Chapter 3: Existing Conditions / Affected Environment

Chapter 3: Existing Conditions/Affected Environment

Introduction

The *Secretary of the Interior's Standards for the Treatment of Historic Properties* require a comprehensive understanding of the current conditions to provide a baseline for the development of treatment recommendations. This chapter provides a thorough inventory of the existing conditions of the environmental context, cultural resources (including cultural landscapes, buildings, and archeological sites), wildlife, socioeconomics, visitor experience, and park operations related to the Delta-01 and Delta-09 sites.

Cultural landscapes are natural landscapes that have developed through interventions by cultural groups. Landscape characteristics are the tangible and intangible aspects of cultural landscapes that individually and collectively aid in understanding the value of a landscape as a cultural resource.[1] For each of the two cultural landscapes at Minuteman Missile National Historic Site, the following landscape characteristics are described: spatial organization, land use, circulation, topography and views, vegetation, buildings and structures (within their landscape setting), small scale features, and archeological resources. In addition, views to other former missile sites are discussed.

Buildings are described according to four categories including exterior envelope, interior architecture and finishes, structural systems and building systems.

Minuteman Missile National Historic Site is located in rural South Dakota about seventy miles east-southeast of Rapid City. Built in accordance with the U.S. Air Force dispersal policy, Delta-01 Launch Control Facility and Delta-09 Launch Facility lie approximately ten miles apart. During operation, the two sites were linked by a system of blast-proof underground cables and a radio communications network known as the Hardened Intersite Cable System (HICS). Although now decommissioned and disarmed, Delta-01 and -09 facilities are preserved as Minuteman Missile National Historic Site to interpret the use of Minuteman Ib and II intercontinental ballistic missile systems in the United States as part of the United States nuclear missile defense program during the Cold War era.

The Delta flight facilities were part of the 66th Missile Squadron that included five launch control facilities and fifty launch facilities (see figure 3-2). The 66th Missile Squadron was one of three squadrons that made up the 44th Missile Wing in South Dakota (see figure 3-1).

[1] Page, Gilbert and Dolan, A *Guide to Cultural Landscape Reports*, 5-6.

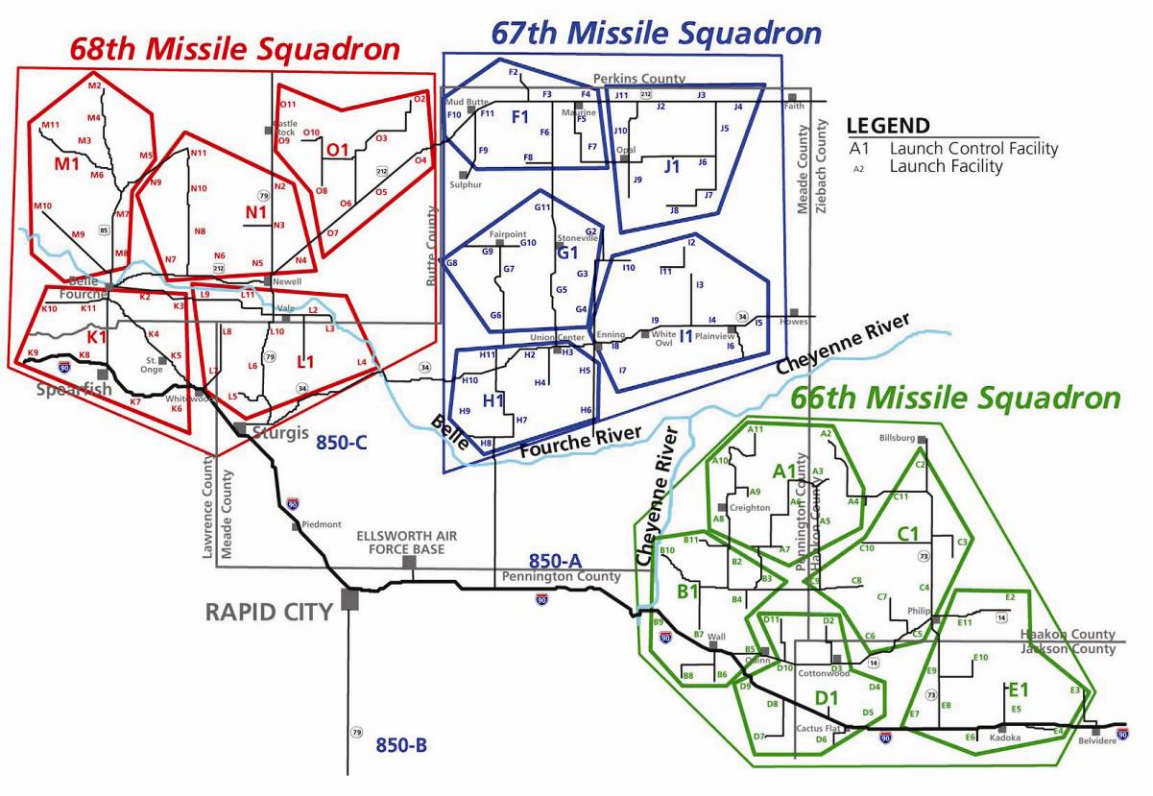


Figure 3- 1: 44th Missile Wing (source: MIMI digital file "44th Missile Wing Map")

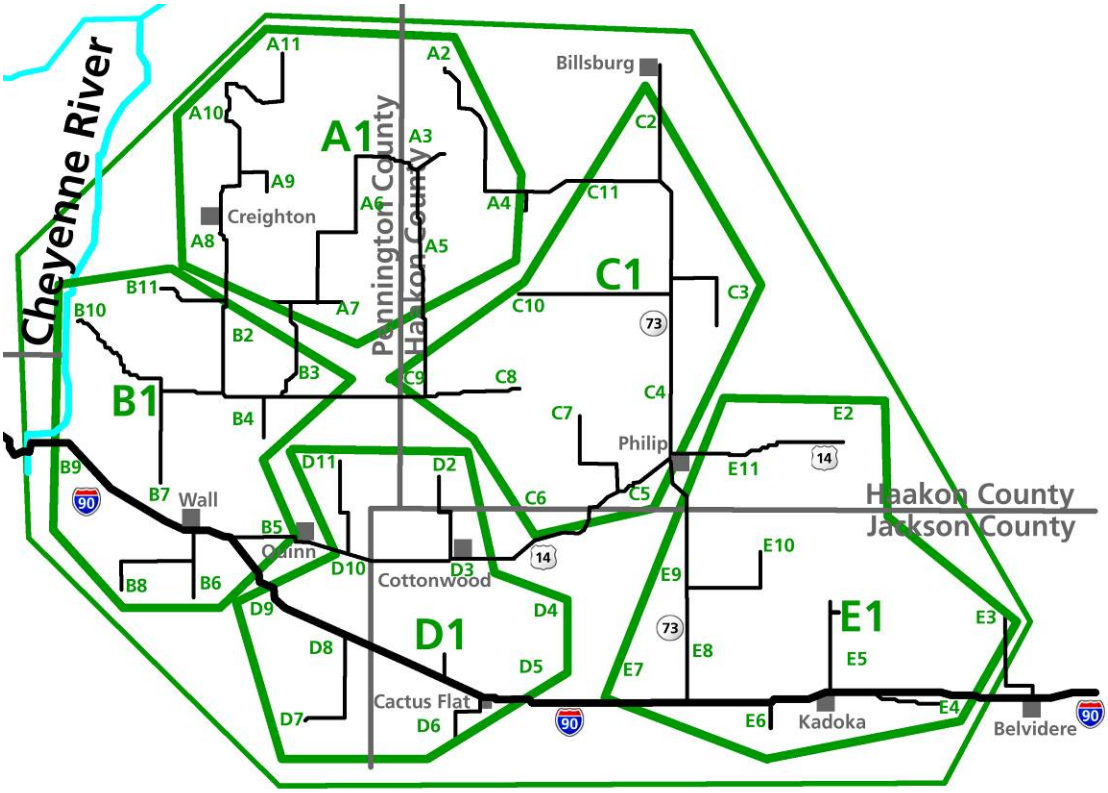


Figure 3- 2: 66th Missile Squadron (source: MIMI digital file "44th Missile Wing Map")

Environmental Context and Natural Systems

The Delta-01 Launch Control Facility and Delta-09 Launch Facility are both situated in the northern Great Plains physiographic province, a region typified by open rolling mixed-grass prairie. The dominant grass species are medium-height warm season grasses such as western wheatgrass (*Pascopyrum smithii)* and green needlegrass (*Nassella viridula)*. Short grasses such as blue gramma *(Bouteloua gracilis)* and buffalograss *(Bouteloua dactyloides)* may dominate localized areas, particularly during times of stress. Forbs commonly associated with the mixed grasses include scarlet globemallow (*Sphaeralcea coccinea)*, American vetch (*Vicia americana)*, prickly pear *(Opuntia)*, and fringed sagewort *(Artemisia frigid)*. Shrubs and trees are usually restricted to draws, gullies, and areas of surface water.

Elevations near Delta-01 range from about 2,550 to 2,565 feet above sea level. At Delta-09 elevations extend from approximately 2,550 to 2,700 feet above sea level. The South Dakota badlands lie to the south of both sites. Geologic formations similar to those found in Badlands National Park are visible along the southern horizon from the Delta sites.

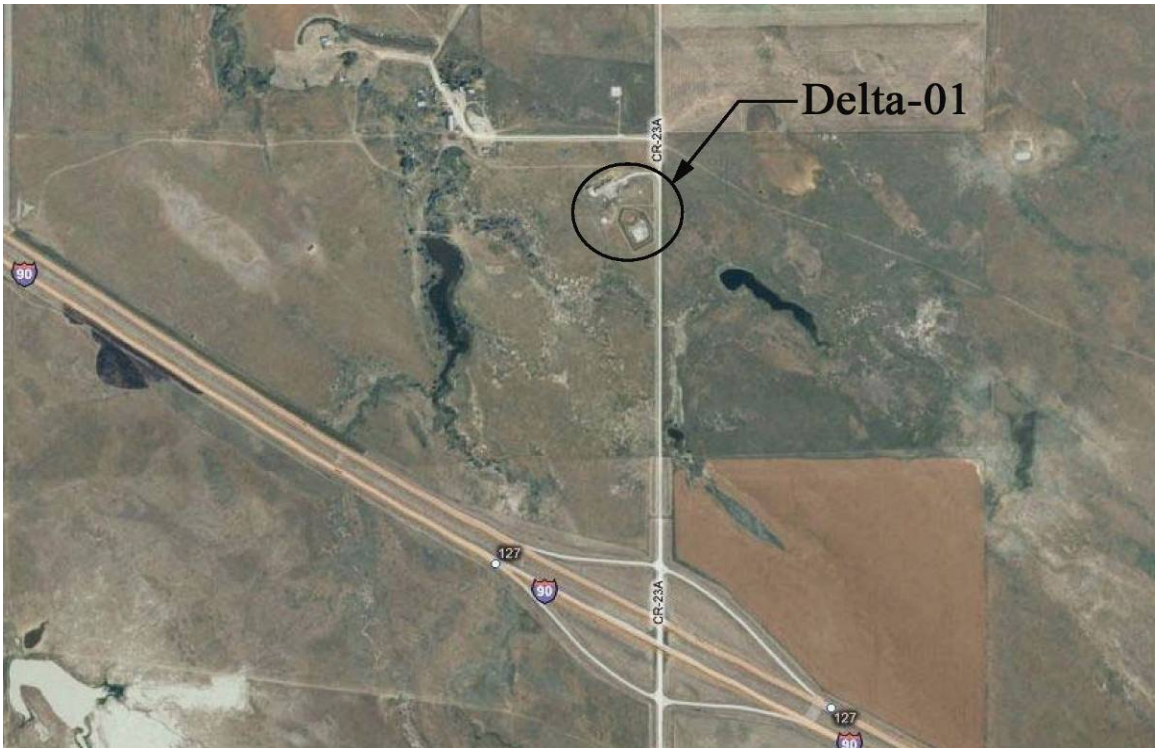


Figure 3- 3: Aerial view of Delta-01 and surrounding area, 2009
(source: http://maps.live.com, 4/29/2009).

Figure 3- 4: Aerial view of Delta-09 and surrounding area, 2009
(source: http://maps.live.com, 4/29/2009).

Environmental Assessment Impact Topics

Cultural Resources

Cultural resources at Minuteman Missile National Historic Site include cultural landscapes, buildings and structures, archeological resources, ethnographic resources, and museum objects/collections. Ethnographic resources and museum objects/collections have been dismissed because there is very little likelihood that alternatives generated by the plan will impact these resources. The remainder are being documented and analyzed because there will be impacts from the treatment alternatives.

Existing Conditions: Cultural Landscapes

Delta-01 Landscape Existing Conditions

Description of the Delta-01 Site

Launch Control Facility Delta-01 consists of 6.4 acres of land with approximately 1.9 acres located inside a chain-link security fence topped with barbed wire (see figure 3-5, Delta-01 Existing Conditions Site Plan). The site is situated in a rural setting surrounded by prairie ranch land utilized for pasture. Horses, donkeys, and cows graze adjacent to the security fence. A small electric fence was added recently north of the site access drive to discourage livestock from damaging cars and equipment. A ranch, including a residence

and several small outbuildings, is located northwest of the site. Interstate 90 and a billboard are visible to the south.

Vegetation includes mixed native grasses. The terrain at the site rises gradually toward the north. The site is located on the west side of Jackson County Road CS 23A, approximately one half mile north of Interstate Highway 90, exit 127. Jackson County Road CS 23A is an improved gravel road, prone to washouts and potholes (see figure 3-6).

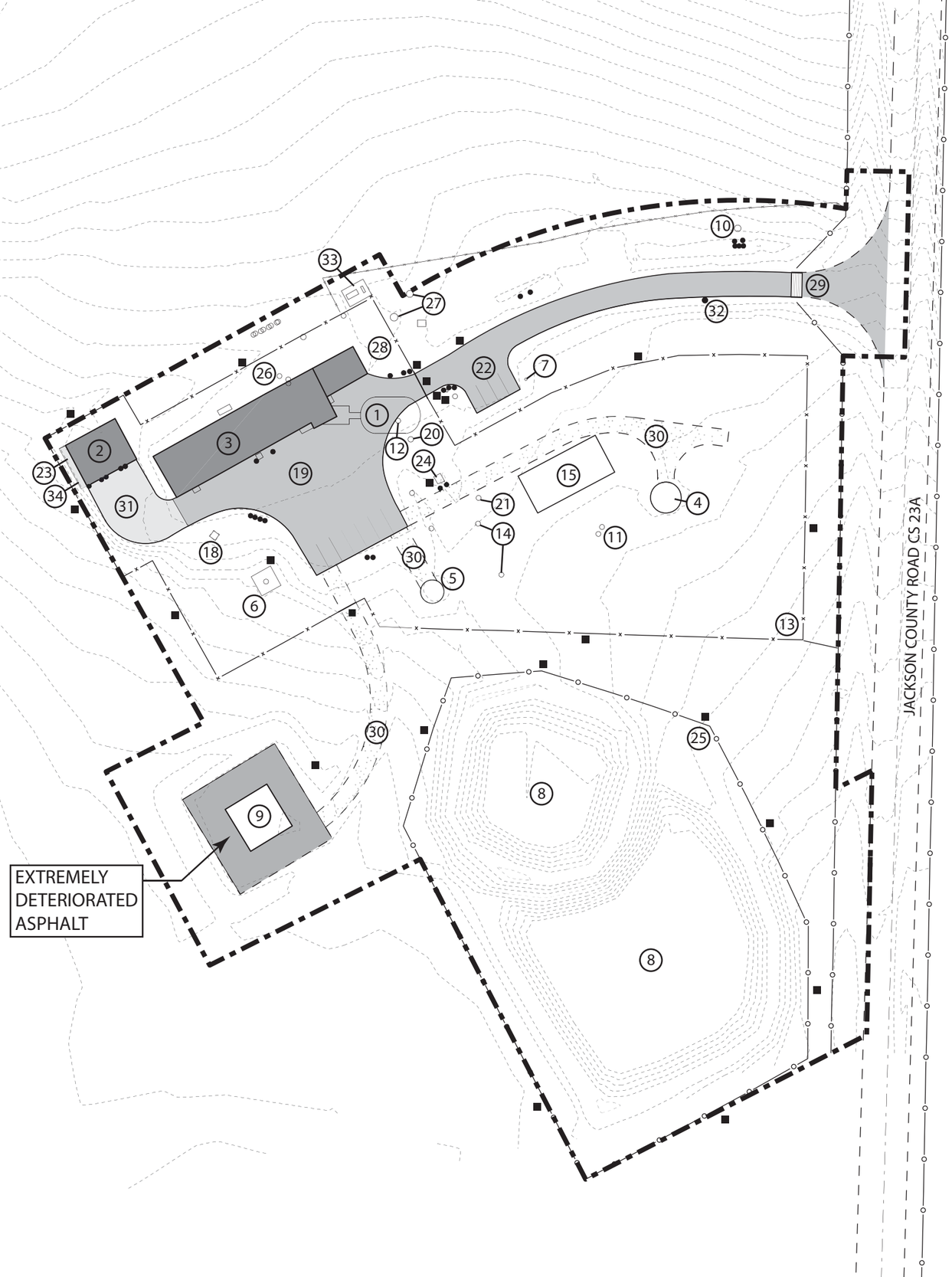
Next page:

Figure 3- 5: Delta-01 Existing Conditions Site Plan (source: QEA September 2009).

MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

HSR/CLR/EA
DRAFT JUNE 2010

DELTA-01 EXISTING CONDITIONS



0 40 80 160 240 NORTH

APPROXIMATE SCALE (FEET)

MAP KEY

1 Launch Control Center
2 Heated Vehicle Storage Building
3 Launch Control Facility
4 Hardened HF Transmit Antenna
5 Hardened HF Receive Antenna
6 Hardened UHF Antenna
7 SLFCS Antenna
8 Sewage Lagoon
9 Helicopter Pad
10 Cathodic Protection Rectifier
11 Code Burner
12 Basketball Goal
13 Security Fencing
14 Horseshoe Court
15 Volleyball Court
16 Bollards •
17 Warning Signs ■
18 Well & Water Tanks
19 Access Road & Parking Area
20 Flagpole
21 Television Satellite Dish
22 Gas Pump
23 Sidewalk
24 Diesel Fuel Tank
25 Sewage Lagoon Fencing
26 ISST Antenna
27 Utility Poles
28 Underground Diesel Storage Tank
29 Cattle Guard
30 Gravel Access Roads
31 Concrete Driveway
32 Monument Set by Woolpert, 2009
33 Concrete Pad w/ Electric Generator
34 Underground Diesel Tank

Building
Property Line/ Historic Boundary
Gravel Boundary
Security Fence
Ranch Fence
Contour Line
Low Density Gravel
Asphalt
Concrete

SOURCES

TOPOGRAPHIC SURVEY, WOOLPERT INC., 2009
MINUTEMAN ICBM LAUNCH FACILITY DELTA-01, LCS, 2009

QUINN EVANS
ARCHITECTS

Figure 3- 6: Jackson County Road CS23A, facing northwest, Delta-01 is in the left portion of the image, also note cell tower, June 2009 (source: QEA 3155)

Spatial Organization, Delta-01

The buildings and landscape features at Delta-01 are arranged in a linear pattern running from northeast to southwest. The heated vehicle storage building is at the western end of the buildings. Landscape features are arranged throughout the site, in a layout designed to simplify implementation, maintenance, and day to day operations. Although not visible on the landscape, the underground facilities influenced the historic placement of landscape elements and continue to affect where contemporary landscape elements may be situated in the future.

The central core of the site is compact and enclosed by a chain-link security fence. The remaining features are protected from livestock by ranch fences, a cattle-guard, and a low voltage electric fence.

Land Use, Delta-01

Land within the security fence at Delta-01 is used solely for the protection and interpretation of the historic resources. NPS staff accompany all visitors within this area, conducting regular tours and interpretive programs. Other areas are fenced to prevent livestock from entering. The unfenced portions of the property are used for grazing by livestock from the adjacent ranch. A small portion of the grazing land is owned by the NPS, the remainder is privately owned.

The access drive to the site is located on tract FD100 E-1, which is an easement allowing a permanent access road, utility lines, and water pipes. The adjacent rancher retains the right to cross over the tract to move machinery, equipment and livestock to their adjoining land.[2]

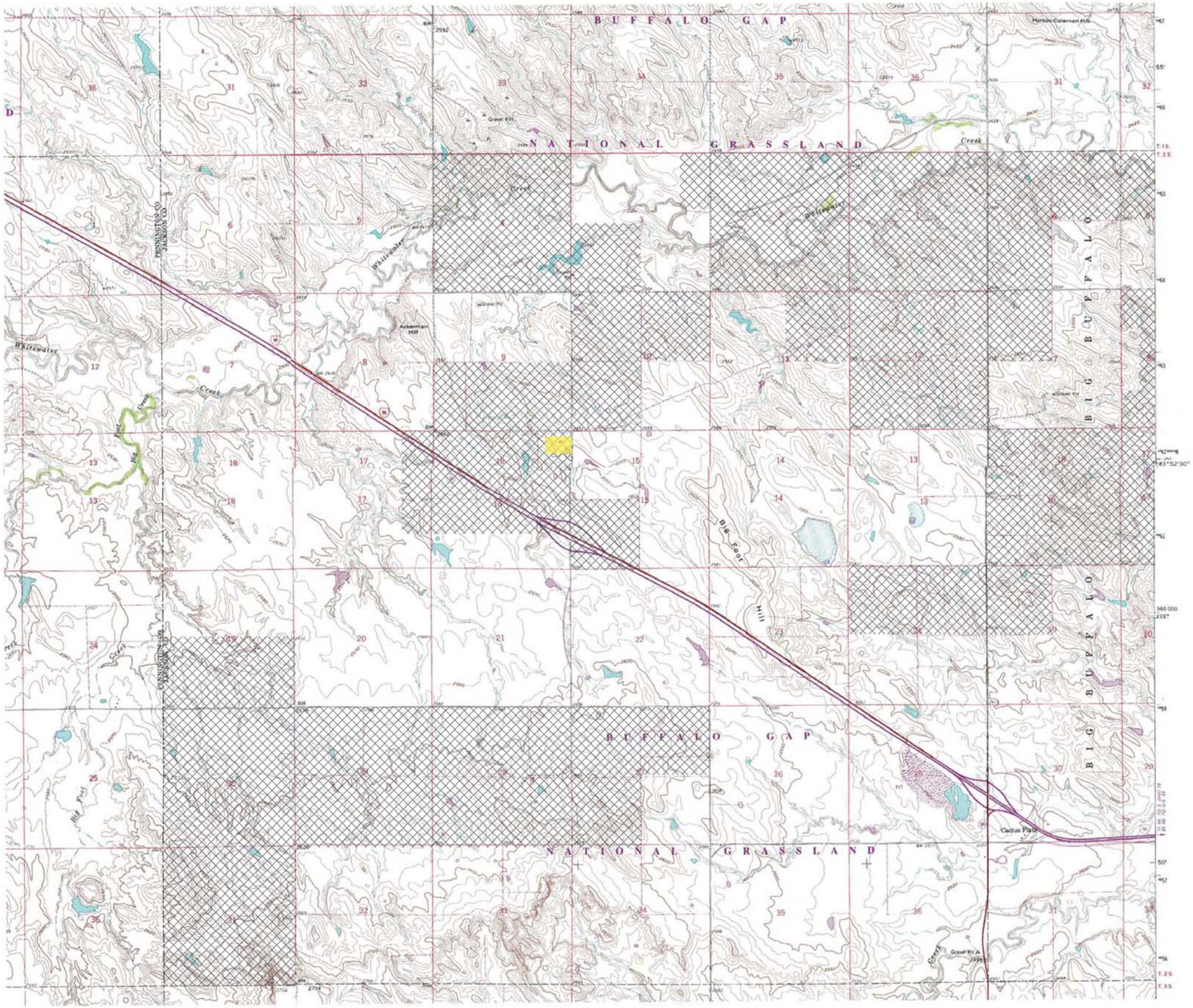
[2] "Launch Control Facility (LCF) D-1 Transfer to Park Service Pursuant to Public Law 106-115,"

The land immediately adjacent to the northern, western, and southern boundaries of Delta-01 is privately owned, as are several large tracts that are within the historic views of the facility (see figure 3-7). The eastern boundary of the site is delineated by Jackson County Road CS23A. The remainder of the landscape within view of Delta-01 is publically owned as part of Buffalo Gap National Grassland.

Next page

Figure 3- 7: Delta-01 Existing Property Ownership Plan (source: QEA September 2009).

Minuteman Missile Archives Document 660/D-5.



MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

DELTA-01 EXISTING OWNERSHIP

0 1000 3000 5000 7000

APPROXIMATE SCALE (FEET)

NORTH

MAP KEY

Privately Owned Land

Approximate location of Delta-01

SOURCES

USGS MAP
JACKSON COUNTY TRACT MAPS

QUINN EVANS | ARCHITECTS

Circulation, Delta-01

Vehicular and pedestrian circulation at the site is controlled by the security fence that surrounds the main resources. Vehicles approach the site from Interstate Highway 90 and head north on Jackson County Road CS 23A. The site access road is paved with asphalt and extends from CS 23A to the west. Parking for four vehicles is provided on the south side of the access road, near the entrance gate. The entrance gate is kept locked when NPS personnel are not present. The vehicular entrance is used by NPS and service vehicles.

Once visitors are within the fence, interpreters provide information about the facility, features on site, and answer questions before guiding visitors to the Launch Control Facility support building.

Topography and Views, Delta-01

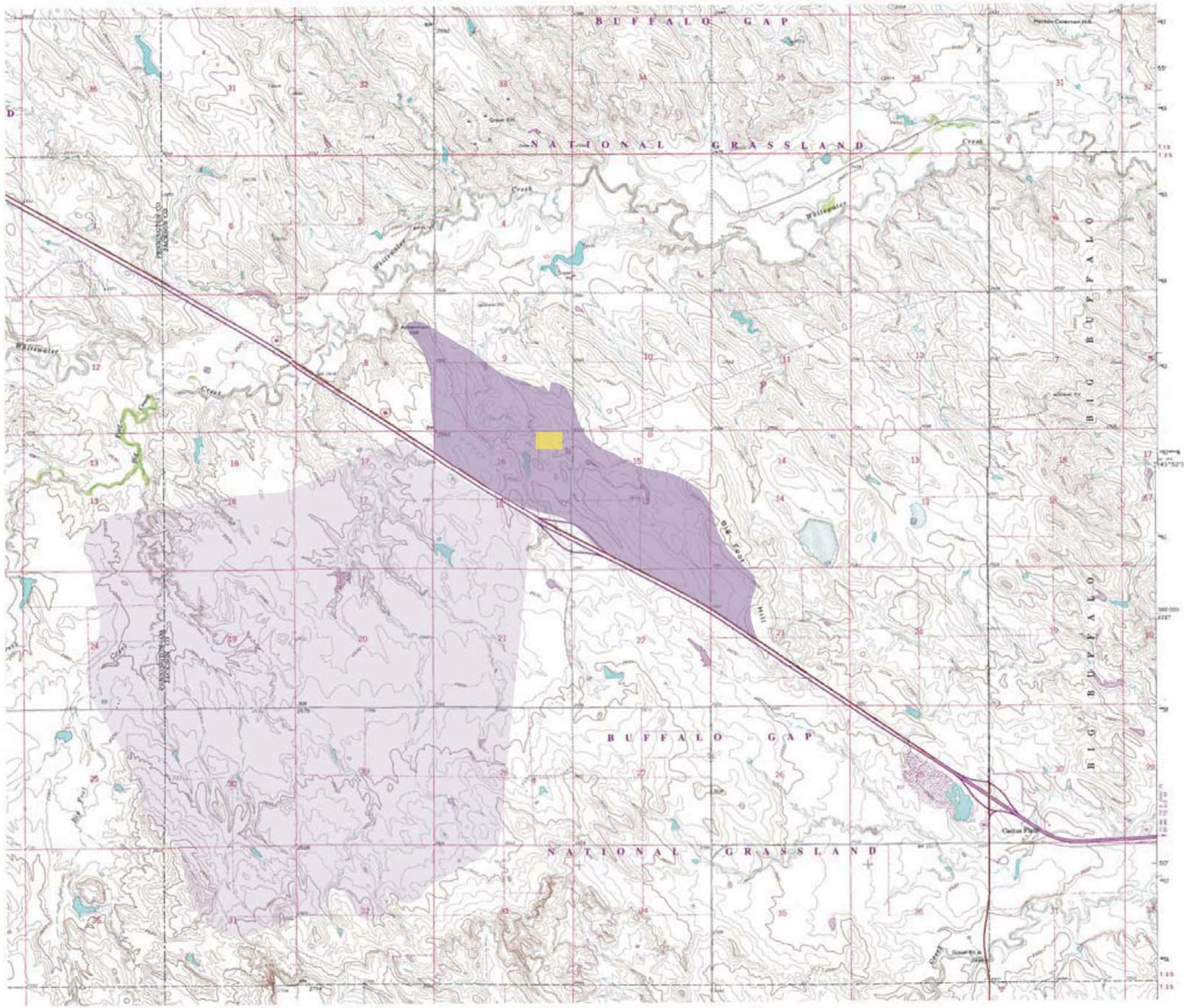
The slopes on the site average from two-percent to approximately five-percent, creating a fairly level terrain that rises gradually to the north. The grades surrounding the sewage lagoons are steeper, with side slopes of about twenty-five percent. The lagoons lie about 240 feet southeast of the Launch Control Facility support building. The northern-most lagoon is an open settling basin, 118 feet square, surrounded by an eight-foot-high earthen berm. The southern lagoon is an overflow lagoon with an irregular shape appended to the southeastern side of the northern lagoon.[3]

Since the complex is situated on a south-facing slope, the main views from the facility are to the south, as illustrated in figure 3-8. The surrounding topography continues to gradually descend toward the south, with Interstate Highway 90 providing the only large-scale, non-topographic feature within view. In this way, Interstate 90 provides a barrier defining the southern boundary of the foreground view from Delta-01. A rise in the topography to the north, east and west defines foreground views in those directions. Topographic formations ranging from 2650 to 2700 feet above sea level create edges to the broad reaching, or background views to the south.

[3] Slattery, Ebeling, Pogany, and Squitieri, "The Missile Plains: Frontline of America's Cold War,"(Historic Resource Study), 87.

Next page:

Figure 3- 8: Delta-01 Existing Views (source: QEA September 2009).



MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

DELTA-01 EXISTING VIEWS

0 1000 3000 5000 7000

APPROXIMATE SCALE (FEET)

NORTH

MAP KEY

Delta-01 Foreground Views

Delta-01 Background Views

Approximate location of Delta-01

SOURCES

USGS MAP
QE|A FIELD INVESTIGATIONS, JUNE 2009

QUINN EVANS | ARCHITECTS

Vegetation, Delta-01

The Delta-01 Launch Control Facility is situated in the northern Great Plains physiographic province, a region typified by open rolling mixed-grass prairie. The area surrounding Delta-01 includes grasslands, lagoons, and several permanent wetlands (these are not within the site boundary). An intermittent stream south of the property has Russian olive trees (*Elaeagnus angustifolia*) growing along the stream banks. A recent study identified 79 vascular plant species at Delta-01, the majority of which are native to the United States. These include graminoids such as buffalo grass (*Bouteloua dactyloides)* and needleleaf sedge (*Carex duriuscula*), forbs (e.g., prairie coneflower (*Ratibida columnifera),* slimflower scurfpea (*Psoralidium tenuiflorum),* and white heath aster (*Symphyotrichum ericoides)*), and cacti shrubs (*Opuntia sp).*[4] Medium-height warm season grasses include western wheatgrass (*Pascopyrum smithii)* and green needlegrass (*Nassella viridula).* Short grasses such as blue gramma *(Boutelous gracilis)* and buffalograss (*Bouteloua dactyloides)* may dominate localized areas, particularly during times of stress. Throughout the region shrubs and trees are generally restricted to draws, gullies, and areas of surface water. At Delta-01 the only woody plants noted were Siberian elm (*Ulmus pumila)* at the lagoons.

Buildings and Structures, Delta-01

Three primary structures are present on the site including the Launch Control Facility Support Building (HS103, IDLCS 100477), the heated vehicle storage building (HS 102, IDLCS 100479), and the Underground Launch Control Center (HS 101, IDLCS 100478). The Architectural, Structural and Cathodic Protection Existing Conditions sections of this chapter includes detailed information about the building conditions.

[4] Wilson, Gitzen and Bynum, *Vertebrate and Floristic Inventories at Minuteman Missile National Historic Site.*

Small Scale Features, Delta-01

Table 3-1: Delta-01 Small Scale Landscape Features

Small Scale Features	Description/Condition	Figure #
Hardened high frequency transmit antenna (HS 104, IDLCS 100480)	*Blast-hardened antenna, constructed in 1963, deactivated in early-1970s. Includes underground, reinforced-concrete cylinder, approximately twenty-one feet in diameter and fifty feet deep. Cylinder well contains a telescoping, four-sided radio antenna that was capable of extending to a maximum height of 120 feet.[5] The antenna is in good condition.*	**3-10**
Hardened high frequency receive antenna (HS 105, IDLCS 100481)	*The antenna is set into the ground about 160 feet south-southeast of the LCF support building. Built in 1963, the structure consists of a reinforced-concrete cylinder covered by a concrete cap and measuring approximately sixteen feet in diameter and thirty-seven feet deep (outside dimensions). Five small ports are distributed evenly around the perimeter of the structure. Each port contained a slender, ballistically actuated, steel, monopole antenna. The antenna system was deactivated circa 1987-88.[6] The antenna is in good condition.*	**3-11**
Hardened ultra-high frequency antenna (HS 106, IDLCS 100483)	*The hardened UHF antenna is located near the southwest corner of the LCF support building. It consists of a massive, cast-steel frustum, bolted to a thick, reinforced-concrete slab sixteen feet square. A conical, white fiberglass weather dome surmounts the frustum. The antenna was installed in 1976. The antenna is in good condition.*	**3-12**
Survivable low frequency communication system antenna (HS 107, IDLCS 100484)	*Installed in 1968, the SLFCS antenna is buried in the ground about 140 feet east of the LCF support building and is not visible from the surface. The antenna is in good condition.*	**Not visible on surface, see map for location.**
Cathodic protection rectifier (HS 110, IDLCS 100485)	*Electronic device installed in 1982 to protect underground features from corrosion. Located outside the security fence on the north side of the access road. The aboveground portion includes a white-painted steel electrical box mounted on a wood pole. The below ground portion is a well approximately 220 feet deep, containing eleven graphite anodes. The rectifier is in poor condition.*	**3-13**

[5] Slattery, Ebeling, Pogany, and Squitieri, "The Missile Plains: Frontline of America's Cold War,"(Historic Resource Study), 86.
[6] Ibid.

Small Scale Features, cont.	Description/Condition	Figure #
Two sewage lagoons (HS 108, IDLCS 100486)	*Northern lagoon is the primary structure which is roughly square with sides oriented at approximately a 30 degree angle from north/south. The southern lagoon is the secondary structure and is an odd shape, wrapping around the southeast corner of the primary lagoon. Both structures have earthen berms surrounding their sides to detain settlement materials. The lagoons are in good condition.*	**3-14**
Helicopter pad (HS 109, IDLCS 100485)	*Square concrete pad outside security fence on raised platform. Access is by graded gravel route from the Launch Control Center parking area. There is an asphalt perimeter around the helipad. The helipad is in good condition.*	**3-15**
ICBM super-high frequency satellite terminal antenna (ISST) (HS 126, IDLCS 754345)	*Installed circa1992, the antenna is located at the rear of the LCF support building. The antenna was installed when the missile sites were being deactivated in Ellsworth's 67th Strategic Missile Squadron. The antenna is in good condition.*	**3-16**
Television satellite dish (HS 121, IDLCS 398298)	*Installed circa 1987-88, the satellite dish is located in the grassy area in front (south) of the LCF support building. The satellite dish is in good condition.*	**3-17**
HICS	*Underground cable connecting Delta-01 to Delta-09. The cable was severed as part of the decommissioning of the site. The cable no longer functions, it is in poor condition.*	**Not visible above ground at Delta-01.**
Security fencing (HS 113, IDLCS 287263)	*Eight-foot high chain-link fence topped with barbed wire. The security fencing is in good condition.*	**3-10, 3-11, 3-12, 3-16, 3-17, 3-20, 3-22, 3-24, 3-25, 3-27**
Sewage lagoon fencing / Livestock fencing (HS 125, IDLCS 754342)	*Four-foot high barbed wire fence with red t-posts. The fences are in good condition.*	**3-14**
Cattle-guard (HS 129, IDLCS 754354)	*Horizontal metal grate at the intersection of the entrance driveway and Jackson County Road CS23A. The cattle-guard is in good condition.*	**3-18**
Electric fence	*Gray t-posts painted red on top and white plastic posts with a single low voltage electrical wire at about two-feet off the ground. Erected by the National Park Service to prevent livestock from damaging vehicles on the entrance drive. The electric fence is in good condition.*	**3-19**
Historic signage (HS 117, IDLCS 354856)	*Brown metal signs with white lettering hung on the security fence, warning signs, and no smoking signs. The signs are in good condition.*	**3-20**

Small Scale Features, cont.	Description/Condition	Figure #
Protective bollards (HS 116, IDLCS 354857)	*Wood and concrete bollards painted brown located near the buildings and other features to prevent damage from large vehicles. The bollards are in good condition.*	**3-21**
Access road and parking area (HS 119, IDLCS 390289)	*Asphalt drive and parking area. The pavement is in fair condition.*	**3-22, 3-23**
Well and water tanks (HS 118, IDLCS 354851)	*Brown metal box approximately four foot square and one foot tall is visible above ground. The portion of the well and water tanks that is visible is in good condition. The condition of the underground features is unknkown.(verify)*	**3-12**
Flagpole (HS 120, IDLCS 398270)	*Metal pole. The flagpole is in good condition.*	**3-23**
Basketball goal (HS 112, IDLCS 287625)	*Metal basketball post with goal. The basketball goal is in good condition.*	**3-23**
Volleyball court (HS 115, IDLCS 287266)	*Sand/dirt court with net supported by metal posts. The volleyball court is in fair condition. There are weeds encroaching into the sand.*	**3-24**
Horseshoe court (HS 114, IDLCS 287261)	*Two u-shaped wood pits with stakes aligned with each other. Grass is growing between the dirt pits. The horseshoe pits are in fair condition.*	**3-25**
Code burner (HS 111, IDLCS 287264)	*Small concrete square flush at the ground is visible. The code burner is in good condition.*	**3-26**
Interpretive wayside	*NPS wayside with historic photographs and text describing the "invisible warriors." Fiberglass panel mounted on aluminum posts. The wayside is in good condition.*	**3-20**
Portable toilet	*Tan plastic portable toilet building. The portable toilet is in good condition.*	**3-16**
Concrete pad, transfer switch, and generator	*Concrete slab and electrical transfer switch, and generator the generator is yellow. The pad, generator and switch are in good condition.*	**3-27**
Ranch	*A ranch complex is located to the northwest of the property. The complex includes a residence and several outbuildings. The ranch pre-dates the Delta-01 implementation and was present the entire time that the site was operational.*	**3-9**
Jackson County Road C23A	*Improved gravel road provides access to Delta-01 site. The road contains many potholes and washouts. It is in poor condition.*	**3-28**

Figure 3- 9: Delta-01 and adjacent ranch, facing northwest, June 2009
(source: QEA 3152 and 3154 combined)

Figure 3- 10: Hardened High Frequency Transmit Antenna, facing northwest, June 2009 (QEA 3438)

Figure 3- 11: Hardened High Frequency Receive Antenna at Delta-01, facing southeast, June 2009 (source: QEA 3385)

Figure 3- 12: Well cap (brown box) and Hardened Ultra High Frequency Antenna (white cone), facing southwest, June 2009 (source: QEA 3354)

Figure 3- 13: Aboveground portion of the cathodic protection rectifier at Delta-01, facing northeast, June 2009 (source: QEA 3468)

Figure 3- 14: Livestock fence with embankment of secondary sewage lagoon behind and Delta-01 buildings in background, facing northwest, June 2009 (source: QEA 3649)

Figure 3- 15: Helicopter landing pad and security fence, facing southwest, June 2009
(source: QEA 3363)

Figure 3- 16: ISST Antenna with portable toilet in background, facing east, June 2009
(source: QEA 3292)

Figure 3- 17: Television satellite dish, facing northeast, June 2009 (source: QEA 3414)

Figure 3- 18: Cattle guard at entrance drive, facing northwest, June 2009 (source: QEA 3472)

Figure 3- 19: Electric fence north of access drive, facing northwest, June 2009 (source: QEA 3453)

Figure 3- 20: Interpretive wayside and historic signs in background, facing northwest, June 2009 (source: QEA 3253)

Figure 3- 21: Wood bollards at Launch Control Facility, facing northwest, June 2009 (source: QEA 3376)

Figure 3- 22: Entrance driveway, parking area, security fence with vehicle gate open, facing west, June 2009 (source: QEA 3161)

Figure 3- 23: Driveway and parking inside security fence, flagpole and basketball goal, facing southwest, June 2009 (source: QEA 3274)

Figure 3- 24: Security fence and volleyball court, facing south, June 2009 (source: QEA 3159)

Figure 3- 25: South end of horseshoe court, facing south, June 2009 (source: QEA 3412)

Figure 3- 26: Code burner, facing southeast, June 2009 (source: QEA 3442)

Figure 3- 27: Concrete pad, transformer and generator, facing southwest, June 2009 (source: QEA 3458)

Figure 3- 28: Jackson County Road CS23A, with Interstate Highway 90 overpass in background, facing south, June 2009 (source: QEA 3627)

Delta-09 Landscape Existing Conditions

Description of the Site, Delta-09

Launch Facility Delta-09 is located approximately ten miles west-northwest of Launch Control Facility Delta-01. The Delta-09 site that is part of Minuteman Missile NHS includes five acres of land. The historic site included 90 acres within the northeast quarter of Section 26, Township 1 South, Range 16 East, including the south half of the northeast quarter of the northeast quarter, the southeast quarter of the northeast quarter, the east half of the east half of the southwest quarter of the northeast quarter, the southeast quarter of the southeast quarter of the northwest quarter of the northeast quarter, the northeast quarter of the northeast quarter of the southeast quarter, the east half of the northwest quarter of the northeast quarter of the southeast quarter, and the northwest quarter of the northwest quarter of the northeast quarter of the southeast quarter.

The site occupies part of an open, grassy landscape adjacent to Pennington County Road T512, about six-tenths of a mile west and south of Interstate 90, Exit 116. The Interstate is visible to the north and northeast of the property. The site and surrounding landscape slope gradually down from the north to the south. Views to the west, south and east present a rural landscape void of developments other than utility poles and the occasional ranch fence.

The core of the site consists of one and one-half acres of land that is surrounded by a chain-link security fence topped with barbed wire. Figure 3-29 illustrates the historic boundary of the property in relation to the core that is surrounded by a security fence. Figure 3-30: Delta-09 Existing Conditions Site Plan, illustrates the site and landscape features.

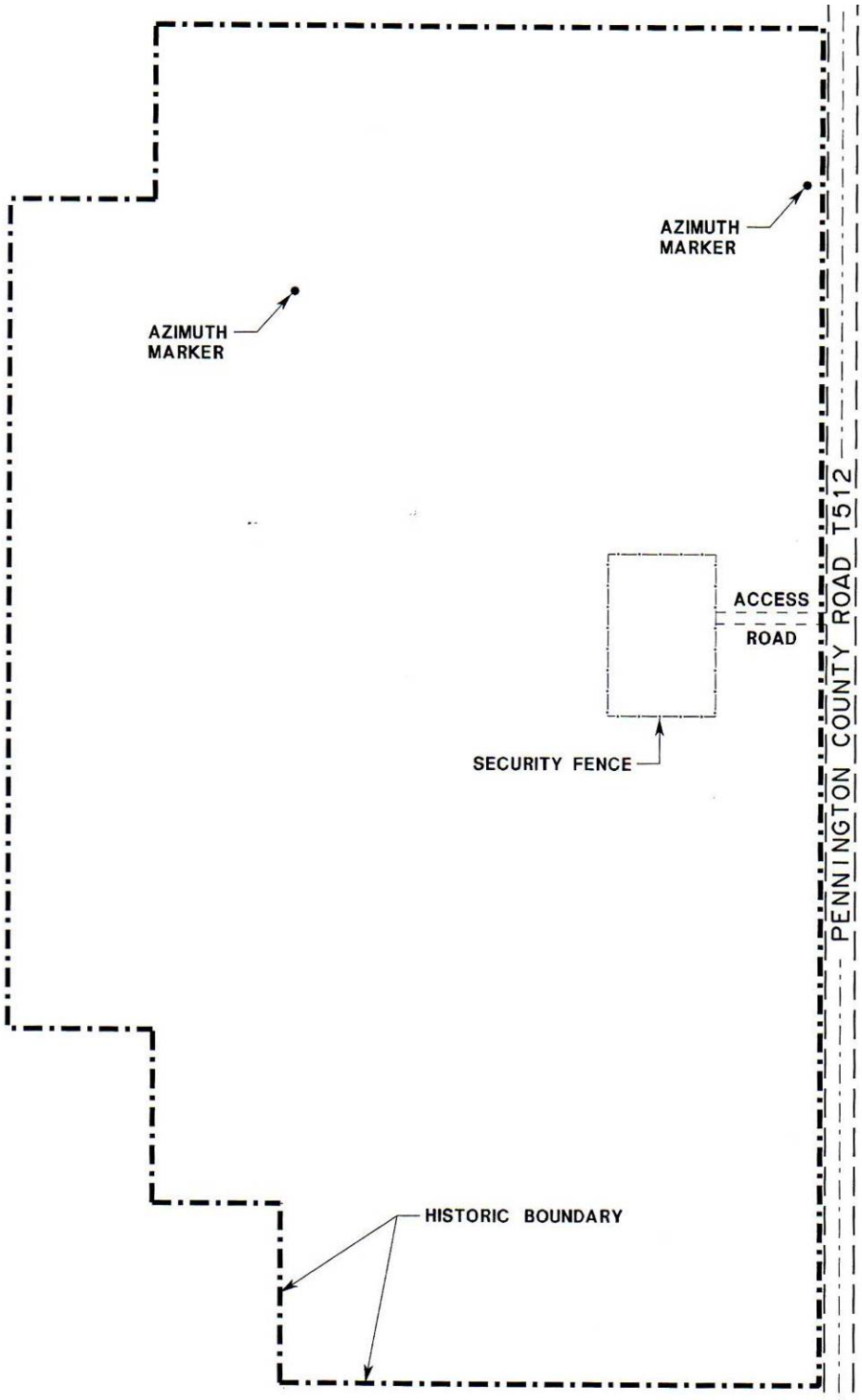


Figure 3- 29: Delta-09 Historic Boundary (source: National Park Service, Modified by Mead & Hunt, Inc., National Register Nomination for Minuteman ICBM Launch Control Facility Delta-01 and Launch Facility Delta-09, Ellsworth Air Force Base)

Next page:
Figure 3- 30: Delta-01 Existing Conditions Site Plan (source: QEA September 2009).

MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

HSR/CLR/EA
DRAFT JUNE 2010

DELTA-09 EXISTING CONDITIONS

0 20 40 80 120 NORTH

APPROXIMATE SCALE (FEET)

MAP KEY

1 Missile Launcher
2 Launch Facility Support Building
3 IMPSS Antenna
4 Hardened UHF Antenna
5 Azimuth Marker
6 Security Fencing
7 HICS Marker
8 Light Posts
9 Bollards
10 Helipad & Markers
11 Access Road & Maneuvering Area
12 Cathodic Protection Rectifier
13 Antenna Piers
14 Transporter Erector Pylons
15 Launch Facility Signs
16 Monument Set by Woolpert, 2009
17 Culvert
18 Portable Toilet

Building
Property Line/ Historic Boundary
Gravel Boundary
Security Fence
Contour Line
Low Density Gravel
High Density Gravel
Asphalt
Concrete

SOURCES

LAUNCH FACILITY SITE D-9 (276) PLOT PLAN, AS BUILT DRAWINGS SHEET C-48A, 1961
MINUTEMAN ICBM LAUNCH FACILITY DELTA-09, LCS, 2009
TOPOGRAPHIC SURVEY, WOOLPERT INC., 2009

QUINN EVANS
ARCHITECTS

The launch structures are located inside the security fence. A double gate is located on the east side of the security fence. A gravel access drive leads from Pennington County Road T512 to the double gate. The county road is an improved gravel road, prone to washouts and potholes.

The missile launcher and Launch Facility support building are located near the southern end of the fenced area. The majority of the structural elements associated with the facility are located underground. The area inside the enclosure includes an elevated gravel platform designed to provide space for the truck-like transporter-erector vehicles to maneuver. These vehicles hauled and emplaced the Minuteman missiles. A rectangular area at the north end of the platform served as a helicopter landing pad and is outlined by four small concrete corner pylons.

Soil at Delta-09 site is of the Comborthids-Argiustolls subgroup and has a clay-like texture. The soil shrinks when dry and expands when wet. In dry weather, this type of soil can develop deep cracks up to two inches wide, a yard long, and several feet deep. Permeability is moderate, and run-off is rapid. The shale bedrock is generally 30 to 60 inches below the surface.[7]

Spatial Organization, Delta-09

Delta-09 consists of approximately 5 acres of land, of which 1.58 acres lie inside the security fence. The fenced area is located approximately half way down the east side of the 5 acre tract and offset to the west of County Road T512 about 200 feet. The structures within the fenced area are mostly clustered in the southern half of the enclosure.

Land Use, Delta-09

Delta-09 is surrounded on the north, west, and south sides by the open landscape of Buffalo Gap National Grassland, under ownership of the United States Forest Service. The National Grassland is used for pasture for livestock. The land directly east of Pennington County Road T512 is privately owned and utilized for pasture. To the far north and east, other privately owned land within view of the facility is mainly utilized for pasture, although views to the west and north include the Interstate Highway, the town of Wall, and private development along the ridge south of Wall. Figure 3-31 illustrates the privately owned land within the area surrounding Delta-09.

Land within the security fence at Delta-09 is used for the protection and interpretation of the historic resources. The access gate is opened daily for independent access by visitors. Visitors who choose to take a tour of the park may be accompanied by NPS staff to the site as part of regularly scheduled interpretive programs.

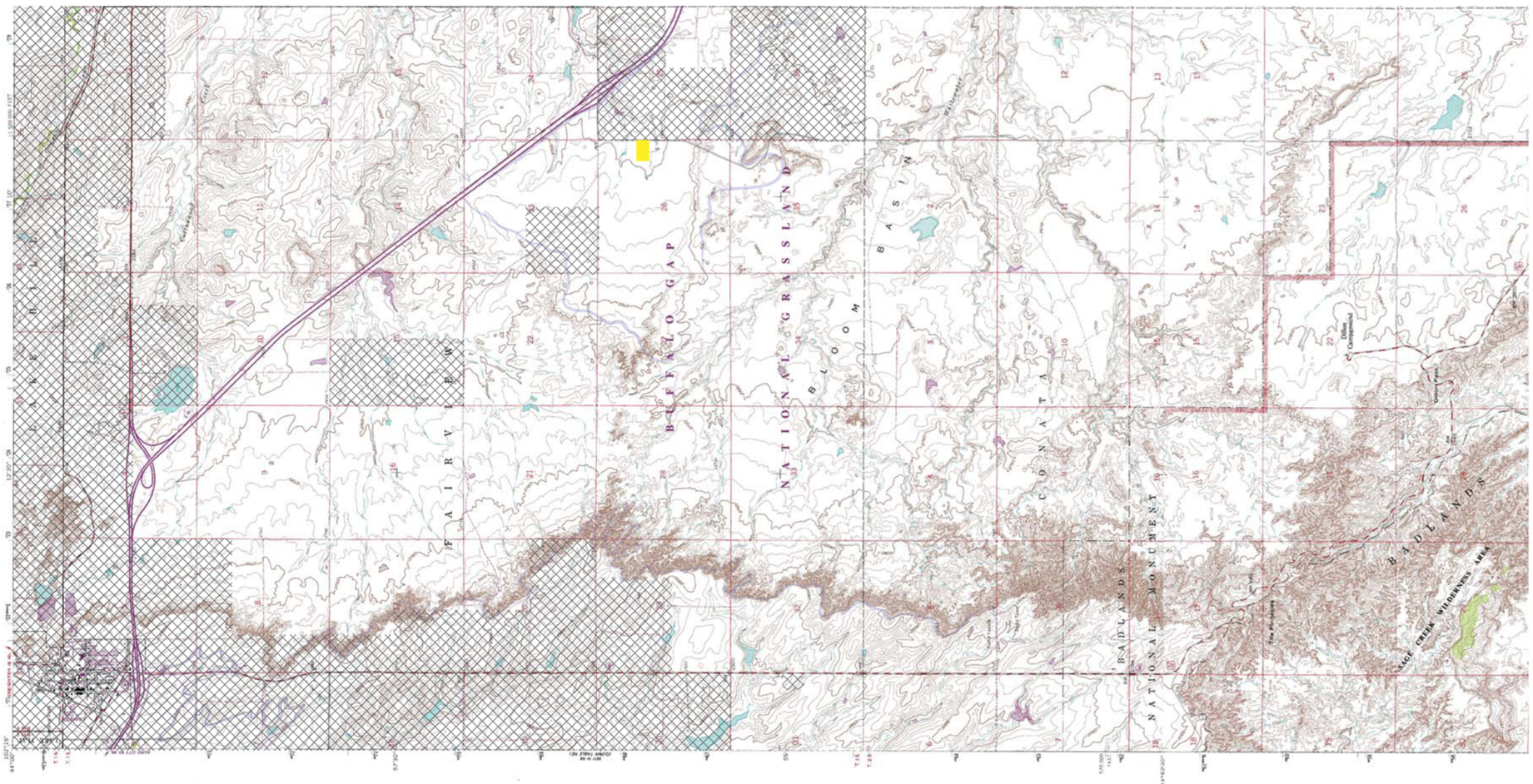
[7] *Delta-09 Cultural Landscape Inventory*, 2009, 7.

Next page:

Figure 3- 31: Delta-09 Existing Property Ownership (source: QEA September 2009).

MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

DELTA-09 EXISTING OWNERSHIP



0 1000 3000 5000 7000 9000

APPROXIMATE SCALE (FEET)

NORTH

MAP KEY

- Privately Owned Land
- Approximate Location of Delta-09

SOURCES

USGS MAP

QUINN EVANS | ARCHITECTS

Circulation, Delta-09

Vehicular access to the site is from Interstate Highway 90 exit 116 to Pennington County Road T512, an improved gravel road that is prone to washouts and potholes. The site access road has a gravel surface and extends to the west from County Road T512. Parking occurs on the sides of the driveway and County Road. Vehicular and pedestrian access to the facility is controlled by the security fence that surrounds the main resources. The entrance gate is locked at the end of each day and opened for pedestrian access during the park's operational hours. NPS maintenance vehicles may enter the facility as necessary through the controlled gate opening.

Once inside the fence, pedestrians are free to explore the facility. The missile launcher and viewing enclosure are the main point of interest, and most visitors move directly from the gate to the missile launcher. After observing the missile launcher, visitors look around the site and notice the other features and the surrounding landscape. Upon leaving the site, vehicles must back out of the access drive to the County Road. Frequently visitor vehicles are blocked by other vehicles, and must wait or ask other visitors to move their cars.

Topography and Views, Delta-09

The area inside the security fence at Delta-09 has been graded to form a level, earthen platform that is elevated above the surrounding terrain. The platform has a gravel surface, and was designed to provide a maneuvering platform for the truck-like transporter-erector vehicles that hauled and emplaced the Minuteman Ib and II missiles. The missile launcher and Launch Facility support building are located near the southern end of the platform.[8] The east-west oriented access drive was regraded recently, and a drain pipe was updated at the intersection of County Road T512 and the access drive. During the wet season, the southern portion of the site is inundated with water, causing erosion of the terrain on the south sides of the structures. A drainage channel lined with dense aggregate runs from the southern portion of the enclosed area, extending beyond the fence to the south. The channel then wraps around the outside of the eastern security fence to the southern side of the access road where it continues to the culvert.

The topography beyond the security fence on the west, south and east sides is relatively level grassland, allowing for far reaching views toward the badlands formations in the distance (see figure 3-32). Views to the north are also of grassland, however the elevation of the highway creates a visual edge to the views in that direction.

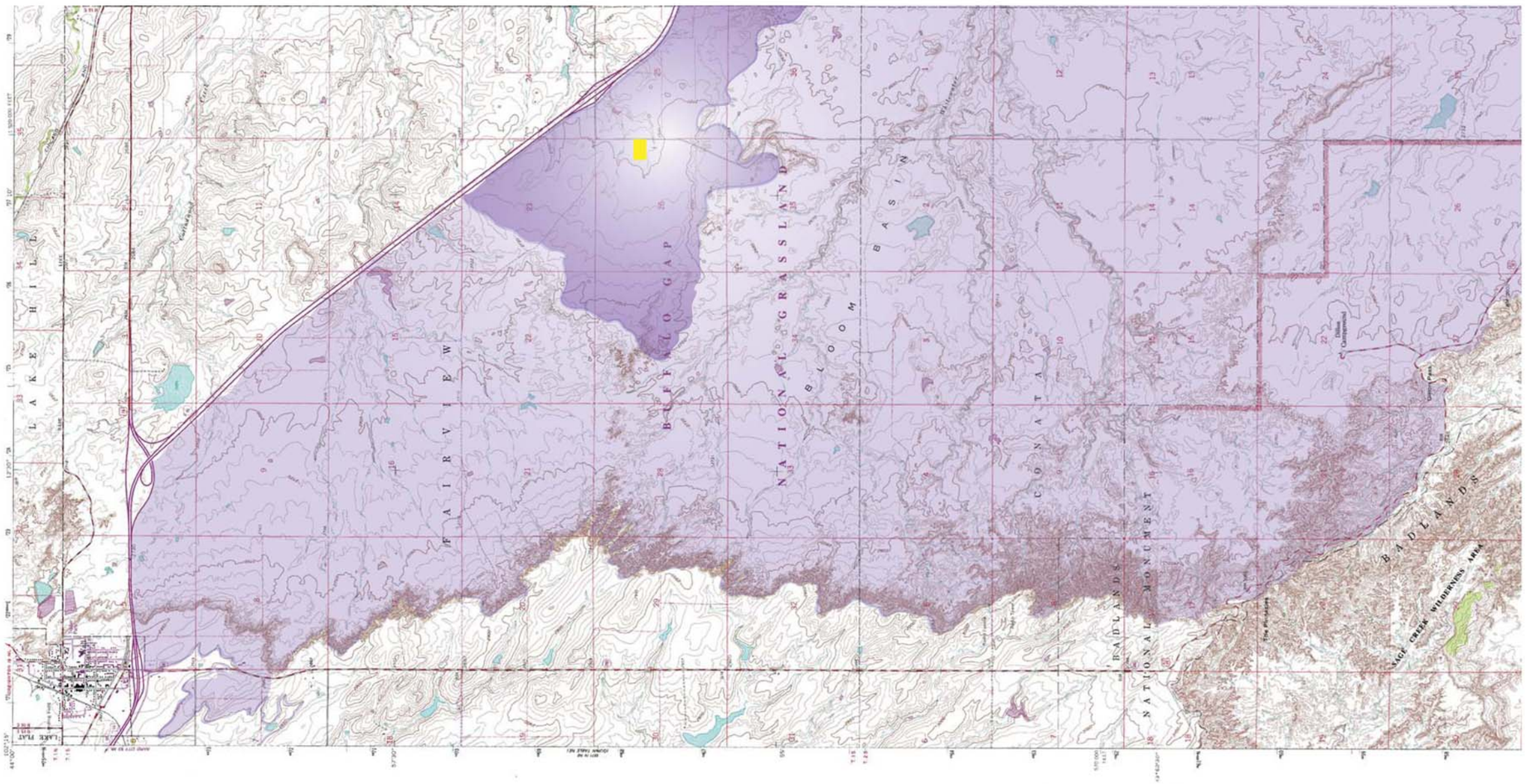
[8] Slattery, Ebeling, Pogany, and Squitieri, "The Missile Plains: Frontline of America's Cold War,"(Historic Resource Study), 87.

Next page:

Figure 3- 32: Delta-09 Existing Views (source: QEA September 2009).

MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

DELTA-09 EXISTING VIEWS



0 1000 3000 5000 7000 9000

APPROXIMATE SCALE (FEET)

NORTH

MAP KEY

- Delta-09 Foreground Views
- Delta-09 Background Views
- Approximate location of Delta-09

SOURCES

USGS MAP
QEA FIELD INVESTIGATIONS, JUNE 2009

QUINN EVANS | ARCHITECTS

Vegetation, Delta-09

The Delta-09 Launch Facility is situated in the northern Great Plains physiographic province, a region typified by open rolling mixed-grass prairie. The area surrounding Delta-09 includes an impoundment to the northeast along with drainages north and south of the site. A recent study identified 73 vascular plant species at Delta-09. These include graminoids such as buffalo grass (*Bouteloua dactyloides),* forbs (e.g., prairie coneflower (*Ratibida columnifera)* and slimflower scurfpea (*Psoralidium tenuiflorum),* and cacti shrubs (*Opuntia sp).*[9] Medium-height warm season grasses include western wheatgrass (*Pascopyrum smithii)* and green needlegrass (*Nassella viridula).* Short grasses such as blue gramma *(Bouteloua gracilis)* and buffalograss (*Bouteloua dactyloides)* may dominate localized areas, particularly during times of stress. Throughout the region shrubs and trees are generally restricted to draws, gullies, and surface waters.

No shrubs of any size are noticeable at Delta-09. When the Launch Facility was an active military site, the U.S. Air Force kept the maneuvering area and much of the rest of the space inside the security fencing clear of all vegetation through applications of herbicides.

Buildings and Structures, Delta-09

The primary structures at Delta-09 are the Missile Launcher (HS 901, IDLCS 100488) and the Launch Facility Support Building (HS 902, IDLCS 100490). The Architectural, Structural and Cathodic Protection Existing Conditions sections of this chapter provides detailed information about the building conditions.

[9] U. S. Department of the Interior, National Park Service, Natural Resource Program Center, Wilson, Gitzen, and Bynum, *Vertebrate and Floristic Inventories at Minuteman Missile National Historic Site: 2007 Status Report*, September 2008.

Small Scale Features, Delta-09

Table 3-2: Delta-09 Small Scale Landscape Features

Small Scale Features	Description/Condition	Figure #
Glass viewing enclosure	*A glass and aluminum viewing enclosure installed over the opening of the missile launcher in 2001. The enclosure is in good condition.*	**3-33, 3-34**
Improved Minuteman Physical Security System (IMPSS) antenna (HS 903, IDLCS 100489)	*White fiberglass monopole that rises from the base of the roof slab on the east side of the closure door opening of the missile launcher. Installed 1989. Microprocessor-based surveillance system designed to detect outer zone intruders. The antenna is in good condition. (verify)*	**3-34**
Hardened UHF antenna (HS 904, IDLCS 100491)	*Installed circa 1968 to link the Launch Facility with the SAC's airborne launch control center. It is located a few feet to the northwest of the silo opening and rests atop a thirteen-foot-diameter, reinforced-concrete base, shaped like an inverted saucer. The antenna is housed inside a cast-steel frustum capped with a conical, gray fiberglass weather dome. The antenna is in good condition. (verify)*	**3-33**
Cathodic protection rectifier (HS 912, IDLCS 390310)	*Installed 1982-83. Located on the south side of the access drive, approximately 160 feet east of the security fence. The below ground portion consists of a well approximately 220 feet deep that contains eleven graphite anodes. The system is not operational. It is in poor condition.*	**3-35**
Two azimuth markers (HS 905, IDLCS 100492)	*Used in conjunction with the autocollimator to align the Minuteman guidance system. They are located approximately one thousand feet from the launcher—one to the north-northwest and one to the north-northeast. Each marker consists of a cylindrical concrete pylon, three feet in diameter and eight feet deep, set vertically into the ground. The visible (above-ground) portion of each pylon is approximately eighteen inches in diameter and four feet high. A disc-shaped aluminum alloy survey plate is set into the top of each pylon. The azimuth markers are in good condition.*	**3-36**
Two HICS marker posts (HS 907, IDLCS 345796)	*Located to the south of the security fence. The wooden posts are about twelve feet tall with orange bands around the top and directional arrows to mark the location of the underground HICS. The marker posts weathered and are in fair condition.*	**3-37**
Security fence (HS 906, IDLCS 295903)	*Eight-foot high chain link security fence topped with barbed wire. The fence is in good condition.*	**3-37, 3-38**

Small Scale Features, cont.	Description/Condition	Figure #
Light posts (HS 908, IDLCS 354853)	*Two floodlights atop wooden utility poles provided illumination for nighttime maintenance activities at the site. The light posts are in good condition.*	**3-38, 3-39**
Bollard (HS 909, IDLCS 354859)	*Wood post painted yellow, approximately three feet tall. The bollards are in good condition.*	**3-38, 3-39**
Helipad & Markers (HS 910, IDLCS 354855)	*Level, square, raised gravel platform on north side of area enclosed by security fence with four small concrete cones painted yellow, one at each corner of the helipad. The helipad is in good condition.*	**3-39, 3-40**
Access Road and Maneuvering Area (HS 911, IDLCS 390310)	*Raised gravel road bed and elevated gravel platform designed to provide space for the truck-like transporter-erector vehicles to maneuver. The gravel surface is loose and plants are encroaching in some areas. It is in fair condition.*	**3-41**
Antenna piers (HS 913, IDLCS 400831)	*Two remnants of the concrete-based pad from early outer zone security system antennas. One is a square concrete pad with four reflector mount pedestals located sowthwest of the missile launcher. The other is a clutter monument and footing of the antenna pedestal located to the south of the launch support building. The antenna piers are in good condition, although the antenna is no longer operational.*	
Transporter erector pylons (HS 914, IDLCS 412538)	*Six steel elements located on the north side of the missile launcher at the four corners of a rectangular concrete pad used by the transporter-erector vehicles. The pylons are in poor condition.*	**3-42**
Launch facility warning signs (HS 915, IDLCS 754362)	*Metal signs mounted to the outside of the security fence. The signs are in good condition.*	
Culvert	*Metal culvert at the intersection of the access drive and County Road T512. The culvert is in good condition.*	**3-41**
Drainage ditch	*Ditch along the southern side of the access road, continuing along the southern side of the eastern security fence, and approximately half-way along the eastern side of the southern security fence. The ditch was regraded and lined with dense gravel in 2006. It is in good condition.*	**3-41**
Portable toilet	*A portable toilet structure is located at the northwestern corner of the site within the security fence. The structure was placed by the National Park Service. The portable toilet is in good condition.*	**3-39**

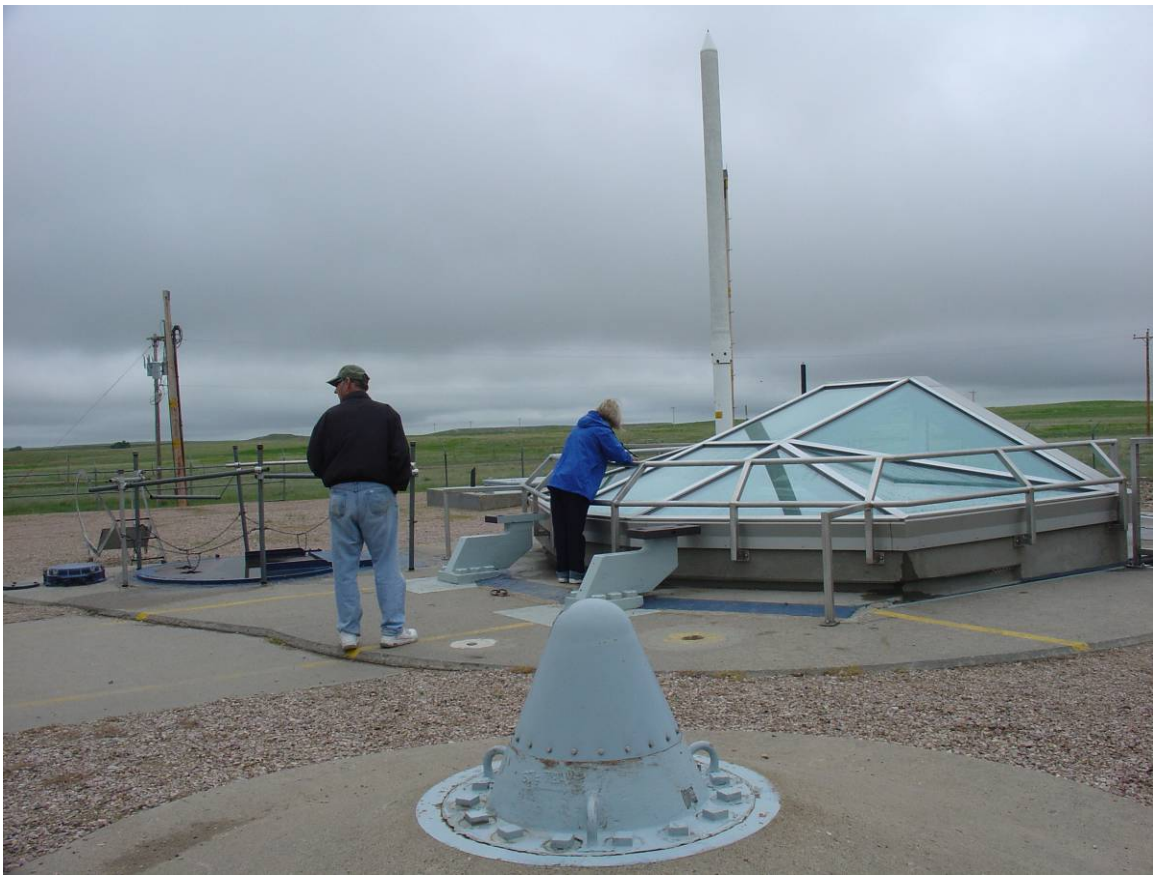


Figure 3- 33: Missile Launcher viewing enclosure with the hardened UHF antenna in the foreground, facing southeast, June 2009 (source: QEA 3578)

Figure 3- 34: Missile Launcher, facing north, the IMPSS antenna is the tall structure on the right of the viewing enclosure, the post on the left is a light post, June 2009 (source: QEA 3549)

Figure 3- 35: Cathodic protection rectifier, facing southeast, June 2009 (source: QEA 3521)

Figure 3- 36: Azimuth marker at Delta-09 with badlands formations in the background, June 2009 (source: QEA 3144)

Figure 3- 37: HICS marker post, with security fence in foreground and utility pole and ranch fence in background, facing south, June 2009 (source: QEA 3572)

Figure 3- 38: Wood bollard and lower portion of light post, with security fence and portable toilet in the background, facing northwest, June 2009 (source: QEA 3582)

Figure 3- 39: **Helipad, facing northeast, June 2009** (source: QEA 3574)

Figure 3- 40: Helipad marker, June 2009 (source: QEA 3584)

Figure 3- 41: Access drive at Delta-09, facing west, June 2009. Culvert under drive in foreground, cathodic protection device in middle, and gravel ditch to the left of the image. (source: QEA 3115)

Figure 3- 42: Transporter erector pylons, facing southwest, June 2009 (source: QEA 3592)

Figure 3- 43: Launch Facility Support Building, facing southwest, June 2009 (source: QEA 3536)

Views to other Missile Sites

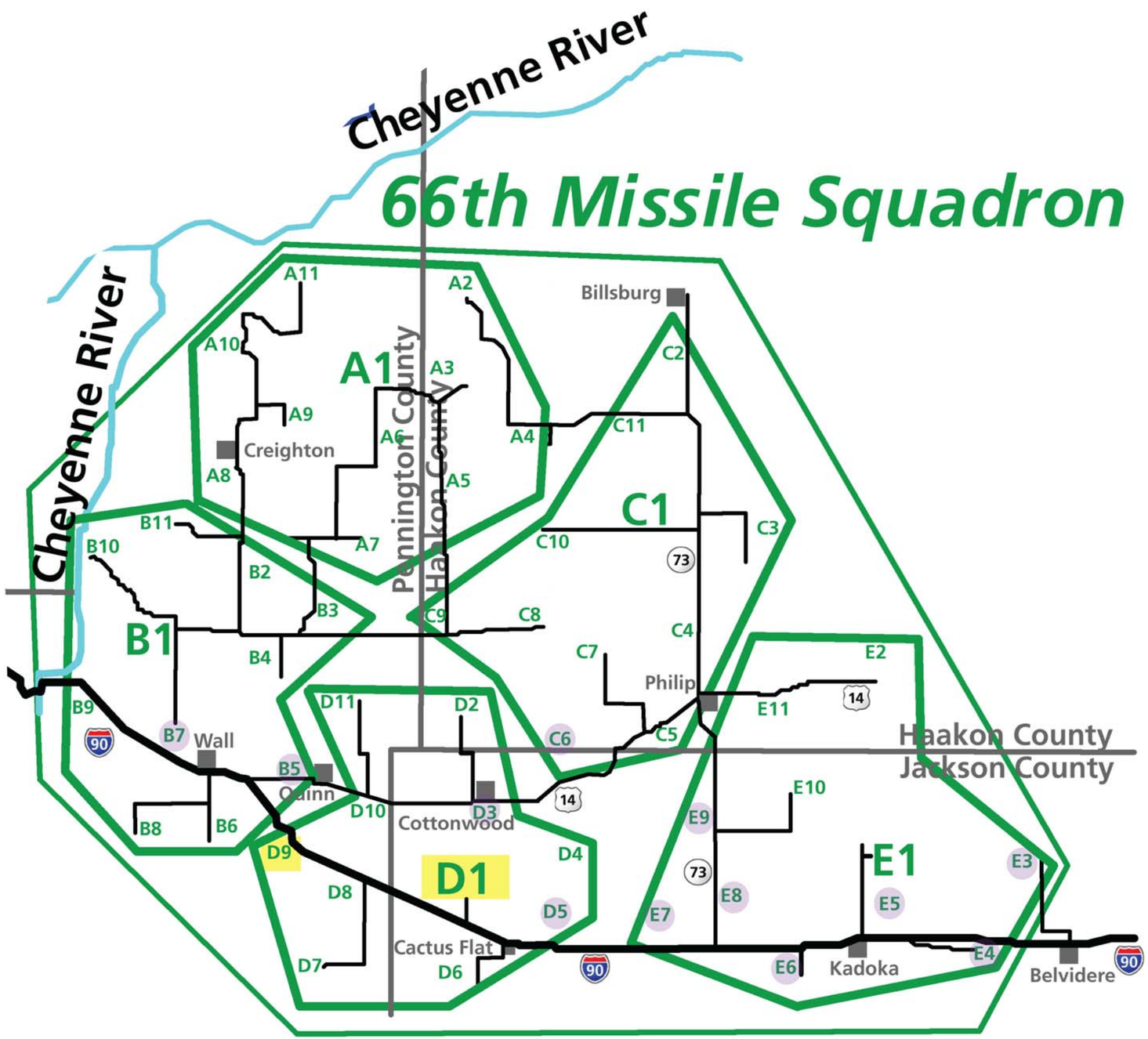
As indicated earlier, the Delta-01 and -09 facilities were part of the 66th Missile Squadron that included five launch control facilities and fifty launch facilities (see figure 3-2). The 66th Missile Squadron was one of three squadrons that made up the 44th Missile Wing in South Dakota (see figure 3-1). The facilities preserved at Delta-01 and -09 are representative of the extent of the Minuteman Missile programs. From a landscape perspective, part of the story is the quantity of missile sites that were present across the landscape of the Great Plains for over thirty years. Although the other Minuteman

facilities have been deactivated and the majority of their physical aspects have been erased from the landscape, hints of their previous existence remain.

When the sites were deactivated and the silos were imploded, the land was sold back to ranchers. The private owners may use the land as they see fit, with the stipulation that they may not disturb the ground beyond two feet from the surface. Each of the facilities had security fences similar to those at Delta-01 and -09. These fences extend above and below ground to a depth of eight feet. Therefore, the owners may not remove the security fences. In the locations of Minuteman sites, chain link fences are extant and can be viewed on the landscape. Some ranchers are utilizing the fences to store hay or farm equipment. Figure 3-44 illustrates the Minuteman sites that are visible from the highway between Delta-01 and -09.

Next page: Figure 3- 44: Former Minuteman Missile Sites Visible from the Highway, June 2009

MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA



FORMER SITES EXISTING VIEWS

NORTH

Former Minuteman Missile Sites that can be seen from the road.

Delta-01 and Delta-09

Former missile sites visible from I-90 Eastbound:
- Delta-01
- Echo-06
- Echo-05
- Echo-04

Former missile sites visible from I-90 Westbound:
- Echo-05
- Delta-01
- Delta-05
- Delta-09
- Bravo-07

Former missile sites visible from Hwy 73, Northbound:
- Echo-08
- Echo-09

Former missile sites visible from Hwy 14, Westbound:
- Charlie-06
- Delta-03
- Bravo-05

Former missile sites visible from access road South of I-90:
- Echo-07

SOURCES

Minuteman Missile National Park
QEA field investigations, June 2009

QUINN EVANS | ARCHITECTS

Existing Conditions: Architecture

Delta-01 Launch Control Support Building

The one-story ranch-style Launch Control support building is in good condition due to the maintenance provided by the Air Force personnel from Ellsworth Air Force Base and the National Park Service and the exterior and interior upgrades received in the mid-1980s. This analysis will address both exterior and interior materials, as well as building systems, as they existed during physical inspections that took place in 2008 and 2009.

Analysis of the nature and color of the paint finishes on the exterior and selected interior rooms of the Launch Control support building that are associated with the initial construction, the 1973 conversion to the Minuteman II, and the most recent paint colors that were applied prior to the transfer of the site to the National Park Service was undertaken. The findings of this investigation are provided in Appendix A: Paint Analysis.

The following definitions are utilized in the conditions assessment:[10]

Good: No visible damage; requires only standard maintenance.
Fair: Minor visible damage; may require repair.
Poor: Visible damage that affects the physical integrity of the element; may require repair or replacement of the element.

Exterior Envelope, Delta-01 Launch Control Support Building

Foundation: The 8 inch thick reinforced concrete foundation wall is in good condition with a couple areas of minor blemishes along the north and south elevations. The grade, especially along the south elevation, slopes towards the foundation wall allowing water to pond against the surface (figure 3-46). The presence of water and ice standing against the concrete foundation can, over time, deteriorate the concrete and negatively affect the structural steel rebar encased in the concrete as well as causing deterioration of the wood wall structure. The face of the wall is painted a dark chocolate brown, except below the door sills where it is painted off-white. The paint is in good condition.

[10] Definitions established by Quinn Evans Architects.

Figure 3- 45: Delta-01 Launch Control Support Building (source: QEA 8394)

Figure 3- 46: Ponding at south elevation foundation wall (source: QEA 0008)

Figure 3- 47: North elevation looking west (source: QEA 0041)

Siding: The pre-finished tan colored, wood grain embossed, prefabricated steel siding (8" exposure), which replaced the original asbestos cement shingle siding in the mid-80s, is in good condition with several dings, gouges, and dents throughout the four elevations (figures 3-45, 3-47, 3-48, 3-49). There is some staining below the hose bib on the south elevation caused by dripping water from the bib. The exterior and interior corner trim and window surrounds are also in good condition. There are no indications that the siding is not functioning as expected for its age and condition.

Copper condensate pipes protrude through the steel siding along the north and south elevations high on the wall and are routed down to grade to discharge the condensate water. These are located in conjunction with the fan coil units installed on the interior circa 1986. The lines are in good condition.

There are black metal brackets attached to the steel siding at various points on the north, south and east elevations that are remnants of an earlier security and

intrusion system that was removed. This security system was installed by USAF and NPS during the transfer period for the museum.

There are various other elements on the field of the metal siding on each elevation and are itemized as follows:

South Elevation:

- A dual-headed weatherproof electrical connection exists adjacent to door #2 at the generator room and is in good condition, although it is unknown if they still work.
- Security lights at each corner of the building, paired at the southeast and southwest corners and single at the northeast and northwest and a single over door #13, are in good condition. The NPS has paperwork submitted to replace selected exposed wiring.
- Exterior caged light fixtures at doors #9, 13, 14, and 17 are in good condition.
- Speaker adjacent to door #13 is damaged and may not function, as this was part of the removed intrusion system.
- Hood over door #13 at the pressure relief damper is painted (trim color dark brown) metal and in good condition.
- Hood east of door #17 at the fresh air intake grille is painted (trim color dark brown) metal and in good condition.
- There are two low louvers adjacent to doors 17 and 13 that show on the original drawings that are no longer extant on the building. It is likely they were removed or covered during the installation of the steel siding.
- The fire suppression system Siamese connection between door #14 and #17 installed in 1999/2000 is in good condition.
- Honeywell ambient temperature sensors for the boiler and chiller are mounted near door #17 high on the wall and are in good condition.
- Small steel tubing protruding above and west of door #17 is a vent tube for the propane tank servicing the boiler and was installed in 2000 by the NPS.

West Elevation

- Miscellaneous horizontal and vertical metal conduit, both painted and un-painted, are in good condition.
- There is one location in the south half of the gable where a previous penetration of electrical wire through the siding has been abandoned.
- The metal louver at the top of the gable is painted the dark brown trim color and is in good condition.

Figure 3- 48: Launch Control Support Building, west elevation (source: QEA 0018)

North Elevation

- The women's toilet room exhaust hood, unpainted, is in good condition.
- The electrical conduit, disconnect switch panel and propane supply pipe are in good condition.
- Two metal hoods over intake air louvers are painted the dark brown trim color and are in good condition. The air intake louver for the original brine chiller in Equipment Room #106 is lying on the floor, inside the room, below the opening. The opening has been sealed with plywood to protect the room from water infiltration. One or both of these hoods appears to have been added circa 1982; existing drawing ML-MH-005 indicates a hood being installed over the brine chiller louver.
- The original drawings show two large side by side and two small high and low air intake louvers in Equipment Room #106, only one of which is visible now.
- Between the two hoods are a piece of metal tubing and a capped off metal pipe that penetrate the siding. The pipe is an inspection test point for the sprinkler system installed in 1999 and is in good condition.
- The metal flue for the old generator penetrates the wall and turns skyward. It is painted the dark brown trim color and while in good condition needs repainted.
- At the northeast corner, a metal pipe, painted the tan wall color, runs vertically to above the line of the gutter. This pipe was the vent pipe for the diesel tank now filled in and no longer functions, but is in good condition.

Figure 3- 49: Launch Control Support Building, east elevation (source: QEA 0045)

East Elevation

- Miscellaneous metal electrical conduit, vertical and horizontal, painted and un-painted, is in good condition. One vertical conduit is painted white versus the tan siding color. The two lower horizontal conduits were used to store the dipsticks for the underground diesel tank when it was in use.
- The metal louver at the top of the gable is painted the dark brown trim color and is in good condition.

Windows: The windows are wood one-over-one double hung with vinyl cladding on the exterior installed circa 1983. Each window has a combination aluminum storm window comprising a stationary upper glass storm panel and an operable lower storm/screen panel held in place by aluminum clips with steel screws, many site-made. The windows are in fair to good condition with most having cracked vinyl at the glazing stop and some weatherization of the vinyl coating. The combination storms are in good condition. The interior face of the glass in the Men's Latrine Room #115 has a film coating which has discolored.

Doors: All exterior doors were replaced circa 1976 with hollow metal doors and frames and ¼" wire glass on doors #9, #17 & #25 (figure 3-50). NPS replaced all the door knobs and added the strike cover plates to all doors; they have the replaced hardware in storage. The attached garage door was changed to a pair of flush hollow metal doors circa 1985. All doors and hardware are in good

condition. All but two of the original ground mounted door holders are missing or damaged and the remaining two are in fair to poor condition.

- The concrete stoops at doors #9, #17, and #25 are in good condition.
- The concrete pad at door #4 slopes up from the asphalt drive to just below the threshold and is in good condition.

Figure 3- 50: Launch Control Support Building, south elevation doors (source: QEA 0012)

Gutters and Downspouts: The original gutters and downspouts were replaced circa 1983 with new aluminum gutters and downspouts along with new aluminum soffit and fascia panels and trim strips installed over the existing wood soffit and fascia boards. The gutters and downspouts were replaced again, in kind, by the NPS in 2008. Soffit and fascia panels, trim strips and gutters were pre-finished the dark brown trim color; downspouts are painted tan. All are in good condition. New concrete splash blocks were installed at the same time, painted dark brown and are in good condition.

Roof: The original roof had dark green asphalt shingles over 15 pound building felt over 1/2" plywood sheathing.. These shingles were removed and replaced, circa 1983, with Certainteed Saf-T-Lok Class C 2-tab, Timber Blend color over an additional layer of ½" plywood sheathing. The NPS removed the second roof and replaced it in-kind in 2008 with Certainteed Custom-Lok 25, Timber Blend color. The roof is in good condition.

- Miscellaneous metal vents, exhaust hoods and ventilators are all painted dark brown trim color and are in good condition.

- Wind direction indicator (no date as to original installation) is painted dark brown on the legs and yellow on the arrow and is in good condition.

Interior Finishes, Delta-01 Launch Control Support Building

General Finishes

Doors: All doors are original solid core wood doors painted and in good condition with the exception of door #12 which is a stained and varnished, hollow core wood, closet double sliding door in good condition. The matching doors on Storage Closet 109 were removed prior to1995 (1995 HAER photographs of the Day Room show them removed). Door 21 into the Security Bedroom and the adjacent hallway door have a vinyl or wood parquet pattern tile glued to the outer face of the door ¾ of the height. Door #8 also had a similar treatment on the bottom ¾ of the door removed by the National Park Service in 2004 due to the failure of the adhesive to hold the vinyl or wood in place. Interior doors #8 and the mid-corridor door have vision glass panels.

Carpet: All carpet was replaced, in kind, by the National Park Service in 2007, with the exception of the gun locker in Security Office 101, the Cook's Bedroom 106, the Day Room Storage Closet 110 and the Closet 122. During replacement, approximately 50% of the vinyl asbestos tiles and asphalt tiles were removed and not replaced due to loss of adherence to the concrete substrate.

Security Office 101

Floor: Partial original asphalt tile floor is under pad and carpet (light mauve with a dark mauve runner) installed in 2007. Carpet is in good condition.

Walls: Vinyl wood grained panel wainscot goes approximately half-way up the wall with the exception of an area above and to the east of door #7 to the corner where the paneling is full height. Paneling is in good condition. Remainder of the wall is painted drywall in good condition.

Ceiling: Suspended 2' x 2' tegular acoustic tile ceiling with surface mounted fluorescent light fixtures is in good condition. The definition of tegular or recessed T-bar ceiling is essentially a standard T-bar type ceiling construction except that each lay-in ceiling panel is kerffed or rabetted so that when installed in the T-bar frame the panel hangs below the grid.

Window Treatment: Tinted plastic transparent roller shades cover the windows from the interior and are in good condition. The corner window on the east wall is missing a roller shade and hardware.

Security Console: The extant security console was installed circa 1983 and is in good condition *(figure 3-51)*. The console was installed over the original carpet with the circa 1990 carpet scribed to the console. The original carpet remains exposed between the console and the east and south walls.

Expanded Metal Panel and Door: Expanded metal wire panel and door in the security office is in good condition. It was installed sometime between 1983 and 1999.

Figure 3- 51: Security Office looking east, 2009 (source: QEA 0117)

Entrance Shaft Vestibule 102

Floor: Steel plate floor is painted a medium-light grey and is in good condition.

Walls: Walls are painted drywall, color off-white, and in good condition.

Ceiling: Ceiling is painted drywall, color off-white, and in good condition.

Elevator: Steel frame, folding metal gate, expanded metal panels, and metal cab are all painted and in good condition. Cab interior has a carpet glued to wall panel in a wood frame on the three interior walls to a height of approximately 6 feet and is in good condition. It is unknown when this finish was installed.

Elevator Equip. Room 103

Floor: Concrete floor is painted a medium-light grey and is in good condition.

Walls: Walls are painted drywall, color off-white, and in good condition.

Ceiling: Ceiling is painted drywall, color off-white, and in good condition.

Expanded Metal Gate and Frame: Gate into the equipment room is an expanded metal gate painted off-white and is in good condition.

Recreation Room 104

The original attached garage was converted, circa 1983, into a finished recreation room.

Floor: The original concrete floor was covered with carpet during the conversion. The NPS replaced the carpet in-kind due to staining from a leak in the roof. Carpet is in good condition.

Walls: All walls are painted drywall in good condition. Four foot high vinyl, wood-grained wainscot with a wood cap molding is on each wall, and is in good condition.

Ceiling: Ceiling is painted drywall and is in good condition.

Generator Room 105

Floor: The original hardened concrete floor has been covered with vinyl asbestos tile (VAT), installation date unknown, and is in good condition. An area immediately adjacent to door #2 was damaged from a water leak and replaced by the NPS with tile matching the pattern but in a lighter color.

Walls: Walls are painted drywall and are in good condition with some wear and tear.

Ceiling: The ceiling is painted drywall and is in good condition with some isolated areas of water damage by the roof ventilator duct.

Equipment Room 106

Floor: Original hardened concrete floor has been covered in vinyl asbestos tile, installation date unknown, and is in good condition. The NPS stripped the finish

of the tile and re-waxed the floor post 2002. The floor of the Clean Room is the original hardened concrete painted and is in good condition.

Walls: Walls are painted drywall and are in good condition with some wear and tear. The NPS repainted the walls with the same color post 2002.

Ceiling: The ceiling is painted drywall and is in good condition. The NPS repainted the ceiling with the same color post 2002.

Vestibule 107

Floor: The original hardened concrete floor has been carpeted in 2007. The carpet is in good condition.

Walls: The base walls are painted drywall in good condition. A lower wood wainscot with cap and base occurs on the west wall that is similar to the wood wainscot on the west and south walls of the Dining and Recreation Room, stained slightly darker and is in good condition. The east wall of the Vestibule has vinyl wood grained hardboard paneling with cap and base that matches the typical wainscot in the building; also in good condition.

Ceiling: Suspended 2’ x 2’ tegular acoustic tile ceiling with recessed fluorescent light fixtures is in good condition.

Dining & Rec. Room 108

Floor: Partial original vinyl asbestos tile floor is under carpet and pad installed by the NPS in 2007. The light mauve color is similar to the carpet replaced and the dark mauve runner was added by the NPS to designate a route for visitors. Carpet is in good condition.

Walls: Base walls are painted drywall in good condition; some areas along the south wall have been previously wallpapered and painted over.

- East wall has full height wood paneling from the southeast corner to just behind the entertainment console. The paneling has no base or cap and is in good condition. A large wood framed woodland mural is mounted under the paneling (figure 3-52).
- The northeast corner has a large wood corner entertainment console that is in good condition.
- The north wall has the typical vinyl wood grained wainscot with a vinyl cap in good condition.
- The northwest corner has a built-in base cabinet with countertop and a smaller wall cabinet above in good condition. A refrigerator sits next to the base unit to the east.

- The west wall has a lower height wood wainscot with cap and base, stained, in good condition (figure 3-53).
- The south wall has the same stained wood wainscot found on the west wall that terminates at the Storage Closet and is in good condition.

Ceiling: Suspended 2' x 2' tegular acoustic tile ceiling with recessed fluorescent light fixtures in good condition.

Window Treatment: The windows on the north wall are covered with vinyl vertical blinds with matching valance in good condition.

Figure 3- 52: Dining and Rec Room 108, looking east (source: QEA 0080)

Figure 3- 53: Dining and Rec Room 108, looking west (source: QEA 0084)

Storage Closet 109

Storage Closet 109 has been converted, prior to 1995, to a vending alcove off the Recreation room. Conversion date is unknown; however, the 1995 HAER interior photographs indicate the doors removed and oral traditions, yet to be transcribed, indicate a Coke machine was in the west end of this converted area.

Floor: Carpet, installed in 2007, is in good condition.

Walls: Base walls are painted drywall in good condition but visually rough at a level above the door opening. The standard vinyl wood grained wainscot with cap and base are on the east, south and west walls and is in good condition.

Ceiling: The painted drywall in good condition.

Storage Closet 110

Floor: Carpet, circa 1983, over the original vinyl asbestos tile on the front half, with the tile creating a riser towards the back half. Both materials are in fair condition with some staining on the carpet and scuff marks on the tile.

Walls: Painted drywall in good condition.

Ceiling: Painted drywall in good condition.

Shelves: Painted wood shelves in good condition.

Telephone Equipment Room 111

Floor: The original hardened concrete has been covered with vinyl asbestos tile, installation date unknown, and is in good condition.

Walls: Walls are painted drywall with a 3'- 4" high hardboard wainscot painted and are in good condition with some wear and tear.

Ceiling: The ceiling is painted drywall and is in good condition.

Water Treatment Room 112

Floor: The original hardened concrete has been covered with vinyl asbestos tile, installation date unknown, and is in good condition.

Walls: Walls are painted drywall with a 3'- 4" high hardboard wainscot painted and are in good condition with some wear and tear.

Ceiling: The ceiling is painted drywall and is in good condition.

Utility Room 113

Floor: The original hardened concrete has been covered with vinyl asbestos tile, installation date unknown, and is in good condition.

Walls: Walls are painted drywall with a 3'- 4" high hardboard wainscot painted and are in good condition with some wear and tear.

Ceiling: The ceiling is painted drywall and is in good condition.

Kitchen 114

Floor: vinyl asbestos tile, color grey marbleized, installation date unknown, is in good condition.

Walls: Base walls are painted drywall in good condition. Covering the drywall is partial height prefinished hardboard paneling, painted white, with rubber base in good condition.

Ceiling: The ceiling is painted drywall and is in good condition.

Cabinets: Various kitchen cabinets were replaced circa 1976, 1980 and 1983 with the metal cabinets that presumably are extant today (figure 3-56). Cabinets are orange and in good condition. "Midway Units" cabinets with sliding glass doors were added under the upper wall cabinets on the south wall circa 1983 and are in good condition.

Countertops: Original stainless steel counters and integral backsplash were replaced circa 1983 along with the double bowl sink at the north wall; all are in good condition. The double bowl sink on the south wall was removed during the circa 1983 remodeling.

Pass-Thru Window: The pass-thru window received a new stainless steel frame circa 1983 and is in good condition (figure 3-55).

Kitchen Equipment:

- The exhaust hood, base cabinets, food warmer, and griddle all appear to be original equipment and in good condition (figure 3-57).
- The original range (4 burner) with oven appears to have been replaced with a commercial oven unit, between 1980 and 1983, which is in good condition.
- The original deep fat fryer appears to have been replaced with a two burner cook top unit, between 1980 and 1983, which is in good condition.
- Refrigerator, unknown date, is in good condition.
- Dishwasher: The original dishwasher was relocated on the north wall to the east, circa 1980, and is in good condition (figure 3-54). It is unknown if this unit is still the original.

Figure 3- 54: Kitchen, looking north (source: QEA 0012)

Figure 3- 55: Kitchen serving and pass-thru, looking southwest (source: QEA 0078)

Figure 3- 56: Kitchen cabinets, looking south (source: QEA 0074)

Figure 3- 57: Kitchen stove, looking southwest (source: QEA 0071)

Serving 114A

Floor: vinyl asbestos tile, color grey marbleized, installation date unknown, is in good condition.

Walls: Base walls are painted drywall with rubber base in good condition. Covering the drywall is partial height vinyl wood grained hardboard paneling on the north and west wall in good condition. The paneling on the west wall has a tall, black, solid material base with the rubber base attached to it; all in good condition. The south and east wall of this room were reconstructed circa 1985.

Ceiling: Suspended 2' x 2' tegular acoustic tile ceiling with recessed fluorescent light fixtures in good condition.

Kitchen Equipment:

- Two stand alone upright freezers are against the north wall, one relocated from the kitchen; both in good condition.
- A three unit commercial freezer unit stands along the east wall and is in good condition (figure 3-59).

Figure 3-58: Commercial freezer unit on east wall of serving room (source: QEA 0077)

Men's Latrine 115

Floor: The original vinyl asbestos tile was replaced with ceramic tile, circa 1980, and is in good condition. Colors are Cocoa Brown for the field and Reef Brown for the 12" wide accent band.

Walls: The original base wall is painted drywall and is in good condition. The original prefinished hardboard panels and rubber base were replaced with ceramic tile wainscot, 4'-0" high, circa 1980, and is in good condition. Color of the wall tile is Reef Brown.

Ceiling: The original drywall ceiling is painted and in good condition.

Bathroom Accessories:

- The original wall mounted porcelain sinks were replaced with cast iron single bowls with a porcelain finish set in a new plastic laminate countertop and backsplash, circa 1980; all in good condition.
- A new plastic laminate shelf was installed above the counter, circa 1980, and is in good condition.
- The original three individual light fixtures above the sinks were replaced, circa 1980, with a continuous bar light and is in good condition.
- Original paper towel dispenser was replaced, circa 1980, with a new towel dispenser and trash receptor and is in good condition.
- All original metal toilet & urinal partitions and dressing compartments, and prefabricated shower stalls were replaced, circa 1980, with new metal partitions (Knicker Bocker Co.) and prefabricated shower stalls. The shower stalls and metal dressing compartments partitions (Knicker Bocker Co.) were replaced again, circa 1983, when the supporting walls were reconstructed. Associated shelves and benches were re-installed during the last episode. All are in good condition.

Women's Latrine 116A

The women's latrine was installed circa 1985/86.

Floor: 1" x 1" ceramic tile in good condition.

Walls: Base walls are painted drywall in good condition. A 4 ¼" x 4 ¼" ceramic tile wainscot is on each wall to a height of 4'-4 ¼" and is in good condition.

Ceiling: Painted drywall in good condition.

Bathroom Accessories

- Lavatory: Plastic laminate lavatory counter, backsplash, leg, and porcelain sink are all in good condition.

- Prefabricated vinyl plastic shower stall is in good condition except for a hole in the floor.
- Mirror, over mirror light fixture, wall mounted soap dispenser, and wall mounted paper towel and toilet paper dispenser all are in good condition.

Bedroom 116

Floor: The circa 1983 carpet was removed to route new plumbing lines below the concrete slab and construct the Women's Latrine. New carpet was installed after the work and is in good condition.

Walls: Base walls are painted drywall in good condition. The north wall has a partial height vinyl wood grained hardboard wainscot from corner to corner in good condition. The east and south wall of the room and the walls adjacent to the Women's Latrine are covered in fabric covered acoustic panels from floor to ceiling and are in good condition.

Ceiling: Suspended 2' x 2' tegular acoustic tile ceiling with recessed fluorescent light fixtures in good condition.

Typical Bedroom (Rooms 117, 118, 119, 120, 123, & 124)

Floor: All bedrooms had the circa 1983 carpet replaced with reproduction carpet in 2007-2008, installed over the original asphalt tile (figure 3-59). All carpets are in good condition. In Room 124, the carpet had been removed for replacement exposing the original tile pattern. There is a 4" dark brown or burgundy border tile that only occurs at the exterior wall (both north and west wall in this room). Next to that is a 9" x 9" tile border of light beige and then the field tile of grey or dark beige (it is difficult to tell the color). All tiles are the marbleized pattern and have carpet adhesive coating the entire floor. Reproduction carpet now covers the original tile in Room 124.

Walls: Base walls are painted drywall in good condition. The exterior wall of each room has the partial height vinyl wood grained hardboard wainscot from corner to corner in good condition (figure 3-60). The corridor walls and walls adjoining the Men's Latrine have the fabric covered acoustic panels from floor to ceiling in good condition.

Ceilings: Suspended 2' x 2' tegular acoustic tile ceiling with recessed fluorescent light fixtures in good condition.

Window Treatments: Vertical fabric curtains on a retractable rod in good condition. Window glass in Bedrooms 118 and 120 has been painted black.

Figure 3- 59: Typical bedroom (118) looking northwest (source: QEA 0063)

Figure 3- 60: Typical bedroom (123) looking south (source: QEA 0058)

Corridor 121

Floor: Partial original asphalt tile floor is under pad and carpet installed by NPS in 2007. The dark mauve color was added by the NPS to designate a route for visitors. Carpet is in good condition.

Walls: Original base wall is painted drywall. Vinyl wall fabric was installed on the drywall prior to 1985 and then subsequently painted. Walls are in good condition. The lower parts of the walls have the partial height vinyl wood grained hardboard wainscot with wood cap and base in good condition. The drinking fountain alcove has dark brown, fabric weave pattern, wall covering on three sides, in good condition.

Ceiling: Suspended 2’ x 2’ tegular acoustic tile ceiling with recessed fluorescent light fixtures in good condition (figure 3-61).

Linen Closet 122

Floor: Blue carpet, installation date unknown, over original asphalt tile, both in good condition.

Walls: Painted drywall in good condition.

Ceiling: Painted drywall in good condition.

Shelves: Painted wood shelves in good condition.

F**igure 3- 61: Corridor, looking west** (source: QEA 0012)

Launch Control Center

Vestibule B-1

Floor: Original concrete, painted, in fair condition with moderate wear of the painted surface.

Walls: Original concrete, painted, in good condition with moderate wear of the painted surface. See Part 1-A Historical Background for discussion on decorative paintings in this area.

Ceiling: Original concrete, painted in good condition.

Blast Door and Door Stop: The original 8-ton, blast-proof, steel and concrete door is painted light grey and in good condition (figure 3-62 and 3-63). See Part 1-A Historical Background for discussion on decorative paintings on the face of this door. The steel door stop is bolted to the concrete wall 3'-5" high to the center and painted bright yellow with a rubber or neoprene bumper pad attached to the end. The door stop is in good condition.

Figure 3- 62: LCC Vestibule, blast door (source: QEA 7015)

Figure 3- 63: Launch control center vestibule artwork (source: QEA 7017)

Shell: The original interior concrete surface and steel interior liner are painted and are in good condition. Additional elements within the capsule are as follows:

- Emergency escape tube steel cover is painted red and is in good condition along with the associated linked chains attached to it.
- The structural steel floor support, floor plate, and permanent shoring devices are painted and in good condition.
- Stainless steel handrails, added by the National Park Service for safety, are in good condition.
- Shock isolators (4) are painted white and are in good condition.
- Chilled water tank on north wall is galvanized steel and is in good condition.
- Cable protective frame enclosure on south wall is galvanized steel and is in good condition.
- Exterior surface of the Launch Control Center is galvanized steel and is in good condition.
- Insulated electrical cables are in good condition. NPS reported that a whitish growth had attached itself to the cable covering, had the growth tested and determined that it is not harmful to the cable.
- Miscellaneous equipment boxes, conduit, piping, handholds and footholds, etc., all appear to be in good condition.

Floors: Carpet, installed with a reproduction of the prior carpet in 2007 by NPS, is in good condition. Original documents called for vinyl sheet floor covering over the steel plates. 1982 photographs do not appear to show carpet on the floor. 1990 photographs show carpeting of a beige/gold color with a beige/gold vinyl tile between the rails of the sliding chair.

Walls: Solid and perforated metal acoustic panels, painted, in good condition. Sound absorption fabric panels were installed between 1982 and 1990 on the walls and ceiling to deaden the noise in the Center (figures 3-64 and 3-65). These beige colored panels are in good condition with the exception that the hook and loop fasteners are coming loose from the racks due to the contact cement releasing from the attachment point.

Ceiling: Acoustic fabric over perforated metal acoustic panels, painted, in good condition.

Equipment:

- Latrine unit was changed out circa 1988 and is in good condition.
- Modular bed storage unit assembly was installed circa 1990 and is in good condition.
- All other fixed equipment including desks, chairs, and electronics are all in good condition.

Figure 3- 64: Launch Control Center, looking west (source: QEA 0110)

Figure 3- 65: Launch Control Center, looking east (source: QEA 0113)

Life Safety and Accessibility

A conceptual-level assessment of the Delta-01 Launch Control and Support Facility with respect to barrier-free accessibility and life-safety issues has been conducted, see Appendix B. This analysis was based on Chapters 3 through 10 of the 2006 International Building Code (IBC) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG). The project was not reviewed under the International Existing Building Code or under Chapter 34 of IBC.

The Delta-01 site consists of a one-story, ranch-style structure containing living quarters for the personnel at the site, a security office, and associated utility and support requirements. The structure is wood, platform framed, with a concrete foundation, qualifying as Type IIIB. The main floor is about 5,080 square feet. Constructed beneath this structure is an underground concrete capsule containing the missile launch control facility. This underground capsule is accessed via an open elevator hoistway. Additionally, there are a number of communications structures on site and a detached heated vehicle storage facility. The vehicle storage facility and communications structures were not evaluated as part of this assessment.

The facility was de-commissioned by treaty and is now administered by the National Park Service as a historic site. Public access to the site is currently limited to three groups of six individuals, escorted by ranger guides. While one group tours the above-ground launch support building, a second group tours the site, while the third group is escorted through the underground launch control facility. Permanent restroom facilities in the launch support building are not used. Temporary toilet facilities are available on site, and a comfort station near the site is contemplated by the NPS to provide permanent barrier-free restroom facilities for the site.

Barrier-Free Issues: The launch support facility is a former military installation and it was not designed to accommodate universal accessibility. Despite this, the building has few accessibility issues, owing mainly to the facts that it is a single story structure and that the existing restroom facilities within the structure are not available for public use. The two most significant barrier-free issues identified at the site are (1) the lack of barrier-free on-grade entrances and (2) the presence of narrow door openings in the building, which present obstacles to an accessible route through the building. Additionally, the elevator to the Launch Control Center is not adequately sized to meet current barrier-free design requirements.

Although the building is a one-story structure, the finish floor is a few inches above grade. Although there is a sloped grade up to the utility area doors adjacent to the elevator lobby entrance (Door 4) this grade still does not provide suitable barrier-free access.

There is adequate width at the exterior entry doors and most interior doors along circulation paths. Doors to the dormitory and security office spaces within the building, according to USAF as-built drawings, are 32 inches in width, equating to an approximately 30 inch clear swing. Existing latrine doors are indicated to be 30 inches

wide. The security office doors, which are the only available interior connection between the living quarters and the elevator lobby for the capsule, present an issue for the accessible route through the building. Approach clearances at doors vary throughout the building. Latch-side clearances are not always available, but maneuvering clearances are available.

A minimum clear swing of 32 inches is required for doors by ADAAG. In practical terms, a 36-inch door is required to provide this minimum opening. However, the fact that public access is limited to small, escorted groups provides the opportunity for the escorting ranger to provide assistance to visitors in wheelchairs, for whom the width requirements are intended. Doors along the accessible route are not so narrow as to preclude wheelchair passage altogether, therefore a reasonable accommodation can be made for these visitors by providing assistance through the door opening. If self-guided tours were ever implemented for this facility, the narrow doors along the accessible route would need to be replaced with 36-inch doors of the same design and materials, to accommodate wheelchair users. An alternative to this approach is to remove the 32" door and door stops providing the 32" minimum clearance at the doors to the dormitory and security office. A second option is to provide a narrower Park-owned wheel chair offered to the visitor as a choice.

Access to the Launch Control Center is provided by an elevator. The only alternative means of egress from the underground center is a ladder. National Park Service safety requirements include asking all visitors if they are physically able to climb a thirty-one foot ladder in the event an emergency. Visitors who cannot do so are not allowed to descend into the Launch Control Center. While it is unlikely that many visitors in wheelchairs could meet this requirement, it is possible and the park would like to keep the option available. For visitors who cannot meet the requirements to visit the Launch Control Center, NPS will need to provide an alternative approach to interpreting the Launch Control Center.

The existing elevator to the Launch Control Center is very small, and its use as a barrier-free means of access is consequently limited. The elevator cab measures approximately three feet by five feet. As a result, an individual in a wheelchair will take up most of the space within the elevator. The location of the elevator within the structure, and its servicing of an underground structure, precludes the possibility of alteration of the hoistway. Therefore it is neither practical nor technically feasible to provide a larger elevator car. It should be possible for a wheelchair user to maneuver into the car, and an accompanying ranger can operate the elevator controls, so it is possible to accommodate wheelchair users with this elevator. However, it is unlikely that a wheelchair user can share this car with more than two or three standing individuals, due to the space limits in the car, and this operational issue will need to be addressed by the NPS.

Life-Safety Issues: Exit access, capacity and remoteness in the above-ground facility meet or exceed the requirements of IBC, with three available exits remotely located. The facility is fully-sprinklered and equipped with smoke detectors. Height and area requirements fall well within parameters established by IBC for the construction type (IIIB) of the building.

The real challenge to life-safety compliance at this facility is the Launch Control Center. A confined underground space, this chamber is accessible only by means of the elevator, which is served by an open hoistway. An emergency escape ladder is adjacent to the hoistway, which leads up to the ground-level elevator lobby. Typically, ladders such as these are not considered a valid means of egress. Open elevator hoistways connecting different floors of a building are not permitted under the current IBC. In this case, the elevator lobby is fully enclosed and provided with a direct means of egress (via Door 4), which mitigates some of the life-safety risk from the interconnection created by the open hoistway.

Under Chapter 4 of IBC 2006, it appears that the Launch Control Center qualifies as both an underground building (Section 405) and as a Special Amusement Building (Section 411). Under Section 405, the Capsule appears to comply with exceptions due to its size, occupant capacity and distance below grade, and therefore the special rules of Section 405 do not apply. As a Special Amusement Building, the capsule is required to have automatic fire detection, sprinklers, marked paths to exits, an emergency voice communications system, and Class A interior finishes. Fire detection systems and sprinklers have been installed in the capsule. However, the emergency voice communication system is not installed. As the facility is relatively small, the issue with egress deals not so much with the path to the exit not being clear, so much as the means of egress itself being not readily available. Interior finishes generally consist of painted metals and concrete. It is unknown whether the historic acoustical fabric ceiling panels installed in the control center are treated to perform as a Class A interior finish material.

Asbestos Containing Building Materials and Lead Paint

Two asbestos surveys have been conducted on Delta-01 to determine the presence of asbestos containing building materials (ACBMs) (see Appendix D). The first report was published on January 3, 1994 by Intermountain Technical Services, Inc., of Rapid City, South Dakota, and commissioned by Ellsworth Air Force Base, South Dakota. The second report was published in 2009 by Anderson Environmental Services, of Belle Fourche, South Dakota and commissioned by the National Park Service.

The 1994 report identified the following materials as containing the asbestos in the form of chrysotile or amosite:

- Floor tile under carpet & mastic (the amount of square footage identified would suggest this is all the original 9” x 9” vinyl asbestos and asphalt tiles in the Dining and Recreation Room, adjacent Storage Closets, Bedrooms, Corridors, Linen Closet, and Kitchen) now beneath carpeting.

- 9" tan floor tile & mastic (assumed to be in the Launch control center).
- Mudded pipe joints on the mechanical piping.
- Exhaust stack insulation
- Roof caulk on the Launch Facility Support Building and the Vehicle Heated Storage Building.
- Vibration isolator in the Vehicle Heated Storage Building.

The 2009 report identified the following materials as containing asbestos:

- Mudded pipe joints throughout.
- 12" floor tile, grey from the LCC
- Metalbestos chimney.
- 9" floor tile from West (Linen) Closet.
- Flat panels (transite) from weapons locker in Security Control Center.
- LCC vent insulation, grey – silver foil covered flex duct on top of the LCC.

No lead paint testing has been performed to date at Delta-01.

Building Systems[11]

Heating, Ventilating, and Air Conditioning: The building has two mechanical systems. One system serves the Launch Control Facility and one system serves the Launch control center.

The LCF system consists of a hot water heating system and a chilled water cooling system. The hot water heating system consists of a Kewanee Model 3R1-KO gas fired boiler with a capacity of 324 MBH, two circulating pumps and radiation units. Heating for the space is accomplished using a radiant heat (hot water system) delivered through baseboard wall fins and convectors. This appears to have been the original heating system for the building. The boiler burner and the circulating pumps have been replaced recently.

The chilled water system was added to the building sometime after the original construction. It consists of an air cooled chiller unit with a split evaporator. The evaporator is located at the ceiling in the boiler room. The chiller is located at the back of the building. The refrigerant lines run from the chiller to the evaporator which generates chilled water for the building. Two chilled water pumps supply chilled water to three fan coil units located in the living/dining area and one fan coil unit located in the first floor security room.

Both the heating and cooling systems have been upgraded recently and appear to be in good shape. Anticipated life of the present system is estimated at 10+ years.

[11] Provided by Affiliated Engineers, Inc.

The systems for the Launch Control Center are original to the construction of the structure. The cooling for the center was accomplished by the use of a brine chiller. An air handling unit located in a room next to the chiller provided conditioned air to the capsule area. The air supply was maintained at 55°F and the return air was 77°F. These units are located on ground level in rooms attached to the main building. These units were on a 120/208 power source and also on an emergency generator. The control center also has an emergency air handling unit that could supply air if the ground side unit was made inoperable. The equipment that serves the Launch Control Center is not in use.

Electrical: There appears to be adequate power for the Launch Control Facility as it is presently being used. The original building had an Allis Chalmers diesel engine generator set that provided emergency power for the building as well as the Launch control center. There is a day tank in the room for the generator that was fed from underground oil tanks. These underground tanks have been removed from the site. This unit is no longer operational. From what the team was able to observe, it appears the electrical system was installed per code requirements at the time of installation. No items of non-compliance with existing codes were observed.

A new LP gas fired emergency generator was installed by the NPS just outside the fence on the northeast corner of the building. This generator is sized to provide emergency power to the elevator motor, the building heating system and some lighting in the building and on the site.

Delta-01 Vehicle Heated Storage Building

The 32 foot by 40 foot, three-bay, gable roof Vehicle Heated Storage Building was constructed ca. 1968 to match the look and materials of the adjacent Launch Control Facility. The building is in good condition due to the maintenance provided by the Air Force personnel from Ellsworth Air Force Base and the National Park Service and the exterior and interior upgrades received in the mid-1980s. This analysis will address both exterior and interior materials, as well as building systems, as they existed during physical inspections that took place in 2008 and 2009. As additional information is gathered or discovered during on-going research, this section will be amended.

Figure 3- 66: Vehicle Heated Storage Building, south elevation (source: QEA 0019)

Exterior Envelope, Vehicle Heated Storage Building

Foundation: The 8 inch thick reinforced concrete foundation wall is in good condition. The face of the wall is painted the trim color of a dark chocolate brown. The paint is in good condition.

Siding: The pre-finished tan colored, wood grain embossed, prefabricated steel siding (8" exposure), which replaced the original asbestos cement shingle siding in the mid-1980s, is in good condition with several dings, gouges, and dents throughout the four elevations. The exterior and interior corner trim and door surrounds (dark brown) are also in good condition. There are no indications that the siding is not functioning as expected for its age and condition.

There are various other elements on the field of the metal siding on each elevation and are itemized as follows:

South Elevation:

- Concrete filled steel bollards flank each of the three bay doors, painted dark brown, in good condition.
- Caged, exterior light fixtures flank the center bay door in good condition.

West Elevation:

- A steel pipe, painted yellow, is an abandoned vent from an oil tank that was below the side-walk, now removed.
- A second steel pipe stub sits adjacent to the vent pipe, not painted, and may have been the fill tube for the oil tank. (verify)
- A single caged, exterior light fixture is located between the two man doors in good condition.

North Elevation:

- A small intake louver with screen is high on the wall near the northwest corner and provides fresh air to the furnace in the heater room. The vent surround is tan color and the vent is in good condition (figure 3-67).
- A propane connection is stubbed-up at the northwest corner to provide fuel to a new furnace unit that will be, in the near future, replacing the extant unit.
- Two electrical conduit stubs daylight at the northwest corner and the wires penetrate the siding low on the building into the heating room.

East Elevation:

- One unpainted vertical electrical conduit stubs out of the ground near the southeast corner and enters the building low on the wall; in good condition. The conduit was installed by the NPS for the current security system.

Figure 3- 67: Vehicle Heated Storage Building, north elevation (source: QEA 0024)

Doors: The original painted solid core wood doors were replaced with painted hollow metal doors, presumably during the circa 1983 period, although the current known documentation does not include them. They are in good condition. The NPS replaced the locksets and added the strike covers. The original sectional insulated metal, chain hoist operated, overhead doors were replaced last year by the NPS using the same manufacturer, "Overhead Door" as the original with a

slight variation in appearance (figure 3-66). Doors are pre-finished white and are in good condition.

Gutters and Downspouts: The original gutters and downspouts were replaced circa 1983 with new aluminum gutters and downspouts along with new aluminum soffit and fascia panels and trim strips installed over the existing wood soffit and fascia boards. The gutters and downspouts were replaced again, in kind, by the NPS in 2008. Soffit and fascia panels, trim strips and gutters were pre-finished the dark brown trim color; downspouts are painted tan. All are in good condition (figure 3-68). New concrete splash blocks were installed at the same time, painted dark brown and are in good condition.

Figure 3- 68: Vehicle Heated Storage Building, gutters, downspouts, and vent (source: QEA 0026)

Roof: The original roof had dark green asphalt shingles over 15 pound building felt over 1/2" plywood sheathing. These were removed and replaced, circa 1983, with Certainteed Saf-T-Lok Class C 2-tab, Timber Blend color. The NPS removed the second roof and replaced it in-kind in 2008 with Certainteed Custom-Lok 25, Timber Blend color. The roof is in good condition.

- The furnace flue penetrating the roof on the northwest corner, painted the dark brown trim color, is in good condition.
- An electrical conduit with waterproof head and electrical feed penetrates the roof adjacent to the flue, is painted dark brown and in good condition.

Sidewalk: Concrete sidewalk on the west side of the building is in good condition. The exposed edge is painted dark brown. One door holder for the Heating Room door is mounted on the top of the walk and is in good condition.

Interior Finishes

Vehicle Storage Room

Floor: Original concrete in fair condition showing moderate wear and tear. It appears that it has previously been sealed and waxed and the wax may have yellowed with age.

Walls: Painted and unpainted hardboard in good condition, with some minor wear and tear (figure 3-69).

Ceiling: Exposed unpainted roof rafters, batt insulation, and wire mesh to hold in the insulation, all in good condition.

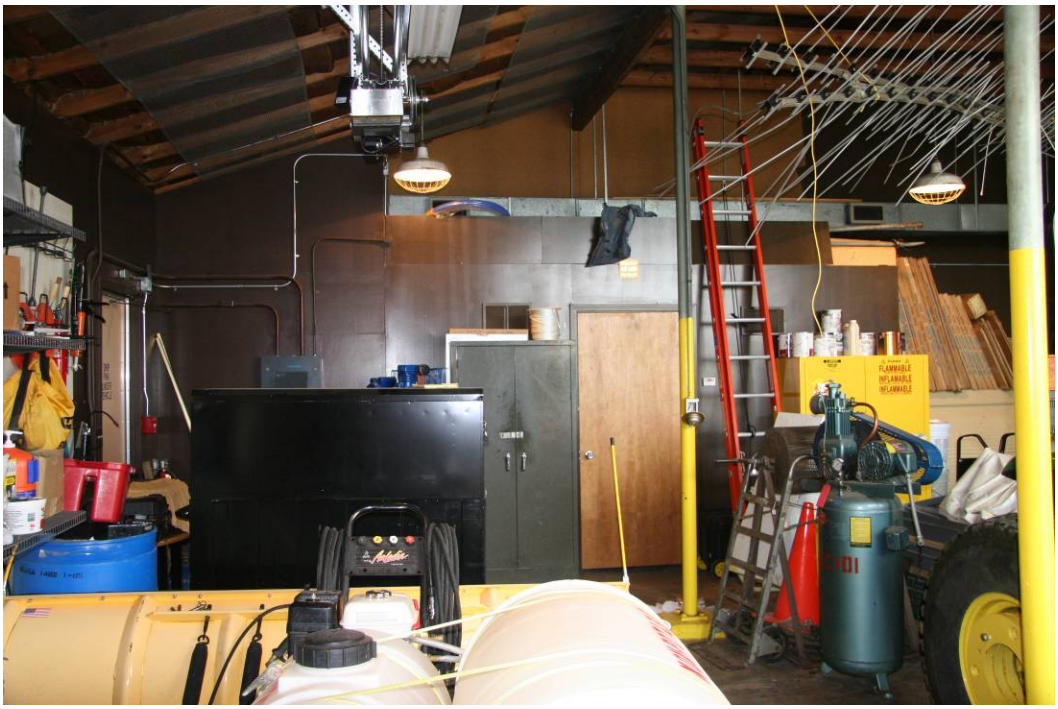


Figure 3- 69: Vehicle Heated Storage Building interior, looking north (source: QEA 0049)

Heater Room

Floor: Original concrete in fair condition.

Walls: Painted drywall in good condition with minor wear and tear.

Ceiling: Painted drywall in good condition.

Tool Storage Room

Floor: Concrete in fair condition.

Walls: Painted hardboard in good condition.

Ceiling: Painted hardboard in good condition.

Delta-09 Launch Facility

The underground Launch Facility and support building is in good condition due to the maintenance provided by the Air Force personnel from Ellsworth Air Force Base and the National Park Service. This analysis will address the exterior condition of the glass enclosure and above ground portion of the Launch Facility as they existed during physical inspections that took place in 2008 and 2009. Reference the structural section of this report for the condition of the support structure. The underground portion of the Launch Facility was not accessible during the survey effort. As additional information is gathered or discovered during on-going research, this section will be amended.

Launcher Closure and Launcher Apron

The original concrete apron is in good condition with some moderate spalling and cracking in selective areas around the perimeter, along with some paint erosion (figure 3-70).

- The original Launcher closure concrete and steel plating is in good condition, repainted in 2001 when the viewing enclosure was installed.
- The original concrete retaining walls are in good condition with some minor cracking and spalling on the south faces.
- The original concrete and steel closure tracks are in good condition, repainted in 2001 when the viewing enclosure was installed.
- The steel personnel access hatch is in good condition. The caulking at the perimeter edge has lost its adhesion and should be replaced.
- The original painted steel pylons are in good condition, repainted in 2001 when the viewing enclosure was installed.

Figure 3- 70: Delta-09 Launch Facility launch closure and viewing enclosure, looking west
(source: QEA 8308)

Viewing Enclosure

The aluminum and glass viewing enclosure and concrete base, installed in 2001, is in very good condition.

Stainless steel handrails and guardrails, installed in 2001, are in very good condition.

Delta-09 Asbestos Containing Building Materials and Lead Paint

No asbestos or lead paint surveys have been performed at Delta-09.

Figure 3- 71: Delta-09 Silo interior and missile training model (source: QEA 3988)

Existing Conditions: Structural

Methodology

The survey was performed on May 4 and 5, 2008, and consisted of review of material at the park archives and at Ellsworth Air Force Base, and physical non-destructive inspection. Park staff and Ellsworth AFB provided Parsons-Staver drawings for the project which were reviewed. Additional historic documentation of maintenance for the facilities was also reviewed. Field notes were made during the physical survey and digital photos were taken. A photo log was kept and transcribed to digital format.

Delta-01 Launch Control Support Building, Existing Structural Conditions

The LCF support building housed the security and maintenance personnel and the Air Force Missileers for the Delta Flight. The above grade structure is principally a one story steel sided wood frame building. The east end of the building rests over the below ground Launch Control Center (LCC). The center controlled 10 remotely located missile silos. The LCC is essentially a hardened concrete cocoon shape isolated from access by a heavy massive vault like door. The control center itself is a metal structure suspended inside the concrete cocoon.

Sill and Foundations: The foundations and exterior door sills appear to be in good condition. A sill crack was noted at door 106, but the crack has been previously painted over and the paint shows no re-cracking.

Roof Framing: Access was gained to the attic space of the LCF. The wood framing generally conforms to the Parsons-Staven drawings and appeared in good condition (see figure 3-72). The roof ridge lines appeared to be straight and true. Some flaking paint was noted at the ceiling of the Generator Room 105 (see figure 3-73). This occurred at the edge of the roof ventilator and is likely due to a flashing problem around the ventilator curb. Reportedly, the problem has been corrected.

It was not possible to access the connection between the roof and the wall framing to determine the resistance to wind load. Review of the Parsons-Staven drawings (Job No. 1880-1, dated 1961) does not show the specific mechanical connection between these elements. However, drawing sheets 370, 371, and 372 indicate that the wall framing has "let-in" 1" x 4" diagonal bracing. This occurs at all exterior walls as well as many of the interior partitions both in the longitudinal and transverse directions. Additionally, the details show ½" diameter anchor bolts through the wall sill plates at 4 foot centers at the exterior walls and the interior partitions. This would certainly indicate that high wind load was considered in the original design. Also, the roof appears in good condition with no apparent distress from wind load over the life of the building (early 1960s). It would be prudent to visually inspect the connection at some time when roof repairs or re-roofing is needed to determine how the roof is anchored to the walls by removal of isolated areas of sheathing.

Figure 3- 72: Launch Control Support Building attic (source: FSE 1054)

Figure 3- 73: Launch Control Support Building, flaking paint at Generator Room 105 (source: FSE 1056)

Site Drainage: Site drainage around the LCF is very poor. During rains, water pools next to the foundation (see figure 3-46). This condition can cause long term deterioration of the foundations and the base of the wood wall framing.

Launch Control Center (Capsule), Existing Structural Conditions

Access was gained around the interstitial space between the concrete cocoon and the metal command module around the south side to the east end. The concrete was observed to be in very good condition where visually exposed.

Delta-01 Vehicle Heated Storage Building, Existing Structural Conditions

General: This structure is a wood frame structure with additions located west of the LCF. Generally, the framing appears in good condition.

West Exterior Slab: A walkway slab on grade extends along the west exterior side of the building. Reportedly a diesel tank was removed from under the sidewalk. This resulted in settlement of the slab. The NPS had the slab mudjacked to correct the problem.

Delta-09 Launch Facility, Existing Structural Conditions

Generator Vault: The support building for the LF is a concrete vault below grade that houses a generator, electrical equipment and panels, and communications equipment. The interior of the vault measures 14'-0" x 24'-2" in plan according to the Parsons-Staven drawings. The vault room is shown as 11'-0" from top of foundation slab to top of vault slab. There are two large covered access hatches in the top slab. The covers rest on short concrete stub walls. Areaway extensions occur at the north and south ends of the vault. The south areaway is covered with steel plate. The north areaway is covered with steel grating and vertical access into the vault by ladder is located at this areaway. The foundation is a 12 inch thick slab below the entire vault and there is a sump pit below the generator. Vaults walls are shown as 10" thick at the exterior (grade against the walls) and 8" thick elsewhere. A plan layout is shown in figure 3-74. A 2-1/2" concrete wearing slab containing wire fabric reinforcing was placed over the structural slab at the top of the vault. This wearing slab is separated from the structural slab with a 'WATERPROOFING POLYVINYL SPRAY MEMBRANE' according to sheet 378 (A-9) of the Parsons-Staven drawings. Generally, the drawings indicate that the vault was well detailed and properly reinforced.

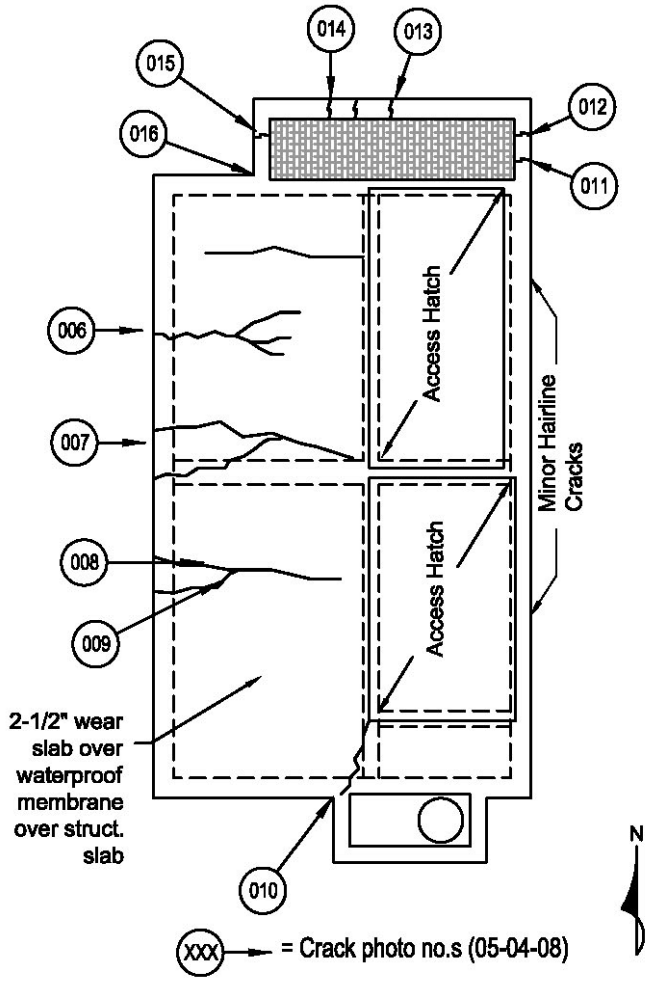


Figure 3- 74: Top Plan View of Vault

Exterior Wearing Slab: Figure 3-74 shows crack patterns observed during the survey. These cracks presumably occur only in the topping slab as this slab is isolated by the waterproofing membrane for the concrete below. The crack patterns are typical for shrinkage and thermal movement and probably showed up within the first year after construction. There has been some previous attempt to patch the cracks as can be seen in figure 3-75. The patching material appears to be a thin cementitious coating over the cracks that has worn away. There is no evidence of injection ports along the cracks.

Generally, this type of cracking does not present a serious structural concern. However, moisture can easily penetrate into the cracks and the slab will be subject to long term deterioration due to freeze/thaw action. It does appear that the waterproofing membrane is working to protect the structural slab. Moisture was observed migrating out from between the wear slab and the structural slab as shown in figure 3-76.

Figure 3- 75: Previously patched cracks at Delta-09 (source: FSE 010)

Figure 3- 76: Moisture migrating out from cracks at Delta-09 (source: FSE 051).

Interior of Vault: Access was gained to the interior of the vault. Generally, the concrete walls, roof, and floor appear in good condition with no obvious sign of cracking distress. The floor does show water staining and there was standing water on the floor near the north end of the vault. This condition is likely due to water coming in from under the door at this location. Additionally, there are penetrations in the vault walls which may also contribute to the water on the floor.

Silo: Access to the interior of the silo was not provided during the survey. Viewing from the skylights revealed no obvious concerns. The park personnel indicated that there were no water problems associated with the silo. Review of the Air Force maintenance documents indicated there had been water problems with many of the sites and that many methods were tried to alleviate the condition with limited success. It was not possible to determine the specific sites or if Delta-09 was included in that effort. If there is currently no water problem then either the Delta-09 site was not affected or remedial treatment has worked.

Concrete Apron at Missile Silo: The concrete apron at the north side of the silo shows cracking and surface deterioration of the slab. Figure 3-77 illustrates the cracking condition as well as showing a loss of the surface matrix or cement paste due to erosion and freeze/thaw action. Additionally, there is cracking of the concrete and grout near the silo metal plates as shown in figure 3-78.

Figure 3- 77: Slab deterioration at north side of silo (source: FSE 038).

Figure 3- 78: Cracking of grout and concrete near silo metal plates (source: FSE 049)

Silo Cover Head Walls: Cracking was observed in the head walls (wing walls) extending east and west of the silo. Figure 3-79 illustrates this cracking. The cracking does not pose a serious structural concern at this time and is fairly fine in terms of width of crack. However, with moisture penetration and long term freeze/thaw action the distress can be expected to worsen.

Figure 3- 79: Cracking in head walls at silo (source: FSE 040)

Existing Conditions: Cathodic Protection[12]

Cathodic Protection was installed at many of the Minuteman Sites in the early 1980s. Delta-01 and Delta-09 both received systems that were commissioned on August 3, 1983. The purpose of the cathodic protection system was to protect steel buried in the ground at each site. The style designed for this protection is a deep well anode bed. A 10" diameter hole was drilled a total of 220 feet and (8) 3-inch by 72-inch graphite anodes were installed, and backfilled with coke breeze. Cables were then routed to a junction box with shunts, and a rectifier. A negative grounding grid was placed around the entire facility to ensure electrical continuity to each structure that required protection and routed back to the rectifier.

Cathodic protection works by impressing a DC voltage into the anodes; current travels from the anodes through the soil and onto the structure. Current then leaves the structure by way of the negative connection attached to each structure being protected, and goes back to the rectifier completing the electrical circuit. When cathodic protection is not working and or not present, a loss of material occurs. If the system is working and current is entering the ground, but the negative connections have been disrupted, the structures can also experience damage through loss of material. Depending on the soil conditions this may take years, but it can happen within months as well. The typical life span of these types of systems range from 20 to 25 years.

Delta-01 Launch Control Facility, Existing Cathodic Protection

The structures at this location measured between -0.33 and -0.61 volts, while the rectifier measured -1.39 volts to a fixed reference, demonstrating a lack of electrical continuity. In a properly functioning system, these numbers would be common (all the same). These non-common numbers mean that the current applied on the structures from the anodes does not have a path off the structures back to rectifier, resulting in potential damage to the structures. During the test a temporary negative was made to energize the system, and the rectifier was found to be functioning properly and six of the eight anodes were producing current.

> ***Rectifier Information:*** Model: PATSB 36V-34A Serial: 82D252
> The output of the unit at the time of survey was 15.8 volts and 0 Amps with tap settings at Coarse=B and Fine=3. This indicated that the rectifier was pushing out 15 volts to the anodes but had no current, indicating a break in the negative grounding grid. The coarse and fine settings indicate the amount of current the rectifier is set at to push out to the anodes; this can be dialed higher or lower depending on the design of the system.

[12] Provided by CorPreTek Incorporated.

Delta-09 Launch Facility, Existing Cathodic Protection

The structures at this location measured between -0.30 and -0.59, while the rectifier measured -0.60 to a fixed reference, again demonstrating a lack of electrical continuity; the numbers were not common (the same). The rectifier was also found to be not functioning properly, thus further investigation for anode condition was not available. The electrical power feed from the adjacent overhead power pole had been disconnected from the junction box, therefore no electrical power was going to the rectifier.

> ***Rectifier Information:*** Model: Universal APB 24V-22A Serial: 830618
> The rectifier would not power up at the time of survey. Power was available.

Testing indicated that the cathodic protection system is non-operable at both Delta-01 and Delta-09. Both negative grounding grids were no longer functioning and the rectifier at Delta-09 is no longer functioning. The systems will be 27 years old as of August 2010, well past their projected life. Repairing these systems is difficult with no guarantee as to the system ever working properly or efficient again or for how long and is usually not cost effective. The length of time for depletion of the anodes cannot be accurately determined with a repaired system.

Replacing the system with a new engineered system can be accomplished, for the most part, outside of the perimeter fence with minimal trenching inside the fence to re-establish a new negative grounding grid. A lack of cathodic protection means loss of material; this can mean considerable damage to the integrity of the underground structures.

Environmental Assessment Impact Topics

Socioeconomics

Population

The scattered sites of Minuteman Missile NHS are located in Pennington County and Jackson County. However, given its proximity, Shannon County will also be represented in the socioeconomic geography.

The area around Minuteman Missile NHS is rural. Jackson, Pennington, and Shannon Counties have population densities of 1.4, 35.3, and 6.5 people per square mile respectively. The southern half of Jackson County and all of Shannon County are located within the Pine Ridge Indian Reservation. The density of Pennington County is higher because of Rapid City and Ellsworth Air Force Base (AFB). These population centers are approximately 50 miles west of Minuteman Missile NHS.

Over the last 80 years the population of Pennington County and Shannon County has steadily increased. Jackson County on the other hand has witnessed a continual population fluctuation between 1,500 people and 3,500 people. Over the last decade, Shannon and Pennington both increased in population while Jackson lost population.

The composition of the population of the three counties is quite varied. At 87%, Pennington County is mostly white. Native Americans make up 8% of the County's population. Shannon County on the other hand is 86% Native American and 9% white. Jackson County's population is roughly divided equally between Native Americans and white residents.

Income

Income indicators show large disparities between the three counties. The per capita income of Pennington County residents is twice that of Jackson County and three times higher than Shannon County. Poverty rates and unemployment rates are significantly higher in Jackson and Shannon Counties than in Pennington County. Native Americans are disproportionately affected by the low economic indications.

Table 3-3
Census Data

	Jackson County	Pennington County	Shannon County	South Dakota
Total Population				
2000 Pop.	2,930	88,565	12,466	754,844
2008 Pop. Est.	2,711	98,533	13,637	804,194
Racial Composition				
White 2000	50%	86.7%	4.5%	88.7%
White 2008	47.2%	86.7%	9.1%	88.2%
Native Amer. 2000	47.8%	8.1%	94.2%	8.2%
Native Amer. 2008	50%	8.2%	85.5%	8.4%
All Others 2000	2.2%	5.2%	1.3%	3.1%
All Others 2008	2.8%	5.1%	5.4%	3.4%
Economic Factors (2000)				
Per Capita Income	$9,981	$18,938	$6,286	$17,562
Per Capita Income – Native Americans	$4,771	$7,895	$5,924	
Poverty Rate	36.5%	11.5%	52.3%	13.2%
Poverty Rate – Native Americans	60%	44%	52.6%	

Source: US Census Bureau

Economic Resources

The largest single economic activity in the region of Minuteman Missile NHS is tourism. The South Dakota Office of Tourism records statistics reporting that the southwest quadrant of the state receives almost 60% of all tourism dollars spent in South Dakota. Pennington County alone earned 28% of all tourism dollars spent in the state in 2008. The Office of Tourism also uses a multiplier of 2.5 to estimate economic impact of tourism spending. A summary of the most recent number can be found in the table below.

Table 3-4
Tourism Impacts - 2008

	Jackson County	Pennington County	Shannon County	South Dakota
Tourism Spending	$8.8 Million	$271.6 Million	$1.3 Million	$967 Million
Economic Impact	$22 Million	$679 Million	$3.2 Million	$2,417 Million

Source: South Dakota Office of Tourism

Visitor Experience

Minuteman Missile NHS is a relatively new National Park Service unit. The first full visitor season began on Memorial Day, 2003. Since that weekend, the number of visitors to Minuteman Missile NHS has risen dramatically. This is not surprising considering the proximity of Minuteman Missile NHS to Badlands National Park (NP), which receives approximately 1 million visitors per year. Table 3-5 summarizes visitation to Minuteman Missile NHS over the past 4+ years. The site's website has also received a similar increase in "hits" which corresponds to the increase in visitation. The continued increase in visitation was anticipated. A 2003 transportation study estimated that visitation could eventually reach 3-400,000 visitors per year.

Table 3-5
Visitor Statistics FY 05-07

	Visitors	Number of Tours	Visitors on Tour
FY 04	3,458	120	1,305
FY 05	5,211	265	2,292
FY 06	11,874	408	4,329
FY 07	16,802	702	7,267
FY 08	21,843	846	9,311
FY 09	26,434	898	10,403

Source: Minuteman Missile NHS

Another likely reason for continued growth in visitation is the relative proximity to many other attractions in the region including Badlands NP; the National Grasslands Visitor Center in Wall, SD; Wind Cave NP; Jewel Cave National Monument; Mount Rushmore National Memorial and the Crazy Horse Memorial. In addition to these and many more natural and cultural attractions, the South Dakota Air and Space Museum at nearby Ellsworth AFB is a particularly attractive to visitors interested in military history.

Minuteman Missile NHS visitor contact is primarily conducted at the visitor contact and administrative center at exit 131 on Interstate 90. This highway exit is also one of the primary entrances into Badlands NP, which benefits visitation at Minuteman Missile NHS. Visitors can watch a film on the site, receive brochures and other information regarding Delta-01 and Delta-09 at the visitor contact center. If visitors have not already, they can make reservations or join a site tour of Delta-01. At this time, visitors are required to drive their own vehicles to both Delta-01 and Delta-09.

With some exceptions, Ranger-led tours of Delta-01 are offered twice a day, six days per week during the summer season. During the shoulder seasons (May and September) the tour schedule is reduced to five days per week. During the winter season (October through April) one tour per day Monday through Friday is offered. An open house tour is offered on Thursdays during the summer that provides visitors an abbreviated tour of Delta-01. Limited ranger-led interpretation occurs at Delta-09 and there are no tours

offered. In addition to ranger-led tours and interpretation, visitors have the option of utilizing their cell phone to listen to information regarding Delta-09.

National Park Service staff has prepared the Long-Range Interpretive Plan (LRIP) for Minuteman Missile NHS that establishes goals for visitor experience and recommendations for implementing that goal. Recommendations for providing a unique visitor experience are being implemented.

Because no formal tour is offered at Delta-09, there is no apparent visitor capacity issue at that site. There is a visitor capacity issue at Delta-01. Because of facility limitations only six people are allowed on each tour. In addition to limiting tour capacity, safety of visitors is enhanced through the establishment of "rules" and guidelines that need to be agreed and adhered to by visitors. These include ability to climb a ladder, height limitations for visitors and the ability to be comfortable in tight spaces. Prior to opening Delta-01 for tours, a number of public safety measures were undertaken.

Park Operations

The Visitor Contact facility is currently in temporary facilities located adjacent to a gas station at exit 131 on Interstate 90. Delta-01 occupies 6.4 acres and Delta-09 occupies 5 acres of land. Delta-01 is approximately four miles from the visitor contact center and Delta-09 is approximately 15 miles from the visitor contact center. All NPS operations are conducted out of the visitor contact center and administrative facility. Currently there are six full-time, permanent employees and six seasonal employees. Ranger-led tours are conducted at Delta-01. Visitors are required to join a tour to enter the perimeter fence at this site. Visitors are encouraged to visit Delta-09 on their own.

Park staffing is as follows:

Full-Time
- Superintendent
- Administrative Support Assistant
- Chief of Law Enforcement and Interpretation
- Cultural Resource Specialist
- Facility Operations Specialist
- Interpretive Park Ranger

Seasonal
- Park Ranger/Law Enforcement (1)
- Seasonal Park Guides (3)
- Maintenance Laborers (2)

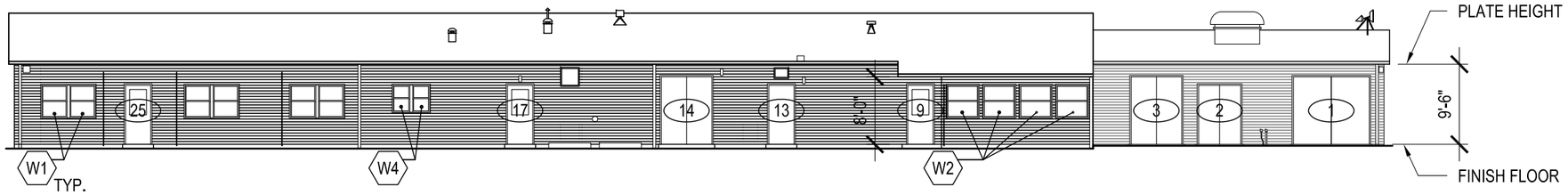
Next pages:

Figure 3- 80: Delta-01 Elevations, Existing Conditions (source: QEA 2010)
Figure 3- 81: Delta-01 Floor Plans, Existing Conditions (source: QEA 2010)
Figure 3- 82: Delta-09 Floor Plans, Existing Conditions (source: QEA 2010)

MINUTEMAN MISSILE
NATIONAL HISTORIC SITE
JACKSON COUNTY, SOUTH DAKOTA

HSR/CLR/EA
DRAFT JUNE 2010

DELTA-01 ELEVATIONS
EXISTING CONDITIONS



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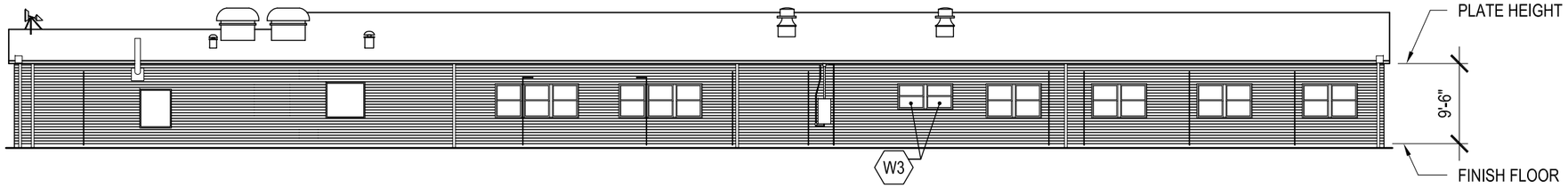

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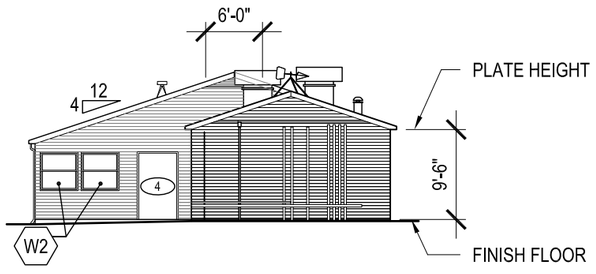
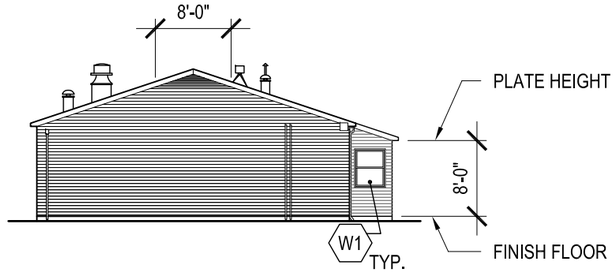


3 EAST ELEVATION



4 WEST ELEVATION

16 8 0 16 32
1/16"=1'-0" SCALE OF FEET

NORTH

GENERAL NOTES

1. ALL WINDOWS ARE WINDOW TYPE W/1 UNLESS NOTED OTHERWISE.

QUINN EVANS
ARCHITECTS

MINUTEMAN MISSILE
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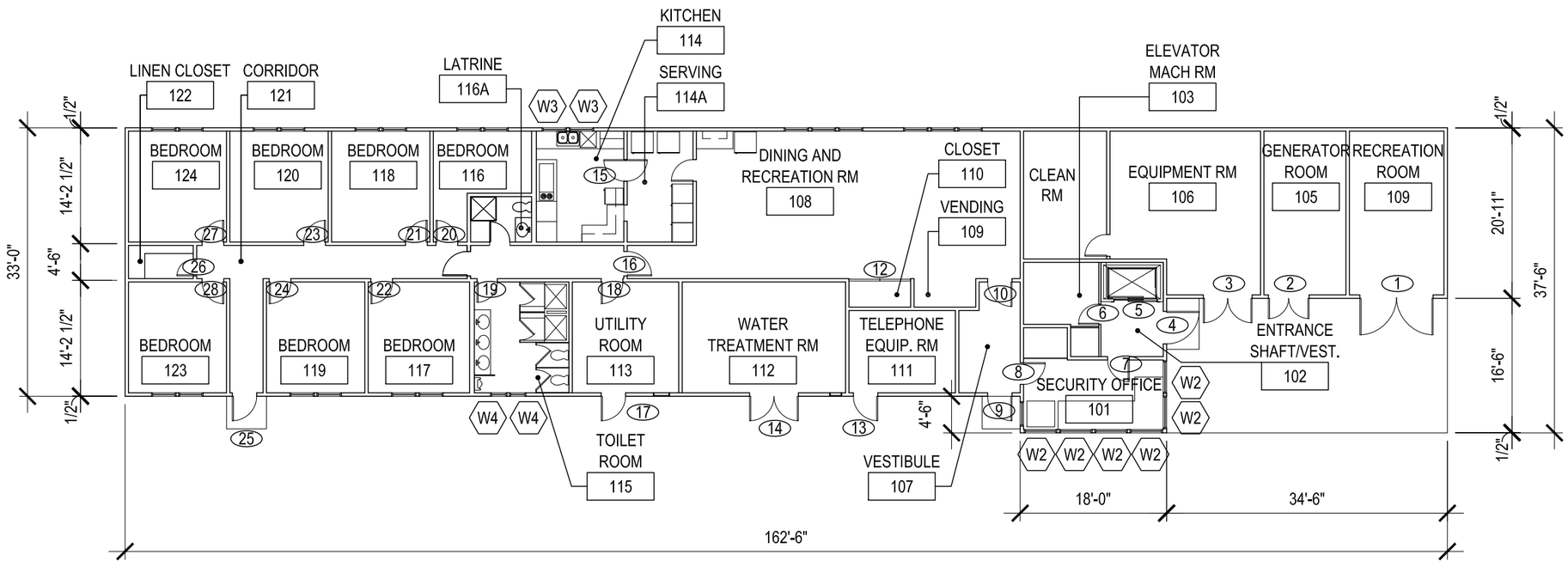
DELTA-01 FLOOR PLANS
EXISTING CONDITIONS



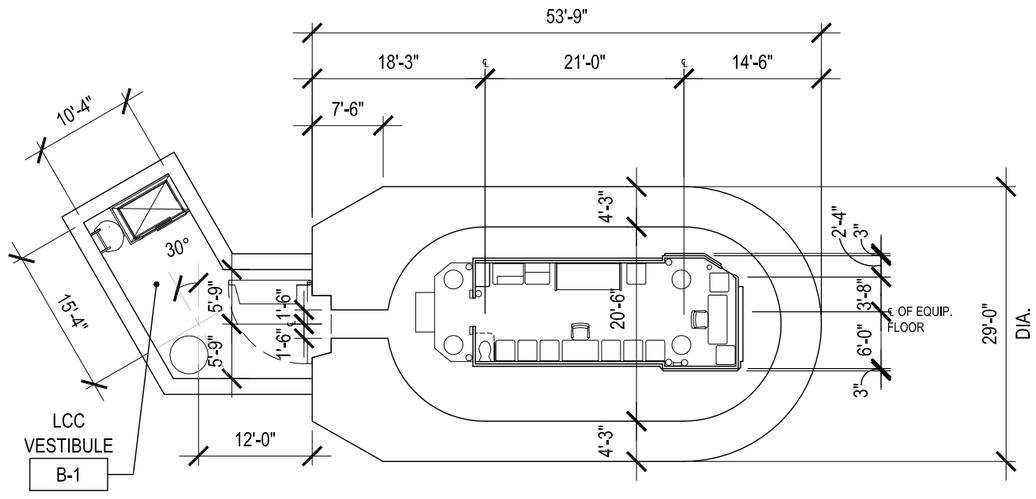
16 8 0 16 32
1/16"=1'-0" SCALE OF FEET

NORTH

GENERAL NOTES

1. ALL WINDOWS ARE WINDOW TYPE W/1 UNLESS NOTED OTHERWISE.

1 LAUNCH CONTROL SUPPORT BUILDING FLOOR PLAN



2 LAUNCH CONTROL CENTER FLOOR PLAN

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DELTA-09 FLOOR PLANS

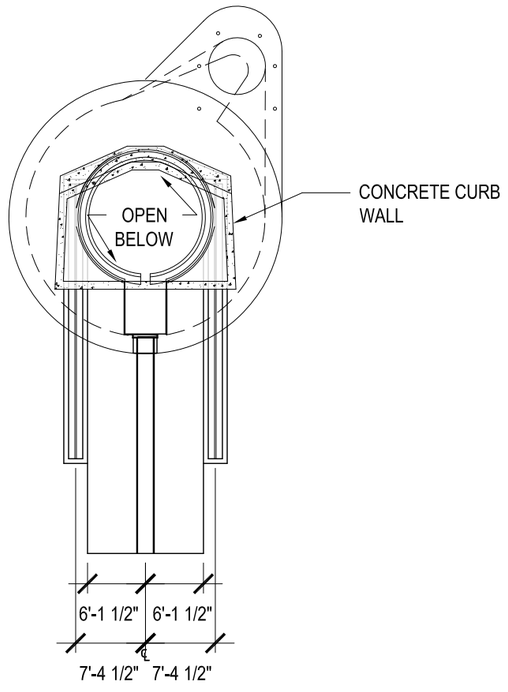
EXISTING CONDITIONS

16 8 0 16 32

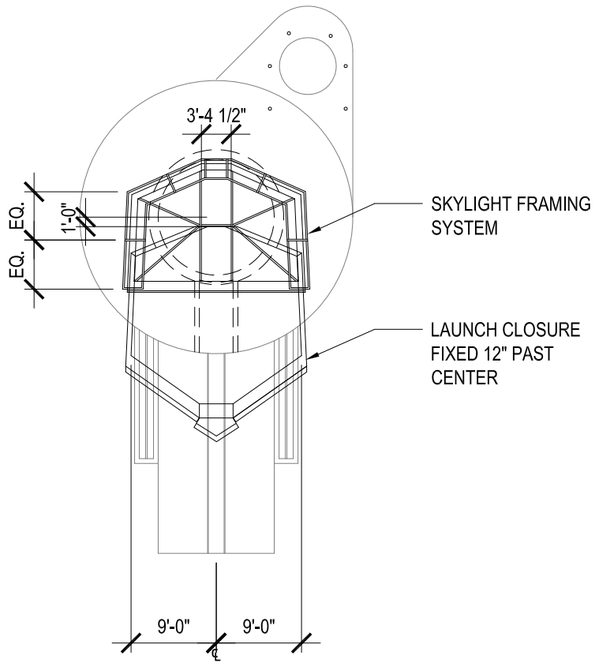
1/16"=1'-0" SCALE OF FEET

NORTH

GENERAL NOTES



1 FLOOR PLAN



2 ROOF PLAN

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