

FINAL REPORT

**Archaeological Investigations at
the Commercial Pacific Cable
Company Station and Marine
Barracks, Midway Atoll National
Wildlife Refuge**

Contract No. F11PX05662

Prepared for:

U.S. Fish and Wildlife Service
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502

March 2012

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**ARCHAEOLOGICAL INVESTIGATIONS
AT THE
COMMERCIAL PACIFIC CABLE COMPANY STATION
AND
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MIDWAY ATOLL NATIONAL WILDLIFE REFUGE**

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ABSTRACT

Under contract with the United States Fish and Wildlife Service (USFWS), Pacific Consulting Services, Inc. (PCSI) completed archaeological investigations at the Commercial Pacific Cable Company station (Cable Station, State of Hawaii Site 50-93-01-001) and two U.S. Marine barracks (Marine Barracks, State of Hawaii Site 50-93-01-002) located on Sand Island within the Midway Atoll National Wildlife Refuge. The project was undertaken in anticipation of a lead removal and encapsulation program that will, in part, remove contaminated sands from around the Cable Station buildings and Marine Barracks. The fieldwork was conducted between 6 October and 12 October, 2011.

The goal of the project was to identify and characterize subsurface cultural resources, evaluate their potential National Register of Historic Places (NRHP) significance, and provide recommendations to the USFWS. The project was conducted in compliance with Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's regulations for compliance with Section 106, codified as 36 CFR (Code of Federal Regulations) Part 800.

The archaeological investigations included shovel testing at the Cable Station and the Marine Barracks, as well as test excavations at the Cable Station. A total of 53 shovel tests were excavated at and around the Cable Station, while 10 shovel tests were excavated at the Marine Barracks. Seven test units measuring 1-m-x-2-m were excavated at the Cable Station.

A total of 2,107 artifacts were recovered from shovel testing and test excavations. Five subsurface features were recorded, including a bottle dump dating to the period of original occupation of the Cable Station. In addition to non-diagnostics artifacts, the assemblage included Euro-American historic bottles and ceramics, as well as Overseas Chinese ceramics and glass vials.

Prior to excavations, the only information concerning the Cable Station was from historical accounts and brief correspondences of those who worked on or visited the station. The excavation of Features 2 and 3 at the Cable Station confirm some of the accounts, while clarifying others concerning ethnic groups working and living on Midway at the turn of the twentieth century. Likewise, the results of shovel testing provide data concerning likely areas of future research, or at least areas of heightened concern during future development. Thus, Site 50-93-01-001 has provided important information concerning the Cable Station, and is likely to yield additional information in the future. Site 50-93-01-001 is recommended as eligible for inclusion on the NRHP under Criterion D (in addition to the other criteria already considered during architectural studies).

It is recommended that archaeological monitoring occur during soil removal and building demolition, and that data recovery excavations be undertaken on potentially significant features uncovered during the soil removal project. In addition, it is recommended that the soil removal within the compound be monitored in order to retrieve additional artifacts dating to the early to mid-twentieth century as well as documenting the system of pipes likely to be encountered.

Based on the general lack of cultural material recorded during shovel testing as well as a lack of subsurface integrity, it is recommended that the subsurface archaeological deposit (Site 50-93-01-002) surrounding the Marine Barracks does not significantly contribute to the historic property under Criterion D of the NRHP. However, the Marine Barracks have already been determined eligible for the NRHP under Criteria A and C. No further work is recommended for the Marine Barracks.

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INTRODUCTION

Under contract with the United States Fish and Wildlife Service (USFWS), Pacific Consulting Services, Inc. (PCSI) has completed archaeological investigations at the Commercial Pacific Cable Company station (Cable Station, State of Hawaii Site 50-93-01-001) and two U.S. Marine barracks (Marine Barracks, State of Hawaii Site 50-93-01-002) located on Sand Island within the Midway Atoll National Wildlife Refuge (Figures 1 and 2). The project was undertaken in anticipation of a lead removal and encapsulation program that will, in part, remove contaminated sands from around the Cable Station buildings and Marine Barracks. The fieldwork was conducted between 6 October and 12 October, 2011.

The goal of the project was to identify and characterize subsurface cultural resources, evaluate their potential National Register of Historic Places (NRHP) significance, and provide recommendations to the USFWS. The project was conducted in compliance with Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's regulations for compliance with Section 106, codified as 36 CFR (Code of Federal Regulations) Part 800. The scope of the investigations (SOW; Appendix A) was consistent with the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. Key project personnel meet or exceed the qualification standards established by the *Secretary of the Interior's Standards and Guidelines* published in 36 CFR Part 61.

ENVIRONMENTAL SETTING

Midway Atoll includes an approximately 6.2 km² apron or fringing reef and lagoon, as well as two islands (Sand Island and Eastern Island) and smaller islets at the southern end of the atoll (Speulda-Drews 2010; Yoklavich and Reinman 1997). Sand Island is composed primarily of wind-blown sand deposits from Eastern Island. The average monthly temperature at Midway Atoll is 72 degrees F with a mean relative humidity of 76 percent (Yoklavich and Reinman 1997). Rainfall averages about 42 inches a year and falls primarily between December and February (Yoklavich and Reinman 1997).

The vegetation regime on Sand Island near the project areas is composed mostly of introduced species such as ironwood (*Casurina* sp.), Verbesina (*Verbesina encelioides*), and grasses imported to stabilize the drifting sands and help establish top soil brought from Hawaii and Guam. Around the Cable Station, there are several clusters of trees and shrubs likely introduced as ornamentals during the early twentieth century (Indian Banyan [*Ficus benghalensis*], coconut palms [*Cocos nucifera*], Norfolk Island or Cook Island Pines [*Araucaria* sp.], Spider lily [*Crinum asiaticum*], Surinam cherry [*Eugenia uniflora*], Nephthytis [*Syngonium podophyllum*], Bougainvillea [*Bougainvillea spectabilis*], Turk's Cap [*Malvaviscus penduliflorus*], and Sago palm [*Cycas circinalis*) (Figures 3 and 4).

Midway Atoll is host to 19 species of nesting seabirds, including the largest Laysan Albatross (*Phoebastria immutabilis*) colony in the world (estimated 1.5 million birds [USFWS 2011]). In addition to the ground-nesting albatross and other seabirds, Midway also supports a large Bonin Petrel (*Pterodroma hypoleuca*) population (estimated at approximately 96,200 in 2001 [USFWS 2011]).

Both the Laysan Albatross and Bonin Petrel likely have affected subsurface archaeological deposits. While the albatross is ground-nesting, the large population of birds has introduced quantities of marine debris (plastics) to the inland portions of the island through their feeding behavior. In addition, a high mortality rate means that non-cultural albatross bone may

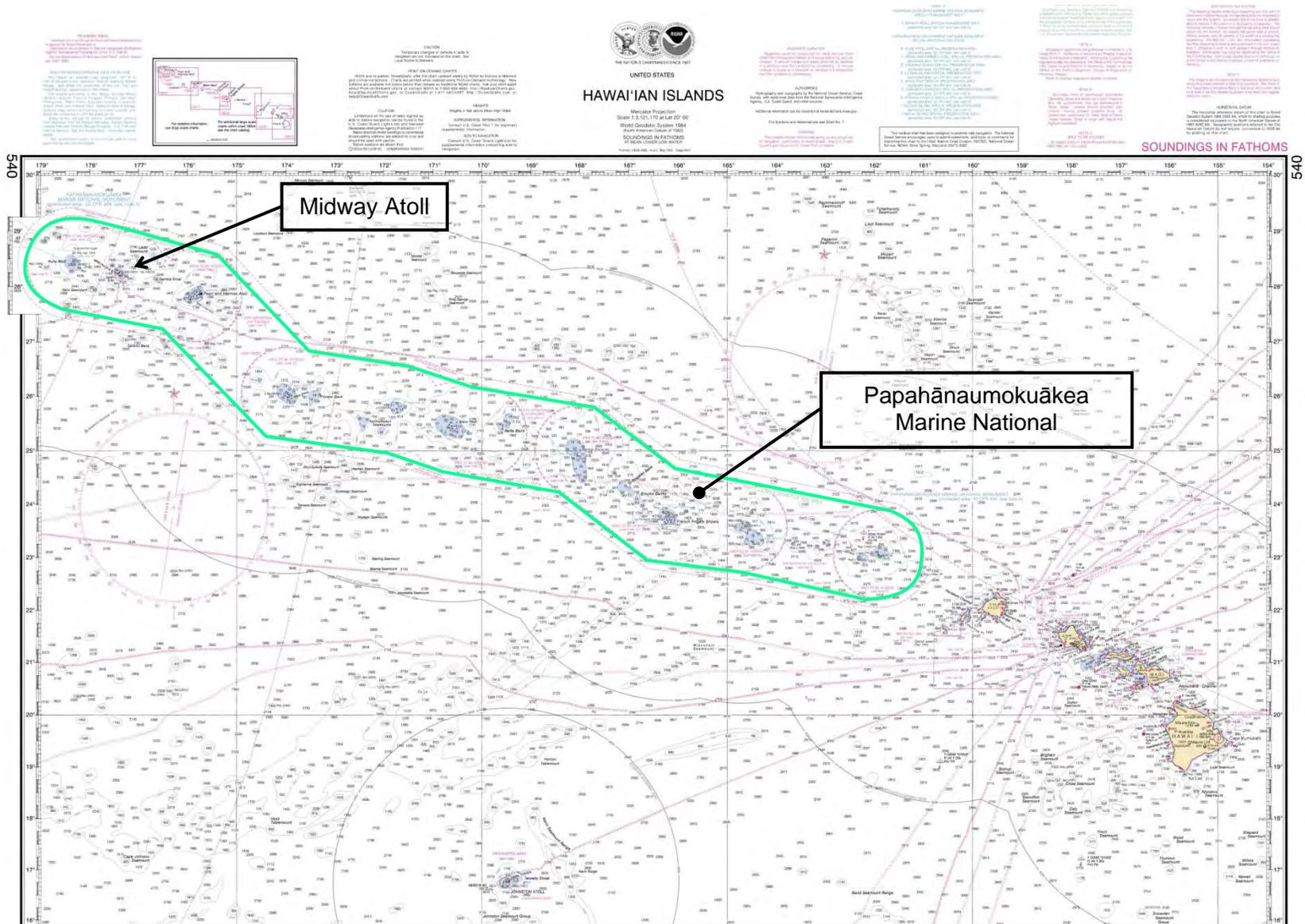


Figure 1. National Oceanic and Atmospheric Administration Nautical Chart of the Hawaiian Islands (2008).

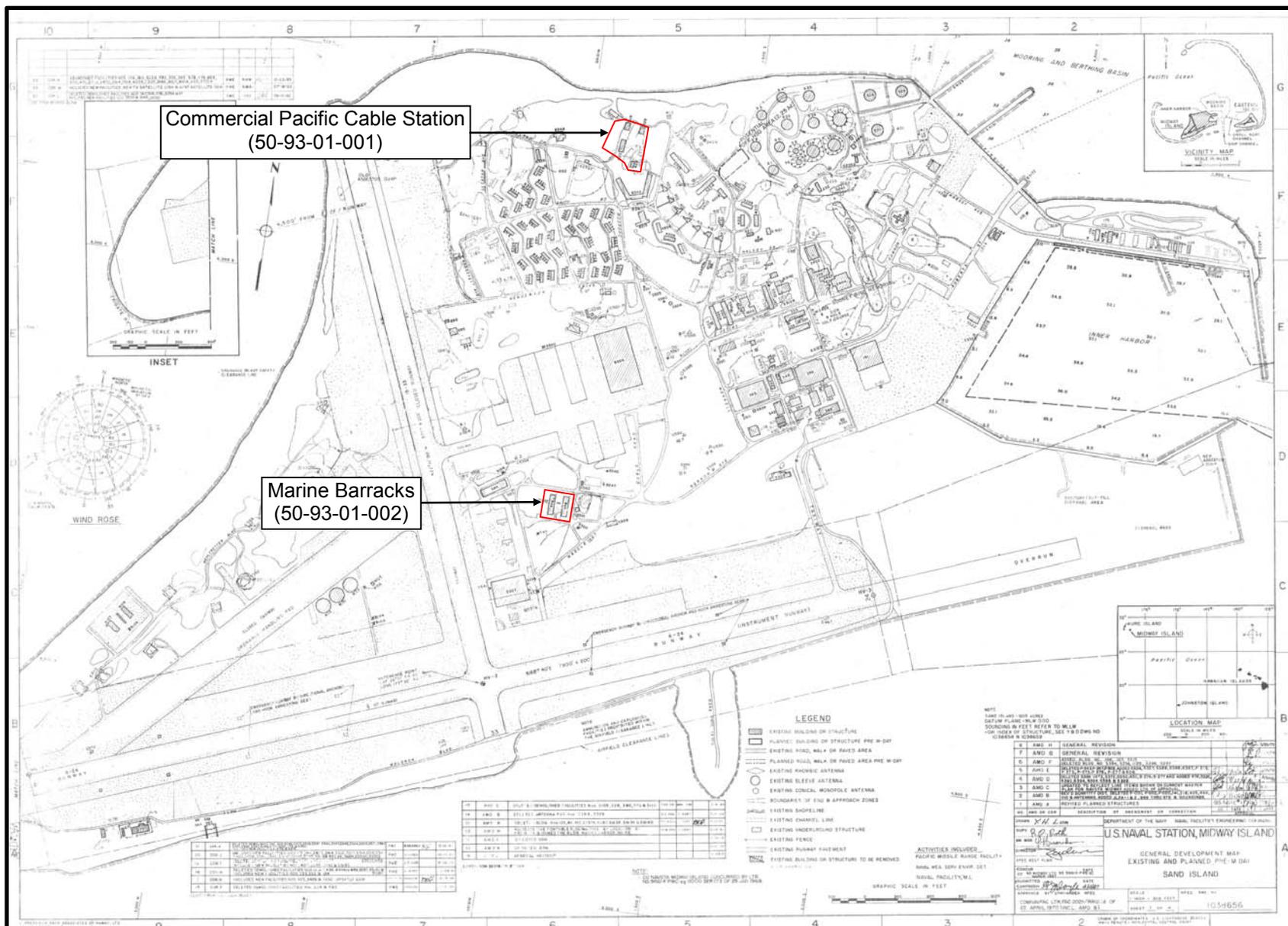


Figure 2. US Naval Air Station, Midway Island (1967) Showing Sites 5-93-01-001 and 5-93-01-002.



Figure 3. Exotic Vegetation Including Coconut Palm, Norfolk or Cook Island Pine, Ironwood, and Spider Lily South of Building 619.



Figure 4. Exotic Vegetation Including Turk's Head, Coconut Palm, and Surinam Cherry, West of Building 643.

be introduced into subsurface archaeological deposits by filtering through unconsolidated sands. Bonin Petrel, which burrow up to a meter underground to nest and have an average nesting density of 86 nests/hectare, are particularly detrimental to subsurface archaeological deposits. Some of the highest concentrations of petrel burrows on Sand Island are within the Cable Station compound.

HISTORIC CONTEXT

The historic context for Midway Atoll has been well documented in Speulda-Drews (2010) and Yoklavich and Reinman (1997). The current study briefly draws upon and summarizes these resources to establish the possible contexts for materials recovered from the Cable Station and the Marine Barracks. While the current study does not include a prehistoric context because no known prehistoric sites have been recorded on Midway Atoll, it is possible that precontact voyagers encountered the islands. Precontact deposits are not expected as part of the current study.

Prior to the twentieth century, occupation of Midway Atoll was sporadic. An early map of Midway was prepared by Coy and Burdett in 1867 for the Pacific Mail Steamship Company and was subsequently redrawn by E. Willenbacher of the U.S. Coast Survey in 1868 (Figure 5). The map shows three structures in the general vicinity of the Cable Station along with another structure labeled “coal” well to the west of the compound. The structures were frame houses constructed of materials brought onboard of the *Milton Badger* (Nautical Magazine 1868:275); Figure 6, labeled “Midway Island Harbor and Coal Depot” may be a sketch of the three buildings. The Pacific Mail Steamship Company intended to establish Midway as a “coal station, to be used in case of their steamers being disabled” (Nautical Magazine 1868:275). The US steamer *Lackawanna* also visited and surveyed Midway while the *Milton Badger* was anchored in the lagoon.

For the remainder of the nineteenth century, little development occurred on Midway, although a dredging operation briefly reused buildings constructed by the Pacific Mail Steamship Company and may have constructed new buildings as well (Speulda-Drews 2010). The shipwrecked passengers and crew of both the *General Seigel* (1886) and the *Wandering Minstrel* (1888) inhabited Sand Island until their rescue in 1889.

Commercial Pacific Cable Company

Although talks and legislation concerning a trans-Pacific communication cable had been initiated during the mid to late nineteenth century, it was not until 1903 that the first temporary Cable Station buildings were erected on Sand Island (Figures 7 and 8; Speulda-Drews 2010, Yaklovich and Reinman 1997). Five permanent buildings constituting the Cable Station (Buildings 619, 623, 626, 628, and 643) were completed by 1905. The buildings were designed by Henry Meyers, a San Francisco Bay Area-based architect known for his early use of concrete and rebar in industrial, governmental, and commercial structures (Figures 9 and 10). Wilder (1905:7-8) described the complex as consisting of:

...four commodious, two story, slate roofed and fire proof buildings, which were constructed by Miliken Brothers of New York.

These four buildings form a rectangle, the inside court of which is about 50 x 100 yards. In the centre of this court are large cisterns for conserving the rain water, caught from the roofs of the buildings. At one end of the court is a well, from which the water is raised by means of a windmill....

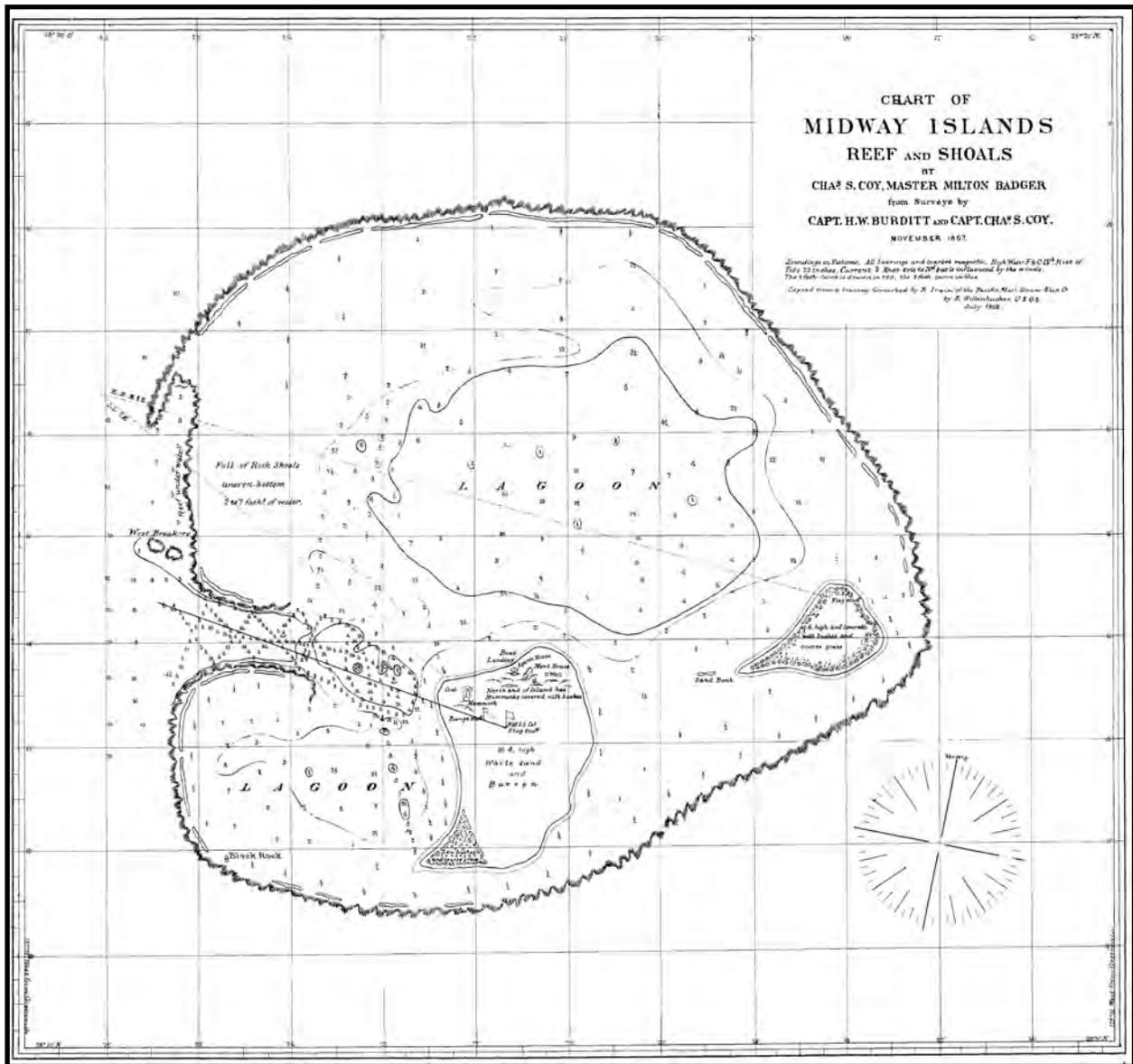


Figure 5. 1867 Chart of Midway Islands Showing Structures Located Near the Commercial Pacific Cable Station Area (Willenbacher 1868).

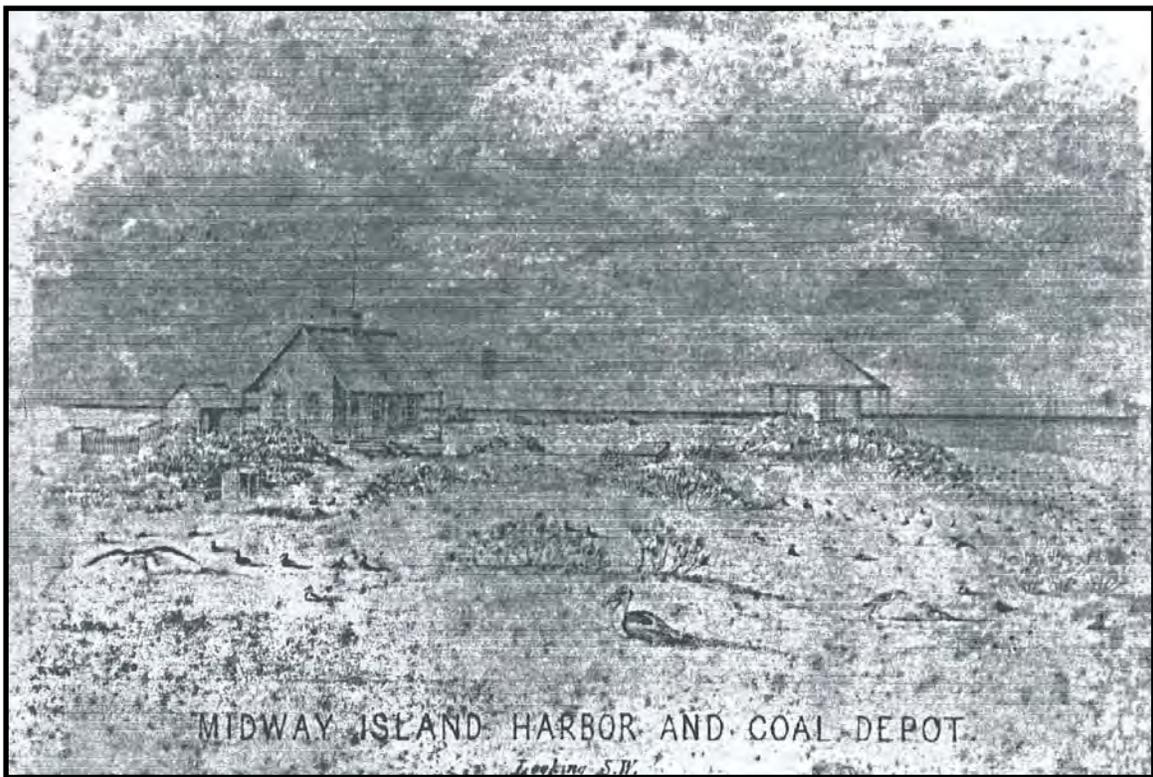


Figure 6. Sketch of Buildings on Midway by M. Dickson ca. 1867 (from Yoklavich and Reinman 1997; original source: Hawaii State Archives).

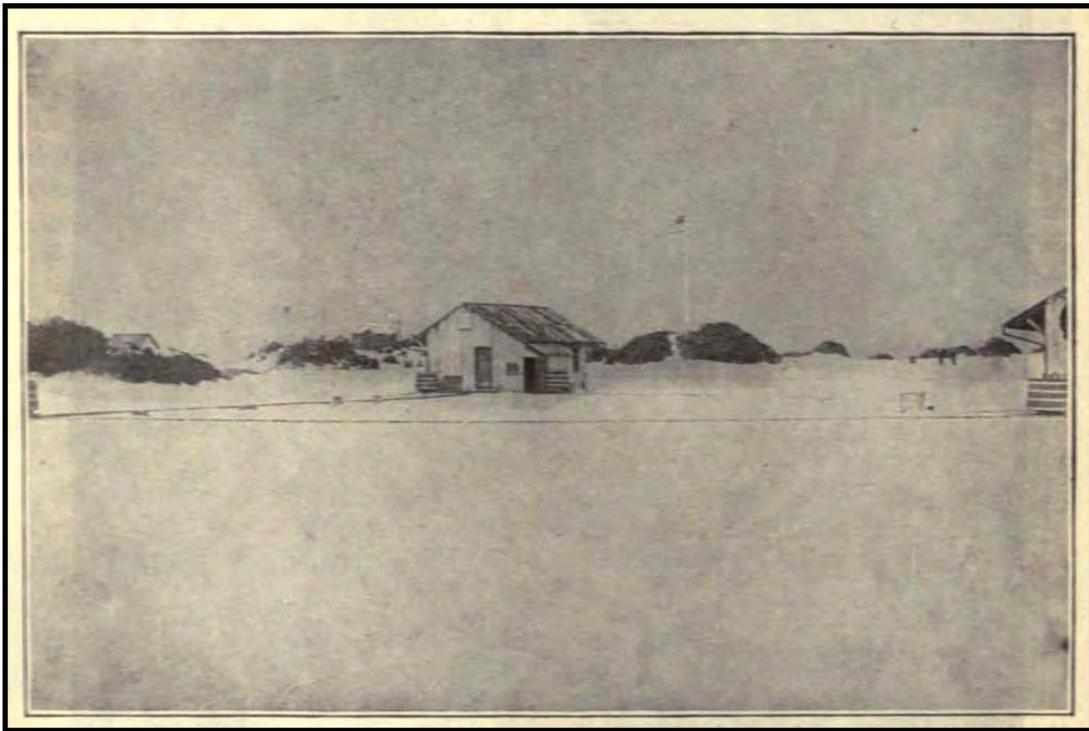


Figure 7. The First Office of the Commercial Pacific Cable Company (Crook 1905).

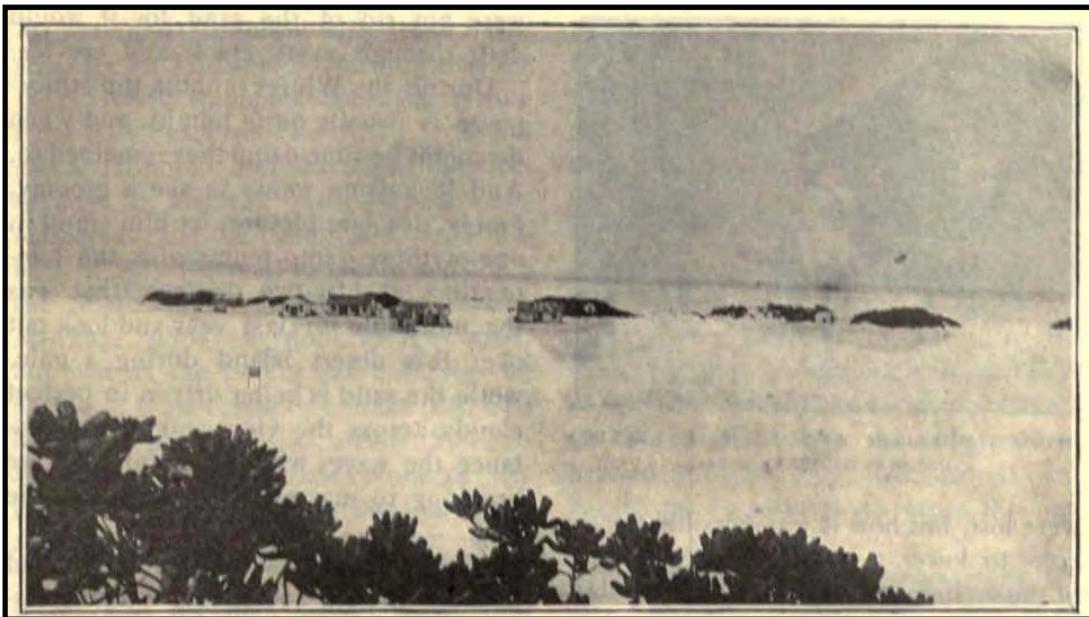
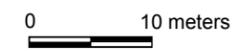
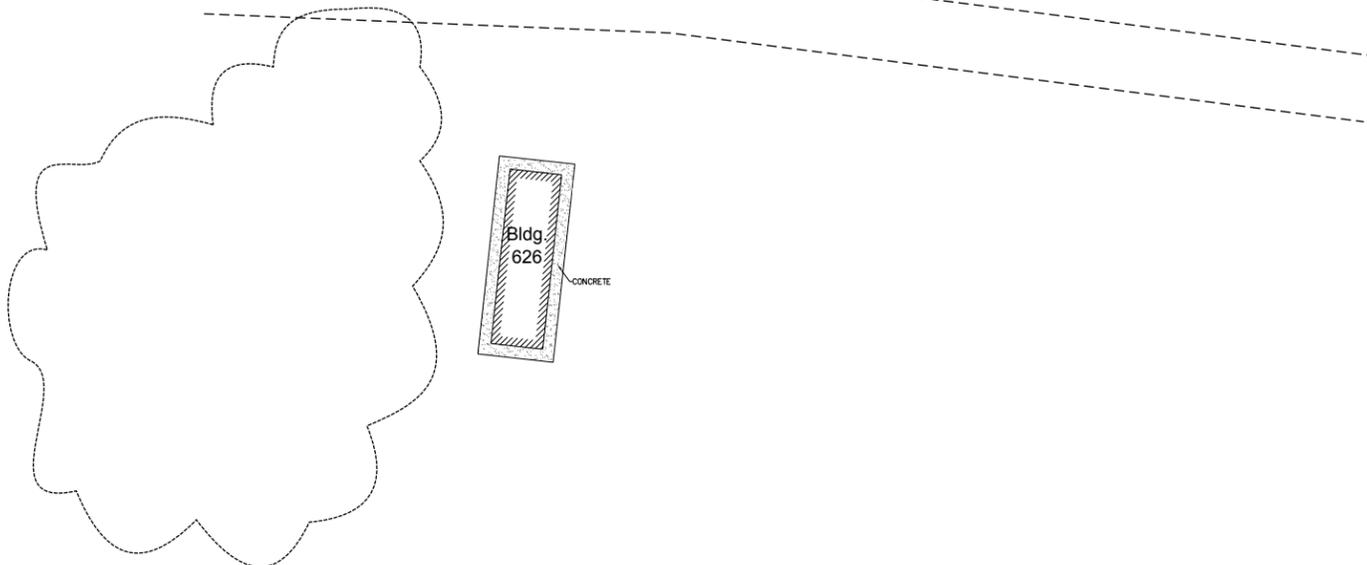
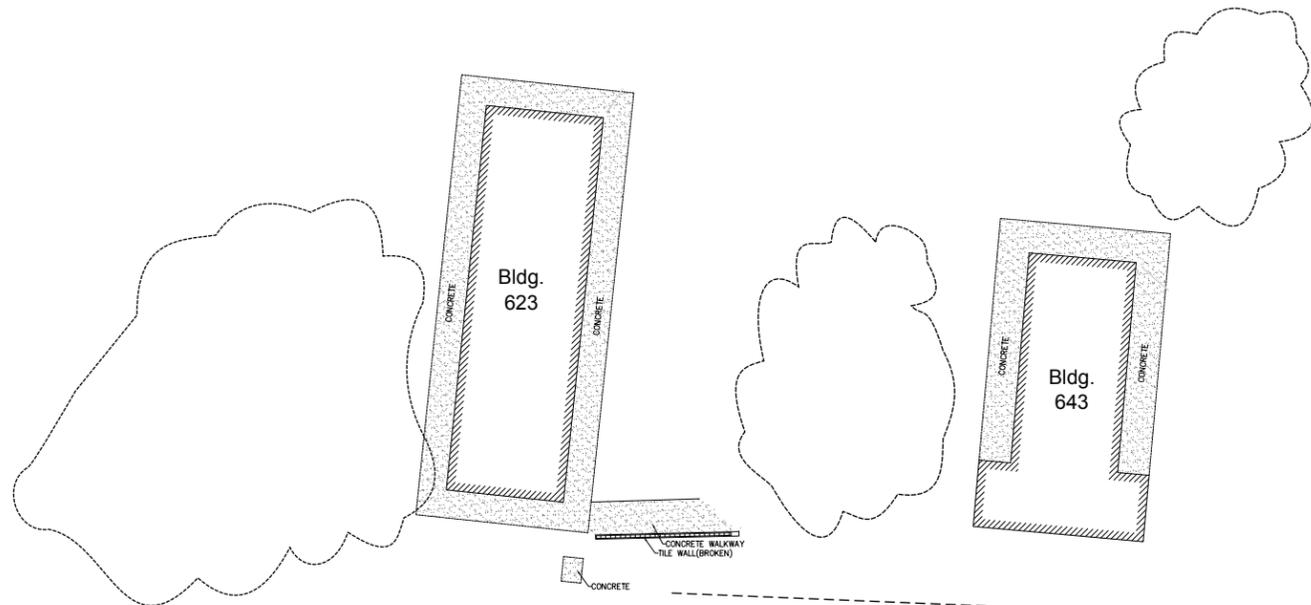
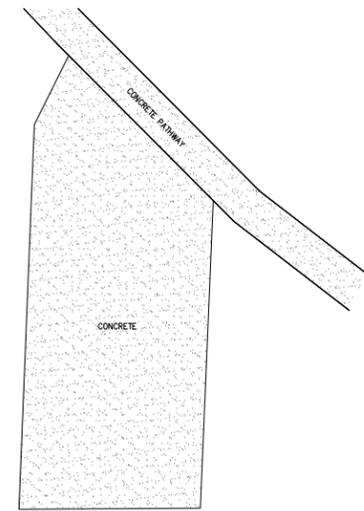
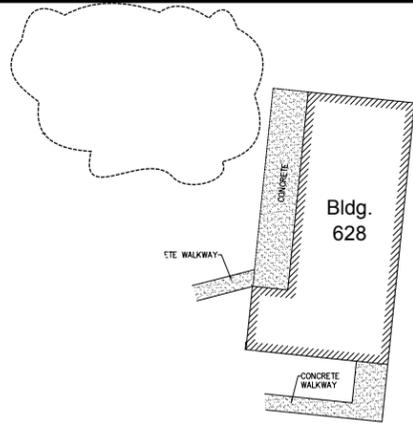
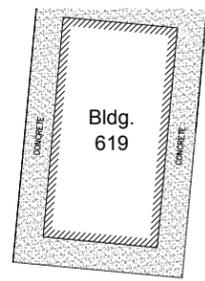


Figure 8. A General View of the Cable Station Including all the Houses on Midway Island (Crook 1905).



Figure 9. Cable Station Compound from the South Showing the Five Permanent Buildings, Additional Buildings to the West, and Rows of Vegetation Likely Planted to Stabilize the Sand (Robert Johnston 1913).



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Figure 10. Site 50-93-01-001, Plan View.

Besides the Manager's house there is one for the office, in which the cable instruments and machinery are kept, another for the operators, and in the fourth is the general dining-room and kitchen....In a detached building the servants are housed. All these buildings have modern plumbing.

In a 1922 report, Morrison (1922:2-3) noted that the temporary buildings erected in 1903 were being used for various functions, and that a refrigeration and ice making plant was located near the rear of the mess building. Furthermore, the report indicates that the lighting system for the Station was Acetylene gas, a system developed in the late nineteenth century that converted calcium carbide to acetylene (Figure 11; Dillion 2010). The report also noted that rain water collected from the slate roofs was conducted into a 50,000 gallon reservoir in the center of the Station compound. A 1923 report notes 19 structures associated with the Cable Station, including outhouses, barns, and sheds (Yoklavich and Reinman 1997:13).

The Commercial Pacific Cable Company ended operations on Midway in 1951. However, most of the buildings continued to be used, primarily by the US Navy, until 1978 (Figures 12 and 13). The Historic American Buildings Survey (HABS; UM-1-A) forms note interior remodeling in the 1950s and 1960s and that the original slate shingle roofs were replaced with asphalt tiles in 1976. The descriptions for each building suggest multiple uses:

- Building 619
 - Main Cable Station office 1905-1951
 - Apartments for US Navy enlisted men after 1951
 - Not used after 1978
- Building 623
 - Cable Station residential 1905-1942/1943
 - US Navy Hospital ward during WWII
 - School rooms for George H. Cannon School by 1956
 - Apartments for enlisted men by 1966
 - Not used after 1978
- Building 626
 - Cable Station servants quarters 1904/1905-1951?
 - Enlisted men's quarter 1951-1978
 - Civilian residence until early 1980s
- Building 628
 - Cable Station Superintendent's residence/office 1904/1905-1941
 - Naval Dispensary during WWII
 - Enlisted men's apartments until 1978
 - Not used after 1978
- Building 643
 - Cable Station Mess Hall and Social Hall 1905-WWII
 - Galley during WWII-1948?
 - Vacant until mid 1960s when converted to apartments for enlisted men
 - Not used after 1978

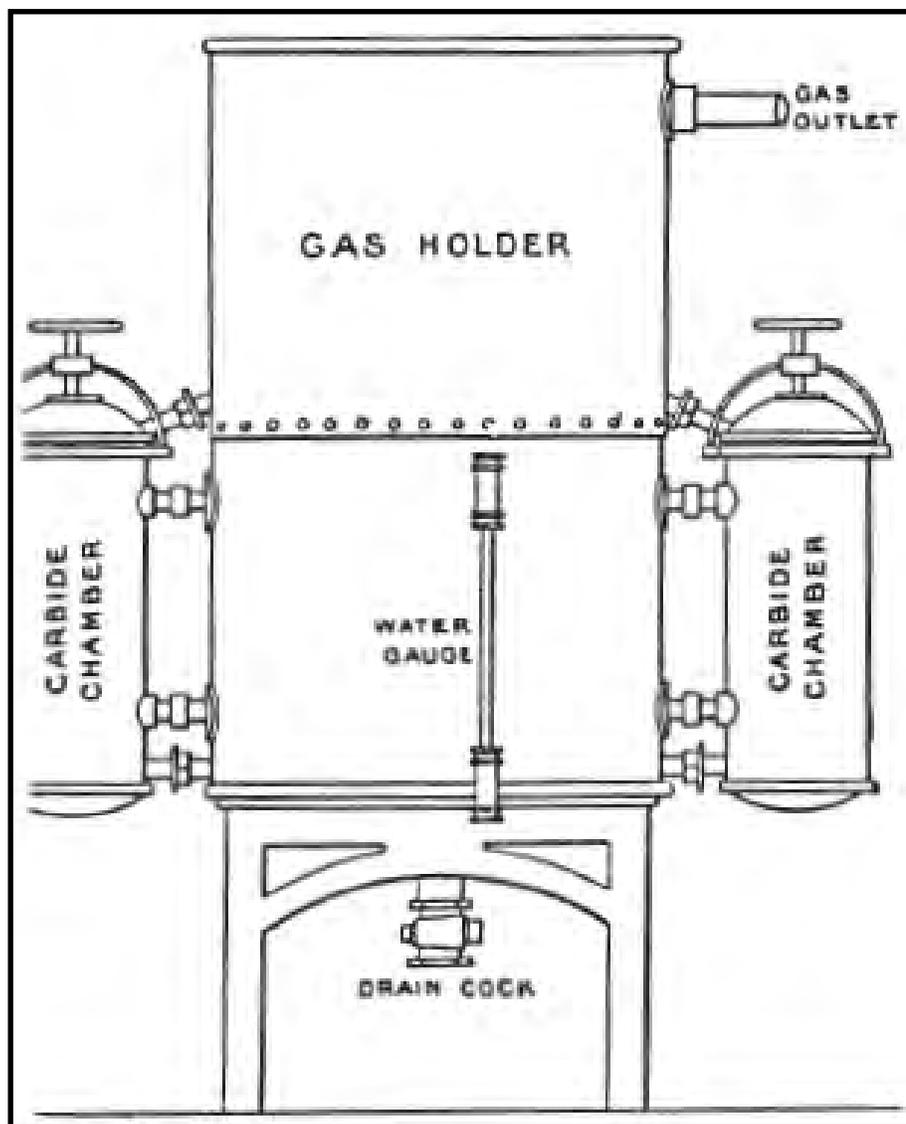


Figure 11. Drawing of Acetylene Gas Generator (from Dillion 2010).



Figure 12. Picture of Building 643 Looking Southeast Probably During Use as Military Housing (Photographer Unknown, Date: before 1976—note slate shingle roof) (<http://www.midway-island.com/DaakWebPage/images/Historical/CableHouses/pages/CableHouse16.html>.)



Figure 13. Probably Building 623 Looking West During Use as School Classrooms (Photographer and Date Unknown; http://www.midway-island.com/Daak_WebPage/images/Historical/CableHouses/pages/CableHouse16.html)

Marine Barracks

Less is known about the history and use of the Marine Barracks (Buildings 578 and 579) than about the Cable Station (Figures 14 and 15). The two structures, along with 18 others on Midway, were designed in 1940 by Albert Kahn, a nationally prominent architect specializing in large industrial structures (Speulda-Drews 2010). Buildings 578 and 579 appear to have functioned as residential units throughout their history, although Yoklavich and Reinman (1997:53) note that later plans for the buildings show that “the original large dormitory spaces [had] been divided up into smaller rooms,” possibly indicating a conversion to smaller residential units or a change in function to offices or meeting spaces. The buildings were abandoned in about 1980.

RESEARCH QUESTIONS

Three primary research questions guided the current study:

1. Is there any evidence of the occupants or operation of the Cable Station within the compound that will be disturbed or dug-up by the building demolition or sand removal? Are the remains scattered or are there areas of artifact concentrations? Do the remains constitute a significant deposit as per the NRHP?
2. Is there evidence of the Cable Station employees outside of the compound, perhaps an area where they discarded household items? And
3. The Marine Barracks were built in 1940, modified over the years, and abandoned in about 1980. Are artifacts associated with men stationed in the barracks deposited near the exits where individuals probably gathered? Are the artifact categories primarily personal items that may represent casual loss? Do the remains constitute a significant deposit as per the NRHP?

National Register of Historic Places Significance (NRHP)

Resources were assessed against the NRHP criteria to determine their potential for eligibility. These criteria require that the quality of significance in American history, architecture, culture, and archaeology should be present in buildings, structures, objects, sites, or districts that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that the buildings, structures, objects, sites, or districts:

- A. are associated with events that have made a significant contribution to the broad patterns of our history;
- B. are associated with the lives of persons significant in our past;
- C. embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. have yielded, or may be likely to yield, information important in prehistory or history (Federal Register 1981).

The architectural components of the Cable Station and the Marine Barracks have been determined to be eligible for inclusion on the NRHP under criteria A and C but have not been evaluated with regard to criterion D, which typically comprises archaeological resources and their potential to contribute to the understanding of a particular theme or themes.



Figure 14. Marine Barracks, View to East in 1947 (Yoklavich and Reinman 1997; source: National Archives 80-G-497453).



Figure 15. Marine Barracks, View to Southeast in 2007 (Photographer: James Lloyd; <http://www.pbase.com/freespirit/image/80601423>).

The significance of the Cable Station is summarized in the HABS form (extracted from the NRHP determination letter (Luce 1980):

These five buildings are the only remnants of the United States' permanent colonization of the Midway Islands and their incorporation into the United States' growing communications, transportation, military, and commercial network in the Pacific following the Spanish-American War. The rapid installation of the Commercial Pacific Cable Company's relay station in 1903 completed the trans-Pacific Cable system. The first round-the-world message, sent by President Roosevelt, was a triumph of American entrepreneurship and vision of advances in communications technology. . . . The buildings themselves are also significant in architecture, despite alterations and deterioration, as an expression of the functional architecture used in such outposts, combining concrete and steel construction with steep pitched roofs and open first and second-story verandas in an effective adaptation to the tropical environment.

Likewise, the significance of the Marine Barracks is summarized in the HABS form (UM-1-F):

These barracks were designed by the firm of Albert Kahn, a noted Detroit architect. He was "one of the country's foremost industrial designers" (Woodbury 1946:76), and "had been a consultant to the military services since World War I" (Garner 1993:48). Kahn's firm was chosen by the Navy to prepare standardized plans for the air bases to be built in the Pacific, as part of the pre-World War II build-up in the late 1930s and early 1940s. This use of standardized plans was a necessity given the speed with which bases had to be built.

In both cases, there is little or no discussion of the individuals associated with the complexes or the material culture associated with the use of the complexes over time. The goal of the current research is to investigate subsurface contexts and determine if recovered remains contribute to the significance of these sites under criterion D.

Material Expectations

Based on the historic background of Midway, it is clear that the history of the Cable Station included several functional changes beyond its original purpose; occasionally these functions overlapped. For example, while the Cable Station was operational during WWII, some of the structures were also used as medical facilities. In addition, while the Cable Station was in operation for nearly 50 years, it operated with a relatively small crew of between 16 and about 30 individuals. Presumably, this was a less intense occupation of the Cable Station area (in terms of material accumulation and discard) than its subsequent use as a military facility. These two characteristics would suggest that it is likely that evidence of the original Cable Station use may be mixed with evidence of subsequent uses, and that the subsequent, more intensive uses may have a more ubiquitous presence in the subsurface deposits.

Existing evidence and documentation do not appear to contribute much concerning discard behavior during the Cable Station's primary use. Wilder (1905) does note "modern plumbing," for the five buildings but does not expand on the type of discharge or removal system involved (e.g., septic tank and leach field). Whether the outhouses mentioned as part of

a 1922 report were associated directly with the Cable Station is unclear. While it is likely that refuse was removed systematically to a specific or multiple specific locations (dumps), it is unclear where those locations were; a range of possibilities exist from localized dumps near buildings to dumping waste in the ocean. In addition, less systematic discard or loss of materials likely occurred around buildings and walkways.

The material expectations for the Marine Barracks should reflect a relatively homogenous use over the duration of occupation. The goal of the testing plan for the Marine Barracks was to investigate areas around the buildings entrances where Marines may have gathered to socialize and possibly discarded materials. If this type of behavior occurred in the same general areas over time, it is expected that a stratigraphic deposition may have accumulated with older materials near the base and more recent materials near the surface. However, this type of profile may be atypical in this case due to the unconsolidated nature of the soils (sands) as well as post depositional disturbance caused by burrowing Bonin Petrels.

METHODS

FIELD METHODS

Archaeological investigations on Midway Atoll comprised three efforts: shovel testing at the Cable Station, test excavations at the Cable Station, and shovel testing at the Marine Barracks.

Shovel Testing

Thirty shovel tests (designated ST 1-1 through ST 1-30) were excavated within the Cable Station compound, while 23 shovel tests were excavated around the exterior of the Cable Station (designated ST 1-A through ST 1-W). The goal of shovel testing in and around the Cable Station was to collect data to address research questions (see below) and to determine the nature and NRHP significance of possible subsurface cultural deposits in order to provide recommendations concerning future work and management of the site. Within the compound, shovel tests were spaced approximately 10 m apart, except in areas with exceptionally dense vegetation. Outside the compound, shovel tests were discretionary and placed in areas suspected of containing previous buildings or in areas thought to be candidates for subsurface cultural deposits.

Shovel testing around the Marine Barracks was limited to 10 shovel tests (designated ST 2-1 through ST 2-10) excavated near entrances at the Marine Barracks (see Figures 14 and 15). The goals at the Marine Barracks were to collect data to address research questions (see below) and to determine the nature and NRHP significance of possible subsurface cultural deposits in order to provide recommendations concerning future work and management of the site.

Shovel tests were approximately 30 cm in diameter and excavated by natural stratigraphic layers to at least 100 cm below the ground surface, unless obstructed. Materials were screened through ¼-inch screen and recovered artifacts were collected in bags labeled with provenience data consisting of site number, shovel test number, layer designation, layer depth range, date, and excavator. Soil descriptions were made using standard USDA terminology, while colors were determined using Munsell Color Charts. Shovel test locations were located using GPS or conventional surveying methods (Total Station).

Test Excavations

Test excavations were only undertaken in and around the Cable Station. All test excavations measured 1-m-x-2-m and were excavated with shovel and trowel to a minimum of 100 cm below the ground surface. Like the shovel tests, materials were screened through ¼-inch screen and artifacts were collected in bags labeled with provenience data. As well, soil descriptions were made using standard USDA terminology, while colors were determined using Munsell Color Charts. Test unit locations were located using GPS or conventional surveying methods (Total Station). If encountered, subsurface features were given unique designations and excavated separately from the surrounding stratigraphic layers. Information from each test excavation was recorded on standardized forms and digital photographs were taken (Appendix C [attached CD]) of wall profiles and other significant occurrences.

In addition to shovel testing and excavations conducted by PCSI, materials were also collected by the USFWS from the perimeter of the Cable Station during trench excavations in support of the lead removal project. Artifacts were also collected while the USFWS removed petrels from burrows as part of the same project.

Laboratory Methods

Recovered cultural material was returned to Honolulu for analysis in the PCSI laboratory. Once in the laboratory, artifacts were cleaned and cataloged prior to analysis. Because much of the recovered assemblage constituted recent or modern non-diagnostic debris, both temporally and functionally diagnostic artifacts were culled and analyzed at a more intensive level than non-diagnostic materials. All artifact bags were assigned bag numbers, while diagnostic artifacts were assigned individual accession numbers (Appendix D). Identified bone was identified using the Bishop Museum's faunal reference collection.

RESULTS

CABLE STATION (STATE OF HAWAII SITE 50-93-01-001)

The archaeological component of the Cable Station was designated as Site 50-93-01-001 and currently is defined arbitrarily based on building location, a berm to the north of the site, and the limits of shovel testing. A total of 53 shovel tests and seven test units were excavated at the site (Figure 16). It is likely that the boundary of the site could expand as a result of future developments and investigations. No subsurface investigations conducted as part of the current study were culturally sterile, although the predominant artifact type recovered was introduced plastic marine debris.

As part of the project, the four corners of each existing building (Buildings 619, 623, 626, 628, 643 [Cable Station], and 578 and 579 [Marine Barracks]) were located using conventional surveying methods (Total Station), as well as GPS technology. In addition, shovel test and test unit locations were also located using the same technologies. Appendix B provides latitude and longitude data for each recorded point. Likewise, Appendix C provides photograph log data for photographs taken, and Appendix D provides artifact bag list and accession list information for all collected proveniences.

The site area is relatively flat and covered with exotic flora (Figures 17 and 18). As noted above, the Cable Station is an area where Bonin petrel nest in dense numbers and, as a result the upper stratum of the site is a mix of loosely consolidated sand and humic or loamy material. While some building materials are present on the surface of the site (near buildings), the remainder of the area is largely devoid of concentrated surface artifacts that could indicate subsurface features such as trash dumps, privies, and pits.

Shovel Testing

The results of shovel testing suggest a consistent stratigraphic profile across the site (Figure 19; also see Appendix E and Figure 16). As shown in Figure 19, Layer I, a grayish brown (10YR 5/2) loamy fine to medium sand becomes increasingly thicker from east to west and is least thick within the compound. In 45 shovel tests, Layer I was directly above a pale yellow (2.5Y 8/2) fine to medium sand (Layer II), in which very few artifacts were recovered. In three shovel tests (ST 1-11, ST 1-L, and ST 1-Q) possible subsurface features were recorded that were later expanded into test units (TU-3, TU-7, and TU-6, respectively) (Figures 20 and 21). In ST 1-16, a cement and iron architectural element was recorded and later expanded into TU-4. In ST 1-A, a complete bottle was recovered and later expanded into TU-2.

A total of 534 artifacts were recovered from shovel tests, approximately 96 percent of which were recovered from Layer I (Appendix F, Table F-1). In addition, 186 pieces of faunal bone were collected, 86 percent of which were from locally nesting species such as albatross (*Phoebastria* sp.), Bonin petrel (*Pterodroma hypoleuca*), and frigatebirds (*Fregata minor*) (Appendix F, Table F-2). Construction materials (wire nails, window glass, slate shingles, asphalt shingles, asphalt floor tiles, and miscellaneous metal hardware) account for approximately 45 percent of the assemblage.

Excavation Units

Seven test units (TU) were excavated at the Cable Station. Test Unit 1 (TU-1) was excavated abutting the southwest corner of Building 628. Five test units (TU-2, TU-3, TU-4, TU-5, and TU-7) were placed based on the results of shovel testing, while one test unit (TU-6) was placed adjacent to a cement walkway to the east of Building 619 to collect possible casual discard from the building as well as the walkway.



Figure 16. Site 50-93-01-001, Plan View Showing Shovel Test and Test Excavation Locations



Figure 17. Building 643 from the Northwest Showing Vegetation Coverage.



Figure 18. Building 619 from the Southwest Showing Deteriorated Condition.

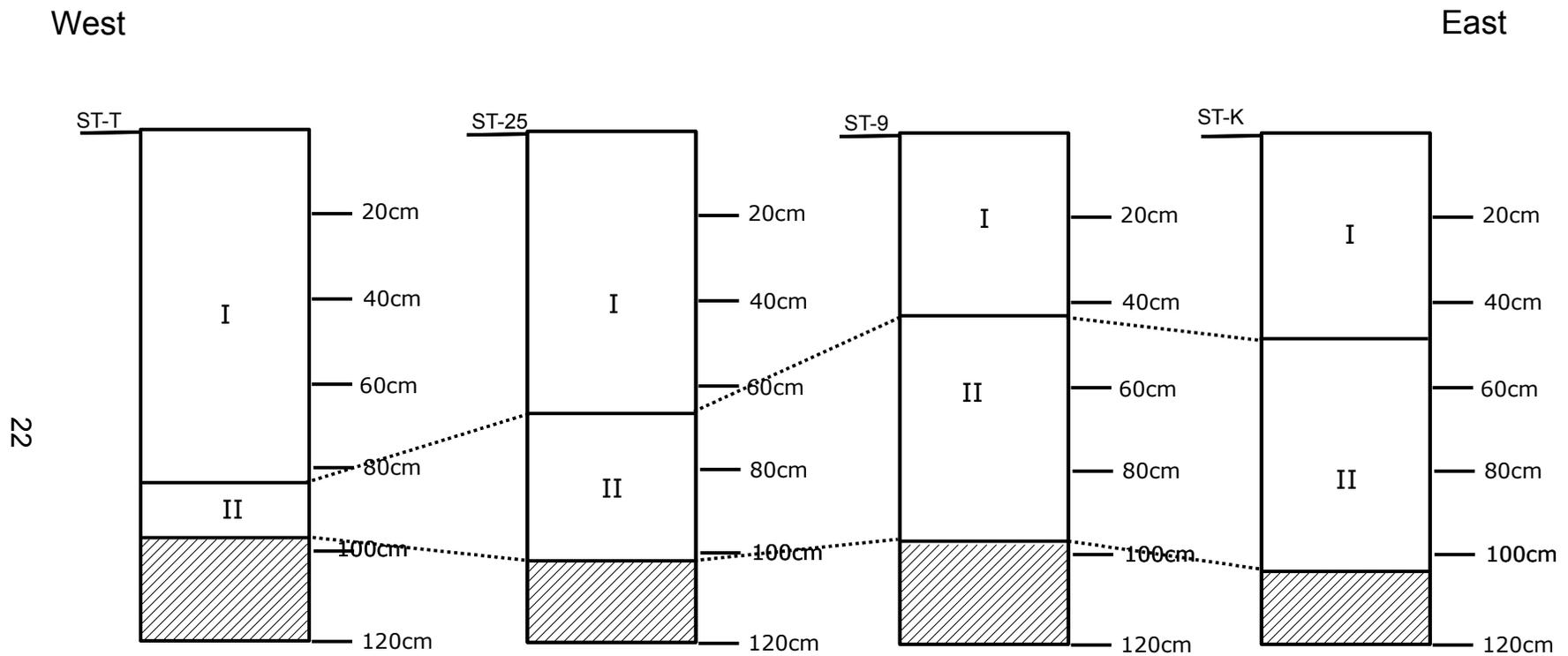


Figure 19. West-East Stratigraphic Profile of Site 50-93-01-001.



Figure 20. Shovel Testing East of Building 643, View to South.



Figure 21. Completed Shovel Test.

TU-1

The objective at TU-1 was to investigate the subsurface foundation of Building 628 and determine if a builder's trench (and associated artifacts) dating to the original construction was present. The unit was positioned to incorporate a portion of the southwest corner of the building (Figure 22). The recorded deposition included a similar two-layer stratigraphy as encountered throughout the site area. Layer I (approximately 30 cm thick) consisted of a grayish brown (10YR 5/2) loamy fine to medium sand above a pale yellow (2.5Y 8/2) fine to medium sand (Layer II). As in other excavations, Layer I represents a mixed context with artifacts from several use periods.

A total of 117 artifacts were recovered from TU-1, 109 of which were from Layer I (Appendix F, Table F-3). Notable artifacts include a glass marble, plastic toys, and a possible sherd of Overseas Chinese porcellaneous stoneware ceramic with a translucent green overglaze (celadon). In addition, 25 pieces of faunal bone were recovered from TU-1, 80 percent of which was identified as bird from locally nesting species (Appendix F, Table F-4).

Excavations at TU-1 exposed the corner of Building 628 beyond the depth limits of the slab concrete foundation, which extended to approximately 83 cm (32.7 in) below ground surface (Figure 23; also see Figure 22). The original elevation drawing for Building 628 (Figure 23) shows a slightly trapezoidal (sloped) subgrade foundation base in the southwest corner. However, the results of excavations indicate that the foundation maintains the same vertical plane as the above-ground portion of the building. In addition, no builder's trench was recorded.

In addition to artifacts, a network of ceramic and iron piping was recorded within TU-1 (see Figure 22). Two stacked ceramic sewer or water pipes (brown stoneware with a salt glaze) parallel the south and west walls of Building 628 (see Figure 22). A third ceramic pipe was recorded approximately 150 cm south of the building. The uppermost ceramic pipes join approximately 50 cm southwest of the building corner and then are routed to the southwest, towards the area that once housed a cistern. The lower ceramic pipe has been cut or broken along both walls of the building. The shallow depth of the upper pipes and the similar orientation of the lower pipes suggest that the upper system replaced the lower. Although there does not appear to be an above-ground connection to the ceramic pipes, it is possible that they functioned to convey water from the building's roof to the cistern. Because the original Cable Station buildings were equipped with "modern" plumbing, it is also possible that the ceramic pipes were part of a sewer system. The function of the iron pipes is unknown, although one possible use was as a delivery system for acetylene gas for lighting within the building.

TU-2

TU-2 was located south of Building 626 based on the results of ST 1-A, which recovered a complete historic bottle (see Figure 16). Three subsurface features (Features 2, 3, and 4) were recorded in TU-2 (Figure 24). However, Feature 4 was only recorded in the test unit's wall profile subsequent to excavations.

Layer I (approximately 40 cm thick) consisted of a grayish brown (10YR 5/2) loamy fine to medium sand. Feature 2 (originally recorded as Layer II; approximately 20 cm thick) included a reddish brown (5YR 5/4) clay deposit mixed with grayish brown (10YR 5/2) loamy fine to medium sand. Feature 4 was recorded below Feature 2 as a dark concentration of clayey loam material, possibly the remnant of a single dump of material. Feature 3, an approximately 45 cm-thick filled pit excavated into the sterile basal sands (Layer IV in TU-2, but typically recorded as Layer II in other excavations) contained a dense deposit of unbroken bottles (22) as well as Overseas Chinese ceramics. Stratigraphically, Feature 3 was separated from Feature 2 by a thin deposit of light gray (2.5Y 7/2) fine to medium sand (Layer III) with no artifacts. Feature 3

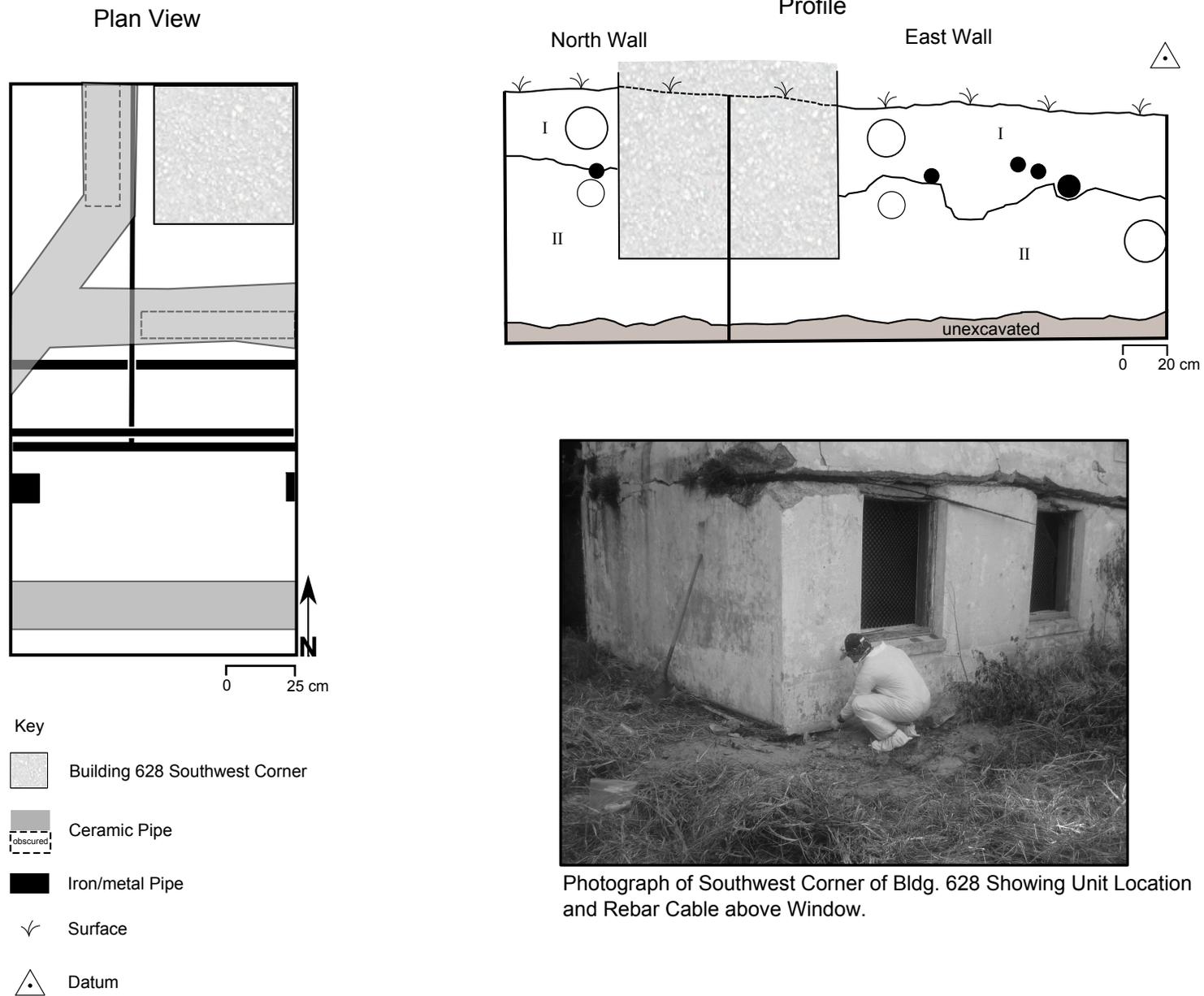


Figure 22. Plan View, Profile Drawing, and Photograph of TU-1, Cable Station.

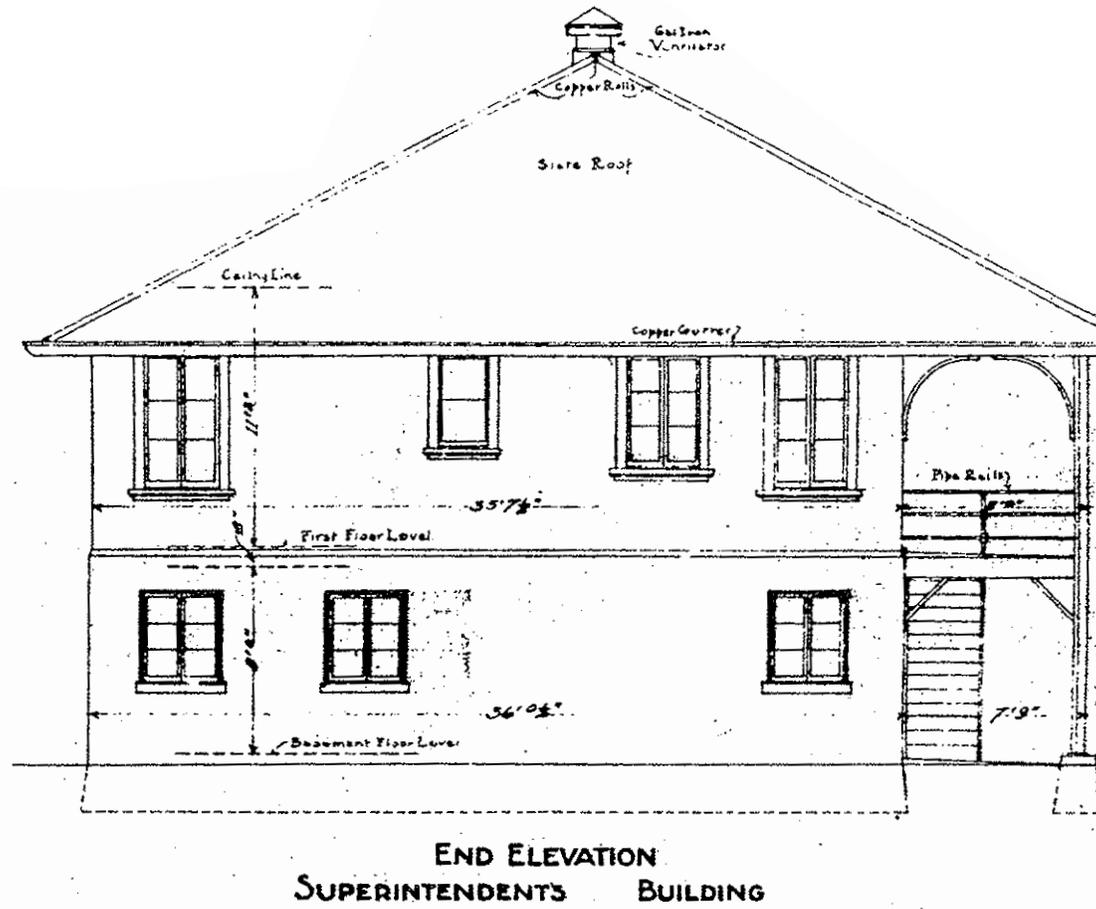


Figure 23. South Elevation, Building 628.

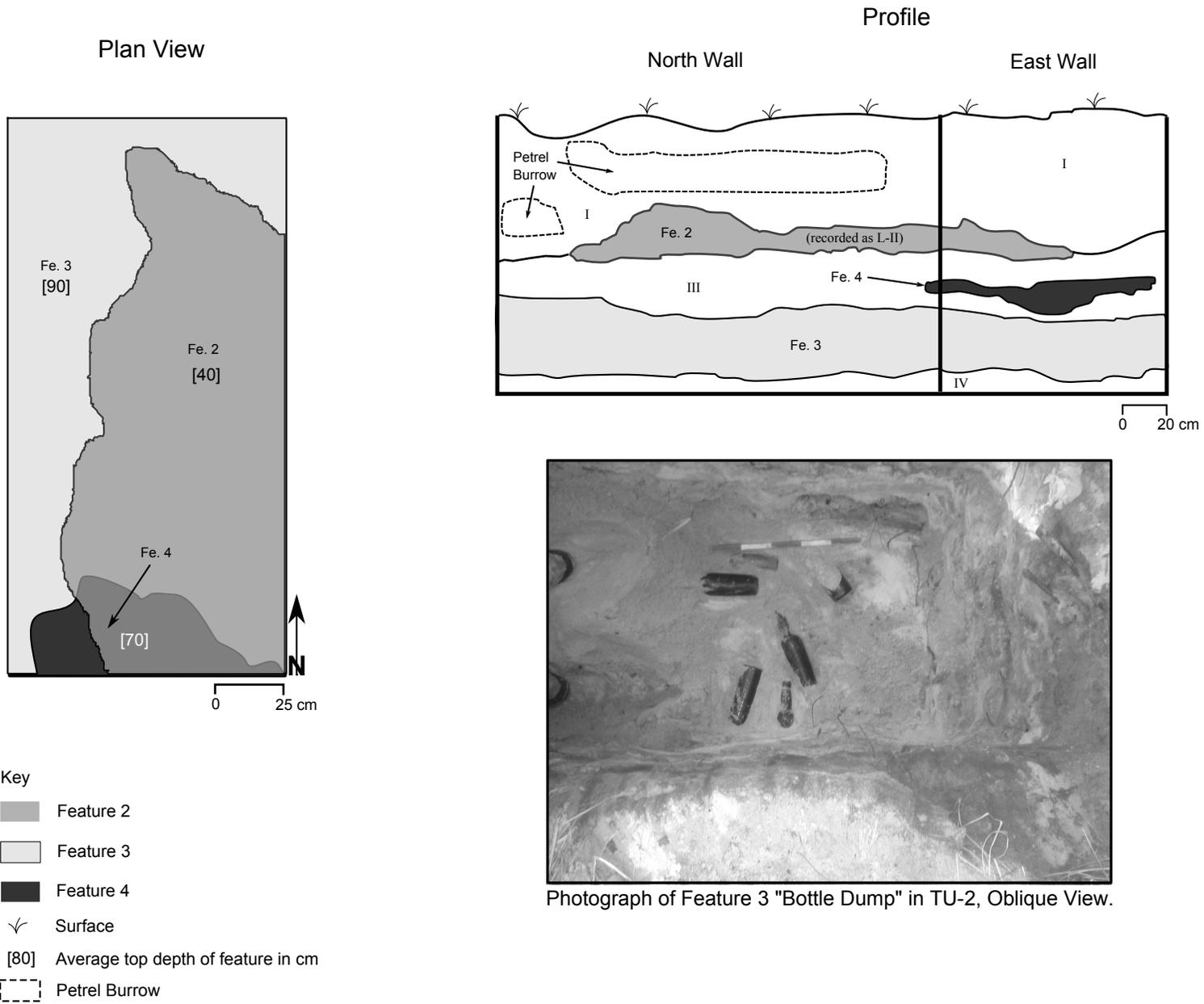


Figure 24. Plan View, Profile Drawing, and Photograph of TU-2, Cable Station.

represents a capped pit with a restricted temporal range dating to the early twentieth century. Layer IV is a sterile pale yellow (2.5Y 8/2) fine to medium sand (see Figure 24).

A total of 740 artifacts were recovered from TU-2, 239 of which were recovered from Feature 3 (Appendix F, Table F-3). While all of the other layers of TU-2 contained construction materials and plastic typical of other excavations at the site, these materials were absent in Feature 3. In addition, 307 pieces of faunal bone were recovered from TU-2. Nearly 40 percent of the bone from Feature 3 was determined to be either pig or a similar medium-sized mammal, indicating that the feature likely also included kitchen refuse (Appendix F, Table F-4).

TU-3

TU-3 was located between Buildings 623 and 619, based on the identification of a subsurface concrete feature recorded in ST 1-16 (Figure 25). At approximately 30 cm below surface, the concrete feature (Feature 5) was exposed and determined to be a portion of a low square or rectangular vault or catchment. The interior of Feature 5 was excavated separately from the remainder of Layer I, although their soil characteristics were similar and composed of a grayish brown (10YR 5/2) loamy fine to medium sand approximately 30 to 50 cm thick. Below Layer I, Layer II was composed of a pale yellow (2.5Y 8/2) fine to medium sand.

Once exposed, it was determined that Feature 5 was not oriented similar to the other original structures of the Cable Station, suggesting it likely was constructed after the five main buildings. A ceramic water or sewer pipe adjoins the low concrete vault on the north and does not appear to be oriented towards the cistern in the center of the compound. Near the base of the vault, a flat iron plate was recorded and likely served as a cover that collapsed inward.

TU-3 recovered the fewest artifacts (55) from any of the test units. Only 13 metal and plastic artifacts were recovered from Feature 5, suggesting that the interior of the vault was not exposed to the same deposition as the exterior. The artifacts recovered from TU-3 were non-diagnostic and primarily modern (Appendix F, Table F-3). Fifty-one pieces of faunal bone were recovered from TU-3, 82 percent of which were from local nesting bird species (Appendix F, Table F-4).

TU-4

TU-4 was located to the east of Building 623 and was placed on the basis of the results from ST 1-11, which recorded a possible subsurface soil anomaly. In addition, a fairly dense concentration of artifacts recovered from ST 1-11 indicated a possible subsurface feature deposit.

The recorded deposition of TU-4 included a similar stratigraphy as encountered throughout the site area. Layer I (approximately 25 cm thick) consisted of a grayish brown (10YR 5/2) loamy fine to medium sand. Layer II, identical in matrix to Layer I, but containing a denser concentration of artifacts was approximately 22 cm thick. Below Layer II was a sterile pale yellow (2.5Y 8/2) fine to medium sand (Layer III). A shallow iron pipe was recorded in Layer II.

Of the 231 artifacts recovered from TU-4, most were fairly modern residential trash or construction materials such as asphalt floor tiles. A rusted metal can opener and retractable knife handle were recovered from Layer II. The artifact deposit likely represents materials from when Building 623 was used as a school or apartments by the mid 1960s (Appendix F, Table F-3). Ninety-four pieces of faunal bone were recovered from TU-4, 53 percent of which were medium mammal such as pig (Appendix F, Table F-4).

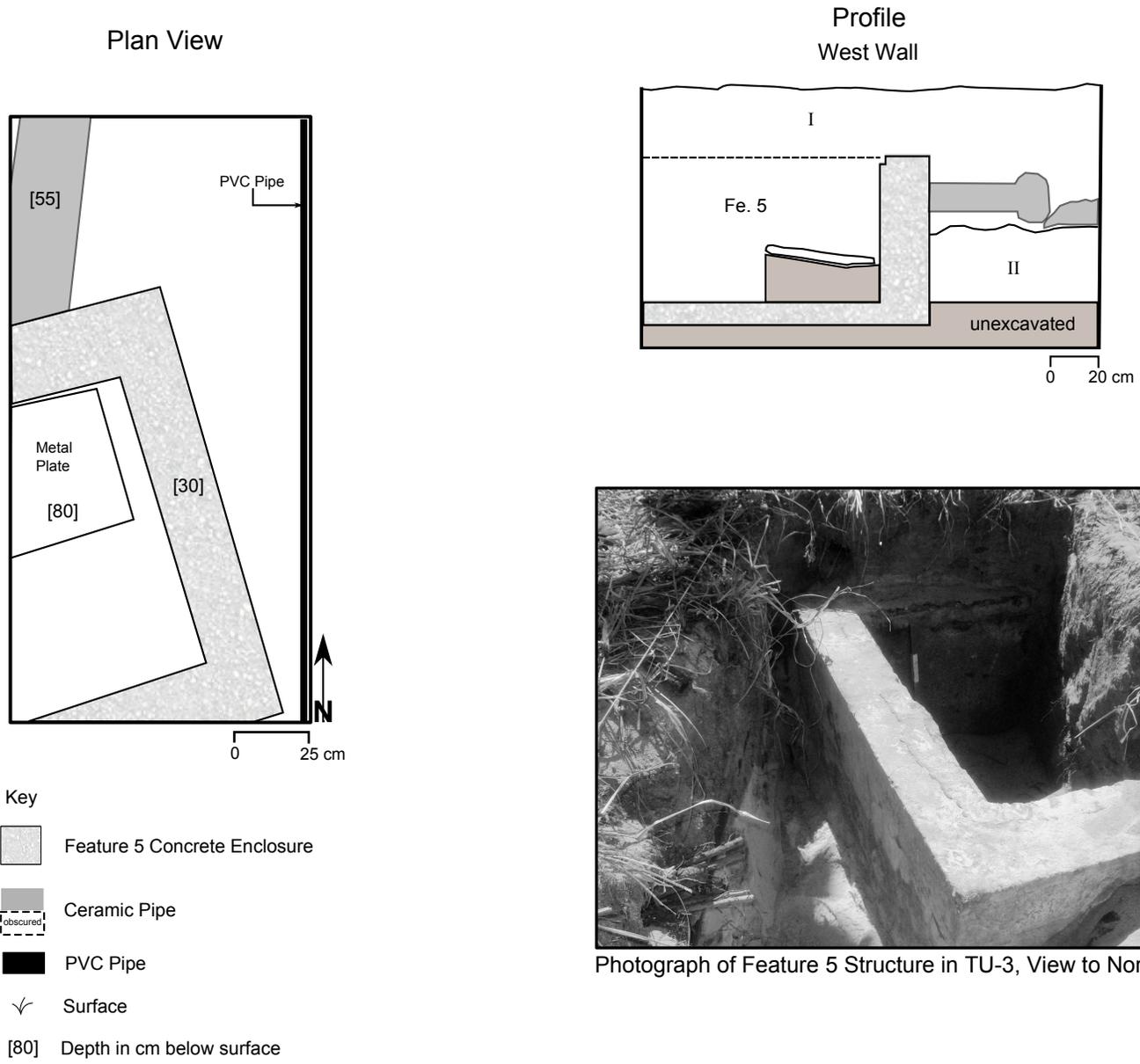


Figure 25. Plan View, Profile Drawing, and Photograph of TU-3, Cable Station.

TU-5

TU-5 was located to the west of the Cable Station based on the results of ST 1-Q, which recorded a soil anomaly consistent with other subsurface features (see Figure 16). The recorded deposition of TU-5 included a three-layer stratigraphy. While Layers I (approximately 50 cm thick) and III were similar to Layers I and II across most of the site, Layer II (approximately 30 cm thick) consisted of a mottled grayish brown (10YR 5/2) loamy sand and dark brown (10YR 4/2) loam that contained fragments of coal and possibly charcoal. A single briquette was recovered from Layer II. However, the cultural materials recovered from Layer II were similar to Layer I in type and quantity indicating that the anomaly did not represent a unique subsurface feature.

Of the 69 artifacts recovered from TU-5, approximately 40 percent were plastic and 40 percent were non diagnostic glass container fragments. No other diagnostic artifacts were recovered from the unit (Appendix F, Table F-3). Thirty-five pieces of faunal bone was recovered from TU-5, 95 percent of which was from local nesting bird species (Appendix F, Table F-4).

TU-6

TU-6 was located adjacent to a concrete walkway approximately 5 m east of Building 619. The purpose of the unit was to collect artifacts discarded along the walkway or possibly from Building 619.

The recorded deposition of TU-6 included a similar two-layer stratigraphy as encountered throughout the site area. Layer I (approximately 50 cm thick) consisted of a grayish brown (10YR 5/2) loamy fine to medium sand above a pale yellow (2.5Y 8/2) fine to medium sand (Layer II). Like TU-1, ceramic sewer or water pipes and iron piping were present in TU-6. The ceramic pipe is located in Layer I and is oriented in a similar fashion as the ceramic pipe in TU-1; two merged pipes are routed in the direction of the cistern once located in the center of the compound. The iron pipes are oriented in a north-south direction. Unlike other test units, Layer I of TU-7 included considerable construction material consistent with a demolished building. A possible pit feature excavated into Layer I was determined to be a pipe trench likely associated with the building. No additional subsurface pits or features were recorded and no artifacts were retained from Layer II.

Approximately 56 percent of the 64 artifacts recovered from TU-6 were plastics including four plastic caps. Building materials comprised approximately 25 percent of the assemblage (Appendix F, Table F-3). A single .45-caliber bullet casing was also recovered. A total of 106 pieces of faunal bone were recovered from TU-6, all of which were likely from local nesting bird species (Appendix F, Table F-4).

TU-7

TU-7 was located northeast of Building 643 and southeast of Building 628 in an area near a demolished building. ST 1-L recovered domestic and construction-related artifacts possibly associated with a subsurface feature.

The recorded deposition of TU-7 included a similar two-layer stratigraphy as encountered throughout the site area. Layer I (approximately 50 cm thick) consisted of a grayish brown (10YR 5/2) loamy fine to medium sand above a pale yellow (2.5Y 8/2) fine to medium sand (Layer II).

Approximately 55 percent of the 89 artifacts recovered from TU-7 were construction materials including wire nails, asphalt floor tiles, and asphalt roof tiles (Appendix F, Table F-3). One sample of concrete wall material with aqua and green paint was collected. The remainder

of the artifacts recovered from TU-7 included non-diagnostic container glass and plastic debris. Nine pieces of faunal bone were recovered from TU-7, all of which were likely from local nesting bird species.

Other Collecting

Subsequent to PCSI's archaeological investigations, activities in support of lead encapsulation of the Cable Station buildings (Decision Unit 1 [DU-1]) recovered 27 artifacts, including 24 chronologically diagnostic glass bottles and aluminum soda cans, as well as a 1960s-era croquet ball, a plastic baby bottle, plastic wheels to a baby stroller or small cart, and a large caliber bullet casing. The activities included a trench excavated approximately 100 ft around the perimeter of the five buildings as well as the removal of Bonin petrels from burrows located around the complex. Figure 26 shows the approximate location of the trenching as well as the approximate locations of artifacts recovered. Other than the depth of the recovered artifacts, no other stratigraphic information is available. The depths, however, appear to correspond with the Layer I loamy sand matrix found throughout the site area.

The overall distribution of artifacts from DU-1 is similar to the distribution of artifacts recovered during shovel testing and test excavations. Bottles dating to the late nineteenth and early twentieth century were recovered predominantly from the southeast portion of the site, near Buildings 643 and 626, while artifacts dating from the 1940s and more recently were dispersed throughout the site.

The recovered artifacts reflect household discard (wine, beer, condiment bottles, etc.), casual discard (soda cans and plastic baby bottle) or loss (croquet ball, marbles), and building modification (industrial ceramic). A large caliber 20-mm anti-aircraft casing (dated 1942) recovered from north of Building 628 is likely a remnant of the Battle of Midway.

MARINE BARRACKS (STATE OF HAWAII SITE 50-93-01-002)

The area around the Marine Barracks was designated as Site 50-93-01-002. The site area consists of two buildings (Buildings 578 and 579) with seven entrances (Figure 27; see also Figures 2, 14, and 15). There are ornamental and invasive trees in front (north elevation) of the buildings and in the space between the buildings. Dense burrowing activity has occurred around each building and in the open space between the buildings.

Shovel testing was undertaken near the north and south entrances of both buildings, as well as near an entrance on the east elevation of Building 578. In addition, a shovel test was placed to the east of Building 579, between the building and a large banyan tree. The stratigraphic profile for each of the 10 shovel tests was consistent (see Appendix B). In ST-3, ST-4, ST-5, ST-6, ST-8, ST-9, and ST-10, the sequence consisted of a grayish brown (10YR 5/2) loamy fine to medium sand (Layer I) above a pale yellow (2.5Y 8/2) fine to medium sand (Layer II). In ST-1, ST-2, and ST-7, the stratigraphic sequence begins with a very dark grayish brown (10YR 3/2) shallow loamy sand A-horizon (9-14 cm thick).

Sparse artifacts (175) were recovered from the Marine Barracks, of which only one, a .30-caliber bullet casing dating to 1942, has any historic significance (Appendix F, Table F-1). Approximately 45 percent of the artifacts recovered were colorless window glass, likely reflecting the proximity of the shovel tests to the buildings. Two pieces of bone of local nesting birds were recovered (Appendix F, Table F-2)

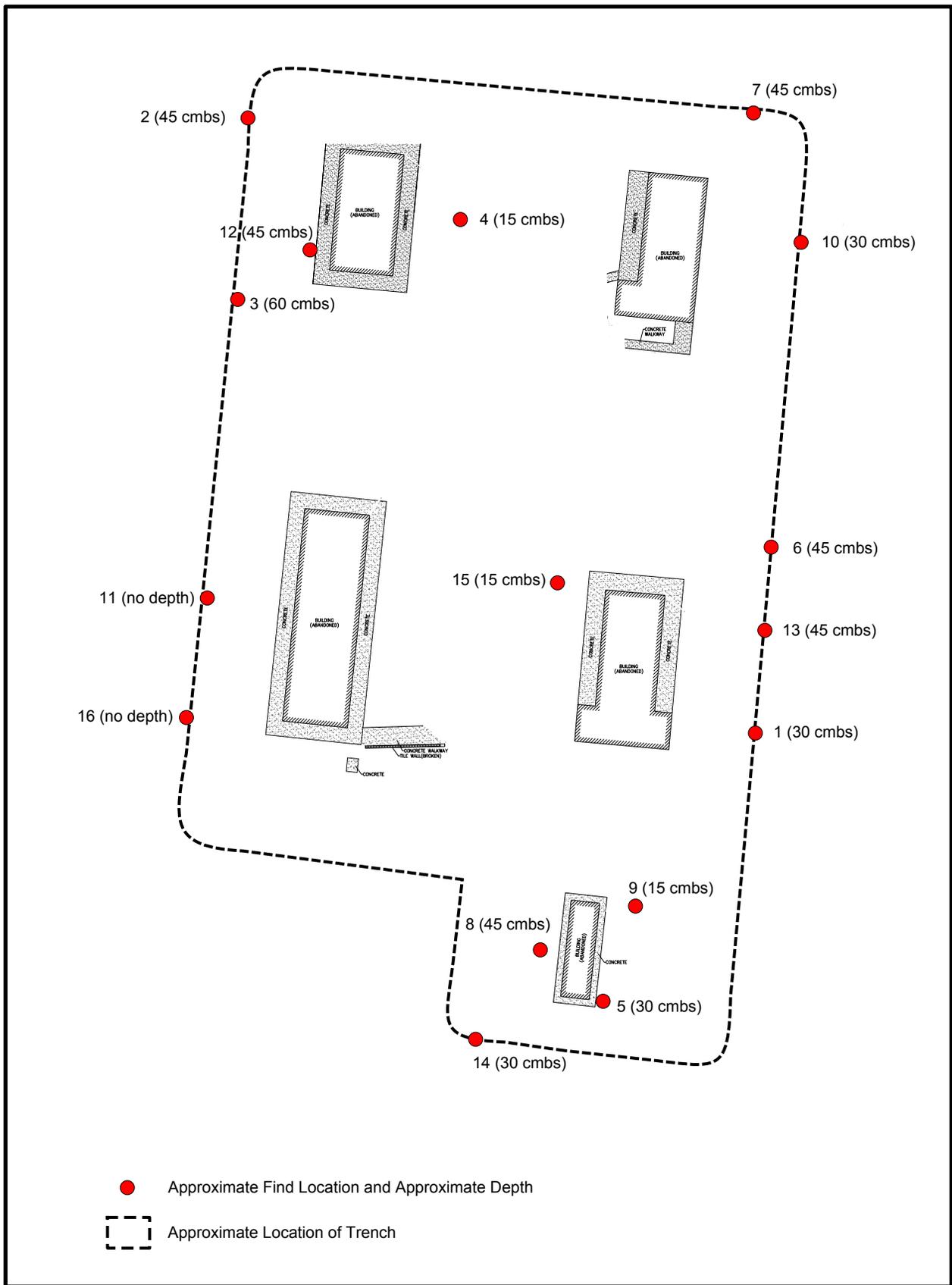


Figure 26. Approximate Location of Decision Unit 1 (DU-1) Trench and Find Locations.

TRUE NORTH
SCALE : 1 IN. = 20 FT.

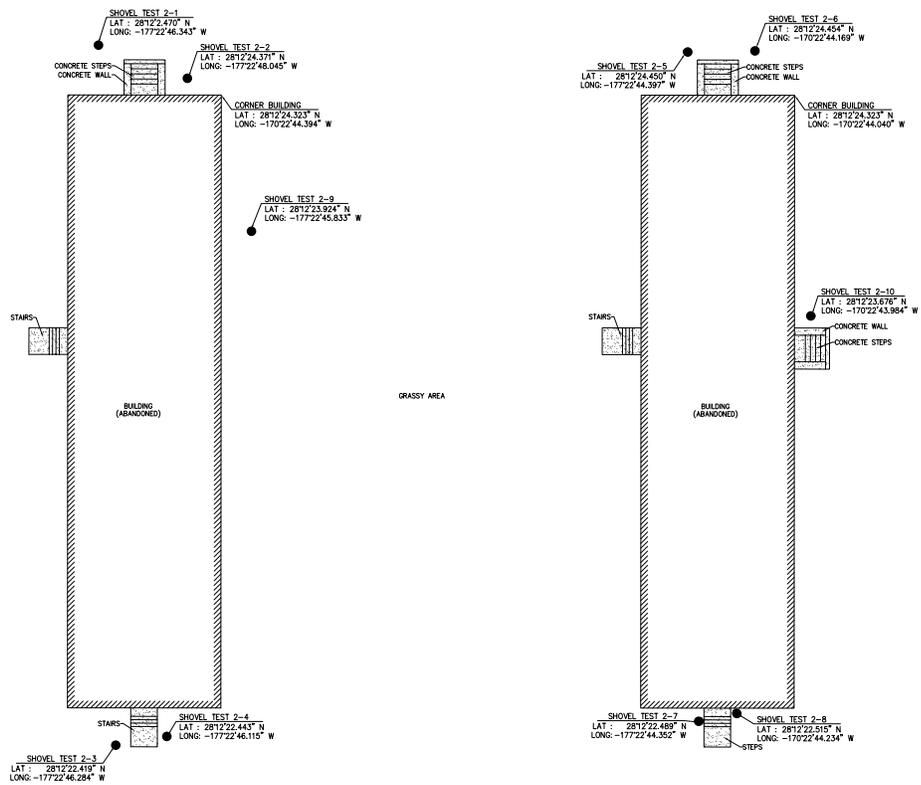


Figure 27. Site 50-93-01-002, Plan View, Showing Shovel Test Locations.

ARTIFACT DESCRIPTIONS

A total of 2,107 artifacts were recovered from shovel tests, excavations, and other collection opportunities (DU-1 trenching) at both the Cable Station and the Marine Barracks (Table 1; also see Appendix F). Approximately 75 percent of all artifacts were recovered from mixed contexts (Layer I) that included modern as well as plastic artifacts. The 238 artifacts collected from Feature 3 (TU-2) at the Cable Station represent the only artifacts from a non mixed provenience.

The bulk of the artifact analyses focus on the recovered bottles as well as other artifacts from Features 2 and 3 at the Cable Station. While other functionally and temporally diagnostic artifacts are discussed, the mixed context and broad distribution of their recovery indicates that they lack sufficient integrity to contribute the NRHP significance of either site, although they can contribute to the site's interpretation.

Table 1. Summary of Recovered Artifacts By Material.

Material	Count	Percentage
Glass	566	26.9
Ceramic	29	1.4
Metal	585	27.8
Plastic	561	26.6
Other	366	17.3
Total	2,107	100

GLASS BOTTLES FROM FEATURES 2 AND 3

A total of 22 glass bottles or bottle fragments are represented in the Cable Station assemblage from Features 2 and 3 (Table 2; also see Appendix F). Twenty of these bottles are complete or nearly complete and two are basal fragments which are missing the shoulder, neck and finish; all but one of the 22 bottles exhibit manufacturing techniques which were in general use between approximately 1880 and 1910. These bottles were individually hand-blown into a mold and finished with a lipping tool. These are referred to as mold blown (MB) bottles. One example (Table 2, Artifact 13), was manufactured by an automatic bottle machine (ABM) sometime after 1905.

The analysis of the temporal attributes of the assemblage based on mold seam characteristics is primarily derived from Toulouse (1969), Munsey (1970), and Berge (1980). Temporal parameters based on bottle maker marks, which are present on Types 1, 2, 3 and 9, are derived from Toulouse (1971). Descriptions of the physical attributes of bottle form, shape and finish are based on conventions provided by Berge (1980:37-38) and Fike (1987:1-17).

Based on differing color, method of manufacture, size and form, embossed product advertisements or bottle maker marks, 10 distinctive bottle types have been defined in the assemblage (see Table 2). Three general product categories are represented: Types 1-4 contained beer; Types 5-7 contained wine or champagne; and Types 8-10 contained ketchup or similar condiments. The general manufacturing attributes of the assemblage and specific

Table 2. Glass Bottles from Site 50-93-01-001.

Artifact #	Provenience	Description	Bottle Type	Method of Manufacturing	Color	Height (cm)	Diameter (cm)	Finish	Date Range
1	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
2	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
3	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
4	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
5	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
6	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
7	TU-2, Fe. 3	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
8	TU-2, Fe. 3	Beer	1	MB	Amber		7.6	Ring	1880-1900
9	TU-2, Fe 2	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
10	TU-2, Fe 2	Beer	1	MB	Amber	28.5	7.6	Ring	1880-1900
11	TU-2, Fe. 3	Beer	2	MB	Amber	29	7.6	Ring	1881-1905
12	T-1, ST-a, LII	Beer	3	MB	Aqua	29.2	7.6	Ring	1904-1911
13	Site 1, TU-2, FE 2	Beer	4	ABM	Amber	24.4	6.6	Crown Cap	1905
14	TU-2, Fe. 3	Champagne/Wine	5	MB	Dark Green	29.1	7	Champagne	1880-1910
15	TU-2, Fe. 3	Champagne/Wine	5	MB	Dark Green	29.1	7	Champagne	1880-1910
16	TU-2, Fe. 3	Champagne/Wine	5	MB	Dark Green		7	Champagne	1880-1910
17	TU-2, Fe. 3	Wine-Brandy	6	MB	Amber	28.7	7.7	Wine-Brandy	1880-1910
18	TU-2, Fe. 3	Wine-Brandy	7	MB	Olive Green	28.5	7.6	Wine-Brandy	1870-1910
19	TU-2, Fe. 3	Ketchup	8	MB	Clear	25.9	7	Small Mouth External Thread	1894-1920's
20	TU-2, Fe. 3	Ketchup?	9	MB	Clear	25.8	7	Small Mouth External Thread	1893-1910
21	TU-2, Fe. 3	Ketchup?	9	MB	Clear	25.8	7	Small Mouth External Thread	1893-1910
22	TU-2, Fe. 3	Ketchup?	10	MB	Clear	24.5	7	Small Mouth External Thread	1880-1910
23	DU-1/5	beer	11	automatic bottle machine	amber	24.0	6.5	crown cap	1929-1954
24	DU-1/5	beer	12	automatic bottle machine	amber	24.4	6.7	crown cap	1905-present
25	DU-1/5	beer	13	mold blown	amber	24.0	6.5	ring	ca 1880-ca 1900
26	DU-1/14	beer	14	automatic bottle machine	amber	17.5	7.3	crown cap	1915-1971
27	DU-1/5	soda root beer	15	mold blown	aqua	24.2	6.3	crown cap	1891-ca 1910
28	DU-1/10	soda cake	16	automatic bottle machine	green	19.5	6.0	crown cap	1942
29	DU-1/10	soda cake	17	automatic bottle machine	clear	19.5	6.0	crown cap	1946
30	DU-1/10	soda	18	automatic bottle machine	clear	16.7	6.7	crown cap	1943-1947
31	DU-1/5	soda	19	automatic bottle machine	clear	23.0	7.3	crown cap	1930-1932
32	DU-1/16	soda	20	automatic bottle machine	clear	24.2	6.6	crown cap	1929-1954
33	DU-1/14	carbonated beverage	21	mold blown	dark olive green	23.4	6.2	crown cap	1891-1910
34	DU-1/5	carbonated beverage	22	mold blown	olive green	23.5	6.7	crown cap	1891-1910
35	DU-1/5	carbonated beverage	23	mold blown	dark olive green	23.5	6.2	crown cap	1891-1910
36	DU-1/15	brandy	24	automatic bottle machine	light olive green	26.9	8.3	external thread	ca 1920-present
37	DU-1/8	whiskey	25	mold blown	pale green	29.6	7.9	ring collar	1903-1910
38	DU-1/15	vinegar	26	automatic bottle machine	clear	24.4	9.1	external thread	1905-1943
39	DU-1/10	chemical cleaner	27	automatic bottle machine	amber	23.0	9.0	external thread	1920-1964
40	DU-1/11	ink	28	automatic bottle machine	clear	7.8	6.5	external thread	1920-1964

temporal data derived from embossed product identification and maker marks indicate that all of the bottles in the collection were most probably manufactured between ca. 1890 and ca. 1910.

Beer Bottles

Type 1

Type 1 is a mold blown, hand-finished, amber beer bottle (Figure 28). Ten examples are present in the collection: two were recovered in TU-2, Feature 2; and eight were recovered from TU-2, Feature 3 (Table 2). Nine of the examples are complete (Table 2, Artifacts 1-7, 9 and 10) and one example (Artifact 8) is missing the neck and finish. The bottles are relatively thick-walled and fashioned from amber glass with numerous small and large bubbles and occasional inclusions. The base profile is round; corresponding to variety 3.20 described by Fike (1987:10). These bottles have a cylindrical body, rounded shoulders and a slightly convex, tapering neck. The base of Type 1 consistently measures 7.60 cm (3 in) in diameter. The nine complete examples of Type 1 vary slightly from 28.5 cm to 28.7 cm (about 10.5 in) in height. These bottles were individually hand-blown into a three-piece, post mold and the finish was hand crafted with a lipping tool.

Type 1 was blown into a post-bottom mold. Bottles blown into a post mold exhibit mold seams which extend from below the finish, down the sides to a circular seam on the bottom of the bottle symmetrical with the bottle base (Toulouse 1969:587; Munsey 1970:38-50). Molds of this type were in general use between ca. 1880 and 1910, by 1917 these manufacturing techniques had been universally replaced by the automatic bottle machine (James 1956:17-18). Type 1 is finished with a simple ring type finish described by Fike (1987:8) as type 2.8. This finish consists of a collar about 2.0 cm (.8 in) in height which has been applied to the neck of the bottle with a lipping tool. Closures of this type were sealed by a cork which was held in place by a wire which passed over the top of the bottle and tied around the base of the collar (Munsey 1970:118).

All of the Type 1 bottles carry the makers mark "R & CO" on the base of the bottle along with a number, ranging from 28 to 40 which probably represent the mold number (Figure 29). Toulouse (1971:439) states that the user of the "R & CO" maker mark remains unknown but is found on export beers exhibiting 1880 to 1900 manufacturing techniques. "Most of the bottles carrying this identification are amber, although some are green and aqua. Most are made with a post mold and all are hand-finished for cork stoppers" (Toulouse 1971:439).

Type 2

Type 2 is a mold blown, hand-finished, amber beer bottle similar in description to Type 1 (see Figure 28). One example (Table 2, Artifact 11) is represented in the assemblage which was recovered from TU-2, Feature 3 (Table 2). The bottle is fashioned from amber glass exhibiting small and large bubbles and occasional inclusions. The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a slightly convex, tapering neck. The bottle measures 7.60 cm (3 in) in diameter and 29.0 cm (about 10.5 in) in height (see Figure 28). This bottle was blown into a three-piece, post mold and the finish was hand crafted with a lipping tool. The bottle exhibits a simple ring type finish (see Fike 1987:8 type 2.8) consisting of a collar about 2.0 cm (.8 in) in height which has been applied to the neck of the bottle with a lipping tool. This bottle was closed with a cork which was held in place by a wire tied around the base of the collar (see Munsey 1970:118).



Figure 28. Photograph of Beer Bottles: Types 1, 2, 3, and 4 (L to R).



Figure 29. Photograph and Drawings of Bottle Makers Mark Types (from left to right) 1,2,3, and 9.

aqua glass exhibits some small bubbles and inclusions. The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a slightly convex, tapering neck. The bottle measures 7.60 cm (3 in) in diameter and 29.2 cm (about 10.5 in) in height (see Figure 28). This bottle was blown into a three- piece, post mold and the finish was hand crafted with a lipping tool. The bottle exhibits a simple ring type finish (see Fike 1987:8 type 2.8) consisting of a collar about 2.0 cm (.8 in) in height which has been applied to the neck of the bottle with a lipping tool. This bottle was also closed with a cork which was held in place by a wire tied around the base of the collar (see Munsey 191970:118).

Type 3 carries the maker mark “R G & B CO” on the base of the bottle (Figure 29). Although the user of this mark remains uncertain it is likely that this is the mark of the Renton Glass Company of Renton, Washington used between 1904 and 1910. The Renton Company was manufacturing bottles from 1904 through 1911. The mark of the Renton Company between 1904 and 1910 remains uncertain, in 1911 the company used the mark “R G CO” indicating Renton Glass Co. (Toulouse 1971:440-441). “R G & B CO” probably indicates Renton Glass and Bottle Co. probably used between 1904 and 1910.

Type 4

Type 4 is an completely machine made, amber, crown cap beer bottle manufactured by an automatic bottle machine after 1905 (Table 2). One example of Type 4 was recovered from TU-2, Feature 2 (Table 2). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a slightly concave, tapering neck. The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 6.6 cm (2.6 in) in diameter and 24.4 cm (9.6 in) in height (see Figure 28). This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38-50). The crown cap finish was patented in 1892 and by 1912 was the most common closure for carbonated beverages (Berge 1980).

Type 4 exhibits a shallow wrinkle in the base of the bottle known as the “Owens ring”. This is a characteristic of the Owens automatic bottle machine (ca. 1905-1917) which is produced when the glass, which was sucked up into the mold was cut off from the rest of the glass in the pot leaving a ring on the bottle base which is off-center and sometimes extends up the sidewalls of the bottle (Kendrick 1966:81). The machine made crown cap beer bottle was manufactured after 1905 ((James 1956:17-18). This bottle carries no maker mark.

Wine, Champagne, and Brandy Bottles

Type 5

Type 5 is a mold blown, hand-finished, dark olive green bottle which contained wine or champagne (Figure 30). Three examples of Type 5 were recovered from Test Unit 2, Feature 3 (Table 2). Two of these (Table 2, Artifacts 14 and 15) are complete and one (Table 2, Artifact 16) is a basal fragment. The bottle has a round basal profile (Fike 1987:10). The body of the bottle slopes slightly outward from the base to the shoulder. The base diameter of Type 5 is 7.0 cm (2.8 in) and the height in the two complete examples is 29.1 cm (11.5 in). This bottle was blown into a turn mold and exhibits no mold seams. In the turn mold, the base and body of the bottle are blown into a single piece shoulder height mold and the shoulder neck closure is finished by hand. When the body of the bottle is in the mold it is rotated, obscuring the mold



Figure 30. Photographs of Wine, Champagne, and Brandy Bottles, Types 5, 6, 6, and 7.

seams. Because the bottle is rotated in the mold, turn mold bottles carry no embossed lettering or maker marks. The turn mold process was used between 1880 and 1910 and its attributes are most commonly found on wine bottles (Munsey 1970:38-50).

The bottle finish consists of a ring or narrow collar about .8 cm (.3 in) in width, which is laid on about .50 cm (.2 in) below the top of the bottle and finished with a lipping tool. This closure type is illustrated in Fike (1987:8, type 2.18) and described as a “champagne” finish. The bottle was sealed with a cork which was tied down with a wire which passed over the cork and twisted below the finish ring. The bottle base exhibits a “push up” which extends about 4.0 cm (1.6 in) into the base of the bottle.

Type 6

Type 6 is a mold blown, hand-finished, reddish amber bottle which contained wine or brandy (see Figure 30). One example of Type 6 was recovered from Test Unit 2, Feature 3 (see Table 2). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 7.7 cm (3 in) in base diameter and 28.7 cm (11.3 in) in height. Type 6 exhibits a cylindrical body, sloping shoulders, and a short neck. This bottle was blown into a shoulder height turn mold and exhibits no mold seams on the body of the bottle. The finish consists of a laid on collar which is formed into an upper collar and underlying ring with a lipping tool. This finish is illustrated in Fike (1987:8, Type 2.12) and described as a “wine or brandy” finish. This bottle type was closed with a cork which was held in place by a wire which was twisted under the lower ring.

No maker mark is present on turn mold bottles. The bottle exhibits a shallow “push up” which extends about 2.5 cm (1 in) into the bottle base. The datable elements of the bottle are confined to the turn mold method of manufacture which was in use between ca. 1880 and 1910 (Munsey 1970:38-50).

Type 7

Type 7 is a mold blown, hand-finished, light olive green bottle which also contained wine or brandy (see Figure 30). One example of Type 7 was recovered from Test Unit 2, Feature 3 (see Table 2). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 7.6 cm (3 in) in base diameter and 28.5 cm (11.2 in) in height. Type 7 has a cylindrical body, rounded shoulders, and a slightly bulging, convex neck. This bottle was blown into a three part hinged mold with a dip mold body. This mold produces a horizontal seam around the shoulder and two side seams continuing up from the shoulder to below the finish (Toulouse 1969:578, Munsey 1970:38-50). Similar to Type 6, the finish consists of a laid on collar which is formed into an upper collar and underlying beveled ring with a lipping tool. This finish is illustrated in Fike (1987:8, Type 2.12) and described as a “wine or brandy” finish. This bottle type was also closed with a cork which was held in place by a wire which was twisted under the lower ring.

No maker mark is present on this bottle. The bottle exhibits a shallow “push up” which extends about 2.5 cm (1 in) into the bottle base. The datable elements of the bottle are confined to the three part mold method of manufacture which was in use between ca. 1870 through 1910 (Munsey 1970:38-50).

Ketchup and Sauce Bottles

Type 8

Type 8 is a mold blown, hand-finished, clear ketchup bottle (Figure 31). One example of Type 8 was recovered from TU-2, Feature 3 (see Table 2). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 7.0 cm (2.8 in) in base diameter and 25.9 cm (10.2) in height. Type 8 has a cylindrical body, rounded shoulders, with an elongated slightly convex neck. The body of the bottle is decorated with an embossed vertical corrugated pattern with a clear panel which accommodated a paper label. Embossed within a circle on the shoulder is the product identification "Curtice Brothers Co., Rochester, N.Y., Preserves". This bottle was blown into a hinged, cup bottom mold. Seams from this type of mold run down the sides to the heel and around the outside of the base (Munsey 1970:38-50). On Type 8, which utilizes a closed cup mold, the mold seams continue up the neck and through the finish of the bottle. The top of the bottle was sheared off after molding and then reheated to smooth the rough bore and lip of the bottle. The bottle finish includes a neck ring about 3.0 cm (1.2 in) below the opening, and wide external threads all of which were formed in the mold. This finish type is illustrated in Fike (1987:8, Type 2.16) and described as a "small mouth external thread" finish. This bottle was closed with a threaded metal cap.

Zumwalt (1980:101) provides a photograph and an illustration of what appears to be an identical bottle and an advertisement for Curtice Brothers Co. "Blue Label" products. In the panel on the body of the illustrated bottle is a label identifying "Curtice Brothers/Blue Label Tomato Ketchup/ Curtice Brothers Co., Rochester, N.Y. (Figure 31). The advertisement is dated 1894. Zumwalt (1980:101) adds that this bottle continued to be used through the 1920s. This bottle carries no maker mark.

Type 9

Type 9 is a clear, mold blown, hand-finished bottle which probably contained ketchup (see Figure 31). Two examples of Type 9 were recovered from Test Unit 2, Feature 3 (see Table 2). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 7.0 cm (2.8 in) in base diameter and 25.8 cm (10.2 in) in height. Type 9 has a cylindrical body, rounded shoulders, and an elongated slightly convex neck. The body of the bottle is decorated near the base, and just below the shoulder, with embossed horizontal rings and a pattern of small squares (see Figure 31). The clear panel in the central body of the bottle probably carried a paper label.

This bottle was blown into a hinged, cup bottom mold. Seams from this type of mold run down the sides to the heel and around the outside of the base (Munsey 1970:38-50). Type 9 utilizes a closed cup mold, the mold seams continue up the neck and through the finish of the bottle. The top of the bottle was sheared off after molding and then reheated to smooth the rough lip of the bottle. The bottle finish includes a neck ring about 3.0 cm (1.2 in) below the opening, and wide external threads all of which were formed in the mold. This finish type is illustrated in Fike (1987:8, Type 2.16) and described as a "small mouth external thread" finish. This bottle was closed with a threaded metal cap.



Figure 31. Photographs of Ketchup and Sauce Bottles, Types 8, 9, and 10.

101

CURTICE BROTHERS
 CB (initials monogrammed)
 ROCHESTER
 N. Y.

aqua, iron or/oxide pushed-up pontil, ext. rare - 125*

This is the first bottle to bear the company name. The type of pontil used on this specimen is generally associated with the time period of 1850's to early 1860's. However, since the company was not formed until 1866 this a fine example of continued use of an old method of glass making continuing for a longer period of time.

VAR: embossed as above - (not pictured) green canning jar, glass insert, screw band, ground lip, ext. rare - 45*

CURTICE BROTHERS CO.
 PRESERVERS
 ROCHESTER, N. Y.

clear, in a range of sizes including miniature all common - newer & neatly made versions - 1*; older & crude specimens - 8*; miniature 3* (This type of bottle continued through the 1920's)

THOSE TRADE MARKS *Different Bottles - Different Outlets*
Curtice Brothers Co. 'Blue Label'
James Conant
 The Curtice Brothers Co. early manufacturing centers of "Blue Label" products was established around 1874 in Rochester, New York.

In this advertising war a fascinating distinction and Curtice Brothers did not hesitate in emphasizing their products. "The ultimate in national goods." Also noted: "Around The World, East, West, North, South Or Over California Coast First." Also noted for "Pineapple, Pickling, Jam, and Blue Label Ketchup."

Blue Label Ketchup, used and recognized by them as "Tangy in taste" and "added to your food by the rub of your hand of which it formed a part."

Another fine product was Curtice Genuine Map Maple Syrup put up in tin cans and bottles. Twenty varieties of soap were marketed under the Blue Label trademark as well as pickles, pears, vegetables and other delicacies etc.

Their products were awarded

Blue Label 1874
Label
Ketchup
 TOMATO
BLUE LABEL KETCHUP
 CURTICE BROTHERS CO.
 ROCHESTER, N. Y.

"Hunger is the Best Sauce"
 and the NEXT best is our
BLUE LABEL
 TOMATO
Ketchup
 CURTICE BROTHERS CO.
 ROCHESTER, N. Y.

1894 ADVERTISEMENT

Figure 32. Copy of Curtice Brothers advertisement from Zumwalt 1980:101).

The base of the bottle carries an embossed "H" with a number; 719 (Table 2, Artifact 20), and 720 (Table 2, Artifact 21; see Figure 29). The "H" maker mark was used by several bottle manufacturers around the turn of the century (Toulouse 1971:231-236). The mark on Type 9 is probably that of the H. J. Heinz Co., Pittsburgh, Pa., bottlers of ketchup and numerous pickles and sauces (Zumwalt 1980:209-236). Toulouse (1971:236) states that the "H" maker mark was used by Heinz Co. sometime after 1888. However, Type 9 bottles may post date 1893 when Heinz entered the glass business and began making their own bottles (Toulouse 1971:237).

Type 10

Type 10 is a clear, mold blown, hand-finished bottle which probably contained ketchup (see Figure 31). One example of Type 10 was recovered from Test Unit 2, Feature 3 (see Table 2). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 7.0 cm (2.8 in) in base diameter and 24.5 cm (9.6 in) in height. Type 10 has a cylindrical body, rounded shoulders, and an elongated slightly convex neck. The body of the bottle is undecorated and probably carried a paper label.

This bottle was blown into a hinged, cup bottom mold. Seams from this type of mold run down the sides to the heel and around the outside of the base (Munsey 1970:38-50). On Type 10, the mold seams continue up the neck and through the finish of the bottle. The top of the bottle was sheared off after molding and then reheated to smooth the rough bore and lip of the bottle. The bottle finish includes a neck ring about 3.0 cm (1.2 in) below the opening, and wide external threads all of which were formed in the mold. This finish type is illustrated in Fike (1987:8, Type 2.16) and described as a "small mouth external thread" finish. This bottle was closed with a threaded metal cap.

This bottle carries no maker mark or other identifying characteristics and so can only be attributed to the general use of the cup bottom mold between ca. 1870 and 1910 (Munsey 1970:38-50). Similar bottles, however, such as Types 8 and 9, with narrow mouth, molded threaded finishes appear to be associated with the period between ca. 1890 through 1910 and possibly through 1920.

GLASS BOTTLES FROM DECISION UNIT 1

An assemblage of bottles and other historic materials was recovered during trench excavation and while inspecting petrel burrows in Decision Unit 1 (DU-1, see Figure 26). The provenience locations of the recovered materials are designated by numbers 1 through 16 (DU-1/1-DU-1/16). The assemblage includes 18 complete glass bottles (see Table 2). Seven bottles were recovered from DU-1/5, four from DU-1/10, two from DU-1/14, two from DU-1/15, and one bottle each from DU-1/8, DU-1/11, and DU-1/16 (see Table 2).

Based on differences of color, size, method of manufacture, maker marks or embossed lettering, each of the 18 bottles in the assemblage must be considered as a separate type. Five of these types are individually mold blown (MB) bottles which are finished by hand with a lipping tool and the remaining 13 types were manufactured by automatic bottle machine (ABM). A range of products are represented including beer, brandy, soda, vinegar, chemical, and ink (see Table 2). Based on dates derived from manufacturing attributes (mold seams) and maker marks, the assemblage reflects two periods. The mold blown bottles probably represent the period between ca. 1900 and 1910, and the machine made bottles generally represent the period between ca. 1940 and 1950.

Beer Bottles

Type 11

Type 11 is an amber, crown cap beer bottle manufactured by an automatic bottle machine. One example of Type 11 was recovered from DU-1/5 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a slightly convex, tapering neck (Figure 33). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 6.5 cm (2.6 in) in diameter and 24.0 cm (9.4 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38-50). The crown cap finish was patented in 1892 and by 1912 was the most common closure for carbonated beverages (Berge 1980).

The most salient temporal attribute is the maker mark of the Owens Illinois Glass Company of Toledo, Ohio. The mark is embossed on the base of the bottle and consists of an "I" inside a circle and diamond (Toulouse 1971:403). This is the mark used by the Owens Illinois company between 1929 and 1954 (Toulouse 1971:403). A year date, which sometimes occurs to the right side of the mark, is not present.

Type 12

Type 12 is an amber, crown cap beer bottle manufactured by an automatic bottle machine. One example of Type 12 was recovered from DU-1/5 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body; rounded shoulders and a slightly concave, tapering neck (see Figure 33). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 6.7 cm (2.6 in) in diameter and 24.4 cm (9.6 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38-50).

Type 12 carries no maker mark or other embossed product information. The single temporal attribute of the bottle is that it was manufactured by an automatic bottle machine which was introduced in 1905 (James 1956:17-18). The manufacture of narrow neck bottles, such as beer bottles, does not seem to have been perfected and wide spread until around 1917 (James 1956:17-18).

Type 13

Type 13 is a mold blown, hand-finished, amber, beer bottle (see Figure 33). One example was recovered from DU-1/5 (see Table 2). This bottle is relatively thick-walled and fashioned from glass with numerous small and large bubbles and occasional inclusions. The base profile is round; corresponding to variety 3.20 described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a slightly convex, tapering neck. Type 13 measures 6.5 cm (2.6 in) in diameter and 24.0 cm (9.4 in) in height.

This bottle was hand-blown into a three- piece, post mold and the finish was hand crafted with a lipping tool. Bottles blown into a post mold exhibit mold seams which extend from below the finish, down the sides to a circular seam on the bottom of the bottle, symmetrical with the bottle base (Toulouse 1969:587. Munsey 1970:38-50). Molds of this type were in general use between ca. 1880 and 1910, by 1917 these manufacturing techniques had been universally replaced by the automatic bottle machine (James 1956:17-18). Type 13 is finished with a



Figure 33. Photograph of Beer Bottles, Types 11-14.

simple ring type finish described by Fike (1987:8) as type 2.8. This finish consists of a collar about 2.0 cm in height which has been applied to the neck of the bottle with a lipping tool. Closures of this type were sealed by a cork which was held in place by a wire which passed over the top of the bottle and tied around the base of the collar (Munsey 1970:118).

Type 13 carries the makers mark "R & CO" on the base of the bottle. Toulouse (1971:439) states that the user of the "R & CO" maker mark remains unknown but is found on export beers exhibiting 1880 to 1900 manufacturing techniques. "Most of the bottles carrying this identification are amber, although some are green and aqua. Most are made with a post mold and all are hand-finished for cork stoppers" (Toulouse 1971:439).

Type 14

Type 14 is a squat, amber, crown cap beer bottle manufactured by an automatic bottle machine. One example of Type 14 was recovered from DU-1/14 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a short, cylindrical body; rounded shoulders and a convex, tapering neck (see Figure 33). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 7.3 cm (2.9 in) in diameter and 17.5 cm (6.9 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38-50).

The base of the bottle carries the maker mark of the Obear-Nester Glass Company of East St. Louis, Illinois. The mark consists of an "N" inside a square. This mark has been used from 1915 to present (Toulouse 1971:374). To the right of the mark is the number "37" which may indicate the year of manufacture.

Soda Bottles

Type 15

Type 15 is a mold blown, hand-finished, aqua bottle which contained root beer. One example was recovered from Location 5 (see Figure 26). The aqua glass exhibits some small bubbles and inclusions. The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a short, straight neck (Figure 34). The bottle measures 6.3 cm (2.5 in) in diameter and 24.2 cm (9.5 in) in height. This bottle was blown into a three- piece, post mold and the crown cap finish was hand crafted with a lipping tool.

The product manufacturer "Hires" is embossed on the base of the bottle however no maker mark is present. The date range for the manufacture of this bottle is after the introduction of the crown cap closure in 1891 (Munsey 1970:105), and prior to the manufacture of crown cap bottles by the automatic bottle machine between around 1910 and 1917 (James 1956:17-18).

Type 16

Type 16 is a green, crown cap, Coca Cola bottle manufactured by an automatic bottle machine. One example of Type 16 was recovered from DU-1/10 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). This is the patented skirted Coke bottle which is slightly concave near the base with slopping shoulders and a short convex, tapering neck (see Figure 34). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 6.0 cm (2.4 in) in diameter and 19.5 cm (7.7 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine



Figure 34. Photograph of Soda Bottles, Types 15-20.

which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

Two panels which encircle the shoulder of the bottle are embossed with “Coca Cola/ Trade Mark Registered/ Min. Contents 6 Fl. Ozs/ Bottle Pat. D-105529.” Located on the body of the bottle, beneath the embossed panel is the maker mark of the Owens Illinois Glass Company. To the right of the maker mark is the number “42” which provides the date of 1942 for the manufacture of this bottle (Toulouse 1971:403).

Type 17

Type 17 is a clear, crown cap, Coca Cola bottle manufactured by an automatic bottle machine. One example of Type 17 was recovered from DU-1/10 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). This is the patented skirted Coke bottle which is slightly concave near the base with slopping shoulders and a short convex, tapering neck (see Figure 34). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 6.0 cm (2.4 in) in diameter and 19.5 cm (7.7 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

Two panels which encircle the shoulder of the bottle are embossed with “Coca Cola/ Trade Mark.” Located on the body of the bottle, beneath the embossed panel is the maker mark of the Owens Illinois Glass Company. To the right of the maker mark is the number “46” which provides the date of 1946 for the manufacture of this bottle (Toulouse 1971:403).

Type 18

Type 18 is a squat, clear, crown cap, bottle manufactured by an automatic bottle machine. This bottle probably contained soda. One example of Type 18 was recovered from DU-1/10 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). This bottle has a short cylindrical body, rounded shoulders, and a short, tapering neck (see Figure 34). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). The bottle measures 6.7 cm (2.6 in) in diameter and 16.7 cm (6.6 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

Embossed around the shoulder of the bottle are the instructions “NOT TO BE REFILLED” and “NO DEPOSIT NO RETURN”. This information is embossed on soda bottles after 1940 (Berge 1980). An “S” in a keystone is embossed on the bottle base. This is the maker mark of the Seaboard Glass Bottle Company of Pittsburgh Pa., which was in use for only a short period between 1943 and 1947 (Toulouse 1971:455).

Type 19

Type 19 is a clear, crown cap, bottle manufactured by an automatic bottle machine. This bottle probably contained soda. One example of Type 19 was recovered from DU-1/5 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). This bottle has a cylindrical body, slopping shoulders, and a concave, tapering neck (see Figure 34). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). This bottle measures 7.3 cm (2.9 in) in diameter and 23.0 cm (9.1 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

The maker mark "I P G Co" is very faintly embossed in a diamond on the base of the bottle. This is the mark of the Illinois Pacific Coast Company of San Francisco California. This maker mark was only in use between 1930 and 1932 (Toulouse 1971:269).

Type 20

Type 20 is a clear, crown cap, bottle manufactured by an automatic bottle machine. This bottle probably contained soda. One example of Type 20 was recovered from DU-1/16 (see Figure 26). The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). This bottle has a cylindrical body, sloping shoulders, and a concave, tapering neck (see Figure 34). The crown cap closure corresponds to type 2.19 described by Fike (1987:8). This bottle measures 6.6 cm (2.6 in) in diameter and 24.2 cm (9.5 in) in height. This bottle exhibits the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

The base of the bottle carries the maker mark of the Owens Illinois Glass Company of Toledo Ohio. The mark consists of an "I" inside a circle with an overlying diamond. This mark was utilized by Owens Illinois between 1924 and 1954 (Toulouse 1971:403).

Other Carbonated Beverage Bottles

Type 21

Bottle Types 21, 22, and 23 are similar but vary slightly in size and glass color (Figure 35). These three types are blown into a turn mold and hand-finished with a crown cap closure. The contents of these bottles remain uncertain. These bottles may have contained soda or mineral water (Munsey 1970:101-103). Similar bottles have also contained beer or rice wine (Wilson and Wilson 1968:164).

Type 21 is a dark olive green, mold blown, hand-finished, crown cap bottle which probably contained a carbonated beverage. One example of Type 21 was recovered from DU-1/14 (see Figure 26). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 6.2 cm (2.4 in) in base diameter and 23.4 cm (9.2) in height. Type 21 exhibits a cylindrical body, sloping shoulders, and a straight neck. This bottle was blown into a shoulder height turn mold and exhibits no mold seams on the body of the bottle. The finish consists of a crown cap closure which has been formed with a lipping tool. This finish is illustrated in Fike (1987:8, Type 2.19).

No maker mark is present on turn mold bottles. The bottle exhibits a shallow "push up" which extends about 2.0 cm into the bottle base. The datable elements of the bottle are confined to the crown cap closure after ca. 1891 (Munsey 1970:105) and the turn mold method of manufacture which was in use until ca. 1910 (Munsey 1970:38-50).

Type 22

Type 22 is a dark green, mold blown, hand-finished, crown cap bottle which probably contained a carbonated beverage. One example of Type 22 was recovered from DU-1/5 (see Figure 26). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 6.7 cm (2.6 in) in base diameter and 23.5 cm (9.3 in) in height. Type 22 has a cylindrical body, sloping shoulders, and a straight neck (see Figure 35). This bottle was blown into a shoulder height turn mold and exhibits no mold seams on the body of the bottle. The finish consists of a crown cap closure which has been formed with a lipping tool. This finish is illustrated in Fike (1987:8, Type 2.19).



Figure 35. Photograph of Other Carbonated Beverage Bottles, Types 21-23.

No maker mark is present on turn mold bottles. The bottle exhibits a shallow “push up” which extends about 2.0 cm (.8 in) into the bottle base. The datable elements of the bottle are confined to the crown cap closure after ca. 1891 (Munsey 1970:105) and the turn mold method of manufacture which was in use until ca. 1910 (Munsey 1970:38-50).

Type 23

Type 23 is a dark olive green, mold blown, hand-finished, crown cap bottle which probably contained a carbonated beverage. One example of Type 23 was recovered from DU-1/5 (see Figure 26). This bottle has a round base profile (Fike 1987:8, Type 3.30). The bottle measures 6.2 cm (2.4 in) in base diameter and 23.5 cm (9.3 in) in height. Type 23 has a cylindrical body, sloping shoulders, and a straight neck (see Figure 35). This bottle was blown into a shoulder height turn mold and exhibits no mold seams on the body of the bottle. The finish consists of a crown cap closure which has been formed with a lipping tool (see Fike 1987:8, Type 2.19).

No maker mark is present on turn mold bottles. The bottle exhibits a shallow “push up” which extends about 2.0 cm (.8 in) into the bottle base. The datable elements of the bottle are confined to the introduction of the crown cap closure after ca. 1891 (Munsey 1970:105) and the termination of the turn mold method of manufacture around 1910 (Munsey 1970:38-50).

Brandy or Wine Bottle

Type 24

Type 24 is a light olive green, machine made bottle which contained brandy or wine. One example of Type 24 was recovered from DU-1/15 (see Figure 26). The bottle has a round base profile (Fike 1987:8, Type 3.30). This bottle measures 8.3 cm (3.3 in) in base diameter and 26.9 cm (10.6 in) in height. The body of Type 24 expands slightly from base to shoulder. The shoulders are rounded with an elongated straight neck (Figure 36). This bottle exhibits an external thread closure (see Fike 1987:8, Type 2.16). This bottle has the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

This bottle has an embossed raised circle on the shoulder which probably accommodated a paper label. The bottle was sealed with a threaded metal cap which is still in place. The base of the bottle exhibits a kick-up extending 3.0 cm (1.2 in) into the bottom of the bottle. The letters “BN” and “0.7L” appear on the bottle base. The maker mark has not been identified. This bottle has the attributes of modern manufacture, probably post 1960, but can not be specifically classified beyond a post ca. 1920 machine made bottle.

Whiskey Bottle

Type 25

Type 25 is a mold blown, hand-finished, pale green bottle which probably contained whiskey. One example was recovered from DU-1/8 (see Figure 26). The bottle is fashioned from glass exhibiting small and large bubbles and occasional inclusions. The base profile is round; corresponding to variety 3.20 as described by Fike (1987:10). The bottle has a cylindrical body, rounded shoulders and a slightly convex, tapering neck.



Figure 36. Photograph of Brandy and Whiskey Bottles, Types 24 and 25.

The bottle measures 7.9 cm (3.1 in) in diameter and 29.6 cm (11.7 in) in height (see Figure 36). This bottle was blown into a three- piece, post mold and the finish was hand crafted with a lipping tool. The bottle exhibits a simple ring type finish (see Fike 1987:8 type 2.25) consisting of a collar about 2.0 cm (.8 in) in height with an underlying ring which has been applied to the neck of the bottle with a lipping tool. This bottle was closed with a cork which was held in place by a wire tied around the base of the collar (see Munsey 1970:118).

Type 25 carries the maker mark "N B" on the base of the bottle. This is the mark of the North British Bottle Manufacturing Co., LTD., Glasgow, Scotland. This mark was in use between 1903 and 1937 (Toulouse 1971:377). "Many of its bottles, filled with Scotch whiskey, found their way to the United States and are identified in collections here" (Toulouse 1971:377). The manufacturing date of this bottle lies between 1903 and the widespread adaptation of automatic bottle machine technology by around 1920.

Heinz Vinegar Bottle

Type 26

Type 26 is a clear, machine made bottle which contained cider vinegar. One example of Type 26 was recovered from DU-1/15 (see Figure 26). The bottle has a round base profile (Fike 1987:8, Type 3.30). This bottle measures 9.1 cm (3.6 in) in base diameter and 24.4 cm (9.6 in) in height. The body of Type 24 expands slightly from base to shoulder and is decorated with an embossed vertical scallop design. The shoulders are rounded with a short, straight neck (Figure 37). This bottle exhibits an external thread closure (see Fike 1987:8, Type 2.16). This bottle has the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

The base of the bottle is embossed with the maker mark "H. J. Heinz Co." and a triangle. The H. J. Heinz Co., maker mark has been used since 1888 (Toulouse 1971:236), however this bottle was manufactured by the fully automated bottle machine probably after ca. 1920. Zumwalt (1980:225) provides a photograph of a similar bottle which contained cider vinegar and states that the triangle in the makers mark was used between 1900 and 1943. The manufacturing date for this bottle therefore falls between ca. 1920 and 1943.

Chemical Bottle

Type 27

Type 27 is an amber, machine made bottle which contained a chemical cleaner. One example was recovered from DU-1/10 (see Figure 26). The bottle has a round base profile (Fike 1987:8, Type 3.30). This bottle measures 9.0 cm (3.5 in) in base diameter and 23.0 cm (9.1 in) in height. The body of Type 27 is cylindrical and the shoulders are rounded with a short, straight neck (see Figure 37). This bottle exhibits an external thread closure (see Fike 1987:8, Type 2.16). This bottle has the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

The product name "DAZZLE" and "32 _ OZ." is embossed on the shoulder of the bottle. The base of the bottle carries a faint maker's mark surrounded by "4837," "9," and "1." The mark could be the Hazel-Atlas logo used between 1923 and 1964. However, Dazzle Bleach was produced the J.L. Prescott Company of Passiac, New Jersey beginning in 1929 (Monroe F. Dreher, Inc. 1945). It is unclear if the Prescott Company produced its own bottles.



Figure 37. Photograph of Vinegar, Chemical, and Ink Bottles, Types 26, 27, and 28.

Ink Bottle

Type 28

Type 28 is a clear, squat, machine made bottle which contained ink. One example was recovered from DU-1/11 (see Figure 26). The bottle has a round base profile (Fike 1987:8, Type 3.30). This bottle measures 6.5 cm (2.6 in) in base diameter and 7.8 cm (3.1 in) in height. The body of has expanded rings near the heel and at the shoulder. The shoulders are rounded with a short neck. This bottle exhibits an external thread closure (see Fike 1987:8, Type 2.16). This bottle has the typical mold seams created by the automatic bottle machine which extend up the sides of the bottle and continue up and over the top of the finish (Munsey 1970: 38- 50).

The shoulder of the bottle is embossed with "4 OZ." The bottle shape is one of several standardized forms which contained ink (Covill 1971:72-74). The base of the bottle carries the maker mark of the Hazel-Atlas Glass Company of Wheeling, West Virginia which was used between 1920 and 1964 (Toulouse 1971:239).

Glass Bottle Summary

The technologies represented by the mold blown, hand-finished bottles span the period between ca. 1880 and 1910 (Toulouse 1969). The maker's marks, specifically the mark of the Streater Bottle and Glass Company (Bottle Type 2), has a narrower range between 1881 and 1905 (Toulouse 1971:461). The "H" maker mark of the H. J. Heinz Company was not used prior to 1888 and probably not until after 1893 (Toulouse 1971:236-237). This provides the probable manufacturing parameter of between ca. 1893 and 1905 for the materials associated with Feature 3. The presence of the machine made beer bottle, Type 4, recovered from Site 1, Test Unit 2, Feature 2, indicates that the materials associated with this bottle were not deposited prior to 1905.

The bottles recovered during trenching and while inspecting bird burrows appear to reflect two separate temporal periods. The hand-made bottles, which were mold blown and finished with a lipping tool, were most probably manufactured before ca. 1920. These include Types 13, 15, 21, 22, 23, and 25 (see Table 2). Semi-automatic bottle machines were introduced between 1898 and 1906 but could only produce wide-mouth ware. Prior to this time all bottles were mold blown. Between 1905 and 1917 the Owens automatic bottle machine was introduced for making all types of wide and narrow mouth ware. Some hand-made bottles continued to be produced into the 1920s but by around 1920 almost all hand bottle manufacture had been replaced by the automatic bottle machine (James 1956:17-18). More specifically, this group of hand-made bottles most probably represents the period between ca. 1900 and 1910. The maker mark on Type 25 has a narrow range between 1903 and 1910 (see Table2). All of the hand-made crown cap bottles were made after 1891 and probably prior to ca. 1910 (Munsey 1970:105). Hand-made types were recovered from DU-1/5, DU-1/8, and DU-1/14 (see Figure 33).

Most of the machine made bottles can be assigned to a post 1929 and probably pre ca. 1950 date of manufacture (see Table2). Several bottles from this group can be specifically attributed to the 1940s. These specific dates include Type 16, manufactured in 1942, Type 17, manufactured in 1946, and Type 18 with a manufacturing range between 1943 and 1947 (see Table2). With the exception of Type 19, all of the machine made bottles could potentially have been manufactured between ca. 1940 and 1950. Machine made bottles were recovered from DU-1/5, DU-1/10, DU-1/11, DU-1/14, DU-1/15, and DU-1/16) (see Table 2).

OTHER GLASS ARTIFACTS

Several other diagnostic glass artifacts were recovered from excavations at the Cable Station, including four marbles (Figure 38), a bottle stopper (Figure 39), a vanilla extract bottle with a metal cap (Figure 39), a small jar lid (Figure 39), an unidentified glass rod (Figure 39), and two Chinese medicinal bottles (see Figure 40) (Table 3). While some of the glass artifacts are datable (primarily based on manufacturing technique), others are functionally or ethnically diagnostic and reflect domestic or residential life at the Cable Station throughout its occupancy.

Table 3. Other Glass Artifacts Recovered from Cable Station.

Prov.	Art #	Type	Size	Date	Description
TU-1/1	68	Marble	1.51-cm (dia.)	1950s- present	Clear with blue cats-eye/ribbon
TU-3/1	69	Marble	1.56-cm (dia.)	1950s- present	Clear with orange cats-eye/ribbon
ST-16/1	70	Marble	1.56-cm (dia.)	1950s- present	Clear with orange cats-eye/ribbon
ST-11/1	71	Marble	1.50-cm (dia.)	1950s- present	Colorless with white cats- eye/ribbon
TU-2/ Fe. 2	55	Bottle stopper	5.0-cm (length)	Pre- WWII?	Clear with flat top and conical stopper
TU-4/II	53	Vanilla Extract	9.5-x-4.7-x-2.1 cm	Modern	Amber
TU-2/I	54	Jar Lid	5.4-cm (dia.)	<1920	Clear/pink; no embellishments
TU-2/ Fe. 2	98	Vial	6-cm-x-1.5 cm-1.6-cm	L-19 th - E-20 th c	Clear/aqua; probable Chinese medicine vial
TU-2/ Fe. 2	99	Vial	1.7-cm-x-1.5-cm	L-19 th - E-20 th c	Clear/aqua; probable Chinese medicine vial
TU-2/I	56	Rod	10.1-cm (length)	?	Clear with patina; possible serving utensil.

Marbles

Although glass marbles have been in production since the late nineteenth century, mass production did not occur until the early to mid-twentieth century with the introduction of the automated gob feeder (Cohill 1990). Gob-fed produced marbles typically do not show evidence of pontil marks (small defect or scar where a formed glass object has been cut away from its molten source material) like earlier marbles made by hand-gathering techniques; the four marbles collected at the Cable Station, ranging in diameter from 1.5 cm to 1.56 cm (.59 in), lack pontil marks (Figure 38). All four marbles are “cats-eyes” (clear marbles with a ribbon of color injected into the interior), which were introduced in Japan in the 1950s and are the predominant type in the modern marble market (see Table 3; Akron Marble 2012).

Informally, the game of marbles is predominantly played by children in an outdoor setting on flat, compacted soil (formal competitions are played by all age ranges in a range of venues). The typical game consists of opponents trying to knock each other’s marbles outside a circular ring and sometimes keeping the ousted piece. The introduction of cheap, mass-produced, unexceptional types such as the cats-eyes from the 1950s to the present has likely led to an increased lack of concern for retrieving lost or misplaced marbles, and even a diminished interest in winner-take-all competitions (Akron Marble 2012). The four marbles in the collection probably entered the archaeological record during the Cable Station’s use as military housing and school sometime after the 1960s.

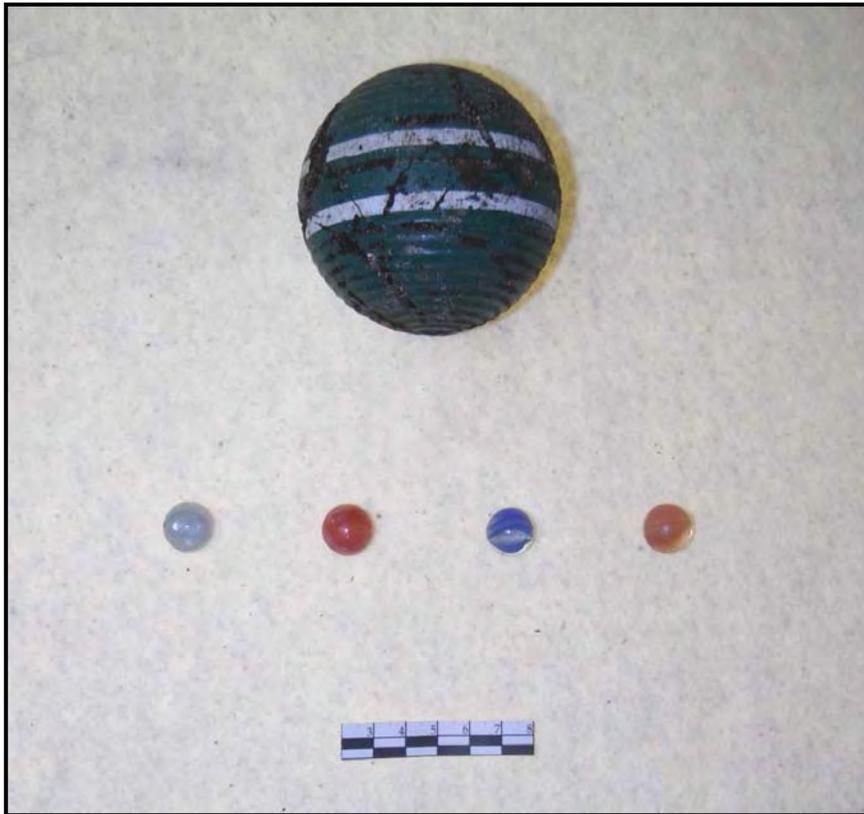


Figure 38. Game Pieces. Top Row: Croquet Ball (Art # 109); Bottom Row (L to R): Marbles (L to R: Art # 71, Art # 70, Art # 68, Art. # 69).

Bottle Stopper

A small clear (possibly frosted) bottle stopper fragment was recovered from Feature 2 in TU-2 (Figure 39, Table 3). The circular top is flat and plain with no apparent embellishment, while the stopper is conical and exhibits evidence of use-wear striations. The striations end where the stopper measures 1.81 cm (.7 in) in diameter, suggesting that the accompanying bottle had a small orifice, possibly a small decanter, medicine bottle, or cologne/perfume bottle. A flat pontil on the base of the stopper shows where the stopper was removed from a punty. No data were available concerning the stopper's age. However, it is likely the artifact is contemporaneous with the Cable Station's use before WWII.

Vanilla Extract Bottle

The amber trapezoidal vanilla extract bottle was recovered from TU-4, Layer II and was mixed with recent materials such as plastic wrap and paper fragments (Figure 39, Table 3). An applied paper label is unreadable but exhibits the color and basic design of McCormick Pure Vanilla Extract (4.0 oz). A metal cap is rusted in place.

Jar Lid

A small (5.4-cm [2.1 in] dia.) circular wide-mouthed jar lid was recovered from Layer I of TU-2 (Figure 39, Table 3). The slightly pink color of the glass suggests that it was made colorless with manganese dioxide (Lindsay 2012). The flat lid lacks embellishment on the exterior, but includes a beveled ring on the interior, suggesting that the associated jar had a groove-ring finish into which the lid was seated. The artifact likely dates to before 1920 based on the manganese dioxide decolorizing process (Lindsey 2012). The associated jar may have been a medicinal ointment jar or possibly a preserves or pickling jar.

Glass Vials

Two glass vials (one whole, one fragment) from Feature 2 of TU-2 are consistent with Chinese medicinal bottles found in mid-nineteenth to mid-twentieth century Overseas Chinese settlements ("Chinatowns," mining camps, railroad camps, etc.) in the western United States (Wegars 1993). The complete, shouldered vial (Artifact 99, Table 3) measures 6 cm (2.4 in) in height, 1.5 cm (.6 in) thick, and 1.6 cm (.6 in) wide (see Figure 41); the neck is 1.5 cm (.6 in) long, and the orifice is 5 mm in diameter. The vial fragment includes the shoulder and neck and is 1.7 cm (.7 in) wide and 1.5 cm (.6 in) thick; the neck is 1.1 cm (.4 in) long and the orifice is 8 mm in diameter. Both vials are light green in color (see Figure 41).

Glass Rod

A fragment of colorless glass rod was recovered from Layer I of TU-2. The solid rod has been broken at both ends and is 1.2 cm (.5 in) in diameter (Figure 39; Table 3). The function of the rod is uncertain.

In addition to bottles and other glass household and medicinal items, window glass is common in most excavations throughout both the Cable Station site and the Marine Barracks (Appendix F, Tables F-1 and F-3). None of the specimens appear to include imperfections such as gas bubbles, striations or other variations that typify early twentieth century pane glass, and it is likely that they date to more recent renovations.

Wood

A single wood-composite croquet ball (7.6 cm [3 in] diameter) was recovered from DU-1/4. The green exterior includes concentric grooves; two white stripes are painted across the central portion, parallel to the grooves (see Figure 38). The exterior paint may contain a resin or



Figure 39. Miscellaneous Glass. Top Row (L to R): Stopper (Art # 55), Vanilla Extract Bottle (Art # 53), Jar Lid (Art # 54); Bottom Row: Glass Rod (Art # 56).

epoxy added to harden the surface. The style (grooving) and composite material are indicative of 1960s and 1970s-era croquet sets. Croquet balls dating to the early twentieth century would have been made of solid wood with a smooth surface, while more recent balls are made of dense plastic.

CERAMIC ARTIFACTS

A total of 34 ceramic artifacts were recovered from excavations at the Cable Station. Of these, 17 were fragments of salt glazed stoneware used for sewer or water pipe (see Figure 48). Overseas Chinese ceramics (Figure 40) were recovered from Features 2 and 3 (TU-2), located behind Building 626, which functioned as a servants quarters during the Cable Station's early history. In addition, fragments of European or American kitchen ceramics were recovered from dispersed locations around the Cables Station.

Overseas Chinese Ceramics

Although Overseas Chinese ceramics continue to be imported today, several types are diagnostic of mid nineteenth to early twentieth century settlements. These utilitarian ceramics sometimes mimic more expensive and prestigious Chinese export wares, but are distinguished by their raw materials and rough method of production. Typical Overseas Chinese ceramic assemblages include celadon green porcellaneous stonewares, bichrome blue on light blue or gray porcellaneous stoneware, and hand-painted polychrome porcellaneous stoneware. In addition, stoneware jars and containers with a thick brown overglaze are also common in mid nineteenth to early twentieth century assemblages (Wegars 1993; Yang and Helmann 1996). The Overseas Chinese ceramics represented in the current collection likely date to the early twentieth century, contemporaneous with other artifacts recovered from Feature 3.

One nearly complete stoneware jar (Figure 40, Artifact 100; Table 4), a stoneware jar lid (Figure 40, Artifact 110; Table 4), and a porcellaneous stoneware polychrome tea cup (Figure 40, Artifact 97; Table 4) were recovered from Feature 3 of TU-2, while one sherd of celadon-like green porcellaneous stoneware was recovered from TU-1 (Figure 41, Artifact 79; Table 4), and one sherd of possible Chinese porcellaneous stoneware was recovered from TU-5 (Figure 41, Artifact 85; Table 4). A small porcelain strainer, possibly of Overseas Chinese origin, was also recovered from Feature 3 of TU-2 (Figure 42, Artifact 87; Table 4).

The stoneware jar measures 10.2 cm (4 in) tall and 7.8 cm (3.1 in) in diameter at the mouth. The shoulder of the jar measures 11 cm (4.3 in) in diameter. A thick brown glaze covers the entire body (exterior), excluding the base. The unglazed stoneware lid is 6.5 cm (2.6 in) in diameter and approximately 3 mm (.1 in) thick.

The porcellaneous polychrome tea cup is approximately 75 percent complete and is 4.7 cm (1.9 in) tall, with a .5 cm (.2 in) tall and 3.4 cm (1.3 in) diameter foot ring. The rim is 7 cm (2.8 in) in diameter. The motif includes floral and geometric elements. While the shape and paste of the tea cup is typical of Overseas Chinese ceramics, the motif appears to be Japanese in theme and execution. The possible Overseas Chinese ceramic strainer is 5.1 cm (2 in) tall, with a lip diameter of 7.9 cm (3.1 in). The strainer holes are irregular and appear to be hand-made.

European/American Ceramics

Seven additional ceramic artifacts (non-sewer or water pipe ceramics) were recovered from the Cable Station, including a possible stoneware bottle fragment with a white or gray salt glaze (Figure 41, Artifact 83; Table 4), a whiteware plate fragment with a small portion of a green transfer makers mark on the base (Figure 41, Artifact 80; Table 4), a stoneware bowl or cup body fragment with a yellow over glaze on the exterior and interior (Figure 41, Artifact 81;

Table 4. Diagnostic Ceramic Artifacts Recovered from the Cable Station (excluding industrial ceramics).

Prov.	Art #	Type	Size	Date	Description
TU-1/I	79	Soup spoon handle	5.0-x-1.6 cm	>1850s	Porcellaneous stoneware; translucent green overglaze; fragment
ST-Q/II	80	Plate frag.	4.5 cm x 4.0 cm	>1870	Whiteware; small portion of green transfer makers mark on exterior.
ST-B/I	81	Body sherd	1.0 cm x 0.7 cm	?	Stoneware; yellow over glaze Compact brownish grey paste with yellow lead? glaze on interior and exterior
ST-B/I	82	Body sherd	3.5 cm x 2.3 cm	>1830	Whiteware with blue over glaze; compact white paste with blue glaze on exterior and white glaze on interior
TU-3/I	83	Poss. Bottle frag.	3.5 cm x 2.4 cm	?	Stoneware; white/gray salt glaze ext. Compact tan-gray paste with white-gray salt glaze exterior
TU-4/II	84	Plate frag.	3.1 cm x 1.8 cm	> 1870	Refined stoneware; gilded Liquid bright gold gilding became common after 1870 (FMNH 2012);
TU-5/I	85	Plate/lid frag.	3.5 cm x 1.5 cm	>1850s	Porcellaneous stoneware; blue transfer Semi vitrious porcellaneous paste indicative of Overseas Chinese export ware
TU-2/Fe. 3	86	Jar	5.7 cm tall, 5.2 cm lip dia	?	Refined Stoneware; poss. Medicinal or ointment jar
TU-2/Fe. 3	87	Strainer	5.1 cm tall, 7.9 cm lip dia	?	Porcelain? Small strainer with hand bored holes; white
TU-2/Fe. 3	97	Tea cup	4.7 cm tall, 7 cm dia	>1850s	Porcellaneous stoneware with floral and geometric polychrome motif; Chinese or Japanese
TU-2/Fe. 3	100	Jar	10.2 cm tall, 7.8 cm dia	>1850s	Brownware jar; Overseas Chinese
TU-2/Fe. 3	110	Jar lid	6.5 cm thick, 3 mm thick	>1850s	Brownware; usually accompanies Artifact 100 or similar jar
TU-2/Fe. 3	111	Saucer	7.8 cm dia, 4 mm thick	>1830	Whiteware; Blue transfer

Table 4), a bowl or cup fragment with a blue glaze exterior and white glaze interior (Figure 41, Artifact 82; Table 4), a refined stoneware plate fragment with a white over glaze and gilded rim (Figure 41, Artifact 84; Table 4), a small whiteware saucer with a blue transfer print (Figure 43), and a small refined stoneware jar with a white overglaze (Figure 42, Artifact 86; Table 4). The whiteware saucer is approximately 50 percent complete and measures 7.8 cm (3.1 in) in diameter and .4 cm (.2 in) thick. The cylindrical jar is 5.7 cm (2.2 in) tall and 5.2 cm (2 in) in diameter. There is a narrow incised groove just below the rim; the jar likely was a medicinal or ointment container.

METAL

Bullet casings

Three bullet casings (.45-caliber, .30-caliber, and 20-mm anti-aircraft) dating to the WWII era were recovered. The large 20-mm anti-aircraft casing was recovered from DU-1/4 north of Building 628 and was likely used during combat. While the other two casings date to the WWII period, it is unclear whether they were discharged during combat or possibly training.



Figure 40. Overseas Chinese or Japanese Artifacts Recovered from Features 2 and 3 of TU-2. Top Row (L to R): Earthenware Lid (Art # 110), Stoneware Jar (Art # 100), Porcellaneous Stoneware Cup (Art # 97); Bottom Row (L to R): Glass Vial Fragment (Art # 98), Glass Vial (Art # 99).



Figure 41. Miscellaneous Ceramics. Top Row (L to R): Art. #79, Art. #85, Art. #84; Bottom Row (L to R): Art. #83, Art. #81, Art. #82, and Art. #80.



Figure 42. Ceramic Strainer and Jar (L to R): Art. # 87 and Art. #86.

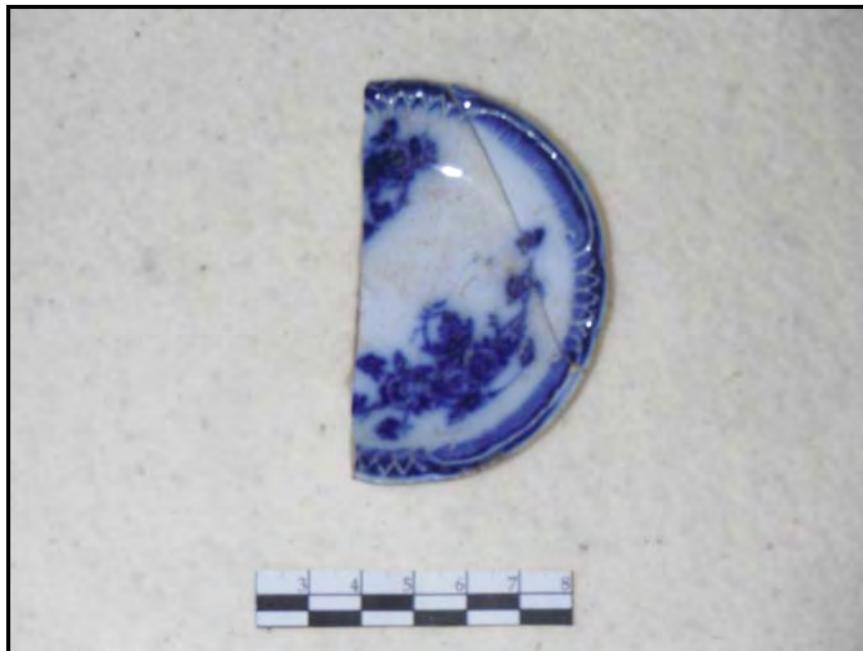


Figure 43. Whiteware Saucer with Blue Transfer Pattern (Art. # 111).

The .30-caliber rifle casing is the only artifact from the Marine Barracks with a military association (Figure 44).

Aluminum Soda Cans and Pull Tabs

Four soda cans and a beer can likely represent casual discard at the Cable Station (Figure 45). Likewise pull tabs and StaTabs were also recovered (Figure 46). Beer and soda cans are relatively narrow chronological markers given changing can and opener technologies, as well as stylistic changes (Maxwell 1993). Can opening technology evolved from “soft-top” lids requiring a can opener in the 1950s, to pull tabs, which were introduced in 1962 and discontinued in 1983, to StaTabs, which were introduced in 1975 (Maxwell 1993). All-aluminum cans were introduced in 1963.

Miscellaneous Metal

A rusted can opener (see Figure 50, Art. #58), rusted spoon fragment (see Figure 50, Art. # 57), and rusted knife handle (see Figure 50, Art. #59) were recovered from excavations. Although functionally diagnostic of residential use, none of these artifacts could be specifically dated to the Cable Station of WWII periods. Additional miscellaneous metal artifacts recovered include primarily construction materials such as wire nails, screws, and wire (Appendix F). Fifteen possible cut nails (rusted) were recovered from the exterior portion of the site (TU-5 and TU-7), but no other materials possibly associated with an early occupation were noted (Appendix F).

SHELL

Five shell buttons were recovered from the Cable Station (Figure 47, Table 5). All of the buttons with drilled holes are between 1 cm (.4 in) and 1.2 cm (.5 in) in diameter and approximately .2 cm (.1 in) thick. Three of the shell buttons have two holes, one has four holes, and one is a shank button (the metal shank is missing). All of the holes are possibly hand-drilled. Three of the buttons (Figure 47, Artifacts 74, 75, and 76; Table 5) come from TU-2, which was located behind a building that may have been used as a laundry (Building 626).

In addition to shell artifacts, three large nearly complete shells were recovered from the Decision Unit 1 project. One large (23.7 long, 19.1 cm diameter) tun (*Tonna perdix*) was recovered from DU-1/6, while a medium-sized (12.6 cm long, 10 cm diameter) tun and a 17.4 cm long, 4 cm diameter Episcopal miter (*Mitra mitra*) were collected from DU-1/7. It is unclear whether these specimens were collected or if they were deposited naturally in the sand matrix.

Table 5. Shell Buttons Recovered from Cable Station.

Prov.	Art #	Type	Size	Date	Description
TU-2/I	74	4-hole button	1 cm dia x .1 cm thick	Ca. post 1900	Poss. Hand drilled
TU-2/Fe.2	75	Shank button	2.3 cm dia x .4 cm thick	Ca. post 1900	Shank missing
TU-2/I	76	2-hole button	1.2 cm dia x .2 cm thick	Ca. post 1900	Bridge between holes broken
TU-1/I	77	2-hole button	1.1 cm dia x .2 cm thick	Ca. post 1900	Poss. Hand drilled
ST-16/I	78	2-hole button	1 cm dia x .2 cm thick	Ca. post 1900	Poss. Hand drilled



Figure 44. Metal Ammunition (L to R): Art. #41, Art. #42, and Art. #43.



Figure 45. Soda and Beer Cans. Top Row (L to R): Hamms (Art # 52), Sprite (Art # 48); Bottom Row (L to R): Fresca (Art # 49), Coca-Cola Art # 50), Coca-Cola (Art # 51).



Figure 46. Pull Tabs (L to R): Art. # 46, Art. #44, Art. # 47, Art. # 45.

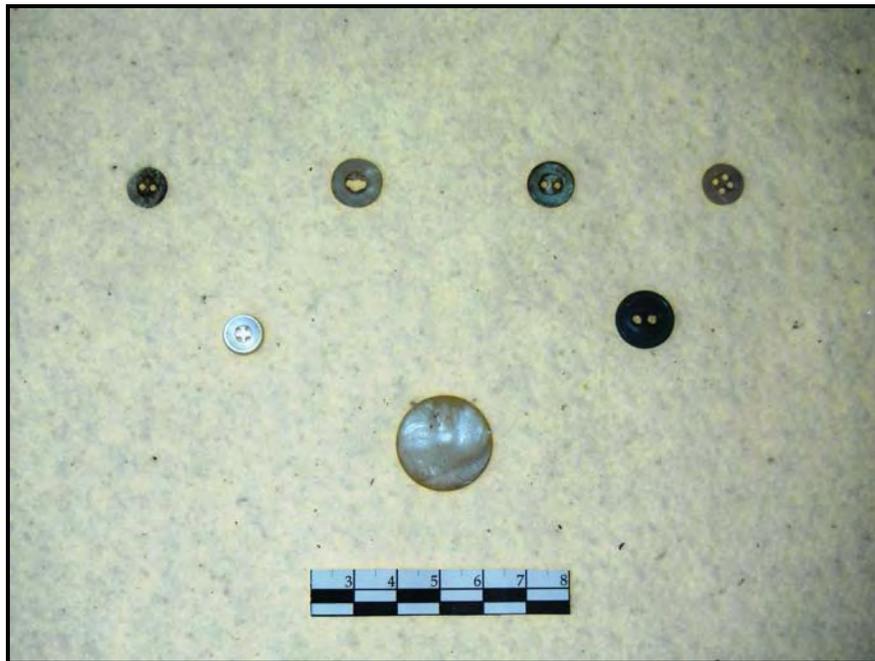


Figure 47. Buttons Recovered from the Cable Station. Top Row (Shell, L to R): Art. # 78, Art. # 76, Art. # 77, Art. # 74. Middle Row (Plastic/Glass, L to R): Art. # 73, Art. # 72. Bottom Row (Shell), Art. # 75.

CONSTRUCTION MATERIALS

Construction materials include nails, bricks, concrete, floor tiles, roof tiles, and window glass. Although many of these artifact types have been discussed in other areas, it is worth noting that, like plastic artifacts, construction materials are ubiquitous across both sites and add some detail concerning the use of the area over time. Figure 48 shows several types of construction material including a fragment of a slate shingle as well as fragments of asphalt floor tiling.

The original roofing material on all of the buildings was slate shingles and these were replaced with asphalt shingles in 1976 according to the HABS data sheets; it is unclear if the slate shingles were replaced during their life-span. The shingles were approximately 30 cm (12 in) long by 10.7 cm (4.2 in) wide and were attached to the roof by holes drilled along the long axis (Figure 48, Art # 101). The shingles were approximately .6 cm (.2 in) thick.

Asphalt floor tile (Figure 48, Art. # 103-107) became popular in commercial and public buildings during the 1920 and was eventually replaced by resilient vinyl flooring by the 1950s. The presence of asphalt floor tile within the archaeological record supports the HABS data sheets, which note that the building interiors were renovated in the 1950s and 1960s for use by the US Navy.

PLASTIC

Although plastics have been produced since the mid 1860s, the practical use of commercial plastics did not occur until after the mid 1940s when the injection molding process was developed (Brydson 1999). By the 1970s, the mass production process was accelerated by the introduction of a gas-assisted system that allowed for highly complex designs to be replicated faster and at a lower cost.

While it is possible to date some of the plastic artifacts in the assemblage (e.g., translucent plastic cigarette lighters date to after 1972), it is more useful to address these artifacts in terms of function. The majority of the 561 plastics artifacts (approximately 76 percent) are unidentifiable small fragments likely carried by albatross and thus represent a non-cultural introduction of cultural material. However, some artifacts reflect the residential, educational, and military use of the Cable Station (see Appendix F, Tables F-1 and F-3). Figure 49 shows plastic toys recovered from TU-1 (adjacent to Building 628), TU-3 (near Building 623 [used as a school]), and TU-6 (adjacent to a walkway near Building 619). Other identifiable plastic artifacts include a toothbrush, a disposable pen with "Property of the U.S. Government" embossed (Figure 50), a bread bag closure with "49c" stamped on one side, a squid lure, a Japanese bottle seal, and a thin plastic nursery plant identification tag (see Figure 50). A plastic baby bottle and plastic wheels to a baby stroller or small cart were also recovered from the DU-1 trenching.

FAUNAL REMAINS

A total of 813 bones were recovered from shovel tests and test excavations at the Cable Station. Of those, 678 bones are from bird species that nest on or otherwise inhabit Midway Atoll. Of the 135 bones of species that do not naturally inhabit the island, three are turtle, 33 are fish, 17 are turkey or chicken, 105 are pig, and one is cow (Appendix F, Table F-2 and F-4). Twenty bones show evidence of cutting or butchering.

The distribution of fauna likely consumed as food is dispersed across the site and does not appear to be clustered, which appears counter-intuitive since it would be reasonable to find more food detritus near the mess and kitchen.



Figure 48. Construction Materials. Top Row (L to R): Concrete (Art # 108), Slate Shingle (Art # 101); Bottom Row: Sewer Pipe (Art # 102), Asphalt Floor Tile (Art # 105, Art # 106, Art # 104, Art # 107, Art # 103).



Figure 49. Plastic Toys. Top Row (L to R): Spoon (Art. # 93), Doll's Brush (Art. # 92); Middle Row (L to R): Ring (Art. # 90), Doll Arm (Art. # 94), Lego Piece (Art. # 91), Bullets (Art. # 95); Bottom Row (L to R): Whistle (Art. # 96), Lego Piece (Art. # 86), and Wheel (Art. # 89).



Figure 50. Miscellaneous Artifacts. Top Row (L to R): Can Opener (Art. #58), Spoon Fragment (Art. # 57), Knife Handle (Art. #59); Middle Row: Squid Lure (Art. #66), Pen Fragment (Art. #63); Lower Row: Bag Closure (Art. #60), Bottle Seal (Art. #65), Bulb (Art. #64), Bulb (Art. #61, Thermometer Fragment (Art. #62); Bottom Row: Plant ID Tag (Art. #67).

ANALYSIS AND DISCUSSION

Archaeological excavations at the Cable Station site (50-93-01-001) and the Marine Barracks site (50-93-01-002) recovered more than 2,100 artifacts in addition to five subsurface features. Although the majority of the recovered artifacts come from mixed contexts that have been disturbed over time by several post depositional processes, the dataset does provide significant information concerning the pre-WWII use of the Cable Station, as well as the WWII and later uses of the Cable Station. The recovered artifacts from the Marine Barracks are less informative concerning the use of those structures and include predominantly construction materials.

CABLE STATION

Two research questions relating to the presence of subsurface cultural material and features drove the excavations at the Cable Station. To address these questions, 53 shovel tests and seven 1-m-x-2-m test units were excavated. A total of 1,899 artifacts were recovered. Feature 1 is the subsurface foundation component of Building 628 exposed during the excavation of TU-1; Features 2 and 3 are subsurface trash deposits excavated (in part) from TU-2; Feature 4 is a dark soil anomaly recorded in the wall profile of TU-2; and Feature 5 is a subsurface concrete vault or catchment recorded in TU-3.

Is there any evidence of the occupants or operation of the Cable Station within the compound that will be disturbed or dug-up by the building demolition or sand removal? Are the remains scattered or are there areas of artifact concentrations? Do the remains constitute a significant deposit as per the NRHP?

The excavation of 30 shovel tests and four excavation units (as well as additional collections associated with Decision Unit I) within the interior portion of the Cable Station compound recorded a dispersed pattern of artifact deposition. While some of the dispersion is the result of post-depositional disturbance and movement, it is likely that the compound was not used for routine or systematic dumping during its active use period. There are three probable reasons for this. First, the permanent Cable Station, including the interior compound area, was designed and constructed *en masse* and as such, the open space was part of the aesthetic. Nearly all historic photographs of the Cable Station demonstrate a well-maintained, manicured landscape. Although casual discard likely occurred, the general rule of use was likely to maintain the original visual design.

Second, as demonstrated in all four excavation units, the subsurface component of the interior compound was active with infrastructure-related pipes. Although excavations did not clarify the exact configuration or function of the ceramic and metal pipes, minimally three systems were in place during the Cable Station's early use: (1) a water catchment system conveying rainwater from the building roofs to the cistern (large diameter ceramic pipes); (2) a gas system to deliver acetylene gas to each building (probably small diameter metal or copper pipes; see figure 11); and (3) a system to deliver water to each building (metal pipes). In addition, a sewer system would have been necessary to remove sewage from each building. However, there is no description of this system, and excavations did not record evidence of such a system. The nested ceramic pipes recorded in TU-1 more likely represent the replacement of a single system rather than two concurrent systems (water catchment and sewer).

Finally, the Cable Station, as a collection of buildings, was an “organic” system in that each part (building) functioned to support each other part. As demonstrated in the historic documents, the five buildings had different functions: Building 619 housed the Cable operations, Building 628 was the Superintendent’s residence, Building 623 housed the Station workers, Building 643 was the mess hall and social hall, and Building 626 housed the servants and possibly other operations. Within this system, only one building stands out as a point for the day-to-day mass accumulation of disposable, non-perishable material culture for the Station that would eventually be introduced into the archaeological record: Building 643. In addition, Building 626 with its multiple uses, location, and connecting walkway to the rear of Building 643 may also have been integral to Building 643 and thus also an accumulation point. Within such a system, use, accumulation, and probably disposal of goods would have focused in and around the area or areas that serviced the entire community. Even the rubbish removed from the administrative and residential buildings would likely have been integrated into larger accumulations rather than disposed of individually.

The presence of sparse Overseas Chinese ceramics, Euro-American ceramics, and sporadic glass bottles dating to the pre-WWII period, suggest that some material evidence of the Cable Station occupants is present within the compound interior. The single piece of Overseas Chinese ceramic (a celadon spoon handle fragment) found in TU-1 (abutting the Superintendent’s residence, Building 628) is interesting. Historic documents note that Chinese were employed as servants for the Cable Station and that Building 626 functioned as quarters for the servants (see below for more evidence of Chinese associated with the Cable Station). The presence of Overseas Chinese food-related ceramics away from both the servants’ quarters and the mess hall may indicate that the Station Superintendent was either exempt from dining in the mess hall or possibly allowed to “dine-in” on occasion. Likewise, the presence of Overseas Chinese material culture away from the servants’ quarters also indicates that the Cable Station crew may have been integrated in terms of material choices and that there may not have been expectations or rules concerning some issues (e.g., whether soup spoons were Chinese or Euro-American).

Within the compound, the vast majority of artifacts relate to the occupation of the Cable Station during the 1960s and more recently. Construction materials recovered during excavations indicate that at least two roofs (one with slate shingles, one with asphalt shingles) have been installed on most of the buildings, and that asphalt flooring was installed. The HABS data sheets for the buildings indicate that the slate shingles were replaced in 1976, and that the interiors of most buildings were remodeled in the 1950s and 1960s. It is unclear if the slate shingles recovered from excavations relate to the original construction or possibly a subsequent re-roofing with slate material.

The presence of plastic toys, toy fragments, and other game-related artifacts such as marbles and a croquet ball in the upper layers of the subsurface likely reflect the use of the compound when it was converted to military housing and used as a school after the mid 1950s. However, even after the area ceased to be used as the Cable Station, there is little evidence of systematic dumping or discard within the compound. With the exception of one modern trash accumulation in TU-4 and the early 1960s discard of beer and soda cans (see Figure 45), it appears that the interior portion of the compound continued to be maintained as a landscape or used for appropriate uses into the 1960s or 1970s (see Figure 12).

Historic documents (Morris 1922; Wilder 1905) note additional buildings and outbuildings associated with the Cable Station. While none were documented, it is possible that the foundations or footprints of some buildings are still present in the subsurface and that they were

not located due to the shovel testing interval. In addition, features such as the two wells seen in Figure 9 may be located outside the current project area.

While it is likely that large subsurface feature deposits (e.g., trash dumps) are not present within the compound, chronologically and functionally diagnostic artifacts dating to the early twentieth and mid-twentieth century are likely to be present. Even if from disturbed contexts, additional artifacts recovered from the compound interior will likely shed light on the Cable Station, its occupants, and subsequent uses of the structures. Likewise, understanding the system of pipes within the compound will likely inform on early twentieth century technology and engineering.

Is there evidence of the Cable Station employees outside of the compound, perhaps an area where they discarded household items?

Shovel testing and excavations outside the compound indicate that dumping likely occurred away from the buildings. Excavations at TU-2, located behind (south) Building 626, recorded two subsurface pit features that represent trash dumps. The deepest of these features (Feature 3) included a narrow range of artifacts both functionally and temporally. Based on the analysis of bottles, Feature 3 was probably created during the first decade of the twentieth century around the time when the Cable Station was established. Feature 2 was likely created more recently, but still during the initial period of occupation at the Station. As part of the current project, neither feature was completely excavated.

In addition to temporal considerations, Feature 3 also provides some information concerning the Cable Station occupants and their lives and activities on Midway. The Cable Station was occupied primarily by Euro-American men who operated the equipment along with Chinese and Japanese servants. By 1922, there were 14 servants of Chinese and Japanese ancestry (Morrison 1922). Figure 51 shows the entire Cable Station crew of 16 in or around 1905, possibly standing and sitting in front of the one story Building 626. Several of the men in the back row appear to be of Southeast Asian ethnicity. While it is uncertain where the servants came from originally, it is likely that they or their families were part of the Overseas Chinese diaspora that emigrated to Hawaii and the western U.S. from southern China in the mid to late nineteenth century (Chace 1976; Hom 1971).

Overseas Chinese material culture from the late nineteenth century is consistent where it has been found in the western U.S., usually in the context of “Chinatowns” or other aggregation points such as mining and railroad camps (Costello and Maniery 1988; Merit 2010; Praetzellis and Praetzellis 1997). Household table ceramics are typically porcellaneous stonewares that include translucent green overglazes (celadon), as well as grey or light blue/dark blue overglazes with traditional motifs. In addition, polychrome porcellaneous stonewares with hand-painted floral depictions are common (Chace 1976). The ceramics are often mass-produced and show signs of expedient decorative application (dripped glaze, off-center motifs, etc.).

Kitchen ceramics include a variety of forms, although short jars with wide mouths (*fūt hów ngá peng*) and spouted jars (*nga hú*) are common in Overseas Chinese archaeological assemblages (Wegars 1993; Yang and Hellmann 1996). While both types are characterized as food containers, the latter type was typically used for soy sauce and other liquids such as peanut oil. The wide mouth jar was commonly used for soy bean curd and other fermented or preserved foods (Yang and Hellman 1996). In addition to ceramics, most Overseas Chinese archaeological collections also contain small glass vials probably used as medicinal bottles.

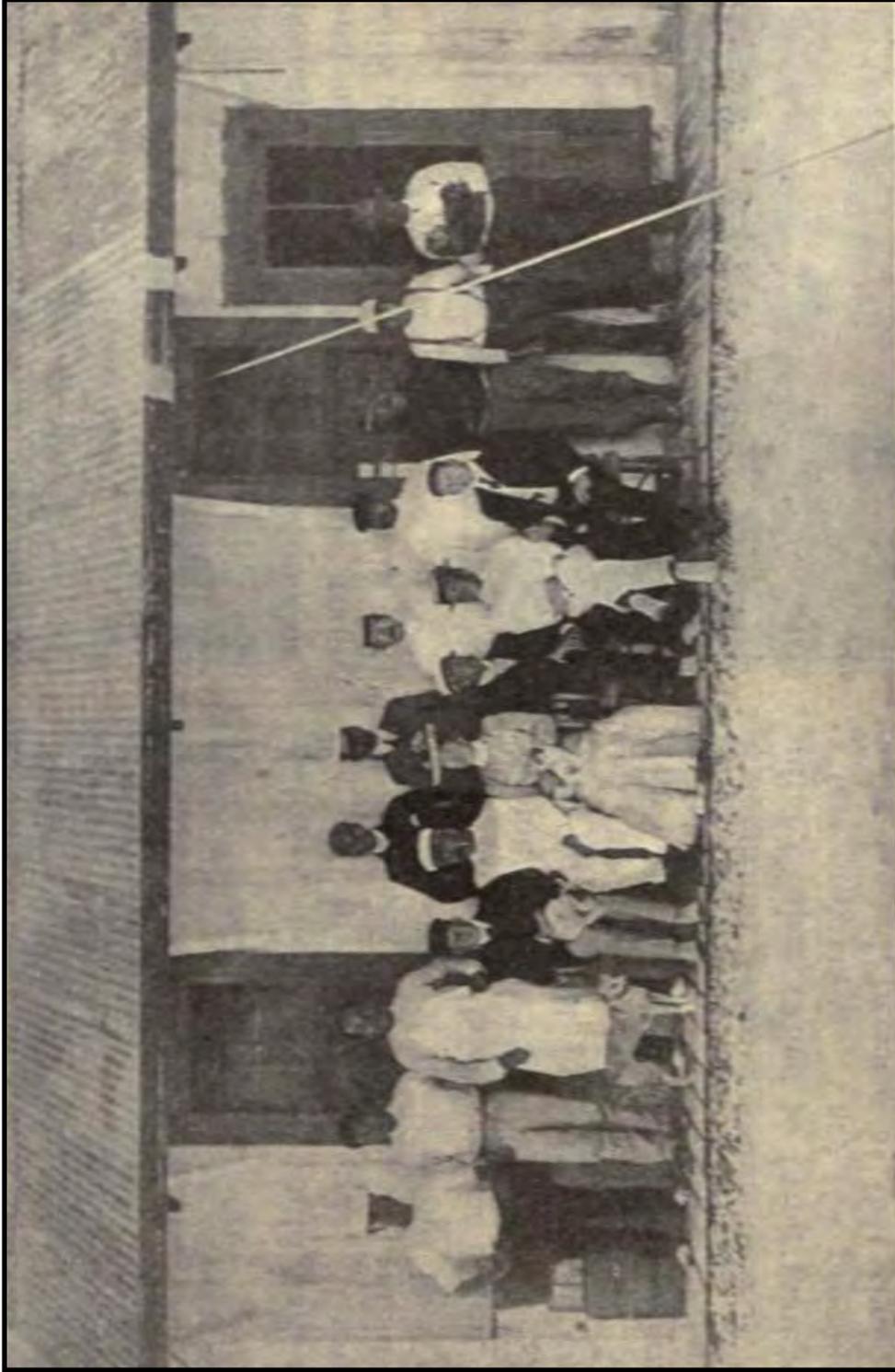


Figure 51. The Entire Cable Colony on Midway.—The Lady in the Middle of the Group is the Wife of the Superintendent (from Crook 1905).

Although a small collection, the Overseas Chinese artifacts recovered from Features 2 and 3 of TU-2 provide clear evidence of the ethnic make-up of some of the Cable Station employees, their function on the island, as well as the function of nearby buildings (Building 626). It is likely that the Feature 2 and Feature 3 assemblage represent a mix of kitchen or recreational hall discard as well as personal discard. The presence of a dense collection of beer, alcohol, and condiment containers likely represents refuse discarded as part of the mess hall or social hall operation, while the Overseas Chinese assemblage, which includes personal as well as kitchen-related items, would appear to be personal discard. This interpretation may change with additional collection from Features 2 and 3.

In addition to the Overseas Chinese artifacts, the three shell buttons (60 percent of the shell button total) recovered from TU-2 may support a non-specific claim (Morris 1922) that Building 626 (or a building nearby) was used as a laundry. Buttons may have entered the archaeological record if they were broken, or discarded with worn garments brought to the laundry.

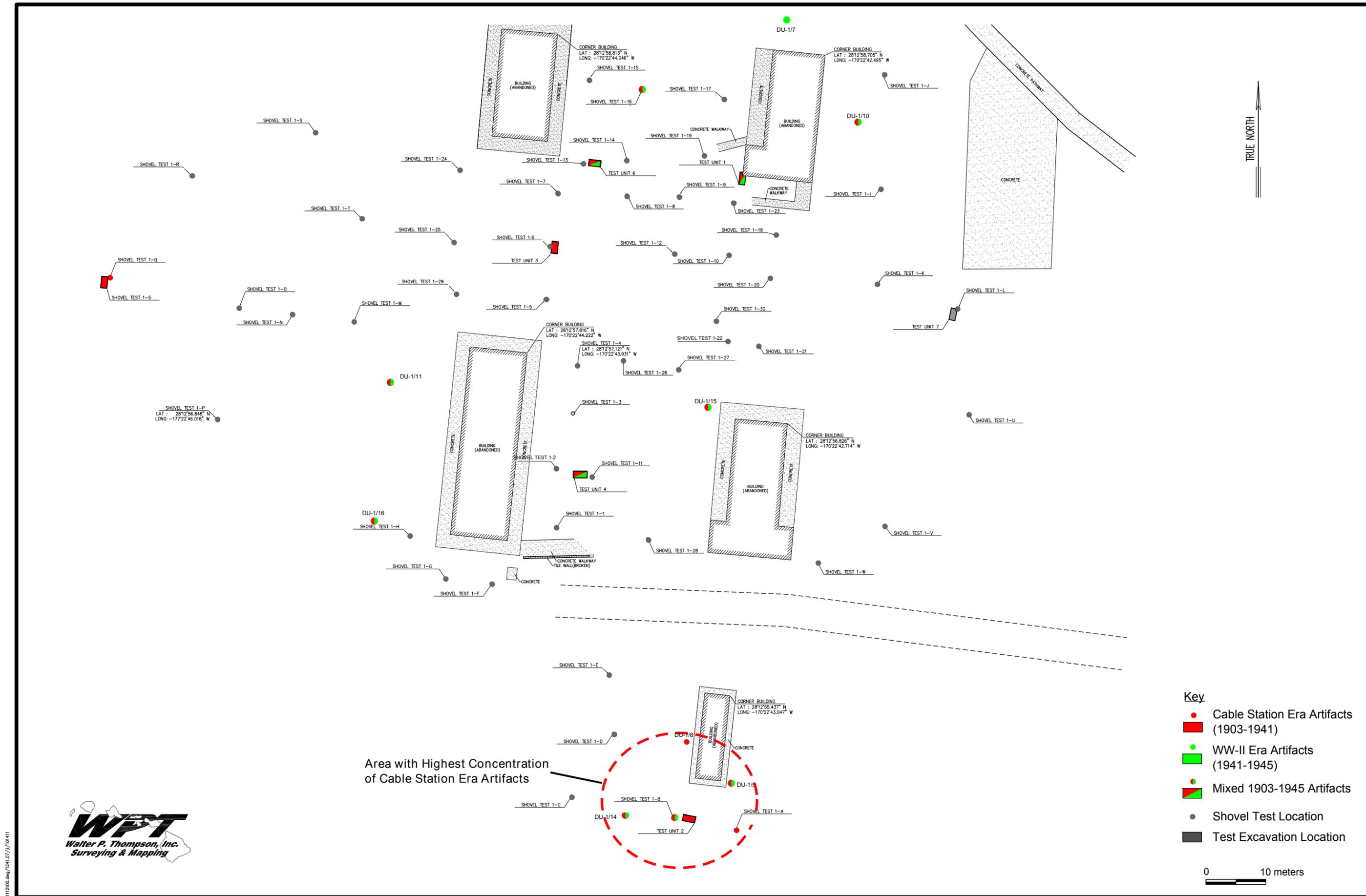
The bottle data from the Cable Station provide useful temporal as well as functional information. Overall, 60 percent of the bottles recovered originally contained alcohol, while approximately 18 percent contained carbonated beverages; the remainder of the bottle assemblage included condiment, kitchen, or cleaning containers. Twenty-eight bottles that date exclusively to ca. 1910 or earlier come from the area south of or adjacent to Building 626, while only one bottle (Table 2, Artifact 38) from this time period was recovered outside that area. Figure 52 (see Table 6) shows the distribution of diagnostic artifacts, including bottles and ceramics, by their temporal range. Within the compound, the distribution of early artifacts is sporadic and likely reflects disturbance and casual discard, while around the southern perimeter early artifacts are much more abundant.

The bottle collection, based on the manufacturing location, appears to be diverse and includes bottles manufactured in the eastern U.S., the Midwest, and the west coast. It is probable that the products in the bottles also originated in areas near where the bottles were made. A single international commodity (whiskey bottle from Scotland) was recorded in the bottle collection.

Summary

As discussed above, the pattern evident in the shovel testing and test excavations is that intensive discard occurred away from the compound, possibly to the south and west (downwind of the prevailing winds), while inside the compound discard was casual and likely more expedient or non-intentional. Prior to the current project, it was unclear how the occupants of the Cable Station dealt with discard or where such discard might occur. While questions remain (e.g., are there additional discard locations near the Cable Station), the current data provide a foundation that suggests the Cable Station occupants (e.g., and probably later occupants as well) were systematic in their life style, which was likely the necessary result of living on an island with limited resources, working within an environment that demanded exactness, and even living within a built environment that emphasized regularized concepts of space.

Prior to the current project, there was no direct artifactual evidence of the ethnic diversity discussed and documented in the historic documents. With the partial excavation of Features 2 and 3 behind the servants' quarters (Building 626), it can now be confirmed that Overseas Chinese worked on Midway and that Building 626 or a nearby structure housed these workers. Additional work in this area may shed additional light on the Chinese experience on Midway during the early twentieth century.



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Figure 52. Site 50-93-01-001, Plan View Showing Where Cable Station and WW-II Era Artifacts were Recovered.

Table 6. General Chronological Breakdown of Diagnostic Artifacts by Provenience.

Provenience	Cable Station (1903-1941**)	WW-II (1941-1945)
TU-1/L-I	77,79	77*
TU-2/L-I	54, 74, 76, 101	74*,76*, 101*
TU-2/Fe. 2	13, 55, 75	55, 75*
TU-2/Fe. 3	1-11, 14-22, 86, 87, 97, 100, 110, 111	
TU-3/I	83	
TU-4/L-II	72, 84	72*
TU-5/I	85	
TU-6/I	102	41
ST-A/L-II	12	
ST-B	81, 82	81, 82
ST-Q	80	
ST-16	78	78*
DU-1/5	23, 24, 25, 27, 31, 34, 35	23, 24
DU-1/7		42
DU-1/8	37	
DU-1/10	39	28, 29*, 30*, 39*
DU-1/11	40	40*
DU-1/14	26, 33	26*
DU-1/15	36, 38	36*, 38
DU-1/16	32	32*
**The Cable Station was in operation until 1951, but was the sole occupant only until 1941, when the U.S. Military began using Buildings 623, 628, and 643.		
*Date range extends beyond WW-II era.		

The early Cable Station is unique, also, in that there was no local production of durable goods, there was no long-term occupation of the site prior to the establishment of the station, and there was little opportunity for localized trade from nearby islands or visiting vessels; even the soil to establish gardens was imported. All goods coming into the Cable Station community arrived via regular ship visits from Honolulu. Yet the recovered artifacts do not appear to have been locally produced in Hawaii and appear to come from distribution points across the United States. While the Overseas Chinese artifacts were likely produced in southern China, these items likely were purchased in Honolulu or possibly the West coast for consumption on Midway. The overall collection and distribution of goods that eventually entered the Midway community was likely organized and orchestrated by the New York-based parent company of the Commercial Pacific Cable Company or by local agents for the company. Additional archival research might be brought to bear on the nature of trade and the intricacies of supplying necessary goods to a remote outpost in the Pacific.

MARINE BARRACKS

The Marine Barracks were built in 1940, modified over the years, and abandoned in about 1980. Are artifacts associated with men stationed in the barracks deposited near the exits where individuals probably gathered? Are the artifact categories primarily personal items that may represent casual loss? Do the remains constitute a significant deposit as per the NRHP?

Of the 177 artifacts recovered from 10 shovel tests at the Marine Barracks (site 50-93-01-002), 147 were construction material or plastic. Eight artifacts (five pull tabs, a 1979 US penny, a broken metal spoon, and a .30 caliber rifle casing (1942) are the only diagnostic items recovered from the Marine Barracks. The paucity of personal items likely indicates that long-term or repeated social activities occurred elsewhere away from the building. The lack of recoverable material cultural from around the buildings, as well as subsurface disturbance due to petrel burrowing diminishes the significance of the archaeological site, since it is unlikely to yield substantial information concerning the occupants or function of the buildings.

RECOMMENDATIONS

Prior to excavations, the only information concerning the Cable Station was from historical accounts and brief correspondences of those who worked on or visited the station. The excavation of Features 2 and 3 at the Cable Station confirm some of the accounts, while clarifying others concerning ethnic groups working and living on Midway at the turn of the twentieth century. Likewise, the results of shovel testing provide data concerning likely areas of future research, or at least areas of heightened concern during future development. Thus, Site 50-93-01-001 has provided important information concerning the Cable Station, and is likely to yield additional information in the future. Site 50-93-01-001 is recommended as eligible for inclusion on the NRHP under Criterion D (in addition to the other criteria already considered during architectural studies).

It is recommended that archaeological monitoring occur during soil removal and building demolition, and that data recovery excavations be undertaken on potentially significant features uncovered during the soil removal project. In addition, it is recommended that the soil removal within the compound be monitored in order to retrieve additional artifacts dating to the early to mid-twentieth century as well as documenting the system of pipes likely to be encountered.

Based on the general lack of cultural material recorded during shovel testing as well as a lack of subsurface integrity, it is recommended that the subsurface archaeological deposit (Site 50-93-01-002) surrounding the Marine Barracks does not significantly contribute to the historic property under Criterion D of the NRHP. However, the Marine Barracks have already been determined eligible for the NRHP under Criteria A and C. No further work is recommended for the Marine Barracks.

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**APPENDIX A:
SCOPE OF WORK**

SCOPE OF WORK
for
Archaeological Services
Midway Atoll National Wildlife Refuge
June 17, 2011

Introduction

This is a purchase order contract for archaeological services for testing the potential for buried cultural remains around the Commercial Pacific Cable Company station (Cable Station) and Marine Barracks, Midway Atoll National Wildlife Refuge (NWR). The Cable Station and Barracks have been determined eligible to the National Register of Historic Places, therefore, the contractor must possess exceptional skills relating sensitivity to historic resources and knowledge of 1900 to 1950 cultural material, and specifically:

- 1) The archaeological investigations are in response to the proposal to eliminate lead paint from the compound by removing three of the two-story buildings, the one-story building, and all of the sand around the buildings down to a depth of 2 ft. The contractor must be sensitive to working around buildings that are painted with lead-based paint, and take steps to protect workers from lead exposure that may be present in the sand surrounding the buildings;
- 2) Contractor must be familiar with cultural material dating from the 1900 to the 1950s. It is anticipated that evidence of the Cable Station employees and operations will be recovered and may include: household items, personal items, cable related items, etc.;
- 3) Contractor must have equipment, suggest survey grade GPS and base station, to produce an accurate site map with excavation datums in UTM's with reference points provided in decimal degree latitude/longitude, WGS 84 datum;
- 4) Contractor will coordinate all fieldwork decisions with FWS Cultural Resources Team on a daily basis. On-island logistics will be coordinated with refuge staff. Fieldwork is restricted to between June and October;
- 5) Contractor will be limited in the amount of equipment, employees, and time to conduct the fieldwork. Work will be compressed within a 7-day period (flight schedules are from Tues to Tues), the maximum crew size is 10 people, and FWS retains the right to reduce the crew size and/or weight as conditions warrant. Personal gear is limited to 50 lbs.; and
- 6) Contractor is under the legal authority of the USFWS while on Midway Atoll NWR and will follow all rules and regulations as posted or verbally presented. Contractor will attend an orientation meeting at the FWS office within 12 hours of their arrival. Failure to comply with regulations is grounds for the immediate termination of the contract, removal from Midway, and federal prosecution.

2. Project Description

The goal of the project is to ascertain if there is a significant deposit of cultural material relating to the occupation of the Cable Station or Marine Barracks, prior to lead base paint remediation steps that include removing sand from around the buildings (see attached photographs and site plan).

The Cable Station was constructed in 1903 and consists of five buildings: four are two-story and arranged around a courtyard and one is a small one-story building constructed just outside the compound. The Cable Station compound with four buildings is about 300 x 300 ft. The smaller, one-story building is outside the compound approximately 50 ft and is 25 x 57 ft. There were about 30 people in residence at Midway to operate the transpacific cable relay station. Between 1903 and 1935 they were the only people permanently living on Midway. Small outbuildings were also present in and around the compound, but there is no surface evidence of them. There is also no surface indication of buried cultural material. The entire compound and a surrounding "activity" area of 100 ft/30m should be included within the testing plan.

Because most of the Cable Station will be demolished, a very detailed, accurate map of the building footprint, walkways, cistern, and landscape plants is required so that the grounds can be re-landscaped to reflect the original disposition of the buildings after the remediation.

The Marine Barracks were constructed in 1940 and used to house military personnel during World War II, and subsequent conflicts up to the 1980s when the buildings were abandoned. Evidence of the WWII-era usage by the Marines stationed on Midway may have been deposited in the sand around the buildings. To date little evidence of individual soldiers has been found on Midway. These buildings and the surrounding lead-laden sand will be removed as part of the lead paint remediation. Therefore, testing near the entries of the building and recording their exact locations is required.

Research Questions

- a) Is there any evidence of the occupants or operation of the Cable Station within the compound that will be disturbed or dug-up by the building demolition or sand removal? Are the remains scattered or are there areas of artifact concentrations? Do the remains constitute a significant deposit as per the National Register of Historic Places criterion d?
- b) Is there evidence of the Cable Station employees outside of the compound, perhaps an area where they discarded household items. Locating a deposit or buried dump would be a highly significant find that would greatly add to our knowledge and interpretation of the Cable Station.
- c) The Marine Barracks were built in 1941, modified over the years, and abandoned in about 1980. Are artifacts associated with men stationed in the barracks deposited near the exits where individuals probably gathered? Are the artifact categories primarily personal items that may

represent casual loss? Do the remains constitute a significant deposit as per the National Register of Historic Places criterion d?

3) Testing Plan

Cable Station:

- Excavate 6-1x2m x at least 1 m deep within the compound. One 1x2m unit will be excavated adjacent to the foundation of one of the buildings to determine the depth of the foundation, then describe and photograph the foundation. A soil sample (1 pint) will be collected from the bottom level of each of the test units. The soil sample will be used to test for lead paint contamination, so the sample needs to be collected in manner that excludes any upper level sediments.
- Draw soil profiles, with Munsell color description, soil description and photograph.
- 30 30-cm diameter shovel probes distributed around the interior of the compound.
- Excavate 20 30-cm diameter shovel probes near the one story-building, and scattered around the exterior of the compound within the 100 ft/30 m "activity" area.
- Excavate 1-1x2m x 1 m unit outside of the compound based on results from shovel probes.

Marine Barracks:

- Excavate 10 30-cm diameter shovel probes near the barrack entrances (2 probes at 4 entrances = 8 probes, 2 discretionary). Testing for subsurface cultural materials relating to the occupation of the barracks.

General:

- Identify each unit and shovel probe with a UTM coordinate.
- Identify all specimens (artifacts and samples) collected from each unit with the identifying coordinate and depth.
- Photograph documentation will include: all 1x2m units, setting, people excavating, shovel probe locations, each building/each elevation, field artifact discoveries.
- Summarize unit contents and map locations daily. E-mail records at end of day to Cultural Resources Team/FWS staff for discussion regarding placement of new units.

Mapping:

- Collect reference points (UTM and DD lat/long) for each of the Cable Station building corners, concrete pad corners, sidewalks, cistern, and compound landscape features in order to "re-create" the compound after the buildings are removed.
- Collect reference points for each corner of the Marine Barracks.
- All test units/shovel probes will be recorded with a point and plotted on a site plan.
- Record the size, thickness, and depth of the concrete pad and foundations.
- Collect data to produce map accurate to 10 cm. tied in with permanent markers on the

atoll, including USGS survey marker, Radar Hill, Cemetery Hill.

Other tasks:

- Collect samples of the building materials from Cable Station including, concrete, rebar mesh, rebar cable, and roof decking. The buildings are a timecapsule of a very early building technology using reinforced poured concrete for a two-story building. Samples of the materials are important for interpreting the site and explaining to the public the unique architectural features of the buildings.
- Tag with an identification card -- containing the location where item was collected, the date, collector, and a description of the item. Photograph the item and move to storage in Building 643.
- Collection of samples will be coordinated with Ms. Speulda-Drews.

4. Deliverables

- Summarize unit contents and map locations daily. E-mail records at end of day to Lou Ann Speulda-Drews for discussion regarding placement of new units.
- Letter defining results of test units with a site map sent to FWS (Speulda-Drews) within 30 days of the completion of fieldwork
- Prepare a professional quality Archaeological Testing Report composed of the testing plan and other tasks, detailed above, within 60 days of the completion of fieldwork, sent to FWS (Speulda-Drews).
- After final approval of report, produce 10 bound hard copies, 2 disk copies, all photographs and photo logs, all field notes, all stratigraphic profiles, sketch maps, artifact/sample logs, and artifacts/samples (not stored at Cable Building 643) will be sent to FWS (Ms Speulda-Drews).
- Additionally, prepare a stand-alone accurate map of the Cable Station compound with building footings, walkways, landscape plants, and archaeologically discovered features. Send a hard copy and electronic file format to FWS (Speulda-Drews).

The report will include:

- A brief background/context statement of the history of the Cable Station,
- Methods/strategy of testing,
- Research question discussion,
- Results of testing per unit and artifact type,
- Significance of testing results,
- Site map with locations of each building, testing unit and shovel probe,
- Illustration of a soil profile with Munsell color and sediment description of at least one unit. If all units are the same then only one needs to be illustrated; however, variations in the stratigraphy are likely, and
- Photographs to include: test units, context views of unit locations, people working on excavation, recovered artifacts, general site views/setting, each building, and building materials that are collected and stored.

- All photographs and photo log attached to the report as an Appendix.
- Artifact Catalog attached to the report as an Appendix.
- List of building materials collected attached to report as an Appendix.

Report Format

- Text will be word processed on good quality bond paper, 8.5 x 11 inches with 1-inch margins. Final report single-spaced type and set up for double sided printing. The report will also be produced and submitted in a digital format (specifics to be negotiated), suitable for printing.
- The title page will indicate the U.S. Fish and Wildlife Service as the sponsor, contract number, date, and principal investigator's name and affiliation.
- All references in the text will be in the standard *American Antiquity/Society for Historical Archaeology* format.
- All pages, figures, and tables will be consecutively numbered throughout the report.
- The first time the common name of a biological species is used, it should be followed by the scientific name.
- Location maps will include the Hawaiian Island Chain, Midway Atoll map, Sand Island map, and Cable Station compound.
- All tables, figures, and maps will be produced in a paper and digital format. They will have a number, title, and explanatory caption note. In addition, they will display a north arrow, scale, and a key as appropriate.
- Digital photographs will be accompanied by a photo log and burned on to a cd to be included with report.
- References cited in report will be listed.

5) Review

- The FWS will have 30 days to review the draft report. The contractor shall consider all comments made and revise the report accordingly, if necessary.
- After the FWS has reviewed and returned the report, the contractor will submit a corrected "final" report and all products within 60 days.

6. Special Qualifications

In order for the contractor to qualify, they must have a demonstrated track record on completing archaeological testing/report preparation projects, possess knowledge of early-twentieth century cultural material. Contractor must meet the requirements for a professional archaeologist and have experience working with historical archaeological sites. Contractor must have experience working in isolated locations with no commercial products available. Contractor and employees are required to have valid passports.

7. Contract Schedule:

Fieldwork is from June to October. Fieldwork will begin as soon as possible after award of contract and must be completed within 6 months. It is anticipated that the project will require 7-

days of fieldwork on Midway Atoll NWR.

Travel to the project is one of the major factors at this remote station and work will be coordinated among the FWS staff and contractor to be as efficient as possible. This may require the contractor to be fairly flexible with the work schedule.

8. Payment Schedule

Contractor will submit three invoices: 1) at the completion of the fieldwork for costs incurred; 2) after the submission of the "draft" report; and 3) upon acceptance by the FWS CRT of the final report and all products identified above. To receive final payment the contractor will submit: 10 bound hard copies, 2 disk copies, all photographs and photo logs, all field notes, all stratigraphic profiles, sketch maps, artifact/sample logs, and artifacts/samples. Payment for the work will be within 30-days of approval by the refuge manager/project leader.

9. Special Considerations

Contractor will work with the Fish and Wildlife Service's Cultural Resources Team to ensure that the goal of investigating the potential for buried material in and around the Cable Station is implemented in a manner that will meet the requirements for assessing the adverse effect of lead paint removal.

Travel to Midway Atoll NWR is restricted. Flights are by private carrier on a weekly schedule and cost approximately \$1000 per person round trip. Housing and meals are coordinated through the FWS and its on-island contractor. Housing costs approximately \$150 per night; meals are \$50.00 per day at the Clipper house. These are the only options available on Midway. Travel and per diem costs should be included in this quotation.

A small convenience store and the Friends of Midway gift shop are the only commercial products available on island for purchase (cash only). There are no hardware stores, etc. contractor must bring all supplies that they will need for the project.

Contractor will provide all hand tools, screens, equipment, etc. to complete the work.

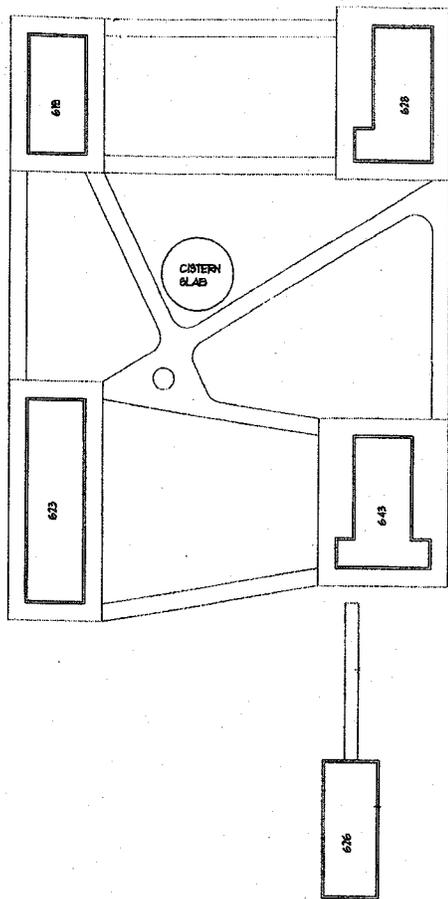
10. Contacts

Carlton Morris
Environmental Compliance Coordinator
U.S. Fish and Wildlife Service
911 NE 11th Ave
Portland, OR 97232-4181
503-231-6143; cell 503-784-3911

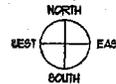
Susan Schulmeister, Refuge Manager
Midway Atoll NWR
PO Box 50167

Honolulu, HI 96850
808-674-8237
808-954-4819

Lou Ann Speulda-Drews, Historian/Historical Archaeologist
U.S. Fish and Wildlife Service
1340 Financial Blvd, Suite 234
Reno, NV 89502
Phone 775-861-6335 FAX 775-861-6301



SITE PLAN
SCALE: 1/8" = 1'-0"



Cable Station Plan Map.

**APPENDIX B:
GPS COORDINATES**

Site	Location	Description	Latitude (North)	Longitude (West)
50-93-01-002	Marine Barracks	Shovel Test 2-1	28°12'24.470"	-177°22'46.343"
50-93-01-002	Marine Barracks	Shovel Test 2-2	28°12'24.371"	-177°22'48.045"
50-93-01-002	Marine Barracks	Shovel Test 2-3	28°12'22.419"	-177°22'46.284"
50-93-01-002	Marine Barracks	Shovel Test 2-4	28°12'22.443"	-177°22'46.115"
50-93-01-002	Marine Barracks	Shovel Test 2-5	28°12'24.450"	-177°22'44.397"
50-93-01-002	Marine Barracks	Shovel Test 2-6	28°12'24.454"	-177°22'44.169"
50-93-01-002	Marine Barracks	Shovel Test 2-7	28°12'22.489"	-177°22'44.352"
50-93-01-002	Marine Barracks	Shovel Test 2-8	28°12'22.515"	-177°22'44.234"
50-93-01-002	Marine Barracks	Shovel Test 2-9	28°12'23.924"	-177°22'44.394"
50-93-01-002	Marine Barracks	Shovel Test 2-10	28°12'23.676"	-177°22'43.984"
50-93-01-002	Building 579	Northwest Building Corner	28°12'24.324"	-177°22'46.441"
50-93-01-002	Building 579	Southwest Building Corner	28°12'22.528"	-177°22'46.443"
50-93-01-002	Building 579	Southeast Building Corner	28°12'22.528"	-177°22'45.936"
50-93-01-002	Building 579	Northeast Building Corner	28°12'24.323"	-177°22'44.394"
50-93-01-002	Building 578	Northwest Building Corner	28°12'24.323"	-177°22'44.547"
50-93-01-002	Building 578	Southwest Building Corner	28°12'25.528"	-177°22'44.549"
50-93-01-002	Building 578	Southeast Building Corner	28°12'22.527"	-177°22'44.042"
50-93-01-002	Building 578	Northeast Building Corner	28°12'24.323"	-177°22'44.040"
50-93-01-001	Building 619	Northwest Building Corner	28°12'58.839"	-177°22'44.369"
50-93-01-001	Building 619	Southwest Building Corner	28°12'58.292"	-177°22'44.426"
50-93-01-001	Building 619	Southeast Building Corner	28°12'58.265"	-177°22'44.103"
50-93-01-001	Building 619	Northeast Building Corner	28°12'58.813"	-177°22'44.046"
50-93-01-001	Building 628	Northwest Building Corner	28°12'58.733"	-177°22'42.796"
50-93-01-001	Building 628	Southwest Building Corner	28°12'58.091"	-177°22'42.972"
50-93-01-001	Building 628	Southeast Building Corner	28°12'58.054"	-177°22'42.571"
50-93-01-001	Building 628	Northeast Building Corner	28°12'58.705"	-177°22'42.495"
50-93-01-001	Building 623	Northwest Building Corner	28°12'57.217"	-177°22'44.553"
50-93-01-001	Building 623	Southwest Building Corner	28°12'56.259"	-177°22'44.666"
50-93-01-001	Building 623	Southeast Building Corner	28°12'56.228"	-177°22'44.335"
50-93-01-001	Building 623	Northeast Building Corner	28°12'57.186"	-177°22'44.222"
50-93-01-001	Building 643	Northwest Building Corner	28°12'56.849"	-177°22'43.017"
50-93-01-001	Building 643	Southwest Building Corner	28°12'56.168"	-177°22'43.175"
50-93-01-001	Building 643	Southeast Building Corner	28°12'56.130"	-177°22'42.694"
50-93-01-001	Building 643	Northeast Building Corner	28°12'56.826"	-177°22'42.714"
50-93-01-001	Building 626	Northwest Building Corner	28°12'55.451"	-177°22'43.193"
50-93-01-001	Building 626	Southwest Building Corner	28°12'55.017"	-177°22'43.247"
50-93-01-001	Building 626	Southeast Building Corner	28°12'55.003"	-177°22'43.100"
50-93-01-001	Building 626	Northeast Building Corner	28°12'55.437"	-177°22'43.047"
50-93-01-001	Cable Station	Test Unit 1	28°12'58.110"	-177°22'42.989"
50-93-01-001	Cable Station	Test Unit 1	28°12'58.046"	-177°22'42.996"
50-93-01-001	Cable Station	Test Unit 2	28°12'54.832"	-177°22'43.315"
50-93-01-001	Cable Station	Test Unit 2	28°12'54.818"	-177°22'43.244"
50-93-01-001	Cable Station	Test Unit 3	28°12'57.757"	-177°22'44.076"
50-93-01-001	Cable Station	Test Unit 3	28°12'57.695"	-177°22'44.084"
50-93-01-001	Cable Station	Test Unit 4	28°12'56.583"	-177°22'43.949"
50-93-01-001	Cable Station	Test Unit 4	28°12'56.581"	-177°22'43.874"

Site	Location	Description	Latitude (North)	Longitude (West)
50-93-01-001	Cable Station	Test Unit 5	28°12'57.577"	-177°22'46.686"
50-93-01-001	Cable Station	Test Unit 5	28°12'57.519"	-177°22'46.692"
50-93-01-001	Cable Station	Test Unit 6	28°12'58.174"	-177°22'43.862"
50-93-01-001	Cable Station	Test Unit 6	28°12'58.167"	-177°22'43.792"
50-93-01-001	Cable Station	Test Unit 7	28°12'57.416"	-177°22'41.765"
50-93-01-001	Cable Station	Test Unit 7	28°12'57.356"	-177°22'41.779"
50-93-01-001	Cable Station	Shovel Test 1-1	28°15'56.295"	-177°22'44.053"
50-93-01-001	Cable Station	Shovel Test 1-2	28°12'56.586"	-177°22'44.005"
50-93-01-001	Cable Station	Shovel Test 1-3	28°12'24.454"	-177°22'44.169"
50-93-01-001	Cable Station	Shovel Test 1-4	28°12'57.121"	-177°22'43.931"
50-93-01-001	Cable Station	Shovel Test 1-5	28°12'57.459"	-177°22'44.115"
50-93-01-001	Cable Station	Shovel Test 1-6	28°12'57.724"	-177°22'44.084"
50-93-01-001	Cable Station	Shovel Test 1-7	28°12'58.003"	-177°22'44.046"
50-93-01-001	Cable Station	Shovel Test 1-8	28°12'24.454"	-177°22'44.169"
50-93-01-001	Cable Station	Shovel Test 1-9	28°12'57.984"	-177°22'43.342"
50-93-01-001	Cable Station	Shovel Test 1-10	28°12'57.686"	-177°22'43.054"
50-93-01-001	Cable Station	Shovel Test 1-11	28°12'56.555"	-177°22'43.846"
50-93-01-001	Cable Station	Shovel Test 1-12	28°12'57.693"	-177°22'43.368"
50-93-01-001	Cable Station	Shovel Test 1-13	28°12'58.153"	-177°22'43.894"
50-93-01-001	Cable Station	Shovel Test 1-14	28°12'58.169"	-177°22'46.646"
50-93-01-001	Cable Station	Shovel Test 1-15	28°12'58.580"	-177°22'43.861"
50-93-01-001	Cable Station	Shovel Test 1-16	28°12'58.526"	-177°22'43.561"
50-93-01-001	Cable Station	Shovel Test 1-17	28°12'58.478"	-177°22'43.081"
50-93-01-001	Cable Station	Shovel Test 1-18	28°12'22.419"	-177°22'42.779"
50-93-01-001	Cable Station	Shovel Test 1-19	28°12'57.194"	-177°22'43.193"
50-93-01-001	Cable Station	Shovel Test 1-20	28°12'22.419"	-177°22'46.284"
50-93-01-001	Cable Station	Shovel Test 1-21	28°12'57.222"	-177°22'42.881"
50-93-01-001	Cable Station	Shovel Test 1-22	28°12'57.237"	-177°22'43.066"
50-93-01-001	Cable Station	Shovel Test 1-23	28°12'57.952"	-177°22'43.028"
50-93-01-001	Cable Station	Shovel Test 1-24	28°12'58.119"	-177°22'44.614"
50-93-01-001	Cable Station	Shovel Test 1-25	28°12'57.752"	-177°22'44.647"
50-93-01-001	Cable Station	Shovel Test 1-26	28°12'57.149"	-177°22'43.663"
50-93-01-001	Cable Station	Shovel Test 1-27	28°12'57.101"	-177°22'43.345"
50-93-01-001	Cable Station	Shovel Test 1-28	28°12'56.235"	-177°22'43.521"
50-93-01-001	Cable Station	Shovel Test 1-29	28°12'57.485"	-177°22'44.269"
50-93-01-001	Cable Station	Shovel Test 1-30	28°12'57.350"	-177°22'43.127"
50-93-01-001	Cable Station	Shovel Test 1-A	28°12'54.752"	-177°22'43.011"
50-93-01-001	Cable Station	Shovel Test 1-B	28°12'54.812"	-177°22'43.375"
50-93-01-001	Cable Station	Shovel Test 1-C	28°12'54.922"	-177°22'43.963"
50-93-01-001	Cable Station	Shovel Test 1-D	28°12'56.242"	-177°22'43.720"
50-93-01-001	Cable Station	Shovel Test 1-E	28°12'55.545"	-177°22'43.746"
50-93-01-001	Cable Station	Shovel Test 1-F	28°12'56.008"	-177°22'44.428"
50-93-01-001	Cable Station	Shovel Test 1-G	28°12'56.032"	-177°22'44.693"
50-93-01-001	Cable Station	Shovel Test 1-H	28°12'56.253"	-177°22'44.901"
50-93-01-001	Cable Station	Shovel Test 1-I	28°12'22.419"	-177°22'46.284"
50-93-01-001	Cable Station	Shovel Test 1-J	28°12'56.608"	-177°22'42.151"

Site	Location	Description	Latitude (North)	Longitude (West)
50-93-01-001	Cable Station	Shovel Test 1-K	28°12'57.537"	-177°22'42.193"
50-93-01-001	Cable Station	Shovel Test 1-L	28°12'57.412"	-177°22'41.727"
50-93-01-001	Cable Station	Shovel Test 1-M	28°12'57.346"	-177°22'45.225"
50-93-01-001	Cable Station	Shovel Test 1-N	28°12'57.384"	-177°22'45.582"
50-93-01-001	Cable Station	Shovel Test 1-O	28°12'57.415"	-177°22'45.890"
50-93-01-001	Cable Station	Shovel Test 1-P	28°12'56.848"	-177°22'46.018"
50-93-01-001	Cable Station	Shovel Test 1-Q	28°12'57.570"	-177°22'46.638"
50-93-01-001	Cable Station	Shovel Test 1-R	28°12'58.090"	-177°22'46.166"
50-93-01-001	Cable Station	Shovel Test 1-S	28°12'58.311"	-177°22'45.117"
50-93-01-001	Cable Station	Shovel Test 1-T	28°12'57.873"	-177°22'45.179"
50-93-01-001	Cable Station	Shovel Test 1-U	28°12'56.872"	-177°22'41.663"
50-93-01-001	Cable Station	Shovel Test 1-V	28°12'56.304"	-177°22'42.151"
50-93-01-001	Cable Station	Shovel Test 1-W	28°12'56.116"	-177°22'42.537"

APPENDIX C:

PHOTOLOGS

(CD containing Digital Images Attached)

SONY

PCSI PHOTO RECORD

Bld 628 is Fe. 1 of SITE T-1

Project: Midway Atoll CPCC		Camera SONY	# of Frames:		
Frame	Description	View to:	Initials	Date	
1	Keola stringing TU-1 @ Bld 628	SITE T-1	RN	10/7/11	
2	TU-1 pre-excavation	SITE T-1			
3	Rich @ Bld 628	NW			
4	TU-1 End of layer I	N			
5	TU-1 End of layer I	N			
6	TU-1 Boe (1.0m)	W			
7	TU-1 Boe (1.0m)	W			
8	TU-1 Boe (1.0m)	E			
9	TU-1 Boe (1.0m)	N			
10	TU-1 Boe (1.0m)	N			
11	TU-1 Boe (1.0m)	S			
12	TU-1 Boe (1.0m)	S			
13	Keola taking Boe notes @ TU-1	NNE			
14	Albatross egg	-			
15	Site T-1 ST-A BOE	W		10/8/11	
16	Site T-1 ST-B BOE	NW			
17	General location of ST-C @ T-1	W			
18	Site T-1 ST-C BOE	WSW			
19	Site T-1 ST-D TERMINATED IN LI	N			
20	Site T-1 ST-E BOE	SE			
21	Site T-1 TU-2 PRE-EXCAVATION	N	KT	10/8/11	
22	" " FE. 3 B. END PORTION OF UNIT	N/PLAN	RT	"	
23	" " "	"	RT	"	
24	Site T-1 TU-2 North face	N	RU	10/9/11	
25	" " West face	W			
26	" " South face	S			
27	" " East face	E			
28	"				
29	" TU-3 PRE-EXCAVATION	N	KN	10/9/11	
30	" " "	N			
31	" " TOP OF LAYER II	S			
32	" " "	N			
33	" " FE. 5 @ BOE (5cmbs)	N			
34	" " BOE	N			
35	" " "	N			
36	" " W. WALL	N			
37	" " S. WALL	N			
38	" " E. WALL	N			
39	" " N. WALL	N			

SONY

PCSI PHOTO RECORD

Project: Midway Atoll CPCC		Camera Sony	# of Frames:			
Frame	Description	View to:	Initials	Date		
40	RICH WORKING, SITE 1, TU-4,	E	KN	10/9/11		
41	SITE 1, TU-4, BOE	E	}	}		
42	" " " " NORTH WALL	N				
43	" " " " EAST WALL	E				
44	" " " " SOUTH WALL	S				
45	" " " " WEST WALL	W				
46	Site T-1 TU-5 START	S	RN	10/10/11		
47	Site T-1 TU-5 Boe Keola	S	}	}		
48	Site T-1 TU-5 South wall	S				
49	" " " " NORTH WALL	N	RN	10/10/11		
50	" " " " EAST WALL	N	}	}		
51	" " " " "	S				
52	" " " " WEST WALL	N				
53	" " " " SOUTH + WEST WALL	S				
54	" " " " BOE	S				
55	" " " " "	K	}	}		
56	Site T-1, TU-6, BOE	W				
57	" " " " WEST WALL	W				
58	" " " " EAST WALL	E				
59	" " " " NORTH WALL	N				
60	" " " " SOUTH WALL	S	}	}		
61	Site T-1 TU-7 clearing	SW			RN	10/11/11
62	Site T-1 Jeff	W			}	}
63	Site T-1 Bld 628	NW				
64	" " " " Front	N				
65	" " " " South Side	N				
66	" " " " Front	W				
67	" " " " NE corner	NW	}	}		
68	Site T-1 Bld from TU-7	SSW				
69	Site T-1 TU-7 Pre-excavation	N				
70	" " " " "	N				
71	Site T-1 TU-7 Boe South end of E face	E			}	}
72	North end of E face	E				
73	South end of W face	W				
74	North end of W face	W				
75	South face	S				
76	North face	N	}	}		

SONY

PCSI PHOTO RECORD

Project: Midway Atoll CPCC		Camera SONY	# of Frames:		
Frame	Description	View to:	Initials	Date	
113	Bld 643c SE corner Dennis/MaryAnn	NW	RN	10	11/11
114	Bld 643c S side	W			
115	Bld 643c East side staircase	W			
116	Bld 643c East side	W			
117	Bld 643c North side	W			
118	Bld 626	SSW			
119	Bld 626 North side	S			
120	Bld 626 Northeast corner	SW			
121	Bld 626 North side w/ support	W			
122	Bld 626 interior	W			
123	Bld 626 rebar in door way	SW			
124	Bld 626 rebar in interior door way	NW			
125	Bld 626 interior with white terrin	W			
126	Bld 626 south side	N			
127	Bld 626 Southeast corner	N			
128	Bld 626 East side	W			
129	Bld 626 NW corner	SE			
130	Bld 626 W side support closeup	E			
131	Bld 626 W side north end	E			
132	Bld 626 W side south end	E			
133	Bld 623 SE corner	NW			
134	Bld 623 Fire hydrant	N			
135	Bld 623 South side	N			
136	concrete box off SE corner of Bld 623	NE			
137	Bld 623 SW corner	NE			
138	Bld 623 West side	NE			
139	Bld 623 NW corner	SE			
140	Bld 623 NE corner	S			
141	Bld 643c West side	ESE			
142	GEO. CANNON SCHOOL	NE			
143	" "	NE			
144	Post (broken) @ GEO CANNON	-			
145					
146					
147					
148					

CHIRP 2

SONY

PCSI PHOTO RECORD

Project: Midway Atoll CPCC		Camera Sony	# of Frames:	
Frame	Description	View to:	Initials	Date
77	Dennis excavating SP-U	S	RN	10/11/11
78	Keala profiling TU-7	S		
79	Rich's / Dennis' transportation	N		
80	TU 7 and Dennis	S		
81	Bld 628 SW corner	NE		
82	Bld 628 braided cable between floors	E		
83	Bld 628 corner window SW corner	E		
84	Fire hydrant between Bld 628 &	W		
85	Bld 628 NW corner 2 nd floor	E		
86	Bld 628 back central	SE		
87	Bld 628 SW corner	SE		
88	Bld 619 Front	W		
89	Bld 628 back w/ structural remains	E		
90	Bld 619 SE corner	NW		
91	Bld 619 South side	N		
92	Bld 619 SW corner	NE		
93	Bld 619 Tiled exterior back wall	NE		
94	Bld 619 SW corner remnants of walkway	E/NE		
95	Bld 619 NW corner remnants	N		
96	Bld 619 NE corner	SW		
97	Bld 619 N side	S		
98	Bld 619 NW corner	SE		
99	Bld 619 W side	SE		
100	Bld 619 W side	E		
101	Bld 628 NW corner vegetation	SE		
102	Bld 628 NE corner	SSW		
103	Jeff @ station	SE		
104	Bld 643c N side	S		
105	Bld 643c architectural arch support	S		
106	Bld 643c NW corner	SE		
107	Bld 643c SW corner west side	S		
108	white TERMS	SW		
109	Bld 643c SW corner	NE		
110	Bld 643c SW corner	NE		
111	Bld 643c South side	N		
112	Keala / Jeff TU7 area	N		

TRIMBLE

PCSI PHOTO RECORD

Project: Midway Atoll CPCC		Camera	# of Frames:	
Frame	Description	View to:	Initials	Date
	6111010-0001			
1	6111010-0000 623 from IW ST-9			
2	6111010-0003 623 from "Agave" ST-T			
3	628 from ST-I			
4	628 from ST-J			
5	643 from ST-17			
6	628 from ST-19			
7	628 from ST-23			
8	618 from ST-9			
9	618 from ST-8			
10	618 from ST-14			
11	643 from ST-15			
12	623 from ST-16			
13	643 from ST-13			
14	643 from ST-2			
15	643 623 from ST-27			
16	643 from ST-4			
17	623 from ST-25			
18	618 from ST-29			
19	618 from ST-24			
20	643 from ST-V			
21	643 from ST-V			
22	628 from ST-18			
23	643 from Banyan			
24	628 from Banyan			
25	623 from ST-30			
26	643 from Coconut			
27	626 from ST-29 Coconut			
28	626 from Banyan			
29	643c from Ironwood			
30	623 from Banyan			
31	623 from ST-H			
32	628 from Ohiaender?			
33	619a from Banyan			
34	619 from Norfolk			
35	628 from Coconut			

**APPENDIX D:
BAG LIST AND ACCESSION LIST**

Table D-2. Diagnostic Artifact Accession List

Artifact #	Bag #	Artifact Type	Material	Brief Description
1	10	Bottle	Glass	beer
2	10	Bottle	Glass	beer
3	10	Bottle	Glass	beer
4	10	Bottle	Glass	beer
5	10	Bottle	Glass	beer
6	10	Bottle	Glass	beer
7	10	Bottle	Glass	beer
8	10	Bottle	Glass	beer
9	10	Bottle	Glass	beer
10	10	Bottle	Glass	beer
11	10	Bottle	Glass	beer
12	9	Bottle	Glass	beer
13	9	Bottle	Glass	beer
14	10	Bottle	Glass	champagne/wine
15	10	Bottle	Glass	champagne/wine
16	10	Bottle	Glass	champagne/wine
17	10	Bottle	Glass	wine-brandy
18	10	Bottle	Glass	wine-brandy
19	10	Bottle	Glass	ketchup
20	10	Bottle	Glass	ketchup
21	10	Bottle	Glass	ketchup
22	10	Bottle	Glass	ketchup
23	DU-1/5	Bottle	Glass	beer
24	DU-1/5	Bottle	Glass	beer
25	DU-1/5	Bottle	Glass	beer
26	DU-1/14	Bottle	Glass	beer
27	DU-1/5	Bottle	Glass	soda root beer
28	DU-1/10	Bottle	Glass	soda cake
29	DU-1/10	Bottle	Glass	soda cake
30	DU-1/10	Bottle	Glass	soda
31	DU-1/5	Bottle	Glass	soda
32	DU-1/16	Bottle	Glass	soda
33	DU-1/14	Bottle	Glass	carbonated beverage
34	DU-1/5	Bottle	Glass	carbonated beverage
35	DU-1/5	Bottle	Glass	carbonated beverage
36	DU-1/15	Bottle	Glass	brandy
37	DU-1/8	Bottle	Glass	whiskey
38	DU-1/15	Bottle	Glass	vinegar
39	DU-1/10	Bottle	Glass	chemical cleaner

Table D-2. Diagnostic Artifact Accession List

Artifact #	Bag #	Artifact Type	Material	Brief Description
40	DU-1/11	Bottle	Glass	ink
41	19	Bullet casing	Metal alloy	.45 caliber
42	DU-1/7	Bullet casing	Metal alloy	20-mm antiaircraft
43	95	Bullet casing	Metal alloy	.30 caliber
44	13	Pull tabs	Aluminum	
45	92	Pull tabs	Aluminum	
46	38	Pull tabs	Aluminum	
47	16	Sta Tab	Aluminum	
48	13	Soda Can	Aluminum	Sprite Intro1961. Can post 1966
49	27	Soda Can	Aluminum	Fresca post 1970, cyclamate ban
50	DU-1/2	Coca Cola	Aluminum	Ca. 1963-all aluminum style
51	DU-1/2	Coca Cola	Aluminum	Ca. 1963-all aluminum style
52	DU-1/2	Coca Cola	Aluminum	Hamms, ca. 1963
53	15	Bottle	Glass	Vanilla extract
54	7	Lid	Glass	
55	9	Stopper	Glass	Decanter stopper
56	7	Rod	Glass	
57	95	Spoon	Metal, rusted	Bowl of spoon
58	15	Church key	Metal, rusted	Bottle/can opener
59	15	Swiss Army Style knife	Metal, rusted	
60	15	Tab	Plastic	Bread bag closure
61	15	Bulb	Glass/metal	Light bulb (car)
62	15	Thermometer	Glass	Partial piece
63	15	Pen casing	Plastic	
64	19	Bulb	Glass/metal	Light Bulb (car)
65	16	Seal	Plastic	Bottle seal
66	11	Squid lure	Plastic/metal	
67	7	Tab	Plastic	Plant identification tag with hand writing, in pencil
68	3	Marble	Glass	Post 1903
69	11	Marble	Glass	Post 1903
70	63	Marble	Glass	Post 1903
71	58	Marble	Glass	Post 1903
72	15	Button	Plastic	1.2 cm dia; two hole, green
73	15	Button	Plastic	1 cm dia; four hole
74	7	Button	Mother of Pearl	1 cm dia; four hole
75	9	Button	Mother of Pearl	2.3 cm; shank

Table D-2. Diagnostic Artifact Accession List

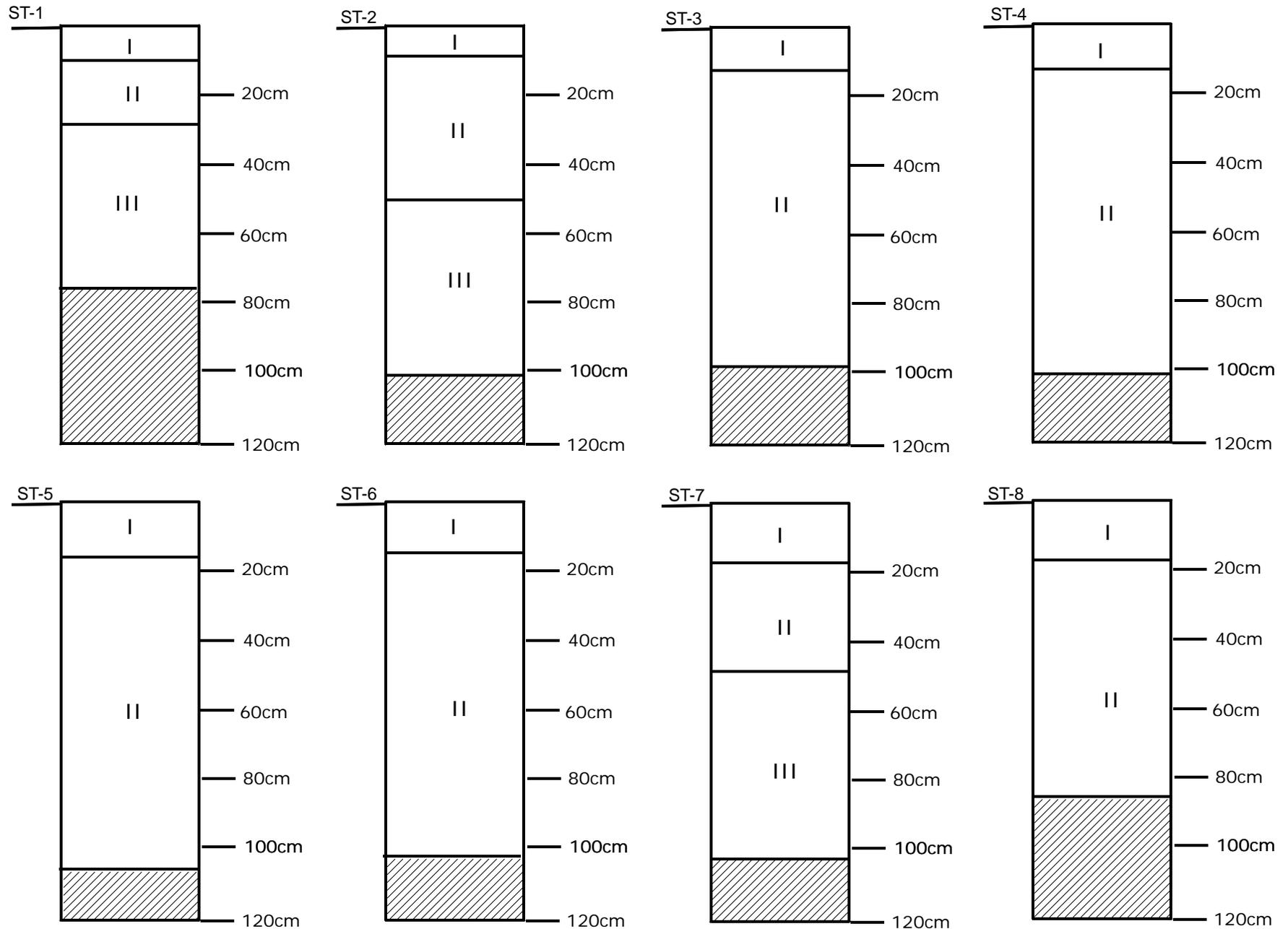
Artifact #	Bag #	Artifact Type	Material	Brief Description
76	7	Button	Mother of Pearl	1.2 cm; two hole (broken)
77	3	Button	Mother of Pearl	1 cm dia; two hole
78	63	Button	Mother of Pearl	1 cm dia; two hole
79	2	Fragment	Ceramic	Porcellaneous stoneware; translucent green overglaze
80	41	Fragment	Ceramic	Porcellaneous stoneware
81	23	Fragment	Ceramic	Stoneware; yellow overglaze
82	23	Fragment	Ceramic	Stoneware; blue overglaze
83	11	Fragment	Ceramic	Stoneware; white salt glaze ext.
84	15	Fragment	Ceramic	Refined stoneware; gilded
85	16	Fragment	Ceramic	Porcellaneous stoneware; blue transfer
86	10	Container	Ceramic	Refined Stoneware
87	10	Strainer	Ceramic	Porcelain?
88	11	Toy	Plastic	Lego
89	11	Toy	Plastic	Car wheel
90	16	Toy	Metal	Ring
91	19	Toy	Plastic	Lego
92	19	Toy	Plastic	Doll brush
93	15	Toy	Plastic	Spoon
94	51	Toy	Plastic	Arm from an action figure
95	2	Toy	Plastic	bullets
96	2	Toy	Plastic	whistle
97	10	Cup	Ceramic	Saki cup
98	7	Vial	Glass	Poss. Opium container
99	9	Vial	Glass	Poss. Opium container
100	10	Jar	Ceramic	Brownware jar; Chinese
101	7	Shingle	Slate	Roofing material
102	19	Pipe	Ceramic	Salt glaze
103	46	Tile	Asphalt	Black/brown floor tile
104	13	Tile	Asphalt	Green floor tile
105	46	Tile	Asphalt	Green floor tile
106	69	Tile	Asphalt	Green floor tile
107	13	Tile	Asphalt	Green floor tile
108	82	Wall	Concrete	Green paint

Table D-2. Diagnostic Artifact Accession List

Artifact #	Bag #	Artifact Type	Material	Brief Description
		fragment		
109	DU-1/4	Croquet ball	Wood	Green w/2 white stripes/fluted, 1960's-70's
110	10	Jar lid	Ceramic	Brownware
111	10	Saucer	Ceramic	Blue transfer

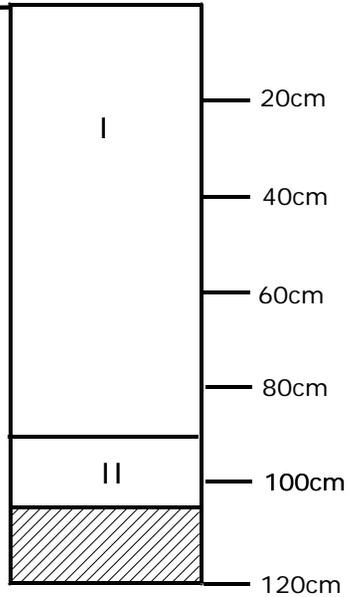
APPENDIX E:
SHOVEL TEST PROFILES

Shovel Test Profiles: Marine Barracks (Site T-2).

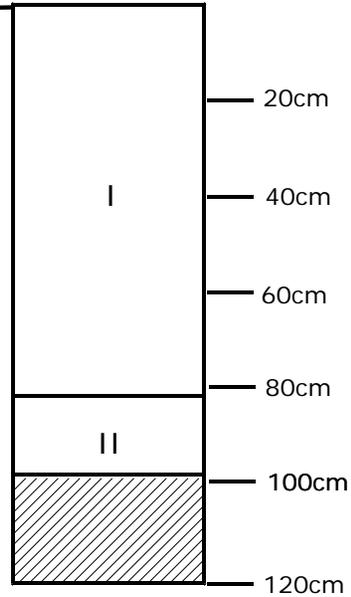


Shovel Test Profiles: Cable Station (50-93-01-001)

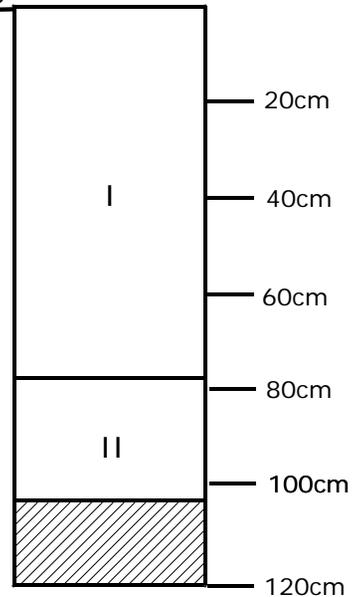
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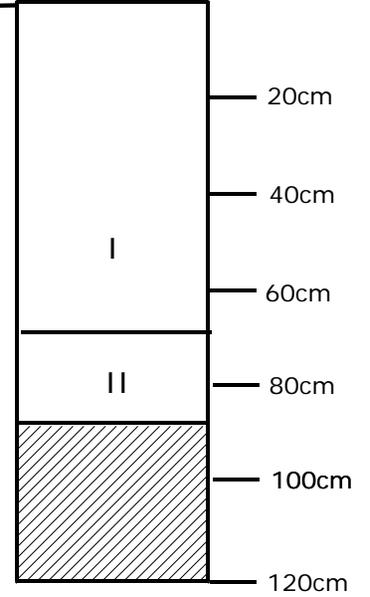
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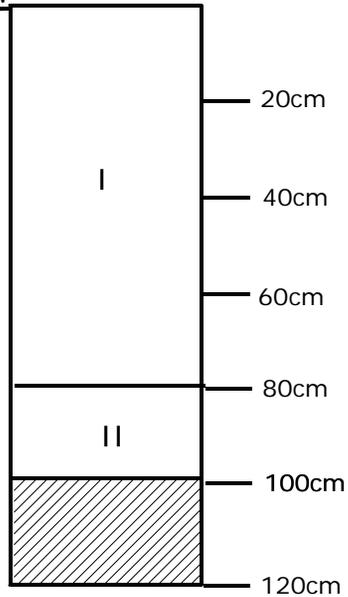
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ST-V

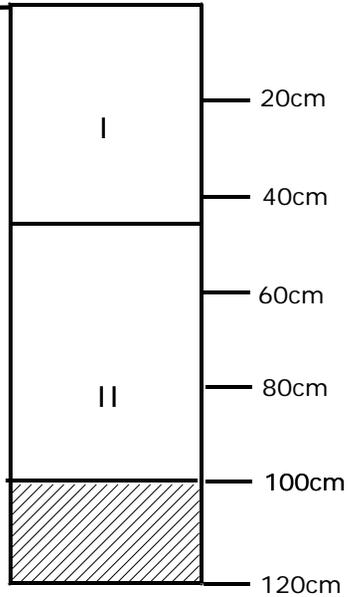


ST-W

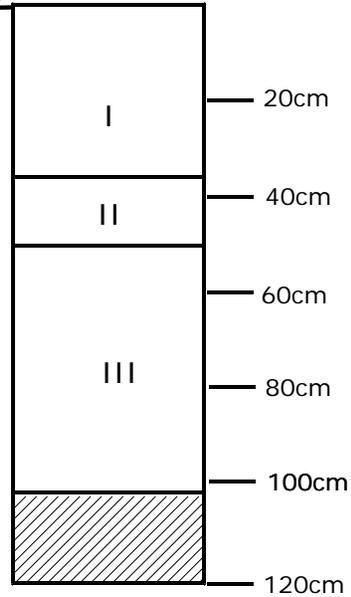


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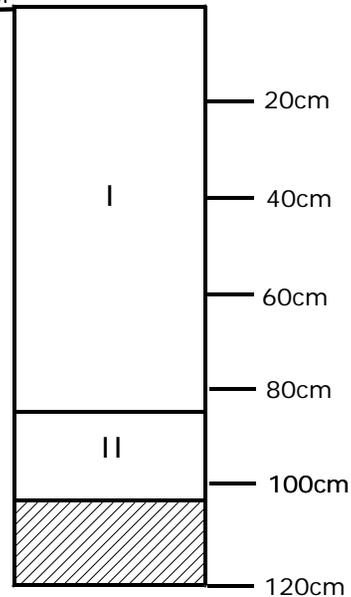
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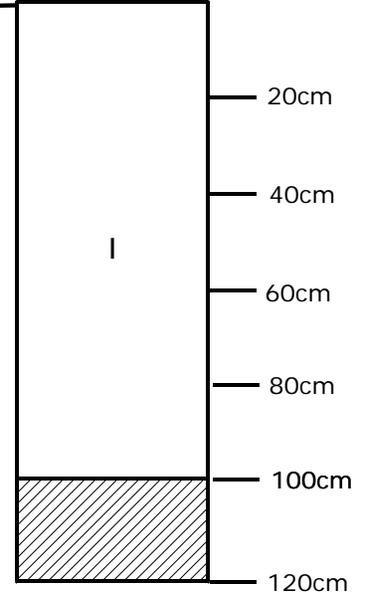
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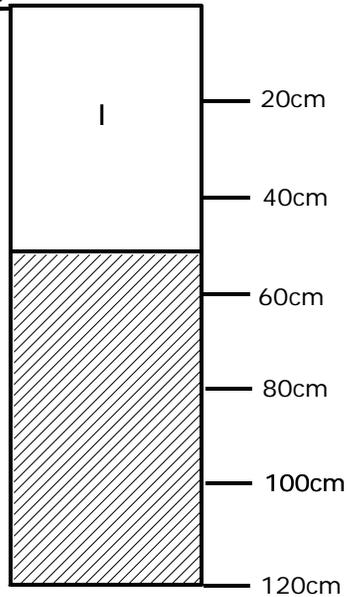
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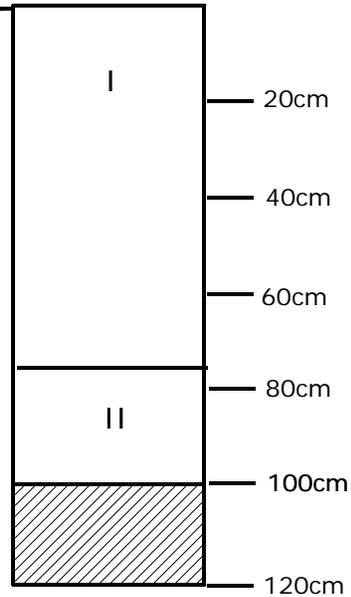
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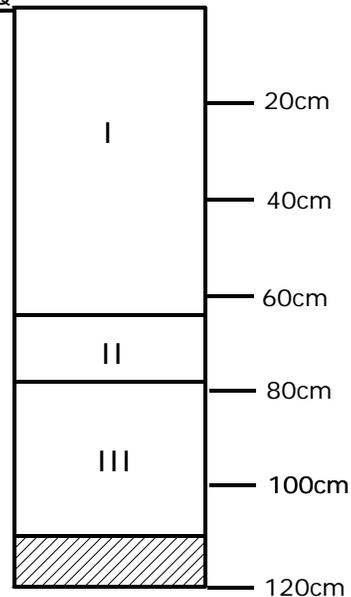
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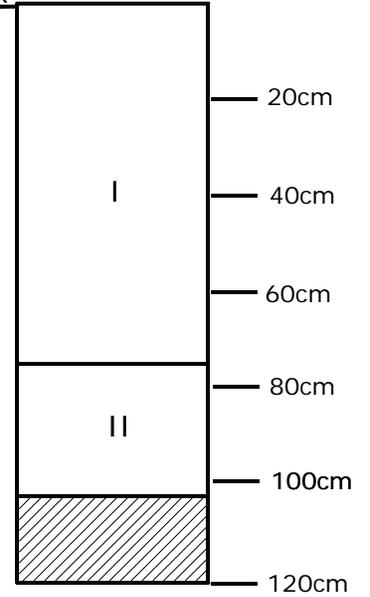
ST-P



ST-Q

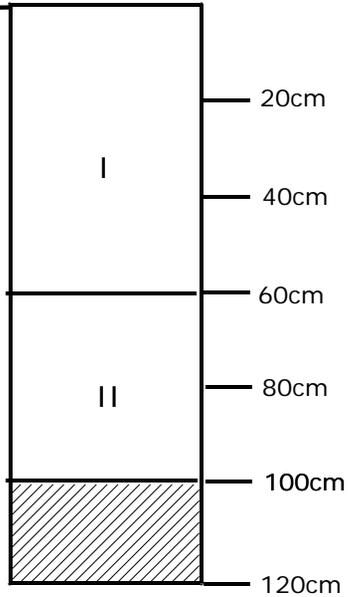


ST-R

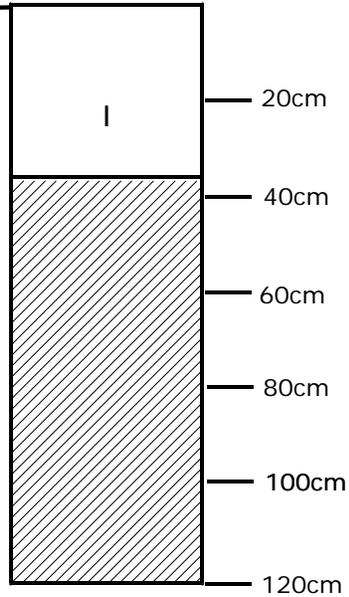


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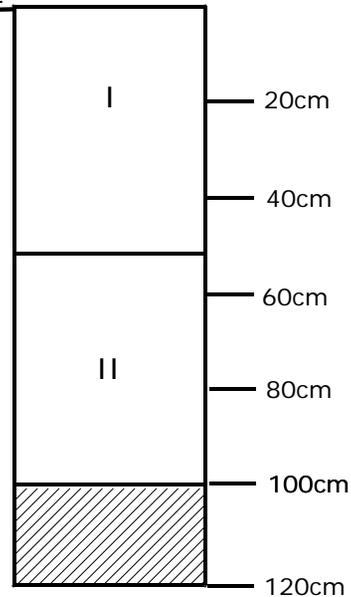
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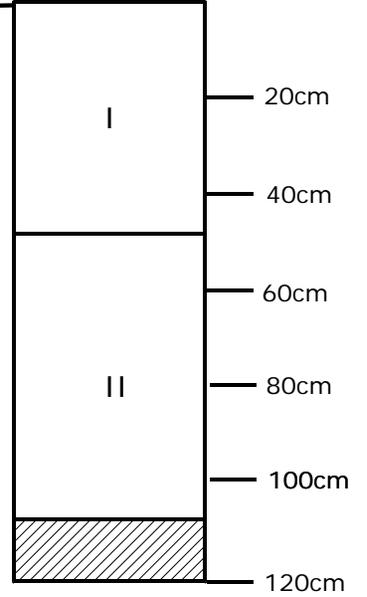
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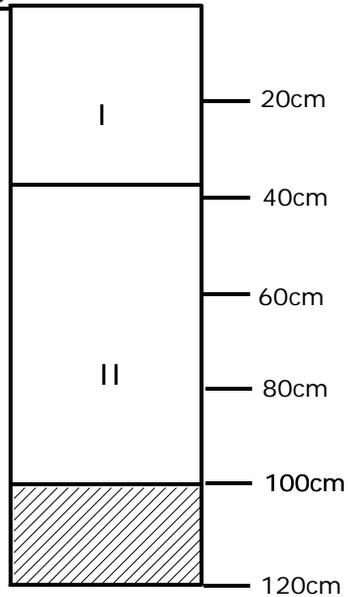
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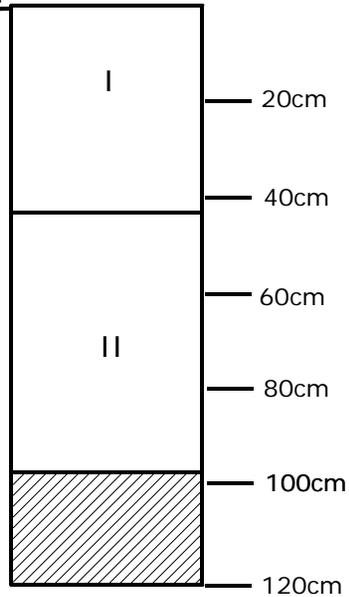
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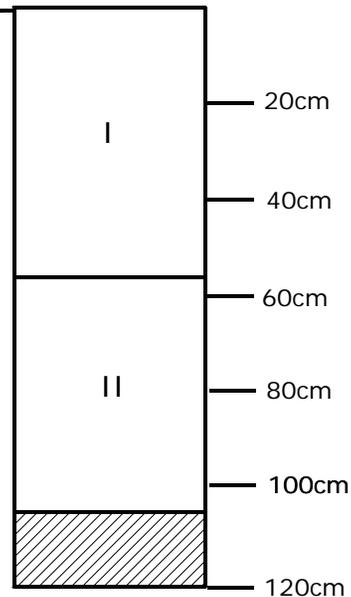
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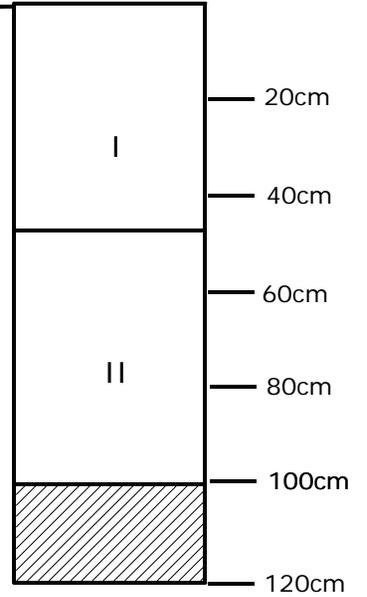
ST-H



ST-I

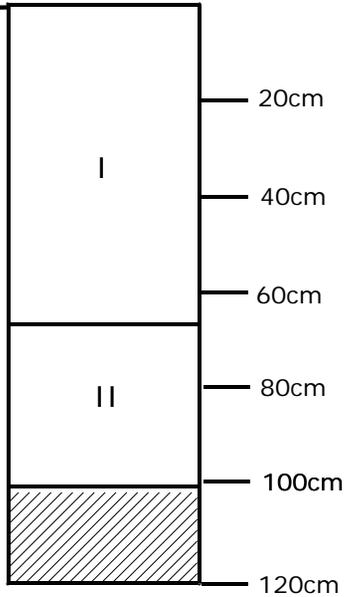


ST-J

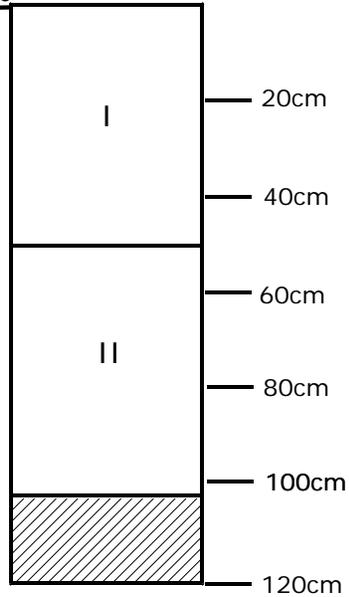


Shovel Test Profiles: Cable Station (50-93-01-001)

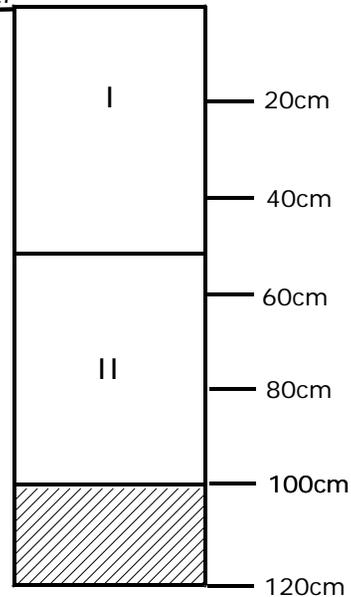
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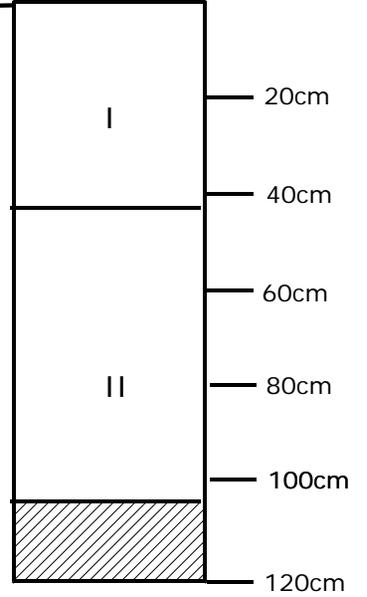
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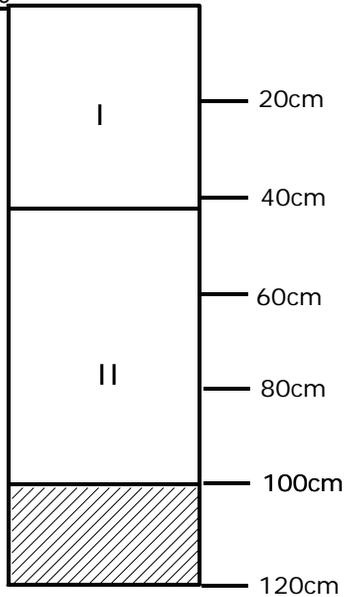
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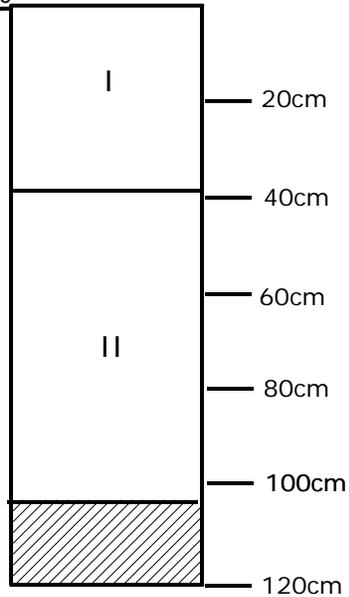
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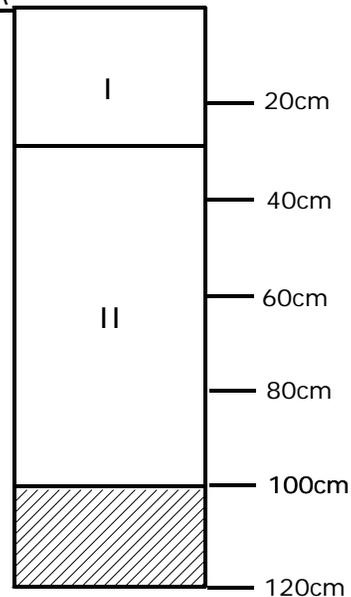
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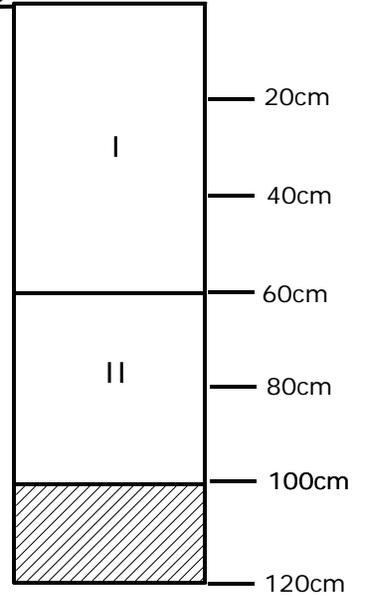
ST-30



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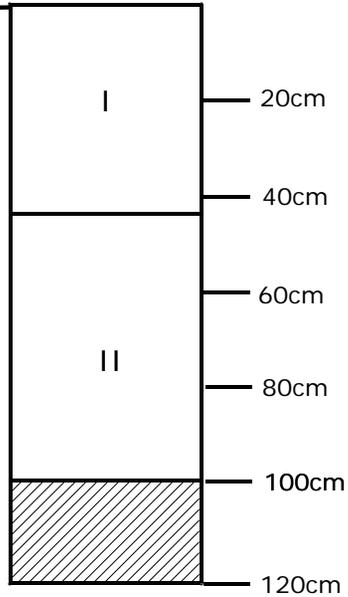


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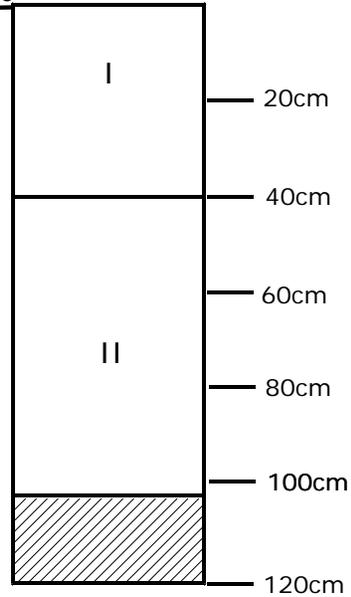


Shovel Test Profiles: Cable Station (50-93-01-001)

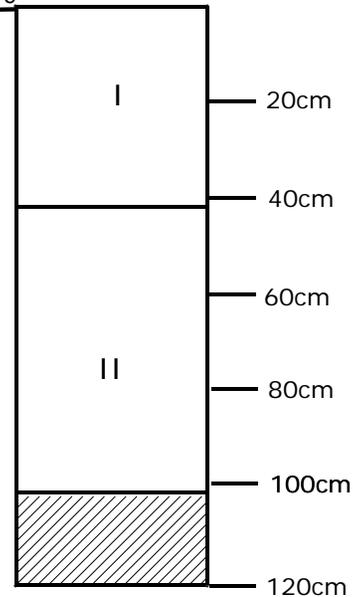
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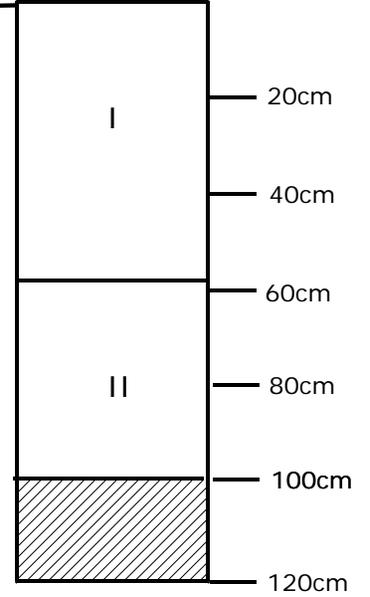
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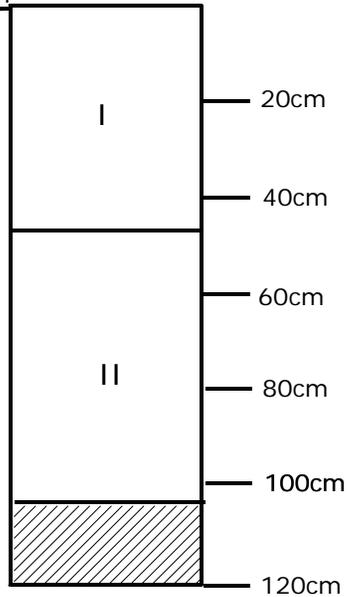
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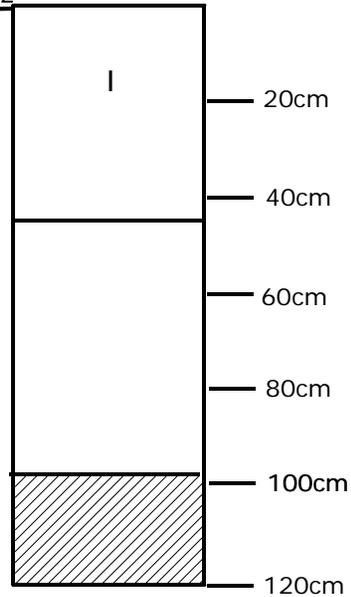
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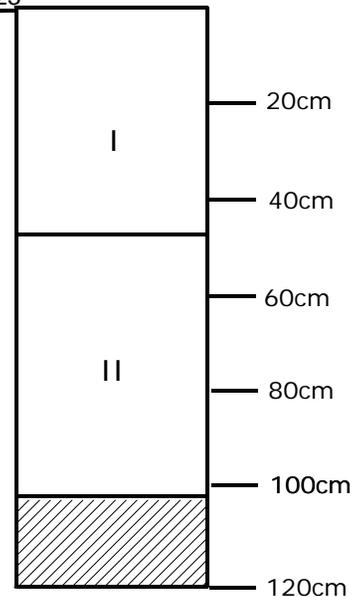
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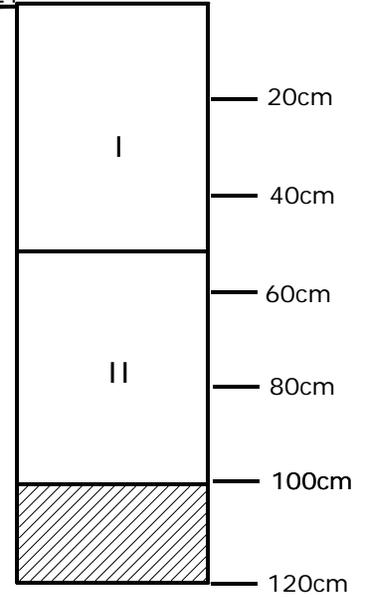
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ST-23

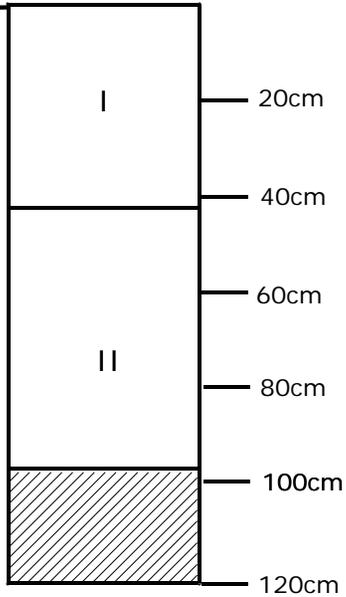


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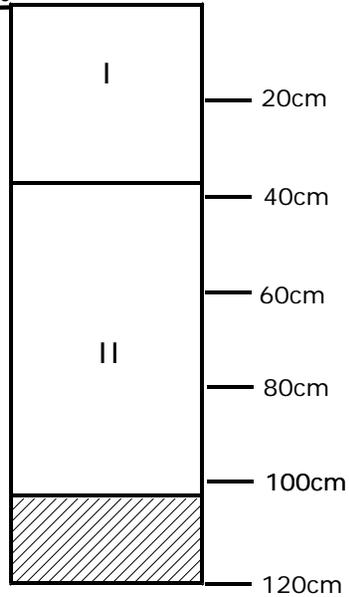


Shovel Test Profiles: Cable Station (50-93-01-001)

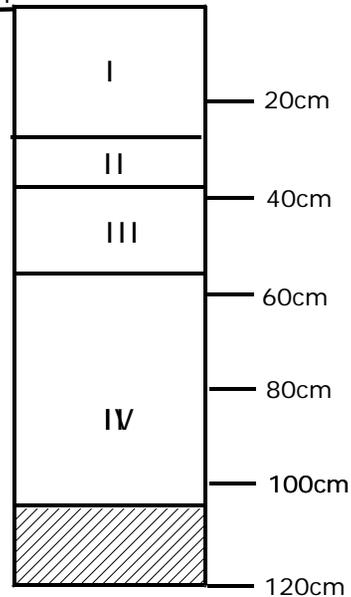
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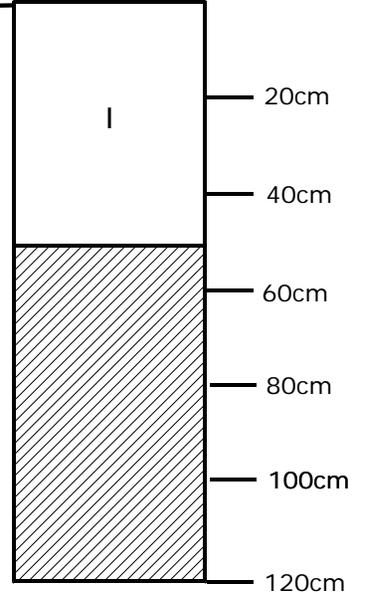
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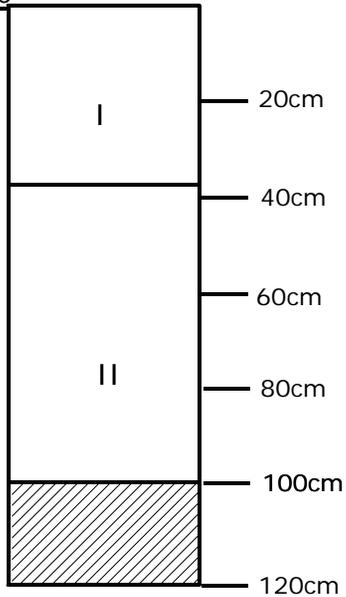
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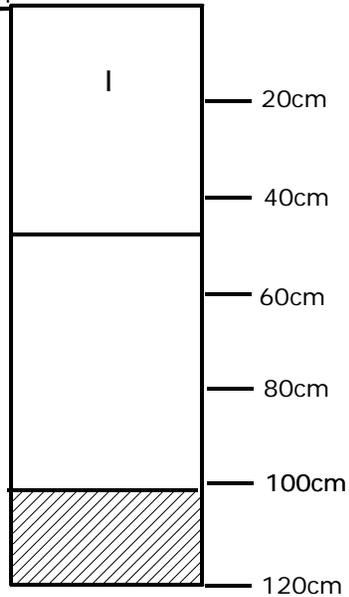
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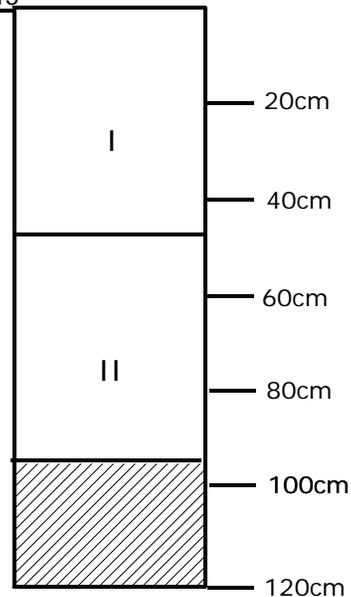
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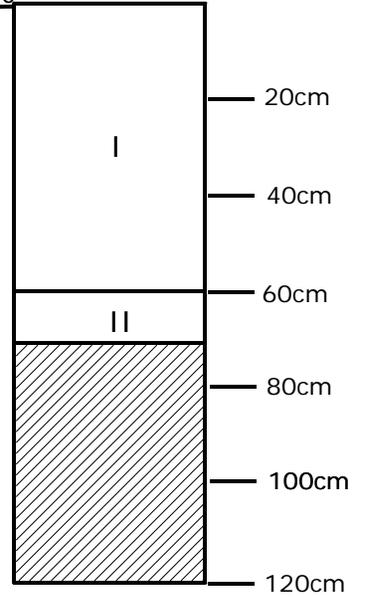
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ST-15

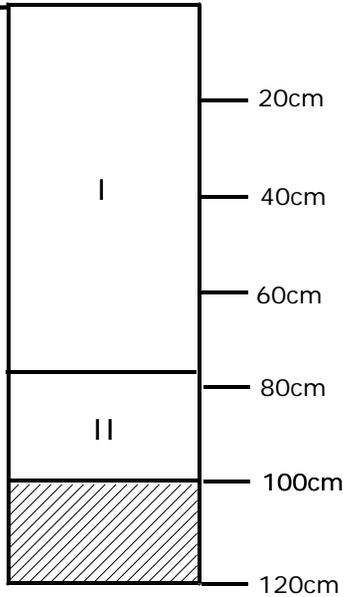


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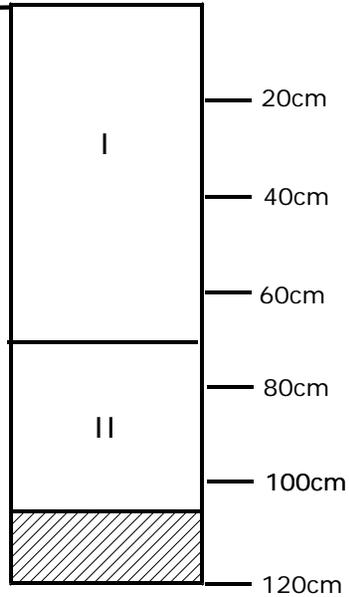


Shovel Test Profiles: Cable Station (50-93-01-001)

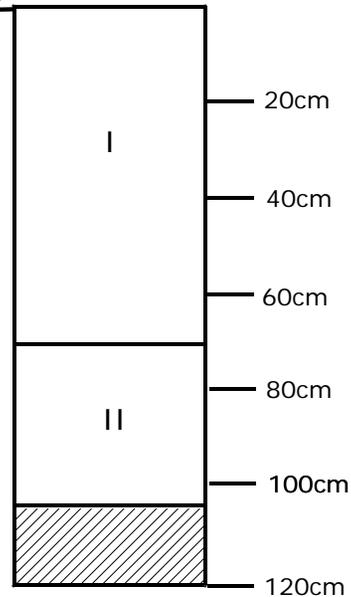
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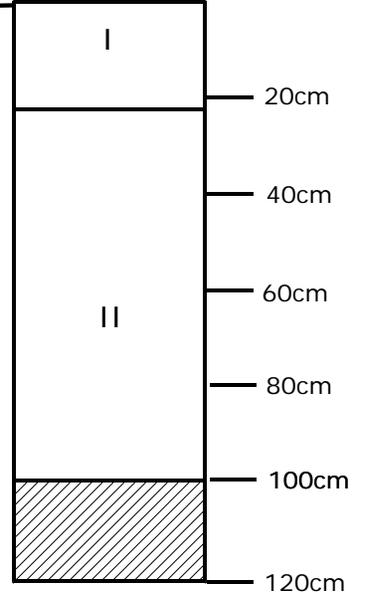
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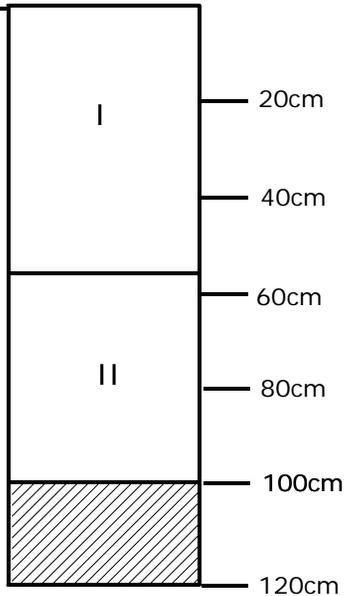
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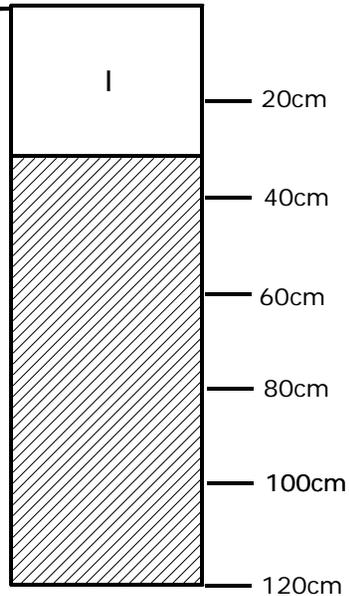
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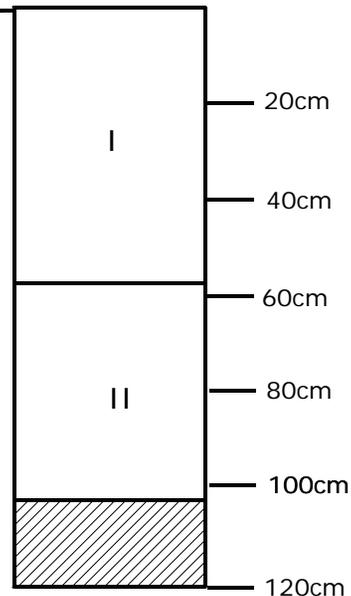
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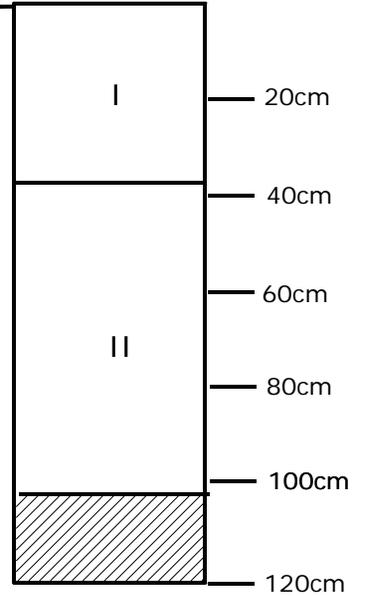
ST-6



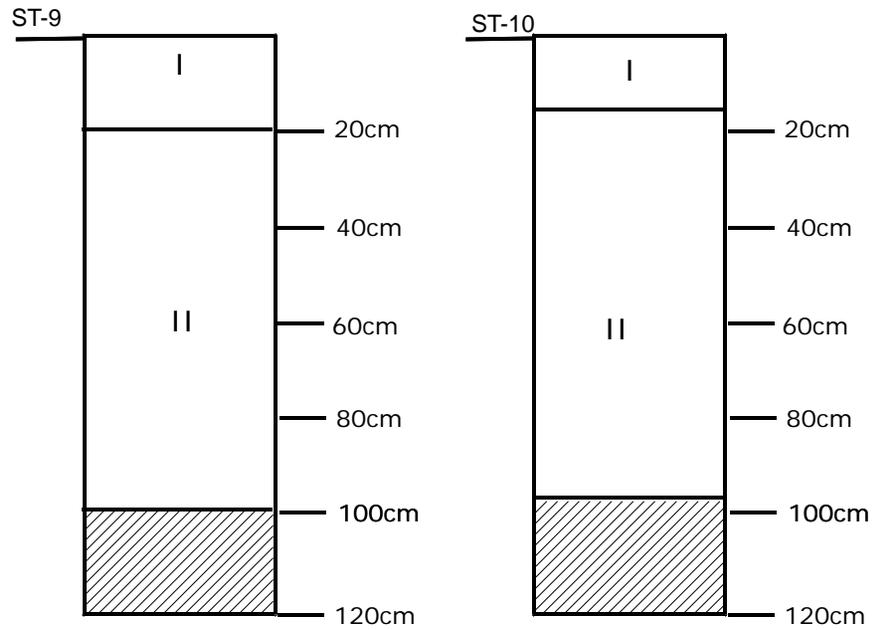
ST-7



ST-8



Shovel Test Profiles: Marine Barracks (Site T-2).



**APPENDIX ::
ARTIFACT TABLES**

Table F-5. Complete Bottle Inventory from Cable Station

Artifact #	Provenience	Description	Bottle Type	Quality	Condition	Manufacture Method	Color	Base Profile	Height (cm)	Diameter (cm)	Finish	Contents	Water Marks
1	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
2	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
3	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
4	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
5	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
6	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
7	TU-2, Fe. 3	Beer	1	7	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
8	TU-2, Fe. 3	Beer	1	1	f	MB	Amber	Round		7.6	Ring	Beer	R&CO
9	TU-2, Fe 2	Beer	1	2	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
10	TU-2, Fe 2	Beer	1	2	c	MB	Amber	Round	28.5	7.6	Ring	Beer	R&CO
11	TU-2, Fe. 3	Beer	2	1	c	MB	Amber	Round	29	7.6	Ring	Beer	SB&CO.
12	T-1, ST-a, LII	Beer	3	1	c	MB	Aqua	Round	29.2	7.6	Ring	Beer	RG&BCO
13	Site 1, TU-2, FE 2	Beer	4	1	c	ABM	Amber	Round	24.4	6.6	Crown Cap	Beer	
14	TU-2, Fe. 3	Champagne/Wine	5	2	c	MB	Dark Green	Round	29.1	7	Champagne	Champagne/Wine	
15	TU-2, Fe. 3	Champagne/Wine	5	2	c	MB	Dark Green	Round	29.1	7	Champagne	Champagne/Wine	
16	TU-2, Fe. 3	Champagne/Wine	5	1	f	MB	Dark Green	Round		7	Champagne	Champagne/Wine	
17	TU-2, Fe. 3	Wine-Brandy	6	1	c	MB	Amber	Round	28.7	7.7	Wine-Brandy	Wine-Brandy	
18	TU-2, Fe. 3	Wine-Brandy	7	1	c	MB	Olive Green	Round	28.5	7.6	Wine-Brandy	Wine-Brandy	
19	TU-2, Fe. 3	Ketchup	8	1	f	MB	Clear	Round	25.9	7	Small Mouth External Thread	Ketchup	
20	TU-2, Fe. 3	Ketchup?	9	2	c	MB	Clear	Round	25.8	7	Small Mouth External Thread	Ketchup?	H
21	TU-2, Fe. 3	Ketchup?	9	2	c	MB	Clear	Round	25.8	7	Small Mouth External Thread	Ketchup?	H
22	TU-2, Fe. 3	Ketchup?	10	1	c	MB	Clear	Round	24.5	7	Small Mouth External Thread	Ketchup?	
23	Location 5	beer	11		complete	ABM	amber	round	24.0	6.5	crown cap	beer	Owens- Illinois Glass Co. Toledo, Ohio
24	Location 5	beer	12		complete	ABM	amber	round	24.4	6.7	crown cap	beer	
25	Location 5	beer	13		complete	MB	amber	round	24.0	6.5	ring	beer	R & Co.
26	Location 14	beer	14		complete	ABM	amber	round	17.5	7.3	crown cap	beer	Obear- Nester Glass Co. East Saint Louis, Illinois
27	Location 5	soda root beer	15		complete	MB	aqua	round	24.2	6.3	crown cap	soda root beer	
28	Location 10	soda cake	16		complete	ABM	green	round	19.5	6.0	crown cap	soda cake	Owens- Illinois Glass Co. Toledo, Ohio
29	Location 10	soda cake	17		complete	ABM	clear	round	19.5	6.0	crown cap	soda cake	Owens- Illinois Glass Co. Toledo, Ohio
30	Location 10	soda	18		complete	ABM	clear	round	16.7	6.7	crown cap	soda	Seaboard Glass Co. Pittsburgh, PA
31	Location 5	soda	19		complete	ABM	clear	round	23.0	7.3	crown cap	soda	Illinois Pacific Glass Co. San Francisco CA
32	Location 16	soda	20		complete	ABM	clear	round	24.2	6.6	crown cap	soda	Owens- Illinois Glass Co. Toledo, Ohio
33	Location 14	carbonated beverage	21		complete	MB	dark olive green	round	23.4	6.2	crown cap	carbonated beverage	
34	Location 5	carbonated beverage	22		complete	MB	olive green	round	23.5	6.7	crown cap	carbonated beverage	
35	Location 5	carbonated beverage	23		complete	MB	dark olive green	round	23.5	6.2	crown cap	carbonated beverage	
36	Location 15	brandy	24		complete	ABM	light olive green	round	26.9	8.3	external thread	brandy	North British Bottle Manufacturing Co. LTD. Shettlestou, Scotland
37	Location 8	whiskey	25		complete	MB	pale green	round	29.6	7.9	ring collar	whiskey	North British Bottle Manufacturing Co. LTD. Shettlestou, Scotland
38	Location 15	vinegar	26		complete	ABM	clear	round	24.4	9.1	external thread	vinegar	H.J. Heinz Co. Pittsburgh, PA
39	Location 10	chemical cleaner	27		complete	ABM	amber	round	23.0	9.0	external thread	chemical cleaner	Hazel-Atlas Glass Co. Wheeling, West Virginia
40	Location 11	ink	28		complete	ABM	clear	round	7.8	6.5	external thread	ink	Hazel-Atlas Glass Co. Wheeling, West Virginia

Table F-5. Complete Bottle Inventory from Cable Station

Artifact #	Provenience	Embossing	Date Range	Remarks
1	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
2	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
3	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
4	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
5	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
6	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
7	TU-2, Fe. 3		1880-1900	1880 Toulouse 438-439, Post Mold Tool 1969
8	TU-2, Fe. 3		1880-1900	
9	TU-2, Fe 2		1880-1900	
10	TU-2, Fe 2		1880-1900	
11	TU-2, Fe. 3		1881-1905	Post Tool, 461
12	T-1, ST-a, LII		1904-1911	Post Tool, 440-441
13	Site 1, TU-2, FE 2		1905	1905, p472 Umac
14	TU-2, Fe. 3		1880-1910	Turn mold, 472 Umac
15	TU-2, Fe. 3		1880-1910	Turn mold, 472 Umac
16	TU-2, Fe. 3		1880-1910	472
17	TU-2, Fe. 3		1880-1910	2.12 Fike Turn Mord
18	TU-2, Fe. 3		1870-1910	3 Pout Dipmold, 472
19	TU-2, Fe. 3	Curtice Brothers Co Preserves Rochester, N.Y.	1894-1920's	zumwalt, 101
20	TU-2, Fe. 3		1893-1910	1893-1910 Handplant Tool, 237
21	TU-2, Fe. 3		1893-1910	1893-1910 Handplant Tool, 237
22	TU-2, Fe. 3		1880-1910	
23	Location 5		1929-1954	T. 403
24	Location 5		1905-present	James 1956, 17-18
25	Location 5		ca 1880-ca 1900	T. 439
26	Location 14		1915-1971	T. 374
27	Location 5	HIRES	1891-ca 1910	crown Monsey 1970, 105
28	Location 10	Coca Cola TRADEMARK Registered PHT. 6.02	1942	Owens T. 403 T. 446
29	Location 10	Coca Cola TRADEMARK	1946	Owens T. 403
30	Location 10	No Deposit No Return Not to be Refilled	1943-1947	Seaboard 1943-47
31	Location 5		1930-1932	IPGCO T. 269 1930-32
32	Location 16		1929-1954	Owens T. 403
33	Location 14		1891-1910	crown cap 1891 Monsey, Rock 1980 turn mold 1880-1910 Monsey 38-50
34	Location 5		1891-1910	crown cap 1891 Monsey, Rock 1980 turn mold 1880-1910 Monsey 38-50
35	Location 5		1891-1910	crown cap Monsey 1970:104 turn mold 1880-1910 Monsey 38-50
36	Location 15		ca 1920-present	
37	Location 8		1903-1910	T. 377 Whiskey post mold North British Bot Co.
38	Location 15		1905-1943	T. 236 Zumwalt 225, James 1956 17-18
39	Location 10	DAZZLE 32oz	1920-1964	T. 239
40	Location 11	4oz	1920-1964	T. 239 Covill 1971 (ink)

Table F-3: Artifacts From Test Units

Site 50-93-01-001 (Cable Station)

Bag #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	82	Total							
Excavation Unit	TU-1					TU-2					TU-3			TU-4			TU-5				TU-6			TU-7		Total		
Layer	Surface	I/1	I/2	II/1	II/2	Total	I/1	I/2	II/1	Fe. 2	Fe. 3	Total	I	Fe. 5	Total	I	II	Total	I	II	III	Total	1	II	Total	I	Total	Total
Depth (cm)	n/a	0-20	20-30	30-50	50-70		0-20	20-40	40-60	60-75	75-120		0-50	37-82		0-35	35-57		0-50	50-80	80-100		0-50	50-100		0-50		
Container Glass																												
Clear fragment	3		3			6		6	7	5	63	81	1	1	2	1	2	3	8	5	1	14		1	1	14	14	121
Clear complete						0			1		4	5			0			0				0			0	0	0	5
Green fragment	3	2				5	1			3	21	25			0	1	1	2	2	1		3			0	2	2	37
Green complete						0					4	4			0			0				0			0	0	0	4
Amber/brown fragment						0	6	8	7	15	58	94			0		1	1	1	1	9	10			0	2	2	107
Amber/brown complete						0				1	12	13			0		1	1				0			0	0	0	14
Vile								1		1		2																2
Clear jar lid								1				1																1
Clear bottle stop										1		1																1
Window Glass						0						0			0			0				0			0	0	0	0
Window fragment	8	6				14		9	7	6	1	23			0	1		1	1		1	1	1	1	1	0	0	40
Other Glass						0						0																0
Rod fragment								1				1																1
Thermometer frag						0						0			0		1	1				0			0	0	0	1
Marble	1		1			2						0	1		1			0				0			0	0	0	3
Total Glass	15	8	4	0	0	27	7	26	22	32	163	250	2	1	3	3	6	9	12	15	1	28	1	1	2	18	18	337
Plastic																												
Toothbrush						0						0		0	1		1					0			0	0	0	1
Spoon						0						0		0		1	1					0			0	0	0	1
Button	1					1		1				1		0		2	2					0			0	0	0	4
Pen Fragment						0						0		0		1	1					0			0	0	0	1
Wrapper	1					1	1					1	1	1				0				0			0	0	0	3
Bag Fragment						0	2		3	4		9		0		50	50					0			0	0	0	59
Cap Whole	1				1	2						0	2	2	5	3	8	2				2		4	4	1	1	19
Cap fragment	1					1						0	4	4				0				0			0	1	1	6
Toy whistle (2)		1				1						0		0				0				0			0	0	0	1
Toy bullet (3)		1				1						0		0				0				0			0	0	0	1
Toy hair brush						0						0		0				0				0	1		1	0	0	1
Lego toy piece						0						0	1	1				0				0	1		1	0	0	2
Toy wheel						0						0	1	1				0				0			0	0	0	1
Squid lure						0						0	1	1	1	1		1				0			0	0	0	2
Chess piece						0						0		0	1			1				0			0	0	0	1
Band-Aid						0						0		0			1	1				0			0	0	0	1
Bread bag closure						0						0		0		1	1					0			0	0	0	1
Plant ID tag								1																				
Miscellaneous	9	7	4	2		22	20	18	35	15		88	16	5	21	10	40	50	20	3	2	25		29	29	20	20	255
Total Plastic	13	9	4	2	1	29	23	20	38	19	0	100	26	5	31	18	99	117	22	3	2	27	2	33	35	22	22	361
Metal																												
Wire Nails, rusted	5	4			1	10	14	20	33	48	17	132			0	1	5	6				0	1	3	4	12	12	164
Wire nails, galvanized						0			6	2		8		0				0				0			0	0	0	8
Poss. Cut nails						0						0		0		13	13					0			0	2	2	15
Screw	3	1				4	1	2	2			5		0				0				0			0	2	2	11
Spike			1			1		1				1		0				0				0			0	0	0	2
washer, rusted						0						0		0				0				0	2		2	1	1	3
Bolt						0		1				1		0				0				0			0	1	1	2
Crown cap						0						0	1	1		2	2	1				1			0	0	0	4
Screen						0	2					2		0		3	3	1		1		1			0	0	0	6
Bottle Opener						0						0		0		1	1					0			0	0	0	1
Kinfe						0						0		0		1	1					0			0	0	0	1
Wire	2					2	2	3	4	1	5	15		0		6	6					0			0	0	0	23
Coin (1975 penny)						0	1					1		0				0				0			0	0	0	1

Table F-3: Artifacts From Test Units

Site 50-93-01-001 (Cable Station)

Bag #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	82									
Excavation Unit	TU-1					TU-2					TU-3			TU-4			TU-5				TU-6			TU-7					
Layer	Surface	I/1	I/2	II/1	II/2	Total	I/1	I/2	II/1	Fe. 2	Fe. 3	Total	I	Fe. 5	Total	I	II	Total	I	II	III	Total	1	II	Total	I	Total	Total	
Depth (cm)	n/a	0-20	20-30	30-50	50-70		0-20	20-40	40-60	60-75	75-120		0-50	37-82		0-35	35-57		0-50	50-80	80-100		0-50	50-100		0-50			
.45 bullet shell						0						0			0			0	1			1			0		1		
Pulley (plastic wheel)						0						0			0			0	1			1			0		1		
Pull Tab						0						0	2		2	1	1	2	1				1			0		5	
Church key tin opener						0				1		1			0			0					0			0		1	
Iron elbow joint, rusted						0			1			1			0			0					0			0		1	
Can Fragment						0			38	25	42	105	1	1	2	1		1					0			0		108	
Coat hook						0						0	1		1			0					0			0		1	
Eye hook		1				1						0			0			0					0			0		1	
Copper rod						0				3	1	4			0			0					0			0		4	
Miscellaneous	8	1	4			13	13	25	2	8	5	53	2	5	7		20	20			4	4	2	5	7	1	1	105	
Total Metal	18	7	5	0	1	31	33	55	86	86	69	329	6	7	13	3	52	55	2	1	4	7	7	8	15	19	19	469	
Ceramic																													
Porcelain, Chinese/Japanese poly											1	1																1	
Porcelain, small colander											1	1																1	
Whiteware, blue transfer sml dish											1	1																1	
blue transfer plate base fragment																			1									0	
Whiteware, sml container						0					1	1			0			0					0			0		1	
earthenware plate (gilded edge)																	1											0	
Porcelain. Stoneware (cf celadon)		1				1						0			0			0					0			0		1	
Stoneware (lead glaze?)													1															0	
Brownware jar (Chinese)											1	1																1	
Earthenware jar lid (Chinese)											2	2																2	
Earthenware, flower pot						0						0			0		3	3					0			0		3	
Porcelain, industrial						0						0			0	1		1					0	1		1		2	
Sewer pipe salt glaze			3		4	7		1				1	2		2	1	1	1					0			0		11	
Total Ceramic		1	3	0	4	8	0	1	0	0	7	8	3	0	2	1	5	5	1	0	0	0	1	0	1	0	0	24	
Miscellaneous																													
Shell button, shanked						0				1		1			0			0					0			0		1	
Shell button, two hole			1					1																				0	
Shell button, four hole								1																				0	
Foil						0		1				1			0		14	14					0			0		15	
Formica						0						0		1				1					0		2	2		3	
Bulb whole						0						0			0		1	1					0		1		0	2	
Golf ball						0						0			0		1	1					0			0		1	
Tennis ball fragment						0						0			0		6	6					0			0		6	
Styrofoam						0		5			5			1	1	2		2					0			0		7	
Briquettes						0					0				0		1	1		1			1			0		2	
Screen, nylon						0		2			2				0			0					0			0		2	
Wood		1				1					0				0			0					0		1	1		2	
Coal		1				1	16	3	8		27				0			0	3	3		6			0		0	34	
Asphalt floor tile			1			1			1		1	5	5	14	5	19							0			0	15	15	41
Slate shingle		12				12		5	2	2	9				0			0				0	4	1	5	1	1	27	
Asphalt roof shingle						0		11			11				0			0				0	5		5	6	6	22	
Plaster		1	2			3			2		2	1	1		0			0				0			0	3	3	9	
Fiberglass, corrugated						0					0				0			0				0			0	2	2	2	
Window caulking		3	1			4					0				0			0				0			0		0	4	
Total Miscellaneous	0	18	5	0	0	22	16	22	18	5	0	59	6	0	6	16	29	45	3	4	0	7	9	2	11	30	30	180	
Total Artifact	46	43	21	2	6	117	79	124	164	142	239	746	43	13	55	41	191	231	40	23	7	69	20	44	64	89	89	1371	

Table F-2: Faunal Remains from Shovel Tests

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	
1	Bag	21	22	23	24	25	28	29	30	31	32	34	36	37	38	39	44	45	49	59	60	61	62	63	67	72	76	78	86	90		
2	Site	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-1	T-2	T-2		
3	Shovel Test	A	A	B	B	C	E	E	F	G	I	L	M	N	O	P	T	1	3	12	13	14	15	16	20	25	29	H	3	5		
4	Layer/Feature	I	I	I	II	I	I	II	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
5	Depth	0-30	30-100	0-60	60-100	0-60	0-50	50-100	0-48	0-38	0-57	0-36	0-85	0-85	0-52	0-78	0-87	0-25	0-68	0-50	0-38	0-42	0-48	0-60	0-58	0-64	0-41	0-42	0-13	0-15	Total	
6	Medium Vertebrate poss. Turtle										1			1																		2
7	Pisces	1											12												1							14
8	Cheloniidae	1																														1
9	Medium Aves	20		3	1							1	14		2					3									1			45
10	Medium-Large Aves			2					4				28	1		9								3		3						52
11	Med-Lge Aves poss. P. immutabilis										~15					10				1												26
12	Medium Procellariid cf. P. hypoleuca																1															1
13	Pterodroma hypoleuca	2		2		4	8	3					5		2												1			1		28
14	Phoebastria immutabilis									1			4			1																6
15	Phoebastria nigripes		1																													1
16	Fregata minor																				1											1
17	Anous minutus																											1				1
18	Medium Mammal				1				1			1					1	1						1								6
19	Rattus rattus																							1								1
20	Bos taurus																						1									1
21	Total	24	1	7	2	4	8	3	5	16	1	1	64	2	2	21	2	1	1	3	1	1	1	5	1	3	1	1	1	1	186	

Table F-4: Faunal Material from Test Excavations

Site 50-93-01-001 (Cable Station)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	50-93-01-001																					
2	Bag	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	82	
3	Unit/Shovel Test	TU-1	TU-1	TU-1	TU-1	TU-2	TU-2	TU-2	TU-2	TU-2	TU-3	TU-3	TU-3	TU-4	TU-4	TU-5	TU-5	TU-5	TU-6	TU-6	TU-7	
4	Layer/Feature	I	I	II	II	I	I	II	2	3	I	II	5	I	II	I	II	III	I	II	II	
5	Depth (cmbs)	0-20	10-30	30-50	50-70	0-20	20-40	40-60			0-65	65-100		0-35	35-100	0-50	50-80	80-100	0-50	50-105	50-100	
6	Medium Vertebrate poss. Turtle																					
7	Pisces	3				3	1		5	6	1											19
8	Medium Aves				4	29			15				1							40		89
9	Medium-Large Aves	5	3	4	1		1	5	5	~50	11		2		~40	1	1		~30	8	5	172
10	Med-Lge Aves poss. <i>P. immutabilis</i>					3				2												5
11	Med Aves poss. <i>P. hypoleuca</i>					12	19															31
12	Small Procellariiform										13									1		14
13	<i>Pterodroma hypoleuca</i>	1				16	21	14	14	4	5	4	1			1	22	1	1	10	2	117
14	<i>Phoebastria immutabilis</i>	2								3	4		1	6	4	7			6	7	1	41
15	<i>Phoebastria nigripes</i>																		3			3
16	Large Galliform cf. <i>M. gallopavo</i>								1	9					4							14
17	<i>Gallus gallus</i>						1		2													3
18	<i>Anous stolidus</i>							1														1
19	<i>Anous minutus</i>						1															1
20	<i>Gygis alba</i>																				1	1
21	cf. <i>Acridotheres tristis</i>					3																3
22	Medium Mammal					4			3	~40					22							69
23	Medium Mammal poss. <i>S. scrofa</i>						1	1		7			1		18							28
24	<i>Rattus</i> spp.			1							7					1						9
25	<i>Rattus exulans</i>																1					1
26	<i>Rattus rattus</i>				1			1														2
27	<i>Rattus norvegicus</i>									2												2
28	<i>Sus scrofa</i>						2															2
29	<i>Bos taurus</i>																					0
30	Total	11	3	5	6	70	47	22	45	123	41	4	6	6	88	10	24	1	40	66	9	627

Bag #	47	50	59	64	23	30	36	41	
Shovel Test	2	4	12	17	B	F	M	Q	
Layer	II	I	I	I	I	I		II	
Depth	25-73	0-21	0-50	0-43		0-48		63-78	Total
Household									
Yellowware					1				1
Whiteware (blue glaze)					1				1
Earthenware (green glaze)		1							1
Whiteware Plate Base								1	1
Industrial									0
Sewer Pipe (salt glaze)	2		1	1		1	1		6
Total	2	1	1	1	2	1	1	1	10

Table F-1: Glass

Site 50-93-01-001																																								
Bag #	45	50	54	55	60	62	65	67	68	69	70	71	72	73	75	76	77	21	22	23	24	25	27	28	30	31	33	34	36	37	38	40	41	43	44	78	79			
Shovel Test	1	4	7	8	13	15	18	20	21	22	23	24	25	26	28	29	30	A	A	B	B	C	D	E	F	G	K	L	M	N	O	Q	Q	S	T	H	V			
Layer	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	II	I	II	I	I	I	I	I	I	I	I	I	I	I	II	I	I	I	I			
Depth	0-25	0-21	0-53	0-38	0-38	0-48	0-40	0-58	0-47	0-44	0-45	0-53	0-64	0-50	0-42	0-41	0-39	0-30	30-100	0-60	60-100	0-60	0-35	0-50	0-48	0-38	0-46	0-36	0-85	0-85	0-52	0-63	63-78	0-91	0-82	0-42	0-67	Total		
Container Glass																																								
Aqua																		1	6	3																			10	
Dark Green																		2																					1	4
Olive Green																		1																						2
Amber					1						1			1	1			1			1				1			1	2		1	1							12	
Clear			1		1	2	2								2	1				2	1	4	1		1	1		3		5	1	2	3			1	3	37		
Total Container Glass			1		2	2	2				1			1	3	1	2	9	3	2	2	4	1		2	1		1	5	2	6	2	2	3		1	4	65		
Window Glass																																								
Total Clear	2			2		2		1	3	1			1					2		1				1		1	5	7			6	2		3	1		2	43		
Miscellaneous Glass																																								
Globe		1																																					1	
Bulb																																						1	1	
Solid tube												1																												1
Marble					1																																		1	
Total Miscellaneous Glass		1			1							1																									1		4	
Total	2	1	1	2	3	4	2	1	3	1	1	1	1	1	3	1	2	11	3	3	2	4	1	1	2	2	5	8	5	2	12	4	2	6	2	1	6	112		

Table F-1: Glass

Site 50-93-01-002 (Marine Barracks)

	Site 50-93-01-002															
Bag #	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	
Shovel Test	ST-1	ST-2	ST-2	ST-3	ST-4	ST-4	ST-5	ST-5	ST-6	ST-7	ST-7	ST-8	ST-8	ST-9	ST-10	
Layer	I	I	II	II	I	II	II	I	I	I	II	I	II	I	I	
Depth	0-9	0-9	9-50	15-97	0-13	13-103	15-106	0-15	0-14	0-18	18-47	0-18	18-86	0-	0-14	Total
Container Glass																
Dark Green						1		1								2
Amber		1					1	1	1			1			1	6
Clear		1							2	1					4	8
Opaque Milk Glass					1											1
Total Container Glass		2			1	1	1	2	3	1		1			5	17
Window Glass																
Total Clear			1		5	1	14	9	1		3	4	1	20	20	79
Miscellaneous Glass																
Bulb		1		1					1						1	4
Total Miscellaneous Glass		1		1					1						1	4
Total		3	1	1	6	2	15	11	5	1	3	5	1	20	26	100

Table F-1: Metal

Site 50-93-01-002 (Marine Barracks)

50-93-01-002																	
Bag #	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97		
Shovel Test	1	2	2	3	4	4	5	5	6	7	7	8	8	9	10		
Layer	I	I	II	II	I	II	II	I	I	I	II	I	II	I	I		
Depth	0-9	0-9	9-50	15-97	0-13	13-103	15-106	0-15	0-14	0-18	18-47	0-18	18-86	0-	0-14		Total
Hardware																	
Wire nail (galvanized)					1		1								1		3
Wire nail (rusted)				1		2	1		1				3		1		9
Plumbing fitting (stainless steel)							1										1
Pipe fragment (rusted)				1				1									2
Washer (rusted)												1					1
Wood screw (rusted)												1					1
Screw fragment (stainless steel)	1		1												1		2
Household																	
Spoon fragment (rusted)													1				1
Coins																	
Penny 1979					1												1
Containers																	
Pull Tab							1	1			1			1	1		5
StaTab										1							1
Crown cap, rusted							1					1					2
Miscellaneous																	
Tarp Pin							1										1
Wire key ring (stainless steel)						1											1
.30 cal bullet casing 1942													1				1
Flat strip (Copper)		1															1
Misc. fragments					2			1		1			3				7
Total	1	1	1	2	4	3	6	3	1	2	1	3	8	1	4		40

Table F-1: Miscellaneous Materials

Site 50-93-01-002 (Marine Barracks)

Bag #	83	84	87	89	90	91	92	93	94	95	96	97	
Shovel Test	ST-1	ST-2	4	ST-5	ST-5	ST-6	ST-7	ST-7	ST-8	ST-8	ST-9	ST-10	
Layer	I	I	I	II	I	I	I	II	I	II	I	I	
Depth	0-9	0-9	0-13	15-106	0-15	0-14	0-18	18-47	0-18	18-86	0-	0-14	Total
Construction Materials													
Asphalt tile fragment, white			1										1
Asphalt tile fragment, tan			1										1
Asphalt tile fragment, green			2							1			3
Misc. floor tile		1					2						2
Burnt material, unid.											3		3
Total Construction Material													10
Plastic													
Plastic curtain hanger												1	1
Plastic Container Lid	1												1
Rubber tubing fragment								1					1
Plastic cap											1		1
Marine debris			1	3	4	5		1	4			1	19
Total Plastic													23
Miscellaneous													
Small light bulb, electronic component									1				1
Total Miscellaneous									1				
Total	1	1	5	3	4	5	2	2	5	1	4	2	35