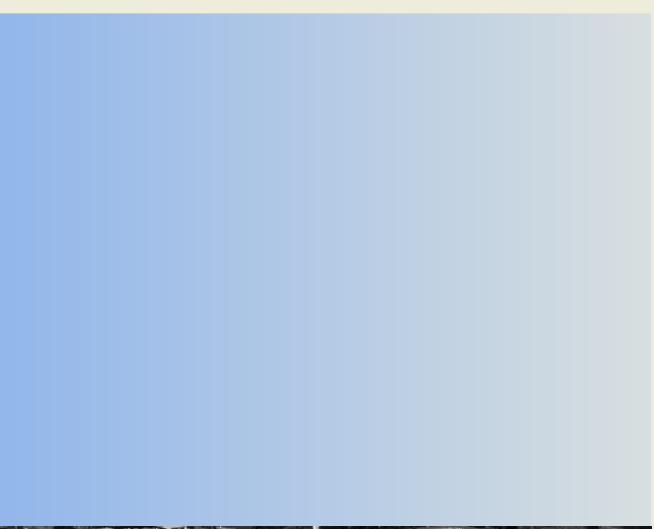


California State Historic Preservation Office Historic American Buildings Survey Level II-Type Documentation

U.S. Air Force Satellite Test Center
(Onizuka Air Force Station)
City of Sunnyvale, Santa Clara County, California



U.S. AIR FORCE SATELLITE TEST CENTER
(Onizuka Air Force Station)
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A

WRITTEN HISTORICAL AND DESCRIPTIVE DATA
PHOTOGRAPHS

California Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

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U.S. AIR FORCE SATELLITE TEST CENTER
(Onizuka Air Force Station)
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

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SECTION I

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **U.S. AIR FORCE SATELLITE TEST CENTER**
5 **(Onizuka Air Force Station)**

6
7 Log No. USAF041221A
8

9 **Location:** 1080 Innovation Way
10 City of Sunnyvale, Santa Clara County, California

11
12 USGS *Mountainview, California, Quadrangle*
13 Universal Transverse Mercator Coordinates:
14 N: 586033.742; E: 4140232.576
15

16 **Present Owner:** U.S. Air Force
17

18 **Present Occupant:** 21st Space Operations Squadron (SOPS)
19

20 **Present Use:** U.S. Air Force Station
21

22 **Significance:** The National Register-eligible U.S. Air Force Satellite Test Center
23 Historic District consists of six interconnected contributing resources,
24 Buildings 1001, 1002, 1003, 1004, 10031, and 10032, and two non-
25 contributing resources, Buildings 1015 and 1025. The district is significant
26 at a national, state, and local level under Criterion A for its associations
27 with satellite reconnaissance during the Cold War, and Criteria
28 Consideration G, because five of the six buildings are not yet fifty years
29 old, and have exceptional importance for their associations with satellite
30 reconnaissance during the Cold War.
31

32 The U.S. Air Force Satellite Test Center Historic District is significant at
33 the national level for its association with satellite reconnaissance during
34 the Cold War. The installation was established in 1959 to serve as the
35 command-and-control center for the first reconnaissance satellite program,
36 the Corona Program. It was developed by the U.S. Air Force and the
37 Central Intelligence Agency (CIA), with assistance from a private
38 contractor, Lockheed Missiles and Space Division. Shortly thereafter, the
39 National Reconnaissance Office (NRO) was established to provide
40 oversight of the program and develop other satellite programs. As new
41 satellite technologies developed, such as communications, early missile
42 warning, meteorology, navigation, and nuclear detonation detection,
43 additional buildings were constructed. These satellite programs provided
44 valuable data throughout the Cold War, and were supported from the U.S.
45 Air Force Satellite Test Center Historic District. Although many of the
46 satellite programs remain classified, it is apparent through the continued

1 presence of the NRO that the installation played a key role in the United
2 States' conduct of the Cold War. The six interconnected buildings form a
3 cohesive unit, and represent the massive investment of the United States to
4 combat the perceived threat posed by the Soviet Union during the Cold
5 War.
6

7 The U.S. Air Force Satellite Test Center Historic District is also
8 significant at the state and local levels for its association with the
9 development of California as a leader in technological innovations.
10 California, and specifically the City of Sunnyvale in Silicon Valley, began
11 to emerge as a leading technological center during the Cold War. This was
12 due, in part, to the military's investment in the development of defense
13 technologies in California, such as command and control of
14 reconnaissance satellites at Onizuka Air Force Station (AFS). The
15 presence of Lockheed Missiles and Space Division in Sunnyvale in the
16 mid-1950s, followed by Onizuka AFS in the late 1950s, burnished its
17 reputation as a high-technology center. The district's period of
18 significance extends from 1959, the date of construction of Building 1001,
19 through 1991, the conclusion of the Cold War.
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1 **PART I: HISTORICAL INFORMATION**

2
3 **A. Historical Context**

4
5 **1. Introduction**

6
7 The U.S. Air Force Satellite Test Center (STC), known as Onizuka Air Force Station
8 (AFS), is located in the City of Sunnyvale, Santa Clara County, California. It was
9 established in 1959 to support the Corona Program, a reconnaissance satellite program
10 developed by the U.S. Air Force and Central Intelligence Agency (CIA), and overseen by
11 the National Reconnaissance Office (NRO). The development and expansion of the STC
12 in the subsequent decades illustrates multiple trends in American history – namely the
13 massive investment of the Department of Defense (DoD) during the Cold War, and the
14 role that satellite reconnaissance played. The secrecy surrounding the STC and its
15 satellite programs was illustrated by the presence of the NRO, whose existence remained
16 classified throughout the Cold War. Many of the reconnaissance satellites supported by
17 the STC were also classified, and remain classified today. The development of the STC in
18 Sunnyvale, California, also illustrates the transformation of California’s economy from
19 agricultural to industrial, and ultimately to its prominence as a technological center. The
20 historic context in this document explores the development of the STC, its relationship to
21 the surrounding area, and to trends in American history, such as the Cold War.
22

23 **2. Historical Development of Sunnyvale, 1700s-1945**

24
25 By the 1770s, the Santa Clara Valley was inhabited by Spanish settlers who established
26 missions and converted much of the Native American population to Christianity. The
27 economy was agricultural and consisted of wheat farms, which later gave way to fruit
28 farms in the late-nineteenth century (Ignoffo, 1994). In 1906, the first non-agrarian
29 industry arrived in Sunnyvale, the Joshua Hendy Iron Works. The iron works was
30 established in 1856 in San Francisco to supply miners during the gold rush, and was
31 destroyed in the 1906 earthquake. Sunnyvale, anxious to attract industry and expand its
32 population, offered thirty-two acres of former fruit orchards to the iron works at no cost
33 to induce industrial development (American Society of Mechanical Engineers [ASME],
34 December 14, 1978). In 1912, Sunnyvale was incorporated (Redevelopment Agency of
35 the City of Sunnyvale, 1964).
36

37 Sunnyvale’s economy received a boost during World War I (1914-19) when the Joshua
38 Hendy Iron Works began to produce ship engines for the U.S. Navy (ASME, December
39 14, 1978). Following the war, advances in aviation technology led to an interest in
40 Germany’s dirigible airships, two of which were granted to the United States as war
41 reparations. As a result of lobbying efforts led by U.S. Navy Rear Admiral William A.
42 Moffett, the U.S. Navy opted to develop east and west coast dirigible air bases to house

1 two newly constructed air ships, the *Akron* and the *Macon*. A real estate agent, Laura
2 Whipple, based in nearby Alameda County, California recognized the potential of former
3 pasture lands in the Sunnyvale vicinity, and spearheaded a campaign to persuade the U.S.
4 Navy to locate its new air base there (Ignoffo, 1994).

5
6 On December 12, 1930, Sunnyvale was selected as the site of the U.S. Navy air base. In
7 April 1933, the *Akron* crashed off the New Jersey coast, killing seventy-three people,
8 among them Admiral Moffett. A week later, on April 12, the U.S. Navy commissioned
9 Naval Air Station Sunnyvale. The following month, it was re-designated Moffett Field, in
10 honor of Admiral Moffett. By the end of 1933, the *Macon* was stationed at Moffett Field.
11 However, the *Macon* was also short lived, and in 1935, was destroyed in a crash. Shortly
12 thereafter, the U.S. Army assumed control of Moffett Field, and renamed it Moffett Field
13 Army Air Corps Base (Ignoffo, 1994).

14
15 The establishment of Moffett Field in Sunnyvale provided numerous jobs during the
16 Great Depression (1929-41). Despite this, Sunnyvale's main economy remained farming,
17 and unemployment skyrocketed with an influx of migrant workers fleeing the Midwest as
18 a result of the Dust Bowl (1931-37). In addition, although the Joshua Hendy Iron Works
19 remained open during the Great Depression, the company was forced to lay off workers
20 due to a lack of steady business (Ignoffo, 1994).

21
22 In 1940, ownership of the Joshua Hendy Iron Works was assumed by Charles E. Moore,
23 backed by a group of western business men, including Felix Kahn, K.K. Bechtel, and
24 Henry J. Kaiser, among others. The group had teamed together to construct the Hoover
25 Dam in Boulder City, Nevada, and were referred to as the Six Companies. Under their
26 leadership, the iron works expanded and resumed production of ship engines for the U.S.
27 Navy (ASME, December 17, 1978). The combination of the change in ownership, and
28 advent of World War II (1941-45) helped create an increase in economic activity in
29 Sunnyvale. Between 1941-45, the federal government pumped approximately \$35 billion
30 into California's economy. In Sunnyvale, Moffett Field and Joshua Hendy Iron Works
31 were the prime beneficiaries, and war-related industry usurped farming as Sunnyvale's
32 main economy (Ignoffo, 1994).

33
34 **3. Beginning of the Cold War and Post World War II Development in Sunnyvale,**
35 **1946-56**

36
37 With the defeat of Germany and Japan at the conclusion of World War II, international
38 politics and conditions affecting post-war strategy changed radically, and the United
39 States entered the Cold War (1946-91) with the Soviet Union and its allies. During the
40 late 1940s and early 1950s, the Euro-centric order yielded to a world in which the United
41 States and the Soviet Union became two contending blocs representing fundamentally

1 opposed political ideologies, i.e., democracy and communism (Center for Air Force
2 History, 1994).

3
4 Following the war, economic growth in Sunnyvale slowed as a result of its heavy
5 dependence on war-related activities. The Joshua Hendy Iron Works reduced its
6 workforce, eliminating 8,000 jobs at the plant, which during the war, operated twenty-
7 four hours per day to keep up with demand. In 1947, Westinghouse Corporation acquired
8 the iron works. During this time, the city embarked on a plan to attract more industry,
9 although it met with considerable opposition from Sunnyvale's remaining farmers.

10
11 In 1949, the City of Sunnyvale restructured their local government and established a city
12 executive position, appointed by the City Council. This change essentially marked the
13 end of the agricultural-based economy, and signaled Sunnyvale's transition to a modern,
14 industrial city (Ignoffo, 1994).

15
16 In the early 1950s, Sunnyvale annexed land to expand the city's boundaries and provide
17 space for industrial development. Sunnyvale aggressively marketed itself as a prime
18 location for industrial development by advertising in newspapers such as *The Wall Street*
19 *Journal*. By 1952, ten companies had relocated to Sunnyvale, including: Bowser, Inc.;
20 R.H. Hamilton Company; Duncan Smith Company; Thorton Mills Company; and Kaiser
21 Aluminum and Chemical Company, among others. In 1953, Personal Products
22 Corporation, a subsidiary of Johnson & Johnson, constructed a factory in Sunnyvale. By
23 1954, twenty-nine residential housing developments were under construction to
24 accommodate the influx of workers to the area (Ignoffo, 1994).

25
26 In 1956, Lockheed Missiles and Space Division, a division of Lockheed Aircraft
27 Corporation, acquired an approximately 275-acre tract of land adjacent to Moffett Field
28 that had been annexed by the city in the early 1950s (Ignoffo, 1994). Lockheed Aircraft
29 Corporation, formed in 1926 in Hollywood, California, became one of the major
30 producers of military aircraft for the United States and its allies in World War II. In 1954,
31 Lockheed Aircraft Corporation expanded its mission and services to confront the
32 challenges of the Cold War, and established the Lockheed Missiles and Space Division
33 (*New Horizons*, April 2007).

34
35 Lockheed Missiles and Space Division selected Sunnyvale based, in part, on the
36 recommendation of one of the division's directors, Herschel Brown. Sunnyvale was
37 touted as an attractive location because of its climate, and proximity to the airport and
38 Stanford University in nearby Palo Alto, which would provide a steady workforce of
39 recent college graduates (Ignoffo, 1994). Following construction, Lockheed moved into
40 the Sunnyvale facility in 1956. A 1981 *San Jose Mercury News* article celebrating the
41 twenty-fifth anniversary of Lockheed Missiles and Space Division in Sunnyvale, noted
42 that it was "the first postwar, big-time industry in town, and its presence and pool of

1 skilled labor put Sunnyvale on the map,” paving the way for future industries to follow
2 (Miller, July 28, 1981). The facility featured a Research & Development Building,
3 Manufacturing Building, Administration Building, Cafeteria, Sentry Building, Gas Plant,
4 and parking areas (Ralph M. Parsons Company/U.S. Air Force Ballistic Missile Division
5 (AFBMD), March 6, 1959a).

6
7 **4. Early Intelligence Gathering and the Cold War, 1949-58**
8

9 By 1949, the Soviet Union had acquired nuclear capability, ending the United States’
10 monopoly on nuclear power and raising the stakes for nuclear war. This in turn led the
11 United States to focus on weapons development, as well as intelligence-gathering efforts
12 to gauge the Soviet Union’s weapons capabilities. In the mid 1940s, the U.S. Air Force
13 began to research the possibility of providing reconnaissance efforts via satellites and
14 global tracking stations. By 1951, the Air Research and Development Command (ARDC)
15 authorized the RAND Corporation to make recommendations regarding the development
16 of a national reconnaissance satellite system. The RAND Corporation, a non-profit think
17 tank, was established following World War II to provide research and development
18 (R&D) services to the United States military. The RAND Corporation recommended the
19 use of satellites for reconnaissance missions by the U.S. Air Force, indicating that it was
20 of “vital strategic importance” (Arnold, 2005; RAND Corporation, no date [n.d.]).
21

22 In July 1954, Western Development Division (WDD) was established by the ARDC, and
23 in the following year, it assumed responsibility for the development of Weapon System
24 117L (WS-117L). WS-117L was envisioned as a satellite system, under which separate
25 satellite subsystems with diverse functions, such as photo reconnaissance and early
26 warning of missile launches, would be developed. Shortly thereafter, WDD also assumed
27 responsibility for development of the Thor Intermediate Range Ballistic Missile (IRBM)
28 (Rosalanka, n.d.; Jernigan, 1983).
29

30 In March 1955, the U.S. Air Force issued a directive which established requirements for
31 development of an advanced reconnaissance satellite system. The system was originally
32 designated Advanced Reconnaissance System (ARS), followed by Sentry, and ultimately
33 became known as the Satellite and Missile Observation System (SAMOS). Under the
34 SAMOS Program, satellites would take photographs, develop the film in orbit, and
35 transmit television scans of the photographs. By 1957, the U.S. Air Force also began to
36 develop feasibility studies for the Missile Detection Alarm System (MIDAS), to provide
37 early warning of missile launches. In 1957, the WDD was re-designated as the U.S. Air
38 Force Ballistic Missile Division (AFBMD) (Jernigan, 1983). Lockheed Missiles and
39 Space Division in Sunnyvale served as the prime contractor to provide a multi-purpose
40 satellite spacecraft for the U.S. Air Force’s developing satellite systems (Lockheed
41 Martin Space Systems, n.d.).
42

1 Despite the development of the U.S. Air Force's satellite programs, the primary method
2 of reconnaissance technology at the time involved aerial photography taken from long-
3 range bombers, or U-2s (Arnold, 2005). U-2s were manufactured by the Lockheed
4 Aircraft Corporation at its Advanced Development Programs (ADP) facility in Palmdale,
5 California. U-2 reconnaissance missions were initiated in 1956, and yielded photographs
6 of Soviet Union airfields, missile test and training facilities, nuclear weapons, and atomic
7 facilities, among others. These top-secret flights were dangerous, and the U.S. Air Force
8 continued to work on developing satellite reconnaissance systems. However, much of
9 military funding at this time was dedicated to weapons systems, such as Intercontinental
10 Ballistic Missiles (ICBMs), while the satellite reconnaissance efforts lagged behind
11 (Richelson, 2002).

12
13 Funding priorities changed with the October 1957 launch of *Sputnik I* by the Soviet
14 Union. *Sputnik I*, the first earth-orbiting satellite, marked a turning point in the Cold War.
15 In an effort to keep pace, the United States revived a dormant program known as Project
16 Orbiter. The goal of the program, initiated by the U.S. Army and U.S. Navy in 1954, was
17 to put a scientific satellite into orbit; however, the program had never been implemented.
18 By January 1958, Explorer I was launched, and became the United States' first satellite in
19 space (Arnold, 2005).

20
21 The successful launch of *Sputnik I* also led the U.S. Air Force to fast-track the SAMOS
22 and MIDAS programs in 1957. However, in February 1958, concerns about the lack of
23 progress led President Dwight D. Eisenhower to allow the CIA to develop a
24 reconnaissance satellite program, the Corona Program (Arnold, 2005). Initially, the
25 Corona Program was intended to serve an interim purpose, until programs such as
26 SAMOS, believed to have greater potential, were completed. The U.S. Air Force also
27 continued to develop the SAMOS and MIDAS programs (Rosalanka, n.d.).
28

29 **5. Development of the Corona Program, 1958**

30
31 Initiated in 1958, the Corona Program was similar to the SAMOS Program. For example,
32 the Corona Program involved the launch of a low-orbit satellite that would take
33 reconnaissance photographs of the Soviet Union and other communist countries.
34 However, unlike SAMOS, Corona satellites would not transmit the images via television,
35 but would instead return the images to earth in a satellite recovery vehicle (SRV) for
36 development and analysis. The CIA worked in tandem with the U.S. Air Force and
37 private contractors to develop the Corona Program. Numerous contracts were let to
38 produce specialized camera systems and film; spacecraft to house the systems and film;
39 and launch equipment (Arnold, 2005).
40

41 The first two camera systems for the Corona Program were manufactured by Fairchild
42 Camera Company, which was based on the east coast of the United States. Fairchild

1 manufactured aerial cameras for military and commercial use, and held multiple contracts
2 with the U.S. Army, U.S. Navy and U.S. Air Force (Fairchild Imaging, n.d.). The third
3 camera system was designed by the Itek Corporation in Lexington, Massachusetts. Itek
4 Corporation was founded in the 1950s by Richard Leghorn, a former U.S. Air Force
5 aerial reconnaissance expert. Leghorn's company's designs for the camera systems
6 offered technological improvements over earlier models. Itek Corporation also held the
7 contract for the U.S. Air Force's SAMOS Program. Film was provided by the Eastman
8 Kodak Company in Rochester, New York (Gruntman, 2004).

9
10 Lockheed Missiles and Space Division designed and manufactured the Agena spacecraft
11 powered by a Thor booster, which would house and launch the reconnaissance camera
12 system. Development of the Agena spacecraft was initiated in the mid-1950s in
13 conjunction with WS-117L (Gruntman, 2004). General Electric (GE) Re-entry Systems
14 in Philadelphia, Pennsylvania, designed and manufactured the gold-plated SRV, often
15 referred to as a "bucket." A sub-division of GE, GE Re-entry Systems was established in
16 1956 to develop re-entry vehicles which could successfully re-enter the earth's
17 atmosphere from space (American Institute of Aeronautics and Astronautics, n.d.).

18
19 Concerns about preserving the secrecy of the Corona Program and its objectives led to
20 the designation of the Discoverer Program as a cover program (Richelson, 2002). The
21 publicly-stated goal of the Discoverer Program was scientific research. It consisted of the
22 following activities:

- 23
24 • Development and flight tests of the satellite and subsystems.
- 25
26 • Development of reliable stabilization of the satellite in orbit and response
27 to programmed reorientation controls.
- 28
29 • Development of proven techniques for recovery of capsules ejected from
30 orbiting satellites.
- 31
32 • Performance of space research and engineering tests in support of
33 advanced military reconnaissance satellite programs (6594th Aerospace
34 Test Wing (ATW), n.d.).
- 35

36 However, the scientific pursuits were never fulfilled, and the Discoverer Program simply
37 remained a cover for the Corona Program (Vukotich, n.d.). The cover story was widely
38 reported on by the newspapers. In January 1959, *The New York Times* reported that
39 ultimately, mice and primates would be placed in the capsules to study the effects of
40 space travel on animals. The article indicated that there would be cameras in the capsule,

1 but their purpose, along with other instruments, would be to record the animal's reaction
2 to space flight, rather than to serve reconnaissance purposes (Krieger, January 18, 1959).
3

4 **6. Interim Control Center and Early Corona Missions, 1959**
5

6 In January 1959, an interim Satellite Control Center was developed by the U.S. Air Force
7 and Lockheed Missiles and Space Division in Palo Alto, California. The interim Satellite
8 Control Center, in conjunction with tracking stations, supported the launch, orbit, and
9 recovery of the Corona satellites. They were complex low-orbiting satellites that required
10 extensive command and control. Satellites were launched from Vandenberg Air Force
11 Base (AFB), California (Jernigan, 1983). Vandenberg AFB's location on the northern
12 Pacific Ocean made it possible to easily reach polar orbit, and its location relative to the
13 jet stream also rendered it an ideal site to launch reconnaissance satellites (Vandenberg
14 AFB, n.d.). Vandenberg AFB also functioned as a tracking station.
15

16 On February 28, 1959, Discoverer I, the first Corona satellite, was launched from
17 Vandenberg AFB and was supported from the interim Satellite Control Center. The first
18 launch was essentially a test of the system, and was not equipped with a camera system
19 or SRV. The interim Satellite Control Center received a total of 514 seconds of telemetry,
20 but the satellite failed to remain in orbit (Jernigan, 1983; *The New York Times*, November
21 8, 1959).
22

23 On April 6, 1959, the 6594th Aerospace Test Wing (ATW) was activated as the first unit
24 to be tasked with military satellite operations. The unit worked closely with Lockheed
25 Missiles and Space Division, as well as with the CIA (Jernigan, 1983; Richelson, 2002).
26 In addition to the interim Satellite Control Center, the 6594th ATW was also assigned to
27 three operating locations:
28

- 29 • Edwards AFB, Mojave, California
 - 30 • Chiniak Point, Kodiak, Alaska
 - 31 • Annette Island, Alaska
- 32

33 Tracking stations were also established at the following locations:
34

- 35 • Annette Island, Alaska
 - 36 • Chiniak Point, Kodiak, Alaska
 - 37 • Kaena Point, Hawaii
 - 38 • New Boston, New Hampshire
 - 39 • Vandenberg AFB, California
- 40

41 In June 1959, the 6594th Launch Squadron, assigned to the 6594th ATW, was activated at
42 Vandenberg AFB to assist with satellite launches. In November, the 6594th Recovery

1 Control Group was activated at Hickam AFB, in Honolulu Hawaii. The 6594th Recovery
2 Control Group was responsible for retrieval of the SRVs. This was accomplished while
3 flying Fairchild C-119 *Flying Boxcars* (C-119) equipped with grappling hooks to catch
4 the SRV, which was suspended from a parachute. In the event aircraft were unable to
5 catch the SRV, the 6594th Recovery Control Group would attempt to recover it from the
6 ocean. The SRVs were also equipped with salt plugs designed to dissolve and sink within
7 72 hours if they couldn't be retrieved (Jernigan, 1983; Monmonier, 2002).
8

9 In April 1959, Discoverer II, the first Corona satellite to achieve polar orbit, was
10 launched from Vandenberg AFB and supported from the interim Satellite Control Center.
11 However, during ejection of the SRV, control was lost, and the satellite crashed in the
12 vicinity of Spitsbergen, Norway. Subsequent reconnaissance missions indicated that the
13 Soviet Union may have recovered the SRV. Fortunately, the satellite, still in testing
14 phase, was not equipped with reconnaissance cameras (Jernigan, 1983; Arnold, 2005).
15

16 Throughout 1959, Discoverer satellites continued to be launched and publicized in local
17 and national newspapers. In keeping with the cover story, the U.S. Air Force supplied
18 newspapers with misinformation about the program, ensuring that the true purpose was
19 not publicly known. For example, a *New York Times* article on the launch of the fifth
20 Discoverer satellite in August 1959 indicated that it was a preliminary step in the creation
21 of a future "snooper satellite," that would also provide data concerning the impact of
22 outer space on humans (*The New York Times*, August 14, 1959).
23

24 7. Development of the Satellite Test Center, 1959-60

25

26 While satellites were being supported from the interim Satellite Control Center in Palo
27 Alto, the U.S. Air Force made preparations to construct a permanent building on land
28 owned by Lockheed Missiles and Space Division in Sunnyvale, California. The building
29 was located east of the Lockheed Missiles and Space Division facility, on the west side of
30 Mathilda Avenue. Plans for Building 1001 (Development Control Center) were prepared
31 under the auspices of the AFBMD in Englewood, California. It was designed by the
32 Ralph M. Parsons Company, an architecture and engineering firm based in Los Angeles,
33 California (Ralph M. Parsons Company/AFBMD, March 6, 1959a).
34

35 The company was established in 1944 by engineer Ralph M. Parsons. Parsons, a New
36 York native, graduated in 1916 with an engineering degree from Pratt Institute in
37 Brooklyn, New York. Following graduation, he enlisted in the U.S. Navy for four years,
38 after which he served as a civilian aeronautical engineer for the U.S. Navy. During World
39 War II, he formed a partnership with Stephen D. Bechtel and John A. McCone, who later
40 headed the CIA from 1961-65 (*The New York Times*, December 21, 1974). Following
41 establishment of the Ralph M. Parsons Company in 1944, they began work for the
42 military as designer of the Canol Pipeline, a 1,200-mile oil pipeline between the United

1 States and Canada. Their selection for the Sunnyvale project was presumably a result of
2 Parsons' U.S. Navy contacts. By 1948, they had further cemented their reputation on
3 defense-related projects with the 1948 design of the Point Mugu Missile Facility in Point
4 Mugu, California (Parsons, n.d.).
5

6 The plans were prepared in two stages over the course of 1959. Plans entitled
7 "Development Control Center, Floor Plan A" and "Development Control Center, Floor
8 Plan B," dated March 6, 1959, depicts a rectangular-plan, single-story building (Ralph M.
9 Parsons Company/AFBMD, March 6, 1959a-b). A plan entitled "Development Control
10 Center Increment Two, Plot, Utility, and Grading Plan," dated August 21, 1959, depicts
11 the building with an L-shaped addition appended to the east and south facades (Ralph M.
12 Parsons Company/AFBMD, August 21, 1959).
13

14 In November 1959, 11.423 acres of land was officially transferred to the U.S. Air Force
15 from Lockheed Aircraft Corporation at a cost of one dollar (Kearton, 1959). By the end
16 of 1959, Building 1001 was in its final phase of construction (Forrest McCartney, pers.
17 comm., August 11, 2009). On January 28, 1960, the installation, newly designated as the
18 Satellite Test Center (STC), was dedicated by the U.S. Air Force. Nearly ready for
19 occupancy, construction cost approximately \$2,200,000. The single-story, windowless,
20 pre-cast concrete utilitarian building was heralded by *The New York Times* as the
21 "command post of a worldwide network of launching, tracking and recovery bases for
22 artificial satellites" (Davies, 1960). Building 1001, as it appeared during and following
23 construction, is depicted in the graphic documentation section of this report
24

25 A few months later, on March 1, 1960, the STC was occupied by the 6594th ATW,
26 Lockheed Missiles and Space Division employees, and likely the CIA. The 6594th ATW
27 provided oversight for Lockheed Missiles and Space Division, which was responsible for
28 satellite operations (6594th ATW, 1961; Jernigan, 1983). However, portions of the
29 building remained under construction, including the state-of-the-art Satellite Control
30 Room within the Satellite Control Room Complex. An interim Satellite Control Room
31 was established, from which Lockheed Missiles and Space Division, monitored by the
32 6594th ATW, could direct the launch, tracking, data acquisition, command and control,
33 and recovery phase of military satellites to provide satellite tracking and control (6594th
34 ATW, 1961; Jernigan, 1983). The building also housed administrative and planning
35 facilities, a weather forecasting station, an information center, status rooms, offices,
36 conference rooms, and a cafeteria (Jernigan, 1983).
37

38 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
39 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
40 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
41 the public, likely due in part to a building sign which indicated "U.S. Air Force Satellite
42 Test Center." By the early 1960s, an additional tracking station was established at Fort

1 Greely in Donnelly Flats, Alaska. By this time, the launch site, the STC, and the tracking
2 stations were collectively referred to as the Satellite Control Facility (SCF), although this
3 was not an official designation (Jernigan, 1983). The relationship between Building 1001,
4 tracking stations, and satellites is depicted in the graphic documentation section of this
5 report.
6

7 **8. Satellite Control Room Operational, 1961**

8

9 On February 6, 1961, the Satellite Control Room, became operational, and is depicted in
10 the graphic documentation section of this report. The primary purpose was to support
11 Corona satellites, although additional programs were supported by this time. According
12 to a 1961 6594th ATW Fact Sheet, it featured eight “ultra modern consoles” from which
13 satellites were supported. Each console contained communications and control and
14 display equipment, such as closed-circuit television screens and push-button
15 communications panels. The consoles faced a row of eight projector screens which
16 enabled the controllers to display maps, meteorological conditions, orbital information,
17 telemetry read-outs, and other data (6594th ATW, 1961). The control room featured a
18 balcony from which activity could be observed, and walls of the control room were
19 sheathed in acoustical tile, indicative of the secrecy that surrounded the program (Ralph
20 M. Parsons Company/AFBMD, May 31, 1960). Much of the displayed information was
21 received via tracking stations, and processed and evaluated by computers, such as the
22 Control Data Corporation (CDC) 1604 computer (6594th ATW, 1961).
23

24 In addition, four primary areas supported the Satellite Control Room during operations.
25 These included:

- 26 • The Operational Support Area which provided plotting, display, and
27 meteorological support.
 - 28 • The Communications Center which provided communications support.
 - 29 • The Computer/Programmable Integrated Communications Equipment
30 (PICE) Area which provided high-speed computation and data reduction.
 - 31 • The Technical Director Room which provided consultative support and
32 oversight.
- 33
34
35
36
37

38 With the exception of the Technical Director Room, which likely housed upper-level
39 personnel, all areas were operated by the U.S. Air Force and Lockheed Missiles and
40 Space Division personnel (6594th ATW, 1961). In April 1961, the AFBMD was
41 inactivated, and was replaced by the U.S. Air Force Ballistic Systems Division (BSD)
42 and the U.S. Air Force Space Systems Division (SSD). Furthermore, the 6594th ATW

1 assumed total responsibility for satellite operations, supported by Lockheed Missiles and
2 Space Division. Four new tracking stations were also established in 1961, at:

- 3
- 4 • Fort Dix, New Jersey
- 5 • Camp Roberts, California
- 6 • Fort Greely, Alaska
- 7 • Thule, Greenland (Jernigan, 1983)
- 8

9 **9. Establishment of the National Reconnaissance Office, 1961**

10
11 In September 1961, Secretary of Defense Robert McNamara established the National
12 Reconnaissance Program (NRP), which consisted of development and operation of CIA
13 and U.S. Air Force satellite reconnaissance systems, including the Corona and SAMOS
14 programs, as well as U-2 reconnaissance missions. The National Reconnaissance Office
15 (NRO) was established as a classified agency in DoD, and was tasked with oversight of
16 the NRP (Richelson, 2000). A 1962 memo regarding the organization and function of the
17 NRO indicated that although it was established as an operating agency, the sensitivity of
18 its mission and security required for projects necessitated the concealment of the NRO
19 behind other plausible, overt names, organizations and functions (Charyk, July 23, 1962).

20
21 The NRO was overseen by a joint directorship of the CIA and U.S. Air Force, led by
22 Undersecretary of the Air Force, Dr. Joseph V. Charyk and CIA Deputy Director of
23 Plans, Dr. Richard M. Bissell. The following year, the joint-directorship was eliminated
24 and Dr. Charyk became the sole NRO director (NRO, n.d.). The NRO was staffed by
25 DoD and CIA personnel.

26
27 As a result of NRO oversight of reconnaissance satellite programs, the organization
28 became a presence at the STC and likely had offices in the Technical Director Room in
29 Building 1001. The establishment of the NRO ended direct U.S. Air Force control of
30 reconnaissance satellite programs. The U.S. Air Force continued to provide launch and
31 tracking support for satellites, as well as military support missions, including
32 communications, missile-early warning, meteorology, navigation, and detection of
33 nuclear detonations (Peebles, 1997).

34
35 **10. Early Corona Missions Supported from the Satellite Test Center, 1960-61**

36
37 Three unsuccessful Corona satellites were launched between January and April 1960. On
38 May 1, 1960, U.S. Air Force pilot Francis Gary Powers was shot down while flying a U-2
39 reconnaissance mission over the Soviet Union, resulting in what became known as the U-
40 2 Incident. The United States attempted to conceal the fact that it was a reconnaissance
41 mission, and stated that Powers had piloted a weather research aircraft which
42 inadvertently strayed into Soviet airspace. However, unbeknownst to the United States,

1 the Soviets had captured Powers, his fairly intact plane and surveillance camera, and
2 developed some of the film. Thus, the Soviets were well aware of the intentions of the
3 mission, and were aware of the high-quality photography the United States had from
4 other surveillance missions. This incident resulted in a marked deterioration in relations
5 between the United States and the Soviet Union, and also led to the acceleration of the
6 Corona Program (Temple, 2005).

7
8 In August 1960, the U.S. Air Force accomplished the first successful retrieval of a
9 Discoverer satellite. At 6:00 AM Pacific Daylight Time (PDT), on August 10, countdown
10 for launch of Discoverer XIII commenced. For the next six hours, the launch site at
11 Vandenberg AFB, the tracking stations, and the interim Satellite Control Room at the
12 STC were in communication to perform the necessary activities to launch the satellite.
13 For example, communications checks on voice and data links and periodic weather
14 studies were performed, and equipment status and readiness was checked (6594th ATW,
15 n.d.).

16
17 At 1:38 PM PDT, the satellite was launched, achieved polar orbit for a period of ninety-
18 four minutes, and orbited the earth seventeen times (6594th ATW, n.d.). According to the
19 *San Jose Mercury News*, the satellite was “directed at the Air Force’s Satellite Test
20 Center in Sunnyvale, which was in constant voice communication with the Hawaii
21 Control Center during the operation” (Lindsey, August 12, 1960). The satellites’ orbital
22 characteristics were calculated from the STC to determine when the SRV should be
23 ejected. Upon ejection, the SRV began its descent to earth, and its parachute opened at
24 50,000’. However, the 6594th Recovery Control Group was unable to capture the satellite
25 in the air. The capsule and parachute’s location in the Pacific Ocean was marked utilizing
26 smoke bombs and sonobuoys. It was recovered from the Pacific Ocean on August 11 at
27 7:22 PM PDT, marking the first successful recovery of an object from space (Arnold,
28 2005; 6594th ATW, n.d.). The SRV was presented to President Eisenhower to
29 commemorate the occasions, which is depicted in the graphic documentation section of
30 this report. Still in the testing phase, the satellite did not yet contain a camera (Jernigan,
31 1983).

32
33 In keeping with the publicly stated scientific objectives of the Discoverer Program, the
34 *San Jose Mercury News* noted that “Discoverer recovery techniques will be used soon to
35 return monkeys from space,” and were vital to “returning a man to earth after orbiting in
36 space.” The article further noted that the recovery techniques would be implemented for
37 the successful return of aerial photography associated with the U.S. Air Force SAMOS
38 satellite program (*San Jose Mercury News*, August 12, 1960). Likewise, *The New York*
39 *Times* reported on the launch of Discoverer XIII, and indicated that after two successful
40 capsule recoveries “a monkey is to be strapped into the capsule” (*The New York Times*,
41 August 11, 1960).

1 Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from
2 Vandenberg AFB (Arnold, 2005). Similar to Discoverer XIII, the public was unaware
3 that it was a reconnaissance satellite. *The New York Times* reported that the satellite
4 housed special instruments designed to assist SAMOS and MIDAS satellites in relaying
5 information, and indicated that the next steps for the program “involved chimpanzees in
6 the capsules, firing them into orbit and trying to recover them” (*The New York Times*,
7 August 19, 1960).
8

9 Discoverer XIV orbited the earth seventeen times, supported by the STC from the interim
10 Satellite Control Room in Building 1001, and the Kodiak tracking station, before the
11 eject command was relayed to the satellite. Following the command, at 300 miles above
12 the earth, the SRV separated from the spacecraft, and began its descent to earth. The
13 parachute opened at 50,000’, which slowed its descent to 1,600’ per second (Arnold,
14 2005). A specially equipped C-119 piloted by U.S. Air Force Captain Harold Mitchell
15 missed the capsule by approximately 6” on its first pass, and approximately 2’ on its
16 second pass, before catching it on its third pass, marking the first successful air recovery
17 of an object from space. Captain Mitchell was awarded the Distinguished Flying Cross,
18 and his crew was awarded Air Medals for this feat (*The New York Times*, August 20,
19 1960).
20

21 The Discoverer XIV SRV contained twenty pounds of film which documented over
22 1,650,000 square miles of the Soviet Union, and provided the first successful satellite
23 reconnaissance photographs of the country. It also resulted in more photographic
24 coverage of the Soviet Union than all previous U-2 flights combined. Furthermore, it
25 provided evidence that the missile gap, feared since the 1957 launch of *Sputnik I* by the
26 Soviet Union, did not exist, and that the Soviets did not have an immense stockpile of
27 ICBMs (Day, 2006). However, despite the historic nature of this event, the crew, who
28 were not cleared for the Corona Program, were unaware of the importance of their
29 mission (Arnold, 2005).
30

31 Corona satellites continued to be successfully launched between 1960-61, and Discoverer
32 satellites continued to be covered in the news. For example, on November 12, 1960, *The*
33 *New York Times* reported on the launch of Discoverer XVII, and noted that it was the first
34 of a series of “new military satellites capable of changing course if threatened.” It was
35 described as an approximately 25’ satellite, 6’ longer and 400 pounds heavier than earlier
36 generations of Discoverer satellites. In keeping with the cover story of the Discoverer
37 program, it was reported that “a future Discoverer satellite is expected to carry a monkey
38 into orbit” (*The New York Times*, November 13, 1960). The satellite was ultimately
39 successfully retrieved.
40

41 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
42 satellite supported by the STC from the Satellite Control Room in Building 1001. *The*

1 *New York Times* reported that the launch occurred at 11:21 AM, Pacific Standard Time
2 (PST). The U.S. Air Force didn't announce the purpose of the satellite, though the
3 newspaper speculated that the satellite was part of the on-going development of MIDAS
4 and SAMOS satellites (*The New York Times*, April 9, 1961). Similarly, in November
5 1961, *The New York Times* reported on the launch of Discoverer XXXV, and noted that
6 "the thirty-fifth launching in the intensive Air Force research program, was sent aloft in a
7 continuing effort to perfect a way for recovering capsules from military reconnaissance
8 satellites" (*The New York Times*, November 16, 1961). Although the newspapers
9 continued to report on the Discover cover story, the early Corona satellites were actually
10 providing images of the Soviet Union, as well as other communist countries. Building of
11 the Berlin Wall between East and West Germany was documented in these images
12 (Chapman, 2008).

13
14 Although it was envisioned as an interim reconnaissance satellite program, the success of
15 the early-1960s launches, coupled with the technical and financial failures of other
16 satellite reconnaissance programs, led the NRO to view the Corona Program as a more
17 effective program than originally thought. Therefore, the Corona Program continued to
18 be developed and improved (Perry, November 1973).

19
20 **11. Early SAMOS and MIDAS Missions Supported from the Satellite Test Center,**
21 **1960-61**

22
23 By the fall of 1960, the STC also supported SAMOS and MIDAS programs. However,
24 because the Satellite Control Room in Building 1001 was designed to support a single
25 program, it was only capable of supporting one orbiting satellite vehicle at a time.
26 Therefore, the launch and orbiting sequences were carefully scheduled to avoid overlap
27 (Arnold, 2005).

28
29 On October 11, 1960, the first SAMOS satellite was launched from Vandenberg AFB,
30 but it failed to reach orbit. The *San Jose Mercury News* reported that it was the first U.S.
31 Air Force spy satellite to be launched, and also indicated that it was the first space system
32 whose mission was "purely military, rather than scientific" (*San Jose Mercury News*,
33 October 12, 1960). This underscores the level of secrecy associated with the Corona
34 Program, and the success of the Discoverer Program cover story. Nonetheless, through
35 information supplied by the U.S. Air Force, a general idea of the United States' satellite
36 reconnaissance capabilities was publicized during this time.

37
38 By July 1961, MIDAS satellites were launched from Vandenberg AFB and supported by
39 the STC. By the end of 1961, two MIDAS satellites had reached orbit (6594th ATW,
40 1961). By 1962, the MIDAS Program was re-designated Program 461 (*Milsat Magazine*,
41 July 2008).

1 **12. Construction of Building 1002, 1962**

2
3 In 1962, plans for a two-story, L-shaped building, Building 1002 (Addition to the
4 Satellite Test Annex) were prepared for the U.S. Air Force SSD by Kaiser Engineers, a
5 division of the Henry J. Kaiser Company. Kaiser Engineers was a well-known
6 architecture and engineering firm located in Oakland, California (Kaiser Engineers/U.S.
7 Air Force SSD, January 15, 1962a-b); Air Force Satellite Control Facility (AFSCF),
8 1972).

9
10 Henry J. Kaiser founded his eponymous company in 1914. The company quickly grew
11 through its involvement with large-scale public projects, such as the Hoover Dam in
12 Boulder City, Nevada, and the Grand Coulee Dam, in Grand Coulee, Washington. In
13 addition, Kaiser's company was heavily involved with World War II manufacturing
14 efforts, and fabricated munitions, aircraft, and ships. During the war, engineers at
15 Kaiser's company also constructed airfields and other military facilities. These wartime
16 efforts led to the development of Kaiser Engineers as a separate division of the Henry J.
17 Kaiser Company. Furthermore, as one of the Six Companies, Kaiser was a World War II-
18 era backer of the Sunnyvale-based Joshua Hendy Iron Works. As a result, it is likely that
19 the military and Sunnyvale connections Kaiser had cultivated over the years contributed
20 to the selection of Kaiser Engineers for the STC project (Kaiser Engineers, n.d.).

21
22 A plan entitled "Plot Plan" depicts the L-shaped footprint of Building 1002. The plan also
23 depicts a future addition, appended to the east façade of the L-shaped Building 1002. The
24 addition resulted in a rectangular-shaped building with two interior courtyards (Kaiser
25 Engineers/U.S. Air Force SSD, January 15, 1962c). Construction on the L-shaped
26 building commenced in April 1962, and was completed by September of that year. The
27 building during construction and an aerial view of the installation following construction
28 is included in the graphic documentation section of this report.

29
30 The new building was connected to the north façade of Building 1001 by a hyphen, and
31 provided administrative space. The first story housed offices for technical directors and
32 support staff, security personnel, technical libraries, copy rooms, and conference rooms.
33 The second story housed offices for the commander, intelligence, accounting,
34 maintenance, and engineers, among others. It was constructed of pre-cast concrete panels,
35 and featured fixed-pane ribbon windows (Kaiser Engineers/U.S. Air Force SSD, January
36 15, 1962a-b).

37
38 **13. Multiple Satellite Augmentation Program and Upgrades, 1962-63**

39
40 Although Building 1001 was only completed in 1960, in 1962, Kaiser Engineers prepared
41 plans for modifications to Building 1001, including a single-story addition and room
42 reconfiguration. According to the plans, a single-story 4,200-square foot addition

1 appended to the east façade of Building 1001 housed a new communications center,
2 crypto equipment, and electrical and mechanical rooms. A 1,400-square-foot penthouse
3 was added on the roof of the new addition for heating, ventilating, and air conditioning
4 (HVAC) equipment, necessitated by the installation of new systems (Jernigan, 1983).
5 Kaiser Engineers also prepared plans for interior modifications and upgraded HVAC,
6 plumbing, and electrical systems necessitated by the technological upgrades. Some rooms
7 in the Satellite Control Complex underwent modifications as part of this effort (Kaiser
8 Engineers/U.S. Air Force SSD, October 17, 1962).
9

10 The modifications were likely necessitated by the U.S. Air Force's first modernization
11 effort, the Multiple Satellite Augmentation Program (MSAP). MSAP was initiated to
12 provide support for multiple satellite programs. This effort was initiated in part, to
13 standardize and provide updated equipment to the STC and tracking stations. Prior to this
14 time, each tracking station was unique, with outdated equipment that had limited capacity
15 to support operations. In anticipation of future development of new satellite programs, the
16 systems and operations were designed to provide ample growth potential. The
17 standardization of operations also allowed for personnel to provide the same role at any
18 tracking station (Lockheed Missiles and Space Company, 1963).
19

20 At the STC, computer capabilities were upgraded from two to six CDC 1604 computers,
21 and from two to six CDC 160A computers. New display and communications equipment
22 were also installed, and connections between the STC and tracking stations were
23 upgraded. This enabled controllers to support multiple satellite operations (Jernigan,
24 1983). In January 1963, a secure circuit was activated between the STC and DoD
25 headquarters at the Pentagon in Washington, DC. This facilitated the relay of information
26 between agencies, including the NRO. In August 1963, a new tracking station was
27 established on the Seychelles Islands in the Indian Ocean, utilizing standardized systems
28 implemented by MSAP. Later that year, a microwave link between Vandenberg AFB and
29 the STC was placed into service. As a result of MSAP efforts, by mid-1963, six satellite
30 programs were supported by the STC (Jernigan, 1983).
31

32 **14. Last Discoverer Launch and New DoD Security Directives, 1962**

33

34 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
35 The following month, the DoD issued a directive that instituted a new security and public
36 information program for all military space projects. The directive classified all military
37 space programs, noting that it was "impractical to selectively protect certain military
38 space programs while continuing an open launch policy for others since to do so would
39 emphasize sensitive projects" (DoD, March 23, 1962). In addition, the directive
40 eliminated project names, and subsequently referred to all projects by randomly selected
41 numbers and letters.
42

1 A CIA memo written the following month underscores the necessity of the new security
2 policy. Considerable information on satellite reconnaissance efforts was available in the
3 United States through newspapers and technical journals, and was therefore also available
4 to the Soviet Union. In fact, articles published in the Soviet Union quoted U.S.
5 newspapers which provided information about satellite reconnaissance capabilities.
6 Although much of the information in newspapers was deliberately misleading, it
7 nonetheless presented a relatively clear picture of the United States' capabilities.
8 Furthermore, details on the launch and orbital data made it easier for the Soviet Union to
9 track the satellites (Armory, April 11, 1962).

10
11 As a result, Discoverer XXXVIII was the last Discoverer satellite launched. Because
12 information about all military satellite programs was subsequently classified, the Corona
13 Program no longer required a cover-story. Satellite launches continued to be announced
14 by the U.S. Air Force, but only limited information was provided. For example, the U.S.
15 Air Force issued the following statement in conjunction with a satellite launched on April
16 17, 1962, "[A] satellite employing a Thor Agena B booster combination was launched
17 today by the Air Force from Vandenberg Air Force Base, California" (*The New York*
18 *Times*, April 18, 1962). In November of that same year, *The New York Times* reported
19 that the U.S. Air Force announced another satellite launch in the same manner. However,
20 the newspaper speculated that it was "believed to be another in the Discoverer series"
21 (*The New York Times*, November 6, 1962). Both satellites launched were Corona
22 satellites (Mission and Spacecraft Library, n.d.).

23
24 By this time, the Keyhole (KH) designation was established and applied to photographic
25 reconnaissance satellites, with a number following the KH (e.g. KH-1) to indicate the
26 type of camera system on-board the satellite. KH designations were retroactively applied
27 to the Corona satellites launched between 1960 and 1962. For example, satellites
28 launched in 1960 had utilized the KH-1 camera system, while those launched between
29 1960 and 1962 had utilized KH-2, -3, -4 and -5 camera systems. The early versions –
30 KH-1, KH-2, KH-3 and KH-6 – carried a single panoramic camera, and the KH-5 carried
31 a single frame camera. Later systems, such as KH-4, KH-4A, and KH-4B carried two
32 panoramic cameras, set 30 degrees apart (Mission and Spacecraft Library, n.d.).
33 Furthermore, the first camera had a ground resolution of approximately 40' feet, while
34 later cameras had a ground resolution of approximately 25' (Broad, September 12, 1995).

35
36 **15. Satellites Supported from the Satellite Test Center, 1963-64**

37
38 Between 1962 and 1963, Defense Meteorological Satellite Program (DMSP) satellites
39 were launched, and supported by the STC. DMSP was a DoD meteorological satellite
40 program initiated in 1960 to provide weather and climate data for more effective military
41 operations. After 1963, DMSP utilized ground stations located at surplus Nike missile

1 sites near Loring AFB, Limestone, Maine, and Fairchild AFB, Spokane, Washington
2 (DMSP, n.d.).
3

4 On October 16, 1963, the first Vela satellite was launched and supported by the STC. The
5 Vela Program – vela means vigil in Spanish – was a series of satellites designed to detect
6 nuclear detonations. The satellites each weighed approximately 300 pounds, received
7 power from solar cells, and typically functioned for up to five years (Jernigan, 1983;
8 Peebles, 1997). Presumably, Vela satellites provided images of the Lanzhou Diffusion
9 Plant in Lanzhou, China, and the Baotao Nuclear Fuel Component Plant in Baotao, China
10 (Richelson, 2002).
11

12 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
13 Furthermore, 1963 marked the beginning of the KH-7 surveillance system, noted in a
14 2006 NRO memo as “the Intelligence Community’s first high resolution surveillance or
15 ‘spotting’ satellite.” Similar to Corona satellites, the KH-7 was a reconnaissance satellite
16 that returned film to earth in SRVs. It was primarily used to provide surveillance of
17 nuclear facilities and ICBM sites in the Soviet Union and China (NRO, 2006).
18

19 In July 1964, two additional Vela satellites were launched, resulting in a total of four
20 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III
21 was launched and supported by the STC. Syncom III was a National Aeronautics and
22 Space Administration (NASA) satellite used for DoD military communications
23 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).
24

25 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
26 satellites had accurately mapped all twenty-five of Moscow’s long-range missile sites.
27 Furthermore, images taken by Corona satellites indicated that China was readying its
28 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that “[O]n
29 the basis of new overhead photography, we are now convinced that the previously
30 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
31 for use in about two months.” Within two months, on October 16, 1964, China tested an
32 atomic bomb at the Lop Nur site (Broad, September 12, 1995). An article in *Time*
33 magazine following the blast reported that the U.S. government had “predicted the blast
34 weeks in advance” and “reported it as soon as it happened,” and lauded the United States’
35 detection methods. However, the detection methods were not divulged, and the general
36 public was unaware that it was a Corona satellite that provided the United States with
37 visual evidence of the developing test site (*Time*, October 30, 1964).
38

39 **16. Establishment of the Air Force Satellite Control Facility, 1963-65**
40

41 On November 20, 1963, the DoD announced that the U.S. Navy Missile Facility at Point
42 Arguello, California, and U.S. Navy tracking stations in the Pacific Ocean would be

1 transferred to the U.S. Air Force. Furthermore, Secretary of Defense Robert McNamara
2 directed that the satellite control be nationalized to serve as the nucleus for development
3 of one satellite control center for all DoD facilities. Thus, the U.S. Air Force became the
4 single manager for ICBM and space-tracking activities. However, development,
5 operation, and management required ongoing high-level interfaces between the U.S. Air
6 Force, DoD, and NASA.

7
8 On July 1, 1965, the AFSCF was officially designated. The mission of the AFSCF was to
9 direct launch, tracking, data acquisition, command and control, and recovery of DoD
10 military satellites. AFSCF Headquarters was established at Los Angeles AFS, El
11 Segundo, California. Detachment 1, AFSCF, and the 6594th Support Group were
12 established at the STC, and the 6594th ATW was discontinued. The 6594th Recovery
13 Control Group at Hickam AFB and tracking stations were also included in the AFSCF
14 organization (Jernigan, 1983).

15
16 **17. Development of the Manned Orbiting Laboratory, 1963-67**

17
18 In 1963, the Manned Orbiting Laboratory (MOL) Program was initiated. The concept
19 involved a Titan III booster rocket which carried a modified Gemini B capsule attached
20 to a space laboratory, and was intended to serve reconnaissance purposes. By July 1965,
21 the *San Jose Mercury News* reported that the U.S. Air Force confirmed that MOL flights
22 would be supported by the STC (*San Jose Mercury News*, September 10, 1965). The
23 following month, President Lyndon Johnson approved \$1.5 billion in plans to develop the
24 MOL Program, and development began in earnest. By June 1967, the STC began to
25 support the testing and development of the MOL Program, which was also designated
26 632A (AFSCF, July-December 1966; Jernigan, 1983).

27
28 **18. Construction and Technological Upgrades, 1964**

29
30 As indicated on the 1962 plan designed by Kaiser Engineers, an addition to Building
31 1002 was planned during its initial construction. The full extent of the building was never
32 realized. However, in May 1964, plans were prepared for a two-story, L-shaped addition
33 to Building 1002 to provide additional administrative space. It was designed by Maher &
34 Martens, a San Francisco-based architecture firm for the U.S. Army Corps of Engineers
35 (USACE), Sacramento District.

36
37 Maher & Martens was founded in 1961 by Edward John Maher and Henry Ernest
38 Martens, both members of the Northern California Chapter of the American Institute of
39 Architects (AIA) (AIA, 1970). Prior to the formation of Maher & Martens, Maher was a
40 principal in the firm Blanchard & Maher, which was hired by the U.S. Forest Service in
41 the 1930s to design buildings in California's national parks (Grosvenor, 1999). Maher &
42 Martens received awards for their design for San Francisco Bay Area Rapid Transit and

1 the U.S. Department of Housing and Urban Design (AIA, 1970). The addition was
2 appended to the east façade of Building 1002, and created an interior courtyard. A
3 hyphen connected the south façade of Building 1002 to the north façade of Building 1001
4 (Maher & Martens/USACE Sacramento District, May 7, 1964a-b; AFSCF, 1972).

5
6 Communications systems were also upgraded that year. Upgrades included the
7 installation of a semi-automatic teletype switch, which provided near real-time
8 capabilities, and the installation of high-frequency, high-power radio station. The
9 switchboard capacity was also increased to 1,000 lines. Univac 1040 computer systems
10 were also installed, at a cost of \$42,000, and two CDC 1604 mainframes were purchased
11 for \$594,000 (Jernigan, 1983).

12 13 **19. Interim Expansion Plan and Technological Upgrades, 1965-67**

14
15 By the mid-1960s, the U.S. Air Force had begun to weigh the benefits of expansion of the
16 STC versus the development of additional satellite control facilities at another location.
17 Following the establishment of the MOL Program in 1963 and the official establishment
18 of the AFSCF in July 1965, the decision was made to expand the STC. An Interim
19 Expansion Plan (IEP) was initiated to augment the facility and implement the Mission
20 Control Center (MCC) concept, which focused on the development of mission-oriented
21 control centers over a single control room (Jernigan, 1983).

22
23 A test MCC was established at the STC in Building 1001, and plans for additional MCCs
24 as well as other elements of the IEP were prepared by San Francisco-based consulting
25 engineers, Bentley Engineers, and Earl & Wright, Inc., under the auspices of the U.S. Air
26 Force SSD. The plans indicated that the building was reconfigured to accommodate four
27 new MCCs, known as MCCs 1, 2, 3, and 4. In addition, the building also featured two
28 new complex areas, known as Complex Numbers 6 and 7. Although earlier plans do not
29 identify other complex areas, it appears that there were such areas in Building 1001
30 which likely housed operations of some sort. The plans also indicated that two new
31 communications areas, labeled Communications Area A and B, were added, as well as a
32 new bird buffer area (Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD,
33 December 13, 1965a-d).

34
35 The Satellite Control Room Complex remained relatively unchanged, and continued to
36 serve as the control room for the Corona Program. In addition, Bentley Engineers and
37 Earl & Wright also prepared mechanical plans to upgrade HVAC, plumbing, and
38 electrical systems necessitated by the installation of computers and equipment (Onizuka
39 AFS, n.d.).

40
41 According to the plans, the construction schedule identified a January 1966 start date and
42 a May 1966 completion date (Bentley Engineers and Earl & Wright, Inc./U.S. Air Force

1 SSD, December 13, 1965b). Keeping somewhat on track, the majority of construction
2 was completed by December 1966 (AFSCF, January-June 1966). As part of the IEP, new
3 equipment was installed throughout 1967, including CDC 3600 computers, which
4 replaced the CDC 1604 computers (Jernigan, 1983).

5
6 In 1970, the AFSCF prepared an unclassified document that served as a guide for
7 military, civilian, and contractor personnel to ensure understanding of operations at the
8 STC. The guide provided a brief description of the MCCs in Building 1001. Although it
9 was produced after the 1966 modifications, it is likely that they functioned in much the
10 same way. As described in the guide MCCs in Building 1001 included:

- 11
12 • MCC 1: supported several satellite programs in conjunction with all
13 tracking stations.
- 14
15 • MCC2: supported several satellite programs involving multiple satellites
16 in conjunction with all but one tracking station.
- 17
18 • MCC 3: supported high-complex, low-orbit satellites that required
19 extensive commanding and analysis of a large volume of telemetry data.
- 20
21 • MCC 4: supported a highly sophisticated low-orbit satellite program
22 (AFSCF, 1970).

23
24 The MCC's included a control console with seven twenty-channel television monitors,
25 remote controlled 35 mm projectors, secure and non-secure telephones, and time display
26 units (AFSCF, January-June 1967).

27
28 The increase in the number of flight support hours logged by the AFSCF between 1965
29 and 1966 appears to indicate that at least some of the MCCs may have been operational
30 in 1966. In 1965, the AFSCF logged 20,757 hours of satellite flight support. By 1966,
31 29,400 hours of flight support were logged. The Satellite Control Room continued to be
32 used to support the Corona Program at that time (Arnold, 2005; Hughes, 1966). The
33 number of satellites supported also increased. In 1965, the STC supported approximately
34 fourteen satellites (AFSCF, 1972). In January 1967, the STC supported thirty-one
35 satellites per day, and by June were supporting forty-four per day, which was expected to
36 increase to forty-seven per day by July (AFSCF January-June 1967).

37
38 Additional advances in 1966 included the development of a centralized scheduling
39 program, known as Scheduling Control and Resource Allocation Buffer Link (SCRABL).
40 In addition to scheduling flight and non-flight satellite activity, this new program also
41 took into account station downtime, equipment modifications, and computer operations.

1 All these factors were incorporated into ninety-day and thirty-day schedules, and a more-
2 detailed seven-day schedule (Jernigan, 1983). This allowed greater efficiency in satellite
3 operations.
4

5 In 1967, the U.S. Air Force BSD and SSD were combined to form the U.S. Air Force
6 Space and Missiles System Organization (SAMSO). That year, the STC, under the
7 auspices of SAMSO, underwent a second modernization effort, which involved the
8 establishment of new data handling, display, communications, and support systems. Two
9 key programs were initiated as part of this effort – the Advanced Data System (ADS) and
10 the Expanded Communications Electronics System (EXCELS). ADS involved major
11 computer and software upgrades in order to expand data handling capability. EXCELS
12 replaced the manual communications system with an automated, centrally controlled
13 system fully integrated with the ADS. Ultimately, this effort provided a single operational
14 entity with control over the AFSCF and support for present and future MCCs regardless
15 of location. The systems were installed at the STC and tracking stations (Jernigan, 1983;
16 Fedor, et al., 2006).
17

18 **20. Development of Buildings 1003 and 1004, 1966-70**
19

20 In conjunction with the technological upgrades which occurred throughout the mid-to-
21 late 1960s, a real estate estimate was prepared by the USACE Sacramento District in
22 August 1966 that proposed the acquisition of 8.2 acres of land from Lockheed Aircraft
23 Corporation at a cost of \$49,000. In 1966, Alhambra, California-based architecture and
24 engineering firm, C.F. Braun & Company prepared site development plans under the
25 auspices of the U.S. Naval Facilities Engineering Command (NAVFAC) Western
26 Division, San Bruno, California, and SAMSO, Los Angeles, California, (C.F. Braun &
27 Company/NAVFAC/SAMSO, December 23, 1966).
28

29 C.F. Braun & Company was founded by Carl Braun in 1909, and quickly became well-
30 known for construction of industrial facilities, including oil refineries and chemical plants
31 (*The New York Times*, February 5, 1954). Although Braun died in 1954, the reputation he
32 had established for his company as a builder of industrial facilities likely led to his
33 selection by SAMSO to develop the STC's new buildings. Carl Swenson, Inc. of San
34 Jose, California, and the Powerhouse Oakland Construction Company of Salt Lake City,
35 Utah, served as contractors (*Aerospace Daily*, September 19, 1969).
36

37 Site development plans, dated December 30, 1966, included relocation of an existing
38 Lockheed Missiles and Space building; reconfiguration of Lockheed Martin Way
39 (formerly known as East Perimeter Road) west of Building 1001; creation of additional
40 parking space; and installation of underground utilities (C.F. Braun &
41 Company/NAVFAC/SAMSO, December 23, 1966). In addition, C.F. Braun & Company
42 also prepared plans for the development of two new buildings, Building 1003 (STC

1 Building Addition), and Building 1004 (Power Plant) (C.F. Braun/NAVFAC/SAMSO,
2 November 14, 1967).

3
4 By 1968, funds were appropriated for acquisition of land and construction of two
5 buildings. By August 1968, Lockheed Aircraft Corporation transferred the land to the
6 U.S. Air Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). That year, the *San*
7 *Jose Mercury News* reported that the STC would be “updated in a project expected to
8 cost more than \$40 million” to support the MOL Program. The article noted that the
9 project was under “tight security wraps” and was “smothered in secrecy” (*San Jose*
10 *Mercury News*, January 10, 1967 and January 17, 1967). By September, the newspaper
11 reported that the U.S. Air Force announced plans to build a four-story, 150,000-square-
12 foot addition at the STC, Building 1003 (*San Jose Mercury News*, September 16, 1967).

13
14 Building 1003 was designed to house the MOL Program, as well as other satellite
15 programs. However, in June 1969, the DoD announced the cancellation of the MOL
16 Program to save money. The cancellation led to a short work stoppage, however
17 construction resumed a few weeks later. *Aerospace Daily* reported that the U.S. Air
18 Force had evaluated requirements for current and future programs, and determined that
19 construction on the building should continue (*Aerospace Daily*, September 19, 1969).
20 The *San Jose Mercury News* reported that “official announcements merely declared that
21 ‘other activities’ would replace the MOL in the sky-blue building.” The article also noted
22 that the new facilities may “become home for a space shuttle command post” (Carey,
23 1969). Building 1003 during and following construction is depicted in the graphic
24 documentation section of this report.

25
26 By the end of 1969, the 164,000-square foot Building 1003, constructed at a cost of \$8
27 million, was nearly complete. A windowless, pre-cast concrete-panel building, it was
28 appended to the west façade of Building 1001. Although the building was technically
29 four stories, it was approximately 104’ high, and each story measured approximately 25’
30 high to accommodate mechanical equipment necessary to maintain satellite programs. In
31 addition, the building featured a mezzanine that housed mechanical equipment, including
32 electrical panels and massive air handling units (AHU), among others. A large amount of
33 mechanical equipment was necessary for satellite operations. The building was painted
34 “Air Force blue,” resulting in its nickname, the “Blue Cube” (*Aerospace Daily*,
35 September 19, 1969)

36
37 Although the original plans do not indicate room names or functions, a 1970 AFSCF
38 document includes a partially labeled floor plan for the building. The first story housed
39 communications and crypto equipment, data distribution center, mechanical equipment
40 and storage, and the second story housed four CDC 3800 computer rooms and a tape
41 library. Three MCCs were located on the third story, MCCs D, F, and M. The fourth

1 story housed offices for field detachment and training. The document also included
2 information on the function of the three MCCs:
3

- 4 • MCC D: Supported several high and low-orbit satellite programs and
5 ballistic test programs. Support was provided to approximately twenty
6 satellites daily, and the duration of support varied from five minutes to
7 two hours.
8
- 9 • MCC F: Supported several high-altitude satellites requiring extensive SCF
10 support in conjunction with using organizations external to the SCF. The
11 MCC was manned continuously throughout the duration of the program.
12
- 13 • MCC M: Supported multiple high-orbit satellites which required that the
14 MCC be manned continuously throughout the duration of the program
15 (AFSCF, 1970).
16

17 In addition, the Onizuka AFS Drawing Number Log indicates that MCCs B, C, and D
18 were on the fourth story.
19

20 Shortly after construction, the Vela Program office, along with another unidentified
21 satellite program, was relocated from Building 1001 to Building 1003 (AFSCF, July-
22 December 1969). The satellite was supported from MCC M, located on the third story
23 (Jernigan, 1983).
24

25 Architectural plans for Building 1004 were developed by C.F. Braun & Company, and
26 mechanical plans were developed by consulting engineers, Pope, Evans & Robbins, on
27 behalf of Solar, a division of International Harvester Company, based in San Diego,
28 California. Solar provided the Saturn gas turbine generator sets that powered the plant,
29 and therefore was responsible for the mechanical layout of the building. In 1927, Solar,
30 originally known as the Prudden-San Diego Airplane Company, was founded to
31 manufacture aircraft. By 1929, the company had only manufactured three aircraft, and
32 opted to begin manufacturing aircraft components for other manufacturers as Solar
33 Aircraft Company. During World War II, they produced exhaust manifolds for military
34 aircraft, and developed high-temperature components for jet engines.
35

36 After World War II, the company was awarded multiple contracts to develop engine
37 parts, including one with the U.S. Navy to develop an afterburner for a turbojet engine.
38 Solar became the first U.S. company to develop a practical afterburner. Following this
39 success, the company was awarded a contract by the U.S. Navy to develop gas turbine
40 engines to provide auxiliary power for ships, as well by the U.S. Air Force to develop gas
41 turbines to provide auxiliary power for aircraft (Fleming and Leyes, 1999). In the 1950s,

1 under contract to the U.S. Navy, the company developed the Saturn gas turbine, a 750
2 kilowatt (kW) engine. In addition to its application on ships, the company also saw the
3 commercial potential in the product, because it was smaller, lighter, more reliable, and
4 easier to maintain than low-speed reciprocating engines traditionally used for industrial
5 applications (Solar Turbines, n.d.)
6

7 In 1960, Solar Aircraft Company was acquired by International Harvester Company
8 (Solar Turbines, n.d.). That year, an article about the benefits of gas turbine engines
9 appeared in *Time* magazine, and touted the company as a “major gas turbine maker”
10 (*Time*, October 31, 1960). By 1965, Solar purchased 99 acres in San Diego to construct a
11 “major manufacturing facility for gas turbine engines,” indicative of their growth and
12 prominence during this time period (*Gas Turbine*, 1965).
13

14 It is likely that Solar’s reputation as a gas turbine manufacturer, and their prior work for
15 the military, led the U.S. Air Force to select them to provide Saturn gas turbine generator
16 sets for Building 1004. The two-story power plant cost \$5.4 million to construct, and was
17 designed to operate as a “total energy system” for the STC, and provided all the electrical
18 and mechanical power required to support Buildings 1001 and 1003 (*Aerospace Daily*,
19 September 19, 1969). Similar to Building 1003, it was also a windowless building clad in
20 pre-cast concrete panels. Metal louvers pierced the east and west facades to provide
21 ventilation for the mechanical equipment (C.F. Braun & Company/NAVFAC/SAMSO,
22 August 12, 1968c-d).
23

24 Building 1004 featured twelve, 750 kW 1,000 horsepower, Solar Saturn gas turbine
25 generator sets, described by *Aerospace Daily* as “state-of-the-art,” and cost \$3.1 million
26 (*Aerospace Daily*, September 19, 1969). The *San Jose Mercury News* reported that they
27 were “twelve of the largest turbines in the country” (*San Jose Mercury News*, February
28 20, 1970). The installation of the turbines required the use of cranes. Building 1004
29 during and following construction is depicted in the graphic documentation section of this
30 report.
31

32 The turbines, sparked by wet-cell batteries, were run by natural gas supplied by Pacific
33 Gas & Electric (PG&E) Company, with diesel fuel available as back-up. In the event of a
34 natural gas interruption, the turbines were designed to automatically switch to diesel fuel
35 without any disruption of power. Waste heat generated from the turbines was piped into
36 heat recovery boilers, and converted into steam to run absorption chillers to provide air
37 conditioning, and heat exchangers to provide heat and hot water (Anthony Ruocchio,
38 pers. comm., June 9, 2010).
39

40 The first story housed the battery room, chillers, and heat exchangers. The second story
41 housed the turbines, boilers, and the Solar Control Consoles (C.F. Braun &
42 Company/NAVFAC/SAMSO, August 12, 1968a-b). The Solar Control Console is

1 depicted in the graphic documentation section of this report. All systems were designed
2 with redundancies, because the power provided by Building 1004 was critical to ensure
3 continued support of satellite programs controlled from the STC (Anthony Ruocchio,
4 pers. comm., June 9, 2010).

5
6 The development of Building 1004 necessitated modifications to the installation's power
7 distribution system. Ties connecting to the PG&E power grid were severed, with the
8 exception of one line which provided power through a Lockheed Missiles and Space
9 Division Substation, and was likely kept active for back-up purposes (AFSCF, 1972). In
10 addition to providing the Saturn gas turbine generator sets, Solar also provided the
11 personnel to run and maintain the plant (Anthony Ruocchio, pers. comm., June 9, 2010).
12 It became operational in February 1970, and provided power to the entire installation,
13 rendering it energy-independent at that time (Jernigan, 1983).

14
15 Building 1004 was designed as a prototype power plant intended to be developed at U.S.
16 Air Force facilities across the United States. This plan was never realized, in part due to
17 the 1970s oil crisis (Ruocchio, pers. comm., June 9, 2010). However, it should be noted
18 that the U.S. Air Force continued to utilize Saturn gas turbines at other installations. For
19 example, in 1985, *Turbomachinery International* reported that the U.S. Air Force had
20 acquired twenty-three Saturn-powered generator sets to support remote deployments
21 without facilities (*Turbomachinery International*, January-February 1985).

22 23 **21. Satellites Supported and Notable Events, 1966-70**

24
25 Between 1966-70, the STC supported over thirty Corona satellite launches from the
26 Satellite Control Room in Building 1001 (Mission and Spacecraft Library, n.d.). The U.S.
27 Air Force continued to publicize the launch of all of these satellites, but declined to
28 provide any additional information. By 1966, upgrades to the installation had resulted in
29 an increase in involvement in satellite programs. In addition to Corona, Vela, and other
30 programs (many of which likely remained classified) new programs such as NASA's
31 Biosatellite Program were supported. The Biosatellite Program was a series of three
32 satellites designed to assess the effects of spaceflight on living organisms. Support for the
33 program focused on directing satellite recovery by Lockheed C-130 *Hercules* (C-130)
34 aircraft flown by the 6594th Aircraft Recovery Group based at Hickam AFB, Honolulu,
35 Hawaii (Jernigan, 1983).

36
37 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
38 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
39 SESP was responsible for providing flights for research and experiments undertaken by
40 government agencies (AFSCF, January-June 1968; Jernigan, 1983). That year, the KH-7
41 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
42 of which successfully returned usable images (NRO, 2006).

1 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
2 supported by the STC, uncovered the Soviet Union's plans for the invasion of
3 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
4 monitored Soviet radio transmissions which signaled the invasion was imminent, and
5 photographic reconnaissance satellites had monitored unusual military activities on the
6 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops" (*San*
7 *Jose Mercury News*, August 27, 1968).

8
9 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
10 supported by the STC and tracking stations. The LES was an experimental satellite used
11 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).

12
13 In 1969, support was provided for NASA's manned flights to the moon. The STC
14 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar landing
15 mission. Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program
16 949 was designated in November 1966 to supplant Program 461, which had initially
17 supplanted the MIDAS Program in 1963. Program 949 provided a wider range of
18 capabilities, and by the 1970s, was expected to have "progressively enhanced world-wide
19 early-warning, surveillance and detection capabilities" (Piper, 1970).

20
21 By the end of 1969, an *Aerospace Daily* article noted that "it is reliably reported that the
22 AFSCF can service in real time more than thirty active satellites representing a variety of
23 different operational and research/development programs simultaneously" (*Aerospace*
24 *Daily*, September 19, 1969). However, STC operations, and many of the satellites it
25 supported remained shrouded in secrecy. In fact, security was so tight that in 1968, a *San*
26 *Jose Mercury News* article reported that "when Vice President Hubert Humphrey visited
27 the nearby Lockheed plant recently, he was at first banned from admission to the satellite
28 center." Eventually, Humphrey was allowed in, and became one of the few publicly
29 identified notable visitors to the installation (Lindsey, March 10, 1968).

30
31 **22. Termination of the Corona Program, 1972**

32
33 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. On May 25, 1972,
34 Sunnyvale AFS supported the 145th and final launch of the Corona Program, from the
35 original Satellite Control Room in Building 1001. It was terminated as a result of
36 advances in satellite technology. By the time the Corona Program concluded, Corona
37 satellites had provided approximately 800,000 reconnaissance photographs covering
38 approximately 510 million square miles (Chapman, 2008; Vukotich, n.d). Following the
39 termination of the Corona Program, the Satellite Control Room Complex continued to be
40 utilized for control of other satellite programs.

1 **23. Building and Technological Upgrades, 1970s**

2
3 Technological upgrades continued to be made throughout the 1970s to support the
4 various missions of Sunnyvale AFS. The Onizuka AFS Drawing Number Log reveals
5 that plans were prepared for numerous projects during the 1970s. The scale of these
6 projects ranged from routine maintenance to building additions. A majority of the plans
7 from the early 1970s focused on upgrades to integrate technological and mechanical
8 equipment between Buildings 1001; 1002; 1003; and 1004 (Onizuka AFS, n.d.). For
9 example, in 1971, communications circuits were relocated from Building 1001 to
10 Building 1003, which permitted additional operator space and generally improved
11 working and security conditions. In 1972, a twenty-channel digital television for
12 computer-controlled switching was installed between Building 1001 and Building 1003.
13 A keyboard/light-pen entry system was installed, likely in both buildings. In 1973, a
14 seventh CDC 3800 computer was installed in Building 1003 (Jernigan, 1983).

15
16 Throughout the early 1970s, the U.S. Air Force contracted with Solar to staff Building
17 1004. However, a yearly increase in prices led the U.S. Air Force to directly hire Solar
18 employees in 1974, rather than pay Solar to run the plant (Ruocchio, pers. comm. June 9,
19 2010).

20
21 Numerous plans were prepared for reconfiguration and renovation of interior space, many
22 as a result of changing technology and establishment of new satellite programs.
23 Following the termination of the Corona Program, in 1975, plans were prepared by San
24 Francisco-based architecture and engineering firm Keller & Gannon, under the auspices
25 of U.S. Air Force SAMSO to alter the original Satellite Control Room Complex (Keller
26 & Gannon/SAMSO, September 24, 1975). Keller & Gannon was founded in 1941 by
27 engineers Philip E. Gannon Sr. and George Keller, who had national and international
28 project experience (*The Almanac*, April 27, 2005). Keller & Gannon met during World
29 War II while working for the 12th Naval District, headquartered in San Francisco,
30 strengthening their military ties (*San Francisco Chronicle*, June 5, 2005).

31
32 The plans indicate that the eight consoles, which had been “state-of-the-art” when they
33 were installed in 1961, were slated for removal. In addition, walls, raised floors and
34 ceilings were reconfigured (Keller & Gannon/U.S. Air Force, September 24, 1975).
35 MCCs were also modified to incorporate new technology or new satellite programs,
36 including MCC A and MCC B in Building 1003. Building additions were also
37 constructed in the 1970s. In 1975, Keller & Gannon prepared plans for construction of an
38 addition to the east façade of Building 1004 which functioned as a test laboratory (Keller
39 & Gannon/SAMSO, May 5, 1975)

40
41 In 1974, Building 1015 was constructed to serve as a recreational facility. It was located
42 between Buildings 1001 and Building 1003. Routine maintenance was also performed,

1 and included exterior paint application; maintenance of interior finishes; and maintenance
2 of and re-roofing the buildings. The critical nature of on-going missions at the STC is
3 reflected in routine maintenance tasks. For example, plans prepared by Keller & Gannon
4 to re-roof Building 1001 in 1977 include notes which indicate that the building “houses
5 costly equipment which is essential to the vital military mission of command control,
6 tracking, data acquisition, and space recovery activities of the Air Force Satellite
7 program.” The plans indicate that the building was in continuous operation and its critical
8 function “demands no interruption” (Keller & Gannon, July 29, 1977).
9

10 By 1978, a tracking station was established in the United Kingdom in Oakhanger, shared
11 by the United States and the British. In 1979, SAMSO was divided into two separate U.S.
12 Air Force entities – the Space Division (SD) and the Ballistic Missile Office (BMO)
13 (Jernigan, 1983).
14

15 **24. Satellites Supported and the Origins of the Term “Silicon Valley,” 1970s**
16

17 In the 1970s, Sunnyvale AFS continued to support existing and newly established
18 satellite programs, many of which remained classified, from Buildings 1001 and 1003. In
19 1970, the AFSCF Satellite Test Operations Historical Reports noted the successful
20 support of two “unique orbital events” from the installation. These events included
21 support of the Apollo 13 mission in April, which was aborted following the explosion of
22 an on-board oxygen tank, and support of the first North Atlantic Treaty Organization
23 (NATO) communications satellite in March (AFSCF, January-June 1970).
24

25 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
26 support throughout the 1970s for the orbiting satellite (Jernigan, 1983). Program 949 was
27 also re-designated the Defense System Program (DSP) in 1970. Sunnyvale AFS
28 continued to support this program throughout the early 1970s (AFSCF, July-December
29 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was approximately 23’
30 long, 10’ wide, and contained a large infrared telescope which scanned the earth for
31 missile launches. In the event a missile was launched, it would be detected by the United
32 States within minutes, which removed the possibility of a surprise attack (Peebles, 1997).
33

34 In 1971, the AFSCF, including Sunnyvale AFS, tracking stations, and recovery
35 operations, was awarded for its “exceptionally meritorious service” for satellite control
36 during 1969-70. The citation noted that the AFSCF provided “outstanding support” to the
37 DoD satellite research programs and NASA Apollo lunar missions, and made a
38 “substantial contribution to the current and future capabilities of the U.S. Air Force to
39 conduct operations in space” (Wagner, November 30, 1971).
40

41 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
42 advanced communications satellites had been launched to handle voice, teletype,

1 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
2 satellites – code-named HEXAGON, and popularly known as “Big Bird” – were also
3 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
4 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
5 to photograph large areas and return the film to earth via SRV. They carried
6 technologically advanced cameras, additional film capsules, and antennae for other
7 intelligence-gathering purposes (Clark, 2007).
8

9 In 1971, a trade magazine, *Electronic News* ran a three-part series, entitled “Silicon
10 Valley, USA” on the history of the semiconductor industry in the Santa Clara Valley.
11 Silicon is a primary material used in the manufacture of semiconductors. As a result, this
12 area, which included Sunnyvale AFS, and continued to be at the forefront of
13 technological advancement, became commonly known as Silicon Valley (Lecuyer, 2006).
14

15 In July 1975, the final Apollo flight was launched and supported by Sunnyvale AFS. The
16 final flight was known as the Apollo-Soyuz Test Project, which marked the first joint
17 United States-Soviet Union space mission. The mission was the first time two foreign
18 spacecraft docked together in orbit (NASA, July 14, 2010). In 1976, the first DMSP
19 Block 5D, a meteorological satellite, was launched, and was presumably supported from
20 Sunnyvale AFS. It was an upgraded version of the 1960s-era DMSP, and provided twice-
21 daily, worldwide meteorological, oceanographic, and solar-terrestrial physics
22 measurements (Jernigan, 1983; Wade, n.d.).
23

24 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
25 the first successful electronic imaging satellite, and transmitted high-quality images in
26 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources
27 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
28 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
29 lettering on billboards” (Ingersoll, November 5, 1978). Nonetheless, this top-secret
30 satellite represented significant advances in the development of satellite technology, and
31 was supported from an MCC in Building 1001 or 1003 at Sunnyvale AFS, as well as
32 associated tracking stations.
33

34 In February 1978, the first Navigation System for Timing and Ranging (NAVSTAR)
35 Global Positioning Satellite (GPS) was successfully launched into orbit and was
36 supported from Sunnyvale AFS. It was operational by March, and was the first vehicle in
37 a constellation of satellites planned for the GPS program. Subsequent NAVSTAR
38 satellites were launched in May, October, and December of that year, and April 1979
39 (Jernigan, 1983).
40
41
42

1 **25. Development of the Space Transportation System, 1972-76**

2
3 In January 1972, President Richard Nixon announced the development of the Space
4 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
5 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
6 bases for the Space Shuttle Program. R&D shuttle launches would originate from the
7 Kennedy Space Center, and military launches would originate from Vandenberg AFB
8 (Jernigan, 1983). The shuttle would be responsible for the launch of all commercial,
9 scientific, and military satellites into space. The NRO was involved with the development
10 and design of the shuttle to suit the needs of its satellite reconnaissance missions. For
11 example, the NRO required a larger cargo bay than originally planned by NASA, as well
12 as greater landing maneuverability (Cassutt, August 1, 2009).

13
14 The AFSCF, including Sunnyvale AFS and tracking stations, would provide tracking and
15 control for the program. AFSCF would support the following aspects of the Space Shuttle
16 Program:

- 17 • Flight planning and resource scheduling.
- 18 • On-pad shuttle and payload examination.
- 19 • Tracking, telemetry & commanding (TT&C) in altitudes above 400
20 nautical miles, and during contingency operations.
- 21 • Interface with crew during satellite retrieval and deployment.
- 22 • Support launches with as little as two hours notice (Jernigan, 1983).
- 23
- 24
- 25
- 26
- 27
- 28

29 In 1976, concerns over the reliability of the shuttle were articulated by Acting Director of
30 the NRO, Charles W. Cook. Cook indicated that backup booster vehicles were required in
31 the event the shuttle was unable to launch the satellites, and noted that “[S]huttle
32 vulnerability and operational and logistic restrictions will continue indefinitely to
33 influence the need for backup boosters.” Furthermore, the backup boosters were also
34 required to “provide a quick reaction capability in a time of crisis,” because “the
35 importance of overhead reconnaissance would increase, yet our primary reconnaissance
36 vehicles and launch vehicles (Shuttle) might be neutralized” (Cook, July 8, 1976).

37
38 **26. Development of the Air Force Satellite Control Network and the Strategic Defense**
39 **Initiative, 1980s**

40
41 In the early 1980s, the Soviet Union’s military arsenal surpassed the United States. In
42 1982, the U.S. Air Force Space Command (SPACECOM) was formed, with space

1 operations as its primary mission. Its goal was to ensure that the United States could
2 defend itself from a Soviet attack (SPACECOM, n.d.).
3

4 The operations concept for Air Force Satellite Control Network (AFSCN) was also
5 developed in 1982. The goal of the AFSCN was to provide “enduring control capability
6 commensurate with the need for operational space suites throughout the conflict
7 spectrum” (AFSCF, 1983). The AFSCN was not a formal organization, but rather
8 denoted a group of common user resources, assets, and facilities which collectively
9 provided TT&C support for virtually all DoD spacecraft, plus select NASA and foreign
10 government programs (Hane, 1988).
11

12 To accomplish this goal, a Data Modernization Program was implemented, and
13 Sunnyvale AFS underwent upgrades. This \$500 million upgrade introduced centralized
14 database-driven computer hardware and software to replace outdated systems. The
15 upgraded system was more reliable, cheaper to maintain, and faster than its predecessor,
16 allowing it to support a steadily increasing satellite support workload (Fedor et al., 2006).
17

18 In addition, a new satellite control center – the Consolidated Space Operations Center
19 (CSOC) – was constructed at Falcon AFS, Colorado Springs, Colorado (present-day
20 Schriever AFB) (Fedor et al., 2006). The CSOC was constructed partially due to concern
21 about the vulnerability of Sunnyvale AFS to earthquakes and terrorism. In 1982, the U.S.
22 General Accounting office prepared a report which indicated that a loss of the control
23 center in Sunnyvale would result in a major disruption of communications, and of
24 tracking and control of space systems. A *San Jose Mercury News* article three years later
25 indicated that Sunnyvale AFS would be a top priority for Soviet spies, and quoted an
26 unnamed Federal Bureau of Investigation (FBI) agent who indicated that Sunnyvale AFS
27 – and specifically the “Blue Cube” – was “probably number one on their list” (Philp, June
28 9, 1985).
29

30 In 1983, fears that the United States lagged behind the Soviet Union in manned space
31 flights led President Ronald Regan to propose the Strategic Defense Initiative (SDI). SDI,
32 which became known as “Star Wars,” would use ground and space-based missile systems
33 to protect the United States from attack by strategic nuclear ballistic missiles. One of the
34 goals of the program was to establish a permanent presence in space for the United States
35 (*Business Week*, June 20, 1983).
36

37 **26. Construction of Buildings 10031 and 10032, 1980s**
38

39 Two new buildings were constructed in the 1980s in conjunction with the Data Systems
40 Modernization Program to provide space for satellite control, Buildings 10031 and
41 10032, referred to on plans as MCCs. In 1981, King/Reif and Associates, an architecture
42 and planning firm, prepared plans for Building 10031 on behalf of NAVFAC Western

1 Division. Plans were stamped by AIA-registered architect Richard A. Reif, a partner in
2 the firm; however, no further information about the firm, or Mr. Reif was available. The
3 three-story building was appended to the north façades of Buildings 1001 and 1003, and
4 included construction of a new entrance that obscured the original entrance on the west
5 façade of Building 1001. Although the lobby and entrance was constructed as part of
6 Building 10031, they were considered part of Building 1001. The entrance was
7 embellished with a metal sign that read “Sunnyvale Air Force Station” (King/Reif and
8 Associates/NAVFAC, December 18, 1981d; Fola Odafalu, pers. comm., July 26, 2010).
9

10 The first two stories housed parking facilities, and the third story included secure space
11 that supported a “high priority” satellite system known as Program 106. In addition to
12 Program 106, the third story housed MCC IX, computer rooms, communications rooms,
13 and offices, and may have also housed other MCCs. The third story was radio frequency
14 interference (RFI)-shielded to protect electronic and communications systems critical to
15 satellite control from electromagnetic interference (EMI) and RFI. Floor plans for the
16 third story indicate that the RFI-penetration protection was provided on the roof, floor,
17 and exterior walls to protect the third story. In addition, several interior spaces were also
18 separated by RFI partitions, likely to protect individual satellite support activities in
19 MCCs. In general, the RFI-shielded areas were accessed via interlock doors, where only
20 one door opened at a time, ensuring that the area remained shielded at all times
21 (King/Reif and Associates/NAVFAC, December 18, 1981a-c). Construction began in
22 March 1982 (U.S. Air Force, 2006).
23

24 In 1982, plans were prepared for Building 10032 by Rasmussen Ingle Anderson, a San
25 Francisco-based architecture firm, under the auspices of NAVFAC Western Division.
26 Many of the plans were stamped by AIA-registered architect, John Frederick Ingle, a
27 founder of the firm. Ingle served in the USACE during World War II, and as a partner in
28 Rasmussen Ingle Anderson, was a pioneer in Silicon Valley for his design of industrial
29 clean-air rooms (*The San Francisco Chronicle*, November 15, 2009). The firm was also
30 noted for its expertise in earthquake engineering, which may have helped it be selected to
31 design Building 10032 (*Electronics*, 1980).
32

33 The design of Building 10032 was similar to Building 10031. It was a three-story
34 building which provided two stories of parking, and one story of RFI-shielded space for
35 MCCs, computer rooms, communications rooms, and offices. Likewise, the roof, floors,
36 and exterior walls were RFI-shielded to protect the third story. Several interior areas were
37 also RFI-shielded. The floor plans indicate that four groups of rooms were shielded, and
38 it is likely that these four areas housed MCCs. The RFI-shielded areas were accessed via
39 interlock doors (Rasmussen Ingle Anderson/NAVFAC, October 29, 1982a-c).
40 Furthermore, the Onizuka AFS Drawing Number Log indicates that MCCs 4, 7, and 12
41 were located in Building 10032. MCC 4 was originally located in Building 1001, and
42 presumably was relocated to Building 10032 (Onizuka AFS, n.d.).

1 Building 10032 was constructed adjacent to the west façade of Building 1003. According
2 to the plans, a north and south bridge were envisioned to provide access to the second
3 story of Building 1003. However, because cables and wiring existed at the proposed
4 location of the north bridge, only the south bridge was constructed (Rasmussen Ingle
5 Anderson/NACFAC October 29, 1982c; Dennis Ralphs, pers. comm., June 9, 2010). The
6 plans also illustrate the top-secret nature of activities within the building, and note that
7 where the two buildings joined, contractors were required to stay within certain work
8 areas under supervision of security (Rasmussen Ingle Anderson/NAVFAC, October 29,
9 1982c-d). Both Building 10031 and Building 10032 were operational by 1984, and are
10 depicted in the graphic documentation section of this report (Fola Odafalu, pers, comm.,
11 July 26, 2010).

12
13 **27. Other Construction and Technological Upgrades, 1980s**

14
15 In addition to new construction, according to the Onizuka AFS Drawing Number Log,
16 plans were prepared for hundreds of projects throughout the 1980s to maintain and
17 upgrade the facilities, as well as reconfigure existing MCCs to provide support for new
18 satellite programs, such as the Space Shuttle Program. In September 1981, the U.S. Air
19 Force prepared plans to reconfigure MCC B on the fourth story of Building 1003 to
20 provide support for the Space Shuttle Program. Reconfigured rooms included Rooms
21 4501, 4502, 4503, 4504, 4505, 4506, 4507, 4302, 4303, 4304, 4305, 4306, and 4307. The
22 plans indicated that some walls and high partitions were removed to create larger spaces,
23 while other partitions were be installed to divide spaces. Rooms were painted and tile and
24 carpeting were installed, including soundproof carpet and tile in select rooms. In addition,
25 plans called for the installation of new locks, key boxes, and alarms, indicative of the
26 change in management of MCC B to support the shuttle (U.S. Air Force, September
27 1981).

28
29 In addition, many 1980s-era plans were prepared in conjunction with the Data Systems
30 Modernization Program, and involved renovations to accommodate new computer
31 systems and satellite programs. In 1987, two major projects presumably related to this
32 effort were undertaken. The Satellite Data Terminal Link (SDTL) area, also known as
33 Complex D, and the Inter-Range Operations (IRO) area in Building 1001, were renovated
34 and RFI-shielded to serve as secure mission areas.

35
36 Plans to renovate the SDTL area were prepared by the Stearns-Roger Division of United
37 Engineers and Constructors, an engineering and construction company based in Denver,
38 Colorado, under the auspices of the U.S. Air Force Space Division. The Stearns-Rogers
39 Corporation specialized in construction of industrial facilities. In 1982, they were
40 acquired by United Engineers and Constructor, a Philadelphia-based engineering and
41 construction company, who also specialized in industrial construction (Air Products, May
42 2007).

1 The SDTL area originally functioned as the Satellite Control Room Complex for the
2 Corona Program, and had been somewhat reconfigured in the 1970s following its
3 termination. During the 1980s renovations, the entire area was gutted to accommodate the
4 installation of RFI-shielded materials. The concrete-slab floor was removed and a new,
5 presumably RFI-shielded, concrete slab was poured. New RFI-shielded walls, with
6 acoustical insulation, were constructed on the perimeter of the area, which was
7 reconfigured to house four operations rooms, two printer rooms, and one large equipment
8 room, accessed via a long north/south central corridor. A new RFI-shielded ceiling was
9 installed as well. Entry to the area was provided at the northern and southern ends of the
10 corridor, via RFI-shielded interlock doors (Stearns-Rogers Division, United
11 Engineers/U.S. Air Force Space Division, September 18, 1987; December 18, 1987).
12 According to Mr. Dennis Ralphs, 21st Space Operations Squadron (SOPS) employee, the
13 roof of the building was removed to allow for the installation of RFI-shielded
14 components via crane (Dennis Ralphs, pers. comm., June 9, 2010).

15
16 In addition, the IRO area, which was a smaller area, was also renovated and shielded
17 during this time. Unlike the SDTL area, the IRO area housed only one operations area. In
18 addition, plans indicate that the IRO also housed offices, including a director's office,
19 equipment rooms, and telecommunications rooms. It was accessed by one set of RFI-
20 shielded interlock doors. Mechanical equipment was also installed, including two AHUs
21 on the roof, necessary to maintain air flow in the sealed areas (Stearns-Rogers Division,
22 United Engineers/U.S. Air Force Space Division, September 22, 1987).

23
24 Plans were prepared to alter numerous MCCs throughout the 1980s, also likely in
25 response to the Data Systems Modernization Program. It is likely that all MCCs at the
26 STC underwent some type of renovation during this time. Many of the alterations to the
27 MCCs involved relatively simple room reconfiguration and associated electrical and
28 mechanical work. For example, in 1981, the U.S. Air Force prepared plans to reconfigure
29 MCC B on the fourth story of Building 1003. The plans indicated that some walls and
30 high partitions were removed to create larger spaces, while other partitions were installed
31 to divide spaces. In addition, the plans called for the installation of new locks, key boxes,
32 and alarms, which likely indicated management of the MCC was transitioning to new
33 personnel. Mechanical and electrical upgrades also occurred in conjunction with this
34 project (U.S. Air Force, September 1981).

35
36 In 1987, plans were prepared by Holmes and Narver, Inc., under the auspices of the
37 AFSCF Headquarters, Los Angeles, California, to modify a MCC located in the northeast
38 corner on the third story of Building 1003. Holmes and Narver, Inc., a well-known
39 Orange, California-based architecture and engineering firm held prior contracts with the
40 military. In 1950, the company was awarded a joint DoD and Atomic Energy
41 Commission contract to construct atomic testing facilities on the Eniwok Atoll in the
42 Pacific Ocean (*The New York Times*, February 22, 1950). The plans indicate minor

1 alterations, including the removal of multiple interior walls to create larger spaces
2 (Holmes & Narver, Inc./AFSCF, August 14, 1987).
3

4 In 1984, Building 1025, located between Buildings 1001 and 1004 was constructed to
5 serve as an armory. In addition, security modifications were undertaken throughout the
6 buildings to meet changing mission needs. Alarms, locks, security cameras, and flashing
7 red lights to alert personnel that non-secure individuals were in classified areas, were
8 installed in various rooms in Buildings 1001, 1003, 10031 and 10032 throughout the
9 1980s. Plans were also prepared for routine maintenance of the buildings, such as re-
10 roofing, replacing boilers, and restroom upgrades (Onizuka AFS, n.d.).
11

12 In 1988, the *San Jose Mercury News* reported that the multimillion-dollar Data Systems
13 Modernization Program was behind schedule and over budget. The article indicated that
14 the original \$600 million budget had risen to \$1.4 billion, with the potential to increase by
15 another \$450 million (*San Jose Mercury News*, August 25, 1988).
16

17 **28. Satellite and Shuttle Support, 1980s**
18

19 Sunnyvale AFS continued to support numerous satellite programs throughout the 1980s,
20 although many remained classified. On April 12, 1981, the first mission flown by the
21 Space Shuttle *Columbia* was launched, and successfully returned to earth two days later.
22 The AFSCF provided support for the mission, and five AFSCF mission controllers
23 received U.S. Air Force Commendation Medals (Jernigan, 1983). In addition, most, if not
24 all, of the Space Shuttle Program astronauts visited or trained at Sunnyvale AFS (Dennis
25 Ralphs, pers. comm., August 3, 2009). This was likely because the shuttle was used to
26 launch all satellites, including classified reconnaissance satellites.
27

28 In June 1982, the first classified military payload was carried into orbit aboard the fourth
29 *Columbia* shuttle mission (Jernigan, 1983). Throughout the 1980s, classified payloads
30 continued to be launched on dedicated military flights sponsored by the NRO and U.S.
31 Air Force, and as secondary payloads on NASA-sponsored flights (Cassutt, August 1,
32 2009).
33

34 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
35 appeared to be planning a surprise invasion of Chad and Sudan. The United States
36 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-
37 secret satellite was supported from Sunnyvale AFS. The mission produced photographs
38 that documented massive troop build-ups at the border of Sudan, and the *USS Nimitz* was
39 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
40 1989; Philp, October 30, 1985). In 1984, the twentieth and last KH-9 satellite was
41 launched and supported by the STC (Day, November 8, 2004).
42

1 The first dedicated military shuttle flight, aboard the Space Shuttle *Discoverer*, was
2 launched in January 1985, and was supported from Building 1003. *The New York Times*
3 reported on the launch, and noted that “all communication with the astronauts will be
4 hidden in complex codes intelligible only with special unscrambling equipment”
5 (Bamford, January 13, 1985). An article in the August 2009 edition of *Air & Space*
6 *Magazine* indicated that “according to most accounts, STS-51C’s payload was ORION,
7 an eavesdropping satellite for signals intelligence” (Cassutt, August 1, 2009). In October
8 1985, the second dedicated military flight was launched by the Space Shuttle *Atlantis*
9 (Cassutt, August 1, 2009). *The New York Times* reported that, according to reliable
10 sources, “two \$100 million communication satellites” were deployed into orbit, on a
11 mission classified as secret by the Pentagon (Broad, October 5, 1985).

12
13 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
14 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
15 communications satellite developed by NASA (Levien, 1989).

16
17 **29. Onizuka Air Force Station, 1986-87**

18
19 In 1986, Sunnyvale AFS was renamed Onizuka AFS in honor of Space Shuttle
20 *Challenger* astronaut Lieutenant Colonel Ellison S. Onizuka. The following year it was
21 re-designated Onizuka AFB, and a memorial to Onizuka was developed in the lobby.
22 Onizuka was born in Kealahou, Kona, Hawaii in 1946. In 1969, he received Bachelor
23 of Science and Master of Science degrees in Aerospace Engineering from the University
24 of Colorado. He participated in the Reserve Officers’ Training Corps (ROTC) Program at
25 the University of Colorado. In 1970, he entered the U.S. Air Force, and served as an
26 aerospace flight test engineer with the Sacramento Air Logistics Center at McClellan
27 AFB, Sacramento California. At McClellan AFB, he participated in numerous flight test
28 programs. In 1975, he was assigned to the Air Force Flight Test Center at Edwards AFB,
29 Mojave, California, where he served on the Air Force Test Pilot School staff as a
30 squadron flight test engineer, and later as a chief of the engineering support section in the
31 training resources branch.

32
33 Between 1978 and 1979, Onizuka completed a one-year astronaut training and evaluation
34 program. Afterward, he worked at the Kennedy Space Center to support the first two
35 launches of the Space Shuttle *Columbia*, in 1981. He also worked on the Shuttle Avionics
36 Integration Laboratory (SAIL) software team, as well as on other technical projects.
37 During this period, he often worked at Sunnyvale AFS.

38
39 In 1985, Onizuka flew his first space shuttle mission aboard the Space Shuttle *Discovery*,
40 which was also the first DoD-classified mission. In 1986, Onizuka served as the mission
41 specialist on Space Shuttle *Challenger*, which exploded after launch, killing its seven
42 crew members (NASA, January 2007). Following the *Challenger* explosion, the U.S. Air

1 Force reverted to sending satellites into orbit via unmanned launches. It was not until
2 December 1988 that the Space Shuttle *Atlantis* was launched with a top-secret military
3 payload (Cassutt, August 1, 2009).
4

5 **30. Deactivation of the AFSCF, 1987**
6

7 The AFSCF was officially deactivated October 1, 1987, and four new organizations were
8 created:
9

- 10 • Consolidated Space Test Center (CSTC)
- 11 • 1004th Space Support Group
- 12 • 2nd Satellite Tracking Group
- 13 • AFSCN System Program Office (SPO)
14

15 The CSTC, 1004th Space Support Group, and the 2nd Satellite Tracking Group remained
16 at Onizuka AFB. The AFSCN SPO was located at Los Angeles AFB, with detachments
17 at Onizuka AFB and Falcon AFS. Furthermore, Onizuka AFB was transferred to
18 SPACECOM in 1987 (Hane, 1988).
19

20 **31. Dissolution of the Soviet Union and End of the Cold War, 1980s-1991**
21

22 By the mid-1980s, increased military, diplomatic, and economic pressure by the United
23 States had led to the weakening of the Soviet Union. The cost of war in Afghanistan,
24 coupled with the escalating costs of the space race, resulted in a weakened Soviet
25 economy and dissent amongst its population. This led Soviet President Mikhail
26 Gorbachev to introduce the liberalizing reforms of *perestroika* (Russian for
27 reconstruction), and *glasnost* (Russian for openness). Between 1989 and 1990, the Berlin
28 Wall was removed and by 1991, the Soviet Union had dissolved, signaling the end of the
29 Cold War (Center for Air Force History, 1994).
30

31 **32. Onizuka Air Force Base, 1990-93**
32

33 Following the end of the Cold War, the level of secrecy at Onizuka AFB somewhat
34 decreased. Prior to 1990, the *Sunnyvale Times* had reported that the U.S. Air Force had
35 even “rejected street signs identifying Onizuka” (Mead, March 2, 1994). However by the
36 early 1990s, the U.S. Air Force allowed street signs, opened a public affairs office, and
37 established a community program with schools and youth groups. A 1993 *San Jose*
38 *Mercury News* article reported that the “top-secret facility” was opening its doors for
39 tours. Due to a decrease in military spending, the U.S. Air Force looked toward
40 publicizing its assets, in hopes of gaining more funding. However, tours were limited,
41 and much of the installation remained restricted (Peterson, July 30, 1993). The end of the
42 Cold War also led to the declassification of the NRO in September 1992.

1 As the Cold War came to a close in the early 1990s, modifications continued to be made
2 at Onizuka AFS, although fewer modifications were made than in previous decades,
3 likely as a result of a decrease in military funding. By the early 1990s, it appears that
4 installation of computer systems associated with the Data Systems Modernization
5 Program initiated in the early 1980s was completed (Carey, February 14, 1990).
6

7 In 1989, plans were prepared to construct an addition along the south façade of Building
8 1004, known as the Emergency Utility Building (EUB). The EUB was constructed in
9 1992, and enhanced the installation's power distribution system. In addition, the Onizuka
10 AFS Drawing Number Log indicates construction of the EUB also entailed upgrading
11 mechanical systems in Buildings 1003, 10031 and 10032 (Onizuka AFS, n.d.).
12

13 In 1990, Building 1002's exterior was rehabilitated, including replacement of fenestration
14 and application of Exterior Insulated Finishing System (EIFS) (Fola Odafalu pers.
15 comm., October 13, 2009). According to the Onizuka AFS Drawing Number Log,
16 interior spaces were also renovated likely in association with the activation of the 21st
17 SOPS in 1991. They assumed the role of operations of the 2nd Satellite Tracking Group.
18 In 1992, the 750th Space Group was activated, and assumed responsibility supporting
19 numerous satellites, and the Space Shuttle (Schriever AFB, n.d.).
20

21 During this time, numerous plans were prepared to modify MCCs, many likely in
22 conjunction with the arrival of the 21st SOPS and 750th Space Group at the installation. In
23 1990, Martin Marietta Space Systems Facilities prepared plans on behalf of Onizuka
24 AFB for modifications to MCC IX in Building 10031 (Martin Marietta Space Systems
25 Facilities, April 30, 1990). Martin Marietta Space Systems Facilities was a division of
26 Bethesda, Maryland-based Martin Marietta Corporation, a major aerospace DoD-
27 contractor. In 1995 Martin Marietta Corporation merged with Lockheed Aircraft
28 Corporation to form Lockheed Martin. In 1992, Keller & Gannon prepared plans to
29 modify MCCs in Buildings 1001 and 1003. Modifications included room reconfiguration,
30 and mechanical and electrical upgrades to accommodate new satellite programs (Onizuka
31 AFS, n.d.).
32

33 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
34 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported by Onizuka
35 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
36 weather satellites assisted with United States missile launches, and navigation satellites
37 assisted the troops in maneuvering through the desert. Reconnaissance satellites, such as
38 those in the NRO's KH-11 satellite program, also likely continued to be supported by the
39 installation (Peterson, July 30, 1993).
40

41 The early 1990s also represented a key year for satellite scheduling, with the advent of a
42 computerized scheduling system. Prior to this time, scheduling was plotted by hand,

1 using colored tape to represent different spacecraft on approximately 50' rolls of butcher-
2 paper, as depicted in the graphic documentation section of this report (Mead, March 2,
3 1994).
4

5 **33. Onizuka Air Force Station, 1994-2005**
6

7 In 1994 Onizuka AFB was renamed Onizuka AFS. The installation continued to provide
8 support for Space Shuttle launches throughout the 1990s. In addition, the installation also
9 supported the following NASA space exploration programs:

- 10 • *Magellan*, a space probe which mapped and provided high-resolution
11 photographs of Venus.
12
- 13 • *Galileo*, an unmanned spacecraft developed to study Jupiter and its moons.
14
- 15 • *Ulysses*, a space probe designed to reach high solar latitudes to study the
16 sun.
17
- 18 • The Hubble Space Telescope, designed to operate above the earth's
19 atmosphere to observe celestial objects at ultraviolet, visible, and near-
20 infrared wavelengths.
21
- 22 • The Chandra X-Ray Observatory, the largest, heaviest, and most powerful
23 x-ray telescope ever launched into space.
24
25

26 In the early 1990s, a task force was formed to examine the merits of declassifying the
27 Corona Program. Based on their recommendations, on February 24, 1995, President
28 William Clinton signed an order that declassified the Corona Program. The 800,000
29 images taken between 1960-72 were made available to the public the following year.
30 Formerly classified documents also became available (NRO, February 24, 1995).
31

32 In 1995, the Base Realignment and Closure (BRAC) commission recommended the
33 realignment of Onizuka AFS and the relocation of select functions to CSOC in Falcon
34 AFB, Colorado Springs, Colorado. The recommendations were approved by President
35 Clinton. The 750th Space Group was reassigned to CSOC, and missions of the 21st SOPS
36 at Onizuka AFS were realigned. The realignment resulted in a loss of approximately
37 1,100 jobs at Onizuka AFS (City of Sunnyvale, 2006). Throughout the end of the 1990s
38 and during the early 2000s, responsibility for controlling the DoD satellite network
39 continued to be transferred to the CSOC, and Onizuka AFS's responsibilities
40 substantially decreased (Flinn, 1991; Wulff, 1995).
41

1 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
2 U.S., British, and French military personnel in Dhahran, Saudi Arabia, led to increased
3 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
4 permitted on the first two stories of Buildings 10031 and 10032. In addition, because the
5 S-curve section of Innovation Way was in close proximity to Buildings 10031 and 10032,
6 the street was closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey
7 barriers and bollards were also installed around the perimeter of the buildings (Dennis
8 Ralphs, pers. comm., August 2, 2010).

9
10 In 1994, the installation no longer relied on Building 1004 as the primary energy source,
11 and began to transition to PG&E for its power needs. In 1998, Building 1004 ceased to
12 function as the primary energy provider for the installation, and was relegated to back-up
13 support (Fola Odafalu, pers. comm., October 13, 2009). During this time, the Onizuka
14 AFS Drawing Number Log indicates that fewer plans were prepared than in prior years.
15 The majority of these plans relate to routine maintenance. In addition, some plans
16 prepared in the early 2000s were never fully realized. For example, in 2002, plans were
17 prepared to install an elevator in Building 1002. However, no action was taken to
18 implement these plans (Onizuka AFS, n.d.).

19
20 **34. Closure of Onizuka Air Force Station, 2005-Present**

21
22 In 2005, the BRAC commission recommended closure of Onizuka AFS. The
23 recommendations were approved by President George W. Bush. In 2006, the DoD,
24 through the Office of Economic Adjustment, formally recognized the City of Sunnyvale
25 as the Local Redevelopment Authority (LRA) for planning the redevelopment of Onizuka
26 AFS and its conversion to civilian use (City of Sunnyvale, 2006).

27
28 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
29 and open house were held to commemorate this event, and was attended by over 800
30 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
31 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the
32 history of the NRO and reconnaissance satellite programs supported from the installation
33 between 1961-2007. Following the open house, displays and histories of the programs,
34 many of which remain classified, were moved to the NRO archives in Chantilly, Virginia
35 (Dennis Ralphs, pers. comm., August 3, 2009).

36
37 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
38 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
39 attendance were current and former employees, both military and civilian, as well as
40 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan
41 noted that "[T]his facility here in Sunnyvale has supported an amazing 3.4 million
42 satellite operations over the past years. Much of the details of this work are still classified

1 and we cannot talk openly about it, but what I can tell you is that the operations
2 conducted by the NRO from this site have made our nation a tremendously safer place to
3 be” (Bauer, July 29, 2010).
4

5 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
6 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
7 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
8 transferred out of federal hands in September 2011. It is anticipated that the Department
9 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
10 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
11 remainder of the installation will be redeveloped.
12

13 **PART II: DESCRIPTIVE INFORMATION**

14 **A. Physical Character of the Site and its Relationship to the Surrounding Environment**

- 15
- 16
- 17 **1. Physical Description of the Site:** The boundary of the U.S. Air Force Satellite Test
18 Center Historic District encompasses the building footprints of the six interconnected
19 contributing buildings, Buildings 1001, 1002, 1003, 1004, 10031, and 10032 at Onizuka
20 AFS. The six buildings are situated on the central portion of the 23-acre Onizuka AFS.
21 Building 1001 was the first building constructed on the installation in 1959, and as
22 subsequent buildings were constructed, all except Building 10032 were appended to
23 Building 1001.
24

25 Building 1002 is appended to the north façade of Building 1001; Building 1004 is
26 appended to its south façade; Buildings 1003 and 10031 are appended to its west façade.
27 Building 10032 is the only building not appended to Building 1001, and is appended to
28 the west façade of Building 1003, and the south façade of Building 10031. Two non-
29 contributing buildings, Buildings 1015 and 1025, are also located in the boundary.
30 Building 1015, Multipurpose Recreation Facility, is located between Buildings 1001 and
31 1003. Building 1025, Security Police Operations, is located between Buildings 1001 and
32 1004. Both buildings were determined not eligible for the National Register of Historic
33 Places in conjunction with the Historic Building Inventory and Evaluation (HBIE)
34 prepared in 2004.
35

- 36 **2. Surrounding Environment:** The U.S. Air Force Satellite Test Center Historic District
37 occupies the central portion of Onizuka AFS. It is bound to the north and south by
38 asphalt-paved parking lots and support buildings and structures, to the east by an asphalt-
39 paved parking lot and support structures and to the west by an asphalt-paved road. The
40 installation itself is bound to the north by Innovation Way and North Mathilda Avenue,
41 the south by West Moffett Park Drive, the east by North Mathilda Avenue, and the west
42 by Innovation Way. Due to security measures, only the northern and southern portions of

1 Innovation Way are asphalt-paved and function as a roadway. Vehicular traffic is
2 prohibited and the central portion of Innovation Way has been covered with astro-turf
3 and plantings.
4

5 **B. Physical Description of the Complex**
6

7 The boundary of the U.S. Air Force Satellite Test Center Historic District encompasses
8 the footprints of the six contributing buildings (Buildings 1001, 1002, 1003, 1004, 10031,
9 and 10032). In general, this section focuses on the contributing buildings. However, the
10 overall installation is also described to provide a better understanding of the U.S. Air
11 Force Satellite Test Center Historic District. In-depth descriptions of the six contributing
12 buildings are featured in individual building reports.
13

- 14 **1. According to the Original Plan:** In 1959, the Ralph M. Parsons Company prepared site
15 plans for Building 1001, referred to as the Development Control Center. The plans were
16 prepared under the auspices of the AFBMD in Englewood, California. The plan entitled
17 “Development Control Center, Site and Vicinity Plan” depicts the 11.43-acre installation
18 bound to the north and east by Mathilda Avenue, the south by an easement for a storm
19 drainage canal, and the west by East Perimeter Road. Buildings that comprise the
20 Lockheed Space and Missiles Company were situated west of the installation (Ralph M.
21 Parsons Company/AFBMD, March 6, 1959a).
22

23 The plan entitled “Development Control Center, Plot and Utility Plan” depicts a more
24 detailed view of the layout of the installation, and is featured in the graphic
25 documentation section of this report. Building 1001 was centrally located along the
26 western edge of the installation, and the plan indicates that it was constructed in two
27 phases. It was a single-story, rectangular-plan, windowless, concrete panel-clad building
28 capped by a flat roof, constructed to provide support for reconnaissance satellites. Space
29 north and south of the building was allocated for future expansion, which indicates that
30 the U.S. Air Force intended to construct additional buildings at the installation from its
31 inception. A parking area for 186 cars and forty-three sports cars was located north of
32 northern area allocated for future expansion. Concrete walkways connected the parking
33 area to the building, and provided access to the entrance, located within the cut-out
34 portion of the west façade. An additional site plan was prepared in conjunction with the
35 second set of Building 1001 plans, entitled “Site and Vicinity Plan” dated August 19,
36 1959. This plan features an additional parking area located north of the parking area
37 depicted on the “Development Control Center, Plot and Utility Plan” (Ralph M. Parsons
38 Company/AFBMD, March 6, 1959b).
39

- 40 **2. Changes Over Time:** Only Building 1001 was constructed during the original
41 development of the installation. The remaining five contributing buildings were
42 constructed between 1962-84.

1
2 As indicated on the plan entitled "Development Control Center, Plot and Utility Plan,"
3 featured in the graphic documentation section of this report, portions of the installation
4 were earmarked for future development. In 1962, plans were prepared by Kaiser
5 Engineers, under the auspices of the U.S. Air Force SSD, to construct Building 1002
6 along the north façade of Building 1001, on a portion of the installation set aside for
7 future expansion. Building 1002, a two-story, L-plan, concrete panel-clad building,
8 pierced by ribbon windows and capped by a flat roof, was constructed to provide
9 administrative space. At that time, Kaiser Engineers also prepared plans for an addition to
10 the east façade of Building 1001 (Kaiser Engineers/U.S. Air Force SSD, January 15,
11 1962c).

12
13 In 1964, plans were prepared by Maher & Martens, under the auspices of the USACE,
14 Sacramento District, to construct an addition to Building 1002. The two-story, L-shaped
15 building was appended to the east façade of Building 1002 and the north façade of
16 Building 1001, and occupied a portion of the installation set aside for future expansion.
17 The design of the addition was similar to the original, and it provided administrative
18 space. Its construction resulted in creation of Building 1002's interior courtyard (Maher
19 & Martens/USACE Sacramento District, May 7, 1964a-b).

20
21 In 1967, the U.S. Air Force acquired 8.2 acres of land west of the existing installation
22 from Lockheed Missiles and Space Division. C.F. Braun & Company, under the auspices
23 of NAVFAC Western Division, San Bruno, California, and SAMSO, Los Angeles,
24 California, prepared plans for the STC expansion, including a site plan entitled "STC
25 Building Addition, Plot Plan," dated November 17, 1967. The plan is featured in the
26 graphic documentation section of the report.

27
28 The plan depicts the footprints of two new buildings and additional parking areas.
29 Building 1003, labeled Satellite Test Center Building Addition, was located west of
30 Building 1001, and was appended to the building by a hyphen. The four-story,
31 rectangular-plan, concrete panel-clad building was capped by a flat roof, and constructed
32 to provide additional support for reconnaissance satellites programs (C.F. Braun &
33 Company/NAVFAC/SAMSO, November 14, 1967).

34
35 Building 1004, labeled Power Plant, was located south of Building 1001, and was
36 connected to Buildings 1001 and 1003 by a hyphen. The two-story, rectangular-plan,
37 windowless, concrete panel-clad building, pierced by two-story, metal louvered vents,
38 was capped by a flat roof, and was constructed to provide power for the installation (C.F.
39 Braun & Company/NAVFAC/SAMSO, August 12, 1968a-d).

40
41 Access to Buildings 1002 and 1003 was provided through Building 1001's main entrance
42 because they were interconnected. The plans also depict new parking areas located south

1 and west of Building 1003, and at the southern and western boundaries of the installation
2 (C.F. Braun & Company/NAVFAC/SAMSO, November 14, 1967).
3

4 Construction of the buildings and parking lots resulted in the in the reconfiguration of
5 Lockheed Martin Way (formerly known as East Perimeter Road) west of Building 1001.
6 The north/south-oriented road was realigned westward to accommodate the installation's
7 expansion. The road was also realigned south along the western boundary of the
8 installation, forming an S-curve. Concrete sidewalks extended around Building 1003 to
9 the north, south, and west (C.F. Braun & Company/NAVFAC/SAMSO, December 23,
10 1966).
11

12 In 1974, Building 1015 was constructed to serve as a recreational facility. It was located
13 between Buildings 1001 and Building 1003.
14

15 In 1981, King/Reif and Associates prepared plans for construction of a new building on
16 behalf of NAVFAC Western Division. Building 10031 was a three-story, rectangular-
17 plan building appended to the north facade of Building 1003, and to the recessed portion
18 of the north and west façades of Building 1001. As a result, it obscured the original
19 entrance to Building 1001, and a new entrance and lobby were designed in conjunction
20 with Building 10031. However, it should be noted that the entrance and lobby were
21 technically considered part of Building 1001, rather than Building 10031. The new
22 entrance provided access to Buildings 1001, 1002, 1003, and 1004. The first two stories
23 featured parking spaces, and a concrete ramp appended to the west façade provided
24 access to the second story. The third story housed space to provide satellite support
25 (King/Reif and Associates/NAVFAC, December 18, 1981a-d).
26

27 In 1982, Rasmussen Ingle Anderson prepared plans for construction of a new building
28 under the auspices of NAVFAC Western Division. The plan entitled "Alter Satellite
29 Control Facility, Site Plan, Grading, Drainage, and Parking," featured in the graphic
30 documentation section of this report, depicts Building 10032, a three-story, rectangular-
31 plan building, appended to the west façade of Building 1003 by two hyphens, although
32 only one hyphen was ultimately constructed. Similar to Building 10031, Building 10032
33 also featured two stories of parking space, with the second-story accessible via Building
34 10031. The third story housed space to provide satellite support. Buildings 10031 and
35 10032 were operational by 1984 (Rasmussen Ingle Anderson/NAVFAC, October 29,
36 1982a-c).
37

38 In 1984, Building 1025, located between Buildings 1001 and 1004 was constructed to
39 serve as an armory.
40

1 In 1992, an addition was appended to the south façade of Building 1004, and the exterior
2 of Building 1002 was renovated. In addition, the interiors of all six buildings have been
3 repeatedly reconfigured times since their original construction.
4

5 The two non-contributing resources, Buildings 1015 and 1025, were constructed in 1974
6 and 1984, respectively. Building 1015 is located between Buildings 1001 and 1003, and
7 Building 1025 is located between Building 1001 and 1004.
8

9 In addition, between 1971-97, twenty-two support buildings and structures were
10 constructed outside the National Register boundary of the historic district.
11

12 **3. Current Features and Appearance**

13
14 The U.S. Air Force Satellite Test Center Historic District features six interconnected
15 contributing buildings (Buildings 1001, 1002, 1003, 1004, 10031, and 10032) and two
16 non-contributing buildings (Buildings 1015 and 1052) situated on the 23-acre Onizuka
17 AFS installation.
18

19 The current appearance of the installation is similar to its appearance following
20 construction of Buildings 10031 and 10032 in 1984. However, Building 1002's exterior
21 was renovated in 1990, including replacement of fenestration and application of EIFS.
22

23 **PART III: SOURCES OF INFORMATION**

24 **A. Architectural Drawings**

25
26
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28 *Sunnyvale, California. Where applicable, the numbers following the plans in parentheses*
29 *correspond to the Onizuka AFS Drawing Number Log.*
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33

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35 "Interim Expansion Partial Floor Plan B." (1413)
36

37 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965c.
38 "Interim Expansion Partial Floor Plan C." (1414)
39

40 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965d.
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6
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8 Plan, Interior Elevations, and Reflected Ceiling Plan." (862)
9
- 10 C.F. Braun & Company/NAVFAC/SAMSO. August 12, 1968b. "Power Plant Second
11 Floor Plan, Interior Elevations, and Reflected Ceiling Plan." (863)
12
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14 Elevation and Section (South and West)." (865)
15
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36
- 37 Keller & Gannon/SAMSO. September 24, 1975. "Satellite Test Center, Building 1001
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39
- 40 Keller & Gannon/SAMSO. July 29, 1977. "Satellite Test Center, Re-roofing Building
41 1001, Photos of Existing Conditions."
42

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2 Ground Parking Plan – Level 1 & Lobby." (520)

3
4 King/Reif and Associates/NAVFAC. December 18, 1981b. "Mission Control Complex:
5 Parking Plan – Level 2." December 18, 1981. (521)

6
7 King/Reif and Associates/NAVFAC. December 18, 1981c. "Mission Control Complex:
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9
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15
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36
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39
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14
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16
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19
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21
22 Building 1001, 1968.

23
24 Building 1001 Entrance, ca. 1962.

25
26 Satellite Test Center, Aerial View, ca. 1962.

27
28 Building 1002 During Construction, ca. 1962.

29
30 Building 1003 Construction Photos, 1968.

31
32 Building 1004 Construction Photos, 1969.

33
34 Satellite Test Center, ca. 1975.

35
36 Solar Control Consoles, Building 1004, 1970.

37
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41
42

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5
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10
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13
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36 **E. Likely Sources Not yet Investigated**

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38 This report provides a comprehensive record of the historical development of the U.S.
39 Air Force Satellite Test Center, including Buildings 1001, 1002, 1003, 1004, 10031, and
40 10032 from the inception of the installation in 1959 through its closing ceremony in
41 2010. Additional research could be conducted on the history of the buildings, as well as
42 the history of the Corona Program, and other reconnaissance programs associated with

1 the installation. Possible repositories to be consulted include the The National Archives
2 and Records Administration, College Park, Virginia; Maxwell AFB, Montgomery,
3 Alabama; Peterson Air and Space Museum, Peterson AFB, Colorado Springs, Colorado;
4 and Schriever AFB, El Paso County, Colorado.
5

6 **PART IV. PROJECT INFORMATION**

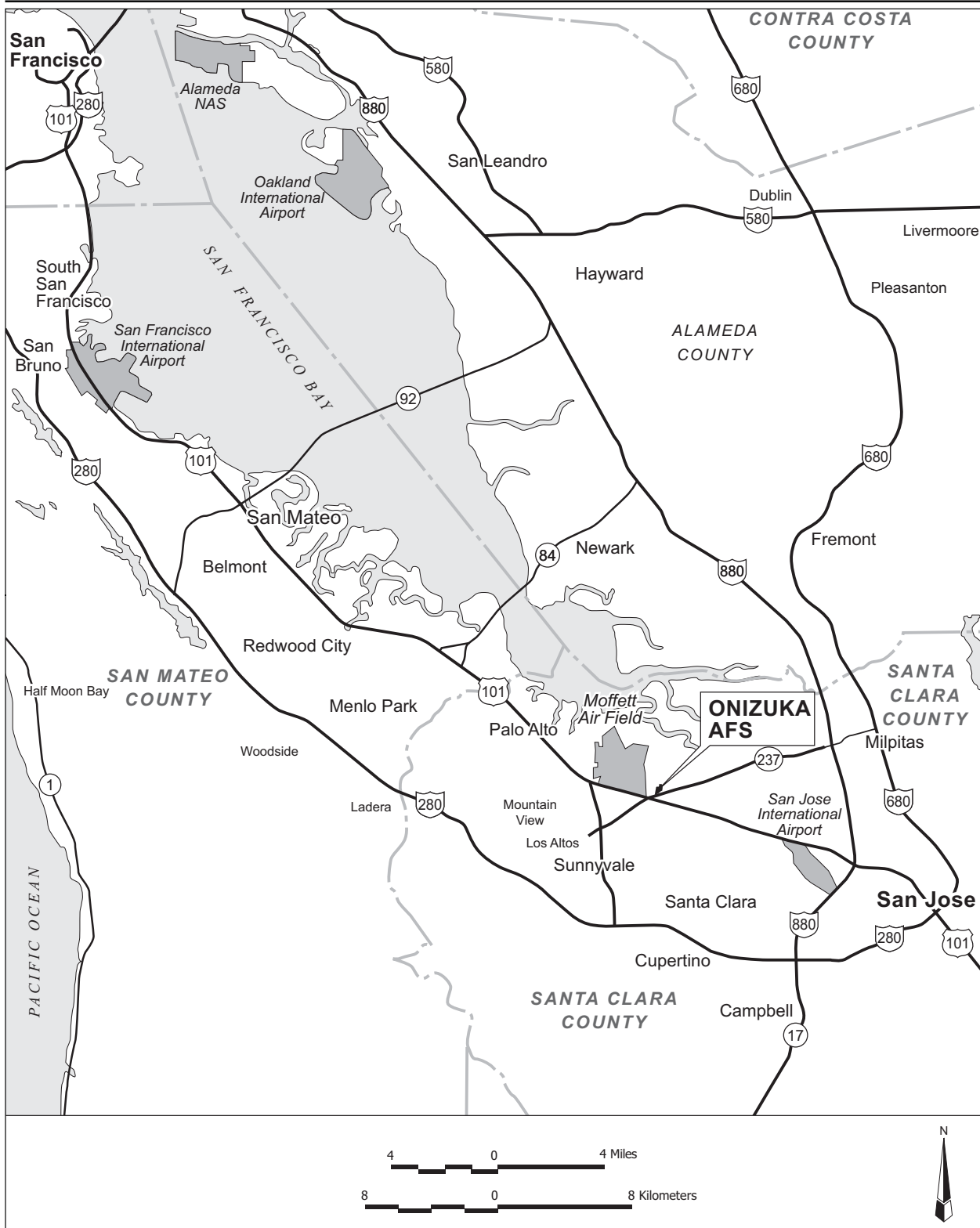
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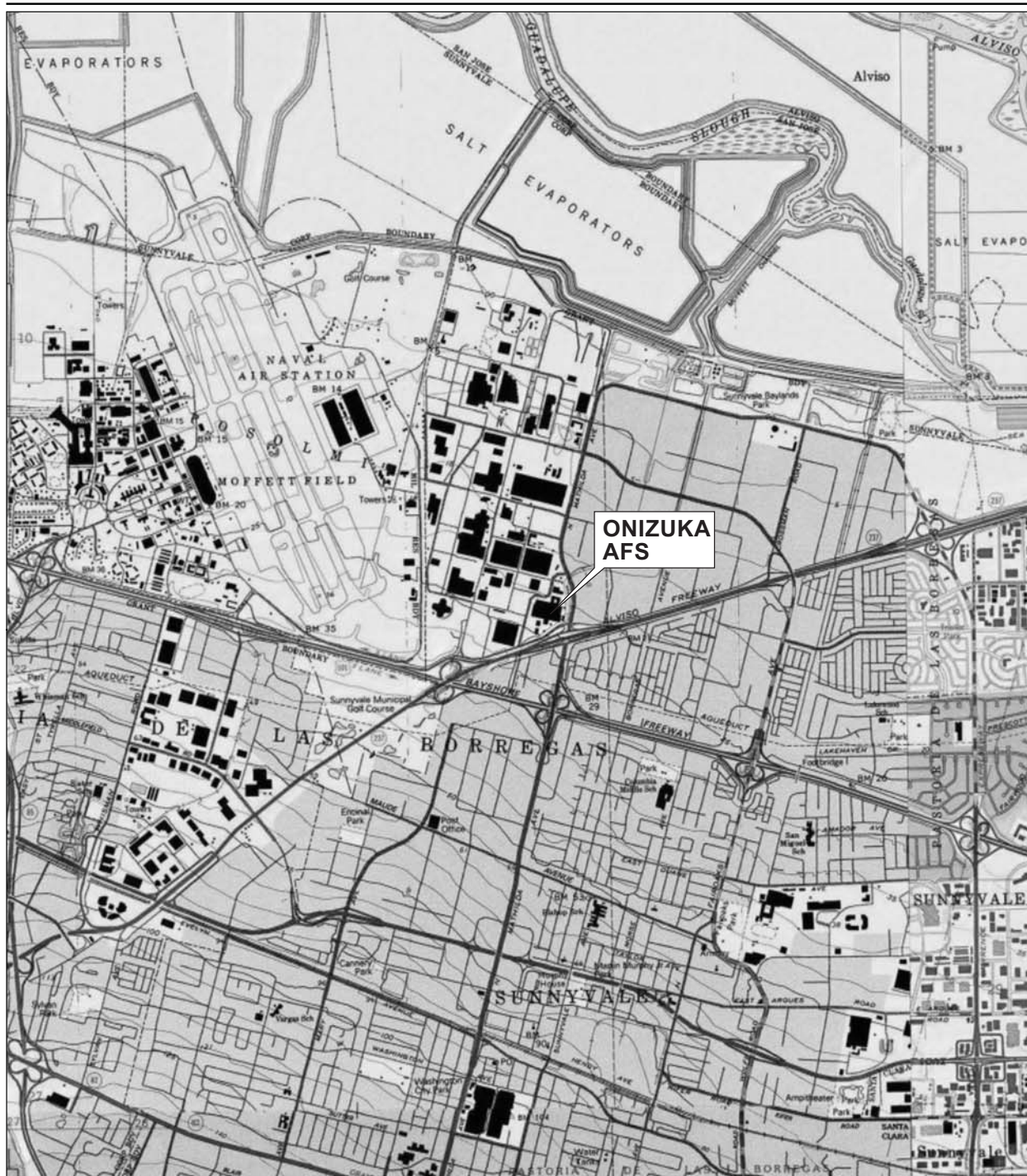
8 Onizuka AFS is slated for disposal and reuse in accordance with the federal Defense Base
9 Closure and Realignment Act (DBCRA) of 1900, commonly known as Base Realignment and
10 Closure (BRAC). In 2005, the installation was selected for closure through the BRAC process. In
11 2009, the California State Historic Preservation Office (SHPO) concurred with the U.S. Air
12 Force Center for Engineering and the Environment (AFCEE) that six buildings at the installation
13 (Buildings 1001, 1002, 1003, 1004, 10031, and 10032) contribute to the National Register-
14 eligible U.S. Air Force Satellite Test Center Historic District. The district is significant at a
15 national, state, and local level under Criterion A for its associations with satellite reconnaissance
16 during the Cold War, and Criteria Consideration G, because five of the six buildings are not yet
17 fifty years old, and have exceptional importance for their associations with satellite
18 reconnaissance during the Cold War.
19

20 In accordance with Section 106 of the National Historic Preservation Act (NHPA) (36 CFR Part
21 800), AFCEE and the CA SHPO concur that the transfer of the installation out of federal hands
22 will constitute an adverse effect to the district. To partially mitigate the adverse effect, AFCEE
23 and the CA SHPO have agreed that a Historic American Building Survey (HABS) Level II-type
24 Documentation should be prepared on the U.S. Air Force Satellite Test Center Historic District.
25 This overview report and associated reports on the six contributing resources fulfills this
26 obligation.
27

28 Prepared by: Anne Jennings
29 Allison S. Rachleff
30 Titles: Architectural Historian
31 Senior Architectural Historian
32 Affiliation: AECOM under contract to AFCEE
33 Contract Number: FA8903-08-D-8770
34 Date: September 2010
35

U.S. AIR FORCE SATELLITE TEST CENTER
(Onizuka Air Force Station)
Log No. USAF041221A



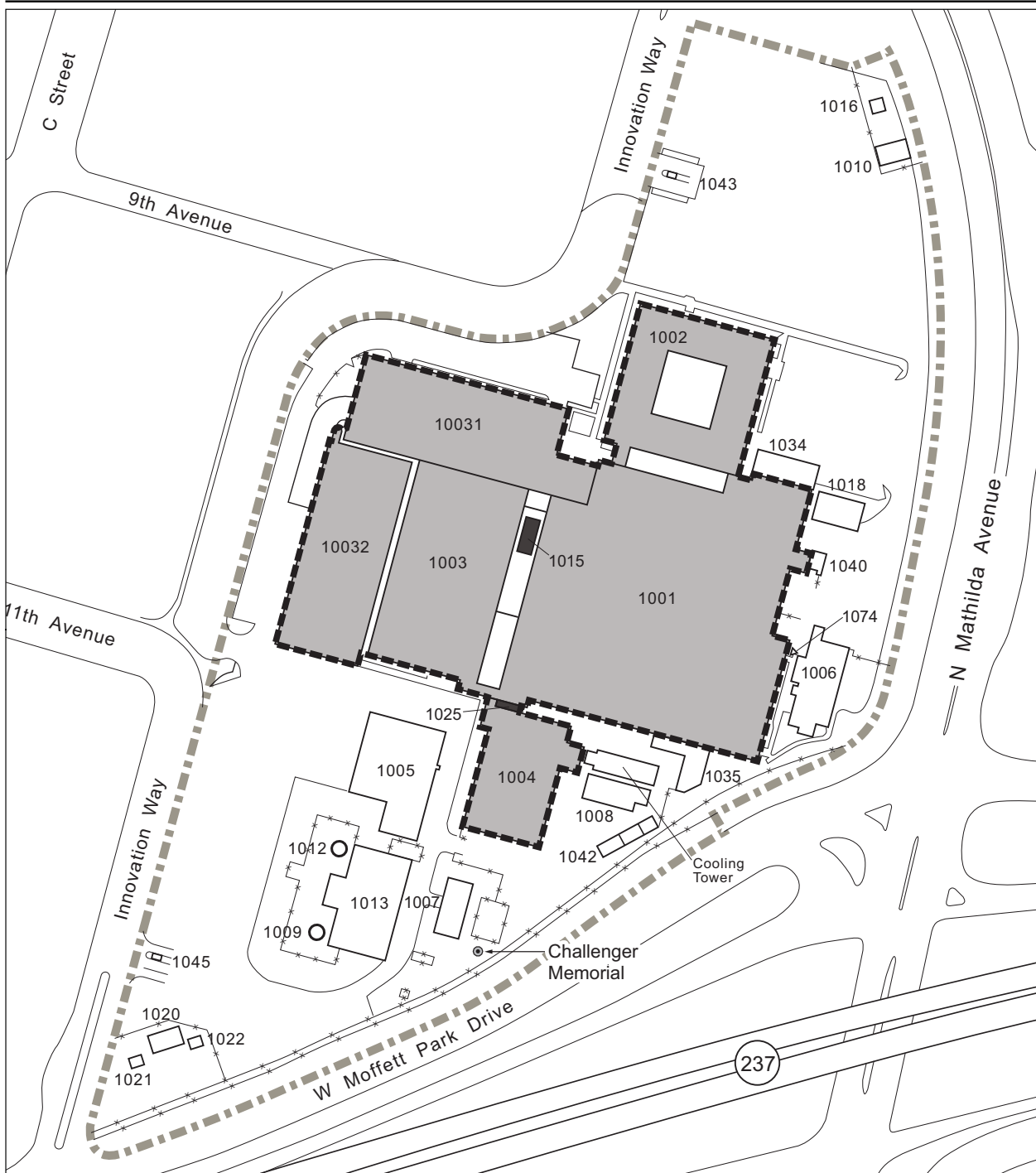






U.S. AIR FORCE SATELLITE TEST CENTER

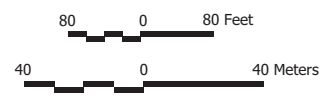
(Onizuka Air Force Station)

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-  Installation Boundary
-  National Register Boundary
-  Contributing
-  Non-contributing





Aerial view of Building 1001, ca. 1959.

Source: Onizuka AFS.



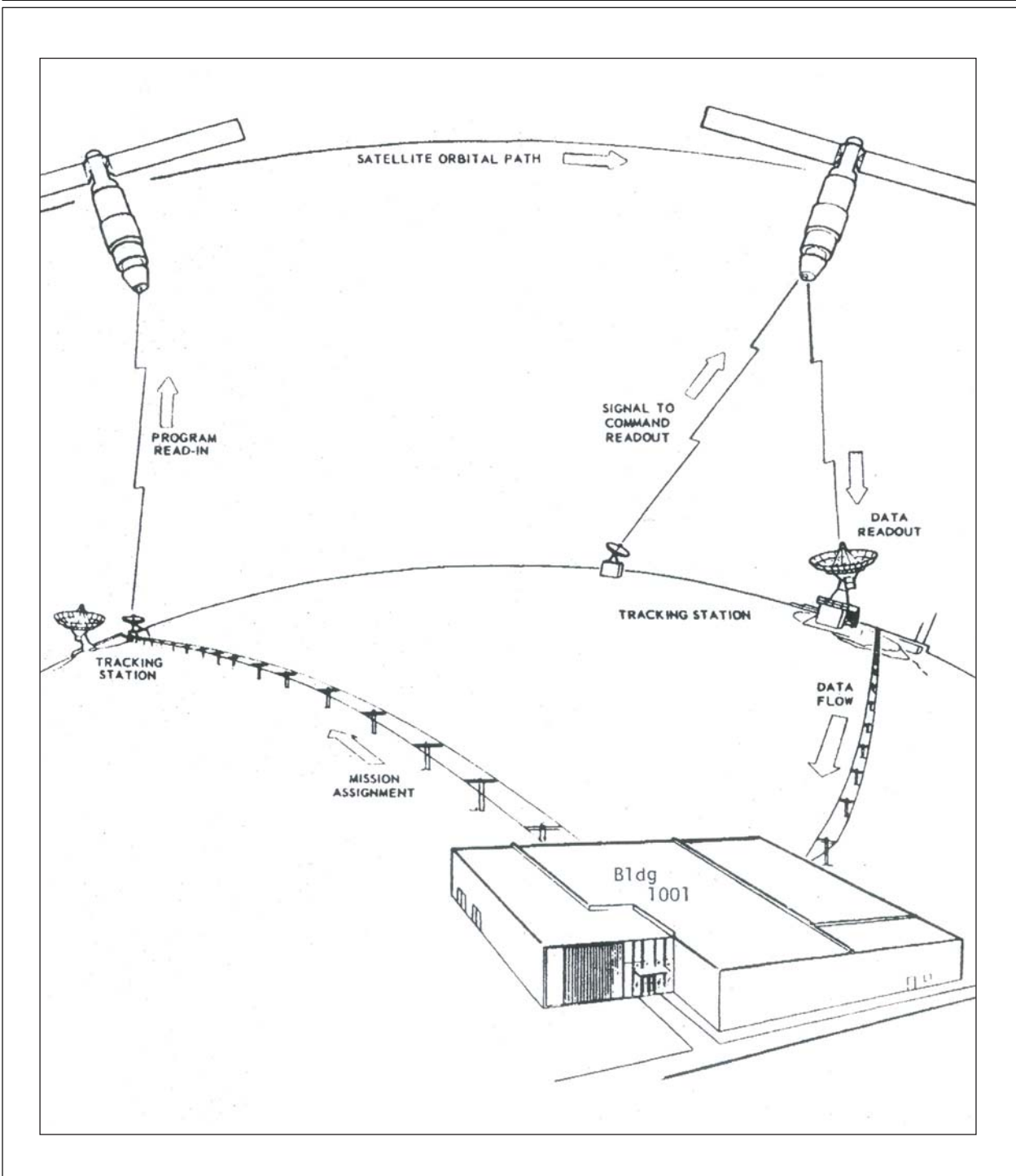
View looking southeast toward Building 1001 in 1968, prior to construction of Buildings 1003 and 1004.

Source: Onizuka AFS.



View looking east toward original entrance to Building 1001, ca. 1971.

Source: Onizuka AFS.



Relationship between Building 1001, tracking stations, and satellites.

Source: Jernigan, 1983.



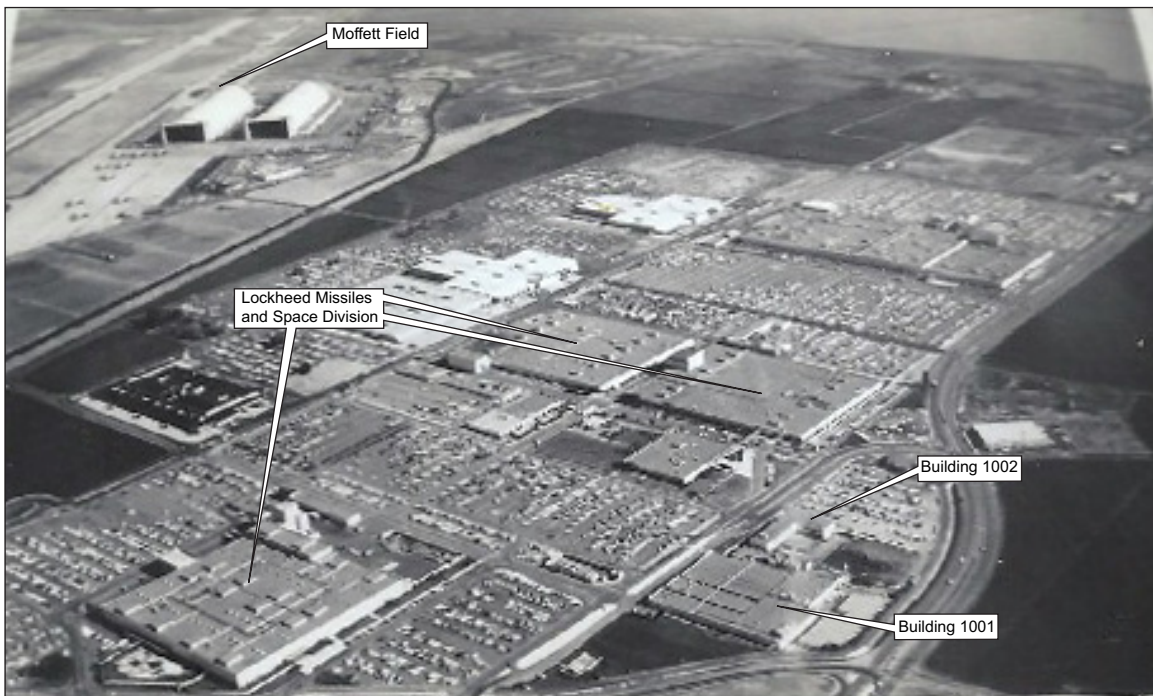
View of the Satellite Control Room in Building 1001, ca. 1961.

Source: Fedor, et. al., 2006.



President Eisenhower inspecting Discoverer XIII's Satellite Recovery Vehicle, August 1960.

Source: Dwight D. Eisenhower Presidential Library and Museum Collection, 1960.



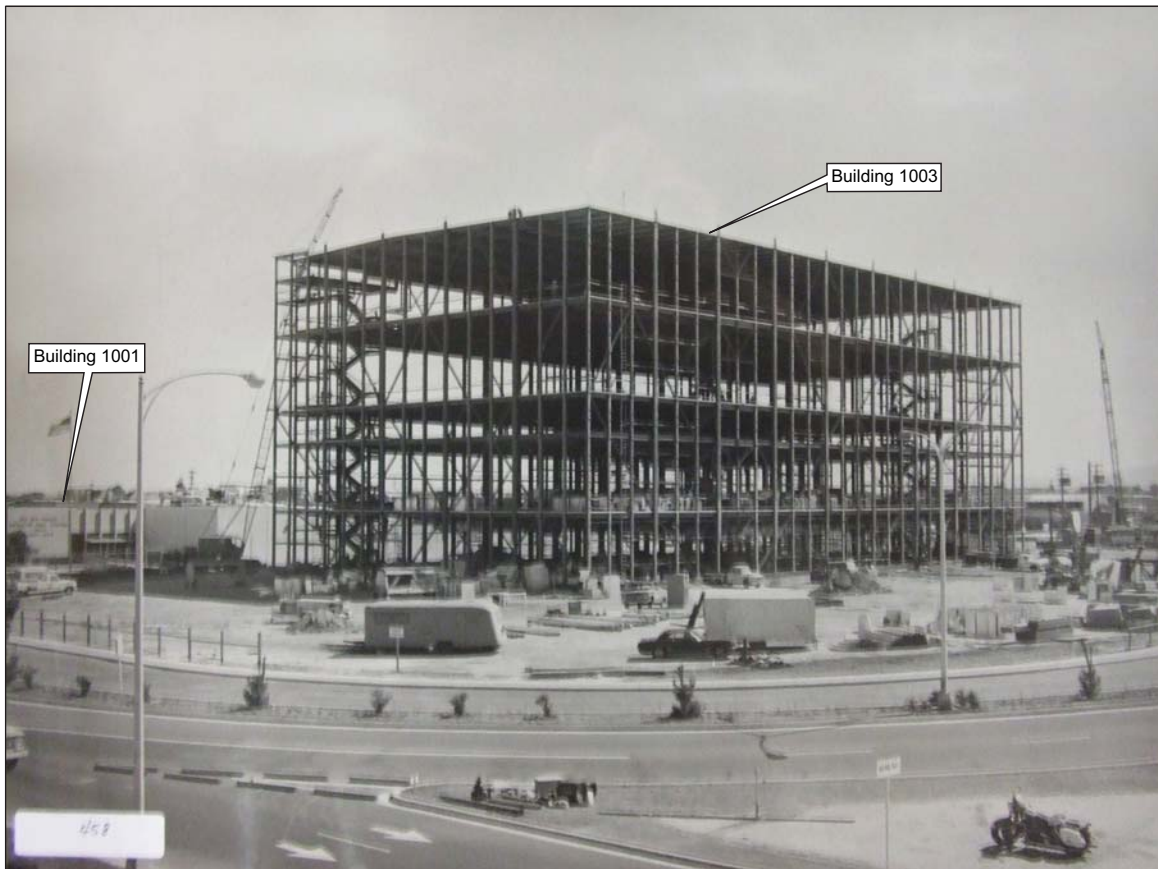
Aerial view of the U.S. Air Force Satellite Test Center, ca. 1962. Note Building 1001 and the original L-plan Building 1002 appended to the north.

Source: Onizuka AFS.



View of Building 1002 during construction, ca. 1962.

Source: Onizuka AFS.



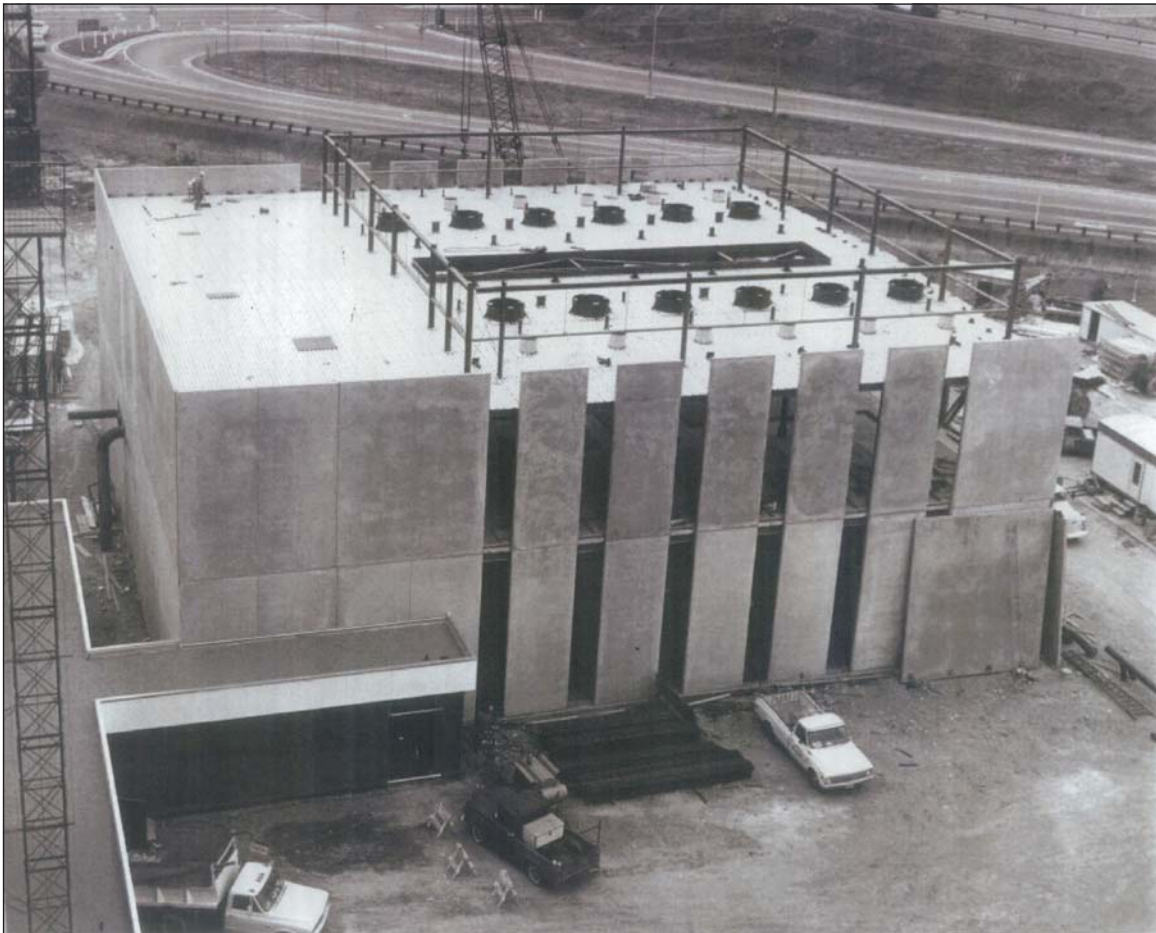
View looking southwest at installation, including Building 1003 under construction, 1968. Note Building 1001 in the background.

Source: Onizuka AFS.



View looking southwest toward Building 1003 during construction, 1968.

Source: Onizuka AFS.



View looking southwest toward Building 1004 during construction, ca. 1969.

Source: Onizuka AFS.



Installation of Solar Saturn gas turbine generator sets in Building 1004, 1969.

Source: Onizuka AFS.



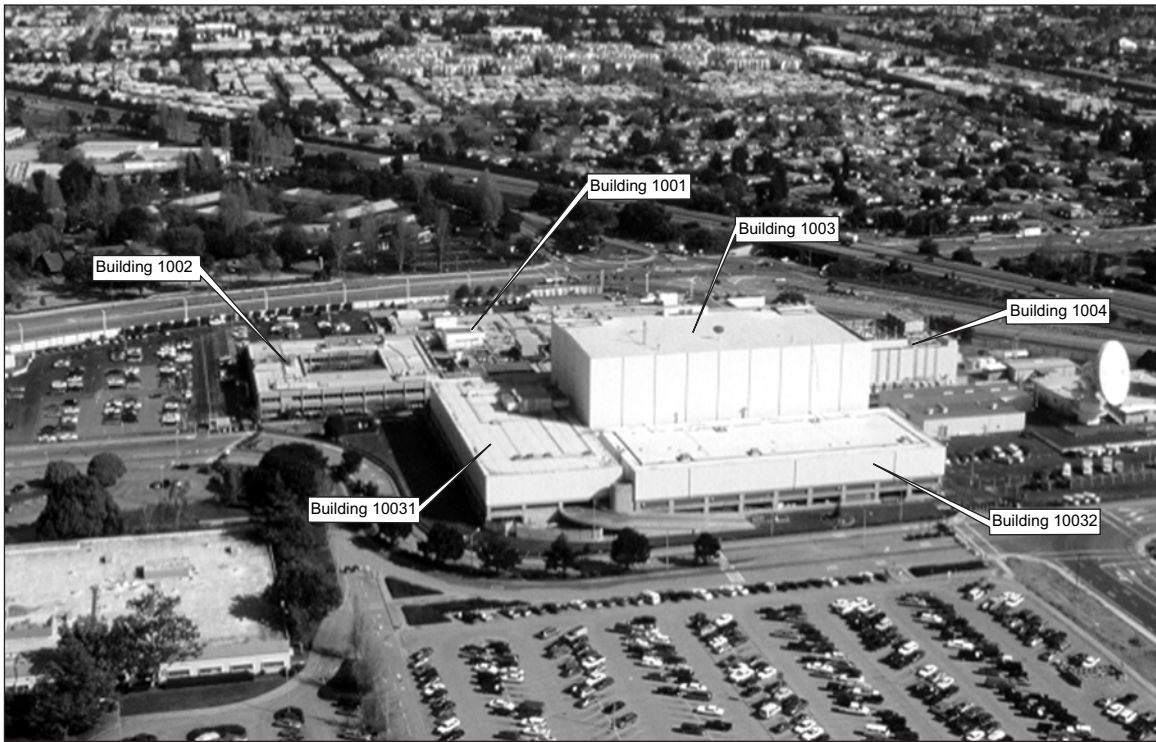
View looking northeast toward U.S. Air Force Satellite Test Center, ca. 1975.

Source: Onizuka AFS.



Solar Control Console in Building 1004 operated by Solar employees, 1970.

Source: Onizuka AFS.



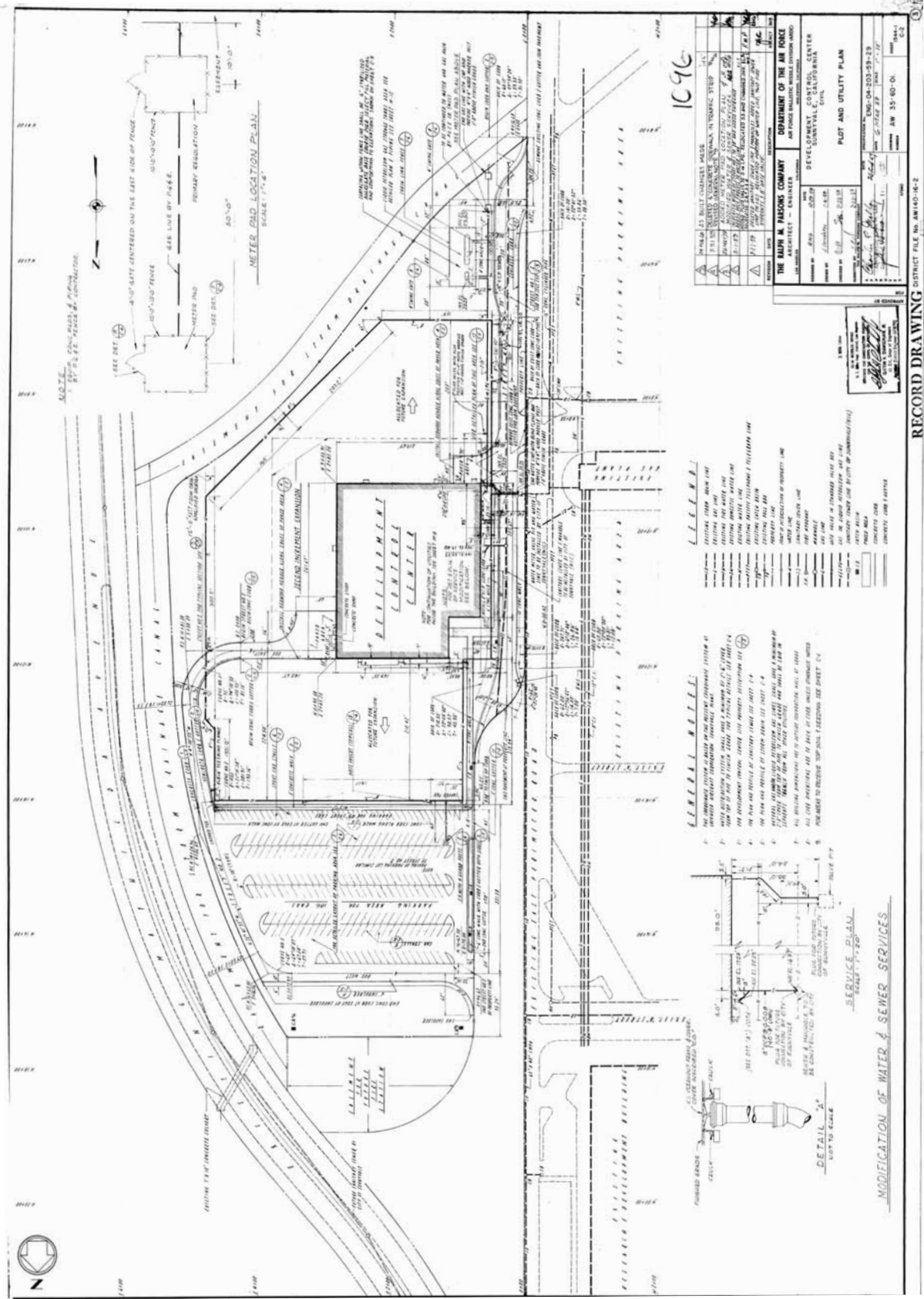
Aerial view of Onizuka AFS, ca. 1996.

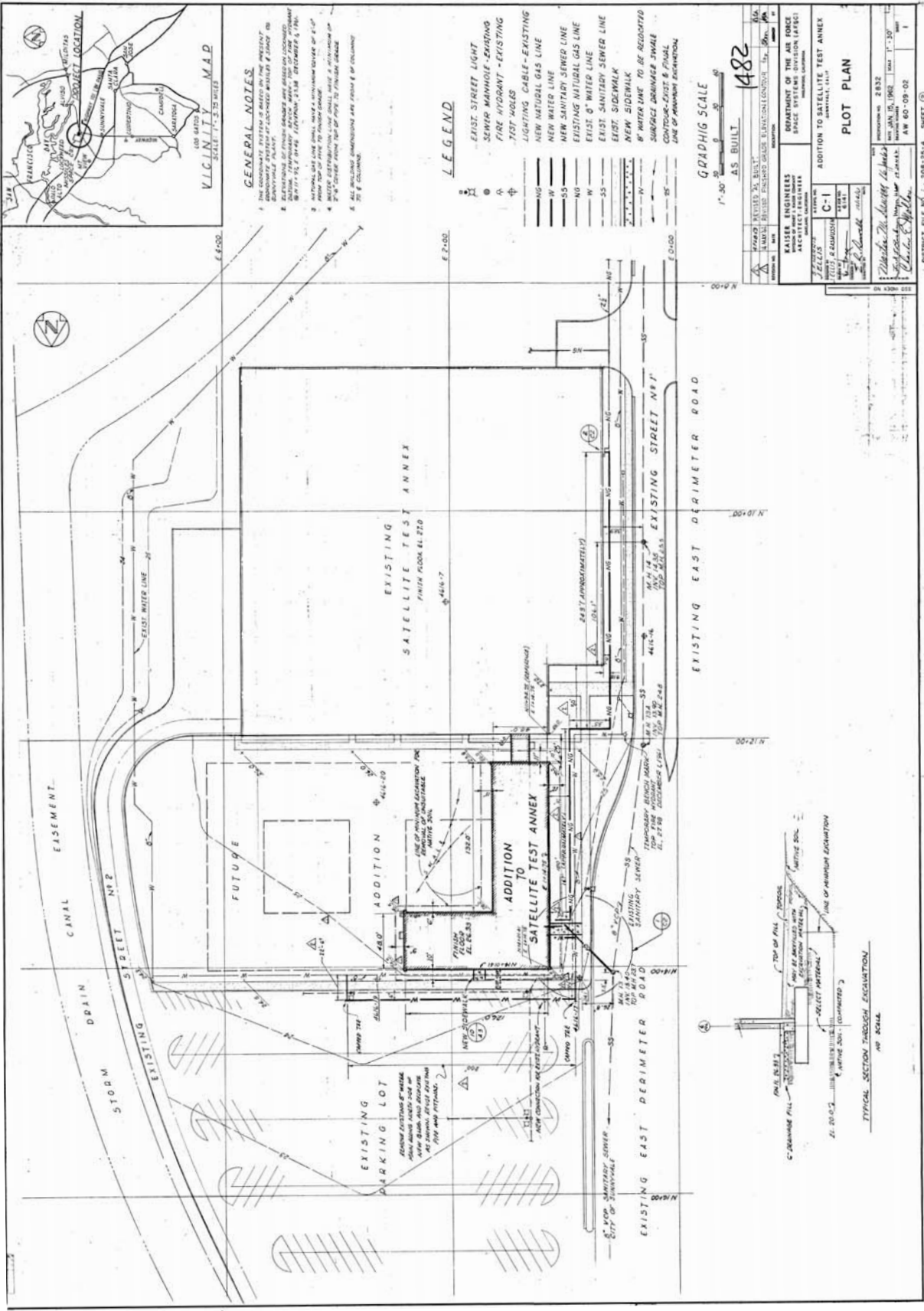
Source: Onizuka AFS.



Satellite schedulers at Onizuka AFS, ca. 1990.

Source: Onizuka AFS.





GENERAL NOTES

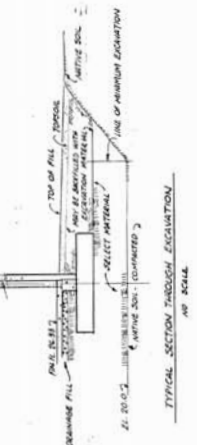
1. THE EXISTING AND PROPOSED UTILITIES SHOWN ON THIS DRAWING ARE BASED ON RECORD DRAWINGS AND FIELD SURVEY DATA. THE LOCATION OF UTILITIES IS APPROXIMATE AND SHOULD BE VERIFIED BY FIELD SURVEY PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHALL BE DEEPENED TO A MINIMUM OF 48" BELOW FINISH GRADE UNLESS OTHERWISE NOTED.
3. ALL UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF CONCRETE OR 24" OF SAND FILL.
4. ALL UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF CONCRETE OR 24" OF SAND FILL.
5. ALL UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF CONCRETE OR 24" OF SAND FILL.

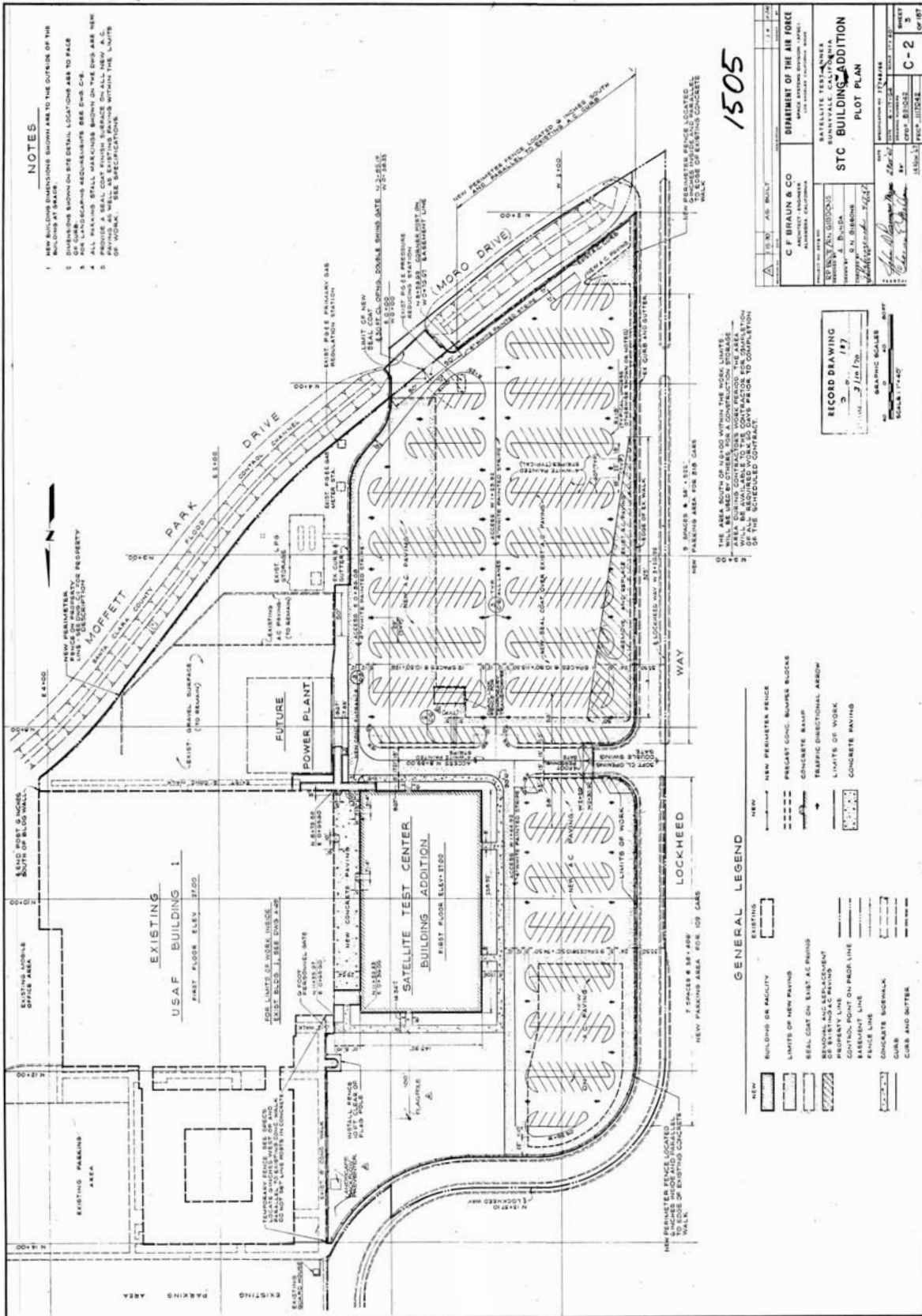
LEGEND

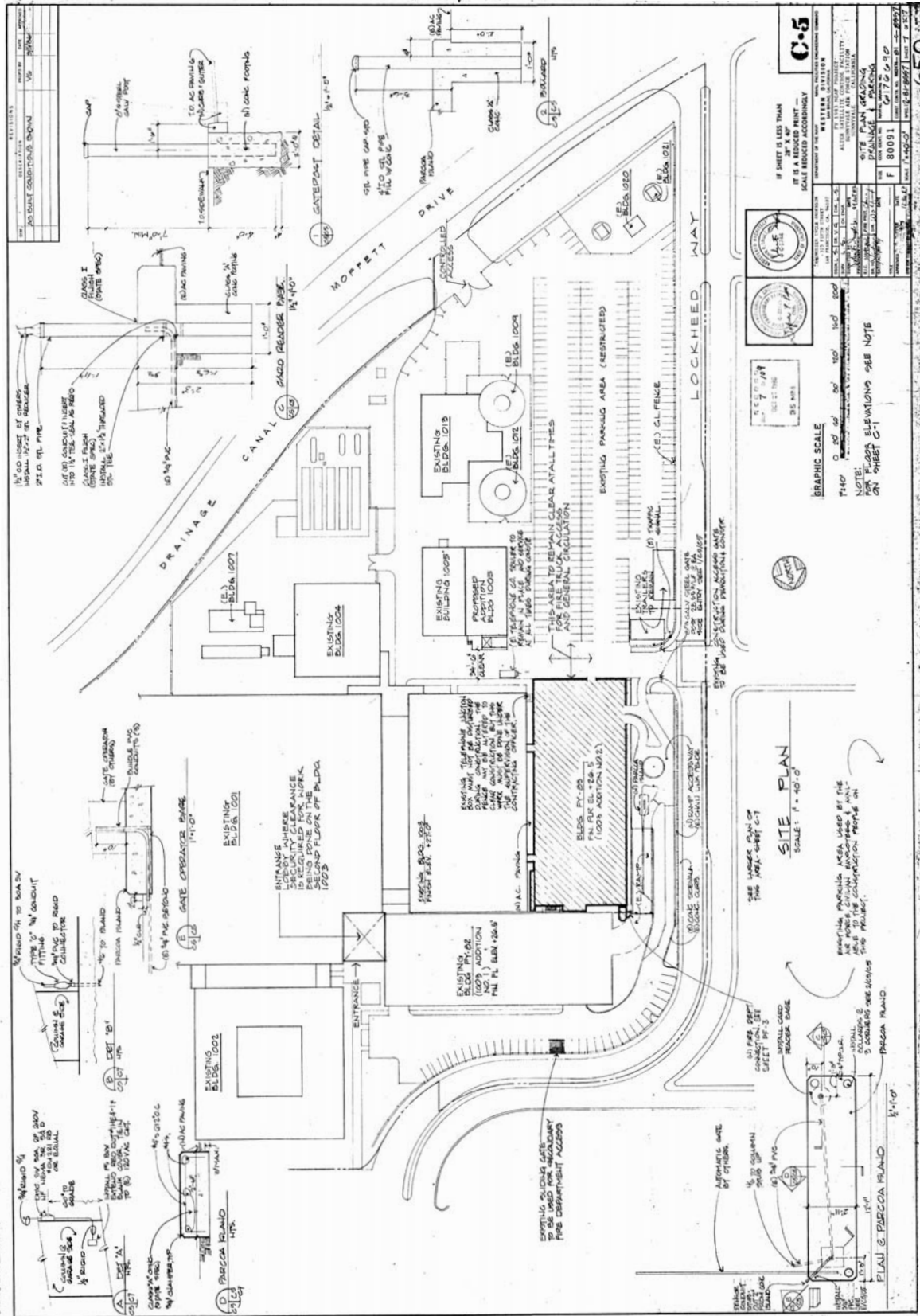
- EXIST. STREET LIGHT
- SEWER MANHOLE - EXISTING
- FIRE HYDRANT - EXISTING
- TEST HOLES
- LIGHTING CABLE - EXISTING
- NEW NATURAL GAS LINE
- NEW WATER LINE
- NEW SANITARY SEWER LINE
- EXISTING NATURAL GAS LINE
- EXISTING WATER LINE
- EXIST. SANITARY SEWER LINE
- EXIST. SIDEWALK
- NEW SIDEWALK
- 8" WATER LINE TO BE ADJUSTED TO SURFACE DRAINAGE SWALE
- CONCRETE CURB
- CONCRETE SIDEWALK

GRAPHIC SCALE
 1" = 30'
 AS BUILT
 1482

ENGINEER J. J. JONES PROJECT ENGINEER		ARCHITECT C. I. JONES ARCHITECT	
DEPARTMENT OF THE AIR FORCE SPACE SYSTEMS DIVISION (ASST)			
ADDITION TO SATELLITE TEST ANNEX			
PLOT PLAN			
DISTRICT FILE NO. 1-268-25-4		SHEET (2)	







PROJECT: WESTERN SYSTEM	DATE: 11/15/60
DESIGNER: USAF	SCALE: 1/4" = 1'-0"
CHECKER: USAF	PROJECT NO: 650
APPROVED: USAF	DATE: 11/15/60
PROJECT NO: 650	SHEET NO: 85

C-5

IF WHITE IS LESS THAN
 IT IS A REDUCED PRINT
 SIZE

WESTERN SYSTEM

ONIZUKA AIR FORCE STATION
 AIR MAIL ROOM BUILDING
 ADDITION

DATE: 11/15/60
 PROJECT NO: 650
 SHEET NO: 85

GRAPHIC SCALE

1" = 100'

1/4" = 25'

1/8" = 12.5'

1/16" = 6.25'

NOTE:

SEE ELEVATIONS ON SHEET C-1

NOTE:

SEE UNDER PLAN OF THE 1009-ADDITION ON SHEET C-1

NOTE:

EXISTING PAVING AREA USED BY THE AIR FORCE, CIVILIAN AIRCRAFT, AND MILITARY VEHICLES IS TO BE MAINTAINED. CONSTRUCTION SHALL BE LIMITED TO THE PAVING.

NOTE:

SEE UNDER PLAN OF THE 1009-ADDITION ON SHEET C-1

NOTE:

SEE UNDER PLAN OF THE 1009-ADDITION ON SHEET C-1

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U.S. AIR FORCE SATELLITE TEST CENTER
(Onizuka Air Force Station)
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A

SECTION II

FOR OFFICIAL USE ONLY

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**HISTORIC AMERICAN BUILDING SURVEY
LEVEL II-TYPE DOCUMENTATION**

INDEX TO PHOTOGRAPHS

U.S. AIR FORCE SATELLITE TEST CENTER Log No. USAF041221A
(Onizuka Air Force Station)
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Anne Jennings, Photographer Date of Photographs: June 7-14, 2010

Log No. USAF041221A-01 VIEW OF BUILDING 1002 AND AREA
SURROUNDING INSTALLATION FROM ROOF
OF BUILDING 1003, LOOKING NORTHEAST.

Log No. USAF041221A-02 VIEW OF BUILDING 1004 AND AREA
SURROUNDING INSTALLATION FROM ROOF
OF BUILDING 1003, LOOKING SOUTHEAST.

Log No. USAF041221A-03 VIEW OF BUILDING 10031 (FOREGROUND),
BUILDING 1003 (BACKGROUND), AND
INSTALLATION ENTRANCE (LEFT) FROM
INNOVATION WAY, LOOKING SOUTH. NOTE
CONCRETE PLANTERS THAT PROHIBIT
VEHICULAR TRAFFIC.

Log No. USAF041221A-04 VIEW OF BUILDING 1002 (LEFT) AND
INSTALLATION ENTRANCE (RIGHT) FROM
INNOVATION WAY, LOOKING SOUTHEAST.

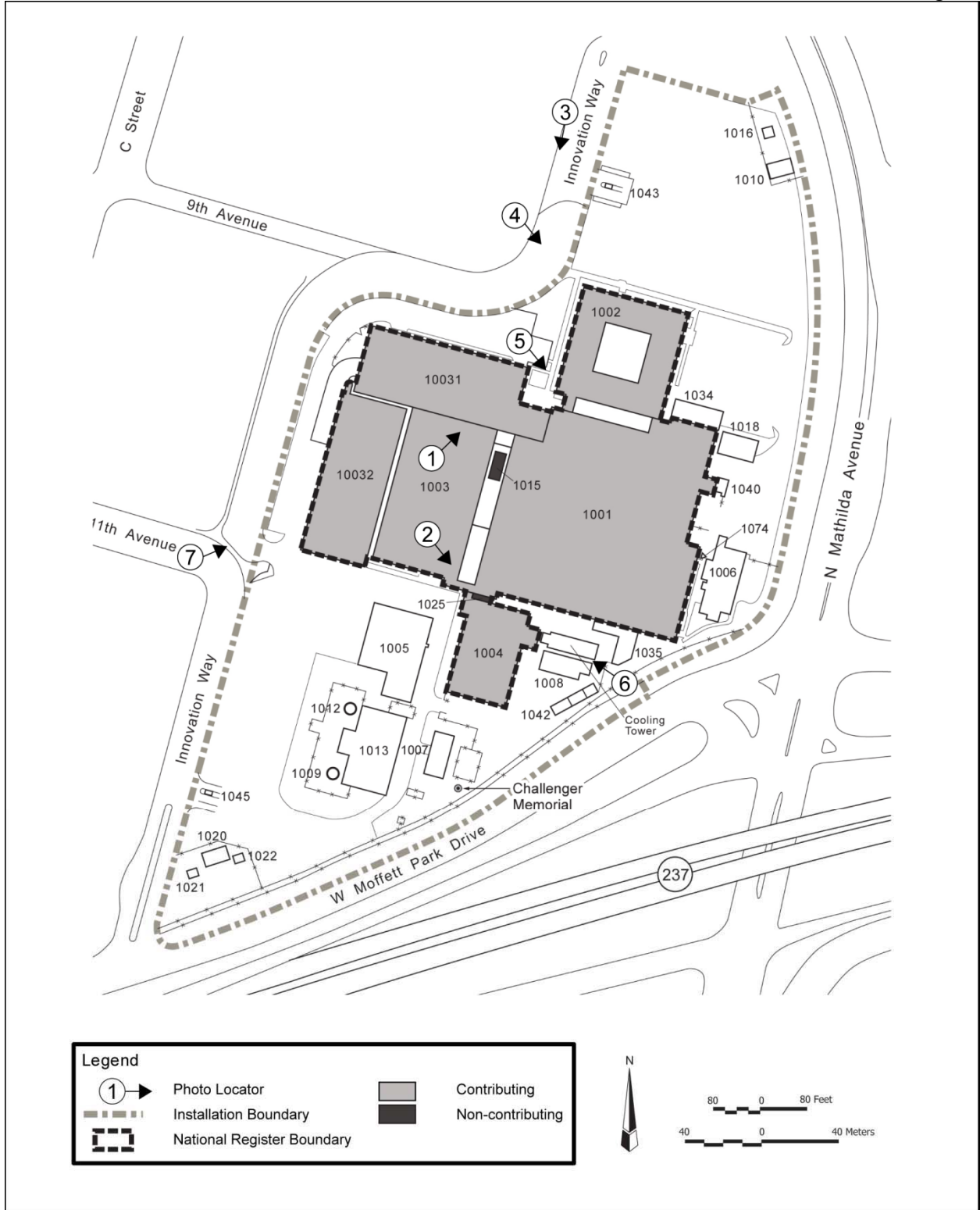
Log No. USAF041221A-05 VIEW OF BUILDING 1001'S MAIN ENTRANCE
FROM SECOND STORY OF BUILDING 10031,
LOOKING EAST.

Log No. USAF041221A-06 VIEW OF BUILDING 1004 (RIGHT
FOREGROUND) AND BUILDING 1003 (LEFT
BACKGROUND) LOOKING WEST.

1 Log No. USAF041221A-07
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VIEW OF BUILDING 10032 (FOREGROUND)
AND BUILDING 1003 (BACKGROUND) FROM
INNOVATION WAY AND 11TH AVENUE,
LOOKING NORTHEAST. NOTE CONCRETE
PLANTERS WHICH PROHIBIT VEHICULAR
TRAFFIC.

U.S. AIR FORCE SATELLITE TEST CENTER
 (Onizuka Air Force Station)
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 Key to Photographs
 Page 3







U.S. AIR FORCE SATELLITE TEST CENTER
(Onizuka Air Force Station)
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(Onizuka Air Force Station)
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(Onizuka Air Force Station)
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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1001
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-A

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

California Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1001
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-A

SECTION I

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **U.S. AIR FORCE SATELLITE TEST CENTER**
5 **BUILDING 1001**

6
7 **Log No. USAF041221A-A**
8

9 **A. Location:** Building 1001, Onizuka Air Force Station
10 1080 Innovation Way, Sunnyvale, Santa Clara County, California
11

12 **B. Significance:** Building 1001, constructed in 1959 to support reconnaissance satellites, is
13 a contributing resource to the National Register-eligible U.S. Air Force Satellite Test
14 Center Historic District. The district is significant at a national, state, and local level
15 under Criterion A for its associations with satellite reconnaissance during the Cold War,
16 and Criteria Consideration G, because five of the six buildings, excluding Building 1001,
17 are not yet fifty years old, and have exceptional importance for their associations with
18 satellite reconnaissance during the Cold War.
19

20 The U.S. Air Force Satellite Test Center Historic District is significant at the national
21 level for its association with satellite reconnaissance during the Cold War. The
22 installation was established in 1959 to serve as the command-and-control center for the
23 first reconnaissance satellite program, the Corona Program. It was developed by the U.S.
24 Air Force and the Central Intelligence Agency (CIA), with assistance from a private
25 contractor, Lockheed Missiles and Space Division. Shortly thereafter, the National
26 Reconnaissance Office (NRO) was established to provide oversight of the program and
27 develop other satellite programs. As new satellite technologies emerged, such as
28 communications, early missile warning, meteorology, navigation, and nuclear detonation
29 detection, additional buildings were constructed. These satellite programs provided
30 valuable data throughout the Cold War, and were supported from the U.S. Air Force
31 Satellite Test Center Historic District, including Building 1001. Although many of the
32 satellite programs remain classified, it is apparent through the continued presence of the
33 NRO that the installation played a key role in the United States' conduct of the Cold War.
34

35 The U.S. Air Force Satellite Test Center Historic District is also significant at the state
36 and local levels for its association with the development of California as a leader in
37 technological innovations. California, and specifically the City of Sunnyvale in Silicon
38 Valley, began to emerge as a leading technological center during the Cold War. This was
39 due, in part, to the military's investment in the development of defense technologies in
40 California, such as command and control of reconnaissance satellites at Onizuka (AFS).
41 The presence of Lockheed Missiles and Space Division in Sunnyvale in the mid-1950s,
42 followed by Onizuka AFS in the late 1950s, burnished its reputation as a high-technology
43 center. The district's period of significance extends from 1959, the date of construction of
44 Building 1001, through 1991, the conclusion of the Cold War.
45
46

1 **C. Description:**
2

3 **1. Current Description**
4

5 Building 1001 was constructed in 1959 to serve as the command-and-control center for
6 reconnaissance satellites. It is a single-story, irregular-plan, windowless, utilitarian steel-
7 frame building sheathed in pre-cast concrete panels. It sits atop a concrete-pile
8 foundation, and is capped by a flat built-up asphalt roof. Multiple mechanical
9 penthouses and exposed mechanical equipment are situated on the roof.

10
11 The entry to Building 1001 occurs on the north façade in the west corner. It should be
12 noted that this entry is not original to the building, and was constructed in 1984 as part
13 of Building 10031, a three-story building which provided two stories of parking space
14 and a single-story devoted to satellite operations. However, the entry is considered part
15 of Building 1001, likely because the entrance to the installation historically occurred on
16 the building. Therefore, the entry will be described in this section. It is two-stories high,
17 and provides access to Buildings 1001, 1002, 1003, 1004, 10031, and 10032 through a
18 high-ceiling lobby. The first story is recessed and is supported by four concrete columns.
19 The façade and columns are clad in vertical metal siding. The entry features a double-
20 glass door with wood handles flanked on the top and sides by floor-to-ceiling, glass-and-
21 metal-panel windows. A section of the first-story façade west of the entry is clad in
22 concrete, and is pierced by a single-metal door with no exterior hardware, set within
23 metal surrounds. A metal sign that reads “Onizuka Air Force Station” is appended above
24 the entry.

25
26 The majority of the exterior of Building 1001 has been obscured over time by the
27 construction of additional buildings. Moving east from the entry, the central section of
28 the north façade is obscured by Building 1002, and the eastern section is obscured by
29 Building 1034. A small section of Building 1001’s north façade is visible between
30 Building 1002 and Building 1034, and is pierced by a metal garage door located behind
31 a chain-link fence with vinyl privacy slats.

32
33 Moving from north to south, the east façade is pierced by a metal garage door, set within
34 metal surrounds. It is accessed by a concrete ramp with four metal bollards. South of the
35 garage door, the façade is pierced by a metal door with a metal handle and safety-glass
36 panel window, set within a metal surround. It is accessed by a concrete ramp flanked by
37 metal pipe railings. South of the doors, Building 1034 is appended to the façade. Beyond
38 Building 1034, mechanical equipment partially enclosed behind rusticated concrete
39 block walls obscures the façade. The mechanical equipment includes transformers
40 connected by pipes to the façade. A double-metal-louvered door with no exterior
41 hardware, set within a metal surround pierces the façade south of the mechanical

1 equipment. The door is accessed by two concrete steps. A safety light is situated above
2 the door. A large rectangular metal-louvered vent occurs south of the door.
3

4 An addition is appended to the east façade south of the vent. The north façade of the
5 addition is pierced by a double-metal door, with no exterior hardware, set within a metal
6 surround, accessed by two concrete steps. A safety light is situated above the door. The
7 east façade of the addition is pierced by a single-metal door with no exterior hardware,
8 set within a metal surround, accessed by three concrete steps; a rectangular metal-
9 louvered vent; and double-metal-louvered doors with a metal doorknob, set within metal
10 surrounds. The door is situated slightly below street-level, and is accessed by a
11 downward-sloping concrete ramp, flanked by concrete-and-metal-pipe railings. Safety
12 lights are situated above the three doors. Horizontal and vertically-oriented pipes are
13 appended to the east façade.
14

15 The south façade is mostly obscured by Building 1035 and Building 1004. Pipes and
16 other mechanical equipment are appended to the south façade.
17

18 The west façade is obscured by Building 1003 and Building 1015. The façade is pierced
19 by a metal-louvered vent. A basketball hoop is appended to the façade, and gym wall
20 pads are appended to a portion of the façade.
21

22 Building 1001 encompasses approximately 105,000 square feet. A current sketch plan is
23 included in the Index to Photographs. Interior spaces within Building 1001 have been
24 renovated as satellite technology evolved. A comparison of the original floor plans with
25 the current floor plan indicates that the majority of the interior has been reconfigured.
26 Not all areas within the building were accessible during the building survey conducted
27 in June 2010. However, an inspection of select interior spaces, coupled with information
28 included in the Onizuka AFS Drawing Number Log, indicate that most interior spaces,
29 even in cases where they retain their original configuration, no longer retain their
30 original function, features, or finishes.
31

32 **2. According to Original Plan**

33

34 Original plans of Building 1001 (Development Control Center) are on file in the Civil
35 Engineering Office, Building 1002, Onizuka AFS, Sunnyvale, Santa Clara County,
36 California. Original building plans were prepared in 1959 in two phases by the Ralph M.
37 Parsons Company based in Los Angeles, California under the auspices of the U.S. Air
38 Force Ballistic Missile Division (AFBMD) in Englewood, California. The following
39 plans are featured in the graphic documentation section of the report:
40

- 41 • “Development Control Center, Floor Plan A” (Ralph M. Parsons
42 Company/AFBMD, March 6, 1959b)

- 1 • “Development Control Center, Floor Plan B” (Ralph M. Parsons
2 Company/AFBMD, March 6, 1959c)
- 3 • “Satellite Test Center Modification, Site and Vicinity Plan” (Ralph M.
4 Parsons Company/AFBMD, May 31, 1960a)
- 5 • “Development Control Center, Elevations” (Ralph M. Parsons
6 Company/AFBMD, March 6, 1959d)

7
8 In addition, historic photographs were also consulted to determine the original
9 appearance of the building. A sampling of historic photographs of Building 1001 are
10 reproduced in the graphic documentation section of the overview report entitled
11 California State Historic Preservation Office, Historic American Building Survey Level
12 II-Type Documentation, U.S. Air Force Satellite Test Center, Log No. USAF041221A.
13

14 Building 1001, the first building developed on the installation, was centrally located
15 along the western boundary of the 11.43-acre installation. Plans for the building were
16 prepared in two phases in March and August 1959. Plans dated March 6, 1959, entitled
17 “Development Control Center, Plot and Utility Plan” depict the footprint of Building
18 1001 as a rectangular-plan building with a cut-out northwest corner (Ralph M. Parsons
19 Company/AFBMD, March 6, 1959a). In addition, the plan indicates that two rectangular
20 additions would be appended to the east and south facades to enlarge the building. Plans
21 dated August 21, 1959, entitled “Development Control Center, Site and Vicinity Plan,”
22 depict the expansion (Ralph M. Parsons Company/AFBMD, August 21, 1959a).
23

24 Original plans indicate that Building 1001 was conceived of as a single-story,
25 windowless, steel-frame building, sheathed in six-foot, tilt-up, pre-cast concrete panels,
26 set atop a concrete-pile foundation, capped by a flat graveled-surface asphalt roof.
27

28 As indicated on the original plans, the entrance was located on the west façade of the
29 northwest corner. Plans and historic photographs reveal that this portion of the west
30 façade was clad in a variety of materials. The entry itself consisted of a double-glass
31 door, topped by a flat metal overhang, flanked by heat-absorbing glass panels. Laminated
32 enameled panels were situated above the entry. Moving north from the entry, the façade
33 was clad in 6'-0" thick concrete panels which terminated in laminated enamel panels at
34 the northern corner. South of the entrance, the west façade was also pierced by one metal
35 door and a louvered-metal vent (Ralph M. Parsons Company/AFBMD, March 6, 1959e).
36

37 According to the original plans, moving from east to west, the north façade was pierced
38 by a single-metal louvered door and a double-metal louvered door. Moving from north to
39 south, the east façade was pierced by a metal roll-up garage door, a single-metal door, a
40 double-metal door, a single-metal door, a double-metal door topped by a rectangular-
41 shaped metal louvered vent, and a large rectangular-shaped metal-louvered vent. Moving
42 from east to west, the south façade was pierced by a single-metal door, two double-metal

1 doors, and double-metal-louvered doors. The doors were accessed by concrete steps, and
2 it is likely that many of the doors only opened from the interior. Downspouts were also
3 appended to the building (Ralph M. Parsons Company/AFBMD, March 6, 1959d-e).

4
5 Heating Ventilation and Air Conditioning (HVAC) equipment was located on the roof. A
6 parking area which could accommodate 186 cars and forty-three sports cars was located
7 north of the building. A concrete path connected the parking lot to the building's entrance
8 (Ralph M. Parsons Company/AFBMD, March 6, 1959a).

9
10 Floor plans were prepared in two phases in 1959. These include plans dated March 6,
11 1959, entitled "Development Control Center, Floor Plan A" and "Development Control
12 Center, Floor Plan B," and plans dated August 21, 1959, entitled "Development Control
13 Center Increment Two, Plan A," "Development Control Center, Increment Two, Plan B,"
14 and "Development Control Center, Increment Two, Plan C and Room Finish Schedule"
15 (Ralph M. Parsons Company/AFBMD, August 21, 1959b-d). Although the building was
16 occupied by January 1960, interior work continued in certain areas, including the Satellite
17 Control Room within the Satellite Control Room Complex. The floor plan in its entirety
18 is depicted on the plan entitled "Satellite Test Center Modification, Site and Vicinity
19 Plan," dated May 31, 1960. By February 1961, construction was complete, and the
20 building was fully occupied (Jernigan, 1983).

21
22 Although the original plans are not labeled with room functions, documents such as the
23 Chronology prepared by the AFSCF History Office in 1983 provide information
24 pertaining to room function. For example, Room 127 served as the Satellite Control
25 Room, and featured a balcony from which activity could be observed. (Ralph M. Parsons
26 Company/AFBMD, May 31, 1960b). Surrounding rooms (including Rooms 120, 121,
27 122, 130, 131, 132, and 133) formed part of the Satellite Control Room Complex. In
28 addition, Room 111 functioned as the Telephone Exchange Room; Rooms 138, 139, and
29 140 housed offices for the Test Director; Room 318 served as the Data Control Center,
30 and housed computers and telemetry equipment. Room 329 functioned as the cafeteria
31 (Jernigan, 1983; Ralph M. Parsons Company/AFBMD, May 31, 1960a).

32
33 The plan entitled "Development Control Center Increment Two, Plan C and Room Finish
34 Schedule" provides floor, wall, and ceiling finish information for a portion of the
35 building. Finishes were typical of the time, and floor surfaces included unfinished
36 concrete, typically in mechanical areas; asphalt tiles; vinyl tiles; quarry tile, ceramic tile,
37 and linoleum. Wall surfaces included concrete block; gypsum plaster; cement plaster;
38 gypsum board; glass partitions; and acoustic tiles. Ceiling surfaces included cement
39 plaster; gypsum board; gypsum plaster; concrete; and acoustical tiles (Ralph M. Parsons
40 Company/AFBMD, August 21, 1959d). The control room walls and ceiling were
41 sheathed in acoustical tile, indicative of the secrecy that surrounded the program (Ralph
42 M. Parsons Company/AFBMD, May 31, 1960b).

1 **D. History:**

2
3 **1. Development of the Satellite Test Center, 1959-61**

4
5 The development of satellite reconnaissance during the Cold War (1946-91) and the
6 specific role of the U.S. Air Force Satellite Test Center (STC) is fully described in the
7 associated overview report, California State Historic Preservation Office Historic
8 American Building Survey Level II-Type Documentation, U.S. Air Force Satellite Test
9 Center, Log No. U.S.AF041121A. The following section provides a brief summary of the
10 role that Building 1001 played at the STC from 1959-91, its period of significance.

11
12 Building 1001 was constructed in 1959 to serve as the command-and-control center for
13 the Corona Program to support the launch, orbit, and recovery of Corona satellites. The
14 Corona Program, initiated in 1958, was the first reconnaissance satellite program
15 developed by the U.S. Air Force and the CIA, with assistance from private contractors,
16 such as Lockheed Missiles and Space Division, located in Sunnyvale, California.
17 Concerns about preserving the secrecy of the Corona Program and its objectives led to
18 the designation of the Discoverer Program as a cover program. The publicly-stated goal
19 of the Discoverer Program was scientific research (Richelson, 2002). Prior to the
20 construction of Building 1001, at least eight Corona satellites, described as Discoverer
21 satellites in the press, were launched from Vandenberg Air Force Base (AFB), and were
22 supported from an interim control center in Palo Alto, California. Tracking stations
23 located around the world also provided support.

24
25 In 1959, the U.S. Air Force acquired 11.43 acres of land in Sunnyvale from Lockheed
26 Missiles and Space Division located to the west. Plans for the installation were designed
27 by the Ralph M. Parsons Company, an architecture and engineering firm based in Los
28 Angeles, California, under the auspices of the AFBMD in Englewood, California (Ralph
29 M. Parsons Company/AFBMD, March 6, 1959a).

30
31 The Ralph M. Parsons Company was established in 1944, by engineer Ralph M. Parsons.
32 Parsons, a New York native, graduated in 1916 with an engineering degree from Pratt
33 Institute in Brooklyn, New York. Following graduation, he enlisted in the U.S. Navy for
34 four years, after which he served as a civilian aeronautical engineer for the U.S. Navy.
35 During World War II (1941-45), he formed a partnership with Stephen D. Bechtel and
36 John A. McCone, who later headed the CIA from 1961-65 (*The New York Times*,
37 December 21, 1974). Following establishment of the Ralph M. Parsons Company in
38 1944, they began work for the military as designer of the Canol Pipeline, a 1,200-mile oil
39 pipeline between the United States and Canada. Their selection for this project was
40 presumably as a result of Parsons' prior U.S. Navy contacts. By 1948, they had further
41 cemented their reputation on defense-related projects with the 1948 design of the Point
42 Mugu Missile Facility in Point Mugu, California (Parsons, no date [n.d.]).

1 On January 28, 1960, the installation, newly designated as the STC, was dedicated by the
2 U.S. Air Force (Davies, 1960). A few months later, on March 1, 1960, it was occupied by
3 the 6594th Aerospace Test Wing (ATW), the first unit to be tasked with military satellite
4 operations; Lockheed Missiles and Space Division employees; and likely the CIA. The
5 6594th ATW provided oversight for Lockheed Missiles and Space Division which was
6 responsible for satellite operations (6594th ATW, 1961; Jernigan, 1983). However,
7 portions of the building remained under construction, including the state-of-the-art
8 Satellite Control Room in the Satellite Control Room Complex. An interim Satellite
9 Control Room was established from which Lockheed Missiles and Space Division,
10 monitored by the 6594th ATW, could direct the launch, tracking, data acquisition,
11 command and control, and recovery phase of military satellites (6594th ATW, 1961;
12 Jernigan, 1983).

13
14 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
15 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
16 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
17 the public, likely due in part to a building sign which indicated "U.S. Air Force Satellite
18 Test Center" (Jernigan, 1983).

19
20 On February 6, 1961, the Satellite Control Room and remainder of the Satellite Control
21 Room Complex became operational. The primary purpose of the complex was to support
22 Corona satellites, although additional programs were supported by this time. According
23 to a 1961 6594th ATW Fact Sheet, the Satellite Control Room featured eight "ultra
24 modern consoles" from which satellites were supported. Each console contained
25 communications and control and display equipment, such as closed-circuit television
26 screens and push-button communications panels. The consoles faced a row of eight
27 projector screens which enabled the controllers to display maps, meteorological
28 conditions, orbital information, telemetry read-outs, and other data. Much of the
29 displayed information was received via worldwide tracking stations, and processed and
30 evaluated by computers, such as the Control Data Corporation (CDC) 1604 computer
31 (6594th ATW, 1961).

32
33 In addition, four primary areas supported the Satellite Control Room during operations.
34 These included:

- 35
36 • The Operational Support Area which provided plotting, display, and
37 meteorological support.
- 38
39 • The Communications Center which provided communications support.
- 40
41 • The Computer/Programmable Integrated Communications Equipment
42 (PICE) Area which provided high-speed computation and data reduction.

- The Technical Director Room which provided consultative support and oversight.

With the exception of the Technical Director Room, which likely housed upper-level personnel, all areas were operated by the U.S. Air Force and Lockheed Missiles and Space Division personnel (6594th ATW, 1961).

2. Significant Events and Satellites Supported, 1960-61

In August 1960, the U.S. Air Force accomplished the first successful retrieval of a Discoverer satellite. On August 10, Discoverer XIII was launched from Vandenberg AFB, and was supported by the STC. The satellite achieved polar orbit for a period of ninety-four minutes, during which time it was in contact with worldwide tracking stations, and the interim Satellite Control Room at the STC. During its seventeenth rotation of the earth, the eject command was issued from the STC, and the capsule was ultimately recovered from the Pacific Ocean, marking the first successful retrieval of an object from space (Arnold, 2005; 6594th ATW, n.d.). In-keeping with the publicly stated scientific objectives of the Discoverer Program, the *San Jose Mercury News* noted that “Discoverer recovery techniques will be used soon to return monkeys from space,” and were vital to “returning a man to earth after orbiting in space” (Lindsey, August 12, 1960). Still in the testing phase, the satellite did not yet contain a camera (Jernigan, 1983).

Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from Vandenberg AFB (Arnold, 2005). Discoverer XIV orbited the earth seventeen times, supported by the STC from the interim Satellite Control Room in Building 1001, and the Kodiak tracking station, before the eject command was relayed to the satellite. Following the command, at 300 miles above the earth, the satellite recovery vehicle (SRV) separated from the spacecraft, and began its descent to earth, where it was caught by a specially equipped Fairchild C-119 *Flying Boxcars* (C-119) piloted by U.S. Air Force Captain Harold Mitchell (*The New York Times*, August 20, 1960).

The Discoverer XIV SRV contained 20 pounds of film which documented over 1,650,000 square miles, and provided the first successful satellite reconnaissance photographs of the Soviet Union. It also resulted in more photographic coverage of the Soviet Union than all previous U-2 flights combined. Furthermore, it provided evidence that the missile gap, feared since the 1957 launch of *Sputnik I* by the Soviet Union, did not exist, and that the Soviets did not have an immense stockpile of Intercontinental Ballistic Missiles (ICBM) (Day, 2006). However, despite the historic nature of this event, the crew, who were not cleared for the Corona Program, were unaware of the importance of their mission (Arnold, 2005).

1 Although the STC was developed to support the Corona Program, by the fall of 1960, it
2 also supported the Satellite and Missile Observation System (SAMOS) and Missile
3 Detection Alarm System (MIDAS). Both programs were initially developed by the U.S.
4 Air Force in the mid-1950s as reconnaissance and missile detection satellites,
5 respectively. On October 11, 1960, the first SAMOS satellite was launched from
6 Vandenberg AFB, and supported from the STC, although it failed to reach orbit (*San Jose*
7 *Mercury News*, October 12, 1960). By July 1961, MIDAS satellites were launched from
8 Vandenberg AFB and supported by the STC. By the end of 1961, two MIDAS satellites
9 had reached orbit (6594th ATW, 1961).

10
11 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
12 Corona satellite supported by the STC from the new control room. By this time, Corona
13 satellites were regularly providing images of the Soviet Union, as well as other
14 communist countries. Among these images included evidence of the building of the
15 Berlin Wall between East and West Germany (Chapman, 2008). In September 1961, the
16 NRO was established as a classified agency in the Department of Defense (DoD), and
17 was tasked with oversight of reconnaissance satellite programs, including the Corona
18 Program, and therefore became a presence at the STC (Richelson, 2000).

19
20 **3. Building 1002 Construction and Upgrades, 1962**

21
22 In 1962, the STC experienced its first of many expansions, when plans for a two-story, L-
23 shaped administrative building – Building 1002 (Addition to the Satellite Test Annex) -
24 were prepared for the U.S. Air Force Space Systems Division (SSD) by Kaiser Engineers,
25 a division of the Henry J. Kaiser Company. Kaiser Engineers was a well-known
26 architecture and engineering firm located in Oakland, California. Building 1002 was
27 appended north of Building 1001 by a hyphen, the construction of which resulted in
28 modifications to Building 1001's north façade and interior (Kaiser Engineers/U.S. Air
29 Force SSD, January 15, 1962a-b).

30
31 During this time, Kaiser Engineers also prepared plans for a single-story addition to
32 Building 1001, and interior modifications to the Satellite Control Room Complex. The
33 4,200-square foot addition appended to the east façade of Building 1001 housed a new
34 communications center, crypto equipment, electrical and mechanical rooms, and an
35 HVAC penthouse on the roof, necessitated by the installation of new systems (Jernigan,
36 1983). Minor alterations were also made to rooms within the Satellite Control Room
37 Complex (Kaiser Engineers/U.S. Air Force SSD, October 17, 1962a-b).

38
39 The 1962 renovations were likely implemented in conjunction with the U.S. Air Force's
40 first modernization effort, the Multiple Satellite Augmentation Program (MSAP). This
41 effort was initiated in part, to standardize and provide updated equipment to the STC and
42 tracking stations which would enable them to simultaneously support multiple satellite

1 programs (Lockheed Missiles and Space Division, 1963). Computer capabilities were
2 upgraded, new display and communications equipment were installed, and connections
3 between the STC and tracking stations were upgraded (Jernigan, 1983).
4

5 **4. Significant Events and Satellites Supported, 1962-64**
6

7 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
8 The following month, the DoD classified all military satellite programs (DoD, March 23,
9 1962). As a result, Discoverer XXXVIII was the last satellite launched as part of the
10 Discoverer program. Corona satellites continued to be launched and supported by the
11 STC, however, because all satellites were classified, the Corona Program no longer
12 required a cover story.
13

14 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
15 satellites had accurately mapped all twenty-five of Moscow's long-range missile sites.
16 Furthermore, images taken by Corona satellites indicated that China was readying its
17 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that "[O]n
18 the basis of new overhead photography, we are now convinced that the previously
19 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
20 for use in about two months." Within two months, on October 16, 1964, China tested an
21 atomic bomb at the Lop Nur site (Broad, September 12, 1995).
22

23 In addition to Corona, SAMOS, and MIDAS satellites, the STC supported the Defense
24 Meteorological Satellite Program (DMSP) in 1962 and 1963. DMSP was a
25 meteorological satellite program initiated in 1960 to provide weather and climate data for
26 more effective military operations (DMSP, n.d.). On October 16, 1963, the first Vela
27 satellite was launched and supported by the STC. The Vela Program – vela means vigil in
28 Spanish – was a series of satellites designed to detect nuclear detonations (Jernigan,
29 1983; Peebles, 1997). Presumably, Vela satellites provided images of the Lanzhou
30 Diffusion Plant in Lanzhou, China and the Baotao Nuclear Fuel Component Plant in
31 Baotao, China (Richelson, 2002).
32

33 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
34 Furthermore, 1963 marked the beginning of the Keyhole (KH)-7 surveillance system,
35 noted in a 2006 NRO memo as "the Intelligence Community's first high resolution
36 surveillance or 'spotting' satellite." Similar to Corona satellites, the KH-7 was a
37 reconnaissance satellite that returned film to earth in SRVs. It was primarily used to
38 provide surveillance of nuclear facilities and Intermediate Range Ballistic Missiles
39 (IRBM) in the Soviet Union and China (NRO, 2006).
40

41 In July 1964, two additional Vela satellites were launched, resulting in a total of four
42 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III

1 was launched and supported by the STC. Syncom III was a National Aeronautics and
2 Space Administration (NASA) satellite used for DoD military communications
3 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).
4

5 **5. Construction, Upgrades, and Designation of the Air Force Satellite Control Facility,**
6 **1964-67**
7

8 In May 1964, plans were prepared for a two-story, L-shaped administrative addition to
9 Building 1002. It was designed by Maher & Martens, a San Francisco-based architecture
10 firm for the U.S. Army Corps of Engineers (USACE), Sacramento District. The addition
11 was appended to the east façade of Building 1002, and created an interior courtyard. A
12 hyphen connected the south façade of Building 1002 to the north façade of Building
13 1001, which necessitated modifications to Building 1001's north façade and interior
14 (Maher & Martens/USACE Sacramento District, May 7, 1964).
15

16 Communications systems were also upgraded that year. Upgrades included the
17 installation of a semi-automatic teletype switch, which provided near real-time
18 capabilities, and the installation of high-frequency, high-power radio station. The
19 switchboard capacity was also increased to 1,000 lines. Univac 1040 computer systems
20 were also installed at a cost of \$42,000, and two CDC 1604 mainframes were purchased
21 for \$594,000 (Jernigan, 1983).
22

23 In 1965, the U.S. Air Force Satellite Control Facility (AFSCF) was officially designated.
24 The mission of the AFSCF was to direct launch, tracking, data acquisition, command and
25 control, and recovery of DoD military satellites. Following the establishment of AFSCF,
26 an Interim Expansion Plan (IEP) was initiated to augment the facility and implement the
27 Mission Control Center (MCC) concept, which focused on the development of mission-
28 oriented control centers rather than a single control room (Jernigan, 1983).
29

30 Plans to develop multiple MCCs in Building 1001, as well as other elements of the IEP
31 were prepared by San Francisco-based consulting engineers, Bentley Engineers and Earl
32 & Wright, Inc. under the auspices of the U.S. Air Force SSD. The plans indicate that the
33 building was reconfigured to accommodate four new MCCs, known as MCCs 1, 2, 3, and
34 4. In addition, the building also featured two new complex areas, known as Complex
35 Numbers 6 and 7. Although prior plans do not indicate other complex areas, it appears
36 that there were such areas in Building 1001 which likely housed operations of some sort.
37 The plans also indicated that two new communications areas, labeled as Communications
38 Area A and B, were developed, as well as a new bird buffer area (Bentley Engineers and
39 Earl & Wright, Inc./U.S. Air Force SSD, December 13, 1965a-e).
40

41 The Satellite Control Room Complex remained relatively unchanged, and continued to
42 support the Corona Program. In addition, Bentley Engineers and Earl & Wright also

1 prepared mechanical plans to upgrade HVAC, plumbing, and electrical systems
2 necessitated by the installation of computers and equipment (Onizuka AFS, n.d.).
3

4 The plans identified a January 1966 start date, and May 1966 completion date (Bentley
5 Engineers and Earl & Wright, Inc./U.S. Air Force SSD, December 13, 1965a). Keeping
6 somewhat on track, the majority of construction was completed by December 1966
7 (AFSCF, January-June 1966). As part of the IEP, new equipment was installed
8 throughout 1967, including CDC 3600 computers which replaced the CDC 1604
9 computers (Jernigan, 1983).
10

11 In 1970, the AFSCF prepared an unclassified document that served as a guide for
12 military, civilian, and contractor personnel at the STC. It provided a brief description of
13 the MCCs in Building 1001. Although the guide was produced after the 1966
14 modifications, it is likely that they functioned in much the same way. As described in the
15 guide, MCCs in Building 1001 included:
16

- 17 • MCC 1: supported several satellite programs in conjunction with all
18 tracking stations.
- 19 • MCC 2: supported several satellite programs in conjunction with all but
20 one tracking station.
- 21 • MCC 3: supported complex, low-orbit satellites that required extensive
22 commanding and analysis of a large volume of telemetry data.
- 23 • MCC 4: supported a highly sophisticated low-orbit satellite program
24 (AFSCF, 1970).
25
26
27
28

29 **6. Significant Events and Satellites Supported, 1965-70**

30

31 The increase in the number of flight support hours logged by the AFSCF between 1965-
32 66 appears to indicate that at least some of the MCCs were operational in 1966. In 1965,
33 the AFSCF logged 20,757 hours of satellite flight support. By 1966, 29,400 hours of
34 flight support were logged. The number of satellites supported also increased. In 1965,
35 the STC supported approximately fourteen satellites (AFSCF, 1972). In January 1967, the
36 STC supported thirty-one satellites per day, and by June were supporting forty-four per
37 day, which was expected to increase to forty-seven per day by July (AFSCF January-June
38 1967).
39

40 Between 1965-70, the STC supported over forty Corona satellite launches (Mission and
41 Spacecraft Library, n.d.). By 1966, upgrades to the installation had resulted in an increase
42 in satellite programs supported. In addition to Corona, Vela, and other programs (many of

1 which likely remained classified) new programs such as NASA's Biosatellite Program
2 were supported. The Biosatellite Program was a series of three satellites designed to
3 assess the effects of spaceflight on living organisms. Support for the program focused on
4 directing operations of the recovery of the satellites by Lockheed C-130 *Hercules* (C-
5 130) aircraft flown by the 6594th Aircraft Recovery Group based at Hickam AFB,
6 Honolulu, Hawaii (Jernigan, 1983).
7

8 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
9 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
10 SESP was responsible for providing flights for research and experiments undertaken by
11 government agencies (AFSCF, January-June 1968; Jernigan, 1983). In 1967, the KH-7
12 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
13 of which successfully returned usable images (NRO, 2006).
14

15 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
16 supported by the STC, uncovered the Soviet Union's plans for the invasion of
17 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
18 monitored Soviet radio transmissions which signaled the invasion was imminent, and
19 photographic reconnaissance satellites had monitored unusual military activities on the
20 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops" (*San*
21 *Jose Mercury News*, August 27, 1968).
22

23 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
24 supported by the STC and tracking stations. The LES was an experimental satellite used
25 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).
26

27 In 1969, support was provided for NASA's manned flights to the moon. The STC
28 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar mission.
29 Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program 949 was
30 designated in November 1966 to supplant Program 461, which had initially supplanted
31 the MIDAS Program in 1963. Program 949 provided a wider range of capabilities, and by
32 the 1970s, was expected to have "progressively enhanced world-wide early-warning,
33 surveillance and detection capabilities" (Piper, 1970).
34

35 **7. Development of Buildings 1003 and 1004, 1966-70**

36

37 In conjunction with the technological upgrades which occurred throughout the mid-to-
38 late 1960s, in August 1966, a real estate estimate was prepared by the USACE
39 Sacramento District which proposed the acquisition of 8.2 acres of land from Lockheed
40 Aircraft Corporation, at a cost of \$49,000. In 1966, C.F. Braun & Company of Alhambra,
41 California, under the auspices of the U.S. Naval Facilities Engineering Command
42 (NAVFAC) Western Division, San Bruno, California, and Space and Missiles System

1 Organization (SAMSO), Los Angeles, California, prepared site development plans (C.F.
2 Braun/NAVFAC/SAMSO, December 30, 1966). C.F. Braun & Company also prepared
3 plans to develop two new buildings, Building 1003 (STC Building Addition), and
4 Building 1004 (Power Plant) (C.F. Braun/NAVFAC/SAMSO, November 14, 1967;
5 August 12, 1968).

6
7 By August 1968, Lockheed Aircraft Corporation transferred the land to the U.S. Air
8 Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). By this time site
9 development was underway, and included relocation of an existing Lockheed Missiles
10 and Space building; reconfiguration of Lockheed Martin Way (formerly known as East
11 Perimeter Road) west of Building 1001; creation of additional parking spaces; and
12 installation of underground utilities (C.F. Braun/NAVFAC/SAMSO, December 30,
13 1966).

14
15 Following site development, construction of Buildings 1003 and 1004 commenced.
16 Building 1003 was designed to house the Manned Orbiting Laboratory (MOL) Program,
17 as well as other satellite programs. Initiated in 1963, the concept involved a Titan III
18 booster rocket which carried a modified Gemini B capsule attached to a space laboratory,
19 and was intended to serve reconnaissance purposes (Jernigan, 1983). However, in June
20 1969, the DoD announced the cancellation of the MOL Program, to save money. The
21 cancellation led to a short work stoppage, however construction resumed a few weeks
22 later. *Aerospace Daily* reported that the U.S. Air Force had evaluated requirements for
23 current and future programs, and determined that construction on the building should
24 continue (*Aerospace Daily*, September 19, 1969).

25
26 By the end of 1969, the 164,000-square foot building, constructed at a cost of \$8 million
27 was nearly complete. A windowless, pre-cast concrete-panel building, it was appended to
28 the west façade of Building 1001. Although the building was four stories, it was
29 approximately 104' high, with each story approximately 25' high to accommodate the
30 mechanical equipment necessary to maintain satellite programs. The building was painted
31 "Air Force blue," resulting in its nickname, the "Blue Cube" (*Aerospace Daily*,
32 September 19, 1969).

33
34 Building 1003 housed multiple MCCs, communications and crypto equipment, a data
35 distribution center, mechanical equipment, CDC 3800 computers, and a tape library
36 (AFSCF, 1970). In addition, shortly after it was constructed, the Vela Program office
37 along with another unidentified satellite program, were relocated from Building 1001 to
38 Building 1003 (AFSCF, July-December 1969).

39
40 Building 1004 was also designed by C.F. Braun & Company. Solar, a division of
41 International Harvester Company provided the Saturn gas turbine generator sets that
42 powered the plant. The development of Building 1004 necessitated modifications to the

1 installation's power distribution system. Ties to the electric power provided by Pacific
2 Gas and Electric (PG&E) were severed, with the exception of one power line which
3 provided power through a Lockheed Missiles and Space Substation, and was likely kept
4 active to provide back-up power (AFSCF, 1972). The plant, staffed by Solar contractors,
5 was operational in February 1970, and provided power to the entire installation, rendering
6 it energy-independent at that time (Jernigan, 1983).
7

8 **8. Termination of the Corona Program and Upgrades, 1970s**
9

10 Construction of Buildings 1003 and 1004 resulted in renovations to Building 1001. Walls
11 were removed and rooms reconfigured where the two buildings joined. In addition, the
12 Onizuka AFS Drawing Number Log indicates that Building 1001 underwent numerous
13 HVAC, electrical, and plumbing upgrades in the 1970s. During that time, it also indicates
14 that multiple rooms were refurbished, including: Rooms 212, 318, 319, 320, 321, 465,
15 467, 468, 469, and 495 (Onizuka AFS, n.d.).
16

17 In addition, equipment was relocated from Building 1001 to 1003. For example, in 1971,
18 communications circuits were relocated from Building 1001 to Building 1003, which
19 permitted additional operator space and generally improved working and security
20 conditions. Equipment was also installed to link the two buildings, including a twenty-
21 channel digital television for computer-controlled switching between Building 1001 and
22 Building 1003 in 1973. A keyboard/light-pen entry system was installed, likely in both
23 buildings (Jernigan, 1983).
24

25 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. On May 25, 1972,
26 Sunnyvale AFS supported the 145th and final launch of the Corona Program from the
27 Satellite Control Room in Building 1001. It was terminated as a result of advances in
28 satellite technology. By the time the Corona Program concluded, Corona satellites had
29 provided approximately 800,000 reconnaissance photographs covering approximately
30 510 million square miles (Chapman, 2008; Vukotich, n.d.). Following its termination, the
31 Satellite Control Room Complex likely continued to be utilized for control of other
32 satellite programs.
33

34 In 1974, Building 1015 was constructed to serve as a recreational facility. It was located
35 between Buildings 1001 and Building 1003. In 1975, plans were prepared by Keller &
36 Gannon, and architecture and engineering firm based in San Francisco to alter the
37 original Satellite Control Room Complex (Keller & Gannon/U.S. Air Force, September
38 24, 1975). The plans indicate that the eight consoles, which had been "state of the art"
39 when they were installed in 1961, were slated for removal. In addition, walls, raised
40 floors, and ceilings were reconfigured (Keller & Gannon/SAMSO, September 24, 1975).
41

1 In 1977, Keller & Gannon prepared plans to re-roof Building 1001 (Keller &
2 Gannon/SAMSO, July 29, 1977). In addition, the Onizuka AFS Drawing Number Log
3 indicates that maintenance and paint shops were constructed in Building 1001. In 1979,
4 plans were prepared to renovate the following areas: MCC C; MCC 4; Rooms 112, 329,
5 318, 435; and Complex 7. Renovations appear to have included reconfiguration of rooms,
6 such as installation and removal of partitions, and associated electrical and HVAC
7 upgrades (Onizuka AFS, n.d.).
8

9 **9. Significant Events and Satellites Supported, 1970s**

10
11 In the 1970s, Sunnyvale AFS continued to support existing and newly established
12 satellite programs, although many of them remained classified. By this time, MCCs were
13 established in both Building 1001 and 1003. The Corona Program continued to be
14 supported from Building 1001 until its final launch in 1972, and the Vela Program was
15 supported from Building 1003 throughout the 1970s. However, in general, specific
16 information is not available concerning the programs supported in the buildings.
17 However, Building 1001 continued to be upgraded to support new missions, and
18 therefore, likely supported multiple satellite programs.
19

20 In 1970, the AFSCF Satellite Test Operations Historical Reports noted the successful
21 support of two “unique orbital events” from the installation. These events included
22 support of the Apollo 13 mission in April, which was aborted following the explosion of
23 an on-board oxygen tank, and support of the first North Atlantic Treaty Organization
24 (NATO) communications satellite in March (AFSCF, January-June 1970).
25

26 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
27 support throughout the 1970s for the orbiting satellite (Jernigan, 1983). Program 949 was
28 also re-designated the Defense System Program (DSP) in 1970. Sunnyvale AFS
29 continued to support this program throughout the early 1970s (AFSCF, July-December
30 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was approximately 23’
31 long, 10’ wide, and contained a large infrared telescope which scanned the earth for
32 missile launches. In the event a missile was launched, it would be detected by the United
33 States within minutes, which removed the possibility of a surprise attack (Peebles, 1997).
34

35 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
36 advanced communications satellites had been launched to handle voice, teletype,
37 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
38 satellites – code-named HEXAGON, and popularly known as “Big Bird” – were also
39 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
40 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
41 to photograph large areas, and return the film to earth via SRV. They carried

1 technologically advanced cameras, additional film capsules, and antennae for other
2 intelligence-gathering purposes (Clark, 2007).

3 In January 1972, President Richard Nixon announced the development of the Space
4 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
5 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
6 bases for the program. Research and development (R&D) shuttle launches would
7 originate from the Kennedy Space Center, and military launches would originate from
8 Vandenberg AFB. The shuttle would be responsible for the launch of all commercial,
9 scientific, and military satellites into space. The AFSCF, including Sunnyvale AFS and
10 tracking stations, would provide tracking and control for the program (Jernigan, 1983).

11
12 In July 1975, the final Apollo flight was launched and supported by Sunnyvale AFS. The
13 final flight was known as the Apollo-Soyuz Test Project, which marked the first joint
14 United States-Soviet Union space mission. The mission was the first time two foreign
15 spacecraft docked together in orbit (NASA, July 14, 2010). In 1976, the first DMSP
16 Block 5D, a meteorological satellite, was launched, and was presumably supported from
17 Sunnyvale AFS. It was an upgraded version of the 1960s-era DMSP, and provided twice-
18 daily, world-wide meteorological, oceanographic, and solar-terrestrial physics
19 measurements (Jernigan, 1983; Wade, n.d.).
20

21 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
22 the first successful electronic imaging satellite, and transmitted high-quality images in
23 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources
24 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
25 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
26 lettering on billboards” (Ingersoll, November 5, 1978). Nonetheless, this top-secret
27 satellite represented significant advances in the development of satellite technology, and
28 was supported from Sunnyvale AFS, as well as associated tracking stations.
29

30 **10. Development of the Air Force Satellite Control Network, Expansion, and Upgrades,**
31 **1980s**

32
33 In 1982, the Air Force Satellite Control Network (AFSCN) was organized. The AFSCN
34 was not a formal organization, but rather denoted a group of common user resources,
35 assets, and facilities which collectively provided tracking, telemetry & commanding
36 (TT&C) support for virtually all DoD spacecraft, and select NASA and foreign
37 government programs (Hane, 1988). The goal of the AFSCN was to provide “enduring
38 control capability commensurate with the need for operational space suites throughout
39 the conflict spectrum” (AFSCF, 1983). To accomplish this goal, Sunnyvale AFS was
40 upgraded as part of the Data Systems Modernization Program. This \$500 million upgrade
41 introduced centralized database-driven computer hardware and software to replace
42 outdated systems. The upgraded system was more reliable, cheaper to maintain, and

1 faster than its predecessor, allowing it to support a steadily increasing satellite support
2 workload (Fedor et al., 2006).
3

4 A new satellite control center – the Consolidated Space Operations Center (CSOC) – was
5 constructed at Falcon AFS, Colorado Springs, Colorado (present-day Schriever AFB) in
6 conjunction with the Data Systems Modernization Program (Fedor et al., 2006). The
7 CSOC was constructed partially due to concern about the vulnerability of Sunnyvale AFS
8 to earthquakes and terrorism (Philp, June 9, 1985).
9

10 In addition, two new buildings, Buildings 10031 and 10032 were constructed at the STC
11 to provide additional space for satellite control in conjunction with the Data Systems
12 Modernization Program. In 1981, plans were prepared by King/Reif and Associates on
13 behalf of NAVFAC Western Division to construct Building 10031. The three-story
14 building was appended to the north façade of Building 1003, and to the north and west
15 façades of Building 1001. As a result, it obscured the original entrance to Building 1001,
16 and a new entrance and lobby were designed in conjunction with Building 10031.
17 However, it should be noted that the entrance and lobby were technically considered part
18 of Building 1001, rather than Building 10031, likely because the installation had been
19 historically entered via Building 1001. The new entrance was sheathed in metal siding
20 and was embellished with a metal sign that read “Sunnyvale Air Force Station.” The first
21 two stories housed parking, and the radio frequency interference (RFI)-shielded third
22 story had secure space for MCCs, computer rooms, communications rooms, and offices
23 that supported satellite programs (King/Reif and Associates/NAVFAC, December 18,
24 1981).
25

26 In 1982, plans were prepared to construct Building 10032 by Rasmussen Ingle Anderson
27 of San Francisco under the auspices of NAVFAC Western Division. The three-story
28 building was appended to the west façade of Building 1003, and also featured two stories
29 of parking and a RFI-shielded third story for MCCs (Rasmussen Ingle
30 Anderson/NAVFAC, October 29, 1982). It does not appear that any modifications to
31 Building 1001 were undertaken in conjunction with construction of Building 10032.
32 Buildings 10031 and 10032 were operational by 1984 (Fola Odafalu, pers. comm., July
33 26, 2010).
34

35 Building 1001 also underwent numerous upgrades during the 1980s, likely in conjunction
36 with the Data Systems Modernization Program. For example, in 1987, two major projects
37 related to this effort were undertaken. The Satellite Data Terminal Link (SDTL) area,
38 also known as Complex D, and the Inter-Range Operations (IRO) area were renovated
39 and RFI-shielded to serve as secure mission areas.
40

41 Plans to renovate the SDTL area were prepared by the Stearns-Roger Division of United
42 Engineers and Contractors, based in Denver, Colorado, under the auspices of the U.S. Air

1 Force Space Division. This area originally functioned as the Main Satellite Control Room
2 Complex for the Corona Program, and had been somewhat reconfigured in the 1970s
3 following termination of the program. During the 1980s, the area was gutted to
4 accommodate the installation of RFI-shielded materials. The concrete-slab floor was
5 removed and a new, presumably RFI-shielded, concrete slab was poured. New RFI-
6 shielded walls with acoustical insulation were constructed on the perimeter of the area
7 which was reconfigured to house four operations rooms, two printer rooms, and one large
8 equipment room, accessed via a long north/south-oriented corridor. A new RFI-shielded
9 ceiling was installed as well. Entry to the area was provided at the northern and southern
10 ends of the corridor, via RFI-shielded interlock doors (Stearns-Rogers Division, United
11 Engineers/U.S. Air Force Space Division, December 18, 1987a-b). According to Mr.
12 Dennis Ralphs, a 21st Space Operations Squadron (SOPS) employee, the roof of the
13 building was removed to allow for the installation of RFI-shielded components via crane
14 (Ralphs, pers. comm., June 9, 2010).
15

16 In addition, the IRO, which was a smaller area, was also renovated and shielded during
17 this time. Unlike the SDTL area, the IRO area housed only one operations area. In
18 addition, plans indicate that the IRO also housed offices, including a director's office,
19 equipment rooms, and telecommunications rooms. The IRO was accessed by one set of
20 RFI-shielded interlock doors (Stearns-Rogers Division, United Engineers/U.S. Air Force
21 Space Division, September 22, 1987). Mechanical equipment was also installed,
22 including two air handling units (AHUs) on the roof necessary to maintain air flow in the
23 sealed areas. Plans were prepared to alter a number of MCCs throughout the 1980s, also
24 likely in response to the Data Systems Modernization Program (Onizuka AFS, n.d.).
25

26 In addition, the Onizuka AFS Drawing Number Log indicates that Building 1001 also
27 underwent smaller-scale modifications during the 1980s. Projects included plans prepared
28 in 1981 to renovate Rooms 150, 154, and 155 to support MCC F in Building 1003. In
29 1984, Building 1025, located between Buildings 1001 and 1004 was constructed to serve
30 as an armory, likely resulting in minor alterations to Building 1001. In 1986, plans were
31 prepared to relocate MCC 1 to Room 201, as well as plans for new construction and
32 furniture installation in Room 106. In addition, security modifications were undertaken
33 throughout the buildings to meet changing mission needs and personnel. Alarms, locks,
34 security cameras, and flashing red lights were installed in various rooms throughout the
35 1980s. Plans were also prepared for routine maintenance of the buildings, such as re-
36 roofing, replacing boilers, and restroom upgrades (Onizuka AFS, n.d.).
37

38 **11. Significant Events and Satellites Supported, 1980s**

39

40 Sunnyvale AFS continued to support numerous satellites programs throughout the 1980s,
41 although many remained classified. On April 12, 1981, the first mission flown by the
42 Space Shuttle *Columbia* was launched, and successfully returned to earth on April 14.

1 Following their successful support of the first shuttle mission, five AFSCF mission
2 controllers received U.S. Air Force Commendation Medals. In June 1982, the first
3 classified military payload was carried into orbit aboard the fourth shuttle mission flown
4 by *Columbia* (Jernigan, 1983).

5
6 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
7 appeared to be planning a surprise invasion of Chad and Sudan. The United States
8 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-
9 secret satellite was supported by Sunnyvale AFS. The mission produced photographs that
10 documented massive troop build-ups at the border of Sudan, and the *U.S.S Nimitz* was
11 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
12 1989; Philp, October 30, 1985). In 1984, the twentieth and last KH-9 satellite was
13 launched and supported from Sunnyvale AFS (Day, November 8, 2004).

14
15 The first dedicated military shuttle flight, aboard the Space Shuttle *Discoverer*, was
16 launched in January 1985, and was supported from Sunnyvale AFS. *The New York Times*
17 reported on the launch, and noted that “all communication with the astronauts will be
18 hidden in complex codes intelligible only with special unscrambling equipment”
19 (Bamford, January 13, 1985). An article in the August 2009 edition of *Air & Space*
20 *Magazine* indicated that “according to most accounts, STS-51C’s payload was ORION,
21 an eavesdropping satellite for signals intelligence.” In October 1985, the second
22 dedicated military flight was launched by the Space Shuttle *Atlantis* (Cassutt, August 1,
23 2009). *The New York Times* reported that, according to reliable sources, “two \$100
24 million communication satellites” were deployed into orbit, on a mission classified as
25 secret by the Pentagon (Broad, October 5, 1985).

26
27 In 1986, the Space Shuttle *Challenger* exploded after launch, killing its seven crew
28 members, including the shuttle’s mission specialist, Lieutenant Colonel Ellison S.
29 Onizuka, who had trained at Sunnyvale AFS (NASA, January 2007). That same year,
30 Sunnyvale AFS was renamed Onizuka AFB in honor of Onizuka, and a memorial was
31 installed in the lobby. Following the *Challenger* explosion, the U.S. Air Force returned to
32 sending satellites into orbit via unmanned launches. It was not until December 1988 that
33 the Space Shuttle *Atlantis* was launched with a top-secret military payload (Cassutt,
34 August 1, 2009).

35
36 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
37 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
38 communications satellite developed by NASA (Levien, 1989).

1 **12. Onizuka Air Force Station, 1990s-Present**

2
3 By 1991, the Soviet Union had dissolved, signaling the end of the Cold War (Center for
4 Air Force History, 1994). The end of the Cold War led, in part, to the declassification of
5 the NRO in September 1992. The end of the Cold War also led to a decrease in military
6 spending. However, modifications continued to be undertaken at Onizuka AFB, although
7 less than in prior decades. According to the Onizuka AFS Drawing Number Log, the
8 majority of alterations involved room reconfiguration and associated mechanical and
9 security upgrades to accommodate new mission needs. For example, some of the smaller-
10 scale room reconfiguration projects include modification of Rooms 158, 408, 490, and
11 493 in 1991; renovation of Rooms 138, 139, 316, 346, and 347 in 1992; and modification
12 of Rooms 30-44, 324, 326, 327, and 405 in 1993 (Onizuka AS, n.d.).

13
14 In 1992, some larger-scale projects were also undertaken such as replacement of the
15 equipment, and renovation of rooms in many of Building 1001's MCCs. Keller &
16 Gannon prepared plans under the auspices of the U.S. Air Force for this project, which
17 included alterations of Rooms 107, 167, 169, 301, 328, and 426, among others (Onizuka
18 AFS, n.d.).

19
20 In 1992, an addition was appended to the south façade of Building 1004, known as the
21 Emergency Utility Building (EUB), and enhanced the installation's power distribution
22 system. The Onizuka AFS Drawing Number Log indicates construction of the EUB also
23 entailed upgrading mechanical systems in Buildings 1003, 10031, and 10032 (Onizuka
24 AFS, n.d.). Although it does not specify upgrades to Building 1001, it is likely that such
25 upgrades were also undertaken at Building 1001 in conjunction with EUB construction.

26
27 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
28 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported from Onizuka
29 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
30 weather satellites assisted with U.S. missile launches, and navigation satellites assisted
31 the troops in maneuvering through the desert. Reconnaissance satellites, such as those in
32 the NRO's KH-11 satellite program, also likely continued to be supported by the
33 installation (Peterson, July 30, 1993). The early 1990s also represented a key year for
34 satellite scheduling, with the advent of a computerized scheduling system. Prior to this
35 time, scheduling was plotted by hand, using colored tape to represent different spacecraft
36 on approximately 50' rolls of butcher-paper (Mead, March 2, 1994).

37
38 In 1991, the 21st SOPS were activated at Onizuka AFB; and in 1992, the 750th Space
39 Group was activated and assumed responsibility for launch and early orbit of numerous
40 satellites, including the space shuttles (Schriever AFB, n.d.). In addition, the installation
41 also supported numerous NASA space exploration programs. In 1994, Onizuka AFB was
42 renamed Onizuka AFS.

1 In 1995, the Corona Program was declassified, and the following year, 800,000 images
2 taken between 1960-72 were made available to the public. Formerly classified documents
3 also became available (NRO, February 24, 1995). In addition, Onizuka AFS was
4 realigned in accordance with the Base Realignment and Closure (BRAC) Act, and select
5 functions were relocated to CSOC at Falcon AFB, Colorado Springs, Colorado. The
6 realignment resulted in a loss of approximately 1,100 jobs at Onizuka AFS (City of
7 Sunnyvale, 2006). By the end of the 1990s and during the early 2000s, responsibility for
8 controlling the DoD satellite network continued to be transferred to the CSOC, and
9 Onizuka AFS's responsibilities substantially decreased (Flinn, December 1, 1991; Wulff,
10 November 29, 1995).

11
12 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
13 U.S., British, and French military personnel in Dhahran, Saudi Arabia led to increased
14 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
15 permitted on the first two stories of Buildings 10031 and 10032. In addition, because
16 Innovation Way was in close proximity to Buildings 10031 and 10032, the street was
17 closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey barriers and
18 bollards were also installed around the perimeter of the buildings (Dennis Ralphs, pers.
19 comm., August 2, 2010).

20
21 Very few plans were prepared in the 2000s for Building 1001. Among them were plans to
22 renovate the Commanders Office and Rooms 155 and 159 (Onizuka AFS, n.d.). In 2005,
23 the BRAC commission recommended closure of Onizuka AFS. The recommendations
24 were approved by President George W. Bush. In 2006, the DoD, through the Office of
25 Economic Adjustment, formally recognized the City of Sunnyvale as the Local
26 Redevelopment Authority (LRA) for planning the redevelopment of Onizuka AFS and its
27 conversion to civilian use (City of Sunnyvale, 2006).

28
29 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
30 and open house were held to commemorate this event, and were attended by over 800
31 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
32 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the
33 history of the NRO and reconnaissance satellite programs supported from the installation
34 between through 2007. Following the open house, displays and histories of the programs,
35 many of which remain classified, were relocated to the NRO archives in Chantilly,
36 Virginia (Dennis Ralphs, pers. comm., August 3, 2009).

37
38 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
39 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
40 attendance were current and former employees, both military and civilian, as well as
41 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan
42 noted that "[T]his facility here in Sunnyvale has supported an amazing 3.4 million

1 satellite operations over the past years. Much of the details of this work are still classified
2 and we cannot talk openly about it, but what I can tell you is that the operations
3 conducted by the NRO from this site have made our nation a tremendously safer place to
4 be” (Bauer, July 29, 2010).

5
6 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
7 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
8 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
9 transferred out of federal hands in September 2011. It is anticipated that the Department
10 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
11 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
12 remainder of the installation will be redeveloped.

13
14 **D. Sources:**

15
16 **1. Architectural Drawings**

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29 Floor Plan B.” (1205)

30
31 Ralph M. Parsons Company/AFBMD. March 6, 1959d. “Development Control Center,
32 Elevations.” (1206)

33
34 Ralph M. Parsons Company/AFBMD. March 6, 1959e. “Development Control Center,
35 Window Schedule and Details.” (1212)

36
37 Ralph M. Parsons Company/AFBMD. August 21, 1959a. “Development Control Center
38 Increment Two, Site and Vicinity Plan.” (1252)

39
40 Ralph M. Parsons Company/AFBMD. August 21, 1959b. “Development Control Center
41 Increment Two, Plan A.” (1256)

42

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2 Increment Two, Plan B." (1257)
3
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6
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8 Increment Two, Elevations." (1259)
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18
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20 "Interim Expansion Partial Floor Plan A." (1412)
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22 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965c.
23 "Interim Expansion Partial Floor Plan B." (1413)
24
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38 Plan, Interior Elevations, and Reflected Ceiling Plan." (862)
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41 Annex First Floor Plan." (1484)
42

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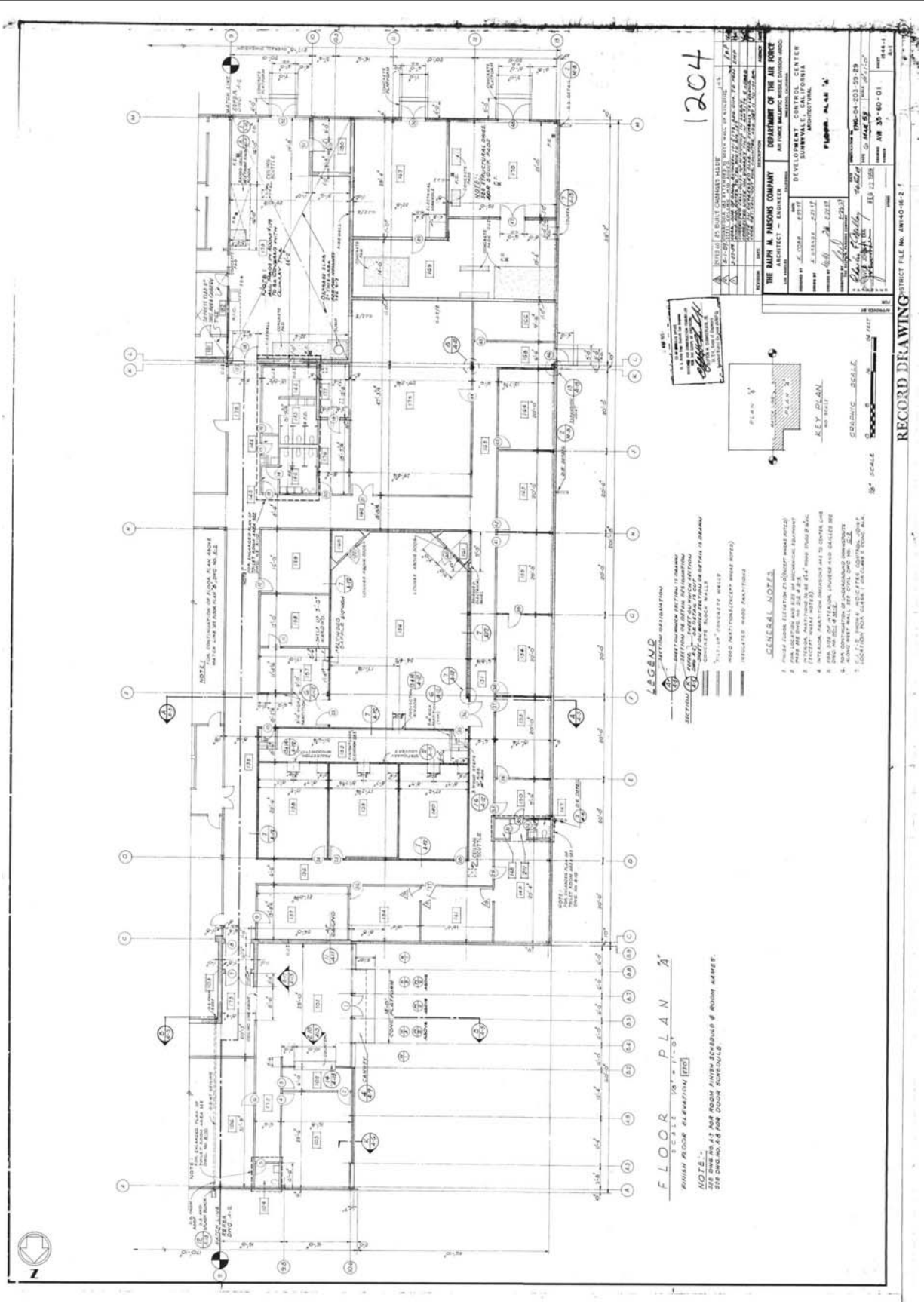
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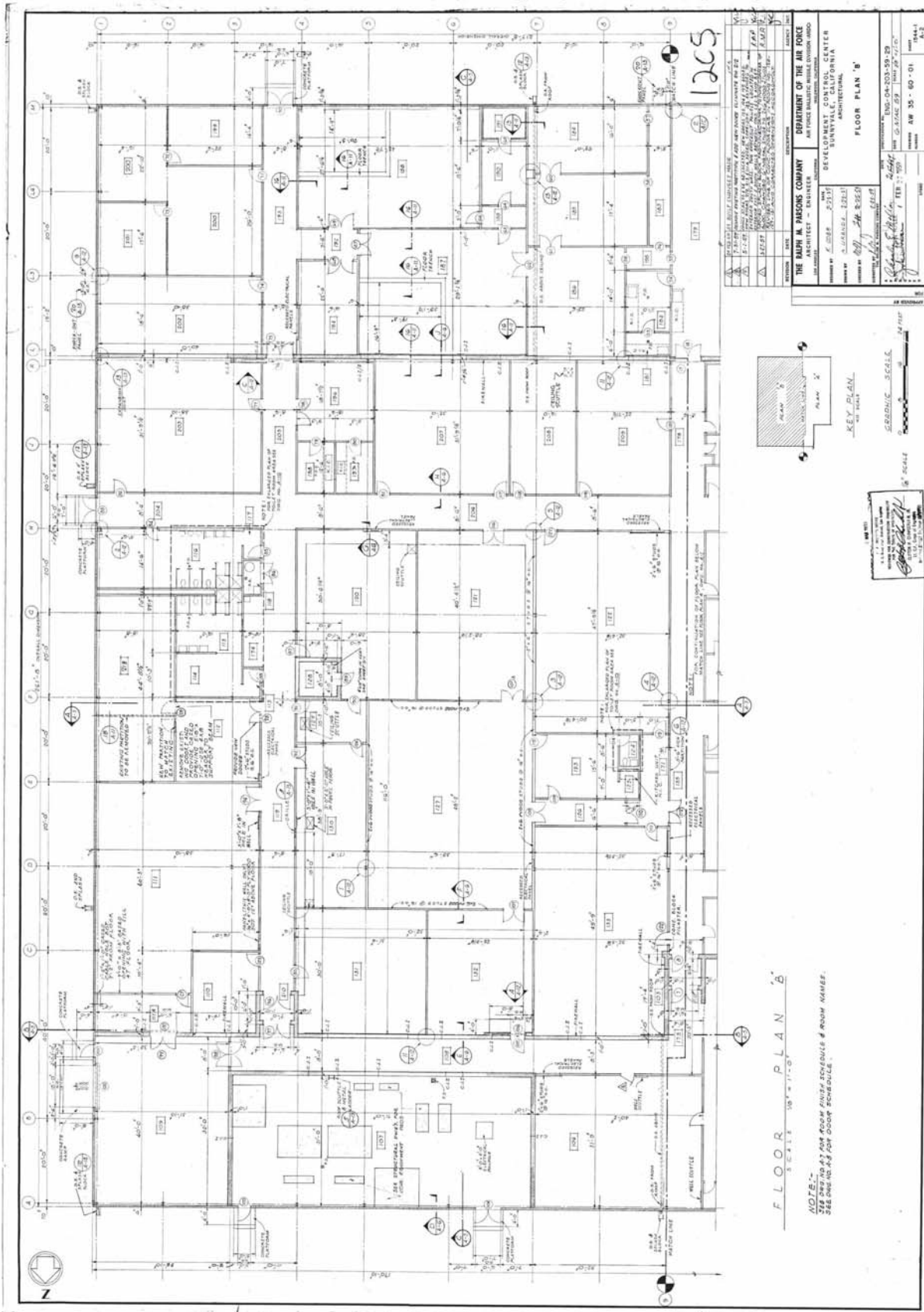
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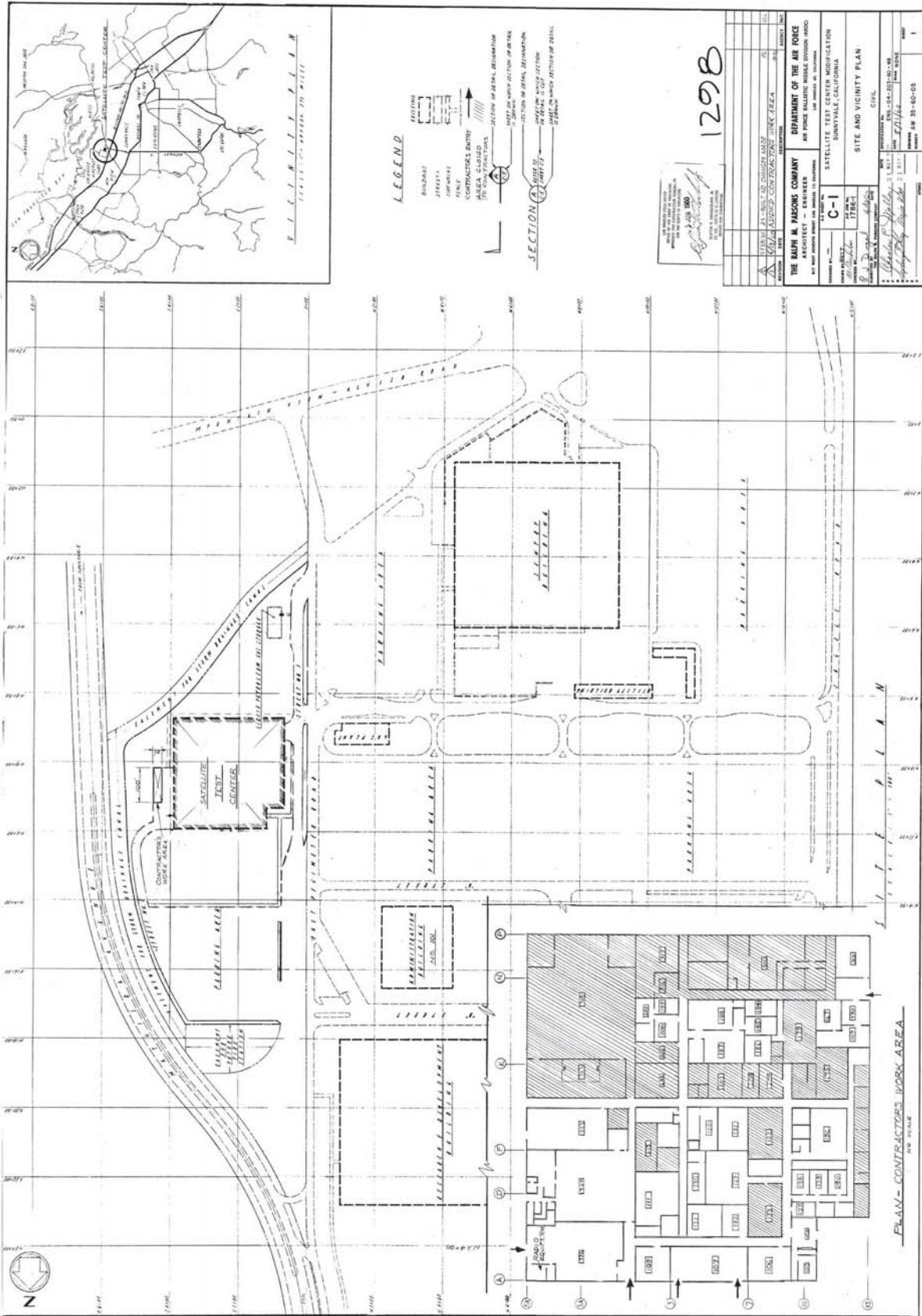
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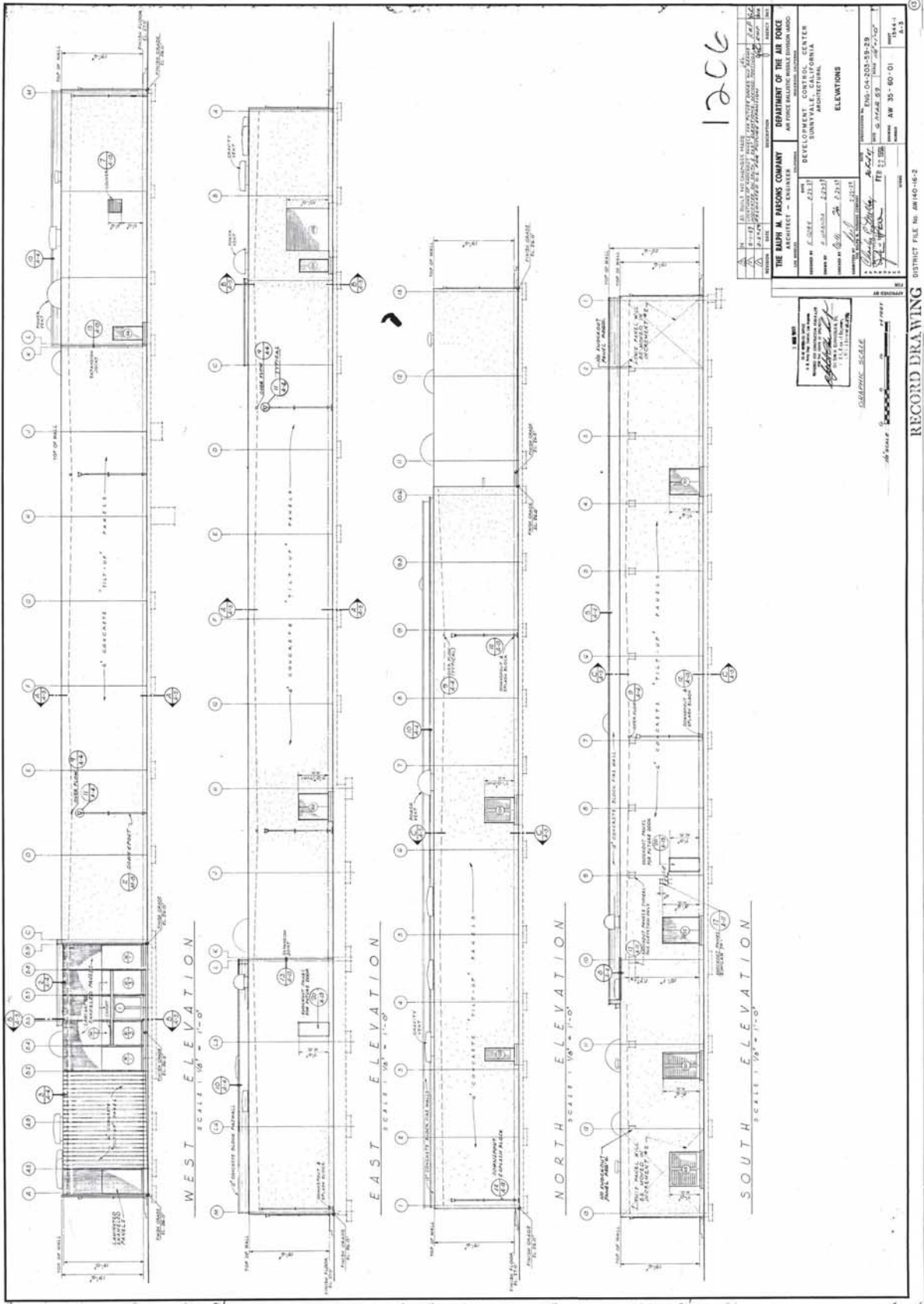






RECORD DRAWING

PLAN - CONTRACTORS WORK AREA
AW 100-10-7



1206

THE BAIRD M. PARSONS COMPANY ARCHITECT - ENGINEER		DEPARTMENT OF THE AIR FORCE DEVELOPMENT - CONTROL CENTER SUNNYVALE, CALIFORNIA	
DESIGNED BY: E. B. ...	DATE: ...	PROJECT NO.: ...	DATE: ...
DRAWN BY: ...	DATE: ...	PROJECT NO.: ...	DATE: ...
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APPROVED BY: ...	DATE: ...	PROJECT NO.: ...	DATE: ...
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DISTRICT FILE NO. AM140-16-2		DISTRICT FILE NO. AM140-16-2	

RECORD DRAWING

U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1001
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-A

SECTION II

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **INDEX TO PHOTOGRAPHS**

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7 BUILDING 1001
8 Onizuka Air Force Station
9 1080 Innovation Way
10 City of Sunnyvale
11 Santa Clara County
12 California

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14 Anne Jennings, Photographer Date of Photographs: June 7-14, 2010

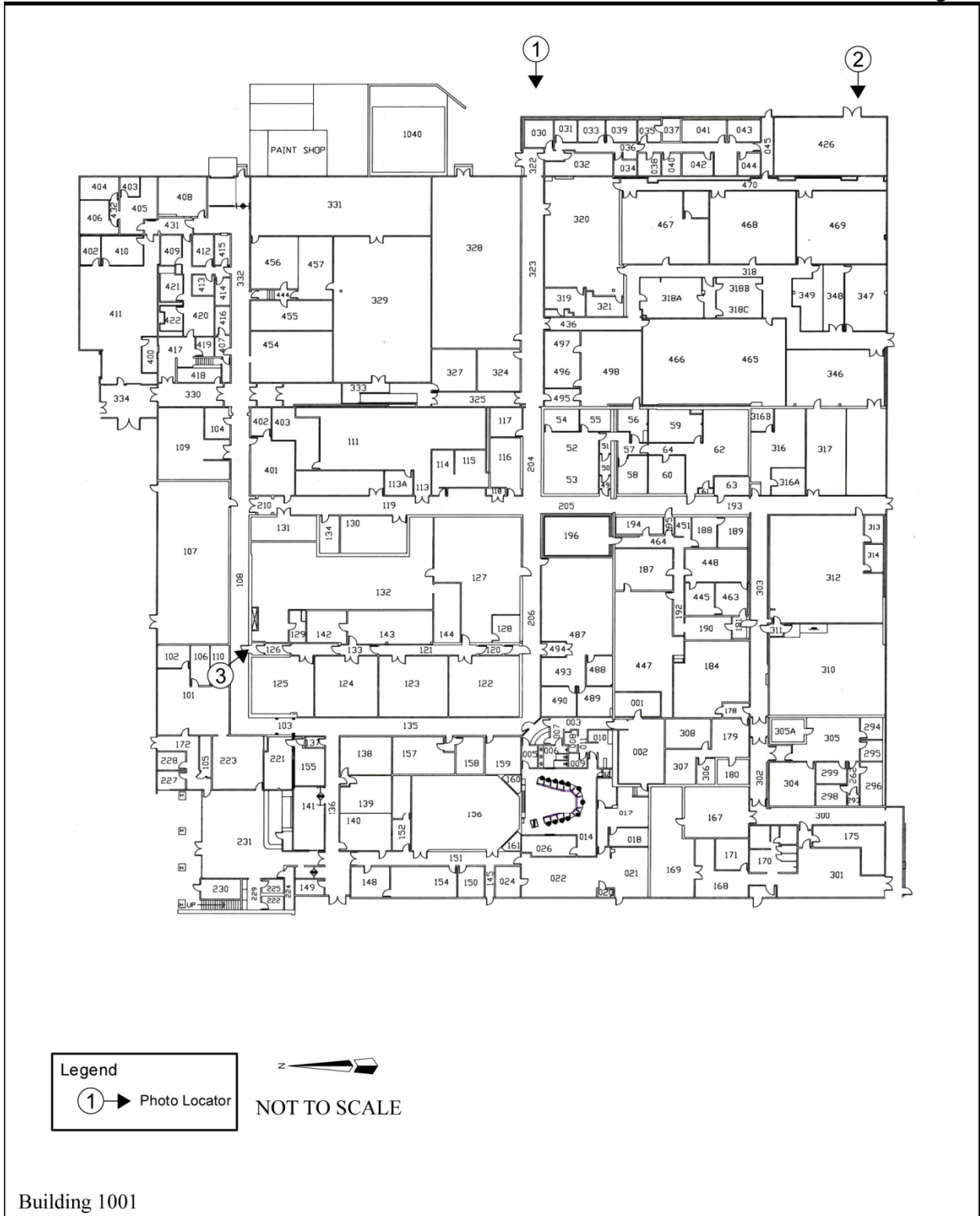
15
16 Log No. USAF041221A-A-01 VIEW OF EAST FAÇADE, LOOKING
17 SOUTHWEST.

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19 Log No. USAF041221A-A-02 DETAILED VIEW OF SOUTHEAST CORNER
20 OF EAST FAÇADE, LOOKING WEST.

21
22 Log No. USAF041221A-A-03 VIEW OF INTERLOCKING DOORS WHICH
23 PROVIDED ACCESS TO RADIO FREQUENCY
24 INTERFERENCE (RFI)-SHIELDED SATELLITE
25 DATA TERMINAL (SDTL) AREA, LOOKING
26 SOUTH.

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U.S. AIR FORCE SATELLITE TEST CENTER, BUILDING 1001
 Log. No. USAF041221A-A
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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1002
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-B

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

California Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

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BUILDING 1002
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California

Log No. USAF041221A-B

SECTION I

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1 **C. Description:**
2

3 **1. Current Description**
4

5 Building 1002 is a square-plan, two-story, steel-frame building, sheathed in Exterior
6 Insulation Finishing System (EIFS). It sits atop a concrete-pile foundation, and is capped
7 by a flat, asphalt-clad roof with a rounded parapet. Mechanical equipment is located on
8 the roof behind metal screens.
9

10 The north façade is divided into eight uniform sections punctuated by rounded pilasters.
11 Six sets of four tinted ribbon windows are located on the first and second stories of the
12 six central sections. Metal vents pierce the façade between the first and second story
13 windows. An aluminum-and-plate-glass double-door, set within an aluminum surround,
14 flanked by a transom and side-lights is located on the first story of the third section from
15 the west. The entry is topped by an overhang, also clad in EIFS, and is accessed by two
16 concrete steps, flanked by a metal-pipe railing. Two tinted ribbon windows flank the
17 entry to the west, and the two windows above the entry are blocked.
18

19 The south façade is mostly obscured by Building 1001. It is divided into seven non-
20 uniform sections punctuated by rounded pilasters. Five sets of four tinted ribbon windows
21 are located on the first and second stories of the five central sections. Metal vents pierce
22 the façade between the first and second story windows. Two single-story hyphens
23 connect the south façade of Building 1002 to the north façade of Building 1001. A
24 rooftop catwalk connects the two buildings, and pipes are appended to the façade.
25

26 The east façade is divided into eight non-uniform sections punctuated by rounded
27 pilasters. The northernmost section projects from the building to shelter an exterior metal
28 stairway with metal pipe railings. A metal-and-plate-glass door, with a metal handle, set
29 within a metal surround is located on the first story. It is accessed by three concrete steps
30 flanked by a metal pipe railing to the north. A double-metal-and-plate-glass door, with no
31 exterior hardware, set within a metal surround is located on the second story. Moving
32 south from the entry, a single tinted window is located in one section, and seven sets of
33 four tinted ribbon windows pierce the first and second stories of the seven remaining
34 sections. Metal vents pierce the façade between the first and second story windows.
35

36 The west façade is divided into nine uniform sections punctuated by rounded pilasters.
37 Moving from north to south, the first section features four tinted ribbon windows; the
38 following section features two tinted ribbon windows, and two blocked-in windows; the
39 following three sections all feature four tinted ribbon windows; the sixth section features
40 a double-metal-louvered door, with metal handles, set within a metal surround on the first
41 story, and a set of four tinted ribbon windows on the second story; the following two
42 sections feature four tinted ribbon windows, and the remaining section features two

1 blocked-in windows, and two tinted windows. The west façade of the single-story hyphen
2 between Building 1002 and 1001 is clad in vertical metal siding. A recessed entry pierces
3 the hyphen, and features a double-plate-glass door, set within a metal surround, flanked
4 by a transom, and floor-to-ceiling window panels.
5

6 The first story of Building 1002 encompasses 25,664 square feet and the second story
7 encompasses 25,271 square feet. The building also features an interior courtyard. The
8 concrete-paved courtyard is landscaped with mature trees and shrubbery, and furnished
9 with wood picnic tables. A current sketch plan is included in the Index to Photographs. A
10 comparison of the original floor plan with the current floor plan indicates that the
11 majority of the interior has been reconfigured. An inspection of select interior spaces,
12 coupled with information included in the Onizuka AFS Drawing Number Log, indicate
13 that most interior spaces, even in cases where they retain their original configuration, no
14 longer retain their original function, features, or finishes. However, the building retains
15 its function as an administrative building.
16

17 **2. According to Original Plan**
18

19 Original plans of Building 1002 are on file in the Civil Engineering Office, Building
20 1002, Onizuka AFS, Sunnyvale, Santa Clara County, California. Building 1002 was
21 constructed in two sections. In 1962, building plans for the first section were prepared by
22 Kaiser Engineers, a division of the Henry J. Kaiser Company in Oakland, California,
23 under the auspices of the U.S. Air Force Space Systems Division (SSD). In 1964,
24 building plans for the second section were prepared by Maher & Martens in San
25 Francisco, California, under the auspices of the U.S. Army Corps of Engineers (USACE)
26 Sacramento District. The 1964 addition will be described in this section because it was
27 envisioned as part of the original plans, and was constructed shortly thereafter. The
28 following plans are featured in the graphic documentation section of the report:
29

- 30 • “Addition to the Satellite Test Annex First Floor Plan” (Kaiser
31 Engineers/U.S. Air Force SSD, January 15, 1962a)
- 32 • “Addition to the Satellite Test Annex Second Floor Plan” (Kaiser
33 Engineers/U.S. Air Force SSD, January 15, 1962b)
- 34 • “Satellite test Annex Addition First Floor Plans and Miscellaneous
35 Details” (Maher & Martens/USACE Sacramento District, May 7, 1964a)
- 36 • “Satellite Test Annex Addition Second Floor and Roof Plans” (Maher &
37 Martens/USACE Sacramento District, May 7, 1964b)
38

39 In addition, historic photographs were also consulted to determine the original
40 appearance of the building. A sampling of historic photographs are reproduced in the
41 graphic documentation section of the overview report entitled California State Historic

1 Preservation Office, Historic American Building Survey Level II-Type Documentation,
2 U.S. Air Force Satellite Test Center, Log No. USAF041221A.
3

4 Kaiser Engineers developed site plans for Building 1002 entitled "Addition to the
5 Satellite Test Annex Plot Plan," dated January 15, 1962. The plan indicated that an L-
6 plan administrative building, now known as Building 1002, was appended to the north
7 façade of Building 1001 by a single-story hyphen. The plan also included provision for a
8 future addition which would be appended to the east façade of Building 1002, resulting in
9 the creation of a rectangular-plan building with two interior courtyards (Kaiser
10 Engineers/U.S. Air Force SSD, January 15, 1962d).
11

12 Original plans indicate that as constructed in 1962, Building 1002 was a two-story, steel-
13 frame, L-plan building that sat atop a concrete-pile foundation, and was capped by a flat,
14 built-up, asphalt-clad roof. According to plans and historic photographs, it was clad in
15 pre-cast concrete panels, and featured tinted ribbon windows on the first and second
16 stories, interspersed with solid panels, separated by two-story metal pilasters. An entry
17 was located on both the north façade and the west façade of the hyphen which connected
18 Building 1002 to Building 1001. Mechanical equipment was located on the roof (Kaiser
19 Engineers/U.S. Air Force SSD, January 15, 1962a-c).
20

21 According to the plans, the first story of Building 1002 housed offices for technical
22 directors and their support staff, field training and detachment, and security. It also
23 housed a conference room, telephone equipment room, technical library, publications,
24 and reproduction rooms (Kaiser Engineers/U.S. Air Force SSD, January 15, 1962a). The
25 second story housed maintenance, engineering, administration, financial, personnel, and
26 intelligence offices, possibly occupied by the NRO (Kaiser Engineers/U.S. Air Force
27 SSD, January 15, 1962b).
28

29 The full extent of the building as it was envisioned in 1962 was never realized. However,
30 in 1964, plans were prepared for a two-story, L-plan addition appended to the east façade
31 of Building 1002. The addition resulted in a square-plan building with an interior
32 courtyard. Plans and historic photographs indicate that the appearance of the 1964
33 addition was identical to the 1962 building, and provided additional administrative space.
34 The northern end of the east façade featured two entries on the first and second stories.
35 The second-story entry was accessed via metal stairway with metal-pipe railings. The
36 western end of the south façade was pierced by a double-door entry. The eastern end of
37 the south façade featured a hyphen that connected the building to Building 1001 (Maher
38 & Martens/USACE Sacramento District, May 7, 1964a-c).
39

40 According to the original plans, finishes were typical of the time period. Floors were clad
41 in asphalt tiles, walls were clad in gypsum wall board or cement, and ceilings were clad
42 in acoustical tiles (Maher & Martens/USACE Sacramento District, May 7, 1964d).

1 **D. History:**

2
3 **1. Development of the Satellite Test Center, 1959-61**

4
5 The development of satellite reconnaissance during the Cold War (1946-91) and the
6 specific role of the U.S. Air Force Satellite Test Center (STC) is fully described in the
7 associated overview report, California State Historic Preservation Office Historic
8 American Building Survey Level II-Type Documentation, U.S. Air Force Satellite Test
9 Center, Log No. USAF041121A. The following section provides a brief summary of the
10 role that Building 1002 played at the STC from 1959-91, its period of significance.

11
12 The installation was established in 1959 when Building 1001 was constructed to serve as
13 the command-and-control center for the Corona Program to support the launch, orbit, and
14 recovery of Corona satellites. The Corona Program, initiated in 1958, was the first
15 reconnaissance satellite program developed by the U.S. Air Force and the CIA, with
16 assistance from private contractors, such as Lockheed Missiles and Space Division,
17 located in Sunnyvale, California. Concerns about preserving the secrecy of the Corona
18 Program and its objectives led to the designation of the Discoverer Program as a cover
19 program. The publicly-stated goal of the Discoverer Program was scientific research
20 (Richelson, 2002). Prior to the construction of Building 1001, at least eight Corona
21 satellites, described as Discoverer satellites in the press, were launched from Vandenberg
22 Air Force Base (AFB), and were supported from an interim control center in Palo Alto,
23 California. Tracking stations located around the world also provided support.

24
25 In 1959, the U.S. Air Force acquired 11.43 acres of land in Sunnyvale from Lockheed
26 Missiles and Space Division located to the west. Plans for the installation were designed
27 by the Ralph M. Parsons Company, an architecture and engineering firm based in Los
28 Angeles, California, under the auspices of the U.S. Air Force Ballistic Missile Division
29 (AFBMD) in Englewood, California (Ralph M. Parsons Company/AFBMD, March 6,
30 1959).

31
32 On January 28, 1960, the installation, newly designated as the STC, was dedicated by the
33 U.S. Air Force (Davies, 1960). A few months later, on March 1, 1960, it was occupied
34 by the 6594th Aerospace Test Wing (ATW), the first unit to be tasked with military
35 satellite operations; Lockheed Missiles and Space Division employees; and likely the
36 CIA. The 6594th ATW provided oversight for Lockheed Missiles and Space Division
37 which was responsible for satellite operations (6594th ATW, 1961; Jernigan, 1983).
38 However, portions of the building remained under construction, including the state-of-
39 the-art Satellite Control Room in the Satellite Control Room Complex. An interim
40 Satellite Control Room was established from which Lockheed Missiles and Space
41 Division, monitored by the 6594th ATW, could direct the launch, tracking, data

1 acquisition, command and control, and recovery phase of military satellites (6594th ATW,
2 1961; Jernigan, 1983).
3

4 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
5 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
6 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
7 the public, likely due in part to a building sign which indicated "US Air Force Satellite
8 Test Center." On February 6, 1961, the Satellite Control Room and remainder of the
9 Satellite Control Room Complex became operational. The primary purpose of the
10 complex was to support Corona satellites, although additional programs were supported
11 by this time (Jernigan, 1983).
12

13 **2. Significant Events and Satellites Supported, 1960-61**
14

15 In August 1960, the U.S. Air Force accomplished the first successful retrieval of a
16 Discoverer satellite. On August 10, Discoverer XIII was launched from Vandenberg
17 AFB, and was supported by the STC. The satellite achieved polar orbit for a period of
18 ninety-four minutes, during which time it was in contact with worldwide tracking
19 stations, and the interim Satellite Control Room at the STC. During its seventeenth
20 rotation of the earth, the eject command was issued from the STC, and the capsule was
21 ultimately recovered from the Pacific Ocean, marking the first successful retrieval of an
22 object from space (Arnold, 2005; 6594th ATW, no date [n.d.]). In keeping with the
23 publicly stated scientific objectives of the Discoverer Program, the *San Jose Mercury*
24 *News* noted that "Discoverer recovery techniques will be used soon to return monkeys
25 from space," and were vital to "returning a man to earth after orbiting in space" (Lindsey,
26 August 12, 1960). Still in the testing phase, the satellite did not yet contain a camera
27 (Jernigan, 1983).
28

29 Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from
30 Vandenberg AFB (Arnold, 2005). Discoverer XIV orbited the earth seventeen times,
31 supported by the STC from the interim Satellite Control Room in Building 1001, and the
32 Kodiak tracking station, before the eject command was relayed to the satellite. Following
33 the command, at 300 miles above the earth, the satellite recovery vehicle (SRV)
34 separated from the spacecraft, and began its descent to earth, where it was caught by a
35 specially equipped Fairchild C-119 *Flying Boxcars* (C-119) piloted by U.S. Air Force
36 Captain Harold Mitchell (*The New York Times*, August 20, 1960).
37

38 The Discoverer XIV SRV contained 20 pounds of film which documented over
39 1,650,000 square miles, and provided the first successful satellite reconnaissance
40 photographs of the Soviet Union. It also resulted in more photographic coverage of the
41 Soviet Union than all previous U-2 flights combined. Furthermore, it provided evidence
42 that the missile gap, feared since the 1957 launch of *Sputnik I* by the Soviet Union, did

1 not exist, and that the Soviets did not have an immense stockpile of Intercontinental
2 Ballistic Missiles (ICBM) (Day, 2006). However, despite the historic nature of this event,
3 the crew, who were not cleared for the Corona Program, were unaware of the importance
4 of their mission (Arnold, 2005).

5
6 Although the STC was developed to support the Corona Program, by the fall of 1960, it
7 also supported the Satellite and Missile Observation System (SAMOS) and Missile
8 Detection Alarm System (MIDAS). Both programs were initially developed by the U.S.
9 Air Force in the mid-1950s as reconnaissance and missile detection satellites,
10 respectively (Jernigan, 1983). On October 11, 1960, the first SAMOS satellite was
11 launched from Vandenberg AFB, and supported from the STC, although it failed to reach
12 orbit (*San Jose Mercury News*, October 12, 1960). By July 1961, MIDAS satellites were
13 launched from Vandenberg AFB and supported by the STC. By the end of 1961, two
14 MIDAS satellites had reached orbit (6594th ATW, 1961).

15
16 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
17 Corona satellite supported by the STC from the new control room. By this time, Corona
18 satellites were regularly providing images of the Soviet Union, as well as other
19 communist countries. Among these images included evidence of the building of the
20 Berlin Wall between East and West Germany (Chapman, 2008). In September 1961, the
21 NRO was established as a classified agency in the Department of Defense (DoD), and
22 was tasked with oversight of reconnaissance satellite programs, including the Corona
23 Program, and therefore became a presence at the STC (Richelson, 2000).

24
25 **3. Building 1002 Construction and Upgrades, 1962**

26
27 In 1962, plans for a two-story, L-plan building – Building 1002 (Addition to the Satellite
28 Test Annex) - were prepared for the U.S. Air Force SSD by Kaiser Engineers, a division
29 of the Henry J. Kaiser Company. Kaiser Engineers was a well-known architecture and
30 engineering firm located in Oakland, California (Kaiser Engineers/U.S. Air Force SSD,
31 January 15, 1962a-b; Air Force Satellite Control Facility (AFSCF), 1972).

32
33 Henry J. Kaiser founded his eponymous company in 1914. The company quickly grew
34 through its involvement with large-scale public projects, such as the Hoover Dam in
35 Boulder City, Nevada, and the Grand Coulee Dam, in Grand Coulee, Washington. In
36 addition, Kaiser's company was heavily involved with World War II (1941-45)
37 manufacturing efforts, and fabricated munitions, aircraft, and ships. During the war,
38 engineers at Kaiser's company also constructed airfields and other military facilities.
39 These wartime efforts led to the development of Kaiser Engineers as a separate division
40 of the Henry J. Kaiser Company. Furthermore, Kaiser was a World War II-era backer of
41 the Sunnyvale-based Joshua Hendy Iron Works. As a result, it is likely that the military

1 and Sunnyvale connections Kaiser had cultivated over the years contributed to the
2 selection of Kaiser Engineers for the STC project (Kaiser Engineers, n.d.).
3

4 Original plans indicated that an L-plan administrative building, now known as Building
5 1002, was appended to the north façade of Building 1001 by a hyphen. Furthermore, the
6 plan included provision for a future addition which would be appended to the east façade
7 of Building 1002, resulting in the creation of a rectangular-plan building with two interior
8 courtyards (Kaiser Engineers/U.S. Air Force SSD, January 15, 1962d). Construction on
9 the L-plan building commenced in April 1962 and was completed by September of that
10 year. The new building was connected to the north façade of Building 1001 by a hyphen,
11 and provided administrative space (Kaiser Engineers/U.S. Air Force SSD, January 15,
12 1962a-b). During this time, Kaiser Engineers also prepared plans for a single-story
13 addition to Building 1001 to house a new communications center, and interior
14 modifications for the Satellite Control Room Complex (Kaiser Engineers/U.S. Air Force
15 SSD, October 17, 1962; Jernigan, 1983).
16

17 The 1962 renovations were likely implemented in conjunction with the U.S. Air Force's
18 first modernization effort, the Multiple Satellite Augmentation Program (MSAP). This
19 effort was initiated in part, to standardize and provide updated equipment to the STC and
20 tracking stations which would enable them to simultaneously support multiple satellite
21 programs (Lockheed Missiles and Space Division, 1963). Computer capabilities were
22 upgraded, new display and communications equipment were also installed, and
23 connections between the STC and tracking stations were upgraded (Jernigan, 1983).
24

25 **4. Significant Events and Satellites Supported, 1962-64**

26

27 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
28 The following month, the DoD classified all military satellite programs (DoD, March 23,
29 1962). As a result, Discoverer XXXVIII was the last satellite launched as part of the
30 Discoverer program. Corona satellites continued to be launched and supported by the
31 STC, however, because all satellites were classified, the Corona Program no longer
32 required a cover story.
33

34 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
35 satellites had accurately mapped all twenty-five of Moscow's long-range missile sites.
36 Furthermore, images taken by Corona satellites indicated that China was readying its
37 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that "[O]n
38 the basis of new overhead photography, we are now convinced that the previously
39 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
40 for use in about two months." Within two months, on October 16, 1964, China tested an
41 atomic bomb at the Lop Nur site (Broad, September 12, 1995).
42

1 In addition to Corona, SAMOS, and MIDAS satellites, the STC supported the Defense
2 Meteorological Satellite Program (DMSP) in 1962 and 1963. DMSP was a
3 meteorological satellite program initiated in 1960 to provide weather and climate data for
4 more effective military operations (DMSP, n.d.). On October 16, 1963, the first Vela
5 satellite was launched and supported by the STC. The Vela Program – vela means vigil in
6 Spanish – was a series of satellites designed to detect nuclear detonations (Jernigan,
7 1983; Peebles, 1997). Presumably, Vela satellites provided images of the Lanzhou
8 Diffusion Plant in Lanzhou, China and the Baotao Nuclear Fuel Component Plant in
9 Baotao, China (Richelson, 2002).

10
11 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
12 Furthermore, 1963 marked the beginning of the Keyhole (KH)-7 surveillance system,
13 noted in a 2006 NRO memo as “the Intelligence Community’s first high resolution
14 surveillance or ‘spotting’ satellite.” Similar to Corona satellites, the KH-7 was a
15 reconnaissance satellite that returned film to earth in SRVs. It was primarily used to
16 provide surveillance of nuclear facilities and Intermediate Range Ballistic Missiles
17 (IRBM) in the Soviet Union and China (NRO, 2006).

18
19 In July 1964, two additional Vela satellites were launched, resulting in a total of four
20 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III
21 was launched and supported by the STC. Syncom III was a National Aeronautics and
22 Space Administration (NASA) satellite used for DoD military communications
23 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).

24
25 **5. Construction, Upgrades, and Designation of the Air Force Satellite Control Facility,**
26 **1964-67**

27
28 As indicated on the 1962 plan entitled “Satellite Test Annex Plot Plan,” an addition to
29 Building 1002 was planned during its initial construction. The full extent of the building
30 was never realized. However, in May 1964, plans were prepared for a two-story, L-plan
31 addition to Building 1002 to provide additional administrative space. The addition was
32 designed by Maher & Martens, a San Francisco-based architecture firm for the USACE,
33 Sacramento District.

34
35 Maher & Martens was founded in 1961 by Edward John Maher and Henry Ernest
36 Martens, both members of the Northern California Chapter of the American Institute of
37 Architects (AIA) (AIA, 1970). Prior to the formation of Maher & Martens, Maher was a
38 principal in the firm Blanchard & Maher, which was hired by the U.S. Forest Service in
39 the 1930s to design buildings in California’s national parks (Grosvenor, 1999). Maher &
40 Martens received awards for their design for San Francisco Bay Area Rapid Transit and
41 the U.S. Department of Housing and Urban Design (AIA, 1970). The addition was
42 appended to the east façade of Building 1002, and created an interior courtyard. A

1 hyphen connected the south façade of Building 1002 to the north façade of Building 1001
2 (Maher & Martens/USACE Sacramento District, May 7, 1964a-b; AFSCF, 1972).
3

4 In 1965, the U.S. Air Force Satellite Control Facility (AFSCF) was officially designated.
5 The mission of the AFSCF was to direct launch, tracking, data acquisition, command and
6 control, and recovery of DoD military satellites. Following the establishment of AFSCF,
7 an Interim Expansion Plan (IEP) was initiated to augment the facility and implement the
8 Mission Control Center (MCC) concept, which focused on the development of mission-
9 oriented control centers rather than a single control room (Jernigan, 1983).
10

11 Plans were prepared by San Francisco-based consulting engineers, Bentley Engineers and
12 Earl & Wright, Inc., under the auspices of the U.S. Air Force SSD to develop multiple
13 MCCs in Building 1001. The plans indicate that the building was reconfigured to
14 accommodate four new MCCs, known as MCCs 1, 2, 3, and 4. In addition, the building
15 featured two new complex areas, known as Complex Numbers 6 and 7. The plans also
16 indicated that two new communications areas, labeled as Communications Area A and B,
17 were also added, as well as a new bird buffer area (Bentley Engineers and Earl & Wright,
18 Inc./U.S. Air Force SSD, December 13, 1965a-e). The majority of the work was
19 completed by December 1966 (AFSCF, January-June 1966).
20

21 **6. Significant Events and Satellites Supported, 1965-70**

22

23 The increase in the number of flight support hours logged by the AFSCF between 1965-
24 66 appears to indicate that at least some of the MCCs were operational in 1966. In 1965,
25 the AFSCF logged 20,757 hours of satellite flight support. By 1966, 29,400 hours of
26 flight support were logged. The number of satellites supported also increased. In 1965,
27 the STC supported approximately fourteen satellites (AFSCF, 1972). In January 1967, the
28 STC supported thirty-one satellites per day, and by June were supporting forty-four per
29 day, which was expected to increase to forty-seven per day by July (AFSCF, January-
30 June 1967).
31

32 Between 1965-70, the STC supported over forty Corona satellite launches (Mission and
33 Spacecraft Library, n.d.). By 1966, upgrades to the installation had resulted in an increase
34 in satellite programs involvement. In addition to Corona, Vela, and other programs (many
35 of which likely remained classified) new programs such as NASA's Biosatellite Program
36 were supported. The Biosatellite Program was a series of three satellites designed to
37 assess the effects of spaceflight on living organisms. Support for the program focused on
38 directing operations of the recovery of the satellites by Lockheed C-130 *Hercules* (C-
39 130) aircraft flown by the 6594th Aircraft Recovery Group based at Hickam AFB,
40 Honolulu, Hawaii (Jernigan, 1983).
41

1 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
2 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
3 SESP was responsible for providing flights for research and experiments undertaken by
4 government agencies (AFSCF, January-June 1968; Jernigan, 1983). In 1967, the KH-7
5 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
6 of which successfully returned usable images (NRO, 2006).

7
8 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
9 supported by the STC, uncovered the Soviet Union's plans for the invasion of
10 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
11 monitored Soviet radio transmissions which signaled the invasion was imminent, and
12 photographic reconnaissance satellites had monitored unusual military activities on the
13 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops" (*San*
14 *Jose Mercury News*, August 27, 1968).

15
16 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
17 supported by the STC and tracking stations. The LES was an experimental satellite used
18 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).

19
20 In 1969, support was provided for NASA's manned flights to the moon. The STC
21 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar landing
22 mission. Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program
23 949 was designated in November 1966 to supplant Program 461, which had initially
24 supplanted the MIDAS Program in 1963. Program 949 provided a wider range of
25 capabilities, and by the 1970s, was expected to have "progressively enhanced world-wide
26 early-warning, surveillance and detection capabilities" (Piper, 1970).

27
28 **7. Development of Buildings 1003 and 1004, 1966-70**

29
30 In conjunction with the technological upgrades which occurred throughout the mid-to-
31 late 1960s, in August 1966, a real estate estimate was prepared by the USACE
32 Sacramento District which proposed the acquisition of 8.2 acres of land from Lockheed
33 Aircraft Corporation, at a cost of \$49,000. In 1966, C.F. Braun & Company of Alhambra,
34 California, under the auspices of the U.S. Naval Facilities Engineering Command
35 (NAVFAC) Western Division, San Bruno, California, and Space and Missiles System
36 Organization (SAMSO), Los Angeles, California, prepared site development plans (C.F.
37 Braun/NAVFAC/SAMSO, December 30, 1966). C.F. Braun & Company also prepared
38 plans to develop two new buildings, Building 1003 (STC Building Addition), and
39 Building 1004 (Power Plant) (C.F. Braun/NAVFAC/SAMSO, November 14, 1967;
40 August 12, 1968).

1 By August 1968, Lockheed Aircraft Corporation transferred the land to the U.S. Air
2 Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). By this time site
3 development was underway, and included relocation of an existing Lockheed Missiles
4 and Space building; reconfiguration of Lockheed Martin Way (formerly known as East
5 Perimeter Road) west of Building 1001; creation of additional parking space; and
6 installation of underground utilities (C.F. Braun/NAVFAC/SAMSO, December 30,
7 1966).

8
9 Following site development, construction of Buildings 1003 and 1004 commenced.
10 Building 1003 was designed to house the Manned Orbiting Laboratory (MOL) Program,
11 as well as other satellite programs. The MOL Program was initiated in 1963. The concept
12 involved a Titan III booster rocket which carried a modified Gemini B capsule attached
13 to a space laboratory, and was intended to serve reconnaissance purposes (Jernigan,
14 1983). However, in June 1969, the DoD announced the cancellation of the MOL Program
15 to save money. The cancellation led to a short work stoppage, however construction
16 resumed a few weeks later. *Aerospace Daily* reported that the U.S. Air Force had
17 evaluated requirements for current and future programs, and determined that construction
18 on the building should continue (*Aerospace Daily*, September 19, 1969).

19
20 By the end of 1969, the 164,000-square foot building, constructed at a cost of \$8 million
21 was nearly complete. The building was painted "Air Force blue," resulting in its
22 nickname, the "Blue Cube" (*Aerospace Daily*, September 19, 1969). Building 1003
23 housed multiple MCCs, communications and crypto equipment, a data distribution
24 center, mechanical equipment, CDC 3800 computers, and a tape library (AFSCF, 1970).
25 In addition, shortly after it was constructed, the Vela Program office, along with another
26 unidentified satellite program, was relocated from Building 1001 to Building 1003
27 (AFSCF, July-December 1969).

28
29 Building 1004 was also designed by C.F. Braun & Company. Solar, a division of
30 International Harvester Company, provided the Saturn gas turbine generator sets that
31 powered the plant. The development of Building 1004 necessitated modifications to the
32 installation's power distribution system. Ties to the electric power provided by Pacific
33 Gas and Electric (PG&E) were severed, with the exception of one power line which
34 provided power through a Lockheed Missiles and Space Substation, and was likely kept
35 active to provide back-up power (AFSCF, 1972). The plant, staffed by Solar contractors,
36 was operational in February 1970, and provided power to the entire installation, rendering
37 it energy-independent at that time (Jernigan, 1983).

38
39 **8. Upgrades, Significant Events and Satellites Supported, 1970s**

40
41 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. In the 1970s,
42 Sunnyvale AFS continued to support existing and newly established satellite programs,

1 although many of them remained classified. By this time, MCCs were established in both
2 Building 1001 and 1003. Administrative support continued to be housed in Building
3 1002. The Onizuka AFS Drawing Number Log indicates that there were few plans
4 prepared for Building 1002 during the 1970s, likely because it was constructed in 1962
5 and 1964, and because it provided administrative, rather than technical support, for
6 satellite programs. However, it is likely that alterations to Building 1002's electrical
7 system were undertaken following construction of Building 1004 in 1970s.
8

9 In 1970, the AFSCF Satellite Test Operations Historical Reports noted the successful
10 support of two "unique orbital events" from the installation. These events included
11 support of the Apollo 13 mission in April, which was aborted following the explosion of
12 an on-board oxygen tank, and support of the first North Atlantic Treaty Organization
13 (NATO) communications satellite in March (AFSCF, January-June 1970).
14

15 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
16 support from Building 1003 throughout the 1970s for the orbiting satellite (Jernigan,
17 1983). Program 949 was also re-designated the Defense System Program (DSP) in 1970.
18 Sunnyvale AFS continued to support this program throughout the early 1970s (AFSCF,
19 July-December 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was
20 approximately 23' long, 10' wide, and contained a large infrared telescope which scanned
21 the earth for missile launches. In the event a missile was launched, it would be detected
22 by the United States within minutes, which removed the possibility of a surprise attack
23 (Peebles, 1997).
24

25 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
26 advanced communications satellites had been launched to handle voice, teletype,
27 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
28 satellites – code-named HEXAGON, and popularly known as "Big Bird" – were also
29 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
30 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
31 to photograph large areas, and return the film to earth via SRV. They carried
32 technologically advanced cameras, additional film capsules, and antennae for other
33 intelligence-gathering purposes (Clark, 2007).
34

35 In January 1972, President Richard Nixon announced the development of the Space
36 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
37 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
38 bases for the program. Research and development (R&D) shuttle launches would
39 originate from the Kennedy Space Center, and military launches would originate from
40 Vandenberg AFB. The shuttle would be responsible for the launch of all commercial,
41 scientific, and military satellites into space. The AFSCF, including Sunnyvale AFS and
42 tracking stations, would provide tracking and control for the program (Jernigan, 1983).

1 On May 25, 1972, Sunnyvale AFS supported the 145th and final launch of the Corona
2 Program from the original Satellite Control Room in Building 1001. It was terminated as
3 a result of advances in satellite technology. By the time the Corona Program concluded,
4 Corona satellites had provided approximately 800,000 reconnaissance photographs
5 covering approximately 510 million square miles (Chapman, 2008; Vukotich, n.d.).
6 Following its termination the Satellite Control Room Complex likely continued to be
7 utilized for control of other satellite programs.
8

9 In 1976, the first DMSP Block 5D, a meteorological satellite, was launched, and was
10 presumably supported from Sunnyvale AFS. It was an upgraded version of the 1960s-era
11 DMSP, and provided twice-daily, world-wide meteorological, oceanographic, and solar-
12 terrestrial physics measurements. The satellites continued to be launched throughout the
13 1970s (Jernigan, 1983; Wade, n.d.).
14

15 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
16 the first successful electronic imaging satellite, and transmitted high-quality images in
17 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources
18 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
19 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
20 lettering on billboards” (Ingersoll, 1978). Nonetheless, this top-secret satellite represented
21 significant advances in the development of satellite technology, and was supported from
22 Sunnyvale AFS, as well as associated tracking stations.
23

24 **9. Development of the Air Force Satellite Control Network, Expansion, and Upgrades,**
25 **1980s**
26

27 According to the Onizuka AFS Drawing Number Log, numerous plans were prepared to
28 modify and maintain all buildings throughout the 1980s, to keep up with evolving
29 satellite technologies. Although more plans were prepared to modify Buildings 1001,
30 1003, and 1004, a significant number of plans were also prepared for Building 1002
31 throughout the 1980s. These plans typically involved room reconfiguration, likely in
32 response to changing personnel associated with new satellite programs, as well as general
33 administrative requirements. For example, in 1980, plans were prepared to upgrade
34 administration areas on the first and second stories, including Rooms 689, 690, 693, 694,
35 695, 696, 689, and 690. Plans were also prepared to modify the finance area, soundproof
36 Room 628, and modify Room 631. Throughout the 1980s, similar plans were prepared to
37 modify the majority of rooms in the building (Onizuka AFS, n.d.).
38

39 In 1982, the Air Force Satellite Control Network (AFSCN) was organized. The AFSCN
40 was not a formal organization, but rather denoted a group of common user resources,
41 assets, and facilities which collectively provided tracking, telemetry & commanding
42 (TT&C) support for virtually all DoD spacecraft, and select NASA and foreign

1 government programs (Hane, 1988). The goal of the AFSCN was to provide “enduring
2 control capability commensurate with the need for operational space suites throughout
3 the conflict spectrum” (AFSCF, 1983).

4
5 To accomplish this goal, Sunnyvale AFS was upgraded as part of the Data Systems
6 Modernization Program. This \$500 million upgrade introduced centralized database-
7 driven computer hardware and software to replace outdated systems. The upgraded
8 system was more reliable, cheaper to maintain, and faster than its predecessor, allowing it
9 to support a steadily increasing satellite support workload (Fedor et al., 2006).

10
11 A new satellite control center – the Consolidated Space Operations Center (CSOC) – was
12 constructed at Falcon AFS, Colorado Springs, Colorado (present-day Schriever AFB) in
13 conjunction with the Data Systems Modernization Program (Fedor et al., 2006). The
14 CSOC was constructed partially due to concern about the vulnerability of Sunnyvale AFS
15 to earthquakes and terrorism (Philp, June 9, 1985).

16
17 Buildings 10031 and 10032 were constructed at the STC in the 1980s in conjunction with
18 the Data Systems Modernization Program to provide additional space for satellite control.
19 In 1981, King/Reif and Associates, an architectural and planning firm, prepared plans for
20 Building 10031 on behalf of NAVFAC Western Division (King/Reif and
21 Associates/NAVFAC, December 18, 1981). In 1982, plans were prepared for Building
22 10032 by Rasmussen Ingle Anderson, a San Francisco-based architecture firm, under the
23 auspices of NAVFAC Western Division. Both three-story buildings housed two stories of
24 parking space, and had radio frequency interference (RFI)-shielded third stories with
25 secure space for MCCs, computer rooms, communications rooms, and offices that
26 supported satellite programs (King/Reif and Associates/NAVFAC, December 18, 1981;
27 Rasmussen Ingle Anderson/NAVFAC, October 29, 1982). Both buildings were
28 operational by 1984 (Fola Odafalu, pers. comm., July 26, 2010).

29
30 **10. Significant Events and Satellites Supported, 1980s**

31
32 Sunnyvale AFS continued to support numerous satellite programs throughout the 1980s,
33 although many remained classified. On April 12, 1981, the first mission flown by the
34 Space Shuttle *Columbia* was launched, and successfully returned to earth on April 14.
35 The AFSC provided support for the mission, and five AFSCF mission controllers
36 received U.S. Air Force Commendation Medals. In June 1982, the first classified military
37 payload was carried into orbit aboard the fourth shuttle mission flown by *Columbia*, and
38 was supported from MCC B in Building 1003 (Jernigan, 1983).

39
40 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
41 appeared to be planning a surprise invasion of Chad and Sudan. The United States
42 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-

1 secret satellite was supported by Sunnyvale AFS. The mission produced photographs that
2 documented massive troop build-ups at the border of Sudan, and the *USS Nimitz* was
3 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
4 1989; Philp, October 30, 1985). In 1984, the twentieth and last KH-9 satellite was
5 launched and supported from Sunnyvale AFS (Day, November 8, 2004).

6
7 The first dedicated military flight, aboard the Space Shuttle *Discoverer*, was launched in
8 January 1985, and an article in the August 2009 edition of *Air & Space Magazine*
9 indicated that “according to most accounts, STS-51C’s payload was ORION, an
10 eavesdropping satellite for signals intelligence” (Cassutt, August 1, 2009). In October
11 1985, the second dedicated military flight was launched by the Space Shuttle *Atlantis*
12 (Cassutt, August 1, 2009). *The New York Times* reported that, according to reliable
13 sources, “two \$100 million communication satellites” were deployed into orbit on a
14 mission classified as secret by the Pentagon (Broad, October 5, 1985).

15
16 In 1986, the Space Shuttle *Challenger* exploded after launch, killing its seven crew
17 members, including the shuttle’s mission specialist, Lieutenant Colonel Ellison S.
18 Onizuka, who had trained at Onizuka AFS (NASA, 2007). That same year, Sunnyvale
19 AFS was renamed Onizuka AFB in honor of Onizuka. Following the *Challenger*
20 explosion, the U.S. Air Force returned to sending satellites into orbit via unmanned
21 launches. It was not until December 1988 that the Space Shuttle *Atlantis* was launched
22 with a top-secret military payload (Cassutt, August 1, 2009).

23
24 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
25 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
26 communications satellite developed by NASA (Levien, 1989).

27
28 **11. Onizuka Air Force Station, 1990s-Present**

29
30 By 1991, the Soviet Union had dissolved, signaling the end of the Cold War (Center for
31 Air Force History, 1994). The end of the Cold War led, in part, to the declassification of
32 the NRO in September 1992. The end of the Cold War also led to a decrease in military
33 spending. However, modifications continued to be undertaken at Onizuka AFS, although
34 less than in prior decades. In the early 1990s, an addition appended to the south façade of
35 Building 1004, known as the Emergency Utility Building (EUB), and enhanced the
36 installation’s power distribution system. The Onizuka AFS Drawing Number Log
37 indicates construction of the EUB also entailed upgrading mechanical systems in
38 Buildings 1003, 10031, and 10032, and likely also Building 1002 (Onizuka AFS, n.d.).

39
40 In 1990, Building 1002’s exterior was rehabilitated, including replacement of fenestration
41 and application of EIFS (Fola Odafalu, pers. comm., October 13, 2009). In 1991, the 21st
42 Space Operations Squadron (SOPS) were activated at Onizuka AFB, and assumed the

1 role of operations of the 2nd Satellite Tracking Group. In 1992, the 750th Space Group
2 was activated and assumed responsibility for launch and early orbit of numerous
3 satellites, including the Space Shuttle (Schriever AFB, n.d.).
4

5 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
6 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported from Onizuka
7 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
8 weather satellites assisted with U.S. missile launches, and navigation satellites assisted
9 the troops in maneuvering through the desert. Reconnaissance satellites, such as those in
10 the NRO's KH-11 satellite program, also likely continued to be supported by the
11 installation (Peterson, July 30, 1993). The early 1990s also represented a key year for
12 satellite scheduling, with the advent of a computerized scheduling system. Prior to this
13 time, scheduling was plotted by hand, using colored tape to represent different spacecraft
14 on approximately 50' rolls of butcher-paper (Mead, March 2, 1994). In addition, the
15 installation also supported numerous NASA space exploration programs.
16

17 In 1994, Onizuka AFB was renamed Onizuka AFS. In 1995, the Corona Program was
18 declassified, and the following year 800,000 images taken between 1960-72 were made
19 available to the public. Formerly classified documents also became available (NRO,
20 February 24, 1995).
21

22 In 1995, Onizuka AFS was realigned in accordance with the Base Realignment and
23 Closure (BRAC) Act, and select functions were relocated to CSOC at Falcon AFB,
24 Colorado Springs, Colorado. The realignment resulted in a loss of approximately 1,100
25 jobs at Onizuka AFS (City of Sunnyvale, 2006). By the end of the 1990s and during the
26 early 2000s, responsibility for controlling the DoD satellite network continued to be
27 transferred to the CSOC, and Onizuka AFS's responsibilities substantially decreased
28 (Flinn, December 1, 1991; Wulff, November 29, 1995).
29

30 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
31 U.S., British, and French military personnel in Dhahran, Saudi Arabia led to increased
32 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
33 permitted on the first two stories of Buildings 10031 and 10032. In addition, because
34 Innovation Way was in close proximity to Buildings 10031 and 10032, the street was
35 closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey barriers and
36 bollards were also installed around the perimeter of the buildings (Dennis Ralphs, pers.
37 comm., August 2, 2010).
38

39 In 2005, the BRAC commission recommended closure of Onizuka AFS. The
40 recommendations were approved by President George W. Bush. In 2006, the DoD,
41 through the Office of Economic Adjustment, formally recognized the City of Sunnyvale

1 as the Local Redevelopment Authority (LRA) for planning the redevelopment of Onizuka
2 AFS and its conversion to civilian use (City of Sunnyvale, 2006).
3

4 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
5 and open house were held to commemorate this event, and were attended by over 800
6 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
7 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the
8 history of the NRO and reconnaissance satellite programs supported from the installation
9 between through 2007. Following the open house, displays and histories of the programs,
10 many of which remain classified, were relocated to the NRO archives in Chantilly,
11 Virginia (Dennis Ralphs, pers. comm., August 3, 2009).
12

13 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
14 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
15 attendance were current and former employees, both military and civilian, as well as
16 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan
17 noted that "[T]his facility here in Sunnyvale has supported an amazing 3.4 million
18 satellite operations over the past years. Much of the details of this work are still classified
19 and we cannot talk openly about it, but what I can tell you is that the operations
20 conducted by the NRO from this site have made our nation a tremendously safer place to
21 be" (Bauer, July 29, 2010).
22

23 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
24 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
25 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
26 transferred out of federal hands in September 2011. It is anticipated that the Department
27 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
28 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
29 remainder of the installation will be redeveloped.
30

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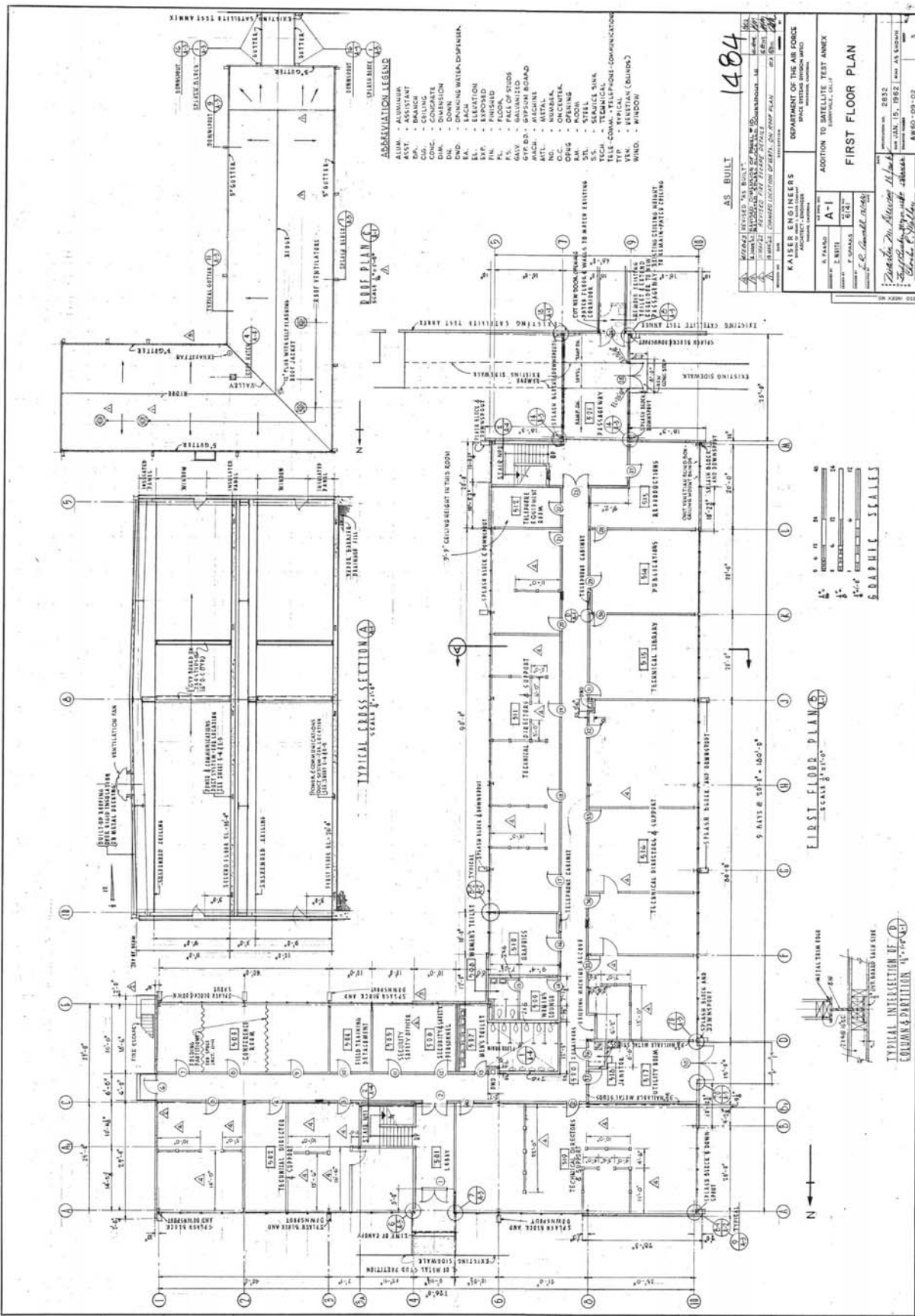
14 Vick, Charles P. 2007. "KH-11 KENNAN, Reconnaissance Imaging Spacecraft." [web
15 page] <<http://www.globalsecurity.org/space/systems/kh-11.htm>>. [Accessed September
16 4, 2009].
17

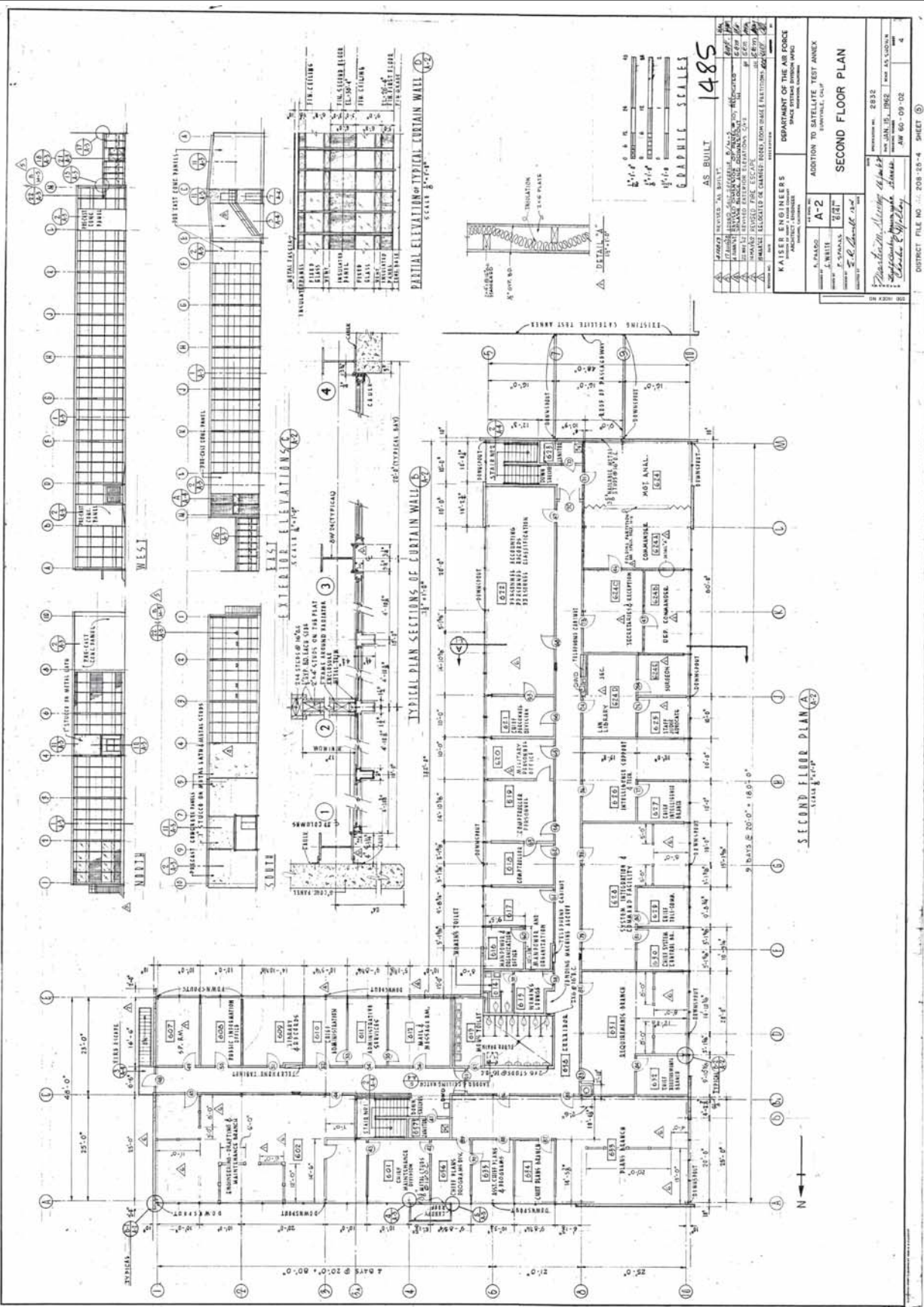
18 Vukotich, Charles J. n.d. "Corona." [web page]
19 <http://www.spacecovers.com/articles/article_corona2.htm>. [Accessed September 4,
20 2009].
21

22 Wade, Mark. n.d. "DMSP Block 5D-2." [web page]
23 <<http://www.astronautix.com/craft/dmsck5d2.htm>>. [Accessed September 4, 2009].
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RAISER ENGINEERS
ARCHITECTS

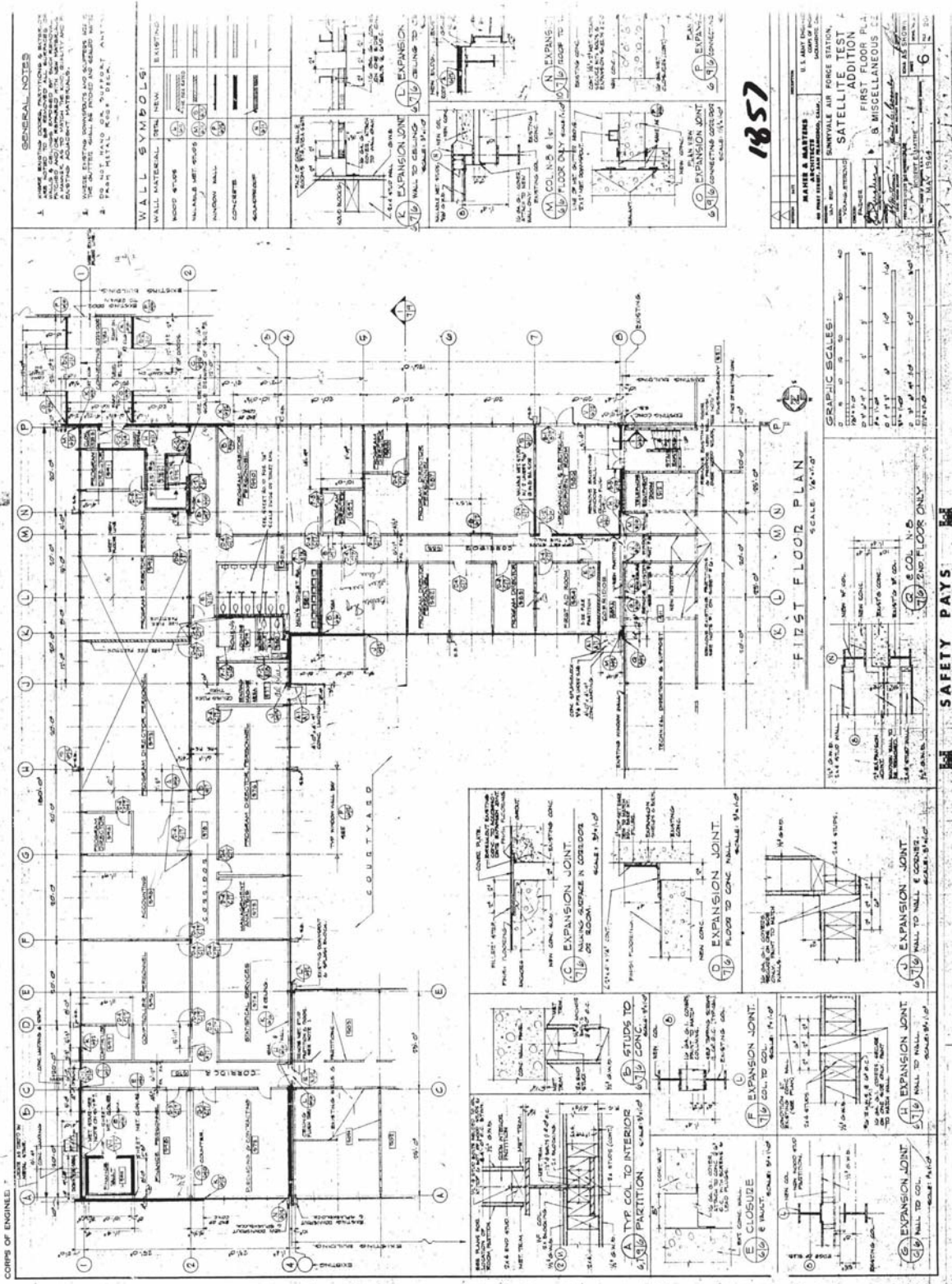
DEPARTMENT OF THE AIR FORCE
SPACE SYSTEMS DIVISION

ADDITION TO SATELLITE TEST ANNEX
BUILDING 1002

SECOND FLOOR PLAN

DATE: 10/15/52
DRAWN BY: J. L. BIRSE
CHECKED BY: J. L. BIRSE
APPROVED BY: J. L. BIRSE

DISTRICT FILE NO. 44-208-254-4 SHEET 27

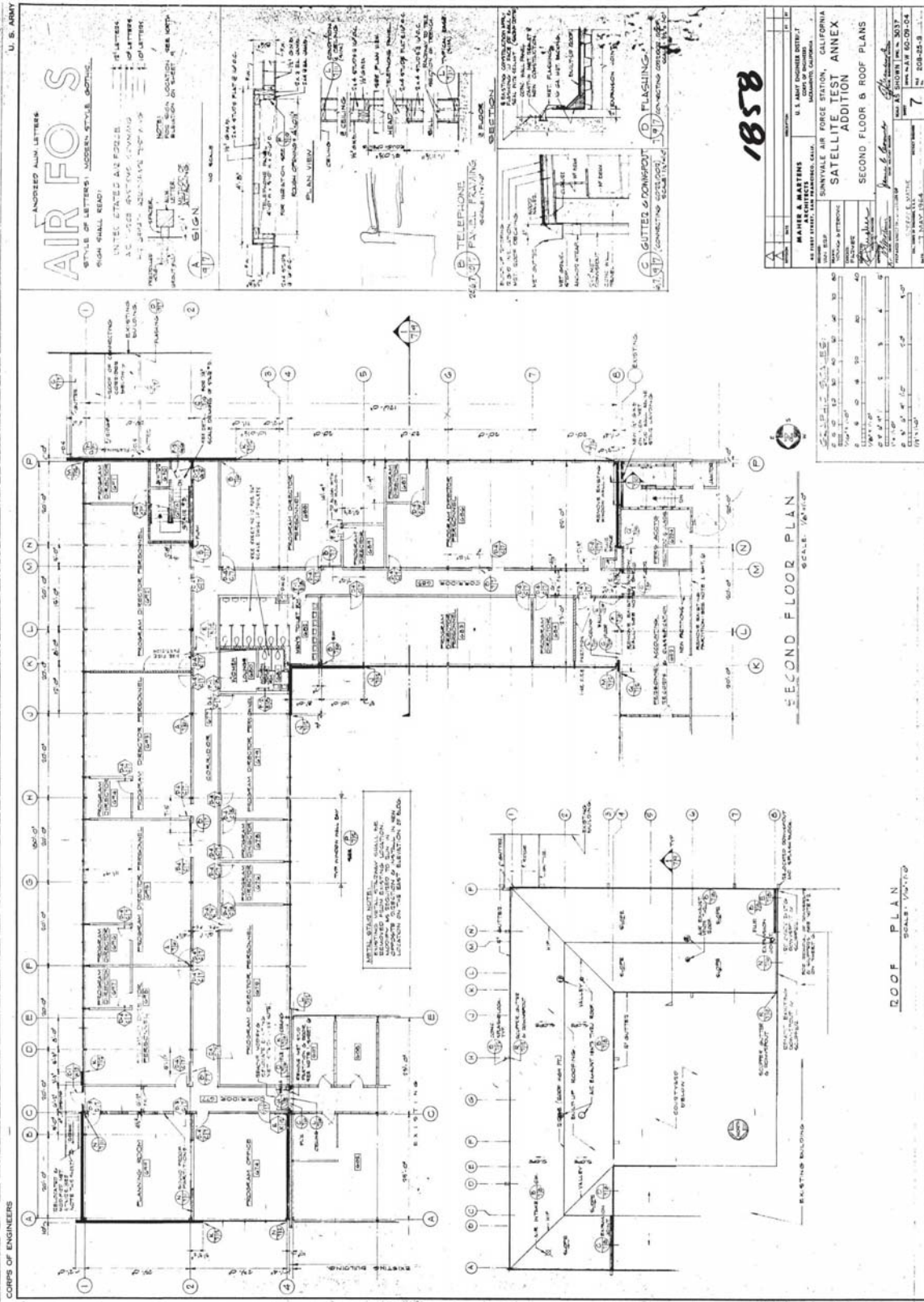


1857

REVISIONS & MATTERS:

NO.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	MAY 1954
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3	REVISIONS	
4	REVISIONS	
5	REVISIONS	
6	REVISIONS	

PROJECT: SATELLITE TEST ADDITION
LOCATION: SHAWNEE AIR FORCE STATION
DATE: MAY 1954



U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1002
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-B

SECTION II

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2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **INDEX TO PHOTOGRAPHS**

5
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7 BUILDING 1002
8 Onizuka Air Force Station
9 1080 Innovation Way
10 City of Sunnyvale
11 Santa Clara County
12 California

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14 Anne Jennings, Photographer Date of Photographs: June 7-14, 2010

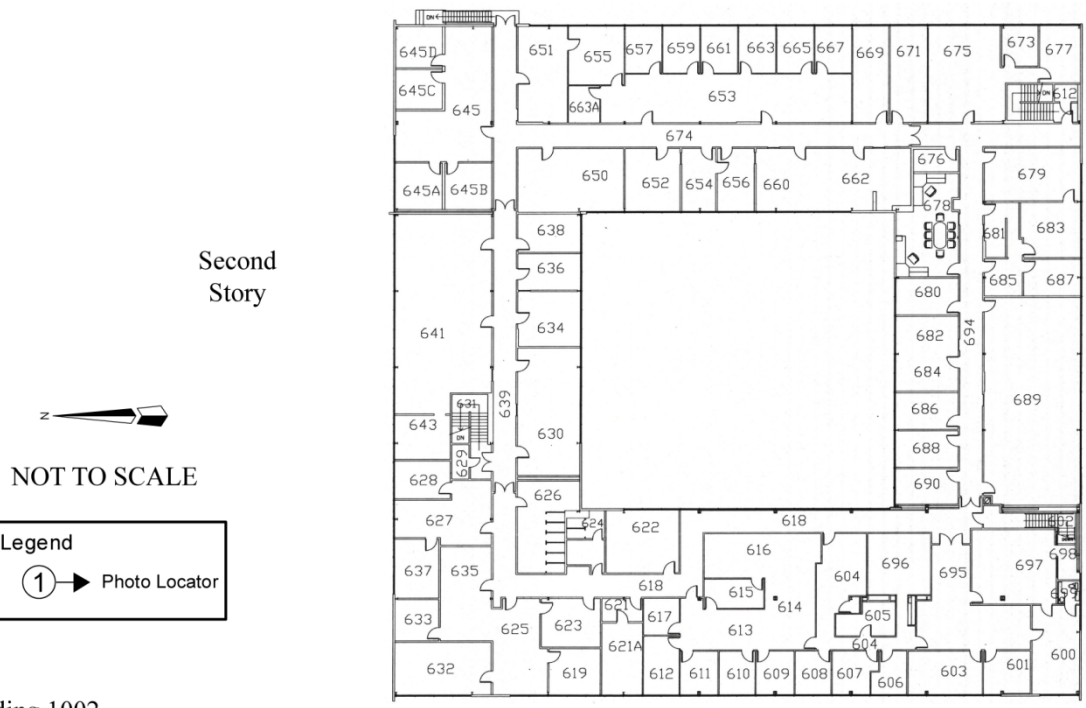
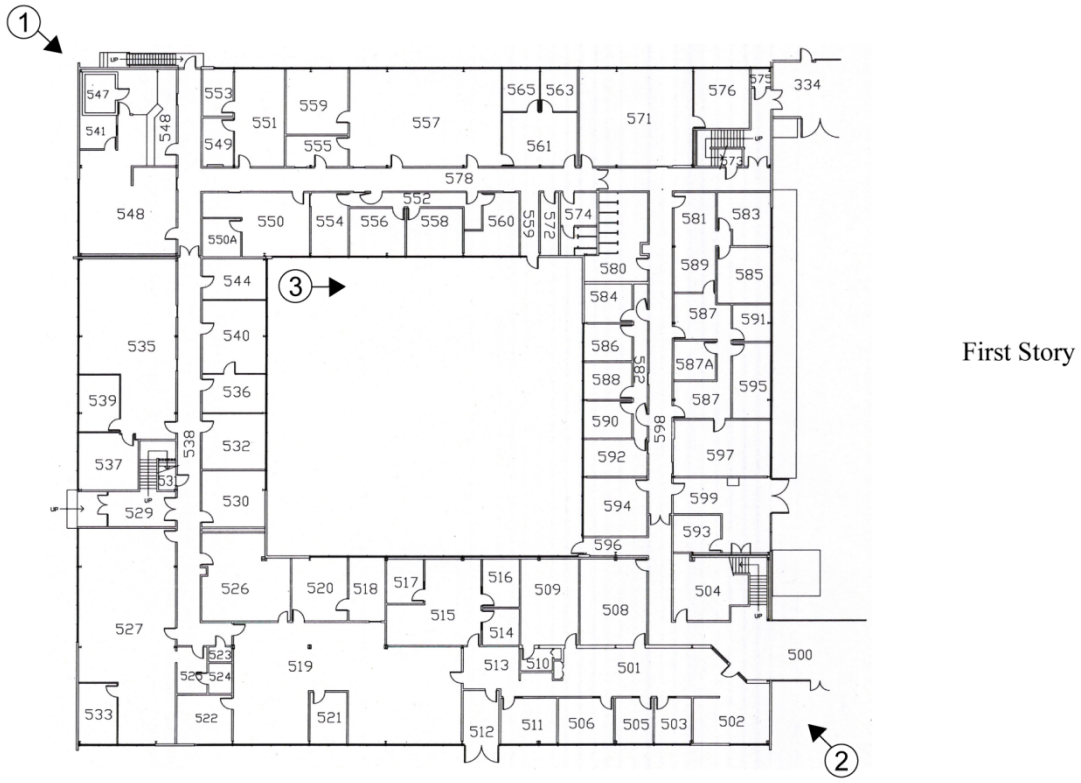
15
16 Log No. USAF041221A-B-01 VIEW OF NORTH AND EAST FAÇADES,
17 LOOKING SOUTHWEST.

18
19 Log No. USAF041221A-B-02 VIEW OF ROOF, WEST, AND SOUTH
20 FAÇADES FROM ROOF OF BUILDING 1003,
21 LOOKING NORTHEAST. NOTE HYPHENS
22 THAT CONNECT SOUTH FAÇADE OF
23 BUILDING 1002 TO NORTH FAÇADE OF
24 BUILDING 1001.

25
26 Log No. USAF041221A-B-03 VIEW OF INTERIOR COURTYARD, LOOKING
27 SOUTH. NOTE CONCRETE PATIO AND
28 LANDSCAPING.

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U.S. AIR FORCE SATELLITE TEST CENTER, BUILDING 1002
 Log. No. USAF041221A-B
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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1003
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-C

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

California Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1003
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-C

SECTION I

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **U.S. AIR FORCE SATELLITE TEST CENTER**
5 **BUILDING 1003**

6
7 **Log No. USAF041221A-C**
8

9 **A. Location:** Building 1003, Onizuka Air Force Station
10 1080 Innovation Way, Sunnyvale, Santa Clara County, California
11

12 **B. Significance:** Building 1003, constructed in 1969 to support reconnaissance satellites, is
13 a contributing resource to the National Register-eligible U.S. Air Force Satellite Test
14 Center Historic District. The district is significant at a national, state, and local level
15 under Criterion A for its associations with satellite reconnaissance during the Cold War,
16 and Criteria Consideration G, because five of the six buildings, including Building 1003,
17 are not yet fifty years old, and have exceptional importance for their associations with
18 satellite reconnaissance during the Cold War.
19

20 The U.S. Air Force Satellite Test Center Historic District is significant at the national
21 level for its association with satellite reconnaissance during the Cold War. The
22 installation was established in 1959 to serve as the command-and-control center for the
23 first reconnaissance satellite program, the Corona Program. It was developed by the U.S.
24 Air Force and the Central Intelligence Agency (CIA), with assistance from a private
25 contractor, Lockheed Missiles and Space Division. Shortly thereafter, the National
26 Reconnaissance Office (NRO) was established to provide oversight of the program and
27 develop other satellite programs. As new satellite technologies emerged, such as
28 communications, early missile warning, meteorology, navigation, and nuclear detonation
29 detection, Building 1003 was constructed for satellite support. These satellite programs
30 provided valuable data throughout the Cold War, and were supported from the U.S. Air
31 Force Satellite Test Center Historic District. Although many of the satellite programs
32 remain classified, it is apparent through the continued presence of the NRO that the
33 installation played a key role in the United States' conduct of the Cold War.
34

35 The U.S. Air Force Satellite Test Center Historic District is also significant at the state
36 and local levels for its association with the development of California as a leader in
37 technological innovations. California, and specifically the City of Sunnyvale in Silicon
38 Valley, began to emerge as a leading technological center during the Cold War. This was
39 due, in part, to the military's investment in the development of defense technologies in
40 California, such as command and control of reconnaissance satellites at Onizuka Air
41 Force Station (AFS). The presence of Lockheed Missiles and Space Division in
42 Sunnyvale in the mid-1950s, followed by Onizuka AFS in the late 1950s, burnished its
43 reputation as a high-technology center. The district's period of significance extends from
44 1959, the date of development of the installation, through 1991, the conclusion of the
45 Cold War.
46

1 **C. Description:**
2

3 **1. Current Description**
4

5 Building 1003 was constructed in 1969 to provide satellite support in conjunction with
6 Building 1001. It is a four-story, rectangular-plan, windowless, utilitarian steel-frame
7 building. It is approximately 104' high, and measures approximately 25' per story, with a
8 mezzanine between the second and third stories. The first story is clad in marblecrete
9 with stucco, topped by a horizontal dark blue metal reveal. The remainder of the building
10 is clad in pale blue tilt-up, pre-cast, concrete panels punctuated by vertical dark blue
11 metal reveals. In general, the majority of the building is clad in panels that measure
12 approximately 11' x 9'.
13

14 The building is set atop a concrete-pile foundation and is capped by a flat built-up asphalt
15 roof and parapet. Metal hatches are located in the northeast and southeast corners, and a
16 metal railing is appended to the roof along the north, east, and south facades.
17

18 The north façade features five three-panel sections punctuated by dark blue metal reveals.
19 Building 10031 is appended to the north façade, and obscures the lower portion of the
20 building.
21

22 The south façade also features five three-panel sections, and is the only façade that is not
23 obscured by other buildings. The first story is clad in marblecrete with stucco. It is
24 pierced by two double-metal doors with metal handles set within metal surrounds. A
25 metal overhang supported by metal posts is appended above the first story, and screens
26 pipes along the façade.
27

28 A single-story, T-plan hyphen, referred to on the original plans as Building Connector
29 Number 2, is appended to the south façade of Buildings 1001 and 1003, and the west
30 façade of Building 1004. It is clad in marblecrete with stucco, is set atop a concrete
31 foundation, and is capped by a stucco-clad parapet articulated with blue-painted
32 galvanized steel. Two entries occur on the section appended to Building 1003. The west
33 façade is pierced by a double-metal-and-glass-panel door with metal handles set within
34 metal surrounds. A concrete ramp flanked by one metal pipe railing to the south provides
35 access. The south façade is pierced by a double-metal door with no exterior hardware, set
36 within metal surrounds. Four metal bollards are located south of the door. One entry
37 occurs on the section that is appended to Building 1004, and includes a double-metal
38 door with no exterior hardware, set within a metal surround. A concrete step provides
39 access to the entry, set behind three metal bollards. Mechanical equipment is located on
40 the roof behind metal screens.
41

1 The east and west façades feature nine three-panel panel sections punctuated by dark blue
2 metal reveals. The east façade is partially obscured by Building 1001. However, a small
3 portion of the façade is visible between the two buildings. Moving from north to south,
4 the first story is pierced by three metal-louvered vents and a double-metal door with
5 metal doorknob, set within a metal surround. Five metal vents pierce pre-cast concrete
6 panels on the second story. Gym wall pads are appended to the first story. The majority
7 of the west façade is obstructed by Building 10032.
8

9 The first story of Building 1003 encompasses 37,262 square feet, the second story 36,328
10 square feet, the mezzanine 14,194 square feet, the third story 36,328, and the fourth story
11 36,328 square feet. A current sketch plan is included in the Index to Photographs. A
12 comparison of the original floor plan with the current floor plan indicates that the
13 majority of the interior has been reconfigured, with the exception of the mezzanine which
14 houses mechanical equipment and has likely remained relatively intact.
15

16 Not all areas within the building were accessible during the building survey conducted in
17 June 2010. Visual evidence of interior spaces, coupled with information included in the
18 Onizuka AFS Drawing Number Log, indicate that most interior spaces, even in cases
19 where they retain their original configuration, no longer retain their original function,
20 features, or finishes. However, certain features remain which are evocative of its
21 function, including concrete floors and mechanical equipment in the mezzanine, and
22 raised floors and acoustical ceiling tiles in select rooms.
23

24 **2. According to Original Plan**
25

26 Original plans of Building 1003 are on file in the Civil Engineering Office, Building
27 1002, Onizuka AFS, Sunnyvale, Santa Clara County, California. Original building plans
28 were prepared in 1967 by Alhambra, California-based architecture and engineering firm,
29 C.F. Braun & Company, under the auspices of the U.S. Naval Facilities Engineering
30 Command (NAVFAC) Western Division, San Bruno, California, and SAMSO, Los
31 Angeles, California. The following plans are featured in the graphic documentation
32 section of the report:
33

- 34 • “STC Building Addition First Floor Plan” (C.F. Braun &
35 Company/NAVFAC/SAMSO, November 14, 1967a) - 1514
- 36 • “STC Building Addition Second Floor Plan” (C.F. Braun &
37 Company/NAVFAC/SAMSO, November 14, 1967b)
- 38 • “STC Building Addition Third Floor Plan” (C.F. Braun &
39 Company/NAVFAC/SAMSO, November 14, 1967c)
- 40 • “STC Building Addition Fourth Floor Plan” (C.F. Braun &
41 Company/NAVFAC/SAMSO, November 14, 1967d)

- “STC Building Addition South Elevation” (C.F. Braun & Company/NAVFAC/SAMSO, November 14, 1967f)

In addition, historic photographs were also consulted to determine the original appearance of the building. A sampling of historic photographs are reproduced in the graphic documentation section of the overview report entitled California State Historic Preservation Office, Historic American Building Survey Level II-Type Documentation, U.S. Air Force Satellite Test Center, Log No. USAF041221A.

Original plans indicate that Building 1003’s exterior was similar to its current appearance. However, the construction of Buildings 10031 and 10032 in the 1980s obscured the north and west facades, respectively, and the east façade was partially obscured by the construction of Building 1015.

As conceived on the original plans, the north and south façades were pierced by a centrally located double-metal door. The east façade was pierced by two double-metal doors, and three metal-louvered vents, and the west façade was pierced by two double-metal doors. Historic photos indicate that stainless steel signs that read “U.S. Air Force Satellite Test Center” were appended to the south and west facades (C.F. Braun & Company/NAVFAC/SAMSO, November 14, 1967e-h).

In addition, plans were prepared for the two single-story hyphens, known as Building Connector 1 and Building Connector 2. Both were stucco-and-marblecrete-clad, sat atop concrete foundations, and were capped by flat roofs. Building Connector Number 1 was appended to the east façade of Building 1003 and provided access to Building 1001. According to the plans, the north façade was pierced by a double-metal door. Building Connector Number 2 was appended to the south façade and provided access to Buildings 1001 and 1004. The original appearance of Building Connector Number 2 was similar to its current appearance.

Although the original plans do not indicate room names or functions, a 1970 Air Force Satellite Control Facility (AFSCF) document provides some information. The first story housed communications and crypto equipment, data distribution center, mechanical equipment, storage, and the second story housed four Control Data Corporation (CDC) 3800 computer rooms and a tape library. Three Mission Control Centers (MCCs) were located on the third story, MCCs D, F, and M. The fourth story housed rooms for field detachment and training (AFSCF, 1970). The Onizuka AFS Drawing Number Log indicates that the fourth story also housed MCCs B, C, and D (Onizuka AFS, no date [n.d.]).

Plans indicate that walls were clad in gypsum board, floor surfaces were typically raised and clad in vinyl tiles, and ceilings featured acoustical tiles. In addition, many rooms

1 featured soundproofing material installed within the walls (C.F. Braun &
2 Company/NAVFAC/SAMSO, November 14, 1967i).

3
4 **D. History:**

5
6 **1. Development of the Satellite Test Center, 1959-61**

7
8 The development of satellite reconnaissance during the Cold War (1946-91) and the
9 specific role of the U.S. Air Force Satellite Test Center (STC) is fully described in the
10 associated overview report, California State Historic Preservation Office Historic
11 American Building Survey Level II-Type Documentation, U.S. Air Force Satellite Test
12 Center, Log No. USAF041121A. The following section provides a brief summary of the
13 role that Building 1003 played at the STC from 1959-91, its period of significance.

14
15 The installation was established in 1959 when Building 1001 was constructed to serve as
16 the command-and-control center for the Corona Program to support the launch, orbit, and
17 recovery of Corona satellites. The Corona Program, initiated in 1958, was the first
18 reconnaissance satellite program developed by the U.S. Air Force and the CIA, with
19 assistance from private contractors, such as Lockheed Missiles and Space Division,
20 located in Sunnyvale, California. Concerns about preserving the secrecy of the Corona
21 Program and its objectives led to the designation of the Discoverer Program as a cover
22 program. The publicly-stated goal of the Discoverer Program was scientific research
23 (Richelson, 2002). Prior to the construction of Building 1001, at least eight Corona
24 satellites, described as Discoverer satellites in the press, were launched from Vandenberg
25 Air Force Base (AFB), and were supported from an interim control center in Palo Alto,
26 California. Tracking stations located around the world also provided support.

27
28 In 1959, the U.S. Air Force acquired 11.43 acres of land in Sunnyvale from Lockheed
29 Missiles and Space Division located to the west. Plans for the installation were designed
30 by the Ralph M. Parsons Company, an architecture and engineering firm based in Los
31 Angeles, California, under the auspices of the U.S. Air Force Ballistic Missile Division
32 (AFBMD) in Englewood, California (Ralph M. Parsons Company/AFBMD, March 6,
33 1959).

34
35 On January 28, 1960, the installation, newly designated as the STC, was dedicated by the
36 U.S. Air Force (Davies, 1960). A few months later, on March 1, 1960, it was occupied by
37 the 6594th Aerospace Test Wing (ATW), the first unit to be tasked with military satellite
38 operations; Lockheed Missiles and Space Division employees; and likely the CIA. The
39 6594th ATW provided oversight for Lockheed Missiles and Space Division which was
40 responsible for satellite operations. However, portions of the building remained under
41 construction, including the state-of-the-art Satellite Control Room in the Satellite Control
42 Room Complex. An interim Satellite Control Room was established from which

1 Lockheed Missiles and Space Division, monitored by the 6594th ATW, could direct the
2 launch, tracking, data acquisition, command and control, and recovery phase of military
3 satellites (6594th ATW, 1961; Jernigan, 1983).
4

5 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
6 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
7 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
8 the public, likely due in part to a building sign which indicated "U.S. Air Force Satellite
9 Test Center." On February 6, 1961, the Satellite Control Room and remainder of the
10 Satellite Control Room Complex became operational. The primary purpose of the
11 complex was to support Corona satellites, although additional programs were supported
12 by this time (Jernigan, 1983).
13

14 **2. Significant Events and Satellites Supported, 1960-61**
15

16 In August 1960, the U.S. Air Force accomplished the first successful retrieval of a
17 Discoverer satellite. On August 10, Discoverer XIII was launched from Vandenberg
18 AFB, and was supported by the STC. The satellite achieved polar orbit for a period of
19 ninety-four minutes, during which time it was in contact with worldwide tracking
20 stations, and the interim Satellite Control Room at the STC. During its seventeenth
21 rotation of the earth, the eject command was issued from the STC, and the capsule was
22 ultimately recovered from the Pacific Ocean, marking the first successful retrieval of an
23 object from space (Arnold, 2005; 6594th ATW, n.d.). In-keeping with the publicly stated
24 scientific objectives of the Discoverer Program, the *San Jose Mercury News* noted that
25 "Discoverer recovery techniques will be used soon to return monkeys from space," and
26 were vital to "returning a man to earth after orbiting in space" (Lindsey, August 12,
27 1960). Still in the testing phase, the satellite did not yet contain a camera (Jernigan,
28 1983).
29

30 Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from
31 Vandenberg AFB (Arnold, 2005). Discoverer XIV orbited the earth seventeen times,
32 supported by the STC from the interim Satellite Control Room in Building 1001, and the
33 Kodiak tracking station, before the eject command was relayed to the satellite. Following
34 the command, at 300 miles above the earth, the satellite recovery vehicle (SRV)
35 separated from the spacecraft, and began its descent to earth, where it was caught by a
36 specially equipped Fairchild C-119 *Flying Boxcars* (C-119) piloted by U.S. Air Force
37 Captain Harold Mitchell (*The New York Times*, August 20, 1960).
38

39 The Discoverer XIV SRV contained 20 pounds of film which documented over
40 1,650,000 square miles, and provided the first successful satellite reconnaissance
41 photographs of the Soviet Union. It also resulted in more photographic coverage of the
42 Soviet Union than all previous U-2 flights combined. Furthermore, it provided evidence

1 that the missile gap, feared since the 1957 launch of *Sputnik I* by the Soviet Union, did
2 not exist, and that the Soviets did not have an immense stockpile of Intercontinental
3 Ballistic Missiles (ICBMs) (Day, 2006). However, despite the historic nature of this
4 event, the crew, who were not cleared for the Corona Program, were unaware of the
5 importance of their mission (Arnold, 2005).

6
7 Although the STC was developed to support the Corona Program, by the fall of 1960, it
8 also supported the Satellite and Missile Observation System (SAMOS) and Missile
9 Detection Alarm System (MIDAS). Both programs were initially developed by the U.S.
10 Air Force in the mid-1950s as reconnaissance and missile detection satellites,
11 respectively (Jernigan, 1983). On October 11, 1960, the first SAMOS satellite was
12 launched from Vandenberg AFB, and supported from the STC, although it failed to reach
13 orbit (*San Jose Mercury News*, October 12, 1960). By July 1961, MIDAS satellites were
14 launched from Vandenberg AFB and supported by the STC. By the end of 1961, two
15 MIDAS satellites had reached orbit (6594th ATW, 1961).

16
17 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
18 Corona satellite supported by the STC from the new control room. By this time, Corona
19 satellites were regularly providing images of the Soviet Union, as well as other
20 communist countries. Among these images included evidence of the building of the
21 Berlin Wall between East and West Germany (Chapman, 2008). In September 1961, the
22 NRO was established as a classified agency in the Department of Defense (DoD), and
23 was tasked with oversight of reconnaissance satellite programs, including the Corona
24 Program, and therefore became a presence at the STC (Richelson, 2000).

25
26 **3. Building 1002 Construction and Upgrades, 1962**

27
28 In 1962, the STC experienced its first of many expansions, when plans for a two-story, L-
29 shaped administrative building – Building 1002 (Addition to the Satellite Test Annex) -
30 were prepared for the U.S. Air Force Space Systems Division (SSD) by Kaiser Engineers,
31 a division of the Henry J. Kaiser Company. Kaiser Engineers was a well-known
32 architecture and engineering firm located in Oakland, California (Kaiser Engineers/U.S.
33 Air Force SSD, January 15, 1962a-b; AFSCF, 1972).

34
35 During this time, Kaiser Engineers also prepared plans for a single-story addition to
36 Building 1001 to house new a new communications center, and interior modifications to
37 the Satellite Control Room Complex (Kaiser Engineers/U.S. Air Force SSD, October 17,
38 1962a-b; Jernigan, 1983).

39
40 The 1962 renovations were likely implemented in conjunction with the U.S. Air Force's
41 first modernization effort, the Multiple Satellite Augmentation Program (MSAP). This
42 effort was initiated in part, to standardize and provide updated equipment to the STC and

1 tracking stations which enabled them to simultaneously support multiple satellite
2 programs (Lockheed Missiles and Space Division, 1963). Computer capabilities were
3 upgraded, new display and communications equipment were also installed, and
4 connections between the STC and tracking stations were upgraded (Jernigan, 1983).
5

6 **4. Significant Events and Satellites Supported, 1962-64**
7

8 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
9 The following month, the DoD classified all military satellite programs (DoD, March 23,
10 1962). As a result, Discoverer XXXVIII was the last satellite launched as part of the
11 Discoverer program. Corona satellites continued to be launched and supported by the
12 STC, however, because all satellites were classified, the Corona Program no longer
13 required a cover story.
14

15 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
16 satellites had accurately mapped all twenty-five of Moscow's long-range missile sites.
17 Furthermore, images taken by Corona satellites indicated that China was readying its
18 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that "[O]n
19 the basis of new overhead photography, we are now convinced that the previously
20 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
21 for use in about two months." Within two months, on October 16, 1964, China tested an
22 atomic bomb at the Lop Nur site (Broad, September 12, 1995).
23

24 In addition to Corona, SAMOS, and MIDAS satellites, the STC supported the Defense
25 Meteorological Satellite Program (DMSP) in 1962 and 1963. DMSP was a
26 meteorological satellite program initiated in 1960 to provide weather and climate data for
27 more effective military operations (DMSP, n.d.). On October 16, 1963, the first Vela
28 satellite was launched and supported by the STC. The Vela Program – vela means vigil in
29 Spanish – was a series of satellites designed to detect nuclear detonations (Jernigan,
30 1983; Peebles, 1997). Presumably, Vela satellites provided images of the Lanzhou
31 Diffusion Plant in Lanzhou, China and the Baotao Nuclear Fuel Component Plant in
32 Baotao, China (Richelson, 2002).
33

34 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
35 Furthermore, 1963 marked the beginning of the Keyhole (KH)-7 surveillance system,
36 noted in a 2006 NRO memo as "the Intelligence Community's first high resolution
37 surveillance or 'spotting' satellite." Similar to Corona satellites, the KH-7 was a
38 reconnaissance satellite that returned film to earth in SRVs. It was primarily used to
39 provide surveillance of nuclear facilities and Intermediate Range Ballistic Missiles
40 (IRBM) in the Soviet Union and China (NRO, 2006).
41

1 In July 1964, two additional Vela satellites were launched, resulting in a total of four
2 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III
3 was launched and supported by the STC. Syncom III was a National Aeronautics and
4 Space Administration (NASA) satellite used for DoD military communications
5 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).
6

7 **5. Construction, Upgrades, and Designation of the Air Force Satellite Control Facility,**
8 **1964-67**
9

10 In May 1964, plans were prepared for a two-story, L-plan addition to Building 1002 to
11 provide additional administrative space. The addition was designed by Maher & Martens,
12 a San Francisco-based architecture firm for the U.S. Army Corps of Engineers (USACE),
13 Sacramento District (Maher & Martens/USACE Sacramento District, May 7, 1964).
14

15 In 1965, the AFSCF was officially designated. Its mission was to direct launch, tracking,
16 data acquisition, command and control, and recovery of DoD military satellites.
17 Following the establishment of AFSCF, an Interim Expansion Plan (IEP) was initiated to
18 augment the facility and implement the MCC concept, which focused on the development
19 of mission-oriented control centers rather than a single control room (Jernigan, 1983).
20

21 Plans were prepared by San Francisco-based consulting engineers, Bentley Engineers and
22 Earl & Wright, Inc., under the auspices of the U.S. Air Force SSD to develop multiple
23 MCCs in Building 1001. The plans indicate that the building was reconfigured to
24 accommodate four new MCCs, known as MCCs 1, 2, 3, and 4. In addition, the building
25 also featured two new complex areas, known as Complex Numbers 6 and 7. The plans
26 also indicated that two new communications areas, labeled as Communications Area A
27 and B, were added, as well as a new bird buffer area (Bentley Engineers and Earl &
28 Wright, Inc./U.S. Air Force SSD, December 13, 1965a-e). The majority of the work was
29 completed by December 1966 (AFSCF, January-June 1966).
30

31 **6. Significant Events and Satellites Supported, 1965-70**
32

33 The increase in the number of flight support hours logged by the AFSCF between 1965-
34 66 appears to indicate that at least some of the MCCs were operational in 1966. In 1965,
35 the AFSCF logged 20,757 hours of satellite flight support. By 1966, 29,400 hours of
36 flight support were logged. The number of satellites supported also increased. In 1965,
37 the STC supported approximately fourteen satellites (AFSCF, 1972). In January 1967, the
38 STC supported thirty-one satellites per day, and by June were supporting forty-four per
39 day, which was expected to increase to forty-seven per day by July (AFSCF January-June
40 1967).
41

1 Between 1965-70, the STC supported over forty Corona satellite launches (Mission and
2 Spacecraft Library, n.d.). By 1966, upgrades to the installation had resulted in an increase
3 in involvement in satellite programs. In addition to Corona, Vela, and other programs
4 (many of which likely remained classified) new programs such as NASA's Biosatellite
5 Program were supported. The Biosatellite Program was a series of three satellites
6 designed to assess the effects of spaceflight on living organisms. Support for the program
7 focused on directing operations of the recovery of the satellites by Lockheed C-130
8 *Hercules* (C-130) aircraft flown by the 6594th Aircraft Recovery Group based at Hickam
9 AFB, Honolulu, Hawaii (Jernigan, 1983).

10
11 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
12 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
13 SESP was responsible for providing flights for research and experiments undertaken by
14 government agencies (AFSCF, January-June 1968; Jernigan, 1983). In 1967, the KH-7
15 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
16 of which successfully returned usable images (NRO, 2006).

17
18 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
19 supported by the STC, uncovered the Soviet Union's plans for the invasion of
20 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
21 monitored Soviet radio transmissions which signaled the invasion was imminent, and
22 photographic reconnaissance satellites had monitored unusual military activities on the
23 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops" (*San*
24 *Jose Mercury News*, August 27, 1968).

25
26 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
27 supported by the STC and tracking stations. The LES was an experimental satellite used
28 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).

29
30 In 1969, support was provided for NASA's manned flights to the moon. The STC
31 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar landing.
32 Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program 949 was
33 designated in November 1966 to supplant Program 461, which had initially supplanted
34 the MIDAS Program in 1963. Program 949 provided a wider range of capabilities, and by
35 the 1970s, was expected to have "progressively enhanced world-wide early-warning,
36 surveillance and detection capabilities" (Piper, 1970).

37
38 **7. Development of Buildings 1003 and 1004, 1966-70**

39
40 In conjunction with the technological upgrades which occurred throughout the mid-to-
41 late 1960s, a real estate estimate was prepared by the USACE Sacramento District in
42 August 1966 that proposed the acquisition of 8.2 acres of land from Lockheed Aircraft

1 Corporation at a cost of \$49,000. In 1966, Alhambra, California-based architecture and
2 engineering firm, C.F. Braun & Company, under the auspices of NAVFAC Western
3 Division, San Bruno, California, and SAMSO, Los Angeles, California, prepared site
4 development plans (C.F. Braun & Company/NAVFAC/SAMSO, December 30, 1966).

5
6 C.F. Braun & Company was founded by Carl Braun in 1909, and quickly became well-
7 known for construction of industrial facilities, including oil refineries and chemical plants
8 (*The New York Times*, February 5, 1954). Although Braun died in 1954, the reputation he
9 had established for his company as a builder of industrial facilities likely led to his
10 selection by SAMSO to develop the STC's new buildings. Carl Swenson, Inc. of San
11 Jose, California and the Powerhouse Oakland Construction Company of Salt Lake City,
12 Utah, served as contractors (*Aerospace Daily*, September 19, 1969).

13
14 Site development plans, dated December 30, 1966, included relocation of an existing
15 Lockheed Missiles and Space building; realignment of Lockheed Martin Way (formerly
16 known as East Perimeter Road) west of Building 1001; creation of additional parking
17 space; and installation of underground utilities (C.F. Braun &
18 Company/NAVFAC/SAMSO, December 30, 1966). In addition, C.F. Braun & Company
19 also prepared plans to develop two new buildings, Building 1003 (STC Building
20 Addition), and Building 1004 (Power Plant) (C.F. Braun/NAVFAC/SAMSO, November
21 14, 1967a; August 12, 1968).

22
23 By 1968, funds were appropriated for acquisition of the land and construction of the two
24 buildings, and in August, Lockheed Aircraft Corporation transferred the land to the U.S.
25 Air Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). That year, the *San Jose*
26 *Mercury News* reported that the STC would be "updated in a project expected to cost
27 more than \$40 million" to support the Manned Orbiting Laboratory (MOL) Program (*San*
28 *Jose Mercury News*, January 10, 1967 & January 17, 1967). The MOL Program was
29 initiated in 1963, and involved a Titan III booster rocket which carried a modified
30 Gemini B capsule attached to a space laboratory, and was intended to serve
31 reconnaissance purposes.

32
33 In September 1967, the U.S. Air Force announced plans to build a four-story, 150,000-
34 square-foot addition at the STC (*San Jose Mercury News*, September 16, 1967). As noted
35 in the January 1967 *San Jose Mercury News* articles, Building 1003 was designed to
36 house the MOL Program as well as other satellite programs. However, in June 1969, the
37 DoD announced the cancellation of the MOL Program to save money. The cancellation
38 led to a short work stoppage, however construction resumed a few weeks later.
39 *Aerospace Daily* reported that the U.S. Air Force had evaluated requirements for current
40 and future programs, and determined that construction on the building should continue
41 (*Aerospace Daily*, September 19, 1969). The *San Jose Mercury News* reported that
42 "official announcements merely declared that 'other activities' would replace the MOL in

1 the sky-blue building.” The article also noted that the new facilities may “become home
2 for a space shuttle command post” (Carey, 1969).

3
4 By the end of 1969, the 164,000-square foot Building 1003, constructed at a cost of \$8
5 million, was nearly complete. A windowless, pre-cast concrete-panel building, it was
6 appended to the west façade of Building 1001. Although the building was four stories, it
7 was approximately 104’ high, with each story approximately 25’ high to accommodate
8 the mechanical equipment necessary to maintain satellite programs. The building was
9 painted “Air Force blue,” resulting in its nickname, the “Blue Cube” (*Aerospace Daily*,
10 September 19, 1969).

11
12 Although the original floor plans do not indicate room names or functions, a 1970
13 AFSCF document includes a partially labeled floor plan for the building. The first story
14 housed communications and crypto equipment, data distribution center, mechanical
15 equipment and storage, and the second story housed four CDC 3800 computer rooms and
16 a tape library. Three MCCs were located on the third story, MCCs D, F, and M. The
17 fourth story housed offices for field detachment and training. The document also included
18 information on the function of the three MCCs:

- 19
20 • MCC D: Supported several high and low-orbit multi-satellite programs
21 and ballistic test programs. Support was provided to approximately twenty
22 satellites daily, and the duration of support varied from five minutes to
23 two hours.
24
25 • MCC F: Supported several high-altitude satellites requiring extensive
26 support in conjunction with using external organizations. The MCC was
27 required to be manned continuously throughout the duration of the
28 program.
29
30 • MCC M: Supported multiple high-orbit satellites which required that the
31 MCC be manned continuously throughout the duration of the program
32 (AFSCF, 1970).

33
34 In addition, the Onizuka AFS Drawing Number Log indicates that MCCs B, C, and D
35 were on the fourth story (Onizuka AFS, n.d.).

36
37 Shortly after construction, the Vela Program office, along with another unidentified
38 satellite program was relocated from Building 1001 to Building 1003 (AFSCF, July-
39 December 1969). The satellite was supported from MCC M, located on the third story
40 (Jernigan, 1983).

1 Building 1004 was also designed by C.F. Braun & Company. Solar, a division of
2 International Harvester Company, provided the Saturn gas turbine generator sets that
3 powered the plant. The development of Building 1004 necessitated modifications to the
4 installation's power distribution system. Ties to the electric power provided by Pacific
5 Gas and Electric (PG&E) were severed, with the exception of one power line which
6 provided power through a Lockheed Missiles and Space Substation, and was likely kept
7 active to provide back-up power (AFSCF, 1972). The plant, staffed by Solar contractors,
8 was operational in February 1970, and provided power to the entire installation, rendering
9 it energy-independent at that time (Jernigan, 1983).

10
11 **8. Upgrades, 1970s**

12
13 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. Technological
14 upgrades continued to be made throughout the 1970s to support the various missions at
15 Sunnyvale AFS. In 1971, communications circuits were relocated from Building 1001 to
16 Building 1003, which permitted additional operator space and generally improved
17 working and security conditions. In 1972, a twenty-channel digital television for
18 computer-controlled switching was installed between Building 1001 and Building 1003.
19 A keyboard/light-pen entry system was installed, likely in both buildings. In 1973, a
20 seventh CDC 3800 computer was installed in Building 1003 (Jernigan, 1983).

21
22 A small number of plans were prepared in the 1970s for Building 1003, and mainly
23 consisted of room reconfigurations and/or renovations. For example, in 1974, plans were
24 prepared to alter Room 2302 and modify MCC A. In 1974, Building 1015, located
25 between Buildings 1001 and 1003, was constructed to serve as a recreational facility. In
26 1976, plans were prepared to modify MCC B, and in 1977 plans were prepared to alter
27 Room 1601 (Onizuka AFS, n.d.). Presumably, there were fewer repairs and alterations in
28 the 1970s because the building was completed in 1969.

29
30 By 1979, the Onizuka AFS Drawing Number Log indicates that plans were prepared to
31 modify MCCs A, D, and C. Rooms were reconfigured and renovated, and security
32 systems installed, presumably to enable new missions to be supported from the MCCs.
33 Plans were also prepared for routine maintenance, and included exterior and interior
34 painting (Onizuka AFS, n.d.).

35
36 **9. Significant Events and Satellites Supported, 1970s**

37
38 In the 1970s, Sunnyvale AFS continued to support existing and newly established
39 satellite programs, although many of them remained classified. By this time, MCCs were
40 established in both Building 1001 and 1003. The Corona Program continued to be
41 supported from Building 1001, and the Vela Program was supported from Building 1003.
42 However, in general, specific information is not available concerning the programs

1 supported in the buildings. However, due to its size and number of MCCs, it is likely that
2 following its construction, Building 1003 supported the majority of satellite programs.
3

4 In 1970, the AFSCF Satellite Test Operations Historical Reports noted the successful
5 support of two “unique orbital events” from the installation. These events included
6 support of the Apollo 13 mission in April, which was aborted following the explosion of
7 an on-board oxygen tank, and support of the first North Atlantic Treaty Organization
8 (NATO) communications satellite in March (AFSCF, January-June 1970).
9

10 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
11 support from Building 1003 throughout the 1970s for the orbiting satellite (Jernigan,
12 1983). Program 949 was also re-designated the Defense System Program (DSP) in 1970.
13 Sunnyvale AFS continued to support this program throughout the early 1970s (AFSCF,
14 July-December 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was
15 approximately 23’ long, 10’ wide, and contained a large infrared telescope which scanned
16 the earth for missile launches. In the event a missile was launched, it would be detected
17 by the United States within minutes, which removed the possibility of a surprise attack
18 (Pebbles, 1997).
19

20 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
21 advanced communications satellites had been launched to handle voice, teletype,
22 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
23 satellites – code-named HEXAGON, and popularly known as “Big Bird” – were also
24 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
25 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
26 to photograph large areas, and return the film to earth via SRV. They carried
27 technologically advanced cameras, additional film capsules, and antennae for other
28 intelligence-gathering purposes (Clark, 2007).
29

30 In January 1972, President Richard Nixon announced the development of the Space
31 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
32 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
33 bases for the program. Research and development (R&D) shuttle launches would
34 originate from the Kennedy Space Center, and military launches would originate from
35 Vandenberg AFB. The shuttle would be responsible for the launch of all commercial,
36 scientific, and military satellites into space. The AFSCF, including Sunnyvale AFS and
37 tracking stations, would provide tracking and control for the program (Jernigan, 1983).
38

39 On May 25, 1972, Sunnyvale AFS supported the 145th and final launch of the Corona
40 Program from the original Satellite Control Room in Building 1001. It was terminated as
41 a result of advances in satellite technology. By the time the Corona Program concluded,
42 Corona satellites had provided approximately 800,000 reconnaissance photographs

1 covering approximately 510 million square miles (Chapman, 2008; Vukotich, n.d.).
2 Following its termination, the Satellite Control Room Complex likely continued to be
3 utilized for control of other satellite programs.
4

5 In July 1975, the final Apollo flight was launched and supported by Sunnyvale AFS. The
6 final flight was known as the Apollo-Soyuz Test Project, which marked the first joint
7 United States-Soviet Union space mission. The mission was the first time two foreign
8 spacecraft docked together in orbit (NASA, July 14, 2010). In 1976, the first DMSP
9 Block 5D, a meteorological satellite, was launched, and was presumably supported from
10 Sunnyvale AFS. It was an upgraded version of the 1960s-era DMSP, and provided twice-
11 daily, worldwide meteorological, oceanographic, and solar-terrestrial physics
12 measurements (Jernigan, 1983; Wade, n.d.).

13 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
14 the first successful electronic imaging satellite, and transmitted high-quality images in
15 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources
16 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
17 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
18 lettering on billboards” (Ingersoll, 1978). Nonetheless, this top-secret satellite represented
19 significant advances in the development of satellite technology, and was supported from
20 Sunnyvale AFS, as well as associated tracking stations.
21

22 **10. Development of the Air Force Satellite Control Network, Expansion, and Upgrades,**
23 **1980s**
24

25 According to the Onizuka AFS Drawing Number Log, numerous plans were prepared
26 concerning Building 1003 throughout the 1980s. In November 1980, the U.S. Air Force
27 prepared plans to expand communications rooms on the first story including Rooms
28 1031, 1501, and 1502. Rooms were reconfigured and new cable ducts and conduits were
29 installed (U.S. Air Force, November 6, 1980). Also that year, plans were prepared to
30 expand MCC F on the third story (Onizuka AFS, n.d.).
31

32 In September 1981, the U.S. Air Force prepared plans to reconfigure MCC B on the
33 fourth story of Building 1003 to provide support for the Space Shuttle Program.
34 Reconfigured rooms included Rooms 4501, 4502, 4503, 4504, 4505, 4506, 4507, 4302,
35 4303, 4304, 4305, 4306, and 4307. The plans indicated that some walls and partitions
36 were removed to create larger spaces, while other partitions were installed to divide
37 spaces. Rooms were painted, and tile and carpeting was installed, including soundproof
38 carpet and tile in select rooms. In addition, the plans called for the installation of new
39 locks, key boxes, and alarms, clearly illustrating the change MCC B’s role in the Space
40 Shuttle Program (U.S. Air Force, September 1981). Plans were also prepared to modify
41 and expand MCCs C and F in 1981. Additional plans for modifications to MCCs B, C,
42 and F continued to be prepared from 1982-85 (Onizuka AFS, n.d.).

1 In 1982, the Air Force Satellite Control Network (AFSCN) was organized. The AFSCN
2 was not a formal organization, but rather denoted a group of common user resources,
3 assets, and facilities which collectively provided tracking, telemetry & commanding
4 (TT&C) support for virtually all DoD spacecraft, and select NASA and foreign
5 government programs (Hane, 1988). The goal of the AFSCN was to provide “enduring
6 control capability commensurate with the need for operational space suites throughout
7 the conflict spectrum” (AFSCF, 1983).

8
9 To accomplish this goal, Sunnyvale AFS was upgraded as part of the Data Systems
10 Modernization Program. This \$500 million upgrade introduced centralized database-
11 driven computer hardware and software to replace outdated systems. The upgraded
12 system was more reliable, cheaper to maintain, and faster than its predecessor, allowing it
13 to support a steadily increasing satellite support workload (Fedor et al., 2006).

14
15 A new satellite control center – the Consolidated Space Operations Center (CSOC) – was
16 constructed at Falcon AFS, Colorado Springs, Colorado (present-day Schriever AFB) in
17 conjunction with the Data Systems Modernization Program (Fedor et al., 2006). The
18 CSOC was constructed partially due to concern about the vulnerability of Sunnyvale AFS
19 to earthquakes and terrorism (Philp, June 9, 1985).

20
21 Buildings 10031 and 10032 were constructed at the STC in the 1980s in conjunction with
22 the Data Systems Modernization Program to provide additional space for satellite control.
23 In 1981, King/Reif and Associates, an architectural and planning firm, prepared plans for
24 Building 10031 on behalf of NAVFAC Western Division (King/Reif and
25 Associates/NAVFAC, December 18, 1981). In 1982, plans were prepared for Building
26 10032 by Rasmussen Ingle Anderson, a San Francisco-based architecture firm, under the
27 auspices of NAVFAC Western Division.

28
29 Both three-story buildings housed parking facilities, and had radio frequency interference
30 (RFI)-shielded third stories with secure space for MCCs, computer rooms,
31 communications rooms, and offices that supported satellite programs (King/Reif and
32 Associates/NAVFAC, December 18, 1981; Rasmussen Ingle Anderson/NAVFAC,
33 October 29, 1982). Construction of Buildings 10031 and 10032 resulted in modifications
34 to the north and west facades of Building 1003. Both buildings were operational by 1984
35 (Fola Odafalu, pers. comm., July 26, 2010).

36
37 In 1985, the Onizuka AFS Drawing Number Log indicates that Rooms 1401 and 1402 on
38 the first story of Building 1003 were modified. These two rooms housed communications
39 and crypto equipment. In 1986, plans were prepared to construct a mezzanine in Room
40 1201. In 1987, plans were prepared to upgrade the security in these rooms, including
41 installation of red strobe lights and a door alarm system with a buzzer. Plans were also
42 prepared in 1987 by Orange, California-based architecture and engineering firm Holmes

1 & Narver Inc., under the auspices of AFSCF Headquarters, Los Angeles, California, to
2 modify a MCC at the northeast corner of the third story. The plans indicate that minor
3 alterations, such as the removal of interior walls to create larger spaces, were undertaken
4 (Holmes & Narver, Inc./AFSCF, August 14, 1987). In addition, the Onizuka AFS
5 Drawing Number Log indicates that plans were prepared to renovate rooms that housed
6 CDC 3800 computers and other areas on the second story to accommodate a new mission
7 (Onizuka AFS, n.d.).
8

9 In 1988, plans were prepared to reconfigure Rooms 4401, 4402, 4403, 4409, 4412 on the
10 fourth story, and to install alarms in Rooms 1801-1805 on the first story. In 1989, plans
11 were prepared to expand communications areas on the first story of Building 1003
12 (Onizuka AFS, n.d.).
13

14 **11. Significant Events and Satellites Supported, 1980s**

15
16 Sunnyvale AFS continued to support numerous satellites programs throughout the 1980s,
17 although many remained classified. On April 12, 1981, the first mission flown by the
18 Space Shuttle *Columbia* was launched, and successfully returned to earth two days later.
19 The AFSC provided support for the first shuttle mission, and five AFSCF mission
20 controllers received U.S. Air Force Commendation Medals. In June 1982, the first
21 classified military payload was carried into orbit aboard the fourth shuttle mission flown
22 by *Columbia*, and was supported from MCC B in Building 1003 (Jernigan, 1983).
23

24 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
25 appeared to be planning a surprise invasion of Chad and Sudan. The United States
26 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-
27 secret satellite was supported by Sunnyvale AFS. The mission produced photographs that
28 documented massive troop build-ups at the border of Sudan, and the *USS Nimitz* was
29 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
30 1989; Philp, October 30, 1985). In 1984, the twentieth and last KH-9 satellite was
31 launched and supported from Sunnyvale AFS (Day, November 8, 2004).
32

33 The first dedicated military shuttle flight, aboard the Space Shuttle *Discoverer*, was
34 launched in January 1985, and was supported from Building 1003. *The New York Times*
35 reported on the launch, and noted that “all communication with the astronauts will be
36 hidden in complex codes intelligible only with special unscrambling equipment”
37 (Bamford, January 13, 1985). An article in the August 2009 edition of *Air & Space*
38 *Magazine* indicated that “according to most accounts, STS-51C’s payload was ORION,
39 an eavesdropping satellite for signals intelligence” (Cassutt, August 1, 2009).
40

41 In October 1985, the second dedicated military flight was launched by the Space Shuttle
42 *Atlantis* (Cassutt, August 1, 2009). *The New York Times* reported that, according to

1 reliable sources, “two \$100 million communication satellites” were deployed into orbit,
2 on a mission classified as secret by the Pentagon (Broad, October 5, 1985).
3

4 In 1986, the Space Shuttle *Challenger* exploded after launch, killing its seven crew
5 members, including the shuttle’s mission specialist, Lieutenant Colonel Ellison S.
6 Onizuka, who had trained at Sunnyvale AFS (NASA, 2007). That same year, Sunnyvale
7 AFS was renamed Onizuka AFB in honor of Onizuka. Following the *Challenger*
8 explosion, the U.S. Air Force returned to sending satellites into orbit via unmanned
9 launches. It was not until December 1988 that the Space Shuttle *Atlantis* was launched
10 with a top-secret military payload (Cassutt, August 1, 2009).
11

12 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
13 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
14 communications satellite developed by NASA (Levien, 1989).
15

16 **12. Onizuka Air Force Station, 1990s-Present**
17

18 By 1991, the Soviet Union had dissolved, signaling the end of the Cold War (Center for
19 Air Force History, 1994). The end of the Cold War led, in part, to the declassification of
20 the NRO in September 1992. The end of the Cold War also led to a decrease in military
21 spending. However, modifications continued to be undertaken at Onizuka AFB, although
22 less than in prior decades. In 1992, an addition was appended to the south façade of
23 Building 1004, known as the Emergency Utility Building (EUB), and enhanced the
24 installation’s power distribution system. The Onizuka AFS Drawing Number Log
25 indicates construction of the EUB also entailed upgrading mechanical systems in
26 Buildings 1003, 10031, and 10032 (Onizuka AFS, n.d.).
27

28 In general, the majority of the plans prepared in the 1990s for Building 1003 were for
29 routine maintenance, and included mechanical system upgrades, painting, and corridor
30 renovation. However, in 1992, Keller & Gannon, a San Francisco-based architecture and
31 engineering firm, prepared plans on behalf of the U.S. Air Force to repair and alter
32 multiple MCCs on the third and fourth stories on behalf of the U.S. Air Force.
33 Modifications included room reconfiguration, and mechanical, and electrical upgrades,
34 likely to accommodate new satellite programs (Keller & Gannon/U.S. Air Force, July 16,
35 1992). In 1997, plans were prepared to remodel a portion of the third story (Onizuka
36 AFS, n.d.).
37

38 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
39 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported from Onizuka
40 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
41 weather satellites assisted with U.S. missile launches, and navigation satellites assisted
42 the troops in maneuvering through the desert. Reconnaissance satellites, such as those in

1 the NRO's KH-11 satellite program, also likely continued to be supported by the
2 installation (Peterson, July 30, 1993). The early 1990s also represented a key year for
3 satellite scheduling, with the advent of a computerized scheduling system. Prior to this
4 time, scheduling was plotted by hand, using colored tape to represent different spacecraft
5 on approximately 50' rolls of butcher-paper (Mead, March 2, 1994).

6
7 In 1991, the 21st Space Operations Squadron (SOPS) were activated at Onizuka AFB; and
8 in 1992, the 750th Space Group was activated and assumed responsibility for launch and
9 early orbit of numerous satellites, including the space shuttles (Schriever AFB, n.d.). In
10 addition, the installation also supported numerous NASA space exploration programs. In
11 1994, Onizuka AFB was renamed Onizuka AFS.

12
13 In 1995, the Corona Program was declassified, and the following year, 800,000 images
14 taken between 1960 and 1972 were made available to the public. Formerly classified
15 documents also became available (NRO, February 24, 1995). In addition, Onizuka AFS
16 was realigned in accordance with the Base Realignment and Closure (BRAC) Act, and
17 select functions were relocated to CSOC at Falcon AFB, Colorado Springs, Colorado.
18 The realignment resulted in a loss of approximately 1,100 jobs at Onizuka AFS (City of
19 Sunnyvale, 2006). By the end of the 1990s and during the early 2000s, responsibility for
20 controlling the DoD satellite network continued to be transferred to the CSOC, and
21 Onizuka AFS's responsibilities substantially decreased (Flinn, December 1, 1991; Wulff,
22 November 29, 1995).

23
24 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
25 U.S., British, and French military personnel in Dhahran, Saudi Arabia led to increased
26 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
27 permitted on the first two stories of Buildings 10031 and 10032. In addition, because
28 Innovation Way was in close proximity to Buildings 10031 and 10032, the street was
29 closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey barriers and
30 bollards were also installed around the perimeter of the buildings (Dennis Ralphs, pers.
31 comm., August 2, 2010).

32
33 In 2005, the BRAC commission recommended closure of Onizuka AFS. The
34 recommendations were approved by President George W. Bush. In 2006, the DoD,
35 through the Office of Economic Adjustment, formally recognized the City of Sunnyvale
36 as the Local Redevelopment Authority (LRA) for planning the redevelopment of Onizuka
37 AFS and its conversion to civilian use (City of Sunnyvale, 2006).

38
39 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
40 and open house were held to commemorate this event, and were attended by over 800
41 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
42 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the

1 history of the NRO and reconnaissance satellite programs supported from the installation
2 between through 2007. Following the open house, displays and histories of the programs,
3 many of which remain classified, were relocated to the NRO archives in Chantilly,
4 Virginia (Dennis Ralphs, pers. comm., August 3, 2009).

5
6 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
7 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
8 attendance were current and former employees, both military and civilian, as well as
9 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan
10 noted that "[T]his facility here in Sunnyvale has supported an amazing 3.4 million
11 satellite operations over the past years. Much of the details of this work are still classified
12 and we cannot talk openly about it, but what I can tell you is that the operations
13 conducted by the NRO from this site have made our nation a tremendously safer place to
14 be" (Bauer, July 29, 2010).

15
16 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
17 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
18 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
19 transferred out of federal hands in September 2011. It is anticipated that the Department
20 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
21 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
22 remainder of the installation will be redeveloped.

23
24 **E. Sources:**

25
26 **1. Architectural Drawings**

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39 "Interim Expansion Partial Floor Plan A." (1412)

40
41 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965c.
42 "Interim Expansion Partial Floor Plan B." (1413)

1 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965d.
2 “Interim Expansion Partial Floor Plan C.” (1414)

3
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24
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27
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30
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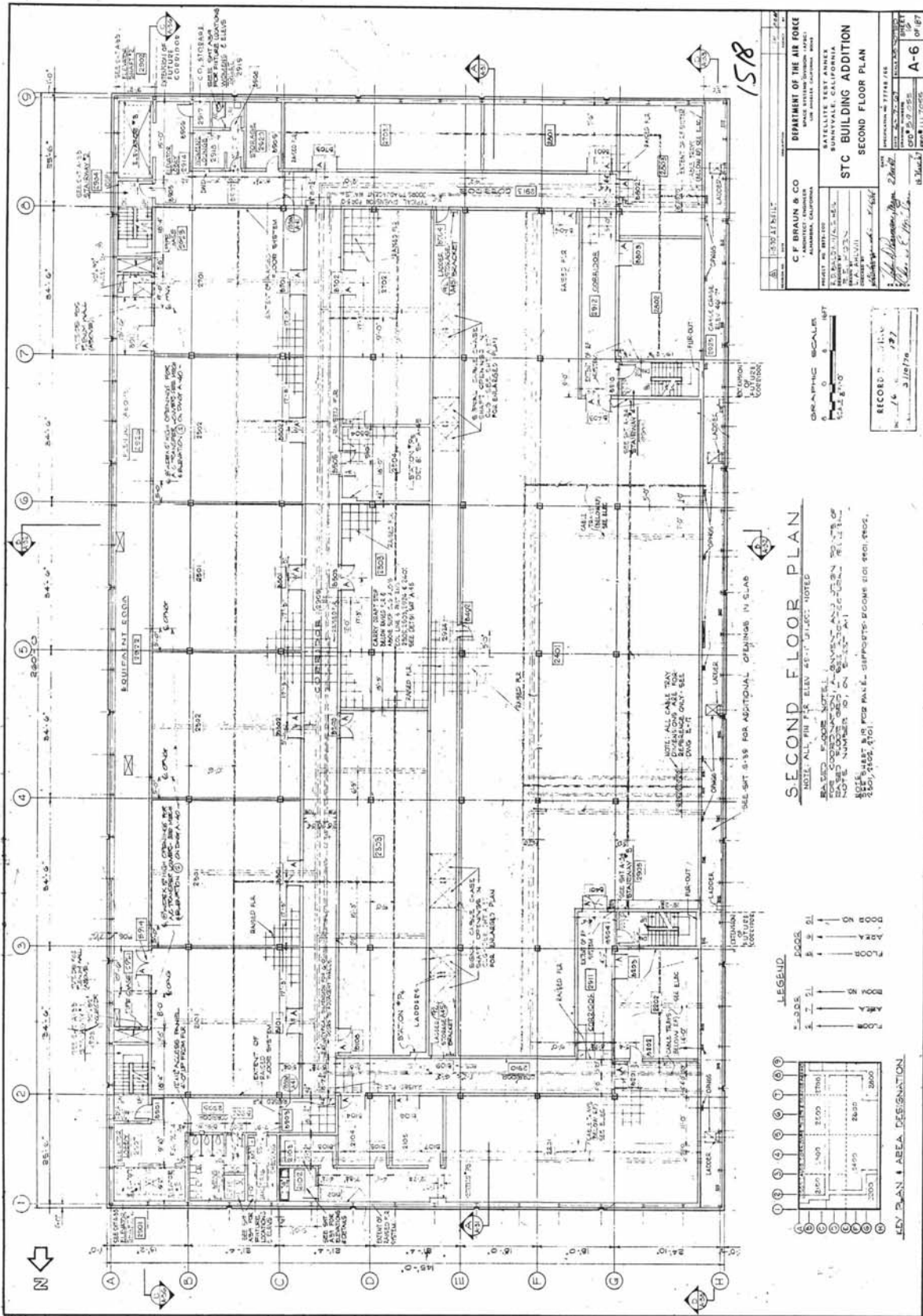
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C. F. BRAIN & CO. ARCHITECTS 1000 W. 10TH ST., SUITE 100 DENVER, COLORADO	
SATELLITE TEST CENTER STC BUILDING ADDITION SECOND FLOOR PLAN	
DRAWN BY: [Name] CHECKED BY: [Name] DATE: [Date]	PROJECT NO.: [Number] SHEET NO.: [Number] OF [Total]

GRAPHIC SCALE
 0 5 10 FT
 0 15 30 M

RECORD
 NO. 16
 DATE 3/18/76

SECOND FLOOR PLAN

NOTE: ALL FIN FLS. ELEV. AS NOTED.

NOTE: ALL CABLE TRAY SCHEDULES AND JUNCTION BOXES TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, 1975 EDITION.

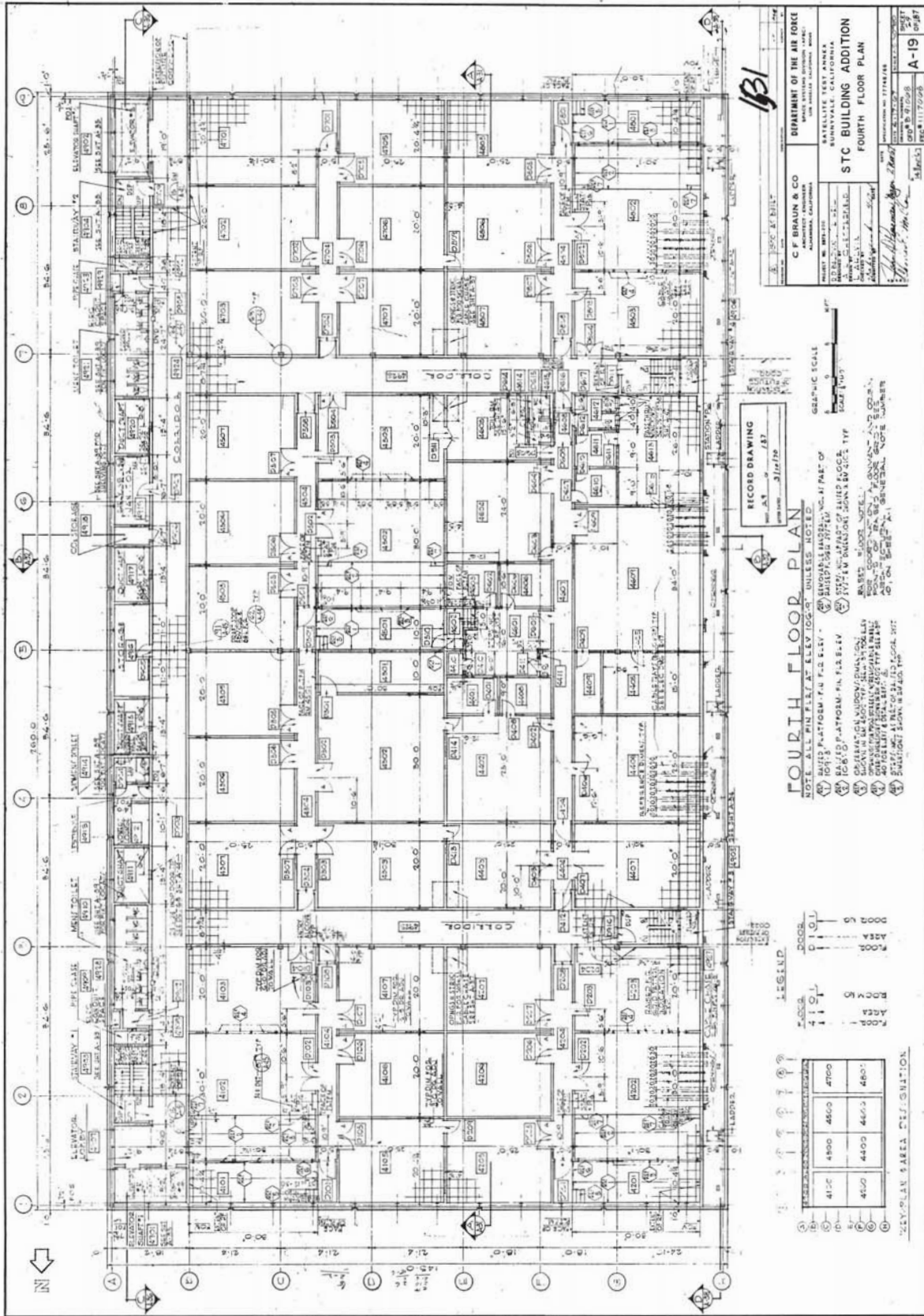
NOTE: ALL CABLE TRAY SCHEDULES AND JUNCTION BOXES TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, 1975 EDITION.

LEGEND

—	WALL
—	DOOR
—	WINDOW
—	FLOOR
—	CEILING
—	MECHANICAL
—	ELECTRICAL
—	PLUMBING
—	TELEPHONE
—	TELEVISION
—	RECORDING
—	VIDEO
—	OTHER

GRID PLAN - AREA DESIGNATION

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10



FOURTH FLOOR PLAN

NOTE: ALL FIN F.L.T. AT ELEV. 100'-0" UNLESS NOTED

- (1) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (2) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (3) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (4) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
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- (15) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (16) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (17) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (18) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (19) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED
- (20) BAIRD PLATFORM - FIN. F.L.T. ELEV. 100'-0" UNLESS NOTED

LEGEND

DOOR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ROOM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

REV. PLAN AREA DIS. SUCTION

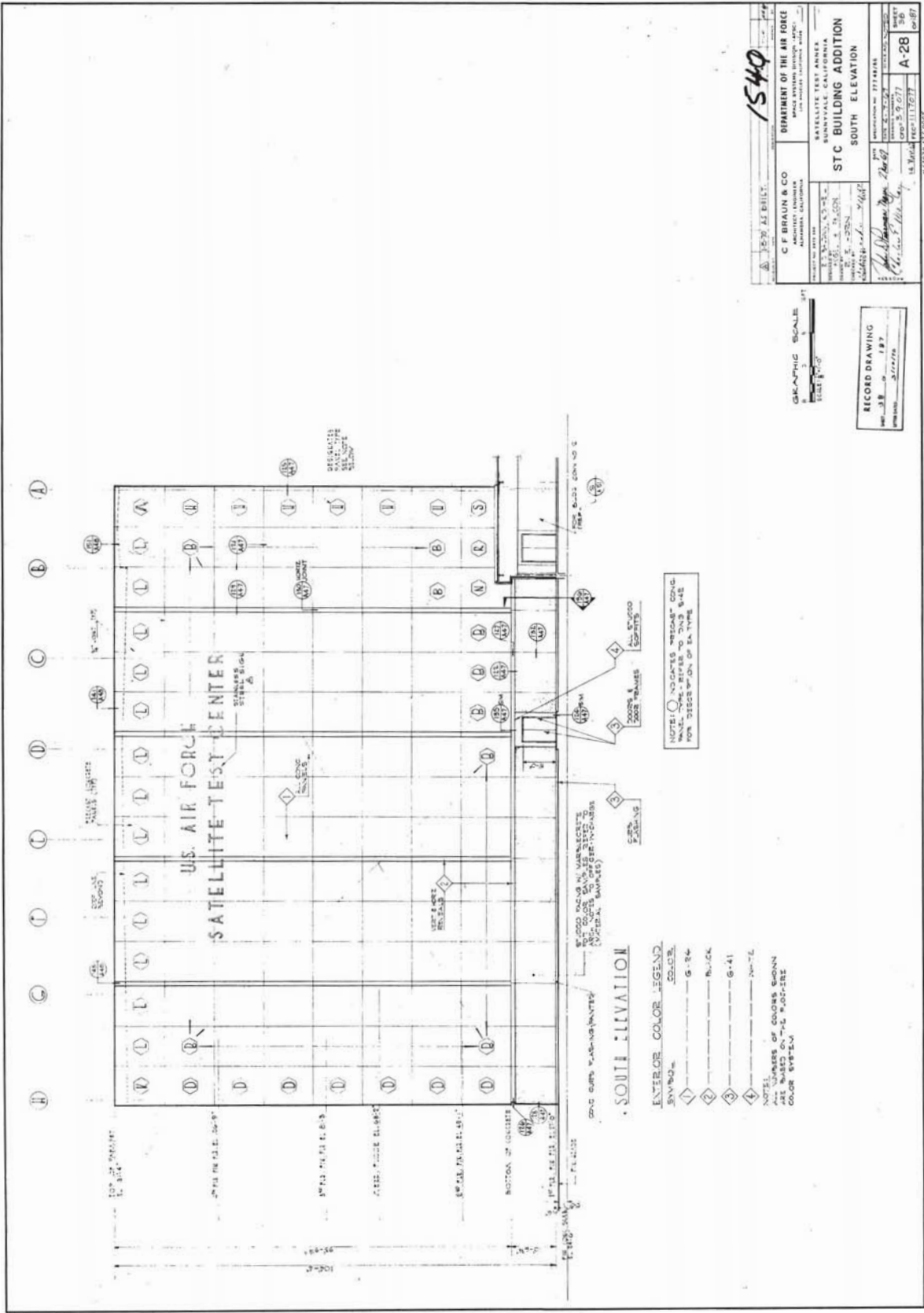
RECORD DRAWING
DATE: 11/17/57
SCALE: 3/16" = 1'-0"

DEPARTMENT OF THE AIR FORCE
SPACE SYSTEMS DIVISION (AFSC)
SATELLITE TEST CENTER
BUNNYVALE, CALIFORNIA

STC BUILDING ADDITION
FOURTH FLOOR PLAN

C.F. BRAUN & CO.
ARCHITECTS
2221 BROADWAY
SAN FRANCISCO, CALIFORNIA

PROJECT NO. 1003-4
DRAWING NO. 1003-4-19
DATE: 11/17/57
BY: [Signature]
CHECKED: [Signature]



1540

C. P. BRAUN & CO.
 ARCHITECTS

BUILDING OF THE AIR FORCE
 SATELLITE TEST CENTER
 SUNNYVALE, CALIFORNIA

STC BUILDING ADDITION
 SOUTH ELEVATION

RECORD DRAWING

SCALE

DATE

1957

NO. 38

REV. 1

REV. 2

REV. 3

REV. 4

REV. 5

REV. 6

REV. 7

REV. 8

REV. 9

REV. 10

REV. 11

REV. 12

REV. 13

REV. 14

REV. 15

REV. 16

REV. 17

REV. 18

REV. 19

REV. 20

REV. 21

REV. 22

REV. 23

REV. 24

REV. 25

REV. 26

REV. 27

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US AIR FORCE SATELLITE TEST CENTER
BUILDING 1003
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No.USAF041221A-C

SECTION II

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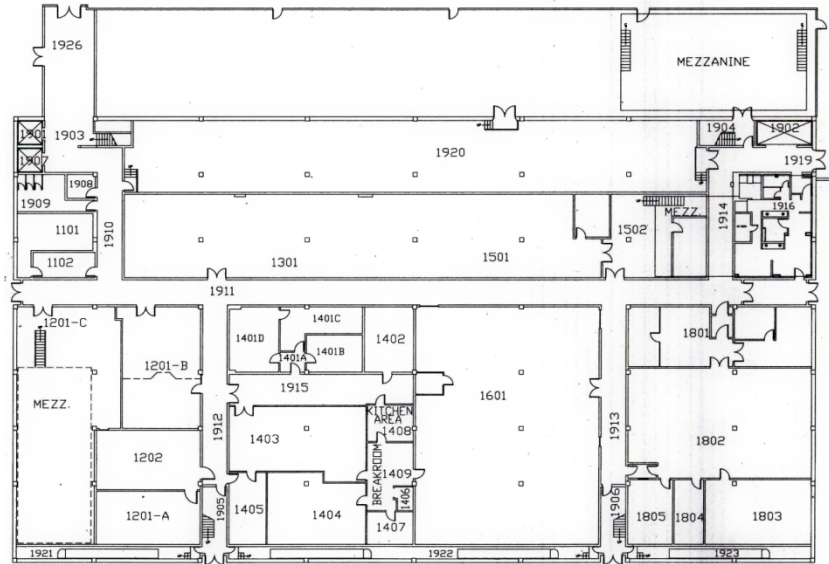
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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

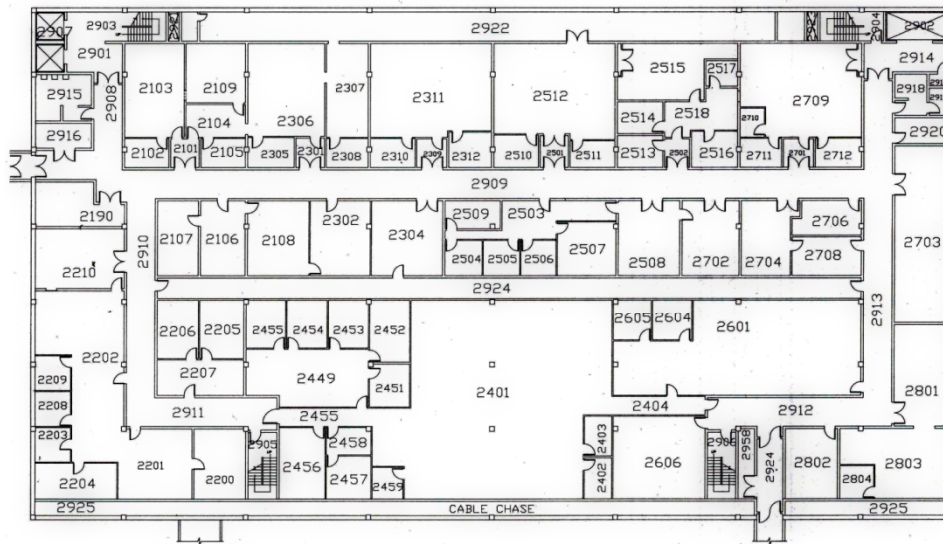
3
4 **INDEX TO PHOTOGRAPHS**

5		
6	U.S. AIR FORCE SATELLITE TEST CENTER	Log No. USAF041221A-C
7	BUILDING 1003	
8	Onizuka Air Force Station	
9	1080 Innovation Way	
10	City of Sunnyvale	
11	Santa Clara County	
12	California	
13		
14	Anne Jennings, Photographer	Date of Photographs: June 7-14, 2010
15		
16	Log No. USAF041221A-C-01	VIEW OF SOUTH AND WEST FAÇADES,
17		LOOKING NORTHEAST. NOTE FIVE SETS OF
18		THREE CONCRETE PANELS, PUNCTUATED
19		BY METAL REVEALS.
20		
21	Log No. USAF041221A-C-02	VIEW OF SINGLE-STORY, T-PLAN HYPHEN
22		APPENDED TO SOUTH FAÇADE OF
23		BUILDING 1003 AND WEST FAÇADE OF
24		BUILDING 1004, LOOKING NORTHEAST.
25		NOTE MARBLECRETE WITH STUCCO-CLAD
26		SURFACE.
27		
28	Log No. USAF041221A-C-03	VIEW OF ROOM 4507 ON FOURTH STORY,
29		LOOKING SOUTH. NOTE RAISED FLOOR
30		AND ACOUSTICAL TILE-CLAD CEILING
31		INDICATIVE OF ITS FORMER FUNCTION AS
32		A COMPUTER ROOM.
33		
34	Log No. USAF041221A-C-04	VIEW OF MEZZANINE BETWEEN SECOND
35		AND THIRD STORIES, LOOKING NORTH.
36		NOTE MECHANICAL EQUIPMENT,
37		INCLUDING LARGE AIR HANDLING UNITS
38		(AHU) NECESSARY TO MAINTAIN
39		SATELLITE OPERATIONS.

U.S. AIR FORCE SATELLITE TEST CENTER, BUILDING 1003
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First Story

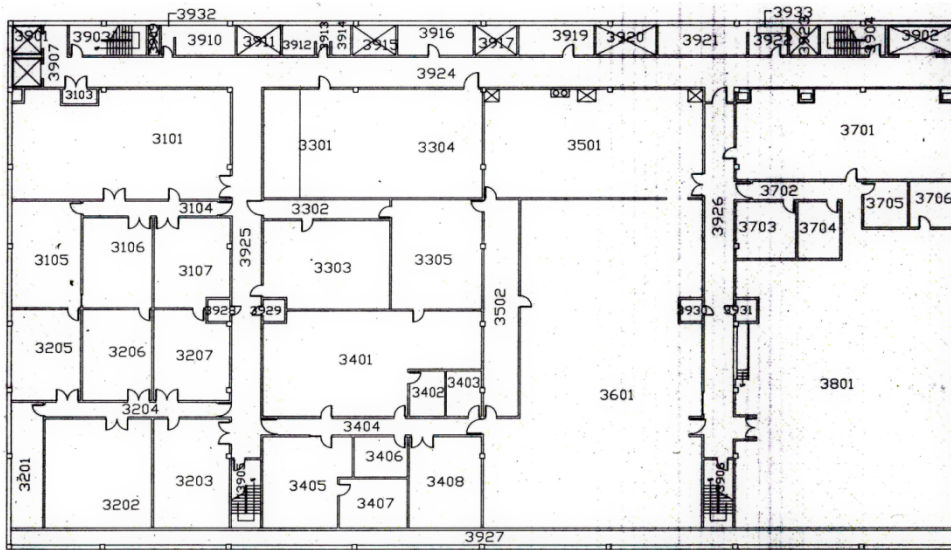


Second Story

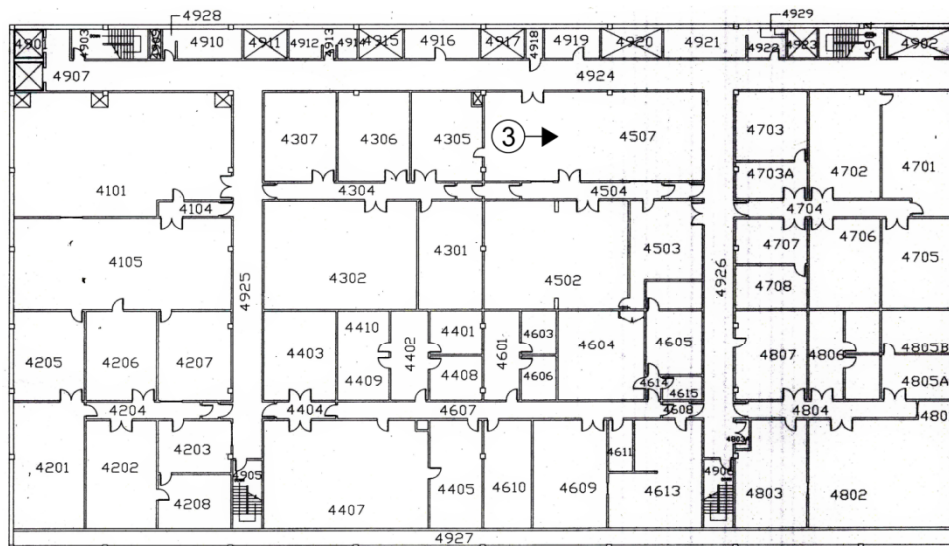
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U.S. AIR FORCE SATELLITE TEST CENTER, BUILDING 1003
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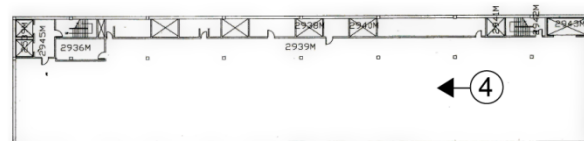
Third Story



Fourth Story

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Mezzanine

Building 1003; Third and Fourth Stories, and Mezzanine









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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1004
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-D

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

California Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1004
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-D

SECTION I

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**
3

4 **U.S. AIR FORCE SATELLITE TEST CENTER**
5 **BUILDING 1004**
6

7 **Log No. USAF041221A-D**
8

9
10 **A. Location:** Building 1004, Onizuka Air Force Station
11 1080 Innovation Way, Sunnyvale, Santa Clara County, California
12

13 **B. Significance:** Building 1004, constructed in 1970 to serve as the installation's power
14 plant, is a contributing resource to the National Register-eligible U.S. Air Force Satellite
15 Test Center Historic District. The district is significant at a national, state, and local level
16 under Criterion A for its associations with satellite reconnaissance during the Cold War,
17 and Criteria Consideration G, because five of the six buildings, including Building 1004,
18 are not yet fifty years old, and have exceptional importance for their associations with
19 satellite reconnaissance during the Cold War.
20

21 The U.S. Air Force Satellite Test Center Historic District is significant at the national
22 level for its association with satellite reconnaissance during the Cold War. The
23 installation was established in 1959 to serve as the command-and-control center for the
24 first reconnaissance satellite program, the Corona Program. It was developed by the U.S.
25 Air Force and the Central Intelligence Agency (CIA), with assistance from a private
26 contractor, Lockheed Missiles and Space Division. Shortly thereafter, the National
27 Reconnaissance Office (NRO) was established to provide oversight of the program and
28 develop other satellite programs. As new satellite technologies emerged, such as
29 communications, early missile warning, meteorology, navigation, and nuclear detonation
30 detection, Building 1004 was constructed to provide a reliable source of electrical and
31 mechanical power to the installation. Upon its completion in 1970, it served as the sole
32 source of power, and ensured that critical, and often classified, satellite programs were
33 overseen at the installation. These programs provided valuable data throughout the Cold
34 War, and were supported from the U.S. Air Force Satellite Test Center Historic District.
35 Although many of the satellite programs remain classified, it is apparent through the
36 continued presence of the NRO that the installation played a key role in the United
37 States' conduct of the Cold War.
38

39 The U.S. Air Force Satellite Test Center Historic District is also significant at the state
40 and local levels for its association with the development of California as a leader in
41 technological innovations. California, and specifically the City of Sunnyvale in Silicon
42 Valley, began to emerge as a leading technological center during the Cold War. This was
43 due, in part, to the military's investment in the development of defense technologies in
44 California, such as command and control of reconnaissance satellites at Onizuka Air
45 Force Station (AFS). The presence of Lockheed Missiles and Space Division in

1 Sunnyvale in the mid-1950s, followed by Onizuka AFS in the late 1950s, burnished its
2 reputation as a high-technology center. The district's period of significance extends from
3 1959, the date of development of the installation, through 1991, the conclusion of the
4 Cold War.

5
6 **C. Description:**

7
8 **1. Current Description**

9
10 Building 1004 was completed in 1970 to serve as the installation's power plant. It is a
11 two-story, rectangular-plan, windowless, utilitarian steel-frame building sheathed in pre-
12 cast concrete panels that measure approximately 21'x 8'. It is set atop a concrete-pile
13 foundation and is capped by a flat, built-up, asphalt-clad roof and parapet articulated with
14 blue-painted galvanized steel.

15
16 The north façade is ten panels wide and two panels high, and is appended to the south
17 façade of Building 1001. It is mostly obscured by Building 1001. Numerous pipes pierce
18 the north façade associated with Building 1001's mechanical equipment.

19
20 The south façade is also ten panels high and two panels wide. It forms part of the 1992
21 addition, known as the Emergency Utility Building (EUB). The addition was designed in
22 a context sensitive manner to the original building. The south façade is pierced by a
23 central metal roll-up garage door, set within a metal surround. A metal door with a metal
24 handle pierces the garage door. The garage door is topped with a flat aluminum-clad
25 overhang, and a metal-louvered vent pierces the façade above the overhang.

26
27 The east façade is pierced by nine two-story metal-louvered vents. Moving from north to
28 south, metal fire stairs with metal pipe railings are appended to the east façade, and
29 provide access to a metal door with metal hardware, set within a metal surround on the
30 second story. The door is topped by an aluminum overhang and safety light. South of the
31 stairs, the façade is pierced by a metal door, with metal handles, set within a metal
32 surround. The door is topped by an aluminum overhang and safety light. Thousand gallon
33 and 300 gallon gas tanks are appended south of the door and six air intake chambers are
34 appended south of the gas tanks. An addition clad in vertical metal siding, supported by
35 steel beams, is appended to the second story of the east façade, located above the two
36 southernmost air intake chambers. The southernmost portion of the façade forms part of
37 the 1992 EUB addition. Multiple pipes are appended to the east façade.

38
39 The west façade is pierced by nine two-story, metal-louvered vents. Moving from north
40 to south, a single-story hyphen is appended to the northernmost portion of the west
41 façade. It connects Building 1004 to Buildings 1001 and 1003. The section appended to
42 Building 1003 is set atop a concrete foundation, capped by a stucco-clad parapet

1 articulated with blue-painted galvanized steel. A double-metal door with no exterior
2 hardware, set within a metal surround, pierces the west façade. A concrete step provides
3 access to the entry, set behind three metal bollards. Six air intake chambers are located
4 south of the hyphen. A metal-roof shed, supported by metal posts, is appended to the
5 façade south of the air intake chambers. It is open on the north and west facades, clad in
6 concrete panels on the south façade, and enclosed by a chain-link fence, topped with
7 barbed-wire. It shelters transformers and other mechanical equipment. A metal roll-up
8 garage door set within a metal surround, topped by an aluminum overhang pierces the
9 façade south of the shed. A safety light is located south of the door. The southernmost
10 portion of the façade forms part of the 1992 EUB addition.

11
12 Mechanical equipment is located on the roof, including turbine stacks that are behind
13 metal screens. A mechanical penthouse, clad in concrete, and capped by a flat roof, is
14 situated on the southwest corner of the roof. Additional mechanical equipment is located
15 on the northern section of the roof.

16
17 The first story of Building 1004 encompasses 15,033 square feet and the second story
18 encompasses 15,300 square feet. A current sketch plan is included in the Index to
19 Photographs. Although an addition was appended to the south façade in the early-1990s,
20 a comparison of the original floor plan with the current floor plan indicates that the
21 majority of interior spaces have retained their original configuration, and in some cases,
22 finishes and mechanical equipment as well.

23
24 The first story houses small rooms along the north side, including the Battery Room
25 (Room 103), the defunct Pump Room (Room 101), the Turbine Start Rectifier Room
26 (Room 102), and the Locker Room/Restrooms (Room 105). The Equipment Room
27 (Room 100) encompasses the remainder of the first story and houses mechanical
28 equipment. Major mechanical equipment includes twelve original American Air Filter
29 Company air inlet structures located along the east and west walls; absorption chillers,
30 including York centrifugal chillers and defunct Trane absorption chillers; electric panels;
31 and circuit breakers. Select electric panels and circuit breakers are original to the
32 building.

33
34 The second story also houses small rooms along the north side, including the Control
35 Room (Room 201) which houses the original Solar Console; a Kitchen (Room 210) and
36 Office (Room 202), as well as a restroom. The south wall of the Control Room is pierced
37 by a sound control window that enables personnel to oversee the Equipment Room. The
38 Equipment Room (Room 200) encompasses the remainder of the second story and houses
39 mechanical equipment, including twelve original Solar gas turbine generator sets and
40 original Besler heat recovery boilers.

1 Finishes are in keeping with the building's industrial function, and typically include
2 plaster walls, concrete floors, and exposed ceilings in equipment areas, and plaster walls,
3 vinyl tiles, and dropped ceilings in smaller rooms.
4

5 **2. According to Original Plan**
6

7 Original plans of Building 1004 are on file in the Civil Engineering Office, Building
8 1002, Onizuka AFS, Sunnyvale, Santa Clara County, California. Original building plans
9 were prepared in 1969 by C.F. Braun & Company under the auspices of the U.S. Naval
10 Facilities Engineering Command (NAVFAC) Western Division, San Bruno, California,
11 and U.S. Air Force Space and Missiles System Organization (SAMSO), Los Angeles,
12 California. Mechanical plans were developed by consulting engineers, Pope, Evans &
13 Robbins, on behalf of Solar, a division of International Harvester Company, based in San
14 Diego, California. The following plans are reproduced in the graphic documentation
15 section of the report:
16

- 17 • "Power Plant, First Floor Plan, Interior Elevations and Reflected Ceiling
18 Plan" (C.F. Braun & Company/NAVFAC/SAMSO, August 12, 1968a)
- 19 • "Power Plant, Second Floor Plan, Interior Elevations and Reflected
20 Ceiling Plan" (C.F. Braun & Company/NAVFAC/SAMSO, August 12,
21 1968b)
- 22 • "Power Plant, Exterior Elevations and Sections" (C.F. Braun &
23 Company/NAVFAC/SAMSO, August 12, 1968c)
24

25 In addition, historic photographs were also consulted to determine the original
26 appearance of the building. A sampling of historic photographs are reproduced in the
27 graphic documentation section of the overview report entitled California State Historic
28 Preservation Office, Historic American Building Survey Level II-Type Documentation,
29 U.S. Air Force Satellite Test Center, Log No. USAF041221A.
30

31 According to the original plans, Building 1004's original exterior appearance was similar
32 to its current appearance, in terms of cladding, foundation, and roof. The north façade
33 had no fenestration. The east façade was pierced by six two-story metal-louvered vents,
34 and by two doors towards the southern end of the façade. The south façade was pierced
35 by one central steel roll-up steel door on the first story, flanked by metal panels to the
36 east and west, topped by a metal canopy. Steel fire stairs were appended to the south
37 façade, and provided access to a second-story door. The west façade was pierced by two-
38 story metal-louvered vents (C.F. Braun/NAVFAC/SAMSO, August 12, 1968c-d).
39

40 According to the original plans, the original configuration of the first and second stories
41 was similar to the current configuration. Room functions were also similar, with the
42 exception of Room 102 which originally served as the Maintenance Shop. Original

1 finishes were similar to the current finishes, and were in keeping with the building's
2 industrial function. Select non-extant original mechanical equipment included Carrier
3 absorption chillers.
4

5 **D. History:**

6
7 **1. Development of the Satellite Test Center, 1959-61**
8

9 The development of satellite reconnaissance during the Cold War (1946-91) and the
10 specific role of the STC is fully described in the associated overview report, California
11 State Historic Preservation Office Historic American Building Survey Level II-Type
12 Documentation, U.S. Air Force Satellite Test Center, Log No. USAF041121A. The
13 following section provides a brief summary of the role that Building 1003 played at the
14 STC from 1959-91, its period of significance.
15

16 The installation was established in 1959 when Building 1001 was constructed to serve as
17 the command-and-control center for the Corona Program to support the launch, orbit, and
18 recovery of Corona satellites. The Corona Program, initiated in 1958, was the first
19 reconnaissance satellite program developed by the U.S. Air Force and the CIA, with
20 assistance from private contractors, such as Lockheed Missiles and Space Division,
21 located in Sunnyvale, California. Concerns about preserving the secrecy of the Corona
22 Program and its objectives led to the designation of the Discoverer Program as a cover
23 program. The publicly-stated goal of the Discoverer Program was scientific research
24 (Richelson, 2002). Prior to the construction of Building 1001, at least eight Corona
25 satellites, described as Discoverer satellites in the press, were launched from Vandenberg
26 Air Force Base (AFB), and were supported from an interim control center in Palo Alto,
27 California. Tracking stations located around the world also provided support.
28

29 In 1959, the U.S. Air Force acquired 11.43 acres of land in Sunnyvale from Lockheed
30 Missiles and Space Division located to the west. Plans for the installation were designed
31 by the Ralph M. Parsons Company, an architecture and engineering firm based in Los
32 Angeles, California, under the auspices of the U.S. Air Force Ballistic Missile Division
33 (AFBMD) in Englewood, California (Ralph M. Parsons Company/AFBMD, March 6,
34 1959).
35

36 On January 28, 1960, the installation, newly designated as the STC, was dedicated by the
37 U.S. Air Force (Davies, 1960). A few months later, on March 1, 1960, it was occupied by
38 the 6594th Aerospace Test Wing (ATW), the first unit to be tasked with military satellite
39 operations; Lockheed Missiles and Space Division employees; and likely the CIA. The
40 6594th ATW provided oversight for Lockheed Missiles and Space Division which was
41 responsible for satellite operations (6594th ATW, 1961; Jernigan, 1983). However,
42 portions of the building remained under construction, including the state-of-the-art

1 Satellite Control Room in the Satellite Control Room Complex. An interim Satellite
2 Control Room was established from which Lockheed Missiles and Space Division,
3 monitored by the 6594th ATW, could direct the launch, tracking, data acquisition,
4 command and control, and recovery phase of military satellites (6594th ATW, 1961;
5 Jernigan, 1983).

6
7 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
8 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
9 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
10 the public, likely due in part to a building sign which indicated "U.S. Air Force Satellite
11 Test Center." On February 6, 1961, the Satellite Control Room and remainder of the
12 Satellite Control Room Complex became operational. The primary purpose of the
13 complex was to support Corona satellites, although additional programs were supported
14 by this time (Jernigan, 1983).

15
16 **2. Significant Events and Satellites Supported, 1960-61**

17
18 In August 1960, the U.S. Air Force accomplished the first successful retrieval of a
19 Discoverer satellite. On August 10, Discoverer XIII was launched from Vandenberg
20 AFB, and was supported by the STC. The satellite achieved polar orbit for a period of
21 ninety-four minutes, during which time it was in contact with worldwide tracking
22 stations, and the interim Satellite Control Room at the STC. During its seventeenth
23 rotation of the earth, the eject command was issued from the STC, and the capsule was
24 ultimately recovered from the Pacific Ocean, marking the first successful retrieval of an
25 object from space (Arnold, 2005; 6594th ATW, no date [n.d.]). In-keeping with the
26 publicly stated scientific objectives of the Discoverer Program, the *San Jose Mercury*
27 *News* noted that "Discoverer recovery techniques will be used soon to return monkeys
28 from space," and were vital to "returning a man to earth after orbiting in space" (Lindsey,
29 August 12, 1960). Still in the testing phase, the satellite did not yet contain a camera
30 (Jernigan, 1983).

31
32 Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from
33 Vandenberg AFB (Arnold, 2005). Discoverer XIV orbited the earth seventeen times,
34 supported by the STC from the interim Satellite Control Room in Building 1001, and the
35 Kodiak tracking station, before the eject command was relayed to the satellite. Following
36 the command, at 300 miles above the earth, the satellite recovery vehicle (SRV)
37 separated from the spacecraft, and began its descent to earth, where it was caught by a
38 specially equipped Fairchild C-119 *Flying Boxcars* (C-119) piloted by U.S. Air Force
39 Captain Harold Mitchell (*The New York Times*, August 20, 1960).

40
41 The Discoverer XIV SRV contained 20 pounds of film which documented over
42 1,650,000 square miles, and provided the first successful satellite reconnaissance

1 photographs of the Soviet Union. It also resulted in more photographic coverage of the
2 Soviet Union than all previous U-2 flights combined. Furthermore, it provided evidence
3 that the missile gap, feared since the 1957 launch of *Sputnik I* by the Soviet Union, did
4 not exist, and that the Soviets did not have an immense stockpile of Intercontinental
5 Ballistic Missiles (ICBMs) (Day, 2006). However, despite the historic nature of this
6 event, the crew, who were not cleared for the Corona Program, were unaware of the
7 importance of their mission (Arnold, 2005).
8

9 Although the STC was developed to support the Corona Program, by the fall of 1960, it
10 also supported the Satellite and Missile Observation System (SAMOS) and Missile
11 Detection Alarm System (MIDAS). Both programs were initially developed by the U.S.
12 Air Force in the mid-1950s as reconnaissance and missile detection satellites,
13 respectively (Jernigan, 1983). On October 11, 1960, the first SAMOS satellite was
14 launched from Vandenberg AFB, and supported from the STC, although it failed to reach
15 orbit (*San Jose Mercury News*, October 12, 1960). By July 1961, MIDAS satellites were
16 launched from Vandenberg AFB and supported by the STC. By the end of 1961, two
17 MIDAS satellites had reached orbit (6594th ATW, 1961).
18

19 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
20 Corona satellite supported by the STC from the new control room. By this time, Corona
21 satellites were regularly providing images of the Soviet Union, as well as other
22 communist countries. Among these images included evidence of the building of the
23 Berlin Wall between East and West Germany (Chapman, 2008). In September 1961, the
24 NRO was established as a classified agency in the Department of Defense (DoD), and
25 was tasked with oversight of reconnaissance satellite programs, including the Corona
26 Program, and therefore became a presence at the STC (Richelson, 2000).
27

28 **3. Building 1002 Construction and Upgrades, 1962**

29
30 In 1962, the STC experienced its first of many expansions when plans for a two-story, L-
31 shaped administrative building – Building 1002 (Addition to the Satellite Test Annex) -
32 were prepared for the U.S. Air Force Space Systems Division (SSD) by Kaiser Engineers,
33 a division of the Henry J. Kaiser Company. Kaiser Engineers was a well-known
34 architecture and engineering firm located in Oakland, California (Kaiser Engineers/U.S.
35 Air Force SSD, January 15, 1962a-b; Air Force Satellite Control Facility (AFSCF),
36 1972).
37

38 During this time, Kaiser Engineers also prepared plans for a single-story addition to
39 Building 1001 to house new a new communications center, and interior modifications to
40 the Satellite Control Room Complex (Kaiser Engineers/U.S. Air Force SSD, October 17,
41 1962a-b - 1325; Jernigan, 1983).
42

1 The 1962 renovations were likely implemented in conjunction with the U.S. Air Force's
2 first modernization effort, the Multiple Satellite Augmentation Program (MSAP). This
3 effort was initiated in part, to standardize and provide updated equipment to the STC and
4 tracking stations which enabled them to simultaneously support multiple satellite
5 programs (Lockheed Missiles and Space Division, 1963). Computer capabilities were
6 upgraded, new display and communications equipment were also installed, and
7 connections between the STC and tracking stations were upgraded (Jernigan, 1983).
8

9 **4. Significant Events and Satellites Supported, 1962-64**

10
11 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
12 The following month, the DoD classified all military satellite programs (DoD, March 23,
13 1962). As a result, Discoverer XXXVIII was the last satellite launched as part of the
14 Discoverer program. Corona satellites continued to be launched and supported by the
15 STC, however, because all satellites were classified, the Corona Program no longer
16 required a cover story.
17

18 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
19 satellites had accurately mapped all twenty-five of Moscow's long-range missile sites.
20 Furthermore, images taken by Corona satellites indicated that China was readying its
21 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that "[O]n
22 the basis of new overhead photography, we are now convinced that the previously
23 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
24 for use in about two months." Within two months, on October 16, 1964, China tested an
25 atomic bomb at the Lop Nur site (Broad, September 12, 1995).
26

27 In addition to Corona, SAMOS, and MIDAS satellites, the STC supported the Defense
28 Meteorological Satellite Program (DMSP) in 1962 and 1963. DMSP was a
29 meteorological satellite program initiated in 1960 to provide weather and climate data for
30 more effective military operations (DMSP, n.d.). On October 16, 1963, the first Vela
31 satellite was launched and supported by the STC. The Vela Program – vela means vigil in
32 Spanish – was a series of satellites designed to detect nuclear detonations (Jernigan,
33 1983; Peebles, 1997). Presumably, Vela satellites provided images of the Lanzhou
34 Diffusion Plant in Lanzhou, China and the Baotao Nuclear Fuel Component Plant in
35 Baotao, China (Richelson, 2002).
36

37 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
38 Furthermore, 1963 marked the beginning of the Keyhole (KH)-7 surveillance system,
39 noted in a 2006 NRO memo as "the Intelligence Community's first high resolution
40 surveillance or 'spotting' satellite." Similar to Corona satellites, the KH-7 was a
41 reconnaissance satellite that returned film to earth in SRVs. It was primarily used to

1 provide surveillance of nuclear facilities and Intermediate Range Ballistic Missiles
2 (IRBM) in the Soviet Union and China (NRO, 2006).

3
4 In July 1964, two additional Vela satellites were launched, resulting in a total of four
5 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III
6 was launched and was supported by the STC. Syncom III was a National Aeronautics and
7 Space Administration (NASA) satellite used for DoD military communications
8 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).

9
10 **5. Construction, Upgrades, and Designation of the Air Force Satellite Control Facility,**
11 **1964-67**

12
13 In May 1964, plans were prepared for a two-story, L-shaped administrative addition to
14 Building 1002. It was designed by Maher & Martens, a San Francisco-based architecture
15 firm for the U.S. Army Corps of Engineers (USACE), Sacramento District. The addition
16 was appended to the east façade of Building 1002, and created an interior courtyard. A
17 hyphen connected the south façade of Building 1002 to the north façade of Building 1001
18 (Maher & Martens/USACE Sacramento District, May 7, 1964; AFSCF, 1972).

19
20 In 1965, the U.S. Air Force Satellite Control Facility (AFSCF) was officially designated.
21 The mission of the AFSCF was to direct launch, tracking, data acquisition, command and
22 control, and recovery of DoD military satellites. Following the establishment of AFSCF,
23 an Interim Expansion Plan (IEP) was initiated to augment the facility and implement the
24 Mission Control Center (MCC) concept. The concept focused on the development of
25 mission-oriented control centers rather than a single control room (Jernigan, 1983).

26
27 Plans were prepared by San Francisco-based consulting engineers, Bentley Engineers and
28 Earl & Wright, Inc., under the auspices of the U.S. Air Force SSD to develop multiple
29 MCCs in Building 1001. The plans indicate that the building was reconfigured to
30 accommodate four new MCCs, known as MCCs 1, 2, 3, and 4. In addition, the building
31 also featured two new complex areas, known as Complex Numbers 6 and 7. The plans
32 also indicated that two new communications areas, labeled as Communications Area A
33 and B, were added, as well as a new bird buffer area (Bentley Engineers and Earl &
34 Wright, Inc./U.S. Air Force SSD, December 13, 1965a-d). The majority of the work was
35 completed by December 1966 (AFSCF, January-June 1966).

36
37 **6. Significant Events and Satellites Supported, 1965-70**

38
39 The increase in the number of flight support hours logged by the AFSCF between 1965-
40 66 appears to indicate that at least some of the MCCs were operational in 1966. In 1965,
41 the AFSCF logged 20,757 hours of satellite flight support. By 1966, 29,400 hours of
42 flight support were logged. The number of satellites supported also increased. In 1965,

1 the STC supported approximately fourteen satellites (AFSCF, 1972). In January 1967, the
2 STC supported thirty-one satellites per day, and by June were supporting forty-four per
3 day, which was expected to increase to forty-seven per day by July (AFSCF January-June
4 1967).

5
6 Between 1965-70, the STC supported over forty Corona satellite launches (Mission and
7 Spacecraft Library, n.d.). By 1966, upgrades to the installation had resulted in an increase
8 in involvement in satellite programs. In addition to Corona, Vela, and other programs
9 (many of which likely remained classified) new programs such as NASA's Biosatellite
10 Program were supported. The Biosatellite Program was a series of three satellites
11 designed to assess the effects of spaceflight on living organisms. Support for the program
12 focused on directing operations of the recovery of the satellites by Lockheed C-130
13 *Hercules* (C-130) aircraft flown by the 6594th Aircraft Recovery Group based at Hickam
14 AFB, Honolulu, Hawaii (Jernigan, 1983).

15
16 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
17 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
18 SESP was responsible for providing flights for research and experiments undertaken by
19 government agencies (AFSCF, January-June 1968; Jernigan, 1983). In 1967, the KH-7
20 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
21 of which successfully returned usable images (NRO, 2006).

22
23 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
24 supported by the STC, uncovered the Soviet Union's plans for the invasion of
25 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
26 monitored Soviet radio transmissions which signaled the invasion was imminent, and
27 photographic reconnaissance satellites had monitored unusual military activities on the
28 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops" (*San*
29 *Jose Mercury News*, August 27, 1968).

30
31 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
32 supported by the STC and tracking stations. The LES was an experimental satellite used
33 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).

34
35 In 1969, support was provided for NASA's manned flights to the moon. The STC
36 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar landing.
37 Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program 949 was
38 designated in November 1966 to supplant Program 461, which had initially supplanted
39 the MIDAS Program in 1963. Program 949 provided a wider range of capabilities, and by
40 the 1970s, was expected to have "progressively enhanced world-wide early-warning,
41 surveillance and detection capabilities" (Piper, 1970).

1 **7. Development of Buildings 1003 and 1004, 1966-70**

2
3 In conjunction with the technological upgrades which occurred throughout the mid-to-
4 late 1960s, a real estate estimate was prepared by the USACE Sacramento District in
5 August 1966 that proposed the acquisition of 8.2 acres of land from Lockheed Aircraft
6 Corporation at a cost of \$49,000. In 1966, Alhambra, California-based architecture and
7 engineering firm, C.F. Braun & Company, under the auspices of the U.S. Naval Facilities
8 Engineering Command (NAVFAC) Western Division, San Bruno, California, and
9 SAMSO, Los Angeles, California, prepared site development plans (C.F. Braun &
10 Company/NAVFAC/SAMSO, December 30, 1966).

11
12 C.F. Braun & Company was founded by Carl Braun in 1909, and quickly became well-
13 known for construction of industrial facilities, including oil refineries and chemical plants
14 (*The New York Times*, February 5, 1954). Although Braun died in 1954, the reputation he
15 had established for his company as a builder of industrial facilities likely led to his
16 selection by SAMSO to develop the STC's new buildings. Carl Swenson, Inc. of San
17 Jose, California, and the Powerhouse Oakland Construction Company of Salt Lake City,
18 Utah, served as contractors (*Aerospace Daily*, September 19, 1969).

19
20 Site development plans, dated December 30, 1966, included relocation of an existing
21 Lockheed Missiles and Space building, realignment of Lockheed Martin Way (formerly
22 known as East Perimeter Road) west of Building 1001, creation of additional parking
23 space, and installation of underground utilities (C.F. Braun &
24 Company/NAVFAC/SAMSO, December 30, 1966). In addition, C.F. Braun & Company
25 also prepared plans for the development of two new buildings, Building 1003 (STC
26 Building Addition), and Building 1004 (Power Plant) (C.F. Braun/NAVFAC /SAMSO,
27 November 14, 1967; August 12, 1968a).

28
29 By 1968, funds were appropriated for acquisition of the land and construction of the two
30 buildings, and in August, Lockheed Aircraft Corporation transferred the land to the U.S.
31 Air Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). That year, the *San Jose*
32 *Mercury News* reported that the STC would be "updated in a project expected to cost
33 more than \$40 million" to support the Manned Orbiting Laboratory (MOL) Program (*San*
34 *Jose Mercury News*, January 10, 1967 & January 17, 1967). The MOL Program was
35 initiated in 1963, and involved a Titan III booster rocket which carried a modified
36 Gemini B capsule attached to a space laboratory, and was intended to serve
37 reconnaissance purposes.

38
39 In September 1967, the U.S. Air Force announced plans to build a four-story, 150,000-
40 square-foot addition at the STC (*San Jose Mercury News*, September 16, 1967). As noted
41 in the January 1967 *San Jose Mercury News* articles, Building 1003 was designed to
42 house the MOL Program as well as other satellite programs. However, in June 1969, the

1 DoD announced the cancellation of the MOL Program to save money. The cancellation
2 led to a short work stoppage, however construction resumed a few weeks later.
3 *Aerospace Daily* reported that the U.S. Air Force had evaluated requirements for current
4 and future programs, and determined that construction on the building should continue
5 (*Aerospace Daily*, September 19, 1969). The *San Jose Mercury News* reported that
6 “official announcements merely declared that ‘other activities’ would replace the MOL in
7 the sky-blue building.” The article also noted that the new facilities may “become home
8 for a space shuttle command post” (Carey, 1969).
9

10 By the end of 1969, the 164,000-square foot Building 1003, constructed at a cost of \$8
11 million, was nearly complete. A windowless, pre-cast concrete-panel building, it was
12 appended to the west façade of Building 1001. The building was painted “Air Force
13 blue,” resulting in its nickname, the “Blue Cube” (*Aerospace Daily*, September 19,
14 1969).
15

16 Architectural plans for Building 1004 were also developed by C.F. Braun & Company
17 and mechanical plans were developed by consulting engineers, Pope, Evans & Robbins,
18 on behalf of Solar, a division of International Harvester Company, based in San Diego,
19 California. Solar provided the Saturn gas turbine generator sets that powered the plant,
20 and therefore were responsible for the mechanical layout of the building. In 1927, Solar,
21 originally known as the Prudden-San Diego Airplane Company, was founded to
22 manufacture aircraft. By 1929, the company had only manufactured three aircraft, and
23 opted to begin manufacturing aircraft components for other manufacturers under the
24 name Solar Aircraft Company. During World War II, they provided exhaust manifolds
25 for military aircraft, and developed high-temperature components for jet engines.
26

27 After World War II, the company was awarded multiple contracts to develop engine
28 parts, including one with the U.S. Navy to develop an afterburner for a turbojet engine.
29 Solar became the first U.S. company to develop a practical afterburner. Following this
30 success, the company was awarded a contract by the U.S. Navy to develop gas turbine
31 engines to provide auxiliary power for ships, as well by the U.S. Air Force to develop gas
32 turbines to provide auxiliary power for aircraft (Fleming and Leyes, 1999). In the 1950s,
33 under contract to the U.S. Navy, the company developed the Saturn gas turbine, a 750
34 kilowatt (kW) engine. In addition to its application on ships, the company also saw the
35 commercial potential in the product, because it was smaller, lighter, more reliable, and
36 easier to maintain than low-speed reciprocating engines traditionally used for industrial
37 applications (Solar Turbines, n.d.).
38

39 In 1960, Solar Aircraft Company was acquired by International Harvester Company
40 (Solar Turbines, n.d.). That year, an article about the benefits of gas turbine engines
41 appeared in *Time* magazine, and touted the company as a “major gas turbine maker”
42 (*Time*, October 31, 1960). By 1965, Solar had purchased 99 acres in San Diego to

1 construct a “major manufacturing facility for gas turbine engines,” indicative of their
2 growth and prominence during this time period (*Gas Turbine*, 1965).

3
4 It is likely that Solar’s reputation as a gas turbine manufacturer, and their prior work for
5 the military, led the U.S. Air Force to select them to provide Saturn gas turbine generator
6 sets for Building 1004. The two-story power plant cost \$5.4 million to construct, and was
7 designed to operate as a “total energy system” for the STC, and provided all the electrical
8 and mechanical power required to support Buildings 1001 and 1003 (*Aerospace Daily*,
9 September 19, 1969).

10
11 Similar to Building 1003, it was also a windowless building clad in pre-cast concrete
12 panels. Metal louvers pierced the east and west facades to provide ventilation for the
13 mechanical equipment (C.F. Braun & Company/NAVFAC/SAMSO, August 12, 1968c-
14 d). It featured twelve, 750 kW 1,000 horsepower, Solar Saturn gas turbine generator sets,
15 described by *Aerospace Daily* as “state-of-the-art,” and cost \$3.1 million (*Aerospace*
16 *Daily*, September 19, 1969). The *San Jose Mercury News* reported that they were “twelve
17 of the largest turbines in the country” (*San Jose Mercury News*, February 20, 1970). The
18 installation of the turbines required the use of cranes.

19
20 The turbines, sparked by wet-cell batteries, were run by natural gas supplied by Pacific
21 Gas & Electric (PG&E) Company, with diesel fuel available for back-up. In the event of
22 a natural gas interruption, the turbines were designed to automatically switch to diesel
23 fuel without any disruption of power. Waste heat generated from the turbines was piped
24 into recovery boilers, and converted into steam to run absorption chillers to provide air
25 conditioning, and to heat exchangers to provide heat and hot water. All functions were
26 monitored from Solar Control Consoles. All systems were designed with redundancies,
27 because the power provided by Building 1004 was critical to ensure continued support of
28 satellite programs controlled from the STC (Ruocchio, pers comm., June 9, 2010).

29
30 The development of Building 1004 necessitated modifications to the installation’s power
31 distribution system. Ties connecting to the PG&E power grid were severed, with the
32 exception of one line which provided power through a Lockheed Missiles and Space
33 Substation, and was likely kept active for back-up purposes (AFSCF, 1972). In addition
34 to providing the Saturn gas turbine generator sets, Solar also provided the personnel to
35 run and maintain the plant. It became operational in February 1970, and provided power
36 to the entire installation, rendering it energy-independent at that time (Jernigan, 1983).

37
38 Building 1004 was designed as a prototype power plant intended to be developed at U.S.
39 Air Force facilities across the United States. This plan was never realized, in part due to
40 the 1970s oil crisis (Ruocchio, pers. comm., June 9, 2010). However, it should be noted
41 that the U.S. Air Force continued to utilize Saturn gas turbines at other installations. For
42 example, in 1985, *Turbomachinery International* reported that the U.S. Air Force had

1 acquired twenty-three Saturn-powered generator sets to support remote deployments
2 without facilities (*Turbomachinery International*, January-February 1985).
3

4 **8. Upgrades, 1970s**

5
6 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. In 1975, San
7 Francisco-based architecture and engineering firm Keller & Gannon, under the auspices
8 of SAMSO, prepared plans to construct an addition to the east façade of Building 1004
9 which functioned as a Test Laboratory (Keller & Gannon/SAMSO, May 5, 1975). The
10 majority of other plans prepared in the 1970s concerned equipment maintenance and
11 upgrades. For example, in 1977, plans were prepared to install soot blowers (Onizuka
12 AFS, n.d.). In addition, that same year, the original Carrier absorption chillers were
13 replaced by Trane absorption chillers (Anthony Ruocchio, pers. comm., July 31, 2010).
14 In 1979, plans were prepared to repair the steam condensate system and turbine exhaust
15 system insulation, and paint the exterior of the building (Onizuka AFS, n.d.).
16

17 **9. Significant Events and Satellites Supported, 1970s**

18
19 In the 1970s, Sunnyvale AFS continued to support existing and newly established
20 satellite programs from Buildings 1001 and 1003, although many of them remained
21 classified. Building 1004 provided a reliable source of electrical and mechanical power
22 necessary to support the programs. In 1970, the AFSCF Satellite Test Operations
23 Historical Reports noted the successful support of two “unique orbital events” from the
24 installation. These events included support of the Apollo 13 mission in April, which was
25 aborted following the explosion of an on-board oxygen tank, and support of the first
26 North Atlantic Treaty Organization (NATO) communications satellite in March (AFSCF,
27 January-June 1970).
28

29 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
30 support from Building 1003 throughout the 1970s for the orbiting satellite (Jernigan,
31 1983). Program 949 was also re-designated the Defense System Program (DSP) in 1970.
32 Sunnyvale AFS continued to support this program throughout the early 1970s (AFSCF,
33 July-December 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was
34 approximately 23’ long, 10’ wide, and contained a large infrared telescope which scanned
35 the earth for missile launches. In the event a missile was launched, it would be detected
36 by the United States within minutes, which removed the possibility of a surprise attack
37 (Peebles, 1997).
38

39 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
40 advanced communications satellites had been launched to handle voice, teletype,
41 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
42 satellites – code-named HEXAGON, and popularly known as “Big Bird” – were also

1 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
2 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
3 to photograph large areas, and return the film to earth via SRV. They carried
4 technologically advanced cameras, additional film capsules, and antennae for other
5 intelligence-gathering purposes (Clark, 2007).
6

7 In January 1972, President Richard Nixon announced the development of the Space
8 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
9 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
10 bases for the program. Research and development (R&D) shuttle launches would
11 originate from the Kennedy Space Center, and military launches would originate from
12 Vandenberg AFB. The shuttle would be responsible for the launch of all commercial,
13 scientific, and military satellites into space. The AFSCF, including Sunnyvale AFS and
14 tracking stations, would provide tracking and control for the program (Jernigan, 1983).
15

16 On May 25, 1972, Sunnyvale AFS supported the 145th and final launch of the Corona
17 Program from the original Satellite Control Room in Building 1001. It was terminated as
18 a result of advances in satellite technology. By the time the Corona Program concluded,
19 Corona satellites had provided approximately 800,000 reconnaissance photographs
20 covering approximately 510 million square miles (Chapman, 2008; Vukotich, n.d.).
21 Following its termination, the Satellite Control Room Complex likely continued to be
22 utilized for control of other satellite programs.
23

24 In July 1975, the final Apollo flight was launched and supported by Sunnyvale AFS. The
25 final flight was known as the Apollo-Soyuz Test Project, which marked the first joint
26 United States-Soviet Union space mission. The mission was the first time two foreign
27 spacecraft docked together in orbit (NASA, July 14, 2010). In 1976, the first DMSP
28 Block 5D, a meteorological satellite, was launched, and presumably supported from
29 Sunnyvale AFS. It was an upgraded version of the 1960s-era DMSP, and provided twice-
30 daily, worldwide meteorological, oceanographic, and solar-terrestrial physics
31 measurements (Jernigan, 1983; Wade, n.d.).
32

33 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
34 the first successful electronic imaging satellite, and transmitted high-quality images in
35 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources
36 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
37 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
38 lettering on billboards” (Ingersoll, November 5, 1978). Nonetheless, this top-secret
39 satellite represented significant advances in the development of satellite technology, and
40 was supported from Sunnyvale AFS, as well as associated tracking stations.
41
42

1 **10. Development of the Air Force Satellite Control Network, Expansion, and Upgrades,**
2 **1980s**
3

4 In 1982, the Air Force Satellite Control Network (AFSCN) was organized. The AFSCN
5 was not a formal organization, but rather denoted a group of common user resources,
6 assets, and facilities which collectively provided tracking, telemetry & commanding
7 (TT&C) support for virtually all DoD spacecraft, and select NASA and foreign
8 government programs (Hane, 1988). The goal of the AFSCN was to provide “enduring
9 control capability commensurate with the need for operational space suites throughout
10 the conflict spectrum” (AFSCF, 1983).
11

12 To accomplish this goal, Sunnyvale AFS was upgraded as part of the Data Systems
13 Modernization Program. This \$500 million upgrade introduced centralized database-
14 driven computer hardware and software to replace outdated systems. The upgraded
15 system was more reliable, cheaper to maintain, and faster than its predecessor, allowing it
16 to support a steadily increasing satellite support workload (Fedor et al., 2006).
17

18 A new satellite control center – the Consolidated Space Operations Center (CSOC) – was
19 constructed at Falcon AFS, Colorado Springs, Colorado (present-day Schriever AFB) in
20 conjunction with the Data Systems Modernization Program (Fedor et al., 2006). The
21 CSOC was constructed partially due to concerns about the vulnerability of Sunnyvale
22 AFS to earthquakes and terrorism (Philp, June 9, 1985).
23

24 Buildings 10031 and 10032 were constructed at the STC in the 1980s in conjunction with
25 the Data Systems Modernization Program to provide additional space for satellite control.
26 In 1981, King/Reif and Associates, an architectural and planning firm, prepared plans for
27 Building 10031 on behalf of NAVFAC Western Division (King/Reif and
28 Associates/NAVFAC, December 18, 1981). In 1982, plans were prepared for Building
29 10032 by Rasmussen Ingle Anderson, a San Francisco-based architecture firm, under the
30 auspices of NAVFAC Western Division. Both three-story buildings housed parking
31 facilities, and had radio frequency interference (RFI)-shielded third stories with secure
32 space for MCCs, computer rooms, communications rooms, and offices that supported
33 satellite programs (King/Reif and Associates/NAVFAC, December 18, 1981; Rasmussen
34 Ingle Anderson/NAVFAC, October 29, 1982). Both buildings were operational by 1984
35 (Fola Odafalu, pers. comm., July 26, 2010).
36

37 As in prior decades, the majority of plans prepared in the 1980s for Building 1004
38 concerned equipment maintenance and upgrades. For example, between 1982-88, plans
39 were prepared for the installation of a fire protection system for gas turbine generators,
40 piping for emergency water supply, and monitoring system for gas turbine generators.
41 Gas turbine cleaning and cooling systems were refurbished and repaired, and
42 polychlorinated biphenyls (PCB) were removed from the building (Onizuka AFS, n.d.).

1 In addition, during the 1980s, computers were installed in the Control Room to control
2 equipment in conjunction with the Solar Control Console, including the gas turbine
3 generators (Ruocchio, pers. comm., June 9, 2010). Plans were also prepared to upgrade
4 security, including installation of closed-circuit televisions and a remote-control door
5 lock for the control room (Onizuka AFS, n.d.).
6

7 **11. Significant Events and Satellites Supported, 1980s**
8

9 Sunnyvale AFS continued to support numerous satellites programs throughout the 1980s,
10 although many remained classified. On April 12, 1981, the first mission flown by the
11 Space Shuttle *Columbia* was launched, and successfully returned to earth two days later.
12 The AFSC provided support for the first shuttle mission, and five AFSCF mission
13 controllers received U.S. Air Force Commendation Medals. In June 1982, the first
14 classified military payload was carried into orbit aboard the fourth shuttle mission flown
15 by *Columbia*, and was supported from MCC B in Building 1003 (Jernigan, 1983).
16

17 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
18 appeared to be planning a surprise invasion of Chad and Sudan. The United States
19 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-
20 secret satellite was supported from Sunnyvale AFS. The mission produced photographs
21 that documented massive troop build-ups at the border of Sudan, and the *USS Nimitz* was
22 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
23 1989; Philp, October 30, 1985). In 1984, the twentieth and last KH-9 satellite was
24 launched and supported from Sunnyvale AFS (Day, November 8, 2004).
25

26 The first dedicated military flight, aboard the Space Shuttle *Discoverer*, was launched in
27 January 1985, and an article in the August 2009 edition of *Air & Space Magazine*
28 indicated that “according to most accounts, STS-51C’s payload was ORION, an
29 eavesdropping satellite for signals intelligence.” In October 1985, the second dedicated
30 military flight was launched by the Space Shuttle *Atlantis* (Cassutt, August 1, 2009). *The*
31 *New York Times* reported that, according to reliable sources, “two \$100 million
32 communication satellites” were deployed into orbit on a mission classified as secret by
33 the Pentagon (Broad, October 5, 1985).
34

35 In 1986, the Space Shuttle *Challenger* exploded after launch, killing its seven crew
36 members, including the shuttle’s mission specialist, Lieutenant Colonel Ellison S.
37 Onizuka, who had trained at Sunnyvale AFS (NASA, 2007). That same year, Sunnyvale
38 AFS was renamed Onizuka AFB in honor of Onizuka. Following the *Challenger*
39 explosion, the U.S. Air Force returned to sending satellites into orbit via unmanned
40 launches. It was not until December 1988 that the Space Shuttle *Atlantis* was launched
41 with a top-secret military payload (Cassutt, August 1, 2009).
42

1 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
2 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
3 communications satellite developed by NASA (Levien, 1989).
4

5 **12. Onizuka Air Force Station, 1990s-Present**
6

7 By 1991, the Soviet Union had dissolved, signaling the end of the Cold War (Center for
8 Air Force History, 1994). The end of the Cold War led, in part, to the declassification of
9 the NRO in September 1992. The end of the Cold War also led to a decrease in military
10 spending. However, modifications continued to be undertaken at Onizuka AFB, although
11 less than in prior decades
12

13 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
14 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported from Onizuka
15 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
16 weather satellites assisted with U.S. missile launches, and navigation satellites assisted
17 the troops in maneuvering through the desert. Reconnaissance satellites, such as those in
18 the NRO's KH-11 satellite program, also likely continued to be supported from the
19 installation (Peterson, July 30, 1993). The early 1990s also represented a key year for
20 satellite scheduling, with the advent of a computerized scheduling system. Prior to this
21 time, scheduling was plotted by hand, using colored tape to represent different spacecraft
22 on approximately 50' rolls of butcher-paper (Mead, March 2, 1994).
23

24 In 1991, the 21st Space Operations Squadron (SOPS) were activated at Onizuka AFB; and
25 in 1992, the 750th Space Group was activated and assumed responsibility for launch and
26 early orbit of numerous satellites, including the space shuttles (Schriever AFB, n.d.). In
27 addition, the installation also supported numerous NASA space exploration programs. In
28 1994, Onizuka AFB was renamed Onizuka AFS.
29

30 In 1992, the EUB was appended to the south façade of Building 1004. It was constructed
31 to supplement power distribution to the installation. Between 1993-94, the original Besler
32 heat recovery boilers were retired in favor of Cleaver Brooks gas-fired boilers installed in
33 the EUB (Anthony Ruocchio, pers. comm., August 12, 2010).
34

35 In addition, numerous plans were also prepared for mechanical maintenance and
36 upgrades, including improvements to the electrical and fire alarm systems. Plans were
37 also prepared to construct a mezzanine over Rooms 102, 103, and 105 that would be
38 accessible from the northwest stairway, and installation of high intensity discharge (HID)
39 lights (Onizuka AFS, n.d.). In 1993, Trane absorption chillers were replaced with York
40 centrifugal chillers (Anthony Ruocchio, pers. comm., July 31, 2010).
41

1 In 1994, the installation no longer relied on Building 1004 as the primary energy source,
2 and began to transition to PG&E for its power needs. In 1998, Building 1004 ceased to
3 function as the primary energy provider for the installation, and was relegated to back-up
4 support (Fola Odafalu, pers. comm., October 13, 2009).

5
6 In 1995, the Corona Program was declassified, and following year, 800,000 images taken
7 between 1960 and 1972 were made available to the public. Formerly classified
8 documents also became available (NRO, February 24, 1995). In addition, Onizuka AFS
9 was realigned in accordance with the Base Realignment and Closure (BRAC) Act, and
10 select functions were relocated to CSOC at Falcon AFB, Colorado Springs, Colorado.
11 The realignment resulted in a loss of approximately 1,100 jobs at Onizuka AFS (City of
12 Sunnyvale, 2006). By the end of the 1990s and during the early 2000s, responsibility for
13 controlling the DoD satellite network continued to be transferred to the CSOC, and
14 Onizuka AFS's responsibilities substantially decreased (Flinn, December 1, 1991; Wulff,
15 November 29, 1995).

16
17 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
18 U.S., British, and French military personnel in Dhahran, Saudi Arabia, led to increased
19 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
20 permitted on the first two stories of Buildings 10031 and 10032. In addition, because
21 Innovation Way was in close proximity to Buildings 10031 and 10032, the street was
22 closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey barriers and
23 bollards were also installed around the perimeter of the buildings (Dennis Ralphs, pers.
24 comm., August 2, 2010).

25
26 The Onizuka AFS Drawing Number Log indicates that at least one plan was prepared in
27 the 2000s, and was related to maintenance of the gas turbine generators. In addition, it is
28 likely that the facility also underwent routine maintenance throughout the decade
29 (Onizuka AFS, n.d.).

30
31 In 2005, the BRAC commission recommended closure of Onizuka AFS. The
32 recommendations were approved by President George W. Bush. In 2006, the DoD,
33 through the Office of Economic Adjustment, formally recognized the City of Sunnyvale
34 as the Local Redevelopment Authority (LRA) to plan the redevelopment of Onizuka AFS
35 and its conversion to civilian use (City of Sunnyvale, 2006).

36
37 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
38 and open house were held to commemorate this event, and were attended by over 800
39 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
40 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the
41 history of the NRO and reconnaissance satellite programs supported from the installation
42 between through 2007. Following the open house, displays and histories of the programs,

1 many of which remain classified, were relocated to the NRO archives in Chantilly,
2 Virginia (Dennis Ralphs, pers. comm., August 3, 2009).
3

4 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
5 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
6 attendance were current and former employees, both military and civilian, as well as
7 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan
8 noted that "[T]his facility here in Sunnyvale has supported an amazing 3.4 million
9 satellite operations over the past years. Much of the details of this work are still classified
10 and we cannot talk openly about it, but what I can tell you is that the operations
11 conducted by the NRO from this site have made our nation a tremendously safer place to
12 be" (Bauer, July 29, 2010).
13

14 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
15 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
16 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
17 transferred out of federal hands in September 2011. It is anticipated that the Department
18 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
19 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
20 remainder of the installation will be redeveloped.
21

22 **E. Sources:**

23
24 **1. Architectural Drawings**
25

26 *Original plans are on file in Building 1002, Civil Engineering Office, Onizuka AFS,*
27 *Sunnyvale, California, and include the following. Where applicable, the numbers*
28 *following the plans in parentheses correspond to the Onizuka AFS Drawing Number Log.*
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31 "Interim Expansion Partial Floor Plan A." (1412)
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33 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965b.
34 "Interim Expansion Partial Floor Plan B." (1413)
35

36 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965c.
37 "Interim Expansion Partial Floor Plan C." (1414)
38

39 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965d.
40 "Interim Expansion Partial Floor Plan D." (1415)
41

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10 C.F. Braun & Company/NAVFAC/SAMSO. August 12, 1968c. "Power Exterior
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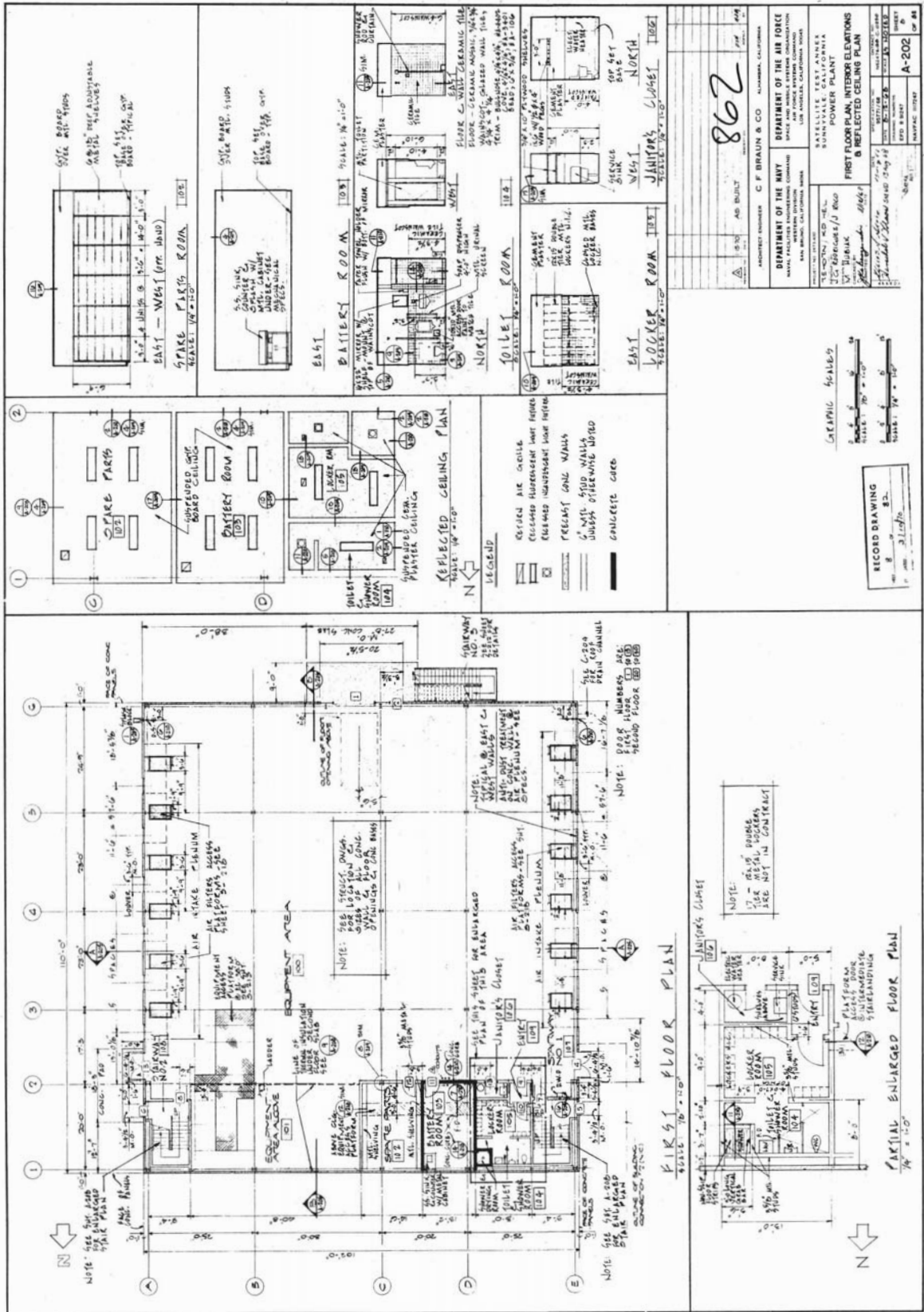
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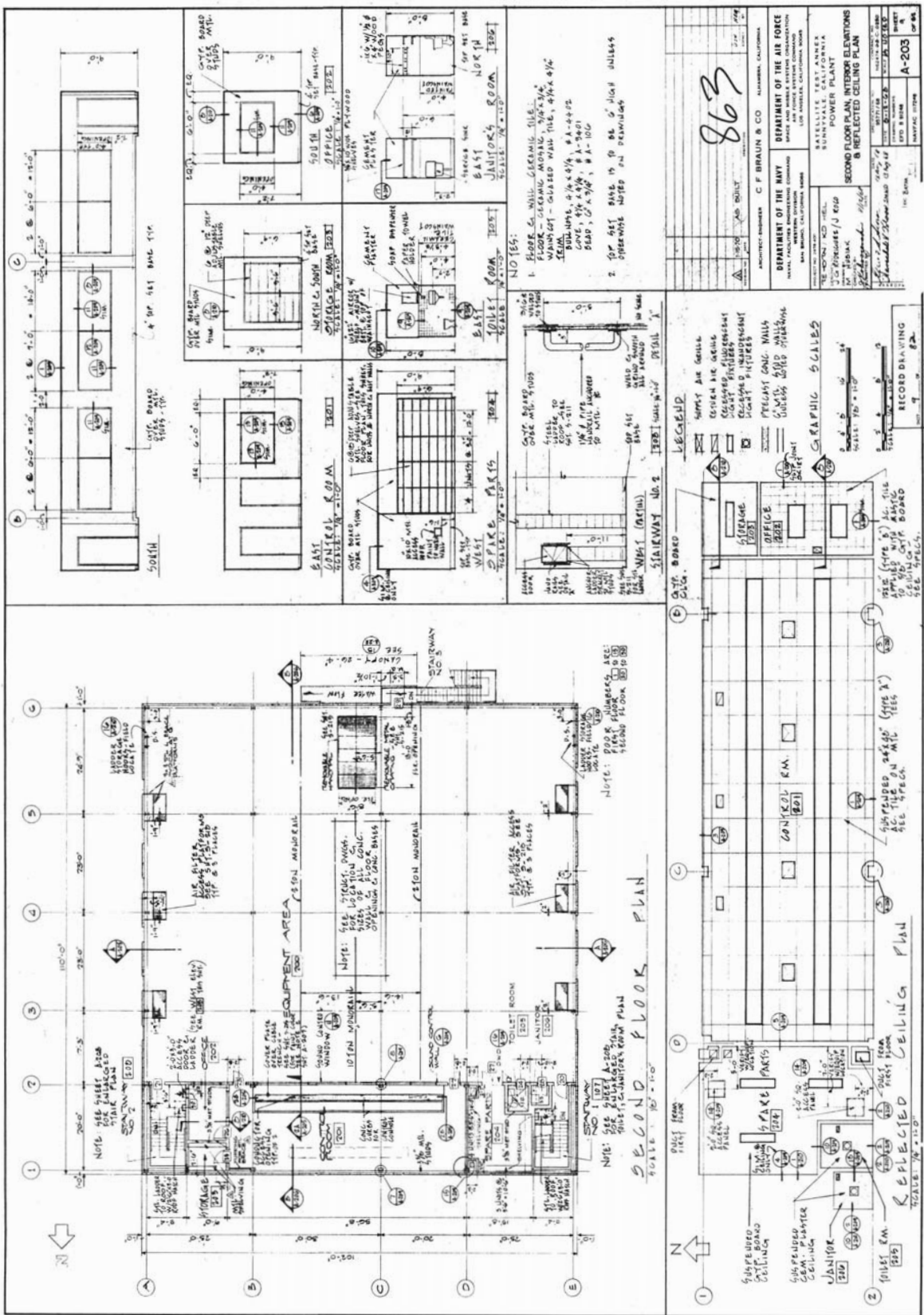
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863

<p>ARCHITECT: C. F. BRAUN & CO., AUSTIN, CALIFORNIA</p> <p>DEPARTMENT OF THE AIR FORCE</p> <p>SATELLITE TEST CENTER</p> <p>UNIVERSITY OF CALIFORNIA</p> <p>UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA</p>	<p>SATELLITE TEST CENTER</p> <p>POWER PLANT</p> <p>SECOND FLOOR PLAN, INTERIOR ELEVATIONS</p> <p>B REFLECTED CEILING PLAN</p> <p>DATE: 12/15/54</p> <p>BY: C.F.B.</p> <p>CHECKED: [Signature]</p> <p>SCALE: 1/8" = 1'-0"</p>
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<p>RECORD DRAWING</p> <p>SCALE: 1/8" = 1'-0"</p> <p>DATE: 12/15/54</p>
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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 1004
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-D

SECTION II

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

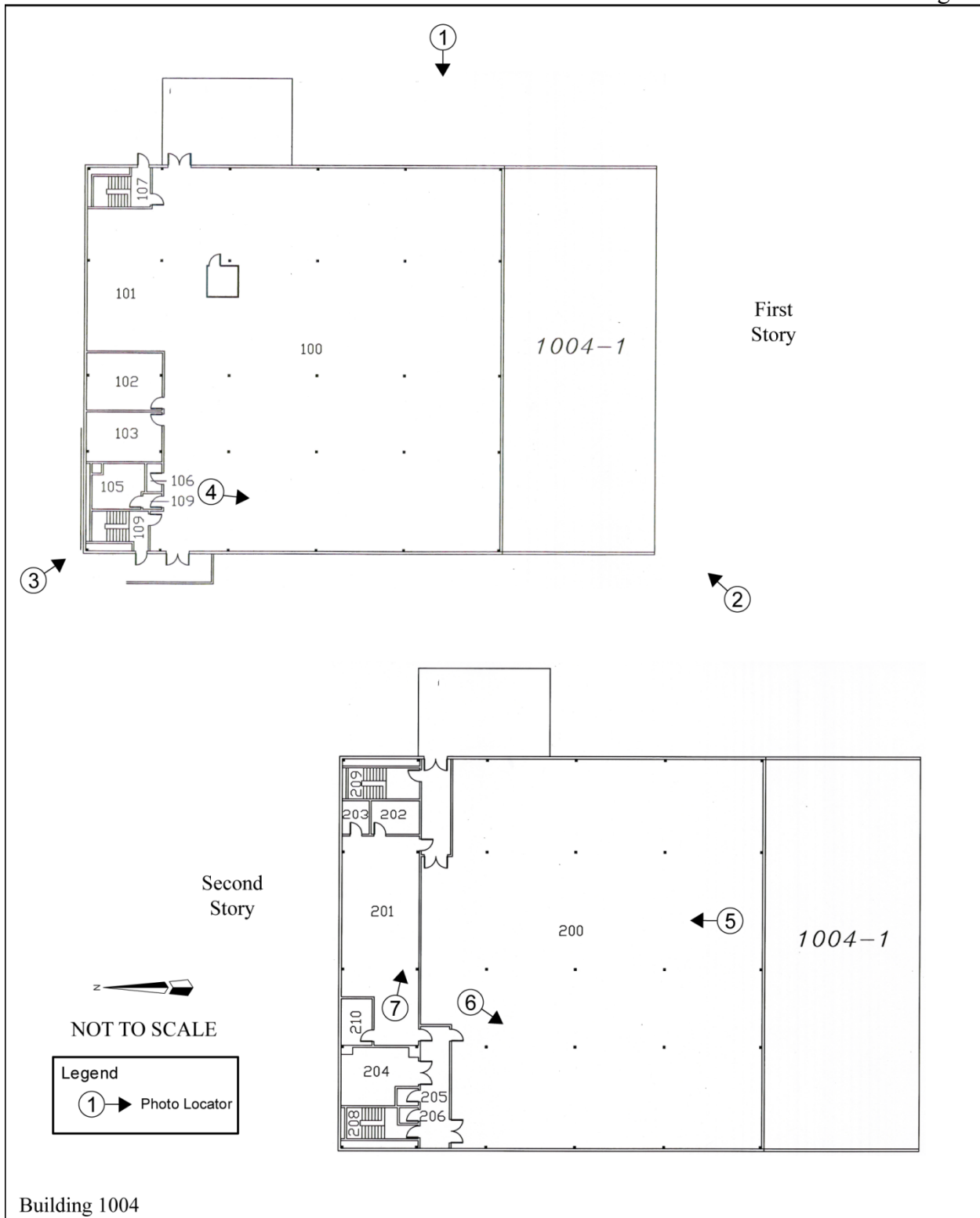
3
4 **INDEX TO PHOTOGRAPHS**

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6	U.S. AIR FORCE SATELLITE TEST CENTER	Log No. USAF041221A-D
7	BUILDING 1004	
8	Onizuka Air Force Station	
9	1080 Innovation Way	
10	City of Sunnyvale	
11	Santa Clara County	
12	California	
13		
14	Anne Jennings, Photographer	Date of Photographs: June 7-14, 2010
15		
16	Log No. USAF041221A-D-01	VIEW OF WEST FAÇADE, LOOKING EAST. NOTE TWO-STORY METAL VENTS AND SECOND-STORY ADDITION CLAD IN METAL SIDING.
17		
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21	Log No. USAF041221A-D-02	VIEW OF SOUTH AND WEST FAÇADES, LOOKING NORTHEAST. NOTE CONTEXTUALLY SENSITIVE DESIGN OF SOUTH FAÇADE, WHICH FORMS PART OF THE 1992 EMERGENCY UTILITY BUILDING (EUB) ADDITION.
22		
23		
24		
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26		
27		
28	Log No. USAF041221A-D-03	VIEW OF ROOF, NORTH, AND WEST FAÇADES FROM ROOF OF BUILDING 1003, LOOKING SOUTHEAST. NOTE TURBINE STACKS ENCLOSED BEHIND METAL SCREENS ON ROOF.
29		
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34	Log No. USAF041221A-D-04	VIEW OF ORIGINAL AIR INLET STRUCTURES IN EQUIPMENT ROOM (ROOM 100) ON FIRST STORY, LOOKING SOUTHWEST.
35		
36		
37		
38	Log No. USAF041221A-D-05	VIEW OF EQUIPMENT ROOM (ROOM 200) ON SECOND STORY, LOOKING NORTH. NOTE ORIGINAL BESLER HEAT RECOVERY BOILERS ON LEFT AND RIGHT.
39		
40		
41		
42		
43	Log No. USAF041221A-D-06	VIEW OF ORIGINAL SOLAR SATURN GAS TURBINE GENERATOR SET, LOOKING SOUTHWEST.
44		
45		
46		

1 Log No. USAF041221A-D-07

VIEW OF ORIGINAL SOLAR CONTROL
CONSOLE IN CONTROL ROOM (ROOM 201),
LOOKING EAST. NOTE SOLAR CONSOLE,
AND WINDOW ON SOUTH WALL
OVERLOOKING EQUIPMENT ROOM (ROOM
200).

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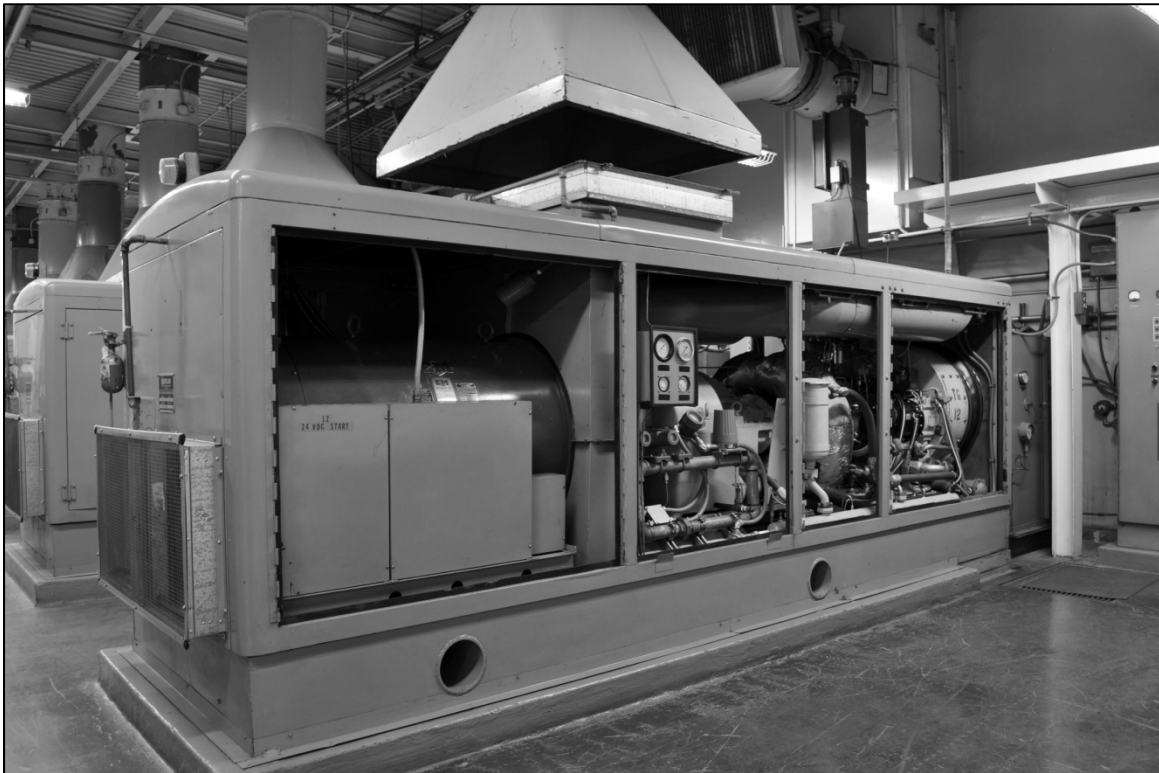














U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 10031
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-E

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

California Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

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U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 10031
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-E

SECTION I

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6. Significant Events and Satellites Supported, 1965-70.....	8
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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **U.S. AIR FORCE SATELLITE TEST CENTER**
5 **BUILDING 10031**
6

7 **Log No. USAF041221A-E**
8

9 **A. Location:** Building 10031, Onizuka Air Force Station
10 1080 Innovation Way, Sunnyvale, Santa Clara County, California
11

12 **B. Significance:** Building 10031, constructed in 1984 to support reconnaissance satellites,
13 is a contributing resource to the National Register-eligible U.S. Air Force Satellite Test
14 Center Historic District. The district is significant at a national, state, and local level
15 under Criterion A for its associations with satellite reconnaissance during the Cold War,
16 and Criteria Consideration G, because five of the six buildings, including Building
17 10031, are not yet fifty years old, and have exceptional importance for their associations
18 with satellite reconnaissance during the Cold War.
19

20 The U.S. Air Force Satellite Test Center Historic District is significant at the national
21 level for its association with satellite reconnaissance during the Cold War. The
22 installation was established in 1959 to serve as the command-and-control center for the
23 first reconnaissance satellite program, the Corona Program. It was developed by the U.S.
24 Air Force and the Central Intelligence Agency (CIA), with assistance from a private
25 contractor, Lockheed Missiles and Space Division. Shortly thereafter, the National
26 Reconnaissance Office (NRO) was established to provide oversight of the program and
27 other developing satellite programs. As new satellite technologies developed, such as
28 communications, early missile warning, meteorology, navigation, and nuclear detonation
29 detection, Building 10031 was constructed for satellite support. These satellite programs
30 also provided valuable data throughout the Cold War, and were supported from the U.S.
31 Air Force Satellite Test Center Historic District. Although many of the satellite programs
32 remain classified, it is apparent through the continued presence of the NRO that the
33 installation played a key role in the United States' conduct of the Cold War.
34

35 The U.S. Air Force Satellite Test Center Historic District is also significant at the state
36 and local levels for its association with the development of California as a leader in
37 technological innovations. California, and specifically the City of Sunnyvale in Silicon
38 Valley, began to emerge as a leading technological center during the Cold War. This was
39 due, in part, to the military's investment in the development of defense technologies in
40 California, such as command and control of reconnaissance satellites at Onizuka Air
41 Force Station (AFS). The presence of Lockheed Missiles and Space Division in
42 Sunnyvale in the mid-1950s, followed by Onizuka AFS in the late 1950s, burnished its
43 reputation as a high-technology center. The district's period of significance extends from
44 1959, the date of development of the installation, through 1991, the conclusion of the
45 Cold War.
46

1 **C. Description:**
2

3 **1. Current Description**
4

5 Building 10031 was constructed in 1984 to provide satellite support in conjunction with
6 Buildings 1001 and 1003. It is a three-story, windowless, rectangular-plan building, with
7 a recessed northwest corner. The northwest portion of the building is appended to
8 Building 1001. The entrance to the building is located on the west façade of the northwest
9 corner, and is considered part of Building 1001. Therefore, the entrance is described in
10 the individual building report for Building 1001.
11

12 Building 10031 is set atop a concrete-pile foundation, augmented by two-story concrete
13 columns. There are ten columns along the north and south facades, five along the east and
14 west facades, and twenty-four interior columns. The first and second stories are open, and
15 metal-pipe railings are located between the columns on the second story. A two-lane
16 concrete ramp flanked to the east and west by metal pipe railings is appended to the south
17 façade and provides access to the second story. The steel-frame, radio frequency
18 interference (RFI)-shielded third story is clad in vertical metal siding, and is capped by a
19 flat corrugated metal-clad roof. Building 10031 is appended to north façade of Building
20 1003, and has no fenestration.
21

22 The first story of Building 10031 encompasses 27,500 square feet, the second story
23 28,368 square feet, and the third story 29,307 square feet. A comparison of the original
24 floor plan with the current floor plan indicates that the first story, which originally
25 functioned as a parking area, has retained its configuration. However it no longer
26 accommodates parking. The majority of the second and third stories have been
27 reconfigured. An inspection of select interior spaces in June 2010, coupled with
28 information included in the Onizuka AFS Drawing Number Log, indicate that most
29 interior spaces, even in cases where they retain their original configuration, no longer
30 retain their original function, features, or finishes. However, the first story retains some
31 original features and finishes, such as concrete walls and asphalt-paved surfaces, and
32 select areas on the third story retain RFI-partitions and are accessed via interlock doors.
33

34 **2. According to Original Plan**
35

36 Original plans of Building 10031 are on file in the Civil Engineering Office, Building
37 1002, Onizuka AFS, Sunnyvale, Santa Clara County, California. Original building plans
38 were prepared in 1981 by King/Reif and Associates, an architecture and planning firm on
39 behalf of NAVFAC Western Division. The following plans are featured in the graphic
40 documentation section of the report:
41
42

- 1 • “Mission Control Complex: Ground Floor Parking Plan, Level 1 and
- 2 Lobby” (King/Reif and Associates/NAVAFC, December 18, 1981a)
- 3 • “Mission Control Complex: Parking Plan, Level 2” (King/Reif and
- 4 Associates/NAVAFC, December 18, 1981b)
- 5 • “Mission Control Complex: Computer Floor Plan, Level 3” (King/Reif
- 6 and Associates/NAVAFC, December 18, 1981c)
- 7 • “Mission Control Complex: Building Elevations” (King/Reif and
- 8 Associates/NAVAFC, December 18, 1981d)
- 9

10 The historic appearance of Building 10031’s exterior is similar to its current appearance.
11 According to the original floor plans, the first two stories housed parking, and the third
12 story housed computer rooms, communications rooms, and Mission Control Centers
13 (MCC). Although the plans do not include room functions, the Onizuka AFS Drawing
14 Number Log indicates that MCC IX and MCC T were housed on the third story, likely in
15 areas that were separated by RFI-shielded partitions, and accessed by interlock doors.
16

17 **D. History:**

18
19 **1. Development of the Satellite Test Center, 1959-61**

20
21 The development of satellite reconnaissance during the Cold War (1946-91) and the
22 specific role of the U.S. Air Force Satellite Test Center (STC) is fully described in the
23 associated overview report, California State Historic Preservation Office Historic
24 American Building Survey Level II-Type Documentation, U.S. Air Force Satellite Test
25 Center, Log No. USAF041121A. The following section provides a brief summary of the
26 role that Building 10031 played at the STC from 1959-91, its period of significance.
27

28 The installation was established in 1959 when Building 1001 was constructed to serve as
29 the command-and-control center for the Corona Program to support the launch, orbit, and
30 recovery of Corona satellites. The Corona Program, initiated in 1958, was the first
31 reconnaissance satellite program developed by the U.S. Air Force and the Central
32 Intelligence Agency (CIA), with assistance from private contractors, such as Lockheed
33 Missiles and Space Division, located in Sunnyvale, California. Concerns about
34 preserving the secrecy of the Corona Program and its objectives led to the designation of
35 the Discoverer Program as a cover program. The publicly-stated goal of the Discoverer
36 Program was scientific research (Richelson, 2002). Prior to the construction of Building
37 1001, at least eight Corona satellites, described as Discoverer satellites in the press, were
38 launched from Vandenberg Air Force Base (AFB), and were supported from an interim
39 control center in Palo Alto, California. Tracking stations located around the world also
40 provided support.
41

1 In 1959, the U.S. Air Force acquired 11.43 acres of land in Sunnyvale from Lockheed
2 Missiles and Space Division located to the west. Plans for the installation were designed
3 by the Ralph M. Parsons Company, an architecture and engineering firm based in Los
4 Angeles, California, under the auspices of the U.S. Air Force Ballistic Missile Division
5 (AFBMD) in Englewood, California (Ralph M. Parsons Company/AFBMD, March 6,
6 1959).

7
8 On January 28, 1960, the installation, newly designated as the STC, was dedicated by the
9 U.S. Air Force (Davies, 1960). A few months later, on March 1, 1960, it was occupied by
10 the 6594th Aerospace Test Wing (ATW), the first unit to be tasked with military satellite
11 operations; Lockheed Missiles and Space Division employees; and likely the CIA. The
12 6594th ATW provided oversight for Lockheed Missiles and Space Division which was
13 responsible for satellite operations (6594th ATW, 1961; Jernigan, 1983). However,
14 portions of the building remained under construction, including the state-of-the-art
15 Satellite Control Room in the Satellite Control Room Complex. An interim Satellite
16 Control Room was established from which the Lockheed Missiles and Space Division,
17 monitored by the 6594th ATW, could direct the launch, tracking, data acquisition,
18 command and control, and recovery phase of military satellites (6594th ATW, 1961;
19 Jernigan, 1983).

20
21 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
22 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
23 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
24 the public, likely due in part to a building sign which indicated “U.S. Air Force Satellite
25 Test Center.” On February 6, 1961, the Satellite Control Room and remainder of the
26 Satellite Control Room Complex became operational. The primary purpose of the
27 complex was to support Corona satellites, although additional programs were supported
28 by this time (Jernigan, 1983).

29
30 **2. Significant Events and Satellites Supported, 1960-61**

31
32 In August 1960, the U.S. Air Force accomplished the first successful retrieval of a
33 Discoverer satellite. On August 10, Discoverer XIII was launched from Vandenberg
34 AFB, and was supported by the STC. The satellite achieved polar orbit for a period of
35 ninety-four minutes, during which time it was in contact with worldwide tracking
36 stations, and the interim Satellite Control Room at the STC. During its seventeenth
37 rotation of the earth, the eject command was issued from the STC, and the capsule was
38 ultimately recovered from the Pacific Ocean, marking the first successful retrieval of an
39 object from space (Arnold, 2005; 6594th ATW, no date [n.d.]). In keeping with the
40 publicly stated scientific objectives of the Discoverer Program, the *San Jose Mercury*
41 *News* noted that “Discoverer recovery techniques will be used soon to return monkeys
42 from space,” and were vital to “returning a man to earth after orbiting in space” (Lindsey,

1 August 12, 1960). Still in the testing phase, the satellite did not yet contain a camera
2 (Jernigan, 1983).
3

4 Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from
5 Vandenberg AFB (Arnold, 2005). Discoverer XIV orbited the earth seventeen times,
6 supported by the STC from the interim Satellite Control Room in Building 1001, and the
7 Kodiak tracking station, before the eject command was relayed to the satellite. Following
8 the command, at 300 miles above the earth, the satellite recovery vehicle (SRV)
9 separated from the spacecraft, and began its descent to earth, where it was caught by a
10 specially equipped Fairchild C-119 *Flying Boxcars* (C-119) piloted by U.S. Air Force
11 Captain Harold Mitchell (*The New York Times*, August 20, 1960).
12

13 The Discoverer XIV SRV contained 20 pounds of film which documented over
14 1,650,000 square miles, and provided the first successful satellite reconnaissance
15 photographs of the Soviet Union. It also resulted in more photographic coverage of the
16 Soviet Union than all previous U-2 flights combined. Furthermore, it provided evidence
17 that the missile gap, feared since the 1957 launch of *Sputnik I* by the Soviet Union, did
18 not exist, and that the Soviets did not have an immense stockpile of Intercontinental
19 Ballistic Missiles (ICBM) (Day, 2006). However, despite the historic nature of this event,
20 the crew, who were not cleared for the Corona Program, were unaware of the importance
21 of their mission (Arnold, 2005).
22

23 Although the STC was developed to support the Corona Program, by the fall of 1960, it
24 also supported the Satellite and Missile Observation System (SAMOS) and Missile
25 Detection Alarm System (MIDAS). Both programs were initially developed by the U.S.
26 Air Force in the mid-1950s as reconnaissance and missile detection satellites,
27 respectively (Jernigan, 1983). On October 11, 1960, the first SAMOS satellite was
28 launched from Vandenberg AFB, and supported from the STC, although it failed to reach
29 orbit (*San Jose Mercury News*, October 12, 1960). By July 1961, MIDAS satellites were
30 launched from Vandenberg AFB and supported by the STC. By the end of 1961, two
31 MIDAS satellites had reached orbit (6594th ATW, 1961).
32

33 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
34 Corona satellite supported by the STC from the new control room. By this time, Corona
35 satellites were regularly providing images of the Soviet Union, as well as other
36 communist countries. Among these images included evidence of the building of the
37 Berlin Wall between East and West Germany (Chapman, 2008). In September 1961, the
38 NRO was established as a classified agency in the Department of Defense (DoD), and
39 was tasked with oversight of reconnaissance satellite programs, including the Corona
40 Program, and therefore became a presence at the STC (Richelson, 2000).
41
42

1 **3. Building 1002 Construction and Upgrades, 1962**

2
3 In 1962, the STC experienced its first of many expansions when plans for a two-story, L-
4 shaped administrative building – Building 1002 (Addition to the Satellite Test Annex) -
5 were prepared for the U.S. Air Force Space Systems Division (SSD) by Kaiser Engineers,
6 a division of the Henry J. Kaiser Company. Kaiser Engineers was a well-known
7 architecture and engineering firm located in Oakland, California (Kaiser Engineers/U.S.
8 Air Force SSD, January 15, 1962a-b; Air Force Satellite Control Facility (AFSCF),
9 1972).

10
11 During this time, Kaiser Engineers also prepared plans for a single-story addition to
12 Building 1001 to house new a new communications center, and interior modifications to
13 the Satellite Control Room Complex (Kaiser Engineers/U.S. Air Force SSD, October 17,
14 1962a-b; Jernigan, 1983).

15
16 The 1962 renovations were likely implemented in conjunction with the U.S. Air Force’s
17 first modernization effort, the Multiple Satellite Augmentation Program (MSAP). This
18 effort was initiated in part, to standardize and provide updated equipment to the STC and
19 tracking stations which enabled them to simultaneously support multiple satellite
20 programs (Lockheed Missiles and Space Division, 1963). Computer capabilities were
21 upgraded, new display and communications equipment were also installed, and
22 connections between the STC and tracking stations were upgraded (Jernigan, 1983).

23
24 **4. Significant Events and Satellites Supported, 1962-64**

25
26 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
27 The following month, the DoD classified all military satellite programs (DoD, March 23,
28 1962). As a result, Discoverer XXXVIII was the last satellite launched as part of the
29 Discoverer program. Corona satellites continued to be launched and supported by the
30 STC, however, because all satellites were classified, the Corona Program no longer
31 required a cover story.

32
33 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
34 satellites had accurately mapped all twenty-five of Moscow’s long-range missile sites.
35 Furthermore, images taken by Corona satellites indicated that China was readying its
36 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that “[O]n
37 the basis of new overhead photography, we are now convinced that the previously
38 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
39 for use in about two months.” Within two months, on October 16, 1964, China tested an
40 atomic bomb at the Lop Nur site (Broad, September 12, 1995).

1 In addition to Corona, SAMOS, and MIDAS satellites, the STC supported the Defense
2 Meteorological Satellite Program (DMSP) in 1962 and 1963. DMSP was a
3 meteorological satellite program initiated in 1960 to provide weather and climate data for
4 more effective military operations (DMSP, n.d.). On October 16, 1963, the first Vela
5 satellite was launched and supported by the STC. The Vela Program – vela means vigil in
6 Spanish – was a series of satellites designed to detect nuclear detonations (Jernigan,
7 1983; Peebles, 1997). Presumably, Vela satellites provided images of the Lanzhou
8 Diffusion Plant in Lanzhou, China and the Baotao Nuclear Fuel Component Plant in
9 Baotao, China (Richelson, 2002).

10
11 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
12 Furthermore, 1963 marked the beginning of the Keyhole (KH)-7 surveillance system,
13 noted in a 2006 NRO memo as “the Intelligence Community’s first high resolution
14 surveillance or ‘spotting’ satellite.” Similar to Corona satellites, the KH-7 was a
15 reconnaissance satellite that returned film to earth in SRVs. It was primarily used to
16 provide surveillance of nuclear facilities and Intermediate Range Ballistic Missiles
17 (IRBM) in the Soviet Union and China (NRO, 2006).

18
19 In July 1964, two additional Vela satellites were launched, resulting in a total of four
20 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III
21 was launched and supported by the STC. Syncom III was a National Aeronautics and
22 Space Administration (NASA) satellite used for DoD military communications
23 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).

24
25 **5. Construction, Upgrades, and Establishment of the Air Force Satellite Control**
26 **Facility, 1964-67**

27
28 In May 1964, plans were prepared for a two-story, L-plan addition to Building 1002 to
29 provide additional administrative space. The addition was designed by Maher & Martens,
30 a San Francisco-based architecture firm for the U.S. Army Corps of Engineers (USACE),
31 Sacramento District (Maher & Martens/USACE Sacramento District, May 7, 1964).

32
33 In 1965, the AFSCF was officially designated. Its mission was to direct launch, tracking,
34 data acquisition, command and control, and recovery of DoD military satellites.
35 Following the establishment of AFSCF, an Interim Expansion Plan (IEP) was initiated to
36 augment the facility and implement the newly developed MCC concept, which focused
37 on the development of mission-oriented control centers rather than a single control room
38 (Jernigan, 1983).

39
40 Plans were prepared by San Francisco-based consulting engineers, Bentley Engineers and
41 Earl & Wright, Inc., under the auspices of the U.S. Air Force SSD to develop multiple
42 MCCs in Building 1001. The plans indicate that the building was reconfigured to

1 accommodate four new MCCs, two new complex areas, two new communications areas,
2 and a new bird buffer area (Bentley Engineers and Earl & Wright, Inc./U.S. Air Force
3 SSD, December 13, 1965a-e). The majority of the work was completed by December
4 1966 (AFSCF, January-June 1966).

5
6 **6. Significant Events and Satellites Supported, 1965-70**
7

8 The increase in the number of flight support hours logged by the AFSCF between 1965-
9 66 appears to indicate that at least some of the MCCs were operational in 1966. In 1965,
10 the AFSCF logged 20,757 hours of satellite flight support. By 1966, 29,400 hours of
11 flight support were logged. The number of satellites supported also increased. In 1965,
12 the STC supported approximately fourteen satellites (AFSCF, 1972). In January 1967, the
13 STC supported thirty-one satellites per day, and by June were supporting forty-four per
14 day, which was expected to increase to forty-seven per day by July (AFSCF January-June
15 1967).

16
17 Between 1965-70, the STC supported over forty Corona satellite launches (Mission and
18 Spacecraft Library, n.d.). By 1966, upgrades to the installation had resulted in an increase
19 in satellite programs supported. In addition to Corona, Vela, and other programs (many of
20 which likely remained classified) new programs such as NASA's Biosatellite Program
21 were supported. The Biosatellite Program was a series of three satellites designed to
22 assess the effects of spaceflight on living organisms. Support for the program focused on
23 directing operations of the recovery of the satellites by Lockheed C-130 *Hercules* (C-
24 130) aircraft flown by the 6594th Aircraft Recovery Group based at Hickam AFB,
25 Honolulu, Hawaii (Jernigan, 1983).

26
27 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
28 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
29 SESP was responsible for providing flights for research and experiments undertaken by
30 government agencies (AFSCF, January-June 1968; Jernigan, 1983). In 1967, the KH-7
31 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
32 of which successfully returned usable images (NRO, 2006).

33
34 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
35 supported by the STC, uncovered the Soviet Union's plans for the invasion of
36 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
37 monitored Soviet radio transmissions which signaled the invasion was imminent, and
38 photographic reconnaissance satellites had monitored unusual military activities on the
39 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops" (*San*
40 *Jose Mercury News*, August 27, 1968).
41

1 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
2 supported by the STC and tracking stations. The LES was an experimental satellite used
3 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).
4

5 In 1969, support was provided for NASA's manned flights to the moon. The STC
6 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar landing
7 mission. Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program
8 949 was designated in November 1966 to supplant Program 461, which had initially
9 supplanted the MIDAS Program in 1963. Program 949 provided a wider range of
10 capabilities, and by the 1970s, was expected to have "progressively enhanced world-wide
11 early-warning, surveillance and detection capabilities" (Piper, 1970).
12

13 **7. Development of Buildings 1003 and 1004, 1966-70**
14

15 In conjunction with the technological upgrades which occurred throughout the mid-to-
16 late 1960s, in August 1966, a real estate estimate was prepared by the USACE
17 Sacramento District which proposed the acquisition of 8.2 acres of land from Lockheed
18 Aircraft Corporation, at a cost of \$49,000. In 1966, C.F. Braun & Company of Alhambra,
19 California, under the auspices of the U.S. Naval Facilities Engineering Command
20 (NAVFAC) Western Division, San Bruno, California, and SAMSO, Los Angeles,
21 California, prepared site development plans (C.F. Braun/NAVFAC/SAMSO, December
22 30, 1966). C.F. Braun & Company also prepared plans for the development of two new
23 buildings, Building 1003 (STC Building Addition), and Building 1004 (Power Plant)
24 (C.F. Braun/NAVFAC/SAMSO, November 14, 1967; August 12, 1968).
25

26 By August 1968, Lockheed Aircraft Corporation transferred the land to the U.S. Air
27 Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). By this time site
28 development was underway, and included relocation of an existing Lockheed Missiles
29 and Space building; reconfiguration of Lockheed Martin Way (formerly known as East
30 Perimeter Road) west of Building 1001; creation of additional parking spaces; and
31 installation of underground utilities (C.F. Braun/NAVFAC/SAMSO, December 30,
32 1966).
33

34 Following site development, construction of Buildings 1003 and 1004 commenced.
35 Building 1003 was designed to house the Manned Orbiting Laboratory (MOL) Program,
36 as well as other satellite programs. Initiated in 1963, the concept involved a Titan III
37 booster rocket which carried a modified Gemini B capsule attached to a space laboratory,
38 and was intended to serve reconnaissance purposes (Jernigan, 1983). However, in June
39 1969, the DoD announced the cancellation of the MOL Program, to save money. The
40 cancellation led to a short work stoppage, however construction resumed a few weeks
41 later. *Aerospace Daily* reported that the U.S. Air Force had evaluated requirements for

1 current and future programs, and determined that construction on the building should
2 continue (*Aerospace Daily*, September 19, 1969).

3
4 By the end of 1969, the 164,000-square foot building, constructed at a cost of \$8 million
5 was nearly complete. The building was painted "Air Force blue," resulting in its
6 nickname, the "Blue Cube" (*Aerospace Daily*, September 19, 1969). Building 1003
7 housed multiple MCCs, communications and crypto equipment, a data distribution
8 center, mechanical equipment, Control Data Corporation (CDC) 3800 computers, and a
9 tape library (AFSCF, 1970). In addition, shortly after it was constructed, the Vela
10 Program office and another unidentified satellite program were relocated from Building
11 1001 to Building 1003 (AFSCF, July-December 1969).

12
13 Building 1004 was also designed by C.F. Braun & Company. Solar, a division of
14 International Harvester Company, provided the Saturn gas turbine generator sets that
15 powered the plant. The development of Building 1004 necessitated modifications to the
16 installation's power distribution system. Ties to the electric power provided by Pacific
17 Gas and Electric (PG&E) were severed, with the exception of one power line which
18 provided power through a Lockheed Missiles and Space Substation, and was likely kept
19 active to provide back-up power (AFSCF, 1972). The plant, staffed by Solar contractors,
20 was operational in February 1970, and provided power to the entire installation, rendering
21 it energy-independent at that time (Jernigan, 1983).

22
23 **8. Significant Events and Satellites Supported, 1970s**

24
25 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. In the 1970s,
26 Sunnyvale AFS continued to support existing and newly established satellite programs,
27 although many of them remained classified. In 1970, the AFSCF Satellite Test
28 Operations Historical Reports noted the successful support of two "unique orbital events"
29 from the installation. These events included support of the Apollo 13 mission in April,
30 which was aborted following the explosion of an on-board oxygen tank, and support of
31 the first North Atlantic Treaty Organization (NATO) communications satellite in March
32 (AFSCF, January-June 1970).

33
34 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
35 support from Building 1003 throughout the 1970s for the orbiting satellite (Jernigan,
36 1983). Program 949 was also re-designated the Defense System Program (DSP) in 1970.
37 Sunnyvale AFS continued to support this program throughout the early 1970s (AFSCF,
38 July-December 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was
39 approximately 23' long, 10' wide, and contained a large infrared telescope which scanned
40 the earth for missile launches. In the event a missile was launched, it would be detected
41 by the United States within minutes, which removed the possibility of a surprise attack
42 (Peebles, 1997).

1 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
2 advanced communications satellites had been launched to handle voice, teletype,
3 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
4 satellites – code-named HEXAGON, and popularly known as “Big Bird” – were also
5 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
6 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
7 to photograph large areas, and return the film to earth via SRV. They carried
8 technologically advanced cameras, additional film capsules, and antennae for other
9 intelligence-gathering purposes (Clark, 2007).

10
11 In January 1972, President Richard Nixon announced the development of the Space
12 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
13 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
14 bases for the program. Research and development (R&D) shuttle launches would
15 originate from the Kennedy Space Center, and military launches would originate from
16 Vandenberg AFB. The shuttle would be responsible for the launch of all commercial,
17 scientific, and military satellites into space. The AFSCF, including Sunnyvale AFS and
18 tracking stations, would provide tracking and control for the program (Jernigan, 1983).

19
20 On May 25, 1972, Sunnyvale AFS supported the 145th and final launch of the Corona
21 Program from the original Satellite Control Room in Building 1001. It was terminated as
22 a result of advances in satellite technology. By the time the Corona Program concluded,
23 Corona satellites had provided approximately 800,000 reconnaissance photographs
24 covering approximately 510 million square miles (Chapman, 2008; Vukotich, n.d.).
25 Following its termination the Satellite Control Room Complex likely continued to be
26 utilized for control of other satellite programs.

27
28 In July 1975, the final Apollo flight was launched and supported by Sunnyvale AFS. The
29 final flight was known as the Apollo-Soyuz Test Project, which marked the first joint
30 United States-Soviet Union space mission. The mission was the first time two foreign
31 spacecraft docked together in orbit (NASA, July 14, 2010). In 1976, the first DMSP
32 Block 5D, a meteorological satellite, was launched, and was presumably supported from
33 Sunnyvale AFS. It was an upgraded version of the 1960s-era DMSP, and provided twice-
34 daily, worldwide meteorological, oceanographic, and solar-terrestrial physics
35 measurements (Jernigan, 1983; Wade, n.d.).

36
37 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
38 the first successful electronic imaging satellite, and transmitted high-quality images in
39 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources
40 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
41 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
42 lettering on billboards” (Ingersoll, 1978). Nonetheless, this top-secret satellite represented

1 significant advances in the development of satellite technology, and was supported from
2 Sunnyvale AFS, as well as associated tracking stations.
3

4 **9. Development of the Air Force Satellite Control Network, Expansion, and Upgrades,**
5 **1980s**
6

7 In 1982, the Air Force Satellite Control Network (AFSCN) was organized. The AFSCN
8 was not a formal organization, but rather denoted a group of common user resources,
9 assets, and facilities which collectively provided tracking, telemetry & commanding
10 (TT&C) support for virtually all DoD spacecraft, and select NASA and foreign
11 government programs (Hane, 1988). The goal of the AFSCN was to provide “enduring
12 control capability commensurate with the need for operational space suites throughout
13 the conflict spectrum” (AFSCF, 1983).
14

15 To accomplish this goal, Sunnyvale AFS was upgraded as part of the Data Systems
16 Modernization Program. This \$500 million upgrade introduced centralized database-
17 driven computer hardware and software to replace outdated systems. The upgraded
18 system was more reliable, cheaper to maintain, and faster than its predecessor, allowing it
19 to support a steadily increasing satellite support workload (Fedor et al., 2006).
20

21 In 1981, King/Reif and Associates, an architecture and planning firm, prepared plans for
22 Building 10031 on behalf of NAVFAC Western Division. The building was constructed
23 to provide support for a “high priority” satellite system known as Program 106. Referred
24 to on plans as an MCC, Building 10031 was constructed in conjunction with the Data
25 Systems Modernization Program. Plans were stamped by AIA-registered architect
26 Richard A. Reif, a partner in the firm; however, no further information about the firm, or
27 Mr. Reif is available. The three-story building was appended to the north façades of
28 Buildings 1001 and 1003, and required construction of a new entrance that obscured the
29 original entrance on the west façade of Building 1001. Although the lobby and entrance
30 was constructed as part of Building 10031, they were considered part of Building 1001.
31 The entrance was embellished with a metal sign that read “Sunnyvale Air Force Station”
32 (King/Reif and Associates/NAVAFC, December 18, 1981d; Fola Odafalu, pers. comm.,
33 July 26, 2010).
34

35 The first two stories of Building 10031 housed parking areas, and the third story included
36 secure space to support Program 106. In addition, the third story housed MCC IX,
37 computer rooms, communications rooms, and likely other MCCs. The third story was
38 RFI-shielded to protect electronic and communications systems critical to satellite control
39 from electromagnetic interference (EMI) and RFI. Floor plans for the third story indicate
40 that the RFI-penetration protection was provided on the roof, floor, and exterior walls to
41 protect the third story. In addition, several interior spaces were also separated by RFI
42 partitions, likely to protect individual satellite support activities in MCCs. In general, the

1 RFI-shielded areas were accessed via interlock doors, where only one door opened at a
2 time, ensuring that the area remained shielded at all times (King/Reif and
3 Associates/NAVAFC, December 18, 1981a-c). Construction began in March 1982 (U.S.
4 Air Force, 2006).

5
6 In 1982, plans were prepared for Building 10032 by Rasmussen Ingle Anderson, a San
7 Francisco-based architecture firm, under the auspices of NAVFAC Western Division.
8 Building 10032 was also designed as part of the Data Systems Modernization Program,
9 and was similar to Building 10031. It was a three-story building which provided two
10 stories of parking, and one story of RFI-shielded space for MCCs, computer rooms,
11 communications rooms, and offices (Rasmussen Ingle Anderson/NACFAC, October 29,
12 1982a-c). Buildings 10031 and 10032 were operational by 1984 (Fola Odafalu, pers,
13 comm., July 26, 2010).

14
15 In addition, a new satellite control center – the Consolidated Space Operations Center
16 (CSOC) – was constructed at Falcon AFS, Colorado Springs, Colorado (present-day
17 Schriever AFB) in conjunction with the Data Systems Modernization Program (Fedor et
18 al., 2006). The CSOC was constructed partially due to concern about the vulnerability of
19 Sunnyvale AFS to earthquakes and terrorism (Philp, June 9, 1985).

20
21 According to the Onizuka AFS Drawing Number Log, in 1985, plans were prepared for
22 minor modifications to Building 10031. These included plans to install a back-up air
23 handling unit (AHU) on the roof; additional electrical outlets; and a door between Rooms
24 2158 and 2160. In 1989, plans were prepared to reconfigure and enlarge Room 2164. The
25 room functioned as the communications area, and plans indicate the expansion was
26 undertaken to provide support for the expansion of MCC T (Onizuka AFS, n.d.).
27

28 **10. Significant Events and Satellites Supported, 1980s**

29
30 Sunnyvale AFS continued to support numerous satellite programs throughout the 1980s,
31 although many remained classified. On April 12, 1981, the first mission flown by the
32 Space Shuttle *Columbia* was launched, and successfully returned to earth on April 14.
33 The AFSC provided support for the first shuttle mission, and five AFSCF mission
34 controllers received U.S. Air Force Commendation Medals. In June 1982, the first
35 classified military payload was carried into orbit aboard the fourth shuttle mission flown
36 by *Columbia*, and was supported from MCC B in Building 1003 (Jernigan, 1983).
37

38 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
39 appeared to be planning a surprise invasion of Chad and Sudan. The United States
40 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-
41 secret satellite was supported from Sunnyvale AFS. The mission produced photographs
42 that documented massive troop build-ups at the border of Sudan, and the *USS Nimitz* was

1 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
2 1989; Philp, October 30, 1985). In 1984, the twentieth and final KH-9 satellite was
3 launched and supported from Sunnyvale AFS (Day, November 8, 2004).
4

5 The first dedicated military flight, aboard the Space Shuttle *Discoverer*, was launched in
6 January 1985, and an article in the August 2009 edition of *Air & Space Magazine*
7 indicated that “according to most accounts, STS-51C’s payload was ORION, an
8 eavesdropping satellite for signals intelligence” (Cassutt, August 1, 2009). In October
9 1985, the second dedicated military flight was launched by the Space Shuttle *Atlantis*
10 (Cassutt, August 1, 2009). *The New York Times* reported that, according to reliable
11 sources, “two \$100 million communication satellites” were deployed into orbit on a
12 mission classified as secret by the Pentagon (Broad, October 5, 1985).
13

14 In 1986, the Space Shuttle *Challenger* exploded after launch, killing its seven crew
15 members, including the shuttle’s mission specialist, Lieutenant Colonel Ellison S.
16 Onizuka, who had trained at Onizuka AFS (NASA, January 2007). That same year,
17 Sunnyvale AFS was renamed Onizuka AFB in honor of Onizuka. Following the
18 *Challenger* explosion, the U.S. Air Force returned to sending satellites into orbit via
19 unmanned launches. It was not until December 1988 that the Space Shuttle *Atlantis* was
20 launched with a top-secret military payload (Cassutt, August 1, 2009).
21

22 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
23 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
24 communications satellite developed by NASA (Levien, 1989).
25

26 **11. Onizuka Air Force Station, 1990s-Present**

27

28 By 1991, the Soviet Union had dissolved, signaling the end of the Cold War (Center for
29 Air Force History, 1994). The end of the Cold War led, in part, to the declassification of
30 the NRO in September 1992. The end of the Cold War also led to a decrease in military
31 spending. However, modifications continued to be undertaken at Onizuka AFS, although
32 less than in prior decades. In 1990, Martin Marietta Space Systems Facilities prepared
33 plans on behalf of Onizuka AFB for modifications to MCC IX in Building 10031 (Martin
34 Marietta Space Systems Facilities, April 30, 1990). In 1992, Keller & Gannon prepared
35 plans to modify MCCs in Buildings 1001 and 1003. Modifications included room
36 reconfiguration, and mechanical and electrical upgrades to accommodate new satellite
37 programs (Onizuka AFS, n.d.).
38

39 In 1992, an addition, known as the Emergency Utility Building (EUB) was appended to
40 the south façade of Building 1004. The EUB was constructed to supplement power
41 distribution to the installation, and as a result of its construction, Building 10031
42 underwent mechanical upgrades (Onizuka AFS, n.d.).

1 In 1991, the 21st Space Operations Squadron (SOPS) were activated at Onizuka AFB, and
2 assumed the role of operations of the 2nd Satellite Tracking Group. In 1992, the 750th
3 Space Group was activated and assumed responsibility for launch and early orbit of
4 numerous satellites, including the Space Shuttle (Schriever AFB, n.d.).
5

6 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
7 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported by Onizuka
8 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
9 weather satellites assisted with U.S. missile launches, and navigation satellites assisted
10 the troops in maneuvering through the desert. Reconnaissance satellites, such as those in
11 the NRO's KH-11 satellite program, also likely continued to be supported by the
12 installation (Peterson, July 30, 1993). The early 1990s also represented a key year for
13 satellite scheduling, with the advent of a computerized scheduling system. Prior to this
14 time, scheduling was plotted by hand, using colored tape to represent different spacecraft
15 on approximately 50' rolls of butcher-paper (Mead, March 2, 1994). In addition, the
16 installation also supported numerous NASA space exploration programs.
17

18 In 1994, Onizuka AFB was renamed Onizuka AFS. In 1995, the Corona Program was
19 declassified, and the following year, 800,000 images taken between 1960-72 were made
20 available to the public. Formerly classified documents also became available (NRO,
21 February 24, 1995). In addition, Onizuka AFS was realigned in accordance with the Base
22 Realignment and Closure (BRAC) Act, and select functions were relocated to CSOC at
23 Falcon AFB, Colorado Springs, Colorado. The realignment resulted in a loss of
24 approximately 1,100 jobs at Onizuka AFS (City of Sunnyvale, 2006). By the end of the
25 1990s and during the early 2000s, responsibility for controlling the DoD satellite network
26 continued to be transferred to the CSOC, and Onizuka AFS's responsibilities
27 substantially decreased (Flinn, December 1, 1991; Wulff, November 29, 1995).
28

29 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
30 U.S., British, and French military personnel in Dhahran, Saudi Arabia, led to increased
31 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
32 permitted on the first two stories of Buildings 10031 and 10032. In addition, because
33 Innovation Way was in close proximity to Buildings 10031 and 10032, the street was
34 closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey barriers and
35 bollards were also installed around the perimeter of the buildings (Dennis Ralphs, pers.
36 comm., August 2, 2010).
37

38 In addition, following the closure of the first two stories to vehicles, portions were
39 reconfigured to provide storage. Additional security apparatus was installed in Building
40 10031 in the early 2000s, such as horns and flashing strobe lights that indicated the
41 presence of unauthorized personnel in classified areas (Onizuka AFS, n.d.).
42

1 In 2005, the BRAC commission recommended closure of Onizuka AFS. The
2 recommendations were approved by President George W. Bush. In 2006, the DoD,
3 through the Office of Economic Adjustment, formally recognized the City of Sunnyvale
4 as the Local Redevelopment Authority (LRA) to plan the redevelopment of Onizuka AFS
5 and its conversion to civilian use (City of Sunnyvale, 2006).
6

7 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
8 and open house were held to commemorate this event, and were attended by over 800
9 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
10 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the
11 history of the NRO and reconnaissance satellite programs supported from the installation
12 between through 2007. Following the open house, displays and histories of the programs,
13 many of which remain classified, were relocated to the NRO archives in Chantilly,
14 Virginia (Dennis Ralphs, pers. comm., August 3, 2009).
15

16 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
17 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
18 attendance were current and former employees, both military and civilian, as well as
19 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan
20 noted that "[T]his facility here in Sunnyvale has supported an amazing 3.4 million
21 satellite operations over the past years. Much of the details of this work are still classified
22 and we cannot talk openly about it, but what I can tell you is that the operations
23 conducted by the NRO from this site have made our nation a tremendously safer place to
24 be" (Bauer, July 29, 2010).
25

26 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
27 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
28 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
29 transferred out of federal hands in September 2011. It is anticipated that the Department
30 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
31 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
32 remainder of the installation will be redeveloped.
33

34 **E. Sources:**

35
36 **1. Architectural Drawings**
37

38 *Original plans are on file in Building 1002, Civil Engineering Office, Onizuka AFS,*
39 *Sunnyvale, California, and include the following. Where applicable, the numbers*
40 *following the plans in parentheses correspond to the Onizuka AFS Drawing Number Log.*
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5 "Interim Expansion Partial Floor Plan A." (1412)
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8 "Interim Expansion Partial Floor Plan B." (1413)
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10 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965d.
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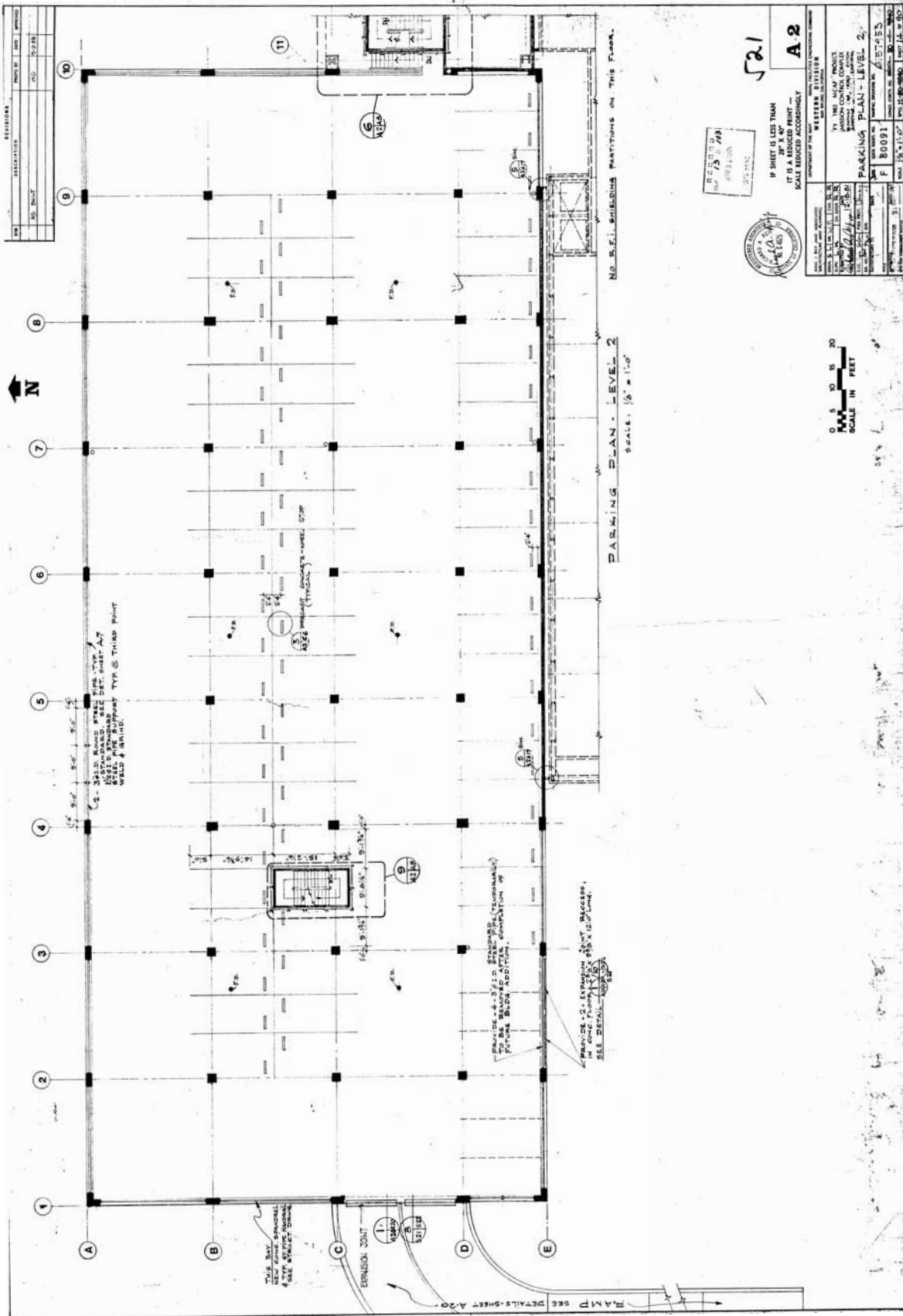
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REVISED BY: JTB
DATE: 11/13/78

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IF SHEET IS LESS THAN
1/4" X 11" PRINT
IT IS A REDUCED COPY
SCALE INDICATED ACCORDINGLY

PROJECT: USAF041221A-E	
BUILDING: 10031	
FLOOR: LEVEL 2	
DRAWING: PARKING PLAN - LEVEL 2	
DATE: 11/13/78	
DRAWN BY: JTB	
CHECKED BY: [Signature]	
SCALE: 1/8" = 1'-0"	
SHEET NO.: F 80091	
TOTAL SHEETS: 10	
PROJECT NO.: A12753	



U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 10031
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-E

SECTION II

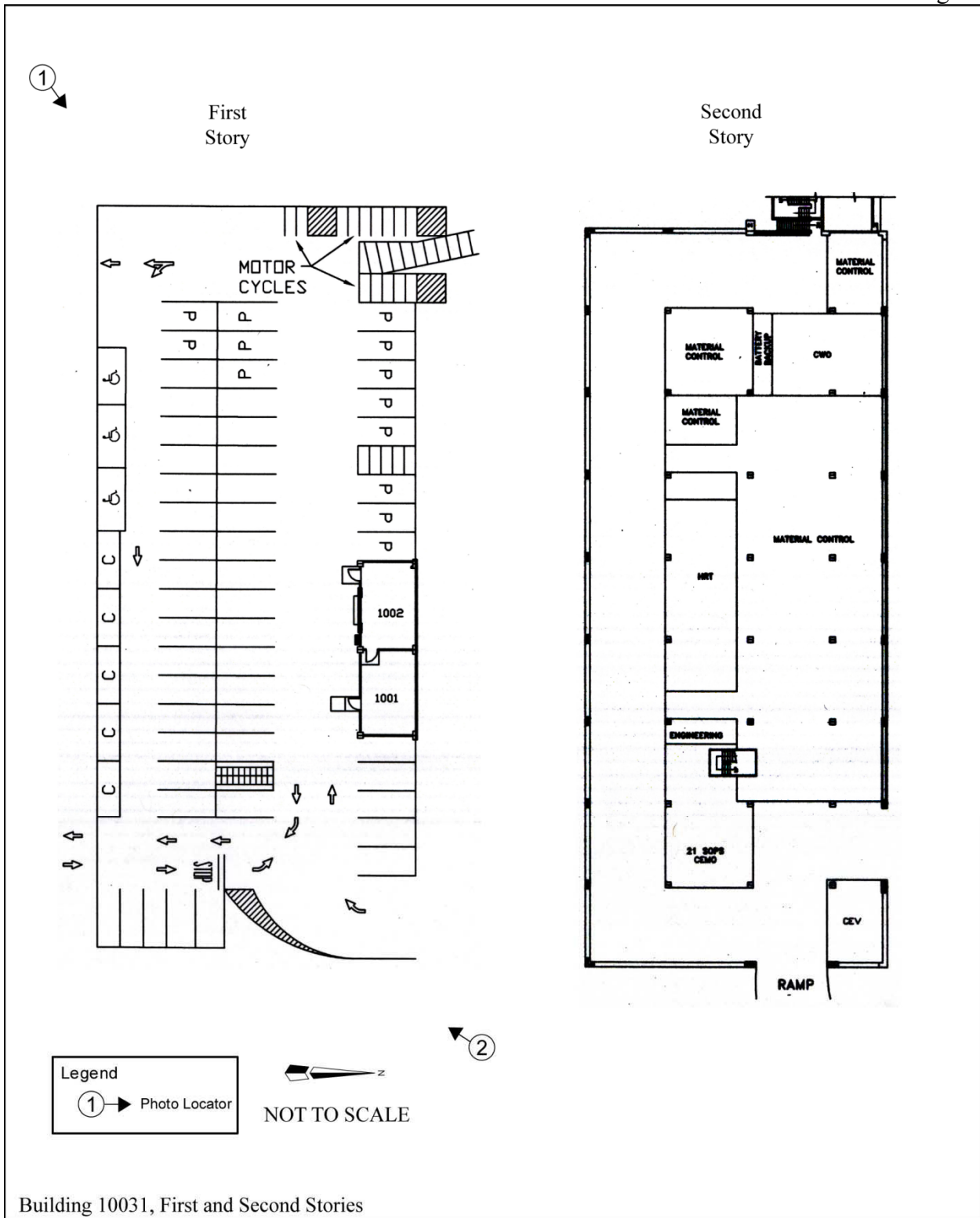
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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **INDEX TO PHOTOGRAPHS**

5
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7 BUILDING 10031
8 Onizuka Air Force Station
9 1080 Innovation Way
10 City of Sunnyvale
11 Santa Clara County
12 California
13
14 Anne Jennings, Photographer Date of Photographs: June 7-14, 2010
15
16 Log No. USAF041221A-E-01 VIEW OF NORTH AND EAST FAÇADES,
17 LOOKING SOUTHWEST. NOTE OPEN FIRST
18 AND SECOND STORIES WHICH ORIGINALLY
19 HOUSED PARKING AREAS.
20
21 Log No. USAF041221A-E-02 VIEW OF CONCRETE RAMP APPENDED TO
22 WEST FAÇADE, LOOKING NORTH. RAMP
23 PROVIDED ACCESS TO SECOND STORIES OF
24 BUILDINGS 10031 (BACKGROUND) AND
25 10032 (FOREGROUND).
26
27 Log No. USAF041221A-E-03 VIEW OF ROOM 2164, A FORMER
28 COMMUNICATIONS AREA ON THIRD
29 STORY, LOOKING WEST.
30

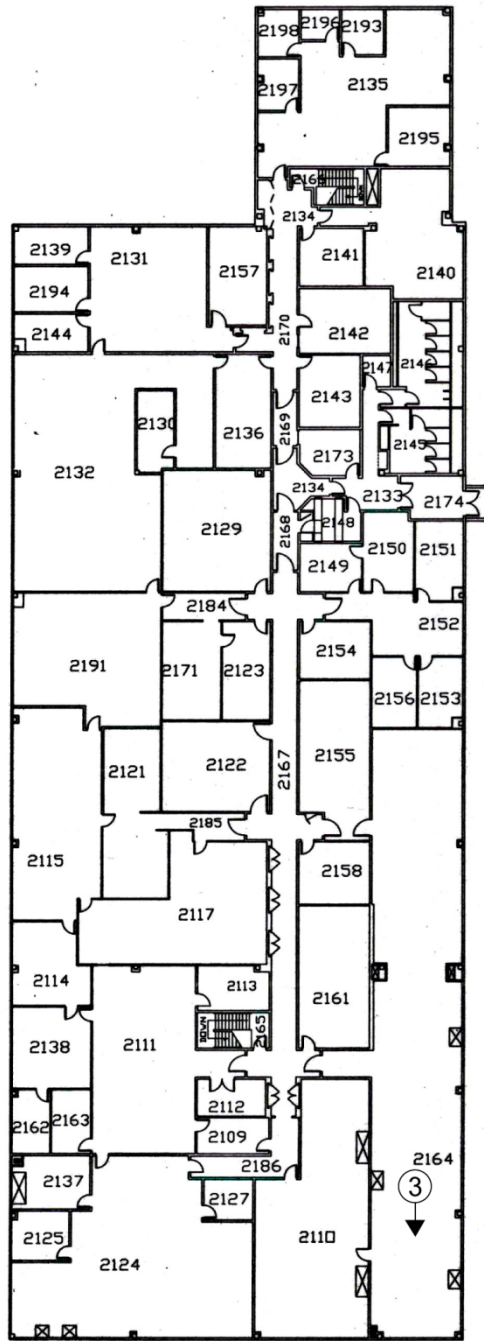


Third
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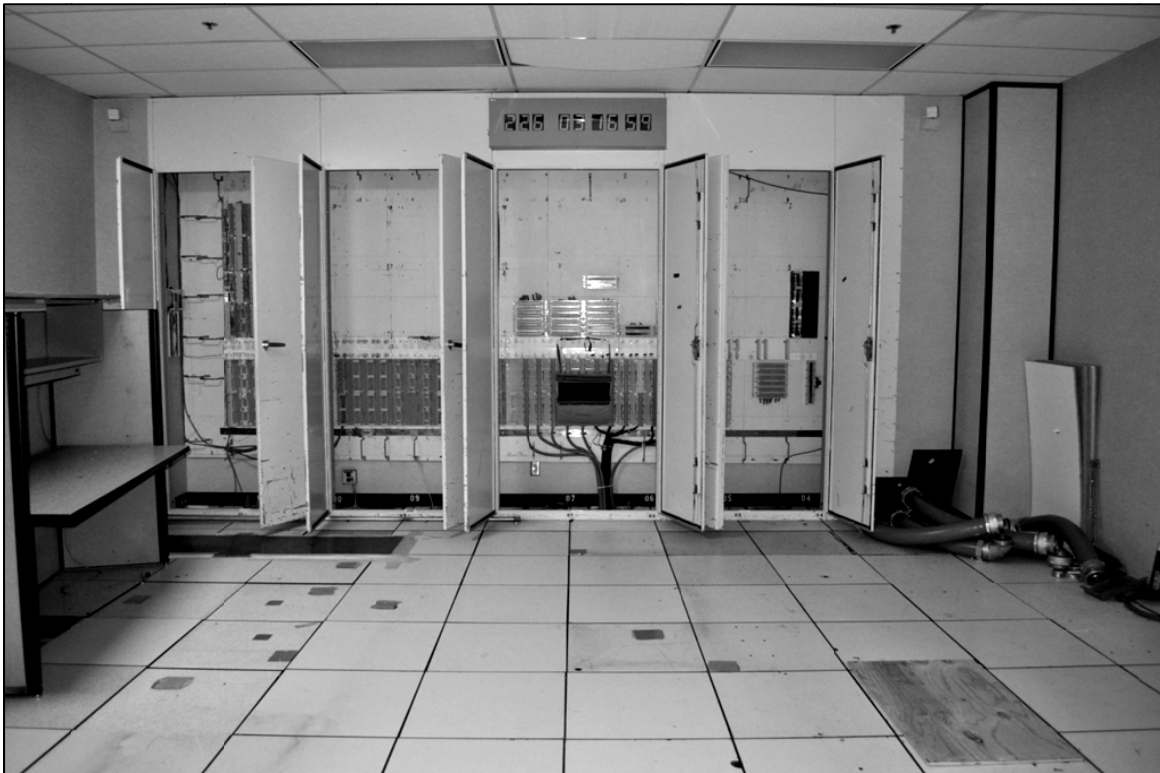
① → Photo Locator



Building 10031, Third Story







U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 10032
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-F

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

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Santa Clara County
California

Log No.USAF041221A-F

SECTION I

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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

3
4 **U.S. AIR FORCE SATELLITE TEST CENTER**
5 **BUILDING 10032**

6
7 **Log No. USAF041221A-F**
8

9 **A. Location:** Building 10032, Onizuka Air Force Station
10 1080 Innovation Way, Sunnyvale, Santa Clara County, California
11

12 **B. Significance:** Building 10032, constructed in 1984 to support reconnaissance satellites,
13 is a contributing resource to the National Register-eligible U.S. Air Force Satellite Test
14 Center Historic District. The district is significant at a national, state, and local level
15 under Criterion A for its associations with satellite reconnaissance during the Cold War,
16 and Criteria Consideration G, because five of the six buildings, including Building
17 10032, are not yet fifty years old, and have exceptional importance for their associations
18 with satellite reconnaissance during the Cold War.
19

20 The U.S. Air Force Satellite Test Center Historic District is significant at the national
21 level for its association with satellite reconnaissance during the Cold War. The
22 installation was established in 1959 to serve as the command-and-control center for the
23 first reconnaissance satellite program, the Corona Program. It was developed by the U.S.
24 Air Force and the Central Intelligence Agency (CIA), with assistance from a private
25 contractor, Lockheed Missiles and Space Division. Shortly thereafter, the National
26 Reconnaissance Office (NRO) was established to provide oversight of the program and
27 develop other satellite programs. As new satellite technologies emerged, such as
28 communications, early missile warning, meteorology, navigation, and nuclear detonation
29 detection, Building 10032 was constructed for satellite support. These satellite programs
30 also provided valuable data throughout the Cold War, and were supported from the U.S.
31 Air Force Satellite Test Center Historic District. Although many of the satellite programs
32 remain classified, it is apparent through the continued presence of the NRO that the
33 installation played a key role in the United States' conduct of the Cold War.
34

35 The U.S. Air Force Satellite Test Center Historic District is also significant at the state
36 and local levels for its association with the development of California as a leader in
37 technological innovations. California, and specifically the City of Sunnyvale in Silicon
38 Valley, began to emerge as a leading technological center during the Cold War. This was
39 due, in part, to the military's investment in the development of defense technologies in
40 California, such as command and control of reconnaissance satellites at Onizuka Air
41 Force Station (AFS). The presence of Lockheed Missiles and Space Division in
42 Sunnyvale in the mid-1950s, followed by Onizuka AFS in the late 1950s, burnished its
43 reputation as a high-technology center. The district's period of significance extends from
44 1959, the date of development of the installation, through 1991, the conclusion of the
45 Cold War.
46

1 **C. Description:**
2

3 **1. Current Description**
4

5 Building 10032 was constructed in 1984 to provide satellite support in conjunction with
6 Buildings 1001, 1003, and 10031. It is a three-story, rectangular-plan, windowless, steel-
7 frame, utilitarian building. It sits atop a concrete-pile foundation, and is augmented by
8 two-story concrete columns, ten along the north and south facades, five along the east and
9 west facades, and twenty-four interior columns. The first story is open, and the second
10 story features concrete panels between the columns. The steel-frame, radio frequency
11 interference (RFI)-shielded third story is clad in vertical metal siding and capped by a flat
12 corrugated metal-clad roof. Building 10032 is appended to the south façade of Building
13 10031 and the west façade of Building 1003. A concrete ramp appended to the west
14 façade of Building 10031 also provides access to the second story of Building 10032. An
15 enclosed cylindrical concrete stairwell is appended to the west corner of the north façade.
16 The building has no fenestration.
17

18 The first story of Building 10032 encompasses 30,373 square feet, the second story
19 27,817 square feet, and the third story 29,307 square feet. A current sketch plan is
20 included in the Index to Photographs. A comparison of the original floor plan with the
21 current floor plan indicates that the majority of Building 10032 has been reconfigured.
22 An inspection of select interior spaces, coupled with information included in the Onizuka
23 AFS Drawing Number Log, indicate that most interior spaces, even in cases where they
24 retain their original configuration, no longer retain their original function, features, or
25 finishes. However select areas on the third story retain RFI-shielded walls and are
26 accessed via interlock doors.
27

28 **2. According to Original Plan**
29

30 Original plans of Building 10032 are on file in the Civil Engineering Office, Building
31 1002, Onizuka AFS, Sunnyvale, Santa Clara County, California. Original building plans
32 were prepared in 1982 by Rasmussen Ingle Anderson, a San Francisco-based architecture
33 firm, on behalf of NAVFAC, Western Division. The following plans are featured in the
34 graphic documentation section of the report:
35

- 36 • “Alter Satellite Control Facility, First Floor Plan” (Rasmussen Ingle
37 Anderson/NAVFAC, October 29, 1982a)
- 38 • “Alter Satellite Control Facility, Second Floor Plan” (Rasmussen Ingle
39 Anderson/NAVFAC, October 29, 1982b)
- 40 • “Alter Satellite Control facility, Third Floor Plan” (Rasmussen Ingle
41 Anderson/NAVFAC, October 29, 1982c)

- “Alter Satellite Control Facility, Elevations” (Rasmussen Ingle Anderson/NAVFAC, October 29, 1982d)

The historic appearance of Building 10031’s exterior is similar to its current appearance. However, as originally conceived, the second story was open, and featured metal-pipe railings between the concrete columns.

According to the original plans, the first and second stories housed parking, and the second story also housed a mechanical room located along the east side. The RFI-shielded third story was arranged in four distinct areas, which likely housed four Mission Control Centers (MCCs) accessed via interlock doors. Although the plans do not indicate room functions, the Onizuka AFS Drawing Number Log indicates that Building 10032 housed MCCs 4 and 7 (Rasmussen Ingle Anderson/NAVFAC, October 29, 1982a-d).

According to the plans, north and south bridges were envisioned to provide access from the second story of Building 1003 to Building 10032 (Rasmussen Ingle Anderson/NAVFAC, October 29, 1982c). However, because cables and wiring existed at the proposed location of the north bridge, only the south bridge was constructed (Dennis Ralphs, pers. comm., June 9, 2010).

D. History:

1. Development of the Satellite Test Center, 1959-61

The development of satellite reconnaissance during the Cold War (1946-91) and the specific role of the U.S. Air Force Satellite Test Center (STC) is fully described in the associated overview report, California State Historic Preservation Office Historic American Building Survey Level II-Type Documentation, U.S. Air Force Satellite Test Center, Log No. USAF041121A. The following section provides a brief summary of the role that Building 10031 played at the STC from 1959-91, its period of significance.

The installation was established in 1959 when Building 1001 was constructed to serve as the command-and-control center for the Corona Program to support the launch, orbit, and recovery of Corona satellites. The Corona Program, initiated in 1958, was the first satellite reconnaissance program developed by the U.S. Air Force and the Central Intelligence Agency (CIA), with assistance from private contractors, such as Lockheed Missiles and Space Division, located in Sunnyvale, California. Concerns about preserving the secrecy of the Corona Program and its objectives led to the designation of the Discoverer Program as a cover program. The publicly-stated goal of the Discoverer Program was scientific research (Richelson, 2002). Prior to the construction of Building 1001, at least eight Corona satellites, described as Discoverer satellites in the press, were launched from Vandenberg Air Force Base (AFB), and were supported from an interim

1 control center in Palo Alto, California. Tracking stations located around the world also
2 provided support.
3

4 In 1959, the U.S. Air Force acquired 11.43 acres of land in Sunnyvale from Lockheed
5 Missiles and Space Division located to the west. Plans for the installation were designed
6 by the Ralph M. Parsons Company, an architecture and engineering firm based in Los
7 Angeles, California, under the auspices of the U.S. Air Force Ballistic Missile Division
8 (AFBMD) in Englewood, California (Ralph M. Parsons Company/AFBMD, March 6,
9 1959).
10

11 On January 28, 1960, the installation, newly designated as the STC, was dedicated by the
12 U.S. Air Force (Davies, 1960). A few months later, on March 1, 1960, it was occupied by
13 the 6594th Aerospace Test Wing (ATW), the first unit to be tasked with military satellite
14 operations; Lockheed Missiles and Space Division employees; and likely the CIA. The
15 6594th ATW provided oversight for Lockheed Missiles and Space Division which was
16 responsible for satellite operations (6594th ATW, 1961; Jernigan, 1983). However,
17 portions of the building remained under construction, including the state-of-the-art
18 Satellite Control Room in the Satellite Control Room Complex. An interim Satellite
19 Control Room was established from which Lockheed Missiles and Space Division,
20 monitored by the 6594th ATW, could direct the launch, tracking, data acquisition,
21 command and control, and recovery phase of military satellites (6594th ATW, 1961;
22 Jernigan, 1983).
23

24 On July 7, 1960, the installation was officially designated as the Satellite Test Annex
25 (STA) under the jurisdiction of the AFBMD. However, it should be noted that it
26 continued to be referred to as the STC, both in U.S. Air Force documents, as well as by
27 the public, likely due in part to a building sign which indicated "U.S. Air Force Satellite
28 Test Center." On February 6, 1961, the Satellite Control Room and remainder of the
29 Satellite Control Room Complex became operational. The primary purpose of the
30 complex was to support Corona satellites, although additional programs were supported
31 by this time (Jernigan, 1983).
32

33 **2. Significant Events and Satellites Supported, 1960-61**

34

35 In August 1960, the U.S. Air Force accomplished the first successful retrieval of a
36 Discoverer satellite. On August 10, Discoverer XIII was launched from Vandenberg
37 AFB, and was supported by the STC. The satellite achieved polar orbit for a period of
38 ninety-four minutes, during which time it was in contact with worldwide tracking
39 stations, and the interim Satellite Control Room at the STC. During its seventeenth
40 rotation of the earth, the eject command was issued from the STC, and the capsule was
41 ultimately recovered from the Pacific Ocean, marking the first successful retrieval of an
42 object from space (Arnold, 2005; 6594th ATW, no date [n.d.]). In-keeping with the

1 publicly stated scientific objectives of the Discoverer Program, the *San Jose Mercury*
2 *News* noted that “Discoverer recovery techniques will be used soon to return monkeys
3 from space,” and were vital to “returning a man to earth after orbiting in space” (Lindsey,
4 August 12, 1960). Still in the testing phase, the satellite did not yet contain a camera
5 (Jernigan, 1983).
6

7 Shortly after this historic event, Discoverer XIV was launched on August 18, 1960 from
8 Vandenberg AFB (Arnold, 2005). Discoverer XIV orbited the earth seventeen times,
9 supported by the STC from the interim Satellite Control Room in Building 1001, and the
10 Kodiak tracking station, before the eject command was relayed to the satellite. Following
11 the command, at 300 miles above the earth, the satellite recovery vehicle (SRV)
12 separated from the spacecraft, and began its descent to earth, where it was caught by a
13 specially equipped Fairchild C-119 *Flying Boxcars* (C-119) piloted by U.S. Air Force
14 Captain Harold Mitchell (*The New York Times*, August 20, 1960).
15

16 The Discoverer XIV SRV contained 20 pounds of film which documented over
17 1,650,000 square miles, and provided the first successful satellite reconnaissance
18 photographs of the Soviet Union. It also resulted in more photographic coverage of the
19 Soviet Union than all previous U-2 flights combined. Furthermore, it provided evidence
20 that the missile gap, feared since the 1957 launch of *Sputnik I* by the Soviet Union, did
21 not exist, and that the Soviets did not have an immense stockpile of Intercontinental
22 Ballistic Missiles (ICBM) (Day, 2006). However, despite the historic nature of this event,
23 the crew, who were not cleared for the Corona Program, were unaware of the importance
24 of their mission (Arnold, 2005).
25

26 Although the STC was developed to support the Corona Program, by the fall of 1960, it
27 also supported the Satellite and Missile Observation System (SAMOS) and Missile
28 Detection Alarm System (MIDAS). Both programs were initially developed by the U.S.
29 Air Force in the mid-1950s as reconnaissance and missile detection satellites,
30 respectively (Jernigan, 1983). On October 11, 1960, the first SAMOS satellite was
31 launched from Vandenberg AFB, and supported from the STC, although it failed to reach
32 orbit (*San Jose Mercury News*, October 12, 1960). By July 1961, MIDAS satellites were
33 launched from Vandenberg AFB and supported by the STC. By the end of 1961, two
34 MIDAS satellites had reached orbit (6594th ATW, 1961).
35

36 In April 1961, Discoverer XXIII was launched from Vandenberg AFB, and was the first
37 Corona satellite supported by the STC from the new control room. By this time, Corona
38 satellites were regularly providing images of the Soviet Union, as well as other
39 communist countries. Among these images included evidence of the building of the
40 Berlin Wall between East and West Germany (Chapman, 2008). In September 1961, the
41 NRO was established as a classified agency in the Department of Defense (DoD), and

1 was tasked with oversight of satellite reconnaissance programs, including the Corona
2 Program, and therefore became a presence at the STC (Richelson, 2000).
3

4 **3. Building 1002 Construction and Upgrades, 1962**
5

6 In 1962, the STC experienced its first of many expansions when plans for a two-story, L-
7 shaped administrative building – Building 1002 (Addition to the Satellite Test Annex) -
8 were prepared for the U.S. Air Force Space Systems Division (SSD) by Kaiser Engineers,
9 a division of the Henry J. Kaiser Company. Kaiser Engineers was a well-known
10 architecture and engineering firm located in Oakland, California (Kaiser Engineers/U.S.
11 Air Force SSD, January 15, 1962; Air Force Satellite Control Facility (AFSCF), 1972).
12

13 During this time, Kaiser Engineers also prepared plans for a single-story addition to
14 Building 1001 to house new a new communications center, and interior modifications to
15 the Satellite Control Room Complex (Kaiser Engineers/U.S. Air Force SSD, October 17,
16 1962a-b; Jernigan, 1983).
17

18 The 1962 renovations were likely implemented in conjunction with the U.S. Air Force’s
19 first modernization effort, the Multiple Satellite Augmentation Program (MSAP). This
20 effort was initiated, in part, to standardize and provide updated equipment to the STC and
21 tracking stations which enabled them to simultaneously support multiple satellite
22 programs (Lockheed Missiles and Space Division, 1963). Computer capabilities were
23 upgraded, new display and communications equipment were also installed, and
24 connections between the STC and tracking stations were upgraded (Jernigan, 1983).
25

26 **4. Significant Events and Satellites Supported, 1962-64**
27

28 On February 27, 1962, Discoverer XXXVIII was launched and supported from the STC.
29 The following month, the DoD classified all military satellite programs (DoD, March 23,
30 1962). As a result, Discoverer XXXVIII was the last satellite launched as part of the
31 Discoverer program. Corona satellites continued to be launched and supported by the
32 STC, however, because all satellites were classified, the Corona Program no longer
33 required a cover story.
34

35 Between 1962-64, the STC supported over fifty Corona satellites. By this time, Corona
36 satellites had accurately mapped all twenty-five of Moscow’s long-range missile sites.
37 Furthermore, images taken by Corona satellites indicated that China was readying its
38 nuclear facility in Lop Nur for testing. It was noted in a classified CIA briefing that “[O]n
39 the basis of new overhead photography, we are now convinced that the previously
40 suspect facility at Lop Nur in western China is a nuclear test site which could be ready
41 for use in about two months.” Within two months, on October 16, 1964, China tested an
42 atomic bomb at the Lop Nur site (Broad, September 12, 1995).

1 In addition to Corona, SAMOS, and MIDAS satellites the STC supported the Defense
2 Meteorological Satellite Program (DMSP) in 1962 and 1963. DMSP was a meteorological
3 satellite program initiated in 1960 to provide weather and climate data for more effective
4 military operations (DMSP, n.d.). On October 16, 1963, the first Vela satellite was
5 launched and supported by the STC. The Vela Program – vela means vigil in Spanish –
6 was a series of satellites designed to detect nuclear detonations (Jernigan, 1983; Peebles,
7 1997). Presumably, Vela satellites provided images of the Lanzhou Diffusion Plant in
8 Lanzhou, China and the Baotao Nuclear Fuel Component Plant in Baotao, China
9 (Richelson, 2002).

10
11 In November 1963, the final SAMOS satellite was launched (Peebles, 1997).
12 Furthermore, 1963 marked the beginning of the Keyhole (KH)-7 surveillance system,
13 noted in a 2006 NRO memo as “the Intelligence Community’s first high resolution
14 surveillance or ‘spotting’ satellite.” Similar to Corona satellites, the KH-7 was a
15 reconnaissance satellite that returned film to earth in SRVs. It was primarily used to
16 provide surveillance of nuclear facilities and Intermediate Range Ballistic Missiles
17 (IRBM) in the Soviet Union and China (NRO, 2006).

18
19 In July 1964, two additional Vela satellites were launched, resulting in a total of four
20 orbiting satellites capable of detecting nuclear detonations. In August 1964, Syncom III
21 was launched and supported by the STC. Syncom III was a National Aeronautics and
22 Space Administration (NASA) satellite used for DoD military communications
23 experiments between Saigon, Vietnam, and Hawaii (Jernigan, 1983).

24
25 **5. Construction, Upgrades, and Designation of the Air Force Satellite Control Facility,**
26 **1964-67**

27
28 As indicated on the 1962 plan entitled “Satellite Test Annex Plot Plan,” an addition to
29 Building 1002 was planned during its initial construction. The full extent of the building
30 was never realized, however, in May 1964, plans were prepared for a two-story, L-plan
31 addition to Building 1002 to provide additional administrative space. The addition was
32 designed by Maher & Martens, a San Francisco-based architecture firm for the U.S.
33 Army Corps of Engineers (USACE), Sacramento District (Maher & Martens/USACE
34 Sacramento District, May 7, 1964).

35
36 In 1965, the U.S. Air Force Satellite Control Facility (AFSCF) was officially designated.
37 The mission of the AFSCF was to direct launch, tracking, data acquisition, command and
38 control, and recovery of DoD military satellites. Following the establishment of AFSCF,
39 an Interim Expansion Plan (IEP) was initiated to augment the facility and implement the
40 newly developed MCC concept, which focused on the development of mission-oriented
41 control centers rather than a single control room (Jernigan, 1983).

1 Plans were prepared by San Francisco-based consulting engineers, Bentley Engineers and
2 Earl & Wright, Inc., under the auspices of the U.S. Air Force SSD to develop multiple
3 MCCs in Building 1001. The plans indicate that the building was reconfigured to
4 accommodate four new MCCs, two new complex areas, two new communications areas,
5 and a new bird buffer area (Bentley Engineers and Earl & Wright, Inc./U.S. Air Force
6 SSD, December 13, 1965a-e). The majority of the work was completed by December
7 1966 (AFSCF, January-June 1966).
8

9 **6. Significant Events and Satellites Supported, 1965-70**

10
11 The increase in the number of flight support hours logged by the AFSCF between 1965-
12 66 appears to indicate that at least some of the MCCs were operational in 1966. In 1965,
13 the AFSCF logged 20,757 hours of satellite flight support. By 1966, 29,400 hours of
14 flight support were logged. The number of satellites supported also increased. In 1965,
15 the STC supported approximately fourteen satellites (AFSCF, 1972). In January 1967, the
16 STC supported thirty-one satellites per day, and by June were supporting forty-four per
17 day, which was expected to increase to forty-seven per day by July (AFSCF January-June
18 1967).
19

20 Between 1965-70, the STC supported over forty Corona satellite launches (Mission and
21 Spacecraft Library, n.d.). By 1966, upgrades to the installation had resulted in an increase
22 in involvement in satellite programs. In addition to Corona, Vela, and other programs
23 (many of which likely remained classified) new programs such as NASA's Biosatellite
24 Program were supported. The Biosatellite Program was a series of three satellites
25 designed to assess the effects of spaceflight on living organisms. Support for the program
26 focused on directing operations of the recovery of the satellites by Lockheed C-130
27 *Hercules* (C-130) aircraft flown by the 6594th Aircraft Recovery Group based at Hickam
28 AFB, Honolulu, Hawaii (Jernigan, 1983).
29

30 In June 1967, two scientific satellites, one owned by the U.S. Army, the other by the U.S.
31 Navy, were launched as the first flight in the DoD Space Experiments Program (SESP).
32 SESP was responsible for providing flights for research and experiments undertaken by
33 government agencies (AFSCF, January-June 1968; Jernigan, 1983). In 1967, the KH-7
34 surveillance system was terminated, after having flown thirty-eight missions, thirty-four
35 of which successfully returned usable images (NRO, 2006).
36

37 In June 1968, the *San Jose Mercury News* reported that satellite reconnaissance, likely
38 supported by the STC, uncovered the Soviet Union's plans for the invasion of
39 Czechoslovakia. The article noted that "[S]atellites spinning over Eastern Europe
40 monitored Soviet radio transmissions which signaled the invasion was imminent, and
41 photographic reconnaissance satellites had monitored unusual military activities on the

1 Czech borders by Soviet, East German, Polish, Hungarian, and Bulgarian troops” (*San*
2 *Jose Mercury News*, August 27, 1968).

3
4 In September 1968, a Lincoln Experimental Satellite (LES) was launched into orbit and
5 supported by the STC and tracking stations. The LES was an experimental satellite used
6 to test communications between aircraft, ships, and ground forces (Jernigan, 1983).

7
8 In 1969, support was provided for NASA’s manned flights to the moon. The STC
9 supported Apollo missions 9 and 10, and Apollo 11, the first manned lunar landing
10 mission. Program 949 was also supported in 1969 (AFSCF, January-June 1969). Program
11 949 was designated in November 1966 to supplant Program 461, which had initially
12 supplanted the MIDAS Program in 1963. Program 949 provided a wider range of
13 capabilities, and by the 1970s, was expected to have “progressively enhanced world-wide
14 early-warning, surveillance and detection capabilities” (Piper, 1970).

15
16 **7. Development of Buildings 1003 and 1004, 1966-70**

17
18 In conjunction with the technological upgrades which occurred throughout the mid-to-
19 late 1960s, in August 1966, a real estate estimate was prepared by the USACE
20 Sacramento District which proposed the acquisition of 8.2 acres of land from Lockheed
21 Aircraft Corporation, at a cost of \$49,000. In 1966, C.F. Braun & Company of Alhambra,
22 California, under the auspices of the U.S. Naval Facilities Engineering Command
23 (NAVFAC), Western Division, San Bruno, California, and SAMSO, Los Angeles,
24 California, prepared site development plans (C.F. Braun/NAVFAC/SAMSO, December
25 30, 1966). C.F. Braun & Company also prepared plans for the development of two new
26 buildings, Building 1003 (STC Building Addition), and Building 1004 (Power Plant)
27 (C.F. Braun/NAVFAC/SAMSO; November 14, 1967; August 12, 1968).

28
29 By August 1968, Lockheed Aircraft Corporation transferred the land to the U.S. Air
30 Force (Lockheed Aircraft Corporation, 1968; Jernigan, 1983). By this time site
31 development was underway, and included relocation of an existing Lockheed Missiles
32 and Space building; reconfiguration of Lockheed Martin Way (formerly known as East
33 Perimeter Road) west of Building 1001; creation of additional parking spaces; and
34 installation of underground utilities (C.F. Braun/NAVFAC/SAMSO, December 30,
35 1966).

36
37 Following site development, construction of Buildings 1003 and 1004 commenced.
38 Building 1003 was designed to house the Manned Orbiting Laboratory (MOL) Program,
39 as well as other satellite programs. Initiated in 1963, the concept involved a Titan III
40 booster rocket which carried a modified Gemini B capsule attached to a space laboratory,
41 and was intended to serve reconnaissance purposes (Jernigan, 1983). However, in June
42 1969, the DoD announced the cancellation of the MOL Program, to save money. The

1 cancellation led to a short work stoppage, however construction resumed a few weeks
2 later. *Aerospace Daily* reported that the U.S. Air Force had evaluated requirements for
3 current and future programs, and determined that construction on the building should
4 continue (*Aerospace Daily*, September 19, 1969).

5
6 By the end of 1969, the 164,000-square foot building, constructed at a cost of \$8 million
7 was nearly complete. The building was painted "Air Force blue," resulting in its
8 nickname, the "Blue Cube" (*Aerospace Daily*, September 19, 1969). Building 1003
9 housed multiple MCCs, communications and crypto equipment, a data distribution
10 center, mechanical equipment, Control Data Corporation (CDC) 3800 computers, and a
11 tape library (AFSCF, 1970). In addition, shortly after it was constructed the Vela
12 Program office, along with another unidentified satellite program was relocated from
13 Building 1001 to Building 1003 (AFSCF, July-December 1969).

14
15 Building 1004 was also designed by C.F. Braun & Company. Solar, a division of
16 International Harvester Company, provided the Saturn gas turbine generator sets that
17 powered the plant. The development of Building 1004 necessitated modifications to the
18 installation's power distribution system. Ties to the electric power provided by Pacific
19 Gas and Electric (PG&E) were severed, with the exception of one power line which
20 provided power through a Lockheed Missiles and Space Substation, and was likely kept
21 active to provide back-up power (AFSCF, 1972). The plant, staffed by Solar contractors,
22 was operational in February 1970, and provided power to the entire installation, rendering
23 it energy-independent at that time (Jernigan, 1983).

24
25 **8. Significant Events and Satellites Supported, 1970s**

26
27 On January 1, 1971, AFSCF re-designated STC as Sunnyvale AFS. In the 1970s,
28 Sunnyvale AFS continued to support existing and newly established satellite programs,
29 although many of them remained classified. In 1970, the AFSCF Satellite Test
30 Operations Historical Reports noted the successful support of two "unique orbital events"
31 from the installation. These events included support of the Apollo 13 mission in April,
32 which was aborted following the explosion of an on-board oxygen tank, and support of
33 the first North Atlantic Treaty Organization (NATO) communications satellite in March
34 (AFSCF, January-June 1970).

35
36 In June 1970, the final Vela satellite was launched. Sunnyvale AFS continued to provide
37 support from Building 1003 throughout the 1970s for the orbiting satellite (Jernigan,
38 1983). Program 949 was also re-designated the Defense System Program (DSP) in 1970.
39 Sunnyvale AFS continued to support this program throughout the early 1970s (AFSCF,
40 July-December 1970; 1971; 1972). The DSP satellite weighed 2,000 pounds, was
41 approximately 23' long, 10' wide, and contained a large infrared telescope which scanned
42 the earth for missile launches. In the event a missile was launched, it would be detected

1 by the United States within minutes, which removed the possibility of a surprise attack
2 (Peebles, 1997).
3

4 By November 1971, a pair of Defense Satellite Communications System (DSCS) II
5 advanced communications satellites had been launched to handle voice, teletype,
6 computerized digital data, and video transmissions (Jernigan, 1983). The first KH-9
7 satellites – code-named HEXAGON, and popularly known as “Big Bird” – were also
8 launched in 1971. The KH-9 satellites were 30,000-pound photographic reconnaissance
9 satellites initially developed in the 1960s. Similar to Corona satellites, they were designed
10 to photograph large areas, and return the film to earth via SRV. They carried
11 technologically advanced cameras, additional film capsules, and antennae for other
12 intelligence-gathering purposes (Clark, 2007).
13

14 In January 1972, President Richard Nixon announced the development of the Space
15 Transportation System (STS), or Space Shuttle Program, managed by NASA. Kennedy
16 Space Center in Houston, Texas, and Vandenberg AFB would serve as the operational
17 bases for the program. Research and development (R&D) shuttle launches would
18 originate from the Kennedy Space Center, and military launches would originate from
19 Vandenberg AFB. The shuttle would be responsible for the launch of all commercial,
20 scientific, and military satellites into space. The AFSCF, including Sunnyvale AFS and
21 tracking stations, would provide tracking and control for the program (Jernigan, 1983).
22

23 On May 25, 1972, Sunnyvale AFS supported the 145th and final launch of the Corona
24 Program from the original Satellite Control Room in Building 1001. It was terminated as
25 a result of advances in satellite technology. By the time the Corona Program concluded,
26 Corona satellites had provided approximately 800,000 reconnaissance photographs
27 covering approximately 510 million square miles (Chapman, 2008; Vukotich, n.d.).
28 Following its termination, the Satellite Control Room Complex likely continued to be
29 utilized for control of other satellite programs.
30

31 In July 1975, the final Apollo flight was launched and supported by Sunnyvale AFS. The
32 final flight was known as the Apollo-Soyuz Test Project, which marked the first joint
33 United States-Soviet Union space mission. The mission was the first time two foreign
34 spacecraft docked together in orbit (NASA, July 14, 2010). In 1976, the first DMSP
35 Block 5D, a meteorological satellite, was launched, and was presumably supported from
36 Sunnyvale AFS. It was an upgraded version of the 1960s-era DMSP, and provided twice-
37 daily, worldwide meteorological, oceanographic, and solar-terrestrial physics
38 measurements (Jernigan, 1983; Wade, n.d.).
39

40 In 1976, the KH-11 KENNAN satellite, a reconnaissance satellite, was launched. It was
41 the first successful electronic imaging satellite, and transmitted high-quality images in
42 real time (Vick, 2007). A 1978 *San Jose Mercury News* article noted that some sources

1 indicated that the top-secret “KH-11, from 200 to 300 miles up, can detect a pack of
2 cigarets [sic] on Russian soil,” while another source indicated it could only “read the
3 lettering on billboards” (Ingersoll, November 5, 1978). Nonetheless, this top-secret
4 satellite represented significant advances in the development of satellite technology, and
5 was supported from Sunnyvale AFS, as well as associated tracking stations.
6

7 **9. Development of the Air Force Satellite Control Network, Expansion, and Upgrades,**
8 **1980s**
9

10 In 1982, the Air Force Satellite Control Network (AFSCN) was organized. The AFSCN
11 was not a formal organization, but rather denoted a group of common user resources,
12 assets, and facilities which collectively provided tracking, telemetry & commanding
13 (TT&C) support for virtually all DoD spacecraft, and select NASA and foreign
14 government programs (Hane, 1988). The goal of the AFSCN was to provide “enduring
15 control capability commensurate with the need for operational space suites throughout
16 the conflict spectrum” (AFSCF, 1983).
17

18 To accomplish this goal, Sunnyvale AFS was upgraded as part of the Data Systems
19 Modernization Program. This \$500 million upgrade introduced centralized database-
20 driven computer hardware and software to replace outdated systems. The upgraded
21 system was more reliable, cheaper to maintain, and faster than its predecessor, allowing it
22 to support a steadily increasing satellite support workload (Fedor et al., 2006).
23

24 Buildings 10031 and 10032 were constructed in the 1980s. They were built in
25 conjunction with the Data Systems Modernization Program and were referred to on plans
26 as MCCs. In 1981, King/Reif and Associates, an architecture and planning firm, prepared
27 plans for Building 10031 on behalf of NAVFAC Western Division. The first and second
28 stories housed parking, and the RFI-shielded third story housed MCCs. It was RFI-
29 shielded to protect electronic and communications systems critical to satellite control
30 from electromagnetic interference (EMI) and RFI (King/Reif and Associates/NAVFAC,
31 December 18, 1981a-c).
32

33 In 1982, Rasmussen Ingle Anderson, a San Francisco-based architecture firm, prepared
34 plans for Building 10032 under the auspices of NAVFAC Western Division. Many of the
35 plans were stamped by AIA-registered architect, John Frederick Ingle, a founder of the
36 firm. Ingle served in the USACE during World War II (1941-45), and as a partner in
37 Rasmussen Ingle Anderson, was a pioneer in Silicon Valley for his design of industrial
38 clean-air rooms (*The San Francisco Chronicle*, November 15, 2009). The firm was also
39 noted for its expertise in earthquake engineering, which may have helped them be
40 selected to design Building 10032 (*Electronics*, 1980).
41

1 Similar to Building 10031, the first two stories of Building 10032 housed parking areas,
2 and the RFI-shielded third story housed MCCs, including MCC 4 and MCC 7, computer
3 rooms, communications rooms, and offices. In general, the RFI-shielded areas were
4 accessed via interlock doors, where only one door opened at a time, ensuring that the area
5 remained shielded at all times (Rasmussen Ingle Anderson/NAVFAC, October 29,
6 1982c). Buildings 10031 and 10032 were operational by 1984 (Fola Odafalu, pers.
7 comm., July 26, 2010). According to the Onizuka AFS Drawing Number Log, shortly
8 after Building 10032 was completed in 1985, plans were prepared to modify the parking
9 area on the second story. In 1989, some RFI doors were replaced (Onizuka AFS, n.d.).

10
11 **10. Significant Events and Satellites Supported, 1980s**

12
13 Sunnyvale AFS continued to support numerous satellite programs throughout the 1980s,
14 although many remained classified. On April 12, 1981, the first mission flown by the
15 Space Shuttle *Columbia* was launched, and successfully returned to earth on April 14.
16 The AFSC provided support for the first shuttle mission, and five AFSCF mission
17 controllers received U.S. Air Force Commendation Medals. In June 1982, the first
18 classified military payload was carried into orbit aboard the fourth shuttle mission flown
19 by *Columbia*, and was supported from MCC B in Building 1003 (Jernigan, 1983).

20
21 In February 1983, Libyan troops, led by military dictator Colonel Muammar al-Gaddafi,
22 appeared to be planning a surprise invasion of Chad and Sudan. The United States
23 launched a KH-8 reconnaissance satellite to provide photographs of the activity. The top-
24 secret satellite was supported from Sunnyvale AFS. The mission produced photographs
25 that documented massive troop build-ups at the border of Sudan, and the *USS Nimitz* was
26 dispatched to the Gulf of Sidra, thus preventing a Libyan invasion of Sudan (Levien,
27 1989; Philp, October 30, 1985). In 1984, the twentieth and final KH-9 satellite was
28 launched and supported from Sunnyvale AFS (Day, November 8, 2004).

29
30 The first dedicated military flight, aboard the Space Shuttle *Discoverer*, was launched in
31 January 1985, and an article in the August 2009 edition of *Air & Space Magazine*
32 indicated that “according to most accounts, STS-51C’s payload was ORION, an
33 eavesdropping satellite for signals intelligence.” In October 1985, the second dedicated
34 military flight was launched by the Space Shuttle *Atlantis* (Cassutt, August 1, 2009). *The*
35 *New York Times* reported that, according to reliable sources, “two \$100 million
36 communication satellites” were deployed into orbit on a mission classified as secret by
37 the Pentagon (Broad, October 5, 1985).

38
39 In 1986, the Space Shuttle *Challenger* exploded after launch, killing its seven crew
40 members, including the shuttle’s mission specialist, Lieutenant Colonel Ellison S.
41 Onizuka, who had trained at Onizuka AFS (NASA, January 2007). That same year,
42 Sunnyvale AFS was renamed Onizuka AFB in honor of Onizuka. Following the

1 *Challenger* explosion, the U.S. Air Force returned to sending satellites into orbit via
2 unmanned launches. It was not until December 1988 that the Space Shuttle *Atlantis* was
3 launched with a top-secret military payload (Cassutt, August 1, 2009).
4

5 In 1989, a Tracking and Data Relay Satellite System (TDRSS) satellite was launched,
6 supported by Sunnyvale AFS. The TDRSS was a sophisticated data-relay
7 communications satellite developed by NASA (Levien, 1989).
8

9 **11. Onizuka Air Force Station, 1990s-Present**

10
11 By 1991, the Soviet Union had dissolved, signaling the end of the Cold War (Center for
12 Air Force History, 1994). The end of the Cold War led, in part, to the declassification of
13 the NRO in September 1992. The end of the Cold War also led to a decrease in military
14 spending. However, modifications continued to be undertaken at Onizuka AFS, although
15 less than in prior decades.
16

17 In 1991, the 21st Space Operations Squadron (SOPS) were activated at Onizuka AFB, and
18 assumed the role of operations of the 2nd Satellite Tracking Group. In 1992, the 750th
19 Space Group was activated and assumed responsibility for launch and early orbit of
20 numerous satellites, including the Space Shuttle (Schriever AFB, n.d.).
21

22 In 1992, mechanical upgrades were undertaken in conjunction with the construction of
23 the Emergency Utility Building (EUB). The EUB was appended to Building 1004 to
24 supplement electrical power to the installation, and as a result of its construction, Building
25 10032 underwent mechanical upgrades. In addition, MCC 7 underwent upgrades to its
26 network and electrical systems, and a signal conveyance was installed between Buildings
27 10032 and 1002 (Onizuka AFS, n.d.).
28

29 By the early 1990s, Onizuka AFB and tracking stations provided radio links to over
30 eighty active DoD spacecraft (Mead, March 2, 1994). Satellites supported from Onizuka
31 AFB assisted with the success of Operation Desert Storm (1990-91). For example,
32 weather satellites assisted with U.S. missile launches, and navigation satellites assisted
33 the troops in maneuvering through the desert. Reconnaissance satellites, such as those in
34 the NRO's KH-11 satellite program, also likely continued to be supported by the
35 installation (Peterson, July 30, 1993). The early 1990s also represented a key year for
36 satellite scheduling, with the advent of a computerized scheduling system. Prior to this
37 time, scheduling was plotted by hand, using colored tape to represent different spacecraft
38 on approximately 50' rolls of butcher-paper (Mead, March 2, 1994). In addition, the
39 installation also supported numerous NASA space exploration programs.
40

41 In 1994, Onizuka AFB was renamed Onizuka AFS. The Onizuka AFS Drawing Number
42 Log indicates that MCC 7 in Building 10032 underwent upgrades during this time

1 (Onizuka AFS, n.d.) In 1995, the Corona Program was declassified, and the following
2 year, 800,000 images taken between 1960-72 were made available to the public.
3 Formerly classified documents also became available (NRO, February 24, 1995). In
4 addition, Onizuka AFS was realigned in accordance with the Base Realignment and
5 Closure (BRAC) Act, and select functions were relocated to CSOC at Falcon AFB,
6 Colorado Springs, Colorado. The realignment resulted in a loss of approximately 1,100
7 jobs at Onizuka AFS (City of Sunnyvale, 2006). By the end of the 1990s and during the
8 early 2000s, responsibility for controlling the DoD satellite network continued to be
9 transferred to the CSOC, and Onizuka AFS's responsibilities substantially decreased
10 (Flinn, December 1, 1991; Wulff, November 29, 1995).

11
12 In 1996, a terrorist attack on Khobar Towers, a high-rise apartment complex that housed
13 U.S., British, and French military personnel in Dhahran, Saudi Arabia, led to increased
14 security measures at U.S. military installations. At Onizuka AFS, parking was no longer
15 permitted on the first two stories of Buildings 10031 and 10032. In addition, because
16 Innovation Way was in close proximity to Buildings 10031 and 10032, the street was
17 closed to vehicular traffic, covered with astro-turf, and landscaped. Jersey barriers and
18 bollards were also installed around the perimeter of the buildings (Dennis Ralphs, pers.
19 comm., August 2, 2010). In addition, portions of the first two stories were reconfigured to
20 provide storage. Additional security measures were installed in Building 10032 in the
21 early 2000s such as horns and flashing strobe lights that indicated the presence of
22 unauthorized personnel in classified areas (Onizuka AFS, n.d.).

23
24 In 2005, the BRAC commission recommended closure of Onizuka AFS. The
25 recommendations were approved by President George W. Bush. In 2006, the DoD,
26 through the Office of Economic Adjustment, formally recognized the City of Sunnyvale
27 as the Local Redevelopment Authority (LRA) for planning the redevelopment of Onizuka
28 AFS and its conversion to civilian use (City of Sunnyvale, 2006).

29
30 In May 2007, the NRO officially departed from Onizuka AFS. A deactivation ceremony
31 and open house were held to commemorate this event, and were attended by over 800
32 guests, many of them former NRO, U.S. Air Force, CIA, and civilian employees (Munro,
33 2007). Displays were mounted on the corridor walls of Building 1003, highlighting the
34 history of the NRO and reconnaissance satellite programs supported from the installation
35 between through 2007. Following the open house, displays and histories of the programs,
36 many of which remain classified, were relocated to the NRO archives in Chantilly,
37 Virginia (Dennis Ralphs, pers. comm., August 3, 2009).

38
39 On July 28, 2010, a closing ceremony was presided over by Lieutenant General John
40 Sheridan, commander of the Space and Missile Systems Center, Los Angeles AFB. In
41 attendance were current and former employees, both military and civilian, as well as
42 Lorna Onizuka, Ellison Onizuka's widow. In his remarks, Lieutenant General Sheridan

1 noted that “[T]his facility here in Sunnyvale has supported an amazing 3.4 million
2 satellite operations over the past years. Much of the details of this work are still classified
3 and we cannot talk openly about it, but what I can tell you is that the operations
4 conducted by the NRO from this site have made our nation a tremendously safer place to
5 be” (Bauer, July 29, 2010).

6
7 The 21st SOPS relocated to Vandenberg AFB, and on July 30, 2010, a dedication
8 ceremony was held to commemorate the opening of the 21st SOPS Ellison Onizuka
9 Satellite Operations Facility at Vandenberg AFB. Onizuka AFS is scheduled to be
10 transferred out of federal hands in September 2011. It is anticipated that the Department
11 of Veterans Affairs (VA) will occupy Building 1002, and two buildings located outside
12 the U.S. Air Force Satellite Test Center Historic District, Buildings 1018 and 1034. The
13 remainder of the installation will be redeveloped.

14
15 **E. Sources:**

16
17 **1. Architectural Drawings**

18
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20 *Sunnyvale, California, and include the following. Where applicable, the numbers*
21 *following the plans in parentheses correspond to the Onizuka AFS Drawing Number Log.*

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25
26 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965b.
27 “Interim Expansion Partial Floor Plan A.” (1412)

28
29 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965c.
30 “Interim Expansion Partial Floor Plan B.” (1413)

31
32 Bentley Engineers and Earl & Wright, Inc./U.S. Air Force SSD. December 13, 1965d.
33 “Interim Expansion Partial Floor Plan C.” (1414)

34
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3
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- 31 Rasmussen Ingle Anderson/NAVFAC. October 29, 1982b. "Alter Satellite Control
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33
- 34 Rasmussen Ingle Anderson/NAVFAC. October 29, 1982c. "Alter Satellite Control
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36
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39
40
41
42

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2
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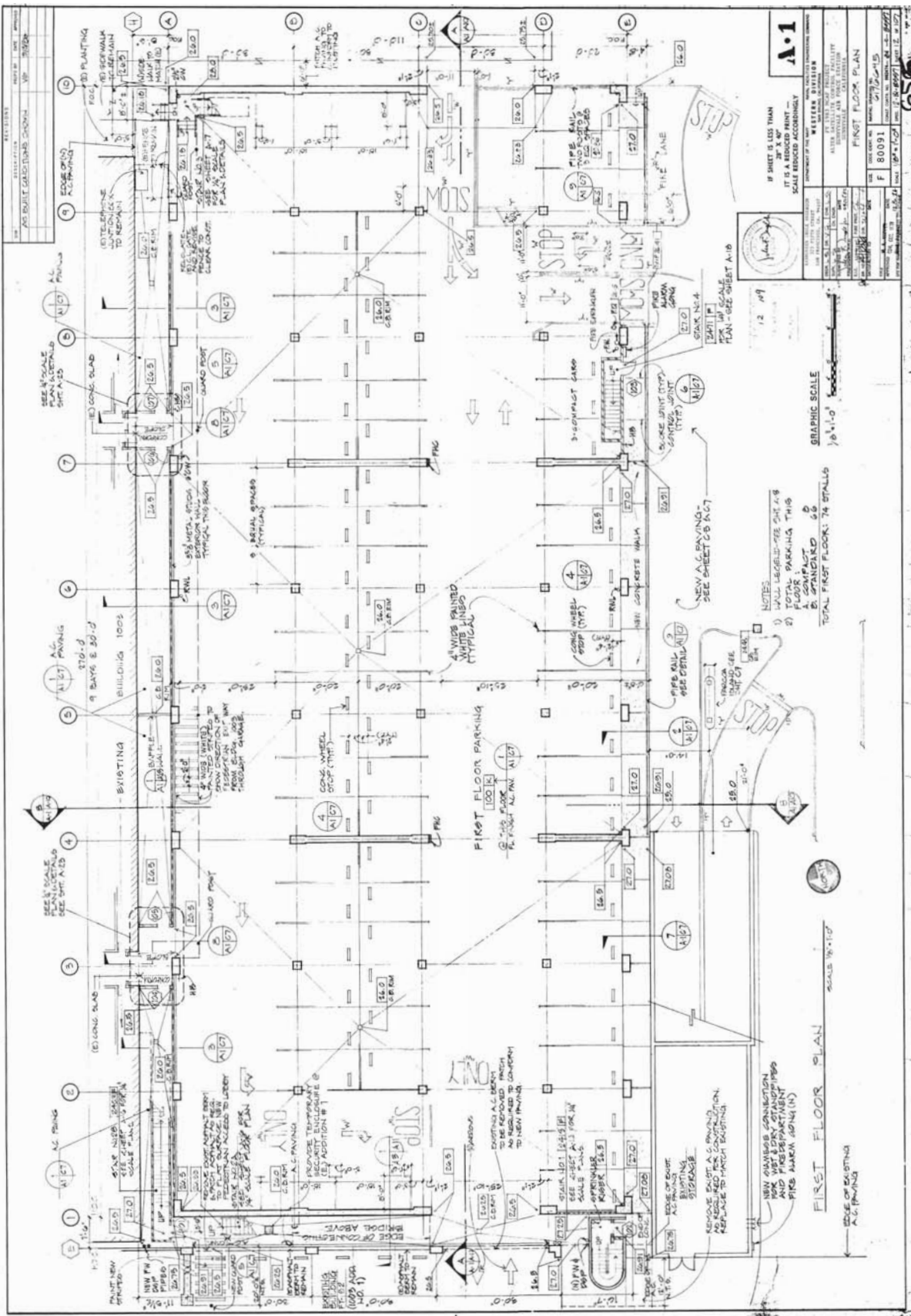
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A.1	
WESTERN BRILLIANT	
PROJECT OF THE ARCHITECT	
ARCHITECT: WESTERN BRILLIANT	
1515 WEST 10TH AVENUE, SUITE 100, DENVER, CO 80202	
PHONE: (303) 733-1100	
FLOOR PLAN	
DATE: 08/12/09	SCALE: 1/8" = 1'-0"
PROJECT NO: 10032	SHEET NO: 08
OWNER: USAF	CONTRACT NO: 10032

NOTES:
1) WALL LEGAL-ITE SHIT 018
2) TOTAL PARKING THIS FLOOR 74 STALLS
3) STANDARD 60
TOTAL FIRST FLOOR: 74 STALLS

GRAPHIC SCALE
1/8" = 1'-0"

SCALE 1/8" = 1'-0"

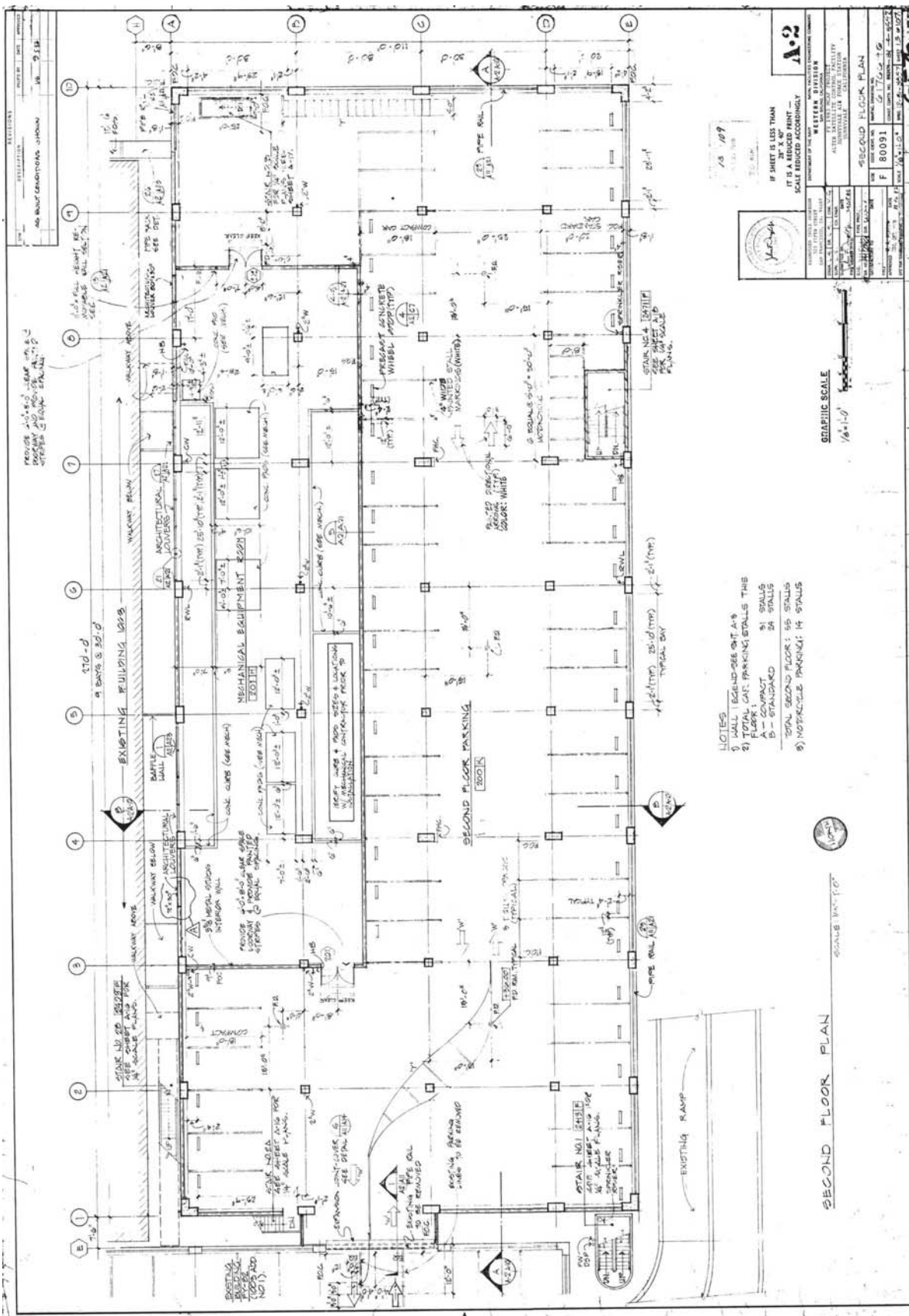
NEW ANGLEBAR CONNECTION FOR VEST & DRY STAIRWAYS AND FIRE DEPARTMENT FIRST MARCH (MFM)

NEW A.C. BAYING - SEE SHEET 08 RCT

4 WIDE PAINTED WHITE LINES TYPICAL

PIPE CALL SEE DETAIL A107

SEE SHEET 08 RCT



13 109
 IF SHEET IS LESS THAN 24" X 36" SCALE REDUCED ACCORDINGLY

WESTERN DIVISION	
ARCHITECTS	
1000 AVENUE OF THE STARS, SUITE 1000 WASHINGTON, D.C. 20004	
PROJECT: USAF SATELLITE TEST CENTER, BUILDING 10032	
DRAWING NO.: 10032-200	
DATE: 01/16/68	
SCALE: 1/8" = 1'-0"	
SHEET NO.: 20 OF 20	
PROJECT NO.: 10032	
DRAWN BY: [Signature]	
CHECKED BY: [Signature]	
APPROVED BY: [Signature]	

- NOTES
- 1) WALLS TO BE REMOVED OUT A-B
 - 2) TOTAL CAR PARKING STALLS THIS FLOOR:
 - A - COMPACT 31 STALLS
 - B - STANDARD 24 STALLS
 - 3) TOTAL SECOND FLOOR: 55 STALLS
 - 4) MOTORCYCLE PARKING: 14 STALLS



GRAPHIC SCALE
 1/8" = 1'-0"

SECOND FLOOR PLAN

U.S. AIR FORCE SATELLITE TEST CENTER
BUILDING 10032
Onizuka Air Force Station
1080 Innovation Way
City of Sunnyvale
Santa Clara County
California

Log No. USAF041221A-F

SECTION II

FOR OFFICIAL USE ONLY

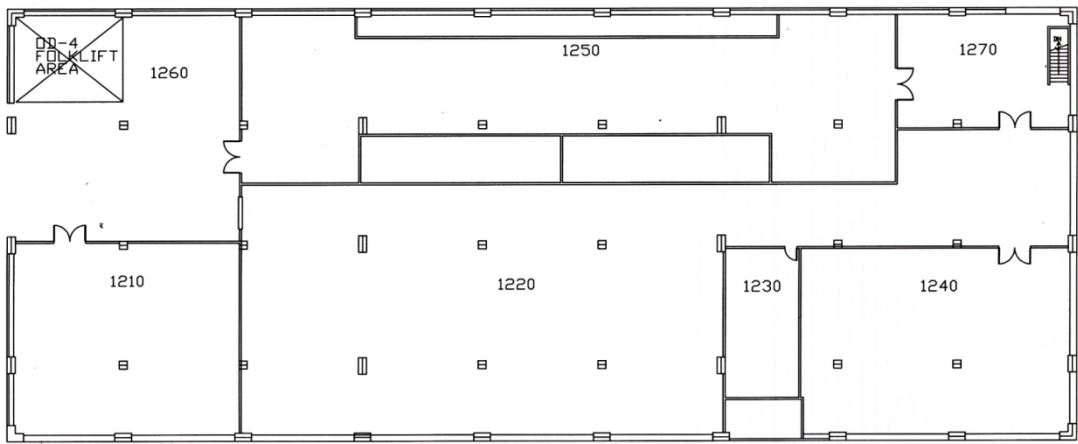
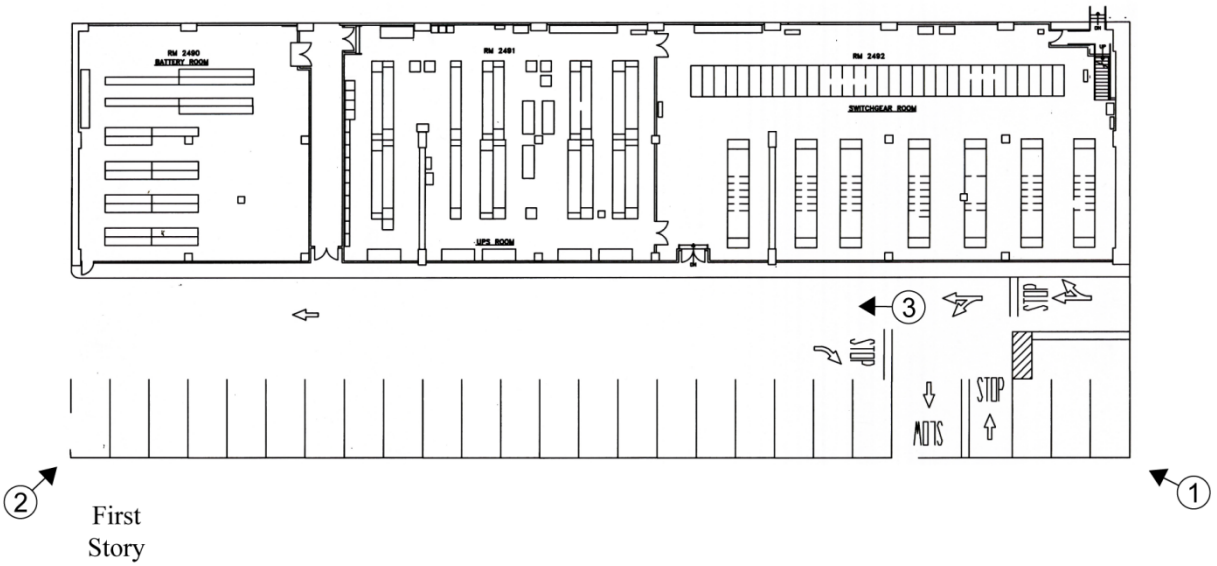
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1 **HISTORIC AMERICAN BUILDING SURVEY**
2 **LEVEL II-TYPE DOCUMENTATION**

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4 **INDEX TO PHOTOGRAPHS**

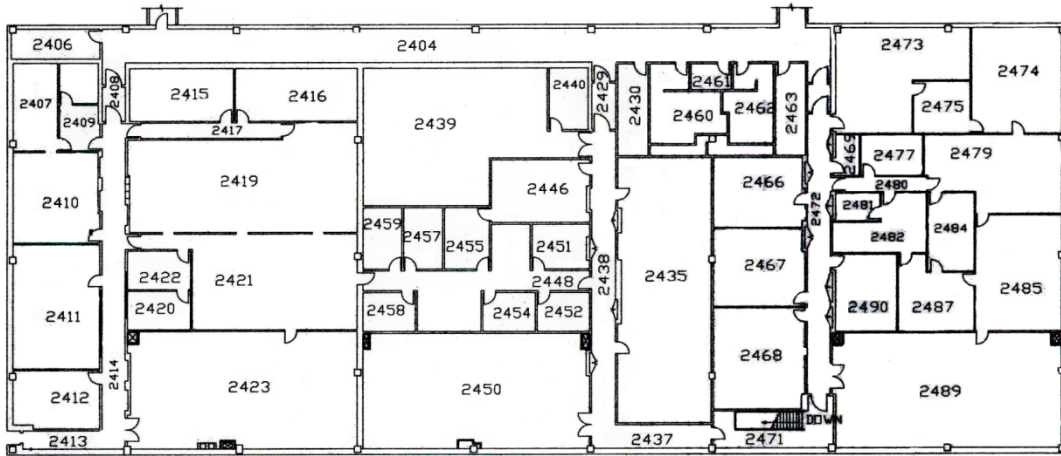
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6 U.S. AIR FORCE SATELLITE TEST CENTER Log No. USAF041221A-F
7 BUILDING 10032
8 Onizuka Air Force Station
9 1080 Innovation Way
10 City of Sunnyvale
11 Santa Clara County
12 California
13
14 Anne Jennings, Photographer Date of Photographs: June 7-14, 2010
15
16 Log No. USAF041221A-F-01 VIEW OF SOUTH AND WEST FAÇADES,
17 LOOKING NORTHEAST. NOTE SECOND
18 CONCRETE PANEL-CLAD SECOND STORY.
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20 Log No. USAF041221A-F-02 VIEW OF NORTH AND WEST FAÇADES,
21 LOOKING SOUTH. NOTE ENCLOSED
22 CYNDRICAL CONCRETE STAIRWELL
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25 Log No. USAF041221A-F-03 VIEW OF FORMER PARKING AREA ON FIRST
26 STORY, LOOKING NORTH.
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Legend
 ① → Photo Locator

NOT TO SCALE



Third
Story

Legend

① → Photo Locator



NOT TO SCALE

Building 10032, Third Story





