# Section 106 Consultation
# Publication Form

**Project Name:** Proposed Undertaking to Conduct Periodic Depot Maintenance (PDM) at Buildings 39005 & 39006, USAF Kaena Point Satellite Tracking Station (KPSTS)

**Island:** OAHU

**District:** Wai‘anae and North Shore

**TMKs:** Project within (1) 6-9-003:005

**Permits:** N/A

**Applicant or Proposing Agency:** United States Air Force (USAF), Kaena Point Satellite Tracking Station
Detachment 3, 21 Space Operations Squadron/CC
10 Hickam Court, Unit 4
JBPHH, HI 96853-5208
Contact & Phone: Mr. Lance Hayashi, (808) 697-4314

**Approving Agency:** USAF, Kaena Point STS
Contact & Phone: Mr. Lance Hayashi, (808) 697-4314

**Consultant:** N/A

**Status:** Comments due no later than September 28, 2017 to:
Det 3, 21 SOPS/CC
10 Hickam Court, Unit 4
JBPHH, HI 96853-5208
(808) 697-4314

Summary:

The US Air Force (USAF) Detachment 3, 21 Space Operations Squadron (Det 3, 21 SOPS) proposes to conduct Periodic Depot Maintenance (PDM) on Buildings 39005 & 39006 antenna facilities at KPSTS.

All repairs and work to be performed at these facilities and associated equipment will be done as minor in-kind repair or replacement of building or site features, elements or materials as part of routine maintenance. This work will not change the visual qualities of the buildings and there will be no change to the original/significant historic fabric of the buildings.

KPSTS has requested SHPD’s concurrence with its conclusion that the proposed undertaking will have “no adverse effect” on Archeological, Native Hawaiian Cultural Resources or Historic Properties.

The Section 106 consultation document will also be available for review at the Waianae Public Library and the Waialua Public Library during the review period ending on September 28, 2017.

# *Section 106 Consultation for the*
# Proposed Undertaking to
# Conduct periodic depot maintenance at
# Buildings 39005&39006
# Ka‘ena Point Satellite Tracking Station
# O‘ahu, Hawai‘i

**August 28, 2017**

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# DEPARTMENT OF THE AIR FORCE
**50TH SPACE WING (AFSPC)**

AUG 2 8 2017

MEMORANDUM FOR HAWAII STATE HISTORIC PRESERVATION DIVISION
Administrator
601 Kamokila Blvd., Suite 555
Kapolei, Hawaii 96707

FROM: Det 3, 21 SOPS/CC
10 Hickam Court, Unit 4
JBPHH, HI 96853-5208

Subject: Request for Section 106 Review and Concurrence for Proposed Undertakings to Conduct Periodic Depot Maintenance (PDM) at Buildings 39005 & 39006, Kaena Point Satellite Tracking Station (KPSTS).

1. The U.S. Air Force (USAF) is evaluating alternatives for a proposed undertaking, to perform Periodic Depot Maintenance (PDM) on Buildings 39005 & 39006. PDM is routine maintenance required for mission equipment that is located in the historic facilities.

2. In accordance with 36 CFR Part 800.3, this letter initiates our Section 106 process, and we request your concurrence with our determination of no potential to cause effects for the proposed undertaking. This letter, and the attached information, fulfills the documentation standards found inof of 36 CFR 800.11 and supports our determination of no adverse effect.

3. Please direct questions or comments to Mr. Lance Hayashi by telephone at 697-4312, by mail at the above address or via email to Ms. Lynn Cruz at: linda.cruz.ctr@us.af.mil.

EDMOND R. CHAN, Major, USAF
Commander

2 Attachments:
1. Section 106 Consultation Documentation
2. HAER HI-97-F (Building 39005) & G (Building 39006)

*Attachment 1*

**PERIODIC DEPOT MAINTENANCE (PDM) AT KAENA POINT SATELLITE TRACKING STATION (KPSTS)**
(Proponent)

**NATIONAL HISTORIC PRESERVATION ACT COMPLIANCE REQUEST FOR SECTION 106 REVIEW AND CONCURRENCE**

**SECTION I** (Information from Proponent of Undertaking)

A. TITLE OF UNDERTAKING: Periodic Depot Maintenance (PDM) at Kaena Point Satellite Tracking Station

B. PROPOSED START DATE: Sept 28, 2017.

C. LOCATION: The Tax Map Key for this undertaking is 6-9-003:005 and is located at Kaena Point Satellite Tracking Station Appendix A. There are two project sites for this undertaking and they are located at Buildings 39005 and 39006.

D. DESCRIPTION OF PROPOSED UNDERTAKING: The US Air Force (USAF) Detachment 3, 21 Space Operations Squadron (Det 3, 21 SOPS) proposes to conduct periodic depot maintenance (PDM) on the B-side (Building 39005) & C-side legacy (Building 39006) antenna facilities at KPSTS.

All repairs and work to be performed at these facilities and associated equipment will be done as minor in-kind repair or replacement of building or site features, elements or materials as part of routine maintenance. This work will not change the visual qualities of the buildings and there will be no change to the original/significant historic fabric of the buildings.

Under this Proposed Action (PA), the existing legacy facilities and associated equipment, i.e. radomes, antennas, etc. at each of the buildings will undergo PDM work that will include the following: power washing using pressure and water, scrubbing and painting of exterior radome panels, touch up caulking around radome seams if required, corrosion control using a wire brush to remove visible corrosion on the radome frames if corrosion is identified and installing safety access points.

**SECTION II** (Information from the Environmental Planning Office)

A. IDENTIFY HISTORIC RESOURCES

1. ARCHITECTURAL FEATURES

**Building 39005** is a large radome constructed in 1968 (Appendix B) for its original mission of space vehicle radar (satellite) tracking and communications. Over its lifetime, Building 39005 has experienced mission changes as well as modifications, additions and

renovations to its architecture, systems, mechanical equipment and mission equipment. The building has reached a current age of 49 years. Although less than 50 years old, Building 39005 is associated with the KPSTS satellite tracking mission that began in the early 1960s and has significance related to Cold War activities.

**Building 39006** is also a large radome that was constructed in 1972 (Appendix C) for its original mission of space vehicle (satellite) radar tracking and communications. Over its lifetime, Building 39006 has experienced mission changes as well as modifications, additions and renovations to its architecture, systems, mechanical equipment and mission equipment. The building has reached a current age of 45 years. Although less than 50 years old, Building 39006 is associated with the KPSTS satellite tracking mission that began in the early 1960s and has significance related to Cold War activities.

In April 2012, KPSTS completed and submitted to the SHPD a Determination of Eligibility (DOE) for buildings at KPSTS that were potentially eligible for registry in the National Register of Historic Places (NRHP). As a result of the DOE, Buildings 39005 and 39006, despite age and alterations, was deemed eligible for listing in the NRHP under Criterion A for associations with persons or events significant to our history, and Criterion C, Architecture, as part of a thematic group of buildings associated with the Cold War. The SHPD concurred with the DOE and recommended completion of a Historic American Engineering Record (HAER) Level II recordation as stated in a letter dated May 7, 2012 (SHPD Log 2012.1292, Doc. 1205RS09).

In March 2013, a HAER, recorded by the SHPD as document HAER HI-97, was completed for four KPSTS buildings determined eligible for NRHP listing. Within that document, Buildings 39005 and 39006 are recorded as HAER HI-97-F and G respectively (Attachment 2).

2. ARCHAEOLOGICAL FEATURES

According to KPSTS' Integrated Cultural Resource Management Plan (ICRMP) (International Archaeological Research Institute, Inc, September 2009), there are no known archeological sites within the project area. The proposed undertakings would not adversely affect any archeological sites or cultural resources. Further, this undertaking involves no ground-disturbing activities.

3. TRADITIONAL RESOURCES

Kaena Point is particularly well known as a Hawaiian *leina a ka 'uhane*, or 'leaping place of the spirit.' This cultural use, however, is traditionally understood to have occurred at the westernmost tip of Oahu Island, several kilometers from the proposed project areas. Although the ahupua'a of Kaena and Keawaula are rich in traditional history, there are no known traditional cultural places within the proposed project areas.

B. DETERMINE POTENTIAL EFFECT

The Area of Potential Effect (APE) for this proposed undertaking is limited to Buildings 39005 and 39006. Since work on these projects will be conducted within and upon the buildings, the likelihood of human remains or other archeological materials being inadvertently discovered is negligible. If such discovery were to occur, then all work in the vicinity of the discovery will stop and KPSTS personnel will take measures to help secure any remains, archeological materials associated context and the State Historic Preservation Division will be notified and consulted in accordance with the ICRMPs compliance procedures and standard operating procedures.

All the work to be completed is minor and will not affect the buildings overall visual appearance. HAER HI-97 documents buildings 39005 and 39006 as they are determined eligible for NRHP listing. The building's general appearance would not change, and would remain consistent with other facilities on site.

The HAER recommended by SHPD in 2012 is adequate recordation of the buildings and provides a lasting record, through photographs, engineering drawings, history, timeline and references, to mitigate any potentially adverse effects of the proposed undertaking.

C. REQUEST FOR CONCURRENCE

It is the opinion of KPSTS that, pursuant to 36 Code of Federal Regulations §800.4 (d) (1), the proposed undertakings will have "no adverse effect" on archaeological resources or other native Hawaiian cultural resources; this is based on the information gathered from archival documents, old maps, and recent archaeological investigations. Further, this undertaking involves no ground-disturbing activities.

We have determined, and respectfully request your concurrence pursuant to 36 Code of Federal Regulations §800.4 (d) (1) that the proposed undertakings will have "no adverse effect" on historic properties because (1) the PDM proposed above will not change the visual quality of the site or the facility; and (2) Buildings 39005 and 39006 are adequately documented in HAER HI-97 recordation.

**SECTION III** Contact Information

For further information you may contact Mr. Lance Hayashi at 697-4312 or via email to linda.cruz.ctr@us.af.mil.

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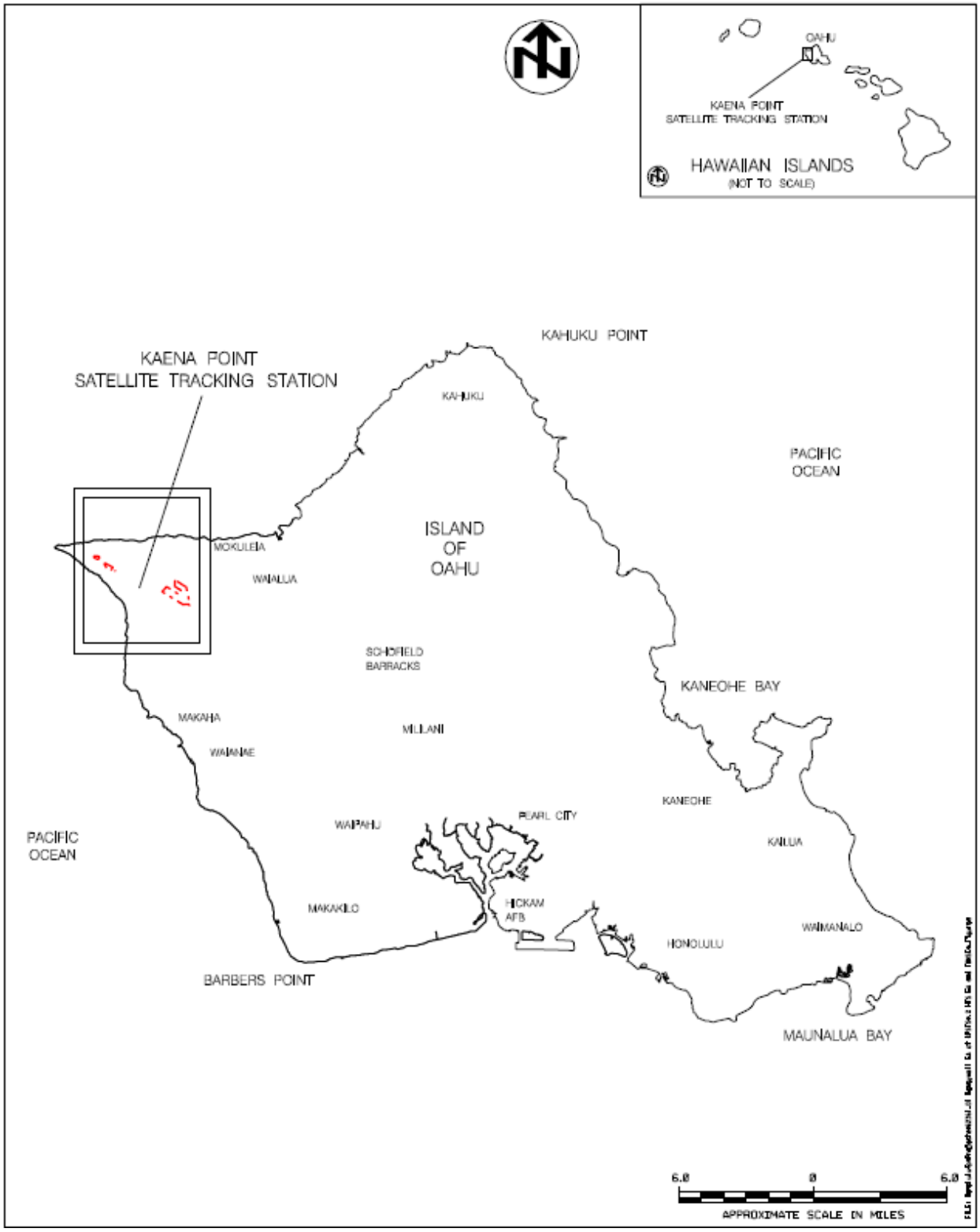
*Appendix A*




**Location of Kaena Point Satellite Tracking Station on Oahu, Hawaii**

*Appendix B*


Building 39005 photo taken in 1999 (from KPSTS ICRMP 2008:49)

**Building 39005 detail photo**

*Appendix C*

**Building 39006 photo**

**Building 39006 detail photo**

# THE UNITED STATES AIR FORCE

**FINAL**

# HISTORIC AMERICAN ENGINEERING RECORD FOR HISTORIC AND COLD WAR ERA EVALUATION AND SURVEY AT KAʻENA POINT SATELLITE TRACKING STATION OAHU, HAWAIʻI

**Contract Number:** FA8903-08-D-8791

**Task Order:** 0027

**Project Number: LXHY496805**

**April 2013**

**Building No. 39005** ..... HAER HI-97-F

**Building No. 39006** .....HAER HI-97-G

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

KA‘ENA POINT SATELLITE TRACKING STATION HAER HI-97-F
BUILDING 39005
(Satellite Tracking Antenna)
Ka‘ena Point, Wai‘anae Mountains above Keawaula Bay
Waialua
Honolulu County
Hawai‘i

Documentation: 5 Exterior Photographs (2012)
3 Interior Photographs (2012)
4 Architectural/Engineering Drawings (1967)

Original materials are owned by the U.S. Air Force and held at Ka`ena Point Satellite Tracking Station Administration Building.

Steve Brinkman, Photographer April 2012
Tony Martie, Photographer April 2012

| Photo No. | Description |
|---|---|
| HAER HI-97-F-01 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005, Exterior, looking Southwest |
| HAER HI-97-F-02 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005, Exterior, looking Northwest |
| HAER HI-97-F-03 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005, Exterior, looking Northeast |
| HAER HI-97-F-04 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005, Exterior, looking Southwest |
| HAER HI-97-F-05 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005 Exterior, looking Southeast |
| HAER HI-97-F-06 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005 Interior, looking Northeast |
| HAER HI-97-F-07 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005 Interior, Northwest |
| HAER HI-97-F-08 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39005 Interior, Oblique |
| HAER HI-97-F-09 | Burns & Roe, Inc., “T&D Antenna/ Radome Support Building,” Drawing No. KP-11, AW-70-03-01. Sheet 12, Los Angeles, California, 26 April 1967 |

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS CONTINUED

HAER HI-97-F

Original materials are owned by the U.S. Air Force and held at Ka`ena Point Satellite Tracking Station Administration Building.

| Photo No. | Description |
|---|---|
| HAER HI-97-F-10 | Clarence Fong, Architect, "Satellite Antenna Support Facilities, Plans," AW 199-16-10, Sheet 6, Honolulu, Hawai`i, 7 June 1967 |
| HAER HI-97-F-11 | Clarence Fong, Architect, "Satellite Antenna Support Facilities, Exterior Elevations, Cross Section & Schedules," AW 199-16-10, Sheet 7, Honolulu, Hawai`i, 7 June 1967 |
| HAER HI-97-F-12 | Clarence Fong, Architect, "Satellite Antenna Support Facilities, Site Plan," AW 199-16-10, Unidentified Sheet, Honolulu, Hawai`i, 7 June 1967 |

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

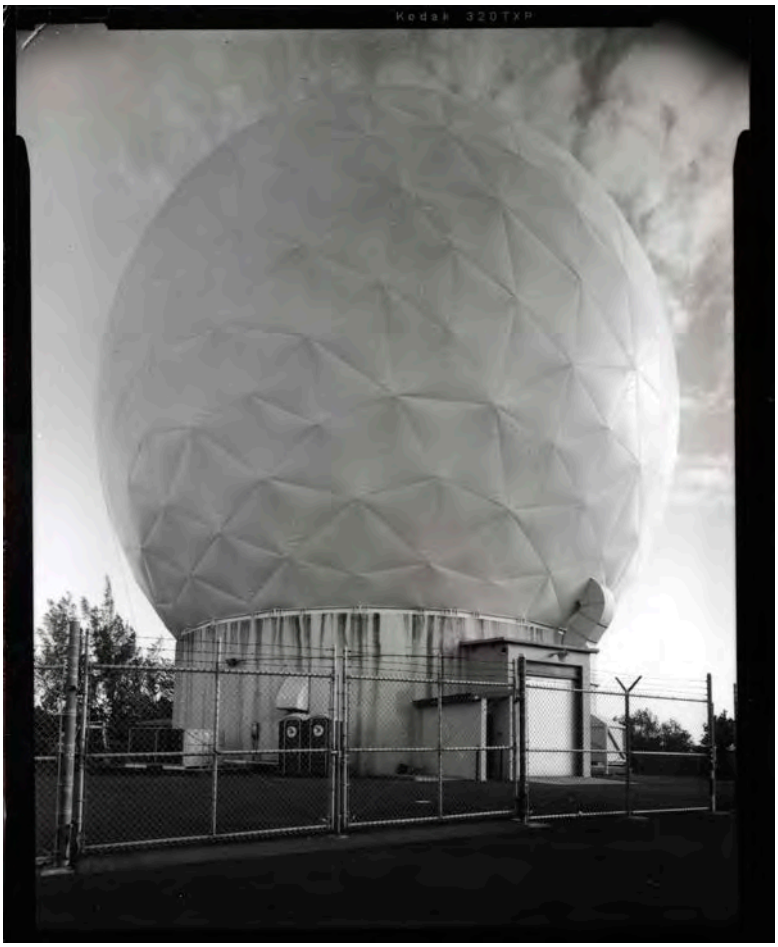
HAER HI-97-F-01

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-02

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-03



HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-04

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-05

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-06

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

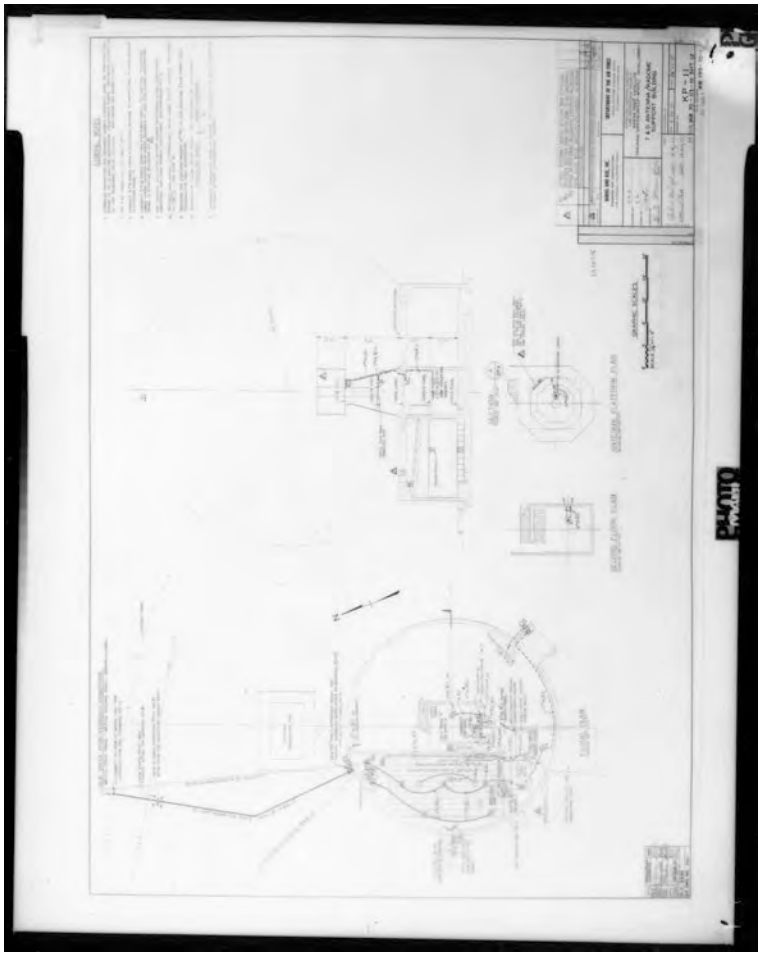
HAER HI-97-F-07

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-08

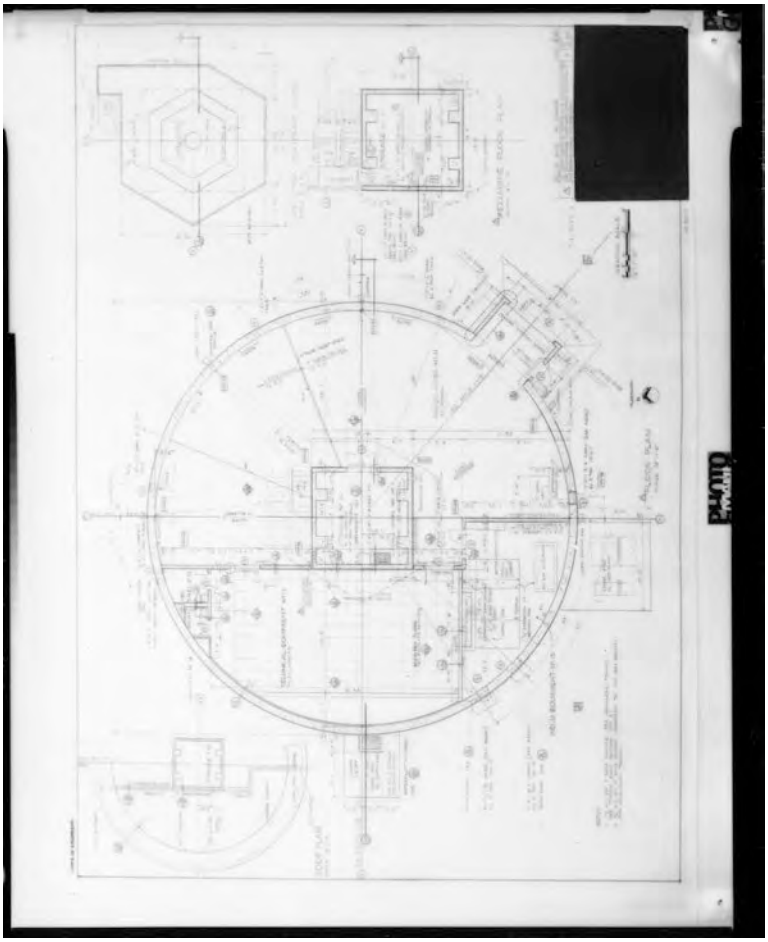
HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-09



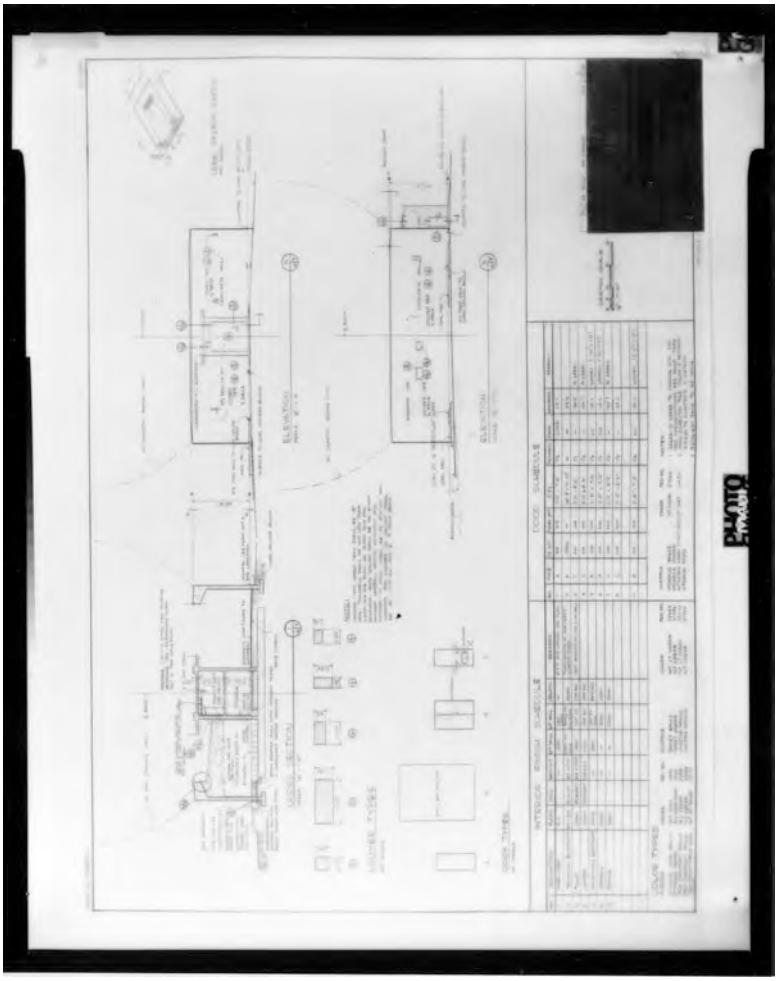
HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-10



HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-11



HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-F-12

HISTORIC AMERICAN ENGINEERING RECORD

KA‘ENA POINT SATELLITE TRACKING STATION
BUILDING NO. 39005
(Satellite Tracking Antenna)
(Antenna support structure/pedestal with associated radome)



Location: Ka‘ena Point, Wai‘anae Mountains above Keawaula Bay
Waialua, Honolulu County, Hawai‘i

United States Geological Survey (USGS) Ka`ena Point,
Hawaii Quadrangle,
Universal Transverse Mercator Coordinates
Building 39005: 2384575.05 m N, 578471.49 m E

Present Owner: Headquarters, Air Force Space Command
150 Vandenberg Street, Suite 1105
Peterson Air Force Base, CO 80914

Present Occupant: United States Air Force
Detachment 3, 21st Space Operations Squadron
50th Space Wing
P.O. Box 868
Waianae, Hawai‘i 96792-0868

Present Use: Satellite Tracking Station

Significance: Ka‘ena Point Satellite Tracking Station (KPSTS) is a radio receiving and transmitting facility that occupies approximately 153 acres of land leased from the State of Hawai`i, including easements and rights-of-way. KPSTS was originally established in 1958 to support the CORONA/Discoverer Satellite Program.

The CORONA/Discoverer Program was a covert surveillance and satellite reconnaissance program run by the United States (U.S.) in the 1950s and 1960s that was instrumental in the development of radar and surveillance technological advancements. The nation’s first satellite reconnaissance program was named Discoverer. Since the program was classified, it became known by its codeword CORONA although CORONA is not an acronym. The antenna equipment and support structures, and command stations, located within KPSTS, then known as “HULA,” supported the CORONA/Discoverer programs with data retrieval, tracking and relay; as well as gathering orbit and trajectory data to aid in the recovery of surveillance film capsules that were ejected from the satellites.

During the Cold War years when suspicions between the U.S. and the Soviet Union were high, concerns over the manufacture of nuclear

weapons by the Union of Soviet Socialist Republics (U.S.S.R.) spurred the innovations in the U.S. reconnaissance missions. Space surveillance satellites captured photographs of suspect weapons storage and manufacturing locations within the Soviet Union at increasingly higher resolution throughout the duration of the CORONA/Discoverer program.[1] Global mapping and terrain imagery became an indispensable part of military intelligence. The last CORONA/Discoverer mission flight was in 1972.

Selected History Timeline of Events that Influenced the CORONA/Discoverer Program [2]

| | |
|---|---|
| 1946 | First Post-war nuclear bombs explode in Operation Crossroads |
| 1947 | Central Intelligence Agency (CIA) established; Army separates from Air Force (AF) |
| 1954 | U-2 Program begins |
| 1957 | Soviets launch Sputnik I |
| 1958 | National Aeronautic Space Administration (NASA) established; Advanced Research Projects Agency (ARPA) est.; Air Force WS-117-L cancelled (and reconstituted as CORONA secretly) |
| 1959 | First series of "Special students" from Air Force Aeronautical Charting and Information Center (ACIC) arrive at Ohio State University (OSU); Army World Geodetic Datum (WGD59) finished |
| 1960 | First successful CORONA/Discoverer mission; Francis Gary Powers and U-2 shot down over Soviet Union; RACOMS Program begins |
| 1961 | Bay of Pigs invasion; TALENT-KEYHOLE security protocols formalized; National Reconnaissance Office (NRO) established |
| 1962 | Cuban Missile crisis; first successful CORONA-ARGON mission; first "Advanced" CORONA/Discoverer KH-4 mission |
| 1965 | Escalation of wars in Vietnam and Laos |
| 1966 | Secret Department of Defense (DOD) study suggests applications of classified reconnaissance information by nominally civilian federal agencies |

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1 USNSSDC 1960: n.p. United States National Space Science Data Center, U. N., 20 August 1960. "Discoverer 14: NSSDC ID: 1960 -010A." Accessed 21 January 2012. <http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-010A>

2 Cloud 2002: 262. Cloud, J. "American Cartographic Transformations During the Cold War." In *Cartography and Geographic Information Science*, Vol. 29, No. 3, pp. 261-282, 2002.

Selected History Timeline of Events that Influenced the CORONA/Discoverer Program (continued)

1966 U.S. Geological Survey (USGS) begins Building E-1 at new National Mapping Division (NMD) center in Virginia

1967 Six-Day War, Soviet invasion of Czechoslovakia, first CORONA/Discoverer KH-4B mission; Outer Space Treaty signed
1968 First color films flown in CORONA/Discoverer missions; Civilian Applications Committee (CAC) formed
1969 Strategic Arms Limitations Talks (SALT) begin in Finland; Apollo 11Astronauts reach the Moon; Military Geographic Information Systems (MGIS) Program begins
1971 First HEXAGON satellite reconnaissance mission
1972 Last CORONA/Discoverer Mission; SALT Treaty signed; World Geodetic System of 1972 (WGS72) completed; Most DOD and IC service-level mapping and geodesy service agencies consolidated into the Defense Mapping Agency (DMA)
1973 Office of Management and Budget Mapping Agency Task Force recommends consolidation
1975 Vietnam War ends
1978 President Carter publicly acknowledges the U.S. employs satellite reconnaissance
1992 NRO is officially recognized to exist; President Clinton elected
1995 Authorization for the declassification of CORONA; the CAC is acknowledged to exist

As a result of the contributions of the CORONA/Discoverer program, KPSTS is significant for its contributions to America’s history in the science and space exploration advances during the Cold War. KPSTS was a vital part of the U.S. military reconnaissance mission during the early development of our nation’s Satellite Command and Control Network.

## PART I. ARCHITECTURAL STATEMENT

A. General Statement:

1. History: Building 39005 is an antenna support structure/pedestal with associated radome that was designed by Clarence Fong, architect, for the Department of the Air Force and erected in 1968 as a Satellite Control Station for the CORONA/Discoverer Project. It contains the most intact radome interior on the Ka‘ena Point Satellite Tracking Station premises, including a period crane and other equipment. The radome was designed by Geometrics Inc. in 1978. The radome structure and shell underwent repairs in 1984

following damage incurred during Hurricane Iwa in 1982. Subsequently, the exterior of the radome shell was repaired following Hurricane Iniki in 1992.

2. Architectural Character: The antenna support structure/pedestal is a two-story concrete building with a two-story antenna pedestal structure with associated radome, and two one-story additions. It has an entrance that is located on the southeast facade. (See photographic documentation for HAER HI-97-F-01 through HAER HI-97-F-12).

B. Description of the Exterior:

1. Overall Dimensions: In plan, the outside diameter of the radome ringwall is 76 feet – 6 inches while the outside diameter of the radome is 105 feet – 0 inches. The height of the exterior walls of the antenna support structure measure approximately 20 feet – 6 inches vertically above grade to the intersection of the radome.

2. Foundations: The foundations of the radome base and the antenna support structure are two independent systems. The radome base has cast-in-place foundation walls which are supported on concrete piers that have been poured to a depth of 5 feet – 2 inches beneath finished floor. The footings are 5 feet – 0 inches in width and 1 feet – 6 inches in depth The antenna support structure's foundation is a floating, octagonal concrete slab that is 60 feet – 0 inches in width, 2 feet – 6 inches in depth, and is located 2 feet – 4 inches beneath finished grade. The floor slabs are typically 6 inches in thickness.

3. Wall Construction: The building base has walls of reinforced cast-in-place concrete, the walls of the additions are of reinforced concrete masonry unit construction with a plaster coating, and the radome is of steel frame construction and has been covered with a membrane.

4. Wall System, Framing: The walls of the radome base are reinforced concrete and are 1 feet – 2 inches in thickness.

5. Vestibules: There is a portico which is of concrete masonry unit construction, located on the southeast side of the building, and provides shelter for the pedestrian entry.

6. Openings:

a. Doorways and Doors: The exterior door of the pedestrian entry is solid core metal while the maintenance entrance is enclosed by a metal overhead door. There is a personnel hatch that is located at the top of the radome.

b. Windows: There are no windows in the walls of the radome base but there are tower boresight and star boresight windows located in the radome.

7. Roof:

a. Shape and Covering: The roof of the radome is a sphere with inside and outside radii of 51 feet – 8 inches and 52 feet – 6 inches, respectively, as well as an overall height of 88 feet – 11 inches. Its structure is that of a geodesic dome and it is composed of a self-bracing framework of extruded metal frames and struts which form triangles to which are attached a membrane.

b. Cornice: The building does not have a cornice but features a battered concrete cap that measures 6 feet – 6 inches in width, has minimum and maximum depths of 2 feet – 6 inches and 4 feet – 8 inches, and provides support for a steel wide flange I-beam (W 10) to which is anchored the steel framed radome above.

C. Description of the Interior:

1. Floor Plan: Entry is made from the southeast side of the building base, through a covered pedestrian entry which contains an airlock into Room No. 2. The room is open, contains a crane, and provides access to Room No. 3 which is centrally located within the building and serves as the base of the antenna, as well as the control room. Room No. 1 is located on the north side of the building and contains transmitter, air conditioning, and other mechanical equipment. A second entrance which permits access and egress for oversize equipment and maintenance is located on the southeast side of the building base. A steel stair provides access to a concrete catwalk for the maintenance of the antenna and the interior of the radome.

2. Flooring: The floor finish is concrete throughout.

3. Wall Finishes: Interior wall finishes are painted concrete and painted concrete masonry unit.

4. Doorways and Doors: Interior doors are metal throughout.

5. Light Fixtures: Period light fixtures include mid- and late-twentieth century fluorescent and incandescent fixtures.

6. Heating: Constant temperature, humidity, and air pressure is provided by mechanical systems which have been upgraded since the building's initial construction.

PART II. SOURCES OF INFORMATION

A. Original Architectural/Engineering Drawings:

Burns & Roe, Inc. "[Building 39005] T&D Antenna/ Radome Support Building, Floor Plan, Second Floor Plan, Antenna Platform Plan, Building Section," Drawing No. KP-11, AW 70-03-01, Sheet 12, Los Angeles, California, 26 April 1967.

Fong, Clarence, Architects. “[Building 39005] Structural General Notes[,] Sections & Anchor Bolt Details,” AW 195-16-10, Sheet 13, Honolulu, Hawaii, 7 June 1967.

_____. “[Building 39005] Satellite Antenna Support Facilities, Plans,” AW 199-16-10, Sheet 6, Honolulu, Hawai`i, 7 June 1967.

_____. “[Building 39005] Satellite Antenna Support Facilities, Exterior Elevations, Cross Section & Schedules,” AW 199-16-10, Sheet 7, Honolulu, Hawai`i, 7 June 1967.

_____. “[Building 39005] Satellite Antenna Support Facilities, Site Plan,” AW 199-16-10, Unidentified Sheet, Honolulu, Hawai`i, 7 June 1967

Geometrics, Inc. “Drawing List & Symbol Key[,]105M75.5 Radome,” Drawing No. 105M75.5-1, Sheet 1 of 15. Cambridge, Massachusetts, 1978.

_____. “Assembly Drawing, 105M75.5 Radome.” Drawing No. 105M75.5-2, Sheet 2 of 15.

_____.“Base Layout and Assembly Details [for] Radome 2[,] 105M75.5 Radome,” Drawing No. 105M75.5-4, Sheet 4 of 15.

## PART III. BIBLIOGRAPHY

Cloud, J. “American Cartographic Transformations During the Cold War.” In *Cartography and Geographic Information Science*, Vol. 29, No. 3, pp. 261-282, 2002.

United States National Space Science Data Center, U. N., 20 August 1960. “Discoverer 14: NSSDC ID: 1960 -010A.” Accessed 21 January 2012. <http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-010A>

## PART IV. HISTORIANS

Historical research was conducted and the historical narrative was prepared by Kathryn Ladoulis Urban, AIA, K Design Group, Honolulu, while the architectural descriptions were prepared by Stanley Solamillo, also of K Design Group, and completed on July 16, 2012.

## PART V. PROJECT INFORMATION

This Historic American Engineering Record (HAER) recording project was undertaken and funded by the United States Air Force Center for Environmental Excellence, Department of Defense as part of an agreed mitigation with the Architecture Branch, State Historic Preservation Division (SHPD) of the Hawai‘i Department of Land and Natural Resources. The recording team consisted of preservation architect Kathryn Ladoulis Urban, AIA, architectural historian Stanley Solamillo, as well as architectural photographers Steve Brinkman and Tony Martie.

Research for this project was conducted at the University of Hawai‘i Government Documents collection; the Joint Base Pearl Harbor Hickam 15 Airlift Wing Base historian office archive

collection, at KPSTS Administration Building 10 archive drawing collection; the National Electronics Museum archives in Linthicum Heights, Maryland; the University of Notre Dame Hersburgh Library, South Bend, Indiana, in the General collection and Government documents collection; the Declassified Files section of the National Reconnaissance Office; as well as on-line sources from December 2, 2011 through July 12, 2012.

Initial site visits were performed from December 13 through 15, 2011 at KPSTS. A two day site visit and photographic fieldwork for HAER documentation as well as photography of archival construction and as-built drawings of KPSTS buildings No. 11, 35, 39005, and 39006 was performed from April 18-19, 2012. Additional HAER photography of existing measured drawings was performed on June 28, 2012.

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

KA‘ENA POINT SATELLITE TRACKING STATION — HAER HI-97-G
BUILDING NO. 39006
(Satellite Tracking Antenna)
Ka‘ena Point, Wai‘anae Mountains above Keawaula Bay
Waialua
Honolulu County
Hawai‘i

Documentation: 4 Exterior Photographs (2012)
2 Interior Photographs (2012)
5 Architectural/Engineering Drawings (1970)

Original materials are owned by the U.S. Air Force and held at Ka`ena Point Satellite Tracking Station Administration Building.

Steve Brinkman, Photographer — April 2012
Tony Martie, Photographer — April 2012

| Photo No. | Description |
|---|---|
| HAER HI-97-G-01 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39006, Exterior, looking West |
| HAER HI-97-G-02 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39006, Exterior, looking Southwest |
| HAER HI-97-G-03 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39006, Exterior, looking East |
| HAER HI-97-G-04 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39006, Exterior, looking Southeast |
| HAER HI-97-G-05 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39006, Interior, Oblique |
| HAER HI-97-G-06 | Ka`ena Point Satellite Tracking Station, vicinity of Building No. 39006, Interior, Oblique |
| HAER HI-97-G-07 | Department of the Air Force, “Antenna & Radome Support Structure, Architectural Plans & Details,” AW 35-47-01, Sheet A-1, Los Angeles, California, 14 December 1970 |
| HAER HI-97-G-08 | Department of the Air Force, “Antenna & Radome Support Structure, Civil & Plot Utility Plan,” AW 35-47-01, Sheet C-1, Los Angeles, California, 14 December 1970 |

INDEX TO PHOTOGRAPHS CONTINUED



Original materials are owned by the U.S. Air Force and held at Ka`ena Point Satellite Tracking Station Administration Building.

| Photo No. | Description |
|---|---|
| HAER HI-97-G-09 | Department of the Air Force, "Antenna & Radome Support Structure, Structural Plans, Sections & Details," AW 35-47-01, Sheet S-1, Los Angeles, California, 14 December 1970 |
| HAER HI-97-G-10 | Department of the Air Force, "Antenna & Radome Support Structure, Structural Plans, Elevations, Sections & Details," AW 35-47-01, Sheet S-2, Los Angeles, California, 14 December 1970 |
| HAER HI-97-G-11 | Department of the Air Force, "Antenna & Radome Support Structure, Structural Plans, Elevations, Sections & Details," AW 35-47-01, Sheet S-3, Los Angeles, California, 14 December 1970 |

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-01

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-02

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-03

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-04

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

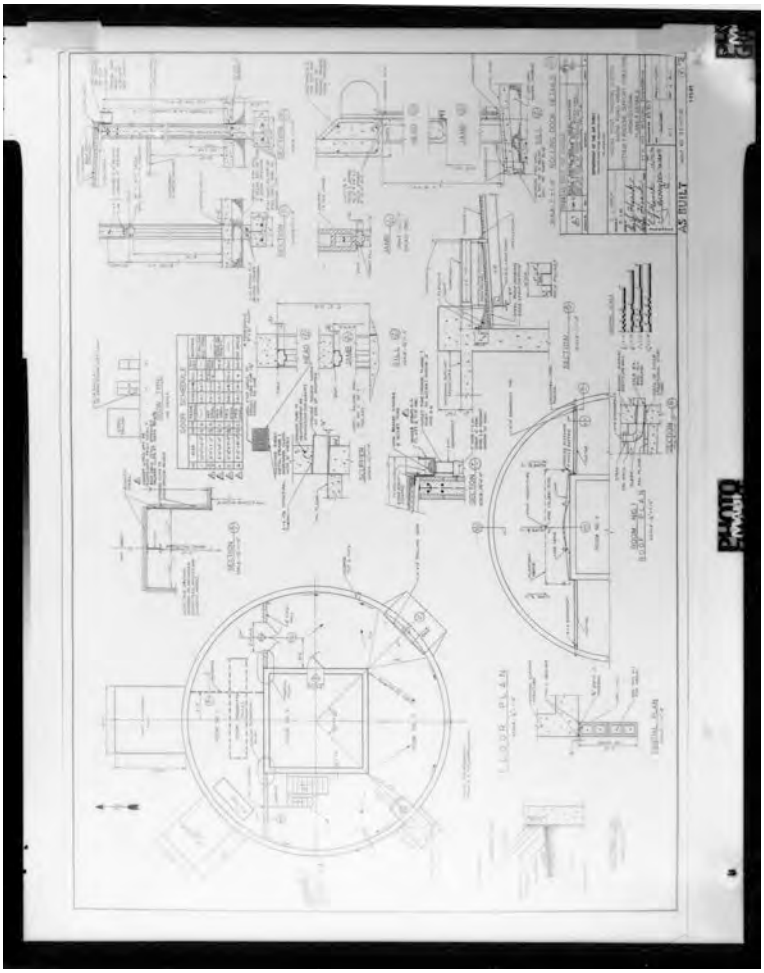
HAER HI-97-G-05

HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-06

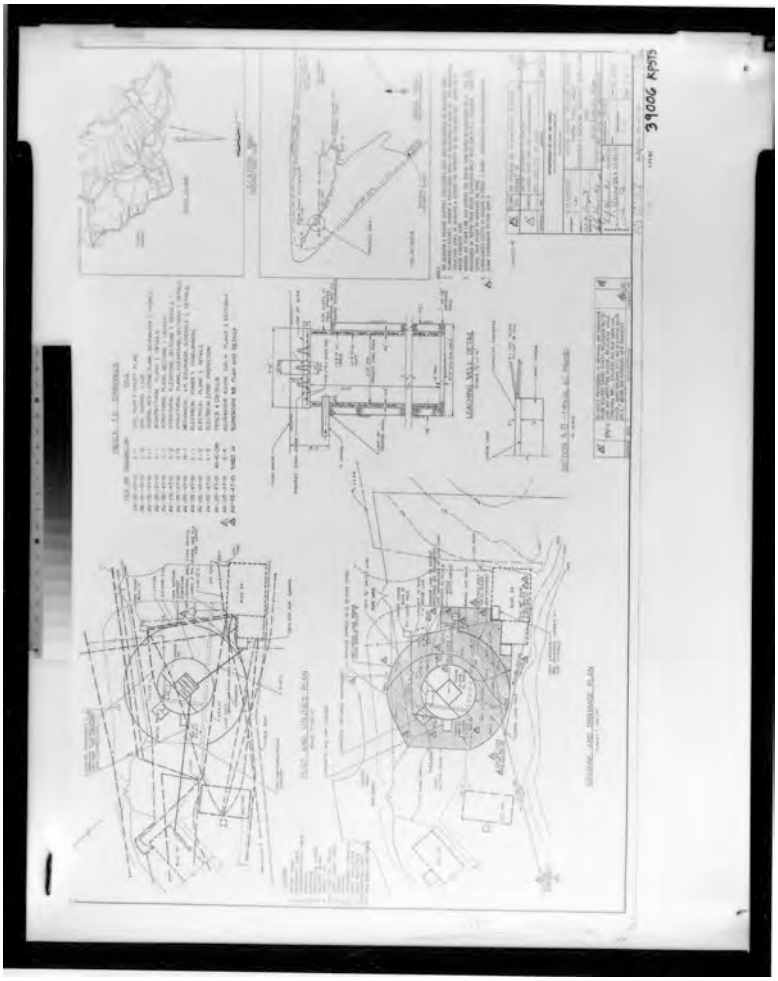
HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-07



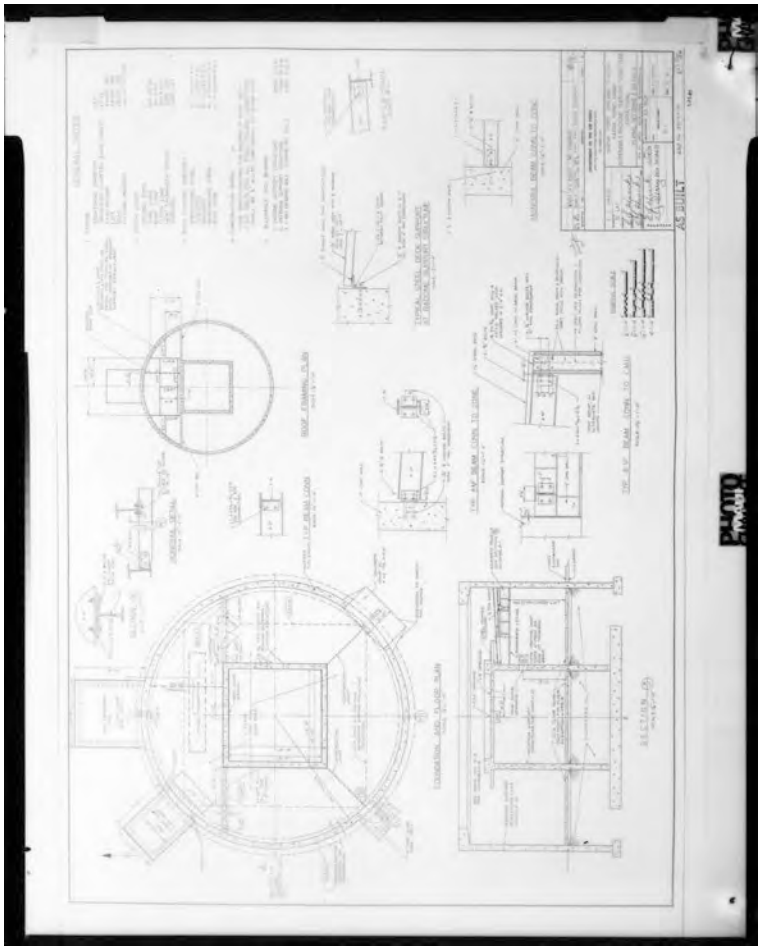
HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-08



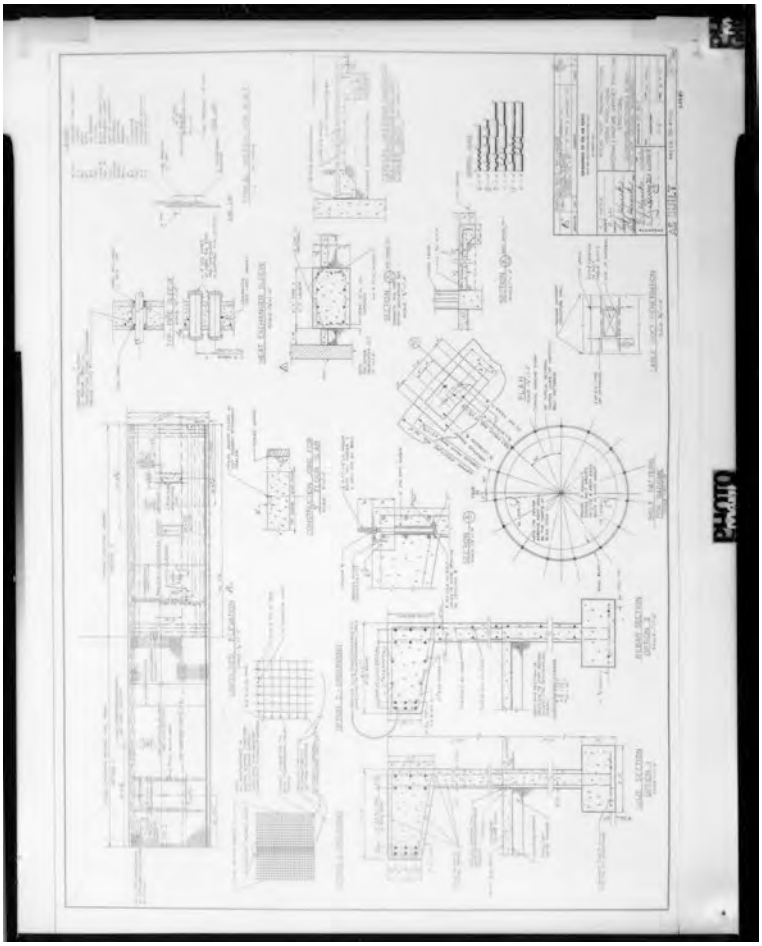
HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-09



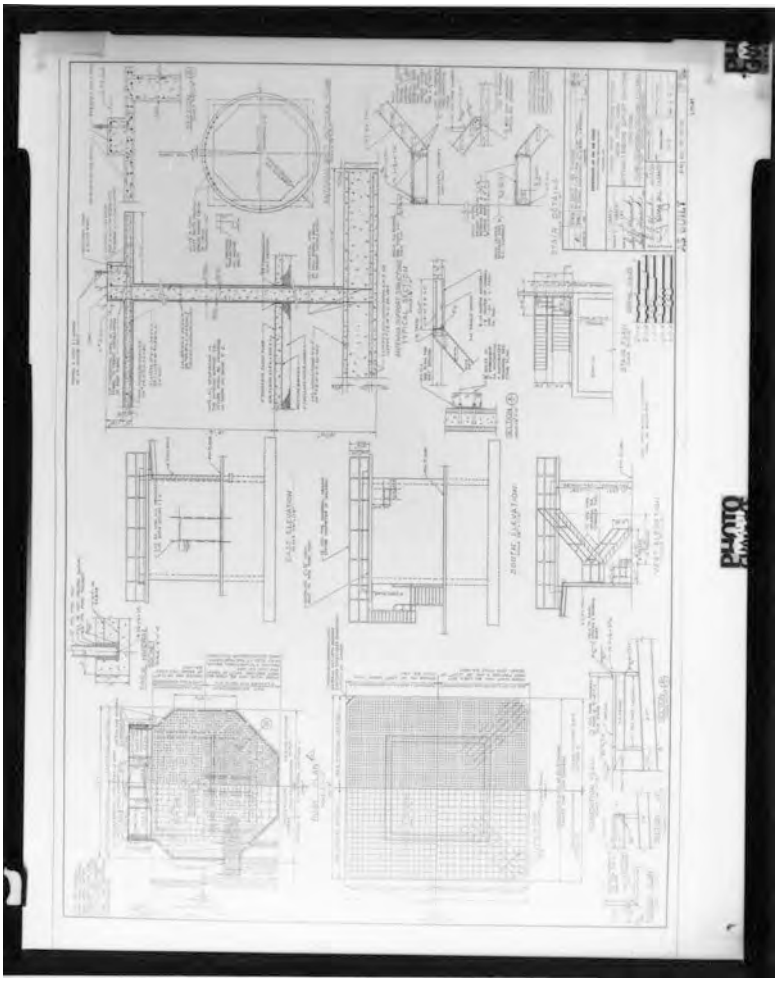
HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-10



HISTORIC AMERICAN ENGINEERING RECORD
SEE INDEX TO PHOTOGRAPHS FOR CAPTION

HAER HI-97-G-11



HISTORIC AMERICAN ENGINEERING RECORD

KA‘ENA POINT SATELLITE TRACKING STATION
BUILDING NO. 39006
(Satellite Tracking Antenna)
(Antenna support structure/pedestal with associated radome)



Location: Ka‘ena Point, Wai‘anae Mountains above Keawaula Bay
Waialua, Honolulu County, Hawai‘i

United States Geological Survey (USGS) Ka`ena Point,
Hawaii Quadrangle,
Universal Transverse Mercator Coordinates
Building 39006: 2385304.93 m N, 576375.77 m E

Present Owner: Headquarters, Air Force Space Command
150 Vandenberg Street, Suite 1105
Peterson Air Force Base, CO 80914

Present Occupant: United States Air Force
Detachment 3, 21st Space Operations Squadron
50th Space Wing
P.O. Box 868
Waianae, Hawai‘i 96792-0868

Present Use: Satellite Tracking Station

Significance: Ka‘ena Point Satellite Tracking Station (KPSTS) is a radio receiving and transmitting facility that occupies approximately 153 acres of land leased from the State of Hawai`i, including easements and rights-of-way. KPSTS was originally established in 1958 to support the CORONA/Discoverer Satellite Program.

The CORONA/Discoverer Program was a covert surveillance and satellite reconnaissance program run by the United States (U.S.) in the 1950s and 1960s that was instrumental in the development of radar and surveillance technological advancements. The nation’s first satellite reconnaissance program was named Discoverer. Since the program was classified, it became known by its codeword CORONA although CORONA is not an acronym. The antenna equipment and support structures, and command stations, located within KPSTS, then known as “HULA,” supported the CORONA/Discoverer programs with data retrieval, tracking and relay; as well as gathering orbit and trajectory data to aid in the recovery of surveillance film capsules that were ejected from the satellites.

During the Cold War years when suspicions between the U.S. and the Soviet Union were high, concerns over the manufacture of nuclear weapons by the Union of Soviet Socialist Republics (U.S.S.R.) spurred

innovations in the U.S. reconnaissance missions. Space surveillance satellites captured photographs of suspect weapons storage and manufacturing locations within the Soviet Union at increasingly higher resolution throughout the duration of the CORONA/Discoverer program.[1] Global mapping and terrain imagery became an indispensable part of military intelligence. The last CORONA/Discoverer mission flight was in 1972.

Selected History Timeline of Events that Influenced the CORONA/Discoverer Program [2]

| | |
|---|---|
| 1946 | First Post-war nuclear bombs explode in Operation Crossroads |
| 1947 | Central Intelligence Agency (CIA) established; Army separates from Air Force (AF) |
| 1954 | U-2 Program begins |
| 1957 | Soviets launch Sputnik I |
| 1958 | National Aeronautic Space Administration (NASA) established; Advanced Research Projects Agency (ARPA) est.; Air Force WS-117-L cancelled (and reconstituted as CORONA secretly) |
| 1959 | First series of "Special students" from Air Force Aeronautical Charting and Information Center (ACIC) arrive at Ohio State University (OSU); Army World Geodetic Datum (WGD59) finished |
| 1960 | First successful CORONA/Discoverer mission; Francis Gary Powers and U-2 shot down over Soviet Union; RACOMS Program begins |
| 1961 | Bay of Pigs invasion; TALENT-KEYHOLE security protocols formalized; National Reconnaissance Office (NRO) established |
| 1962 | Cuban Missile crisis; first successful CORONA-ARGON mission; first "Advanced" CORONA/Discoverer KH-4 mission |
| 1965 | Escalation of wars in Vietnam and Laos |
| 1966 | Secret Department of Defense (DOD) study suggests applications of classified reconnaissance information by nominally civilian federal agencies |
| 1966 | U.S. Geological Survey (USGS) begins Building E-1 at new National Mapping Division (NMD) center in Virginia |

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1 USNSSDC 1960: n.p. United States National Space Science Data Center, U. N., 20 August 1960. "Discoverer 14: NSSDC ID: 1960 -010A." Accessed 21 January 2012. <http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-010A>

2 Cloud 2002: 262. Cloud, J. "American Cartographic Transformations During the Cold War." In *Cartography and Geographic Information Science*, Vol. 29, No. 3, pp. 261-282, 2002.

Selected History Timeline of Events that Influenced the CORONA/Discoverer Program (continued)

| | |
|---|---|
| 1967 | Six-Day War, Soviet invasion of Czechoslovakia, first CORONA/Discoverer KH-4B mission; Outer Space Treaty signed |
| 1968 | First color films flown in CORONA/Discoverer missions; Civilian Applications Committee (CAC) formed |
| 1969 | Strategic Arms Limitations Talks (SALT) begin in Finland; Apollo 11Astronauts reach the Moon; Military Geographic Information Systems (MGIS) Program begins |
| 1971 | First HEXAGON satellite reconnaissance mission |
| 1972 | Last CORONA/Discoverer Mission; SALT Treaty signed; World Geodetic System of 1972 (WGS72) completed; Most DOD and IC service-level mapping and geodesy service agencies consolidated into the Defense Mapping Agency (DMA) |
| 1973 | Office of Management and Budget Mapping Agency Task Force recommends consolidation |
| 1975 | Vietnam War ends |
| 1978 | President Carter publicly acknowledges the U.S. employs satellite reconnaissance |
| 1992 | NRO is officially recognized to exist; President Clinton elected |
| 1995 | Authorization for the declassification of CORONA; the CAC is acknowledged to exist |

As a result of the contributions of the CORONA/Discoverer program, KPSTS is significant for its contributions to America’s history in the science and space exploration advances during the Cold War. KPSTS was a vital part of the U.S. military reconnaissance mission during the early development of our nation’s Satellite Command and Control Network.

## PART I. ARCHITECTURAL STATEMENT

A. General Statement:

1. History: Building 39006 is an antenna support structure/pedestal with associated radome that was designed by an unidentified engineering company for the Department of the Air Force and erected in 1972 as a Satellite Control Station for the CORONA/Discoverer Project. It contains the second most intact radome interior on the Ka‘ena Point Satellite Tracking Station premises.

2. Architectural Character: The antenna support structure/pedestal is a two-story circular concrete building with a dome and two one-story additions. It has entrances that are located on the southwest and southeast sides of the base. (See photographic documentation for HAER HI-97-G-01 through HAER HI-97-G-11).

B. Description of the Exterior:

1. Overall Dimensions: In plan, the radome ringwall measures 24 feet – 0 inches in radius or 48 feet 0 inches in diameter and the radome's equatorial radius measures 68 feet – 0 inches. An addition containing a mechanical room has plan dimensions of 13 feet – 4 inches in width and 8 feet – 11 inches in depth while another addition which contains a heat exchanger is of indeterminate dimension. The exterior walls of the antenna support structure are visible approximately 19 feet – 7 inches vertical above grade to the intersection of the radome.

2. Foundations: The foundations of the radome base and the antenna support structure are two independent systems. The radome base has cast-in-place foundation walls which are supported on concrete piers that have been poured to a depth of 8 feet -6 inches beneath finished floor. The footings are 3 feet – 0 inches in width and 1 feet – 6 inch in depth The antenna support structure's foundation is a floating concrete slab which is square with clipped corners. It is 32 feet – 8 inches in width, 2 feet – 0 inches in depth, and is located 3 feet – 0 inches beneath finished grade. The floor slabs are typically 6 inches in thickness.

3. Wall Construction: The building base has walls of reinforced cast-in-place concrete, the walls of the additions are of reinforced concrete masonry unit construction with a plaster coating.

4. Wall System, Framing: The walls of the antenna support structure are reinforced concrete and are 1 feet – 2 inches in thickness.

5. Vestibules: There is a portico which is of concrete masonry unit construction, located on the southwest side of the building, and provides shelter for the pedestrian entry.

6. Openings:

a. Doorways and Doors: The exterior door of the pedestrian entry is solid core metal while the maintenance entrance is enclosed by a metal overhead door. There is a personnel hatch that is located at the top of the radome. Louvered metal doors provide access to the mechanical room.

b. Windows: There are no windows in the walls of the radome base but there are tower boresight and star boresight windows located in the radome.

7. Roof:

a. Shape and Covering: Its structure is that of a geodesic dome and it is composed of a self-bracing framework of extruded metal frames and struts which form triangles to which are attached a membrane.

b. Cornice: The building does not have a cornice but features a battered concrete cap that measures 6 feet – 6 inches in width, has minimum and maximum depths of 2 feet – 6 inches and 4 feet – 8 inches, and provides support for a steel wide flange I-beam (W 10) to which is anchored the steel framed radome above.

C. Description of the Interior:

1. Floor Plan: Entry is made from the southwest side of the building base, through a covered pedestrian entry which contains an airlock into Room No. 2. The room is open and provides access to Room No. 3 which is centrally located within the building and serves as the base of the antenna. Room No. 1 is located on the north side of the building and contains transmitter, air conditioning, and other mechanical equipment. A second entrance which permits access and egress for oversize equipment and maintenance is located on the southeast side of the building base. A steel stair provides access to a concrete catwalk for the maintenance of the antenna and the interior of the radome. Room No. 4 is a mechanical room which was built in 1971 on the west side of the building base. Room No. 5 is an addition which appears to have been constructed after Room No. 4 to enclose a heat exchanger.

2. Flooring: The floor finish is concrete throughout.

3. Wall Finishes: Interior wall finishes are painted concrete and painted concrete masonry unit.

4. Doorways and Doors: Interior doors are metal throughout.

5. Light Fixtures: Period light fixtures include mid- and late-twentieth century fluorescent fixtures.

6. Heating: Constant temperature, humidity, and air pressure is provided by mechanical systems which have been upgraded since the building's initial construction.

PART II. SOURCES OF INFORMATION

A. Original Architectural/Engineering Drawings:

Louie, Paul & Associates. "Foundation Plan, Building. Sections, Penthouse Roof Framing Plan," Drawing No. 04-14-92, Sheet A-4.

Louie, Paul & Associates. "[Building 39006] Floor Plan, Foundation Plan, Roof Framing Plan, Antennae Plat- form Floor Plan," Drawing No. 04-14-92, Sheet A-2, April 1992.

_____. "Reflected Ceiling Plans, North & West Exterior Elevations," Drawing No. 04-14-92, Sheet A-3, April 1992

_____. "Building Section, Wall Section of Antennae Platform, Wall Section of Radome Support, Roof Framing Plan," Drawing No. 04-14-92, Sheet A-4, April 1992.

U.S. Department of the Air Force. Space and Missile Systems (AFSC). "[Building 39006] Civil, Plot & Utility Plan," As-Built AW 35-47-01, Drawing No. C-1, Los Angeles, California, 20 January 1971.

_____. "Architectural Plans & Details," Drawing No. A-1.

_____. "Structural Plans, Sections & Details," Drawing No. S-1.

_____. "Structural Elevations, Sections & Details," Drawing No. S-2.

_____. "Structural Plans Elevations, Plans, Sections & Details" Drawing No. S-3.

PART III. BIBLIOGRAPHY

Cloud, J. "American Cartographic Transformations During the Cold War." In *Cartography and Geographic Information Science*, Vol. 29, No. 3, pp. 261-282, 2002.

United States National Space Science Data Center, U. N., 20 August 1960. "Discoverer 14: NSSDC ID: 1960 -010A." Accessed 21 January 2012. <http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-010A>

PART IV. HISTORIANS

Historical research was conducted and the historical narrative was prepared by Kathryn Ladoulis Urban, AIA, K Design Group, Honolulu, while the architectural descriptions were prepared by Stanley Solamillo, also of K Design Group, and completed on July 16, 2012.

## PART V. PROJECT INFORMATION

This Historic American Engineering Record (HAER) recording project was undertaken and funded by the United States Air Force Center for Environmental Excellence, Department of Defense as part of an agreed mitigation with the Architecture Branch, State Historic Preservation Division (SHPD) of the Hawai‘i Department of Land and Natural Resources. The recording team consisted of preservation architect Kathryn Ladoulis Urban, AIA, architectural historian Stanley Solamillo, as well as architectural photographers Steve Brinkman and Tony Martie.

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