NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

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NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

**United States Department of the Interior**
**National Park Service**

1642

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by Marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPA Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

## 1. Name of Property

historic name Vehicle Assembly Building - High Bay and Low Bay (VAB)
other names/site number 8BR1684

## 2. Location

street & number NASA, John F. Kennedy Space Center ___not for publication

city or town Kennedy Space Center ___vicinity

state Florida code FL county Brevard code 009 zip code 32899

## 3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this __X__ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property __X__ meets ____ does not meet the National Register criteria. I recommend that this property be considered significant __X__ nationally ____ statewide ___ locally. (____ See continuation sheet for additional comments.)

Kenneth M. Kumer, NASA Federal Preservation Officer — Nov. 19, 1999
Signature of certifying official/Title — Date

National Aeronautics and Space Administration
State of Federal agency and bureau

In my opinion, the property X meets ____ does not meet the National Register criteria.
(____ See continuation sheet for additional comments.)

Signature of certifying official/Title — 8/20/98 Date

Florida State Historic Preservation Office, Division of Historical Resources
State or Federal agency and bureau

## 4. National Park Service Certification

I hereby certify that the property is:

| | Signature of the Keeper | Date of Action |
|---|---|---|
| X entered in the National Register. ____ See continuation sheet. | Carol B. Shull | 1/21/2000 |
| ___ determined eligible for the National Register. ____ See continuation sheet. | | |
| ___ determined not eligible for the National Register. | | |
| ___ removed from the National Register. | | |
| ___ other, (explain:)_____ | | |

VAB - High Bay and Low Bay
Name of Property

Brevard, FL
County and State

## 5. Classification

**Ownership of Property**
(Check as many boxes as apply.)

__ private
__ public-local
__ public-State
X public-Federal

**Category of Property**
(Check only one box.)

X building(s)
__ district
__ site
__ structure
__ object

**Number of Resources within Property**
(Do not include previously listed resources in the count.)

| Contributing | Noncontributing | |
|---|---|---|
| 2 | 0 | buildings |
| 0 | 0 | sites |
| 0 | 0 | structures |
| 0 | 0 | objects |
| 2 | 0 | Total |

**Name of related multiple property listing**
(Enter "N/A" if property is not part of a multiple property listing.)
John F. Kennedy Space Center

**Number of contributing resources previously listed in the National Register**
1

## 6. Function or Use

**Historic Functions**
(Enter categories from instructions.)
instructions.)
TRANSPORTATION: air-related
DEFENSE: aerospace facility

**Current Functions**
(Enter categories from

TRANSPORTATION: air-related
DEFENSE: aerospace facility

## 7. Description

**Architectural Classification**
(Enter categories from instructions.)
OTHER: No Style

**Materials**
(Enter categories from instructions.)
foundation METAL
walls METAL
roofs ASPHALT
other
other

**Narrative Description**
(Describe the historic and current condition of the property on one or more continuation sheets.)

VAB - High Bay and Low Bay | Brevard, FL
Name of Property | County and State

## 8. Statement of Significance

**Applicable National Register Criteria**
(Mark "x" in one or more boxes for the criteria qualify the property for National Register Listing.)

_X_ **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

__ **B** Property is associated with the lives of persons significant in out past.

_X_ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

__ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

__ **A** owned by a religious institution or used for religious purposes.
__ **B** removed from its original locations.
__ **C** a birthplace or grave.
__ **D** a cemetery.
__ **E** a reconstructed building, object or structure.
__ **F** a commemorative property.
_X_ **G** less than 50 years of age or achieved significance within the past 50 years.

**Areas of Significance**
(Enter categories from instructions.)

OTHER: SPACE EXPLORATION ENGINEERING

**Period of Significance**
1966-1975

**Significant Dates**
1966

**Significant Person**
(Complete if Criterion B is marked above.)
N/A

**Cultural Affiliation**
N/A

**Architect/Builder**
Urbahn-Roberts-Seelye-Moran Architects & Engineers, NY, NY

**Narrative Statement of Significance**
(Explain the significance of the property on one or more continuation sheets.)

## 9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

**Previous documentation on file (NPS):**
__ preliminary determination of individual listing (36 CFR 67) has been requested
_X_ previously listed in the National Register
__ previously determined eligible by the National Register
__ designated a National Historic Landmark
__ recorded by Historic American Buildings Survey # _____
___ recorded by Historic American Engineering Record # _____

**Primary location of additional data:**
__ State Historic Preservation Office
__ Other State agency
_X_ Federal agency
__ Local government
__ University
__ Other
Name of repository:
NASA: Kennedy Space Center

VAB - High Bay and Low Bay | Brevard, FL
Name of Property | County and State

## 10. Geographical Data

**Acreage of Property** Approx. 8 acres

**UTM Reference**
(Place additional UTM references on a continuation sheet.)

| | Zone | Easting | Northing | | Zone | Easting | Northing |
|---|---|---|---|---|---|---|---|
| 1 | 17 | 534100 | 3161940 | 3 | | | |
| 2 | | | | 4 | | | |

**Verbal Boundary Description**
(Describe the boundaries of the property on a continuation sheet.)

**Boundary Justification**
(Explain why the boundaries were selected on a continuation sheet.)

## 11. Form Prepared By

name/title Daniel Delahaye and Kimberly Hinder, Architectural Historians
organization Archaeological Consultants, Inc. date August 1996
street & number P.O. Box 5103 telephone (941)925-9906
city or town Sarasota state FL zip code 34277

## Additional Documentation

Submit the following items with the completed form:
**Continuation Sheets**

**Maps**

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

**Photographs**

**Representative black and white photographs** of the property.

**Additional items**
(Check with the SHPO or FPO for any additional items.)

**Property Owner**
(Complete this item at the request of SHPO or FPO.)
name
street & number telephone
city or town state zip code

**Narrative Description**
**Vehicle Assembly Building-High Bay and Low Bay**

Year Built: 1966
Facility Name: Vehicle Assembly Building - High Bay and Low Bay
Facility Number: K6-848
Functional Name: Space Vehicle Assembly Facility (VAB/LC-39)
Apollo Era Technological Areas Supported: Saturn V Vehicle
Apollo Era Narrative Description of Facility Capabilities & Functions: Housed assembly, test, checkout, and protective storage facilities for launch vehicles and spacecraft. Assembly of Saturn V and Saturn IB vehicles was performed here, readying them for launch.
Shuttle Era Narrative Description of Facility Capabilities & Functions: Provides same type of functions for the Space Shuttle, Solid Rocket Boosters (SRBs), and the External Tank (ET) (NASA 1967:10-77-78; Anon 1994:42-43).

The Vehicle Assembly Building (VAB) is one of the world's largest buildings by volume and was considered the largest when it was built in 1966. It encloses 129,482,000 $ft^3$ of space and covers 8 acres. The exterior boasts of an American flag and Bicentennial Emblem which was added in 1976. The flag is 209 x 110 ft. The building is designed to withstand winds up to 125 mi/hr. A Utility Annex, extending from the west side of the building, was constructed in 1966 to support the functions of the VAB (Anon 1994:43-44).

The VAB High Bay is a steel-framed, metal-covered structure, 418 feet long by 513 feet wide by 524 feet high. It provides four High Bay cells for vertical assembly, checkout, and protective storage of Launch Vehicles and spacecraft. Two of the cells were outfitted for assembly and checkout of Saturn V Launch Vehicles during the Apollo program. One cell was outfitted for assembly and launch of Saturn IB Launch Vehicles, and the remaining cell was not outfitted. The outfitted cells contained five extensible platforms to provide access and service connections to the rocket stages and spacecraft. Each High Bay cell was provided with a doorway for ingress and egress of the Mobile Launcher (platform and umbilical tower) and assembled launch vehicle atop the crawler transporter. The assembly cell doors, 456 feet high by approximately 150 feet wide, are a series of electrically operated, horizontal-rolling, and vertical-lift sections. The building contained approximately 10,000 tons of air-conditioning capacity. Chilled and hot water for air-conditioning and compressed air were obtained from the adjacent Utility Annex. High-pressure gas was furnished from a remote gas facility (Butowsky 1981:51).

The VAB Low Bay is 256 feet long by 437 feet wide by 209 feet high at its center section. The Low Bay housed assembly and test facilities for various stages of the Saturn V and Saturn IB vehicles used in the Apollo effort. When the stages arrived at the Low Bay, a 175-ton capacity bridge crane was employed for moving the stages into the checkout cells. There were four active checkout cells, each with three work platforms for checking out the stages. The building configuration was designed to accommodate four additional cells, for a total of eight. The main exterior door on the south end of the Low Bay is 55 feet wide by 94 feet high (Butowsky 1981:51).

Shops and clean room facilities were provided in the Low Bay for checkout of the instrumentation for the Saturn V and Saturn IB vehicles. The Shop Area has been modified to house institutional-type shops for KSC and additional Shuttle shops--Rocket and Air-Breathing Engine Shop, Line Replaceable Unit Avionics Shop, and Line Replaceable Unit Maintenance Shop (Butowsky 1981:51).

Upon completion of checkout in the Low Bay, the stages and instrumentation units were delivered to the VAB High Bay for mating with the booster stage of the Saturn V or Saturn IB vehicle (Butowsky 1981:51).

The VAB is the largest building at KSC. It was built in 1966 for the 363 ft tall Apollo/Saturn V vehicles. However, it has been modified for the Space Shuttle. Integration and stacking of the complete Space Shuttle vehicle (Orbiter, two Solid Rocket Boosters (SRBs) and the External Tank (ET)) takes place on the Mobile Launcher Platform (MLP) in High Bays 1 or 3, facing east. External tank checkout and storage occurs in High Bays 2 and 4, facing west. The Low Bay is used for Shuttle main engine maintenance and as a holding area for Solid Rocket Booster forward assemblies. The North-South Transfer Aisle transects and connects the two Bay areas (Anon 1994:43-44).

**Narrative Statement of Significance
Vehicle Assembly Building-High Bay and Low Bay**

Summary

The VAB High and Low Bays, considered as one building, and the Utility Annex contribute to the Historic Cultural Resources of the John F. Kennedy Space Center, Florida, under the historical context Apollo Program 1961-1975, and each of its three subcontexts under property type F.2, Launch Processing Facilities. They are significant at the national level under NHRP Criterion A in the area of space exploration. The VAB is also significant under Criterion C under engineering. Because these buildings have achieved significance within the past 50 years and are of exceptional importance in the areas of space exploration and engineering, Criteria Consideration G applies.

Significance

The VAB was designed to house the Saturn rockets of the Apollo mission and was later modified to house the Space Shuttle, SRBs and ETs. Through its function as a building which houses the assembly, test, checkout, and protective storage facilities for Launch Vehicles and spacecraft, the VAB has played an integral part in the Apollo and Space Shuttle programs. Built in 1966, the VAB had to be large enough to hold the 363 ft tall Apollo/Saturn V vehicles. As a result, the VAB is one of the world's largest buildings by volume and was considered the largest when it was built. Therefore, its engineering, design and innovation are exceptionally important. The VAB has substantially retained its integrity of design, materials, workmanship, feeling, setting, location, and association which made it vital to the Apollo program. The Utility Annex is an adjacent feature constructed to house utility support for the VAB and other nearby Launch Complex 39 facilities. Consequently, it is considered contributing.

**Bibliography**
**Vehicle Assembly Building-High Bay and Low Bay**

Advisory Council on Historic Preservation
1991 Balancing Historic Preservation Needs With the Operation of Highly Technical or Scientific Facilities. Washington, D.C. February.

Anon.
1994 Facts: John F. Kennedy Space Center.

Butowsky, Dr. Harry A.
1981 Reconnaissance Survey: Man in Space. U.S. Department of the Interior, National Park Service, Washington, D.C. November.

National Aeronautics and Space Administration (NASA)
1967 Technical Facilities Catalog Volume II [NHB 8800.5 (II)]. March.

1974 Technical Facilities Catalog Volume II [NHB 8800.5A (II)]. October.

1994 Facilities Space Control Document: LC-39 Area. [GP-679]. August 19.

1995 Facility Utilization Charts, Chart F, July 1.

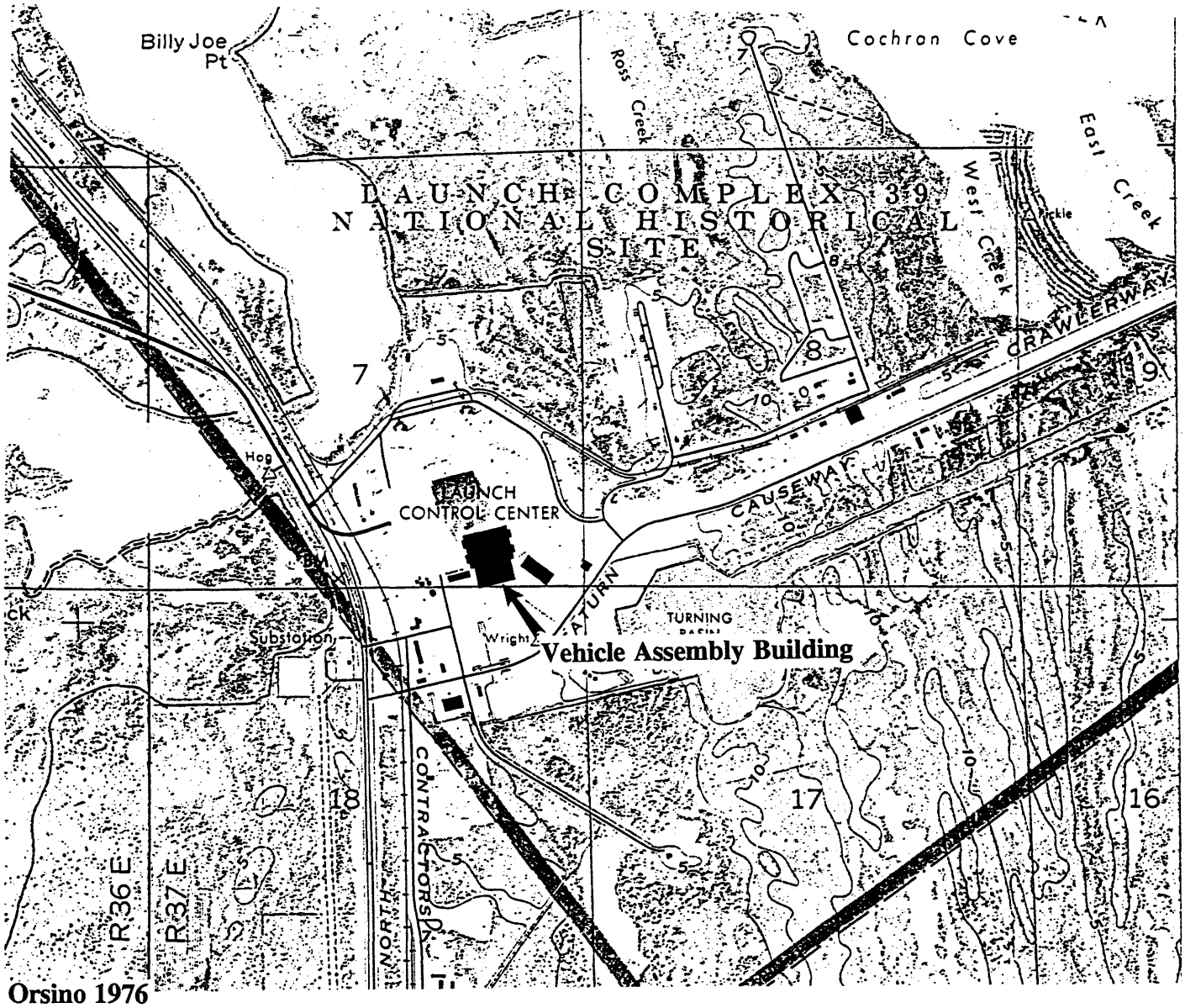
**Verbal Boundary Description**
**Vehicle Assembly Building-High Bay and Low Bay**

The boundary extends from the footprint of the VAB High and Low Bays and the Utility Annex approximately 10 feet. This does not include the elevated bridge that links the VAB to the LCC.

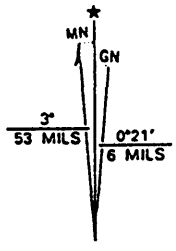
**Boundary Justification**

This includes the VAB High and Low Bays and the Utility Annex historically required to support its functions.

**USGS Map**
**Vehicle Assembly Building**

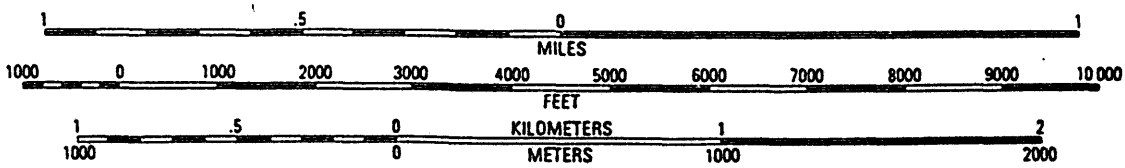



**Orsino 1976**

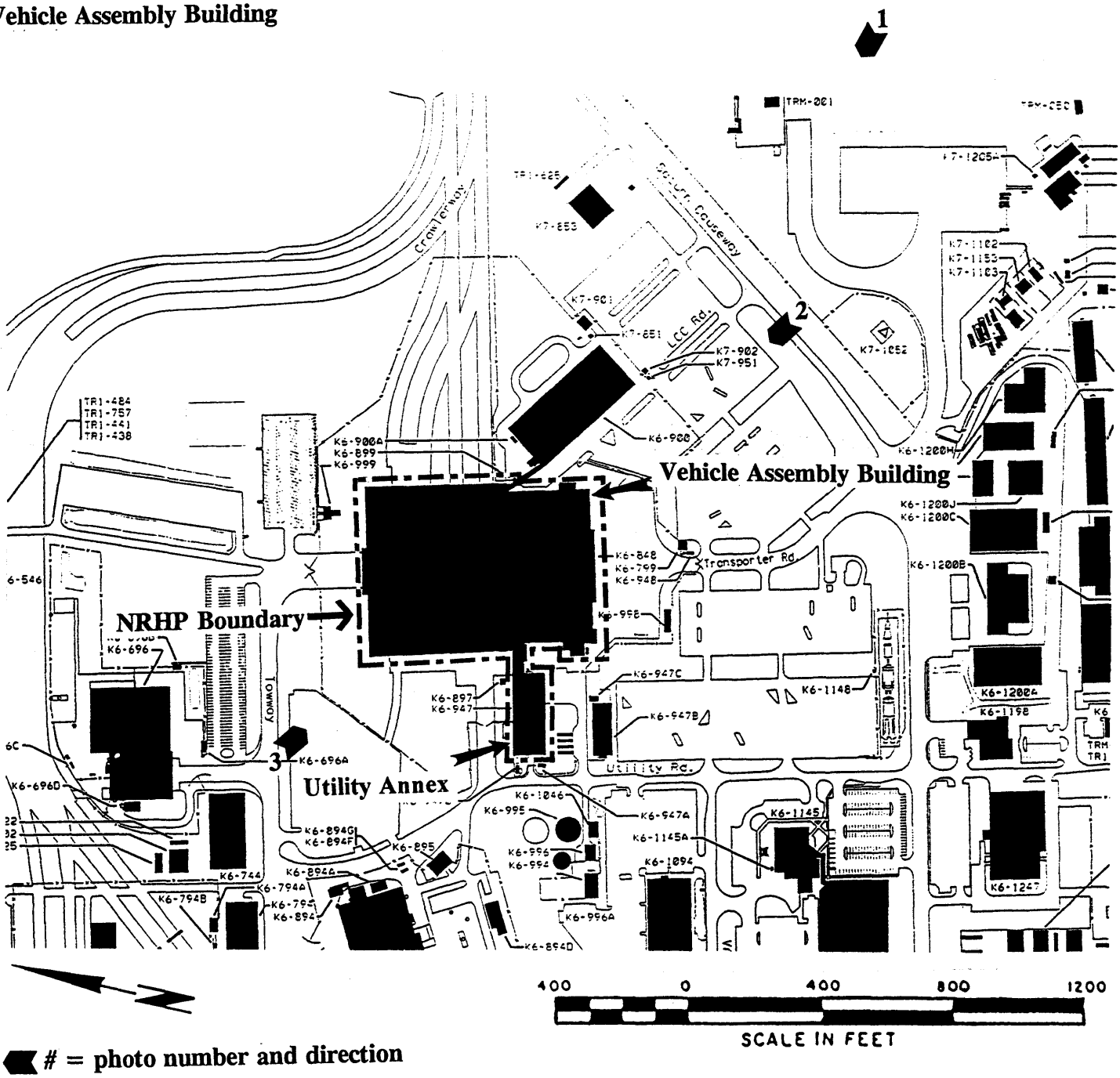



UTM GRID AND 1988 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:24 000



**Site Plan**
**Vehicle Assembly Building**




**Source: NASA Facility Utilization Charts, Chart F, July 1, 1995.**

**List of Photographs**
**Vehicle Assembly Building-High Bay and Low Bay**

1. Vehicle Assembly Building (VAB)
2. Brevard County, Florida
3. Kennedy Space Center
4. January 1965
5. Kennedy Space Center
6. VAB aerial, east and south elevations, looking northwest (KSC-66C-710)
7. 1 of 8

1. VAB
2. Brevard County, Florida
3. Daniel Delahaye & Kimberly Hinder
4. September 1996
5. Archaeological Consultants, Inc.
6. VAB, south and east elevations, looking northwest
7. 2 of 8

1. VAB
2. Brevard County, Florida
3. Daniel Delahaye & Kimberly Hinder
4. September 1996
5. Archaeological Consultants, Inc.
6. VAB, north and west elevations, looking southeast
7. 3 of 8

1. VAB
2. Brevard County, Florida
3. Kennedy Space Center
4. November 1964
5. Kennedy Space Center
6. VAB, interior, Low Bay Assembly Bay 14, showing platforms (KSC-64C-4495)
7. 4 of 8

**List of Photographs**
**Vehicle Assembly Building-High Bay and Low Bay**

The information for items 1 through 3 is the same for the following photographs:

4. February 1968
5. Kennedy Space Center
6. VAB, interior, fish-eye view from the top of the VAB (KSC-68P-52)
7. 5 of 8

4. February 1969
5. Kennedy Space Center
6. VAB, interior, the overhead crane lifts the Saturn V from the transfer aisle floor (KSC-69PC-69)
7. 6 of 8

4. March 1969
5. Kennedy Space Center
6. VAB, interior, High Bay Assembly showing stacking of the Saturn rocket (KSC-69P-175)
7. 7 of 8

4. July 1989
5. Kennedy Space Center
6. VAB, interior, mating of the Shuttle with the External Tank/Solid Rocket Boosters in the High Bay Assembly (KSC-89P-641)
7. 8 of 8