave has been mounted on an inside

wall about ten m from the entry. Cleared Ground Demining has removed the UXO from the tunnel floor for the safety of visitors. The tunnel is fairly dry throughout and ranges from 2-4 m wide, and the height is also variable and a good portion of the cave must be negotiated in a low crouch and we were on hands and knees in a few low spots. Charring from flame-thrower attacks is evident on the walls and ceilings of passages and piles of rubble exist in front of many entries from past attempts by the Americans to seal the Japanese defenders inside the cave. The cave is remarkably insect-free for a Palauan cave and colonies of bats roost in the ends of the least-visited passages on the southern end.

Despite its accessibility, the cave has not been vandalized by graffiti however many of the Japanese sake and beer bottles that once lined the largest passages cave by the hundreds have been broken or removed in the past five years. Most of the surface Japanese military artifacts and human remains that were once visible where upright walking is easiest, tunnels 4, 6, 7, and 8, have also been removed. Artifacts still exist in the more remote passages however. We saw a mortar base plate for a Japanese type 77 81 mm mortar, metal ammunition boxes for a 70mm IJN battalion gun, leather ammunition pouches, scraps of clothing, stacks of sake bottles and other items. A bipod for a Japanese 81 mm mortar was found just outside the exit of tunnel 8. Cases of tinned food in the cave present during Denfeld's 1981 visit are now gone (Denfeld 1988: 89)

The Thousand Man Cave's name may derive from an interview with a Japanese prisoner who surrendered along with a handful of others after holding out in the cave for six months.

The prisoner told his American captors that when he had first entered the cave on September 3, there were about a thousand men in them and that attrition had steadily reduced those numbers. Phelan (1945:8-9) quoted Island Command POW Interrogation Report No. 6 which recounts an impressive story of what life was like for the Japanese resisting in this and other caves:

> …on 28 September 1944 "all the surviving military personnel (about 250 men were organized for an attack on the American forces who were holding the hill directly over the caves. They poured forth from all nine tunnels and attacked. He claims that they drove the Americans off the hill but suffered many losses. When they reassembled in the caves after the attack there were only about 50 military men left.

The First Marine Division reports for the night of September 28 (1944:72) mention that "desperation raids" occurred that night that were repulsed but not until they had reached "bayonet range". The interrogation account continues:

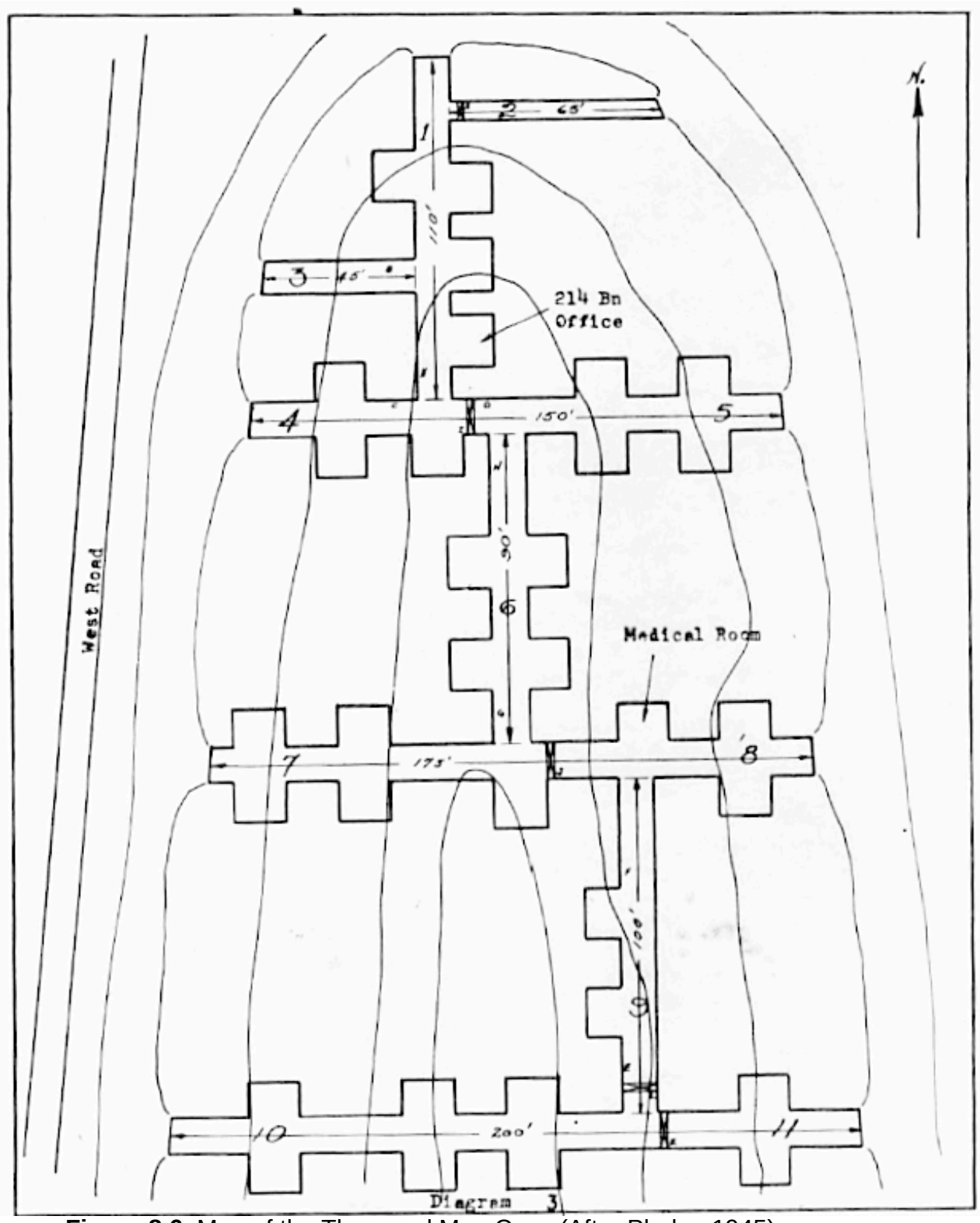

Figure 8.6 Map of the Thousand Man Cave (After Phelan 1945).

The survivors moved the wounded and they were carried into tunnels 9, 10 and 11 and the workers into tunnels 4,5,6,7, and 8 and the military personnel into tunnels 1, 2 and 3. On the morning of September 29 our forces assaulted tunnel 1 with a tank, machine guns and flame-throwers. The Japanese military personnel attacked through tunnel 1 killing all the soldiers except the prisoner who remained behind an improvised barricade at 'A" tunnel 2 and six others who were in lower passages. The flame-thrower used by our forces penetrated to where he was and burned his left arm and leg. He claims the flame-thrower was our most effective weapon in this attack and that it reached the point 'A' where he was standing and points 'B', 'C' and 'D' killing some of the workmen who were located in these areas. The tank and machine gun fire was only effective in the immediate tunnel it was firing into.

Later, tank and flame-throwers were used on most of the entrances and when our forces withdrew there were only 30 remaining alive. The wounded in tunnels 9, 10 and 11 were all killed by our flame-throwers which penetrated the entire length of tunnel 7-8.... Our flame-throwers also penetrated the entire length of tunnel 3 and tunnels 4 and 5... Tunnel 2 was not subjected to the flame-thrower and most of those men who survived had taken refuge in it.

Our forces then closed all entrances and the Japs moved into tunnel 2 which was the most completely closed. They posted men at points…in tunnel 5, 8, and 11. These men were able to pick off a number of "Foolish Yankees" who wandered into the entrances of tunnels 10, 7 and 4 during November and December. According to the prisoner as soon as they fired at anyone they would withdraw into tunnel 2 and as many times flame-throwers and demolitions were used in the various tunnels they were always safe…

Prisoner states that about 1 January 1945, after they shot an American in tunnel 8, very large explosive charges were set off in all the entrances except tunnel 2 and that the force of these explosions was much more penetrative than the flame-throwers. They reached to every part of the cave and shocked those they did not kill…19 of the remaining 30 were killed and three more badly injured. On 24 January 1945 American Seabees who were excavating in that area stumbled on two of the Japs …in tunnel 2. The prisoner states that they moved the three wounded into tunnel 6, left two men…in tunnel 2 as guards and the others went to tunnel 11…The flame thrower used on tunnel 2 at this time killed the two guards... The prisoner claims that on the night of 1 February 1945 the five Japs who were in good physical condition dug their way out of tunnel 8.

Figure 8.7 Interior of the Thousand Man Cave; site AB154.

Figure 8.8 Ammunition boxes for a Japanese 70mm Battalion gun on the floor of the Thousand Man Cave; site AB154.

Figure 8.9 Cave entry 3 in 1944 (Phelan 1945) and in 2010; site AB154

Figure 8.10 Japanese leather ammunition pouch on cave floor; site AB154

Figure 8.11 Japanese 81mm mortar base plate; site AB154

Figure 8.12 Pillbox on the main road near the north end of Peleliu; site AB156.

AB156 Pillbox

This heavily constructed pillbox of reinforced concrete stands near the junction on the main road and is landscaped and kept clear of vegetation. Firing ports in the walls cover the beach and the harbor near the Peleliu dock. The SW corner is being used as a benchmark and coordinates have been written on it in a painted panel on corner. It is in undamaged condition but lacks a gun or any associated surface artifacts. This pillbox remains as it was when documented by Denfeld (1988:89) except that the steel plate on the firing port is now missing:

> It is 3.8 m wide on the firing port face, 1.9 m high and 3.2 m deep. The walls are 50 cm thick. For additional protection, steel plate, 1 cm thick, was installed below the firing port on the exterior and on the interior firing port wall. The ports measure 2.3 m wide, 70 cm high and 80 cm above ground level. This fortification probably housed a 37mm or 47mm gun.

Figure 8.13 Pillbox nearly buried by rubble and vegetation; site AB157.

AB157 Pillbox
A small reinforced concrete pillbox is located about 50 m SE across the road from AB156. It has a narrow firing port and may have held an automatic weapon rather than an artillery piece. It has been damaged by shell fire above the firing port and on the roof. It is covered by brush and built into the coral rubble of the hillside. It is 1.4 m high, 4 m wide and 5.25 m wide (Denfeld 1988:89).

Figure 8.14 Causeway between Negedbus and Peleliu Island after American pre-invasion bombardment. (NARA: RG127)

AB158, Negedbus Causeway Foundations
The Japanese constructed a wooden causeway across the shallow water between the harbor area of northern Peleliu eastward about 330 m across to Negedbus Island, where a small airstrip and supporting structures were under construction at the time of the American assault. In 1981, Denfeld recorded some wooden debris in shallow water 110m SW of the dock. The 2010 survey found although this debris may be no longer present, remains of the causeway can nevertheless be seen in a line of narrow wooden post stumps on the sea bottom that extend away from the Peleliu shoreline toward Negedbus. The posts extend only a few cm from the sand but are well defined and average about 20 cm in diameter and a line of three are about .76 cm apart to form a support that was 1.55 cm wide. They align in at NW-SE direction with the point where the causeway once linked to the shore of Negedbus Island.

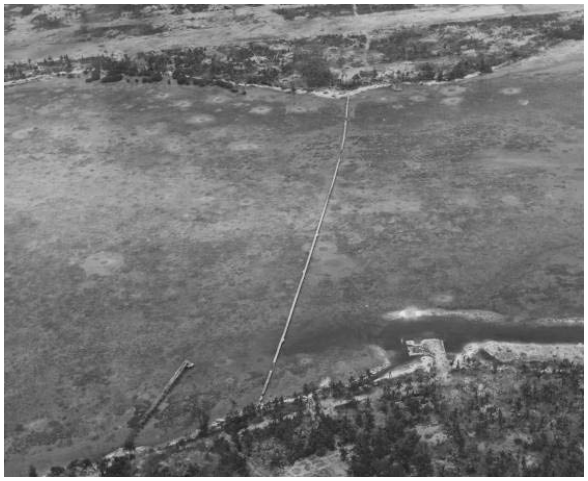

Figure 8.15 A1944 aerial view of the phosphate pier, causeway and north dock. (NARA: RG127)

AB222 Peleliu North Dock

The Peleliu dock is a pre-war structure of uncertain age that may date back to the German occupation of Palau early in the 20th century. Denfeld (1988:90) reports that it was rebuilt during the war by the 33rd Seabees (Naval Construction Battalion). Peleliu is surrounded by shallow water and even today the dredged channel does not allow large vessels to approach. Historic photographs show that the configuration of Peleliu's north dock has not changed since before the war. It is interesting to note from the pre-war aerial photograph that the line of iron barges that are still visible along the island side of the dredged channel on the dock approach are of pre-war vintage.

Figure 8.16 Low aerial view of Radar Hill shortly after being taken in 1944 with much of the jungle cover blasted away. A Japanese radar array existed on the very top of the hill. (NARA: RG127).

Radar Hill
Radar hill is a prominent limestone peak named for a Japanese radar antenna that was constructed on the summit. Fortified caves and guns existed on the northern slope and radar installations were located on the east side (Denfeld 1988:92). The radar was destroyed and the vegetation was stripped from the hill by heavy naval bombardment. The hill nevertheless remained a Japanese strongpoint as American forces attempted to secure the north end of Peleliu in late September of 1944. By the 29th of September the Marines were assaulting Radar Hill with flame-throwers, bazookas and demolition charges (Hough 1950:127). The 81st Army division took over the attack on September 30th but encountered resistance from a cave on the hill. Hough (1950:133) quoted the 81st Infantry Division Operation Report:

Japanese swarmed from Radar Hill to attack our troops ascending the slope. A major skirmish ensued in which tanks and mortar fire had to be employed to drive the Japanese back into their cave. The company was unable to take the hill before dark and organized a perimeter defense for the night on the low ground at its base. Company B assaulted Radar Hill again on 1 October, and the area of main enemy resistance was localized. At 1600 a rifle platoon and an engineer demolition squad attempted to storm this, but a Japanese counterattack again drove them from the hill.

Reinforcements were called in and an attack with flame-throwers and heavy demolition charges was successful. About 100 Japanese dead were found in the cave area immediately after the assault.

Figure 8.17 Japanese 120mm gun barrel; site AB161.

AB161 120 mm Japanese Gun
Most of a barrel from a 120 mm gun is protruding from the edge of a large pond located just west of Radar Hill. The gun is just off the edge of a roadway adjacent to the pond, which is being used to raise milkfish. It is unknown how much of the remaining gun is still extant. According to Denfeld (1988:92) the type 10 120mm gun was found outside of a cave that had stopped one of the American assaults on the hill. Inside the cave was a 75mm gun and apparently the Japanese were about to replace it with the larger gun before they came under attack. At some point the 120mm gun was dragged down from its position on Radar Hill, probably by post war metal salvagers, and at least the barrel, if not the entire gun was abandoned in its current position.

AB162 Japanese Defensive Cave

A square-shaped cave mouth measuring 1.5m wide and 1.75 m high is located on the lower east side of Radar Hill. There is a substantial deposit of small Marine univalve shells just south the south of the cave, probably representing a midden of food refuse, however whether it is associated with wartime Japanese use of the area or an earlier Palauan occupation is uncertain. The cave is not large and extends into the hill for only about 2.75 m. It contains a Japanese bottle and a cut down barrel that appears to have been used as a fire pit.

AB163 Rock Shelters

A cluster of natural rock shelters located upslope from AB162 are no more than a meter deep and are 1-2 m high at their mouths. They are north facing and reportedly sheltered Japanese snipers during the assault on Radar Hill. Much larger rock overhangs exist in the limestone rock faces all across the western face of Radar Hill and may have also functioned as rock shelters in the prehistoric past.

AB164 Japanese Generator Platform

A series of square poured concrete footings and parts of a generator engine are located in a shallow rock shelter at an east facing cliff edge of Radar Hill. A circular ring of bolts 2 m in diameter is set into a concrete base with a threaded bolt every 10 cm around the circumference. A jerry can and a fuel barrel are also present.

AB165 Japanese Defensive Cave w/ Electrical Equipment

An artificial cave cut into the side of Radar Hill has a mouth 3 m wide and 1.5 m high and extends into the hillside for about 7 m. It contains electrical equipment, probably the remains of Japanese radar gear, as well as some fragmentary human remains and a damaged Japanese canteen.

Figure 8.18 Probable remains of Japanese radar equipment; site AB165

AB166 Japanese Defensive U-Shaped Cave

The east entrance of a U-shaped cave in Radar Hill is 2.85 m wide and 1.8m high. About 11.55m to the west is the other entrance which is circular and about 2 m in diameter. Inside the cave is a rectangular concrete base with iron mounts for a small engine, porcelain electrical insulators and metal fragments. The generator was used to supply power for the radar according to Denfeld (1988:92), who also states that this cave housed the 75 mm gun and is the location where the bodies of more than 100 Japanese were found after the American assault on the hill.

Figure 8.19 Entrance to U-shaped cave; site AB166

Figure 8.20 Concrete base with iron engine mount on cave floor; site AB166

Figure 8.21 Radar antenna platform on the top of Radar Hill after vegetation has been cleared away; site AB167.

AB167 Radar Antenna Platform

On the narrow summit of Radar Hill is an octagonal iron platform that was fully visible only after a great deal of clearing of overgrowth with machetes. The platform has a central pivot hole and larger holes installed on the platform's east side. Fragments of the antenna are abundant down the eastern slope of Radar Hill. The platform is 2.25 m wide and it is 20 cm high above a round iron collar inset about 20 cm from the edge of the iron octagon which in turn is installed on what appears to be a coral rock foundation that is about 45 cm above the ground surface. A spectacular and 360 degree view of Peleliu and the surrounding waters is afforded from this location, which would be an ideal place for an interpretive historic overview for visitors.

Figure 8.22 Japanese Navy Radio Station Building shortly after being secured by U.S. Marines on September 25, 1944. (NARA: RG127)

AB278 Japanese Navy Radio Station Building

On September 25th, the 5th Marines took the Navy Radio station on their drive toward the north end of Peleliu. This structure was the largest of the reinforced concrete buildings constructed by the Japanese on Peleliu. Like the other major structures, it follows a standardized design documented in other Japanese bases in the Pacific. Analogues for the Peleliu radio station exist on Moen, Roi-Namur and Tinian (Denfeld 1988:86). Each of these facilities featured supporting structures; a diesel fuel storage building, water cooling tanks and radio towers, however on Peleliu the radio towers and water cooling tanks are now missing. A pair of water cisterns noted in the 1981 survey may survive among the residential areas surrounding the building which were not surveyed by us in 2010. The main building and nearby diesel fuel storage building were both damaged in the pre-invasion bombardment, particularly the main building where the damage was quite heavy, particularly to portions of the south facing walls. Despite this, the radio station, like the Japanese concrete buildings in the former airfield complex, was utilized by American forces. According to Denfeld (1988) the building served as a command post first for the Marines, then for the 321st Infantry and after the island was secured it was headquarters for the 111th Infantry Regiment which garrisoned Peleliu from February to November 1945. After the military left the island the residents of Peleliu used the building as a bar and movie theatre, and it was locally nicknamed ‘the cave’.

Denfeld (1988:86) recorded the dimensions of the building and the functions of the various rooms:

> The main building is 51 m long a 14m wide and possesses a wing to the rear that measures 15 m wide and 10 m long. At both ends of the structure are bunker-like units with walls that are 60 cm thick. On the first floor, the bunker rooms contained the generators and transmitting room. Those on the second floor were used to house the storage batteries and battery charging equipment. The transmitter room is ten m long and the shop within the bunker is five m long. Next is a barracks in the center of the building. This center section is constructed of reinforced concrete

with walls that are 20 cm thick. At the west end of the structure is a bunker for the generators. It measures 20 m long. In the wing that is the stem of the 'T' are located two rooms; one is a storeroom and the other a motor generator parts room. Stairs in this wing lead to the second floor. On the second floor above the transmitter room was a battery storage and charging room that extended into the area above the barracks on the first floor. In the bunker on the west end were additional generators and three small rooms on the east wall. They housed a transformer, a storage area and an administrative office. Also on the second floor were living areas and mess.

Except for the latrines, there are few indicators today of the room functions in this building; all of the equipment has been long since removed and only a few metal wall and ceiling mounts remain. Heavy blast doors and window coverings remain mostly intact This is one of the few WWII structures on Peleliu that has been extensively vandalized, primarily by spray painted graffiti on the building interior. Located in the midst of the modern village, it is very accessible and is an attractive refuge for bored young people. Jungle vegetation is abundant on the roof and walls of the main building and a large banyan tree has become established on the roof of the fuel storage building and its spreading root system will soon dominate the exterior wall of that structure. The fuel storage building was constructed of reinforced concrete with iron blast doors and shutters and was intended to protect fuel tanks for the power generators inside the main building Denfeld found that it is 7.3 m wide and 9.2 m long (1988:87). Denfeld reported that there were six steel fuel tanks inside however we were unable to confirm that.

Figure 8.23 Heavily damaged south facing side of the Japanese Navy Radio Station (NARA: RG127)

Figure 8.24 Aerial view of the Japanese Navy Radio Station after bombardment. (NARA: RG127)

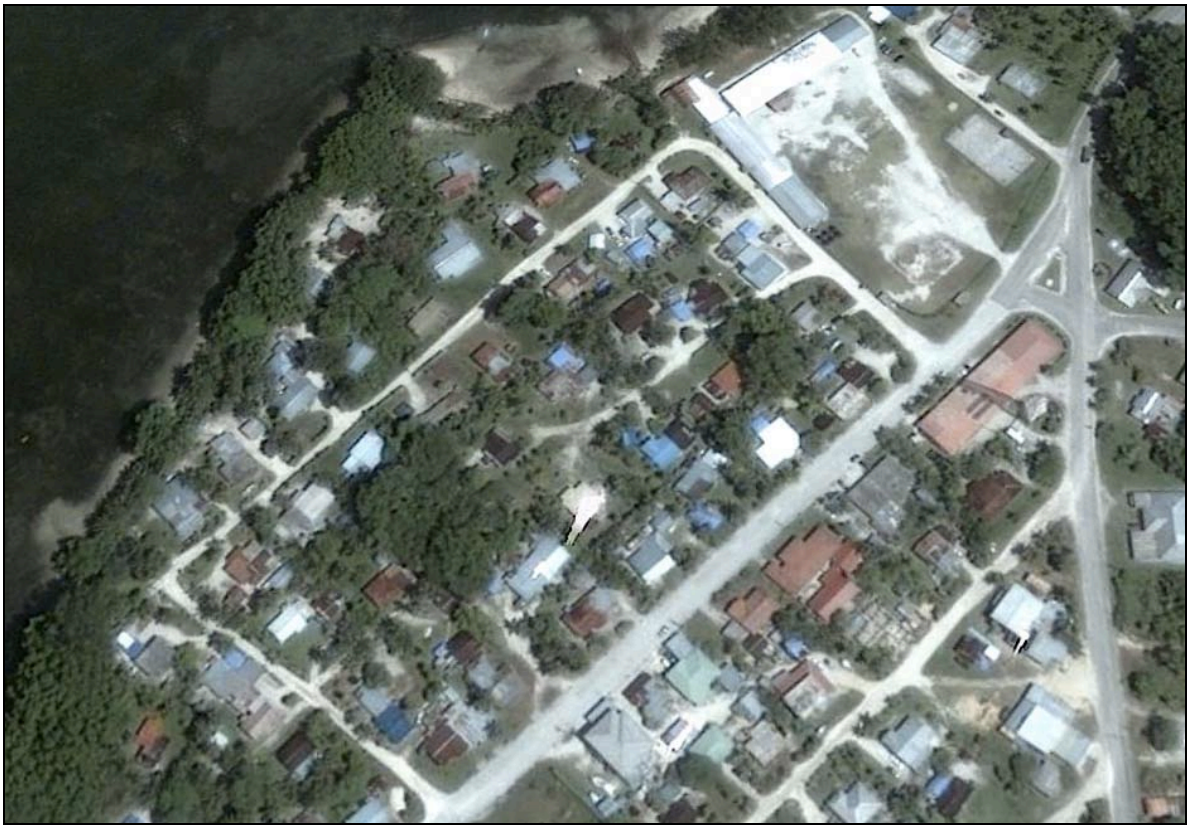

Figure 8.25 Same aerial view in 2009 (Google Earth Image).

Figure 8.26 Interior of first floor of Japanese Navy Radio Station; site AB278.

Figure 8.27 Generator room of Japanese Navy Radio Station; site AB278.

Figure 8.28 Interior of second floor of Japanese Navy Radio Station; site AB278.

Figure 8.29 Heavily overgrown fuel storage building; site AB278.1.

Part 9 Summary

In the 2010 survey we were able to confirm what other scholars have long suspected; that Peleliu is by far the best preserved battlefield in the Pacific. As the nature of the resources here has begun to reach academic audiences further afield, the emerging consensus is that Peleliu may in fact be one of the best preserved battlefields left to us in any WWII theatre. The historic significance of the Peleliu battlefield is hard to overstate.

The sheer quantity of artifacts and their remarkable state of preservation on Peleliu are unique in their capacity to convey the nature of the Pacific War. On Peleliu we can go beyond the conventional histories of the commanders and troop movements and understand what war was like for the common soldier. The human cost is inestimable; for every square mile of Peleliu, 2400 men died in battle and more Americans died on Peleliu than all the Allied fatalities of all five Normandy beaches combined. Surviving veterans returned home with memories that haunted them for life. The experience of the Japanese on Peleliu is largely an untold story and we are only now beginning to assess the toll on Korean workers and others who were killed along with the Japanese in the assault. Another little known story is the impact of the battle on the people of Peleliu, Anguar and Palau. Much remains to be done to preserve and share this complex event and this survey represents only a very preliminary first step.

Our survey covered only a small fraction of land on Peleliu that has a high probability of containing undiscovered and historically significant remains of the battle. There are also substantial remains still extant of the post-battle occupation and expansion of the airfield and other facilities that was underway until 1947 and which still marks the historic and cultural landscape of Peleliu.

Based on our field survey, we offer the following summary observations:

- There remains a critical need to survey and assess WWII remains on Peleliu in order to make informed decisions on preservation.

- The surviving standing structures are in dire need of a professional assessment by engineers and conservators. Until that time, many of them present a genuine public safety hazard.

- Nobody should consider conducting research in the ridge system or in any areas of the former battlefield without a fully qualified UXO team. Many areas of Peleliu remain extremely dangerous.

- Nearly all of the natural caves used by the Japanese in WWII are multi-component sites in that they were used by Palauans, probably for many centuries. Palauan pottery was seen in the vicinity of every natural cave and large prehistoric middens exist even in remote areas of the island's interior.

- Human remains in the caves are not all from the WWII era. A significant proportion may in fact represent pre-contact Palauan burials.

- Future survey and preservation planning should consider the extent of the changes that followed the American expansion of the former Japanese airfield and construction of new facilities and garrison areas. These are reflected in the 1945 USGS maps of Peleliu (compiled here into a single map).

Figure 9.1 Compilation of 1945 USGS quad sheets for Peleliu that show the extent of post-battle expansion of the airfield, especially on the southern end of the island.

Summary Tables; WWII Sites Documented in the 2010 Survey

2010 Survey	Denfeld 1988 Survey	Palau Site Number	Site Description	General Location
AB1	Site 31 Feature 1		Japanese RDF Administration Building	Airfield Complex
AB1.1	Site 31 Feature 3		Japanese RDF Water Tank	Airfield Complex
AB1.2	Site 31 Feature 4		Japanese RDF Power Plant Building	Airfield Complex
AB1.3	Site 31 Feature 5	B:BE-2:9	Japanese RDF Supply Building	Airfield Complex
AB2	New site/feature		Japanese RDF Bunker/Bomb Shelter	Airfield Complex
AB6	New site/feature		Japanese Dugout and Natural Defensive Cave	Airfield Complex
AB7	Site 6 Feature 4		American Hussman Reefer and Platform	Airfield Complex
AB8	Site 26 Feature 1		Japanese School Building Ruins	Airfield Complex
AB9	Site 26 Feature 3		Japanese Gate; 2 posts	Airfield Complex
AB10	New site/feature		Japanese Sea Plane Float: Jake or Aichi E13A	Airfield Complex
AB11	Site 23 Feature 1		Japanese Airfield Bomb Shelter	Airfield Complex
AB12	Site 23 Feature 1		Japanese Airfield Bomb Shelter	Airfield Complex
AB13	Site 23 Feature 2		Japanese Mess Hall Foundation	Airfield Complex
AB14	New site/feature		Oil Drum Platform and Can dump	Airfield Complex
AB15	Site 23 Feature 3		Japanese Water Tank	Airfield Complex
AB16	New site/feature		Japanese Gate; 4 posts	Airfield Complex
AB17	New site/feature		Japanese Barrack Foundation	Airfield Complex
AB18	New site/feature		Japanese Barrack Foundation	Airfield Complex
AB19	New site/feature		Japanese Barrack Foundation	Airfield Complex
AB20	New site/feature		Japanese Barrack Foundation	Airfield Complex
AB21	New site/feature		Japanese Barrack Foundation	Airfield Complex
AB22	New site/feature		Japanese Bath House Foundation	Airfield Complex
AB23	New site/feature		Japanese Bath House Water Tank	Airfield Complex
AB24	New site/feature		Japanese Bath House Water Tank	Airfield Complex
AB25	New site/feature		Japanese Underground Shelter	Airfield Complex
AB26	New site/feature		Japanese Bunker/Bomb Shelter	Airfield Complex
AB27	Site 26 Feature 5		Concrete Slab on Coral Foundation	Airfield Complex
AB28	Site 23 Feature 1		Japanese Airfield Bomb Shelter	Airfield Complex
AB29	New site/feature		Japanese Gun Position	Airfield Complex
AB30	New site/feature		Japanese Defensive Cave	Airfield Complex
AB31	New site/feature		Aircraft part dump; NE end	Airfield Complex
AB31	New site/feature		Aircraft part dump; SW end	Airfield Complex
AB32	Site 22 Feature 4		Japanese Power Plant 2	Airfield Complex
AB32.1	New site/feature		Japanese Power Plant 2 Water Tank	Airfield Complex
AB33	New site/feature		Collapsed Japanese Defensive Cave	Airfield Complex
AB34	New site/feature		Japanese Defensive Cave	Airfield Complex
AB35	New site/feature		Japanese Defensive Cave	Airfield Complex
AB36	Site 19 Feature 1		Japanese Power Plant 1	Airfield Complex
AB36.1	Site 19 Feature 4		Japanese Power Plant Pillbox	Airfield Complex
AB36.2	Site 19 Feature 3		Japanese Power Plant Watertank/slab	Airfield Complex
AB37	Site 19 Feature 2		Japanese Power Plant Diesel Storage Building	Airfield Complex
AB38	Site 20 Feature 1		Japanese Air Headquarters Building	Airfield Complex
AB38.1	Site 20 Feature 3		Japanese Air Headquarters Bomb Shelter	Airfield Complex
AB38.2	Site 20 Feature 4		American Quonset Shelters and Motor Pool	Airfield Complex
AB39	Site 23 Feature 1		Japanese Airfield Bomb Shelter	Airfield Complex
AB40	New site/feature		Concrete Pad for Radio Mast	Airfield Complex
AB41	New site/feature		American Hussman Reefer Units and Pad	Airfield Complex
AB43	New site/feature		Japanese Pillbox	Amber Beach
AB48	Site 1 Feature 13		American Quonset hut slab	White Beach
AB49	Site 1 Feature 13		American Quonset hut slab	White Beach
AB50	Site 1 Feature 12		Japanese Bunker/Casemate	White Beach
AB51	Site 1 Feature 13		American Quonset hut slab	White Beach
AB52	Site 1 Feature 1		Japanese Bunker w/gun	White Beach
AB52.1	Site 1 Feature 1		Japanese Defensive Cave - sealed	White Beach
AB53	Site 1 Feature 1		Japanese Defensive Cave - sealed	White Beach
AB54	Site 1 Feature 3		Japanese Defensive Cave - collapsed	White Beach
AB55	Feature 20		Japanese Defensive Cave	White Beach

2010 Survey	Denfeld 1988 Survey	Palau Site Number	Site Description	General Location
AB56	Site 1 Feature 14		American Officer's Club and Mess Foundations	White Beach
AB56.1	Site 1 Feature 16		American Officer's Club Hussman Reefers	White Beach
AB56.2	Site 1 Feature 15		American Officer's Club Japanese Rail Wheels	White Beach
AB57	New site/feature		American Officers Housing Area Coral ramps	White Beach
AB58	New site/feature		American Navy Officers Housing area	White Beach
AB59	New site/feature		Japanese Rifle Pit	White Beach
AB60	New site/feature		Japanese Pill Box	White Beach
AB61	Site 14		Japanese Fuel Storage Bunker Foundation	White Beach
AB62	Site 14		Japanese Fuel Storage Bunker Foundation	White Beach
AB63	New site/feature		Japanese Defensive Cave w/AA gun	Southern Ridges
AB64	New site/feature		Japanese Defensive Caves, (2) rifle pit	Southern Ridges
AB65	New site/feature		Japanese Defensive Caves, rifle pits	Death Valley
AB66	New site/feature		Japanese field kitchen	Death Valley
AB67	New site/feature		Japanese Aircraft Pilot Seat	Death Valley
AB69	New site/feature		Hells Pocket	Death Valley
AB70	New site/feature		Japanese Defensive Caves (2)	Death Valley
AB71	New site/feature		Japanese Defensive Cave	Death Valley
AB72	New site/feature		Japanese Defensive Cave, human remains	Death Valley
AB73	New site/feature		Japanese Defensive Cave	Death Valley
AB74	New site/feature		Japanese Defensive Cave	Death Valley
AB75	New site/feature		Vertical Japanese Defensive Cave	Death Valley
AB76	New site/feature		Y-shaped Japanese Defensive Cave	Death Valley
AB77	New site/feature		Japanese Defensive Cave	Death Valley
AB78	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB79	New site/feature		U-shaped Japanese Defensive Cave	Wildcat Bowl
AB80	New site/feature		I-shaped Japanese Defensive Cave	Wildcat Bowl
AB81	New site/feature		H-shaped Japanese Command Cave	Wildcat Bowl
AB82	Post-1981		Japanese Monument	Wildcat Bowl
AB83	New site/feature		U-shaped Japanese Defensive Cave	Wildcat Bowl
AB84	New site/feature		I-shaped Japanese Defensive Cave	Wildcat Bowl
AB85	New site/feature		U-shaped Japanese Defensive Cave	Wildcat Bowl
AB86	New site/feature		Japanese Defensive Cave, through China wall	Wildcat Bowl
AB87	New site/feature		Japanese Defensive Cave mouth -buried	Wildcat Bowl
AB88	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB89	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB90	New site/feature		American Ramp up China Wall	Wildcat Bowl
AB92	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB93	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB94	New site/feature		U-shaped Japanese Defensive Cave	Wildcat Bowl
AB95	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB96	New site/feature		Y-shaped Japanese Defensive Cave	Wildcat Bowl
AB97	New site/feature		Y-shaped Japanese Defensive Cave	Wildcat Bowl
AB98	New site/feature		Y-shaped Japanese Defensive Cave	Wildcat Bowl
AB99	New site/feature		Japanese Defensive Cave mouth	Wildcat Bowl
AB100	New site/feature		Y-shaped Japanese Defensive Cave	Wildcat Bowl
AB101	New site/feature		End pocket; rock shelter	Wildcat Bowl
AB102	New site/feature		Japanese Defensive Cave mouth	Wildcat Bowl
AB103	New site/feature		Japanese Defensive Cave	North BNose Ridge
AB104	New site/feature		Japanese Defensive Cave; natural	North BNose Ridge
AB105	New site/feature		Sm. Japanese Defensive Cave	North BNose Ridge
AB106	New site/feature		American Napalm Barrels	Wildcat Bowl
AB107	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB108	New site/feature		Shallow Japanese Defensive Cave	Wildcat Bowl
AB109	New site/feature		U-Shaped Japanese Defensive Cave	Wildcat Bowl
AB111	New site/feature		Sealed Japanese Defensive Cave	Wildcat Bowl
AB112	New site/feature		Sealed Japanese Defensive Cave	Wildcat Bowl
AB113	New site/feature		Sealed Japanese Defensive Cave	Wildcat Bowl
AB114	New site/feature		Y- Shaped Japanese Defensive Cave	Wildcat Bowl
AB115	New site/feature		American 1000 lb. Napalm bomb	Wildcat Bowl

2010 Survey	Denfeld 1988 Survey	Palau Site Number	Site Description	General Location
AB116	New site/feature		Collapsed Japanese Defensive Cave	Wildcat Bowl
AB117	New site/feature		Japanese bicycles	Death Valley
AB118	New site/feature		Sealed Japanese Defensive Cave	Wildcat Bowl
AB119	New site/feature		Sealed Japanese Defensive Cave	Wildcat Bowl
AB120	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB121	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB122	New site/feature		Japanese Defensive Cave	Wildcat Bowl
AB123	New site/feature		Japanese Bomb 100 Kg. Type 99	Wildcat Bowl
AB124	New site/feature		Japanese 100Kg. Bomb Cache (7)	Wildcat Bowl
AB125	New site/feature		Japanese Firing position/ Trench	Wildcat Bowl
AB126	New site/feature		Japanese 70 mm gun with carriage	Wildcat Bowl
AB127	New site/feature		Mortar or gun position pit	Wildcat Bowl
AB128	Site 25		Wildcat Monument hilltop	Bloody Nose Ridge
AB129	New site/feature		Collapsed Japanese Defensive Cave	Wildcat Bowl
AB130	(Post-1981)		Marine Corps monument	Bloody Nose Ridge
AB131	(Post-1981)		Japanese Memorial Shinto Shrine	Bloody Nose Ridge
AB132	Site 18 Feature 3		American LVT with Stuart Turret	Southern Ridges
AB133	Site 18 Feature 1		200 MM Japanese Gun in Defensive Cave	Southern Ridges
AB134	New site/feature		Firing position, Japanese Defensive Cave	Southern Ridges
AB135	New site/feature		Japanese Defensive Cave, oil drum wall	Southern Ridges
AB136	New site/feature		Japanese Defensive Cave	Southern Ridges
AB137	New site/feature		Sealed Japanese Defensive Cave	Southern Ridges
AB138	Site 24		American LVT	Airfield Complex
AB138.1	Site 24		American LVT	Airfield Complex
AB139	Site 22 Feature 5		American LVT with ramp down	Airfield Complex
AB140	New site/feature		American Avenger wreck (45676) VT-51	Airfield Complex
AB141	Site 2		Japanese Tank	White Beach
AB142	Site 11		Japanese ‘German’ Bunker	Scarlet Beach
AB143	New site/feature		Japanese 37 mm wheeled gun	Scarlet Beach
AB144	New site/feature		Japanese Searchlight Power Bunker	Scarlet Beach
AB145	Site 17		Japanese Storage Cave with Caissons	Southern Ridges
AB146	New site/feature		Japanese Navy Command Post Cave	Southern Ridges
AB147	New site/feature		Japanese Tank; buried	White Beach
AB148	New site/feature		American Aircraft Wreckage, Merlin Engine	White Beach
AB149	Site 4		Orange Beach Cemetery	Orange Beach
AB149.1	Site 4 Feature 2		Orange Beach Cemetery Flagpole and Stand	Orange Beach
AB150	Site 4 Feature 3		Orange Beach Cemetery Chapel Ruins	Orange Beach
AB151	New site/feature		Japanese Holdout Cave; 1947 surrender	Amber Beach
AB152	New site/feature		Rifle pits	Amber Beach
AB153	Site 39 Feature 2		Japanese Phosphate Pier Foundations	North Peleliu
AB154	Site 38		1000 Man Japanese Defensive Cave	North Peleliu
AB155	Site 39 Feature 1		Japanese Phosphate Plant loading dock	North Peleliu
AB156	Site 38 Feature 2		Japanese Pillbox	North Peleliu
AB157	Site 38 Feature 4		Japanese Pillbox	North Peleliu
AB158	Site 40 Feature 1		Japanese Ngedbus Causeway Foundations	North Peleliu
AB159	Site 40 Feature 2		Japanese Pier (Peleliu North Dock)	North Peleliu
AB160	New site/feature		Japanese Defensive Cave, w/ land mines	Bloody Nose Ridge
AB161	New site/feature		120mm Japanese Gun	Radar Hill area
AB162	New site/feature		Japanese Defensive Cave	Radar Hill
AB163	New site/feature		Rock Shelters	Radar Hill
AB164	New site/feature		Japanese Generator Platform	Radar Hill
AB165	New site/feature		Japanese Defensive Cave w/electrical gear	Radar Hill
AB166	Site 46 Feature 1		U-Shaped Japanese Defensive Cave	Radar Hill
AB167	Site 46 Feature 3		Radar Antenna Platform	Radar Hill
AB168	Site 14		Japanese Fuel Storage Bunker/ WWII Museum	White Beach
AB169	New site/feature		Japanese Open Well (across from Museum)	White Beach
AB173	Post 1981		Japanese Memorial Scarlet Beach	Scarlet Beach
AB174	New site/feature		Japanese Mortar Pit	Scarlet Beach
AB175	New site/feature		American pontoon barge	Scarlet Beach

2010 Survey	Denfeld 1988 Survey	Palau Site Number	Site Description	General Location
AB176	New site/feature		American Concrete gun mount	Scarlet Beach
AB177	New site/feature		Japanese? Mooring Buoys	Scarlet Beach
AB178	New site/feature		Japanese bunker w gun	Scarlet Beach
AB179	New site/feature		American TNT cache (removed by UXO team)	Scarlet Beach
AB180	Site 8 Feature 1?		Japanese Pillbox- collapsed	Scarlet Beach
AB181	New site/feature		American Corsair Belly Tank, Napalm Canister	Scarlet Beach
AB182	New site/feature		American LVT4	Scarlet Beach
AB183	New site/feature		American Water Pumping Complex	Scarlet Beach
AB184	New site/feature		Japanese dugout	Scarlet Beach
AB185	New site/feature		Japanese 120 mm gun position (and gun?)	Scarlet Beach
AB186	New site/feature		American 'Lady Luck' LVT	Scarlet Beach
AB187	New site/feature		Japanese 120 mm gun position	Scarlet Beach
AB188	New site/feature		Japanese Anti-Aircraft Gun pit	Scarlet Beach
AB189	New site/feature		Japanese Anti-Aircraft Gun pit	Scarlet Beach
AB190	New site/feature		Japanese 25 mm Anti-Aircraft gun	Scarlet Beach
AB191	New site/feature		American Water tank	Scarlet Beach
AB192	New site/feature		Japanese 25 mm Anti-Aircraft Gun mount	Scarlet Beach
AB193	New site/feature		American Mortar pit	Scarlet Beach
AB194	New site/feature		Japanese Defensive Cave	Scarlet Beach
AB195	New site/feature		Japanese Firing positions (2)	North BNose Ridge
AB196	New site/feature		Japanese Type 92 machine gun	North BNose Ridge
AB197	New site/feature		Japanese Defensive Cave/crack	North BNose Ridge
AB199	New site/feature		Japanese Firing position	North BNose Ridge
AB201	New site/feature		U-shaped Japanese Defensive Cave	North BNose Ridge
AB202	New site/feature		Japanese Defensive Cave with wall	North BNose Ridge
AB203	New site/feature		Japanese Defensive Cave	North BNose Ridge
AB204	New site/feature		Rock shelter	North BNose Ridge
AB205	New site/feature		U-shaped Japanese Defensive Cave	North BNose Ridge
AB206	New site/feature		Natural Japanese Defensive Cave	North BNose Ridge
AB207	New site/feature		Japanese Defensive Cave	North BNose Ridge
AB208	New site/feature		Japanese Defensive Cave	North BNose Ridge
AB209	New site/feature		American Aircraft wing ;TBM-1C Avenger	North BNose Ridge
AB210	New site/feature		Japanese Sniper position	North BNose Ridge
AB211	New site/feature		Human Remains	North BNose Ridge
AB212	New site/feature		American Aircraft fragment; Avenger 16956	North BNose Ridge
AB213	New site/feature		F-shaped Japanese Defensive Cave	North BNose Ridge
AB214	New site/feature		Japanese Aircraft Parts	North BNose Ridge
AB215	New site/feature		U shaped Japanese Defensive Cave	North BNose Ridge
AB216	New site/feature		American LVT in modern dump	North BNose Ridge
AB217	New site/feature		U shaped Japanese Defensive Cave	Amber Beach
AB218	New site/feature		Post-war amphibious vehicle	Orange Beach
AB219	Site 3 Feature 6		Aircraft part dump; 100 m long	Orange Beach
AB220	Site 7		Japanese Defensive Caves (2)	Orange Beach
AB221	Site 7		Japanese Defensive Cave	Orange Beach
AB222	Site 40 Feature 2		Peleliu North Dock	North Peleliu
AB223	Site 7		Japanese Defensive Cave and gun position	Southern Ridges
AB224	New site/feature		U shaped Japanese Defensive Cave	Southern Ridges
AB225	New site/feature		Japanese Defensive Cave	Southern Ridges
AB226	New site/feature		Japanese Defensive Cave	Southern Ridges
AB227	New site/feature		Y-shaped Japanese Defensive Cave	Southern Ridges
AB228	New site/feature		L-shaped Japanese Defensive Cave	Southern Ridges
AB229	Site 27		American NCB Caterpillar Bulldozer	Southern Ridges
AB230	New site/feature		Aircraft cowling	Orange Beach
AB231	New site/feature		Japanese Defensive Cave and firing positions	Southern Ridges
AB232	New site/feature		Concrete pad	Southern Ridges
AB233	New site/feature		Japanese Defensive Cave and 75mm field gun	Southern Ridges
AB234	New site/feature		American Standing water tower	Southern Ridges
AB235	New site/feature		Foxhole and trench	Southern Ridges
AB236	New site/feature		Japanese Large Coral Revetment	Southern Ridges

2010 Survey	Denfeld 1988 Survey	Palau Site Number	Site Description	General Location
AB237	New site/feature		Japanese Defensive Cave and firing positions	Southern Ridges
AB238	New site/feature		C-shaped Japanese Defensive Cave	Southern Ridges
AB239	New site/feature		Japanese Defensive Cave with 75mm shells	Southern Ridges
AB240	New site/feature		Japanese Bunker with 75mm wheeled gun	Southern Ridges
AB241	New site/feature		Japanese Bunker with wooden doors	Southern Ridges
AB242	New site/feature		Japanese Defensive Cave with gun	Southern Ridges
AB243	New site/feature		Japanese Bunker	Southern Ridges
AB244	New site/feature		Japanese Defensive Cave/rockshelter	Southern Ridges
AB245	New site/feature		Japanese Defensive Cave complex	Southern Ridges
AB246	New site/feature		Japanese Defensive Cave	Southern Ridges
AB248	New site/feature		Japanese Defensive Cave	Southern Ridges
AB249	New site/feature		Human Remains	Southern Ridges
AB250	New site/feature		Three firing positions	Southern Ridges
AB251	New site/feature		Firing position, rock shelter	Southern Ridges
AB252	New site/feature		Japanese artillery ammo can dump and position	Southern Ridges
AB253	New site/feature		Small Japanese Defensive Caves	Southern Ridges
AB254	New site/feature		Small Japanese Defensive Cave	Southern Ridges
AB255	New site/feature		Small Japanese Defensive Cave	Southern Ridges
AB256	New site/feature		Small Japanese Defensive Cave	Southern Ridges
AB257	New site/feature		Japanese helmet and human remains	Southern Ridges
AB258	New site/feature		F shaped Japanese Defensive Cave	Southern Ridges
AB259	New site/feature		Rock platform	Southern Ridges
AB260	New site/feature		Japanese Defensive Caves (2)	Southern Ridges
AB261	New site/feature		L shaped Japanese Defensive Cave with gun	Southern Ridges
AB262	New site/feature		Japanese Air Operations Building	Airfield Complex
AB263	New site/feature		Japanese Air Operations Bomb Shelter	Airfield Complex
AB264	Site 9 Feature 1		Japanese 127mm gun emplacement #1	Airfield Complex
AB265	Site 9 Feature 2		Japanese 127mm gun emplacement #2	Airfield Complex
AB266	Site 9 Feature 3		Japanese 127mm gun emplacement #3	Airfield Complex
AB267	Not recorded in 1981	B:BE-1:124	Japanese Defensive Cave; human remains	Southern Ridges
AB268	New site/feature		Japanese Zero wreck	Orange Beach
AB269	New site/feature		Aircraft part dump, wing US aircraft; Navy Hellcat	Southern Ridges
AB270	New site/feature		American Sherman tank, memorial	Southern Ridges
AB271	New site/feature		Japanese Defensive Cave	Southern Ridges
AB272	New site/feature		L-shaped Japanese Defensive Cave	Southern Ridges
AB273	New site/feature		Japanese Navy Communication Cave	Southern Ridges
AB274	New site/feature		Japanese Defensive Cave/ rock shelter	Southern Ridges
AB275	New site/feature		Japanese Defensive Cave	Southern Ridges
AB276	New site/feature		Extreme UXO concentration area (450 x 350 M)	Purple Beach
AB277	Site 34		Peleliu Cemetery, Japanese Memorials	North Peleliu
AB278	Site 36 Feature 1		Japanese Naval Radio station building	North Peleliu
AB278.1	Site 36 Feature 2		Japanese Naval Radio station fuel building	North Peleliu
AB279	Site 1 Feature 7		Japanese Fuel drum emplacement	White Beach
AB280	Site 1 Feature 6		American LVT	White Beach

- Note: Prewar and Historic Palauan Sites encountered during the 2010 survey have been excluded from this summary pending review by the Palau Bureau of Arts and Culture in consultation with the State of Peleliu.

References

Ambrose, H. 2010. *The Pacific*. Edinburgh: Canongate.

Ball, E. 2011. An American Tragedy. 'Disunion' op-ed series. *New York Times* 11.04.11.

BBKS (Bōeichō Bōei Kenshūjō Senshishitsu, 'Self-Defence Agency, Self-Defence Research Institute, War History Office') 1966 *Senshi Sōsho 13. Chūbu Taiheiyō rikugun sakusen, 2: Periryū, Angaru, Iōtō* ('War History Series Vol. 13. Army Operations in the Central Pacific, part 2: Peleliu, Angaur and Iwo Jima'). Tokyo: Asagumo Shimbun Sha.

Beardsley, F.R.
1997Fishponds, Taro Patches and Shell Middens: Archeological Investigations of Peleliu, Republic of Palau, Data Recovery and Monitoring for the Palau Rural Water System Program, IARII, Honolulu

Blaiyok, V., T.Techur and R. Olsudong
1992 An Archeological Reconnaissance Survey of Beleliu State (draft). Division of Cultural Affairs, Ministry of Community and Cultural Affairs, ROP

Blair, B.B. & DeCioccio, J.P.
2011. *Victory at Peleliu: the 81st Infantry Division's Pacific Campaign*. Norman: University of Oklahoma Press.

Blaiyok, V.K.
1985 *An Archeological Reconnaissance Survey of Portion of Ngerdelolk, Peliliu State*. Koror: Division of Cultural Affairs, Dept. of Social Services.

Blaiyok, V.K., Techur, T. & Olsudong, R.
1992 *An Archeological Reconnaissance Survey of Beliliou State*. Koror: Division of Cultural Affairs, Ministry of Community and Cultural Affairs.

Bronemann, L.B.
1982. *Once Upon a Tide*. Bryn Mawr: Dorrance.

Burgin, R.V.
2010. *Islands of the Damned: a Marine at War in the Pacific*. New York: New American Library.

Burns, K.
2011. A Conflict's Acoustic Shadows. 'Disunion' op-ed series. *New York Times* 11.04.11.

Cameron, C.M.
1994 *American Samurai: Myth, Imagination and the Conduct of Battle in the First Marine Division, 1941-1951*. Cambridge: Cambridge University Press.

Camp, D.
2008. *Last Man Standing: the 1st Marine Regiment on Peleliu*. London: Zenith Press.

Christiansen, H.
2002 Forgotten and Refound Military Structures in the Central Pacific: Examples from the Marshall Islands. In Schofield, J., Johnson, W.G. & Beck, C.M. (eds) *Matériel Culture: the Archeology of Twentieth-Century Conflict*. London: Routledge: 58-64.

Craven, W.F. & Cate, J.L.
1953 *The Army Air Forces in World War II. Vol. 5, The Pacific: Matterhorn to Nagasaki, June, 1944 to August, 1945*. Chicago: University of Chicago Press.

Deen, B.D.
1984 *Trial by Combat!* Self-published: Deen Books.

Denfeld, D.C.
1981a. *Field Survey of Ponape: World War II Features*. Micronesian Archeological Survey 2. Saipan: Division of Historic Preservation.

1981b. *Field Survey of Truk: World War II Features.* Micronesian Archeological Survey 6. Saipan: Division of Historic Preservation.

1981c *Japanese Fortifications and Other Military Structures in the Central Pacific*. Micronesian Archeological Survey 9. Saipan: Division of Historic Preservation.

1988 *Peleliu Revisited: an Historical and Archeological Survey of World War II Sites on Peleliu Island*. Micronesian Archeological Survey 24. Saipan: Division of Historic Preservation.

Denfeld, D.C. & Russell, S.
1984. *Home of the Superfort: an Historical and Archeological Survey of Isely Field.* Micronesian Archeological Survey 21. Saipan: Division of Historic Preservation.

Dixon, B., Gilda, L. & Bulgrin, L.
2011. Shifting Boundaries at a Crossroads in the Western Pacific: the Archeology of WWII Japanese Stragglers on Guam. Paper delivered to the 2011 Society for Historical Archeology conference, Austin, Texas.

Falgout, S., Poyer, L. & Carucci, L.M.
2008. *Memories of War: Micronesians in the Pacific War*. Honolulu: University of Hawaii Press.

Farrell, Nancy, Stephen Murray and David Gaddis
2008 A Preservation Plan for the Peleliu Battlefield National Historic Landmark, Island of Peleliu, Republic of Palau. Prepared for the Peleliu War Historical Society, Inc., Palmer, Alaska. Funded by the American Battlefield Protection Program, Grant #2255-06-005.

First Marine Division
1944 Intelligence Section. Peleliu, Its Terrain and Defenses. 1st Marine Division, Serial number 00161 over 475/355; dated 14 Dec 44.

Fuller, C.A.
2011 Survey and Assessment of World War II Japanese aircraft at the Old Colonia Airport, Yap State, Federated States of Micronesia. Paper delivered to the 2011 Society for Historical Archeology conference, Austin, Texas.

Funasaka, H.
1986 *Falling Blossoms*. Singapore: Times Books International.

Gailey, H.A.
1983 *Peleliu 1944*. Annapolis: Nautical & Aviation.

Garand, G.W. & Strowbridge, T.R.
1971 *History of U.S. Marine Corps Operations in World War II. Vol. 4: Western Pacific Operations*. Historical Branch, G-3 Division. Washington, D.C.: USMC HQ.

Gayle, G.D.
1996 *Bloody Beaches: the Marines at Peleliu*. Washington DC: US Marine Corps Historical Center.

Gilliland, A.O.
1994 *Peleliu Remembered*. Self-published: Booker Publications.

Greeley, B.M.
2008 *The Two Thousand Yard Stare: Tom Lea's World War II*. College Station: Texas A&M University Press.

Gumerman, Gerge J., D. Snyder, W.B. Masse
1981 Archeological Reconnaissance in the Palau Archipelago, Western Islands, Micronesia, Center for Archeological Investigations for Research Paper, Southern Illinois University, Carbondale.

Hallas, J.H.
1994 *The Devil's Anvil: the Assault on Peleliu*. London: Praeger.

Hammel, E.
2005 *Pacific Warriors: the U.S. Marines in World War II*. St. Paul: Zenith.

Harries, M. & Harries, S.
1991 *Soldiers of the Sun: the Rise and Fall of the Imperial Japanese Army 1868-1945*. London: Heinemann.

Hastings, M.
2007 *Nemesis: the Battle for Japan 1944-45*. London: Harper.

Hijikata Hisakatsu
1995 Collective Works of Hijikata Hsakatsu: Gods and Religion of Palau, Endo Hisashi, ed. The Sasakawa Peace Foundation, Tokyo

Hough, F.O.
1950 *The Assault on Peleliu*. Historical Branch, G-3 Division. Washington DC: USMC HQ.

Hunt, G.P.
1958 *Coral Comes High; An Account of the Author's Experiences during the Attack by U.S. Marines on Peleliu, September 1944*. New York: New American Library.

Krämer A.
1919 Palau ethnography. In: Thilenius G, editor. Ergebnisse der Sudsee Expedition 1908–1910. II. Ethnographie; B. Mikronesien. Band 3, Teilband 2. Friederichsen, Hamburg [typescript]. Human Relations Area File typescript

Lea, T.
1945 *Peleliu Landing*. El Paso: Herzog.

Leckie, R.
1957 Helmet for my Pillow: from Parris Island to the Pacific. New York: Random House.

Mailer, N.
1948 *The Naked and the Dead*. New York: Rinehart.

McKinnon, J.F.
2011 Planes, Tanks and Shipwrecks: Underwater Archeology of WWII in Saipan, CNMI. Five-paper session organized at the 2011 Society for Historical Archeology conference, Austin, Texas.

McMillan, G.
1949 *The Old Breed*. Washington, DC: Infantry Journal Press.

Moran, J. & Rottman, G.L.
2002 *Peleliu 1944: the Forgotten Corner of Hell*. Oxford: Osprey.
Murray, S.C.

Murray, S.C.
2006 *War and Remembrance on Peleliu: Islander, Japanese, and American Memories of a Battle in the Pacific War*. Unpublished PhD thesis in Anthropology. Santa Barbara: University of California.

National Park Service
2003 Peleliu Battlefield National Historic Landmark. United States Department of Interior

Oda, M.
2003 *The Breaking Jewel*. New York: Columbia University Press.

Ohnuki-Tierney, E.
2002 *Kamikaze, Cherry Blossoms and Nationalisms: the Militarization of Aesthetics in Japanese History*. Chicago: University of Chicago Press.

Osborne D.
1966 *The Archeology of the Palau Islands, An Intensive Survey.* BP Bishop Museum Bulletin 230. Honolulu: Bishop Museum Press. 494 p.

1979 Archeological test excavations, Palau Islands, 1968–1969. *Micronesia Supplement 1.*

Peattie, M.R.
1988 *Nan'yō: the Rise and Fall of the Japanese in Micronesia, 1885-1945*. Honolulu: University of Hawaii Press.

Petchey, P.
2009 Second World War Archeology on Watom Island, East New Britain Province, Papua New Guinea. Paper presented to the Indo-Pacific Prehistory Association conference, Hanoi.

Phelan, W.C
1945 Bulletin Number 173-45. "Japanese Military Caves on Peleliu-Know Your Enemy!" CINCPAC-CINCPOA

Poyer, L., Falgout, S. & Carucci, L.M. 2001. *The Typhoon of War: Micronesian Experiences of the Pacific War*. Honolulu: University of Hawaii Press.

Price, N. & Knecht, R.
2012 Peleliu 1944: The Archeology of a Pacific D-Day. Journal of Conflict Archeology, pp. 4-47, Vol. 7:1.

In press
After the Typhoon: Multicultural Archaeologies of World War II on Peleliu, Palau, Micronesia. *Journal of Conflict Archeology*.

Ross. B.D.
1991 *Peleliu – Tragic Triumph. The Untold Story of the Pacific War's Forgotten Battle*. New York: Random House.

Rottman, G.L.
2003 *Japanese Pacific Island Defences 1941-45*. Oxford: Osprey.

Sledge, E.B.
1979-80 Peleliu: a neglected battle. 3 parts: *Marine Corps Gazette* 63/11: 88-95, 63/12: 28-41, 64/1: 32-42.

Sledge, E.B.
1981 *With the Old Breed: at Peleliu and Okinawa*. Novato: Presidio Press.

Sloan, B.
2005 *Brotherhood of Heroes: the Marines at Peleliu, 1944*. New York: Simon & Schuster.

Smith, R.R.
1953 *United States Army in World War II. Vol. 2 The War in the Pacific. Part 3: Approach to the Philippines*. Washington, DC: Dept. of the Army.

Stinnett, R.B.
1992 *George Bush: His World War II Years*. Washington, DC: Brassey's.

Takayama, Jun and H. Takasugi
1978 Preliminary Report of the Archeological Investigations of Paat-2 in Palau

US Army
1948 *The 81st Infantry Wildcat Division in World War II*. Washington DC: Infantry Journal Press.

Watkins, R.B.
1992 *Brothers in Battle: One Marine's Account of War in the Pacific*. Manchester, CT: self-published.

Woodard, L.L.
1994 *Before the First Wave: the 3rd Armored Amphibian Tractor Battalion, Peleliu and Okinawa*. Manhattan, Kan.: Sunflower University Press.

Wright, D.
2002 *To the Far Side of Hell: the Battle for Peleliu, 1944*. Marlborough: Crowood.

Wright, D.
2005 *Pacific Victory: Tarawa to Okinawa 1943-1945*. Stroud: Sutton.

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