

HISTORY OF THE ALTUS AREA OFFICE
U. S. ARMY CORPS OF ENGINEERS
BALLISTIC MISSILE CONSTRUCTION OFFICE
ALTUS, OKLAHOMA

14 March 1960 - 28 April 1962

Prepared by

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CONTENTSVOLUME 1

	Page
List of Photographs and Illustrations-----	ii
Foreword-----	iii
Chapter 1. General-----	1
Chapter 2. Executive Office-----	21
Chapter 3. Administration Branch-----	25
Chapter 4. Engineering Branch-----	41

VOLUME 2

Chapter 5. Construction Branch-----	53
Chapter 6. Contract Administration Branch-----	114
Chapter 7. Safety Branch-----	135
Chapter 8. Office of Counsel-----	144

VOLUME 3

Chapter 9. Special Activities-----	152
Chapter 10. Conclusions and Recommendations-----	178
Bibliography-----	183
Glossary-----	192
Notes-----	196

Appendices

A. Weather Data-----	205 - 206
B. Standard Operating Procedure, Altus Area-----	207
C. Area Office Costs-----	217
D. Staff Visits and Inspections-----	218
E. Key Personnel-----	227
F. Organization Chart, Altus Area, 1 May 1961-----	230
G. Exploded View of Concrete Work, Atlas F ICBM Complex-----	231

LIST OF PHOTOS AND CHARTSVOLUME 1

Map of Altus Area-----	Page 4
Area Organization Under Tulsa District-----	Page 10
Photo of Officers-----	Follows Page 10
Buildup and Phaseout Area Personnel-----	Page 12
SATF Organizational Chart-----	Page 14
Photos of Buildings 147 and 44-----	Follow Page 16

VOLUME 2

Construction Progress Photos-----	Follow Page 73
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VOLUME 3

Photos of Ground Breaking Ceremony-----	Follow Page 152
Photos of Site 2 Ceremonies-----	Follow Page 155
Photos of Site 5 Ceremonies-----	Follow Page 163
Weather Data, Temperatures-----	Page 205
Weather Data, Rainfall-----	Page 206
Area Office Costs-----	Page 217
Area Organization Chart-----	Page 230
Exploded View Concrete Work-----	Page 231

FOREWORD

The purpose of this historical summary is to implement Department of the Army Regulation, AR 220-345, dated 18 October 1954, and U. S. Army, Corps of Engineers Ballistic Missile Construction Circular Number 61-74, dated 27 October 1961. Department of the Air Force Manual 210-1, dated 1 September 1959, subject: "Manual for Air Force Historians" was used as a guide for the general format.

The preparation of this historical summary began in the fall of 1961, in order to take full advantage of the experiences and knowledge of the various Branch Chiefs prior to demobilization. This summary is divided into Chapters representing each functional branch of the Area Office. Each chapter was substantially prepared by the Branch Chief, who in each instance served for the full period of the project.


CARL F. BASWELL
Lt Col CE
Area Engineer

CHAPTER 1

GENERAL

1-01. BACKGROUND - a. The United States Air Force in 1946 awarded the first research and development contract in a program to develop a missile capable of carrying a warhead 5,000 miles. Defense Department economy cutbacks in 1947 had curtailed research and development of an ICBM until 1951 when the Korean conflict brought increased military appropriations permitting a renewal of ICBM work on a conservative basis. However, it wasn't until late in 1954, when studies established the feasibility of developing a small nuclear warhead, that the ICBM project was assigned top Air Force priority and placed on a full "crash" basis.

b. In early 1955 Atlas ICBM fabrication had begun with the first test flight of this type missile occurring on 11 June 1957. The urgency, complexity, and magnitude of the ballistic missile development program had dictated new concepts of program management. One of these new concepts was that of "concurrency". This meant integrating under a single development plan all aspects of development, testing, production, procurement, facilities, logistics, operations training, programming, and budgeting for a total weapon system program. By the middle of 1958 the Chief of Engineers had been given the responsibility for the construction of USAF ballistic missile and associated weapon facilities, including the responsibilities for: advising the Air Force on construction matters and status of construction; review of Air Force produced drawings and specifications to the extent necessary to insure

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acceptability for construction; supporting the AFBM design effort by performing surveys, foundation and material and collecting data pertaining to site adaption; acquiring real estate; designing facilities as requested by AFBMD; issuing funds and authorizing construction; and developing and executing procedures to meet abbreviated schedules and other extra ordinary requirements of this program. On 28 November 1958, less than 18 months after the first U. S. ICBM flight, the Atlas missile performed full range, flying more than 6,300 statute miles across the South Atlantic from its launch site at Cape Canaveral, Florida.

c. By September 1959 the art of designing ICBM launch facilities had progressed to the stage of the so-called hardened, underground, launching site. In February 1960 the general public had been made aware of the squadron locations for the silo based Atlas missile.² Among such locations was the Altus, Oklahoma site. The following text contains the history of the U. S. Army Corps of Engineers organization that was responsible for the accomplishment of the heavy construction of the twelve hardened launching complexes located in the vicinity of Altus, Oklahoma.

1-02. ACTIVATION - The Altus Area Office was established on 14 March 1960 by the District Engineer, U. S. Army Engineer District, Tulsa in District Order Number 60-12 dated 1 March 1960.

1-03. MISSION - a. The original mission as assigned to the Altus Area Office in March 1960 was to perform those portions of contract administration which were delegated from the District Engineer, U. S.

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Army Engineer District, Tulsa to the Altus Area Office. The contracts to which this mission applied were those under which twelve hardened Atlas F ICBM Launch Base Complexes and their related support facilities were to be constructed in the vicinity of Altus, Oklahoma.

b. Effective 1 August 1960 the Los Angeles Field Office, Military Construction, Office of the Chief of Engineers, was re-designated the Corps of Engineers Ballistic Missile Construction Office, a separate activity under the direct command of the Chief of Engineers. Responsibility for construction of ICBM Facilities was transferred from the various Corps of Engineers Districts to CEBMCO. In accordance with this re-alignment of the Corps of Engineers ICBM construction effort on 4 November 1960 the Altus Area Office was transferred from the Tulsa District control to CEBMCO. Accordingly, the basic mission of the Altus Area Office remained, for all intents and purposes, unchanged with the major exception that the performance of contract administration was delegated from the Atlas F Construction Directorate, CEBMCO instead of the Tulsa District.

1-04. PHYSICAL DATA - a. The construction areas under the control of the Altus Area Office were located in Southwestern Oklahoma centered on the City of Altus. A map of the area is to be found on page 4. The city is just 36 miles North of the Texas border and 162 miles from Oklahoma City, the State Capitol of Oklahoma. Altus may be reached by vehicle from the East and West via U. S. Highway 62 and from the North and South via U. S. Highway 283. Incoming personnel or freight enroute to Altus via air had to land either at Lawton, Oklahoma

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5

or Wichita Falls, Texas, and proceed from there to Altus by motor vehicle. Altus is served by three railroads: the Atchison, Topeka and Santa Fe; the Frisco Lines and the Missouri-Kansas-Texas.

b. Altus Air Force Base itself is located approximately 4 miles East of downtown Altus, Oklahoma. It was and is the headquarters of the 816th Strategic Aerospace Division and the 11th Strategic Aerospace Wing of the U. S. Air Force Strategic Air Command. The supporting facilities located on this installation are those typical of a U. S. Air Force Base.

c. Since Tulsa District operated a Resident Office on Altus Air Force Base it was determined by the District Engineer, that in the best interests of the government and to provide the most economical span of control over the actual construction sites, the logical location for the Area office proper was on this air base. Hence a request was originated by Tulsa District Engineer through the Division Engineer, U. S. Army Engineer Division, Southwestern, Dallas, Texas that space for an Area Office in the amount of 5,000 square feet be made available on or about 1 April 1960. As a result thereof Building 147, Altus Air Force Base was made available by Altus Air Force Base for housing personnel of the Corps of Engineers and the Altus segments of Air Force Ballistic Missile Division, Architect Engineer and Air Force Special Service Contractors. This building, theater of operations type structure, was rehabilitated by the Tulsa District, at a cost of approximately \$27,000.00 in accordance with the requirements of the Area Engineer. Occupancy was initiated on 11 April 1960.

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1-05. GEOLOGY AND TOPOGRAPHY OF AREA - a. The Altus Area is that generally lying on the Western limits of the Wichita Uplift, which occurred during the early Pennsylvania Period.

b. Surface deposits and outcrops in the area include the following:

(1) Recent formations consisting of alluvial flood plains deposits along major streams.

(2) Quaternary formations consisting of dune sands and alluvial or eolian terrace deposits along major streams.

(3) Permian - Well over half the surface of the Area was underlain by rocks of Permian Age. Four formations of the Permian period were represented in the Area in the following stratigraphic sequence: Dog Creek Shale; Blaine Gypsum; Flower-Pot Shale; and Hennesy Shale.

c. Precambrian Rocks - The oldest works in the Area were granites forming the Wichita Mountains. Rock quarries have been developed in the area near the towns of Lone Wolf and Snyder, Oklahoma. Most concrete and base course aggregates were supplied from a crusher near Lone Wolf.

d. Soils - Soils in the area have for the most part been developed as sedimentary deposits and are underlain by "Permian Red Beds".

e. Terrain - The terrain is generally flat to gently rolling hills approximately 1,600 square miles in Area and falls within the boundaries of the Red River Watershed.

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f. Weather Conditions - The climate in the area is usually classified as semi-arid, with long, hot summers, during which temperatures have risen as high as 120⁰ F., and short mild winters with cold snaps of frequent occurrence, but with scanty snowfall. The extreme low recorded temperature is -9⁰ F. The average frost-free period is 224 days per year. Precipitation is extremely variable, ranging from a recorded minimum in 1917 of 13.92 inches to more than 48 inches in 1941. Mean annual precipitation for the years 1929 - 1953 was 23.5 inches. Weather data covering the period of construction and obtained from Altus Air Force Weather Station is to be found in Appendix A.

1-06. WATER - a. As noted above the Altus Area consisted in the main of that area lying within the Red River Watershed. The main streams in that area are: the Red River, with its tributaries; the North Fork of the Red River; the Prairie Dog Town Fork of the Red River; the Salt Fork of the Red River and the Pease River.

b. Foundation explorations conducted by the Tulsa District indicated that at most locations chosen for launching sites ground water would be encountered at relatively shallow depths.

1-07. ORGANIZATION - a. As an initial step in the organization for accomplishment of construction of the missile project, located at Altus, the Southwestern Division Office authorized the establishment of a new position in the Construction Division, Tulsa District as Special Assistant to Chief, Construction Division. The duties of this position encompassed all planning and coordination required between elements of the District Office and other echelons, such as the Los Angeles Field

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Office; USAF Ballistic Missile Division; and other Corps of Engineers Districts. Mr. A. B. Elias of the Construction Division, Tulsa District was appointed to function in this capacity.

b. As a result of visits by Tulsa District personnel to other ICBM sites that were then under construction, and based upon operational procedures observed, it was decided that the most feasible and efficient means of supervising construction activities of the work would be through the establishment of an area office in the vicinity of Altus, commanded by a Corps of Engineers officer. In order to facilitate the assigned mission, this Area Engineer would be granted broad authority, both contractually and operationally, and the area office would be staffed with sufficient and capable personnel to enable it to operate almost completely independent of the Tulsa District organization. The Division Engineer, Southwestern Division had in February 1960 approved the area office concept and the grades of all personnel GS-12 and above, plus the grade of GS-11 for an administrative assistant. Establishment of grades for all other positions were to be subject to classification by the Personnel Branch, Tulsa District, and staffing would be accomplished as the workload developed. During February 1960 the Tulsa District had also developed a plan for accomplishing the ICBM construction at Altus. This plan was developed along the lines of the standard military operations plan and outlined in detail the operations and functions necessary to insure efficient operations of the Altus Area Office.

c. On 1 March 1960 and by District Order Number 60-12 the

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District Engineer, Colonel Howard W. Penney, CE, U. S. Army Engineer District, Tulsa established the Altus Area Office. This order became effective 14 March 1960. Concurrently and in the same order Lieutenant Colonel (then Major) Carl F. Baswell, CE, was designated as Area Engineer. This assignment was effective upon Lieutenant Colonel Baswell's arrival at Altus. On 14 March 1960 Mr. Walden J. Evans, formerly Resident Engineer, Southwestern Resident Office, Fort Sill, Oklahoma, U. S. Army Engineer District, Tulsa and recruited as the Altus Assistant Area Engineer, arrived at Altus Air Force Base and assumed command of the Altus Area Office as Acting Area Engineer. Lt Col Baswell assumed the duties of Area Engineer on 30 March 1960.

d. Recruiting to man the Area Office, according to the organization approved by SWD, was accomplished by Tulsa District, an illustration of this organization is to be found on page 10. By the end of March 1960 the Chiefs of the Engineering and Technical Branch, the Contract Administration Branch, the Construction Branch and the Administration Branch had arrived at Altus.

e. Buildup of the Area office personnel strength was originally programmed to reach 107 personnel in May 1960, however, as construction progressed it became evident that in order to provide the necessary uniform control and administration of the Altus complexes personnel increases were necessary. Accordingly, the Area Engineer and his staff requested additional personnel. By the end of October 1960 the number of personnel assigned to the Area office reached its zenith with 7 Corps of Engineers officers and 170 Department of the Army civilians. Photos of these officers appear on page 11. From that point

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U.S. ARMY ENGINEER DISTRICT
TULSA

AREA ENGINEER
ALTUS

LEGAL BR

ADMIN BR

CONTRACT ADMIN BR

CONSTR BR

ENG & TECH BR

ALTUS AFB PROJ

SITE 2-SNYDER

SITE 3-CACHE

SITE 4-FREDERICK

SITE 11-MANITOU

SITE 1-LONE WOLF

SITE 9-WILLOW

SITE 10-HOBART

SITE 12-GRANITE

SITE 5-FARGO

SITE 6-CRETA

SITE 7-HOLLIS

SITE 8-RUSSELL

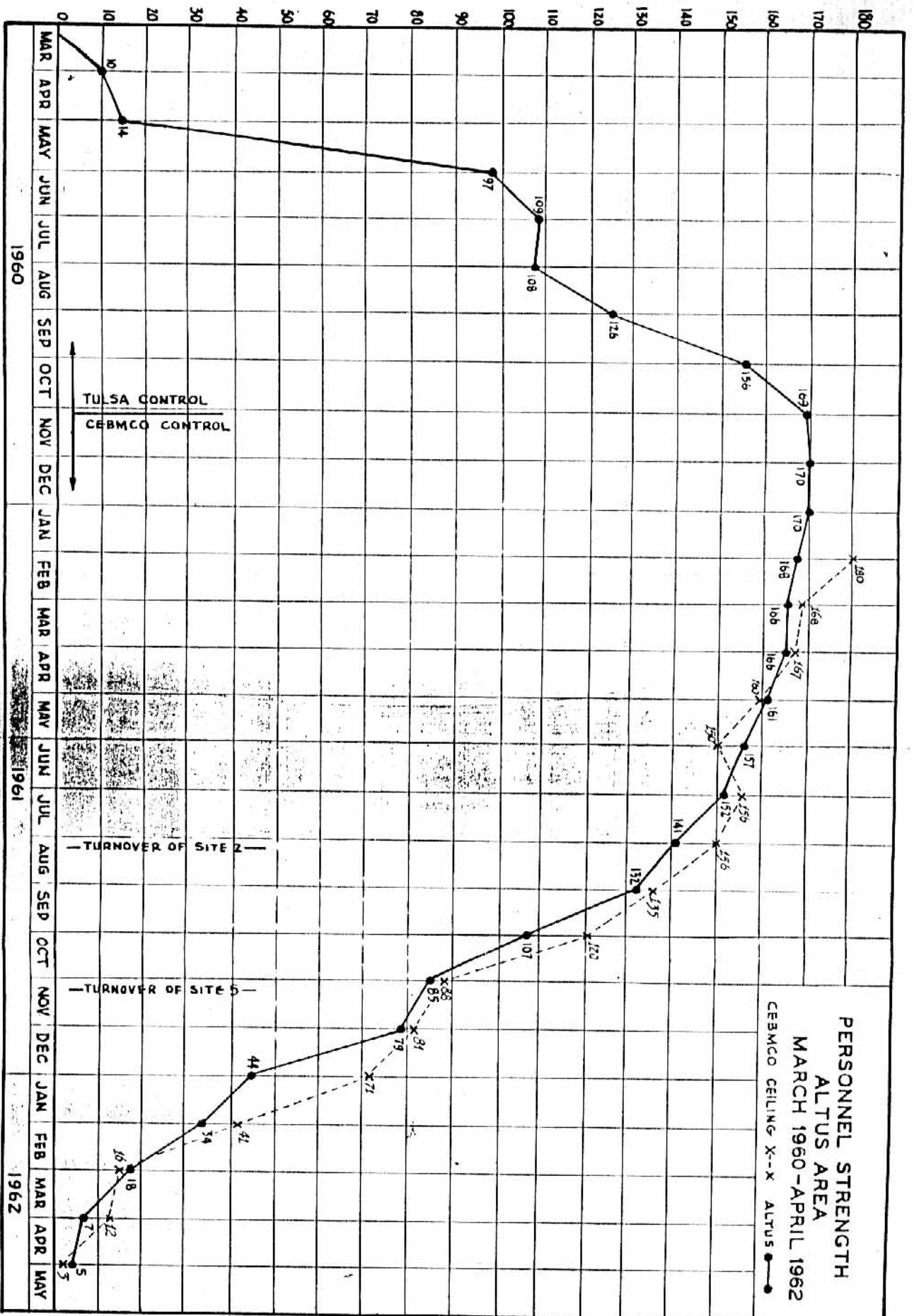
STRENGTH	
AUTH	1
MILITARY	107
CIVILIAN	
TOTAL	108

ORGANIZATIONAL CHART
3 MAY 1960

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and as the workload decreased to date, the personnel of the Area Office were released in consonance with a phaseout plan developed jointly by the Area Staff. The buildup and phaseout of number of personnel assigned to Altus is illustrated on the chart on page 12.

1-08. DEACTIVATION - The Altus Area Office was discontinued 28 April 1962 pursuant to Paragraph 1, General Order Number 5, Headquarters, U. S. Army Corps of Engineers Ballistic Missile Construction Office dated 18 April 1962.

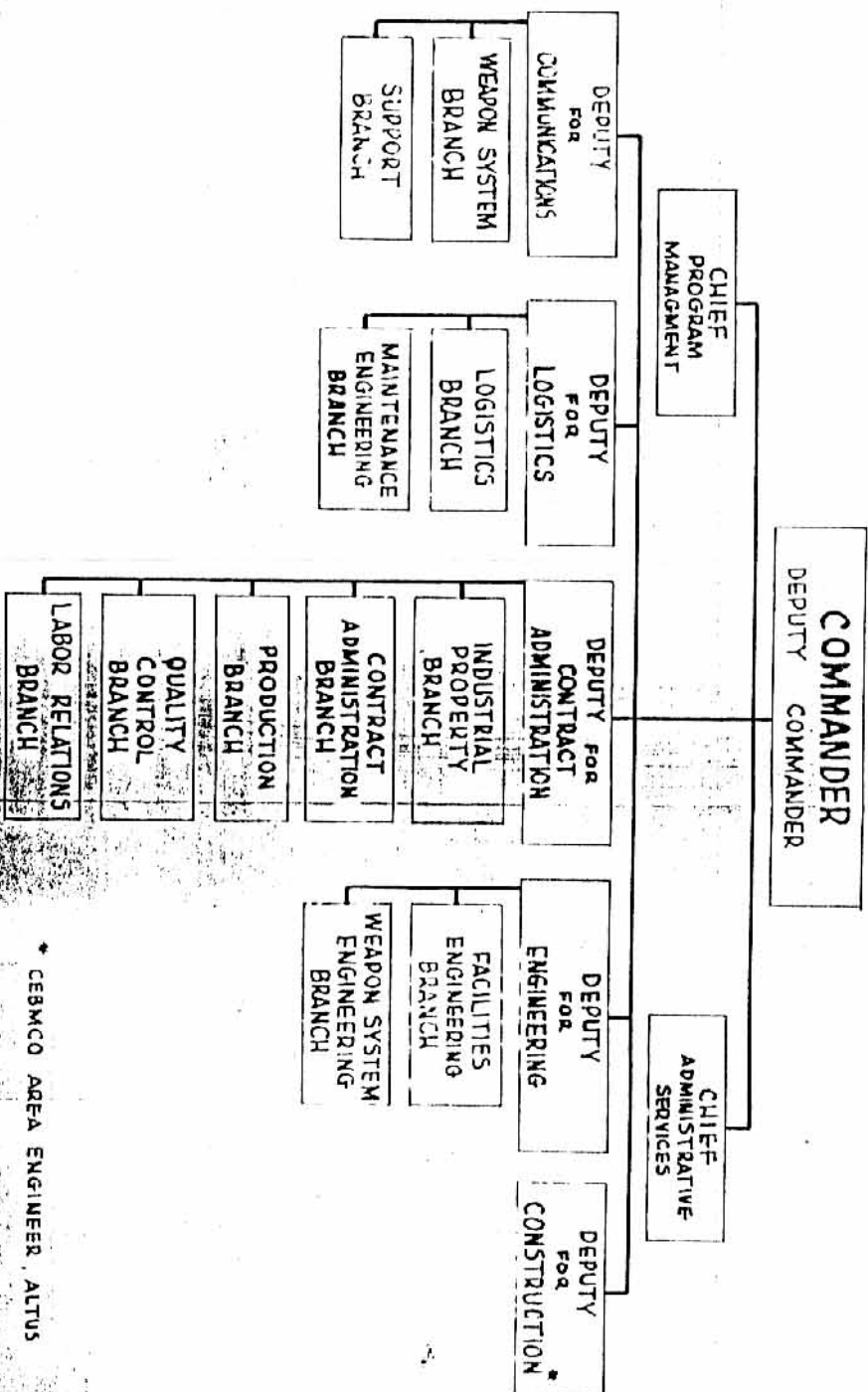
1-09. SITE ACTIVATION TASK FORCE - a. On 1 August 1960 the Altus Site Activation Task Force was formed. This U. S. Air Force organization was responsible for insuring that the construction of facilities, the installation and checkout of the weapons system and associated equipment, and the turnover of completely operational Atlas missile launching and support facilities to the Strategic Air Command would be in a timely and economical matter.

b. The office of the SATAF Commander was a detachment of the USAF's Air Materiel Command's Ballistic Missile Center and was the field representative of the Commander, BMC. Colonel Ernest L. Ramme, Altus SATAF, exercised the executive management responsibility for the Altus project. As SATAF Commander Colonel Ramme had operational control of the various detachments that comprised SATAF and of the personnel assigned to those detachments. A chart illustrating the SATAF organization will be found on page 14.

c. The BMC Detachment was composed of the SATAF Commander's office and a program control office (Command Post) which maintained

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SITE ACTIVATION TASK FORCE ALTUS



* CEBMCO AREA ENGINEER, ALTUS

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complete and up-to-date records of construction, and the installation and checkout status, monitored and reviewed, such status to insure that required schedules were met, identified and resolved or reported the problem areas -- in essence, provided the SATAF Commander with a centralized one point control for the entire project. Also included in the BMC Detachment was a joint administration office to provide the SATAF with centralized administrative services; a message center; security; classified documents control, etc. The remainder of the SATAF was composed of an AFBMD Detachment, an AMA Detachment, a CMR Detachment and a GEEIA Detachment.

d. Relationship between the Altus Area Office and SATAF was marked with a degree of excellence and harmony seldom realized in an accomplishment of a mission of this type. The main contributing factor to this vital and successful relationship was founded on the fact that Colonel Ernest L. Ramme, SATAF Commander (1 August 1960 to date) was exceptionally well-qualified for his job. He showed excellent understanding and good management in recognizing and respecting the position of the Area Engineer and in meeting all problems with a realistic and positive approach. The SATAF Commander's staff provided excellent support in maintaining the established relationships.

1-10. AREA OFFICE FACILITIES - a. As noted previously the Area Engineer and his staff were housed in Building 147, Altus Air Force Base. This building was shared with the SATAF organization on a ratio of approximately 1:1 with the Altus Area Office personnel occupying the Southwestern half of Building 147. However, it was determined by

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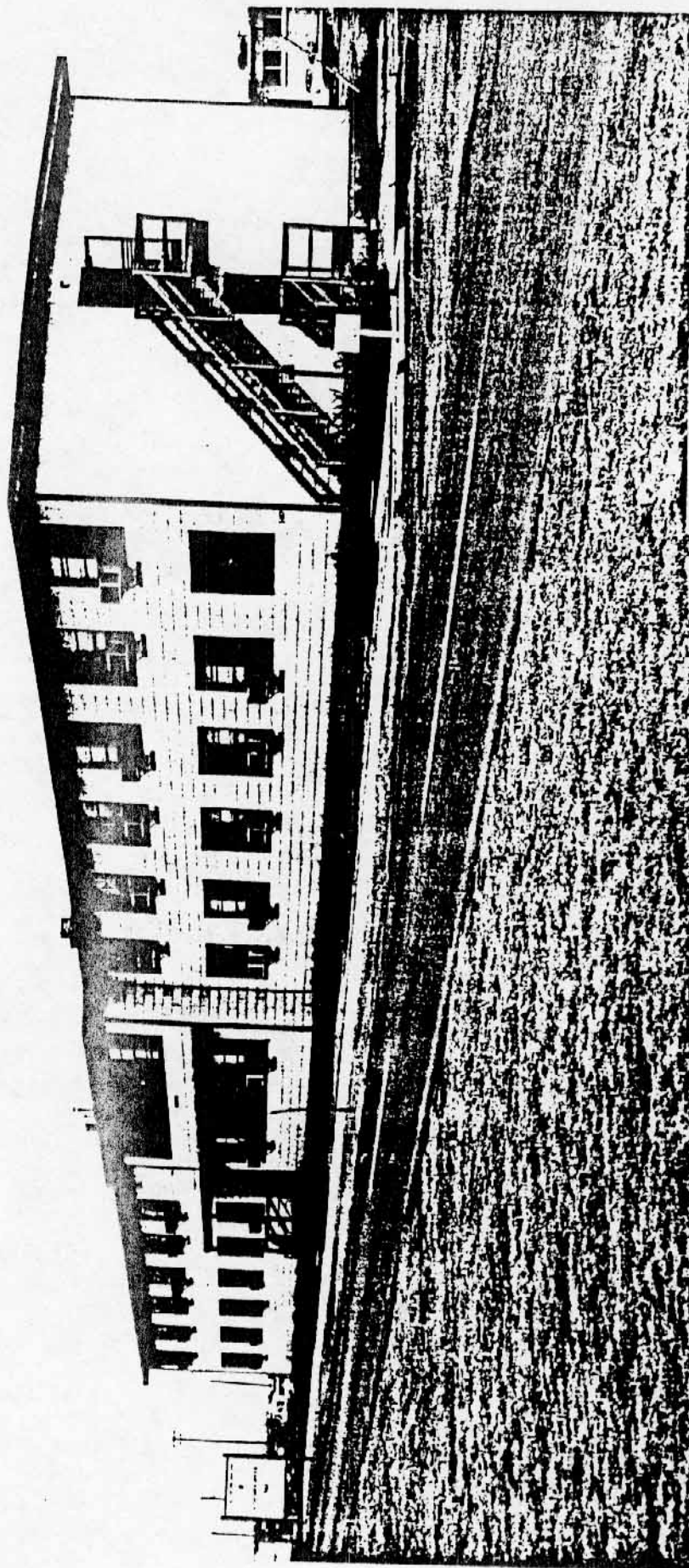
11 April 1960 that the space in Building 147 was not sufficient. Building 44, originally Tulsa District's Altus Project Office, was also retained in order to provide some 4400 square feet additional space for the Area Office's Altus Air Force Base (Missile Support Branch) and reproduction equipment. See pages 17 and 18 for photographs of these buildings.

b. Hard surfaced parking was afforded the Area office employees on both the Southwestern and Southeastern sides of Building 147. In addition, Building 44 had a small parking lot immediately to its front. Because of lack of adequate government motor pool facilities on the base it was necessary that the Corps of Engineer vehicles also be parked at the Southwestern end of Building 147.

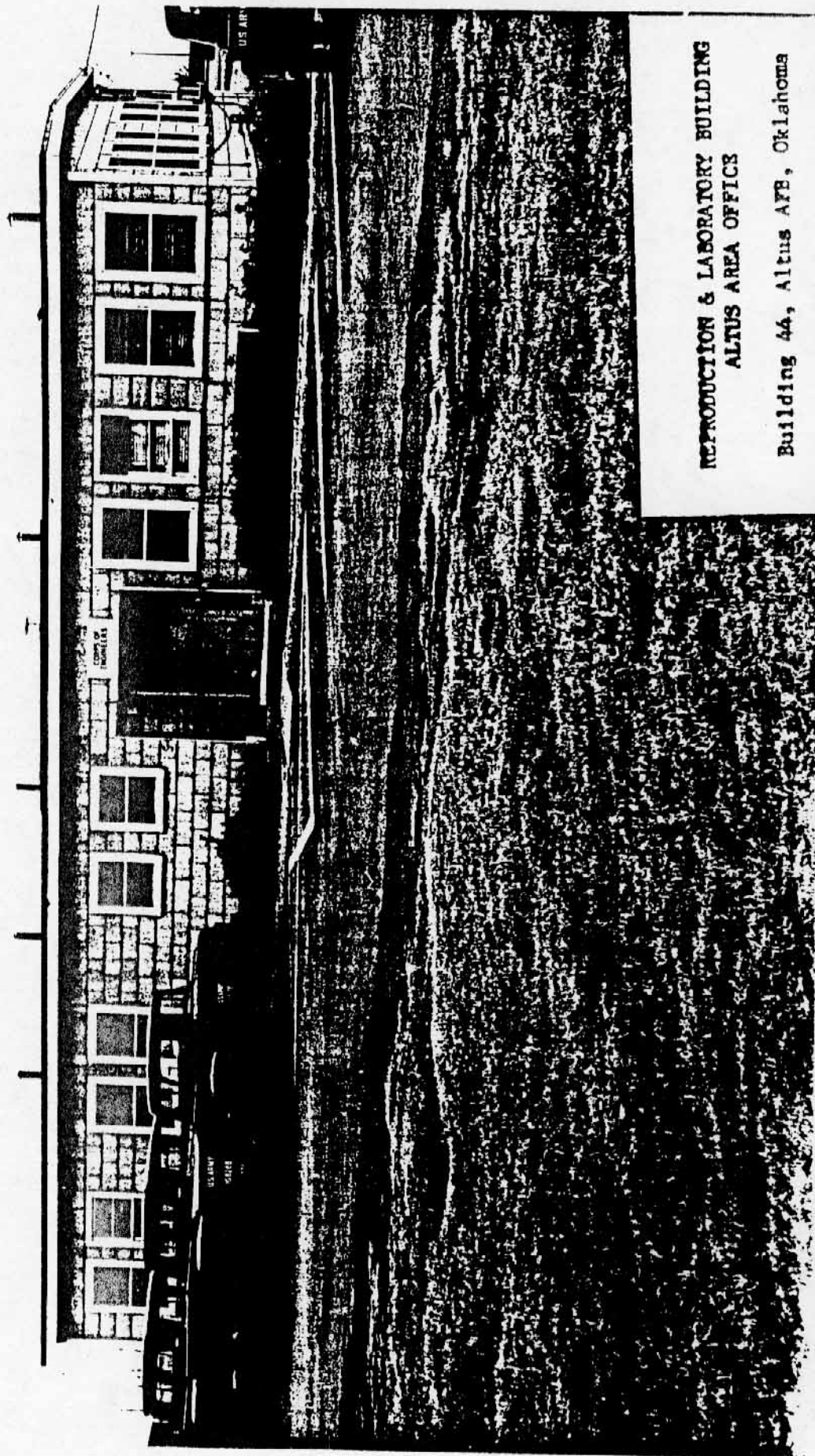
c. Utilities required for operation of the Area Office were furnished by Altus Air Force Base.

d. Civilian employees of the Area Office were permitted to utilize the facilities of the Officers' and the Non-Commissioned Officers' Open Messes as associate members. Those personnel with a grade of GS-9 or above were offered memberships in the Officers' Open Mess. Other personnel in the lower grades were permitted to join the Non-Commissioned Officers' Club. Corps of Engineer officers assigned to the Altus Area were accepted as full members in the Officers' Club. Dues were \$8.00 per month for the officers' mess and \$2.00 monthly for non-commissioned officers' mess. It is interesting to note that employees of the civilian contracting firms on the Altus project were also extended the privileges afforded associate members both in the

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HEADQUARTERS, ALTUS AREA OFFICE
Building 147, Altus AFB, Oklahoma



REPRODUCTION & LABORATORY BUILDING
ALTUS AREA OFFICE

Building 44, Altus AFB, Oklahoma

Officer's and NCO Clubs. Other on-base facilities which civilian employees of the Altus Area Office could utilize were the bank, the cafeteria, the Post Office, and the Credit Union.

e. In early 1960 housing in the Altus Area became extremely scarce and by October 1960 rentals were virtually non-existent. The Army personnel assigned to Altus were placed on the On-Base Housing list, but during the period 31 August 1960 to 28 April 1962 no military service member reached that point on the list where Government on-base housing was authorized. To alleviate the scarcity of housing General Dynamics Astronautics (then Convair-Astronautics) entered into a lease agreement in December 1960 with a local real estate owner to rent a block of some 200 Title IX homes to GD/A, Air Force, and Army employees to include those members of the military service assigned to the missile project. Rental rates were on par with the Altus, Oklahoma area rental rates. For example, a 4-bedroom home rented for \$100.00, \$95.00 for a 3-bedroom and \$85.00 for a 2-bedroom home. In addition if the occupant desired the use of a stove and refrigerator the cost was increased \$10.00 monthly. By the time that this housing was made available in December 1960 only 9 Corps of Engineer military and civilian personnel required housing.

f. By the first part of 1962 the Area Office requirements for office space had been reduced to the extent that consolidation of the office facilities was deemed necessary. On 10 January 1962 the Area Office was consolidated on the Southwest end of the first floor of Building 147. By 2 April 1962 the Area had been further reduced to

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utilization of 3 offices plus a supply room, approximately 530 square feet, in Building 147. On discontinuance of the Area Office this space was turned over to the Project Engineer, U. S. Army Engineer District, Albuquerque. Building 44 had previously been returned to USAF control on 13 April 1962.

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CHAPTER 2

EXECUTIVE OFFICE

2-01. ORGANIZATION - a. The original concept of the Tulsa District Engineer in early 1960 was to pattern the organization along the lines of a typical Corps of Engineers District modified to fulfill the unique requirements generated by the project at Altus. This concept¹ was formalized by the District Engineer in February 1960.²

b. At that time the Executive Office (then referred to as the Office of the Area Engineer) was programmed to consist of an Area Engineer (Major, Corps of Engineers), an Assistant Area Engineer (Civilian GS-14), and a stenographer (Civilian GS-4). By 27 March 1960 the office was staffed in accordance with this plan.

c. During the interval of 27 March 1960 to 31 August 1960 the Area Engineer, through experience, had learned that this staffing was inadequate to efficiently handle the growing workload and a new position of Executive Officer was created. Upon his arrival 31 August 1960 Captain Maury F. Cochran, Jr. was assigned the duties of the Executive Officer.³

d. As the project progressed, its complexity and uniqueness plus the urgency for rapid completion created a definite requirement for a full time security officer. Accordingly, upon his arrival⁴ 17 October 1960, Captain James R. McKnight was assigned these duties.

e. On 20 October 1960 Major Samuel C. Wood reported for duty and was assigned as Executive Officer.⁵ Captain Cochran was subsequently reassigned within the Area Office as Chief, Electrical Section,

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Construction Branch.

f. In March 1961 the backlog of work within the Contract Administration Branch of the Area office had reached the point where it became evident that additional specialized help was required in the Contract Administration Branch. A decision was reached between the Area Engineer and the Director, Atlas F Construction Directorate, CEBMCO, to recruit a Special Assistant to the Area Engineer for Contract Administration. Mr. Frank S. Connole was assigned in this capacity on 19 March 1961. Mr. Connole acted in a dual capacity, however, working both as the Chief, Estimating Section, Contract Administration Branch and advisor to the Area Engineer in the field of contract negotiations.

g. The organization of the Executive Office remained without change until 15 January 1962 when Mr. Connole was released and exercised his re-employment rights to return to duty with the Tulsa District. Captain McKnight was reassigned by Department of Army Orders and departed the Area Office 20 January 1962. Lieutenant Colonel Baswell departed on a permanent change of station 6 March 1962.

h. Upon Lieutenant Colonel Baswell's reassignment, Major Wood was appointed Acting Area Engineer in which position he remained until the discontinuance of the Area Office on 28 April 1962.

2-02. FUNCTIONS - a. The functions of the Area Engineer, upon his assumption of command of the Area Office in March 1960, was primarily to supervise construction on those contracts assigned to the Area Office. He represented the Contracting Officer in the enforcement of contract provisions and recommended and negotiated contract modifications. As a representative of the Contracting Officer the Area Engineer

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effected and maintained direct liaison with LAFO, SWD, BMD, AFRCE, and the using U. S. Air Force activities. Of course, the Area Engineer was also responsible for the direction, coordination, and operations of all branches of the Area Office.

b. These functions and responsibilities were carried out by the Area Engineer until 1 December 1960 when, on that date, a Successor Contracting Officer in CEBMCO assumed the contracting responsibilities for the Altus Missile Projects. The Successor Contracting Officer appointed the Area Engineer and the Area Executive Officer as his authorized representatives for administering the contracts under his jurisdiction and pertaining to the Altus projects. These appointments remained in effect until either the departure of the incumbent or until the discontinuance of the Area Office.

c. During the period 4 November 1960 (the date that CEBMCO assumed operational control of the Altus Area Office) to 20 January 1961, the functional responsibilities of the Executive Office remained essentially those as were established originally by the District Engineer, Tulsa District. Operations of the Area Office during that time were studied by the Executive Officer and upon his recommendations 20 January 1961 the Area Engineer published an SOP which formally, in detail, prescribed the functional responsibilities of the various elements of the Area Office. This SOP created the Executive Office and its internal staffing which to date has not been changed. A complete text of this SOP is contained in Appendix B.

d. In early April 1961 the Atlas F Construction Directorate

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12

published a document similar in nature to the SOP noted above. This publication created an additional position, over and above the ones utilized in the Executive Office, of Military Assistant to the Area Engineer. It was discovered at that time that the functional responsibilities assigned this individual so closely paralleled the duties of the Area Executive Officer that the Area Engineer made the decision not to change the staffing in Area Executive Office.

e. The Secretary of Defense, in March of 1961, announced

13

a reorganization of the Air Force Systems Management designed to centralize direction of the ballistic missile programs and to insure the most effective discharge of those military space responsibilities assigned to the Air Force. This announcement did not directly effect the operations of the Altus Area Office until 18 May 1961 when the Area Engineer was assigned the additional duty of Deputy for Construction on

14

the local SATAF Commander's Staff. This new duty entailed providing advice to the SATAF Commander concerning those construction matters under CEBMCO control as well as assisting SATAF in the coordination of CEBMCO construction with I & C activities. In this capacity and aside from daily contact with the SATAF Commander, the Area Engineer (or Acting Area Engineer) attended the SATAF Staff Conferences which were held twice per week on Wednesdays and Fridays. During these conferences, the Area Engineer or his representative, briefed the conferees on the status of construction under the Area control.

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CHAPTER 3

ADMINISTRATION BRANCH

- 3-01. ORGANIZATION OF BRANCH - As previously noted the original concept of an organization of the Altus Area Office was along the lines of a typical U. S. Engineer District Office modified to meet local conditions. Accordingly upon activation in March 1960 the Administration Branch was assigned the following functions:
- a. Processes incoming and outgoing correspondence, maintains and secures all record files, directs the records retirement program, controls and processes all regular and periodic reports, and directs the management and security programs.
 - b. Serves as staff advisor on labor enforcement and wage rates.
 - c. Reviews contractor payrolls for compliance with labor laws and contracts, and prepares reports on work stoppages or strikes.
 - d. Provides office services to all Branches including supply stenographic, communications, janitorial, reproduction and transportation.
 - e. Procures, issues, and accounts for government property for Area and contractors.
 - f. Directs civilian personnel actions and maintains personnel records to include time and attendance, leave and pay.
 - g. Prepares accident exposure data for Government and contractor activities.

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h. Establishes distribution of Area payroll cost to contracts.

3-02. BUILDUP OF BRANCH - The personnel buildup of the Branch was started on 20 March 1960 with the arrival of Mr. Robert E. Moore, GS-11, as Chief of the branch. Recruiting to man the branch was continued until January 1961 when the peak of 16 employees was attained. By July 1961 the workload was such that the phaseout of branch personnel could be undertaken. This phaseout was carried out over a period of 10 months and by the end of March 1962 only one person remained to handle the administrative function of the Area Office.

3-03. AREA PERSONNEL ACTIVITIES - a. Personnel support for the Altus Area Office was originally the responsibility of the Tulsa District and remained so from the Area Office's inception to date. To meet this responsibility Mr. Guy Dallas, Assistant Personnel Officer, Tulsa District was assigned as coordinator to handle personnel problems arising during operation of the Area office. He remained physically located in the Tulsa District Office.

b. During the mobilization of the Altus office, the Personnel Branch at Tulsa District would forward applications for employment to the Area office to permit the Area Staff to make selections to fill job vacancies within the Area. Necessary liaison with Tulsa concerning Area personnel matters was conducted through the Chief of the Area Administration Branch.

c. DA Form 374, "Job Descriptions", were prepared by the Area Administration office with assistance of the Personnel Branch,

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Tulsa District in those instances wherein jobs involving unusual duties were involved.

d. During the period 14 March until early August 1960 and as a result of successful recruiting the total strength of the Area Office had expanded to one Corps of Engineer officer and 110 civilian employees. This strength was a portion of the personnel authorization of the Tulsa District and was the program strength established by that agency. On 9 August 1960, during a conference at the Area Office, the CEBMCO representative recommended an increase in the strength of the Area by some 38 persons.³ This recommendation was based upon a future requirement for the inspection of the Propellant Loading Systems portion of the prime contract. Recruiting was started immediately by Tulsa District and by the end of October 1960 the Area strength had been increased to a total of 169 civilian employees.

e. In early September 1960 CEBMCO had published an organizational chart for the typical Area office involved in supervising construction of Atlas F ICBM launchers.⁴ This chart proposed manning an Area office with 8 Corps of Engineers officers, 193 graded and 7 wage board employees. However, on 17 October 1960 Tulsa District was advised by CEBMCO that the maximum strength of the Altus office would be limited to 167 spaces.⁵ On 21 October 1960 the Area Engineer was notified by CEBMCO that the personnel authorization for the Altus office was established at 175 spaces.⁶

f. By the end of November 1960 the Area Office had reached its peak strength of 170. This peak continued until the end of December

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1960 at which time the reduction in Area Office strength began and which has continued to 28 April 1962.

g. In January 1961 CEBMCO published the official organizational chart for the Altus Area Office. This chart illustrated an organization with an authorized strength of 180. The following month CEBMCO formally established the Area strength at 7 officers and 180 civilian personnel. By the 13th of February the authorized strength was reduced by CEBMCO to 7 officers and 168 civilians. On 24 March 1961 in correspondence to the Area Engineer, the Director, Atlas F Construction Directorate advised that the projected strength ceilings for the Altus Area had been established for the period 31 March to 30 June 1961. In view of the actual and projected time extensions to the prime contract the Area Engineer requested Director, Atlas F to make a re-appraisal of these strengths. On 21 June the Area Engineer was advised that the strength ceilings established in the 24 March correspondence were rescinded and the new authorizations were 30 June - 156, 31 July - 150 and 31 August - 135.

h. On 3 July 1960 CEBMCO issued a personnel authorization voucher establishing the ceilings for the Area Office for the First Half FY-62.

i. Based upon these established ceilings by CEBMCO in early July the Area staff developed a personnel program to comply with the CEBMCO directive. By the latter part of September 1961 it became evident that as a result of time extensions to the prime contract plus knowledge of future assignments of several small contracts the phaseout

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date for the Area Office required revision. A revised personnel program was prepared by the Area staff - this time reflecting requirements through the end of January 1962.

j. During the summer months public announcements had been made indicating that Minuteman sites were to be constructed at Minot and Whiteman AF Bases. In early August the Area Engineer had been advised that personnel would be required for the projected Minuteman sites and that Area Office key personnel desiring consideration for employment on the new projects should take necessary action. On 26 September 1961 the Area Engineer was informed that personnel selected for the Minot project would be delayed in their transfers by 30 to 60 days. Personnel at Altus so effected could be retained at Altus in a productive capacity; placed on annual leave; or placed on TDY to other Area offices if required. This information generated the requirement for the re-evaluation of the Area phaseout program and on 30 September 1961 a new Area personnel program was developed extending through 30 January 1962. On 20 October 1961 the Area received notification that the Whiteman Project was delayed. Again the Area had to re-evaluate its personnel program and by 7 November 1961 this program was developed. Based upon the projected workload, coupled with the known delays, the Area Office phaseout date was extended through the end of April 1962. On 17 November 1961 notification was received that personnel scheduled for employment on the Whiteman Project and who could not be economically utilized at Altus would be released. In accordance with this directive action was initiated to release surplus personnel and by the end of April 1962,

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83 persons had been dropped from the Area's rolls. The personnel build-up and phaseout of the Area Office has been previously depicted graphically on page 12.

k. During the period 14 March 1960 to 28 April 1962, personnel losses that had occurred in the Area strength were attributed to:

(1) Transfers to other CEBMCO Area offices, Corps of Engineers Districts and Federal Agencies as a result of recruiting actions.

(2) Release of personnel under Area phaseout program.

(3) Resignations. In this category resignations were found mostly in the female employees due to either marriage, pregnancy, or transfer of spouses.

(4) One suicide.

1. From an overall standpoint and by the end of April 1962 only 8 persons did not have job commitments. During the same period 15 individuals had resigned and 12 were affected by RIF procedures.

3-04. AREA PROPERTY - a. At the time of mobilization of the Altus Area Office a property account was established with Mr. W. J. Evans¹⁹ as Responsible Employee. Concurrently a Tulsa District property account was also being maintained on Altus Air Force Base by the Project Engineer²⁰ of the Tulsa's Project Office. Since the Area and Project Offices were located in the same geographical area property and supplies were being utilized by personnel affiliated with both offices. To alleviate this situation on 14 April 1960 the Project Engineer proposed that his²¹ property account be merged with the Area account. This plan was

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concurrent by the Area Engineer and early in May, correspondence was forwarded to Tulsa District requesting approval of the proposed action. This proposal was subsequently approved in the Tulsa District with Mr. Evans appointed as Responsible Employee. On 30 November 1960 the Area Account was transferred to CEBMCO with Mr. Evans remaining the Responsible Employee. ²² This designation of Responsible Employee remained unchanged until 9 April 1962 when Mr. Paul Roberds, Jr. was appointed this responsibility. Mr. Roberds remained in this job until discontinuance of the office.

b. Office property was obtained for the Area during its mobilization period from Tulsa District. This property was that which Tulsa considered excess to their requirements, however, it rapidly became evident that the amount required could not be provided from the Tulsa stocks and new purchases were made in order to equip the Area Office. Funding for these purchases was made from money allotted for the Area Supervision and Inspection. Until the time that CEBMCO assumed control of the Area Office necessary purchase orders were written and funded by Tulsa District. Subsequent to this "take-over" the Area Office has written its own purchase orders with the payment being made by CEBMCO.

c. At the time of the opening of the Altus Area Office vehicles assigned to the Project Office were transferred to the Area Office. In addition Tulsa District requested the Amarillo District Office to transfer 11 pickup trucks and 2 sedans to Altus during the month of March 1960. By the end of the month a total of 22 vehicles

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were on hand. Additional vehicles were received as follows: April 60 - 4; June 60 - 1; July 60 - 7; September 60 - 2; October 60 - 9; December 60 - 1; March 61 - 12 and June 61 - 6. The total number of vehicles assigned to the Altus facility was 64 consisting of 48 pickups, 1 carryall and 15 sedans. Of the total number of vehicles making up the Altus Area motor pool, 28 were purchased new; the remainder were transferred to Altus from other Resident Offices in the Tulsa District.²³ The total value of these vehicles was \$105,049.86. On 31 July 1961 this office notified CEBMCO that nine vehicles at Altus were surplus and could be shipped to other sites. On 21 November 1961 this office notified CEBMCO that as of that date 27 vehicles had been placed in limited storage awaiting shipping instructions. By 20 December 1961 a total of 44 vehicles were out of operation and were available for transfer. On 29 December 1961 two sedans were shipped per instructions from CEBMCO to the CEBMCO Little Rock Area Office.²⁴ Due to the lack of parking area at the Area Office arrangements were made with SATAF for utilizing a portion of a storage area assigned to their contractor for the limited storage of Area vehicles not in use. On 15 January 1962 18 vehicles were shipped to the CEBMCO Minot Area Office, Minot Air Force Base, North Dakota.²⁵ On 16 January 1962 4 vehicles were shipped to the Project Office, U. S. Army Engineer District, Albuquerque, Ft Sill, Oklahoma.²⁶ On 29 January 1962 another shipment of 12 vehicles was made to the CEBMCO Minot Area Office.²⁷ On 30 January 1962 18 vehicles were shipped to the Albuquerque District's Project Office at Ft Sill.²⁸ On 26 February 1962 two sedans were transferred to Ft Chaffee, Arkansas.²⁹

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On 28 February 1962 two sedans were shipped to the CEBMCO Whiteman Area Office, Whiteman Air Force Base, Missouri. ³⁰ By the end of April 1962 the remaining two sedans and three 1/2 ton pickups had been transferred to the Whiteman Area Office while one sedan was retained at Altus Air Force Base for the Altus Project Office, U. S. Engineer District, Albuquerque.

d. The phaseout of personnel in August 1961 created an excess of office type property. Since it appeared then that the Whiteman Project was to be initiated in late fall of 1961 all surplus property was placed in storage with the plan of utilizing this property at Whiteman. In November 1961 when the Altus Office received word of the delay in the Whiteman start date, an inventory listing surplus property was forwarded to CEBMCO for disposal instructions. Subsequent directives from CEBMCO authorized the Altus Area to transfer "personal" type property to other CEBMCO Areas; U. S. Army Engineer Districts; and the local SATAF. As a result of the circulation of the Altus surplus property listing, property was shipped to the CEBMCO Area Offices at Little Rock, Arkansas; Minot, North Dakota; and Sedalia, Missouri; and the Project Offices of the U. S. Army Engineer District, Albuquerque, located at Ft Sill, and Altus Air Force Base, Oklahoma. The total value of the property "owned" by the Area Office from its inception in March 1960 until its discontinuance in April 1962 was approximately \$95,000.

3-05. TRAVEL - a. In early April 1960 it became evident that until construction actually was initiated on the Altus Project some office employees were going to be in a TDY status. Since the distance

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from Altus to Tulsa District was too great to permit efficient and economical processing of travel requests on short notice, Mrs. W. G. Baer was appointed 13 April 1960 by Tulsa District as Transportation Agent for the Altus Area. Subsequently, on 3 November 1960, Messrs. R. E. Moore and F. M. Pitts were also appointed Transportation Agents for the Area. On 22 November 1960 and after the assumption of Area Control by CEBMCO, Mr. R. E. Moore and Mrs. W. G. Baer were appointed ³¹ Transportation Agents. In March 1961 the original CEBMCO order was rescinded, however, the same directive reappointed the identical individuals, i.e. Moore and Baer. ³² In August 1961 the designation of Mr. Moore as ³³ Transportation Agent was terminated and Mr. W. J. Forsyth ³⁴ appointed this duty. These designations, i.e., Forsyth and Baer, remained unchanged until December 1961 when Mrs. Baer departed the Area Office on a permanent change of station. On 7 March 1962 Mrs. Louise Wilson was appointed the Transportation Agent for the Area Office in ³⁵ which duty she remained until 28 April 1962.

b. Originally and until 8 December 1960 TDY travel for personnel of the Area was authorized by orders published by the Area while PCS orders were cut by Tulsa District. After 31 August 1961 PCS ³⁶ orders were published by the Area. Payment of travel vouchers was the responsibility of the Tulsa District until 1 July 1961 after which time CEBMCO paid all travel vouchers for the Area Office. It is interesting to note that during the period 14 March 1960 to 31 December 1961 a total of 3532 man-days were spent in a TDY status by civilian and military personnel assigned to the Area Office.

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3-06. COST AND FUNDING ACTIVITIES - a. Costs for the mobilization of the Altus Area Office were charged by Tulsa District against Account 820. ³⁷ This account was utilized for all supplies, services, travel, and PCS moves. Area personnel labor charges were charged to this account and were made directly against the applicable Line Item in those instances where actual work was being accomplished. After the actual contracts had been awarded and monetary values established for the different features of work (Line Items) the costs incurred against the mobilization account was pro-rated.

b. The Initial FY-61 Budget for the Area Office was submitted to Tulsa District for approval 15 June 1960. This budget encompassed only the minimum requirements of the Altus Area Office. The monetary value of this budget was \$1,015,300. Revision #1 to this estimate was submitted on 30 September 1960. Increases in this budget had been generated by the Area Office expansion and the Federal Pay Act of 1960. At this time S & I costs were estimated to be \$1,935,600 for the period 1 October 1960 to 30 September 1961.

³⁸
c. Prior to 1 December 1960 the funding activities for the Area Office had been handled by Tulsa District. After that date the final responsibility for the Altus operation was assigned to CEBMCO. At this time Accounting Classifications were changed, however, Tulsa District was authorized to still support Altus in making payments, on a reimbursable basis, of travel orders; purchase requisitions; and miscellaneous vouchers.

d. On 1 February 1961 the Area Office submitted its initial

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budget to CEBMCO for the remainder of the fiscal year. Total estimated costs for the Area Office operations were \$669,900 of which a stipulated \$594,250 was to be used for Area labor charges. The following tabulation of costs illustrates the monthly cumulative budget labor amounts compared with actual expenditures:

<u>MONTH</u>	<u>BUDGET</u>	<u>ACTUAL AREA LABOR COSTS</u>
February 1961	\$112,000	\$100,762
March 1961	221,600	240,888
April 1961	330,000	332,778
May 1961	438,400	447,314
June 1961	594,250	553,170

e. By 16 June 1961 the FY-62 Area Office Budget for \$500,000 had been forwarded to CEBMCO. It became necessary, however, on 12 October 1961 to forward a revision covering the period extending to 27 January 1962. This revision, reflecting an increase of \$20,650, was necessary as a result of reprogramming of the Area's reduction-in-force actions concerning personnel to be retained while awaiting opening of the new Minuteman Projects at Minot and Whiteman Air Force Bases. Appendix C illustrates the Area Office Costs during the period March 1960 through April 1962.

3-07. SUPPLIES - a. Supplies for the Area Office operations were obtained either on a reimbursable basis from the Altus AF Base Sales Store or by small purchase procedures. In the case of purchases made from the Air Force during the period April 1960 through April 1962 some \$5,338.23 worth of supplies were obtained in this manner. In the case

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of small purchases made on the local civilian market for the same period, the total amount was \$98,116.33.³⁹

b. POL products obtained from the AF dispensing facility for vehicles operating daily out of the Area Office resulted in the expenditure of approximately \$3,240.⁴⁰ POL purchases for vehicles physically located at the launch complexes were made through the use of Government credit cards.

3-08. TIMEKEEPING AND PAYROLLS - a. Timekeeping in the Area Office organization was accomplished by timekeeper or alternate in each branch.⁴¹ In the field each site supervisor forwarded a report of the employee's time to the timekeepers in the Construction Branch who subsequently posted the applicable time to the ENG Form 1301 "Time and Attendance Report". This procedure was questioned in February 1961 by a CEBMCO inspection team whose members maintained that timekeepers should be appointed for each site.⁴² In a reclama dated 9 May 1961 to the CEBMCO team findings, the Area Engineer stated in essence that the Area Office had been organized and staffed to operate with no administrative personnel or office equipment at the sites, and the dispersal of the individual sites precluded submission of up-to-date payrolls in sufficient time to meet suspense dates established by the supporting District Central Payroll Office. In late June 1961 Director, Atlas F CEBMCO stated in a memorandum to the field that timekeeping could be conducted in a manner used by the Altus Area Office.⁴³⁴⁴

b. Payrolls for personnel of the Area Office were paid by Central Payroll Office, U. S. Engineer District, Fort Worth.

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3-09. AREA COMMUNICATIONS - a. During the period 14 March 1960 to 28 April 1962 the Area Office utilized a maximum of 21 Class A phone lines; 9 by the Area Office and 1 on each launch complex; and 12 Class C lines on Altus Air Force Base. The maximum number of telephone instruments utilized was 39. The total costs of local phone service for the period of time noted above was \$25,988.18 with a maximum monthly cost of \$2,378.32 occurring in November 1960 and a minimum of \$73.92 in April 1960.

b. Early in the mobilization phase of the Altus project it was recognized by the Area staff that due to the urgency of the work that a mobile radio net within the Area operations was indicated. Action was initiated through Altus AF Base in April 1960 to procure such a radio net. On 1 September 1960 a contract was let through SAC to obtain, on a rental basis, 12 General Electric 60 watt Transistorized Progress Line Mobil Units; a 50 watt Fixed Transmitter (GE Model DO-36-WK, 144 - 174 mcs); an antenna with 200 feet Foamflex Cable; and a GE-155 control unit handset. The Marshall Electronics Company located on Altus AF Base and under contract to that facility installed and maintained the mobil equipment in six sedans and six pickup trucks. Vehicles so equipped were utilized by supervisory personnel visiting the project sites. The original cost of installation was \$505.00 with a monthly rental of \$338.82. On 30 November 1961 the radio net was shut down and the equipment removed at a cost of \$193.00.

c. The teletypewriter in use at the Area was commercially installed 5 December 1960 with the station number Altus 893. From

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this date until 31 December 1961 the total costs of messages dispatched were approximately \$1,500. The average number by month of messages dispatched were 88 with an average group count of 105.7 groups per message. Recurring monthly rental costs of the TWX facility were funded by CEBMCO. The machine was removed from the Area Office on 1 February 1962.

d. Tie Line - A direct telephone line was installed in the Area Office 30 November 1960. This line, leased by CEBMCO, provided direct service to the office of Director, Atlas F Construction Directorate, CEBMCO and the Dyess and Walker Area Offices. The system located in the Area Office consisted of one master instrument, located in the Area Engineer's Office and 7 extensions placed in the Branch Chief's offices. Service was discontinued on 1 January 1962.

3-10. REPRODUCTION FACILITIES - a. On 1 August 1960 the Area Office rented a 54" Paragon Revolute Comet Whiteprint machine for the purpose of reproducing drawings by the diazo process. This equipment was rented at a cost of \$1,800.00 annually. In August 1961 the machine was again rented for an additional six months at a cost of \$1,050.00. During the period August 1960 through February 1962, a total of 715,670 square feet of material was reproduced at a total cost, including rent, labor and material, of \$25,850 or approximately \$.036 per square foot. This average cost includes both sepia and blue line reproductions.

b. In order to provide the Contract Administration Branch of the Area Office with a means to quickly reproduce necessary contractual documents, a Ditto machine was procured at a cost of \$444.13.

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During the life of the Altus Area some \$1,300. was expended on materials for this machine. This machine was transferred to the Project Office, U. S. Army Engineer District, Albuquerque, on discontinuance of the Area Office.

c. To assist the Administration Branch of the Area Office in providing quick copies of correspondence, a Verifax Machine was procured at a cost of \$103.00. During the life of the Area Office approximately \$600.00 was expended for materials to operate this piece of equipment. This equipment was also transferred to the Project Office, U. S. Army Engineer District, Albuquerque, on discontinuance of the Area Office.

3-11. CUSTODIAL SERVICES - Custodial services for the Area Office were accomplished from the time of mobilization of the office until 31 March 1961 by 2 wage board employees assigned to the Administration Branch. This service cost approximately \$580.00 per month. On 1 April 1961 to economize, the Area Office procured the services of the Bowland Janitorial Services of Altus, Oklahoma, at a cost of \$280.00 per month. On 9 May 1961 the local SATAF organization assumed this responsibility and this procedure was employed until discontinuance of the Area Office.

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CHAPTER 4

ENGINEERING BRANCH

4-01. ORGANIZATION - a. The Engineering Branch (then Engineering & Technical Branch) was organized on 27 March 1960 with the arrival of the Chief of Engineering being assigned to the Altus Area Office. By the middle of April 1960 the Branch consisted of 6 personnel with various qualifications in the electrical, mechanical, and structural engineering fields and one draftsman.

b. By August 1960 the work had grown to such proportions the Area Engineer deemed it necessary to request some temporary engineering assistance in the mechanical and electrical fields from Tulsa District. This assistance consisted of 2 mechanical and 1 electrical engineer spending 2 weeks in the Area Office in a TDY status.

c. Subsequent to the above the Branch increased to its peak size of 12 employees in late 1961.

d. To supplement the work force during the period June through August 1960 Professor B. M. Aldrich of the Engineering School, University of Wichita and Mr. Larry Hove, an engineering student at the University of Oklahoma were hired temporarily to assist in the Engineering Branch operations. The services of Professor Aldrich were procured again during the period of June through August 1961.

e. On 27 March 1961 First Lieutenant William V. Lee, Jr. was assigned to the Branch as a Military Assistant with the primary duty of liaison officer on all contract changes referred to or processed by the Branch. Lt Lee remained in this capacity until 24 July 1961

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when he departed the Altus Area on a permanent change of station to the CEBMCO Area Office located at Mountain Home Air Force Base, Idaho.

4-02. FUNCTIONS OF BRANCH - a. Originally Tulsa District had not envisioned a need for an Engineering Branch in the Area Office. It had been assumed that the Engineering Division of Tulsa District would be required to only monitor the preconstruction phases of the work to be accomplished at the Altus complexes and to assist the Altus Area Engineer in processing change orders from BMD's Architect Engineer.

b. As Tulsa District became more involved in the Atlas F ICBM program it became increasingly evident that Tulsa's original plans were not valid. Accordingly, organization of an Area Office Engineering & Technical Branch was requested and subsequently approved by Tulsa District Engineer.

c. By the time of the activation of the Area Office in March 1960 a set of the functions of the E & T Branch were, in essence, established as follows:

(1) Furnish general engineering and specialized services in support of the Area Office Construction Activities.

(2) Provide for the procurement, receipt, technical review, approval and proper distribution of plans, specifications, shop drawings and material samples.

(3) Supervision of contracts for services of Architect Engineers and Special Consultants in connection with its field of responsibility.

(4) Provide technical advice and assistance for special

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testing required.

(5) Prepare revised plans and specifications and other engineering data required for contract modifications.

(6) Maintain file of as-built drawings, using data provided by the Construction Branch.

(7) Maintains the record set of contract plans and specifications.

(8) Supervises contracts for Architect Engineer services in connection with the Branch responsibility.

(9) Resolves conflicts in design and, where necessary, recommends change order action to the Area Office Contract Administration Branch.

(10) Maintained master equipment list.

(11) Maintained technical library for Area Office.

d. On 20 January 1961 the Area Engineer formalized the responsibilities of the Engineering Branch by the publication of an Area Office SOP entitled "Organization and Functions of the Altus Area Office". These functions assigned to the Branch were modified by the Atlas F Construction Directorate on 12 April 1961 in its "Statement of Functions for the Altus Area Office, Atlas F Construction Directorate". This latter publication has been used as a guide for operations of the Branch to its discontinuance in March 1962.

4-03. ENGINEERING BRANCH ACTIVITIES - a. The Branch received, processed, and reviewed (with the assistance of the contract Architect-⁵ Engineer's staffs, all submittals requiring the approval of the Contracting Officer. The general breakout of the submittals, on the five

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basic contracts is as follows:

<u>CONTRACT</u>	<u>WORK DESCRIPTION</u>	<u>SUBMITTALS</u>	<u>ITEMS</u>
5909	Missile Launch Complexes	1000	3000
5967	Unitary Silo Water Supply	70	2000
5970	25-Ton LOX Plant	100	250
5979	Missile Assembly & Technical Supply Building	320	500
5992	Re-Entry Vehicle Facilities	30	80

b. In addition to the actions noted above, the personnel of the Branch processed over 700 letters from contractors requesting clarifications of some particular contract item.

c. The Branch reviewed and analyzed all conditions which arose and which required engineering field changes to contracts. The facility changes issued after the award of the prime contract were as follows:

CHANGE ORDER CONFERENCE NUMBER

(Design Record Number)

C. O. C. 169, 29 March 1960

CHANGE DESCRIPTION

Change painting requirements for mating metal surfaces; certain crib steel items and support and miscellaneous items on the process vessels.

C. O. C. 176, 5 April 1960

Change requirements of gas detection equipment and site surveillance equipment.

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C. O. C. 182, 22 April 1960	Miscellaneous changes to electrical cabinets and receptacles, cryogenic vessel space envelope, sump pump arrangement, crib steel members, correct certain miscellaneous drawing errors, provide closed diesel jacket water system, provide imbedded sleeves in concrete for later items, and install some new utility piping.
C. O. C. 195, 20 April 1960	Miscellaneous facility changes to provide for CVA/AMF interface items (later phase I & C contractors).
C. O. C. 205, 28 April 1960	Added some conduit runs, changed tolerances on silo, corrected silo foundation design.
C. O. C. 215, 3 May 1960	Changed the LCC compressed system for the air cylinder spring supports. Add miscellaneous changes for chilled water system. Relocated some pressure indicators.
C. O. C. 223, 12 May 1960	Miscellaneous changes. Support a panel, change switchgear location, change LCC partition work points, structural dimensional changes, LCC tunnel hose requirements change;

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C. O. C. 228, 10 May 1960

added shop drawing requirement for some electrical items.

Include final dimensioning for HV & AC piping equipment in accordance with government furnished equipment vendor prints. Also coordinate electrical and structural drawings similarly.

C. O. C. 237, 17 May 1960

Provide for additional facilities validation procedures and made miscellaneous design changes to: counterweight guide rail; crib suspension bracket; electrical revisions; and miscellaneous steel items.

C. O. C. 249, 25 May 1960

Change location of cable trays; door schedule; distribution panel size; and clarify Special Conditions wording concerning "reference points".

C. O. C. 262, 8 June 1960

Establish gaseous vessel nozzle location, change two air supply fans circuitry, provide clarification to ventilating and air conditioning requirements, change controls on the

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C. O. C. 280, 14 June 1960

air washer, add cooling tower foundation details, make change necessary to match diesel generator (A. S. C.) vendor prints.

Modify diesel room enclosure, revise air piping to blast vent, make crib steel revisions, change F. R. C. P. terminal strip, add water chiller unit control changes.

C. O. C. 287, 21 June 1960

Add Electrical conduits and change conduits and change conduit locations, revise utility tanks liquid level controls, relocate light fixtures to avoid interferences, add operation and maintenance manuals for immersion heaters, include location dimensions for cable trays and make some cable tray revisions.

C. O. C. 301, 28 June 1960

Add design pressure for helium cooling coil, revise generator enclosure, add alignment hardware to facility elevator guide rails, change miscellaneous crib steel members, and provide for adjustment to match AMF designed striker plates.

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C. O. C. 319, 1 July 1960	Provide for preloading of shock hanger spring capsule, and relocate jacks to each corner of the counterweight.
C. O. C. 327, 5 July 1960	Add support back-up steel for the facility elevator, alter crib steel at elevator framing, up date Master Equipment List.
C. O. C. 335, 12 July 1960	Relocate HV & AC control panel, provide new drawing on collimator insert plates, modify ventilation ductwork.
C. O. C. 344, 20 July 1960	Provide "rattle" space (crib steel clearance) by cable tray and ventilating duct changes, replace diesel exhaust pipe bends with flexible tubing.
C. O. C. 370, 9 August 1960	Changes necessary to accommodate the installation of detector and sensor units.
C. O. C. 383, 16 August 1960	Provide blackout in silo cap to accommodate missile erection system, delete TV surveillance and motor operated gate. Revise pipe hanger to suit piping changes.

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C. O. C. 398, 23 August 1960	Delete three monorails in the launch silo.
C. O. C. 403, 23 August 1960	Relocate access road entrance.
C. O. C. 410, 30 August 1960	Provide concrete pad for site tube, revise sand settling tank location because of interference with hydraulic control panel, revise facility Pad AC unit exhaust duct to eliminate an interference with GSE.
C. O. C. 418, 9 September 1960	Provide government furnished property installation procedures and drawings. Provide fire prevention and personnel safety items. Change facility chilled water pumping for pad cooler. Revisions to erection of reinforcement steel to provide magnetic screening.
C. O. C. 437, 21 September 1960	Change plumbness tolerance for shock hangers. Alter crib steel at diesel exhaust and at dust collector unit. Provide water control equipment at Site #9.
C. O. C. 446, 28 September 1960	Miscellaneous revisions to crib steel and floor grating or plate.
C. O. C. 455, 5 October 1960	Miscellaneous mechanical changes.

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C. O. C. 464, 12 October 1960	Relocate and revise piping, provide "rattle" space at silo cap, add duct supports and change pipe hangers, add pipe anchors, add some interface details.
C. O. C. 495, 2 November 1960	Modify overhead door cylinder bracket and actuator bracket.
C. O. C. 504, 16 November 1960	Correct pipe and duct hanger details, add diesel exhaust insulation.
C. O. C. 512, 30 November 1960	Revise cryogenic vessel guy lugs, provide pulse protection (bonding and grounding items).
C. O. C. 526, 7 December 1960	Rotate shock struts to eliminate interferences, add hardware for launch platform guide rail to maintain GSE interface, miscellaneous mechanical changes.
C. O. C. 540, 21 December 1960	Miscellaneous mechanical changes.
C. O. C. 550, 12 January 1961	Increase size of an LCC transformer.
C. O. C. 563, 19 January 1961	Miscellaneous steel changes, revise silo cap blackout.
C. O. C. 587, 16 February 1961	Strengthen launch platform guide rail.
C. O. C. 611, 23 March 1961	Revision to air wash dust collector system.

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d. Master Equipment Lists were government furnished basic documents that the various construction contractors were required to complete and furnish manufacturer's technical data in support thereof for the specific equipment the contractor purchased and installed. The Master Equipment List is organized by major and sub-systems of each particular facility. The Missile Assembly Building and the Missile Launch Complexes were the MELs that required contractor action. The Water Supply MEL was a CEBMCO required function. Contracts for Fuel Catchment Tanks and Safety Platforms also contained small MELs for contractor support. Both of these MELs were approximately the same in organization. Each had approximately six major systems with approximately twenty-five sub-systems or sequence numbers. The MELs contain approximately 150 pages. For each line item on each page the contractor submitted 40 pieces of supporting technical data. One copy of each item was maintained locally, one copy given General Dynamics/Astronautics locally, and thirty-eight copies were forwarded to RPIE Task Force, CEBMCO, Los Angeles, California. It is estimated that this involved the receiving, processing, and shipment of one hundred boxes of technical data on these two contracts alone. Further, each MEL was supported by a "Recommended Spare Parts List" of approximately 500 pages each. These listings provided the manufacturer's recommendation for spares with prices and addresses. On future similar programs this task should be handled by a separate and isolated section within the Engineering Branch as this task requires uninterrupted effort by reviewing personnel. In addition, it requires a large storage and work area to handle

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the necessary paperwork.

4-04. RELATIONSHIP WITH SATAF - The relationship that the Engineering Branch had with SATAF consisted primarily of coordination with BSD representatives on problems concerned with design deficiencies, i.e., requesting authority of BSD to make modifications to correct such deficiencies or obtaining technical advice concerning interest of design in those instances where this intent was not clearly established within the contract. The local Air Force BSD office consisted of one USAF major, one DAFC and three AE representatives. The relationship and cooperation enjoyed by the Area Office with BSD was considered excellent.

4-05. UNUSUAL AND UNFORESEEN EVENTS - a. The volume of contract changes was unforeseen and unexpected and could not be attributed to concurrency of design and construction. There were instances wherein items added by a change were later deleted. Such action was prima facie evidence of inadequate review at the time of conception of this category of changes.

b. The quality of the plans and specifications of the initial contracts and later AE contract changes involving "construction feasibility" and "clarity of contract delineation" were not in keeping with that quality normally encountered in the U. S. Army Corps of Engineers construction contracts.

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