

BROOKS AIR FORCE BASE, BUILDING NO. 186  
(Brooks Air Force Base, Radiation Science Laboratory)  
7914 Dave Erwin Drive  
San Antonio  
Bexar County  
Texas

HABS TX-3521-O  
*HABS TX-3521-O*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY  
SOUTHWEST SYSTEM SUPPORT OFFICE  
National Park Service  
U.S. Department of the Interior  
PO Box 728  
Santa Fe, New Mexico

HISTORIC AMERICAN BUILDINGS SURVEY  
BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)

HABS No. TX-3521-O

Location: 7914 Dave Erwin Drive  
San Antonio  
Bexar County  
Texas

~~USGS Southton, Texas Quadrangle (7.5<sup>3</sup>)~~

~~Universal Transverse Mercator Coordinates: 14.553141.3246257~~

*Google Earth Lat/Long 29.346651, -98.453253*

Present Owner: Brooks Development Authority (BDA)

Present Occupant: Air Force Research Laboratory (AFRL)

Present Use: Administrative Offices

Significance: Building 186 (Radiation Science Laboratory) formed a vital component of the U.S. Air Force School of Aerospace Medicine (USAFSAM) complex at Brooks Air Force Base (AFB). Building 186 housed an x-ray machine, a neutron generator, and a nuclear linear accelerator. Scientists from the Radiobiology, Microbiology, Space Ecology, and Experimental Surgery branches utilized the equipment at Building 186 to perform radiation experiments, which aided the Air Force and the National Aeronautic and Space Administration's (NASA) efforts in understanding the biological effects of radiation exposure to aviation and aerospace personnel. Building 186 is no longer used for radiation experiments and currently houses administrative offices.

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date(s) of erection: 1966
2. Architect: Phelps and Simmons and Associates
3. Original and subsequent owners: Air Force
4. Builder, contractor, suppliers: Unknown

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 2)

5. Original plans and construction: Original plans are held by BDA, 8030 Challenger Drive, Brooks City-Base, San Antonio, Texas.
6. Alterations and additions: Building 186 has suffered some interior modifications due to a change from a laboratory function to an administrative one. Changes include replacement of some finishes and spatial arrangements.

**B. Historical Context:**

Building 186 was among four buildings erected during the third phase of construction (1966-73) at USAFSAM at Brooks AFB. The multiple-building complex represented the base's expanding role and mission as one of the largest aerospace medical research centers in the world. With research and development goals ranging from space to warfare, USAFSAM has played a central role in the mission of the Air Force as well as NASA. Though the USAFSAM campus was constructed in 1959, the history of Brooks AFB has involved multiple missions beginning with the training of Army pilots in World War I to reserve flight training during the Cold War.

**Establishment of Brooks Field and Early Aviation Training, 1917-31**

Established on an 873-acre tract of land in San Antonio, Texas, in November 1917, Kelly Field No. 5 grew out of the increasing wartime need for cadets and trainers. In February 1918, the airfield was officially renamed Brooks Field in honor of Cadet Sidney Johnson Brooks, Jr., a San Antonio native who died in a plane crash at Kelly Field No. 2 in 1917. The new commander of Brooks Field, Major Henry Conger Pratt, oversaw the installation's mission of preparing up to 5,000 airmen for wartime service in Europe. In addition, Brooks trained flight officers as teachers of a new British training regimen known as the Gosport System, which utilized innovative controls and speaking tubes to improve communication between instructors and cadets while in the air. The use of the Gosport system at Brooks Field convinced the War Department in October 1918, to incorporate the experimental system at Brooks Field into all Army airfields.<sup>1</sup>

In May 1919 the Observation School at Camp Ben Wise in San Antonio, which trained cadets in the use of aerial observation, moved to Brooks Field. As one of five national balloon observation schools, Brooks Field provided surveillance along the U.S.-Mexico border utilizing the 16<sup>th</sup> Airship Company and the 4<sup>th</sup> and 5<sup>th</sup> Balloon companies. The balloon and airship program at Brooks Field, despite the initial investment of manpower and expense, proved to be a short-lived experiment for the San Antonio region. Several accidents involving explosions forced the school to close in 1922.<sup>2</sup>

The decision to remove the Balloon and Airship Observation School was part of a 1920 Army Reorganization Bill which stipulated that all flight training for the country would be centered in San Antonio air fields, including Brooks Field. By June 1922, Brooks Field was classified as the only Primary Flying School in the country as a result of the consolidation of two former flying schools in California and Florida. From 1922-31, Brooks Field earned the reputation of being one of the premier aviation training sites in the

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 3)

country and was responsible for developing the young Army Air Service at a crucial period of its growth.

The system established in 1922 required all military aviators to begin their basic flying training at Brooks Field, with the graduating class moving on to the Air Service Advanced Flying School at Kelly Field. The graduating classes at Brooks later formed the basic structure of the Air Corps for decades to come. The school graduated numerous important aviators including Charles Lindbergh, Frank M. Hawks, Nathan Twining, Jimmy Doolittle, and Barney Giles. Instructors at Brooks were among the most experienced and talented aviators in the country, including Claire Chennault of the famed "Flying Tigers," Russell Maughan and Elwood Quesada.<sup>3</sup>

In addition to its celebrated graduates and instructors, Brooks Field was also the site of important advances in aviation. In April and September 1929 Brooks Field held public demonstrations of one of the earliest paratroop warfare experiments. In 1930, Colonel William C. Ocker devised a device allowing pilots to fly "blind" with the use of instruments inside the cockpit.<sup>4</sup>

#### **School of Aviation Medicine (SAM), 1926-31**

In 1926, SAM was relocated from Mitchell Field, New York to Brooks Field in an effort to improve pilot performance and to learn firsthand from pilots about the medical factors affecting flight. From 1926-31, flight surgeons at SAM generally acted as physicians first and teachers second; their main responsibility was to direct physical examinations to determine the condition of cadets for flying.

In 1931, SAM and the Primary Flying School moved to the newly created Randolph Field in San Antonio, Texas, ending Brooks Field's important aviation training mission. In the 1930s, Brooks was designated a center for observation training and housed several observation squadrons. Escalating tensions in Europe led to the establishment of an Air Corps Advanced Flying School in early 1941, which focused on training pilots in observation skills using single-engine aircraft. Because of lessons learned early in World War II, the Army Air Corps reassessed the importance of aerial observation, placing greater importance upon bombing and pursuit aircraft training. As a result, in 1943, Brooks Field began a training program for the new B-25 bomber, which greatly aided the war effort. Brooks Field became Brooks AFB in 1948 and assumed a new postwar mission as a reserve flight training center which it maintained until 1960 when all flight activities ceased.<sup>5</sup>

#### **SAM: the Space Program to Vietnam, 1959-69**

In 1959, SAM, now known as the School of Aerospace Medicine (SAM) was reassigned to Brooks AFB as part of a new Air Force mission to consolidate its aviation and space medicine efforts at one base. From 1959-69, Brooks AFB, as part of the Aerospace Medical Division (AMD), played a key role in providing NASA and the Air Force with innovative and important space medicine research, ensuring the success of the country's efforts in space exploration. Research at Brooks AFB utilized a range of laboratories and research facilities to perform experiments ranging from altitude and pressure experiments to space food nutritional studies. In addition to direct contributions to NASA's Mercury, Gemini, and

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 4)

Apollo programs, Brooks focused much of its space medicine efforts on the Air Force's military space program, the Manned Orbiting Laboratory (MOL). By the mid-1960s, researchers and physicians at Brooks AFB increasingly became involved in the Vietnam War, forcing SAM and AMD to manage dual missions of space and warfare.

### **The USAFSAM Campus**

In 1952, with its intention to relocate the crowded facilities at Randolph AFB to Brooks AFB, the Air Force required a new master plan accommodating the new "Aeromedical Center." Early in the planning stages, officers of the Air Force Headquarters in Washington, D.C., had a clear notion of the type of facility they wanted, distinguishing it from other Air Force installations: "Consideration should be given to permanence and preeminence of this facility as an academic institution . . . The quality of construction should be comparable to that of the leading medical institutions in the United States."<sup>6</sup> In designing the master plan for such an institution, officers of the Headquarters of the Air Force made an unqualified recommendation for the St. Paul, Minnesota firm of Ellerbe & Company, which already had two years experience with an earlier Brooks AFB master plan:

The Ellerbe Company, because of the design over the past twenty-five years of the varied and highly specialized diagnostic research and hospital facilities for the Mayo Clinic at Rochester, Minnesota, is considered eminently qualified to continue this project.<sup>7</sup>

Utilizing the master plan designed by the Ellerbe Company, Brooks AFB underwent three phases of construction beginning with the erection of five buildings in 1959. The second phase occurred from 1961 to 1964 and included six buildings. The third phase, occurring between 1966 and 1973, consisted of four buildings, each utilizing a separate architect. According to Lieutenant General George Schafer, who served at Brooks AFB as Commander of USAFSAM from 1967-69 and as Commander of AMD from 1971-75, these four buildings were erected in a piecemeal fashion, in response to the scientific needs of the research community at USAFSAM.<sup>8</sup> In addition to Building 110 (Environmental Science Laboratory), the third phase of construction included Building 176 (Electronics Laboratory), Building 167 (Equipment Repair Shop), and Building 186 (Radiation Science Laboratory).

### **Building 186**

Building 186 was designed by the San Antonio firm of Phelps & Simmons & Associates in 1966 and was constructed at a cost of \$600,000. As a radiation science laboratory, Building 186 was built by the Air Force to increase USAFSAM's capabilities in studying the effects of ionizing radiation. Prior to its construction, scientists at the school had performed radiation experiments using two large cobalt-60 facilities and a 250 kilovolt peak x-ray machine. The increasing complexity of nuclear technology required additional research into radiomedical problems and how they affected the Air Force. To meet this need, scientists at USAFSAM were forced to utilize off-base institutions, such as Oak Ridge National Laboratory, Tennessee; the White Sands Missile Range Nuclear Effects Laboratory, New Mexico; and the University of Chicago, Illinois.<sup>9</sup>

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 5)

The new facility at Brooks AFB (Building 186) housed an x-ray machine, a neutron generator, and a nuclear linear accelerator. Funded by NASA, the nuclear accelerator was capable of accelerating particles such as electrons, protons, deuterons, tritons, and other nuclei, giving scientists an enhanced ability to perform research on-base. Radiation research carried out at Building 186 explored the biological effects of fallout conditions, bomb testing, nuclear weapons handling as well as nuclear-powered spacecraft.<sup>10</sup> The facility included holding rooms for animals, which were used in radiation experiments.

Research conducted at Building 186 aided the Air Force and NASA's efforts in understanding the biological effects of radiation exposure to aviation and aerospace personnel. The building is no longer used for radiation studies and currently houses administrative offices.

## PART II. ARCHITECTURAL INFORMATION

### A. General Statement:

1. Architectural character: Block-like Building 186 exhibits characteristics of the International Style in common with the other buildings in the USAFSAM campus: a flat roof, the treatment of the facade as a broad, flat surface accented by narrow vertical windows, and lack of ornamentation.
2. Condition of fabric: Building 186 is in good condition.

### B. Description of Exterior:

1. Overall dimensions: Building 186 is one story with a large basement. It is irregular in plan, with the rectangular main body of the building measuring 46'-0" x 61'-0". An 8'-0" x 9'-4" service vestibule and loading dock wing extends from the rear (north) facade. Overall, the building measures 46'-0" x 70'-4".
2. Foundation: The building rests on a raised, reinforced concrete foundation. The design is distinctive in that the foundation is recessed 1'-6" from the plane of the facade, giving the building a floating appearance.
3. Walls: Exterior walls are brick veneer with 0'-6" (nominal) structural clay tile backing, and are 0'-12" thick.
4. Structural system, framing: Building 186 utilizes steel construction for the wall and roof framing.
5. Porches, stoops, balconies, bulkheads:

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 6)

- a. South facade: A cantilevered concrete platform supported by a central concrete pylon forms a porch at the main entry to Building 186. The porch has five cantilevered concrete steps and an aluminum railing.
- b. East facade: The porch on the east facade is similar to the one on the south facade except that it has a three-step metal ladder and steel pipe railing.
- c. North facade: A loading dock on the north facade is similar in design to the porches. A cantilevered aluminum canopy shelters the loading dock.

6. Chimneys: None.

7. Openings:

- a. Doorways and doors: The main entrance to the building, on the southwest facade, consists of a pair of 2'-6" flush wood doors. Secondary entrances on the northwest facade and the northeast facade utilize similar pairs of doors.
- b. Windows and shutters: Seven narrow fixed-glass windows with steel spandrel panels extend from the foundation to the roof on the south, east, and west facades.

8. Roof:

- a. Shape, covering: Building 186 has a flat roof with built-up roofing and gravel stop edge.
- b. Cornice, eaves: None.
- c. Dormers, cupolas, towers: None.

C. Description of Interior:

1. Floor plans:

- a. Basement: A partial basement is 9'-7" below the first floor and is accessible only by means of a service elevator and exterior stair. A utility tunnel enters the basement through the east wall. A 63'-0" x 40'-0" underground room, which is 19'-6" below the first floor, is to the north of the building footprint. At the time of construction, the room contained four spaces: a neutron generator room, a control area, an x-ray room, and an accelerator room. A service elevator provides primary access to this area.

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 7)

Secondary access is by means of a metal spiral stair that leads to an escape hatch at grade level. Access to the basement level is now restricted.

- b. First floor: A double-loaded corridor extends the length of the building from the main entry to the rear entry at the north end. Interior spaces consist of offices, laboratories, and support areas. There are no character-defining interior spaces.
2. Stairways: A metal spiral stair provides emergency egress from the underground room. A metal ladder on the north facade leads from the loading dock to the roof.
3. Flooring: Flooring throughout the first floor is vinyl asbestos tile, except for animal holding areas, which have cement floors, and toilet areas, which have unglazed ceramic tile flooring. All floors in the basement are rubbed concrete.
4. Walls and ceiling finishes:
  - a. Walls: The typical wall finish on the first floor is painted plaster, with glazed ceramic tile wainscots in toilet rooms, glazed structural units in animal holding areas, and clay tile in the equipment room. All interior walls in the basement are rubbed concrete.
  - b. Ceilings: Ceilings on the first floor are typically suspended acoustical tile, except for the toilet rooms, which have suspended plaster ceilings, and the mechanical room, which has exposed concrete ceilings. All areas in the basement have rubbed concrete ceilings.
5. Openings:
  - a. Doorways and doors: Typical interior doors are solid-core flush wood doors.
  - b. Windows: Building 186 has no interior windows.
6. Decorative features and trim: There are no distinctive decorative features or trim.
7. Hardware: Building 186 has standard manufactured commercial door hardware with brushed chrome finish.
8. Mechanical Equipment:
  - a. Heating, air conditioning, ventilation: Building 186 is equipped with central air conditioning and heating.
  - b. Lighting: Typical lighting fixtures are recessed fluorescent troffers.

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 8)

- c. Plumbing: Building 186 has only two toilet rooms, both located north of the main corridor on the first floor. The men's toilet room is equipped with one water closet with flush valve, one urinal and a single lavatory. The women's toilet has one water closet with flush valve and one lavatory. Other plumbing fixtures in the building include sinks in the janitor's closet and laboratories.

D. Site:

- 1. General setting and orientation: Building 186 sits just west of the Brooks City-Base golf course, separated from the rest of the USAFSAM campus by Dave Erwin Drive on the building's west side. The building has a generally north-south orientation, coinciding with that of other USAFSAM buildings including its neighbor to the north, Building 185.
- 2. Historic landscape design: Original drawings and early photographs give no indication of historic landscape design other than sidewalks on the building's left side linking it to Building 185.

PART III. SOURCES OF INFORMATION

- A. Original architectural drawings: Original drawings by Phelps & Simmons & Associates, dated December 1964, are held by the BDA, 8030 Challenger Drive, Brooks City-Base, San Antonio, Texas.
- B. Early views: Early aerial views of Building 186 are held by the Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base.
- C. Interviews: HHM Interview with Dr. George Schafer, Lieutenant General, USAF Retired, November 22, 2002.

D. NOTES

<sup>1</sup> Martha Freeman, "Appendix L: Historic Context: Brooks Air Force Base, An American Flying Field, 1917-1946." in *Brooks Air Force Base – Historic Preservation Plan* by D.E. Peter, M.B. Cliff, J. Freeman and K.L. Kane. Geo-Marine, Inc., Plano, Texas, L-3.

<sup>2</sup> Brooks Air Force Base, *The First Seventy-Five Years*, (n.p., 1992).

<sup>3</sup> Brooks Air Force Base, *Commemorative Program, Pride in the Past, Faith in the Future – Brooks Air Force Base, 1917-1992*, (San Antonio Press, 1992), p. 9.

<sup>4</sup> Freeman, "Historic Context," L-23.

BROOKS AIR FORCE BASE, BUILDING 186  
(BROOKS AIR FORCE BASE, RADIATION SCIENCE LABORATORY)  
HABS NO. TX-3521-O  
(Page 9)

<sup>5</sup> Commemorative Program, 1992.

<sup>6</sup> Department of the Air Force, HQ, Washington DC to Chief of Engineers, Department of the Army, (June 5, 1952), Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base.

<sup>7</sup> Department of the Air Force HQ to Chief of Engineers, Department of the Army, Revision of "Advance Planning FY53" Document. Various Minor Changes, (June 12, 1952), Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base.

<sup>8</sup> HHM Interview with Lieutenant General George Schafer, November 22, 2002.

<sup>9</sup> Edward B. Alcott, *Aerospace Medical Division: Twenty-Five Years of Excellence, 1961-1986*, (Brooks Air Force Base, History Office, 1986), p. 139.

<sup>10</sup> "Construction Program at the Aerospace Medical Center, Brooks AFB, Texas," 1963.

#### BIBLIOGRAPHY

1. Primary and unpublished sources:

Brooks Air Force Base, *Commemorative Program, Pride in the Past, Faith in the Future*,

*Brooks Air Force Base, 1917-1992*. San Antonio Press, 1992.

Brooks Air Force Base, *The First Seventy-Five Years*. N.p., 1992. Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base.

"Construction Program at the Aerospace Medical Center, Brooks AFB, Texas," 1963. Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City Base.

"Department of the Air Force HQ, Washington DC to Chief of Engineers, Department of the Army." June 5, 1952. Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base.

"Department of the Air Force HQ to Chief of Engineers, Department of the Army, Revision of 'Advance Planning FY53' Document. Various Minor Changes." June 12, 1952. Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base.

2. Secondary and published sources:

Freeman, Martha. "Appendix L: Historic Context: Brooks Air Force Base, An American Flying Field, 1917-46." Geo-Marine, Inc., Plano, Texas, 1995.

E. Likely sources not yet investigated: The archives at the Edward H. White II Museum of Aerospace Medicine in Hangar 9 at Brooks City-Base contain a wealth of documentation that merits further exploration.

F. Supplemental Materials:

LIST OF ACRONYMS

AFB	Air Force Base
AFRL	Air Force Research Laboratory
AMC	Aerospace Medical Center
AMD	Aerospace Medical Division
AMRL	Aerospace Medical Research Laboratory
ARL	Aeromedical Research Laboratory
BDA	Brooks Development Authority
BHF	Brooks Heritage Foundation
BRAC	Base Realignment and Closure
DOD	Department of Defense
HSD	Human Systems Division
ICBM	Intercontinental Ballistic Missile
MISS	Man in Space Soonest
MOA	Memorandum of Agreement
MOL	Manned Orbiting Laboratory
NASA	National Aeronautics and Space Administration
NHPA	National Historic Preservation Act
NPS	National Park Service
SACS	San Antonio Conservation Society
SAM	School of Aviation (Aerospace) Medicine
SHPO	State Historic Preservation Office
USAFSAM	U.S. Air Force School of Aerospace Medicine
WAC	Womens Air Corps

PART IV. PROJECT INFORMATION

A. Federal Agency:  
Air Force

311<sup>th</sup> Human Systems Wing  
Brooks City-Base  
San Antonio, Texas.

- B. Project Causing Adverse Effect: The Brooks City-Base project is a cooperative partnership between the Air Force and the non-federal community in which the physical assets of the former Brooks AFB have been transferred from the Air Force to BDA, a local municipality under Texas statute. Under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its enabling regulations 36 CFR 800, the transfer of Federal property is an adverse effect that must be mitigated via a Memorandum of Agreement (MOA) between the lead federal agency, the State Historic Preservation Officer (SHPO) and other consulting parties invited to participate in the consultation.

In consultation with the Texas SHPO, the Air Force determined that seventeen buildings at Brooks City-Base were eligible for inclusion in the National Register of Historic Places. The Air Force developed an MOA in consultation with the Texas SHPO, City of San Antonio and BDA to mitigate the adverse impact that transfer would have on the seventeen historic properties at the former Brooks AFB. The MOA was also signed by two concurring parties, the San Antonio Conservation Society (SACS) and the Brooks Heritage Foundation (BHF). The MOA stipulated multiple measures, including preparation of a Historic American Buildings Survey (HABS) Level II documentation report. The Air Force, through the 311<sup>th</sup> Human Systems Wing, hired Earth Tech, Inc. to oversee the preparation of HABS documentation. Under contract to Earth Tech, HHM Inc. of Austin, Texas, gathered historical and architectural information and prepared a historic context and the HABS forms.

The following individuals contributed to this report:

Julia Cantrell, Environmental Protection Specialist, Air Force Center for Environmental Excellence;  
Hamid Kamalpour, Cultural Resources Manager, 311<sup>th</sup> Human Systems Wing;  
Juvencio Lopez, Construction Manager, Grubb & Ellis Management Services, Inc.;  
Allison Rachleff, Architectural Historian, Earth Tech/TAMS;  
David W. Moore, Jr., Project Director, HHM Inc.;  
Thomas P. Eisenhour, RA, Project Manager and Photographer, HHM Inc;  
Justin B. Edgington, Historian, HHM Inc;  
Olivia L. Fagerberg, Architectural Historian, HHM Inc.;  
Jennifer R. Ross, Architectural Historian, HHM Inc.