NPS Form 10-900 (Rev.8/2002) OMB No. 10024-0018 (Expires 1-31-2009)

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NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instruction in National Register Bulletin *How to Complete the National Register of Historic Places Registration Form* (formerly 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 classifications, materials and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Oscar-Zero Missile Alert Facility

other names/site number Oscar-Zero MAF; O-0 MAF

2. Location

street & number State Highway 45 not for publication ___

city or town Cooperstown vicinity X

state ND code ND county Griggs code 039 zip code 58435

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 sheets for additional comments.)

Merlan E. Paaverud Jr. — 8-29-08

Signature of certifying official/Title — Date

Merlan E. Paaverud, Jr. SHPO, ND

State or Federal agency and bureau or Tribal government

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

Signature of commenting official/Title — Date

State or Federal agency and bureau or Tribal government

4. National Park Service Certification

I hereby certify that the property is:

✓ entered in the National Register
___ See continuation sheet

Signature of the Keeper: Linda McClelland — Date of Action: 10-14-08

___ determined eligible for the National Register
___ See continuation sheet

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain):

5. Classification

Ownership of Property
(check as many as apply)

___ private
_x_ public - local
___ public - state
___ 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		buildings
		sites
9		structures
1		objects
		Total

Name of related multiple property listing
(enter "N/A" if property is not part of a multiple property listing)

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(enter categories from instructions)

DEFENSE: air facility

Current Functions
(Enter categories from instructions)

VACANT

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Utilitarian

Materials
(Enter categories from instructions)

foundation Concrete
walls Metal
roof Asphalt composition shingles; metal
other

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

See Continuation Sheets

NARRATIVE DESCRIPTION

SUMMARY STATEMENT

The Oscar-Zero Missile Alert Facility (O-0 MAF) is significant as remnant of the Cold War and North Dakota's contributions towards the arms race and national security during that time. Oscar-Zero was an integral part of the Minuteman missile system built in the 1960s, one of fifteen MAFs associated with Grand Forks Air Force Base Wing VI (the last missile wing formed by the Air Force), and the control center for 10 unmanned missile launch facilities. Originally armed with Minuteman II ICBMs, it was upgraded in the early 1970s to accommodate Minuteman III missiles.

In accordance with the arms reduction treaty (START), the Grand Forks missile wing was deactivated in the late 1990s. The missiles were removed from their silos and the silos were destroyed. The MAFs were retired from service, sensitive equipment was removed, and they were scheduled for demolition. The Oscar-Zero facility is one of two missile-related sites (the other is the November-33 Launch Facility – a missile silo) obtained by the State Historical Society of North Dakota to be preserved and developed as historical interpretation sites.

A series of Historic American Engineering Record (HAER) reports were prepared for the Oscar-Zero MAF site in 2000 and 2001. Those reports provide a detailed description of the MAF components, as well as photographs and drawings; portions of those reports are included in this nomination. Full copies of the reports are available through the State Historic Society of North Dakota and the Midwest Regional Office of the National Park Service.

SETTING

The Oscar-Zero MAF is located in Griggs County in east-central North Dakota. It is southwest of Grand Forks AFB and approximately 4.5 miles north of the community of Cooperstown. Located on the west side of North Dakota State Highway 45, it sits back from the road approximately one-quarter mile. The site is essentially a flat grassy field. It is surrounded by rural farmland.

GENERAL CHARACTERISTICS AND FEATURES

The Oscar-Zero MAF is a complex of above-ground and below-ground buildings and structures, including the Launch Control Support Building, the Launch Control Center, the Launch Control Equipment Building, and the Vehicle Storage Building. The site is accessed via an asphalt driveway that extends west from the highway. A paved helipad is located on the south side of the driveway near the main complex, which is surrounded by a chain-linked fenced topped with barbed wire. A large, electrically operated gate allows for vehicle traffic inside the fenced area. A parking area is located between the Launch Control Support Building and the Vehicle Storage Building to its south. A number of radio antenna structures are situated within the fenced area. The sewage lagoon is located outside the fenced area to the west.

LAUNCH CONTROL SUPPORT BUILDING

The most obvious feature of the complex is the Launch Control Support Building. The building served as the security center for the Oscar-Zero flight and provided living accommodations for the eight-person crew assigned to the premises in three-day shifts. The staff consisted of two flight security controllers, two two-person armed security teams, a cook, and a facility manager.

The Launch Control Support Building is a one-story building with an asymmetrical L-shaped footprint. The central section of the building, from which the wings extend to the west and north, is slighting taller in profile than the wings. The southeast corner of the building projects approximately five feet from the adjacent exterior walls. The building measures 150 feet on the east/west axis and 75 feet on the north/south axis.

The building lacks architectural ornamentation and is perhaps best described stylistically as Utilitarian. It is wood-framed and sits on a concrete slab foundation. It is clad with a horizontally lapped steel siding; this siding replaced the original asbestos shingles (Transite) in the 1980s. The gabled roof is covered with asphalt shingles and is punctuated by exhaust fans, ventilators, a boiler stack, a personal hatch, and communication antennae. Several floodlights are also located on the roof.

There are several window and door openings in the building. The main door is located on the south elevation near the southeast corner of the building; additional doors are located on the east, north and south sides of the building (there are no doors on the west elevation). A variety of windows are located around the building (none on the west end); most are currently boarded over. The original, double-hung wood sash windows were replaced in the early 1990s with vinyl-clad wood windows. The most notable windows are those that wrap around the southeast corner of the building; this room served as the security office and the entrance gate and driveway could be easily seen through the bands of windows in the east and south sides of the office.

As noted, the security office occupies the southeast corner of the building and is accessed from the entry vestibule on the south elevation (west of the office). Directly north of the security office is the elevator vestibule, the elevator machine room, and the elevator to the Launch Control Center and Launch Control Equipment Building, both located beneath the Launch Control Support Building. The recreation room is located north of the elevator area. Also located in the north wing is a generator room (directly north of the recreation room) and a weight room (at the north end of the wing).

The main entry vestibule also opens into the living room/dining area, located on the north side of the west wing. The kitchen is located directly west of this space, also on the north side of the wing. A central corridor extends to the west end of the wing; four bedrooms are located on the north side (west of the kitchen) and three bedrooms are located on the south side of the wing (at the west end). Also located in this wing (all on the south side) is the bathroom, a utility room, the heating equipment room (which includes a boiler), the water treatment room (which provided access to the wells, pumps

and storage tanks), and the telephone equipment room. The bedrooms and toilet facilities were modified in the 1980s to accommodate women crew members. The ceilings in the living spaces have been altered with the addition of a dropped ceiling system and carpet was added to the living spaces.

LAUNCH CONTROL CENTER

The most important component of the MAF is the Launch Control Center (LCC), which is located approximately 50 feet beneath the Launch Control Support Building. The LCC was the room from which the unmanned missiles associated with the missile flight could be launched.

The LCC is a blast-hardened capsule with an outside diameter of 45 feet and an overall length of 71 feet. It is constructed of steel-reinforced concrete with steel-lined walls seven feet thick. Within the capsule is a rectangular room called the acoustical enclosure, which is approximately 20 feet wide and 41 feet long. This enclosure, which contains all the equipment needed to monitor and launch the missiles, also contains life support equipment and minimal accommodations for the staff on duty. It sits on a steel-framed platform over the equipment and mechanical base. The enclosure is engineered to withstand earthquakes or nuclear blasts and is suspended from the concrete shell with a shock-absorbing system. Four shock isolators hang from heavy chains at each corner of the enclosure and are designed to limit vertical movement of the enclosure. Horizontal movement is limited by sway dampers located beneath the enclosure.

The HAER report (No. ND-12-B) described the acoustical enclosure as follows:

> The walls and ceiling of the acoustical enclosure are made of hollow, perforated steel panels filled with sound absorbing material. The floor is made up of removable steel plates covered with sheet vinyl and carpet. Compartments beneath the floor contain survival equipment, a back-up generator and emergency batteries (back-up to the back-up generator). Surface-mounted florescent lighting panels centered in the ceiling illuminate the interior of the enclosure. Lining the walls of the enclosure are heavy aluminum electronic racks containing computer equipment, radio transmitters and receivers, a telephone relay system and power control panel. The enclosure is air-conditioned to evacuate heat from the electronic equipment racks, as well to maintain a comfortable climate for the crew on duty. Outdoor air can be brought in through a chemical-bacteriological-radiological filter, or, if automatic blast valves shut off the outside supply air, oxygen can be regenerated using a hand-pumped unit stored within the capsule. A chilled brine tank located at one end of the enclosure is used for emergency air conditioning. Primary and standby electrical power are provided either commercially or by a standby generator. Emergency power is supplied by a storage battery set. The acoustical enclosure is also equipped with a stainless steel latrine, a small refrigerator/microwave oven unit, and a curtained sleeping compartment.

Located within the acoustical enclosure are two desk-like consoles. Positioned in front of each console is a swiveling, high-backed operator's chair, fitted with a seat belt and shoulder harness. Both chairs are anchored on a pair of rails running several feet along the length of the enclosure. This arrangement provides the console operators with easy access to the myriad of components located at the consoles. The two consoles serve different functions. The status console allows the deputy commander to continually monitor the operational and security status of each of the ten missiles in Oscar Flight. At one end of the enclosure is the command console. It contains the radio and telephone equipment that enables the crew to communicate with other launch control facilities, base headquarters and the Strategic Air Command. At each side of each console is a small panel containing a spring-loaded, key-operated launch switch. The keys to these switches are kept in a double-padlocked steel box mounted above the deputy commander's console. The two consoles are spaced sufficiently apart to prohibit a single crewmember from activating the missiles on his or her own.

The entrance to the LCC is protected by an eight-ton blast door constructed of welded steel shells filled with concrete grout. It is designed to provide an environmental seal and withstand a nuclear blast.

The LCC is accessed via the elevator from the Launch Control Support Building. The elevator is located in a reinforced concrete room called the "tunnel junction" located between the LCC and the Launch Control Equipment Building. In addition to the elevator, there is vertical ladder in the shaft leading to the Support Building above. There is also an emergency escape hatch that can be used by the crew in the event that the elevator shaft is destroyed. The three-foot diameter tube is made of corrugated metal and it extends from the LCC to just below the ground surface at an angle that can be climbed. The tube is filled with sand to prevent its collapse; in the event of an emergency the crew would dig out the sand and climb to the top. Two large ducts provide intake and exhaust air to the LCC and the Launch Control Equipment Building. These ducts are fitted with 36-inch blast valves designed to seal off outside air in the event of a nuclear attack.

LAUNCH CONTROL EQUIPMENT BUILDING

The Launch Control Equipment Building is south of the LCC at the opposite end of the "tunnel junction." This Equipment Building's construction is essentially the same as the LCC – heavily reinforced concrete complete with shock isolators. Its purpose is to house all of the support equipment for the LCC including the environmental control system, the air conditioning unit, the power distribution equipment, a back-up generator, an air compressor, the air supply system with hydraulic blast valves (designed to seal off outside air in the event of a nuclear attack), and exhaust fans. Also located adjacent to the Equipment Building are a 3700-gallon water tank, a 14,000-gallon diesel fuel storage tank, and an emergency sewage tank. The building's equipment and supplies could theoretically allow the crew in the LCC to function for up to nine weeks in isolation.

VEHICLE STORAGE BUILDING

Located south of the Launch Control Support Building is the Vehicle Storage Building. A paved parking area is located between the two buildings.

The Vehicle Storage Building is a tall, one-story building measuring 32 x 40 feet. It is wood-framed and sits on a concrete slab. It has a side-facing gabled roof covered with standing seam metal roofing material. The building is clad with a metal siding applied vertically. Two over-sized overhead doors are located on the east elevation. The doors have an applied gridwork pattern. A chimney stack pierces the roof on the west elevation.

ASSOCIATED FEATURES

There are a number of associated features at the Oscar-Zero MAF.

ARTWORK

Perhaps one of the most interesting features is the artwork painted on the walls by the missileers at the MAF. HAER reports in 2000 and 2001 documented the artwork at the fifteen MAFs and described the following pieces of artwork at the Oscar-Zero MAF:

> "Welcome to O-0" Eagle superimposed over an American flag – located in the elevator lobby in the Launch Control Support Building (this distinguishes Oscar-Zero as one of only a few MAFs to feature artwork in the surface building); artist is listed as Zuf (?); date of painting is listed as [19]94; medium is enamel over enamel substrate on sheetrock; dimensions are 2'9" x 4'0"
>
> Viking surrounded by sunburst/snowflake logo - located on a panel over the doorway into the LCC; work is unsigned; no date indicated; medium is enamel/marker over enamel substrate on thick steel plate; dimensions are 4'9" x 4'9"
>
> Crew Roster – located on a panel beside the doorway into the LCC; names signed by various crew members that served at this site; medium is enamel and marker lettering over enamel substrate on thick steel plate; dimensions are 2'6" x 2'10"
>
> "Who Ya Gonna Call" mural with Oscar the Grouch standing next to an Air Force eagle – located on the west wall of the acoustical enclosure of the LCC; it is unsigned and undated; medium is acrylic/enamel over enameled steel acoustical panel; dimensions are 5'8" x 7'10"

COMMUNICATION RESOURCES

There are several above-ground and below-ground radio antenna structures within the fenced grounds of the Oscar-Zero MAF. These antennas are part of a complex communications network designed to maintain missile launch control and communications during and after a nuclear attack. These antennas include:

Hardened Ultra-High-Frequency Transmit and Receive Antenna – located north of the Support Building, it consists of a massive, cast-steel frustrum bolted to a thick, reinforced concrete slab covered with a conical fiberglass weather dome; its primary purposes were to provide a channel between the Oscar-Zero LCC and the Airborne LCC (an aircraft that functions as a back-up control center in the event that ground-based control centers are incapacitated) and to receive alert, launch and execution orders from SAC communication rockets and to permit communications via Air Force satellites.

Hardened High-Frequency Receive Antenna – located southwest of the Support Building, it is a below-grade structure consisting of a reinforced concrete cylinder which measures about 16 feet in diameter and 37 feet deep covered with a concrete cap; five ports, each containing a slender steel monopole antenna, are evenly spaced around the concrete cap; one antenna extended from the cylinder at all times; its purpose was to provide SAC with voice communications as a back-up to the land-line communications; this system was deactivate in 1971, although one pole antenna still extends from its port.

Hardened High-Frequency Transmit Antenna – located northwest of the Support Building; it is a below-grade cylinder topped with a concrete cap.

ICBM Super-High-Frequency Satellite Terminal – located just a few feet north of the Support Building; it consists of an above-ground pole mounted by a large dome.

HELIPAD

The helipad is located outside of the fenced area to the east on the south side of the access road. It is paved with concrete with dimensions of 50 feet by 50 feet.

SEWAGE LAGOON

The lagoon is located outside the fenced area to the west. It was used for treating waste materials produced at the MAF and is an open settling basin surrounded by an earthen berm.

OTHER FEATURES

In addition to those mentioned, there are several poles with large flood lights located within the fenced compound. The air exhaust and air intakes vents are located in the southeast corner of the compound, inside the fenced area. There are two propane storage tanks located behind (west) of the Vehicle Storage Building. There is a satellite dish for television reception located west of the Support Building.

The fence and gate are also significant features that illustrate the history of the site.

CONTRIBUTING FEATURES

The Oscar-Zero has the following features that are considered contributing features:

Buildings

Launch Control Support Building/Launch Control Center/Launch Control Equipment Building (counted as one building because they are interconnected)

Vehicle Storage Building

Structures

Four communications antennas

Two air system vents (intake and exhaust vents)

Helipad

Sewage Lagoon

Fence and gate

Objects

The collection of Missileer artwork

Oscar-Zero Missile Alert Facility
Name of Property

Griggs, North Dakota
County and State

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying 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 our 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)

Property is:

_____ A owned by a religious institution or used for religious purposes

_____ B removed from its original location

_____ 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

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

Areas of Significance
(Enter categories from instructions)

Military
Engineering

Period of Significance
1966-1998

Significant Dates
1966, 1973

Significant Person
(Complete if Criterion B is marked above)

Cultural Affiliation

Architect/Builder
Ralph M. Parsons Col, Los Angeles, CA
Morrison-Perini-Leavell Companies

9. Major Bibliographical References

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

Previous documentation on file (NPS)
__ preliminary determination of individual listing (36CFR67) has been requested
__ previously listed in the National Register
__ previously determined eligible by the National Register
__ designated a National Historic Landmark
__ recorded by Historic American Buildings Survey #_____
__x__ recorded by Historic American Engineering Record # ND-12

Primary Location of Additional Data
__x__ State Historic Preservation Office
__ Other State agency
__ Federal agency
__ Local government
__ University
__ Other
Name of repository: _____

NARRATIVE STATEMENT OF SIGNIFICANCE

Introduction

The Oscar-Zero Missile Alert Facility is significant in its association with the Minuteman missile system and North Dakota's contributions to the Cold War. It is one of fifteen MAFs associated with Wing VI administered by the Grand Forks AFB; Wing VI was the last cluster of missile sites built by the Air Force. Oscar-Zero represents the conclusive step in design and construction of the Minuteman missile system's architecture and technology. Originally armed with Minuteman II missiles, the facility was upgraded to Minuteman III missiles in the early 1970s.

The Oscar-Zero MAF is being nominated under Criteria A and C with significance in the areas of Military and Engineering. Its period of significance is from 1966 (when construction was completed) to 1998, when the 321st Missile Group was deactivated at Grand Forks AFB and the crews were removed from the facilities. It meets Criterion Consideration G for achieving significance within the past 50 years. It should be considered significant on the national level for its contributions to national security.

This nomination has several contributing features including two buildings - the Launch Control Support Building/Launch Control Center/Launch Control Equipment Building [counted as one because they are interconnected] (contributing) and the Vehicle Storage Building (contributing) and nine structures - the four antennas (contributing), the two air supply vents (contributing), the helipad (contributing), the sewage lagoon (contributing), and the security fence and gate (contributing). Also considered a contributing object is the artwork inside the launch control center and the launch control support building.

The Cold War and the Arms Race

World War II changed the world. Following the war the world shifted, ideologically and geopolitically, from a paradigm of isolationist countries to a world of West vs. East, anti-Communists against Communists, those nations aligned with the United States confronting those assembled under Soviet leadership, and what became known as the "Cold War" between power blocs.[1]

The term "cold war" was coined by George Orwell in 1945, when he referred to a world living in the shadow of a nuclear war as a "cold war." The term was popularized by Walter Lippman in his book,

[1] Maurice Matloff, ed., American Military History (Conshohocken, PA: Combined Books, Inc., 1996), vol. 2, 1902-1996, by B.C. Mossman, 196.

The Cold War, in 1947. The term came to define the political, social and economic history of the last half of the twentieth century.[2]

It is difficult to say exactly when the Cold War began. There were no surprise attacks, no declarations of war, no severing of diplomatic ties, but a growing sense of insecurity and a deepening distrust, in part based on patterns established before the end of World War II, resulted in efforts by each front to ensure their own postwar security.

In early 1946, Winston Churchill warned that the USSR was lowering an "iron curtain" across Europe; already eastern Germany, Poland, Hungary, Rumania, Bulgaria, Yugoslavia, and Albania had been drawn in. The Soviets also had a foothold in Iran, and in Asia they insisted on full control over northern Korea and were encouraging Chinese Communists to spread their control throughout China. Whether in an effort to promote Communist revolution or in search of national security, under Stalin's leadership, the USSR's strategy was one of expansion.[3]

The United States, on the other hand, adopted a policy of containment with hopes of blocking any further extension of Communist influence. It focused its efforts in Europe even while it implemented its postwar demobilization and troop reduction plan. At the end of World War II, America had more than eight million troops in 89 divisions; by 1950 the number of troops was reduced to 591,000 in ten divisions despite the worsening trend in international events.[4]

General George C. Marshall was appointed Secretary of State in January 1947 and under President Truman's directions, began constructing a strategy that would allow the US to "seize both the geopolitical and the moral initiative of the emerging Cold War."[5] Marshall devised a four-year European Recovery Program and when it was introduced in June 1947, it immediately became known as the "Marshall Plan."

In September 1947, Stalin organized the "Cominform" – a committee to fight the Marshall Plan as "an instrument of American imperialism."[6] In February 1948, the USSR placed a Communist government in power in Czechoslovakia and in June they established a blockade in Berlin. These events persuaded the US Congress to quickly fund the Marshall Plan and led to the Treaty of Brussels,

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[2] Mead & Hunt, Inc. *The Missile Plains: Frontline of America's Cold War* (Omaha, NE: Midwest Regional Office of the National Park Service, 2003), 1.

[3] Matloff, 194.

[4] Matloff, 198.

[5] John Lewis Gaddis, The Cold War A New History (New York. The Penguin Press, 2005), 34.

[6] Matloff, 196.

which established a military alliance between Belgium, the Netherlands, Luxembourg, France and Great Britain. This treaty was soon followed by the creation of the North Atlantic Treaty Organization (NATO) in April 1949, which included the five European countries from the Brussels treaty and the US, Canada, Portugal, Italy, Norway, Denmark, and Iceland (Greece and Turkey joined NATO in 1952). Following the creation of NATO, the USSR lifted the blockade in Berlin in May 1949.

Tensions were growing and the Cold War was about to heat up. During the summer of 1949, a surprise explosion over Siberia announced the Soviet possession of an atomic weapon. By the end of 1949, the civil war in China had ended in favor of the Communists and by early 1950, the USSR and Communist China had negotiated a treaty of mutual assistance.[7]

The loss of the nuclear monopoly spurred the US to a review of its political and strategic position. Following World War II, there had been a complete reorganization of the national security system. The need for a unified control at the national level resulted in the National Security Act of 1947, which provided for the National Security Council and the National Military Establishment headed by the Secretary of Defense. The reorganization allowed each military service to retain much of its former autonomy administered by separate departments, but the Air Force was created as a separate service equal with the Army and Navy. The Air Force was given jurisdiction over strategic air warfare, air transport, and combat air support of the Army.[8] The review in 1950 led to recommendations for further revisions, including a large expansion of the American military, as well as expanded diplomatic and economic efforts to meet the changing world situation.

Before any changes could be made, however, the Cold War erupted into open hostilities in June 1950 when the North Korea People's Army invaded the Republic of Korea (south Korea). North Korea was, of course, backed by the Communists; the Republic of Korea was supported by the US and its allies. The conflict continued until July 1953 when a military armistice agreement was signed. Although it ended in a virtual stalemate, the conflict resulted in an emergence of Communist China as a great power and a strengthening of NATO alliance for the Western bloc.

The shooting and killing stopped, but the tension continued. It had become clear to the US that if they were to continue their policy of containment they would have to change their military strategy. Gone were the days of mobilizing only under the threat of conflict. Secretary of State John Foster Dulles, under the Eisenhower administration, sought to raise the strategic initiative to a higher level and in doing so, developed a doctrine, known as "massive retaliation" that relied heavily on American nuclear superiority.

Since the end of WWII, both the US and the USSR had been working on new weapons. The Soviets had developed a strategic bomber, the Tu-4 Bull, which was a direct copy of the American B-29

[7] Matloff, 195-201.

[8] Matloff, 190.

Superfortress. By 1948, it was estimated that they had approximately 200, with as many as 1000 expected within a year. With the development of their nuclear bomb, the Soviets now had the means to deliver a nuclear attack.[9]

The US had continued to build atomic bombs and by 1950 had nearly 300 stockpiled around the country, in Canada, and in Morocco and Spain. By the end of 1952, the number of atomic bombs stood at 832. The Air Force maintained 250 nuclear-capable B-29 and B-36 aircraft at that time and had begun to install a radar network around the country to defend against possible Soviet attack.[10]

In 1950, Truman ordered the development of the hydrogen bomb and in 1952, the US successfully tested its first thermonuclear device. This technological advancement placed the US in the lead of the arms race.

The lead was short-lived, however, as the USSR exploded their first thermonuclear bomb in August 1953. Under the USSR's new leader, Nikita Khrushchev (Stalin died in March 1953), the Soviet Union moved ahead in the arms race and in November 1955, they tested their first air-dropped thermonuclear bomb. This was of particular concern because they already had long-range bombers capable of reaching American targets. In August 1957, the USSR successfully launched the world's first intercontinental ballistic missile (ICBM) and in October, they launched Sputnik, the world's first satellite. This development was shocking not only for its scientific importance, but because of the implications for world security. It was logical that the next step was to arm the missiles with nuclear warheads.[11]

By the end of 1953, the US had 1161 atomic bombs and 1000 airplanes to carry them, but they had no operational long-range missiles. The US missile program had its roots in WWII when both the Army Service Forces and the Army Air Force (the predecessor to the Air Force) began developing missiles for use both defensively and as components of the strategic nuclear deterrent.

The Army developed the Nike antiaircraft missile system. The initial model, the Nike Ajax, a liquid-fueled missile 21-feet in length, had a range of 30 miles. The first successful tests were in 1945, but the first battery wasn't deployed until 1954. By 1958, there were 200 Nike missile sites in the country. In 1958, the Army introduced the Nike Hercules missile. It was 41-feet in length with a range of 75 miles and an operational ceiling to 150,000 feet. It was the first antiaircraft missile to be armed with a nuclear warhead and it was eventually deployed at 137 sites.[12]

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[9] Clayton B. Fraser, Historic American Engineering Record (HAER No. ND-12), *Grand Forks Air Force Base, Missile Alert Facility Oscar-Zero* (Omaha, NE: Midwest Regional Office of the National Park Service, 2000), 9.

[10] Fraser, 10.

[11] Gaddis, 68.

[12] John C. Lonnquest and David F. Winkler, To Defend and Deter: The Legacy of the United States Cold War Missile Program (Rock Island, IL: Defense Publishing Service, 1996), 3.

The Air Force began work in 1945 on the Snark missile system and in 1946 on the Navaho missile system. Both were winged, air-breathing missiles that were guided throughout their flight. The Snark was 67-feet long with a wingspan of 43 feet. It could carry an atomic warhead for 5000 miles at a speed of 600 miles per hour. The Navaho, designed to have the same range and payload as the Snark, could travel at supersonic speed. It was 70-feet in length and had a cruising speed of 2150 miles per hour. Both missiles were plagued with guidance and control problems and the Navaho program was cancelled in 1958. The Snark was deployed at a single squadron in Maine in February 1961 and deactivated less than six months later.[13]

The ICBM Missile Program

The Intercontinental Ballistic Missile (ICBM) had its roots in the 1945 Air Force program to develop a ballistic missile. In contrast with the Snark and Navaho missiles, the ICBM was bullet-shaped and had an internal oxygen supply. It was called a ballistic missile because "once the warhead reached the apogee of its flight path, it followed a ballistic trajectory to its target."[14] Initially the ICBM's development languished in favor of the Snark and Navaho, in part because it was thought that they would be easier to build, and in part, because it was thought that the ICBM was not technologically feasible.

In April 1946, the Air Force awarded a contract to Consolidated Vultee Aircraft Corporation (commonly called Convair) to evaluate a ballistic missile. Although the contract was cancelled in June 1947, Convair was allowed to build and test three missiles (in late 1948 and 1949); the tests confirmed the practicality of the system but not enough to dissuade the Air Force from canceling the project. The Air Force renewed its support in January 1951 and Convair was again employed to develop a ballistic missile. The new design, called the Atlas, was submitted in July 1951. Full-scale development began immediately with the hopes of having the Atlas operational by 1960. Testing on the Atlas began in June 1957 and after a number of modifications, the Atlas was first deployed in September 1959 as the country's first ICBM. Several additional modifications followed; there were six generations (A-F) in all. There were twelve Atlas squadrons; ten were located in the center of the country, one in upstate New York, and one in eastern Washington. The Atlas missile was large – 82.5 feet long and 10 feet in diameter; it weighed 267,136 pounds (when fueled). Its range was between 6400 and 9000 miles. The Atlas saw only brief service and was taken off operational status in 1965.[15]

The Titan program began in January 1955 as a back-up to the Atlas missile system. It was a bigger missile with a longer range and bigger payload. The Titan I was operational from 1962 to 1965, but

[13] Lonnquest, 24-25.

[14] Lonnquest, 3.

[15] Lonnquest, 209-215.

the Titan II, developed with a better fuel system, was in operation from 1963 to 1987. The Titan was the first two-stage ICBM in the country's arsenal of missiles. The Titan I was 98 feet long and 10 feet in diameter; the Titan II was 108 feet long and 10 feet in diameter. The Titan I could be equipped with one warhead with a 4-megaton yield, while the Titan II had one warhead with a 9-megaton yield. The range for the Titan I was 6300 miles, the range for the Titan II was 9000 miles. Initially, there were four Titan squadrons; this number increased to twelve with an even split between Titan I and Titan II missiles. Titan I missiles were located in Colorado, Idaho, California, Washington and South Dakota. Titan II missiles were located in Arizona, Kansas and Arkansas.[16]

The next generation of ICBM missiles was developed to be more cost effective, smaller and better suited to mass production, as well as powered by solid fuel rather than liquid-fueled like the Atlas and Titan missiles. The push for improved technology was driven by the desire to close the perceived "missile gap" between the US and USSR and surpass the Soviet's missile technology. Although later records disproved its existence (the US actually possessed greater nuclear strike capabilities), the "missile gap" was an important political issue in the late 1950s and early 1960s, one that resulted in improved funding for this new generation of missiles.

The Minuteman missile grew out of this effort. It was designed and named by Lt. Colonel Edward Hall in 1957. The Air Force accepted Hall's design – and retained the name Minuteman – in March 1958 and began to make plans to deploy 100 missiles by 1964 and another 400 by 1965. Budget problems threatened to delay the missile's development, but after successful arguments for the program, the Air Force was able to move forward with the project. In January 1959, an operational schedule was established and the first flight tests were to take place in December 1960 with the system in place by 1963.[17]

The Air Force Ballistic Missile Division (BMD) successfully launched a tethered Minuteman I missile on September 15, 1959. This test demonstrated that the missile could be launched directly from an underground silo, prompting the Air Force to fast-track the program in hopes of having the first operational Minuteman I missile wing in place by 1962. The production of the missiles was approved in March 1960 and construction on the operational facility at Malmstrom Air Force Base in Montana began in March 1961. The missile wing was to consist of three squadrons with fifty missiles each for a total of 150 missiles. The first ten missiles were on operational alert by October 1962 and by 1964 a missile force of 1000 missiles was planned. By June 1965 the Air Force was on its way to meeting this goal with an operational force of 800 Minuteman I missiles.[18]

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[16] Lonnquest, 227-235.

[17] Mead & Hunt, 26-27.

[18] Mead & Hunt, 27-28.

The Minuteman missile was designed as a three-stage solid propellant missile that could travel more than 5000 miles to reach its target. The missile went through two major modifications, which greatly enhanced its capabilities. The first Minuteman II missiles were deployed in 1966 and the first Minuteman III missiles in 1971. Once the system was fully operational, the force remained at 1000 missiles for most of the Cold War.

The Minuteman I missile was deployed in two variants, Minuteman I/A and Minuteman I/B. The I/A missile measured 53.8 feel, while the I/B measured 55.11 feet. Both weighed 65,000 pounds and traveled at speeds exceeding 15,000 miles per hour. The I/A had a range of only 4300 miles, far shorter than expected 5000 miles, so the Air Force developed the I/B with a range of 6300 miles. Both missiles featured an inertial guidance system designed to deliver a single warhead to a preprogrammed target. The I/A missile supported one warhead with a one megaton yield; the I/B's warhead had a 1.2 megaton yield.[19]

Research and development into the Minuteman II missiles was underway by the time the Air Force began deploying the Minuteman I missiles. The new missile was created to improve the missile guidance systems, payload capacity, and anti-missile defenses. The Minuteman II's range improved to 7000 miles and it could carry a warhead with a 1.2 megaton yield. It was larger than the Minuteman I missile; its length was 57.7 feet and it weighed 73,000 pounds. The first test flight occurred in September 1964 and by May 1966 the first Minuteman II squadron was on operational alert. By April 1967, the force included 200 Minuteman II missiles (in addition to 800 Minuteman I missiles). By May 1969, an additional 300 Minuteman II missiles had replaced 300 Minuteman I missiles).[20]

The last of the series, the Minuteman III, began development in December 1964. It represented a change in technology and a change in the country's strategic planning. Physically, the Minuteman III was even larger than the others – it was 59.9 feet long and weighed 78,000 pounds. Improved motors and fueling increased its range to over 8000 miles and allowed for a larger payload. The missile was the first to be outfitted with MIRVs that enabled a single missile to carry multiple warheads, each programmed to attack a different target. An improved guidance system also improved its accuracy, said to be within 800 feet. In February 1968, testing was completed and by January 1971, the first squadron of Minuteman IIIs was installed at Minot AFB in North Dakota. With the continued modernization, the Minuteman I missiles were replaced with Minuteman III missiles; by July 1975, there were 450 Minuteman II missiles and 550 Minuteman III missiles.[21]

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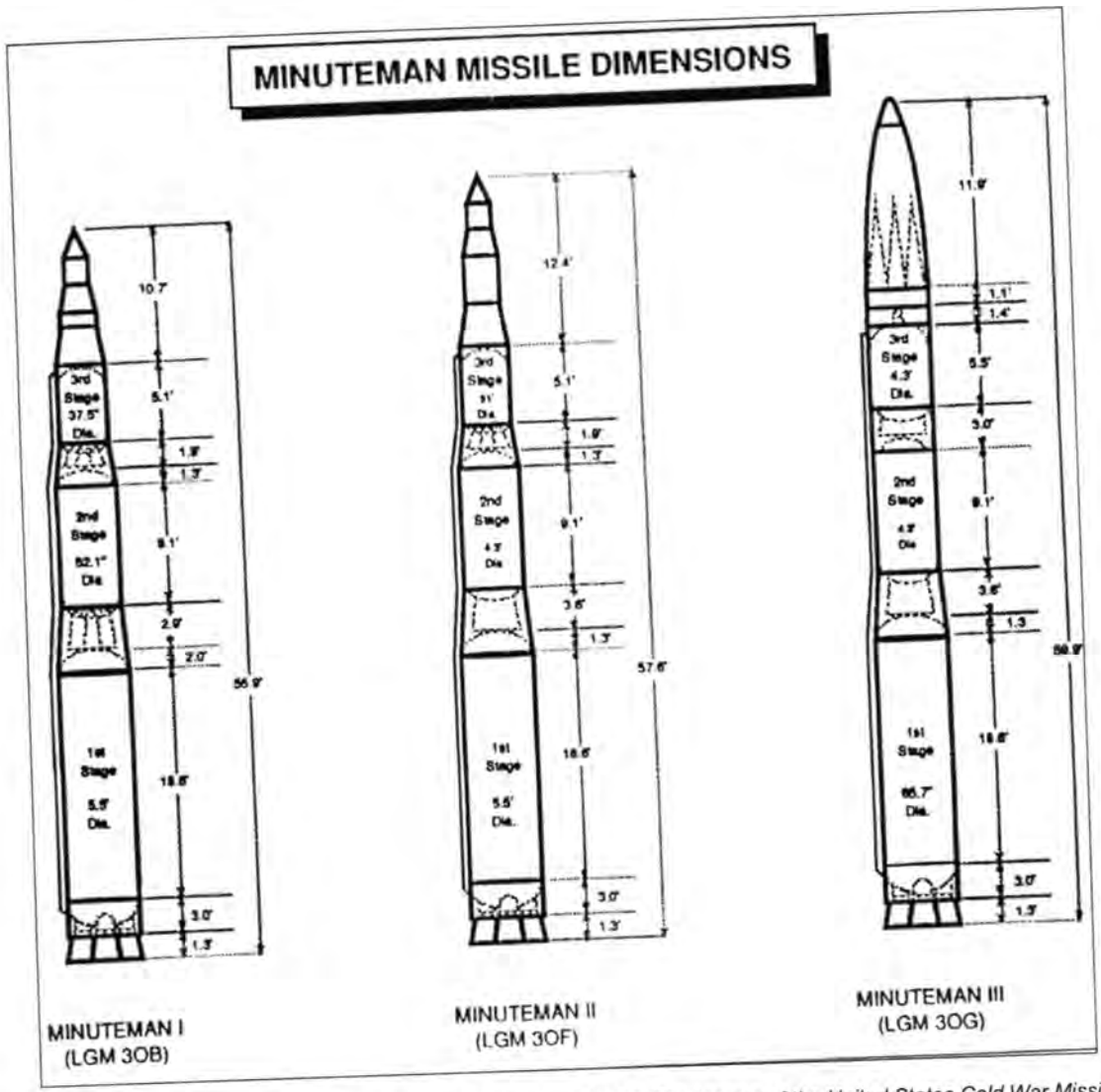
[19] Lonnquest, 241-243.

[20] Lonnquest, 246-247.

[21] Lonnquest, 247.



The evolution of the Minuteman missile [drawing from *To Defend and Deter: The Legacy of the United States Cold War Missile Program*]

The Minuteman deployments were organized into administrative units called wings. Each wing had three or four squadrons. The squadrons, in turn, were further divided into five units called flights. Each flight consisted of a staffed command post called a Launch Control Facility (LCF) or Missile Alert Facility (MAF) and ten unmanned missile silo Launch Facilities (LF). There were a total of six missile wings, one each at Malmstrom AFB in Montana, Ellsworth AFB in South Dakota, Minot AFB in North Dakota, Whiteman AFB in Missouri, F.E. Warren AFB in Wyoming (of which some of the LF are located in Colorado and Nebraska), and the final installment at Grand Forks AFB in North Dakota.

The flights administered by each squadron were designated in alphanumeric order. For example, the 446th Squadron had Flights Alpha through Echo and the 447th Squadron's flights were Foxtrot through Juliet. Within each flight, the LCF or MAF was designated with the numeral 0 (zero) and the ten LFs were numbered sequentially in a system that generally corresponded with the geographic layout. The LCF or MAF typically occupied a central position with the LFs arranged around it. The LFs were separated from each other by several miles to minimize damage from enemy attack.[22]

The LFs contained three elements. The first was the launch tube made of prefabricated steel plate; it was approximately 12 feet in diameter and approximately 62 feet long. The lower 52 feet of the tube was surrounded by 14 inches of heavily reinforced concrete. The missile rested inside the tube, suspended by a pulley system affixed to a series of shock absorbers mounted on the silo floor. The silo was covered with a reinforced concrete blast door, hardened to withstand a direct hit from an enemy warhead. The second element, was the cylindrical, two-level equipment room that surrounded the upper third of the launch tube. Also built of heavily reinforced concrete with a steel liner, this room housed generators, surge arresters to protect the electronic equipment from electromagnetic pulses, gas generators to open the silo's 80-ton door, guidance equipment, and communications equipment to connect the LF to the LCF or MAF. The final element was an adjacent launch facility support building. The design of this building changed over time. With the first LFs, it was constructed as a subterranean structure with its roof at ground level (facilities at Wings I and II). The second version (at Wings III, IV, and V) had only a corner of the building exposed at ground level. The support buildings constructed at the Wing VI facilities were encased in heavily reinforced concrete and buried beneath the ground. The purpose of this building was to house the heating and cooling equipment that served the LF and the generators that served as a back-up power supply.[23]

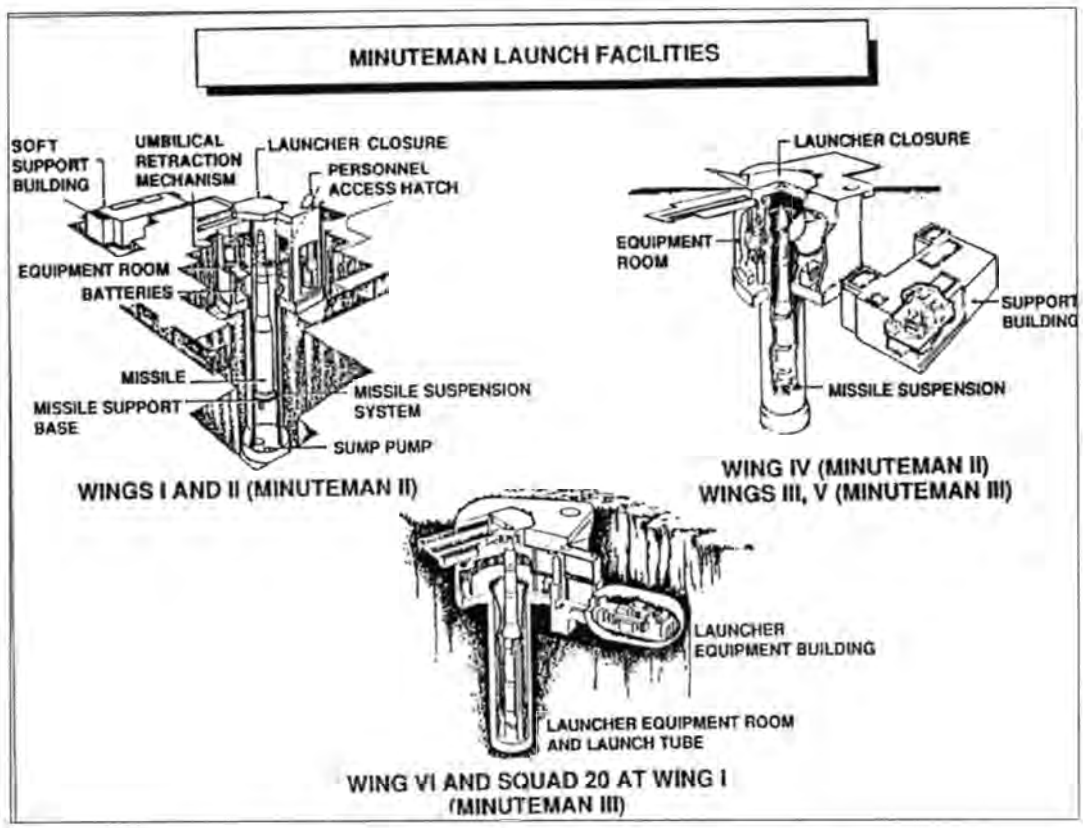
The LFs were linked to the LCFs or MAFs by means of underground cables and airway communication networks.[24] The LCFs or MAFs, the central command post for each flight, consisted of above-ground and below-ground buildings and structures. The design varied between the earliest installations and the later installations, but each included a Launch Control Center (LCC), a Launch Control Equipment Building, a Launch Control Support Building, and various antennas. At Wings I and II, only the LCC was buried beneath the ground; the equipment building was built an above-ground facility with this early design. With the installation of Wings III, IV and V, the Launch Control Equipment Building was moved to a reinforced building below ground and adjacent to the LCC. The design changed slightly with the installation at Wing VI – both the LCC and the equipment building

[22] Fraser, 4.

[23] Lonnquest, 254-255.

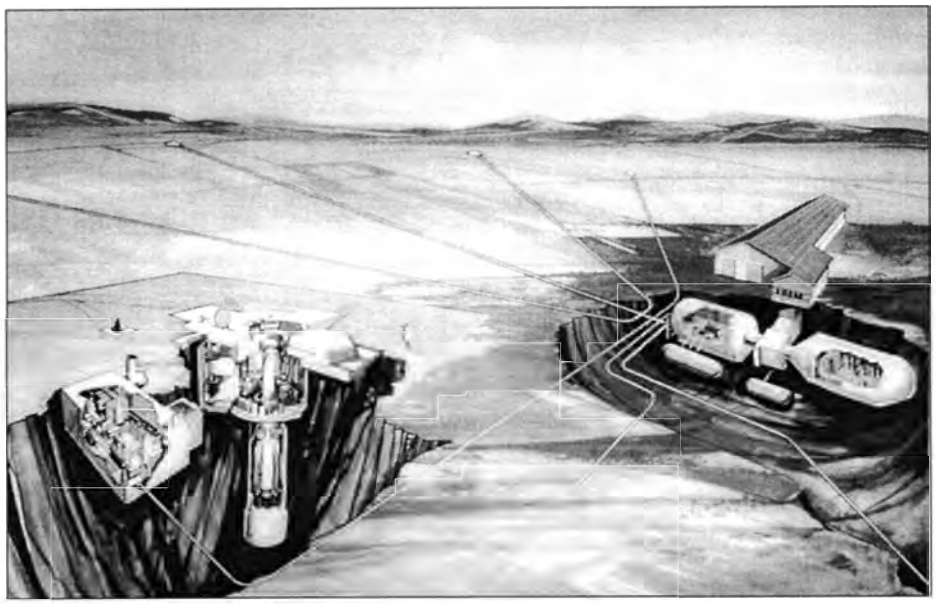
[24] Fraser, 22.

were below ground, but the design of the equipment building more closely resembled the shape of the LCC, creating what became known as the "dumbbell" design.[25] The above-ground support building housed a security office, a living/dining room, a kitchen, bedrooms, toilet facilities, a recreation room, a weight room, and various equipment rooms, including elevator equipment, communications equipment, water system equipment, and heating and air system equipment.

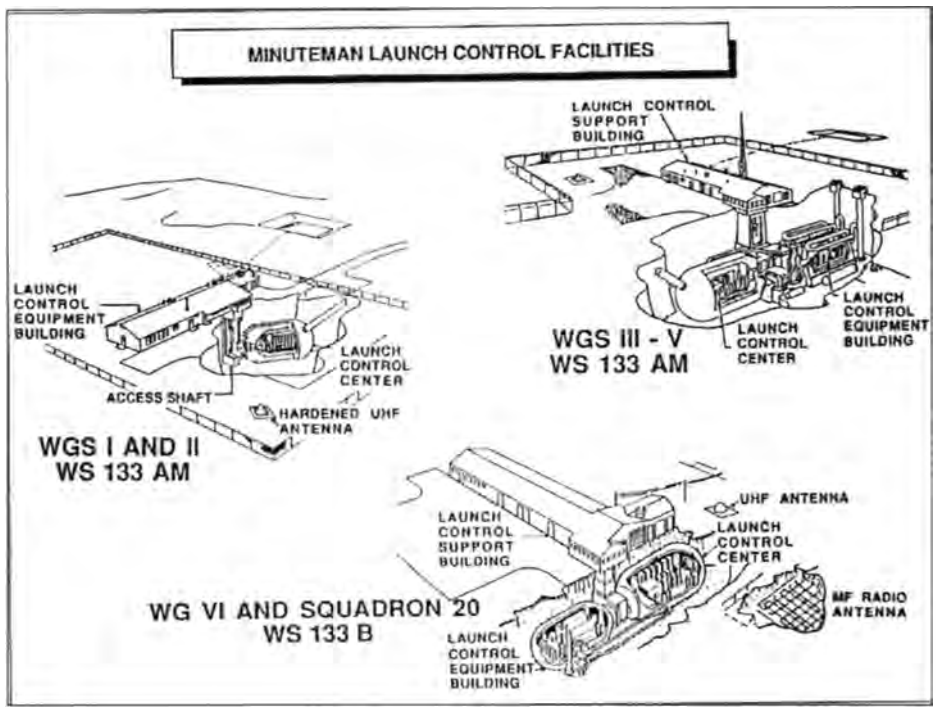


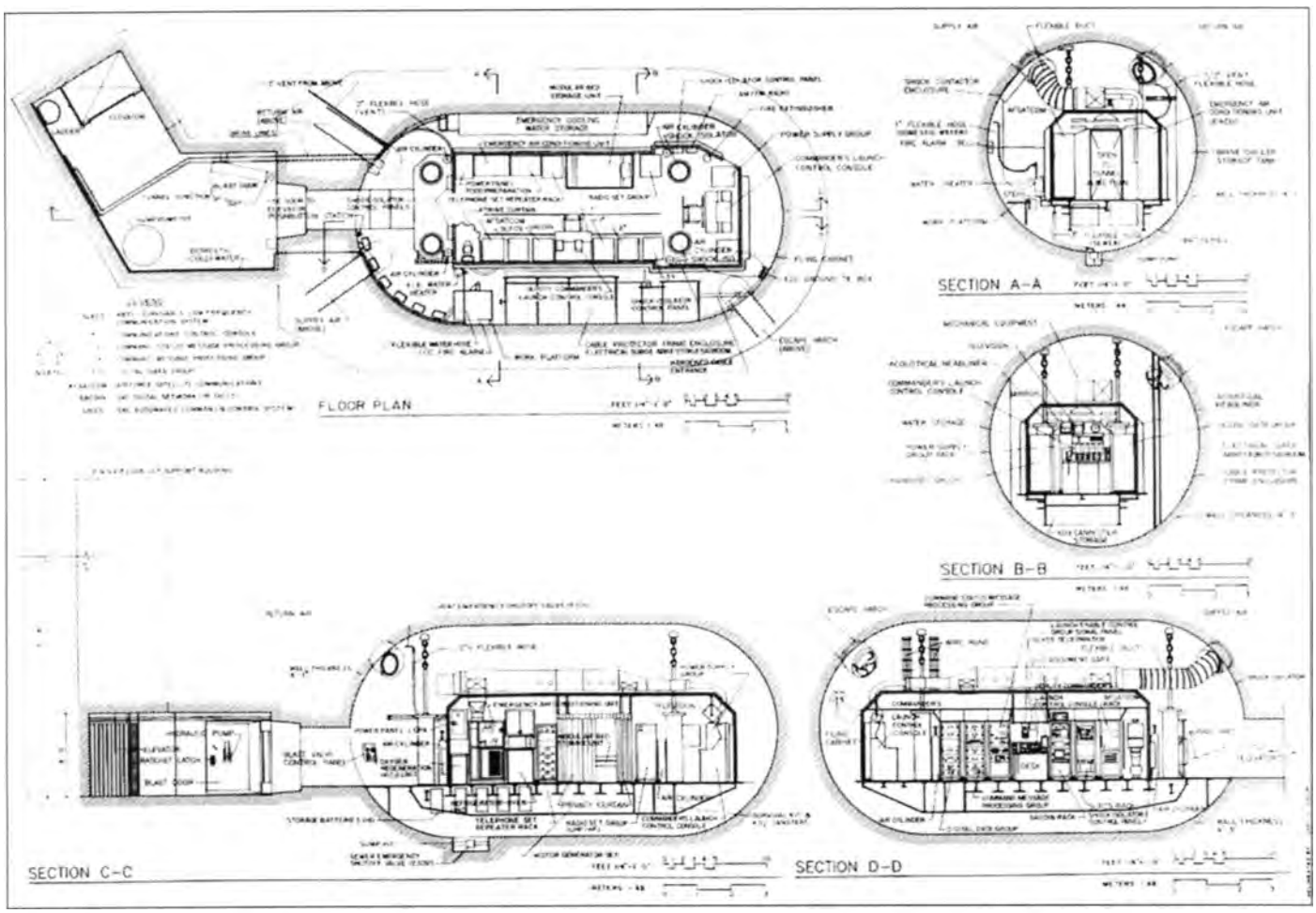
The evolution of the Minuteman Launch Facilities (LFs)
[drawing from *To Defend and Deter: The Legacy of the United States Cold War Missile Program*]

[25] Lonnquest, 253-254.



Drawings showing connection between LCC and LF (above) and the evolution of the Minuteman MAFs (below)
[drawings from *To Defend and Deter: The Legacy of the United States Cold War Missile Program*]





Floor plan and section diagrams of LCC [drawings from *To Defend and Deter: The Legacy of the United States Cold War Missile Program*]

Generally a crew of eight staffed the LCF or MAF at all times. Included in this crew were two officers, called "missileers," who worked 24-hour shifts on alert duty in the LCC. These officers were highly trained and were responsible for monitoring the system for operational irregularities or signs of trouble around the clock. They were also the crew that was responsible for launching the missiles, should the need arise. The LCC was designed so that no one person could launch the missiles alone; the system required two officers, located at opposite ends of the LCC to set the launch selector switches, insert and turn the keys to initiate the launch sequence. Originally all male, the missile crews began to include women in the 1980s.[26]

[26] Fraser, 32-33; Lonnquest, 243-244.

The Army Corps of Engineers was given the responsibility for construction of the LFs and LCFs and MAFs. After the Air Force determined at which bases the missile wings would be located, the Army Corps, the BMD, and SAC headquarters selected the individual silo sites. Private contractors were hired to build the facilities. At the height of construction, the contractors and subcontractors employed thousands of works to keep pace with the aggressive building schedule.[27]

The continued production and installation of ICBMs in the US was slowed by the SALT I and SALT II treaties which aimed to limit the number of ICBMs in both the US and the USSR. As the Minuteman system aged, however, a new missile, the Peacekeeper, was developed and in January 1986, 50 Minuteman missiles at Warren AFB were replaced with the new Peacekeeper ICBM. At that time the ICBM force included 450 Minuteman II missiles and 500 Minuteman III missiles, in addition to the Peacekeeper missiles.

In the late 1980s the economic and political structure of the Soviet Union began to collapse. The Solidarity movement in Poland, the reunification of Germany with the removal of the Berlin Wall, and the election of democratic governments in a number of Eastern Bloc countries contributed to the demise of the USSR. With the collapse of the Soviet Union in 1991, the Cold War ended.

In July 1991, Presidents George H.W. Bush and Mikhail Gorbachev signed the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms (START Treaty). This treaty limited the number of ICBMs and nuclear warheads that each country could possess. Weapons in excess of the agreed upon number would be disarmed and the launch facilities destroyed. This treaty coincided with the Air Force's growing concerns about the costs for repairing and maintaining the Minuteman II missiles. Rather than upgrade them to Minuteman III missiles, the decision was made to deactivate them.

On September 27, 1991, President Bush ordered all 450 Minuteman II ICBM be taken off alert. This resulted in the removal of 150 missiles each from Ellsworth AFB and Whiteman AFB. The 150 Minuteman II missiles located at Malmstrom AFB were replaced with Minuteman III missiles when in 1998 the missile wing at Grand Forks AFB was deactivated and the missiles moved to Malmstrom.[28] Minuteman missiles remain in place at Malmstrom AFB, Minot AFB, and F.E. Warren AFB.

After the missiles were removed from the silos, LFs were either imploded or filled in accordance with the arms reduction treaties. Sensitive equipment at the LFCs and MAFs were removed and the facilities were dismantled. Only a few of the facilities were left intact, each with the intent of retaining the resource for public interpretation. In Missouri, the Oscar-01 LCC, located on the base, was left intact. In South Dakota, the Delta-01 LCF and the Delta-09 LF were left intact and have been

[27] Mead & Hunt, 30.

[28] Mead & Hunt, 142-143.

designated as the Minuteman Missile National Historic Site, operated by the National Park Service. In North Dakota, the State Historical Society of North Dakota has obtained the Oscar-Zero MAF and the November-33 LF sites for the purposes of historic interpretation.

The Cold War: North Dakota's Contributions

The post-World War II years in North Dakota brought great change. The depression had ended, rain was ample, the market demand was strong, land values were low and crop prices were high. Farms became large and more mechanized. Rural electrification made life easier. Roads were paved. Cities and towns grew. The construction boom resulted in new houses, churches, schools, commercial and public buildings.

Perhaps one of the biggest changes for the state, however, was the creation of two Air Force bases in the 1950s. When the Air Force began site selection for new Air Defense Command bases, both the towns of Minot and Grand Forks stepped up. Sites near each town were selected in 1954, construction at each base began in 1956, and both bases were opened in 1957. Initially both bases were home to Fighter-Interceptor groups; both were also activated as Strategic Air Command (SAC) bases in 1958.[29]

At Minot AFB, an air refueling support wing (4136th Strategic Wing) was assigned in 1958. Bombers came to the base in 1961 when the 525th Bombardment Squadron was assigned. Also in 1961, the base was chosen to host Minuteman I missiles and the 455th Strategic Missile Wing (SMW) was activated in December 1962. A missile maintenance squadron was created in 1963. In 1968, the 450th BW and the 455th SMW were deactivated and replaced by the 5th BW (from Travis AFB) and the 91st SMW (from Glasgow AFB). In the mid-1970s, the Minuteman I missiles were converted to Minuteman III missiles. The air base today continues to be home to the 5th BW, which maintains and operates the B-52H Stratofortress bombers, and the 91st Space Wing, which is responsible for the Minuteman missiles.

In addition to the original 478th Fighter Group at Grand Forks AFB, the Air Force activated the Grand Forks Air Defense Sector of the North American Air Defense Command (NORAD) in December 1957. The sector became operational with the semi-automatic ground environment (SAGE) system two years later in December 1959. The Grand Forks Air Defense Sector covered the air space of three states and one Canadian province. As mentioned, SAC activated a Strategic Wing (4133rd SW) in September 1958. It was a provisional wing and SAC expected to equip the unit with bombers and tankers within a few years.[30]

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[29] William A. Young (SMSgt), *History of Grand Forks Air Force Base and the 319th Air Refueling Wing* (a paper prepared for the Office of History, Grand Forks AFB, 1996), 3.

[30] Young, 3.

The first flying units were stationed at Grand Forks AFB in February 1960 when SAC organized the 905th Air Refueling Squadron; the first KC-135A Stratotanker arrived in May. Also in May 1960, the Air Defense Command transferred the 18th Fighter-Interceptor Squadron from Wurtsmith AFB in Michigan to Grand Forks. In December 1960, the 478th Fighter Group became the 478th Fighter Wing. In early 1962, SAC transferred the 30th Bombardment Squadron (BMS) to Grand Forks from Homestead AFB in Florida and assigned it to the 4133rd SW. That BMS acquired its first B-52H Stratofortress in April 1962. In February 1963, SAC organized the 319th Bombardment Wing (BMW) at Grand Forks AFB after the 4133rd SW and the 30th BMS were deactivated and assigned the 905th Air Refueling Squadron and the newly organized 46th BMS to the 319th BMW. The 46th BMS was equipped with B-52H bombers. That year, the Air Defense Command turned over full command and control of the base to SAC.[31]

Changes continued in 1964. In August, SAC activated the 804th Combat Support Group to assume duties as the host unit. In September, SAC stationed the 4th Air Division (later called the Strategic Aerospace Division) at the base. In November, the command organized the 321st Strategic Missile Wing (SMW) when construction began on a Minuteman II missile complex. The 321st became operational in December 1966.[32]

The early 1970s brought several changes to Grand Forks AFB. In June 1971, SAC transferred the 4th Strategic Aerospace Division to the F.E. Warren AFB in Wyoming. The 321st SMW assumed command over the 804th Combat Support Group and took over host responsibilities. Also in July 1971, the 18th Fighter-Interceptor Squadron was replaced by the 460th Fighter-Interceptor Squadron. One year later, in July 1972, the 804th was deactivated. During this period, the 321st SMW was converting the Minuteman II missiles to Minuteman III missiles; the conversion was completed in March 1973.[33]

Further changes occurred in the 1980s. In 1983, the 319th BMW swapped its B-52H bombers for B-52G bombers. In 1987, these bombers were replaced with B-1B Lancers. In June 1988, SAC stationed the 42nd Air Division at Grand Forks AFB and made it the host unit, relieving the 321st SMW of that duty.[34]

The 1990s brought some of the biggest changes yet. In 1991, SAC deactivated the 42nd Air Division and appointed the 319th BMW as the host unit. In June 1992, the Air Force deactivated the Strategic Air Common and reassigned Grand Forks AFB to the newly established Air Combat Command. As

[31] Young, 4.

[32] Young, 4.

[33] Young, 5.

[34] Young, 5.

part of the restructuring process, the Air Force reassigned the 321st MW from the Air Combat Command to the Air Force Space Command in 1993. That command redesignated the wing as the 321st Missile Group in July 1994. Also in 1993, the 319th BMW was redesignated as the 319th Air Refueling Wing and was reassigned to the Air Mobility Command. Three Air Refueling Squadrons were then reassigned to the 319th in 1994. The last B-1B Lander left the base on May 26, 1994, ending over thirty years of heavy bomber operations at the base. In 1995, the Air Force announced that it would remove the 150 Minuteman III ICBMs and deactivate the 321st Missile Group in 1998.[35]

The Grand Forks AFB Missile Field and the Oscar-Zero MAF

Grand Forks AFB was the sixth and final Air Force Base to be designated a missile wing (Wing VI). As with the other missile facilities, the Army Corps of Engineers was responsible for the construction of the Minuteman launch sites and support facilities. The Corps hired Porter, O'Brien and Armstrong, a Grand Forks engineering firm, to conduct soil tests at the proposed launch sites in 1962. It was originally thought the some of the missile sites would be situated in western Minnesota; as it turned out the missile field was located completely in North Dakota, northwest, west and southwest of Grand Forks AFB.[36]

The 321st SMW was organized into three squadrons – the 446th, the 447th, and the 448th - each with 50 missiles. The entire missile field covered an area that was approximately 60 miles wide and 150 miles long, stretching from the Canadian border on the north to Valley City on the south. The field's eastern edge was about 25 miles west of Grand Forks and its western edge was approximately 85 miles west of Devil's Lake.[37]

The oversight of the entire installation process was the responsibility of the Air Force Ballistic Systems Division. The Army Corps of Engineers was responsible for the design of the operational ground facilities. Boeing was responsible for the missile installation and site activation. For all other work, the Air Force contracted with private architects, engineers, contractors, and construction companies. The Ralph M. Parsons Company of Los Angeles was given responsibility for the architectural engineering. In February 1964, the general contract was awarded to a consortium of three major firms led by the Morrison-Knudsen Company of Boise. M-K, as it was known, had been one of the six companies that built the Hoover Dam in the 1930s, numerous military installations in the 1940s, and large-scale industrial plants in the 1950s. M-K had built the first Titan II silos at Lowry AFB in Colorado, as well as the Minuteman facilities at Whiteman and Warren AFBs. The other two

[35] Young, 6.

[36] Fraser, 25.

[37] Fraser, 25-26.

successful bidders were the Perini Corporation of Framingham, Massachusetts and the C.H. Leavell & Company of El Paso, Texas.[38]

Construction on the Grand Forks missile field began in the spring of 1964. The first work occurred at LF Golf-12, a site near Park River. Construction continued through the summer and fall with an average of 5000 people working at the various sites. The building of the LFs was exacting and often dangerous work, but the technique had been refined during the construction of hundreds of silos elsewhere. As described in the HAER report (No. ND-12), construction on the missile silos occurred as follows:

> With the shaft excavated, the men installed a 62-foot-long, prefabricated steel silo liner into the hole. Fabricated by U.S. Steel's American Bridge Division and shipped to the site by train and truck, this liner featured quarter-inch-thick steel plate walls and concentric circles of steel reinforcing rods. With the liner in position, concrete was pumped between it and the walls of the excavation to form the cylindrical silo. The upper level of the silo, with its equipment rooms and stairways and the capsule-shaped equipment building, were constructed using traditional concrete-and-steel erection methods. Once the underground portions of the LF were completed, soil would be backfilled into the remaining excavations. MAFs were built using much the same techniques.[39]

By late fall, M-K had more than 6750 people working to backfill as many of the excavations as they could before winter set in. Unfortunately, the temperatures dropped below zero the third week in November and stayed there for weeks. Numerous sites were damaged by frost heaving, requiring repairs and costing millions of dollars.

Work began on the Oscar-Zero MAF on July 27, 1964. By mid-August, an open-cut hole for the LCC and equipment building capsules had been excavated. Heavy rains forces crews to stop work and when work resumed at the end of the month, the walls of the excavated site began collapsing due to saturation from the rain. To remedy the situation, the angle of the walls was lessened, involving the excavation of an additional 37,000 cubic yards. By September 20th the pit was complete and work began on the underground capsules. The concrete work was only partially complete when the hard freeze came in November. Construction was slowed during the bitter cold winter and didn't reach full-scale operations again until the following spring.[40]

Work continued through the summer and by August 1965, M-K had completed more than 100 of the LFs, in which Boeing had begun installing the weapons systems. The first Minuteman II missile

[38] Fraser, 26-27.

[39] Fraser, 30.

[40] Fraser, 31.

Construction of the LCC and Equipment Building at Golf-Zero (above) and at Delta-Zero (below)
[Photos from Library of Congress files]

(unarmed) arrived in Grand Forks via train on August 5 and was transported the next day to the Golf-15 LF and inserted into the silo. By the end of August M-K had completed 130 of the 150 LFs and twelve of the fifteen MAFs. Five missiles had been delivered and installed. Sylvania Electric Products Division was installing antennas at 165 sites, the American Filter Company was installing the environmental control systems, and Boeing was installing the launch systems. On December 7, 1966 the 321st SMW, with its 150 Minuteman II missiles, was declared fully operational.[41]

Changes were made to the LFs and MAFs over time, most notably to accommodate the Minuteman III missiles in the early 1970s. Other changes included improvements to the operations and communication systems as new technological advances warranted. In 1985, SAC and the Air Force Logistics Command jointing initiated a Minuteman upgrade and modification. It was a $493 million program to recondition and repair LF and MAF facilities. The most visible modifications included the application of new steel siding, new windows, and interior remodeling to accommodate female crewmembers at the MAFs.[42]

The Oscar-Zero MAF fell under the responsibility of the 448th Missile Squadron. The design, layout, and construction of the facilities at Oscar-Zero are identical to the other fourteen Minuteman flights that constituted Wing VI.

The Air Force deactivated the 321st Missile Group on July 2, 1998 after 34 years of service at the Grand Forks AFB. On October 6, 1999, the first silo was imploded in accordance with the Strategic Arms Reduction Treaty (START). The last silo was imploded on August 24, 2001.

Conclusion

The Oscar-Zero MAF retains a high degree of integrity and has been left virtually intact (with the exception of the removal of sensitive equipment). It is now under the ownership of the State Historical Society of North Dakota (SHSND). The Society plans to use the facility for historic interpretation.

It meets National Register criteria for significance in the areas of Military and Engineering and is being nominated under Criteria A and C. Although it is not yet 50 years of age, it meets the Criterion Consideration for achieving exceptional significance within the past 50 years.

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[41] Fraser, 31-32.

[42] Fraser, 38.

MAJOR BIBLIOGRAPHICAL REFERENCES

Fraser, Clayton B. Historic American Engineering Record (HAER No. ND-12)[*Grand Forks Air Force Base, Missile Alert Facility Oscar-Zero*]. Omaha, NE: Regional Office of the National Park Service, 2000.

Gaddis, John Lewis. The Cold War: A New History. New York: The Penguin Press, 2005.

Lauber, John F. *Minuteman ICBM National Historic Landmark* [nomination], 1994.

Library of Congress. Photo collection of HAER reports.

Lonnquest, John C. and David F. Winkler. To Defend and Deter: The Legacy of the United States Cold War Missile Program. Rock Island, IL: Defense Publishing Service, 1996.

Matloff, Maurice, ed. American Military History. [Vol. 2: 1902-1996] Conshohocken, PA: Combined Books, Inc., 1996.

Mead & Hunt, Inc. *The Missile Plains: Frontline of America's Cold War* (A Historic Resource Study). Omaha, NE: Midwest Regional Office of the National Park Service, 2003.

Sherfy, Marcella and W. Ray Luce. *Guidelines for Evaluating and Nominating Properties that Have Achieved Significance Within the Past Fifty Years*. [National Register Bulletin] Washington, DC: National Park Service, USDI, 1998.

Urbas, Andrea. Revised edition of Historic American Engineering Record (HAER No. ND-12)[*Grand Forks Air Force Base, Missile Alert Facility Oscar-Zero*]. Omaha, NE: Regional Office of the National Park Service, 2001.

Young, William A. (SMSgt, USAF). *History of Grand Forks Air Force Base and the 319th Air Refueling Wing*. A paper prepared for the Office of History, Grand Forks AFB, 1996.

Oscar-Zero Missile Alert Facility
Name of Property

Griggs, North Dakota
County and State

10. Geographical Data

Acreage of Property 17 acres

UTM References (Place additional UTM references on a continuation sheet)

1	14 Zone	565908 Easting	5260967 Northing
2	14 Zone	565893 Easting	5260720 Northing
3	14 Zone	565569 Easting	5260804 Northing
4	14 Zone	565576 Easting	5260951 Northing

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 Michelle L. Dennis

organization M.L. Dennis Consulting date March 2008

street & number 513 Meade St. telephone 605-342-8286

city or town Rapid City state SD zip code 57701

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

name State Historical Society of North Dakota

street & number 612 East Boulevard Avenue telephone 701-328-2666

city or town Bismarck state ND zip code 58505

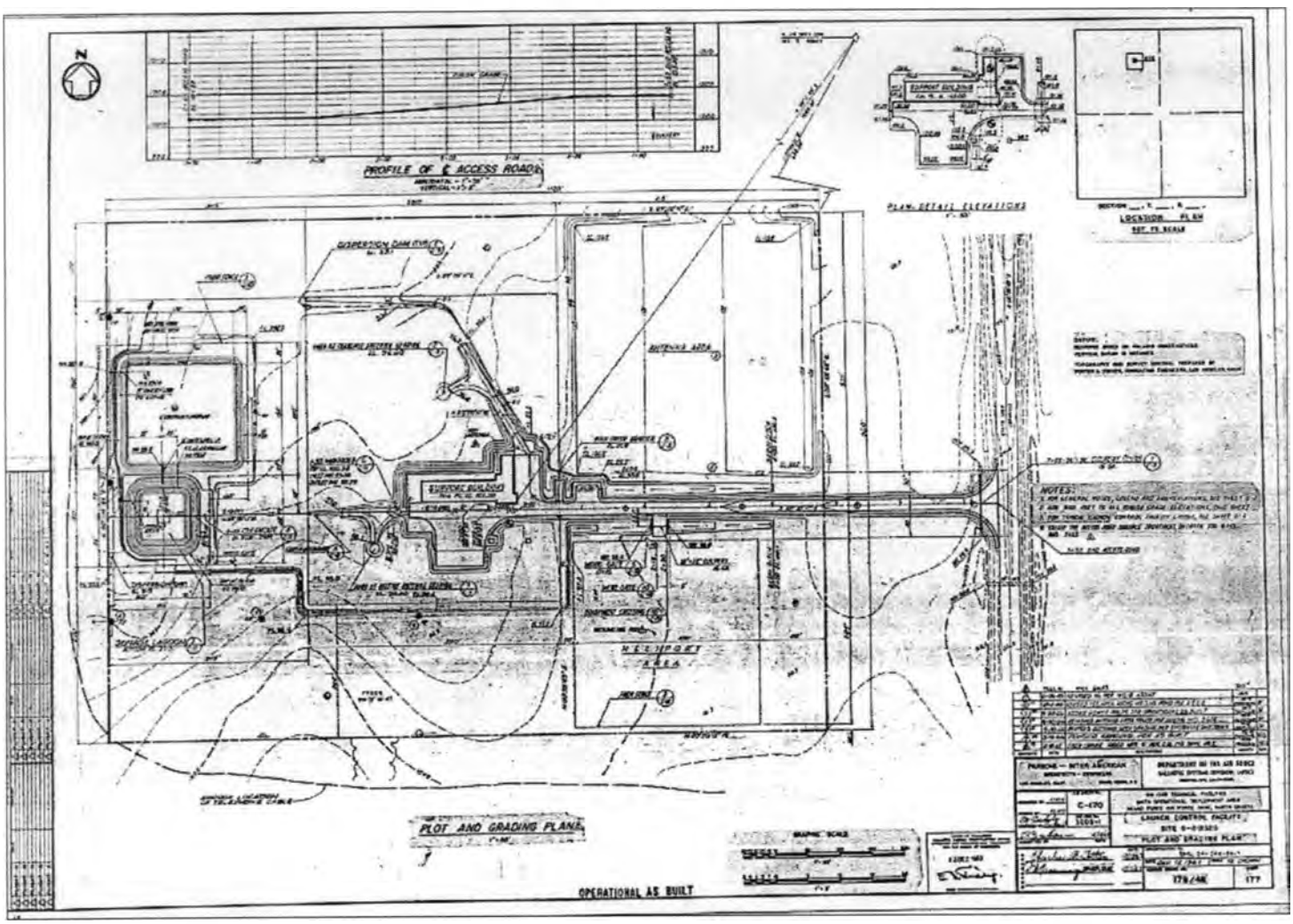
VERBAL BOUNDARY DESCRIPTION

The property includes the Oscar-Zero MAF site in its entirety, including the fenced compound and the surrounding property associated with it. The total area is 17 acres and includes the driveway between the highway and the helipad and parking areas outside the fenced compound.

BOUNDARY JUSTIFICATION

The boundary is based on the significance of the property as a whole and includes the buildings (above-ground and below-ground), all of the associated features (such as antennas) within the fenced area, the adjacent associated features outside the fenced area (the helipad and sewage lagoon), and the surrounding land in ownership of the SHSND.

OSCAR-ZERO MISSILE ALERT FACILITY
SITE PLAN



Photographic copy of construction drawing, Parsons-Inter-American, Architects and Engineers, 13 December 1963
(original print located at Grand Forks Air Force Base, Grand Forks, North Dakota)

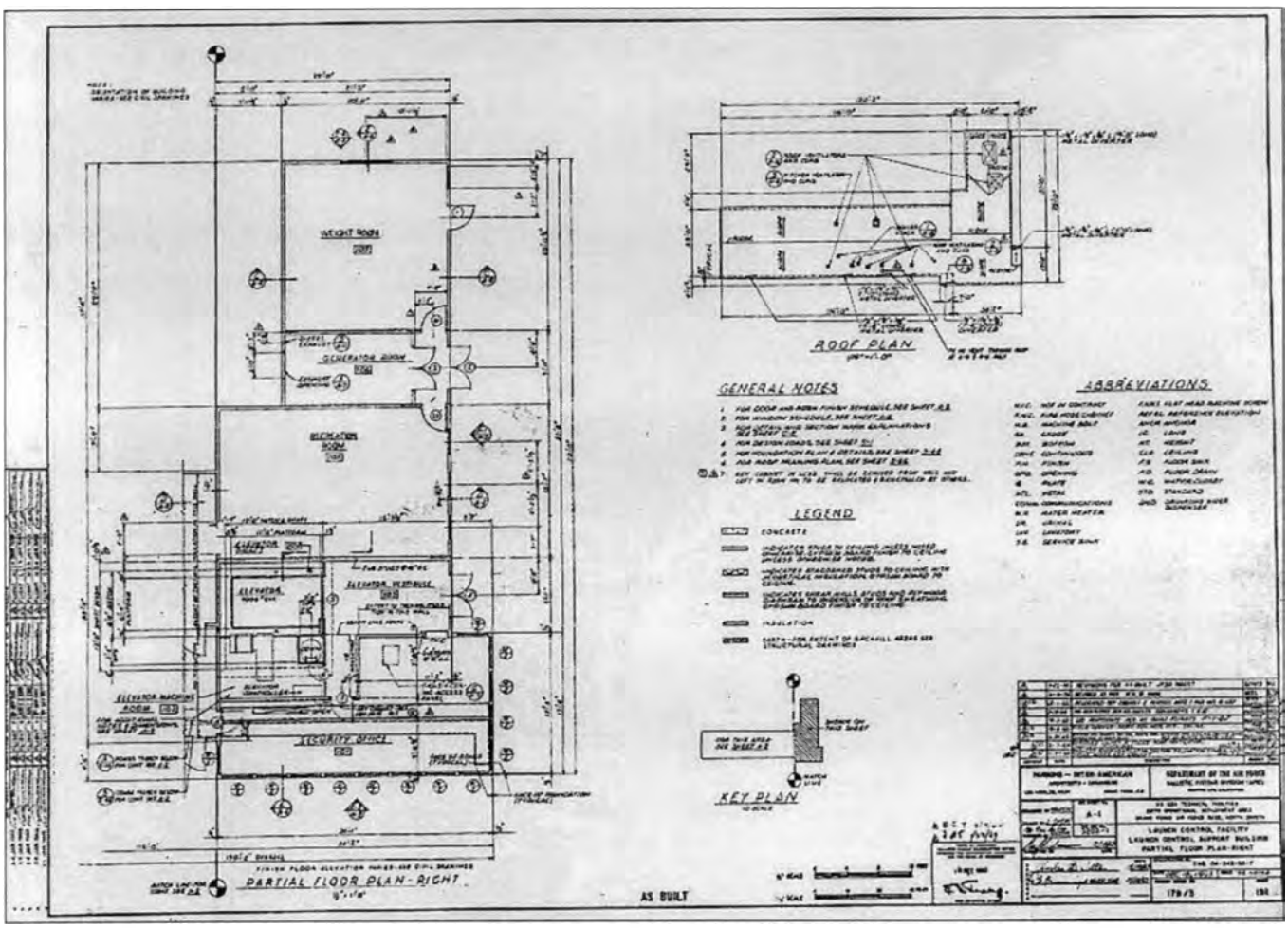
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Oscar-Zero Missile Alert Facility
Name of Property
Griggs, North Dakota
County & State
N/A
Name of multiple property listing (if applicable)

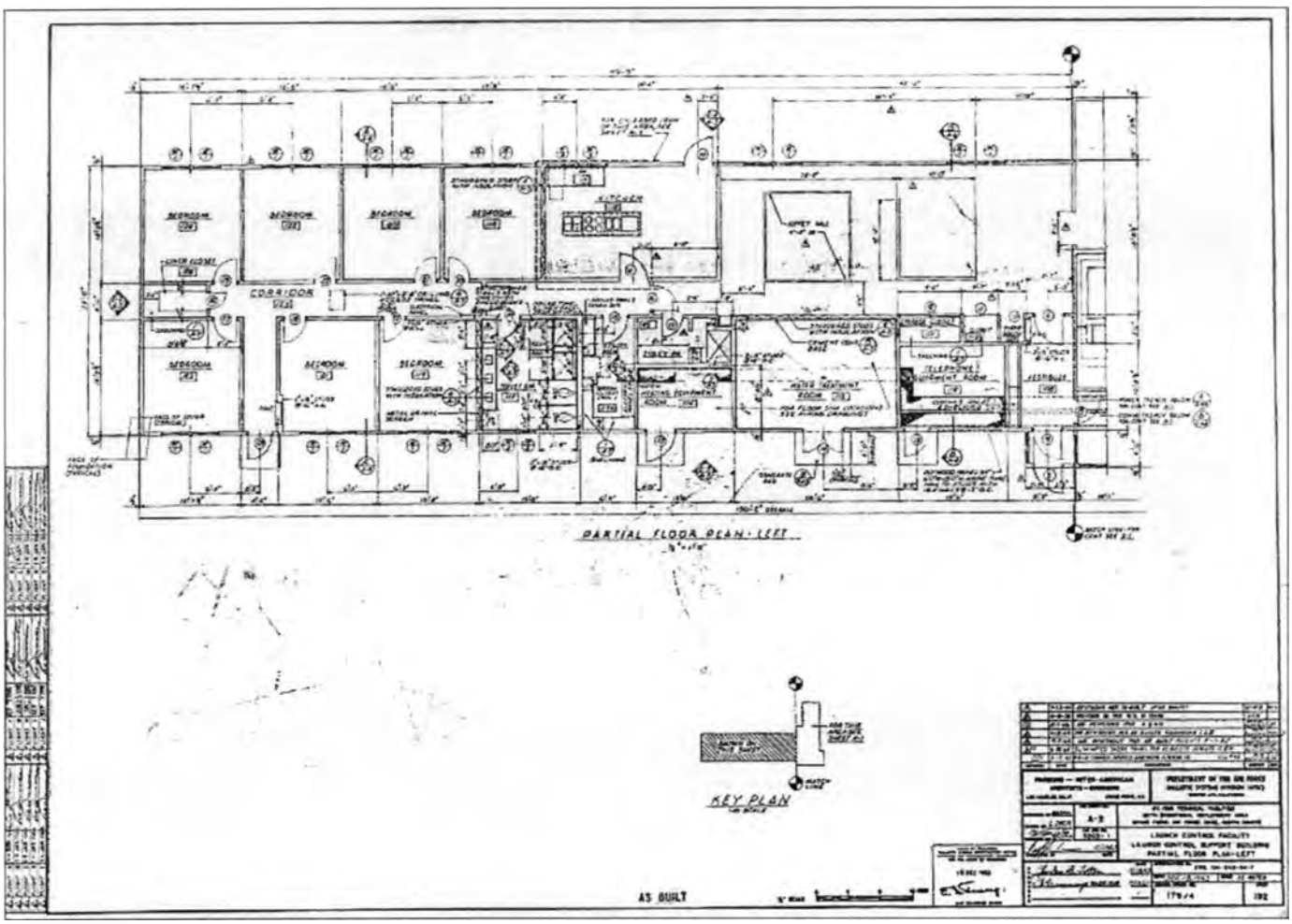
Section number Floor Plans Page 1

OSCAR-ZERO MISSILE ALERT FACILITY
LAUNCH CONTROL SUPPORT BUILDING
PARTIAL FLOOR PLAN (CENTER SECTION AND NORTH WING)



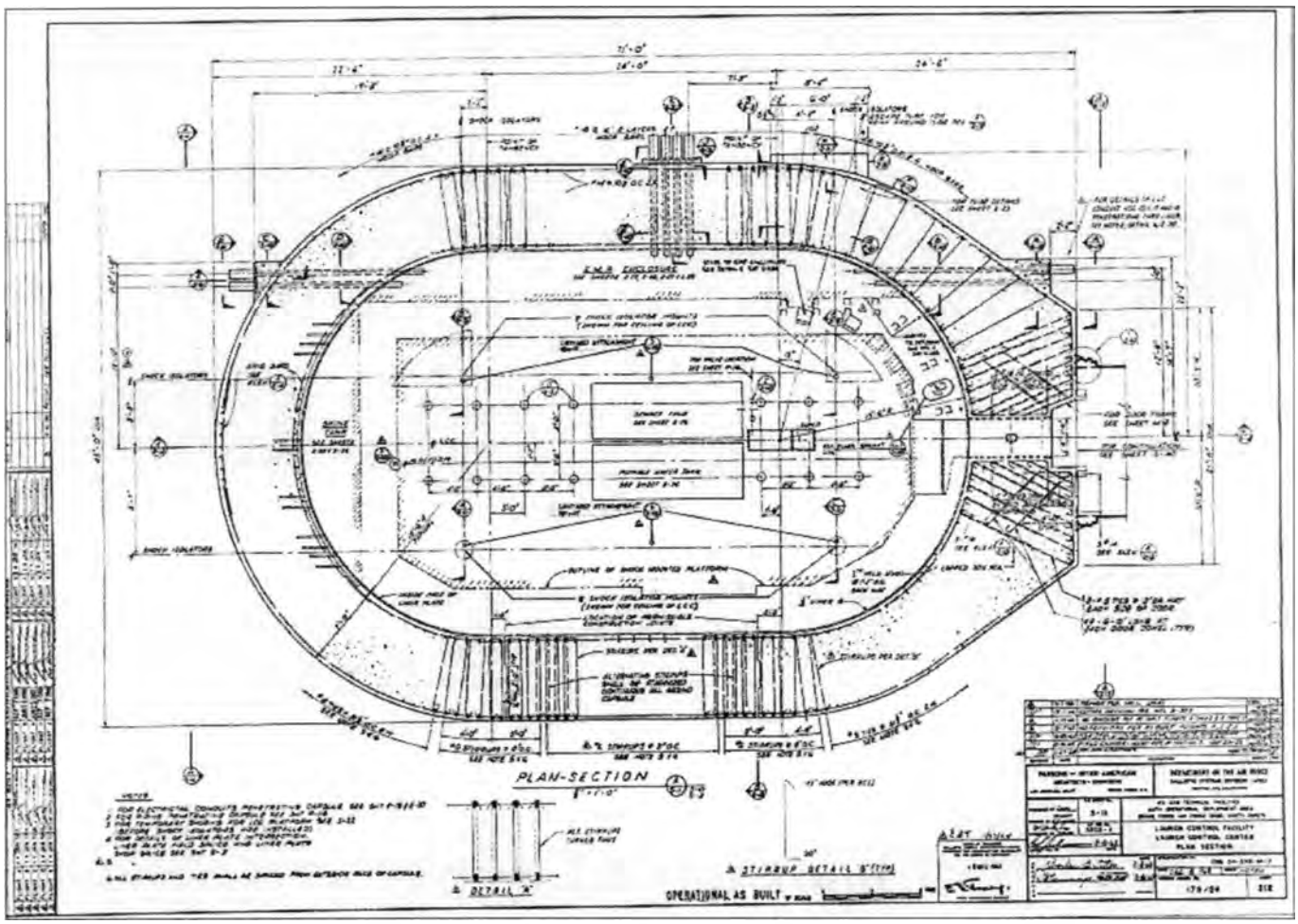
Photographic copy of construction drawing, Parsons-Inter-American, Architects and Engineers, 13 December 1963
(original print located at Grand Forks Air Force Base, Grand Forks, North Dakota)

OSCAR-ZERO MISSILE ALERT FACILITY
LAUNCH CONTROL SUPPORT BUILDING
PARTIAL FLOOR PLAN (WEST WING)



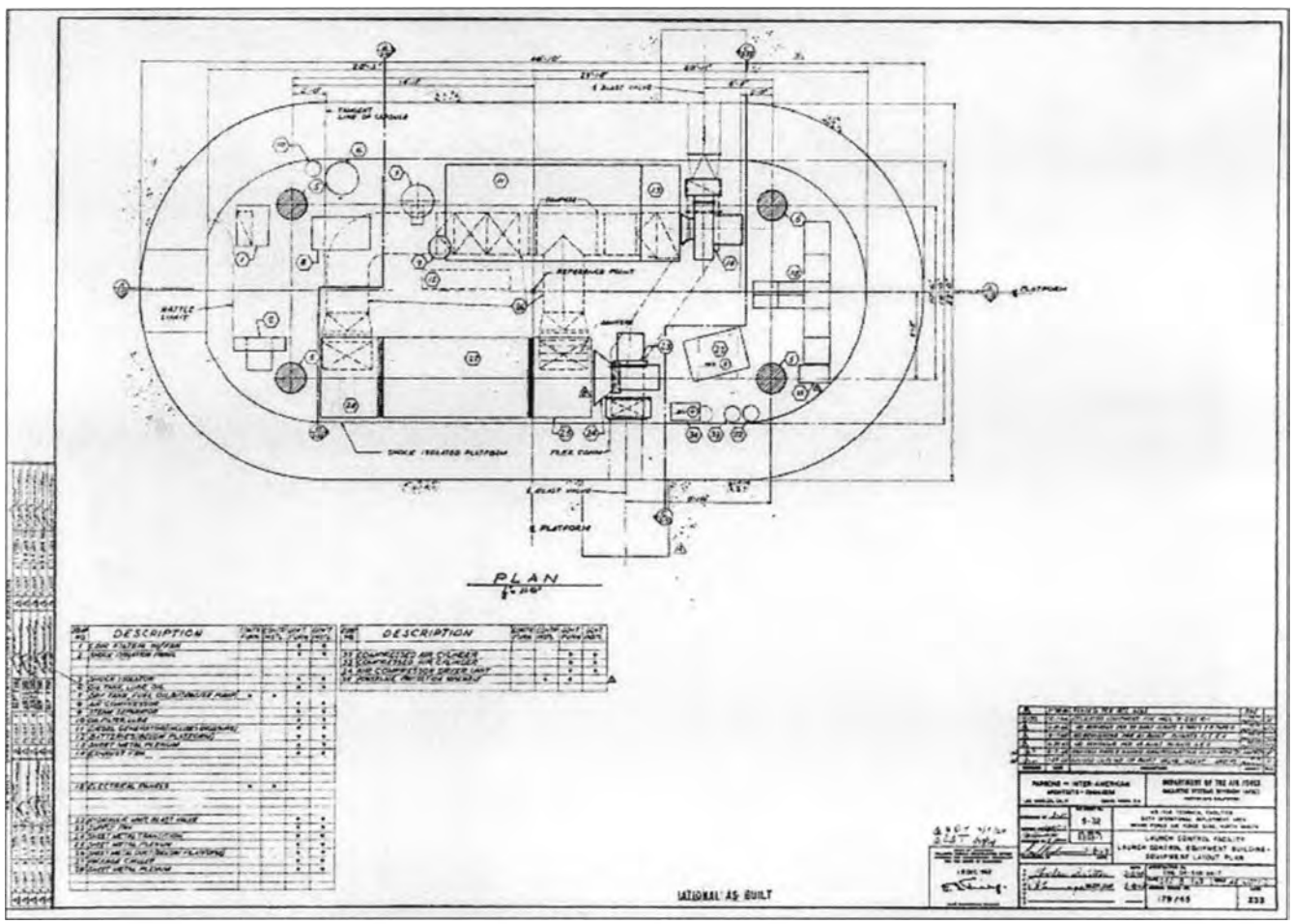
Photographic copy of construction drawing, Parsons-Inter-American, Architects and Engineers, 13 December 1963
(original print located at Grand Forks Air Force Base, Grand Forks, North Dakota)

OSCAR-ZERO MISSILE ALERT FACILITY
LAUNCH CONTROL CENTER
PLAN SECTION



Photographic copy of construction drawing, Parsons-Inter-American, Architects and Engineers, 13 December 1963
(original print located at Grand Forks Air Force Base, Grand Forks, North Dakota)

OSCAR-ZERO MISSILE ALERT FACILITY
LAUNCH CONTROL EQUIPMENT BUILDING
PLAN



Photographic copy of construction drawing, Parsons-Inter-American, Architects and Engineers, 13 December 1963
(original print located at Grand Forks Air Force Base, Grand Forks, North Dakota)

PHOTO IDENTIFICATION

All photos are at the Oscar-Zero Missile Alert Facility, Griggs County, North Dakota; west of Highway 45 approximately 4.5 miles north of Cooperstown.

All photographs were taken by Clayton B. Fraser in October 2000 in association with HAER Report #ND-12. Photos and negatives are located at the Library of Congress.

Photo 1 Oscar-Zero Missile Alert Facility; east front; view to west.

Photo 2 Launch Control Support Building; southeast corner; view to northwest.

Photo 3 Launch Control Support Building; northeast corner; view to southwest.

Photo 4 Launch Control Support Building; northwest corner; view to southeast.

Photo 5 Launch Control Support Building; southwest corner; view to northeast.

Photo 6 Launch Control Support Building; south elevation; view to north.

Photo 7 Security Office, Launch Control Support Building.

Photo 8 Recreation room, Launch Control Support Building.

Photo 9 Weight room, Launch Control Support Building.

Photo 10 Living room, Launch Control Support Building.

Photo 11 Dining area, Launch Control Support Building.

Photo 12 Kitchen, Launch Control Support Building.

Photo 13 Bedroom, Launch Control Support Building.

Photo 14 Bedroom, Launch Control Support Building.

Photo 15 Bathroom/toilet facilities, Launch Control Support Building

Photo 16 Heating equipment room, Launch Control Support Building.

Photo 17 View into the Launch Control Center; power panels on right with consoles beyond; curtained bunk area on far left.

Photo 18 Launch Control Center console with monitoring and communication equipment.

Photo 19 Launch Control Center console with monitoring and communication equipment.

Photo 20 Launch Control Center bunk.

Photo 21 Tunnel junction between the Launch Control Center and Launch Control Equipment Building; view into the Equipment Building.

Photo 22 Launch Control Equipment Building.

Photo 23 Launch Control Equipment Building.

Photo 24 Vehicle Storage Building; east and north elevations; view to southwest.

Photo 25 Vehicle Storage Building; west and south elevations; view to northeast; propane tanks in foreground.

Photo 26 Hardened Ultra-High-Frequency Transmit and Receive Antenna; view to southwest.

Photo 27 Hardened High-Frequency Receive Antenna; view to northeast

Photo 28 Hardened High-Frequency Transmit Antenna; view to southeast.

Photo 29 ICBM Super-High-Frequency Satellite Terminal; view to east.

Photo 30 Helipad; view to northwest.

Photo 31 Air intake and exhaust vents; view to west.

Photo 32 "Welcome to O-0" artwork located in elevator lobby of Launch Control Support Building..

Photo 33 Viking with sunburst/snowflake logo; located on panel over doorway into Launch Control Center.

Photo 34 Crew roster; located on panel beside doorway into Launch Control Center.

Photo 35 "Who Ya Gonna Call" artwork; located on west wall in Launch Control Center.

LIST OF ABBREVIATIONS

BG	Bombardment Group
BMD	Ballistic Missile Division
BMW	Bombardment Missile Wing
BS	Bombardment Squadron
Convair	Consolidated Vultee Aircraft Corporation
ICBM	Intercontinental ballistic missile
LCC	Launch Control Center
LF	Launch Facility (unmanned missile silo)
MAF	Missile Alert Facility
NATO	North Atlantic Treaty Organization
O-0	Oscar-Zero MAF
SAC	Strategic Air Command
SALT Treaty	Strategic Arms Limitation Talks Treaty
SMS	Strategic Missile Squadron
SMW	Strategic Missile Wing
START Treaty	Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Oscar-Zero Missile Alert Facility

MULTIPLE NAME:

STATE & COUNTY: NORTH DAKOTA, Griggs

DATE RECEIVED: 9/03/08 DATE OF PENDING LIST: 9/22/08
DATE OF 16TH DAY: 10/07/08 DATE OF 45TH DAY: 10/17/08
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 08000994

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	Y
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	Y	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	Y

COMMENT WAIVER: N

___ACCEPT ___RETURN ___REJECT _____DATE

ABSTRACT/SUMMARY COMMENTS:

See attached Comment

RECOM./CRITERIA Accept A+C, Crit. Cons & Natl Importance

REVIEWER JM McClelland DISCIPLINE _____

TELEPHONE _____ DATE 10-14-08

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

Oscar-Zero Missile Alert Facility

Griggs County, ND

Recommendation: Accept A & C, Criterion Consideration G, National level of significance

The Oscar-Zero Missile Alert Facility (O-0 MAF) was an integral part of the nation's Minuteman missile system that was built in the 1960s and maintained a strategic force of 1000 long-range missiles nationwide until the late 1990s. The Oscar-Zero site is a remnant example of the 15 missile alert facilities associated with the North Forks Air Force Base (AFB) Wing VI, the last cluster of missile sites built by the U.S. Air Force during the nation's activation of an Intercontinental Ballistic Missile System during the 1960s. This 17-acre facility served as the staffed command post/control center for ten unmanned missiles that were installed in underground silos and remained ready for release upon command. Missile Wing VI, located at North Forks Air Force Base in North Dakota, was one of the six missile wings operational nationwide (others were located at Malmstrom AFB in Montana, Ellsworth AFB in South Dakota, Minot AFB in North Dakota, Whitman AFB in Missouri, and F.E. Warren AFB in Wyoming). Wing VI was fully operational and equipped with 150 Minuteman II missiles in December 1966; it was later upgraded (in the 1970s) with Minuteman III missiles. Each successive missile type had longer range and greater weight, was able to carry warheads with increasingly powerful yields (measured in megatons) or multiple warheads, and gradually replaced earlier missiles. When the North Forks Wing VI operation was deactivated in 1998, the Oscar-Zero site became one of two representative, missile-related sites slated for preservation and development as historical interpretation sites in North Dakota.

The Oscar-Zero Site is nationally significant and exceptionally important for its contributions to national security and the nation's long-range, intercontinental defense strategy of the Cold War era. Its exceptional importance is underscored by the fact that it is one of the few facilities remaining of the original (and identical) fifteen MAF sites that carried out the defense mission of the Wing VI cluster (321st Missile Group). Significant in both Military History and Engineering under NR criteria A & C, it is a highly intact and well preserved illustration of the basic operational unit (one centralized missile alert facility having oversight for the readiness and operation of 10 missile-launching facilities) that made up the nation's Intercontinental Ballistic Missile (IBCM) system. Once the ICBM system became fully operational nationwide, it involved a force of about 1000 missiles; it maintained this level of potential power throughout the Cold War, with the North Forks missile field providing a force of 150 missiles.

The documentation provides an excellent discussion of the history of the technological development of the Minuteman missile and the design and functional operation of the manned control/command facilities (MAFs and LCCs) and its subordinate launch facilities (LF). It also includes pertinent facts concerning the construction, operation, and deactivation of the Oscar-Zero site.

The North Forks missile wing remained active as a crucial element of the nation's long-range air defense system until the late 1990s when the program was curtailed and reorganized as a result of the 1991

Reduction and Limitation of Strategic Offensive Arms Treaty, known as the START Treaty. Constructed in 1966, the Oscar-Zero Facility was vacated and the Minuteman III missiles in its command were moved to Malmstrom Air Base, when Wing VI at North Forks AFB was deactivated in 1998. This date is justifiably the basis for the closing date of the period of significance. As a result of the deactivation of three of the nation's six ICBM missile wings, including the North Forks operation, missiles were removed from the belowground silos and the silos imploded or filled in; command/control facilities were dismantled after sensitive equipment was removed. To recognize the historical significance and inherent exceptional importance of the ICBM system's basic operational unit, several representative facilities, including the Oscar-Zero site, remained intact, and provisions made for their preservation and public interpretation. The Delta-01 Launch Control Facility and Delta-09 launch facility in South Dakota have been documented in a 1994 NHL nomination and were designated the Minuteman Missile National Historic Site (National Park Service); the Oscar-01 Launch Command Center in Missouri has been preserved; and the North Dakota State Historical Society has acquired the Oscar-Zero Missile Alert Facility and the November-33 launch facility site. The Oscar-Zero facility was recorded by the Historic American Engineering Record (HAER no. ND-12, 2000/2001).

Linda McClelland, Historian

National Register of Historic Places

PHOTO 1

OSCAR-ZERO MISSILE ALERT FACILITY

GRIGGS CO, ND

PHOTO 2

OSCAR-ZERO MISSILE ALERT FACILITY

GRIGGS CO, ND

PHOTO 3

OSCAR-ZERO MISSILE ALERT FACILITY

GRIGGS CO, ND

PHOTO 4

OSCAR-ZERO MISSILE ALERT FACILITY

Griggs Co., ND

PHOTO 5

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 6

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 7

Oscar-Zero Missile Alert Facility

Griggs Co., ND


KETTLER

PHOTO 8

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 9

Oscar - Zero Missile Alert Facility
Griggs Co, ND

PHOTO 10

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 11

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 12

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 13

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 14

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 15

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 16

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 17

Oscar-Zero Missile Alert Facility
Griggs Co., ND


WT 48 LB
WT 52 LB
WT 65 LB

PHOTO 18

Oscar-Zero Missile Alert Facility
Griggs Co., ND

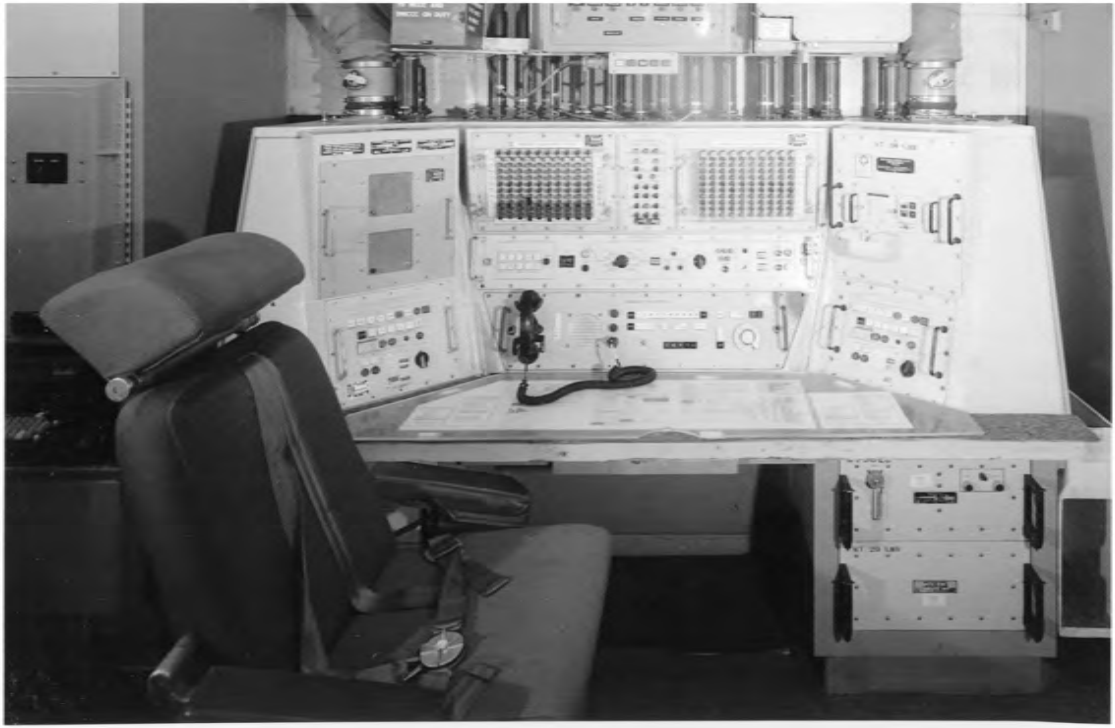


PHOTO 19
Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 20

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 21

Oscar-Zero Missile Alert Facility

Griggs Co., ND


A
B
E
F

PHOTO 22

Oscar-Zero Missile Alert Facility

Griggs Co., ND

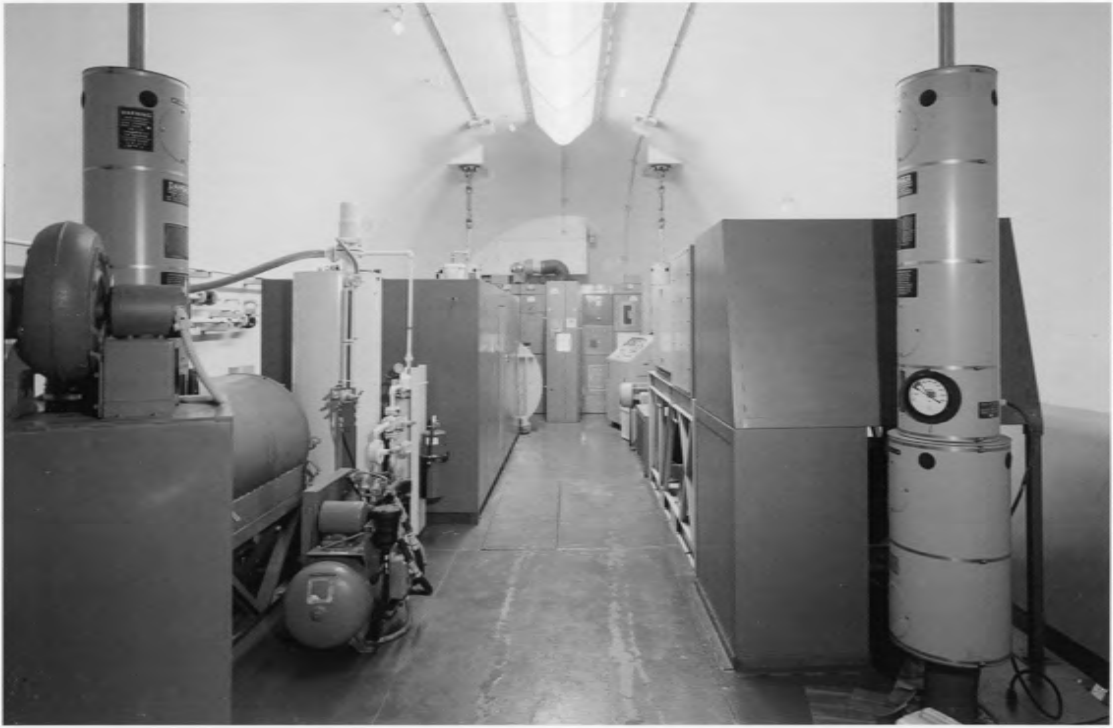


PHOTO 23

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 24

Oscar-Zero Missile Alert Facility

Griggs Co, ND

PHOTO 25

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 26

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 29

Oscar-Zero Missile Alert facility

Griggs Co., ND

PHOTO 28

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 29

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 30

Oscar-Zero Missile Alert Facility

Griggs Co., ND

PHOTO 31

Oscar-Zero Missile Alert Facility

Griggs Co., ND


WELCOME TO O-O

PHOTO 32

Oscar-Zero Missile Alert Facility
Griggs Co., ND

PHOTO 33

Oscar-Zero Missile Alert Facility
Griggs Co., ND

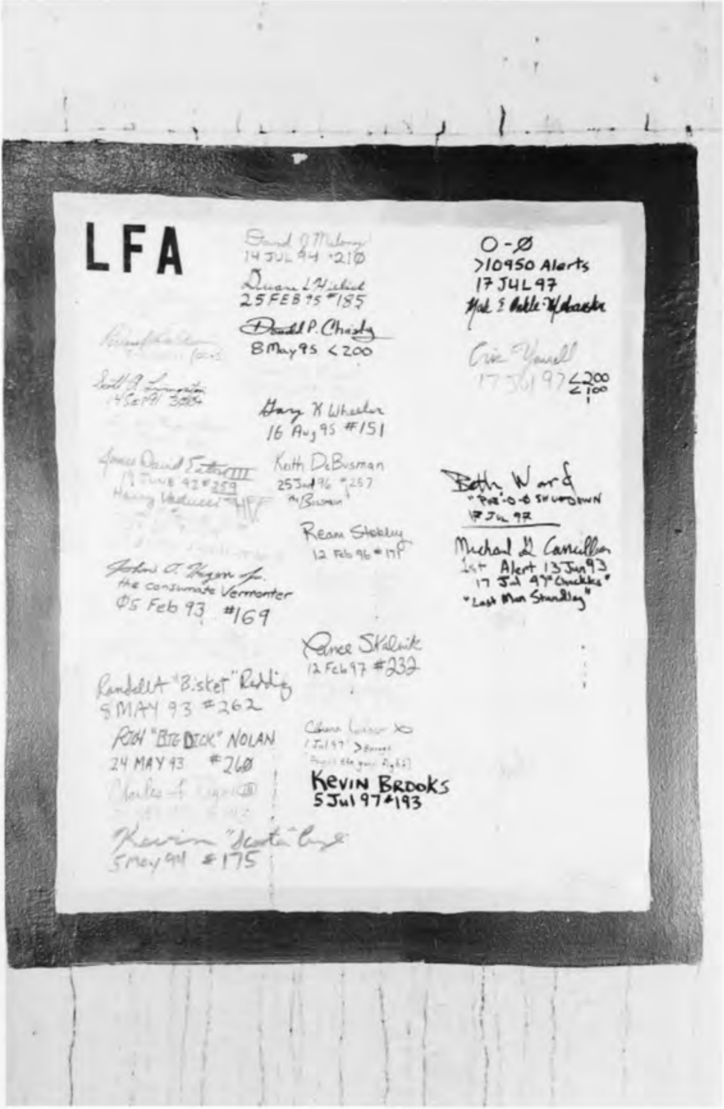

LFA
14 JUL 94 #210
25 FEB 95 #185
8 May 95 <200
Gary K Wheeler
16 Aug 95 #151
Keith DeBusman
the consumate Vermonter
Φ5 Feb 93 #169
12 Feb 97 #232
5 MAY 93 #262
RICH "BIG DICK" NOLAN
24 MAY 93 #260
KEVIN BROOKS
5 Jul 97 #193
5 May 94 #175
0-Ø
>10950 Alerts
17 JUL 97
Beth Ward
1st Alert 13 Jun 93
"Last Man Standing"

PHOTO 34

Oscar-Zero Missile Alert Facility
Griggs Co., ND


WHO YA GONNA CALL
448
HEY! THIS IS A JOB FOR..... THE BEST OF THE BEST!
448
EAGLE
0-0

PHOTO 35

Oscar-Zero Missile Alert Facility
Griggs Co., ND

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COOPERSTOWN WEST QUADRANGLE

NORTH DAKOTA—GRIGGS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

6379 II SE (BINFORD)
6379 I SE (KLOTEN SE)
6379 II SW (JESSIE)
6378 IV NE (SUTTON NE)
6378 I NE (COOPERSTOWN EAST)
(REVERE) 6378 IV SE
(KARNAK) 6378 I SE
(HANNAFORD) 6378 I SW

98°15′ — 98°07′30″ — 47°30′ — 47°22′30″

R. 60 W. — R. 59 W.

JESSIE 4.1 MI.

HANNAFORD 4.1 MI.
30 MI. TO INTERSTATE 94

CARRINGTON 42 MI.
GLENFIELD 15 MI.

T. 146 N.
T. 145 N.

2 560 000 FEET — 150 000 FEET

Lake Five

C O O P E R S T O W N

C L E A R F I E L D

H E L E N A

B A L L H I L L

Gravel Pit

Gravel Pits

Cooperstown

BURLINGTON NORTHERN

BM 1450
BM 1440
BM 1437
BM 1429
BM 1426
BM 1421

Mapped, edited, and published by the Geological Survey as part of the Department of the Interior program for the development of the Missouri River Basin

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1959. Field checked 1961

Polyconic projection. 1927 North American datum
10,000-foot grid based on North Dakota coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks, zone 14, shown in blue

To place on the predicted North American Datum 1983 move the projection lines 5 meters north and 28 meters east as shown by dashed corner ticks

Revisions shown in purple compiled from aerial photographs taken 1981-82 and other sources. This information not field checked. Map edited 1984

UTM GRID AND 1984 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN — GN — 0°36′ 11 MILS — 8° 142 MILS

SCALE 1:24000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

NORTH DAKOTA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Medium-duty — Light-duty —
Unimproved dirt - - - - -
State Route

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND NORTH DAKOTA WATER COMMISSION, BISMARCK, NORTH DAKOTA 58501
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1984

COOPERSTOWN WEST, N. DAK.
47098-D2-TF-024

1961
PHOTOREVISED 1984
DMA 6378 I NW—SERIES V871

OSCAR-ZERO MISSILE
ALERT FACILITY
GRIGGS CO, NORTH DAKOTA

UTM COORDINATES
A 14/565908/5260967
B 14/565893/5260720
C 14/565569/5260804
D 14/565576/5260951

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

To: Keeper, National Register of Historic Places
From: Merlan E. Paaverud, Jr./ Lorna Meidinger
Date: 29 August 2008
Subject: National Register Nomination

The following materials are submitted on this 29th day of August 2008, for

the nomination of the Oscar Zero Missile Alert Facility to the National Register of Historic Places.

✓ National Register of Historic Places nomination form on archival paper

____ Multiple Property Nomination form on archival paper

✓ Photographs, black and white

✓ Original USGS map(s)

✓ Sketch map(s)/figure(s)/exhibit(s)

____ Pieces of correspondence

1 Other: Photo CD

COMMENTS:

✓ Please insure that this nomination is reviewed

____ This property has been certified under 36 CFR 67

____ The enclosed owner objections ____ do ____ do not constitute a majority of property owners.

____ Other: