

WHITE SANDS SPACE HARBOR AREA 1,  
HUB MAINTENANCE FACILITY

HAER No. NM-28-F

(Space Shuttle Landing Facility Area 1, HUB Maintenance Facility)

White Sands Missile Range

Approximately 25 feet east of the Control Tower

White Sands vicinity

Doña Ana County

New Mexico

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
National Park Service  
U.S. Department of the Interior  
Intermountain Regional Office  
12795 Alameda Parkway  
Denver, CO 80225-0287

HISTORIC AMERICAN ENGINEERING RECORD

WHITE SANDS SPACE HARBOR AREA 1, HUB MAINTENANCE FACILITY  
(Space Shuttle Landing Facility Area 1, HUB Maintenance Facility)

HAER No. NM-28-F

Location: White Sands Missile Range  
Approximately 25' east of Control Tower  
White Sands vicinity  
Doña Ana County  
New Mexico  
  
U.S.G.S. 7.5 Minute Las Cruces, New Mexico,  
Quadrangle, Universal Transverse Mercator Coordinates  
(center of runways): E 32.944408 N 106.41993 Zone 13S,  
NAD 1983

Construction: 1984-1985

Architect: Not known

Builder: Not known

Present Owner: Commander, U.S. Army White Sands Missile Range,  
New Mexico 88002-5018

Present Use: Vacant

Significance: The HUB Maintenance Facility was an essential component of the White Sands Space Harbor (WSSH) from 1984-2011. It is considered to have national significance and is eligible for listing in the National Register of Historic Places (NRHP) under Criterion A for its association with the NASA Space Shuttle Program (SSP) with a period of significance of 1976-2011. Because it achieved significance within the past fifty years, Criterion Consideration G also applies.

Report

Prepared by: Robbie D. Jones, Senior Historian  
New South Associates  
118 South 11<sup>th</sup> Street  
Nashville, TN 37206

Date: September 2013

LIST OF ACRONYMS

ABGR	Alamogordo Bombing and Gunnery Range
ABS	Anti-lock Braking System
ACHP	Advisory Council on Historic Preservation
ACI	Archaeological Consultants, Inc.
AIAA	American Institute of Aeronautics and Astronautics
APE	Area of Potential Effects
ATC	Air Traffic Control
BTT	Basic Training Target
CCC	Civilian Conservation Corps
CIT	California Institute of Technology
CONEX	Container Express
DC-X	Delta Clipper, Experimental
DoD	Department of Defense
GPS	Global Positioning System
HAFB	Holloman Air Force Base
HPO	Historic Preservation Officer
HPWG	Historic Preservation Working Group
HUB	Harbor Utility Building
IGS	Inter Glide Slope
IHA	InoMedic Health Applications, LLC
JSC	Johnson Space Center
KSC	Kennedy Space Center
LC	Launch Complex
MD	McDonnell Douglas
MSBLS	Microwave Scanning Beam Landing System
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NAVAIDS	Navigational Aids
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places

NSA	New South Associates
OCC	Operations Control Center
ORD	Army Ordnance Department
PAPI	Precision Approach Path Indicator
RFP	Request for Proposal
SCAPE	Self Contained Atmospheric Protective Ensemble
SHPO	State Historic Preservation Officer
SSP	Space Shuttle Program
SSRT	Single Stage Rocket Technology
STA	Shuttle Training Aircraft
STS	Space Transportation System
TACAN	Tactical Air Navigation
TAL	Transoceanic Abort Landing
UHF	Ultrahigh Frequency
USAAF	United States Army Air Force
USAF	United States Air Force
VITT	Vehicle Integration Test Team
WPA	Works Progress Administration
WSMR	White Sands Missile Range
WSNM	White Sands National Monument
WSPG	White Sands Proving Ground
WSSH	White Sands Space Harbor
WSTF	White Sands Test Facility

PART I. HISTORICAL INFORMATION

A. PHYSICAL HISTORY

1. DATE OF CONSTRUCTION

The HUB Maintenance Facility was constructed from 1984-1985.

2. ENGINEER

Not known.

3. BUILDER/CONTRACTOR/SUPPLIER

Not known.

4. ORIGINAL PLANS

Not available.

5. ALTERATIONS AND ADDITIONS

A prefabricated residential trailer was attached to the south elevation around 1988. The entire facility was covered with spray foam insulation. All electronic equipment, machinery, and furnishings were removed once the facility was vacated in 2011. The U.S. Army initiated occupation and reuse of the facility in the summer of 2012.

PART II. STRUCTURAL/DESIGN INFORMATION

A. GENERAL DESCRIPTION

1. CHARACTER

The HUB Maintenance Facility (NASA Inventory #1002) is located at the southeast side of the Control Tower approximately 3,000' southeast of the centerline of where Runway 17/34 and Runway 23/05 intersect. This facility replaced the original prefabricated building relocated here in the mid-1970s.

The HUB Maintenance Facility is two-story prefabricated metal garage on a concrete pad with a carport attached to the north elevation and a prefabricated residential trailer attached to the south elevation. The main building features square fixed pane glass windows on the east, west, and south elevations. The north elevation features a metal pedestrian entrance door on the west side and a metal garage door on the east side. Constructed with a prefabricated steel frame, the elevations and shallow gable roof are covered with metal panels. The interior is divided equally by a metal north/south curtain wall with centrally located double wood doors.

The north side of the HUB Maintenance Facility contains an office and storage closet with a drop ceiling and sheetrock walls. The south side contains a maintenance workspace with an open ceiling, exposed walls, and freestanding metal frame storage loft. A bathroom and utility closet are located beneath the loft in the southeast corner. An entrance is located in the center of the south elevation, which leads to small vestibule connected to a 1960s prefabricated residential trailer that was attached around 1988 and repurposed for use as offices.

The trailer was relocated from NASA Johnson Space Center in Houston, Texas, where it was originally used during the Apollo program (1963-1972) to quarantine astronauts after returning from Earth-orbiting flights. At that time, the trailer was housed within a larger metal building.

Manufactured in Texas, the trailer features double hung glass pane windows and a modern replacement metal pedestrian entrance door along the west elevation. Windows and doors on the south

and east elevations have been covered over with foam core. A small wooden, covered porch serves the west entrance. The trailer's foundation piers are hidden by a metal skirt. The interior retains wood paneled walls and a linoleum floor. A bathroom and storage are located on the north end and a bedroom converted into a private office on the south end. The central multi-purpose living room/kitchen/eating area was repurposed into an open office work space.

The exterior of the entire HUB Maintenance Facility was covered with spray foam insulation that assisted with protecting the interior from the harsh desert environment.

The attached pass-through, covered parking and work area at the north elevation is supported by steel I-beams. A modern HVAC unit is located on the exterior of the west elevation of the trailer. A flagpole was installed at the southeast corner of the trailer around 1990 and removed in 2012. Satellite dishes and other communication devices were located on the roof and ground along the eastern side of the trailer and removed in 2012.

## 2. CONDITION OF FABRIC

When documented in March 2012, the HUB Maintenance Facility had been abandoned for over six months, but was in fair condition. The interior equipment had been removed and the exterior was showing signs of neglect due to the harsh desert environment, which requires that facilities are constantly maintained and repaired due to shifting sands, flash floods, and extreme temperature variations.

### B. CONSTRUCTION

The HUB Maintenance Facility is constructed of a prefabricated metal building on a concrete pad. A prefabricated residential trailer on concrete piers is attached to the south elevation. A metal carport on a concrete pad is attached to the north elevation. A detached metal water tank on a concrete pad is located southeast of the facility.

C. MECHANICAL/OPERATION

The HUB Maintenance Facility featured electricity to power interior lights, electronic navigational equipment, radios, and wall-mounted air conditioning units. Non potable water was supplied by a freestanding water tank to the east. Generators provided back-up power.



PART III. SOURCES OF INFORMATION

A. ENGINEERING PLANS AND DRAWINGS

There are no original engineering plans or drawings for the HUB Maintenance Facility. NASA staff created an as-built, not-to-scale site plan, which was used as a base map for this report (Figure 2).

B. EARLY VIEWS AND HISTORICAL DATA

Historic photographs and maps of the WSSH are very limited. Some of these views can be found on pages 19-24 of this document. All views are captioned and dated as available. The other historical data comes from a variety of sources cited in the Bibliography below.

The historic photographs and most of the historical data used in this documentation came from sources within WSTF and WSSH. Other more current imagery was obtained from the online WSTF Media Archive. Many of the original photographs have been donated to the WSMR Museum for digitization and curation. A body of recent aerial photographs were located and photocopied for inclusion in the HAER document to supplement the current ground photography.

C. INTERVIEWS

The following NASA and WSMR employees were interviewed for this documentation.

Robert E. Mitchell, WSTF Manager, September 2011.

Frank Offutt, WSSH Manager, September 2011.

Timothy Davis, WSTF Historic Preservation Officer, September 2011 and March 2012.

Bill Godby, WSMR Historic Preservation Officer, September 2011.

Doyle Piland, WSMR Museum Archivist, September 2011.

Dennis G. Perrin, NASA Johnson Space Center, Houston, Texas, and  
WSTF Facility Manager (1975-1989), June 2013.

D. BIBLIOGRAPHY

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E. LIKELY SOURCES NOT YET INVESTIGATED

Research was conducted at WSSH and WSTF using primary and secondary sources. Sources that were not investigated that may contain secondary information are archived at NASA's Lyndon B. Johnson Space Center in Houston, Texas.

Additional oral history interviews with other engineers and technicians could also prove useful.

PART IV. PROJECT INFORMATION

In 2011-2012, New South Associates (NSA), under contract with InoMedic Health Applications, LLC (IHA) of Kennedy Space Center, Florida, and in coordination with NASA and the U.S. Army, conducted background research and a historic architecture survey of resources at the NASA WSSH. The survey included the documentation and evaluation for NRHP eligibility for seventy-two resources located in four distinct areas. Based on this research, NSA determined that no properties remain at WSSH from the period prior to NASA acquisition in 1963 except for the footprint of the packed gypsum Runway 17/35.<sup>1</sup>

NSA recommended that the three NASA WSSH Runways and the Control Tower in Area 1 were individually eligible for listing in the NRHP and eligible as contributing resources to the "WSSH Shuttle Landing Facility District" under Criterion A and Criterion Consideration G for their association with the NASA SSP. None of the other sixty-eight inventoried properties were recommended individually eligible for listing in the NRHP due to lack of historical association with the NASA SSP or other historic contexts, lack of unique design or construction features, or insufficient integrity; however, nineteen of these properties, all of which lie within Area 1, were recommended as contributing resources to "WSSH Shuttle Landing Facility District," even though they were not recommended individually eligible for the NRHP. The historic district contains a total of twenty-eight resources: twenty-three are contributing and five are non-contributing.

After formally ending the SSP on August 31, 2011, NASA disposed of the WSSH and released use of the property to the U.S. Army WSMR. The property transfer was a federal undertaking on federally-owned property and subject to compliance with Section 106 of the NRHP Act of 1966, as amended. The undertaking resulted in an Adverse Effect to the NRHP-eligible WSSH Shuttle Landing Facility District. To mitigate the adverse effects, NASA completed HAER Level II documentation of the historic district

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<sup>1</sup> Reed, Mary Beth, and Robbie D. Jones. "Historic Architecture Survey and National Register of Historic Places Evaluation of the NASA White Sands Space Harbor on the U.S. Army Whites Sands Missile Range, Doña Ana County, New Mexico." New South Associates, Stone Mountain, Georgia, 1998: 44-62. Unpublished report on file at NASA WSTF, Las Cruces, New Mexico.

and relocated the Control Tower to the WSMR Museum for conservation, exhibition, and public interpretation.

The mitigation plan was defined in a Memorandum of Agreement (MOA), executed between NASA, the U.S. Army, and the NM-SHPO in August 2012. The properties within the historic district were documented with large format photography in March 2012.

APPENDIX- LOCATION MAPS AND HISTORICAL VIEWS



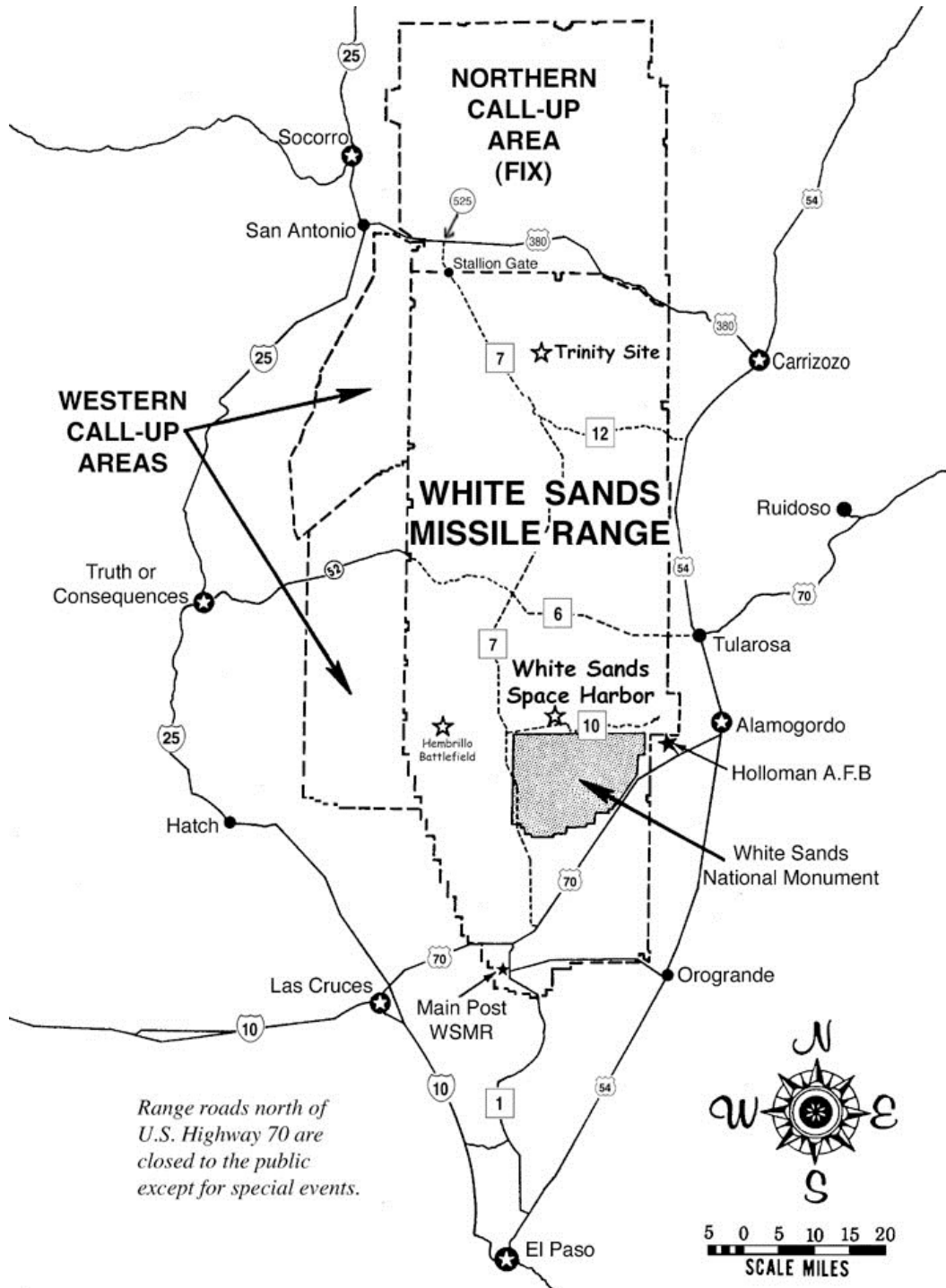


Figure 1. Map of White Sands Military Reservation showing White Sands Space Harbor (Source: U.S. Army).

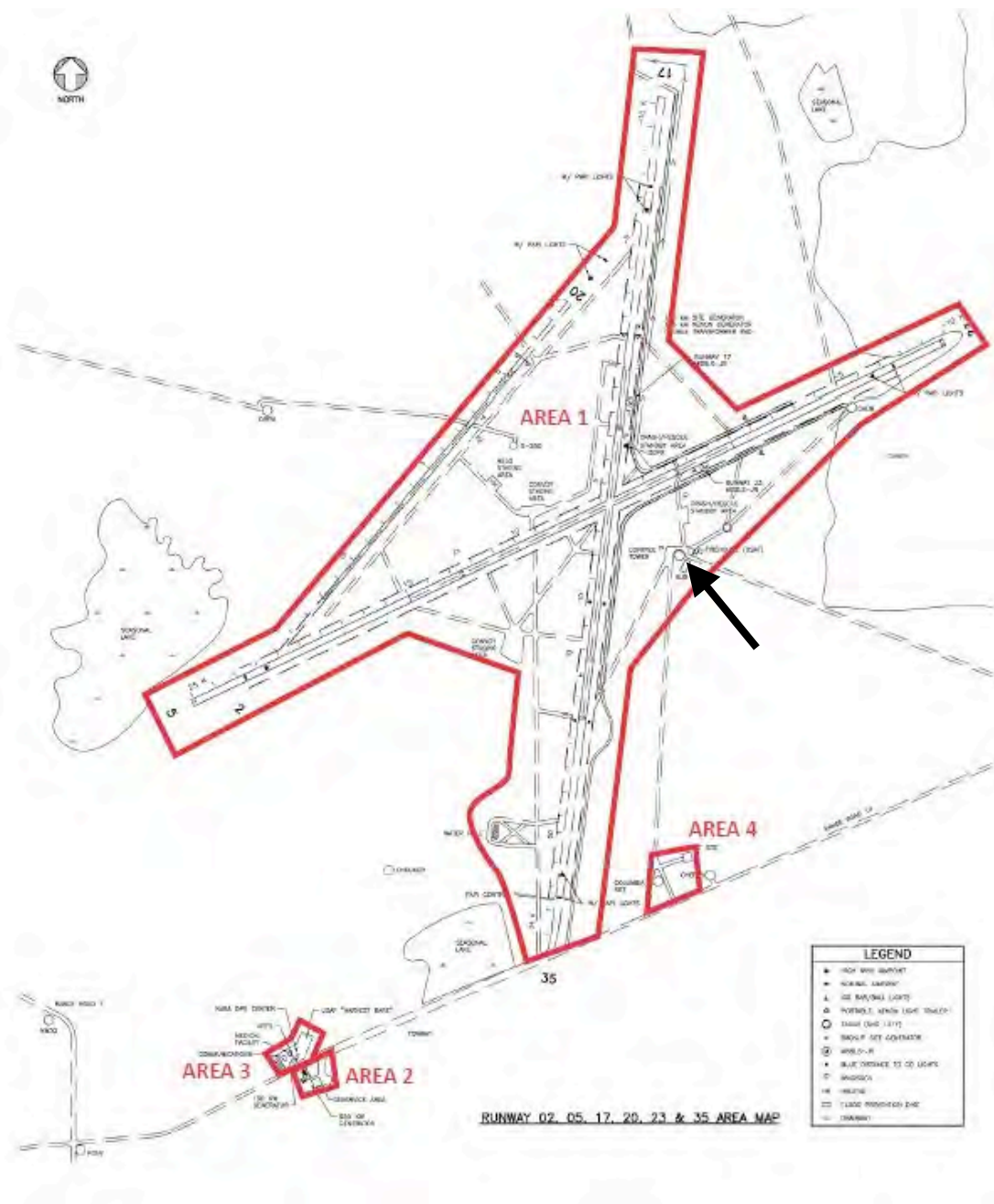


Figure 2. Map of WSSH showing location of HUB Maintenance Facility in Area 1, which delineates the NRHP boundaries of the WSSH Shuttle Landing Facility District (Base Map Source: NASA WSTF).

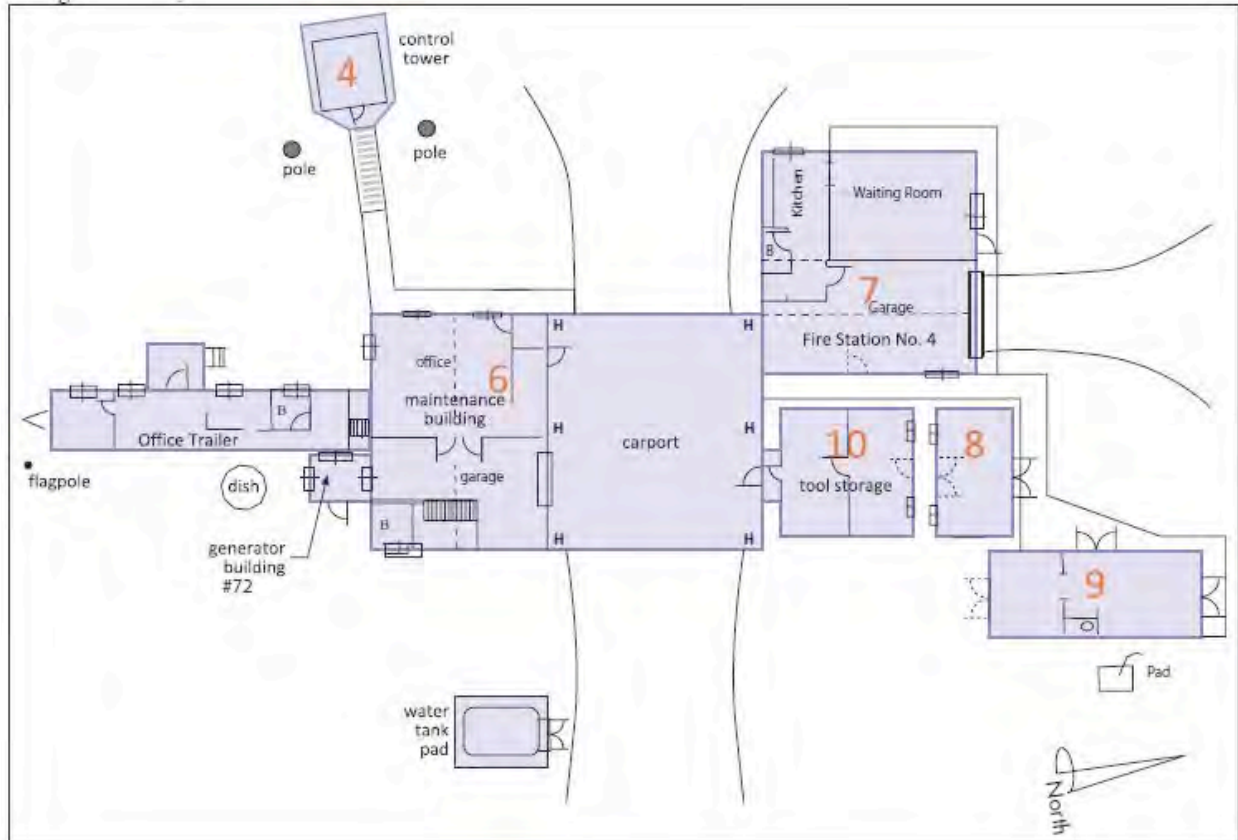


Figure 3. Map of the White Sands Space Harbor HUB complex showing the HUB Maintenance Building (#6). (Site Plan Source: NASA WSTF).



Figure 3. Aerial View of HUB Complex, looking West towards the San Andres Mountains, 2007 (Source: NASA WSTF).



Figure 4. Aerial View of HUB Complex, looking East, 2006 (Source: NASA WSTF).



Figure 5A. View of the HUB Maintenance Building, 1988, looking northwest (Source: NASA WSTF).



Figure 5B. View of the HUB Maintenance Building, 1988, looking northeast at the trailer wing (Source: NASA WSTF).



Figure 6A. View of the HUB Maintenance Building, 1988, looking north at the trailer wing (Source: NASA WSTF).



Figure 6B. View of the HUB Maintenance Building, 1988, looking northeast at the trailer wing (Source: NASA WSTF).



Figure 7A. View of the HUB Maintenance Building, 1988, looking southwest from the carport (Source: NASA WSTF).



Figure 7B. View of satellite dish located southeast of the trailer wing, looking southwest, November 2005 (Source: NASA WSTF).





Figure 8. View of the HUB Maintenance Building, 1988, looking north  
(Source: NASA WSTF).

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

WHITE SANDS SPACE HARBOR AREA 1, HAER No. NM-28-F  
HUB MAINTENANCE FACILITY  
(Space Shuttle Landing Facility Area 1, HUB Maintenance Facility)  
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David Diener, Photographer March 27-29, 2012

NM-28-F-1 CONTEXT VIEW OF SOUTH SIDE OF HUB COMPLEX LOOKING  
NORTH FROM ACCESS ROAD RUNNING PARALLEL TO EAST SIDE  
OF RUNWAY 17/35.

NM-28-F-2 CONTEXT VIEW OF EAST SIDE OF HUB COMPLEX LOOKING WEST  
FROM CRASH/RESCUE STANDBY AREA WITH SAN ANDRES  
MOUNTAIN RANGE IN BACKGROUND.

NM-28-F-3 CONTEXT VIEW OF WEST SIDE OF HUB COMPLEX LOOKING  
SOUTHEAST FROM CENTER OF RUNWAYS 17/35 AND 23/05 WITH  
SACRAMENTO MOUNTAIN RANGE IN BACKGROUND.

NM-28-F-4 VIEW OF HUB COMPLEX LOOKING EAST. THE CONTROL TOWER,  
HAER NO. NM-28-D, IS ALSO PICTURED.

NM-28-F-5 VIEW OF HUB COMPLEX LOOKING NORTHEAST. THE CONTROL  
TOWER, HAER NO. NM-28-D, IS ALSO PICTURED.

NM-28-F-6 VIEW OF HUB MAINTENANCE BUILDING LOOKING NORTHEAST  
FROM CONTROL TOWER.

NM-28-F-7 VIEW OF HUB COMPLEX LOOKING WEST, WITH SIGN.

NM-28-F-8 VIEW OF HUB COMPLEX LOOKING WEST, WITH MEASURING  
STICK. THE CONTROL TOWER, HAER NO. NM-28-D, IS ALSO  
PICTURED.

NM-28-F-9 VIEW OF HUB COMPLEX LOOKING SOUTHEAST. THE CONTROL  
TOWER, HAER NO. NM-28-D, IS ALSO PICTURED.

NM-28-F-10 VIEW OF HUB COMPLEX LOOKING SOUTH. THE CONTROL TOWER,  
HAER NO. NM-28-D, IS ALSO PICTURED.

NM-28-F-11 VIEW OF HUB COMPLEX LOOKING SOUTHEAST. THE CONTROL  
TOWER, HAER NO. NM-28-D, IS ALSO PICTURED.

NM-28-F-12 VIEW OF HUB COMPLEX LOOKING EAST.

WHITE SANDS SPACE HARBOR AREA 1, HUB MAINTENANCE FACILITY  
HAER No. NM-28-F  
INDEX TO PHOTOGRAPHS  
(Page 2)

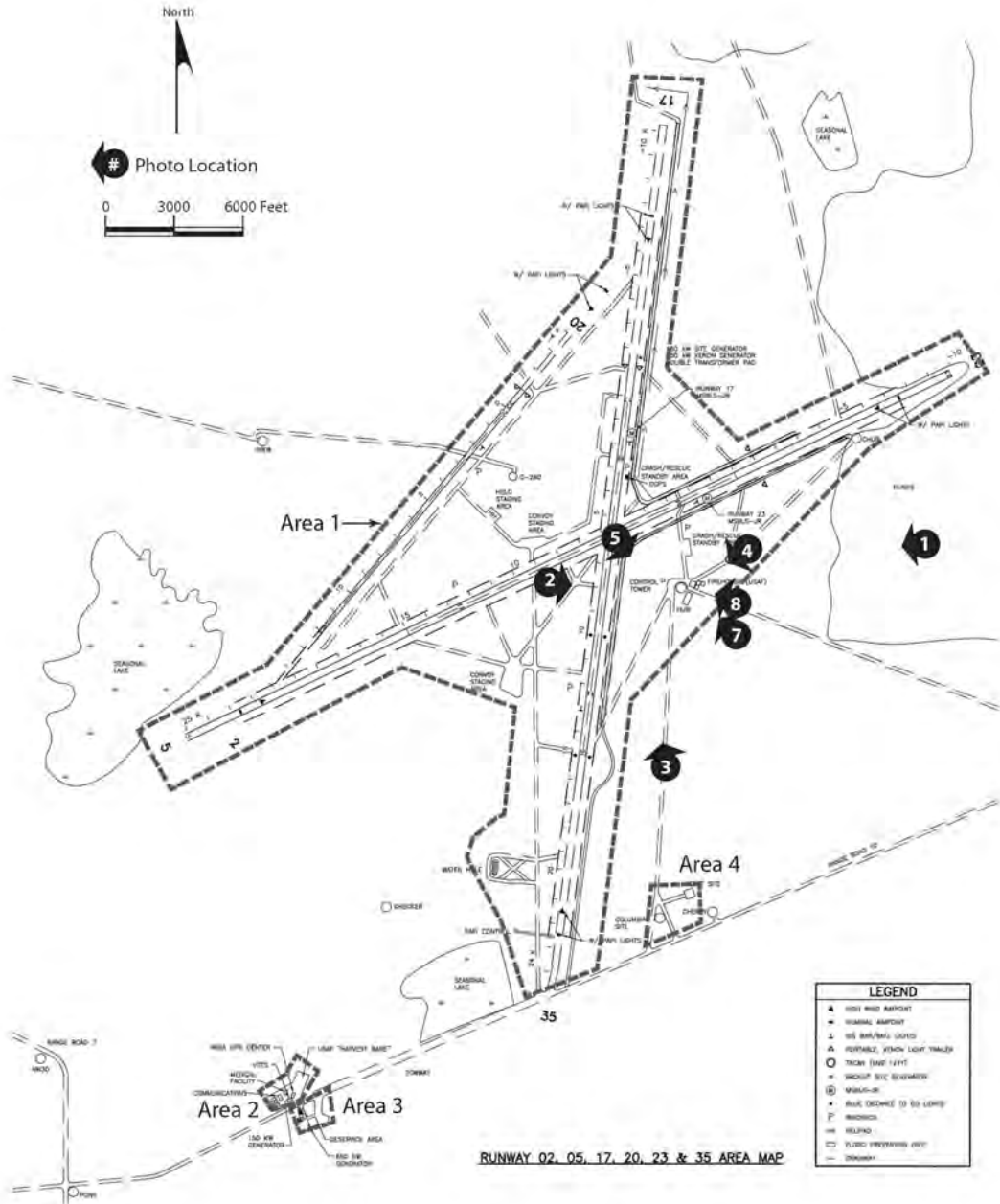
NM-28-F-13           VIEW OF HUB COMPLEX LOOKING NORTH.

NM-28-F-14           VIEW OF HUB MAINTENANCE BUILDING LOOKING NORTH AT  
TRAILER WING.

NM-28-F-15           VIEW OF HUB MAINTENANCE BUILDING, LOOKING SOUTHWEST AT  
NORTH ELEVATION FROM BENEATH CARPORT.

NM-28-F-16           VIEW OF HUB MAINTENANCE BUILDING, INTERIOR LOOKING  
SOUTH AT STORAGE LOFT IN GARAGE BAY.

WHITE SANDS SPACE HARBOR AREA 1, HUB MAINTENANCE FACILITY  
 HAER No. NM-28-F  
 INDEX TO PHOTOGRAPHS  
 (Page 3)



WHITE SANDS SPACE HARBOR AREA 1, HUB MAINTENANCE FACILITY  
HAER No. NM-28-F  
INDEX TO PHOTOGRAPHS  
(Page 4)

