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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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[1] 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

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. 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.

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.[3] 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.[4]

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

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.

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. Precambian 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.

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 120° F., and short mild winters with cold snaps of frequent occurrence, but with scanty snowfall. The extreme low recorded temperature is -9° 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

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.

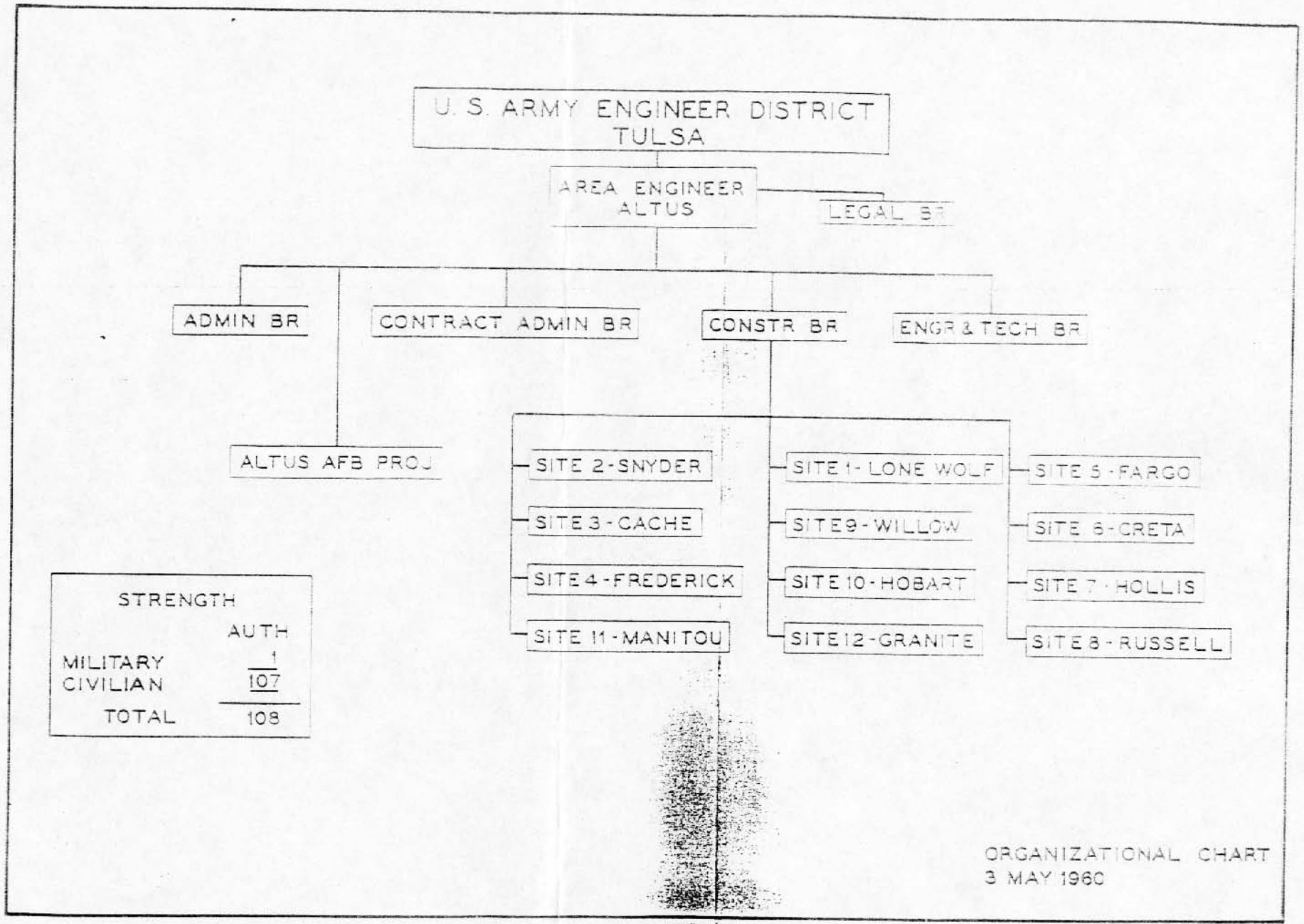
b. As a result of visits by Tulsa District personnel to other ICBM sites that were then under construction, and based upon operational procedures observed, it was decided that the most feasible and efficient means of supervising construction activities of the work would be through the establishment of 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.[5]

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

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.[6] 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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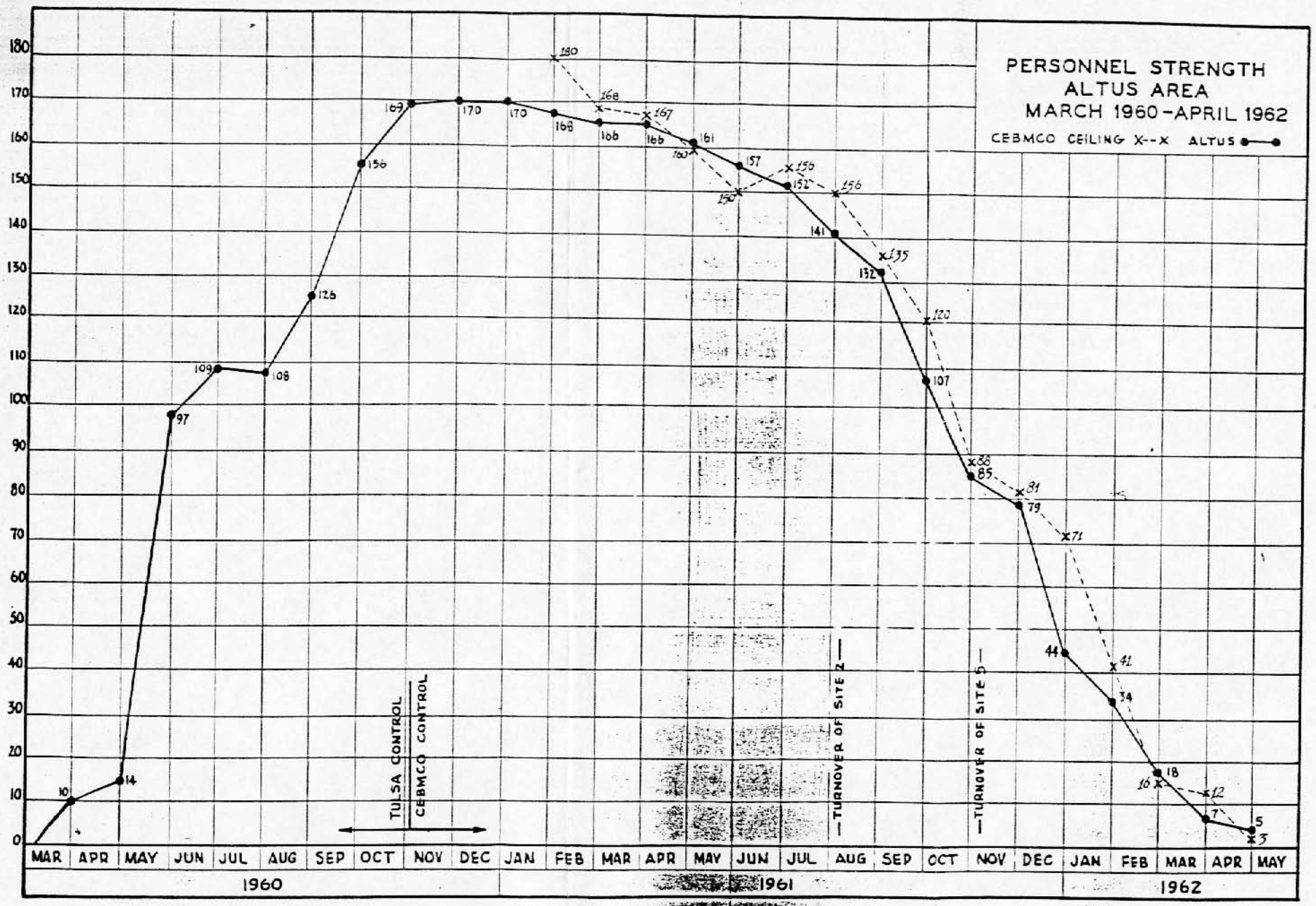

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and as the workload decreased to date, the personnel of the Area Office were released in consonance with a phaseout plan developed jointly by the Area Staff. The buildup and phaseout of number of personnel assigned to Altus is illustrated on the chart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

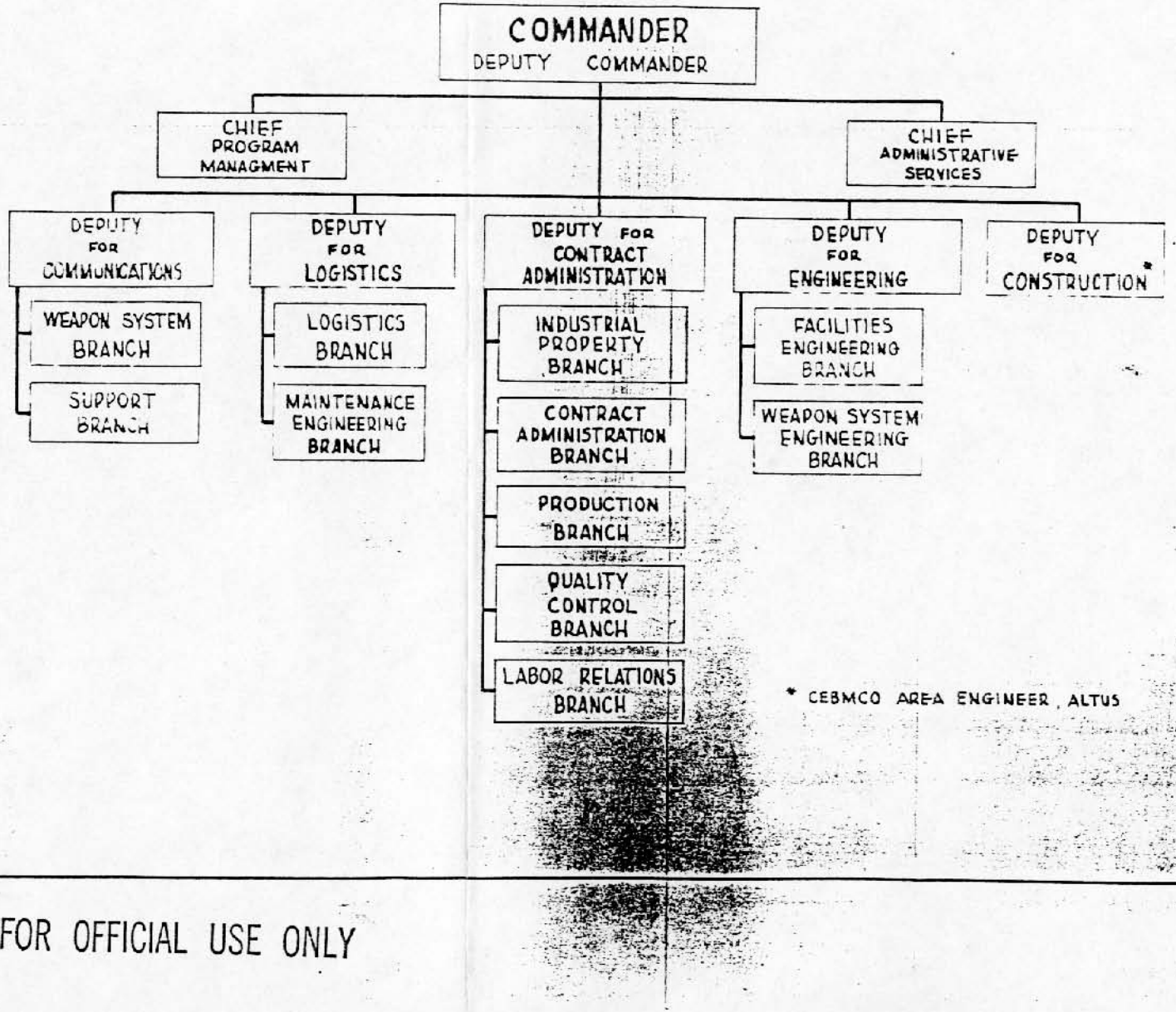
1-08. DEACTIVATION - The Altus Area Office was discontinued 28 April 1962 pursuant to Paragraph 1, General Order Number 5, Headquarters, U. S. Army Corps of Engineers Ballistic Missile Construction Office dated 18 April 1962.

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

SITE ACTIVATION TASK FORCE
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

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.

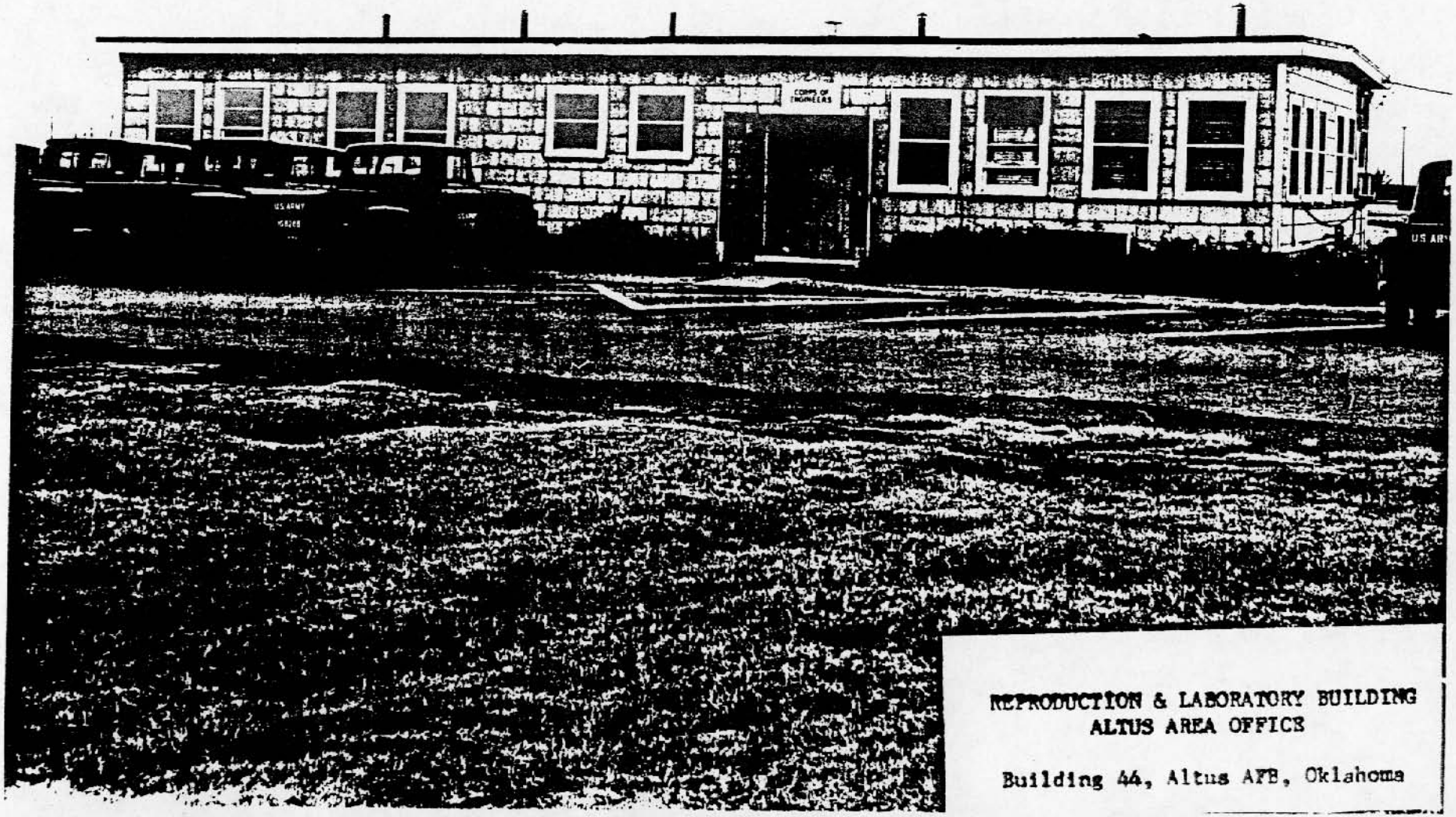
b. Hard surfaced parking was afforded the Area office employees on both the Southwestern and Southeastern sides of Building 147. In addition, Building 44 had a small parking lot immediately to its front. Because of lack of adequate government motor pool facilities on the base it was necessary that the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

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

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.

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.[1] This concept 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 arrival 17 October 1960, Captain James R. McKnight was assigned these duties.[4]

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,

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[6] and departed the Area Office 20 January 1962. Lieutenant Colonel Baswell departed on a permanent change of station 6 March 1962.[7]

h. Upon Lieutenant Colonel Baswell's reassignment, Major Wood was appointed Acting Area Engineer[8] 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.[9] He represented the Contracting Officer in the enforcement of contract provisions and recommended and negotiated contract modifications.[10] As a representative of the Contracting Officer the Area Engineer

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[11] 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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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
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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
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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.

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.

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,

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

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.[7] By the 13th of February the authorized strength was reduced by CEBMCO to 7 officers and 168 civilians.[8] 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.[9] In view of the actual and projected time extensions to the prime contract the Area Engineer requested Director, Atlas F to make a reappraisal of these strengths.[10] On 21 June the Area Engineer was advised[11] 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.[12]

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

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[13] 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.[14] 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.[15] 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.[16] 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[17] that personnel scheduled for employment on the Whiteman Project[18] 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,

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.

l. 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. Evans [19] as Responsible Employee. Concurrently a Tulsa District property account was also being maintained on Altus Air Force Base by the Project Engineer [20] 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 his property account be merged with the Area account. [21] This plan was

concurred 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

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]

On 28 February 1962 two sedans were shipped to the CEBMCO Whiteman Area Office, Whiteman Air Force Base, Missouri. 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.

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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

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 Transportation Agents.[31] 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 Transportation Agent was terminated[33] and Mr. W. J. Forsyth appointed this duty.[34] 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 which duty she remained until 28 April 1962.[35]

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 orders were published by the Area.[36] Payment of travel vouchers was the 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.

3-06. COST AND FUNDING ACTIVITIES - a. Costs for the mobilization of the Altus Area Office were charged by Tulsa District against
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Account 820. 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.

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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

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:

MONTH	BUDGET	ACTUAL AREA LABOR COSTS
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

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[42] 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.[43] 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.[44]

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

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. 45 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

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.

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.

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[1] 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.[2]

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.[3]

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.[4] 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

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

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-Engineer's staffs, all submittals requiring the approval of the Contracting Officer. The general breakout of the submittals, on the five

basic contracts is as follows:

CONTRACT	WORK DESCRIPTION	SUBMITTALS	ITEMS
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	CHANGE DESCRIPTION
C. O. C. 169, 29 March 1960	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.

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,

	added shop drawing requirement for some electrical items.
C. O. C. 228, 10 May 1960	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 circuity, provide clarification to ventilating and air conditioning requirements, change controls on the

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

C. O. C. 280, 14 June 1960 — 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.

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 blockout in silo cap to accommodate missile erection system, delete TV surveillance and motor operated gate. Revise pipe hanger to suit piping changes.

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.

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 blockout.
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.

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

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.[6] 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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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

CARL F. BASWELL
Lt Col CE
Area Engineer

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

S. C. WOOD, Major, CE
CEBMCO Liaison Officer
Altus

CHAPTER 5

CONSTRUCTION BRANCH

5-01. ORGANIZATION - a. The Construction Branch was organized on 14 March 1960 with the arrival of the Chief of Construction[1] being assigned to the Altus Area Office. By the end of March 1960 the Branch consisted of 13 personnel of various qualifications in electrical, mechanical and civil engineering fields of endeavor.

b. As it has been noted previously, Tulsa District had envisioned the Area Office Construction Branch to consist of the branch proper plus 13 project offices; one on each launcher site and one on Altus AF Base proper to supervise the construction of the "on-base facilities"[2]. Each of these Project Offices was to be manned by a Project Engineer and 5 inspector personnel.[3]

c. By the end of May 1960 the Construction Branch had grown to 13 technicians in the Area Office and 62 site inspection personnel.

d. As a means of insuring adequate staffing, span of control, training and technical support, the Area Engineer, on 1 July 1960, created four sub-sections in the Branch. These sections were the Structural & Civil, Materials, Mechanical, and Propellant Loading System Sections. Simultaneously, Section Chiefs were appointed and personnel assigned appropriate areas of responsibility.

e. On 17 August 1960 Captain Walter P. Tokarz reported for duty and was assigned as Military Assistant in the Structural & Civil Section.[4] He remained in this capacity until 27 November 1961 when he

was reassigned.

f. By 1 September 1960 construction had progressed to the extent where it became evident that the coordination between the Construction Branch and the Project Offices was inadequate. To alleviate this situation the Area Engineer created 4 additional positions. Three of these positions were those of a coordinator responsible for four complexes and the remaining one that of an Assistant Chief of Branch.

g. On 24 October 1960 First Lieutenant William V. Lee was assigned to the Branch with duty as Military Assistant to the Project Engineer for the "on-base" facilities. Lt Lee remained in this assignment until 27 March 1961 when he was reassigned to the Engineering Branch of the Area Office.

h. On 24 October 1960 Captain Maury Cochran was assigned to the Branch as Chief, Electrical Section where he remained until he departed on reassignment 16 September 1961.[5]

i. In early November 1960 in an effort to further the efficiency of the PLS Section and to insure closer coordination of the works at the project sites, a PLS Branch was established, separating the PLS Section from the Construction Branch. The PLS Branch will be discussed separately. Immediately prior to this reorganization action the Construction Branch consisted of 31 office and 87 site personnel.

j. During the period 1 October 1960 through 1 September 1961 the strength of the branch remained static for all intents with 22 office and 87 site personnel. After the latter date the PLS Branch was redesignated as a Section and again placed under direct control of

the Construction Branch where it has remained to date of this text.

k. By 15 October 1961 the workload was such that phaseout of personnel assigned to the Branch could begin. This phaseout continued through 15 April 1962 on which date the branch was discontinued.

5-02. FUNCTIONS OF BRANCH - a. Upon activation of the Area Office the Construction Branch was assigned the following functions as quoted from the Tulsa District's "Time Phase Plan for ICBM Construction, Altus, Oklahoma": ."Coordinates contractor activities to meet construction contract objectives, conducts continuous inspection of contract construction operations and prepares daily records of work accomplished, decisions, conditions and progress. Conducts frequent inspection of construction, establishes construction inspection standards and conducts final inspection. Controls material quality and monitors contract laboratory work. Conducts periodic inspections to assure compliance with Labor Standard Provisions. Advises, assists and interprets plans and specifications for contractors. Reviews plans and specifications for practicability for construction, originates need for design changes and reports as-built construction details. Assists preparation of modifications by providing costing data, facts, construction advice and assists in negotiation of claims and contract modifications. Certifies estimates for payment to contractors. Directs the Area safety program. Provides for training of inspectors."

b. The Construction Branch operated under these functional statements until 1961 when the Area Engineer established new operating procedures by publication of an Area Office SOP detailing the functions

of the various branches. The branch operated under the provisions of this document until 12 April 1961 at which time CEBMCO distributed a publication entitled "Statement of Functions for the Altus Area Office, Atlas F Construction Directorate". No additional major changes were made in the functional responsibilities of the Construction Branch.

5-03. GENERAL DESCRIPTION OF CONSTRUCTION - a. Primarily, the Altus Area Office was responsible for the construction of twelve underground launch silos and control centers for the Atlas F ICBM. This construction was accomplished both under general conditions of urgency and procedures whereby design changes were numerous and made while the construction was in progress. Original review of the project plans and specifications by personnel of the Construction Branch revealed they faced a complex task which would, in the end, produce a tailored glove-like environment for the Atlas F Missile. Such an environment imposed a need for dimensional tolerances, reliability and ingenuity of design of the highest order. Completion of this task was to be further complicated by the principle of concurrency.

b. The launch silo is a highly reinforced concrete structure 174 feet deep, located entirely below the ground level. The inside diameter is 52 feet. Vertical walls vary in thickness from 2½ to 9 feet. The top of the silo is flush with the ground surface. Overhead doors, weighing approximately 65 tons, operated hydraulically, can be used to completely seal off the silo. Construction of this concrete shell required over 1,800 tons of reinforcing steel and approximately 6,000 cubic yards of high strength concrete. The silo walls were poured by the slip form method. In this procedure a 6 foot high circular form

is set in the bottom of the silo and connected to a head frame above the ground surface by 38 steel rods. These rods were sectional and extend through hydraulic jacks which were used to raise the slip form. The concrete was pumped from a mixer through a pipeline down to the slip form where it was placed behind the form. Once a pour was started, the form would be slowly raised until the entire 174 feet of wall was placed. The average rate of jacking was 28 inches per hour. This rate allowed the concrete to "set" sufficiently to remain in place before the slip form passed its elevation.

c. Attached to this silo by a 25 ft passageway is a two story launch control center. This structure, 40 feet in diameter and 27 feet high of reinforced concrete, was also placed underground to provide an operational and living area for the crew which would eventually live on the site. These crew facilities within this underground structure are suspended in a shock mounted steel crib.

d. Approximately 60,000 cubic yards of material were excavated for each silo and launch control site. To accomplish this, the contractor made an open cut to the level of the foundation of the launch control center, a depth of some 45 feet below ground level. From that depth to the bottom of the silo was a shafting operation. The open cut permitted the launch control center, the connecting tunnel, and the top portion of the silo to be built in the open. After completion of the construction work the open area surrounding exposed work was backfilled.

e. Extending the entire inner depth of the concrete silo

and suspended within it on four sets of springs is a structural steel frame named the "crib". When completely loaded, including the ICBM, these springs are required to carry a load of approximately 900 tons. The crib also serves as a container for the missile launching platform, a maintenance shop and fuel loading system.

f. There are eight floor levels in the crib with one level being divided into two additional sub-levels. For convenience purposes these levels are assigned numbers from top to bottom of the silo. Major items of equipment placed on each level are as follows:

(1) Level 1 - Launch Platform Drive Assembly and Controls.

(2) Level 2 - Hydraulic Power Supply; Air Conditioning and Ventilation Fans; and Facility Motor Control Center.

(3) Level 3 - Control Consoles and Cabinet Air Conditioning.

(4) Level 4 - Refrigeration, Heating, and Utility Water Equipment.

(5) Level 5 & 6 - Diesel Generators and Auxiliary Equipment.

(6) Level 7 - Propellant Loading System Controls.

(7) Level 8 - Propellant Loading System Tanks.

5-04. CHRONOLOGICAL LISTING OF SIGNIFICANT CONSTRUCTION EVENTS: [6]

a. Month of May 1960

9th - Excavation was started at Sites 1, 2 & 3.

18th - Excavation was started at Site 6.

24th - Excavation was started at Site 5.

26th - Excavation was started at Site 4.

b. Month of June 1960

6th - Excavation was started at Site 8.

13th - Excavation was started at Site 11.

21st - Excavation was started at Site 7.

24th - Excavation completed at Site 2.

30th - Excavation started at Site 12.

- Launch Control Center started at Site 1.

c. Month of July 1960

1st - Excavation started at Site 9.

7th - Excavation completed at Site 1.

13th - Launch Control Center started at Site 2.

20th - Excavation completed at Site 3.

27th - Excavation completed at Site 4.

- Launch Control Center started at Site 3.

28th - Excavation started at Site 10.

d. Month of August 1960

2nd - Installation of silo reinforcing steel started at Site 2.[7]

4th - Excavation completed at Site 11.

12th - Installation of silo reinforcing steel started at Site 1.

17th - Excavation completed at Site 6.

24th - Launch Control Center started at Site 11.

26th - Launch Control Center started at Site 4.

27th - Installation of silo reinforcing steel started at Site 3.

e. Month of September 1960

1st - Launch Control Center started at Site 6.

4th - Installation of silo reinforcing steel started at Site 11.

10th - Launch Control Center started at Site 9.

13th - Installation of silo reinforcing steel started at Site 4.

14th - Installation of silo reinforcing steel completed at Site 2.

15th - Launch Control Center started at Site 7.

16th - Excavation completed at Site 8.

18th - Launch Control Center started at Site 12.

22nd - Excavation completed at Site 9.

- Installation of silo reinforcing steel started at Site 6.

- Launch Control Center started at Site 8.

23rd - Silo concrete pour started at Site 2.

24th - Installation of silo reinforcing steel completed at Site 1.

25th - Excavation completed at Site 12.

28th - Silo concrete pour completed at Site 2.

29th - Silo concrete pour started at Site 1.

f. Month of October 1960

3rd - Installation of silo reinforcing steel completed at Site 3.

- Silo concrete pour completed at Site 1.

- Launch Control Center started at Site 10.

7th - Installation of silo reinforcing steel completed at Site 11.

- Silo concrete pour started at Site 3.

9th - Installation of silo reinforcing steel started at Site 9.

12th - Installation of silo reinforcing steel completed at Site 6.

- Silo concrete pour completed at Site 3.

14th - Installation of silo reinforcing steel started at Site 8.

- Silo concrete pour started at Site 11.

15th - Excavation completed at Site 7.

18th - Silo concrete pour completed at Site 11.

20th - Installation of silo reinforcing steel completed at Site 4.

21st - Installation of silo reinforcing steel started at Site 12.

- Installation of crib steel started at Site 2.

22nd - Excavation completed at Site 10.

23rd - Silo concrete pour started at Site 6.

27th - Silo concrete pour completed at Site 6.

28th - Silo concrete pour started at Site 4.

g. Month of November 1960

1st - Silo concrete pour completed at Site 4.

2nd - Installation of silo reinforcing steel started at Site 7.

- Installation of silo reinforcing steel completed at Site 8.

- Installation of silo reinforcing steel completed at Site 9.

4th - Installation of silo reinforcing steel started at Site 10.

7th - Installation of crib steel started at Site 1.

10th - Installation of silo reinforcing steel completed at Site 12.

11th - Silo concrete pour started at Site 8.

12th - Placed LOX Tank and Cryogenic Vessels in silo at Site 2.

15th - Silo concrete pour completed at Site 8.

- Installation of crib steel started at Site 11.

16th - Silo concrete pour started at Site 9.

19th - Installation of silo reinforcing steel completed at Site 7.

- Silo concrete pour completed at Site 9.

20th - Silo concrete pour started at Site 12.

- Placed LOX Tank and Cryogenic Vessels in silo at Site 1.

21st - Installation of crib steel started at Site 3.

23rd - Installation of silo reinforcing steel completed at Site 10.

- Silo concrete pour completed at Site 12.

28th - Silo concrete pour started at Site 7.

30th - Placed LOX Tank and cryogenic Vessels in silo at Site 11.

h. Month of December 1960

1st - Silo concrete pour completed at Site 7.

- Placed LOX Tank and Cryogenic Vessels in silo at Site 3.

5th - Silo concrete pour started at Site 10.

7th - Installation of crib steel started at Site 6.

8th - Silo concrete pour completed at Site 10.

9th - Installation of crib steel started at Site 4.

10th - Excavation completed at Site 5.

19th - Placed LOX Tank and Cryogenic Vessels in silo at Site 6.

22nd - Installation of crib steel started at Site 8.

27th - Placed LOX Tank and Cryogenic Vessels in silo at Site 4.

i. Month of January 1961

3rd - Installation of silo reinforcing steel started at Site 5.

5th - Placed LOX Tank and Cryogenic Vessels in silo at

Site 8.

7th - Installation of crib steel started at Site 9.

11th - Installation of crib steel started at Site 7.

- Placed LOX Tank and Cryogenic Vessels in silo at Site 9.

14th - Installation of crib steel started at Site 12.

18th - Installation of silo reinforcing steel completed at Site 5.

19th - Placed LOX Tank and Cryogenic Vessels in silo at Site 12.

24th - Silo concrete pour started at Site 5.

25th - Placed LOX Tank and Cryogenic Vessels in silo at Site 7.

28th - Silo concrete pour completed at Site 5.

30th - Installation of crib steel started at Site 10.

j. Month of February 1961

1st - Launch Control Center started at Site 5.

2nd - Placed LOX Tank and Cryogenic Vessels in silo at Site 10.

k. Month of March 1961

9th - Installation of crib steel started at Site 5.

15th - Placed LOX Tank and Cryogenic Vessels in silo at Site 5.

l. Month of April 1961

24th - Construction of silo cap and doors started at

Site 2.

28th - Construction of silo cap and doors started at Site 3.

m. Month of May 1961

5th - Construction of silo cap and doors started at Site 11.

11th - Construction of silo cap and doors started at Site 1.

13th - Silo cap and doors completed at Site 2.

22nd - Launch Control Center completed at Site 2.

23rd - Silo cap and doors completed at Site 3.

24th - Construction of silo cap and doors started at Site 4.

25th - Silo cap and doors completed at Site 11.

29th - Launch Control Center completed at Site 1.

- Construction of silo cap and doors started at Site 6.

n. Month of June 1961

5th - Silo cap and doors completed at Site 1.

- Launch Control Center completed at Site 3.

6th - Construction of silo cap and doors started at Site 8.

12th - Launch Control Center completed at Site 11.

13th - Silo cap and doors completed at Site 4.

14th - Construction of silo cap and doors started at

Site 7.

19th - Launch Control Center completed at Site 6.

20th - Construction of silo cap and doors started at Site 12.

21st - Silo cap and doors completed at Site 6.

26th - Silo cap and doors completed at Site 8.

- Launch Control Center completed at Site 4.

27th - Crib steel completed at Site 2.

29th - Construction of silo cap and doors started at Site 9.

30th - Crib steel completed at Site 3.

- Silo cap and doors completed at Site 7.

- Launch Control Center completed at Site 8.

o. Month of July 1961

10th - Construction of silo cap and doors started at Site 10.

- Launch Control Center completed at Site 9.

11th - Silo cap and doors completed at Site 12.

14th - Construction of silo cap and doors started at Site 5.

15th - Crib steel completed at Site 11.

19th - Crib steel completed at Site 1.

- Silo cap and doors completed at Site 9.

21st - Launch Control Center completed at Site 12.

29th - Launch Control Center completed at Site 7.

p. Month of August 1961

1st - Site 2 turned over to Using Agency.[9]

8th - Launch Control Center completed at Site 10.

21st - Crib steel completed at Site 9.

23rd - Site 3 turned over to Using Agency.

- Launch Control Center completed at Site 5 (last of the 12 LCC's).

29th - Crib steel completed at Site 12.

30th - Site 11 turned over to the Using Agency.

q. Month of September 1961

5th - Crib steel completed at Site 6.

6th - Site 1 turned over to the Using Agency.

20th - Site 6 turned over to the Using Agency.

21st - Crib steel completed at Site 8.

22nd - Crib steel completed at Site 10.

26th - Crib steel completed at Site 7.

27th - Site 4 turned over to the Using Agency.

- Crib steel completed at Site 4.

r. Month of October 1961

4th - Site 9 turned over to the Using Agency.

11th - Site 8 turned over to the Using Agency.

18th - Site 12 turned over to the Using Agency.

25th - Site 7 turned over to the Using Agency.

s. Month of November 1961

1st - Site 10 turned over to the Using Agency.

7th - Crib steel completed at Site 5.

8th - Site 5, the last site, turned over to the Using Agency.

NOTE: Photographs illustrating construction are to be found following page 73.

5-05. GENERAL EXPERIENCE DATA - The paragraphs below indicate the minimum and maximum time required to complete features of the work so noted.

a. Excavation of Open Cut

Shortest time to complete - 12 days on Site 1.

Longest time to complete - 63 days on Site 5.

b. Shafting of Silo

Shortest time to complete - 34 days on Site 2.

Longest time to complete - 138 days on Site 5.

c. Installation of Reinforcing Steel in Silo

Shortest time - 16 days at Site 5.

Longest time - 44 days at Site 2.

d. Slip Form Concrete Operations

Shortest time - 80 hours at Site 9.

Longest time - 138 hours at Site 2.

e. Installation of Crib Steel in Silo

Shortest time - 221 days at Site 3.

Longest time - 294 days at Site 4.

f. Construction of Silo Cap and Doors

Shortest time - 15 days at Site 5.

Longest time - 25 days at Sites 2 and 3.

5-06. MAJOR OPERATIONAL PROBLEMS - a. Surveillance of construction by General Dynamics/Astronautics (originally on the project as Convair Astronautics) personnel who were inexperienced in heavy construction operations. In most instances the number of these surveillance personnel on a site outnumbered the Corps of Engineers personnel. This situation was a basis for many complaints from the Corps of Engineers' contractors. To solve such problems conferences between the Area Engineer and the SATAF Commander were hald in an effort to determine the maximum number of GD/A inspection personnel to be permitted on the sites. This problem was never successfully resolved.

b. Conflicts between GD/A planning cards and contract plans and specifications - In many instances GD/A personnel attempted to generate construction deficiency reports (CDR's) based upon their planning cards and not upon the contract specifications, which led to many arguments and disputes. This problem was solved by the Area Engineer explaining to the SATAF Commander that the Corps of Engineers' personnel could require only what was in the contract. The SATAF Commander then issued applicable instructions in the matter in question.

c. Close tolerance requirements for embedded items - Such tolerances were not always specific on contract drawings, but were shown on GD/A drawings for ASC items. This became an area for disputes between the Area Office and the Using Agency (SATAF) especially in those instances when the GD/A drawings indicated an extraordinary amount of loose fit in mating parts. Reasonable tolerances were maintained as

per the contract, but impracticable, uneconomical ones were modified by meetings between the Area Engineer and the Using Agency.

d. Multitude of structural steel changes - This problem was for the most part, the most perplexing problem which faced the Construction Branch. It was further complicated by delays in providing changes to the fabricator and in correcting items already fabricated. The obvious solution which could be used by the Area Office was by accomplishing the processing and issuing of changed shop drawings with a minimum delay. Such action precluded a material delay in the construction schedule.

5-07. UNUSUAL, UNFORESEEN OR CHANGED CONDITIONS - a. Changed or unforeseen conditions were found at Sites 5, 7, 8 and 12.[10] On Sites 5, 7 and 12 the contractor encountered excessive water due to an unexpected high water table. On Site 8 cavities encountered during the shafting phase had been unexpected.

b. Water wells drilled by the Corps of Engineers failed to produce water with an acceptable amount of hardness and salt content.

5-08. ASSESSMENT OF LIQUIDATED DAMAGES - There were no assessments of liquidated damages in the Altus Area.

5-09. CONTRACTORS RELATIONS WITH LABOR - The prime contractor and his subcontractors enjoyed very harmonious relations with labor. Several jurisdictional disputes were avoided as a result of the prime contractor's planning of work. In this connection the prime contractor obtained organized labor's concurrence prior to the assignment of work to any particular craft.[11]

5-10. CONTROVERSIAL OPINIONS AND DISPUTES - a. The first major dispute which arose was concerning the milestone dates set forth in the prime contract. Detailed examination of this subject revealed that these milestones were not clear cut, were not in the proper sequence, and could not be forced upon the contractor for the lack of a provision in the contract for assessing liquidated damages. It was eventually decided to meet only the major dates as indicated by the contract.

b. Secondly, the prime contractor took exception to any items of work not clearly and specifically defined within the contract structure. It became necessary to direct the contractor to accomplish work in many such areas of dispute through correspondence signed by the COR. Each dispute eventually became a basis for a claim. (Note - Claims will be covered later on in this text.)

5-11. PLS SECTION - a. General. Since the PLS Section was, for the greatest period of time, a part of the Construction Branch, the history of this aspect of the Area Office operations has been included in this Chapter.

b. Activation and Staffing - (1) The PLS Section was originally programmed as part of the Construction Branch upon activation of the Area Office. During the month of June 1960 a formal request to the Tulsa District had been initiated for 24 mechanical and 12 electrical engineers and inspectors to provide the required PLS and Electrical Quality Control. Recruiting action, however, did not commence until late July 1960.

(2) During the months of August through November 1960

the majority of these personnel were assigned to the Altus Area Office. Previous arrangements had been made with the Tulsa District to place PLS personnel on TDY to other missile bases already under construction for on-the-job training in PLS installation. Prior to this TDY assignment each employee was required to attend the PLS School being conducted at Denver, Colorado.

(3) Upon completion of the school and TDY, assignments to the sites were made with two Corps of Engineer mechanical engineers and one mechanical inspector assigned to each of the 12 sites.

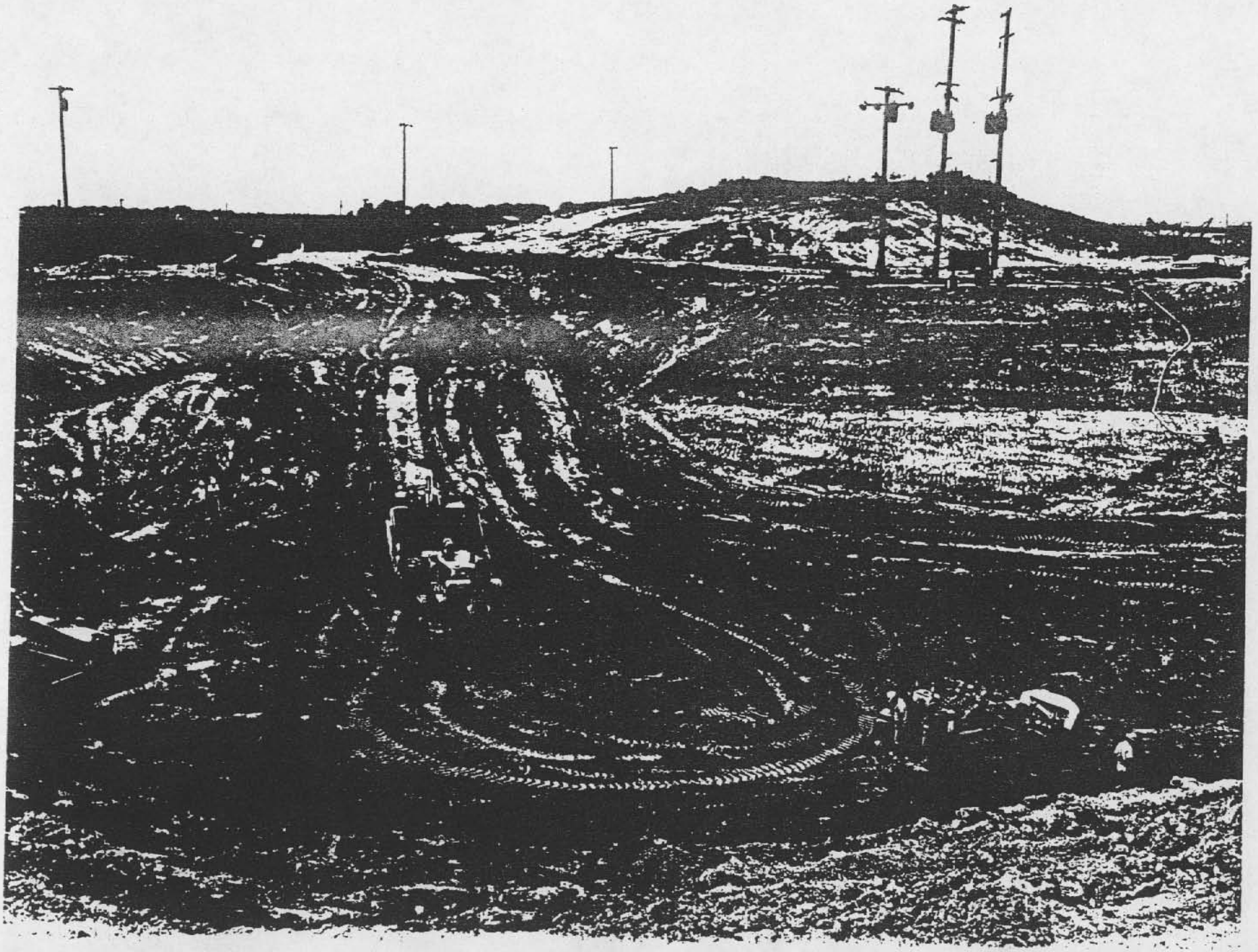
(4) The PLS Branch was officially established in November 1960. The Branch was staffed with a Military Chief (Major, CE), 5 engineers, one electrical equipment inspector and one clerk-stenographer. The PLS site personnel were under the administration and operational control of the site Project Engineers.[12]

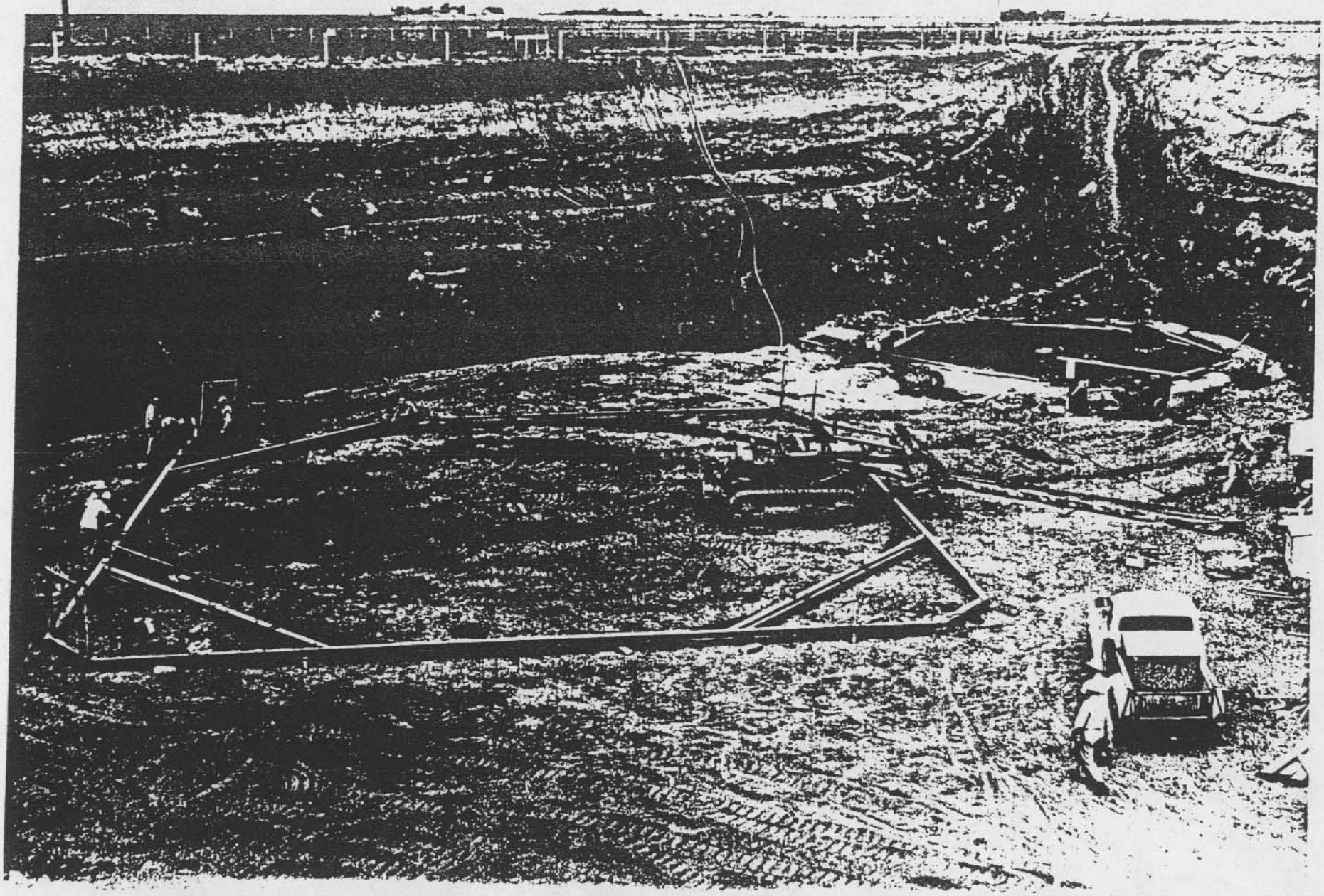
(5) In September 1961 the PLS Branch was redesignated as the PLS Section under direct control of the Construction Branch.

c. Scope of work - (1) The PLS staff coordinated the installation and testing of the PLS system; assisting in the determination of correction of installation and conflicts; and coordination of installation and testing acceptance with the contractor, SATAF, and GD/A representatives. In addition, coordination for the supply of test liquids, gases, and PLS Test Equipment was carried on by the PLS Section.

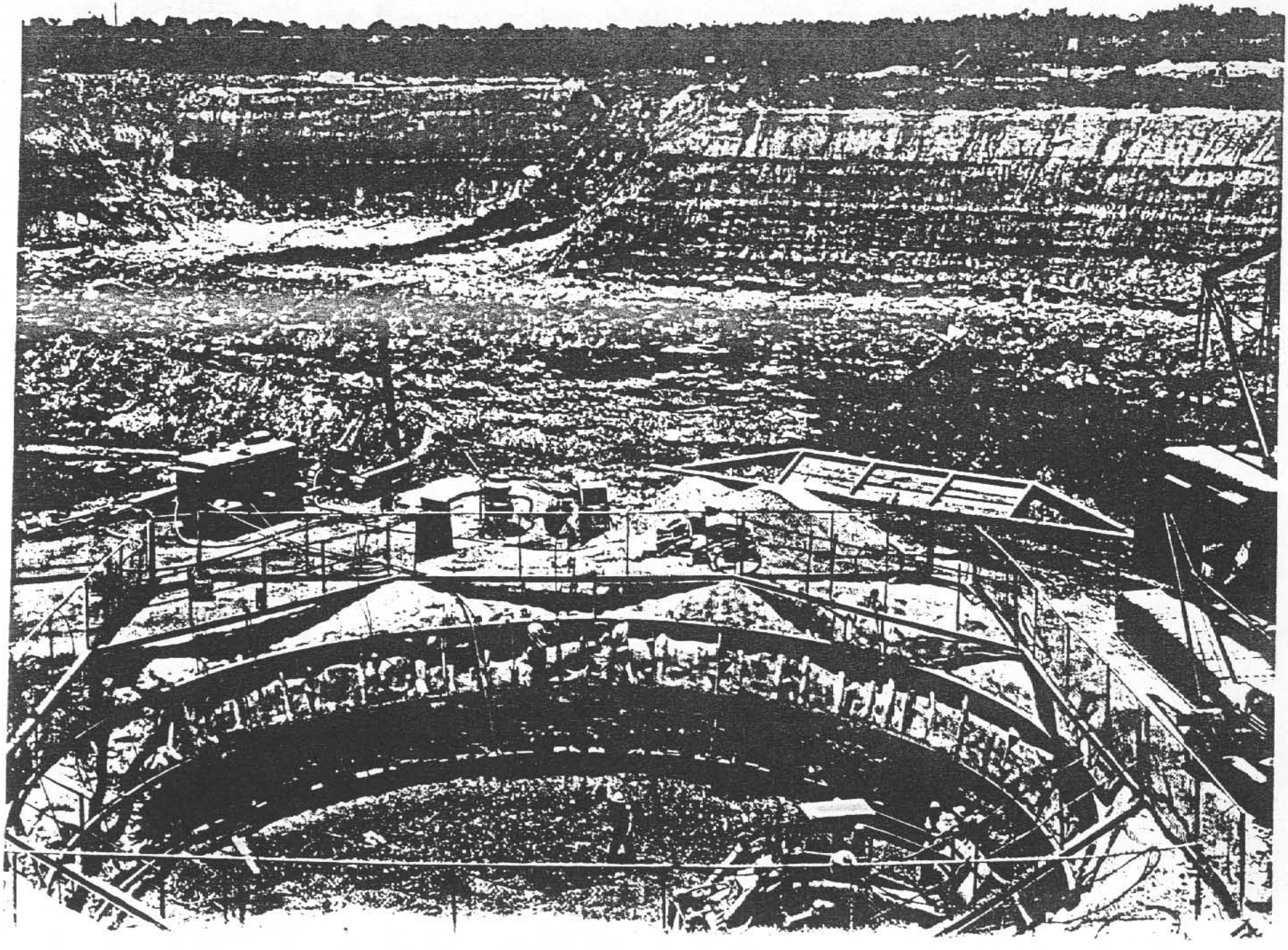
d. Unusual or Unforeseen Event - (1) Contamination of gaseous oxygen and gaseous nitrogen vessels were the major problems which confronted the Area PLS personnel. The legal positions taken

by the government, the PLS subcontractor and the vessel fabricator were so divergent that considerable difficulty and delay was encountered in the completion of the testing portion of the contract.

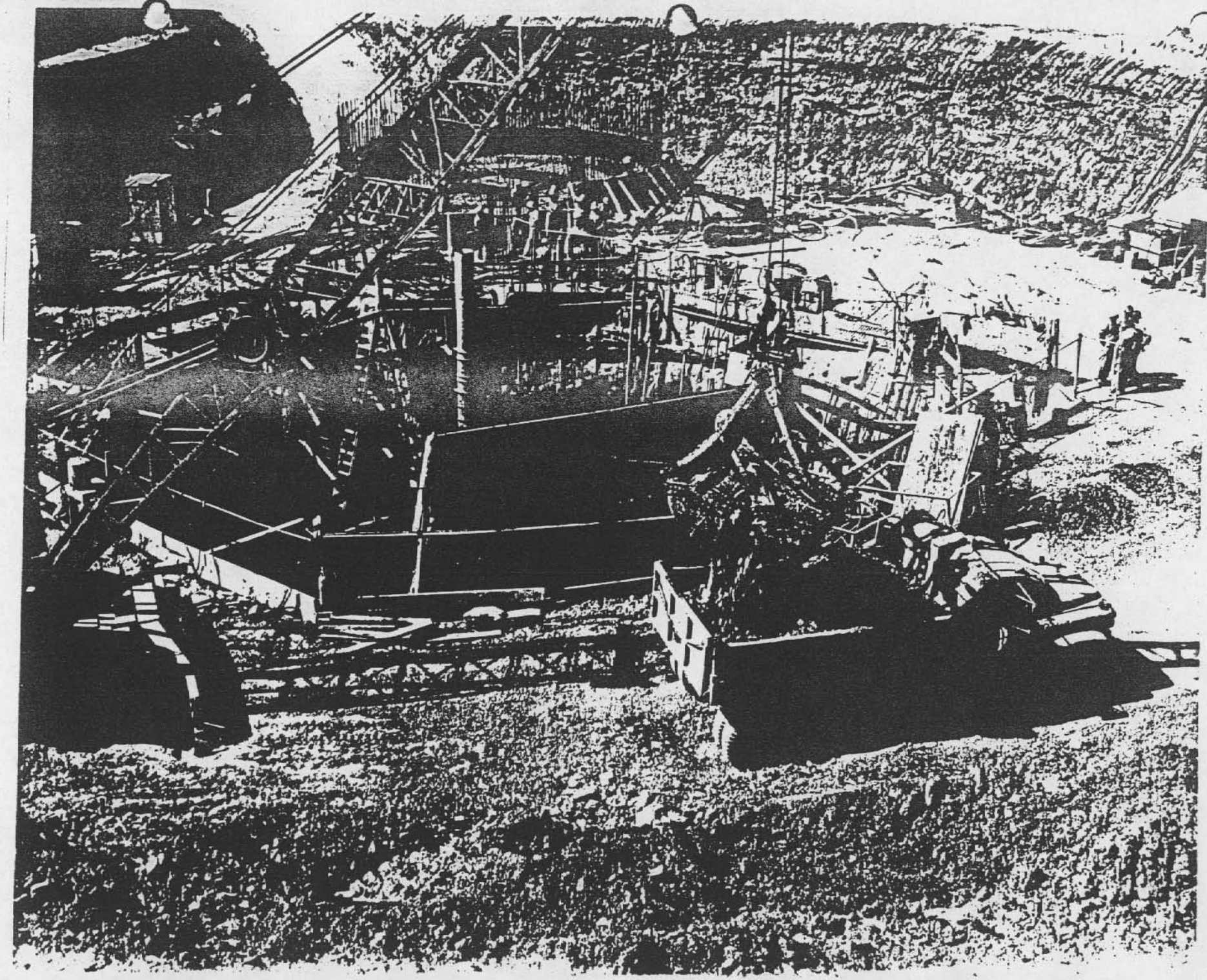


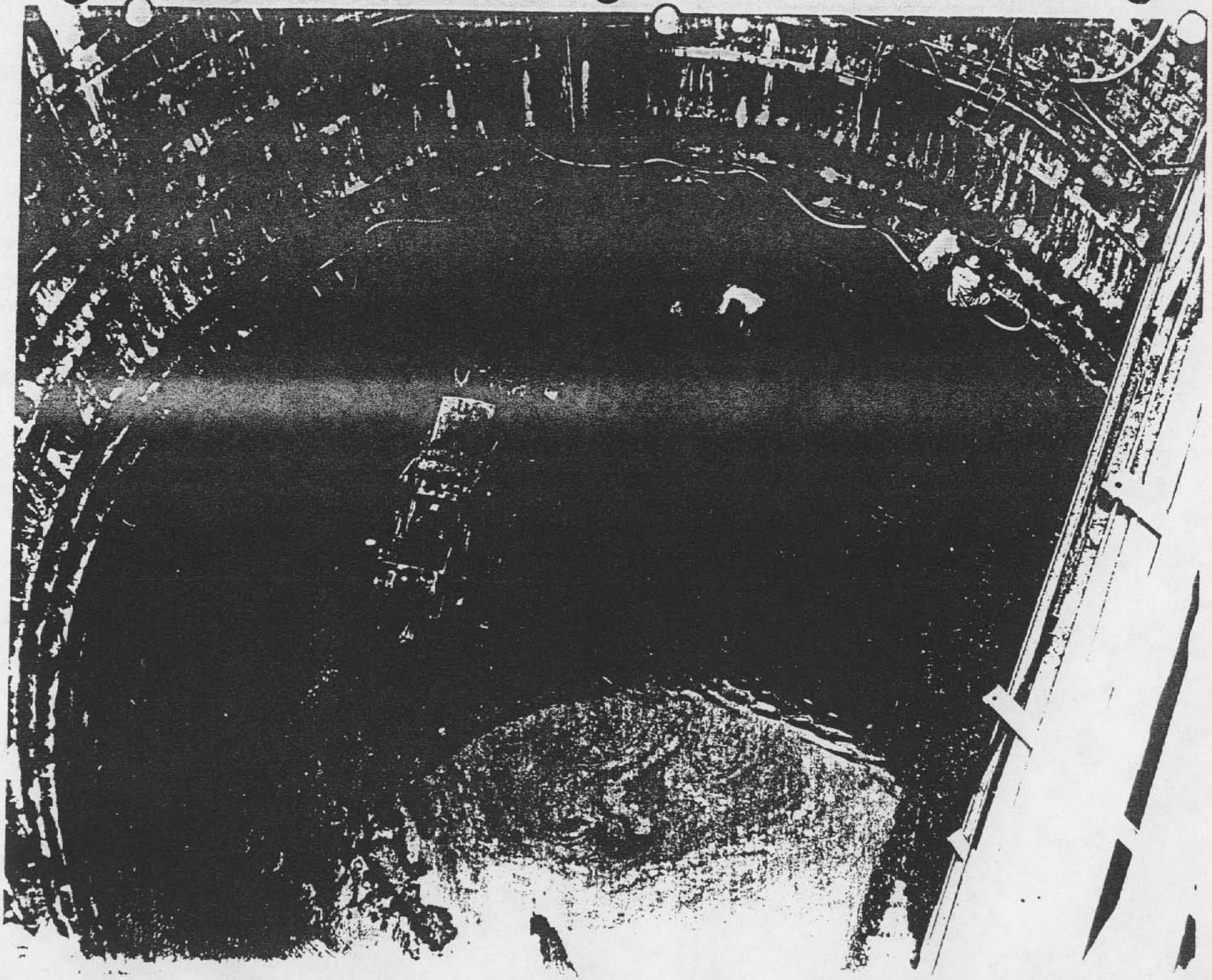


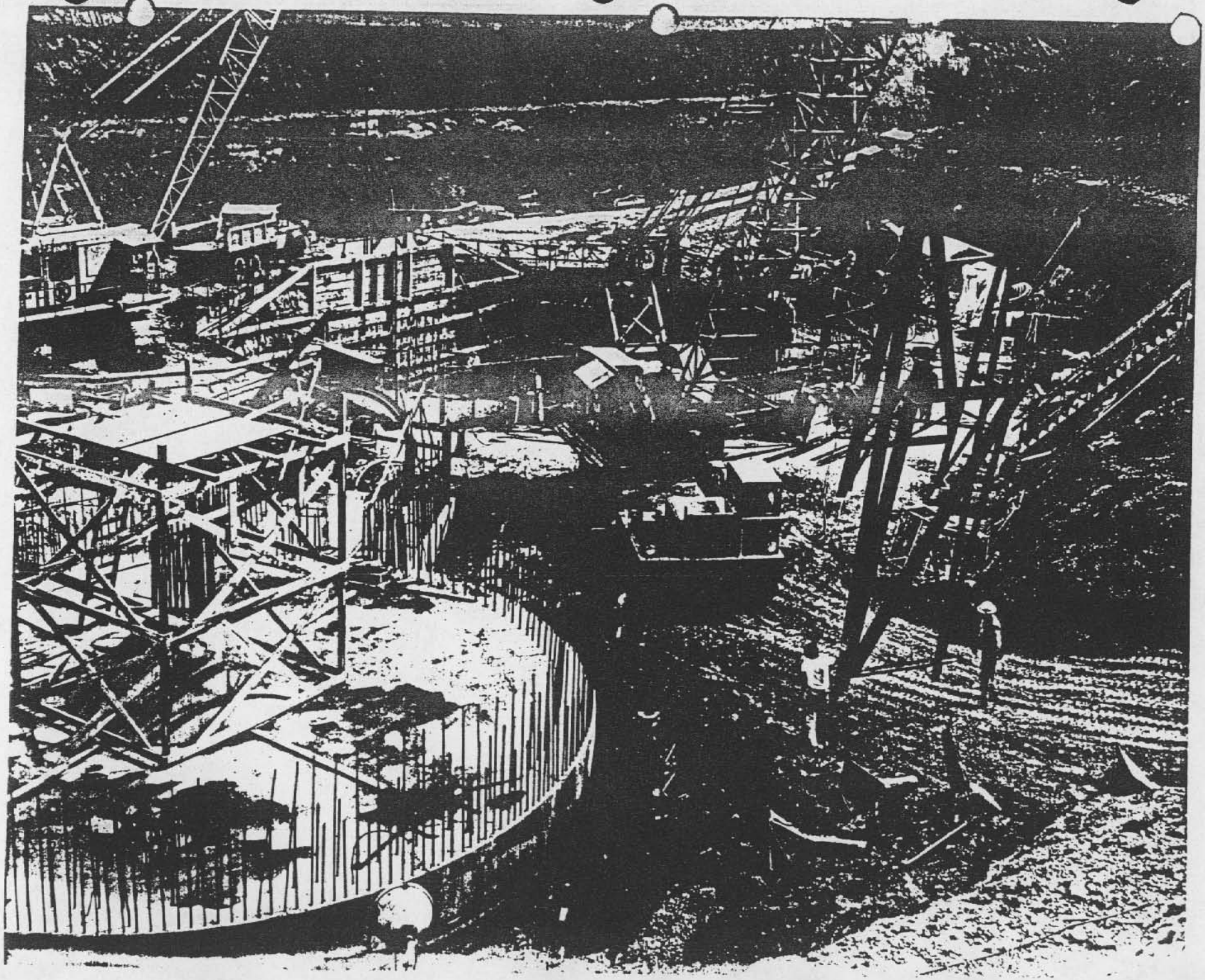
Beginning excavation, also view of
ring beam

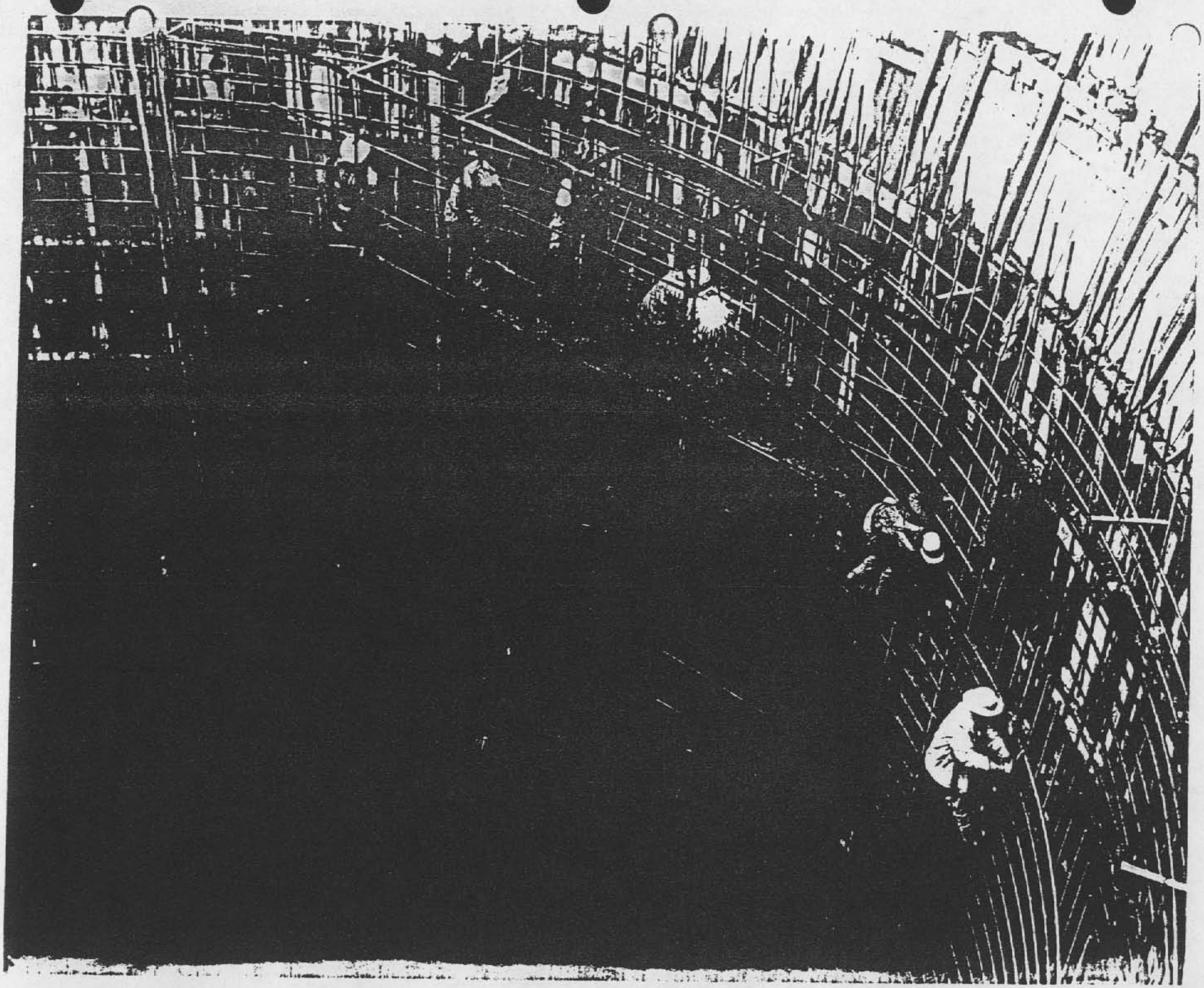


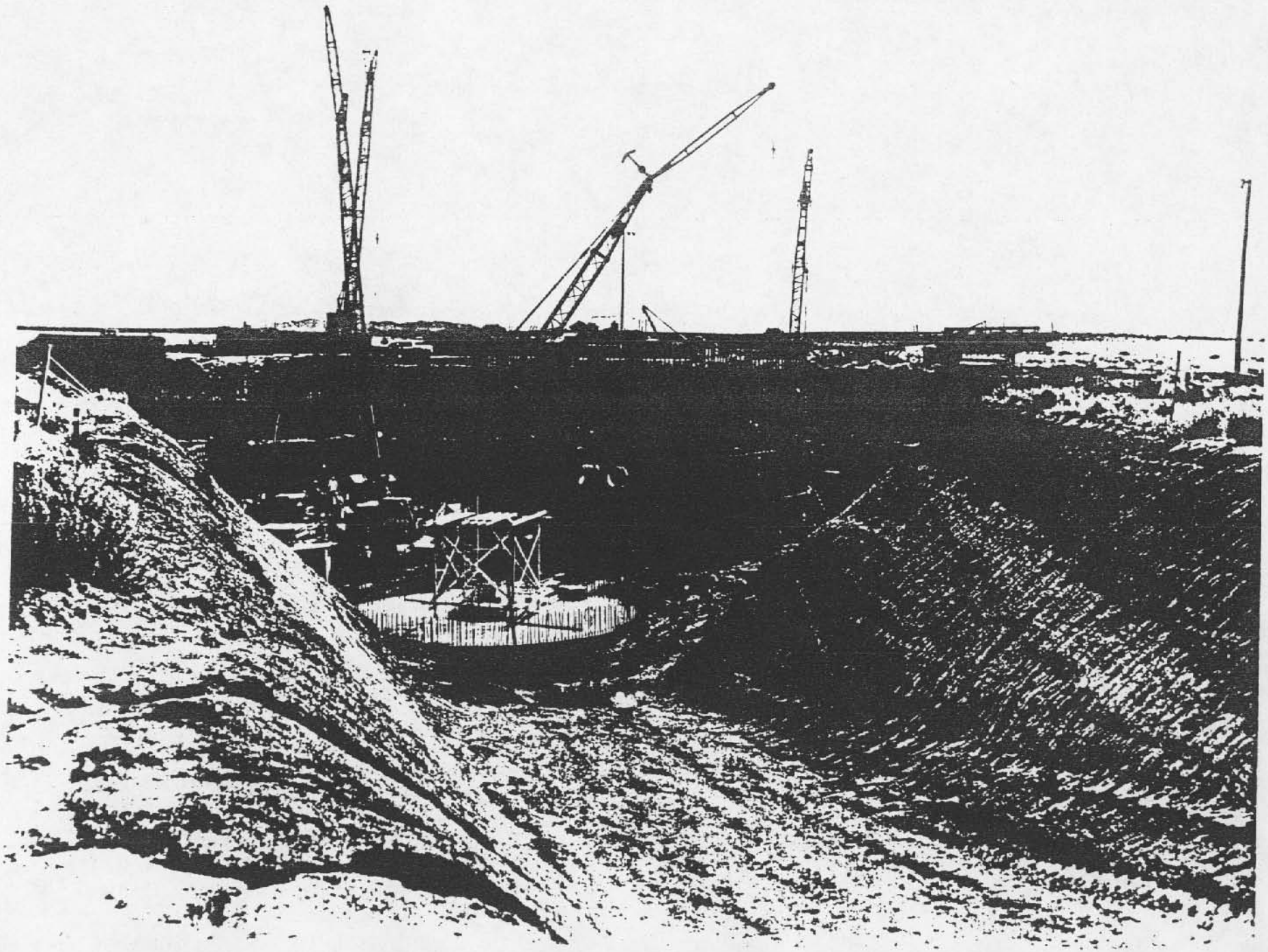
Excavating with cam shaft

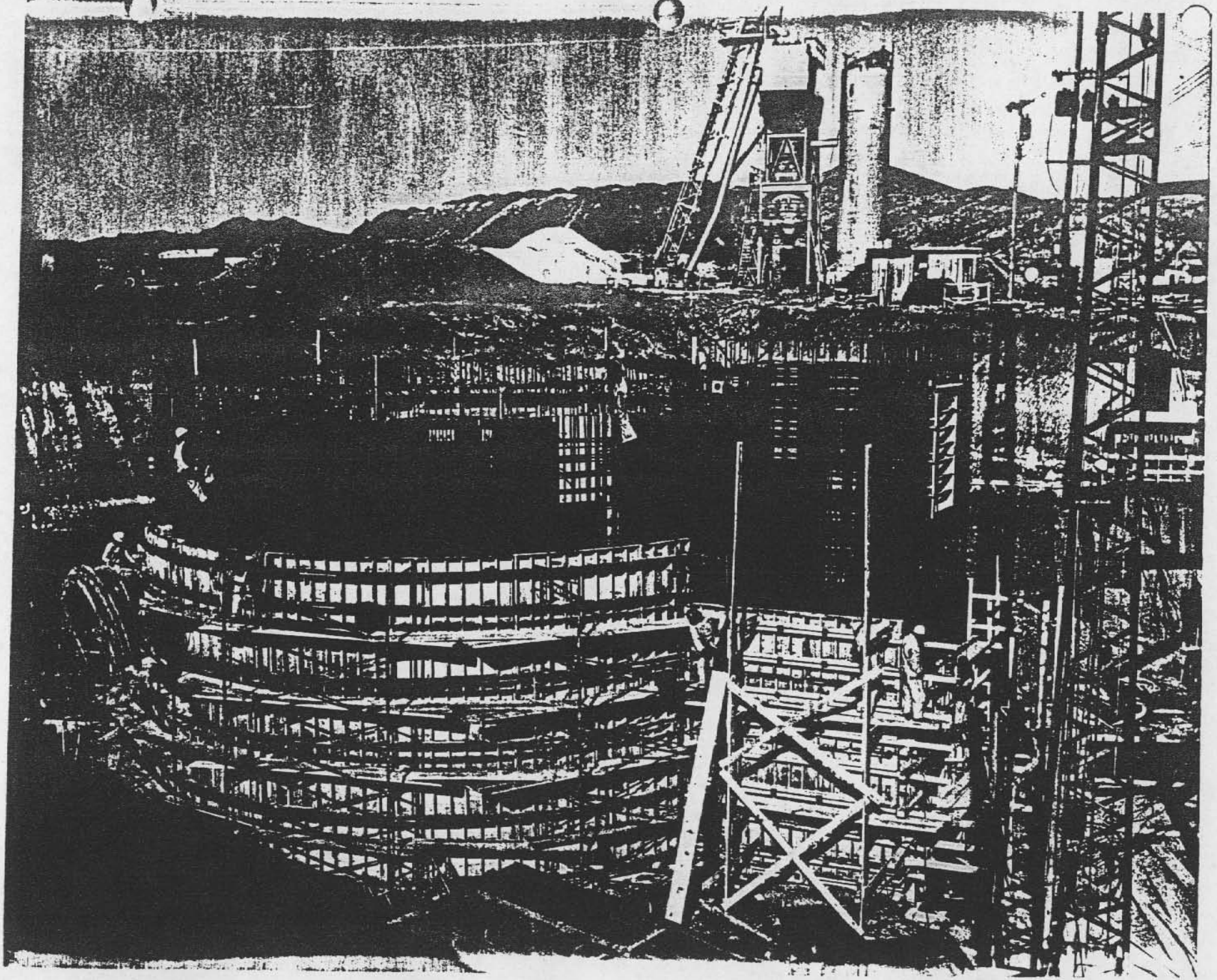


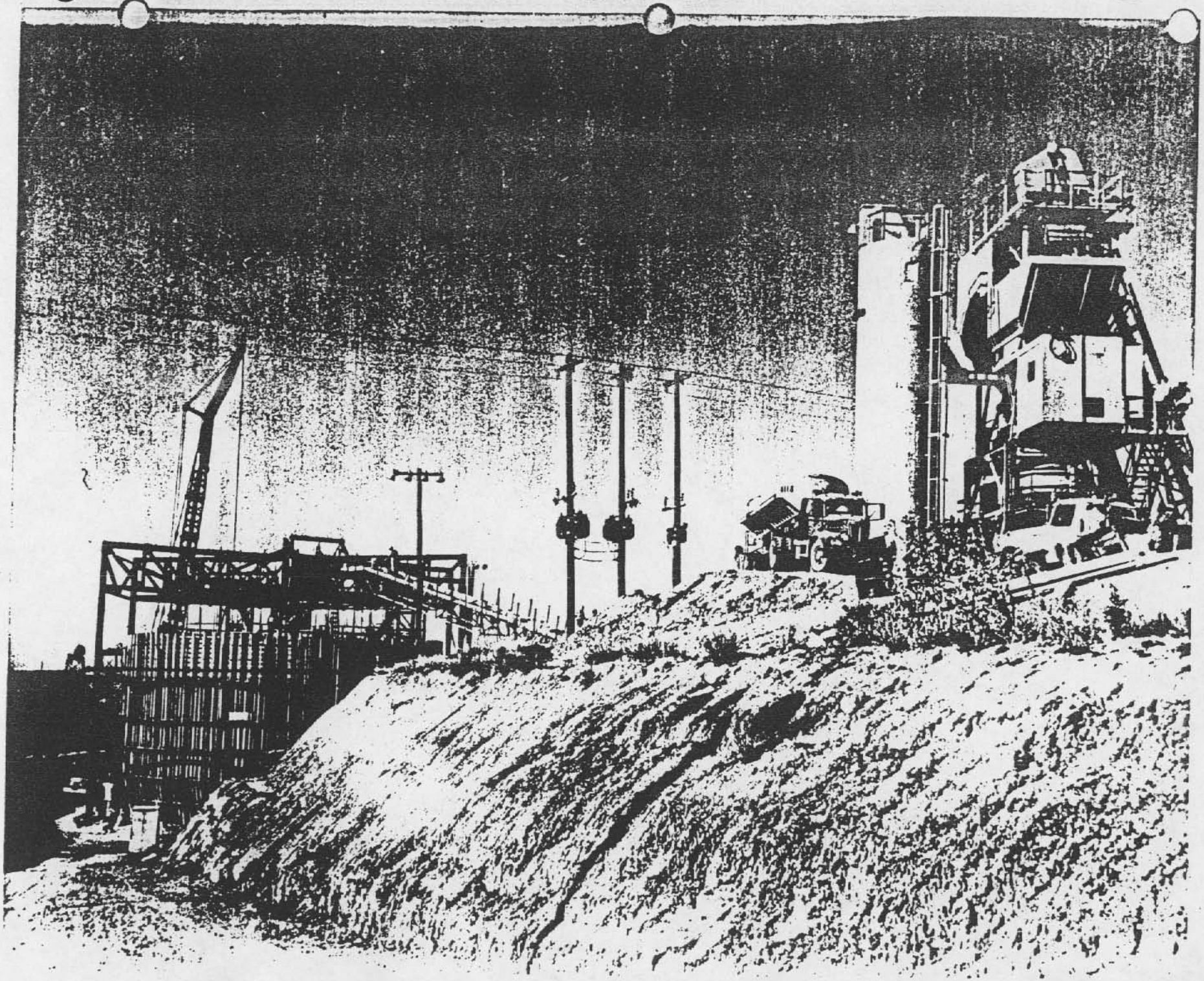


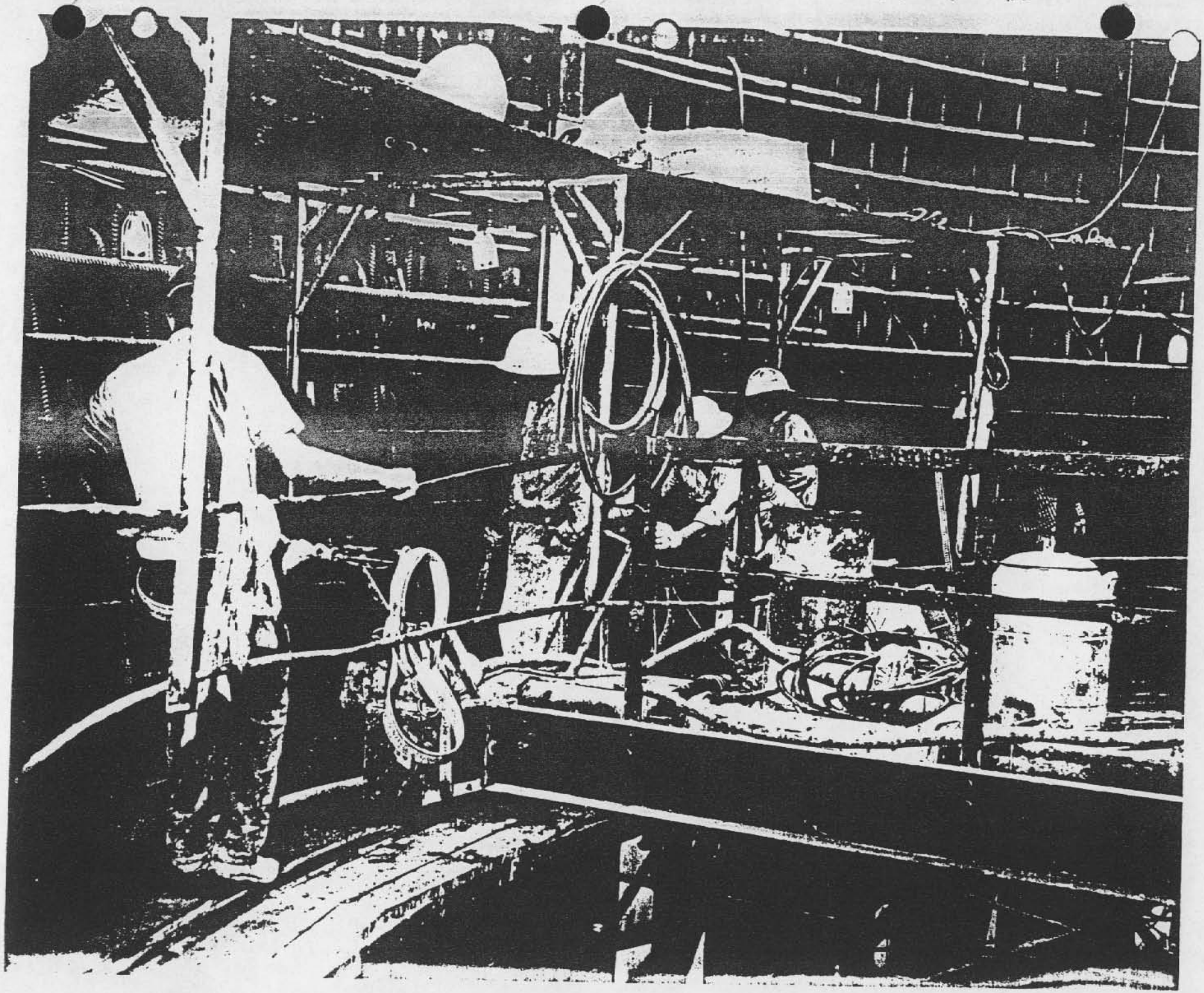


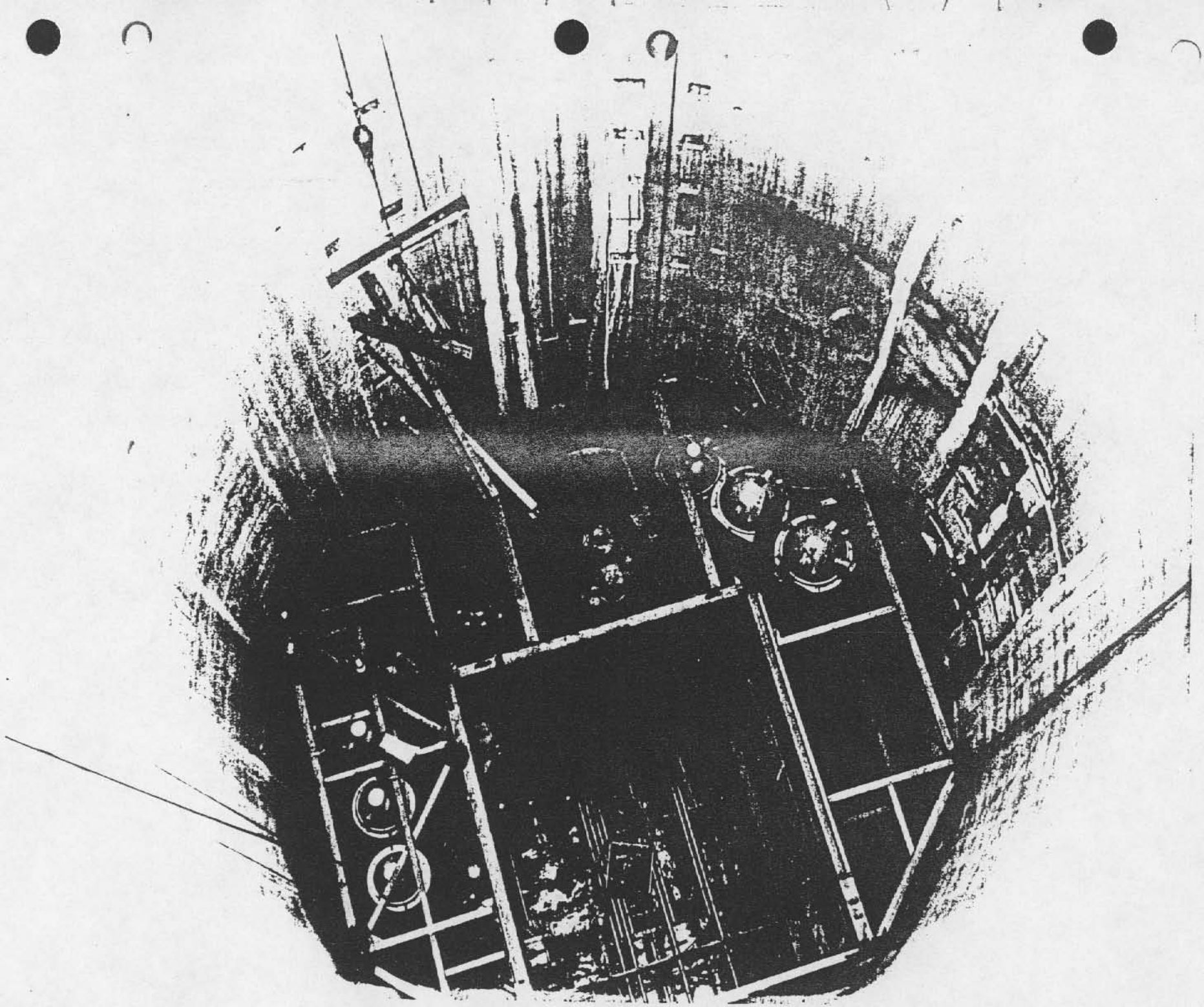


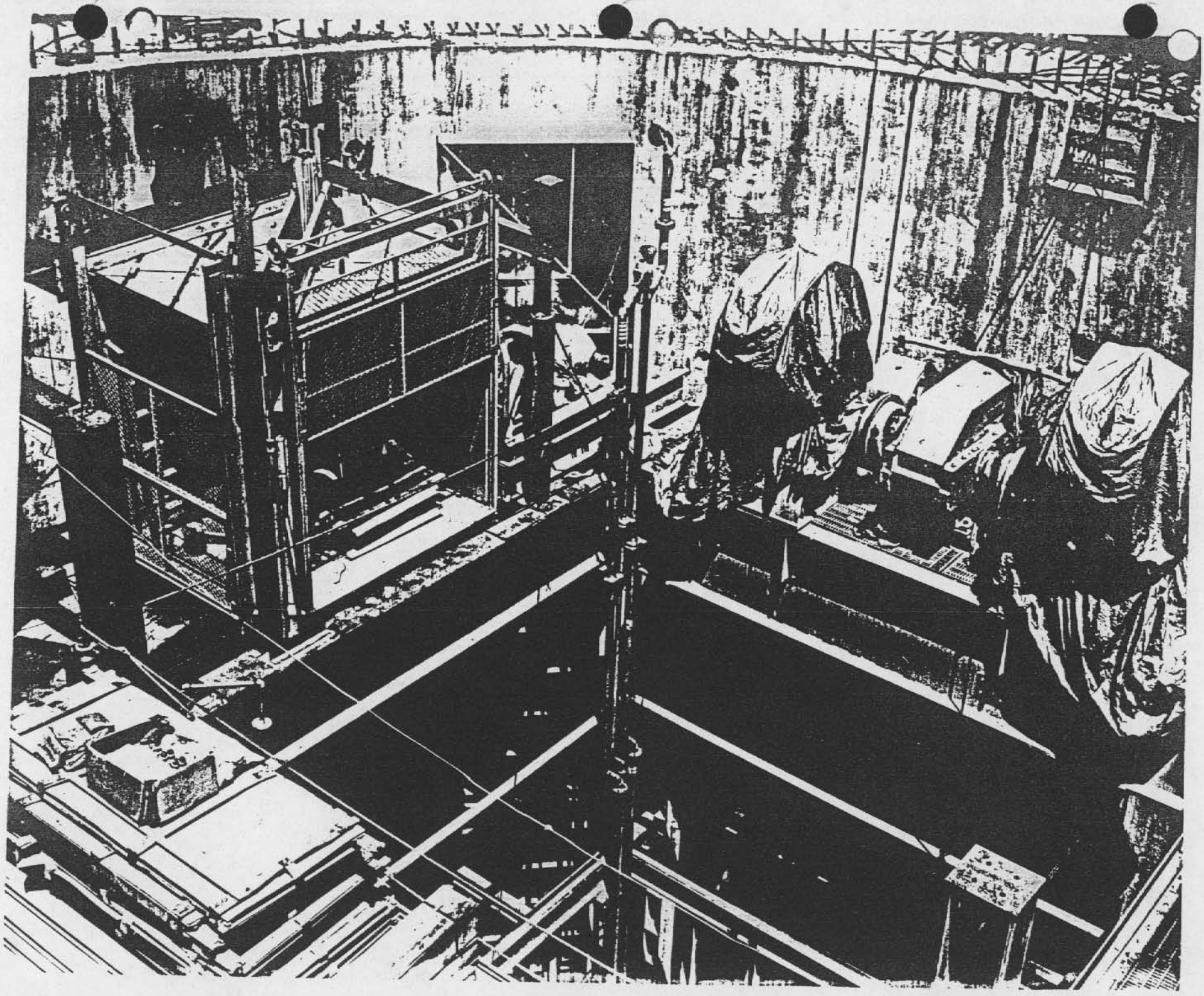


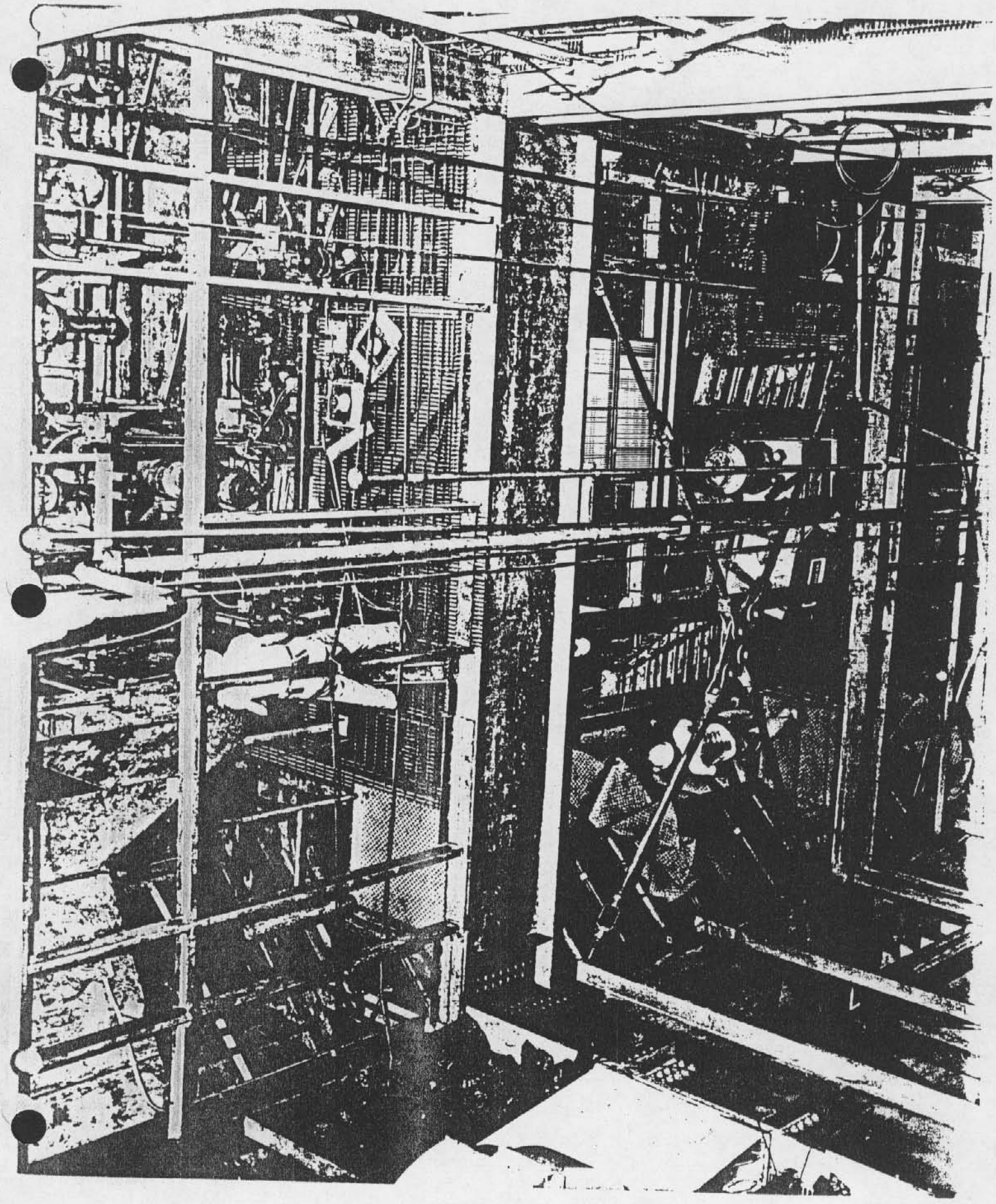


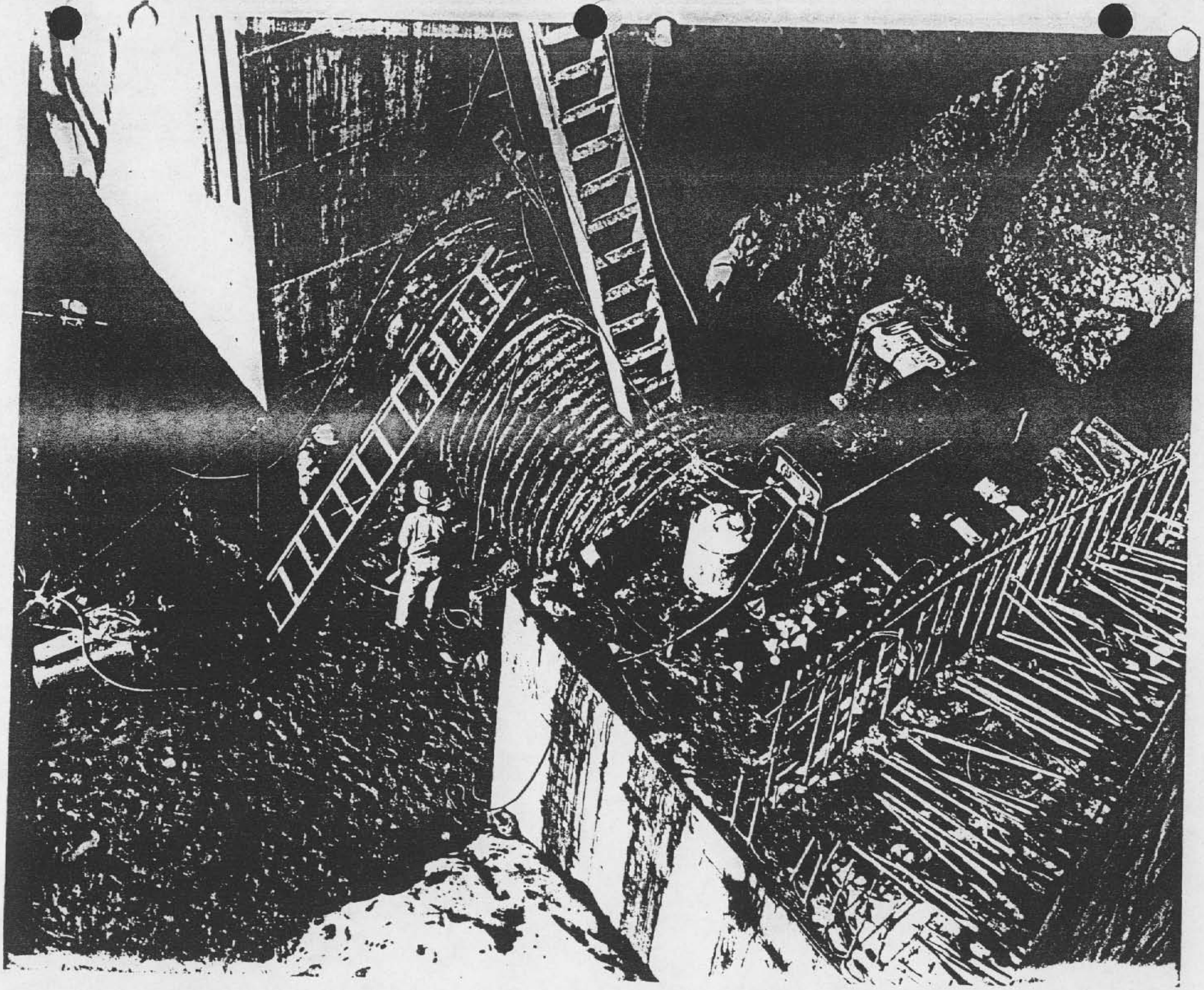


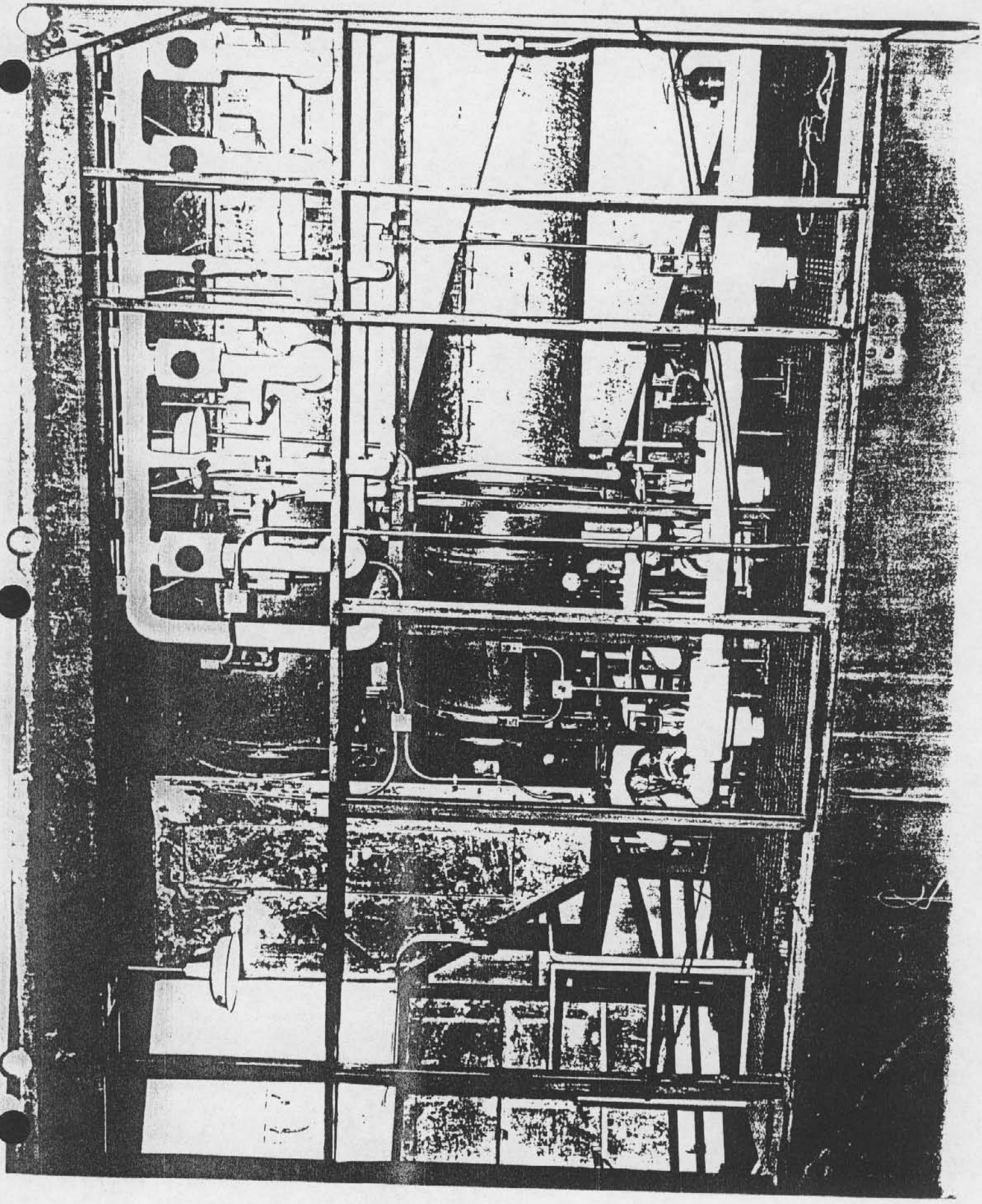


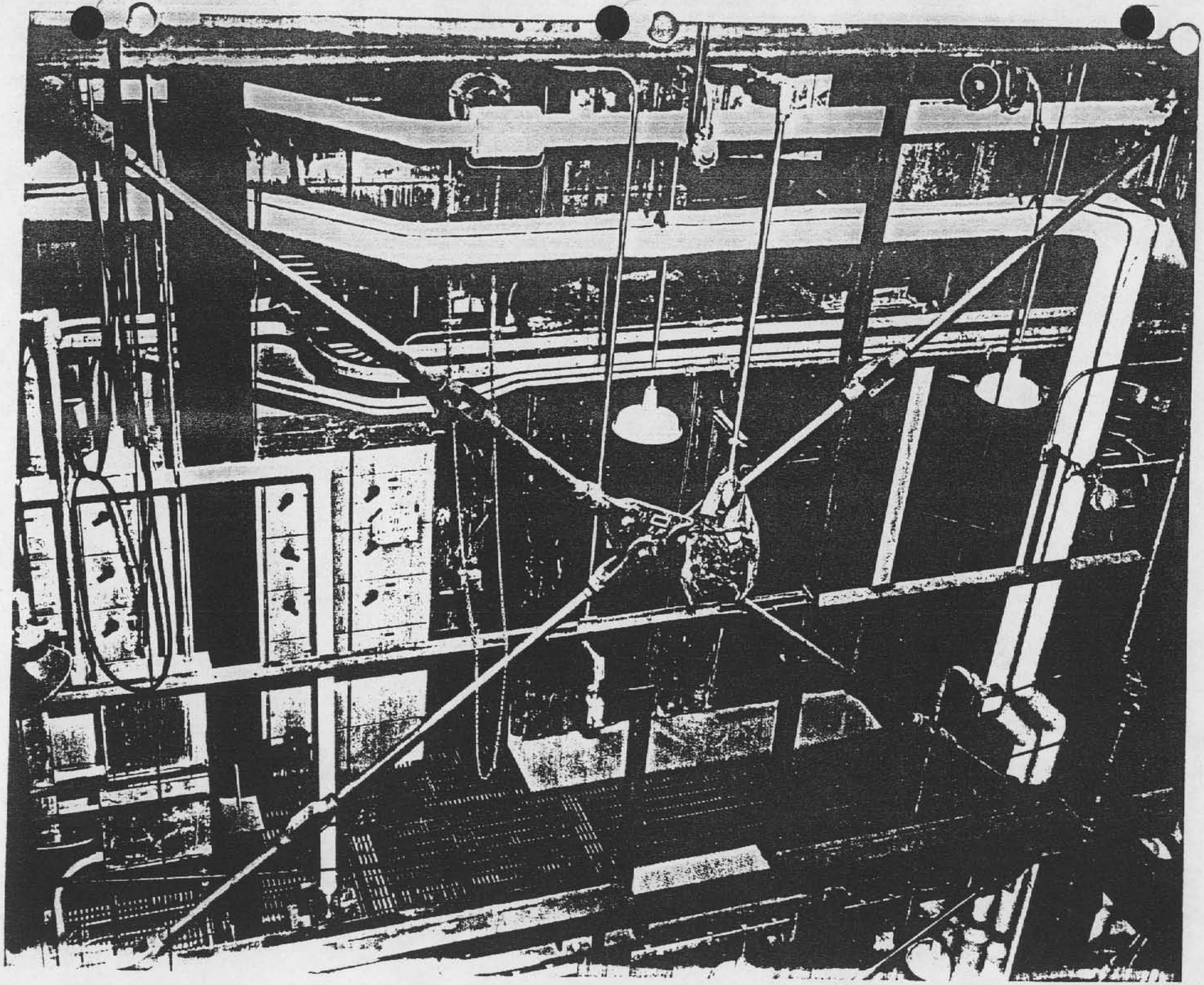


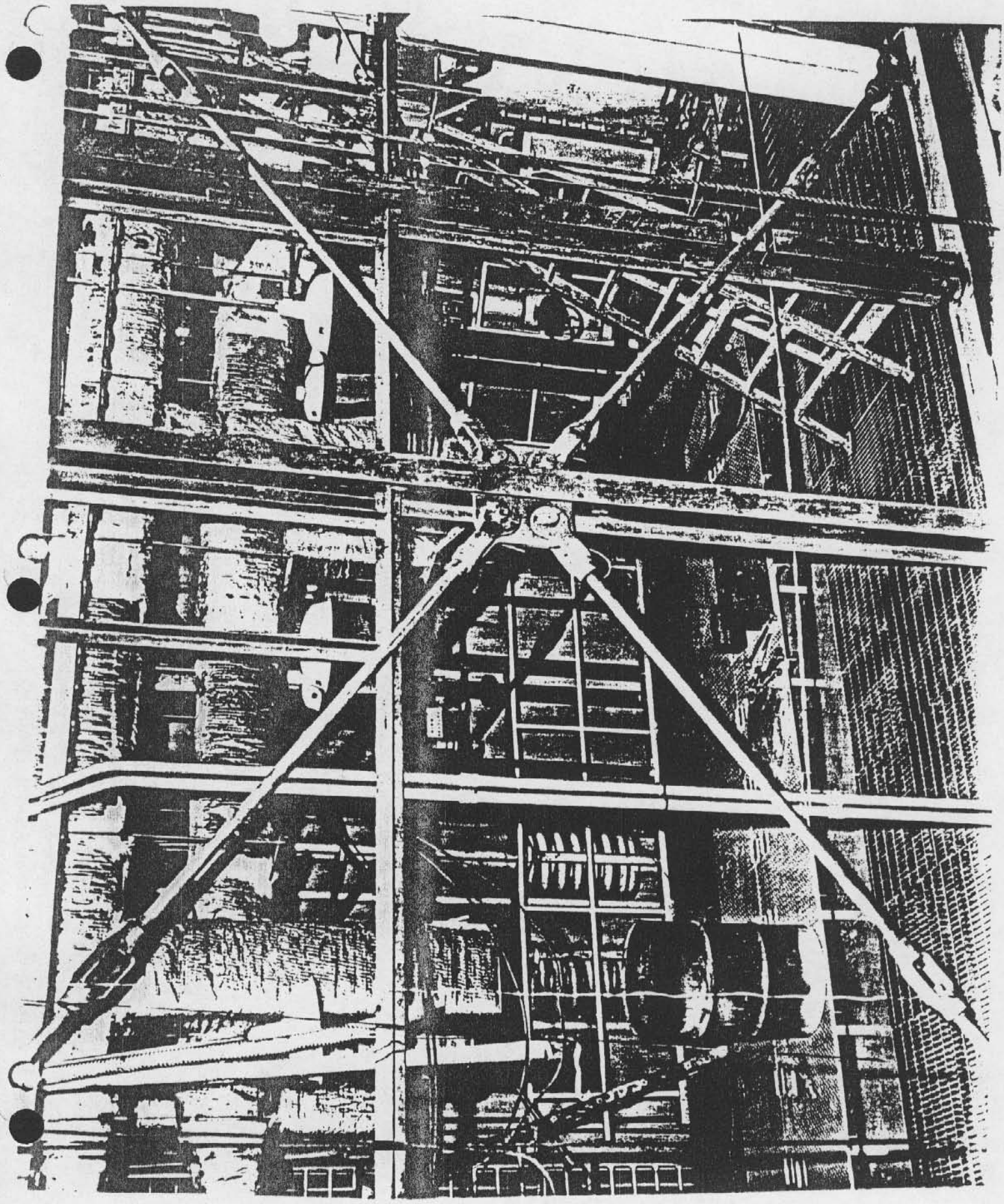


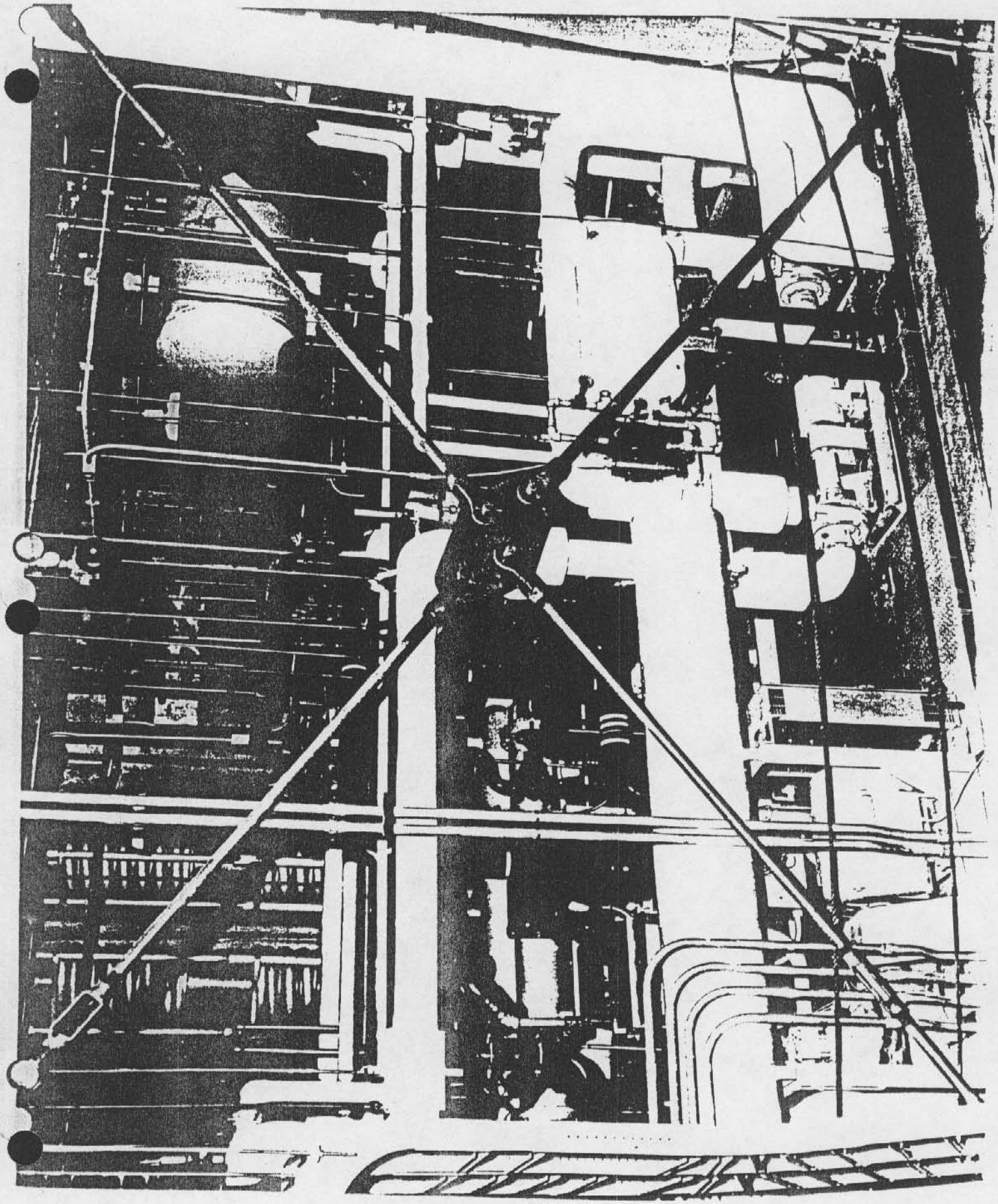


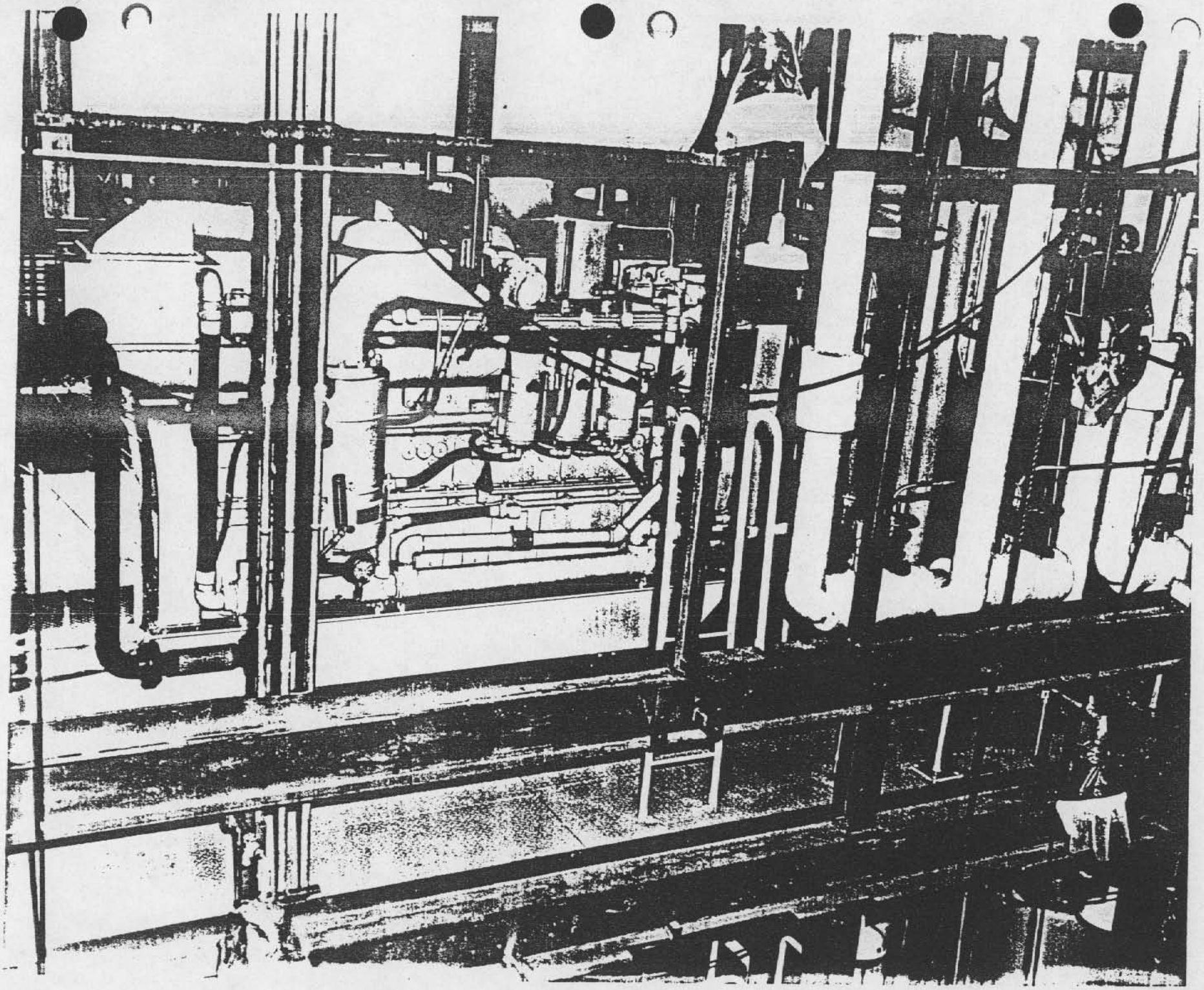


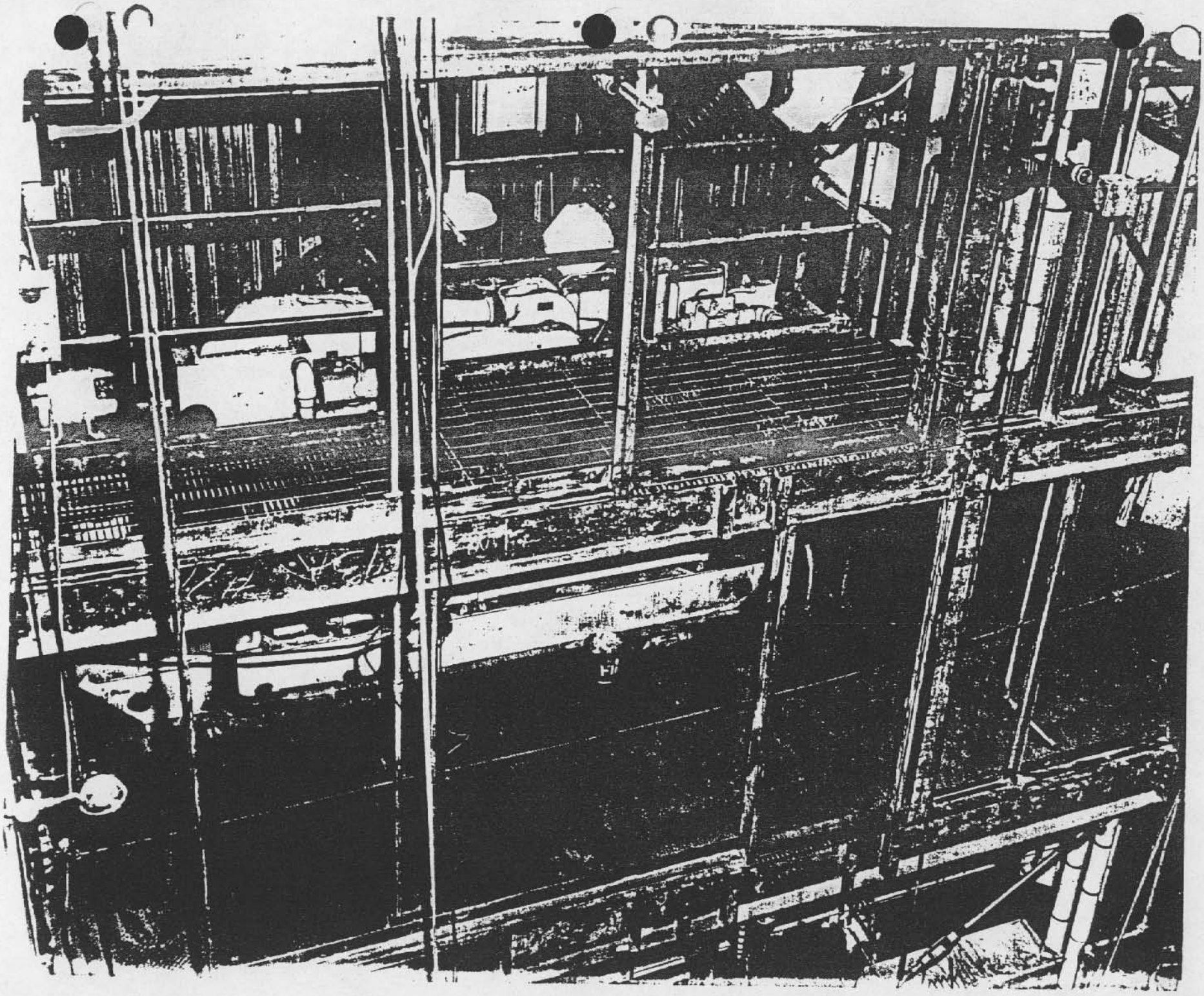


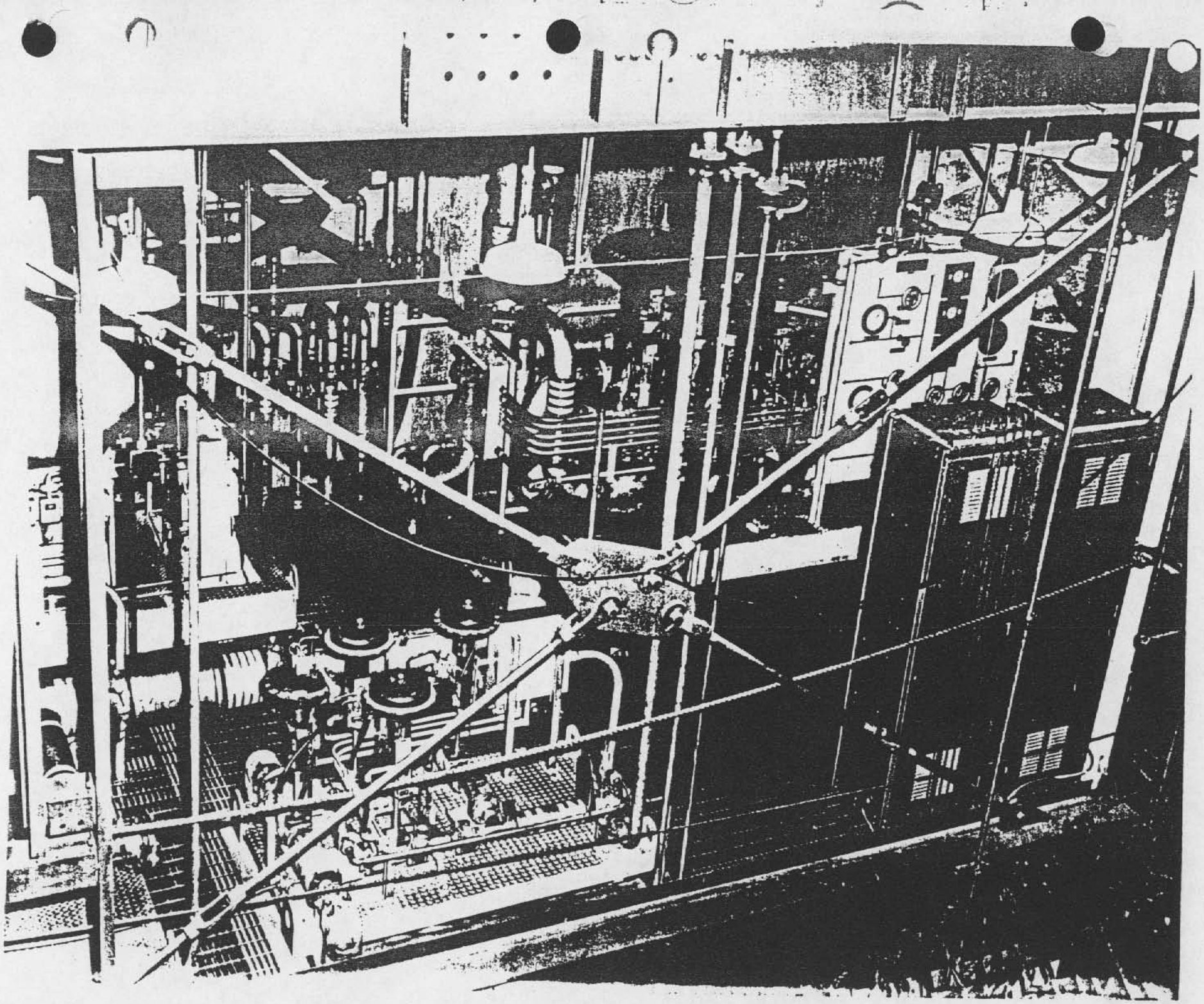












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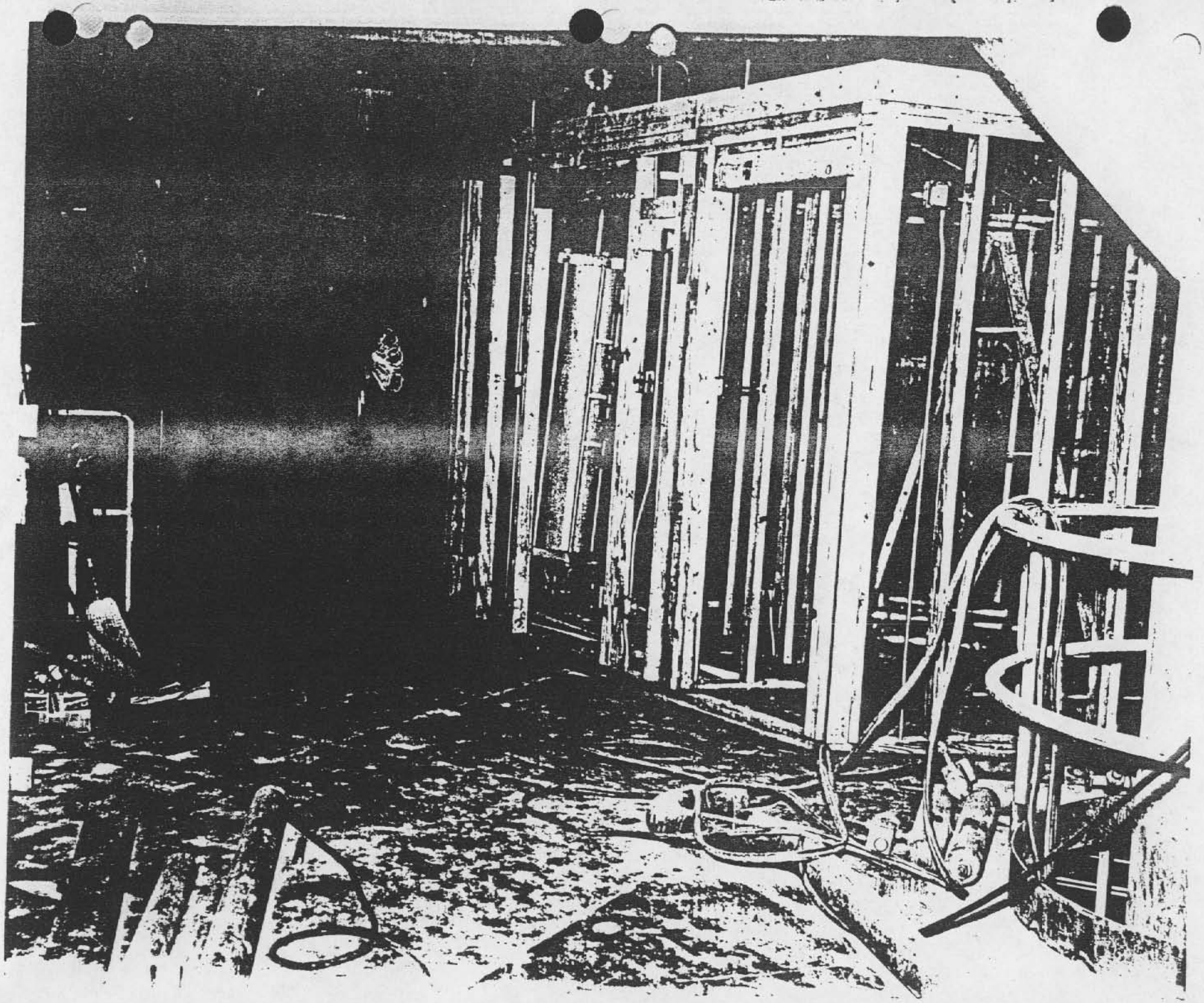
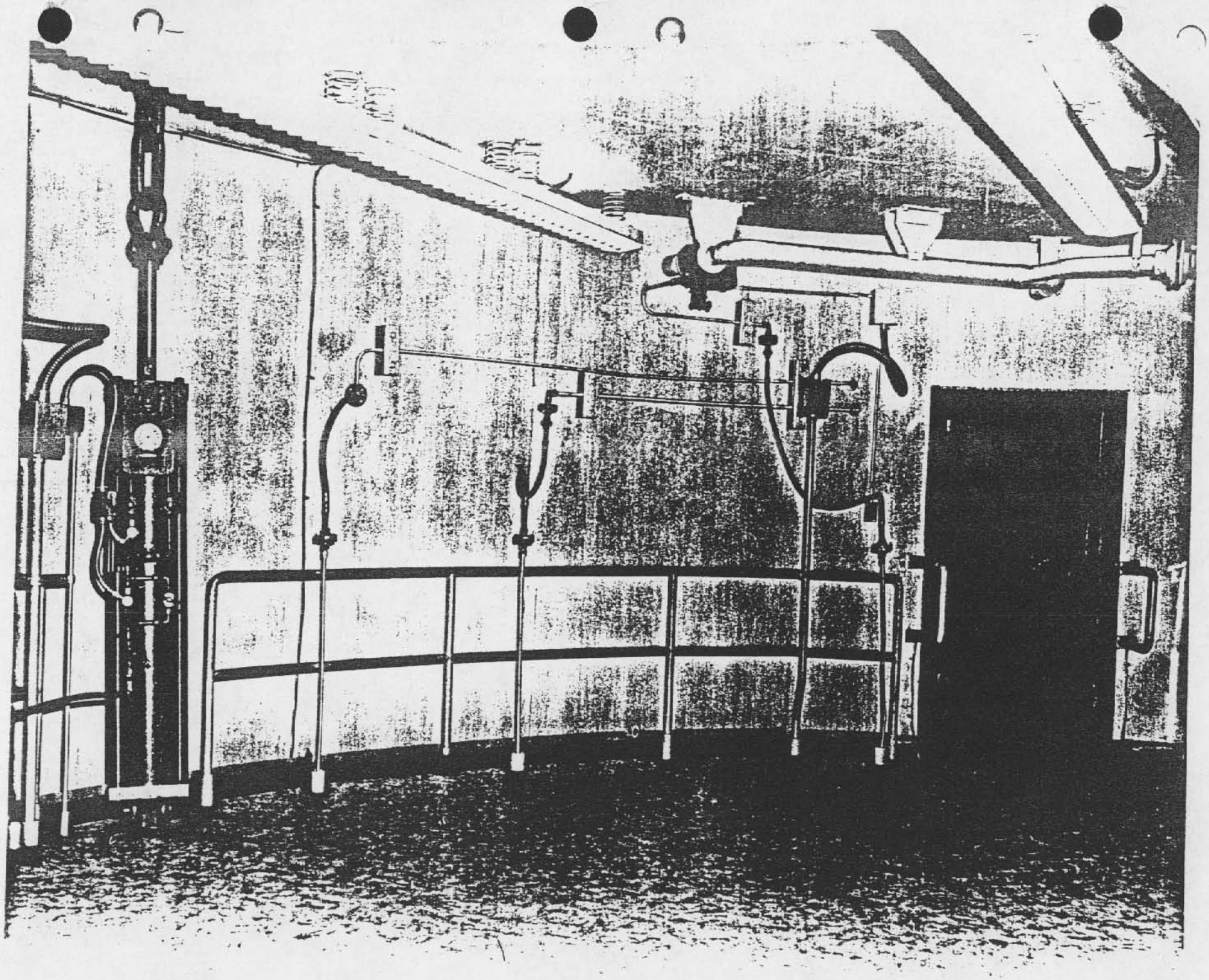
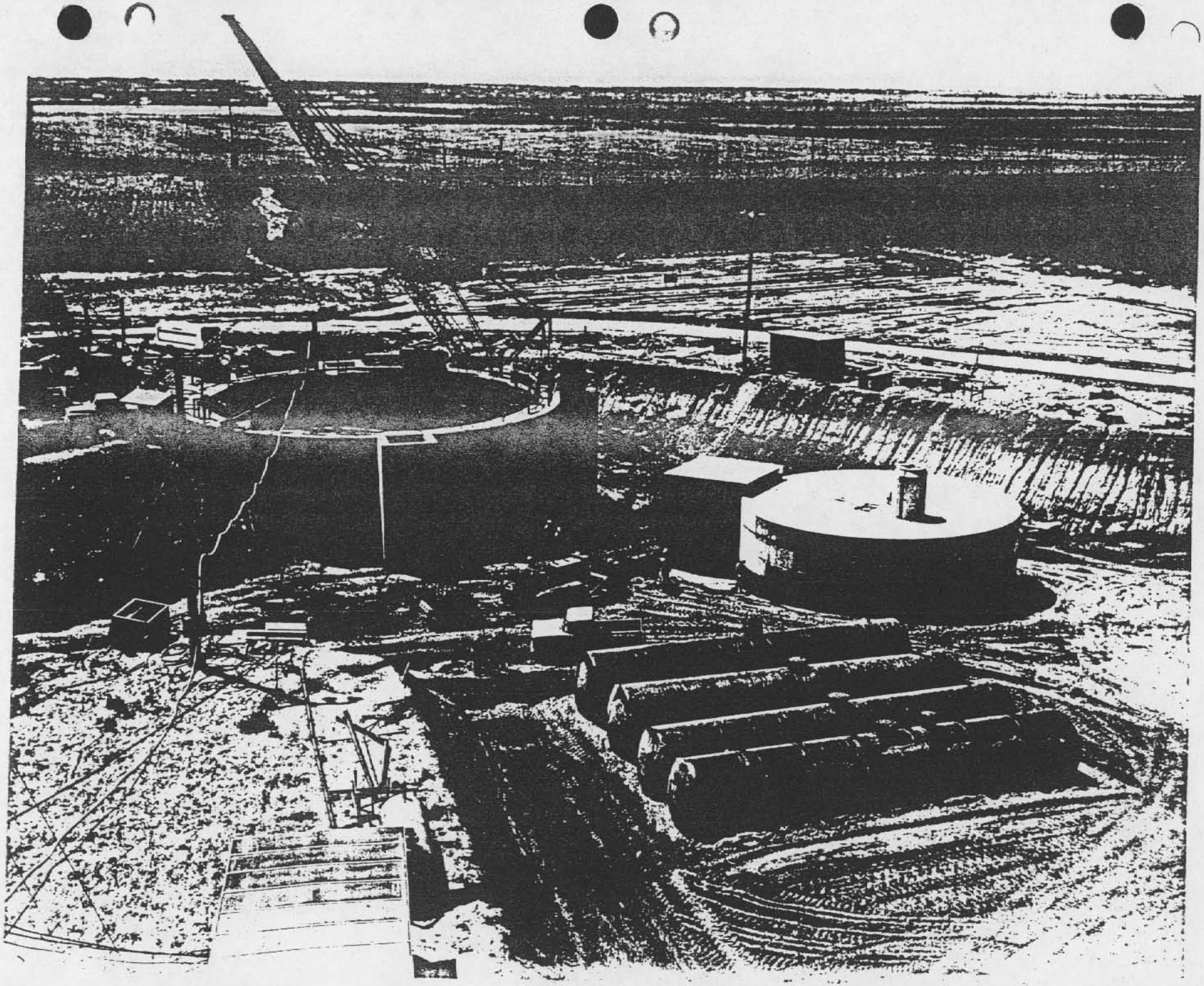


ATLAS AIR FORCE MISSILE SYSTEM (SAC)
ATLAS FACILITIES
12 June 1961
DA-34-066-eng-5200
Site 557-8
Subject - LCC
Direction - Interior
Level 1 - Ready room





CHAPTER 6

CONTRACT ADMINISTRATION BRANCH

6-01. ORGANIZATION - a. The Area Contract Administration Branch organization was originally programmed in February 1960 by the Tulsa District as part of the general plan for the creation of the Altus Area Office.

b. At this stage of the development of the Area Office concept it was envisioned that the branch would be composed of eleven personnel.[1]

c. During the period from March 1960 to the end of January 1961 it had become quite apparent to both the Area Engineer and the Branch Chief that the branch as organized was not operating at peak efficiency. In order to reach this peak of desired efficiency and to create a proper span of control, the Branch organization was revamped to create an Estimating Section; a Contract Modifications Section; and a Progress and Reports Section within the branch. These sections remained in existence until the end of September 1961 by which time the workload of the branch had decreased to the point where separate sections were no longer justified. No further organizational changes were made in the Contract Administration Branch until its abolishment at the end of March 1962 as a separate branch of the Area Office.[2]

6-02. FUNCTIONS - In general the principal functions of the Branch were as follows:

a. Prepared, negotiated, documented and distributed contract modifications.

b. Prepared government estimates in connection with contract modifications.

c. Investigated and evaluated claims and disputes for the Contracting Officer.

d. Prepared and distributed progress reports.

e. Expedited deliveries of material and equipment for those contracts providing Government Furnished Property.

f. Obtained and maintained files of Contractors' purchase orders, materials receiving reports, and sub-contracts.

6-03. KEY BRANCH PERSONNEL - a. Mr. Paul T. Roberds, Jr. arrived at the Area Office on 27 March 1960 and assumed the duties of Branch Chief. Mr. Roberds remained in this duty assignment until 28 April 1962 when the Area Office was discontinued.

b. Mr. Moritz A. Dieter served in a dual capacity as Assistant Branch Chief and Materials Expediter during the period 21 March 1960 to the end of October 1960. Subsequent to the latter date, Mr. John M. Barrett was appointed Assistant Branch Chief in which job assignment he remained until his departure on a permanent change of station 24 February 1962.

c. Preparation of contract change orders was under the supervision of Mr. Dan Clutch during the period from his arrival in the Area Office 17 April 1960 until his reassignment 23 September 1961. Subsequently Mr. Clutch's duties were assumed by Mr. Barrett.

d. Estimates were prepared by and under the guidance of Mr. Wendall Houston until 19 March 1961 when Mr. Frank Connole arrived.

Mr. Connole remained assigned to the Area until 15 January 1962. Subsequently Messrs. Roberds or Barrett assumed the duties vacated by Mr. Connole's departure.

c. Contract reporting, to include progress reports, was at various intervals during the life of the Altus Area the responsibility of Messrs. Roberds, Barrett, Clutch and Dieter.

f. Clerical and stenographical work was handled within the branch by two female employees at a time, among whom have been: Mrs. Shirley Crane; Mrs. Mary Owens; Mrs. Mary Salsbury; Mrs. Mary Stults; Mrs. Mary Blackmon; and Mrs. Elizabeth Kent.

6-04. HISTORICAL SUMMARY OF THE PRIME CONTRACT - a. Contract Number DA-34-066-eng-5909 for the Construction of WS-107 A-1 Operational Missile Launch Complexes was advertised by the U. S. Army Engineer District under the Invitation for Bid, Serial Number ENG-34-066-60-32 dated 29 March 1960.

b. A pre-bid conference, attended by representatives of Tulsa District, AFBMD, LAFO, SWD, Bechtel Corporation, Stearns-Roger and 84 Contractors' representatives, was held on 11 April 1960 in the Ivory Room of the Hotel Mayo, 115 West Fifth Street, Tulsa, Oklahoma.

c. The bids were opened on 26 April 1960 by the District Engineer, U. S. Army Engineer District, Tulsa.

d. The contract was awarded on 27 April 1960 to Morrison-Knudsen-Hardeman Company, Incorporated; Paul Hardeman, Incorporated; C. H. Leavell and Company; Olson Construction Company and Scott Company of Northern California, acting as Joint Contractors and Co-Adventurers,

Los Angeles, California.

e. The Notice to Proceed was issued 4 May 1960 with actual construction beginning on 6 May 1960. At that time, the scheduled completion date was 16 August 1961. However, during the construction period, the contract was extended for various reasons to 21 November 1961. Actually the physical work was completed 8 November 1961.

f. The original contract amount was $20,926,500.00. To date (28 April 1962) the present contract amount is approximately $42,750,134.46.

g. As of 28 April 1962 173 modifications to the contract have been issued.

6-05. DESCRIPTION OF MODIFICATIONS TO PRIME CONTRACT EXCEEDING $100,000.00:

a. No. 11 - $1,550,000.00 - Revisions to Collimator Plate Assembly and Acceleration.

b. No. 14 - $1,296,865.16 - Assignment of the Installation and Testing Portion of ASC Contract No. DA-41-442-eng-5762 with Paul Hardeman, Inc. This contract was for furnishing, installing and testing PLS prefabs and interconnection piping. There is an additional supplement yet to be issued to this modification.

c. No. 17 - $567,000.00 - Crib Steel Acceleration: In order to overcome delays in fabrication and delivery of structural steel for silo cribs, due to revisions to plans and specifications, the Contractor was directed to overcome such delays by modifying the plan of operations of the steel fabricator, utilize additional equipment

and/or plant, resort to additional shifts and hours of work and revise methods of shipment and delivery.

d. No. 21 - $400,106.61 - Mechanical and Structural Revisions: Revisions to gas detection system, floodlighting for LCC vents, battery charger circuit, generator control cable, cable trays, flexible hose, valves, demineralized water makeup, chemical feeder, water pumps. All work in connection with preloading shock hanger springs and adding 7 leaves to launch platform counterweights; and other miscellaneous electrical and mechanical revisions.

e. No. 23 - $354,000.00 - Shock Hanger Insert Plate Revision: Extensive revision in plans and specifications for shock hanger insert plates and acceleration of fabricator's operations to overcome delays in fabrication and delivery due to such changes.

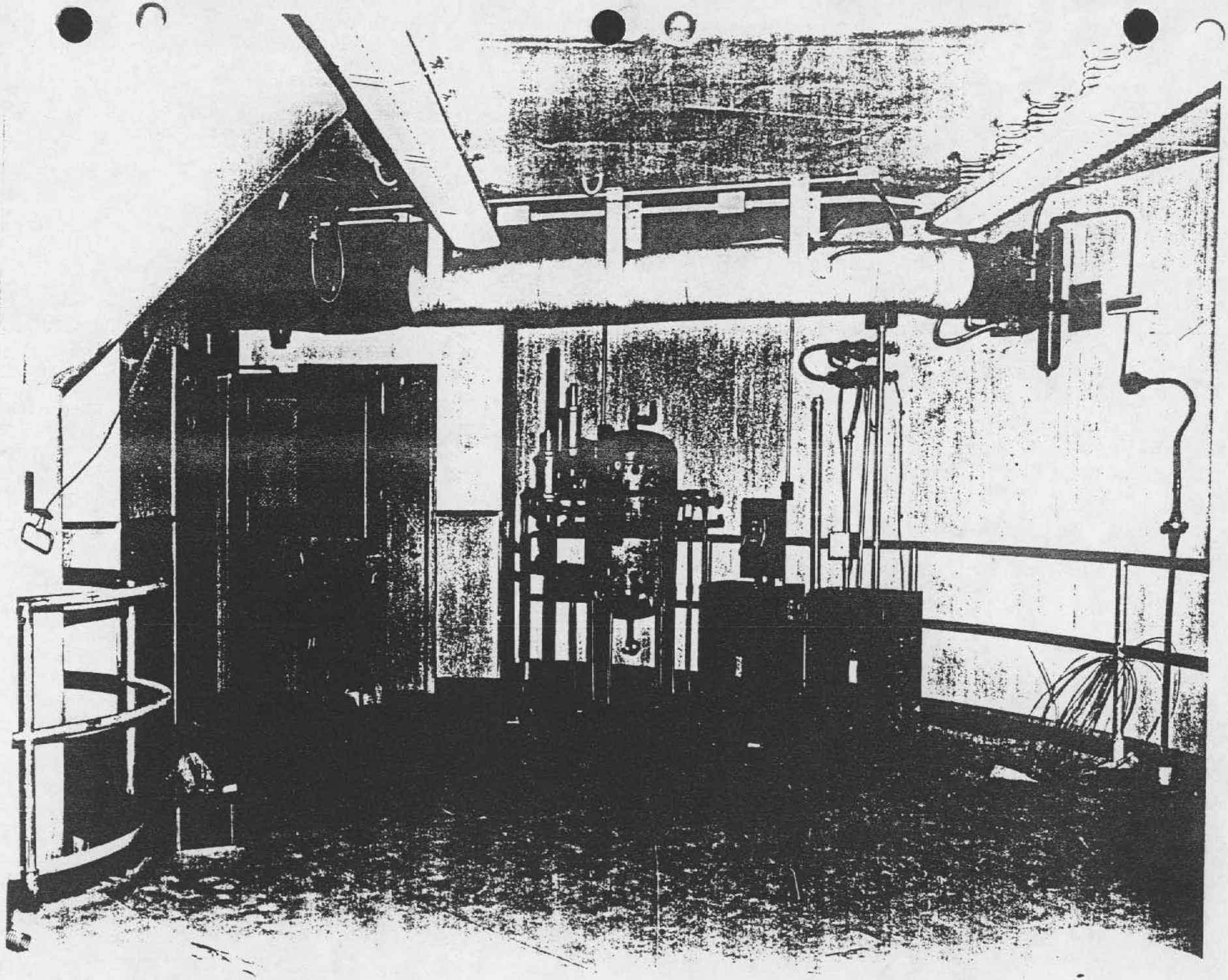
f. No. 24 - $330,000.00 - Crib Steel Revision: Extensive revisions in silo crib steel, plans and specifications which entailed additional structural steel.

g. No. 26 - $1,498,668.00 - Major Mechanical, Electrical and Structural Changes.

h. No. 31 - $276,588.00 - Electro-Magnetic Screen Revision: Necessary to provide Fire, Personnel and Electro-Magnetic Pulse Protection Systems.

i. No. 39 - $238,913.63 - Assignment of ASC Contract DA-23-028-eng-4342, with Boeing Airplane Company for furnishing overhead door hinge assemblies.

j. No. 40 - $342,143.34 - Assignment of ASC Contract No.



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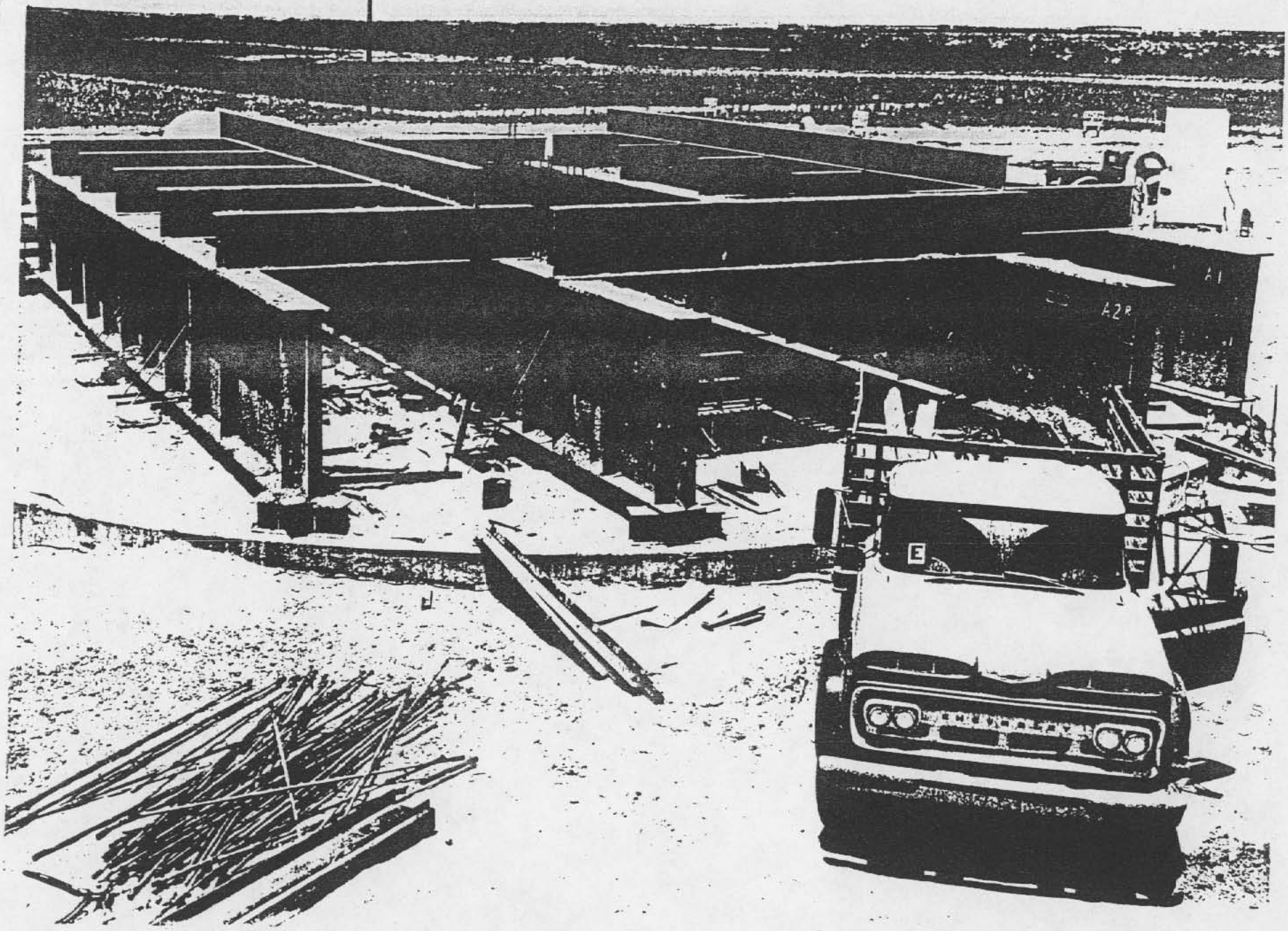
Aircraft bearing construction - ready
for [illegible] use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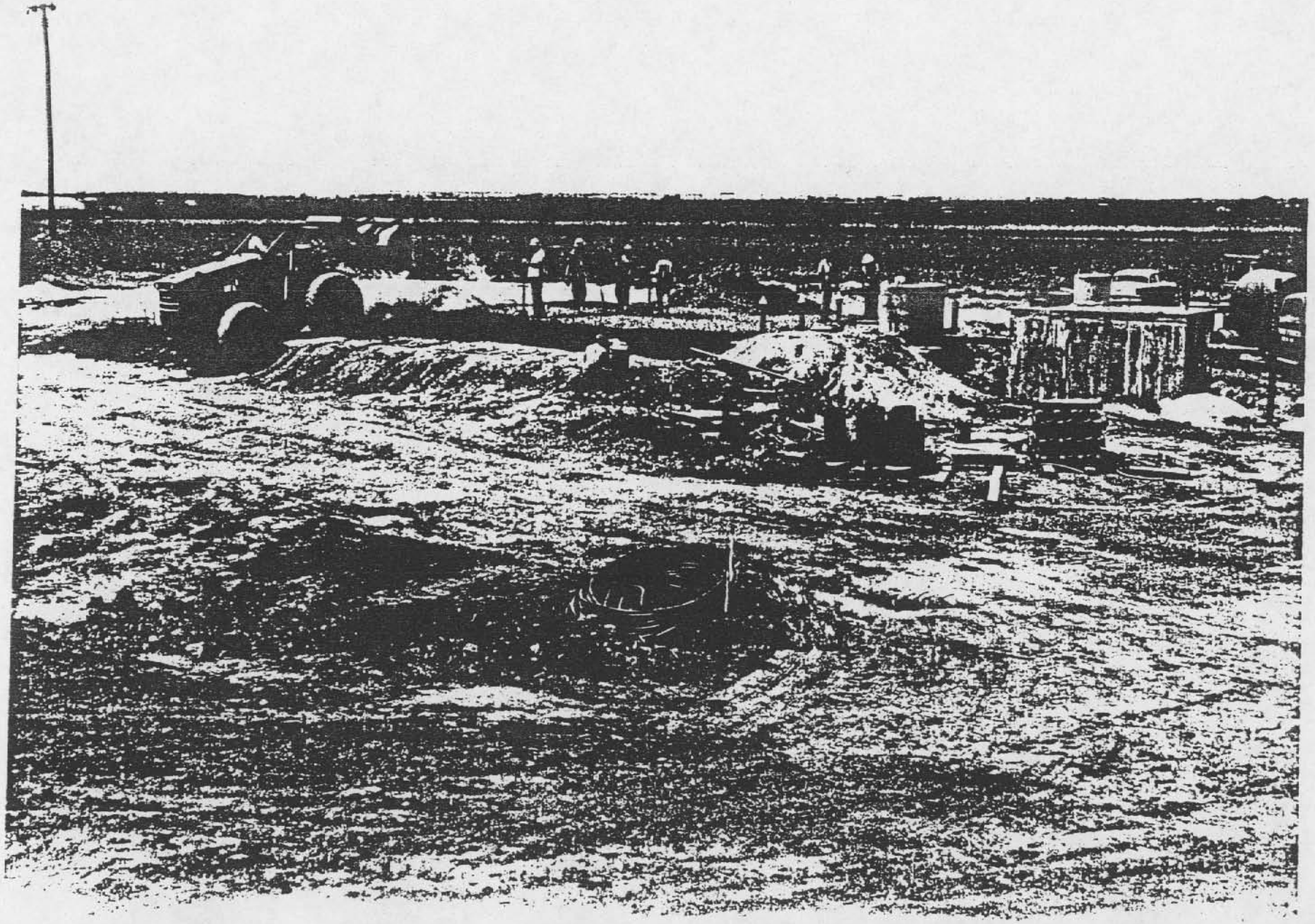

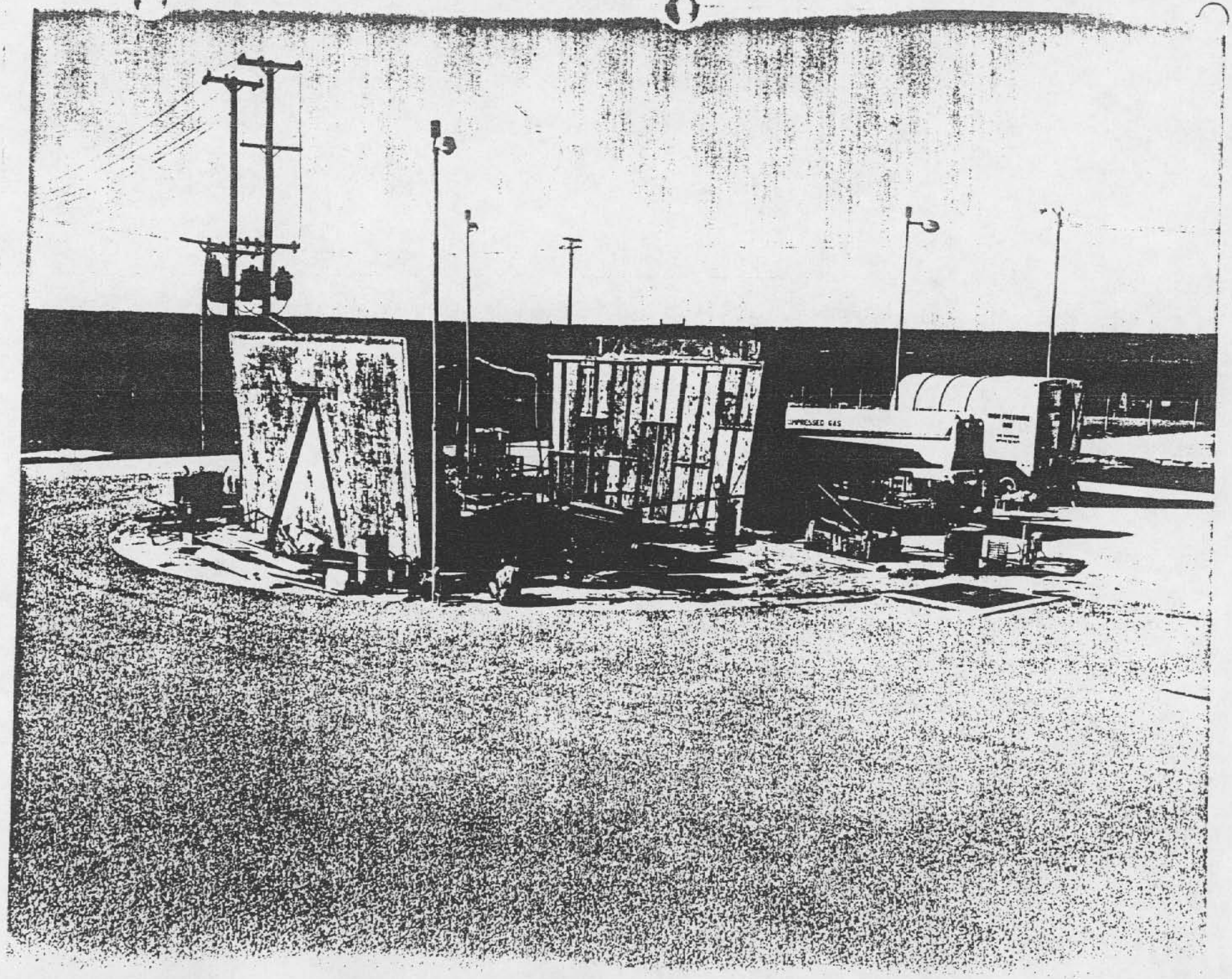

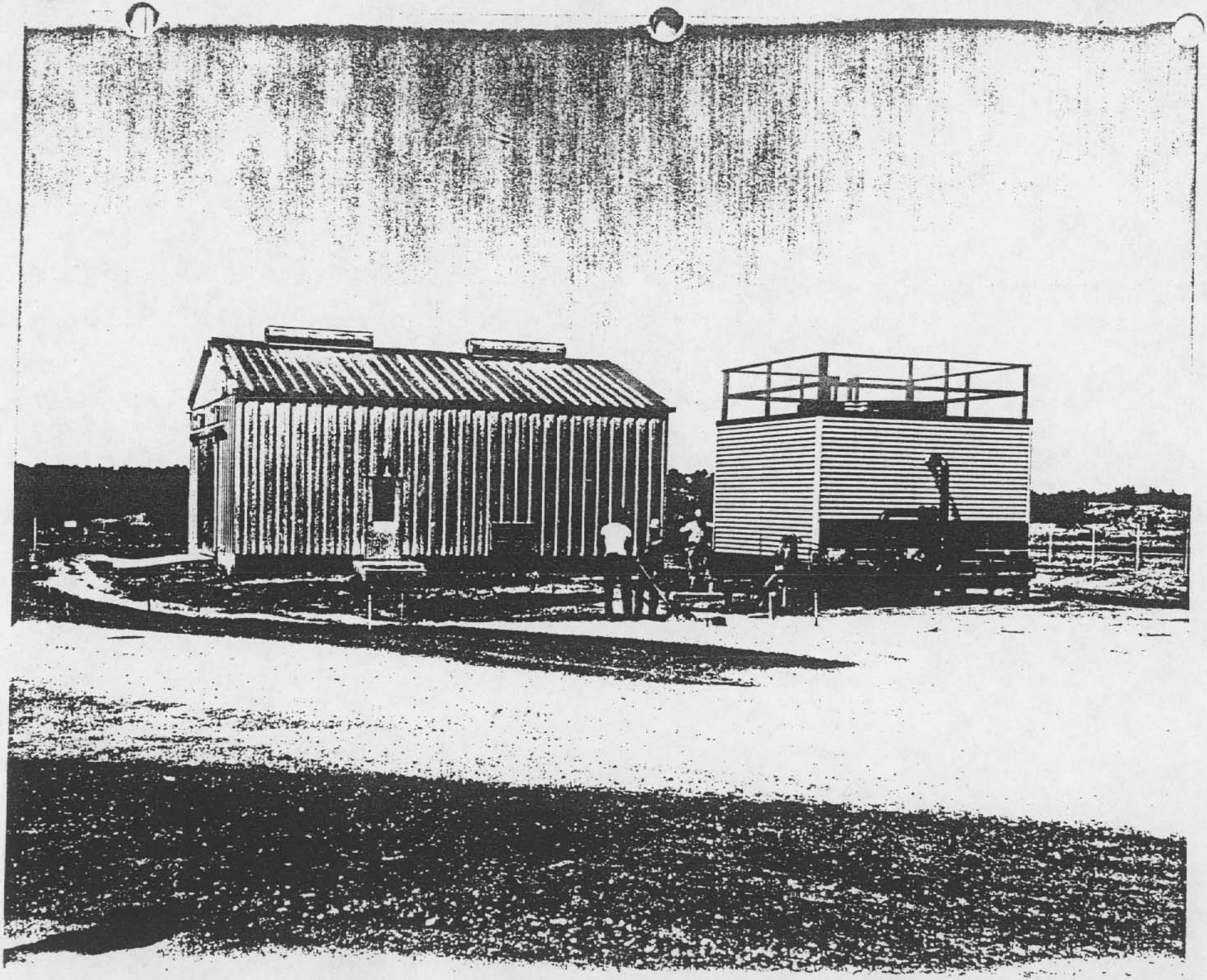

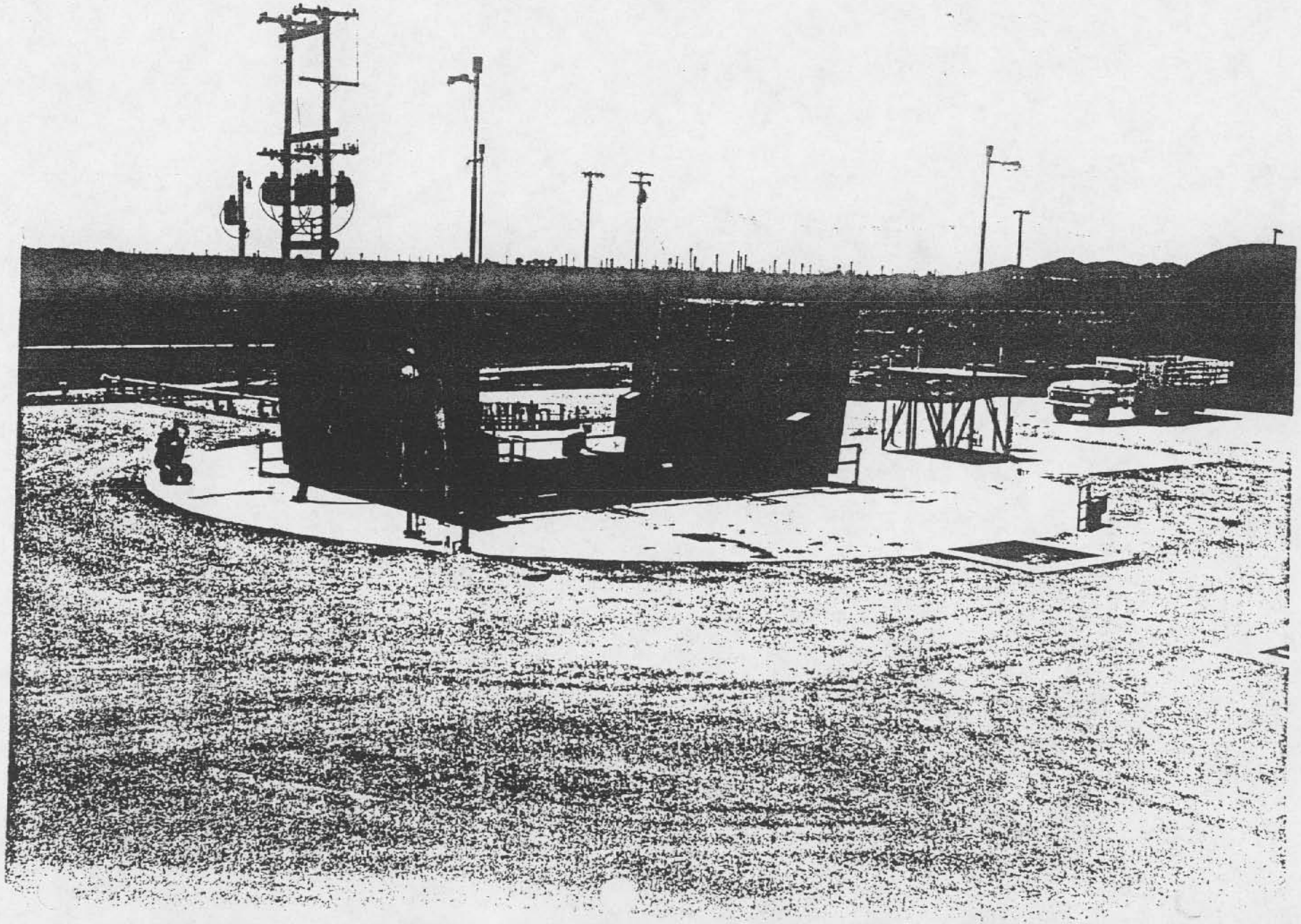


STOP

DA-23-028-eng-4243, with Otis Elevator Company for furnishing and installing facility elevators.

k. No. 41 - $106,950.73 - Assignment of ASC Contract No. DA-41-443-eng-5715, with A. M. Lockett and Company, Ltd., for furnishing package water chiller units and rotary pumps.

l. No. 42 - $138,411.21 - Assignment of ASC Contract No. DA-23-028-eng-4327, with Henry Pratt Company for furnishing Blast Closures.

m. No. 43 - $997,479.44 - Assignment of ASC Contract No. DA-23-028-eng-4265, with White Diesel Engine Company for furnishing diesel generators.

n. No. 44 - $147,052.97 - Assignment of ASC Contract No. DA-23-028-eng-4248, with General Electric Company for furnishing switchgear and panels.

o. No. 51 - $131,485.39 - Assignment of ASC Contract No. DA-41-443-eng-5750, with Joy Manufacturing Company for furnishing air washer dust collector units.

p. No. 62 - $147,384.00 - TV Surveillance System: Revisions to access doors, missile erection system, field test of vacuum insulated vessels and entrapment television system.

q. No. 71 - $107,796.00 - Revisions to Launch Platform Guide Roller; Add Power Panel in Battery Room of LCC.

r. No. 72 - $192,624.00 - Pipe Spool Deviations: Field revisions to pipe spools to eliminate conflicts between the waste drain and crib steel.

s. No. 87 - $101,616.00 - Furnish Temporary Power for Testing PLS System: Contract originally required Government to furnish power for tests from diesel generators. Due to time extensions, generators were not installed in time for tests. Contractor was, therefor, directed to furnish power.

t. No. 100 - $1,452,192.00 - Overhead on Modifications: Compensation for overhead costs on all modifications on which notice to proceed had been given as of 11 May 1961 which had not been formally executed.

u. No. 103 - $635,000.00 - Change Conditions at Site No. 7: Water encountered during shaft excavation was materially in excess of that which could have been anticipated.

v. No. 106 - $341,484.00 - Crib Connections: Provide additional structural and miscellaneous steel based on difference between bidding documents and supplemental design drawings.

w. No. 132 - $347,556.00 - Revisions to Dust Collection System: Addition of new volume control damper and duct entrance to blast closure and revision of air washer dust collector water supply piping.

x. No. 147 - $2,686,404.00 - Structural Steel Erection.

y. No. 151 - $224,000.00 (Initial) - Miscellaneous Electrical Changes: Major electrical revisions.

6-06. DESCRIPTION OF CLAIMS BY PRIME CONTRACTOR EXCEEDING $100,000.00:

a. Claim No. CA-1 - Performance of blowdown test on high

pressure vessels. To be settled as Modification No. 190.

b. Claim No. CA-2 - Cleaning requirement by acid pickling of high pressure vessel was in excess to the contract requirements. To be settled by Modification No. 191.

c. Claim No. CA-4 - $140,326.00 - Changed Conditions at Site No. 8. (Settled by Modification No. 167, for $4,000.00.) Contractor alleged extremely hard ground was encountered which was at variance with data on drawings; that numerous large crevices not shown on drawings were encountered; that unusual sub-surface water conditions resulted in construction problems beyond those expected; and that information available to the Government was withheld. Contracting Officer denied all portions of claim except that for encountering those large crevices not indicated on drawings. A price of $4,000 was negotiated on this item.

d. Claim No. CA-5 - $251,556.00 - Changed Conditions at Site No. 12. (Settlement by Modification No. 168 for $243,000.00.) Contractor claimed changed conditions existed due to excessive ground water being encountered during excavation. Contracting Officer allowed claim and a price of $243,000.00 was negotiated with the Contractor.

e. Claim No. CA-10 - $2,889,306.00 - Changed Conditions at Site No. 5. (Settlement by Modification No. 166 for $1,570,000.00.) Contractor claimed changed conditions because (1) excess water, (2) bedrock different than indicated, (3) unexpected water encountered in bedrock, (4) design inadequacies, (5) pertinent information omitted from plans and specifications, (6) soils encountered different than

indicated, and (7) backfilling problems encountered. Contracting Officer allowed claim and a price of $1,570,000.00 was negotiated.

f. Claim Nos. CA-11 & CA-56 - $810,168.00 - Revisions in Pipe Supports. (Settlement by Modification No. 148 for $455,004.00.)

g. Claim No. CA-13 - $101,700.00 - Delay in Approval of Paint for Underground Tanks. (Settlement by Modification No. 178 for $33,000.00.)

h. Claim No. CA-19 - $213,579.00 - Remedial Work and Acceleration on Cryogenic Vessels. (To be settled by Modification No. 189.)

i. Claim Nos. CA-27, CA-57, CA-59 & CA-60 - $1,780,400.00 - Joint Occupancy with PLS Contractor. (Settlement to be made by Modification No. 177 for $755,000.00.)

j. Claim No. CA-37 - $953,200.00 - Protest of Validation Procedures. Withdrawn by Contractor.

k. Claim No. CA-43 - $203,427.00 - Claim for Additional Compensation for Checkout and Testing of Work Involved in Electrical Modifications. Withdrawn by Contractor.

l. Claim No. CA-44 - $116,896.00 - Claim for Additional Compensation for Lost Production by Electrical Subcontractor because of the Delay in Crib Steel Installation and Validation. This claim under investigation by Area Office. Considered in Modification No. 146.

m. Claim No. CA-53 - $762,600.00 - Claim for Costs due to Multiplicity of Modifications and the Concurrency of Work under the Multiple Modifications. Withdrawn by Contractor.

n. Claim No. CA-54 - $673,600.00 - Claim for Added Cost of Modified Work Directly Attributable to General Plant Expense. This claim under investigation by Area. (Settled by Modification No. 188 for $29,869.00.)

o. Claim No. CA-62 - $127,100.00 - Water Control in Area of Collimator Housing. (Settlement by Modification No. 175 for $110,000.00.)

p. Claim No. CA-63 - $882,500.00 - Claim for Extra Costs Due to Disapproval of Universal Forms. (Settlement by Modification No. 176 for $352,000.00.)

q. Claim No. CA-64 - $479,842.00 - Claim for Extra Costs Due to Disapproval of Proposal to Use Silo Crib for Support of Cap Form. (Settled by Modification No. 184 for $410,508.00.)

r. Claim No. CA-65 - $683,988.00 - Claim for Cost of Extra Work Due to Modified Backfilling Procedure Required. (Settlement by Modification No. 179 for $570,000.00.)

6-07. FINAL PAYMENT - As of 28 April 1962 final payment to the prime contractor has not been made pending issuance of additional modifications and settlement of claims.

6-08. PRINCIPAL SUBCONTRACTS TO THE PRIME CONTRACT:

a. Electrical - Cloverland Contracting Company & U. S. Engineering Company, Kansas City, Missouri.

b. Sheet Metal - Cloverland Contracting Company & U. S. Engineering Company, Kansas City, Missouri.

c. Open Cut Excavation and Backfilling - Amis Construction

Company, Oklahoma City, Oklahoma.

d. Installation of Structural Steel, Tanks, Miscellaneous Steel, Government Furnished Property and ASC Equipment at 6 Sites - Owl Truck & Construction Company, Compton, California.

e. Installation of Structural Steel, Tanks, Miscellaneous Steel, Government Furnished Property and ASC Equipment at 6 Sites - Merchants Transfer Company, Tulsa, Oklahoma.

f. Reinforcing Steel and Mesh - Gilmore-Skoubye, Oakland, California.

g. Fencing - Cyclone Fence Department, U. S. Steel Corp., Oklahoma City, Oklahoma.

h. Insulation - Industrial Insulators, Inc., Houston, Texas.

i. Waterproofing - Premier Roof Company, Montebello, California.

j. Metal Walls and Doors - S & T Construction Company, Altus, Oklahoma

k. Sight Tube Installation - Selby Drilling Corporation, Boise, Idaho.

l. Carpentry and Wall Board - Wm. Cameron and Company, Altus, Oklahoma.

m. Automatic Controls - Barber-Colman Company, Rockford, Illinois.

n. Floor Covering - Aycock & Felton Tile Company, Lawton, Oklahoma.

o. Painting - Randall H. Sharpe, Oklahoma City, Oklahoma.

6-09. HISTORICAL SUMMARY OF CONTRACTS OTHER THAN THE PRIME:

a. Contract No. DA-34-066-eng-5967, "Construction of Unitary Silo Water Supply, WS-107 A-1 Operational Base".

(1) Contractor: Chaney & Hope, Dallas, Texas.

(2) Bids Opened: 14 July 1960.

(3) Contract Awarded: 27 July 1960.

(4) Notice to Proceed Issued: 27 July 1960.

(5) Work Began: 3 August 1960.

(6) Scheduled Completion Date: 16 August 1961.

(7) Revised Completion Date: 14 November 1961.

(8) Actual Completion Date: 14 November 1961.

(9) Original Contract Amount: $487,400.00.

(10) Present Contract Amount: $542,565.02 (As of 4 January 1962.)

(11) Number of Modifications Issued: 28

(12) Modifications Exceeding $100,000.00: None

(13) Claims Exceeding $100,000.00: None

(14) Claims Submitted: 1

(15) Unsettled Claims: None

(16) Final Payment not made as of 28 April 1962.

(17) Principal Subs:

(a) Roadwork, Grading and Installation of Water Lines - Pierce Paving Company, Altus, Oklahoma.

(b) All Electrical Work - Alps Corporation, Dallas, Texas.

b. Contract No. DA-34-066-eng-5970, "Construction of 25 Ton Liquid Oxygen Plant and Liquid Oxygen Disposal Facility".

(1) Contractor: Universal Engineers & Constructors, Inc., Tulsa, Oklahoma.

(2) Bids Opened: 16 August 1960.

(3) Contract Awarded: 17 August 1960.

(4) Notice to Proceed Issued: 19 August 1960.

(5) Work Began: 24 August 1960.

(6) Scheduled Completion Date: 28 January 1961.

(7) Revised Completion Date: 23 March 1961.

(8) Original Contract Amount: $395,739.00.

(9) Final Contract Amount: $416,325.39.

(10) Actual Completion Date: 23 March 1961.

(11) Final Payment: Final estimate to CEBMCO 9 January 1962.

(12) Number of Modifications Issued: 16.

(13) Modifications Exceeding $100,000.00: None

(14) Claims Submitted: 2

(15) Claims Exceeding $100,000.00: None

(16) Principal Subs:

(a) Electrical - Herrick L. Johnson Company, Columbus, Ohio.

(b) Furnish & Erect Metal Building - Fleming Building Company, Inc., Tulsa, Oklahoma.

(c) Excavation, Utilities, Concrete, Roadwork &

Miscellaneous - K. P. Construction Company, Altus, Oklahoma.

c. Contract No. DA-34-066-eng-5979, "Construction of Missile Assembly and Technical Supply Building".

(1) Contractor: T. C. Bateson Construction Company, Dallas, Texas.

(2) Bids Opened: 1 September 1960.

(3) Contract Awarded: 2 September 1960.

(4) Notice to Proceed Issued: 14 September 1960.

(5) Work Began: 20 September 1960.

(6) Scheduled Completion Date: 1 July 1961.

(7) Revised Completion Date: 14 August 1961.

(8) Original Contract Amount: $609,000.00.

(9) Final Contract Amount: $687,872.91.

(10) Actual Completion Date: 14 August 1961.

(11) Final Payment: Final Estimate to CEBMCO 10 January 1962.

(12) Number of Modifications Issued: 17

(13) Modifications Exceeding $100,000.00: None

(14) Claims Submitted: None

(15) Principal Subs:

(a) Structural Steel & Miscellaneous Iron - Bedingfield Construction Company, Oklahoma City, Oklahoma.

(b) Sprinkler System - Grinnel Company, Inc., Dallas, Texas.

(c) Mechanical - Natkins & Company, Dallas, Texas.

(d) Electrical - Perry Electric Company, Vernon, Texas.

d. Contract No. DA-34-066-eng-5992, "Construction of Re-Entry Vehicle Facilities".

(1) Contractor: LaQua Construction Company, Lawton, Oklahoma.

(2) Bids Opened: 20 September 1960.

(3) Contract Awarded: 14 October 1960.

(4) Notice to Proceed Issued: 25 October 1960.

(5) Work Began: 28 October 1960.

(6) Scheduled Completion Date: 1 June 1961.

(7) Revised Completion Date: 1 July 1961.

(8) Original Contract Amount: $99,683.00.

(9) Final Contract Amount: $109,504.00.

(10) Actual Completion Date: 1 July 1961.

(11) Number of Modifications Issued: 4

(12) Modifications Exceeding $100,000.00: None

(13) Claims Submitted: 1

(14) Claims Exceeding $100,000.00: None

(15) Principal Subs:

(a) Masonry - Pac Construction Company, Lawton, Oklahoma.

(b) Sheet Metal, Roofing, Duct Work & Grills - Reliable Roofing, Lawton, Oklahoma

(c) Electrical - Industrial Electric Company, Lawton, Oklahoma.

(d) Plumbing & Heating - Acme Plumbing Company, Lawton, Oklahoma.

e. Contract No. DA-34-066-eng-6068, "Turfing, 1961, Altus Air Force Base, Altus, Oklahoma, Schedule No. 2 - Missile Support Facilities".

(1) Contractor: Harry J. Marten, Wichita Falls, Texas.

(2) Bids Opened: 9 May 1961.

(3) Contract Awarded: 16 May 1961.

(4) Notice to Proceed Issued: 16 May 1961.

(5) Work Began: 23 June 1961.

(6) Scheduled Completion Date: No final date scheduled.

(7) Actual Completion Date: 3 August 1961.

(8) Original Contract Amount: $1,334.00.

(9) Final Contract Amount: $1,876.40.

(10) Modifications Issued: 1

(11) Claims Submitted: None

(12) No Subcontracts

(13) Final Payment Made: 28 November 1961.

f. Contract No. DA-34-066-eng-6075, "Fuel Catchment Tank System for WS-107 A-1 Operational Base Missile Launch Complexes".

(1) Contractor: Martyn Brothers, Inc., Dallas, Texas.

(2) Bids Opened: 24 May 1961.

(3) Contract Awarded: 26 May 1961.

(4) Notice to Proceed Issued: 6 June 1961.

(5) Work Began (at Site): 19 September 1961.

(6) Scheduled Completion Date: 22 December 1961.

(7) Actual Completion Date: 10 February 1962.

(8) Original Contract Amount: $192,000.00.

(9) Final Contract Amount: Not available to date.

(10) Number of Modifications Issued to Date: 5

(11) Modifications Exceeding $100,000.00: None

(12) Claims Submitted to Date: None

(13) Principal Subs:

(a) Excavation - J & J Construction Company, Lawton, Oklahoma

g. Contract No. DA-34-066-eng-6077, "Furnish and Install Safety Platforms for WS-107 A-1 Operational Base Missile Launch Complexes".

(1) Contractor: Allied Engineering Company, Hollydale, California.

(2) Bids Opened: 1 June 1961.

(3) Contract Awarded: 6 June 1961.

(4) Notice to Proceed Issued: 11 July 1961.

(5) Work Began (at Site): 23 October 1961.

(6) Scheduled Completion Date: 16 January 1962.

(7) Actual Completion Date: 20 March 1962

(8) Original Contract Amount: $53,664.00.

(9) Final Contract Amount: $98,147.12

(10) Number of Modifications Issued to Date: 8

(11) Modifications Exceeding $100,000.00: None

(12) Claims Submitted: None

(13) Principal Subs:

(a) Steel erection - Beddingfield Construction Company, Oklahoma City, Oklahoma.

h. Contract No. DA-23-028-eng-5160, "Furnishing and Installing Blast Closure Sleeve in Silo Wall for WS-107 A-1 Operational Base Missile Launch Complexes, All Atlas F Bases".

(1) Contractor: M. W. Hills Construction, Inc., Salina, Kansas.

(2) Bids Opened: Unknown - Kansas City District.

(3) Contract Awarded: 8 November 1961.

(4) Notice to Proceed Acknowledged: 8 November 1961.

(5) Work Began (at Altus): 7 December 1961.

(6) Scheduled Completion Date: 12 March 1962.

(7) Contract 10% complete as of 31 December 1961.

(8) Original Contract Amount (Altus only): $41,000.00.

(9) No modifications Issued to Date.

i. Contract No. DA-34-066-eng-5912, "Engineering Services Necessary to Perform Laboratory Tests in Connection with Construction of Atlas Missile Facility near Altus Air Force Base, Oklahoma", dated 16 May 1960.

(1) Contractor: Oklahoma Testing Laboratories, Oklahoma City, Oklahoma.

(2) Original Contract Amount: $132,000.00.

(3) Final Contract Amount: $125,828.10.

(4) Scheduled Completion Date: 12 August 1961.

(5) Actual Completion Date: 12 August 1961.

(6) Number of Modifications Issued: 5 (none over $100,000.00).

(7) Claims: None

(8) Final Payment Made: 6 November 1961.

j. Contract No. DA-34-066-eng-5926, "Checking Shop Drawings for WS-107 A-1 Operational Base Missile Launch Complexes", dated 24 May 1960.

(1) Contractor: Bechtel Corporation, Vernon, California.

(2) Original Contract Amount: $70,220.00.

(3) Final Contract Amount: $70,220.00.

(4) Scheduled Completion Date: 31 May 1961.

(5) Actual Completion Date: 30 June 1961.

(6) No Modifications Issued.

(7) No Claims Submitted.

(8) Final Payment Made: (Date Unknown).

k. Contract No. DA-34-066-eng-5973, "Approval of Shop Drawings in Connection With the Construction of the Liquid Oxygen Plant and Liquid Oxygen Disposal Facility", dated 24 August 1960.

(1) Contractor: Tudor Engineering Company, San Francisco, California.

(2) Original Contract Amount: $5,250.00.

(3) Final Contract Amount: $5,250.00.

(4) Scheduled Completion Date: 1 December 1960.

(5) Actual Completion Date: 1 January 1961.

(6) No Modifications Issued.

(7) No Claims Submitted.

(8) Final Payment Made: (Date Unknown).

l. Contract No. DA-34-066-eng-5977, "Approval of Shop Drawings in Connection With the Missile Assembly and Technical Supply Building", dated 2 September 1960.

(1) Contractor: Servis, Van Doren and Hazard, Topeka, Kansas.

(2) Original Contract Amount: $5,200.00.

(3) Final Contract Amount: $5,200.00.

(4) Scheduled Completion Date: 1 February 1961.

(5) Actual Completion Date: 15 April 1961.

(6) No Modifications Issued.

(7) No Claims Submitted.

(8) Final Payment Made: (Date Unknown).

m. Contract No. DA-04-203-eng-5862, "Atlas and Titan I Blast Detection Systems", (Supply Contract), dated 14 September 1960.

(1) Contractor: ITT Kellogg, Chicago, Illinois.

(2) Original Contract Amount (Altus portion - delivery, installation & testing): $23,366.04.

(3) Work Started at Altus: 2 January 1962.

(4) Scheduled Completion Date: 29 June 1962.

(5) Note: This contract is being administered by the San Francisco District Office. Supervision and inspection of installation and testing was assigned to Altus Area Office until 27 April 1962

when these responsibilities were transferred to the Altus Project Office, U. S. Army Engineer District, Albuquerque.

n. Contract No. DA-41-443-eng-6486, "Installation of Modification Kits for Missile Silo Blast Closures".

(1) Contractor: Delta Electric Construction Company, Incorporated, San Antonio, Texas.

(2) Bids Opened: 5 February 1962.

(3) Contract Awarded: 6 February 1962.

(4) Notice to Proceed: 8 February 1962.

(5) Work Began: 12 March 1962.

(6) Scheduled Completion Date: 4 June 1962.

(7) Actual Completion Date: 19 February 1962.

(8) Original Contract Amount: $21,000.00.

(9) Number of Modifications Issued to Date: 2

(10) Modifications Exceeding $100,000.00: None

(11) Claims Submitted to Date: 1

CHAPTER 7

SAFETY BRANCH

7-01. ACTIVATION OF BRANCH - a. The branch was formally organized on 17 October 1960 with the assignment of Captain James R. McKnight as Safety Officer. Capt McKnight remained assigned as Safety Officer until 24 April 1961 when Mr. John E. Geiglein, GS-12, formerly of the U. S. Army Engineer District, Detroit, was assigned as Area Safety Engineer. Mr. Geiglein remained Safety Engineer until 3 November 1961 at which time he departed the Area on a PCS move. Upon the departure of Mr. Geiglein, Captain McKnight again resumed the duties of Safety Officer.

b. Prior to the assignment of a Safety Officer, Tulsa District had provided supervisory control of the Altus Area Safety Program. During the period 14 March to 21 October 1960, the on-the-site supervision of safety had been assigned as a responsibility of the Area Office Administration Branch.

c. Tulsa District continued to aid in the Area Safety Program until 4 November 1960 when CEBMCO assumed control of the Altus Area.

7-02. FUNCTIONS - The Area Safety Branch had the following functions:

a. Supervise and direct the Safety Program for the Altus Area in accordance with policies and objectives established in Army Regulation 385-10 and Corps of Engineer publications.

b. Advise the Area Engineer of accident potentials or programs and the requirements for control.

c. Prescribe and coordinate a balanced program of safety activities.

d. Provide advisory safety engineering services for all Area activities in support of accident prevention including occupational health, fire prevention and protection.

e. Survey all activities to ascertain compliance with the policies and objectives of the safety program.

f. Conduct progressive research into accident problems and develop corrective controls to prevent future accidents.

g. Survey facilities for fire protection, fire fighting and emergency rescue capabilities and to establish adequate and efficient utilization thereof.

h. Supervise the accident reporting system and compile, analyze, forward accident data and designate any corrective action to be taken.

i. Provide frequent safety inspection at all work sites.

7-03. MAJOR ACCIDENTS - a. There were 3 fatal accidents within the Area during the course of construction.

(1) On 3 November 1961, at Site 10, Hobart, Oklahoma, Mr. Otis S. Hopson, iron worker, was electrocuted when the crane he was working on established contact with some high tension lines. The truck crane had just finished setting a tool house to the left rear of the crane and the operator was swinging the boom clock-wise; raising it to clear another crane in the area. When the boom was about 8 feet from the high tension lines, the operator stopped his swing and started

to lower his boom to go under the high tension lines. At this instant a gust of wind blew the slings on the load line into the high tension lines.

The deceased was working at the rear of the crane securing the outriggers and pads prior to moving and received the fatal shock.

In order to prevent similar accidents, operators were instructed as to their responsibility to keep crane boom outside of the 10 ft limit restrictions set by the Corps of Engineer safety regulations.

(2) At approximately 1030 hours, 28 December 1960, Mr. Warren N. Willis, iron worker, was killed in a fall at Site 3, Cache, Oklahoma.

The deceased and a co-worker were proceding from the silo 6th level to the 5th level in order to obtain some lashings. The deceased started to slide down the X-bracing between the levels instead of climbing down a ladder that was approximately 18 feet away. At the intersection of the X-bracing he either slipped or lost his grip and fell about 21 feet to some wooden decking on level 7. After striking the decking the victim bounced out into the space between the silo crib steel and silo wall falling some 68 feet to the bottom.

To prevent further accidents of this type more temporary ladders were installed between crib levels and the use of them enforced. Safety nets were also installed in the silos.

(3) At about 0830 hours, 24 March 1961, Mr. Keith B.

Arnold, carpenter, was killed in a fall at Site 5, Fargo, Texas.

The deceased was working ahead of the rest of his crew on top of a vertical wall of the Launch Control Center. At the time of the accident the victim was bending over from the top of a concrete form attempting to remove a grade strip. He appeared to start to stand erect, lost his balance and fell off backwards from the top of the concrete form to the ground, a distance of about 29 feet.

The primary cause of the accident was the failure to use the safety equipment, i.e., safety belt, provided for his use. A contributing factor to this accident was the lack of scaffolding from which to work.

To prevent further accidents of this nature, scaffolds, platforms or temporary floors were provided for all work except that which could be done safely from the ground, other substantial footing, or from ladders. Also, supervisory personnel were instructed to exercise their authority to insure that persons under their control used all the safety measures applicable to the job at hand.

b. There have been 2 major fires at this project.

(1) On 11 May 1961 about 1700 hours a Caterpillar Diesel Generating Unit D-8800-S and two small buildings were damaged by fire. The damages amounted to $4,975.00.

Early in the afternoon a small fire some 4 to 5 feet from the generating unit was started in a pile of sawdust. This was noted and put out by water and dry chemical before it reached any proportions. The sawdust pile was not agitated after extinguishing the

fire. Since there were high winds all day, it was found that a small portion of ignited sawdust was blown under the generating unit. The area, because of prior oil spillage and fuel leakage was potentially volatile and the fire resulted therefrom.

To prevent future occurrences the new generating unit was relocated 100 feet from any building and placed on a concrete slab. The generator sheds were made open enough to prevent any accumulation of fumes in the shed, also the spillage of oil and fuel under the generator was removed daily.

(2) About 1400 hours 20 July 1961 a fire occurred in the bottom of the silo at Site 4, Frederick, Oklahoma. The major damage was caused by smoke. Damages amounted to $5,800.00.

The proximate cause of the fire was the ignition of a polyethylene material from sparks of an oxy-acetylene cutting torch. The combustion of this polyethylene material was of such a temperature and duration to ignite a RP-1 fuel layer lying of the surface of the water ponded on the silo floor.

The factors contributing to the fire were:

(a) Improper handling of RP-1 fuel which resulted in a residue of this fuel remaining on the surface of the water ponded on the bottom of the launch silo.

(b) Improper housekeeping in permitting debris to collect in the bottom of the launch silo.

(c) Lack of readily accessible fire fighting equipment.

To prevent future occurrences the Contractors were

instructed to use extreme care to prevent RP-1 fuel spillage and in the event any was spilled, to clean it up immediately. Also, the Contractor was to conduct a continual trash removal program in the silos. When possible all waste polyethylene material was to be placed in trash barrels provided for that purpose.

7-04. AREA SAFETY RECORD - a. During the period May through December 1960 under Tulsa District the Area had the following safety record:

(1) Manhours Worked:

Government	Contractors	Total
179,880	1,628,620.5	1,808,500.5

(2) Non-Disabling Injuries:

Government	Contractors	Total
1	554	555

(3) Disabling Injuries:

Government	Contractors	Total
None	12	12

(4) Fatalities:

Government	Contractors	Total
None	1	1

(5) Days Lost Time:

Government	Contractors	Total
None	6,507	6,507

(6) Employees of the Area Office drove 295,458 miles without an accident.

(7) Property Damage:

Government	Contractors	Total
None	$3,250.00	$3,250.00

(8) Fire Losses:

Government	Contractors	Total
None	None	None

b. During the period January 1961 through April 1962 the Area Office had the following safety record:

(1) Manhours Worked:

Government	Contractors	Total
318,768	2,265,345	2,584,113

(2) Non-Disabling Injuries:

Government	Contractors	Total
None	269	269

(3) Disabling Injuries:

Government	Contractors	Total
3	9	12

(4) Fatalities:

Government	Contractors	Total
None	2	2

(5) Days Lost Time:

Government	Contractors	Total
38	12,101	12,139

(6) Government Vehicle Accidents: 2

(a) One in collision with two privately

owned vehicles. Third party was cited by Oklahoma State Police as having caused accident.

(b) One hit by privately owned vehicle. Private civilian driver cited by City Police for failure to yield right of way.

(7) Miles Driven by Government Employees: 669,349 miles.

(8) Property Damage:

Government	Contractors	Total
$25.00	$875.00	$900.00

(9) Fire Losses:

Government	Contractors	Total
None	$10,775.00	$10,775.00

7-05. PROBLEM AREAS AND RECOMMENDATIONS - a. Joint occupancy by two Prime Contractors without common construction safety regulations. Prior to joint occupancy, it should be resolved between all concerned that the safety regulations of the contractor with the prime contract will be followed until the completion of their work.

b. Unfamiliarity of labor force with safety equipment. Prior to assigning a man to a job requiring him to use special safety equipment the man should demonstrate to the site clerk or safety man, his ability to use the equipment properly.

c. Presence of Non-Contractor and/or Non-Corps personnel on the job during Phase 1. It should be impressed upon all concerned at the start of a job that the only safety regulations required of a

contractor are those required by Corps of Engineers Safety Regulations.

d. Contractor Compliance with Corps of Engineers Safety Regulations. From the start of the project the regulations should be strictly enforced and in the case of non-compliance immediate and stringent action taken. This will preclude running battles with the contractor to obtain the necessary compliance with the safety program.

e. Safety procedures in regard to new types of construction. When a new type construction is encountered that requires special safety precautions the lead sites should forward their problems and recommendations immediately to CEBMCO Safety Branch for evaluation, re-write if necessary, and dissemination to the down stream sites.

CHAPTER 8

OFFICE OF COUNSEL

8-01. STAFFING OF OFFICE - a. The original planning for the Altus Area by Tulsa District envisioned a Legal Branch whose Chief would act as a personal staff advisor to the Area Engineer. Mr. Maurice F. Ellison, Jr was hired on 30 March 1960 by Tulsa District as the attorney-advisor for the Altus Area organization.

b. From 30 March through 3 September 1960 Mr. Ellison remained in the Tulsa District Office conducting necessary business transactions with the Altus Office via telephone and correspondence. The primary reason behind such an operation was founded on the fact of Mr. Ellison's lack of experience and background in government legal matters. This period of time permitted Mr. Ellison to develop such experience under the supervision of Mr. Melton Schmidt, Tulsa District Counsel.

c. By the end of August 1960 the decision was made by the District Engineer, Tulsa District to move Mr. Ellison to Altus and the reassignment was made on 4 September 1960.

d. On 30 July 1961 Mr. Robert E. Moore, who had until that date been the Chief, Administration Branch, was appointed full time Labor Relations Officer under the Area Counsel. Previously, and as an additional duty, Mr. Moore had acted in this capacity. Mr. Moore departed the Area Office in December 1961, at which time the labor relations functions were assumed by the Executive Office.

e. Operational requirements coupled with a shortage of

qualified lawyers in the missile program dictated that Mr. Ellison's services were required in CEBMCO Headquarters. Accordingly, he was transferred to the CEBMCO Office of Counsel on 14 October 1961 as a General Attorney. His duties at CEBMCO still included the provision of legal advice to the Altus Area Office.

8-02. DUTIES AND FUNCTIONS - The legal counsel for the Area Office had the following duties and functions:

a. Assisted and advised the Area Engineer and his supporting elements on legal matters except Real Estate.

b. Rendered staff advice in the negotiation and preparation of contractual documents and reviews all contract actions for legal sufficiency.

c. Prepared necessary action concerning all contractual and non-contractual claims for the Area.

d. Prepared action on appeals made by contractors to decisions made by the Contracting Officer or the Contracting Officer's Representative.

e. Prepared litigation reports as required.

f. Administered the Area Labor Relations Program.

8-03. CHRONOLOGICAL LISTING OF SIGNIFICANT EVENTS - The following chronological listing of significant events are those in which the Area Counsel was directly involved:

a. 23 July 1960 - Conference between representatives of prime contractor, Tulsa District, and Area Office regarding construction progress and additional effort required of contractor to meet approved

progress schedule.

b. 28 July 1960 - Conference between representatives of prime contractor, Tulsa District and Area Office concerning problems affecting construction progress. Items discussed with legal connatations were:

(1) Assignment of service contracts under SC-48 of the contract. Contractor had made a request during the meeting that assignment of the Service Contracts under this provision of contract be made by letter instead of by modification since the Renegotiation Act subjects a contractor to renegotiate when modifications of the contract exceed one-third of contract price. Contractors were requested to submit request in writing.

(2) Payment to Contractor for Materials Delivered to Site by Sub-contractor or Supplier. Prime contractors' took position that the contract provisions stated that such payment may be made by the Contracting Officer on an estimate basis. Point of interest was resolved that the contractor may include on pay estimates materials or equipment delivered to the site by sub-contractor or supplier provided the estimate was accompanied by a certification that similar payments made to contractor in the preceding month were used to satisfy the supplier or sub-contractor supplying the material or equipment to the site.

c. 9 August 1960 - Conference between representatives of the prime contractor, Tulsa District and Area Office concerning Delays and Acceleration of Work. Legal Counsel requested clarification of

Area Engineer's authority concerning design changes. Contractor was informed that the Area Engineer spoke for the Contracting Officer in this regard and that his work, in the absence of other direction, may be taken as authoritative on the subject.

d. 25 October 1960 - Conference between representatives of the prime contractor, Tulsa District, and Area Office concerning Modification 11, "Revisions to Collimator Plate Assembly and Acceleration". The attorney for the contractor had taken the position that in complying with the modification directive the prime contractor had breached their contract with Continental EMSCO when they (the prime) had directed them (EMSCO) to sub out crib steel and that the prime contractor would include in the estimate what it cost to obey the order, less what the prime contractor would have paid EMSCO in the first place.

e. 2 November 1960 - Conference between representatives of prime contractor, Tulsa District, and Area Office concerning negotiations on Change Order 11.

f. 4 November 1960 - Conference between representatives of prime contractor, Tulsa District, and Area Office concerning further negotiation on Modification 11.

g. 29 December 1960 - Conference between representatives of Southwestern Building & Trades Association concerning labor differences between the organized labor and Chaney & Hope, Water Supply contractors. This contractor was non-union and SB&TA objected to the fact that Chaney & Hope were not paying their personnel fringe benefits and that since prime contractor, MKH&A, was union, non-union and union

personnel were working side by side. It was agreed that representatives of SB&TA and Chaney & Hope would meet at a later date in an effort to resolve these problems.

h. 26 January 1961 - Conference between representatives of MKH&A, Foster Wheeler Corporation and Area Office concerning pickling, blowdown and cleaning of PLS process vessels.

i. 30 January 1961 - Conference between representatives of MKH&A and Area Office concerning construction delays due to the delay in pipe support fabrication.

j. 14 April 1961 - Labor conference between representative of the Area Office and Sinor Brothers Construction Company concerning action which Sinor Brothers must take in regard to correction of time reporting on their payrolls.

k. 2 May 1961 - Conference between representatives of Chaney & Hope, contractor, MKH&A, Labor Unions, and Area Office to resolve problem of working a non-union contractor alongside a union contractor.

8-04. WORK STOPPAGES - The following work stoppages occurred in the Altus Area on the dates noted:

a. 8 September 1960 - Electricians at Sites 1, 2, 3 and 6 walked off job due to fact that some temporary electrical work had been done by other than electricians. Work was resumed 12 September 1960 after negotiations between MKH&A, Cloverland Contracting Company and IBEW. 18 man days lost.

b. 21 October 1960 - Carpenters and laborers refused to

work on Site 7 when prohibited from riding the material skip in and out of silo; claiming the bottom 25 feet of the ladder installed in the silo was uncaged and therefor unsafe. Work resumed 24 October 1961 after mediation between representatives of MKH&A and Carpenter Local. 20 man days lost.

c. 4 November 1960 - Ironworkers walked off Site 2 claiming lack of safe access to silo, i.e., improper use of man skip and unsecured ladders. Work resumed 7 November 1960 after mediation between contractor and union representatives. 6.5 man days lost.

d. 16 November 1960 - Ironworkers refused to work at Site 12 because of dissatisfaction with supervision. Upon change of supervision by contractor, work was resumed on 17 November 1960. 7 man days lost.

e. 22 November 1960 - Plumbers walked off Sites 1, 2, 3, 6, 7, 10 and 11 because of jurisdictional dispute involving unloading and placement of tanks. Plumbers contended work was improperly assigned to ironworkers. Union representative instructed plumbers to return to work. 28 man days lost.

f. 28 December 1960 - Ironworkers walked off job at Site 3 in sympathy for ironworker killed in fall at site that date. Resumed work 29 December 1960. 57 man days lost.

8. 25-28 April 1961 - Carpenters, asbestos workers, pipefitters, electricians, and sheet metal workers walked off in protest over verbal agreement between IBEW local and non-union contractor. 267 man days lost.

h. 5 July 1961 - Sheet metal workers walked off project on all sites except Site 5 over negotiation of new yearly contract between that craft and contractor's sheet metal workers association. Work resumed on 6 July 1961. 24 man days lost.

8-05. LABOR INVESTIGATIONS - Only one labor investigation was conducted by the Area Office. This investigation concerned the application of contract labor standards provisions to materials hauling under the prime contract. On 22 November 1960 the U. S. Army Engineer District, Tulsa, had referred this case to the U. S. Department of Labor for a decision as to whether the contract labor provisions did apply under these circumstances. The Area Office was advised 16 February 1961 through the Labor Department that the contract labor provisions did apply in this case. Subsequently an investigation conducted by Mr. Robert E. Moore, Area Labor Relations Officer revealed that:

a. Payrolls submitted to the Area Office by the contractor for period 14 June 1960 through 4 March 1961 did not accurately reflect actual hours of work performed by employees.

b. Officials of the company denied any falsification of records.

c. To resolve this matter Sinor Brothers Construction Company, the company involved, reconstructed their payrolls through 4 March 1961. Examination of these reconstructed payrolls submitted to the Area Office on 18 September 1961 did not reveal any labor violations. On 1 December 1961 the Area Engineer forwarded the completed investigative report to CEBMCO recommending the case be closed. The

Area Office was notified in April 1962 that the Labor Department had closed the case with no further action required.

8-06. LABOR COSTS - Of the prime contract, approximately $9.3 million of the cost was expended by the contractor for labor. Of this total cost, approximately $3.9 million was for overtime; $.17 million for travel and subsistence; and $1.5 million for premium pay. These costs were based upon the contractor utilizing approximately 2.9 million man-hours of straight time and .8 million man-hours of overtime.

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LIST OF PHOTOS AND CHARTS

VOLUME 2

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

S. C. WOOD, Major, CE
CEBMCO Liaison Officer
Altus

FOR OFFICIAL USE ONLY

CHAPTER 9

SPECIAL ACTIVITIES

9-01. GENERAL - This section of text on the history of the Altus Area is to provide a summary of activities on events which are of a general nature and which do not appear elsewhere in this history.

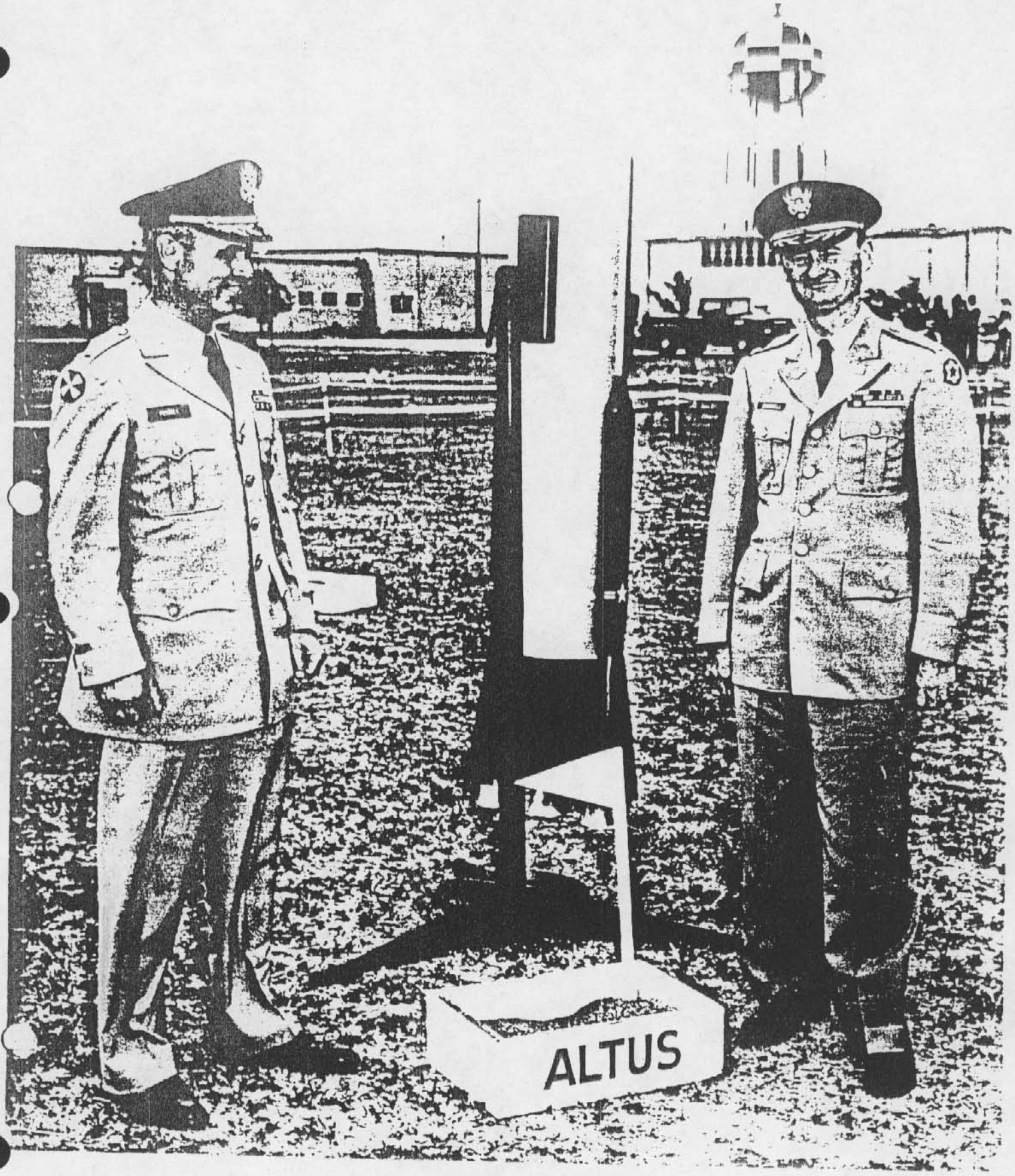
9-02. CEREMONIES - a. 20 May 1960 - A symbolic ground breaking ceremony was held at Altus Air Force Base and attended by Oklahoma's U. S. Senator Robert S. Kerr; U. S. Congressman Toby Morris from the 6th Congressional District; Colonel Howard W. Penney, CE, Tulsa District Engineer; Colonel Frederick R. Ramputi, USAF, 11th Bombardment Wing Commander; Colonel (now Brigadier General) Howard W. Moore, USAF, 816th Air Division Commander; and the Mayors representing the City of Altus and 12 communities located near the proposed missile sites. Photographs of this ceremony appear on pages 153 and 154.

b. 16 June 1960 - Observation of the Corps of Engineers 185th anniversary. Lieutenant Colonel (then Major) Carl F. Baswell, Altus Area Engineer conducted the ceremony.

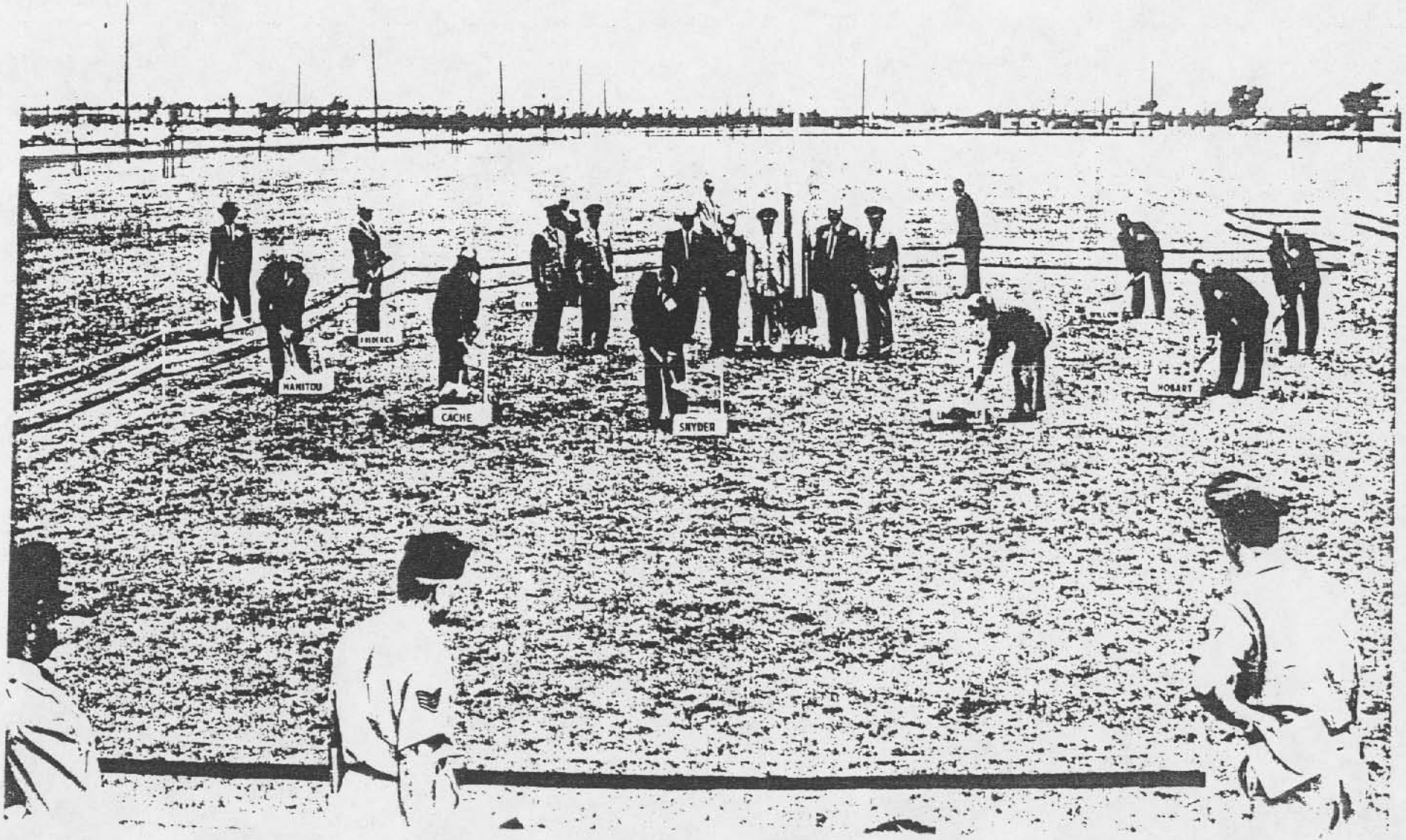
c. 4 November 1960 - Ceremonies held at Complex 2 and marking the command transfer of the Altus Area Office from the U. S. Army Engineer District, Tulsa to U. S. Army Corps of Engineer Ballistic Missile Construction Office. Principal speakers at this ceremony were Colonel Howard W. Penney, CE, Tulsa District Engineer and Colonel Woodrow W. Wilson, CE, Director Atlas F Construction Directorate, CEBMCO. Also attending was Mayor of the city of Altus, Hoyt Shadid;

SYMBOLIC GROUND BREAKING CEREMONY
ALTUS AFB, OKLAHOMA
20 May 1960

Left to Right: Colonel Howard W. Penney, District Engineer, Tulsa District; Lt Col (then Major) Carl F. Baswell, Area Engineer, Altus


ALTUS

SYMBOLIC GROUND BREAKING CEREMONY
ALTUS AFB, OKLAHOMA
20 May 1960


MANITOU
CACHE
SNYDER
HOBART

Colonel Frederick R. Ramputi, USAF, 11th Bombardment Wing Commander; Colonel Ernest C. Ramme, USAF, Altus SATAF Commander; Colonel Adolph Kroeher, USAF, AFRCE Southwest and the Altus Area Engineer's Staff.

d. 15 June 1961 - Ceremony was held commemorating the 186th anniversary of the U. S. Army Corps of Engineers. Lieutenant Colonel Carl F. Baswell, Altus Area Engineer presided and was the principal speaker.

e. 1 August 1961 - Ceremonies were conducted at Complex 2, Snyder, Oklahoma, marking the turnover of the first of the Altus Area projects to the Using Agency. Brigadier General Howard W. Moore, USAF, 816th Air Division Commander; Colonel W. W. Wilson, Director, Atlas F Construction Directorate, CEBMCO; Colonel John T. Compton, USAF, Altus Air Force Base Commander; Lieutenant Colonel Carl F. Baswell, CE, Altus Area Engineer; Mr. Bert Perkins, Los Angeles District Manager, MKH; and Mr. William McMurren, Altus Project Manager, MKH&A, were the principal speakers. The general public was permitted to tour the project. Photographs appear on pages 156 thru 162.

f. 8 November 1961 - Ceremony was conducted at Complex 5, Fargo, Texas, marking the turnover of that site (the last of 12) to the Using Agency. Major General A. C. Welling, USA, Deputy for Site Activation Ballistic Cystems Division, Air Force Systems Command; Brigadier General (then Colonel) Thomas J. Hayes, CE, Commanding Officer, CEBMCO; Colonel Woodrow W. Wilson, CE, Director, Atlas F Construction Directorate, CEBMCO; Colonel Ernest L. Ramme, USAF, Altus SATAF Commander; Lieutenant Colonel Carl F. Baswell, CE, Altus Area Engineer, and Mr.

CEREMONIES MARKING TURNOVER OF SITE 2, SNYDER, OKLAHOMA TO USAF
1 August 1961

General view of assembled guests


STOP

CEREMONIES MARKING TURNOVER OF SITE 2, SNYDER, OKLAHOMA TO USAF
1 August 1961

Col E. L. Ramme, USAF, Altus SATAF Comdr addressing assembled guests.

Date 8-T-61

TURNOVER TO AF

ALTUS AIR FORCE BASE 263

ALTUS [illegible]

Date 8-1-61

DI[illegible]

Site 2

Subject

Direction of View

Remarks: TURNOVER TO AF

CEREMONIES MARKING TURNOVER OF SITE 2, SNYDER, OKLAHOMA TO USAF
1 August 1961

Col J. T. Compton, USAF, Comdr, Altus AFB addressing assembled guests.

ALTUS AIR FORCE BASE- 267

Date 8-1-61

Photo No/- 2

Subject

Direction of View

Remarks: TURNOVER TO AF

CEREMONIES MARKING TURNOVER OF SITE 2, SNYDER, OKLAHOMA TO USAF
1 August 1961

Lt Col Carl F. Boswell, CE, CEBMCO Altus Area Engineer addressing assembly.

AIR FORCE BASE- 268

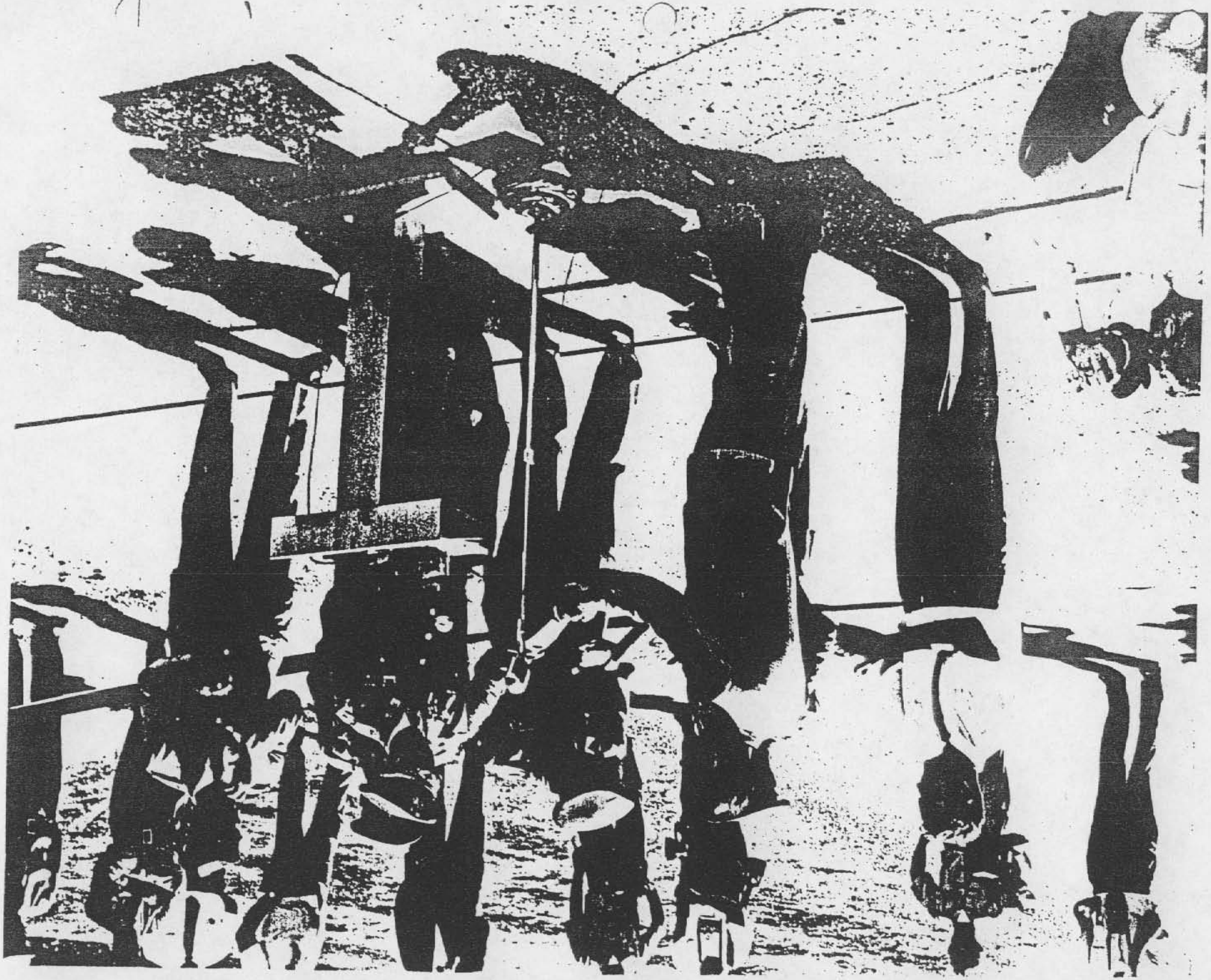
8-1-61

2

TURNOVER TO AF

CEREMONIES MARKING TURNOVER OF SITE 2, SNYDER, OKLAHOMA TO USAF
1 August 1961

Lt Col C. F. Baswell, CE, CEBMCO Altus Area Engineer congratulating Mr. W. McMurren, MKM & Assoc. upon completion of Site 2.



Altus Air Force Base 269

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Date 8-1-61

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Site No. 2

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CEREMONIES MARKING TURNOVER OF SITE 2, SNYDER, OKLAHOMA TO USAF
1 August 1961

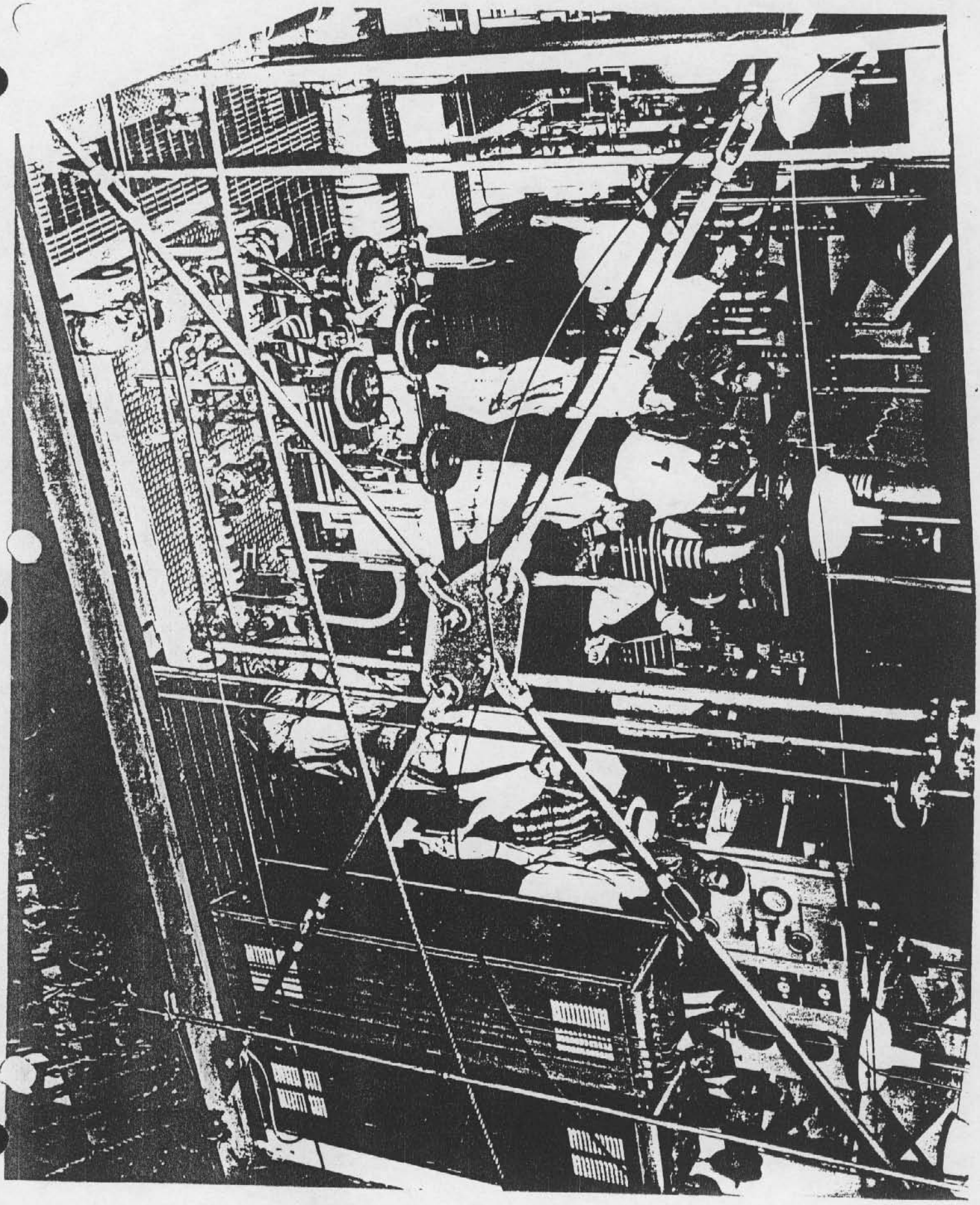
MG (then BG) H. W. Moore, USAF, Comdr, 816th Air Division, Altus AFB cutting ribbon.

270

8-1-61

2

TURNOVER TO AF



Bert Perkins, District Manager Los Angeles District, MKH, were the speakers. Photographs appear on pages 164 thru 167.

9-03. DECORATIONS AND AWARDS - a. U. S. Air Force Commendation Medal - Two medals were awarded to members of the Altus Area on 8 November 1961. Lieutenant Colonel Carl F. Baswell, CE, Altus Area Engineer and Captain Walter P. Tokarz, CE, received these decorations for exceptionally meritorious service in connection with construction of the Atlas F ICBM Complexes at Altus. It is interesting to note that these two officers were the first Army officers to receive these USAF decorations on Altus Air Force Base.

b. Outstanding Performance Award - Mr. Guss Green, GS-9, Construction Control, Construction Branch was presented this award.

c. Sustained Superior Performance Award - The following named employees of the Altus Area received the Sustained Superior Performance Awards:

(1) Mr. Walden J. Evans, GS-14, Deputy Area Engineer.

(2) Mr. Ira E. Williams, GS-14, Chief, Construction Branch (2 awards).

(3) Mr. Walter E. McGowan, GS-13, Assistant Chief, Construction Branch.

(4) Mr. Charles C. Hawkins, GS-13, Chief, Engineering Branch.

(5) Mr. Paul T. Roberds, Jr., GS-13, Chief, Contract Administration Branch.

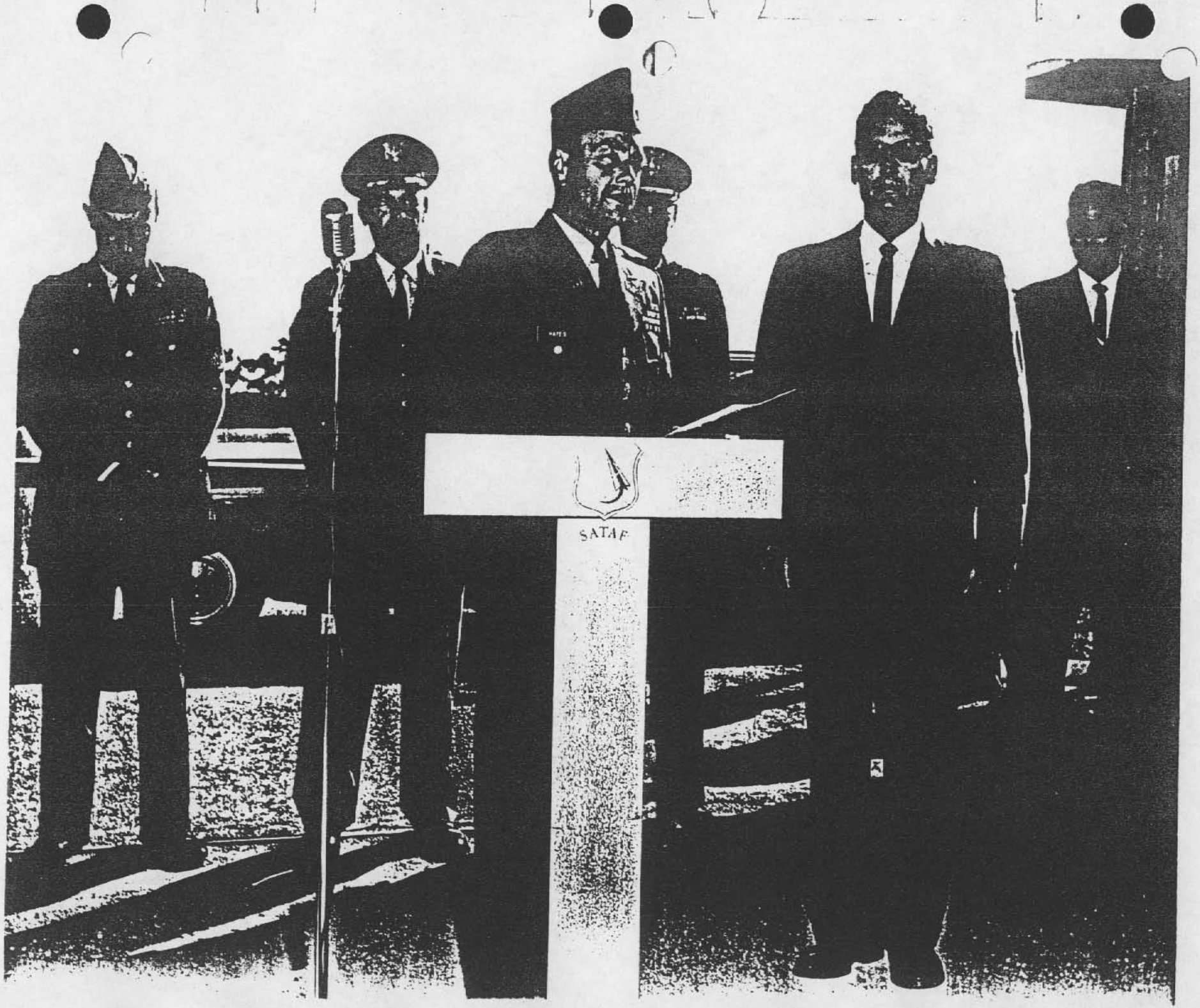
(6) Mr. William R. Major, GS-12, Structural Engineer,

CEREMONIES MARKING TURNOVER OF SITE 5, FARGO, TEXAS TO USAF
8 November 1961

BG (then Colonel) T. J. Hayes, USA, CO, CEBMCO presenting Mr. B. Perkins, VP, MKH with Certificate of Achievement.

In background (left to right): MG A. C. Welling, USA, Deputy for Site Activation, BSD; Col E. L. Ramme, USAF, Altus SATAF Comdr; Lt Col Carl F. Baswell, CE, CEBMCO Altus Area Engineer; Mr. W. McMurren, Altus Project Manager, MKH

Turnover To AF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CEREMONIES MARKING TURNOVER OF SITE 5, FARGO, TEXAS TO USAF
8 November 1961

Major General A. C. Welling, USA, Deputy for Site Activation, BSD addressing audience.

In background (left to right): BG (then Col) T. J. Hayes, USA; Col E. L. Romne, USAF; Lt Col Carl F. Baswell, CE; Messrs. B. Perkins and W. McMurren; Col W. W. Wilson, CE

Remarks: TURNOVER TO [illegible]

CEREMONIES MARKING TURNOVER OF SITE 5, FARGO, TEXAS TO USAF
8 November 1961

MG A. C. Welling, USA, cutting ribbon.

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ATLAS FACILITIES
Date 11-8-61
DA-[illegible]-eng-5909
Site USA- 5
Subject
Direction of View
Remarks: Turnover To AF

ALTUS AIR FORCE BASE- 357
ATLAS FACILITIES
Date 11-8-61
DA-34-066-eng-5909
Site 557- 5
Subject
Direction of View
Remarks: TURNOVER TO AF

CEREMONIES MARKING TURNOVER OF SITE 5, FARGO, TEXAS
TO USAF
8 November 1961

General View of Audience

Engineering Branch.

(7) Mr. Maurice Ellison, GS-12, Area Counsel.

(8) Mr. Pete Wylie, GS-12, Sector Coordinator, Construction Branch.

(9) Mr. Warren Wilson, GS-11, Mechanical Engineer, PLS Branch.

(10) Mr. W. L. Kliffel, GS-11, Construction Control, Site 5.

(11) Mr. Henry Adams, GS-9, Construction Control, Site 4.

(12) Miss Wayna L. Duffer, GS-5, Secretary, Executive Office.

(13) Mrs. Vera Wells, GS-4, Clerk-Steno, Office of Counsel.

(14) Mrs. Ruth Young, GS-4, Clerk-Steno, Engineering Branch.

(15) Mrs. Patricia Nagel, GS-4, Clerk-Steno, Construction Branch.

d. Suggestion Awards - (1) Mr. Allen Wooldridge, GS-12, was awarded $25.00 for his suggestion concerning the design and issue of a card size welder's certificate. Holders of such cards would be permitted to weld on any CEBMCO project without re-qualifying at each project.

(2) Mr. Henry Bradley, GS-11, was awarded $15.00 for his suggestion to overprint DD Form 96, "Disposition Form", to provide

a form whereby the inspectors on a site could transmit as-built information to the project engineer.

e. 20 Year Service Awards - (1) During 1960 the following named employees received 20 year awards:

(a) Mr. Otto A. Fusch

(b) Mr. James L. Findley

(c) Mr. Joseph W. Wilkins

(d) Mr. Francis W. Krshka

(2) During 1961 the following named employees received 20 year awards:

(a) Mr. Walden J. Evans

(b) Mr. J. L. Treadwell

(c) Mr. George J. Suchar

(d) Mr. Kermit V. Evans

(e) Mr. Henry L. Adams

f. 10 Year Service Awards - (1) During 1960 the following named employees received 10 year awards:

(a) Mr. Earl W. Johnson

(b) Mr. Claude Wynn

(c) Mr. Glenn Dean

(d) Mr. Charles C. Hawkins

(e) Mr. Benjamin Porter

(f) Mr. Julius A. Bell

(g) Mr. Allen M. Wooldridge

(h) Mr. J. T. Cavanaugh

(i) Mr. R. S. Lees

9-04. VISITS BY VIPS - The following named persons visited the Altus Area on the dates noted:

a. 28 April 1960 - Miss Ella Nance Ryan, Administrative Assistant to Congressman Toby Morris, 6th Congressional District of Oklahoma, visited the office to establish Congressional contact with Area Office key personnel.

b. 16 September 1960 - Lt General John P. McConnell, USAF, Commander 2nd Air Force (SAC) visited Complex 1 at Lone Wolf, Oklahoma.

c. 1 October 1960 - Brigadier General Joseph E. Gill, USAF, Deputy SATAF, Hq, AMC Ballistic Missile Center visited Complex 1, Lone Wolf and Complex 5, Fargo.

d. 6-7 October 1960 - Brigadier General Alvin C. Welling, USA, Commanding General, CEBMCO, visited Altus Area Office for briefing of construction status.

e. 15-16 October 1960 - Mr. H. M. Morrison, Chairman of the Board, Morrison-Knudsen Company, Inc. toured the Altus complexes.

f. 19 October 1960 - Major General T. P. Gerrity, USAF, Commander, AMCBMC toured the Altus complexes.

g. 9 November 1960 - Major General Ben I. Funk, USAF, Commander, SBAMA visited Complex 2, Snyder, and Complex 11, Manitou.

h. 27 February 1961 - General S. O. Anderson, USAF, Commander, AMC; Major General H. C. Porter, USAF, AMC, Chief of Plans; Major General R. G. Ruegg, USAF, AMC, Chief of Procurement; Brigadier General C. F. Dreyer, USAF, AMC, Chief of Civil Engineering visited Complex 11, Manitou.

i. 7 March 1961 - Brigadier General A. C. Welling, USA, Commanding General, CEBMCO, visited Altus Area Office and toured Complex 2, Snyder and Complex 11, Manitou.

j. 15 March 1961 - Mr. J. B. Bonny, President, Morrison-Knudsen Company, Inc visited Altus AFB for a briefing on construction status of missile launch complexes.

k. 7-9 November 1961 - Major General A. C. Welling, USA, Deputy for Site Activation, BSD, visited the Area Office for briefing on construction status and contract administration.

9-05. OTHER OFFICIAL VISITORS - During the period 10 March 1960 through 28 April 1962 the Altus Area Office was the host organization for some 117 official visitors or inspecting parties. See Appendix "D" for complete listing.

9-06. TECHNICAL LIAISON ACTIVITIES - a. Upon organization of the Altus Area Office, Mr. R. H. Holmes of the Tulsa District was assigned the responsibility of carrying out technical liaison activities for the Altus Area Office. These activities consisted of preparation of news releases and monthly progress photography to include black and white still photos; 35mm colored slides, and 16mm movies. The Tulsa District continued to provide this support until the 8th of November 1961 when the last launcher complex was turned over to USAF control. The files of this material are maintained in the Tulsa District.

b. On the local scene the Altus Air Force Base Information Officer, Major Louis A. Burdman, USAF, prepared news releases concerning activities of the Altus Area Office to the Altus daily newspaper, "The

Times-Democrat", as well as for other news media throughout Southwest Oklahoma. In addition, news articles appeared periodically in the Altus AF Base newspaper, "The Altus Word". All news articles were co-ordinated with the Area Engineer before release.

c. During the period from the opening of the Area Office to 28 April 1962 sixty-nine news articles appeared in newspapers originating in cities or communities located near the launch complexes under construction. These articles depicted some phase of the construction work under control of the Area Office. In addition, one nationwide news release was published by the Army Times, Washington, D. C. Copies of these releases were forwarded to CEBMCO and not retained in Area files.

d. On 2 July 1961 the Area Engineer appeared in a 45 minute panel discussion on KSWO-TV, Lawton, Oklahoma. Other members of the panel were Colonel Ernest L. Ramme, USAF, Altus SATAF Commander; Lt Col R. E. Jarrell, USAF, Deputy Commander, 577th Strategic Missile Squadron and Mr. J. N. McPheeters, Altus Manager, General Dynamics/Astronautics. The panel discussed the construction of the Atlas F ICBM Complexes in the Altus Area.

e. On 1 August 1961 a film clip of approximately 4 minutes duration, showing turnover ceremonies at the Snyder Complex was broadcast by KWFT-TV, Wichita Falls, Texas. On 8 November 1961 a film clip of approximately 5 minutes duration showing the turnover of the Fargo Complex to the USAF was broadcast by KWFT-TV, Wichita Falls, Texas.

f. In April 1960 the Area Engineer inaugurated a program

of providing guest speakers for community organizations desiring a briefing concerning the construction work under the control of the Corps of Engineers at Altus. By 28 April 1962 Area Office speakers have appeared before 46 organizations, i.e., Kiwanis, Lions, Rotary, Oklahoma Society of Professional Engineers, etc., with a total audience of 2,126 persons.

g. On 3 December 1960 twenty-six Engineer ROTC Cadets from Oklahoma State University and the University of Oklahoma were escorted through the complexes at Lone Wolf and Willow by Captains James R. McKnight, CE, and Walter P. Tokarz, CE, of the Area Office staff.

9-07. SCHOOLS AND SCHOOLING - a. Classes were conducted by the Construction Branch in the Area Office during the period preceding initiation of work for those personnel involved in the conduct of electrical, mechanical, and concrete inspection; excavation and backfill methods; and erection of reinforcing and crib steel. These classes consisted of 2 hour sessions at 2 week intervals.

b. Review of the proposed work on the Altus Complex had revealed that the Propellant Loading Systems work was unique in the heavy construction field. To insure proper PLS inspection 46 employees of the Area, to include each Project Engineer, were sent to the PLS school in Denver, Colorado. In addition 8 employees were placed on TDY status for on-the-job training at Fairchild, Vandenberg and Schilling Air Force Bases.

9-08. SECURITY - a. The Security Section was organized on 1 November 1960 with the appointment of Captain James R. McKnight, 073375, CE,

as Area Office Security Officer. This was an additional duty for this officer.

b. The functions of this section were to coordinate the storage and flow of classified plans and documents; prepare the Area Office procedures for the control of classified documents; the Area Security Program; the Emergency Removal Plan and account for Restricted Area Passes issued by the Air Force to certain employees of the Area Office.

c. On 21 November 1960 the Tulsa District transferred 21 sets of drawings and reproducibles classified "Confidential" pertaining to the installation of an Intrusion Alarm System for the Re-Entry Vehicle Facility to the Altus Area control.

d. On 14 December 1960 10 sets of these drawings were transferred by the Area Office to LaQua Construction Company of Lawton, Oklahoma, in order that work on the alarm system could begin. By 3 November 1961 all ten sets of drawings were returned to the Altus Area. The same day the reproducibles and one set of drawings were turned over to the Altus Air Force Base Civil Engineers. The remaining sets of these documents were destroyed by burning.

e. There were two staff security inspections of the Altus Area Office. On 6-7 March 1961 Warrant Officer R. W. Lucas of the CEBMCO Security Office and Major R. L. Lewis, INF, Security Officer, U. S. Army Engineer Division, Southwestern conducted the first inspection. The second inspection was conducted 10-11 August 1961 by Mr. C. D. Daniel, CEBMCO Security Office.

f. Upon arrival of Government Furnished Equipment the prime contractor provided watchman service on all launch complexes. Formal guard orders, on SAC Forms 299, were issued 1 June 1961 by the Base Commander.

g. The William J. Burns International Detective Agency, Inc., a subcontractor for GD/A assumed security on the launch complexes on the date that the final inspection for a particular complex was accomplished. Subsequent to the turnover of these security functions to the Burns Agency, Corps of Engineers contractor personnel were admitted to the sites on the basis of the various company badges. The Altus Area Office employees were admitted on the basis of the CEBMCO Area Badges, until March 1962 after which time both the Corps and contractor employees were admitted to the complexes only through the use of a SAC Form 300.

9-09. CLAIMS BOARD - In early March 1961 the Area Engineer, in order to insure prompt and uniform processing of contractual claims by the Area Office, appointed a Claims Board for the purpose of reviewing and determining recommendations for the allowance or disallowance of contractual claims submitted by the contractor. The board's recommendations, supported by a finding of fact were submitted to the Area Engineer for his recommendation in the matter to the Contracting Officer. During its existence the Area Claims Board reviewed 65 contractual claims. In addition the board also reviewed that correspondence received from the contractor which indicated possible action against the government. This review resulted in recommendations to the Area Engineer to the content

of the answer to the contractor.

9-10. INCENTIVE AWARDS COMMITTEE - In May 1961 the Area Engineer appointed an Area Office Incentive Awards Committee for the purpose of making a careful, expeditious, and impartial analysis and evaluation of employee suggestions, inventions, sustained superior performances, and other achievements originating in the Altus Area. This committee made recommendations to the Area Engineer who in furn forwarded his recommendations to the Tulsa District for processing.

9-11. VISITS BY THE ENGINEER INSPECTOR GENERAL - During the life of the Altus Area Office the command was inspected twice by field office representatives of the Office of the Engineer Inspector General. These general inspections were conducted by the personnel on the dates as noted below:

a. 24-25 April 1961 - Lieutenant Colonel Eugene E. Morath, Jr, 058980, CE, Assistant Engineer Inspector General, Atlanta Field Office, The Engineer Inspector General, Atlanta, Georgia.

b. 5-6 February 1962 - Colonel Clyde F. Townsend, 031526, CE, Assistant Engineer Inspector General, Chicago Field Office, The Engineer Inspector General, Chicago, Illinois accompanied by Mr. Miles E. Robertson, Los Angeles Field Office, The Engineer Inspector General, Los Angeles, California.

(NOTE - In both instances the overall Area Office operations were rated as Superior by these inspectors.)

9-12. APPOINTMENT OF ACTING INSPECTOR GENERAL - On 7 September 1961 Major Samuel C. Wood, 060598, CE, was appointed Acting Inspector

General for the Altus Area Office per Paragraph 6, Special Orders 55, Office of Chief of Engineers. During the interval 7 September 1961 to the close of the Area Office on 27 April 1962 no formal complaints were received or processed by the Area's Acting Inspector General.

CHAPTER 10

CONCLUSIONS AND RECOMMENDATIONS

10-01. GENERAL - This chapter of the Altus Area Office Historical Summary contains the conclusions and recommendations not outlined elsewhere in the text and reached from the joint experience of the Area staff in the internal operations of the office; construction operations in the field; and contract administration. To simplify presentation of this subject matter the following text is sub-divided into paragraphs containing the conclusions and recommendations keyed to each functional branch of the Area Office.

10-02. EXECUTIVE OFFICE

a. Security

(1) Employee Identification

CONCLUSION - The system used at Altus for employee identification was not entirely satisfactory. The Altus Area utilized an elliptical white badge 2-3/4 inches by 1-3/4 inches with 1/8 inch red lettering stating "ALTUS AREA OFFICE, CEBMCO, CORPS OF ENGINEERS". This badge had a transparent window which permitted the employee's name and job to be typewritten on a cardboard strip and inserted in the window. This type of identification was considered to be adequate at the time of procurement, however, with the large influx of SATAF personnel, contractor and GD/A employees, it became evident that a lost badge could be picked up and with a small amount of effort made to work for anyone desiring to effect an illegal entry to a complex.

RECOMMENDATION - Adopt a CEBMCO wide plastic laminated serially numbered

photographic type badge similar to the SAC Form 300 badge. This type identification would have a two-fold advantage: (a) Employees transferred from area to area would retain their badge, and (b) CEBMCO employees visiting another area would be able to gain entry to the sites without getting a new badge or visitor's permit.

b. Organization

(1) Assignment of Officers

CONCLUSION - The utilization of assigned company grade military personnel was unsatisfactory. RECOMMENDATION - In order to provide proper training and experience of company grade Corps of Engineer officers in heavy construction methods and exercise of control over civilian contractors on a military construction project such officer should be assigned duties on the actual construction site as project or resident engineers. Lack of any construction experience in these officers could be alleviated by the assignment of an experienced government employee as assistant resident or project engineer.

(2) Supply Functions

CONCLUSION - The assignment of supply functions to the Administration Branch of the Altus Area Office did not result in an efficient operation. Such an assignment created a division of responsibilities between the Contract Administration and Administration Branches. For Example: Contract Modifications involving the use of GFP were not always distributed to the Administration Branch for action by supply personnel, thus supply was not aware of the accounting requirement for certain items of GFP. In other instances reports required by

higher headquarters necessitated the accumulation of necessary data by personnel of both the Contract Administration and Administration Branches again creating a diversion of responsibilities. RECOMMENDATION - Supply functions be assigned to the Contract Administration element of a CEBMCO Area Office.

10-03. ADMINISTRATION BRANCH

a. Communications

(1) TWX Machine

CONCLUSION - The time difference between the Altus Area employees completing their normal workday 2 hours before their counterparts in CEBMCO headquarters. This fact generated an average delay in transmission of important TWX messages of some 16 hours during the week and 52 hours on weekends. RECOMMENDATION - Install an unattended TWX machine in the CEBMCO Area Offices. Cost of such an installation and monthly rental would approximately be $72.00 per year more than the rental of an unattended machine. Some $350.00 annual savings would be realized where considering, such as was the case in the Altus Area Office, the employee overtime expended while awaiting transmission of high priority messages after normal working hours and on Saturdays and Sundays.

(2) Telephone Switchboard

CONCLUSION - Long distance telephone calls were not satisfactorily controlled. In addition and on innumerous occasions occasions Area Office employees being called were phoned on the wrong Area Office number necessitating transferring calls to the right number

or calling employee to the telephone actually called. RECOMMENDATION - Install a telephone switchboard in the Area Office. Such an installation would permit:

(a) The switchboard operator to route incoming calls.

(b) Reduce the number of Class A phones and trunk lines in the Area Office.

(c) One individual, i.e., switchboard operator, to assign call numbers and maintain a log of long distance calls placed by the Area Office employees.

b. Reproduction

CONCLUSION - The use of a ditto machine for reproduction of Area directives and contract documents was not efficient or satisfactory. Ditto masters are limited in the number of copies, approximately 100 good copies, that they can reproduce. In addition ditto reproductions are subject to fading. RECOMMENDATION - Install and use the multilith process which permits good permanent copies.

10-04. ENGINEERING BRANCH

a. Mobilization of Engineering Branch

CONCLUSION - Mobilization of the branch was not timely. At Altus the mobilization of the branch was not fully accomplished until months after the contract award and the staff was not adequate enough to expeditiously process submittals. RECOMMENDATION - It is believed that the Engineering Branch in an Area Office must be mobilized a minimum of 3 weeks prior to the award of the prime contract.

This mobilization would permit extensive review of contract; posting of addenda; and preparation for approval of contractor's schedules of submittals.

10-05. CONTRACT ADMINISTRATION BRANCH

a. Estimating Section

CONCLUSION - The number of personnel (6) employed as estimators was insufficient to efficiently handle the workload. In this connection the quality of work produced by personnel on the Altus job left much to be desired. RECOMMENDATION - Hire sufficient number of qualified estimators to adequately handle the workload. At Altus four good estimators could have adequately taken care of this type workload.

10-06. SAFETY BRANCH

a. Safety Regulations

CONCLUSION - The safety regulations (EM 385-1-1) for work under the jurisdiction of the Corps of Engineers are inadequate for use on a missile construction project. These regulations do not take into consideration projects peculiar to the U. S. ICBM effort hence a contractor on a missile construction project can take refuge contractually in this lack of attention to missile site construction. RECOMMENDATION - Update EM 385-1-1 "General Safety Requirements" to include safety requirements concerning space age construction projects.

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61-9 "Functions of Office of Counsel"

61-18 "Organizational Analysis"

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60-31 "Investigating and Processing Non-Contractual Claims" w/1 change

FINANCE AND FISCAL

60-18 "TDY Personnel in Area Office"

AUDIT

61-42 "Liaison with U. S. Army Audit Agency"

FINANCIAL ADMINISTRATION

61-51 "Administrative Control of Appropriated Funds"

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60-8 "Transportation and Travel of Civilian Personnel" w/1 change

60-27 "Travel of Military Personnel"

MOTOR TRANSPORTATION

61-19 "Use of Car Rental System"

61-27 "Administration, Operation and Maintenance of Area Motor Vehicles"

AIR TRANSPORTATION

60-39 "Policy on Area Use of Helicopter Service"

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61-36 "Installation, Maintenance and Use of Telephone"

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61-29 "Quarterly Report of Provost Marshal Activities" (RCS: PMG-2(R-4))

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60-33 "Reporting Serious Incidents and Blue Bell Cases

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60-1 "CEBMCO Publication Media"

61-35 "External, Internal and Accountable Publications"

61-44 "Forms Management"

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61-14 "Reports Control System"

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60-4 "Correspondence and Messages" w/3 changes

60-10 "Addressing Correspondence"

60-15 "Multiple Address Correspondence"

60-24 "Office Information, Area Offices" w/4 changes

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60-20 "Mail Management"

61-38 "Contractor Register and Addressograph Mailing Service" w/1 change

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60-43 "Safeguarding Documents Marked FOR OFFICIAL USE ONLY"

61-13 "Contracts, Official Files of Record"

61-30 "Release of Information and Records" w/1 change

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60-38 "Preparation of Information for Public Release"

61-33 "Liaison with Members of Contress, State and Local Officials, and Civic Leaders"

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61-15 "Removal of Classified Documents"

61-16 "Office Security Procedures"

*61-25 "Security Classification Policy for Future ICBM Bases"

* For Official Use Only

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61-10 "Reporting Procedures for Fatalities, Accidents and Major Incidents"

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61-8 "Authority for and Operation of Defense Materials System"

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61-23 "Officer Efficiency Reports"

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60-32 "Standards of Conduct - Representation Before CEBMCO and Subordinate Commands in Connection with Claims against the United States"

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60-7 "Authorization and Control of Overtime for Civilian Personnel" w/2 changes

61-22 "Release and Placement Program for Civilian Personnel"

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61-37 "Inspection, Production Control and Expediting"

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61-49 "Preparation, Submission and Processing Reports of Survey"

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61-45 "Prevention of Intransit Damage to Components of ICBM Program"

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60-13 "Eight Hour Law - Employment Under Two or More Contracts"

60-14 "SOP for Establishment of Prequalified Bidders List - Intercontinental Ballistic Missile Program"

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GLOSSARY

-A-

AE	- Architect Engineer
AF	- United States Air Force
AFB	- Air Force Base
AFBMD	- United States Air Force Ballistic Missile Division
AFRCE	- United States Air Force Regional Civil Engineer
Air Force	- United States Air Force

-B-

BMC	- United States Air Force Air Material Command Ballistic Missile Center, Inglewood, California

-C-

CE	- Corps of Engineers
CEBMCO	- United States Army Corps of Engineers Ballistic Missile Construction Office
Chief of Engineers	- United States Army Chief of Engineers
CMR	- United States Air Force Contract Management Region
COC	- Change Order Conference
CVA	- Convair Astronautics, now General Dynamics/Astronautics, San Diego California

-D-

DAFC	- Department of the Air Force Civilian

GLOSSARY

-E-

E & T	- Engineering and Technical
EIG	- Engineer Inspector General
ENG	- Engineer

-F-

FRCP	- Facility Remote Control Panel
FY	- Fiscal Year, i.e., 1 July through 30 June

-G-

GD/A	- General Dynamics/Astronautics, originally Convair Astronautics
GEEIA	- Ground Electronics Engineering and Installation Agency
GFE	- Government Furnished Equipment
GFP	- Government Furnished Property
GSE	- Government Supplied Equipment

-H-

HV & AC	- Heating Ventilating and Air Conditioning

-I-

I & C	- Installation and Checkout
ICBM	- Intercontinental Ballistic Missile

GLOSSARY

-L-

LAFO	- Los Angeles Field Office, Office of Chief of Engineers, Los Angeles, California
LCC	- Launch Control Center
LOX	- Liquid Oxygen

-M-

MEL	- Master Equipment List
Mod	- Modification
MKH, MKH&A	- Morrison-Knudsen-Hardeman and Associates

-O-

OCE	- Office of Chief of Engineers, U. S. Army, Washington, D. C.

-P-

PLS	- Propellant Loading System

-R-

RIF	- Reduction in Force
RPIE	- Real Property Installed Equipment
RP-1	- Rocket Propellant Fuel

GLOSSARY

-S-

SAC	- United States Air Force Strategic Air Command
SATAF	- Site Activation Task Force, Altus AFB, Oklahoma
SB&TA	- Southwestern Building and Trades Association, Oklahoma City, Oklahoma
Site	- Location at which construction accomplished on missile launch silo; word has same connotation as "complex"
SOP	- Standard Operating Procedure
Southwestern Division	- United States Army Engineer Division, Southwestern, Dallas, Texas
SWD	- United States Army Engineer Division, Southwestern

-T-

TDO	- Tulsa District Office
TDY	- Temporary Duty
Tulsa District	- United States Army Engineer District, Tulsa, Tulsa, Oklahoma

-U-

USAF	- United States Air Force
Using Agency	- SATAF

-W-

WES	- United States Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi

NOTES

CHAPTER 1: GENERAL

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2. Aviation Week Magazine, 22 February 1960.
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4. Letter dated 4 November 1960 from Acting Director, Atlas F Construction Directorate to the Altus Area Engineer, subject: "Transfer of Construction of Atlas F Operational Base, Altus Air Force Base" outlining the then new command arrangements.
5. Annex B, Construction Division, "Time Phase Plan for ICBM Construction, Altus Oklahoma" published by the U. S. Army Engineer District, Tulsa, February 1960.
6. Paragraph 4, District Order 60-12, U. S. Army Engineer District, Tulsa, dated 1 March 1960.

CHAPTER 2: EXECUTIVE OFFICE

1. See Chapter 8, Engineer Manual 10-1-2 "Organization and Functions" 15 December 1958.
2. For details the reader is referred to the Tulsa District's publication "Time Phase Plan for ICBM Construction, Altus, Oklahoma" February 1960.
3. Captain Maury F. Cochran, Jr., 070303, Corps of Engineers, was assigned per Paragraph 10, Department of Army Special Order 162 dated 26 July 1960.

4. Captain James R. McKnight, 073375, Corps of Engineers was assigned per Paragraph 10, Department of Army Special Order 219 dated 27 July 1960.

5. Major Samuel C. Wood, 060598, Corps of Engineers, was assigned per Department of Army Message 61315 dated 23 September 1960 and an amendment thereto per Department of Army Message 61628 dated 27 September 1960.

6. Captain McKnight reassigned per paragraph 99, Special Order 260, Department of the Army dated 18 October 1961.

7. Lt Col Baswell was reassigned per Paragraph 10, Special Order 251, Department of the Army dated 9 October 1961 and amended by Department of Army Message file AGPA-O 79477, dated 28 February 1962.

8. Major Wood was appointed Acting Area Engineer per Paragraph 2, Special Order 14, CEBMCO, dated 27 February 1962.

9. These contracts were:

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DA-34-066-eng-5967	Unitary Silo Water Supply
DA-34-066-eng-5970	25-Ton Liquid Oxygen Plant
DA-34-066-eng-5979	Missile Assembly and Technical Supply Building
DA-34-066-eng-5992	Re-Entry Vehicle Facilities

10. Colonel Howard W. Penney, 022917, Corps of Engineers, District Engineer, U. S. Army Engineer District, Tulsa.

11. Colonel Woodrow W. Wilson, 021755, Corps of Engineers, Director,

Atlas F Weapons System Directorate, U. S. Army Corps of Engineers Ballistic Missile Construction Office

12. See "Statement of Functions for the Altus Area Office, Atlas F Construction Directorate" published by Atlas F Construction Directorate, CEBMCO 12 April 1961.
13. CEBMCO Message File ENGMA-VY 23023 dated 17 March 1961.
14. CEBMCO Message File ENGMA-ABM 5709 dated 18 May 1961.

CHAPTER 3: ADMINISTRATION BRANCH

1. Quoted from the Tulsa District's publication "Time Phase Plan for ICBM Construction" March 1960.
2. Standard Form 57 "Application for Federal Employment".
3. Conference was attended by Colonel H. W. Penney, CE, Tulsa District; Colonel (then Lieutenant Colonel) A. W. Sanders, CE, CEBMCO; Lieutenant Colonel C. H. Chamberlain, CE, CEBMCO; and Lieutenant Colonel (then Major) C. F. Baswell, CE, Altus Area.
4. Inclosure to letter Atlas F Construction Directorate, CEBMCO 13 Sept 1960 to the Division Engineer, Southwest Division.
5. TWX, CEBMCO, 17 October 1960, file number unknown. This TWX was actually relayed to the Altus Area by telephone and information concerning its contents was derived from notes made by Chief, Administration Branch, Altus.
6. TWX, CEBMCO, 21 October 1960, file ENGMA-VC 2727. This authorization was to be terminated 28 February 1961 and the strength to revert to 168.

7. ENG Form 2673, Voucher ENGMA-AB-A-1-61, 8 February 1961.
8. ENG Form 2673, Voucher ENGMA-AB-A-2-61, 13 February 1961 withdrew 13 temporary spaces and authorized 1 temporary space through September 1961.
9. Comment 1, DF, Director Atlas F, CEBMCO to Altus Area Engineer, 24 March 1961 established strengths: 31 March - 167; 30 April - 160; 31 May - 150; 30 June - 140.
10. Comment 2, 31 March 1961 to DF noted in above (note 9) requesting personnel ceilings of 31 March - 168; 30 April - 168; 31 May - 162; 30 June - 156.
11. DF, Atlas F, CEBMCO, 21 June 1961 to Area Engineer.
12. ENG Form 2673, 3 July 1961, Voucher ENGMA-AB-A-1-62 reflected the following personnel authorizations for the Altus Area Office: 11 July - 150; 31 August - 135; 30 September - 120; 30 November - 45; and 31 December - 40.
13. TWX, CEBMCO, 3 August 1961, file ENGMA-AB-4-6030 also designated key personnel in the Area Office.
14. Submission of Standard Forms 57 and 556 to appropriate recruiting districts.
15. TWX, CEBMCO, ENGMA-AB-4-6213, 26 September 1961.
16. TWX, U. S. Engineer District, Fort Worth, 20 October 1961, file MRKDF-E 220 stated that the Whiteman Minuteman Project was delayed. Flights A-E delayed by 30 days; Flights F-J delayed to 15-20 April 1962; and Flights K-O delayed to 15-31 May 1962.
17. TWX, CEBMCO, file ENGMA-VL-1-10579, 17 November 1961.

18. Personnel had been selected in a conference held in the offices of the U. S. Army Engineer District, Kansas City 30 September 1961. The Altus Area Engineer, Lt Col Carl F. Baswell attended this conference.
19. District Order 60-12, U. S. Army Engineer District, Tulsa 1 March 1960. The account number was #15.
20. Mr. C. W. Surbey, Account #17.
21. DF, Altus Project Engineer, 14 April 1960 to Altus Area Engineer, subject: "Government Property".
22. Mr. Evans was formally notified of this appointment by CEBMCO in a letter dated 29 November 1960, however, the effective date of this action wasn't until 1 December 1960.
23. Vehicles procured from the Tulsa District were Ordnance owned while the purchased vehicles were project owned.
24. Per TWX, CEBMCO, file ENGMA-VO-4-26364, 27 December 1961.
25. This shipment of vehicles consisted of 6 - 1/2-ton pickups and 12 - six passenger pickup trucks per instructions contained in TWX, CEBMCO, file ENGMA-VO-4-26366, 28 December 1961.
26. Shipment consisted of 4 - 1/2-ton pickup trucks.
27. Per TWX, CEBMCO file ENGMA-VO-4-26019, 18 January 1962. Shipment consisted of 10 - 1/2-ton pickups and 2 six passenger pickup trucks.
28. Shipment was made up of 9 - 1/2-ton pickup trucks, 8 sedans, and 1 carryall per CEBMCO TWX file ENGMA-VO-26056.
29. Per DF, CEBMCO, file ENGMA-V, 19 February 1962.
30. Per TWX CEBMCO, file ENGMA-VO-4, dated 26 February 1962.

31. Paragraph 6, Special Orders 29, CEBMCO, 22 November 1960.

32. Paragraph 6, Special Orders 17, CEBMCO, 15 March 1961.

33. Paragraph 3, Special Orders 44, CEBMCO, 10 August 1961.

34. Paragraph 2, Special Orders 44, CEBMCO, 10 August 1961.

35. Paragraph 6, Special Orders 24, CEBMCO, 18 April 1962.

36. Standard Form 1012 "Travel Voucher" was prepared by the Area Office.

37. 57x3300 077-6526 P321 S34-066. Accounting activities were governed by Tulsa District's Manual "Military Field Cost Accounting Manual".

38. Tulsa District Letter, 9 November 1960, subject "Withdrawal of Funds" notified the Area Engineer that CEBMCO would assume responsibility for Altus 1 December 1960. This letter was confirmed by TWX CEBMCO, file ENGMA-VC-3 5617, 1 December 1960.

39. Use of Standard Forms 44 and 1155.

40. Approximately 18,000 gallons of gasoline.

41. Timekeepers were: Mrs. R. A. Young, Engr Br; Mrs. M. Blackmon, Contract Admin Br; Mrs. P. A. Nagel and Mrs. W. P. Tokarz, Construction Br; Mrs. W. G. Baer, Miss D. T. Anderson, Mrs. R. Thomason (alternate), and Mrs. L. Wilson, Admin Br.

42. Southwestern Division Form 16-J.

43. CEBMCO letter, file ENGMA-VC-1, 22 March 1961, subject "Staff Internal Review - Altus Area Office, Report No AL-1".

44. CEBMCO Atlas F Memo No. 61-21, 30 June 1961, subject "Timekeeping and Maintenance of Leave Records in Area Offices".

45. Radio equipped vehicles were allotted to the Area Engineer; Deputy Area Engineer; Chief of the Construction and PLS Branches; Chiefs

of the Structural and Electrical Sections; the Sector Engineers and the Mechanical Inspectors.

CHAPTER 4: ENGINEERING BRANCH

1. Mr. C. C. Hawkins, GS-13 (then GS-12).
2. General Engineer, GS-12; Mechanical Engineer, GS-12; Electrical Engineer, GS-12; Structural Engineer, GS-12; 2 Mechanical Engineers, GS-7; and a Draftsman, GS-5.
3. General Engineer, GS-13; 2 Structural Engineers, GS-12; Mechanical Engineer, GS-12; Electrical Engineer, GS-12; Mechanical Engineer, GS-11; 3 Mechanical Engineers, GS-9; Draftsman, GS-9; Clerk-Stenographer, GS-4; and Clerk-Typist, GS-3.
4. Lt Lee had been performing duties since 21 October 1960 as the assistant to the Project Engineer for the Altus "On Base" facilities. He departed this command pursuant to DA Message AGP-O 61148 dated 10 July 1961.
5. Bechtel Corporation, Los Angeles, California was responsible for the Unitary Launch Silo while Stearns-Roger of Denver, Colorado had the responsibility of making site adaptations.
6. Major J. M. Pierce, USAF; Mr. F. L. Huok, DAFC, GS-13; Mr. W. R. Holland, Bechtel Corporation Senior Technical Representative; Mr. C. G. Fort, Bechtel Corporation Electrical Engineer; and Mr. C. G. Boltons, Jr., Bechtel Corporation Mechanical Engineer.

CHAPTER 5: CONSTRUCTION BRANCH

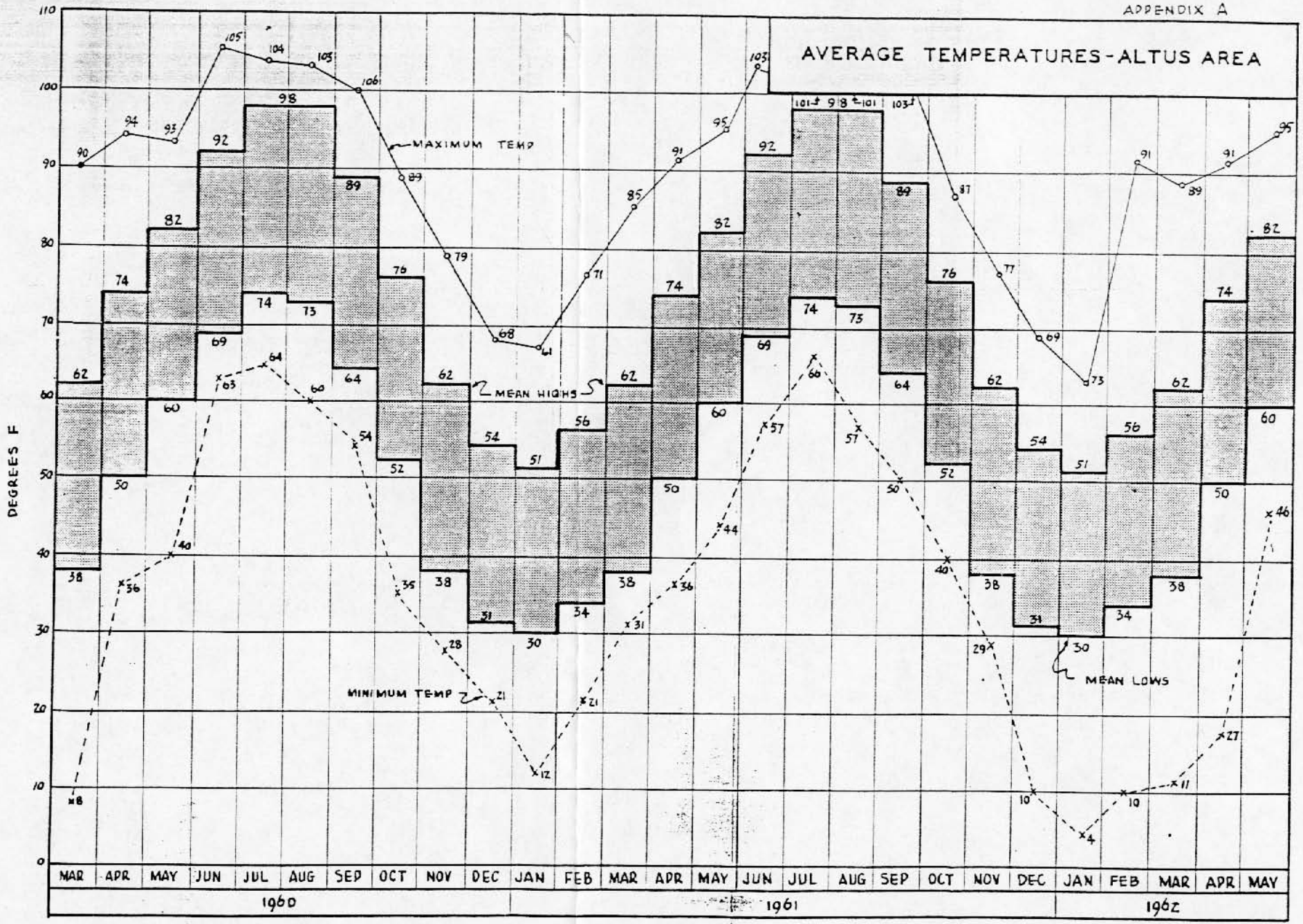
1. Mr. Ira E. Williams, GS-14 (then GS-13).
2. Annex B, Time Phase Plan for ICBM Construction, Altus, Oklahoma.
3. Actually a project office was to consist of a Supervisory Construction Engr, GS-12; a Construction Mgmt Engr, GS-11 and 3 Construction Inspectors, General, 1 - GS-9 and 2 - GS-7's.
4. Captain Walter P. Tokarz, 087949, CE was assigned to Altus Area Office by DA TWX AGPA-07769 dated 27 July 1960. Departed 27 November 1961 per Par 46, DA SO 185 dated 27 July 61 and LO-9, CEBMCO 15 November 1961.
5. Par 88, DA SO 88 dated 9 August 1961.
6. For complete listing refer to Report ENGMA-AB-28 prepared semi-monthly by Area Office. Reports filed at CEBMCO Headquarters.
7. Does not include cap and overhead doors. All future references with a similar connotation.
8. Less cap and overhead doors. All future references to a silo concrete pour in a similar connotation.
9. As substantially complete. All future references in this section of text will have similar connotations.
10. Claims submitted by the contractor totaled $2,452,000.00.
11. Primarily Southwestern Oklahoma Building & Construction Trades Council, Oklahoma City, Oklahoma.
12. Major Robert P. McMath, 060603, CE, was assigned to the Area by DA TWX AGPA-O 63401 dated 26 October 1960. Departed 10 December 1961 per Par 97, DA SO 97 dated 7 September 1961.

CHAPTER 6: CONTRACT ADMINISTRATION BRANCH

1. 1 - GS-13 (Chief of Branch), 1 - GS-12 (Expediter), 2 - GS-11's (Estimators), 1 - GS-11 (Reports), 1 - GS-11 (Change Orders), 2 - GS-9's (Change Orders), 1 - GS-7 (Reports), and 2 - GS-3's (clerks).

2. These functions are outlined in detail in: "Anex B, Time Phase Plan for ICBM Construction, Altus, Oklahoma" published by U. S. Army Engineer District, Tulsa, February 1960; SOP I-1 "Organization and Functions of Altus Area Office", published by CEBMCO Altus Area, 20 January 1961; and "Statement of Functions for the Altus Area Office, Atlas F Construction Directorate" published by the Atlas F Construction Directorate, CEBMCO, 12 April 1961.

APPENDIX A



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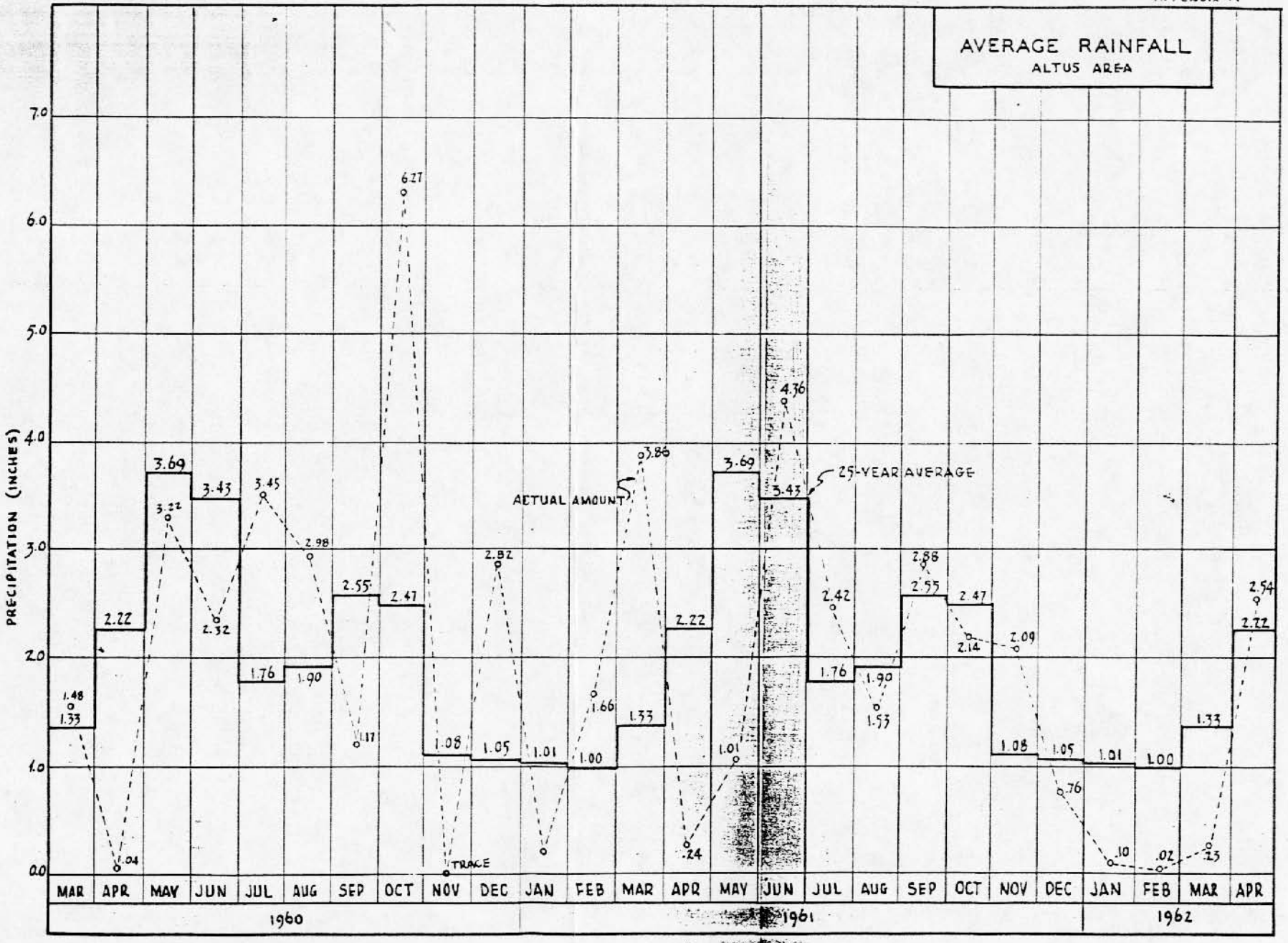

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APPENDIX B

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

ENGMA-AB-A

20 January 1961

SUBJECT: SOP I-1
Organization and Functions of Altus Area Office

TO: See Distribution

SECTION I - GENERAL

1. Purpose.

This SOP is published to establish the functional responsibilities of the various operational elements of the Altus Area Office.

2. Reference.

EM 10-1-2 and changes thereto.

3. Mission.

a. The Area Engineer is directly responsible in the chain of command to the Director, Atlas F, Corps of Engineers Ballistic Missile Construction Office. He and his staff consitute the Area Engineer Office which is the operating component of the Atlas F Directorate, CEBMCO to which broad missions have been assigned as noted in paragraph b below for performance and accomplishment within the area defined by the locations of the Atlas F ICBM complexes in the vicinity of Altus, Oklahoma.

b. The Area Engineer, with the delegation of authority as a representative of the Contracting Officer, is responsible for inspecting the construction of all work under his jurisdiction, for gathering and recording all data pertaining to the execution of each contract, for preparing all reports, payment estimates and other required information and for carrying out the established policies of CEBMCO and OCE.

SECTION II - ORGANIZATION

4. Organizational Chart.

Chart showing Area Office organization is shown in Appendix 1.

SECTION III - STATEMENT OF FUNCTIONS

5. Executive Office.

a. Area Engineer.

(1) Directs administration, supervision and inspection of all contract construction assigned to the Area Office.

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(2) Acts as the authorized representative of the Contracting Officer.

b. Deputy Area Engineer.

(1) Assists the Area Engineer, and acts as the Area Engineer during periods when the Area Engineer is absent from the Area.

(2) Provides direction to the technical and advisory and administrative staff in all matters of a technical and management nature.

(3) Supervises special projects as may be assigned by the Area Engineer.

c. Executive Officer.

(1) Assists the Area Engineer and the Deputy Area Engineer in a staff capacity in delegated matters not requiring the immediate or personal attention of those officials.

(2) Normally, assumes duties which include coordination, review or approval of matters where guidelines of action have been clearly defined.

(3) Serves as focal point in all matters relating to the Administrative and Advisory staff.

(4) Coordinates matters of organization, personnel staffing and space allocation.

(5) During the absence of the Area Engineer acts as the authorized representative of the Contracting Officer.

(6) Serves as the principle administrative assistant to the Executive Office.

(7) Coordinates in those matters relating to overall administration where executive action is required.

(8) Supervises military personnel administration as directed.

(9) Performs additional duties as specifically assigned.

d. Briefing and Liaison Officer.

(1) Serves as the Area Technical Liaison Officer.

(2) Conducts technical briefing for official visitors to the Area Office.

(3) Escorts visiting civil and military dignitaries to and around missile construction sites.

(4) Effects liaison, as related to missile site construction between the Area Engineer and Air Force missile organizations located on Altus Air Force Base.

(5) Conducts weekly construction status briefings for SATAF Commander and staff; staff representatives of the Altus AFB Commander; and Liaison Officers of the 11th Bombardment Wing.

(6) Provides factual information in usable form to general public in connection with activities, policies, and procedures of the Area Engineer's Office.

(7) Monitors Area security programs.

e. Supervisory Construction Management Engineer.

(1) Assists Area Engineer with the preparation and defense of government cost estimates covering modifications and changes affecting the project.

(2) Coordinates Area staff activities concerning the development or preparation of government cost estimates.

(3) Participates in negotiation proceedings to defend and/or clarify government cost estimates.

(4) Makes field visits to observe and discuss with Area Office field personnel the scope and effect of design changes having a bearing on cost estimates.

6. Safety Branch.

a. Assists the Area Engineer in administration of the Corps of Engineers Safety Program within the Area.

b. Provides for frequent safety inspections at all work sites.

c. Advises the Area Engineer of potential safety hazards on all sites which he is unable to have corrected.

d. Prescribes and coordinates a balanced program of safety activities.

e. Assures prompt reporting of accidents.

f. Prepares formal reports of findings with recommended corrective action on all accidents and serious hazards which hamper efficient uninterrupted construction progress.

g. Prepares recurring safety reports.

7. Office of Counsel.

a. Assists and advises the Area Engineer and his supporting elements on legal matters except Real Estate.

b. Renders staff advice in the negotiation and preparation of contractual documents and reviews all contract actions for legal sufficiency.

c. Prepares necessary action concerning all contractual and non-contractual claims for the Area.

d. Processes settlement of contractual documents as delegated by the Office of Counsel, CEBMCO.

e. Prepares action on appeals made by contractors to decisions made by the Contracting Officer or Contracting Officer's Representative.

f. Prepares litigation reports as required.

8. Administrative Branch.

a. Furnishes administrative services to all elements of the Area and Project and Resident Offices as required.

b. Receives and distributes incoming, and collects and dispatches outgoing communications to include those of a classified nature.

c. Maintains the Area general and special files to include these allied functions of records management.

d. Provides for the establishment and operation of electrical communication facilities.

e. Operates the motor pool.

f. Monitors Management Improvement Program and Incentive Award Programs and other similar special activities as assigned.

g. Monitors civilian personnel program for the Area, time and attendance reporting, maintenance of leave records, and other related records and reports.

h. Handles property and supply functions, including procurement, accounting, issuance of supplies and other related activities to include the maintenance of government furnished and accountable property records.

i. Supervises custodial services.

j. Processes Area budget, Area cost records, and Area cost reporting.

k. Provides stenographic and typist assistance to other branches when required.

l. Provides reproduction services.

m. Prepares transportation requests, travel orders, bureau vouchers, and arranges transportation and reservations as required.

n. Assumes initial responsibility for any function not assigned to another branch.

o. Maintains budget control of contract construction costs.

p. Prepares for signature, in coordination with the Contract Administration and Engineer & Technical Branches, all ENG Forms 290 and the related transfer documents and provide for the distribution of ENG Forms 290 and other documents required in conjunction with transfer of construction.

q. Performs labor relations functions, assuring enforcement of contract labor standards and promoting good working relationships between the Corps of Engineers, organized labor and contractors.

r. Receives, reviews, and initiates necessary action on all contractors' payrolls.

s. Monitors small purchase procedures for the Area.

t. Insures a property list included in the construction transfer documents are in proper form for property accounting.

9. Contract Administration Branch.

a. Assists the Area Engineer in the supervision of all contract administration work for contracts assigned to the Area Office.

b. On receipt of recommendations from the Engineering Branch, initiates change order action with the contractor, prepares government estimate when required, conducts negotiations and prepares and distributes modification documents. Initiates and carries to completion administrative modifications.

c. Prepares contractor pay estimates from information received from the Construction Branch and from the contractor.

d. Prepares progress reports from information received from the Construction Branch.

e. Initiates action and follow-up on all government furnished equipment from commencement of construction until arrival at job site or railhead.

f. Initiates action, maintains records, and prepares reports for all expediting of construction materials.

g. Reviews specifications prior to bid openings and furnishes Engineering Branch with comments for addends changes.

h. Maintains a register of proposed Change Orders and modifications within the Area Office.

i. Furnishes monthly to Administration Branch current and projective contractor's earnings for incorporation into Area cost reports.

j. Prepares reports required by EM 415-4-331.

k. Prepares justification for additional funds when the need is generated by proposed modifications or claims.

l. Assists the Office of Counsel in preparing findings of fact and in the resolution of contractor claims.

m. Assists the Office of Counsel in processing contract terminations and negotiation of settlement.

n. Contacts Project and Resident Engineers and other elements of the Area Office and the CEBMCO Atlas F Directorate as necessary in connection with processing of contract modifications.

o. Arranges for photographs of project features at important stages of progress.

p. Controls government and contractor-supplied materials and equipment, and expedites and administers the Defense Materials System to insure timely arrival of materials and equipment.

q. Contacts manufacturers and suppliers and assists in obtaining delivery by required dates.

1C. Construction Branch.

a. Supervises and inspects all contract construction work assigned to the Area Office.

b. Coordinates and formulates construction schedules in conjunction with Engineer and Contract Administration Branches for effective prosecution of the work.

c. Coordinates changes to meet existing field changes.

d. Assists as requested in the preparation of estimates, the negotiation of modifications, and the review and settlement of contractual claims.

e. Compiles daily reports of work accomplished, decisions made, action taken, working conditions, comments on progress, and evaluates the current status of all construction.

f. Coordinates closely with the Safety Branch and takes expeditious action to implement safety features agreed to be necessary.

g. Monitors as-built drawings concurrently as the work is completed.

h. Conducts inspector training program.

i. Supervises the operations of Sector Engineers and Project Engineers and conducts frequent inspections of construction activities.

j. Provides Contract Administration Branch with feeder reports upon which pay estimates and progress reports are based.

k. Reviews all proposed changes for construction feasibility and time and acceleration impact, making appropriate recommendation to the Contract Administration Branch.

l. Arranges for all transfers of construction to the using agency, providing Aiministration Branch with necessary data required from the field for preparation of ENG Form 290 and related transfer documents.

m. Promptly advises Engineering Branch of any conflicts in design deficiencies as soon as they are noted.

n. Reviews plans and specifications prior to bid openings and furnishes comment as to desirable addenda changes to the Engineering Branch.

o. Establishes and furnishes to Contract Administration Branch construction completion and acceptance dates.

p. Directs the Area Survey crew.

q. Operates Area soils, concrete, and materials testing laboratory.

11. Engineering and Technical Branch.

a. Provides general engineering and specialized technical services in support of construction activities.

b. Provides for the procurement, receipt, technical review, approval and proper distribution of plans, specifications, shop drawings and mterial samples.

c. Supervises contracts for services of A-E's and special consultants in connection with its field of responsibility.

d. Furnishes technical advice and assistance for special tests as required.

e. Initiates or reviews requests for changes in design to meet existing conditions.

f. Prepares revised plans and specifications, government cost estimates, and other engineering data required for contract modifications.

g. When requested by Contract Administration Branch, provides technical assistance and advice in negotiations of contract modifications.

h. Performs emergency design and prepares supplemental drawings, layout sheets and similar material for field offices.

i. Performs miscellaneous drafting for all elements of the Area Office.

j. Maintains current as-built drawings, using data obtained from Construction Branch.

k. Maintains the record set of contract plans and specifications.

l. Maintains shop drawing record files.

m. Maintains a suspense register for samples, shop drawings, test results and similar data required under each contract, and insures timely receipt approval.

n. Supervises contracts for AE services in connection with its field of responsibility.

o. Assists Construction Branch in performing technical and engineering approvals of soils, concrete, and other materials.

p. Resolves conflicts in design and, where necessary, recommends Change Order action to Contract Administration Branch.

q. Furnishes limited estimating support to Contract Administration Branch.

r. Assists as requested in negotiation of modifications and the review of a settlement of contractual changes.

s. Performs engineering inspections of construction to insure adequate construction standards in compliance with all design criteria upon request of the Construction Branch.

t. Maintains liaison with architect-engineer, using agency, Atlas F Directorate, supporting district, and other concerned agencies on engineering and technical matters.

u. Maintains master equipment list.

v. Maintains technical library for Area Office.

12. PLS Branch.

a. Assists the Area Engineer by providing specialized technical advice on the procurement, installation, and testing of propellant loading systems.

b. Acts as the Area liaison element with the PLS Division of CEBMCO.

c. Provides technical advice during the construction, installation and field operational testing stage for final acceptance.

d. Coordinates with the Construction Branch the activities of PLS inspectors and the PLS inspection service to operational sites.

e. Conducts PLS inspector training.

f. Coordinates with all branches of the Area in phases of their work involving PLS equipment or materials.

13. Sector Engineer.

The following general functions are performed under the staff supervision of the Chief, Construction Branch.

a. Supervises and inspects construction on four Atlas F Missile Sites at widely separated locations and in different stages of construction.

b. Effects liaison between project engineers and the Area Office concerning construction deficiencies and solution to field problems.

c. Relays Area Office instructions for construction changes.

d. Responsible for safe working conditions at the sites under his control.

14. Project Engineer.

The following general functions are performed under the supervision of the Sector Engineer.

a. Actively supervises and inspects contract construction work on an Atlas F Missile Site.

b. Reviews plans and specifications on any new site work for adequacy.

c. Responsible for safety on his respective work site.

d. Accomplishes materials inspections for material delivered and used at the construction site.

e. Supervises the work and utilization of Corps of Engineers personnel assigned to his work site.

f. Assists in accomplishing final inspection of facility upon completion.

15. On-Base Project Engineer.

The following functions are performed under the staff supervision of the Chief, Construction Branch.

a. Actively supervises and inspects contract construction work on Atlas F Missile Support Facilities on Altus Air Force Base.

b. Accomplishes inspection of construction material delivered and used at his sites.

c. Responsible for insuring the use of safe working practices on sites under his control.

d. Supervises the work and utilization of Corps of Engineers employees assigned to his sites.

e. Assists in accomplishing final inspection of facilities at his sites.

Carl F. Baswell

CARL F. BASWELL
Lt Colonel CE
Area Engineer

1 Incl
Appendix 1

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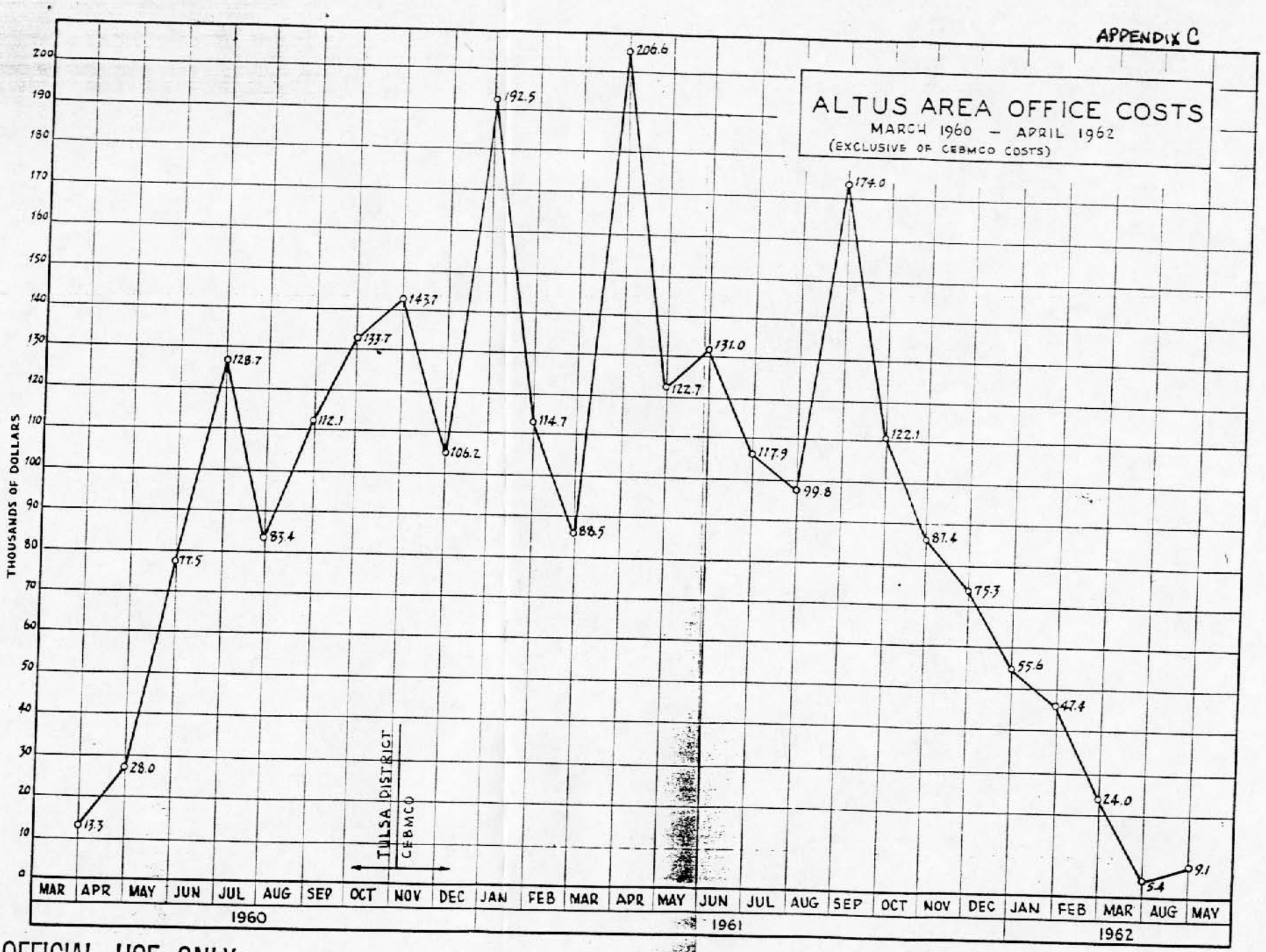
APPENDIX C



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APPENDIX D

STAFF VISITS AND INSPECTIONS

ALTUS AREA OFFICE, CEBMCO

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
10 Mar 60	OCE	Lt Col R. G. Liebhardt	Construction
4 May 60	OCE	Lt Col R. J. Shreder & party	Paving Opns
10 May 60	TDO	Col H. W. Penney & party (District Engineer)	Construction
27 May 60	SWD	C. J. Kocian & party (Asst Chief, Constr Div)	Construction
9 Jun 60	SWD	C. J. Kocian & party (Asst Chief, Constr Div)	Construction
9 Jun 60	LAFO-OCE	Harold J. Brown & party (CONSTR Div Rep)	Construction
30 Jun 60	TDO	Col H. W. Penney & party (District Engineer)	Conference
30 Jun 60	SWD	D. W. Love & party (Chief, Constr Div)	Conference
28-29 Jul 60	TDO	Col H. W. Penney & party (District Engineer)	Scheduling Conference
28-29 Jul 60	SWD	Col John E. Carroll (Actg Deputy Div Engr)	Scheduling Conference
28-29 Jul 60	LAFO-OCE	Mr. Wm A. Micam	Scheduling Conference
8-9 Aug 60	TDO	Col H. W. Penney & party (District Engineer)	Conference
8-9 Aug 60	CEBMCO	Lt Col A. W. Sanders (Chief, PLS Div)	PLS
8-9 Aug 60	CEBMCO	Lt Col C. H. Chamberlain (Chief, Engr Div)	Engineering

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
31 Aug 60	TDO	Col H. W. Penney & party (District Engineer)	Conf on Delays
7 Sep 60	OCE	Lt Col R. J. Shreder & party	Concrete Inspection
6-8 Sep 60	SWD	J. F. Gay (Paving Engr)	Concrete Inspection w/OCE Team
7-8 Sep 60	CEBMCO	Col E. D. Comm (Director, Atlas F)	Staff Visit
15 Sep 60	SWD	Col John E. Carroll (Actg Deputy Div Engr)	Construction
27-28 Sep 60	TDO	Lt Col T. D. Quaid & party (Deputy District Engr)	Chg Ord Conf
6-7 Oct 60	CEBMCO	Brig Gen A. C. Welling & party (CG)	Command Insp
6-7 Oct 60	SWD	Col Stanley G. Reiff & party (Dep Div Engr)	Construction
10-11 Oct 60	TDO	Col H. W. Penney & party (District Engineer)	Construction
10-11 Oct 60	SWD	Col John E. Carroll (Actg Deputy Div Engr)	Construction
10-11 Oct 60	CEBMCO	Lt Col T. F. Spencer (Engr Div, Atlas F)	Construction
10-11 Oct 60	OCE	Col F. P. Koisch	Construction
18-19 Oct 60	SWD	C. J. Kocian & party (Asst Chief, Constr Div)	Construction
18-20 Oct 60	TDO	Col H. W. Penney & party (District Engineer)	Construction
22 Oct 60	CEBMCO	G. J. Byrnes (Deputy Dir, Atlas F)	Staff Visit
25-26 Oct 60	TDO	Col H. W. Penney (District Engineer)	Construction

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
28 Oct 60	TDO	Col H. W. Penney (District Engineer)	Staff Visit
28 Oct 60	CEBMCO	Col W. W. Wilson (Director, Atlas F)	Staff Visit
3 Nov 60	OCE	Col B. DeMelker	Staff Visit
3-4 Nov 60	TDO	Col H. W. Penney (District Engineer)	Construction Command Turn-over TDO to CEBMCO
4 Nov 60	CEBMCO	Col W. W. Wilson (Director, Atlas F)	Staff Visit Command Turn-over TDO to CEBMCO
8-9 Dec 60	TDO	Col H. W. Penney (District Engineer)	Construction
17 Jan 61	CEBMCO	L. T. Rose	Property Records
17-19 Jan 61	CEBMCO	N. J. Bleckmann (Coordinator, Atlas F)	Construction
7-10 Feb 61	CEBMCO	N. J. Bleckmann (Coordinator, Atlas F)	Construction
21-24 Feb 61	CEBMCO	N. J. Bleckmann (Coordinator, Atlas F)	Construction
6-7 Mar 61	SWD	Maj John L. Lewis (Security Officer)	Security Insp
6-7 Mar 61	CEBMCO	W. O. Roy W. Lucas (Sec. Ofc)	Security Insp
7-8 Mar 61	CEBMCO	Brig Gen A. C. Welling & party (CG)	Command Insp
7-8 Mar 61	CEBMCO	Col W. W. Wilson (Director, Atlas F)	Construction
14-17 Mar 61	CEBMCO	N. J. Bleckmann (Coordinator, Atlas F)	Construction

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
28 Mar 61	OCE	Lt Col R. J. Shreder	Construction
3 Apr 61	CEBMCO	Maj F. W. Robson (Asst IG)	IG Staff Visit
5-6 Apr 61	CEBMCO	Lt Col T. F. Spencer & party (Exec Ofc, Atlas F)	Construction
10 Apr 61	CEBMCO	R. W. Miller (Coordinator, Atlas F)	Construction
10 Apr 61	CEBMCO	A. Davis (Records Management)	Office Records Insp
11-12 Apr 61	CE, Ft Worth	Mr. D. E. Walker	GFE Inspection
21-22 Apr 61	CEBMCO	Capt Patrick W. Marks (Liaison Officer, Atlas F)	Staff Visit
21-23 Apr 61	CEBMCO	Mr. Howard M. Gray (Office of Counsel)	Staff Visit
26-28 Apr 61	CEBMCO	Mr. L. H. Miller (Construction Br, Atlas F)	Staff Visit
30 Apr 61	Spencer J. Buchanan & Assoc.	Mr. H. N. Buchanan	Consulting Engr, Changed Conditions Claim
30 Apr 61	Spencer J. Buchanan & Assoc.	Mr. S. J. Buchanan	Consulting Engr, Changed Conditions Claim
1 May 61	CEBMCO	Mr. John J. Martin (Comptroller's Office, Property Acctg Br)	Prop Acctg
1 May 61	CEBMCO	Mr. Howard L. Edison (Safety Engineer)	Safety Survey
8-12 May 61	TDO	Mr. Emmett R. Graves (Audit Branch)	Audit of MKH
9-12 May 61	CEBMCO	Mr. John G. Schenk (Contract Admin Br, Atlas F)	Contract Admin

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
10-13 May 61	CEBMCO	Col W. W. Wilson (Director, Atlas F)	Special Conf & Insp
10-17 May 61	CEBMCO	Mr. John B. Wentzel (PSD)	PLS
16 May 61	CEBMCO	Mr. Arvil C. Sigmon (Engr Br, Atlas F)	Validation Procedures
23 May 61	TDO	Mr. George E. Fox (Office Services Branch)	Security
23-26 May 61	CEBMCO	Mr. John B. Wentzel (PSD)	PLS
23-26 May 61	CEBMCO	Mr. R. Miller (Construction Br, Atlas F)	Construction
24-26 May 61	CEBMCO	Capt Patrick W. Marks	PLS
8 Jun/1 Jul 61	CE Jacksonville	Mr. H. J. Bock (Labor Relations)	Labor Investigation
12-13 Jun 61	CEBMCO	Mr. P. E. Smith (Contr Admin Br, Atlas F)	Contr Admin
16 Jun 61	CEBMCO	Mr. C. G. Moore (Engr Branch)	OCE Soils Team
16 Jun 61	WES	Mr. W. G. Fosbby	OCE Soils Team
16 Jun 61	Ohio River Div Lab	Mr. F. M. Mellinger	OCE Soils Team
20 Jun 61	CEBMCO	Mr. James H. Devine (PSD)	PLS
21-23 Jun 61	CEBMCO	Lt Col T. F. Spencer (Exec Ofc, Atlas F)	Staff Visit
28-29 Jun 61	CE, Ft Worth	Mr. D. E. Walker	GFE Inspection
11 Jul 61	CEBMCO	Mr. R. W. Miller (Constr Br, Atlas F)	Staff Visit
25 Jul 61	CEBMCO	Mr. J. M. Peterson (Engr Br, Atlas F)	Staff Visit

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
26 Jul 61	CEBMCO	Col T. J. Hayes (CO)	Staff Visit
26-28 Jul 61	CEBMCO	Mr. Arvil C. Sigmon (Engr Br, Atlas F)	Validation
1 Aug 61	CEBMCO	Col W. W. Wilson (Director, Atlas F)	Ceremonies, Site 2
9-10 Aug 61	CEBMCO	Mr. James H. Devine (PSD)	PLS
9-10 Aug 61	CEBMCO	Mr. L. L. Phillips (Office of Counsel)	Staff Visit
10 Aug 61	CEBMCO	Mr. C. D. Daniel (Security Branch)	Security
10 Aug 61	CEBMCO	Mr. J. B. Wentzel (PSD)	PLS
10 Aug 61	CEBMCO	Mr. J. C. Brown (Office Services Br)	Vehicles
21 Aug 61	CEBMCO	Capt Patrick W. Marks (Liaison, Atlas F)	Staff Visit
21 Aug 61	CEBMCO	Maj Frank W. Robson	Staff Visit
9 Sep 61	BSSL	Lt Col E. J. Moses	Construction Costs
9 Sep 61	BSD	Mr. Ernest J. Prevost	Construction Costs
9 Sep 61	BSSS	Mr. H. Phizenmayer	Construction Costs
9 Sep 61	BSLMA	Mr. L. A. Evans	Construction Costs
9 Sep 61	BSSF	Capt P. T. Harting	Construction Costs
9 Sep 61	BSJ	Maj H. D. Moore	Construction Costs

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
9 Sep 61	BSD-BSBRG	Lt Col R. P. Gingland	Construction Costs
9 Sep 61	DCAS-DCC	Maj P. B. Chervis	Construction Costs
9-12 Sep 61	CEBMCO	Capt H. C. Littlefield (Program Control Officer)	Construction Costs
10-12 Sep 61	CEBMCO	Mr. Allan B. Aaron (Office of Counsel)	Construction Costs
9-12 Sep 61	CEBMCO	Lt Col J. F. Fishback (Operations Division)	Construction Costs
9-12 Sep 61	CEBMCO	Maj F. W. Robson (Asst IG)	Construction Costs
9-12 Sep 61	CEBMCO	Capt Patrick W. Marks (Liaison Ofc, Atlas F)	Construction Costs
15 Sep 61	TDO	Mr. Bill S. Eichert	Personnel Records
18-21 Sep 61	CEBMCO	Mr. Kendall M. Silva (Property Acctg Br)	Property
21-23 Sep 61	CEBMCO	Mr. Arvil C. Sigmon (Engr Branch, Atlas F)	Validation Tests
29 Sep 61	CEBMCO	Mr. J. B. Wentzel (PSD)	PLS
8-10 Oct 61	OCE	Mr. R. A. Gilman (Mil Construction Div)	Staff Visit
17 Oct 61	CEBMCO	Col T. J. Hayes (CO)	Staff Visit
17 Oct 61	CEBMCO	Col W. W. Wilson (Director Atlas F)	Contract Administration
17-20 Oct 61	OCE	Mr. M. L. Bopp	PLS
17-20 Oct 61	OCE	Mr. E. W. Smithman	PLS
16-20 Oct 61	CEBMCO	Mr. J. B. Wentzel (PSD)	PLS

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
23 Oct 61	CEBMCO	Mr. J. M. Peterson (Engr Br, Atlas F)	Estimates
23 Oct 61	CEBMCO	Mr. Delbert E. Lane (Atlas F)	Estimates
23-24 Oct 61	CE, Ft Worth	Mr. Max M. Rechter	PLS Contract
23-24 Oct 61	CE, Ft Worth	Mr. Charles G. Hazlewood	PLS Contract
23-25 Oct 61	CEBMCO	Maj Patrick W. Marks (PSD)	PLS
30 Oct 61	CEBMCO	Mr. LeRoy Aaron	Validation Test
7-9 Nov 61	BSD	Maj Gen A. C. Welling (Deputy for Site Activation)	Staff Visit
30 Nov 61	CEBMCO	Mr. A. Aaron (Office of Counsel)	Claims
8 Dec 61	CEBMCO	Mr. David Leitch	Personnel
18 Dec 61	CE, Ft Worth	Mr. T. F. Calvin	Audit - Hardeman Contract
15 Jan 62	CEBMCO	Mr. L. T. Rose	Property Records
15 Jan 62	CEBMCO	Mr. K. M. Silva	Property Records
15-16 Jan 62	CEBMCO Little Rock	Mr. C. R. Hacker	Water Supply, Site 6
15-16 Jan 62	CEBMCO	Mr. W. K. Stewart	Water Supply, Site 6
15-16 Jan 62	CEBMCO	Mr. S. Levenson	Water Supply, Site 6
29-31 Jan 62	CEBMCO	Mrs. Ann Davis	Area Records Management
2-3 Feb 62	TDO	Mr. Frank Connole	Contract Estimates

PERIOD	AGENCY	INSPECTOR	AREA INSPECTED
5-6 Feb 62	Los Angeles EIG Office	Mr. M. Robertson	Annual EIG Inspection
5-6 Feb 62	Chicago EIG Office	Col C. F. Townsend, CE (EIG)	Annual EIG
13-15 Feb 62	TDO	Mr. R. C. Losornio	GFP Records
12-14 Feb 62	CEBMCO	Mr. Robert Sikora	Missile Financial Status
13-15 Feb 62	CE, Albuquerque	Mr. S. L. Pearson	Water Supply, Site 6
13-15 Feb 62	CE, Albuquerque	Mr. D. B. Carothers	Water Supply, Site 6
15 Feb 62	CE, Albuquerque	Mr. Louie Bradley	Review of Transfer
15 Feb 62	CEBMCO	Col W. W. Wilson, CE (Director, Atlas F)	Staff Visit
17-25 Feb 62	CEBMCO	Capt R. A. Bush, CE	Contractor Labor Costs
21-22 Mar 62	CE, Albuquerque	Mr. J. P. Pearson	Coordination of Follow-On Work
11-13 Apr 62	CEBMCO	Mr. J. B. Wentzel	Inspection of Gaseous High Pressure Vessels
12-19 Apr 62	CEBMCO	Col W. W. Wilson, CE (Director, Atlas F)	Inspection of Gaseous High Pressure Vessels
17-21 Apr 62	CEBMCO	Major F. W. Robson, CE	Inspection of Gaseous High Pressure Vessels
17 Apr 62	CE, Albuquerque	Mr. Louie Bradley	Coordination of Follow-On Work

APPENDIX E

KEY PERSONNEL OF ALTUS AREA*

NAME	RANK or GRADE	POSITION
	EXECUTIVE OFFICE	
Carl F. Baswell	Lt Col, CE	Area Engineer
Walden J. Evans	GS-14	Deputy Area Engineer
Samuel C. Wood	Maj, CE	Executive Officer
		Military Assistant
		Liaison Officer
		Briefing Officer
James R. McKnight	Capt, CE	Security Officer
	SAFETY BRANCH	
John E. Geiglein	GS-12	Safety Officer
	OFFICE OF COUNSEL	
Maurice F. Ellison, Jr.	GS-12	Attorney-Advisor
Robert E. Moore	GS-11	Labor Relations Officer
	ADMINISTRATION BRANCH	
William J. Forsyth	GS-11	Chief of Branch

* As of 1 July 1961

ENGINEERING BRANCH

C. Charles Hawkins	GS-13	Chief of Branch
William E. Lee, Jr.	1/Lt, CE	Military Assistant

CONTRACT ADMINISTRATION BRANCH

Paul T. Roberds, Jr.	GS-13	Chief of Branch

CONSTRUCTION BRANCH

Ira E. Williams	GS-14	Chief of Branch
William E. McGowan	GS-12	Supv Constr Mgt Engr

PROPELLANT LOADING SYSTEM BRANCH

Robert P. McMath	Maj, CE	Chief of Branch
Russell L. Koger	GS-13	PLS Engr Control

ALTUS AFB PROJECT

Frank B. Hawkins	GS-12	Supv Constr Rep

CONSTRUCTION SECTOR 1

Felix P. Miller, Jr.	GS-12	Sector Engineer
Homer H. Stewart	GS-12	Project Engineer, Site 2
Ben L. Porter	GS-12	Project Engineer, Site 3
Kermit V. Evans	GS-12	Project Engineer, Site 4
Horace D. Brown	GS-12	Project Engineer, Site 11

CONSTRUCTION SECTOR 2

Walter P. Tokarz	Capt, CE	Sector Engineer
Royce W. Anstead	GS-12	Project Engineer, Site 1
Gordon S. Dilley	GS-12	Project Engineer, Site 11 and Site 12
Malcolm J. Babb	GS-10	Project Engineer, Site 10

CONSTRUCTION SECTOR 3

James R. McKnight	Capt, CE	Sector Engineer (temporary)
Jack L. Crawford	GS-12	Project Engineer, Site 5
Bradford Camp	GS-12	Project Engineer, Site 6
James L. Findley	GS-12	Project Engineer, Site 7
Russell E. Richardson	GS-12	Project Engineer, Site 8

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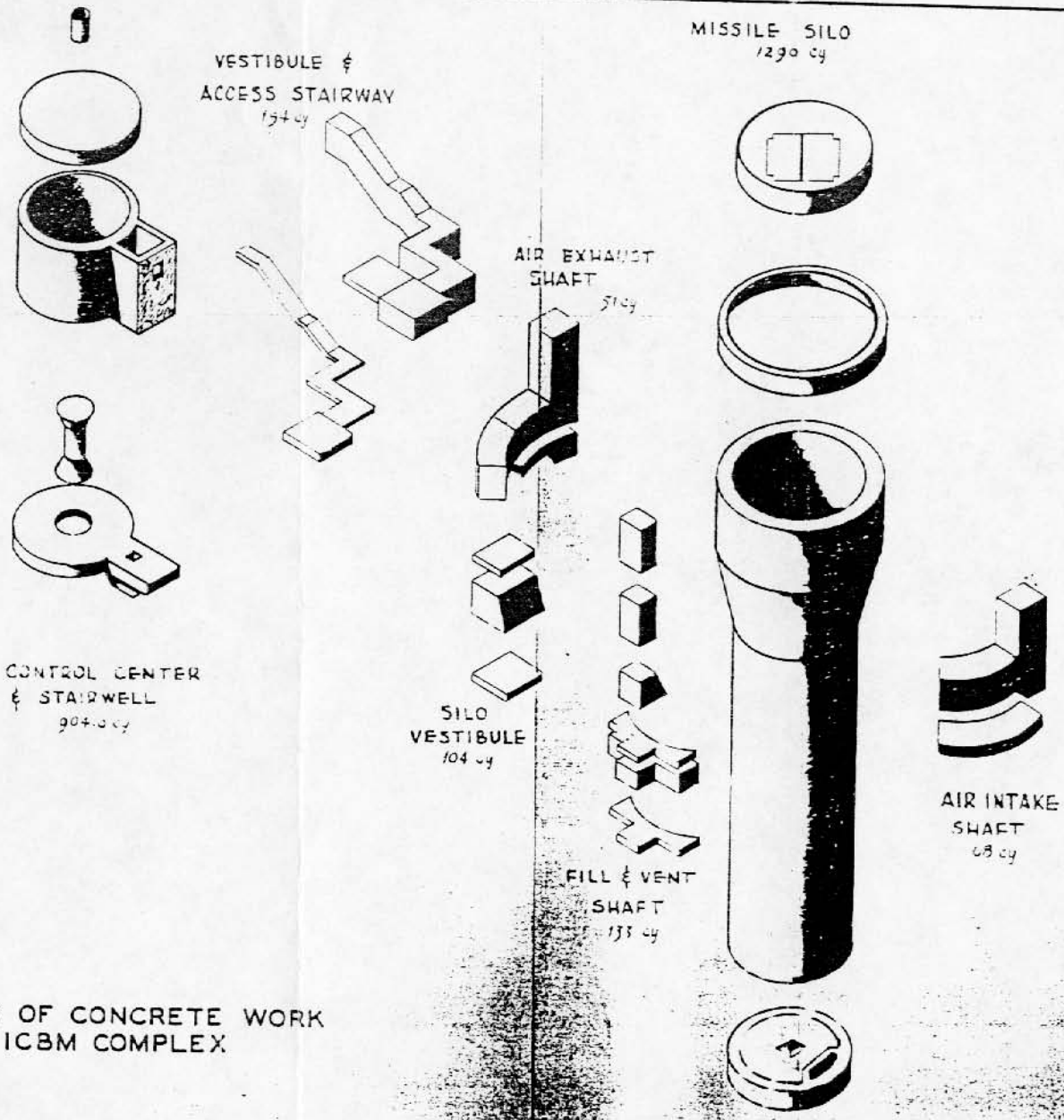
APPENDIX G



EXPLODED VIEW OF CONCRETE WORK
ATLAS F ICBM COMPLEX

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